TMR Sensor Datasheet

1. General Introduction

The T1302 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 T1302 is available in 6mm x 5mm x 1.5mm SOP8 and 3mm × 3mm × 0.75mm DFN8L package.

2. Features

Tunneling Magneto resistance (TMR) Technology
High Sensitivity
Large Dynamic Range
Low Power Consumption
Excellent Thermal Stability

3. Applications

Magnetic Field Sensing
Current Sensors
Displacement Sensing
Rotary Position Sensors

4. Specifications

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		33(2)		μA
Resistance(SOP8)	R			30(2)		KOhm
Sensitivity	SEN	Fit @±80Oe		3.1		mV/V/Oe
Saturation Field	H_{sat}			±150		Oe
Non-Linearity	NONL	Fit @±80Oe		1.5		%FS
Offset Voltage	V_{offset}		-8		8	mV/V
Hysteresis	Hys	Fit @±80Oe		0.5		Oe
Temperature Coefficient of Resistance	TCR	H = 0 Oe		-600		PPM/°C
Temperature Coefficient of Sensitive	TCS			-300		PPM/°C

Notes:

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

(2) Custom resistance may be available upon request.

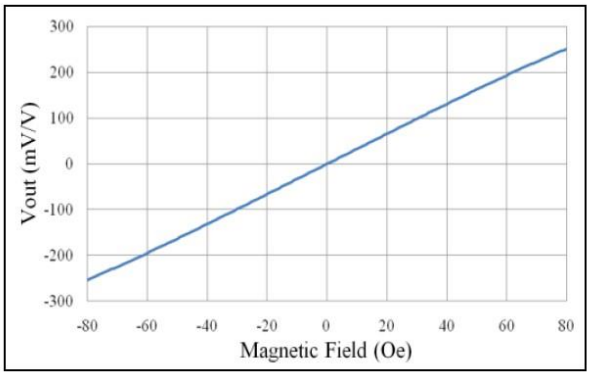
5. Absolute Maximum Ratings

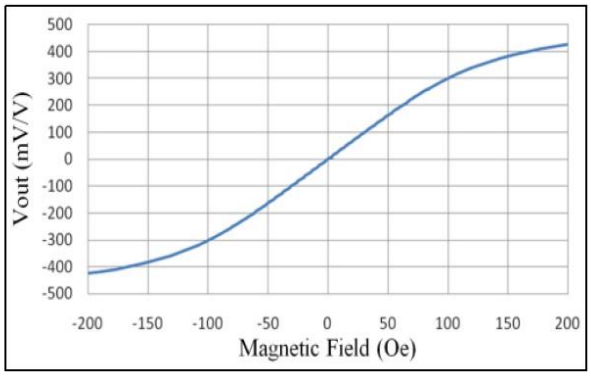
Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Supply Voltage	V_{CC}	7	V
Reverse Supply Voltage	V_{RCC}	7	V
Max Exposed Field	H_E	4000	Oe(1)
ESD Voltage	V_{ESD}	4000	V
Operating Temperature	T_A	-40~125	°C
Storage Temperature	T_{stg}	-50 ~150	°C

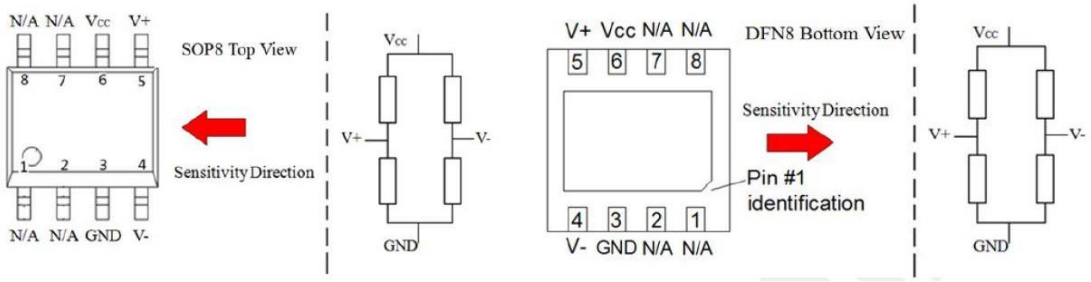
6 · Transfer Curve

The following figure shows the response of the T1302 to an applied magnetic field in the range of ±80 Oe (left) and ±200 Oe (right) when the T1302 is biased at 1 V.





