PRESSURE SENSOR
C-7245

TECHNICAL CHARECTERISTICS

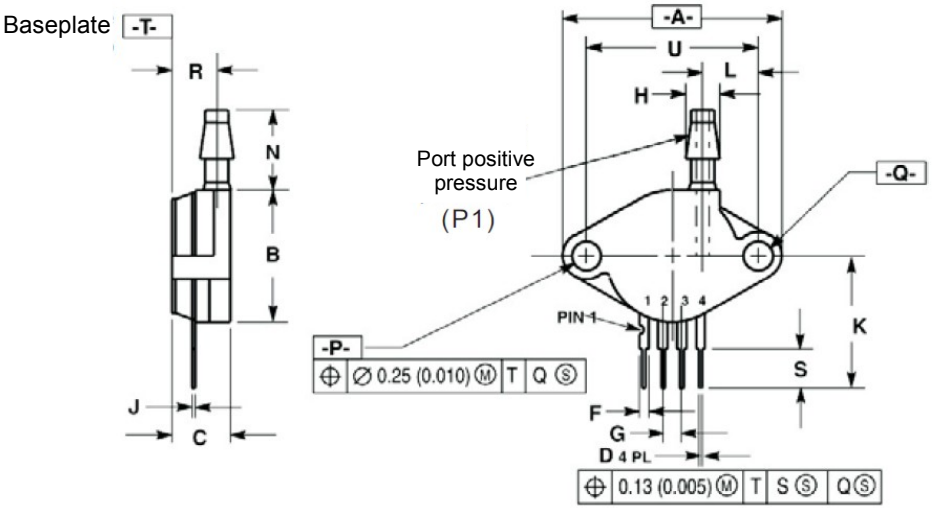
Input: 1 port
Temperature compensated from 0 ° C to 85 ° C
Unique silicon strain gauges, Shear stress,
Radiometric a supply voltage
Linearity ± 0.25%

EXAMPLES OF APPLICATION

- Drivers of motor / pump
- Robotics
- Level Indicators
- Medical Diagnosis
- Pressure Switches
- Non-invasive measurement of blood pressure

Calibrated pressure sensor, silicon. 50 kPa On-Chip. Temperature compensated. 40mV

C-7245 devices are silicon piezoresistive sensors sensitive to pressure.
Provide a linear voltage output high precision, directly proportional to the applied pressure.
The sensor is a monolithic silicon diaphragm with a band and a thin film gage on-chip resistive. The laser chip is set to get a precise span, the offset calibration and temperature compensation



PIN 1 : Mass
2 : Exit
3 : Food
4 : Exit

DIM	MM MIN	MM MAX
A	29.08	29.85
B	17.40	18.16
C	7.75	8.26
D	0.41	0.51
F	1.22	1.63
G	2.54 BSC	
H	4.62	4.93
J	0.36	0.41
K	17.65	18.42
L	7.37	7.62
N	10.67	11.18
P	3.89	4.04
Q	3.89	4.04
R	5.84	6.35
S	5.59	6.10
U	23.11 BSC	

CHARACTERISTICS OF WORK

Characteristics	Symbol	Min.	Tip	Max	Units	Pays attemyion
Pressure range	POP	0	-	50	kPa	1.0 kPa = 0.145 psi
Supply voltage	Vs	-	10	16	Vdc	The device is ratiometric within ra
Current	Io	-	6.0	-	mAdc	The use of the device over the range an
Full scale Span	V_{FSS}	38,5	40	41,5	mV	additional mistake because of their own
Offset	Voff	-1,0	-	1,0	mV	heatingt.
Sensitivity	AV/AP	-	0,8	-	mV/kPa	specified can induce ment specified
Linearity		-0,25	-	0,25	$\%V_{FSS}$	
Hysteresis of the pressure	-	-	+-0,1	-	$\%V_{FSS}$	de 0 a 50 kPa
Temperature hysteresis	-	-	+-0,5	-	$\%V_{FSS}$	de 40ºC a 125ºC
Effect of temperature on the Span	TCV_{FSS}	-1,0	-	1,0	$\%V_{FSS}$	
Effect of temperature on the offset	TCV_{off}	-1,00	-	1,00	$\%V_{FSS}$	
Input impedance	Z_{in}	1000	-	2500	Ω	
Output Impedance	Z_{out}	1400	-	3000	Ω	
Activation Time	t_R	-	1,0	-	ms	
Heating (Warm-Up)	-	-	20	-	ms	
Offset Stability	-	-	+-0,5	-	$\%V_{FSS}$	

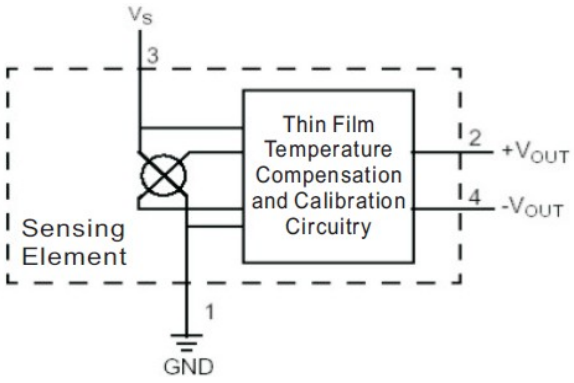
(1). V_S = 10 Vds, T_A = 25ºC, unless otherwise stated, P1>P2

MAXIMUM VALUES (1)

Characteristics	Symbol	Value	Units
Maximum pressure	P_{max}	200	kPa
Storage temperature	T_{stg}	-40 a 125	ºC
Working temperature	T_A	-40 a 125	ºC

(1). Exposure beyond the specified limits may cause permanent damage or degradation of the device

Block diagram of the internal circuitry on the stand-alone pressure sensor chip



Voltage Output versus Applied Differential Pressure

The output voltage of the gauge sensor increases with increasing pressure applied to the pressure side (P1) relative to the vacuum side (P2). Similarly, output voltage increases as increasing vacuum is applied to the vacuum side (P2) relative to the pressure side (P1).

