



MPX5700AP, MPX5700ASX, MPX5700D MPX5700DP, MPX5700GP, MPX5700GP1

Datasheet

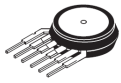
Integrated silicon pressure sensor on-chip signal conditioned, temperature compensated and calibrated

Features

- 2.5% Maximum Error over 0 °C to 85 °C
- Ideally Suited for Microprocessor or Microcontroller-Based Systems
- Available in Absolute, Differential and Gauge Configurations
- Patented Silicon Shear Stress Strain Gauge
- Durable Epoxy Unibody Element

Description

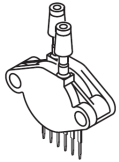
The MPX5700 series piezoresistive transducer is a state-of-the-art monolithic silicon pressure sensor designed for a wide range of applications, but particularly those employing a microcontroller or microprocessor with A/D inputs. This patented, single element transducer combines advanced micromachining techniques, thin-film metallization, and bipolar processing to provide an accurate, high level analog output signal that is proportional to the applied pressure



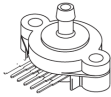
MPX5700D
CASE 867-08



MPX5700AP/GP/GP1
CASE 867B-04



MPX5700DP
CASE 867C-05



MPX5700ASX
CASE 867F-03



1 Ordering information

Table 1. Ordering information

Device Name	Case No.	# of Ports			Pressure Type			Device Marking
		None	Single	Dual	Gauge	Differential	Absolute	
Unibody Package (MPX5700 Series)								
MPX5700AP	867B		•				•	MPX5700AP
MPX5700ASX	867F		•				•	MPX5700A
MPX5700D	867	•				•		MPX5700D
MPX5700DP	867C			•		•		MPX5700DP
MPX5700GP	867B		•		•			MPX5700GP
MPX5700GP1 ⁽¹⁾	867B		•		•			MPX5700GP

1. MPX5700GP1 has 90 degree lead form.



2 Operating Characteristics

Table 2. Operating Characteristics ($V_S = 5.0$ Vdc, $T_A = 25^\circ\text{C}$ unless otherwise noted, $P_1 > P_2$. Decoupling circuit shown in required to meet electrical specifications.)

Characteristic	Symbol	Min	Typ	Max	Unit	
Pressure Range ⁽¹⁾	P _{OP}	0	—	700	kPa	
Gauge, Differential Absolute		15	—	700		
Supply Voltage ⁽²⁾	V _S	4.75	5.0	5.25	Vdc	
Supply Current	I _O	—	7.0	10	mAdc	
Zero Pressure Offset ⁽³⁾	V _{off}	Gauge, Differential (0 to 85 °C)	0.088	0.2	0.313	Vdc
		Absolute (0 to 85 °C)	0.184	—	0.409	
Full Scale Output ⁽⁴⁾	V _{FSSO}	4.587	4.7	4.813	Vdc	
Full Scale Span ⁽⁵⁾	V _{FSS}	—	4.5	—	Vdc	
Accuracy ⁽⁶⁾	—	—	—	±2.5	%V _{FSS}	
Sensitivity	V/P	—	6.4	—	mV/kPa	
Response Time ⁽⁷⁾	t _R	—	1.0	—	ms	
Output Source Current at Full Scale Output	I _{O+}	—	0.1	—	mAdc	
Warm-Up Time ⁽⁸⁾	—	—	20	—	ms	

- 1.0 kPa (kiloPascal) equals 0.145 psi.
- Device is ratiometric within this specified excitation range.
- Offset (V_{off}) is defined as the output voltage at the minimum rated pressure.
- Full Scale Output (V_{FSSO}) is defined as the output voltage at the maximum or full rated pressure.
- 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.
- 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 rated 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_{FSS}, at 25°C.
- 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.
- Warm-up Time is defined as the time required for the device to meet the specified output voltage after the pressure has been stabilized.

3 Maximum ratings

Table 3. Table 2. Maximum Ratings⁽¹⁾

Parametrics	Symbol	Value	Unit
Maximum Pressure ⁽²⁾ ($P_2 \leq 1$ Atmosphere)	P_{1max}	2800	kPa
Storage Temperature	T_{stg}	-40 to +125	°C
Operating Temperature	T_A	-40 to +125	°C

1. Maximum Ratings apply to Case 867 only. Extended exposure at the specified limits may cause permanent damage or degradation to the device.
2. This sensor is designed for applications where P_1 is always greater than, or equal to P_2 . P_2 maximum is 500 kPa.

Figure 1 shows a block diagram of the internal circuitry integrated on a pressure sensor chip.

