TMR2583

Z Axis TMR Linear Magnetic Sensor

Description

The TMR2583 linear magnetic sensor chip utilizes a unique push-pull Wheatstone bridge structure design, comprising four unshielded high-sensitivity TMR sensor elements capable of sensing a magnetic field perpendicular to the chip's surface. As the external magnetic field changes along the direction perpendicular to the chip's surface, the Wheatstone bridge provides a differential voltage output. Within the range of -40 °C to +125 °C, the sensitivity and offset voltage of the TMR2583 can be maintained at a stable level.

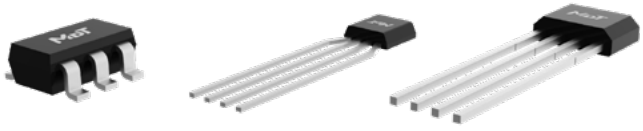
The TMR2583 is available in three packaging forms: TO94, SSIP4, SOT23-5 with P/N of TMR2583T, TMR2583B, and TMR2583S.

Features and Benefits

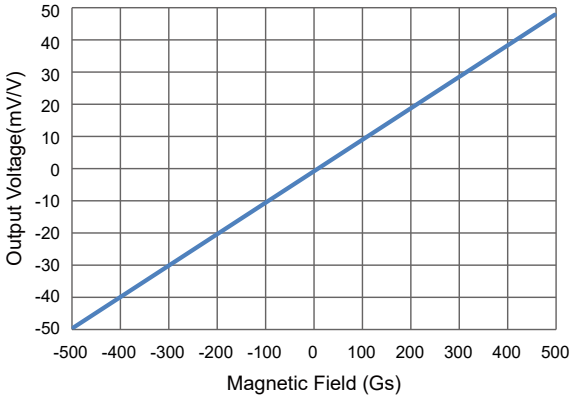
- Tunneling magnetoresistance (TMR) technology
- High sensitivity
- Low power consumption
- Excellent temperature stability
- Low hysteresis
- Wide operating voltage range
- RoHS & REACH compliant

Applications

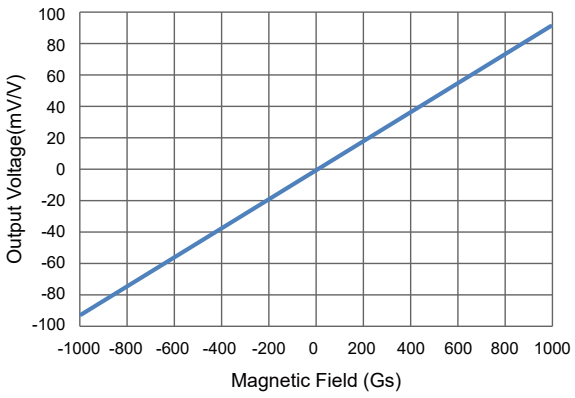
- Magnetometer
- Current sensor
- Motor drives
- Position sensor



SOT23-5 SSIP4 TO94



TMR2583 ±500 Gs Output Curve



TMR2583 ±1000 Gs Output Curve

Selection Guide

Part Number	Supply Voltage	Saturation Field	Sensitivity	Package	Packing Form
TMR2583T	1 V to 7 V	±1000 Gs	0.15 mV/V/Gs	TO94	Anti-Static Bag
TMR2583B	1 V to 7 V	±1000 Gs	0.15 mV/V/Gs	SSIP4	Anti-Static Bag
TMR2583S	1 V to 7 V	±1000 Gs	0.15 mV/V/Gs	SOT23-5	Tape & Reel