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



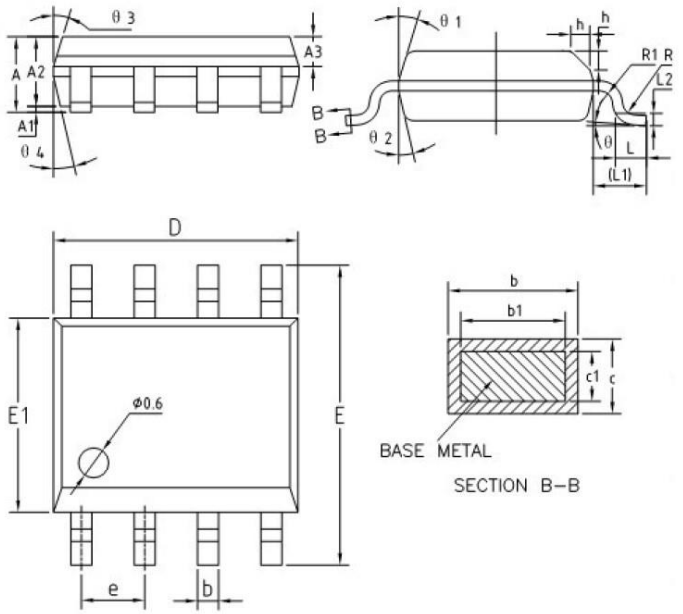
Pin No.	Pin Name	Pin Function
1,2,7,8	N/A	Not Connected
3	GND	Ground
4	V-	Analog Differential Output 2
5	V+	Analog Differential Output 1
6	V_{cc}	Supply Voltage

7. Packing Instructions

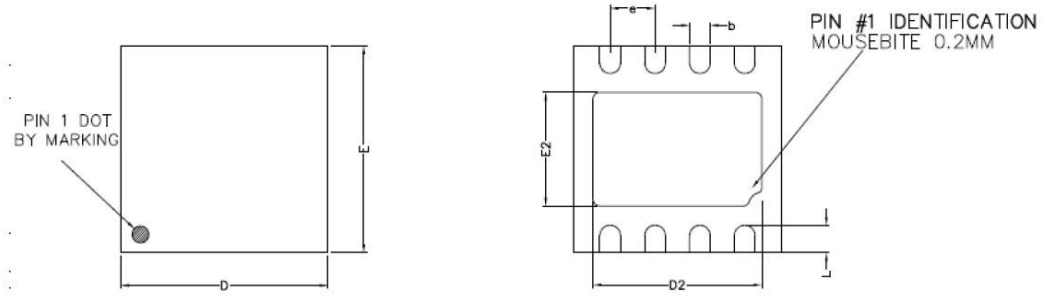
SOP8

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°
θ1	15°	17°	19°
θ2	11°	13°	15°
θ3	15°	17°	19°
θ4	11°	13°	15°

