

TMR2102

Large Dynamic Range TMR linear sensor

General Description

The TMR2102 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 parallel to the surface of the sensor package, and it provides superior temperature compensation of the output. The TMR2102 is available in two packaging form factors: SOP8 6mm X 5mm X 1.5mm (P/N TMR2102P), or DFN8 3mm X 3mm X 0.75mm(P/N TMR2102D).

Features and Benefits

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



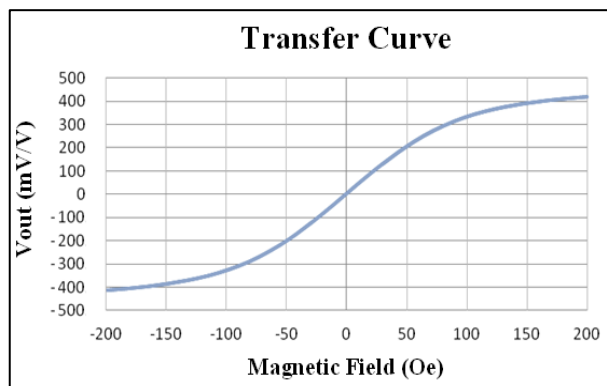
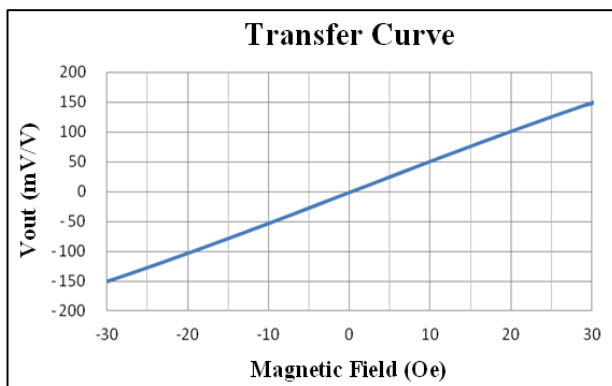
TMR2102

Applications

- Magnetic Field Sensing
- Current Sensors
- Industrial Flow Meters
- Displacement Sensing
- Rotary Position Sensors

Transfer Curve

The following figure shows the response of the TMR2101 to an applied magnetic field in the range of ± 30 Oe (left) and ± 200 Oe (right) when the TMR2102 is biased at 1V. At low fields the TMR2102 response is highly linear, and it is not harmed when the sensor is driven into saturation.



Pin Configuration

(Arrow indicates direction of applied field that generates a positive output voltage.)

Pin No.	Pin Name	Pin Function
1,2,7,8	N/A	Not Connected
3	GND	Ground
4	V-	Analog Differential Output 2
5	V+	Analog Differential Output 1
6	V _{cc}	Supply Voltage

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Supply Voltage	V _{CC}	7	V
Reverse Supply Voltage	V _{RCC}	7	V
Max Exposed Field	H _E	1000	Oe ⁽¹⁾
ESD Voltage	V _{ESD}	4000	V
Operating Temperature	T _A	-40~125	°C
Storage Temperature	T _{stg}	-50 ~150	°C

