Table 1. MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Supply Voltage (Note 1)		V_S	+30	V
Analog Inputs	Differential (V_{IN+})−($V_{IN−}$)	V_{IN+}, $V_{IN−}$	−30 to +30	V
	Common−Mode (Note 2)		(GND−0.3) to +30	
REF Input		V_{REF}	(GND−0.3) to (V_S+0.3)	V
Output (Note 2)		V_{OUT}	(GND−0.3) to (V_S+0.3)	V
Input Current into Any Pin (Note 2)			5	mA
Maximum Junction Temperature		$T_{J(max)}$	+150	°C
Storage Temperature Range		T_{STG}	−65 to +150	°C
ESD Capability, Human Body Model (Note 3)		HBM	±2000	V
Charged Device Model (Note 3)		CDM	±2000	V
Latch−Up Current (Note 4)		I_{LU}	100	mA

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

TYPICAL CHARACTERISTICS (T_A = 25°C, V_S = 5 V, V_{IN}+ = 12 V AND V_{REF} = V_S/2 UNLESS OTHERWISE NOTED.)
(THE NCS199A3R IS USED FOR TYPICAL CHARACTERISTICS)

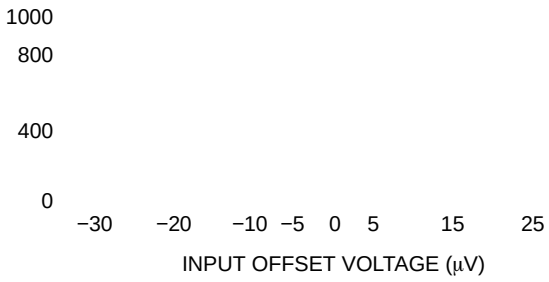


Figure 1. Input Offset Voltage Production Distribution

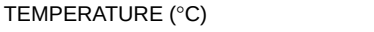


Figure 2. Input Offset Voltage vs. Temperature

TYPICAL CHARACTERISTICS (T_A = 25°C, V_S = 5 V, V_{IN}+ = 12 V AND V_{REF} = V_S/2 UNLESS OTHERWISE NOTED.)
(THE NCS199A3R IS USED FOR TYPICAL CHARACTERISTICS)

