

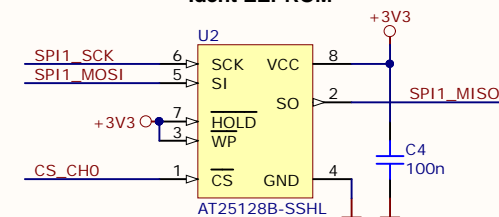
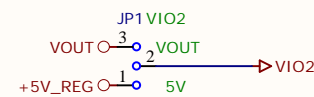
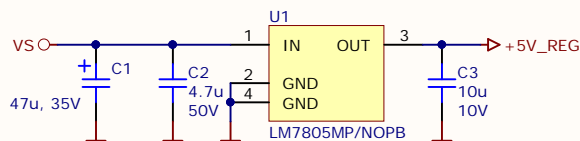
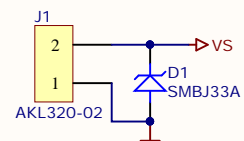
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2

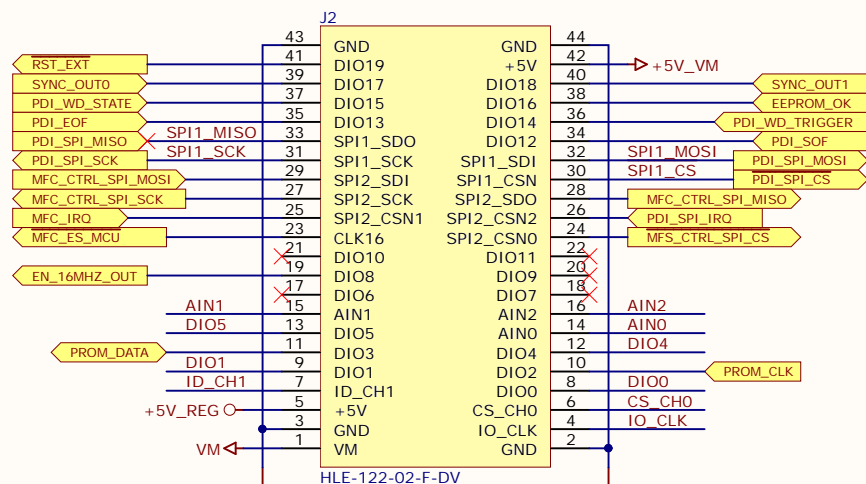
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4

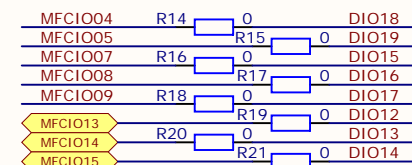
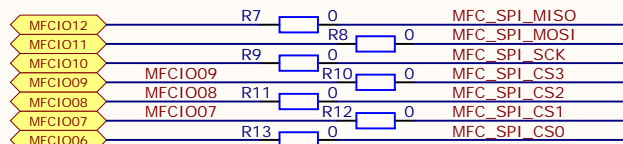
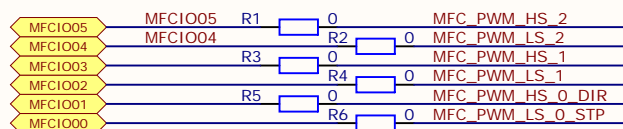
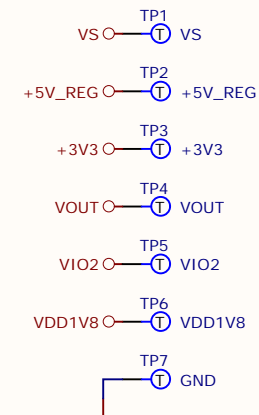
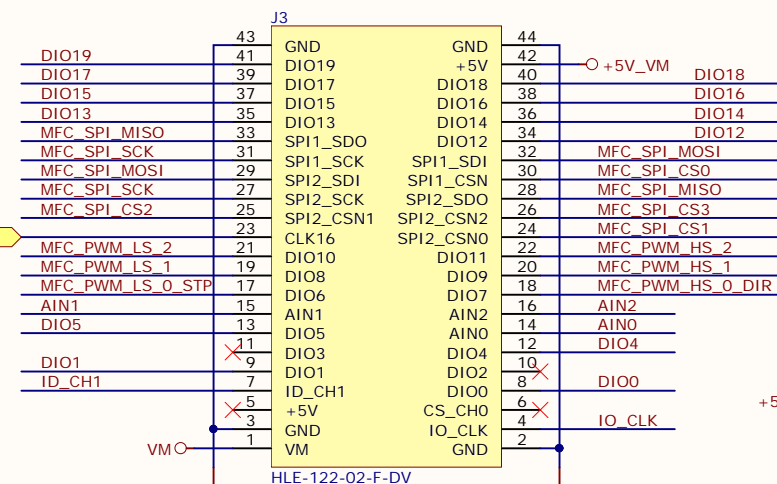
Ident EEPROM



Left Connector (uC)



Right Connector (DRV)



Drafted by: Peep Narusberg
Checked by: ---
Approved by: Stephan Kubisch

Title TMC8462A-EVAL Main Connectors

Size: A4 Revision: V1.0 [No Variations]
Date: 31.07.2019 Time: 16:08:21 Sheet 1 of 6
File: TMC8462A-EVAL-V1.0 Main.SchDoc



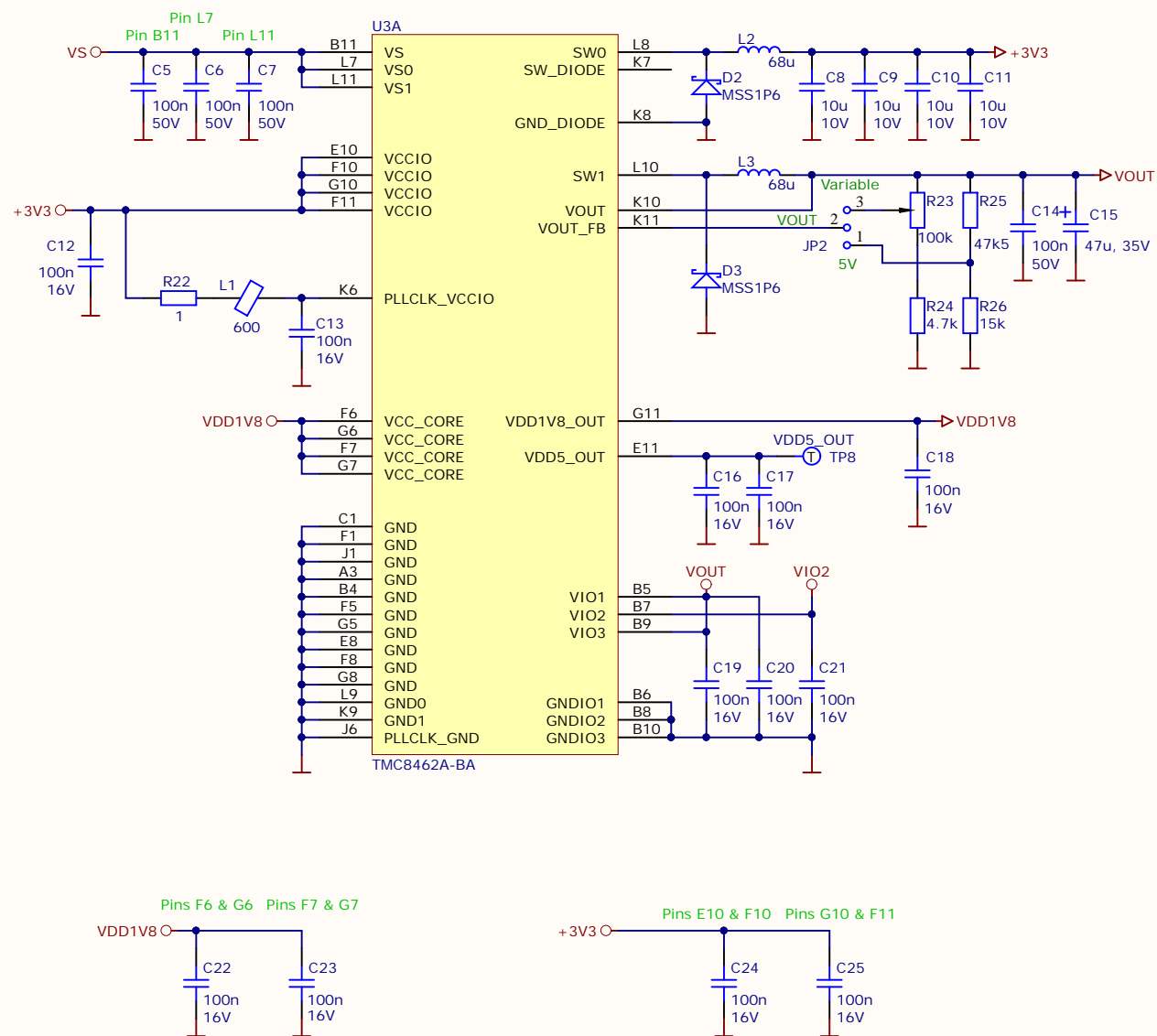
Waterloohain 5
22769 Hamburg
Germany
tmc_info@trinamic.com

