# 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 ($3.0V \le V_{IN} \le 5.5V$). 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:

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

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

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.

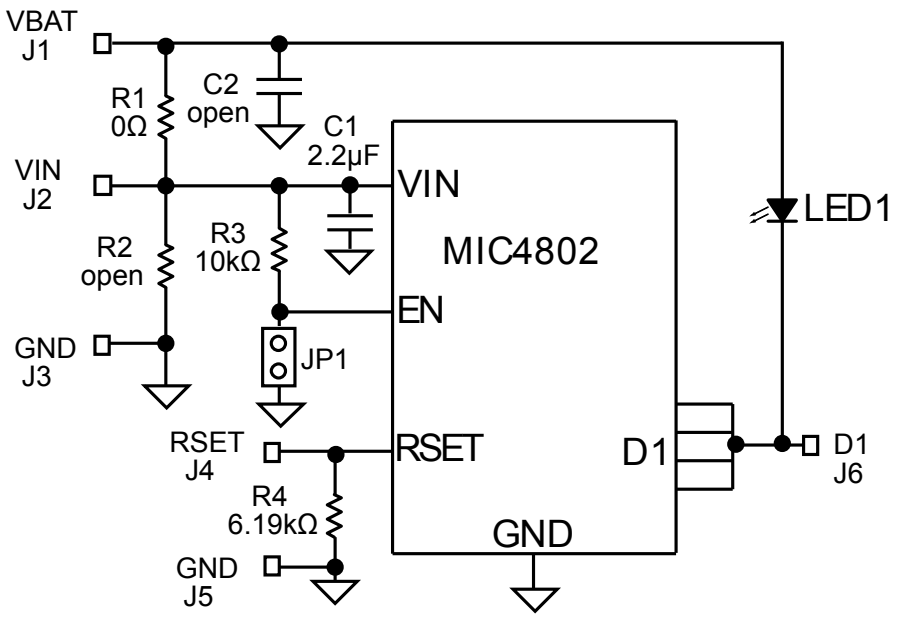
**4. Measuring WLED current**.

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



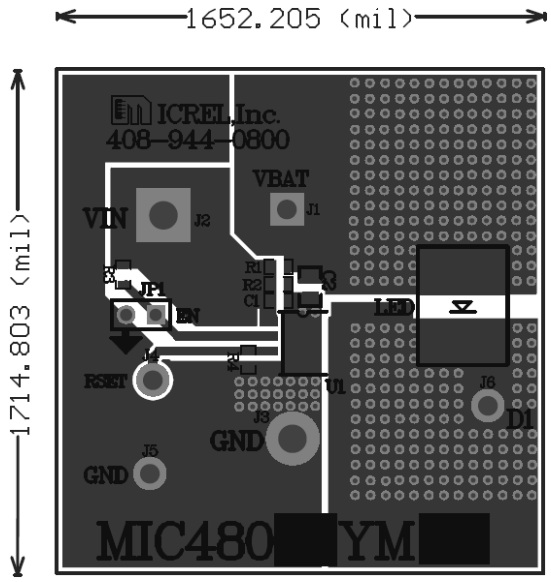

## Bill of Materials

| Item | Part Number | Manufacturer | Description | Qty. |
|---|---|---|---|---|
| C1 | C1608X5R0J225K | TDK[1] | Ceramic Capacitor, 2.2µF, 6.3V, X5R, Size 0603 | 1 |
| | 06036D225KAT2A | AVX[2] | | |
| | GRM188R60J225KE19D | Murata[3] | | |
| | VJ0603G225KXYAT | Vishay[4] | | |
| | CL10B225KQ8NNNC | Samsung[5] | | |
| 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[6] | 3.8W High Power WLED | 1 |
| **U1** | **MIC4802YME** | **Micrel, Inc.[7]** | **800mA Single Channel Ultra Fast PWM™ Linear WLED Driver** | **1** |

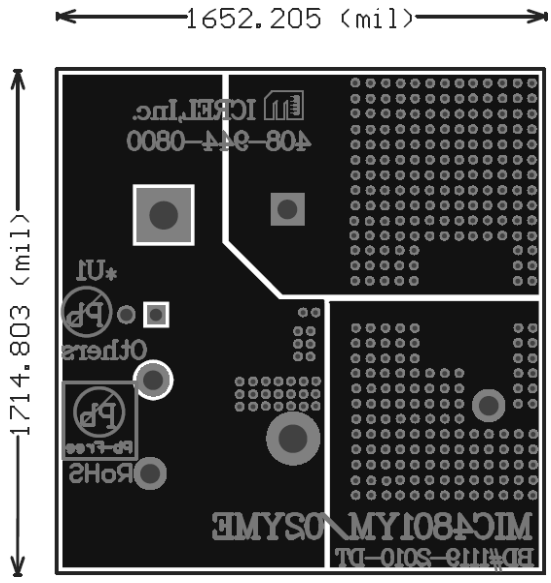
**Notes:**

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

## PCB Layout Recommendations




**Top Layer**




**Bottom Layer**

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