

Features

- Output Power up to 30W
- Chip Enable with Soft-start
- Analog and PWM Dimming
- Peak Efficiency up to 95%
- Low Quiescent Current
- Frequency Select Capability: 1.6MHz/1MHz/500KHz
- Support Boost/Sepic Topology
- Over Current Protection
- Over Voltage Protection
- Thermal Protection
- UVLO
- Tiny Pb-Free Package : TSSOP-20

Applications

- Home Lighting
- Automotive Lighting
- Monitor Backlighting

Description

The PAM2842 is a high power LED driver, capable of driving up to 10 high power LEDs in series. The PAM2842 supports both boost and sepic topology.

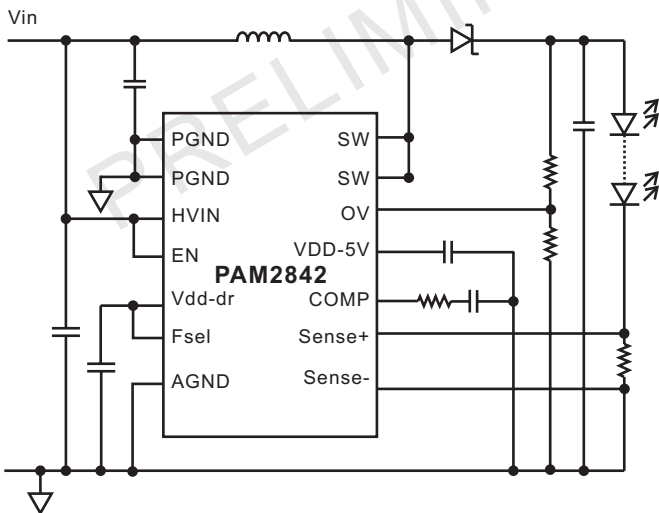
The PAM2842 features over current protection, over voltage protection, under voltage lockout and over temperature protection, which prevent the device from damage.

LED dimming can be done by using a PWM signal to the ENA pin.

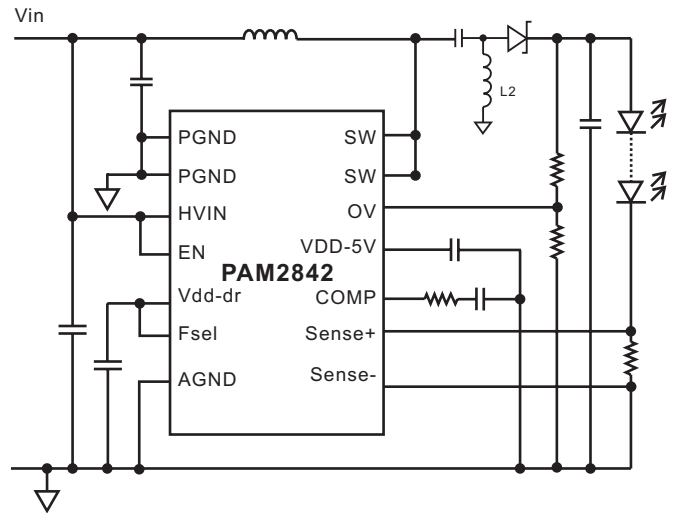
The PAM2842 is available in a TSSOP-20 package.

