



## MIC4802 Evaluation Board

### High Efficiency 800mA Single Channel Linear WLED Driver with Ultra Fast PWM™ Control

## General Description

The MIC4802 is a high efficiency, single channel, White LED (WLED) driver. This constant current linear device is designed to drive a single high power WLED up to 800mA and features a low dropout of 280mV at 800mA (typical). Brightness is controlled through an Ultra Fast PWM™ interface which can operate from 1% to 100% duty cycle.

The MIC4802 is available in an 8-pin Epad SOIC leaded package with a junction temperature range of -40°C to +125°C

## Requirements

The MIC4802 evaluation board requires a power supply that is capable of delivering at least 1A while providing an input voltage between 3.0V and 5.5V.

## Precautions

The MIC4802 evaluation board is designed for an input voltage no greater than 6V. This evaluation board does not have reverse polarity protection; hence, applying a negative voltage to the  $V_{IN}$  terminal may damage the device.

## Getting Started

1. **Connect an external supply to  $V_{IN}$ .** Apply the desired input voltage across  $V_{IN}$  and ground terminals, J2 and J3, respectively, paying careful attention to polarity and supply voltage ( $3.0V \leq V_{IN} \leq 5.5V$ ). 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.  $V_{BAT}$  is connected to  $V_{IN}$  through a 0Ω resistor, R1.

## 2. Enable/Disable the MIC4802

To enable the device, apply a DC voltage of 1.2V or greater to the EN pin. This allows for full brightness of the WLED(s) (100% duty cycle). The EN pin can also be used for dimming by connecting a PWM signal and varying its duty cycle (please refer to the Ultra Fast PWM™ Dimming Interface section in the datasheet). Pulling EN low for more than 40ms forces the MIC4802 into a low  $I_Q$  sleep mode. Do not leave the EN pin floating as this may cause an indeterminate output state. A pull up resistor of 10kΩ is placed from EN (JP1) to  $V_{IN}$  to ensure that the WLED is ON when an input signal is applied.

## 3. Setting LED current with $R_{SET}$ resistor.

The average LED current may be calculated using the equation below:

$$R_{SET} (k\Omega) = \frac{4920 \cdot D}{I_{LED} (mA)} + 0.280$$
$$I_{LED} (mA) = \frac{4920 \cdot D}{(R_{SET} (k\Omega) - 0.280)}$$

D is the duty cycle of the LED current during PWM dimming; D=1 when device is fully ON. The stock evaluation board uses an  $R_{SET}$  value of 6.19kΩ which corresponds to  $I_{LED}$  of 830mA.

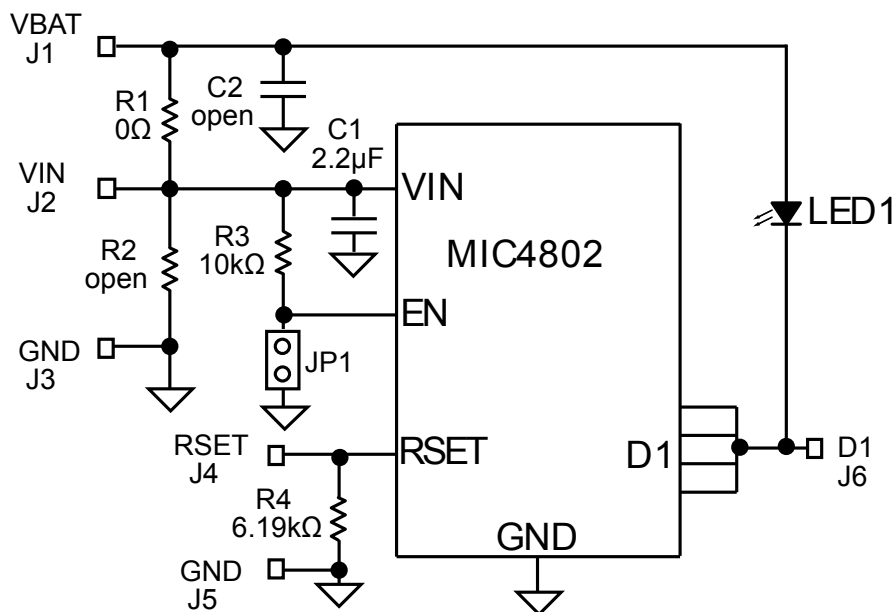
## 4. Measuring WLED current.

