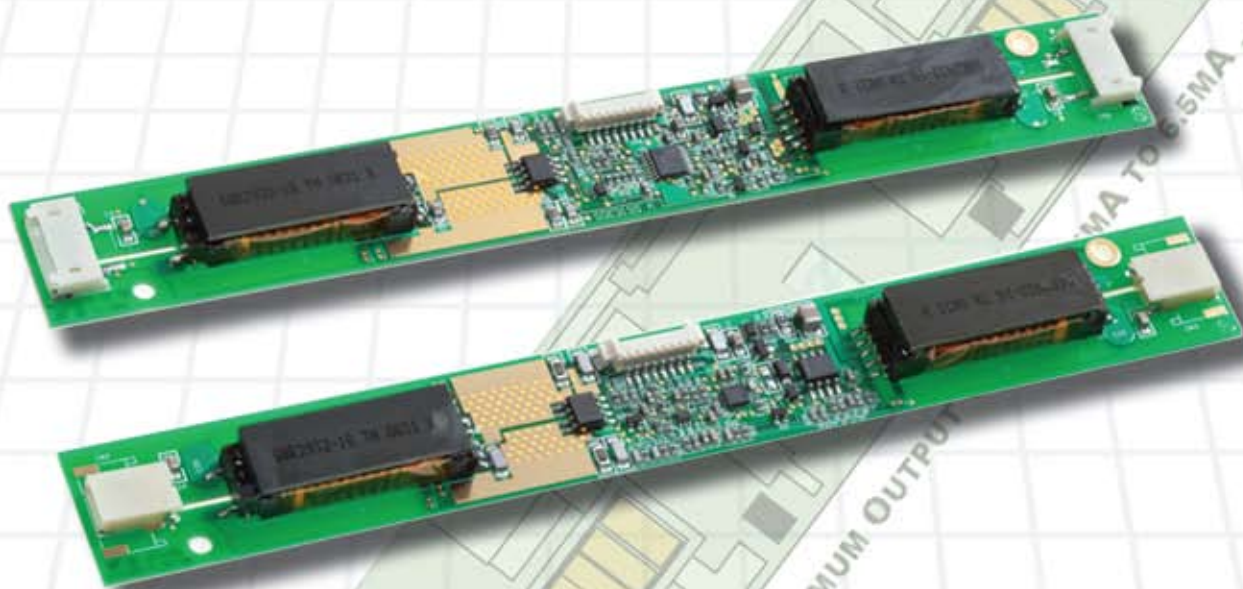


Dual Lamp CCFL Inverters

LXMG1627™ and LXMG1628™



Introducing Microsemi's New High-Performance Dual-Lamp CCFL Inverter Family

Applications

- ATM/POS and Kiosk Displays
- Portable Instrumentation
- Industrial Display Control
- Gaming Displays
- Medical Displays



Microsemi inverter families are designed to migrate Microsemi's proven, IP-differentiated backlighting technology developed to meet demanding automotive and LCD TV and Notebook applications into a broad range of mid-sized panels, by delivering cost-to-feature benefits of outstanding reliability, efficiency and service.

The new inverters will enable Microsemi's leading backlighting technology to be used in many 7- to 19-inch panel applications including medical, POS, kiosk, ATM, and lottery terminals. Inverters identified by product numbers LXMG1627 offer Microsemi's patented RangeMax™ digital dimming technology, while those numbered LXMG1628 provide analog dimming.

Features

- Externally programmable maximum output current
- Easy to use brightness control
- Analog Current Amplitude Dimming available with LXMG1628. RangeMAX™ Wide Range Digital Dimming available with LXMG1627)
- Output Open/Short-Circuit Protection and Automatic Strike-Voltage Regulation and Timeout
- Fixed frequency operation
- Rated from -30°C to 80°C
- UL60950 E175910 pending
- RoHS compliant

Benefits

- Compact, low profile design
- Programmable output current allows inverter to mate with a wide variety of LCD panel's specification (PanelMatch™)
- Output open circuit voltage regulation minimizes corona discharge for high reliability

General Description

Series Identifier	Description	Key Specifications
LXMG1627-XX-XX	Replaces existing LXMG1623™ modules.	<ul style="list-style-type: none"> • 5 and 12 V Input Supply • 4 and 6W maximum power • Extended temperature range [-30C to 80C] • Wide range digital dimming (typically 50:1+) • Slim form factor • PanelMatch™ • UL60950 E175910
LXMG1628-XX-XX	Replaces existing LXMG1624™ modules.	<ul style="list-style-type: none"> • 12 V Input Supply • 4 and 6W maximum power • Extended temperature range [-30C to 80C] • Standard range digital dimming (typically less 3:1) • Slim form factor • PanelMatch™ • UL60950 E175910

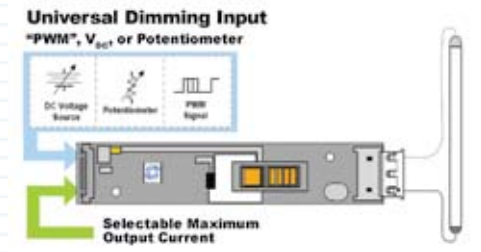
Cross Reference Guide

The below table is provided as a quick reference for those customers already using the older models. Always refer to the latest datasheets on the website for the most up to date information.

