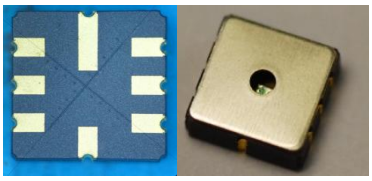
WPS-TP15A1: PIEZO-RESISTIVE PRESSURE SENSOR

FEATURE



- **1 Bar – 16 Bar absolute Pressure Range**
- **Uncompensated temperature**
- **Piezoresistive pressure sensor**
- **High linearity and Low % ERROR**
- **Gel protection humidity and water**

Description and Designed

The pressure sensor is designed for pressure sensor systems with highest linearity and low % error. The device consists of a piezo-resistive micro-machine pressure sensor die mounted on chip Ceramic QFN 5x5mm 8 lead package type with gel protection humidity and water.

Table 1. Maximum Ratting

Characteristics	Symbol	Min	Max	Unit
Pressure Range[1]	Pop	1	16	Bar
Temperature Range	T_A	-20	120	^oC
Supply Voltage[2]	Vs	1.5	15	Vdc

Table 2. Operating Characteristics

All parameter are measured at 5 V supply at T_A = 25 ^oC , unless otherwise specified

Characteristics	Symbol	Min	Typ	Max	Unit
Supply Current[3]	I_S	-	1	-	mAdc
Full Scale Span[4]	V_{FSS}	85.5	90.75	93	mV
Offset[5]	V_{off}	-16	0	16	mV
Sensitivity (1 – 16 Bar)	$\Delta V / \Delta P$	5.6	6.05	6.2	mV /Bar
Non Linearity [6]	N_L	-0.05	-	0.05	%FSO
Pressure Hysteresis [7]	P_H	-0.4		+0.4	%FSO
Accuracy	-	-0.25		+0.25	%FSO
Resistance Bridge	R_B	4.0	4.5	5.0	kΩ
The Temperature coefficient offset [8]	TCO	-	±10	-	µV/^oC
The Temperature coefficient sensitivity[9]	TCS	- 0.05	-	0.05	%/^{o}CFSO

APPLICATION

• Air tube Pressure • Tire pressure monitoring systems (TPMS) • Water pressure test system	• Water Level Measurement • Pump Pressure Monitor • Etc.

PIN CONFIGURATION

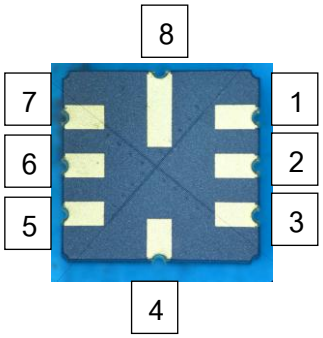


Figure 1. pressure sensor Schematic

Table 1. Pin connect for pressure sensor

Pin NO.	Pin Name	Function
1,7	Vs	Supply voltage of Wheatstone bridge
2	OUT-	Negative output voltage of Wheatstone bridge
6	OUT+	Positive output voltage of Wheatstone bridge
3,5	GND	Ground
8,4	NC	No contract

TYPICAL CHARACTERISTICS: WPS-TP15A1

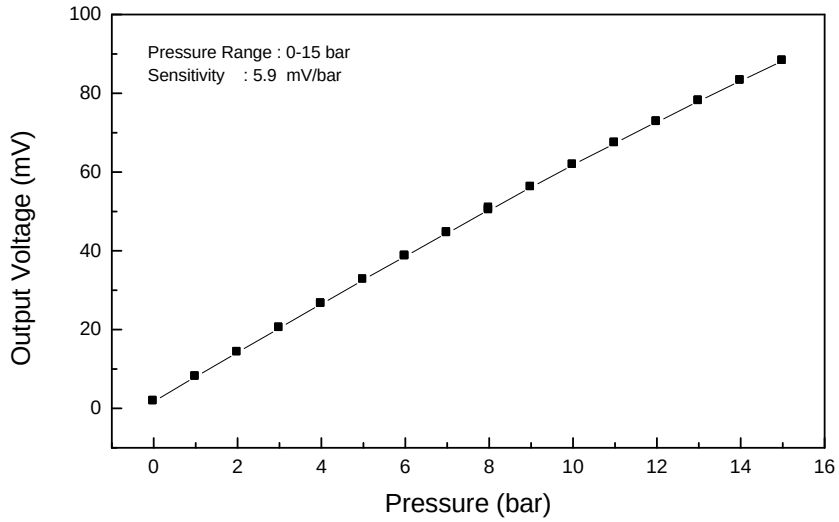


Figure2. Output-Voltage as function of testing pressure gauge at supply voltage of 5V

Sample Circuit :

