

A

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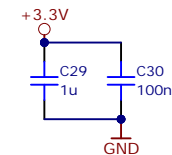
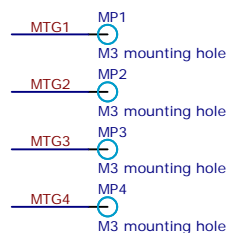
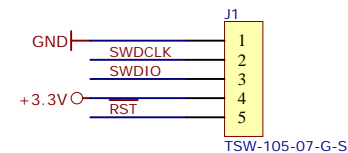
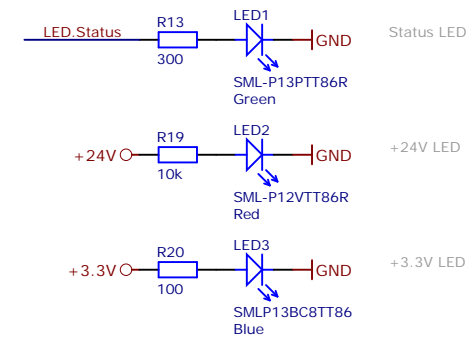
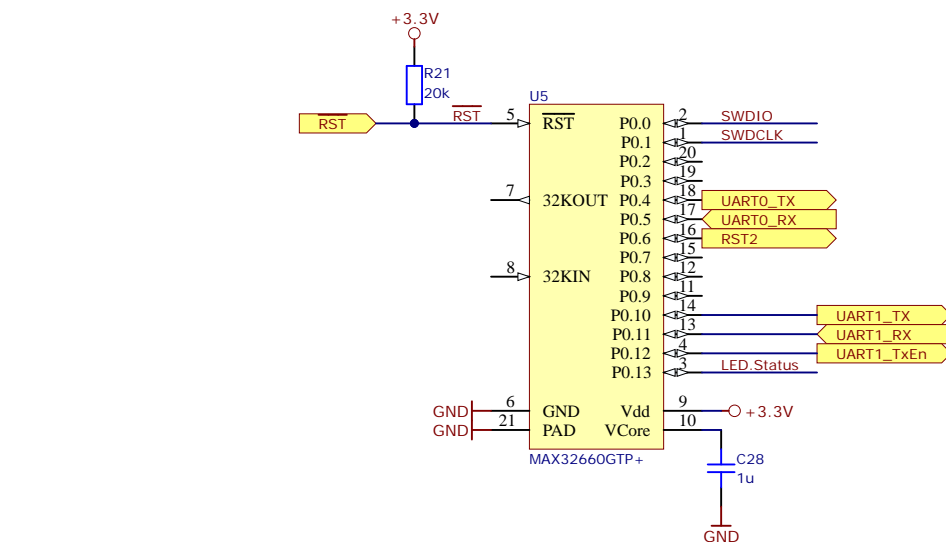
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Title TCMC-HBS-MREF MCU

