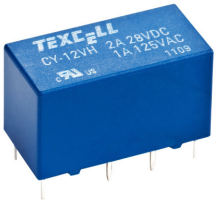
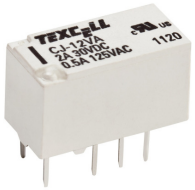
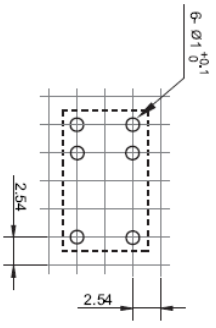
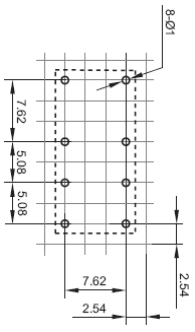
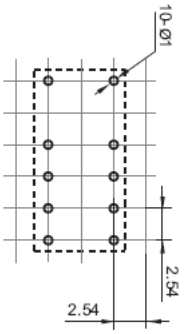
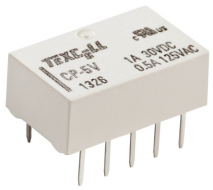
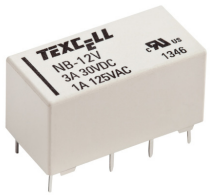
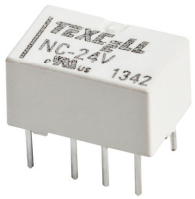
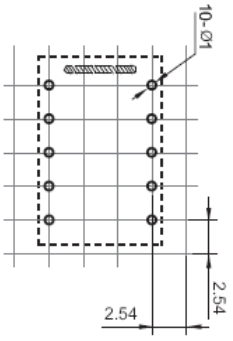
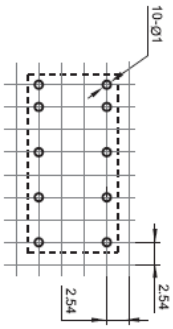
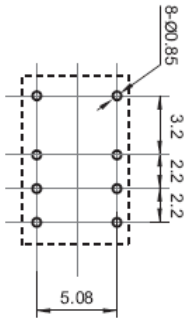
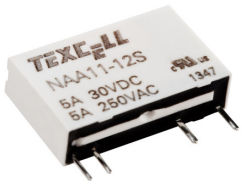
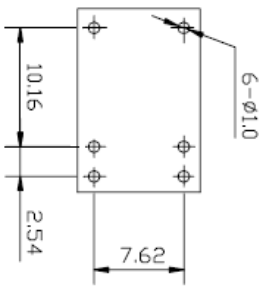
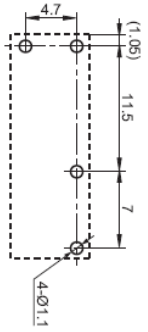
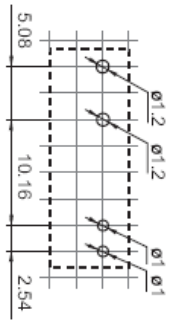
TEXCELL RELAY SELECTION GUIDE

Model		TY	CY	CJ
Appearance				
Outline Dimension: L x W x H (mm)		12.5 x 7.5 x 10.0	20.2 x 10.0 x 11. 5	15.0 x 7.5 x 9.0(9.4)
Contact	Contact Arrangement	1C	2C	2C
	Contact Resistance	100mΩ	100mΩ	100mΩ
	Contact Material	AgNi + Au plated	AgNi + Au plated	AgNi + Au plated
	Contact Ratings (Resistive Load)	0.5A 125VAC 1A 30VDC	1A 125VAC 2A 30VDC	0.5A 125VAC 2A 30VDC
	Max. Switching Current	2A	2A	2A
	Max. Switching Voltage	125VAC / 60VDC	240VAC / 120VDC	250VAC / 220VDC
	Max. Switching Power	62.5VA / 30W	125VA / 60W	62.5VA / 60W
Coil	Rated Voltage	1.5~24VDC	3~24VDC	1.5~48VDC
	Coil Power	150mW, 200mW	150mW, 200mW	100mW, 140mW, 200mW
Insulation Resistance		1000MΩ	1000MΩ	1000MΩ
Dielectric Strength	Open Contacts	400VAC	1000 / 750VAC	1000 / 1500VAC
	Coil and Contacts	1000VAC	1500VAC	2000 / 3000VAC
	Contact Sets	-	-	1500VAC
Temprtature Range		-30 to 70℃	-40 to 85℃	-40 to 85℃
Operate / Release Time (max.)		5ms / 5ms	7ms / 4ms	4ms/4ms, 6ms/6ms
Electrical Endurance (min.)		100,000	100,000	100,000
Mechanical Endurance (min.)		10,000,000	100,000,000	10,000,000
Weight (Approx.)		2.2g	5g	2g
Lay Out (Bottom View)				
Terminal Type		PCB (DIP)	PCB (DIP)	PCB (DIP, SMT)
Approved Standards		UL, cUL	UL, cUL	UL, cUL
Page		15	19	23

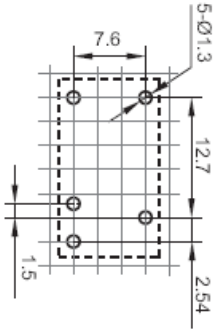
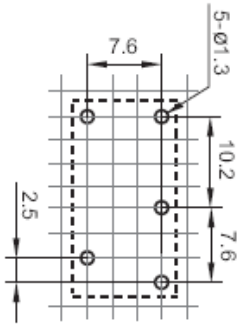
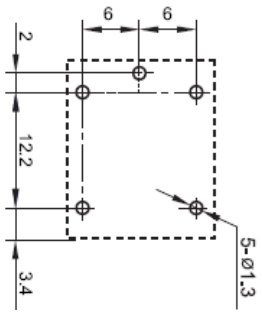
TEXCELL RELAY SELECTION GUIDE

Model		CP	NB	NC
Appearance				
Outline Dimension: L x W x H (mm)		14.0 x 9.0 x 5.0	20.2 x 10.2 x 10.6	10.0 x 6.5 x 5.4
Contact	Contact Arrangement	2C	2C	2C
	Contact Resistance	100mΩ	100mΩ	100mΩ
	Contact Material	AgNi + Au plated	Ag + Gold plated	AgNi + Au plated
	Contact Ratings (Resistive Load)	0.5A 125VAC 1A 30VDC	1A 125VAC 2/3A 30VDC	0.5A 125VAC 2A 30VDC
	Max. Switching Current	2A	3A	2A
	Max. Switching Voltage	125VAC / 110VDC	250VAC / 220VDC	250VAC / 220VDC
	Max. Switching Power	62.5VA / 30W	125VA / 90W	62.5VA / 60W
Coil	Rated Voltage	1.5~24VDC	3~48VDC	1.5~24VDC
	Coil Power	100mW, 140mW, 200mW	75mW, 100mW, 150mW, 200mW	100mW, 140mW, 200mW
Insulation Resistance		1000MΩ	1000MΩ	1000MΩ
Dielectric Strength	Open Contacts	750VAC	1000VAC	1000VAC
	Coil and Contacts	1000VAC	1000 / 1500VAC	1600VAC
	Contact Sets	1000VAC	-	1800VAC
Temprtature Range		-40 to 70℃	-40 to 85℃	-40 to 85℃
Operate / Release Time (max.)		3ms / 3ms	4.5ms/3.5ms, 4.5ms/4.5ms	3ms / 3ms
Electrical Endurance (min.)		100,000	50,000	100,000
Mechanical Endurance (min.)		100,000,000	100,000,000	100,000,000
Weight (Approx.)		1.5g	4.5g	0.8g
Lay Out (Bottom View)				
Terminal Type		PCB (DIP, SMT)	PCB (DIP)	PCB (DIP, SMT)
Approved Standards		UL, cUL	UL, cUL	UL, cUL
Page		34	41	47

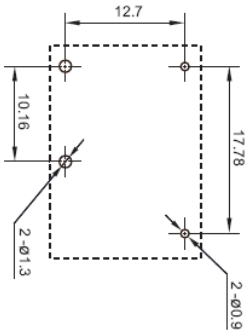
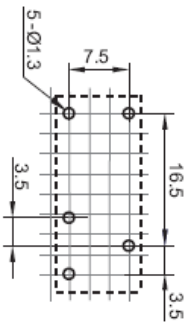
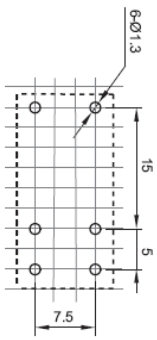
TEXCELL RELAY SELECTION GUIDE

Model		TA	CU	NA
Appearance				
Outline Dimension: L x W x H (mm)		15.7 x 10.4 x 11.7	20.5 x 7.0 x 15.3	20.0 x 5.0 x 12.5
Contact	Contact Arrangement	1A, 1C	1A	1A
	Contact Resistance	100mΩ	100mΩ	100mΩ
	Contact Material	AgNi	AgNi	AgNi, $AgSnO_2$
	Contact Ratings (Resistive Load)	3A 120VAC 3A 24VDC	5/7A 250VAC 5/7A 30VDC	5A 250VAC 5A 30VDC
	Max. Switching Current	5A	5/10A	5A
	Max. Switching Voltage	240VAC / 60VDC	277VAC / 30VDC	250VAC / 30VDC
	Max. Switching Power	360VA / 90W	2770VA / 300W	1250VA / 150W
Coil	Rated Voltage	3~48VDC	3~24VDC	5~24VDC
	Coil Power	200mW, 360mW, 450mW	200mW	120~180mW
Insulation Resistance		100MΩ	1000MΩ	1000MΩ
Dielectric Strength	Open Contacts	500VAC	1000VAC	1000VAC
	Coil and Contacts	1000VAC	4000VAC	3000VAC
	Contact Sets	-	-	-
Temperature Range		-30 to 85℃	-40 to 85℃	-40 to 85℃
Operate / Release Time (max.)		5ms / 5ms	10ms / 10ms	10ms / 5ms
Electrical Endurance (min.)		100,000	100,000	100,000
Mechanical Endurance (min.)		10,000,000	5,000,000	20,000,000
Weight (Approx.)		3.5g	3g	3g
Lay Out (Bottom View)				
Terminal Type		PCB (DIP)	PCB	PCB
Approved Standards		UL, cUL	UL, cUL	UL, cUL
Page		55	60	64

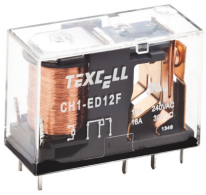
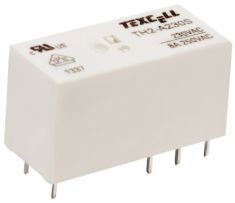
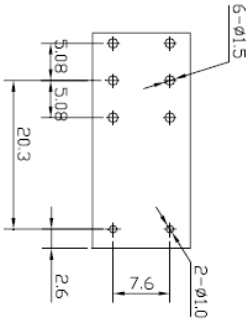
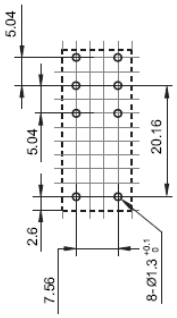
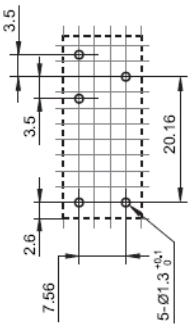
TEXCELL RELAY SELECTION GUIDE

Model		CS	NS	NKB
Appearance				
Outline Dimension: L x W x H (mm)		18.4 x 10.2 x 15.3	20.5 x 10.2 x 15.3	19.0 x 15.2 x 15.5
Contact	Contact Arrangement	1A, 1C	1A, 1C	1A, 1C
	Contact Resistance	100mΩ	100mΩ	100mΩ
	Contact Material	AgNi, $AgSnO_2$	AgNi	$AgSnO_2$, AgCdO
	Contact Ratings (Resistive Load)	10A 250VAC 10A 30VDC	5A 250VAC 5A 30VDC	10A 277VAC 10A 28VDC
	Max. Switching Current	10A	10A	15A
	Max. Switching Voltage	277VAC / 30VDC	250VAC / 30VDC	277VAC / 28VDC
	Max. Switching Power	2770VA / 300W	1250VA / 150W	2770VA / 280W
Coil	Rated Voltage	3~48VDC	3~48VDC	5~48VDC
	Coil Power	200mW, 450mW	200mW, 450mW	360mW
Insulation Resistance		1000MΩ	1000MΩ	100MΩ
Dielectric Strength	Open Contacts	1000VAC	1000VAC	750VAC
	Coil and Contacts	4000 / 2500VAC	4000VAC	1500VAC
	Contact Sets	-	-	-
Temperature Range		-40 to 85℃	-40 to 70℃	-40 to 70℃
Operate / Release Time (max.)		8ms / 5ms	8ms / 5ms	10ms / 5ms
Electrical Endurance (min.)		100,000	100,000	100,000
Mechanical Endurance (min.)		10,000,000	5,000,000	10,000,000
Weight (Approx.)		6g	7g	10g
Lay Out (Bottom View)				
Terminal Type		PCB	PCB	PCB
Approved Standards		UL, cUL	UL, cUL	UL, cUL, TUV, CQC
Page		68	74	78

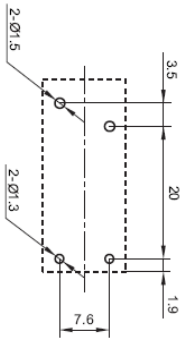
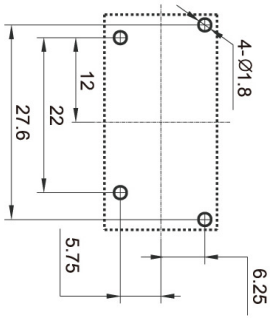
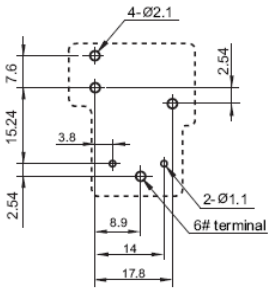
TEXCELL RELAY SELECTION GUIDE

Model		CQ	CK	CN
Appearance				
Outline Dimension: L x W x H (mm)		22.0 x 16.0 x 10.5	24.5 x 10.5 x 24.5	24.4 x 12.8 x 24.8
Contact	Contact Arrangement	1A, 1C	1A, 1C	2A
	Contact Resistance	100mΩ	100mΩ	100mΩ
	Contact Material	$AgSnO_2$	$AgSnO_2$	$AgSnO_2$
	Contact Ratings (Resistive Load)	16A 125VAC 10A 30VDC	10A 250VAC 10A 30VDC	5A 250VAC 5A 30VDC
	Max. Switching Current	16A	10A	5A
	Max. Switching Voltage	250VAC / 30VDC	250VAC / 110VDC	250VAC / 30VDC
	Max. Switching Power	4000VA / 300W	2500VA / 300W	1250VA / 150W
Coil	Rated Voltage	5~48VDC	5~48VDC	5~48VDC
	Coil Power	200mW, 400mW	250mW, 530mW, 540mW	530mW
Insulation Resistance		1000MΩ	100MΩ	1000MΩ
Dielectric Strength	Open Contacts	1000VAC	900VAC	1000VAC
	Coil and Contacts	2500VAC	4000VAC	4000VAC
	Contact Sets	-	-	2000VAC
Temperature Range		-40 to 105℃	-30 to 70℃	-40 to 70℃
Operate / Release Time (max.)		15ms / 5ms	15ms / 8ms	15ms / 10ms
Electrical Endurance (min.)		100,000	100,000	50,000
Mechanical Endurance (min.)		10,000,000	10,000,000	10,000,000
Weight (Approx.)		8g	11g	14.5g
Lay Out (Bottom View)				
Terminal Type		PCB	PCB	PCB
Approved Standards		UL, cUL	UL, cUL, TUV	UL, cUL
Page		82	87	91

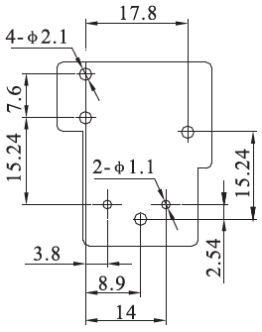
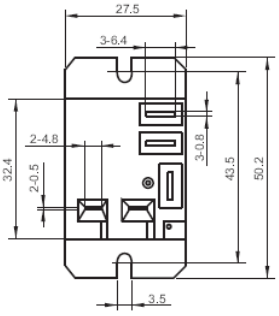
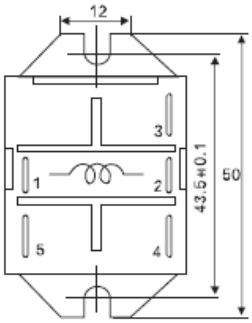
TEXCELL RELAY SELECTION GUIDE

Model		CH	TH	THD
Appearance				
Outline Dimension: L x W x H (mm)		29.0 x 12.7 x 20.0	29.0 x 12.7 x 15.7	29.0 x 12.7 x 15.7
Contact	Contact Arrangement	1A, 1C, 2A, 2C	1A, 1B, 1C, 2A, 2B, 2C	1A, 1C
	Contact Resistance	100mΩ	100mΩ	100mΩ
	Contact Material	$AgSnO_2$	AgNi	AgNi
	Contact Ratings (Resistive Load)	16A 240VAC 16A 30VDC	16A 250VAC	16A 250VAC
	Max. Switching Current	20A	16A	16A
	Max. Switching Voltage	250VAC / 30VDC	440VAC / 300VDC	440VAC / 300VDC
	Max. Switching Power	4800VA / 480W	4000VA	4000VA
Coil	Rated Voltage	3~48VDC	5~110VDC, 24~230VAC	5~48VDC
	Coil Power	240mW, 540mW	400mW, 0.75VA	400mW
Insulation Resistance		100MΩ	1000MΩ	1000MΩ
Dielectric Strength	Open Contacts	1000VAC	1000VAC	1000VAC
	Coil and Contacts	5000VAC	5000VAC	5000VAC
	Contact Sets	-	2500VAC	-
Temperature Range		-40 to 85℃	-40 to 85℃	-40 to 85℃
Operate / Release Time (max.)		20ms / 10ms	15ms / 8ms	15ms / 8ms
Electrical Endurance (min.)		100,000	100,000	100,000
Mechanical Endurance (min.)		10,000,000	10,000,000	10,000,000
Weight (Approx.)		14g	13.5g	13.5g
Lay Out (Bottom View)				
Terminal Type		PCB	PCB	PCB
Approved Standards		UL, cUL	UL, cUL, VDE	UL, cUL
Page		94	104	109

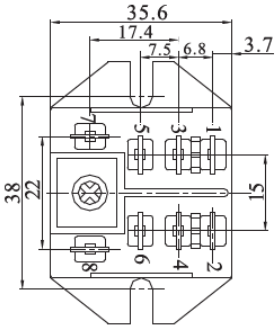
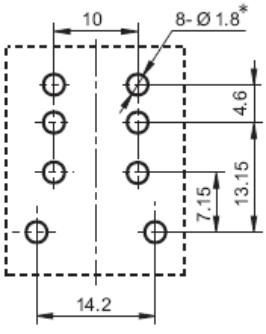
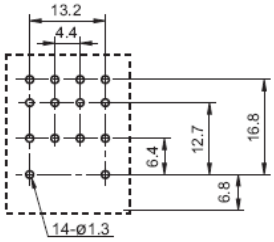
TEXCELL RELAY SELECTION GUIDE

Model		KH	NG	CT
Appearance				
Outline Dimension: L x W x H (mm)		29.0 x 12.6 x 24.4	30.2 x 15.8 x 23.3	32.3 x 27.1 x 20.0
Contact	Contact Arrangement	1A	1A	1A, 1B, 1C
	Contact Resistance	50mΩ	100mΩ	50mΩ
	Contact Material	$AgSnO_2$	$AgSnO_2$	$AgSnO_2$
	Contact Ratings (Resistive Load)	16A 250VAC 16A 30VDC	20A 250VAC 20A 30VDC	30A 240VAC 20A 28VDC
	Max. Switching Current	16A	25A	40A
	Max. Switching Voltage	277VAC / 30VDC	250VAC	277VAC / 28VDC
	Max. Switching Power	4000VA / 480W	6250VA	7200VA / 560W
Coil	Rated Voltage	5~48VDC	5~48VDC	5~110VDC, 12~277VAC
	Coil Power	540mW	900mW	900mW, 2VA
Insulation Resistance		1000MΩ	1000MΩ	1000MΩ
Dielectric Strength	Open Contacts	1000VAC	1500VAC	1500VAC
	Coil and Contacts	5000VAC	4500VAC	4000 / 2500VAC
	Contact Sets	-	-	-
Temperature Range		-40 to 105℃	-25 to 85℃	-55 to 85℃
Operate / Release Time (max.)		20ms / 10ms	15ms / 5ms	15ms / 10ms
Electrical Endurance (min.)		100,000	100,000	100,000
Mechanical Endurance (min.)		10,000,000	10,000,000	10,000,000
Weight (Approx.)		15g	23g	36g
Lay Out (Bottom View)				
Terminal Type		PCB, PCB & QC	PCB, PCB & QC	PCB, PCB & QC
Approved Standards		UL, cUL	UL, cUL	UL, cUL
Page		114	118	122

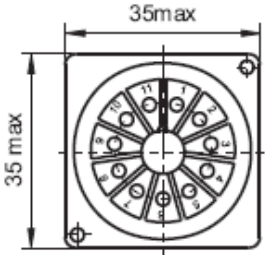
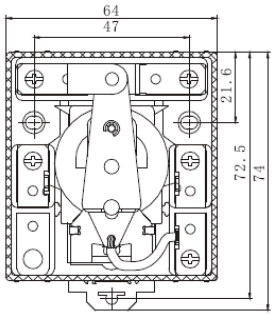
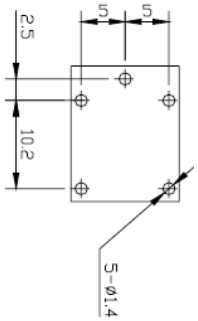
TEXCELL RELAY SELECTION GUIDE

Model		NCT	TNC	CHP
Appearance				
Outline Dimension: L x W x H (mm)		32.5 x 27.6 x 20.2	50.0 x 27.2 x 27.8	50.0 x 32.0 x 29.0
Contact	Contact Arrangement	1A, 1B, 1C	1A, 1B, 1C	1A, 1B, 1C
	Contact Resistance	100mΩ	50mΩ	100mΩ
	Contact Material	$AgSnO_2$	$AgSnO_2$	$AgSnO_2$
	Contact Ratings (Resistive Load)	40A 240VAC 40A 28VDC	30A 240VAC 20A 28VDC	15A 250VAC 15A 30VDC
	Max. Switching Current	40A	40A	15A
	Max. Switching Voltage	240VAC / 28VDC	277VAC / 28VDC	250VAC / 30VDC
	Max. Switching Power	9600VA / 1120W	7200VA / 560W	3750VA / 450W
Coil	Rated Voltage	6~48VDC	5~110VDC, 12~277VAC	6~110VDC, 6~240VAC
	Coil Power	930mW	900mW, 2VA	900mW, 1.2VA
Insulation Resistance		100MΩ	1000MΩ	1000MΩ
Dielectric Strength	Open Contacts	1500VAC	1500VAC	1000VAC
	Coil and Contacts	1500VAC	2500VAC	1500VAC
	Contact Sets	-	-	-
Temperature Range		-55 to 70℃	-55 to 85℃	-40 to 85℃
Operate / Release Time (max.)		15ms / 10ms	15ms / 10ms	20ms / 20ms
Electrical Endurance (min.)		100,000	100,000	100,000
Mechanical Endurance (min.)		10,000,000	10,000,000	10,000,000
Weight (Approx.)		33g	36g	45g
Lay Out (Bottom View)				
Terminal Type		PCB	QC	QC
Approved Standards		TUV	UL, cUL	-
Page		127	131	135

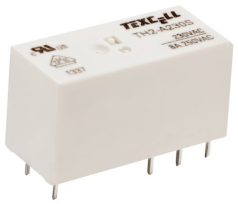
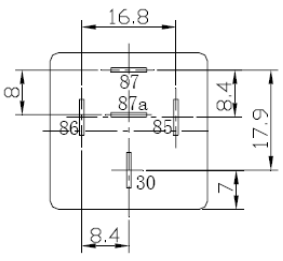
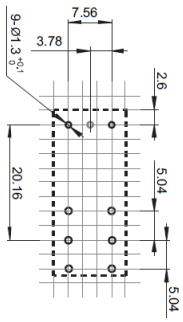
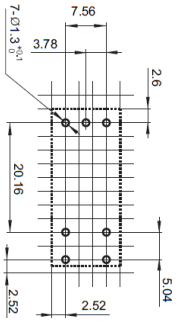
TEXCELL RELAY SELECTION GUIDE

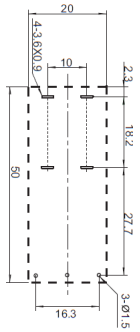
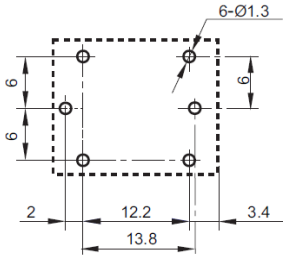
Model		NY	KML	KMH
Appearance				
Outline Dimension: L x W x H (mm)		50.0 x 35.6 x 47.7	28.0 x 21.5 x 35.0	28.0 x 21.5 x 35.0
Contact	Contact Arrangement	1C, 2C	1C, 2C, 3C, 4C	2C, 3C, 4C
	Contact Resistance	100mΩ	100mΩ	100mΩ
	Contact Material	AgCdO	AgCe, $AgSnO_2$	$AgSnO_2$
	Contact Ratings (Resistive Load)	30A 250VAC 30A 28VDC	15A 250VAC 15A 30VDC	7A 250VAC 7A 30VDC
	Max. Switching Current	30A	15A	7A
	Max. Switching Voltage	250VAC / 28VDC	250VAC / 30VDC	250VAC / 30VDC
	Max. Switching Power	7500VA / 840W	3750VA / 450W	210W / 1750VA
Coil	Rated Voltage	6~110VDC, 12~240VAC	5~220VDC, 6~240VAC	5~110VDC, 6~240VAC
	Coil Power	2500mW, 4VA	900~1100mW, 1.2~1.8VA	900~1100mW, 1.2~1.8VA
Insulation Resistance		1000MΩ	500MΩ	1000MΩ
Dielectric Strength	Open Contacts	1200VAC	1000VAC	1000VAC
	Coil and Contacts	2500VAC	1500VAC	1500VAC
	Contact Sets	-	1500VAC	1500VAC
Temperature Range		-40 to 70℃	-40 to 70℃	-40 to 70℃
Operate / Release Time (max.)		20ms / 15ms	25ms / 25ms	25ms / 25ms
Electrical Endurance (min.)		10,000	100,000	100,000
Mechanical Endurance (min.)		10,000,000	10,000,000	20,000,000
Weight (Approx.)		70g	37g	37g
Lay Out (Bottom View)				
Terminal Type		QC	PCB, Plug-in	PCB, Plug-in
Approved Standards		-	UL, cUL	UL, cUL
Page		139	142	150

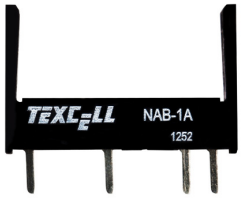
TEXCELL RELAY SELECTION GUIDE

Model		KMK	NX	KA
Appearance				
Outline Dimension: L x W x H (mm)		35.0 x 35.0 x 55.0	74.0 x 64.0 x 56.8	15.7 x 12.3 x 14.0
Contact	Contact Arrangement	2C, 3C	1C, 2A, 2C	1A, 1C
	Contact Resistance	100mΩ	100mΩ	100mΩ
	Contact Material	$AgSnO_2$	AgCdO	$AgSnO_2$
	Contact Ratings (Resistive Load)	10A 250VAC 10A 30VDC	100A 250VAC 100A 28VDC	NO: 20A 14VDC NC: 12A 14VDC
	Max. Switching Current	10A	100A	25A
	Max. Switching Voltage	250VAC / 30VDC	250VAC / 28VDC	250VAC / 16VDC
	Max. Switching Power	2500VA / 300W	25000VA / 2800W	840VA / 280W
Coil	Rated Voltage	6~110VDC, 6~230VAC	6~220VDC, 6~380VAC	6~24VDC
	Coil Power	1500mW, 2.7VA	3000mW, 10VA	600mW, 800mW
Insulation Resistance		500MΩ	1000MΩ	100MΩ
Dielectric Strength	Open Contacts	1000VAC	1500VAC	500VAC
	Coil and Contacts	1500VAC	2500VAC	500VAC
	Contact Sets	-	2500VAC	-
Temperature Range		-40 to 55℃	-25 to 55℃	-40 to 85℃
Operate / Release Time (max.)		30ms / 30ms	30ms / 30ms	10ms / 5ms
Electrical Endurance (min.)		100,000	100,000	100,000
Mechanical Endurance (min.)		10,000,000	1,000,000	10,000,000
Weight (Approx.)		90g	240g, 245g, 300g	6g
Lay Out (Bottom View)				
Terminal Type		Octal and Undecal Type Plug	Screw Mounting	PCB
Approved Standards		UL, cUL	-	UL, cUL
Page		156	160	164

TEXCELL RELAY SELECTION GUIDE

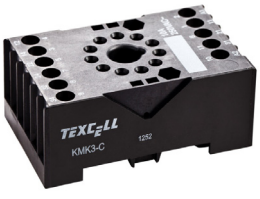
Model		HY	THL	THLS
Appearance				
Outline Dimension: L x W x H (mm)		28.0 x 28.0 x 25.0	29.0 x 12.7 x 15.7	29.0 x 12.7 x 15.7
Contact	Contact Arrangement	1A, 1B, 1C, 1U	1A, 1C, 2A, 2C	1A
	Contact Resistance	100mΩ	100mΩ	100mΩ
	Contact Material	$AgSnO_2$	$AgSnO_2$	W + $AgSnO_2$
	Contact Ratings (Resistive Load)	NO: 40A 14VDC NC: 30A 14VDC	16A 250VAC	16A 250VAC
	Max. Switching Current	40A	20A	16A
	Max. Switching Voltage	30VDC	440VAC / 300VDC	440VAC
	Max. Switching Power	560W	4000VA	4000VA
Coil	Rated Voltage	6~24VDC	5~24VDC	5~24VDC
	Coil Power	1600mW, 1900mW	400mW, 600mW	400mW, 600mW
Insulation Resistance		100MΩ	1000MΩ	1000MΩ
Dielectric Strength	Open Contacts	500VAC	1000VAC	1250VAC
	Coil and Contacts	750VAC	5000VAC	5000VAC
	Contact Sets	-	2500VAC	-
Temprtature Range		-40 to 85℃	-40 to 85℃	-40 to 85℃
Operate / Release Time (max.)		10ms / 10ms	10ms / 10ms	10ms / 10ms
Electrical Endurance (min.)		100,000	50,000	6,000
Mechanical Endurance (min.)		10,000,000	2,000,000	2,000,000
Weight (Approx.)		40g	13.5g	13.5g
Lay Out (Bottom View)				
Terminal Type		PCB, Plug-in	PCB	PCB
Approved Standards		-	UL, cUL	UL, cUL
Page		168	173	178

Model		AL	NKBL	
Appearance				
Outline Dimension: L x W x H (mm)		50.0 x 27.0 x 20.0	19.0 x 15.2 x 15.5	
Contact	Contact Arrangement	1A + 1B	1A, 1C	
	Contact Resistance	100mΩ	100mΩ	
	Contact Material	$AgSnO_2$	$AgSnO_2$	
	Contact Ratings (Resistive Load)	25A 277VAC	10A 277VAC 10A 30VDC	
	Max. Switching Current	25A	15A	
	Max. Switching Voltage	277VAC	277VAC / 30VDC	
	Max. Switching Power	6925VA	2770VA / 300W	
Coil	Rated Voltage	5~48VDC	5~48VDC	
	Coil Power	1200mW, 2400mW	400mW, 800mW	
Insulation Resistance		1000MΩ	100MΩ	
Dielectric Strength	Open Contacts	2000VAC	750VAC	
	Coil and Contacts	5000VAC	2000VAC	
	Contact Sets	-	-	
Temprtature Range		-40 to 85℃	-40 to 85℃	
Operate / Release Time (max.)		25ms / 25ms	8ms / 5ms	
Electrical Endurance (min.)		30,000	10,000	
Mechanical Endurance (min.)		600,000	10,000,000	
Weight (Approx.)		45g	9g	
Lay Out (Bottom View)				
Terminal Type		PCB	PCB	
Approved Standards		UL, cUL	UL, cUL	
Page		182	186	

Model	NA sockets	CH sockets	TH, THD sockets
Appearance			
Part numbers	NAA-1A, NAB-1A	TH-1C, TH-2C	
Page	191	192	193

Model	KML sockets		
Appearance			
Part numbers	KML2-B	KML2-C	KML3-C
Page	194	195	196

Model	KML sockets	KMH sockets	
Appearance			
Part numbers	KML4-C	KMH2-B, KHM3-B, KMH4-B	KMH2-C, KMH3-C, KMH4-C
Page	196	197	199

Model	KMK sockets		
Appearance			
Part numbers	KMK2-A, KMK3-A	KMK2-B, KMK3-B	KMK2-C, KMK3-C
Page	201	202	203

Subminiature Signal Relay	TY

Features

- 1 Form C (SPDT-NO) configuration
- Max. 2A switching capability
- High sensitive: 150mW
- Plastic sealed type

c UL us
(File No.:E122258)

1. COIL DATA (at 23℃)

1) Standard Type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
1.5	1.20	0.15	2.25	133	11.3 x (1±10%)	200
2.4	1.92	0.24	3.60	83.3	28.8 x (1±10%)	
3	2.40	0.30	4.50	66.7	45 x (1±10%)	
4.5	3.60	0.45	5.75	57.1	101.3 x (1±10%)	
5	4.00	0.50	7.50	40.0	125 x (1±10%)	
6	4.80	0.60	9.00	33.3	180 x (1±10%)	
9	7.20	0.90	13.5	22.2	405 x (1±10%)	
12	9.60	1.20	18.0	16.7	720 x (1±10%)	
24	19.2	2.40	36.0	8.33	2880 x (1±15%)	

2) Sensitive Type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
1.5	1.20	0.15	2.25	100	15 x (1±10%)	150
2.4	1.90	0.24	3.6	62.5	38.4 x (1±10%)	
3	2.40	0.30	4.50	50.0	60 x (1±10%)	
4.5	3.60	0.45	5.75	33.3	135 x (1±10%)	
5	4.00	0.50	7.50	30.0	167 x (1±10%)	
6	4.80	0.60	9.00	25.0	240 x (1±10%)	
9	7.20	0.90	13.5	16.7	540 x (1±10%)	
12	9.60	1.20	18.0	12.5	960 x (1±10%)	
24	19.2	2.40	36.0	6.25	3840 x (1±15%)	

Notes: In case of 5V of transistor drive circuit, it is recommended to be use 4.5V type relay, and 3V to use 2.4V type relay.

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2. CONTACT DATA

Contact Arrangement		1 Form C (SPDT-NO)
Contact Resistance		100mΩ max. (at 10mA 30mVDC)
Contact Material		AgNi + Au plated
Contact Ratings (Resistive Load)		0.5A 125VAC / 1A 30VDC
Max. Switching Voltage		125VAC / 60VDC
Max. Switching Current		2A
Max. Switching Power		62.5VA / 30W
Min. Applicable Load[1)]		1mA 5V
Life Expectancy[2)]	Electrical	90,000
	Mechanical	10,000,000

Notes:

1) Minimum applicable load is reference value. Please perform the confirmation test with the actual load before production since reference value may change according to switching frequencies, environmental conditions, expected contact resistance and reliability.

2) Life expectancy data are collected in the NO or NC contact test.

3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	400VAC 1min
	Coil and Contacts	1000VAC 1min
Operate Time (at nominal voltage)		5ms max.
Release Time (at nominal voltage)		5ms max.
Temperature Rise (at nominal voltage)		65K max.
Temperature Range		-30℃ ~ 70℃
Shock Resistance	Functional	98 m/s^2
	Destructive	980 m/s^2
Vibration Resistance		10 ~ 55Hz, 3.3mm DA
Humidity		5 ~ 85% RH
Termination		PCB (DIP)
Weight		Approx. 2.2g
Outline Dimension (L x W x H)		12.5 x 7.5 x 10.0 mm

Notes:

1) The data shown above are initial values.

2) UL insulation system: Class A

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4. SAFETY APPROVAL RATINGS

Safety Standard	Contact Form	Contact Rating
UL/cUL	1 Form C	0.5A 125VAC 1A 30VDC 0.3A 60VDC

Notes:

1) All values unspecified are at room temperature

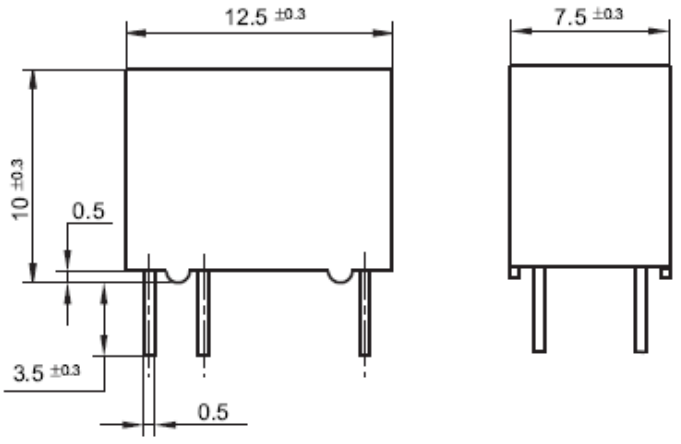
2) Only typical loads are listed above. Other load specifications can be available upon request.

5. ORDERING INFORMATION

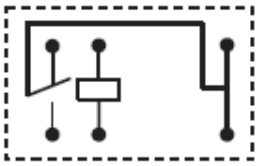
TY - 12 S H ① ② ③ ④	
① Relay Model	TY
② Coil Voltage	1.5=1.5VDC, 2.4=2.4VDC 3=3VDC, 4.5=4.5VDC, 5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 24=24VDC
③ Construction	S: Sealed Type
④ Coil Power	Nil: Standard Type (200mW) H: Sensitive Type (150mW)

6. DIMENSIONS (Unit: mm)

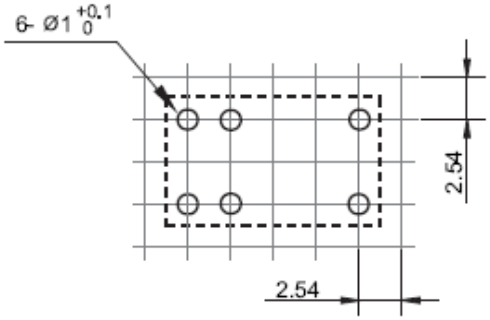
Outline Dimensions



Wiring Diagram
(Bottom View)



PCB Layout
(Bottom View)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm

3) The width of the gridding is 2.54mm

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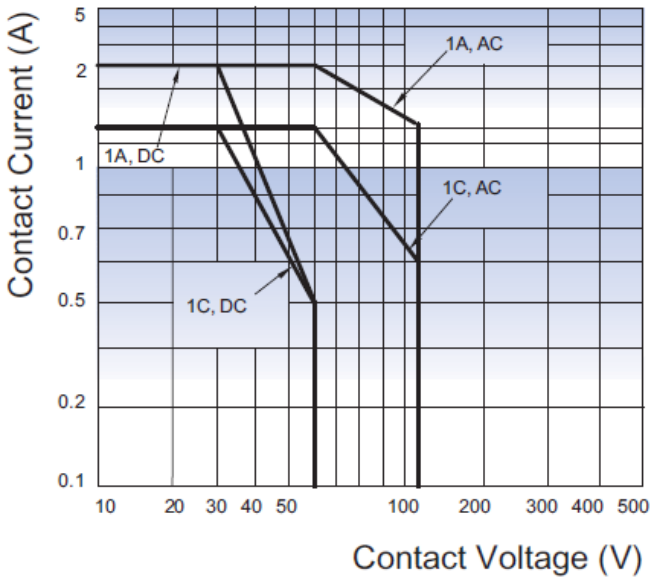
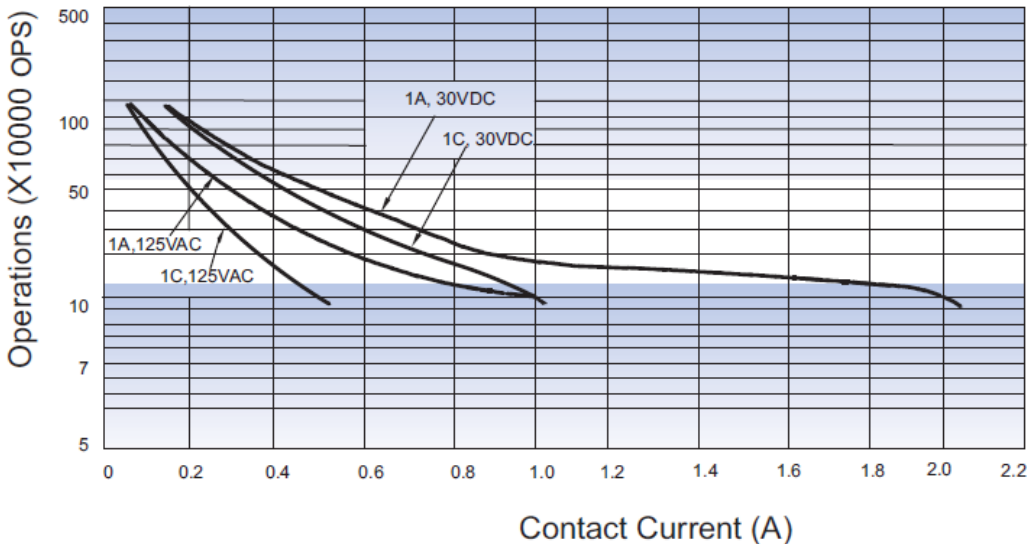
7. CHARACTERISTIC CURVES

Maximum Switching Power



Endurance Curve



Notice

1) To avoid using relays under strong magnetic field which will change the parameters of relays such as pick-up voltage and drop-out voltage.

2) The relay may be damaged because of falling or when shocking conditions exceed the requirement.

3) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

4) Regarding the plastic sealed relay, we should leave it cooling naturally until below 40℃ after welding, then clean it and deal with coating, remarkably the temperature of solvents should also be controlled below 40℃. Please avoid cleaning the relay by ultrasonic, avoid using the solvents like gasoline, freon, and so on, which would affect the configuration of relay or influence the environment.

5) Energizing coil with rated voltage is basic for normal operation of a relay. Please make sure the energized voltage to relay coil have reached the rated voltage

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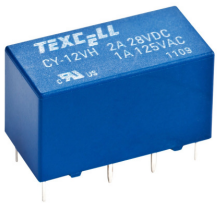
Subminiature DIP Relay	CY

Features

- Matching 16 pins IC socket
- Bifurcated contacts
- Gold overlay contact
- 2 Form C (DPDT) configuration
- High switching capacity: 125VA/60W
- Epoxy sealed for automatic-wave soldering and cleaning



c UL us
(File No.:E122258)

1. COIL DATA (at 23℃)

1) Sensitive Type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.25	0.3	6	66.7	45 x (1±10%)	200
5	3.75	0.5	10	40.0	125 x (1±10%)	
6	4.50	0.6	12	33.3	180 x (1±10%)	
9	6.80	0.9	18	22.2	405 x (1±10%)	
12	9.00	1.2	24	16.7	720 x (1±10%)	
15	11.3	1.5	30	13.3	1125 x (1±10%)	
24	18.0	2.4	48	8.33	2880 x (1±10%)	

2) High Sensitive Type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.4	0.3	7.00	50.0	60 x (1±10%)	150
5	4.0	0.5	11.5	30.0	167 x (1±10%)	
6	4.8	0.6	13.8	25.0	240 x (1±10%)	
9	7.2	0.9	20.8	16.7	540 x (1±10%)	
12	9.6	1.2	27.7	12.5	960 x (1±10%)	
15	12.0	1.5	34.6	10.0	1500 x (1±10%)	
24	19.2	2.4	55.2	6.25	3840 x (1±10%)	

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2. CONTACT DATA

Contact Arrangement		2 Form C (DPDT)
Contact Resistance		100mΩ max. (at 10mA 30mVDC)
Contact Material		AgNi + Au plated
Contact Ratings (Resistive Load)		1A 125VAC / 2A 30VDC
Max. Switching Voltage		240VAC / 120VDC
Max. Switching Current		2A
Max. Switching Power		125VA / 60W
Min. Applicable Load[1)]		10mV 10μA
Life Expectancy[2)]	Electrical	100,000 operations
	Mechanical	100,000,000 operations

Notes:

1) Minimum applicable load is reference value. Please perform the confirmation test with the actual load before production since reference value may change according to switching frequencies, environmental conditions, expected contact resistance and reliability.

2) Life expectancy data are collected in one pair CO contact test.

3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	Sensitive type: 1000VAC 1min High sensitive type: 750VAC 1mm
	Coil and Contacts	1500VAC 1min
Operate Time (at nominal voltage)		7ms max.
Release Time (at nominal voltage)		4ms max.
Temperature Rise		65K max.
Temperature Range		-40℃ ~ 85℃
Shock Resistance	Functional	196 m/s^2
	Destructive	980 m/s^2
Vibration Resistance		10 ~ 55Hz, 1.5mm DA
Humidity		5 ~ 85% RH
Termination		PCB (DIP)
Weight		Approx. 5g
Outline Dimension (L x W x H)		20.2 x 10.0 x 11.5 mm

Notes:

1) The data shown above are initial values.

2) UL insulation system: Class A

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4. SAFETY APPROVAL RATINGS

Safety Standard	Contact Form	Contact Rating
UL/cUL	2 Form C	1A 125VAC 2A 30VDC

Notes:

1) All values unspecified are at 85℃

2) Only typical loads are listed above. Other load specifications can be available upon request.

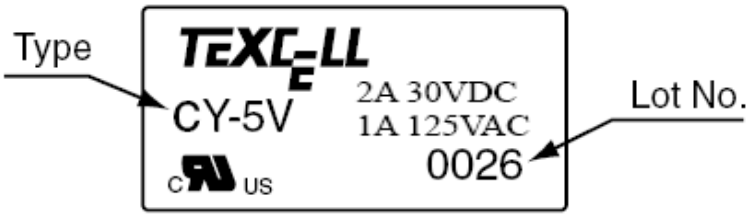
5. ORDERING INFORMATION

CY - 5V H ① ② ③	
① Relay Model	CY
② Coil Voltage	3V=3VDC, 5V=5VDC, 6V=6VDC, 9V=9VDC, 12V=12VDC, 15V=15VDC, 24V=24VDC
③ Coil Power	Nil: Sensitive type (200mW) H: High-sensitive type (150mW)

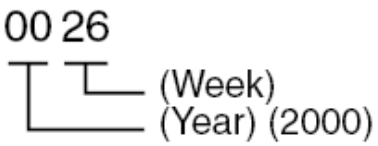
6. DIMENSIONS (Unit: mm)

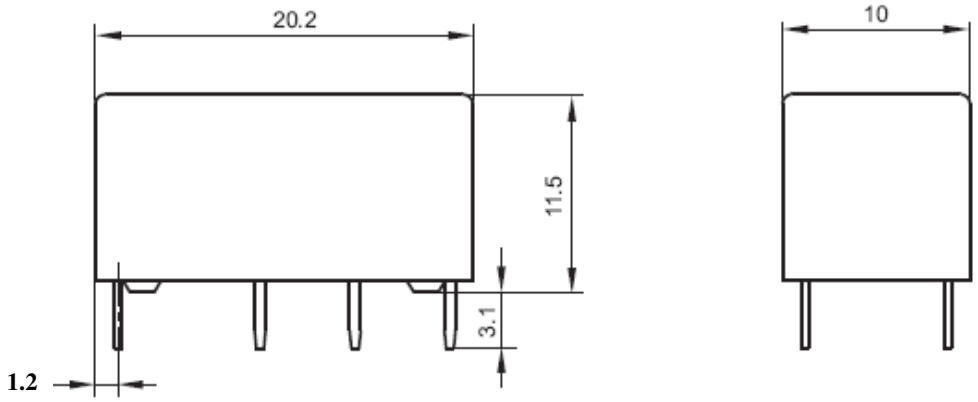
Outline Dimensions

An illustration of indication



An illustration of Lot No.





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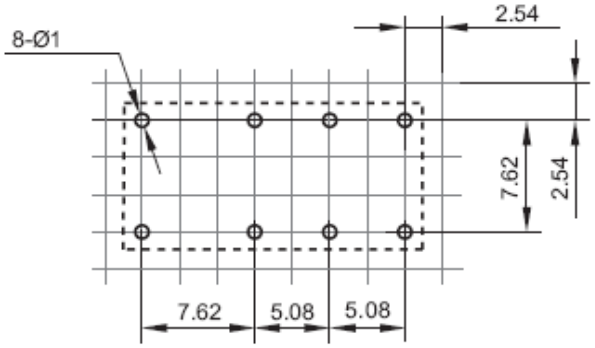
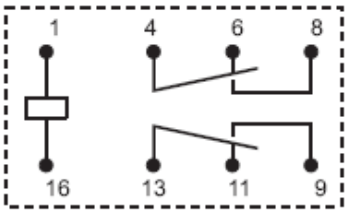
PCB Layout (Bottom View)



Wiring Diagram (Bottom View)



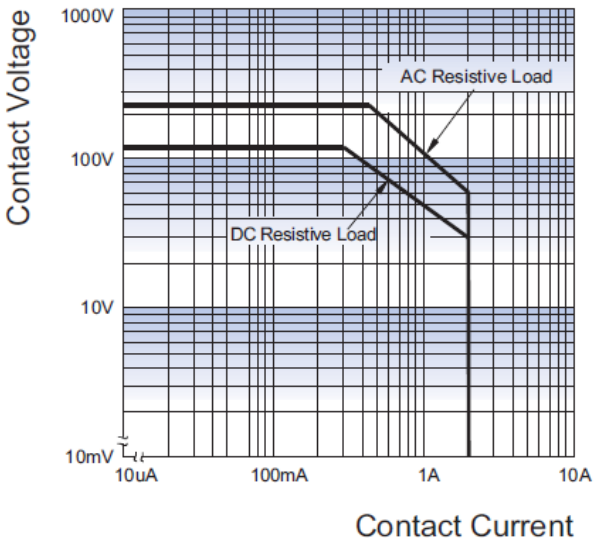
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

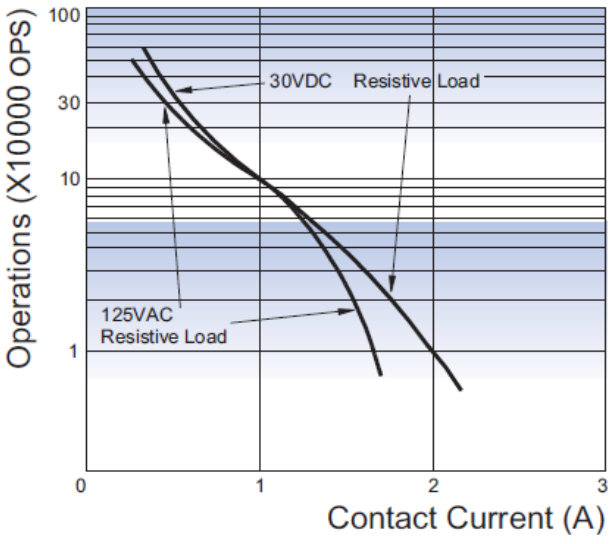
3) The width of the gridding is 2.54mm.

7. CHARACTERISTIC CURVES

Maximum Switching Power



Endurance Curve



1) To avoid using relays under strong magnetic field which will change the parameters of relays such as pick-up voltage and drop-out voltage.

2) The relay may be damaged because of falling or when shocking conditions exceed the requirement.

3) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

4) Regarding the plastic sealed relay, we should leave it cooling naturally until below 40℃ after welding, then clean it and deal with coating, remarkably the temperature of solvents should also be controlled below 40℃. Please avoid cleaning the relay by ultrasonic, avoid using the solvents like gasoline, freon, and so on, which would affect the configuration of relay or influence the environment.

5) Energizing coil with rated voltage is basic for normal operation of a relay. Please make sure the energized voltage to relay coil have reached the rated voltage.

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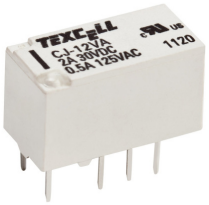
Subminiature Signal Relay	CJ

Features

- Surge withstand voltage up to 6000VAC, meets FCC part 68 and Telecordia
- Meets EN60950 / EN41003
- SMT and DIP types available
- Bifurcated contacts
- Single side stable and latching type available



c UL us
(File No.:E122258)

1. COIL DATA (at 23℃)

1) Single side stable (A type)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
1.5	1.13	0.15	2.20	93.3	16 x (1±10%)	140
2.4	1.80	0.24	3.60	58.3	41 x (1±10%)	
3	2.25	0.30	4.50	46.7	64.3 x (1±10%)	
4.5	3.38	0.45	6.70	31.1	145 x (1±10%)	
5	3.75	0.50	7.50	28.0	178 x (1±10%)	
6	4.50	0.60	9.00	23.3	257 x (1±10%)	
9	6.75	0.90	13.5	15.6	579 x (1±10%)	
12	9.00	1.20	18.0	11.7	1028 x (1±10%)	
24	18.0	2.40	36.0	58.3	4114 x (1±10%)	
48	36.0	4.80	57.6	5.63	8533 x (1±10%)	270

2) Single side stable (H type)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
1.5	1.13	0.15	2.20	133	11.2 x (1±10%)	200
2.4	1.80	0.24	3.60	83.3	28.8 x (1±10%)	
3	2.25	0.30	4.50	66.7	45 x (1±10%)	
4.5	3.38	0.45	6.70	44.4	101 x (1±10%)	
5	3.75	0.50	7.50	40.0	125 x (1±10%)	
6	4.50	0.60	9.00	33.3	180 x (1±10%)	
9	6.75	0.90	13.5	22.2	405 x (1±10%)	
12	9.00	1.20	18.0	16.7	720 x (1±10%)	
24	18.0	2.40	36.0	8.33	2880 x (1±10%)	

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3) 1 coil latching (A type)

Nominal Voltage (VDC)	Set Voltage (VDC) max.	Reset Voltage (VDC) max.	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
1.5	1.13	1.13	2.70	66.7	22.5 x (1±10%)	100
2.4	1.80	1.80	4.30	41.7	58 x (1±10%)	
3	2.25	2.25	5.40	33.3	90 x (1±10%)	
4.5	3.38	3.38	8.10	22.2	203 x (1±10%)	
5	3.75	3.75	9.00	20.0	250 x (1±10%)	
6	4.50	4.50	10.8	16.7	360 x (1±10%)	
9	6.75	6.75	16.2	11.1	810 x (1±10%)	
12	9.00	9.00	21.6	8.33	1440 x (1±10%)	
24	18.0	18.0	43.2	4.17	5760 x (1±10%)	

4) 1 coil latching (H type)

Nominal Voltage (VDC)	Set Voltage (VDC) max.	Reset Voltage (VDC) max.	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
1.5	1.13	1.13	2.70	66.7	16.1 x (1±10%)	140
2.4	1.80	1.80	4.30	41.7	41 x (1±10%)	
3	2.25	2.25	5.40	33.3	64.3 x (1±10%)	
4.5	3.38	3.38	8.10	22.2	145 x (1±10%)	
5	3.75	3.75	9.00	20.0	178 x (1±10%)	
6	4.50	4.50	10.8	16.7	257 x (1±10%)	
9	6.75	6.75	16.2	11.1	579 x (1±10%)	
12	9.00	9.00	21.6	8.33	1028 x (1±10%)	
24	18.0	18.0	43.2	4.17	4114 x (1±10%)	

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5) 2 coils latching (A type)

Nominal Voltage (VDC)	Set Voltage (VDC) max.	Reset Voltage (VDC) max.	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
1.5	1.13	1.13	2.20	133	11.2 x (1±10%)	200
2.4	1.80	1.80	3.60	83.3	29 x (1±10%)	
3	2.25	2.25	4.50	66.7	45 x (1±10%)	
4.5	3.38	3.38	6.70	44.4	101 x (1±10%)	
5	3.75	3.75	7.50	40.0	125 x (1±10%)	
6	4.50	4.50	9.00	33.3	180 x (1±10%)	
9	6.75	6.75	13.5	22.2	405 x (1±10%)	
12	9.00	9.00	18.0	16.7	720 x (1±10%)	
24	18.0	18.0	36.0	8.33	2880 x (1±10%)	

Note: 1) When user's requirements can't be found in the above table, special order allowed.

2) In case of 5V of transistor drive circuit, it is recommended to use 4.5V type relay, and 3V to use 2.4V type relay.

2. CONTACT DATA

Contact Arrangement		2 Form C (DPDT)
Contact Resistance		100mΩ max. (at 10mA 30mVDC)
Contact Material		AgNi + Au plated
Contact Ratings (Resistive load)		0.5A 125VAC / 2A 30VDC
Max. Switching Voltage		250VAC / 220VDC
Max. Switching Current		2A
Max. Switching Power		62.5VA / 60W
Min. applicable load[1)]		10mV 10μA
Life Expectancy[2)]	Electrical	100,000 operations (at 0.5A 125VAC)
	Mechanical	10,000,000 operations

Notes:

1) Minimum applicable load is reference value. Please perform the confirmation test with the actual load before production since reference value may change according to switching frequencies, environmental conditions, expected contact resistance and reliability.

2) Life expectancy data are collected in one pair CO contact test.

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3. CHARACTERISTICS

Dielectric strength between coil and contacts		A type (2000VAC)	H type (3000VAC)
Insulation Resistance		1000MΩ (at 500VDC)	
Dielectric Strength	Open Contacts	1000VAC 1min	1500VAC 1min
	Coil and Contacts	2000VAC 1min	3000VAC 1min
	Contact Sets	1500VAC 1min	1500VAC 1min
Surge withstand voltage Between open contacts Between coil & contacts		10/160μs: 1500VAC (FCC part 68) 2/10μs: 2500VAC (Telecordia)	10/160μs: 2.5kV 1.2/50μs: 6kV
Operate Time (Set Time)		4ms max.	6ms max.
Release Time (Reset Time)		4ms max.	6ms max.
Temperature Rise		50K max.	
Temperature Range		-40℃ to 85℃	
Vibration Resistance	Functional	10 ~ 55Hz 3.3mm DA	10 ~ 55Hz 3.3mm DA
	Destructive		10 ~ 55Hz 5.0mm DA
Shock Resistance	Functional	735 m/s^2	
	Destructive	980 m/s^2	
Humidity		5 ~ 85% RH	
Termination		PCB (DIP, SMT)	
Moisture sensitive levels (Only for SMT type, JEDEC-STD-020)		MSL3	
Weight		Approx. 2g	
Outline Dimension (L x W x H)		15.0 x 7.5 x 9.0 mm	15.0 x 7.5 x 9.4 mm

Notes:

1) The data shown above are initial values.

2) UL insulation system: Class A

4. SAFETY APPROVAL RATINGS

Safety Standard	Contact Form	Contact Rating
UL/cUL	2 Form C	0.5A 125VAC at 85℃ 2A 30VDC at 85℃

Notes:

1) All values unspecified are at room temperature

2) Only typical loads are listed above. Other load specifications can be available upon request.

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5. ORDERING INFORMATION

CJ - 5V L1 S R A ① ② ③ ④ ⑤ ⑥	
① Relay Model	CJ
② Coil Voltage	1.5V=1.5VDC, 2.4V=2.4VDC, 3V=3VDC, 4.5V=4.5VDC, 5V=5VDC, 6V=6VDC, 9V=9VDC, 12V=12VDC, 24V=24VDC, 48V=48VDC
③ Sort	Nil: Single side stable L1: 1 coil latching L2: 2 coils latching
④ Termination	Nil: DIP S: Standard SMT S1: Short terminal SMT
⑤ Packing	Nil: Tube packing R: Tape & reel packing (only for SMT type)
⑥ Dielectric strength (Between coil and contacts)	A: 2000VAC H: 3000VAC (for single side stable and 1 coil latching version)

Note:

1) 48VDC coil voltage is only for single side stable version of A type.

2) For the R type, the letter "R" will only be printed on packing tag and will not appear on relay cover. In addition, tube packaging will be adopted when the ordering quantity of R type is equal to or less than 100 pieces unless otherwise specified.

