

General Description

The PAM2808 is a 5W high power HBLED Driver. The PAM2808 supports a range of input voltages from 2.5V to 6.0V. It features high efficiency (~90%) and low quiescent current, making it ideal for battery powered applications. This evaluation board contains a high current 1.5A WLED onboard for quick turn on demonstration. If users required to use any specific types of LEDs, just desolder the LED onboard and connect their required LEDs (Anode to the Vout pin, and Cathode to the FB pin).

A bill of materials, schematics, and layout are included that describes the parts used on this demonstration board along with measured performance characteristics. These materials can be used as a reference design.

Key Features

- High Output Current Up to 1.5A
- Low Feedback Voltage 0.1V
- Stable with a Ceramic Output Capacitor
- Low Quiescent Current
- Open Load °C Protection
- Over Temperature Shutdown
- Low Temperature Coefficient

Applications

- High Bright LED Driver
- White LED Torch (Flashlight)

PAM2808EV1 Specifications

| Parameter | Value |
|----------------|--------------------|
| Input Voltage | 2.8 to 5.5Vdc |
| LED Current | 330mA (Adjustable) |
| Number of LEDs | 1 |
| XYZ Dimension | 2" x 1.5" x 0.7" |

Evaluation Board



Figure 1: Top View

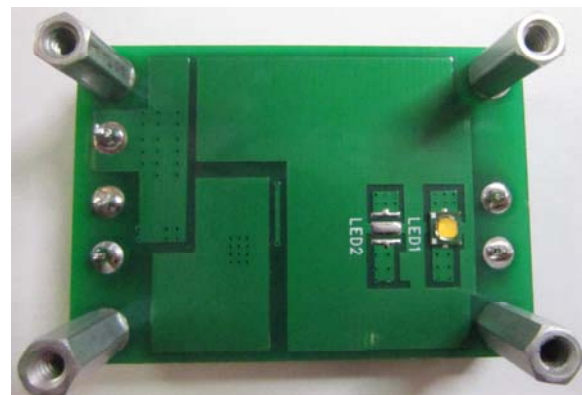


Figure 2: Bottom View

Connection Instructions

Input Voltage: 2.8 to 6.0Vdc (VIN, GND)
Onboard high current 1.5A LED

Evaluation Board Schematic

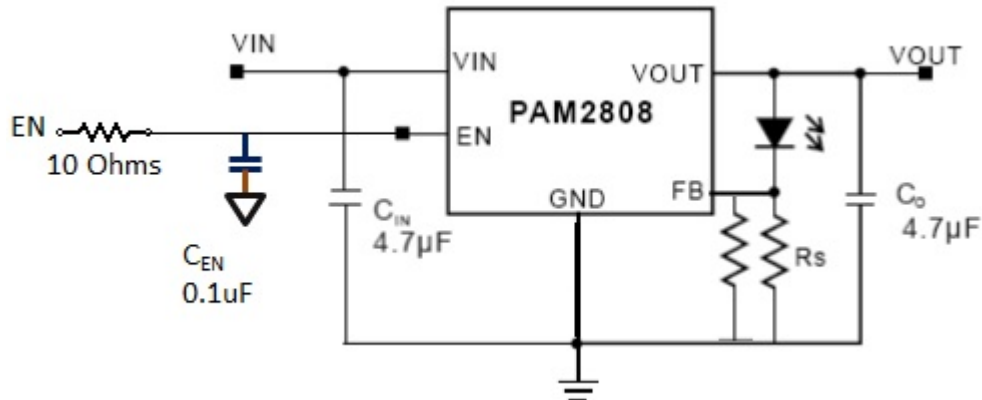


Figure 3: Evaluation Board Schematic

Evaluation Board Layout

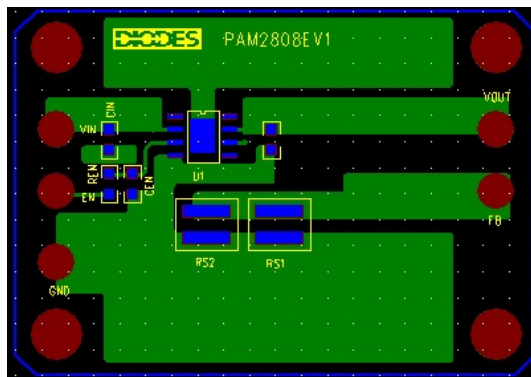


Figure 4: PCB Layout Top View

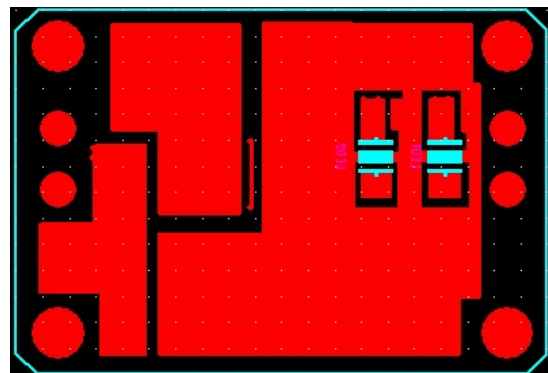


Figure 5: PCB Layout Bottom View

Quick Start Guide

1. By default, the evaluation board is preset at 300mA LED Current by RS1 (0.3 Ohm).
2. Ensure that the DC source is switched OFF or disconnected.
3. Connect the 2.8 to 6.0V_{DC} DC line wires of power supply to VIN and GND on the board.
4. Turn on the main switch. LED should light up underneath the board.

