



Product Number: SM6841

## HIGHLIGHTS

- Small, low cost, robust SO8 package
- For high-volume applications
- Miniature Form Factor

## TYPICAL APPLICATIONS

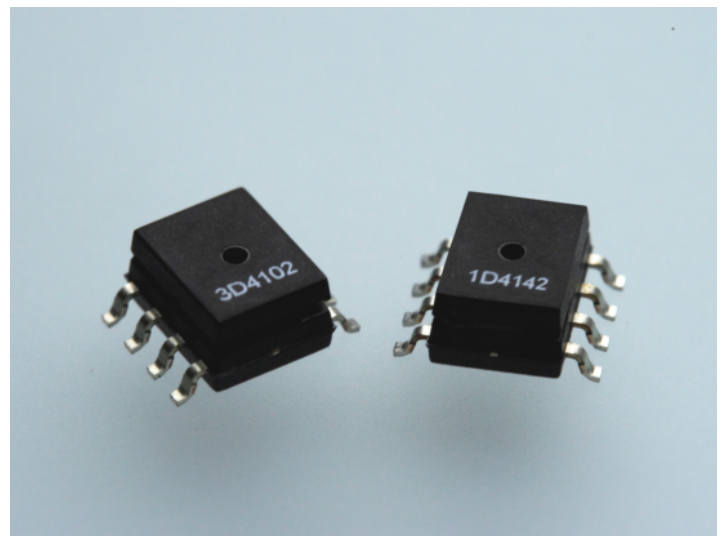
- Automotive tire pressure (TPMS)
- Engine control
- Barometric sensing
- Altitude correction detection
- Pneumatic gauges
- Home appliances
- Pressure Switches

## BASICS

- Absolute pressure
- PCB mountable
- Ported or non-porting configurations
- Tape and reel

## FEATURES

- 30 & 100 PSI (200 & 700 kPa)
- Wide temperature range (-40° to +125°C)
- Suitable for automated assembly
- Constant current or constant voltage drive
- High millivolt output
- Automotive Qualified (AEC-Q100)
- RoHS & REACH Compliant



SOIC8 Packaged Pressure Sensor

## DESCRIPTION

The SM6841 is a small outline SO-8 packaged pressure sensor that incorporates SMI's new SM6841 MEMS piezoresistive pressure sensing die. The SM6841 has been optimized to provide the highest possible accuracy for a package of this size. Performance is achieved through careful resistor placement and mechanical configuration along with advanced MEMS processing.

The packaged sensor is intended for high volume applications where cost is a critical factor, such as consumer and automotive products. The SM6841 is available as an absolute pressure sensor in full-scale range of 30 & 100 PSI (200 & 700 kPa). It is designed to be surface-mounted on ceramic or PC board substrates by high-volume OEM manufacturers.

The SM6841 is available in a non-porting, centered hole, configuration to be used for sensing general environmental pressures or use with an O-ring seal. Either option can be used to sense environmental pressure or measure pressure in a manifold configuration with an O-ring seal.

The standard configuration offers a protective gel over the die. A non-gel version is also available for high volumes where the maximum stability is required, such as in barometric, weather station sensing applications. The SM6841 is shipped tape and reel.



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## ABSOLUTE MAXIMUM RATING TABLE FOR SM6841 SENSOR

All parameters are specified at  $V_{SUPPLY} = 5.00$  V DC supply at room temperature, unless otherwise noted. All parts are covered with gel.

| No. | Characteristic                       | Symbol       | Minimum | Typical | Maximum | Units     |
|-----|--------------------------------------|--------------|---------|---------|---------|-----------|
| 1   | Excitation Voltage <sup>(a)</sup>    | $V_{SUPPLY}$ | 0.0     | 5.0     | 10.0    | V         |
| 2   | Excitation Current <sup>(a)</sup>    | $I_{SUPPLY}$ | 0.0     | 1.0     | 1.6     | mA        |
| 3   | Proof Pressure <sup>(b)</sup>        | $P_{PROOF}$  | 3×      | —       | —       | FS pRANGE |
| 4   | Burst Pressure <sup>(b)</sup>        | $P_{BURST}$  | 5×      | —       | —       | FS pRANGE |
| 5   | Operating Temperature <sup>(b)</sup> | $T_{OP}$     | -40     | —       | +125    | °C        |
| 6   | Storage Temperature <sup>(b)</sup>   | $T_{STG}$    | -55     | —       | +150    | °C        |

## NOTES:

(a) The device can only be driven with the supply voltage connected to the pins as shown. The positive output will increase with increasing pressure applied to the package.