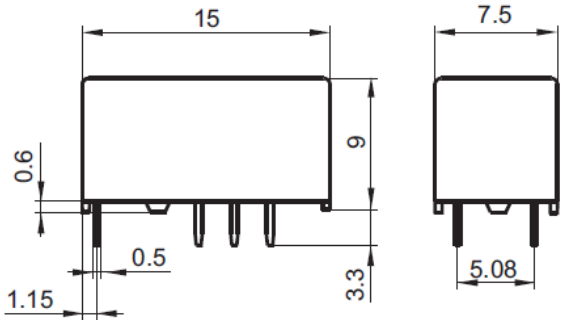
6. DIMENSIONS (Unit: mm)

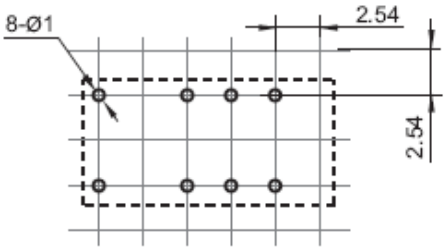
1) DIP (A type)

Outline Dimensions

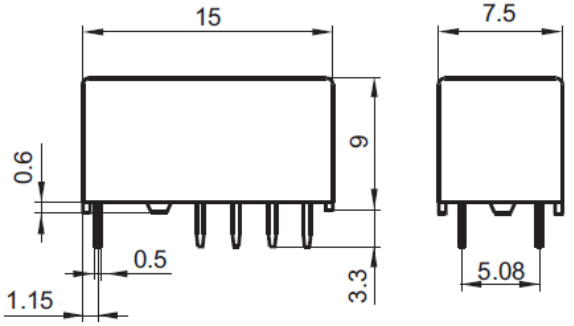
PCB Layout (Bottom view)

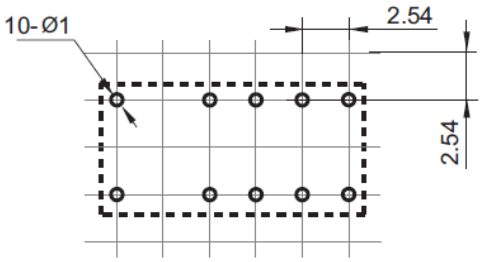
Single side stable & 1 coil latching





2 coils latching





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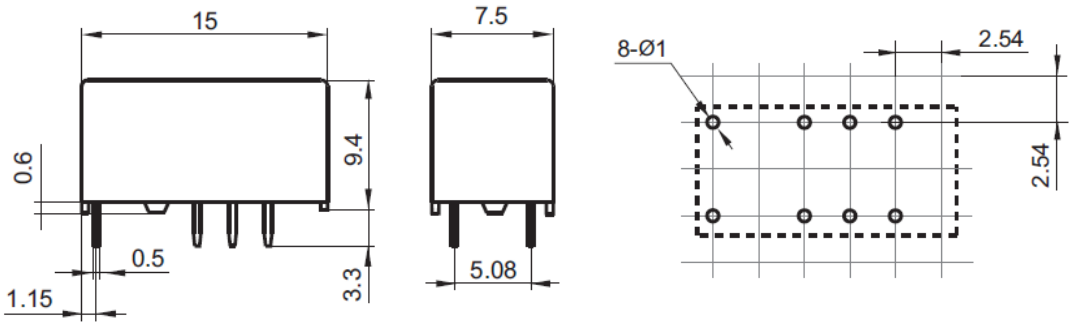
2) DIP (H type)

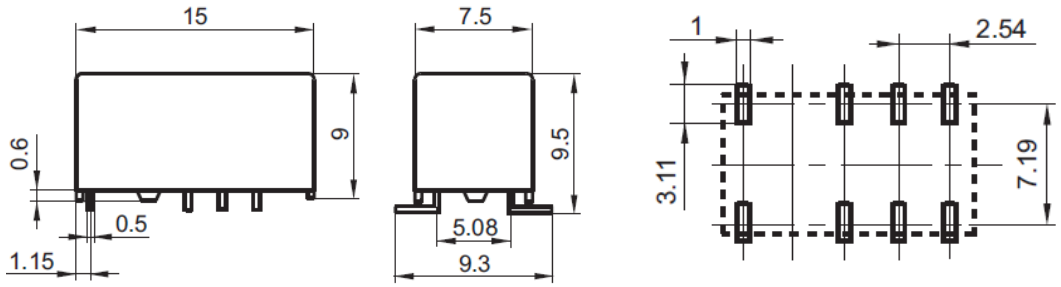
Outline Dimensions PCB Layout (Bottom view)

Single side stable & 1 coil latching

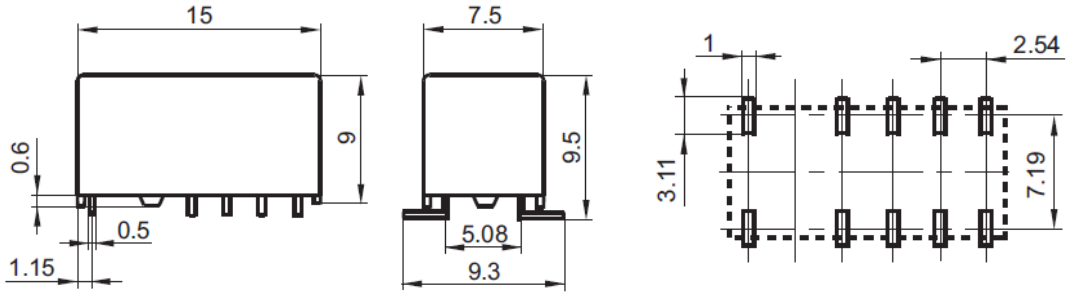


3) Standard SMT (A type)

Single side stable & 1 coil latching



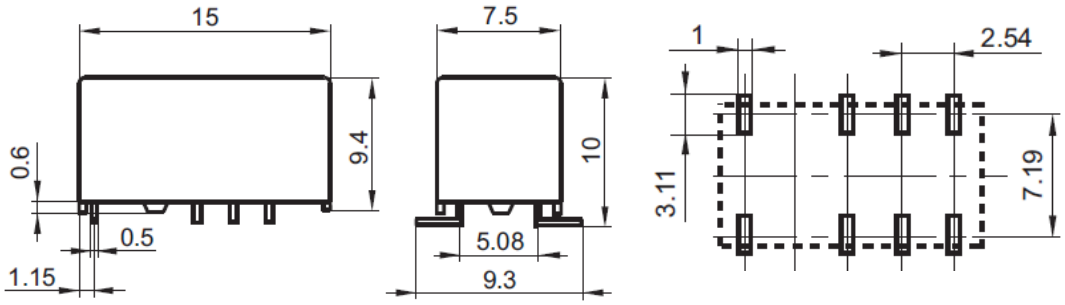
2 coils latching



4) Standard SMT (H type)

Outline Dimensions PCB Layout (Bottom view)

Single side stable & 1 coil latching



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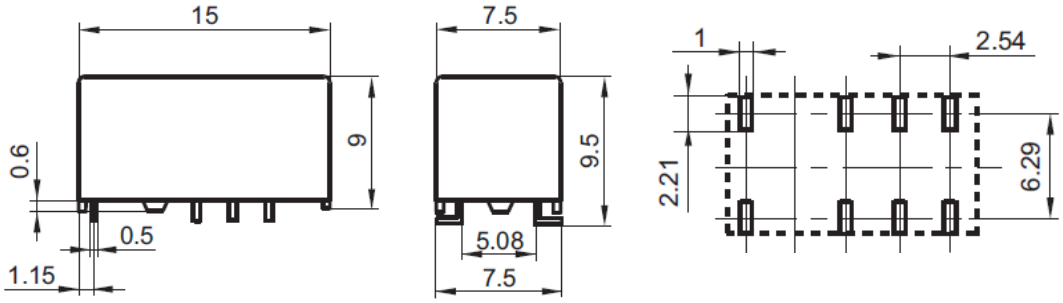
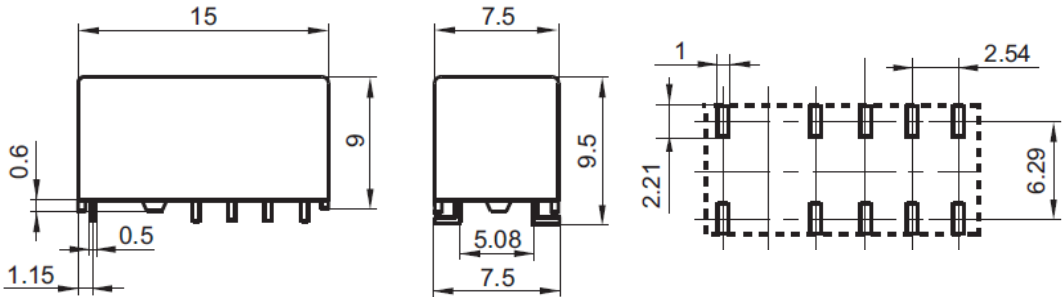
5) Short terminal SMT (A type)

Single side stable & 1 coil latching

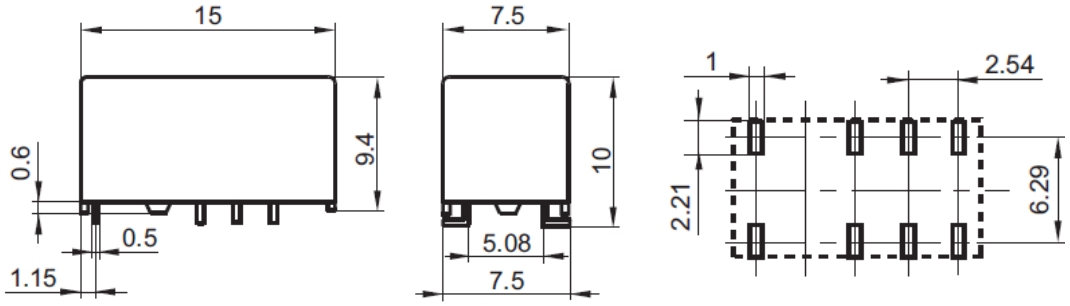


2 coils latching



6) Short terminal SMT (H type)

Single side stable & 1 coil latching

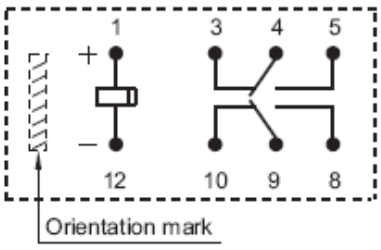


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

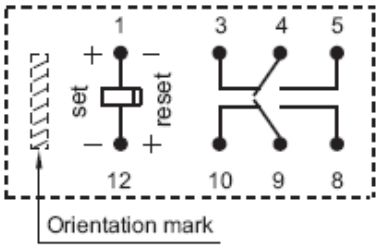
Wiring Diagram (Bottom View)

Single side stable



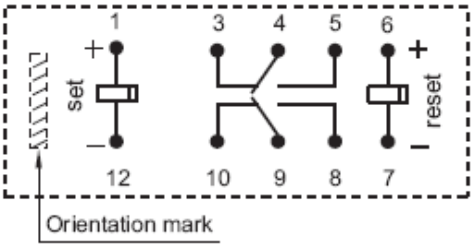
No energized condition

1 coil latching



Reset condition

2 coils latching



Reset condition

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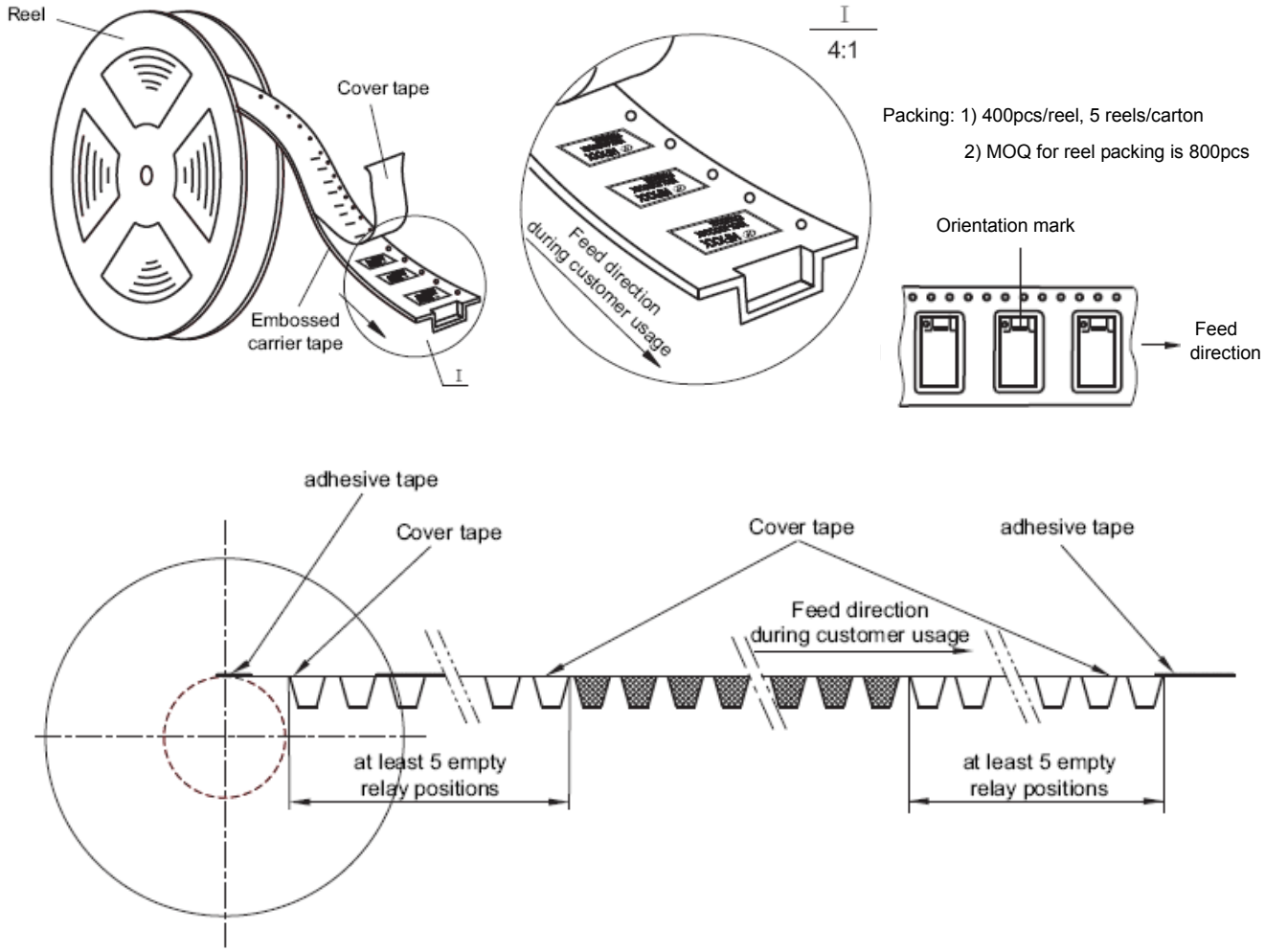
7. TAPE PACKING (Unit: mm)

Direction of Relay Insertion



Reel Dimensions

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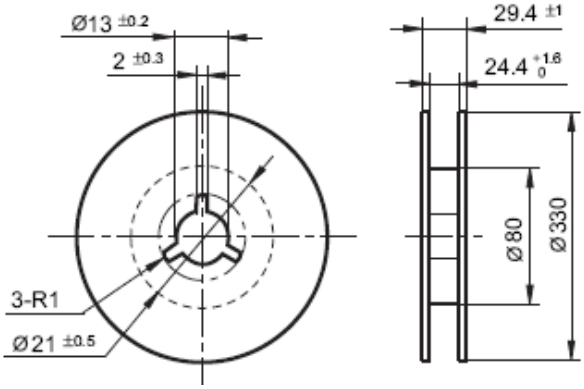

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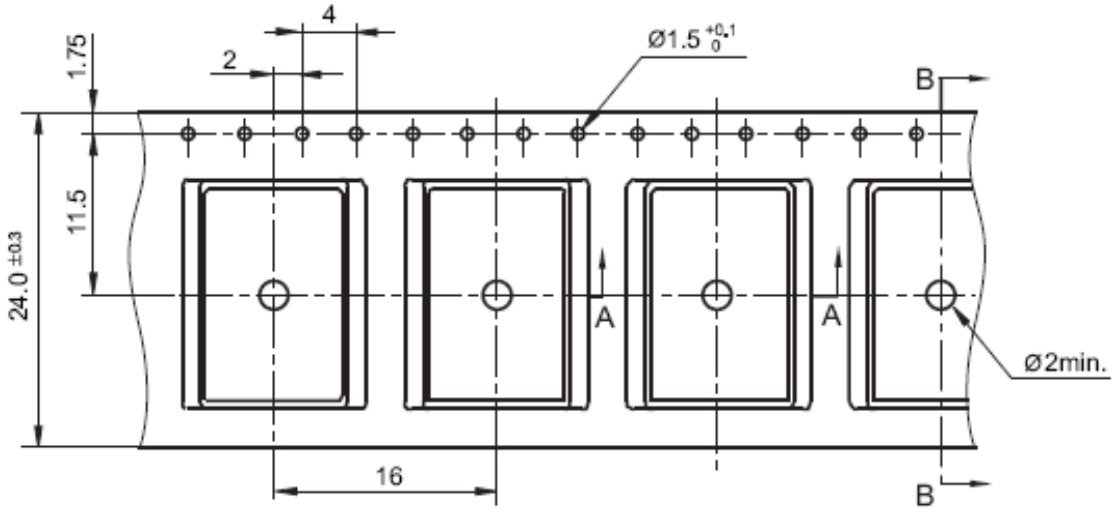
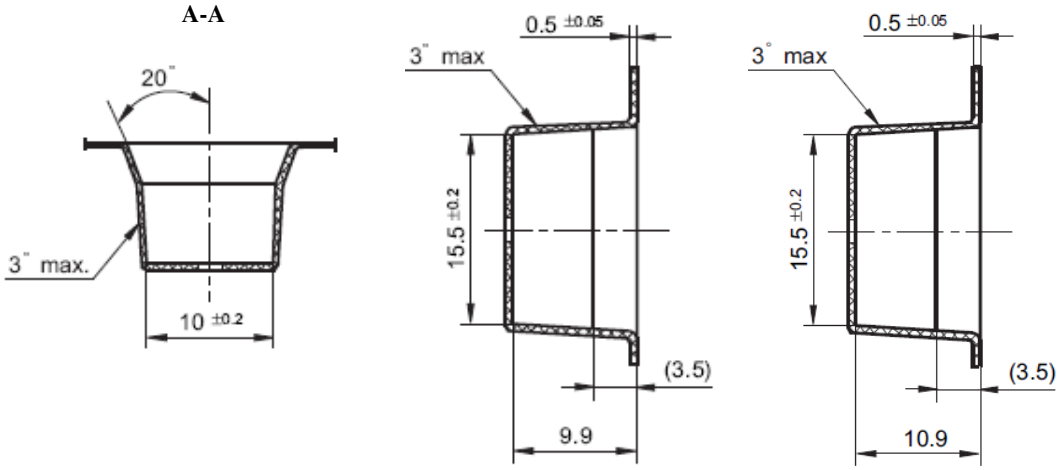
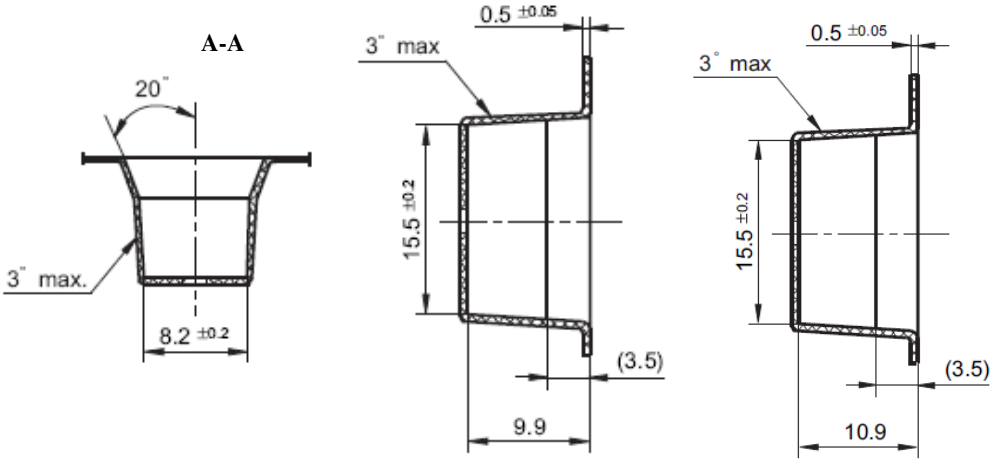
Tape Dimensions



1) Standard SMT type



2) Short terminal SMT type



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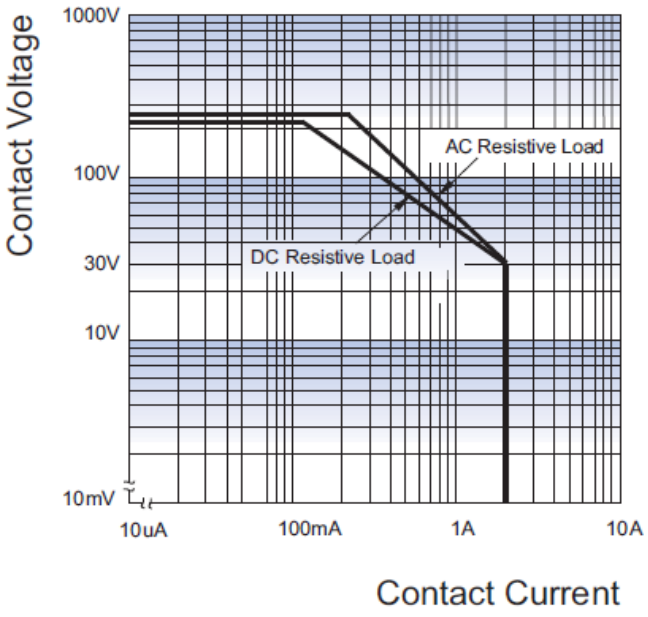
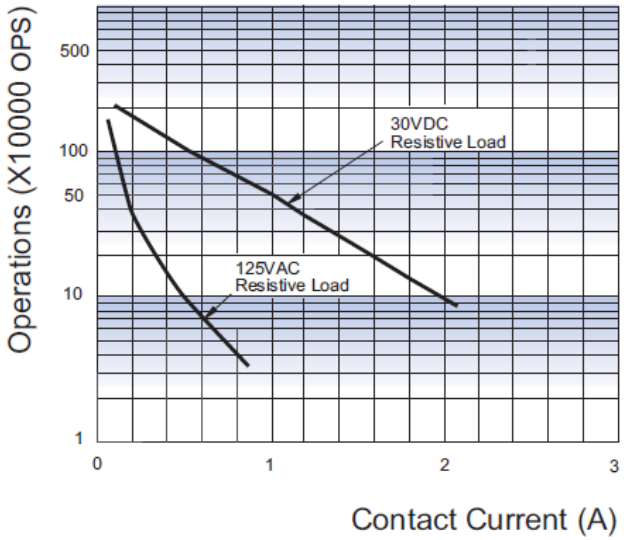
8. CHARACTERISTIC CURVES

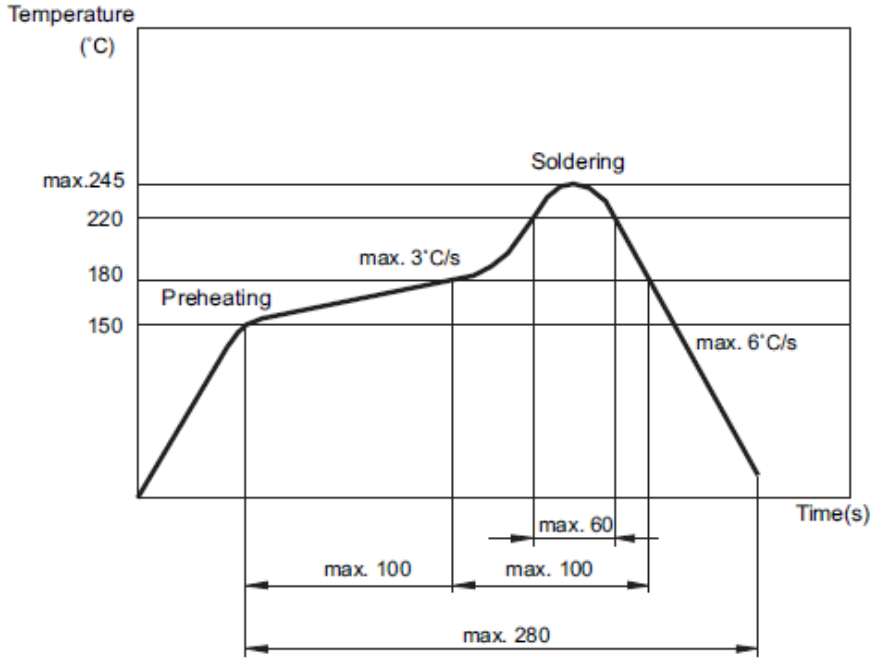
Maximum Switching Power



Endurance Curve



Reflow welding, temperature on PCB board
Recommended welding temperature



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Notice

1) This relay is highly sensitive polarized relay. If correct polarity is not applied to the coil terminals, the relay does not operate properly.
2) To avoid using relays under strong magnetic field which will change the parameters of relays such as pick-up voltage and drop-out voltage.
3) Relay is on the “reset” status when being released from stock, with the consideration of shock risen from transit and relay mounting. It should be changed to the “set” status when application(connecting to the power supply). Please reset the relay to “set” or “reset” status on request.
4) Energizing coil with rated voltage is basic for normal operation of a relay, please make sure the energized voltage to relay coil have reached the rated voltage. Regarding latching relay, in order to maintain the “set” or “reset” status, impulse width of the rated voltage applied to coil should be more than 5 times of “set” or “reset” time.
5) For 2 coil latching relay, do not energize voltage to “set” coil and “reset” coil simultaneously.
6) The relay may be damaged because of falling or when shocking conditions exceed the requirement.
7) For SMT products, validation with real application should be done before your series production, if the reflow-soldering temperature curve is out of our recommendation. Generally, two-time reflow-soldering is not recommended for the relay. However, if two-time reflow-soldering is required, a 60min. interval should be guaranteed and a validation should be done before production.
8) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB
9) Regarding the plastic sealed relay, we should leave it cooling naturally until below 40℃ after welding, then clean it and deal with coating, remarkably the temperature of solvents should also be controlled below 40℃. Please avoid cleaning the relay by ultrasonic, avoid using the solvents like gasoline, freon and so on, which would affect the configuration of relay or influence the environment.
10) Relays packaged in moisture barrier bags meet MSL-3 requirements. The relays should be stored at ambient conditions of ≤30℃ and ≤60% RH after they are removed from their packaging, and should be used within 168 hours. If the relays cannot be used within 168 hours, please repack them or store them in a drying oven at 25℃±5℃, ≤10% RH. Otherwise, relays may be subjected to a soldering test to check their performance, or they may be used after keeping them in an oven for 72 hours at with 50℃±5℃, ≤30% RH

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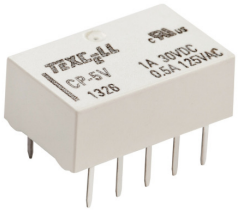
Subminiature Signal Relay	CP

Features

- Offers excellent board space savings
- Surge withstand voltage up to 1500V, meets FCC part 68
- High contact capacity 1A 30VDC
- Low power consumption
- Single side stable and latching type available
- Single or double coil winding type available



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1. COIL DATA (at 23℃)

1) Single side stable

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
1.5	1.13	0.15	2.25	93.3	16 x (1±10%)	140
2.4	1.80	0.24	3.60	58.3	41.3 x (1±10%)	
3	2.25	0.30	4.50	46.7	64.3 x (1±10%)	
4.5	3.38	0.45	6.70	31.1	145 x (1±10%)	
5	3.75	0.50	7.50	28.0	178 x (1±10%)	
6	4.50	0.60	9.00	23.3	257 x (1±10%)	
9	6.75	0.90	13.5	15.6	579 x (1±10%)	
12	9.00	1.20	18.0	11.7	1028 x (1±10%)	
24	18.0	2.40	36.0	8.33	2880 x (1±10%)	200

2) 1 coil latching

Nominal Voltage (VDC)	Set Voltage (VDC) max.	Reset Voltage (VDC) max.	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
1.5	1.13	1.13	2.25	66.7	22.5 x (1±10%)	100
2.4	1.80	1.80	3.60	41.7	58 x (1±10%)	
3	2.25	2.25	4.50	33.3	90 x (1±10%)	
4.5	3.38	3.38	6.70	22.2	203 x (1±10%)	
5	3.75	3.75	7.50	20.0	250 x (1±10%)	
6	4.50	4.50	9.00	16.7	360 x (1±10%)	
9	6.75	6.75	13.5	11.1	810 x (1±10%)	
12	9.00	9.00	18.0	8.33	1440 x (1±10%)	
24	18.0	18.0	36.0	6.25	3840 x (1±10%)	150

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3) 2 coils latching

Nominal Voltage (VDC)	Set Voltage (VDC) max.	Reset Voltage (VDC) max.	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
1.5	1.13	1.13	2.25	133	11.3 x (1±10%)	200
2.4	1.80	1.80	3.60	83.3	29 x (1±10%)	
3	2.25	2.25	4.50	66.7	45 x (1±10%)	
4.5	3.38	3.38	6.70	44.4	101 x (1±10%)	
5	3.75	3.75	7.50	40.0	125 x (1±10%)	
6	4.50	4.50	9.00	33.3	180 x (1±10%)	
9	6.75	6.75	13.5	22.2	405 x (1±10%)	
12	9.00	9.00	18.0	16.7	720 x (1±10%)	
24	18.0	18.0	36.0	12.5	1920 x (1±10%)	300

Note: 1) When user's requirements can't be found in the above table, special order allowed.

2) In case of 5V of transistor drive circuit, it is recommended to use 4.5V type relay, and 3V to use 2.4V type relay.

2. CONTACT DATA

Contact Arrangement		2 Form C
Contact Resistance		100mΩ max. (at 10mA 30mVDC)
Contact Material		AgNi + Au plated
Contact Ratings (Resistive load)		0.5A 125VAC / 1A 30VDC
Max. Switching Voltage		125VAC / 110VDC
Max. Switching Current		2A
Max. Switching Power		62.5VA / 30W
Min. applicable load[1)]		10mV 10μA
Life Expectancy[2)]	Electrical	100,000 operations (at 0.5A 125VAC)
	Mechanical	100,000,000 operations

Notes:

1) Minimum applicable load is reference value. Please perform the confirmation test with the actual load before production since reference value may change according to switching frequencies, environmental conditions, expected contact resistance and reliability.

2) Life expectancy data are collected in one pair CO contact test.

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3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	750VAC 1mm
	Coil and Contacts	1000VAC 1min
	Contact Sets	1000VAC 1min
Surge withstand voltage between open contacts (10/160μs)		1500VAC (FCC part 68)
Operate Time (Set Time)		3ms max.
Release Time (Reset Time)		3ms max.
Temperature Range		-40℃ to 70℃
Vibration Resistance		10 ~ 55Hz 3.0mm DA
Shock Resistance	Functional	490 m/s^2
	Destructive	980 m/s^2
Humidity		5 ~ 85% RH
Termination		PCB (DIP, SMT)
Weight		Approx. 1.5g
Moisture sensitivity levels (Only for SMT type, JEDEC-STD-020)		MSL 3
Outline Dimension (L x W x H)		14.0 x 9.0 x 5.0 mm

Notes:

1) The data shown above are initial values.

2) UL insulation system: Class A

4. ORDERING INFORMATION

CP - 5V L1 S R ① ② ③ ④ ⑤	
① Relay Model	CP
② Coil Voltage	1.5V=1.5VDC, 2.4V=2.4VDC, 3V=3VDC, 4.5V=4.5VDC, 5V=5VDC, 6V=6VDC, 9V=9VDC, 12V=12VDC, 24V=24VDC
③ Sort	Nil: Single side stable L1: 1 coil latching L2: 2 coils latching
④ Termination	Nil: DIP S: Standard SMT
⑤ Packing	Nil: Tube packing R: Tape & reel packing (only for SMT type)

Note: For the R type, the letter "R" will only be printed on packing tag and will not appear on relay cover.

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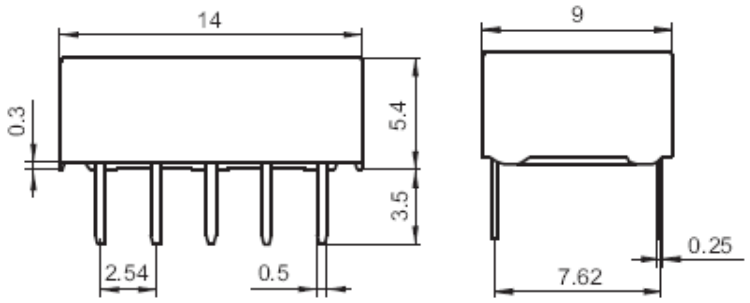
5. DIMENSIONS (Unit: mm)

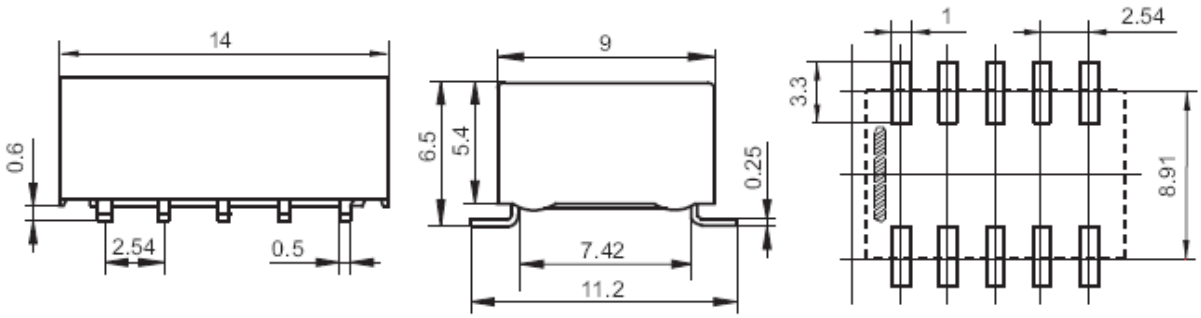
Outline Dimensions

PCB Layout (Bottom view)

DIP

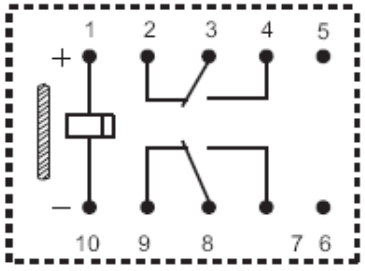


Standard SMT



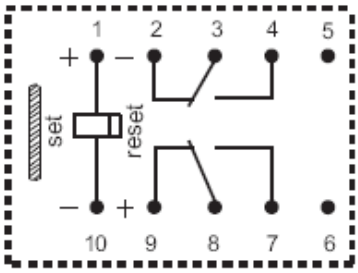
Wiring Diagram (Bottom View)

Single side stable



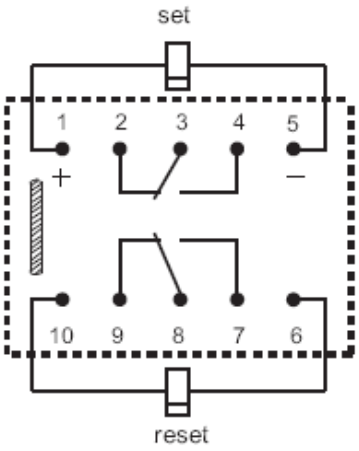
Deenergized condition

1 coil latching



Reset condition

2 coils latching



Reset condition

Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

3) The width of the gridding is 2.54mm.

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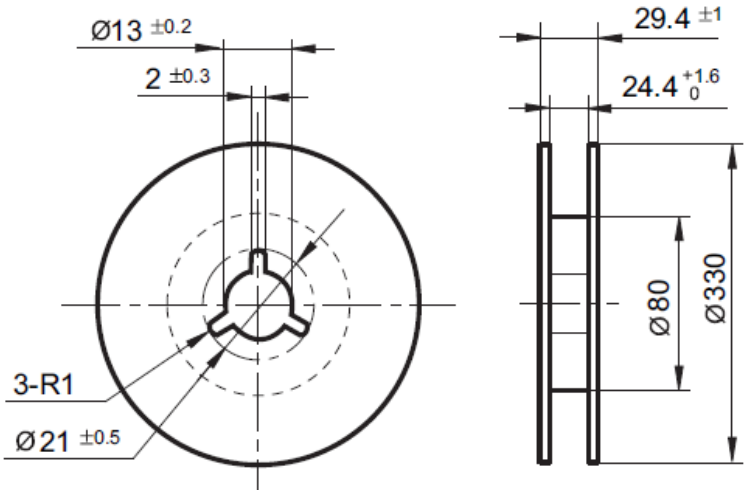
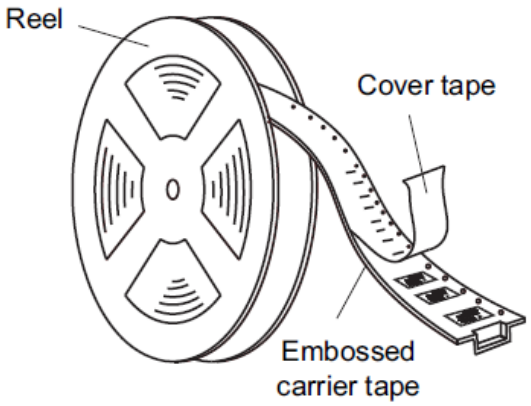
6. TAPE & REEL PACKING CONSTRUCTION AND DIMENSION (Unit: mm)

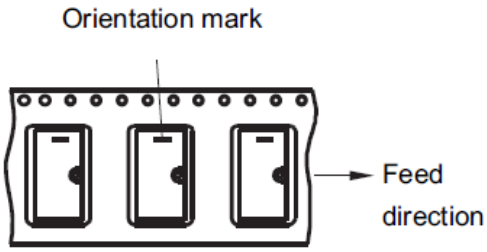
.

Reel Dimensions



Direction of Relay Insertion

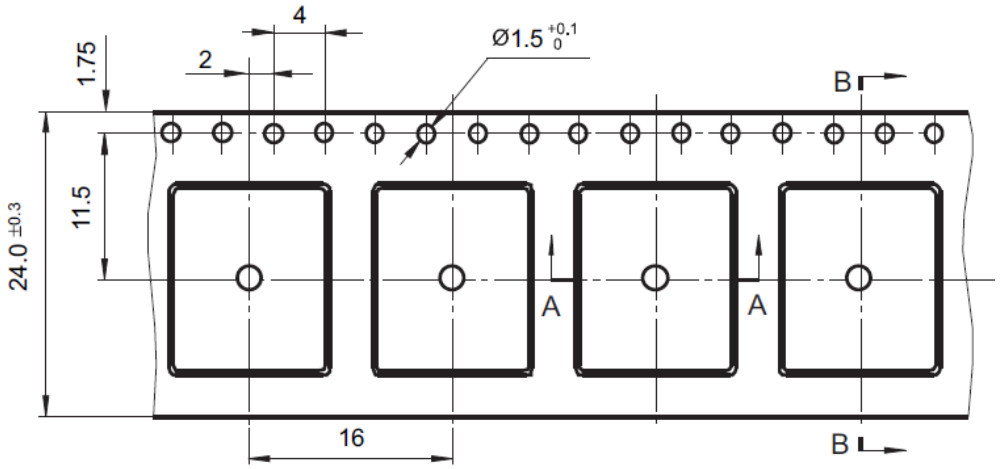




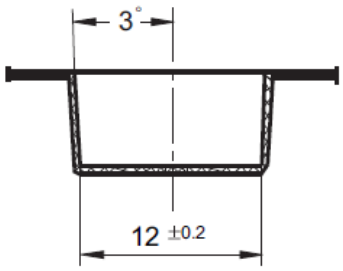
Note: 1) Packing: 550pcs/reel, 4 reels/carton

2) MOQ for reel packing is 550pcs

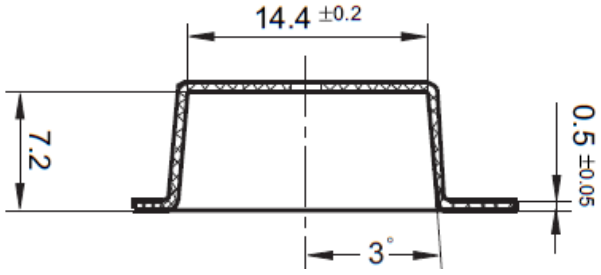
Tape Dimensions



A-A



B-B



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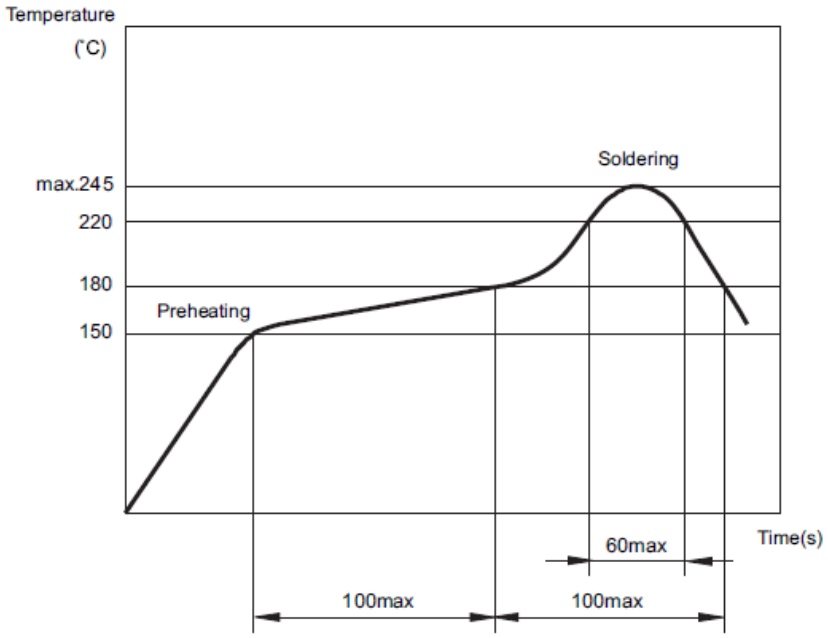
7. RECOMMENDED SOLDERING CONDITIONS

Temperature/Time profile of Reflow Soldering see below:

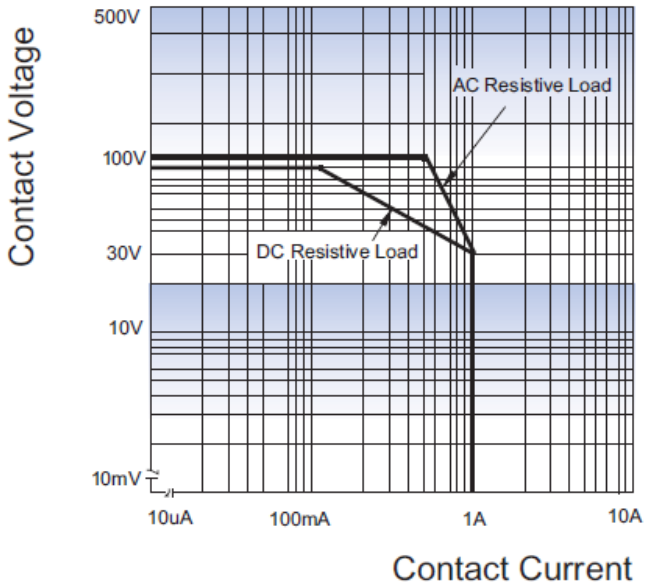


Note: 1) Temperature profile shows Printed Circuit Board surface temperature on the relay terminal portion.

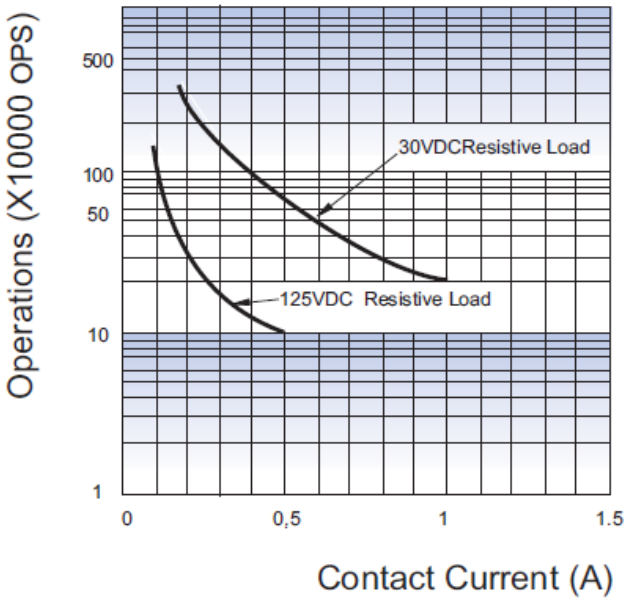
2) Please check the actual soldering condition to use other method except above mentioned temperature profiles.

8. CHARACTERISTIC CURVES

Maximum Switching Power



Endurance Curve



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Notice

1) This relay is highly sensitive polarized relay. If correct polarity is not applied to the coil terminals, the relay does not operate properly.
2) To avoid using relays under strong magnetic field which will change the parameters of relays such as pick-up voltage and drop-out voltage.
3) Relay is on the “reset” status when being released from stock, with the consideration of shock risen from transit and relay mounting. It should be changed to the “set” status when application(connecting to the power supply). Please reset the relay to “set” or “reset” status on request.
4) Energizing coil with rated voltage is basic for normal operation of a relay, please make sure the energized voltage to relay coil have reached the rated voltage. Regarding latching relay, in order to maintain the “set” or “reset” status, impulse width of the rated voltage applied to coil should be more than 5 times of “set” or “reset” time.
5) For 2 coil latching relay, do not energize voltage to “set” coil and “reset” coil simultaneously.
6) The relay may be damaged because of falling or when shocking conditions exceed the requirement.
7) For SMT products, validation with real application should be done before your series production, if the reflow-soldering temperature curve is out of our recommendation. Generally, two-time reflow-soldering is not recommended for the relay. However, if two-time reflow-soldering is required, a 60min. interval should be guaranteed and a validation should be done before production.
8) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB
9) Regarding the plastic sealed relay, we should leave it cooling naturally until below 40℃ after welding, then clean it and deal with coating, remarkably the temperature of solvents should also be controlled below 40℃. Please avoid cleaning the relay by ultrasonic, avoid using the solvents like gasoline, freon and so on, which would affect the configuration of relay or influence the environment.
10) Relays packaged in moisture barrier bags meet MSL-3 requirements. The relays should be stored at ambient conditions of ≤30℃ and ≤60% RH after they are removed from their packaging, and should be used within 168 hours. If the relays cannot be used within 168 hours, please repack them or store them in a drying oven at 25℃±5℃, ≤10% RH. Otherwise, relays may be subjected to a soldering test to check their performance, or they may be used after keeping them in an oven for 72 hours at with 50℃±5℃, ≤30% RH

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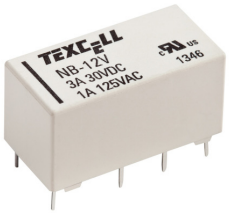
Subminiature DIP Relay	NB

Features

- High sensitive: 150mW
- Matching standard 16 pin IC socket
- High switching capacity: 125VA / 90W
- Bifurcated contacts
- Epoxy sealed for automatic wave soldering and cleaning
- Single side stable and latching type available



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1. COIL DATA (at 23℃)

1) Single side stable (Standard type)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.30	0.3	6	66.7	45 x (1±10%)	200
5	3.75	0.5	10	40.0	125 x (1±10%)	
6	4.50	0.6	12	33.3	180 x (1±10%)	
9	6.75	0.9	18	22.2	405 x (1±10%)	
12	9.00	1.2	24	16.7	720 x (1±10%)	
15	11.25	1.5	30	13.3	1125 x (1±10%)	
24	18.0	2.4	48	8.33	2880 x (1±10%)	
48	36.0	4.8	96	4.17	11520 x (1±10%)	

2) Single side stable (Sensitive type)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	4.00	0.5	11.5	30.0	167 x (1±10%)	150
6	4.80	0.6	13.8	25.0	240 x (1±10%)	
9	7.20	0.9	20.8	16.7	540 x (1±10%)	
12	9.60	1.2	27.7	12.5	960 x (1±10%)	
15	12.0	1.5	34.6	10.0	1500 x (1±10%)	
24	19.2	2.4	55.4	6.25	3840 x (1±10%)	

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3) 1 coil latching (Standard type)

Nominal Voltage (VDC)	Set / Reset Voltage (VDC) max.	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.25	8.4	33.3	90 x (1±10%)	100
5	3.75	14	20.0	250 x (1±10%)	
6	4.50	17	16.7	360 x (1±10%)	
9	6.75	25	11.1	810 x (1±10%)	
12	9.00	34	8.33	1440 x (1±10%)	
15	11.25	42	6.67	2220 x (1±10%)	
24	18.0	56	4.17	4000 x (1±10%)	

4) 1 coil latching (Sensitive type)

Nominal Voltage (VDC)	Set / Reset Voltage (VDC) max.	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.40	6.9	25.0	60 x (1±10%)	75
5	4.00	16	15.0	330 x (1±10%)	
6	4.80	19	12.5	480 x (1±10%)	
9	7.20	29	8.33	1080 x (1±10%)	
12	9.60	39	6.25	1920 x (1±10%)	
15	12.0	43	5.00	3000 x (1±10%)	
24	19.2	78	3.13	7680 x (1±10%)	

5) 2 coils latching (Standard type)

Nominal Voltage (VDC)	Set / Reset Voltage (VDC) max.	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.25	6	66.6	45 x (1±10%)	200
5	3.75	10	40.0	125 x (1±10%)	
6	4.50	12	33.3	180 x (1±10%)	
9	6.75	18	22.2	405 x (1±10%)	
12	9.00	24	16.7	720 x (1±10%)	
15	11.25	30	13.3	1125 x (1±10%)	
24	18.0	48	8.33	2040 x (1±10%)	

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6) 2 coils latching (Sensitive type)

Nominal Voltage (VDC)	Set / Reset Voltage (VDC) max.	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.40	6.90	50.0	60 x (1±10%)	150
5	4.00	11.5	30.0	167 x (1±10%)	
6	4.80	13.8	25.0	240 x (1±10%)	
9	7.20	20.8	16.7	540 x (1±10%)	
12	9.60	27.7	12.5	960 x (1±10%)	
15	12.0	34.6	10.0	1500 x (1±10%)	
24	19.2	55.4	6.25	3840 x (1±10%)	

Note: 1) When user's requirements can't be found in the above table, special order allowed.

2) In case 5V of transistor drive circuit, it is recommended to use 4.5V type relay, and 3V to use 2.4V type relay.

2. TYPICAL CONTACT LIFE EXPECTANCY

Voltage	Power	Electrical endurance	
		Resistive Load	Inductive Load (For AC cosΦ=0.7)
50mVDC	50μW	5 x 10^7 operations	5 x 10^7 operations
30VDC	20W	3 x 10^6 operations	1 x 10^6 operations
30VDC	30W	1 x 10^6 operations	3 x 10^5 operations
30VDC	60W	1 x 10^5 operations	1.5 x 10^4 operations
60VDC	20W	3 x 10^6 operations	--
60VDC	30W	5 x 10^5 operations	--
60VDC	60W	1 x 10^5 operations	--
30VAC	40VA	3 x 10^6 operations	1 x 10^6 operations
30VAC	80VA	1 x 10^6 operations	3 x 10^5 operations
30VAC	120VA	1 x 10^5 operations	1.5 x 10^4 operations
60VAC	40VA	3 x 10^6 operations	1 x 10^6 operations
60VAC	80VA	1 x 10^6 operations	3 x 10^5 operations
60VAC	120VA	1 x 10^5 operations	1.5 x 10^4 operations
125VAC	40VA	3 x 10^6 operations	1 x 10^6 operations
125VAC	80VA	1 x 10^6 operations	3 x 10^5 operations
125VAC	125VA	1 x 10^5 operations	1.5 x 10^4 operations

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3. CONTACT DATA

Contact Arrangement		2 Form C
Contact Resistance		100mΩ max. (at 10mA 30mVDC)
Contact Material		Ag + Gold plated / Ag + Gold plated
Contact Ratings (Resistive load)		1A 125VAC / 2A 30VDC / 3A 30VDC
Max. Switching Voltage		250VAC / 220VDC
Max. Switching Current		3A
Max. Switching Power		125VA / 90W
Min. applicable load[1)]		10mV 10μA
Life Expectancy[2)]	Electrical	50,000 operations (at 2A 30VDC)
	Mechanical	100,000,000 operations

Notes:

1) Minimum applicable load is reference value. Please perform the confirmation test with the actual load before production since reference value may change according to switching frequencies, environmental conditions, expected contact resistance and reliability.

2) Life expectancy data are collected in one pair CO contact test.

4. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1mm
	Coil and Contacts	1 coil: 1500VAC 1min 2 coils: 1000VAC 1min
Operate Time (at nominal voltage)		4.5ms max.
Release Time (at nominal voltage)		3.5ms max.
Set Time (latching)		4.5ms max.
Reset Time (latching)		4.5ms max.
Temperature Rise		65K max.
Temperature Range		-40℃ to 85℃
Vibration Resistance		10 ~ 55Hz 1.5mm DA
Shock Resistance	Functional	490 m/s^2
	Destructive	980 m/s^2
Humidity		5 ~ 85% RH
Termination		PCB (DIP)
Weight		Approx. 4.5g
Outline Dimension (L x W x H)		20.2 x 10.2 x 10.6 mm

Notes:

1) The data shown above are initial values.

2) UL insulation system: Class A

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5. ORDERING INFORMATION

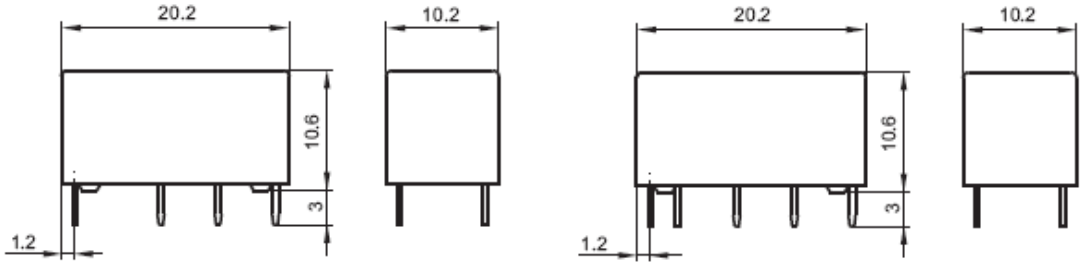
NB - 5V L1 S ① ② ③ ④	
① Relay Model	NB
② Coil Voltage	3V=3VDC, 5V=5VDC, 6V=6VDC, 9V=9VDC, 12V=12VDC, 15V=15VDC, 24V=24VDC, 48V=48VDC
③ Sort	Nil: Single side stable L1: 1 coil latching L2: 2 coils latching
④ Coil Power	Nil: Standard S: Sensitive

6. DIMENSIONS (Unit: mm)

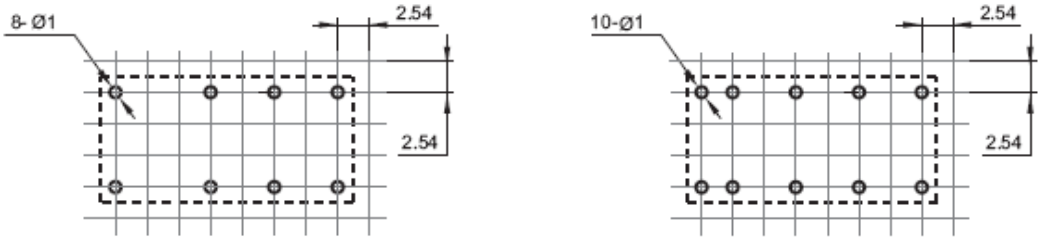
Single side stable or 1 coil latching

2 coils latching

Outline Dimensions



PCB Layout
(Bottom view)



Matching 16 pin IC socket

Matching 16 pin IC socket

Wiring Diagram
(Bottom View)

For latching, diagram shows the “reset” position

Energize terminals 1 and 16 to “set”

Reverse energize terminals 1 and 16 to “reset”

Diagram shows the “reset” position

Energize terminals 1 and 16 to “set”

Energize terminals 2 and 15 to “reset”

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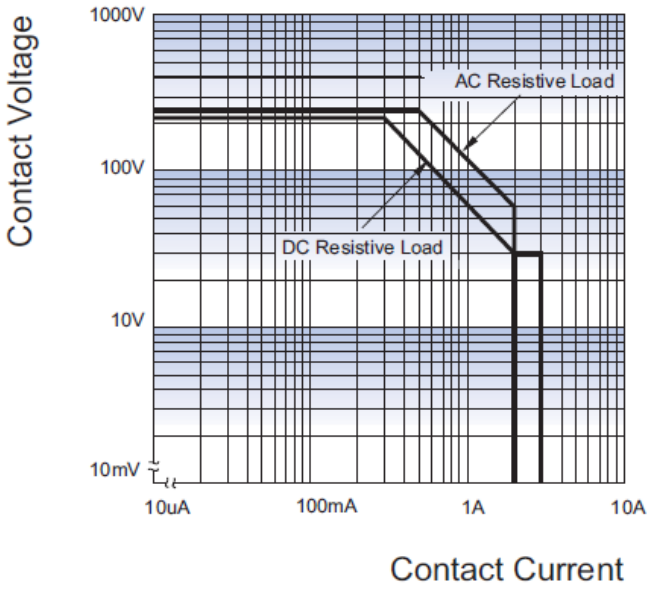
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

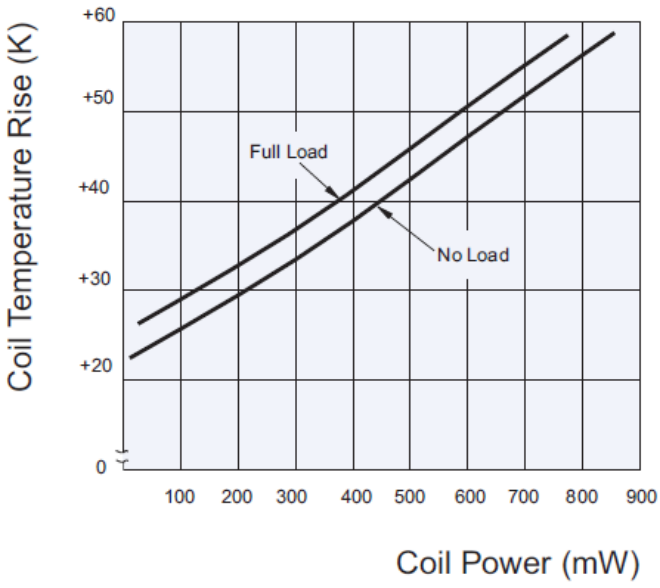
3) The width of the gridding is 2.54mm.

7. CHARACTERISTIC CURVES

Maximum Switching Power



Coil Temperature Rise



Notice

1) This relay is highly sensitive polarized relay. If correct polarity is not applied to the coil terminals, the relay does not operate properly.

2) To avoid using relays under strong magnetic fiel d which will change the parameters of relays such as pick-up voltage and drop-out voltage.

3) Relay is on the “reset” status when being released from stock, with the consideration of shock risen from transit and relay mounting. It should be changed to the “set” status when application(connecting to the power supply). Please reset the relay to “set” or “reset” status on request.

4) Energizing coil with rated voltage is basic for normal operation of a relay, please make sure the energized voltage to relay coil have reached the rated voltage. Regarding latching relay, in order to maintain the “set” or “reset” status, impulse width of the rated voltage applied to coil should be more than 5 times of “set” or “reset” time.

5) For 2 coil latching relay, do not energized voltage to “set” coil and “reset” coil simultaneously.

6) The relay may be damaged because of falling or when shocking conditions exceed the requirement.

7) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB

8) Regarding the plastic sealed relay, we should leave it cooling naturally until below 40℃. after welding, then clean it and deal with coating, remarkably the temperature of solvents should also be controlled below 40℃. Please avoid cleaning the relay by ultrasonic, avoid using the solvents like gasoline, freon and so on, which would affect the configuration of relay or influence the environment.

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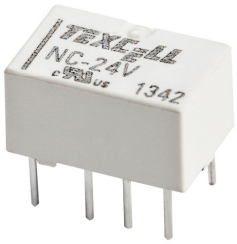
Subminiature Signal Relay	NC

Features

- Offers excellent board space savings
- Surge withstand voltage up to 2500V, meets FCC part 68 and Telecordia
- Meets EN60950 / EN41003
- SMT and DIP types available
- High contact capacity 2A 30VDC
- Low power consumption
- Single side stable and latching type available



c UL us
(File No.:E122258)

1. COIL DATA (at 23℃)

1) Single side stable

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
1.5	1.13	0.15	2.20	93.3	16 x (1±10%)	140
2.4	1.80	0.24	3.60	58.3	41 x (1±10%)	
3	2.25	0.30	4.50	46.7	64.3 x (1±10%)	
4.5	3.38	0.45	6.70	31.1	145 x (1±10%)	
5	3.75	0.50	7.50	28.0	178 x (1±10%)	
6	4.50	0.60	9.00	23.3	257 x (1±10%)	
9	6.75	0.90	13.5	15.6	579 x (1±10%)	
12	9.00	1.20	18.0	11.7	1028 x (1±10%)	
24	18.0	2.40	36.0	8.33	2880 x (1±10%)	200

2) 1 coil latching

Nominal Voltage (VDC)	Set Voltage (VDC) max.	Reset Voltage (VDC) max.	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
1.5	1.13	1.13	3.00	66.7	22.5 x (1±10%)	100
2.4	1.80	1.80	4.80	41.7	58 x (1±10%)	
3	2.25	2.25	6.00	33.3	90 x (1±10%)	
4.5	3.38	3.38	9.00	22.2	203 x (1±10%)	
5	3.75	3.75	10.0	20.0	250 x (1±10%)	
6	4.50	4.50	12.0	16.7	360 x (1±10%)	
9	6.75	6.75	18.0	11.1	810 x (1±10%)	
12	9.00	9.00	24.0	8.33	1440 x (1±10%)	
24	18.0	18.0	36.0	8.33	2880 x (1±10%)	200

Note: 1) When user's requirements can't be found in the above table, special order allowed.

2) In case 5V of transistor drive circuit, it is recommended to use 4.5V type relay, and 3V to use 2.4V type relay.

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2. CONTACT DATA

Contact Arrangement		2 Form C
Contact Resistance		100mΩ max. (at 10mA 30mVDC)
Contact Material		AgNi + Au plated
Contact Ratings (Resistive load)		0.5A 125VAC / 2A 30VDC
Max. Switching Voltage		250VAC / 220VDC
Max. Switching Current		2A
Max. Switching Power		62.5VA / 60W
Min. applicable load[1)]		10mV 10μA
Life Expectancy[2)]	Electrical	100,000 operations (at 0.5A 125VAC)
	Mechanical	100,000,000 operations

Notes:

1) Minimum applicable load is reference value. Please perform the confirmation test with the actual load before production since reference value may change according to switching frequencies, environmental conditions, expected contact resistance and reliability.

2) Life expectancy data are collected in one pair CO contact test.

3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1mm
	Coil and Contacts	1600VAC 1min
	Contact Sets	1800VAC 1min
Surge withstand voltage Between open contacts (10 x 160μs) Between coil & contacts (2 x 10μs)		1500VAC (FCC part 68) 2500VAC (Telecordia)
Operate Time (Set Time)		3ms max.
Release Time (Reset Time)		3ms max.
Temperature Rise		50K max. (at 1A load, 85℃ environment)
Temperature Range		-40℃ to 85℃
Vibration Resistance		10 ~ 55Hz 3.3mm DA
Shock Resistance	Functional	735 m/s^2
	Destructive	980 m/s^2
Humidity		5 ~ 85% RH
Termination		PCB (DIP, SMT)
Weight		Approx. 0.8g
Moisture sensitivity levels (Only for SMT type, JEDEC-STD-020)		MSL 3
Outline Dimension (L x W x H)		10.0 x 6.5 x 5.4 mm

Notes: 1) The data shown above are initial values.

2) UL insulation system: Class A

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4. ORDERING INFORMATION

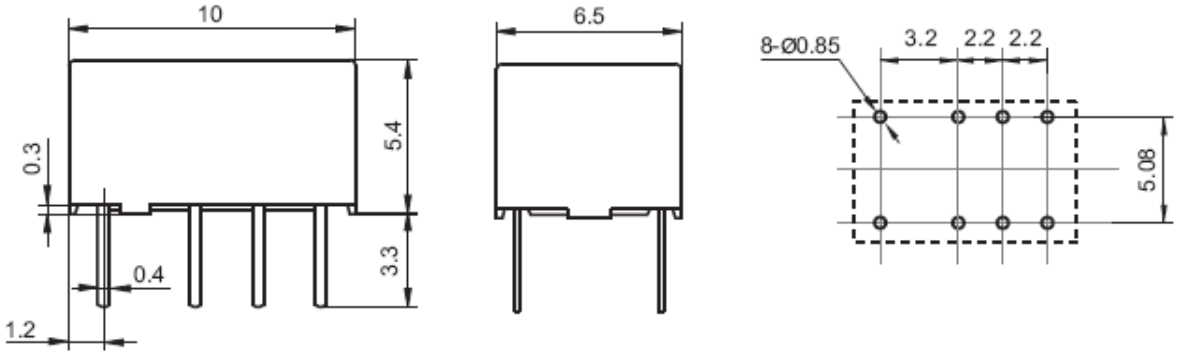
NC - 5V L1 S R ① ② ③ ④ ⑤	
① Relay Model	NC
② Coil Voltage	1.5V=1.5VDC, 2.4V=2.4VDC, 3V=3VDC, 4.5V=4.5VDC, 5V=5VDC, 6V=6VDC, 9V=9VDC, 12V=12VDC, 24V=24VDC
③ Sort	Nil: Single side stable L1: 1 coil latching
④ Termination	Nil: DIP S: Standard SMT S1: Short terminal SMT
⑤ Packing	Nil: Tube packing R: Tape & reel packing (only for SMT type)

Note: For the R type, the letter "R" will only be printed on packing tag and will not appear on relay cover.

