



The Future of Analog IC Technology®

EVQ2483-Q-00A

55V, Programmable Frequency
White LED Driver Evaluation Board
AEC-Q100 Qualified

DESCRIPTION

The MPQ2483 is a 55V, white LED driver suitable for either step-down or inverting step-up/down applications. It achieves 2.5A peak current over a wide input supply range with excellent load and line regulation. Current mode operation provides fast transient response and eases loop stabilization. Fault condition protection includes thermal shutdown, cycle-by-cycle peak current limiting, input over voltage protection, open strings protection and output short circuit protection.

The MPQ2483 incorporates both DC and PWM dimming onto a single control pin. The separate input reference ground pin allows for direct enable and/or dimming control for a positive to negative power conversion.

The MPQ2483 is package in QFN10 (3 x 3)mm.

MPQ2483-Q DEMO BOARDS

Board number	Operating Mode	Input (V)	LED#	ILED (mA)
EVQ2483-Q-00A	Buck-boost	12	1-4	700
EVQ2483-Q-00B	Buck	15-50	3	700
EVQ2483-Q-00C	Boost	12	6-9	500

FEATURES

- Unique Step-up/down Operation (Buck-Boost Mode)
- Wide 4.5V to 55V Operating Input Range for Step-Down Applications (Buck Mode)
- 0.28Ω Internal Power MOSFET Switch
- Adjustable Switching Frequency
- Analog and PWM Dimming
- 0.198V Reference Voltage
- 5μA Shutdown Mode
- No minimum LED required
- Stable with Low ESR Output Ceramic Capacitors
- Cycle-by-Cycle Over Current Protection
- Thermal Shutdown Protection
- Open Strings Protection
- Output Short Circuit Protection
- Available in 10-Pin 3x3 QFN Package

APPLICATIONS

- General LED Illuminations
- LCD Backlight Panels
- Automotive Lighting

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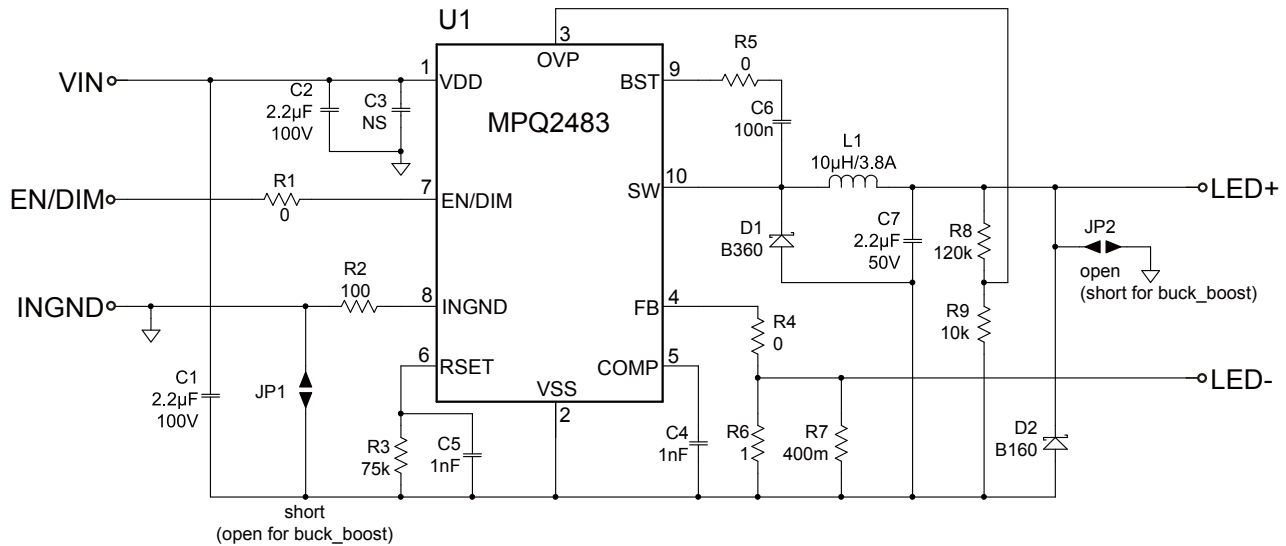
EVQ2483-Q-00A EVALUATION BOARD