1

2

3

4



Drafted by: Peep Narusberg
 Checked by: ---
 Approved by: Stephan Kubisch

Title **TMC8462A-EVAL Power Supply**

Size: **A4** Revision: **V1.0** [No Variations]

Date: 31.07.2019 Time: 16:08:22 Sheet 2 of 6

File: TMC8462A-EVAL-V1.0 Power_SchDoc



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 Germany
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1

2

3

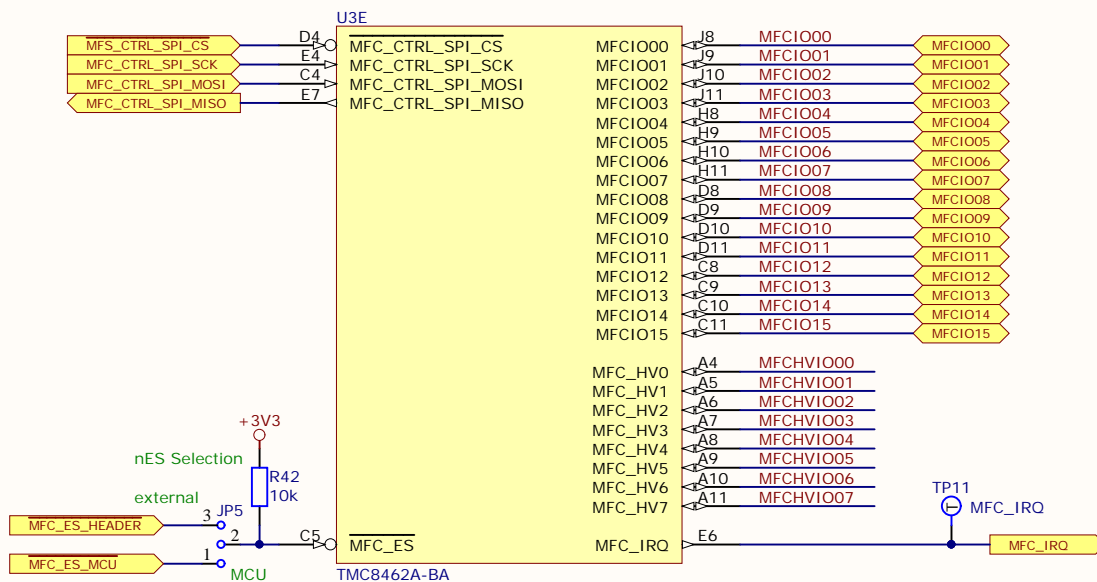
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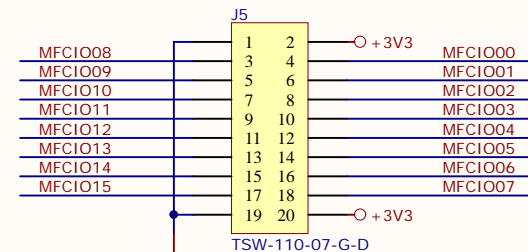
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C

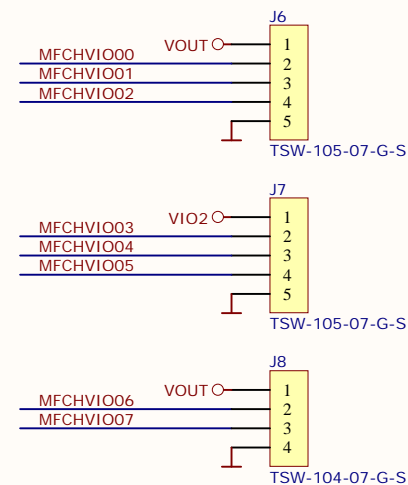
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MFCIO LV



MFCIO HV

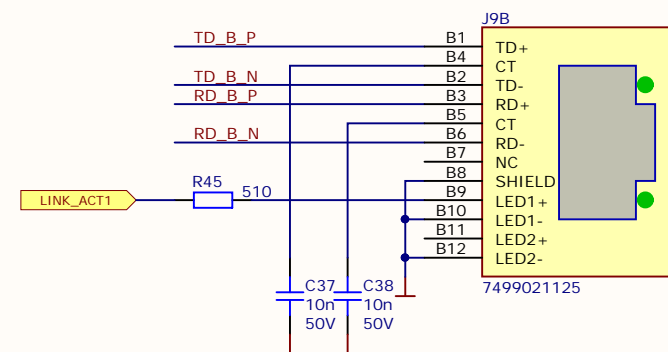
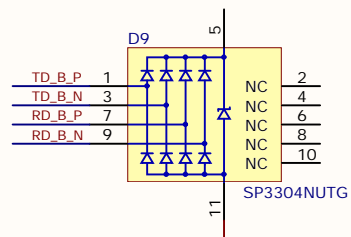
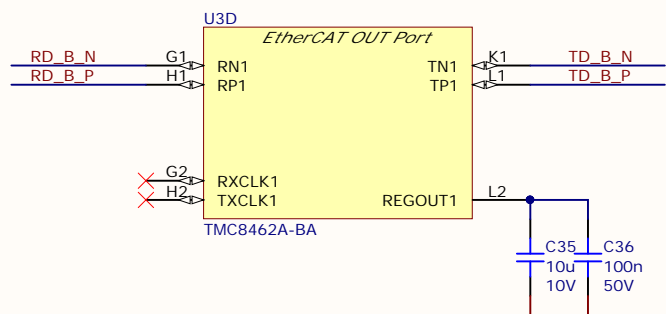
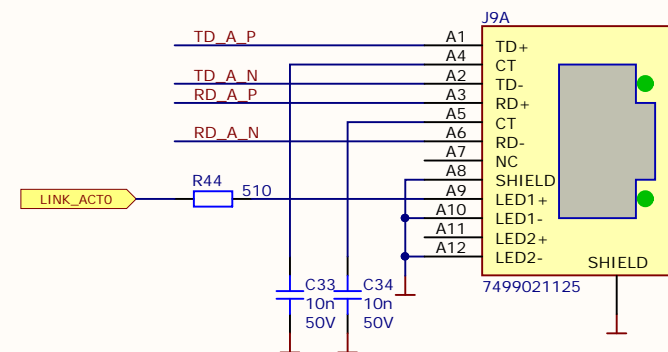
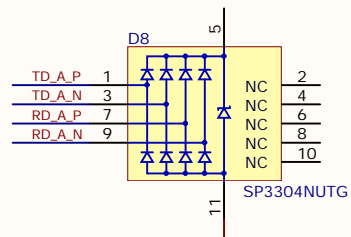
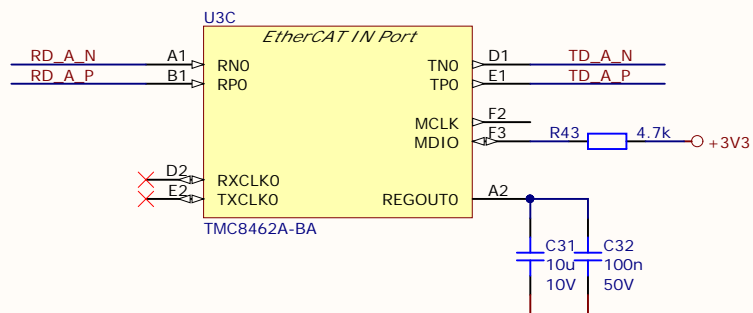


Drafted by: Peep Narusberg
Checked by: ---
Approved by: Stephan Kubisch

Title TMC8462A-EVAL MFC		
Size: A4	Revision: V1.0	[No Variations]
Date: 31.07.2019	Time: 16:08:22	Sheet 4 of 6
File: TMC8462A-EVAL-V1.0 MFC.SchDoc		



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22769 Hamburg
Germany
tmc_info@trinamic.com




Drafted by: Peep Narusberg
Checked by: ---
Approved by: Stephan Kubisch

Title **TMC8462A-EVAL PHY Ports**

Size: **A4** Revision: **V1.0** [No Variations]
Date: **31.07.2019** Time: **16:08:22** Sheet **5** of **6**
File: **TMC8462A-EVAL-V1.0 PHY.SchDoc**



