

TMR2103

Large Dynamic Range TMR Linear Sensor

Description

The TMR2103 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.

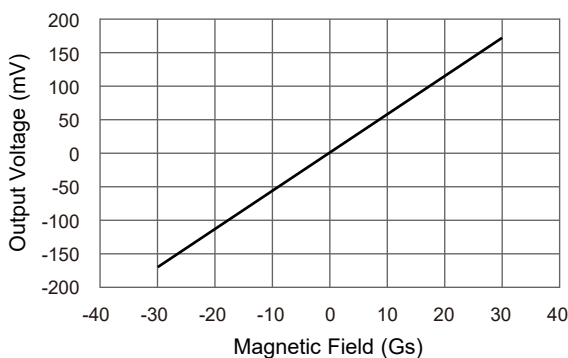
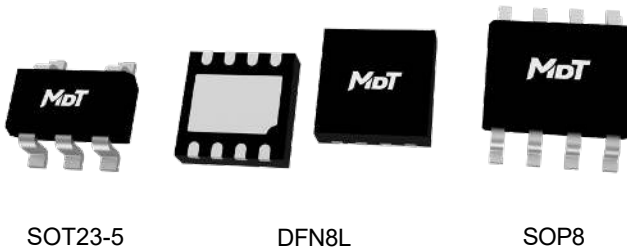
This TMR2103 magnetic linear sensor are available in SOT23-5, SOP8 and DFN8L (3 mm × 3 mm × 0.75 mm) package with compact size and easy to weld.

Features and Benefits

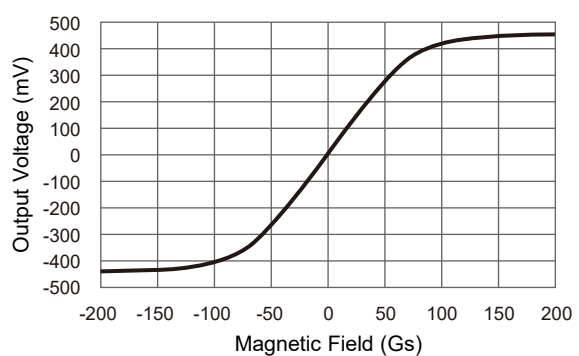
- Tunneling magnetoresistance (TMR) technology
- High sensitivity
- Large dynamic range
- Low power consumption
- Excellent temperature stability
- Very low hysteresis
- Compatible with wide range of supply voltages

Applications

- Magnetometer
- Current sensor
- Position sensor
- Rotation sensor



TMR2103 ±30 Gs Output Curve



TMR2103 ±200 Gs Output Curve

Selection Guide

Part Number	Resistance	Linear Range	Sensitivity	Package	Packing Form
TMR2103P	50 kΩ	±30 Gs	6.0 mV/V/Gs	SOP8	Tape & Reel
TMR2103D	50 kΩ	±30 Gs	6.0 mV/V/Gs	DFN8L	Tape & Reel
TMR2103S	50 kΩ	±30 Gs	6.0 mV/V/Gs	SOT23-5	Tape & Reel

Catalogue

1. Functional Block Diagram.....	03
2. Sensing Direction	03
3. Pin Configuration	03
4. Absolute Maximum Ratings	04
5. Electrical Specifications.....	04
6. Dimensions.....	05

1. Functional Block Diagram

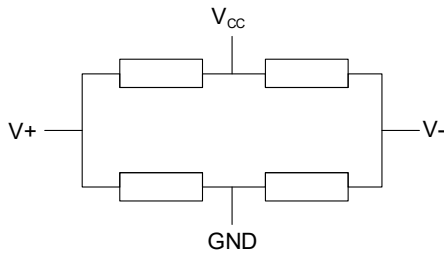


Figure 1. Block Diagram

Pin Number	Name	Function
1	V _{CC}	Power supply
2	N/A	Not connected
3	V+	Analog differential output 1
4	V-	Analog differential output 2
5	GND	Ground

