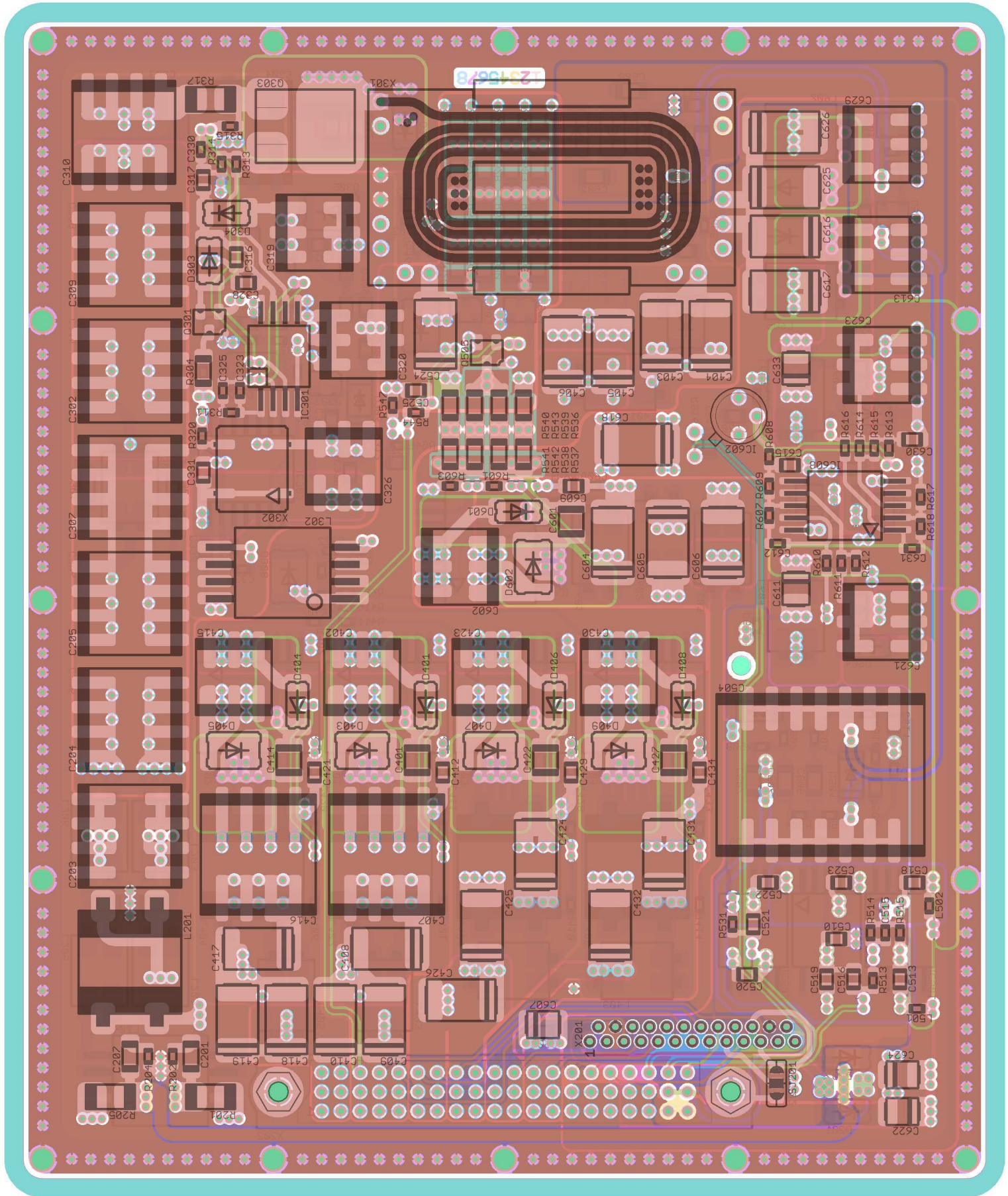
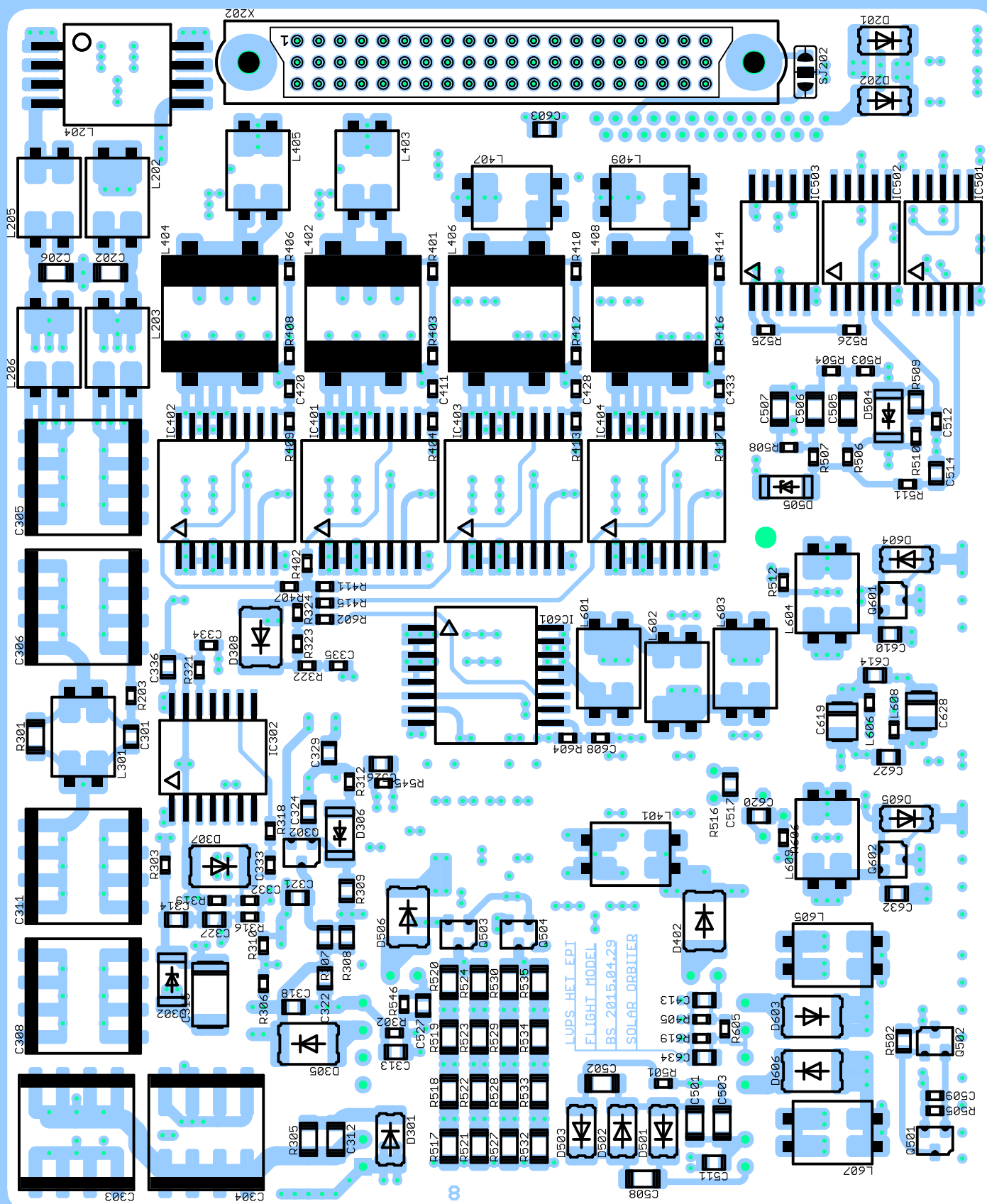
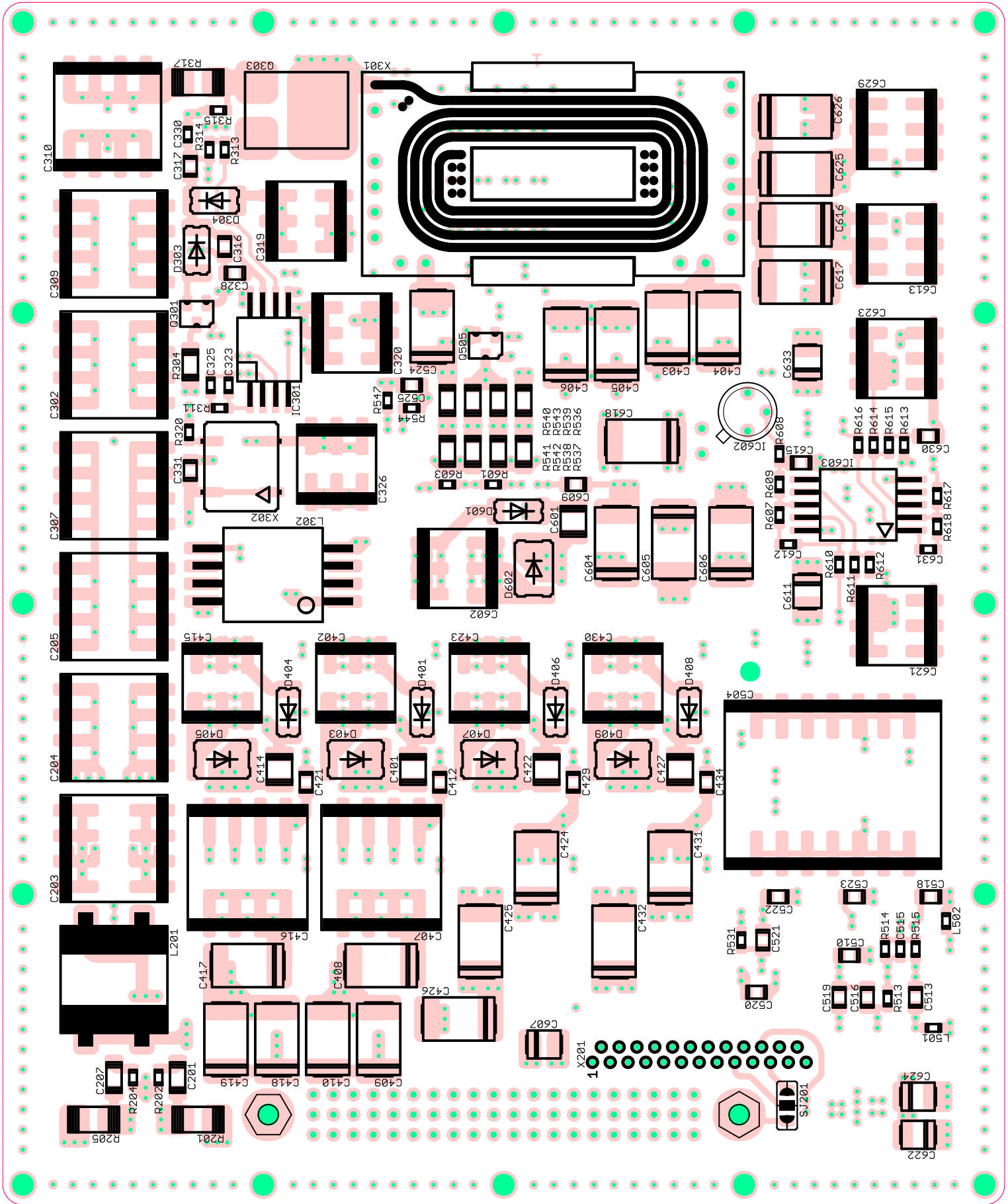
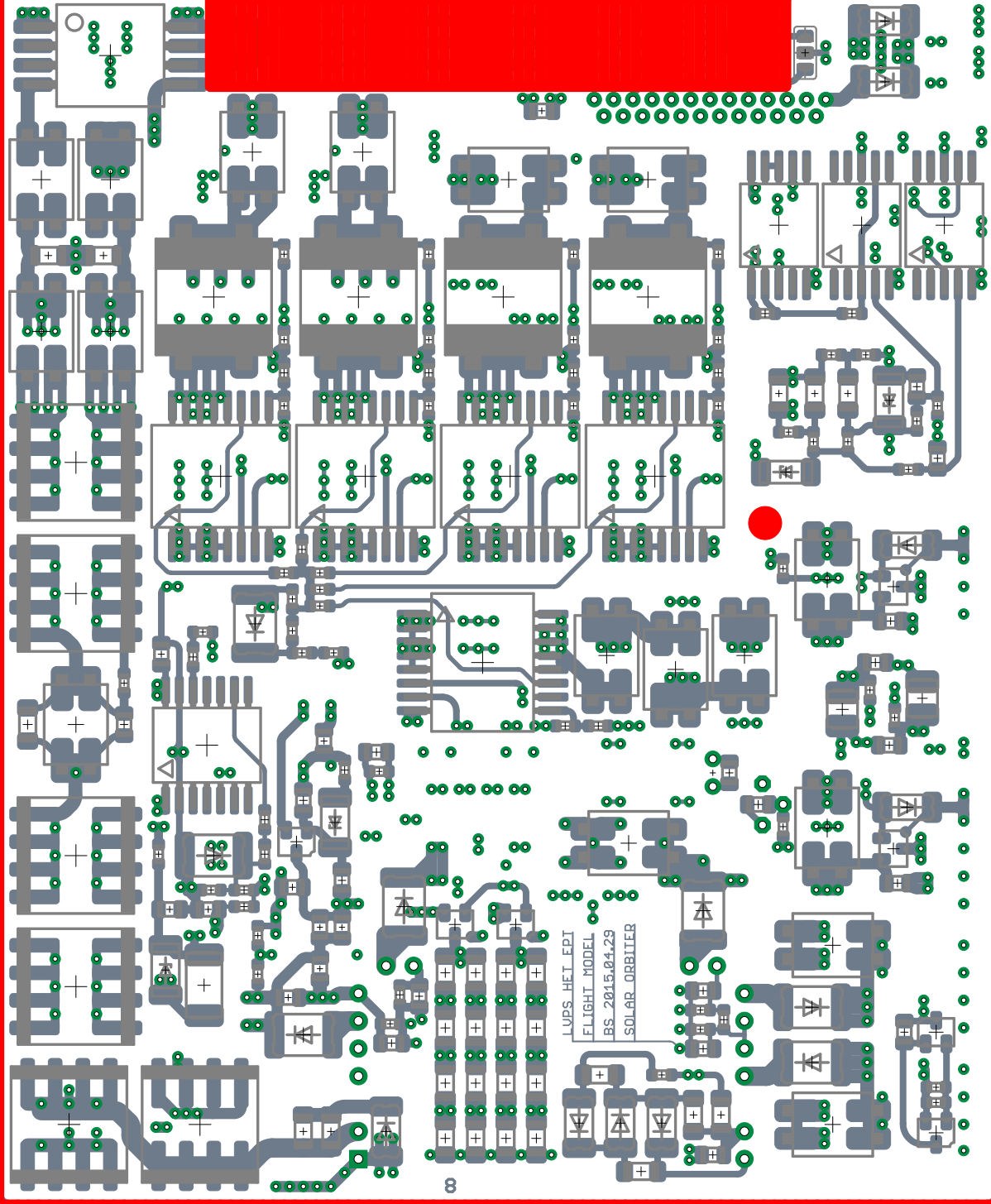


