

MINIATURE LED DRIVER LX1994 EVALUATION KIT

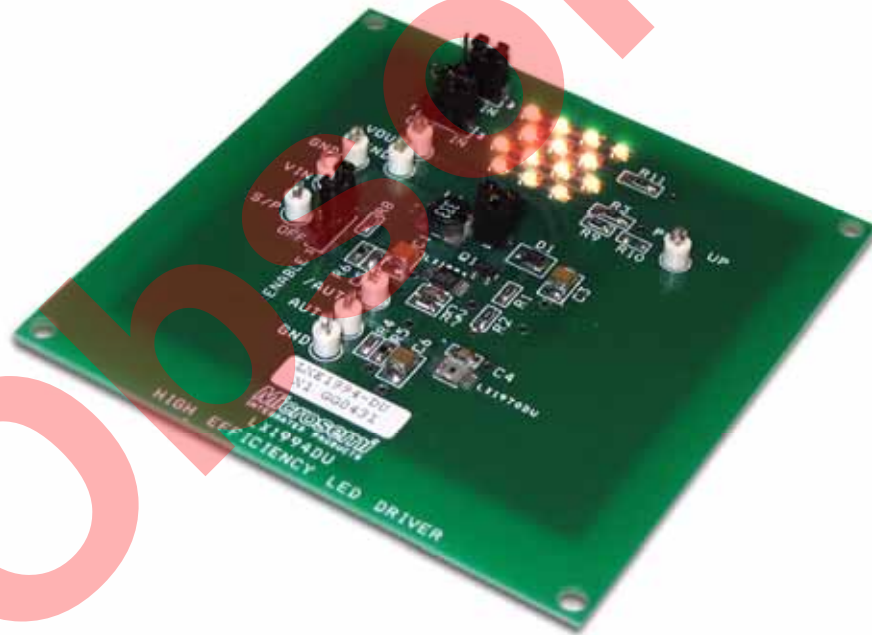


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Obsolete

INTRODUCING TO PRODUCT

The LX1994 Evaluation Board (EB) is available from Microsemi for evaluating the performance of the LX1994 LED driver integrated circuit and the LX1970 light sensor. (See picture 1) The combination of the two ICs provides a Automatic Light Control (ALC) system that increases the LED current in response to increases in ambient lighting. The light sensing portion of the EB can be disabled so that the LX1994 can be evaluated separately since not all applications of the LED driver will require light sensing.

KEY FEATURES OF THE LX1994

- Efficiency > 92%
- Dual PFM Architecture To Extend Battery Life
- V_{IN} Range 2.0V To 5.5V. Start Up Warranty @ 2.0V
- Logic Control Shutdown
- 100 μ A Typical Quiescent Current
- Shutdown I_Q Current <1 μ A
- OVP For Open String Output Voltage
- Low Voltage And Offset Current Sense
- Light Sensor (LX1970) interface
- Dual Dimming Options (PWM or DC Voltage)
- No External Zener Clamp Diode
- 10-Pin MLP or MSOP

APPLICATIONS

- Pagers
- PDA
- Cell Phone
- Portable Display
- Digital Cameras

PART SPECIFIC INFORMATION

Part Number	Description
LX1994CLD ¹	High Efficiency LED Driver
LX1994CDU ¹	

Table 1 – Part Information

IC	EVALUATION BOARDS
LX1994CDU ¹	LX1994-DU EVAL
LX1994CLD ¹	LX1994-LD EVAL

Table 2 – Evaluation Board Information

1. LX1994CLD and LX1994CDU: Patent Pending

LX1994 EVALUATION HOOK UP

The following is a demonstration scenario that can be used to evaluate the LX1994.

HOOK UP DIRECTION (DC DIMMING MODE)

1. Install Jumper JU1
2. Install ENABLE Jumper in the ON position.
3. Install J1 and J2 in the IN position.

4. Connect a 3.6V typical 1A power source between VIN and GND terminals.
5. Apply a 3.3V logic level to the AUTO pin. Connect the AUTO pin to GND.
6. Apply a 3.3V logic level 10KHz PWM signal to the S/P terminal. Vary duty cycle to control dimming in conjunction with the light sensor. The dimming response will be similar to the contours of graph 1.

