

LED-Driver

Macroblock

passion.experience.reliability.





Uwe Fischer (managing director), Tanja Hollfelder (managing and training director),
Georg Fischer (managing director)



Who we are ...

For almost 70 years, we have been one of the leading design-in distributors for electronic components and systems. At five locations in Germany with a total of 65 employees.



Headquarters:
Weisendorf



Branch Office:
Ahrensburg



Offices:
Berlin, Dortmund, Munich



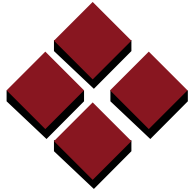
... and what we do

As a traditional and family-owned company, we work exclusively with renowned and leading manufacturers. Our focus is on individual consulting as well as solutions and custom-fit products for our customers. Because only when our customers are 100% satisfied we have done a good job.



You can also find us here





Macroblock

Macroblock is one of the leading suppliers of LED driver IC's and focuses on LED driver design. Macroblock was founded in June 1999 in Hsinchu (Taiwan). The company positions itself as a mixed-signal design house and focuses on power management and optoelectronic applications. This results in ultimate LED performance for display and lighting applications. Not least thanks to its innovative technologies, Macroblock's customers include many renowned companies.

According to a survey by IMS Research, the company is among the TOP 3 manufacturers of LED driver ICs. Macroblock developed the world's first LED driver with integrated 16-bit PWM function and patented S-PWM technology. This technology was used, for example, at the opening ceremony of the 2008 Olympic Games in Beijing and at the Expo 2010 in Shanghai. With outstanding technologies and solutions, Macroblock is preparing for future developments in LED display and lighting technology.

Quality

ISO 9001:2015
Process Reliability
Product Reliability
Package Reliability
Supplier Quality Management

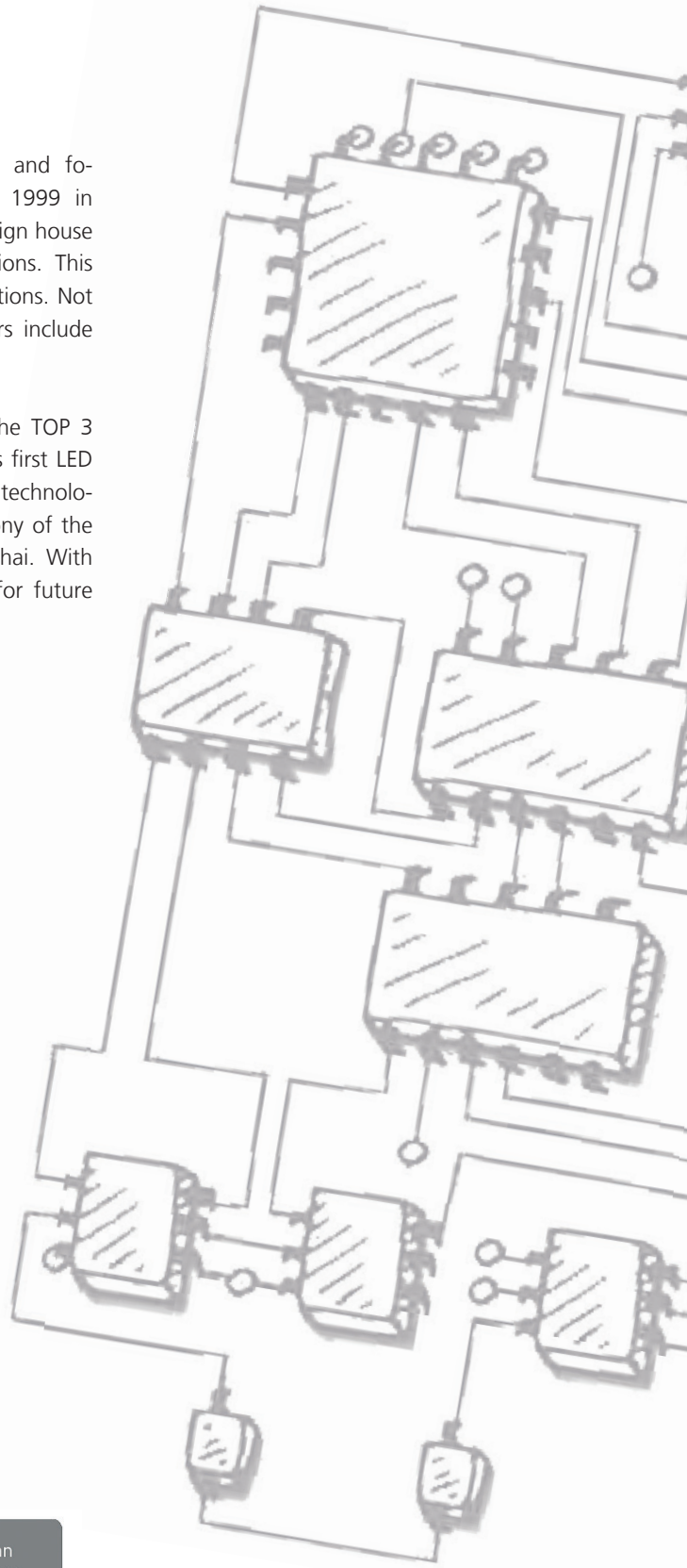
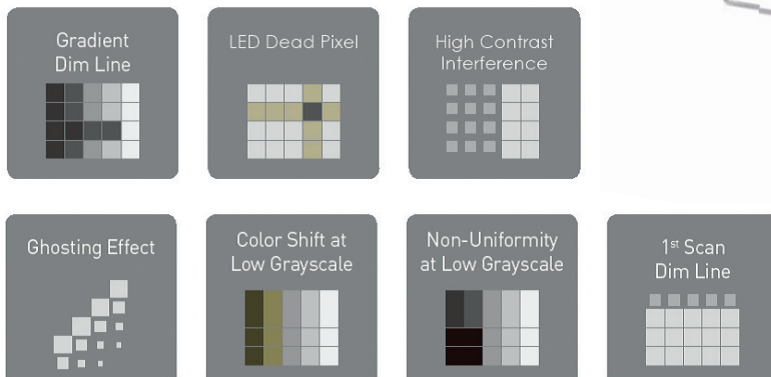
Performance features

