

# TMR2901

Ultra High Sensitivity TMR linear sensor

## General Description

The TMR2901 linear sensor utilizes a unique push-pull Wheatstone bridge composed of four TMR sensor elements. The TMR2901 is available in a 3 mm X 3 mm X 0.75 mm DFN8 package and 6mm X 5mm X 1.5mm SOP8 package.

## Features and Benefits

- Tunneling Magneto resistance (TMR) Technology
- High Sensitivity (25mV/V/Oe)
- Very Low Noise Spectral Density (2nT/√Hz @1Hz)
- Low Power Consumption
- Excellent Thermal Stability
- Very Low Hysteresis
- Compatible with wide Range of Supply Voltages
- NO need for set/reset calibration

## Applications

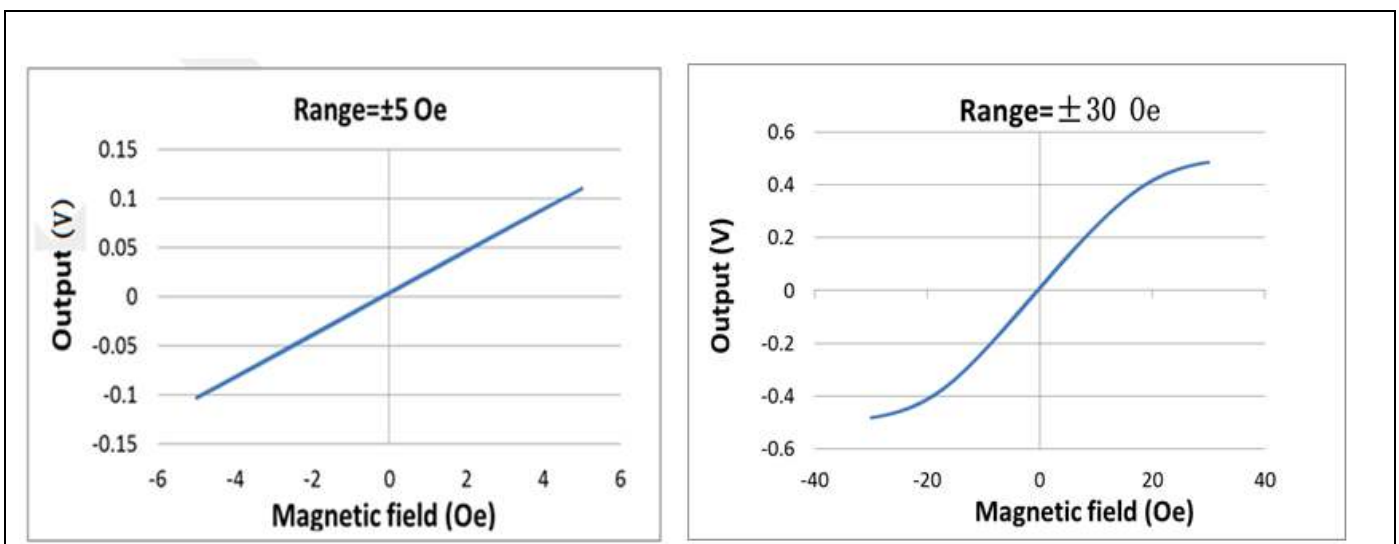
- Weak Magnetic Field Sensing
- Current Sensors
- Position and Displacement Sensing



