TMR2185

Large Dynamic Range TMR Linear Magnetic Sensor

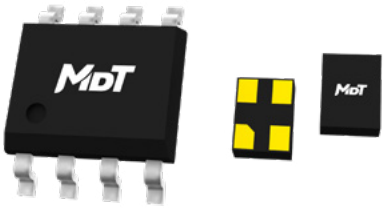
Description

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.

Features and Benefits

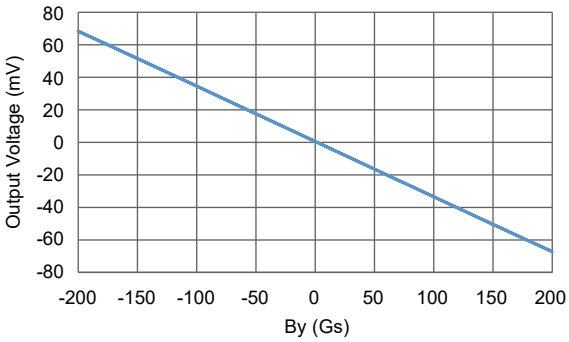
- Tunneling magnetoresistance (TMR) technology
- High sensitivity
- Large dynamic range
- Low power consumption
- Excellent temperature stability
- RoHS & REACH compliant



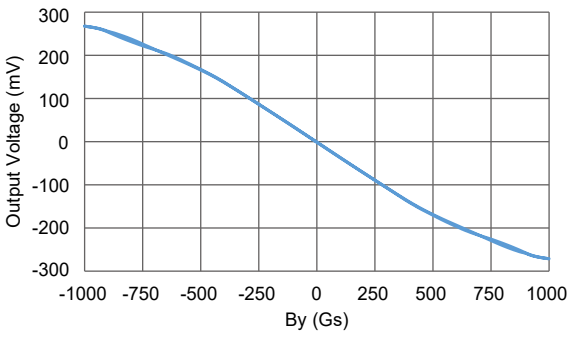
SOP8 LGA4L

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. Operating Principle

The TMR2185 sensing axis is parallel to the package top-marking surface; the sensing axis is defined from the N pole toward the S pole, as indicated by the arrow in the figure below.

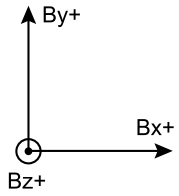


Figure 1-1. Definition of axis

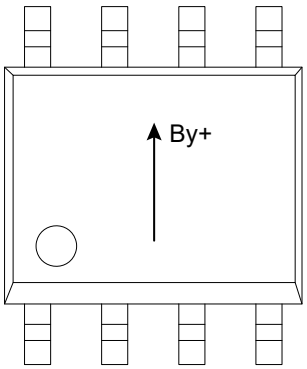


Figure 1-2. Axial diagram (SOP8 top view)

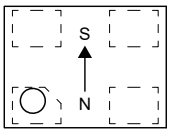


Figure 1-3. Axial diagram (LGA4L top view)

The TMR2185 output voltage varies linearly with the magnetic field along the sensing axis.

