

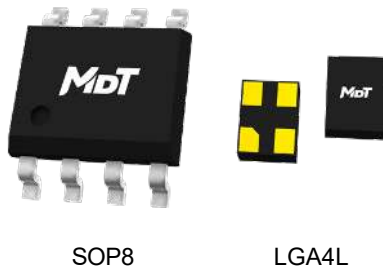
TMR2185

High Frequency Response Programmable TMR Linear Magnetic Sensor

Description

TMR2185 TMR linear sensor adopts a unique push-pull Wheatstone full bridge structure utilizing four TMR sensor elements. This Wheatstone full bridge provides differential voltage output with excellent temperature stability when the applied magnetic field changes parallel to the sensor's sensitive direction.

The TMR2185 linear magnetic sensor is available in SOP8 and LGA4L (2 mm × 1.5 mm × 0.73 mm) package with P/N of TMR2185P and TMR2185G.



SOP8

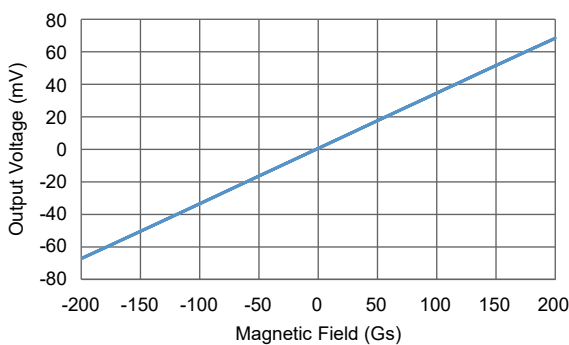
LGA4L

Features and Benefits

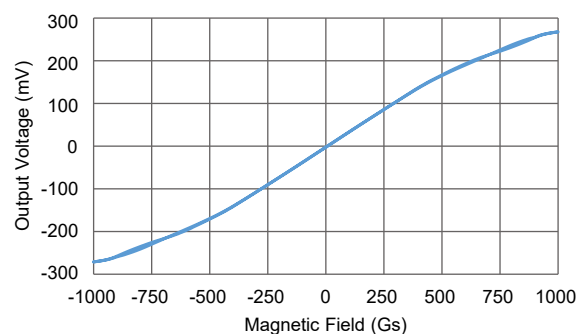
- Tunneling magnetoresistance (TMR) technology
- High sensitivity
- Large dynamic range
- Low power consumption
- Excellent temperature stability

Applications

- Magnetometer
- Current sensor
- Position sensor
- Rotation sensor



TMR2185 ±200 Gs Output Curve



TMR2185 ±1000 Gs Output Curve

Selection Guide

| Part Number | Supply Voltage | Saturation Field | Sensitivity | Package | Packing Form |
|-------------|----------------|------------------|--------------|---------|--------------|
| TMR2185P | 0.5 V to 7 V | ±1000 Gs | 0.34 mV/V/Gs | SOP8 | Tape & Reel |
| TMR2185G | 0.5 V to 7 V | ±1000 Gs | 0.34 mV/V/Gs | LGA4L | Tape & Reel |

Catalogue

| | |
|-----------------------------------|----|
| 1. Pin Configuration | 03 |
| 2. Sensing Direction | 03 |
| 3. Absolute Maximum Ratings | 04 |
| 4. Electrical Specifications..... | 04 |
| 5. Dimensions..... | 05 |

1. Pin Configuration

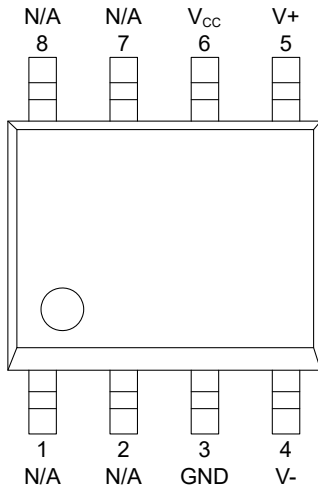


Figure 1-1. Pin Configuration (SOP8)

| Pin Number | Name | Function |
|------------|-----------------|------------------------------|
| 3 | GND | Ground |
| 4 | V- | Analog differential output 2 |
| 5 | V+ | Analog differential output 1 |
| 6 | V _{CC} | Supply voltage |
| 1, 2, 7, 8 | N/A | Not connected |

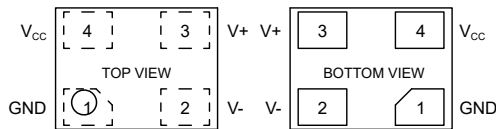


Figure 1-2. Pin Configuration (LGA4L)

| Pin Number | Name | Function |
|------------|-----------------|------------------------------|
| 1 | GND | Ground |
| 2 | V- | Analog differential output 2 |
| 3 | V+ | Analog differential output 1 |
| 4 | V _{CC} | Supply voltage |

