



**THE DATASHEET OF
MPXV5010GC6U**



MPX5010-MPXV5010-MPVZ5010

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

Rev. 14 — 17 May 2024

Product data sheet

1 General description

The MPxx5010 series piezoresistive transducers are state-of-the-art monolithic silicon pressure sensors designed for a wide range of applications, but particularly those employing a microcontroller or microprocessor with A/D inputs. This 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. The axial port has been modified to accommodate industrial grade tubing.

2 Features and benefits

- 5.0% maximum error over 0° to 85° C
- Ideally suited for microprocessor or microcontroller-based systems
- Durable epoxy unibody and thermoplastic (PPS) surface mount package
- Temperature compensated over -40° to +125° C
- Patented silicon shear stress strain gauge
- Available in differential and gauge configurations
- Available in surface mount (SMT) or through-hole (DIP) configurations

3 Applications

- Hospital beds
- HVAC
- Respiratory systems
- Process control
- Washing machine water level measurement (Reference AN1950)
- Ideally suited for microprocessor or microcontroller-based systems
- Appliance liquid level and pressure measurement



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

4 Ordering information

Table 1. Ordering information

Type number	Package		
	Name	Description	Version
Unibody package (MPX5010 series)			
MPX5010DP	SENSOR4F	sensor package, 6 terminals, 2.54 mm pitch, 17.78 mm x 29.48 mm x 10.67 mm body	SOT1756-1
MPX5010GP	SENSOR6F	sensor package, 6 terminals, 2.54 mm pitch, 17.78 mm x 29.47 mm x 8.01 mm body	SOT1852-1
Small outline package (MPXV5010 series)			
MPXV5010DP	S08	plastic, small outline package, 8 terminals, 2.54 mm pitch, 12.06 mm x 12.06 mm x 7.62 mm body	SOT1693-1
MPXV5010GC6T1	S08	plastic, small outline package, 8 terminals, 2.54 mm pitch, 10.67 mm x 10.67 mm x 12.96 mm body	SOT1854-1
MPXV5010GC7U	S08	plastic, small outline package, 8 terminals, 2.54 mm pitch, 10.67 mm x 10.67 mm x 12.96 mm body	SOT1863-1
MPXV5010GP	S08	plastic, small outline package, 8 terminals, 2.54 mm pitch, 12.06 mm x 12.06 mm x 7.62 mm body	SOT1693-3
Small outline package (Media resistant gel) (MPVZ5010 series)			
MPVZ5010GW6U	S08	plastic, small outline package, 8 terminals, 2.54 mm pitch, 1.07 mm x 1.07 mm x 1.99 mm body	SOT1691-2
MPVZ5010GW7U	S08	plastic, small outline package, 8 terminals, 2.54 mm pitch, 1.07 mm x 1.07 mm x 1.99 mm body	SOT1691-1

4.1 Ordering options

Table 2. Ordering options

ORDERING INFORMATION								
Device Name	Case No.	# of Ports			Pressure Type			Device Marking
		None	Single	Dual	Gauge	Differential	Absolute	
Unibody Package (MPX5010 Series)								
MPX5010DP	867C			•		•		MPX5010DP
MPX5010GP	867B		•		•			MPX5010GP
Small Outline Package (MPXV5010 Series)								
MPXV5010DP	1351			•		•		MPXV5010DP
MPXV5010GC6T1	482A		•		•			MPXV5010G
MPXV5010GC7U	482C		•		•			MPXV5010G
MPXV5010GP	1369		•		•			MPXV5010GP
Small Outline Package (Media Resistant Gel) (MPVZ5010 Series)								
MPVZ5010GW6U	1735		•		•			MZ5010GW
MPVZ5010GW7U	1560		•		•			MZ5010GW

