

### General Description

The TMR2101 linear sensor utilizes a unique push-pull half bridge composed of four unshielded TMR sensor elements. The unique bridge design provides a high sensitivity signal output that is linearly proportional to a magnetic field applied parallel to the surface of the sensor package, and it provides superior temperature compensation of the output. The TMR2101 is available in a 6 mm X 5 mm X1.7 mm SOP8 package.

### Features and Benefits

- Tunneling Magneto resistance (TMR) Technology
- High Sensitivity
- Large Dynamic Range
- Very Low Power Consumption
- Excellent Thermal Stability
- Very Low Hysteresis
- Compatible with Wide Range of Supply Voltages

### Applications

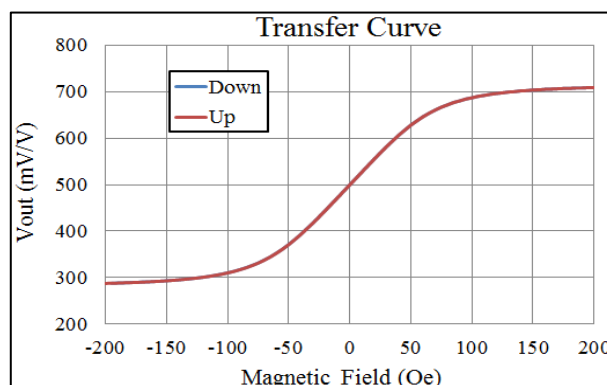
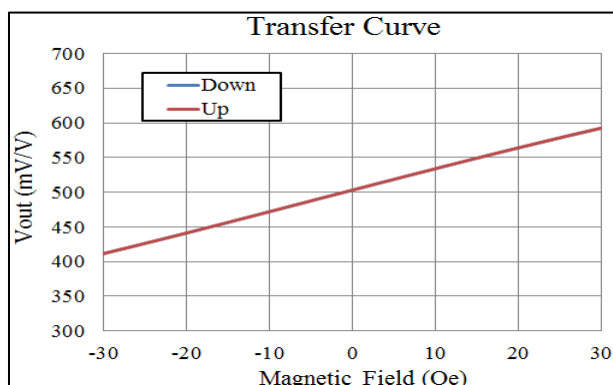
- Weak Magnetic Field Sensing
- Current Sensors
- Displacement Sensing
- Rotary Position Sensors