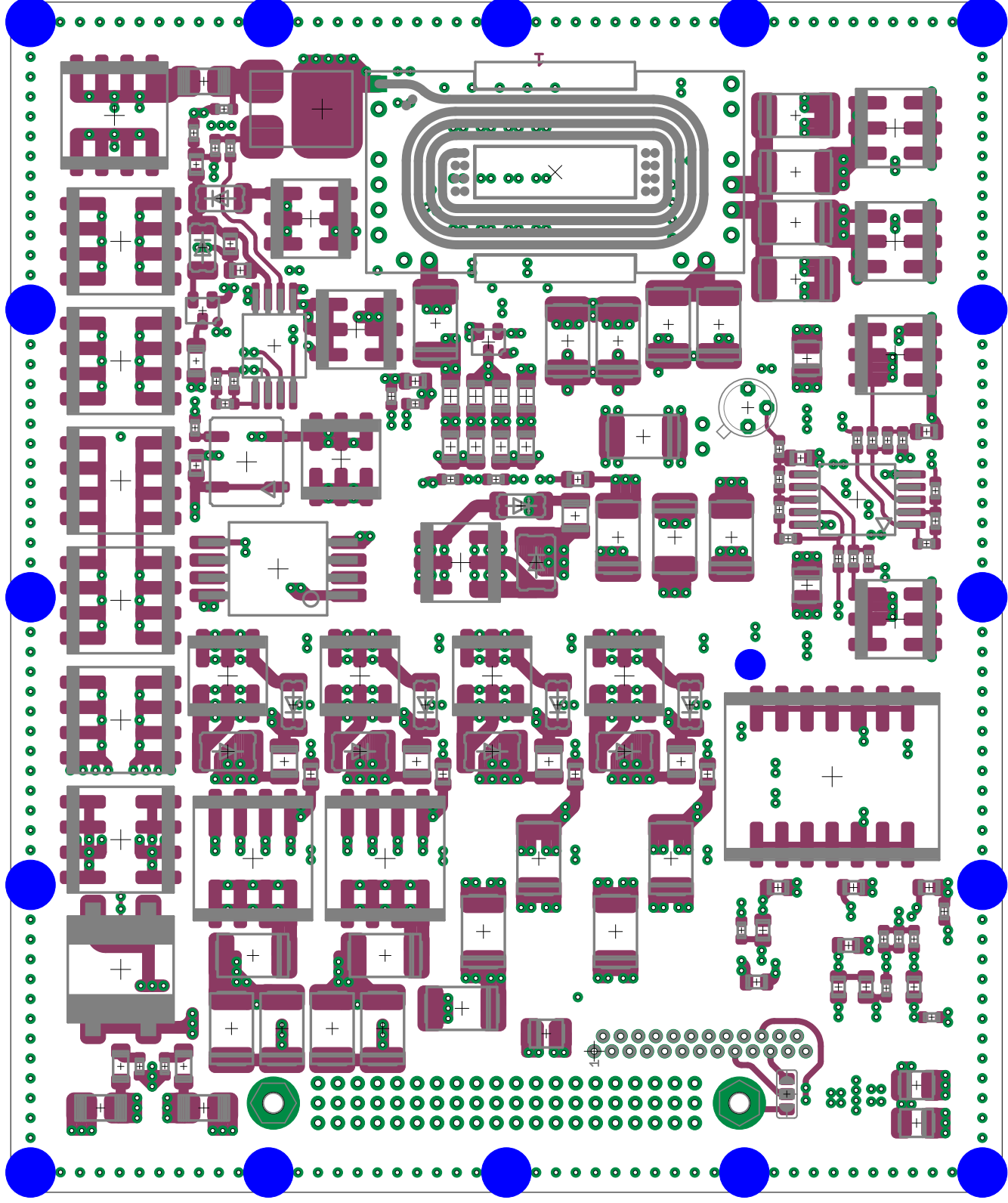






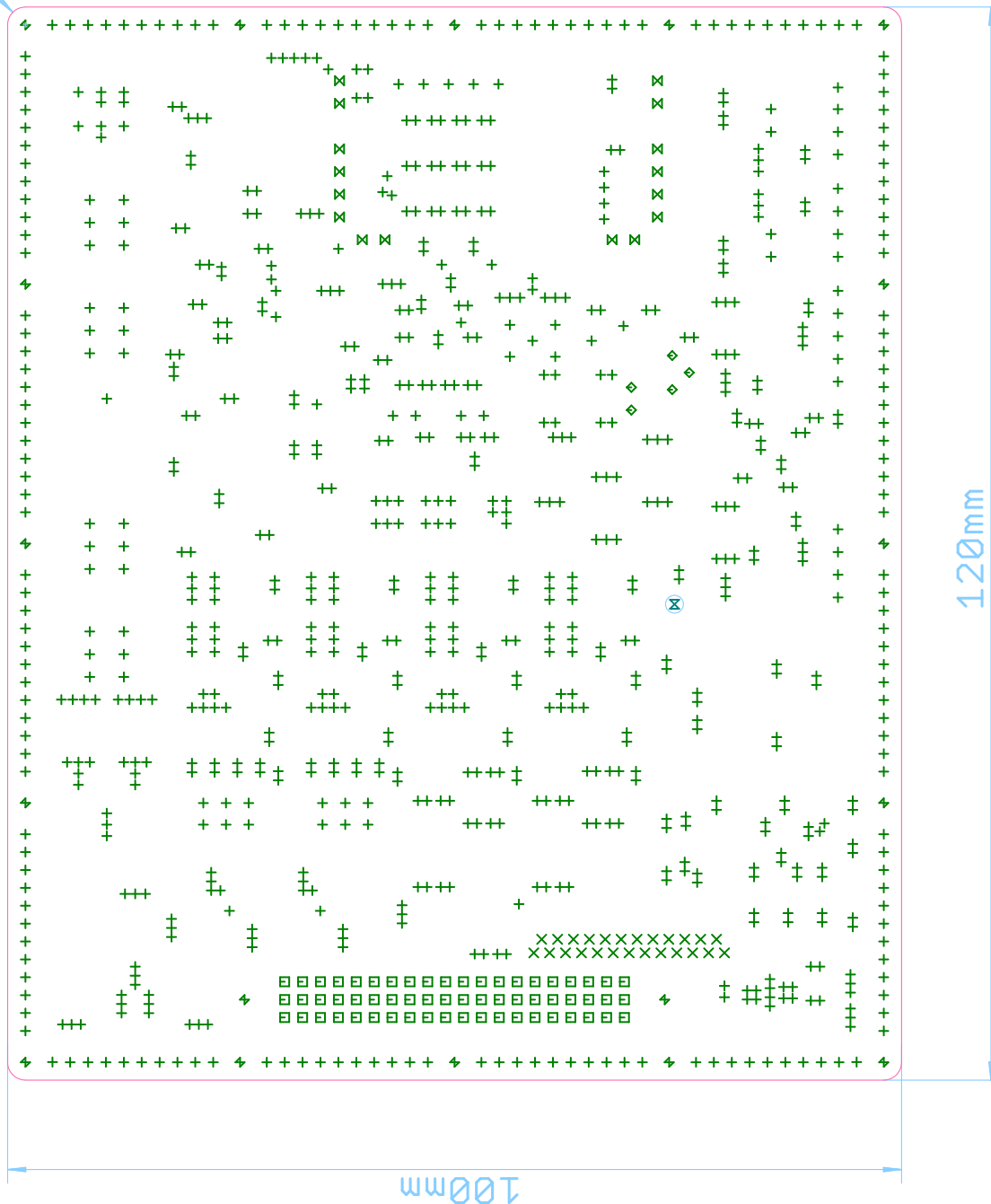


coating free area - bottom layer

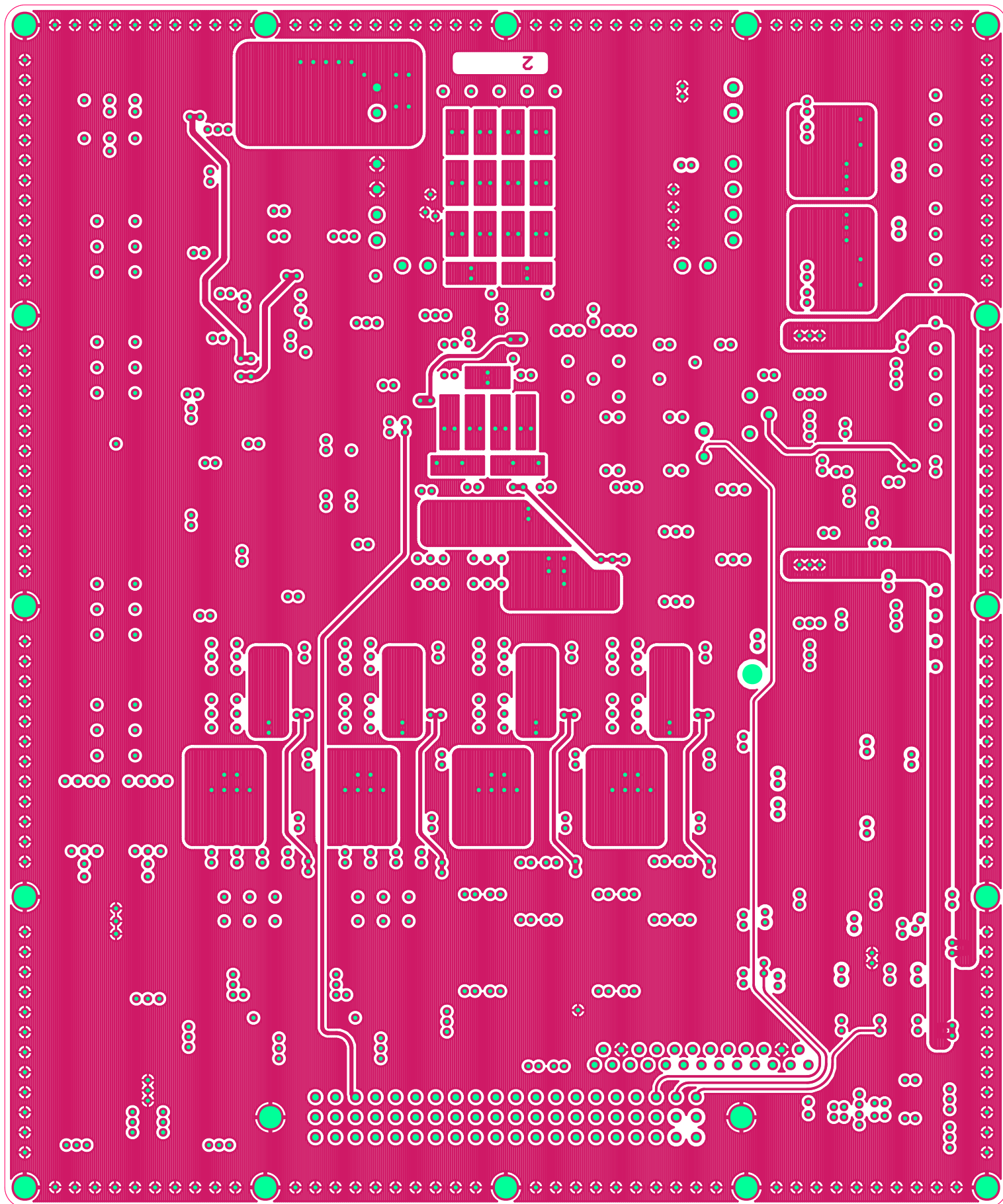