2. Sensing Direction

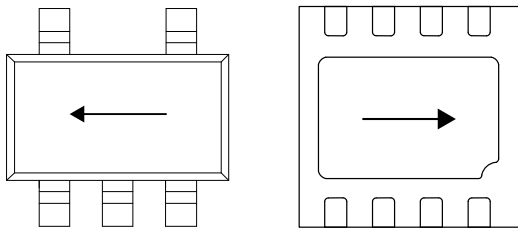


Figure 2-1. Sensing Direction (SOT23-5) and (DFN8L)

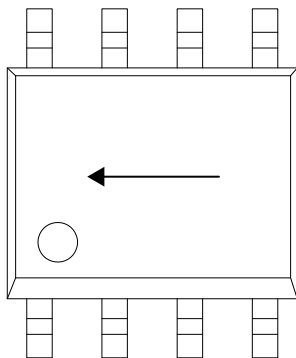


Figure 2-2. Sensing Direction (SOP8)

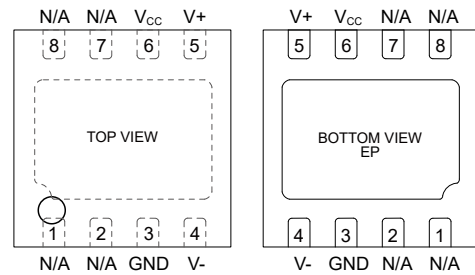


Figure 3-2. Pin Configuration (DFN8L)

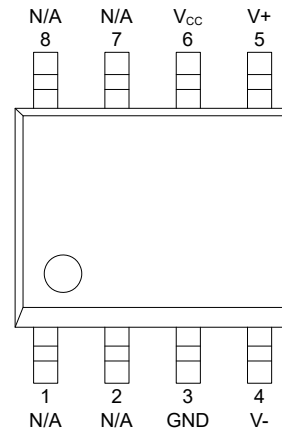


Figure 3-3. Pin Configuration (SOP8)

3. Pin Configuration

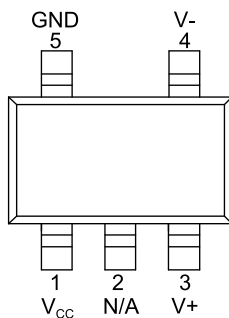


Figure 3-1. Pin Configuration (SOT23-5)

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

4. 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}	-	4	kV
Operating Ambient Temperature	T_A	-40	125	°C
Storage Ambient Temperature	T_{STG}	-50	150	°C

5. Electrical Specifications

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

Parameters	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}	Operating	-	1	7	V
Supply Current ¹⁾	I_{CC}	Output Open	-	60	-	μA
Resistance ^{1,2)}	R_B	-	-	50	-	kΩ
Sensitivity	SEN	B in ±30 Gs	-	6.0	-	mV/V/Gs
Saturation Magnetic Field	H_{SAT}	-	-	±75	-	Gs
Nonlinearity	NONL	B in ±30 Gs	-	0.5	-	%FS
Offset	V_{OFFSET}	-	-15	-	15	mV/V
Hysteresis	HYS	B in ±30 Gs	-	0.3	-	Gs
Offset Temperature Coefficient	TCO	B = 0 Gs	-	-640	-	PPM/°C
Sensitivity Temperature Coefficient	TCS	-	-	-13	-	PPM/°C

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

2) Bridge resistance is customizable. Contact MultiDimension Technology for details.

