TMR2905

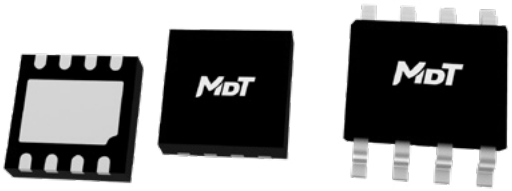
High sensitivity, Low Noise TMR Magnetic Linear Sensor

Description

The TMR2905 linear sensor utilizes a unique push-pull Wheatstone bridge composed of four unshielded TMR sensor elements. The unique bridge design provides a high sensitivity differential 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 TMR2905 is available in SOP8 package and DFN8L (3 mm × 3 mm × 0.75 mm) package.

Features and Benefits

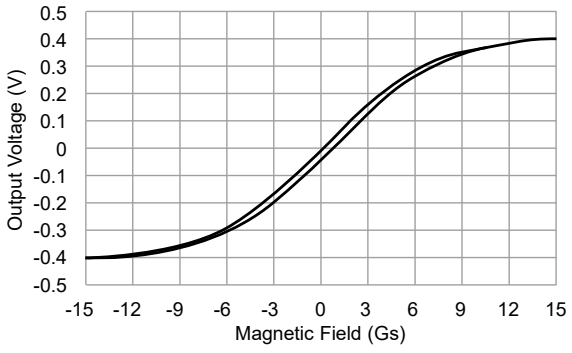
- Tunneling magnetoresistance (TMR) technology
- Ultra high sensitivity (50~60 mV/V/Gs)
- Large dynamic range
- Very low power consumption
- Excellent thermal stability
- Very low hysteresis
- Compatible with wide range of supply voltages
- Ultra low noise spectral density: < 2 nT/rt(Hz)@1Hz
- RoHS & REACH compliant



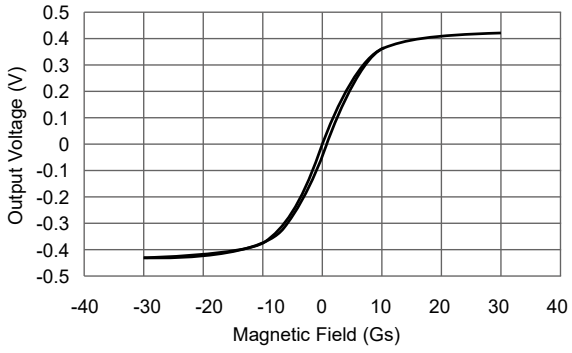
DFN8L SOP8

Applications

- Weak magnetic field sensing
- Current sensors
- Position and displacement sensing



TMR2905 ±15Gs Output Curve



TMR2905 ±30Gs Output Curve

Selection Guide

Part Number	Linear Range	Resistance	Package	Packing Form
TMR2905SP	±5 Gs	5 kΩ	SOP8	Tape & Reel
TMR2905BP	±5 Gs	45 kΩ	SOP8	Tape & Reel
TMR2905SD	±5 Gs	5 kΩ	DFN8L	Tape & Reel
TMR2905BD	±5 Gs	45 kΩ	DFN8L	Tape & Reel

Catalogue

1. Sensing Direction

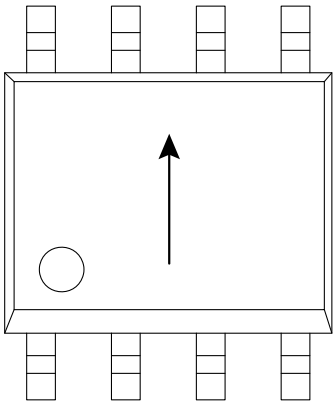


Figure 1-1. Sensing Direction (SOP8)

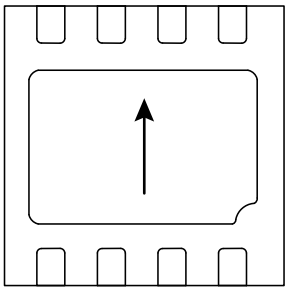


Figure 1-2. Sensing Direction (DFN8L)

2. Pin Configuration

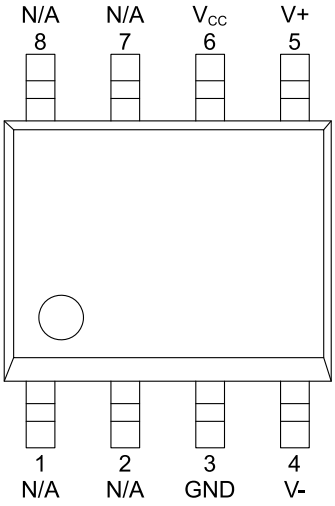


Figure 2-1. Pin Configuration (SOP8)

