

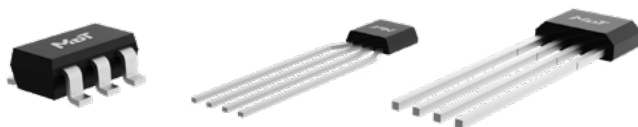
TMR2583

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.

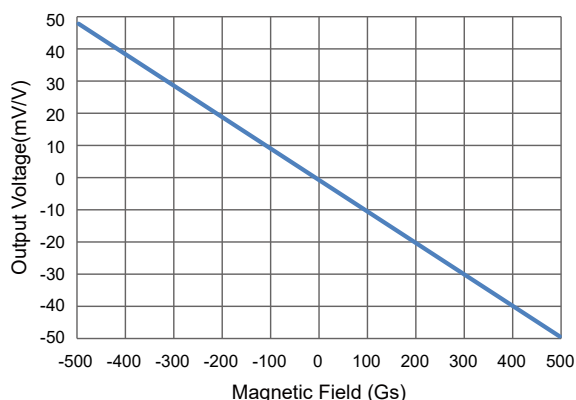
The TMR2583 is available in three packaging forms: TO94, SSIP4, SOT23-5 with P/N of TMR2583T, TMR2583B, and TMR2583S.



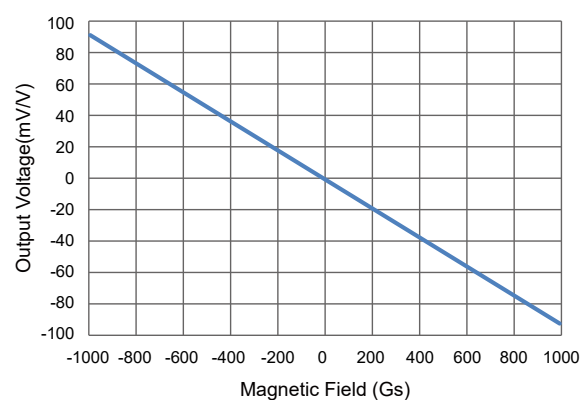
SOT23-5

SSIP4

TO94



TMR2583 ±500 Gs Output Curve



TMR2583 ±1000 Gs Output Curve

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

Selection Guide

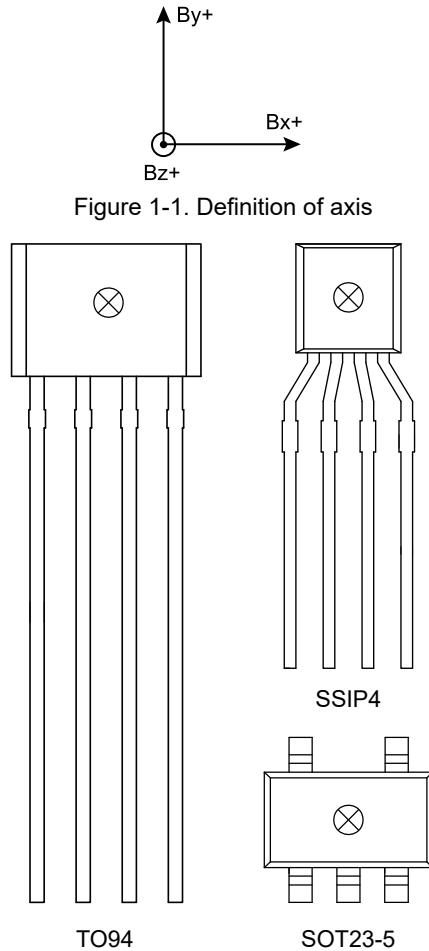
Part Number	Supply Voltage	Saturation Field	Sensitivity	Package	Packing Form
TMR2583T	1 V to 7 V	±1000 Gs	-0.15 mV/V/Gs	TO94	Anti-Static Bag
TMR2583B	1 V to 7 V	±1000 Gs	-0.15 mV/V/Gs	SSIP4	Anti-Static Bag
TMR2583S	1 V to 7 V	±1000 Gs	-0.15 mV/V/Gs	SOT23-5	Tape & Reel

Catalogue

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1. Operating Principle

The TMR2583 sensing axis is Perpendicular 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.



The TMR2583 output voltage varies linearly with the magnetic field along the sensing axis.

