

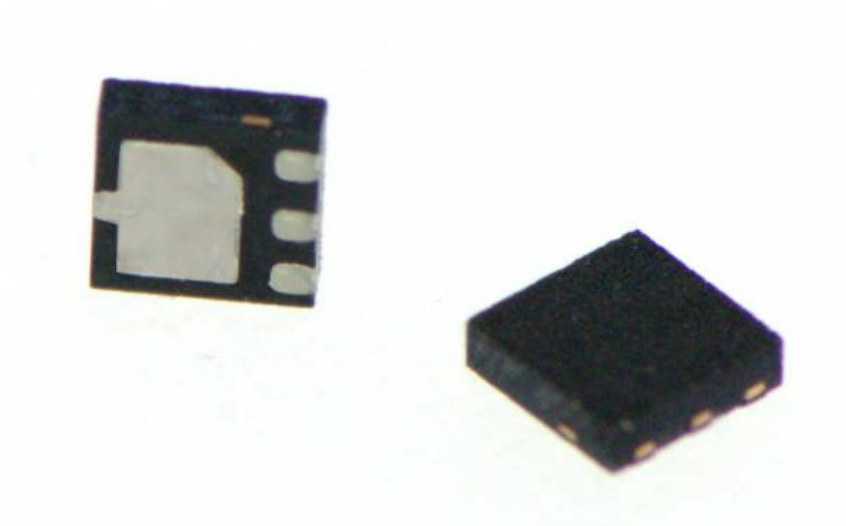
Product Data Sheet

TMR magnetic sensor chip

Product Series: BBT-A907D16JR magnetic sensors

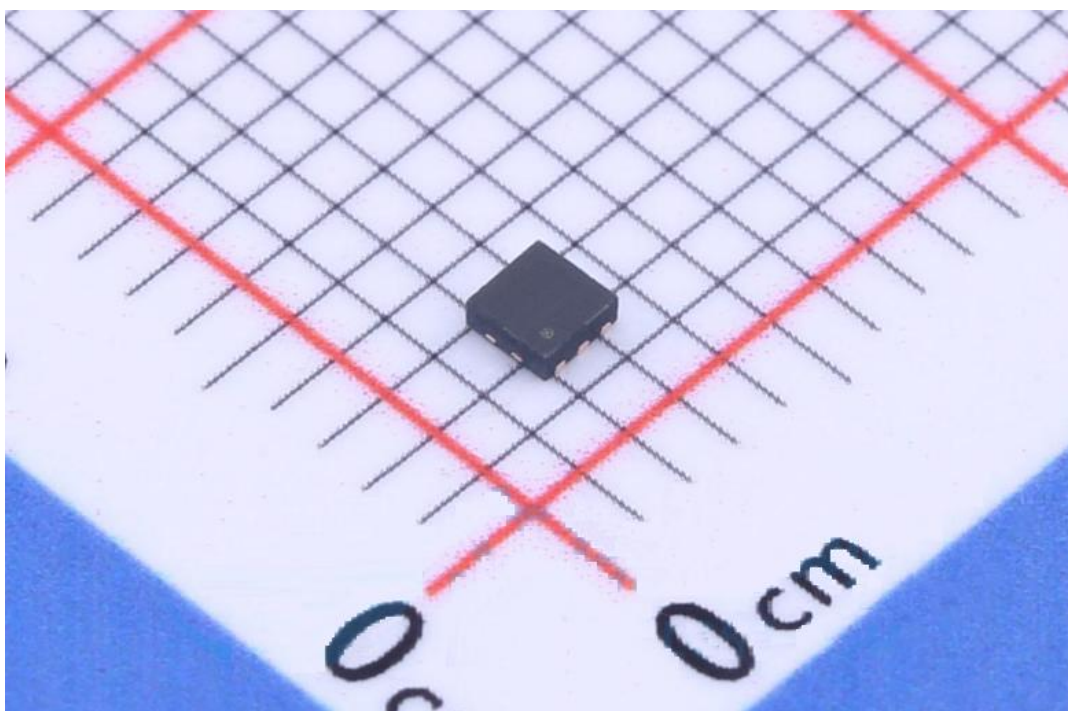
Part Number: BBT-A907D16JR

Version: Ver 1.0



CONTENTS

1. Key Features	3
2. Application	3
3. Description	3
4. Operating Characteristics	3
5. Absolute Maximum Ratings	4
6. Noise testing	4
7. Transfer Curve	5
8. Functional Diagram and Sensing Direction	5
9. Package Dimension & Sensing Area	6
10. Footprint on PCB	6
11. Packing	7
12. Reflow Profile (Reference)	8