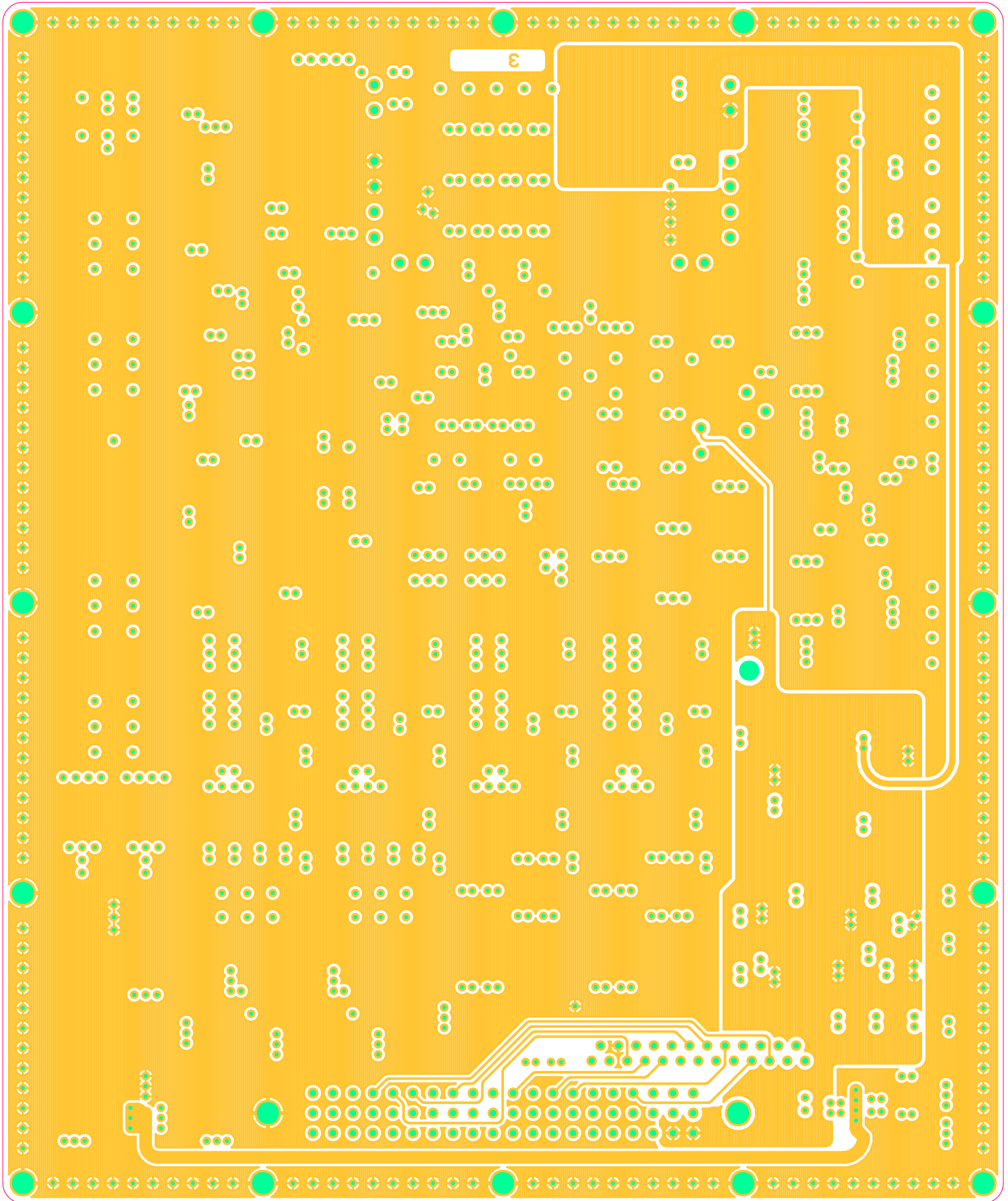
coating free area - top layer

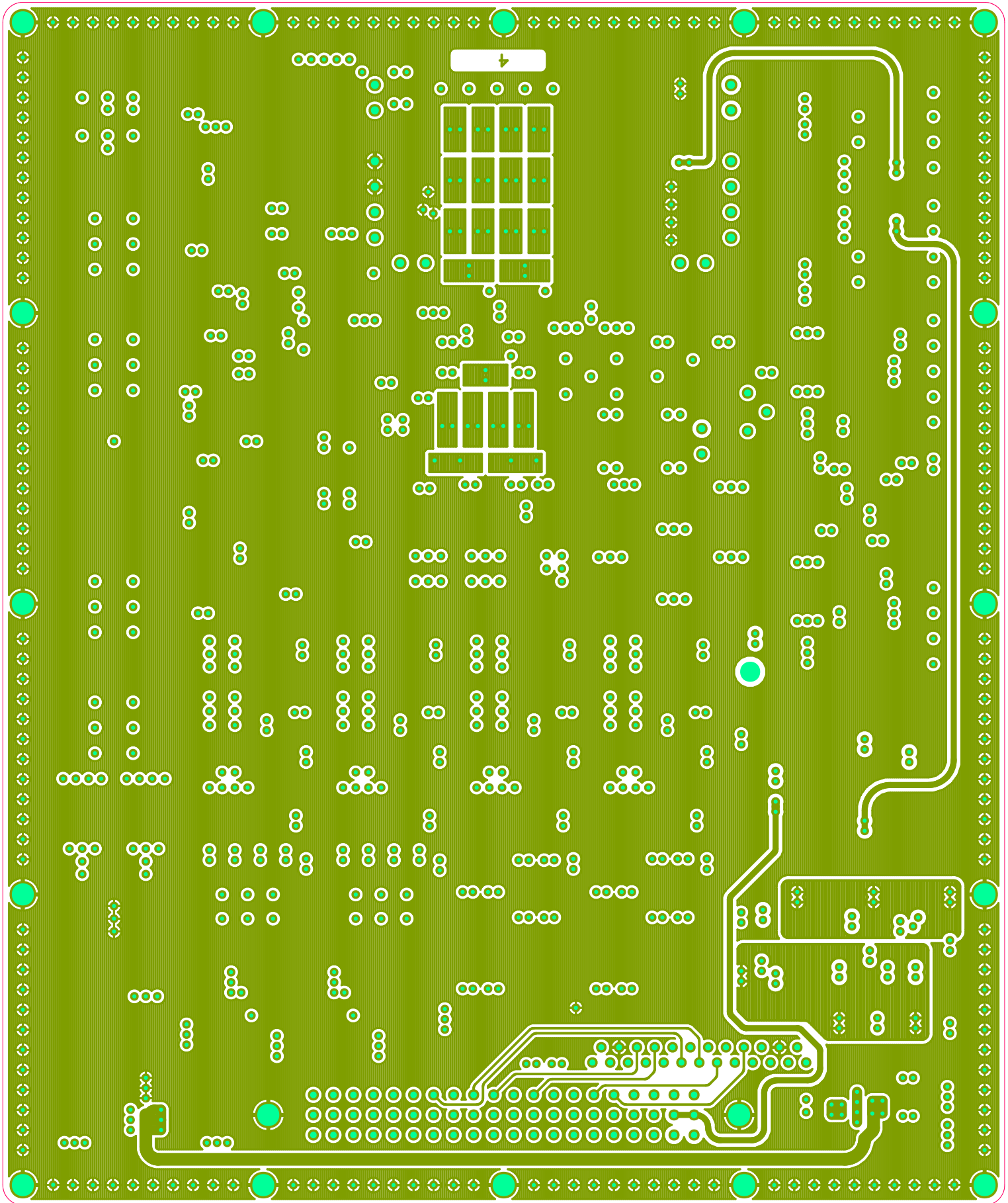
2mm

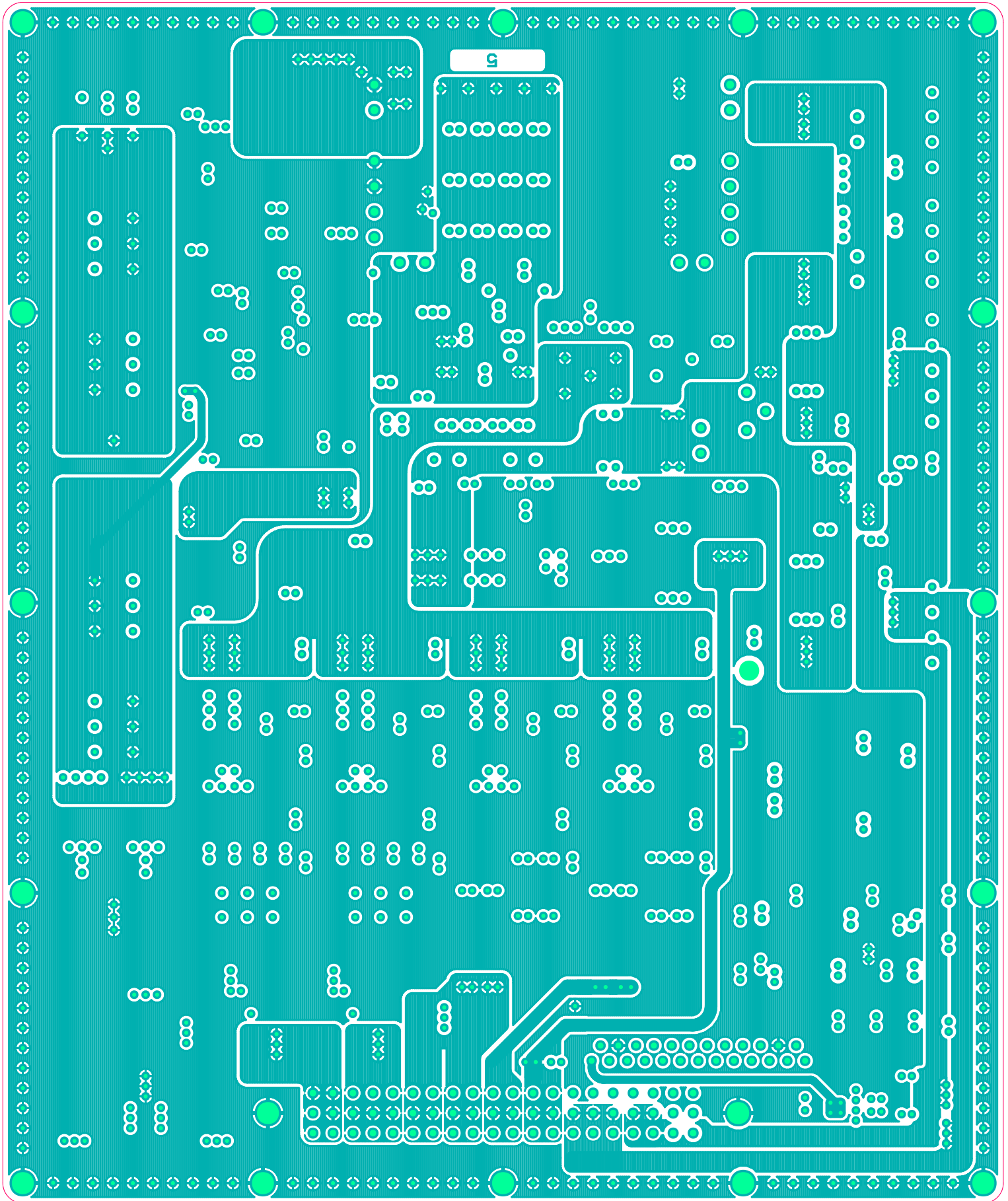


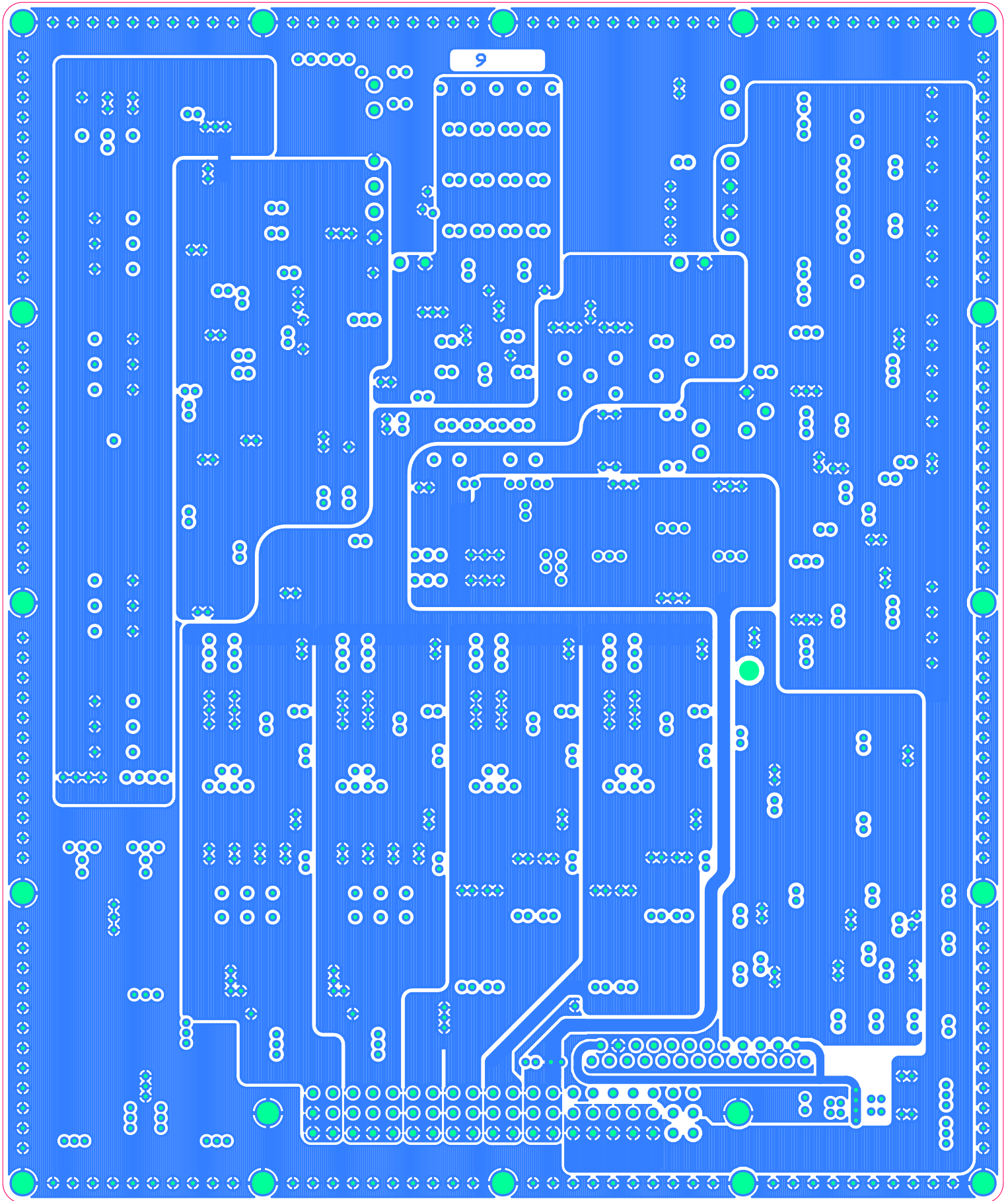
Sym	Nº	Mils	MM	Qty	Plated
+	1	16	0.41	854	YES
x	2	24	0.60	25	YES
□	3	26	0.65	60	YES
◇	4	28	0.70	5	YES
⊠	5	31	0.80	16	YES
⊞	6	79	2.00	1	NOT
⋈	7	87	2.20	18	YES



