

**Micro Oscillator's
sMart shunts**

Endurance Analog Family



Micro-oscillator.com

High Side Precision Current Sense Amplifier with Built In Shunt Resistor – Voltage Output

MOI-HSCS-20mA5VI, MOI-HSCS-20mA5VE
MOI-HSCS-20mA40VI, MOI-HSCS-20mA40VE

General Description

Micro Oscillator Inc.'s patent pending sMart shunt Family, provides a high precision voltage or 20mA current loop output. The **sMart shunt** maintains accuracy over a broader temperature range including -40°C to 125°C in a smaller profile. In most cases, no calibration is required; simply connect the **sMart shunt** output to the DVM or current loop. The accuracy is 100% tested over an extended temperature range and High Side measurements don't require an additional supply. The increased performance and combined functionality in a small profile package comes without increasing system cost.

Custom specified products to meet varying application requirements are available.

Features and Benefits

- 200mV, & 2 Volt Meter Compatible Versions
- 20ma Current Loop Compatible Version (see High Side Precision Current Sense Amplifier with Built In Shunt Resistor – Current Loop Data Sheet)
- Low Voltage (2.7V-5.5V) & high voltage (5V-40V) Versions
- Customer Specified Variations Available
- Industrial, Military, or Down Hole Environments

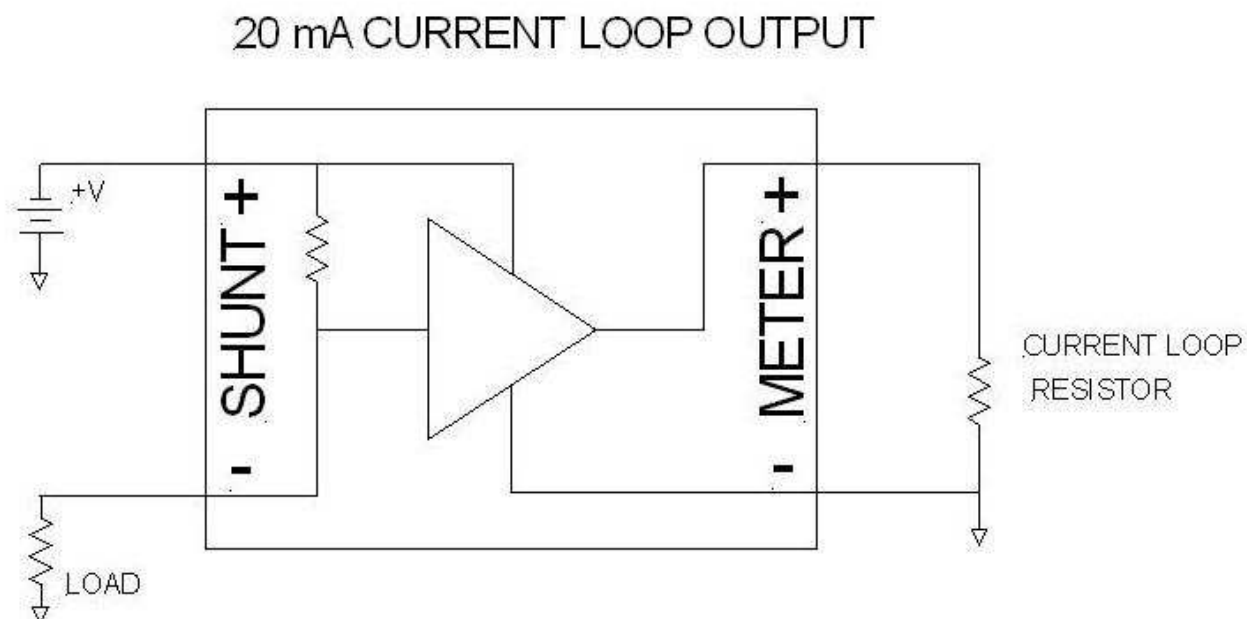
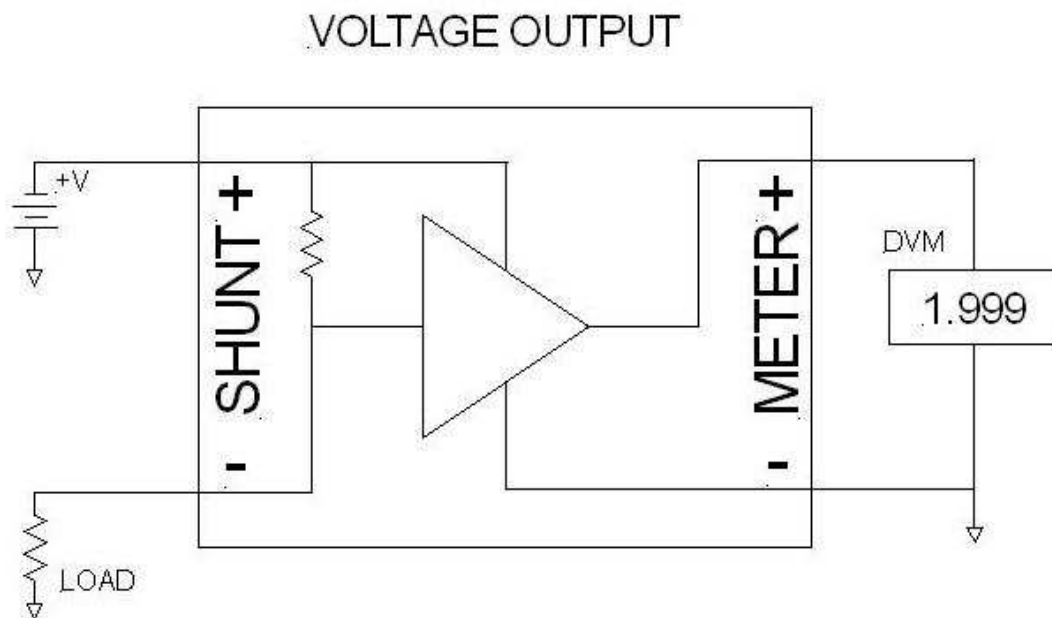
Applications

