SUNSTAR 商斯达实业集团是集研发、生产、工程、销售、代理经销 、技术咨询、信息服务等为一体的高科技企业，是专业高科技电子产品生产厂家，是具有10 多年历史的专业电子元器件供应商，是中国最早和最大的仓储式连锁规模经营大型综合电子零部件代理分销商之一,是一家专业代理和分銷世界各大品牌IC 芯片和電子元器件的连锁经营綜合性国际公司，专业经营进口、国产名厂名牌电子元件，型号、种类齐全。在香港、北京、深圳、上海、西安、成都等全国主要电子市场设有直属分公司和产品展示展销窗口门市部专卖店及代理分销商,已在全国范围内建成强大统一的供货和代理分销网络。 我们专业代理经销、开发生产电子元器件、集成电路、传感器、微波光电元器件、工控机/DOC/DOM 电子盘、专用电路、单片机开发、MCU/DSP/ARM/FPGA 软件硬件、二极管、三极管、模块等，是您可靠的一站式现货配套供应商、方案提供商、部件功能模块开发配套商。商斯达实业公司拥有庞大的资料库，有数位毕业于著名高校——有中国电子工业摇篮之称的西安电子科技大学（西军电）并长期从事国防尖端科技研究的高级工程师为您精挑细选、量身订做各种高科技电子元器件，并解决各种技术问题。

微波光电部专业研制、代理经销高频、微波、光纤、光电元器件、组件、部件、模块、整机；电磁兼容元器件、材料、设备；微波CAD、EDA 软件、开发测试仿真工具；微波、光纤仪器仪表。欢迎国外高科技微波、光纤厂商将优秀产品介绍到中国、共同开拓市场。长期大量现货专业批发高频、微波、卫星、光纤、电视、CATV 器件：晶振、VCO、连接器、PIN 开关、变容二极管、开关二极管、低噪晶体管、功率电阻及电容、放大器、功率管、MMIC、混频器、耦合器、功分器、振荡器、合成器、衰减器、滤波器、隔离器、环行器、移相器、调制解调器；光电子元器件和组件：红外发射管、红外接收管、光电开关、光敏管、发光二极管和发光二极管组件、半导体激光二极管和激光器组件、光电探测器和光接收组件、光发射接收模块、光纤激光器和光放大器、光调制器、光开关、DWDM 用光发射和接收器件、用户接入系统光光收发器件与模块、光纤连接器、光纤跳线/尾纤、光衰减器、光纤适 配器、光隔离器、光耦合器、光环行器、光复用器/转换器；无线收发芯片和模组、蓝牙芯片和模组。

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New Product Guide

Microsemi Analog Mixed Signal Group

Visible Light Sensors

StayLIT™ Backlight Inverters

DAZL!™ Breakthrough LED Lighting for Large LCD TVs

Power over Ethernet PSE Managers

Microsemi

AMSG

Analog Mixed Signal Group

The vision of Microsemi's Analog Mixed Signal Group (AMSG) is to engineer high performance power management products differentiated for the most demanding applications. The technical teams at AMSG focus on display lighting technologies, power management, wireless communications and Power over Ethernet controllers.

Headquartered in Garden Grove, California, and with major design locations in Irvine, Garden Grove and El Segundo, California, and Tel Aviv, Israel, AMSG technologists focus on dedicated devices for specific high performance applications in consumer, computing, wireless and networking applications. With our systems level approach we also supply complete modules for LCD backlighting applications, PoE switching, and have the industry leading portfolio of PoE midspan products.

By focusing on an in depth understanding of customer needs, Microsemi Integrated Products applies sophisticated systems-engineering techniques to create innovative solutions with "must-have" benefits for specific customer and niche market applications.

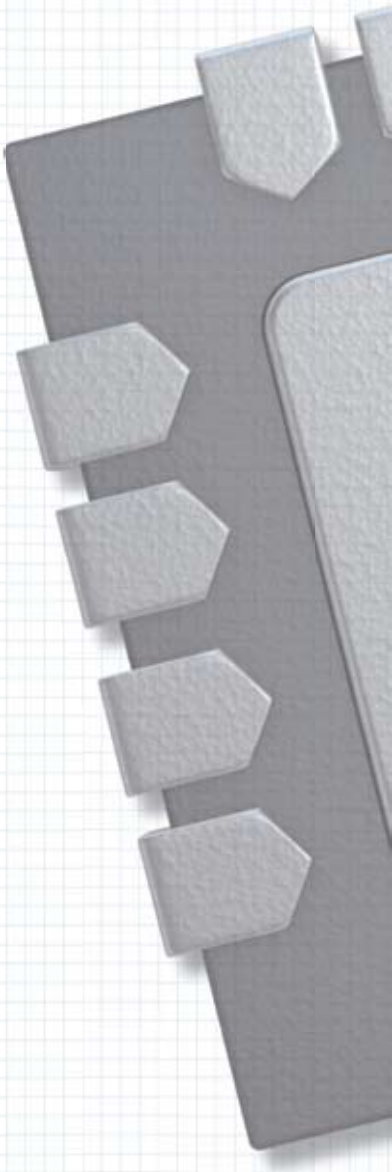
The results are components and modules that are smaller, perform better, use less power and provide greater value.

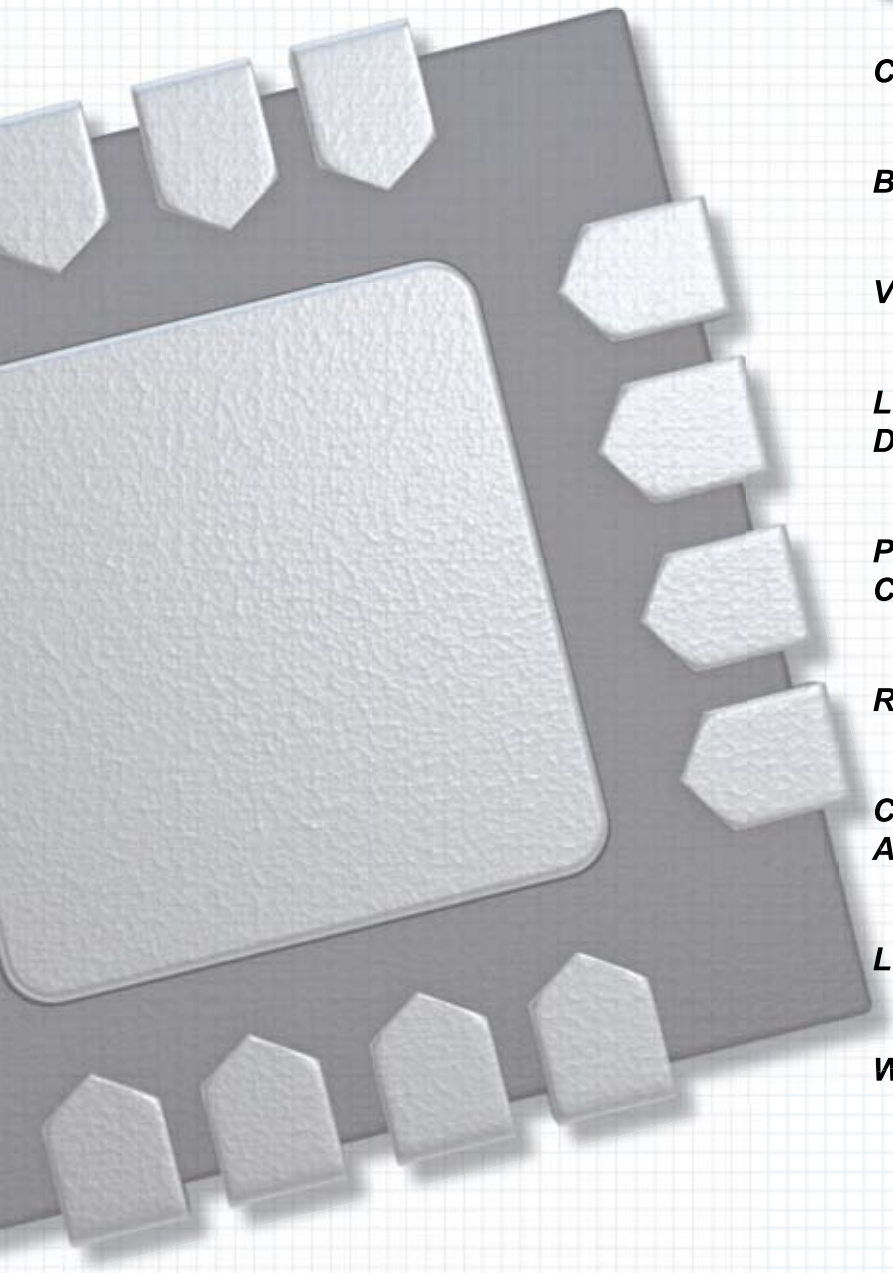
Microsemi Corporation, headquartered in Irvine, California, is a leading designer, manufacturer, and global marketer of high performance analog and mixed signal integrated circuits and high reliability semiconductors. The company's semiconductors manage and control or regulate power, protect against transient voltage spikes and transmit, receive and amplify signals.

Microsemi's products include individual components as well as integrated circuit solutions that enhance customer designs by improving performance and reliability, battery optimization, reducing size or protecting circuits. The principal markets the company serves include implanted medical, defense / aerospace and satellite, notebook computers, monitors and LCD TVs, automotive and mobile connectivity applications. More information may be obtained by visiting our website at www.microsemi.com.

The following pages highlight our recent product innovations in the areas of cold cathode fluorescent lighting (CCFL) for TV, notebook, display and automotive applications; CCFL backlight inverter modules; unique performance ambient light sensing technology; LED drivers and complete integrated LED light management solutions for TV consumer applications.

Our power management competence focuses on PoE controllers, DC-DC controllers and regulators, battery chargers, Class D audio amplifiers, and on our market leading power amplifier portfolio for WLAN applications. An up-to-date listing of our entire portfolio, plus on-going product announcements, can be found at www.microsemi.com.