Size: A4

Revision: V1.0

default

Date: 15-Mar-21

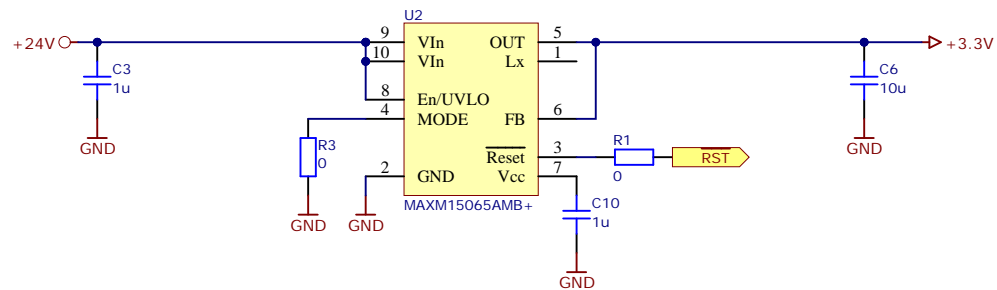
Time: 18:19:12

Sheet 2 of 5

File: MREF-MCU.SchDoc



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Title **TMCM-HBS-MREF PSU**

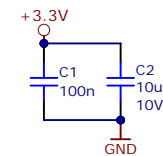
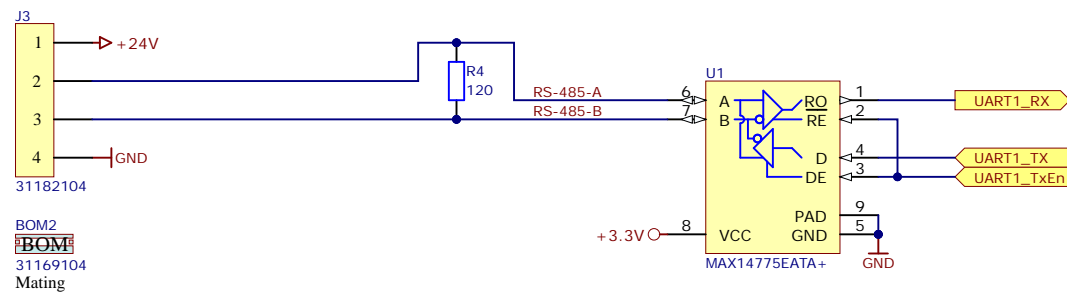
Size: **A4** Revision: **V1.0** default

Date: **15-Mar-21** Time: **18:19:13** Sheet 3 of 5

File: **MREF-PSU.SchDoc**



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Title TCMC-HBS-MREF Title

Size: A4

Revision: V1.0

default

Date: 15-Mar-21


Time: 18:19:13

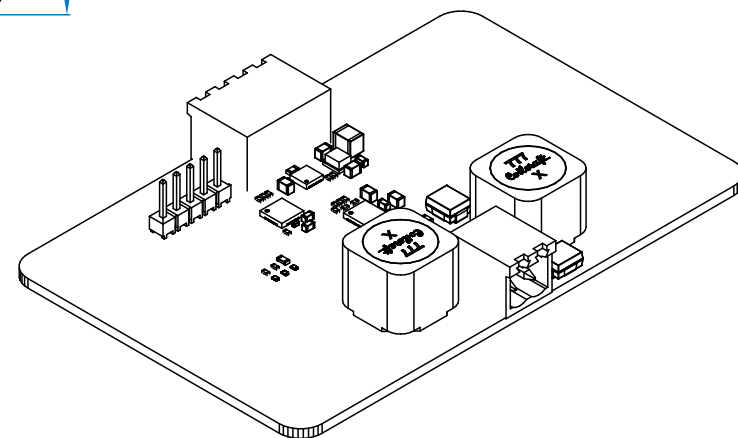
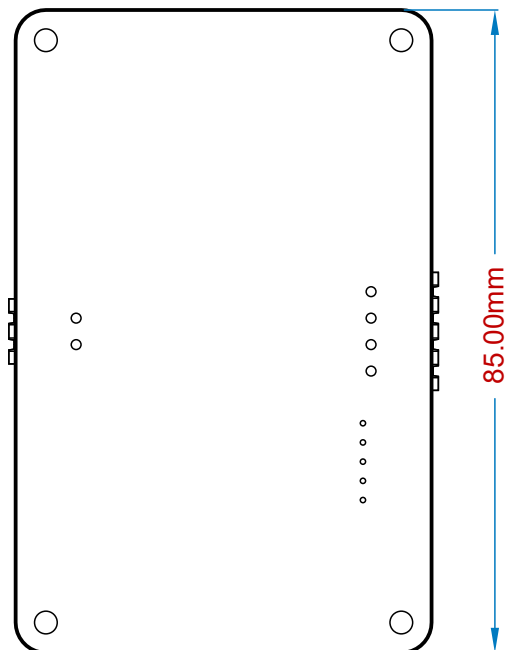
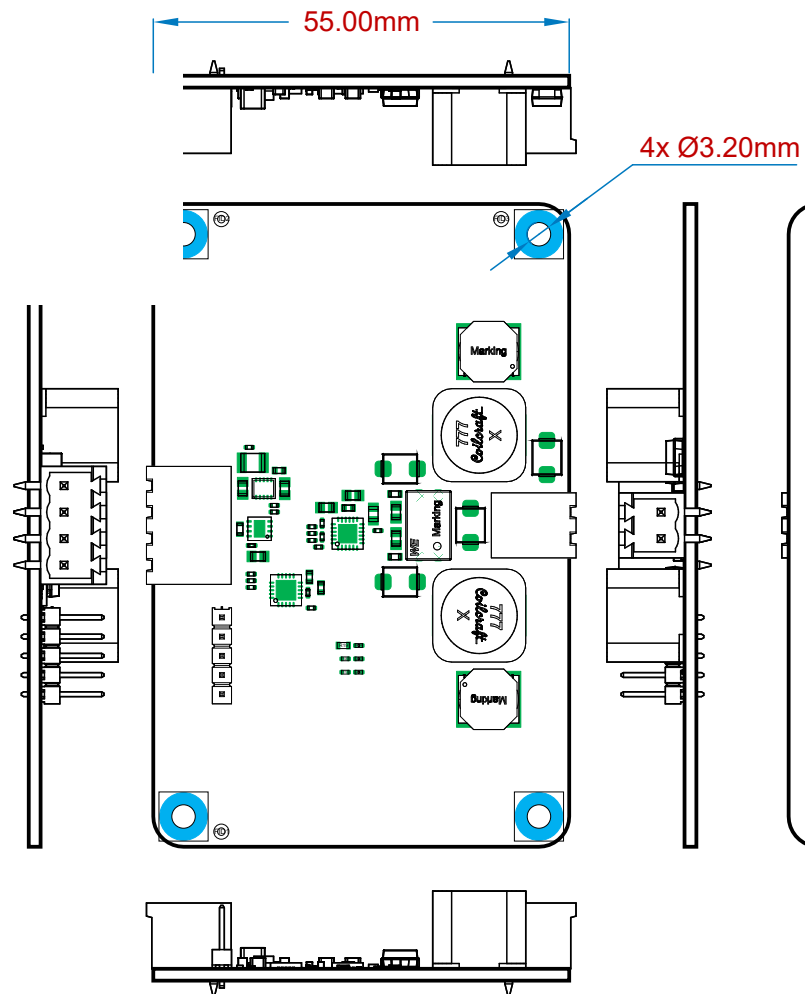
Sheet 4 of 5

