

TMR9001

Ultra High Sensitivity, Ultra Low Noise TMR linear sensor

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

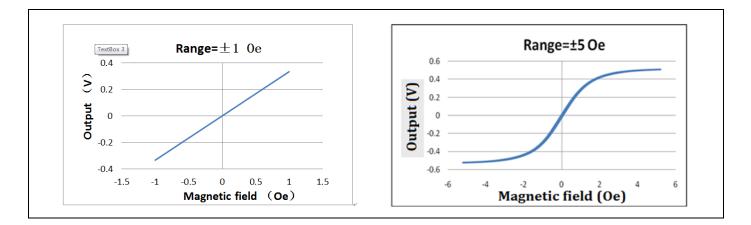
Applications

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



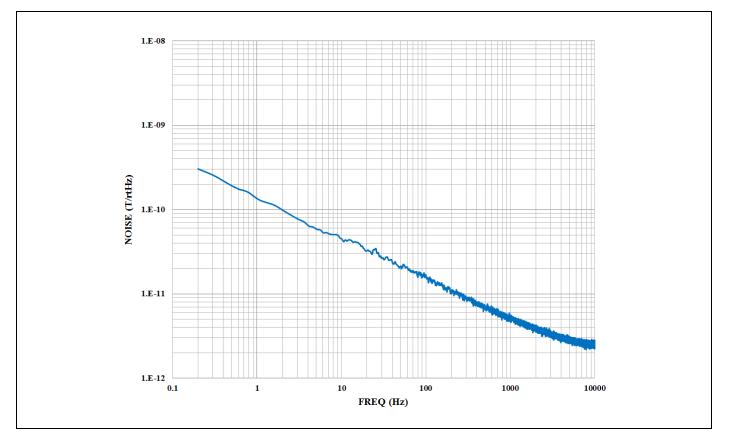
Transfer Curve

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.



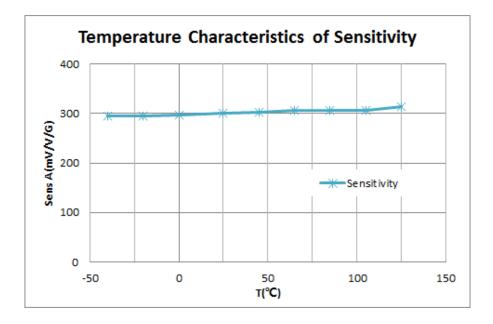
Sensor Noise

The following figure illustrates the Power Spectral Density (PSD) of the TMR9001 self noise (*N*_i). The 1/*f* noise isapproximately 150 pT/ \checkmark Hz @ 1Hz, and the white noise is approximately 2.5pT/ \checkmark 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

GND V- V+ VCC							
		SOP8 Top	View				
ſ	Pin No.	SOP8 Top Pin Name	View Pin Function	7			
	Pin No . 5			7			
-		Pin Name	Pin Function				
-	5	Pin Name Vcc	Pin Function Supply Voltage				
	5 6	Pin Name Vcc V+	Pin Function Supply Voltage Analog Differential Output 1				

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Supply Voltage	V _{CC}	3	V
Reverse Supply Voltage	V _{RCC}	3	V
Max Exposed Field	HE	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°C,Differential Output)

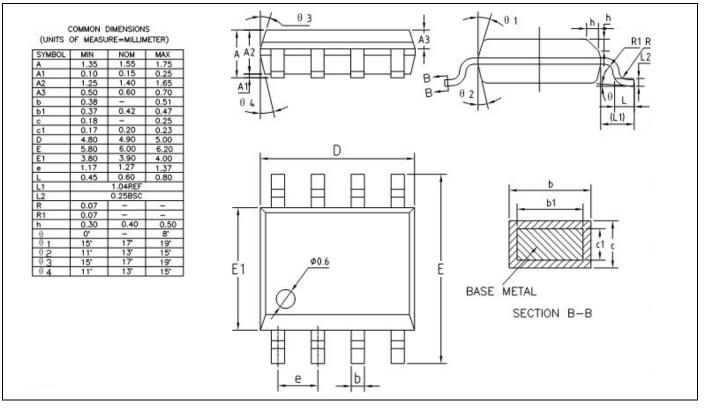
Parameter	Symbol	Conditions	Min	Тур	Мах	Unit
Supply Voltage	Vcc	Normal Operating		1	3	V
Supply Current	Icc	Output Open		20 ⁽²⁾		μA
Resistance	R			50		KOhm
Sensitivity	SEN	Fit @±0.5 Oe		300		mV/V/Oe
Saturation Field	H _{sat}			±4		Oe
Non-Linearity	NONL	Fit @±0.5 Oe		1		%FS
Offset Voltage	V _{offset}	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

Notes:

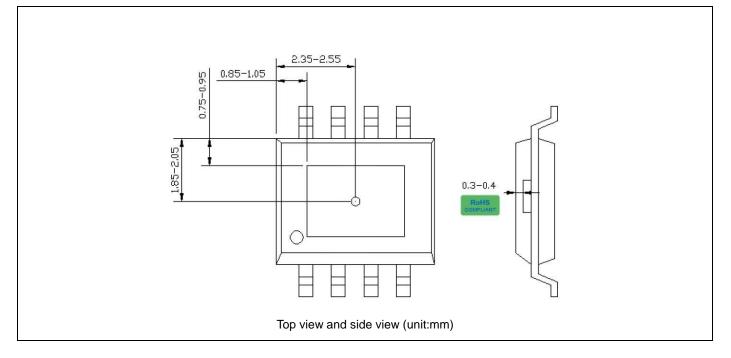
(1) 1 Oe (Oersted) = 1 Gauss in air = 0.1 millitesla = 79.8 A/m.

(2) Custom resistance may be available upon request.

Package Information



TMR Sensor Position





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