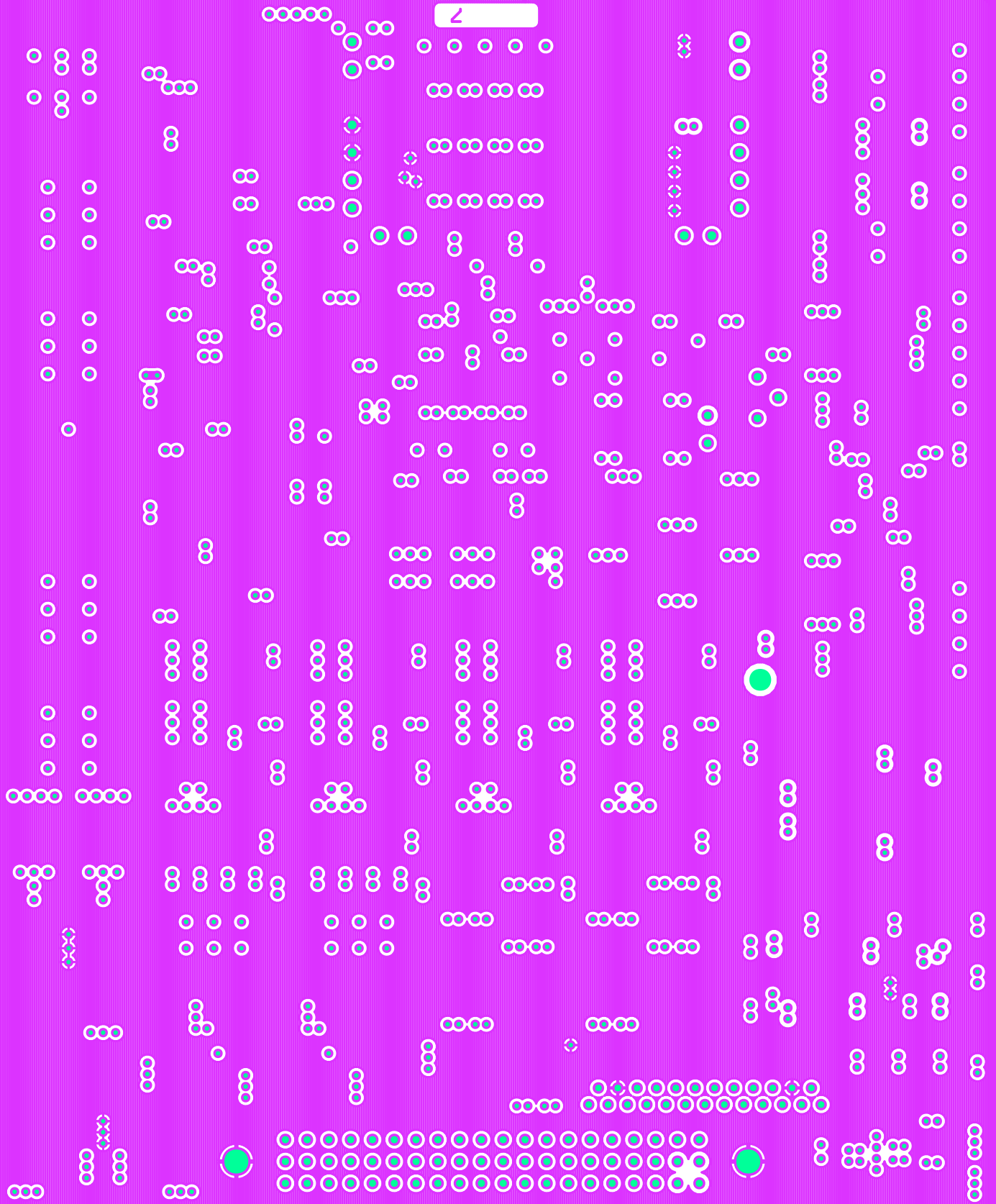


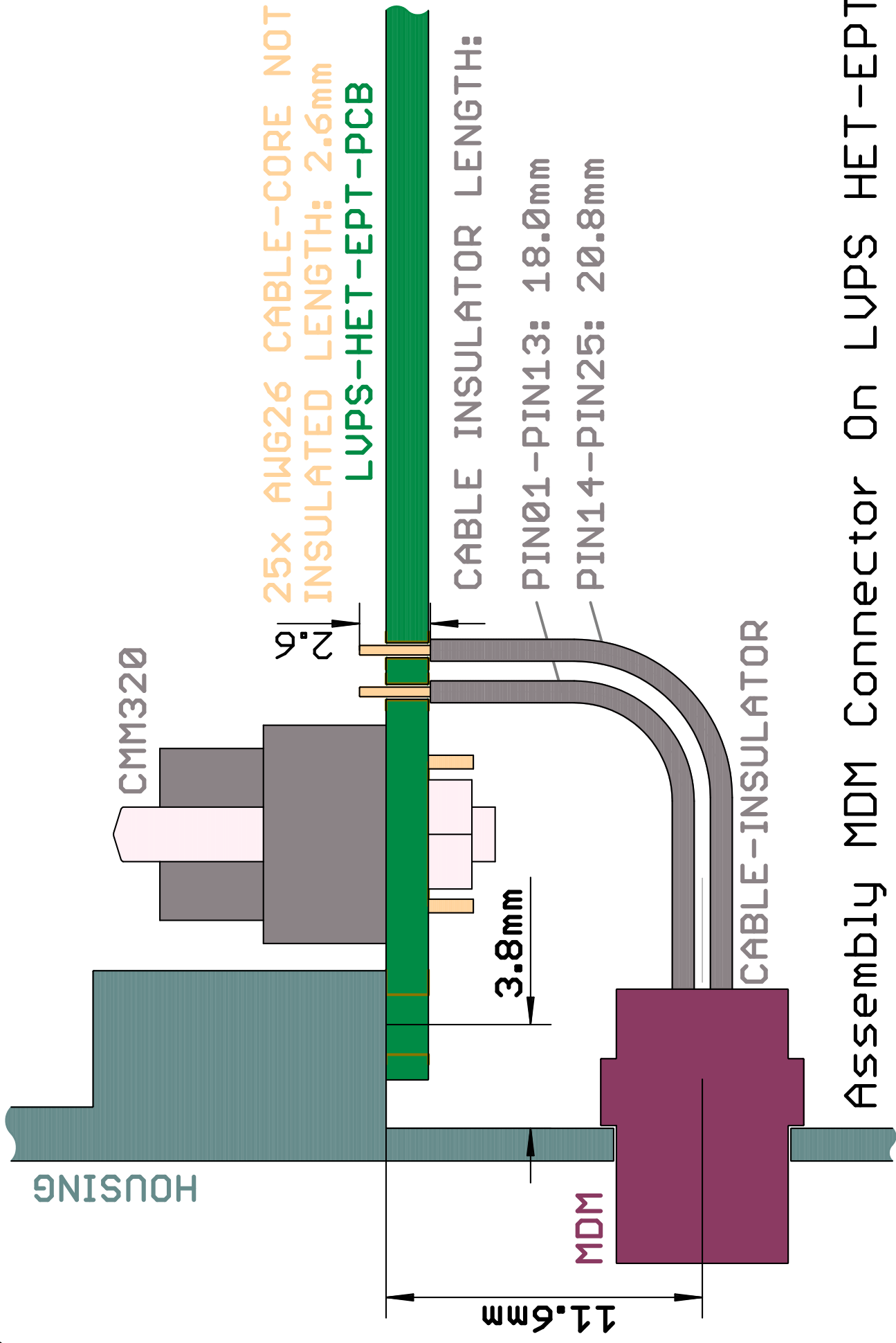






2





Assembly MDM Connector On LVPS HET-EPT

Pos	Qty	Part	Value	Device	Package	Description	GENERIC PART NUMBER
1	12	C201, C202, C206, C207, C312, C501, C502, C503, C505, C506, C507, C508	10n	C1206	C1206	Capacitor	CNC12 10nF 10% 500V
2	10	C203, C204, C205, C302, C303, C304, C307, C308, C309, C310	8u2	CNC54_8.2UF_10%_100V	CNC54PE	ceramic cap 8.2uF 100V X7R 10% CNC54 10.7x10.7x8mm	CNC54 8.2uF 10% 100V
3	39	C301, C313, C314, C316, C317, C318, C321, C322, C324, C327, C328, C329, C331, C336, C413, C510, C511, C513, C514, C516, C517, C518, C519, C520, C521, C522, C523, C525, C526, C527, C603, C610, C614, C615, C620, C627, C630, C632, C634	100n	C0805	C0805	Capacitor	CNC2 100nF 10% 50V
4	3	C305, C306, C311	3u9	CNC54_3.9UF_10%_100V	CNC54PE	ceramic cap 3.9uF 100V X7R 10% CNC54 10.7x10.7x4mm	CNC54 3.9uF 10% 100V
5	1	C315	33u	TESC336K020	TES-CASE-C	tantalum cap 33uF 20V 300mOhm 10% TES CASE C	TES C 336 K 020
6	3	C319, C320, C326	4u7	CNC32_4.7UF_10%_25V	CNC32PE	ceramic cap 4.7uF 25V 10% CNC32 8x8x5mm	CNC32 4.7uF 10% 25V
7	2	C323, C330	221p	C0603	C0603	Capacitor	CEC14 221pF 1% 50V
8	8	C325, C332, C333, C411, C420, C428, C433, C608	1n	C0603	C0603	Capacitor	CEC14 1nF 1% 16V
9	3	C334, C335, C509	10n	C0603	C0603	Capacitor	CNC14 10nF 5% 50V
10	5	C401, C414, C422, C427, C601	470n	C1210	C1210	Capacitor	CNC4 470nF 10% 16V
11	9	C402, C415, C423, C430, C602, C613, C621, C623, C629	10u	CNC32_10UF_10%_16V	CNC32PE	ceramic cap 10uF 16V 10% CNC32 8x8x5mm	CNC32 10uF 10% 16V
12	23	C403, C404, C405, C406, C408, C409, C410, C417, C418, C419, C424, C425, C426, C431, C432, C604, C605, C606, C616, C617, C618, C625, C626	150u	TESE157K016	TES_CASE-E	tantalum cap 150uF 16V 40mOhm 10% TES CASE E	TES E 157 K 016
13	2	C407, C416	47u	CNC34_47UF_10%_16V	CNC34PE	ceramic cap 47uF 16V 10% CNC34 12.5x12x7.5mm	CNC34 47uF 10% 16V
14	5	C412, C421, C429, C434, C609	1n5	C0805	C0805	Capacitor	CEC2 1.5nF 1% 50V
15	1	C504	6u8 200V	CNC56_6.8UF_10%_200V	CNC56PE	ceramic cap 6.8uF 200V X7R 10% CNC56 16.8x21.6x8mm	CNC56 6.8uF 10% 200V
16	2	C512, C515	100p	C0603	C0603	Capacitor	CEC14 100pF 5% 50V
17	1	C524	47u	TESE476K025	TES_CASE-E	tantalum cap 47uF 25V 65mOhm 10% TES CASE E	TES E 476 K 025
18	7	C607, C611, C619, C622, C624, C628, C633	22u	TESB226K016	TES-CASE-B	tantalum cap 22uF 16V 600mOhm 10% TES CASE B	TES B 226 K 016
19	2	C612, C631	47p	C0603	C0603	Capacitor	CEC14 47pF 5% 50V
20	8	D201, D202, D301, D303, D304, D501, D502, D503	1N5806U	1N5806U	LCC2A	Aerospace 2.5 A fast recovery rectifier	1N5806
21	1	D302	1N4467US	1N4467US	D-5A	12V VOIDLESS-HERMETICALLY-SEALED Surface Mount 1.5W Glass Zener Diode	1N4467
22	6	D305, D307, D308, D506, D603, D606	1N5819U	1N5819U	LCC2B	Aerospace 45 V power Schottky rectifier	1N5819
23	1	D306	1N6491US	1N6491US	D-5A	5.6V VOIDLESS-HERMETICALLY-SEALED Surface Mount 1.5W Glass Zener Diode	1N6491
24	7	D401, D404, D406, D408, D601, D604, D605	1N6642U	1N6642U	LCC2D	Aerospace 0.3A - 100V switching diode	1N6642
25	6	D402, D403, D405, D407, D409, D602	1N5822U	1N5822U	LCC2B	Aerospace 40 V power Schottky rectifier	1N5822
26	1	D504	1N4486US	1N4486US	D-5A	75V VOIDLESS-HERMETICALLY-SEALED Surface Mount 1.5W Glass Zener Diode	1N4486
27	1	D505	1N3595US	1N3595US	B-SQ	Ultra Low Reverse Current Rectifier	1N3595
28	1	IC301	ISL78841ASRH	ISL78841ASRH	8LD-FLATPACK	Radiation Hardened, High Performance Industry Standard Single-Ended Current Mode PWM Controller	ISL78841ASRH
29	1	IC302	HCC4024B	HCC4024B	14LD-FLATPACK	Rad-hard 7-stage binary/ripple counter	CD4024
30	5	IC401, IC402, IC403, IC404, IC601	MSK5059KRHG	MSK5059KRHG	16LD-FLATPACK	RAD HARD 4.5A, 500KHz STEP DOWN SWITCHING REGULATOR CONTROLLER	MSK5059
31	2	IC501, IC502	RH1056AMW	RH1056AMW	10LD-FLATPACK	6.5MHz Precision, High Speed, JFET Inout Operational Amplifier	RH1056
32	2	IC503, IC603	RH1498MW	RH1498MW	10LD-FLATPACK	10MHz, 6V/I _q s, Dual Rail-to-Rail Input and Output Precision C-Load Op Amp	RH1498
33	1	IC602	IS-1009RH	IS-1009RH	T0-206AB	Radiation Hardened 2.5V Reference	IS-1009
34	5	L201, L402, L404, L406, L408	10u	SESI9_1_10K_2WR	SESI9.1	SMD Power Inductor	SESI 9.1 10K 2WR

