

iC-MHM EVAL MHM4M

EVALUATION KIT DESCRIPTION

ORDERING INFORMATION

Type	Order Designation	Description Options
Evaluation kit	iC-MHM EVAL MHM4M	Evaluation kit includes the PCB module MHM4M Ready-to-operate, supplied with magnet and adapter cable
Evaluation Software	iC-MHM GUI	GUI Software for Windows PC Device setup file generation, board configuration via adapter
Related parts PC adapter	(to be ordered separately) iC-MB3 iCSY MB3U-I2C iC-MB4 iCSY MB4U iC-MB5 iCSY MB5U	PC-USB adapter for BiSS/SSI w. I2C/SPI extension cable High-Performance PC-USB adapter for BiSS C High-Performance isolated PC-USB adapter for BiSS C

MHM4M PCB

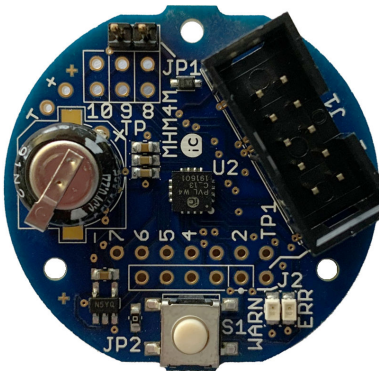


Figure 1: PCB Module MHM4M top side

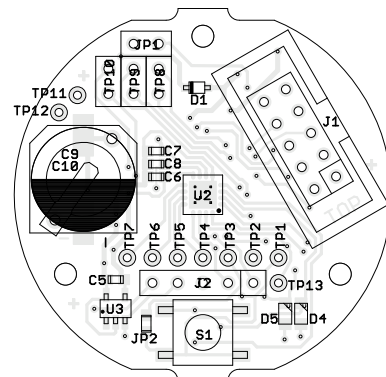


Figure 3: PCB Module MHM4M top side

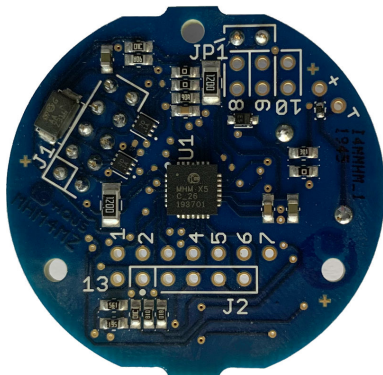


Figure 2: PCB Module MHM4M bottom side

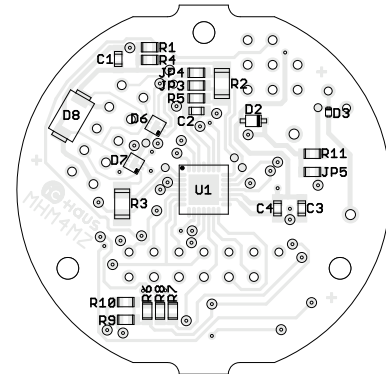


Figure 4: PCB Module MHM4M bottom side

CONNECTOR AND TERMINAL CONFIGURATION

- J1 Serial interface and power supply connector
- J2 Optional test terminal

PUSHBUTTON DESCRIPTION

- S1 Triggers iC-PVL Preset

SENSOR COMPONENTS

- U1 iC-MHM
- U2 iC-PVL

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RELATED PRODUCTS AND DOCUMENTATION

- IC Documentation
 - www.ichaus.de/PVL_datasheet_en
 - www.ichaus.de/MHM_datasheet_en
- GUI Software for Windows PC
 - http://www.ichaus.de/MHM_gui_rte
 - http://www.ichaus.de/MHM_gui
- BiSS-to-PC Adapter Descriptions
 - http://www.ichaus.de/MB3U-I2C_datasheet_en
 - http://www.ichaus.de/MB4U_datasheet_en
 - http://www.ichaus.de/MB5U_datasheet_en

