

## GENERAL DESCRIPTION

The PS1583 is a step down monolithic regulator with a built in internal power MOSFET, capable of driving up to 3A continuous output current with excellent line and load regulation. The output voltage can be set from **1.22 to 22V**.

Requiring a minimum number of external components, it offers simple to use, but high efficiency and advanced protection features including pulse-by-pulse current limiting and thermal shutdown. Adjustable soft-start reduces the stress on the input source at turn-on and the regulator draws only 20uA in shutdown mode.

PS1583 is available in a Pb-Free SOIC8 with Exposed Pad package.

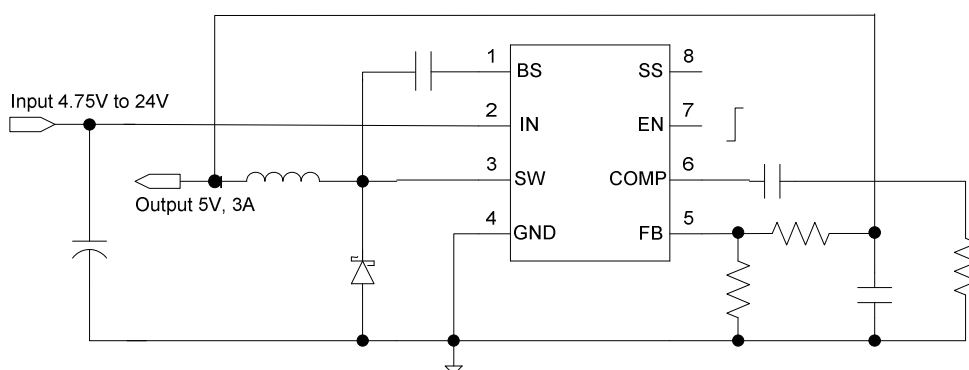
## FEATURES

- Wide Vin Range: **4.75 to 24V**
- 3A Output Current
- High Efficiency up to 95%
- Output Adjustable from **1.22 to 22V**
- 385KHz Fixed Frequency internal oscillator
- 20uA Shutdown Mode
- Pulse-to-Pulse Over Current Protection
- Thermal Shutdown
- Automatic Soft Start
- Compact SOIC8 with Exposed Pad

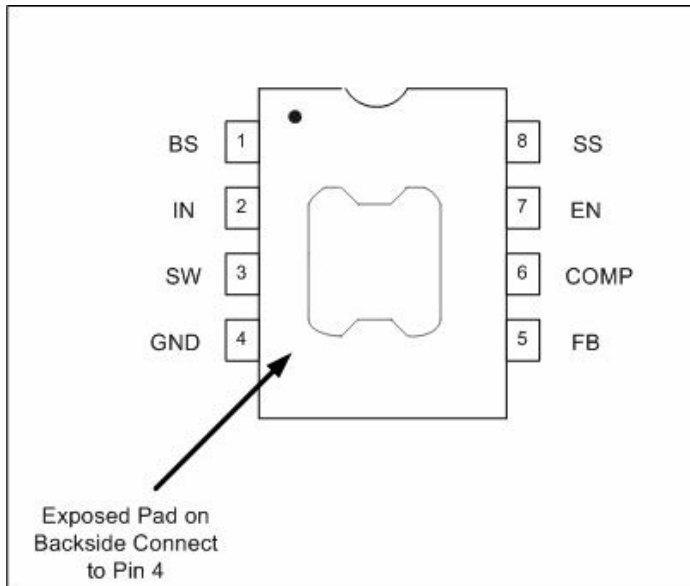
## APPLICATIONS

- Simple High Efficiency Step-down
- Consumer: TV, STB, DVD, VCR
- Car Audio/TV/Navigation
- Battery Charger
- Pre-Regulator for Linear Regulators