6. Dimensions

SOT23-5 Package

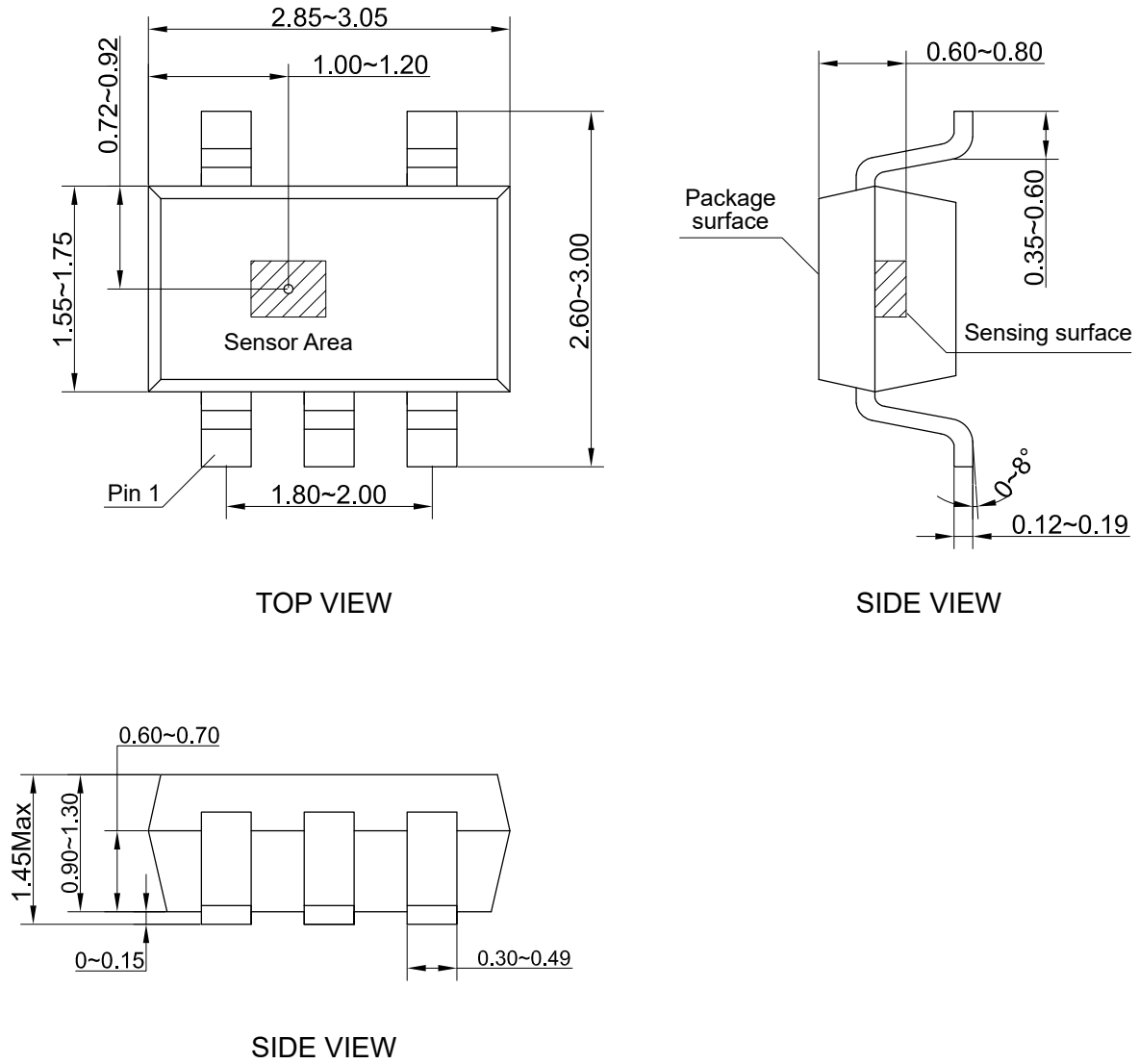


Figure 4. Package outline of SOT23-5 (unit: mm)

