

## Brief Description

The ZSSC3015 sensor signal conditioner IC is adjustable to nearly all piezo-resistive bridge sensors. Measured and corrected bridge values are provided at the Sig™ pin, which can be configured as an analog voltage output or as a one-wire serial digital output.

The ZACwire™ digital one-wire interface (OWI) can be used for a simple PC-controlled calibration procedure to program a set of calibration coefficients into an on-chip EEPROM. The calibrated ZSSC3015 and a specific sensor are mated digitally: fast, precise, and without the cost overhead associated with trimming by external devices or laser. Integrated diagnostics functions make the ZSSC3015 particularly well suited for automotive applications.

## Features

- Digital compensation of sensor offset, sensitivity, temperature drift, and nonlinearity
- Programmable analog gain and digital gain; accommodates bridges with spans < 1mV/V and high offset
- Many diagnostic features on chip (e.g., EEPROM signature, bridge connection checks, bridge short detection, power loss detection)
- Independently programmable high and low clipping levels
- 24-bit customer ID field for module traceability
- Internal temperature compensation reference (no external components)
- Option for external temperature compensation with addition of single diode
- Output options: rail-to-rail ratiometric analog voltage (12-bit resolution), absolute analog voltage, ZACwire™ digital one-wire interface
- Fast power-up to data out response; output available 5ms after power-up
- Current consumption depends on programmed sample rate and mode: 1mA down to 300µA (typ.)
- Fast response time: 1.4ms typical
- High voltage protection: ≤ 30V with external JFET
- AEC-Q100 qualified

## Benefits

- No external trimming components required
- PC-controlled configuration and calibration via ZACwire™ one-wire interface – simple, low cost
- High accuracy (as high as ±0.1% FSO @ -25 to 85°C; ±0.25% FSO @ -50 to 150°C)
- Single-pass calibration – quick and precise

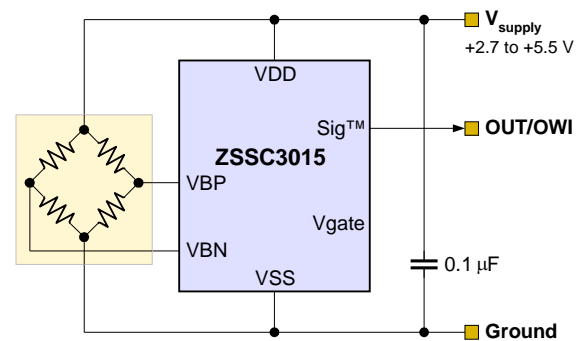
## Available Support

- Evaluation Kit available
- Mass Calibration System available
- Support for industrial mass calibration available
- Quick circuit customization possible for large production volumes

## Physical Characteristics

- Wide operation temperature: –50°C to +150°C
- Supply voltage 2.7 to 5.5V; with external JFET, 5.5 to 30V
- Small SOP8 package