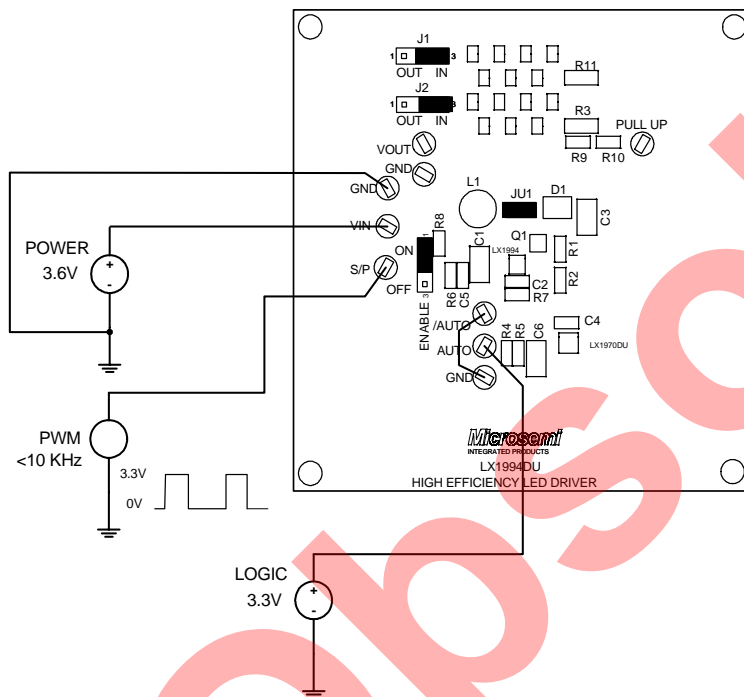


Figure 2 – Typical Hook Up for the LX1994 Eval Board

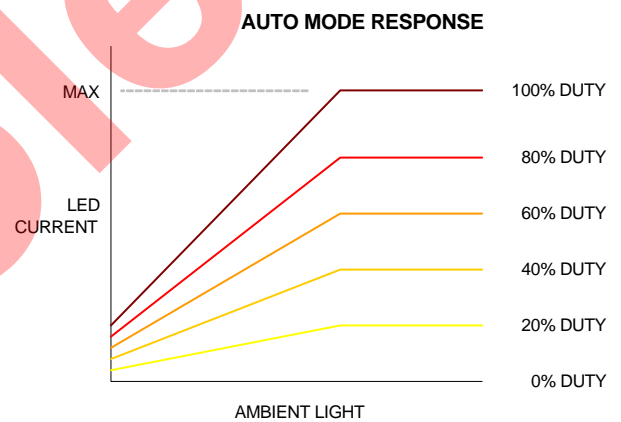


Figure 3 – Dimming Contours

CONNECTIONS

The LX1994 Evaluation Board has 9 test lead attachment points for applying power and control signals and for monitoring voltages.

Function	Board Label	Connection
Input Power	VIN	Power Supply (3.75 ±1.75V)
Power Ground	GND (3 Points)	Common Power Supply Ground.
Shutdown or PWM Dimming	S/P	Connect to GND to disable LX1994. A PWM > 10KHz log PWM signal can also be applied.
Open String	J2	Remove J1 and J2 to test open circuit load
Double Load	J1	Adding J1 increases the load from 7 to 14 LEDs
Output Voltage	VOUT	Test point to monitor voltage across LED current sense resistor. $I = \frac{V}{15}$ (value of R3)
ALC ¹	AUTO	Apply a 3.3V signal to enable the light sensor and apply a GND signal to disable the light sensor.
NOT ALC	$\overline{\text{AUTO}}$	Apply a GND signal to enable the light sensor and apply a 3.3V signal to disable the light sensor.

Table 3 – Connection Points

¹ Both the ALC and NOT ALC inputs must be properly set to enable or disable the Automatic Light Control.

Note: Jumper JU1 must be connected for the LX1994 to function. This jumper can be replaced with a wire loop so the inductor current waveform can be observed using a current probe.