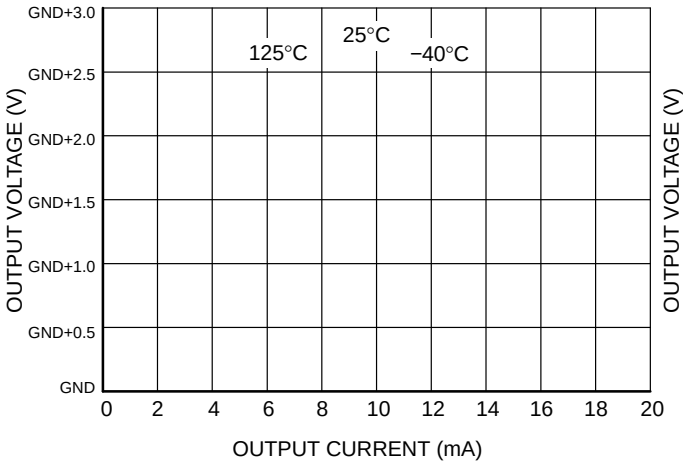


Figure 13. Negative Output Voltage Swing vs. Output Current, V_S = 2.7 V

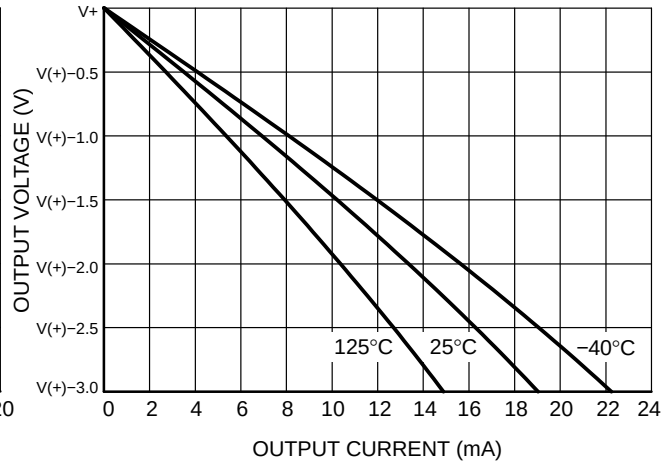


Figure 14. Positive Output Voltage Swing vs. Output Current, V_S = 5 V

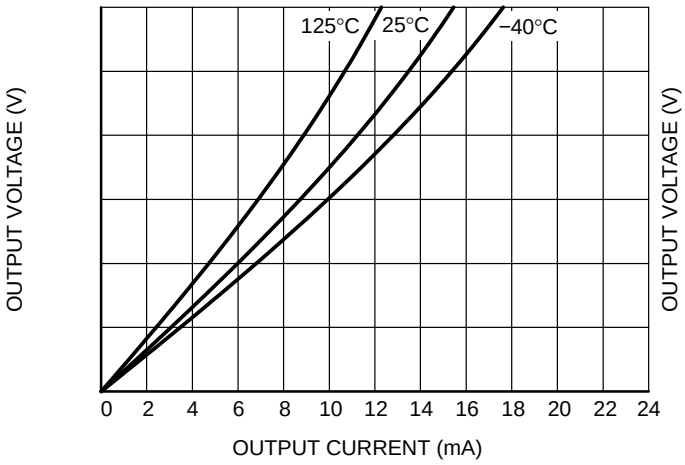


Figure 15. Negative Output Voltage Swing vs. Output Current, V_S = 5 V

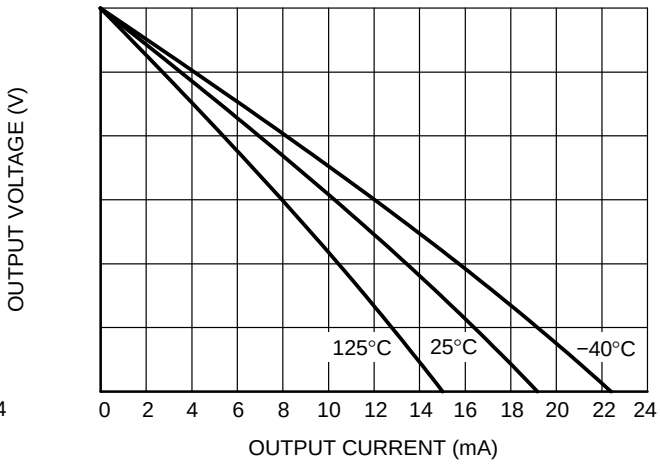


Figure 16. Positive Output Voltage Swing vs. Output Current, V_S = 26 V

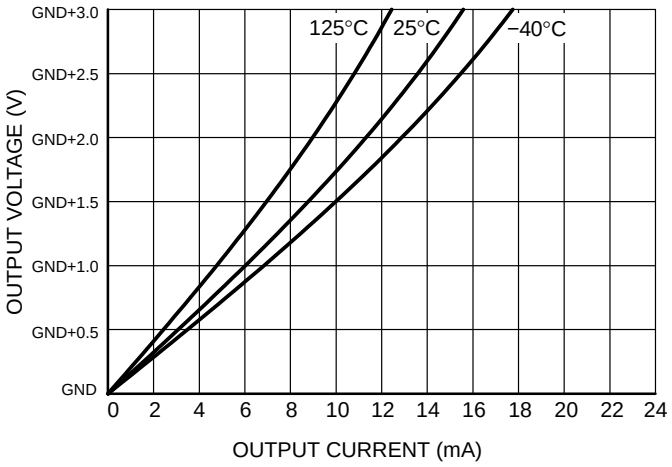


Figure 17. Negative Output Voltage Swing vs. Output Current, V_S = 26 V

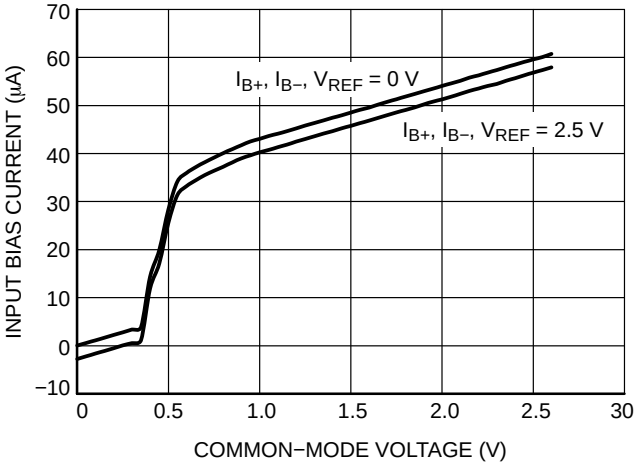


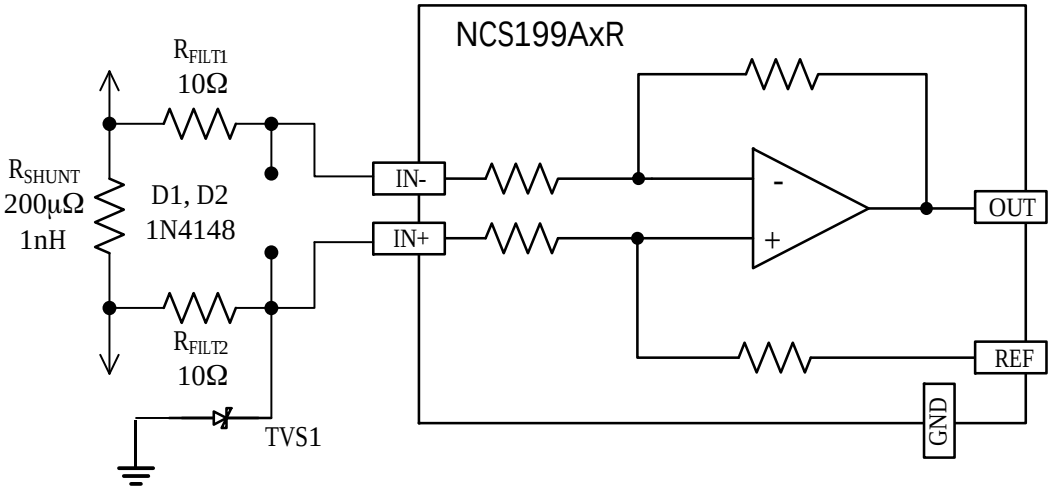
Figure 18. Input Bias Current vs. Common Mode Voltage with V_S = 5 V

