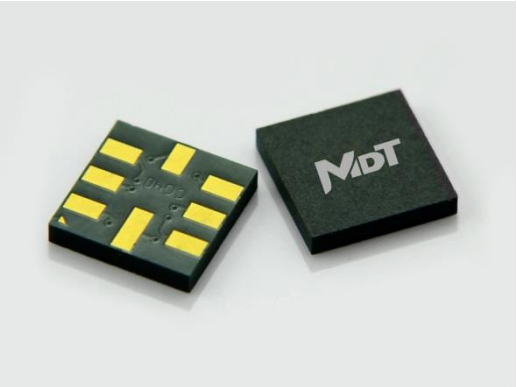
AMR3003L AMR Angle Sensor

Features and Benefits

- Anisotropy of magnetoresistance (AMR) Technology
- Compatible with Wide Range of Supply Voltages
- Wide Airgap Tolerance
- Excellent Thermal Stability
- Very Low Hysteresis
- Compact Package



Applications

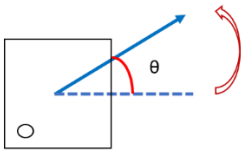
- Rotary Position Sensors
- Rotary Encoders
- Contactless Potentiometers
- Valve Position Sensors
- Knob Position Sensors

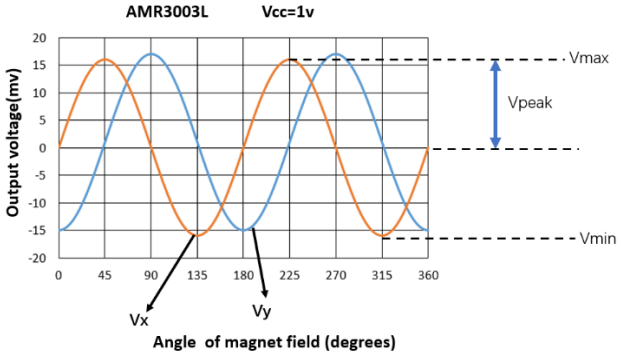
General Description

The output voltage of the AMR3003L AMR angle sensor is proportional to the sine or cosine functions of two times of the angle – sin(2α) and cos(2α) – of a magnetic field applied parallel to the surface of the sensor, which can be provided by a small magnet positioned above the device. The AMR3003L includes two Wheatstone bridges, which can be configured to output sine and cosine functions respectively. Each bridge includes four AMR sensor elements in a push-pull arrangement to produce a peak-to-peak signal at 3.2% of the supply voltage. Additionally, the unique AMR Wheatstone bridge technology accurately compensates the output against changes in ambient temperature. This sensor is assembled in a compact LGA package

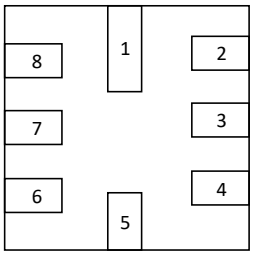
Operation

A small magnet, placed above the AMR3003L, can be used to provide a magnetic field in any desired orientation parallel to the plane of the AMR3003L package. The following chart show a typical sensor output as a function of the angle within 0~180° of the applied magnetic field using a 6 mm diameter, 2.5 mm thick magnet and at 1 V supply.





Pin Out



Bottom view

Pin No.	Pin Name	Pin Function
1	NA	No connection
2	Vcc	Supply Voltage
3	Y-	Analog Differential Output2（direction Y）
4	X+	Analog Differential Output1（direction X）
5	NA	No connection
6	GND	Gound
7	Y+	Analog Differential Output1（direction Y）
8	X-	Analog Differential Output2（direction X）

Absolute Maximum Ratings

Parameter	Symbol	Condition	Min	MAX	Unit
Supply Voltage	VCC	TJ=25℃	-18	18	V
Storage Temperature	Tstg	-	-40	150	℃
operating temperature	TA		-40	125	℃

Specification (Differential Output)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	VCC	TJ=25℃	-	5	18	V
Resistance of Single Bridge	Rbridge	TJ=25℃, H=700 Oe	-	700	-	Ohm
TC of Resistance	TCR	TJ=-40℃~125℃	-	0.25	-	%/K
Offset Voltage	Voffset	Vcc=5V,H=700 Oe	-2	-	2	mV/V
TC of Offset Voltage	TCoffset	TJ=-40℃~125℃	-	4	-	uV/V/℃
Peak Voltage	Vpeak	Vcc=5V,H=700 Oe	-	16	-	mV/V
TC of Peak Voltage	TCVpeak	TJ=-40℃~125℃	-	-0.425	-	%/K
Angular Inaccuracy	Δθ	TJ=25℃,H=200 Oe	-	0.1	-	º

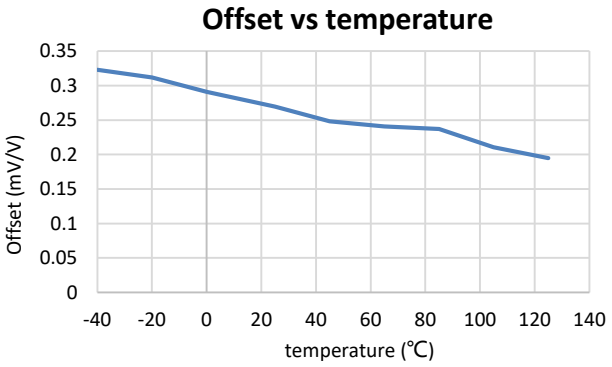
Notes:

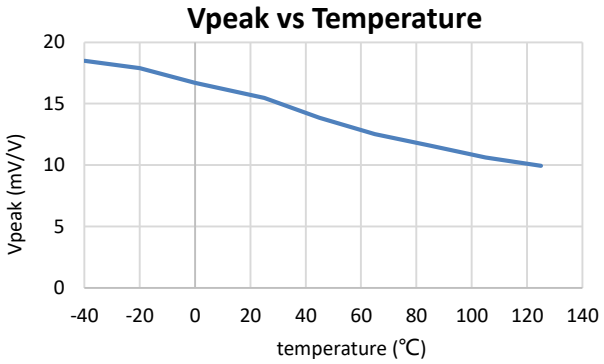
(1) 1 Oe (Oersted) = 1 Gauss in air = 0.1 millitesla = 79.8 A/m.

