# Freescale Semiconductor

Document Number: MPX2102
Rev 9, 01/2012

# 100 kPa On-Chip Temperature Compensated Silicon Pressure Sensors

**MPX2102 Series**

**0 to 100 kPa (0 to 14.5 psi)**
**40 mV Full Scale**
**(Typical)**

The MPX2102 series devices are silicon piezoresistive pressure sensors providing a highly accurate and linear voltage output directly proportional to the applied pressure. The sensor is a single, monolithic silicon diaphragm with the strain gauge and a thin-film resistor network integrated on chip. The chip is laser trimmed for precise span and offset calibration and temperature compensation.

## Features

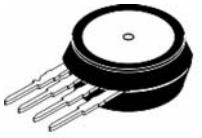
- Temperature Compensated Over 0°C to +85°C
- Easy-to-Use Chip Carrier Package Options
- Available in Absolute, Differential and Gauge Configurations
- Absolute, Differential and Gauge Options

## Application Examples

- Pump/Motor Control
- Robotics
- Level Detectors
- Medical Diagnostics
- Pressure Switching
- Barometers
- Altimeters

| ORDERING INFORMATION | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Device Name | Package Options | Case No. | # of Ports | | | Pressure Type | | | Device Marking |
| | | | None | Single | Dual | Gauge | Differential | Absolute | |
| **Unibody Package (MPX2102 Series)** | | | | | | | | | |
| MPX2102A | Tray | 344 | • | | | | | • | MPX2102A |
| MPX2102AP | Tray | 344B | | • | | | | • | MPX2102AP |
| MPX2102ASX | Tray | 344F | | • | | | | • | MPX2102A |
| MPX2102DP | Tray | 344C | | | • | | • | | MPX2102DP |
| MPX2102GP | Tray | 344B | | • | | • | | | MPX2102GP |
| MPX2102GVP | Tray | 344D | | • | | • | | | MPX2102GVP |
| **Small Outline Package (MPXV2102G Series)** | | | | | | | | | |
| MPXV2102GP | Tray | 1369 | | • | | • | | | MPXV2102GP |
| **MPAK Package (MPXM2102 Series)** | | | | | | | | | |
| MPXM2102A | Rail | 1320 | • | | | | | • | MPXM2102A |
| MPXM2102AT1 | Tape and Reel | 1320 | • | | | | | • | MPXM2102A |
| MPXM2102AS | Rail | 1320A | | • | | | | • | MPXM2102AS |
| MPXM2102AST1 | Tape and Reel | 1320A | | • | | | | • | MPXM2102AS |
| MPXM2102D | Rail | 1320 | • | | | | • | | MPXM2102D |
| MPXM2102DT1 | Tape and Reel | 1320 | • | | | | • | | MPXM2102D |
| MPXM2102GS | Rail | 1320A | | • | | • | | | MPXM2102GS |
| MPXM2102GST1 | Tape and Reel | 1320A | | • | | • | | | MPXM2102GS |

## UNIBODY PACKAGES

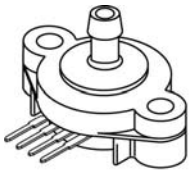


**MPX2102A**
**CASE 344**

**MPX2102AP/GP**
**CASE 344B**

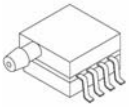
**MPX2102DP**
**CASE 344C**

**MPX2102GVP**
**CASE 344D**



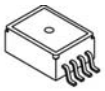
**MPX2102ASX**
**CASE 344F**

## SMALL OUTLINE PACKAGE

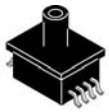


**MPXV2102GP**
**CASE 1369**

## MPAK



**MPXM2102A/ATI**
**MPXM2102D/DT1**
**CASE 1320**



**MPXM2102AS/AST1**
**MPXM2102GS/AS**
**CASE 1320A**

## Operating Characteristics

**Table 1. Operating Characteristics** ($V_S$ = 10 $V_{DC}$, $T_A$ = 25°C unless otherwise noted, P1 > P2)

| Characteristic | Symbol | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Pressure Range[1] | | | | | |
| Absolute Pressure Range MPX2102A | $P_{OP}$ | 20 | — | 100 | kPa |
| Differential Pressure Range MPX2102D | $P_{OP}$ | 0 | — | 100 | kPa |
| Supply Voltage[2] | $V_S$ | — | 10 | 16 | $V_{DC}$ |
| Supply Current | $I_O$ | — | 6.0 | — | mAdc |
| Full Scale Span[3] | $V_{FSS}$ | 38.5 | 40 | 41.5 | mV |
| Offset[4] | | | | | |
| MPX2102D Series | $V_{OFF}$ | -1.0 | — | 1.0 | mV |
| MPX2102A Series | | -2.0 | — | 2.0 | |
| MPXM2102D/G Series | $V_{OFF}$ | -1.0 | — | 1.0 | mV |
| MPXM2102A Series | | -2.0 | — | 2.0 | |
| Sensitivity | ΔV/ΔP | — | 0.4 | — | mV/kPa |
| Linearity[5] | | | | | |
| MPX2102D Series | — | -0.6 | — | 0.4 | $\%V_{FSS}$ |
| MPX2102A Series | — | -1.0 | — | 1.0 | |
| MPXM2102D/G Series | — | -0.6 | — | 0.4 | $\%V_{FSS}$ |
| MPXM2102A Series | — | -1.0 | — | 1.0 | |
| Pressure Hysteresis[5] (0 to 100 kPa) | — | — | ±0.1 | — | $\%V_{FSS}$ |
| Temperature Hysteresis[5](-40°C to +125°C) | — | — | ±0.5 | — | $\%V_{FSS}$ |
| Temperature Coefficient of Full Scale Span[5] | $TCV_{FSS}$ | -2.0 | — | 2.0 | $\%V_{FSS}$ |
| Temperature Coefficient of Offset[5] | $TCV_{OFF}$ | -1.0 | — | 1.0 | mV |
| Input Impedance | $Z_{IN}$ | 1000 | — | 2500 | W |
| Output Impedance | $Z_{OUT}$ | 1400 | — | 3000 | W |
| Response Time[6] (10% to 90%) | $t_R$ | — | 1.0 | — | ms |
| Warm-Up Time | — | — | 20 | — | ms |
| Offset Stability[7] | — | — | ±0.5 | — | $\%V_{FSS}$ |