TYPICAL CHARACTERISTICS

BASIC CONNECTIONS

Current Sensing Techniques

The NCS199AxR current−sense amplifiers can be configured for both low−side and high−side current sensing. Low−side sensing appears to have the advantage of being straightforward,


NCS199AxR
R_{FILT1}
10Ω
R_{SHUNT}
200μΩ
1nH
D1, D2
1N4148
R_{FILT2}
10Ω
TVS1
IN-
IN+
-
+
OUT
REF
GND

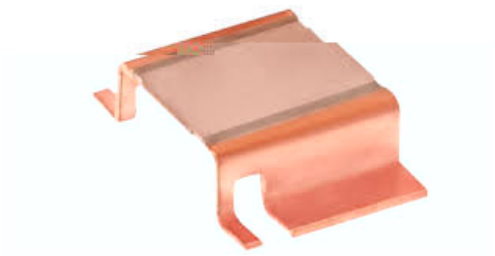
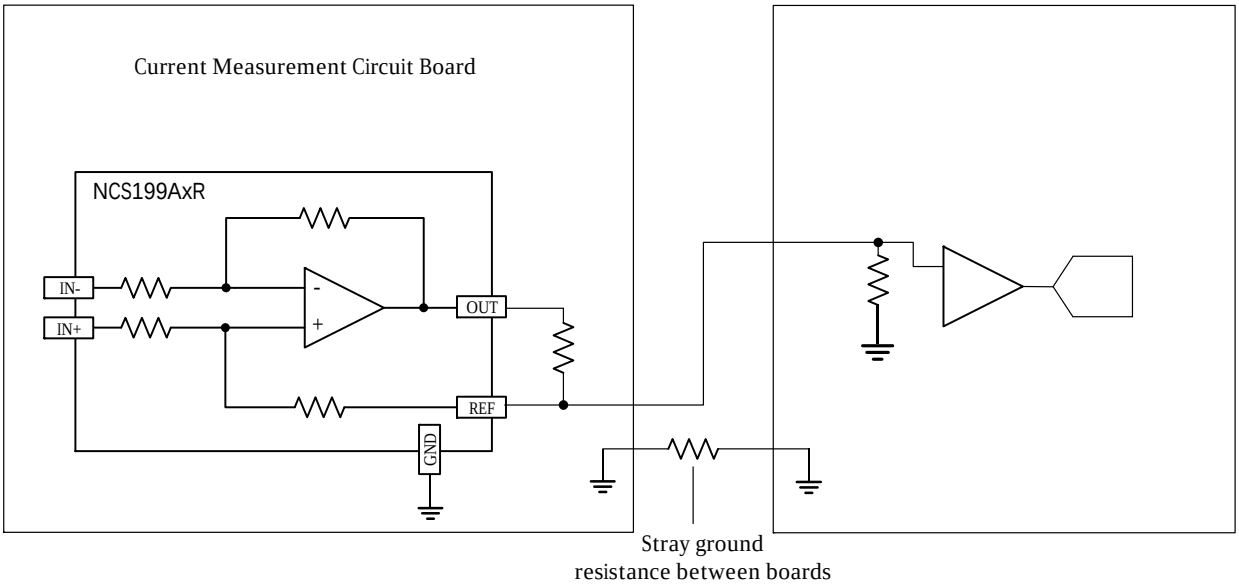


Figure 35. Surface Mount Kelvin Shunt

Current Output Configuration

In applications where the readout boards are remotely located, the voltage output of the NCS199AxR can be converted to a precision current output. The precision output current measurements are read more accurately as it overcomes the errors due to ground drops between the boards.

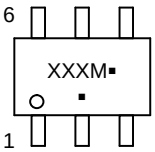


SC−88 2.00x1.25x0.90, 0.65P
CASE 419B−02
ISSUE Z

DATE 18 APR 2024

_ BURRS. MOLD FLASH,
PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.

GENERIC
MARKING DIAGRAM*



XXX = Specific Device Code
M = Date Code*
▪ = Pb−Free Package

(Note: Microdot may be in either location)

*Date Code orientation and/or position may vary depending upon manufacturing location.

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

RECOMMENDED MOUNTING

STYLES ON PAGE 2

STYLE 1:
PIN 1. EMITTER 2
2. BASE 2
3. COLLECTOR 1
4. EMITTER 1
5. BASE 1
6. COLLECTOR 2

STYLE 2:
CANCELLED

STYLE 3:
CANCELLED

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