1. Key Features

- TMR (Tunnel Magneto resistance Effect) technology
- DFN1.6x1.6-4L package form exists half Wheatstone bridge
- Built-in signal preprocessed ASIC operational amplifier
- The output signal is analog output
- Low power, low hysteresis, high frequency response
- Low output noise ensures excellent sensor resolution

2. Application

- Gaming controller & peripherals
- Magnetic proximity sensor
- Mobile robot motor control
- Cordless power tools
- Vacuum robots
- Drone payload control

3. Description

BBT-A907D16JR series is a small-size angle sensor chip based on the TMR principle, with built-in high-precision ultra-low power ASIC operational amplifier. When the applied magnetic field rotate on the sensor's sensitive direction, the sensor provides a single terminal voltage output, and the output has good temperature stability.

Any source that can generate a magnetic field can drive this sensor. The matching magnetic circuit design enables the sensor to have the best performance in detecting Angle, position, etc.

The sensor is DFN1.6x1.6-4L package with dimensions of (L) 1.6mm × (W) 1.6mm × (H) 0.55mm.

4. Operating Characteristics

V_{CC} = 3.3 V, T_A = 25 deg.C, Otherwise Specified

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage	V _{CC}		1.8	3.3	5.5	V
Supply Current @ 3.3 V	I _{DD}			760		μA
Offset	V _{OFF}	H = 0 mT	-20	0	20	mV/V
Range of working Field	H _{WORK}		-130		130	mT
hysteresis	Hys			0.1		mT
Vp with 2x magnification	SEN	Hex: ±20 mT		270		mV/V
Frequency Response	f			6		kHz

5. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Power Supply	V_{CC}	—	6	V
ESD (HBM)	V_{ESD}	—	4	KV
Storage Temperature	Tstg	-40	85	°C
Operation Temperature	TA	-40	85	°C
Range of working Field	H_{WORK}	-1300	1300	Gs

Note: When the operating conditions of the product exceed the limit parameters, it may cause irreparable damage to the product. Working at the limit parameters for a long time may lead to a decline in product performance and product reliability.

