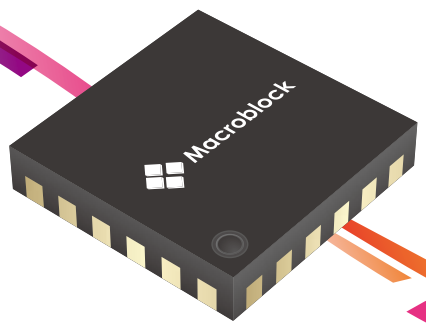
Macroblock

PRODUCT CATALOG

LED Driver IC Expert

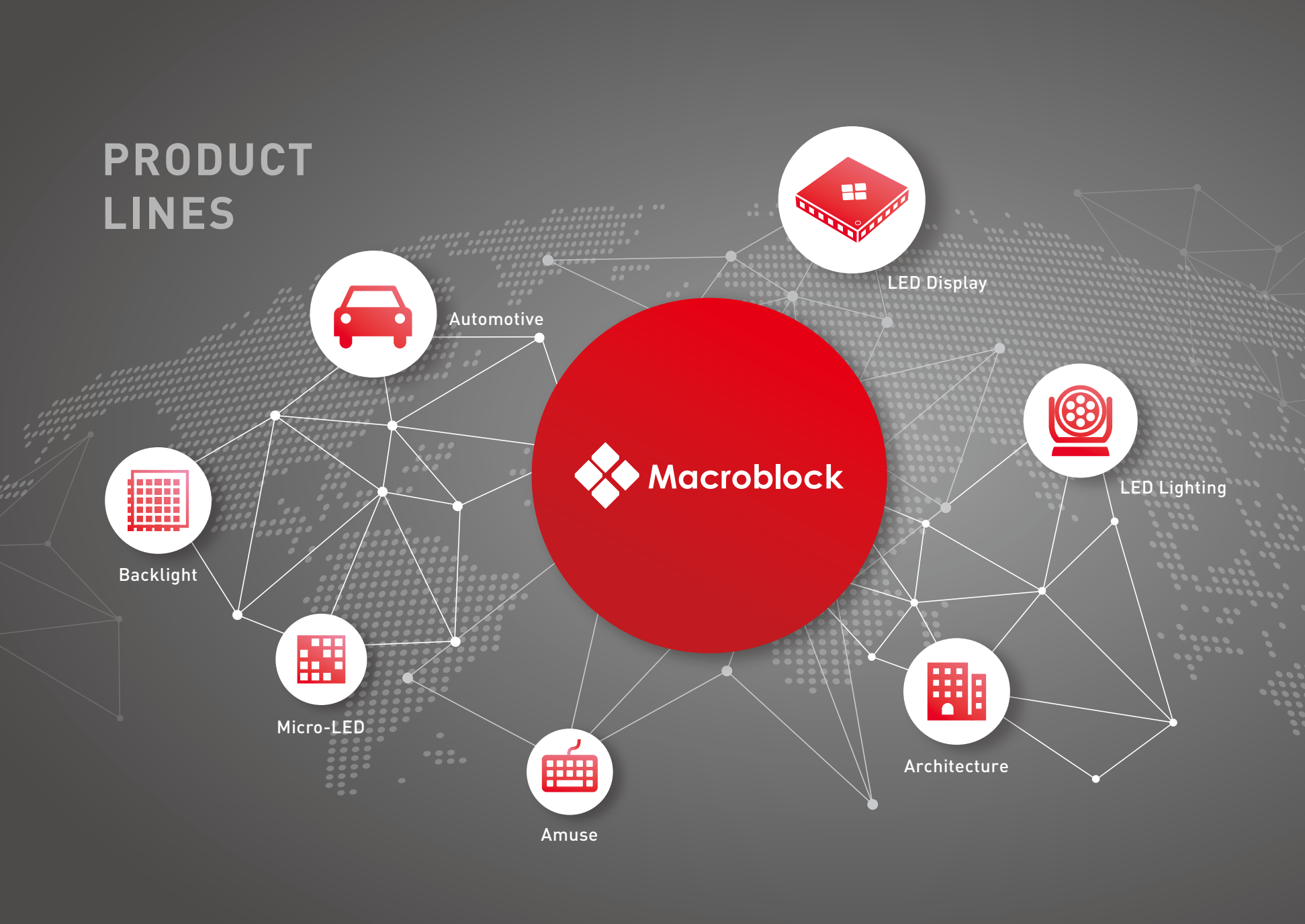


About Macroblock

Macroblock was founded in Taiwan in 1999. With a passion rooted in LED driver IC design, Macroblock positions as a mixed-signal driver IC design house focusing on optoelectronic applications and power management.

Not only have our drivers been used for the FIFA World Cup Qatar 2022™, virtual productions in Hollywood, 2022 Tokyo Dome, 2023 MSG Sphere and etc., but our backlight and automotive driver ICs are also qualified by world key players. Macroblock's driver ICs have been the preferred option adopted by worldwide customers due to our performance and reliability.

PRODUCT LINES



CONTENTS

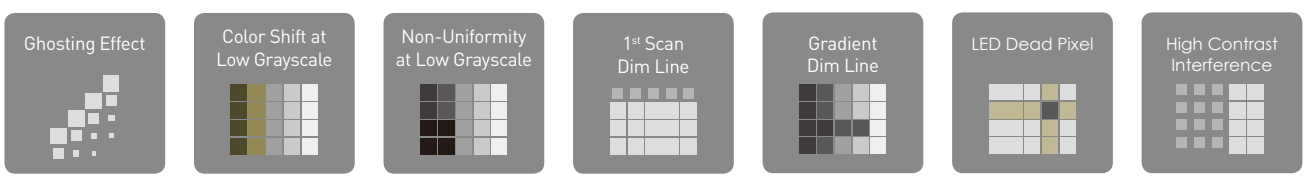
LED Display

As the leading supplier in LED display driver ICs, our products have been chosen and applied towards various world-class events, landmarks, as well as venues with specific demands and strict requirements.