5 Block diagram

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

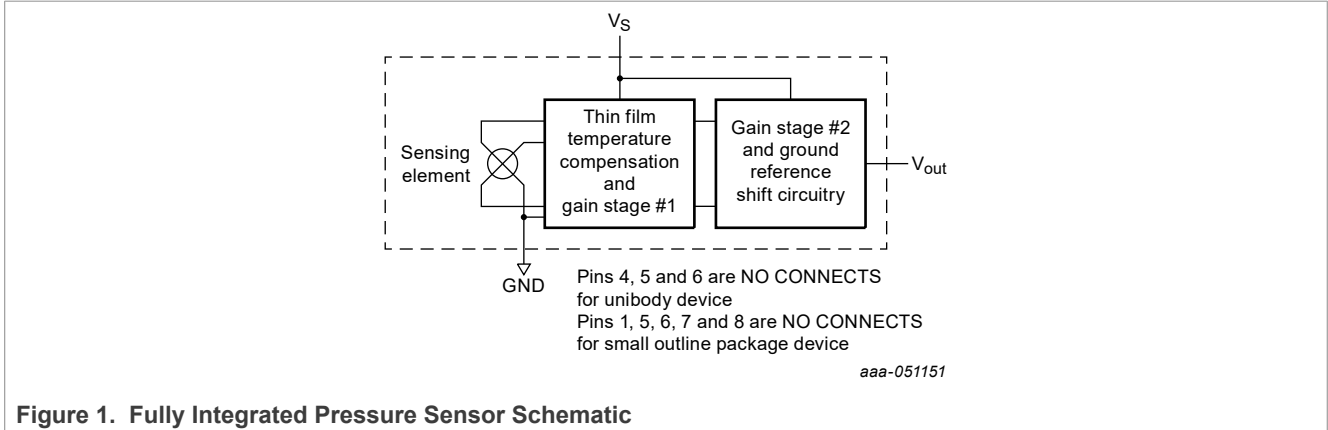


Figure 1. Fully Integrated Pressure Sensor Schematic

6 Pinning information

6.1 Pinning - Unibody packages

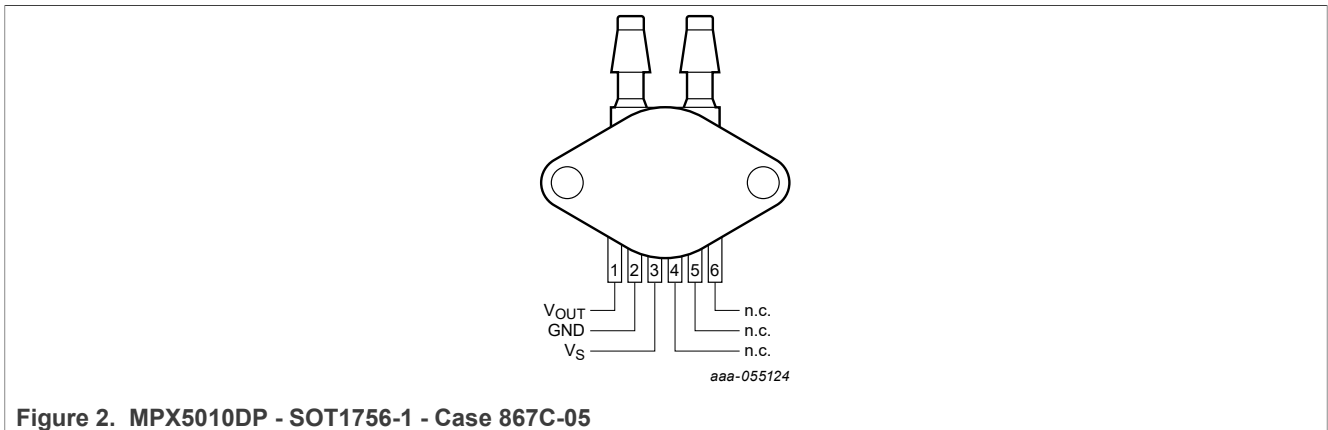


Figure 2. MPX5010DP - SOT1756-1 - Case 867C-05

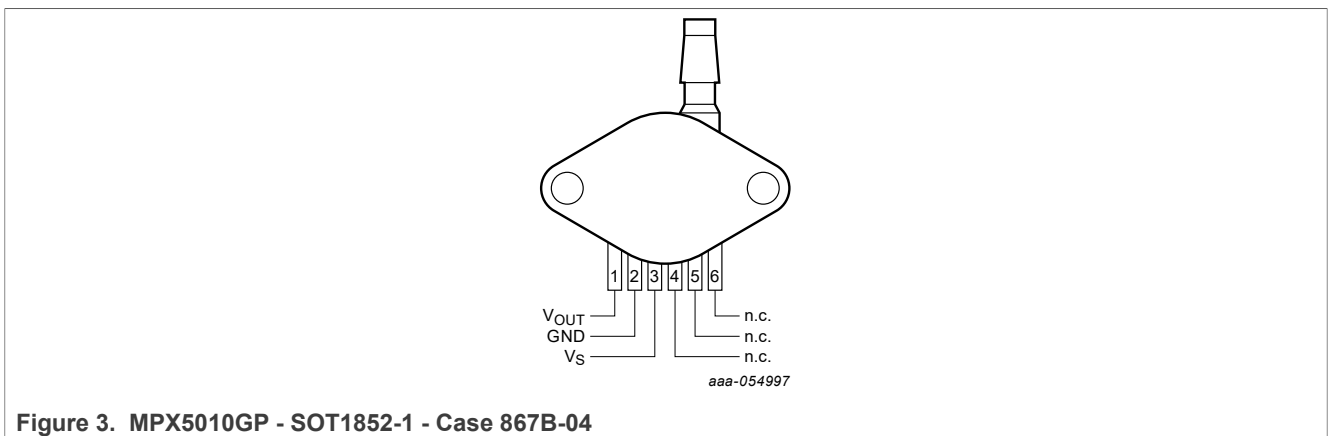


Figure 3. MPX5010GP - SOT1852-1 - Case 867B-04

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

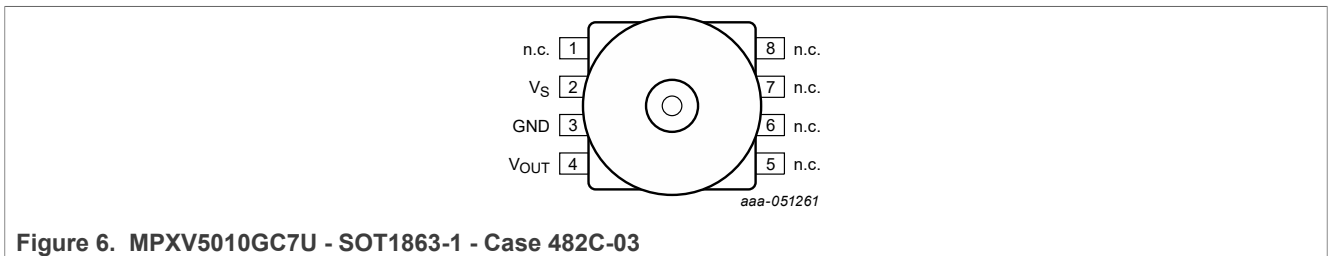
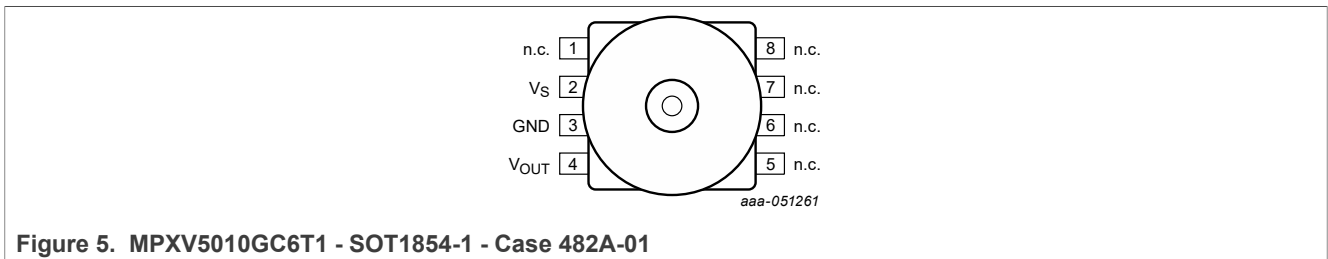
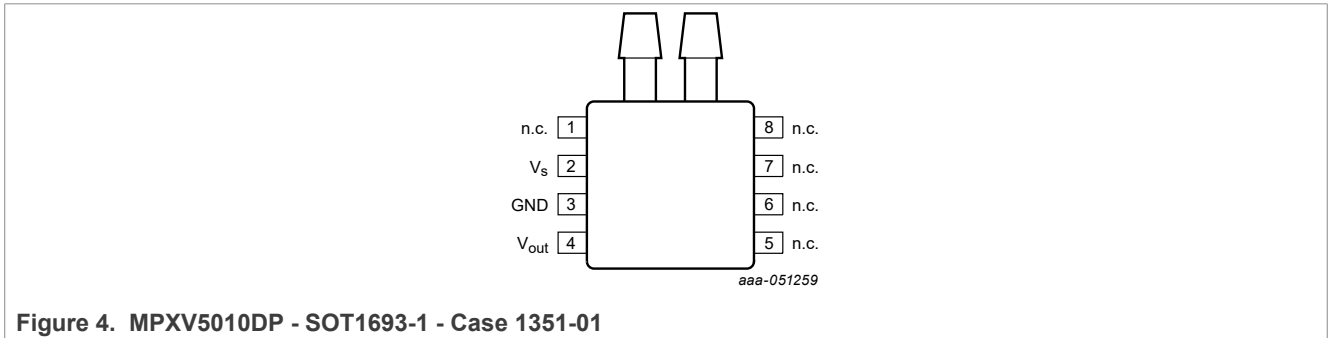
6.2 Pin description - Unibody packages

Table 3. Pin descriptions - Unibody packages

This table defines the pin configuration for the Unibody packages identified in Table 1.

Symbol	Pin	Description
V _{OUT}	1	V _{OUT}
GND	2	Ground
V _S	3	Supply voltage
N.C.	4	No connect
N.C.	5	No connect
N.C.	6	No connect

6.3 Pinning - Small Outline packages



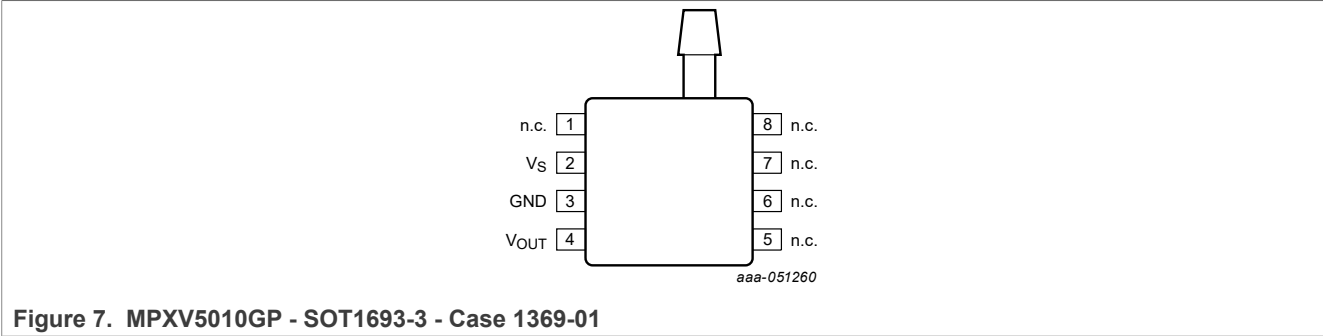


Figure 7. MPXV5010GP - SOT1693-3 - Case 1369-01

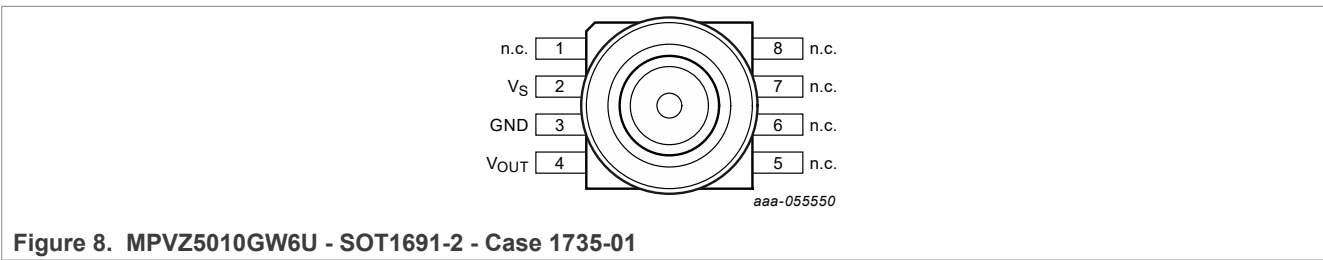


Figure 8. MPVZ5010GW6U - SOT1691-2 - Case 1735-01

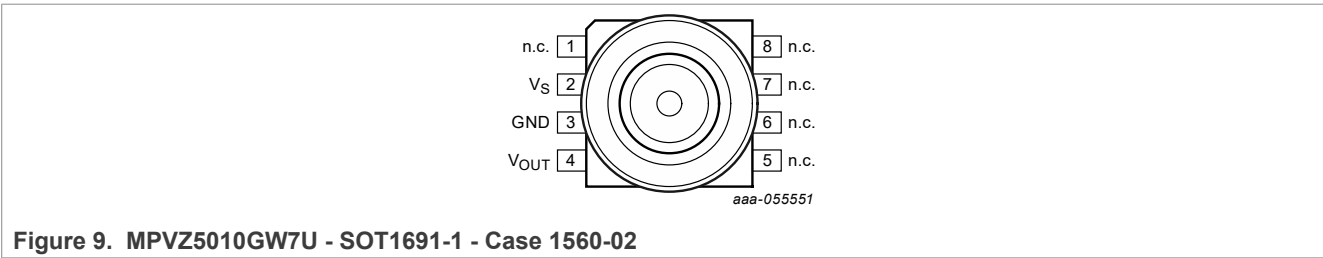


Figure 9. MPVZ5010GW7U - SOT1691-1 - Case 1560-02

6.4 Pin description - Small Outline packages

Table 4. Pin descriptions - Small Outline packages

This table defines the pin configuration for the Small Outline packages identified in [Table 1](#).

Symbol	Pin	Description
N.C.	1	No connect
V _S	2	Supply voltage
GND	3	Ground
V _{OUT}	4	V _{OUT}
N.C.	5	No connect
N.C.	6	No connect
N.C.	7	No connect
N.C.	8	No connect

7 Limiting values

Table 5. Limiting values^[1]

Rating	Symbol	Value	Unit
Maximum Pressure (P1 > P2)	P _{max}	40	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.

8 Recommended operating conditions

Table 6. Recommended operating conditions

V_S = 5.0 Vdc, T_A = 25°C unless otherwise noted, P1 > P2. Decoupling circuit shown in [Figure 11](#) required to meet specification.)

Characteristic	Symbol	Min	Typ	Max	Unit
Pressure Range	P _{OP}	0	—	10 1019.78	kPa mm H ₂ O
Supply Voltage ^[1]	V _S	4.75	5.0	5.25	Vdc
Supply Current	I _o	—	5.0	10	mAdc
Minimum Pressure Offset ^[2] (0 to 85°C) @ V _S = 5.0 Volts	V _{off}	0	0.2	0.425	Vdc
Full Scale Output ^[3] (0 to 85°C) @ V _S = 5.0 Volts	V _{FSSO}	4.475	4.7	4.925	Vdc
Full Scale Span ^[4] (0 to 85°C) @ V _S = 5.0 Volts	V _{FSS}	4.275	4.5	4.725	Vdc
Accuracy ^[5] (0 to 85°C)	—	—	—	±5.0	%V _{FSS}
Sensitivity	V/P	—	450 4.413	—	mV/kPa mV/ kPA H ₂ O
Response Time ^[6]	t _R	—	1.0	—	ms
Output Source Current at Full Scale Output	I _{O+}	—	0.1	—	mAdc
Warm-Up Time ^[7]	—	—	20	—	ms
Offset Stability ^[8]	—	—	±0.5	—	%V _{FSS}

[1] Device is ratiometric within this specified excitation range.

[2] Offset (V_{off}) is defined as the output voltage at the minimum rated pressure.

[3] Full Scale Output (V_{FSSO}) is defined as the output voltage at the maximum or full rated pressure.

[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] 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.

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

- [6] 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.
- [7] Warm-up Time is defined as the time required for the product to meet the specified output voltage after the Pressure has been stabilized.
- [8] Offset Stability is the product's output deviation when subjected to 1000 hours of Pulsed Pressure, Temperature Cycling with Bias Test.

