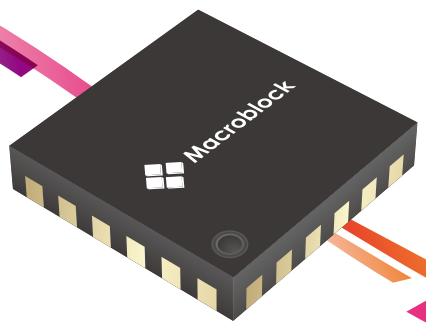
Macroblock

PRODUCT CATALOG

LED Driver IC Expert

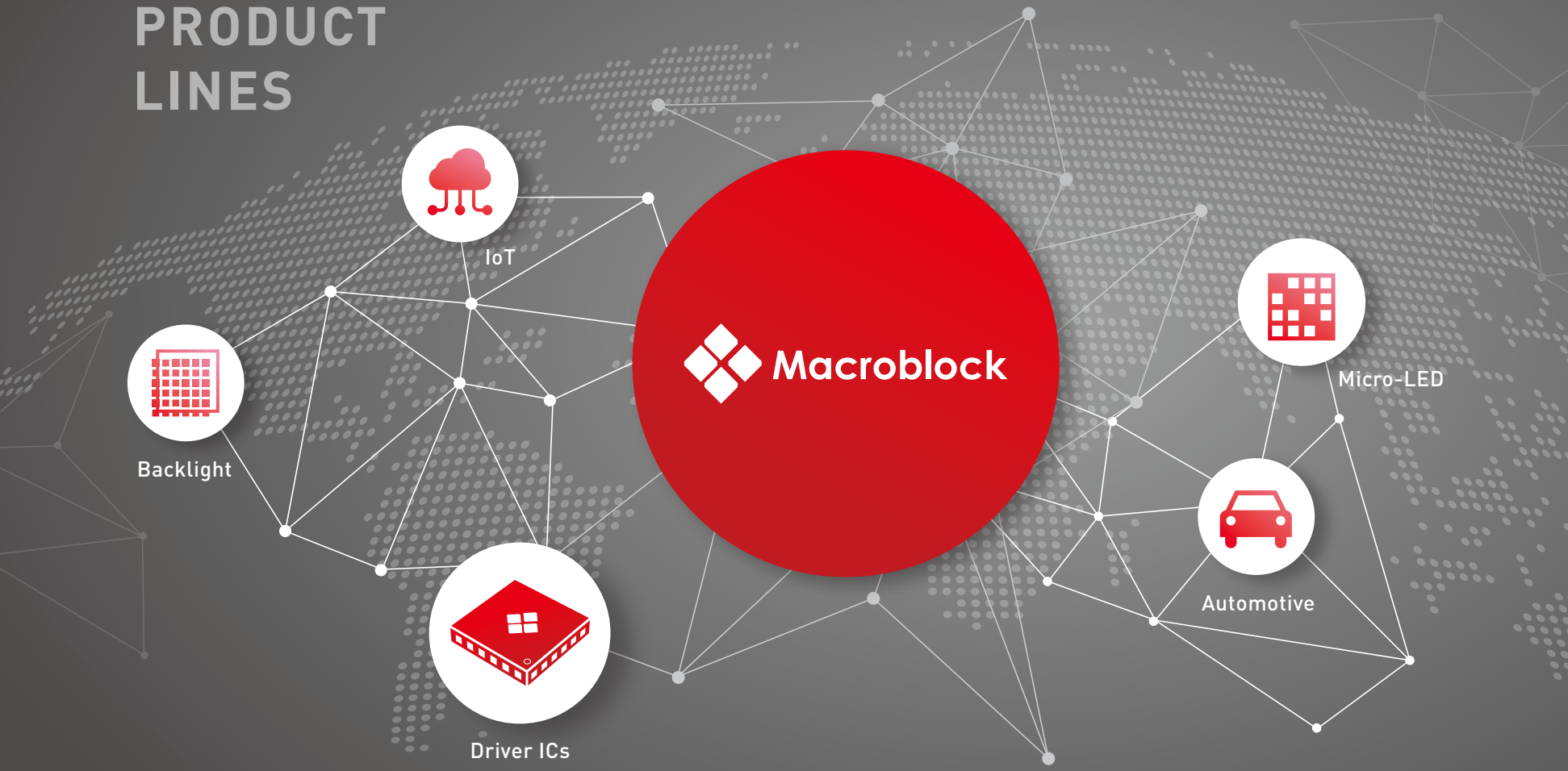


About Macroblock

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 opto-electronic applications and power management.

Not only have our drivers been used for the 2008 Beijing Olympics and Shanghai Expo 2010, whether it is a display found in Times Square, NYC, USA or in Tokyo Dome, Japan, Macroblock's driver ICs have been the preferred option due to our performance and reliability.

PRODUCT LINES



CONTENTS

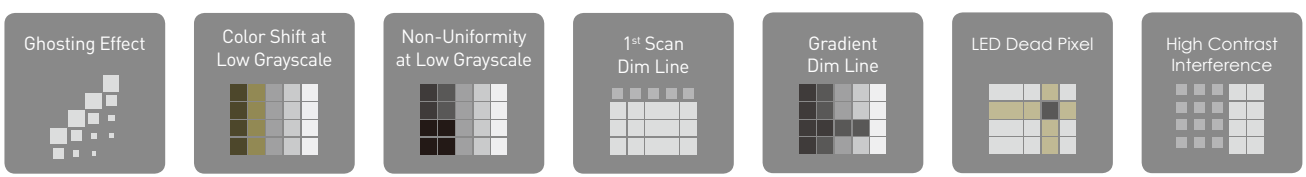
LED Display

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

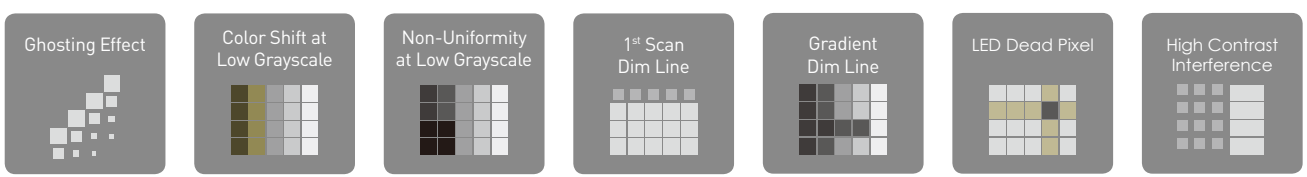
Moonshine XR Studio, Taiwan

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	MBI5262	MBI5253	MBI5264	MBI5265	MBI5754 (for common cathode LED)
MOSFETs	MBI5989	MBI5989	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 16-scan	Up to 32-scan	Up to 64-scan	Up to 96-scan	Up to 64-scan
Intelligent Power Saving	Dynamic+	Dynamic+	Dynamic+	Dynamic+	Dynamic+	Dynamic+
LED Failure Prediction	-	-	-	-	-	-
Board Level Circuitry	Regular					
