Features

- High Output Current Up to 1.5A
- Low Feedback Voltage:0.1V
- Stable with a Ceramic Output Capacitor
- Low Quiescent Current
- Open Load LED Protection
- Over Temperature Shutdown
- Low Temperature Coefficient
- Standard SOP-8(EP) Packages
- Pb-Free Package

Applications

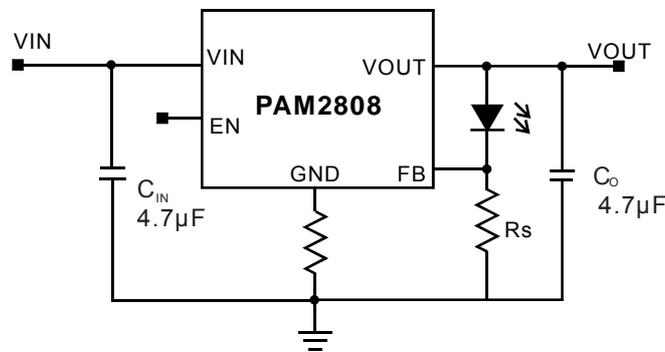- High Bright LED Driver
- White LED Torch (Flashlight)

General Description

The PAM2808 is a 5W high power HBLED driver with 1.5A constant current. It features high efficiency and low quiescent current,making it ideal for battery powered applications.
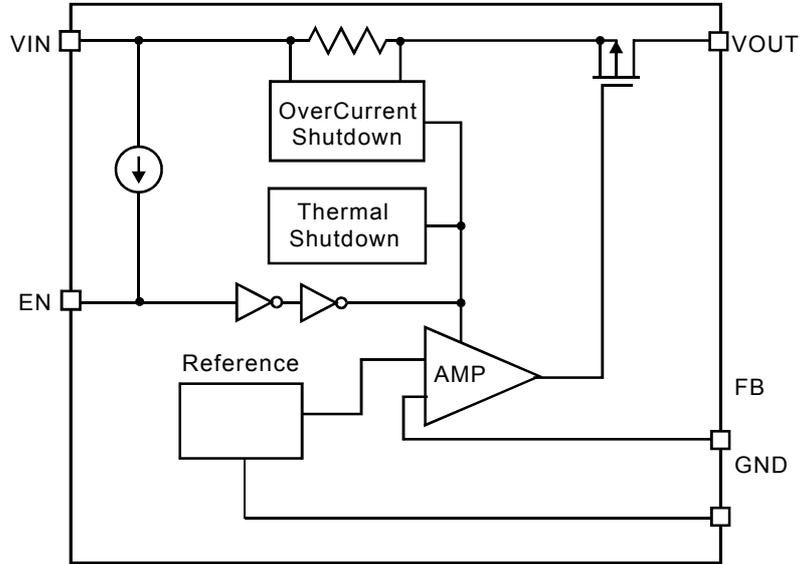
The PAM2808 features over current protection and over temperature shutdown. The PAM2808 is stable with a ceramic output capacitor of 4.7µF or higher.

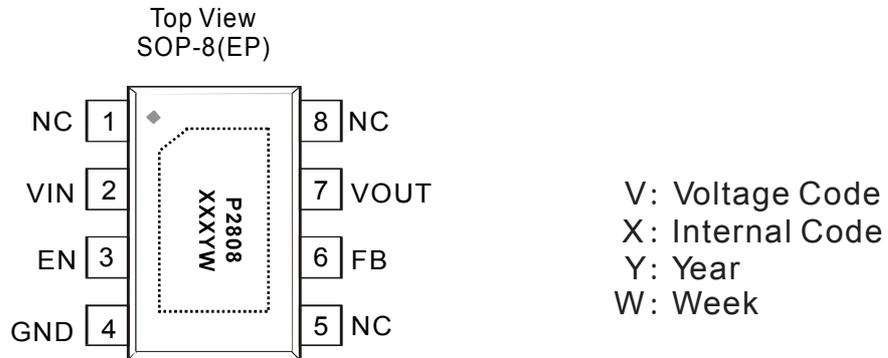PAM2808 is available in SOP-8(EP) package.

Typical Application Circuit

Block Diagram

Pin Configuration & Marking Information

Top View
SOP-8(EP)

NC	1	8 NC
VIN	2	7 VOUT
EN	3	6 FB
GND	4	5 NC

P2808
XXXYW

V : Voltage Code
X : Internal Code
Y : Year
W : Week

Absolute Maximum Ratings

These are stress ratings only and functional operation is not implied. Exposure to absolute maximum ratings for prolonged time periods may affect device reliability. All voltages are with respect to ground.

Input Voltage...6.5V

EN, FB, VOUT Pin Voltage
....-0.3V to V_{IN}+0.3V

Maximum Output Current.......................$P_D/(V_{IN}-V_O)$

Storage Temperature.....................-65°C to 150°C

Maximum Junction Temperature..................150°C

Lead Soldering Temperature (5sec)........... 300°C

Recommended Operating Conditions

Maximum Supply Voltage..............................6V

Junction Temperature Range........-40°C to 125°C

Ambient Temperature Range...........-40°C to 85°C

Electrical Characteristic

V_{IN}=4.5V, T_A=25°C, C_{IN}=4.7µF, C_O=4.7µF, unless otherwise noted.

