

**Micro Oscillator's
sMart shunts**

Endurance Analog Family



Micro-oscillator.com

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

MOI-HSCS-20mA30VICL, MOI-HSCS-20mA25VECL
MOI-HSCS-200mA30VICL, MOI-HSCS-200mA25VECL

General Description

Micro Oscillator Inc.'s patent pending sMart shunts Family, provides a high precision voltage or 20mA current loop output. This **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 Version (see High Side Precision Current Sense Amplifier with Built In Shunt Resistor-Voltage Output Data Sheet)
- 20ma Current Loop Compatible Version
- High voltage (5V-30V) Versions
- Customer Specified Variations Available
- Industrial, Military, or Down Hole Environments

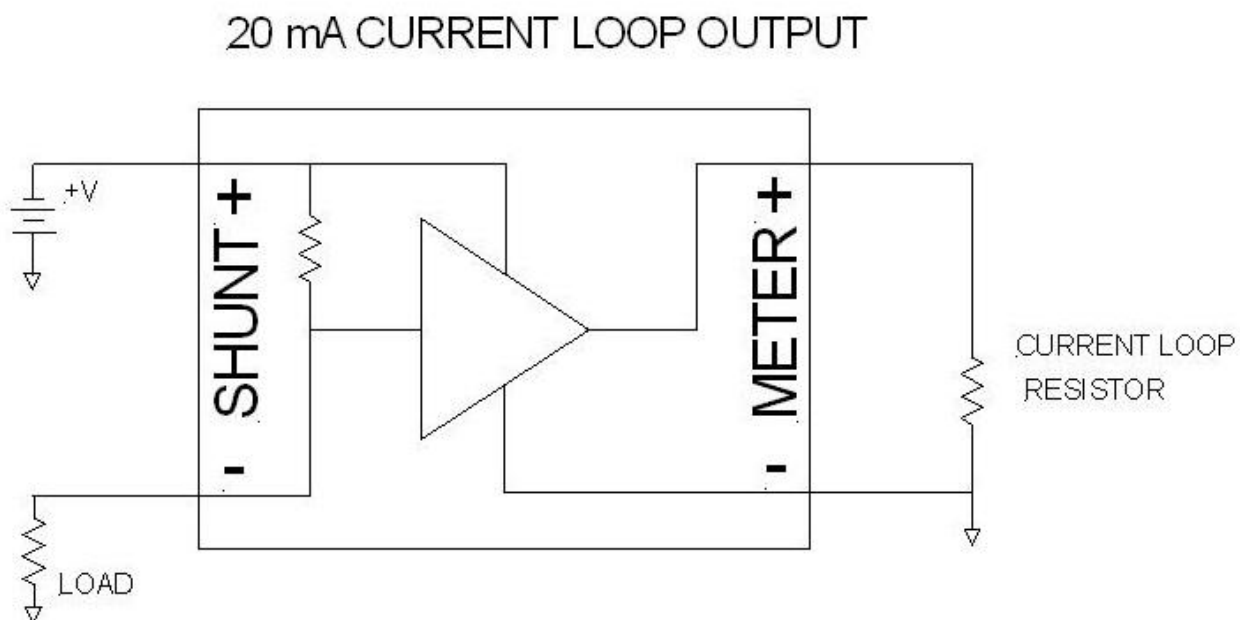
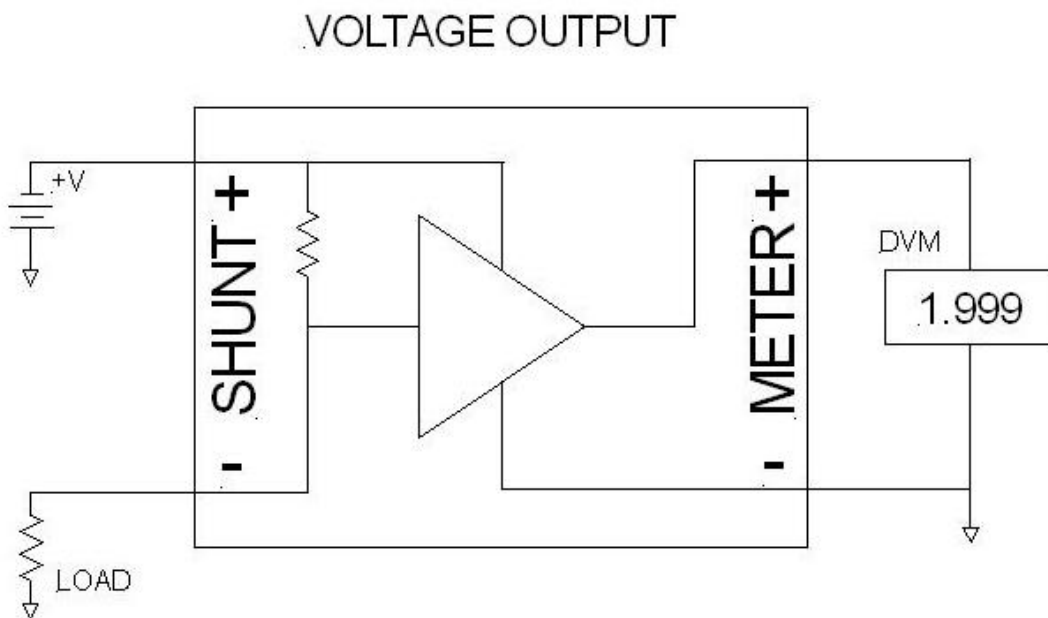
Applications

