To: Believe Srl Electronic Components

High Heat Dissipation Substrate NRA-8

Approval	Making
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Characteristics Table

Item	Method	Condition	Unit	NRA-8	
Insulation Thickness	—	—	μm	80	120
Copper Peel Strength (35 μm Copper Foil)	JIS C6481	Normally	kN/m	1.4	
		S4	kN/m	1.4	
Breakdown Voltage	JIS C2110-1	Normally	AC kV	＞6.6	＞7.5
Solder Resistance	JIS C6481	300ºC	minutes	＞2	
Surface Resistance	JIS C6481	Normally	Ω	6.5×10^{11}	
Volume Resistivity	JIS C6481	Normally	Ω•cm	2.4×10^{15}	
Dielectric Resistance	—	Normally	Ω	—	2.1×10^{12}
Dielectric Constant	JIS C6481	1kHz	—	7.4	
		1MHz	—	7.2	
Dissipation Factor	JIS C6481	1kHz	—	0.0083	
		1MHz	—	0.0174	
Thermal Diffusivity	*1	Z axially	$\times 10^{-6} m^2/s$	0.82	
Thermal Conductivity	*2	Z axially	W/m•K	2.1	
Thermal Resistance	*3	Z axially	K/W	0.38	0.57
Glass Transition Temperature	TMA	—	ºC	110	
Poisson's ratio	JIS K7161-1	r.t.	—	0.30	
Storage Elastic Modulus	DMA	r.t.	Pa	1.2×10^{10}	
Coefficient of Linear Expansion	TMA	XY planar	ppm/ºC	39 (Under Tg) 67 (Over Tg)	

*1 Measured by Thermowave Analyzer (BETHEL Co.,Ltd.)   Ver.6

*2 Thermal conductivity = Thermal diffusivity × Specific gravity × Specific heat

*3 Sample dimension is 10 mm × 10 mm

The data in this report is measured value, not guarantee value. The data might vary according to development.

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A-8 Long Term Reliability (1)