Index

CCFL Controller IC Selector Guide

Part Number Package	Target Application	Inverter Input Voltage	IC Input Voltage	Topology Supported	Lamp Strike	Features
LX6512 MLPQ-16 TSSOP-16 NEW!	Notebook, Portable	7V-28V	4.5V-5.5V	DD, FB, P/NFET	MSCC sweep	Performance/cost value
LX6501 SOIC-28 TSSOP-28 NEW!	LCD-TV, large area LCD, monitors	All configurations (12V, 24V, 400V)	10V-27V	FB, HB, PP N/NFET	Programmable sweep	Integrated FET driver, ideal for 32”-42”, up to 20 lamp panels, Jin Balancer™ compatible
LX1697 MLPQ-24	Notebook, Portable	6.5V-28V	6.5V-25V	FB, N/NFET	MSCC sweep	Wide input voltage range, supports Intel DPST (display power saving technology
LX1696 TSSOP-20	Automotive	7V-28V	4.5V-5.5V	FB, P/NFET	Resonant, variable gain	Optimized for automotive applications and temperature, fault output
LX1693 MLQP-28	Notebook, Portable	6.5V-28V	6.5V-25V	FB, N/NFET	MSCC sweep	Supports Ambient Light Sensor (ALS) control of panel brightness
LX1692B SOIC-20 TSSOP-20	LCD-TV, multi-lamp monitors	7V-28V	7V-22V	PP, FB, P/NFET	Fixed frequency, fixed gain, no sweep	Ideal for 20”-30” range, 40”-65” with external buffer, Jin Balancer™ compatible
LX1692A TSSOP-20	Notebook, Portable	7V-28V	4.5V-5.5V	FB, P/NFET	Resonant, variable gain	5V IC, optimized for full bridge inverters
LX1691B TSSOP-16	Notebook, Portable	7V-28V	2.8V-5.5V	DD, FB, N/NFET	MSCC sweep	Feed forward input voltage sensing

Topology: DD = Microsemi patented Direct Drive, FB = Full Bridge, HB = Half Bridge, PP = Push Pull
MSCC Sweep = Microsemi patented lamp strike technique, JIN Balancer = Microsemi patented lamp current balance circuit

Microsemi offers the most comprehensive family of cold cathode fluorescent lamp (CCFL) controllers to address the varying demands of today’s LCD panel applications. Backlight inverter designers can optimize their designs for specific requirements including panel size, single or multiple lamps, lamp technology, input voltage, inverter circuit topology, fault protection, and other key features unique to the application

Through many years of experience, Microsemi understands these subtle but critical challenges and has developed cost effective, total circuit solutions. Microsemi continues to invent patented, industry recognized lighting techniques and solutions for the future.

The LX1692A, LX1693, and LX1697 are CCFL controllers targeted for wide input voltage, full bridge inverter applications such as notebook and portable product displays. In addition, the LX1693 supports ambient light sensor control of panel brightness and the LX1697 supports Intel™ DPST (display power saving technology). The LX6512 general purpose controller provides outstanding performance and cost value in a small MLPQ or TSSOP 16-pin package. The LX1696 supports automotive and wide temperature applications with fault indicator and shutdown features necessary in automotive environments.

For the LCD-TV and multi-lamp market, Microsemi offers the versatile LX1692B and LX6501 which support full bridge, half bridge, and push pull topologies. The LX6501 includes integrated FET drivers which minimizes external components and reduces total BOM cost. These controllers used in conjunction with Microsemi patented JIN Balancer™ lamp current balancing circuit are the optimum performance/cost solution available for today’s LCD-TV displays.

LX6512™

Microsemi's LX6512 is a cost effective, Direct Drive CCFL (cold cathode fluorescent lamp) controller. The integrated controller is optimized to drive CCFL lamps using either resonant full bridge inverter topology or push-pull Direct Drive configurations.

Resonant full bridge topology provides near sinusoidal waveforms over a wide supply voltage range in order to maximize the life of CCFL lamps, control EMI emissions, and maximize efficiency. This new architecture is also coupled with a wide dimming range capability.

For fixed input supply applications the LX6512 uses Direct Drive topology to supply fixed frequency PWM signals connected directly to the high voltage transformer primary via a single pair of N-FET drivers, providing a simple, low cost inverter solution.

Key Features

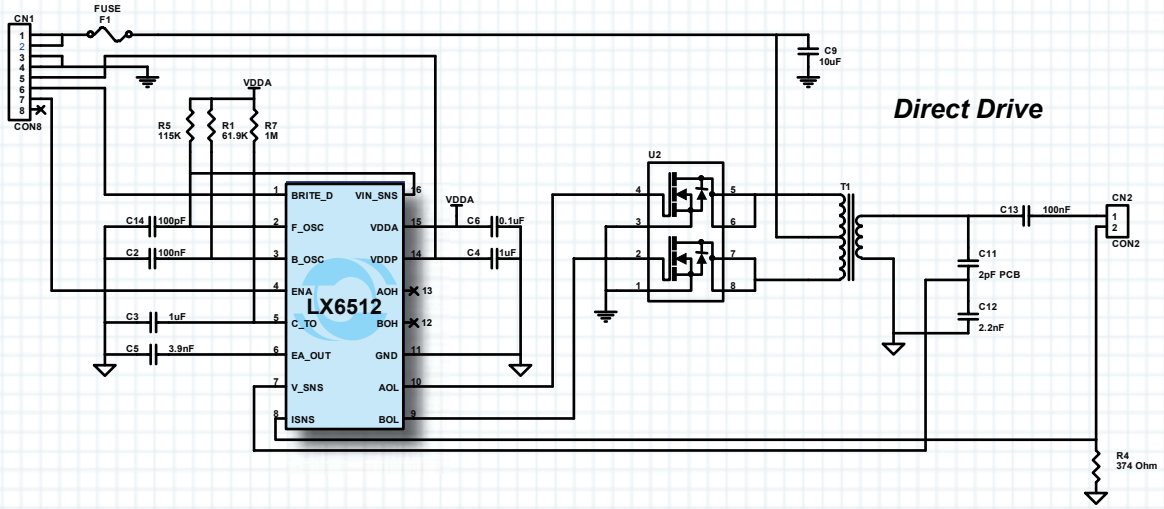
- High Performance Economical cost
- Flexible operation in Full Bridge and Push Pull Direct configurations
- One device type for many applications
- Patented Frequency Sweep Strike Technique
- Dual Analog and Digital brightness control
- Complete Fault Detection
- Wide Range Dimming
- Fixed Frequency Operation
- Multiple Applications
- Notebook, LCD Monitor, LCD Television, Digital Picture Frame, Portable Display Products

The LX6512 contains safety features that limit the transformer secondary voltage and protect against fault conditions which include open lamp, broken lamp and short-circuit faults. The over voltage fault shutdown is disabled during a user programmable interval to allow lamp strike.

The controller can accept a brightness control signal that is either an analog voltage level, or a direct low frequency PWM. Utilizing this signal it provides CCFL brightness dimming control using digital dimming, to achieve a wide dimming range (> 60 to 1).

An integrated 4V LDO (low dropout regulator) powers all internal control circuitry and up to 5mA for external circuitry greatly simplifying supply voltage requirements.

The LX6512 is available in a 16-Pin TSSOP and 3x3 mm 16pin QFN.



High Performance, Multi Lamp Controller with Integrated Gate Driver

LX6501™

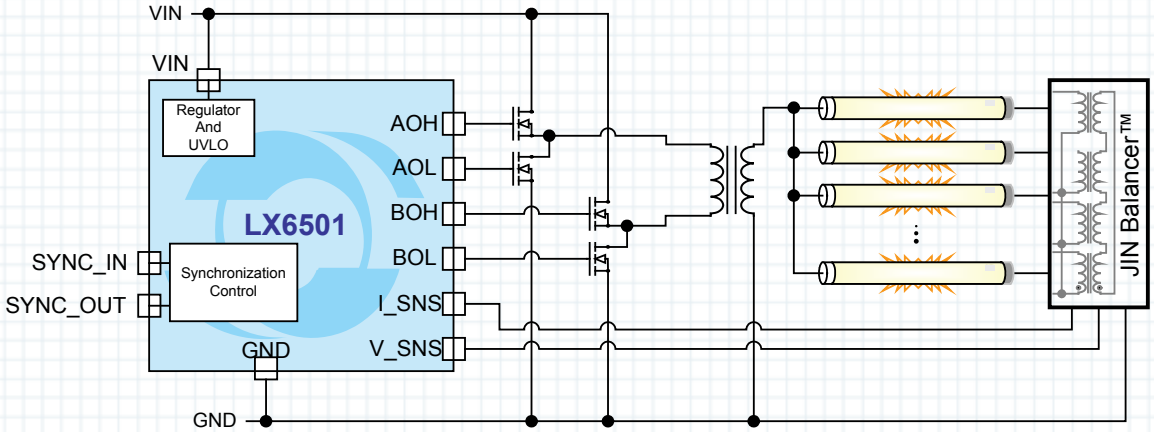
The LX6501 is a multi-lamp TV controller that provides high performance and system cost savings. Reduced total BOM cost is achieved with the integration of gate drivers as well as an on-chip regulator which generates the internal driver operating voltage to supply the gate driver circuit. This LCD-TV CCFL controller is available in a 28 lead TSSOP or SOWB package and is especially ideal for panels typically in the 30" to 50" range but can also support larger display size applications.

Key Features

- Integrated Gate Drivers Supports High Side and Low Side N-Channel FETs for Full Bridge Inverter Designs
- Supports Full Bridge, Half Bridge, Push Pull Inverter Topologies
- 10V – 27V Controller Input Voltage (35V Supply Input Voltage Absolute Maximum)
- On-Chip Regulator Allows Direct Connection of the Controller to Inverter Supply
- Inter-Controller and External Synchronization Capability Of Inverter Operating Frequency and Output Phase Relationship
- Reliable Striking Operation With Programmable Striking Frequency, Striking Time, Fault Time and Open Lamp Monitoring
- Enhanced Lamp Current Regulation and Voltage Regulation, Good Steady State Accuracy and Quick Dynamic Response
- Extensive Fault Detection Including Open Lamp, Over Voltage, Short Circuit, Over Current, UVLO and Over Temperature Protection

Applications

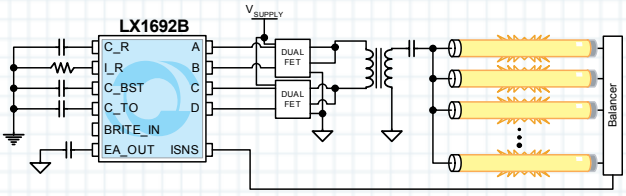
- LCD TV
- Multi Lamp Monitors
- Large Area LCD including Digital Signage
- CCFL, EEFL, FFL Backlight Systems



Full Bridge Resonant CCFL Controller

LX1692B™

The LX1692B is a cost reduced, CCFL controller optimized to drive multi lamp CCFL displays using resonant full bridge inverter topology. The LX1692B regulates the CCFL brightness in three ways: analog dimming, digital dimming, or combined analog and digital dimming methods simultaneously to achieve the widest dimming range (> 60 to 1). The controller is an ideal low cost solution for panel sizes of 20" to 30" range and also supports 40" to greater than 65" displays with an external buffer. The LX1692B is available in either a 20 pin TSSOP or SOIC package.