High accuracy
Patented S-PWM technology
Patented Share-I-O™ technology

Service

Short delivery times
Worldwide distribution network
Excellent pre- and after-sales service

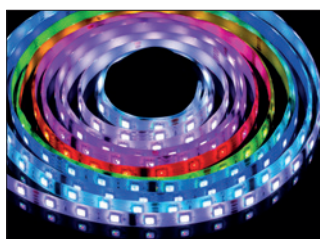
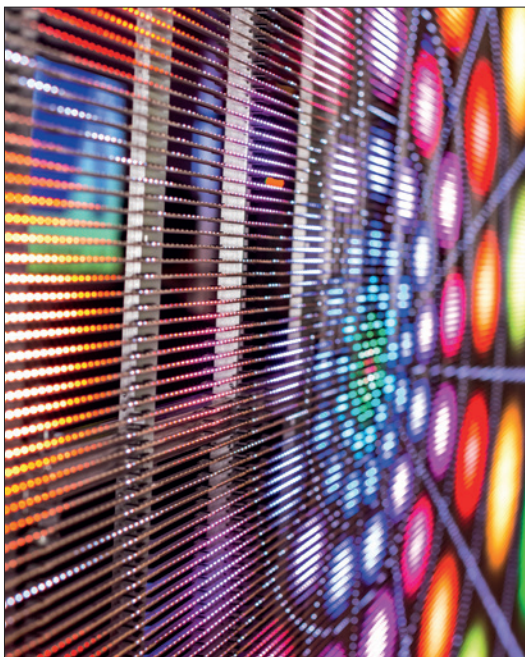
Solving the seven common problems found in fine pitch LED display



RGB LED-Driver ICs

LED-Driver

		MBI6023	MBI6024	MBI6033	MBI6034	MBI6020	MBI6021	MBI6027	MBI6030	MBI6120
Number of Outputs Channels		3x4				3x1				
Interface	Topology	2-Draht								1-Draht
	Clock Integrity	✓	✓	✓	✓	✓	✓	✓	CLK Regeneration	✓
	bi-directional				✓			✓		
Constant Output Current p. Ch.		3 – 45 mA				5 – 50 mA		5 – 45 mA	5 – 150 mA	3 – 30 mA
Max. Sustaining Voltage		17V		28V		17V			40V	17V
Supply Voltage		3 – 5.5V		3 – 5.5V 6 – 24V		3 – 5.5V			7 – 30V	5 – 12V
Integrated LDO				✓	✓				✓	✓
S-PWM		16-bit						12- 8-bit	16- 10-bit	12-bit
PWM						10-bit				
Current Gain				✓	✓			✓		
Pixel Correction			8- 6-bit			8- 6-bit		10- 8-bit	6-bit	
Error Detection	LED open Detection			✓	✓			✓		
	LED short Detection				✓					
	LED Leakage current Detection							✓		
	Interruption detection				✓			✓		
	Thermal protection function								✓	
RoHS compliant Package	SSOP16					✓	✓		✓	
	QFN16					✓				
	SSOP24	✓	✓	✓	✓					
	QFN24	✓	✓	✓	✓			✓	✓	
	TSSOP24			✓	✓					
	SOP8									✓
Main Applications		LED RGB strips, Mesh Displays						Architecture decorative lighting		LED RGB strips