1. 1.0 kPa (kiloPascal) equals 0.145 psi.
2. Device is ratiometric within this specified excitation range. Operating the device above the specified excitation range may induce additional error due to device self-heating.
3. 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 related pressure.
4. Offset ($V_{OFF}$) is defined as the output voltage at the minimum rated pressure.
5. Accuracy (error budget) consists of the following:

   Linearity: Output deviation from a straight line relationship with pressure, using end point method, 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 with the specified range, when this pressure is cycled to and from the minimum or maximum rated pressure at 25°C.

   TcSpan: Output deviation at full rated pressure 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.
6. Response Time is defined as the time from 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.
7. Offset stability is the product's output deviation when subjected to 1000 hours of Pulsed Pressure, Temperature Cycling with Bias Test.

## Maximum Ratings

**Table 2. Maximum Ratings[1]**

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Maximum Pressure (P1 > P2) | $P_{MAX}$ | 400 | kPa |
| Storage Temperature | $T_{STG}$ | -40 to +125 | °C |
| Operating Temperature | $T_A$ | -40 to +125 | °C |

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

## Voltage Output vs. Applied Differential

The differential voltage output of the sensor is directly proportional to the differential pressure applied.

The absolute sensor has a built-in reference vacuum. The output voltage will decrease as vacuum, relative to ambient, is drawn on the pressure (P1) side.

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

Figure 1 illustrates a block diagram of the internal circuitry on the stand-alone pressure sensor chip.

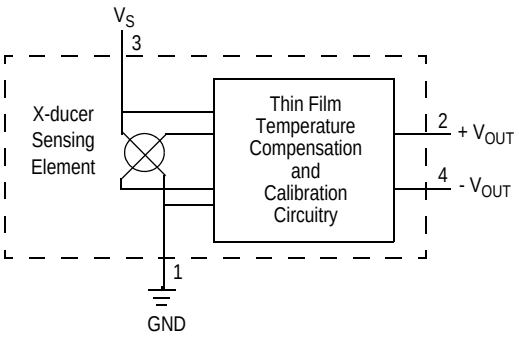



**Figure 1. Temperature Compensated Pressure Sensor Schematic**

## On-Chip Temperature Compensation and Calibration

Figure 2 shows the output characteristics of the MPX2102 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.

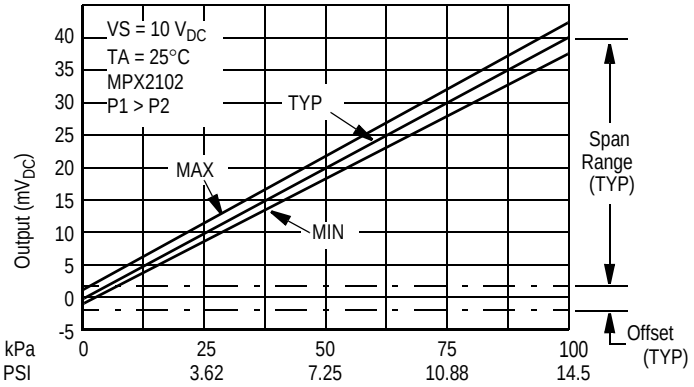



**Figure 2. Output vs. Pressure Differential**

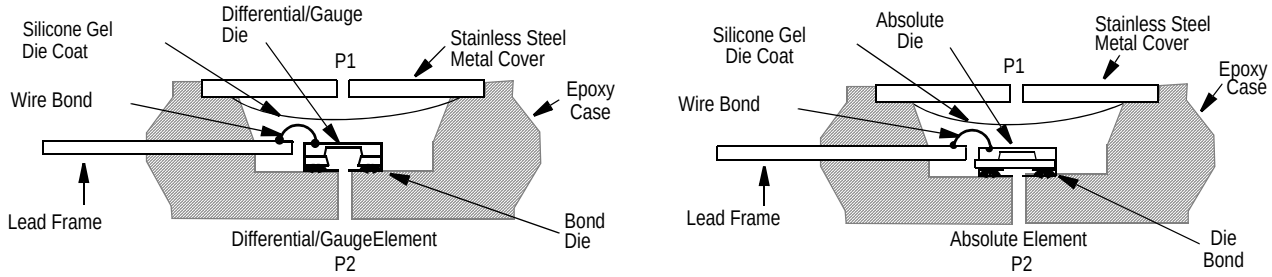



**Figure 3. Cross Sectional Diagrams (Not to Scale)**

Figure 3 illustrates the absolute sensing configuration (right) and 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.