## Typical Application



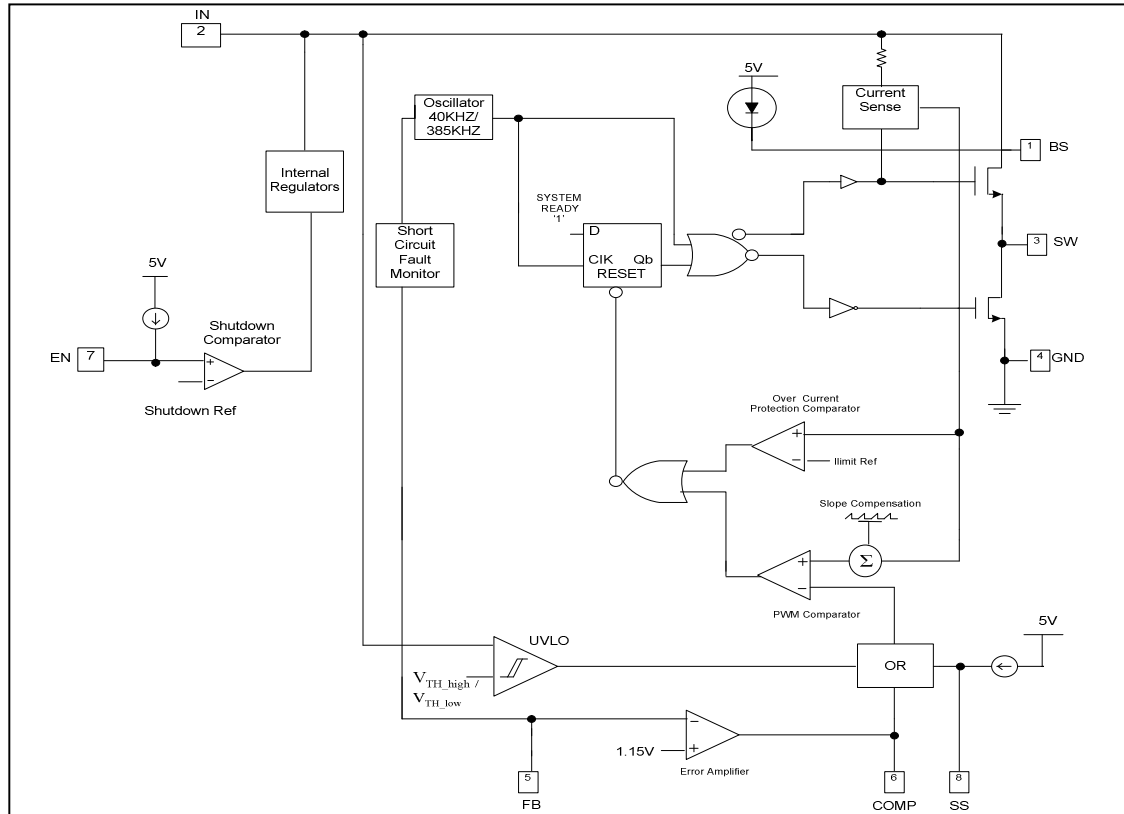
## Pin Assignment



## Pin Descriptions

Pin #	Pin Name	Description
1	BS	High Side Gate Drive Boost Input
2	IN	Power Input
3	SW	Power Switching Output
4	GND	Ground
5	FB	Feedback Input
6	COMP	Compensation Node
7	EN	Enable Input ( <b>H</b> : Step-down Operation, <b>L</b> : All circuits deactivated)
8	SS	Soft Start Control Input

## Block Diagram



## Absolute Maximum Specifications

Rating	Symbol	Value	Unit
Supply Voltage Range	$V_{IN}$	-0.3 to 28	Volts
Switch Voltage Range	$V_{SW}$	-1 to $V_{IN}+0.3$	Volts
Boost Voltage Range	$V_{BS}$	$V_{sw}-0,3$ to $V_{sw}+6$	Volts
All Other Pins		-0.3 to 6	Volts
Storage Temperature Range	$T_{STR}$	-65 to 150	$^{\circ}C$
Maximum Operating Junction Temp	$T_J$	150	$^{\circ}C$