Output Current	2mA-45mA@V_{DD}=5V	4mA-60mA@V_{DD}=3.3V	0.5mA-20mA@V_{DD}=5V	0.5mA-20mA@V_{DD}=4.2V	0.5mA-20mA@V_{DD}=4.2V	1.0mA-18mA@ V_{DD}=2.8V&3.8V
Recommended Pixel Pitch Range	4mm~12mm	2mm~16mm	1.2mm~6mm	1mm~4mm	0.9mm~1.8mm	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 300		Hawkeye 350
Solution	Fine Pitch			Ultra fine pitch, mini-LED, micro-LED		
Driver IC	MBI5353	MBI5762 (for common cathode LED)	MBI5850	MBI5759 (for common cathode LED)	MBI5359	MBI5864
MOSFETs	MBI5989	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 32-scan	Up to 32-scan		Up to 64-scan
Intelligent Power Saving	Dynamic	Dynamic+	Dynamic+	Dynamic+	Dynamic+	Dynamic+
LED Failure Prediction	-	-	-	●	●	●
Board Level Circuitry	Simplified	Simplified	Simplified and Modular	Simplified and Modular		Simplified and Modular
Output Current	0.5mA-20mA@ V_{DD}=5V	0.5mA-10mA@ V_{DD}=3.8V	0.5mA-20mA@V_{DD}=4.2V	0.5mA-15mA@ V_{DD}=2.8V&3.8V	0.5mA - 20mA@ V_{DD}=4.2V	0.1mA - 5mA@V_{DD}=3.3V&4.2V
Recommended Pixel Pitch Range	0.8mm~4mm	1.2mm~4mm	1.5mm~6mm	0.6mm~1.5mm	0.6mm~1.5mm	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.