OVERVIEW OF KIT ITEMS

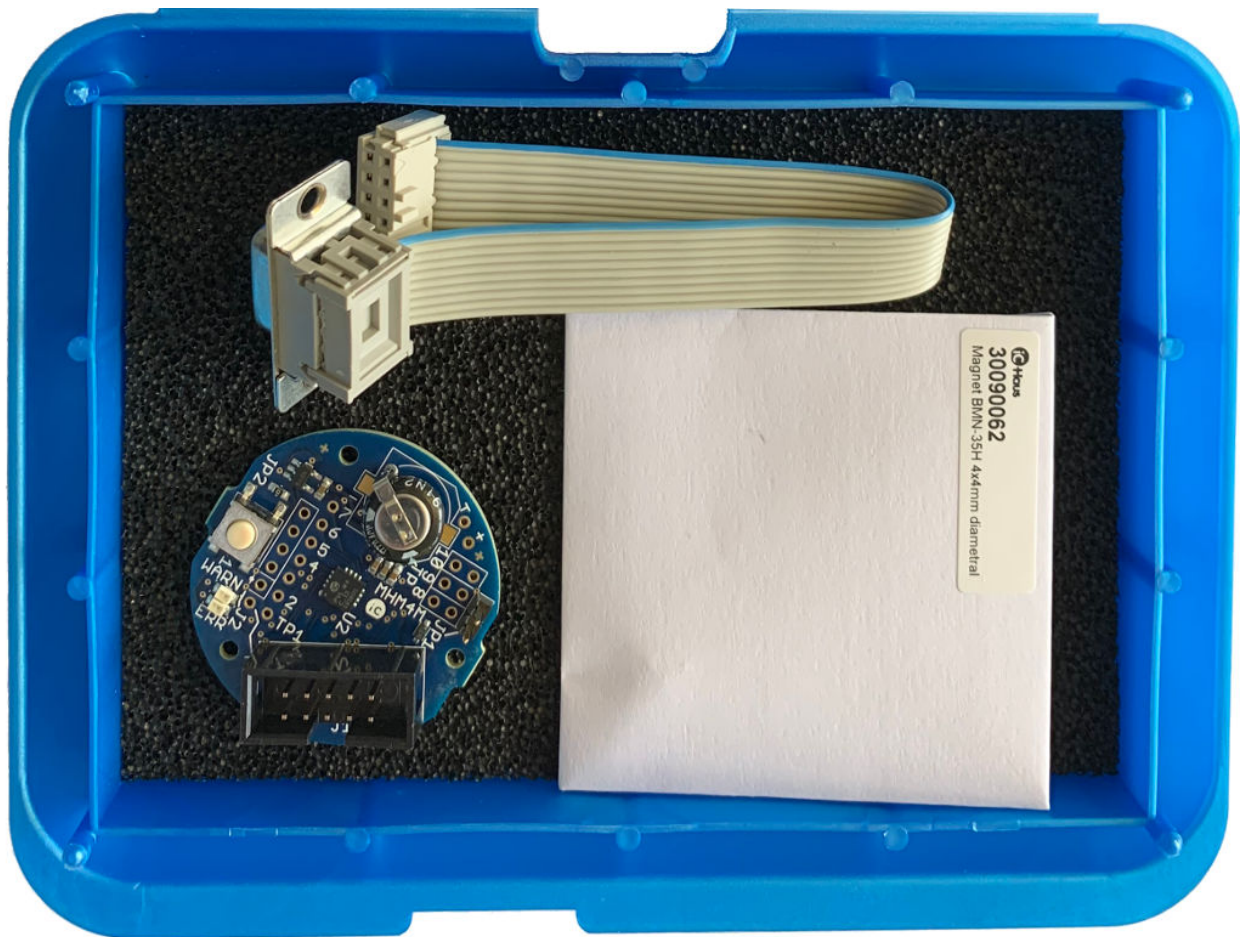


Figure 5: Evaluation kit. Scope of delivery: MHM4M module, diametric 4 mm NdFeB magnet, 10-pin to D-sub cable.