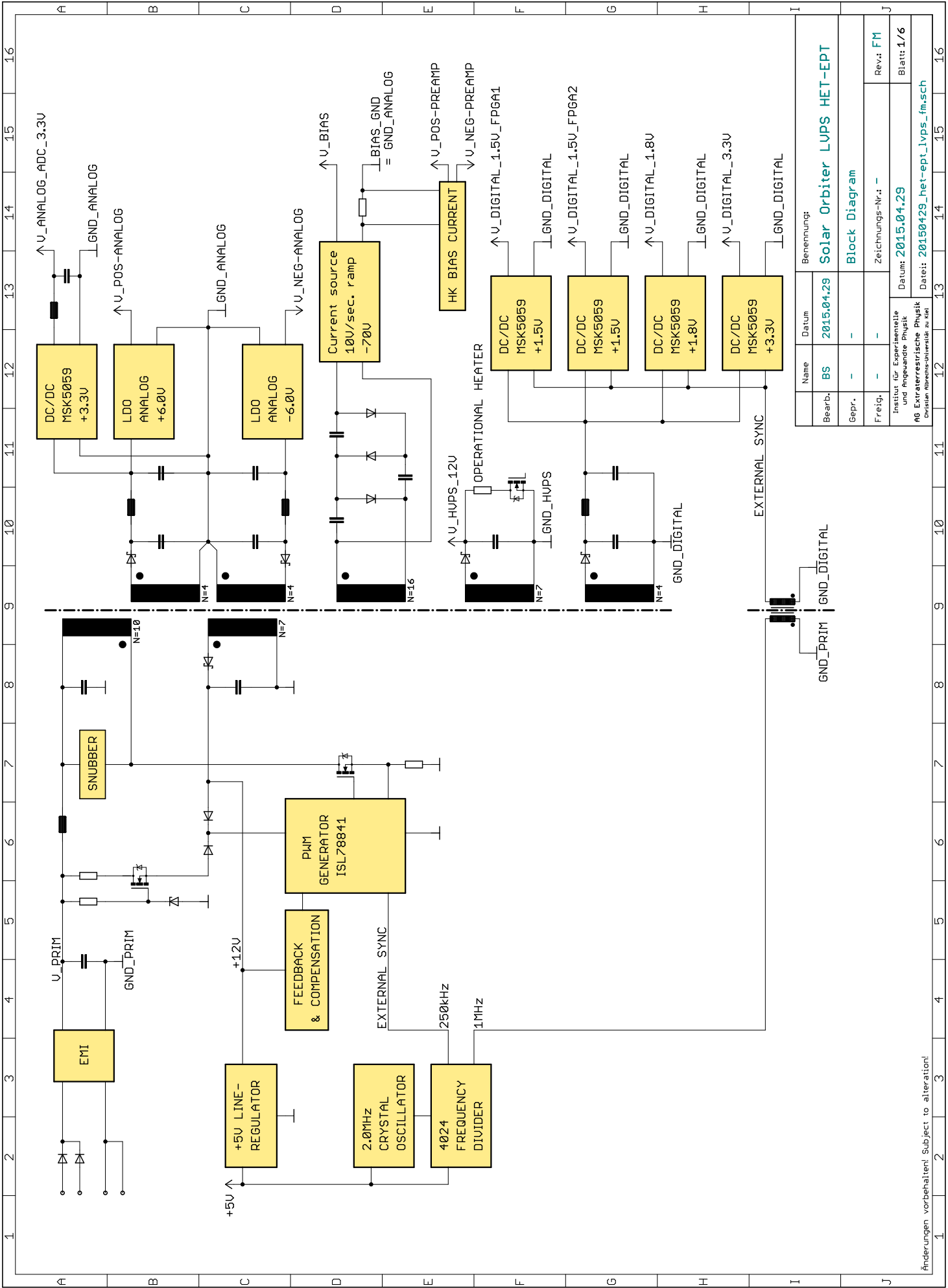
Pos	Qty	Part	Value	Device	Package	Description	GENERIC PART NUMBER
35	14	L202, L203, L205, L206, L301, L407, L409, L601, L602, L603, L604, L605, L607, L609	8u4	ESI7_8K4_1S	ESI7	SMD Power Inductor	ESI 7 8K4 1S
36	2	L204, L302	470u	HCESC10_M47_1S	HCESC10###1S	Common Mode Choke	HCESC 10 M47 1S
37	3	L401, L403, L405	1u2	ESI7_1K2_1S	ESI7	SMD Power Inductor	ESI 7 1K2 1S
38	4	L501, L502, L606, L608	HRB0603S102P.200	HRB0603S102P.200	C0603	Ferrite Bead 0603 1k0hm@100MHz 0.2A RDC=0.60hm	HRB0603S102P.200FT
39	5	Q301, Q503, Q504, Q505, Q602	IRHLUB770Z4	IRHLUB770Z4	UB	RADIATION HARDENED LOGIC LEVEL N-CHANNEL POWER MOSFET - 2N7616	IRHLUB770Z4
40	3	Q302, Q501, Q502	SOC5551HRB	SOC5551HRB	UBN	Hi-Rel NPN bipolar transistor 160 V - 0.5 A	2N5551
41	1	Q303	IRHNJ57133SE	IRHNJ57133SE	SMD0.5	MOSFET, N-CH VGS=20V VDS=130V ID=20A RDS0N=80m0hm VGS=2.5V- 4.5V QG=48nC	IRHNJ57133SE
42	1	Q601	IRHLUB7970Z4	IRHLUB7970Z4	UB	RADIATION HARDENED LOGIC LEVEL P-CHANNEL POWER MOSFET - 2N7626	IRHLUB7970Z4
43	3	R201, R205, R317	0R56	R2010	C2010	Resistor	SMP-PW 2010 0.56R 1% 50ppm
44	5	R202, R204, R320, R610, R616	24,9	R0603	C0603	Resistor	CHPHR0603K24R9FB
45	3	R203, R324, R545	1meg	R0603	C0603	Resistor	CHPHR0603L1004GB
46	2	R301, R304	100	R1206	C1206	Resistor	CHPHR1206K1000FB
47	13	R302, R311, R405, R501, R503, R504, R506, R513, R531, R544, R546, R547, R619	100k	R0603	C0603	Resistor	CHPHR0603K1003FB
48	1	R303	14k	R0603	C0603	Resistor	CHPHR0603K1402FB
49	1	R305	47k	R1206	C1206	Resistor	CHPHR1206K4702JB
50	1	R306	38k3 0.1% 25ppm	R0603	C0603	Resistor	PFRR0603E3832BB
51	3	R307, R308, R309	182	R0805	C0805	Resistor	CHPHR0805K1820FB
52	4	R310, R515, R525, R526	10k 0.1% 25ppm	R0603	C0603	Resistor	PFRR0603E1002BB
53	2	R312, R313	10	R0603	C0603	Resistor	CHPHR0603K10R0FB
54	8	R314, R404, R409, R413, R417, R505, R511, R604	10k	R0603	C0603	Resistor	CHPHR0603K1002FB
55	9	R315, R402, R407, R411, R415, R512, R602, R605, R606	1k	R0603	C0603	Resistor	CHPHR0603K1001FB
56	1	R316	6k81	R0603	C0603	Resistor	CHPHR0603K6811FB
57	5	R318, R321, R322, R608, R613	221	R0603	C0603	Resistor	CHPHR0603K2210FB
58	1	R319	51,1	R0603	C0603	Resistor	CHPHR0603K51R1FB
59	1	R323	100	R0603	C0603	Resistor	CHPHR0603K1000FB
60	2	R401, R406	1k00 0.1% 25ppm	R0603	C0603	Resistor	PFRR0603E1001BB
61	2	R403, R408	4k22 0.1% 25ppm	R0603	C0603	Resistor	PFRR0603E4221BB
62	1	R410	2k80 0.1% 25ppm	R0603	C0603	Resistor	PFRR0603E2801BB
63	1	R412	1k62 0.1% 25ppm	R0603	C0603	Resistor	PFRR0603E1621BB
64	1	R414	1k58 0.1% 25ppm	R0603	C0603	Resistor	PFRR0603E1581BB
