TBMA600

Test Board for the MA600 Series User Guide

NOT RECOMMENDED FOR NEW DESIGNS, REFER TO TBMA600A-Q-LT-00A

DESCRIPTION

The TBMA600 is a test board for the MA600 series TMR magnetic position sensors. The TBMA600 allows users to easily evaluate the MA600 series.

TBMA600 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 MA600 series sensors, and allowing users to evaluate the MA600 series with their own set-up.

The TBMA600 test board includes the assembled board with the sensor, decoupling capacitors, resistor, and connectors.

FEATURES

- Evaluation Board Supports Side Shaft and End-of-Shaft Mounting
- Compatible with the MagAlpha Evaluation App (Software) That Is Used with the EVKT-MagAlpha-MagDiff (Hardware)

APPLICATIONS

- Servo Drives
- Robotics
- Automotive
- BLDC Motor Commutation
- Encoders

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OVERVIEW

Figure 1: TBMA600 Test Board

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Table 1: Board Type

Board Type	Board Part Number	MPS Sensor Part Number
Board Type 1	TBMA600-Q-LT-00A	MA600

TBMA CONTENTS

Figure 2 shows the TBMA test board contents, with each element described in the list below.

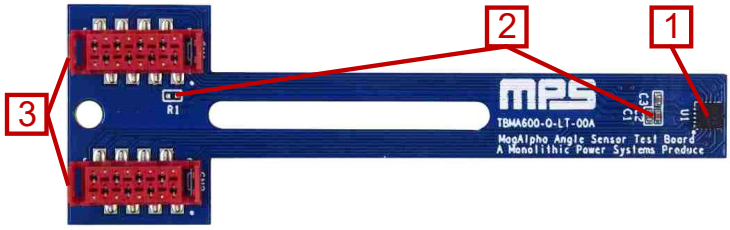

Figure 2: TBMA600 Contents

1. One TBMA board with MagAlpha mounted.
2. Decoupling capacitors and resistor.
3. Connectors.

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BOARD TYPE 1

Figure 3 shows an overview of board type 1.

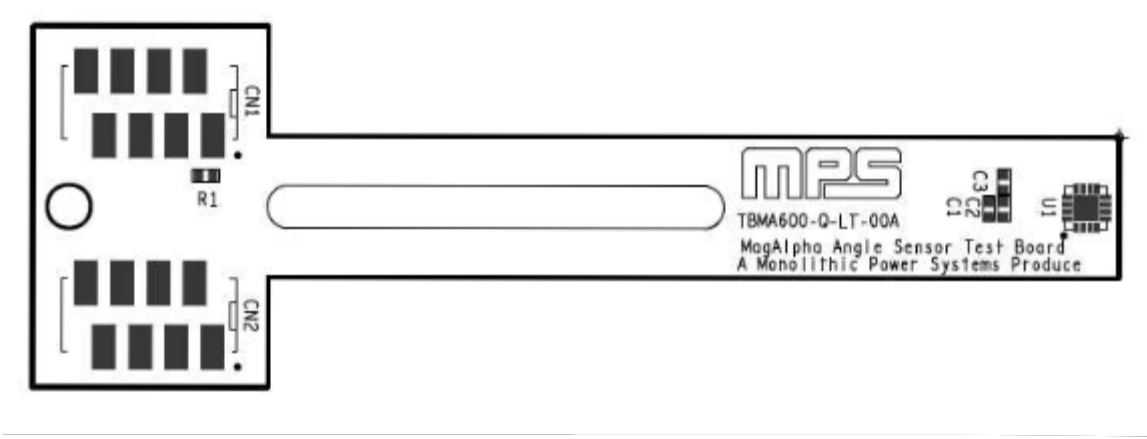

Figure 3: Board Type 1 Board Overview

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Schematic

Figure 4 shows the board type 1 schematic.

