

# TMR2617S-AAC

## Low Power Large Range TMR Linear Magnetic Sensor

### Description

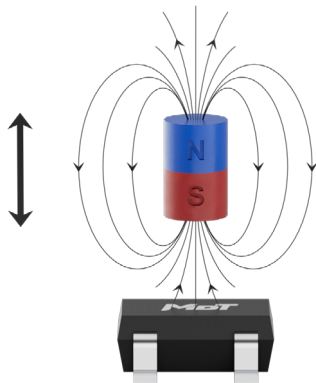
The TMR2617S-AAC magnetic sensor is a low-voltage, low-power consumption TMR linear sensor with wide linear range.

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.



SOT23-3

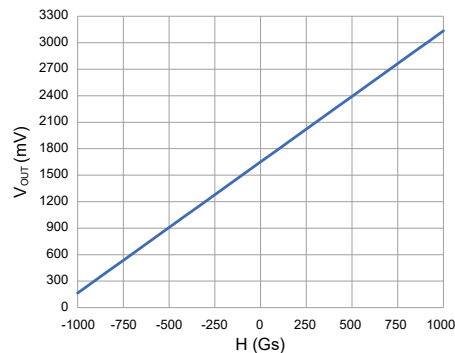


### Features and Benefits

- Tunneling magnetoresistance (TMR) technology
- Supply voltage: 1.71 V to 5 V
- Static current consumption < 300  $\mu$ A
- 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



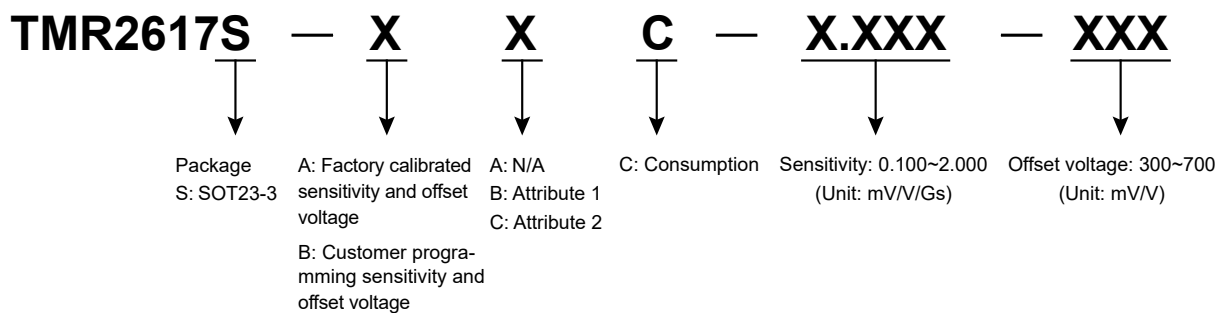
TMR2617S-AAC Output curve

## Selection Guide

Part Number*	Supply Voltage	Linear Range	Operating temperature	Static Current Consumption	Package	Packing Form
TMR2617S-AAC-X.XXX-XXX	1.71 V to 5 V	±1000 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



Note: A sensitivity value of 1.000 corresponds to 1.000 mV/V/Gs, and a zero-offset output voltage value of 500 corresponds to 500 mV/V.

## Catalogue

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## 1. Functional Block Diagram

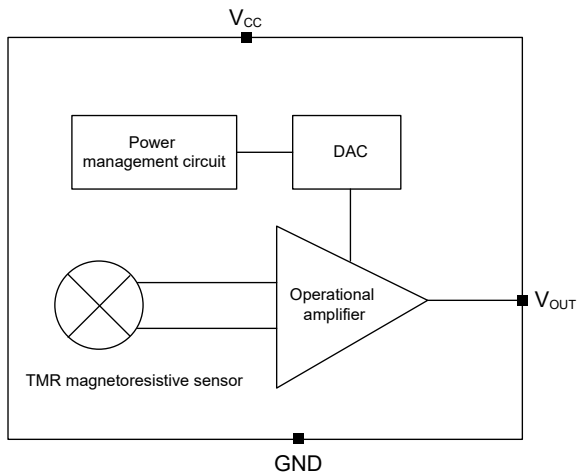


Figure 1. Block Diagram

## 2. Sensing Direction

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

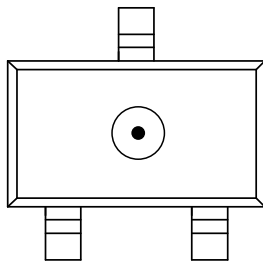


Figure 2. Sensing Direction (SOT23-3)

