



The real world of  
power electronics



Extend Your LED Value



### LED Driver IC Expert

Through the continuous innovations and the professional team support, Macroblock delivers leading technology to achieve excellent performance, reliability and flexibility.

Efora BVBA  
Elfde novemberwal  
Aniciuspark 13/2  
B-3700 Tongeren  
(belgium)

## About Macroblock

Macroblock was founded in June, 1999 in Hsinchu, Taiwan, and positions itself as a mixed-signal design house with special focus on the power management and opto-electronic applications. Macroblock was certified by ISO 9001:2000 in April, 2004.

Macroblock is now a leading LED driver provider and focuses on the LED driver design which contributes to ultimate LED performance for LED display and lighting applications. With continuous technology innovations, Macroblock has been successfully marketed over 500 worldwide customers and ranked 3rd in LED driver IC market by IMS Research In 2011.

Macroblock has developed the world' s first 16-bit PWM embedded LED driver with patented S-PWM technology which has been applied in world events, such as Opening Ceremony of 2008 Beijing Olympics and Expo 2010 Shanghai China. Aiming at future prospect of LED display and lighting market, Macroblock positions itself with outstanding technologies and solutions in LED display and lighting applications.



## Your Best LED Solution Provider

### Performance

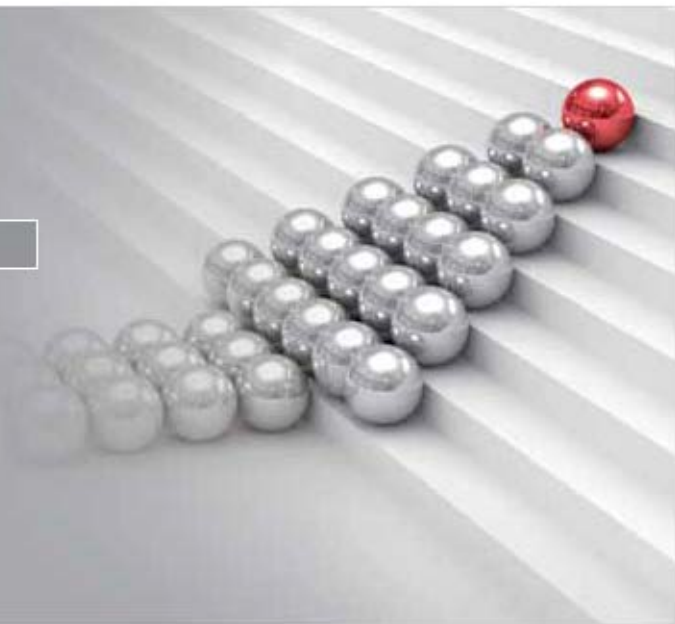
- Good Current Uniformity
- S-PWM Patented Technology
- Share-I-O™ Patented Technology

### Quality

- ISO 9001
- Product Reliability
- Package Reliability
- Process Reliability
- Supplier Quality Management

### Services

- Short Lead -Time
- Global Sales Channel
- Excellent After Service



**LED Display**

	8-Channel	16-Channel	24-Channel
Generic Constant Current LED Driver	MBI5167, MBI5168	MBI5025, MBI5026, MBI5035	—
Multi-Function LED Driver	MBI5169, MBI5170, MBI5171, MBI5137	MBI5037, MBI5039	MBI5324
S-PWM LED Driver	—	MBI5030, MBI5031, MBI5040, MBI5042, MBI5045, MBI5050, MBI5051, MBI5052, MBI5053	—

**Architectural Lighting**

	3-Channel	12-Channel
LED Driver for RGB Clusters	MBI6020, MBI6027, MBI6030, MBI6120	MBI6024, MBI6034

**LED Lighting**

DC/DC Converter	MBI6651, MBI6652, MBI6653, MBI6654, MBI6655, MBI6660, MBI6661, MBI6662				
DC/DC Controller	MBI6703, MBI6705				
AC/DC Controller	MBI6901, MBI6902, MBI6903, MBI6904, MBI6801, MBI6802, MBI6803				
Linear Regulator	1-Channel	2-Channel	4-Channel	8-Channel	16-Channel
	MBI1801	MBI1802, MBI1812	MBI1804	MBI1838	MBI1816





**Generic Constant Current  
LED Driver (PrecisionDrive™)**



**MBI5035**  
Low Knee Voltage LED Driver



## PrecisionDrive™ Technology

The PrecisionDrive™ LED Drivers are dedicated for LED displays. All the series exploits state-of-the-art PrecisionDrive™ technology to enhance the output characteristics and accuracy. The PrecisionDrive™ series features  $\pm 1.5\%$  current accuracy among output ports within a single driver IC, and  $\pm 1.5\%$  deviation among lots of driver ICs. The current varied with the LED forward voltage change is confined to 0.1% per volt. The current varied with supply voltage change and ambient temperature change is also restricted to 1%.