Typical Application

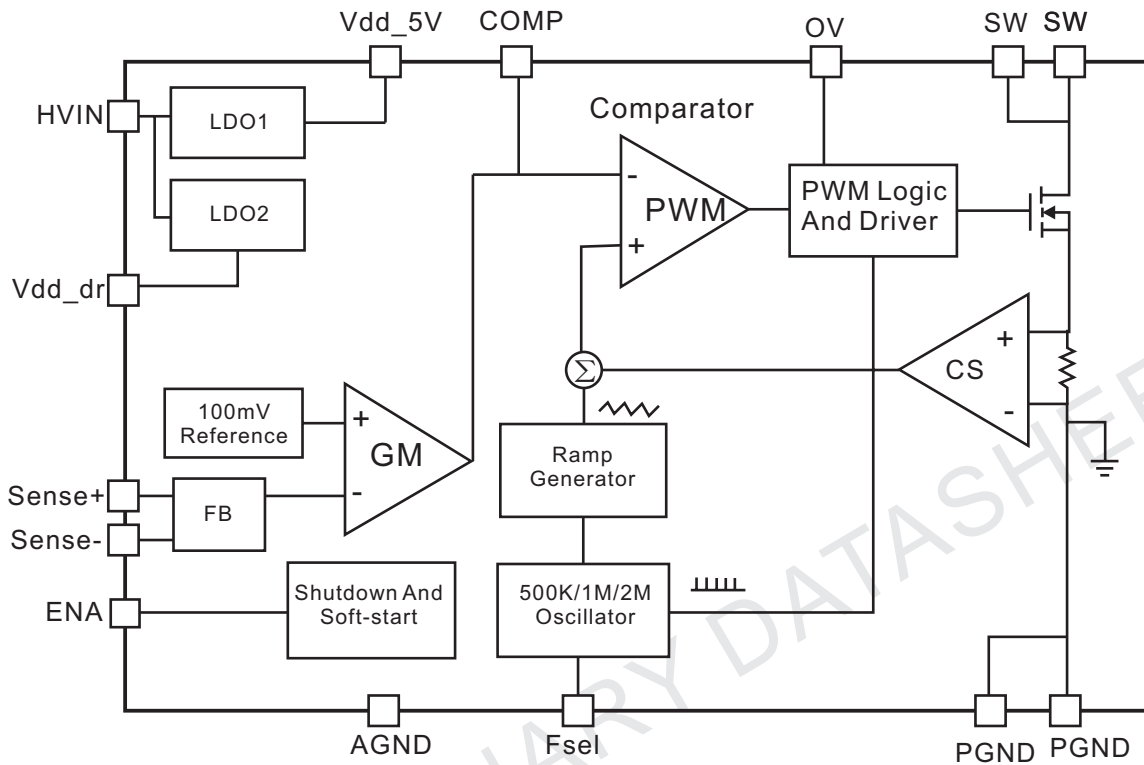
Boost with low side current sense



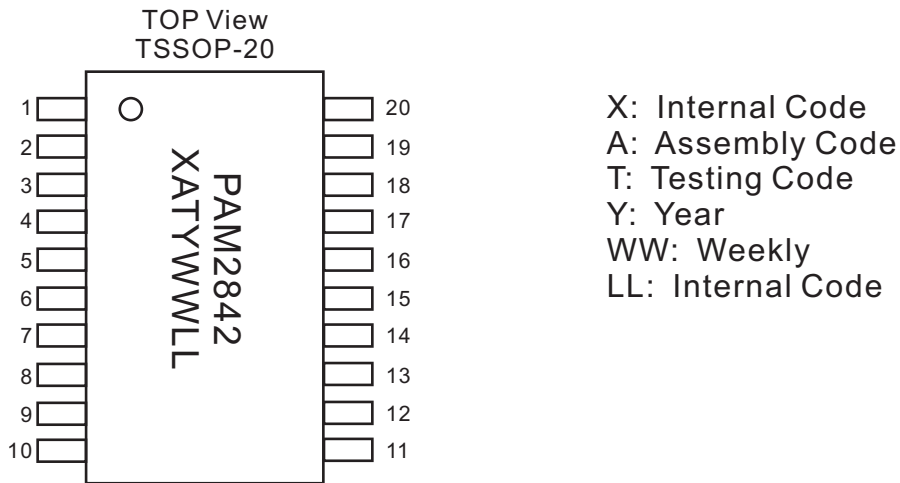
Buck/Boost (sepic) with low side current sense



Block Diagram



Pin Configuration & Marking Information



Pin Number	Name	Description
1,2,3,4	PGND	Power Ground
5	HVIN	Input
6	EN	Chip Enable, Active High
7	Vdd_dr	Internal LDO Output
8	Fsel	Frequency Select
9	AGND	Analog Ground
10,11	PGND	Power Ground
12	Sense-	Sense resistor -
13	Sense+	Sense resistor +
14	COMP	Compensation Node
15	VDD_5V	Internal LDO Output
16	OV	Over Voltage
17,18,19	SW	Drain of Main Switch.
20	NC	No Connect

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.