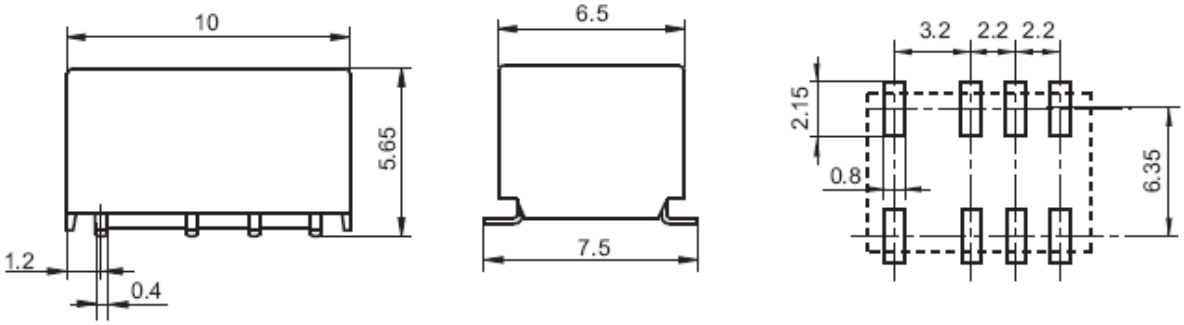
5. DIMENSIONS (Unit: mm)

Outline Dimensions PCB Layout (Bottom view)

DIP type



Standard SMT type



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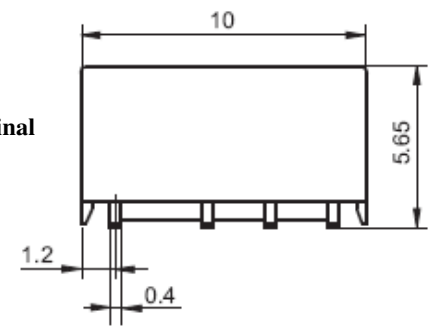
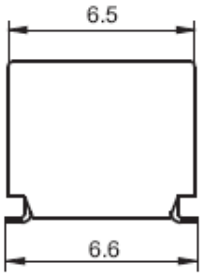
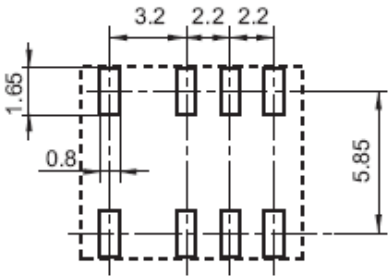
Short terminal
SMT type

Outline Dimensions



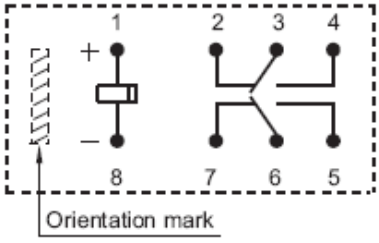


PCB Layout (Bottom view)



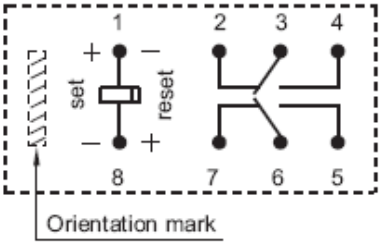
Wiring Diagram (Bottom View)

Single side stable



No energized condition

1 coil latching



Reset condition

Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

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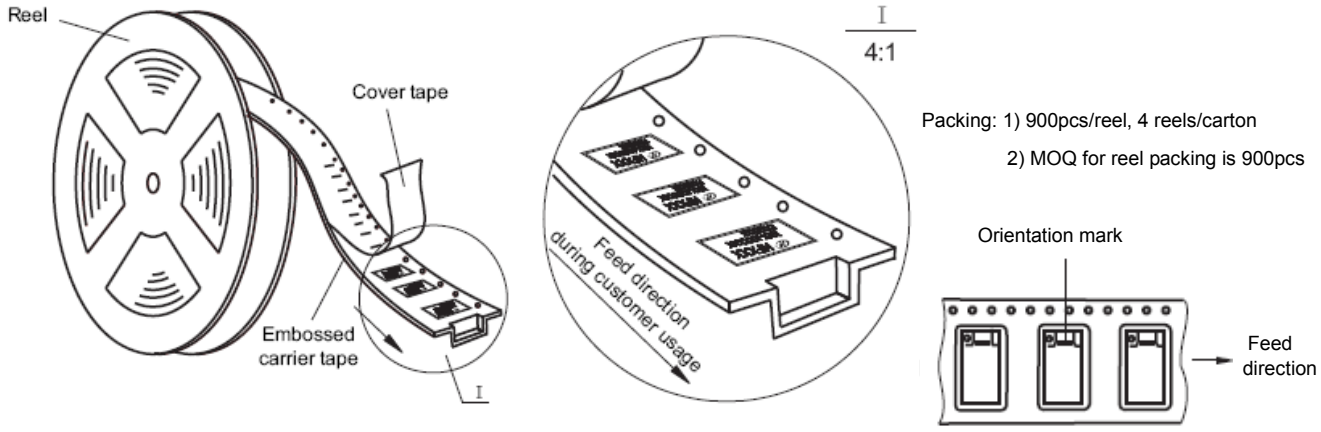
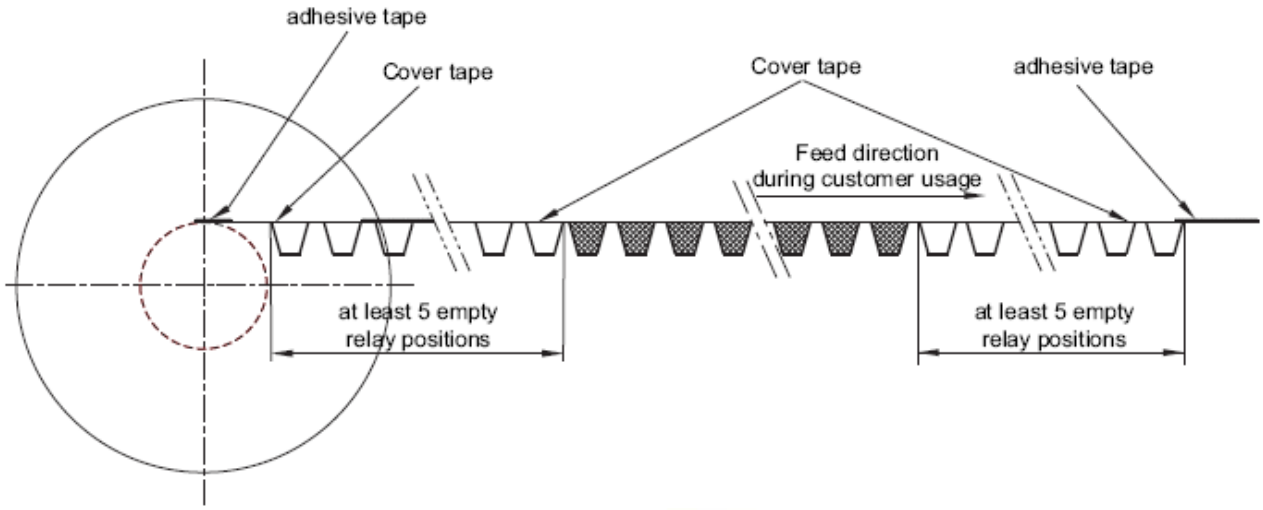
6. TAPE PACKING (Unit: mm)

Direction of Relay Insertion





Reel Dimensions

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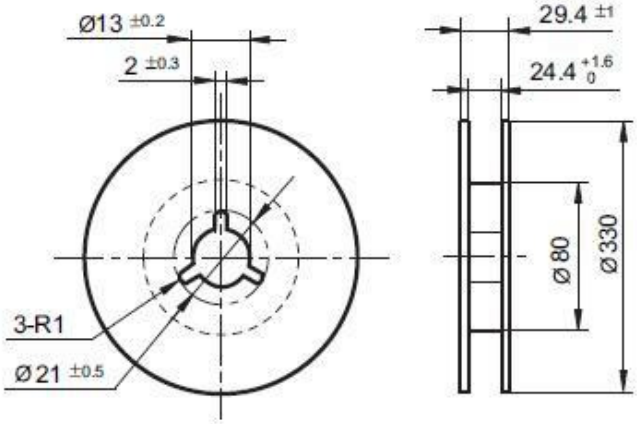

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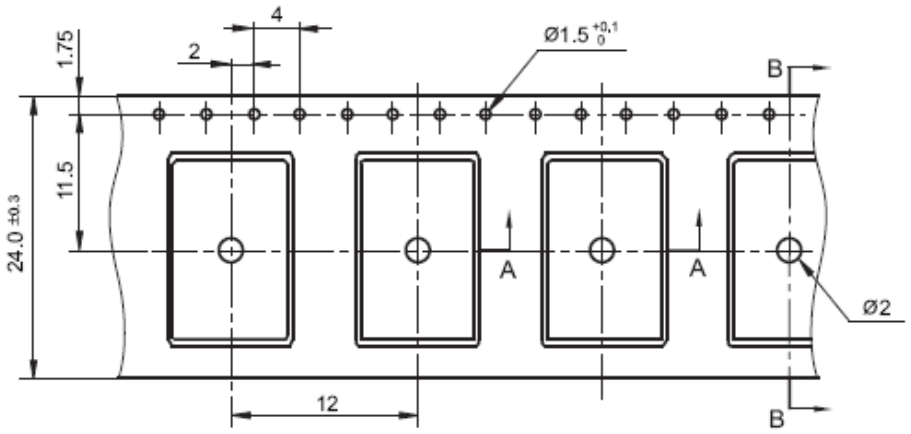
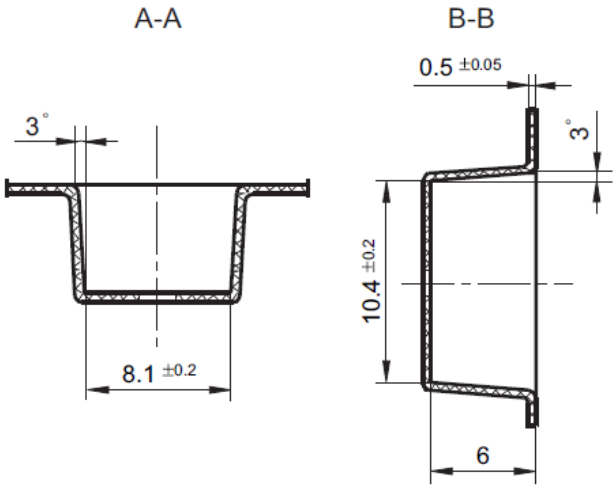
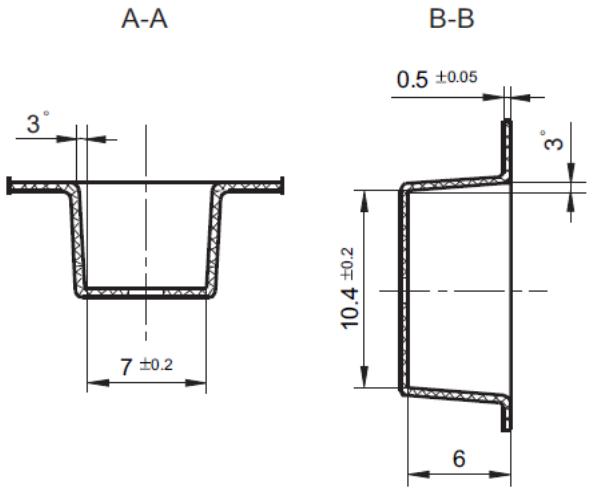
Tape Dimensions



Standard SMT type



Short terminal SMT type



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

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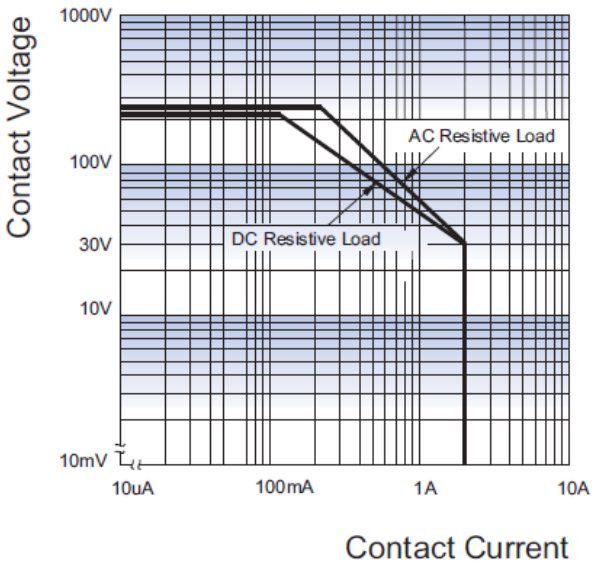
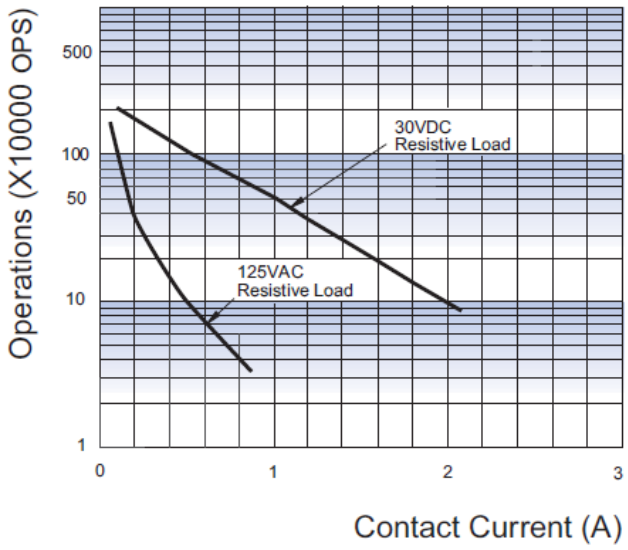
7. CHARACTERISTIC CURVES

Maximum Switching Power

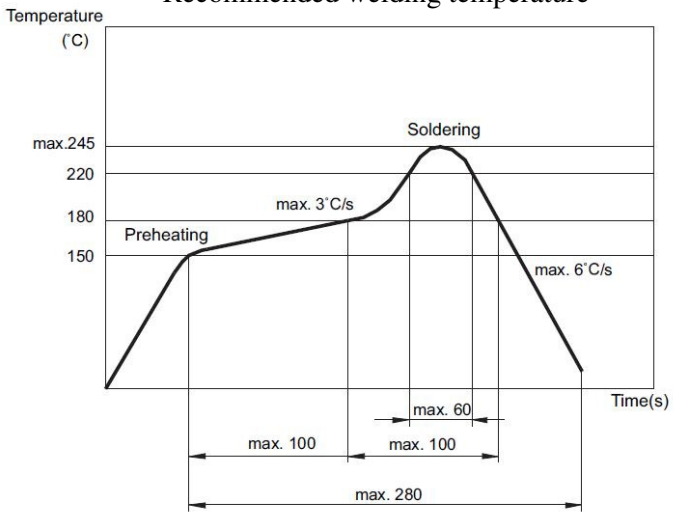


Endurance Curve



Reflow welding, temperature on PCB board

Recommended welding temperature



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Notice

1) This relay is highly sensitive polarized relay. If correct polarity is not applied to the coil terminals, the relay does not operate properly.
2) To avoid using relays under strong magnetic field which will change the parameters of relays such as pick-up voltage and drop-out voltage.
3) Relay is on the “reset” status when being released from stock, with the consideration of shock risen from transit and relay mounting. It should be changed to the “set” status when application(connecting to the power supply). Please reset the relay to “set” or “reset” status on request.
4) Energizing coil with rated voltage is basic for normal operation of a relay, please make sure the energized voltage to relay coil have reached the rated voltage. Regarding latching relay, in order to maintain the “set” or “reset” status, impulse width of the rated voltage applied to coil should be more than 5 times of “set” or “reset” time.
5) The relay may be damaged because of falling or when shocking conditions exceed the requirement.
6) For SMT products, validation with real application should be done before your series production, if the reflow-soldering temperature curve is out of our recommendation. Generally, two-time reflow-soldering is not recommended for the relay. However, if two-time reflow-soldering is required, a 60min. interval should be guaranteed and a validation should be done before production.
7) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB
8) Regarding the plastic sealed relay, we should leave it cooling naturally until below 40℃ after welding, then clean it and deal with coating, remarkably the temperature of solvents should also be controlled below 40℃. Please avoid cleaning the relay by ultrasonic, avoid using the solvents like gasoline, freon and so on, which would affect the configuration of relay or influence the environment.
9) Relays packaged in moisture barrier bags meet MSL-3 requirements. The relays should be stored at ambient conditions of ≤30℃ and ≤60% RH after they are removed from their packaging, and should be used within 168 hours. If the relays cannot be used within 168 hours, please repack them or store them in a drying oven at 25℃±5℃, ≤10% RH. Otherwise, relays may be subjected to a soldering test to check their performance, or they may be used after keeping them in an oven for 72 hours at with 50℃±5℃, ≤30% RH

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Subminiature Signal Relay	TA

Features

- Small size and low cost
- DIP standard terminals
- Sealed type
- Surge strength 1500V FCC68

(File No.:E122258)

1. COIL DATA (at 20℃)

1) Standard type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.25	0.3	3.90	150	20 x (1±10%)	450
5	3.75	0.5	6.50	90.0	56 x (1±10%)	
6	4.50	0.6	7.80	75.0	80 x (1±10%)	
9	6.75	0.9	11.7	50.0	180 x (1±10%)	
12	9.00	1.2	15.6	37.5	320 x (1±10%)	
24	18.0	2.4	31.2	18.7	1280 x (1±10%)	
48	36.0	4.8	62.4	9.00	5120 x (1±10%)	

2) Sensitive type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.25	0.3	3.90	120	25 x (1±10%)	360
5	3.75	0.5	6.50	71.4	69 x (1±10%)	
6	4.50	0.6	7.80	60.0	100 x (1±10%)	
9	6.75	0.9	11.7	40.0	225 x (1±10%)	
12	9.00	1.2	15.6	30.0	400 x (1±10%)	
24	18.0	2.4	31.2	15.0	1600 x (1±10%)	
48	36.0	4.8	62.4	7.50	6400 x (1±10%)	

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3) High-sensitive type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.25	0.3	3.90	66.7	45 x (1±10%)	200
5	3.75	0.5	6.50	40.0	125 x (1±10%)	
6	4.50	0.6	7.80	33.3	180 x (1±10%)	
9	6.75	0.9	11.7	22.2	405 x (1±10%)	
12	9.00	1.2	15.6	16.7	720 x (1±10%)	
24	18.0	2.4	31.2	8.30	2880 x (1±10%)	

2. CONTACT DATA

Contact Arrangement		1 Form A, 1 Form C
Contact Resistance		100mΩ max. (at 1A 6VDC)
Contact Material		AgNi
Load		Resistive load (COSΦ=1)
Contact Ratings		3A 120VAC / 24VDC
Minimum Load		1mA 5VDC
Max. Switching Voltage		240VAC / 60VDC
Max. Switching Current		5A
Max. Switching Power		360VA / 90W
Life Expectancy	Electrical	100,000 operations (at 30 operations/minute)
	Mechanical	10,000,000 operations (at 300 operations/minute)

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3. CHARACTERISTICS

Insulation Resistance		100MΩ Min. (at 500VDC)
Dielectric Strength	Open Contacts	500VAC 1min
	Coil and Contacts	1000VAC 1min
Operate Time		5ms
Release Time		5ms
Temperature Range		-30℃ ~ 85℃
Shock Resistance	Operating Extremes	10G
	Damage Limits	50G
Vibration Resistance		10 ~ 55Hz, 1.5mm
Max. switching frequency	Mechanical	18,000 operations/hr
	Electrical	1,800 operations/hr
Humidity		40 ~ 85%
Termination		PCB (DIP)
Weight		Approx. 3.5g
Outline Dimension (L x W x H)		15.7 x 10.4 x 11.7 mm

4. ORDERING INFORMATION

TAA ①	1 ②	-	12 ③	H ④

① Relay Model	TAA, TAB
② Contact Arrangement	11: 1 Form A (SPST-NO) 1: 1 Form C (SPDT)
③ Coil Voltage	3=3VDC, 5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 24=24VDC, 48=48VDC
④ Coil Power	B: Standard (450mW) N: Sensitive (360mW) H: High-sensitive (200mW)

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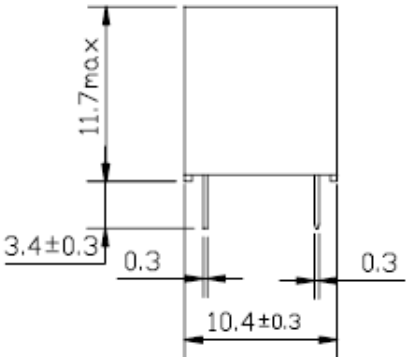
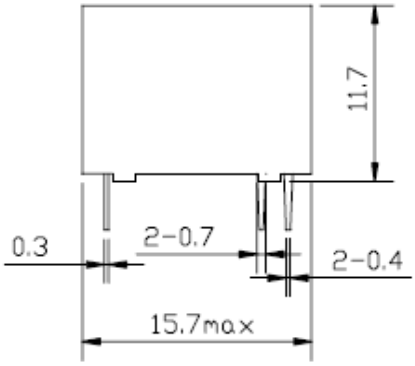
5. DIMENSIONS (Unit: mm)

1) TAA

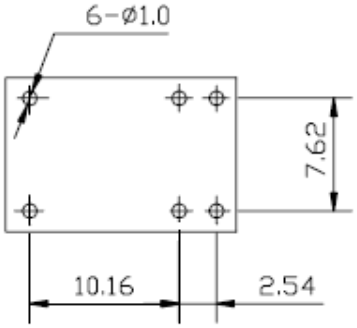
Outline Dimensions

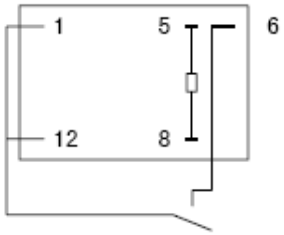


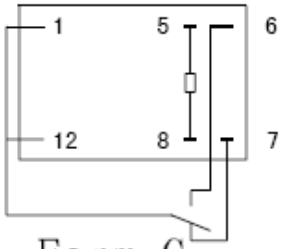


PCB Layout(Bottom View)

Wiring Diagram(Bottom View)

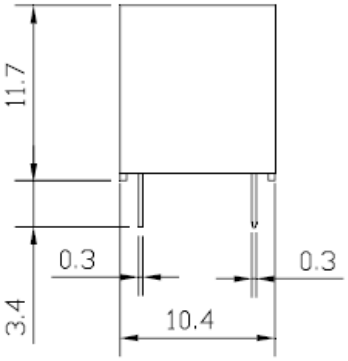


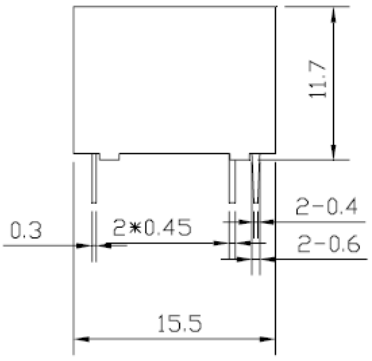




2) TAB

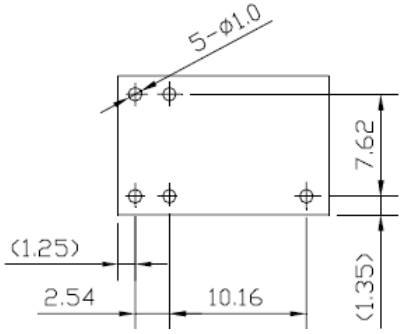
Outline Dimensions

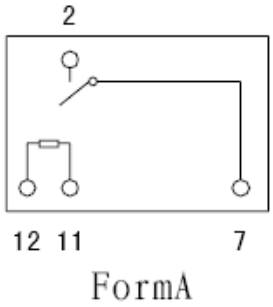


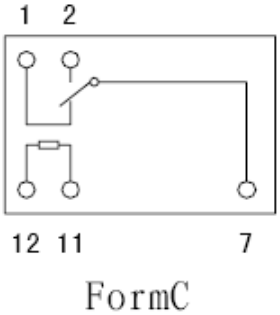


PCB Layout(Bottom View)

Wiring Diagram(Bottom View)







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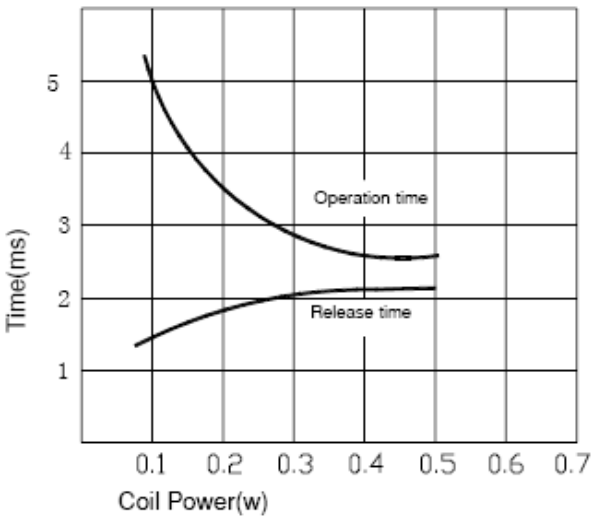
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

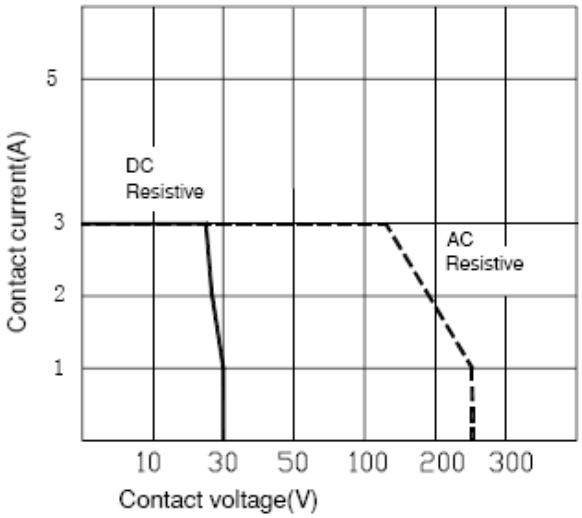
2) The tolerance without indicating for PCB layout is always ±0.1mm

6. CHARACTERISTIC CURVES

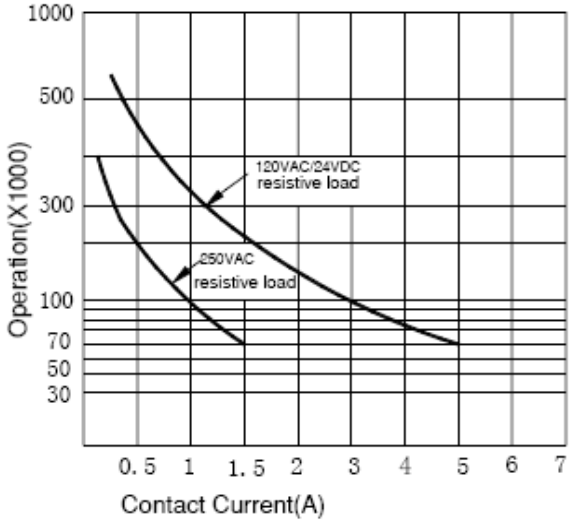
Timing



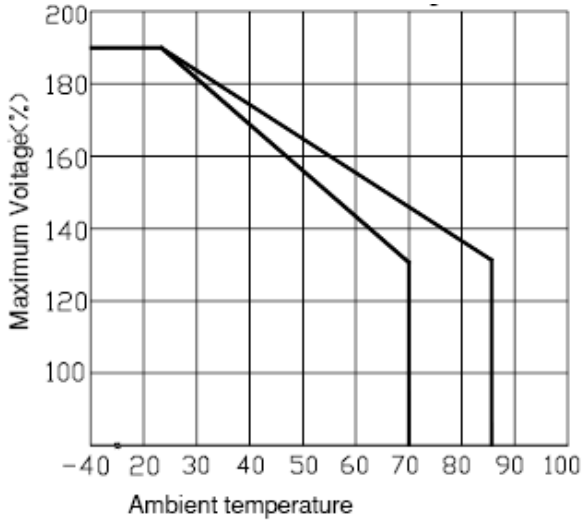
Coil Temperature Rise



Life Expectancy



Ambient Temperature
Vs. Maximum Voltage



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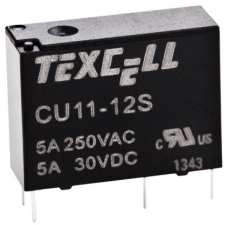
Subminiature Intermediate Power Relay	CU

Features

- 10kV impulse withstand voltage (Between coil and contacts)
- Highly efficient magnetic circuit for high sensitivity : 200mW
- 10A switching capability
- Extremely small footprint utilizing PCB area



c UL us
(File No.:E134581)

1. COIL DATA (at 23℃)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.25	0.18	3.90	66.7	45 x (1±10%)	200
5	3.75	0.25	6.50	40.0	125 x (1±10%)	
6	4.50	0.30	7.80	33.3	180 x (1±10%)	
9	6.75	0.45	11.7	22.2	405 x (1±10%)	
12	9.00	0.60	15.6	16.7	720 x (1±10%)	
18	13.5	0.90	23.4	11.1	1620 x (1±10%)	
24	18.0	1.20	31.2	8.33	2880 x (1±10%)	

2. CONTACT DATA

		Standard (5A)	High Capacity (7A)
Contact Arrangement		1 Form A	
Contact Resistance		100mΩ max. (at 1A 6VDC)	
Contact Material		AgNi	
Contact Ratings		5A 250VAC / 30VDC	7A 250VAC / 30VDC
Max. Switching Voltage		277VAC / 30VDC	
Max. Switching Current		5A	10A
Max. Switching Power		1,385VA / 150W	2770VA / 300W
Life Expectancy	Electrical	100,000 operations (at 5A 250VAC)	50,000 operations (at 7A 250VAC) 10,000 operations (at 10A 250VAC)
	Mechanical	5,000,000 operations	

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3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1min
	Coil and Contacts	4000VAC 1min
Surge Voltage (between coil and contact)		10kV (1.2 x 50μs)
Operate Time (at nominal voltage)		10ms max.
Release Time (at nominal voltage)		10ms max.
Temperature Range		-40℃ ~ 85℃
Shock Resistance[1)]	Functional	98 m/s^2
	Destructive	980 m/s^2
Vibration Resistance[2)]		10 ~ 55Hz, 1.5mm DA
Humidity		5 ~ 85% RH
Termination		PCB
Weight		Approx. 3g
Outline Dimension (L x W x H)		20.5 x 7.0 x 15.3 mm

Note: 1) Shock malfunction: 49 m/s^2 for the length direction.

2) Vibration: 10Hz to 55Hz 1mm DA for the length direction.

3) The data shown above are initial values.

4. ORDERING INFORMATION

CU ①	11 ②	-	12 ③	S ④	G ⑤

① Relay Model	CU
② Contact Arrangement	11: 1 Form A (SPST-NO)
③ Coil Voltage	3=3VDC, 5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 18=18VDC, 24=24VDC
④ Construction	S: Sealed Type
⑤ Contact Rating	Nil: 5A (Standard) G: 7A (High Capacity)

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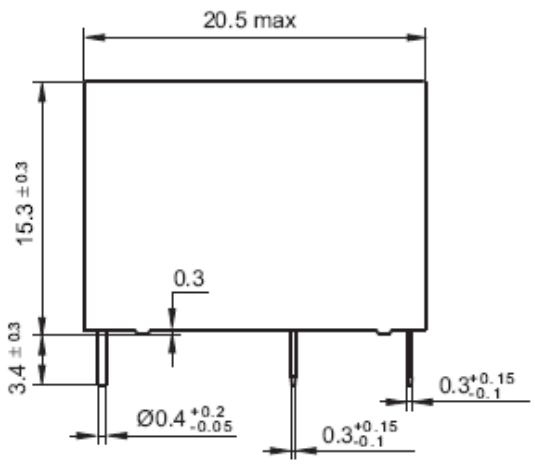
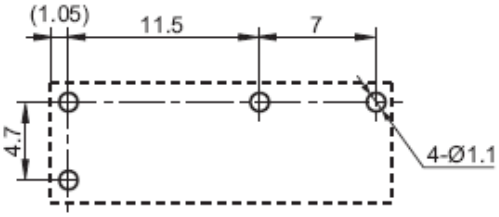
5. DIMENSIONS (Unit: mm)

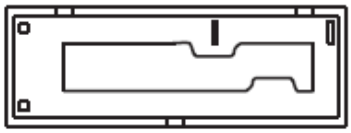
Outline Dimensions





PCB Layout (Bottom View)

Wiring Diagram (Bottom View)



Bottom View

Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

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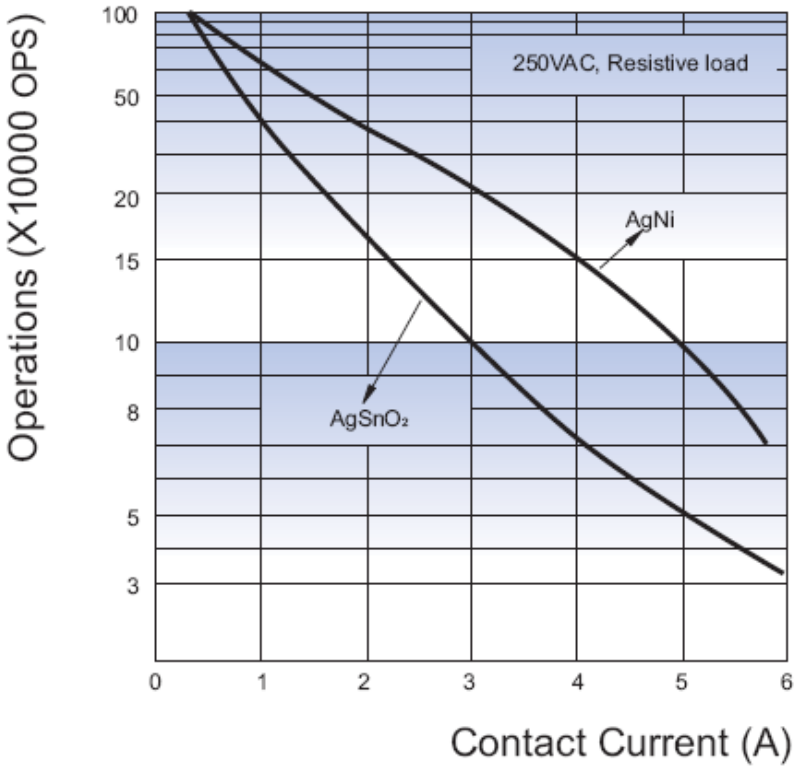
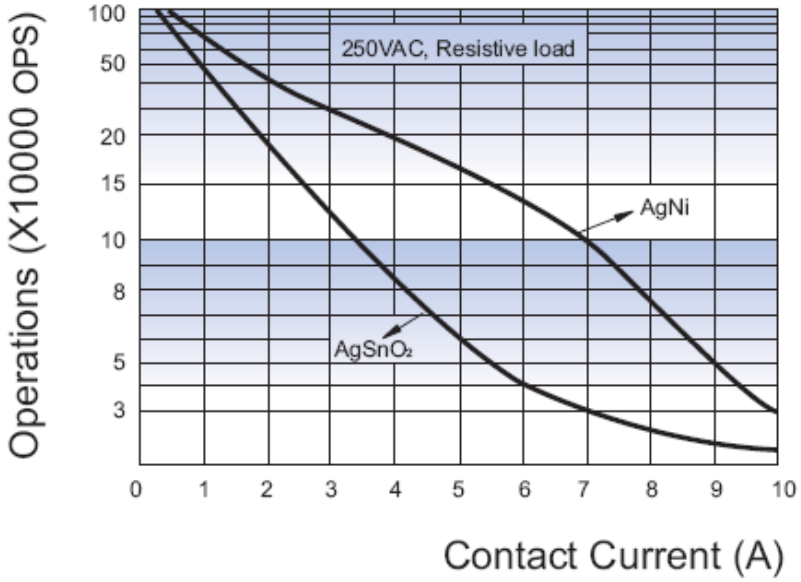
6. ENDURANCE CURVES

1) Standard (5A)



2) High Capacity (7A)



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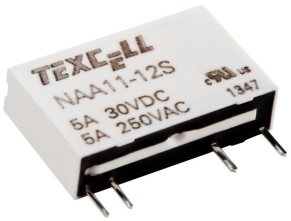
Miniature Power Relay	NA

Features

- 5A switching capability
- 3kV dielectric strength (between coil and contacts)
- Slim size (width: 5mm, height: 12.5mm)
- High sensitive: Min. 120mW
- Meets IEC61131-2 reinforce insulation
- Creepage/clearance distance: Min. 3.5mm
- Socket available
- UL insulation system: Class F available



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1. COIL DATA (at 23℃)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	3.50	0.25	6.00	24.0	208 x (1±10%)	Approx. 120
6	4.20	0.30	7.20	20.0	300 x (1±10%)	
9	6.30	0.45	10.8	13.3	675 x (1±10%)	
12	8.40	0.60	14.4	10.0	1200 x (1±10%)	
18	12.6	0.90	21.6	6.67	2700 x (1±15%)	
24	16.8	1.20	28.8	7.50	3200 x (1±15%)	Approx. 180

Note:

1) All above data are tested when the relays terminals are downward position. Other positions of the terminals, the pick-up and drop-out voltages will have ±5% tolerance. For example, when the relay terminals are transverse position, the max. pick-up voltage change is 75% of nominal voltage.

2) The max. allowable voltage refers to the maximum voltage which relay coil could endure in a short period of time.

3) 24VDC 120mW type is also available. Please see ordering information for more details.

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2. CONTACT DATA

Contact Arrangement		1 Form A (SPST)
Contact Resistance (at 1A 6VDC)		No gold plated: 100mΩ max. Gold plated: 50mΩ max.
Contact Material		AgNi, $AgSnO_2$
Contact Ratings (Resistive load)		5A 250VAC / 30VDC
Max. Switching Voltage		250VAC / 30VDC
Max. Switching Current		5A
Max. Switching Power		1,250VA / 150W
Min. Contact Load[1)]		No gold plated: 5VDC 10mA Gold plated: 5VDC 1mA
Life Expectancy	Electrical	100,000 operations (3A 250VAC / 30VDC) 50,000 operations (5A 250VAC / 30VDC)
	Mechanical	20,000,000 operations

Note:

1) Min. contact load is reference value. Please perform the confirmation test with the actual load before usage since reference value may change according to switching frequencies, environmental conditions and expected life cycles.

3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1min
	Coil and Contacts	3000VAC 1min
Surge voltage (between coil and contacts)		6kV(1.2 / 50μs)
Operate Time (at nominal voltage)		10ms max.
Release Time (at nominal voltage)		5ms max.
Temperature Range		-40℃ ~ 85℃
Shock Resistance	Functional	98 m/s^2
	Destructive	980 m/s^2
Vibration Resistance		10 ~ 55Hz, 1.5mm DA
Humidity		5 ~ 85% RH
Termination		PCB
Weight		Approx. 3g
Outline Dimension (L x W x H)		20.0 x 5.0 x 12.5mm

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4. ORDERING INFORMATION

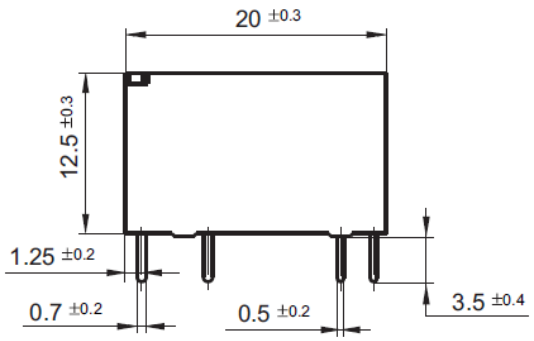
NAA ①	11 ②	-	12 ③	S ④	G ⑤	T ⑥	F ⑦	L ⑧

① Relay Model	NAA: Terminal distance 5.08mm NAB: Terminal distance 7.62mm
② Contact Arrangement	11: 1 Form A (SPST)
③ Coil Voltage	5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 18=18VDC, 24=24VDC
④ Contact Version	S: Single Contact B: Bifurcated Contact (Only for gold plated)
⑤ Contact Plating	Nil: No gold plated (Only for single contact) G: Gold plated
⑥ Contact Material	Nil: AgNi T: $AgSnO_2$ (Only for single contact)
⑦ Insulation Standard	Nil: Class A B: Class B F: Class F
⑧ Coil Power	Nil: Standard L: Sensitive (24voltage with 120mW)

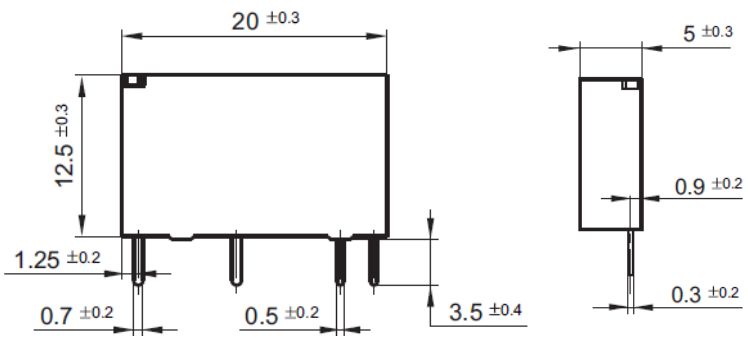
5. DIMENSIONS (Unit: mm)

Outline Dimensions

NAA

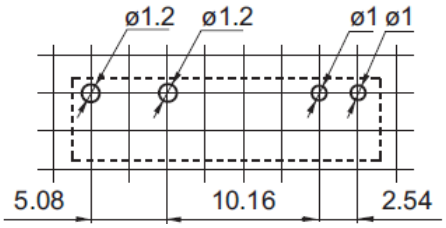


NAB

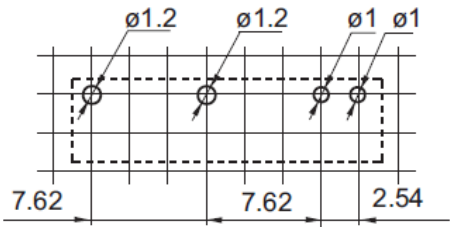


PCB Layout (Bottom view)

NAA



NAB



Wiring Diagram (Bottom View)

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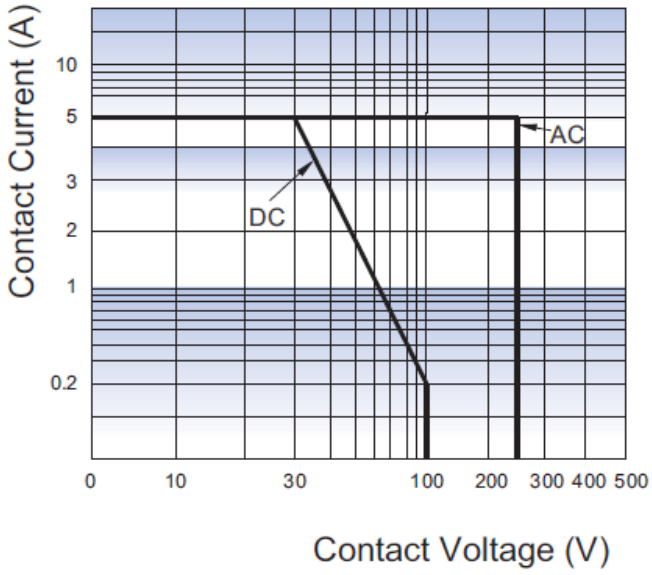
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

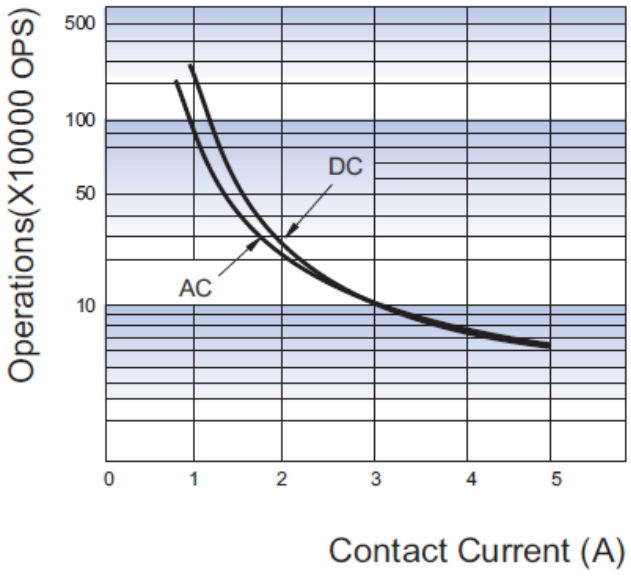
3) The width of the gridding is 2.54mm.

6. CHARACTERISTIC CURVES

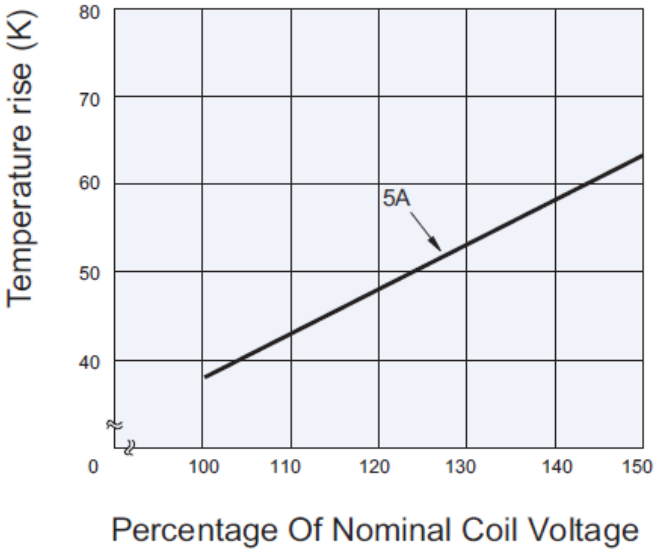
Maximum Switching Power



Endurance Curve



Coil Temperature Rise



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Subminiature Intermediate Power Relay	CS

Features

- 10A switching capability
- 1 Form A and 1 Form C configurations
- Creepage distance: 6.5mm (between coil and contacts)
- Dielectric strength 4kV (between coil and contacts)
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F
- Plastic sealed type
- Subminiature, Standard PCB layout

c UL us
(File No.:E134581)

1. COIL DATA (at 23℃)

1) Standard type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.25	0.15	3.90	150	20 x (1±10%)	450
5	3.75	0.25	6.50	90.0	55 x (1±10%)	
6	4.50	0.30	7.80	75.0	80 x (1±10%)	
9	6.75	0.45	11.7	50.0	180 x (1±10%)	
12	9.00	0.60	15.6	37.5	320 x (1±10%)	
18	13.5	0.90	23.4	25.0	720 x (1±10%)	
24	18.0	1.20	31.2	18.8	1280 x (1±10%)	
48	36.0	2.40	62.4	9.40	5120 x (1±10%)	

2) Sensitive type (Only for 1 Form A)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.25	0.15	4.50	66.7	45 x (1±10%)	200
5	3.75	0.25	7.50	40.0	125 x (1±10%)	
6	4.50	0.30	9.00	33.3	180 x (1±10%)	
9	6.75	0.45	13.5	22.2	400 x (1±10%)	
12	9.00	0.60	18.0	16.7	720 x (1±10%)	
18	13.5	0.90	27.0	11.1	1600 x (1±10%)	
24	18.0	1.20	36.0	8.33	2800 x (1±10%)	
48	36.0	2.40	72.0	4.17	11520 x (1±10%)	

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2. CONTACT DATA

Contact Arrangement		1 Form A				1 Form C
Coil Power (mW)		Standard (450mW)		Sensitive (200mW)		Standard (450mW)
Type (Refer to ordering info.)		SH	SGH	H	Q	SH
Contact Resistance		100mΩ max. (at 1A 6VDC)				
Contact Material		$AgSnO_2$				AgNi
Contact Rating (Resistive Load)		5A 250VAC 5A 30VDC	10A 277VAC 10A 30VDC	3A 250VAC 3A 30VDC	8A 277VAC 8A 30VDC	3A 250VAC 3A 30VDC
Max. Switching Voltage		277VAC / 30VDC				250VAC / 30VDC
Max. Switching Current		5A	10A	3A	8A	3A
Max. Switching Power		1250VA / 150W	2770VA / 300W	750VA / 90W	2216VA / 240W	750VA / 90W
Life Expectancy	Electrical	100,000 operations				
	Mechanical	10,000,000 operations				

3. CHARACTERISTICS

Insulation Resistance			1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts		1000VAC 1min
	Coil and Contacts	1 Form A	4000VAC 1min
		1 Form C	2500VAC 1min
Surge withstand voltage (only for 1 Form A)			6kV(1.2 / 50μs)
Operate Time (at nominal voltage)			8ms max
Release Time (at nominal voltage)			5ms max
Coil Temperature Rise (at nominal voltage)	SH(1 Form A) & H type		60k max.
	SGH & Q type		70k max.
Temperature Range	1 Form A		-40℃ ~ 85℃
	1 Form C		-40℃ ~ 70℃
Shock Resistance	Functional		98 m/s^2
	Destructive		980 m/s^2
Vibration Resistance			10 ~ 55Hz, 1.5mm DA
Humidity			5 ~ 85% RH
Termination			PCB
Weight			Approx. 6g
Outline Dimension (L x W x H)			18.4 x 10.2 x 15.3 mm

Notes: 1) The data shown above are initial values.

2) In order to obtain better electrical endurance, it is better not use this product in the high temperature environment.

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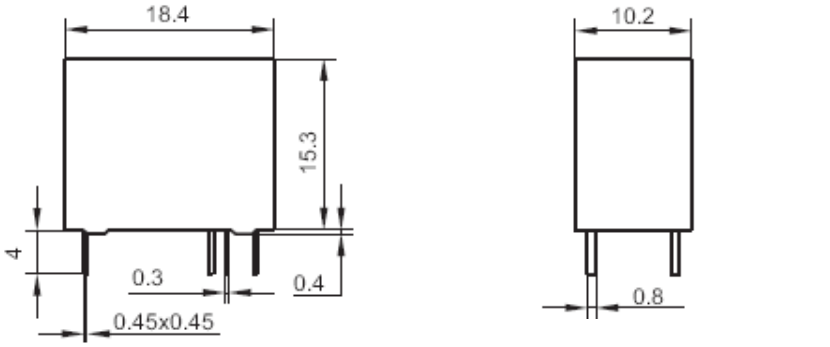
4. ORDERING INFORMATION

CS ①	11 ②	-	12 ③	SH ④
① Relay Model	CS			
② Contact Arrangement	11: 1 Form A (SPST-NO) 1: 1 Form C (SPDT)			
③ Coil Voltage	3=3VDC, 5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 18=18VDC, 24=24VDC, 48=48VDC			
④ Contact Capacity & Coil Power	SH: 5A 250VAC/30VDC, Coil Power 450mW (only for 1 Form A) 3A 250VAC/30VDC, Coil Power 450mW (only for 1 Form C) SGH: 10A 250VAC / 30VDC, Coil Power 450mW (only for 1 Form A) H: 3A 250VAC/30VDC, Coil Power 200mW (only for 1 Form A) Q: 8A 250VAC, Coil Power 200mW (only for 1 Form A)			

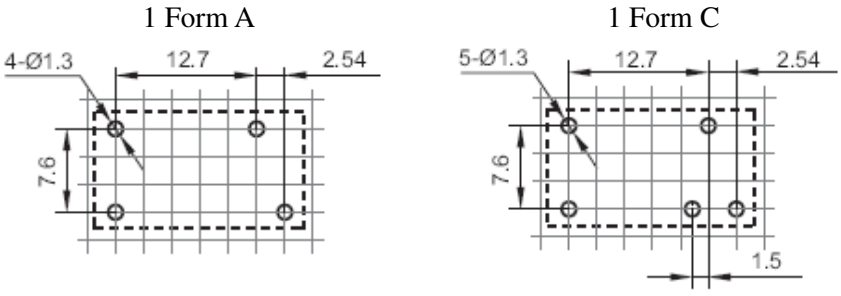
5. DIMENSIONS (Unit: mm)

Outline Dimensions



Wiring Diagram (Bottom View)

PCB Layout (Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

3) The width of the gridding is 2.54mm.

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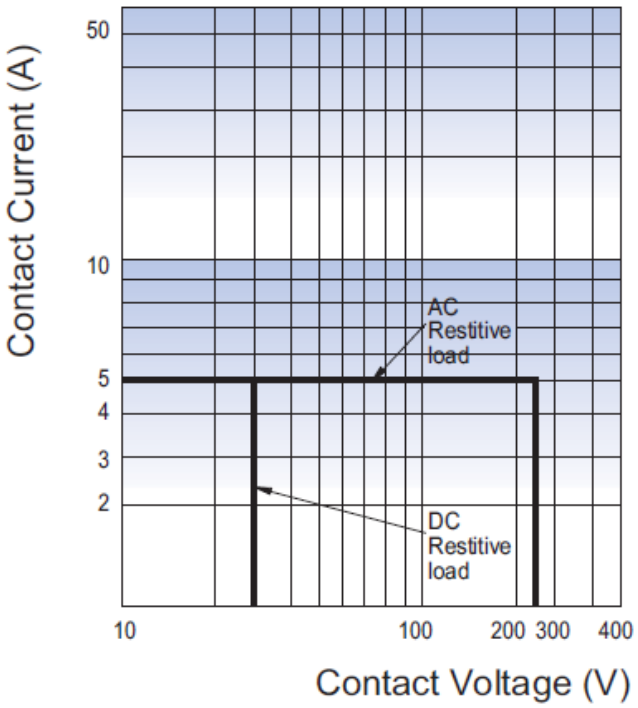
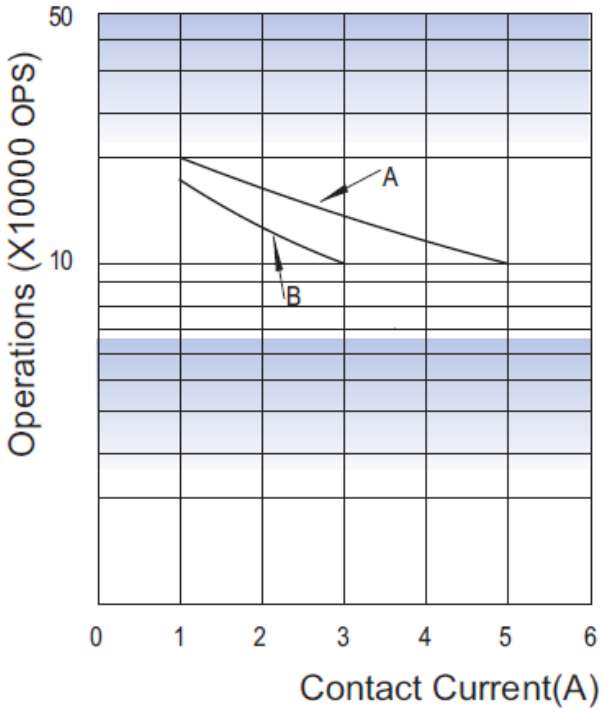
6. CHARACTERISTIC CURVES

1) CS11-□□SH, CS11-□□H

Maximum Switching Power



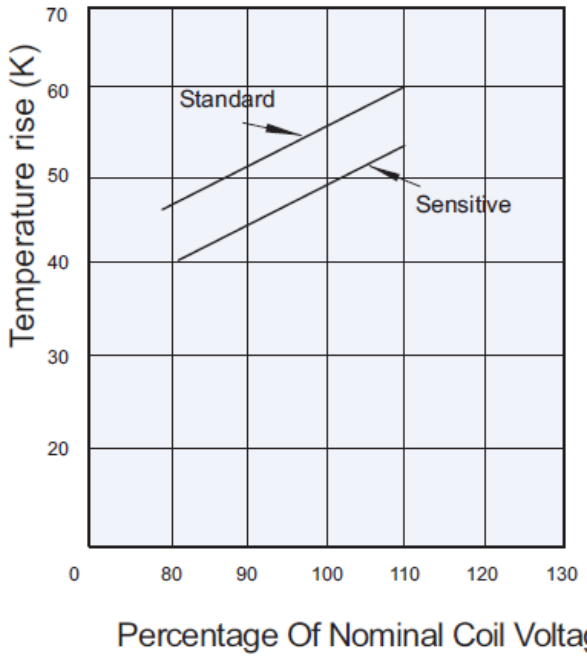
Endurance Curve



Remark:

1. Curve A: standard
2. Curve B: sensitive

Coil Temperature Rise



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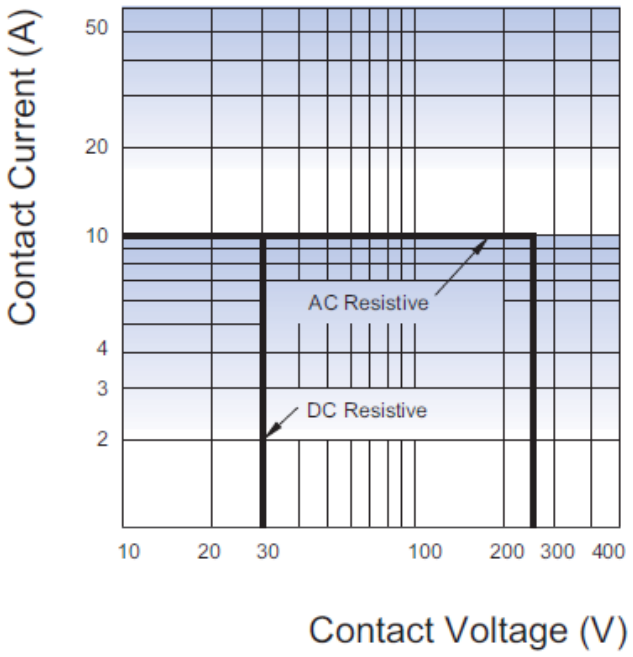
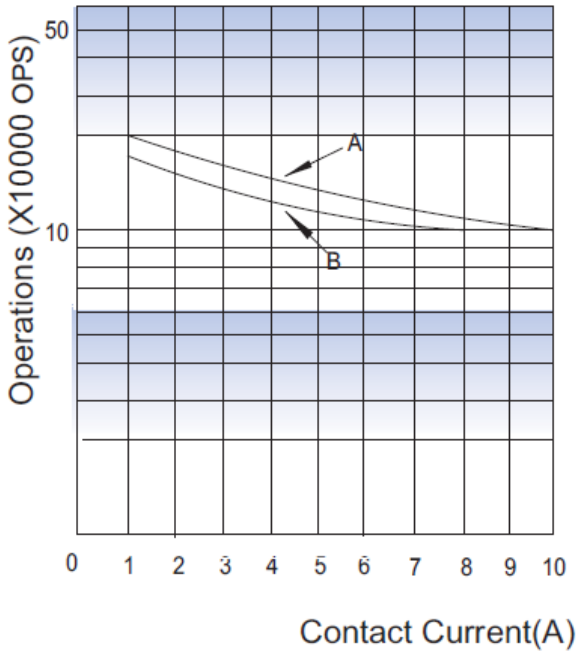
2) CS11-□□SGH, CS11-□□Q

Maximum Switching Power



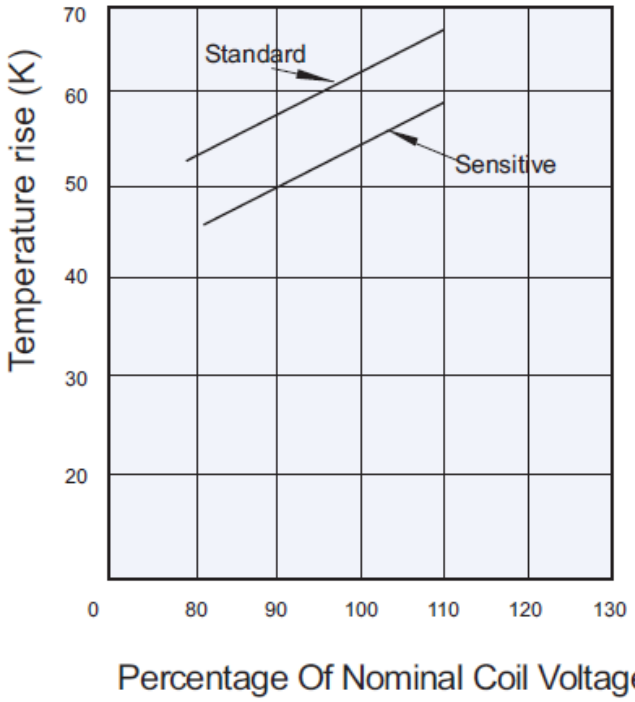
Endurance Curve



Remark:

1. Curve A: standard
2. Curve B: sensitive

Coil Temperature Rise



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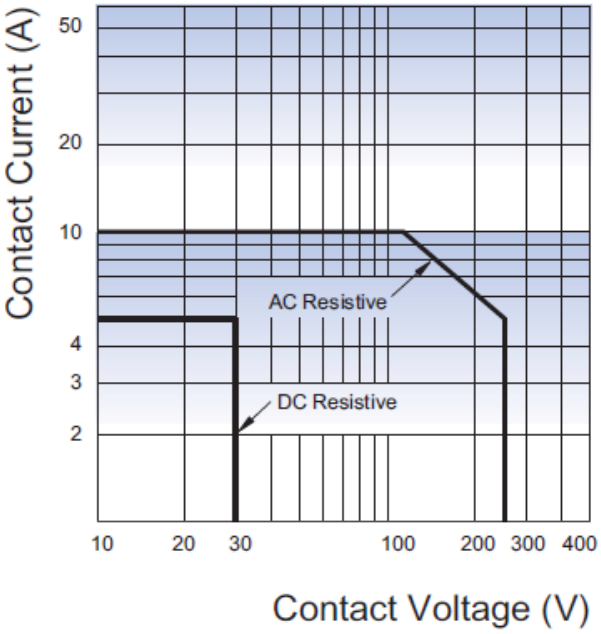
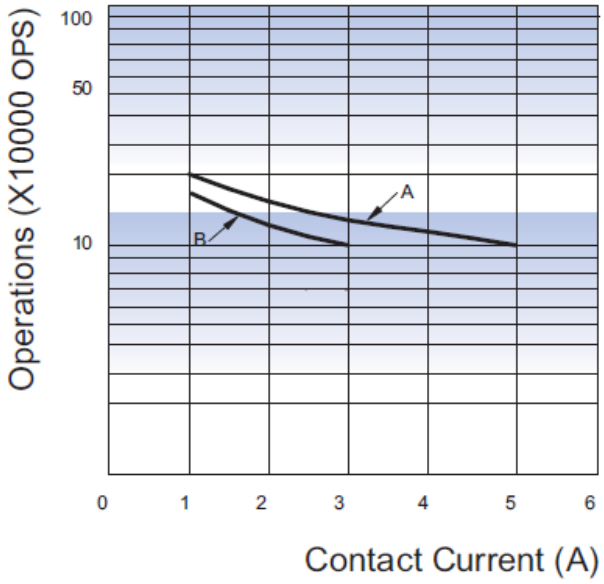
3) CS1-□□SH

Maximum Switching Power



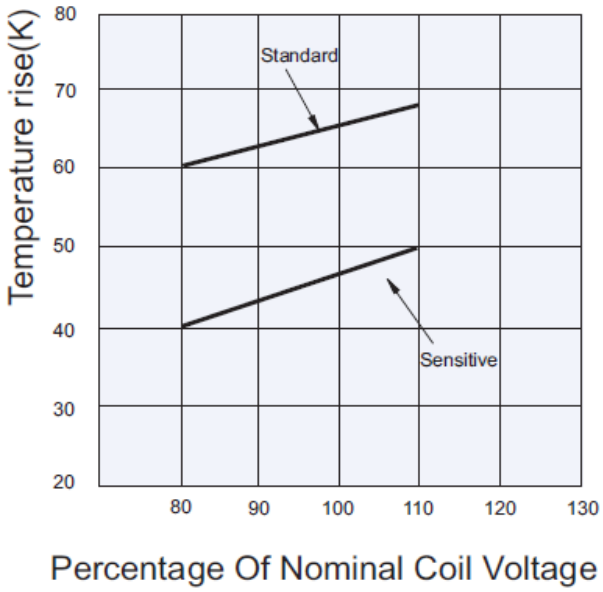
Endurance Curve



Remark:

Curve B: 1 Form C

Coil Temperature Rise



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Subminiature Intermediate Power Relay	NS

Features

- 10A switching capability
- 1 Form A and 1 Form C configurations
- Plastic sealed type
- Subminiature, Standard PCB layout
- Creepage distance: 8mm (coil & contacts)
- Clearance distance: NO type 4.5mm, NC type 4mm
- UL insulation system: Class F
- Product in accordance to IEC60335-1 available

c UL us
(File No.:E134581)

1. COIL DATA (at 23℃)

1) Standard Type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.25	0.15	3.90	150	20 x (1±10%)	450
5	3.75	0.25	6.50	90.0	55 x (1±10%)	
6	4.50	0.30	7.80	75.0	80 x (1±10%)	
9	6.75	0.45	11.7	50.0	180 x (1±10%)	
12	9.00	0.60	15.6	37.5	320 x (1±10%)	
18	13.5	0.90	23.4	25.0	720 x (1±10%)	
24	18.0	1.20	31.2	18.8	1280 x (1±10%)	
48	36.0	2.40	62.4	9.40	5120 x (1±10%)	

2) Sensitive Type (Only for 1 Form A)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
3	2.25	0.15	4.50	66.7	45 x (1±10%)	200
5	3.75	0.25	7.50	40.0	125 x (1±10%)	
6	4.50	0.30	9.00	33.3	180 x (1±10%)	
9	6.75	0.45	13.5	22.2	400 x (1±10%)	
12	9.00	0.60	18.0	16.7	720 x (1±10%)	
18	13.5	0.90	27.0	11.1	1600 x (1±10%)	
24	18.0	1.20	36.0	8.33	2800 x (1±10%)	
48	36.0	2.40	72.0	4.17	11520 x (1±10%)	

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2. CONTACT DATA

Contact Arrangement		1 Form A	1 Form C	
Contact Resistance		100mΩ max. (at 1A 24VDC)		
Contact Material		AgNi		
Contact Ratings		5A 250VAC / 30VDC 10A 125VAC	NO 5A 250VAC / 30VDC 10A 125VAC	NC 3A 250VAC / 30VDC
Max. Switching Voltage		250VAC / 30VDC		
Max. Switching Current		10A		3A
Max. Switching Power		1250VA / 150W		750VA / 90W
Life Expectancy	Electrical	100,000 operations		
	Mechanical	5,000,000 operations		

3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1min
	Coil and Contacts	4000VAC 1min
Operate Time (at nominal voltage)		8ms max.
Release Time (at nominal voltage)		5ms max.
Temperature Range		-40℃ ~ 70℃
Shock Resistance	Functional	98 m/s^2
	Destructive	980 m/s^2
Vibration Resistance		10 ~ 55Hz, 1.6mm DA
Humidity		5 ~ 85% RH
Termination		PCB
Weight		Approx. 7g
Outline Dimension (L x W x H)		20.5 x 10.2 x 15.3 mm

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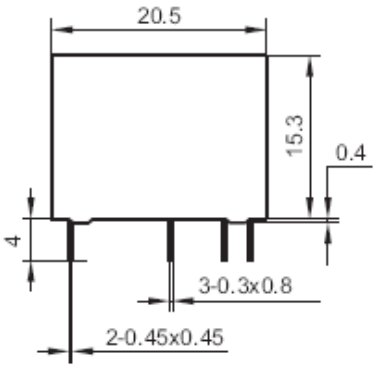
4. ORDERING INFORMATION

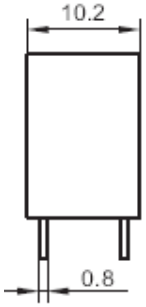
NS ①	11 ②	-	12 ③	S ④	H ⑤	G ⑥	F ⑦

① Relay Model	NS
② Contact Arrangement	11: 1 Form A (SPST-NO) 1: 1 Form C (SPDT)
③ Coil Voltage	3=3VDC, 5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 18=18VDC, 24=24VDC, 48=48VDC
④ Construction	S: Sealed type
⑤ Coil Power	Nil: 200mW (only for 1 Form A) H: 450mW
⑥ Contact Plating	Nil: No gold plated G: Gold plated
⑦ Insulation Standard	Nil: Class B F: Class F

5. DIMENSIONS (Unit: mm)

Outline Dimensions





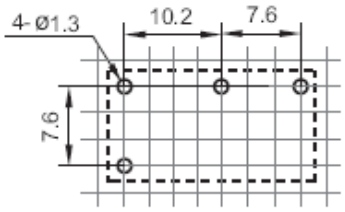
Wiring Diagram (Bottom View)

1 Form A

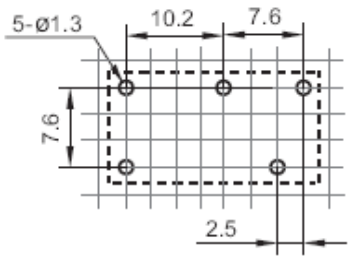
1 Form C

PCB Layout (Bottom view)

1 Form A



1 Form C



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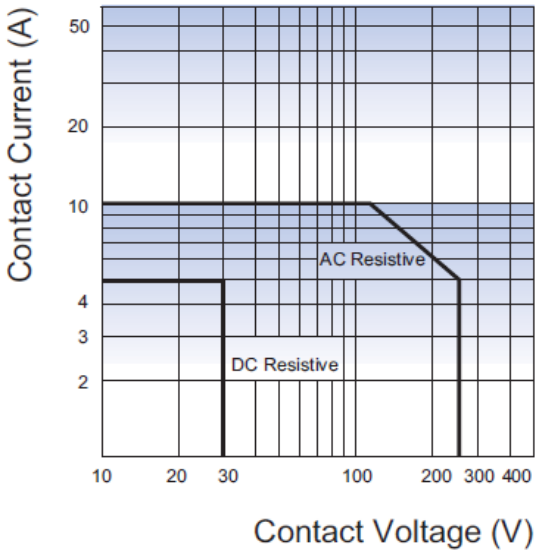
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

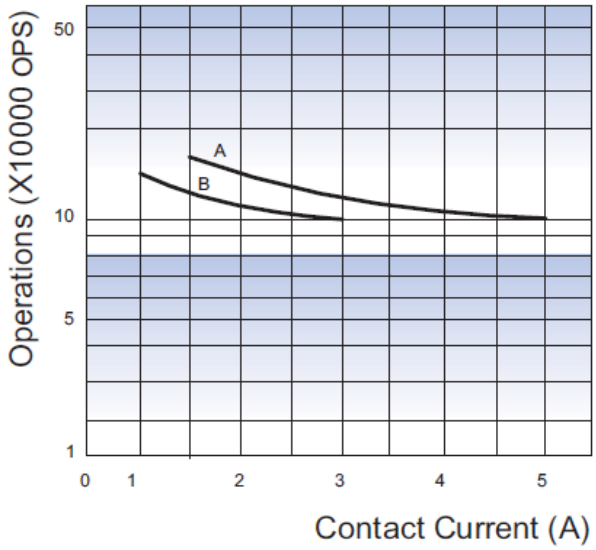
3) The width of the gridding is 2.54mm.