TMR2101

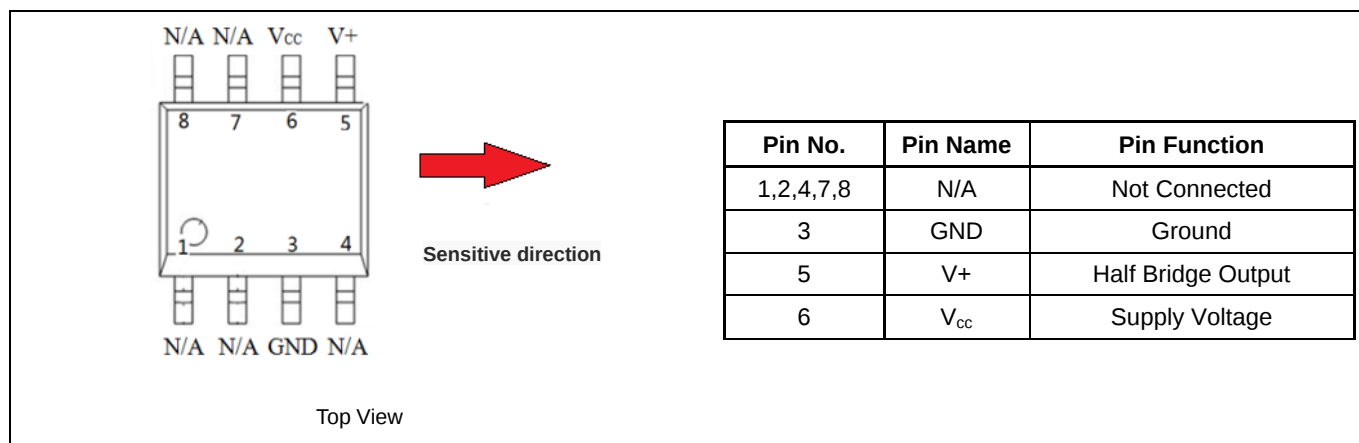
### Transfer Curve

The following figure shows the response of the TMR2101 to an applied magnetic field in the range of  $\pm 30$  Oe (left) and  $\pm 200$  Oe (right) when the TMR2101 is biased at 1V. At low fields the TMR2101 response is highly linear, and it is not harmed when the sensor is driven into saturation.



## Pin Configuration

(Arrow indicates direction of applied field that generates a positive output voltage after a SET pulse.)



## Absolute Maximum Ratings

| Parameter              | Symbol           | Limit    | Unit              |
|------------------------|------------------|----------|-------------------|
| Supply Voltage         | V <sub>CC</sub>  | 7        | V                 |
| Reverse Supply Voltage | V <sub>RCC</sub> | 7        | V                 |
| Max Exposed Field      | H <sub>E</sub>   | 1000     | Oe <sup>(1)</sup> |
| ESD Voltage            | V <sub>ESD</sub> | 4000     | V                 |
| Operating Temperature  | T <sub>A</sub>   | -40~125  | °C                |
| Storage Temperature    | T <sub>stg</sub> | -50 ~150 | °C                |

## Specification (V<sub>CC</sub>=1.0V, T<sub>A</sub>=25°C)

| Parameter                              | Symbol              | Conditions       | Min | Typ                | Max | Unit    |
|----------------------------------------|---------------------|------------------|-----|--------------------|-----|---------|
| Supply Voltage                         | V <sub>CC</sub>     | Operating        |     | 1                  | 7   | V       |
| Supply Current                         | I <sub>CC</sub>     | Output Open      |     | 5                  |     | μA      |
| Resistance                             | R                   |                  |     | 200 <sup>(2)</sup> |     | kOhm    |
| Sensitivity                            | SEN                 | Fit @±30Oe       |     | 3                  |     | mV/V/Oe |
| Saturation Field                       | H <sub>sat</sub>    |                  |     | ±70                |     | Oe      |
| Range Linear                           |                     | 1% Non-linearity |     | ±30                |     | Oe      |
| Offset Voltage                         | V <sub>offset</sub> |                  |     | ±2.5               |     | mV/V    |
| Hysteresis                             | Hys                 | Fit @±30Oe       |     | 0.1                |     | %FS     |
| Temperature Coefficient of Offset      | TCO                 | H = 0 Oe         |     | 0.005              |     | mV/V/°C |
| Temperature Coefficient of Sensitivity | TCS                 |                  |     | -1000              |     | PPM/°C  |

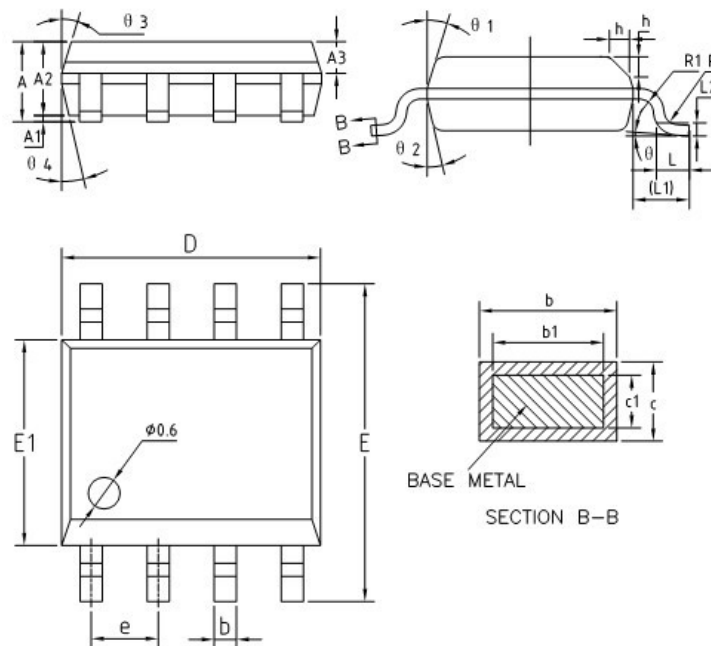
Notes:

