TMR2617S-AAC

Low Power Large Range TMR Linear Magnetic Sensor

Description

The TMR2617S-AAC magnetic sensor is a low-voltage, low-power consumption TMR linear sensor with wide linear range.

The TMR2617S-AAC integrates tunneling magnetoresistance (TMR) sensor, a low-noise operational amplifier, and a DAC circuit, where the analog output voltage maintains a linear relationship with the external magnetic field. The sensor can be widely used in various position sensing applications, supporting customer requirements for low voltage, high resolution, high signal-to-noise ratio, and wide linear range.

The product is packaged in SOT23-3 and complies with RoHS and REACH.

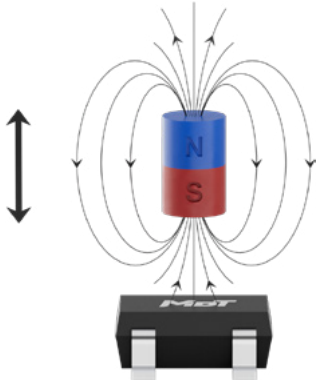
Features and Benefits

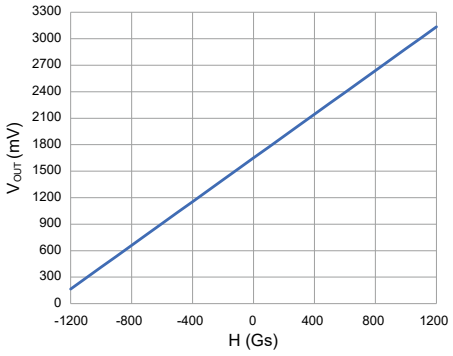
- Tunneling magnetoresistance (TMR) technology
- Supply voltage: 1.6 V to 5 V
- Static current consumption < 300 μA
- Output voltage: 5% to 95% V_{CC}
- Output voltage follows V_{CC} changes
- Low noise
- Z-axis sensitivity
- Sensitivity with high consistency
- Low hysteresis
- RoHS & Reach compliant

Applications

- Magnetic keyboard
- Magnetic field sensing
- Position sensing

SOT23-3





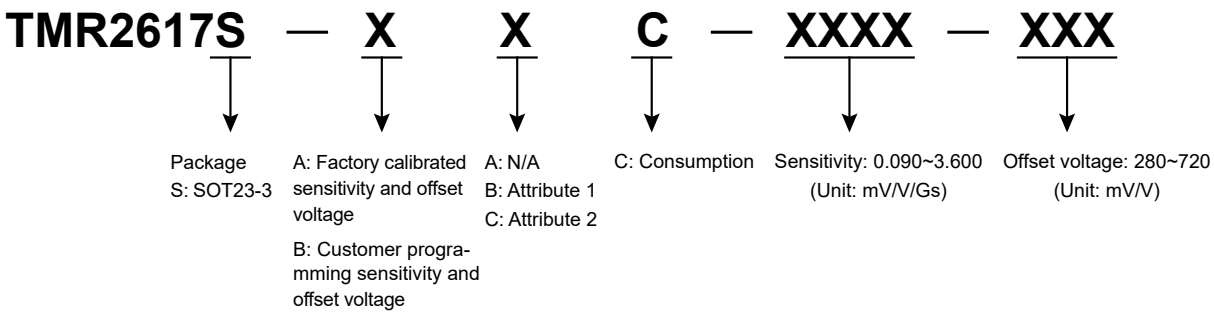
TMR2617S-AAC ±1200 Gs Output curve

Selection Guide

Part Number*	Supply Voltage	Linear Range	Operating temperature	Static Current Consumption	Package	Packing Form
TMR2617S-AAC-XXXX-XXX	1.6 V to 5 V	±1200 Gs	-40 °C to 85 °C	< 300 μA	SOT23-3	Tape & Reel

Note: Sensitivity and offset voltage can be customized according to customer requirements.

Product Model Description



Catalogue

1. Functional Block Diagram

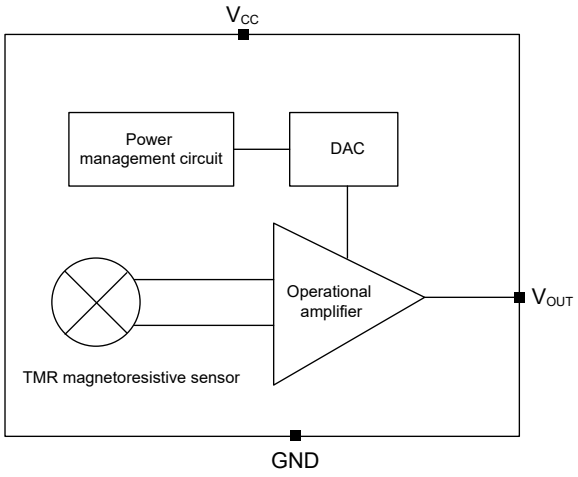


Figure 1. Block Diagram

2. Sensing Direction

The TMR2617S-AAC is sensitive to external magnetic field in the Z-axis as shown in Figure 2.