The MPX2102 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.

### LINEARITY

Linearity refers to how well a transducer's output follows the equation: $V_{OUT} = V_{OFF} + \text{sensitivity} \times P$ over the operating pressure range. There are two basic methods for calculating nonlinearity: (1) end point straight line fit (see Figure 4) 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.

Freescale's specified pressure sensor linearities are based on the end point straight line method measured at the midrange pressure.

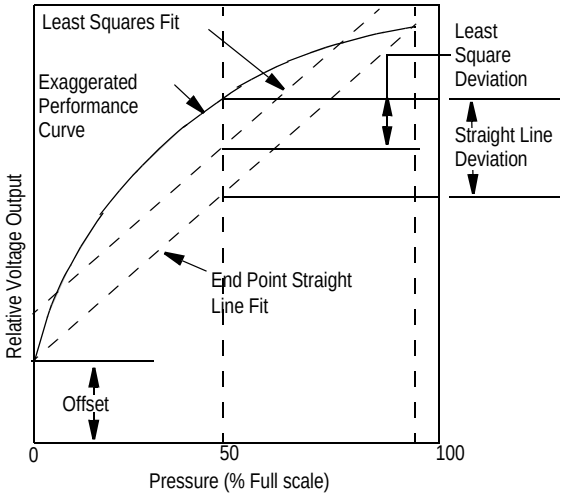



**Figure 4. Linearity Specification Comparison**

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

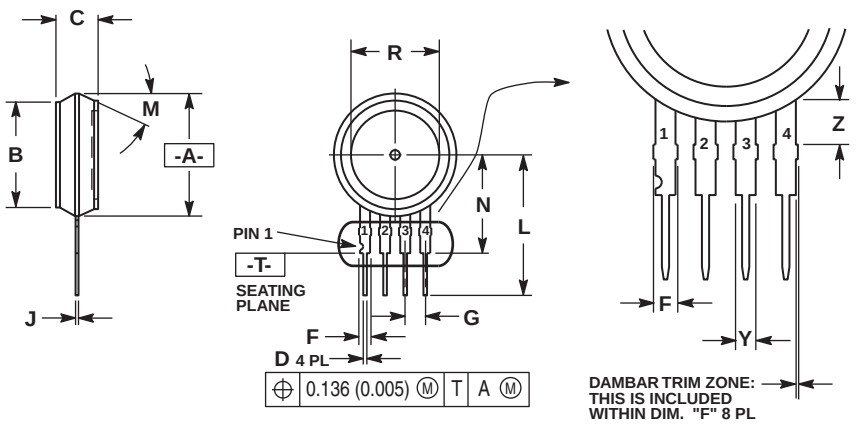
Freescale designates the two sides of the pressure sensor as the Pressure (P1) side and the Vacuum (P2) side. The Pressure (P1) side is the side containing the silicone gel which isolates the die. The differential or gauge sensor is designed to operate with positive differential pressure applied, P1 > P2. The absolute sensor is designed for vacuum applied to P1 side.

The Pressure (P1) side may be identified by using Table 3.

**Table 3. Pressure (P1) Side Delineation**

| Part Number | Case Type | Pressure (P1) Side Identifier |
|---|---|---|
| MPX2102A | 344 | Stainless Steel Cap |
| MPX2102DP | 344C | Side with Part Marking |
| MPX2102AP, MPX2102GP | 344B | Side with Port Attached |
| MPX2102GVP | 344D | Stainless Steel Cap |
| MPX2102ASX | 344F | Side with Port Marking |
| MPXV2102GP | 1369 | Side with Port Attached |
| MPXM2102A, MPX2102ATI, MPXM2102D, MPXM2102DT1 | 1320 | Stainless Steel Cap |
| MPXM2102AS, MPXM2102GS, MPXM2102ASTI, MPXM2102GSTI | 1320A | Side with Port Attached |

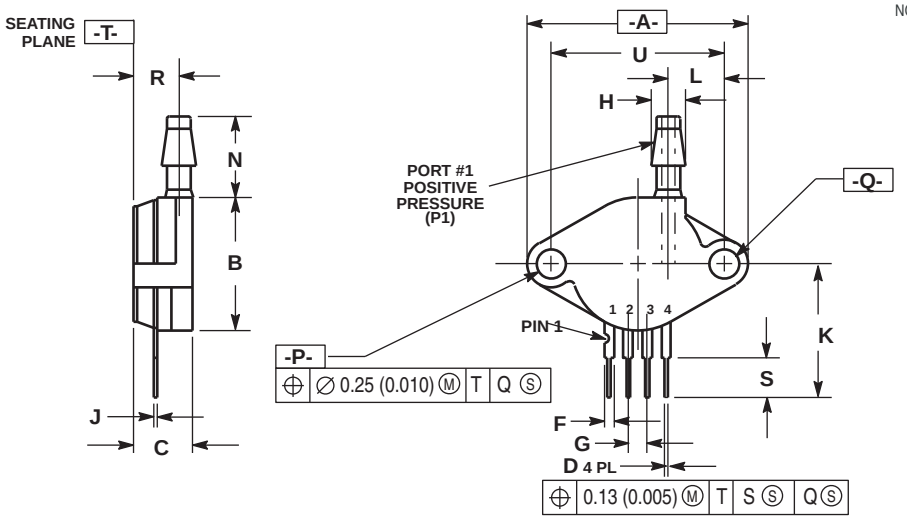
# PACKAGE DIMENSIONS




NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION -A- IS INCLUSIVE OF THE MOLD STOP RING. MOLD STOP RING NOT TO EXCEED 16.00 (0.630).