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CONNECTOR AND TERMINAL PINOUT

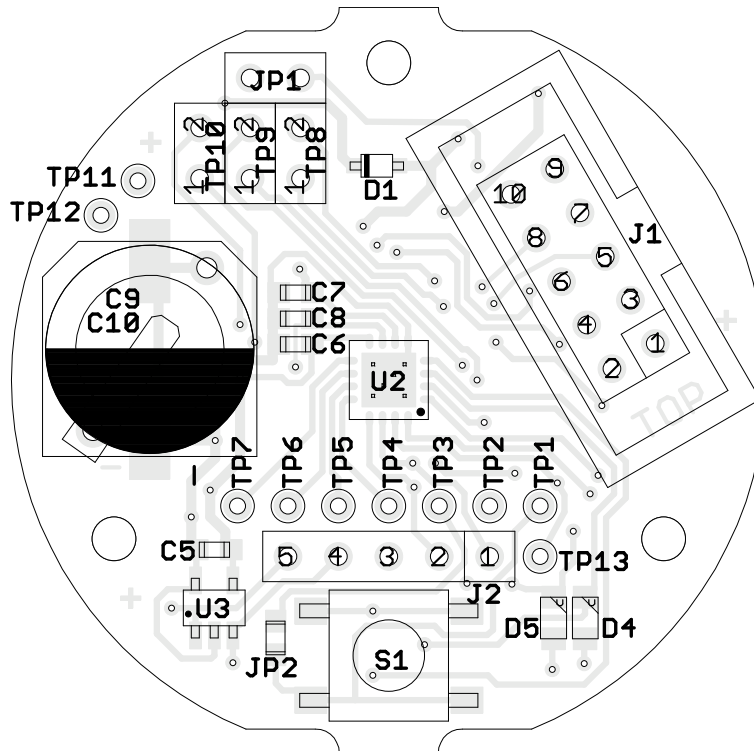


Figure 6: MHM4M top view

J1: Serial interface and power supply

(Use included 10-pin to D-sub cable to connect to BiSS adapter)

Pin	Name	Function
J1-1	n.c.	Not connected
J1-2	GND	Ground
J1-3	MA	Clock
J1-4	SL	Slave Out
J1-5	NMA	Clock (inverted)
J1-6	NSL	Slave Out (inverted)
J1-7	VDD	+5V Supply
J1-8	SLI	Slave In
J1-9	NSLI	Slave In (inverted)
J1-10	NCS	Optional Not Chip Select (SPI)

J2: Test connector

Pin	Name	Function
J2-1	MCL	Multiturn Interface Clock Line
J2-2	MDI	Multiturn Interface Data Line
J2-3	NERR	Error Output (low active)
J2-4	SDA	I2C Data Line
J2-5	SCL	I2C Clock Line

TPx: Test terminals

TP1	PRE	iC-PVL Preset Pin
TP2	P1	iC-MHM digital I/O port 1
TP3	P3	iC-MHM digital I/O port 3 - iC-PVL pin PRE
TP4	P2	iC-MHM digital I/O port 2 - iC-PVL pin NWRN
TP5	N0	iC-PVL pin N0
TP6	P2	iC-PVL pin P2
TP7	N2	iC-PVL pin N2
TP8-1	MAO	iC-MHM BiSS clock output
TP8-2	NMAO	iC-MHM BiSS clock output (inverted)
TP9-1	PSIN	iC-MHM analog sine output
TP9-2	NSIN	iC-MHM analog sine output (inverted)
TP10-1	PCOS	iC-MHM analog cosine output
TP10-2	NCOS	iC-MHM analog cosine output (inverted)

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JUMPER DESCRIPTION

Jumper	Description	Jumper Configuration	Information
JP1	iC-MHM SPI NCS routing	open (default)	iC-MHM SPI NCS not connected to J1-10
		closed	iC-MHM SPI NCS connected to J1-10 - use for iC-MHM SPI communication mode
JP2	iC-MHM pin P3 to iC-PVL pin PRE	open	iC-MHM GPIO pin P3 not connected to iC-PVL pin PRE
		closed (default)	iC-MHM GPIO pin P3 connected to iC-PVL pin PRE - iC-PVL preset can be triggered via iC-MHM GPIO pin P3
JP3	iC-MHM pin SLI to J1-SLI	open	iC-MHM pin SLI not connected to J1-SLI
		closed (default)	iC-MHM pin SLI connected to J1-SLI
JP4	iC-MHM pin NSLI to J1-NSLI	open	iC-MHM pin NSLI not connected to J1-NSLI
		closed (default)	iC-MHM pin NSLI connected to J1-NSLI
JP5	iC-PVL pin VBAT to supercap C9	open	iC-PVL pin VBAT not connected to supercap C9 (use if external battery is connected)
		closed (default)	iC-PVL pin VBAT connected to supercap C9

