

General Description

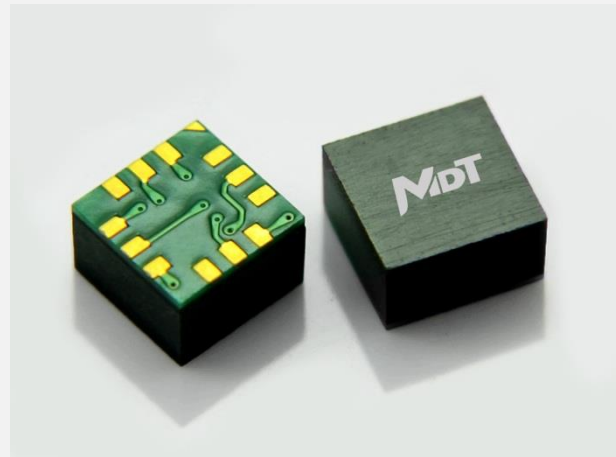
The 3-Axis TMR2301 linear sensor utilizes three unique push-pull Wheatstone bridges. The 3-Axis TMR2301 is available in a 4 mm X 4mm X 2.5 mm LGA package.

Features and Benefits

- Tunneling Magneto resistance (TMR) Technology
- Triple-axis Linear Detection
- Very Wide Dynamic Range
- Low Power Consumption
- Excellent Thermal Stability
- Compatible with wide Range of Supply Voltages
- No need for set/reset calibration

Applications

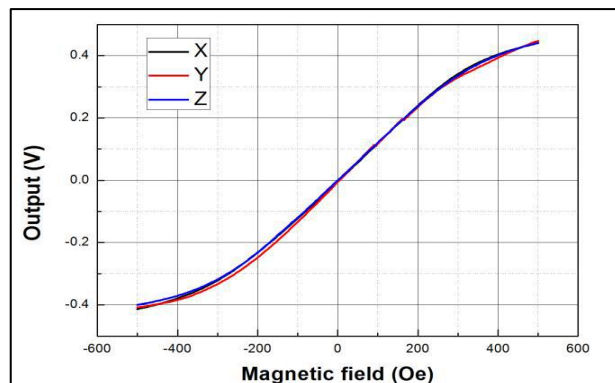
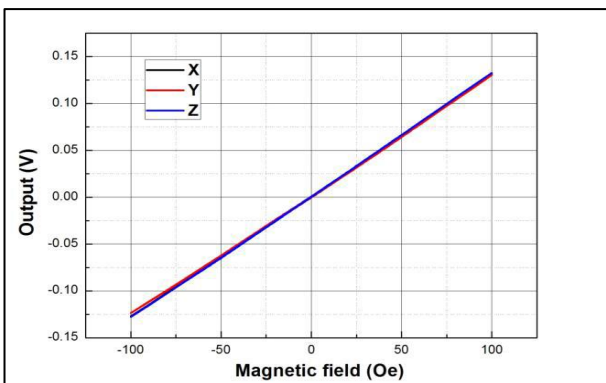
- Three Orthogonal Direction Sensing
- Weak Magnetic Field Sensing
- Current Sensors
- Position and Displacement Sensing



TMR2301

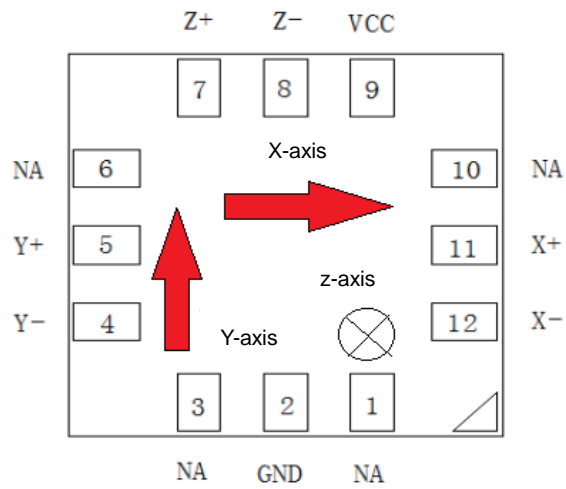
Transfer Curve

The following figure shows the response of the 3-axis TMR2301 to an applied magnetic field in the range of ± 100 Oe (left) and ± 500 Oe when the 3-axis TMR2301 is biased at 1V.



Pin Configuration

(Arrow indicates direction of applied field that generates a positive output voltage.)



Bottom view

Pin No.	Pin Name	Pin Function
1	NA	NA
2	GND	Ground
3	NA	NA
4	VY-	Analog Y-axis Output-
5	VY+	Analog Y-axis Output+
6	NA	NA
7	VZ+	Analog Z-axis Output+
8	VZ-	Analog Z-axis Output-
9	V _{cc}	Supply Voltage
10	NA	NA
11	VX+	Analog X-axis Output+
12	VX-	Analog X-axis Output-