2. Sensing Direction

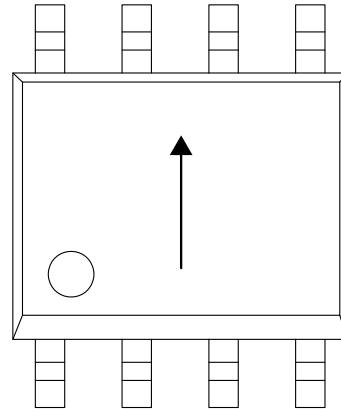


Figure 2-1. Sensing Direction (SOP8)

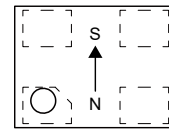


Figure 2-2. Sensing Direction (LGA4L)

3. Absolute Maximum Ratings

| Parameters | Symbol | Min. | Max. | Unit |
|-------------------------------|-----------|------|------|------|
| Supply voltage | V_{CC} | - | 7 | V |
| Reverse supply voltage | V_{RCC} | - | 7 | V |
| External magnetic field | B | - | 4000 | Gs |
| ESD performance (HBM) | V_{ESD} | - | 4000 | V |
| Operating ambient temperature | T_A | -40 | 125 | °C |
| Storage ambient temperature | T_{STG} | -50 | 150 | °C |

4. Electrical Specifications

$V_{CC} = 1.0\text{ V}$, $T_A = 25\text{ °C}$, differential output unless otherwise specified

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|-------------------------------------|--------------|--------------------------------------|------|-------|------|---------|
| Supply Voltage | V_{CC} | Operating | 0.5 | - | 7 | V |
| Supply Current ¹⁾ | I_{CC} | Open output, $V_{CC} = 1.0\text{ V}$ | - | 250 | - | μA |
| Resistance ¹⁾ | R_B | - | - | 4.3 | - | kΩ |
| Sensitivity | SEN | B in ±200 Gs | - | 0.34 | - | mV/V/Gs |
| Saturation Magnetic Field | B_{SAT} | - | - | ±1000 | - | Gs |
| Nonlinearity | NONL | B in ±200 Gs | - | 0.2 | - | %FS |
| Offset | V_{OFFSET} | - | -10 | - | 10 | mV/V |
| Hysteresis | HYS | B in ±200 Gs | - | 0.3 | - | Gs |
| Resistance Temperature Coefficient | TCR_B | B = 0 Gs | - | -660 | - | PPM/°C |
| Sensitivity Temperature Coefficient | TCS | - | - | -770 | - | PPM/°C |

1) $I_{CC} = V_{CC} / R_B$, and supply current changes linearly with supply voltage.