Key Features

- For Wide Voltage Range Inverter Applications (7V to 22V)
- Low Stress to Transformers
- Wide Dimming Range
  Analog Dimming: > 3 to 1
  Digital Dimming: > 20 to 1
  Combined: > 60 to 1
- Programmable Burst Dimming Frequency
- Programmable Timeout Protection
- Fixed Operating Frequency
- Open Lamp Voltage Protection, Short Circuit Lamp Protection, and Arc Protection

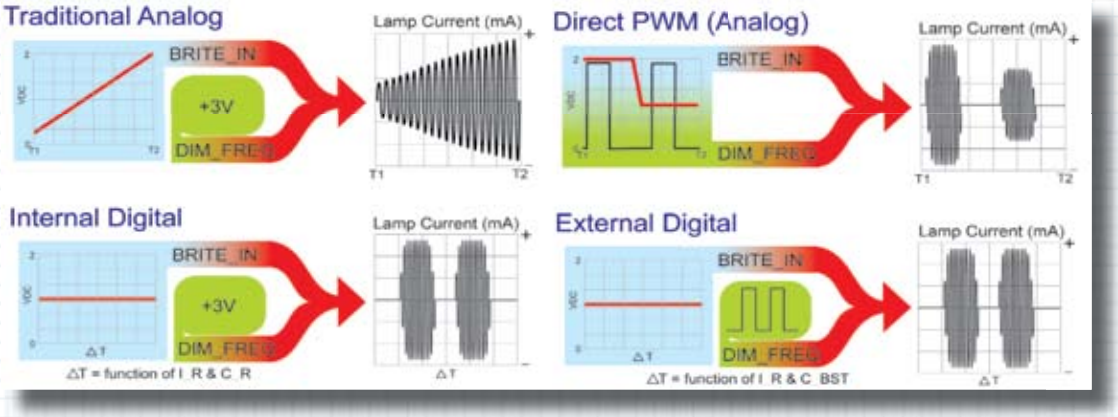
Benefits

- Even Display Light Distribution
- Longer Lamp Life with Optimized Lamp Current Amplitude
- Reduced Operating Voltage Lowers Corona Discharge and Prolongs Module Life
- High "Nits / Watt" Efficiency Makes Less Heat and Brighter Displays

Applications

- LCD TV
- LCD Multi Lamp Monitors

Controller Dimming Modes



Automotive Full Bridge CCFL Controller

LX1696™

The LX1696 is a full bridge resonant controller designed specifically for automotive and high performance display applications. The Direct Drive CCFL controller is optimized to provide the functions, efficiency, and safety features critical to vehicular applications while achieving major advancements in overall component count and costs at the system level.

The resonant full bridge topology provides near sinusoidal waveforms over a wide supply voltage range in order to maximize the life of CCFL lamps, control EMI emissions, and maximize efficiency. This new architecture also provides a wide dimming range.

The LX1696 provides integrated fault indicator and shutdown features necessary in automotive environments. Integration of these functions provides significant reductions in required external support components.

The LX1696 also features integrated gate drivers for the four external power MOSFETs.

An integrated 4V LDO powers all internal control circuitry greatly simplifying supply voltage requirements.

The LX1696 is available in a 20-Pin TSSOP in an extended temperature range.

Key Features

- -40°C to +85°C Operating Ambient Temperature Range
- For Wide Voltage Range Inverter Applications (7V to 22V)
- Patented Resonant Lamp Strike for Unsurpassed Striking Power Combined with Best Efficiency
- Reduced Corona Stress to Transformers
- Wide Dimming Range
  Direct Low PWM Brightness Control Input provides >300:1 Capability
  DC Brightness Control Input Provides > 80:1 Capability
- Programmable Burst Dimming Frequency
- Programmable Timeout Protection
- Fixed Operating Frequency
- Open Lamp Voltage Protection, Short Lamp Protection, Arc Protection
- Compatible with Existing Transformers.

Benefits

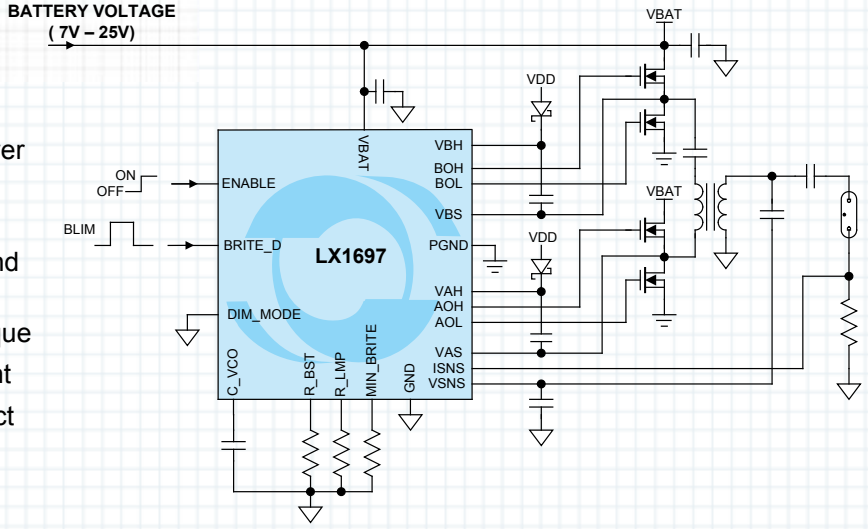
- Even Display Light Distribution
- Longer Lamp Life with Optimized Lamp Current Amplitude
- Reduced Operating Voltage Lowers Corona Discharge and Prolongs Module Life
- High “Nits / Watt” Efficiency Makes Less Heat and Brighter Displays

Applications

- Automotive
- Industrial Applications
- Avionics
- Marine

LX1697™

- 7V – 25 Volt Wide Input Voltage Range
- Supports Intel™ DPST for Notebook Saving system Power
- Programmable Burst and Oscillator Frequency
- Programmable Open Lamp and Load fault “Time Outs”
- Patented Lamp Strike Technique
- Low System Level Parts Count
- Internal 5V Regulator for Direct Operation from the System



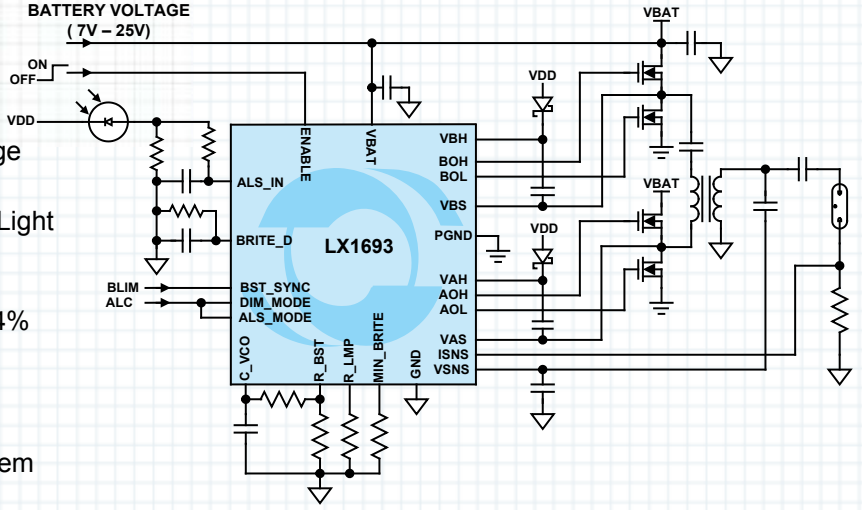
Applications

- Note Book LCD displays
- Transportable Computers
- Web Tablet LCD displays

LX1693™

Key Features

- 7 to 25 Volts Wide Input Voltage Range
- Versatile Support for Ambient Light Sensor Brightness Control
- Resistor Programmable Lamp Operating Frequency within ±4% Tolerance
- Resistor Programmable Burst Operating Frequency
- Support Intel™ DPST for System PWM Input
- Compatible with Microsemi’s New SMBus CCFL Controllers
- Fully Programmable Open Lamp and Load Fault Time Outs
- On Chip Full Wave Rectifiers for Lamp Voltage and Current
- Cost Effective and Low Parts Count Inverter Modules
- Uses Industry Standard High Voltage Transformers



