

**Table 1. Maximum Ratings<sup>(1)</sup>**

Rating	Symbol	Value	Unit
Maximum Pressure (P1 > P2)	P <sub>max</sub>	200	kPa
Storage Temperature	T <sub>stg</sub>	–40° to +125°	°C
Operating Temperature	T <sub>A</sub>	–40° to +125°	°C

1. Exposure beyond the specified limits may cause permanent damage or degradation to the device.

**Table 2. Operating Characteristics** (V<sub>S</sub> = 5.0 Vdc, T<sub>A</sub> = 25°C unless otherwise noted, P1 > P2. Decoupling circuit shown in Figure 3 required to meet electrical specifications.)

Characteristic	Symbol	Min	Typ	Max	Unit
Pressure Range <sup>(1)</sup>	P <sub>OP</sub>	-25	—	25	kPa
Supply Voltage <sup>(2)</sup>	V <sub>S</sub>	4.75	5.0	5.25	Vdc
Supply Current	I <sub>o</sub>	—	7.0	10	mAdc
Minimum Pressure Offset <sup>(3)</sup> @ V <sub>S</sub> = 5.0 Volts	V <sub>off</sub>	0.116	0.25	0.384	Vdc
Full Scale Output <sup>(4)</sup> @ V <sub>S</sub> = 5.0 Volts	V <sub>FSO</sub>	4.610	4.75	4.890	Vdc
Full Scale Span <sup>(5)</sup> @ V <sub>S</sub> = 5.0 Volts	V <sub>FSS</sub>	—	4.5	—	Vdc
Accuracy <sup>(6)</sup>	—	—	—	±5.0	%V <sub>FSS</sub>
Sensitivity	V/P	—	90	—	mV/kPa
Response Time <sup>(7)</sup>	t <sub>R</sub>	—	1.0	—	ms
Output Source Current at Full Scale Output	I <sub>o+</sub>	—	0.1	—	mAdc
Warm-Up Time <sup>(8)</sup>	—	—	20	—	ms
Offset Stability <sup>(9)</sup>	—	—	±0.5	—	%V <sub>FSS</sub>

1. 1.0 kPa (kiloPascal) equals 0.145 psi.

2. Device is ratiometric within this specified excitation range.

3. Offset (V<sub>off</sub>) is defined as the output voltage at the minimum rated pressure.

4. Full Scale Output (V<sub>FSO</sub>) is defined as the output voltage at the maximum or full rated pressure.

5. Full Scale Span (V<sub>FSS</sub>) is defined as the algebraic difference between the output voltage at full rated pressure and the output voltage at the minimum rated pressure.

6. Accuracy (error budget) consists of the following:

- Linearity: Output deviation from a straight line relationship with pressure over the specified pressure range.
- Temperature Hysteresis: Output deviation at any temperature within the operating temperature range, after the temperature is cycled to and from the minimum or maximum operating temperature points, with zero differential pressure applied.
- 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.
- TcSpan: Output deviation over the temperature range of 0° to 85°C, relative to 25°C.
- TcOffset: Output deviation with minimum pressure applied, over the temperature range of 0° to 85°C, relative to 25°C.
- Variation from Nominal: The variation from nominal values, for Offset or Full Scale Span, as a percent of V<sub>FSS</sub> at 25°C.

7. Response Time is defined as the time for the incremental change in the output to go from 10% to 90% of its final value when subjected to a specified step change in pressure.

8. Warm-up Time is defined as the time required for the product to meet the specified output voltage after the Pressure has been stabilized.

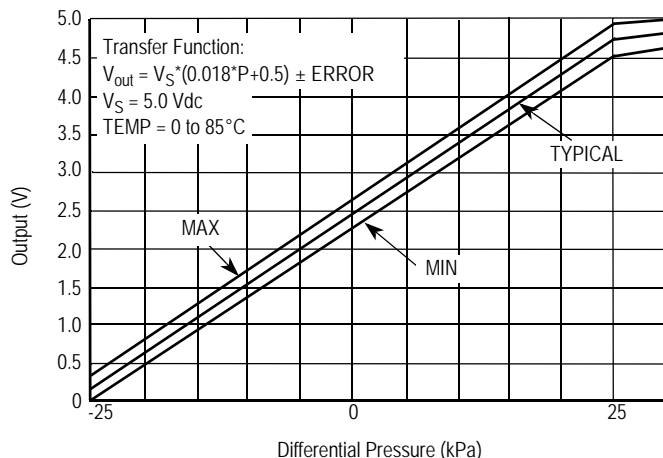
9. Offset Stability is the product's output deviation when subjected to 1000 hours of Pulsed Pressure, Temperature Cycling with Bias Test.