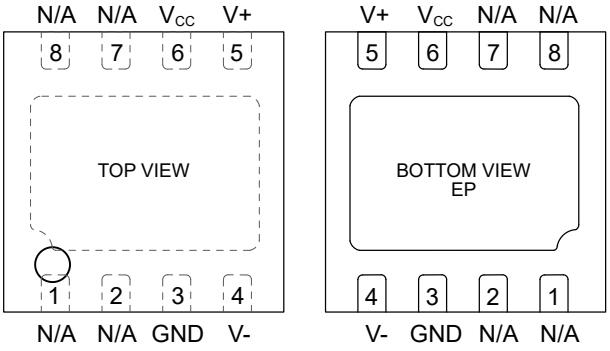


Figure 2-2. Pin Configuration (DFN8L)

Pin Number	Name	Function
1, 2, 7, 8	N/A	Not connected
3	GND	Ground
4	V-	Analog differential output 2
5	V+	Analog differential output 1
6	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	Applicable Model
Supply Voltage	V_{CC}	Operating	-	1	7	V	All models
Supply Current [1)]	I_{CC}	Open output	-	0.2, 0.02	-	mA	All models
Resistance [2)]	R_B	Between V_{CC} and GND	2	5	8	kΩ	TMR2905S
		Between V_{CC} and GND	35	45	55	kΩ	TMR2905B
Sensitivity	SEN	Fit in ±5 Gs	45	-	65	mV/V/Gs	All models
Saturation Magnetic Field	B_{SAT}	-	-	±10	-	Gs	All models
Nonlinearity	NONL	Fit in ±5 Gs	-	2	-	%FS	All models
Offset Voltage	V_{OFFSET}	-	-30	-	30	mV/V	All models
Hysteresis	HYS	Fit in ±30 Gs	-	-	1	Gs	All models
		Fit in ±2 Gs	-	-	0.2	Gs	All models
Temperature Coefficient of Resistance	TCR_B	B = 0 Gs	-	-500	-	PPM/°C	All models
Temperature Coefficient of Sensitivity	TCS	-	-	-1100	-	PPM/°C	All models
Noise spectral density	N_i	@1Hz	-	2	-	nT/rt(Hz)	All models

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

2) 45kΩ be defined TMR2905B, 5kΩ be defined TMR2905S, Custom resistance may be available upon request.

