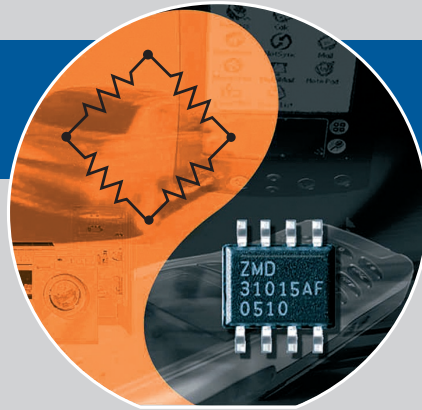# ZMD31015

RBic_{dLite}™

Low-Cost Sensor Signal Conditioner with Diagnostics

PRELIMINARY

Features

- Digital compensation of sensor offset, sensitivity, temperature drift and non-linearity
- 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
- Digital calibration and configuration via one-wire interface – quick and precise
- 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, digital one-wire-interface
- Supply voltage 2.7 to 5.5V; with external JFET, 5.5 to 30V
- Fast power-up to data out response; output available 5ms after power up
- Current consumption depends on programmed sample rate; 1mA down to 250µA (typical)
- Operation temperature: –50°C to +150°C
- Fast response time: 1ms (typical)
- High voltage protection up to 30V with external JFET
- No external trimming components required
- High accuracy (±0.1% FSO @ -25 to 85°C; ±0.25% FSO @ -50 to 150°C)

Brief Description

The RBic_{dLite}™ is a CMOS integrated circuit for highly accurate amplification and sensor-specific correction of bridge sensor signals. Digital compensation of sensor offset, sensitivity, temperature drift and non-linearity is accomplished via an internal digital signal processor running a correction algorithm with calibration coefficients stored in a non-volatile EEPROM.

The RBic_{dLite}™ 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 digital one-wire interface can be used for a simple PC-controlled calibration procedure to program a set of calibration coefficients into an on-chip EEPROM. The calibrated RBic_{dLite}™ 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 RBic_{dLite}™ particularly well suited for automotive applications.

- The RBic_{dLite}™ Development Kit is available – includes the Development Board, SOP8 samples, software, and documentation.
- Support for industrial mass calibration is available
- Quick circuit customization possible for large production volumes

Application Circuit
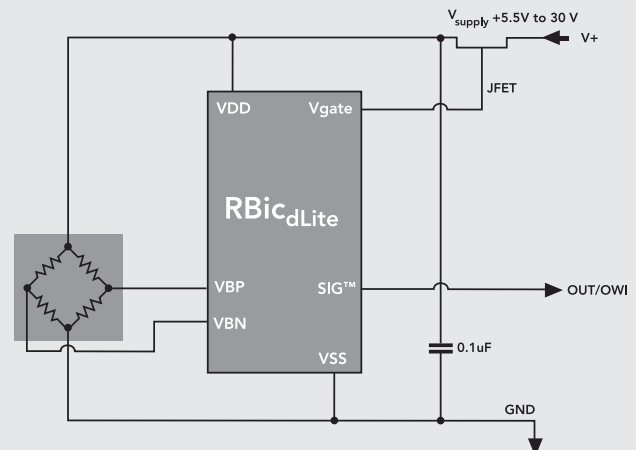
Typical RBic_{dLite}™ Application Circuit

Application Examples

Automotive

- Airflow
- Differential Pressure
- Process Control

Industrial

- Process Control
- Dataloggers

Appliances

- Filter Check
- Refrigerant
- Pressure Monitoring

Consumer/Medical

- Blood Pressure Meters
- PDAs
- Mobile Phones

Ordering Code

Example:	Z M D 3 1 0 1 5 B I F - T

ZMD Product Sales Name

Design Revision

A = first design revision
B = second design revision
etc.

Target Application Area/
Usual Operating Temperature Range*

I = Industrial (-40°C to +125°C)
E = Extended automotive (-50°C to +125°C)

Delivery Form**

T = delivery in tube
R = delivery in tape on reel
S = special (e.g. sample box)

Die/Package Options

B = tested dice on unsawn wafer
C = tested dice on frame
D = tested dice in waffle pack
F = finished parts in plastic package
G1 = finished parts in "green" plastic package
(lead-free terminals – pure Sn)

* only for serial parts; engineering samples don't have this character
** only for finished parts in plastic package

Engineering samples can be marked with the additional characters "ES".
Not all possible product versions are available. Please ask ZMD sales
if and when a certain product version is available.

For further information:

ZMD AG
Grenzstrasse 28
01109 Dresden
Germany
Tel +49.351.8822.366
Fax +49.351.8822.337
sales@zmd.de

ZMD America, Inc.
201 Old Country Road, Suite 204
Melville, NY 11747
USA
Tel +1.631.549.2666
Fax +1.631.549.2882
sales@zmda.com

ZMD Far East
1F, No. 14, Lane 268, Sec. 1 Guangfu Rd.
HsinChu City 300
Taiwan
Tel +886.3.563.1388
Fax +886.3.563.6385
sales@zmd.de

© ZMD AG 2006 · Rev. 0.1 · Preliminary

www.zmd.biz