

DESCRIPTION

The MP24183 is a 55V, 1A, white LED driver suitable for either step-down or inverting step-up/down applications. It achieves 1A peak output 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 MP24183 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 MP24183 requires a minimum number of readily available standard external components and is available in 10-pin 3mm x 3mm QFN packages.

MP24183DQ DEMO BOARDS

Board number	Operating Mode	Input (V)	LED#	I _{LED} (mA)
EV24183DQ-00A	Buck	15~50	3	700
EV24183DQ-00B	Buck-boost	12	3~5	500
EV24183DQ-00C	Boost	12	6~9	500

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	V _{IN}	12	V
LEDs #		6~9	
LED Current	I _{LED}	500	mA

FEATURES

- 1A Maximum Output Current
- 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
- Input Over Voltage Protection
- Output Short Circuit Protection
- Available in 10-Pin 3x3 QFN Package

APPLICATIONS

- General LED Illuminations
- LCD Backlight Panels
- Handheld Computers
- Automotive Internal Lighting
- Portable Multimedia Players
- Portable GPS Devices

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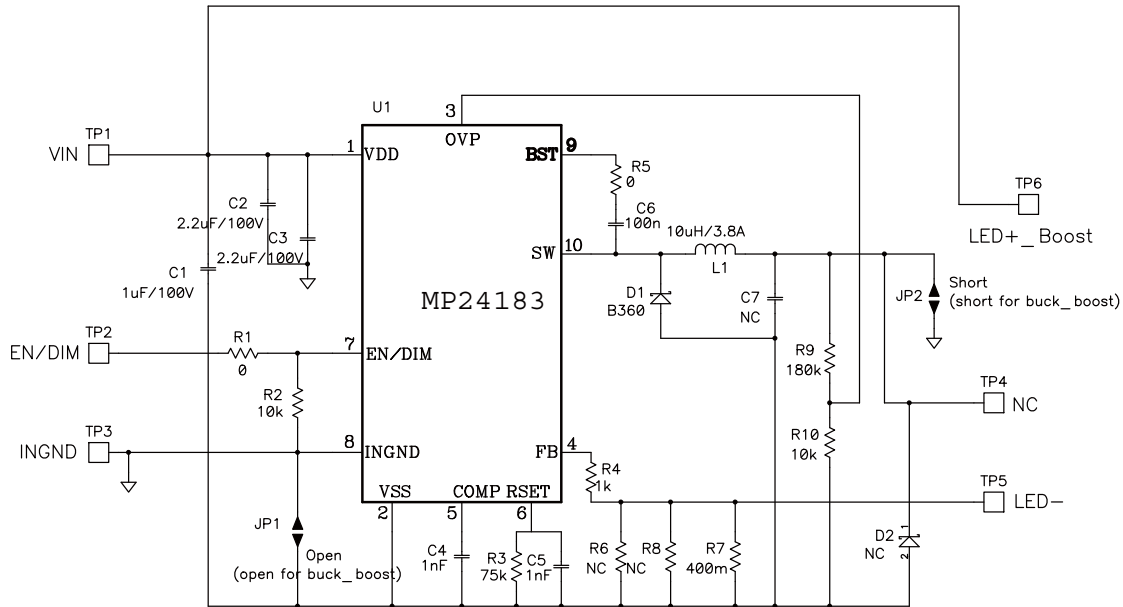
EV24183DQ-00C EVALUATION BOARD



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

Board Number	MPS IC Number
EV24183DQ-00C	MP24183DQ

EVALUATION BOARD SCHEMATIC



EV24183DQ-00C BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	1µF	Ceramic Capacitor, 100V, X7R	1210	Murata	GRM32ER72A105KA01L
2	C2, C3	2.2µF	Ceramic Capacitor, 100V, X7R	1210	Murata	GRM32ER72A225KA35L
2	C4, C5	1n	Ceramic Capacitor, 50V, X7R	0603	TDK	C1608X7R1H102K
1	C6	100n	Ceramic Capacitor, 50V, X7R	0603	TDK	C1608X7R1H104K
1	C7	NC		1210		
1	D1	B360	Diode Schottky	SMA	Diodes Inc.	B360A
1	D2	NC		SMA		
1	L1	10µH	Inductor 3.7A, 22mOhm	SM	TOKO	DH124C-1010ASW-100M
		10µH	Inductor 3.8A, 35mOhm	SM	Cooper	DR1040-100-R
		10µH	inductor 3.8A, 28mOhm	SM	TDK	VLF10040-100M3R8
1	R4	1k	resistor, 1%	0603	Yageo	RC0603JR-071kL
2	R1, R5	0	resistor, 1%	0603	Yageo	RC0603JR-070RL
2	R2, R10	10kΩ	resistor, 1%	0603	Yageo	RC0603FR-0710kL
1	R3	75kΩ	resistor, 1%	0603	Yageo	RC0603FR-0775kL
2	R6, R8	NC		0805		
1	R7	400m	resistor, 1%	0805	ROYALOHM	0805F400LT5E
1	R9	180kΩ	resistor, 1%	0603	Yageo	RC0603FR-07180kL
1	U1	MP24183DQ	MPS WLED Driver, 1A, 55V, frequency programmable	QFN3*3	MPS	MP24183DQ