SUCCESS STORY

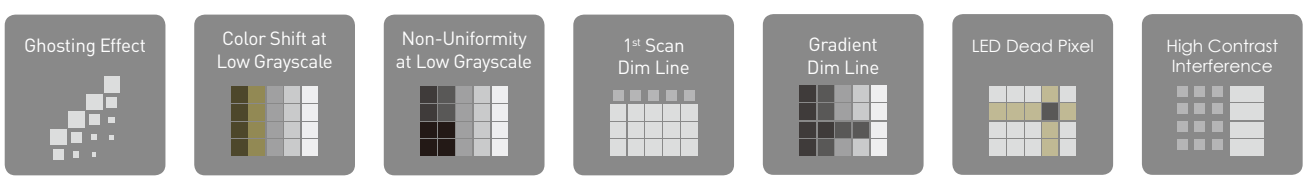
Moonshine XR Studio, Taiwan

Hawkeye Solution: LED Driver IC Recommendation For Time-Multiplexing LED Displays

Category / Specification	Hawkeye 100		Hawkeye 150	
Solution	High Brightness	Fine Pitch	Fine Pitch	
Driver IC	MBI5251	MBI5253	MBI5264	MBI5754 (for common cathode LED)
MOSFETs	MBI5989	MBI5989	MBI5989	MBI5981
HDR-Optimized *	●	-	●	●
Superior Image Quality	Solving the seven common problems found in fine pitch LED display 			
Scan Design	Up to 8-scan	Up to 32-scan	Up to 64-scan	Up to 64-scan
Intelligent Power Saving	Dynamic+	Dynamic+	Dynamic+	Dynamic+
LED Failure Prediction	-	-	-	-
Board Level Circuitry	Regular			
Output Current	2mA-45mA@V_{DD}=5V	0.5mA-20mA@V_{DD}=5V	0.5mA-20mA@V_{DD}=4.2V	1.0mA-18mA@V_{DD}=2.8V&3.8V
Recommended Pixel Pitch Range	4mm~12mm	1.2mm~6mm	1mm~4mm	0.9mm~4mm

* HDR-Optimized: 16-bit grayscale @ 4KHz refresh rate

Hawkeye Solution: LED Driver IC Recommendation For Time-Multiplexing LED Displays

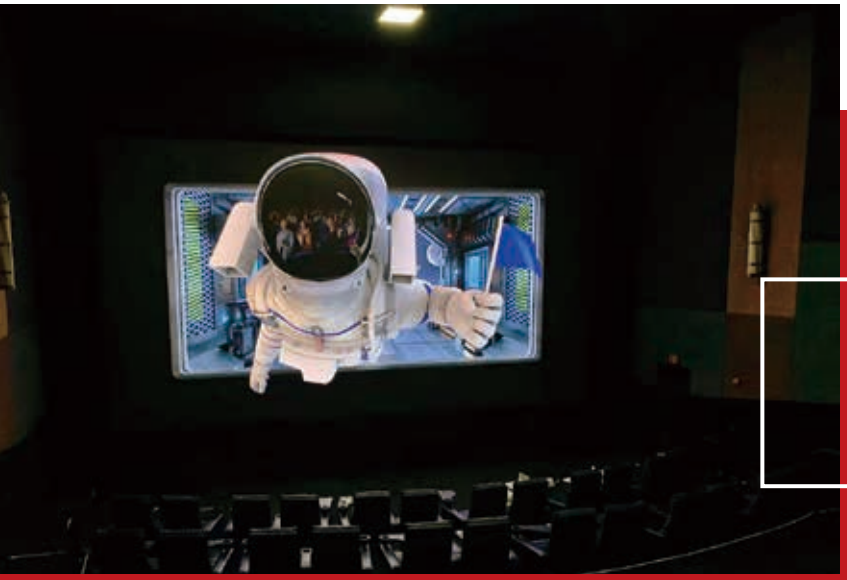
Specification \ Category	Hawkeye 200	Hawkeye 250	Hawkeye 350	
Solution	Fine Pitch	Fine Pitch	Ultra fine pitch, mini-LED, micro-LED	
Driver IC	MBI5762 (for common cathode LED)	MBI5850	MBI5864	MBI5780 (for common cathode LED)
MOSFETs	MBI5981			
HDR-Optimized *	●	●	●	●
Superior Image Quality	Solving the seven common problems found in fine pitch LED display 			
Scan Design	Up to 32-scan	Up to 32-scan	Up to 64-scan	Up to 90-scan
Intelligent Power Saving	Dynamic+	Dynamic+	Dynamic+	Dynamic+
LED Failure Prediction	-	-	●	-
Board Level Circuitry	Simplified	Simplified and Modular	Simplified and Modular	Simplified and Modular
Output Current	0.5mA-10mA@V_{DD}=3.8V	0.5mA-20mA@V_{DD}=4.2V	0.1mA - 5mA@V_{DD}=3.3V&4.2V	0.1mA - 15mA@V_{DD}=2.8V&3.8V
Recommended Pixel Pitch Range	1.2mm~4mm	1.5mm~6mm	0.4mm~1mm	0.4mm~1mm

* HDR-Optimized: 16-bit grayscale @ 4KHz refresh rate

SRAM Embedded S-PWM LED Driver

Driver ICs with built-in memory, primarily used in time-multiplexing display, are the highest level ICs today. Driver IC with built-in SRAM can greatly improve display refresh rate and utilization rate without damaging grayscale performance, and is the driver IC used in mainstream time-multiplexing display in the market today.