DNF8L Package

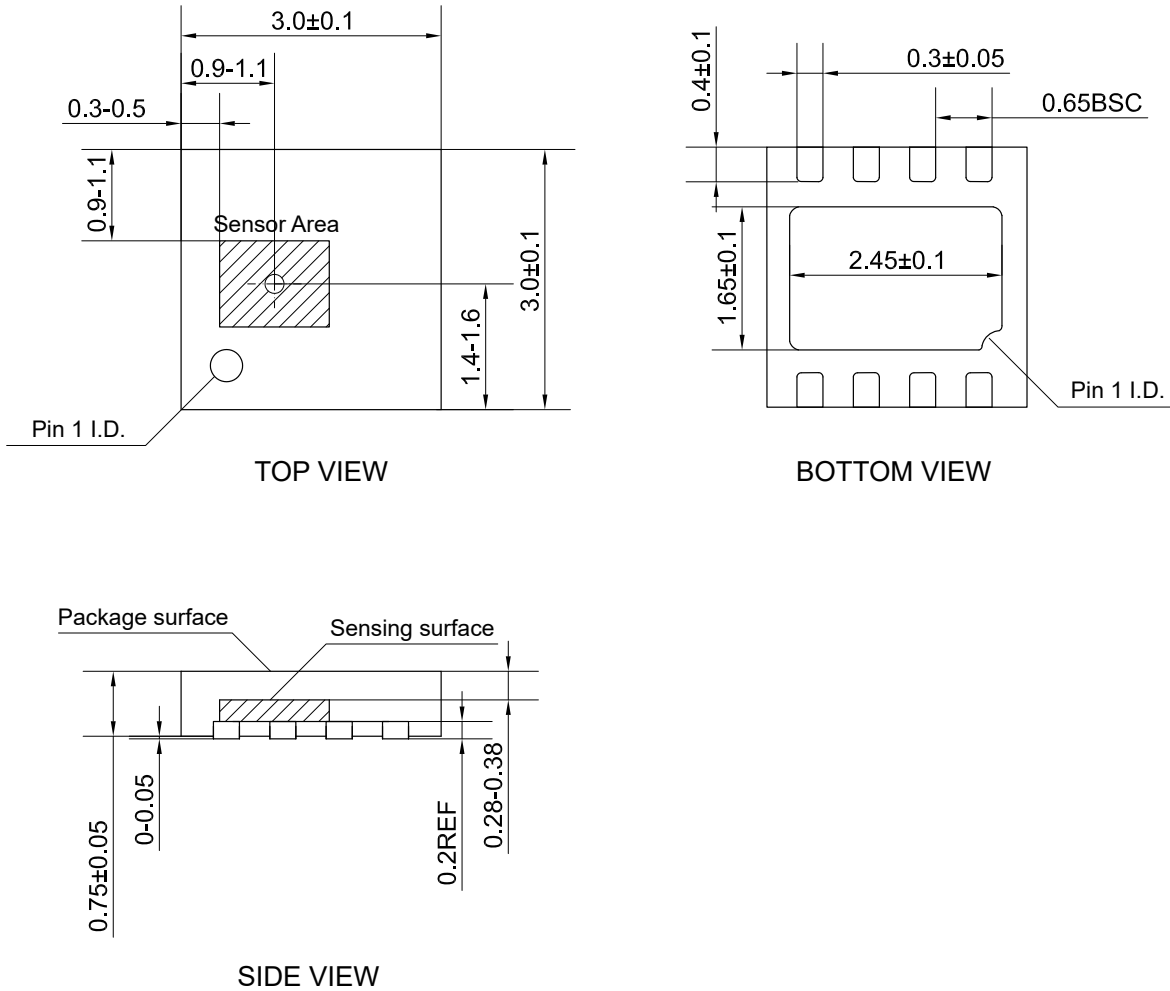


Figure 5. Package outline of DNF8L (unit: mm)

