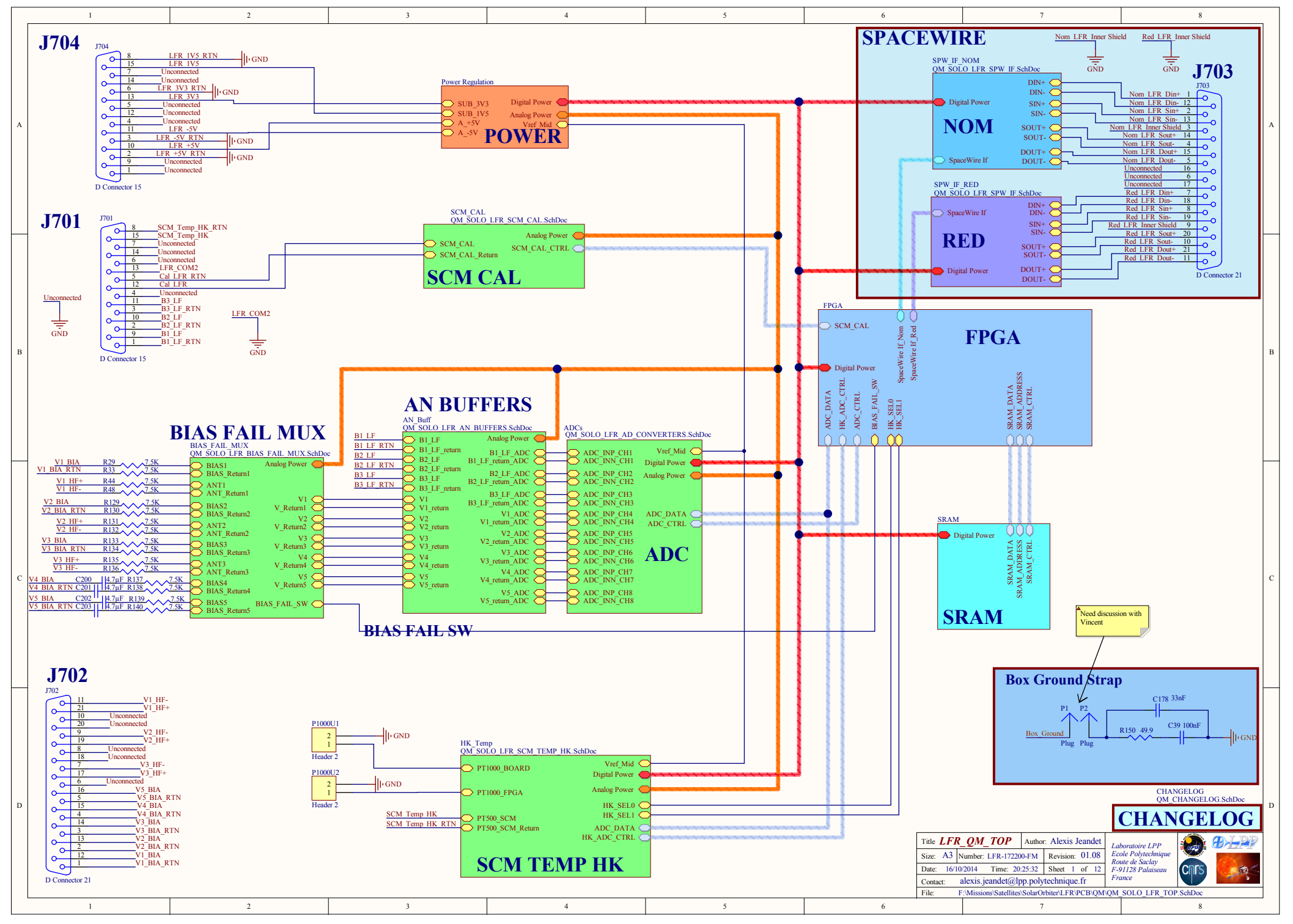
J704
J704
8 LFR_1V5_RTN
15 LFR_1V5
7 Unconnected
14 Unconnected
6 LFR_3V3_RTN
13 LFR_3V3
5 Unconnected
12 Unconnected
4 Unconnected
11 LFR_-5V
3 LFR_-5V_RTN
10 LFR_+5V
2 LFR_+5V_RTN
9 Unconnected
1 Unconnected
GND
D Connector 15
Power Regulation
SUB_3V3
SUB_1V5
A_+5V
A_-5V
Digital Power
Analog Power
Vref_Mid
POWER
SPACEWIRE
Nom_LFR_Inner Shield
Red_LFR_Inner Shield
SPW_IF_NOM
QM_SOLO_LFR_SPW_IF.SchDoc
Digital Power
NOM
SpaceWire If
DIN+
DIN-
SIN+
SIN-
SOUT+
SOUT-
DOUT+
DOUT-
J703
Nom_LFR_Din+ 1
Nom_LFR_Din- 12
Nom_LFR_Sin+ 2
Nom_LFR_Sin- 13
Nom_LFR_Inner Shield 3
Nom_LFR_Sout+ 14
Nom_LFR_Sout- 4
Nom_LFR_Dout+ 15
Nom_LFR_Dout- 5
Unconnected 16
Unconnected 6
Unconnected 17
Red_LFR_Din+ 7
Red_LFR_Din- 18
Red_LFR_Sin+ 8
Red_LFR_Sin- 19
Red_LFR_Inner Shield 9
Red_LFR_Sout+ 20
Red_LFR_Sout- 10
Red_LFR_Dout+ 21
Red_LFR_Dout- 11
D Connector 21
SPW_IF_RED
QM_SOLO_LFR_SPW_IF.SchDoc
SpaceWire If
RED
Digital Power
J701
J701
8 SCM_Temp_HK_RTN
15 SCM_Temp_HK
7 Unconnected
14 Unconnected
6 Unconnected
13 LFR_COM2
5 Cal_LFR_RTN
12 Cal_LFR
4 Unconnected
11 B3_LF
3 B3_LF_RTN
10 B2_LF
2 B2_LF_RTN
9 B1_LF
1 B1_LF_RTN
D Connector 15
Unconnected
GND
LFR_COM2
GND
SCM_CAL
QM_SOLO_LFR_SCM_CAL.SchDoc
SCM_CAL
SCM_CAL_Return
Analog Power
SCM_CAL_CTRL
SCM CAL
FPGA
SCM_CAL
Digital Power
SpaceWire If_Nom
SpaceWire If_Red
ADC_DATA
HK_ADC_CTRL
ADC_CTRL
BIAS_FAIL_SW
HK_SEL0
HK_SEL1
SRAM_DATA
SRAM_ADDRESS
SRAM_CTRL
FPGA
AN BUFFERS
AN_Buff
QM_SOLO_LFR_AN_BUFFERS.SchDoc
B1_LF
B1_LF_RTN
B2_LF
B2_LF_RTN
B3_LF
B3_LF_RTN
Analog Power
B1_LF_ADC
B1_LF_return_ADC
B2_LF_ADC
B2_LF_return_ADC
B3_LF_ADC
B3_LF_return_ADC
V1_ADC
V1_return_ADC
V2_ADC
V2_return_ADC
V3_ADC
V3_return_ADC
V4_ADC
V4_return_ADC
V5_ADC
V5_return_ADC
ADCs
QM_SOLO_LFR_AD_CONVERTERS.SchDoc
ADC_INP_CH1
ADC_INN_CH1
ADC_INP_CH2
ADC_INN_CH2
ADC_INP_CH3
ADC_INN_CH3
ADC_INP_CH4
ADC_INN_CH4