6. CHARACTERISTIC CURVES

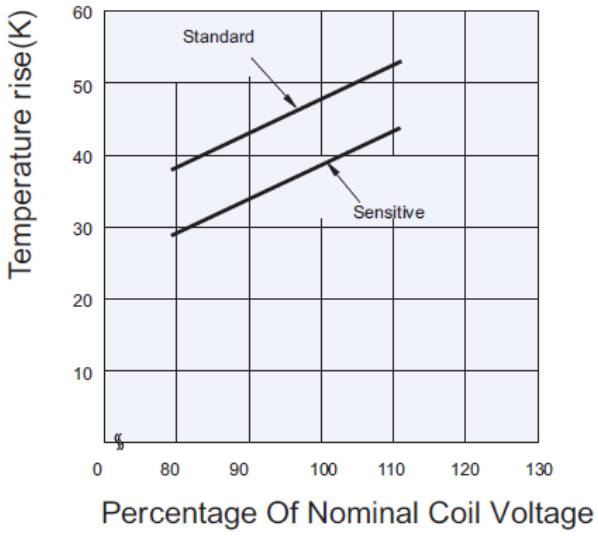
Maximum Switching Power



Endurance Curve



Coil Temperature Rise



Notes: 1) Curve A: NO contact

2) Curve B: NC contact

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Subminiature High Power Relay	NKB

Features

- 15A switching capability
- 1 Form A and 1 Form C configurations
- Subminiature, standard PCB layout
- Plastic sealed type
- UL insulation system: Class F

c UL us (File No.: E134581)

(File No.: R 50265861)

CQC (File No.: CQC16002138659)

1. COIL DATA (at 23℃)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	3.80	0.5	6.50	72	70 x (1±10%)	360
6	4.50	0.6	7.80	60	100 x (1±10%)	
9	6.80	0.9	11.7	40	225 x (1±10%)	
12	9.00	1.2	15.6	30	400 x (1±10%)	
18	13.5	1.8	23.4	20	900 x (1±10%)	
24	18.0	2.4	31.2	15	1600 x (1±10%)	
48	36.0	4.8	62.4	7.5	6400 x (1±10%)	

2. CONTACT DATA

Contact Arrangement		1 Form A	1 Form C	
			NO	NC
Contact Resistance		100mΩ max. (at 1A 6VDC)		
Contact Material		$AgCdO$, $AgSnO_2$		
Contact Ratings (Resistive Load)		10A 277VAC / 28VDC	10A 277VAC / 28VDC[1)]	5A 250VAC
Max. Switching Voltage		277VAC / 28VDC		250VAC
Max. Switching Current		15A	10A	5A
Max. Switching Power		2,770VA / 280W		1,250VA
Life Expectancy	Electrical	100,000 operations		
	Mechanical	10,000,000 operations		

Notes:

1) Applicable when NC is not energized with load.

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3. CHARACTERISTICS

Insulation Resistance		100MΩ (at 500VDC)
Dielectric Strength	Open Contacts	750VAC 1min
	Coil and Contacts	1500VAC 1min
Operate Time (at nominal voltage)		10ms max.
Release Time (at nominal voltage)		5ms max.
Temperature Range		-40℃ ~ 70℃
Shock Resistance	Functional	98 m/s^2
	Destructive	980 m/s^2
Vibration Resistance		10 ~ 55Hz, 1.5mm DA
Humidity		5 ~ 85% RH
Termination		PCB
Weight		Approx. 10g
Outline Dimension (L x W x H)		19.0 x 15.2 x 15.5 mm

4. ORDERING INFORMATION

NKB ① 1 ② - 12 ③ S ④ F ⑤ T ⑥

① Relay Model	NKB
② Contact Arrangement	11: 1 Form A (SPST-NO) 1: 1 Form C (SPDT)
③ Coil Voltage	5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 18=18VDC, 24=24VDC, 48=48VDC
④ Construction	S: Sealed Type
⑤ Insulation Standard	Nil: Class B F: Class F
⑥ Contact Material	Nil: AgCdO T: $AgSnO_2$

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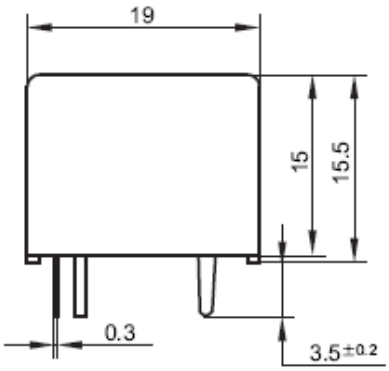
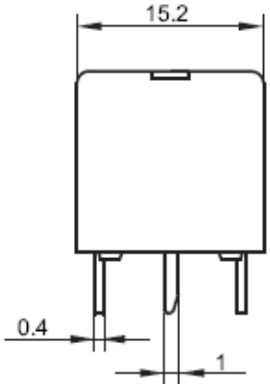
5. DIMENSIONS (Unit: mm)

Outline Dimensions

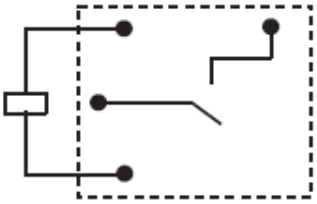


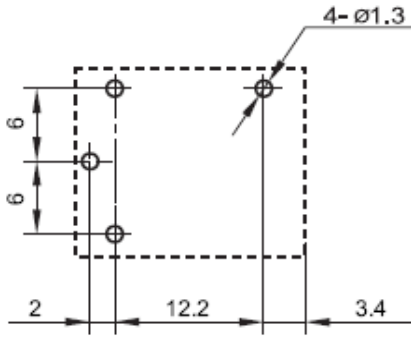


Wiring Diagram (Bottom View)

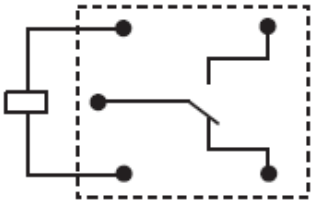
PCB Layout (Bottom View)

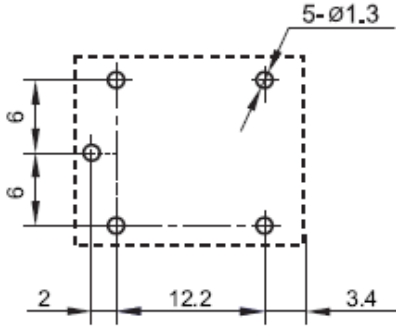
1 From A





1 From C





Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm

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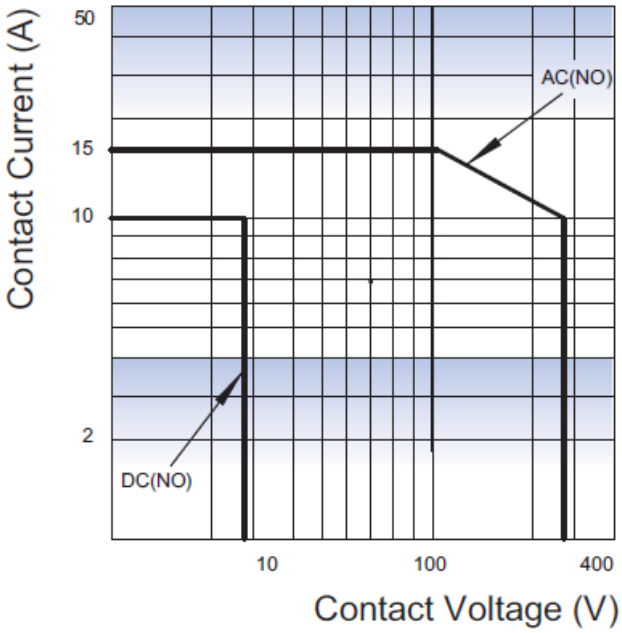
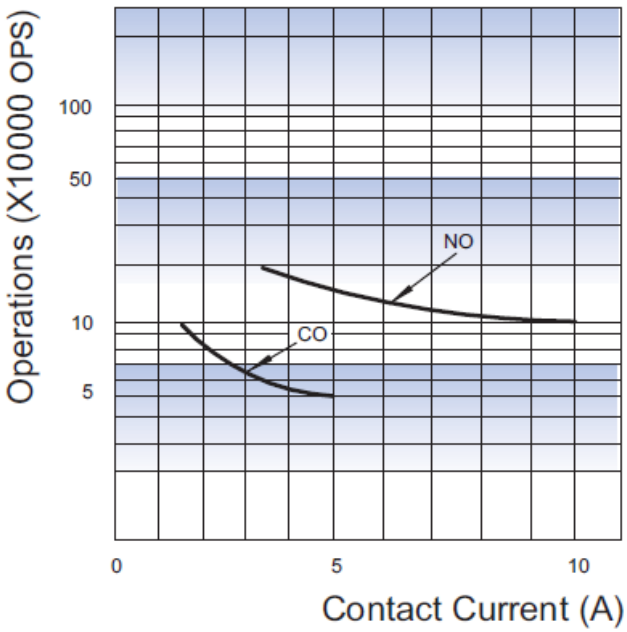
6. CHARACTERISTIC CURVES

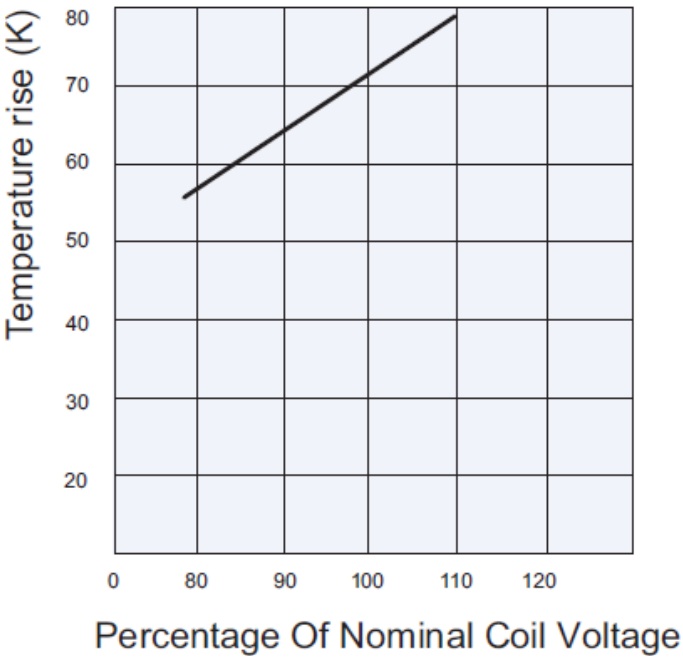
Maximum Switching Power



Coil Temperature Rise



Endurance Curve



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Subminiature Power Relay	CQ

Features

- Low height and flat construction
- High rating: 16A
- High sensitive: 200mW
- Plastic sealed type

(File No.:E122258)

1. COIL DATA (at 23℃)

1) 1 Form A

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	4.00	0.5	6.50	40.0	125 x (1±10%)	Approx. 200
6	4.80	0.6	7.80	33.3	180 x (1±10%)	
9	7.20	0.9	11.7	22.2	405 x (1±10%)	
12	9.60	1.2	15.6	16.7	720 x (1±10%)	
18	14.4	1.8	23.4	11.1	1620 x (1±10%)	
24	19.2	2.4	31.2	8.33	2880 x (1±10%)	
48	38.4	4.8	62.4	4.17	11520 x (1±10%)	

2) 1 Form C

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	4.00	0.5	6.50	80.0	62.5 x (1±10%)	Approx. 400
6	4.80	0.6	7.80	66.7	90.0 x (1±10%)	
9	7.20	0.9	11.7	44.4	202.5 x (1±10%)	
12	9.60	1.2	15.6	33.3	360 x (1±10%)	
18	14.4	1.8	23.4	22.2	810 x (1±10%)	
24	19.2	2.4	31.2	16.7	1440 x (1±10%)	
48	38.4	4.8	62.4	8.33	5760 x (1±10%)	

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2. CONTACT DATA

Contact Arrangement		1 Form A		1 Form C
Contact Resistance		100mΩ max. (at 1A 6VDC)		
Contact Material		$AgSnO_2$		
Contact Ratings (Resistive load)		Standard	High capacity	NO: 10A 250VAC NC: 6A 250VAC
		10A 125/250VAC 10A 30VDC TV-5	16A 125VAC 10A 30VDC TV-5	
Max. Switching Voltage		250VAC / 30VDC		250VAC
Max. Switching Current		16A		NO: 10A / NC: 6A
Max. Switching Power		4000VA / 300W		NO: 2500VA NC: 1500VA
Life Expectancy	Electrical	100,000 operations		
	Mechanical	10,000,000 operations		

3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1min
	Coil and Contacts	2500VAC 1min
Operate Time (at nominal voltage)		15ms max
Release Time (at nominal voltage)		5ms max
Temperature Range		-40℃ ~ 105℃
Shock Resistance	Functional	98 m/s^2
	Destructive	980 m/s^2
Vibration Resistance		10 ~ 55Hz, 1.5mm DA
Humidity		5 ~ 85% RH
Termination		PCB
Weight		Approx. 10g
Outline Dimension (L x W x H)		22.0 x 16.0 x 10.5 mm

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4. ORDERING INFORMATION

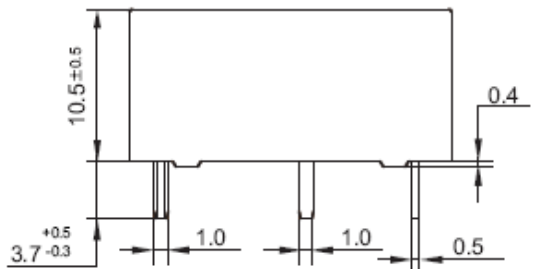
CQ ①	1 ②	-	H ③	12 ④	S ⑤

① Relay Model	CQ
② Contact Arrangement	11: 1 Form A (SPST-NO) 1: 1 Form C (SPDT)
③ Contact Current	H: 10A E: 16A (only for 1 Form A)
④ Coil Voltage	5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 18=18VDC, 24=24VDC, 48=48VDC
⑤ Construction	S: Plastic sealed type

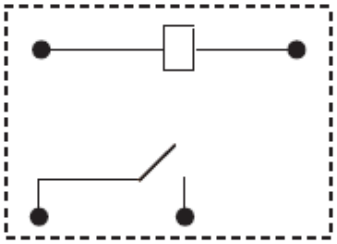
5. DIMENSIONS (Unit: mm)

1) 1 Form A

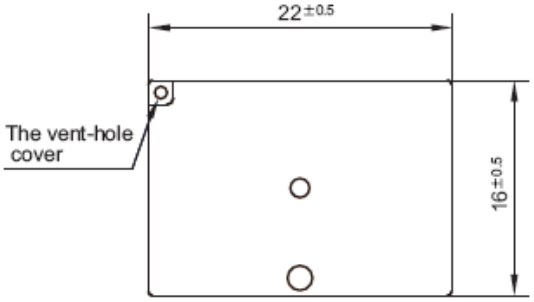
Outline Dimensions



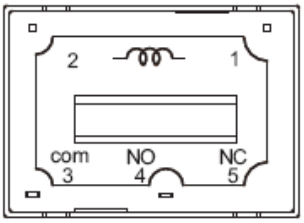
Wiring Diagram (Bottom View)

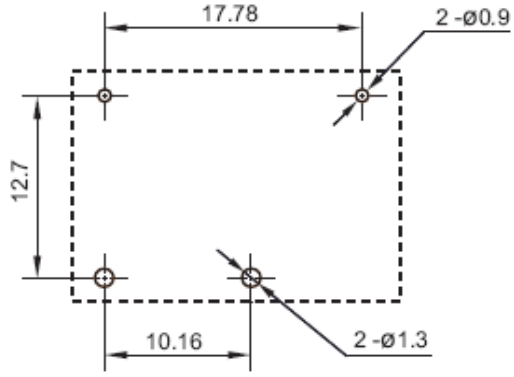


(Top View)



(Bottom View)





PCB Layout (Bottom view)

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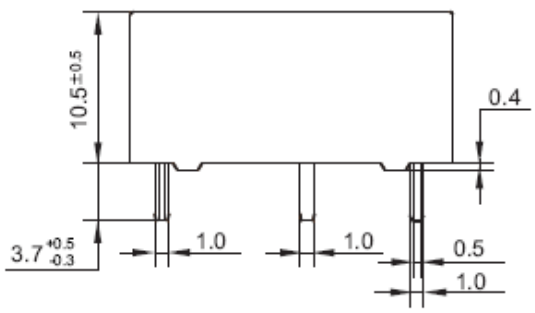
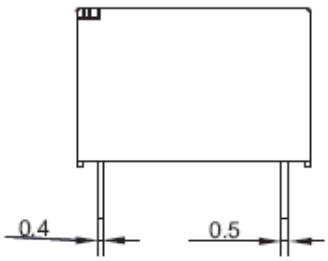
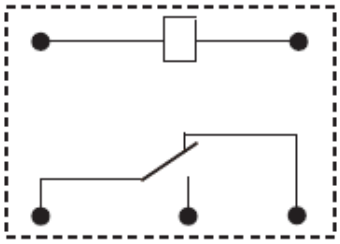
2) 1 Form C

Outline Dimensions

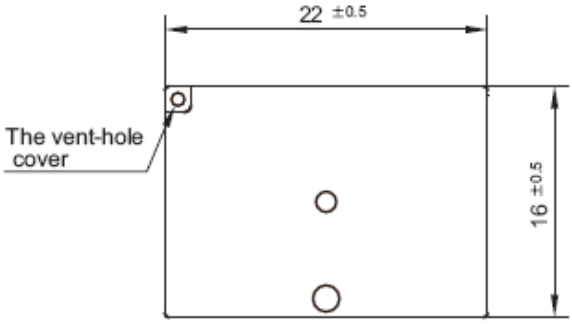




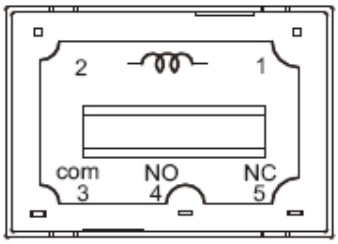
Wiring Diagram (Bottom View)

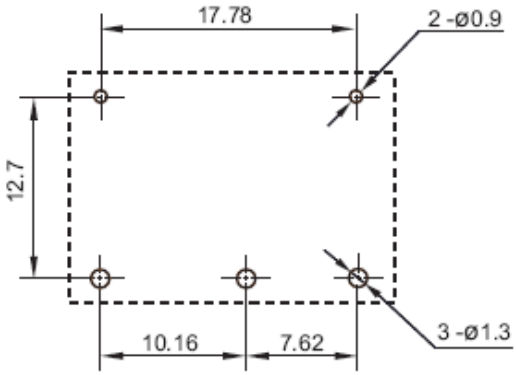


(Top View)



(Bottom View)





PCB Layout (Bottom view)

Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

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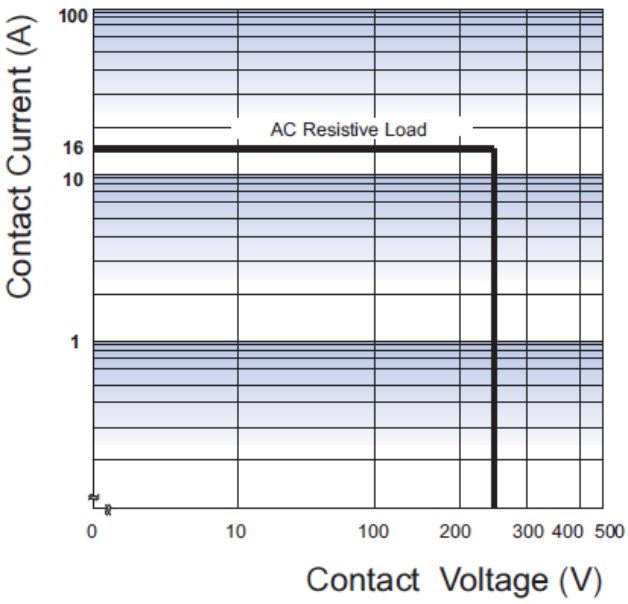
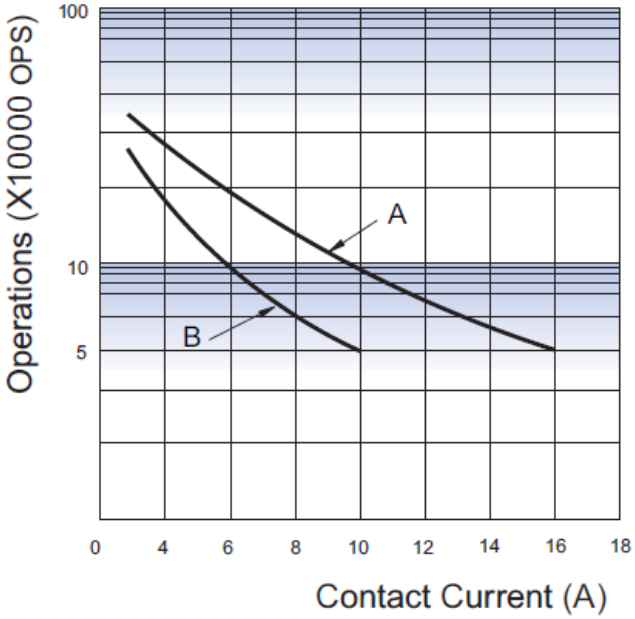
6. CHARACTERISTIC CURVES

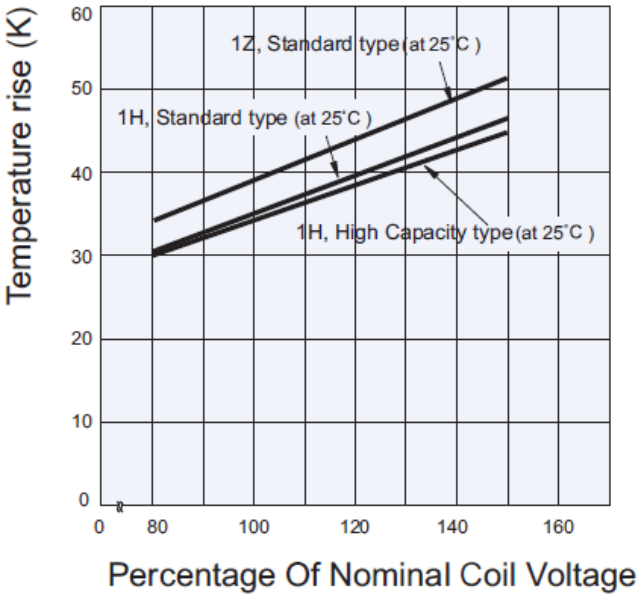
Maximum Switching Power



Endurance Curve



Coil Temperature Rise



Notes:

1) Curve A: 16A 125VAC

2) Curve B: 10A 250VAC

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Subminiature Intermediate Power Relay	CK

Features

- 10A switching capability
- UL TV-5 rating relay
  (only for 1 Form A)
- Available 118A inrush current
  (Please consult with TEXCELL)
- 1 Form A and 1 Form C configurations
- Immersion cleanable and sealed type

c UL us
(File No.: E122258)
(File No.: E134581)

(File No.: R 50252051)

1. COIL DATA (at 23℃)

1) Standard type for 1 Form A

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	3.75	0.25	6.50	108	46 x (1±10%)	Approx. 540
9	6.75	0.45	11.7	60.0	150 x (1±10%)	
12	9.00	0.60	15.6	45.0	270 x (1±10%)	
24	18.0	1.20	31.2	22.5	1050 x (1±10%)	
48	36.0	2.40	62.4	11.3	4250 x (1±10%)	

2) Sensitive type for 1 Form A

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	3.75	0.25	6.50	50	100 x (1±10%)	Approx. 250
9	6.75	0.45	11.7	28	324 x (1±10%)	
12	9.00	0.60	15.6	21	576 x (1±10%)	
24	18.0	1.20	31.2	10	2304 x (1±10%)	
48	36.0	2.40	62.4	5.0	9216 x (1±10%)	

3) Standard type for 1 Form C

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	3.75	0.25	6.50	106	47 x (1±10%)	Approx. 530
9	6.75	0.45	11.7	58.9	155 x (1±10%)	
12	9.00	0.60	15.6	44.2	270 x (1±10%)	
24	18.0	1.20	31.2	22.1	1080 x (1±10%)	
48	36.0	2.40	62.4	11.0	4400 x (1±10%)	

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2. CONTACT DATA

Contact Arrangement		1 Form A	1 Form C
Contact Resistance		100mΩ max. (at 1A 6VDC)	
Contact Material		$AgSnO_2$	
Contact Ratings		10A 250VAC / 30VDC TV-5 (5A 120VAC)	10A 250VAC / 30VDC
Max. Switching Voltage		250VAC / 110VDC	250VAC / 30VDC
Max. Switching Current		10A	
Max. Switching Power		2500VA / 300W	
Life Expectancy	Electrical	100,000 ops	50,000 ops
	Mechanical	10,000,000 operations	

3. CHARACTERISTICS

Contact Arrangement		1 Form A	1 Form C
Insulation Resistance		100MΩ (at 500VDC)	1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	900VAC 1min	1000VAC 1min
	Coil and Contacts	4000VAC 1min	NO: 4000VAC 1min NC: 3000VAC 1min
Operate Time		15ms	
Release Time		8ms	5ms
Temperature Range		-30℃ ~ 70℃	-40℃ ~ 70℃
Shock Resistance	Operating Extremes	10G	$196m/s^2$
	Damage Limits	100G	$980m/s^2$
Vibration Resistance		10 ~ 55Hz, 1.5mm DA	
Humidity		20 ~ 85% RH	5 ~ 85% RH
Termination		PCB	
Weight		Approx. 11g	Approx. 12g
Outline Dimension (L x W x H)		24.5 x 10.5 x 24.5 mm	

4. SAFETY APPROVAL

UL / cUL	E122258	1 Form A
	E134581	1 Form C
TUV	R 50252051	1 Form A

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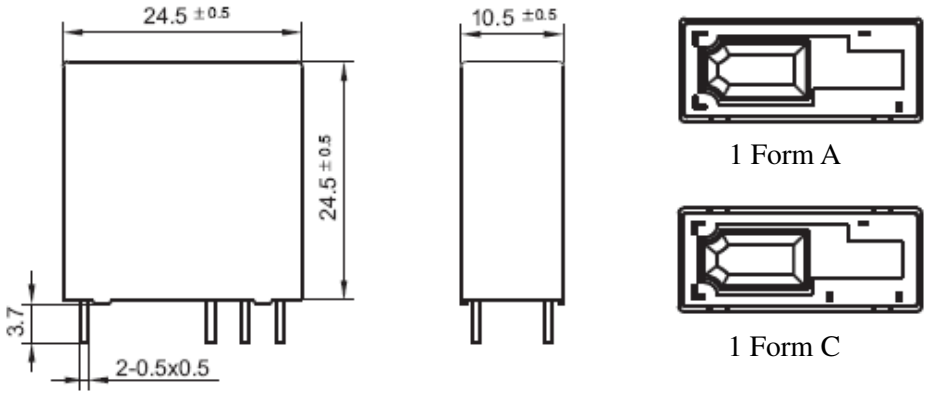
5. ORDERING INFORMATION

CK ①	11 ②	-	H ③	12 ④	S ⑤	H ⑥

① Relay Model	CK
② Contact Arrangement	11: 1 Form A (SPST-NO) 1: 1 Form C (SPDT)
③ Contact Current	H: 10A
④ Coil Voltage	5=5VDC, 9=9VDC, 12=12VDC, 24=24VDC, 48=48VDC
⑤ Construction	S: Sealed Type
⑥ Coil Power	Nil: Standard type H: Sensitive type

6. DIMENSIONS (Unit: mm)

Outline Dimensions



1 Form A

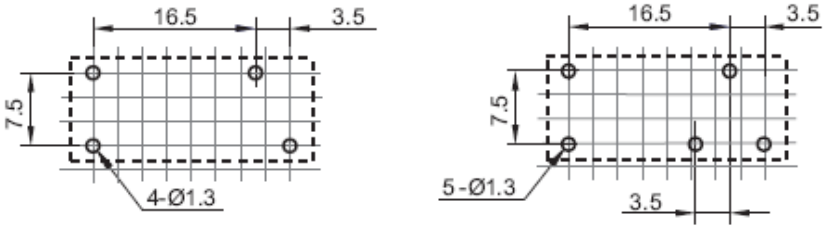
1 Form C

Wiring Diagram (Bottom View)

1 Form A

1 Form C

PCB Layout (Bottom view)



1 Form A

1 Form C

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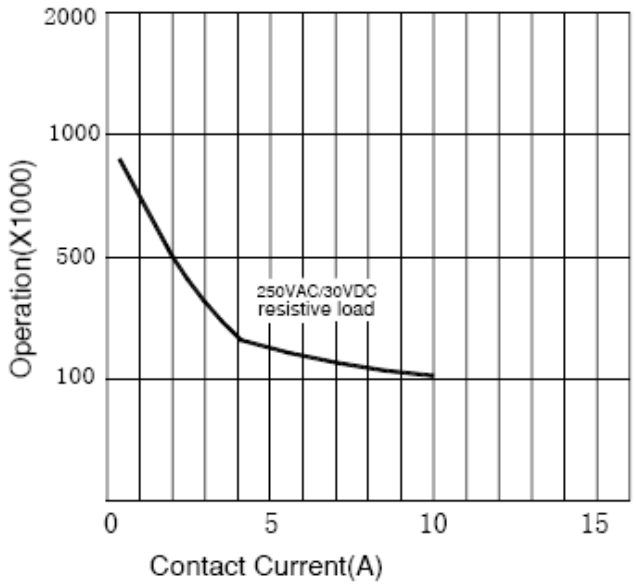
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

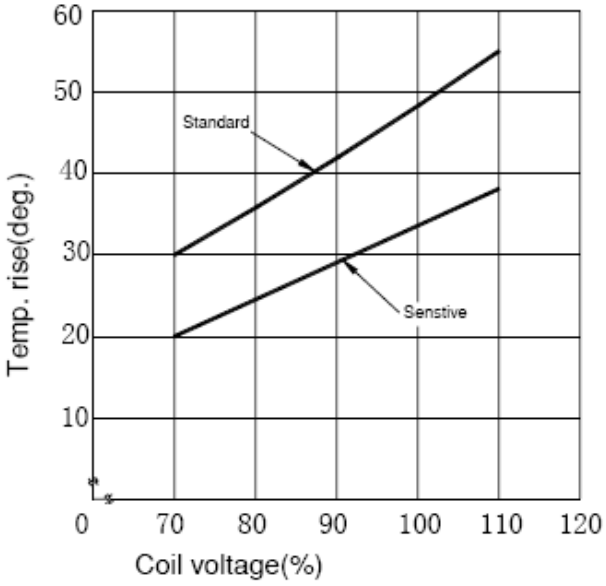
3) The width of the gridding is 2.54mm.

7. CHARACTERISTIC CURVES

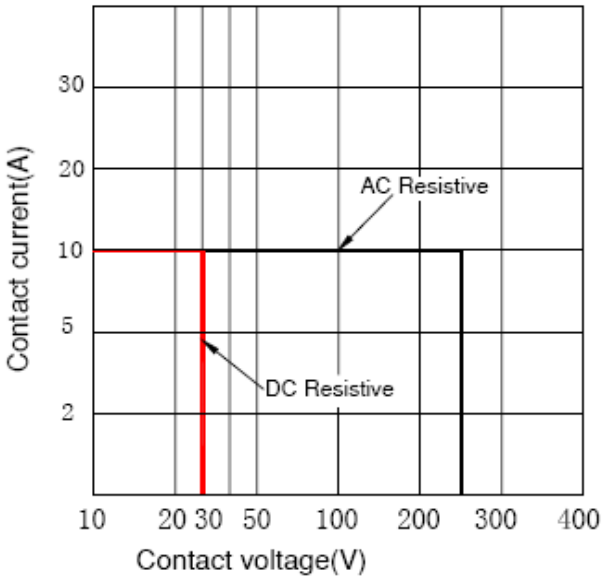
Endurance Curve



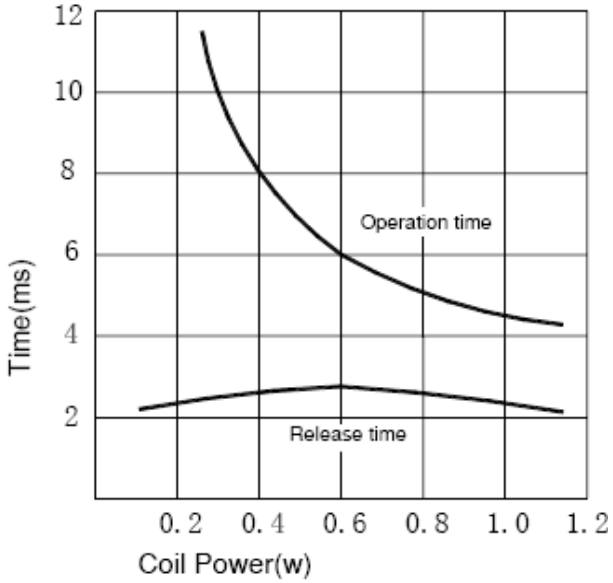
Coil Temperature Rise



Maximum Switching Power



Timing



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Subminiature Intermediate Power Relay	CN

Features

- 5A switching capability
- TV-3 125VAC approved by UL standard
- 2 Form A slim configuration
- Plastic sealed type

c UL us
(File No.:E122258)

1. COIL DATA (at 23℃)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	3.75	0.25	6.50	106	47 x (1±10%)	Approxi. 530
6	4.50	0.30	7.80	83.3	68 x (1±10%)	
9	6.75	0.45	11.7	58.9	155 x (1±10%)	
12	9.00	0.60	15.6	44.2	270 x (1±10%)	
18	13.5	0.90	23.4	29.4	620 x (1±10%)	
24	18.0	1.20	31.2	22.1	1080 x (1±10%)	
48	36.0	2.40	62.4	11.0	4400 x (1±10%)	

2. CONTACT DATA

Contact Arrangement		2 Form A
Contact Resistance		100mΩ max. (at 1A 6VDC)
Contact Material		$AgSnO_2$
Contact Ratings (Resistive load)		5A 250VAC / 30VDC
Max. Switching Voltage		250VAC / 30VDC
Max. Switching Current		5A
Max. Switching Power		1250VA / 150W
Life Expectancy	Electrical	50,000 operations
	Mechanical	10,000,000 operations

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3. CHARACTERISTICS

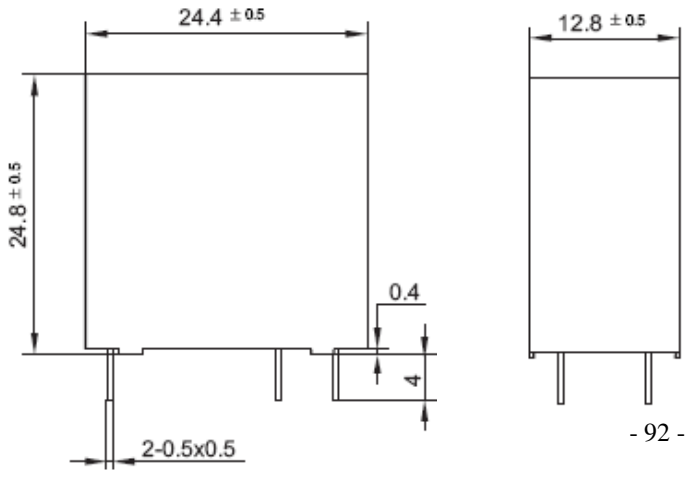
Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1min
	Coil and Contacts	4000VAC 1min
	Contact Sets	2000VAC 1min
Operate Time (at nominal voltage)		15ms max.
Release Time (at nominal voltage)		10ms max.
Temperature Range		-40℃ ~ 70℃
Shock Resistance	Functional	98 m/s^2
	Destructive	980 m/s^2
Vibration Resistance		10 ~ 55Hz, 1.5mm DA
Humidity		5 ~ 85% RH
Weight		Approx. 14.5g
Outline Dimension (L x W x H)		24.4 x 12.8 x 24.8 mm

4. ORDERING INFORMATION

CN ①	22 ②	-	12 ③
① Relay Model	CN		
② Contact Arrangement	22: 2 Form A (DPST)		
③ Coil Voltage	5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 18=18VDC, 24=24VDC, 48=48VDC		

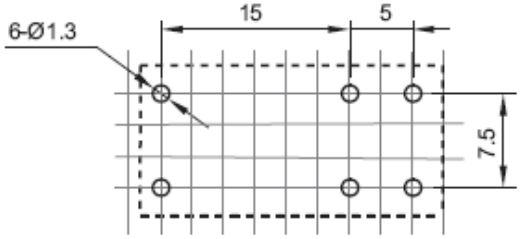
5. DIMENSIONS (Unit: mm)

Outline Dimensions



Wiring Diagram (Bottom View)

PCB Layout (Bottom view)



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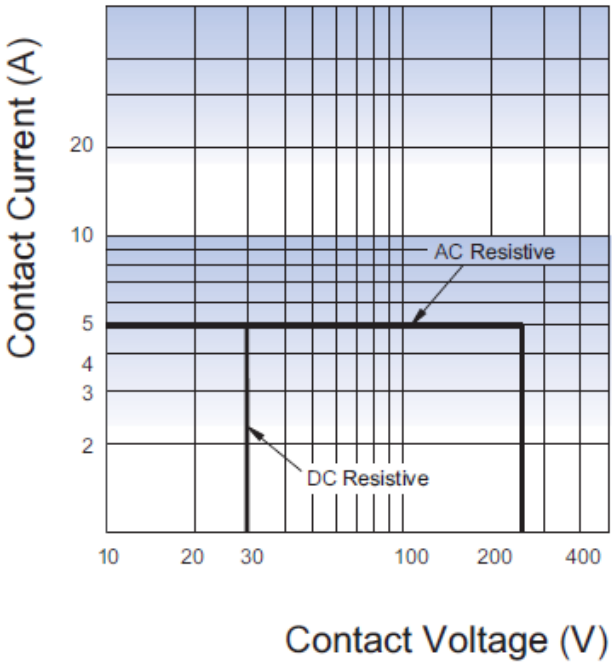
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

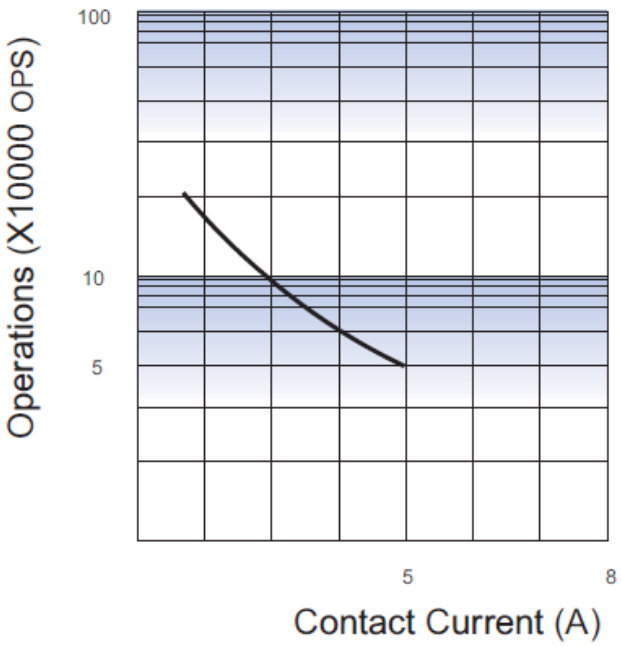
2) The tolerance without indicating for PCB layout is always ±0.1mm

6. CHARACTERISTIC CURVES

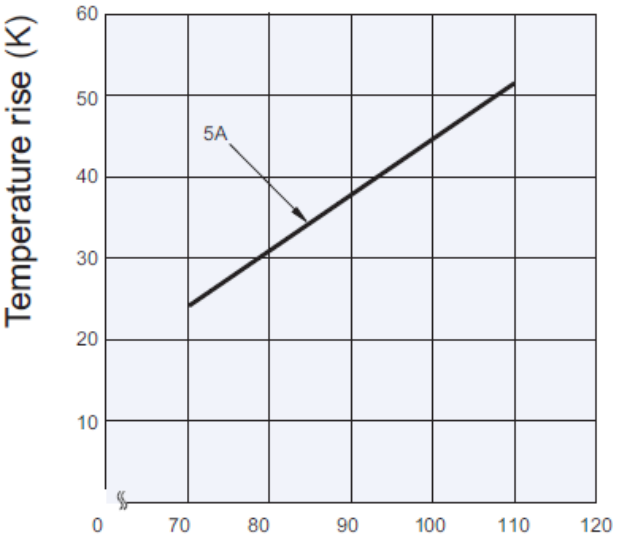
Maximum Switching Power



Endurance Curve



Coil Temperature Rise



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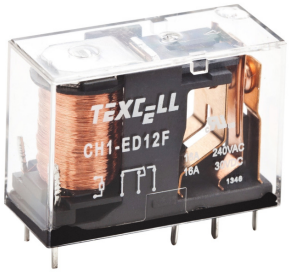
Miniature High Power Relay	CH

Features

- Various configurations (1A, 1C, 2A, 2C)
- 5A, 8A, 10A, 16A switching capability
- Transparent sealed cover
- 5kV dielectric between coil and contacts
- Creepage distance: 8mm Min. for 2 poles
- Class B and F available
- Au-clad contact available for HG and MG type
- Socket available



c UL us
(File No.:E122258)

1. COIL DATA (at 20℃)

1) Standard Type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)	Coil Resistance (Ω)	Coil Power (mW)
3	2.40	0.15	3.90	180	17 x (1±10%)	540
5	4.00	0.25	6.50	108	46 x (1±10%)	
6	4.80	0.30	7.80	90.0	67 x (1±10%)	
9	7.20	0.45	11.7	60.0	150 x (1±10%)	
12	9.60	0.60	15.6	45.0	270 x (1±10%)	
24	19.2	1.20	31.2	22.5	1050 x (1±10%)	
48	38.4	2.40	62.4	11.3	4250 x (1±10%)	

2) Sensitive Type (Only for “E” and “M” type)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)	Coil Resistance (Ω)	Coil Power (mW)
3	2.40	0.15	3.90	80.0	38 x (1±10%)	240
5	4.00	0.25	6.50	48.0	104 x (1±10%)	
6	4.80	0.30	7.80	40.0	150 x (1±10%)	
9	7.20	0.45	11.7	26.7	338 x (1±10%)	
12	9.60	0.60	15.6	20.0	600 x (1±10%)	
24	19.2	1.20	31.2	10.0	2400 x (1±10%)	
48	38.4	2.40	62.4	5.00	9600 x (1±10%)	

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2. CONTACT DATA

Contact Arrangement		1A, 1C (H)	1A, 1C (HG)	1A, 1C (E)	2A, 2C (M)	2A, 2C (MG)
Contact Resistance (Initial)		100mΩ max. (at 1A 6VDC)				
Contact Material[1)]		$AgSnO_2$				
Load		Resistive load (COSΦ=1)				
Contact Ratings		3.5mm pinning		5mm pinning	5mm pinning	
		10A 240VAC 10A 30VDC	16A 250VAC 16A 30VDC	16A 240VAC 16A 30VDC	5A 240VAC 5A 30VDC	8A 250VAC 5A 30VDC
Max. Switching Voltage		250VAC / 30VDC				
Max. Switching Current		12A	16A	20A	8A	8A
Max. Switching Power		2500VA/300W	4000VA/480W	4800VA/480W	1250VA/240W	2000VA/240W
Minimum Load		100mA 5VDC				
Life Expectancy	Electrical	100,000 operations (at 30 operations/minute)				
	Mechanical	10,000,000 operations (at 300 operations/minute)				

Note: Au clad on contact is available for M and MG type

3. CHARACTERISTICS

Insulation Resistance		Min. 100MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1min
	Coil and Contacts	5000VAC 1min
Operate Time (at nominal voltage)		20ms max
Release Time (at nominal voltage)		10ms max
Temperature Range		-40℃ ~ 85℃
Shock Resistance	Operating Extremes	10G
	Damage Limits	100G
Vibration Resistance		10 ~ 55Hz, 1.5mm DA
Max. switching frequency	Mechanical	18,000 operations/hr
	Electrical	1,800 operations/hr
Humidity		40 ~ 85%
Termination		PCB
Weight		Approx. 14g
Outline Dimension (L x W x H)		29.0 x 12.7 x 20.0 mm

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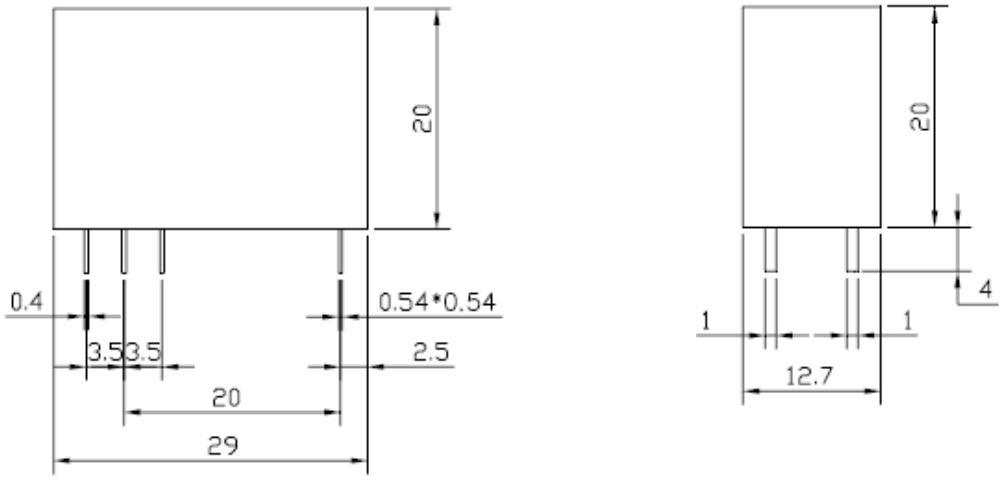
4. ORDERING INFORMATION

CH ①	11 ②	-	E ③	D12 ④	F ⑤	(B) ⑥

① Relay Model	CH
② Contact Arrangement	11: 1 Form A (SPST-NO) 1: 1 Form C (SPDT) 22: 2 Form A (DPST-NO) 2: 2 Form C (DPDT)
③ Contact Current	H: 10A (3.5mm pinning, 1 pole,) HG: 16A (3.5mm pinning, 1 pole) E: 16A (5.0mm pinning, 1 pole) M: 5A (5.0mm pinning, 2 pole) MG: 8A (5.0mm pinning, 2 pole)
④ Coil Voltage	D3=3VDC, D5=5VDC, D6=6VDC, D9=9VDC, D12=12VDC, D24=24VDC, D48=48VDC, D100=100VDC
⑤ Coil Power	F: 540mW S: 240mW (Only for “E” and “M” type on contact current)
⑥ Cover Type	Nil: Transparent cover (B): Black cover

5. DIMENSIONS (Unit: mm)

1) 3.5mm pinning (1pole, 10/16A)



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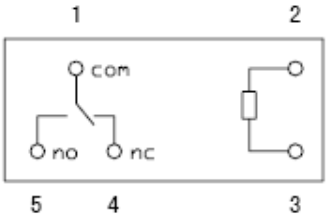
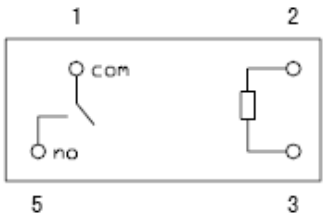


1 Form C



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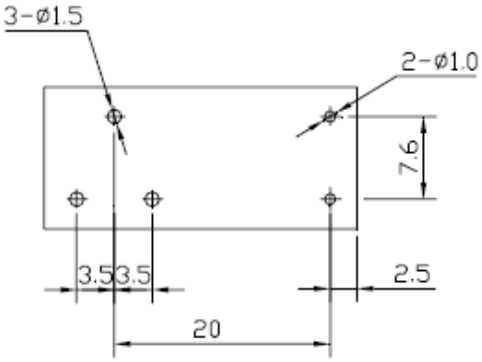
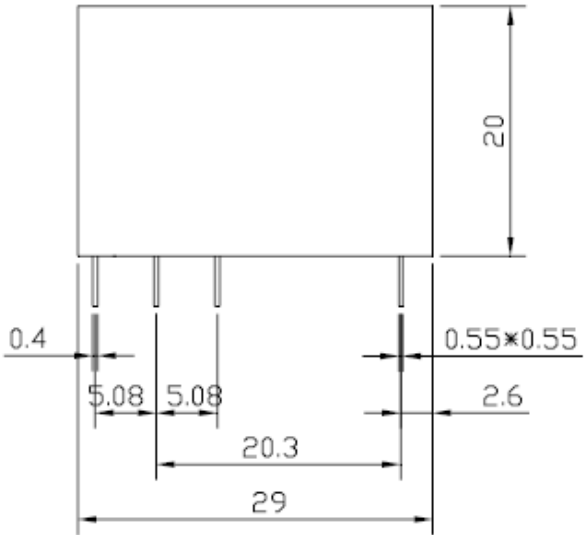
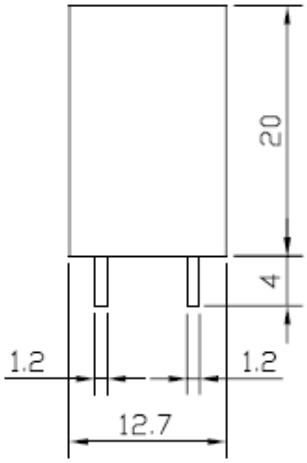
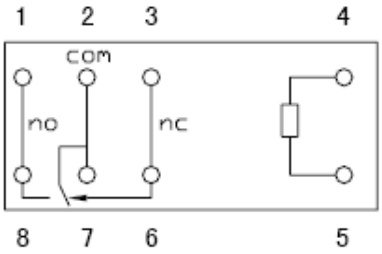


2) 5mm pinning (1pole, 16A)







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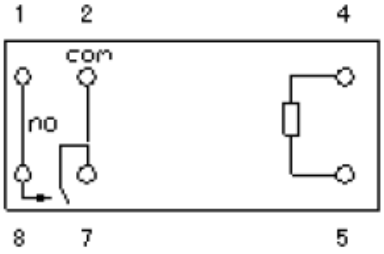
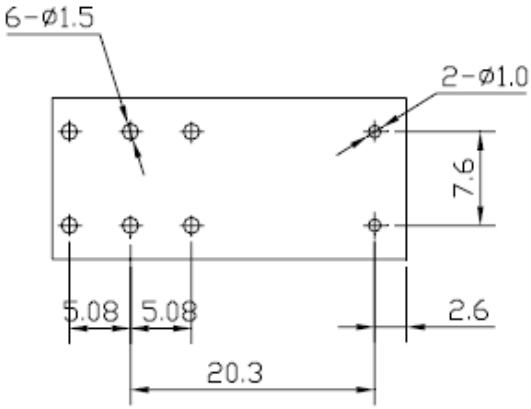


1 Form A



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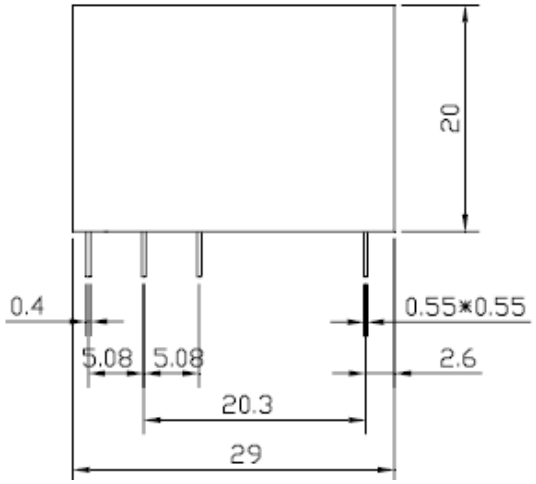
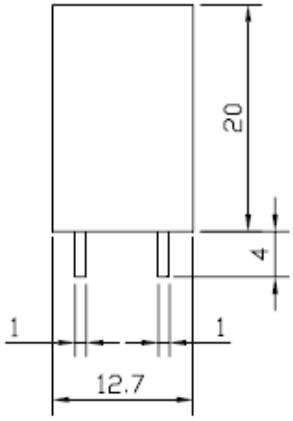
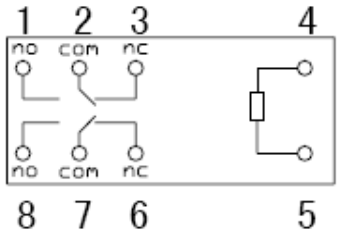
3) 5mm pinning (2pole, 5A/8A)







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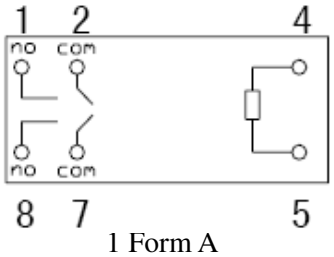
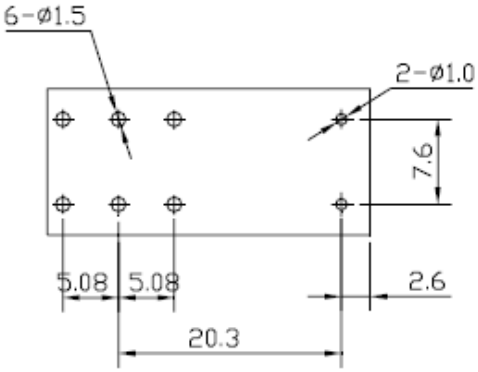


1 Form A



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm

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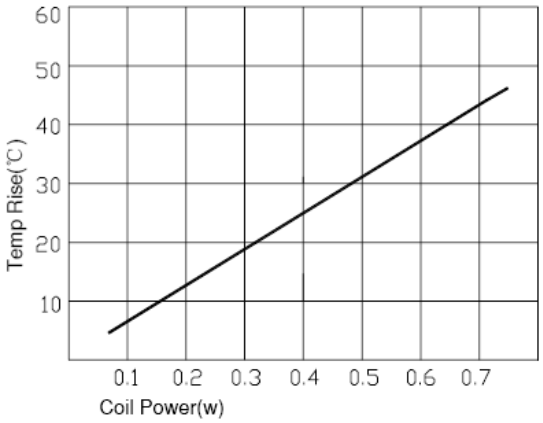
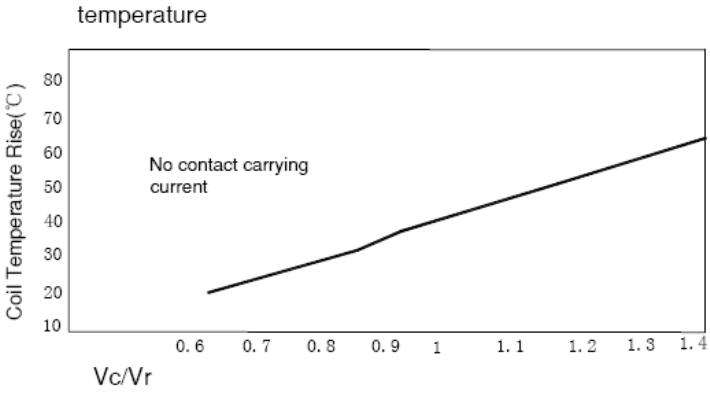
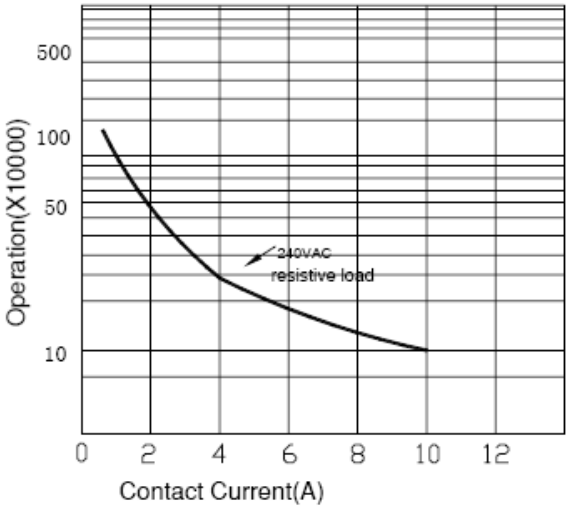
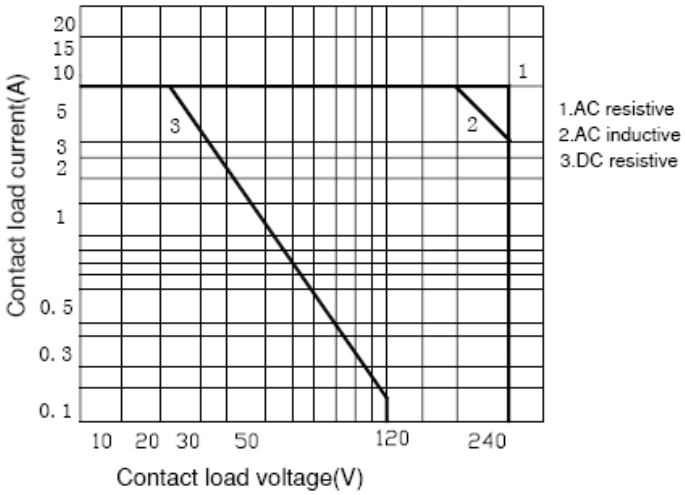
6. CHARACTERISTIC CURVES

1) 3.5mm pinning (1pole, 10A)









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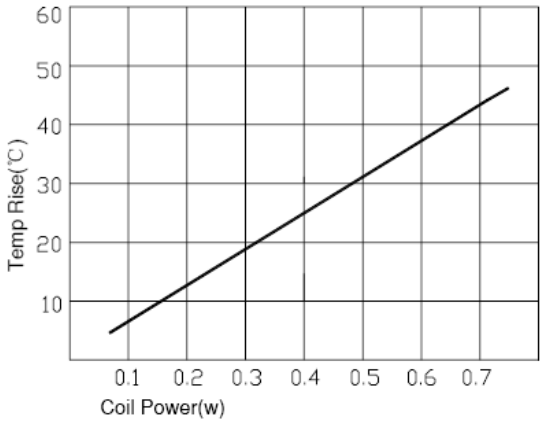
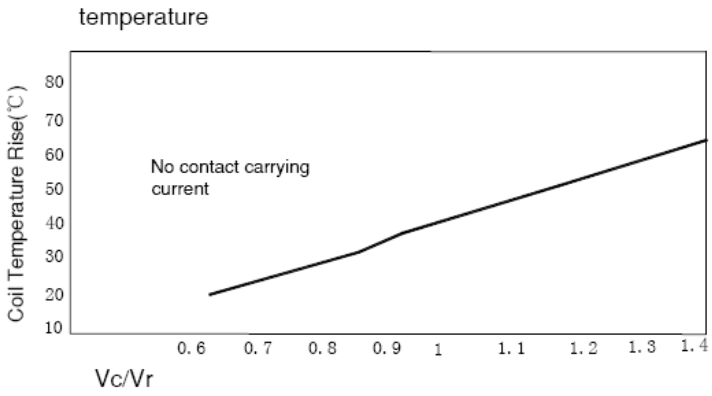
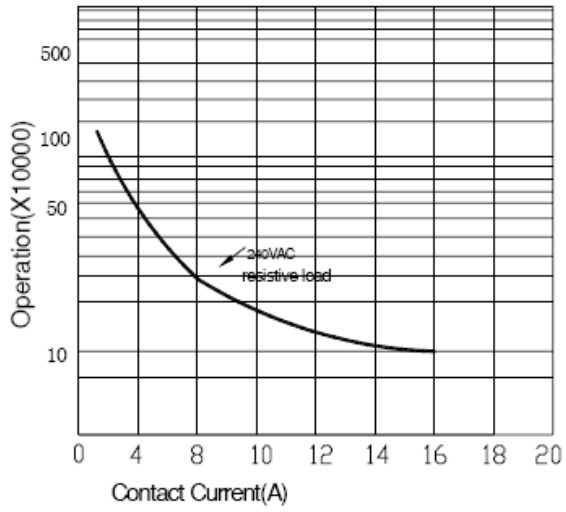
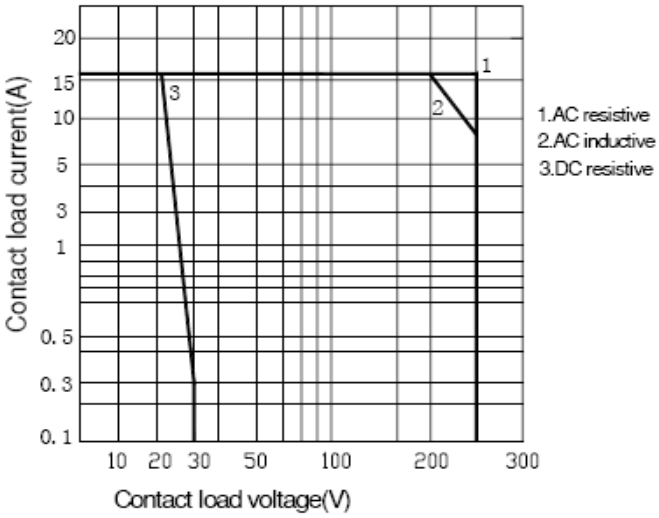
2) 3.5mm pinning (1pole, 16A)









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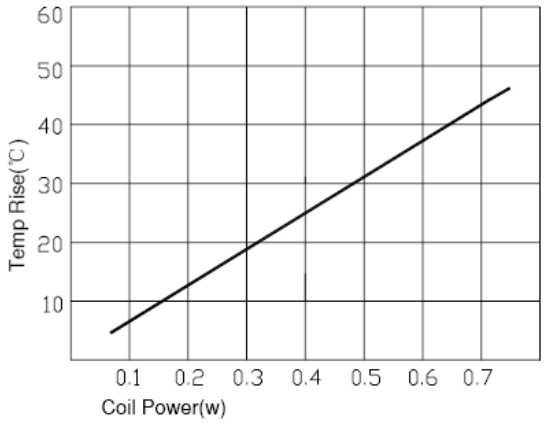
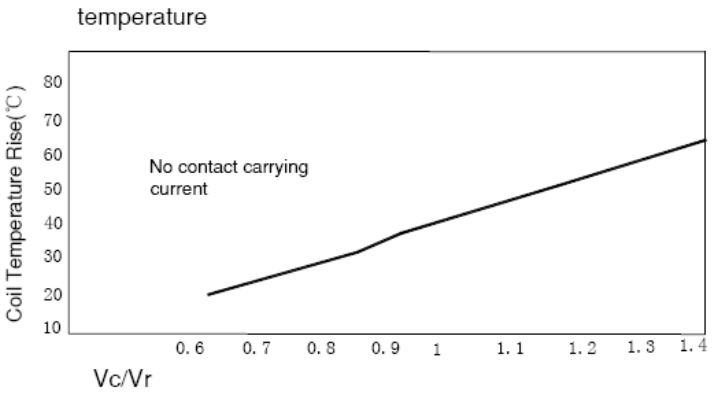
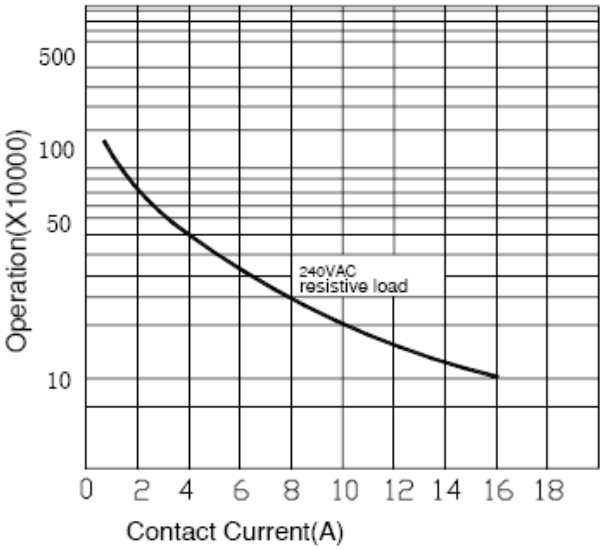
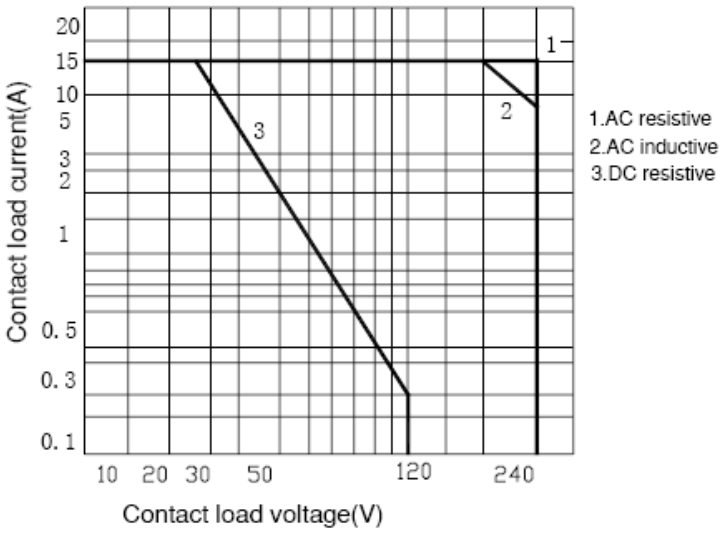
3) 5mm pinning (1pole, 16A)









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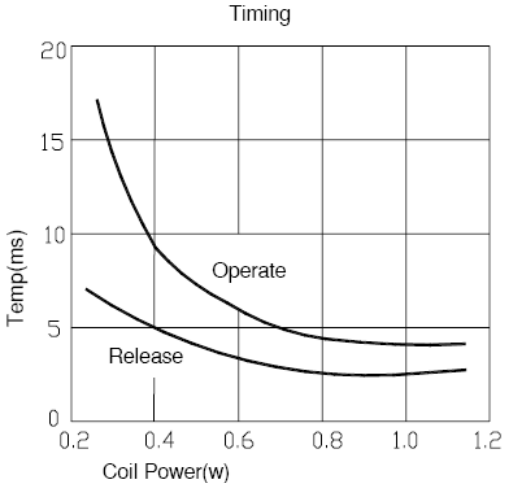
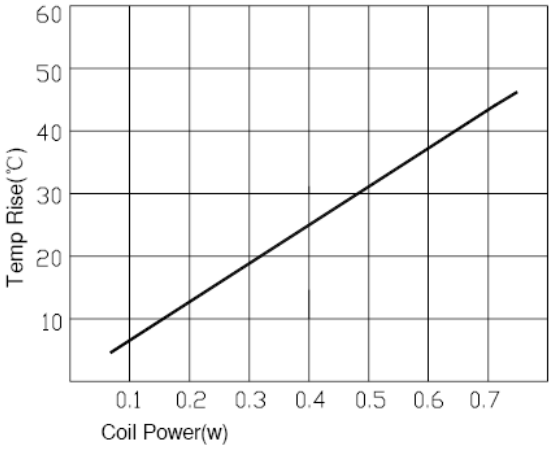
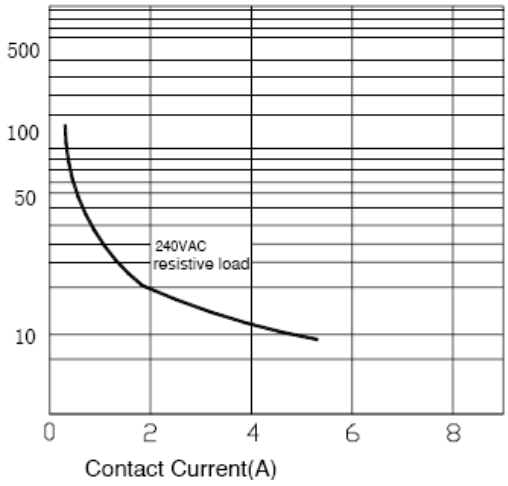
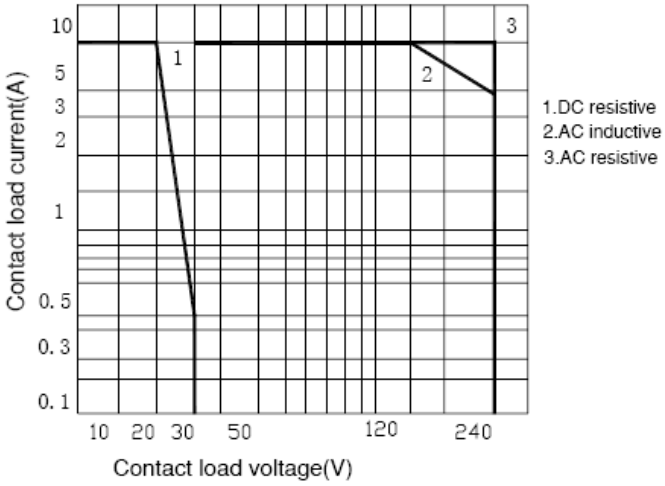
4) 5mm pinning (2pole, 5A)









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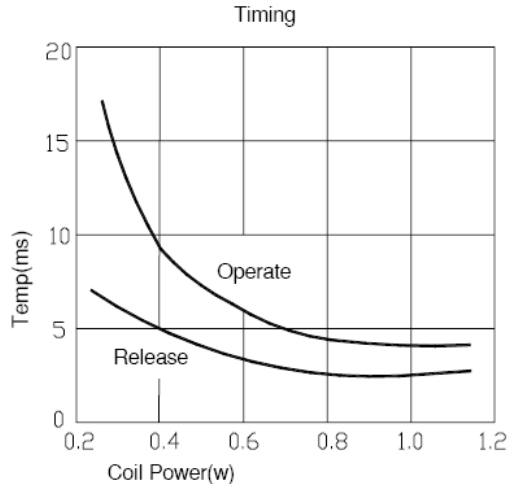
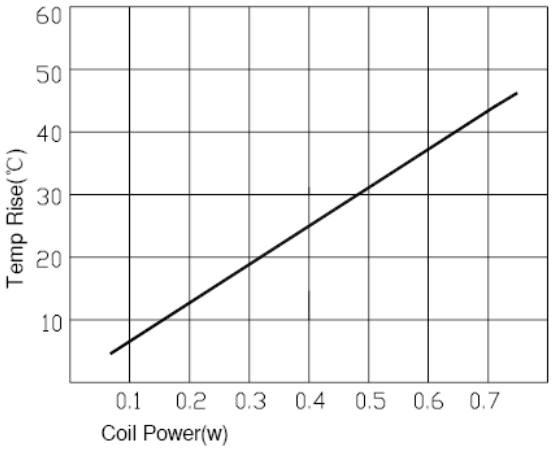
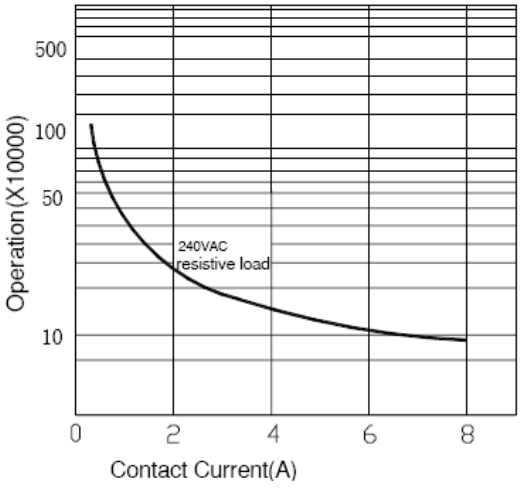
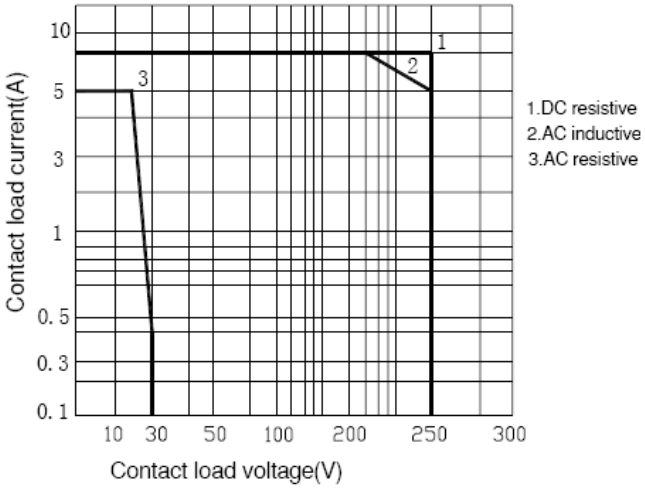
5) 5mm pinning (2pole, 8A)









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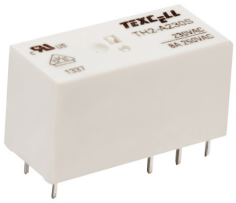
Miniature High Power Relay	TH

Features

- DC & AC voltage coil type
- Low height: 15.7mm
- 16A switching capability
- 5kV dielectric strength
  (between coil and contacts)
- Creepage distance: 10mm
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- Class F & Class B insulation system
- Plastic sealed Type
- Socket available



c UL us
(File No.:E134581)

(File No.: 40038122)

1. COIL DATA (at 23℃)

1) DC coil

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	3.50	0.50	7.50	80.0	62 x (1±10%)	Approx. 400
6	4.20	0.60	9.00	66.7	90 x (1±10%)	
9	6.30	0.90	13.5	44.4	202 x (1±10%)	
12	8.40	1.20	18.0	33.3	360 x (1±10%)	
18	12.6	1.80	27.0	22.2	810 x (1±10%)	
24	16.8	2.40	36.0	16.7	1440 x (1±10%)	
48[2)]	33.6	4.80	72.0	8.33	5760 x (1±15%)	
60[2)]	42.0	6.00	90.0	6.67	7500 x (1±15%)	
110[2)]	77.0	11.0	165	3.64	25200 x (1±15%)	

Notes: 1) The maximum allowable voltage refers to the maximum voltage which relay coil could endure in a very short time.