Tel: +886-3-578-0066 • Fax: +886-3-578-8834 • Website: [www.mblock.com.tw](http://www.mblock.com.tw) • Email: [marketing@mblock.com.tw](mailto:marketing@mblock.com.tw)

## Generic Constant Current LED Driver (PrecisionDrive™)

		MBI5167	MBI5168	MBI5025	MBI5026	MBI5035
No. of Output Channel		8		16		
Output Current per Channel		3~45mA	5~120mA	1~45mA	5~90mA	3~45mA
Sustaining Output Voltage		17V				
Power Saving(Low Knee Voltage)		—	—	—	—	●
Excellent Output Current Accuracy	Between Channels	<±1% (typ.)	<±1% (typ.)	<±1.5% (typ.)	<±1% (typ.)	<±3% (typ.)
	Between ICs	<±1% (typ.)	<±1% (typ.)	<±1.5% (typ.)	<±1% (typ.)	<±3% (typ.)
RoHS Compliant Packag	SOP16	●	●	—	—	—
	SSOP16	●	●	—	—	—
	SOP24	—	—	●	●	●
	SSOP24	—	—	●	●	●
	TSSOP24	—	—	●	—	—
	P-DIP24	—	—	—	●	—
	SP-DIP24	—	—	—	●	—
Major Applications		Commercial LED Panel, Message Sign				Power Saving LED Panel







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



**MB15037**

LED Driver Suitable for Traffic Sign Applications





## Share-I-O™ Technology

Share-I-O™ technology features pin compatibility. By means of the Share-I-O™ technique, additional functions can be added to LED drivers without adding any extra pins in package and without changing the printed circuit board originally designed for conventional LED drivers.

Tel: +886-3-578-0066 • Fax: +886-3-579-5534 • Website: [www.mblock.com.tw](http://www.mblock.com.tw) • Email: [marketing@mblock.com.tw](mailto:marketing@mblock.com.tw)

## Multi-Function LED Driver

		MBI5169	MBI5170	MBI5171	MBI5137	MBI5037	MBI5039	MBI5324
No. of Output Channel		8			16			24
Output Current per Channel		5~120mA			3~80mA	3~80mA	3~90mA	1~35mA
Sustaining Output Voltage		17V						
Excellent Output Current Accuracy	Between Channels	<±1% (typ.)			<±1.5% (typ.)			<±2% (typ.)
	Between ICs	<±1% (typ.)			<±3% (typ.)			<±4% (typ.)
Error Detection	LED Open	●	—	●	●	●	●	●
	LED Short	●	—	●	●	●	●	—
	Leakage Diagnosis	—	—	—	●	●	—	—
Current Gain		—	●	●	—	—	●	—
Power Saving Mode		—	—	—	●	●	—	—
RoHS Compliant Package	P-DIP16	●	●	●	—	—	—	—
	SOP16	●	●	●	●	—	—	—
	SSOP16	●	●	●	●	—	—	—
	SOP24	—	—	—	—	●	●	—
	SSOP24	—	—	—	—	●	●	—
	QFN 24	—	—	—	—	—	●	—
	LQFP48	—	—	—	—	—	—	●
Major Applications		Commercial LED Panel, Message Sign, VMS traffic Sign, Bus Sign						





**S-PWM LED Driver**  
(PrecisionDrive™ / Share-I-O™)



**MBI5053**

LED Driver Suitable for Scan Type LED Display Applications



## S-PWM Technology

The Scrambled-PWM(S-PWM) technology enhances Pulse Width Modulation by scrambling the image into several sub-images with the same color quality. The enhancement equivalently increases the image refresh rate. When building a 16-bit gray scale LED display, S-PWM avoids the flickers and improves the fidelity.

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## S-PWM LED Driver

		MBI5030	MBI5031	MBI5040	MBI5042	MBI5045	MBI5050	MBI5051	MBI5052	MBI5053	
No. of Output Channel		16									
Output Current per Channel		3~90mA		2~60mA	2~45mA		3~45mA	2~45mA			
Sustaining Output Voltage		17V									
Excellent Output Current Accuracy	Between Channels	<±1.5% (typ.)			<±3.0% (typ.)	<±1.5% (typ.)					
	Between ICs	<±3.0% (typ.)									
Error Detection	LED Open	●	●	—	●	—	—	●			
	LED Short	—	●	—	—	—	—	—			
	Thermal Protection	—	●	—	—	—	—	—			
Current Gain (12.5%~200%)		8-bit		7-bit,0%~100%	6-bit						
Power Saving(Low Knee Voltage)		—	—	—	—	●	—	—	—	—	
S-PWM		12/16-bit	12-bit	12/16-bit	16-bit		14/16-bit				
Scan-Type		—	—	—	—	—	Up to 1:8	Up to 1:8	Up to 1:16	Up to 1:32	
Visual Refresh Rate		3840Hz@GCLK=4MHz					>1000Hz@GCLK=16MHz				
Dot Correction		—	—	8-bit, Digital	—	—	—	—	—	—	
RoHS Compliant Package	SOP24	●	●	●	●	●	●	●	●	●	
	SSOP24	—	—	—	●	●	●	●	●	●	
	TSSOP24	●	●	●	●	—	—	—	—	—	
	QFN24	●	●	●	●	—	—	—	—	—	
Major Applications		High Refresh Rate / Gray Scale LED Panel					Time-multiplexing LED Panel				





