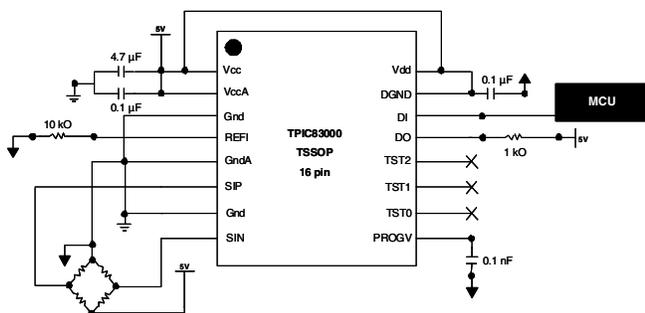


TPIC83000 Pressure Sensor Interface Device

The TPIC83000 is a single-channel signal conditioning device for pressure sensors used in applications such as vehicle passenger occupancy detection. The pressure sensor can be based on strain gauge, piezoresistive, or capacitive elements. This device provides an analog signal conditioning interface between the pressure sensor and a microcontroller. The Analog Front End (AFE) inside the device will process the sensed signal (e.g., weight) from the pressure sensor by amplifying the signal and canceling offset. This processed signal is then converted into a 14-bit, digital word using a sigma-delta analog-to-digital converter (ADC). The device also has a built-in 12-bit ADC that is used to sense ambient temperature to compensate for the temperature coefficient of the sensor and related peripheral circuitry. The compensated digital data is transferred to the microprocessor via a built-in UART interface.

| Part Number | TPIC83000 |
|--|--|
| Vdd, Vcc, VccA | 7 V (absolute max); 5 V (typ.) |
| Amplifier Input Voltage (SIP, SIN) | 0.5Vcc + 0.2 V (max.) |
| Total current consumption (Ivcc, Ivdd, IvccA) | 13 mA (@ operating conditions) |
| Analog Front-end gain (Av) | 300 V/V (typ.) |
| Analog Front-end gain temp. drift (TCAG) | +/- 0.5 % |
| Data Input/Output Accuracy (DOER) | +/- 1% FS (include life time drift) |
| Input offset trim range / trimming step / resolution (1st-order) | +/- 120 mV / 8 μ V / 17 bits |
| Programmable gain range / step / resolution (1st-order) | 75 to 125% of analog gain / 0.1 / 9 bits |
| Input offset voltage (Vcc = 5V; VSIP = VSIN = 2.5 V) | -20 / + 20 μ V (min. / max.) |
| Input Common-mode range (SIP, SIN) | 0.5Vcc + 0.2 V |
| Supported protocol(s) | UART |
| Baud rate (max.) | 38.4 kbps (max.) |
| Programming voltage for charge pump (CProgV) | 500 pF / 1500 pF (min. / max.) |
| Operating Temperature | -40°C - +85°C |
| Storage Temperature | -40°C - +125°C |
| Package / Pin count | TSSOP / 16 |



| Pin | Symbol | Description |
|-----|--------|------------------------------------|
| 1 | Vcc | 5-V input analog supply |
| 2 | VccA | ADC positive reference |
| 3 | GND | Ground (analog) |
| 4 | REFI | Current reference (Vbg/R) |
| 5 | GNDA | ADC negative reference |
| 6 | SIP | Positive sensor input |
| 7 | GND | Ground (analog) |
| 8 | SIN | Negative sensor input |
| 9 | PROGV | EEPROM programming voltage monitor |
| 10 | TST0 | Test I/O (Analog / Digital) |
| 11 | TST1 | Test I/O (Analog / Digital) |
| 12 | TST2 | Test I/O (Digital) |
| 13 | DO | UART interface output |
| 14 | DI | UART interface input |
| 15 | DGND | Digital ground |
| 16 | Vdd | 5V digital supply |

For more information, contact the sales office or distributor nearest you. This contact info can be found on our web site at <http://www.ti.com>

Texas Instruments reserves the right to change its products and services at any time without notice. TI provides customer assistance in various technical areas, but does not have full access to data concerning the uses and applications of customer products. Therefore, TI assumes no responsibility for customer product design or for infringement of patents and/or rights of third parties, which may result from assistance provided by TI.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products

| | |
|-----------------------------|--|
| Amplifiers | amplifier.ti.com |
| Data Converters | dataconverter.ti.com |
| DLP® Products | www.dlp.com |
| DSP | dsp.ti.com |
| Clocks and Timers | www.ti.com/clocks |
| Interface | interface.ti.com |
| Logic | logic.ti.com |
| Power Mgmt | power.ti.com |
| Microcontrollers | microcontroller.ti.com |
| RFID | www.ti-rfid.com |
| RF/IF and ZigBee® Solutions | www.ti.com/lprf |

Applications

| | |
|--------------------|--|
| Audio | www.ti.com/audio |
| Automotive | www.ti.com/automotive |
| Broadband | www.ti.com/broadband |
| Digital Control | www.ti.com/digitalcontrol |
| Medical | www.ti.com/medical |
| Military | www.ti.com/military |
| Optical Networking | www.ti.com/opticalnetwork |
| Security | www.ti.com/security |
| Telephony | www.ti.com/telephony |
| Video & Imaging | www.ti.com/video |
| Wireless | www.ti.com/wireless |

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2009, Texas Instruments Incorporated