

## TMR2101 TMR Linear Sensor

### Features and Benefits

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

### Applications

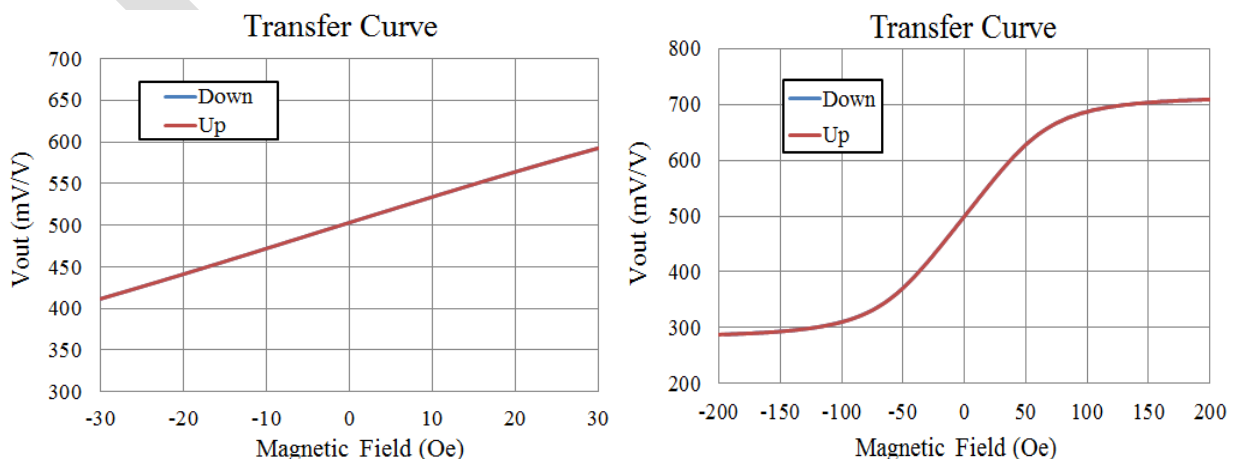
- Magnetic Field Sensing
- Current Sensors
- Displacement Sensing
- Rotary Position Sensors

### General Description

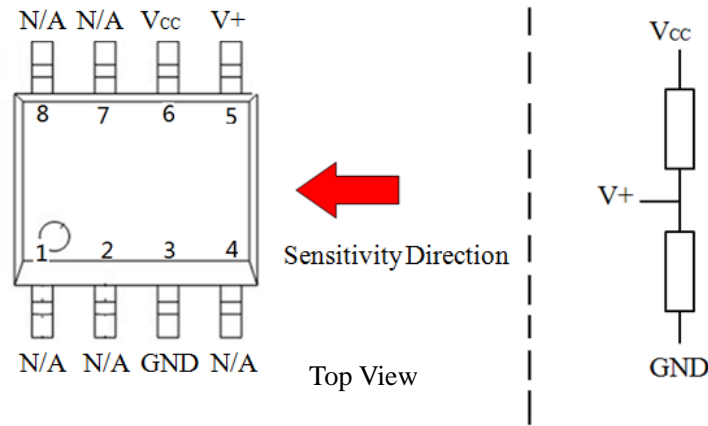
The TMR2101 linear sensor utilizes a unique push-pull half bridge composed of four unshielded TMR sensor elements. The unique bridge design provides a high sensitivity signal output that is linearly proportional to a magnetic field applied parallel to the surface of the sensor package, and it provides superior temperature compensation of the output. The TMR2101 is available in a 6 mm × 5 mm × 1.7 mm SOP8 package.

### Transfer Curve

The following figure shows the response of the TMR2101 to an applied magnetic field in the range of  $\pm 30$  Oe (left) and  $\pm 200$  Oe (right) when the TMR2101 is biased at 1V. At low fields the TMR2101 response is highly linear, and it is not harmed when the sensor is driven into saturation.



## Pin Configuration



Pin No.	Pin Name	Pin Function
1, 2, 4, 7, 8	N/A	Not Connected
3	GND	Ground
5	V+	Half Bridge Output
6	V <sub>CC</sub>	Supply Voltage

## Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Supply Voltage	V <sub>CC</sub>	7	V
Reverse Supply Voltage	V <sub>RCC</sub>	7	V
Magnetic Field	H	1000	Oe <sup>1</sup>
ESD Voltage	V <sub>ESD</sub>	4000	V
Operating Temperature	T <sub>A</sub>	-40 ~ 125	℃
Storage Temperature	T <sub>stg</sub>	-50 ~ 150	℃