9 On-chip temperature compensation and calibration

The performance over temperature is achieved by integrating the shear-stress strain gauge, temperature compensation, calibration and signal conditioning circuitry onto a single monolithic chip.

Figure 10 illustrates the differential or gauge configuration in the basic chip carrier (Case 482). A fluorosilicone gel isolates the die surface and wire bonds from the environment, while allowing the pressure signal to be transmitted to the sensor diaphragm.

The MPxx5010G 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 11 shows the recommended decoupling circuit for interfacing the integrated sensor to the A/D input of a microprocessor or microcontroller. Proper decoupling of the power supply is recommended.

Figure 12 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 11. The output will saturate outside of the specified pressure range.

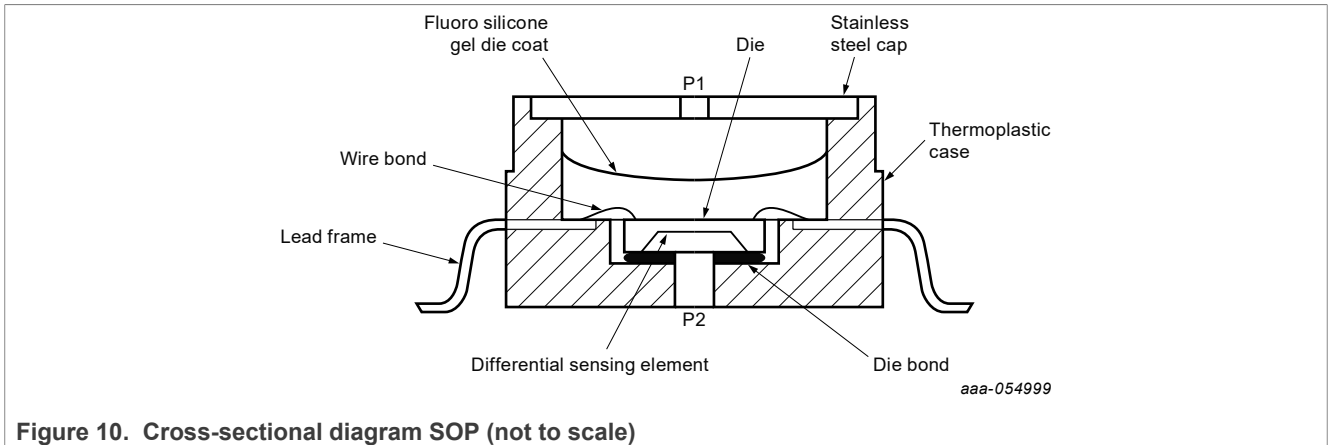


Figure 10. Cross-sectional diagram SOP (not to scale)

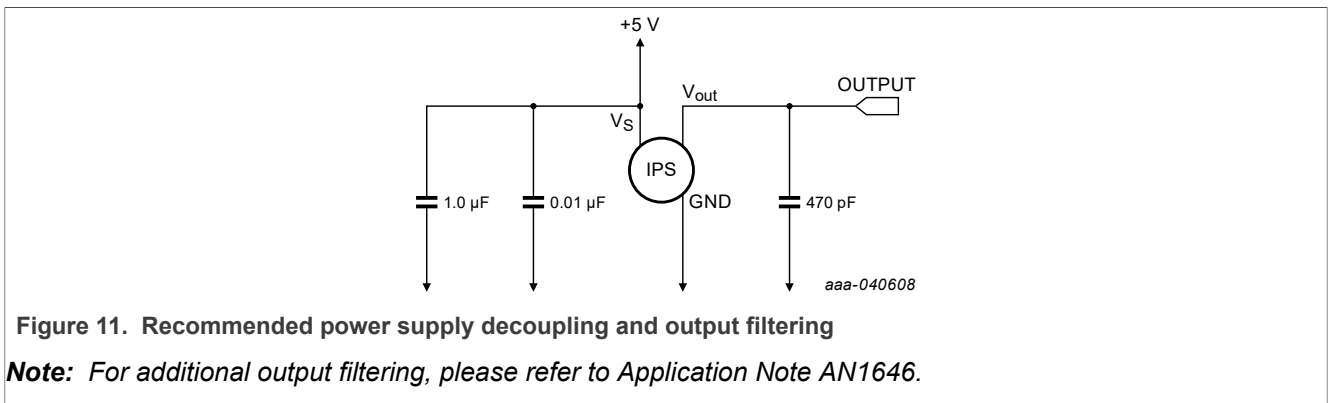


Figure 11. Recommended power supply decoupling and output filtering

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

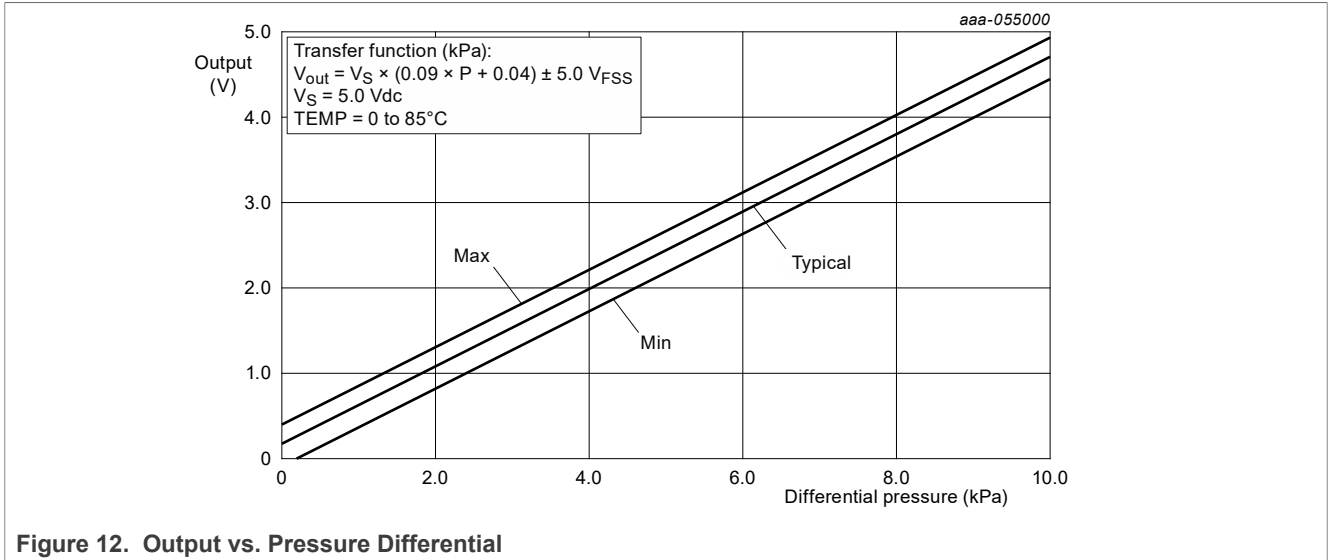


Figure 12. Output vs. Pressure Differential

Nominal Transfer Value:

$$V_{OUT} = V_S \times (0.09 \times P + 0.04)$$

$$\pm (Pressure\ Error \times Temp.\ Factor \times 0.09 V_S)$$

$$V_S = 5.0 V \pm 0.25 V_{dc}$$

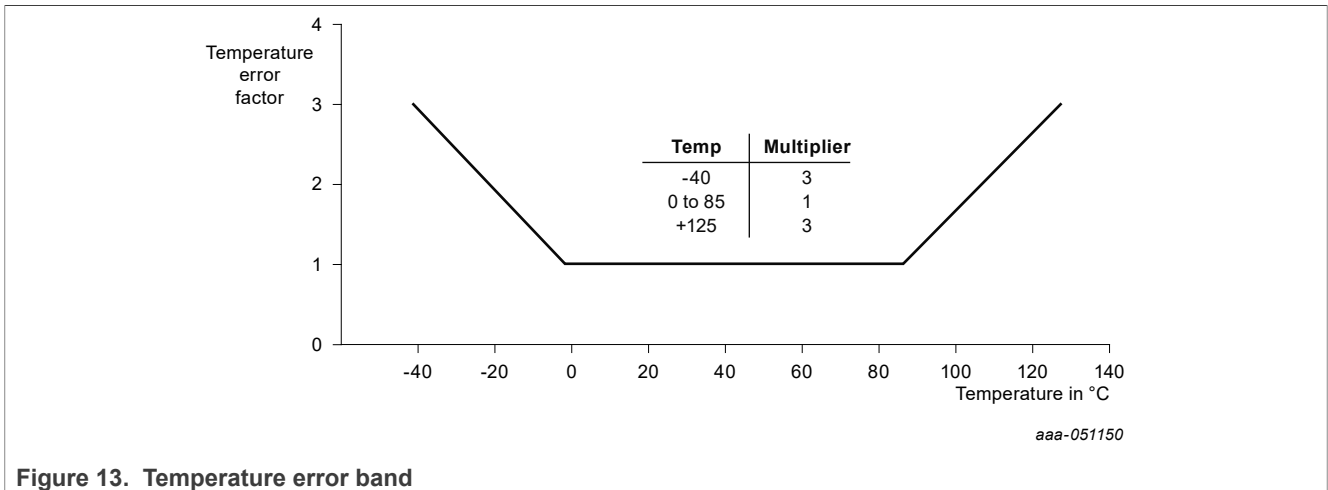


Figure 13. Temperature error band

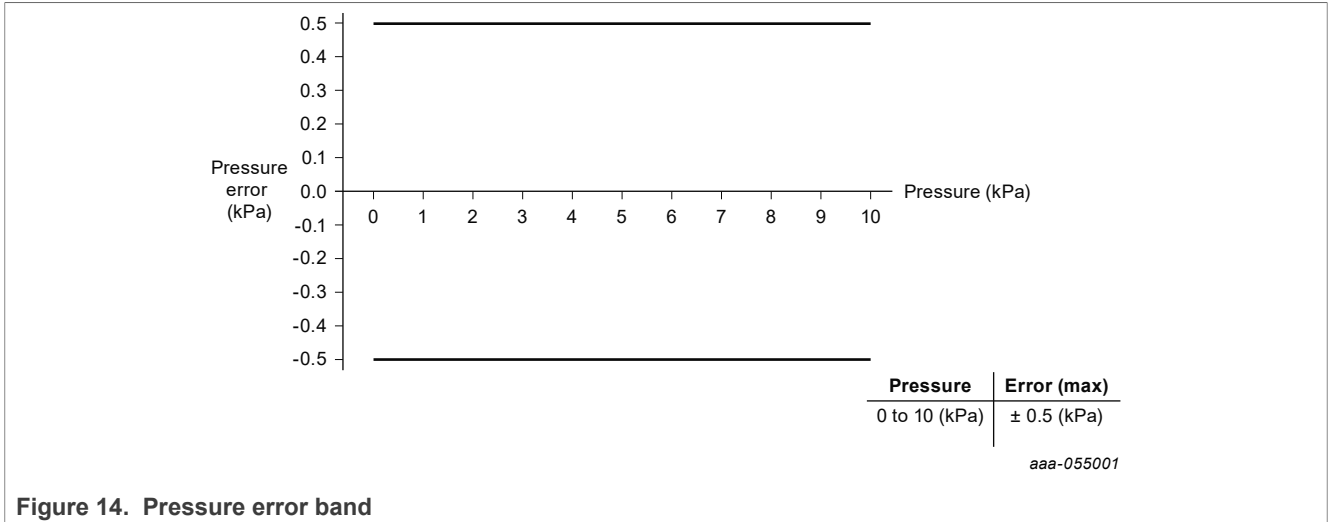


Figure 14. Pressure error band

10 Pressure (P1) / Vacuum (P2) side identification table

NXP 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 [Table 7](#).