SUCCESS STORY



3D LED Cinema Screen "HeyLED" of
Krikorian Theatre in Los Angeles, USA
(Courtesy of Timewaying)

DCI-Certified LED Cinema Screen in
The China Film Cinema Bei'ao, Beijing
(Courtesy of Unilumin)

SRAM Embedded S-PWM LED Driver

		MBI5056	MBI5251	MBI5253	MBI5264
LED Type		Common Anode			
Scan Type		Typical			
No. of Output Channel		16	16	16	16
Output Current Per Channel		2~45mA	2~45mA	0.5~20mA	0.5~20mA
Sustaining Output Voltage		7V			
Excellent Output Current Accuracy	Between Channels	<±2.5% (typ.)	<±1.5% (typ.)	<±1.5% (typ.)	<±1.5% (typ.)
	Between ICs	<±3.0% (typ.)	<±1.5% (typ.)	<±1.5% (typ.)	<±1.5% (typ.)
Embedded MOSFET		-	-	-	-
Error Detection	LED Open	●	●	●	●
	LED Short	●	-	-	-
Current Gain		8-bit	6-bit	6-bit	6-bit
PWM Enhancement		●	-	-	●
GCLK Multiplier		-	●	●	●
Solving 7 Common Problems *		●	●	●	●
Intelligent Power Saving		●	●	●	●
S-PWM		13/14-bit	13/14/15/16-bit	13/14-bit	13/14/15/16-bit
Scan Design		Up to 8-scan	Up to 8-scan	Up to 32-scan	Up to 64-scan
RoHS Compliant Package		SSOP24	SSOP24	SSOP24	SSOP24
		QFN24	QFN24	QFN24	QFN24
Major Applications		Time-Multiplexing LED Display			

* 7 Common Problems: Ghosting / High Contrast Interference / Color Shift / Non-uniformity (IC Controlled) / Dim Line at the 1st Scan Line / Gradient Dim Line / Dead Pixel Isolation

SRAM Embedded S-PWM LED Driver

		MBI5268	MBI5353	MBI5359	MBI5850	MBI5864
LED Type		Common Anode				
Scan Type		Typical			Scan-sharing	
No. of Output Channel		16	48	48	12	48
Output Current Per Channel		3.0~30mA	0.5~20mA	0.5~20mA	0.5~20mA	0.1~5mA
Sustaining Output Voltage		7V	17V	17V	7V	
Excellent Output Current Accuracy	Between Channels	<±2.5% (typ.)	<±1.5% (typ.)	<±1.5% (typ.)	<±1.5% (typ.)	<±1% (typ.)
	Between ICs	<±3.0% (typ.)	<±1.5% (typ.)	<±1.5% (typ.)	<±1.5% (typ.)	<±1% (typ.)
Embedded MOSFET		-	-	32	4	16
Error Detection	LED Open	●	●	●	●	●
	LED Short	-	●	●	●	●
Current Gain		6-bit	Global/RGB	Global/RGB	Global/RGB	Global/RGB
PWM Enhancement		●	-	●	●	●
GCLK Multiplier		●	●	●	●	●
Solving 7 Common Problems *		●	●	●	●	●
Intelligent Power Saving		●	●	●	●	●
S-PWM		13/14-bit	13/14/15/16-bit	13/14/15/16-bit	13/14/15/16-bit	13/14/15/16-bit
Scan Design		Up to128-scan	Up to 32-scan	Up to 32-scan	Up to 32-scan	Up to 64-scan
RoHS Compliant Package		SSOP24	QFN56	BGA104	SSOP24	QFN88
		-	-	-	-	BGA90
Major Applications		Time-Multiplexing LED Display				

* 7 Common Problems: Ghosting / High Contrast Interference / Color Shift / Non-uniformity (IC Controlled) / Dim Line at the 1st Scan Line / Gradient Dim Line / Dead Pixel Isolation

SRAM Embedded S-PWM LED Driver

		MBI5754 (Patented)	MBI5759 (Patented)	MBI5762 (Patented)	MBI5780 (Patented)
LED Type		Common Cathode			
Scan Type		Typical			Scan-sharing
No. of Output Channel		16	48	48	48
Output Current Per Channel		1~18mA	0.5~15mA	0.5~10mA	0.1~15mA
Sustaining Output Voltage		7V	7V	7V	7V
Excellent Output Current Accuracy	Between Channels	<±1.5% (typ.)	<±1.5% (typ.)	<±2.0% (typ.)	<±1% (Max)
	Between ICs	<±1.5% (typ.)	<±1.5% (typ.)	<±2.5% (typ.)	<±1% (Max)
Embedded MOSFET		-	32	-	20
Error Detection	LED Open	●	●	●	●
	LED Short	-	●	●	●
Current Gain		6-bit	Global/RGB	7-bit	Global/RGB
PWM Enhancement		●	●	PLUS	●
GCLK Multiplier		●	●	●	●
Solving 7 Common Problems *		●	●	●	●
Intelligent Power Saving		●	●	●	●
S-PWM		13/14/15/16-bit	13/14/15/16-bit	13/14/15/16-bit	14/15/16-bit
Scan Design		Up to 64-scan	Up to 32-scan	Up to 32-scan	Up to 90-scan
RoHS Compliant Package		SSOP24	BGA104	QFN64	QFN88
		QFN24	-	-	-
Major Applications		Time-Multiplexing LED Display			

MOSFET for Time-Multiplexing LED Display

	MBI5981	MBI5989
No. of Output Channel	8	16
MOSFET Type	NMOS	PMOS
Output Current Per Channel	2.5A	3.5A
Operation Voltage	3.3V ~ 5V	3.3V ~ 5V
ON Resistance	130m ohm	200m ohm
High Contrast Interference Elimination	●	●
Upper Ghosting Effect Elimination	●	●
LED Short-Caterpillar Elimination	●	●
RoHS Compliant Package	SSOP16	SSOP24
	QFN16	-
Major Applications	For Common Cathode LED Driver	For Common Anode LED Driver

SUCCESS STORY

The World's Largest Outdoor Centre-Hung Video Display at Bristol Motor Speedway (BMS), USA (Courtesy of digiLED & Go Vision)

S-PWM Technology

The Scrambled Pulse Width Modulation (S-PWM) technology enhances Pulse Width Modulation (PWM) by scrambling an image into several sub-images with the same color quality. Besides increasing the image refresh rate, this feature also supports flicker-free image and improves reliability when building a 16-bit grayscale LED display.