- High Side Measurements without an additional supply
- 0.2% Accuracy over the specified temperature range without system calibration
- Broader temperature range than Manganin based shunts
- Total system cost savings

For information on pricing, delivery, and ordering, please email sales@micro-oscillator.com or contact a Sales Representative for Micro Oscillator at 512-470-2835, or visit Micro Oscillator's website at www.micro-oscillator.com

HSCS Family Data Sheet Rev. 1 AUG 2012

Functional Block Diagram



Absolute Maximum Ratings

- Supply Voltage; 6V Max MOI-HSCS-20mA5VI, MOI-HSCS-20mA5VE
50V Max MOI-HSCS-20mA40VI, MOI-HSCS-20mA40VE
- Load Current; MOI-HSCS-20mAXXXXXX 22mA Max
- Output Current; 1mA Max
- Storage Temperature; -40°C to 150°C

Electrical Characteristics

		Min	Typ	Max	Units	Conditions
Internal Shunt Resistor						
MOI-HSCS-20mAXXXXXX	Rs		2.5		Ohms	
Load Current						
	I _L	0		21	mA	
Transimpedance Gain						
MOI-HSCS-20mAXXXXXX		0.0998	0.1	0.1002		V/mA
Small-Signal Bandwidth						
			1K		Hz	
Output Offset Voltage						
				1	mV	I _L =0mA
Output Resistance						
			1K		Ohms	
Supply Voltage						
MOI-HSCS-20mA40VI	V _s	5		40	V	
MOI-HSCS-20mA40VE		5		40	V	
MOI-HSCS-20mA5VI		2.7		5.5	V	
MOI-HSCS-20mA5VE		2.7		5.5	V	
Supply Current						
MOI-HSCS-20mA40VI	I _s		0.8		mA	I _L =0mA
MOI-HSCS-20mA40VE			0.8			
MOI-HSCS-20mA5VI			0.03			
MOI-HSCS-20mA5VE			0.03			
Temperature Range						
MOI-HSCS-20mA5VI		-40°		85°	C	
MOI-HSCS-20mA40VI		-40°		85°	C	
MOI-HSCS-20mA5VE		-40°		125°	C	
MOI-HSCS-200mA40VE		-40°		125°	C	