## RGB LED Driver for Architectural Lighting



**MBI6120**

High Cost/Performance Ratio, One-Wire Transmission RGB LED Driver

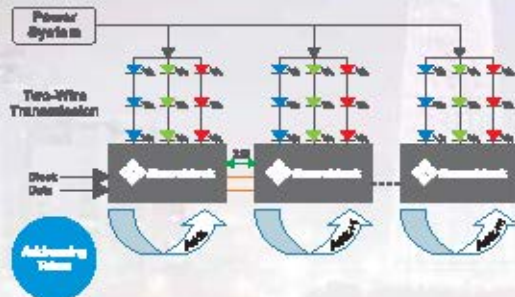


# Macroblock

## Two-Wire / Long Distance Transmission (2 Meters between 2 Clusters)

- **Simple** Two-wire transmission protocol to support 1,024 RGB clusters
- **Smart** A-Token™ (Addressing Token) topology with self-alignment addressing
- **Flexible** S-PWM technology reduces data transmission bandwidth
- **Reliable** Clock regeneration and clock inversion assure signal integrity after long distance transmission

## A-Token™ Topology



Tel: +886-3-579-0088 • Fax: +886-3-579-8934 • Website: [www.mblock.com.tw](http://www.mblock.com.tw) • Email: [marketing@mblock.com.tw](mailto:marketing@mblock.com.tw)

## RGB LED Driver

		MBI6024	MBI6034	MBI6020	MBI6027	MBI6030	MBI6120
No. of Output Channel		3x4		3x1			
Transmission Interface	Topology			2-Wire			1-Wire
	CLK Inversion		●			CLK Regeneration	—
	Bi-directional	—	●	—	●	—	—
Constant Output Current Range Per Channel		3~45mA		5~50mA	5~45mA	5~150mA	3~20mA
Sustaining Output Voltage		17V	28V	17V		40V	17V
Supply Voltage		3~5.5V	6~24V	3~5.5V		7~30V	5V~12V
Built-In LDO		—	●	—	—	●	●
S-PWM		16-bit		12/8-bit		16-bit	12-bit
Dot Correction		8/6-bit	—	8/6-bit	10/8-bit	6-bit	—
Current Gain		—	●	—	●	—	—
Error Detection	LED Open	—	●	—	●	—	—
	LED Short	—	●	—	●	—	—
	Leakage	—	—	—	●	—	—
	Wire Disconnection	—	●	—	●	—	—
	Thermal Protection	—	—	—	—	●	—
RoHS Compliant Package	SSOP16	—	—	●	—	●	—
	QFN16	—	—	●	—	—	—
	SSOP24	●	●	—	—	—	—
	QFN24	●	●	—	●	●	—
	TSSOP24	—	●	—	—	—	—
	SOP8	—	—	—	—	—	●
Major Applications		LED Strip, Mesh Display			LED Cluster, Architectural Lighting		LED Strip





## LED Driver for General LED Lighting



**MBI6661**

High Efficiency, DC/DC Buck Converter Suitable for Wall Wash Light



## LED Drivers for General Lighting Applications

DC/DC converters and AC/DC controllers are specifically designed for high power LED lighting applications. The constant current and high power efficiency meet the higher standards of safety and reliability for LED lighting applications.

Tel: +886-3-579-0088 • Fax: +886-3-579-8934 • Website: [www.mblock.com.tw](http://www.mblock.com.tw) • Email: [marketing@mblock.com.tw](mailto:marketing@mblock.com.tw)