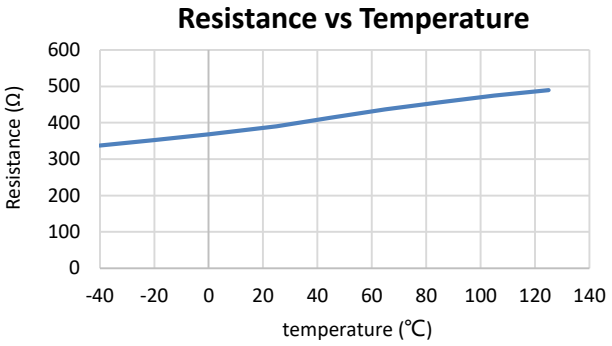
(2) Offset voltage=(Vo(max)-Vo(min))/2

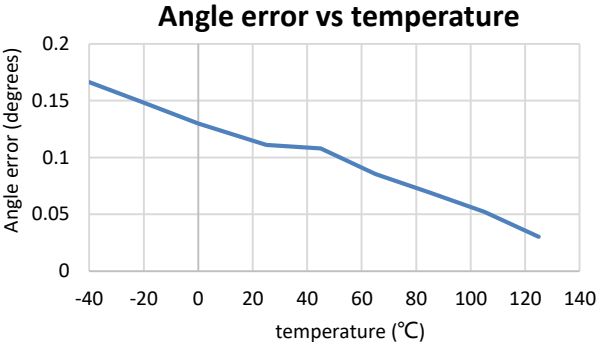
(3) Peak voltage=|Vo(max)-offset|, Periodicity of Vpeask: sin(2α) and cos(2α), respectively.

Characteristic Curves

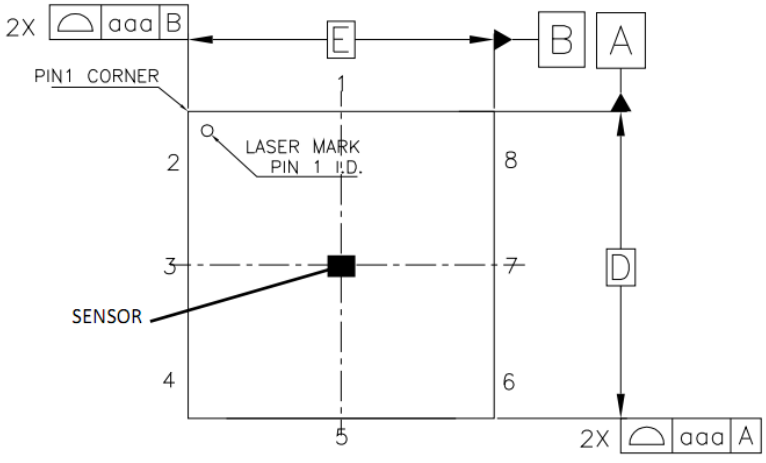




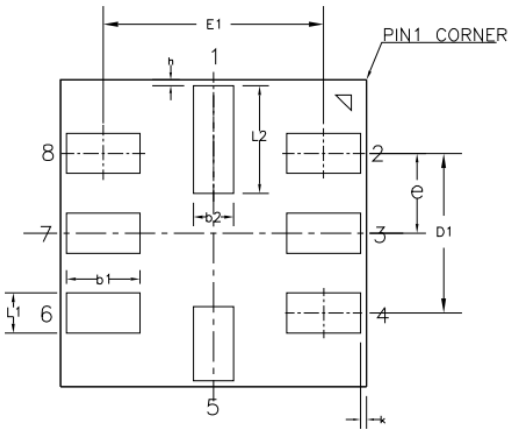




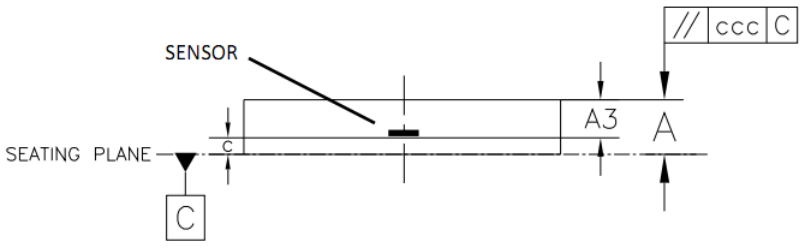
Package Information



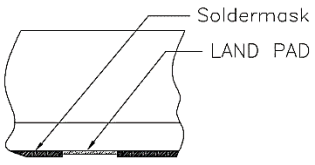
Top view



bottom view



Side view



section view pad

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	---	---	0.92
A3	0.60 BASIC		
c	0.21	0.26	0.31
D	4.90	5.00	5.10
D1	2.60 BASIC		
E	4.90	5.00	5.10
E1	3.60 BASIC		
b1	1.20 BSC		
L1	0.65 BSC		
b2	0.65 BSC		
L2	1.75 BSC		
h	0.10 REF		
k	0.10 REF		
e	1.30 BSC		
aaa	0.10		
ccc	0.20		

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