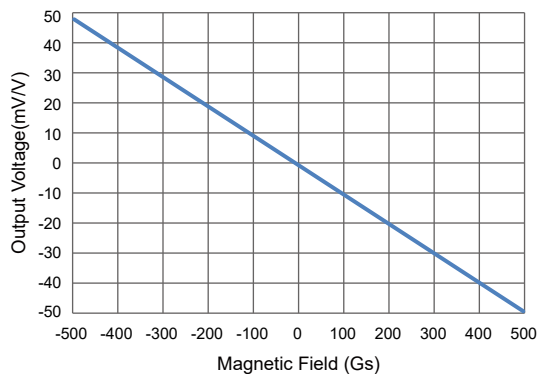


Figure 2. TMR2583 output curve

2. Pin Configuration

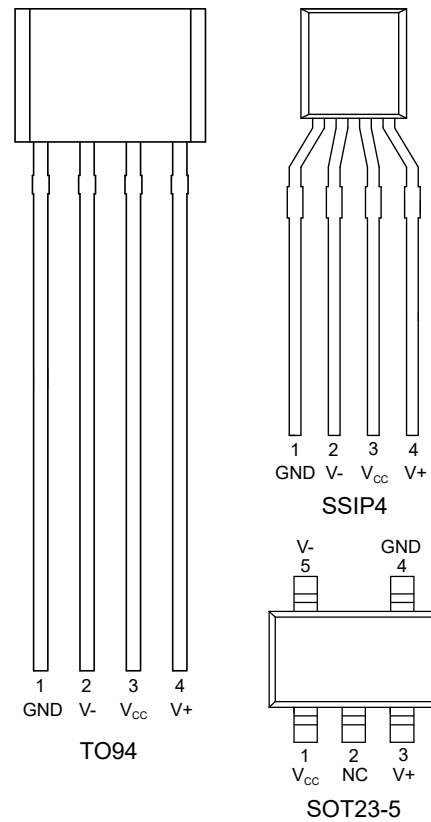


Figure 3. Pin configuration

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

$V_{CC} = 1.0 \text{ V}$, $T_A = 25 \text{ °C}$, 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, $V_{CC} = 1.0 \text{ V}$	-	1	-	mA
Resistance ¹⁾	R_B	-	-	1	-	kΩ
Sensitivity	SEN	B in $\pm 200 \text{ Gs}$	-	-0.15	-	mV/V/Gs
Saturation Magnetic Field	B_{SAT}	-	-1000	-	1000	Gs
Nonlinearity	NONL	B in $\pm 200 \text{ Gs}$	-	1.0	-	%FS
Offset voltage	V_{OFFSET}	-	-10	-	10	mV/V
Hysteresis	HYS	B in $\pm 200 \text{ Gs}$	-	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