(b) Tested on a sample basis.

## OPERATING CHARACTERISTICS FOR SM6841 SENSOR - SPECIFICATIONS

All parameters are specified at  $V_{SUPPLY} = 5.00$  V DC supply at room temperature, unless otherwise noted. All parts are covered with gel.

| No. | Characteristic                     | Symbol     | Minimum | Typical | Maximum | Units       |
|-----|------------------------------------|------------|---------|---------|---------|-------------|
| 7   | Span (30 & 100 PSI) <sup>(e)</sup> | $V_{SPAN}$ | 65      | 100     | 135     | mV          |
| 8   | Zero Offset                        | $V_{ZERO}$ | -35     | 0       | 35      | mV          |
| 9   | TC Span <sup>(b, e)</sup>          | TCS        | -0.24   | -0.19   | -0.155  | %FS/°C      |
| 10  | TC Zero Offset <sup>(b, e)</sup>   | TCZ        | -0.07   | -0.01   | +0.07   | %FS/°C      |
| 11  | TC Resistance <sup>(b, c, e)</sup> | TCR        | 0.24    | 0.275   | 0.33    | % $R_B$ /°C |
| 12  | Linearity <sup>(d)</sup>           | NL         | -0.2    | -0.07   | 0.2     | %FS         |
| 13  | Bridge Resistance                  | $R_B$      | 4.0     | 5.0     | 6.0     | k $\Omega$  |
| 14  | Input Capacitance <sup>(b)</sup>   | $C_{IN}$   | —       | < 2     | —       | pF          |

## NOTES:

(c) Determined by measurements taken at 0°C and 70°C.

(d) Defined as best fit straight line.

(e) For specifications regarding zero offset and span stability, please contact SMI Sales at +1-(408) 577-0100 or [sales@si-micro.com](mailto:sales@si-micro.com)

