TMR2301

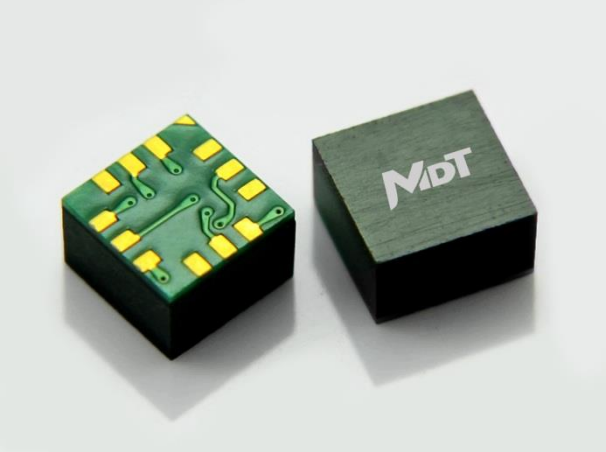
3 axis TMR linear sensor

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



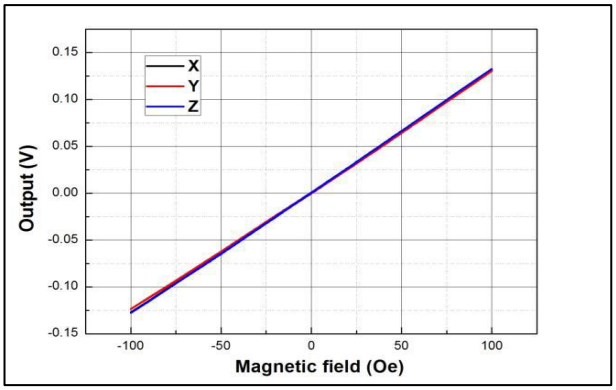
TMR2301

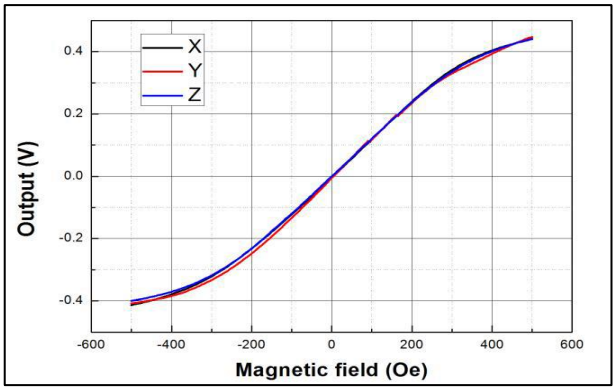
Applications

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

Transfer Curve

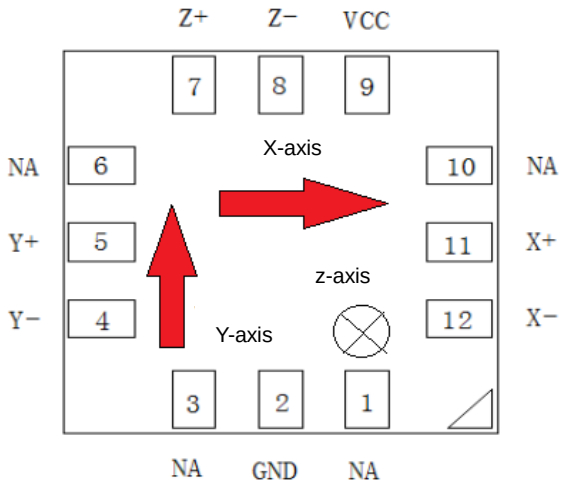
The following figure shows the response of the 3-axis TMR2301 to an applied magnetic field in the range of ±100 Oe (left) and ±500 Oe when the 3-axis TMR2301 is biased at 1V.





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°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/°C
Temperature Coefficient of Sensitive	TCS			-1100		PPM/°C
Self Noise	Ni	X-axis @1Hz		100		nT/√Hz
		Y-axis @1Hz		100		nT/√Hz
		Z-axis @1Hz		100		nT/√Hz

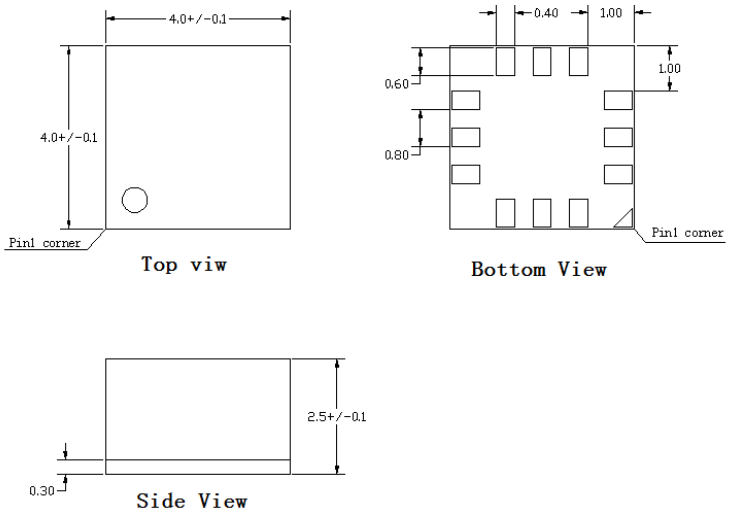
Notes:

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

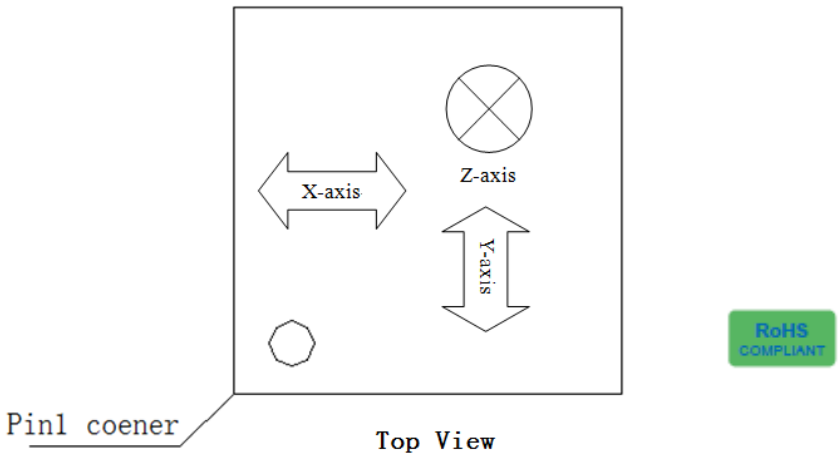
(2) Custom resistance may be available upon request.

Package Information

LGA 4x4x2.5 package drawing:



TMR Sensor Position



Top view and side view(unit: mm)

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