5. Dimensions

SOP8 Package

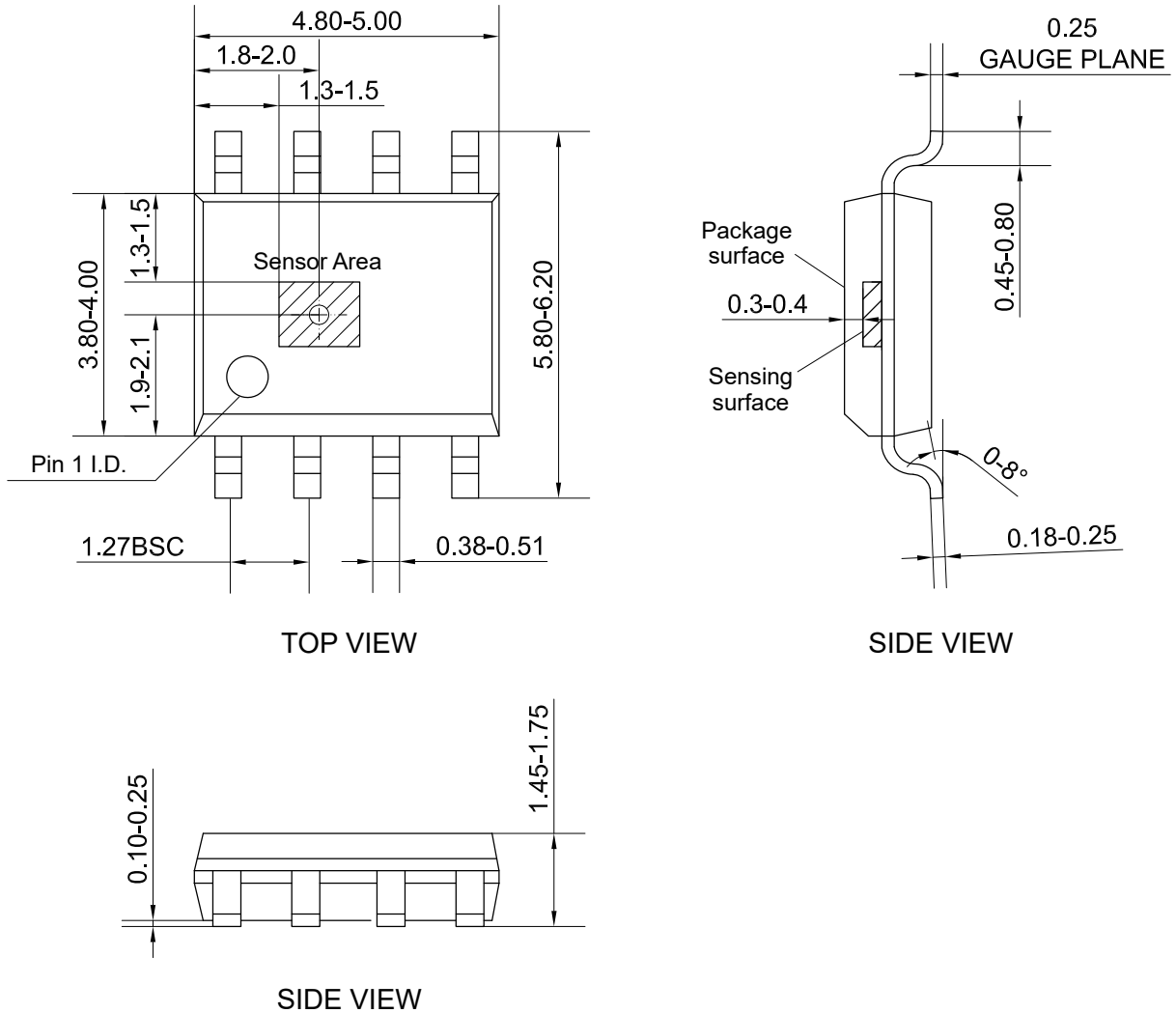


Figure 3. Package outline of SOP8 (unit: mm)

LGA4L Package

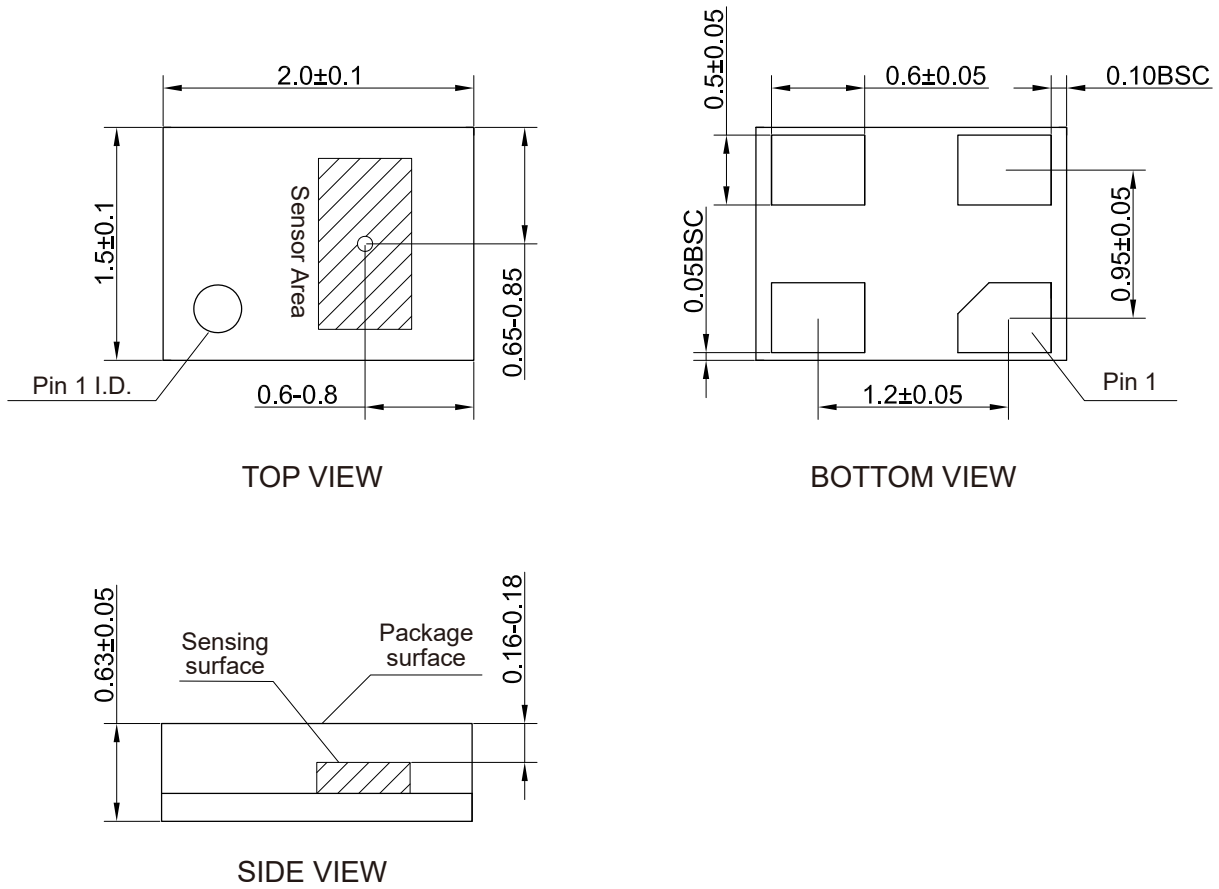


Figure 4. Package outline of LGA4L (unit: mm)

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