Supply Voltage.....40V	Storage Temperature.....-40°C to 125°C
Output Current.....1A	Maximum Junction Temperature.....150°C
I/O Pin Voltage Range.....GND-0.3V to V _{DD} +0.3V	Soldering Temperature.....300°C,5sec

Recommended Operating Conditions

Supply Voltage Range.....5.5V to 40V	Junction Temperature Range.....-40°C to 150°C
Operation Temperature Range.....-40°C to 85°C	

Thermal Information

Parameter	Package	Symbol	Maximum	Unit
Thermal Resistance (Junction to Case)	TSSOP	θ_{JC}	20	°C/W
Thermal Resistance (Junction to Ambient)		θ_{JA}	90	

PRELIMINARY DATASHEET

Electrical Characteristic

$V_{EN}=V_{DD}=24V$, 10 LEDs, $T_A=25^{\circ}C$, unless otherwise noted.

PARAMETER	Conditions	Min	Typ	Max	Units
IN Input Voltage Range		5.5		40	V
IN Quiescent Current	ENA=high (no switching)		2	2.5	mA
	ENA =high (2M switching frequency)		10		
	ENA =high (1M switching frequency)		5		
	ENA =high (500K switching frequency)		3		
	ENA =low		5	10	μA
Feedback Voltage	$V_{FB}=V_{SENSE+} -GND$	97	100	103	mV
LED Current Line Regulation			0.02		%/V
LED Current Load Regulation			1.0		%
LDO Stage					
Vcc_5V	No switching	4.7	5	5.5	V
Vcc_5V current_limit	No switching	14	74	90	mA
Vcc_5V UVLO Threshold	No switching	3.7	4.0	4.3	V
Vcc_5V UVLO Hysteresis	No switching		200		mV
Vcc_dr	No switching	4.7	5	5.5	V
Vcc_dr current_limit	No switching	14	74	90	mA
Vcc_dr UVLO Threshold	No switching	3.7	4.0	4.3	V
Vcc_dr UVLO Hysteresis	No switching		200		mV
Boost Stage					
Switch Rdsn	$V_{cc_5V}=5V$		0.1		Ω
Switch Current Limit			3.5		A
Switch Leakage Current			50		μA
Switching Frequency	Fsel= V_{cc_5V}	1.12	1.6	2.08	MHz
	Fsel=Open	0.7	1	1.3	MHz
	Fsel=GND	350	500	650	KHz
Min Duty Cycle	Fsel= V_{cc_5V}		20		%
	Fsel=Open		10		%
	Fsel=GND		5		%
Max Duty Cycle			95		%
Vc Source Current			60		μA
Vc Sink Current			60		μA

Electrical Characteristic

$V_{EN}=V_{DD}=24V$, 10 LEDs, $T_A=25^{\circ}C$, unless otherwise noted.

