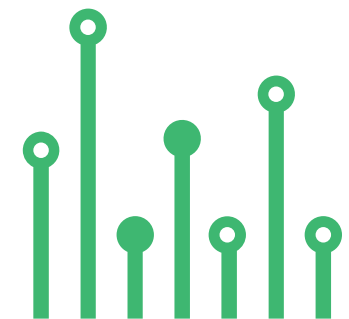


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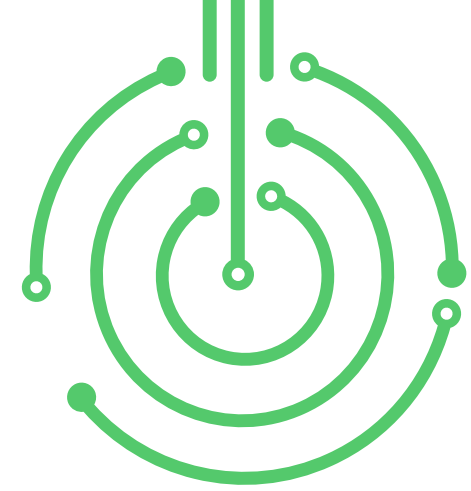
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SENSOR



# Linear Capacitive Proximity Sensor



SKU: EL144713

## SENSOR

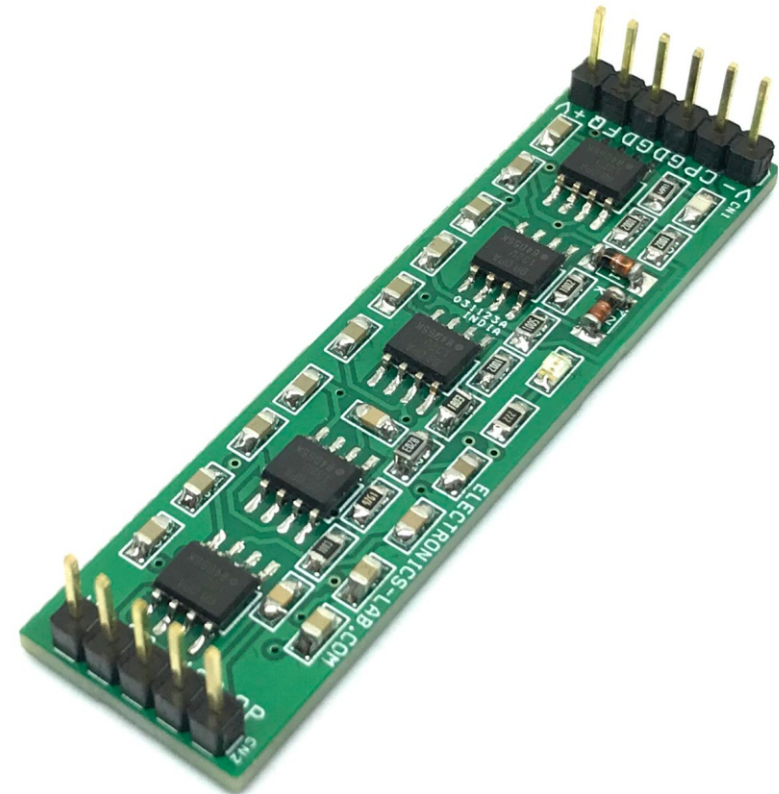
# Linear Capacitive Proximity Sensor



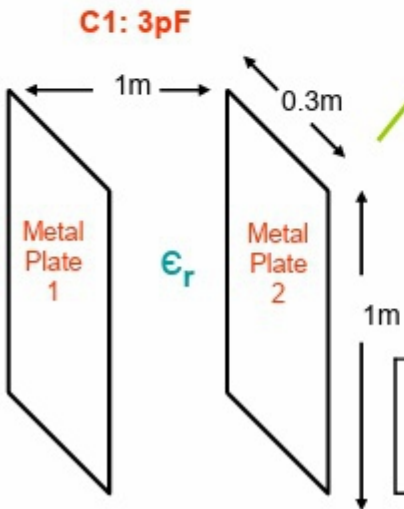
The project presented here is an analog capacitive proximity sensor. The circuit is from Texas Instruments application note. Most conventional capacitive proximity sensors produce a "1" or "0" output, this circuit produces a DC output that is a function of the size and relative permittivity of an object passing between the sense capacitor plates. Different sized and density objects will produce a different output voltage. The oscillator input for this circuit is a 50Khz sine source. The low frequency and sine characteristics keep RFI problems at a minimum. This proximity detector may prove difficult to construct because of the small capacitances involved, parasitic capacitances in the sensor circuit, and noise pickup. The circuit requires an external 50Khz sinewave with 1Vpp Signal. The circuit operates with a dual 15V DC supply.