6. Noise testing

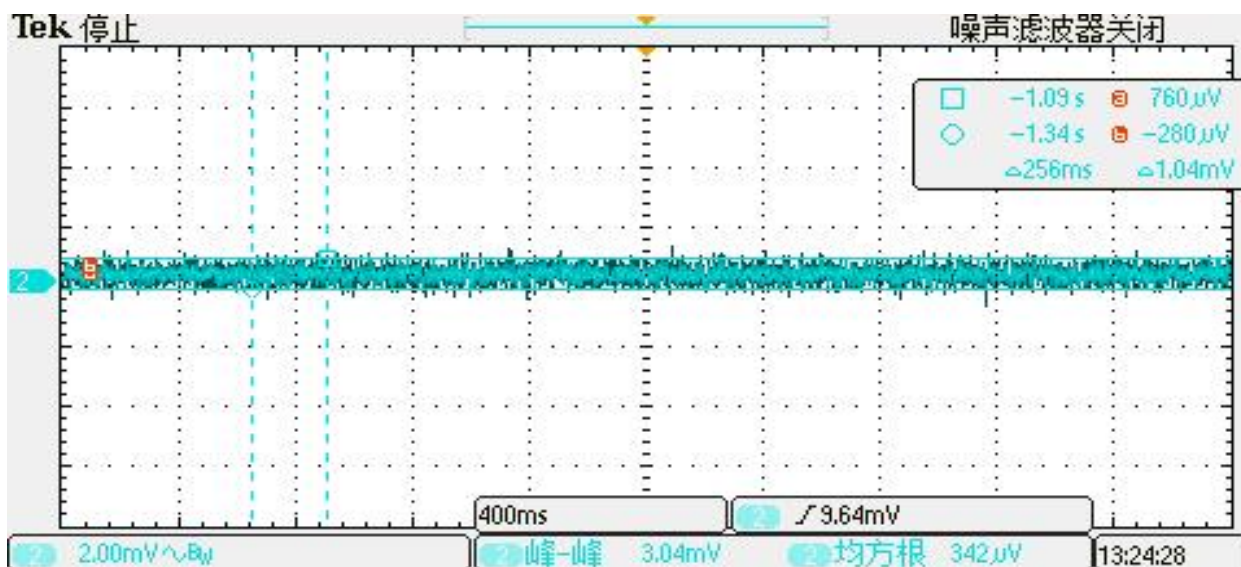


Fig.1 The output noise of the sensor under the configuration of 3x magnification.

7. Transfer Curve

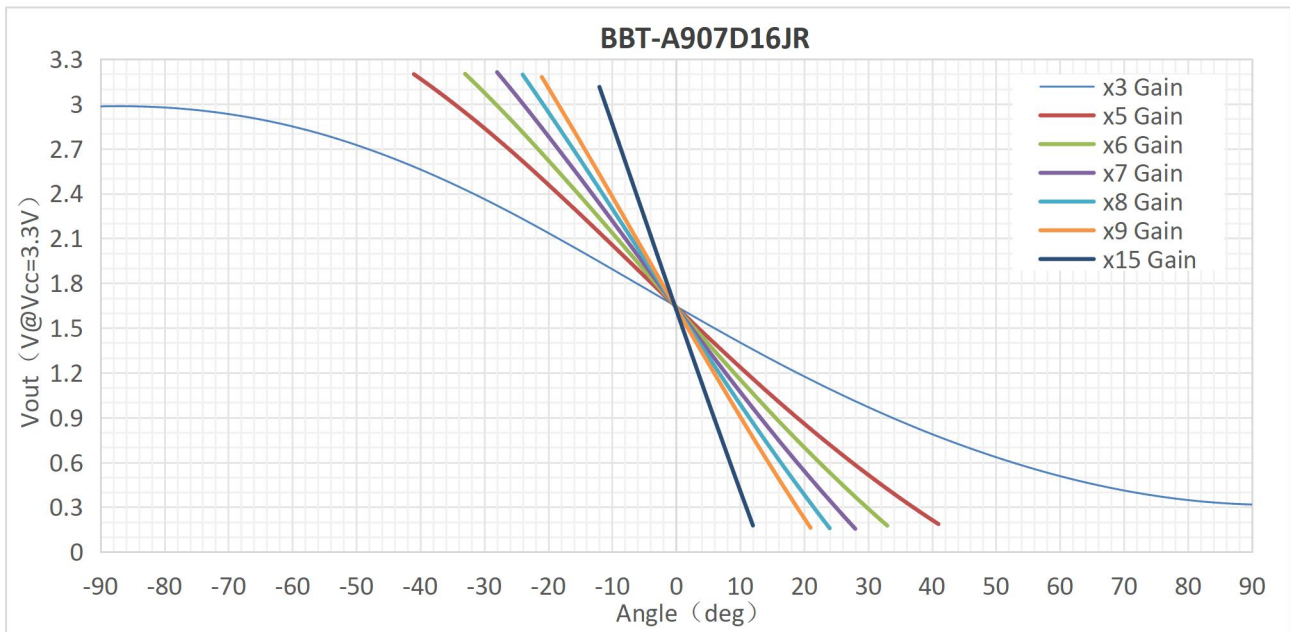


Fig.2 Vout of BBT-A907D16JR series magnetic sensor. The gain can be adjusted. The adjustment range is from 2 to 15. The figure shows the typical 90% gain output under different angle conditions.

