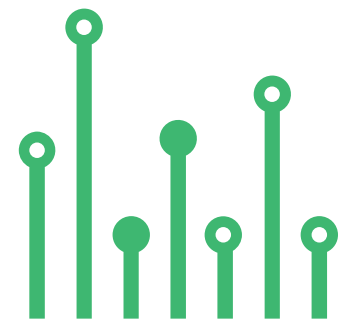


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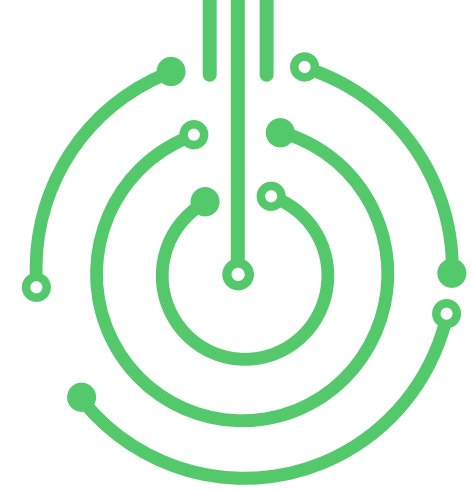
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SENSOR



10uA-10mA Low-side Current Sensor



SKU: EL145610

SENSOR

10uA-10mA Low-side Current Sensor

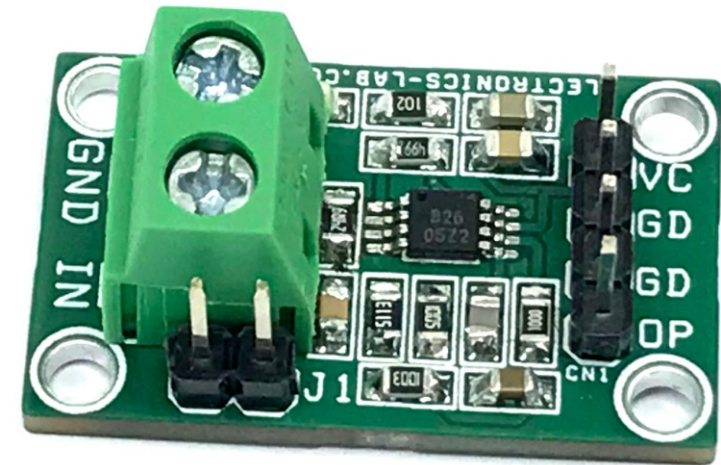


This single-supply, low-side, current-sensing solution accurately detects load current between 10μ and 10mA . A unique yet simple gain-switching network was implemented to measure the three-decade load current range accurately. The linear range of the output is from 100mV to 4.90V . INA326 instrumentation amplifier is used since low-side sensing is desirable because the common-mode voltage is near the ground. Therefore, the current sensing solution is independent of bus voltage, which allows for using single-supply, rail-to-rail input/output (RRIO) amplifiers. Low-side current sensing places a shunt resistor between the system load and the ground. The current drawn by the load generates a voltage across the shunt resistor. The output voltage of the circuit is equal to the current sense across the shunt resistor and the gain of the amplifier. A high-value resistor is used as a shunt for accurate current sense. It is advisable to use 0.1% tolerance shunt resistor R2.

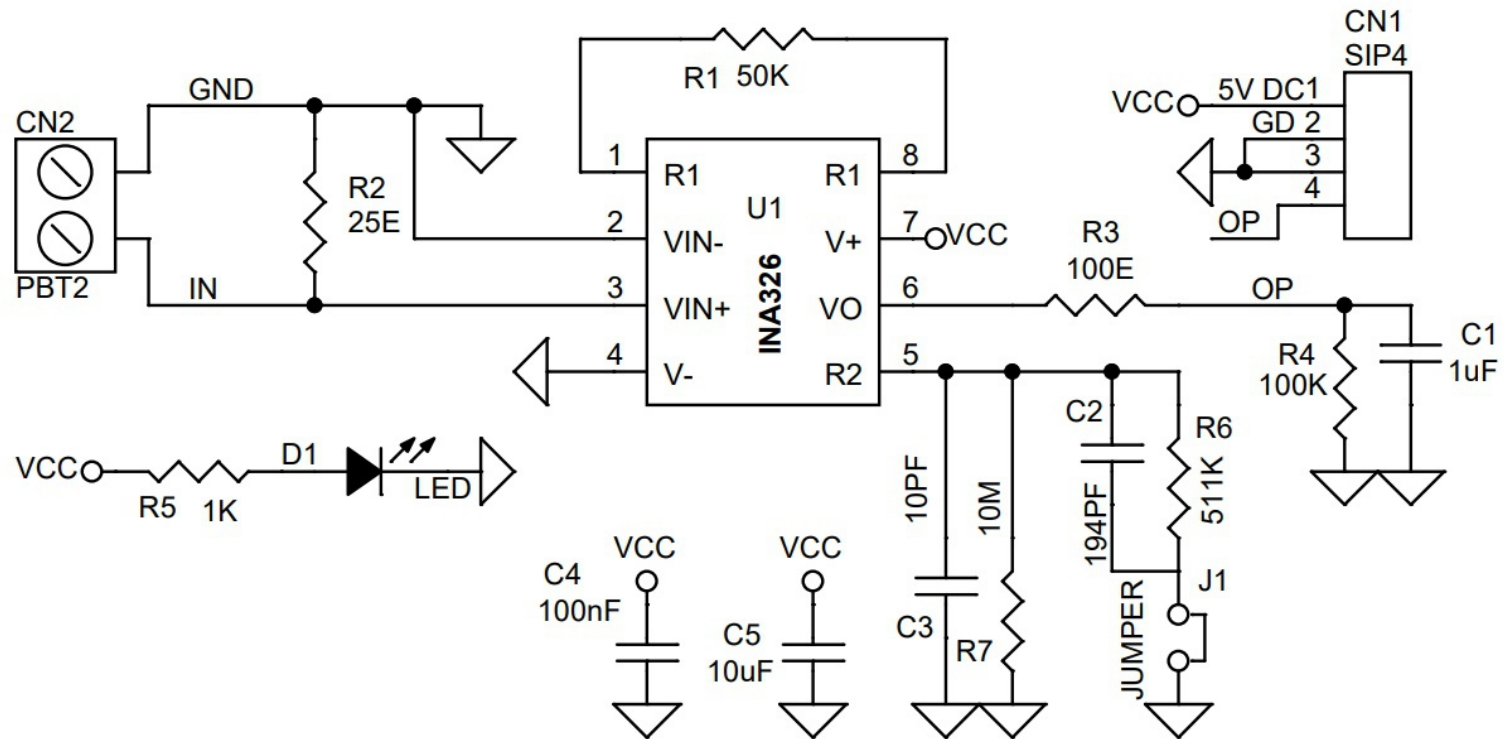
Credits: Circuit is from Texas Instruments Application Note