## FEATURES

- Power Supply +/-15V (Dual 15V DC)
- Header Connector for Sensor Inputs and Outputs
- On Board Power LED
- PCB Dimensions 60.17 X 16.19MM

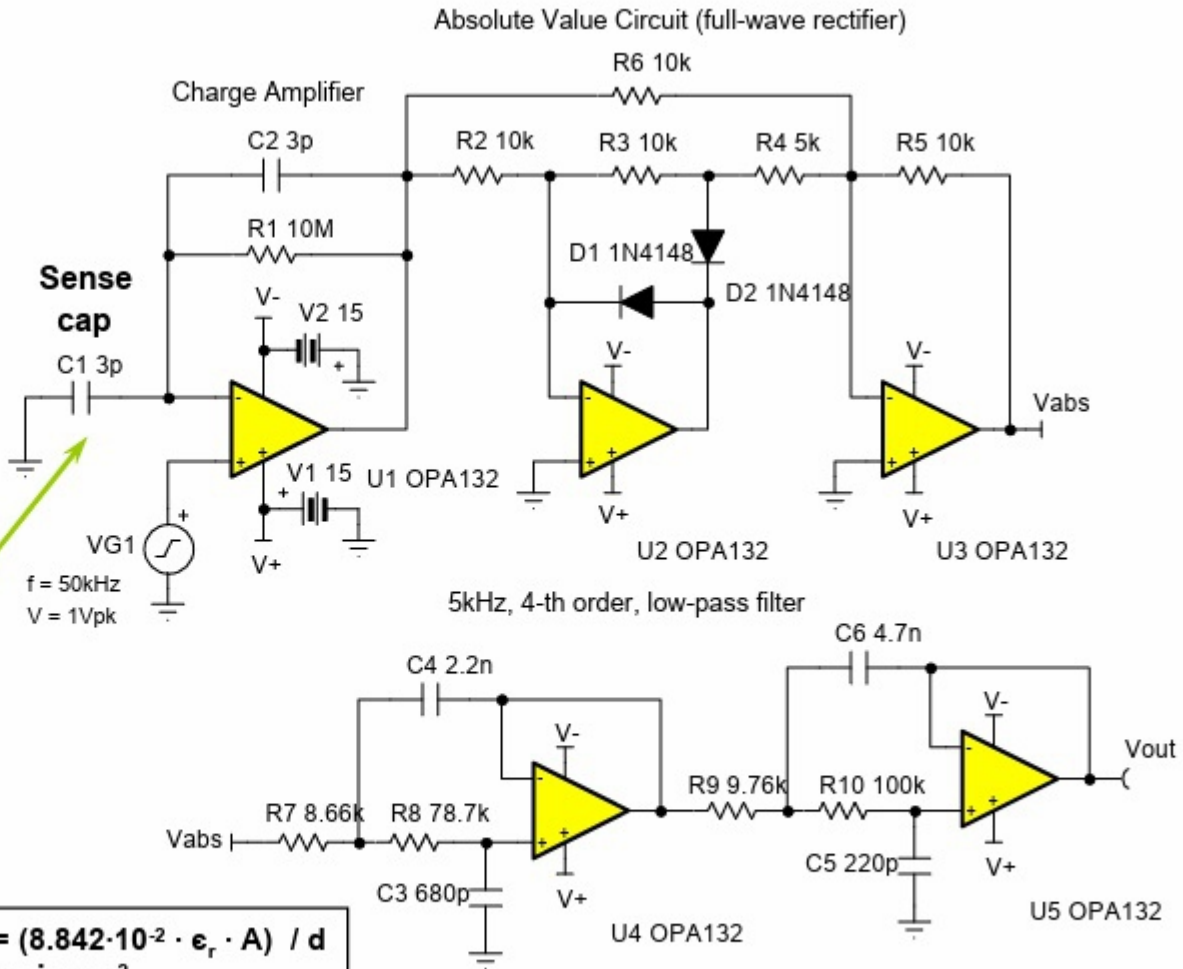


Dielectric	Relative Permittivity
Vacuum	1.0
Air	1.0006
Teflon™	2.0
Glass	7.5
Water	80