PRINTED CIRCUIT BOARD LAYOUT

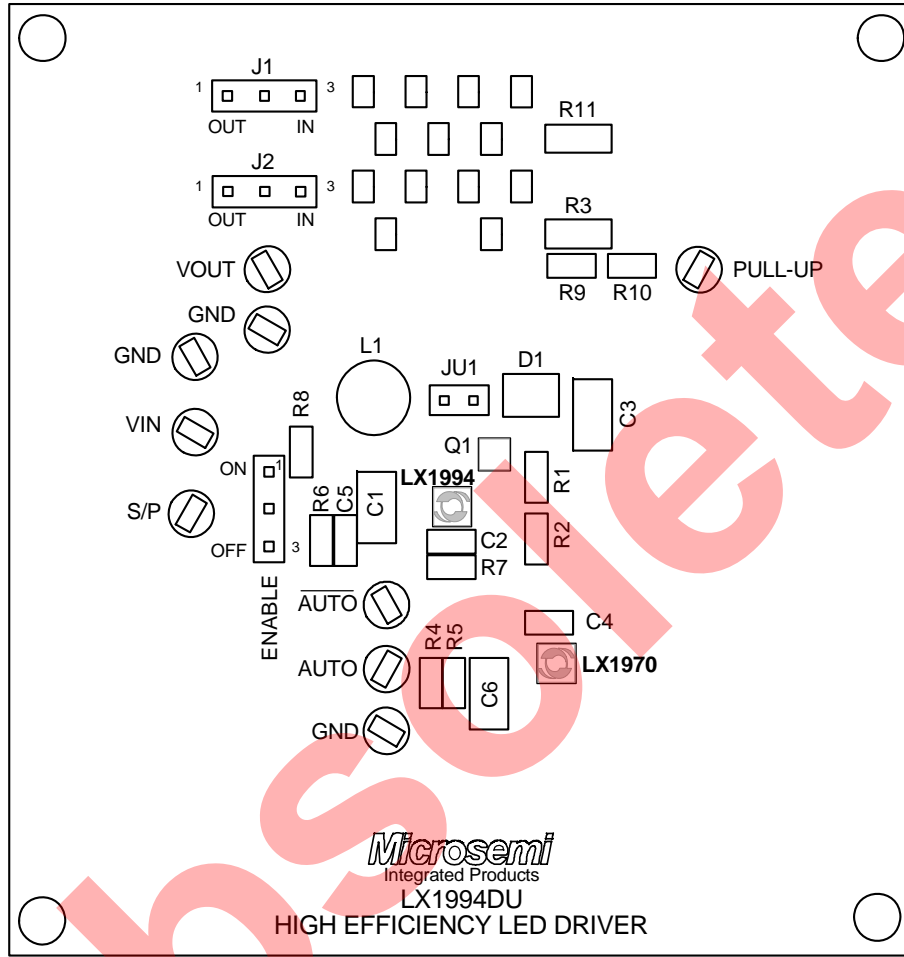


Figure 4 – LX1994CDU Evaluation Board

BILL OF MATERIALS

MISCELLANEOUS COMPONENTS

Line Item	Part Description	Manufacturer & Part #		Case	Reference Designators	Qty
1	High Eff. LED Driver	MICROSEMI	LX1994CDU or LX1994CLD	MSOP10 MLP	U1	1
2	Visible Light Sensor	MICROSEMI	LX1970DU	MSOP8	U2	1
3	NMOSFET, 30V	FAIRCHILD	FDN337N		Q1	1
4	LED, White	MICROSEMI	UPWLED	0603	LED#	14
5	Inductor, 33µH	COILCRAFT	MOS6020-333MX		L1	1
6	Diode, Schottky, 40V, 1A	MICROSEMI	UPS5819	PowerMite	D1	1
7	3-Pin Header, .100					3
8	Jumper					1
9	Lead Attachment HW					9

CAPACITORS

Line Item	Part Description	Part Description		Case	Reference Designators	Qty
1	Capacitor, 4.7µF, 16V, X7R	MURATA	GRM32RR71C475KC01L	1210	C1	1
2	Capacitor, 0.1µF, 25V, X7R	MURATA	GRM21BR71E104KA01L	0805	C2, C4	2
3	Capacitor, 1.0µF, 50V, X7R	MURATA	GRM32RR71H105MA01L	0805	C3, C5	2
4	Capacitor, 22µF, 6.3V, X5R	MURATA	GRM32DR60J226KA01L	1210	C6	1

RESISTORS

Line Item	Part Description	Part Description		Case	Reference Designators	Qty
1	Resistor, 1M Ω	PANASONIC	ERJ-6ENF1004V	0805	R1	1
2	Resistor, 30.1K Ω	PANASONIC	ERJ-6ENF3012V	0805	R2	1
3	Resistor, 15 Ω	PANASONIC	ERJ-6ENF15R0V	1206	R3, R11	2
4	Resistor, 226K Ω	PANASONIC	ERJ-6ENF2263V	0805	R4	1
5	Resistor, 23.2K Ω	PANASONIC	ERJ-6ENF12322V	0805	R5	1
6	Resistor, 2.94K Ω	PANASONIC	ERJ-6ENF2941V	0805	R6	1
7	Resistor, 28.7K Ω	PANASONIC	ERJ-6ENF2872V	0805	R7	1
8	Resistor, 47K Ω	PANASONIC	ERA-6YEB473B	0805	R8	1
9	Resistor, 0 Ω	PANASONIC	ERJ-6GEY0R00V	0805	R9, R10	2