2) For products with rated voltage ≥48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

2) AC coil (at 50Hz)

Nominal Voltage (VAC)	Pick-up Voltage (VAC)	Drop-out Voltage (VAC)	Coil Current (mA)	Coil DC Resistance (Ω)	Coil power (VA)
24	18.00	3.60	31.6	350 x (1±10%)	Approx. 0.75
115	86.30	17.30	6.60	8100 x (1±15%)	
230	172.5	34.50	3.20	32500 x (1±15%)	

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2. CONTACT DATA

Contact Arrangement			1A, 1B, 1C		2A, 2B, 2C
Contact Resistance			100mΩ max. (at 1A 6VDC)		
Contact Material			AgNi		
Contact Ratings (Resistive load)			12A 250VAC	16A 250VAC	8A 250VAC*
Max. Switching Voltage			440VAC / 300VDC		
Max. Switching Current			12A	16A	8A
Max. Switching Power			3000VA	4000VA	2000VA
Life Expectancy	Electrical	DC coil	100,000 operations		
		AC coil	50,000 operations		
	Mechanical	DC coil	10,000,000 operations		
		AC coil	1,000,000 operations		

Notes:* When user require 10A 250VAC on 2poles contact, special order allowed. Please consult with TEXCELL.

3. CHARACTERISTICS

Insulation Resistance			1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts		1000VAC 1min
	Coil and Contacts		5000VAC 1min
	Contact Sets		2500VAC 1min
Surge voltage (between coil and contacts)		DC coil	10kV (1.2 x 50μs)
Operate Time (at nominal voltage)		DC coil	15ms max.
Release Time (at nominal voltage)		DC coil	8ms max.
Temperature rise (at nominal voltage)		DC coil	55K max.
		AC coil	85K max.
Temperature Range		DC coil	-40℃ ~ 85℃
		AC coil	-40℃ ~ 70℃
Shock Resistance*	Functional		98 m/s^2
	Destructive		980 m/s^2
Vibration Resistance*			10 ~ 150Hz 10g/5g
Humidity			5 ~ 85% RH
Termination			PCB
Weight			Approx. 13.5g
Outline Dimension (L x W x H)			29.0 x 12.7 x 15.7 mm

Notes: 1) The data shown above are initial values.

2) *Index is not in relay length direction.

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4. ORDERING INFORMATION

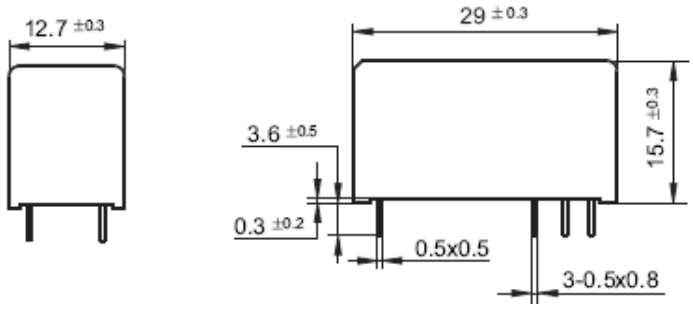
TH ①	1 ②	-	H ③	12 ④	S ⑤	F ⑥	(XX) ⑦

① Relay Model	TH
② Contact Arrangement	11: 1 Form A (SPST-NO) 1B: 1 Form B (SPST-NC) 1: 1 Form C (SPDT) 22: 2 Form A (DPST-NO) 2B: 2 Form B (DPST-NC) 2: 2 Form C (DPDT)
③ Contact Current	Nil: 8A (5.0mm pinning, 2pole) E: 16A (5.0mm pinning, 1pole) H: 12A (3.5mm pinning, 1pole) Q: 12A (5.0mm pinning, 1pole)
④ Coil Voltage	DC: 5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 18=18VDC, 24=24VDC, 48=48VDC, 60=60VDC, 110=110VDC AC: A24=24VAC, A115=115VAC, A230=230VAC
⑤ Construction	S: Sealed Type
⑥ Insulation Standard	Nil: Class B F: Class F
⑦ Customer Special Code	(XX): May be followed by additional letters and/or numbers (Does not affect the construction)

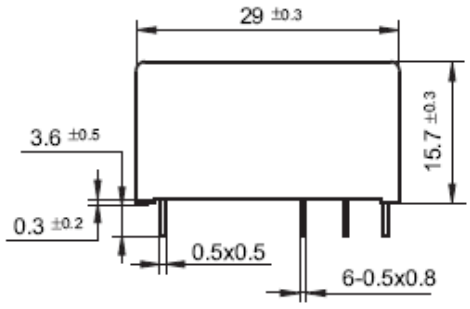
5. DIMENSIONS (Unit: mm)

Outline Dimensions

3.5mm pining (1pole, 12A)



5mm pining (1pole 12A, 1pole 16A, 2pole 8A)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm

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Wiring Diagram (Bottom View)

3.5/5mm pining (1pole, 12A)

1 Form A

1 Form B

1 Form C

5mm pining (1pole, 16A)

1 Form A

1 Form B

1 Form C

5mm pining (2pole, 8A)

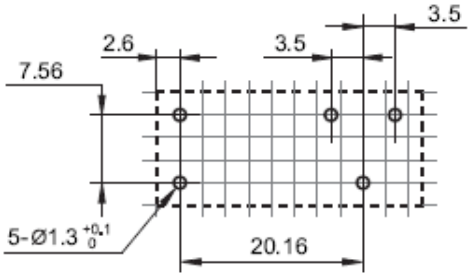
2 Form A

2 Form B

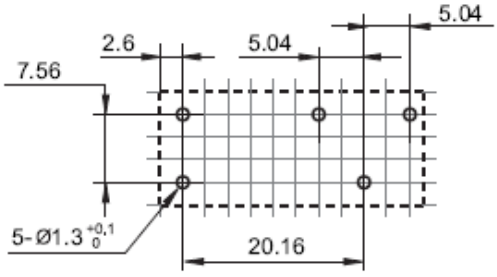
2 Form C

PCB Layout (Bottom view)

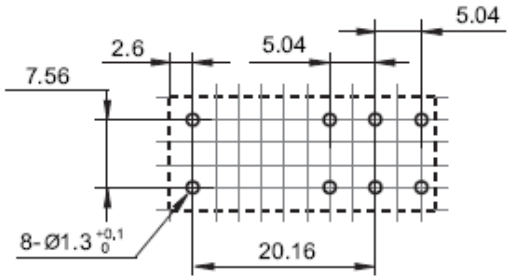
3.5mm 1Pole 12A



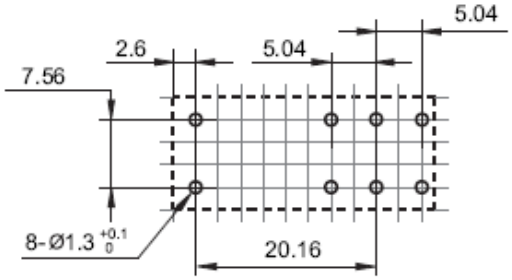
5mm 1Pole 12A



5mm 1Pole 16A



5mm 2Pole 8A



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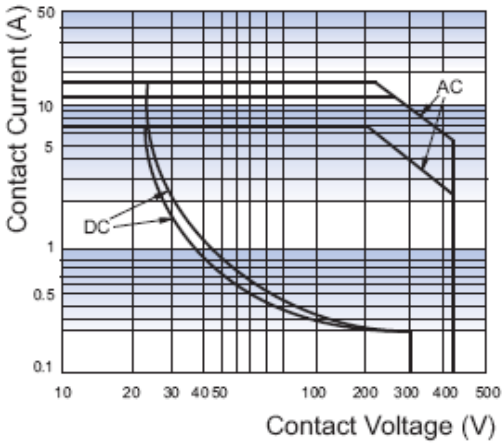
6. CHARACTERISTIC CURVES

Maximum Switching Power

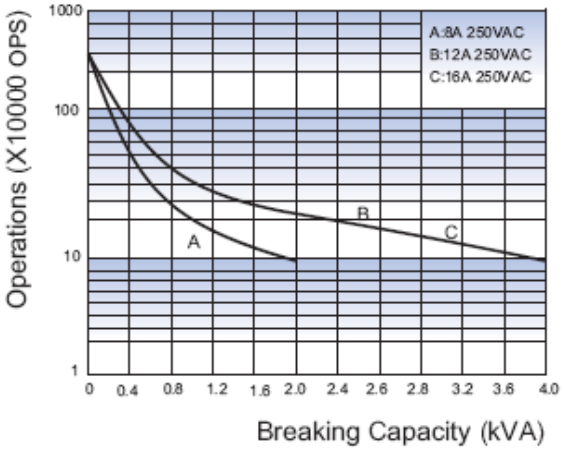


Note: *Coil Operating Range

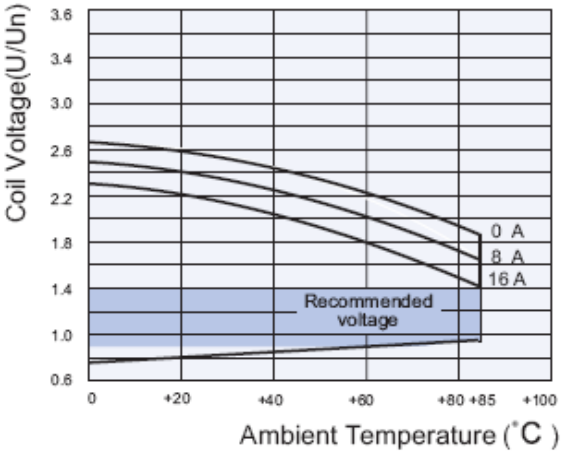
The use of a relay with an energizing voltage other than the rated coil voltage may lead to reduced electrical life. An energizing voltage over the below range may damage the insulation of relay coil.

1) DC coil

Endurance Curve

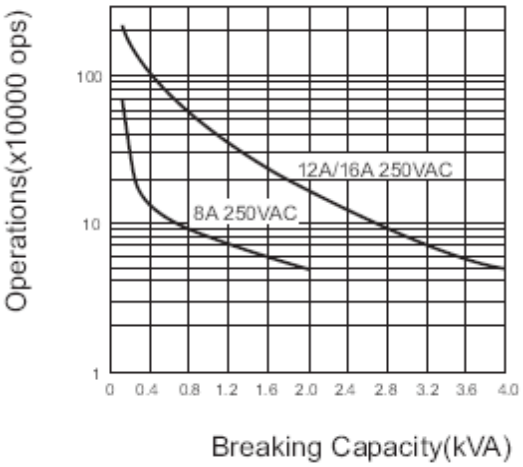


Coil Operating Range*

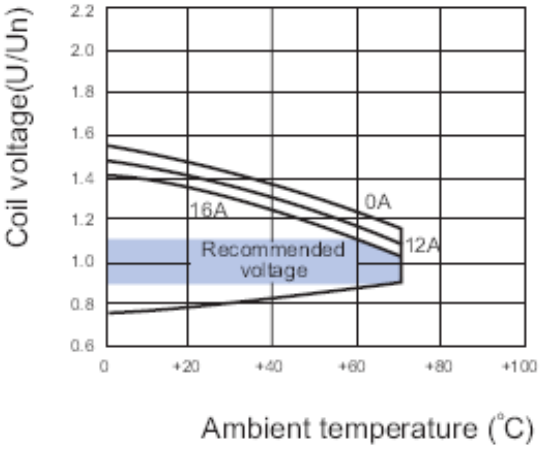


2) AC coil

Endurance Curve



Coil Operating Range*



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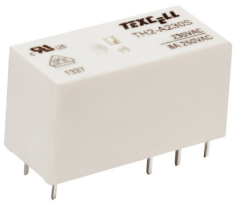
Miniature High Power Relay	THD

Features

- Low height: 15.7mm
- 16A switching capability
- 5kV dielectric strength
  (between coil and contacts)
- Creepage distance: 10mm
- Meeting reinforce insulation
- Product in accordance to IEC 60335-1 available
- Class F & Class B insulation system
- Socket available



c UL us
(File No.:E134581)

1. COIL DATA (at 23℃)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	3.50	0.50	7.50	80.0	62 x (1±10%)	Approx. 400
6	4.20	0.60	9.00	66.7	90 x (1±10%)	
9	6.30	0.90	13.5	44.4	202 x (1±10%)	
12	8.40	1.20	18.0	33.3	360 x (1±10%)	
18	12.6	1.80	27.0	22.2	810 x (1±10%)	
24	16.8	2.40	36.0	16.7	1440 x (1±10%)	
48	33.6	4.80	72.0	8.33	5760 x (1±15%)	

Notes: The max. allowable voltage refers to the maximum value in a varying range of pick-up voltage, not the voltage for continuous operation.

2. CONTACT DATA

Contact Arrangement		1 Form A, 1 Form C	
Contact Resistance		100mΩ max. (at 1A 6VDC)	
Contact Material		AgNi	
Contact Ratings (Resistive load)		12A 250VAC	16A 250VAC
Max. Switching Voltage		440VAC / 300VDC	
Max. Switching Current		12A	16A
Max. Switching Power		3000VA	4000VA
Life Expectancy	Electrical	100,000 operations	
	Mechanical	10,000,000 operations	

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3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1min
	Coil and Contacts	5000VAC 1min
Surge voltage (between coil and contacts)		10kV (1.2 x 50μs)
Operate Time (at nominal voltage)		15ms max.
Release Time (at nominal voltage)		8ms max.
Temperature Rise (at nominal voltage)		55K max.
Temperature Range		-40℃ ~ 85℃
Shock Resistance*	Functional	98 m/s^2
	Destructive	980 m/s^2
Vibration Resistance*		10 ~ 150Hz 10g/5g
Humidity		5 ~ 85% RH
Termination		PCB
Weight		Approx. 13.5g
Outline Dimension (L x W x H)		29.0 x 12.7 x 15.7 mm

Notes: 1) The data shown above are initial values.

2) *Index is not that of relay length direction.

4. ORDERING INFORMATION

THD ①	1 ②	-	H ③	12 ④	S ⑤	F ⑥	(XX) ⑦

① Relay Model	THD
② Contact Arrangement	11: 1 Form A (SPST-NO) 1: 1 Form C (SPDT)
③ Contact Current	E: 16A (5.0mm pinning, 1pole) H: 12A (3.5mm pinning, 1pole) Q: 12A (5.0mm pinning, 1pole)
④ Coil Voltage	5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 18=18VDC, 24=24VDC, 48=48VDC
⑤ Construction	S: Sealed Type
⑥ Insulation Standard	Nil: Class B F: Class F
⑦ Customer Special Code	(XX): May be followed by additional letters and/or numbers (Does not affect the construction)

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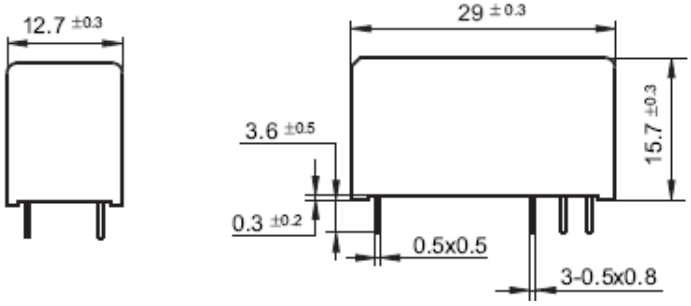
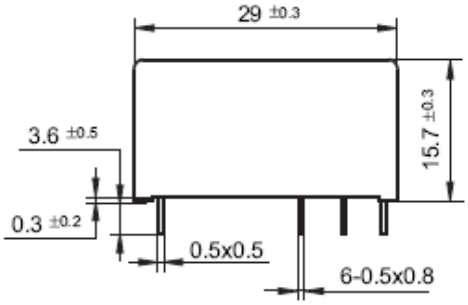
5. DIMENSIONS (Unit: mm)

Outline Dimensions

3.5mm pining (1pole, 12A)



5mm pining (1pole 12A, 1pole 16A)



Wiring Diagram (Bottom View)

3.5/5mm pining (1pole, 12A)

1 Form A

1 Form C

5mm pining (1pole, 16A)

1 Form A

1 Form C

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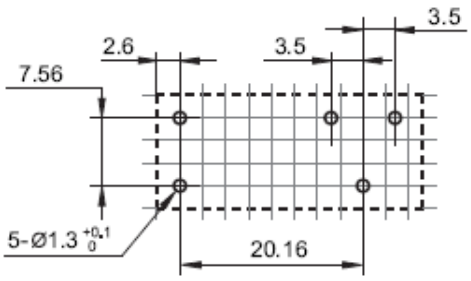
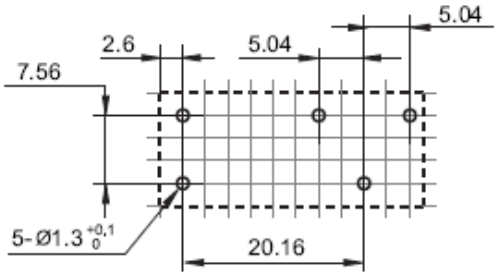
PCB Layout (Bottom view)

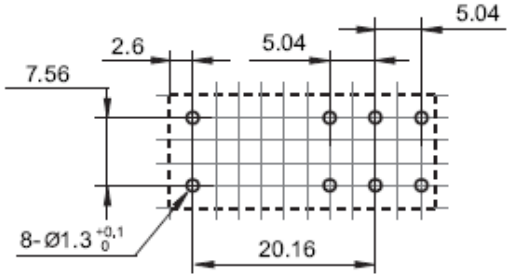
3.5mm 1Pole 12A



5mm 1Pole 12A



5mm 1Pole 16A



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm

3) The width of the gridding is 2.52mm.

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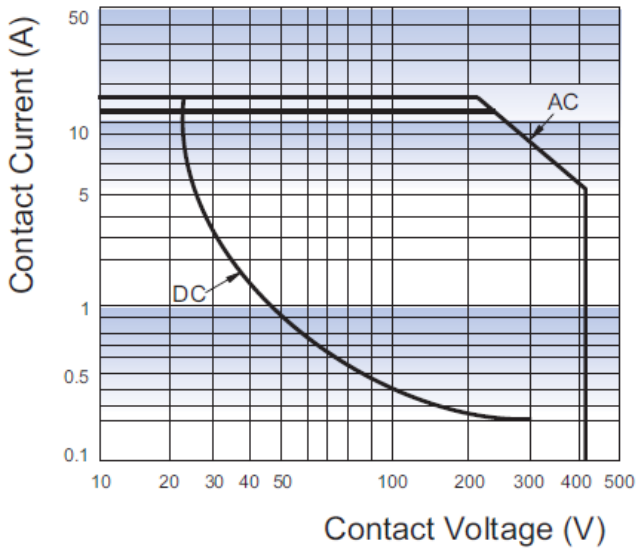
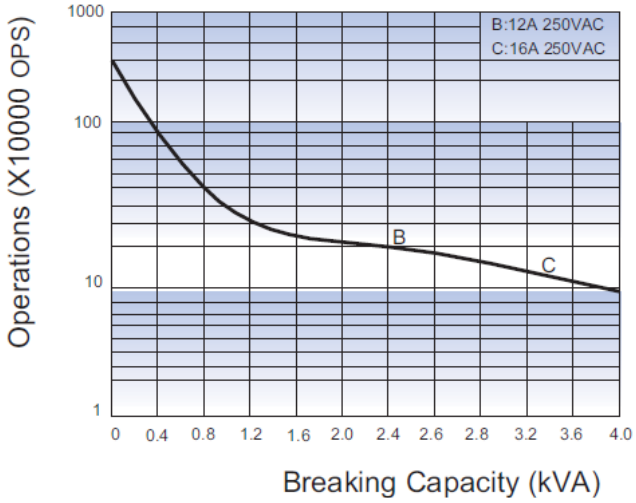
6. CHARACTERISTIC CURVES

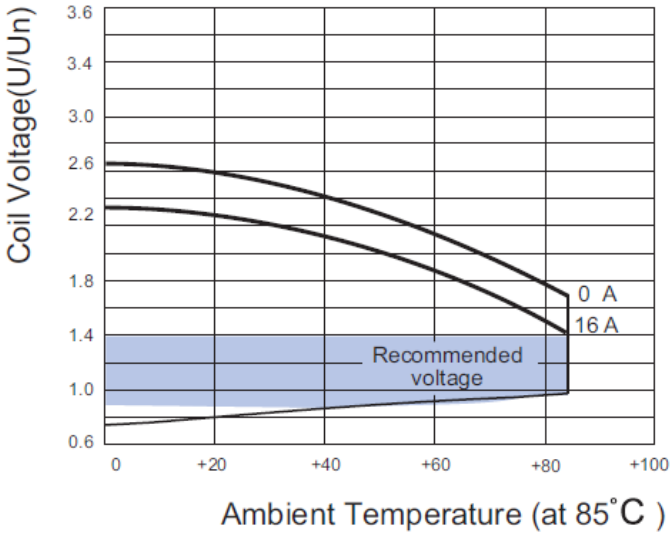
Maximum Switching Power



Endurance Curve



Coil Operating Range



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Miniature High Power Relay	KH

Features

- 16A switching capability
- 5kV dielectric strength (between coil and contacts)
- 10kV impulse (between coil and contacts)
- Low height: 24.2mm
- PCB & QC layouts available

c UL us
(File No.:E134581)

1. COIL DATA (at 23℃)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	4.00	0.5	6.50	108	47 x (1±10%)	Approx. 540
6	4.80	0.6	7.80	90.0	68 x (1±10%)	
9	7.20	0.9	11.7	60.0	155 x (1±10%)	
12	9.60	1.2	15.6	45.0	270 x (1±10%)	
18	14.4	1.8	23.4	30.0	620 x (1±10%)	
24	19.2	2.4	31.2	22.5	1100 x (1±10%)	
48	38.4	4.8	62.4	11.3	4400 x (1±10%)	

2. CONTACT DATA

Contact Arrangement		1 Form A
Contact Resistance		50mΩ max. (at 1A 6VDC)
Contact Material		$AgSnO_2$
Contact Ratings (Resistive load)		16A 250VAC / 30VDC
Max. Switching Voltage		277VAC / 30VDC
Max. Switching Current		16A
Max. Switching Power		4000VA / 480W
Life Expectancy	Electrical	100,000 operations
	Mechanical	10,000,000 operations

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3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1min
	Coil and Contacts	5000VAC 1min
Operate Time (at nominal voltage)		20ms max.
Release Time (at nominal voltage)		10ms max.
Temperature Range		-40℃ ~ 105℃
Shock Resistance	Functional	100 m/s^2 (10g)
	Destructive	1000 m/s^2 (100g)
Vibration Resistance		10 ~ 55Hz 1.5mm
Humidity		5 ~ 85% RH, 40℃
Termination		PCB, PCB & QC, PCB & Bended QC
Construction		Dust protected
Weight		Approx. 15g
Outline Dimension (L x W x H)		29.0 x 12.6 x 24.2 mm

4. ORDERING INFORMATION

KH ①	11 ②	TMP ③	-	E ④	12 ⑤

① Relay Model	KH
② Contact Arrangement	11: 1 Form A (SPST-NO)
③ Termination	Nil: PCB TMP: PCB & QC D: PCB & Bended QC
④ Contact Current	E: 16A
⑤ Coil Voltage	5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 18=18VDC, 24=24VDC, 48=48VDC

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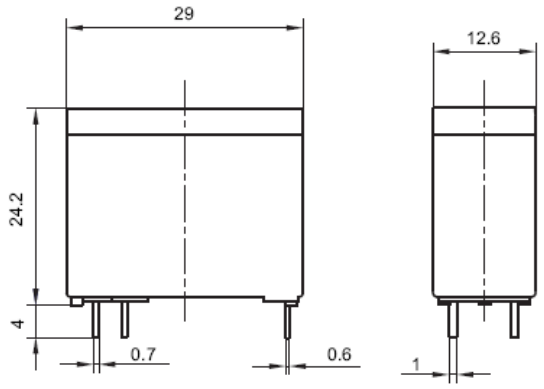
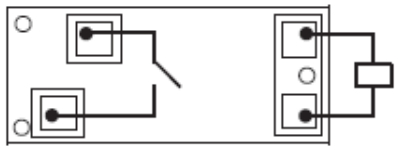
5. DIMENSIONS (Unit: mm)

Outline Dimensions

PCB

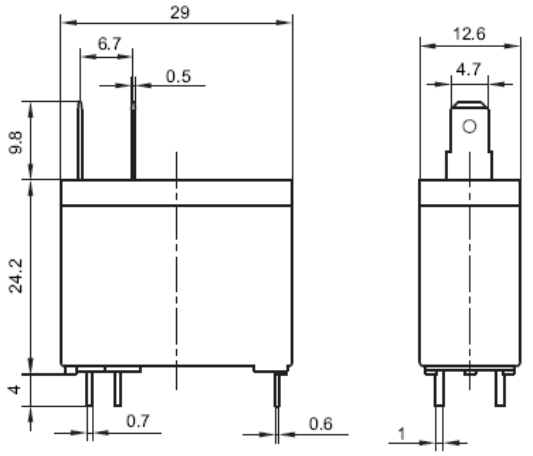


Wiring Diagram

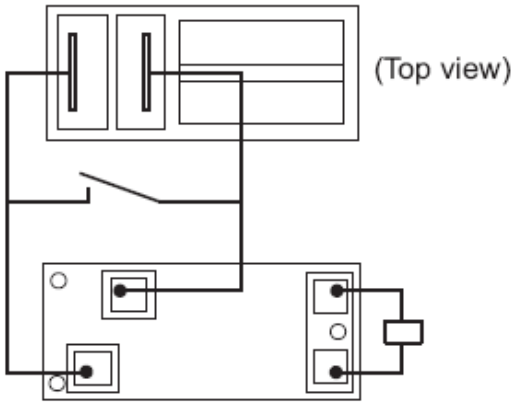


(Bottom View)

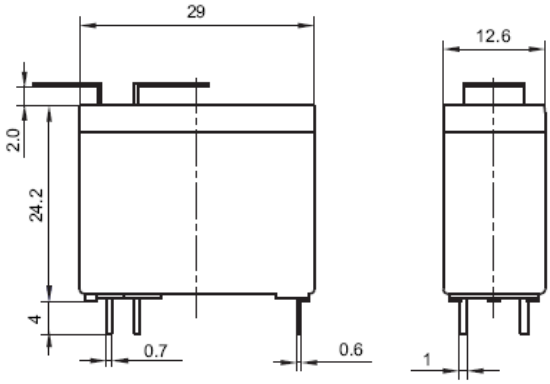
PCB & QC



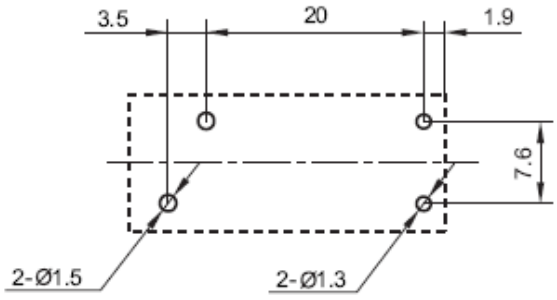
Wiring Diagram

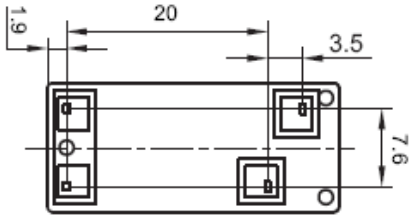


PCB & Bended QC



PCB Layout (Bottom view)





(Bottom View)

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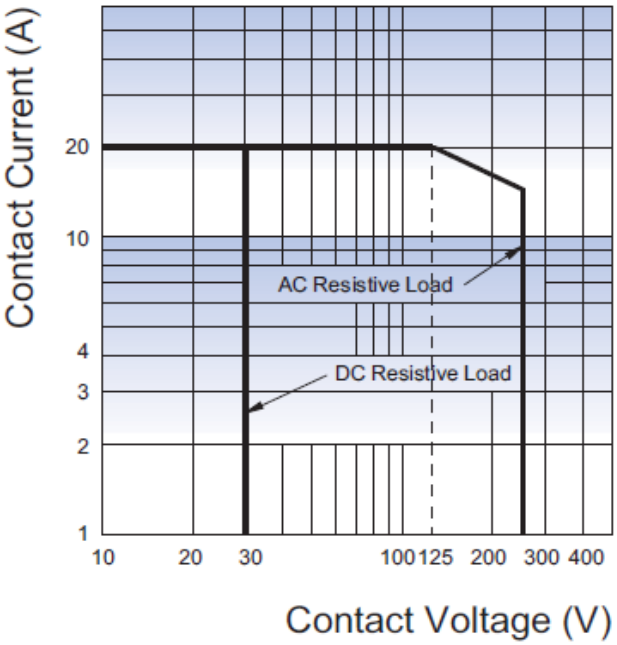
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

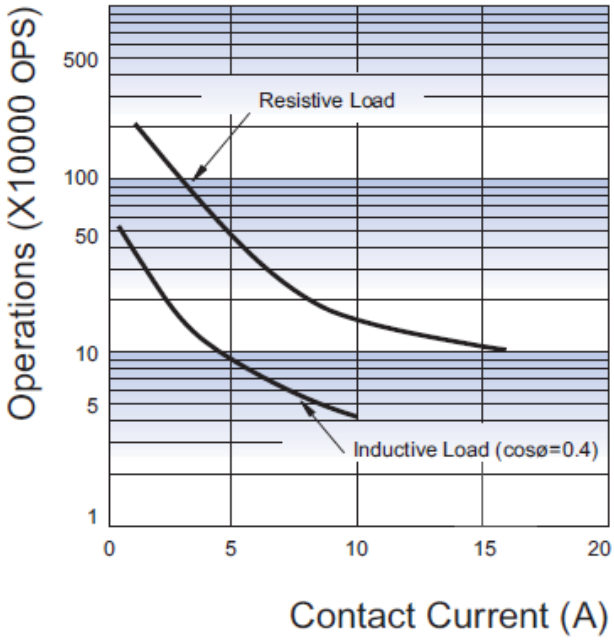
2) The tolerance without indicating for PCB layout is always ±0.1mm

6. CHARACTERISTIC CURVES

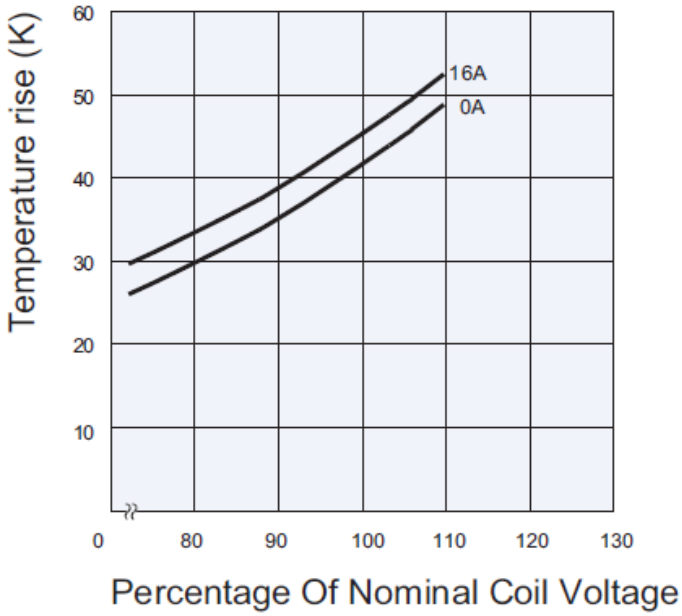
Maximum Switching Power



Endurance Curve



Coil Temperature Rise



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Miniature High Power Relay	NG

Features

- 4.5KV dielectric strength (between coil and contact)
- 25A switching capability
- Ideal for motor switch
- High Power
- PCB & QC layouts available

c US
(File No.:E134581)

1. COIL DATA (at 23℃)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	3.50	0.5	6.00	180	27.8 x (1±10%)	900
12	8.40	1.2	14.4	75.0	160 x (1±10%)	
24	16.8	2.4	28.8	37.5	640 x (1±10%)	
48	33.6	4.8	57.6	18.8	2560 x (1±10%)	

2. CONTACT DATA

Contact Arrangement		1 Form A
Contact Resistance (Initial)		100mΩ Max. (at 1A 6VDC)
Contact Material		$AgSnO_2$
Contact Rating		Resistive: 20A 250VAC / 30VDC Motor: 2HP 240VAC
Max. Switching Voltage (Resistive Load)		250VAC
Max. Switching Current (Resistive Load)		25A
Max. Switching Power		6,250VA
Voltage Drop (Initial)		100mV (at 1A 24VDC)
Life Expectancy	Electrical	100,000 operations
	Mechanical	1,000,000 operations (at 300 operations/minute)

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3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1500VAC 1min
	Coil and Contacts	4500VAC 1min
Operate Time		15ms max.
Release Time		5ms max.
Shock Resistance	Functional	100m/s^2 (10g)
	Destructive	1000m/s^2 (100g)
Vibration Resistance		10 ~ 55Hz, 1.5mm
Ambient temperature		-25℃ ~ 85℃
Termination		PCB, PCB & QC
Weight		Approx. 23g
Outline Dimension (L x W x H)		30.2 x 15.8 x 23.3 mm

4. ORDERING INFORMATION

NG ①	11 ②	TMP ③	-	D12 ④

① Relay Model	NG
② Contact Arrangement	11: 1 Form A (SPST-NO)
③ Termination	Nil: PCB TMP: PCB & QC
④ Coil Voltage	D5=5VDC, D12=12VDC, D24=24VDC, D48=48VDC

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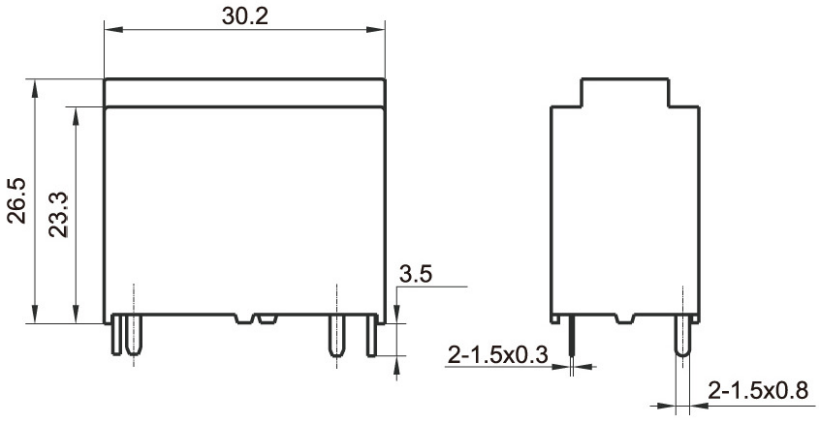
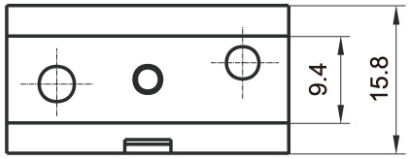
5. DIMENSIONS (Unit: mm)

Outline Dimensions

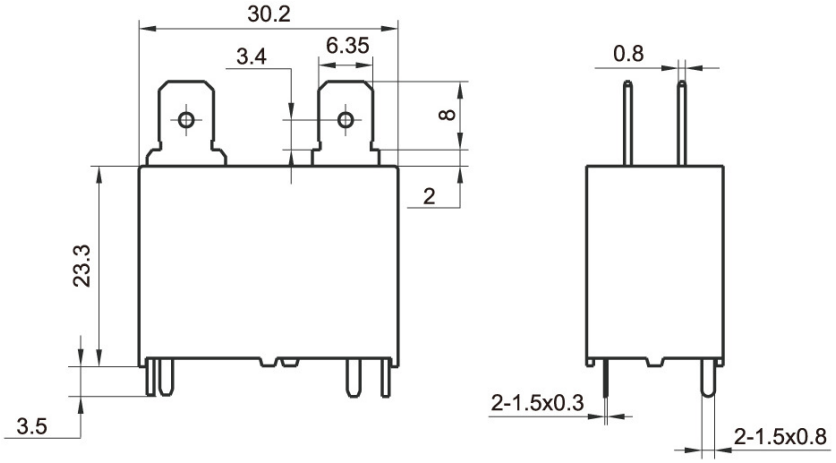
1) PCB

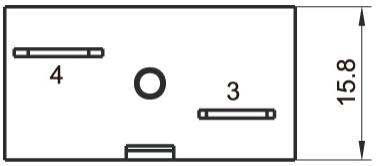




(Top View)

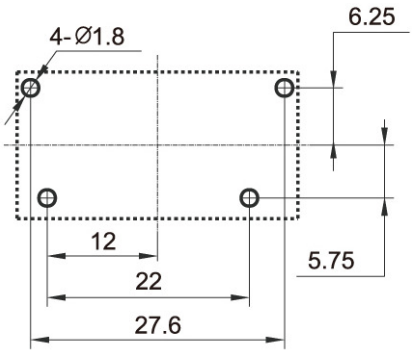
2) PCB & QC



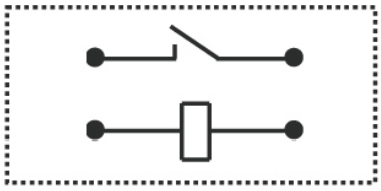


(Top View)

PCB Layout (Bottom view)



Wiring Diagram



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

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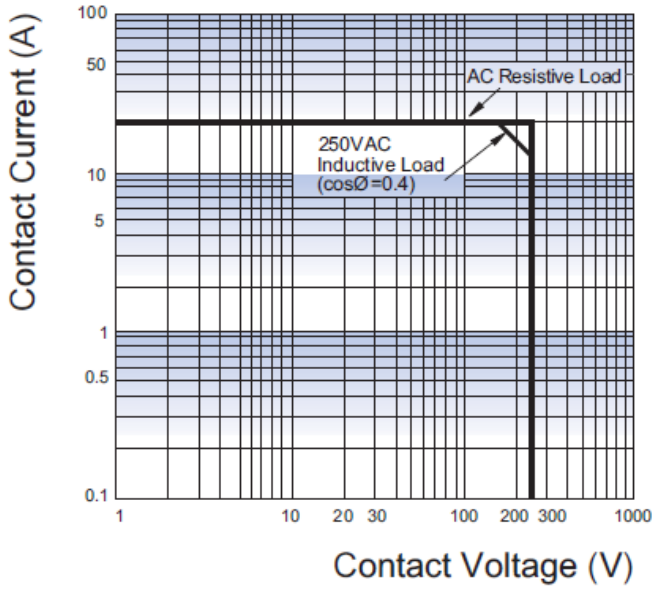
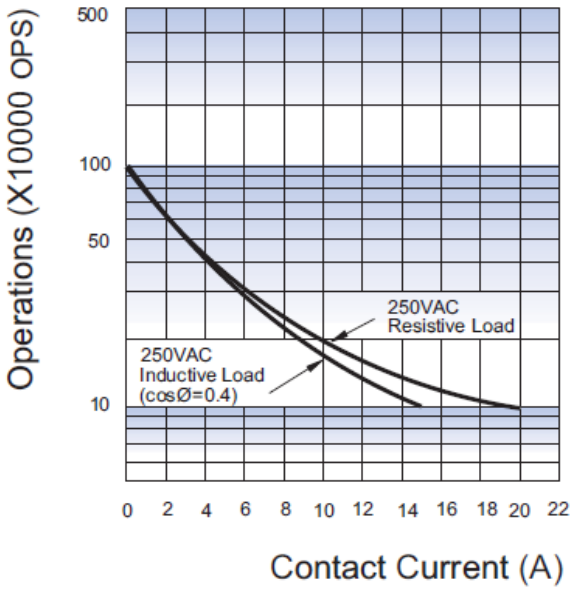
6. CHARACTERISTIC CURVES

Maximum Switching Power



Endurance Curve



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Miniature High Power Relay	CT

Features

- 40A switching capability
- 4kV dielectric strength
  (between coil and contacts)
- Heavy load up to 7,200VA
- PCB coil terminal, ideal for duty load
- Unenclosed and plastic sealed type available
- UL insulation system: Class F available

c UL us
(File No.:E134581)

1. COIL DATA (at 23℃)

1) DC Type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	3.75	0.5	6.50	180	27 x (1±10%)	Approxi. 900
6	4.50	0.6	7.80	150	40 x (1±10%)	
9	6.75	0.9	11.7	100	97 x (1±10%)	
12	9.00	1.2	15.6	75.0	155 x (1±10%)	
15	11.25	1.5	19.5	60.0	256 x (1±10%)	
18	13.50	1.8	23.4	50.0	380 x (1±10%)	
24	18.00	2.4	31.2	37.5	660 x (1±10%)	
48	36.00	4.8	62.4	18.8	2560 x (1±10%)	
70	52.50	7.0	91.0	12.9	5500 x (1±10%)	
110	82.50	11	143	8.18	13450 x (1±10%)	

2) AC Type

Nominal Voltage (VAC)	Pick-up Voltage (VAC)	Drop-out Voltage (VAC)	Max Allowable Voltage (VAC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (VA)
12	9.60	2.4	15.6	167	25 x (1±10%)	Approxi. 2
24	19.2	4.8	31.2	83.3	100 x (1±10%)	
120	96.0	24	156.0	16.7	2500 x (1±10%)	
208	166.4	41	270.4	9.62	11000 x (1±10%)	
220	176	44	286.0	9.10	13490 x (1±10%)	
240	192	48	286.0	8.30	13490 x (1±10%)	
277	220	54	360.1	7.22	15000 x (1±10%)	

Note: 1) When requiring pick-up voltage <80% of nominal voltage, special order allowed.

2) The data shown above are initial values at 50Hz. When requiring 60Hz, special order allowed.

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2. CONTACT DATA

Contact Arrangement		1 Form A	1 Form B	1 Form C	
				NO	NC
Contact Resistance		50mΩ max. (at 1A 24VDC)			
Contact Material		$AgSnO_2$			
Max. Switching Voltage		277VAC / 28VDC			
Max. Switching Current		40A	15A	20A	10A
Max. Switching Power		7200VA / 560W	3600VA / 280W	4800VA / 560W	2400VA / 280W
Contact rating		30A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
Life Expectancy	Electrical	100,000 operations			
	Mechanical	10,000,000 operations			

3. CHARACTERISTICS

Insulation Resistance			1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts		1500VAC 1min
	Coil and Contacts	B type	4000VAC 1min
		Others	2500VAC 1min
Operate Time (at nominal voltage)		DC type	15ms max.
Release Time (at nominal voltage)		DC type	10ms max.
Temperature Range		DC type	-55℃ ~ 85℃
		AC type	-55℃ ~ 60℃
Shock Resistance	Functional		98 m/s^2
	Destructive		980 m/s^2
Vibration Resistance			10 ~ 55Hz, 1.5mm DA
Humidity			5 ~ 85% RH
Termination			PCB, PCB & QC
Construction			Plastic sealed type, Open type(only for DC coil)
Weight			Approx. 36g
Outline Dimension (L x W x H)			PCB: 32.3 x 27.1 x 20.0 mm PCB & QC: 32.4 x 27.5 x 27.8 mm

Note: 1) For plastic sealed type, the venting-hole should be opened in test.

2) The data shown above are initial values.

3) Please find coil temperature curve in the characteristic curves below.

4) UL insulation system: Class F, Class B

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4. ORDERING INFORMATION

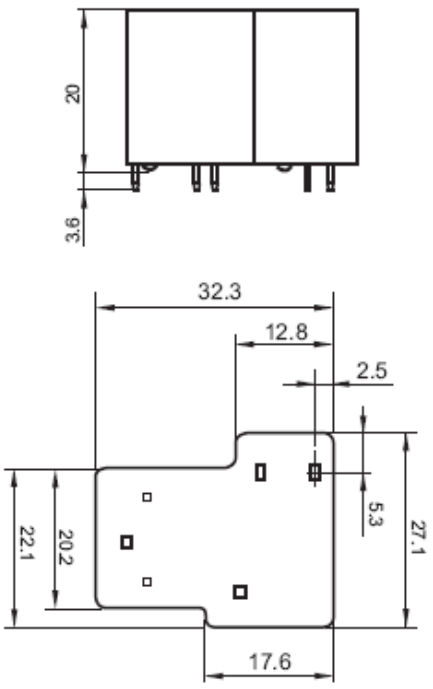
CT ①	11 ②	TMP ③	-	D12 ④	S ⑤	F ⑥

① Relay Model	CT
② Contact Arrangement	11: 1 Form A (SPST-NO) 1B: 1 Form B (SPST-NC) 1: 1 Form C (SPDT)
③ Termination	Nil: With Pin NO. 6, Dielectric strength Between Coil and Contact: 2500VAC B: Without Pin NO. 6, Dielectric strength Between Coil and Contact: 4000VAC N: Without Pin NO. 6, Dielectric strength Between Coil and Contact: 2500VAC TMP: PCB & QC, Dielectric strength Between Coil and Contact: 2500VAC
④ Coil Voltage	DC: D5=5VDC, D6=6VDC, D9=9VDC, D12=12VDC, D15=15VDC, D18=18VDC, D24=24VDC, D48=48VDC, D70=70VDC, D110=110VDC AC: A12=12VAC, A24=24VAC, A120=120VAC, A208=208VAC, A220=220VAC, A240=240VAC, A277=277VAC
⑤ Construction	Nil: Open Type (Only for DC coil) S: Sealed type
⑥ Insulation Standard	Nil: Class B F: Class F

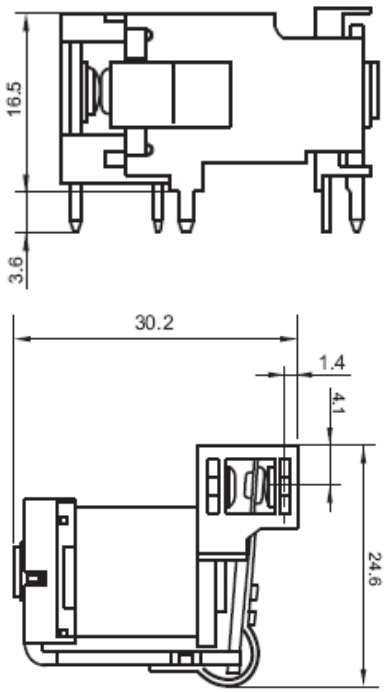
5. DIMENSIONS (Unit: mm)

Outline Dimensions

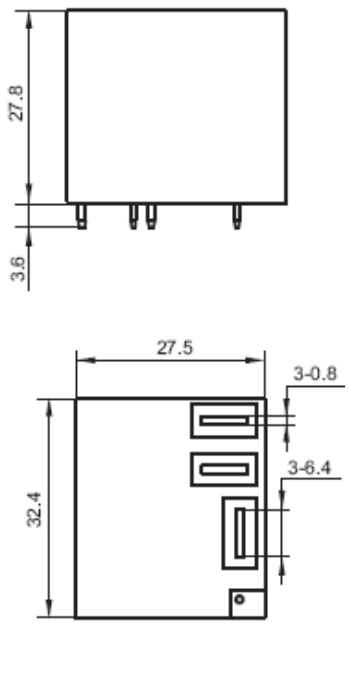
Sealed type



Open type



TMP type



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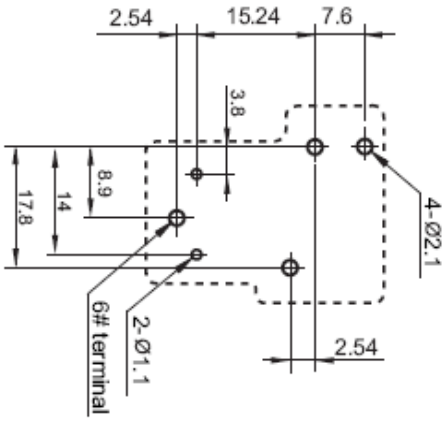
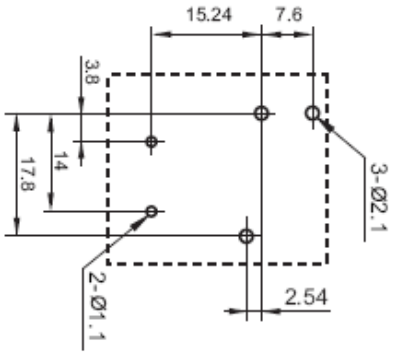
PCB Layout (Bottom View)

Sealed & Open type



TMP Type

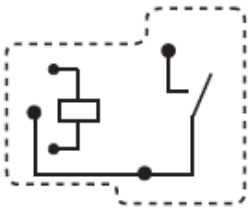


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

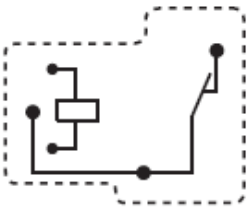
2) The tolerance without indicating for PCB layout is always ±0.1mm

Wiring Diagram (Bottom View)

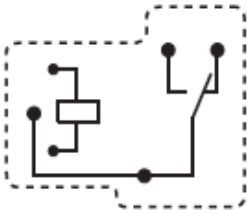
Sealed & Open type with 6# terminal



1 Form A

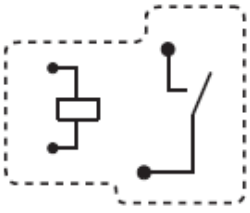


1 Form B

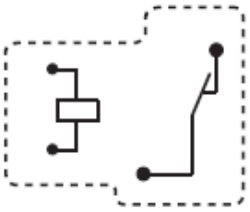


1 Form C

Sealed & Open type without 6# terminal



1 Form A



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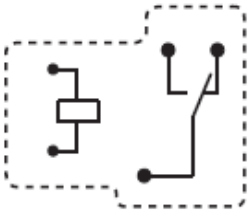

1 Form C

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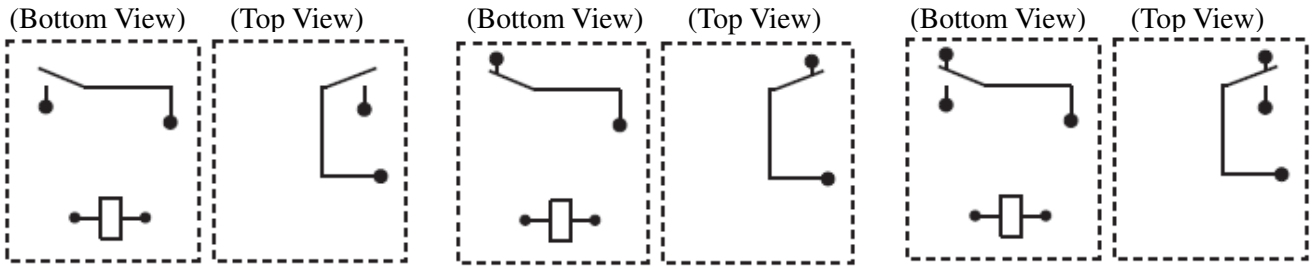
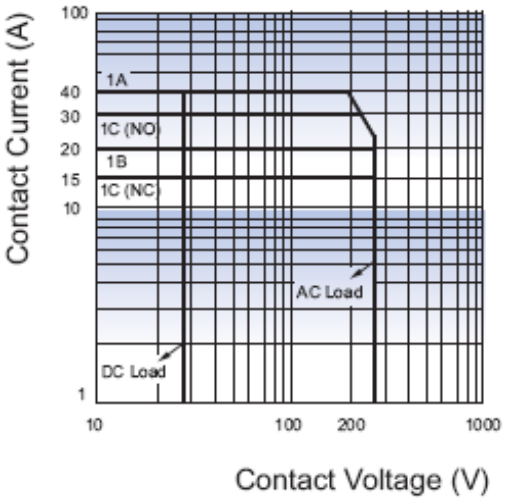
TMP type



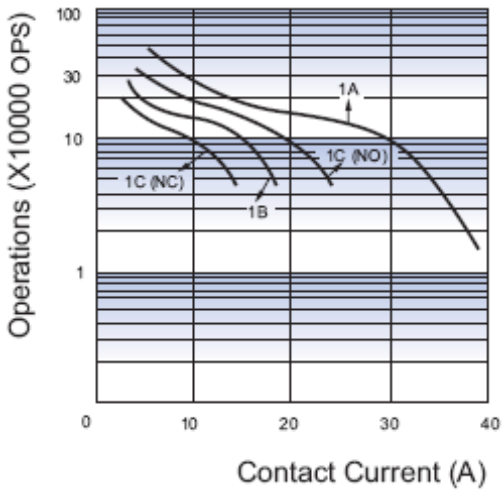
1 Form A　　1 Form B　　1 Form C

6. CHARACTERISTIC CURVES

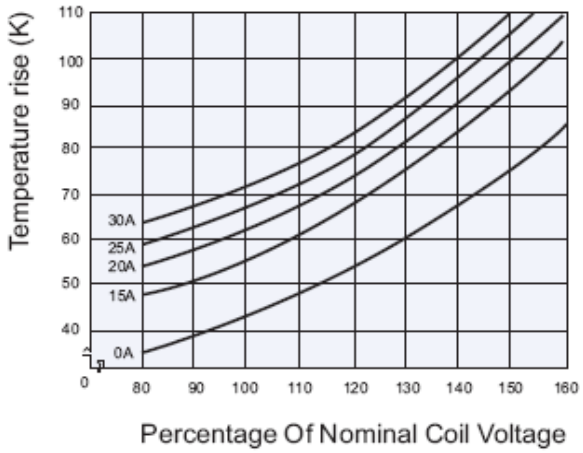
Maximum Switching Power



Endurance Curve



Coil Temperature Rise



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Miniature High Power Relay	NCT

Features

- High switching capacity
  : 40A for 1 Form A and 1 Form C
- PCB coil terminals, ideal for heavy duty load
- Low coil consumption
- Small size, light weight

(File No.: R 50328216)

1. COIL DATA (at 23℃)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
6	4.50	0.6	6.60	155.0	36.8 x (1±10%)	930
9	6.75	0.9	9.90	103.3	82.7 x (1±10%)	
12	9.00	1.2	13.2	77.50	147.1 x (1±10%)	
18	13.5	1.8	19.8	51.67	331.0 x (1±10%)	
24	18.0	2.4	26.4	38.75	588.4 x (1±10%)	
36	27.0	3.6	39.6	25.83	1323.9 x (1±10%)	
48	36.0	4.8	52.8	19.38	2353.5 x (1±10%)	

2. CONTACT DATA

Contact Arrangement		1 Form A	1 Form B	1 Form C	
				NO	NC
Contact Resistance		100mΩ max.			
Contact Material		$AgSnO_2$			
Contact rating	Standard (Nil type)	30A 240VAC 30A 28VDC	20A 240VAC 20A 28VDC	30A 240VAC 30A 28VDC	20A 240VAC 20A 28VDC
	High Capacity (H type)	40A 240VAC 40A 28VDC	30A 240VAC 30A 28VDC	40A 240VAC 40A 28VDC	30A 240VAC 30A 28VDC
Life Expectancy	Electrical	100,000 operations (20A 250VAC / 30VDC)			
	Mechanical	10,000,000 operations			

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3. CHARACTERISTICS

Insulation Resistance		100MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1500VAC 50Hz/1min, Leakage current 1mA
	Coil and Contacts	1500VAC 50Hz/1min, Leakage current 1mA
Temperature Range		-55℃ ~ 70℃
Shock Resistance		10G (Sinusoidal half-wave pulse: 11ms)
Vibration Resistance		10 ~ 55Hz, 1.5mm DA
Atmospheric Pressure		86 ~ 106KPa
Operate Time (at nominal voltage)		15ms max.
Release Time (at nominal voltage)		10ms max.
Humidity		35 ~ 80% RH
Termination		PCB
Weight		Approx. 33g
Outline Dimension (L x W x H)		32.5 x 27.6 x 20.2 mm

4. ORDERING INFORMATION

NCT ①	11 ②	-	D12 ③	S ④	H ⑤

① Relay Model	NCT
② Contact Arrangement	11: 1 Form A (SPST-NO) 1B: 1 Form B (SPST-NC) 1: 1 Form C (SPDT)
③ Coil Voltage	D6=6VDC, D9=9VDC, D12=12VDC, D18=18VDC, D24=24VDC, D36=36VDC, D48=48VDC
④ Construction	S: Plastic sealed type
⑤ Contact Rating	Nil: 30A (Standard) H: 40A (High Capacity)

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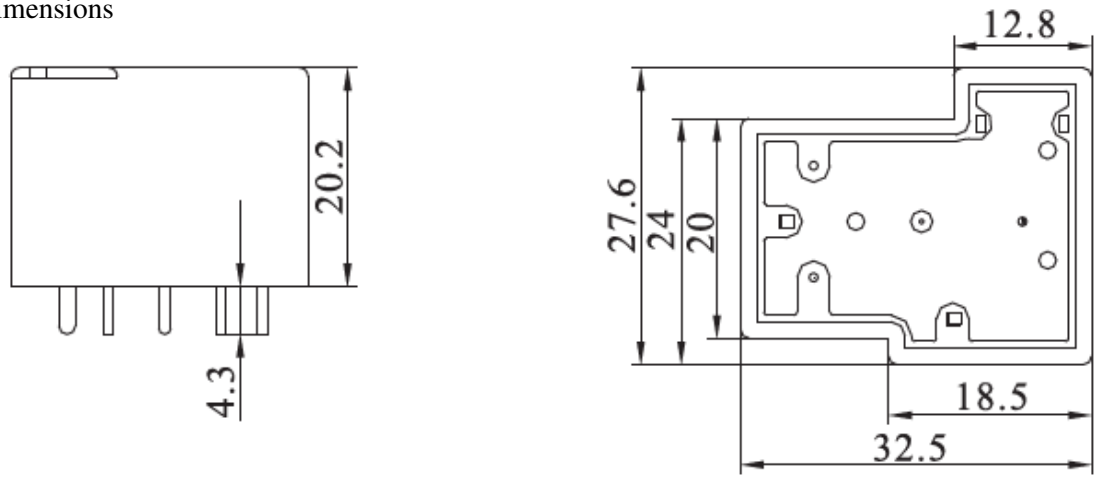
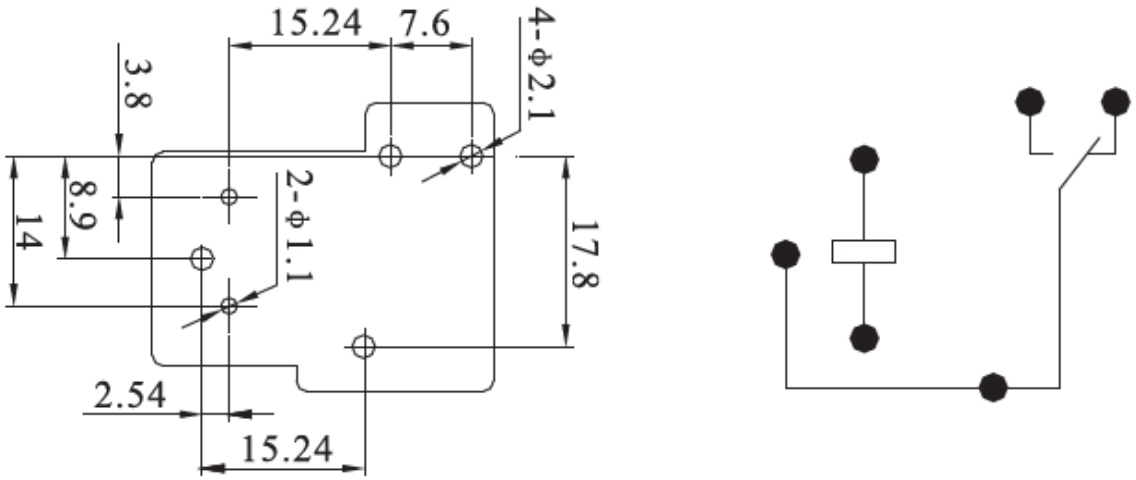
5. DIMENSIONS (Unit: mm)

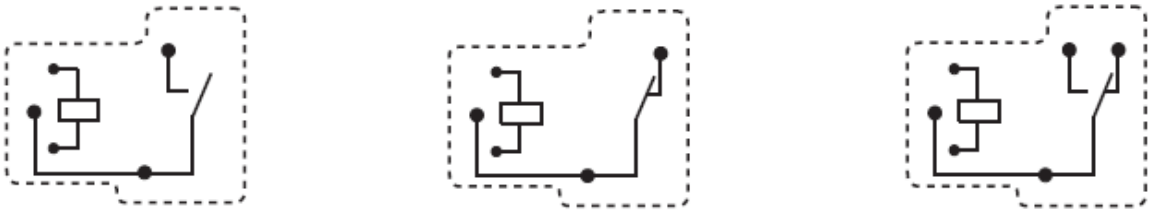
Outline Dimensions



PCB Layout (Bottom View)



Wiring Diagram (Bottom View)



1 Form A　　1 Form B　　1 Form C

Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

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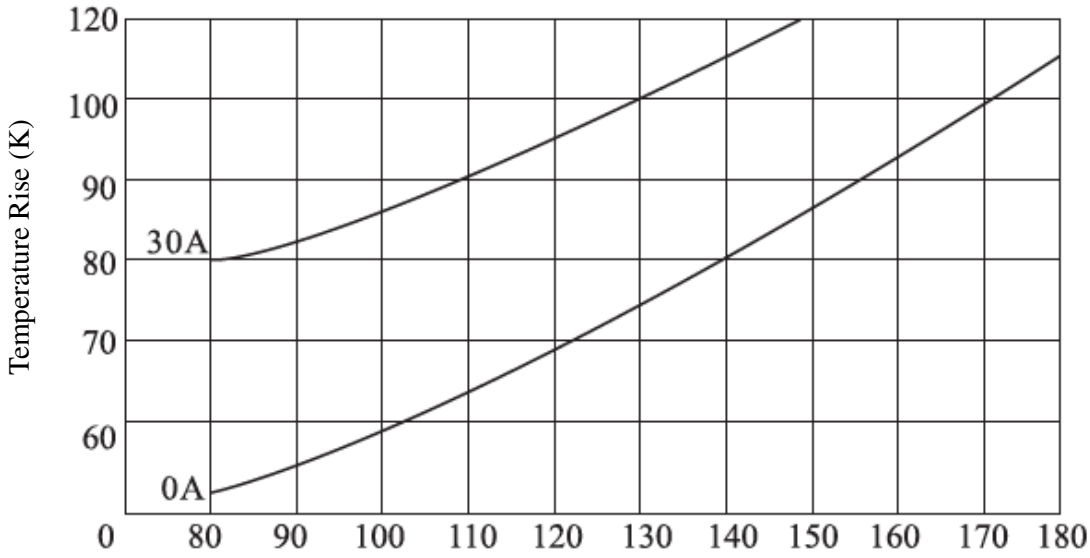
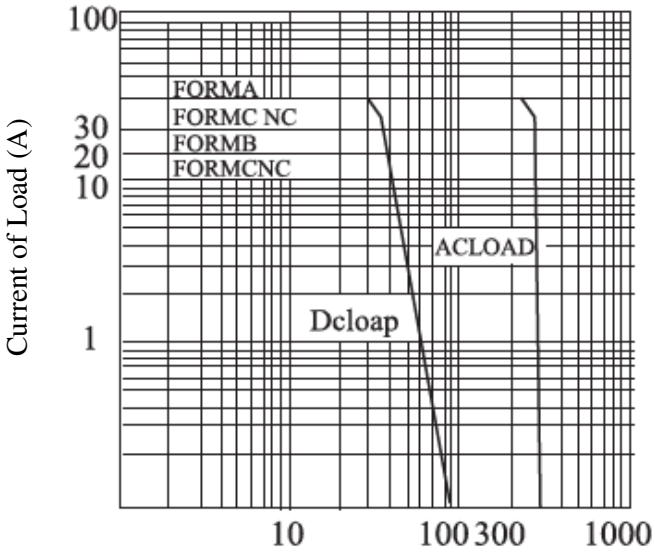
6. CHARACTERISTIC CURVES

Coil Temperature Rise



Maximum Switching Power



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Miniature High Power Relay	TNC

Features

- 40A switching capability
- 2.5kV dielectric strength (between coil and contacts)
- Heavy load up to 7,200VA
- UL insulation system: Class F available

c UL us
(File No.:E134581)

1. COIL DATA (at 23℃)

1) DC Type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	3.75	0.5	6.50	180	27 x (1±10%)	Approxi. 900
6	4.50	0.6	7.80	150	40 x (1±10%)	
9	6.75	0.9	11.7	100	97 x (1±10%)	
12	9.00	1.2	15.6	75.0	155 x (1±10%)	
15	11.25	1.5	19.5	60.0	256 x (1±10%)	
18	13.50	1.8	23.4	50.0	380 x (1±10%)	
24	18.00	2.4	31.2	37.5	660 x (1±10%)	
48	36.00	4.8	62.4	18.8	2560 x (1±10%)	
70	52.50	7.0	91.0	12.9	5500 x (1±10%)	
110	82.50	11	143	8.18	13450 x (1±10%)	

2) AC Type

Nominal Voltage (VAC)	Pick-up Voltage (VAC)	Drop-out Voltage (VAC)	Max Allowable Voltage (VAC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (VA)
12	9.60	2.4	15.6	167	25 x (1±10%)	Approxi. 2
24	19.2	4.8	31.2	83.3	100 x (1±10%)	
120	96.0	24	156	16.7	2500 x (1±10%)	
208	166.4	41	270.4	9.62	11000 x (1±10%)	
220	176	44	286	9.1	13490 x (1±10%)	
240	192	48	286	8.3	13490 x (1±10%)	
277	220	54	360.1	7.22	15000 x (1±10%)	

Note: 1) When requiring pick-up voltage <80% of nominal voltage, special order allowed.

