

DESCRIPTION

The MP3309A is a WLED step-up converter for 2.7V-to-5.5V input that uses peak-current mode to regulate the LED current sensed through an external low-side resistor. The 200mV feedback voltage and synchronous rectification reduces power loss and reduces PCB space requirements. To connect an external Schottky accomplishes the non-synchronous mode for heavy load to improve the thermal performance.

The MP3309A features a programmable switching frequency to optimize efficiency. It supports both analog and PWM dimming.

In addition, the MP3309A has LED open protection, cycle-by-cycle current limit protection and thermal shutdown protection. The I²C interface can set the over-voltage protection threshold, analog dimming and read IC status. MP3309A is available in QFN10 3*3mm package.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	V _{IN}	2.7-5.5	V
Output Voltage	V _{LED}	<35	V
LED Current	I _{LED}	40	mA

FEATURES

- 2.7V-to-5.5V Input Voltage
- Low 200mV Feedback Voltage with ±1% Accuracy
- Selectable Synchronous or Non-synchronous Mode Thru I²C
- 400kHz I²C-Compatible Interface
- Analog and PWM Dimming
- Programmable Switching Frequency
- Programmable Over Voltage Protection Point
- Software- or Hardware-Enable Function
- UVLO, Thermal Shutdown
- Available in 3×3mm QFN 10 package

APPLICATIONS

- Feature Phones and Smart Phones
- Tablets
- Video Displays

All MPS parts are lead-free, halogen free, and adhere to the RoHS directive. For MPS green status, please visit MPS website under Quality Assurance.

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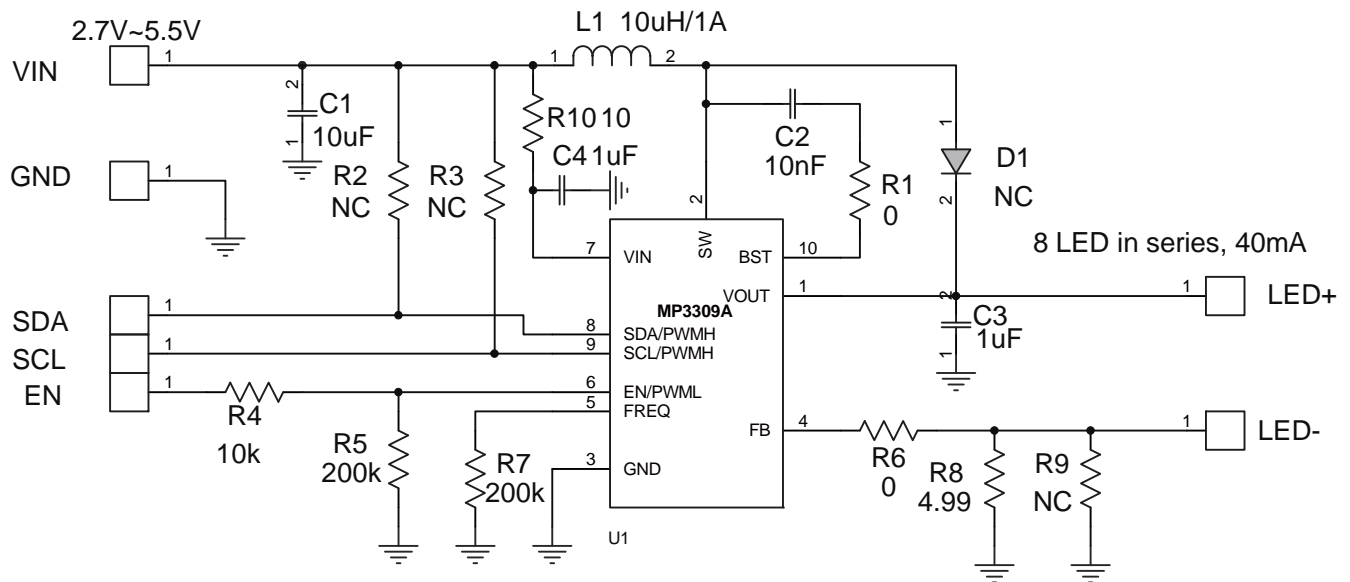
EV3309A-Q-00A EVALUATION BOARD



