TBMA600A

High-Accuracy, High-Bandwidth, Configurable Digital Magnetic Angle Sensor Evaluation Board

DESCRIPTION

The TBMA600A is a test board for the MA600A series TMR magnetic position sensors. The TBMA600A allows users to easily evaluate the MA600A series, and it supports both side-shaft and end-of-shaft mounting.

TBMA600A test boards are compatible with the EVKT-MagAlpha-MagDiff communication kit (hardware) and the MagAlpha Evaluation App (software), offering seamless connection and operation of the MA600A series sensors, and allowing users to evaluate the MA600A series with their own set-up.

The TBMA600A test board includes the assembled board with the sensor, decoupling capacitors, resistor, and connectors.

The IC mounted on TBMA600A boards is the MA600A. Since the MA600A and MAQ600A are functionally equivalent, the TBMA600A can also be used to evaluate the MAQ600A.

EVALUATION BOARD

LxWxH (7.62cmx2.54cmx0.68cm)

Board Number	MPS IC Number
TBMA600A-Q-LT-00A	MA600A, MAQ600A

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QUICK START GUIDE

The TBMA600A is designed to provide a fast evaluation tool for the MA600A when used with the EVKT-MagAlpha-MagDiff and the MagAlpha Evaluation App. (1)

1. Connect the TBMA600A to the EVKT-MA-RP-PICO-V2 board using the flat ribbon cable. (2)
2. Connect the EVKT-MA-RP-PICO-V2 board to the PC using the USB cable. (2)
3. Run the MagAlpha Evaluation App.
4. Use the MagAlpha Evaluation App to read the sensor measurements and configure the sensor parameters.

Notes:

1) Refer to the EVKT-MagAlpha-MagDiff User Guide for more information about the EVKT-MagAlpha-MagDiff and the MagAlpha Evaluation App.
2) The EVKT-MA-RP-PICO-V2 board, the flat ribbon cable, and the USB cable are all provided in the EVKT-MagAlpha-MagDiff evaluation kit.