The MPXV7025G 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.

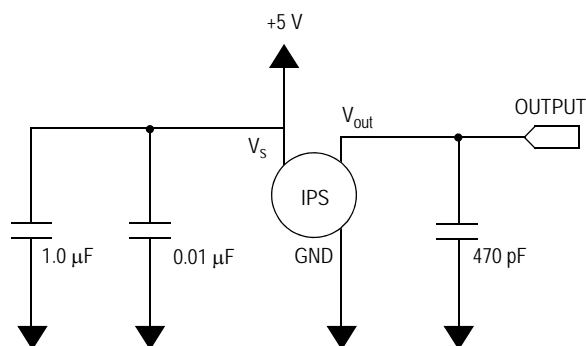
Figure 2 shows the sensor output signal relative to pressure input. Typical, minimum, and maximum output

curves are shown for operation over a temperature range of 0° to 85°C using the decoupling circuit shown in Figure 3. The output will saturate outside of the specified pressure range.

Figure 3 shows the recommended decoupling circuit for interfacing the output of the integrated sensor to the A/D input of a microprocessor or microcontroller. Proper decoupling of the power supply is recommended.



**Figure 2. Output versus Pressure Differential**



**Figure 3. Recommended Power Supply Decoupling and Output Filtering**

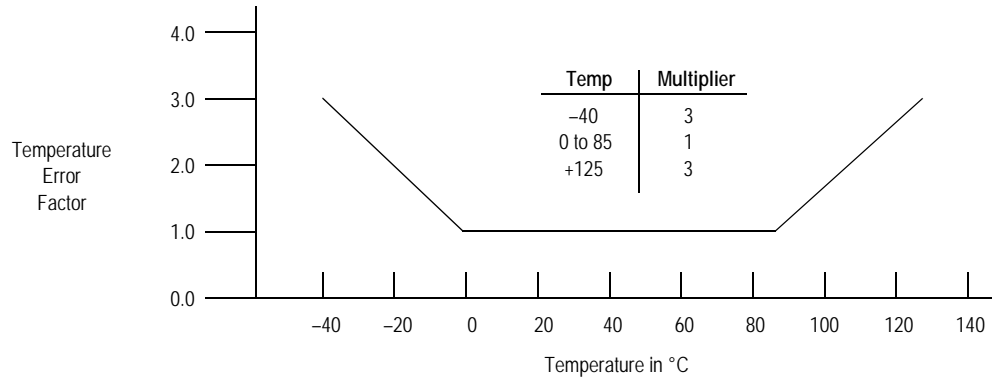
(For additional output filtering, please refer to Application Note AN1646.)

## Transfer Function

**Nominal Transfer Value:**  $V_{out} = V_S (P \times 0.018 + 0.5)$   
 $\pm (\text{Pressure Error} \times \text{Temp. Factor} \times 0.018 \times V_S)$   
 $V_S = 5.0 \text{ V} \pm 0.25 \text{ Vdc}$