File: MREF-RS485.SchDoc



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1		2		3		4													
A	<div>Changelog:</div> <div>From V0.9 to V1.0:</div> <div>- Added Status (G), +3.3V (B) and +24V (R) LEDs</div> <div>- Connected RE to DE line on RS485 transceiver</div> <div>- Added mating connectors to the BOM</div> <div>- Added connector pinout to the silkscreen</div> <div>From V0.9pre4 to V0.9:</div> <div>- Removed the conic bar feature from the top silkscreen</div> <div>- Updated logo</div> <div>From V0.9pre3 to V0.9pre4:</div> <div>- Added a differential mode choke as an option to power the HBS</div> <div>From V0.9pre2 to V0.9pre3:</div> <div>- Renamed the project to TCMC-HBS-MREF</div> <div>- Changed J2&J3 to Metz Typ 182, mating Typ 169</div> <div>- Connected RS485 /RE to GND</div> <div>- Removed temperature sensor</div> <div>- Removed I2C resistors</div> <div>- Replaced the programming connector with 1x5 pin header (GND/CLK/SDIO/+3.3V/RST)</div> <div>- Added inductors L1a/L2a in partallel with L1/L2</div> <div>- Do not populate L1/L2</div> <div>- Changed 3.3V PSU to MAXM15065AMB+</div>						A												
B							B												
C							C												
D							D												
1		2		3		4													
				<table><tr><td colspan="3">Title TMCM-HBS-MREF LOG</td></tr><tr><td>Size: A4</td><td>Revision: V1.0</td><td>default</td></tr><tr><td>Date: 15-Mar-21</td><td>Time: 18:19:13</td><td>Sheet 5 of 5</td></tr><tr><td colspan="3">File: MREF-LOG.SchDoc</td></tr></table>		Title TMCM-HBS-MREF LOG			Size: A4	Revision: V1.0	default	Date: 15-Mar-21	Time: 18:19:13	Sheet 5 of 5	File: MREF-LOG.SchDoc			<div> TRINAMIC MOTION CONTROL</div> <div>Waterloohain 5 22769 Hamburg Germany tmc_info@trinamic.com</div>	
Title TMCM-HBS-MREF LOG																			
Size: A4	Revision: V1.0	default																	
Date: 15-Mar-21	Time: 18:19:13	Sheet 5 of 5																	
File: MREF-LOG.SchDoc																			



