

# TSC10 series

## High-side current sense amplifiers



### STMicroelectronics' has introduced a family of high-side current sensing amplifiers.

The TSC10 series measures a small differential voltage on a high-side shunt resistor and translates it into a ground-referenced output voltage using an internally-fixed gain. Current sense amplifiers are available in compact, tiny packages and offer a wide input common-mode voltage range. Thanks to low quiescent current, they can be used in a wide variety of applications, ranging from battery chargers to automotive current monitoring.

#### Family key features:

- Independent supply and input common-mode voltages
- Wide common-mode operating range: -2.8 to 70 V
- Wide common-mode survival range: -32 to 75 V (load-dump)
- Wide supply voltage range: 2.7 to 24 V
- Low current consumption: ICC max < 450  $\mu$ A
- Internally fixed gain: 20 V/V, 50 V/V or 100 V/V
- Buffered output

#### Main applications:

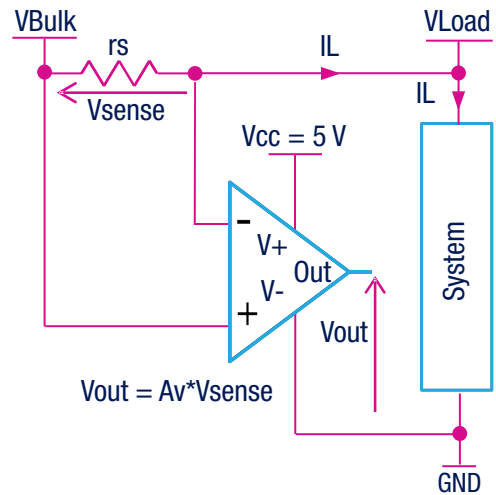
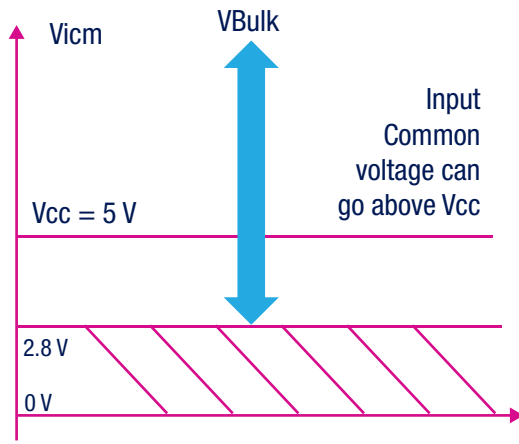
- Battery chargers
- Automotive current monitoring
- Notebook computers
- Photovoltaic systems
- DC motor control
- Precision current sources
- Uninterruptible power supplies
- High-end power supplies

The TSC10 series measures very small differences in voltage across a high-side shunt resistor and, using an internally fixed gain, amplifies the difference into a ground-referenced output voltage. Gains are internally fixed (20 V/V, 50 V/V or 100 V/V) depending on the sensitivity required in the application. Devices use independent input common-mode and power supply voltages. Common-mode voltages can range from 2.8 up to 70 V in absolute maximum ratings.

Quiescent current consumption is very low (< 450 µA), ensuring that the device can operate in battery-operated applications with minimal power consumption. A wide supply voltage range for TSC101, from 4 to 24 V, allows the device to connect the power supply to either side of the current measurement shunt with minimal error in most applications.

The TSC10 series is automotive grade (AECQ100). Devices can sustain load dump voltages up to 75 V.

### APPLICATION EXAMPLE



- Ideal when it is not possible to cut the ground path (as with certain automotive applications)
- TSC series can have a 5 V supply and nevertheless supervise common voltages up to 75 V
- No need for external resistor as the gain is fixed internally
- High level of accuracy compared with traditional devices
- Power consumption less than 450 µA (drawn from low VCC voltage) reduces overall system power dissipation

### TSC SERIES

Part number	$V_{icm}$ (V)	$V_{cc}$ (V)	$I_{cc}$ (µA)	Temperature range (°C)	Precision with 50 mV $V_{sense}$ (%)	Package	Automotive grade
TSC101	2.8 to 30	4 to 24	300	-40 to 125	2.5	SOT23-5	Yes
TSC102	2.8 to 30	3.5 to 5.5	420		2.5	TSSOP8/S08	
TSC1021	2.8 to 30	3.5 to 5.5	300		1.5	TSSOP8/S08	
TSC103	2.9 to 70	2.7 to 5.5	360		2.5	TSSOP8/S08	
TSC1031	-2.1 to 65	to 5.5	360		2.5	TSSOP8/S08	