(L x W x H) 5cm x 4.5cm x 0.7cm

Board Number	MPS IC Number
EVQ2483-Q-00A	MPQ2483DQ

EVALUATION BOARD SCHEMATIC



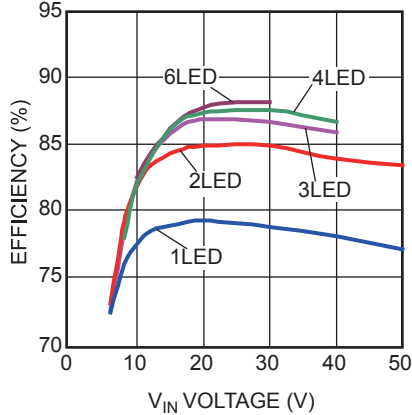
EVQ2483-Q-00A BILL OF MATERIALS

Qty	Reference	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C2	2.2µF	Ceramic Cap., 100V, 10%, X7R	1210	muRata	GRM32ER72A225KA35L
	C3	NS				
2	C4, C5	1nF	Ceramic Cap., 50V, 10%, X7R	0603	Panasonica	GRM188R71H102KA01D
1	C6	0.1µF	Ceramic Cap., 50V, 10%, X7R	0603	muRata	GRM188R71E104KA01D
1	C7	2.2µF	Ceramic Cap., 50V, 10%, X7R	1206	muRata	GRM31CR71H225KA88L
1	D1	B360	Schottky Rect., 60V, 3A	SMA	Diodes Inc	B360A-13-F
1	D2	B160	Schottky Rect., 60V, 1A	SMA	Diodes Inc	B160-13-F
1	L1	10µH	Inductor, Rdc 28mΩ, Isat 4A	SMD	Wurth Elektronik	744066100
3	R1, R4, R5	0	Film Res., 5%	0603	Yageo	RC0603JR-070RL
1	R2	100	Film Res., 5%	0603	Yageo	RC0603JR-07100RL
1	R3	75kΩ	Film Res., 1%	0603	Yageo	RC0603FR-0775KL
1	R6	1Ω	Film Res. 1%	0805	ROYALOHM	RC0805FR-071RL
1	R7	400mΩ	Film Res. 1%	0805	ROYALOHM	0808F400LT5E
1	R8	120kΩ	Film Res., 1%	0603	Yageo	RC0603FR-07120KL
1	R9	10k	Film Res., 1%	0603	Yageo	RC0603FR-0710KL
1	U1	MPQ2483	Power Led Driver	QFN10	MPS	MPQ2483
1	EN/DIM, LED+, LED-, VIN, GND		11 Pin Header, 2.54mm	2.54mm	Sullins	PCC11SAAN
	JP1, JP2		NS			

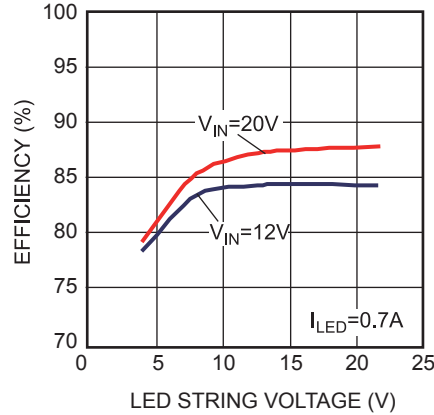
EVB TEST RESULTS

Buck Boost Mode, $L = 10\mu\text{H}$, $F_{\text{SW}} = 330\text{kHz}$, 3LED, $I_{\text{OUT}} = 0.7\text{A}$, $T_A = 25^\circ\text{C}$, unless otherwise noted.