View from Front side (Scale 1:1)

Title		
Assembly drawing		
Size	Revision	Project
A4	V1.0	TCMC-HBS-MREF
Date	15-Mar-21 18:19	Sheet 1 of 2
File	TCMC-HBS-MREF.Assembly.PCBDwf	



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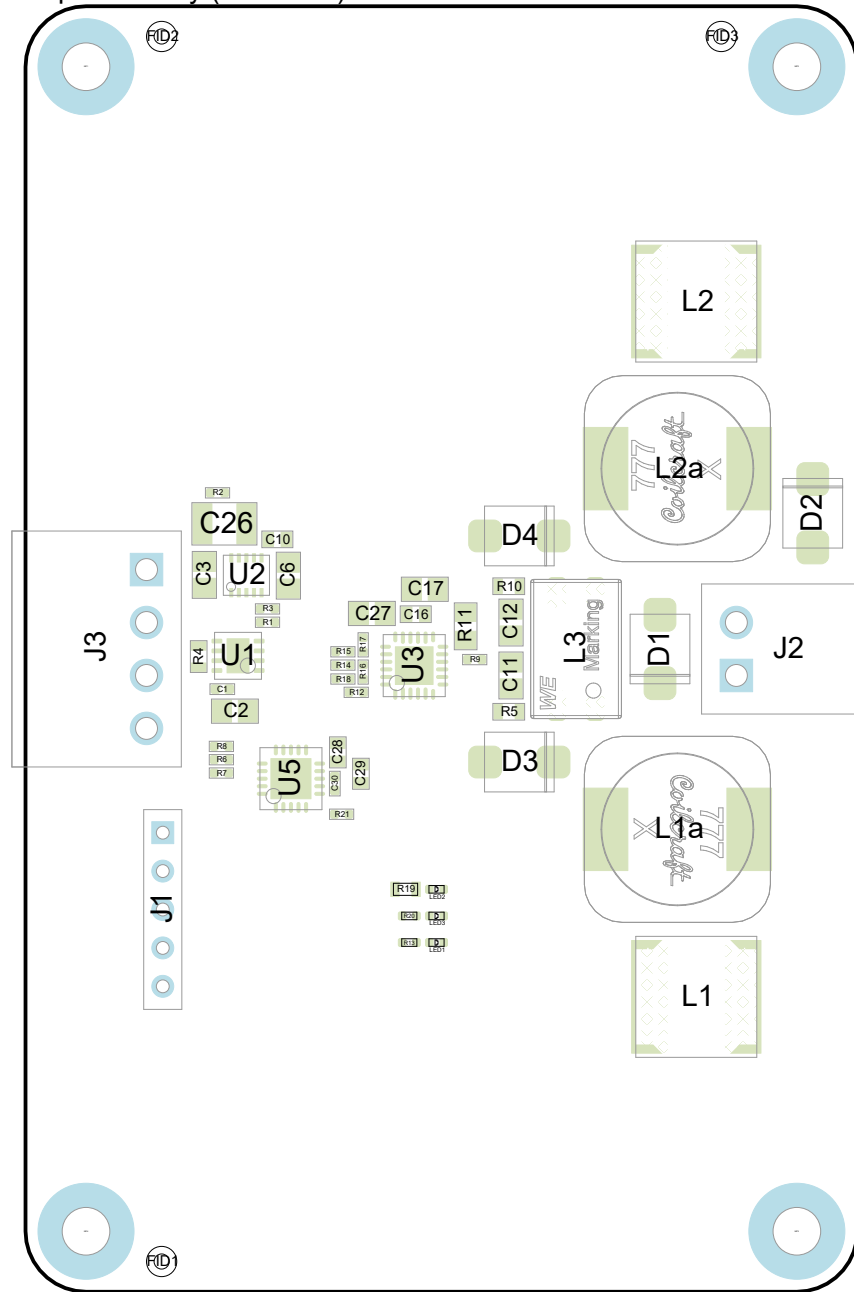
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Top Assembly (Scale 2:1)