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 0.595 | 0.630 | 15.11 | 16.00 |
| B | 0.514 | 0.534 | 13.06 | 13.56 |
| C | 0.200 | 0.220 | 5.08 | 5.59 |
| D | 0.016 | 0.020 | 0.41 | 0.51 |
| F | 0.048 | 0.064 | 1.22 | 1.63 |
| G | 0.100 BSC | | 2.54 BSC | |
| J | 0.014 | 0.016 | 0.36 | 0.40 |
| L | 0.695 | 0.725 | 17.65 | 18.42 |
| M | 30° NOM | | 30° NOM | |
| N | 0.475 | 0.495 | 12.07 | 12.57 |
| R | 0.430 | 0.450 | 10.92 | 11.43 |
| Y | 0.048 | 0.052 | 1.22 | 1.32 |
| Z | 0.106 | 0.118 | 2.68 | 3.00 |

**CASE 344-15**
**ISSUE AA**
**UNIBODY PACKAGE**

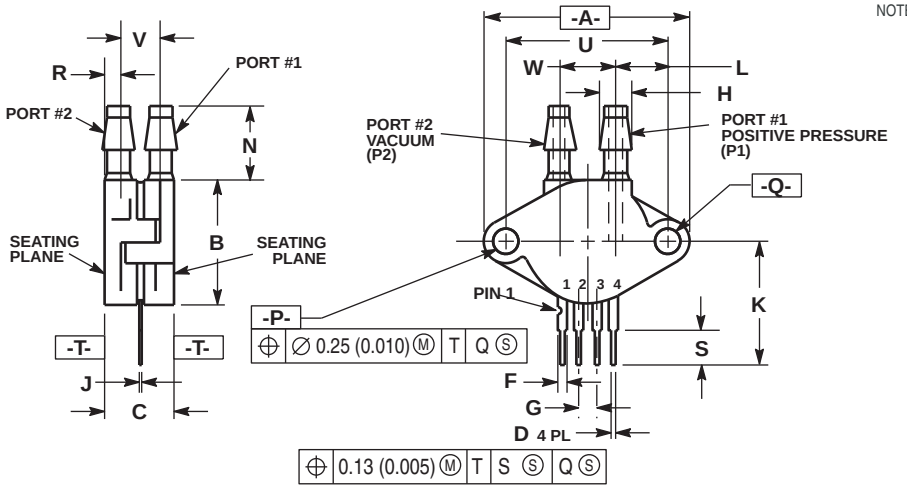



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 1.145 | 1.175 | 29.08 | 29.85 |
| B | 0.685 | 0.715 | 17.40 | 18.16 |
| C | 0.305 | 0.325 | 7.75 | 8.26 |
| D | 0.016 | 0.020 | 0.41 | 0.51 |
| F | 0.048 | 0.064 | 1.22 | 1.63 |
| G | 0.100 BSC | | 2.54 BSC | |
| H | 0.182 | 0.194 | 4.62 | 4.93 |
| J | 0.014 | 0.016 | 0.36 | 0.41 |
| K | 0.695 | 0.725 | 17.65 | 18.42 |
| L | 0.290 | 0.300 | 7.37 | 7.62 |
| N | 0.420 | 0.440 | 10.67 | 11.18 |
| P | 0.153 | 0.159 | 3.89 | 4.04 |
| Q | 0.153 | 0.159 | 3.89 | 4.04 |
| R | 0.230 | 0.250 | 5.84 | 6.35 |
| S | 0.220 | 0.240 | 5.59 | 6.10 |
| U | 0.910 BSC | | 23.11 BSC | |