Macroblock RGB LED driver ICs allow high update rates and flicker-free dimming.

Bidirectional communication of error messages and the ability to control multiple LEDs from a single driver simplifies PCB layout.

All-Ways-ON™-LED-Driver ICs

LED-Driver

		MBI1801	MBI1802	MBI1804	MBI1812	MBI1816	MBI1824	MBI1828	MBI1838
Topology		Linear							
Number of Outputs Channels		1	2	4	2	16	4	8	8
Excellent output current accuracy	Output to output (typ.)	-	1%		3%	1%			
	IC to IC (max.)	6%							
Constant Output Current per Ch.		0.5 – 1.2A	40 – 360mA	240mA	360mA	60mA	120mA	60mA	80mA
Max. Sustaining Voltage		17V					50V		70V
Supply Voltage		5V			12V	5V	8 – 40V		
Dimming Method	Digital	✓	✓	✓		✓	✓	✓	✓
	Analog				✓				
Thermal Protection	Thermal	✓	✓	✓	✓	✓			✓
	Thermal, Output Signal		✓					✓	
RoHS compliant Package	SOP8		✓	✓	✓		✓		
	TSSOP16							✓	
	TSSOP20					✓			
	TSSOP24								✓
	QFN24							✓	
	TO265	✓							
Main Applications		LED Lighting, Automotive Lighting							

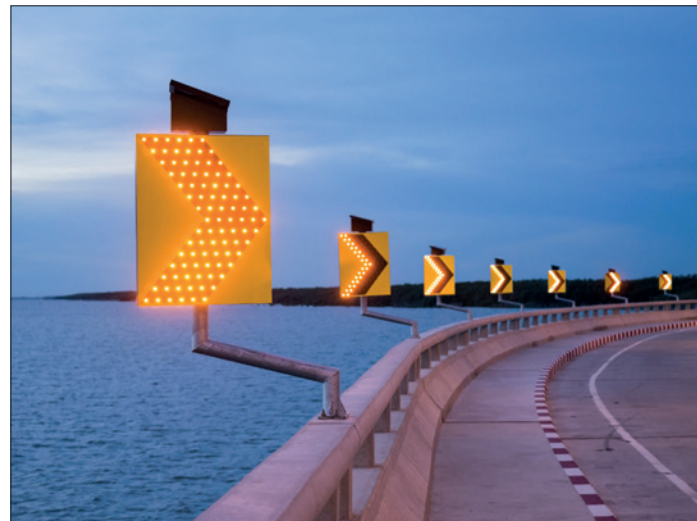


The All-Ways-On™ product series is characterized by the instant on/off switching of the LED Driver IC as well as the possibility, change the LED brightness via PWM signal. The products are not only very easy to integrate, but also reliable with built-in protection against overheating. Up to 16 output channels provide precisely adjustable constant current via resistor to drive the LEDs.