## Recommended Operating Ratings

Rating	Symbol	Value	Unit
Supply Voltage Range	$V_{IN}$	-4.75 to 24	Volts
Ambient Operating Temperature	$T_{OP}$	-40 to 85	$^{\circ}C$

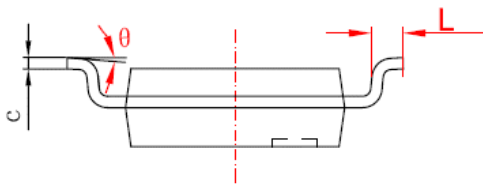
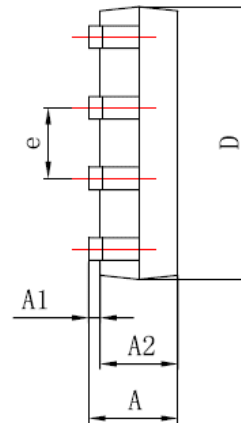
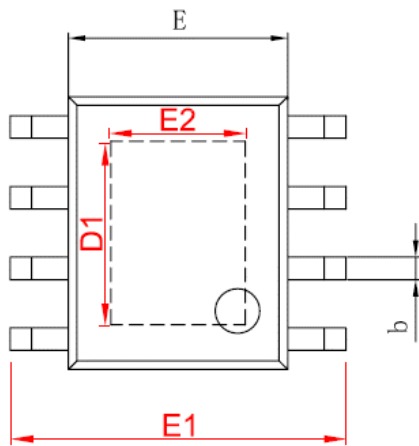
## Electrical Specifications

All electrical specifications are specified at  $T_{AMBIENT} = 25^{\circ}C$ ,  $V_{IN} = 12V$ , unless otherwise specified.

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
	Shutdown Supply Current	$V_{EN}=0V$		20		$\mu A$
	Supply Current	$V_{EN}=4V$		1.0		mA
	Feedback Voltage (Simulated over all corners and temperature)	$4.75V \leq V_{IN} \leq 24V$	1.150	1.222	1.290	V
	Error Amplifier Voltage Gain			1000		V/V
	Error Amplifier Transconductance	$\Delta I_{COMP} = \pm 10\mu A$		800		$\mu A/V$
	High Side Switch-On Resistance			100		m $\Omega$
	Low Side Switch-On Resistance			10		$\Omega$
	High Side Switch Leakage Current	$V_{EN}=0V$ , $V_{SW}=0V$		0		$\mu A$
	Current Limit			5.5		A
	Current Sense to COMP Transconductance			3.8		A/V
	Oscillation Frequency			385		KHz

	Short Circuit Oscillation Frequency	$V_{FB}=0V$		40		KHz
	Maximum Duty Cycle	$V_{FB}=1.0V$		90		%
	Minimum Duty Cycle	$V_{FB}=1.5V$			0	%
	EN Threshold Voltage			3.1		V
	EN Pull-up Current	$V_{EN}=0V$		1.9		$\mu A$
	Under-Voltage Lockout Threshold	Rising $V_{IN}$		3.4		V
	Under-Voltage Lockout Threshold Hysteresis			600		mV
	Soft Start Period	$C_{SS}=0.1\mu F$		10		mS
	Thermal Shutdown			160		$^{\circ}C$

**Package Information: SO8 (Exposed Pad)**



SYMBOL	MIN (Millimeter)	MAX (Millimeter)
A	1.350	1.750
A1	0.050	0.150
A2	1.350	1.550
b	0.330	0.510
c	0.170	0.250
D	4.700	5.100
D1	3.202	3.402
E	3.800	4.000
E1	5.840	6.240
E2	2.313	2.513
e	1.270 (BSC)	
L	0.400	1.270
$\theta$	0°	8°

## Sales Offices

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