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

SUCCESS STORY

SRAM Embedded S-PWM LED Driver

		MBI5251	MBI5253	MBI5262	MBI5264	MBI5265	MBI5268	MBI5269
LED Type		Common anode						
Scan Type		Typical						
No. of Output Channel		16	16	16	16	16	16	16
Output Current Per Channel		2~45mA	0.5~20mA	4~60mA	0.5~20mA	1.0~30mA	3.0~30mA	20~60mA
Sustaining Output Voltage		7V						
Excellent Output Current Accuracy	Between Channels	<±1.5% (typ.)		<±2.5% (typ.)	<±1.5% (typ.)		<±2.5% (typ.)	
	Between ICs	<±1.5% (typ.)		<±3.0% (typ.)	<±1.5% (typ.)		<±3.0% (typ.)	
Embedded MOSFET		-	-	-	-	-	-	-
Error Detection	LED Open	●	●	●	●	●	●	●
	LED Short	-	-	-	-	-	-	-
Current Gain		6-bit	6-bit	6-bit	6-bit	6-bit	6-bit	6-bit
PWM Enhancement		-	-	●	●	●	●	●
GCLK Multiplier		●	●	●	●	●	●	●
Solving 7 Common Problems *		●	●	●	●	●	●	●
Intelligent Power Saving		●	●	●	●	●	●	●
S-PWM		13/14/15/16-bit	13/14-bit	13/14/15/16-bit	13/14/15/16-bit	13/14/15/16-bit	13/14-bit	13/14-bit
Scan Design		Up to 8-scan	Up to 32-scan	Up to 16-scan	Up to 64-scan	Up to 96-scan	Up to128-scan	Up to 96-scan
RoHS Compliant Package		SSOP24	SSOP24	SSOP24	SSOP24	SSOP24	SSOP24	SSOP24
		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

		MBI5353	MBI5359	MBI5850	MBI5864	MBI5754 (Patented)	MBI5759 (Patented)	MBI5762 (Patented)
LED Type		Common anode				Common cathode		
Scan Type		Typical		Scan-sharing		Typical		
No. of Output Channel		48		12	48	16	48	48
Output Current Per Channel		0.5~20mA		0.5~20mA	0.1~5mA	1~18mA	0.5~15mA	0.5~10mA
Sustaining Output Voltage		17V		7V		7V	17V	7V
Excellent Output Current Accuracy	Between Channels	<±1.5% (typ.)			<±1% (typ.)	<±1.5% (typ.)		<±2.0% (typ.)
	Between ICs	<±1.5% (typ.)			<±1% (typ.)	<±1.5% (typ.)		<±2.5% (typ.)
Embedded MOSFET		-	32	4	16	-	32	-
Error Detection	LED Open	●	●	●	●	●	●	●
	LED Short	●	●	●	●	-	●	●
Current Gain		Global/RGB				6-bit	Global/RGB	7-bit
PWM Enhancement		-	●	●	●	●	●	●+
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	13/14/15/16-bit	13/14/15/16-bit	13/14/15/16-bit	13/14/15/16-bit
Scan Design		Up to 32-scan	Up to 32-scan	Up to 32-scan	Up to 64-scan	Up to 64-scan	Up to 32-scan	Up to 32-scan
RoHS Compliant Package		QFN56	BGA104	SSOP24	QFN88	SSOP24	BGA104	QFN64
		-	-	-	BGA90	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