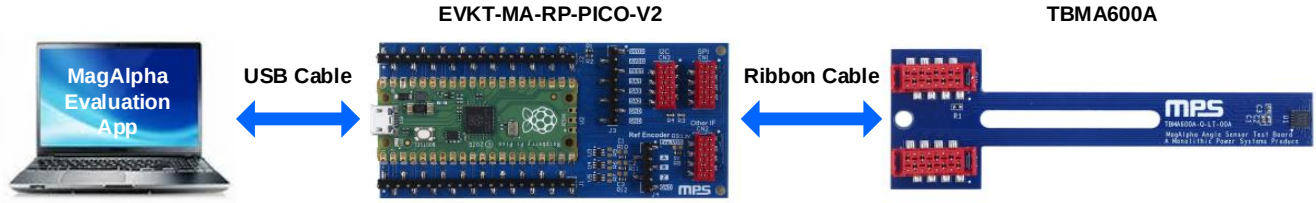

Figure 1: Evaluation Equipment Set-Up

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EVALUATION BOARD SCHEMATIC

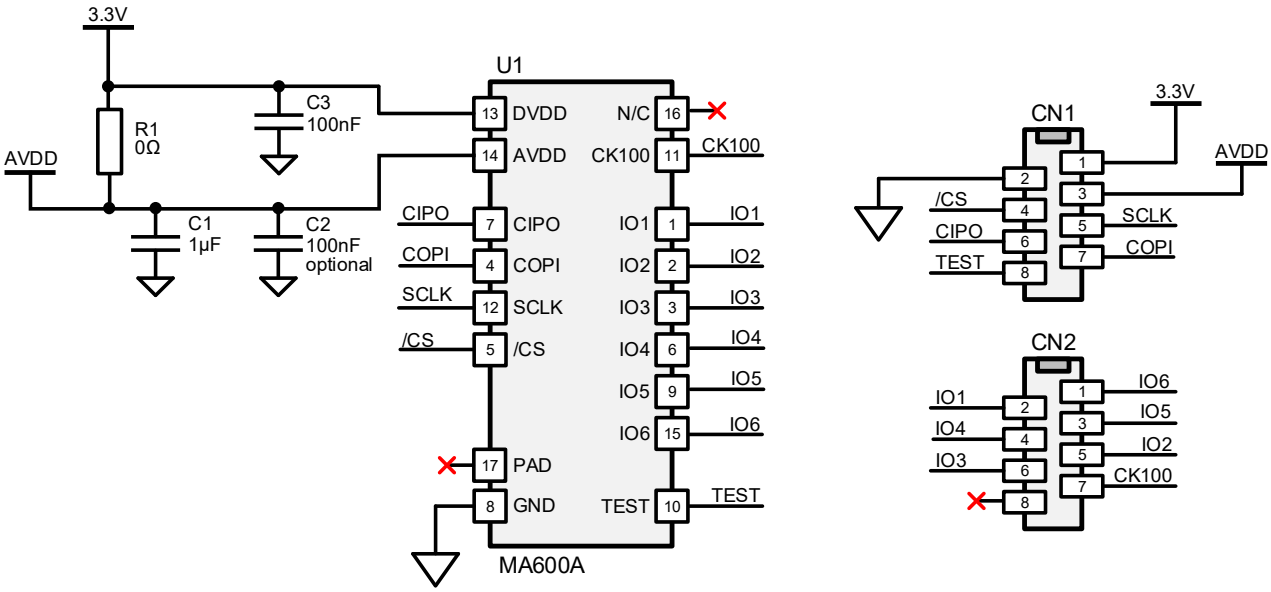

Figure 2: Evaluation Board Schematic

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TBMA600A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
1	C1	1μF	Ceramic capacitor, 6.3V, X7R	0402	Murata	GRM155R70J105KA12D
1	C2 (optional)	100nF	Ceramic capacitor, 6.3V, X7R	0402	Murata	GRM155R70J104KA01D
1	C3	100nF	Ceramic capacitor, 6.3V, X7R	0402	Murata	GRM155R70J104KA01D
1	R1	0Ω	Resistor, 1%	0402	Yageo	RC0402FR-070RL
2	CN1, CN2	2.54mm	8-position receptacle connector, 0.100in (2.54mm), surface-mount tin	-	Wurth or TE Connectivity	690367280876 or 7-2178711-8
1	U1	MA600A	MagAlpha TMR magnetic position sensor	QFN-16 (3mmx 3mm)	MPS	MA600AGQ

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CONNECTOR PINOUT

View from Top Side

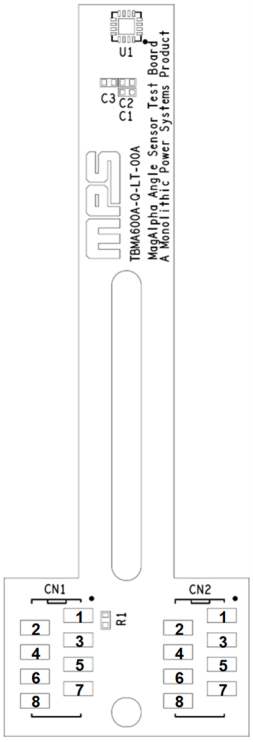

Figure 3: TBMA600A Board Connector Pinout

Table 3 shows the TBMA600A board connector pin registers.

Table 3: TBMA600A Board Connector Pin Registers

Pin	Name	Description
CN1.1	DVDD	3.3V digital supply.
CN1.2	GND	Ground.
CN1.3	AVDD	3.3V analog supply.
CN1.4	/CS	Chip select (serial).
CN1.5	SCLK	Clock (serial).
CN1.6	CIPO	Controller in peripheral out (serial).
CN1.7	COPI	Controller out peripheral in (serial).
CN1.8	TEST	Test pin.
CN2.1	IO6 (3)	Digital I/O pin.
CN2.2	IO1 (3)	Digital I/O pin.
CN2.3	IO5 (3)	Digital I/O pin.
CN2.4	IO4 (3)	Digital I/O pin.
CN2.5	IO2 (3)	Digital I/O pin.
CN2.6	IO3 (3)	Digital I/O pin.
CN2.7	CK100	Clock output reference for speed calculation.
CN2.8	-	-

Notes:

3) Refer directly to the MA600A/MAQ600A datasheet for information on the I/O output interface selection.