TMR2901

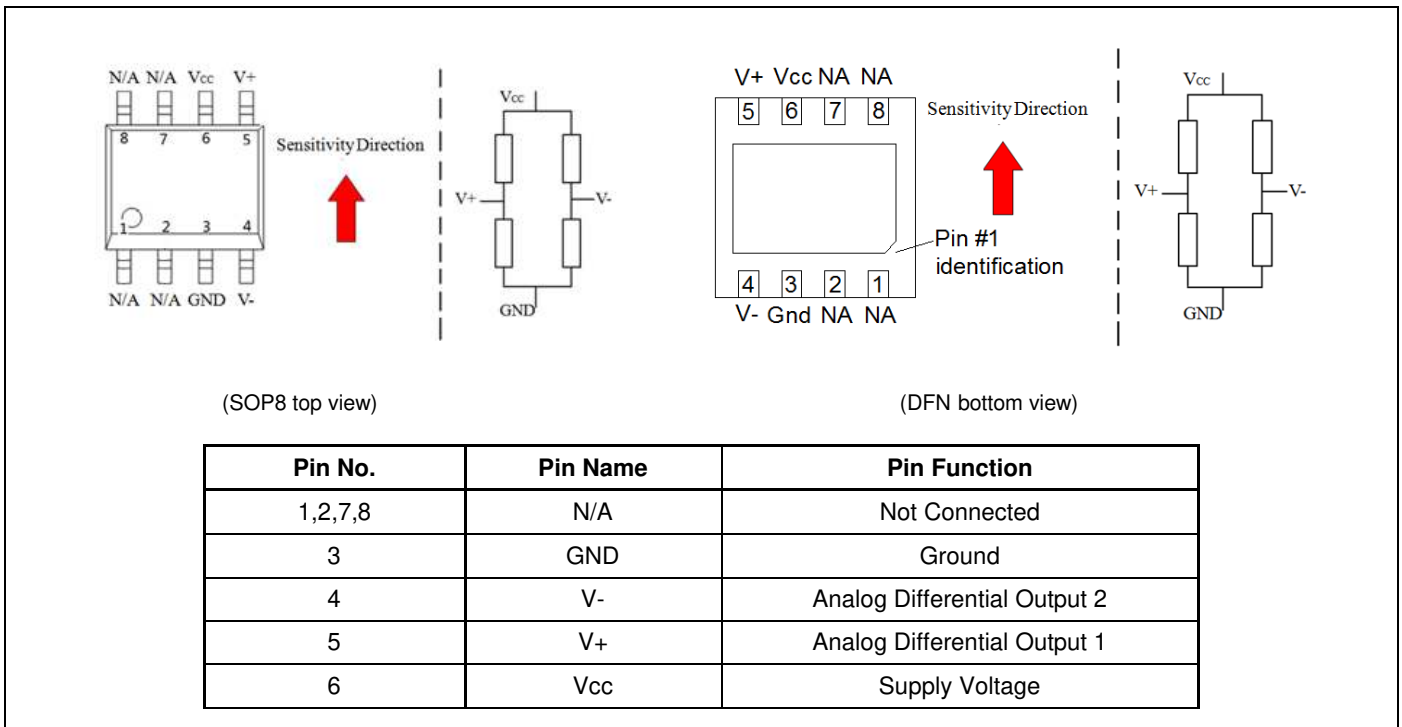
## Transfer Curve

The following figure shows the response of the TMR2901 to an applied magnetic field in the range of ±5 Oe and ±30 Oe when the TMR2901 is biased at 1V.



## Pin Configuration

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



## Absolute Maximum Ratings

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

## Specification ( $V_{CC}=1.0V$ , $T_A=25^{\circ}C$ , Differential Output)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	$V_{CC}$	Operating		1	7	V
Supply Current	$I_{CC}$	Output Open		0.1 <sup>(2)</sup>		mA
Resistance	R		7	45, 9	10	KOhm
Sensitivity	SEN	Fit @ $\pm 1$ Oe	20	25	27	mV/V/Oe
Saturation Field	$H_{sat}$			$\pm 20$		Oe
Non-Linearity	NONL	Fit @ $\pm 1$ Oe		0.3		%FS
Offset Voltage	$V_{offset}$		-10		10	mV/V
Hysteresis	Hys	Fit @ $\pm 1$ Oe			0.2	Oe
Temperature Coefficient of Resistance	TCR	$H = 0$ Oe		-500		PPM/°C
Temperature Coefficient of Sensitivity	TCS			-1100		PPM/°C
Self Noise	$N_i$	@1Hz		2		nT/√Hz

Notes:

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

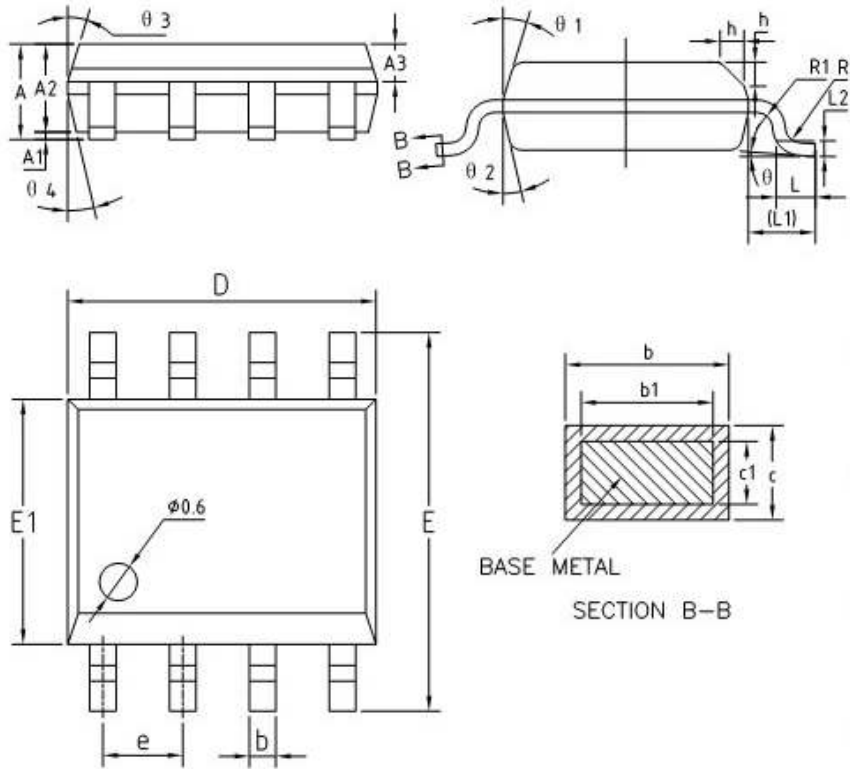
(2) Custom resistance may be available upon request.