SOP8 Package

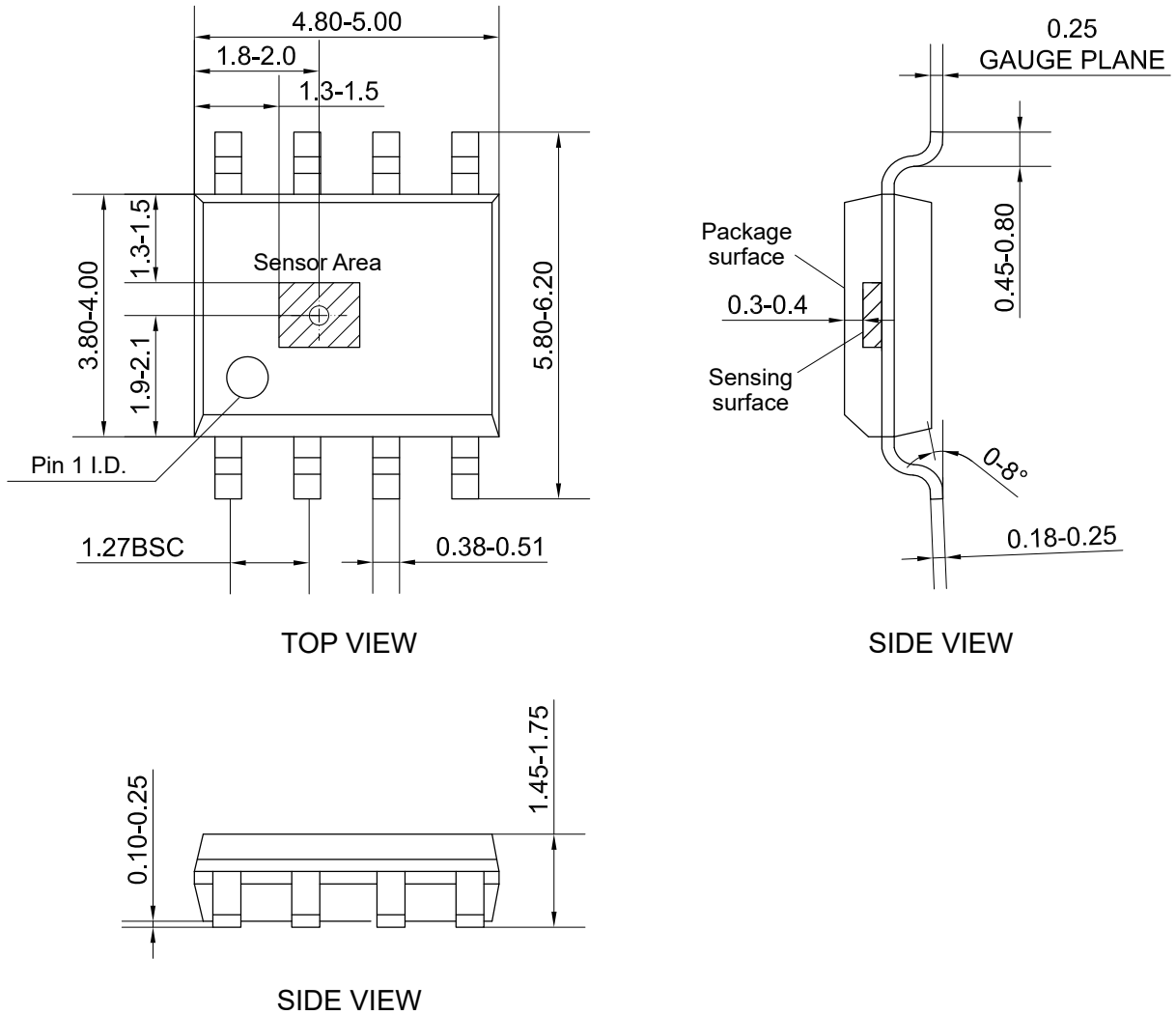


Figure 6. Package outline of SOP8 (unit: mm)

Copyright © 2023 by MultiDimension Technology Co., Ltd.

Information furnished herein by MultiDimension Technology Co., Ltd. (hereinafter MDT) is believed to be accurate and reliable. However, MDT disclaims any and all warranties and liabilities of any kind, with respect to any examples, hints or any performance or use of technical data as described herein and/or any information regarding the application of the product, including without limitation warranties of non-infringement of intellectual property rights of any third party. This document neither conveys nor implies any license under patent or other industrial or intellectual property rights. Customer or any third-party must further determine the suitability of the MDT products for its applications to avoid the applications default of customer or third-party. MDT accept no liability in this respect.

MDT does not assume any liabilities of any indirect, incidental, punitive, special or consequential damages (including without limitation of lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory. Notwithstanding any damages that customer might incur for any reason whatsoever, MDT's aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the terms and conditions of commercial sale of MDT.

Absolute maximum ratings are the extreme limits the device will withstand without damage to the MDT product. However, the electrical and mechanical characteristics are not guaranteed as the maximum limits (above recommended operating conditions) are approached. MDT disclaims any and all warranties and liabilities of the MDT product will operate at absolute maximum ratings.

Specifications may change without notice.

Please download latest document from our official website www.dowaytech.com/en.

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.



No.2 Guangdong Road, Zhangjiagang Free Trade Zone, Jiangsu, China

Web: www.dowaytech.com/en E-mail: info@dowaytech.com

