

General Description

The PAM2803 is a step-up DC-DC converter that delivers a regulated output current. The device switches at a 1.0MHz constant frequency, allowing for the use of smaller value external inductor and ceramic capacitors.

The PAM2803 is targeted to be used for driving loads up to 1A from a two-cell alkaline battery. The LED current can be adjusted by the external current sense resistor, R_s , connected between the feedback pin (FB) and ground. A low 95mV feedback voltage reduces the power loss in the R_s for better efficiency. With its internal 2A, 100m Ω NMOS switch, the device can provide high efficiency even at heavy load. During the shutdown mode, the feedback resistor R_s and the load are completely disconnected and the current consumption is reduced to less than 1uA.

The PAM2803 is available in the 6-lead TSOT23-6L package.

Key Features

- Efficiency up to 80%
- Current Accuracy: 5% ($V_{IN} = 3.6V$ to $1.8V$ @ $V_F = 3.7V$)
- Low Start-Up Voltage: 0.9V ($I_C = 270mA$)
- Low Hold Voltage: 0.75V ($I_C = 200mA$)
- 1MHz Switching Frequency
- Uses Small, Low Profile External Components
- Over Temperature Protection

Applications

- White LED Torch (Flashlight)
- White LED Camera Flash
- DSC Cellular Camera Phone/PDA Flash

PAM2803EV1 Specifications

Parameter	Value
Input Voltage	1.5 to 3.6Vdc
LED Current	350mA (Adjustable)
Number of LEDs	1
XZ Dimension	0.71" Dia x 0.1"

Evaluation Board



Figure 1: Top View

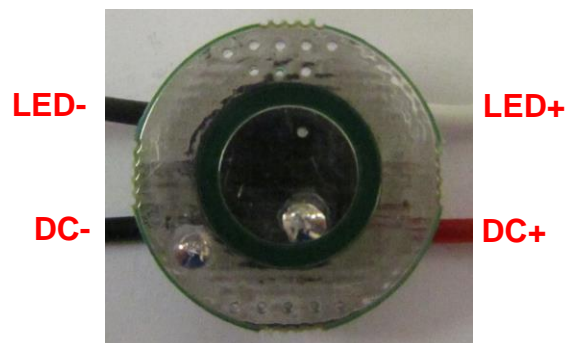


Figure 2: Bottom View

Connection Instructions

Input Voltage: 1.0 to 5.0Vdc (V_{in} , GND)
 LED Outputs: LED+ (White), LED- (Black)

Evaluation Board Schematic

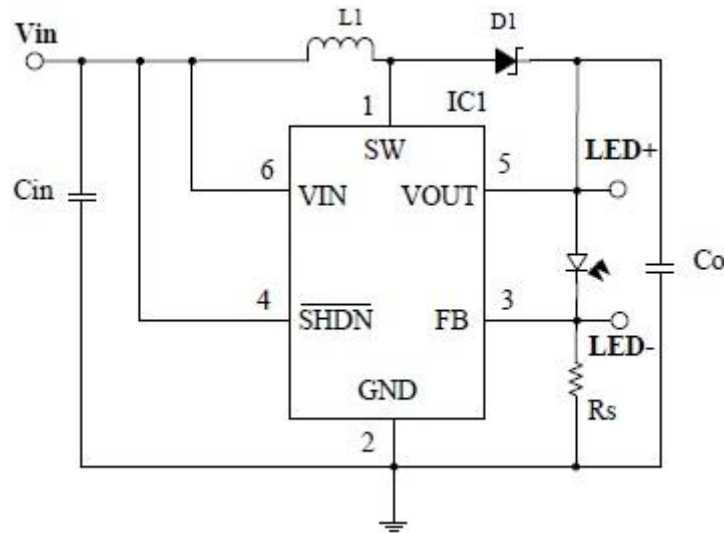


Figure 3: Evaluation Board Schematic

Evaluation Board Layout

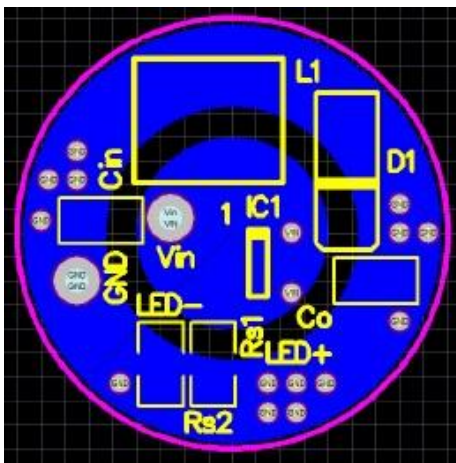


Figure 4: PCB Layout Top View

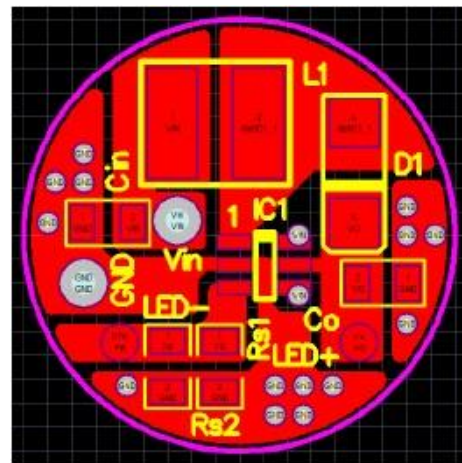


Figure 5: PCB Layout Bottom View

Quick Start Guide

1. By default, the evaluation board is preset at 350mA LED Current by R_s (0.3 Ohm).
2. Ensure that the DC source is switched OFF or disconnected.
3. Connect the 3V_{DC} DC line wires of power supply to Vin and GND on the board.
4. Connect the anode wire of external LED string to LED+ output test point.
5. Connect the cathode wire of external LED string to LED- output test point.
6. Turn on the main switch. LED string should light up.