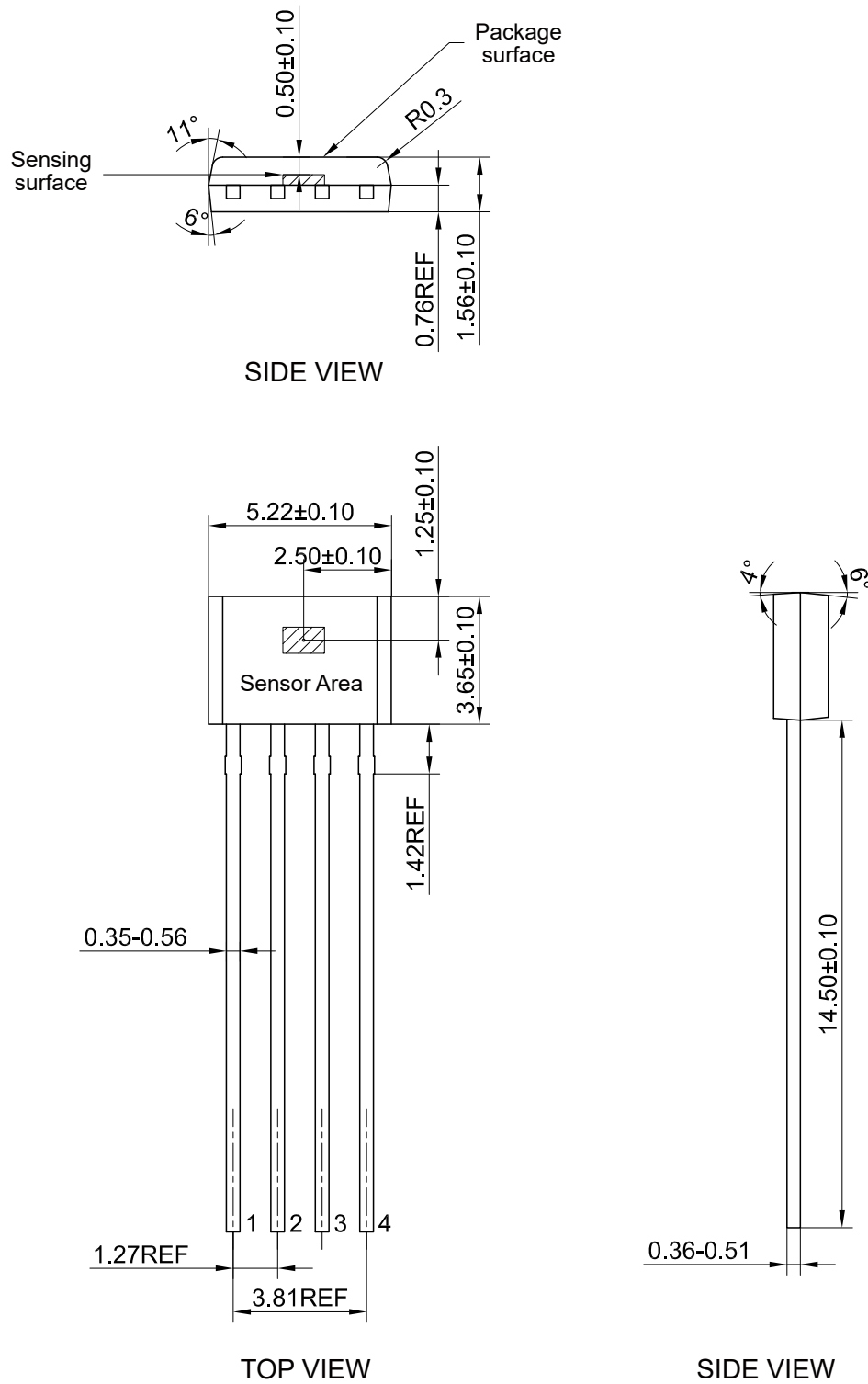


Figure 4. Package outline of TO94 (unit: mm)