PARAMETER	SYMBOL	Test Conditions	MIN	TYP	MAX	UNITS
Input Voltage	V_{IN}		2.5		6.0	V
FB Reference Voltage	V_{REF}			0.1		V
Output Current	I_O	Rs=0.3Ω		330		mA
		Rs=0.14Ω		700		
		Rs=0.1Ω		1000		
		Rs=0.067Ω		1500		
Over Temperature Shutdown	OTS			150		°C
Over Temperature Hysteresis	OTH			40		°C
EN Input High Threshold	V_{EH}	V_{IN}=2.5V to 5V	1.5			V
EN Input Low Threshold	V_{EL}	V_{IN}=2.5V to 5V			0.3	V
Shutdown Current	I_{SD}	V_{EN}=0V			1	µA

Typical Performance Characteristics

T_A=25°C,C_{IN}=4.7µF,Co=4.7µF,unless otherwise noted.
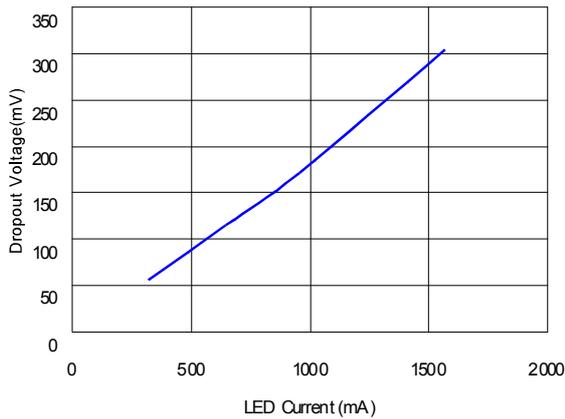
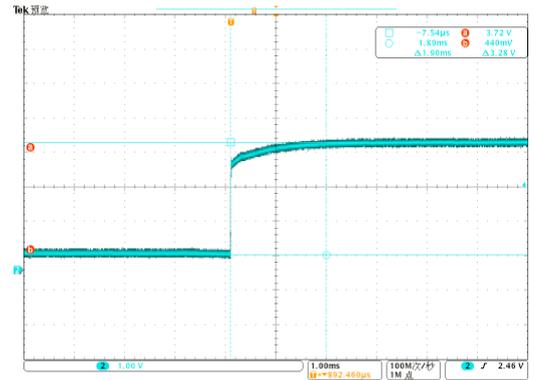### 1. LED Current vs Input Voltage
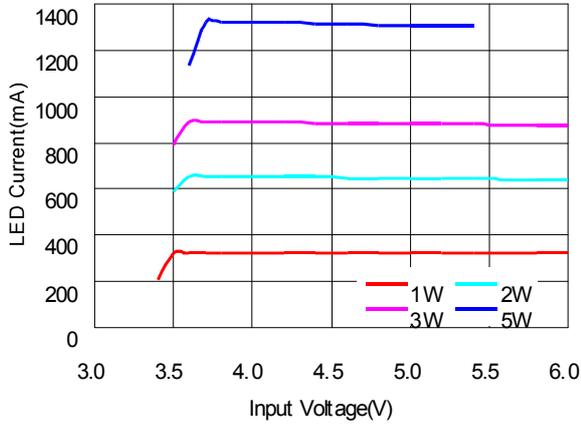
2. Feedback Voltage vs Input Voltage
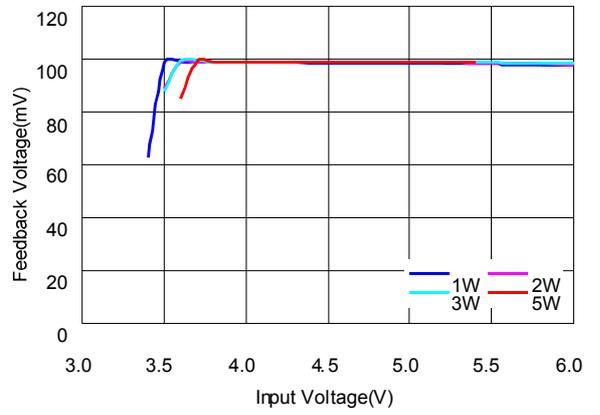
3. Dropout Voltage vs LED Current

4. Start up

Application Information

External Capacitor Requirements

A 4.7µF or larger ceramic input bypass capacitor, connected between V_{IN} and GND and located close to the PAM2808, is required for stability. A 4.7µF minimum value capacitor from V_O to GND is also required. To improve transient response, noise rejection, and ripple rejection, an additional 10µF or larger, low ESR capacitor is recommended at the output. A higher-value, low ESR output capacitor may be necessary if large, fast-rise-time load transients are anticipated and the device is located several inches from the power source, especially if the minimum input voltage of 2.5 V is used.