Part Numbers		Physical Dimensions Differences				Electrical Specifications Differences			
New PN	Replaces PN	Mounting Holes	Length	Width	Height	Operating Frequency (kHz)	Lamp Current (mA)	Linear BRITE Control Input Voltage Range (V)	
LXMG1627-05-41	LXMG1623-05-41	Same relative size and position	+10mm Each Side	Same	Same	50 vs. 80	Same	0 to 2.5V vs. 0.5 to 2.0V	
LXMG1627-05-42	LXMG1623-05-42					Same	0.2mA lower		
LXMG1627-05-44	LXMG1623-05-44		Same		+2.5mm (10mm vs. 7.5mm)	50 vs. 70	Same		
LXMG1627-05-61	LXMG1623-05-61					50 vs. 80			
LXMG1627-05-62	LXMG1623-05-62		+10mm Each Side		Same	+2.5mm (10mm vs. 7.5mm)	50 vs. 70		0.2mA lower
LXMG1627-12-41	LXMG1623-12-41								
LXMG1627-12-42	LXMG1623-12-42		Same		Same	50 vs. 80	Same	0.2mA lower	
LXMG1627-12-44	LXMG1623-12-44								
LXMG1627-12-61	LXMG1623-12-61		+10mm Each Side		Same	+2.5mm (10mm vs. 7.5mm)	50 vs. 80	Same	0 to 2.0V vs. 0.5 to 2.0V
LXMG1627-12-62	LXMG1623-12-62								
LXMG1628-12-41	LXMG1624-12-41		Same		Same	+2.5mm (10mm vs. 7.5mm)	50 vs. 70	Same	
LXMG1628-12-42	LXMG1624-12-42								
LXMG1628-12-61	LXMG1624-12-61								
LXMG1628-12-62	LXMG1624-12-62								

Universal Dimming Input

The modules are designed to be driven by a PWM, a constant Voltage Source or a Potentiometer based on the customer preference



Digital Dimming, RangeMAX™ (LXMG1627-XX-XX)

RangeMax™ digital dimming technology provides smooth, jitter free, wide-range brightness and advanced power management capability and reduces cost of ownership for the end system. This technology is proven to extend the lamp life as measured by light output at the end of the time period compared to the more standard amplitude adjustment method. The life extension depends on the

dimming ratio used by the customer. A 100:1 digital dimming ratio can provide an 80-90% increased light output after 20k hours. Since the lamp is usually the first component needing replacement in a panel, this translates into direct ownership and warranty cost savings.

Temperature Range

The new modules are specified over a temperature range of (-30°C to 80°C) a significant improvement over the current specification.

Datasheets

The new modules have been designed to be a cost effective alternative compared to the existing solutions. Therefore datasheets are extremely similar.

UL and ROHS Qualifications

All Microsemi inverter modules are RoHS compliant (LXMG “G”=Green) and UL60950 certified components (File E175910).

PanelMatch™

As with the previous solutions customers will be able to externally program the output current in steps of 0.5mA or 1mA depending on the inverter with the PanelMatch™ feature.

These wide steps are made possible by custom settings on the module itself thus allowing the SAME module to be used to drive different panels (simpler supply chain and reduced inventory carrying costs specifically for solutions integrators and distributors or customers using multiple displays).

Examples of PanelMatch™ Programmable Output

Output Characteristics	Symbol	Test Conditions	LXMG1627-12-6x			Units
			Min	Typ	Max	
Full Bright Lamp Current (each output)	$I_{L(MAX)}$	SET1 = Ground, SET2 = Ground	4.4	5.0	5.6	mARMS
Full Bright Lamp Current (each output)	$I_{L(MAX)}$	SET1 = Ground, SET2 = Open	5.4	6.0	6.6	mARMS
Full Bright Lamp Current (each output)	$I_{L(MAX)}$	SET1 = Open, SET2 = Ground	6.4	7.0	7.6	mARMS
Full Bright Lamp Current (each output)	$I_{L(MAX)}$	SET1 = Open, SET2 = Open	7.4	8.0	8.6	mARMS

The operation of Microsemi inverter modules can be enhanced using our portfolio of high performance Visible Light Sensors.

See following pages for information on Visible Light Sensors.