S-PWM LED Driver

		MBI5030	MBI5031	MBI5040	MBI5043
No. of Output Channel		16			
Output Current Per Channel		8~90mA		2~60mA	1~45mA
Sustaining Output Voltage		17V			
Excellent Output Current Accuracy	Between Channels	<±1.5% (typ.)			
	Between ICs	<±3% (typ.)			<±1.5% (typ.)
Error Detection	LED Open	●	●	●	-
	LED Short	-	-	●	-
Thermal Shutdown		-	-	●	-
Current Gain		8-bit		7-bit, 0%~100%	6-bit
GCLK Multiplier		-	-	-	●
Lower Ghosting Effect Elimination		-	-	-	●
S-PWM		12 /16-bit	12-bit	12 /16-bit	16-bit
Dot Correction		-	-	8-bit, Digital	-
RoHS Compliant Package		SOP24	SOP24	SOP24	SSOP24
		TSSOP24	TSSOP24	TSSOP24	QFN24
		QFN24	QFN24	QFN24	-
Major Applications		High Refresh Rate, High Grayscale LED Display			

Multi-Function LED Driver (PrecisionDrive™ / Share-I-O™)

Share-I-O™ Technology

Share-I-O™ technology features pin compatibility. Share-I-O™, additional functions can be added to LED drivers without adding extra pins and changing the printed circuit board (PCB) originally designed for conventional LED drivers.

Multi-Function LED Driver

		MBI5037	MBI5038	MBI5039
No. of Output Channel		16		
Output Current Per Channel		10~80mA	3~45mA	8~90mA
Sustaining Output Voltage		17V		
Excellent Output Current Accuracy	Between Channels	<±1.5% (typ.)		
	Between ICs	<±3% (typ.)	<±1.5% (typ.)	<±3% (typ.)
Error Detection	LED Open	●	●	●
	LED Short	●	●	●
	Leakage	●	●	-
Current Gain		-	●	●
Power Saving		●	●	-
RoHS Compliant Package		SOP24	SOP24	SOP24
		SSOP24	SSOP24	SSOP24
		-	-	QFN 24
Major Applications		Commercial LED Display, Message Sign, VMS Traffic Sign, Bus Sign		

Classic Constant Current (PrecisionDrive™) LED Driver

PrecisionDrive™ Technology

The PrecisionDrive™ technology enhances the characteristics of current output and current accuracy, allowing viewers to enjoy a clear and refined image on the LED display. Driver ICs with this technology has a ±1.5% current accuracy between output ports within each driver IC and a ±1.5% deviation between driver ICs. The current varied with LED forward voltage change is no more than 0.1% per volt while the current varied with supply voltage change and ambient temperature change is restricted to 1%.

Classic Constant Current (PrecisionDrive™) LED Driver

		MBI5025	MBI5026	MBI5035	MBI5124
No. of Output Channel		16			
Output Current Per Channel		1~45mA	5~90mA	3~45mA	1~25mA
Sustaining Output Voltage		17V			7V
Excellent Output Current Accuracy	Between Channels	<±1.5% (typ.)	<±3% (typ.)	<±1.5% (typ.)	<±1.5% (typ.)
	Between ICs	<±1.5% (typ.)	<±6% (typ.)	<±3% (typ.)	<±1.5% (typ.)
Lower Ghosting Effect Elimination		-	-	-	●
Low Knee Voltage		-	-	●	-
RoHS Compliant Package		SOP24	SOP24	SOP24	SOP24
		SSOP24	SSOP24	SSOP24	SSOP24
		-	P-DIP24	-	QFN24
		-	SP-DIP24	-	-
Major Applications		Commercial LED Display, Message Sign		Commercial LED Display (Low Power)	Commercial LED Display, Message Sign

Automotive Lighting

Driving Safety with Innovation

Macroblock has a series of LED driver ICs that passed AEC-Q100 for automotive lighting.

Automotive Lighting Driver IC

Switch and/or linear type drivers and controllers are targeted for LED lamps in vehicles. The optimized technical and protection features help strengthen system reliability for automobiles.

AEC-Q100 Automotive Lighting Driver

		MBI1838Q	MBI1841Q	MBI6034Q	MBI6657Q	MBI6659Q	MBI6665Q	MBI6671Q
Topology		Linear	Linear	Linear	Buck	Buck/ Const. Frequency	Multi-topology/ Const. Frequency	Multi-topology/ Const. Frequency
No. of Output Channel		8	8	12	-	-	-	-
Max. Channel Current		80mA	150mA	45mA	1.2A	2.5A	1.5A	By External MOSFET
Max. Sustaining Voltage		70V	50V	28V	45V	45V	71V	71V
Supply Voltage		8~40V	6~50V	6~24V	6~40V	5~45V	6~65V	5.4~65V
Switching on Resistance		-	-	-	0.3Ω	0.25Ω	0.27Ω	-
AEC-Q100		TSSOP24	QFN48	QFN24	SOP8	SOP8	TSSOP20	TSSOP14
Dimming Method	Digital	●	●	●	●	●	●	●
	Analog	-	-	-	●	●	●	●
	Built-in Pattern	-	●	-	-	-	-	-
Protection	LED Open/Short	●	● **	●	●	●	●	● *
	Thermal Fold-back	-	●	-	●	●	●	-
	OTP	●	●	-	●	●	●	●
	UVLO	-	●	●	-	●	●	●
	OCP	-	-	-	●	●	●	-
	Soft Start-up	-	-	-	-	●	●	-
RoHS Compliant Package		TSSOP24	QFN48	QFN24	SOP8	SOP8	TSSOP20	TSSOP14
Major Applications		Emblem Light	Emblem Light, DRL, Fog Light, Interior Light, Rear Light	Ambient Light, Rear Light	DRL, Fog Light, Interior Light, Rear Light	DRL, Fog Light, Interior Light, Rear Light	DRL, Headlight, Fog Light, Interior Light, Rear Light	Headlight, DRL, Fog Light