5. Dimensions

SOP8 Package

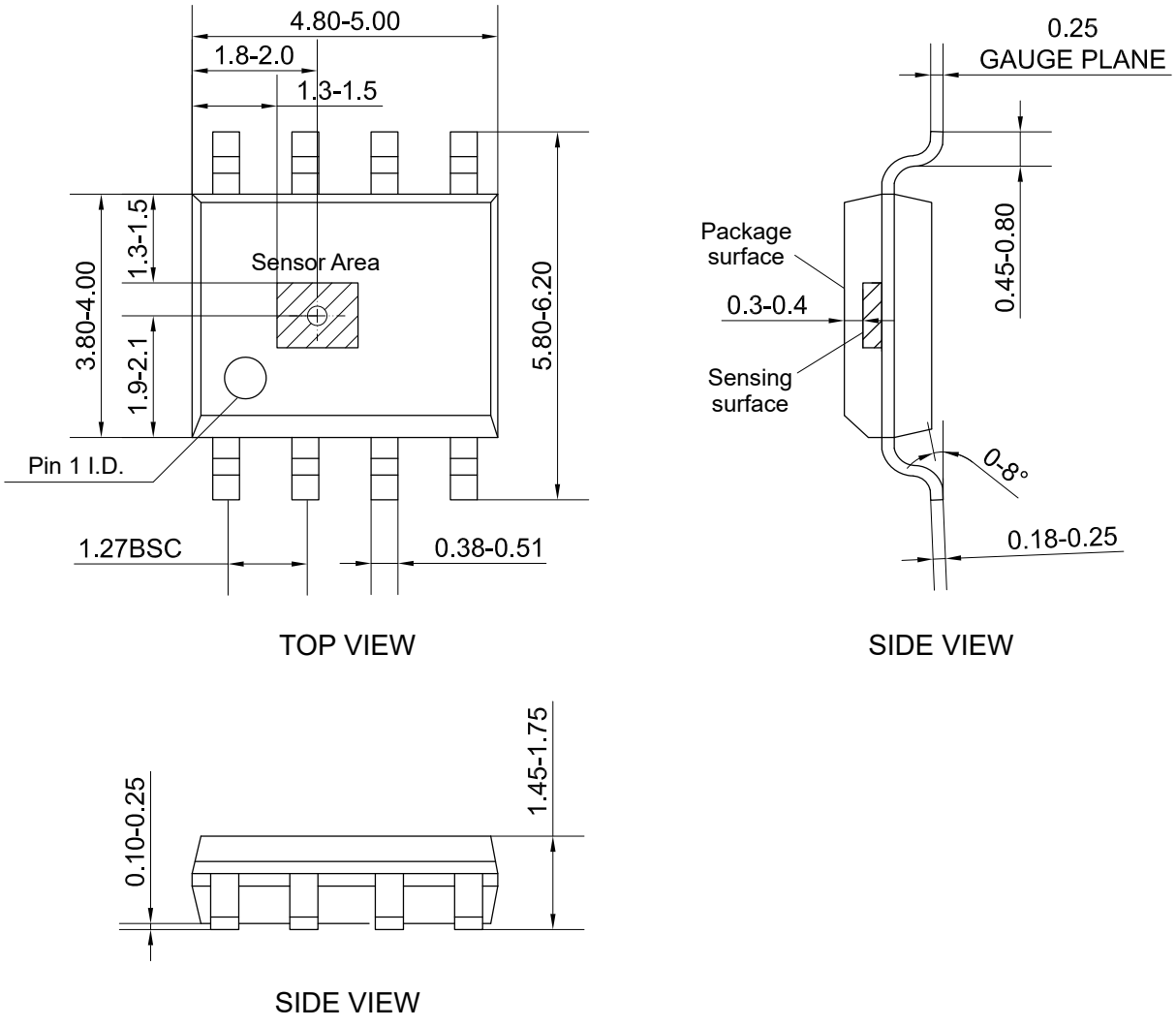


Figure 3. Package outline of SOP8 (unit: mm)

DFN8L Package

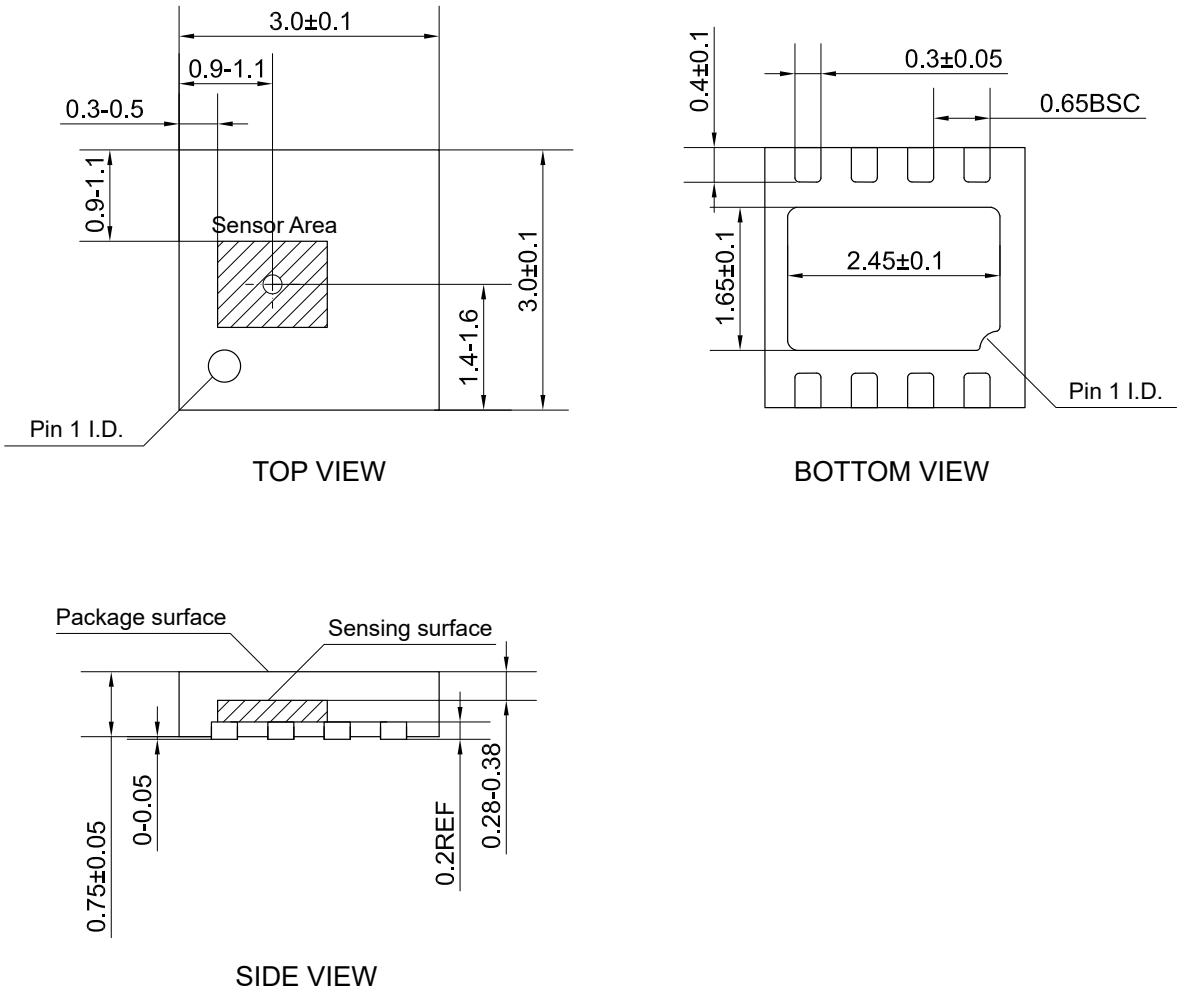


Figure 4. Package outline of DFN8L (unit: mm)

Recycling

The product(s) in this document need to be handed over to a qualified solid waste management services company for recycling in accordance with relevant regulations on waste classification after the end of the product(s) life.

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