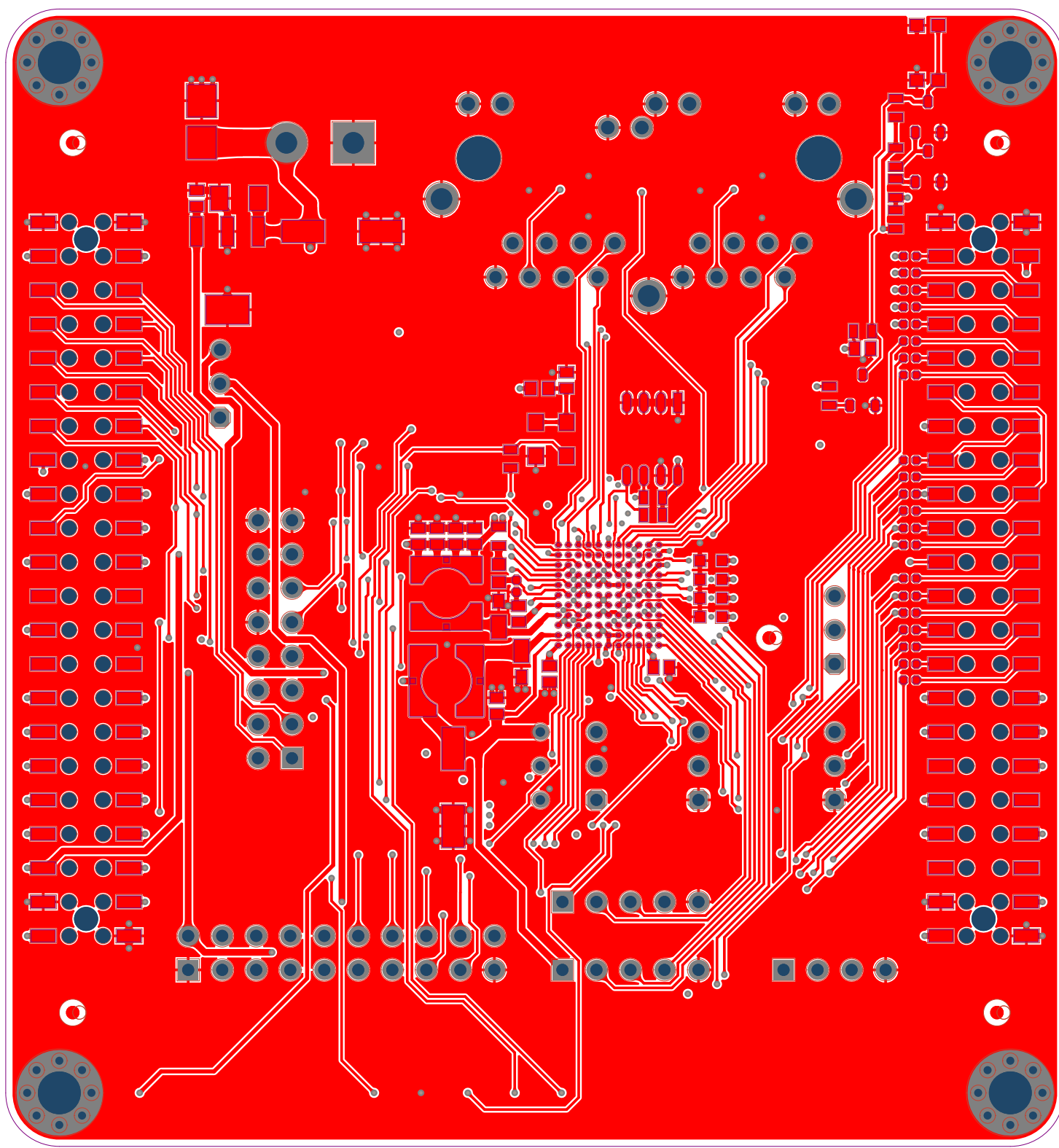
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22769 Hamburg
Germany
tmc_info@trinamic.com

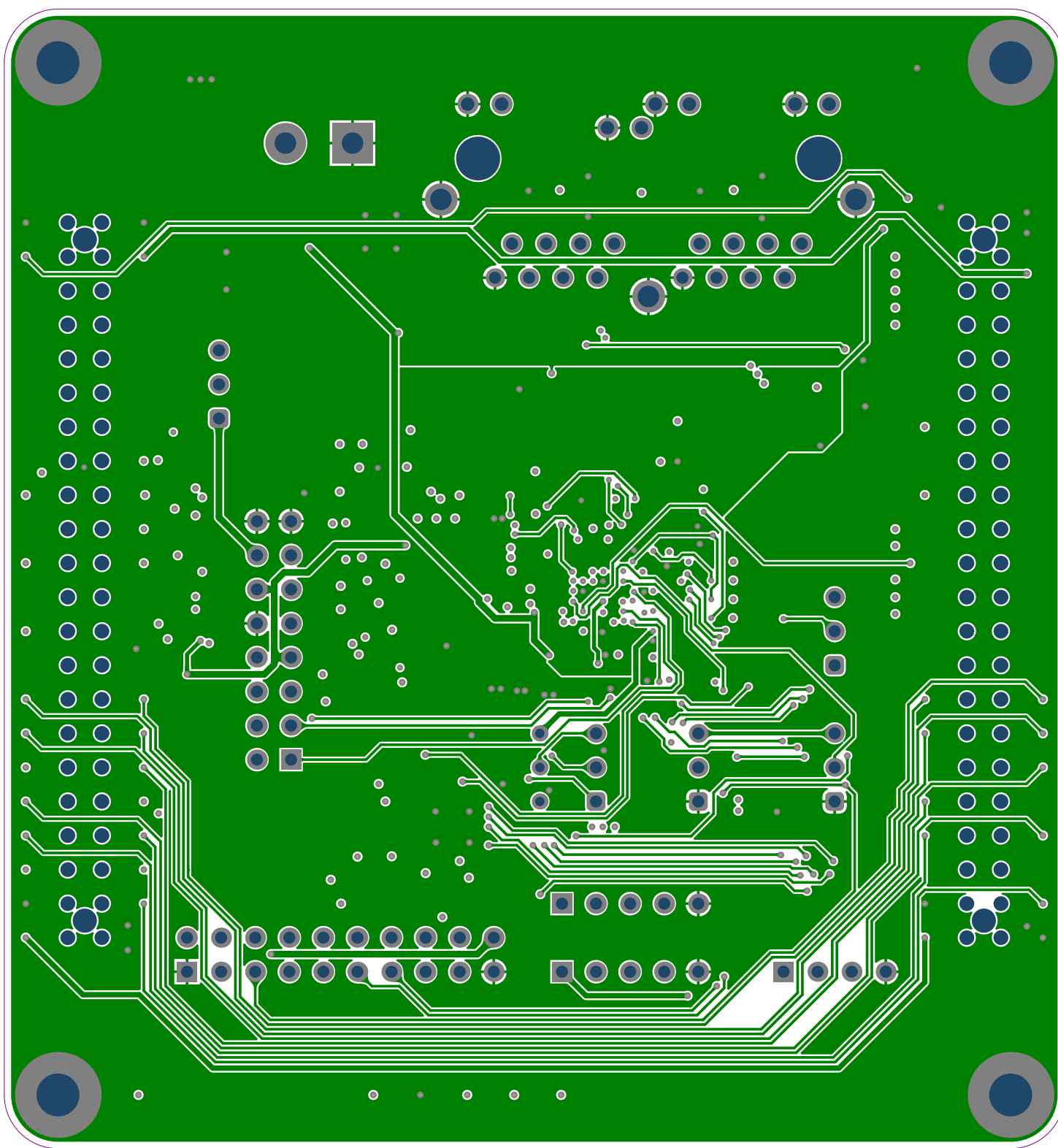
1	2	3	4												
A	<div><div>TMC8462-EVAL V3.1 -> TMC8462A-EVAL V1.0</div><div>1. Created project from old version, changed name</div><div>2. Replaced part U3 with TMC8462A-BA</div><div>3. Removed R28 and R29</div><div>4. Connected TSTCLK_SELECT to GND</div><div>5. Replaced quartz Y1 with 25 MHz version</div><div>6. Trim routes</div></div> <div><div>TMC8462-EVAL V3.0 -> TMC8462-EVAL V3.1</div><div>1. Changed SPI1_SDI to SPI1_MOSI and SPI1_SDO to SPI1_MISO</div><div>2. Flipped EEPROM SPI data lines</div></div> <div><div>TMC8462 V2.0 -> TMC8462-EVAL V3.0</div><div>1. Corrected RJ-45 connectors pinout</div><div>2. Added protective TVSs to Ethernet signals</div><div>3. Changed JP2 pinout</div></div>														
	B	<div><div>TMC8462 V0.9pre2 -> TMC8462-EVAL V2.0</div><div>1. Changed oscillator Y1 to 100MHz in 3.2 x 2.5mm case</div><div>2. Renamed the pin REF_CLK25_IN to REF_CLK100_IN in symbol</div><div>3. Connected TSTCLK_SELECT pin over pullu-up to +3V3, over DNP resistor to GND</div><div>4. Deleted inversion from signal RESET_OUT</div><div>5. Renamed the signal NRST to NRESET</div><div>6. Added reset signal RST_IN to pin 6 of J4</div><div>7. Added inverting stage with BC848A to connect RST_IN to NRESET</div><div>8. Renamed the following pins of the TMC8462:</div><div><div>o FXSD0 -> TXERO</div><div>o FXSD1 -> TXER1</div><div>o FIB_MOD0 ->RXDV0</div><div>o FIB_MOD1 ->RXDV1</div></div><div>9. Moved those signals to TMC8462 symbol part B</div><div>10. Corrected sheet numbers</div><div>11. Added mounting hole symbols to sheet 1</div><div>12 Renumbered resistors</div></div>													
		C	<div><div>TMC8462-V0.9pre1 -> TMC8462 V0.9pre2</div><div>1. Replaced sheets 1-4 with sheets from TMC8461</div><div>2. Changed TMC8461 with TMC8462</div><div>3. Deleted resistors from Control sheet,</div><div>4. Renumbered components</div><div>5. Swap for SPI signals on J2 pins 28 & 29</div></div> <div><div>TMC8462 V0.9pre1</div><div>1. Made from TMC8462-V0.9pre6</div></div>												
D	<div><div>Drafted by: Peep Narusberg</div><div>Checked by: ---</div><div>Approved by: Stephan Kubisch</div></div> <div><table><tr><td colspan="3">Title TMC8462A-EVAL log and approval</td></tr><tr><td>Size: A4</td><td>Revision: V1.0</td><td>[No Variations]</td></tr><tr><td>Date: 31.07.2019</td><td>Time: 16:08:22</td><td>Sheet 6 of 6</td></tr><tr><td colspan="3">File: TMC8462A-EVAL-V1.0 Log.SchDoc</td></tr></table><div><div><div>TRINAMIC <small>MOTION CONTROL</small></div><div>Waterloohain 5 22769 Hamburg Germany tmc_info@trinamic.com</div></div></div></div>			Title TMC8462A-EVAL log and approval			Size: A4	Revision: V1.0	[No Variations]	Date: 31.07.2019	Time: 16:08:22	Sheet 6 of 6	File: TMC8462A-EVAL-V1.0 Log.SchDoc		
Title TMC8462A-EVAL log and approval															
Size: A4	Revision: V1.0	[No Variations]													
Date: 31.07.2019	Time: 16:08:22	Sheet 6 of 6													
File: TMC8462A-EVAL-V1.0 Log.SchDoc															
1	2	3	4												