* LED short protection should be supported by external circuit

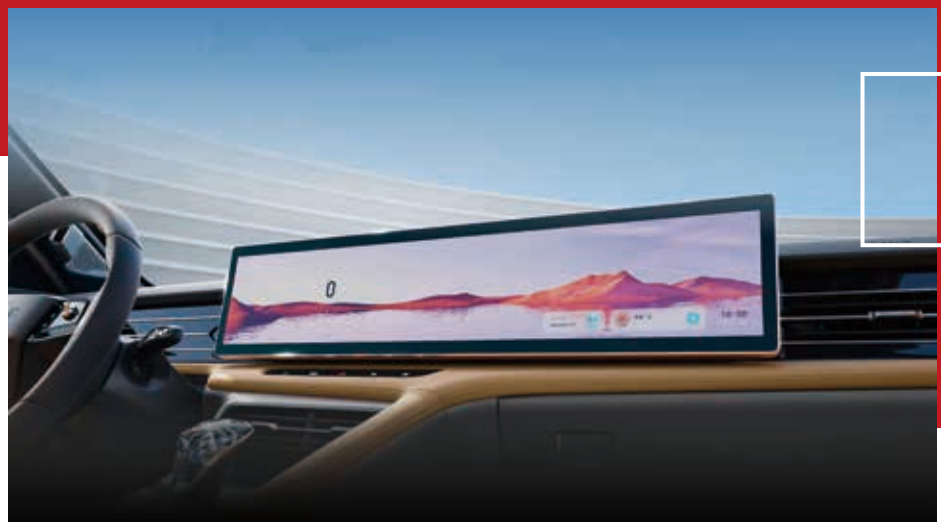
** LED short/open protections are only supported by certain patterns

AEC-Q100 Automotive Lighting Driver

		MBI5353Q	MBI6304Q	MBI6306Q	MBI6329Q	MBI6353Q
No. of Output Channel		48	4	6	48	48
Output Current Per Channel		2-20mA	3-70mA	0.1-10mA	4-40mA	4-100mA
Sustaining Output Voltage		17V	45V	16V	55V	24V
AEC-Q100		QFN56	QFN16	QFN16	QFN64	QFN68
Excellent Output Current Accuracy	Between channels	<±3.5% (max.)	<±2.0% (max.)	<±2.0% (max.)	<±3.0% (max.)	<±3.0% (max.)
	Between ICs	<±7.0% (max.)	<±3.0% (max.)	<±3.0% (max.)	<±3.0% (max.)	<±3.0% (max.)
Scan Design		Up to 32-scan	-	-	Up to 8-scan	Up to 4-scan
Dimming Method		13/14/15/16-bit PWM	12-bit PWM 4-bit PAM	8-bit PAM	12/13/14-bit PWM	12-bit PWM 12-bit Hybrid 10-bit PAM
Current Gain		3-bit/Global 7-bit/Group	8-bit	2-bit/Global	8-bit	8-bit
Error Detection	LED Open	●	●	●	●	●
	LED Short	●	●	●	●	●
Thermal Protection		-	●	●	●	●
RoHS Compliant Package		QFN56 8×8	QFN16 3×3	QFN16 3×3	QFN-64 9×9	QFN68 8×8
Major Applicaiotns		Full-width Rear Light, Ambient Light	Interior Light, Ambient Light	Interior Light, Ambient Light	Interior Light, Turn Indicator, Rear Light	ADB

Automotive Display Driver IC

L9 interactive Safe Driving Display (Courtesy of Li Auto)



Roewe RX5 27-inch 4K In-vehicle Display (Courtesy of SAIC Motor)

SUCCESS STORY

AEC-Q100 Automotive FALD Backlight Driver

		MBI5353Q	MBI6304Q	MBI6306Q	MBI6329Q	MBI6353Q
No. of Output Channel		48	4	6	48	48
Output Current Per Channel		2-20mA	3-70mA	0.1-10mA	4-40mA	4-100mA
Sustaining Output Voltage		17V	45V	16V	55V	24V
AEC-Q100		QFN56	QFN16	QFN16	QFN64	QFN68
Excellent Output Current Accuracy	Between channels	<±3.5% (max.)	<±2.0% (max.)	<±2.0% (max.)	<±3.0% (max.)	<±3.0% (max.)
	Between ICs	<±7.0% (max.)	<±3.0% (max.)	<±3.0% (max.)	<±3.0% (max.)	<±3.0% (max.)
Scan Design		Up to 32-scan	-	-	Up to 8-scan	Up to 4-scan
Dimming Method		13/14/15/16-bit PWM	12-bit PWM 4-bit PAM	8-bit PAM	12/13/14-bit PWM	12-bit PWM 12-bit Hybrid 10-bit PAM
Current Gain		3-bit/Global 7-bit/Group	8-bit	2-bit/Global	8-bit	8-bit
Error Detection	LED Open	●	●	●	●	●
	LED Short	●	●	●	●	●
Thermal Protection		-	●	●	●	●
RoHS Compliant Package		QFN56 8×8	QFN16 3×3	QFN16 3×3	QFN-64 9×9	QFN68 8×8
Major Applicaiotns		Digital Cockpit Platform	Digital Cockpit Platform	Digital Cockpit Platform	Digital Cockpit Platform	HUD, Digital Cockpit Platform