To measure WLED current, simply insert an ammeter in series with the WLED(s). Keep in mind that a series ammeter will add a small voltage drop, so the voltage at the WLED terminal, D1, should be used when making dropout measurements with a series ammeter.

## Ordering Information

Part Number	Description
MIC4802YME EV	Evaluation board with the Single Channel MIC4802 device

## MIC4802 Evaluation Board Schematic



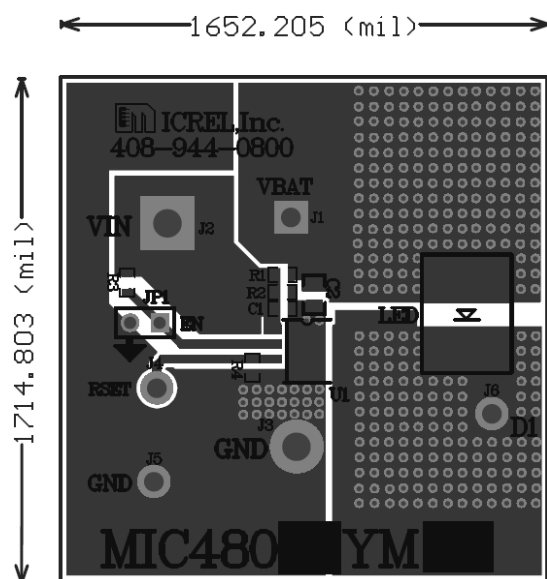
## Bill of Materials

Item	Part Number	Manufacturer	Description	Qty.
C1	C1608X5R0J225K	TDK <sup>(1)</sup>	Ceramic Capacitor, 2.2μF, 6.3V, X5R, Size 0603	1
	06036D225KAT2A	AVX <sup>(2)</sup>		
	GRM188R60J225KE19D	Murata <sup>(3)</sup>		
	VJ0603G225KXYAT	Vishay <sup>(4)</sup>		
	CL10B225KQ8NNNC	Samsung <sup>(5)</sup>		
C2			Open	1
R1	CRCW06030000FKEA	Vishay	Resistor, 0Ω, 1%, 1/16W, Size 0603	1
R2			open	
R3	CRCW060310K0FKEA	Vishay	Resistor, 10kΩ, 1%, 1/16W, Size 0603	1
R4	CRCW06036K191FKEA	Vishay	Resistor, 6.19kΩ, 1%, 1/16W, Size 0603	1
LED	W42180	Seoul Semiconductor <sup>(6)</sup>	3.8W High Power WLED	1
U1	MIC4802YME	Micrel, Inc. <sup>(7)</sup>	800mA Single Channel Ultra Fast PWM™ Linear WLED Driver	1

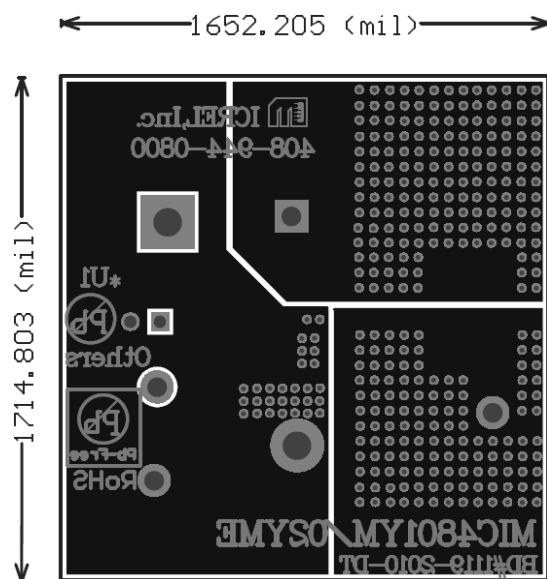
### Notes:

1. TDK: [www.tdk.com](http://www.tdk.com)
2. AVX: [www.avx.com](http://www.avx.com)
3. Murata: [www.murata.com](http://www.murata.com)
4. Vishay: [www.vishay.com](http://www.vishay.com)
5. Samsung: [www.samsung.com](http://www.samsung.com)
6. Seoul Semiconductor: [www.seoulsemicon.com](http://www.seoulsemicon.com)
7. Micrel, Inc.: [www.micrel.com](http://www.micrel.com)

## PCB Layout Recommendations



Top Layer



Bottom Layer

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