

TF922

1D Linear Field TMR Sensor for vertical detection

The TF922 is a highly sensitive TMR sensor, which consists of one Wheatstone bridge. The output of the TF922 is proportional to the applied magnetic field that is vertical to the sensor plane.

The TF922 is a one dimensional magnetic field sensor with a very long linear range of more than 250 mT. Any source, which can generate a magnetic field could drive this sensor to work. The primary working direction for the sensor is identical to common Hall elements, making it an ideal candidate, if low power consumption and noise are required.

With a matching magnetic design, the sensor will have the best performance to detect current, magnetic field, angular, position, etc.

The vertical field detection and high stray field robustness allows to realize short working distances for encoder or magnetic bit read-out.

The TF922 is available in a DFN package.



Product Overview of TF922

Article description	Package	Delivery Type
TF922-AIA-AE	DFN0805	Tape on Reel

Quick Reference Guide

Symbol	Parameter	min.	typ.	max.	Unit
S_{Lh}	Sensitivity	-	1.0	-	mV/V/mT
V_{CC}	Supply voltage	-	1.0	5.0	V
V_{off}	Offset voltage per V_{CC}	-20.0	-	+20.0	mV/V
B_{Lh}	Linear magnetic range	-250	-	+250	mT
R_s	Sensor resistance	5.0	10.0	15.0	k Ω

Absolute Maximum Ratings

In accordance with the absolute maximum rating system (IEC60134).

Symbol	Parameter	Min.	Max.	Unit
V_{CC}	Supply voltage	-	5	V
ESD	Human body model	-	2	kV
T_{amb}	Ambient temperature	-40	125	$^{\circ}C$
T_{stg}	Storage temperature	-50	150	$^{\circ}C$

Stresses beyond those listed under "Absolute maximum ratings" may cause permanent damage to the device.

This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Features

- Based on the TunnelMagnetoresistive (TMR) effect
- Out-of-plane sensitivity
- Wide Power Supply Range
- Low Hysteresis
- Fast Frequency Response
- Excellent Temperature Stability

Advantages

- Contactless position measurement in one direction
- High sensitivity
- Compact design
- High resistance for low power consumption

Applications

- Magnetic Field Sensor
- Magnet position detection
- Mobile phone applications



Magnetic Data

Symbol	Parameter	Conditions	min.	typ.	max.	Unit
B_{Lh}	Linear magnetic flux range		-250	-	+250	mT
B_{Stray}	Stray field robustness in-plane direction		0	-	50	mT
Hys	Hysteresis		-	-	1	mT

Electrical Data

$T_{amb} = +25^{\circ}C$; $V_{CC} = 1.0 V$; $H_{ext} = 30mT$; unless otherwise specified.

Symbol	Parameter	Conditions	min.	typ.	max.	Unit
V_{CC}	Supply voltage		-	1.0	5.0	V
V_{off}	Offset voltage per V_{CC}	$H_{ext} = \pm 50 mT$	-20.0	0.0	+20.0	mV/V
T_{CO}	Offset temperature coefficient		-	-0.01	-	%/K
R_S	Sensor resistance		5.0	10.0	15.0	K Ω
S_{Lh}	Sensitivity	$H_{ext} = \pm 50 mT$	-	1.0	-	mV/V/mT
T_{CS}	Sensitivity temperature coefficient		-	~ -0.01	Tbd.	%/K

Accuracy

$T_{amb} = +25^{\circ}C$, $V_{CC} = 1.0 V$; unless otherwise specified.