**CASE 344B-01**
**ISSUE B**
**UNIBODY PACKAGE**

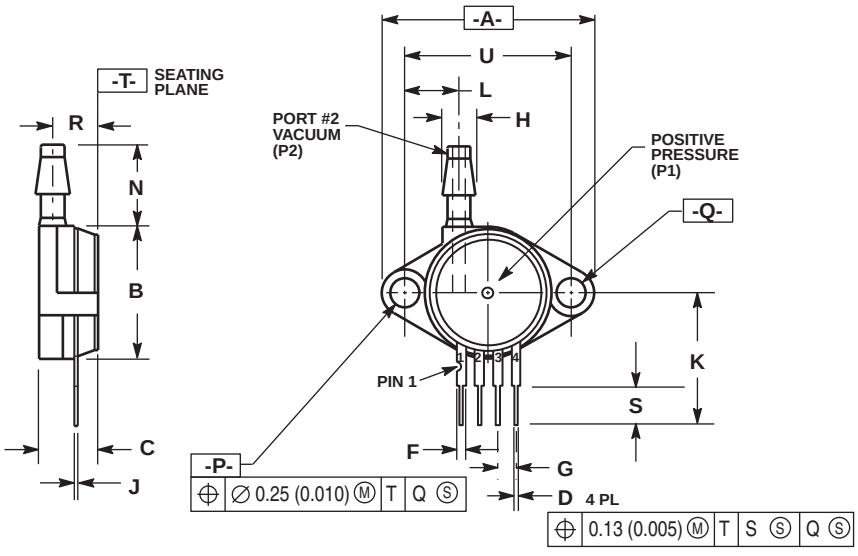
# PACKAGE DIMENSIONS




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 1.145 | 1.175 | 29.08 | 29.85 |
| B | 0.685 | 0.715 | 17.40 | 18.16 |
| C | 0.405 | 0.435 | 10.29 | 11.05 |
| D | 0.016 | 0.020 | 0.41 | 0.51 |
| F | 0.048 | 0.064 | 1.22 | 1.63 |
| G | 0.100 BSC | | 2.54 BSC | |
| H | 0.182 | 0.194 | 4.62 | 4.93 |
| J | 0.014 | 0.016 | 0.36 | 0.41 |
| K | 0.695 | 0.725 | 17.65 | 18.42 |
| L | 0.290 | 0.300 | 7.37 | 7.62 |
| N | 0.420 | 0.440 | 10.67 | 11.18 |
| P | 0.153 | 0.159 | 3.89 | 4.04 |
| Q | 0.153 | 0.159 | 3.89 | 4.04 |
| R | 0.063 | 0.083 | 1.60 | 2.11 |
| S | 0.220 | 0.240 | 5.59 | 6.10 |
| U | 0.910 BSC | | 23.11 BSC | |
| V | 0.248 | 0.278 | 6.30 | 7.06 |
| W | 0.310 | 0.330 | 7.87 | 8.38 |

**CASE 344C-01**
**ISSUE B**
**UNIBODY PACKAGE**

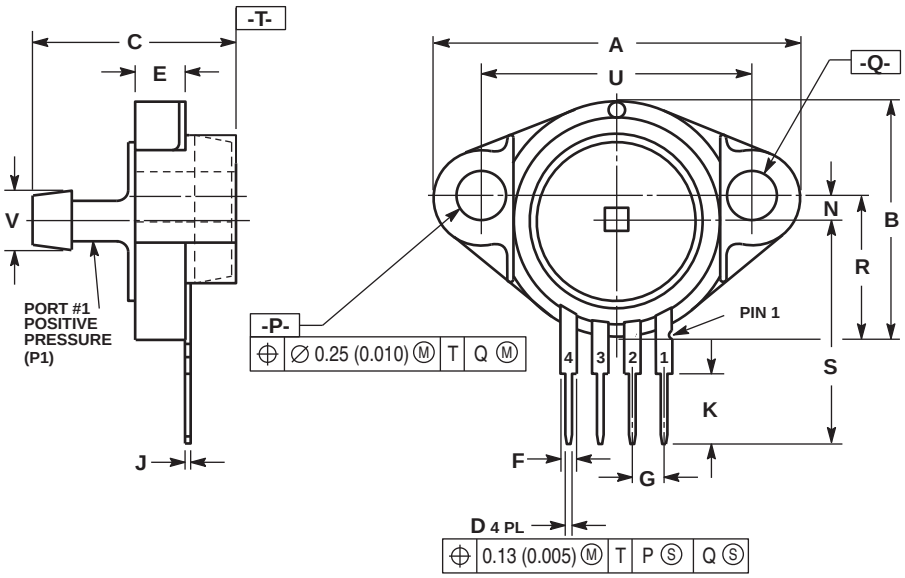



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCH.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 1.145 | 1.175 | 29.08 | 29.85 |
| B | 0.685 | 0.715 | 17.40 | 18.16 |
| C | 0.305 | 0.325 | 7.75 | 8.26 |
| D | 0.016 | 0.020 | 0.41 | 0.51 |
| F | 0.048 | 0.064 | 1.22 | 1.63 |
| G | 0.100 BSC | | 2.54 BSC | |
| H | 0.182 | 0.194 | 4.62 | 4.93 |
| J | 0.014 | 0.016 | 0.36 | 0.41 |
| K | 0.695 | 0.725 | 17.65 | 18.42 |
| L | 0.290 | 0.300 | 7.37 | 7.62 |
| N | 0.420 | 0.440 | 10.67 | 11.18 |
| P | 0.153 | 0.159 | 3.89 | 4.04 |
| Q | 0.153 | 0.158 | 3.89 | 4.04 |
| R | 0.230 | 0.250 | 5.84 | 6.35 |
| S | 0.220 | 0.240 | 5.59 | 6.10 |
| U | 0.910 BSC | | 23.11 BSC | |