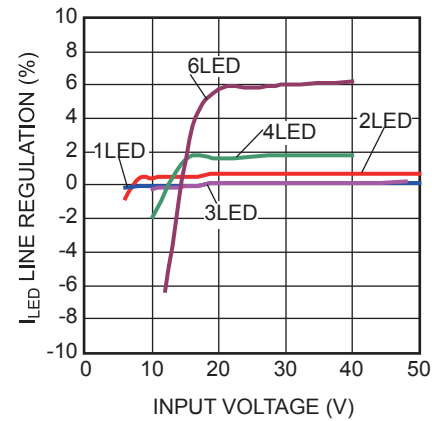
Efficiency vs.
Input Voltage



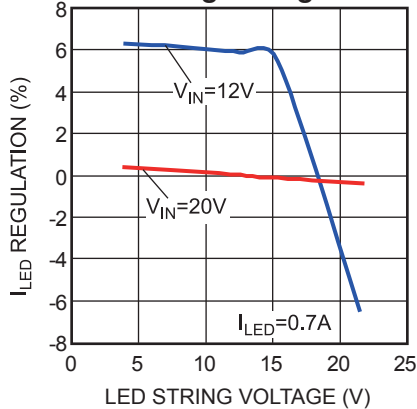
Efficiency vs.
String Voltage



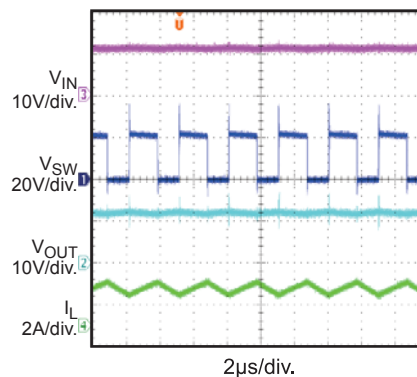
LED Line Regulation



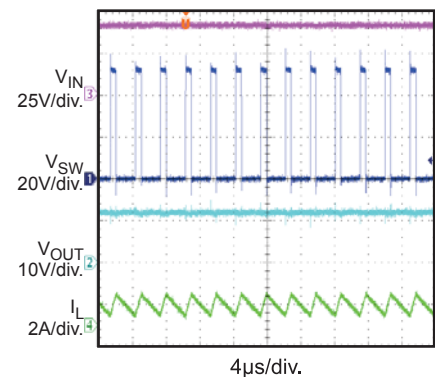
LED Regulation vs.
LED String Voltage



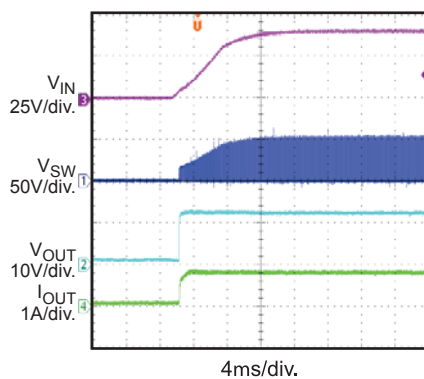
Steady State
 $V_{\text{IN}} = 10\text{V}$



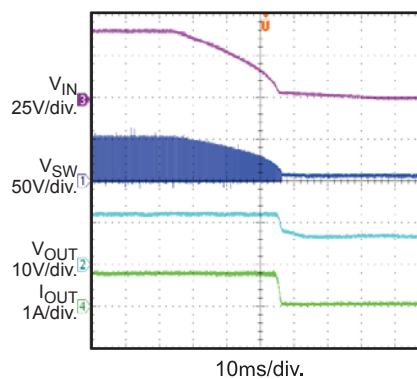
V_{OUT} with Temp
 $V_{\text{IN}} = 40\text{V}$