Symbol	Parameter	Conditions	min.	typ.	max.	Unit
E_{lin}	Linearity error		-	-	2	%

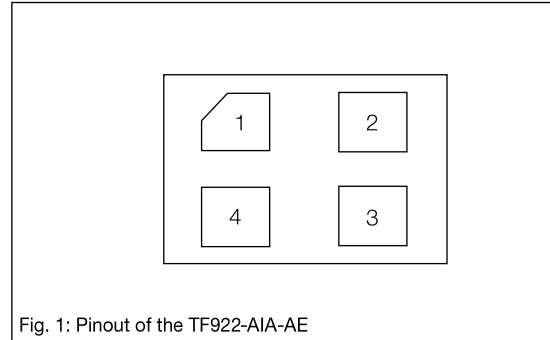
General Data

Symbol	Parameter	Conditions	min.	typ.	max.	Unit
T_{amb}	Ambient temperature		-40	-	125	$^{\circ}C$

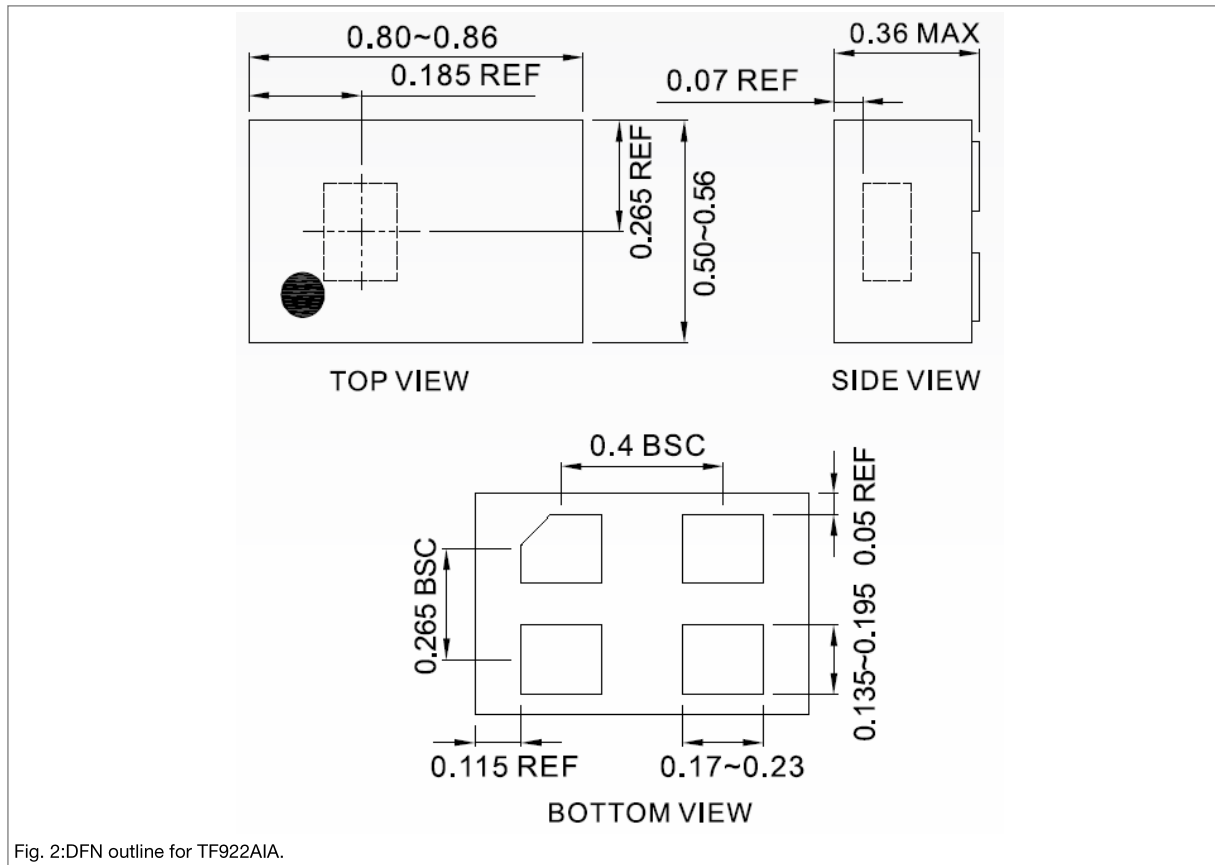
TF921AIA-AE

Pinout

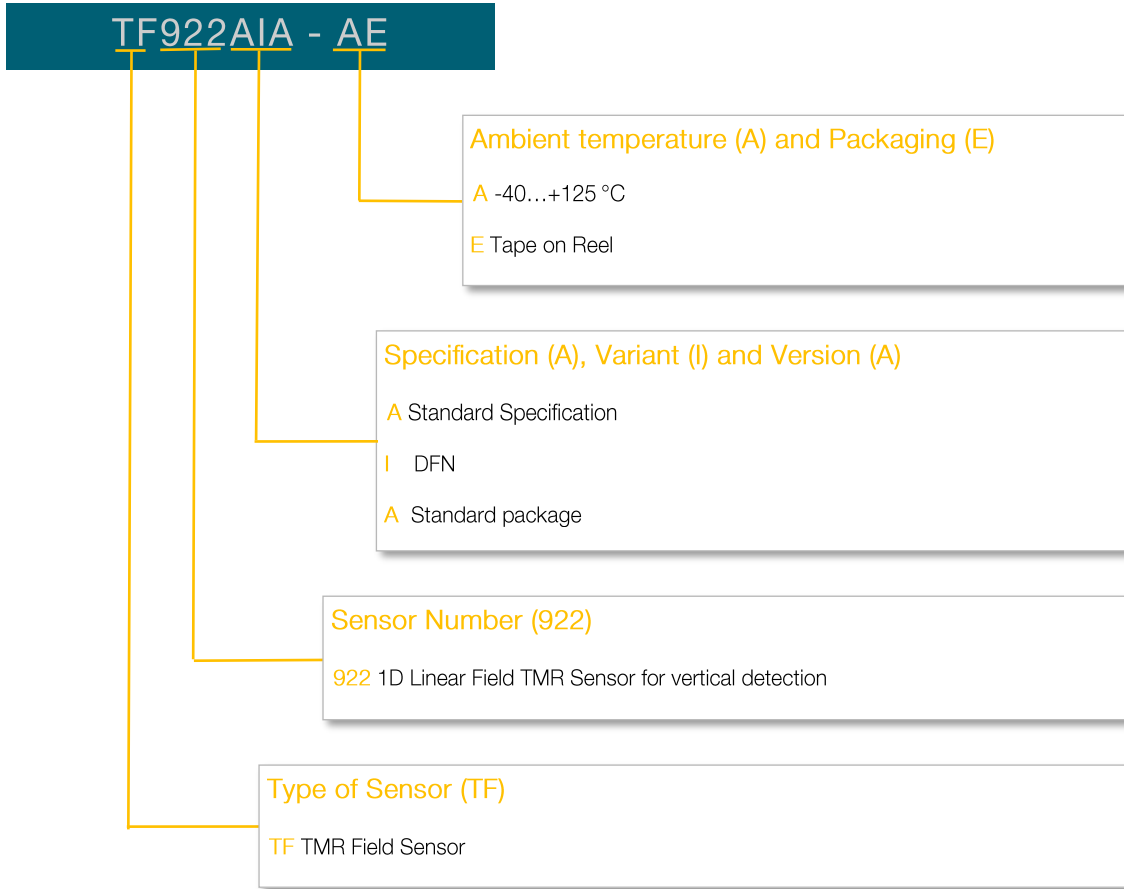
Pad	Symbol	Parameter
1	V_{CC}	Power supply
2	$-V_{out}$	Negative output
3	GND	Ground
4	$+V_{out}$	Positive output



Dimensions



Additional Information on Ordering Code



General Information

Product Status

Article	Status
TF922-AIA-AE	The product is under development, qualification is on going. The datasheet is preliminary.
Note	The status of the product may have changed since this data sheet was published. The latest information is available on the internet at www.sensitec.com .

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General Information

Application Information

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Life Critical Applications

These products are not qualified for use in life support appliances, aeronautical applications or devices or systems where malfunction of these products can reasonably be expected to result in personal injury.

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Changelist

Version	Description of the Change	Date
TF922.DSE.00	Original (pp. 1-6)	04/2025

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