**CASE 344D-01**
**ISSUE B**
**UNIBODY PACKAGE**

## PACKAGE DIMENSIONS

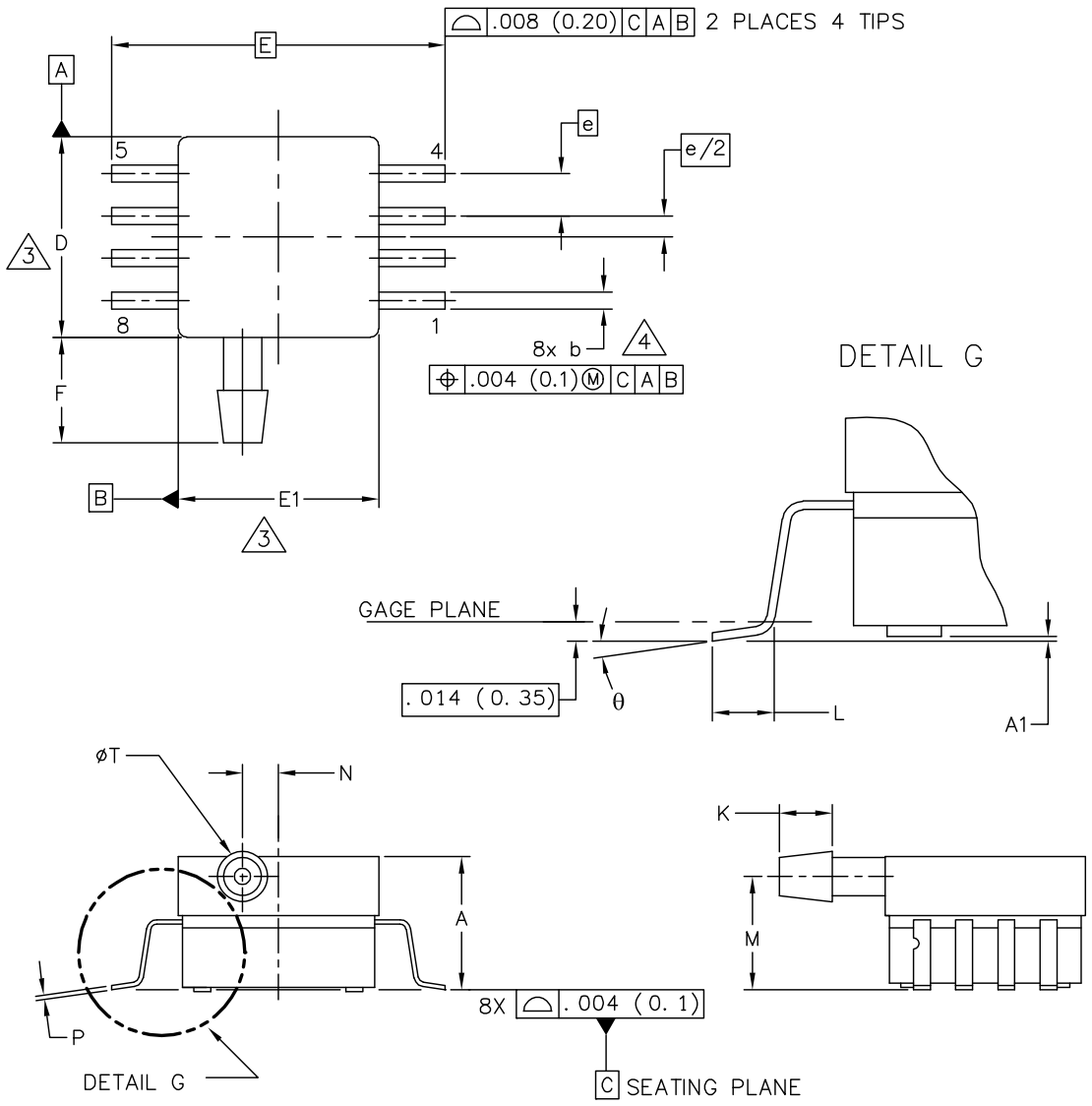



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 1.080 | 1.120 | 27.43 | 28.45 |
| B | 0.740 | 0.760 | 18.80 | 19.30 |
| C | 0.630 | 0.650 | 16.00 | 16.51 |
| D | 0.016 | 0.020 | 0.41 | 0.51 |
| E | 0.160 | 0.180 | 4.06 | 4.57 |
| F | 0.048 | 0.064 | 1.22 | 1.63 |
| G | 0.100 BSC | | 2.54 BSC | |
| J | 0.014 | 0.016 | 0.36 | 0.41 |
| K | 0.220 | 0.240 | 5.59 | 6.10 |
| N | 0.070 | 0.080 | 1.78 | 2.03 |
| P | 0.150 | 0.160 | 3.81 | 4.06 |
| Q | 0.150 | 0.160 | 3.81 | 4.06 |
| R | 0.440 | 0.460 | 11.18 | 11.68 |
| S | 0.695 | 0.725 | 17.65 | 18.42 |
| U | 0.840 | 0.860 | 21.34 | 21.84 |
| V | 0.182 | 0.194 | 4.62 | 4.92 |

**CASE 344F-01**
**ISSUE B**
**UNIBODY PACKAGE**

## PACKAGE DIMENSIONS

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|---|---|---|
| TITLE: 8 LD SOP, SIDE PORT | DOCUMENT NO: 98ASA99303D | REV: B |
| | CASE NUMBER: 1369-01 | 24 MAY 2005 |
| | STANDARD: NON-JEDEC | |

**CASE 1369-01**
**ISSUE B**
**SMALL OUTLINE PACKAGE**

# PACKAGE DIMENSIONS

NOTES:
1. CONTROLLING DIMENSION: INCH

2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M–1994.

3. DIMENSIONS DO NOT INCLUDE MOLD FLASH OR PPROTRUSIONS.
MOLD FLASH AND PROTRUSIONS SHALL NOT EXCEED .006 (0.152) PER SIDE.