2) The data shown above are initial values at 50Hz. When requiring 60Hz, special order allowed.

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2. CONTACT DATA

Contact Arrangement		1 Form A	1 Form B	1 Form C	
				NO	NC
Contact Resistance		50mΩ max. (at 1A 24VDC)			
Contact Material		$AgSnO_2$			
Max. Switching Voltage		277VAC / 28VDC			
Max. Switching Current		40A	15A	20A	10A
Max. Switching Power		7200VA / 560W	3600VA / 280W	4800VA / 560W	2400VA / 280W
Contact rating		30A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
Life Expectancy	Electrical	100,000 operations			
	Mechanical	10,000,000 operations			

3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1500VAC 1min
	Coil and Contacts	2500VAC 1min
Operate Time (at nominal voltage)	DC type	15ms max.
Release Time (at nominal voltage)	DC type	10ms max.
Temperature Range	DC type	-55℃ ~ 85℃
	AC type	-55℃ ~ 60℃
Shock Resistance	Functional	98 m/s^2
	Destructive	980 m/s^2
Vibration Resistance		10 ~ 55Hz, 1.5mm DA
Humidity		5 ~ 85% RH
Termination		QC
Construction		Sealed type
Weight		Approx. 36g
Outline Dimension (L x W x H)		50.0 x 27.2 x 27.8 mm

Note: 1) For plastic sealed type, the venting-hole should be opened in test.

2) The data shown above are initial values.

3) Please find coil temperature curve in characteristic curves below.

4) UL insulation system: Class F, Class B

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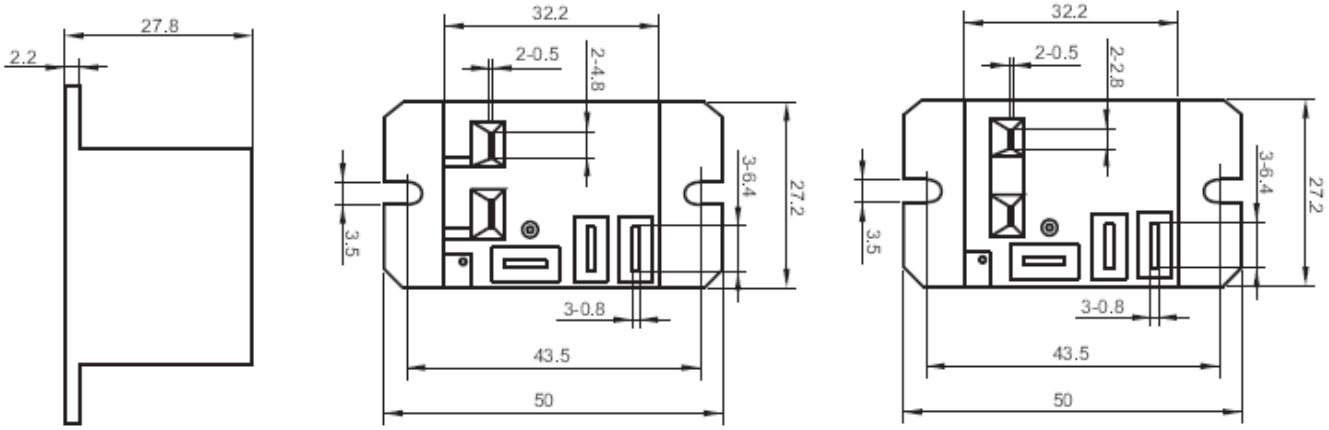
4. ORDERING INFORMATION

TNC ①	11 ②	-	D12 ③	K ④	F ⑤

① Coil Voltage	TNC
② Contact Arrangement	11: 1 Form A (SPST-NO) 1B: 1 Form B (SPST-NC) 1: 1 Form C (SPDT)
③ Coil Voltage	DC: D5=5VDC, D6=6VDC, D9=9VDC, D12=12VDC, D15=15VDC, D18=18VDC, D24=24VDC, D48=48VDC, D70=70VDC, D110=110VDC AC: A12=12VAC, A24=24VAC, A120=120VAC, A208=208VAC, A220=220VAC, A240=240VAC, A277=277VAC
④ Coil Terminal Width	Nil: 2.8mm K: 4.8mm
⑤ Insulation Standard	Nil: Class B F: Class F

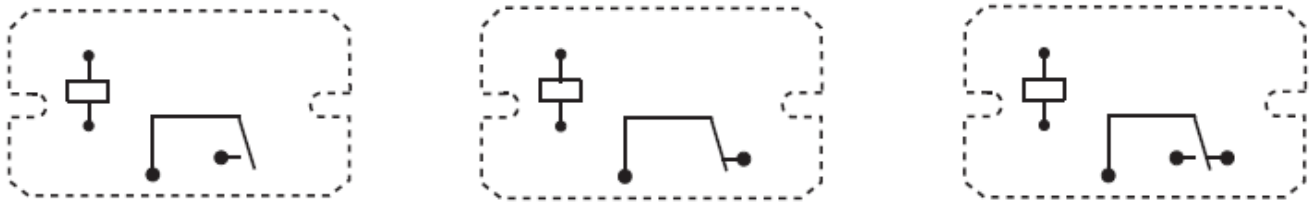
5. DIMENSIONS (Unit: mm)

Outline Dimensions



4.8mm Terminal Width **2.8mm Terminal Width**

Wiring Diagram (Bottom View)



1 Form A 1 Form B 1 Form C

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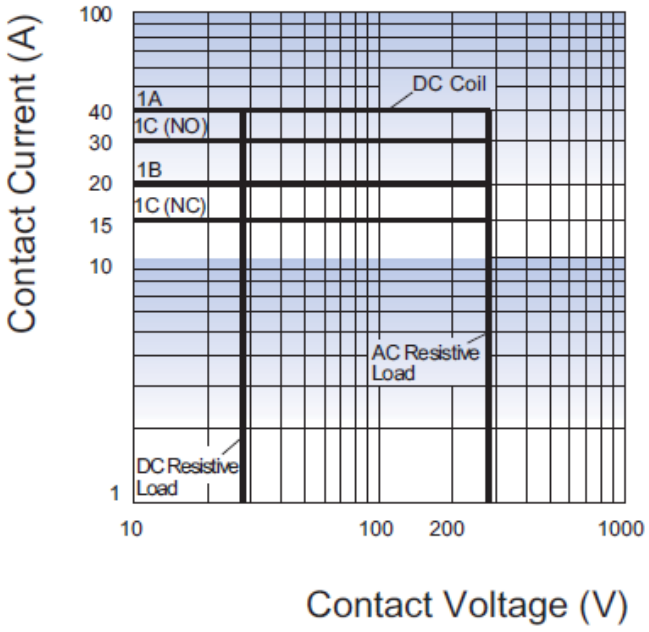
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

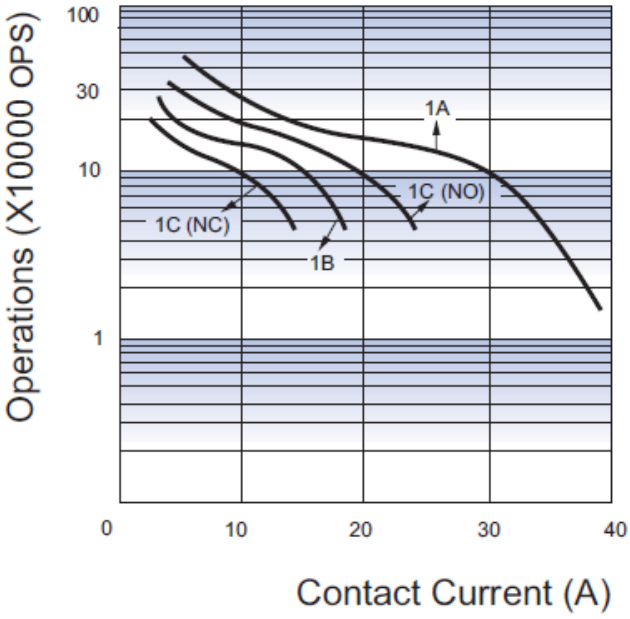
2) The tolerance without indicating for PCB layout is always ±0.1mm

6. CHARACTERISTIC CURVES

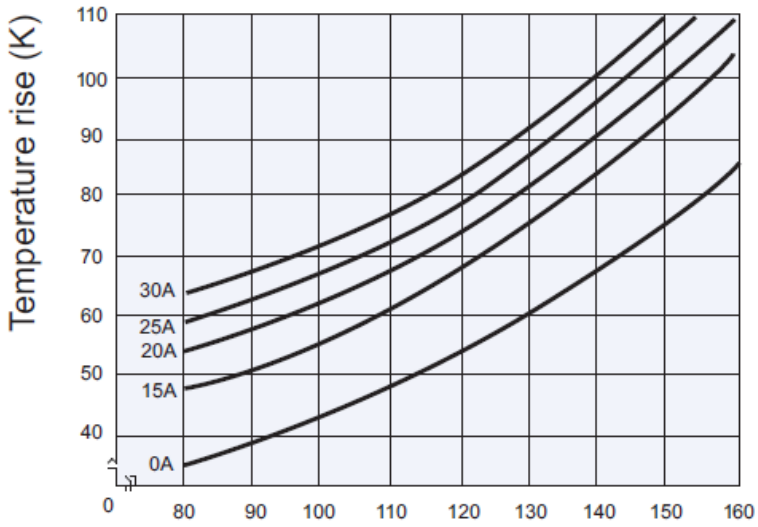
Maximum Switching Power



Endurance Curve



Coil Temperature Rise



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Miniature Power Relay	CHP

Features

- 15A switching capability
- AC and DC coil
- Long life and high reliability
- Various terminals available
- Applied range: microwave oven, dish washer, UPS, air-condition, machine tool, sound equipment

1. COIL DATA (at 20℃)

1) DC coil

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
6	4.50	0.6	7.20	150	40 x (1±10%)	Approx. 900
9	6.80	0.9	10.8	100	90 x (1±10%)	
12	9.00	1.2	14.4	75.0	160 x (1±10%)	
18	13.5	1.8	21.6	50.0	360 x (1±10%)	
24	18.0	2.4	28.8	37.5	640 x (1±10%)	
36	27.0	3.6	43.2	25.0	1440 x (1±10%)	
48	36.0	4.8	57.6	18.8	2560 x (1±10%)	
60	45.0	6.0	72.0	15.0	4000 x (1±10%)	
110	82.5	11	132	8.18	13400 x (1±10%)	

2) AC coil

Nominal Voltage (VAC)	Pick-up Voltage (VAC)	Drop-out Voltage (VAC)	Max Allowable Voltage (VAC)	Coil Resistance (Ω)	Coil Power (VA)
6	4.80	1.80	7.20	10 x (1±10%)	Approx. 1.2
9	7.20	2.70	10.8	23 x (1±10%)	
12	9.60	3.60	14.4	40 x (1±10%)	
18	14.4	5.40	21.6	90 x (1±10%)	
24	19.2	7.20	28.8	160 x (1±10%)	
36	28.8	10.8	43.2	360 x (1±10%)	
48	38.4	14.4	57.6	650 x (1±10%)	
60	48.0	18.0	72.0	1000 x (1±10%)	
110	88.0	33.0	132	3400 x (1±10%)	
220	176	66.0	264	13600 x (1±10%)	
240	192	72.0	288	16800 x (1±10%)	

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2. CONTACT DATA

Contact Arrangement		1 Form A, 1 Form B, 1 Form C
Contact Resistance		100mΩ max. (Initial)
Contact Material		$AgSnO_2$
Contact Ratings		15A 250VAC / 30VDC
Max. Switching Voltage		250VAC / 30VDC
Max. Switching Current		15A
Max. Switching Power		3750VA / 450W
Life Expectancy	Electrical	100,000 operations
	Mechanical	10,000,000 operations

3. CHARACTERISTICS

Insulation Resistance		1000MΩ min. (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1min
	Coil and Contacts	1500VAC 1min
Operate Time (at nominal voltage)		20ms max.
Release Time (at nominal voltage)		20ms max.
Temperature Range		-40℃ ~ 85℃
Shock Resistance	Functional	98 m/s^2
	Destructive	980 m/s^2
Vibration Resistance[1)]		10 ~ 55Hz, Double-amplitude
Humidity		95% RH, 40℃
Termination		QC
Weight		Approx. 45g
Outline Dimension (L x W x H)		50.0 x 32.0 x 29.0 mm

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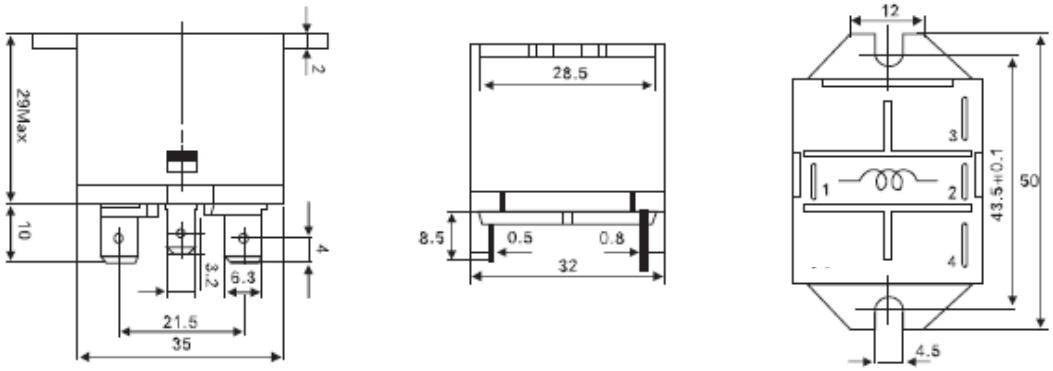
4. ORDERING INFORMATION

CHP ①	11 ②	-	A240 ③	S ④
① Relay Model	CHP			
② Contact Arrangement	11: 1 Form A (SPST-NO) 1B: 1 Form B (SPST-NC) 1: 1 Form C (SPDT)			
③ Coil Voltage	DC: D6=6VDC,D 9=9VDC, D12=12VDC, 18D=18VDC, 24D=24VDC, D36=36VDC, D48=48VDC, D60=60VDC, D110=110VDC AC: A6=6VAC, A9=9VAC, A12=12VAC, A18=18VAC, A24=24VAC, A36=36VAC, A48=48VAC, A60=60VAC, A110=110VAC, A220=220VAC, A240=240VAC			
④ Terminal Form	S: Solder leg Quick-connected type			

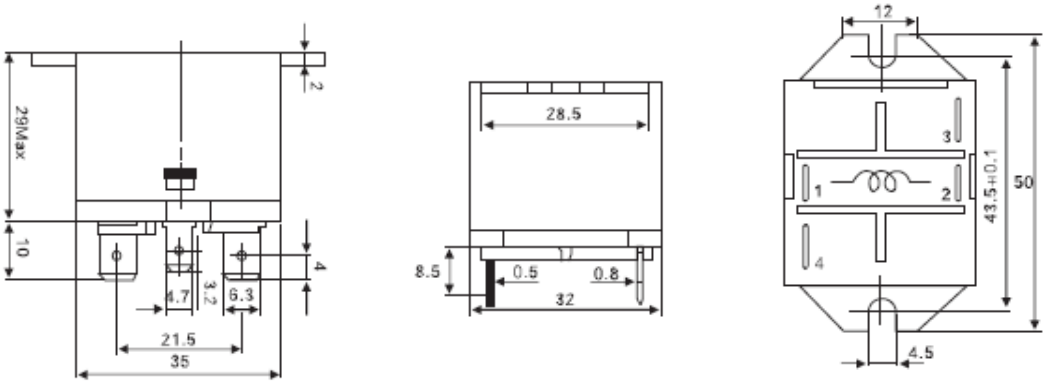
5. DIMENSIONS (Unit: mm)

Outline Dimensions PCB Layout (Bottom view)

1 Form A



1 Form B



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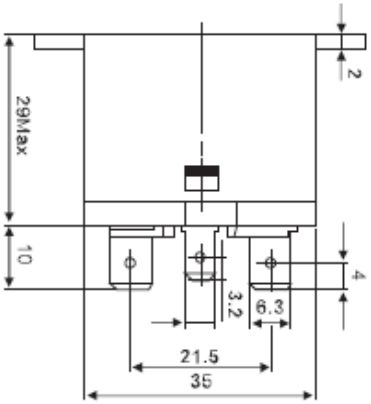
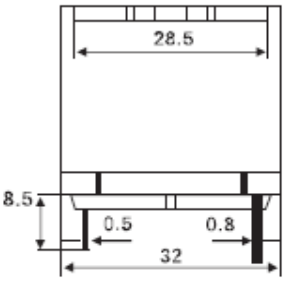
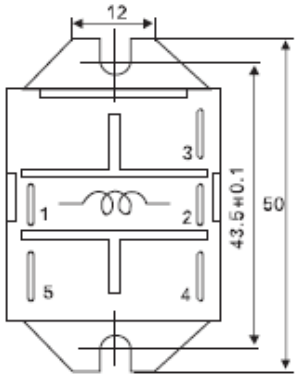
1 Form C

Outline Dimensions

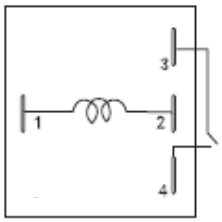




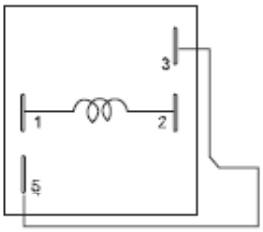
PCB Layout (Bottom view)



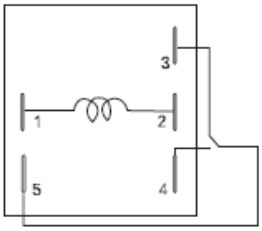
Wiring Diagram



1 Form A



1 Form B



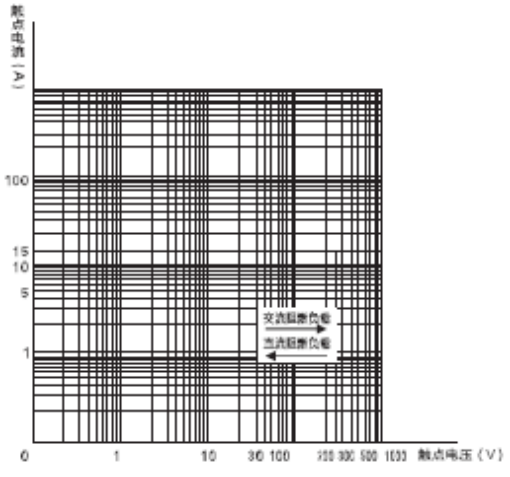
1 Form C

Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

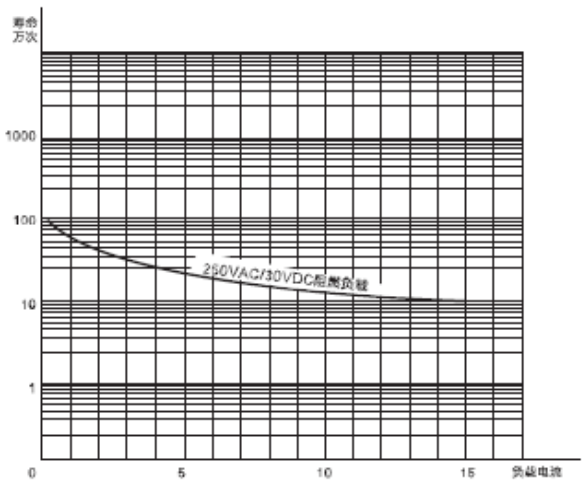
2) The tolerance without indicating for PCB layout is always ±0.1mm.

6. ENDURANCE CURVES

Maximum Switching Power



Endurance Curve



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Power Relay	NY

Features

- 30A contact change-over capacity
- With opening and dust-proof type
- 2500V dielectric strength (between coil and contacts)
- Various terminals available
- 1 & 2 poles configurations

1. COIL DATA (at 23℃)

1) DC Type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Coil Resistance (Ω)	Coil Power (mW)
6	4.80	0.60	30 x (1±10%)	Approx. 2500
12	9.60	1.20	120 x (1±10%)	
24	19.0	2.40	330 x (1±10%)	
48	38.4	4.80	1820 x (1±10%)	
60	48.0	6.00	2800 x (1±10%)	
110	88.0	11.0	9650 x (1±10%)	

2) AC Type

Nominal Voltage (VAC)	Pick-up Voltage (VAC)	Drop-out Voltage (VAC)	Coil Resistance (Ω)	Coil Power (VA)
12	9.60	3.60	11.2 x (1±10%)	Approx. 4
24	19.2	7.20	4.5 x (1±10%)	
48	38.4	14.4	100 x (1±10%)	
110	88.0	36.0	940 x (1±10%)	
220	176	72.0	3764 x (1±10%)	
240	176	72	5050 x (1±10%)	

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2. CONTACT DATA

Contact Arrangement		1 Form C, 2 Form C
Contact Resistance		100mΩ max. (at 1A 6VDC)
Contact Material		AgCdO
Contact Ratings (Resistive load)		30A 250VAC / 28VDC
Max. Switching Voltage		250VAC / 28VDC
Max. Switching Current		30A
Max. Switching Power		7500VA / 840W
Life Expectancy	Electrical*	10,000 operations
	Mechanical	10,000,000 operations

Notes: *Please refer to life expectancy on characteristic curves.

3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1200VAC 1min
	Coil and Contacts	2500VAC 1min
Operate Time (at nominal voltage)		20ms max.
Release Time (at nominal voltage)		15ms max.
Termination		QC
Temperature Range		-40℃ ~ 70℃
Weight		Approx. 70g
Outline dimension (L x W x H)		50.0 x 35.6 x 47.7 mm

4. ORDERING INFORMATION

NY ①	1 ②	-	A220 ③

① Relay Model	NY
② Contact Arrangement	1: 1 Form C (SPDT) 2: 2 Form C (DPDT)
③ Coil Voltage	DC : D6=6VDC, D12=12VDC, D24=24VDC, D48=48VDC, D60=60VDC, D110=110VDC AC: A12=12VAC, A24=24VAC, A48=48VAC, A110=110VAC, A220=220VAC, A240=240VAC

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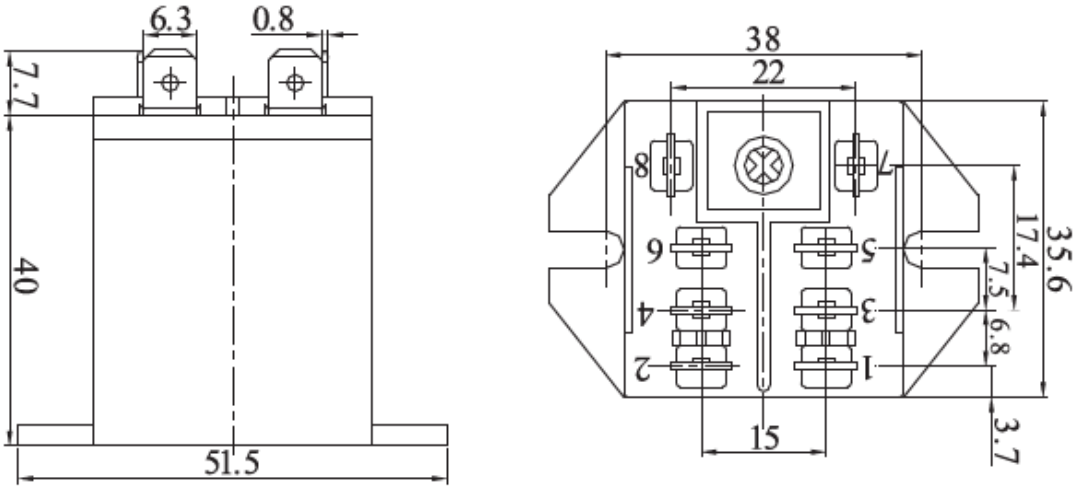
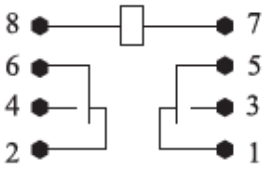
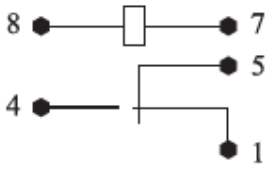
5. DIMENSIONS (Unit: mm)





2 Form C

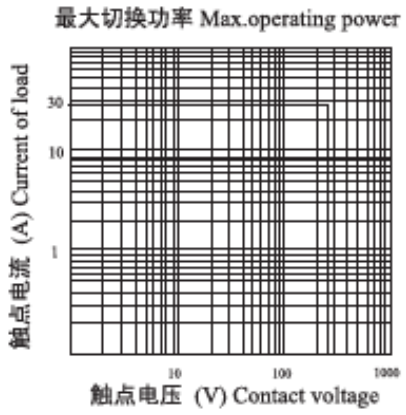


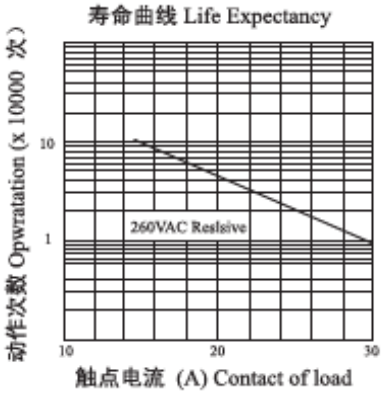
1 Form C

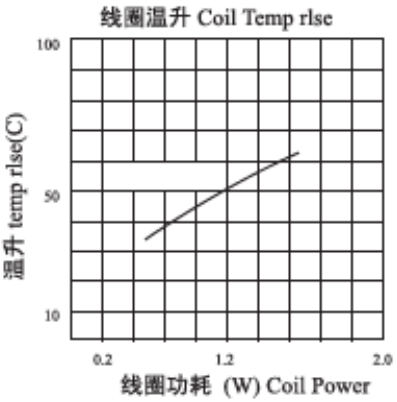
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

6. CHARACTERISTIC CURVES







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Miniature Intermediate Power Relay	KML

Features

- 1C: 15A, 2~4C: 10A switching capability
- 1.5kV dielectric strength (between coil and contacts)
- Various terminals available
- Socket available
- 1 ~ 4 poles configurations

c UL us
(File No.:E122258)

1. COIL DATA (at 23℃)

1) DC Type (1 Form C, 2 Form C)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Resistance (Ω)	Coil Power (mW)
5	4.00	0.50	5.50	27.5 x (1±10%)	Approx. 900 to 1100
6	4.80	0.60	6.60	40 x (1±10%)	
12	9.60	1.20	13.2	160 x (1±10%)	
24	19.2	2.40	26.4	650 x (1±10%)	
48	38.4	4.80	52.8	2600 x (1±10%)	
110	88.0	11.0	121	11000 x (1±10%)	
125	100	12.5	137.5	14000 x (1±10%)	
220	176	22.0	242	53750 x (1±10%)	

2) AC Type (1 Form C, 2 Form C)

Nominal Voltage (VAC)	Pick-up Voltage (VAC)	Drop-out Voltage (VAC)	Max Allowable Voltage (VAC)	Coil Resistance (Ω)	Coil Power (VA)
6	4.80	1.80	6.60	11.5 x (1±10%)	Approx. 1.2 to 1.8
12	9.60	3.60	13.2	46 x (1±10%)	
24	19.2	7.20	26.4	184 x (1±10%)	
48	38.4	14.4	52.8	735 x (1±10%)	
120	96.0	36.0	132	4550 x (1±10%)	
220/240	176	72.0	264	14400 x (1±10%)	

Notes:

1) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coil.

2) Maximum allowable voltage refers to the maximum voltage which relay coil could endure in a short period of time.

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3) DC Type (3 Form C, 4 Form C)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Resistance (Ω) (1±10%)		Coil Power (mW)
				3C	4C	
12	9.00	1.2	13.2	105	100	Approx. 3C: 1400 4C: 1500
24	18.0	2.4	26.4	410	350	
110	82.5	11	121	8500	6900	

4) AC Type (3 Form C, 4 Form C)

Nominal Voltage (VAC)	Pick-up Voltage (VAC)	Drop-out Voltage (VAC)	Max Allowable Voltage (VAC)	Coil Resistance (Ω) (1±10%)		Coil Power (VA)
				3C	4C	
12	9.6	3.6	13.2	24	20	Approx. 3C: 1.6 to 2.0 4C: 1.9 to 2.5
24	19.2	7.2	26.4	100	78	
120	96.0	36	132	2300	1600	
220/240	176	66	240	8650	6700	

Notes: Max allowable voltage refers to the maximum voltage which relay coil could endure in a short period of time.

2. CONTACT DATA

Contact Arrangement		1 Form C	2 Form C, 3 Form C, 4 Form C
Contact Resistance		100mΩ max. (at 1A 6VDC)	
Contact Material		1C, 2C: AgCe 2C, 3C: $AgSnO_2$	
Contact Ratings (Resistive load)		15A 250VAC / 30VDC	10A 250VAC / 30VDC
Max. Switching Voltage		250VAC / 30VDC	
Max. Switching Current		15A	10A
Max. Switching Power		3750VA / 450W	2500VA / 300W
Life Expectancy	Electrical	100,000 operations	
	Mechanical	10,000,000 operations	

3. SAFETY APPROVAL

UL / cUL	1 Form C	AgCe	15A 250VAC / 30VDC
	2 Form C	AgCe	10A 250VAC / 30VDC 1/3 HP 240VAC / 120VAC
	3 Form C, 4 Form C (“S” and “SL” type only)	$AgSnO_2$	10A 250VAC / 30VDC

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4. CHARACTERISTICS

Insulation Resistance		500MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1min
	Coil and Contacts	1500VAC 1min
	Contact Sets	1500VAC 1min
Operate Time (at nominal voltage)		25ms max.
Release Time (at nominal voltage)		25ms max.
Temperature Rise (no-load, at nominal voltage)		60K max.
Temperature Range		1C, 2C: -40℃ ~ 70℃ 3C, 4C: -20℃ ~ 55℃
Shock Resistance	Functional	98 m/s^2
	Destructive	980 m/s^2
Vibration Resistance		10 ~ 55Hz 1mm DA
Humidity		5% ~ 85% RH
Termination		PCB, Plug-in
Weight (Approx.)		1C, 2C: 37g / 3C: 50.6g / 4C: 65.5g
Outline Dimension (L x W x H)		1C, 2C: 28.0 x 21.5 x 35.0 mm 3C: 27.5 x 31.0 x 35.5 mm 4C: 27.5 x 41.0 x 35.5 mm

Notes: The data shown above are initial values.

5. ORDERING INFORMATION

KML ①	1 ②	-	D24 ③	P ④

① Relay Model	KML
② Contact Arrangement	1 : 1 Form C (SPDT) 2 : 2 Form C (DPDT) 3 : 3 Form C (3PDT) 4 : 4 Form C (4PDT)
③ Coil Voltage	DC: D5=5VDC, D6=6VDC, D12=12VDC, D24=24VDC, D48=48VDC, D110=110VDC, D125=125VDC, D220=220VDC AC: A6=6VAC, A12=12VAC, A24=24VAC, A48=48VAC, A120=120VAC, A220/240=220/240VAC
④ Terminal Form	P: PC board S: Plug-in B: Top mounting SL: Light emitting diode with plug-in PL: Light emitting diode with pc board

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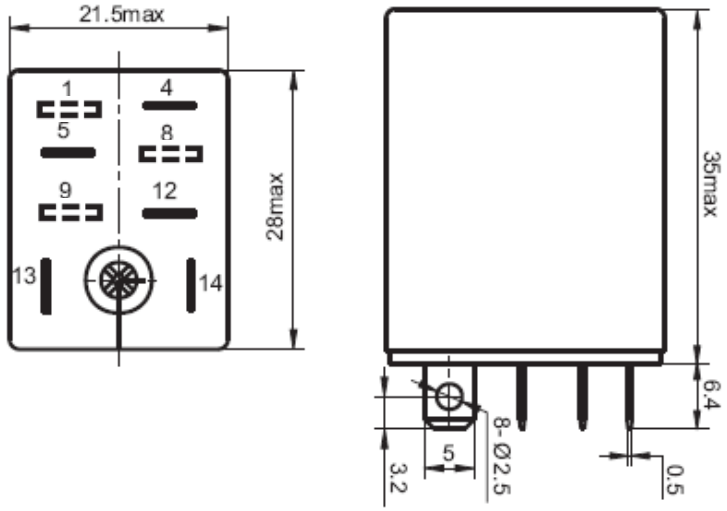
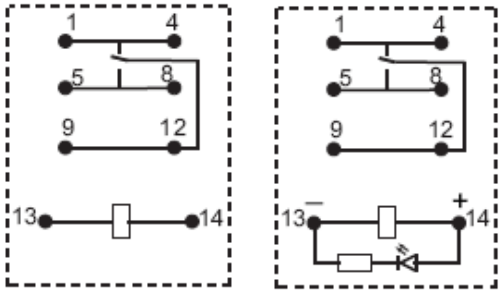
6. DIMENSIONS (Unit: mm)

1 Form C, Plug-in

Outline Dimensions



Wiring Diagram (Bottom View)

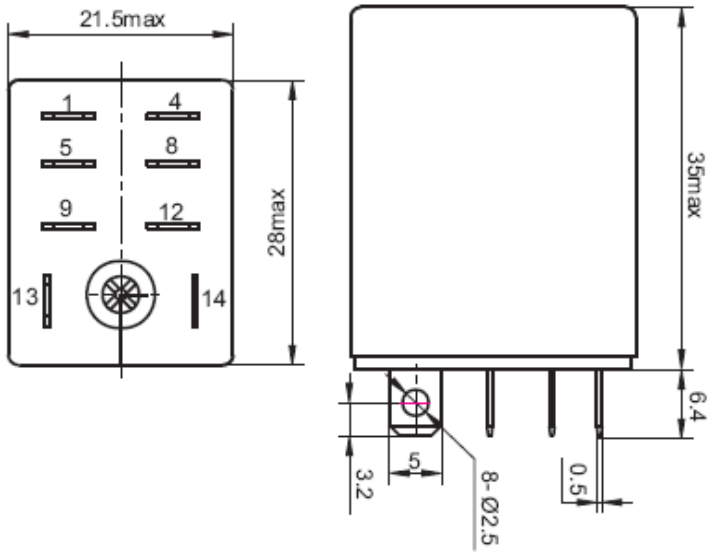


(With LED)

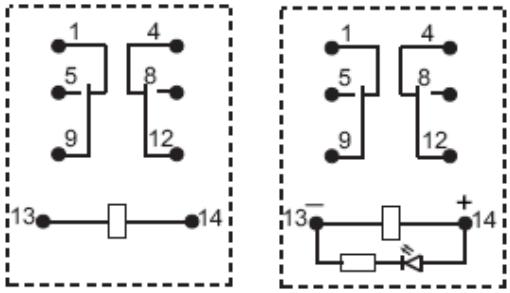
Remark: For AC parts with diode, the positive and negative pole markings on wiring diagram are not applicable.

2 Form C, Plug-in

Outline Dimensions



Wiring Diagram (Bottom View)



(With LED)

Remark: For AC parts with diode, the positive and negative pole markings on wiring diagram are not applicable.

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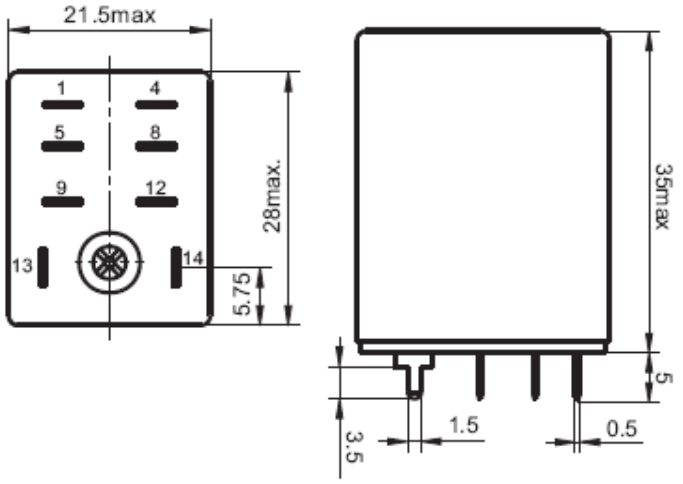
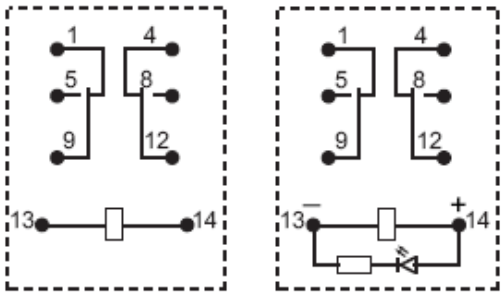
2 Form C, PC Board

Outline Dimensions



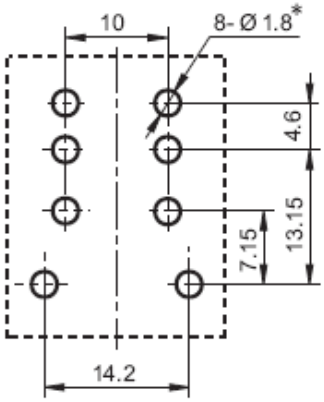
Wiring Diagram (Bottom View)



(With LED)

Remark: For AC parts with diode, the positive and negative pole markings on wiring diagram are not applicable.

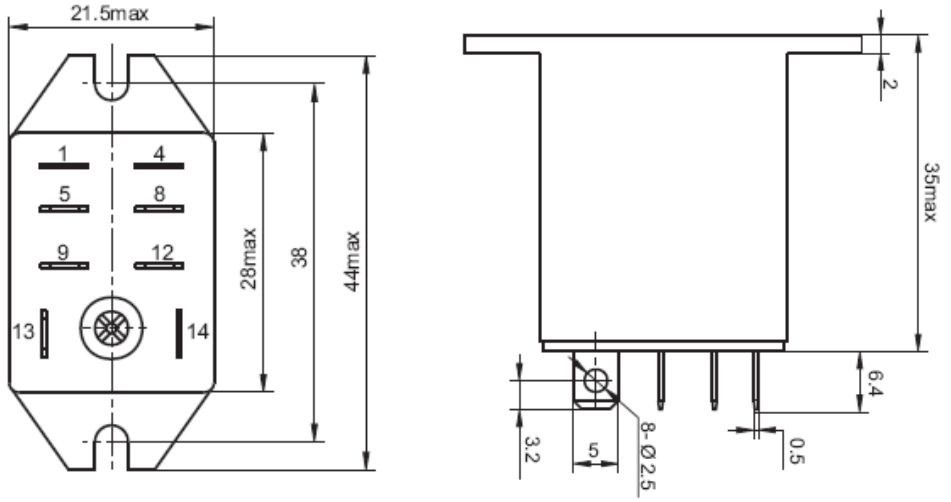
PCB Layout (Bottom view)



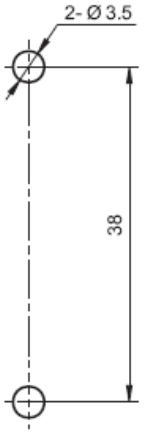
*: Please adjust the site of the diameter according to the actual application

2 Form C, Top mounting

Outline Dimensions



Mounting Holes



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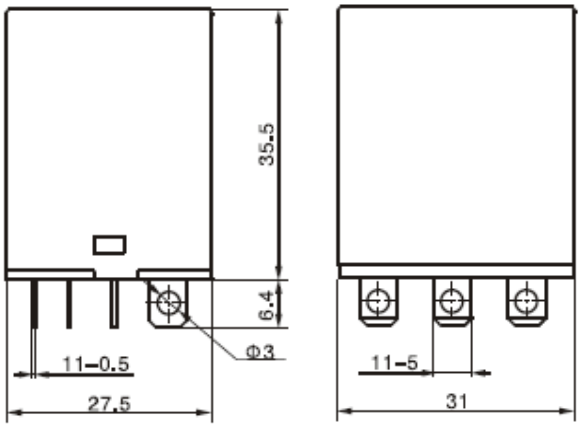
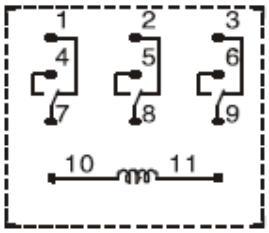
3 Form C, Plug-in

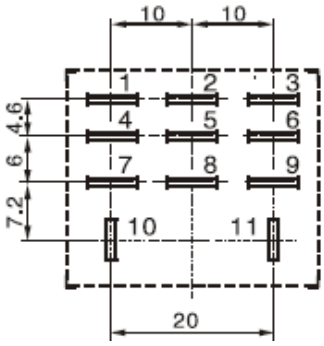
Outline Dimensions



Wiring Diagram
(Bottom View)

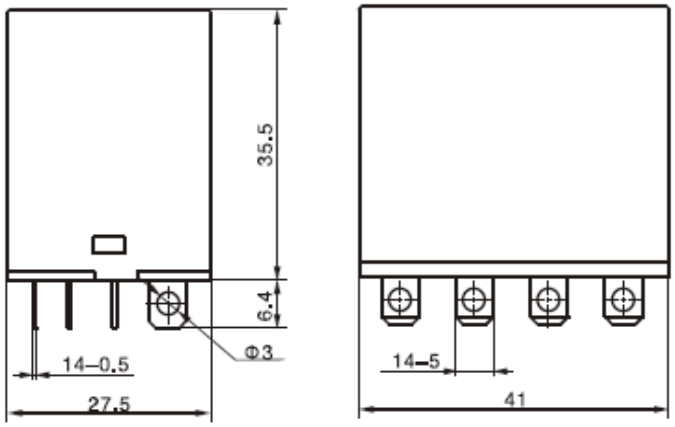


PCB Layout
(Bottom view)

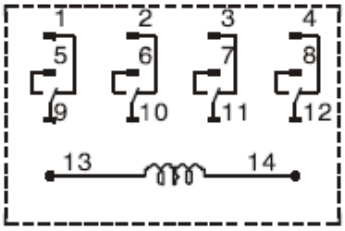


4 Form C, Plug-in

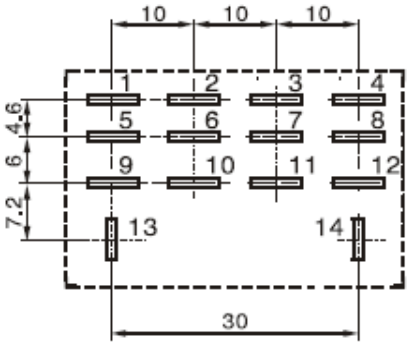
Outline Dimensions



Wiring Diagram (Bottom View)



PCB Layout (Bottom View)



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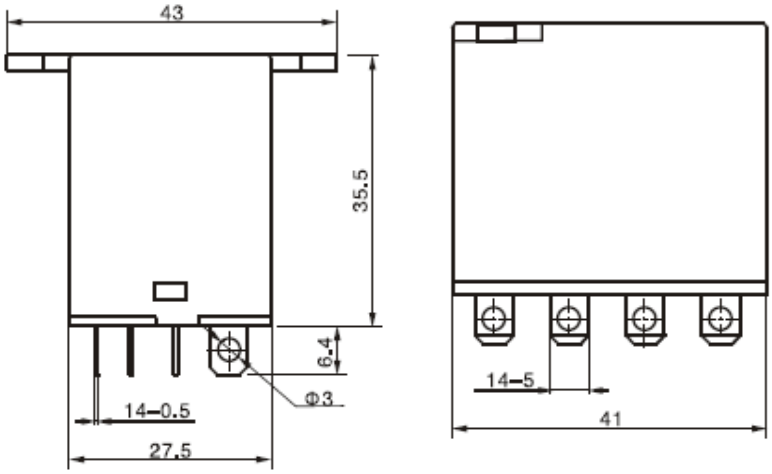
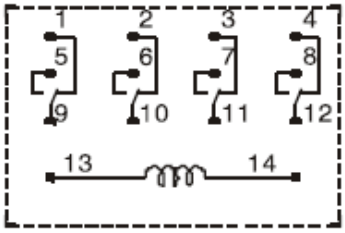
4 Form C, Top mounting

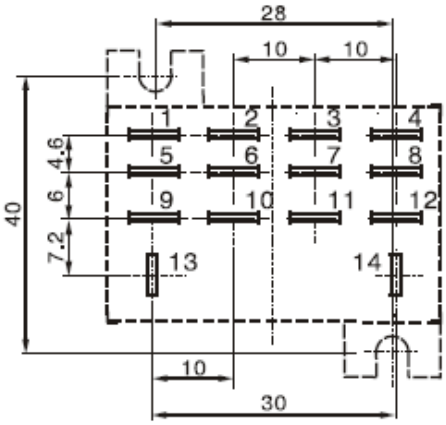
Outline Dimensions



Wiring Diagram (Bottom View)



PCB Layout (Bottom View)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

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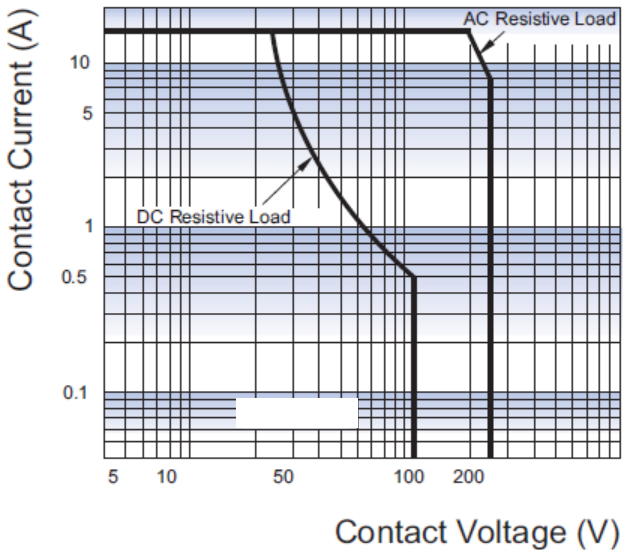
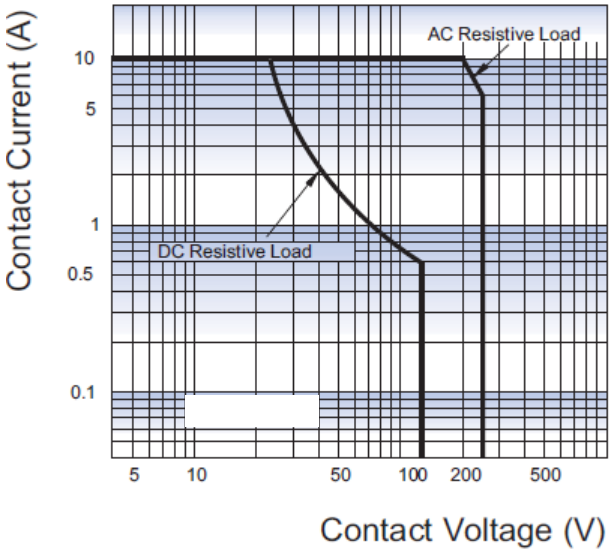
7. CHARACTERISTIC CURVES

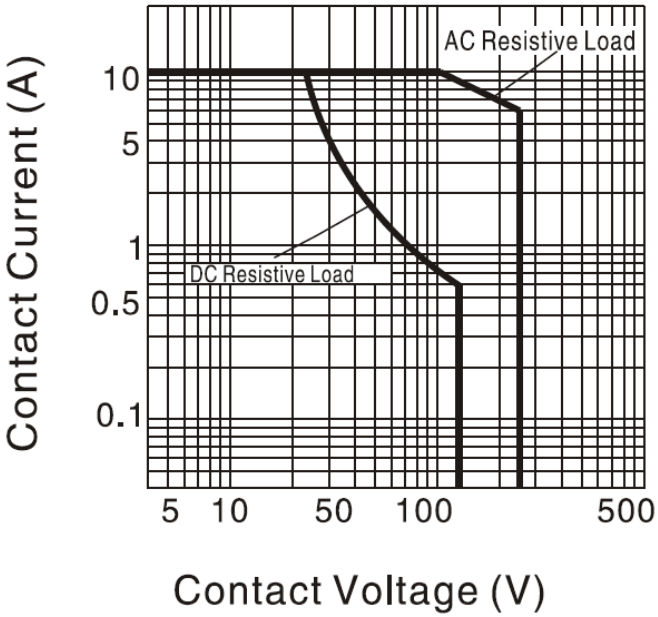
Maximum Switching Power (1 Form C)



Maximum Switching Power (2 Form C)



Maximum Switching Power (3 & 4 Form C)



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Miniature Intermediate Power Relay	KMH

Features

- 7A switching capability (2C, 3C type)
- 1.5kV dielectric strength (between coil and contacts)
- Gold plated contact available
- Socket available
- 2 to 4 pole configurations
- Dust protected type

c UL us
(File No.:E122258)

1. COIL DATA (at 23℃)

1) DC Type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Resistance (Ω)	Coil Power (mW)
5	4.00	0.50	5.50	27.5 x (1±10%)	Approx. 900 to 1100
6	4.80	0.60	6.60	40 x (1±10%)	
12	9.60	1.20	13.2	160 x (1±10%)	
24	19.2	2.40	26.4	650 x (1±10%)	
48	38.4	4.80	52.8	2600 x (1±15%)	
110	88.0	11.0	121	11000 x (1±15%)	

2) AC Type

Nominal Voltage (VAC)	Pick-up Voltage (VAC)	Drop-out Voltage (VAC)	Max Allowable Voltage (VAC)	Coil Resistance (Ω)	Coil Power (VA)
6	4.80	1.80	6.60	11.5 x (1±10%)	Approx. 1.2 to 1.8
12	9.60	3.60	13.2	46 x (1±10%)	
24	19.2	7.20	26.4	184 x (1±10%)	
48	38.4	14.4	52.8	735 x (1±10%)	
120	96.0	36.0	132	4550 x (1±15%)	
220/240	176	72.0	264	14400 x (1±15%)	

Notes:

1) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coil.

2) Maximum allowable voltage refers to the maximum voltage which relay coil could endure in a short period of time.