### Package Information

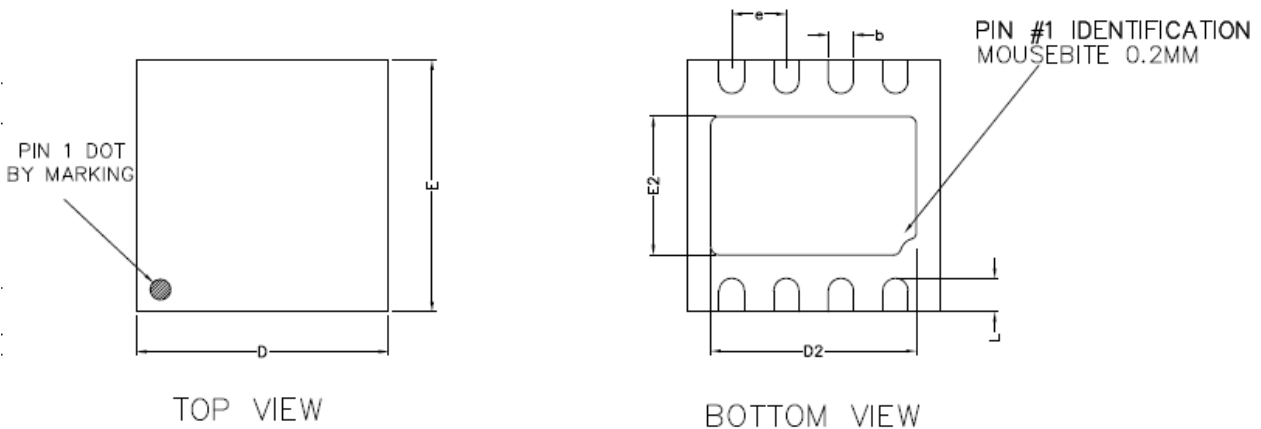
SOP8 package drawing:

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°

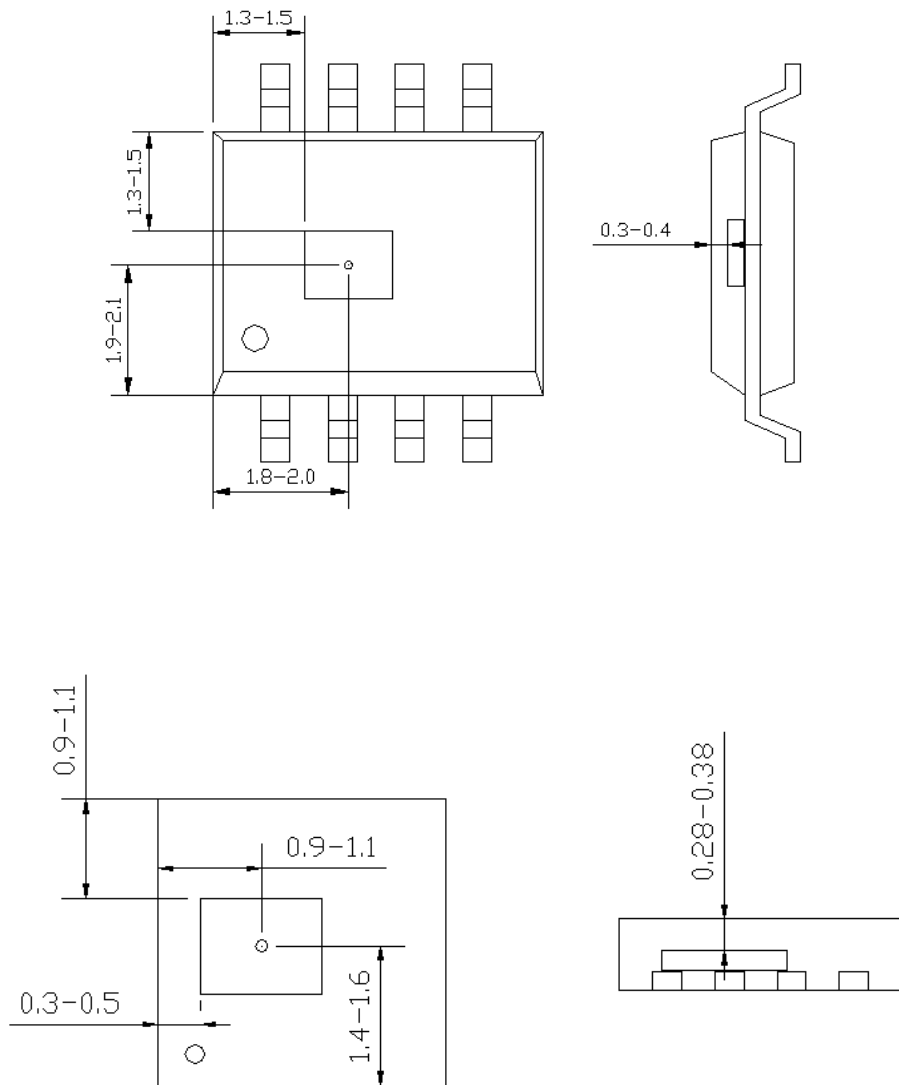


DFN package drawing:



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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