Applications

- Note Book LCD displays
- Transportable Computers
- Web Tablet LCD displays

Backlight Inverter Selector Guide

Type	Typ VIN [V]*	Range VIN [V]*	VLAMP Range [V]*	Typ IOLAMP [mA]**	VLS [V] Min/Typ	Max Dimming	Base PN	DIMENSIONS (L,W,H) [mm]
Single Lamp	3.3	[3.0 --> 3.6]	[325,435]	3.5 to 5.0	1000/1200	<5:1	LXMG1618A-03-2x	86 x 16 x 4.7
						100:1	LXMG1617A-03-2x	
	5	[4.75 --> 5.25]				<5:1	LXMG1618A-05-2x	
						100:1	LXMG1617A-05-2x	
			[465,635]	5.0 to 6.5	1300/1400	<5:1	LXMG1618A-05-4x	86 x 16 x 6.5
						100:1	LXMG1617A-05-4x	
			[545,735]	5.0 to 8.0	1400/1650	<5:1	LXMG1618A-05-6x	100 x 16 x 7.5
						100:1	LXMG1617A-05-6x	
		[4.75 --> 5.50]	[300,750]	4.0 to 7.0	1500/1650	50:1 to **100:1**	LXMG1811-05-6x or 6xS	100 x 16 x 5.5
	12	[10.8 --> 13.2]	[465,635]	5.0 to 6.5	1400/1650	<5:1	LXMG1618A-12-4x	86 x 16 x 6.5
						100:1	LXMG1617A-12-4x	
			[545,735]	5.0 to 8.0		<5:1	LXMG1618A-12-6x	100 x 16 x 7.5
						100:1	LXMG1617A-12-6x	
		[9.0 --> 16.80]	[300,750]	4.0 to 7.0	1500/1650	50:1 to **100:1**	LXMG1813-12-6x or 6xS	100 x 16 x 5.5
		[9.0 --> 16.0]	[500,1000]	3.8 to 8.8	/2000	**100:1**	LXMG1614E-14-11	130 x 23 x 8.5
Dual Lamp	5	[4.75 --> 5.25]	[320,420]	5.0 to 6.0	1250/1400	100:1	LXMG1626-05-46	113 x 30 x 6.5
			[385,485]				LXMG1626-05-45	
			[350,530]	5.0 to 6.5		50:1	LXMG1623-05-4x	115 x 30 x 6.5
			[450,610]	5.2 to 6.7	1450/1600		LXMG1623-05-44	108.7 x 22.35 x 10.2
			[460,620]	5.0 to 7.0		100:1	LXMG1626-05-67	133 x 25 x 7.5
					1350/1500		LXMG1626-05-66	
			[510,690]	5.0 to 6.5	1400/1500		LXMG1626-05-65	
			[480,720]	5.0 to 8.0	1400/1650	50:1	LXMG1623-05-6x	165 x 21 x 7.5
	12	[10.8 --> 13.2]	[,1250]	3.5 to 5.0		100:1	LXMG1626-12-64	
			[320,420]	5.0 to 6.0	1250/1400		LXMG1626-12-46	113 x 30 x 6.5
			[385,485]				LXMG1626-12-45	
			[350,530]	5.0 to 6.5	1250/1400	<5:1	LXMG1624-12-4x	115 x 30 x 6.5
						50:1	LXMG1623-12-4x	
			[450,610]	5.2 to 6.7	1450/1600		LXMG1623-12-44	108.7 x 22.35 x 10.2
			[460,620]	5.0 to 7.0		100:1	LXMG1626-12-66	133 x 25 x 7.5
							LXMG1626-12-67	
			[480,720]	5.0 to 8.0	1400/1650	<5:1	LXMG1624-12-6x	165 x 21 x 7.5
						50:1	LXMG1623-12-6x	
			[510,690]	5.0 to 6.5	1450/1650	100:1	LXMG1626-12-65	133 x 25 x 7.5
Quad Lamp	12	[10.8 --> 13.2]	[530,720]	5.0 to 8.0	1500/1650	<5:1	LXMG1644-12-61	188 x 36 x 8
						50:1	LXMG1643-12-61	
			[530,730]				LXMG1643-12-62	
							LXMG1643-12-63	
							LXMG1643-12-64	188 x 42 x 8

Microsemi is pleased to offer turnkey CCFL inverter module solutions based on our patented technology and best in class CCFL IC.

- Single, Dual and Quad Lamps LCD Panels Backlighting Solutions
- Input Voltage Sources Options of 3.3V, 5V and 12V
- Output Power Management up to 6W per Lamp (see table for Lamp Voltage/Current Combinations)
- Automatic Strike Voltage Generation
- Open and Short Circuit Fault Detection with Auto Shutdown
- Analog or Digital Dimming Versions for Dimming Ranging from 5:1+ to 100:1+
- Output Open Circuit Voltage Regulation to Minimize Corona Discharge for High Reliability and Efficiency
- RangeMax™: Digital Dimming Design Based on a Patented "Burst Drive" Concept that energizes the lamp while ensuring that no premature lamp degradation occurs, allowing significant power savings at lower dim levels. This allows smooth, flicker free full range brightness control
- PanelMatch™: an elegant and simple dual pin setting solution that permits the variation of the typical lamp current that can be driven up to 3mA. The *same* inverter module can than 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).
- Wide Temperature Ranges: at least -20°C to +70°C and up to -30°C to +80°C on the newest designs
- RoHS and UL Certifications: all Microsemi inverter modules are RoHS compliant (LXMG "G"=Green) and UL60950 certified components (File E175910)

StayLIT™

StayLIT™ is a specially designed fault detection and management circuit for multi-lamp LCD panels, initially adopted on dual lamp inverter modules (LXMG1626-05-45, LXMG1626-12-45, LXMG1626-05-46, LXMG1626-12-46).

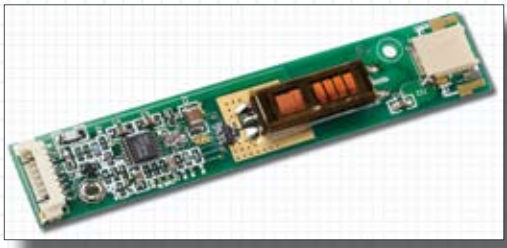
The StayLIT™ circuit detects the abnormal behavior of any of the two lamps (open/short status), resizes and redirects the output power to the remaining working lamp while providing a "fault" signal. The remaining working lamp is not overdriven and therefore it's not prematurely damaged and can be dimmed as in the normal operation mode. The end customer will see very little difference (lower brightness of the display) but the service group will be notified of the need to change the lamp.

This feature is found to be a must for Medical, Banking and POS systems providers where the continuous operation of the LCD display is of major importance.

"A" Series

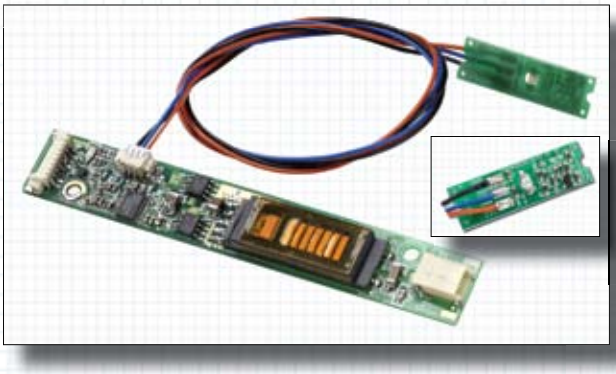
New! Single Lamp Inverters

New single lamp inverters, LXMG1617A/LXMG1618A ("A" Series). A drop-in upgraded replacement of the previous LXMG1617/LXMG1618 offerings. By integrating the newest CCFL IC and the long experience Microsemi is now able to offer wider dimming range and extended temperature range to its customers at a minimal or no re-design cost.



LXMG181X™ & VEasyLIT™

New! Single Lamp Inverters



The LXMG181x Series is designed to enhance the current offering: the customer will benefit from a wider input voltage range (VIN) at fully regulated lamp current, and an enhanced Lamp Driving capability (see the range of VLAMP and the Striking capability). Fewer part numbers (4 instead of 24) will be able to drive an extended list of displays thus greatly simplifying the customer supply change and minimizing the need of re-qualification and redesign of the backlight driving units in case a display is changed. Distributors and integrators dealing with multiple displays will now be able to stock a lower number of parts to meet their needs. When ordering the inverter as a standalone and not as part of the VEasyLIT kit, please use part numbers without the final "S", i.e. LXMG1811-05-61.

The biggest advantage of the LXMG181X series though lies in its availability in a ready and easy to use kit (VEasyLIT™): the customer can order the inverter (i.e. LXMG1811-05-61S) and a light sensor board (LXMG1800_LS) which can be hooked up to the inverter by simply joining the provided connectors. This small light sensor board can mounted easily in the product's bezel with the addition of a small hole or light diffuser so ambient light can be detected. It includes user adjustable gain settings to adjust for the product's typical ambient lighting conditions.

Visible Light Sensors

LX1973™
LX1973A™

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.

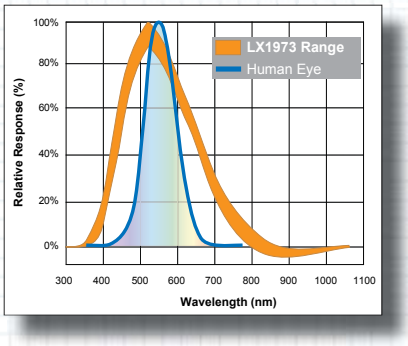
The LX1973 and LX1973A have been optimized for automotive systems such as headlamp brightness control or rear view mirror contrast control. Their radical (fractional exponent) response when interfaced with an 8 bit DAC can detect levels down to 0.001 lux or levels as high as 500 lux.

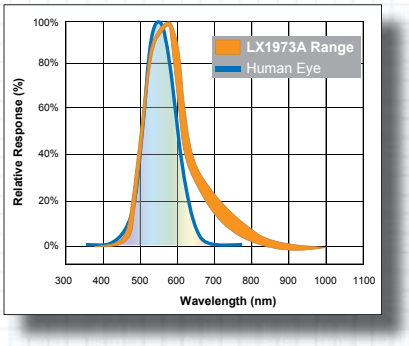
The spectral response of the integrated light sensor closely emulates the human eye so it ignores light such as infrared which emits energy but doesn't aid vision. This eliminates the need for an Infrared filter required with competitor light sensors.

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 ResponseLX1973A
- Human Eye Spectral ResponseLX1973
- 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

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 *Best Eye*™ 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 *Best Eye*™ 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 *Best Eye*™ for superior IR and UV immunity. 60% dark current reduction over the LX1973A.

LX1973B™

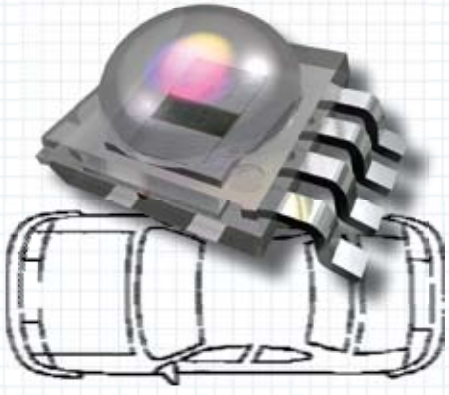
The LX1973B is a very wide dynamic range light sensor that improves on the low-level sensitivity of Microsemi's popular LX1973A. Like the LX1973A, the LX1973B also incorporates Microsemi's patent-pending Best Eye™ technology for the highest performance human eye spectral response available in the market 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

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.