Title			Assembly drawing		
Size	Revision	Project	TMCM-HBS-MREF		
A4	V1.0				
Date	15-Mar-21 18:19		Sheet 2 of 2		
File	TMCM-HBS-MREF.Assembly.PCBDwf				



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A

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Designator	Quantity	Manufacturer	Part Number	Description	Value	LibRef
BOM1	1	Metz Connect	31169102	BOM item	2 pin, 3.5mm	51640
BOM2	1	Metz Connect	31169104	BOM item	4 pin, 3.5mm	51639
C1, C30	2	Any	100n, 50V, X7R, 0402 (1005 metric) chip capacitor	Ceramic chip capacitor	100n	20203
C2, C6, C17	3	Any	10u, 10V, X7R, 0805 (2012 metric) chip capacitor	Ceramic chip capacitor	10u	20166
C3, C27	2	Any	1u, 50V, X5R, 0805 (2012 metric) chip capacitor	Ceramic chip capacitor	1u	20079
C10, C16, C28, C29	4	Any	1u, 16V, X5R, 0603 (1608 metric) chip capacitor	Ceramic chip capacitor	1u	20005
C11, C12	2	Any	2.2u, 50V, X7R, 0805 (2012 metric) chip capacitor	Ceramic chip capacitor	2.2u	20202
C26	1	Samsung	CL32B106KBJNNN	Ceramic chip capacitor	10u	30010
D1	1	Littelfuse	SMBJ24A	TVS, Pin1 Cathode	24V,600W	51483
D2	1	Littelfuse	P6SMB6.8CA	Transient Voltage Suppression (TVS) Diode	6.8V,600W, Bidir	51484
D3, D4	2	Littelfuse	P6SMB6.8A	TVS, Pin1 Cathode	6.8V,600W	51475
J1	1	Samtec	TSW-105-07-G-S	1X5 pin connector	1x5	50584
J2	1	Metz Connect	31182102	1X2 pin connector	2 pin, 3.5mm	51518
J3	1	Metz Connect	31182104	1X4 pin connector	4 pin, 3.5mm	50511
L1a, L2a	2	Coilcraft	MSS1210-106KE	Molded inductor	10m	60125
LED1	1	ROHM	SML-P13PTT86R	LED, pin 1 cathode	Green	51636
LED2	1	ROHM	SML-P12VTT86R	LED, pin 1 cathode	Red	51637
LED3	1	ROHM	SMLP13BC8TT86	LED, pin 1 cathode	Blue	51638
R1, R3	2	Any	0, -, -, 0402 (1005 metric) chip resistor	Chip Resistor	0	10052
R2, R8, R15	3	Any	100k, 1%, 62mW, 0402 (1005 metric) chip resistor	Chip Resistor	100k	10010
R4	1	Any	120, 1%, 100mW, 0603 (1608 metric) chip resistor	Chip Resistor	120	10047
R5, R10	2	Any	4.7, 1%, 100mW, 0603 (1608 metric) chip resistor	Chip Resistor	4.7	10140
R6	1	Any	2.7k, 1%, 62mW, 0402 (1005 metric) chip resistor	Chip Resistor	2.7k	10061
R7, R18, R21	3	Any	20k, 1%, 62mW, 0402 (1005 metric) chip resistor	Chip Resistor	20k	10083
R9	1	Any	1k, 1%, 62mW, 0402 (1005 metric) chip resistor	Chip Resistor	1k	10014
R11	1	Any	82, 0.1%, 125mW, 0805 (2012 metric) chip resistor	Chip Resistor	82	10446
R12	1	Any	62k, 1%, 62mW, 0402 (1005 metric) chip resistor	Chip Resistor	62k	10447
R13	1	Any	300, 1%, 62mW, 0402 (1005 metric) chip resistor	Chip Resistor	300	10332
R14	1	Any	27k, 1%, 62mW, 0402 (1005 metric) chip resistor	Chip Resistor	27k	10241
R16	1	Any	4.3k, 1%, 62mW, 0402 (1005 metric) chip resistor	Chip Resistor	4.3k	10448
R17	1	DNP	DNP	Chip Resistor	DNP	40006
R19	1	Any	10k, 1%, 100mW, 0603 (1608 metric) chip resistor	Chip Resistor	10k	10028
R20	1	Any	100, 1%, 62mW, 0402 (1005 metric) chip resistor	Chip Resistor	100	10009
U1	1	Maxim Integrated	MAX14775EATA+	Half-duplex RS-485/RS-422 Transceiver	RS-485	51480
U2	1	Maxim Integrated	MAXM15065AMB+		3.3V, 300mA buck PSU module	51519
U3	1	Maxim Integrated	MAX22088GTG+	Home Bus System (HBS) Compatible Transceiver	Home Bus System transceiver	51469
U5	1	Maxim Integrated	MAX32660GTP+		ULP M4F MCU	51470