4. DIMENSION DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR
PROTRUSION SHALL BE .008 (0.203) MAXIMUM.

| DIM | INCHES MIN | INCHES MAX | MILLIMETERS MIN | MILLIMETERS MAX | DIM | INCHES MIN | INCHES MAX | MILLIMETERS MIN | MILLIMETERS MAX |
|---|---|---|---|---|---|---|---|---|---|
| A | .300 | .330 | 7.11 | 7.62 | θ | 0° | 7° | 0° | 7° |
| A1 | .002 | .010 | 0.05 | 0.25 | – | --- | --- | --- | --- |
| b | .038 | .042 | 0.96 | 1.07 | – | --- | --- | --- | --- |
| D | .465 | .485 | 11.81 | 12.32 | – | --- | --- | --- | --- |
| E | .717 BSC | | 18.21 BSC | | – | --- | --- | --- | --- |
| E1 | .465 | .485 | 11.81 | 12.32 | – | --- | --- | --- | --- |
| e | .100 BSC | | 2.54 BSC | | – | --- | --- | --- | --- |
| F | .245 | .255 | 6.22 | 6.47 | – | --- | --- | --- | --- |
| K | .120 | .130 | 3.05 | 3.30 | – | --- | --- | --- | --- |
| L | .061 | .071 | 1.55 | 1.80 | – | --- | --- | --- | --- |
| M | .270 | .290 | 6.86 | 7.36 | – | --- | --- | --- | --- |
| N | .080 | .090 | 2.03 | 2.28 | – | --- | --- | --- | --- |
| P | .009 | .011 | 0.23 | 0.28 | – | --- | --- | --- | --- |
| T | .115 | .125 | 2.92 | 3.17 | – | --- | --- | --- | --- |

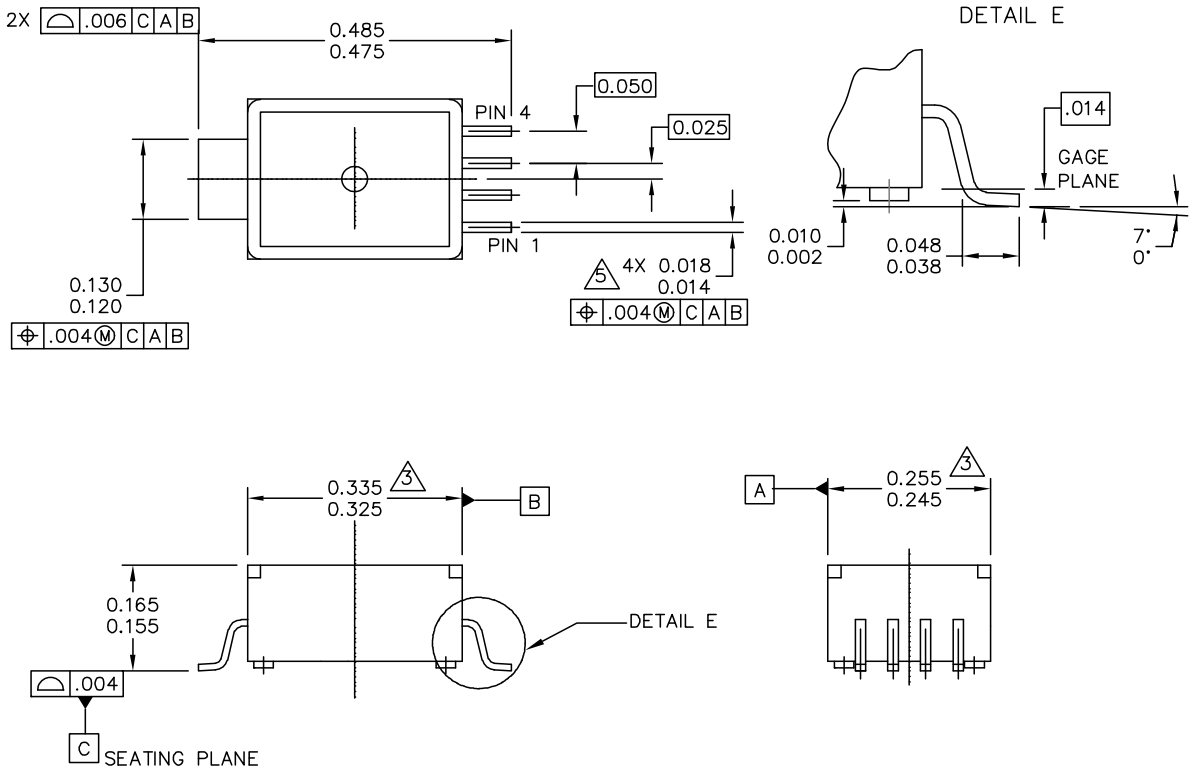


**MECHANICAL OUTLINE** | PRINT VERSION NOT TO SCALE

| TITLE: | DOCUMENT NO: 98ASA99303D | REV: B |
|---|---|---|
| 8 LD SOP, SIDE PORT | CASE NUMBER: 1369–01 | 24 MAY 2005 |
| | STANDARD: NON–JEDEC | |



**CASE 1369-01**
**ISSUE B**
**SMALL OUTLINE PACKAGE**

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|---|---|---|
| TITLE: 5 LD M–PAC | DOCUMENT NO: 98ARH99088A | REV: B |
| | CASE NUMBER: 1320-02 | 22 JUL 2005 |
| | STANDARD: NON-JEDEC | |

**CASE 1320-02**
**ISSUE B**
**MPAK**

NOTES:

1. DIMENSIONS ARE IN INCHES.

2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M–1994.