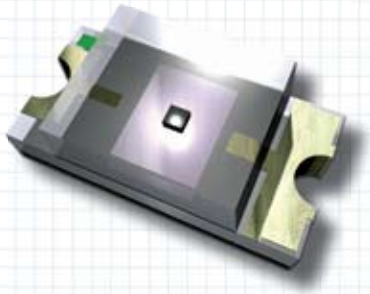
Patented circuitry produces peak spectral response at 520nm, with IR response less than ±5% of the peak response, about900nm.

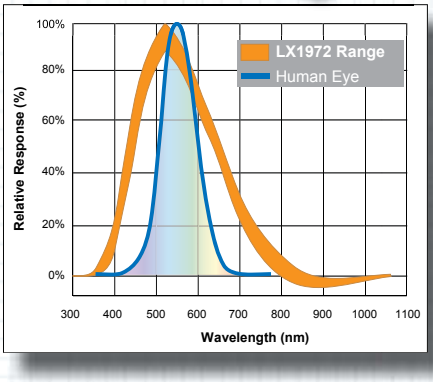
The photo sensor is a pin diode array with a linear, accurate, and very repeat-able current transfer function.

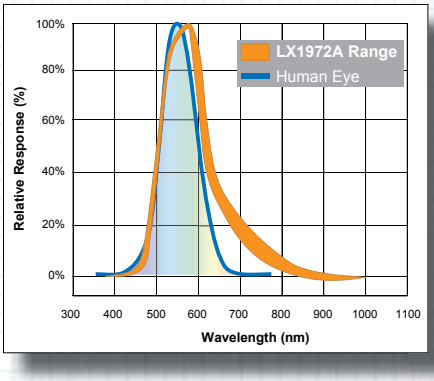
High gain cur-rent mirrors on the chips multiply the PIN diode photo-current to a sensitivity level that can be volt-age scaled with a standard value external resistor. Output current from these simple to use two-pin devices can be used directly or converted to a voltage by placing it in series with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

LED Driver Selector Guide

Part Number Package	Description	Type	# of LEDs	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Applications
LX1996 4x4 MLPQ-24	Integrated LED Driver, up to 6 parallel strings with multi-mode dimming and panel temperature compensated LED current	Switching Boost converter with six precision constant current sources with internal FETs, up to 25kHz PWM	>60	6V - 28V	40V	up to 30mA per string	Large LCD Panel (Notebook size displays)
LX1995-2 SOT 23-5 |TSOT-5	Integrated LED Driver, with high efficiency and low quiescent current	Switching Boost converter with constant current source and internal FET	up to 5 x 2	4.5V - 5.5V	30V	up to 150mA	Small LCD Panel backlight
LX1994 3x3 MLPQ-10 | MSOP-10	High efficiency LED Driver with OVP protection	Switching Boost converter with external N-FET, Light Sensor and PWM interface	up to 14	1.6V - 6V	60V	up to 150mA	Large LCD Panel for portable applications
LX1991 4x4 MLPQ-16	LED display driver with precision current control and dual-mode dimming	6 channel current sink LED driver	up to 60	1.6V - 6V Startup 1.6V	40V	up to 30mA per string	Large LCD Panel for portable applications

LX1995™

Miniature LED Driver

The LX1995 is a small sized step-up boost converter in a tiny TSOT-5 package suitable for driving adjustable boost topologies, which include drivers for white or color LEDs in portable devices. The LX1995 switches at rates up to 2MHz to allow the use of an extremely small inductor and filter capacitor. The LX1995 is big on power capability providing up to600mW of output power to drive up to 10 white LEDs at 20mAfrom a3.5V input.

Designed for maximum efficiency over a wide output power range, the LX1995 features a pseudo-hysteretic pulse frequency modulation that promotes improved performance in battery operated systems by operating with a quiescent supply current <30µA (typical) and shutdown current of less than 1µA.

Key Features

- Integrated FETS
- Provides Automatic Display Brightness when used withLX1970 or LX1972

Multi-string High Precision Integrated LED Driver

LX1996™

The LX1996 is a compact white LED driver for notebook size displays. It is designed to drive up to six strings of LEDs with a variable DC current. The LX1996 consists of a boost converter and six precision current sources.

Key Features

- Up to 30mA LEDs with +/-0.5% Precision Current Matching
- Wide Input Range 6.0V to 28V, -40 to +85C
- LED Panel Temperature Compensation of LED Current
- Direct Ambient Light Sensor Interface for Brightness Control
- Multi-mode Dimming Options by PWM or Analog Signal:
  - Up to 25kHz Direct Digital
  - Analog –to-Digital or Direct Analog
  - Combined Direct Analog and Digital
- Low Standby Current
- On-chip Thermal Shut-Down
- Over-Voltage Protection
- Short-Circuit Protection
- Thermally Efficient 24 pin 4x4mm MLPQ Package

Benefits

- Provide Homogenous Backlight Luminosity by Precision Current Matching
- Eliminate the Need for LED Binning
- Protect LEDs with a Thermal Profile
- Save Battery Power with High Efficiency over the Full Dimming Range
- Reduce Board Space by Minimizing External Components

Six Channel LED Matching Controller

LX1991™

The LX1991 is a six channel current sink driver ideal for con-trolling brightness and hue of high quality dimmable LED displays. High accuracy, dual mode dimming, and controlled current switching time provides consistent color hue, at brightness ratios of up to 1000:1 and keeps electromagnetic emissions in check.

High Efficiency LED Boost Driver

LX1994™

The LX1994 is the next generation compact high efficiency step-up boost controller for driving white or color LEDs in backlight or front light systems. The LX1994 was designed for maximum efficiency, using a dual mode PFM architecture, for reduced board size, and for minimal cost, making it ideal for PDA and digital camera applications. Utilizing an external N-Channel MOSFET, the LX1994 offers designers maximum flexibility with respect to efficiency and cost.

Applications

- LED Backlight Notebook Computers
- Wireless Phones
- PDAs , Handheld Devices
- Backlight LED Drivers
- Digital Camera Displays

DAZL! LED Drivers

For TV Display Backlights & LED Signage

Microsemi's DAZL! family of mixed signal high voltage LED driver ICs are designed for LCD display backlights and LED signboard/displays using white LEDs or strings of either red, green and blue (RGB) LEDs. The DAZL! family integrates all necessary power, analog and logic functions to support multiple LED strings in a compact monolithic package. The ICs drive LED strings, while simultaneously monitoring and measuring backlight string voltage and current, to control power supply voltage for optimum performance.

For low power LEDs, the PD24012L features on-chip MOSFETs capable of driving a string current of unto 85mA on each of its twelve outputs, with a 65V output voltage. For high power LEDs, the PD24012H is capable of driving external MOSFETs for a string current of up to 1.5A on each of its twelve outputs.

All PD24012 drivers are designed to support a full set of advanced features including scanning backlight (D1) and zone dimming (D2). They also support two external SPI buses. The architecture features advanced power management of DC power supply, fault protection and monitoring and individually controlled PWM outputs for each of the LED string outputs.

DAZL!™
Digital Advanced Zone Lighting™

Benefits

- Advanced Power Management
- Fault Detection and Protection
- Advanced Control of Color and Brightness Uniformity
- Supports D0, D1, D2, D3

Applications

- Display Backlight for TVs
- LED Displays/Signboards

PoE PSE Managers

PD64012G/GH™

12-port PoE PSE Manager

The PD64012G is a twelve-port, mixed-signal, high-voltage Power over Ethernet PSE Manager. The IC allows the detection of IEEE 802.3af-2003 powered devices, ensuring safe power feeding and removal over Ethernet ports. With full digital control via a serial communication interface and a minimum of external components, the IC integrates in multi-port and highly populated Ethernet switches.

The PD64012G has two possible working configurations: an automatic stand-alone mode, for basic PoE functions, and an enhanced mode, for extended functions and added flexibility with the presence of the PD63000G and PD83000G MCU's.

The PD64012GH has all the features of the PD64012G but can operate in Iport_max currents of up to 606mA per port.

PD64004A/AH™

4-port PoE PSE Manager

PD64004A is a four-port, mixed-signal, high-voltage Power over Ethernet PSE Manager. The IC allows the detection of IEEE 802.3af-2003 powered devices, ensuring safe power feeding and removal over Ethernet ports. With full digital control via a serial communication interface and a minimum of external components, the IC integrates in multi-port and highly populated Ethernet switches.

The PD64004A has three possible working configurations: an automatic stand-alone mode, for basic PoE functions, the PoE+ mode supporting legacy devices and autonomous operation with the PD33000G MCU and an enhanced mode, for extended functions and added flexibility with the PD63000G and PD83000G MCU's.

The PD64004AH has all the features of the PD64004A but can operate in Iport_max currents of up to 606mA per port.

Key Features

- Compliant with IEEE 802.3af and Pre-Standard Powered Devices
- High Power –H devices IEEE802.3at-ready
- 4-Port and 12-Ports Standalone PoE Control
- AC and DC Disconnect
- Supports RFC3621
- I2C or UART Host Interface
- Single Operating Voltage Source (44 to 57V)
- System-Wide Inrush Protection
- Dynamic Power Management
- Temperature Sense/Monitoring
- Enhanced Mode Features; Emergency Power Management for up to 3 Power Supplies, Maskable Interrupt, Programmable Port Matrix, LED Streaming
- LQFP-64 (12 port) or QFN-48-PS (4 port) Package, RoHS Compliant.

Key Benefits

- Freedom to Power All PoE PD's Including Cisco's Inline Power
- Highest Integration on the Market, Enabling the Lowest PCB Real Estate
- No Need for External DC/DC Converter
- Minimal Power Supply Stress and EMI Noises
- Power Management: based on power allocation and priority map, on class value or on both, provides full flexibility and optimal power supply usage
- Prioritization of Ports in Case of Power Reduction
- Logical to Physical Port Map
- User Can Receive Interrupts on Status or Have Automatic LED Driving
- System Monitoring and Per Port Thermal Protection, Including PCB Protection

PD64001™

1-port PoE PSE Manager

PD64001 is a one-port Power over Ethernet PSE manager. The IC allows the detection of IEEE 802.3af-2003 and IEEE802.3at powered devices, ensuring safe power feeding and removal over Ethernet ports. With a minimum of external components, the IC integrates in one and two-PoE-port Ethernet switches and midspans.