For information on pricing, delivery, and ordering, please email sales@micro-oscillator.com or contact a Sales Representative for Micro Oscillator at 512-470-2835, or visit Micro Oscillator's website at www.micro-oscillator.com

Detailed Description

Micro Oscillator Inc. **sMart shunts** provide uni-directional current sensing with a voltage output. The current flowing from the power supply into the external load controls the current flow from the power supply into an internal resistor to produce the output voltage. This circuit operates similar to that of a current mirror. The major advantage of using the Micro Oscillator Inc. **sMart shunt** is that the shunt resistor's temperature coefficient error is electronically reduced to provide greater total accuracy than normally possible.

The meter connected to the **sMart shunt's** meter output should be 1M ohms minimum to reduce measurement error.

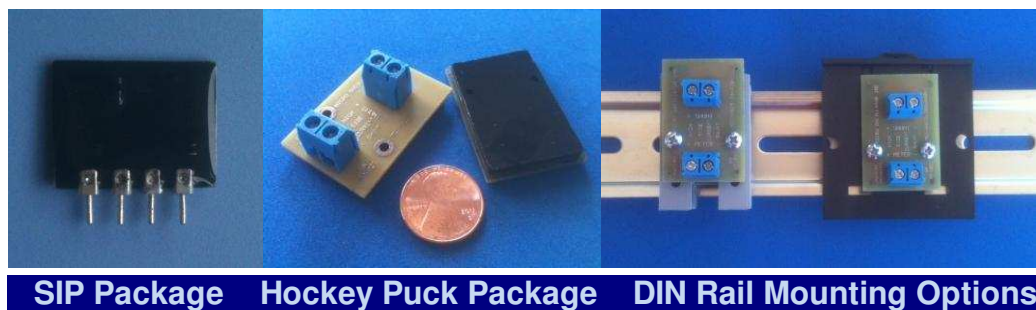
Device Branding Key

MOI-HSCS – xxxmAyyVIECL

Product Number	Full Scale Output	Full Scale Input	Shunt Res Voltage	Package	Temp Range	Supply Voltage	Total Accuracy
MOI-HSCS-20mA5VI	2 Volt	20mA	40mV	SIP/Terminals	-40-85 ⁰ C	2.7-5V	0.2%
MOI-HSCS-20mA5VE	2 Volt	20mA	40mV	SIP/Terminals	-40-125 ⁰ C	2.7-5V	0.2%
MOI-HSCS-20mA40VI	2 Volt	20mA	40mV	Hockey Puck	-40-85 ⁰ C	5-40V	0.2%
MOI-HSCS-20mA40VE	2 Volt	20mA	40mV	Hockey Puck	-40-125 ⁰ C	5-40V	0.2%
MOI-HSCS-20mA30VICL	20mA	20mA	40mV	Hockey Puck	-40-85 ⁰ C	5-30V	0.2%
MOI-HSCS-20mA30VECL	20mA	20mA	40mV	Hockey Puck	-40-125 ⁰ C	5-30V	0.2%
MOI-HSCS-200mA30VICL	20mA	200mA	40mV	Hockey Puck	-40-85 ⁰ C	5-30V	0.4%
MOI-HSCS-200mA30VECL	20mA	200mA	40mV	Hockey Puck	-40-125 ⁰ C	5-30V	0.4%

For information on pricing, delivery, and ordering, please email sales@micro-oscillator.com or contact a Sales Representative for Micro Oscillator at 512-470-2835, or visit Micro Oscillator's website at www.micro-oscillator.com