8. Functional Diagram and Sensing Direction

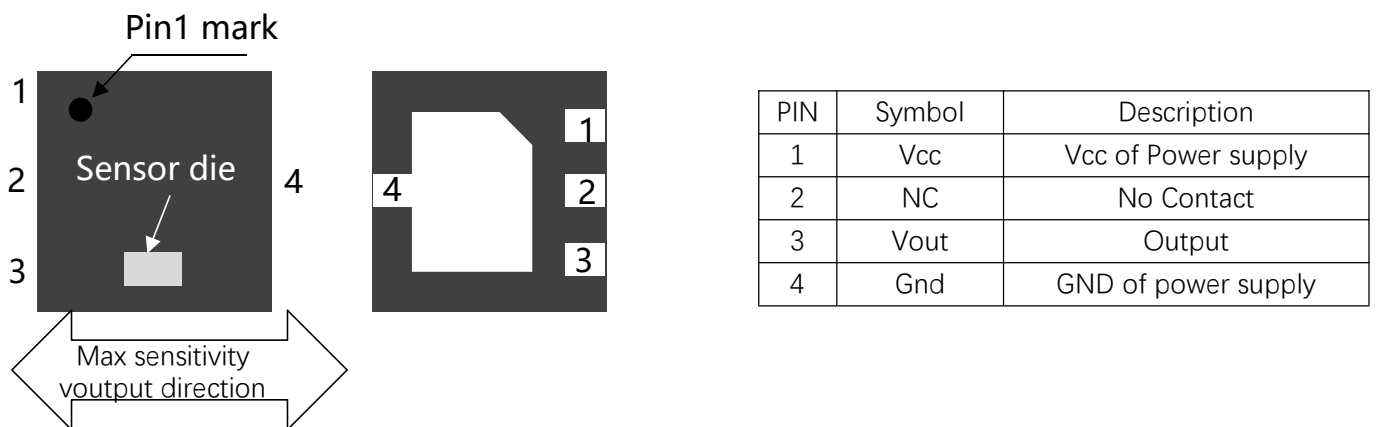


Fig.3 Functional block diagram and pin definition of BBT-A907D16JR series sensor. The arrow defines is the max sensitivity voutput direction.

9. Package Dimension & Sensing Area

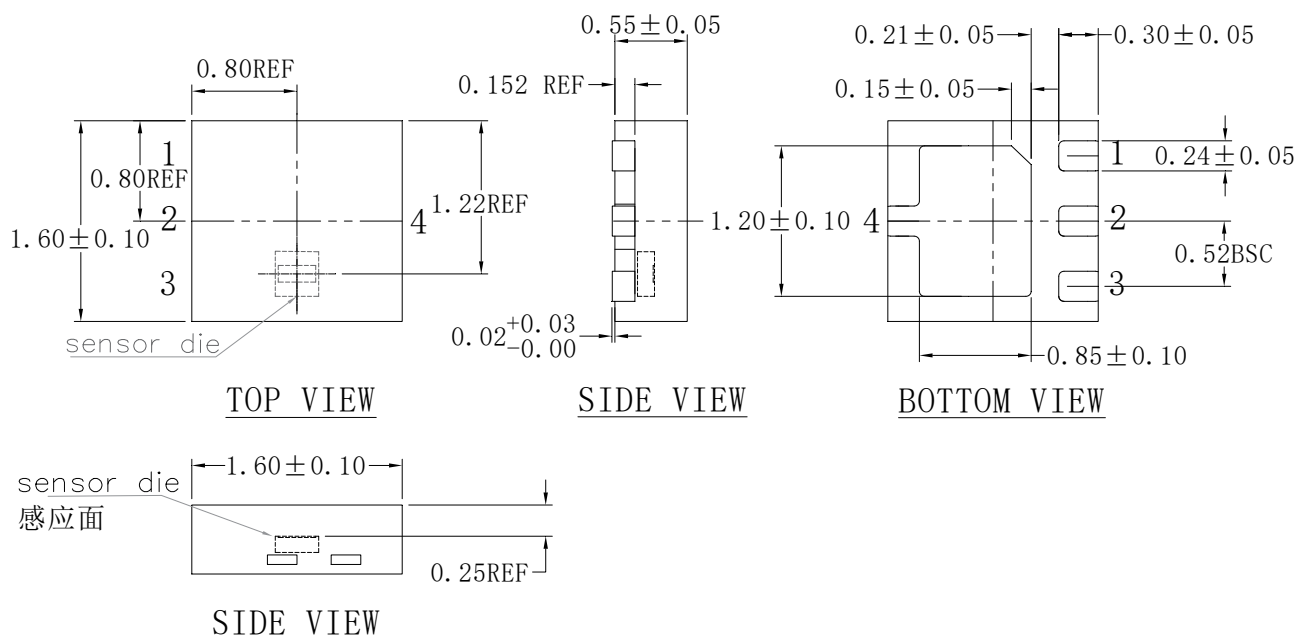


Fig.4 the dimensions of the packaged chips, and the position of sensing area. (unit: mm) 。