The PD64001 has several operating modes, allowing it to be tailored to the customer application, be it switch/midspan, IEEE802.af/IEEE802.3at, 1-event/2-event classification and strict resistor detection/legacy detection modes.

The PD64001 supports 2-events classification and operates in Iport_max currents of up to 720mA per port, making it fully compliant with IEEE802.3at-draft1.0.

Key Features

- Compliant with IEEE 802.3af and Pre-Standard Powered Devices
- IEEE802.3at-draft1.0 compliant
- 1-port standalone PoE Control
- 1-Event and 2-Event Classification Supported
- External FET and Sense Resistor
- AC and DC Disconnect
- Port On/Off Host Interface
- Single Operating Voltage Source (44 to 57V)
- Direct LED Driving Including IEEE802.3at Indication
- SOIC-20 Package, RoHS Compliant,
- -40ºC to +85ºC Operating Ambient Temperature

Key Benefits

- Programmable Solution, Can be Updated as the IEEE802.3at Standard Evolves
- Accurate Power Measuring and Extremely Low Power Dissipation
- BOM and Software Tailored for Specific Application Saving Total Solution Cost
- Freedom to Power all PoE Powered Devices Including Cisco Inline Power
- Minimal Power Supply Stress and EMI Noises
- User Can Have Automatic LED Driving

Coming Soon: PoE PSE Manager with 2-Event Classification

PD69012™

PD69012 is a twelve-port, mixed-signal, high-voltage Power over Ethernet PSE manager. The ICs allows the detection of IEEE 802.3af-2003 and IEEE802.3at powered devices, ensuring safe power feeding and removal over Ethernet ports. With full digital control via a serial communication interface and a minimum of external components, the IC integrates in multi-port and highly populated Ethernet switches. The PD69012 includes 2-events classification, as specified in IEEE8082.3at-draft1.0.

The PD69012 has two possible working configurations: an automatic stand-alone mode, for basic PoE functions, and an enhanced mode, for extended functions and added flexibility with the presence of the PD69000.

P/N	Ports	Iport max	Ta min (oC)	Ta max (oC)	Package	2-event class	Legacy PD's	Dynamic Pwr Mgt	Emergency Pwr Mgt	Production	FETs	Fuses
PD64012G	12	350mA	-20	+85	LQFP-64	No	Yes	Yes	Yes	Yes	Internal	1
PD64012GH	12	606mA	-20	+70	LQFP-64	No	Yes	Yes	Yes	Yes	Internal	1
PD64004A	4	350mA	-40	+85	QFN-48-PS	No	Yes	Yes	Yes	Yes	Internal	1
PD64004AH	4	606mA	-40	+70	QFN-48-PS	No	Yes	Yes	Yes	Yes	Internal	1
PD67024MACG	24	350mA	0	+70	JEDEC MOF161F	No	Yes	Yes	Yes	Yes	Internal	0
PD67024SG	24	350mA	0	+70	JEDEC MOF161F	No	Yes	Yes	Yes	Yes	Internal	0
PD64001	1	720mA	-40	+85	SOIC-20	Yes	Yes	No	No	Feb'08	External	0
PD69012	12	720mA	-40	+85	LQFP-80	Yes	Yes	Yes	Yes	Q2 '08	External	0

Regulator Selector Guide

Part Number Package	Topology	Output	Reference	VIN Range	Features
PWM REGULATORS					
LX1735 MO-229	Synchronous Current Mode Buck	2A	800mV	4V-6V	1.3MHz PWM frequency 150mΩ internal switch PGOOD indicator UVLO, thermal shutdown
LX1911 MO-229	Current Mode Buck	1.5A	800mV	4.5-5.5V	1MHz PWM frequency Soft start PFM mode for higher efficiency ±2% VREF over line / load / temp 0 to 125°C operation
LX1912 TSOT-23	Current Mode Buck	1A	800mV	4-6V	1.2MHz PWM frequency Soft start, UVLO Fully protected, thermal shutdown and current limit
LX1918 MO-229	Synchronous Current Mode Buck	1.5A	600mV	2.7-6.5V	1MHz PWM frequency with PFM mode ±2% VREF -40 to 85°C operation
PWM CONTROLLERS					
LX1675 MO-229	Synchronous Buck	3 PWM 1 LDO	800mV	4.5-24V	Selectable 300kHz or 600kHz PWM Programmable power sequencing No current sense resistor required Programmable soft start -40 to 85°C operation Small 5 x 7mm package
LX1752 MO-229	Synchronous Buck	2 PWM	700mV	4.5-22V	Multiphase solution for single or many outputs, programmable PWM frequency, SoftStart and Power sequencing

LX1752™

The LX1752 is a dual DC to DC Buck PWM controller that may be operated as a point of load regulator with two independent outputs or one multiphase output. Two or more LX1752 devices can be configured to produce a true multiphase solution on a power buss or configured to generate independent regulated outputs benefiting from phase positioning of the power switches. Features include operation over a wide supply voltage, independent soft start, cycle-by-cycle switch current limit, hic-cup mode short circuit current limiting and thermal shut down.

Benefits

- Convenient Point-of-Load Regulation
- Highly Integrated Power Supply Controller IC
- Small 4 x 5 x 1mm Package, RoHS Compliant (Pb-free)

Key Features

- Programmable, Expandable Interleaving of PWM Phases
- Independent Power Sequencing Control
- Adjustable PWM Frequency up to 1.5Mhz
- Single Input Supply Voltage spanning 4.5V to 22V
- High efficiency DC/DC Conversions Achieves >93%
- External Compensation for Design Flexibility
- Fully protected: Short Circuit, Thermal Shut Down and UVLO

LX1675™

Multiple Output Loadshare PWM

The LX1675 is a highly integrated power supply controller IC featuring three voltage mode PWM switching regulator stages with an additional onboard linear regulator driver.

Two of the constant frequency PWM phases can be easily configured for a single Bi-Phase high current output or operated as two independently regulated outputs. All outputs (PWM phases and LDO) have separate, programmable soft-start sequencing. This versatility yields either three or four independently regulated outputs with full power sequencing capability giving system designers the ultimate flexibility in power supply design.

The LX1675 accepts a wide range of supply voltage ranging from 4.5V to 24V. Each PWM regulator output voltage is programmed via a simple voltage-divider network. The LX1675 design gives engineers maximum flexibility with respect to the MOSFET supply. Each phase can utilize different supply voltages for efficient use of available supply rails.

Key Features

- Four Independently Regulated Outputs
- Single Input Supply with Wide Voltage Range: 4.5V to 24V
- Outputs as Low as 0.8V Generated from a • Precision Internal Reference
- Selectable PWM Frequency of 300kHz and 600kHz
- Buffered Reference Voltage Output
- Multiphase Output Reduces Need for Large Input Capacitance at High Currents
- Integrated High Current MOSFET Drivers
- Independent Soft-Start and Power Sequencing
- Adjustable Linear Regulator Driver Output
- No Current-Sense Resistors
- DDR Termination Compliant
- RoHS Complaint

Applications

- Multi-Output Power Supplies
- Video Card Power Supplies
- PC Peripherals
- Portable PC Processor and I/O Supply

LX1735™

2A Step-Down Synchronous Converter

The LX1735 operates as a current mode, synchronous 1.3MHz PWM buck regulator with an adjustable output voltage. It provides up to 2A of DC current with no minimum load requirement. Few external components are needed since the MOSFET switches and compensation components are internal to the IC.

The LX1735 features include: OVP monitoring at the feedback pin for +110% threshold detection; PGOOD indicator to externally signal when VOUT is within ±5 of nominal and Thermal shutdown. Current limit monitors the switch pin load on a cycle by cycle basis for rapid protection during fault conditions.

The 6 pin MO-229 package provides a small form factor with excellent power dissipation capability.

Key Features

- Input Range Voltage 4.5V to 6V
- Maximum Output Current, 2A
- Output Voltage from 0.8V to 90% of VIN
- PWM Fixed Frequency
- Power On Soft Start
- Efficiency up to 95%
- No External Schottky Diode
- Power Good Indicator
- Thermal Shutdown
- Cycle by Cycle Switch Current Limit
- UVLO
- OVP
- Short Circuit Protection
- 6 Pin MLP, JEDEC MO-229

Applications

- Lower Power Embedded Applications
- WLAN Power System
- Portable Design with Single Cell Li-Ion or 3 Cell NiMH/NiCd
- Portable Storage Applications

Class-D Audio Selector Guide

Part Number Package	Channels	Output Power (W)	Min Load (Ω)	VDD / PVDD Range (V)	THD + N @ 1kHz	IQQ (mA)	ISD (µA)	Enable	Mute	De-Pop	Gain (dB)	Description
INTEGRATED AMPLIFIER												
LX1701 MLPQ-16 (4mm²)	Mono	2	2	1.8 ~ 6.0	0.08%	2	<1	Yes	No	Yes	14 / 8	Mono, filterless, Class-D Low EMI, de-pop
LX1702 MLPQ-16 (4mm²)	Stereo	1	8	2.5 ~ 5.5	0.10%	2.5	1	Yes	No	Yes	20	Stereo, filterless, Class-D Low EMI, de-pop
LX1704 MLPQ-16 (4mm²)	Stereo	2	4	2.5 ~ 5.5	0.10%	2.5	1	Yes	No	Yes	20	Stereo, filterless, Class-D Low EMI, de-pop
LX1705 MLPQ-32 (5mm²)	Stereo	15	8	5 ~ 15	0.15%	12	1	Yes	Yes	Yes	26	Stereo, filterless, Class-D All in one, de-pop
LX1708 MLPQ-32 (7mm²)	Stereo	8	4	5 ~ 15	0.15%	12	1	Yes	Yes	Yes	26	Stereo, filterless, Class-D All in one, de-pop
LX1725 MLPQ-32 (7mm²)	Stereo	15	4	12 ~ 30 or ±6 ~ ±15	0.10%	15	100	Yes	Yes	Yes	14 / 20 / 26	Stereo, Single-ended output, High-power, Class-D, de-pop, All in one

1W - 2W Filterless Stereo Class-D Amplifiers

The Microsemi LX1702™ and LX1704™ represent a new generation of fully integrated stereo audio Class-D amplifiers.

