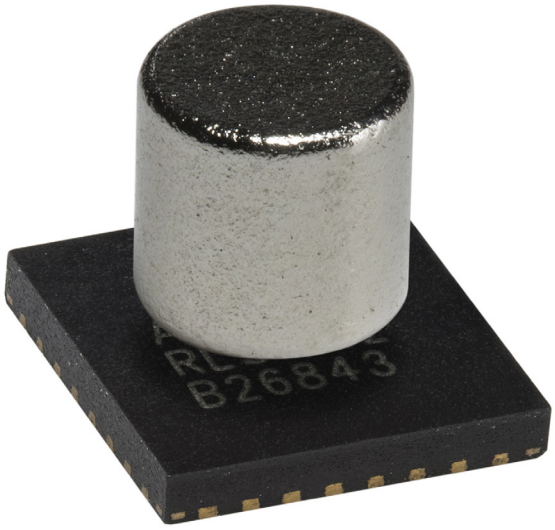
Data sheet
AM4096QD01_04
Issue 4, 18th October 2018

AM4096Q angular magnetic encoder IC



The AM4096Q is a rotary magnetic encoder IC which uses Hall sensor technology for sensing the magnetic field. It offers the same functionality as the AM4096 but comes in a small and compact QFN32 package (6 × 6 mm).

A circular array of sensors detects the perpendicular component of the magnetic field. The signals are summed then amplified. Sine and cosine signals are generated when the magnet rotates. The sine and cosine signals are factory calibrated for optimum performance.

From the sine and cosine values the angular position is calculated with a fast 12 bit interpolator. The calculated position is then output in various digital and analogue formats.

An inbuilt voltage regulator ensures stable conditions for the core of the chip and a more flexible power supply voltage. All inputs and outputs are related to the external supply voltage.

The AM4096Q has many different setting options which are defined by the contents of internal registers. The zero position can be also set with an external pin. The settings of the chip are stored in an integrated EEPROM.

The registers and the EEPROM can be accessed through a serial two wire interface TWI.

With its compact size the AM4096Q is especially suitable for non-contact position or velocity measurements in motor motion control and commutation, robotics, camera positioning, various encoder applications, battery powered devices and other demanding high resolution applications.

For detailed sensor information, please refer to the AM4096 datasheet that can be found on www.rls.si. It has the same features, specifications and performance as AM4096.

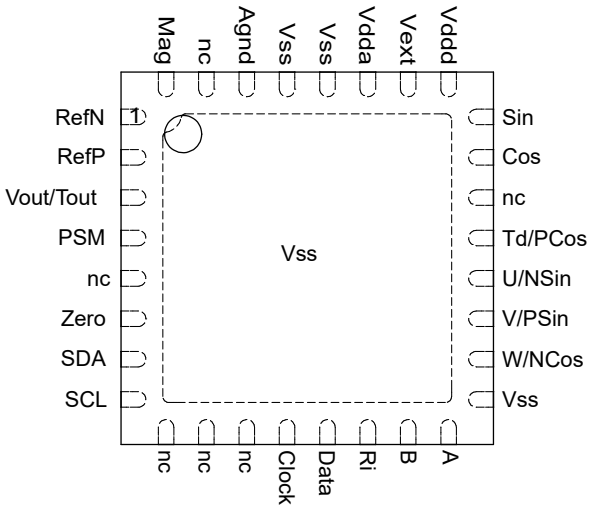
Output options:

- Incremental
- Serial SSI
- Serial two wire interface (TWI)
- UVW commutation output
- Linear voltage
- Tacho
- Analogue sinusoidal

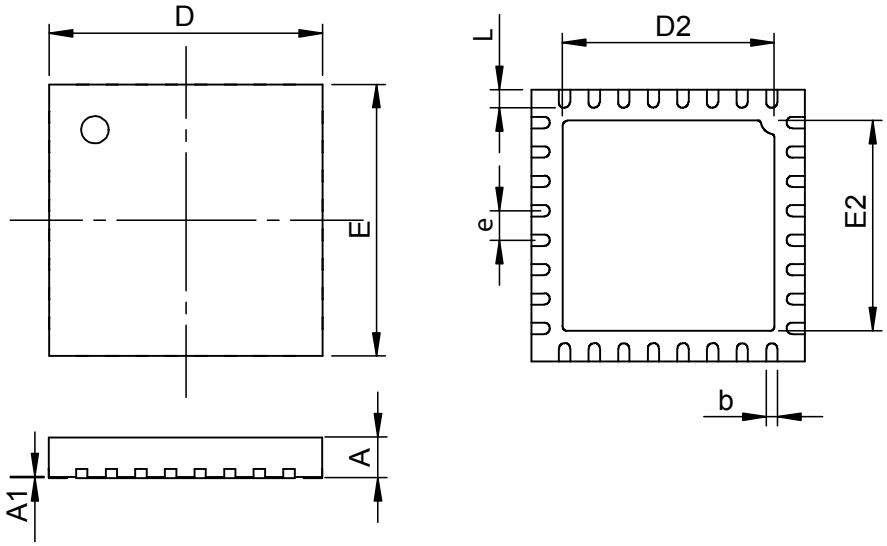
- **Compact size: 6 × 6 mm**
- **Contactless angular position encoding ovexr 360°**
- **12 bit absolute encoder**
- **Presetable zero position**
- **High speed operation to 60,000 rpm**
- **Power save mode for low current consumption**
- **5 V or 3 V power supply**
- **Integrated EEPROM**
- **SMD package QFN32**
- **Moisture sensitivity level 3**
- **RoHS compliant (lead free)**