ADC_INP_CH5
ADC_INN_CH5
ADC_INP_CH6
ADC_INN_CH6
ADC_INP_CH7
ADC_INN_CH7
ADC_INP_CH8
ADC_INN_CH8
Vref_Mid
Digital Power
Analog Power
ADC_DATA
ADC_CTRL
ADC
BIAS FAIL MUX
BIAS_FAIL_MUX
QM_SOLO_LFR_BIAS_FAIL_MUX.SchDoc
V1_BIA R29 7.5K
V1_BIA_RTN R33 7.5K
V1_HF+ R44 7.5K
V1_HF- R48 7.5K
V2_BIA R129 7.5K
V2_BIA_RTN R130 7.5K
V2_HF+ R131 7.5K
V2_HF- R132 7.5K
V3_BIA R133 7.5K
V3_BIA_RTN R134 7.5K
V3_HF+ R135 7.5K
V3_HF- R136 7.5K
V4_BIA C200 4.7µF R137 7.5K
V4_BIA_RTN C201 4.7µF R138 7.5K
V5_BIA C202 4.7µF R139 7.5K
V5_BIA_RTN C203 4.7µF R140 7.5K
BIAS1
BIAS_Return1
ANT1
ANT_Return1
BIAS2
BIAS_Return2
ANT2
ANT_Return2
BIAS3
BIAS_Return3
ANT3
ANT_Return3
BIAS4
BIAS_Return4
BIAS5
BIAS_Return5
Analog Power
V1
V_Return1
V2
V_Return2
V3
V_Return3
V4
V_Return4
V5
V_Return5
BIAS_FAIL_SW
BIAS FAIL SW
SRAM
Digital Power
SRAM_DATA
SRAM_ADDRESS
SRAM_CTRL
SRAM
Need discussion with Vincent
Box Ground Strap
P1
P2
Box_Ground
Plug
Plug
C178 33nF
C39 100nF
R150 49.9
GND
J702
J702
11 V1_HF-
21 V1_HF+
10 Unconnected
20 Unconnected
9 V2_HF-
19 V2_HF+
8 Unconnected
18 Unconnected
7 V3_HF-
17 V3_HF+
6 Unconnected
16 V5_BIA
5 V5_BIA_RTN
15 V4_BIA
4 V4_BIA_RTN
14 V3_BIA
3 V3_BIA_RTN
13 V2_BIA
2 V2_BIA_RTN
12 V1_BIA
1 V1_BIA_RTN
D Connector 21
P1000U1
P1000U2
Header 2
GND
HK_Temp
QM_SOLO_LFR_SCM_TEMP_HK.SchDoc
PT1000_BOARD
PT1000_FPGA
PT500_SCM
PT500_SCM_Return
Vref_Mid
Digital Power
Analog Power
HK_SEL0
HK_SEL1
ADC_DATA
HK_ADC_CTRL
SCM_Temp_HK
SCM_Temp_HK_RTN
SCM TEMP HK
CHANGELOG
QM_CHANGELOG.SchDoc
CHANGELOG
Title LFR_QM_TOP
Author: Alexis Jeandet
Size: A3
Number: LFR-172200-FM
Revision: 01.08
Date: 16/10/2014
Time: 20:25:32
Sheet 1 of 12
Contact: alexis.jeandet@lpp.polytechnique.fr
File: F:\Missions\Satellites\SolarOrbiter\LFR\PCB\QM\QM_SOLO_LFR_TOP.SchDoc
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Ecole Polytechnique
Route de Saclay
F-91128 Palaiseau
France

