

## General Description

The TMR2501 linear sensor utilizes a unique push-pull Wheatstone bridge composed of four unshielded TMR sensor elements. The unique bridge design provides a high sensitivity differential output that is linearly proportional to a magnetic field applied perpendicular to the surface of the sensor package, and it provides superior temperature compensation of the output. The TMR2501 is available in the TO94 and SSIP4 packages.

## Features and Benefits

- Tunneling Magneto resistance (TMR) Technology
- High Sensitivity
- Large Dynamic Range
- Low Power Consumption
- Excellent Thermal Stability
- Very Low Hysteresis
- Compatible with wide Range of Supply Voltages

## Applications

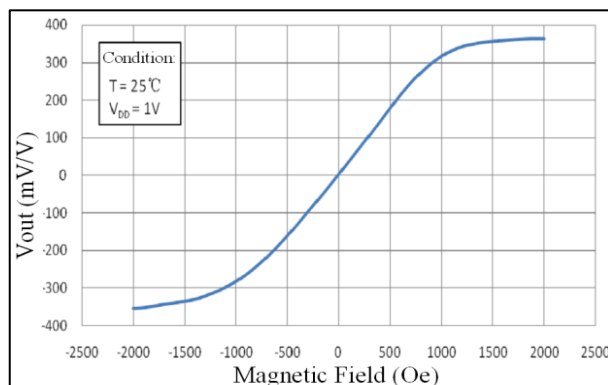
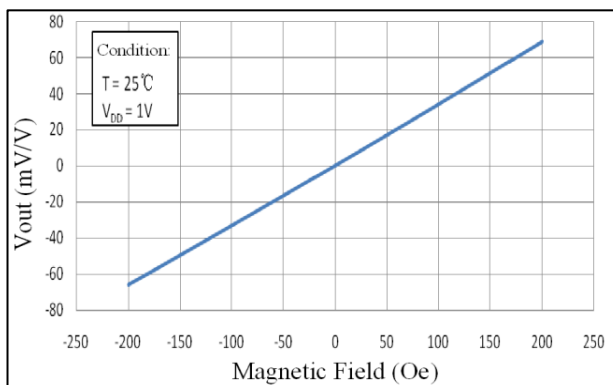
- Magnetic Field Sensing
- Current Sensors
- Position and Displacement Sensing



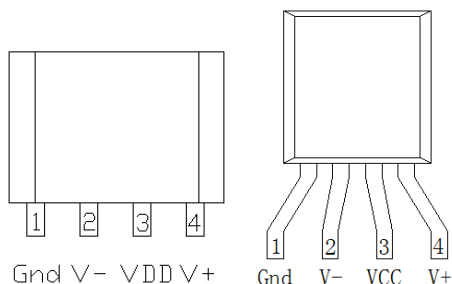
TMR2501

## Transfer Curve

The following figure shows the response of the TMR2501 to an applied magnetic field in the range of  $\pm 200$  Oe(left) and  $\pm 1000$  Oe (right) when the TMR2501 is biased at 1V.



## Pin Configuration



Pin No.	Pin Name	Pin Function
1	GND	Ground
2	Vout-	Analog Differential Output 1
3	V <sub>DD</sub>	Supply Voltage
4	Vout+	Analog Differential Output 2

## Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Supply Voltage	V <sub>DD</sub>	7	V
Reverse Supply Voltage	V <sub>RDD</sub>	-7	V
Max Exposed Field	H <sub>E</sub>	4000	Oe <sup>(1)</sup>
ESD Voltage	V <sub>ESD</sub>	4000	V
Operating Temperature	T <sub>A</sub>	-55~150	°C
Storage Temperature	T <sub>stg</sub>	-70 ~165	°C

## Specification (V<sub>CC</sub>=1.0V, T<sub>A</sub>=25°C, Differential Output)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	V <sub>CC</sub>	Operating		1	7	V
Supply Current	I <sub>CC</sub>	Output Open			1.5 <sup>(2)</sup>	mA
Resistance(SOP8)	R				7 <sup>(2,3)</sup>	KOhm
Sensitivity	SEN	Fit @ ±200 Oe	0.2		0.5	mV/V/Oe
Saturation Field	H <sub>sat</sub>			±1000		Oe
Non-Linearity	NONL	Fit @ ±100 Oe		0.5		%FS
		Fit @ ±500 Oe		1.5		%FS
Offset Voltage	V <sub>offset</sub>		-10		10	mV/V
Hysteresis	Hys	Fit @ ±100 Oe			1	Oe
Temperature Coefficient of Resistance	TCR	H = 0 Oe		-365		PPM/°C
Temperature Coefficient of Offset	TCO	-55°C~150°C		-0.015		mV/V/°C
Temperature Coefficient of Sensitivity	TCS	-55°C~150°C	-0.005		0.005	mV/V/G

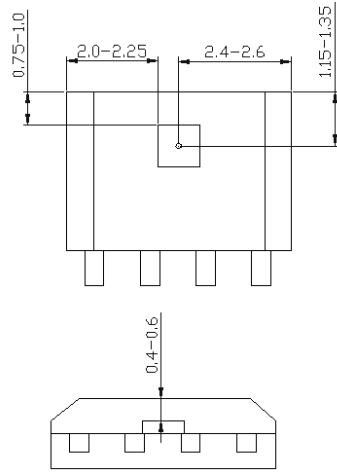
Notes:

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

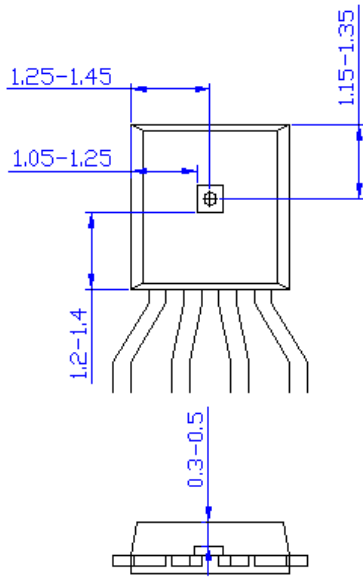
(2) I<sub>CC</sub>= V<sub>CC</sub>/ R. (3) Custom resistance may be available upon request.



## TMR Sensor Position



TO94 Package



SSIP4 Package



Top view and side view (unit:mm)



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