Table 7. Pressure (P1) side identification

Part Number	Case Type	Pressure (P1) Side Identifier
MPX5010DP	867C	Side with Part Marking
MPX5010GP	867B	Side with Port Attached
MPXV5010DP	1351	Side with Part Marking
MPXV5010GC6T1	482A	Side with Port Attached
MPXV5010GC7U	482C	Side with Port Attached
MPXV5010GP	1369	Side with Port Attached
MPVZ5010GW6U	1735	Vertical Port Attached
MPVZ5010GW7U	1560	Vertical Port Attached

11 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.

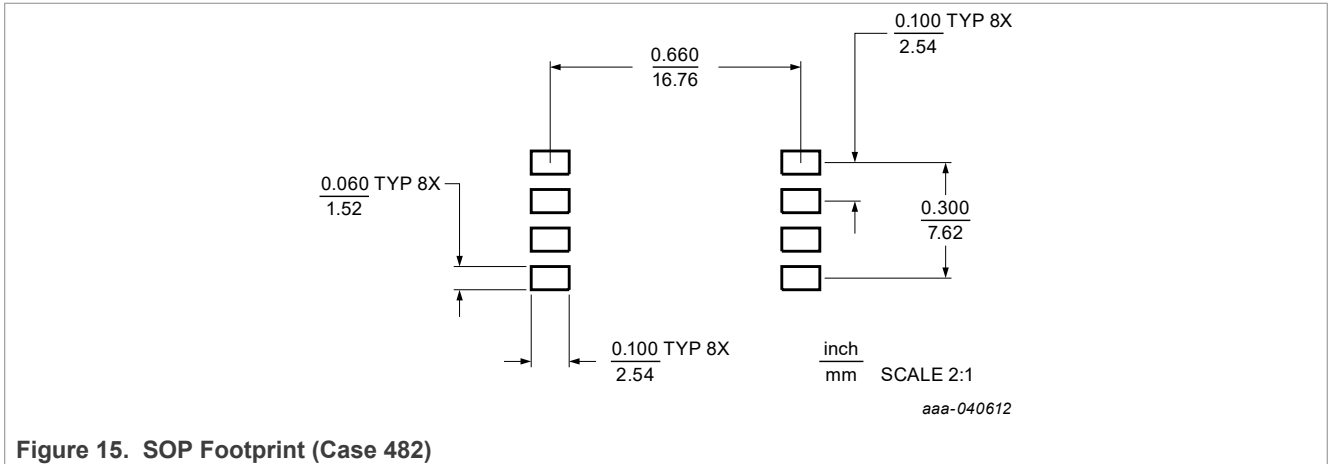


Figure 15. SOP Footprint (Case 482)

12 Package outline

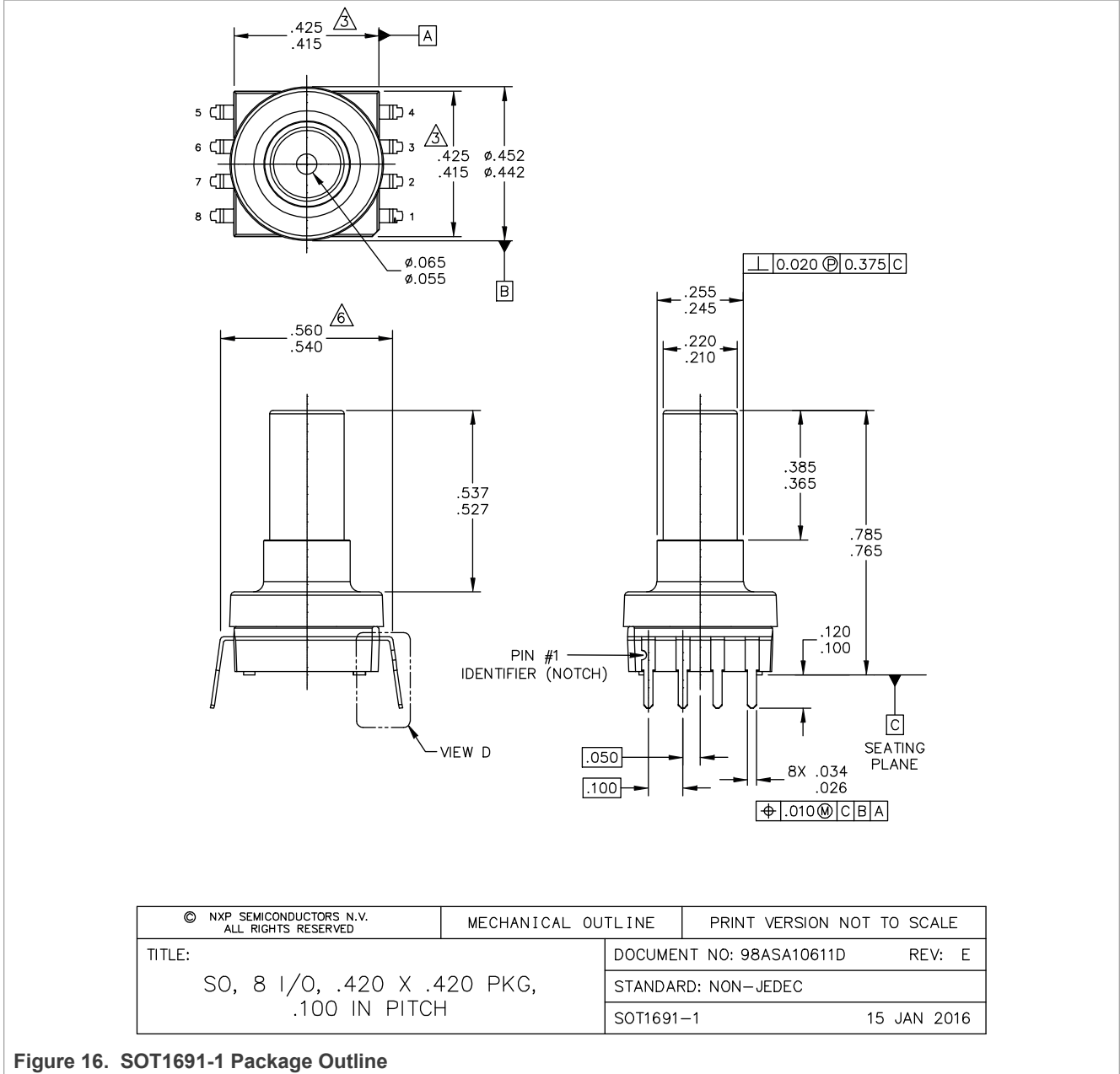
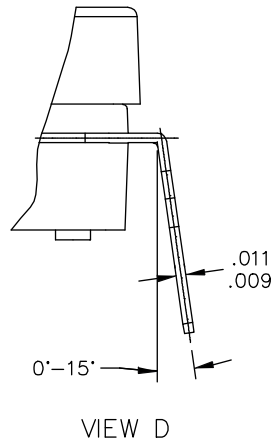


Figure 16. SOT1691-1 Package Outline



© NXP SEMICONDUCTORS N.V. ALL RIGHTS RESERVED	MECHANICAL OUTLINE	PRINT VERSION NOT TO SCALE
TITLE: SO, 8 I/O, .420 X .420 PKG, .100 IN PITCH	DOCUMENT NO: 98ASA10611D	REV: E
	STANDARD: NON-JEDEC	
	SOT1691-1	15 JAN 2016

Figure 17. SOT1691-1 Package Outline Detail

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

NOTES:

- 1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M – 1994.
- 2. CONTROLLING DIMENSION: INCH.
- 3. DIMENSIONS DO NOT INCLUDE MOLD PROTRUSION.
- 4. MAXIMUM MOLD PROTRUSION IS .006.
- 5. ALL VERTICAL SURFACES 5° TYPICAL DRAFT.
- 6. DIMENSION TO CENTER OF LEAD WHEN FORMED PARALLEL.