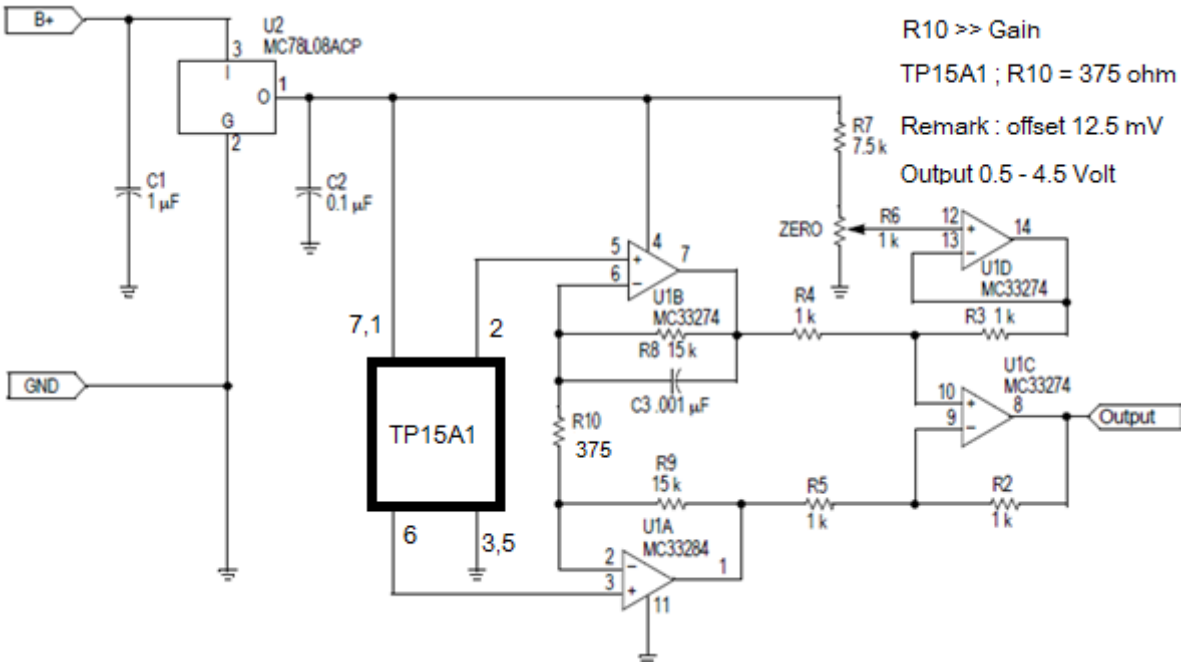
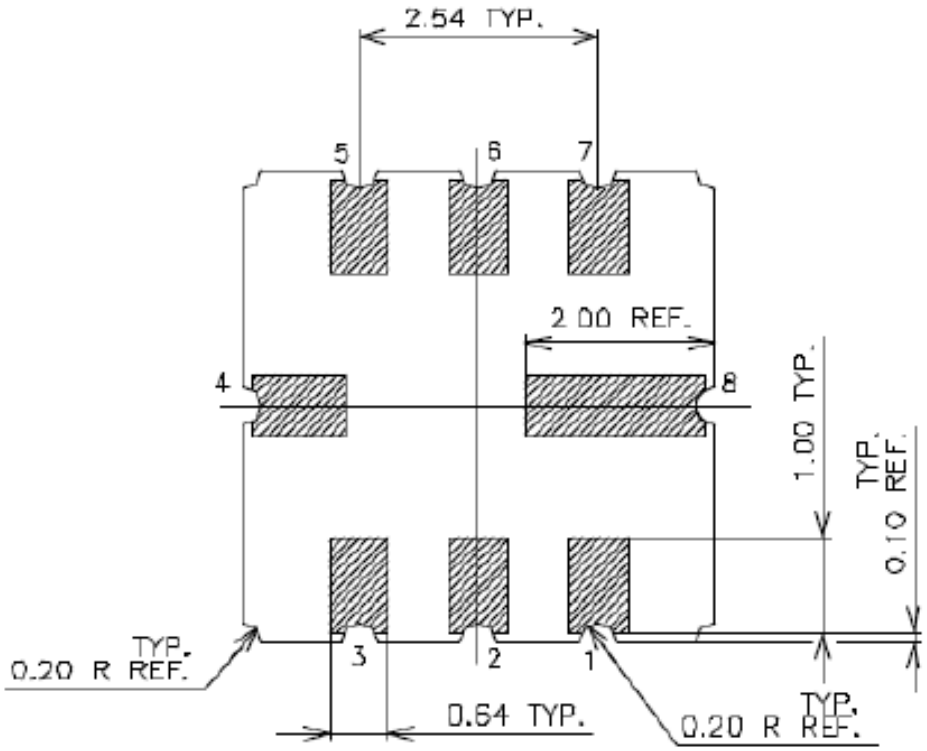


Figure 3 Sample circuit for application of the pressure sensor with 0.5 -4.5 volt output

NOTES

1. 1 Bar equals 14.5 psi
2. The Constance supply voltage is biased in Whetstones bridge configuration.
3. The total current using whetstones bridge configuration.
4. Full Scale Span (V_{FSS}) is defined as the algebraic difference between the output voltage at full
   rated pressure and the output voltage at the minimum rated pressure.
5. Offset (V_{off}) is defined as the output voltage at the minimum rated pressure.
6. Error value of end point line fit between output minimum rated pressure and maximum rate pressure.
7. Pressure Hysteresis: Output deviation at any pressure within the specified range, when this pressure is cycled to and from the minimum or maximum rated pressure, at 25°C.
8. Output deviation with minimum rated pressure applied, over the temperature range of 25 to 120°C, relative to 25°C.
9. Difference output deviation with minimum rated pressure applied and maximum applied pressure, relative to the temperature range of 25 to 120°C with temperature is 25°C.

Packaging layout of WPS-TP15A1



Note : 1. Drawing Unit : mm
2. Plating Thickness
NICKEL: 1.27-8.89 um
GOLD : 0.5-1.5um

Figure 4 Packaging layout of WPS-TP15A1