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MECHANICAL DRAWING

View from Top Side

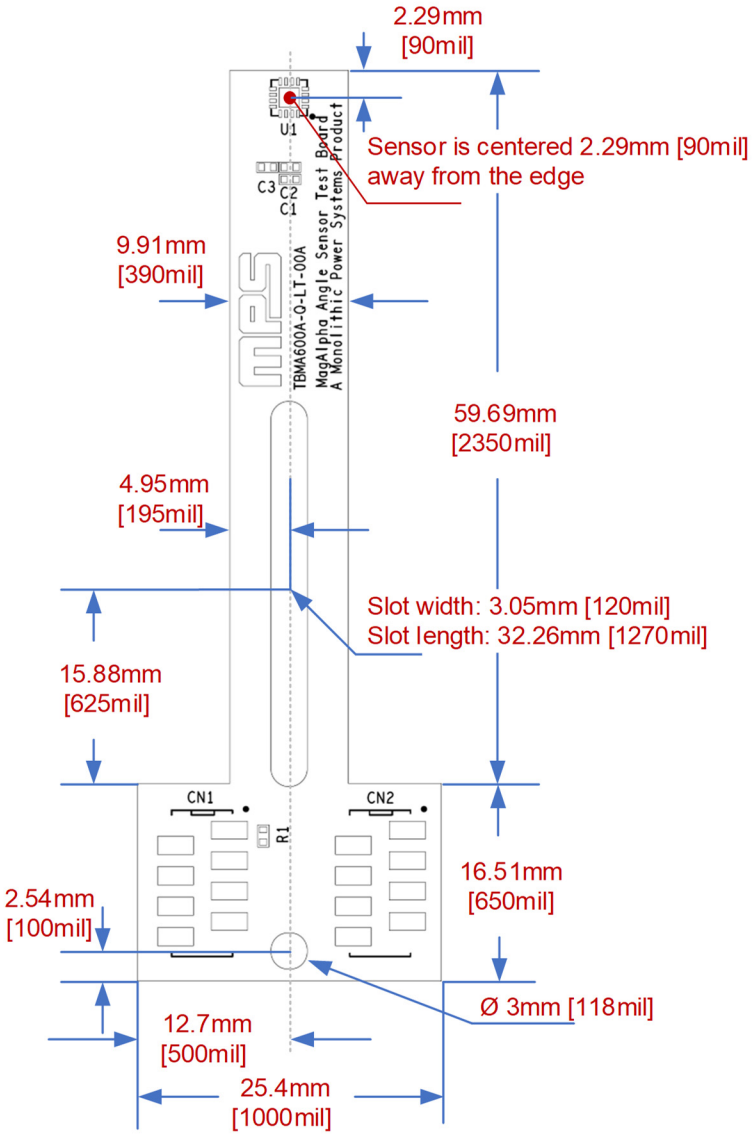

Figure 8: TBMA600 Mechanical Drawing

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PCB LAYOUT

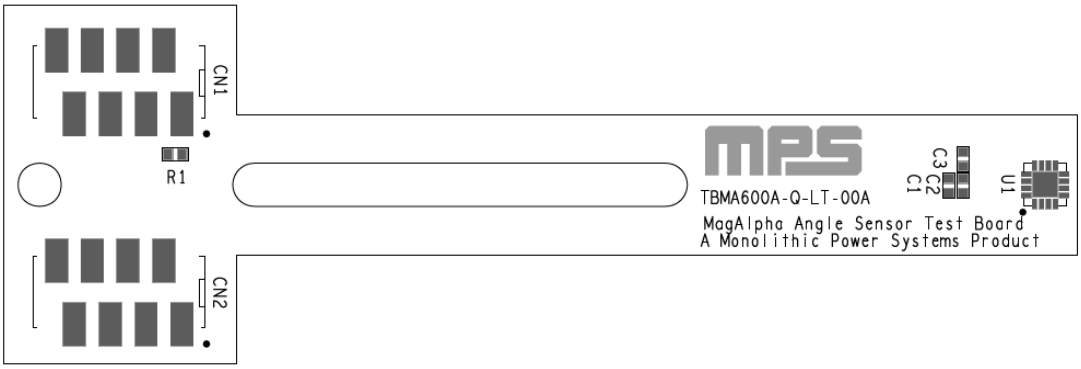

Figure 4: Top Silk and Components Placement

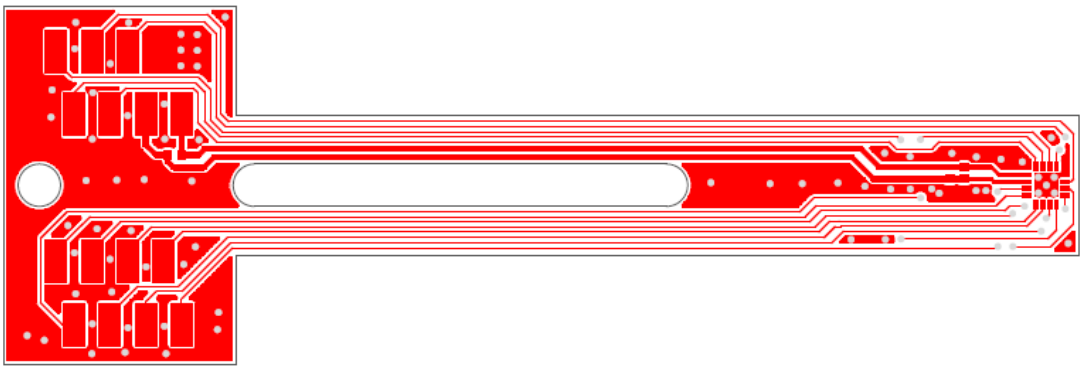

Figure 5: Top Layer

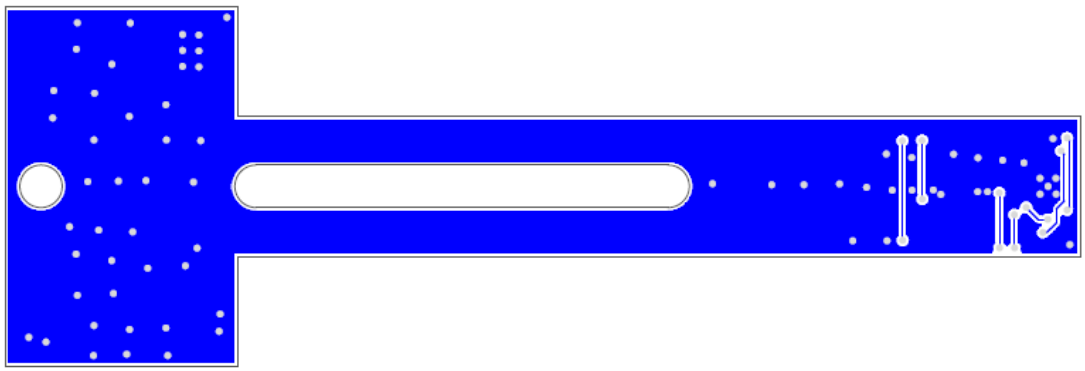

Figure 6: Bottom Layer

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MAGNET SUPPLIERS

A selection of magnets is available with the MPS MAG10 magnet product family. This family offers three different magnet geometries: cylinder, ring, and half-cylinder. Figure 7 shows the available magnet geometries. The MPS MAG10 magnet product family can be purchased directly from MPS.

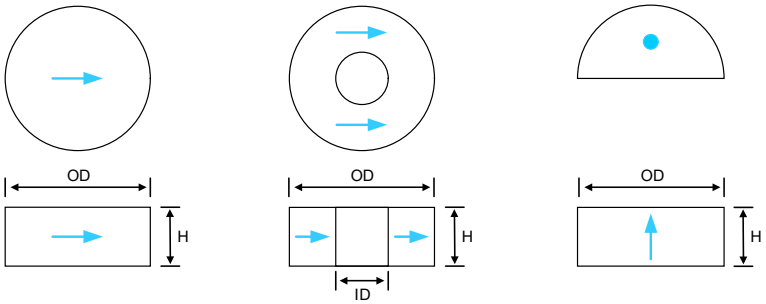

Figure 7: MPS MAG10 Magnet Geometries

Visit our website learn more about our magnet portfolio:

https://www.monolithicpower.com/en/products/sensors/position-sensors/position-sensor-magnets.html