Figure 1. Fully Integrated Pressure Sensor Schematic

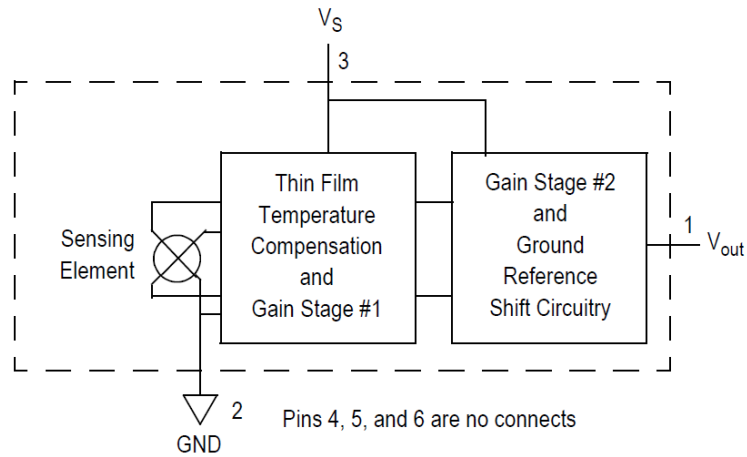
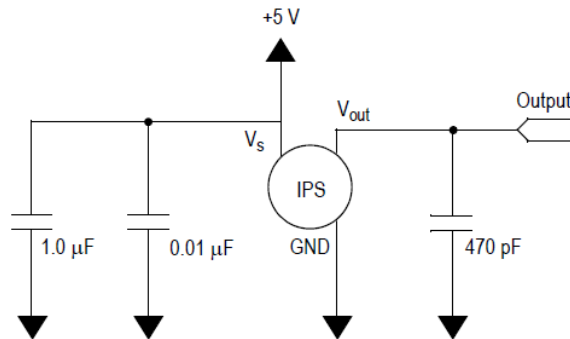


Figure 4. Recommended Power Supply Decoupling and Output Filtering (For additional output filtering, please refer to Application Note AN1646)





5 Pressure (P1) / vacuum (P2) side identification table

ST 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 following table

Part Number	Case Type	Pressure (P1) Side Identifier
MPX5700D	867	Stainless Steel Cap
MPX5700DP	867C	Side with Part Marking
MPX5700GP/AP	867B	Side with Port Attached
MPX5700ASX	867F	Side with Port Attached