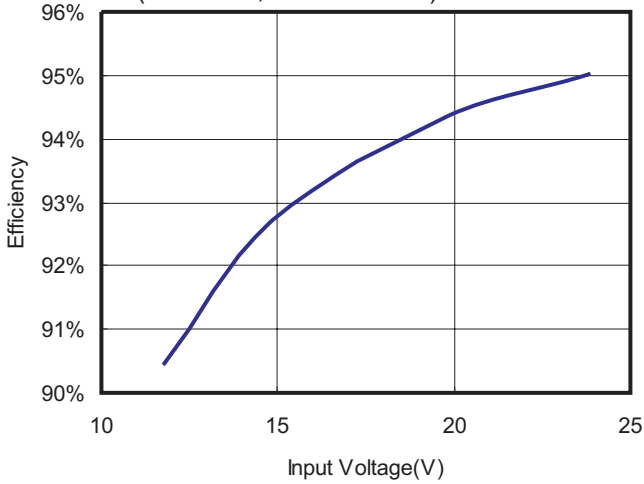
PARAMETER	Conditions	Min	Typ	Max	Units
Fault Protection					
OV threshold Voltage		1.15	1.214	1.28	V
OV Hysteresis			70		mV
Thermal-Shutdown			150		$^{\circ}C$
Thermal-Shutdown Hysteresis			30		$^{\circ}C$
Control Interface					
EN High		1.5			V
EN Low				0.4	V
Fsel High		Vcc_5v-0.5			V
Fsel Midlevel		1		2	V
Fsel Low				0.5	V

PRELIMINARY DATA SHEET

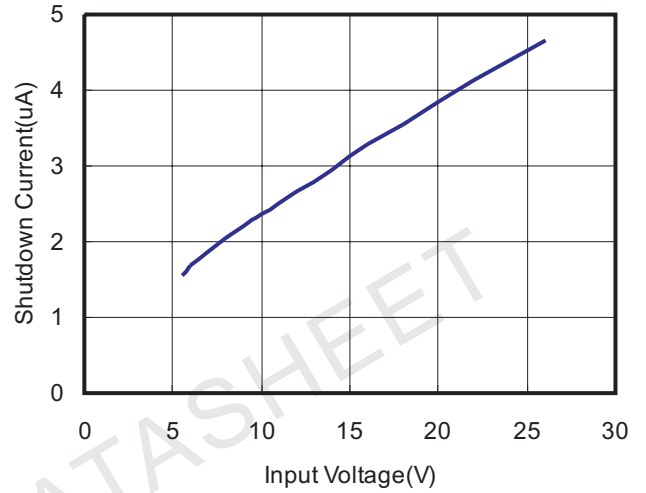
Typical Performance Characteristic

$V_{EN}=V_{DD}=24V$, 10 LEDs, Fsel=low, $T_A=25^\circ C$, unless otherwise noted.

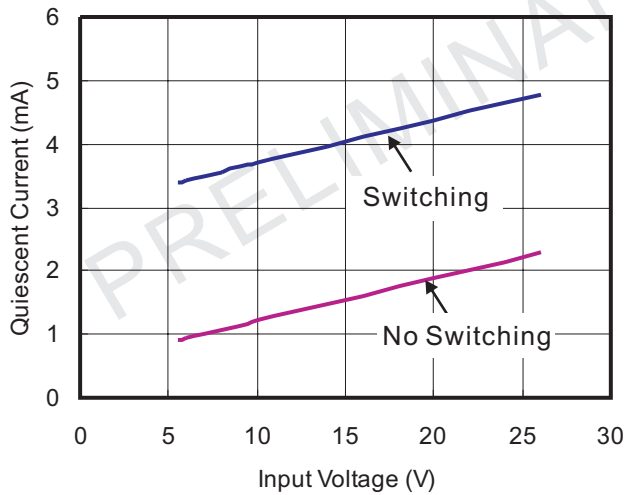
1. Efficiency vs Input Voltage
($P_o=30W$, 10X3W LED)