65	1	R416	3k24 0.1% 25ppm	R0603	C0603	Resistor	PFRR0603E3241BB
66	2	R502, R509	10meg	R0805	C0805	Resistor	CHPHR0805K1005GB
67	3	R507, R508, R510	221k	R0603	C0603	Resistor	CHPHR0603K2213FB
68	1	R514	27.4k 0.1% 25ppm	R0603	C0603	Resistor	PFRR0603E2742BB
69	1	R516	NTC-G15K4D489	NTC-G15K4D489	NTC-G15K4D489	Thru Hole Pads For NTC	G15K4D489
70	24	R517, R518, R519, R520, R521, R522, R523, R524, R527, R528, R529, R530, R532, R533, R534, R535, R536, R537, R538, R539, R540, R541, R542, R543	75	R1206	C1206	Resistor	CHPHR1206K75R0FB
71	1	R601	2k32 0.1% 25ppm	R0603	C0603	Resistor	PFRR0603E2321BB
72	1	R603	1k33 0.1% 25ppm	R0603	C0603	Resistor	PFRR0603E1331BB
73	2	R607, R618	121k	R0603	C0603	Resistor	CHPHR0603K1213FB
74	2	R609, R617	3k32	R0603	C0603	Resistor	CHPHR0603K3321FB
75	1	R611	5k11 0.1% 25ppm	R0603	C0603	Resistor	PFRR0603E5111BB
76	1	R612	3k65 0.1% 25ppm	R0603	C0603	Resistor	PFRR0603E3651BB
77	1	R614	10k2 0.1% 25ppm	R0603	C0603	Resistor	PFRR0603E1022BB
78	1	R615	4k02 0.1% 25ppm	R0603	C0603	Resistor	PFRR0603E4021BB
79	2	SJ201, SJ202 will be poputated at CAU	JUMPER	JUMPER	SJ2	Solderjumper	
80	1	X201	MDSA225SEW50B	MDSA225SEW50B	SOLDERPADS-MDM-25	25pin MDM female pigtail connector, mounted to CHASSIS and connected to LVPS PCB	MDSA225SEW50B
81	1	X202	CMM322Y060M35H	CMM322Y060M35H	CMM322Y060M35H	Connector CMM320 female straight on PCB, 60 LF contacts, M35H	322Y060M35H
82	1	X301 will be poputated at CAU	TRAFO	TRAFO	PLANARTRAFO	Solar Orbiter Planartrafo	FLYBACK-XFORMER-PCB
83	1	X302	QT188HCD10S-2.000MHZ	QT188HCD10S-2.000MHZ	QT188	crystal oscillator 2MHz CMOS 5.0V 100ppm	QT188HCD10S-2.000MHZ
84						HET-EPT-LVPS-PCB	
85	1					COATING	
86	1	will be poputated at CAU				E22/6/16	
87	1	will be poputated at CAU				PLT22	
88	1	will be poputated at CAU				CLM-E22/PLT22	
89	1	will be poputated at CAU				COPPER-WIRE-0.6MM	

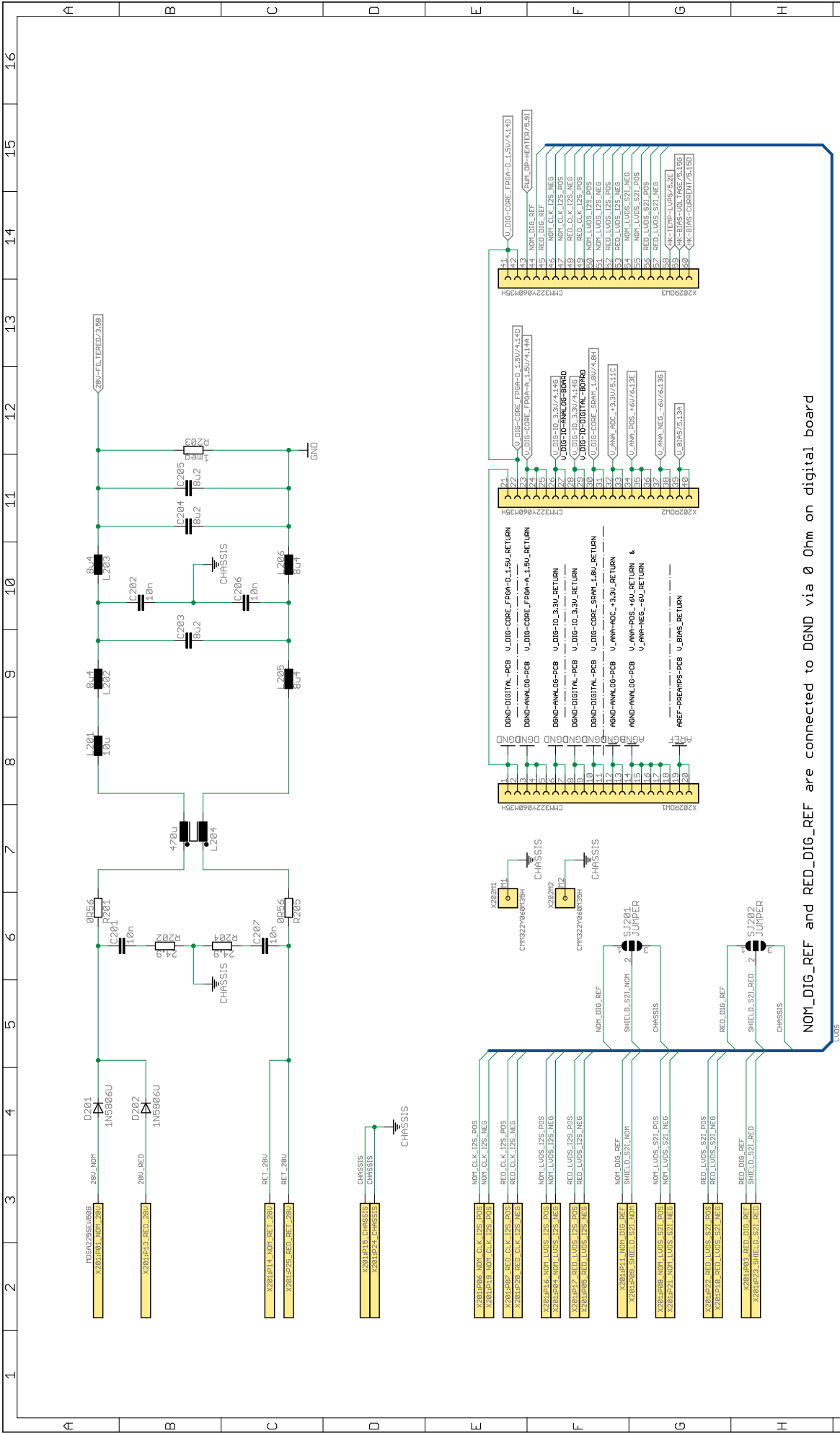
LVPS-HET-EPT-PCBSTACK

Layer	Signal Name	Name	Layer	Thickness / μm
1	Signal TOP	Copper 35 μm	Copper	35
		2 x 1080 polyimide prepreg	Prepreg	150
2	Signal	Copper 35 μm	Copper	35
		polyimide laminate 200 μm	Laminate	200
3	GND1 & Signal	Copper 35 μm	Copper	35
		2 x 1080 polyimide prepreg	Prepreg	150
4	PWR1 & Signal	Copper 35 μm	Copper	35
		polyimide laminate 300 μm	Laminate	300
5	PWR2	Copper 35 μm	Copper	35
		2 x 1080 polyimide prepreg	Prepreg	150
6	GND2	Copper 35 μm	Copper	35
		polyimide laminate 200 μm	Laminate	200
7	CHASSIS	Copper 35 μm	Copper	35
		2 x 1080 polyimide prepreg	Prepreg	150
8	Signal BOT	Copper 35 μm	Copper	35
Thickness total / μm				1580

Aimed total PCB thickness is 1.55mm.