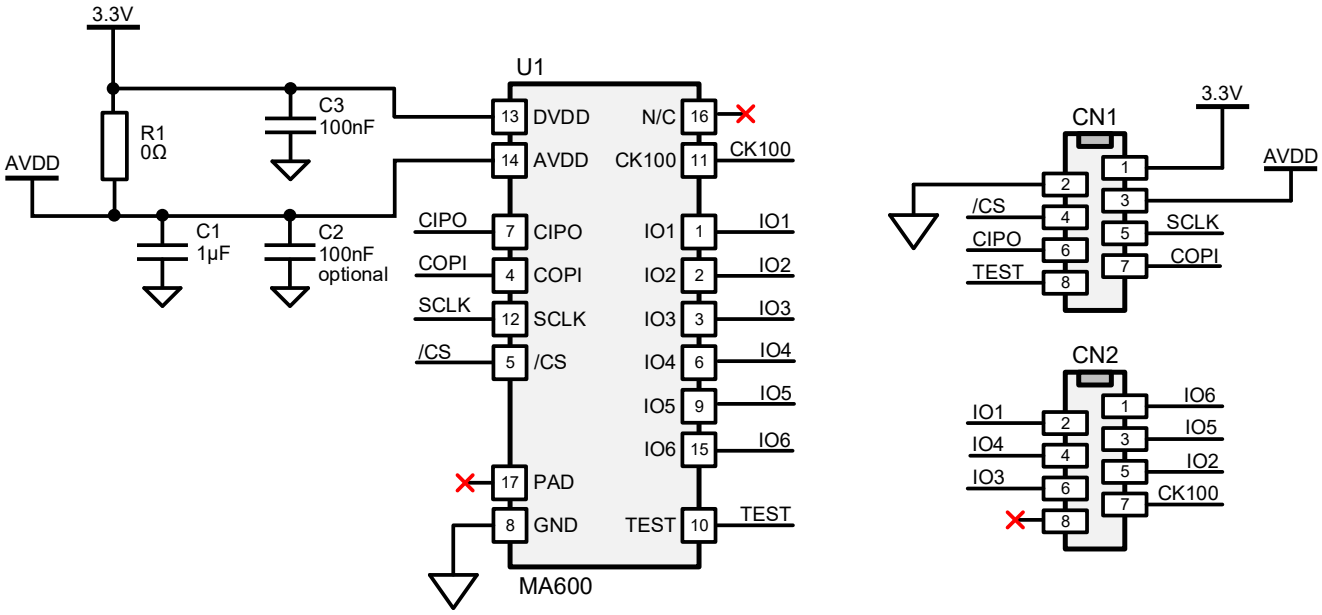

Figure 4: Board Type 1 Schematic

Bill of Materials

Table 2 shows the board type 1 bill of materials (BOM).

Table 2: Board Type 1 Bill of Materials

Quantity	Designator	Description	Value	Manufacturer	Manufacturer PN
2	C1	Ceramic capacitor, 6.3V, X7R, 0402	1µF	Murata	GRM155R70J105KA12D
1	C2 (optional)	Ceramic capacitor, 6.3V, X7R, 0402	100nF	Murata	GRM155R70J104KA01D
1	C3	Ceramic capacitor, 6.3V, X7R, 0402	100nF	Murata	GRM155R70J104KA01D
1	R1	Resistor, 0402, 1%	0Ω	Yageo	RC0402FR-070RL
1	U1	MagAlpha TMR magnetic position sensor	MA600	MPS	MA600GQ-Z
2	CN1, CN2	8-position receptacle connector, 0.100” (2.54mm), surface-mount tin		Wurth or TE Connectivity	690367280876 or 7-2178711-8

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Mechanical Drawing

Figure 5 shows the top-side mechanical drawing of the board type 1.

Note that for this figure, 1mil = 0.001” = 0.0254mm.