© NXP SEMICONDUCTORS N.V. ALL RIGHTS RESERVED	MECHANICAL OUTLINE	PRINT VERSION NOT TO SCALE
TITLE: SO, 8 I/O, .420 X .420 PKG, .100 IN PITCH	DOCUMENT NO: 98ASA10611D	REV: E
	STANDARD: NON-JEDEC	
	SOT1691-1	15 JAN 2016

Figure 18. SOT1691-1 Package Outline Notes

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

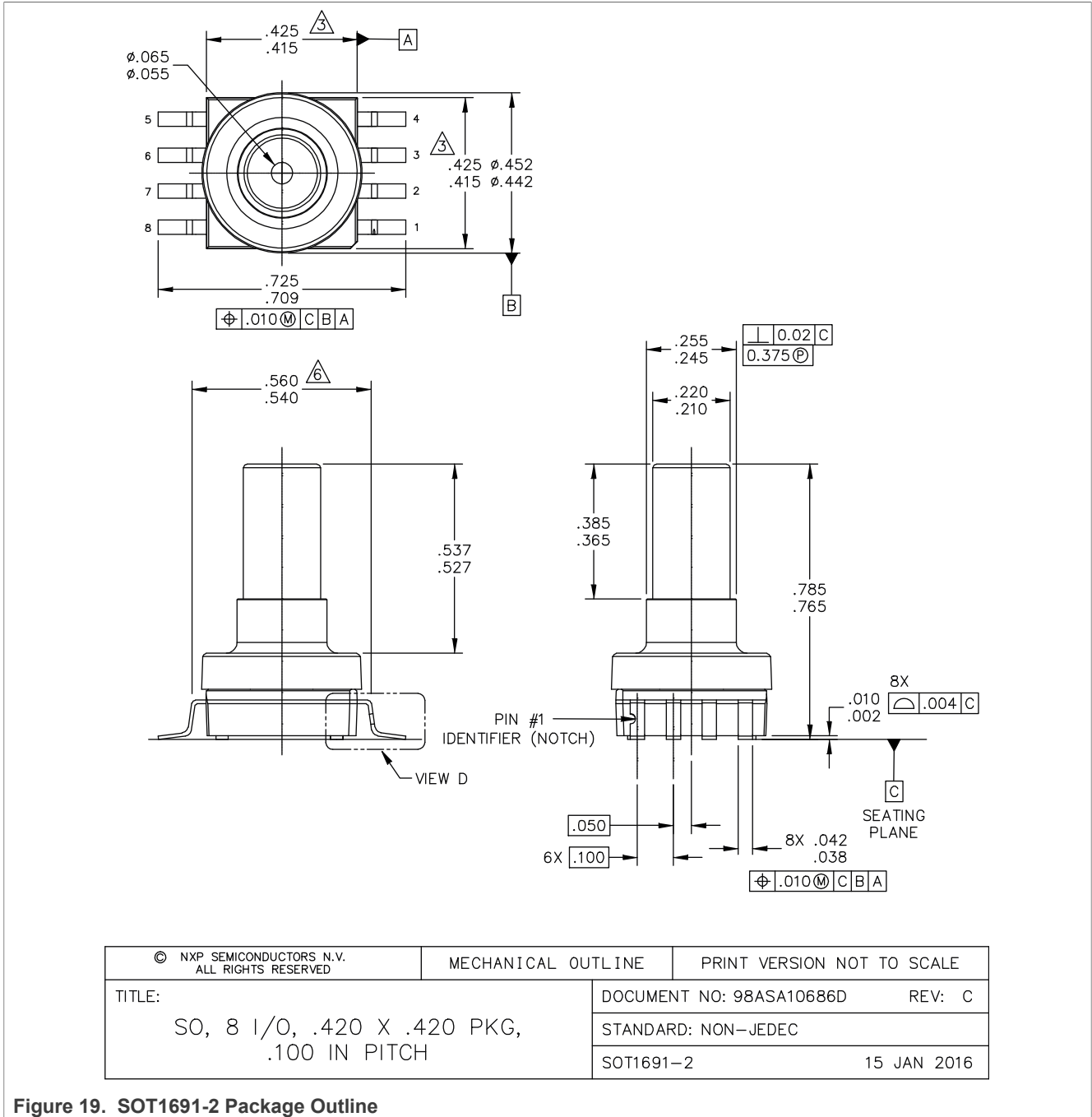
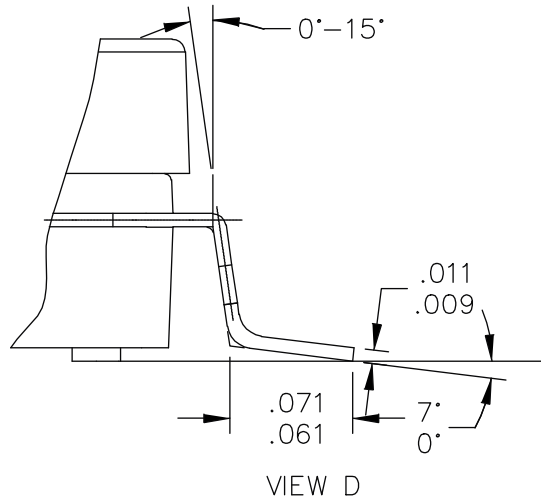


Figure 19. SOT1691-2 Package Outline



© NXP SEMICONDUCTORS N.V. ALL RIGHTS RESERVED	MECHANICAL OUTLINE	PRINT VERSION NOT TO SCALE
TITLE: SO, 8 I/O, .420 X .420 PKG, .100 IN PITCH	DOCUMENT NO: 98ASA10686D	REV: C
	STANDARD: NON-JEDEC	
	SOT1691-2	15 JAN 2016

Figure 20. SOT1691-2 Package Outline Detail

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

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M – 1994.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSIONS DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION IS .006.
5. ALL VERTICAL SURFACES 5° TYPICAL DRAFT.
6. DIMENSION TO CENTER OF LEAD WHEN FORMED PARALLEL.

© NXP SEMICONDUCTORS N.V. ALL RIGHTS RESERVED	MECHANICAL OUTLINE	PRINT VERSION NOT TO SCALE
TITLE: SO, 8 I/O, .420 X .420 PKG, .100 IN PITCH	DOCUMENT NO: 98ASA10686D	REV: C
	STANDARD: NON-JEDEC	
	SOT1691-2	15 JAN 2016

Figure 21. SOT1691-2 Package Outline Notes

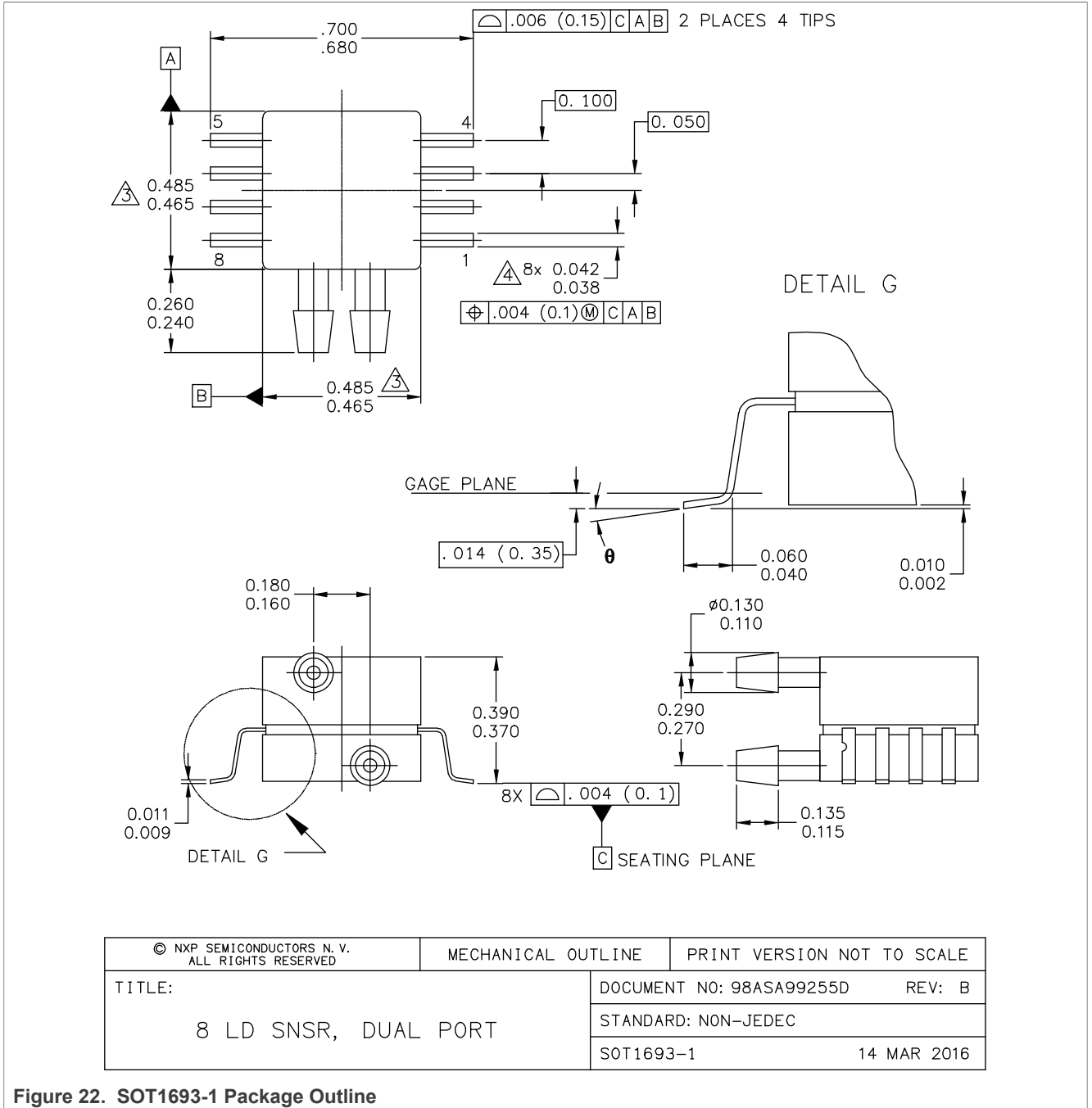


Figure 22. SOT1693-1 Package Outline

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

NOTES:

- 1. CONTROLLING DIMENSION: INCH
- 2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
- 3. DIMENSIONS DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS. MOLD FLASH AND PROTRUSIONS SHALL NOT EXCEED .006 PER SIDE.
- 4. DIMENSION DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE .008 MAXIMUM.