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

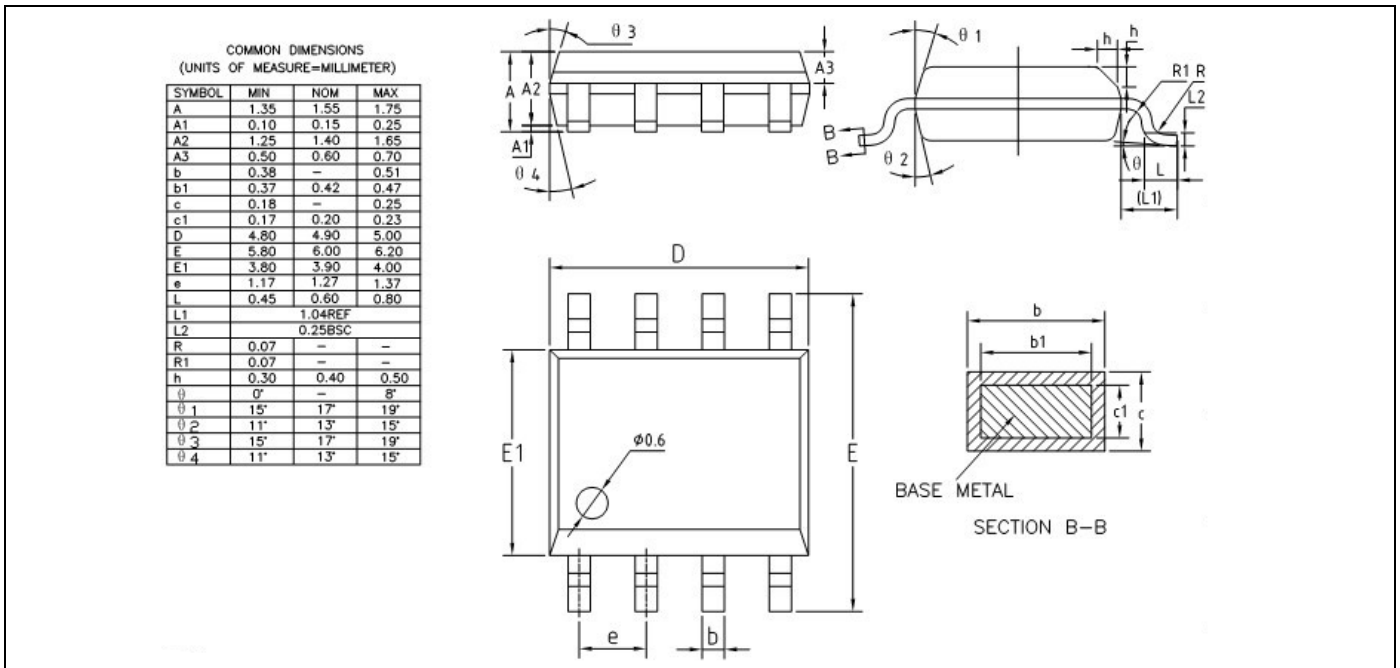
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	V _{CC}	Operating		1	7	V
Supply Current(SOP8)	I _{CC}	Output Open		11 ⁽²⁾		µA
Supply Current(DFN8)	I _{CC}	Output Open		22 ⁽²⁾		µA
Resistance(SOP8)	R			90 ^(2,3)		KOhm
Resistance(DFN8)	R			45 ^(2,3)		KOhm
Sensitivity	SEN	Fit @±30Oe		4.9		mV/V/Oe
Saturation Field	H _{sat}			±90		Oe
Non-Linearity	NoNL	Fit @±30Oe		1		%FS
Offset Voltage	V _{offset}		-20		20	mV/V
Hysteresis	Hys	Fit @±30Oe		0.1	0.2	Oe
Temperature Coefficient of Resistance	TCR	H = 0 Oe		-820		PPM/°C
Temperature Coefficient of Sensitivity	TCS			-1160		PPM/°C

Notes:

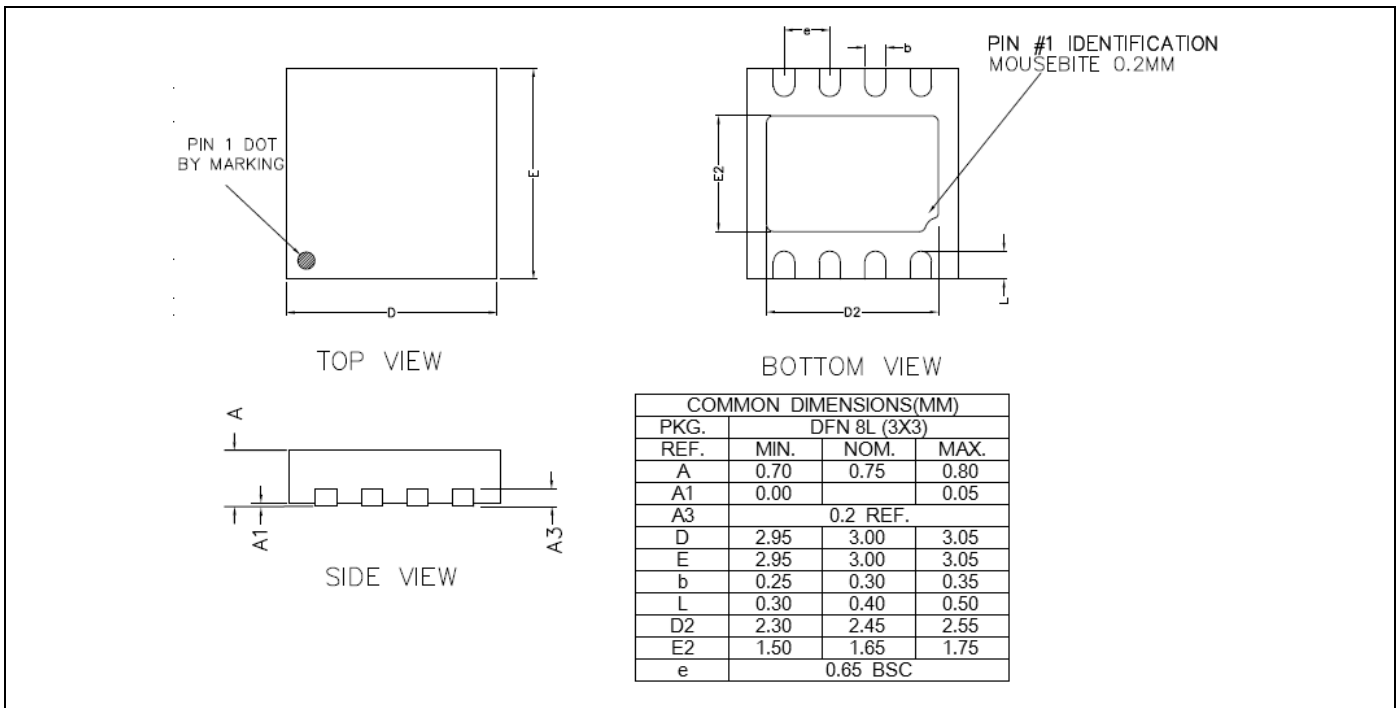
- (1) 1 Oe (Oersted) = 1 Gauss in air = 0.1 millitesla = 79.8 A/m.
- (2) I_{CC} = V_{CC} / R. The SOP8 and DFN8 packages are designed with different resistance values, resulting in different I_{CC} under 1V supply.
- (3) Custom resistance may be available upon request.