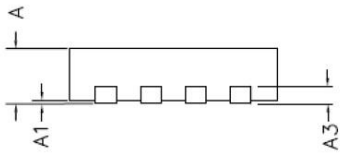


DFN8



TOP VIEW

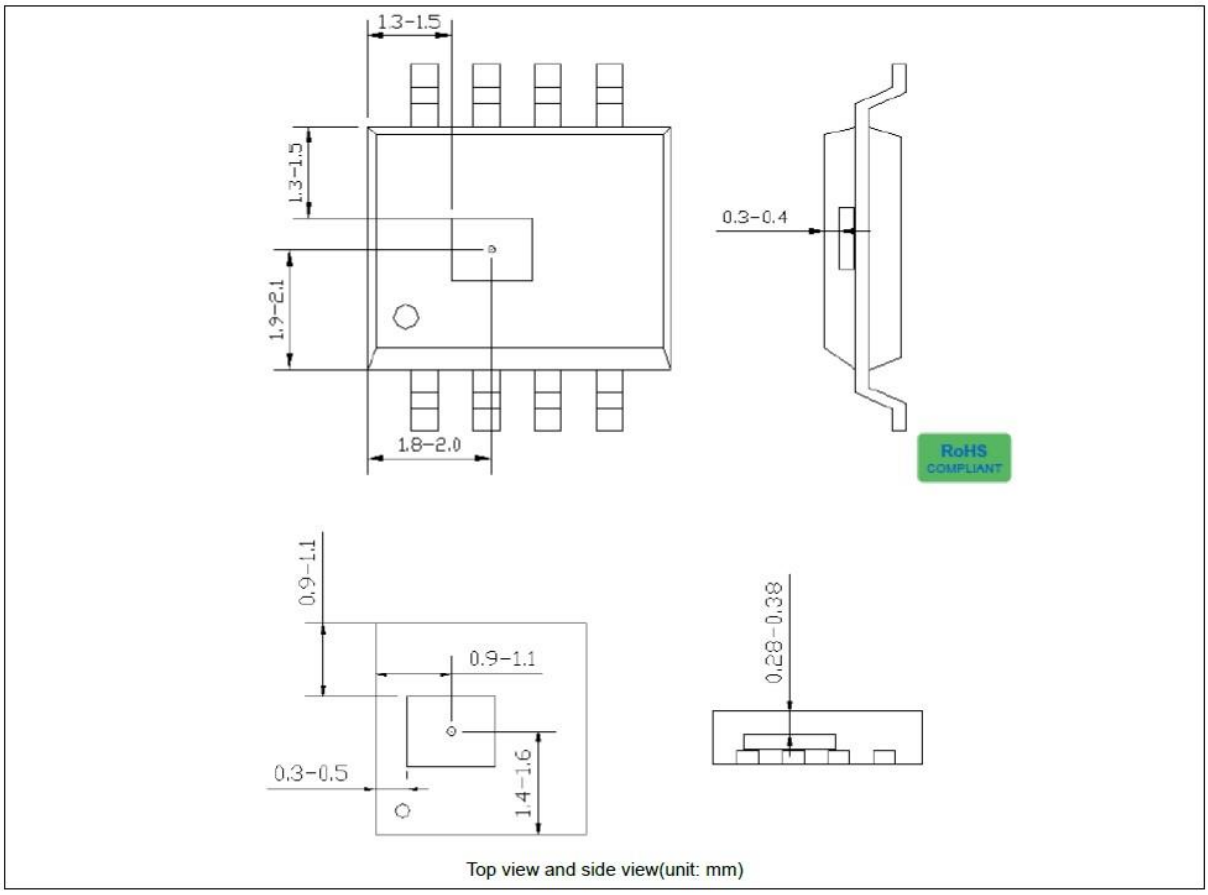
BOTTOM VIEW



SIDE VIEW

COMMON DIMENSIONS(MM)			
PKG.	DFN 8L (3X3)		
REF.	MIN.	NOM.	MAX.
A	0.70	0.75	0.80
A1	0.00		0.05
A3	0.2 REF.		
D	2.95	3.00	3.05
E	2.95	3.00	3.05
b	0.25	0.30	0.35
L	0.30	0.40	0.50
D2	2.30	2.45	2.55
E2	1.50	1.65	1.75
e	0.65 BSC		

TMR Sensor Position



Top view and side view(unit: mm)

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