Bill of Material

| # | Name | Quantity | Part number | Manufacturer | Description |
|---|---------------------------------------|----------|---------------------------|--------------|--|
| 1 | IC1 | 1 | PAM2808BLBR | Diodes Inc | LED Driver SOP-8(EP) |
| 2 | C _{in} , C _{out} | 2 | LMK212BJ475KD-T | Taiyo Yuden | 4.7μF Cer Cap 10V 10% X5R 0805 |
| 3 | C _{EN} | 1 | LMK212SD104JG-T | Taiyo Yuden | 1μF Cer Cap 10V 10% X5R 0805 |
| 4 | RS1 | 1 | RL1218FK-070R3L | Yageo | 0.3Ω Resistor 1W 1% 1218 SMD |
| 5 | R _{EN} | 1 | RMCF0805FT10R0CT-ND | Yageo | 10Ω Resistor 1/8W 1% 0805 SMD |
| 6 | LED1 | 1 | XPGWHT-L1-0000-00BE8CT-ND | CREE | White color, Vf=2.9V, and max current 1.5A |

Functional Performance (1 LED @330mA)

| V _{in} (DC) | P _{in} (W) | V _{out} (V) | I _{out} (mA) | P _{out} (W) | Efficiency (%) | # of LEDs |
|----------------------|---------------------|----------------------|-----------------------|----------------------|----------------|------------|
| 2.8 | 0.325 | 2.70 | 110 | 0.297 | 91.44 | 1(onboard) |
| 3 | 0.789 | 2.79 | 260 | 0.725 | 91.87 | |
| 3.5 | 0.921 | 2.77 | 260 | 0.720 | 78.24 | |
| 4 | 1.052 | 2.77 | 260 | 0.720 | 68.41 | |
| 4.5 | 1.184 | 2.77 | 260 | 0.719 | 60.79 | |
| 5 | 1.310 | 2.77 | 260 | 0.719 | 54.88 | |
| 5.5 | 1.441 | 2.76 | 260 | 0.718 | 49.83 | |
| 6 | 1.560 | 2.76 | 250 | 0.690 | 44.23 | |

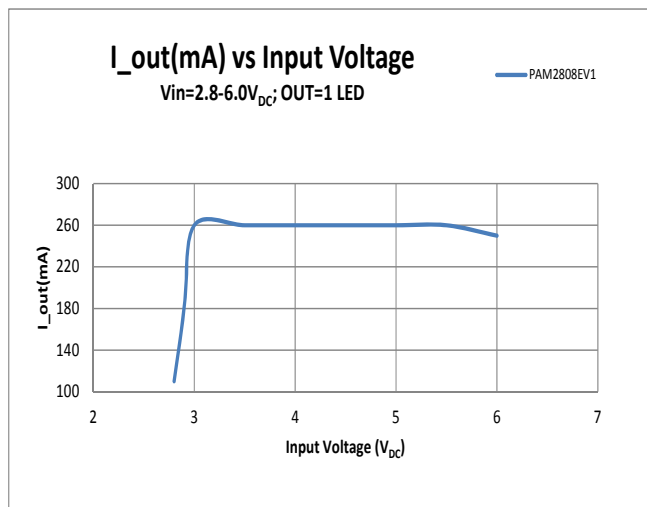


Figure 6 Vin (DC) vs. I_{out} (mA)

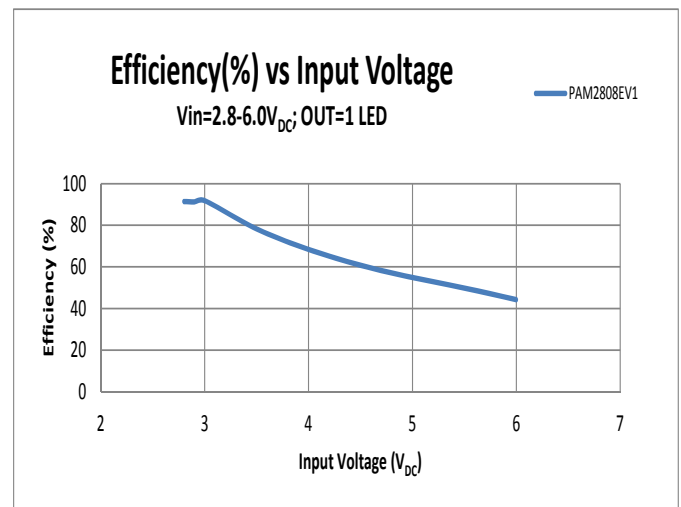


Figure 7 Vin (DC) vs. Efficiency (%)

Application Information

Setting the Output Current:

The internal feedback (FB) voltage is 0.1V (Typical). The output current is calculated as below:

$$I_{LED} = 0.1/RS1$$

The output Current is given by the following table.

| RS1(Ω) | I _{LED} (mA) |
|--------|-----------------------|
| 0.3 | 330 |
| 0.14 | 700 |
| 0.1 | 1000 |
| 0.067 | 1500 |

Thermal Shutdown

When the die temperature exceeds +150°C, a reset occurs and the reset remains until the temperature decrease to +110°C, at which time the circuit can be restarted.

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