

General Description

The TMR9001 linear sensor utilizes a unique push-pull Wheatstone bridge composed of four TMR sensor elements. The TMR9001 is assembled in a 6mm X 5mm X 1.5mm SOP8 package.

Features and Benefits

- Tunneling Magneto resistance (TMR) Technology
- Ultra High Sensitivity (~300mV/V/Oe)
- Ultra Low Noise Spectral Density (150pT/√Hz@1Hz)
- Very Low Power Consumption
- Excellent Thermal Stability
- Low Hysteresis
- Compatible with wide Range of Supply Voltages
- No need for set/reset calibration

Applications

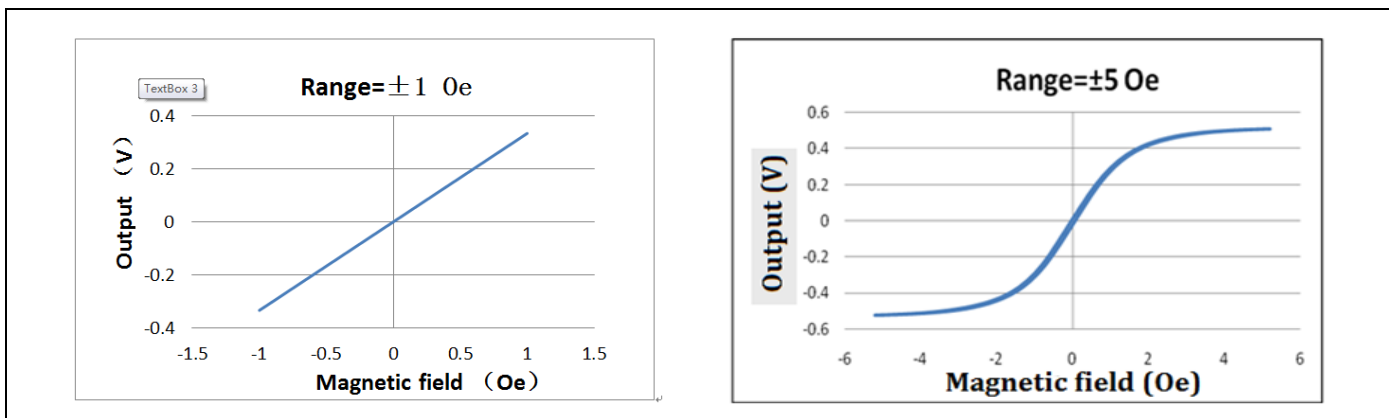
- Weak Magnetic Field Sensing
- Current Sensors
- Position and Displacement Sensing
- Bio-medical Sensing
- Magnetic Communication