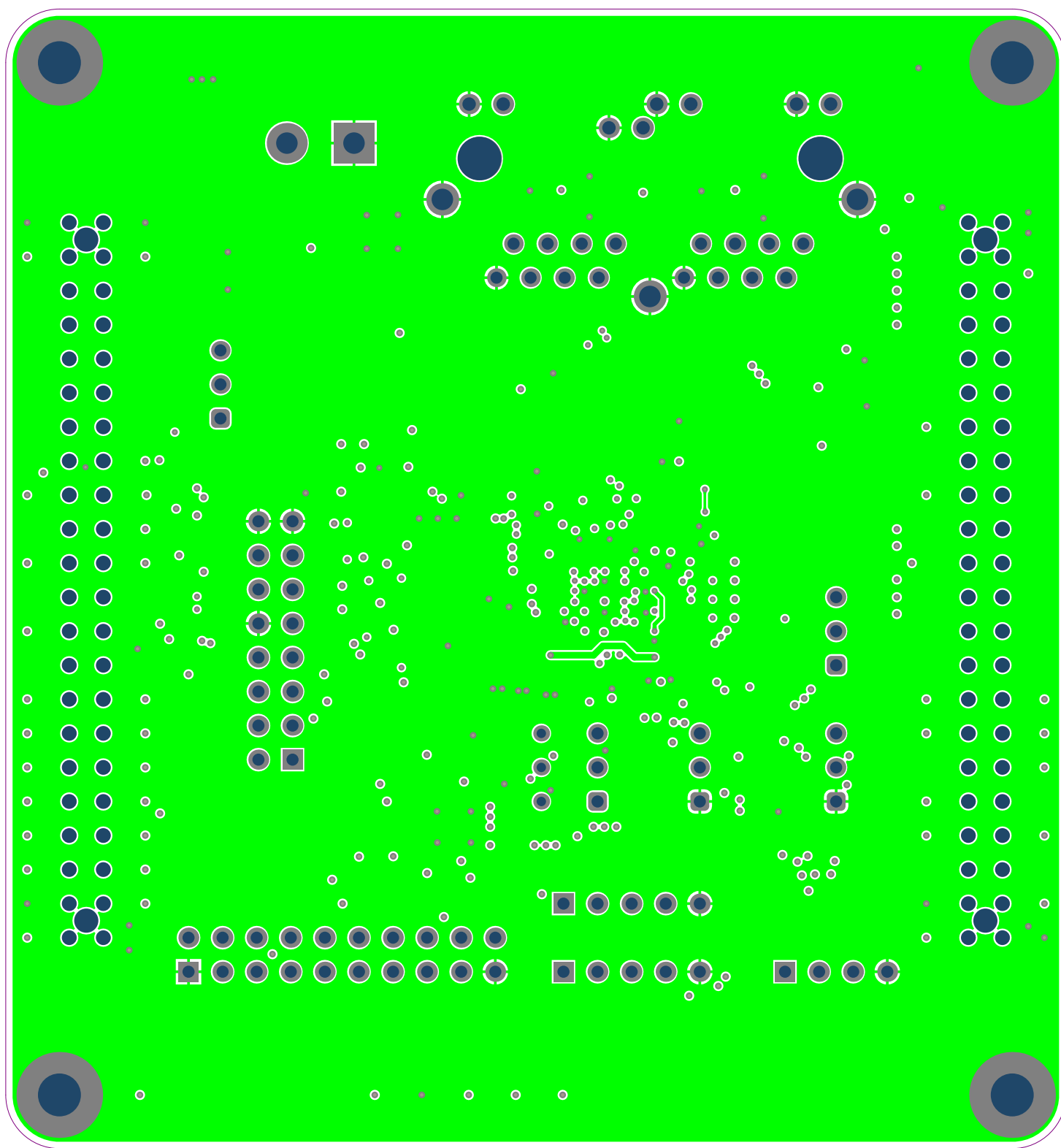
Designator	Quantity	Manufacturer	Part Number	Description	LibRef
C1, C15	2	Nichicon	UWT1V470MCL1GS	Polarized capacitor, pin1 pos	50571
C2	1	Any	4.7u, 50V, X5R, 1206 (3216 metric) chip capacitor	Ceramic chip capacitor	20078
C3, C8, C9, C10, C11, C31, C35	7	Any	10u, 10V, X5R, 0603 (1608 metric) chip capacitor	Ceramic chip capacitor	20111
C4, C5, C6, C7, C14, C28, C32, C36	8	Any	100n, 50V, X5R, 0603 (1608 metric) chip capacitor	Ceramic chip capacitor	20027
C12, C13, C16, C17, C18, C19, C20, C21, C22, C29, C33, C34, C37, C38	13	Any	100n, 16V, X5R, 0402 (1005 metric) chip capacitor	Ceramic chip capacitor	20000
	5	Any	10n, 50V, X5R, 0603 (1608 metric) chip capacitor	Ceramic chip capacitor	20038
D1	1	ST	SMBJ33A	TVS, Pin1 Cathode	50555
D2, D3	2	Vishay	MSS1P6	Schottky Diode, pin1 cathode	50568
D4, D6, D7	3	Kingbright	KPT-1608SGC	LED, pin 1 cathode	50005
D5	1	Kingbright	KPT-1608EC	LED, pin 1 cathode	50002
D8, D9	2	Littelfuse	SP3304NUTG	TVS Diode Array	50693
J1	1	Metz Connect	AKL320-02	1X2 pin connector	50537
J2, J3	2	Samtec	HLE-122-02-F-DV	Trinamic 44-pin connector	50289
J4	1	Samtec	TSW-108-07-G-D	2x8 pin connector	50576
J5	1	Samtec	TSW-110-07-G-D	2x10 pin connector	50583
J6, J7	2	Samtec	TSW-105-07-G-S	1X5 pin connector	50584
J8	1	Samtec	TSW-104-07-G-S	1X4 pin connector	50585
J9	1	Wuerth	7499021125	Dual LAN-Transformer WE-RJ45LAN 10/100BaseT	50579
JP1, JP2, JP3, JP4, JP5	5	Samtec	TSW-103-07-G-S	Jumper pin header	50570
L1, L4	2	Wuerth	742792651	Ferrite bead	60036
L2, L3	2	Wuerth	744042680	Molded inductor	60034
Q1, Q2, Q3	3	Diodes Inc	BC848A	NPN BJT in 3-pin package, 1B 2E 3C	50574
R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	21	Any	0, -, -, 0402 (1005 metric) chip resistor	Chip Resistor	10052
R22	1	Any	1, 1%, 100mW, 0603 (1608 metric) chip resistor	Chip Resistor	10031
R23	1	Vishay	T93YA104KT20	Trimmer potentiometer	50569
R24, R43	2	Any	4.7k, 1%, 100mW, 0603 (1608 metric) chip resistor	Chip Resistor	10032
R25	1	Any	47k5, 1%, 100mW, 0603 (1608 metric) chip resistor	Chip Resistor	10164
R26	1	Any	15k, 1%, 100mW, 0603 (1608 metric) chip resistor	Chip Resistor	10050
R27	1	Any	33, 1%, 100mW, 0603 (1608 metric) chip resistor	Chip Resistor	10170
R30, R31, R32, R33, R35, R42	6	Any	10k, 1%, 100mW, 0603 (1608 metric) chip resistor	Chip Resistor	10028
R34	1	Any	22, 1%, 100mW, 0603 (1608 metric) chip resistor	Chip Resistor	10034
R36, R37, R38, R39	4	Any	1k, 1%, 100mW, 0603 (1608 metric) chip resistor	Chip Resistor	10049
R40, R41	2	Any	2k, 1%, 100mW, 0603 (1608 metric) chip resistor	Chip Resistor	10165
R44, R45	2	Any	510, 1%, 100mW, 0603 (1608 metric) chip resistor	Chip Resistor	10166
S1	1	C&K	KMR241NG	Switch, 4 pin	50573
U1	1	Texas Instrument	LM7805MP/NOPB	LDO in SOT223 package	50548
U2	1	Atmel	AT25128B-SSHL	SPI Serial Flash Memory	50499
U3	1	Trinamic	TMC8462A-BA	Integrated EtherCAT Slave Controller	50844
U4	1	Microchip	24LC64-/SN	I2C serial EEPROM in 8 pin case	50577
Y1	1	Abracon	ASFLMB-25.000MHZ-LR	Standard Clock Oscillators 3.3V 25ppm -40C +85C 15pF	51168