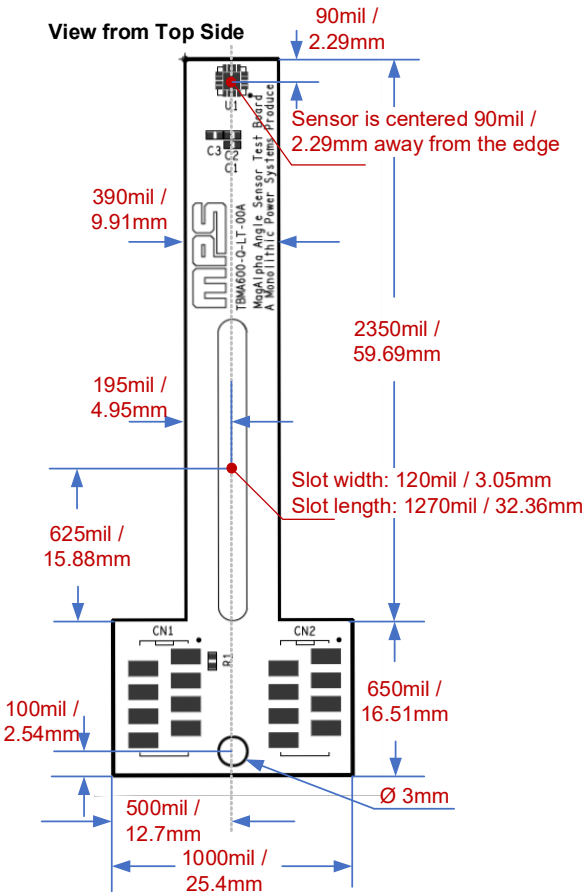

Figure 5: Board Type 1 Mechanical Drawing

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Connector Pinout

Figure 6 shows the board type 1 connector pinout.

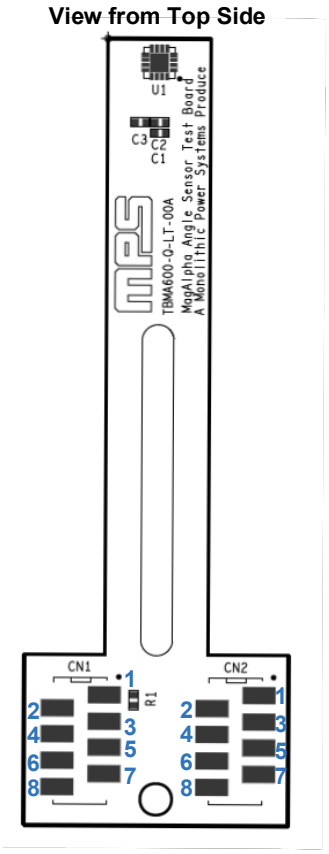

Figure 6: Board Type 1 Connector Pinout

Table 3 shows the Board Type 1 connector pin registers.

Table 3: Board Type 1 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 (1)	Digital I/O pin.
CN2.2	IO1 (1)	Digital I/O pin.
CN2.3	IO5 (1)	Digital I/O pin.
CN2.4	IO4 (1)	Digital I/O pin.
CN2.5	IO2 (1)	Digital I/O pin.
CN2.6	IO3 (1)	Digital I/O pin.
CN2.7	CK100	Clock output reference for speed calculation.
CN2.8	-	-

Note:

1) Refer directly to the part's datasheet for the I/O output interface selection.

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MAGNET SUPPLIERS

A selection of magnets are 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.

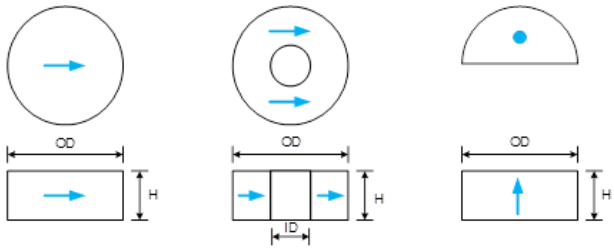

Figure 7: MPS MAG10 Magnet Geometries

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	8/25/2022	Initial Release	-
1.01	5/14/2024	Replaced mentions of the EVKT-MACOM with the EVKT-MagAlpha-MagDiff and added mentions of the MagAlpha Evaluation App (software) in the Description and Features sections	1

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