PRINTED CIRCUIT BOARD LAYOUT

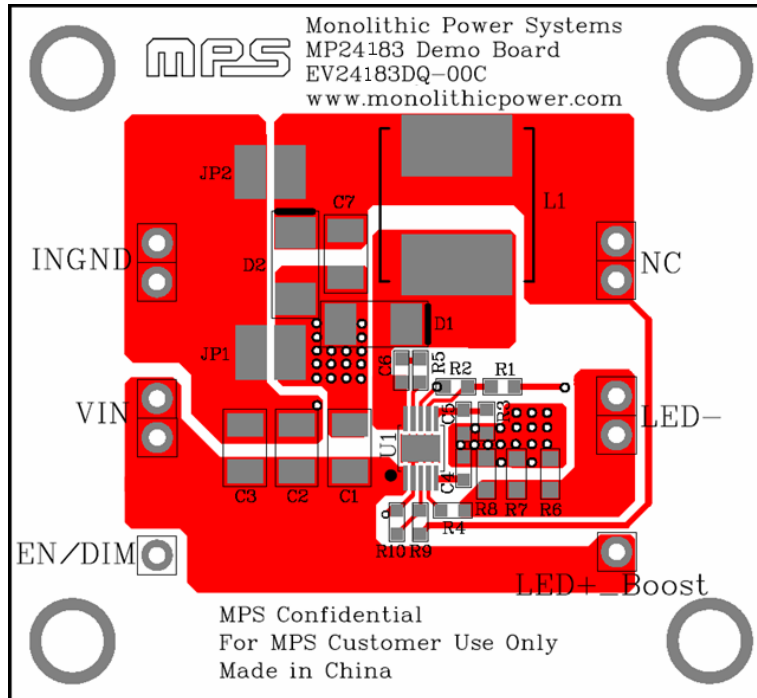


Figure 1—Top Layer

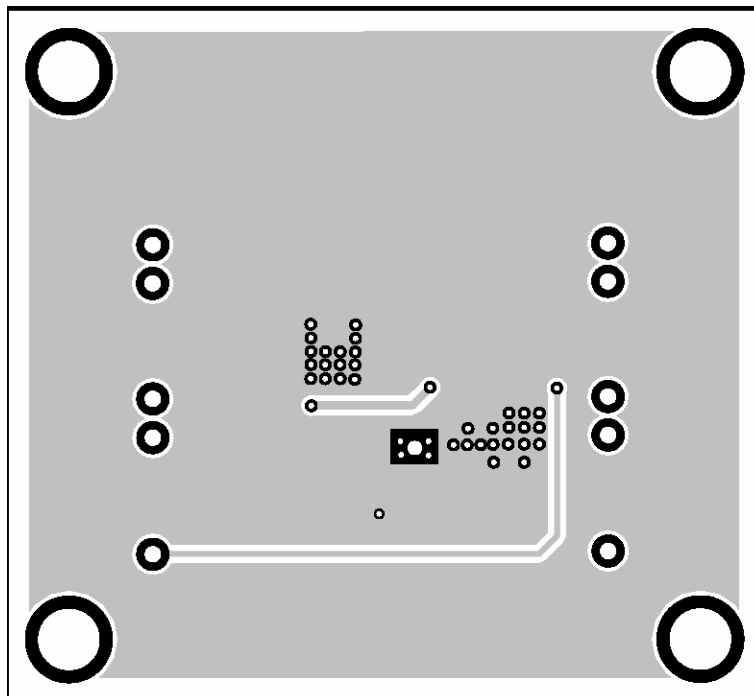


Figure 2—Bottom Layer

QUICK START GUIDE

1. Connect the load (6~9LEDs) to the output. The Anode of the load to “LED+_Boost” 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 initiated 12V.
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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