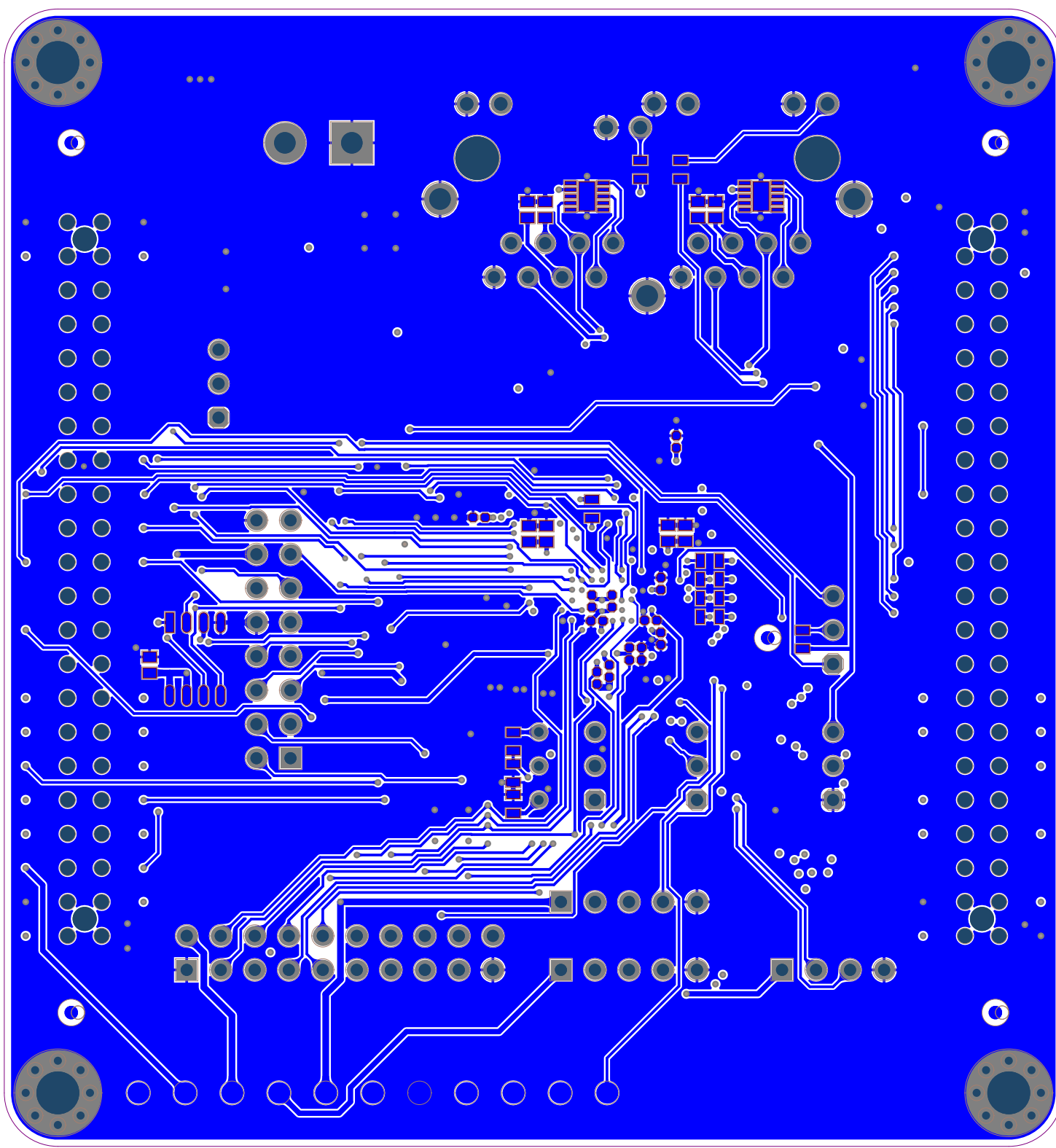
Board Stack Report

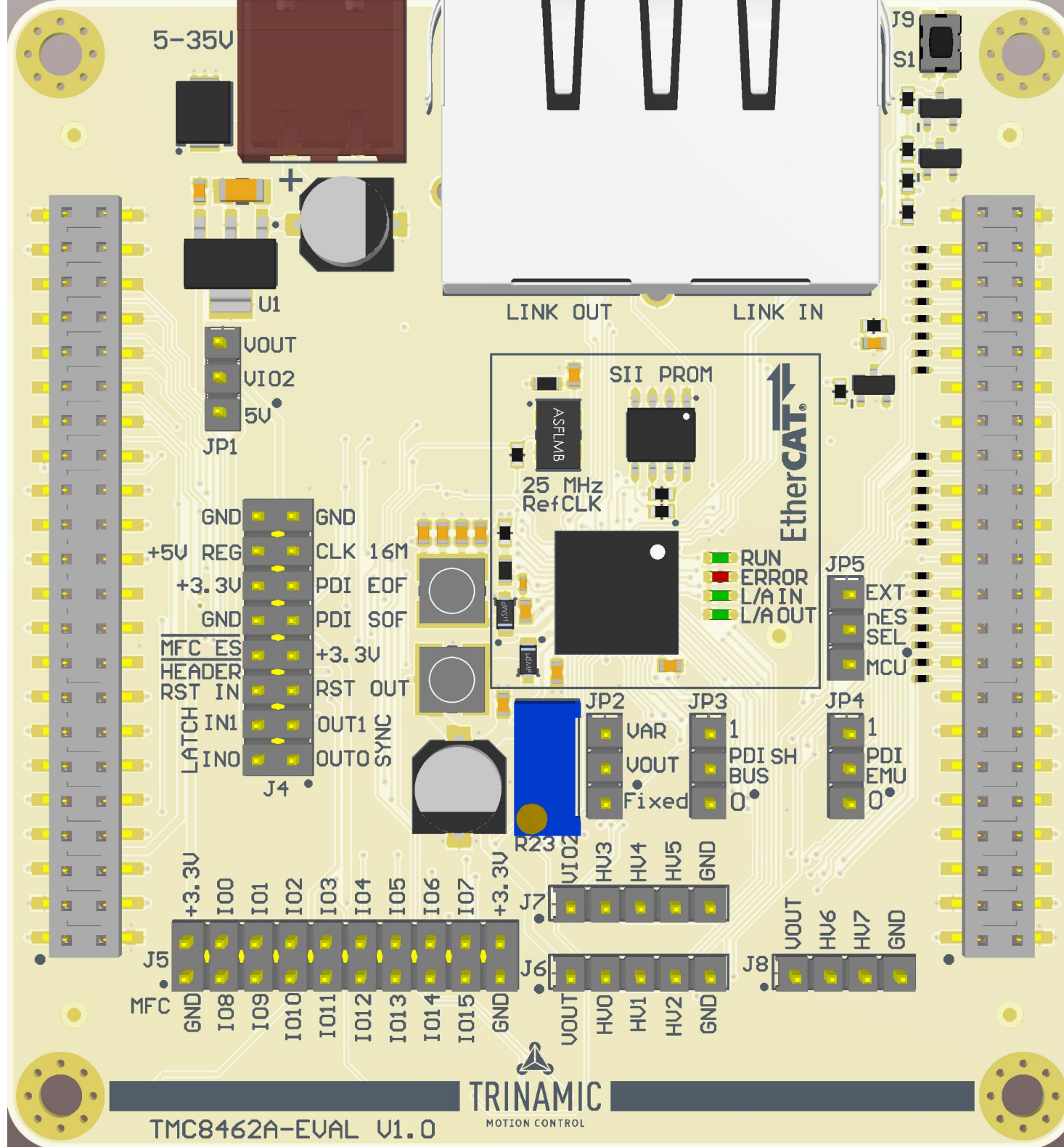
Stack Up		Layer Stack			
Layer	Board Layer Stack	Name	Material	Thickness	Constant
1		Top Paste			
2		Top Overlay			
3		Top Soldermask	Solder Resist	0.010mm	3.5
4		Top Layer	Copper	0.035mm	
5		Prepreg 7628-45		0.360mm	4.6
6		Mid1	Copper	0.036mm	
7		High Tg 1,08mm 35??m/35??m	FR-4	0.710mm	4.6
8		Mid2	Copper	0.036mm	
9		Prepreg 7628-45		0.360mm	4.6
10		Bottom Layer	Copper	0.035mm	
11		Bottom Soldermask	Solder Resist	0.010mm	3.5
12		Bottom Overlay			
13		Bottom Paste			
	Height : 1.592mm				