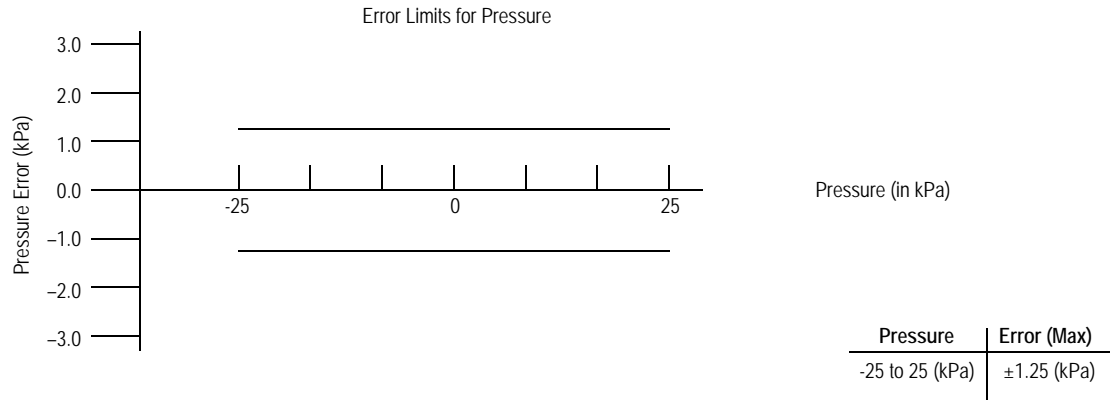
## Temperature Error Band

### MPXV7025G SERIES



NOTE: The Temperature Multiplier is a linear response from 0° to -40°C and from 85° to 125°C.

## Pressure Error Band



## PRESSURE (P1)/VACUUM (P2) SIDE IDENTIFICATION TABLE

Freescle designates the two sides of the pressure sensor as the Pressure (P1) side and the Vacuum (P2) side. The Pressure (P1) side is the side containing fluorosilicone gel which protects the die from harsh media. The MPX pressure

sensor is designed to operate with positive differential pressure applied,  $P1 > P2$ .

The Pressure (P1) side may be identified by using the table below:

Part Number	Case Type	Pressure (P1) Side Identifier
MPX7025GC6U/C6T1	482A	Gauge, Axial Port, SMT
MPXV7025GP/GPT1	1369	Side with Port Attached
MPXV7025DP/DPT1	1351	Side with Part Marking

## MINIMUM RECOMMENDED FOOTPRINT FOR SURFACE MOUNTED APPLICATIONS

Surface mount board layout is a critical portion of the total design. The footprint for the surface mount packages must be the correct size to ensure proper solder connection interface between the board and the package. With the correct

footprint, the packages will self align when subjected to a solder reflow process. It is always recommended to design boards with a solder mask layer to avoid bridging and shorting between solder pads.

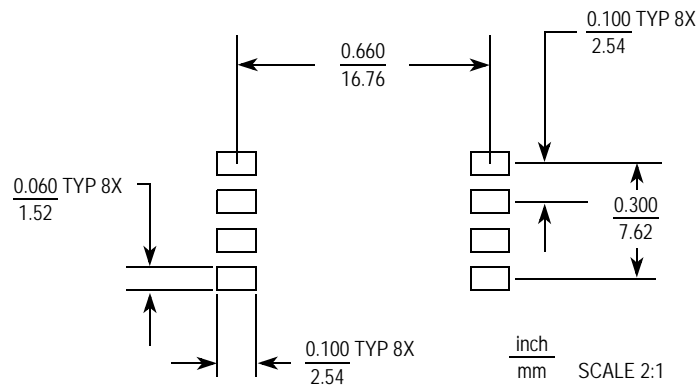
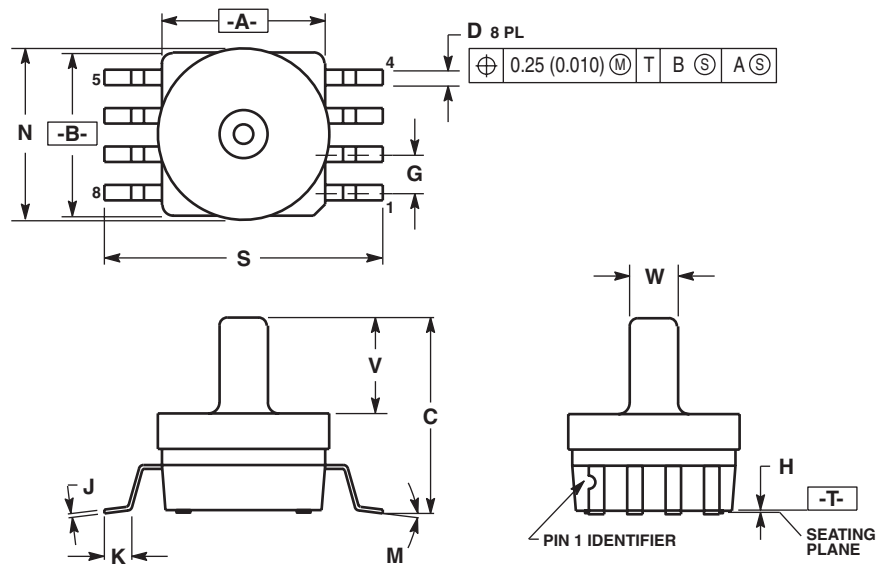