This CMOS stereo Class-D amplifier series is optimized for low voltage, low power operation and minimum system cost. These products are ideal for use in battery powered applications where low power consumption is desirable such as cell phones, PDAs, web tablets, and other portable devices and lower power systems.

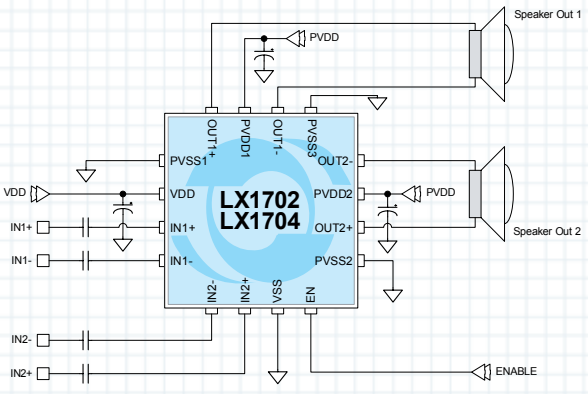
The LX1702 and LX1704 are offered in a small footprint, low profile 4mm2 surface mountable 15 pin MLPQ.

Key Features

- No Output Filter Required
- Low EMI Design
- Low Quiescent Current: 4mA
- Low Shutdown Current: 1µA
- Low and Wide Supply Voltage Range: 2.5 – 5.5V
- 1W Output Power into 8Ω Load with THD<1% @ 5.0V- LX1702 & LX1703
- 2W Output Power into 4Ω Load with THD<1% @ 5.0V – LX1704
- THD+N as Low as 0.1%
- Small Form Factor: 16 Pin MLP Package: 4mm2
- Built-in Clock Frequency
- Built-in Feedback Loop, Keep High Audio Fidelity
- Fixed 26dB Gain
- Full 20Hz to 20kHz Audio Bandwidth
- Shutdown Function
- Internal Thermal Shutdown
- High Efficiency: 80% Through Modulation Scheme and Class-D Operation
- Built-in De-pop Circuit, “POP” Free

Applications

- Cell Phones
- PDAs
- Portable Devices
- Portable Speakers
- Portable DVD
- PMP / PMC



8W + 8W and 15W + 15W Stereo Filterless Class-D Amplifier

The LX1705™ and LX1708™ are part of a new generation of fully integrated stereo class-D amplifiers from Microsemi. These CMOS audio amplifiers are optimized for highly efficient operation and minimal system cost. The stereo/ BTL (Bridge Tied Load) configuration uses 3-level PWM modulation. This allows eliminating the LC filter to reduce the system cost and simplify the system design. The LX1705 outputs 8W and the LX1708 outputs 15W into each of the two channels with better than 85% efficiency.

The part features on-board H-Bridge output stages with low RDSon. External bootstrap capacitors are all that is required to provide the gate drive to the all-NFET output stage since on-board bootstrap diodes are provided.

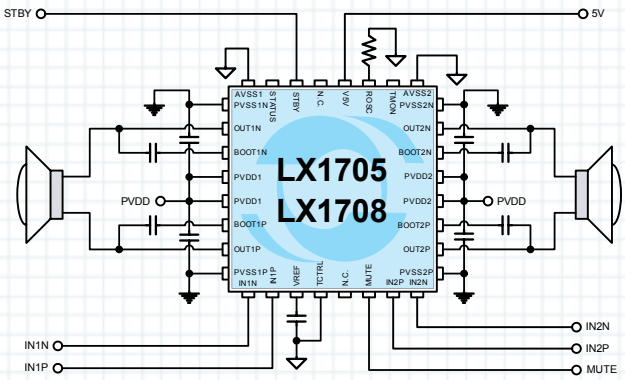
The LX1705 and LX1708 also feature mute and standby modes, over-current protection, POP-free turn-on and turn-off, under voltage lockout, over-voltage protection, and over-temperature protection.

The LX1705 is offered in a small footprint, low profile surface mountable 32-pin MLPQ package in 5mm2.

The LX1708 is offered in a small footprint, low profile surface mountable 32-pin MLPQ in 7mm2.

Applications

- LCD TV
- Car Navigation
- Computer
- Portable Sound Systems



Key Features

- Filter Free Operation
- 8W+8W Output Power @ 8Ω load: THD+N < 1% - LX1705
- 15W + 15W Output Power @ 4Ω Load: THD+N < 1% - LX 1708
- High Efficiency > 85%
- Full Audio Bandwidth: 20Hz to 20kHz
- Low distortion < 0.1% @ 1kHz, 50% of Maximum Power, 8Ω - LX 1705, 4Ω - LX1708
- Low distortion <0.2% @ 20Hz-20kHz, 1W, 8Ω - LX1705, 4Ω - LX1708
- High Signal-to-Noise Ratio: 90dB
- Single Power Supply
- Wide Supply Voltage Range: 5V ~ 15V
- Low Quiescent Current < 30mA
- Turn ON/OFF POP Free
- Standby/ Mute Feature
- Built-In Under Voltage Lockout
- Thermal Protection

Li-Ion Battery Charger Selector Guide

Part Number Package	Charge Current (maximum)	Input: Wall Adapter	Input: USB Mode	Battery Type	LED Drivers	Isolated Topology	Other Features
LX2205 MLPQ-16	1A	Yes	High, Low Suspend	Up to 2A - Hours	2	Yes	Separate adapter / USB inputs USB current limiting Discharge currents to 1.6A
LX2206 MLPD-10	1A	Yes	High, Low Suspend	50mA - 2A - Hours	3	No	Dual power connector Battery temperature monitor "Full battery" lockout
LX2207 MLPD-12	1A	Yes	High, Low Suspend	50mA - 2A - Hours	3	No	Three levels of programmable charge current
LX2208 MLPD-12	2A	Yes	High, Low Suspend	50mA - 2A - Hours	3	No	Up to 2A charging current

Microsemi constant current / constant voltage linear chargers provide precision voltage control, making sure the battery does not get overcharged or otherwise damaged in the charging process. A special protection feature for deeply discharged batteries provides an initial low conditioning current, until the full charging current can safely be applied. The automatic top-off of a nearly full battery assures that a full charge will be maintained over time.

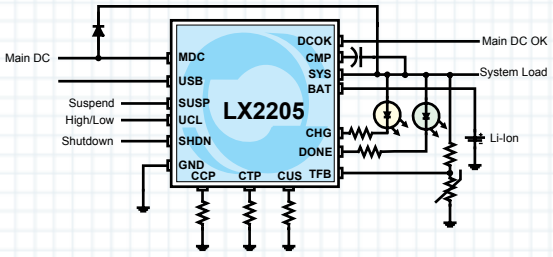
The most commonly used battery-charging configuration is to connect the system load directly to the battery-charger output. This solution is simple and low cost. A more advanced topology provides a power sharing capability, allowing the system to operate while charging the battery at the same time. An example of this architecture can be found in the LX2205™.

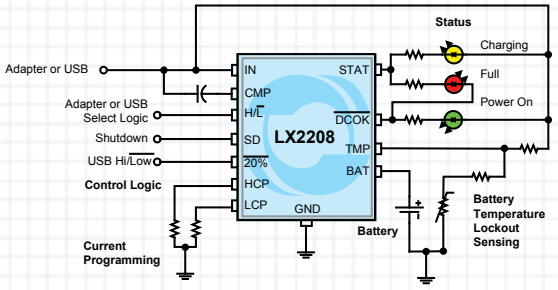
Key Features

- Precision Charger Voltage: No Overcharge
- Programmable Charge Current
- Programmable Cycle Termination Current
- Thermal Control Loop
- Conditioning Current
- Automatic Top-off Restart
- Reverse Current Blocking
- Short Circuit Protection
- Low Dropout Voltage Design
- Thermally Efficient Package with Built-in Heat sink
- LX2205 – Isolated Charging Topology

Applications

- MP3/ MP4 Audio Players
- Digital Multimedia Players
- Bluetooth Headsets – Car Kits
- GPS Devices
- POS Terminals
- Digital Cameras
- PDAs and Cradles
- Wireless Sensors for Security Systems
- Medical Diagnostic Devices





WLAN Power Amplifier Selector Guide

Part Number Package	Applications	Features	Frequency (GHz)	Supply Voltage	Pout @ 3% EVM (64 QAM / 54Mbps OFDM)	Gain (dB)	Total Current (mA)
LX5506B MLPQ-16	802.11a Client/AP U-N11	High Gain and Efficiency Excellent Linearity -48 dBc ACPR @ 30 MHz	5.15 - 5.70	3.3V	18 dBm (2.5% EVM) 20 dBm	25 21	170 (18dBm) 200 (20dBm)
LX5506M MLPQ-16	802.11a Client/AP U-N11 Cordless Phones	Simple design-in High gain, Low Current Low cost	4.9 - 5.9	3.3V	17 dBm	30	140
LX5510B MLPQ-16	802.11b/g Client/AP ISM & Fixed Wireless Radios	On-chip Input Match Output Pre-match High Efficiency	2.4 - 2.5	3.3V 5.0V	19 dBm (3.3V) 23 dBm (5V)	19	135
LX5511 MLPQ-16	802.11b/g Client/AP ISM Applications Fixed Wireless	± 0.25dB Gain Flatness Simplified Machining Excellent Linearity High Efficiency	2.3 - 2.5	3.3V	20 dBm (2.4% EVM)	26	170
LX5512B MLPQ-16L	802.11b/g Client/AP ISM Applications	High Gain, 3-Stages Low Current Simplified Matching	2.4 - 2.5	3.3V	19 dBm	32	140
LX5514 MLPQ-12	802.11b/g/n Client/AP Portable WiFi	High OFDM Power Low Current Small, Thin Package Low Cost	2.3 - 2.5	3.3V	20 dBm	28	150
LX5530 MLPQ-16L	802.11a/n Client/AP 802.16e BTS U-N11	Best-in-Class Linearity Broadband Matching High Gain	4.9 - 5.9	3.3V 5.0V	22 dBm (1.5% EVM, 5V) 19 dBm (2% EVM, 4V)	28	360 (22dBm) 240 (19dBm)
LX5537 MLPQ-16L	802.16e & 802.11b/g WiMAX/WiBro ISM, HyperLAN 1	High, 3-Stage Gain High Linearity 27dB Step Attenuation	2.3 - 2.7	3.6V 5.0V	24 dBm (3.6V) 27 dBm (5V)	32	370 (24dBm)
LX5540 MLPQ-16L	802.11b/g/n Client WLAN/WMAN/AP Portable WiFi	Input 50 Ohm Match High Linearity Best-in-Class Efficiency Ultra-Small Package	2.3 - 2.5	3.3V	20 dBm	28	145
LX5541 MLPQ-16L NEW!	802.11b/g/n Client/AP	PA + LNA + SPDT switch Simple Matching Low Current Ultra-Small Package	2.3 - 2.5	3.3V	19 dBm	27	145

Microsemi's family of RF power amplifier modules is designed for IEEE 802.11 b/g, b/g/n, 802.11a WLAN, and 802.16 WiMax wireless consumer and enterprise applications. They are manufactured with an advanced InGaP / GaAs hetero-junction bipolar transistor (HBT) integrated circuit process, which is ideally suited for high linearity, low power applications requiring only a single polarity supply voltage. Each of these monolithic microwave (MMIC) modules include a thermally-compensated active bias circuit, on-chip power detector, with 50 Ohm on-chip input matching and output pre-match, requiring minimal external components.