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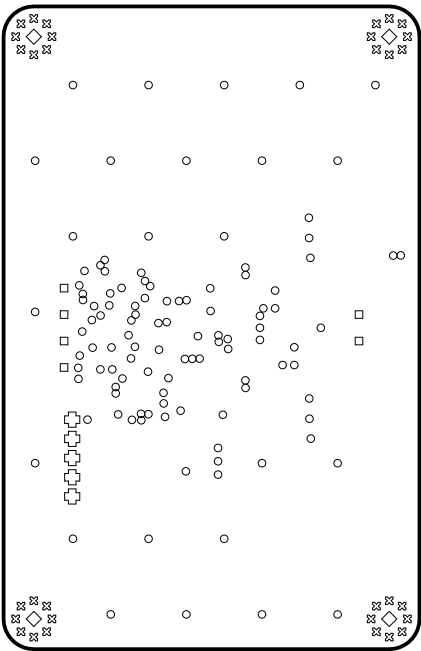
Layer Stack Legend

Material	Layer	Thickness	Gerber
	Top Overlay		GTO
Surface Material	Top Solder	0.010mm	GTS
Copper	Top Layer	0.018mm	GTL
Prepreg		0.180mm	
Copper	Mid1	0.035mm	G1
Core		1.080mm	
Copper	Mid2	0.035mm	G2
Prepreg		0.180mm	
Copper	Bottom Layer	0.018mm	GBL
Surface Material	Bottom Solder	0.010mm	GBS
	Bottom Overlay		GBO
Total thickness: 1.566mm			

Notes:

1. Use current revision of all standards.
2. Board is to be manufactured in accordance to IPC-6012 Class 2.
3. Laminate (core) and prepreg to be in accordance with IPC-4101/126
4. Board finish shall be ENIG
5. Soldermask colour shall be WHITE
6. Silkscreen colour shall be BLACK
7. All hole dimensions except [9] apply after plating
8. All copper dimensions apply after plating
9. Top and bottom thickness is given before plating

Drill Drawing View (Scale 1:1)



Drill Table

Symbol	Count	Hole Size	Plated	Via / Pad	Hole Tolerance
○	113	0.25	Plated	Via	
⊗	32	0.60	Plated	Pad	
⊕	5	0.90	Plated	Pad	
□	6	1.50	Plated	Pad	
◇	4	3.20	Plated	Pad	
	160 Total				

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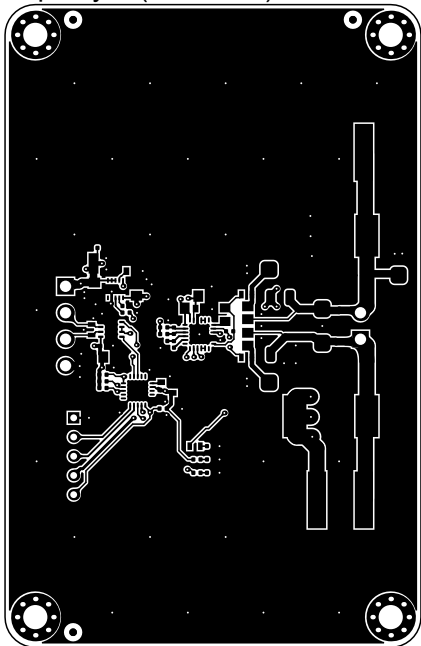
A