Figure 4. Small Outline Package Footprint

# PACKAGE DIMENSIONS

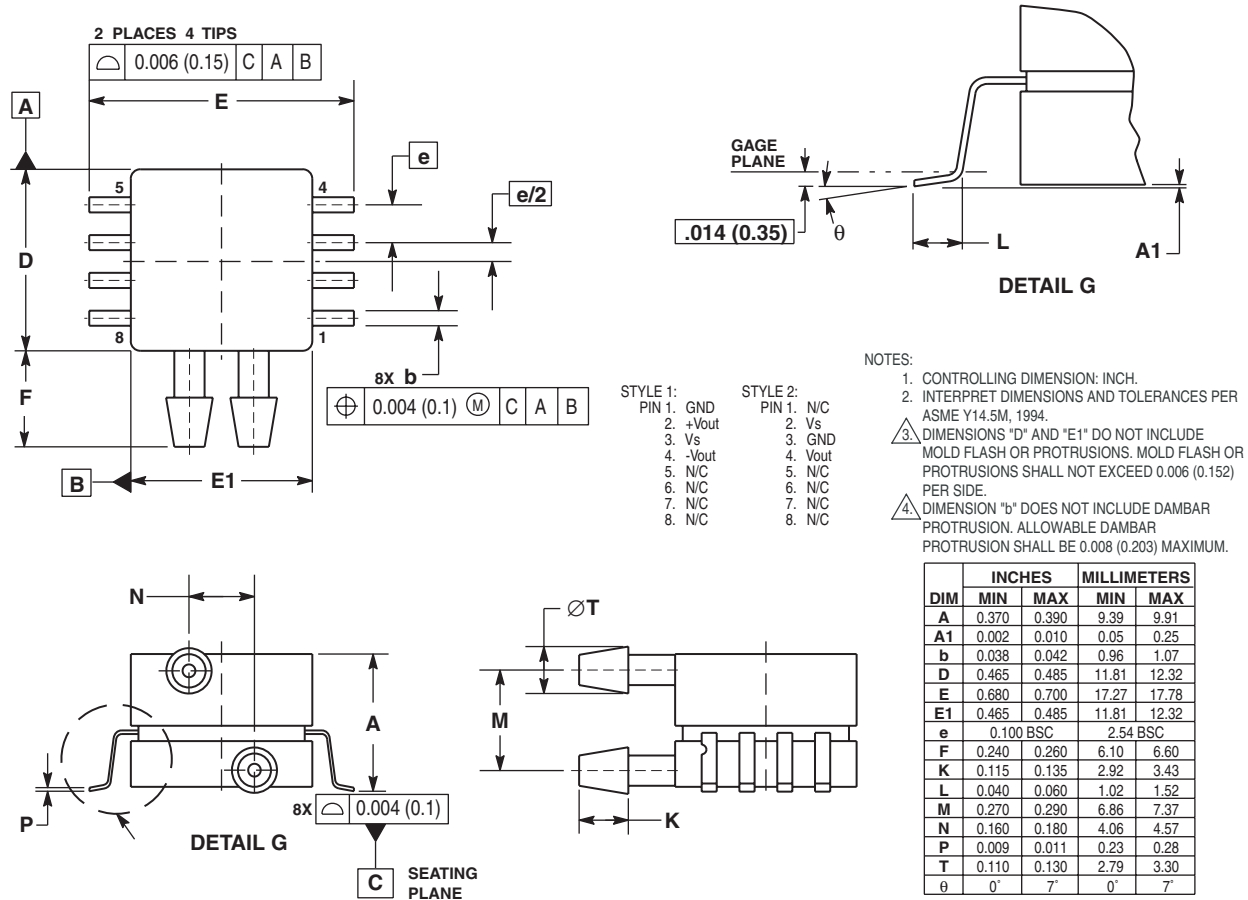


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
  4. MAXIMUM MOLD PROTRUSION 0.15 (0.006).
  5. ALL VERTICAL SURFACES 5° TYPICAL DRAFT.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.415	0.425	10.54	10.79
B	0.415	0.425	10.54	10.79
C	0.500	0.520	12.70	13.21
D	0.038	0.042	0.96	1.07
G	0.100 BSC		2.54 BSC	
H	0.002	0.010	0.05	0.25
J	0.009	0.011	0.23	0.28
K	0.061	0.071	1.55	1.80
M	0"	7"	0"	7"
N	0.444	0.448	11.28	11.38
S	0.709	0.725	18.01	18.41
V	0.245	0.255	6.22	6.48
W	0.115	0.125	2.92	3.17

## CASE 482A-01 ISSUE A SMALL OUTLINE PACKAGE

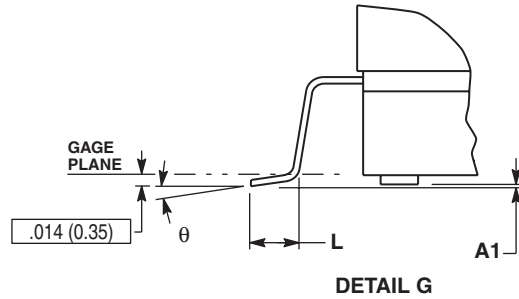
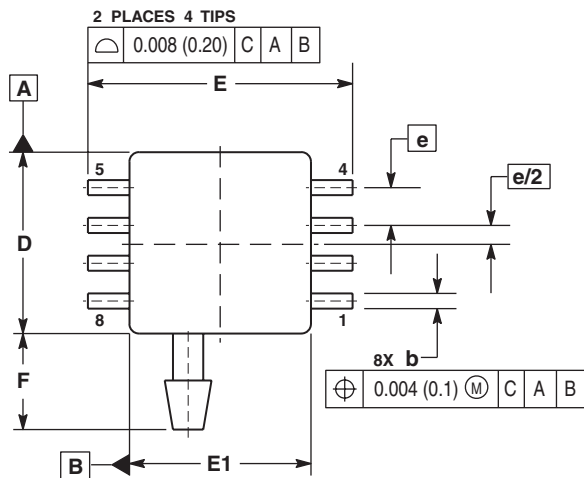
## PACKAGE DIMENSIONS



### CASE 1351-01 ISSUE O SMALL OUTLINE PACKAGE

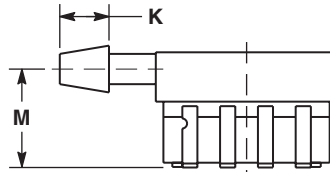
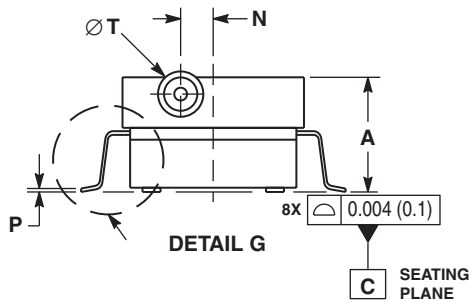
MPXV7025G

## PACKAGE DIMENSIONS



### NOTES:

1. CONTROLLING DIMENSION: INCH.
2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 1994.
3. DIMENSIONS "D" AND "E1" DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS. MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED 0.006 (0.152) PER SIDE.
4. DIMENSION "b" DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.008 (0.203) MAXIMUM.



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.300	0.330	7.11	7.62
A1	0.002	0.010	0.05	0.25
b	0.038	0.042	0.96	1.07
D	0.465	0.485	11.81	12.32
E	0.717 BSC		18.21 BSC	
E1	0.465	0.485	11.81	12.32
e	0.100 BSC		2.54 BSC	
F	0.245	0.255	6.22	6.47
K	0.120	0.130	3.05	3.30
L	0.061	0.071	1.55	1.80
M	0.270	0.290	6.86	7.36
N	0.080	0.090	2.03	2.28
P	0.009	0.011	0.23	0.28
T	0.115	0.125	2.92	3.17
$\theta$	0°	7°	0°	7°

## CASE 1369-01 ISSUE O SMALL OUTLINE PACKAGE

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