Catalogue

1. Pin Configuration

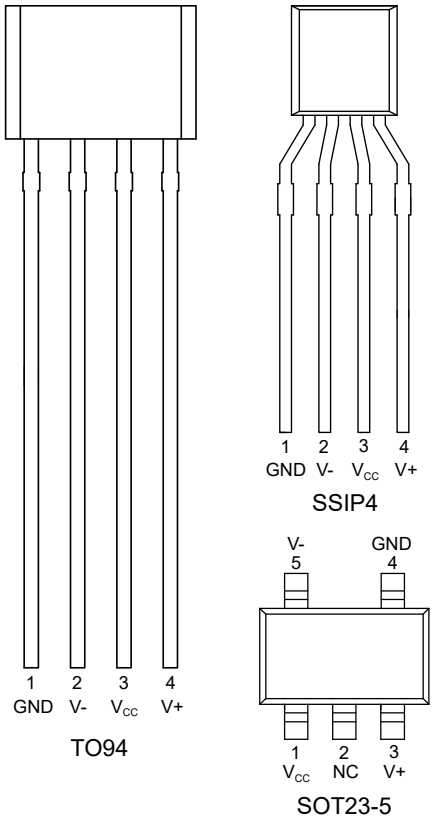


Figure 1. Pin Configuration

2. Sensing Direction

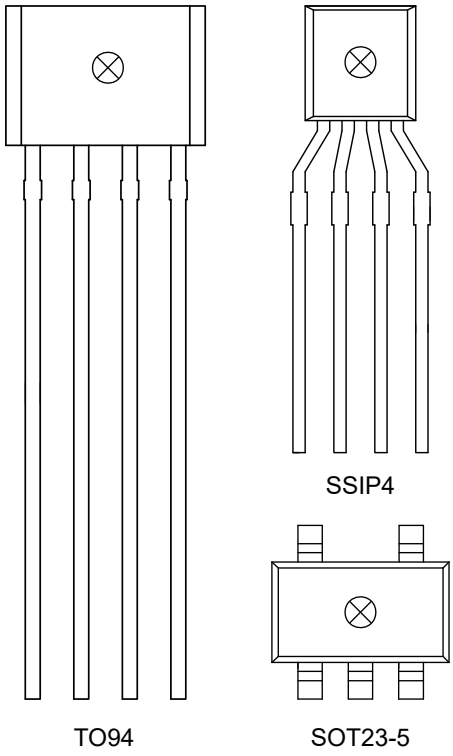


Figure 2. Sensing Direction

Pin Number			Name	Function
TO94	SSIP4	SOT23-5		
1	1	4	GND	Ground
2	2	5	V-	Analog differential output 1
3	3	1	V_{CC}	Supply voltage
4	4	3	V+	Analog differential output 2
-	-	2	NC	Not connected

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	-	1	7	V
Supply Current [1)]	I_{CC}	Open output, V_{CC} = 1.0 V	-	1	-	mA
Resistance [1)]	R_B	-	-	1	-	kΩ
Sensitivity	SEN	B in ±200 Gs	-	0.15	-	mV/V/Gs
Saturation Magnetic Field	B_{SAT}	-	-1000	-	1000	Gs
Nonlinearity	NONL	B in ±200 Gs	-	1.0	-	%FS
Offset voltage	V_{OFFSET}	-	-10	-	10	mV/V
Hysteresis	HYS	B in ±200 Gs	-	2	-	Gs
Temperature coefficient of resistance	TCR_B	B = 0 Gs	-	-260	-	PPM/°C
Temperature coefficient of sensitivity	TCS	-40 °C to 125 °C	-	-950	-	PPM/°C
Temperature coefficient of offset voltage	TCO	-40 °C to 125 °C	-	0.002	-	mV