(1) 1 Oe (Oersted) = 1 Gauss in air = 0.1 millitesla = 79.8 A/m.

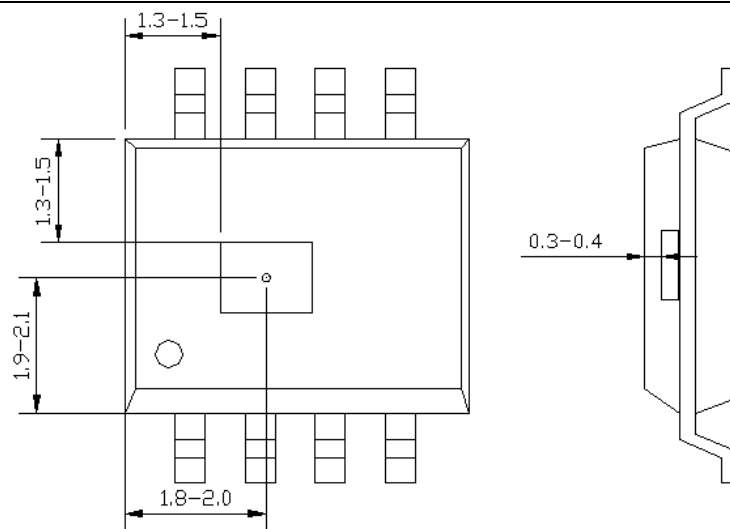
(2) Custom sensor resistance may be available upon request.

## Package Information

| COMMON DIMENSIONS<br>(UNITS OF MEASURE=MILLIMETER) |         |      |      |
|----------------------------------------------------|---------|------|------|
| SYMBOL                                             | MIN     | NOM  | MAX  |
| A                                                  | 1.35    | 1.55 | 1.75 |
| A1                                                 | 0.10    | 0.15 | 0.25 |
| A2                                                 | 1.25    | 1.40 | 1.65 |
| A3                                                 | 0.50    | 0.60 | 0.70 |
| b                                                  | 0.38    | —    | 0.51 |
| b1                                                 | 0.37    | 0.42 | 0.47 |
| c                                                  | 0.18    | —    | 0.25 |
| c1                                                 | 0.17    | 0.20 | 0.23 |
| D                                                  | 4.80    | 4.90 | 5.00 |
| E                                                  | 5.80    | 6.00 | 6.20 |
| E1                                                 | 3.80    | 3.90 | 4.00 |
| e                                                  | 1.17    | 1.27 | 1.37 |
| L                                                  | 0.45    | 0.60 | 0.80 |
| L1                                                 | 1.04REF |      |      |
| L2                                                 | 0.25BSC |      |      |
| R                                                  | 0.07    | —    | —    |
| R1                                                 | 0.07    | —    | —    |
| h                                                  | 0.30    | 0.40 | 0.50 |
| θ                                                  | 0°      | —    | 8°   |
| θ 1                                                | 15°     | 17°  | 19°  |
| θ 2                                                | 11°     | 13°  | 15°  |
| θ 3                                                | 15°     | 17°  | 19°  |
| θ 4                                                | 11°     | 13°  | 15°  |



## TMR Sensor Position



Top view and side view(unit: mm)

RoHS  
COMPLIANT



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