Bill of Material

#	Name	Quantity	Part number	Manufacturer	Description
1	IC1	1	PAM2803	Diodes Inc	LED Driver TSOT23-6L
2	Cin, Co	2	CC0805KKX5R6BB106	Yageo	10 μ F Cer Cap 10V 10% X5R 0805
3	L1	1	CD43-2.2uH	Taiyo Yuden	2.2 μ H, 2A Inductor
4	R1	1	RL1206FR-070R27L	Yageo	0.27 Ω Resistor 1/4W 1% 1206 SMD
5	D1	1	SS22		Schottky Diode 2A/20V
6	PCB	1	PAM2803 EB09AA		

Functional Performance (1 LED @350mA)

Vin (DC)	Pin (W)	I _R (mA)	I _{out} (mA)	V _{out} (V)	P _{out} (W)	Efficiency (%)	# of LEDs
1.5	2.304	1912.00	252.00	3.07	0.772	33.52	1
2	1.969	1401.00	291.00	3.04	0.885	44.93	
2.5	2.252	1279.00	377.50	3.11	1.173	52.07	
3	1.367	465.10	346.00	3.14	1.086	79.43	
3.5	1.615	460.00	403.50	3.18	1.283	79.45	

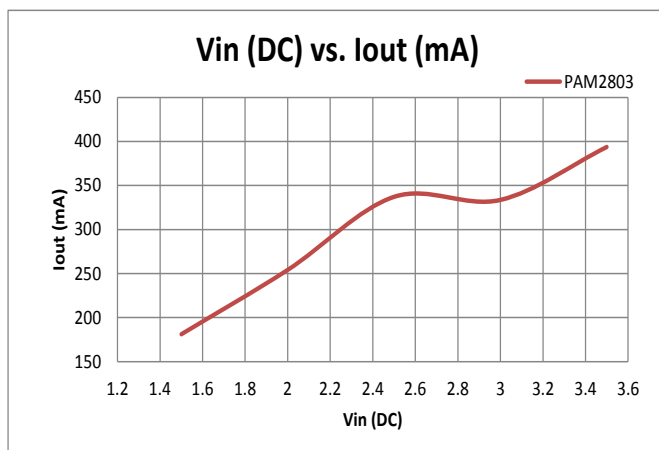


Figure 6: Vin (DC) vs. Iout (mA)

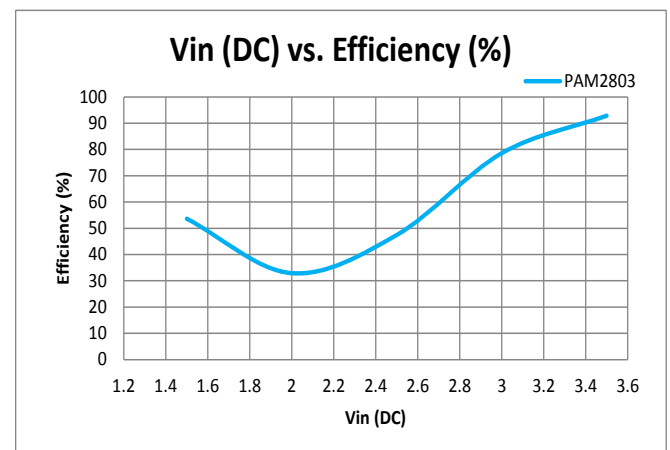


Figure 7: Vin (DC) vs. Efficiency (%)

Application Information

Setting the Output Current:

The internal feedback (FB) voltage is 0.095V. The output current is calculated as below:

$$I_{LED} = 0.095/R_S \quad (R_S = R_{S1} // R_{S2})$$

The output Current is given by the following table.

R_{S1} (Ω)	R_{S2} (Ω)	I_{LED} (mA)
0.27	NC	350
0.27	0.22	700

Thermal Shutdown

When the die temperature exceeds +150°C, a reset occurs and the reset remains until the temperature decrease to +120°C, at which time the circuit can be restarted.

PCB Layout Check List

When laying out the printed circuit board, the following checklist should be used to ensure proper operation of the PAM2803.

1. The power traces, consisting of the GND trace, the SW trace and the V_{IN} trace should be kept short, direct and wide.
2. Does the VFB pin connect directly to the current sense resistor? The current sense resistor to GND trace should be kept short, direct and wide.
3. Does the (+) plate of C_{IN} connect to V_{IN} as closely as possible? This capacitor provides the AC current to the internal power MOSFETs.
4. Keep the switching node, SW, away from the sensitive VFB node.
5. Keep the (-) plates of C_{IN} and C_{OUT} as close as possible.

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