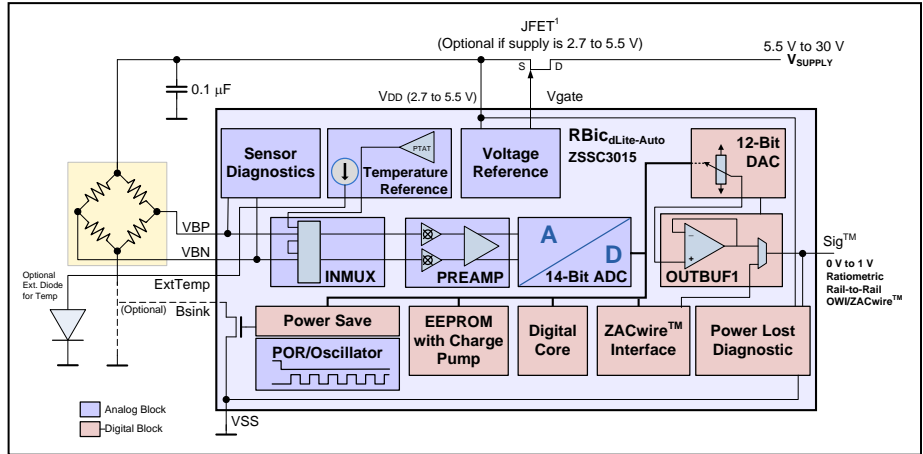
## ZSSC3015 Application Circuit



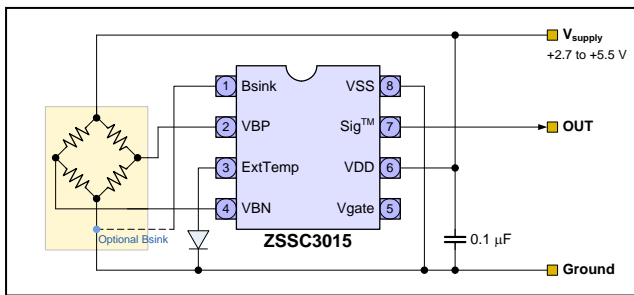
**ZSSC3015 Block Diagram**

*Highly Versatile Applications  
in Many Markets Including*

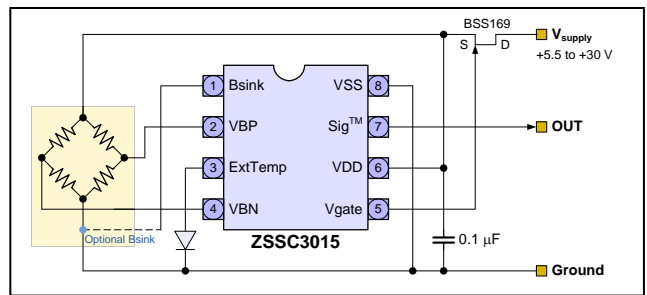
- ❖ Industrial
- ❖ Building Automation
- ❖ Office Automation
- ❖ White Goods
- ❖ Automotive
- ❖ Portable Devices
- ❖ Your Innovative Designs



**Rail-to-Rail Ratiometric Voltage Output Applications**



**Absolute Analog Voltage Output Applications**



**Part Ordering Examples** (See section 11 in the data sheet for additional options.)

Sales Code	Description	Package
ZSSC3015NE1B	ZSSC3015 Die — Temperature range: -50°C to +150°C	Unsawn on Wafer
ZSSC3015NE1C	ZSSC3015 Die — Temperature range: -50°C to +150°C	Sawn on Wafer Frame
ZSSC3015NE2T(R)	ZSSC3015 SOP8 (150 mil) — Temperature range: -50°C to +150°C	Tube: add "-T" to sales code. Reel: add "-R"
ZSSC3015KIT	ZSSC3015 SSC Evaluation Kit: Communication Board, SSC Board, Sensor Replacement Board, USB cable, 5 IC samples, instructions for downloading SSC Evaluation Software	Kit

## IMPORTANT NOTICE AND DISCLAIMER

RENESAS ELECTRONICS CORPORATION AND ITS SUBSIDIARIES (“RENESAS”) PROVIDES TECHNICAL SPECIFICATIONS AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT OF THIRD-PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for developers who are designing with Renesas products. You are solely responsible for (1) selecting the appropriate products for your application, (2) designing, validating, and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. Renesas grants you permission to use these resources only to develop an application that uses Renesas products. Other reproduction or use of these resources is strictly prohibited. No license is granted to any other Renesas intellectual property or to any third-party intellectual property. Renesas disclaims responsibility for, and you will fully indemnify Renesas and its representatives against, any claims, damages, costs, losses, or liabilities arising from your use of these resources. Renesas' products are provided only subject to Renesas' Terms and Conditions of Sale or other applicable terms agreed to in writing. No use of any Renesas resources expands or otherwise alters any applicable warranties or warranty disclaimers for these products.

(Disclaimer Rev.1.01 Jan 2024)

### Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,  
Koto-ku, Tokyo 135-0061, Japan  
[www.renesas.com](http://www.renesas.com)

### Trademarks

Renesas and the Renesas logo are trademarks of Renesas Electronics Corporation. All trademarks and registered trademarks are the property of their respective owners.

### Contact Information

For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit [www.renesas.com/contact-us/](http://www.renesas.com/contact-us/).