BISS ADAPTER CABLE



Figure 7: BiSS adapter cable

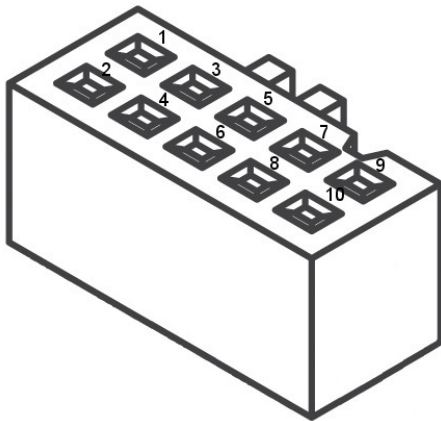


Figure 8: 10-pole connector (to board)

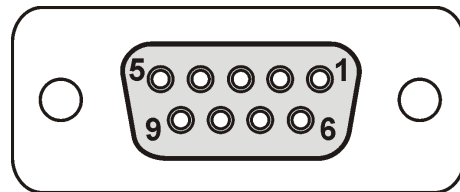


Figure 9: BiSS D-sub 9-pole connector (to PC-USB adapter)

(10-pole ribbon)

Pin Name Function

1	n.c.	(not connected)
2	GND	Ground
3	MA+	Clock Input
4	SLO+	Slave Data Output
5	MA-	Clock Input, inverted
6	SLO-	Slave Data Output, inverted
7	VDD	+5 V Sensor Supply
8	SLI+	Opt. Data In
9	SLI-	Opt. Data In, inverted
10	NCS	Opt. Not Chip Select (SPI)

(D-sub 9-pole)

Pin Slave Master Function

1	n.c.	(VB)	(12 V Sensor Supply Output)
2	MA+	MA+	Clock Line
3	MA-	MA-	Clock Line, inverted
4	VDD	VDD	+5 V Sensor Supply Output
5	SLI-	MO-	Master Data Output, inverted to Slave Data Input, inverted
6	GND	GND	Ground
7	SLO+	SL+	Data Line
8	SLO-	SL-	Data Line, inverted
9	SLI+	MO+	Master Data Output to Slave Data Input