Regulator Protection

The PAM2808 features internal current limiting, thermal protection and short circuit protection. During normal operation, the PAM2808 limits output current to about 2.5A. When current limiting engages, the output voltage scales back linearly until the over current condition ends. While current limiting is designed to prevent gross device failure, care should be taken not to exceed the power dissipation ratings of the package. If the temperature of the device exceeds 150°C, thermal-protection circuitry will shut down. Once the device has cooled down to approximately 40°C below the high temp trip point, regulator operation resumes.

Thermal Information

The amount of heat generates is:

$$P_D=(V_{IN}-V_O)I_O.$$

All integrated circuits have a maximum allowable junction temperature (T_J max) above which normal operation is not assured. A system designer must design the operating environment so that the operating junction temperature (T_J) does not exceed the maximum junction temperature (T_J max). The two main environmental variables that a designer can use to improve thermal performance are air flow and external heatsinks. The purpose of this information is to aid the designer in determining the proper operating environment for a linear regulator that is operating at a specific power level.

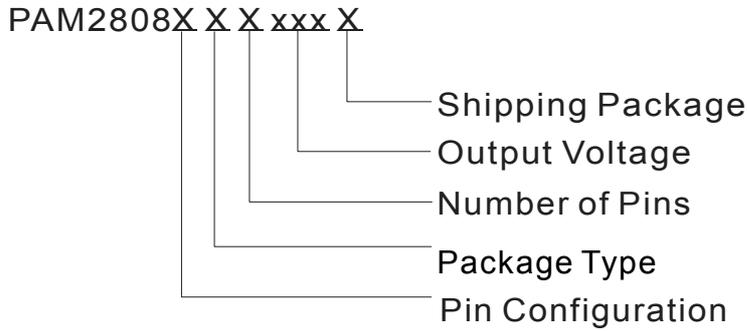In general, the maximum expected power (P_D(max)) consumed by a linear regulator is computed as:

$$P_{DMAX}=(V_{I(avg)}-V_{O(avg)})\times I_{O(avg)}+V_{I(avg)}\times I_{(Q)}$$

Where:
● $V_{I(avg)}$ is the average input voltage.
● $V_{O(avg)}$ is the average output voltage.
● $I_{O(avg)}$ is the average output current.
● $I_{(Q)}$ is the quiescent current.

The quiescent current is insignificant compared to the average output current; therefore, the term $V_{I(avg)} \times I_{(Q)}$ can be neglected. The operating junction temperature is computed by adding the ambient temperature (T_A) and the increase in temperature due to the regulator's power dissipation. The temperature rise is computed by multiplying the maximum expected power dissipation by the sum of the thermal resistances between the junction and the case ($R_{\theta JC}$), the case to heatsink ($R_{\theta CS}$), and the heatsink to ambient ($R_{\theta SA}$). Thermal resistances are measures of how effectively an object dissipates heat. Typically, the larger the device, the more surface area available for power dissipation so that the object's thermal resistance will be lower.

Ordering Information

PAM2808X X X xxx X

- Shipping Package
- Output Voltage
- Number of Pins
- Package Type
- Pin Configuration

Pin Configuration	Package Type	Number of Pins	Shipping Package
B Type: 1. NC 2. VIN 3. EN 4. GND 5. NC 6. FB 7. VOUT 8. NC	L: SOP-8(EP)	B: 8	R: Tape & Reel

Part Number	Marking	Package Type	MOQ & Shipping Pckage
PAM2808BLBR	P2808 XXXYW	SOP-8(EP)	2,500 Units/Tapes&Reel

Outline Dimensions

SOP-8(EP)
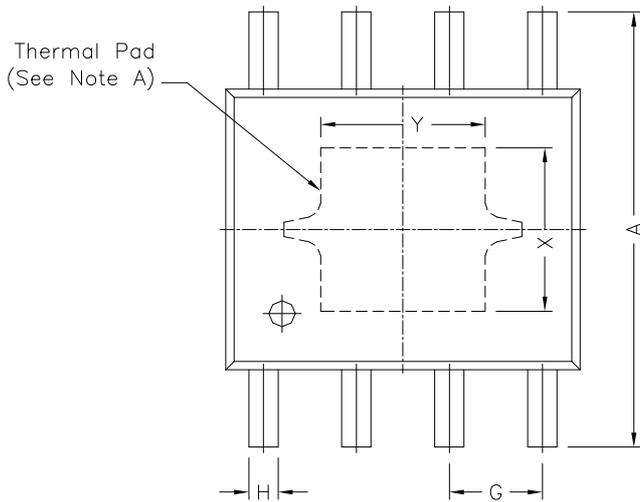
REF.		DIMENSIONS	
		Millimeters	
		Min.	Max.
A		5.80	6.20
B		4.80	5.00
C		3.80	4.00
D		0°	8°
E		0.40	0.90
F		0.19	0.25
M		0	0.15
H		0.35	0.49
L		1.35	1.75
G		1.27 TYP.	
Option1	X	2.28	
	Y	2.28	
Option2	X	2.41	
	Y	3.30	