Package Information

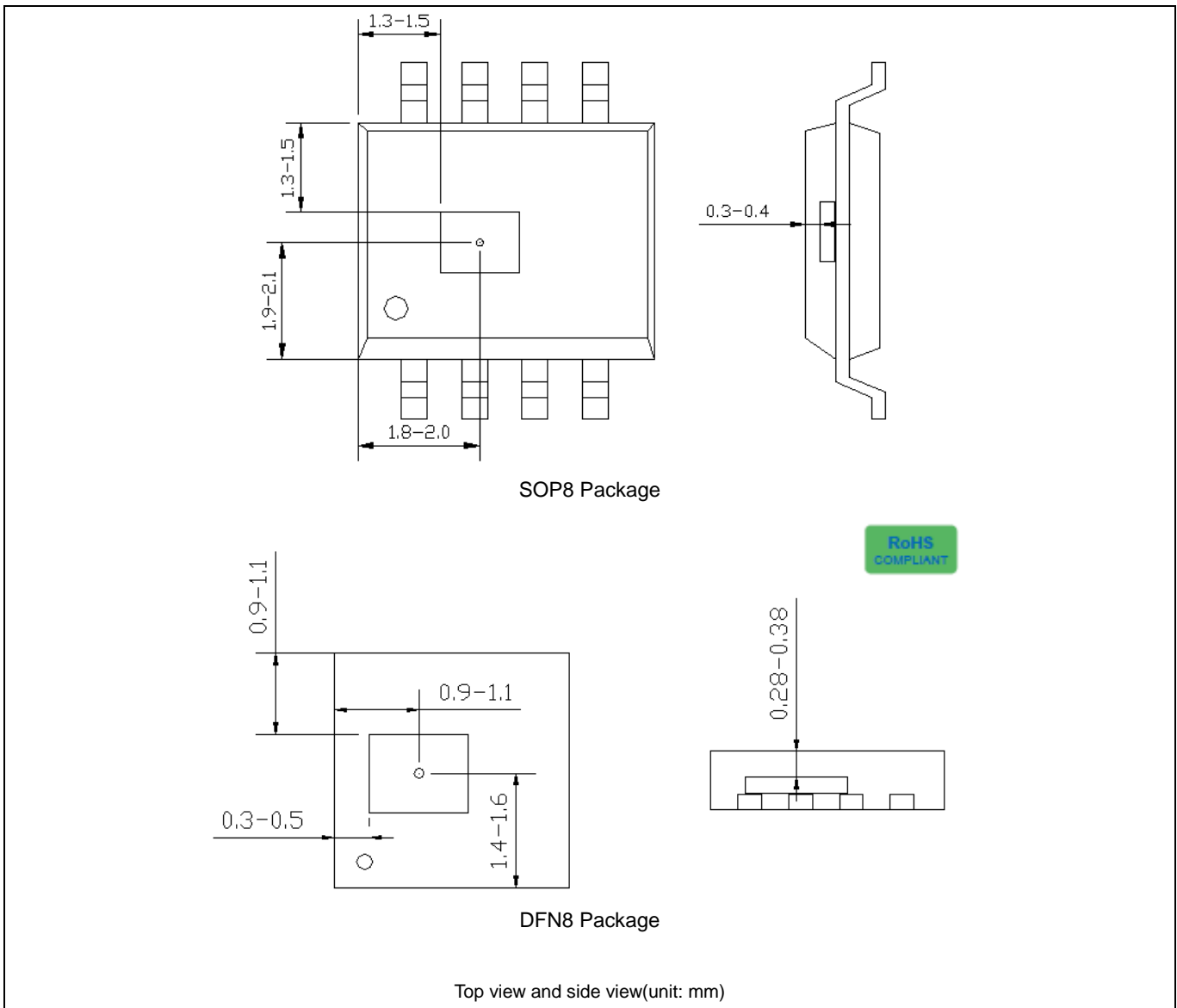
SOP8 package drawing



DFN8 package drawing



TMR Sensor Position





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