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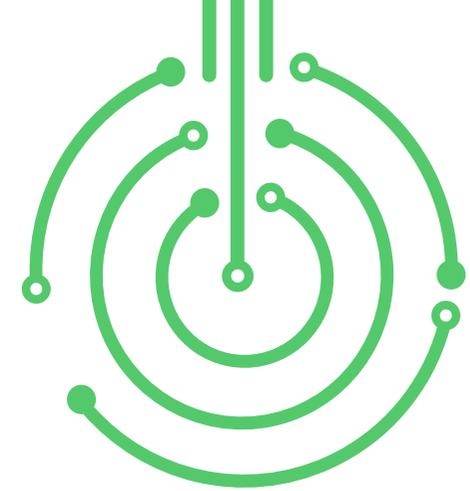
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SENSOR



# 0-1A Single-Supply, Low-side, Current Sensor with Output 0 to 4.9V



SKU: EL143414

## SENSOR

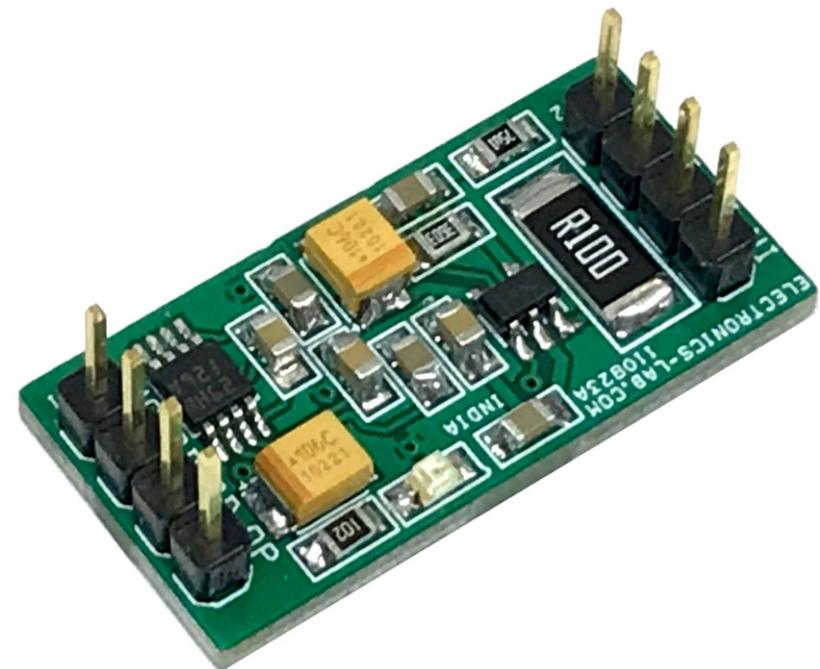
# 0-1A Single-Supply, Low-Side, Current Sensor with Output 0 to 4.9V



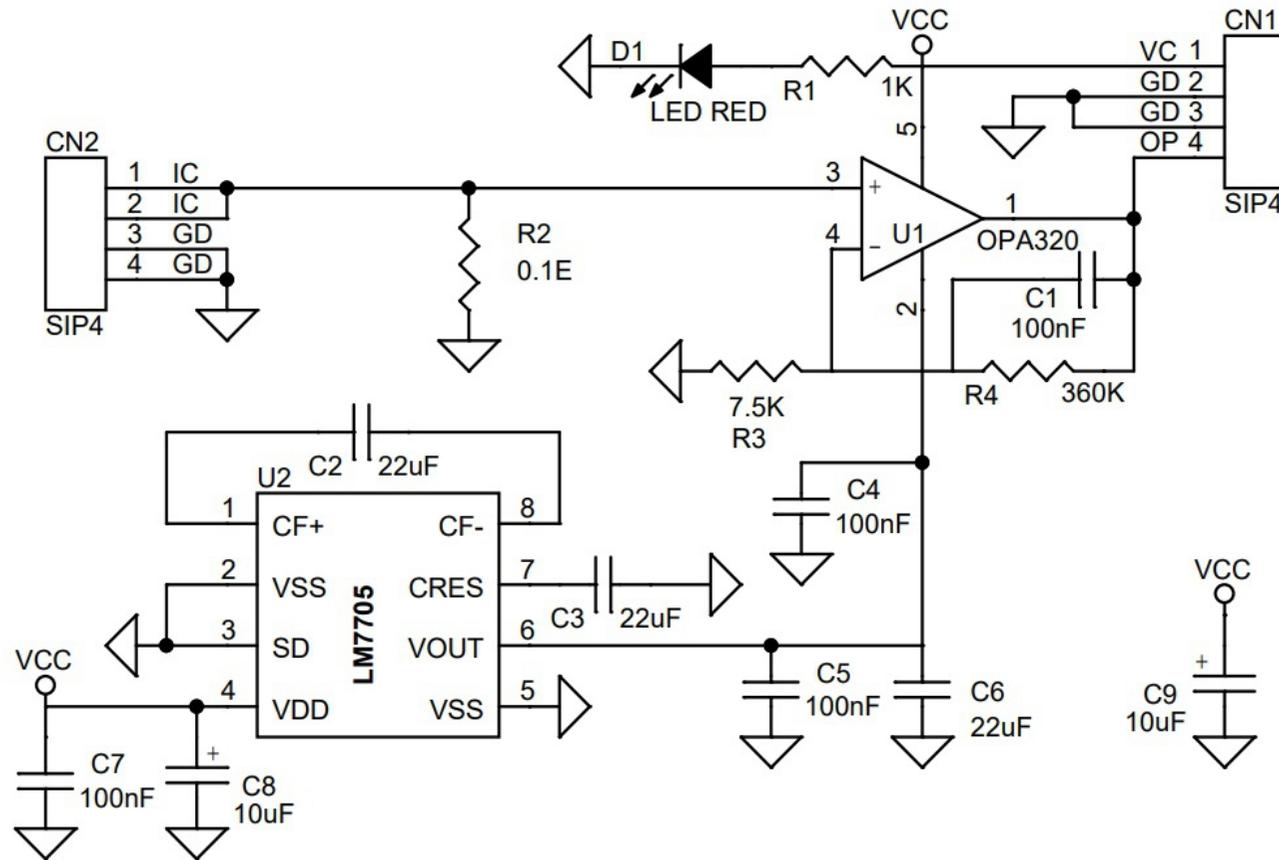
This single-supply, low-side, current sensing solution accurately detects load current between 0 and 1A. The current sensor measures 0 to 1A across the shunt resistor, providing 0 to 4.9V output. The OPA320 features wide bandwidth and low offset voltage making it an excellent amplifier for this design. With a single 5V supply, the LM7705 negative bias generator extends the linear output range of the amplifier below 0V. This enables the op-amp to produce a linear output for a zero-input current condition. The wide sensing range of the design allows for precise measurement of small load currents (i.e., low-power or shutdown modes) and higher currents up to 1A. The LM7705 functions as an inverting charge pump and regulates its output to -0.23V when powered by a single supply. By biasing the negative supply ( $V_{S-}$ ) of the op-amp to -0.23V, the linear output range of the device is extended below 0V. A linear output at 0V allows a calibrated measurement of zero-input current.