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CIRCUIT SCHEMATIC

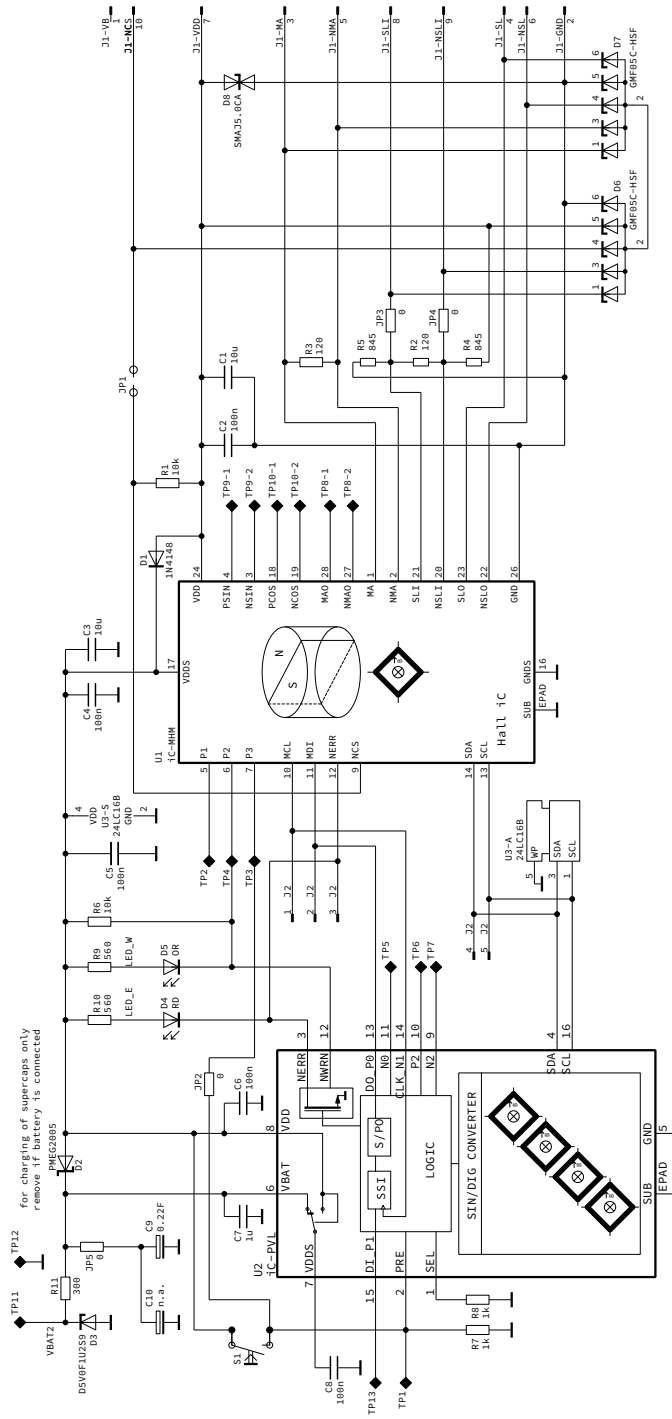


Figure 10: Circuit diagram MHM4M

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ASSEMBLY PART LIST

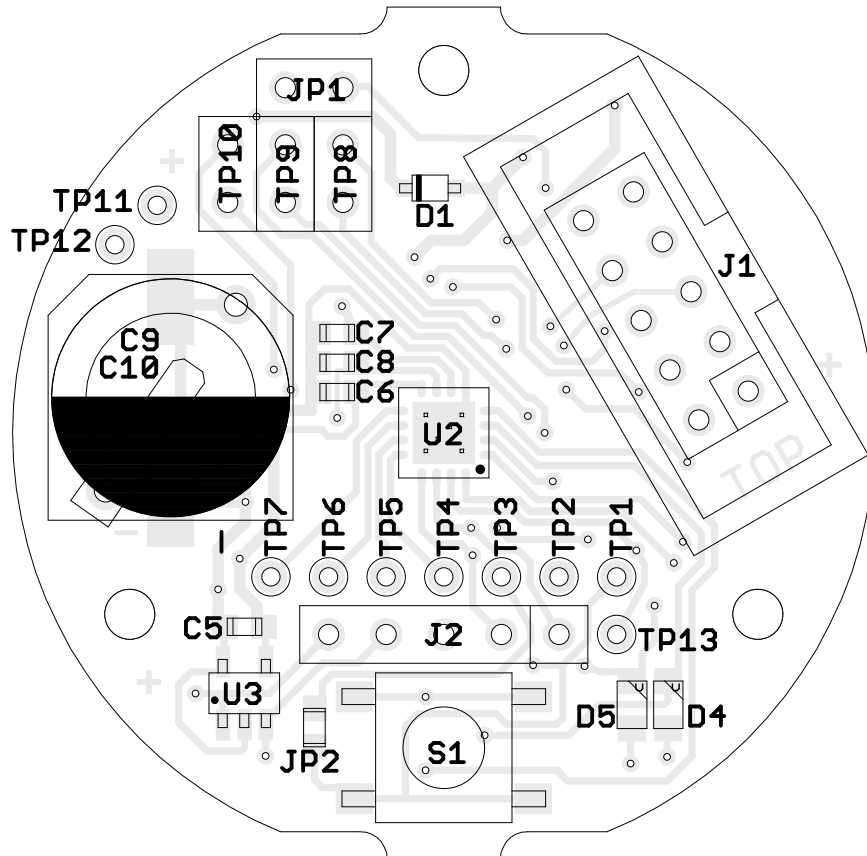


Figure 11: MHM4M top side

ASSEMBLY PART LISTING: Top Side		
Device	Value (typical)	Comment
C5, C6, C8	100 nF	SMD-C 100nF 10% X7R 16V Size 0603
C7	1 μ F	SMD-C 1uF 10% X7R 16V Size 0603
C9	220 mF	220mF -20/+80% ELKO 5,5V Size RM10
C10	n.a.	n.a.
D1	1N4148WS	SMD-D 1N4148WS SOD323
D4	RED	SMD-LED SUPER-RED LS-M67K
D5	ORANGE	SMD-LED ORANGE LO-M67K
J1	2x5-pole	Connector 2x5-pole male (WSL10G)
J2	n.a.	n.a.
JP1	2x1-pole	Connector 2x1-pole 2,54 mm
JP2	0 Ω	SMD-R 0R 5% 1A Size 0603
S1	Push Button	SMD-Switch B3S 6 mm x 6 mm
U2	iC-PVL	iC-PVL QFN16-4x4
U3	EEPROM	24LC16B SOT23-5
Note	n.a. = not assembled	