FEATURES

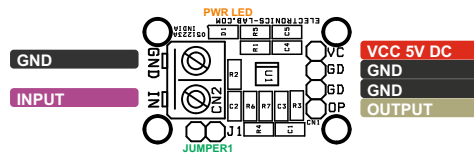
- Supply 5V DC
- Input Current Range $10\mu\text{A}$ to 10mA
- Output $100\text{mV}(0,1\text{V})$ to 4.90V
- On Board Power LED
- Very Small Board
- PCB Dimensions $28.10 \times 17.30\text{MM}$



Schematic



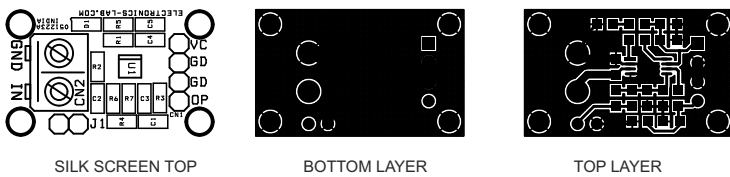
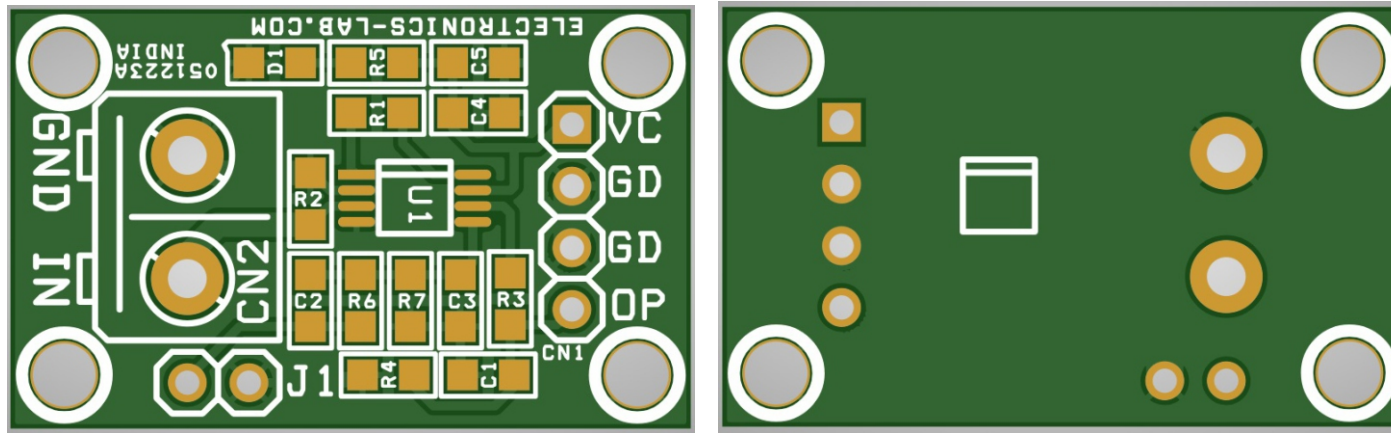
Connections



Connections

- CN1L Pin 1 = VCC 5V DC, Pin 2 = GND, Pin 3 = GND, Pin 4 = Output 100mV to 5V
- CN2: Pin 1 = Current Input, Pin 2 = GND
- D1: Power LED
- J1: Gain Set

PCB



PCB DIMENSIONS 28.10 X 17.30MM

Parts List

BOM						
NO	QNTY.	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	1	CN1	4 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5317-ND
2	1	CN2	2 PIN SCREW TERMINAL PITCH 5.08MM	PHOENIX	DIGIKEY	277-1247-ND
3	1	C1	1uF/25V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
4	1	C2	194PF/25V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
5	1	C3	10PF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
6	1	C4	100nF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
7	1	C5	10uF/25V CERAMCIS SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
8	1	D1	LED SMD SIZE 0805	OSRAM	DIGIKEY	475-1278-1-ND
9	1	J1	2 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5315-ND
10	1	R1	50K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
11	1	R2	25E 0.1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
12	1	R3	100E 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
13	1	R4	100K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
14	1	R5	1K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
15	1	R6	511K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
16	1	R7	10M 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
17	1	U1	INA326	TI	DIGIKEY	INA326EA/2K5CT-ND
18	1	J1	SHUNT FOR JUMPER	SULINS CONNECT	DIGIKEY	S9001-ND



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