(L x W x H) 5cm x 4.6cm x 1.0cm

Board Number	MPS IC Number
EV3309A-Q-00A	MP3309AGQ

EVALUATION BOARD SCHEMATIC



EV3309A-Q-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
1	C1	10uF	Ceramic Capacitor, 6.3V, X7R	0805	muRata	GCM21BR70J106KE2
1	C2	10nF	Ceramic Capacitor, 50V, X7R	0603	muRata	GRM188R71H103KA01D
1	C3	1uF	Ceramic Capacitor, 50V, X7R	1206	muRata	GRM31MR71H105KA88L
1	C4	1uF	Ceramic Capacitor, 6.3V, X5R	0603	muRata	GRM188R60T105KA01D
1	D1	NC				
1	L1	10uH	Inductor, 1.14A, DCR=59mOhm	SMD	TOKO	D63LCB-A921CY- 100M=P3
2	R1,R6	0Ohm	Resister, 0Ohm, 5%	0603	Yageo	RC0603JR-070RL
1	R10	10Ohm	Resister, 10Ohm, 1%	0603	Yageo	RC0603FR-0710RL
3	R2, R3, R9	NC				
2	R5,R7	200kOhm	Resister, 200kOhm, 1%	0603	Yageo	RC0603FR-07200KL
1	R4	10kOhm	Resister, 10kOhm, 1%	0603	Yageo	RC0603FR-0710KL
1	R8	4.99Ohm	Resister, 4.99Ohm, 1%	0603	Yageo	RC0603FR-074R99L
1	U1	MP3309AGQ		QFN10(3*3)	MPS	

EVB TEST RESULTS

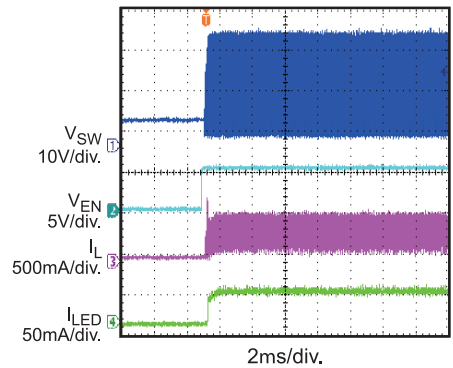
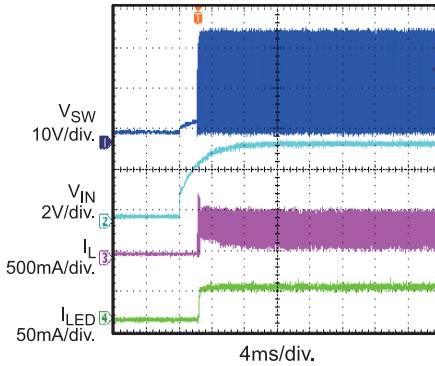
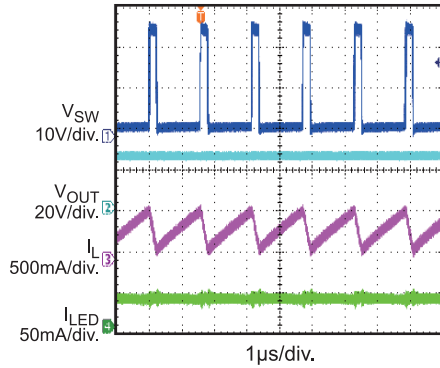
Performance waveforms are tested on the evaluation board.

VIN = 3.6V, 8 LEDs in series, ILED=40mA, L = 10μH, TA = 25°C, unless otherwise noted.