## Specification (V<sub>CC</sub> = 1.0V, T<sub>A</sub> = 25 ℃)

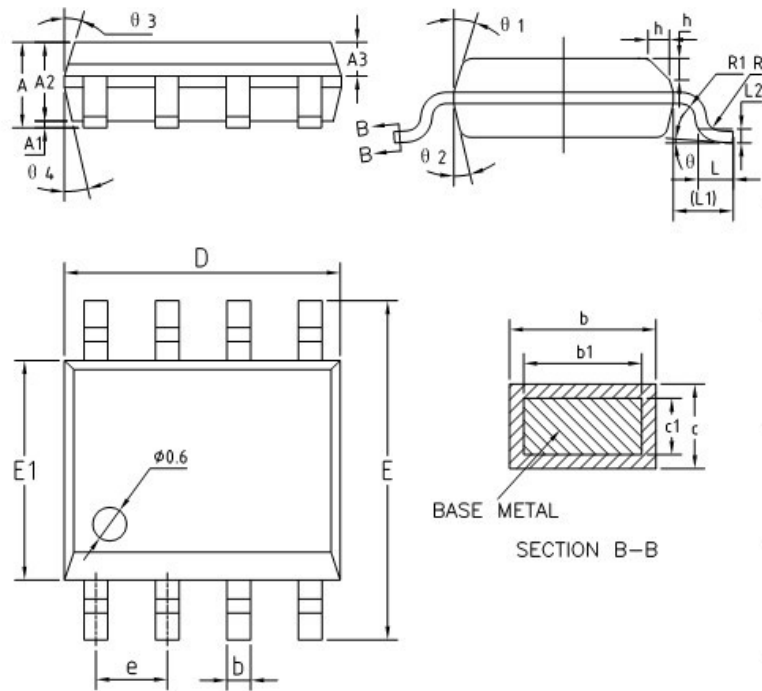
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	V <sub>CC</sub>	Operating		1	7	V
Supply Current	I <sub>CC</sub>	Output Open		5		μA
Resistance	R			200 <sup>2</sup>		kOhm
Sensitivity	SEN	Fit @ ± 30 Oe		3		mV/V/Oe
Saturation Field	H <sub>sat</sub>			± 70		Oe
Linear Range		1% Non-linearity		± 30		Oe
Offset Voltage	V <sub>offset</sub>			± 2.5		mV/V
Hysteresis	Hys	Fit @ ± 30 Oe		0.1		%FS
Temperature Coefficient of Offset	TCO	H = 0 Oe		0.005		mV/V/℃
Temperature Coefficient of Sensitivity	TCS			-1000		PPM/℃

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

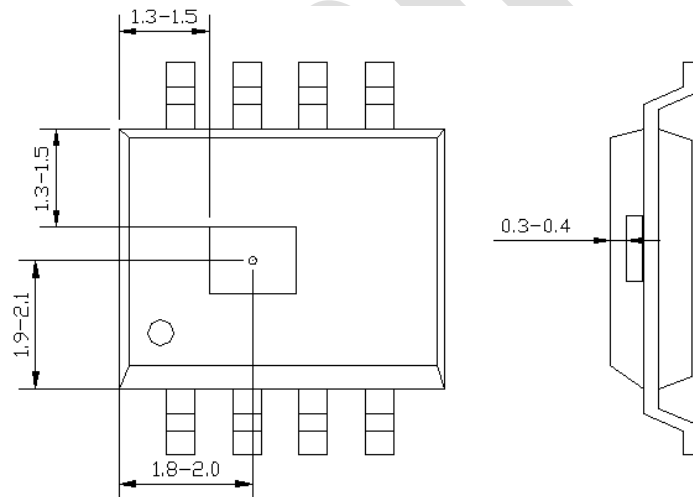
(2) Custom sensor resistance may be available upon request.

## Package Information

COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)			
SYMBOL	MIN	NOM	MAX
A	1.35	1.55	1.75
A1	0.10	0.15	0.25
A2	1.25	1.40	1.65
A3	0.50	0.60	0.70
b	0.38	—	0.51
b1	0.37	0.42	0.47
c	0.18	—	0.25
c1	0.17	0.20	0.23
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.17	1.27	1.37
L	0.45	0.60	0.80
L1	1.04REF		
L2	0.25BSC		
R	0.07	—	—
R1	0.07	—	—
h	0.30	0.40	0.50
θ	0°	—	8°
θ 1	15°	17°	19°
θ 2	11°	13°	15°
θ 3	15°	17°	19°
θ 4	11°	13°	15°



## TMR Sensor Position



Top view and side view (unit: mm)

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