TMR9001

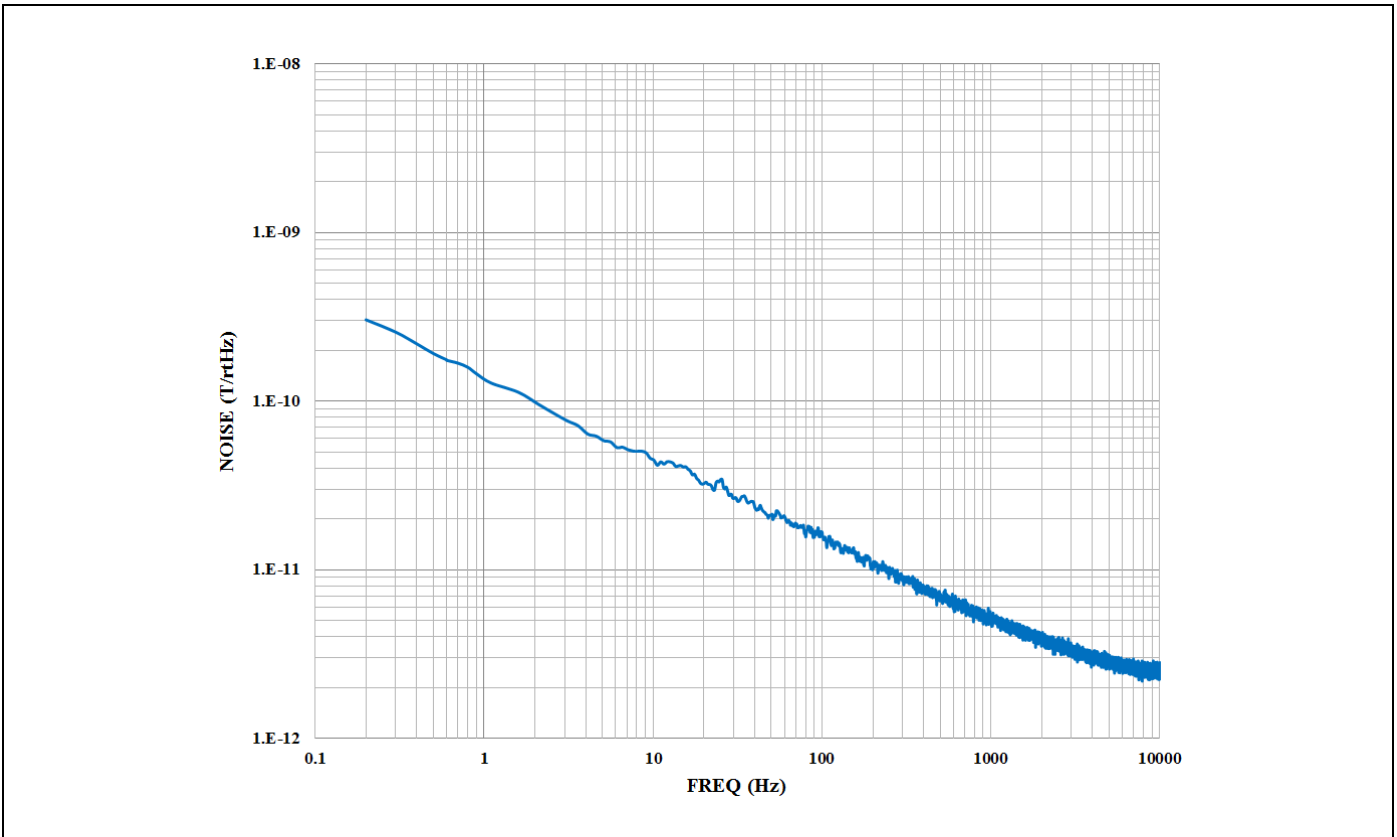
Transfer Curve

The following figure shows the response of the TMR9001 to an applied magnetic field in the range of ±1 Oe and ±5 Oe when the TMR9001 is biased at 1 V. The following specifications are calculated over an analysis range of ±0.5 Oe.



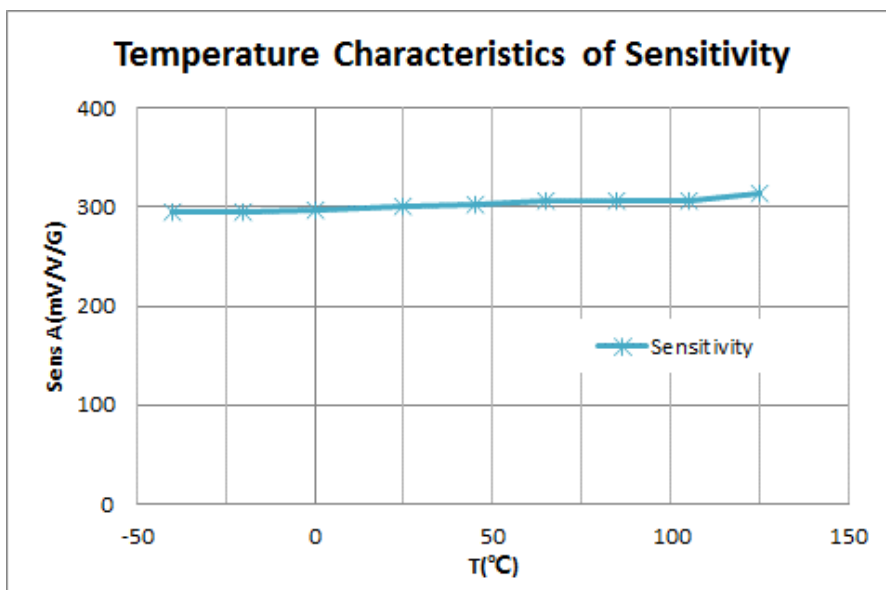
Sensor Noise

The following figure illustrates the Power Spectral Density (PSD) of the TMR9001 self noise (N_i). The $1/f$ noise is approximately $150 \text{ pT}/\sqrt{\text{Hz}}$ @ 1Hz , and the white noise is approximately $2.5\text{pT}/\sqrt{\text{Hz}}$ @ 10kHz .