10. Footprint on PCB

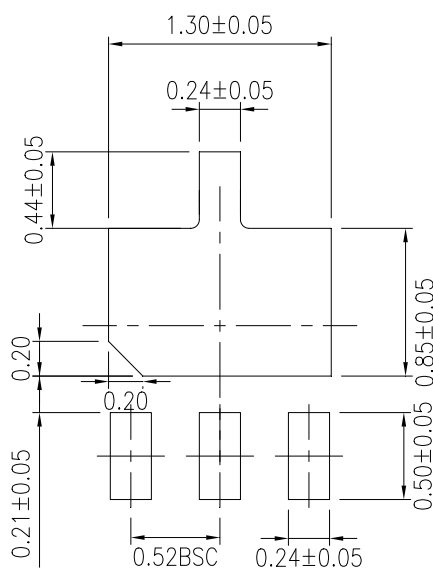


Fig.5 Footprint of the sensor chips with DFN1616H055-4L package (unit: mm).

11. Packing

Item	Spec	Remark
Reel	7 inch	Fig.10
Carrier width	8 mm	Fig.10
Leader empty length	400 mm	REF: EIA-481
Trailer empty length	160 mm	REF: EIA-481
Quantity of reel	4000 pcs/ 7" Reel	Full of tape reel
MSL Level	L3	J-STD-020E

