TMR2104

General-purpose Multi-function TMR Linear Sensor

Description

TMR2104 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.

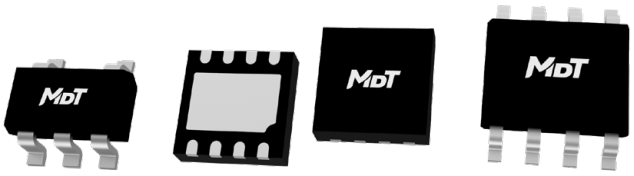
This TMR2104 magnetic linear sensor are available in SOT23-5, SOP8 and DFN8L (3 mm × 3 mm × 0.75 mm) package with compact size and easy to weld.

Features and Benefits

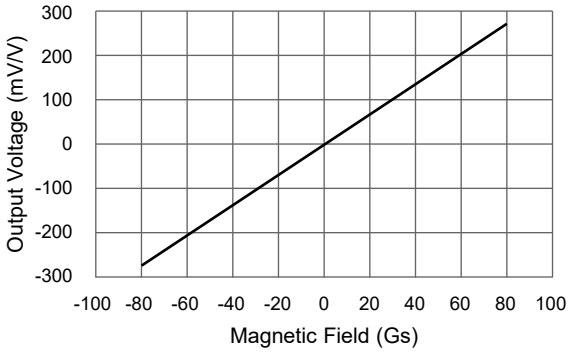
- Tunneling magnetoresistance (TMR) technology
- High sensitivity
- Large dynamic range
- Low power consumption
- Excellent temperature stability

Applications

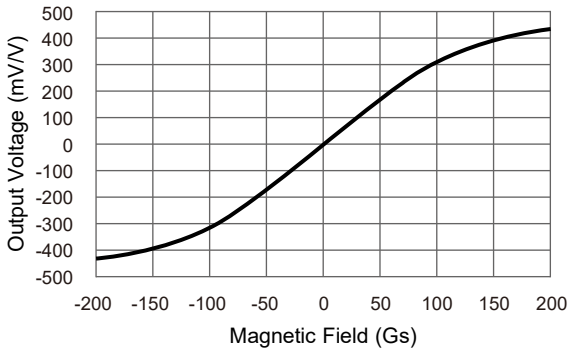
- Magnetometer
- Current sensor
- Position sensor
- Rotation sensor



SOT23-5 DFN8L SOP8



TMR2104 ±80 Gs Output Curve



TMR2104 ±200 Gs Output Curve

Selection Guide

Part Number	Resistance	Linear range	Sensitivity	Package	Packing Form
TMR2104P	30 kΩ	±80 Gs	3.1 mV/V/Gs	SOP8, DFN8L	Tape & Reel
TMR2104D	30 kΩ	±80 Gs	3.1 mV/V/Gs	SOP8, DFN8L	Tape & Reel
TMR2104LS	1 kΩ	±80 Gs	3.1 mV/V/Gs	SOT23-5	Tape & Reel

Catalogue

1. Functional Block Diagram

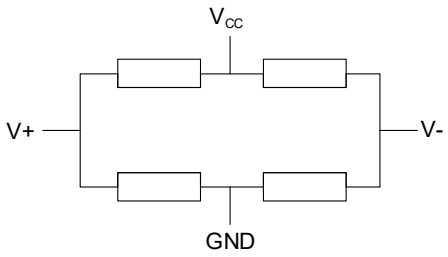


Figure 1. Block Diagram

2. Sensing Direction

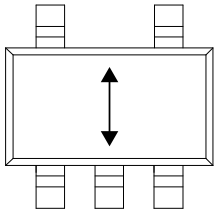


Figure 2-1. Sensing Direction (SOT23-5)

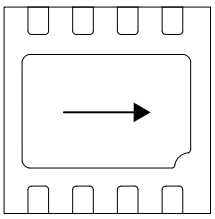


Figure 2-2. Sensing Direction (DFN8L)

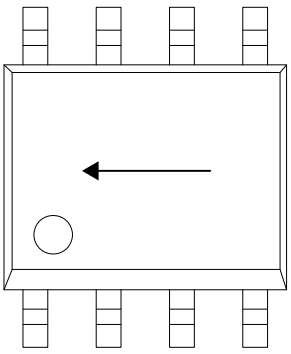


Figure 2-3. Sensing Direction (SOP8)

3. Pin Configuration

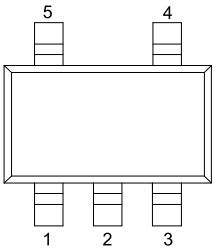


Figure 3-1. Pin Configuration (SOT23-5)