AEC-Q100 Automotive Interactive LED Matrix Display Driver

		MBI5353Q	MBI5780Q
No. of Output Channel		48	48
Output Current Per Channel		2-20mA	0.1~15mA
Sustaining Output Voltage		17V	7V
AEC-Q100		QFN56	QFN88
Excellent Output Current Accuracy	Between Channels	<±3.5% (max.)	<±1% (Max)
	Between ICs	<±7.0% (max.)	<±1% (Max)
Scan Design		Up to 32-scan	Up to 90-scan
Dimming Method		13/14/15/16-bit PWM	14/15/16-bit PWM
Current Gain		3-bit/Global 7-bit/Group	6-bit
Error Detection	LED Open	●	●
	LED Short	●	●
Thermal Protection		-	●
RoHS Compliant Package		QFN56 8×8	QFN88 10×10
Major Applications		Interactive LED Matrix Display, Digital Cockpit Platform	Interactive LED Matrix Display, Digital Cockpit Platform

MOSFET

	MBI5989Q
No. of Output Channel	16
MOSFET Type	PMOS
Output Current Per Channel	2.0A
Operation Voltage	3.3V ~ 5V
ON Resistance	200m ohm
AEC-Q100	SSOP24
High Contrast Interference Elimination	●
Upper Ghosting Effect Elimination	●
Short-LED Color Stripe Elimination	●
RoHS Compliant Package	SSOP24
Major Applications	For Common Anode LED Driver

Full-Array Local Dimming LED Backlight

Macroblock's solution can realize thousands of zones local dimming far beyond the conventional solutions which only support tens of zones.


Gaming Laptop / Gaming Tablet


VR Device


Gaming TV


Gaming Monitor

Full-Array Local Dimming LED Backlight Driver IC

High Dynamic Range (HDR) is a new standard for the new era display equipment. Full-Array Local Dimming (FALD) is a necessary technology for LCD to meet HDR requirements. Macroblock introduces several FALD LED backlight driver ICs designed to cover every size LCD to integrate time-multiplexing architecture.

FALD Backlight LED Driver

		MBI6304	MBI6306	MBI6323	MBI6328	MBI6329	MBI6334	MBI6349	MBI6353	MBI5353
No. of Output Channel		4	6	32	48	48	64	26	48	48
Transmission Interface		SPI-like	SPI-like	SPI W/Daisy Chain	SPI W/Daisy Chain	SPI W/Daisy Chain	SPI W/Daisy Chain	SPI W/Daisy Chain	SPI W/Daisy Chain	SPI-like
Transmission Method	Burst Mode	-	-	●	-	●	●	●	●	-
Output Current Per Channel		3~70mA	0.1~10mA	2.2-46.3mA	4~40mA	4~40mA	5~30mA	5~30mA	4~100mA	0.5-20mA
Sustaining Output Voltage		45V	16V	16V	55V	55V	17V	17V	24V	17V
Excellent Output Current Accuracy	Between Channels	<±2.0% (max.)	<±2.0% (max.)	<±2.0% (max.)	<±3.0% (max.)	<±3.0% (max.)	<±3.0% (max.)	<±2.0% (max.)	<±3.0% (max.)	<±1.5% (Typ.)
	Between ICs	<±3.0% (max.)	<±3.0% (max.)	<±2.5% (max.)	<±3.0% (max.)	<±3.0% (max.)	<±3.0% (max.)	<±2.0% (max.)	<±3.0% (max.)	<±1.5% (Typ.)
Scan Design		-	-	Up to 16-scan	Up to 8-scan	Up to 8-scan	Up to 8-scan	Up to 8-scan	Up to 4-scan	Up to 32-scan
Embedded MOSFET		-	-	16	-	-	-	-	-	-
Dimming Method		12-bit PWM 4-bit PAM	8-bit PAM	10/12-bit PWM	12/13/14-bit PWM	12/13/14-bit PWM	12-bit PWM 10-bit PAM	12-bit PWM 12-bit PAM	12-bit PWM 10-bit PAM	13/14/15/16-bit PWM
Dynamic-Sync		●	●	●	-	●	●	●	●	-
Current Gain		8-bit	2-bit/Global	8-bit	8-bit	8-bit	8-bit	8-bit	8-bit	Global/RGB
Feedback Control		-	-	●	●	●	●	-	●	-
Error Detection	LED Open	●	●	●	●	●	●	●	●	●
	LED Short	●	●	●	●	●	●	●	●	●
Thermal Protection		●	●	●	●	●	●	●	●	-
RoHS Compliant Package		WLCSP-24 1.76×1.76	WLCSP-16 1.07×1.07	QFN-64 7×7	QFN-64 9×9	QFN-64 9×9	BGA 5×11	WLCSP-52 2.2×6	QFN-68 8×8	QFN-56 8×8
		QFN-16 3×3	QFN-16 3×3	-	-	-	-	-	-	-
Major Applications		Monitor, TV	Laptop, Tablet, Watch, Device Protable	Laptop, Tablet, Watch, Device Protable	Monitor, TV	Monitor, TV	Laptop, Tablet	Laptop, Tablet	Monitor, TV	Automotive, Backlight

LED Lighting

Illumination as a Service

Look no further if you're finding the next driver IC to be used in your LED lighting products. We are humbled by our worldwide customers' support and pledge to continue to improve our products and service.

LED Driver for General LED Lighting

DC/DC converters and AC/DC controllers are specifically designed for LED lighting applications that require large power consumption. The constant current and high power efficiency meet the safety and reliability standards required for LED lighting applications.