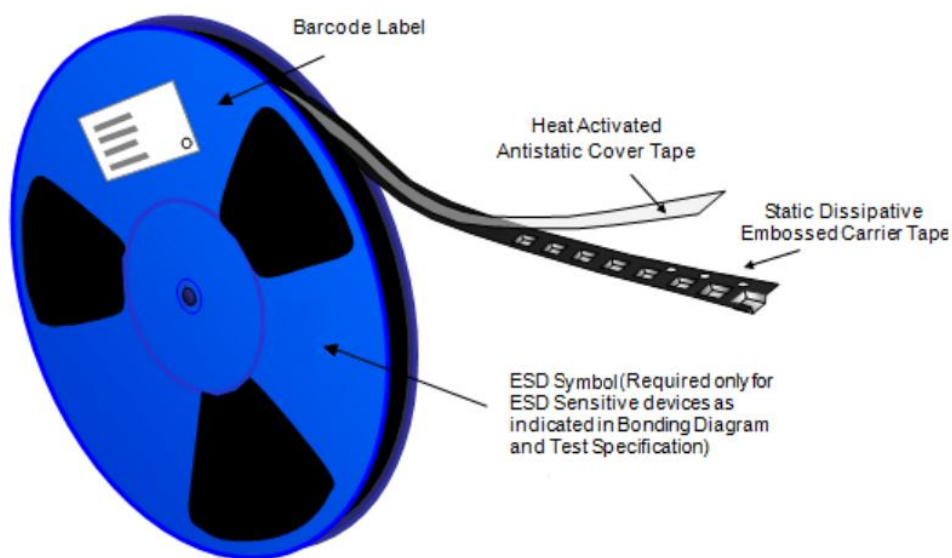


Fig.6 Tape diagram

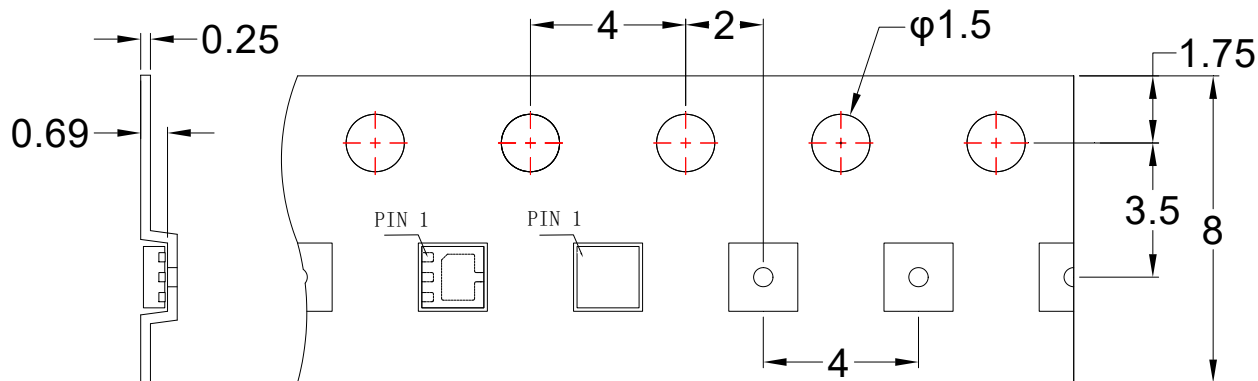
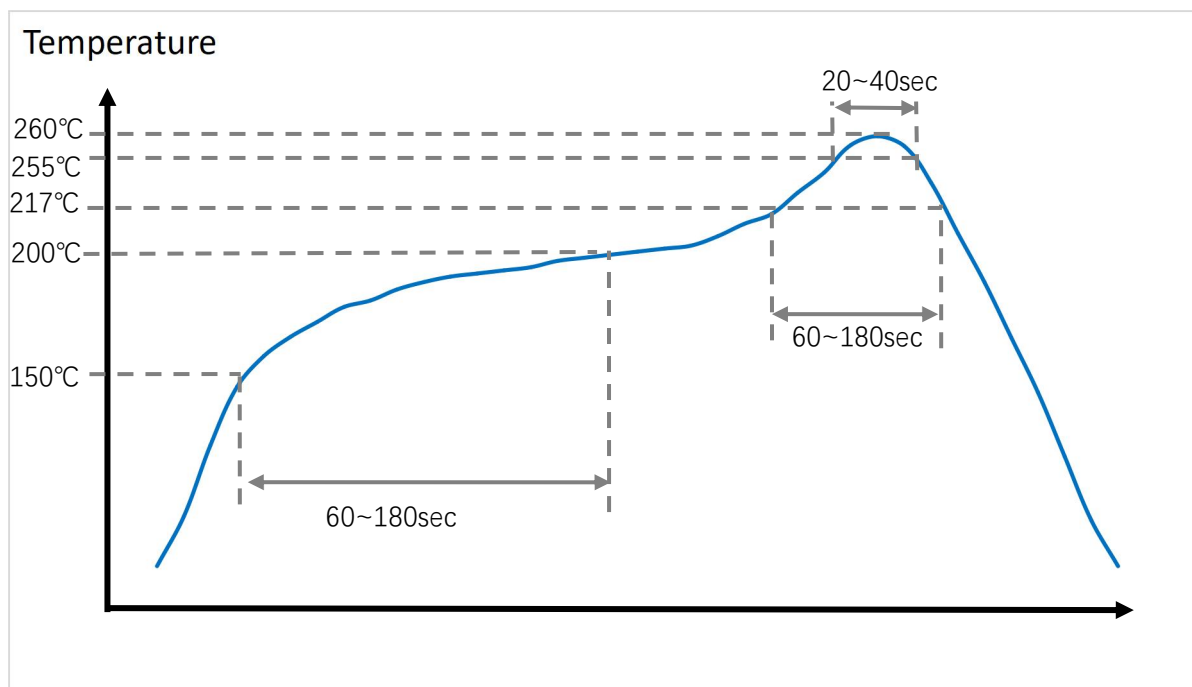


Fig.7 Carrier diagram

12. Reflow Profile (Reference)

Peak Temperature should not exceed 260 degC.

Below Profile is Reference. Please confirm productivity in assembly process.



The information provided herein by ESSTMAGS Technology is believed to be accurate and reliable. Publication neither conveys nor implies any license under patent or other industrial or intellectual property rights. ESSTMAGS reserves the right to make changes on product specifications for the purpose of improving product quality, reliability, and functionality. ESSTMAGS does not assume any liability arising out of the application and use of its products. ESSTMAGS's customers using or selling this product for use in appliances, devices, or systems where malfunction can reasonably be expected to result in personal injury do so at their own risk and agree to fully indemnify ESSTMAGS for any damages resulting from such application.