Pin description

Pin nr.	Name	Pin description
1	RefN	Lower reference input for voltage output
2	RefP	Upper reference input for voltage output
3	Vout/Tout	Linear voltage output/Tacho output
4	PSM	Power save mode input
5	nc	Factory test
6	Zero	Zeroing input
7	SDA	TWI serial interface data line
8	SCL	TWI serial interface clock line
9	nc	Factory test
10	nc	Factory test
11	nc	Factory test
12	Clock	SSI clock input
13	Data	SSI data output
14	Ri	Incremental output Ri
15	B	Incremental output B
16	A	Incremental output A
17	Vss	Power supply 0 V
18	W/NCos	Commutation output W/Cosine negative output
19	V/PSin	Commutation output V/Sine positive output
20	U/NSin	Commutation output U/Sine negative output
21	Td/PCos	Tacho direction output/Cosine positive output
22	nc	Factory test
23	Cos	Cosine analogue output for filtering
24	Sin	Sine analogue output for filtering
25	Vddd	Digital power supply 3.0/3.3 V
26	Vext	Power supply input 5 V
27	Vdda	Analogue power supply 3.0/3.3 V
28	Vss	Power supply 0 V
29	Vss	Power supply 0 V
30	Agnd	Analogue reference voltage
31	nc	Factory test
32	Mag	Output, that indicates magnet presence

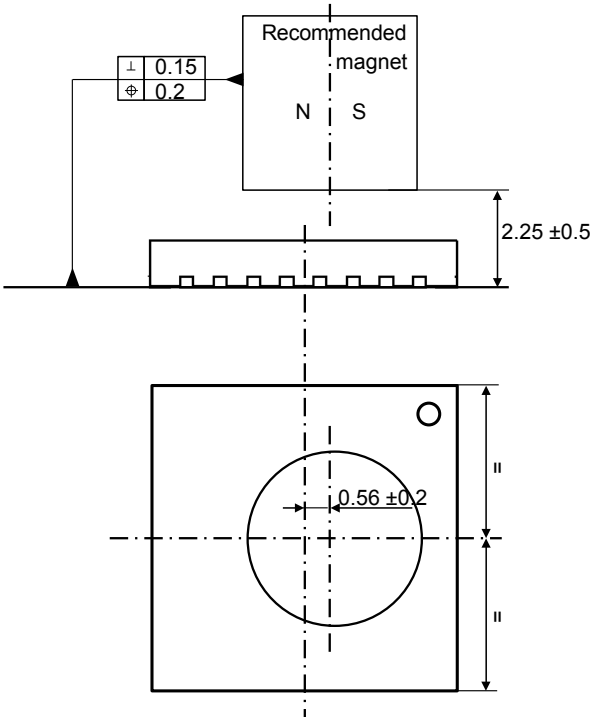


QFN32 package dimensions



	Dimensions (mm)		
	Min	Typ.	Max
A	0.8	0.9	1.0
D		6.0	
E		6.0	
e		0.65	
b	0.18	0.25	0.30
L	0.3	0.4	0.5
A1	0.0	0.02	0.05
D2	4.5	4.65	4.8
E2	4.5	4.65	4.8

Mounting instructions



Magnet position
Magnet must be positioned above the AM4096Q in the centre of the hall sensor array. The centre of the sensor array is not in the centre of the AM4096Q package.

Ordering information

1. Angular Magnetic Encoder IC

Part Number	Description
AM4096Q 	AM4096Q Angular Magnetic Encoder IC with default functionality Output options: - SSI - Incremental - Linear voltage - UVW - TWI Programmable: - Differential buffered Sine/Cosine - Tacho QFN32 plastic package Delivered in tubes (61 units per tube)

Part Number	Description
RMM44A3C00 	Diametrically polarized magnet Dimensions: Ø 4 mm x 4 mm

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Document issues

Issue	Date	Page	Corrections made
2	4. 1. 2016	1	Moisture sensitivity level added
		3	Magnet position note added
3	27. 6. 2016	1	Compact size amended
4	18.10.2018	1	Reference information added
		2	Pin description 22 amended