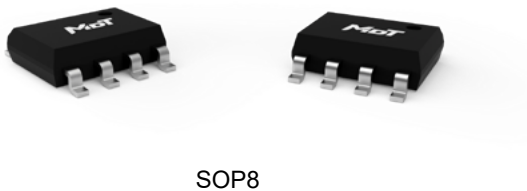


TMR9082

High sensitivity, Low Noise TMR Magnetic Linear Sensor

Description

The TMR9082 linear sensor utilizes a unique push-pull Wheatstone bridges composed of four highly sensitive TMR sensor elements. With low noise, high sensitivity, and a compact package, the TMR9082 is designed for detecting weak magnetic fields such as geomagnetic or magnetic flux leakage. TMR9082 is available in SOP8 package.



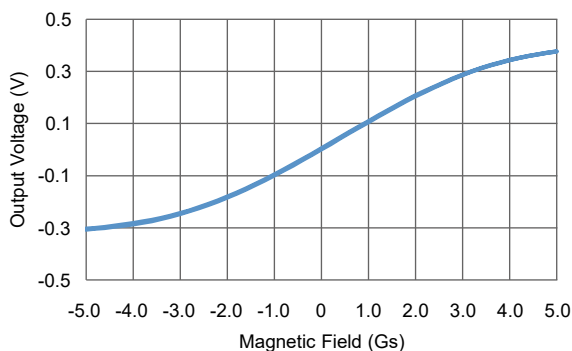
SOP8

Features and Benefits

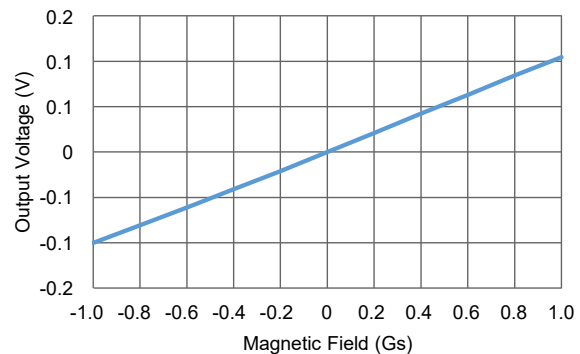
- Tunneling magnetoresistance (TMR) technology
- High sensitivity (~100 mV/V/Gs)
- Low noise spectral density: 250 pT/rt(Hz)@1Hz
- Low power consumption
- Excellent thermal stability
- Low hysteresis
- Wide range supply voltages range
- No need for set/reset pulse circuit
- RoHS & REACH compliant

Applications

- Weak magnetic field sensing
- Current sensor
- Position and displacement sensor
- Biomedical sensor
- Magnetic communication



TMR9082 ±5 Gs Output Curve



TMR9082 ±1 Gs Output Curve

Selection Guide

Part Number	Supply Voltage	Saturation Field	Sensitivity	Noise	Package	Packing Form
TMR9082P	1 V	± 4 Gs	100 mV/V/Gs	250 pT/rt(Hz)@1Hz	SOP8	Tape & Reel

Catalogue

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1. Pin Configuration

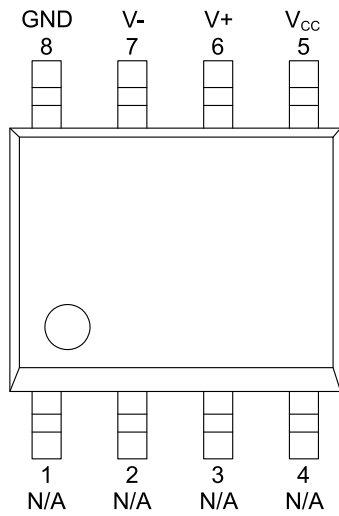


Figure 1. Pin Configuration (SOP8)

Pin Number	Name	Function
1, 2, 3, 4	N/A	Not connected
5	V _{CC}	Supply voltage
6	V+	Analog differential output 1
7	V-	Analog differential output 2
8	GND	Ground

2. Sensing Direction

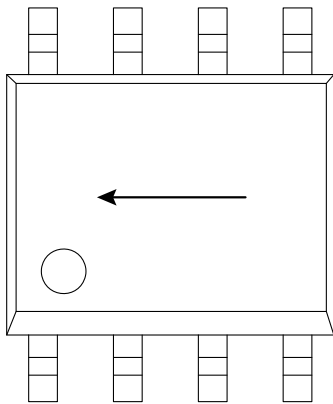


Figure 2. Sensing Direction (SOP8)