## 3. Pin Configuration

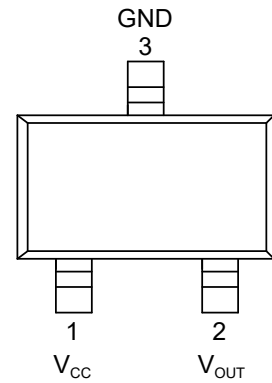


Figure 3. Pin Configuration (SOT23-3)

Pin Number	Name	Function
1	V <sub>CC</sub>	Supply voltage
2	V <sub>OUT</sub>	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

$V_{CC} = 1.71\text{ V to }5\text{ V}$ ,  $T_A = 25\text{ °C}$ , a 100nF capacitor connected between the power and ground

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	$V_{CC}$	-	1.71	3.3	5	V
Operating current	$I_{CC}$	-	-	-	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	$T_A = -40\text{ °C to }85\text{ °C}$	-	1000	-	PPM/°C
Offset voltage	$V_{OFFSET}$	-	User programmable			mV/V
Temperature coefficient of offset	TCO	$T_A = -40\text{ °C to }85\text{ °C}$	-	-0.12	-	mV/°C
Nonlinearity	NONL	in $\pm 1000\text{ Gs}$ range	-	2.5	-	%FS
Hysteresis	HYS	in $\pm 1000\text{ Gs}$ range	-	2.5	-	%FS
Noise	$V_N$	$V_{CC} = 3.3\text{ V}$ , BW = 5 kHz	-	-	10	mV <sub>pp</sub>
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%  $V_{CC}$  to 95%  $V_{CC}$ .

