TMR2501

Z-axis TMR linear sensor

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(P/N TMR2501T) and SSIP4(P/N TMR2501B) 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

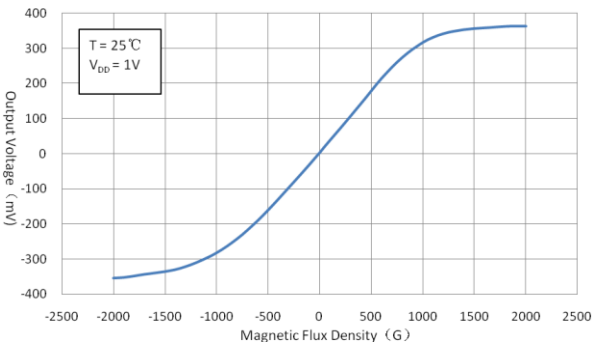
TMR2501B(Left), TMR2501T(Right)

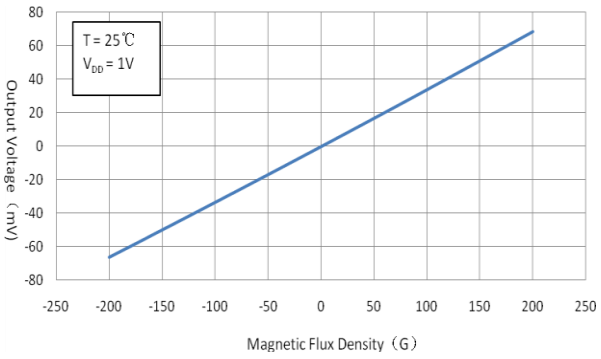
Applications

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

Transfer Curve

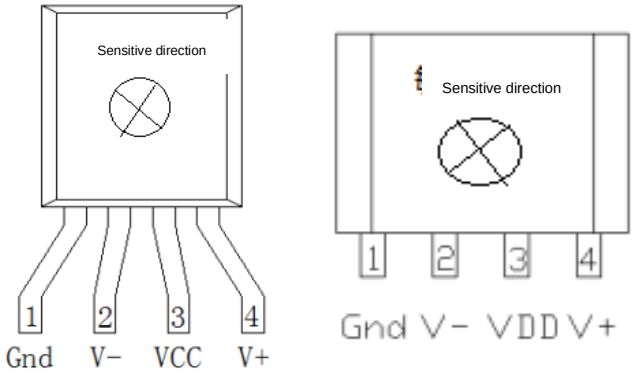
The following figure shows the response of the TMR2501 to an applied magnetic field in the range of ±2000 Oe(left) and ±200 Oe (right) when the TMR2501 is biased at 1V.





Pin Configuration

Note: Arrow indicates direction of applied field(N-S) that generates a positive output voltage.



Pin No.	Pin Name	Pin Function
1	GND	Ground
2	Vout-	Analog Differential Output 1
3	V_{DD}	Supply Voltage
4	Vout+	Analog Differential Output 2

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Supply Voltage	V_{DD}	7	V
Reverse Supply Voltage	V_{RDD}	-7	V
Max Exposed Field	H_E	4000	Oe(1)
ESD Voltage	V_{ESD}	4000	V
Operating Temperature	T_A	-55~150	°C
Storage Temperature	T_{stg}	-70 ~165	°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			1.5(2)	mA
Resistance(SOP8)	R				7(2,3)	KOhm
Sensitivity	SEN	Fit @±200 Oe	0.2		0.5	mV/V/Oe
Saturation Field	H_{sat}			±1000		Oe
Non-Linearity	NONL	Fit @±100 Oe		0.5		%FS
		Fit @±500 Oe		1.5		%FS
Offset Voltage	V_{offset}		-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		345		PPM/°C

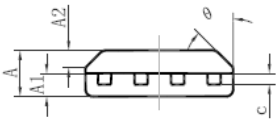
Notes:

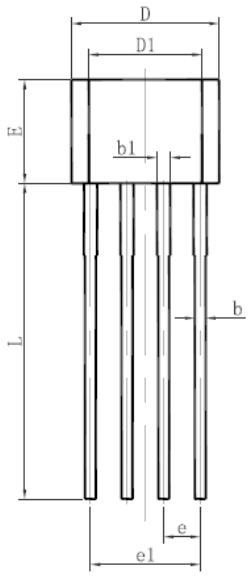
(1) 1 Oe (Oersted) = 1 Gauss in air = 0.1 millitesla = 79.8 A/m.

(2) Icc= Vcc/ R. (3) Custom resistance may be available upon request.

Package Information

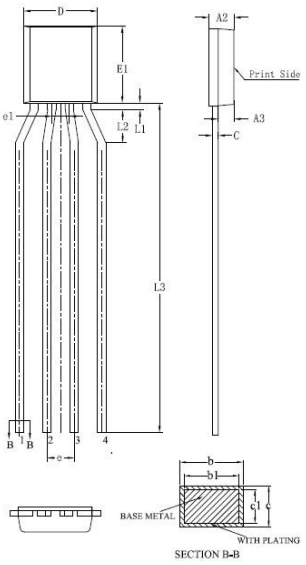
TO94(P/N TMR2501T) package drawing:





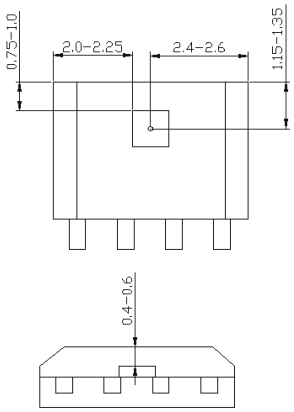
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.800	0.055	0.071
A1	0.700	0.900	0.028	0.035
A2	0.500	0.700	0.020	0.028
b	0.360	0.500	0.014	0.020
b1	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.980	5.280	0.196	0.208
D1	3.780	4.080	0.149	0.161
E	3.450	3.750	0.136	0.148
e	1.270 TYP		0.050 TYP	
e1	3.710	3.910	0.146	0.154
L	14.900	15.300	0.587	0.602
θ	45° TYP		45° TYP	

SSIP4(P/N TMR2501B) package drawing:

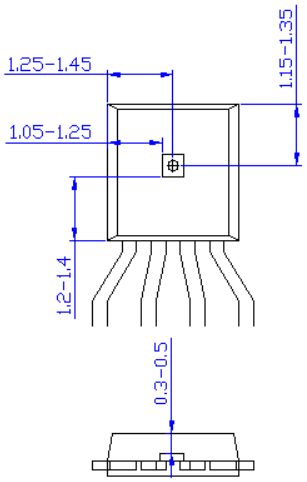


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A2	0.80	0.90	1.00
A3	0.55	0.60	0.65
b	0.28	—	0.38
b1	0.27	0.30	0.33
c	0.20	—	0.26
c1	0.19	0.20	0.21
D	2.85	2.90	2.95
E1	2.70	2.80	2.90
L1	0.20	0.25	0.30
L2	1.10	1.20	1.30
L3	11.80	12.00	12.20
e	1.00BSC		
e1	0.64BSC		

TMR Sensor Position



TO94 (P/N TMR2501T) Package



SSIP4 (P/N TMR2501B) Package

RoHS COMPLIANT

Top view and side view (unit:mm)

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