High Temperature Test

Substrate Composition

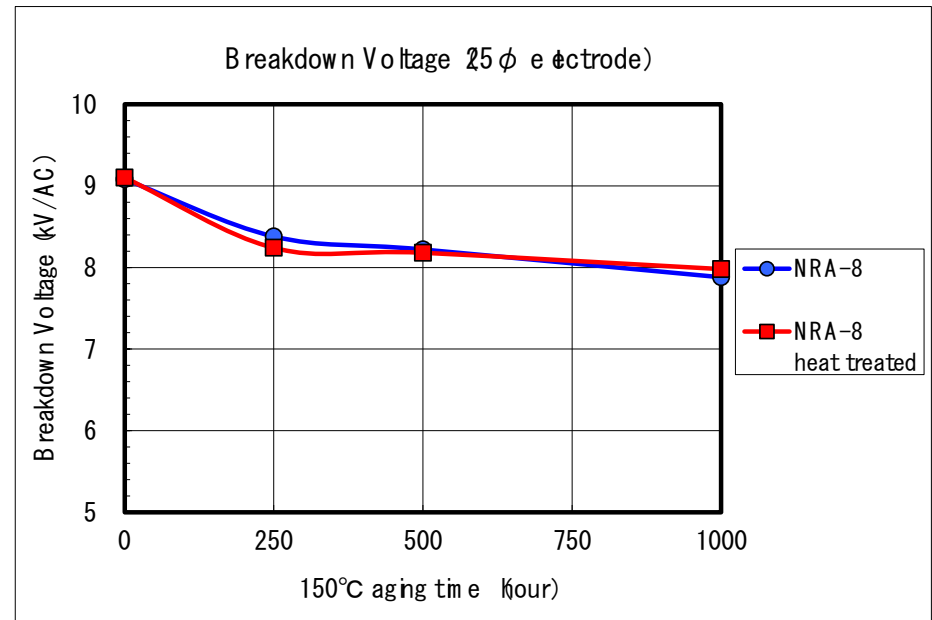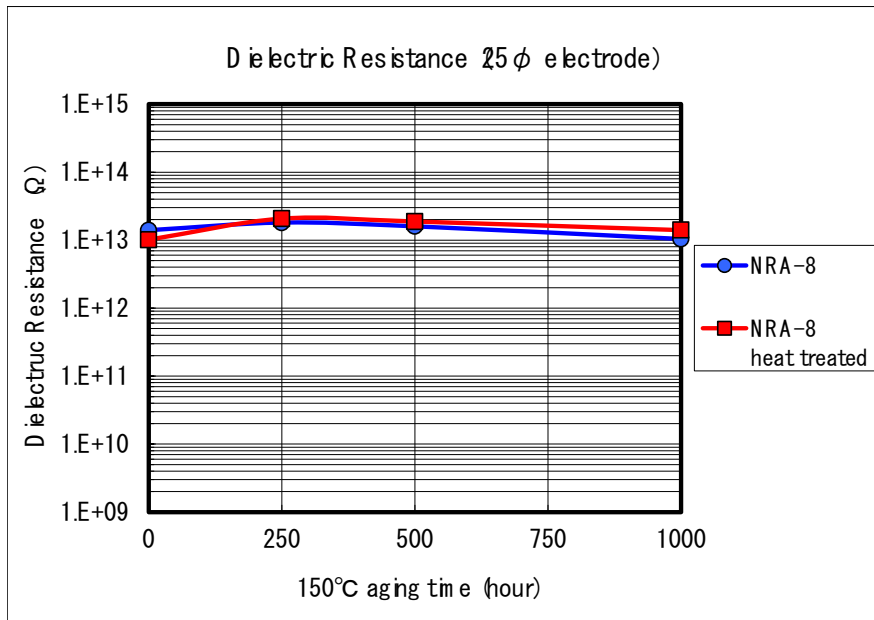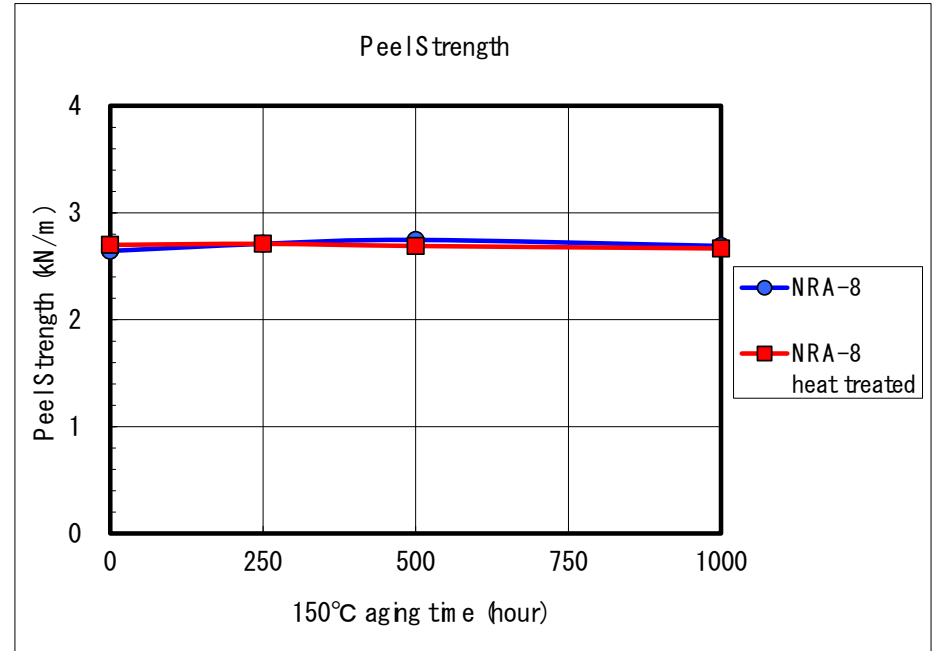　Copper Foil 105μm, Insulation Layer 120μm, Aluminum Base 2.0mm

1. Purpose

　①Estimating IMS`s stability under high temperature storage test

　②Estimating the difference about life reliability between Lead-Free

　　HASL surface treatment (260°C x 5min) and not.