Visible Light Sensor Selector Guide

Part Number Package	Useful Light Range (Lux)	Light Output Function	Output Topology	Input Supply Range	Output Current @ 100 Lux	Properties / Applications
LX1970 MSOP-8	< 1 - 1.2K	Linear	Current Sink and Current Source vs. Light	2V - 5.5V	~38µA	General purpose sensor for illumination and display control applications.
LX1971 MSOP-8	< 1 - 15K	Square Root	Current Sink and Current Source vs. Light	3V - 5.5V	~10µA	Wide dynamic range with extreme sensitivity at low ambient light conditions.
LX1972 1206	< 1 - 5K	Linear	Two Terminal Current Source vs. Light	2V - 5.5V	~10µA	Low cost, small size, high performance general purpose "human eye" response sensor. Packaged for top light applications.
LX1974 1206	< 1 - 5K	Linear	Two Terminal Current Source vs. Light	2V - 5.5V	~10µA	Same as LX1972, but with tape-and-reel orientation for bottom light applications.
LX1972A 1206	< 1 - 5K	Linear	Two Terminal Current Source vs. Light	2V - 5.5V	~10µA	Patented <i>Best Eye™</i> technology provides near perfect immunity to non visible light spectra. Applications demanding superior IR and UV immunity.
LX1973 MSOP-8	.01 - 500	Quarter Root	Current Source vs. Light	4.5V - 5.5V	380µA	High precision in ultra low lighting conditions. Internal dark current cancellation.
LX1973A MSOP-8	.01 - 500	Quarter Root	Current Source vs. Light	4.5V - 5.5V	360µA	High precision in low lighting. Includes <i>Best Eye™</i> for superior IR and UV immunity.
LX1973B MSOP-8 (Lens)	.005 - 400	Quarter Root	Current Source vs. Light	4.5V - 5.5V	410µA	High precision in low lighting. Includes <i>Best Eye™</i> for superior IR and UV immunity. 60% dark current reduction over the LX1973A.

LX1973B™

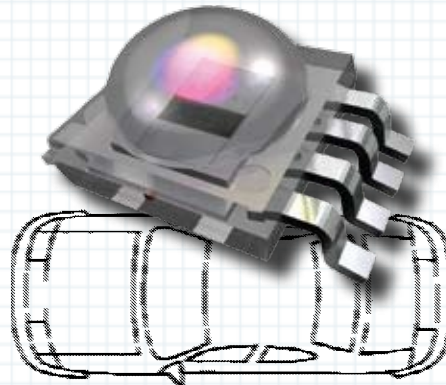
The LX1973B is a very wide dynamic range light sensor that improves on the low-level sensitivity of Microsemi's popular LX1973A. Like the LX1973A, the LX1973B also incorporates Microsemi's patent-pending *Best Eye™* technology for the highest performance human eye spectral response available in the market today. In addition, the LX1973B extends the low-level sensitivity down to unprecedented levels using an innovative dome-lens package and unique dark-current cancellation technology. Users can expect to resolve changes in ambient light to 0.001 lux and below. No other sensor on the market combines the 5-decade dynamic range, low-level sensitivity, and rock-solid thermal and spectral response of the LX1973B.

Key Features

- Nearly Perfect *Best Eye™* Human Eye
- Spectral Response
- 25C Dark Current < 0.005 lux
- 5 Decades Compressed Output
- 15% Accuracy over Temperature
- Scalable Output Voltage
- No Optical Filters Needed

Applications

- Auto Headlamp Control
- Auto Mirror Contrast Control



**Perfect for
Automotive
Applications**

Visible Light Sensors

The LX1973 and LX1973A are wide dynamic range light sensors with a very low dark current that is optimized for sensing low level light signals that typically occur under dark or darkening outdoor ambient lighting.

The LX1973 and LX1973A have been optimized for automotive systems such as headlamp brightness control or rear view mirror contrast control. Their radical (fractional exponent) response when interfaced with an 8 bit DAC can detect levels down to 0.001 lux or levels as high as 500 lux.

The spectral response of the integrated light sensor closely emulates the human eye so it ignores light such as infrared which emits energy but doesn't aid vision. This eliminates the need for an Infrared filter required with competitor light sensors.

The LX1973 and LX1973A internal circuitry consists of a diode array that provides an approximate photopic light wavelength response curve. The LX1973A provides improved spectral response using Microsemi's Best Eye™ Technology.

The sensor outputs feeds into a wide dynamic range compression amplifier that provides accurate resolution over five decades of ambient light. The integrated dark current cancellation circuit facilitates accurate sensing of light below 0.01 lux. The current source output of the LX1973 and the LX1973A can be gain scaled using one external resistor.