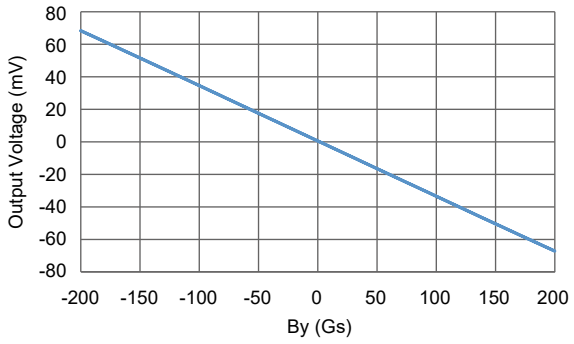


Figure 2-1. TMR2185 output curve

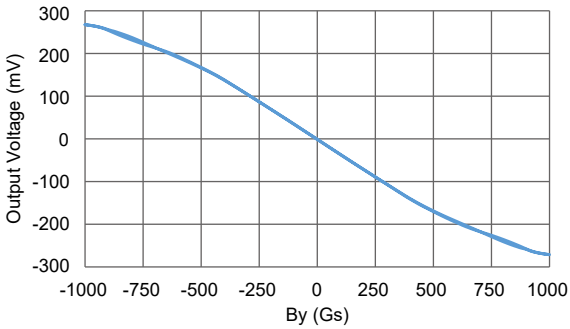


Figure 2-2. TMR2185 output curve

2. Pin Configuration

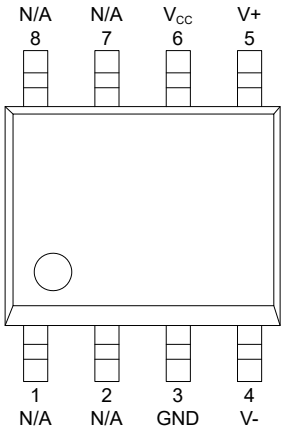


Figure 3-1. Pin Configuration（SOP8）

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

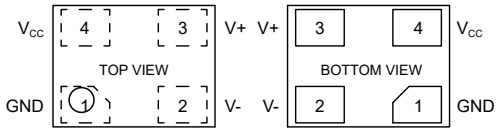


Figure 3-2. Pin Configuration（LGA4L）

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

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 V, T_A = 25 °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 V	-	250	-	μA
Resistance [1)]	R_B	-	-	43	-	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

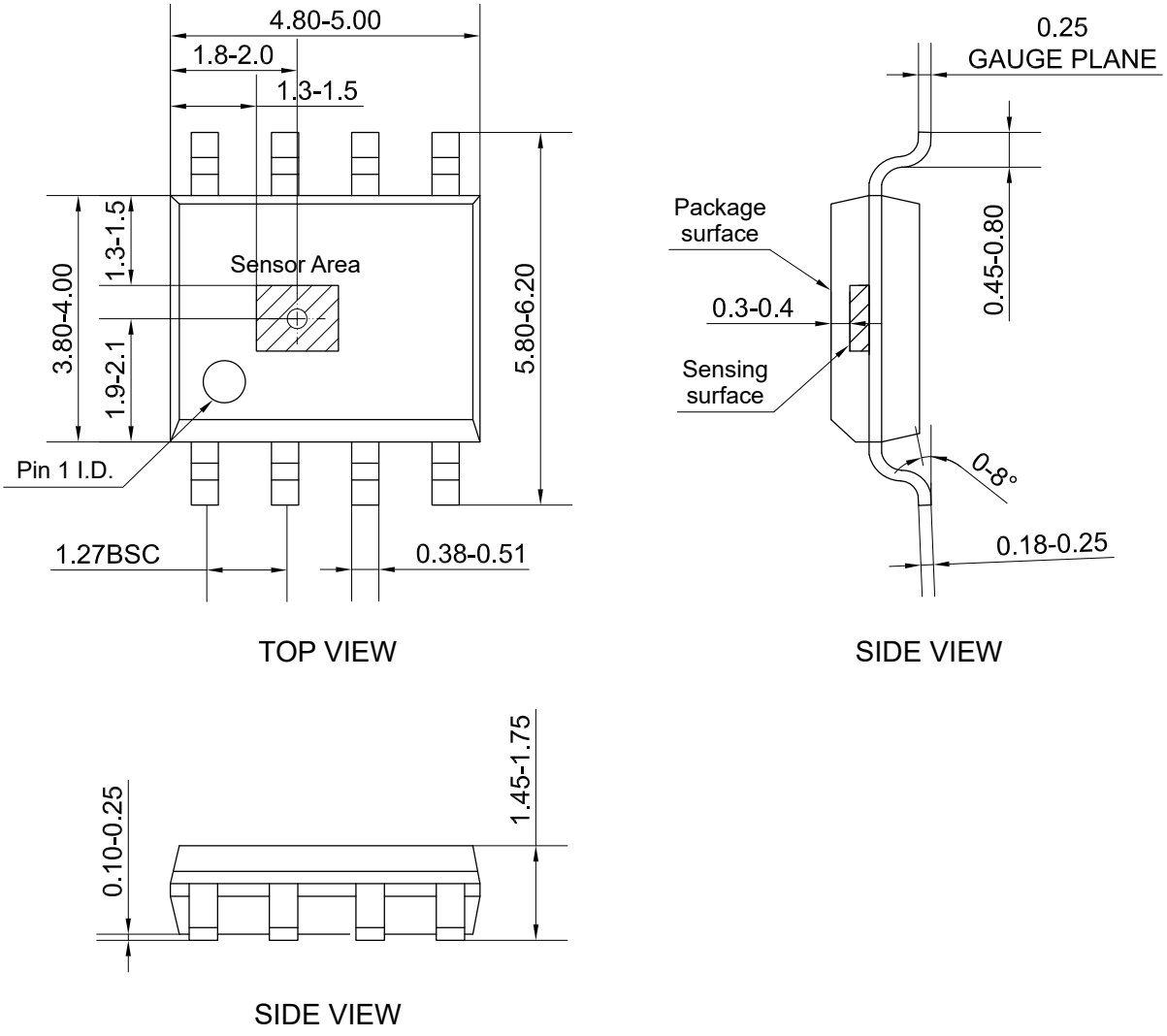


Figure 4. Package outline of SOP8 (unit: mm)