Steady State

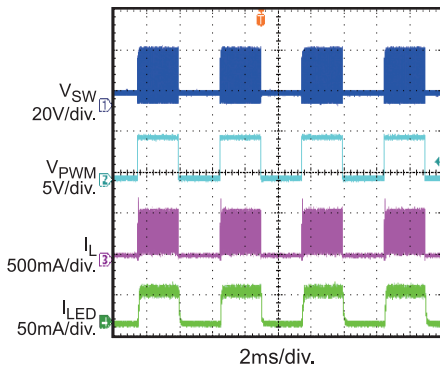
VIN Power On

EN Power On



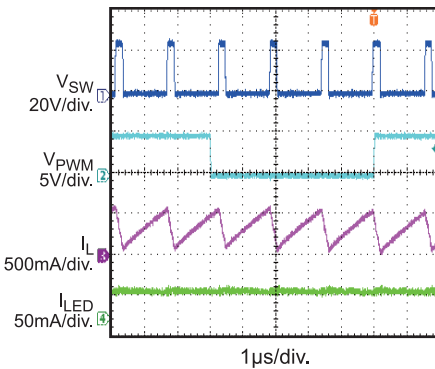
PWM Dimming

fDIM = 200Hz, DDIM = 50%

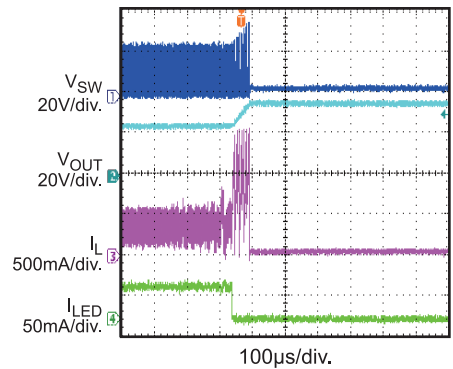


Analog Dimming

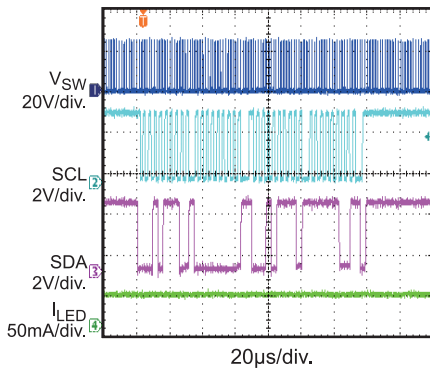
fDIM = 20kHz, DDIM = 90%



Open LED Protection

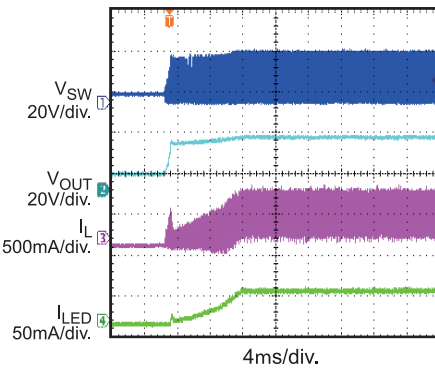


Set ILED With I2C



Set Enable Bit to 1

For MP3309C



PRINTED CIRCUIT BOARD LAYOUT

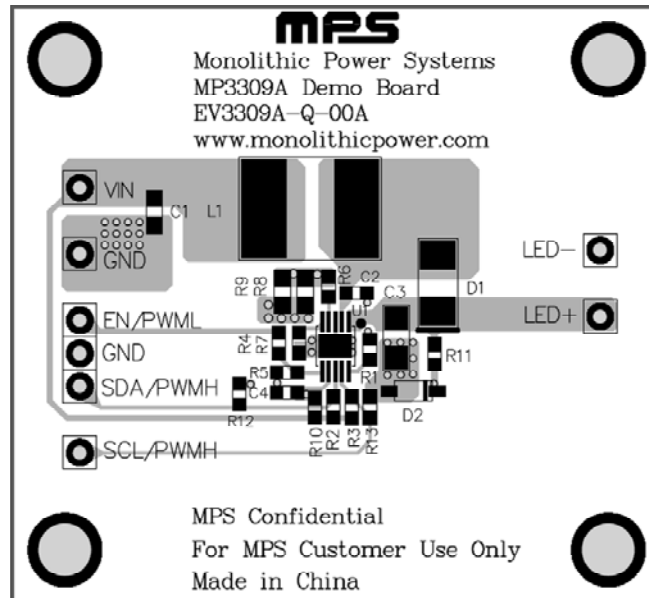


Figure 1—Top Layer

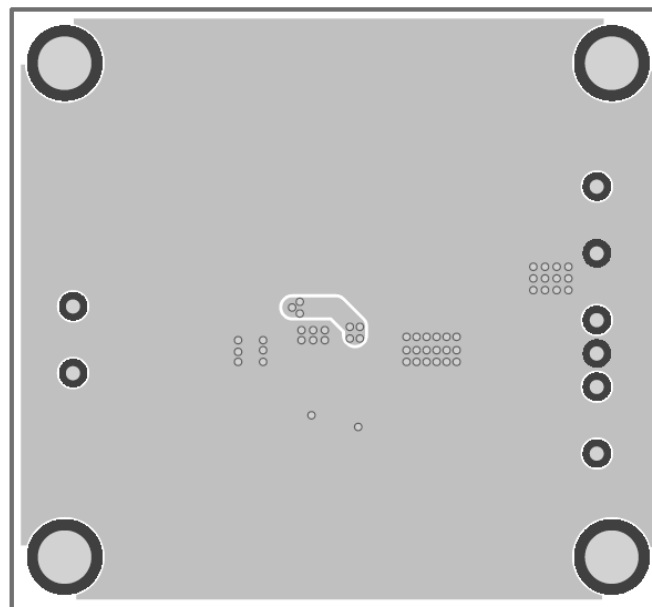


Figure 2—Bottom Layer

QUICK START GUIDE

1. Provide a voltage source ranges from 2.7-5.5V between VIN terminal and GND.
2. Connect LED strings between LED+ and LED-.
3. Dimming Mode

Analog Dimming:

Firstly pull EN/PWML pin to logical high, then connect SCL/PWMH and SDA/PWMH pin together and add >20kHz PWM signal.

PWM Dimming:

Firstly connect SCL/PWMH and SDA/PWMH together and pull to logical high, then add 200-2kHz PWM signal to EN/PWML pin.

4. According output current select feedback resistor at FB pin(resistor-current calculation equation as datasheet).

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