STYLE 1:	STYLE 2:
PIN 1: GND	PIN 1: N/C
PIN 2: +Vout	PIN 2: Vs
PIN 3: Vs	PIN 3: GND
PIN 4: -Vout	PIN 4: Vout
PIN 5: N/C	PIN 5: N/C
PIN 6: N/C	PIN 6: N/C
PIN 7: N/C	PIN 7: N/C
PIN 8: N/C	PIN 8: N/C

© NXP SEMICONDUCTORS N.V. ALL RIGHTS RESERVED	MECHANICAL OUTLINE	PRINT VERSION NOT TO SCALE
TITLE: 8 LD SNSR, DUAL PORT	DOCUMENT NO: 98ASA99255D	REV: B
	STANDARD: NON-JEDEC	
	SOT1693-1	14 MAR 2016

Figure 23. SOT1693-1 Package Outline Notes

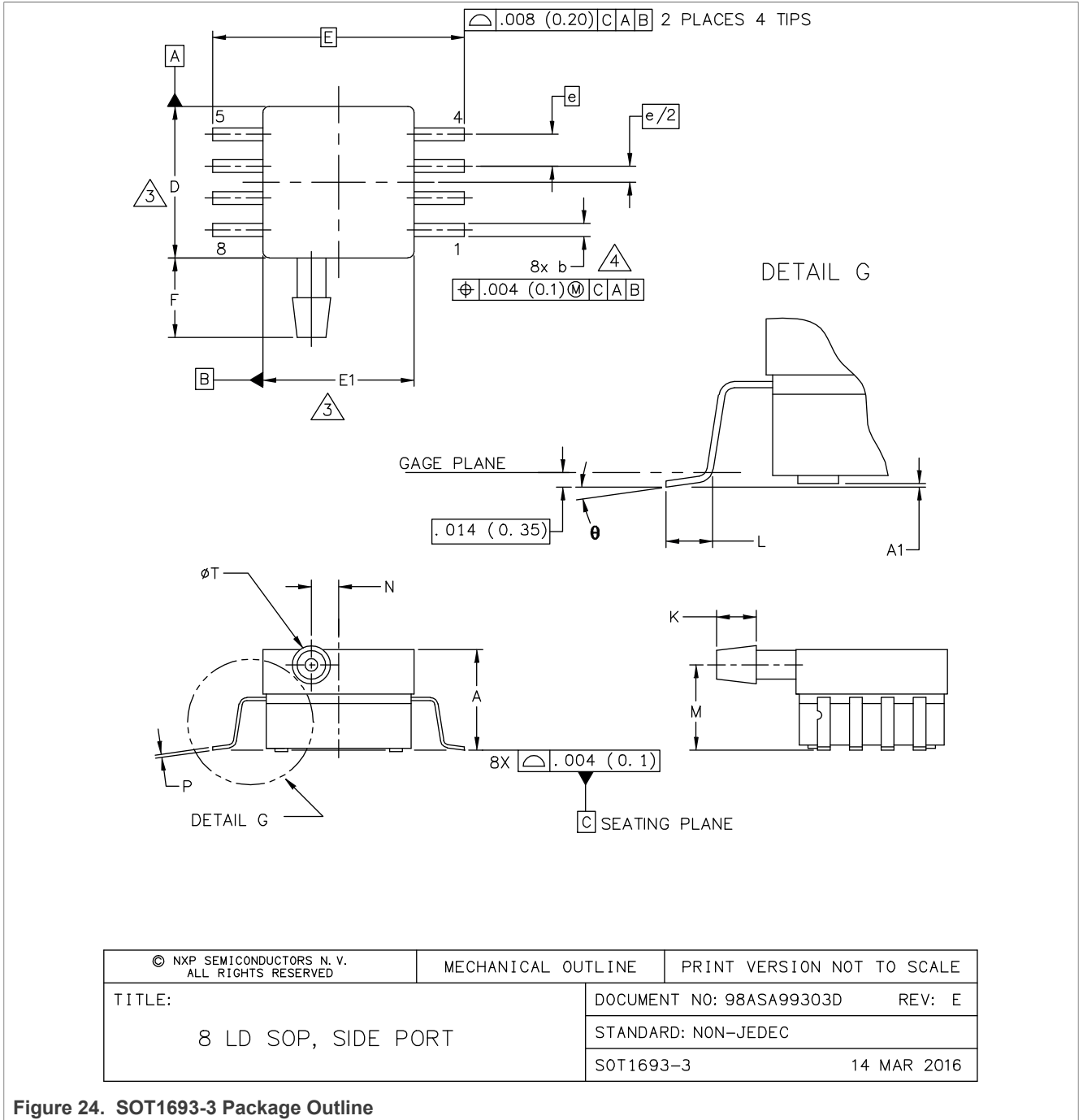


Figure 24. SOT1693-3 Package Outline

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

NOTES:

1. CONTROLLING DIMENSION: INCH

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

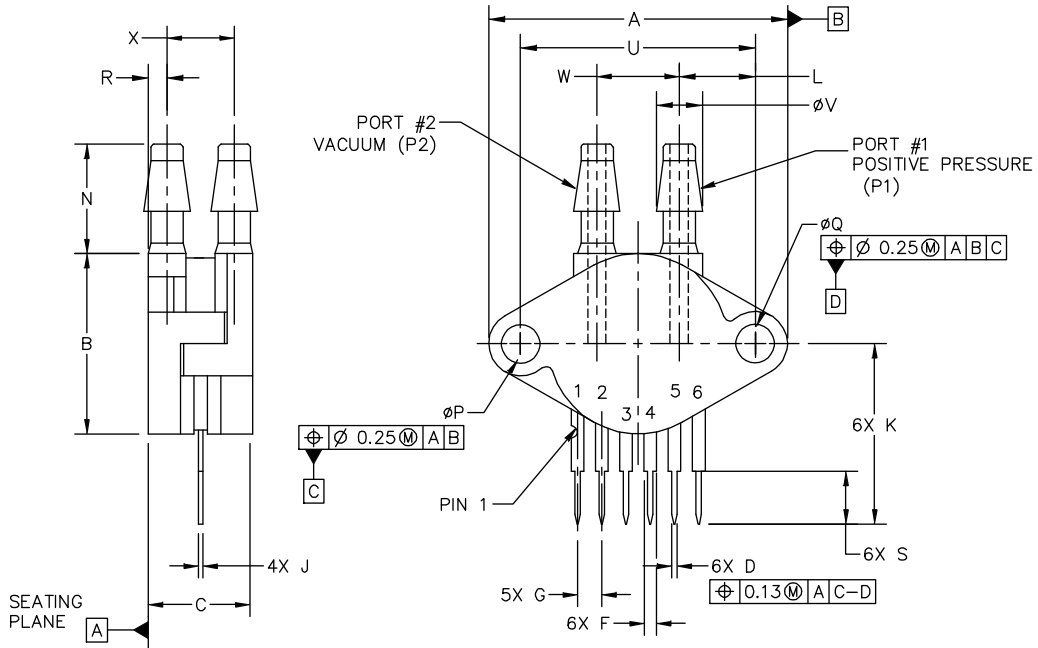
⚠ DIMENSIONS DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS. MOLD FLASH AND PROTRUSIONS SHALL NOT EXCEED .006 (0.152) PER SIDE.

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

DIM	INCHES		MILLIMETERS		DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
A	.300	.330	7.62	8.38	Ø	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	-	---	---	---	---
© NXP SEMICONDUCTORS N. V. ALL RIGHTS RESERVED			MECHANICAL OUTLINE			PRINT VERSION NOT TO SCALE			
TITLE:					DOCUMENT NO: 98ASA99303D REV: E				
8 LD SOP, SIDE PORT					STANDARD: NON-JEDEC				
					SOT1693-3 14 MAR 2016				

Figure 25. SOT1693-3 Package Outline Notes

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



DIM	MILLIMETERS MIN	MILLIMETERS MAX	DIM	MILLIMETERS MIN	MILLIMETERS MAX
A	29.08	29.85	P	$\phi 3.89$	$\phi 4.04$
B	17.40	18.16	Q	$\phi 3.89$	$\phi 4.04$
C	10.29	11.05	R	1.60	2.11
D	0.68	0.84	S	5.59	6.10
F	1.22	1.63	U	23.11	BSC
G	2.54	BSC	V	4.62	4.93
J	0.36	0.41	W	7.87	8.38
K	17.65	18.42	X	6.30	7.06
L	7.37	7.62			
N	10.67	11.18			

NOTES:

- DIMENSIONS ARE IN MILLIMETERS.
- DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
- 867C-01 THRU -04 OBSOLETE, NEW STANDARD 867C-05.

3. STYLE 1:

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

© NXP SEMICONDUCTORS N.V. ALL RIGHTS RESERVED		MECHANICAL OUTLINE	PRINT VERSION NOT TO SCALE
TITLE: SENSOR, 4 LEAD UNIBODY		DOCUMENT NO: 98ASB42797B	REV: H
		STANDARD: NON-JEDEC	
		SOT1756-1	29 JAN 2016

