Brief Description
The ZSSC5101 is a CMOS integrated circuit for converting sine and cosine signals obtained from magnetoresistive bridge sensors into a ratiometric analog voltage with a user-programmable range of travel and clamping levels.
The ZSSC5101 accepts sensor bridge arrangements for both rotational as well as linear movement. Depending on the type of sensor bridge, a full-scale travel range of up to 360 mechanical degrees can be obtained.
Programming of the device is performed through the output pin, allowing in-line programming of fully assembled 3-wire sensors. Programming parameters are stored in an EEPROM and can be re-programmed multiple times.
The ZSSC5101 is fully automotive-qualified with an ambient temperature range up to 160°C.

Features
- Ratiometric analog output
- Up to 4608 analog steps
- Step size as small as 0.022°
- Programming through output pin via one-wire interface
- Offset calibration of the bridge input signals
- Programmable linear transfer characteristic:
  - Zero position
  - Angular range
  - Upper and lower clamping levels
  - Rising or falling slope
- Loss of magnet indication with programmable threshold level
- Accepts anisotropic, giant, and tunnel magnetoresistive bridge sensors (AMR, GMR and TMR)
- Programmable 32-bit user ID
- CRC, error detection, and error correction on EEPROM data
- Diagnostics: broken-wire detection
- Automotive-qualified to AEC-Q100, grade 0

Benefits
- No external trimming components required
- PC-controlled configuration and single-pass calibration via one-wire interface allows programming of fully assembled sensors
- Can be used with low-cost ferrite magnets
- Allows large air gaps between sensors and magnets
- Optimized for automotive environments with extended temperature range and special protection circuitry with excellent electromagnetic compatibility
- Power supply monitoring
- Sensor monitoring
- Detection of EEPROM memory failure
- Connection failure management
- High accuracy: ± 0.15° integral nonlinearity (INL) after calibration

Available Support
- Evaluation Kit
- Application Notes

Physical Characteristics
- Wide operation temperature: -40 C to +160 C (die)
- Supply voltage: 4.5V to 5.5V
- SSOP-14 package, bare die, or unsawn wafer

ZSSC5101 Typical Application Circuit
Applications

- Absolute Rotary Position Sensor
- Steering Wheel Position Sensor
- Pedal Position Sensor
- Throttle Position Sensor
- Float-Level Sensor
- Ride Height Position Sensor
- Non-Contacting Potentiometer
- Rotary Dial

Ordering Information

<table>
<thead>
<tr>
<th>Sales Code</th>
<th>Description</th>
<th>Delivery Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSSC5101BE1B</td>
<td>ZSSC5101 Die – Temperature range: -40°C to +160°C</td>
<td>8” tested wafer, unsawn, thickness = 390 ±15µm</td>
</tr>
<tr>
<td>ZSSC5101BE2B</td>
<td>ZSSC5101 Die – Temperature range: -40°C to +160°C</td>
<td>8” tested wafer, unsawn, thickness = 725 ±15µm</td>
</tr>
<tr>
<td>ZSSC5101BE3B</td>
<td>ZSSC5101 Die – Temperature range: -40°C to +160°C</td>
<td>8” tested wafer, unsawn, thickness = 250 ±15µm</td>
</tr>
<tr>
<td>ZSSC5101BE1C</td>
<td>ZSSC5101 Die – Temperature range: -40°C to +160°C</td>
<td>8” tested wafer, sawn on frame, thickness = 390 ±15µm</td>
</tr>
<tr>
<td>ZSSC5101BE4R</td>
<td>ZSSC5101 SSOP-14 – Temperature range: -40°C to +150°C</td>
<td>13” tape and reel</td>
</tr>
<tr>
<td>ZSSC5101BE4T</td>
<td>ZSSC5101 SSOP-14 – Temperature range: -40°C to +150°C</td>
<td>Tube</td>
</tr>
<tr>
<td>ZSSC5101 KIT</td>
<td>Evaluation Kit: USB Communication Board, ZSSC5101 AMR board, adapters. Software is downloaded (see data sheet).</td>
<td></td>
</tr>
</tbody>
</table>

Corporate Headquarters

6024 Silver Creek Valley Road
San Jose, CA 95138
www.IDT.com

Sales

1-800-345-7015 or 408-284-8200
Fax: 408-284-2775
www.IDT.com/go/sales

Tech Support

www.IDT.com/go/support

DISCLAIMER Integrated Device Technology, Inc. (IDT) reserves the right to modify the products and/or specifications described herein at any time, without notice, at IDT’s sole discretion. Performance specifications and operating parameters of the described products are determined in an independent state and are not guaranteed to perform the same way when installed in customer products. The information contained herein is provided without representation or warranty of any kind, whether express or implied, including, but not limited to, the suitability of IDT’s products for any particular purpose, an implied warranty of merchantability, or non-infringement of the intellectual property rights of others. This document is presented only as a guide and does not convey any license under intellectual property rights of IDT or any third parties.

IDT’s products are not intended for use in applications involving extreme environmental conditions or in life support systems or similar devices where the failure or malfunction of an IDT product can be reasonably expected to significantly affect the health or safety of users. Anyone using an IDT product in such a manner does so at their own risk, absent an express, written agreement by IDT.

Integrated Device Technology, IDT and the IDT logo are trademarks or registered trademarks of IDT and its subsidiaries in the United States and other countries. Other trademarks used herein are the property of IDT or their respective third party owners. For datasheet type definitions and a glossary of common terms, visit www.idt.com/go/glossary. All contents of this document are copyright of Integrated Device Technology, Inc. All rights reserved.