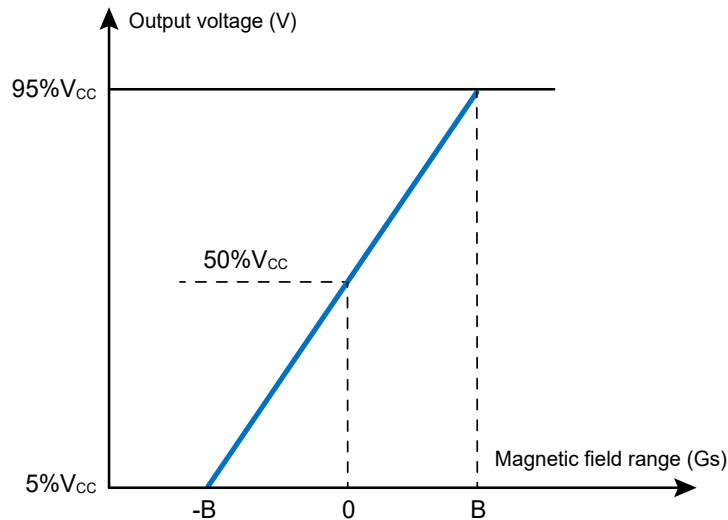


Figure 4. Output voltage versus magnetic field

## 7. Application Circuit

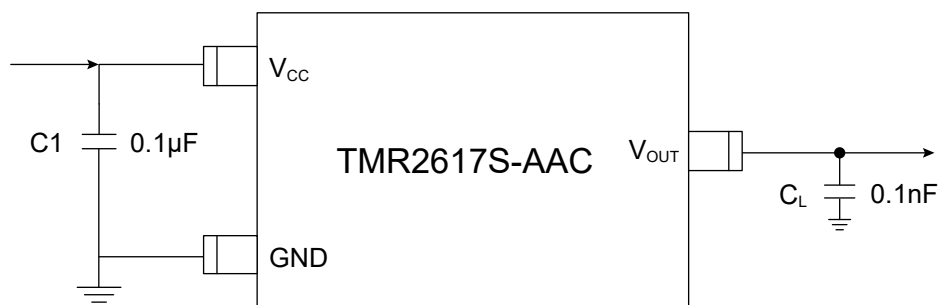


Figure 5. Application circuit diagram

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

## 8. Dimensions

### SOT23-3 Package

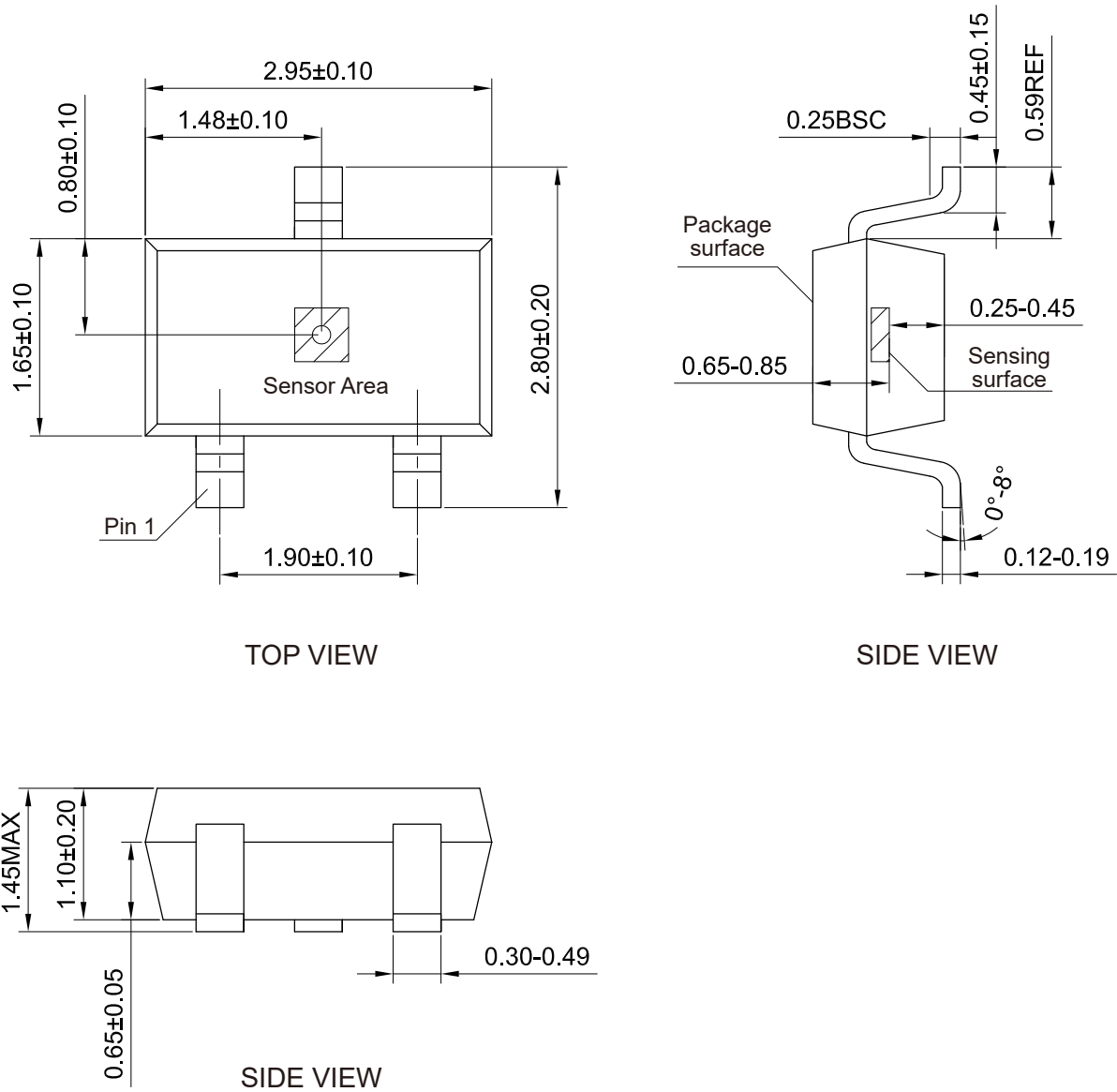


Figure 6. Package outline of SOT23-3 (unit: mm)

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