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MIC2287 (MLF™) Evaluation Board

1.2MHz PWM White LED Driver

General Description

The MIC2287 is a small 1.2MHz constant frequency PWM white LED driver. The MIC2287 is available in either a Thin SOT-23 or a 2mm x 2mm MLF™ package. High power densities in a very small size are achieved using its internal 34V/500mA switch.

Requirements

The MIC2287 evaluation board requires an input power source that is able to deliver greater than 500mA at 2.5V.

Precautions

The evaluation board does not have reverse polarity protection. Applying a negative voltage to the V_{IN} terminal may damage the device.

The MIC2287 evaluation board is tailored for a Li-Ion range input supply voltage. It should not exceed 10V on the input.

Getting Started

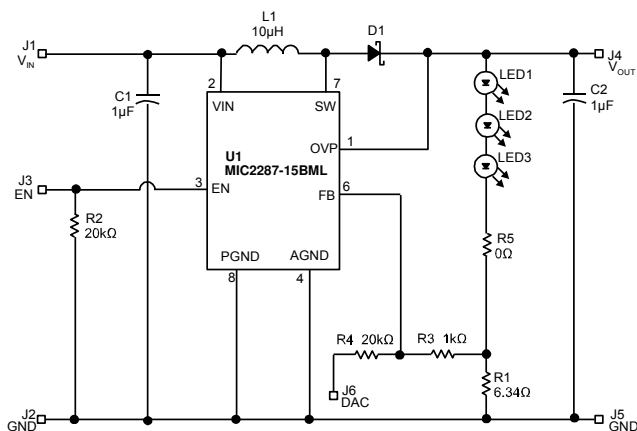
1. **Connect an external supply to V_{IN} .** Apply desired input voltage to the V_{IN} (J1) and ground (J2 and J6) terminals of the evaluation board, paying careful attention to polarity and supply voltage ($2.5V \leq V_{IN} \leq 10V$). An ammeter may be placed between the input supply and the V_{IN} terminal to the evaluation board. Ensure that the supply voltage is monitored at the V_{IN} terminal. The ammeter and/or power lead resistance can reduce the voltage supplied to the input.
2. **Enabling the MIC2287.** Apply a 1.5V or greater voltage source to the enable (J3) terminal.

LED Current Setting

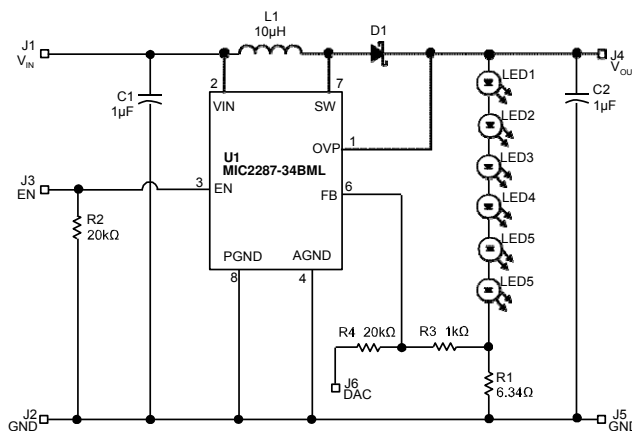
The LED current (I_{LED}) is equal to the feedback voltage (95mV typical) divided by the R1 resistance value. To increase the LED current, the R1 resistor value must be reduced. Conversely, to decrease the LED current the R1 resistor value must be increased. The LED current can be calculated as follows:

$$I_{LED} = \frac{95mV}{R1}$$

The evaluation board is preset for ~15mA of LED current. The evaluation board can easily be modified to yield the desired LED current by replacing the R1 resistor value.