LGA4L Package

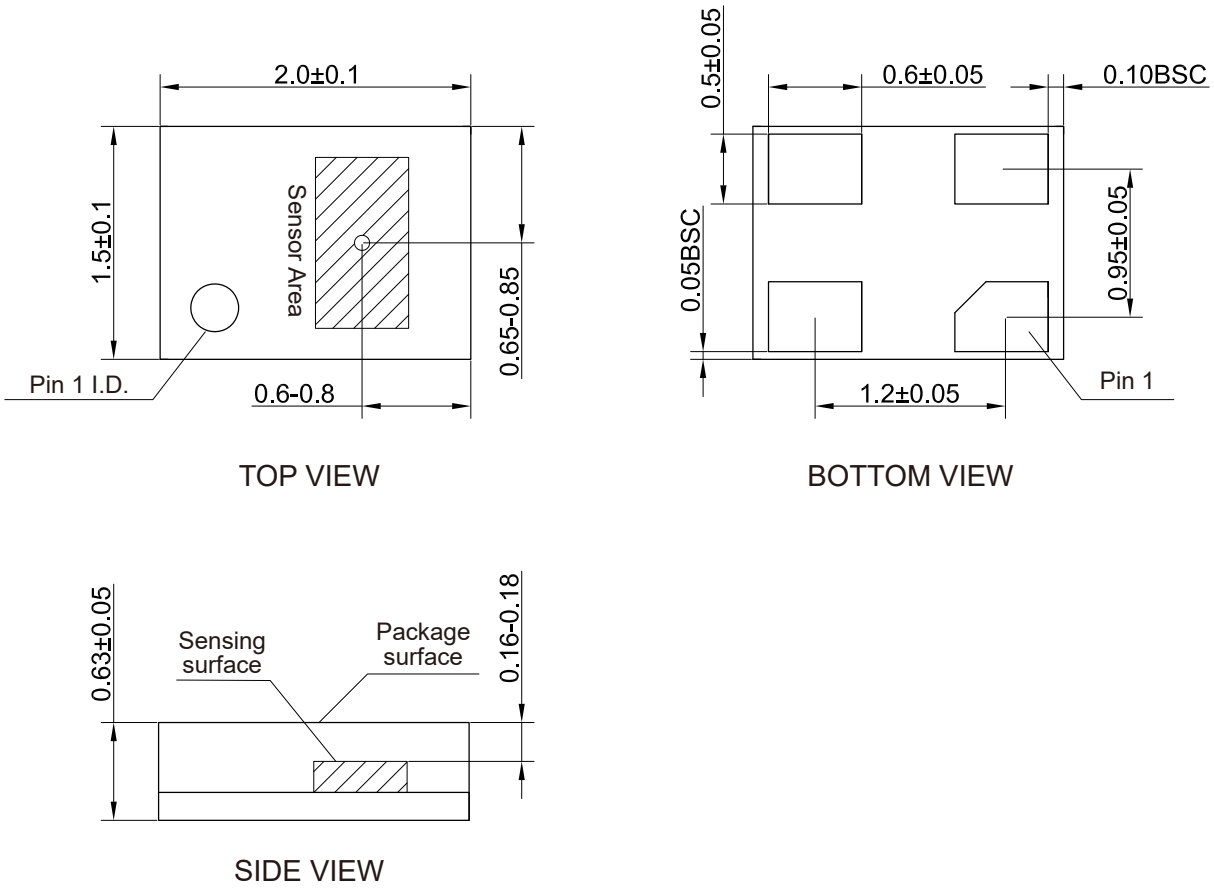


Figure 5. Package outline of LGA4L (unit: mm)

Recycling

The product(s) in this document should be disposed of at the end of the product(s) life using a qualified waste management company for recycling in accordance with local regulations.

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