

**Brief Description**

The ZSSC3036 is a sensor signal conditioner (SSC) integrated circuit for high-accuracy amplification and analog-to-digital conversion of a differential input signal. Designed for high-resolution altimeter module applications, the ZSSC3036 can perform offset, span, and 1<sup>st</sup> and 2<sup>nd</sup> order temperature compensation of the measured signal. Developed for correction of resistive bridge sensors, it can also provide a corrected temperature output measured with an internal sensor.

The measured and corrected bridge values are provided at the digital output pins, which can be configured as I<sup>2</sup>C™\* (≤ 3.4MHz) or SPI (≤ 20MHz). Digital compensation of signal offset, sensitivity, temperature, and non-linearity is accomplished via an 18-bit internal digital signal processor (DSP) running a correction algorithm. Calibration coefficients are stored on-chip in a highly reliable, non-volatile, multiple-time programmable (MTP) memory. Programming the ZSSC3036 is simple via the serial interface. The IC-internal charge pump provides the MTP programming voltage. The interface is used for the PC-controlled calibration procedure, which programs the set of calibration coefficients in memory. The ZSSC3036 provides accelerated signal processing in order to support high-speed control, safety, and real-time sensing applications. It complements IDT's additional ZSSC30x6 products.

**Features**

- Flexible, programmable analog front-end design; up to 16-bit scalable, charge-balancing two-segment analog-to-digital converter (ADC)
- Fully programmable gain amplifier accepting sensors from 14 to 72 (linear factor)
- Internal auto-compensated temperature sensor
- Digital compensation of individual sensor offset; 1<sup>st</sup> and 2<sup>nd</sup> order digital compensation of sensor gain as well as of 1<sup>st</sup> and 2<sup>nd</sup> order temperature gain and offset drift
- Fast sensing: 16-bit conditioned sensor signal measurement rate at more than 200s<sup>-1</sup>
- Typical sensor elements can achieve accuracy of less than ±0.10% FSO\*\* @ -40 to 110°C

**Benefits**

- Integrated 18-bit calibration math DSP
- Fully corrected signal at digital output
- Layout customized for die-die bonding with sensor for high-density chip-on-board assembly
- Single-pass calibration minimizes calibration costs
- No external trimming, filter, or buffering components required
- Highly integrated CMOS design
- Excellent for low-voltage and low-power battery applications
- Optimized for operation in calibrated resistive sensor modules

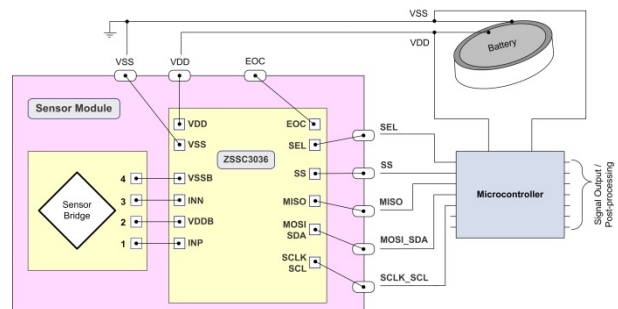
**Physical Characteristics**

- Supply voltage range: 1.8 to 3.6V
- Current consumption: 1mA (operating mode)
- Sleep State current: 50nA (typical)
- Temperature resolution: <0.003K/LSB
- Operation temperatures: -40°C to +85°C  
-40°C to +110°C
- Small die size
- Delivery options: die for wafer bonding

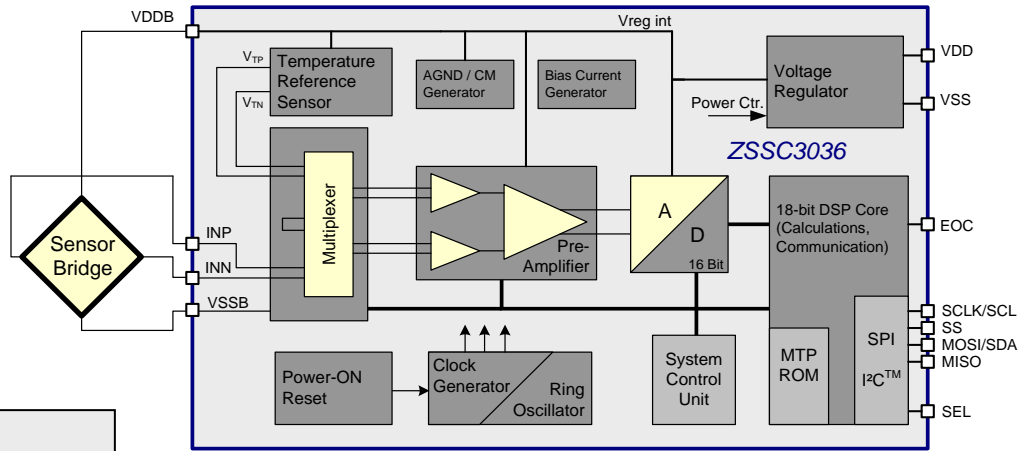
\* I<sup>2</sup>C™ is a trademark of NXP.

\*\* FSO = Full Scale Output.

**ZSSC3036 Application Example**



**ZSSC3036  
Block Diagram**



**Applications**

- ❖ Barometric altitude measurement for portable navigation or emergency call systems
- ❖ Altitude measurement for car navigation
- ❖ Inside hard disk pressure measurement
- ❖ Weather forecast
- ❖ Fan control
- ❖ Industrial, pneumatic, and liquid pressure

**Ordering Information** (See section 6 in the data sheet for additional options for delivery package and wafer thickness of 725µm.)

Sales Code	Description	Delivery Package
ZSSC3036CC1B	Die—temperature range: -40°C to +85 °C	Wafer (304µm) unsawn, tested
ZSSC3036CI1B	Die—temperature range: -40°C to +85 °C, extended qualification	Wafer (304µm) unsawn, tested
ZSSC3036CC1C	Die—temperature range: -40°C to +85°C	Dice on frame (304µm), tested
ZSSC3036CI1BH	Die—temperature range: -40°C to +110 °C, extended qualification	Wafer (304µm) unsawn, tested
ZSSC3036CI1CH	Die—temperature range: -40°C to +110 °C, extended qualification	Dice on frame (304µm), tested
ZSSC30x6-KIT	Evaluation Kit for ZSSC30x6 Product Family, including boards, cable, software, and 1 sample	

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