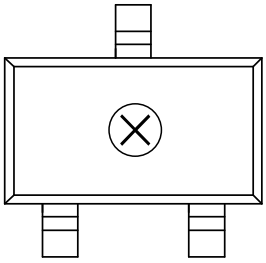


Figure 2. Sensing Direction (SOT23-3)

3. Pin Configuration

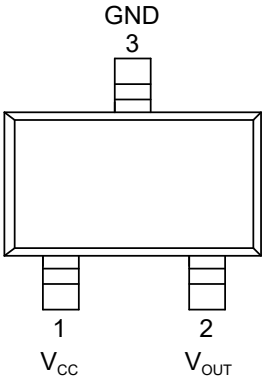


Figure 3. Pin Configuration (SOT23-3)

Pin Number	Name	Function
1	V_{CC}	Supply voltage
2	V_{OUT}	Output
3	GND	Ground

4. Absolute Maximum Ratings

Parameters	Symbol	Min.	Max.	Unit
Supply voltage	V_{CC}	-0.3	6	V
Magnetic flux density	B	-	4000	Gs
V_{OUT} current drive	-	-	1.5	mA
Operating temperature	T_A	-40	85	°C
Storage temperature	T_{STG}	-50	150	°C
ESD (HBM)	V_{ESD}	-	4000	V

Note: The maximum value in the limit parameter only ensures that the IC is not permanently damaged, please refer to the “Electrical Performance Parameters” for normal operating conditions of the IC.

5. Electrical Specifications

V_{CC} = 1.6 V to 5 V, T_A = 25 °C, a 100nF capacitor connected between the power and ground

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	V_{CC}	-	1.6	3.3	5	V
Operating current	I_{CC}	V_{CC} = 1.8 V	-	200	-	μA
		V_{CC} = 3.3 V	-	300	-	μA
Bandwidth	BW	-3 dB	-	-	50	kHz
Load resistance	R_L	-	10	-	-	kΩ
Load conductance	C_L	-	-	-	10	nF
Sensitivity	SEN	-	User programmable			mV/V/Gs
Temperature coefficient of sensitivity	TCS	T_A = -40 °C to 85 °C	-	1000	-	PPM/°C
Offset voltage	V_{OFFSET}	-	User programmable			mV/V
Temperature coefficient of offset	TCO	T_A = -40 °C to 85 °C	-	-0.12	-	mV/°C
Nonlinearity	NONL	in ±1200 Gs range	-	2.5	-	%FS
Hysteresis	HYS	in ±200 Gs range	-	1.2	-	Gs
Noise	V_N	V_{CC} = 3.3 V, BW = 5 kHz	-	-	10	mV_{PP}
Power-on time	t_{PO}	-	-	-	100	μs

6. Output Characteristics

The output voltage of the TMR2617S-AAC changes linearly with external magnetic field. As shown in Figure 4, the V_{OUT} is 50% V_{CC} at zero magnetic field. When the magnetic field changes from -B Gs to B Gs, the V_{OUT} output range is from 5% to 95% V_{CC}.

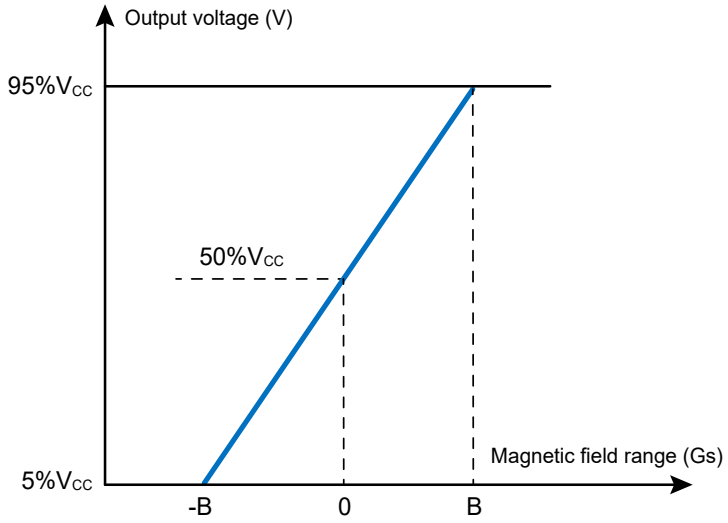


Figure 4. Output voltage versus magnetic field

7. Application Circuit

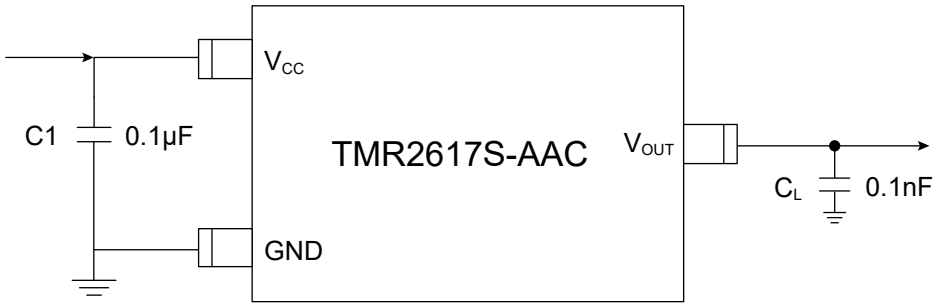


Figure 5. Application circuit diagram

Note: C1 should be as close as possible to the V_{CC} / GND pins.