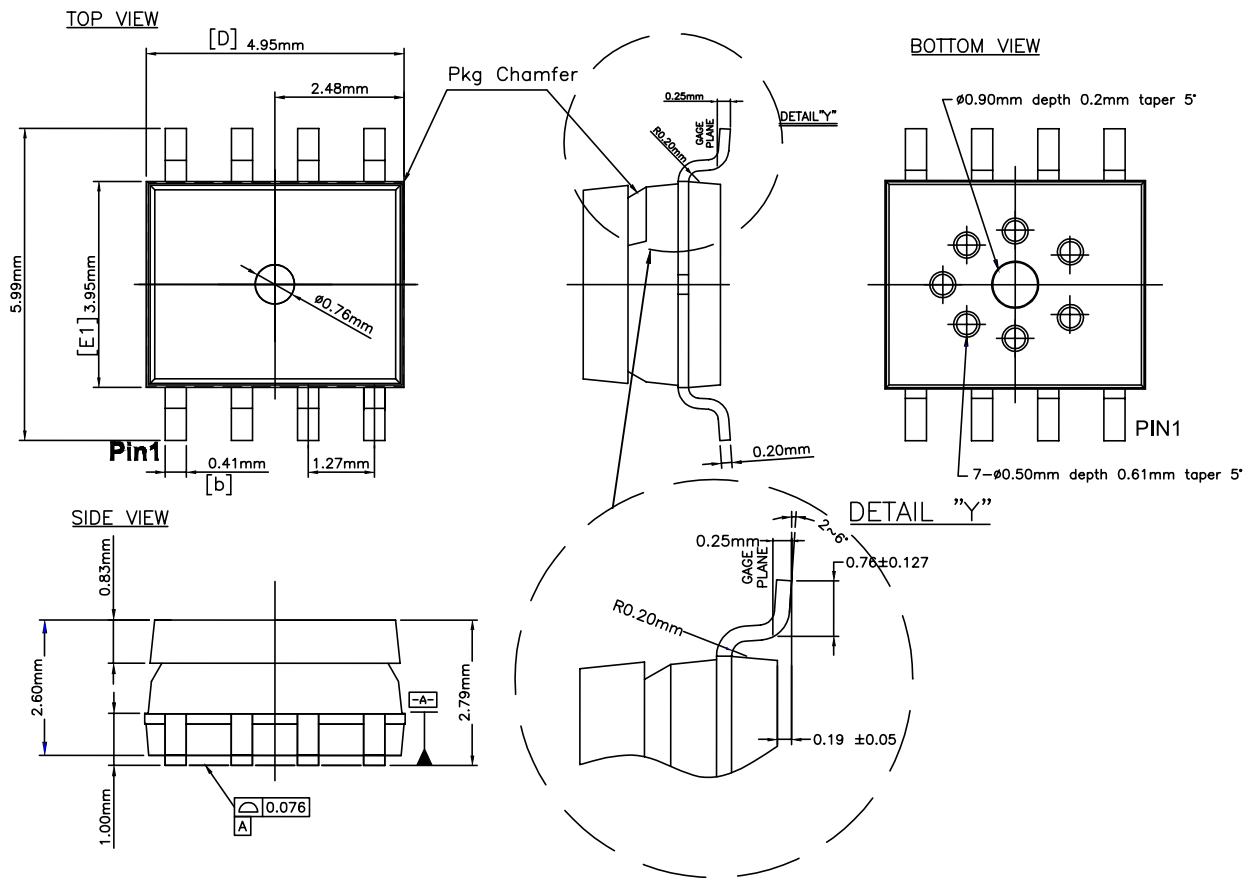
## QUALIFICATION STANDARDS

- REACH compliant
- RoHS compliant
- PFOS/PFOA compliant
- Qualified to meet AEC Q100 standards
- For qualification specifications please contact Sales at [sales@si-micro.com](mailto:sales@si-micro.com)

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Diagrams and Dimensions

H(ole) Configuration



Note: • All dimensions in mm  
• MSL = 3

| Pin-Out |                                                                                                                                                                                                                                                                                                                  |     |             |   |    |   |      |   |    |   |     |   |    |   |      |   |    |   |       |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------------|---|----|---|------|---|----|---|-----|---|----|---|------|---|----|---|-------|
|         | <table><tr><th>PIN</th><th>DESCRIPTION</th></tr><tr><td>1</td><td>NC</td></tr><tr><td>2</td><td>+Sig</td></tr><tr><td>3</td><td>NC</td></tr><tr><td>4</td><td>Gnd</td></tr><tr><td>5</td><td>NC</td></tr><tr><td>6</td><td>-Sig</td></tr><tr><td>7</td><td>NC</td></tr><tr><td>8</td><td>+Vexc</td></tr></table> | PIN | DESCRIPTION | 1 | NC | 2 | +Sig | 3 | NC | 4 | Gnd | 5 | NC | 6 | -Sig | 7 | NC | 8 | +Vexc |
| PIN     | DESCRIPTION                                                                                                                                                                                                                                                                                                      |     |             |   |    |   |      |   |    |   |     |   |    |   |      |   |    |   |       |
| 1       | NC                                                                                                                                                                                                                                                                                                               |     |             |   |    |   |      |   |    |   |     |   |    |   |      |   |    |   |       |
| 2       | +Sig                                                                                                                                                                                                                                                                                                             |     |             |   |    |   |      |   |    |   |     |   |    |   |      |   |    |   |       |
| 3       | NC                                                                                                                                                                                                                                                                                                               |     |             |   |    |   |      |   |    |   |     |   |    |   |      |   |    |   |       |
| 4       | Gnd                                                                                                                                                                                                                                                                                                              |     |             |   |    |   |      |   |    |   |     |   |    |   |      |   |    |   |       |
| 5       | NC                                                                                                                                                                                                                                                                                                               |     |             |   |    |   |      |   |    |   |     |   |    |   |      |   |    |   |       |
| 6       | -Sig                                                                                                                                                                                                                                                                                                             |     |             |   |    |   |      |   |    |   |     |   |    |   |      |   |    |   |       |
| 7       | NC                                                                                                                                                                                                                                                                                                               |     |             |   |    |   |      |   |    |   |     |   |    |   |      |   |    |   |       |
| 8       | +Vexc                                                                                                                                                                                                                                                                                                            |     |             |   |    |   |      |   |    |   |     |   |    |   |      |   |    |   |       |

| Typical Operation |             |            |       |
|-------------------|-------------|------------|-------|
| PIN               | DESCRIPTION | TYPE       | VALUE |
| 2                 | +Sig        | Analog Out | -     |
| 4                 | Gnd         | Gnd        | 0 V   |
| 6                 | -Sig        | Analog Out | -     |
| 8                 | +Vexc       | Power      | +5 V  |

Ordering Information

| Order Code       | Full-Scale Pressure Range | Pressure Type | Minimum Order Quantity |
|------------------|---------------------------|---------------|------------------------|
| SM6841-030-A-H-T | 30 PSI / 200 kPa          | Absolute      | 2,000 units            |
| SM6841-100-A-H-T | 100 PSI / 700 kPa         | Absolute      | 2,000 units            |

For samples, please contact the Sales Department at: sales@si-micro.com

Product Number: SM6841

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