3. Absolute Maximum Ratings

Parameters	Symbol	Min.	Max.	Unit
Supply voltage	V_{CC}	-	3	V
Reverse supply voltage	V_{RCC}	-	3	V
External magnetic field	B	-	4000	Gs
ESD performance (HBM)	V_{ESD}	-	4000	V
Operating ambient temperature	T_A	-40	125	°C
Storage ambient temperature	T_{STG}	-50	150	°C

4. Electrical Specifications

$V_{CC} = 1.0 \text{ V}$, $T_A = 25 \text{ °C}$, differential output unless otherwise specified

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}	Operating	-	1	3	V
Supply Current ¹⁾	I_{CC}	Open output	-	33	-	μA
Resistance ¹⁾	R_B	-	-	30	-	kΩ
Sensitivity	SEN	Fit in $\pm 1 \text{ Gs}$	-	100	-	mV/V/Gs
Saturation Magnetic Field	B_{SAT}	-	-	± 4	-	Gs
Nonlinearity	NONL	Fit in $\pm 1 \text{ Gs}$	-	0.4	-	%FS
Offset Voltage	V_{OFFSET}	-	-20	-	20	mV/V
Hysteresis	HYS	Fit in $\pm 0.5 \text{ Gs}$	-	0.03	-	Gs
Temperature Coefficient of Resistance	TCR_B	-40 °C to 125 °C	-	-900	-	PPM/°C
Temperature Coefficient of Sensitivity	TCS	-40 °C to 125 °C	-	-100	-	PPM/°C
Noise spectral density	N_i	@1Hz	-	250	-	pT/rt(Hz)

1) $I_{CC} = V_{CC} / R_B$, and supply current changes linearly with supply voltage.

5. Characteristic Curves

5.1 Temperature Characteristics of Sensitivity

The following figure illustrates the TMR9082's sensitivity over the operating temperature range (-40 °C to 125 °C).

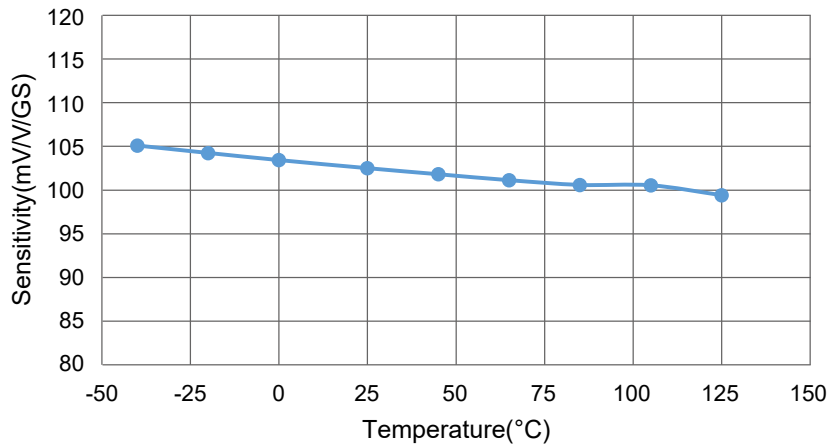


Figure 3. TMR9082 temperature characteristics of sensitivity

5.2 Sensor Noise

The following figure illustrates the power spectral density (PSD) of the TMR9082 background noise (NI). The 1/f noise is approximately 250 pT/rt(Hz)@1Hz and the white noise is approximately 4.5 pT/rt(Hz)@10kHz.