3 LED Configuration



6 LED Configuration

Bill of Material

MIC2287 Evaluation Board

Ref Des	Part Number	Description	Manufacturer
C1	GRM185R61A105KE36D	1µF 10V Ceramic Capacitor, Size 0603	Murata
	C1608X5R1A105K	1µF 10V Ceramic Capacitor, Size 0603	TDK
C2	GRM216R61E105KA12D	1µF 25V Ceramic Capacitor, Size 0805	Murata
	VJ0805Y105KXXAT	1µF 25V Ceramic Capacitor, Size 0805	Vishay
	C2012X5R1E105K	1µF 25V Ceramic Capacitor, Size 0805	TDK
D1	CMDSH-3	100mA 30V Schottky Diode	Central Semi
L1	LQH32CN100K33	10µH 450mA Inductor	Murata
	VLF3010AT-100MR49	10µH 490mA Inductor	TDK
LED1→6	TLMW3101-GS08	20mA White LED	Vishay
R1	CRCW06036R34FRT1	6.34Ω Resistor, Size 0603	Vishay
R2	CRCW06032002FRT1	20kΩ Resistor, Size 0603	Vishay
R3	CRCW06031001FRT1	1kΩ Resistor, Size 0603	Vishay
R4	CRCW06032002FRT1	20kΩ Resistor, Size 0603	Vishay
R5	CRCW06030000FRT1	0Ω Resistor, Size 0603 (For 3 LEDs) OPEN (For 6 LEDs)	Vishay
U1	MIC2287BML-15BML	1.2MHz PWM White LED Driver w/ 15V OVP	Micrel
	MIC2287BML-34BML	1.2MHz PWM White LED Driver w/ 34V OVP	Micrel

Notes:

1. Murata: www.murata.com
2. TDK: www.tdk.com
3. Vishay: www.vishay.com
4. Central Semiconductor: www.centrasemi.com
5. Micrel, Inc.: www.micrel.com

Printed Circuit Board Layout

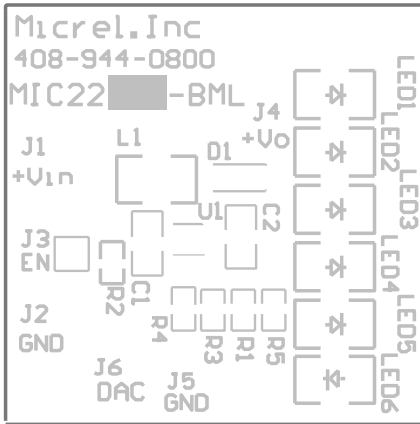


Figure 1a. Top Silkscreen

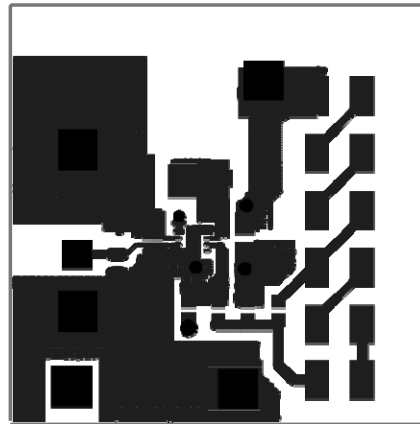


Figure 1b. Top Layer

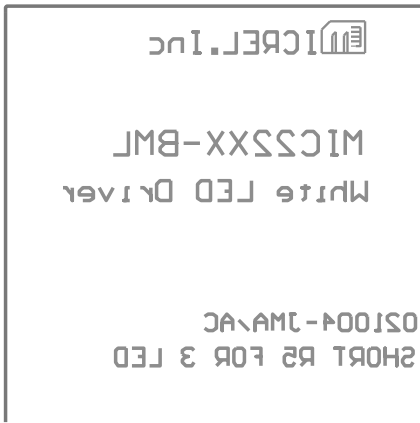


Figure 1c. Bottom Silkscreen

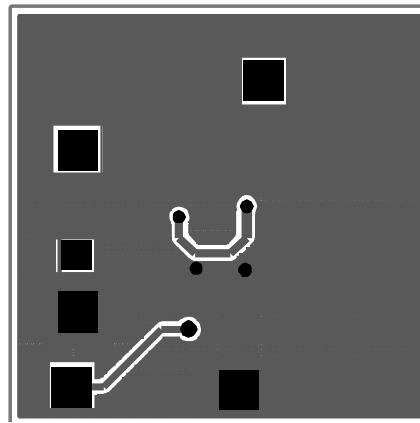


Figure 1d. Bottom Layer

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