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

5. Dimensions

TO94 Package

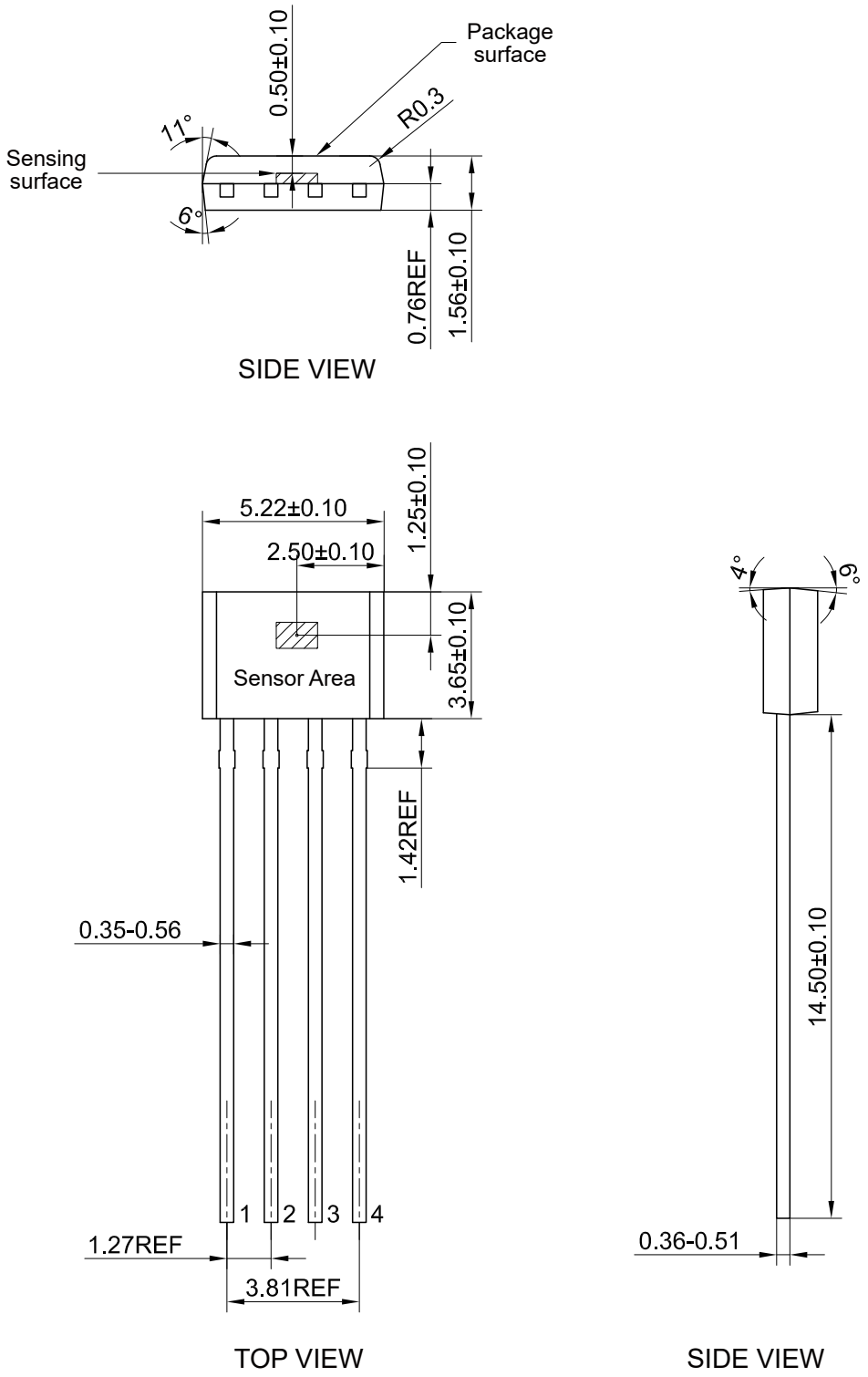


Figure 3. Package outline of TO94 (unit: mm)