All-Ways-On™ LED Driver

		MBI1801	MBI1802	MBI1804	MBI1816	MBI1824	MBI1828	MBI1838
Topology		Linear						
No. of Output Channel		1	2	4	16	4	8	8
Excellent Output Current Accuracy	Between Channels (typ.)	-	1%		3%	1%		
	Between ICs (max.)	6%						
Output Current Per Channel		50mA~1.2A	40~360mA	240mA	60mA	120mA	60mA	80mA
Sustaining Output Voltage		17V				50V		70V
Supply Voltage		5V				8~40V		
Dimming Method	Digital	●	●	●	●	●	●	●
	Analog	-	-	-	-	-	-	-
Protection	Thermal Shutdown	●	●	●	●	-	●	●
	Thermal Error Flag	-	●	-	-	-	●	-
	LED Open/ Short	-	-	-	-	-	●	●
	Error Detection	-	-	-	-	-	●	●
RoHS Compliant Package		TO265	SOP8	SOP8	TSSOP20	SOP8	TSSOP16	TSSOP24
		-	-	-	-	-	QFN24	-
Major Applications		LED Lighting, Automotive Lighting						

DC/DC Converter

		MBI6646	MBI6651	MBI6652	MBI6653	MBI6655	MBI6656	MBI6657	MBI6658	MBI6659	MBI6661	MBI6662
Topology		Buck / Hysteretic PFM			Buck	Buck / Hysteretic PFM				Buck/ Const. Frequency	Buck / Hysteretic PFM	PFM(Const. FSW)
Common Anode		●	-	-	-	-	-	-	●	-	-	●
Max. Output Current Per Channel		1A		750mA	1A			1.2A*	2A	2.5A	1A	2A
Max. Sustaining Voltage		40V		32V	65V	40V	45V	45V	36V	45V	75V	75V
Supply Voltage		6~36V	9~36V	6~30V	4.5~65V	6~36V	6~40V	6~40V	4.5~32V	5~45V	9~60V	4.5~65V
Switch on Resistance (Typ.)		0.6Ω	0.45Ω		0.3Ω			0.25Ω	0.12Ω	0.25Ω	0.35Ω	0.2Ω
Dimming method	Digital	●	●	●	●	●	●	●	●	●	●	●
	Analog	●	-	-	●	-	●	●	-	-	-	-
Protection	LED Open	●	●	●	●	●	●	●	●	●	●	●
	LED Short	●	●	●	●	●	●	●	-	●	●	●
	Thermal Shutdown	●	●	●	●	●	●	●	●	●	●	●
	Start-up	●	●	●	●	●	●	●	-	-	●	●
	UVLO	●	●	-	●	-	●	●	●	●	●	●
	OCP/OCL	●	-	-	●	●	●**	●	-	●	●	●
	Thermal Fold-back	-	-	-	-	-	-	●	-	●	-	-
	OTP Error FLAG	-	-	-	-	-	-	-	●	-	-	-
	OCP Error FLAG	-	-	-	-	-	-	-	●	-	-	-
	Soft Start-up	-	-	-	-	-	-	-	-	●	-	-
RoHS Compliant Package		SOP8	TO252	MSOP8	SOP8	SOP8	TO252	SOT89	SOP8	SOP8	TO252	SOP10
		SOT89	MSOP8	SOT23	-	SOT89	SOP8	SOT23	-	-	SOP8	-
		SOT23	SOT23	-	-	-	SOT89	-	-	-	-	-
		-	-	-	-	-	SOT23	-	-	-	-	-
Major Applications		MR11, MR16, Flood Light, PAR Light, Wall Wash Light, Stage Light, Panel Light, Emergency Lighting, Street Light, Tunnel Lighting, High Power LED Lighting, Automotive Lighting										

* 1.2A for SOT89 package only and 1A for SOT23 Package.

** Protection feature may vary from different versions.

DC/DC Converter

		MBI6663	MBI6664	MBI6665
Topology		Buck / Hysteretic PFM	Buck / Hysteretic PFM	Multi-topology / Const. Frequency
Common Anode		-	●	-
Max. Output Current Per Channel		1A	2A	1.5A
Max. Sustaining Voltage		75V	71V	71V
Supply Voltage		6~65V	4.5~65V	6~65V
Switch on Resistance (Typ.)		0.3Ω	0.2Ω	0.27Ω
Dimming method	Digital	●	●	●
	Analog	●	-	●
Protection	LED Open	●	●	●
	LED Short	●	●	●
	Thermal Shutdown	●	●	●
	Start-up	●	●	-
	UVLO	●	●	●
	OCP/OCL	●	●	●
	Thermal Fold-back	-	-	●
	OTP Error FLAG	-	●	●
	OCP Error FLAG	-	●	●
	Soft Start-up	-	-	●
RoHS Compliant Package		TO252	SOP8	TSSOP20
		SOP8	-	QFN20
		SOT89	-	-
Major Applications		MR11, MR16, Flood Light, PAR Light, Wall Wash Light, Stage Light, Panel Light, Emergency Lighting, Street Light, Tunnel Lighting, High Power LED Lighting, Automotive Lighting		

DC/DC Controller

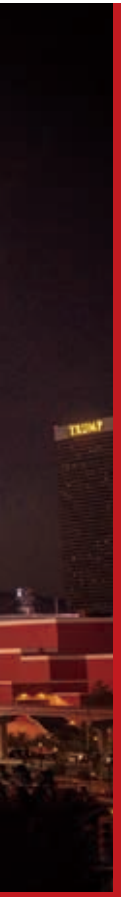
		MBI6671	MBI6672	MBI6673
Topology		Multi-topology / PFM	Constant Off Time with Peak Current Detection	Single Inductor Multi Output / PFM
Max. Output Current Per Channel		By External MOSFET		
Supply Voltage		4.5~65V	6~60V	9~55V
Dimming Method	Digital	●	●	-
	Analog	●	-	-
	Shunt Dimming	-	●	●
Protection	LED Open	● *	-	●
	LED Short	● *	-	-
	Thermal Shutdown	●	●	●
	OVP	●	-	-
	UVLO	●	●	●
	OCP	-	-	●
RoHS Compliant Package		TSSOP14	TSSOP14	TSSOP24
Major Applications		High Power LED Lighting, Automotive Lighting	High Power LED Lighting, Stage Lighting	

* LED open /short status can be reported by the FLT pin

SUCCESS STORY

PHOTO CREDIT: MSG ENTERTAINMENT

MSG Sphere, the World's Largest LED Display with a Spherical Structure in Las Vegas, USA (Courtesy of SACO Technologies)



RGB Lighting

Including RGB LED drivers for architectural lighting and backlight & lighting solutions for consumer electronics.