## FEATURES

- Power Supply 5V DC @ 10mA
- Load Current 0 to 1Amp
- Output 0 to 4.9V
- Full Scale Error +/- 0.1%
- PCB Dimensions 28.58 x 14.13mm



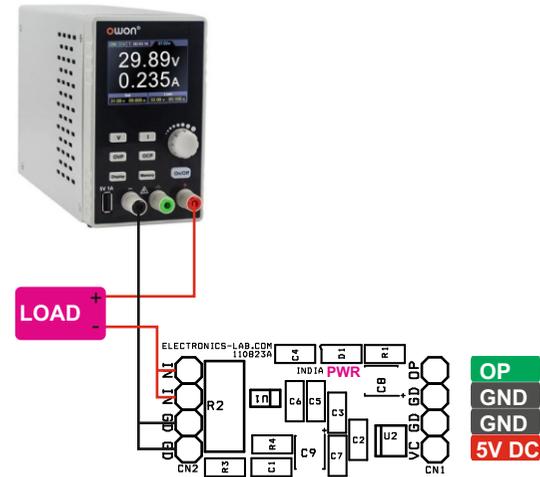
# Schematic



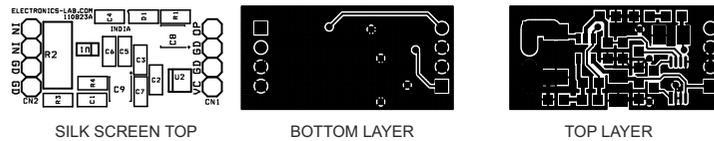
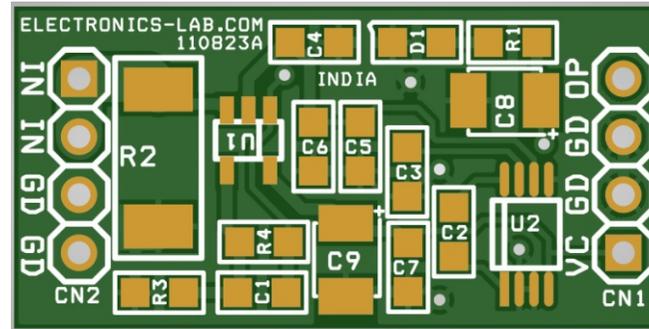
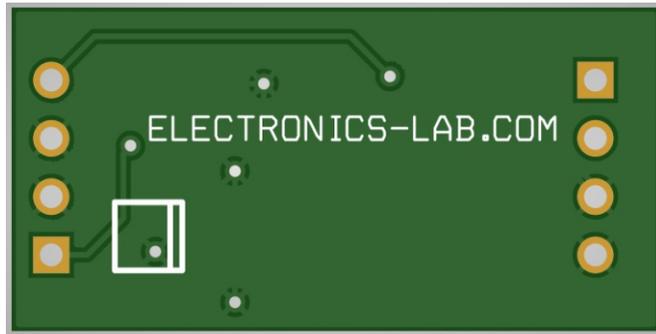
# Connections

## Connections

- CN1: Pin 1 = VCC 5V DC, Pin 2,3 = GND, Pin 4 = Output
- CN2: Load Pin 1,2 = Load, Pin 3,4 = GND
- D1 Power LED



# PCB



PCB DIMENSIONS 28.58 X 14.13MM

# Parts List

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BOM						
NO	QNTY	REF	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	2	CN1,CN2	4 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5317-ND
2	4	C1,C4,C5,C7	100nF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
3	3	C2,C3,C6	22uF/10V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
4	2	C8,C9	10uF/10-16V TANTLUM SIZE 1210	KEMET/MUARATA	DIGIKEY	
5	1	D1	LED RED SMD SIZE 0805	LITE ON INC	DIGIKEY	160-1427-1-ND
6	1	R1	1K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
7	1	R2	0.1E/2W 1% SMD SIZE 0805	BOURNS	DIGIKEY	CRA2512-FZ-R100ELFCT-ND
8	1	R3	7.5K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
9	1	R4	360K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
10	1	U1	OPA320AQDBVRQ1	TI	DIGIKEY	296-45320-1-ND
11	1	U2	LM7705 VSOP8	TI	DIGIKEY	LM7705MM/NOPBCT-ND





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