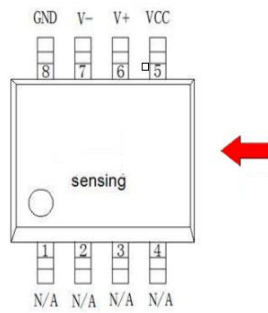


Sensitivity temperature characteristic curve.

The figure below shows the temperature characteristic curve of the TMR9001 sensor (test temperature range: $-40, c \sim 125$)



Pin Configuration



Pin No.	Pin Name	Pin Function
5	VCC	Supply Voltage
6	V+	Analog Differential Output 1
7	V-	Analog Differential Output 2
8	GND	Ground
1,2,3,4	N/A	Not

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Supply Voltage	V_{CC}	3	V
Reverse Supply Voltage	V_{RCC}	3	V
Max Exposed Field	H_E	4000	Oe ⁽¹⁾
ESD Voltage	V_{ESD}	4000	V
Operating Temperature	T_A	-40~125	°C
Storage Temperature	T_{stg}	-50 ~150	°C

Specification ($V_{CC}=1.0V, T_A=25^{\circ}C$, Differential Output)

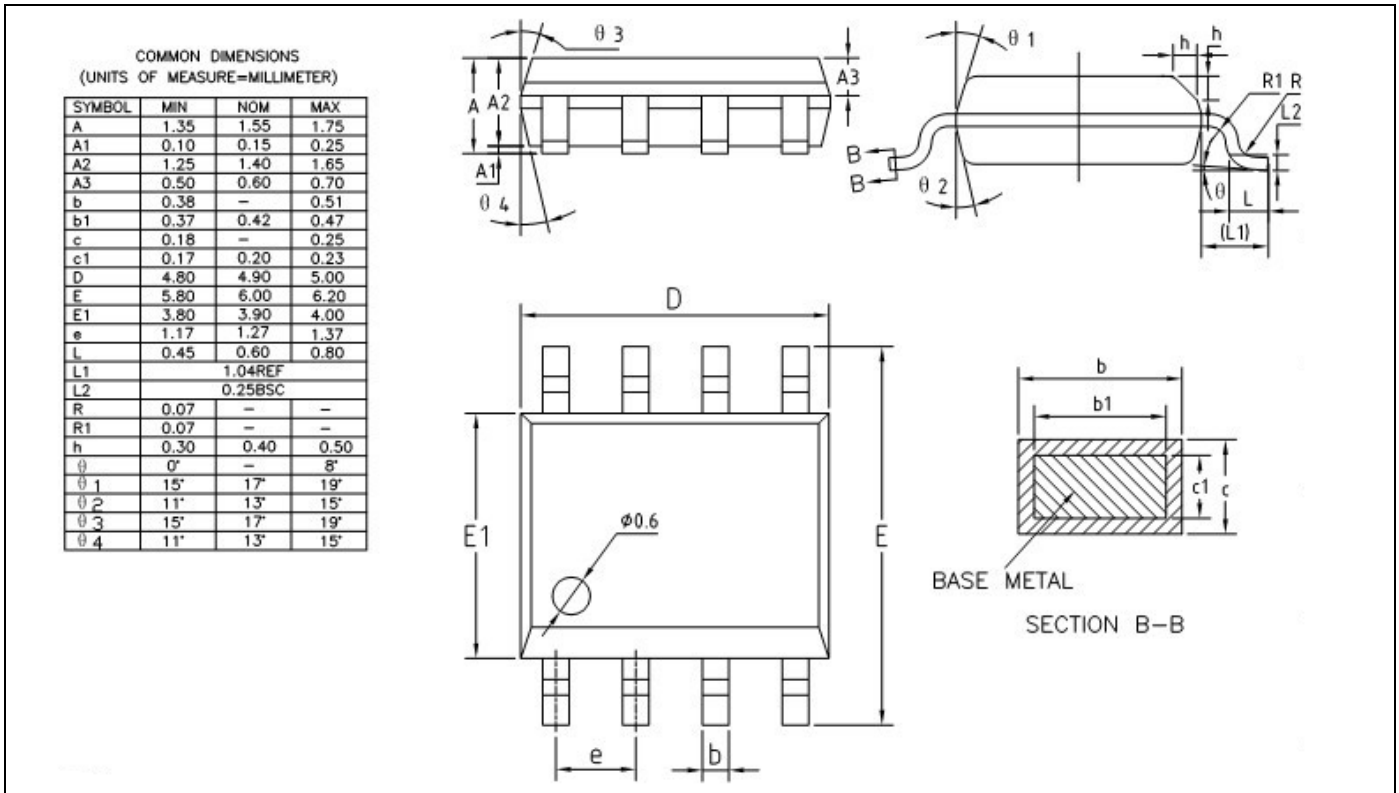
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	Normal Operating		1	3	V
Supply Current	I_{CC}	Output Open		20 ⁽²⁾		μA
Resistance	R			50		KOhm
Sensitivity	SEN	Fit @ ±0.5 Oe		300		mV/V/Oe
Saturation Field	H_{sat}			±4		Oe
Non-Linearity	NONL	Fit @ ±0.5 Oe		1		%FS
Offset Voltage	V_{offset}			15		mV/V
Hysteresis	Hys	Fit @ ±0.5 Oe		0.1		Oe
Resistance temperature coefficient	TCR	-40 °c ~125 °c		-924		PPM/°c
Sensitivity temperature coefficient.	TCS	-40 °c ~125 °c		52		PPM/°c
Self Noise	Ni	@1Hz		150		pT/√Hz