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	170m ohm	180m ohm
High Contrast Interference Elimination	●	●
Upper Ghosting Effect Elimination	●	●
Short-LED Color Stripe 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

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.


60
km/h
500m
self-driving
mode

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

		MBI6322	MBI6328	MBI6329	MBI6334	MBI6353	MBI5353Q
No. of Output Channel		32	48	48	64	48	48
Transmission Interface	SPI	●	-	-	-	-	-
	SPI W/Daisy Chain		●	●	●	●	-
	Daisy Chain	-	-	-	-	-	●
Transmission Method	Burst Mode	●	-	●	●	●	-
Output Current Per Channel		2~15mA	4~40mA	4~40mA	5~30mA	4~100mA	2-20mA
Sustaining Output Voltage		17V	55V	55V	17V	24V	17V
Excellent Output Current Accuracy	Between Channels	<±2.0% (max.)	<±3.0% (max.)	<±3.0% (max.)	<±3.0% (max.)	<±3.0% (max.)	<±3.5% (max.)
	Between ICs	<±2.0% (max.)	<±3.0% (max.)	<±3.0% (max.)	<±3.0% (max.)	<±3.0% (max.)	<±7.0% (max.)
Scan Design		Up to 16-scan	Up to 8-scan	Up to 8-scan	Up to 8-scan	Up to 4-scan	Up to 32-scan
Embedded MOSFET		16	-	-	-	-	-
PWM Enhancement		●	-	-	●	●	-
S-PWM		10/11/12/13/14-bit	12/13/14-bit	12/13/14-bit	12-bit	12-bit	13/14/15/16-bit
Current Gain		3-bit	8-bit	8-bit	8-bit	8-bit	3-bit/Global 7-bit/Group
Feedback Control		●	●	●	●	●	-
Error Detection	LED Short	●	●	●	●	●	●
	LED Open	●	●	●	●	●	●
Thermal Protection		●	●	●	●	●	●
RoHS Compliant Package		QFN-64 7×7	QFN-64 9×9	QFN-64 9×9	BGA 5×11	QFN-68 8×8	QFN-56 8×8
Major Applications		Laptop, Tablet, Watch, Protable Device	Monitor, TV	Monitor, TV	Laptop, Tablet	Monitor, TV	CID

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 Driver

		MBI6657Q	MBI6659Q	MBI6665Q	MBI6671Q	MBI1841Q
Topology		Buck	Buck/ Const. Frequency	Multi-topolofy/ Const. Frequency	Multi-topology	Linear
Max. Channel Current		1.2A	2.5A	1.5A	By External MOSFET	150mA×8
Max. Sustaining Voltage		45V	45V	71V	71V	50V
Supply Voltage		6~40V	5~45	6~65V	5.4~65V	6~50V
Switching on Resistance		0.3Ω	0.25Ω	0.27Ω	-	-
AEC-Q100		SOP8	SOP8	TSSOP20	TSSOP14	QFN
Dimming Method	Digital	●	●	●	●	●
	Analog	●	●	●	●	-
	Built-in Pattern	-	-	-	-	●
Protection	LED Open/Short	●	●	●	● *	● **
	Thermal Fold-back	●	●	●	-	●
	OTP	●	●	●	●	●
	UVLO	-	●	●	●	●
	OCP	●	●	●	-	-
	Soft Start-up	-	●	●	-	-
RoHS Compliant Package		SOP8	SOP8	TSSOP20	TSSOP14	QFN
Major Applications		DRL/Fog Lamp/ Interior Lamp/ Rear Lamp	DRL/Fog Lamp/ Interior Lamp/ Rear Lamp	DRL/Fog Lamp/ Interior Lamp/ Head Lamp/Rear Lamp	Head Lamp/DRL/ Fog Lamp	DRL/Fog Lamp/ Interior Lamp/ Rear Lamp