Linearity

Linearity refers to how well a transducer's output follows the equation: Vout = Voff + sensitivity x P over the operating pressure range. There are two basic methods for calculating nonlinearity: (1) end point straight line fit (see Figure 2) or (2) a least squares best line fit. While a least squares fit gives the “best case” linearity error (lower numerical value), the calculations required are burdensome. Conversely, an end point fit will give the “worst case” error (often more desirable in error budget calculations) and the calculations are more straightforward for the user. Motorola's specified pressure sensor linearities are based on the end point straight line method measured at the midrange pressure

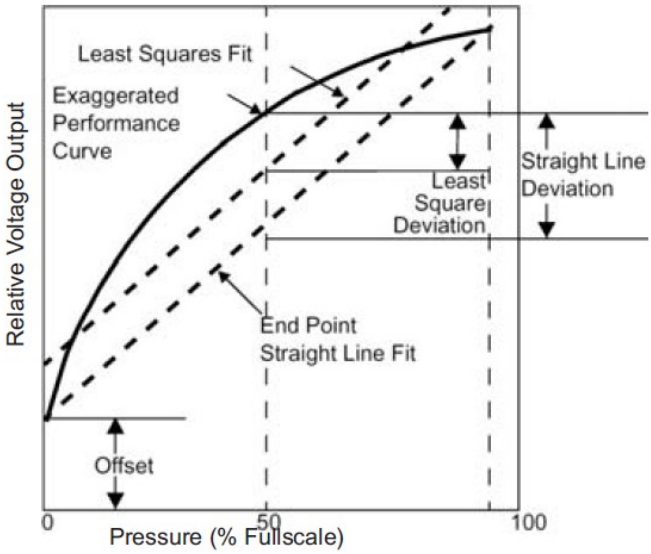


Figure 2. Linearity Specification Comparison

On-Chip Temperature Compensation and Calibration

Figure 3 shows the minimum, maximum and typical output characteristics of the MPX2050 series at 25°C. The output is directly proportional to the differential pressure and is essentially a straight line.
The effects of temperature on Full-Scale Span and Offset are very small and are shown under Operating Characteristics.

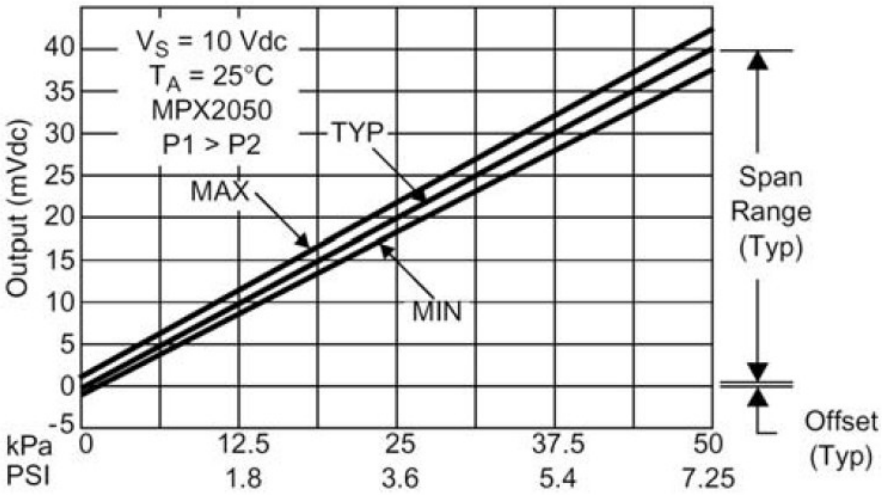


Figure 3. Output versus Pressure Differential

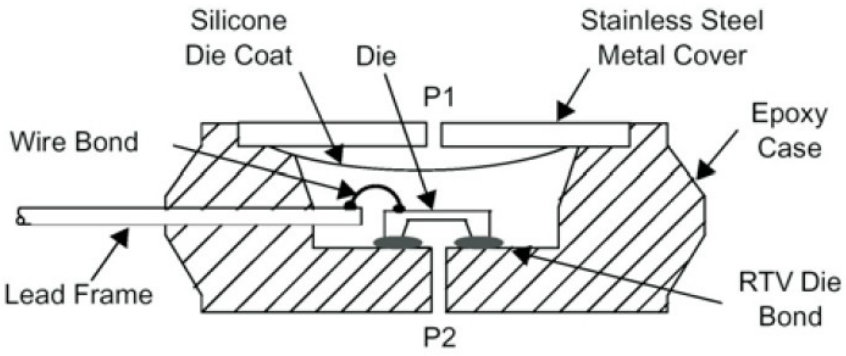


Figure 4. Cross-Sectional Diagram (not to scale)

Figure 4 illustrates the differential or gauge configuration in the basic chip carrier (Case 344). A silicone gel isolates the die surface and wire bonds from the environment, while allowing the pressure signal to be transmitted to the silicon diaphragm.
This series pressure sensor operating characteristics and internal reliability and qualification tests are based on use of dry air as the pressure media. Media other than dry air may have adverse effects on sensor performance and long term reliability. Contact the factory for information regarding media compatibility in your application.