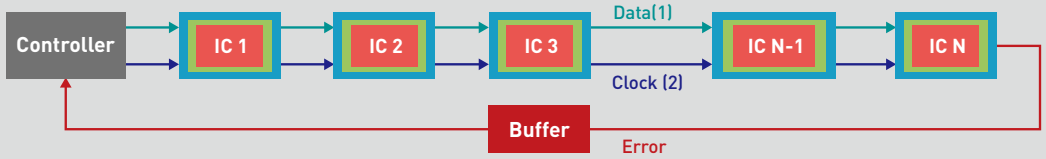
RGB LED Driver for Architectural Lighting

Bi-Directional Transmission

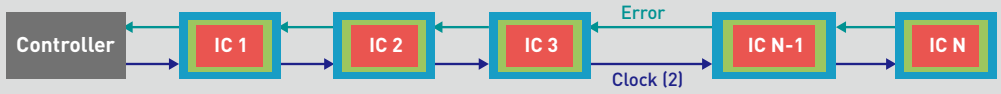
- Data transmission mode: forward transmission
- Error report mode: reverse transmission

In traditional designs, the Error report feature is achieved by connecting one additional wire from the last IC to the controller and a signal buffer. With I/O bi-directional transmission, the same wire connecting the controller to the ICs is used to report information back to the control system. This not only improves communication between control systems and light fixtures but also saves wire costs.

Traditional Daisy-Chain Error Report

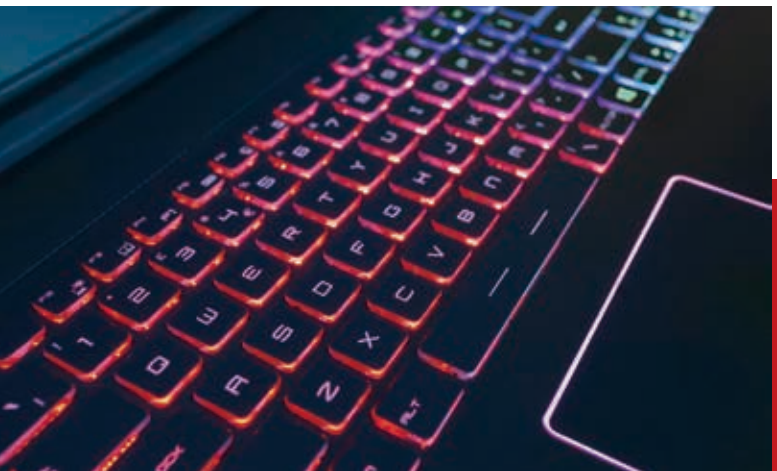


I/O Reverse Error Report



RGB LED Driver

		MBI6023	MBI6024	MBI6033	MBI6034	MBI6030
No. of Output Channel		3×4				3×1
Transmission Interface	Topology	2-Wire				2-Wire
	Clock Integrity	Clock Inversion				Clock Regeneration
	Bi-directional	-	-	-	●	-
Constant Output Current Range Per Channel		3~45mA				5~150mA
Sustaining Output Voltage		17V		28V		40V
Supply Voltage		3~5.5V		3~5.5V/6~24V		7~30V
Built-in LDO		-	-	●	●	●
S-PWM		16-bit				16/10-bit
PWM		●	●	●	●	●
Dot Correction		-	8/6-bit	-	-	6-bit
Current Gain		-	-	●	●	-
Error Detection	LED Open	-	-	-	●	-
	LED Short	-	-	-	●	-
	Wire Disconnection	-	-	-	●	-
	Thermal Protection	-	-	-	-	●
RoHS Compliant Packge		SSOP24	SSOP24	SSOP24	SSOP24	SSOP16
		QFN24	QFN24	QFN24	QFN24	QFN24
		-	-	TSSOP24	TSSOP24	-
Major Applications		LED Strip, Mesh Display				LED Cluster



AMUSE LED Driver

Professional RGB LED Backlight & Lighting Solution for Consumer Electronics

- SPI & I^2C control interface
- Excellent output current accuracy enables precise color lighting
- Built-in auto breath lighting function with gamma correction

AMUSE LED Driver

		MBIA043	MBIA045	MBIA128
No. of Output Channel		16	16	12
Control Interface		Proprietary SPI-like	Proprietary SPI-like	SPI 15MHz
Embedded MOSFET		-	-	4
Scan Type		Static	Static	Scan-sharing
Scan Design		-	-	Up to 20-scan
LED Matrix Configuration		-	-	Up to 400 RGB pixels
Output Current Per Channel		2~45mA	1~45mA	5~40mA
Output Current Accuracy	Between Channels	<±1.5% (typ.)	<±2.0% (typ.)	<±1.5% (typ.)
	Between IC Devices	<±3.0% (typ.)	<±2.5% (typ.)	<±2.5% (typ.)
Supply Voltage		3V ~ 5.5V	3.3V ~ 5V	5V
I/O Level		V_{DD}	V_{DD}	3.3V / 5V Selectable
Sustaining Output Voltage		17V	17V	7V
PWM		10-bit	16 /10-bit	10 / 8-bit
Current Gain		R-ext	6-bit	8-bit
Ghosting Effect Elimination		-	●	●
Error Detection	LED Open	-	-	●
	LED Short	-	-	●
	LED Pixel Short	-	-	●
EMI Noise Reduction	Channel Output Shift	-	●	●
	PWM Forward/Backward Counting	●	●	●
	Output Slew Rate Control	-	-	●
	PWM Enhancement	-	-	●
Protection	Thermal	-	-	●
	Over Current	-	-	●
Intelligent Power Saving		-	-	●
Auto Breath Function		-	-	●
RoHS Compliant Package		SSOP24	SSOP24	TSSOP28
		-	QFN24	QFN28
Major Applications		LED Lighting for Gaming Keyboard, Home Appliance	LED Lighting for Gaming Keyboard, Home Appliance	LED Lighting for Gaming Keyboard, Home Appliance, IoT Device, MIDI Controller