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

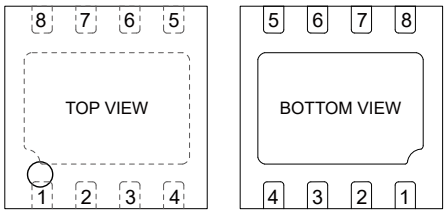


Figure 3-2. Pin Configuration (DFN8L)

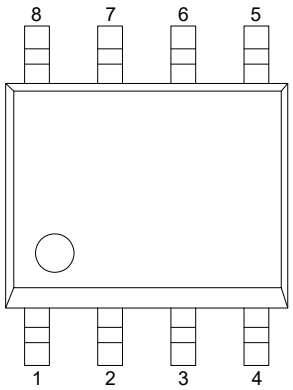


Figure 3-3. Pin Configuration (SOP8)

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

4. Absolute Maximum Ratings

Parameters	Symbol	Min.	Max.	Unit	Applicable Part Number
Supply voltage	V_{CC}	-	7	V	All parts
Reverse supply voltage	V_{RCC}	-	7	V	All parts
External magnetic field	B	-	4000	Gs	All parts
ESD performance (HBM)	V_{ESD}	-	4	kV	All parts
Operating ambient temperature	T_A	-40	125	°C	All parts
Storage ambient temperature	T_{STG}	-50	150	°C	All parts

5. Electrical Specifications

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

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Applicable Part Number
Supply Voltage	V_{CC}	Operating	-	1	7	V	All parts
Supply Current [1)]	I_{CC}	B = 0 Gs	-	1000	-	μA	TMR2104LS
			-	33	-	μA	TMR2104P, TMR2104D
Resistance [1, 2)]	R_B	-	-	1	-	kΩ	TMR2104LS
			-	30	-	kΩ	TMR2104P, TMR2104D
Sensitivity	SEN	B in ±80 Gs	-	3.1	-	mV/V/Gs	All parts
Saturation Magnetic Field	H_{SAT}	-	-	±150	-	Gs	All parts
Nonlinearity	NONL	B in ±80 Gs	-	1.5	-	%FS	All parts
Offset	V_{OFFSET}	-	-10	-	10	mV/V	TMR2104LS
		-	-8	-	8	mV/V	TMR2104P, TMR2104D
Hysteresis	HYS	B in ±80 Gs	-	0.5	-	Gs	All parts
Resistance Temperature Coefficient	TCR_B	B = 0 Gs	-	-600	-	PPM/°C	All parts
Sensitivity Temperature Coefficient	TCS	-	-	-300	-	PPM/°C	All parts