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MOTION CONTROL

TMC8462A-EVAL V1.0
TMC-Evaluation-Platform

Board Supply:
5V to 35V

Interfaces:

- * SPI Master / Slave
- * Incremental Encoder
- * 24 Multifunction I/Os

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open source
hardware

MFC_IRQ

CLK025

CLK25

VDD5
OUT

GND

VDD1V8

VI02

VOOUT

+3V3

+5V
REG

VS

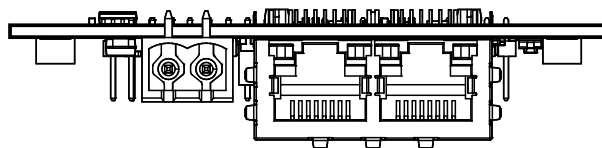
A

B

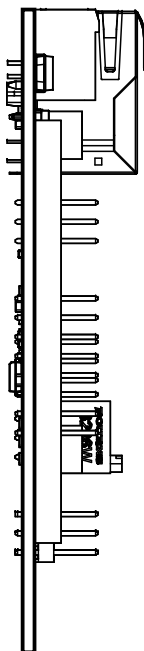
C

D

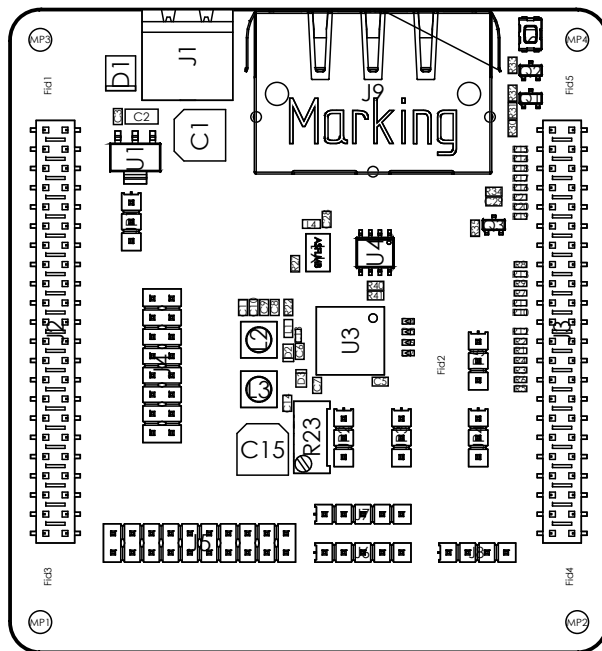
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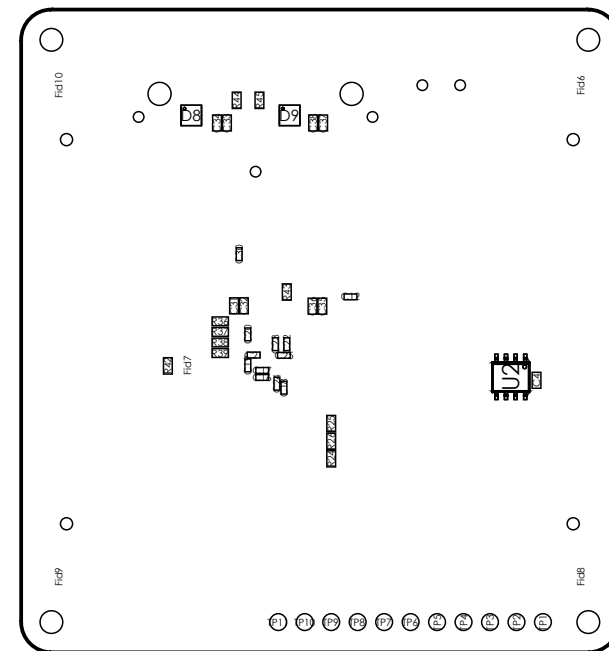
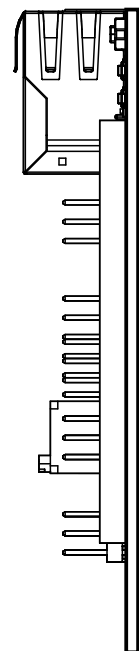
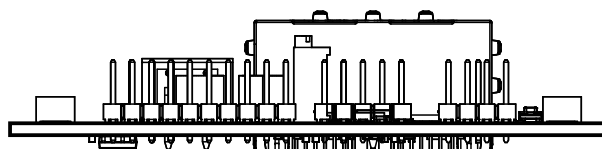
2



3



4




A

B

C

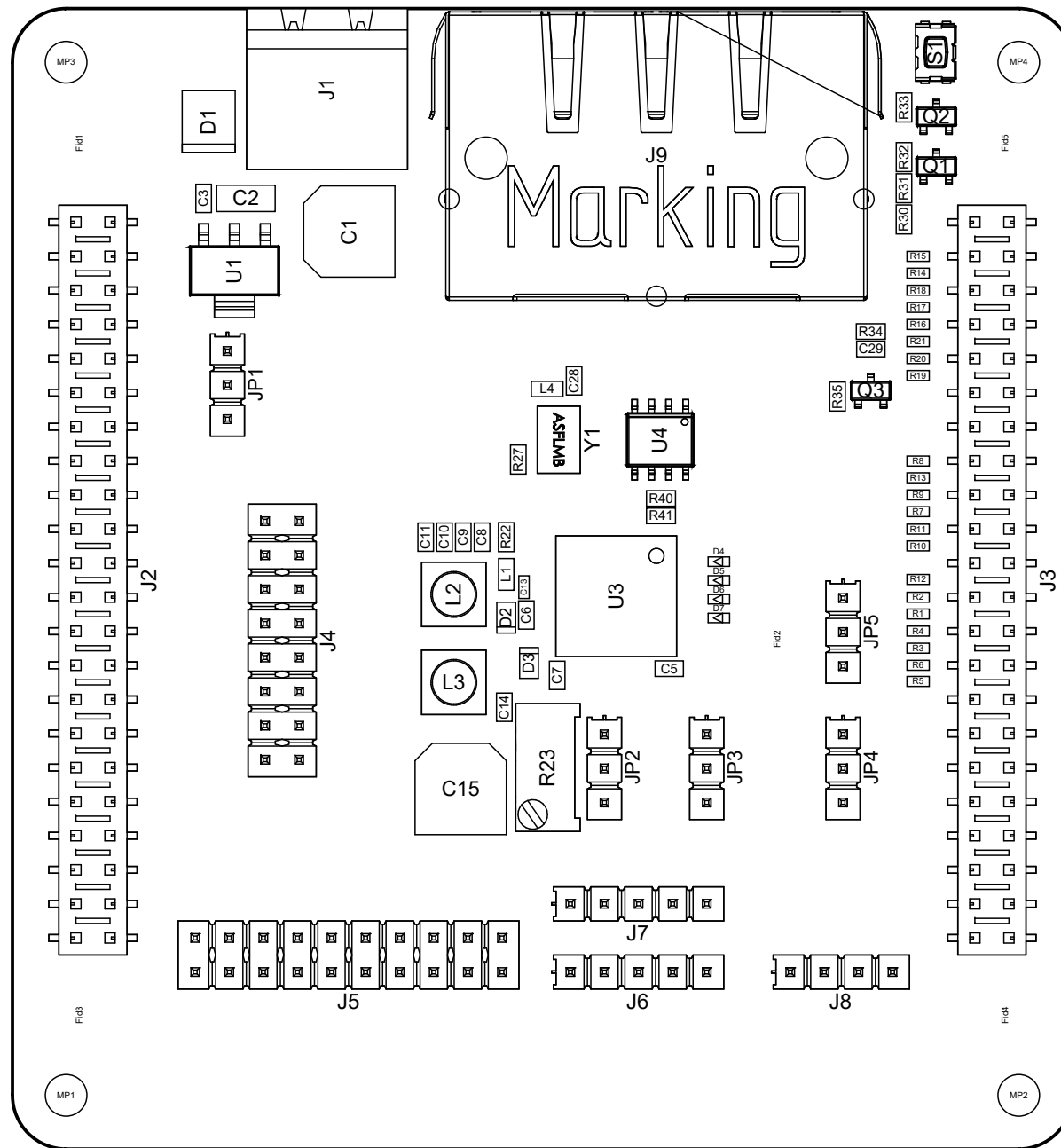
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Title			Assembly Drawing		
Size A4	Revision V1.0	Project	TMC8462A-EVAL		
Date	31.07.2019 16:08		File	TMC8462A-EVAL-V1.0-A.PCBDwf	
			Sheet 1 of 3		