Table 1: Part listing top side

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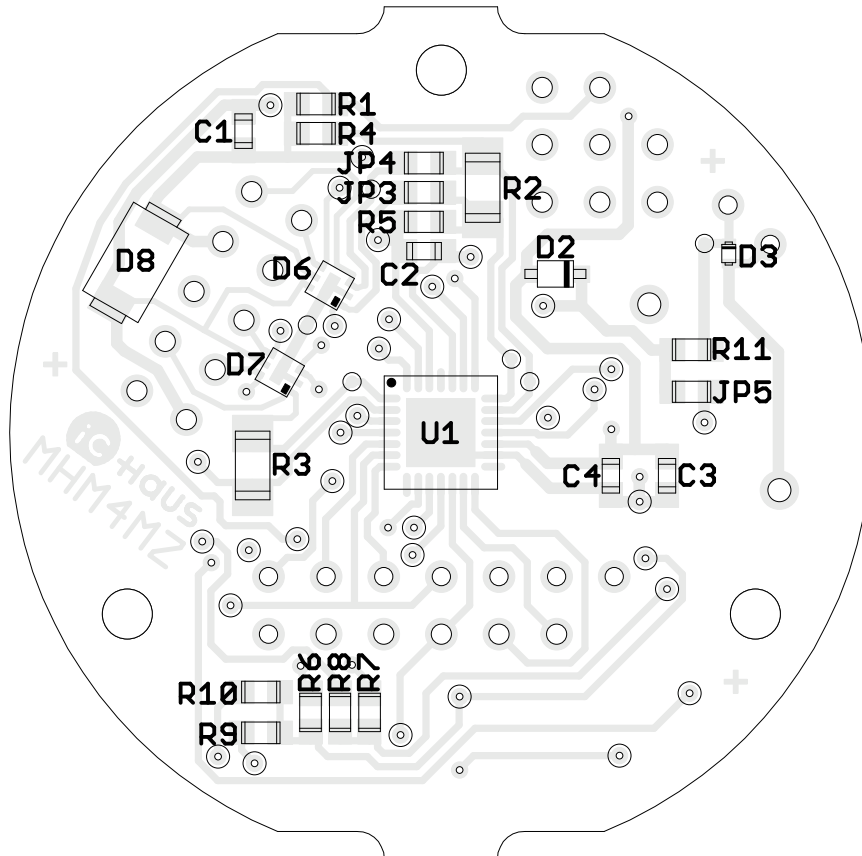
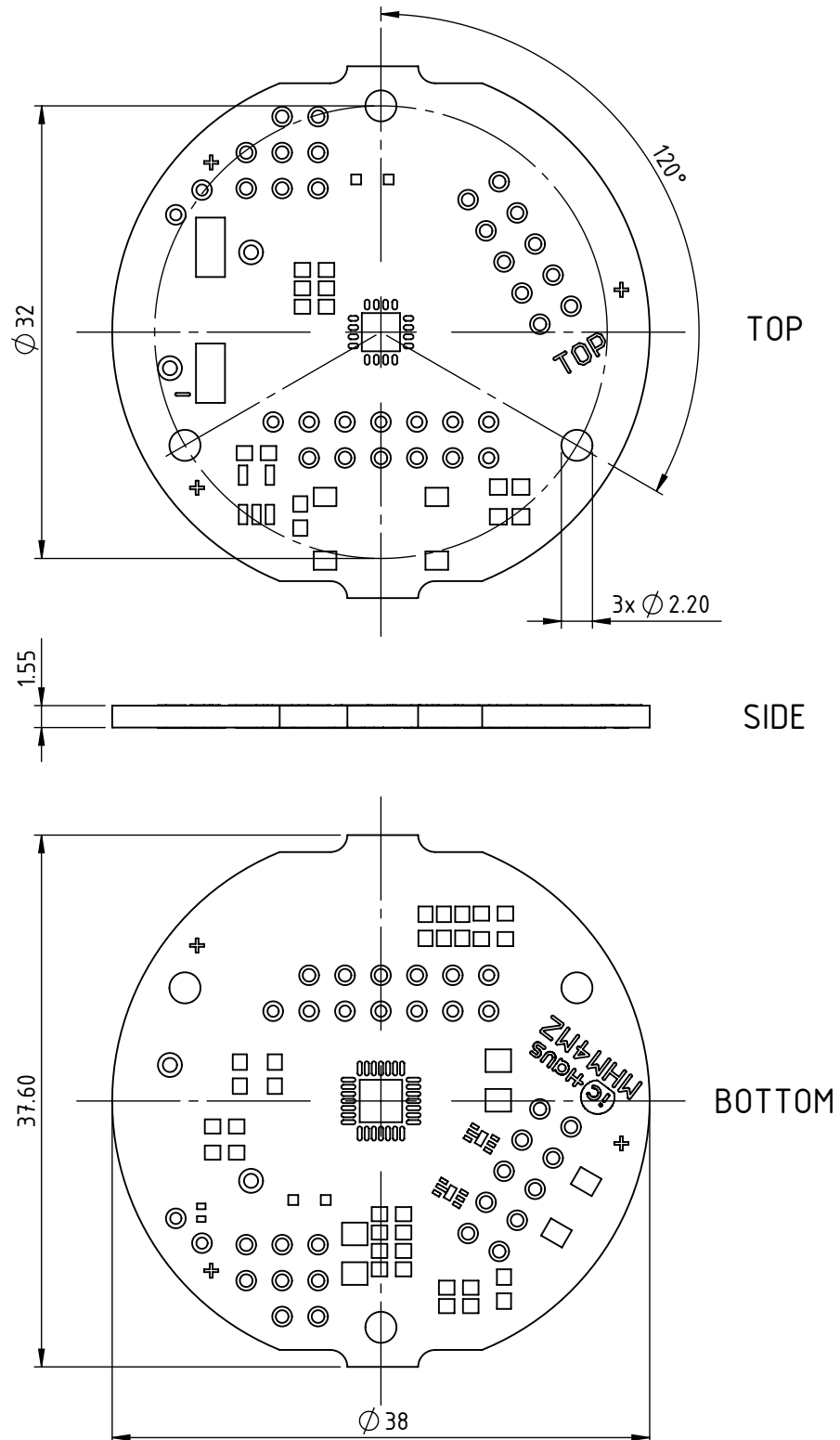