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2. CONTACT DATA

Contact Arrangement		2 From C, 3 Form C	4 From C
Contact Resistance		100mΩ max. (at 1A 6VDC)	
Contact Material		$AgSnO_2$	
Contact Ratings (Resistive load)		7A 250VAC / 30VDC	5A 250VAC / 30VDC
Max. Switching Voltage		250VAC / 30VDC	
Max. Switching Current		7A	5A
Max. Switching Power		210W / 1750VA	150W / 1250VA
Life Expectancy	Electrical	100,000 operations	
	Mechanical	20,000,000 operations	

3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1min
	Coil and Contacts	1500VAC 1min
	Contact Sets	1500VAC 1min
Operate Time (at nominal voltage)		DC type: 25ms max
Release Time (at nominal voltage)		DC type: 25ms max
Temperature Rise (no-load, at nominal voltage)		60K max
Temperature Range		-40℃ ~ 70℃
Shock Resistance	Functional	98 m/s^2
	Destructive	980 m/s^2
Vibration Resistance		10 ~ 55Hz 1mm DA
Humidity		5 ~ 85% RH
Termination		PCB, Plug-in
Weight		Approx. 37g
Outline dimension (L x W x H)		28.0 x 21.5 x 35.0 mm

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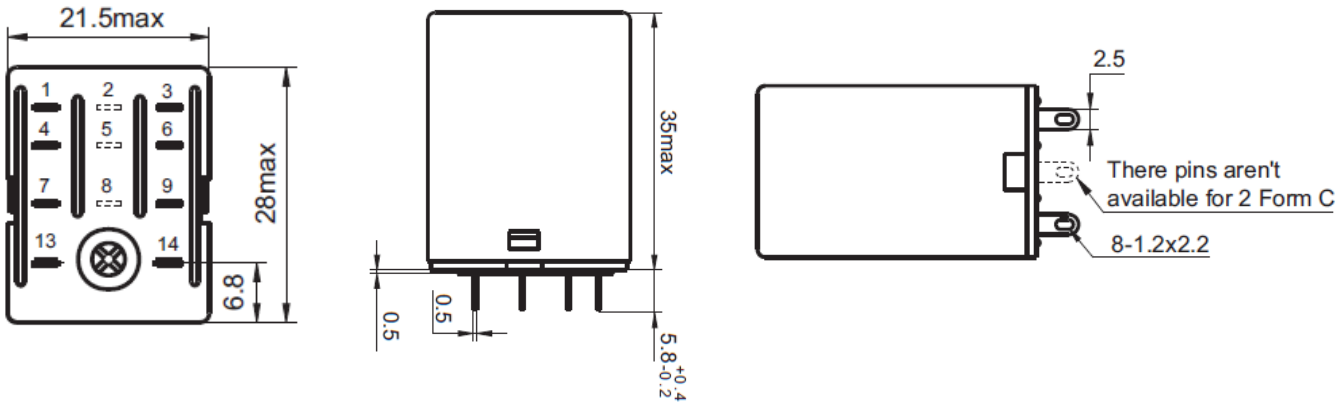
4. ORDERING INFORMATION

KMH 2 - D24 S ① ② ③ ④	
① Relay Model	KMH
② Contact Arrangement	2: 2 Form C (DPDT) 3: 3 Form C (3PDT) 4: 4 From C (4PDT)
③ Coil Voltage	DC: D5=5VDC, D6=6VDC, D12=12VDC, D24=24VDC, D48=48VDC, D110=110VDC AC: A6=6VAC, A12=12VAC, A24=24VAC, A48=48VAC, A120=120VAC, A220/240=220/240VAC
④ Terminal Form	P: PC board S: Plug-in B: Top mounting SL: Light emitting diode with plug-in PL: Light emitting diode with PC board

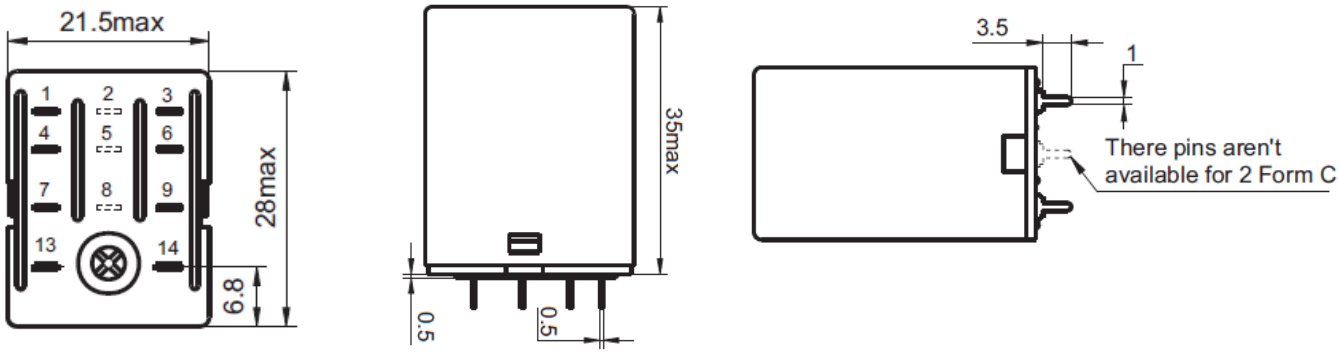
5. DIMENSIONS (Unit: mm)

Outline Dimensions

2 Form C, 3 Form C, Plug-in



2 Form C, 3 Form C, PC board



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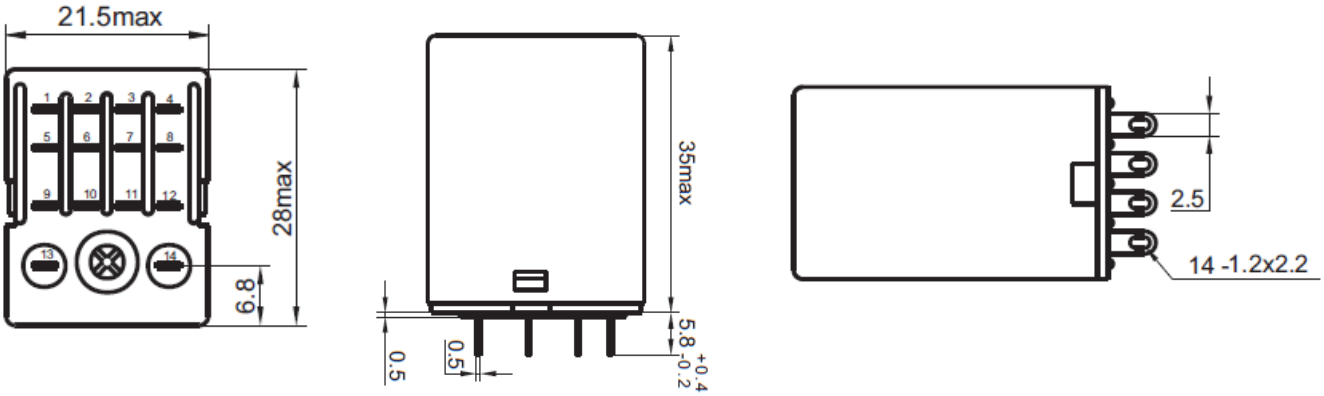
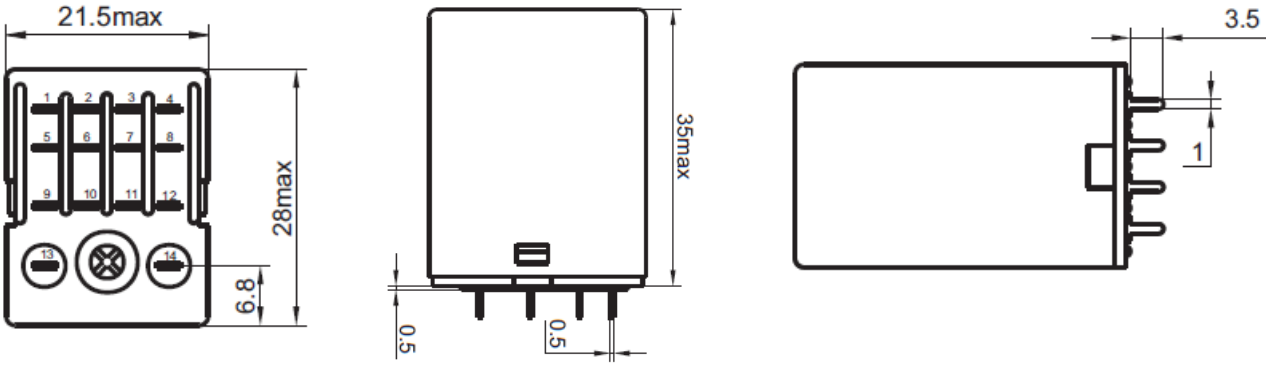
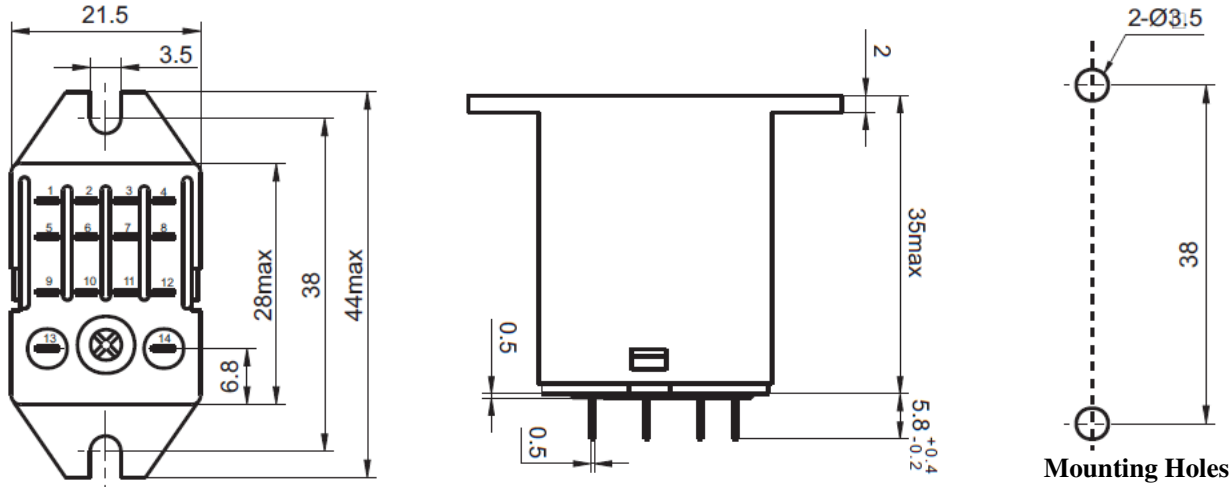
4 Form C, Plug-in



4 Form C, PC board



4 Form C, Top mounting



Mounting Holes

Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

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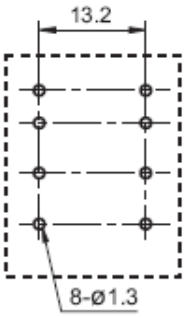
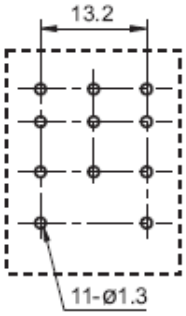
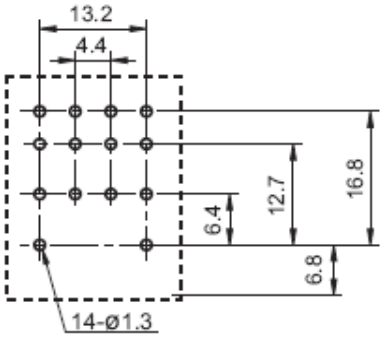
PCB Layout (Bottom view)



2 Form C

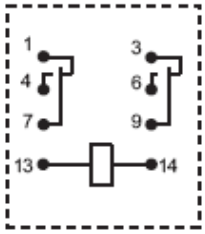


3 Form C

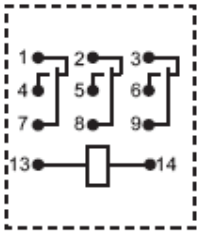


4 Form C

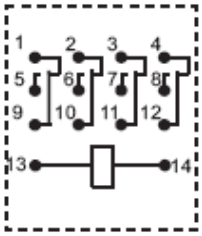
Wiring Diagram (Bottom View)



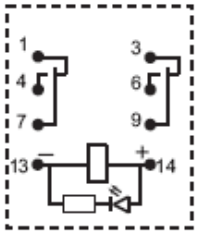
2 Form C



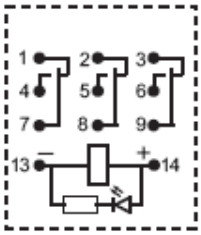
3 Form C



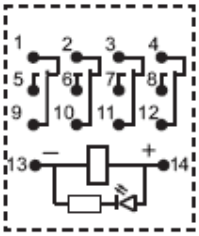
4 Form C



2 Form C (With LED)

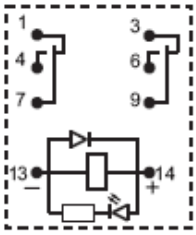


3 Form C (with LED)

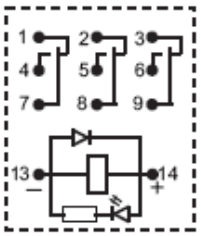


4 Form C (with LED)

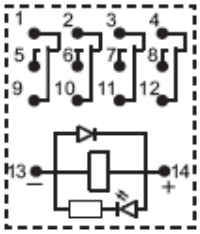
Remark: For AC parts with diode, the positive and negative pole marking on wiring diagram are not applicable



2 Form C
(DC, With fly-wheel diode)



3 Form C
(DC, With fly-wheel diode)



4 Form C
(DC, With fly-wheel diode)

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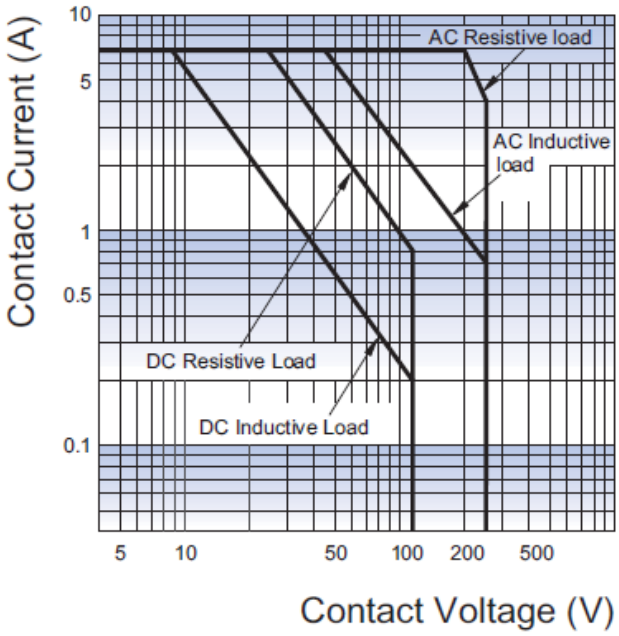
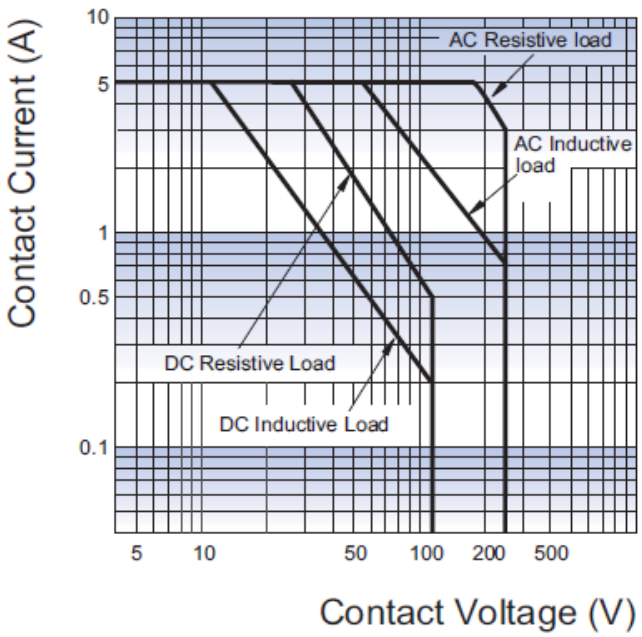
6. CHARACTERISTIC CURVES

Maximum Switching Power (2, 3 Form C)



Maximum Switching Power (4 Form C)



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Industrial Relay	KMK

Features

- 10A switching capability
- Long endurance
- Industry standard 8 or 11 round terminals
- Socket available
- Push button type available

c UL us
(File No.:E134581)

1. COIL DATA (at 23℃)

1) DC Type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Resistance (Ω)	Coil Power (mW)
6	4.80	0.60	7.20	23.5 x (1±10%)	Approx. 1500
12	9.60	1.20	14.4	95 x (1±10%)	
24	19.2	2.40	28.8	430 x (1±10%)	
48	38.4	4.80	57.6	1630 x (1±10%)	
60	48.0	6.00	72.0	1920 x (1±10%)	
100	80.0	10.0	120	6800 x (1±10%)	
110	88.0	11.0	132	7300 x (1±10%)	

2) AC Type

Nominal Voltage (VAC)	Pick-up Voltage (VAC)	Drop-out Voltage (VAC)	Max Allowable Voltage (VAC)	Coil Resistance (Ω)	Coil Power (VA)
6	4.80	1.80	7.20	3.9 x (1±10%)	Approx. 2.7
12	9.60	3.60	14.4	16.9 x (1±10%)	
24	19.2	7.20	28.8	70 x (1±10%)	
48	38.4	14.4	57.6	315 x (1±10%)	
110/120	88.0	36.0	132	1600 x (1±10%)	
220/230	176	69.0	253	6800 x (1±10%)	

Notes:

1) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coil.

2) Max allowable voltage refers to the maximum voltage which relay coil could endure in a short period of time.

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2. CONTACT DATA

Contact Arrangement		2 Form C	3 Form C
Contact Resistance		100mΩ max. (at 1A 24VDC)	
Contact Material		$AgSnO_2$	
Contact Ratings (Resistive load)		10A 250VAC / 30VDC	NO: 10A 250VAC / 30VDC NC: 5A 250VAC / 30VDC
Max. Switching Voltage		250VAC / 30VDC	
Max. Switching Current		10A	
Max. Switching Power		2500VA / 300W	
Life Expectancy	Electrical	100,000 operations	
	Mechanical	10,000,000 operations	

3. CHARACTERISTICS

		Without Push Button	With Push Button
Insulation Resistance		500MΩ (at 500VDC)	
Dielectric Strength	Open Contacts	1000VAC 1min	2000VAC
	Coil and Contacts	1500VAC 1min	2500VAC
Operate Time (at nominal voltage)		30ms max.	
Release Time (at nominal voltage)		30ms max.	
Temperature Rise (at nominal voltage)		100K max.	
Temperature Range		-40℃ ~ 55℃	
Shock Resistance	Functional	98 m/s^2	
	Destructive	980 m/s^2	
Vibration Resistance		10 ~ 55Hz 1.5mm DA	
Humidity		5 ~ 85% RH	
Termination		Octal and Undecal Type Plug	
Weight		Approx. 90g	
Outline Dimension (L x W x H)		35.0 x 35.0 x 55.0 mm	35.5 x 35.5 x 55.3

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4. ORDERING INFORMATION

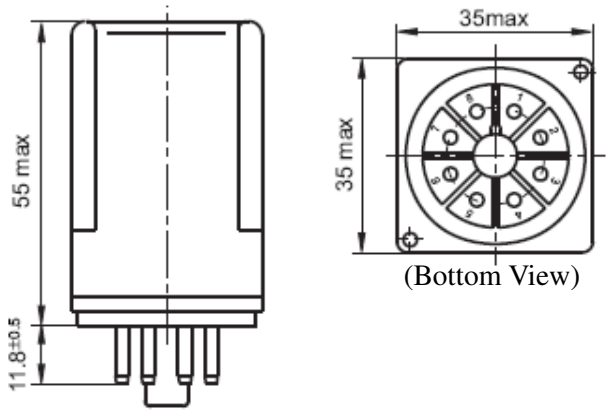
KMK ①	2 ②	-	D24 ③	L ④	P ⑤	G ⑥

① Relay Model	KMK
② Contact Arrangement	2 : 2 Form C (DPDT) 3 : 3 Form C (3PDT) 3F : 3 Form C (3PDT) – Different Wiring Diagram
③ Coil Voltage	DC: D6=6VDC, D12=12VDC, D24=24VDC, D48=48VDC, D60=60VDC, D100=100VDC, D110=110VDC AC: A6=6VAC, A12=12VAC, A24=24VAC, A48=48VAC, A110/120=110/120VAC, A220/230=220/230VAC
④ LED	Nil: Without LED L: With LED
⑤ Push Button	Nil: Without Push Button P: With Push Button
⑥ Contact Plating	Nil: No gold plated G: Gold plated

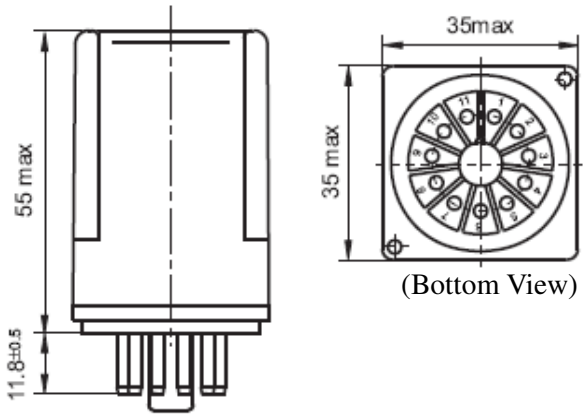
5. DIMENSIONS (Unit: mm)

Outline Dimensions

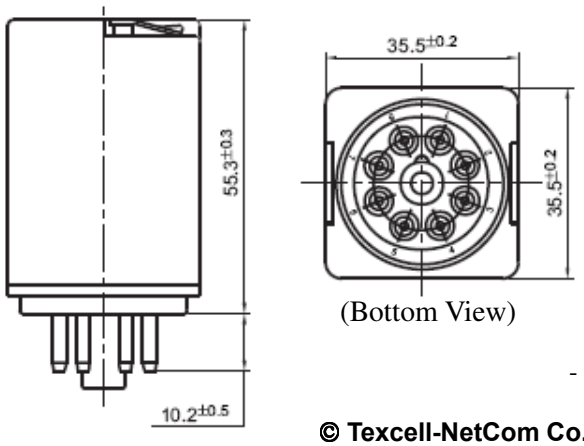
2 Form C (Without Push Button)



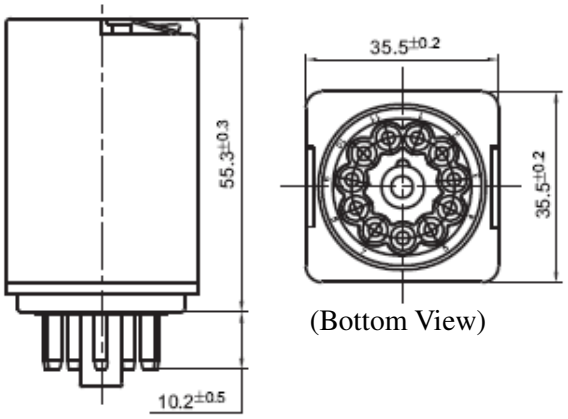
3 Form C (Without Push Button)



2 Form C (With Push Button)



3 Form C (With Push Button)



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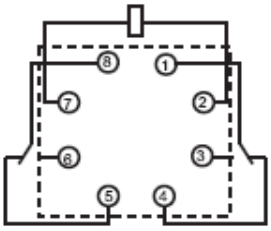
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

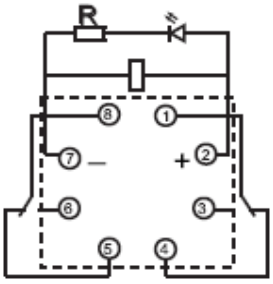
2) The tolerance without indicating for PCB layout is always ±0.1mm.

Wiring Diagram (Bottom View)

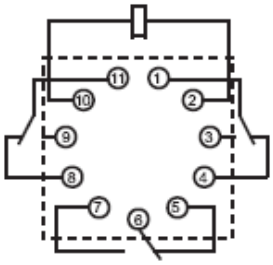
2 Form C



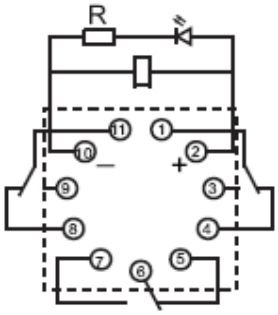
2 Form C (With LED)



3 Form C

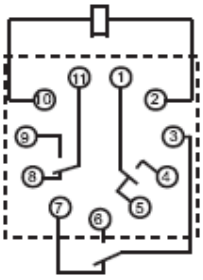


3 Form C (With LED)



3 Form C

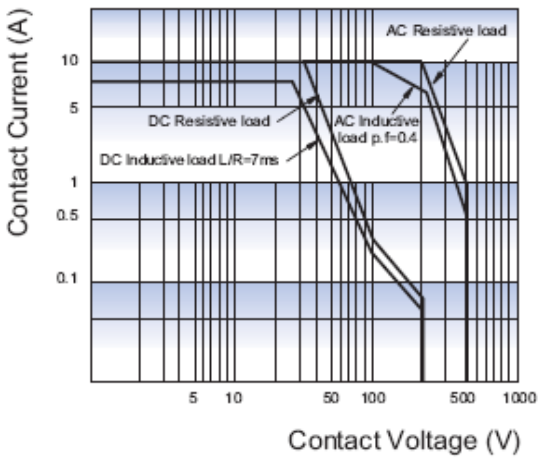
(Different Wiring Diagram)



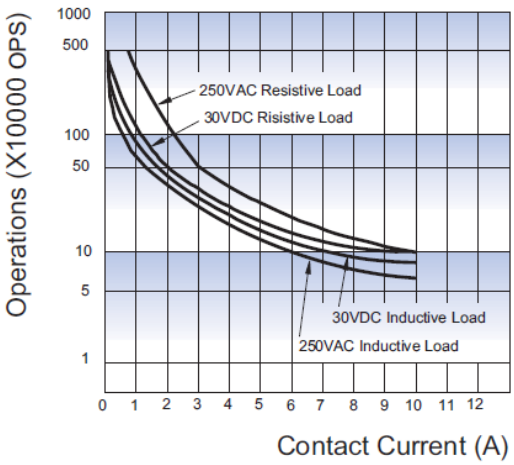
Remark: For AC parts with diode, the positive and negative pole markings on wiring diagram are not applicable

6. CHARACTERISTIC CURVES

Maximum Switching Power



Endurance Curves



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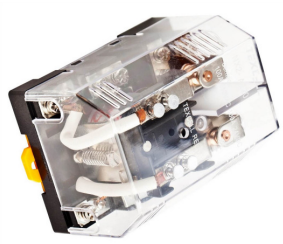
Industrial Relay	NX

Features

- 100A switching capability
- Low coil power consumption
- Plastic cover available
- 1 and 2poles contact arrangement



1. COIL DATA (at 23℃)

1) DC Type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
6	4.50	0.60	6.60	500	18 x (1±10%)	≤3000
9	6.75	0.90	9.90	333	40.5 x (1±10%)	
12	9.00	1.20	13.2	250	72 x (1±10%)	
24	18.0	2.40	26.4	125	288 x (1±10%)	
48	36.0	4.80	52.8	62.5	1152 x (1±10%)	
110	82.5	11.0	121	27.3	6050 x (1±10%)	
220	165	22.0	242	13.6	16176 x (1±10%)	

2) AC Type

Nominal Voltage (VAC)	Pick-up Voltage (VAC)	Drop-out Voltage (VAC)	Max Allowable Voltage (VAC)	Coil Resistance (Ω)	Coil Power (VA)
6	4.80	1.80	6.60	0.8 x (1±10%)	≤10
9	7.20	2.70	9.90	1.8 x (1±10%)	
12	9.60	3.60	13.2	3 x (1±10%)	
24	19.2	7.20	26.4	11.5 x (1±10%)	
48	38.4	14.4	52.8	46 x (1±10%)	
110	88.0	33.0	121	422 x (1±10%)	
220	176	66.0	242	968 x (1±10%)	
380	304	114	418	2888 x (1±10%)	

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2. CONTACT DATA

Contact Arrangement		1 Form C, 2 Form A, 2 Form C
Contact Resistance		100mΩ max. (at 1A 6VDC)
Contact Material		AgCdO
Contact Ratings (Resistive load)		100A 250VAC / 28VDC
Max. Switching Voltage		250VAC / 28VDC
Max. Switching Current		100A
Max. Switching Power		25000VA / 2800W
Life Expectancy	Electrical	100,000 operations (at 30 operations/minute)
	Mechanical	1,000,000 operations (at 300 operations/minute)

3. CHARACTERISTICS

Contact Arrangement		1 Form C	2 Form A	2 Form C
Insulation Resistance		1000MΩ (at 500VDC)		
Dielectric Strength	Open Contacts	1500VAC 50Hz/1min Leakage current 1mA		
	Coil and Contacts	2500VAC 50Hz/1min Leakage current 1mA		
	Contacts pieces	2500VAC 50Hz/1min Leakage current 1mA		
Operate Time (at nominal voltage)		30ms max.		
Release Time (at nominal voltage)		30ms max.		
Temperature Range		-25℃ ~ 55℃		
Termination		Screw Mounting		
Weight		Approx. 240g	Approx. 245g	Approx. 300g
Outline Dimension (L x W x H)		74.0 x 64.0 x 56.8 mm	74.0 x 64.0 x 54.5 mm	92.7 x 64.0 x 54.5 mm

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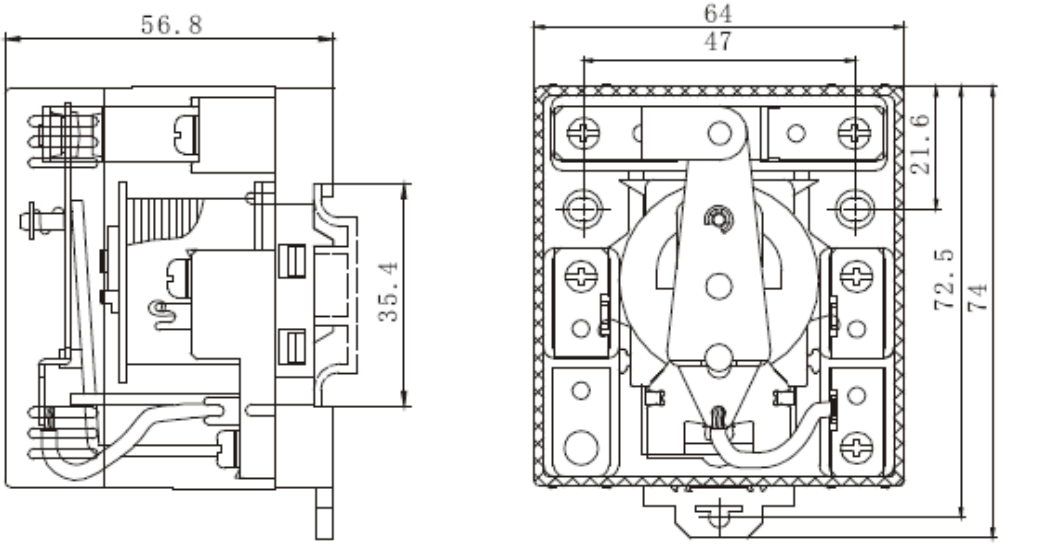
4. ORDERING INFORMATION

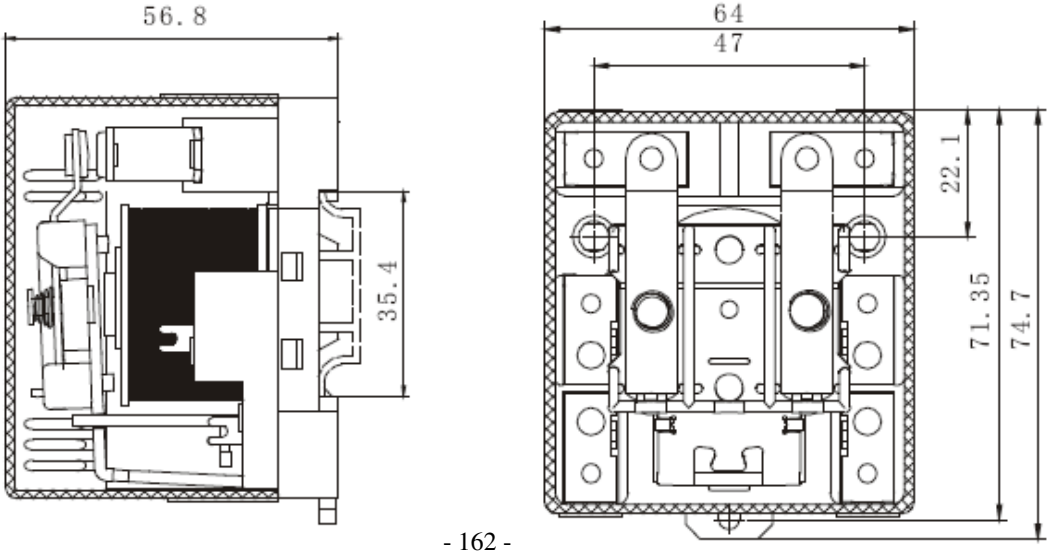
NX 2 - A220 ① ② ③	
① Relay Model	NX
② Contact Arrangement	1: 1 Form C (SPDT) 22: 2 Form A (DPST-NO) 2: 2 Form C (DPDT)
③ Coil Voltage	DC: D6=6VDC, D9=9VDC, D12=12VDC, D24=24VDC, D48=48VDC, D110=110VDC, D220=220VDC AC: A6=6VAC, A9=9VAC, A12=12VAC, A24=24VAC, A48=48VAC, A110=110VAC, A220=220VAC, A380=380VAC

5. INSTALLATION DIMENSIONS (Unit: mm)

1 Form C



2 Form A



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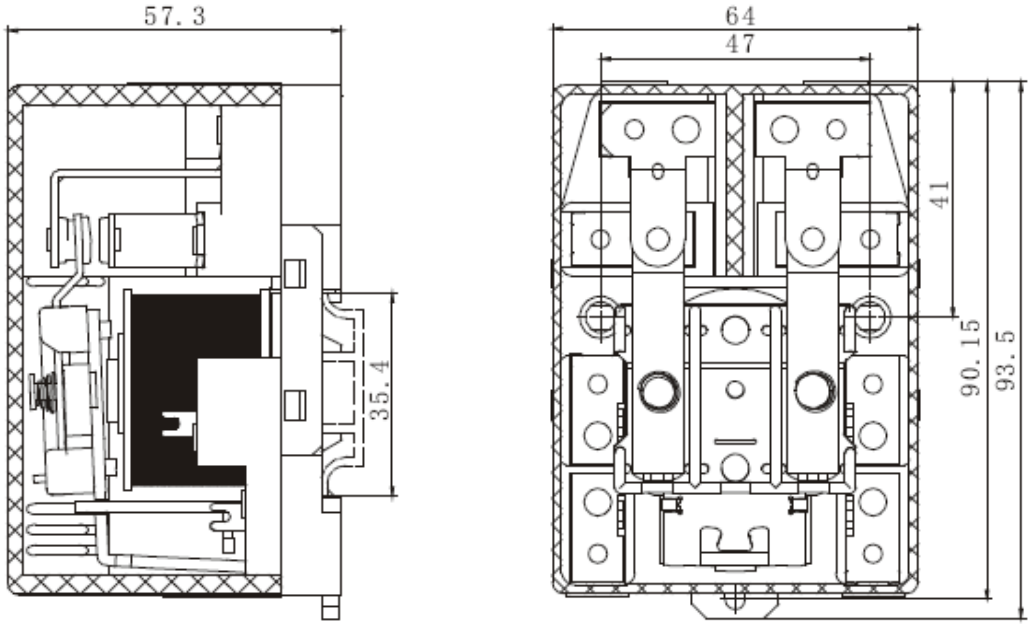
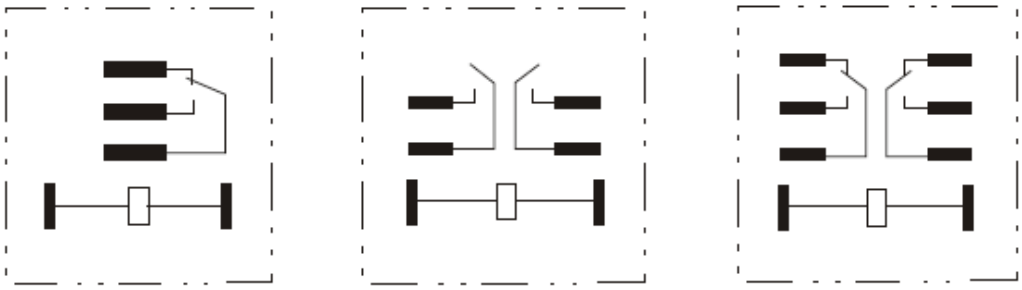
2 Form C



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm

Connecting Diagram



1 Form C　　2 Form A　　2 Form C

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Automotive Relay	KA

Features

- Compact size
- 20A switching capability
- Small size auto relay

c UL us
(File No.:E122258)

1. COIL DATA (at 20℃)

1) Coil Power "L" Type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
6	3.90	0.48	7.80	100	60 x (1±10%)	600
9	5.85	0.72	11.7	66.7	135 x (1±10%)	
12	7.80	0.96	15.6	50.0	240 x (1±10%)	
24	15.6	1.92	31.2	25.0	960 x (1±10%)	

2) Coil Power "D" Type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
6	3.90	0.48	7.80	133.3	45 x (1±10%)	800
9	5.85	0.72	11.7	88.9	100 x (1±10%)	
12	7.80	0.96	15.6	66.7	180 x (1±10%)	
24	15.6	1.92	31.2	33.3	720 x (1±10%)	

2. CONTACT DATA

Contact Arrangement		1 Form A, 1 Form C
Contact Resistance		100mΩ max. (at 1A 6VDC)
Contact Material		$AgSnO_2$
Load		Resistive load (COSΦ=1)
Contact Ratings		NO: 20A 14VDC NC: 12A 14VDC, 1C: 7A 120VAC
Minimum Load		100mA 5VDC
Max. Switching Voltage		250VAC / 16VDC
Max. Switching Current		25A
Max. Switching Power		840VA / 280W
Life Expectancy	Electrical	100,000 operations (at 30 operations/minute)
	Mechanical	10,000,000 operations (at 300 operations/minute)

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3. CHARACTERISTICS

Insulation Resistance		100MΩ Min. (at 500VDC)
Dielectric Strength	Open Contacts	500VAC 1min
	Coil and Contacts	500VAC 1min
Operate Time		10ms
Release Time		5ms
Temperature Range		-40℃ ~ 85℃
Shock Resistance	Operating Extremes	10G
	Damage Limits	100G
Vibration Resistance		10 ~ 55Hz, 1.5mm
Max. switching frequency	Mechanical	18,000 operations/hr
	Electrical	1,800 operations/hr
Humidity		35 ~ 85%
Termination		PCB
Weight		Approx. 6g
Outline Dimension (L x W x H)		15.7 x 12.3 x 14.0 mm

4. ORDERING INFORMATION

KA ①	1 ②	-	L ③	12 ④	S ⑤

① Relay Model	KA
② Contact Arrangement	11: 1 Form A (SPST-NO) 1: 1 Form C (SPDT)
③ Coil Power	L: 600mW D: 800mW
④ Coil Voltage	6=6VDC, 9=9VDC, 12=12VDC, 24=24VDC
⑤ Construction	S: Sealed Type

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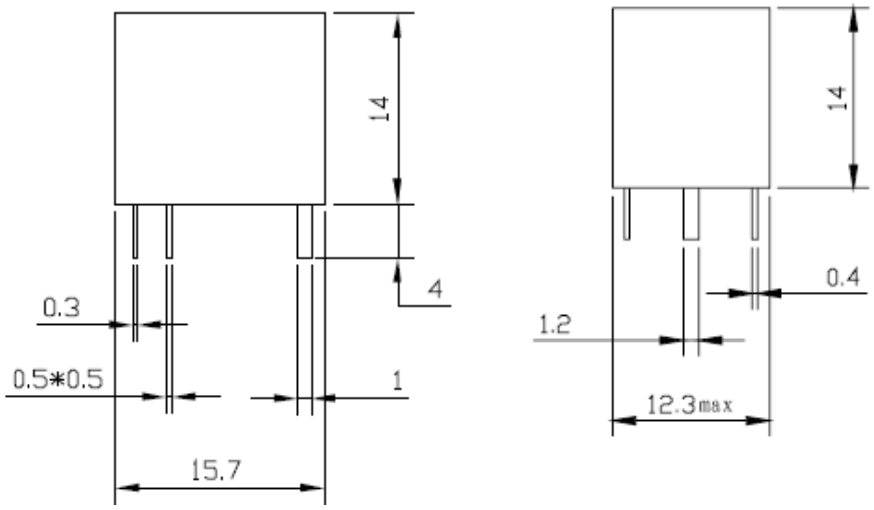
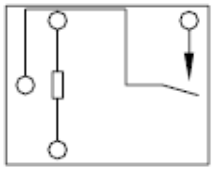
5. DIMENSIONS (Unit: mm)

Outline Dimensions

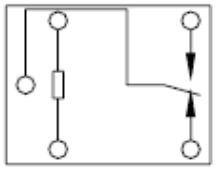


Wiring Diagram (Bottom View)

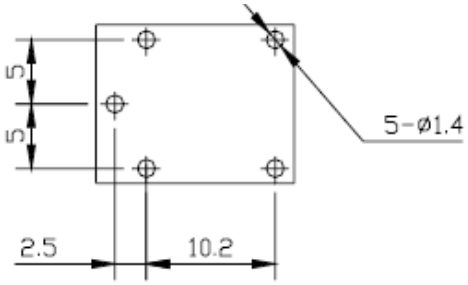
1 Form A



1 Form C



PCB Layout (Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm

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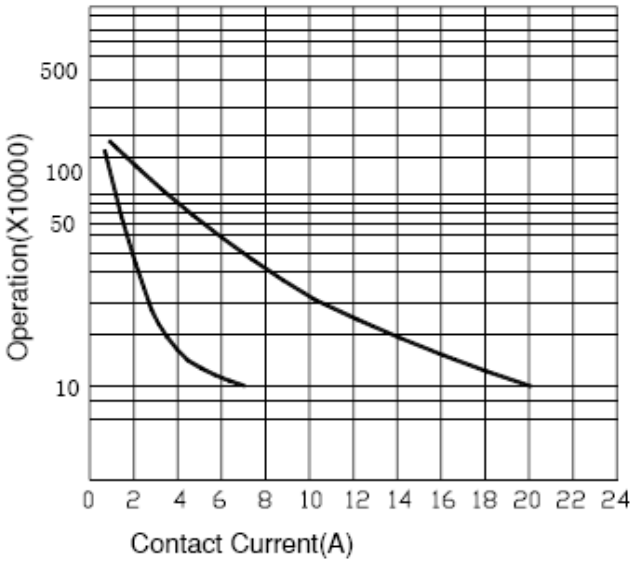
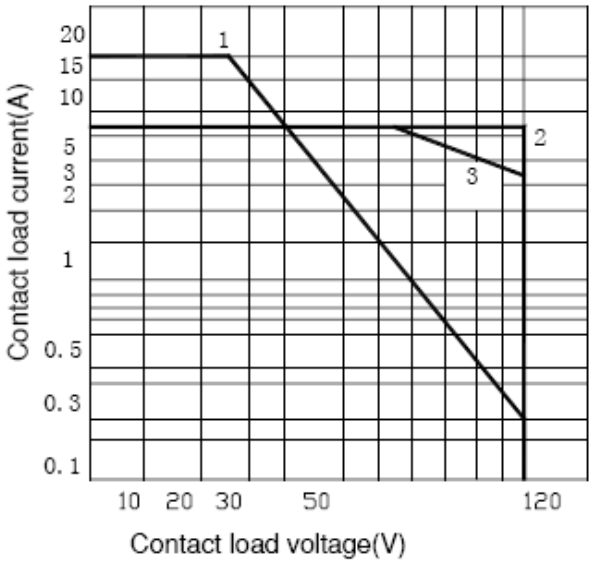
6. CHARACTERISTIC CURVES

Service Life

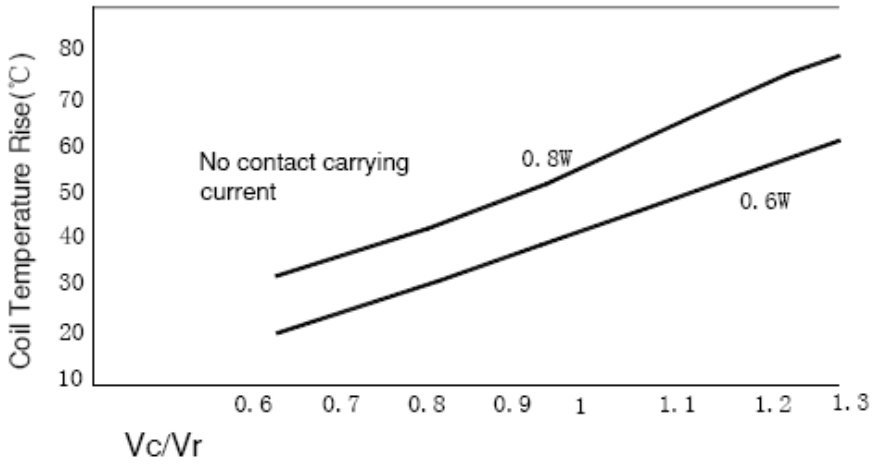


Current



1. DC resistive 2. AC resistive 3. AC inductive

Temperature



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Automotive Relay	HY

Features

- 40A continuous rating 85℃
- Various configurations (1A, 1B, 1C, 1U)
- Plug-in or PC board terminals
- Optional mounting bracket

1. COIL DATA (at 20℃)

1) Coil Power "L" type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
6	3.90	0.6	7.80	267	23 x (1±10%)	1600
12	7.80	1.2	15.6	133	90 x (1±10%)	
24	15.6	2.4	31.2	67	360 x (1±10%)	

2) Coil Power "D" type

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
6	3.90	0.6	7.80	317	19 x (1±10%)	1900
12	7.80	1.2	15.6	158	76 x (1±10%)	
24	15.6	2.4	31.2	79	300 x (1±10%)	

2. CONTACT DATA

Contact Arrangement		1 Form A, 1 Form B, 1 Form C, 1 Form U
Contact Resistance		100mΩ max. (at 1A 6VDC)
Contact Material		$AgSnO_2$
Load		Resistive load (COSΦ=1)
Contact Ratings		NO: 40A 14VDC NC: 30A 14VDC 1U(NO): 2x20A 14VDC
Max. Switching Voltage		30VDC
Max. Switching Current		40A
Max. Switching Power		560W
Life Expectancy	Electrical	100,000 operations (at 30 operations/minute)
	Mechanical	10,000,000 operations (at 300 operations/minute)

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3. CHARACTERISTICS

Insulation Resistance		100MΩ Min. (at 500VDC)
Dielectric Strength	Open Contacts	500VAC 1min
	Coil and Contacts	750VAC 1min
Operate Time		10ms
Release Time		10ms
Temperature Range		-40℃ ~ 85℃
Shock Resistance	Operating Extremes	10G
	Damage Limits	20G
Vibration Resistance		10 ~ 40Hz, 1.5mm
Max. switching frequency	Mechanical	18,000 operations/hr
	Electrical	1,800 operations/hr
Humidity		40 ~ 85%
Termination		PCB, Plug-in
Weight		Approx. 40g
Outline Dimension (L x W x H)		28.0 x 28.0 x 25.0 mm

4. ORDERING INFORMATION

HY ①	1 ②	-	L ③	12 ④	R1 ⑤	P ⑥	B ⑦

① Relay Model	HY
② Contact Arrangement	11: 1 Form A (SPST-NO) 1B: 1 Form B (SPST-NC) 1: 1 Form C (SPDT) 1U: 1 Form U
③ Coil Power	L : 1600mW D: 1900mW
④ Coil Voltage	6=6VDC, 12=12VDC, 24=24VDC
⑤ Division	Nil: Standard R1: Coil parallel with 1/2W resistor 680Ω for coil voltage 12VDC Coil parallel with 1/2W resistor 2700Ω for coil voltage 24VDC D1/D2: With diode
⑥ Construction	Nil: Plug-in type P: PCB type
⑦ Bracket	Nil: Without Bracket B: With Bracket

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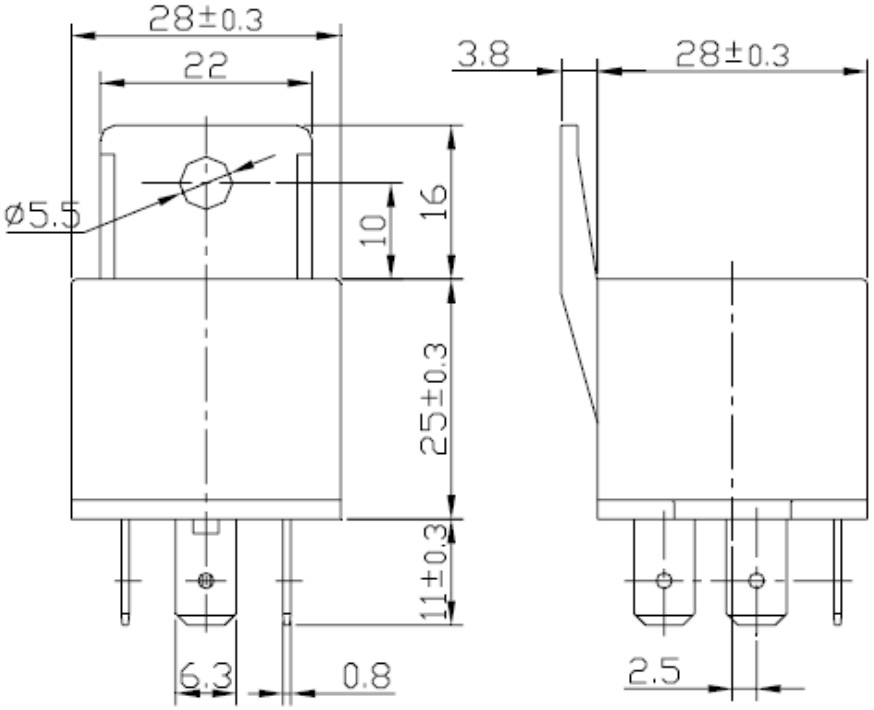
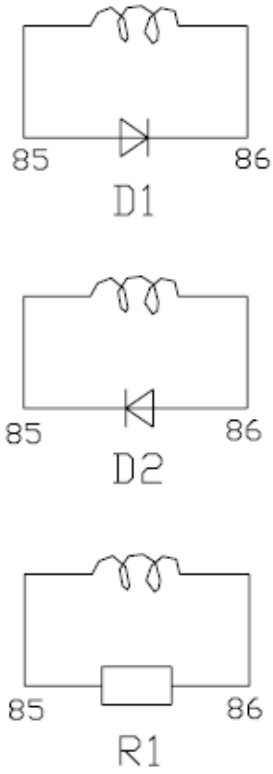
5. DIMENSIONS (Unit: mm)

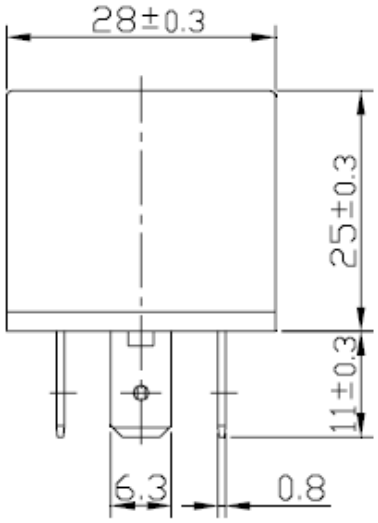
Outline Dimensions

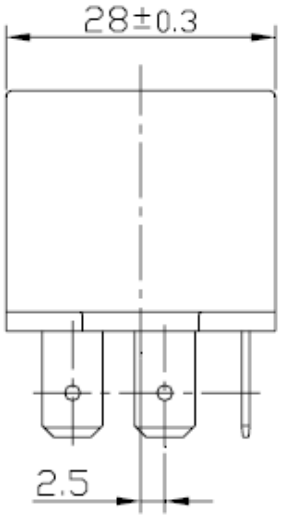
1) Plug-in with bracket

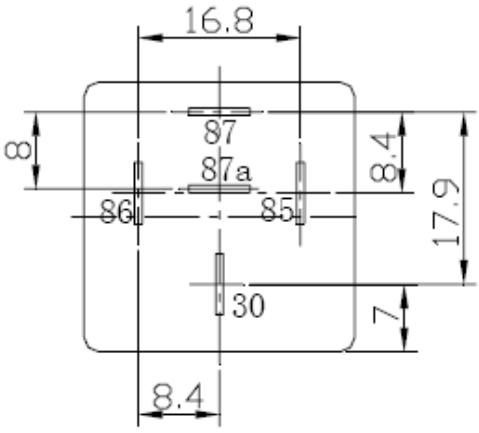




2) Plug-in without bracket







Plug-in Layout (Bottom view)

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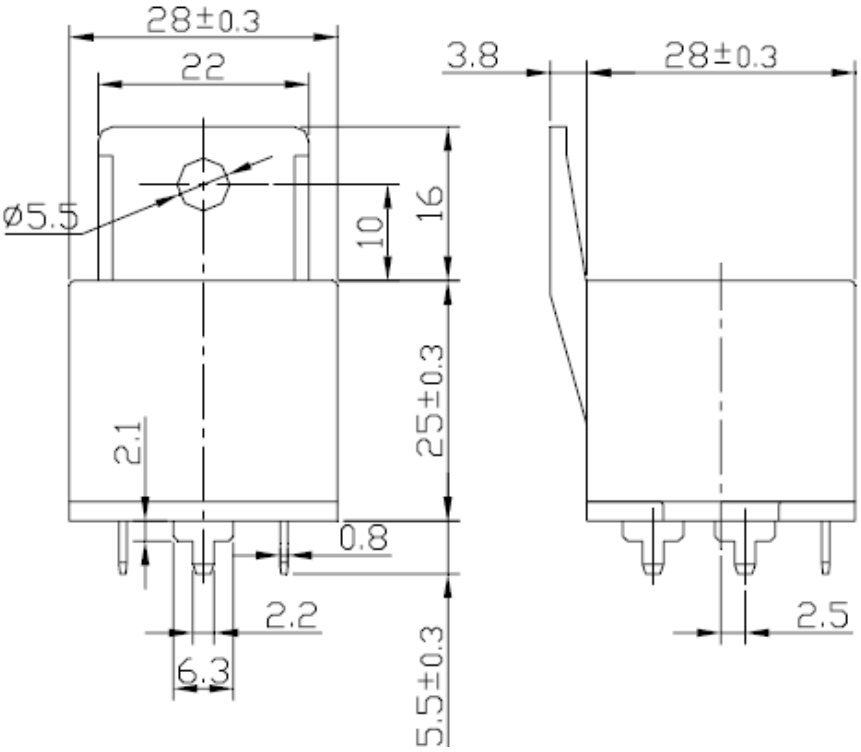
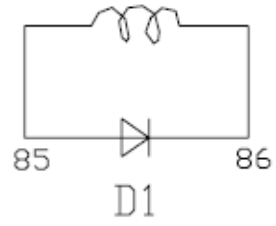
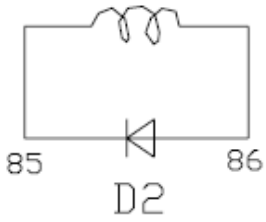
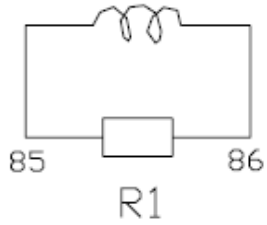
3) PCB with bracket

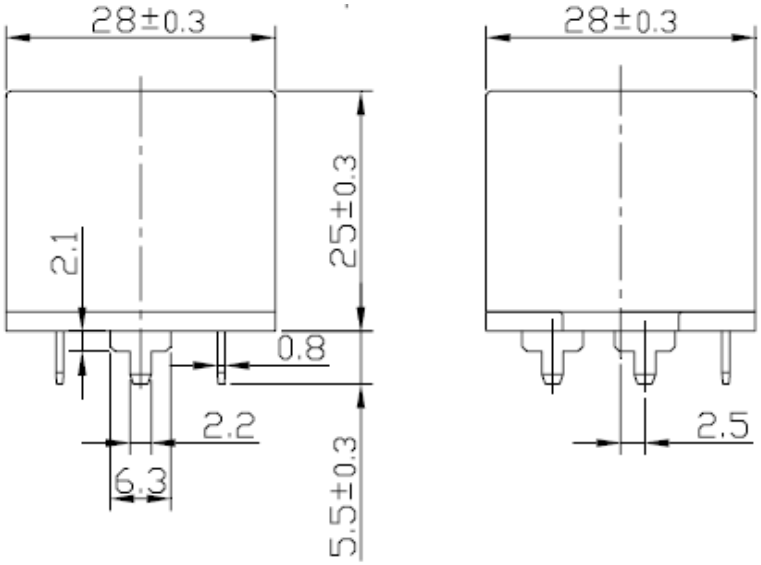


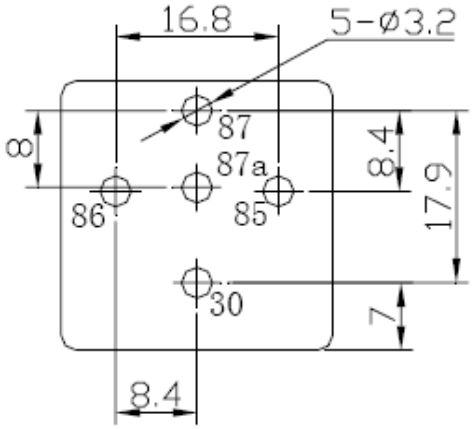






4) PCB without bracket





PCB Layout (Bottom view)

Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

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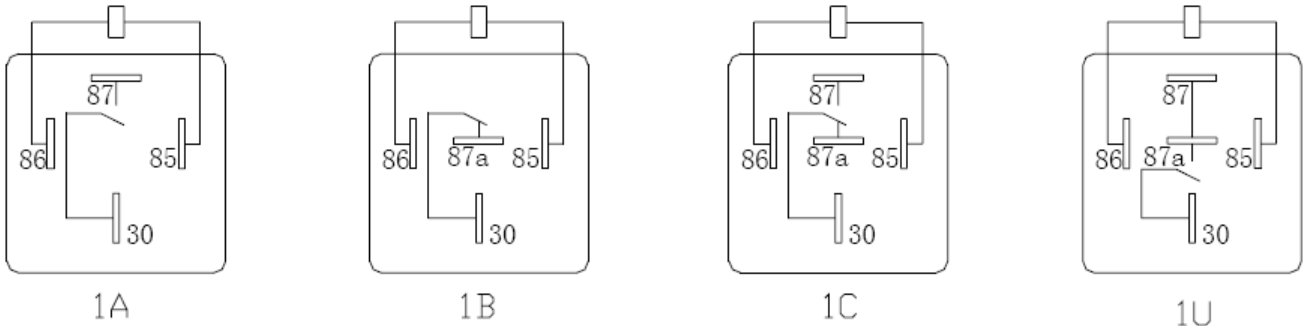
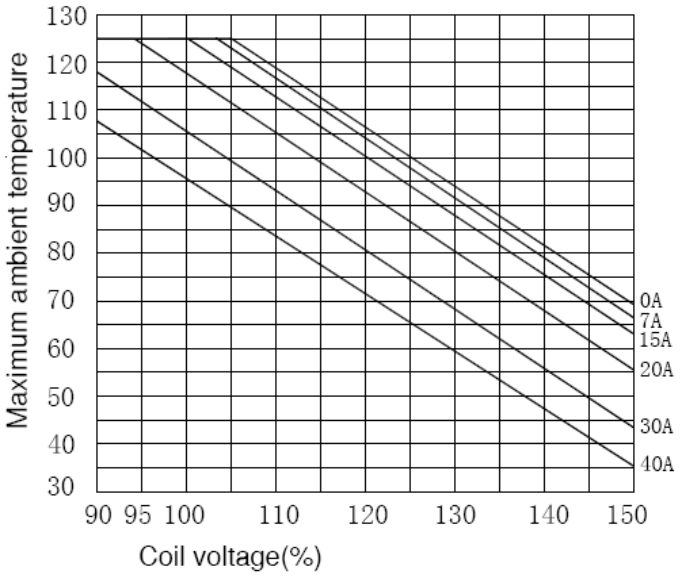
Wiring Diagram (Bottom View)

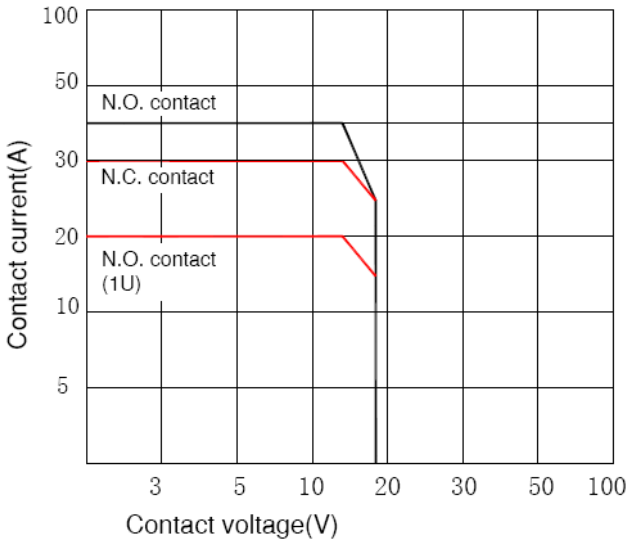


6. CHARACTERISTIC CURVES

Ambient Temperature



Contact Switching Capacity



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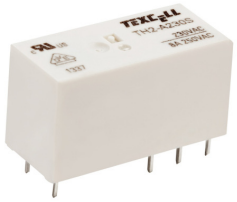
Miniature High Power Latching Relay	THL

Features

- Latching relay
- Low height: 15.7mm
- 20A switching capability (1 pole)
  8A switching capability (2 pole)
- 5kV dielectric strength
  (between coil and contacts)
- Creepage distance: 11mm-NO/10mm-CO version
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F
- Plastic sealed Type



c UL us
(File No.:E134581)

1. COIL DATA (at 23℃)

1) 1 coil latching

Nominal Voltage (VDC)	Set Voltage (VDC) max.	Pulse Width (ms)		Reset Voltage (VDC) max.	Max.Voltage (VDC)	Coil Resistance (Ω)	Coil Power (mW)
		Typical	Min.				
5	3.50	≥50	30	3.50	6.00	62 x (1±10%)	Approx. 400
6	4.20	≥50	30	4.20	7.20	90 x (1±10%)	
9	6.30	≥50	30	6.30	10.8	202 x (1±10%)	
12	8.40	≥50	30	8.40	14.4	360 x (1±10%)	
24	16.8	≥50	30	16.8	28.8	1440 x (1±10%)	

2) 2 coils latching

Nominal Voltage (VDC)	Set Voltage (VDC) max.	Pulse Width (ms) min.		Reset Voltage (VDC) max.	Max.Voltage (VDC)	Coil Resistance (Ω)	Coil Power (mW)
		Typical	Min.				
5	3.50	≥50	30	3.50	7.50	42 x (1±10%)	Approx. 600
6	4.20	≥50	30	4.20	9.00	55 x (1±10%)	
9	6.30	≥50	30	6.30	13.5	135 x (1±10%)	
12	8.40	≥50	30	8.40	18.0	240 x (1±10%)	
24	16.8	≥50	30	16.8	36.0	886 x (1±10%)	

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2. CONTACT DATA

Contact Arrangement		1A, 1C	2A, 2C
Contact Resistance		100mΩ max. (at 1A 6VDC)	
Contact Material		$AgSnO_2$	
Contact Ratings (Resistive load)		16A 250VAC	8A 250VAC
Typical applicable load		Incandescent lamp: 1500W 277VAC Standard ballast: 8A 277VAC Electronic ballast: 5A 120VAC	Tungsten lamp: 3A 277VAC Standard ballast: 3A 277VAC
Max. Switching Voltage		440VAC / 300VDC	
Max. Switching Current		20A	8A
Max. Switching Power		4000VA	2000VA
Life Expectancy	Electrical	50,000 operations	2A: 50,000 operations 2C: 10,000 operations
	Mechanical	2,000,000 operations	

3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1000VAC 1min
	Coil and Contacts	5000VAC 1min
	Contact Sets	2500VAC 1min
Surge voltage (between coil and contacts)		10kV (1.2 / 50μs)
Set Time (at nominal voltage)		10ms max.
Reset Time (at nominal voltage)		10ms max.
Temperature Range		-40℃ ~ 85℃
Shock Resistance*	Functional	98 m/s^2
	Destructive	980 m/s^2
Vibration Resistance*		10 ~ 150Hz 10g/5g
Humidity		5 ~ 85% RH
Termination		PCB
Weight		Approx. 13.5g
Outline Dimension (L x W x H)		29.0 x 12.7 x 15.7 mm

Notes: 1) The data shown above are initial values.

2) *Index is not in relay length direction.

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4. SAFETY APPROVAL

UL / cUL	1 Pole	16A/20A 250VAC at 85℃ 1HP 240VAc TV-5 120VAC (1 Form A) Tungsten 360W 125VAC (1 Form A) Standard ballast 16A 120VAC Standard ballast 8A 277VAC Standard ballast 5A 347VAC/480VAC Electronic ballast 5A 120VAC TV-8 240VAC
	2 Poles	10A/8A 277VAC General use at 85℃ 1/2 HP 240VAC at 40℃ Standard ballast 3A 277VAC at 40℃ Tungsten lamp 3A 277VAC 40℃

5. ORDERING INFORMATION

THL ①	1 ②	-	E ③	12 ④	S ⑤	L1 ⑥	G ⑦

① Relay Model	THL
② Contact Arrangement	11: 1 Form A 1: 1 Form C 22: 2 Form A 2: 2 Form C
③ Contact Current	Nil: 8A (5.0mm pinning, 2pole) E: 16A (5.0mm pinning, 1pole)
④ Coil Voltage	5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 24=24VDC
⑤ Construction	S: Sealed type
⑥ Sort	L1: 1 coil latching L2: 2 coils latching
⑦ Contact plating*	Nil: No gold plated G: Gold plated

Notes: * For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.

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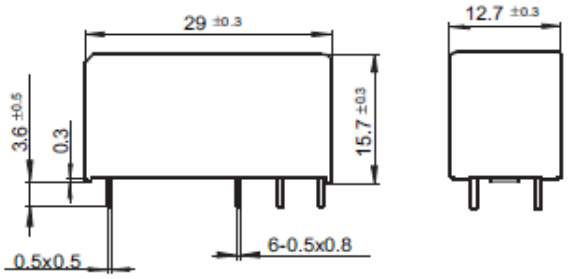
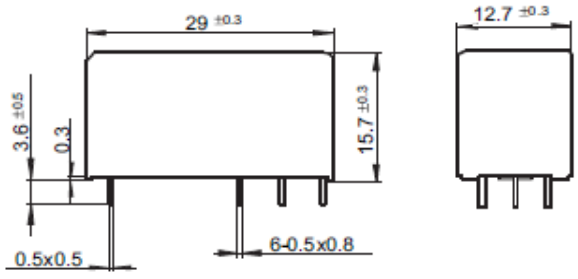
6. DIMENSIONS (Unit: mm)

Outline Dimensions

1 coil latching



2 coils latching



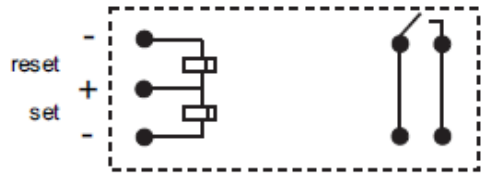
Wiring Diagram (Bottom View)

1 coil latching (Reset Status)

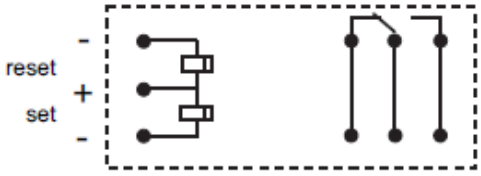
1 Form A

1 Form C

2 coils latching (Reset Status)



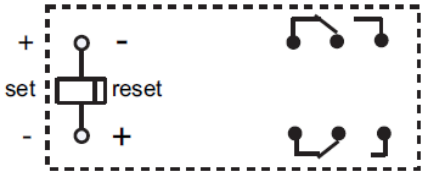
1 Form A



1 Form C

1 coil latching (Reset Status)

2 Form A



2 Form C

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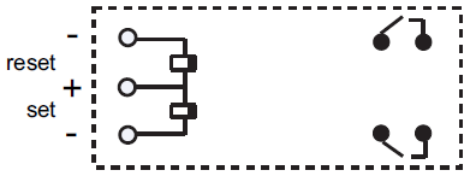
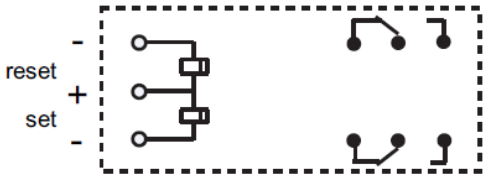
2 coils latching (Reset Status)



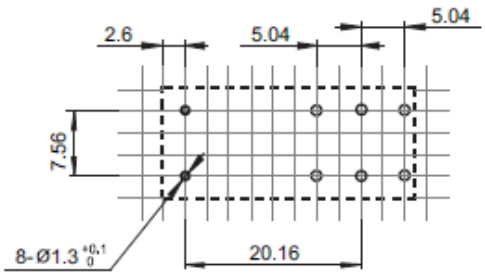
2 Form A



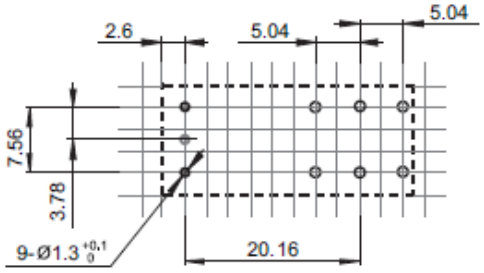
2 Form C

PCB Layout (Bottom view)

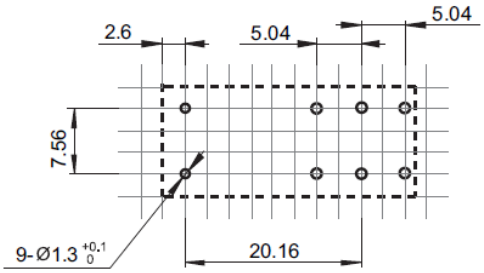
1pole, 1 coil latching



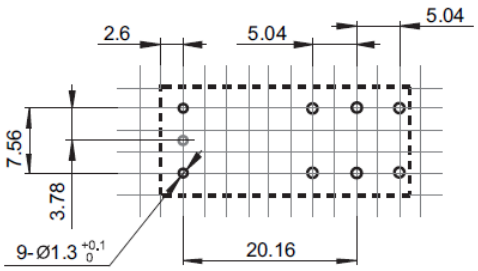
1pole, 2 coils latching



2poles, 1 coil latching



2poles, 2 coils latching



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm

Notice:

1. Relay is on the “reset” or “set” status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to “set” or “reset” status, therefore, when application (connecting the power supply), please reset the relay to “set” or “reset” status on request.
2. In order to maintain “set” or “reset” status, energized voltage to coil should reach the rated voltage, impulse width should be 5 times more than “set” or “reset” time. Do not energized voltage to “set” coil and “reset” coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

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Miniature High Power Latching Relay	THLS

Features

- Latching relay
- Special contact structure
- Incandescent lamp load: 3500W 277VAC
- 5kV dielectric strength
  (between coil and contacts)
- Creepage distance: 11mm
- Low height: 15.7mm
- Meeting reinforce insulation
- Product in accordance to EN60669-1 available
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F
- Plastic sealed Type

c UL us
(File No.:E134581)

1. COIL DATA (at 23℃)

1) 1 coil latching

Nominal Voltage (VDC)	Set Voltage (VDC) max.	Pulse Width (ms)		Reset Voltage (VDC) max.	Max.Voltage (VDC)	Coil Resistance (Ω)	Coil Power (mW)
		Typical	Min.				
5	3.50	≥50	30	3.50	6.00	62 x (1±10%)	Approx. 400
6	4.20	≥50	30	4.20	7.20	90 x (1±10%)	
9	6.30	≥50	30	6.30	10.8	202 x (1±10%)	
12	8.40	≥50	30	8.40	14.4	360 x (1±10%)	
24	16.8	≥50	30	16.8	28.8	1440 x (1±10%)	

2) 2 coils latching

Nominal Voltage (VDC)	Set Voltage (VDC) max.	Pulse Width (ms) min.		Reset Voltage (VDC) max.	Max.Voltage (VDC)	Coil Resistance (Ω)	Coil Power (mW)
		Typical	Min.				
5	3.50	≥50	30	3.50	7.50	42 x (1±10%)	Approx. 600
6	4.20	≥50	30	4.20	9.00	55 x (1±10%)	
9	6.30	≥50	30	6.30	13.5	135 x (1±10%)	
12	8.40	≥50	30	8.40	18.0	240 x (1±10%)	
24	16.8	≥50	30	16.8	36.0	886 x (1±10%)	

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2. CONTACT DATA

Contact Arrangement		1 Form A
Contact Resistance		100mΩ max. (at 1A 6VDC)
Contact Material		W + $AgSnO_2$
Contact Ratings		Resistive: 16A 250VAC Incandescent lamp: 3500W 277VAC Inrush current: 165A / 20ms Flourescent: 800A/200μs
Max. Switching Voltage		440VAC
Max. Switching Current		16A
Max. Switching Power		4000VA
Life Expectancy	Electrical	12,000 operations (3500W 277VAC, Tungsten lamp, at 40℃, 1s on 59s off) 6,000 operations (16A 250VAC, Resistive load, at 85℃, 5s on 5s off)
	Mechanical	2,000,000 operations

3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	1250VAC 1min
	Coil and Contacts	5000VAC 1min
Surge voltage (between coil and contacts)		10kV (1.2 / 50μs)
Set Time (at nominal voltage)		10ms max.
Reset Time (at nominal voltage)		10ms max.
Temperature Range		-40℃ ~ 85℃
Temperature Range (at nominal voltage)		55K max.
Shock Resistance*	Functional	98 m/s^2
	Destructive	980 m/s^2
Vibration Resistance*		10 ~ 150Hz 10g
Humidity		5 ~ 85% RH
Termination		PCB
Weight		Approx. 13.5g
Outline Dimension (L x W x H)		29.0 x 12.7 x 15.7 mm

Notes: 1) The data shown above are initial values.