2. Test Condition: Long-term storage in 150°C atmosphere (1000 h)

3. Evaluation Items

　①Peeling Strength of Copper Foil

　②Dielectric Resistance of Insulation Layer

　③Breakdown Voltage (AC) of Insulation Layer

Peel Strength

Dielectric Resistance (25φ electrode)

Breakdown Voltage (25φ electrode)

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A-8 Long Term Reliability (2)

Confidential

High Temperature and High Humidity Test

Substrate Composition

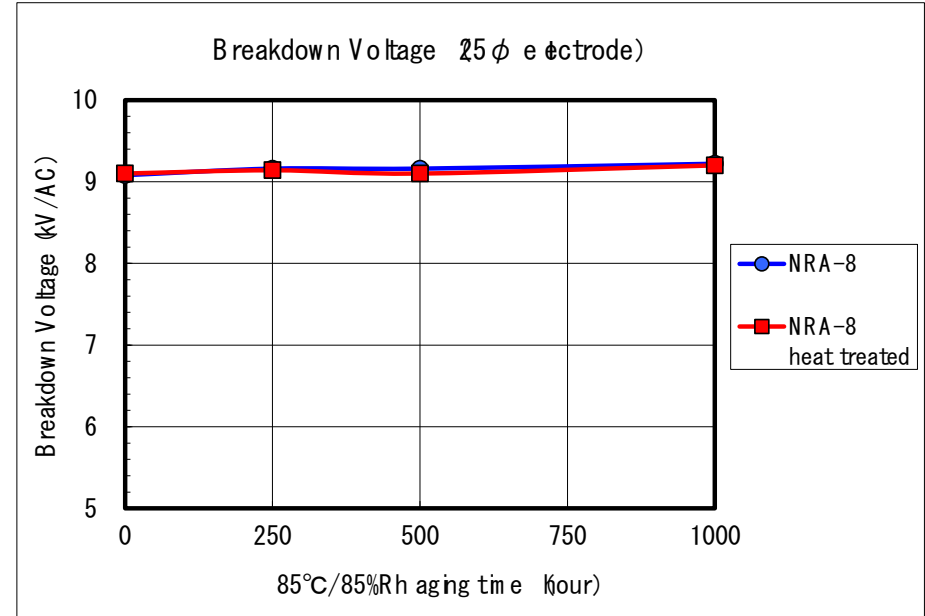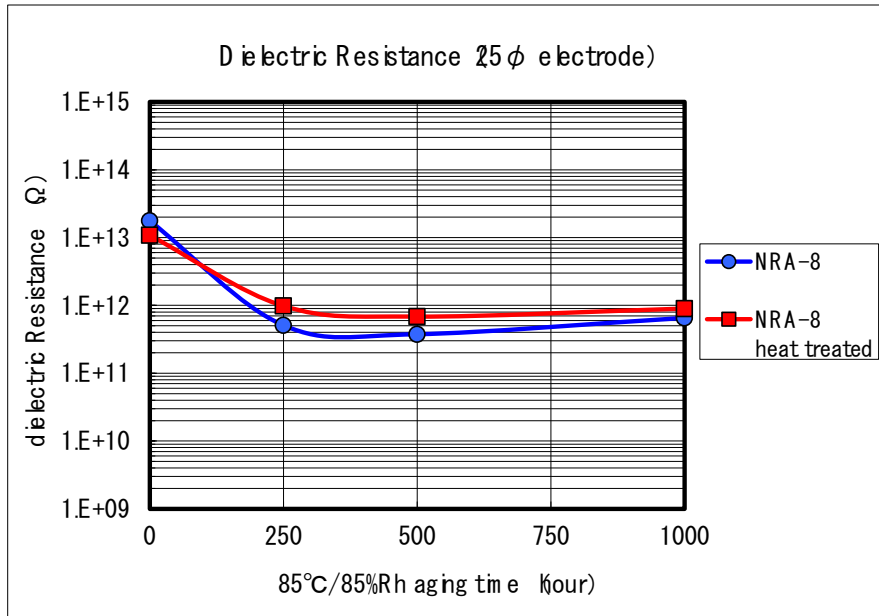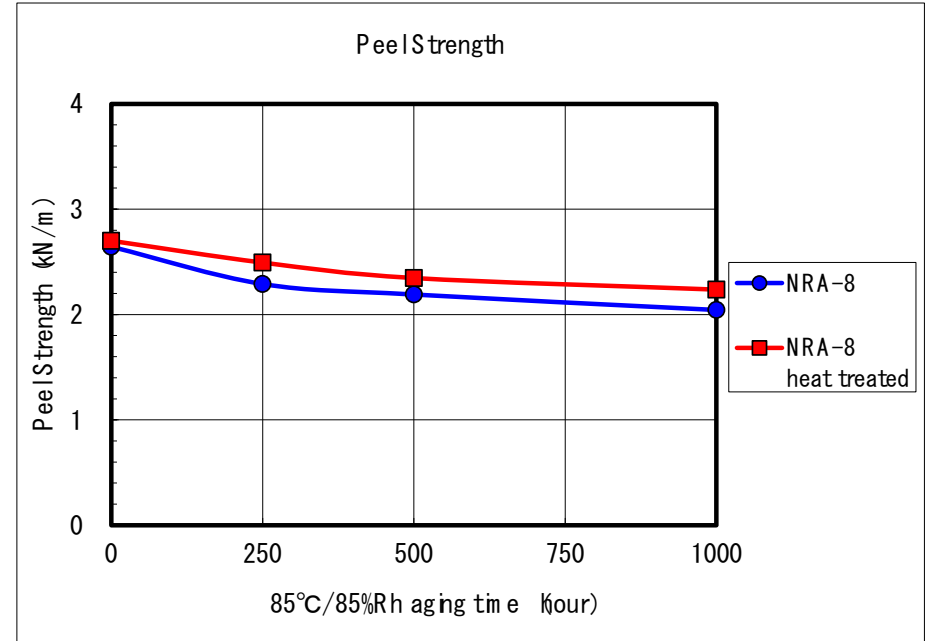Copper Foil 105μm, Insulation Layer 120μm, Aluminum Base 2.0mm

1. Purpose

①Estimating IMS`s stability under high temperature storage test

②Estimating the difference about life reliability between Lead-Free

HASL surface treatment (260°C x 5min) and not.

2. Test Condition: Long-term storage in 85°C/85% atmosphere(1000 h)

3. Evaluation Items

①Peeling Strength of Copper Foil

②Dielectric Resistance of Insulation Layer

③Breakdown Voltage (AC) of Insulation Layer

Peel Strength

Dielectric Resistance (25φ electrode)

Breakdown Voltage (25φ electrode)

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A-8 Long Term Reliability (3)

Temperature Cycling Test

Substrate Composition

Copper Foil 105μm, Insulation Layer 120μm, Aluminum Base 2.0mm

1. Purpose

①Estimating IMS`s stability under high temperature storage test

②Estimating the difference about life reliability between Lead-Free

HASL surface treatment (260°C x 5 min) and not.

2. Test Condition: -40°C・30 min～+125°C・30 min cycle

3. Evaluation Items

①Peeling Strength of Copper Foil

②Dielectric Resistance of Insulation Layer

③Breakdown Voltage (AC) of Insulation Layer

Peel Strength

Dielectric Resistance (25φ electrode)

Breakdown Voltage (25φ electrode)

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