DC/DC Converter ICs

LED-Driver

		MBI6646	MBI6651	MBI6652	MBI6653	MBI6655	MBI6656	MBI6657	MBI6658
Topology		Buck Hysteresis PFM			Buck	Buck Hysteresis PFM			
Common Anode		✓							✓
Constant Output Current p. Ch.		1 A		750 mA	1 A			1,2 A	2 A
Max. Sustaining Voltage		40 V		32 V	65 V	40 V	45 V		36 V
Supply Voltage		6 – 36 V	9 – 36 V	6 – 30 V	4.5 – 65 V	6 – 35 V	6 – 40 V		4.5 – 32 V
Rds (on)		0.6 Ω	0.45 Ω		0.30 Ω			0.25 Ω	0.12 Ω
Dimming Method	Digital	✓	✓	✓	✓	✓	✓	✓	✓
	Digital to Analog				✓				
	Analog	✓			✓		✓	✓	
	Shunt Dimming								
Thermal Protection	LED open	✓	✓	✓	✓	✓	✓	✓	✓
	LED short	✓	✓	✓	✓	✓	✓	✓	✓
	Thermal	✓	✓	✓	✓	✓	✓	✓	✓
	Start-Up	✓	✓	✓	✓	✓	✓	✓	
	UVLO	✓	✓		✓		✓	✓	✓
	Overvoltage								
	OCP	✓			✓	✓	✓	✓	✓
	Thermal Fold-back							✓	
	OTP Error FLAG								✓
	OCP Error FLAG								✓
RoHS compliant Package	TO252	✓	✓				✓		
	SOP8	✓			✓	✓	✓		✓
	SOP10								
	MSOP8		✓	✓	✓				
	SOT89	✓				✓	✓	✓	
	SOT23	✓	✓	✓			✓	✓	
	TSSOP24								
	TSSOP14								
	DFN10								
Main Applications		Street and tunnel lighting, wall wash light, downlights, technical lighting, stage lighting,							



MBI6661	MBI6662	MBI6663	MBI6664	MBI6671	MBI6672	MBI6673
	Buck Adaptive PFM	Buck Hysteresis PFM		Multi- Topology PFM	Constant Off Time + Peak Current Detection	Single Inductor Multi Output PFM
	✓		✓			
1 A	2 A	1 A	2 A	External MOSFET		
75V			71V			
9 – 60V	5 – 60V	6 – 65V	4.5 – 65V	4.5 – 65V	6 – 60V	20 – 50V
0.35Ω	0.2Ω	0.3Ω	0.2Ω			
✓	✓	✓	✓	✓	✓	
		✓		✓		
					✓	✓
✓	✓	✓	✓	✓		✓
✓	✓	✓	✓	✓		
✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓
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✓	✓	✓	✓			✓
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			✓			
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✓		✓	✓			
	✓					
						✓
				✓	✓	
	✓					

Automotive, Signal lamps

Street lighting, stage lighting, automotive

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



Multi-Function LED Display Driver ICs

LED-Driver

		MBI5169	MBI5037	MBI5038	MBI5039
Number of Outputs Channels		8	16		
Constant Output Current per Channel		5 – 120mA	3 – 80mA	3 – 45mA	3 – 90mA
Max. Sustaining Voltage		17V			
Excellent output current accuracy	Output to Output	< ± 1% (typ.)		< ± 1,5% (typ.)	
	IC to IC	< ± 1% (typ.)	< ± 3% (typ.)	< ± 1,5% (typ.)	< ± 3% (typ.)
Error detection	LED open	✓	✓	✓	✓
	LED short	✓	✓	✓	✓
	LEakage		✓	✓	
Current Gain				✓	✓
Power Saving			✓	✓	
RoHS compliant Package	P-DIP16	✓			
	SOP16	✓			
	SSOP16	✓			
	SOP24		✓	✓	✓
	SSOP24		✓	✓	✓
	QFN24				✓
Main Applications		Commercial LED displays, information displays, bus displays, VMS traffic signs			



Macroblock Multi-Function LED Display Driver IC's cover a wide range of applications and are compatible with alternative driverIC's thanks to the integrated Share-I-O™ technology pin.

This allows the functionality, such as additional error detection, to be extended without having to change the PCB layout.



Classic Constant Current LED Display Driver ICs

LED-Driver

		MBI5167	MBI5168	MBI5025	MBI5026	MBI5035	MBI5124	MBI5125
Number of Outputs Channels		8		16				
Output current per channel		3 – 45mA	5 – 120mA	1 – 45mA	5 – 90mA	3 – 45mA	1 – 25mA	2 – 30mA
Max. Sustaining Voltage		17V					VDD+0.3	11V
Lower Ghosting Effect Elimination							✓	✓
Performance saving (Low Knee Voltage)						✓		
Current Gain								✓
Excellent output current accuracy	Output to Output	< ± 1% (typ.)		< ± 1,5% (typ.)	< ± 1% (typ.)	< ± 3% (typ.)	< ± 1,5% (typ.)	
	IC zu IC	< ± 1% (typ.)		< ± 1,5% (typ.)	< ± 1% (typ.)	< ± 3% (typ.)	< ± 1,5% (typ.)	
RoHS compliant Package	SOP16	✓	✓					
	SSOP16	✓	✓					
	SOP24			✓	✓	✓	✓	
	SSOP24			✓	✓	✓	✓	✓
	TSSOP24			✓				
	mSSOP24						✓	
	P-DIP24				✓			
	SP-DIP24				✓			
	QFN24						✓	✓
Main Applications		Commercial LED-Displays, Information displays				Performance-saving LED displays	Commercial LED-Displays, Information displays	



The PrecisionDrive™ technology improves the characteristics of current output and accuracy so that viewers can enjoy a clear and sharp image on the LED display.