SSIP4 Package

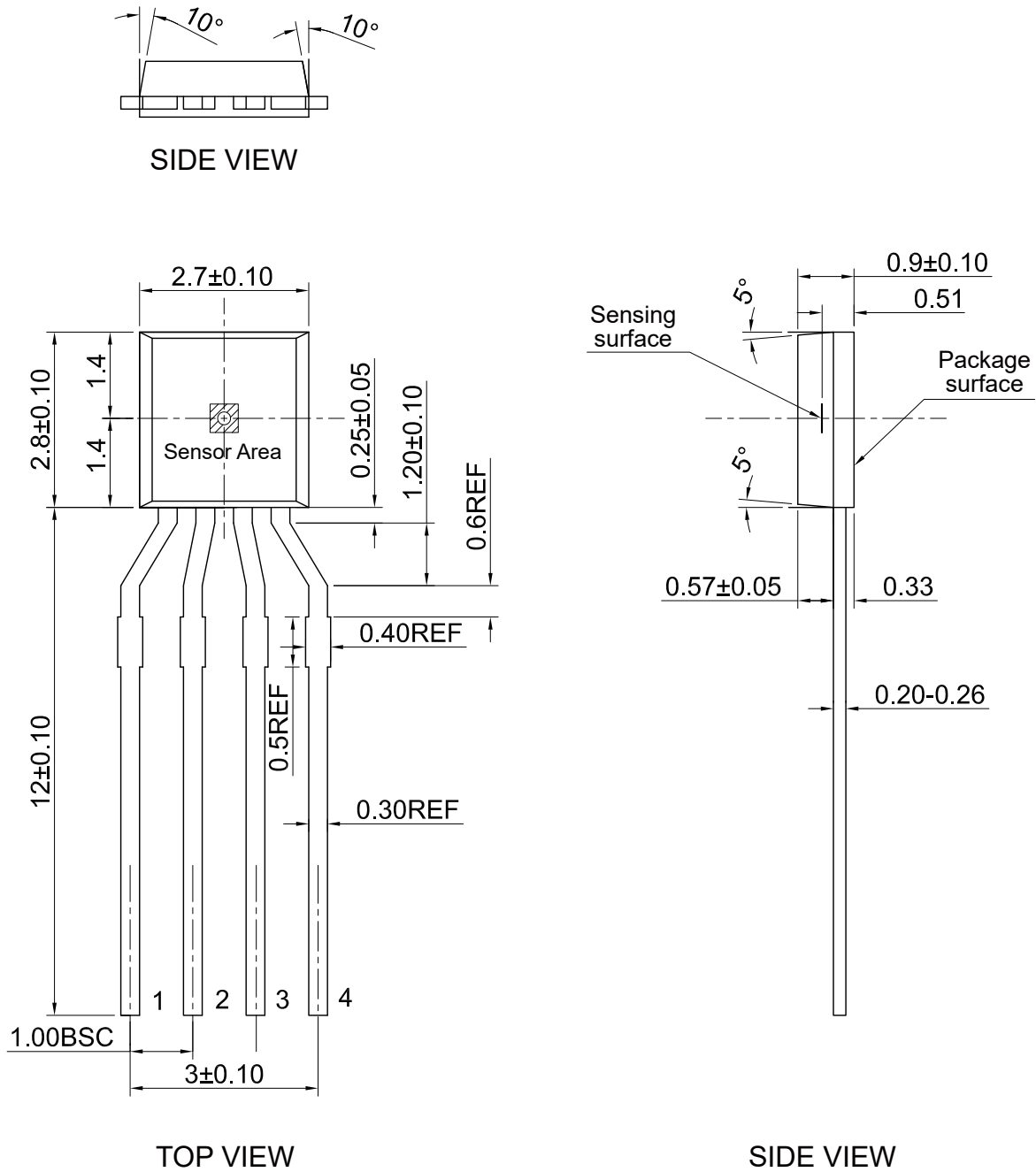
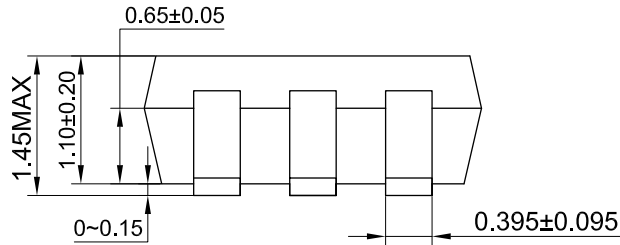
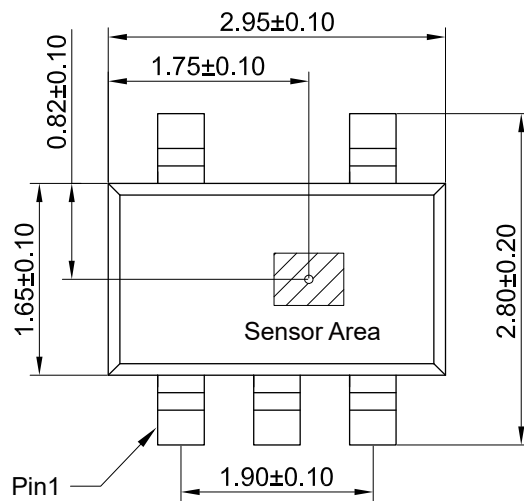


Figure 5. Package outline of SSIP4 (unit: mm)

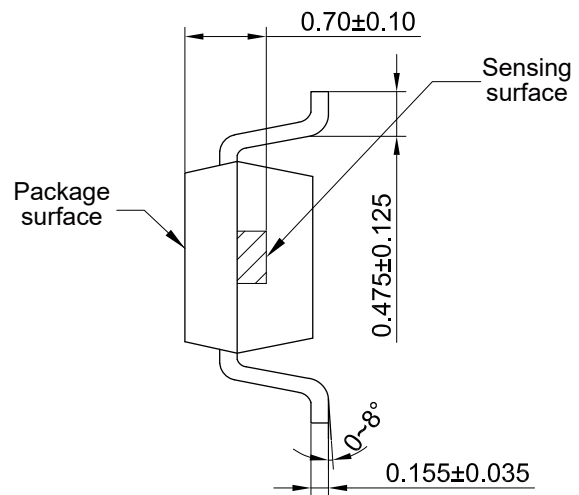
SOT23-5 Package



SIDE VIEW



TOP VIEW



SIDE VIEW

Figure 6. Package outline of SOT23-5 (unit: mm)

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