3. DIMENSION DOES NOT INCLUDE MOLD FLASH OR PROTRUSION. MOLD FLASH OR PROTRUSION SHALL NOT EXCEED .006" PER SIDE.

4. ALL VERTICAL SURFACES TO BE 5° MAXIMUM.

5. DIMENSION DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE .008 MAXIMUM.

PIN 1: GND
PIN 2: +Vout
PIN 3: Vs
PIN 4: –Vout

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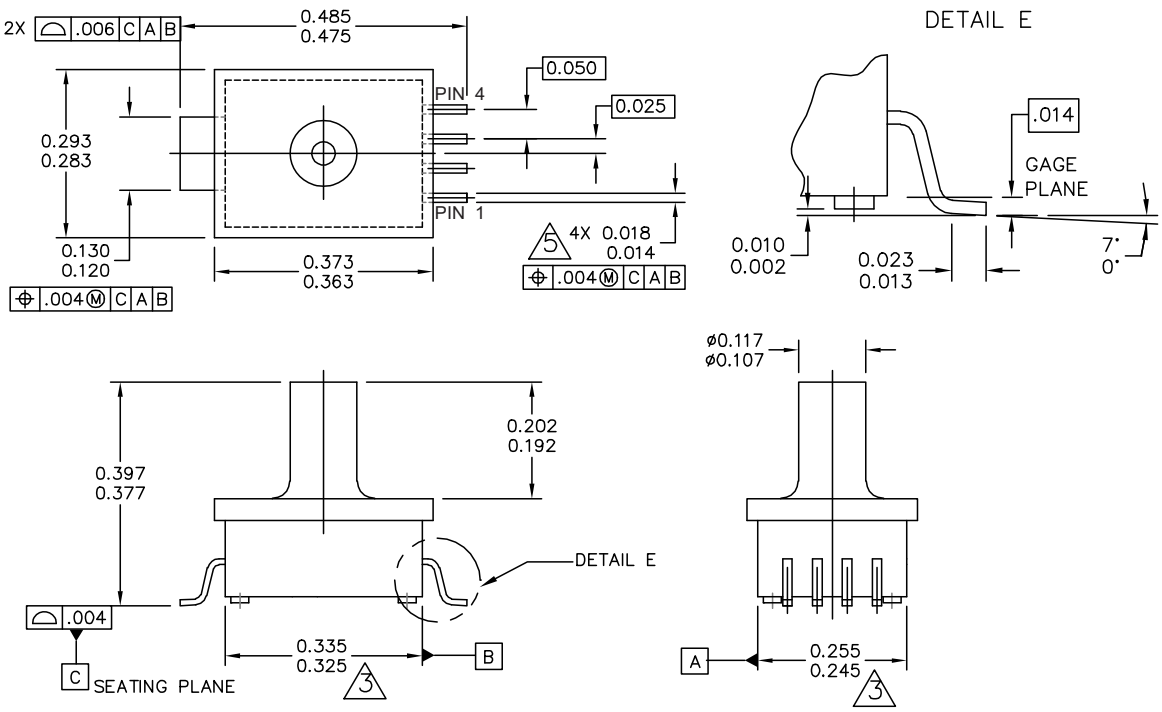
|---|---|---|
| TITLE: 5 LD M–PAC | DOCUMENT NO: 98ARH99088A | REV: B |
| | CASE NUMBER: 1320–02 | 22 JUL 2005 |
| | STANDARD: NON–JEDEC | |

**CASE 1320-02**
**ISSUE B**
**MPAK**

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|---|---|---|
| TITLE: 5 LD M–PAC, PORTED | DOCUMENT NO: 98ARH99087A | REV: A |
| | CASE NUMBER: 1320A-02 | 22 JUL 2005 |
| | STANDARD: NON–JEDEC | |

**CASE 1320A-02**
**ISSUE A**
**MPAK**

NOTES:

1. DIMENSIONS ARE IN INCHES.
2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M–1994.
3. DIMENSIONS DOES NOT INCLUDE MOLD FLASH OR PROTRUSION. MOLD FLASH OR PROTRUSION SHALL NOT EXCEED .006" PER SIDE.
4. ALL VERTICAL SURFACES TO BE 5" MAXIMUM.
5. DIMENSION DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE .008 MAXIMUM.

| | | |
|---|---|---|
|  | **MECHANICAL OUTLINE** | PRINT VERSION NOT TO SCALE |
| TITLE: 5 LD M–PAC, PORTED | DOCUMENT NO: 98ARH99087A | REV: A |
| | CASE NUMBER: 1320A–02 | 22 JUL 2005 |
| | STANDARD: NON–JEDEC | |

**CASE 1320A-02**
**ISSUE A**
**MPAK**

**REVISION HISTORY**

| Revision number | Revision date | Description of changes |
|---|---|---|
| 9 | 01/2012 | • In Table 1. Operating Characteristics, in the Characteristic column under Pressure Range, added rows for Absolute Pressure Range MPX2102A and Differential Pressure Range MPX2102D devices |

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