S-PWM LED-Display Driver ICs

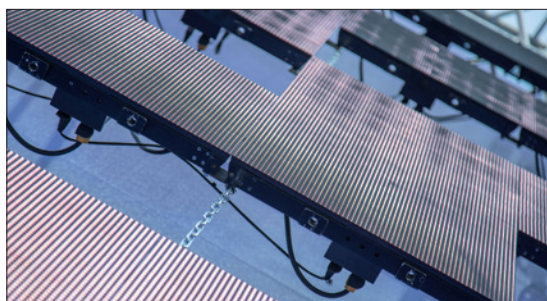
LED-Driver

		Standard							
		MBI5030	MBI5031	MBI5040	MBI5043	MBI5051	MBI5250	MBI5151	MBI5252
Number of Outputs Channels		16							
Output current per channel		3 – 90mA		2 – 60mA	1 – 45mA	2 – 45mA			
Max. Sustaining Voltage		17V					7V	17V	
Excellent output current accuracy	Output to Output								
	IC to IC	< ± 3% (typ.)							
Integrated MOSFET									
HDR optimized									
Advised pixel pitch						4 – 12mm			
Error detection	LED Open	✓	✓	✓		✓	✓	✓	✓
	LED Short			✓					
	Thermal Protection			✓				✓	
	Leakage							✓	
Current Gain		8-bit		7-bit	6-bit				
PWM Improvement									
GCLK Amplifier					✓	✓	✓	✓	✓
Power Saving							✓		
High Contrast Interference Elimination							✓		
Lower Ghosting Elimination					✓	✓	✓	✓	✓
Color Shift Elimination						✓	✓	✓	✓
Non-uniformity Elimination						✓	✓	✓	✓
Dim Line at the 1st Scan Line Elimination							✓	✓	✓
Gradient Dim Line Elimination						✓	✓		✓
Dead Pixel Isolation						✓	✓		✓
S-PWM		12- 16-bit	12-bit	12- 16-bit	16-bit	14- 16-bit			
Scan-Typ						1:8			1:16
Pixel Correction				8-bit. digital					
RoHS compliant Package	SOP24	✓	✓	✓					
	SSOP24				✓	✓	✓	✓	✓
	TSSOP24	✓	✓	✓					
	mSSOP24								
	QFN24	✓	✓	✓			✓		✓
	QFN56								
	QFN88								
	BGA90								
	BGA104								
Main Applications		High refresh rate grayscale LED displays							



SRAM Embedded											
MBI5153	MBI5253	MBI5254	MBI5264	MBI5353	MBI5354	MBI5359	MBI5754	MBI5759	MBI5850	MBI5864	
				48			16	48	12	48	
0.5 – 20mA							1 – 18mA	0.5 – 15mA	0.5 – 20mA	0.1 – 5mA	
	7V										
< ± 1.5% (typ.)										< ± 0.5% (typ.)	
< ± 1.5% (typ.)										< ± 0.5% (typ.)	
						32		32	4	16	
			✓			✓			✓	✓	
1.2-6mm		1 – 4mm		0.8 – 4mm		0.6 – 1.5mm		1.2 – 4mm	0.6 – 1.5mm	1.5 – 6mm	0.4 – 1mm
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
				✓	✓	✓		✓	✓	✓	
				Global/RGB			6-bit	Global/RGB			
			✓			✓			✓	✓	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		✓	✓	✓	✓	✓	✓	✓	✓	✓	
			✓								
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
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✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
13- 14-bit			13- 14- 15- 16-bit						15- 16-bit	13- 14- 15- 16-bit	
1:32		1:64		1:32	1:64	1:32	1:64	1:32		1:64	
✓	✓	✓	✓				✓		✓		
✓	✓	✓	✓								
				✓	✓		✓				
										✓	
										✓	
						✓		✓			
Time-Multiplexing LED Displays											

Time-Multiplexing LED Displays



LED driver ICs with integrated SRAM memory are mainly used for display control via time division multiplexing. This increases the refresh rate without affecting the grayscale performance.



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