

TMR2503

Z-axis TMR linear sensor

General Description

The TMR2503 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 TMR2503 is available in the TO94(P/N TMR2503T),SSIP4(P/N TMR2503B), or SOT23-5(P/N TMR2503S) 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

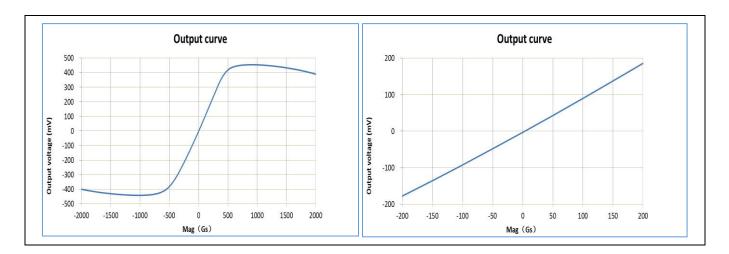
Applications

- Magnetic Field Sensing
- Current Sensors
- Motor and Fan Drivers
- Position and Displacement Sensors



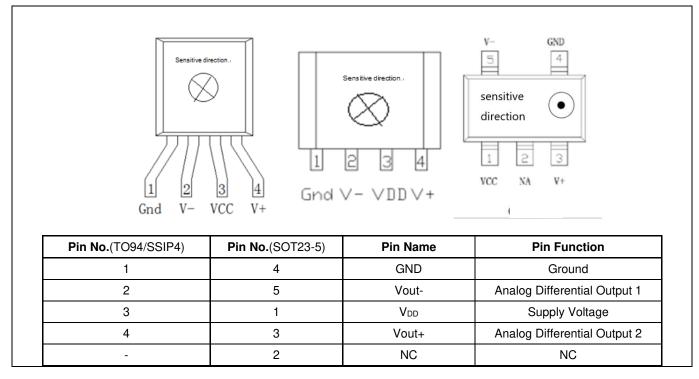
Transfer Curve

The following figure shows the response of the TMR2503 to an applied magnetic field in the range of ± 2000 Oe and ± -2000 when the TMR2503 is biased at 1V.



Pin Configuration

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



Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Supply Voltage	V _{DD}	7	V
Reverse Supply Voltage	V _{RDD}	-7	V
Max Exposed Field	HE	4000	Oe ⁽¹⁾
ESD Voltage	V _{ESD}	4000	V
Operating Temperature	T _A	-55~150	°C
Storage Temperature	T _{stg}	-70 ~165	°C

Specification (Vcc=1.0V, TA=25°C, Differential Output)

Parameter	Symbol	Conditions	Min	Тур	Мах	Unit
Supply Voltage	V _{DD}	Operating		1	7	V
Supply Current	lcc	Output Open		1.1 ⁽²⁾		mA
Resistance	R			0.9 ^(2,3)		KOhm
Sensitivity	SEN	Fit @±50 Oe		1.0		mV/V/Oe
Saturation Field	H _{sat}		-700		+700	Oe
Non-Linearity	NONL	Fit @±50 Oe		0.5		%FS
Offset Voltage	Voffset		-20		20	mV/V
Hysteresis	Hys	Fit @±50 Oe			1	Oe
Temperature Coefficient of Resistance	TCR	H = 0 Oe		-300		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		300		PPM/°C

Notes:

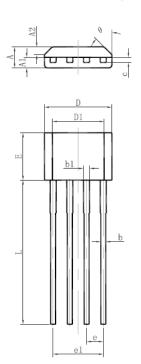
(1) 1 Oe (Oersted) = 1 Gauss in air = 0.1 millitesla = 79.8 A/m.

(2) Icc= Vcc/ R.

(3) Custom resistance may be available upon request.

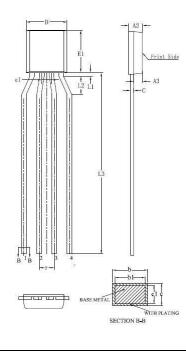
Package Information

TO94 (P/N TMR2503T) 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	
С	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) TYP		
e1	3.710	3.910	0.146	0.154	
L	14.900	15.300	0.587	0.602	
θ	45°	TYP	45°	TYP	

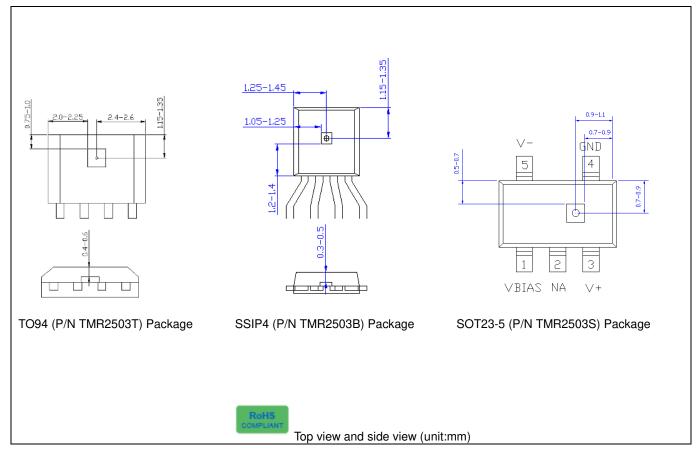
SSIP4 (P/N TMR2503B) package drawing:



SYMBOL	MILLIMETER			
STMBOL	MIN	NOM	MAX	
A2	0.80	0.90	1.00	
A3	0.55	0.60	0.65	
ь	0.28	00 1000 - 7 00	0.38	
b1	0.27	0.30	0.33	
с	0.20	_92 <u>—2</u> 5	0.26	
cl	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	
L.2	1.10	1.20	1.30	
L3	11.80	12.00	12.20	
е	1.00BSC			
el	0.64BSC			

SOT23-5 (P/N TMR2503S) package drawing: $\theta 1$ θ1 $2.9 \pm 0.$ (1) 10 (0.35) . 6) θ2 θ2 E1 (1.9) e1 2.9 ± 0.1 E 170 θ1 θ1 R 11 日期(221) 40° θ 2 10 (0.65) θ2 0.254 C. 08 ±0.05 (2.92)A1 0.45 ± 0.08 D L

TMR Sensor Position





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