6 Package dimensions

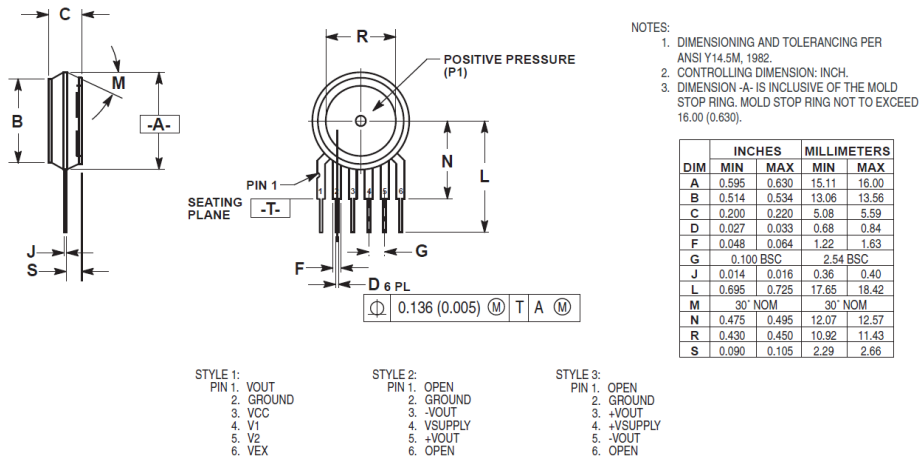
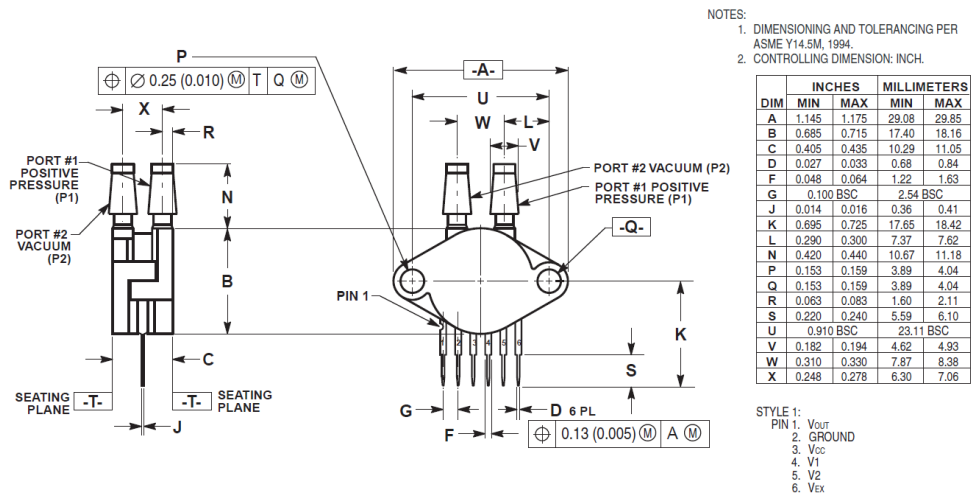
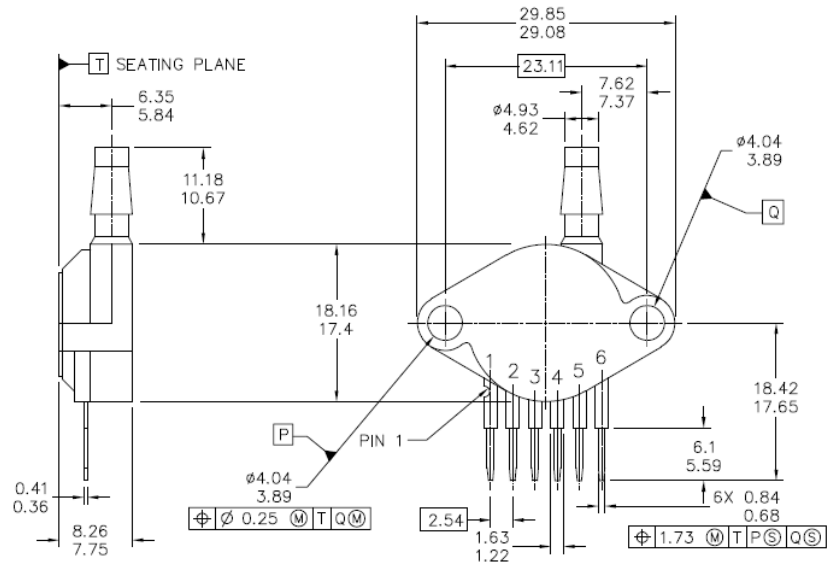
Figure 5. Basic element

Figure 6. Pressure and vacuum sides ported (DP)




Figure 7. PRESSURE SIDE PORTED (AP, GP)



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TITLE: SENSOR, 6 LEAD UNIBODY CELL, AP & GP 01ASB09087B	DOCUMENT NO: 98ASB42796B	REV: G
	CASE NUMBER: 867B-04	28 JUL 2005
	STANDARD: NON-JEDEC	



Figure 8. PRESSURE SIDE PORTED (AP, GP)

NOTES:

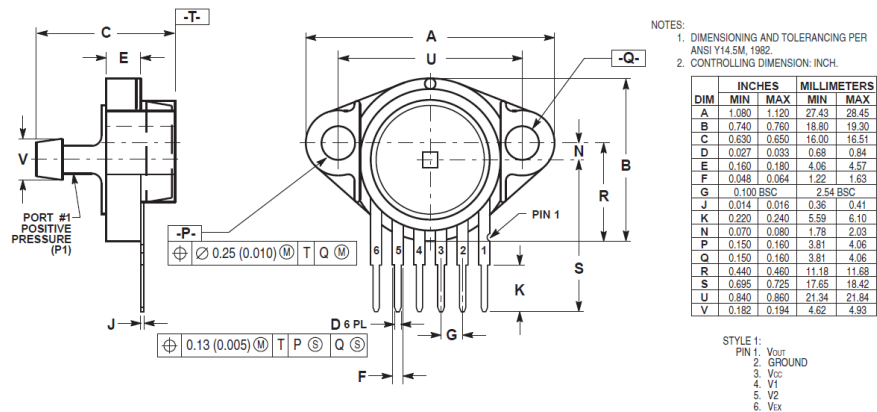
1. DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
3. 867B-01 THRU -3 OBSOLETE, NEW STANDARD 867B-04.

STYLE 1:

- PIN 1: V OUT
 2: GROUND
 3: VCC
 4: V1
 5: V2
 6: V EX

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STANDARD: NON-JEDEC			

Figure 9. PRESSURE SIDE AXIAL PORT (ASX)





Revision history

Table 4. Document revision history

Date	Revision	Changes
03-Jun-2026	1	Initial release from ST, rebranded NXP document



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