SSIP4 Package

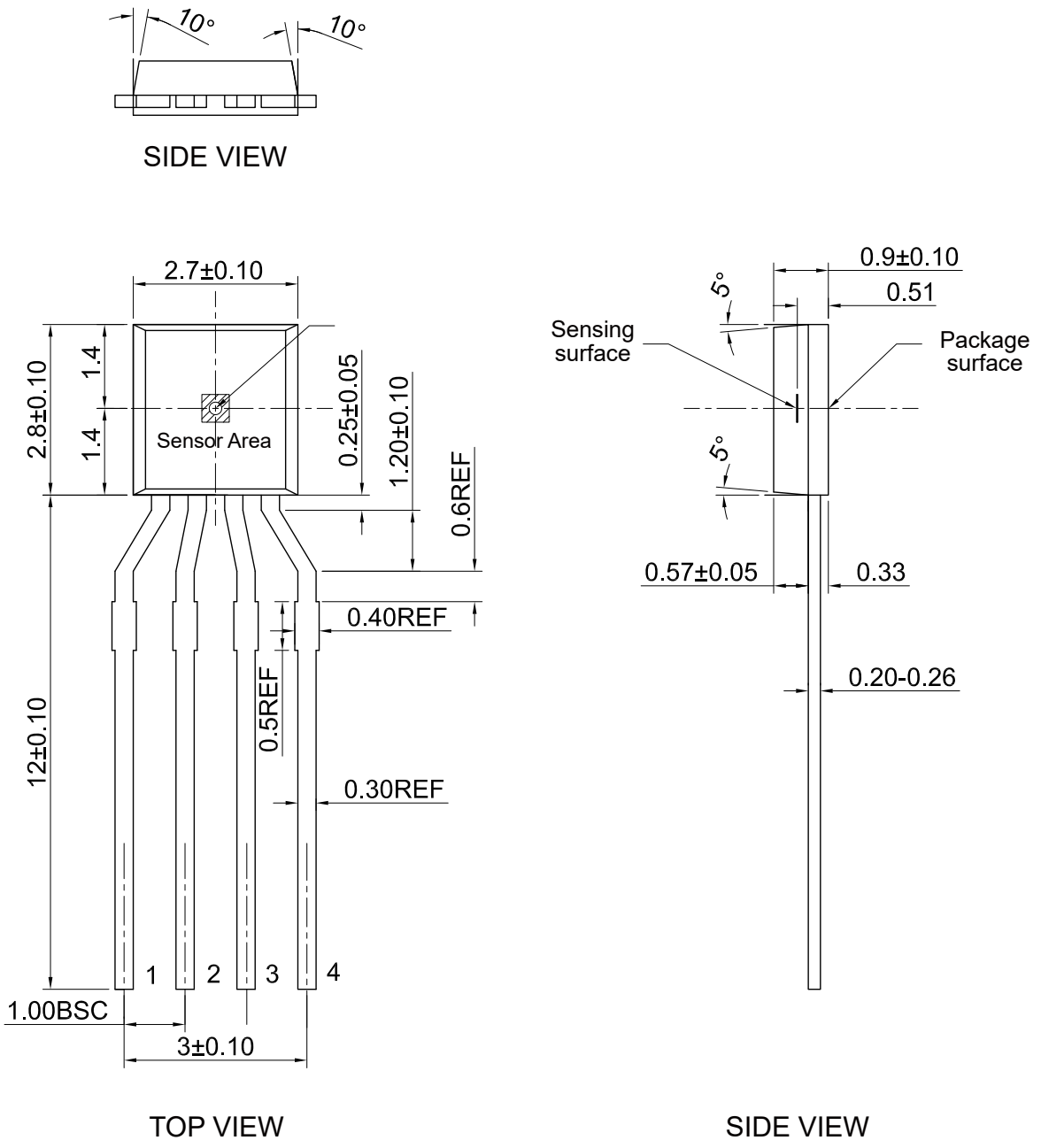


Figure 4. Package outline of SSIP4 (unit: mm)

SOT23-5 Package

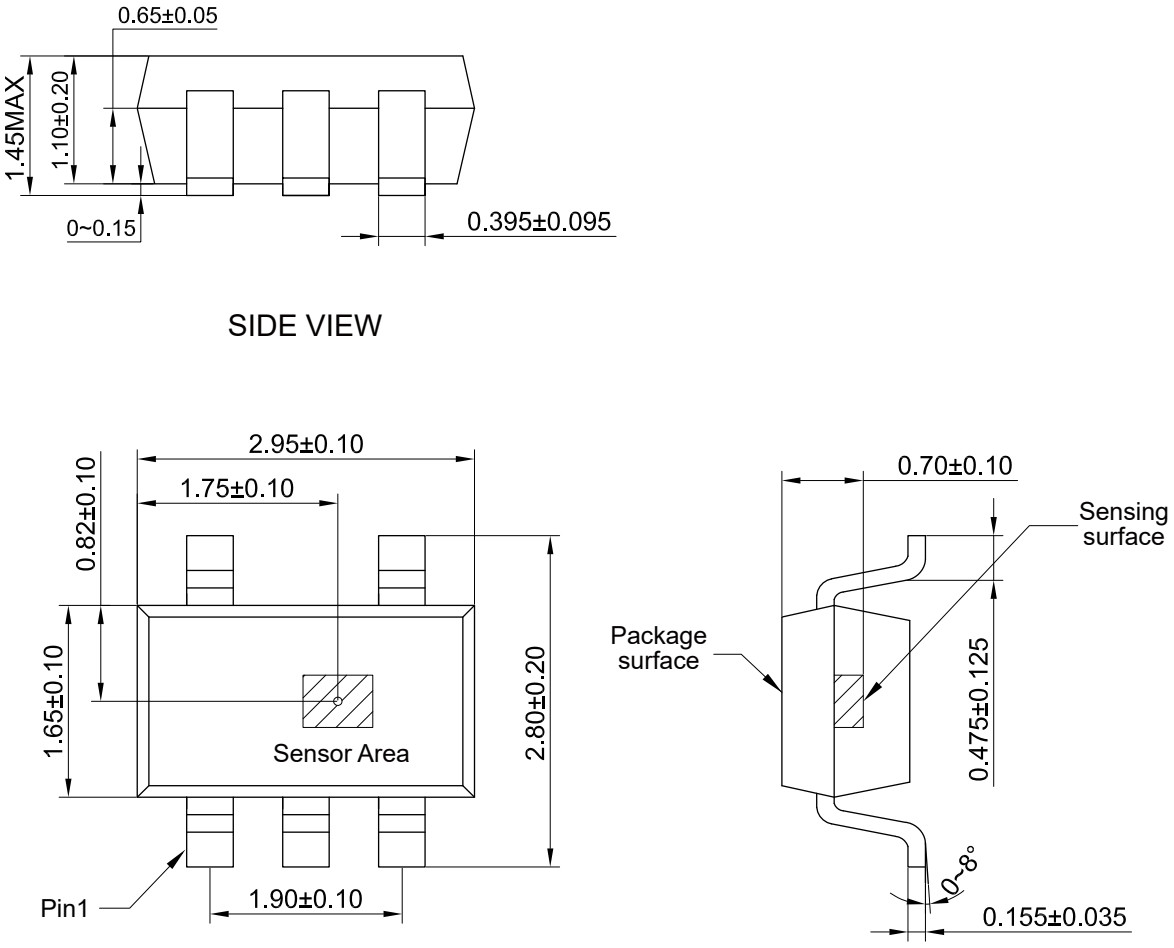


Figure 5. Package outline of SOT23-5 (unit: mm)

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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