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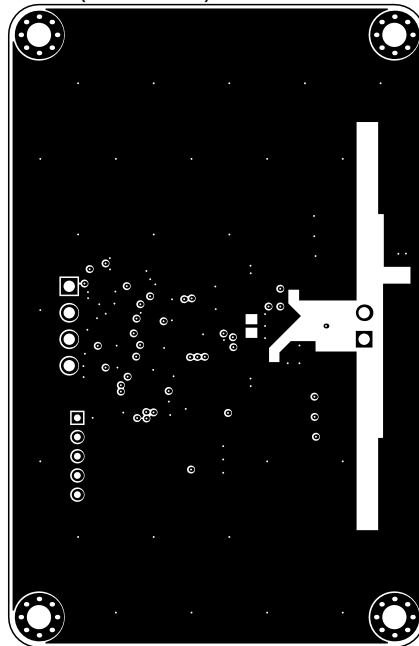
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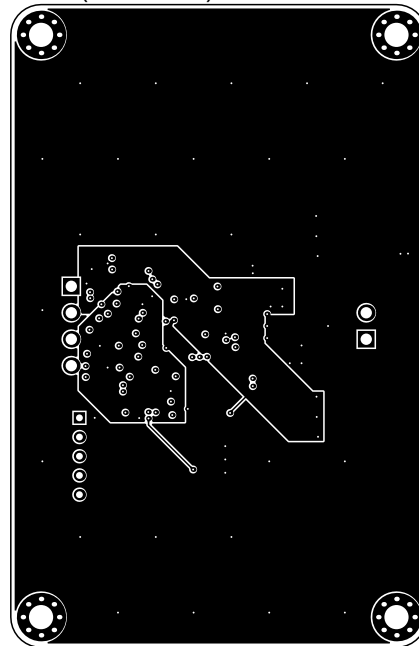
Top Layer (Scale 1:1)



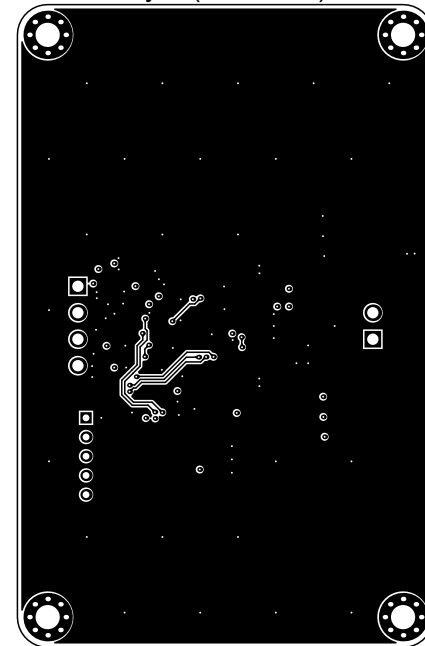
Mid1 (Scale 1:1)



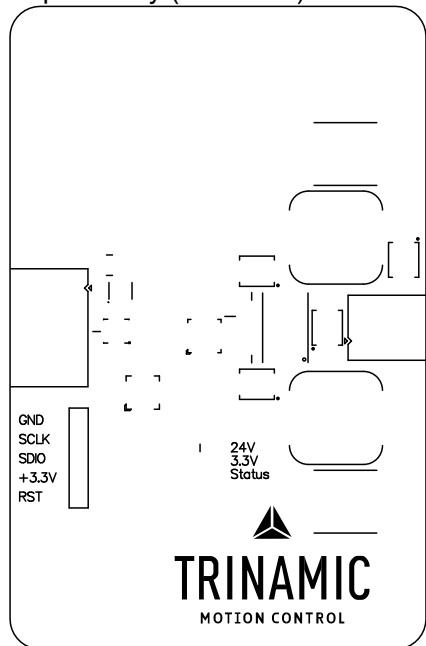
Mid2 (Scale 1:1)