The LX1973 and LX1973A are internally trimmed to an initial accuracy of 5% at room temperature and a light level of 10 lux. Accuracy of 10% is maintained over the full temperature range (-40°C to +85°C).

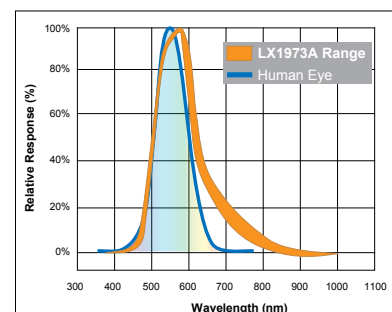
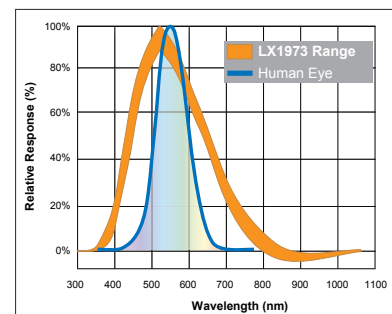
Key Features

- Nearly Perfect Best Eye™ Human Eye Spectral Response LX1973A
- Human Eye Spectral Response LX1973
- 25C Dark Current < 0.005 lux
- 5 Decades Compressed Output
- 10% Accuracy Over Temperature
- Scalable Output Voltage
- No Optical Filters Needed

Applications

- Outdoor Lighting Control
- Automotive Lighting Control -Headlamp, Mirrors, Displays
- Indoor Lighting Control for Architecture, Lighting, Appliances
- Consumer Electronic Displays
- LCD-TV
- Digital Cameras

LX1973 LX1973A



Visible Light Sensors

LX1972™ LX1972A™

The LX1972 and the LX1972A are low cost silicon light sensors with spectral response that closely emulates the human eye.

The LX1972A provides improved spectral response using Microsemi's BestEye™ technology.

Patented circuitry produces peak spectral response at 520nm, with IR response less than $\pm 5\%$ of the peak response, about 900nm.

The photo sensor is a pin diode array with a linear, accurate, and very repeat-able current transfer function.

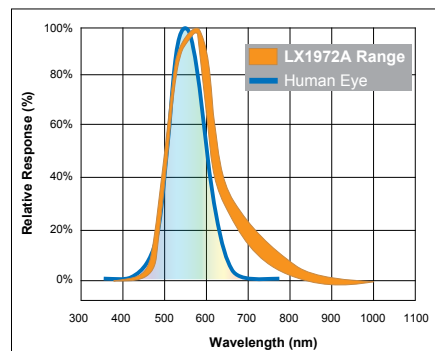
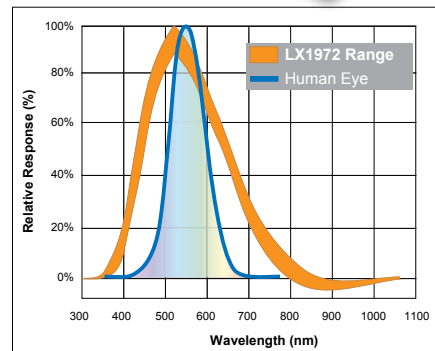
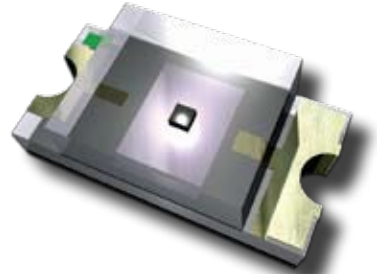
High gain current mirrors on the chips multiply the PIN diode photo-current to a sensitivity level that can be voltage scaled with a standard value external resistor. Output current from these simple to use two-pin devices can be used directly or converted to a voltage by placing it in series with a single resistor at either of its two pins.

Internal temperature compensation allows dark current to be kept below 200nA over the full specification temperature range (-40°C to +85°C) providing high accuracy at low light levels. Usable ambient light conditions range is from 1 lux to more than 5000 lux.

The LX1972 and LX1972A are optimized for controlling back lighting systems in low cost consumer products such as LCD TV, portable computers, and digital cameras.

Key Features

- Near Human Eye Spectral Response - LX1972
 - Nearly Perfect Best Eye™ Human Eye Spectral Response - LX1972A
 - Very Low IR Sensitivity
 - Highly Accurate & Repeatable Output Current vs. Light
 - Scalable Output Voltage
 - Temperature Stable
 - Integrated High Gain Photo Current Amplifiers
 - No Optical Filters Needed
 - Tiny 1206 Package
 - RoHS Compliant / Pb-free
- ### Applications
- Portable Electronic Displays
 - LCD TV Backlight Systems
 - Digital Still Cameras (DCS)
 - Desktop Monitors
 - Notebook Computers





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