Package Details



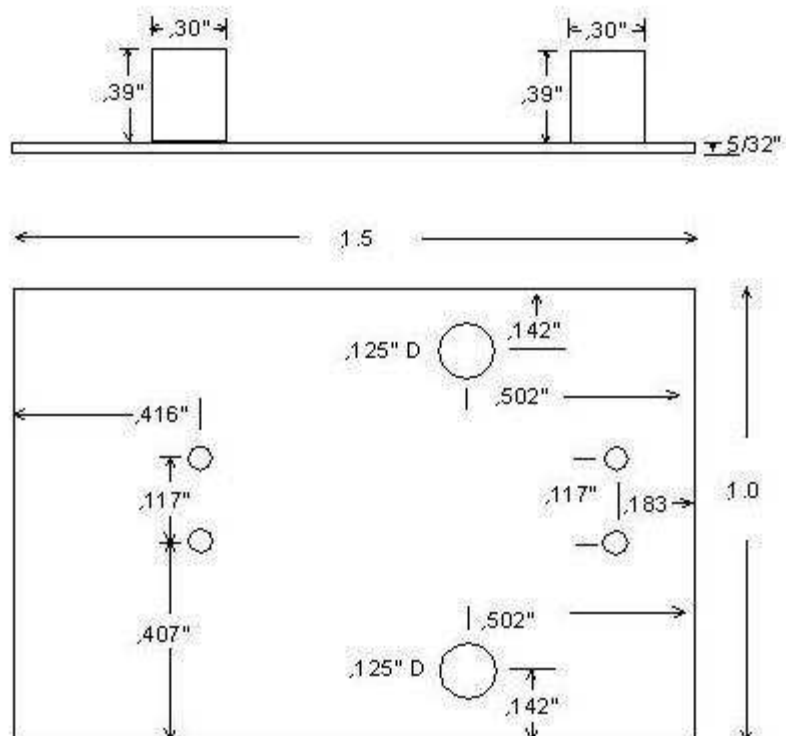
Package contains FR-4 PCB, and UL 94 V-0 flammability rated terminals and flame retardant epoxy.

Recommended #4 machine screws for mounting, not included.

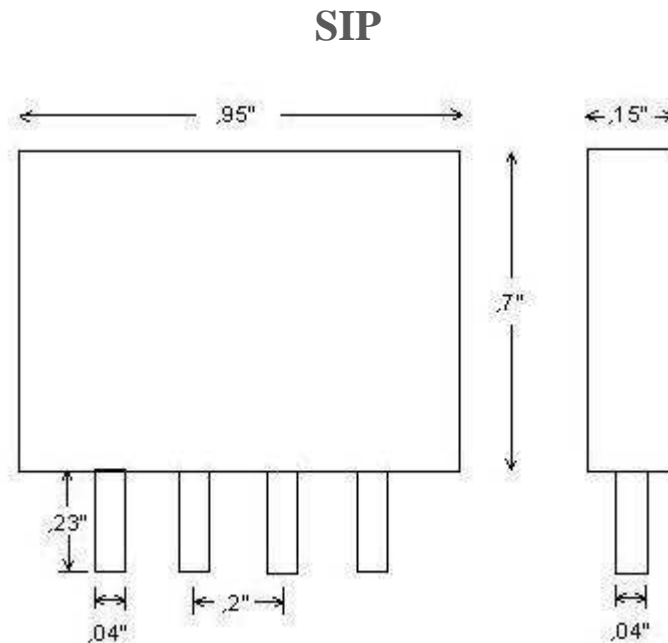
DIN Rail Adapters used in photo are: SSAC SYMCOM INC DIN Rail Mounting Adapter Manufacturer P/N P1023-20 & Eaton/Control Automation ACCESSORY; Kit; DIN Rail Mounting Kit Manufacturer P/N EDINKIT.

Dimensions

HOCKEY PUCK



For information on pricing, delivery, and ordering, please email sales@micro-oscillator.com or contact a Sales Representative for Micro Oscillator at 512-470-2835, or visit Micro Oscillator's website at www.micro-oscillator.com



Handling Precautions

All device pins have limited ESD protection. Normal precautions should be taken to guard against ESD damage.

Warranty

Micro Oscillator, Inc. does not assume any liability arising out of the application or use of any product or circuit described herein. Our products are not authorized for use as components in devices used for life support or other critical application where failure can cause death or bodily injury. In the event of this product being defective due to any cause including but not limited to manufacturing, labeling, packaging or shipping, this product will be replaced with a satisfactory part or the purchase price refunded.