		MBI5353Q
No. of Output Channel		48
Output Current Per Channel		2-20mA
Sustaining Output Voltage		17V
AEC-Q100		QFN
Excellent Output Current Accuracy	Between Channels	<±3.5% (max.)
	Between ICs	<±7.0% (max.)
Scan Design		Up to 32-scan
S-PWM		13/14/15/16-bit
Current Gain		3-bit/Global 7-bit/Group
Error Detection	LED Open	●
	LED Short	●
Thermal Protection		●
RoHS Compliant Package		QFN56 8×8
Major Applications		Brake Lamp/Rear Lamp/LED Display/ Backlight

* LED short protection should be supported by external circuit

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

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	MBI1812	MBI1816	MBI1824	MBI1828	MBI1838
Topology		Linear							
No. of Output Channel		1	2	4	2	16	4	8	8
Excellent Output Current Accuracy	Between Channels (typ.)	-	1%		3%	3%	1%		
	Between ICs (max.)	6%							
Output Current Per Channel		50mA~1.2A	40~360mA	240mA	360 mA	60mA	120mA	60mA	80mA
Sustaining Output Voltage		17V					50V		70V
Supply Voltage		5V			12V	5V	8~40V		
Dimming Method	Digital	●	●	●	-	●	●	●	●
	Analog	-	-	-	●	-	-	-	-
Protection	Thermal Shutdown	●	●	●	●	●	-	●	●
	Thermal Error Flag	-	●	-	-	-	-	●	-
	LED Open/ Short	-	-	-	-	-	-	●	●
	Error Detection	-	-	-	-	-	-	●	●
RoHS Compliant Package		TO265	SOP8	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	MBI6660	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	500mA	1A	2A
Max. Sustaining Voltage		40V		32V	65V	40V	45V	45V	36V	45V	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	TO252	SOP10
		SOT89	MSOP8	SOT23	MSOP8	SOT89	SOP8	SOT23	-	DFN10	SOP8	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-topolofy/ 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		