Figure 26. SOT1756-1 Package Outline

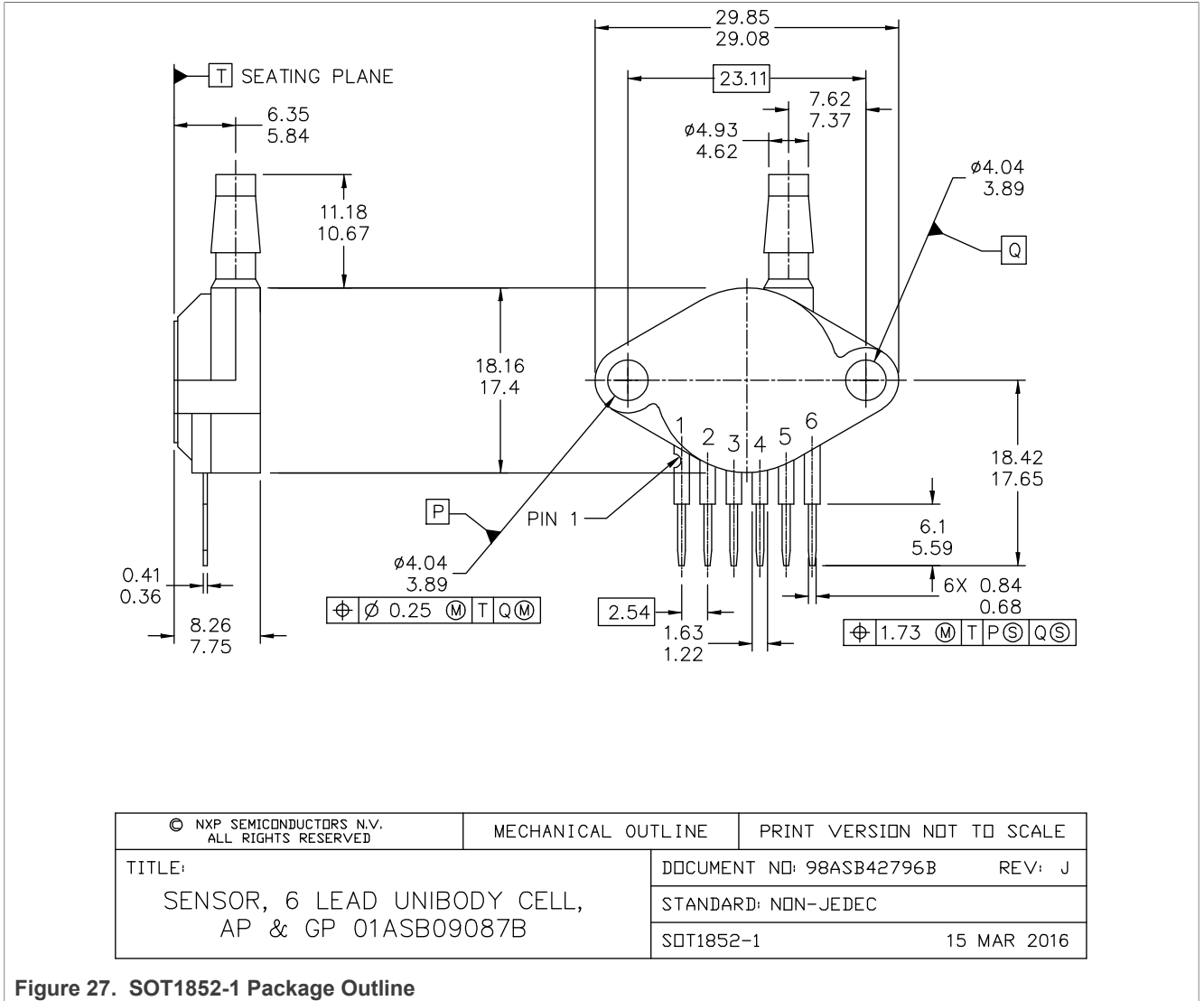


Figure 27. SOT1852-1 Package Outline

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

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

© NXP SEMICONDUCTORS N.V. ALL RIGHTS RESERVED	MECHANICAL OUTLINE	PRINT VERSION NOT TO SCALE
TITLE: SENSOR, 6 LEAD UNIBODY CELL, AP & GP 01ASB09087B	DOCUMENT NO: 98ASB42796B	REV: J
	STANDARD: NON-JEDEC	
	SOT1852-1	15 MAR 2016

Figure 28. SOT1852-1 Package Outline Notes

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

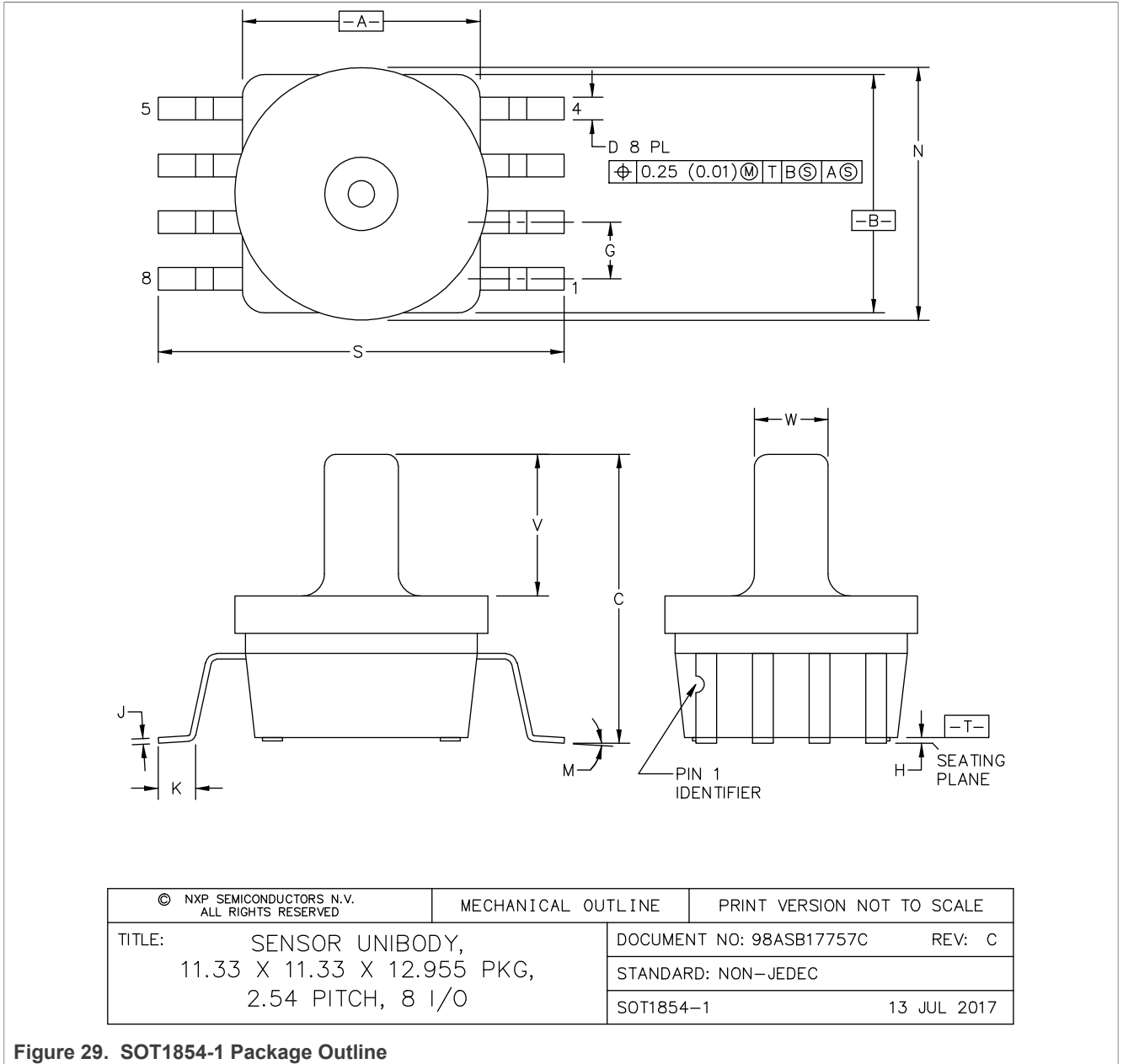


Figure 29. SOT1854-1 Package Outline

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

NOTES:

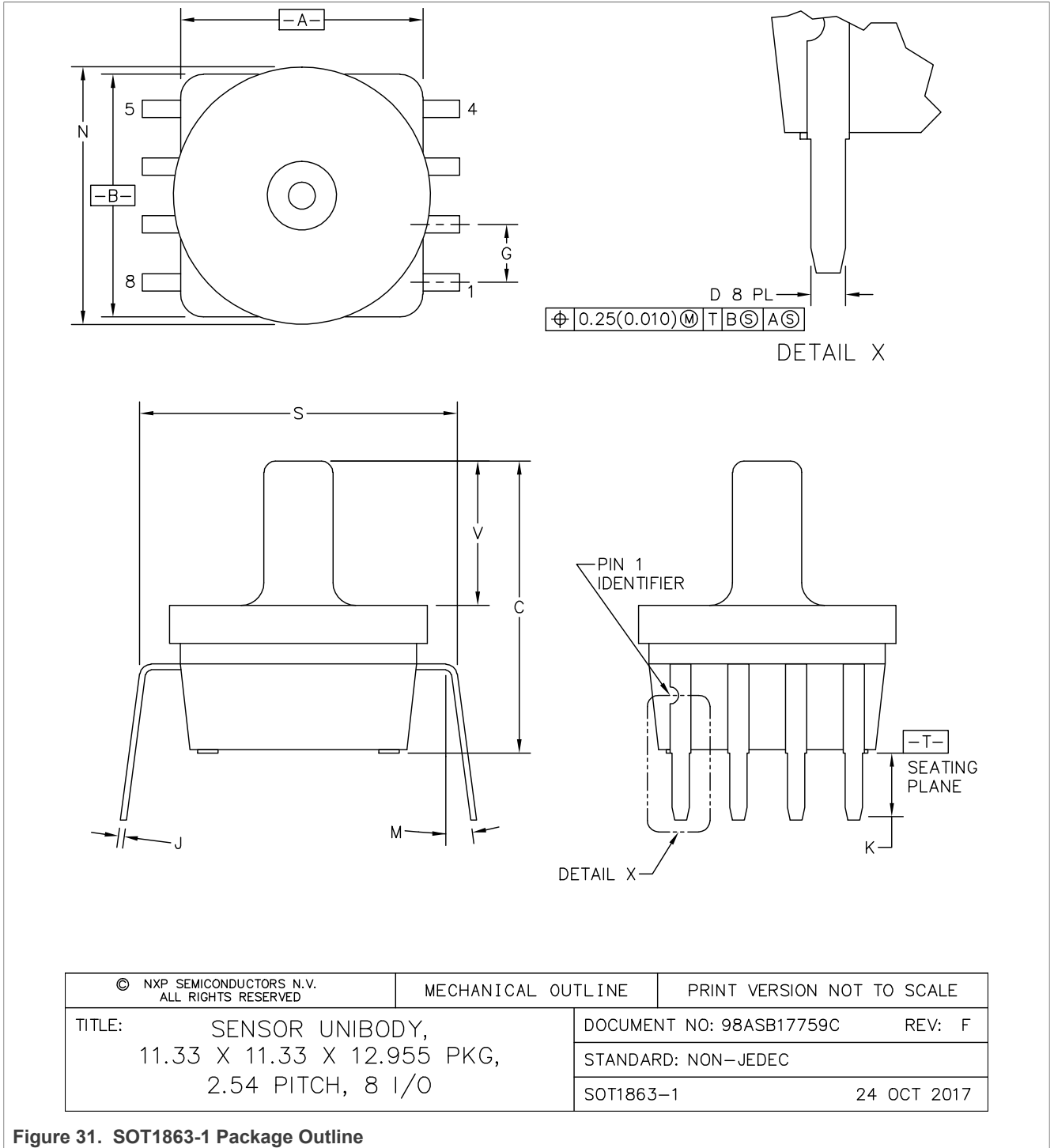
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION 'A' AND 'B' DO NOT INCLUDE MOLD PROTUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006).
5. ALL VERTICAL SURFACES 5° TYPICAL DRAFT.