- 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; 50V
- Load Current; MOI-HSCS-20mAXXXXXX 22mA
MOI-HSCS-200mAXXXXXX 220mA
- Storage Temperature; -40°C to 150°C

Electrical Characteristics

		Min	Typ	Max	Units	Conditions
Internal Shunt Resistor						
MOI-HSCS-20mAXXXXXX	Rs		2.0		Ohms	
MOI-HSCS-200mAXXXXXX	Rs		0.20		Ohms	
Load Current						
	Il	0		21	mA	
Current Loop Resistor						
		0		300	Ohms	
Current Gain						
MOI-HSCS-20mAXXXXXX		0.998	1.0	1.002		mA/mA
MOI-HSCS-200mAXXXXXX		.0996	0.1	0.1004		mA/mA
Small-Signal Bandwidth						
			30		Hz	
Output Offset Current						
				10	uA	Il=0mA
Supply Voltage						
MOI-HSCS-20mA40VICL	Vs	5		30	V	-40° to 85°c
MOI-HSCS-200mA40VICL		5		30	V	-40° to 85°c
MOI-HSCS-20mA40VECL		5		30	V	-40° to 85°c
MOI-HSCS-200mA40VECL		5		30	V	-40° to 85°c
MOI-HSCS-20mA40VECL		5		25	V	85° to 125°c
MOI-HSCS-200mA40VECL		5		25	V	85° to 125°c
Supply Current						
	Is		0.8		mA	Il=0mA
Temperature Range						
MOI-HSCS-20mA40VICL		-40°		85°	C	
MOI-HSCS-200mA40VICL		-40°		85°	C	
MOI-HSCS-20mA40VECL		-40°		125°	C	
MOI-HSCS-200mA40VECL		-40°		125°	C	

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Detailed Description

Micro Oscillator Inc. **sMart shunts** provide uni-directional current sensing with a current output. The current flowing from the power supply into the external load controls the current flow from the power supply into the current loop. 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.

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°C	2.7-5V	0.2%
MOI-HSCS-20mA5VE	2 Volt	20mA	40mV	SIP/Terminals	-40-125°C	2.7-5V	0.2%
MOI-HSCS-20mA40VI	2 Volt	20mA	40mV	Hockey Puck	-40-85°C	5-40V	0.2%
MOI-HSCS-20mA40VE	2 Volt	20mA	40mV	Hockey Puck	-40-125°C	5-40V	0.2%
MOI-HSCS-20mA30VICL	20mA	20mA	40mV	Hockey Puck	-40-85°C	5-30V	0.2%
MOI-HSCS-20mA30VECL	20mA	20mA	40mV	Hockey Puck	-40-125°C	5-25V	0.2%
MOI-HSCS-200mA30VICL	20mA	200mA	40mV	Hockey Puck	-40-85°C	5-30V	0.4%
MOI-HSCS-200mA30VECL	20mA	200mA	40mV	Hockey Puck	-40-125°C	5-25V	0.4%

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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.