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Supply Voltage	V _{CC}	7	V
Reverse Supply Voltage	V _{RCC}	7	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}	Operating		1	7	V
Supply Current	I_{CC}	Output Open		0.2 ⁽²⁾		mA
Resistance(SOP8)	R	X-axis		15		KOhm
		Y-axis		15		KOhm
		Z-axis		15		KOhm
Sensitivity	SEN	X-axis Fit @ ± 200 Oe		1		mV/V/Oe
		Y-axis Fit @ ± 200 Oe		1		mV/V/Oe
		Z-axis Fit @ ± 200 Oe		1		mV/V/Oe
Saturation Field	H_{sat}	X-axis		± 500		Oe
		Y-axis		± 500		Oe
		Z-axis		± 500		Oe
Non-Linearity	NONL	X-axis Fit @ ± 200 Oe		1.5		%FS
		Y-axis Fit @ ± 200 Oe		1.5		%FS
		Y-axis Fit @ ± 200 Oe		1.5		%FS
Offset Voltage	V_{offset}	X-axis	-25		25	mV/V
		Y-axis	-25		25	mV/V
		Z-axis	-25		25	mV/V
Hysteresis	Hys	X-axis Fit @ ± 200 Oe			1	%FS
		Y-axis Fit @ ± 200 Oe			1	%FS
		Z-axis Fit @ ± 200 Oe			1	%FS
Temperature Coefficient of Resistance	TCR	H = 0 Oe		-500		PPM/ $^{\circ}C$
Temperature Coefficient of Sensitive	TCS			-1100		PPM/ $^{\circ}C$
Self Noise	Ni	X-axis @ 1Hz		100		nT/ \sqrt{Hz}
		Y-axis @ 1Hz		100		nT/ \sqrt{Hz}
		Z-axis @ 1Hz		100		nT/ \sqrt{Hz}

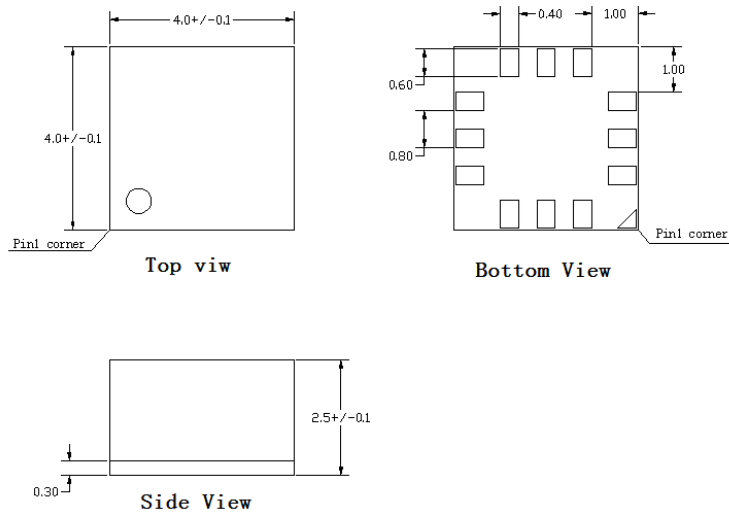
Notes:

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

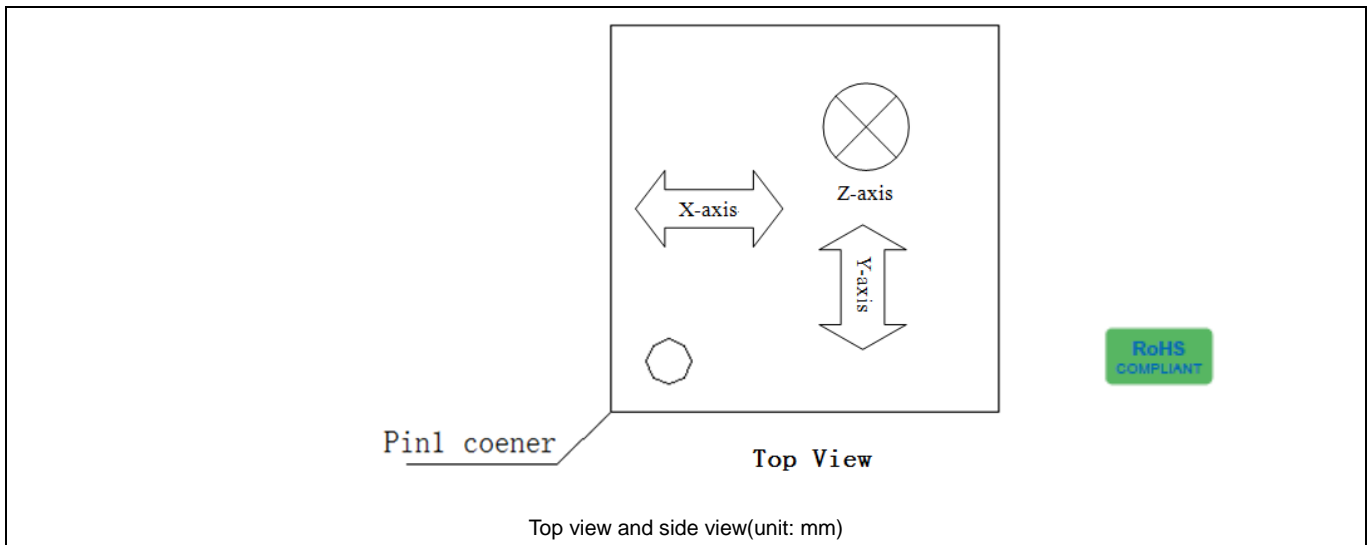
(2) Custom resistance may be available upon request.

Package Information

LGA 4x4x2.5 package drawing:



TMR Sensor Position





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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