

## Features

- Low cost, accurate high-side current sensing
- Output voltage scaling
- Up to 2.5V sense voltage
- 2.5V to 20V supply range
- 4 $\mu$ A quiescent current
- 1% typical accuracy

## General Description

The TP1001S3 is a high side current sense monitor. Using this device eliminates the need to disrupt the ground plane when sensing a load current.

It takes a high side voltage developed across a current shunt resistor and translates it into a proportional output current. A user defined output resistor scales the output current into a ground-referenced voltage.

## Applications

- Battery chargers
- Smart battery packs
- DC motor control
- Over current monitor
- Power management
- Level translating
- Programmable current source

The wide input voltage range of 20V down to as low as 2.5V make it suitable for a range of applications. A minimum operating current of just 4 $\mu$ A, combined with a SOT23 package make it a unique solution for portable battery equipment.

## Ordering Information

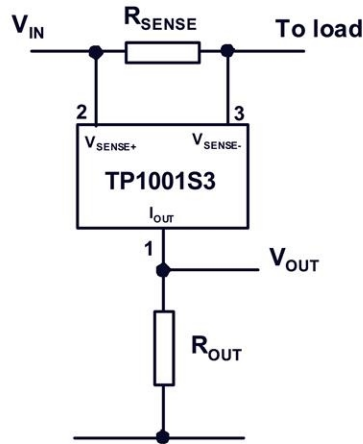
### TP1001S3

S3:SOT23-3

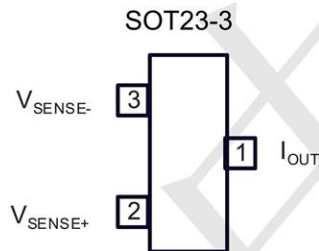
Part Number

TP Brand Name

**TYPICAL APPLICATION**



**PIN CONFIGURATION**



Pin Name	Pin Function
V <sub>SENSE+</sub>	Connection to supply voltage
V <sub>SENSE-</sub>	Connection to load
I <sub>OUT</sub>	Output current, proportional to measured current

**Absolute Maximum Rating** ( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

Description	Rating	Unit	
Voltage on any pin (relative to I <sub>OUT</sub> )	-0.6 to 20	V	
Continuous output current, I <sub>OUT</sub>	25	mA	
Continuous sense voltage, V <sub>SENSE</sub> <sup>†</sup>	-0.5 to +5	V	
Operating temperature, T <sub>A</sub>	-40 to 85	°C	
Storage temperature	-55 to 125	°C	
Package power dissipation @ T <sub>A</sub> = 25°C (Derate to zero @ 125°C)	SOT23	450	mW
	SM8	2	W

**Electrical Characteristics** ( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Limits			Units
			Min	Typ	Max	
V <sub>IN</sub>	V <sub>CC</sub> range		2.5		20	V
I <sub>OUT</sub> <sup>1</sup>	Output Current	V <sub>SENSE</sub> = 0V	1	4	15	μA
		V <sub>SENSE</sub> = 10mV	90	104	120	μA
		V <sub>SENSE</sub> = 100mV	0.975	1.002	1.025	mA
		V <sub>SENSE</sub> = 200mV	1.95	2.0	2.05	mA
		V <sub>SENSE</sub> = 1V	9.6	9.98	10.2	mA
V <sub>SENSE</sub> <sup>†</sup>	Sense Voltage		0		2500	mV
I <sub>SENSE-</sub>	V <sub>SENSE</sub> - Input Current				100	nA
A <sub>CC</sub>	Accuracy	R <sub>SENSE</sub> = 0.1Ω V <sub>SENSE</sub> = 200mV	-2.5		2.5	%
G <sub>M</sub>	Transconductance, I <sub>OUT</sub> /V <sub>SENSE</sub>			10000		μA/V
BW	Bandwidth	V <sub>SENSE(DC)</sub> = 10mv, RF P <sub>IN</sub> = -40dBm <sup>‡</sup>		300		kHz
		V <sub>SENSE(DC)</sub> = 100mv, RF P <sub>IN</sub> = -20dBm <sup>‡</sup>		2		MHz

**BLOCK DIAGRAM**