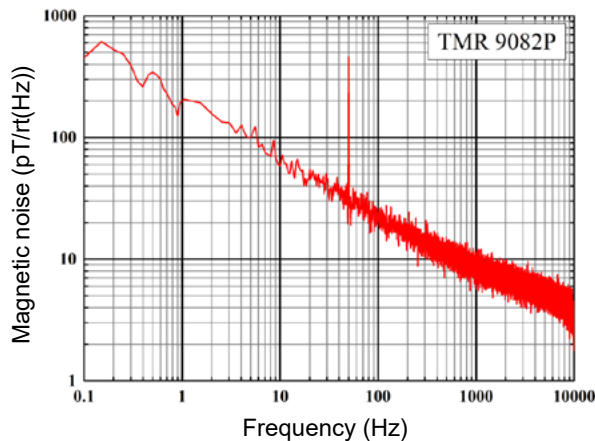


Figure 4. Magnetic noise density of TMR9082

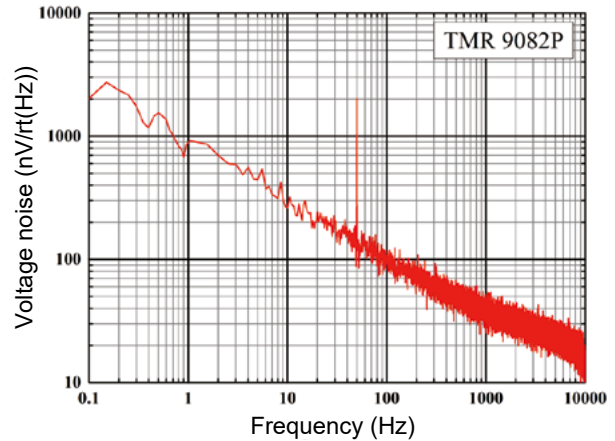


Figure 5. Voltage noise density of TMR9082

6. Dimensions

SOP8 Package

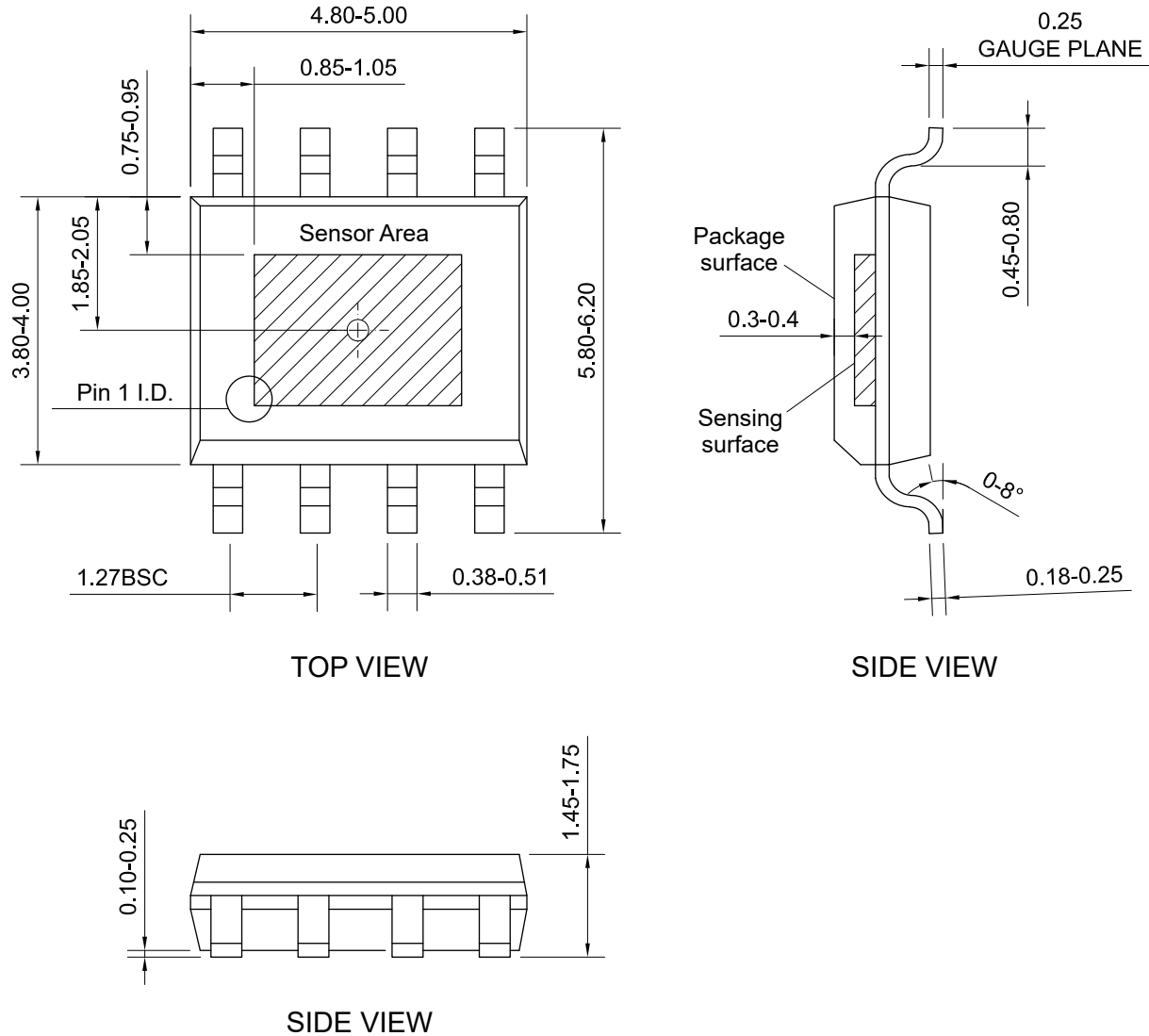


Figure 6. Package outline of SOP8 (unit: mm)

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