Micosemi's RF product portfolio also includes multi-chip, co-packaged power amplifier modules (CPM) available with functions that include an InGaAs pseudomorphic HEMPT (pHEMPT) low noise amplifier and/or a single-pole double-throw switch. These products are available in 16-lead, micro-lead quad packages (MLQP), in a 3 x 3mm, or 2 x 2mm footprint and 0.90mm, or ultra-thin 0.45 mm height.

Key Features

- Reliable Advanced InGaP / GaAs Process
- Ultra-Linear, Industry-Leading OFDM Output
- On-Chip 50 Ohm Input Matching with Output Pre-Match
- Temperature Compensated Active Bias Circuit
- On-chip Power Detector
- Single Polarity 3.3V or 5V supply
- Compact, Low Profile, Thermally Efficient MLQP 16-L Package
- Available pHEMPT LNA and SPDT switch

Applications

- IEEE 802.11 b/g/n and 802.11a Wi-Fi
- IEEE 802.16 WiMax
- Enterprise and Consumer Wireless
- Client Cards / Access Points
- Portable and Handheld Devices
- FCC U-NII, HyperLAN

WLAN Power Amplifiers

LX5511™

2.3 - 2.5 GHz Power Amplifier

The LX5511 power amplifier is a optimized for WLAN applications in the 2.3GHz – 2.5GHz frequency range. It is implemented as a two-stage MMIC with active bias and output pre-matching. With a single low voltage supply of 3.3V the LX5511 provides 26dB power gain between 2.3GHz and 2.5GHz at a low quiescent current of 90mA.

- 2.4 - 2.5GHz Operation
- Single-Polarity 3.3V Supply
- Quiescent Current ICQ ~ 90mA
- Power Gain ~ 26dB @ 2.45GHz and POUT= 18dBm
- Total Current ~ 150mA for POUT= 18dBm @ 2.45GHz OFDM
- EVM < 3% for 64QAM / 54Mbps and POUT= 19dBm
- Small Footprint: 3 x 3 x 0.9mm
- Targeted for IEEE 802.11b/g applications

LX5514™

2.3 - 2.5 GHz Power Amplifier

In one of the smallest form-factors available in-dustry-wide, the LX5514 provides a high gain, low quiescent current power amplifier for 802.11b/g applications in a tiny 2 x 2 mm low profile (0.46mm) MLP package. The device is a 2-stage MMIC power amplifier including active bias and output pre-matching and is ideal for small sized, medium gain power amplifier applications for IEEE 802.11 b/g applications.

- Advanced InGaP HBT
- 2.3 - 2.5GHz Operation
- Single-Polarity 3.3V Supply
- Quiescent Current ICQ ~ 80mA
- Power Gain ~ 28dB Total Current ~ 150mA for POUT= 20dBm OFDM
- EVM ~ 3% for 64QAM / 54Mbps
- Very Small Footprint and low profile : 2 x 2 x 0.46mm
- Targeted for IEEE 802.11b/g applications

LX5530™

4.5 - 6GHz High Power Amplifier

The LX5530 power amplifier is optimized for 802.11a applications and is implemented as a three stage MMIC with active bias, on-chip matching and output pre-matching. At 5V supply it supplies high power gain up to 33dB and provides up to +25dBm linear output for the 802.11a OFDM spectrum and a low EVM of 3% for up to +23dBm output power for the 4.9-5.9GHz band.

- Broadband 4.9-5.9 GHz Operation
- Single-Polarity 3V - 5V Supply
- Power Gain ~ 33dB for VC= 5V, ICQ= 250mA
- Power Gain > ~28dBAcross 4.9-5.85GHz
- OFDM Mask Compliance Power POUT~ +25dBm over 4.9-5.85GHz
- POUT up to +23dBm with EVM ~3% (VC= 5V)
- EVM <~ 2.5% for POUT=+ 21dBm across 4.9-5.85GHz (VC= 5V)
- EVM < ~ 2.5% for POUT= +19dBm across 4.9-5.85GHz (VC= 4V)
- Complete On-Chip Input Match
- Simple Output Match for Optimal Broadband EVM
- On-Chip RF Decoupling
- Temperature-Compensated On-Chip Output
- Power Detector with Wide Dynamic Range
- Small Footprint, Low profile : 3 x 3 x 0.9 mm

LX5535™

2.4 - 2.5 GHz Power Amplifier

The LX5535 power amplifier is optimized for 802.11b/g and 802.16 WiMAX applications and is implemented as a three stage MMIC with active bias, on-chip matching and output pre-matching. At 5V supply it supplies high power gain up to 32dB and provides up to +25dBm linear output for the 802.11g specification, and 28dBm power to the 802.11b mask compliant specification. The LX5535 has a low EVM of 3% for up to +25dBm output power for 64QAM / 54Mbps.

- Advanced InGaP HBT
- 2.3 - 2.4GHz Operation
- Single-Polarity 3.3 – 5.0V Supply
- Quiescent Current ICQ~120mA
- Power Gain ~ 32dB
- Total Current ~ 260mA for POUT= 25dBm 802.11g
- Total Current ~ 370mA for POUT= 28dBm 802.11b
- 802.11b mask-compliant power = 28dBm
- Power for EVM = 3.5% for 64QAM / 54Mbps: 25dBm
- Very Small Footprint: 3 x 3 x 0.9mm
- Suitable for IEEE 802.11b/g applications
- Suitable for IEEE 802.16 WiMAX applications

LX5540™

2.3 – 2.5GHz Power Amplifier with integrated low noise amplifier

The LX5540 is a co-package RFIC consisting of an InGaP/GaAs power amplifier and a low noise amplifier. Both are optimized for WLAN applications in the 2.3-2.5 GHz frequency range. The PA is implemented as a two-stage monolithic microwave integrated circuit (MMIC) with active bias and output pre-matching.

The LNA is fully matched internally and no external matching circuit is required. Both devices operate with single low voltage supply of 3.3V. The PA offers 28 dB power gain between 2.3-2.5GHz, at a low quiescent current of 80mA. For 20dBm OFDM output power (64QAM, 54Mbps), the PA provides a low EVM (Error-Vector Magnitude) of 3%, and consumes 145 mA total DC current. The LNA offers 14 dB gain, 1.5 dB noise figure and a high input IP3 of +4 dBm at 10 mA of DC current.

The LX5540 is available in a 16-pin 3mmx3mm micro-lead package (MLPQ-16L). The compact footprint, low profile, and thermal capability of the MLP package makes the LX5540 an ideal solution for medium-gain power transmitter and very low noise receiver requirements for IEEE 802.11b/g applications

- 2.3 - 2.4GHz Operation
- Single-Polarity 3.3V Supply
- Quiescent Current ICQ~80mA
- Power Gain ~ 28dB
- Total Current ~ 145mA for POUT= 20dBm OFDM
- LNA gain ~ 14dB, LNA noise figure ~ 1.5dB
- Small, Low Profile footprint: 3 x 3 x 0.45mm
- Suitable for IEEE 802.11b/g applications

LX5541™ *COMING SOON*

2.3 – 2.5GHz Power Amplifier with integrated low noise amplifier and switch

LX5541 is a co-package RFIC consisting of a power amplifier, a low noise amplifier, and a SPDT switch. By integrating these 3 devices in a compact footprint Microsemi offers a high level of front-end integration in a small, low thermal resistance footprint. All three RF devices are optimized for WLAN applications in the 2.3 to 2.5 GHz frequency range.

The PA is implemented as a two-stage monolithic microwave integrated circuit (MMIC) with active bias and output pre-matching. The LNA is fully matched internally, and the LNA is connected to the RX port of SPDT switch directly inside the MLPQ package.

Both PA and LNA operate with single low voltage supply of 3.3V. The PA (including SPDT switch loss) offers 27 dB power gain between 2.3-2.5GHz, at a low quiescent current of 95mA.For 19dBm OFDM output power (64QAM, 54Mbps) at the antenna port, the PA including SPDT switch provides a low EVM of about 3%, and consumes 145 mA total DC current. The LNA (including SPDT switch loss) offers 13 dB gain, 2 dB noise figure (switch contribution included).

The LX5541 is available in a low profile 3mmx3mm micro-lead package. By integrating the PA, LNA and SPDT in a small, low profile, and low thermal resistance package, the LX5541 offers an ideal compact front end solution for IEEE 802.11b/g applications.

- 2.3-2.5GHz Operation
- Single-Polarity 3.3V Supply
- Quiescent Current 92mA
- Power Gain 27 dB
- Total Current 145mA for Pout=19 dBm OFDM *
- EVM~3 % at 19dBm (2% at 17dBm) 54Mbps/64QAM
- LNA Gain ~ 13 dB, LNA Noise Figure ~ 2 dB
- On-Chip Bias Circuit
- On-Chip Input/Output Match
- Small, Low Profile Footprint: 3x3x0.45mm

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