8. Dimensions

SOT23-3 Package

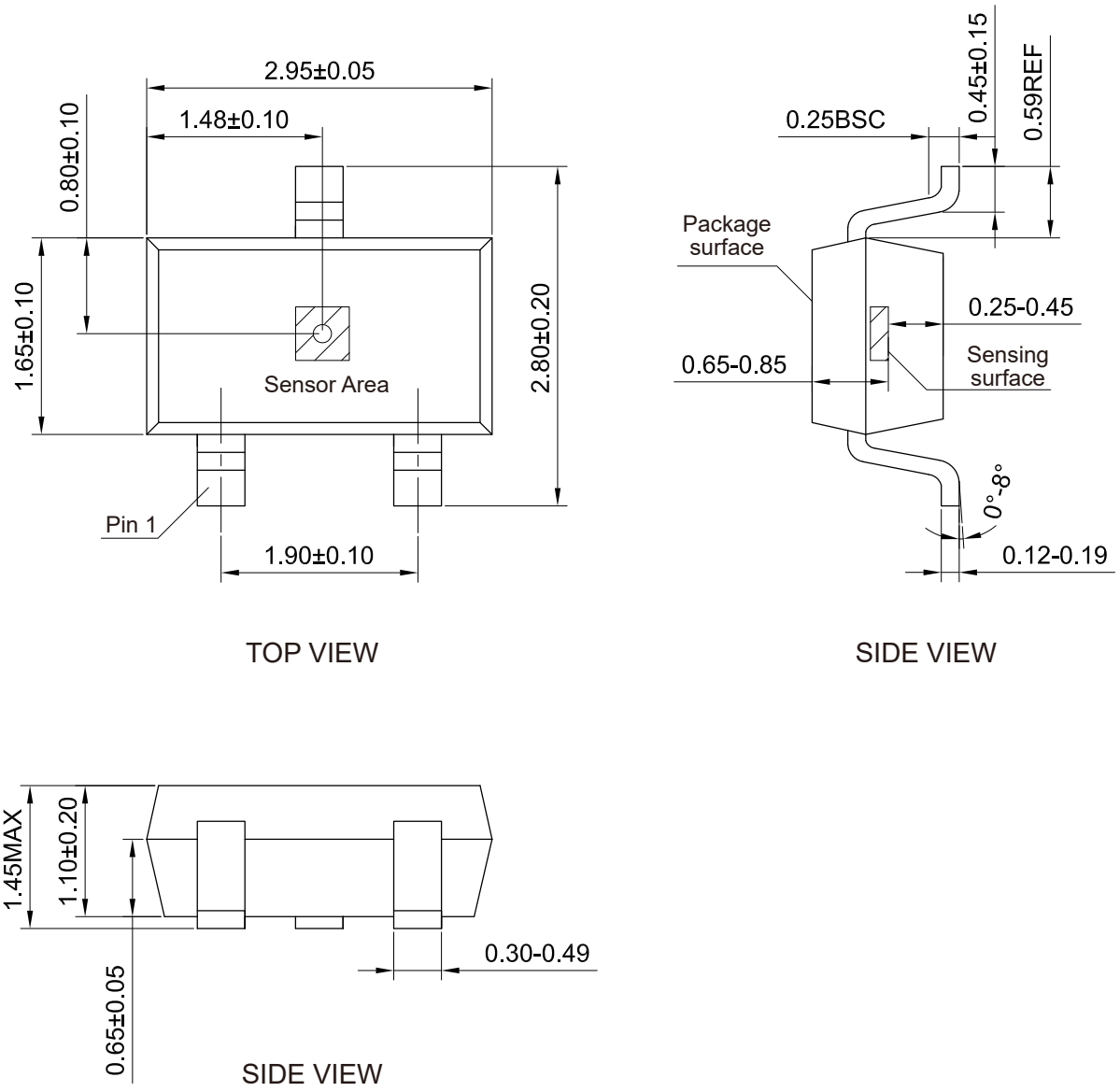


Figure 6. Package outline of SOT23-3 (unit: mm)

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.

MULTIDIMENSION
MultiDimension Technology Co., Ltd.
No.2 Guangdong Road, Zhangjiagang Free Trade Zone, Jiangsu, China
Web：www.dowaytech.com/en E-mail：info@dowaytech.com