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MOTION CONTROL

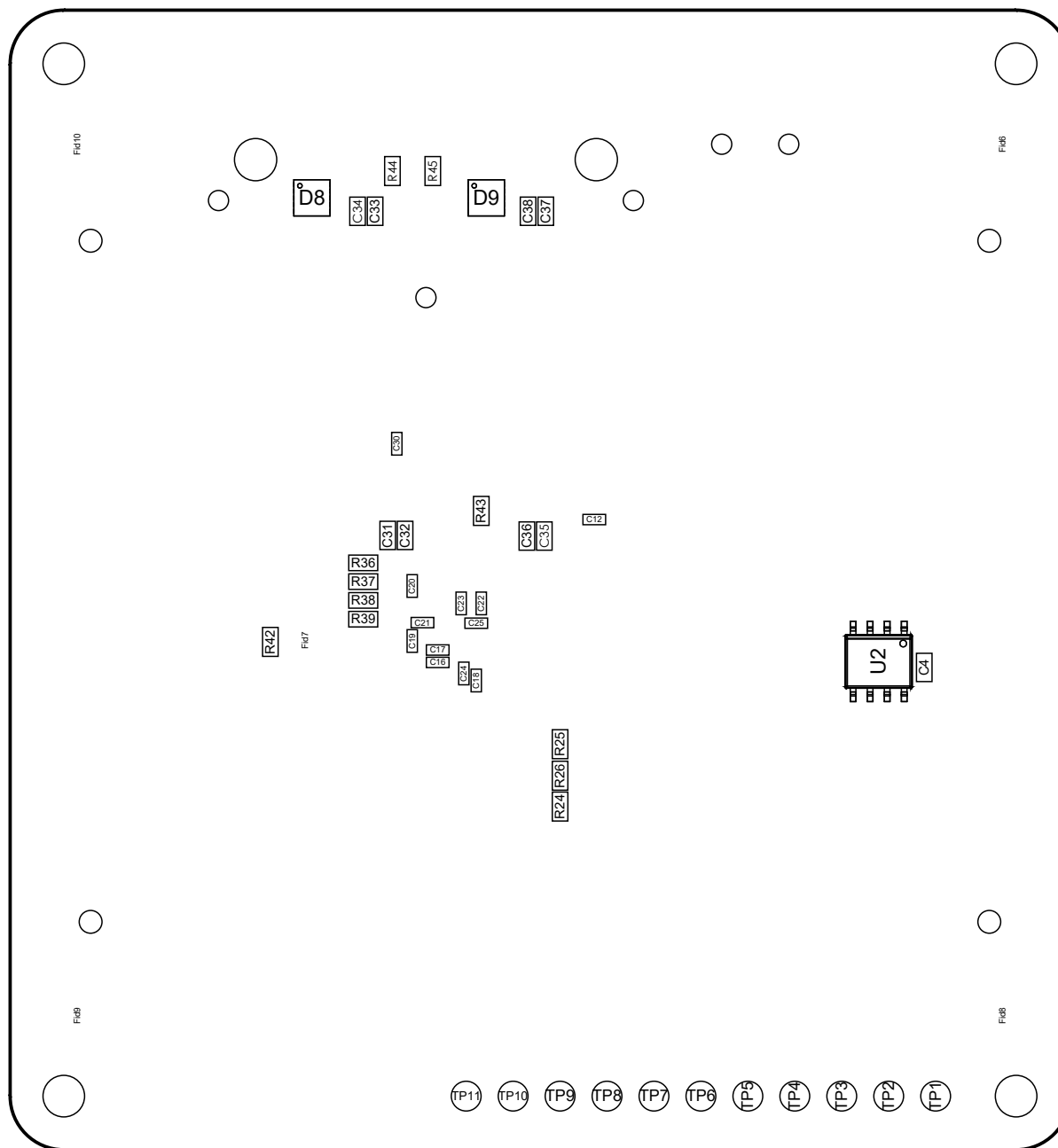
Waterloohain 5
22769 Hamburg
Germany
tmc_info@trinamic.com




Title			Assembly Drawing	
Size	Revision	Project	TMC8462A-EVAL	
A4	V1.0			
Date	31.07.2019	16:08	Sheet 2 of 3	
File	TMC8462A-EVAL-V1.0-A.PCBDwf			



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Title			Assembly Drawing	
Size A4	Revision V1.0	Project	TMC8462A-EVAL	
Date	31.07.2019 16:08		Sheet 3 of 3	
File	TMC8462A-EVAL-V1.0-A.PCBDwf			



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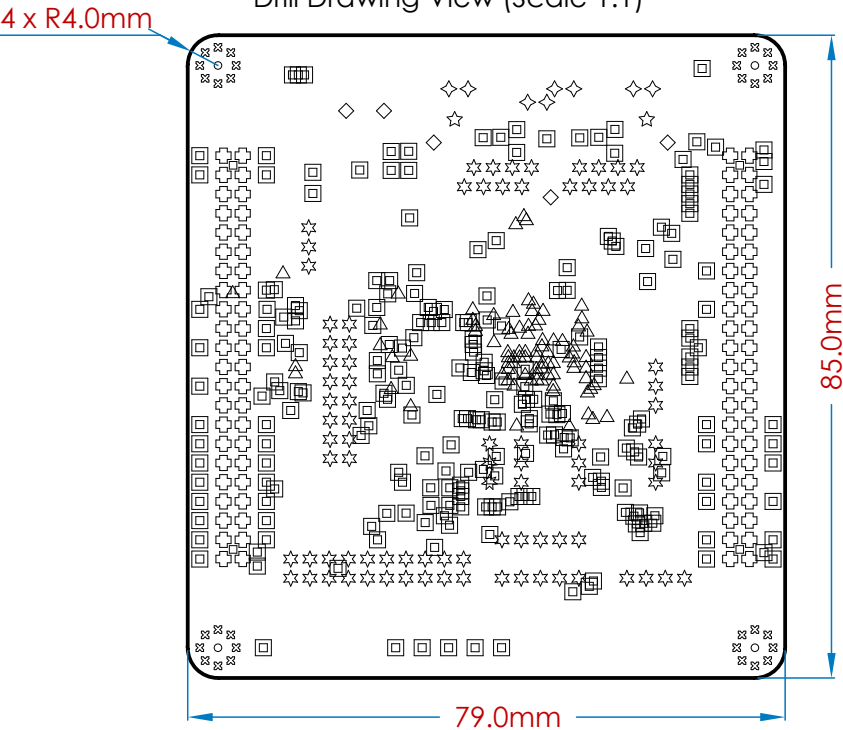
Layer Stack Legend

Material	Layer	Thickness	Gerber
	Top Overlay		GTO
Surface Material	Top Soldermask	0.010mm	GTS
Copper	Top Layer	0.035mm	GTL
Prepreg		0.360mm	
Copper	Mid1	0.036mm	G1
Core		0.710mm	
Copper	Mid2	0.036mm	G2
Prepreg		0.360mm	
Copper	Bottom Layer	0.035mm	GBL
Surface Material	Bottom Soldermask	0.010mm	GBS
	Bottom Overlay		GBO
Total thickness: 1.592mm			

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 apply after plating
8. All copper dimensions apply after plating