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

© NXP SEMICONDUCTORS N.V. ALL RIGHTS RESERVED		MECHANICAL OUTLINE	PRINT VERSION NOT TO SCALE
TITLE: SENSOR UNIBODY, 11.33 X 11.33 X 12.955 PKG, 2.54 PITCH, 8 I/O		DOCUMENT NO: 98ASB17757C	REV: C
		STANDARD: NON-JEDEC	
		SOT1854-1	13 JUL 2017

Figure 30. SOT1854-1 Package Outline Notes

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



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

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION 'A' AND 'B' DO NOT INCLUDE MOLD PROTUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006).
5. ALL VERTICAL SURFACES 5° TYPICAL DRAFT.
6. DIMENSION 'S' TO CENTER OF LEAD WHEN FORMED PARALLEL.
7. 482C-01 AND -02 OBSOLETE. NEW STANDARD 482C-03.

DIM	MILLIMETERS		INCHES		
	MIN	MAX	MIN	MAX	
A	10.54	10.79	0.415	0.425	
B	10.54	10.79	0.415	0.425	
C	12.70	13.21	0.500	0.520	
D	0.66	0.864	0.026	0.034	
G	2.54	BSC	0.100	BSC	
J	0.23	0.28	0.009	0.011	
K	2.54	3.05	0.100	0.120	
M	0°	15°	0°	15°	
N	11.28	11.38	0.444	0.448	
S	13.72	14.22	0.540	0.560	
V	6.22	6.48	0.245	0.255	
W	2.92	3.17	0.115	0.125	

© NXP SEMICONDUCTORS N.V. ALL RIGHTS RESERVED		MECHANICAL OUTLINE	PRINT VERSION NOT TO SCALE
TITLE: SENSOR UNIBODY, 11.33 X 11.33 X 12.955 PKG, 2.54 PITCH, 8 I/O		DOCUMENT NO: 98ASB17759C	REV: F
		STANDARD: NON-JEDEC	
		SOT1863-1	24 OCT 2017

Figure 32. SOT1863-1 Package Outline Notes

13 Revision history

Table 8. Revision history

Document ID	Release date	Description
MPX5010 v.14	17 May 2024	<ul style="list-style-type: none">The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. Legal texts have been adapted to the new company name where appropriate.Section 4, Table 1 and Section 4.1 Table 2, removed devices MPX5010GS, MPX5010GSX, MPXV5010G6U, MPXV5010GC6U, MPVZ5010G7U, and MPVZ5010G6U.Section 8, Table 6, Sensitivity Unit: Revised "mV/mm" to "mV/kPa".
MPX5010 v.13	October 2012	<ul style="list-style-type: none">Deleted references to device number MPVZ5010G6T1, MPVZ5010G6U/T1 and MPVZ5010G6U/6T1 throughout the document.

Legal information

Data sheet status

Document status ^{[1][2]}	Product status ^[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <https://www.nxp.com>.

Definitions

Draft — A draft status on a document indicates that the content is still under internal review and subject to formal approval, which may result in modifications or additions. NXP Semiconductors does not give any representations or warranties as to the accuracy or completeness of information included in a draft version of a document and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local NXP Semiconductors sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

Product specification — The information and data provided in a Product data sheet shall define the specification of the product as agreed between NXP Semiconductors and its customer, unless NXP Semiconductors and customer have explicitly agreed otherwise in writing. In no event however, shall an agreement be valid in which the NXP Semiconductors product is deemed to offer functions and qualities beyond those described in the Product data sheet.

Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information. NXP Semiconductors takes no responsibility for the content in this document if provided by an information source outside of NXP Semiconductors.

In no event shall NXP Semiconductors be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, NXP Semiconductors' aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the Terms and conditions of commercial sale of NXP Semiconductors.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors and its suppliers accept no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Customers are responsible for the design and operation of their applications and products using NXP Semiconductors products, and NXP Semiconductors accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the NXP Semiconductors product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

NXP Semiconductors does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using NXP Semiconductors products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). NXP does not accept any liability in this respect.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) will cause permanent damage to the device. Limiting values are stress ratings only and (proper) operation of the device at these or any other conditions above those given in the Recommended operating conditions section (if present) or the Characteristics sections of this document is not warranted. Constant or repeated exposure to limiting values will permanently and irreversibly affect the quality and reliability of the device.

Terms and conditions of commercial sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at <https://www.nxp.com/profile/terms>, unless otherwise agreed in a valid written individual agreement. In case an individual agreement is concluded only the terms and conditions of the respective agreement shall apply. NXP Semiconductors hereby expressly objects to applying the customer's general terms and conditions with regard to the purchase of NXP Semiconductors products by customer.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

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

Quick reference data — The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.

Suitability for use in non-automotive qualified products — Unless this document expressly states that this specific NXP Semiconductors product is automotive qualified, the product is not suitable for automotive use. It is neither qualified nor tested in accordance with automotive testing or application requirements. NXP Semiconductors accepts no liability for inclusion and/or use of non-automotive qualified products in automotive equipment or applications.

In the event that customer uses the product for design-in and use in automotive applications to automotive specifications and standards, customer (a) shall use the product without NXP Semiconductors' warranty of the product for such automotive applications, use and specifications, and (b) whenever customer uses the product for automotive applications beyond NXP Semiconductors' specifications such use shall be solely at customer's own risk, and (c) customer fully indemnifies NXP Semiconductors for any liability, damages or failed product claims resulting from customer design and use of the product for automotive applications beyond NXP Semiconductors' standard warranty and NXP Semiconductors' product specifications.

Translations — A non-English (translated) version of a document, including the legal information in that document, is for reference only. The English version shall prevail in case of any discrepancy between the translated and English versions.

Security — Customer understands that all NXP products may be subject to unidentified vulnerabilities or may support established security standards or specifications with known limitations. Customer is responsible for the design and operation of its applications and products throughout their lifecycles to reduce the effect of these vulnerabilities on customer's applications and products. Customer's responsibility also extends to other open and/or proprietary technologies supported by NXP products for use in customer's applications. NXP accepts no liability for any vulnerability. Customer should regularly check security updates from NXP and follow up appropriately.

Customer shall select products with security features that best meet rules, regulations, and standards of the intended application and make the ultimate design decisions regarding its products and is solely responsible for compliance with all legal, regulatory, and security related requirements concerning its products, regardless of any information or support that may be provided by NXP.

NXP has a Product Security Incident Response Team (PSIRT) (reachable at PSIRT@nxp.com) that manages the investigation, reporting, and solution release to security vulnerabilities of NXP products.

NXP B.V. — NXP B.V. is not an operating company and it does not distribute or sell products.

Trademarks

Notice: All referenced brands, product names, service names, and trademarks are the property of their respective owners.

NXP — wordmark and logo are trademarks of NXP B.V.

Tables

Tab. 1.	Ordering information	2	Tab. 5.	Limiting values	6
Tab. 2.	Ordering options	2	Tab. 6.	Recommended operating conditions	6
Tab. 3.	Pin descriptions - Unibody packages	4	Tab. 7.	Pressure (P1) side identification	9
Tab. 4.	Pin descriptions - Small Outline packages	5	Tab. 8.	Revision history	28

Figures

Fig. 1.	Fully Integrated Pressure Sensor Schematic	3	Fig. 13.	Temperature error band	8
Fig. 2.	MPX5010DP - SOT1756-1 - Case 867C-05	3	Fig. 14.	Pressure error band	9
Fig. 3.	MPX5010GP - SOT1852-1 - Case 867B-04	3	Fig. 15.	SOP Footprint (Case 482)	10
Fig. 4.	MPXV5010DP - SOT1693-1 - Case 1351-01	4	Fig. 16.	SOT1691-1 Package Outline	11
Fig. 5.	MPXV5010GC6T1 - SOT1854-1 - Case 482A-01	4	Fig. 17.	SOT1691-1 Package Outline Detail	12
Fig. 6.	MPXV5010GC7U - SOT1863-1 - Case 482C-03	4	Fig. 18.	SOT1691-1 Package Outline Notes	13
Fig. 7.	MPXV5010GP - SOT1693-3 - Case 1369-01	5	Fig. 19.	SOT1691-2 Package Outline	14
Fig. 8.	MPVZ5010GW6U - SOT1691-2 - Case 1735-01	5	Fig. 20.	SOT1691-2 Package Outline Detail	15
Fig. 9.	MPVZ5010GW7U - SOT1691-1 - Case 1560-02	5	Fig. 21.	SOT1691-2 Package Outline Notes	16
Fig. 10.	Cross-sectional diagram SOP (not to scale)	7	Fig. 22.	SOT1693-1 Package Outline	17
Fig. 11.	Recommended power supply decoupling and output filtering	7	Fig. 23.	SOT1693-1 Package Outline Notes	18
Fig. 12.	Output vs. Pressure Differential	8	Fig. 24.	SOT1693-3 Package Outline	19
			Fig. 25.	SOT1693-3 Package Outline Notes	20
			Fig. 26.	SOT1756-1 Package Outline	21
			Fig. 27.	SOT1852-1 Package Outline	22
			Fig. 28.	SOT1852-1 Package Outline Notes	23
			Fig. 29.	SOT1854-1 Package Outline	24
			Fig. 30.	SOT1854-1 Package Outline Notes	25
			Fig. 31.	SOT1863-1 Package Outline	26
			Fig. 32.	SOT1863-1 Package Outline Notes	27

Contents

1	General description	1
2	Features and benefits	1
3	Applications	1
4	Ordering information	2
4.1	Ordering options	2
5	Block diagram	3
6	Pinning information	3
6.1	Pinning - Unibody packages	3
6.2	Pin description - Unibody packages	4
6.3	Pinning - Small Outline packages	4
6.4	Pin description - Small Outline packages	5
7	Limiting values	6
8	Recommended operating conditions	6
9	On-chip temperature compensation and calibration	7
10	Pressure (P1) / Vacuum (P2) side identification table	9
11	Minimum recommended footprint for surface mounted applications	10
12	Package outline	11
13	Revision history	28
	Legal information	29

Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.



Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

 [View MPXV5010GC6U on WIN SOURCE](#)

 [NXP / Nexperia Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management