All inner layers are mainly solid - "unused" area is filled with CHASSIS signal.

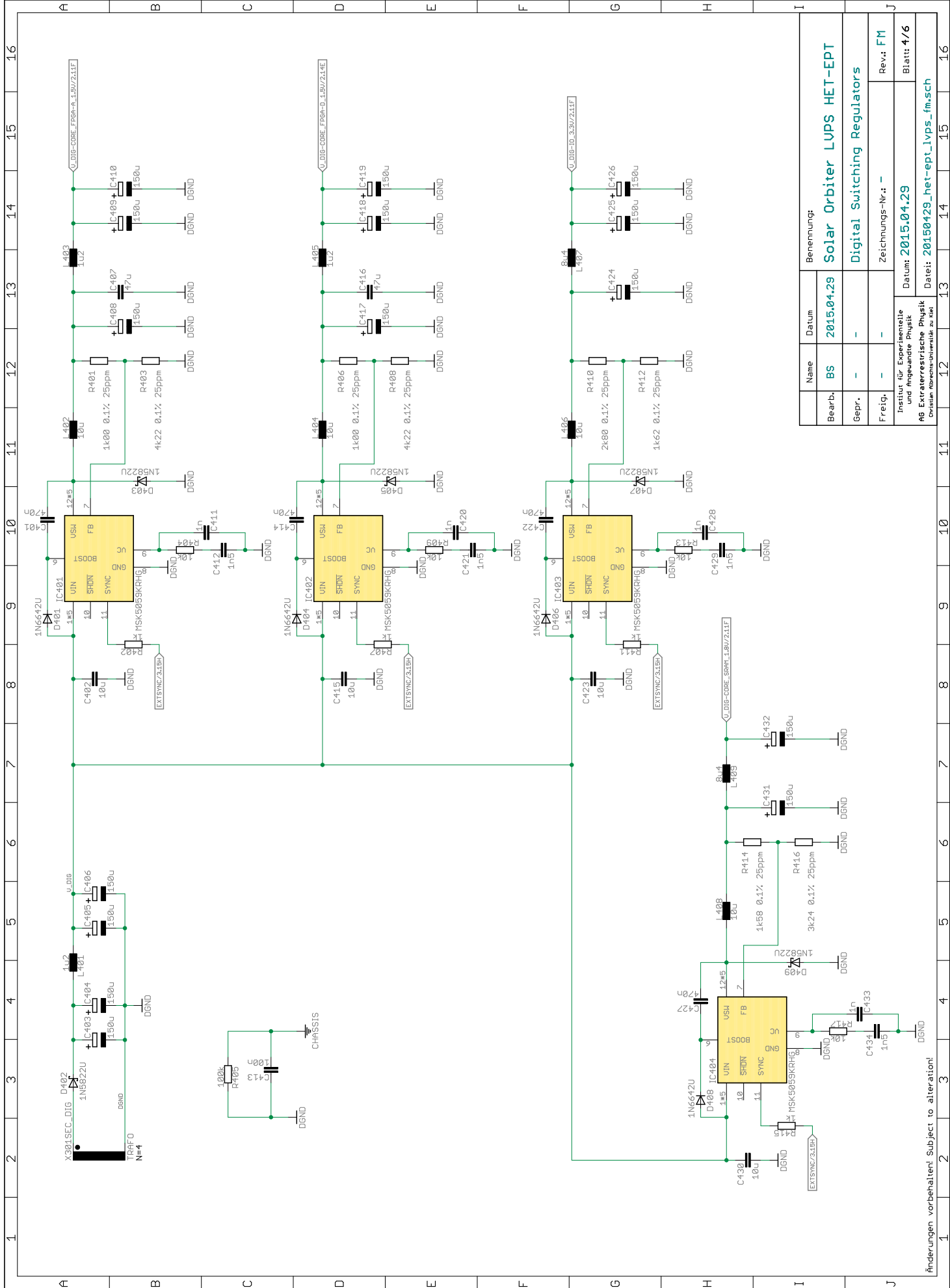




Pin 11 and 3 are shield of sensor transmission lines and digital reference lines.
 Old reference Pins 9 and 23 are connected to digital ground also – compatible to V2.

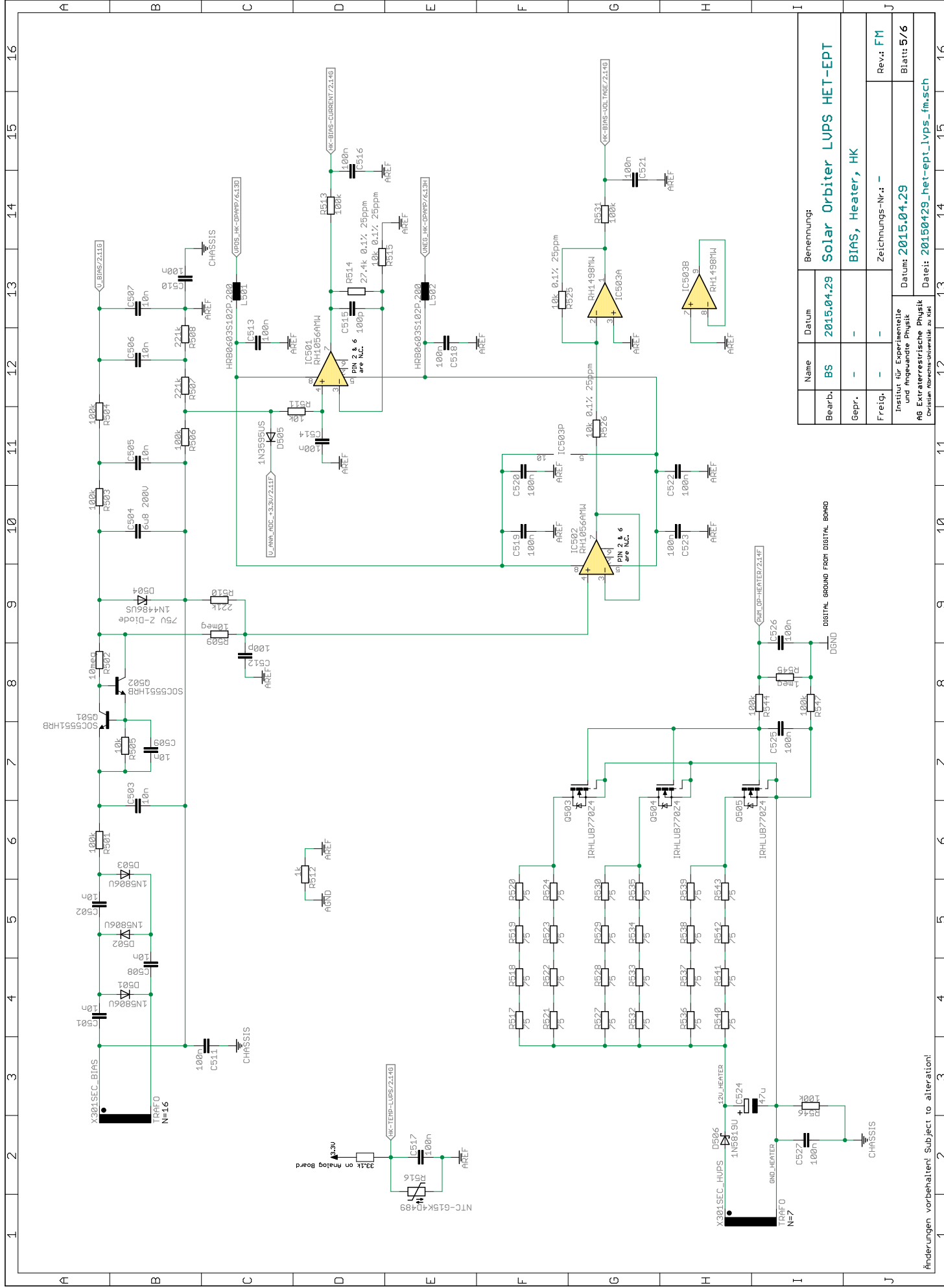
Pins 2, 12 & 18 are not connected

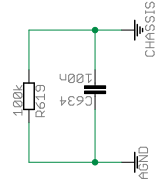
Name	Datum	Benennung:
BS	2015.04.29	Solar Orbiter LUPS HET-EPT
Gepr.	-	Input Connector, Filter, S2I Shield
Freig.	-	Zeichnungs-Nr.: -
Institut für Experimentelle und Angewandte Physik	Datum: 2015.04.29	Rev: FM
08 Extraterrestrische Physik	Blatt: 2/6	
Datei: 20150429_het-eps_lups_fm.sch		



Name		Datum		Benennung:	
Bearb.	BS	2015.04.29		Solar Orbiter LVPS HET-EPT	
Gepr.	-	-		Digital Switching Regulators	
Freig.	-	-		Zeichnungs-Nr.: -	
Institut für Experimentelle und Angewandte Physik		Datum		Rev.: FM	
08 Extraterrestrische Physik		Datei		Blatt 4/6	
Sonnenwind		Datei		20150429_het-ep_lvps_fm.sch	

Änderungen vorbehalten! Subject to alteration!





	Name	Benennung:		
Bearb.	BS	Datum	Solar Orbiter LVPS HET-EPT	
Gepr.	-	-	Analog LDOs, ADC-Power	
Freig.	-	-	Zeichnungs-Nr.: -	Rev.: FM
Institut für Experimentelle und Angewandte Physik		Datum:	2015.04.29	
AG Extraterrestrische Physik		Blatt: 6/6		
Christian Albrechts-Universität zu Kiel		Datei:	20150429_het-ept_lvps_fm.sch	
12	13	14	15	16

