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 1st and 2nd 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 I²C™* (≤ 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; 1st and 2nd order digital compensation of sensor gain as well as of 1st and 2nd order temperature gain and offset drift
- Fast sensing: 16-bit conditioned sensor signal measurement rate at more than 200s^{-1}
- 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

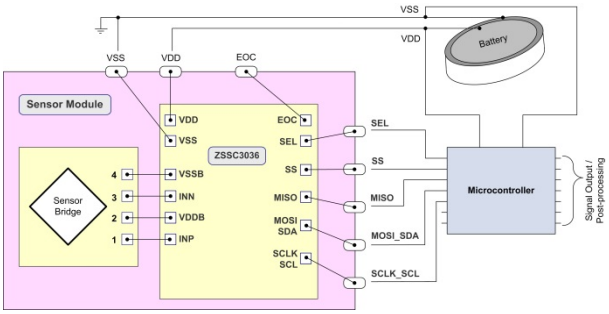
Physical Characteristics

- 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

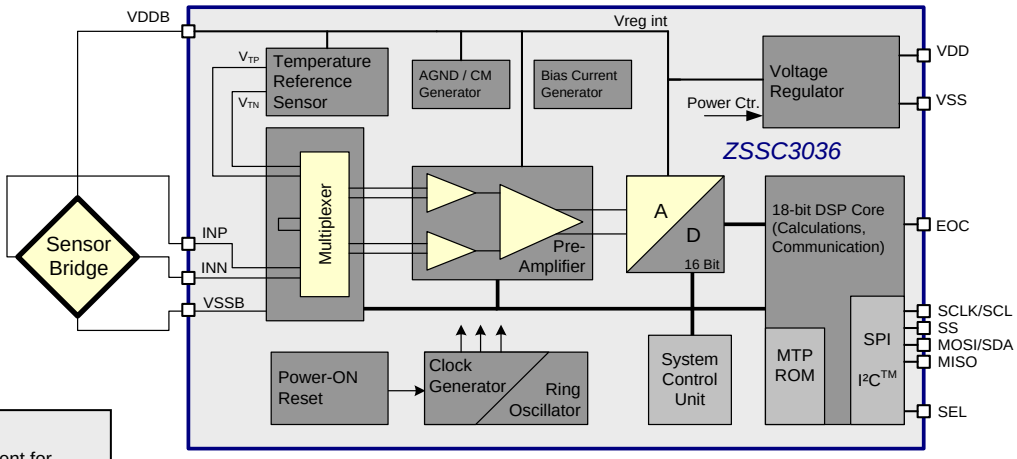
* I²C™ is a trademark of NXP.

** 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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