If the magnet required for your application is not listed on our website, consider the following non-exhaustive list of possible magnet suppliers (see Table 4). The magnetization direction must be chosen wisely given that most sold magnets are often axially magnetized, which is not a magnetization direction typically required in magnetic angle-sensing applications. Angle-sensing applications typically use diametrically magnetized magnets.

Table 4: Magnet Suppliers

Company	Website	Address	Comments
Bomatec AG	www.bomatec.com	Hofstrasse 1, 8181 Höri, Switzerland	An MPS partner for many projects.
Maurer Magnetics AG	www.maurermagnetic.ch	Industriestrasse 8 8627 Grüningen, Switzerland	Maurer offers a selection of diametrically magnetized magnets in stock.
Arnold Technologies AG	www.arnoldmagnetics.com	Hübelacherstrasse 15 5242 Birr-Lupfig, Switzerland	
Dexter Magnetic Technologies	www.dextermag.com	1050 Morse Avenue, Elk Grove Village, IL 60007-5110 USA	
JPMF	www.jpmf.com.cn	8 LongWan Road, Jiangmen City, GuangDong Province, China	Magnet overmolding.
IMA	www.imamagnets.com	Avda. Cataluña 5, 08291 Ripollet, Barcelona, Spain	Magnet overmolding, magnetic tapes.

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REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	7/18/2025	Initial Release	-

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