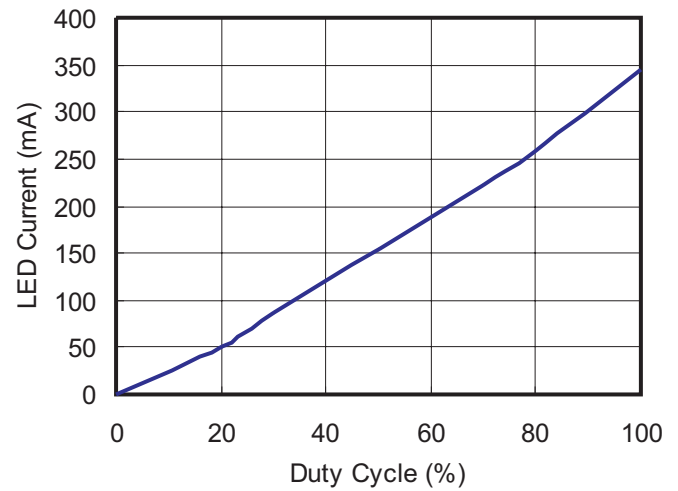
2. Shutdown Current vs Input Voltage



3. Quiescent Current vs Input Voltage



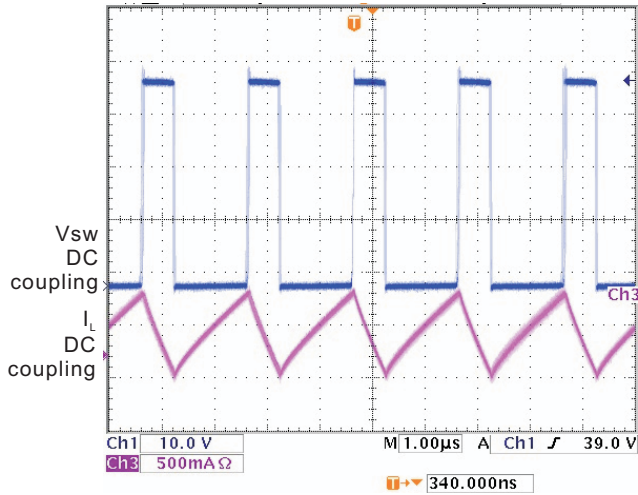
4. LED Current vs Duty Cycle (PWM=100Hz)



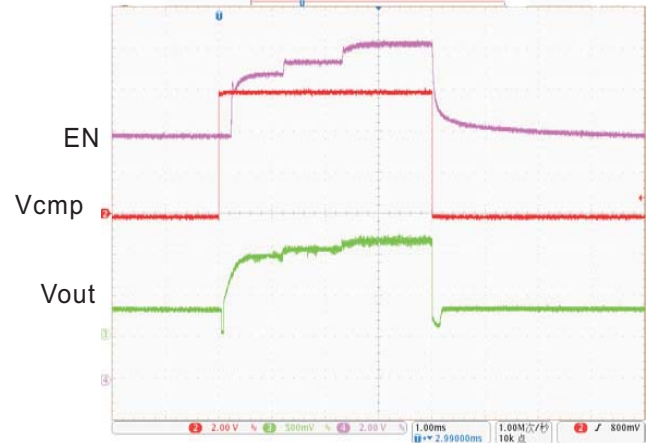
Typical Performance Characteristic

$V_{EN}=V_{DD}=24V$, 10 LEDs, Fsel=low, $T_A=25^\circ C$, unless otherwise noted.