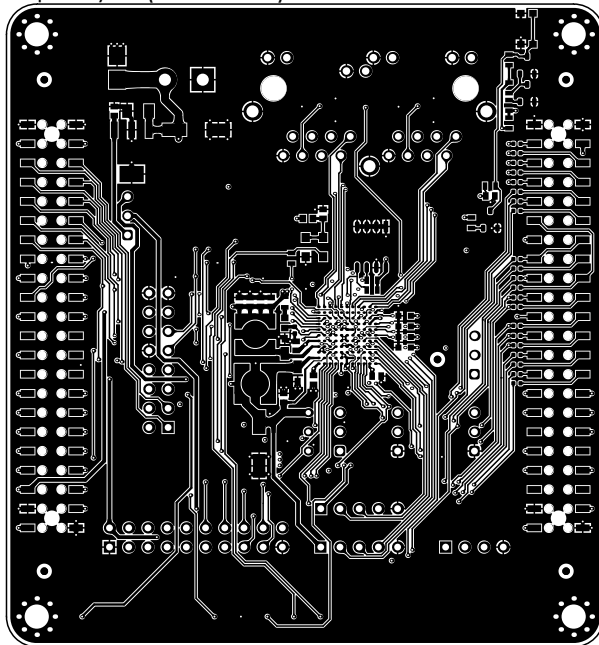
Drill Drawing View (Scale 1:1)



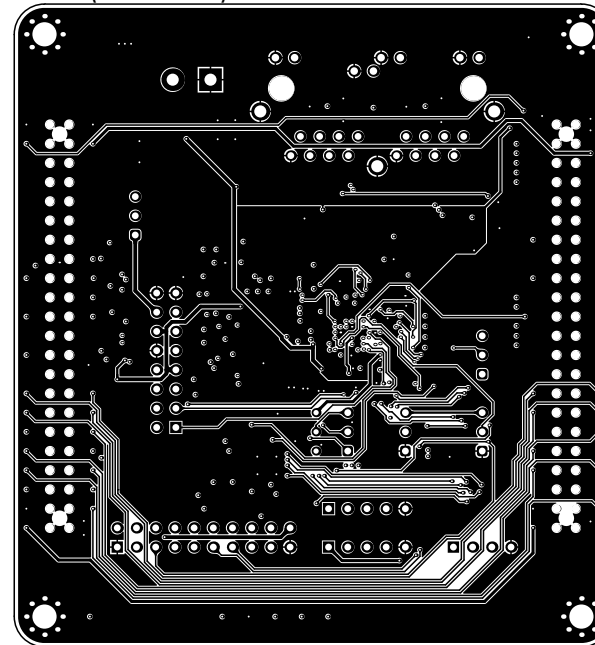
Drill Table

Symbol	Count	Hole Size	Plated	Via / Pad	Hole Tolerance
△	88	0.20	Plated	Via	None
□	245	0.25	Plated	Via	None
⊞	32	0.60	Plated	Pad	None
☆	3	0.70	Plated	Pad	None
☆	81	0.90	Plated	Pad	None
◇	8	1.00	Plated	Pad	None
⊞	88	1.10	Non-Plated	Pad	None
◇	5	1.60	Plated	Pad	None
□	4	1.80	Non-Plated	Pad	None
○	4	3.20	Plated	Pad	None
☆	2	3.25	Non-Plated	Pad	None
	560 Total				

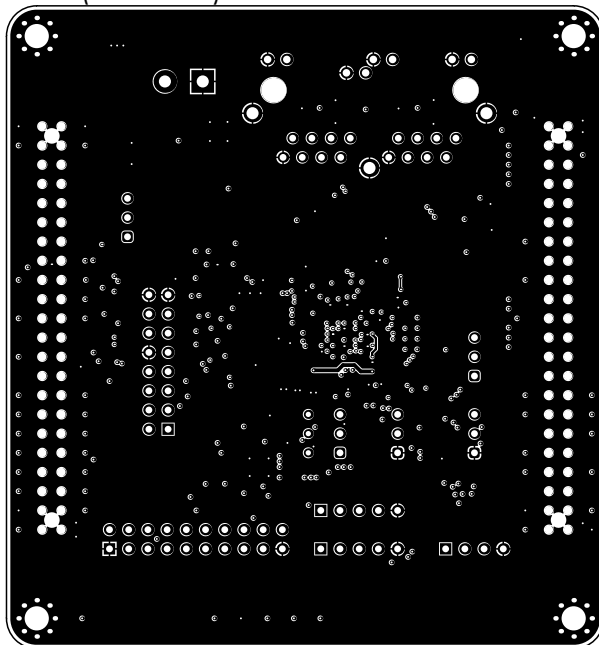
Top Layer (Scale 1:1)



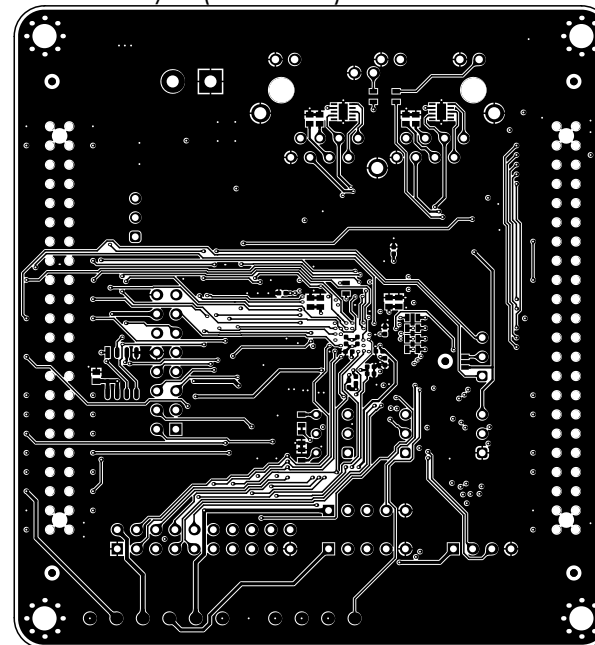
Mid1 (Scale 1:1)



Mid2 (Scale 1:1)



Bottom Layer (Scale 1:1)



Title		
Size	Revision	Project
A4	V1.0	TMC8462A-EVAL
Date	31.07.2019 16:08	Sheet 2 of 4
File	TMC8462A-EVAL-V1.0-F.PCBDwf	

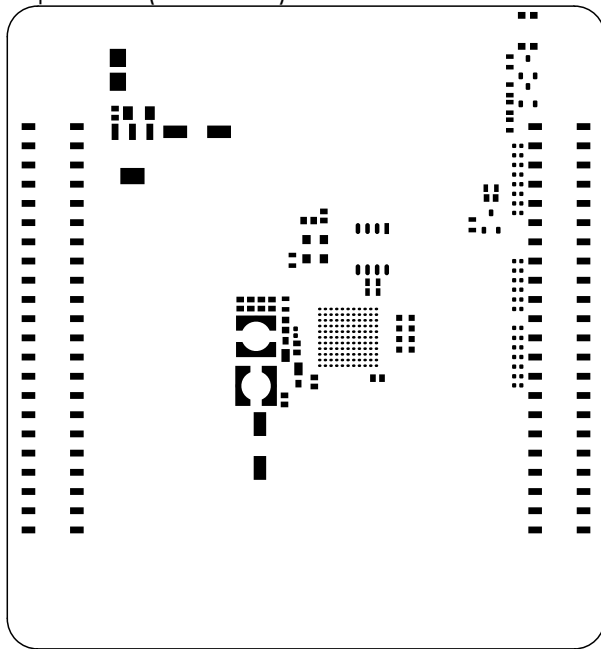
A

B

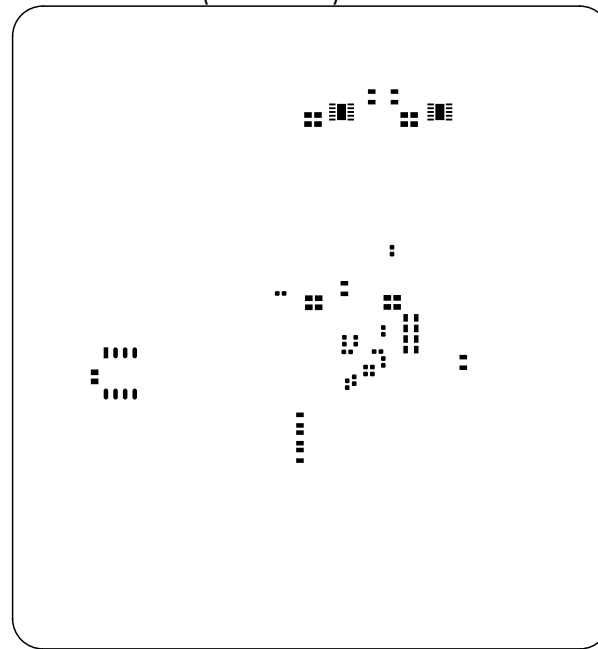
C

D


Top Paste (Scale 1:1)



Bottom Paste (Scale 1:1)



Title			Fabrication Drawing		
Size	Revision	Project			
A4	V1.0	TMC8462A-EVAL			
Date	31.07.2019 16:08		Sheet 4 of 4		
File	TMC8462A-EVAL-V1.0-F.PCBDwf				



Waterloohain 5
22769 Hamburg
Germany
tmc_info@trinamic.com

A

B

C

D