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

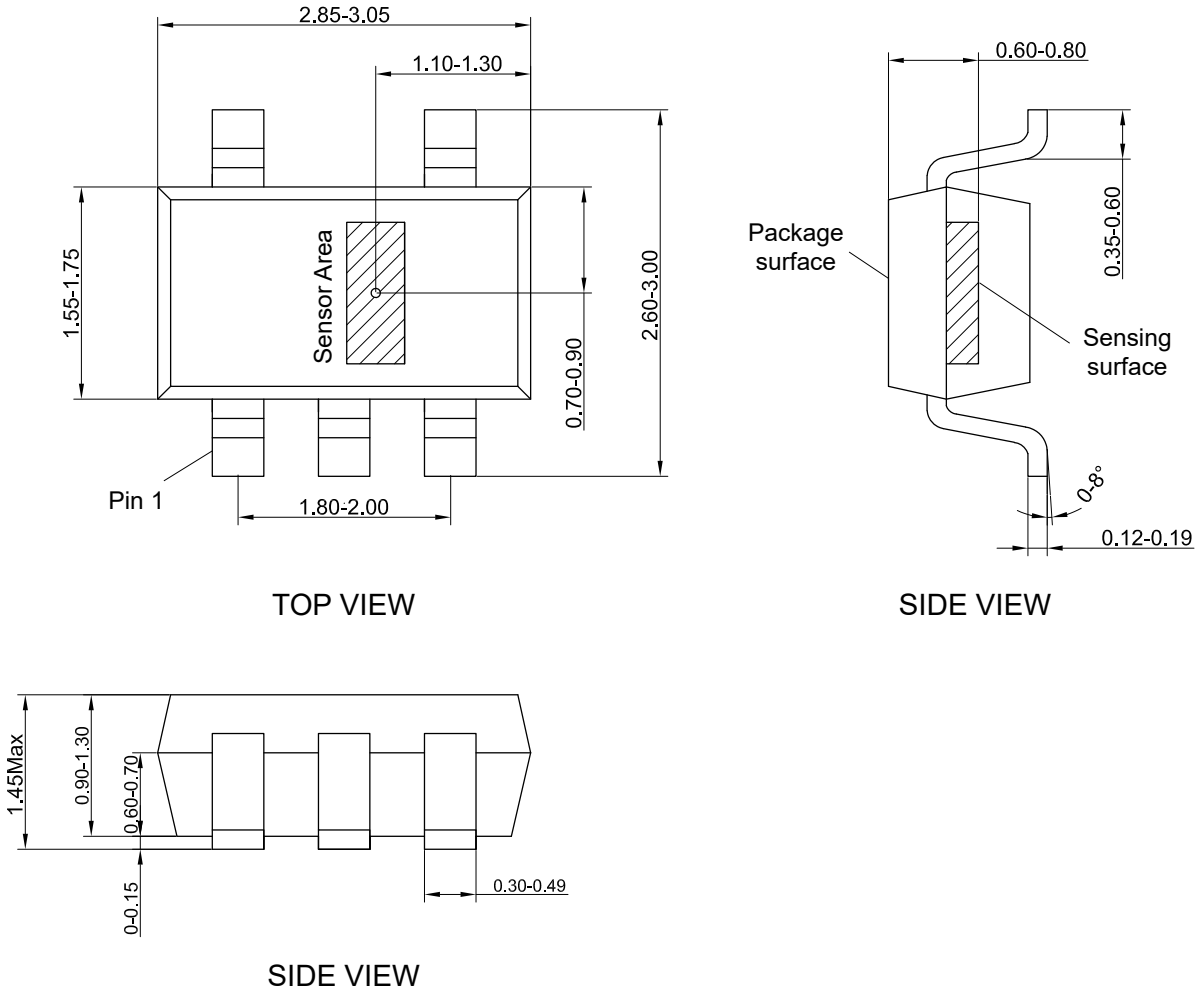


Figure 4. Package outline of SOT23-5 (unit: mm)