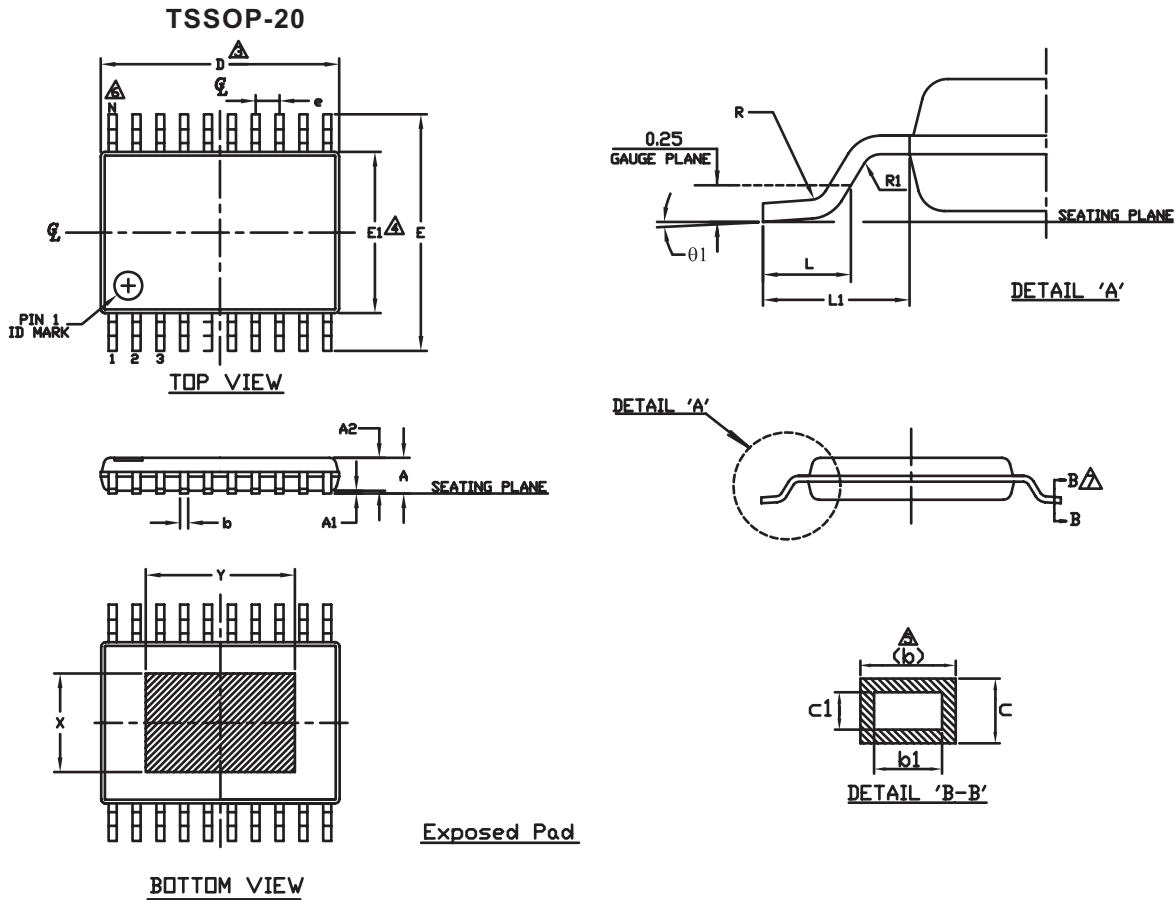
5. Switching Waveforms



6. Start up and Shutdown



Outline Dimensions



SYMBOL	MIN.	NOM.	MAX.	SYMBOL	MIN.	NOM.	MAX.
A	-	-	1.20	b	0.19	-	0.30
A1	0.025	-	0.100	b1	0.19	0.22	0.25
A2	0.80	0.90	1.05	c	0.09	-	0.20
D	6.4	6.5	6.6	c1	0.09	-	0.16
E1	4.3	4.4	4.5	θ	0°	-	8°
E	6.2	6.4	6.6	L1	1.0 REF		
L	0.45	0.60	0.75	e	0.65 BSC		
R	0.09	-	-	N	20		
R1	0.09	-	-				

Notes

1. ALL DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1994.
- ▲ DIMENSION 'D' DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
- ▲ DIMENSION 'E1' DOES NOT INCLUDE INTERNAL FLASH OR PROTRUSION.
- ▲ DIMENSION 'b' DOES NOT INCLUDE DAMBAR PROTRUSION.
- ▲ 'N' IS THE MAXIMUM NUMBER OF LEAD TERMINAL POSITIONS FOR THE SPECIFIED PACKAGE LENGTH.
- ▲ CROSS SECTION B-B TO BE DETERMINED AT 0.10 TO 0.25MM FROM THE LEAD TIP.
8. EXPOSED PAD WILL BE DEPEND ON THE PAD SIZE OF THE L/T