2) *Index is not that of relay length direction.

3) This contact resistance value is tested under the normal voltage.

4) UL insulation system: Class F

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4. SAFETY APPROVAL

UL / cUL	16A 250VAC General use at 85℃ Standard ballast 5A 255VAC at 40℃ Electronic ballast 16A 120VAC at 40℃ Electronic ballast 16A 277VAC at 40℃ 3500W 277VAC Tungsten Lamp at 40℃

5. ORDERING INFORMATION

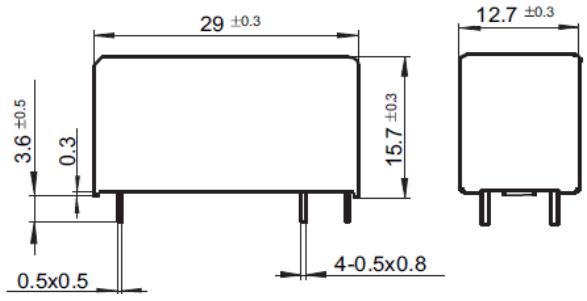
THLS ①	11 ②	-	12 ③	S ④	L1 ⑤

① Relay Model	THLS
② Contact Arrangement	11: 1 Form A
③ Coil Voltage	5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 24=24VDC
④ Construction	S: Sealed type
⑤ Sort	L1: 1 coil latching L2: 2 coils latching

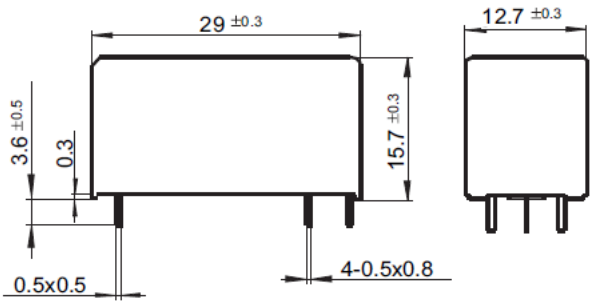
6. DIMENSIONS (Unit: mm)

Outline Dimensions

1 coil latching

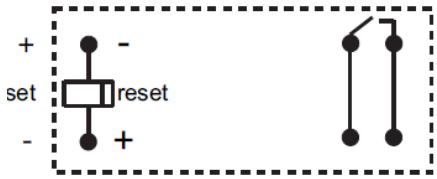


2 coils latching

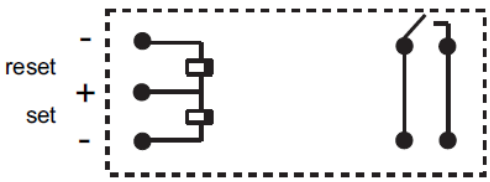


Wiring Diagram (Bottom View)

1 coil latching (Reset Status)



2 coils latching (Reset Status)



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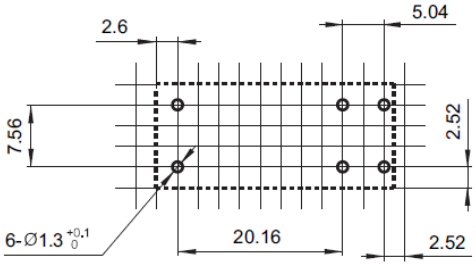
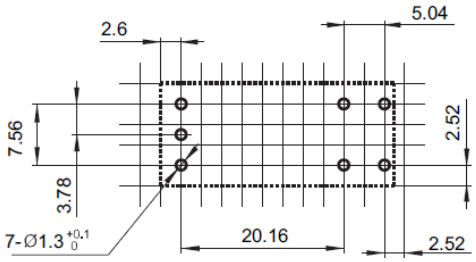
PCB Layout (Bottom view)

1 coil latching



2 coils latching



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm

Notice:

1. Relay is on the “reset” or “set” status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to “set” or “reset” status, therefore, when application (connecting the power supply), please reset the relay to “set” or “reset” status on request.
2. In order to maintain “set” or “reset” status, energized voltage to coil should reach the rated voltage, impulse width should be 5 times more than “set” or “reset” time. Do not energized voltage to “set” coil and “reset” coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

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Miniature High Power Latching Relay	AL

Features

- Latching relay
- 4mm contact gap available
- 25A switching capability
- 5kV dielectric strength (between coil and contacts)
- Creepage distance between coil and contacts: 10mm
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F
- 1A + 1B configuration for power switching
- Flux proofed Type

c UL us
(File No.:E122258)

1. COIL DATA (at 23℃)

1) 1 coil latching

Nominal Voltage (VDC)	Set Voltage (VDC) max.	Pulse Width (ms) min.	Reset Voltage (VDC) max.	Coil Resistance (Ω)	Coil Power (mW)
5	4.00	150	4.00	20.8 x (1±10%)	Approx. 1200
6	4.80	150	4.80	30 x (1±10%)	
12	9.60	150	9.60	120 x (1±10%)	
24	19.2	150	19.2	480 x (1±10%)	
48	38.4	150	38.4	1920 x (1±10%)	

2) 2 coils latching

Nominal Voltage (VDC)	Set Voltage (VDC) max.	Pulse Width (ms) min.	Reset Voltage (VDC) max.	Coil Resistance (Ω)	Coil Power (mW)
5	4.00	150	4.00	10.4 x (1±10%)	Approx. 2400
6	4.80	150	4.80	15 x (1±10%)	
12	9.60	150	9.60	60 x (1±10%)	
24	19.2	150	19.2	240 x (1±10%)	
48	38.4	150	38.4	960 x (1±10%)	

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2. CONTACT DATA

Contact Arrangement		1A + 1B
Contact Gap		4mm min.
Contact Resistance		100mΩ max. (at 1A 6VDC)
Contact Material		$AgSnO_2$
Contact Ratings (Resistive load)		25A 277VAC
Max. Switching Voltage		277VAC
Max. Switching Current		25A
Max. Switching Power		6925VA
Life Expectancy	Electrical	30,000 operations (NO or NC, 25A 277VAC, Resistive load, at 85℃, 1s on 9s off)
	Mechanical	600,000 operations

3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	2000VAC 1min
	Coil and Contacts	5000VAC 1min
Surge voltage (between coil and contacts)		10kV (1.2 / 50μs)
Set Time (at nominal voltage)		25ms max.
Reset Time (at nominal voltage)		25ms max.
Temperature Range		-40℃ ~ 85℃
Shock Resistance	Functional	100 m/s^2
	Destructive	1000 m/s^2
Vibration Resistance		10 ~ 55Hz 2mm DA
Humidity		5 ~ 85% RH
Termination		PCB
Weight		Approx. 45g
Construction		Flux proofed
Outline Dimension (L x W x H)		50.0 x 27.0 x 20.0 mm

Notes: The data shown above are initial values.

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4. SAFETY APPROVAL

UL / cUL	25A 277/250/125VAC at 85℃ 25A 60VDC at 85℃ 0.5A 240VAC at 85℃

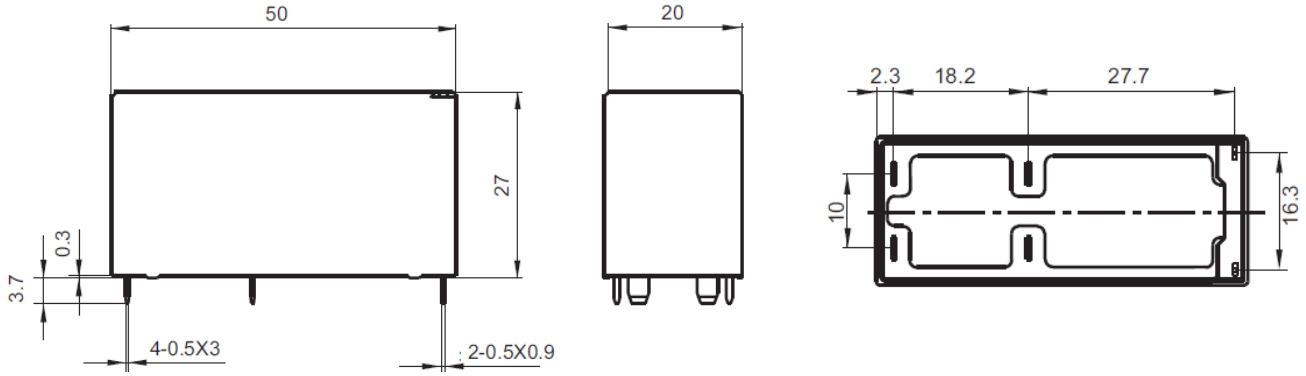
5. ORDERING INFORMATION

AL ①	1A1B ②	-	12 ③	L1 ④
① Relay Model	AL			
② Contact Arrangement	1A1B: 1A + 1B			
③ Coil Voltage	5=5VDC, 6=6VDC, 12=12VDC, 24=24VDC, 48=48VDC			
④ Sort	L1: 1 coil latching L2: 2 coils latching			

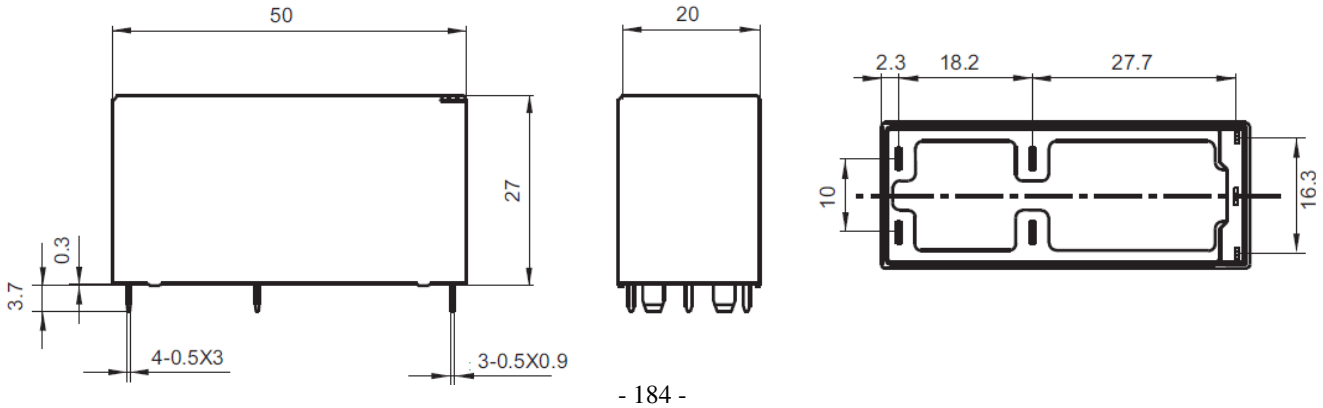
6. DIMENSIONS (Unit: mm)

Outline Dimensions

1 coil latching



2 coils latching



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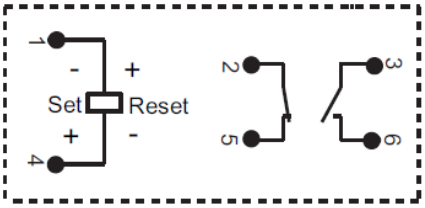
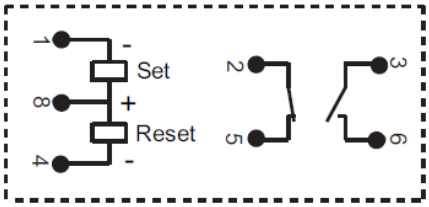
Wiring Diagram (Bottom view)

1 coil latching

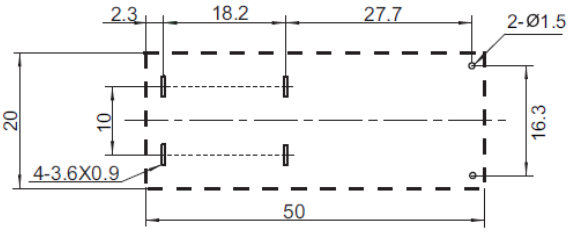


2 coils latching

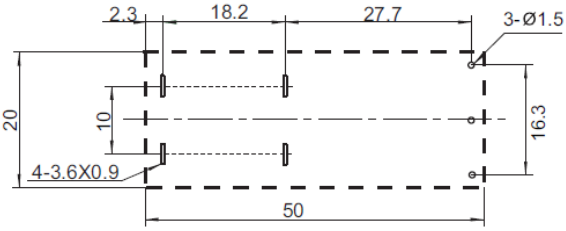


PCB Layout (Bottom view)

1 coil latching



2 coils latching



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1m

Notice:

1. Relay is on the “reset” or “set” status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to “set” or “reset” status, therefore, when application (connecting the power supply), please reset the relay to “set” or “reset” status on request.
2. In order to maintain “set” or “reset” status, energized voltage to coil should reach the rated voltage, impulse width should be 5 times more than “set” or “reset” time. Do not energized voltage to “set” coil and “reset” coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

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Subminiature High Power Latching Relay	NKBL

Features

- Subminiature high power latching relay
- Low coil power
  1 coil latching: approx. 0.4W
  2 coils latching: approx. 0.8W
- 15A switching capability
- 1 Form A and 1 Form C configuration
- Subminiature, standard PCB layout
- Plastic sealed Type

c UL us
(File No.:E134581)

1. COIL DATA (at 23℃)

1) 1 coil latching

Nominal Voltage (VDC)	Set Voltage (VDC) max.	Reset Voltage (VDC) max.	Pulse Width (ms) min.	Max.Voltage (VDC)	Coil Resistance (Ω) (1±10%)	Coil Power (mW)
5	4.00	4.00	100	10	62.5	Approx. 400
6	4.80	4.80	100	12	90	
9	7.20	7.20	100	18	202.5	
12	9.60	9.60	100	24	360	
24	19.2	19.2	100	48	1440	
48	38.4	38.4	100	96	5760	

2) 2 coils latching

Nominal Voltage (VDC)	Set Voltage (VDC) max.	Reset Voltage (VDC) max.	Pulse Width (ms) min.	Max.Voltage (VDC)	Coil Resistance (Ω) (1±10%)	Coil Power (mW)
5	4.00	4.00	100	10	31.5 + 31.5	Approx. 800
6	4.80	4.80	100	12	45 + 45	
9	7.20	7.20	100	18	101.5 + 101.5	
12	9.60	9.60	100	24	180 + 180	
24	19.2	19.2	100	48	720 + 720	
48	38.4	38.4	100	96	2880 + 2880	

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2. CONTACT DATA

Contact Arrangement		1 Form A	1 Form C
Contact Resistance		100mΩ max. (at 1A 6VDC)	
Contact Material		$AgSnO_2$	
Contact Ratings (Resistive load)		10A 277VAC / 30VDC	
Max. Switching Voltage		277VAC / 30VDC	
Max. Switching Current		15A	10A
Max. Switching Power		2770VA / 300W	
Life Expectancy	Electrical	6,000 operations (1 Form A, 15A 120VAC, Incandescent lamp, at 60℃, 1s on 59s off)	
		10,000 operations (10A 277VAC, Resistive load, at 60℃, 1s on 9s off)	
	Mechanical	10,000,000 operations	

3. CHARACTERISTICS

Insulation Resistance		100MΩ (at 500VDC)
Dielectric Strength	Open Contacts	750VAC 1min
	Coil and Contacts	2000VAC 1min
Surge voltage (between coil and contacts)		10kV (1.2 / 50μs)
Set Time (at nominal voltage)		8ms max.
Reset Time (at nominal voltage)		5ms max.
Temperature Range		-40℃ ~ 85℃
Shock Resistance	Functional	98 m/s^2
	Destructive	980 m/s^2
Vibration Resistance		10 ~ 55Hz 1.5mm DA
Humidity		5 ~ 85% RH
Termination		PCB
Weight		Approx. 9g
Outline Dimension (L x W x H)		19.0 x 15.2 x 15.5 mm

Notes: 1) The data shown above are initial values.

2) For sealed type, the vent-hole cover should be excised.

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4. SAFETY APPROVAL

UL / cUL	NO: 10A 277/250/125VAC, Resistive at 60℃ NO: Standard ballast 5.5A 277/220/120VAC at 60℃ NO: Electronic ballast 5A, 120VAC at 60℃ NO: Tungsten (incandescent) 15A 120VAC at 60℃ NO: Tungsten (incandescent) 5A 277VAC at 60℃ NO: 1/6HP 240/120VAC at 85℃

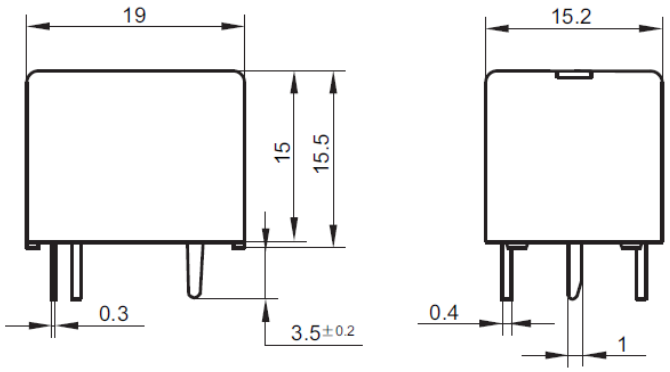
5. ORDERING INFORMATION

NKBL ①	11 ②	-	12 ③	S ④	L1 ⑤	R ⑥

① Relay Model	NKBL
② Contact Arrangement	11: 1 Form A 1: 1 Form C
③ Coil Voltage	5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 24=24VDC, 48=48VDC
④ Construction	S: Sealed type
⑤ Sort	L1: 1 coil latching L2: 2 coils latching
⑥ Polarity	Nil: Standard polarity R: Reverse polarity

6. DIMENSIONS (Unit: mm)

Outline Dimensions



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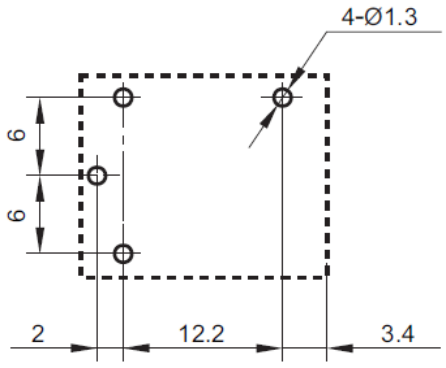
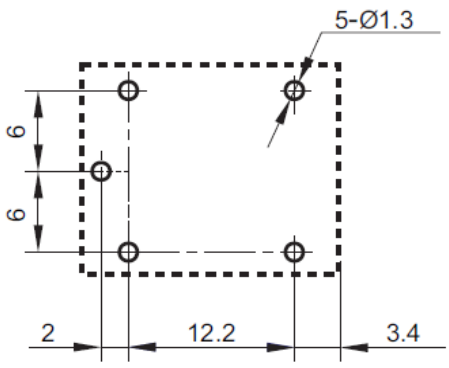
PCB Layout (Bottom view)

1 coil latching

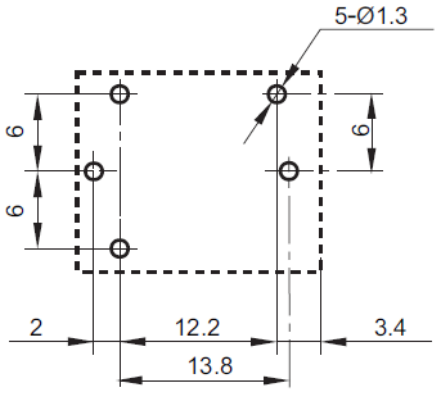
1 Form A

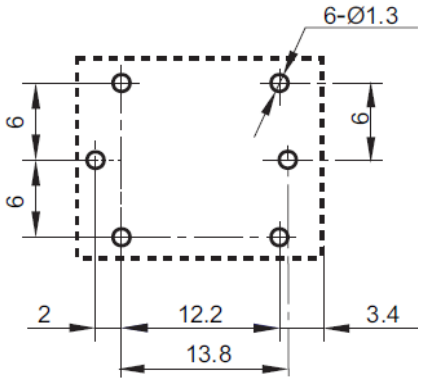


1 Form C



2 coils latching





Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm

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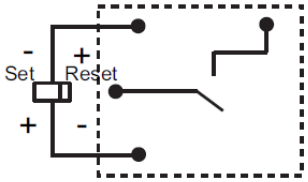
Wiring Diagram (Bottom view)

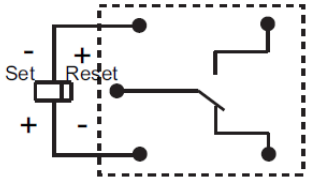
1 coil latching

Standard Polarity

1 Form A

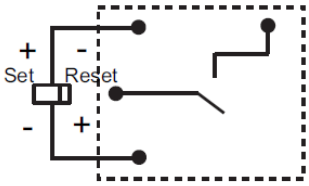


1 From C

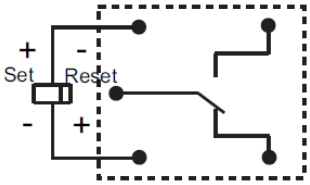


Reverse Polarity

1 Form A



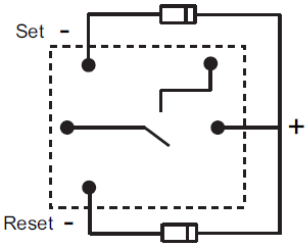
1 From C



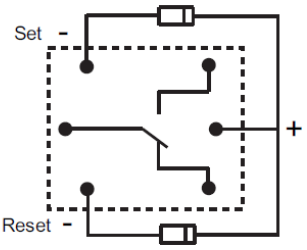
2 coils latching

Standard Polarity

1 Form A

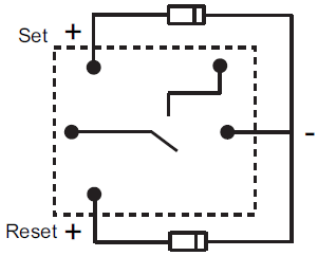


1 From C

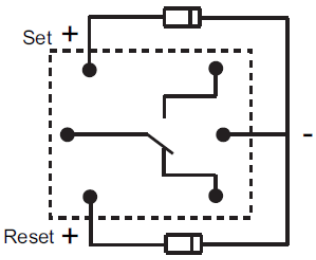


Reverse Polarity

1 Form A



1 From C



Notice:

1. Relay is on the “reset” or “set” status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to “set” or “reset” status, therefore, when application (connecting the power supply), please reset the relay to “set” or “reset” status on request.
2. In order to maintain “set” or “reset” status, energized voltage to coil should reach the rated voltage, impulse width should be 5 times more than “set” or “reset” time. Do not energized voltage to “set” coil and “reset” coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

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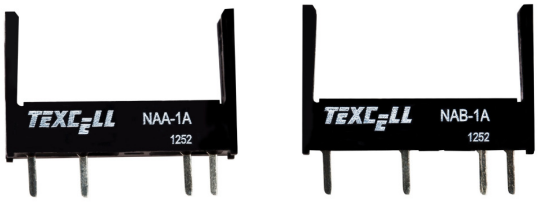
Relay Socket	NA□-1A

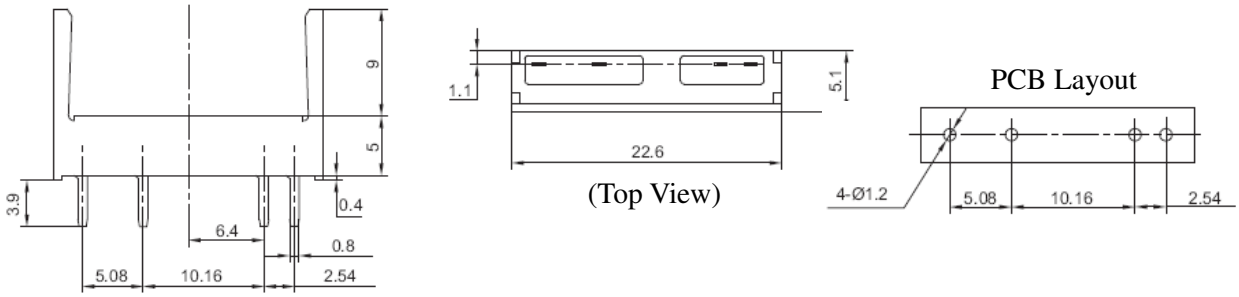
Characteristics

- Ambient temperature : -40℃ to 70℃
- Rated voltage : 250VAC
- Rated current : 5A
- Dielectric strength(Min.): 2000VAC
- Insulation Resistance: 1000MΩ
- Applicable relay type : NAA-1A is suitable for NAA relay.
  NAB-1A is suitable for NAB relay.



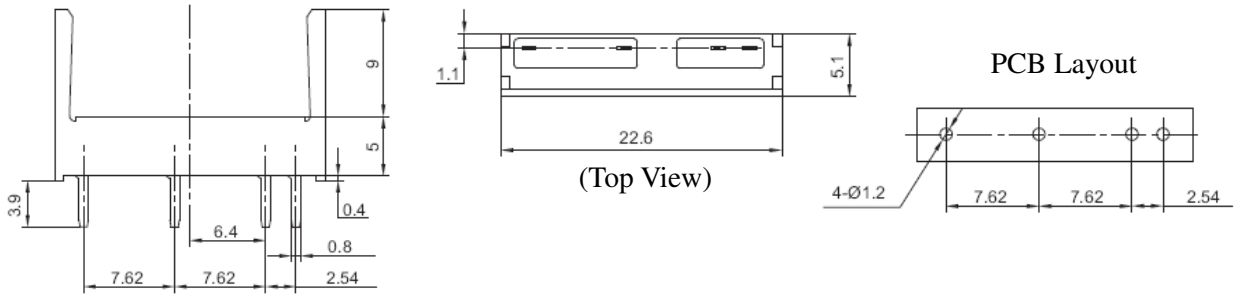
Outline Dimensions

NAA-1A



Outline Dimensions

NAB-1A



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Relay Socket	TH-□C

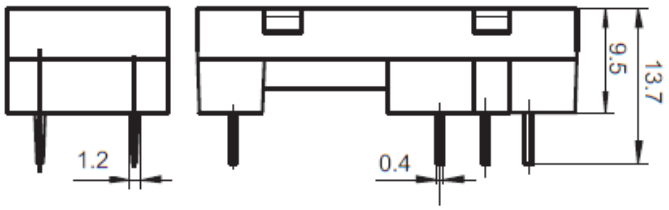
Characteristics

- Ambient temperature : -40℃ to 70℃
- Rated voltage : 250VAC
- Rated current : 10A
- Dielectric strength(Min.) : 5000VAC (between input and output)
- Steel retainer : Available
- Type: PCB terminal, PCB or Screw mounting
- Applicable relay type : CH series

TH-1C

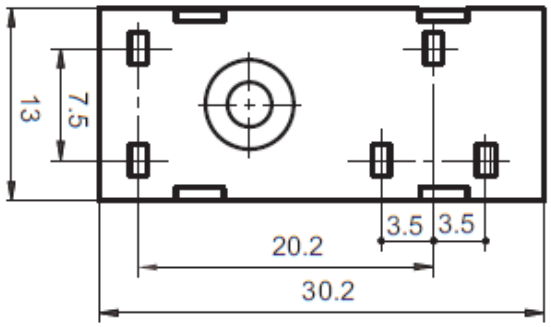
TH-2C

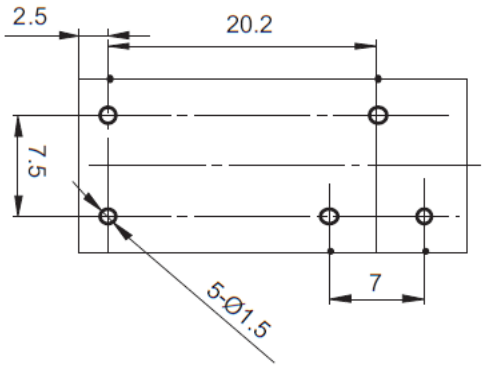
Outline Dimensions



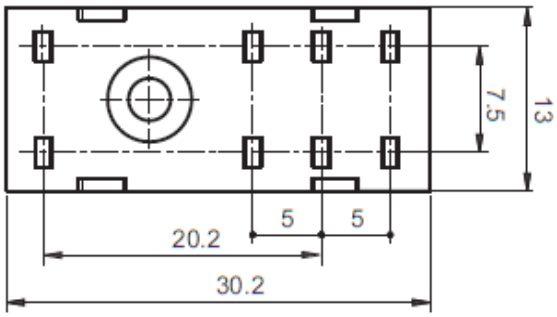
Retainer Dimension (CH-M)

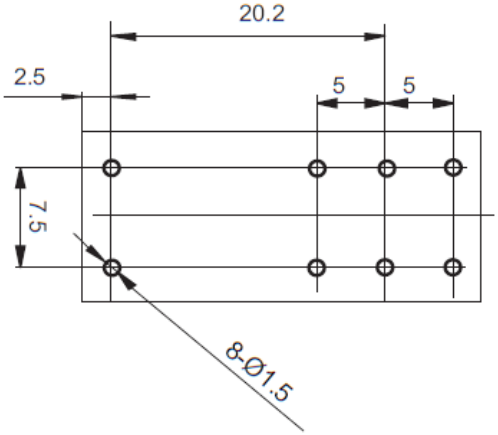
TH-1C (Top View)





TH-2C (Top View)





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Relay Socket	TH-□C

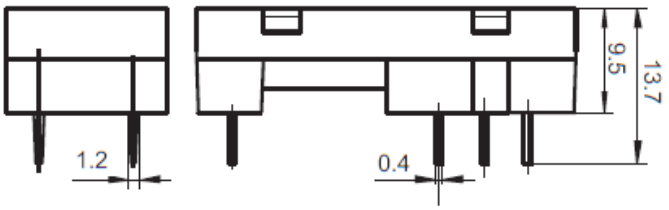
Characteristics

- Ambient temperature : -40℃ to 70℃
- Rated voltage : 250VAC
- Rated current : 10A
- Dielectric strength(Min.) : 5000VAC (between input and output)
- Steel retainer : Available
- Type: PCB terminal, PCB or Screw mounting
- Applicable relay type : TH and THD series

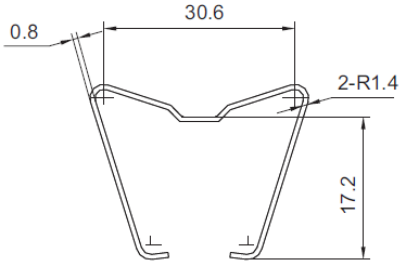
TH-1C

TH-2C

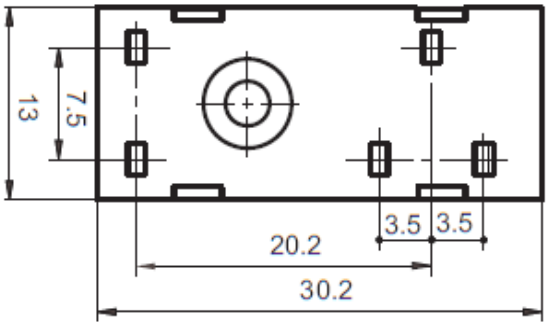
Outline Dimensions

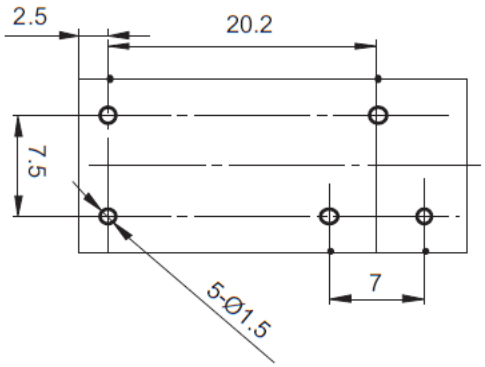


Retainer Dimension (TH-M)

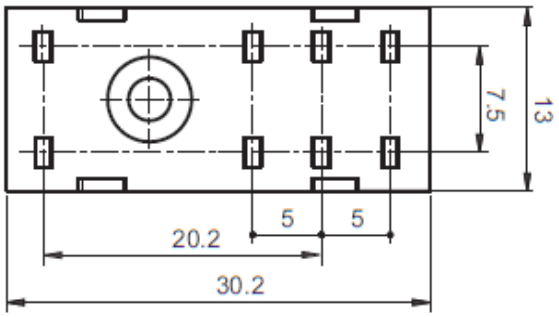


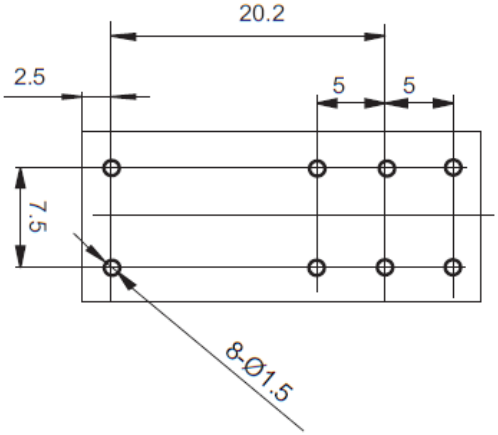
TH-1C (Top View)





TH-2C (Top View)





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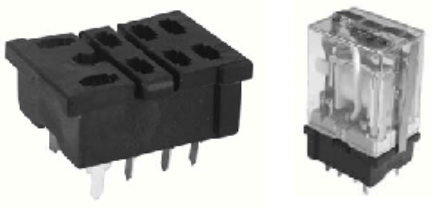
Relay Socket	KML2-B

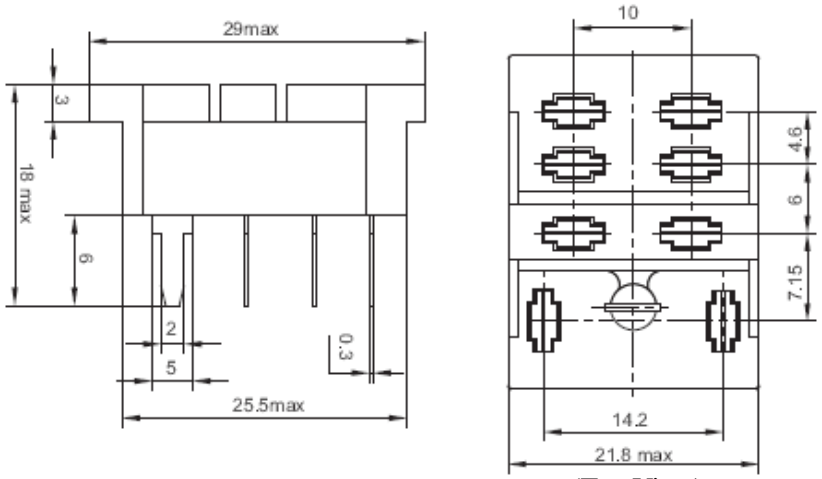
Characteristics

- Ambient temperature : -40℃ to 70℃
- Rated voltage : 250VAC
- Rated current : 10A
- Dielectric strength(Min.) : 2000VAC (between input and output)
- Steel retainer : Available
- Type: PCB terminal, PCB mounting
- Applicable relay type : KML series (1, 2 poles)



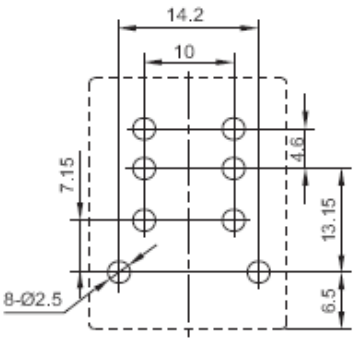
c UL us (File No.:E122258)

Outline Dimensions

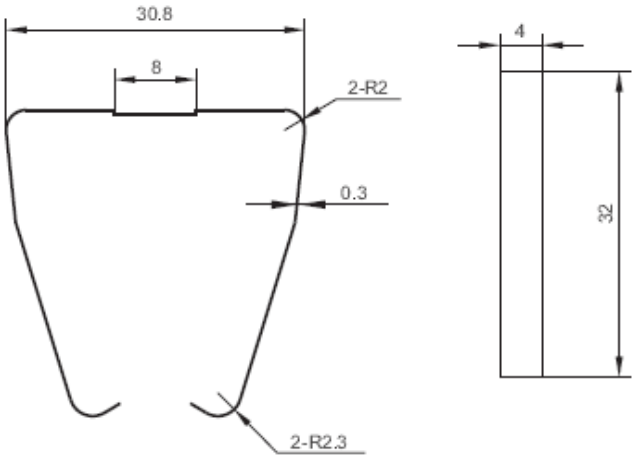


(Top View)

PCB Layout



Retainer Dimensions (KM-R1)



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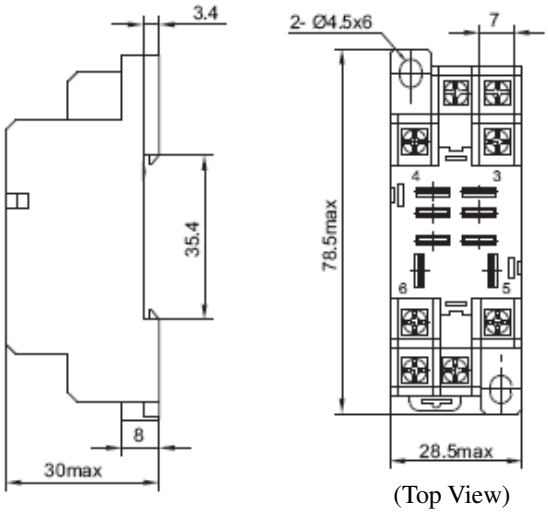
Relay Socket	KML2-C

Characteristics

- Ambient temperature : -40℃ to 70℃
- Rated voltage : 250VAC
- Rated current : 10A
- Dielectric strength(Min.) : 2000VAC (between input and output)
- Steel retainer : Available
- Terminal torgue : 1.0Nm
- Wire strip length: 7mm
- Max. wire range: 2 x 2.5mm^2
- Type: DIN rail or Screw mounting, Screw terminal, Without finger protection device
- Applicable relay type : KML series (1, 2 poles)

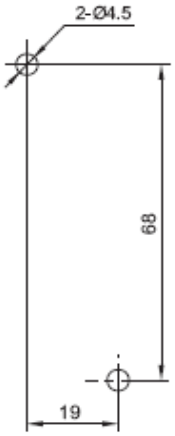
c UL us (File No.:E122258)

Outline Dimensions

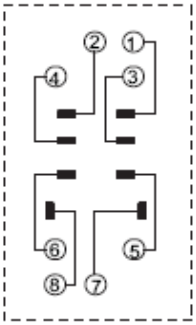


(Top View)

PCB Layout

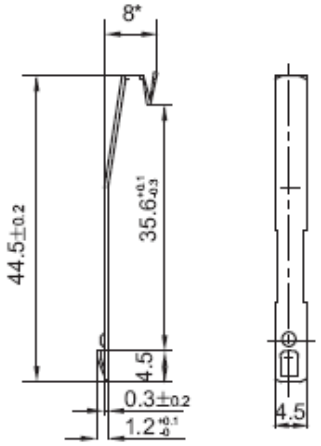


Wiring Diagram



(Top View)

Retainer Dimensions (KM-R2)



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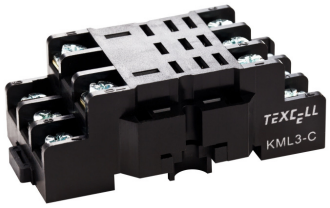
Relay Socket	KML□-C

Characteristics

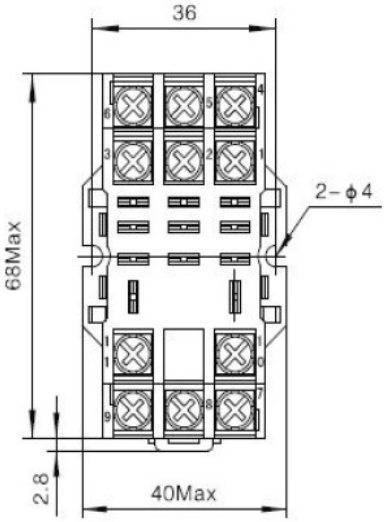
- Ambient temperature: -40℃ to 75℃
- Rated voltage: 250VAC
- Rated current: 10A
- Dielectric strength(Min.): 2000VAC (between input and output)
- Socket material: KML3 - Flame retardance PA46-S250F6(V0)
  KML4 - Flame retardance PA66+GF(V1/V0)
- Contact spring material: QSn6.5-0.1
- Hold down spring(on request): Plastic
- Applicable relay type : KML series (3, 4 poles)

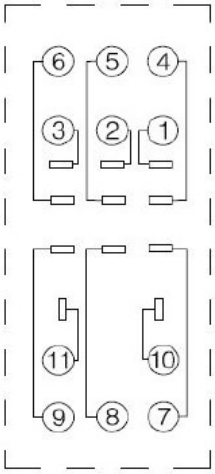
Outline Dimensions

Wiring Diagram

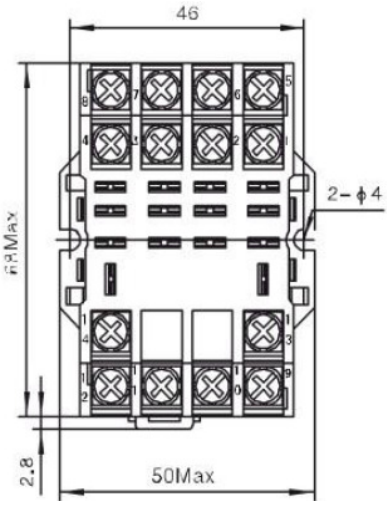


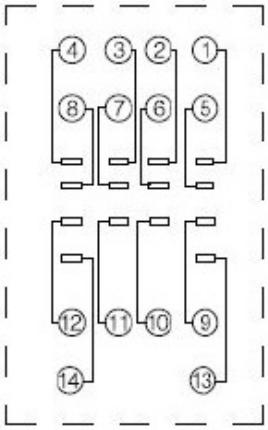
KML3-C





KML4-C





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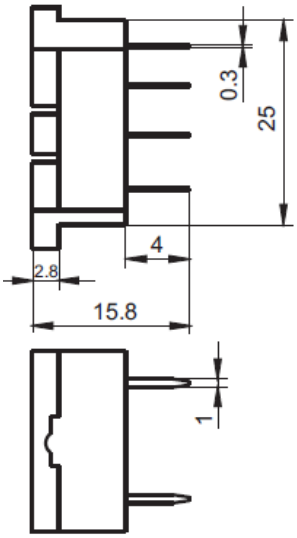
Relay Socket	KMH□-B

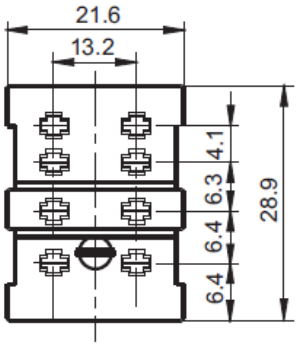
Characteristics

- Ambient temperature : -40℃ to 70℃
- Rated voltage : 250VAC
- Rated current : 7A
- Dielectric strength(Min.) : 2000VAC (between input and output)
- Steel retainer : Available
- Type: PCB terminal, PCB mounting
- Applicable relay type : KMH series (2, 3, 4 poles)

KMH2-B

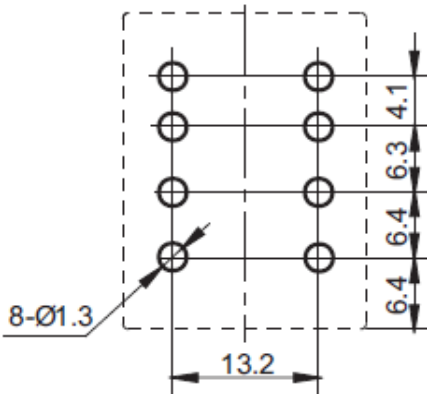
Outline Dimensions





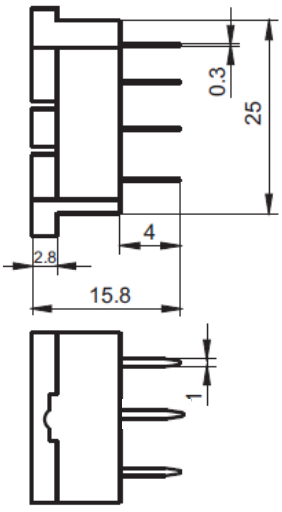
(Top View)

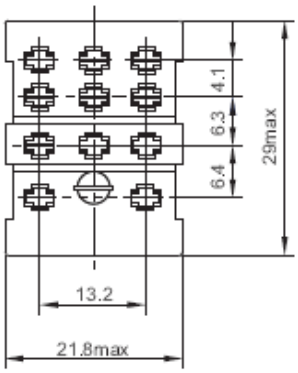
PCB Layout
(Top View)



KMH3-B

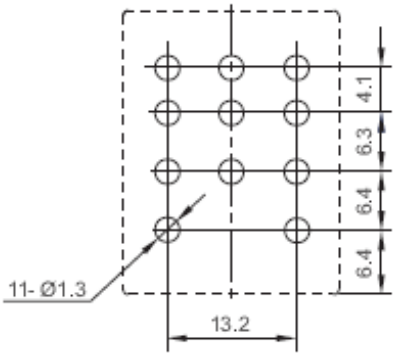
Outline Dimensions





(Top View)

PCB Layout
(Top View)



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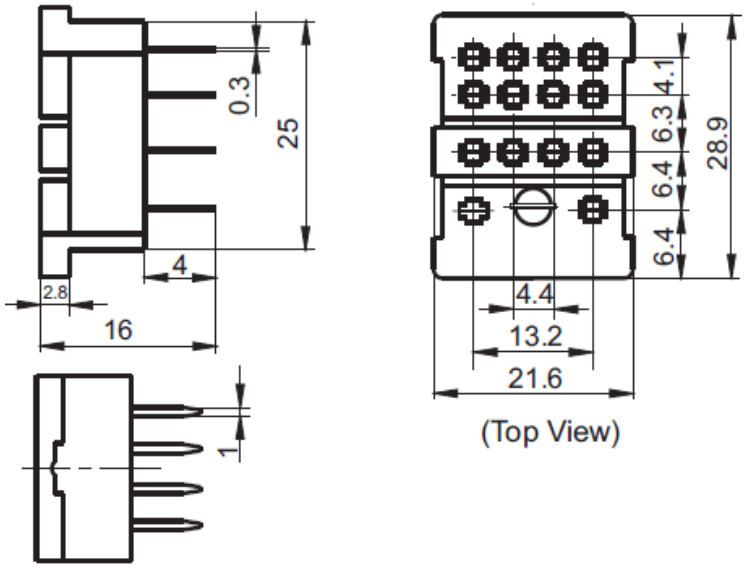
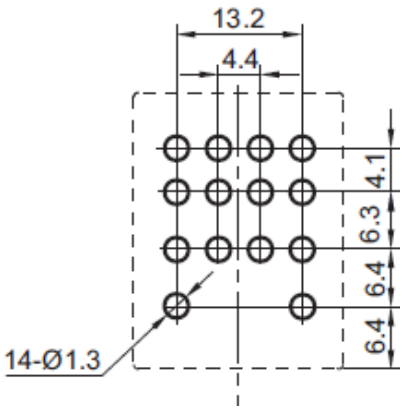
KMH4-B

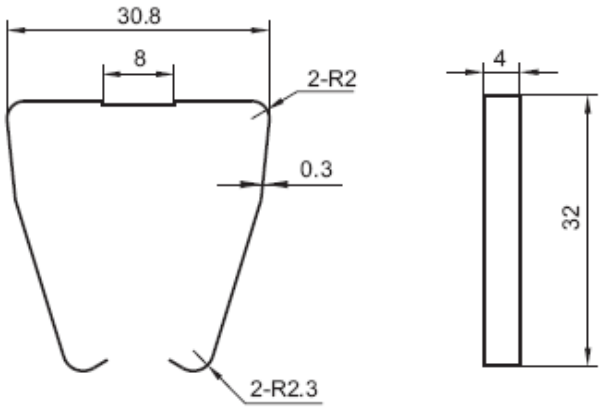
Outline Dimensions



PCB Layout
(Top View)



Retainer Dimensions (KM-R1)



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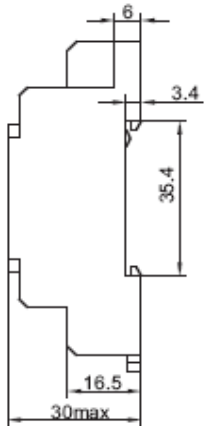
Relay Socket	KMH□-C

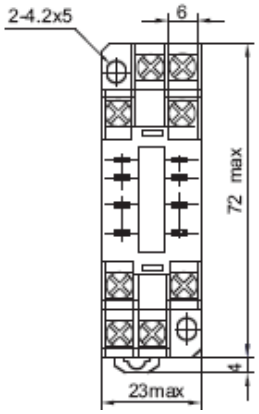
Characteristics

- Ambient temperature : -40℃ to 70℃
- Rated voltage : 250VAC
- Rated current : 7A
- Dielectric strength(Min.) : 2000VAC (between input and output)
- Steel retainer : Available
- Terminal torgue : 0.8Nm
- Wire strip length: 7mm
- Max. wire range: 2 x 1.5mm^2
- Type: DIN rail or Screw mounting, Screw terminal, Without finger protection device
- Applicable relay type : KMH series (2, 3, 4 poles)

Outline Dimensions

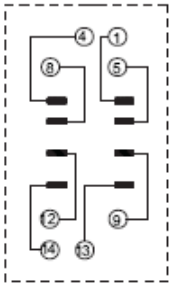
KMH2-C



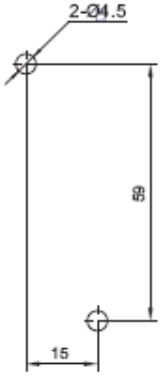


(Top View)

Wiring Diagram



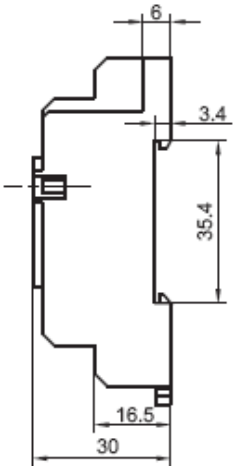
(Top View)

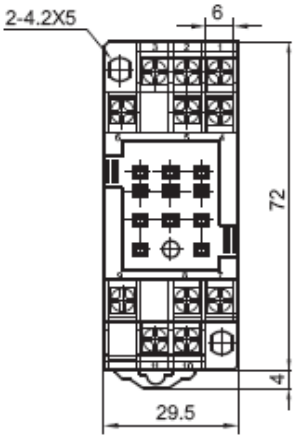


PCB Layout

Outline Dimensions

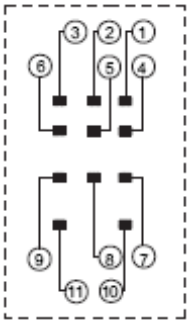
KMH3-C



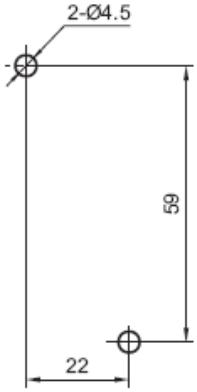


(Top View)

Wiring Diagram



(Top View)



PCB Layout

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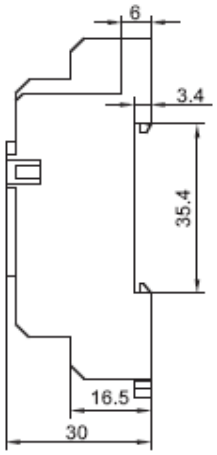
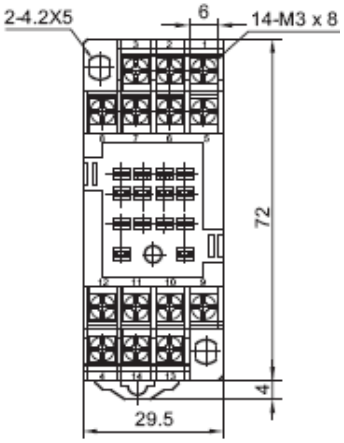
Outline Dimensions

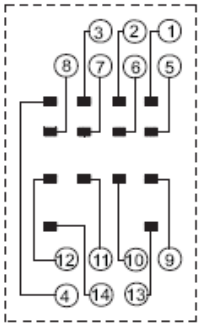
KMH4-C



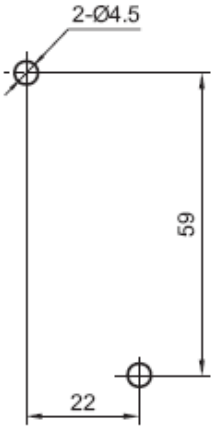


(Top View)

Wiring Diagram

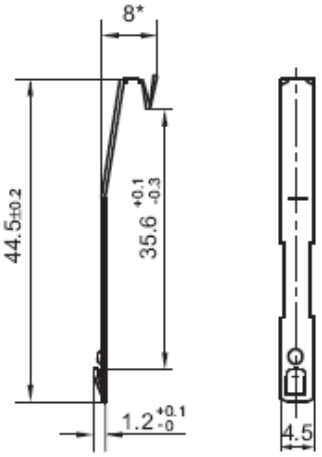


(Top View)



PCB Layout

Retainer Dimensions (KM-R2)



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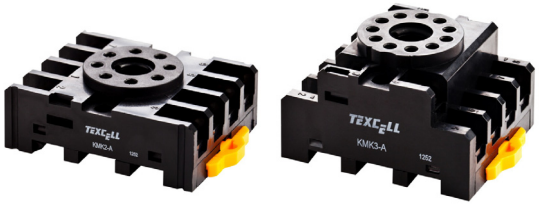
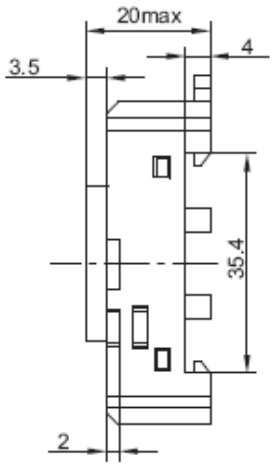
Relay Socket	KMK□-A

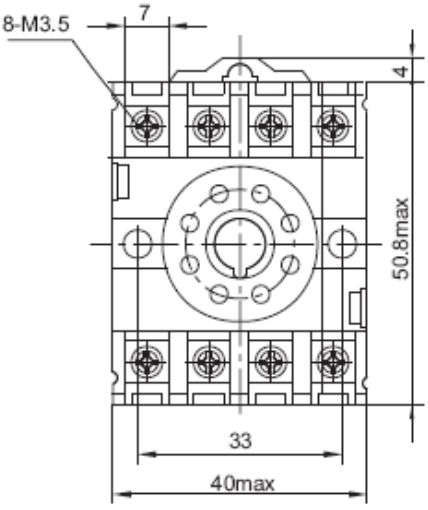
Characteristics

- Ambient temperature : -40℃ to 70℃
- Rated voltage : 250VAC
- Rated current : 10A
- Dielectric strength(Min.) : 2000VAC (between input and output)
- Terminal torque : 1.0Nm
- Wire strip length: 7mm
- Max. wire size: 2 x 1.5mm^2
- Applicable relay type : KMK2 and KMK3 series (2 & 3poles)



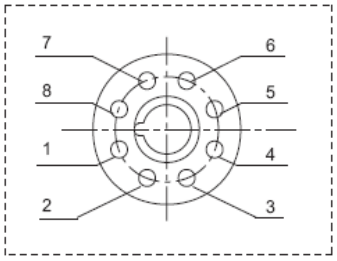
KMK2-A Outline Dimensions



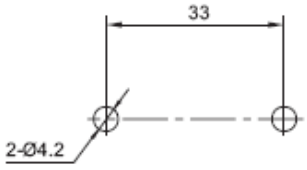


(Top View)

Wiring Diagram

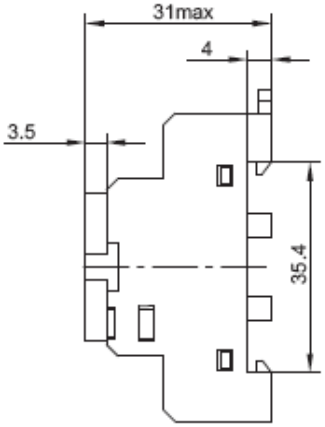


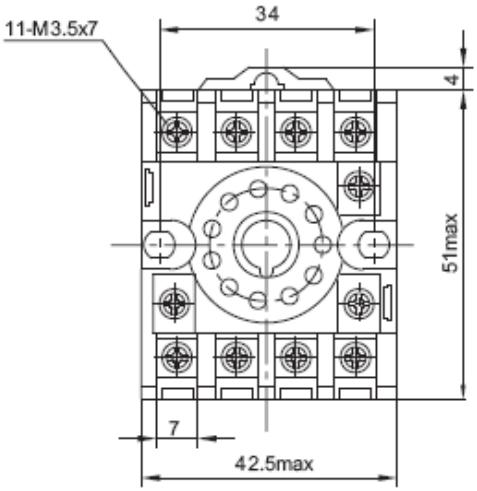
(Top View)



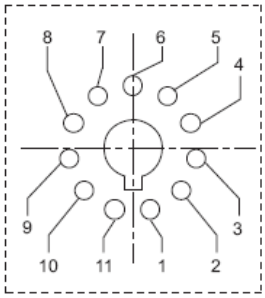
PCB Layout

KMK3-A

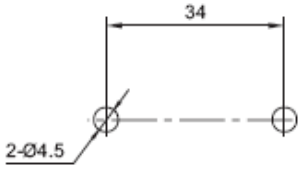




(Top View)



(Top View)



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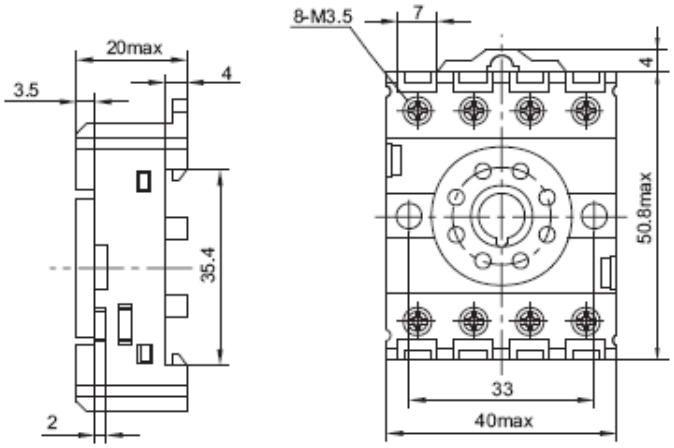
Relay Socket	KMK□-B

Characteristics

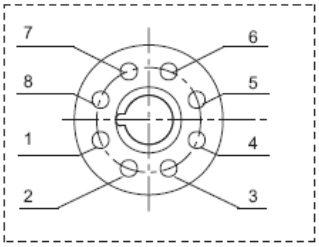
- Ambient temperature : -40℃ to 70℃
- Rated voltage : 250VAC
- Rated current : 10A
- Dielectric strength(Min.) : 2000VAC (between input and output)
- Terminal torque : 1.0Nm
- Wire strip length: 7mm
- Max. wire size: 2 x 1.5mm^2
- Applicable relay type : KMK2 and KMK3 series (2 & 3poles)

KMK2-B Outline Dimensions

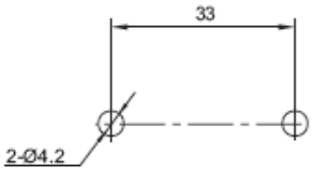


(Top View)

Wiring Diagram

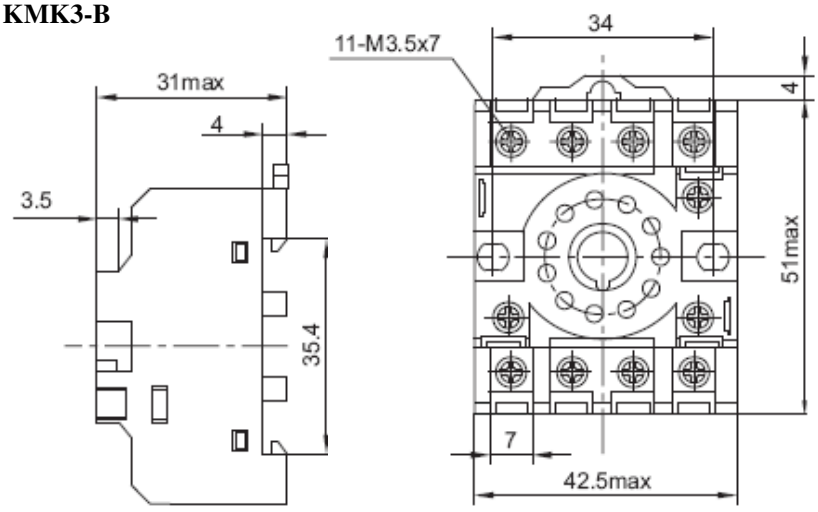


(Top View)

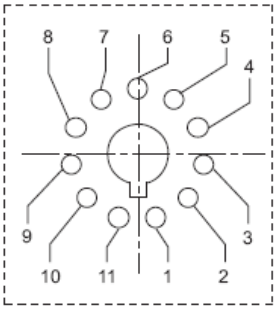


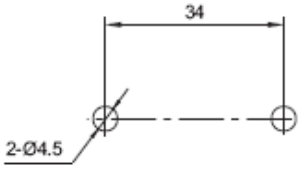
PCB Layout

KMK3-B



(Top View)





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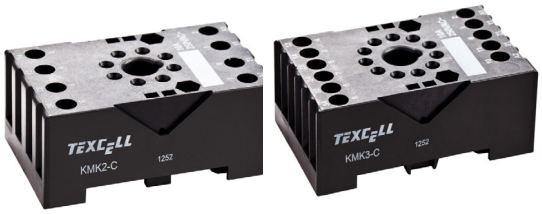
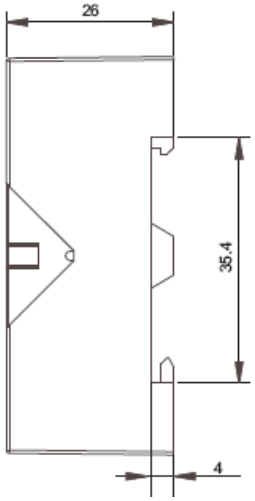
Relay Socket	KMK□-C

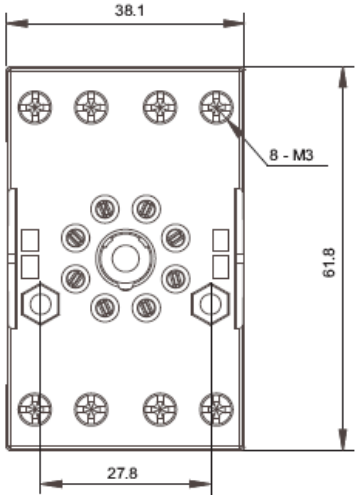
Characteristics

- Ambient temperature : -40℃ to 70℃
- Rated voltage : 250VAC
- Rated current : 10A
- Dielectric strength(Min.) : 2000VAC (between input and output)
- Steel retainer : Available
- Terminal torgue : 0.6Nm
- Wire strip length: 7mm
- Max. wire range: 1 x 4 / 2 x 2.5mm^2
- Applicable relay type : KMK2 and KMK3 series (2 & 3poles)



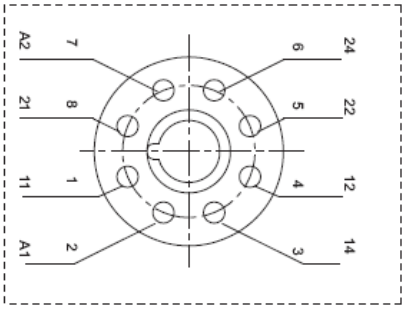
KMK2-C Outline Dimensions



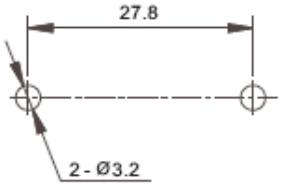


(Top View)

Wiring Diagram

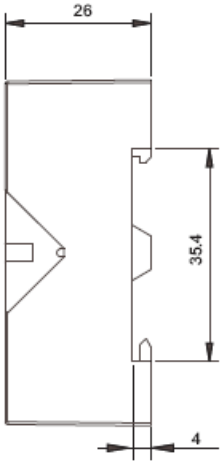


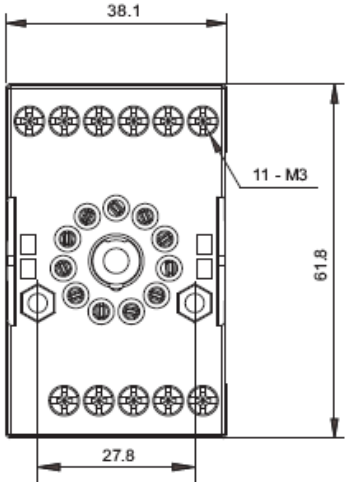
(Top View)

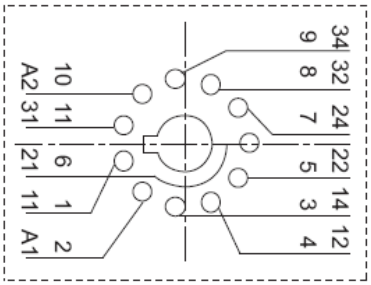


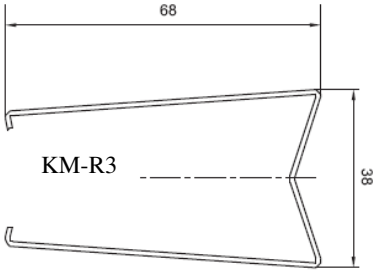
PCB Layout

KMK3-C









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