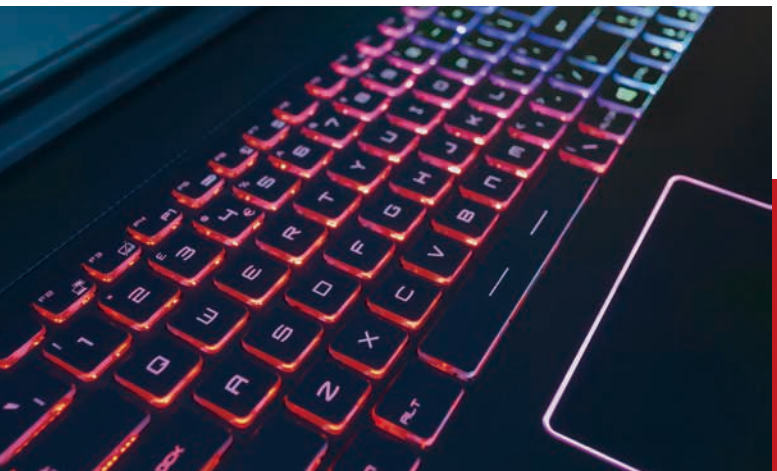
DC/DC Controller

		MBI6671	MBI6672	MBI6673	MBI6674
Topology		Multi-topology / PFM	Constant Off Time with Peak Current Detection	Single Inductor Multi Output / PFM	Constant Off Time with Peak Current Detection
Max. Output Current Per Channel		By External MOSFET			
Supply Voltage		4.5~65V	6~60V	9~55V	6~65V
Dimming Method	Digital	●	●	-	●
	Analog	●	-	-	-
	Shunt Dimming	-	●	●	●
Protection	LED Open	● *	-	●	●
	LED Short	● *	-	-	-
	Thermal Shutdown	●	●	●	●
	OVP	●	-	-	-
	UVLO	●	●	●	●
	OCP	-	-	●	-
RoHS Compliant Package		TSSOP14	TSSOP14	TSSOP24	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

RGB Lighting

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



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	MBIA129
No. of Output Channel		16	16	12	12
Control Interface		Proprietary SPI-like	Proprietary SPI-like	SPI 15MHz	SPI 15MHz
					I^2C 3.4MHz
Embedded MOSFET		-	-	4	8
Scan Type		Static	Static	Scan-sharing	Typical
Scan Design		-	-	Up to 20-scan	Up to 8-scan
LED Matrix Configuration		-	-	Up to 400 RGB pixels	Up to 32 RGB pixels
Output Current Per Channel		2~45mA	1~45mA	5~40mA	5~45mA
Output Current Accuracy	Between Channels	<±1.5% (typ.)	<±2.0% (typ.)	<±1.5% (typ.)	<±3.0% (typ.)
	Between IC Devices	<±3.0% (typ.)	<±2.5% (typ.)	<±2.5% (typ.)	<±6.0% (typ.)
Supply Voltage		3V ~ 5.5V	3.3V ~ 5V	5V	5V
I/O Level		V_{DD}	V_{DD}	3.3V / 5V Selectable	1.8V~5V
Sustaining Output Voltage		17V	17V	7V	5.5V
PWM		10-bit	16 /10-bit	10 / 8-bit	8-bit
Current Gain		R-ext	6-bit	8-bit	8-bit
Ghosting Effect Elimination		-	●	●	●
Error Detection	LED Open	-	-	●	●
	LED Short	-	-	●	●
	LED Pixel Short	-	-	●	-
EMI Noise Reduction	Channel Output Shift	-	●	●	Group output shift
	PWM Forward/Backward Counting	●	●	●	Only Forward
	Output Slew Rate Control	-	-	●	-
	PWM Enhancement	-	-	●	-
Protection	Thermal	-	-	●	●
	Over Current	-	-	●	-
Intelligent Power Saving		-	-	●	●
Auto Breath Function		-	-	●	-
RoHS Compliant Package		SSOP24	SSOP24	TSSOP28	QFN40
		-	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	LED lighting for gaming keyboard, home appliance, IoT device, MIDI controller

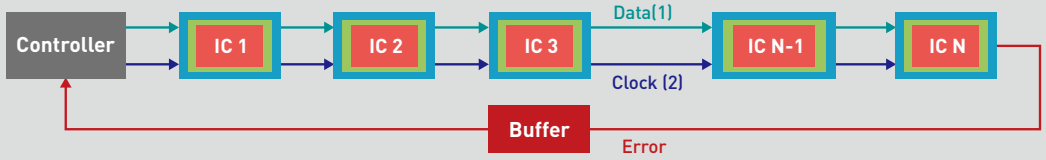
RGB LED Driver for Architectural Lighting

Bi-Directional Transmission

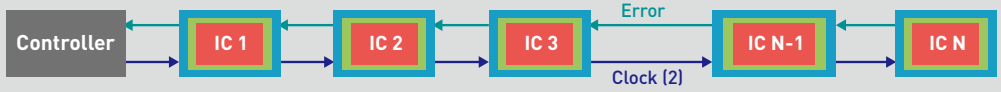
- Data transmission mode: forward transmission
- Error report mode: reverse transmission

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

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