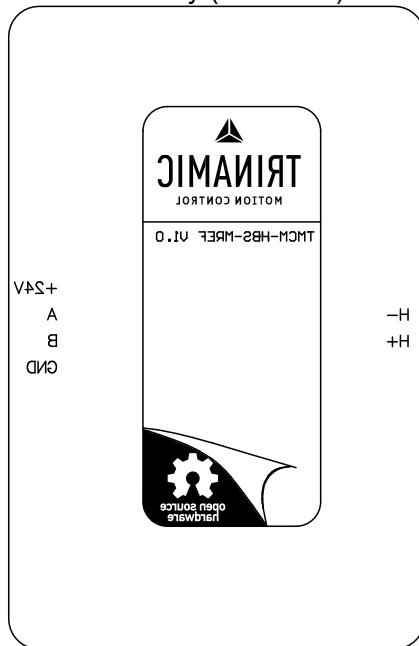
Bottom Layer (Scale 1:1)



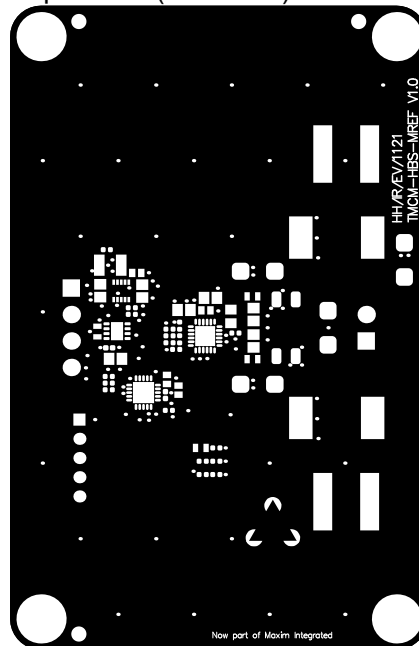
Top Overlay (Scale 1:1)



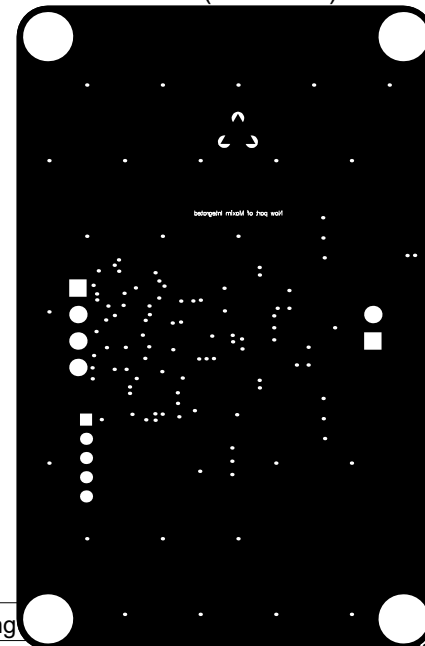
Bottom Overlay (Scale 1:1)



Top Solder (Scale 1:1)



Bottom Solder (Scale 1:1)



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A4	V1.0	TMCM-HBS-MREF
Date	15-Mar-21 18:19	Sheet 2 of 3
File	TMCM-HBS-MREF.Fabrication.PCBdxf	

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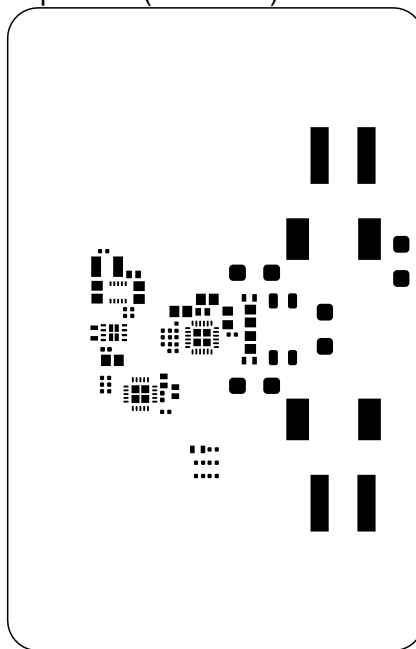
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Top Paste (Scale 1:1)



Title			Fabrication Drawing			 TRINAMIC MOTION CONTROL	Waterloohain 5 22769 Hamburg Germany tmc_info@trinamic.com	
Size	Revision	Project	TMCM-HBS-MREF					
A4	V1.0							
Date	15-Mar-21 18:19		Sheet 3 of 3					
File	TMCM-HBS-MREF.Fabrication.PCBDwf							

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