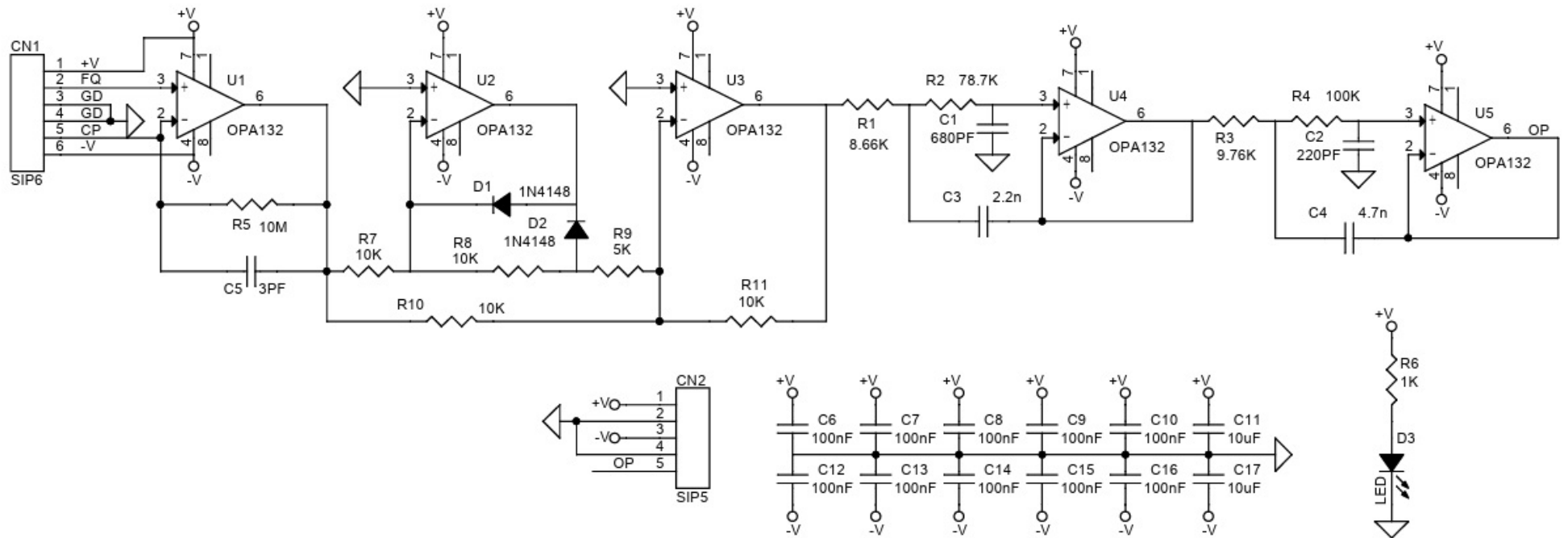


$$C_{(pF)} = (8.842 \cdot 10^{-2} \cdot \epsilon_r \cdot A) / d$$

A: area in cm<sup>2</sup>  
d: plate distance in cm

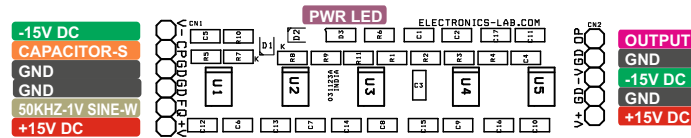


# Schematic



# Connections

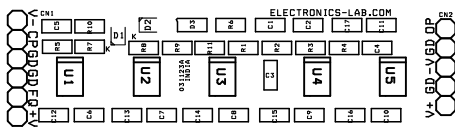
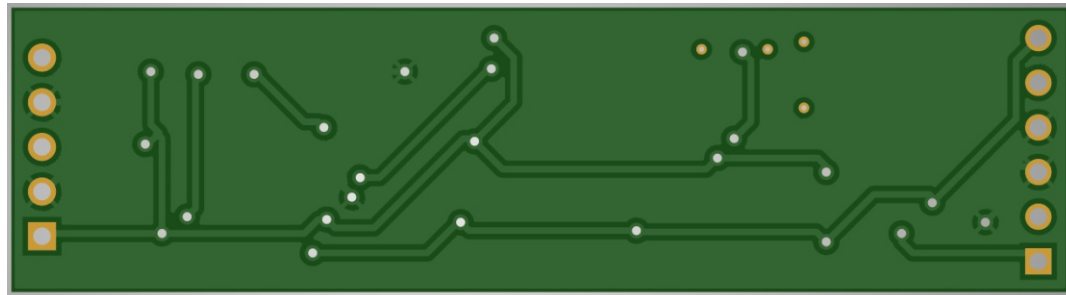
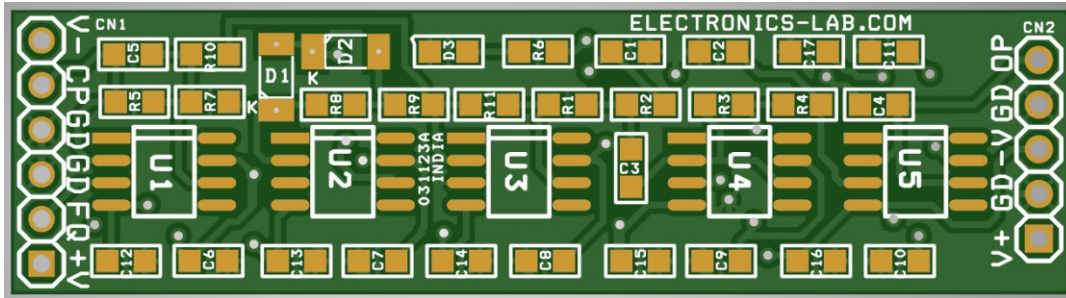
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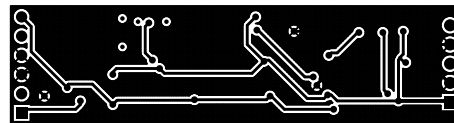
## Connections

- CN1: Pin 1 = +V 15V DC, Pin 2 = Frequency Input 50Khz Sine Wave 1V Peak to Peak, Pin 3 GND, Pin 4 = GND, Pin 5 = Sensor, Pin 6 = -V 15V
- CN2: Pin 1 = +V 15V DC, Pin 2 = GND, Pin 3 = -V 15V, Pin 4 = GND, Pin 5 = Output
- D3 Power LED

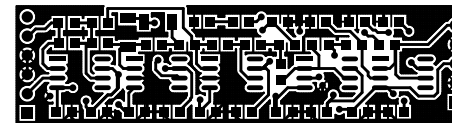
# PCB



SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER

PCB DIMENSIONS 60.17 X 16.19MM



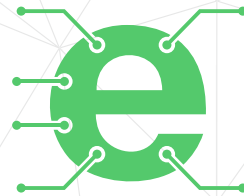
# Parts List

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BOM						
NO.	QNTY.	REF	DESC	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	1	CN1	6 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5319-ND
2	1	CN2	5 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5318-ND
3	1	C1	680PF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
4	1	C2	220PF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
5	1	C3	2.2nF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
6	1	C4	4.7nF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
7	1	C5	3PF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
8	10	C6,C7,C8,C9,C10,C12,C13,C14,C15,C16	100nF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
9	2	C11,C17	10uF/25V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
10	2	D1,D2	1N4148 SMD	MICROCHIP	MOUSER	494-1N4148UR-1
11	1	D3	RED LED SMD SIZE 0805	OSRAM	DIGIKEY	475-1278-1-ND
12	1	R1	8.66K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
13	1	R2	78.7K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
14	1	R3	9.76K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
15	1	R4	100K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
16	1	R5	10M 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
17	1	R6	1K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
18	4	R7,R8,R10,R11	10K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
19	1	R9	5K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
20	5	U1,U2,U3,U4,U5	OPA132 SOIC8	TI	MOUSER	595-OPA132UA/2K5







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