DNF8L Package

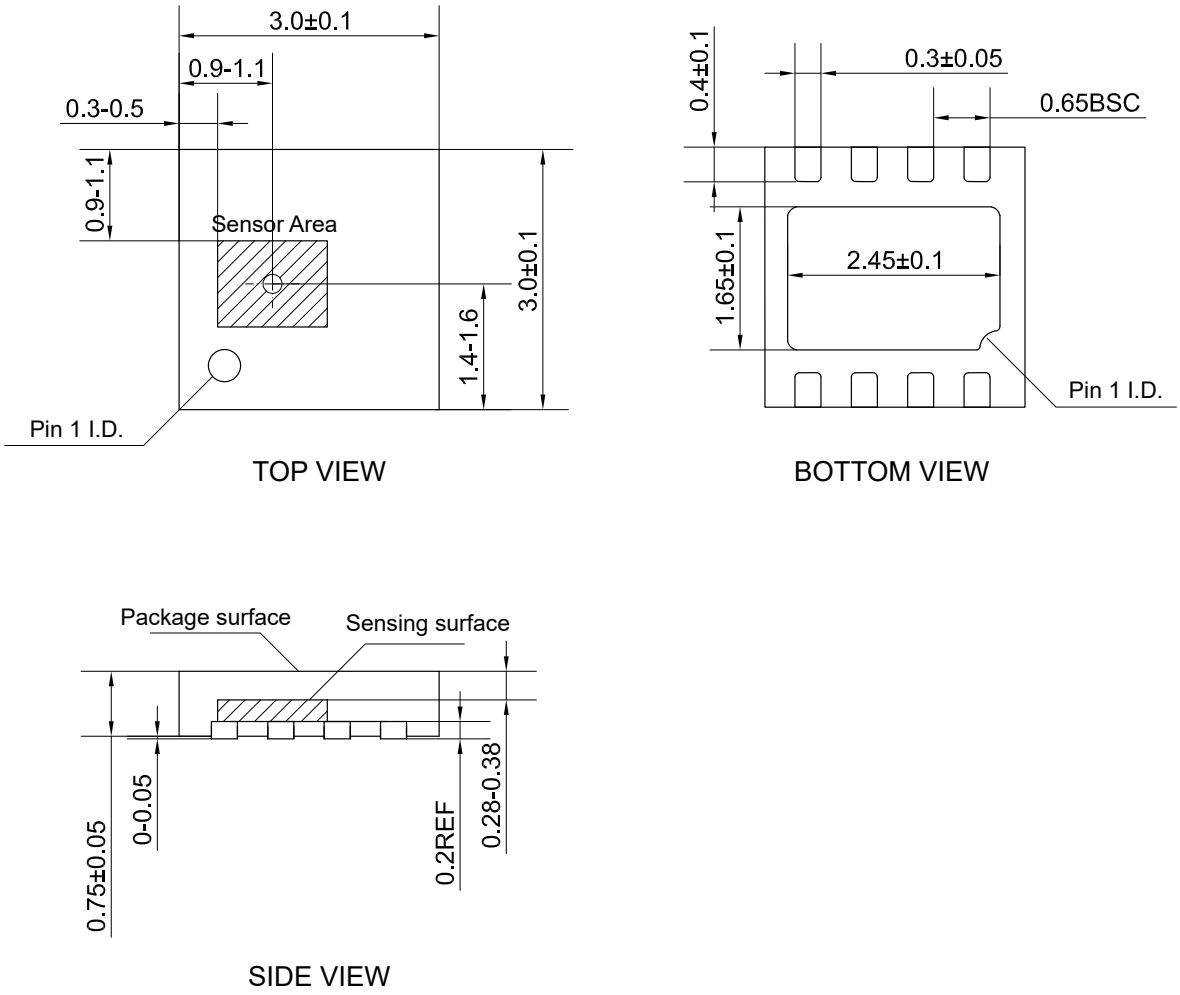


Figure 5. Package outline of DNF8L (unit: mm)

SOP8 Package

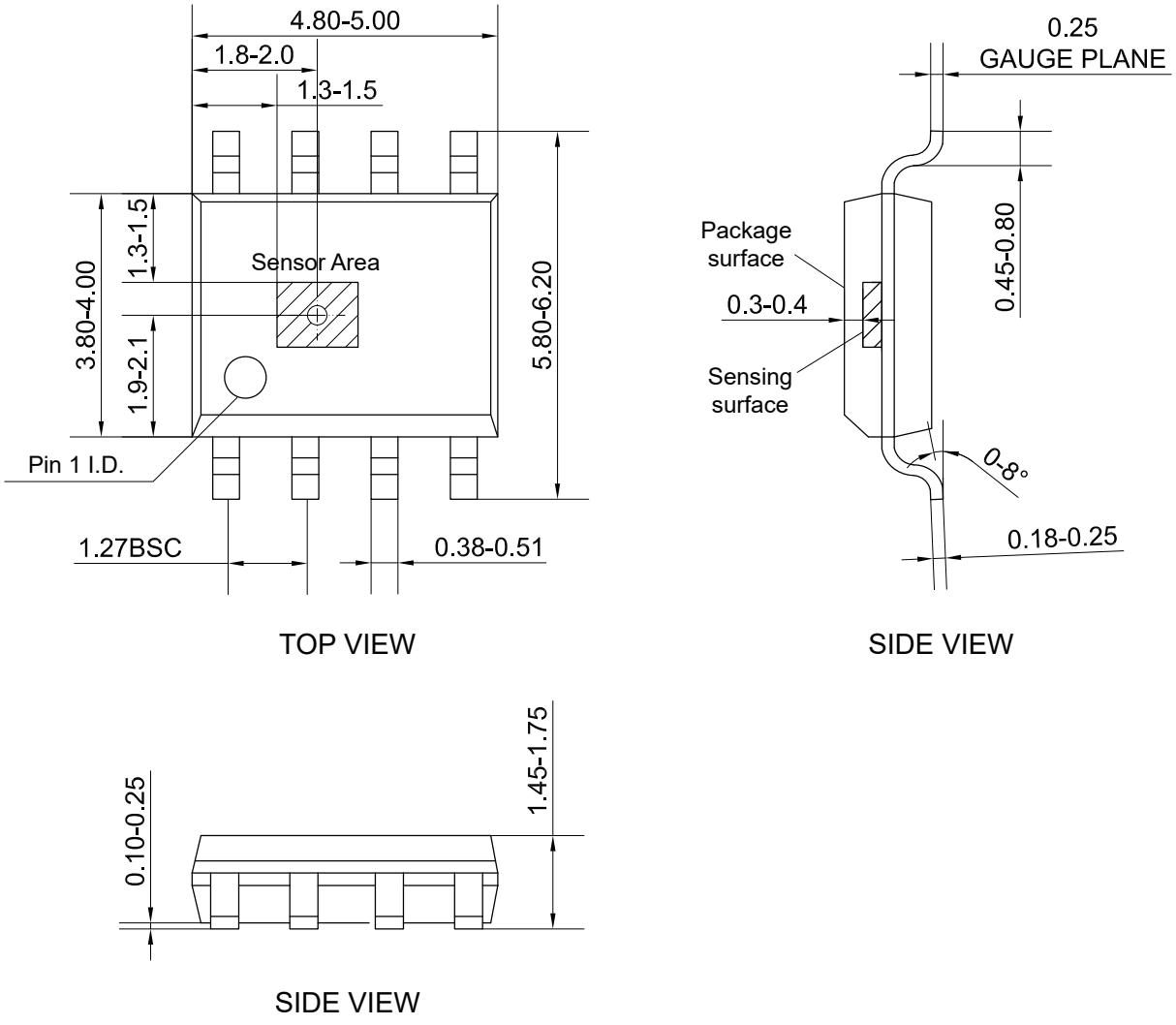


Figure 6. Package outline of SOP8 (unit: mm)

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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