Power Ramp Up
 $V_{\text{IN}} = 40\text{V}$

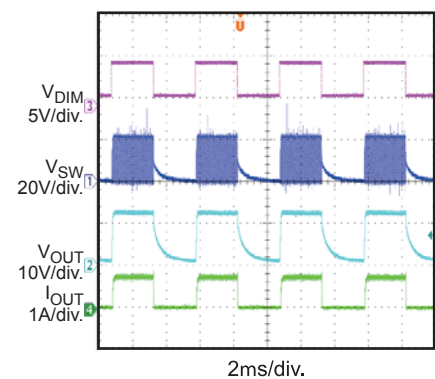


Power Ramp Down
 $V_{\text{IN}} = 40\text{V}$



PWM Dimming

$V_{\text{IN}} = 10\text{V}$, $F_{\text{DIM}} = 0.2\text{kHz}$, 50%



PRINTED CIRCUIT BOARD LAYOUT

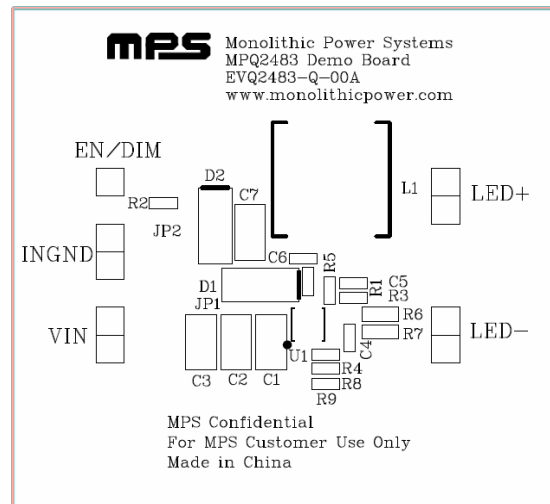
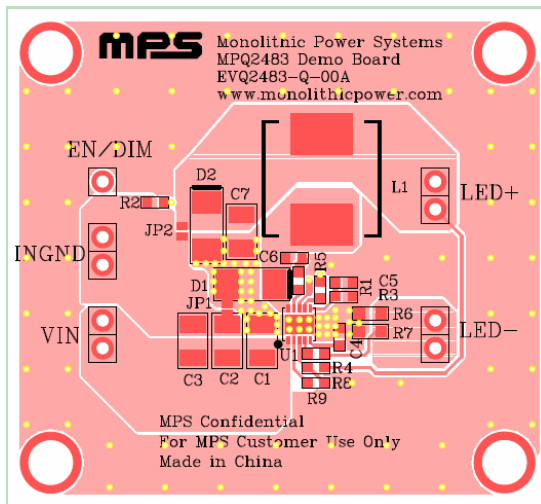


Figure 1—Top Layer

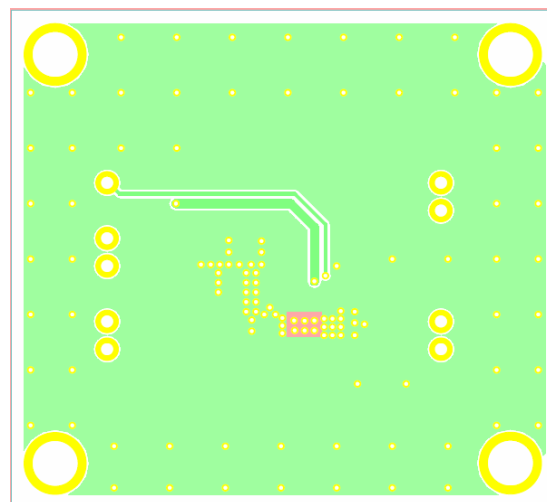
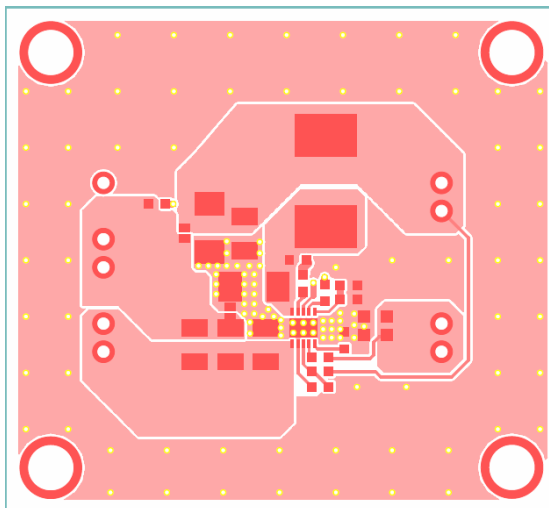


Figure 2—Bottom Layer

QUICK START GUIDE

1. Connect the load (3LEDs or less) to the output. The Anode of the load to "LED+" and the Cathode of the load to "LED -".
2. Connect the input voltage source to the input VIN and INGND. The input voltage source should be initialed 10V - 45V.
3. Connect the EN or dimming signal to EN/Dim pin.

For PWM dimming, connect the PWM signal to EN/Dim pin, the high level should be higher than 1.4V, the low level should be lower than 0.7V.

For analog dimming, connect a DC dimming signal in range of 0.7V~1.4V to EN/Dim pin.

4. Power up the input voltage source, and then power up the EN/Dim signal, the LEDs should be ignited.

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