TMR2309 3-Axis TMR Linear Sensor

Features and Benefits

- Tunneling Magnetoresistance (TMR) Technology
- Ultra High Sensitivity (~100mV/V/Oe)
- Ultra Low Noise Spectral Density (150 pT/ √ 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

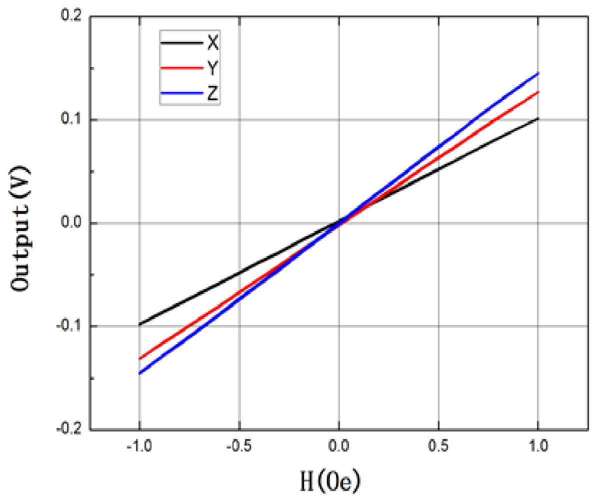
- Weak Magnetic Field Sensing
- Current Sensors
- Position and Displacement Sensing
- Bio-medical Sensing
- Magnetic Communication

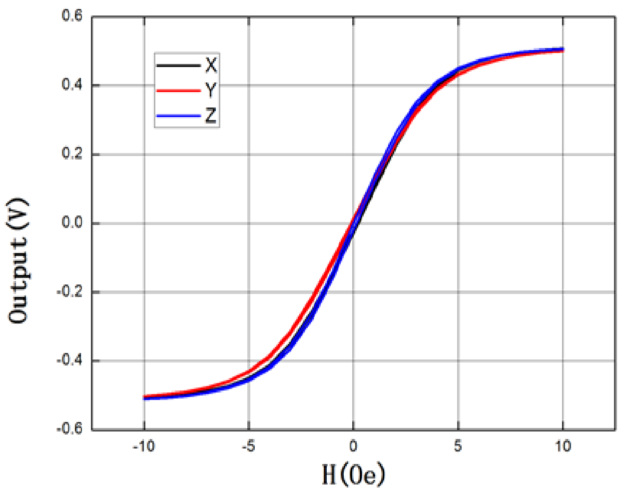
General Description

The 3-Axis TMR2309 linear sensor utilizes three unique push-pull Wheatstone bridges. The 3-Axis TMR2309 is available in a 9.5 mm × 9.5 mm × 6.0 mm^3 package.

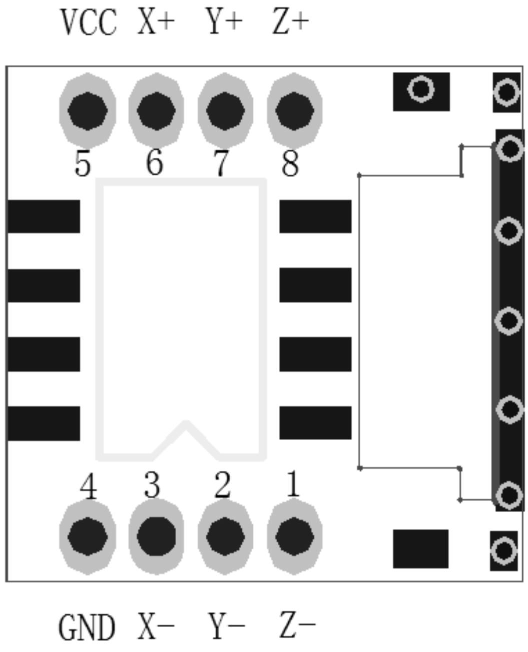
Transfer Curve

The following figure shows the response of the 3-axis TMR2309 to an applied magnetic field in the range of ±1Oe and ±10Oe when the TMR2309 is biased at 1V.





Pin Configuration



Pin No.	Pin Name	Pin Function
1	VZ-	Analog Z-axis Output -
2	VY-	Analog Y-axis Output-
3	VX-	Analog X-axis Output-
4	GND	Ground
5	VCC	Supply Voltage
6	VX+	Analog X-axis Output+
7	VY+	Analog Y-axis Output+
8	VZ+	Analog Z-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	He	5000	Oe(1)
ESD Voltage	V_{ESD}	4000	V
Operating Temperature	T_A	-40 ~125	℃
Storage Temperature	T_{stg}	-50 ~150	℃

Specification (V_{CC}=1.0V, T_A=25 ℃, Differential Output)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	Operating		1	7	V
Supply Current	I_{CC}	Output Open		0.07(2)		mA
Resistance	R			15		kOhm
Sensitivity	SEN	X-axis Fit @±1 Oe		100		mV/V/Oe
		Y-axis Fit @±1 Oe		100		mV/V/Oe
		Z-axis Fit @±1 Oe		100		mV/V/Oe
Saturation Field	H_{sat}	X-axis		±8		Oe
		Y-axis		±8		Oe
		Z-axis		±8		Oe
Non-Linearity	NONL	X-axis Fit @±1 Oe		0.5		%FS
		Y-axis Fit @±1 Oe		0.5		%FS
		Z-axis Fit @±1 Oe		0.5		%FS
Offset Voltage	V_{offset}	X-axis	-15		15	mV/V
		Y-axis	-15		15	mV/V
		Z-axis	-15		15	mV/V
Hysteresis	Hys	X-axis Fit @±1 Oe			0.02	Oe
		Y-axis Fit @±1 Oe			0.02	Oe
		Z-axis Fit @±1 Oe			0.02	Oe
Temperature Coefficient of Resistance	TCR	H = 0 Oe		-600		PPM/ ℃
Temperature Coefficient of Sensitivity	TCS			-300		PPM/ ℃
Self Noise	N_i	X-axis @1Hz		150		pT/ √Hz
		Y-axis @ 1Hz		150		pT/ √Hz
		Z-axis @ 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

Size：Length x Width x Height = 9.5x9.5x6.0 mm^3