Notes:

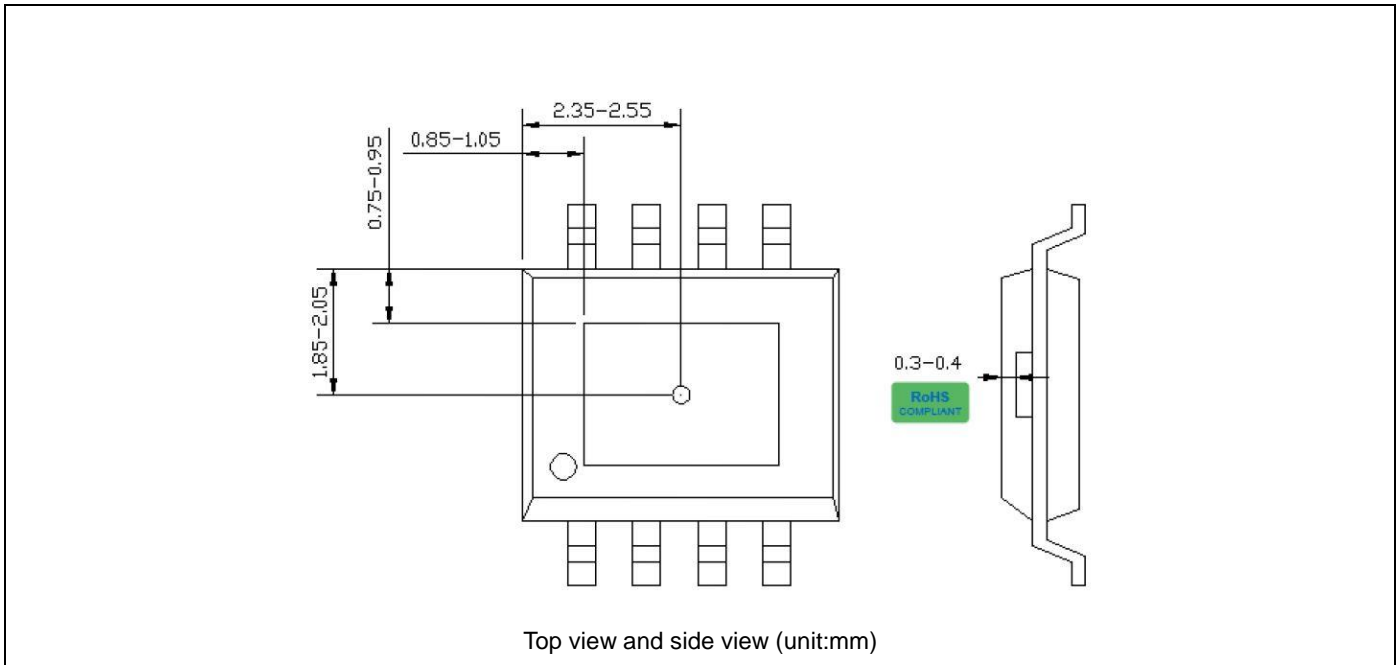
(1) 1 Oe (Oersted) = 1 Gauss in air = 0.1 millitesla = 79.8 A/m.

(2) Custom resistance may be available upon request.

Package Information



TMR Sensor Position



Top view and side view (unit:mm)



American Electronic Components Inc.

1101 Lafayette Street, Elkhart, Indiana 46516, United States of America.

Web: www.aecensors.com Email: sales@aecensors.com

Toll: 888 847 6552, Tel: +1 574 293 8013

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