		DC/DC Converter							
		MBI6651	MBI6652	MBI6653	MBI6654	MBI6655	MBI6660	MBI6661	MBI6662
Topology		Buck / Hysteretic PFM							Buck/Adapted PFM
Max. Output Current per Channel		1A	750mA	1A			500mA	1A	2A
Max. Sustaining Voltage		40V	32V	40V			75V		75V
Supply Voltage		9~38V	6~30V	6~36V			9~60V		5~60V
Switch on Resistance (Typ.)		0.45Ω		0.3Ω			0.35Ω		0.2Ω
Dimming Method	Digital	●	●	●	●	●	●	●	●
	Digital to Analog	—	—	●	—	—	—	—	—
	Analog	—	—	●	—	—	—	—	—
	4-Step	—	—	—	●	—	—	—	—
Protection	LED Open	●	●	●	●	●	●	●	●
	LED Short	●	●	●	●	●	●	●	●
	Thermal	●	●	●	●	●	●	●	●
	Start-Up	●	●	●	●	●	●	●	●
	UVLO	●	—	●	●	—	●	●	●
	OCP	—	—	●	●	●	●	●	●
RoHS Compliant Package	TO252	●	—	—	—	—	●	●	—
	SOP8	—	—	●	●	●	●	●	—
	MSOP8	●	●	●	●	—	—	—	—
	SOT89	—	—	—	—	●	—	—	—
	SOT23	●	●	—	—	—	—	—	—
	DFN10	—	—	—	—	—	—	—	●
Major Application		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	
		MBI6703	MBI6705
Topology		Boost / PWM	
Max. Output Current per Channel		By External MOSFET	
Supply Voltage		10~30V	
Dimming Method	Digital	●	●
Protection	LED Open	—	●
	LED Short	—	●
	Thermal	●	●
	OVP	●	●
	UVLO	●	●
	OCP	●	●
RoHS Compliant Package	TSSOP-24	●	—
	SOP-28	—	●
Major Applications		Street Lighting	



		AC/DC Controller							
		MBI6901	MBI6902	MBI6903	MBI6904	MBI6801	MBI6802	MBI6803	
Electrical Isolation		Non Isolation				Isolation			
Topology		Buck / Hysteretic PFM		BuckBoost / PWM		Flyback / DCM	Flyback / DCM + BCM		
Max. Output Current per Channel		By External MOSFET							
Max. Sustaining Voltage		44V							
Supply Voltage		9~40V		9~36V		16~28V			
AC Input Voltage Range		85-265V ac							
Dimming Method	Non-Dim	—	—	●	—	●	●	—	
	Digital	●	●	—	—	—	—	—	
	Step	—	—	—	●	—	—	—	
	TRIAC	—	—	—	—	—	—	●	
Protection	LED Open	●	●	●	●	●	●	●	
	LED Short	●	●	●	●	●	●	●	
	Thermal	●	●	●	●	●	●	●	
	Start-Up	●	●	●	●	●	●	●	
	UVLO	●	●	●	●	●	●	●	
	OVP	●	●	●	●	●	●	●	
RoHS Compliant Package	MSOP8	●	●	—	—	—	—	—	
	SOP8	—	—	●	●	●	●	—	
	SOP16	—	—	—	—	—	—	●	
Major Applications		T8 LED Solution, LED Light Bulb							

		All-Ways-On™ LED Driver					
		MBI1801	MBI1802	MBI1804	MBI1812	MBI1816	MBI1838
Topology		Linear					
No. of Output Channel		1	2	4	2	16	8
Excellent Output Current Accuracy	Between Channels (Typ.)	—	1%		3%	1%	
	Between ICs (Max.)	6%					
Output Current per Channel		0.5~1.2A	40~360mA	240mA	360mA	60mA	80mA
Sustaining Output Voltage		17V					70V
Supply Voltage		5V			12V	5V	8~40V
Dimming Method	Digital	●	●	●	—	●	●
	Analog	—	—	—	●	—	—
Protection	Thermal	●	●	●	●	●	●
	Thermal Error Flag	—	●	—	—	—	—
RoHS Compliant Package	SOP8	—	●	●	●	—	—
	TSSOP20	—	—	—	—	●	—
	SSOP24	—	—	—	—	—	●
	TO265	●	—	—	—	—	—
Major Applications		LED Lighting, Automotive Lighting					



## Contact Us

Address: Floor 6-4, No. 18, Pu-Ting Rd., Hsinchu 30072, Taiwan, R.O.C

Tel: +886-3-579-0088 E-mail: [info@mblock.com.tw](mailto:info@mblock.com.tw)

Fax: +886-3-579-8934 Website: [www.mblock.com.tw](http://www.mblock.com.tw)



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- Efora BVBA, Elfde novemberwal, Aniciuspark 13/2, B-3700 Tongeren, BELGIUM
- Tel : +32 - 12 74 74 37
- Fax : + 32 - 12 74 74 36
- Email : oger.noelmans@efora.be
- Website : www.efora.be



- Address: Floor 6-4, No. 18, Pu-Ting Rd., Hsinchu 30072, Taiwan, R.O.C
- Tel: +886-3-579-0068
- Fax: +886-3-579-8934
- Email: info@mblock.com.tw
- Website: www.mblock.com.tw