Figure 12: MHM4M bottom side

ASSEMBLY PART LISTING: Top Side		
Device	Value (typical)	Comment
C1, C3	10 μ F	SMD-C 10uF 20% X5R 10V Size 0603
C2, C4	100 nF	SMD-C 100nF 10% X7R 16V Size 0603
D2	PMEG2005AEA	SMD-SD PMEG2005AEA SOD323
D3	D5V0F1U2S9	SMD-TVSD 5V UNI D5V0F1U2S9 SOD923
D6, D7	GMF05C-HSF	SMD-TVSD (5x) 5V BI GMF05C-HSF LLP75-6L
D8	SMAJ5.0CA	SMD-TVSD 5V BI SMAJ5.0CA DO214AC
JP3, JP4, JP5	0 Ω	SMD-R 0R 5% 1A Size 0603
R1, R6	10 k Ω	SMD-R 10K 1% Size 0603
R2, R3	120 Ω	SMD-R 120R 1% Size 1206
R4, R5	845 Ω	SMD-R 845R 1% Size 0603
R7, R8	1 k Ω	SMD-R 1k 1% Size 0603
R9, R10	560 Ω	SMD-R 560R 1% Size 0603
R11	300 Ω	SMD-R 300R 1% Size 0603
U1	iC-MHM	iC-MHM QFN28-5x5

Table 2: Part listing bottom side

PHYSICAL DIMENSIONS



All dimensions given in mm, typical values.

Figure 13: MHM4M physical dimensions

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REVISION HISTORY

Rel.	Rel. Date*	Chapter	Modification	Page
A1	2020-01-10	All	Initial Release	All

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* Release Date format: YYYY-MM-DD