CHANGELOG

09/04/2014
- -Moved analog input buffers resistors before the swithes.
- -C21 (100nF cap @ SUB1.5V input) footprint changed to 0805.
- -Connected SENS input for RHFL4913 to Vout.
- -2.5V analogic connected to sub 3.3V.
- -added R/C Slow start on 2.5V RHFL4913.
- -1.8V MSK5822 VBias input moved from 5V to sub 3.3V.

14/04/2014
- -Connected SCM cal and SPW shield to GND.
- -Unconnected Pin are connected to Unconnected Net which is tied to GND.

15/04/2014
- -Updated ground strap, it's now removable and the circuit is a R C//R.

22/04/2014
- -Connected 3.3V regulator VBIAS input to sub 3.3V.
- -Connected MSKs Latch input to GND.
- -Connected RHFL4913 INH inputs to GND.
- -Replaced DG419 with 54HC4053 for bais/ant mux.

24/04/2014
- -Replaced EM SRAM with FM SRAM UT8ER1M32.

25/04/2014
- -Replaced DG419 with 54HC4053 for HK mux.
- -Replaced DG419 with 54HC4053 for SCM CAL mux.
- -Replaced DAC reference with qualified one.

30/04/2014
- -Replaced EM Oscillators with FM.
- -Replaced EM HK DAC with FM.

05/05/2014
- -Added SPW enable signal.
- -Replaced LT1009 by RH1009.
- -Replaced MSK 3.3V regulator by RHFL4913.
- -Added filtering structures on +/-5V.
- -Added RC reset circuit for FPGA.
- -Changed 400k resistors on ADC bias to 2x200k.

06/05/2014
- -Changed power input inductors from 100µH to 10µH.

16/05/2014
- -Updated footprints from Vincent observations.

30/06/2014
- -added reset connection on FPGA(mistake on 05/05/2014).
- -Grounding strap update.
- -Replaced _ by U in components names and mutlisheet generator rules.

15/07/2014
- -added missing decoupling capacitors on ADC sheet

13/08/2014
- -Updated FPGA connections from steel netlist

12/10/2014
- -Added RHFACT541K01V level shifter
- -Vref/2 buffered by U39B(OPAMP)
- -Added simple resistive voltage divider to reduce ADC's clk input to 2.5V

14/10/2014
- -Added 4.7µF capacitors for BIAS4 and BIAS5 inputs
- -Changed 0.2 ohm and 0.1ohm resistors packages from 1206 to 2010
- -FPGA JTAG TRST pin tied to GND

16/10/2014
- -Changed grounding strap resistor R150 from 50Ohms to 49.9Ohms
- -Changed 4.7µF schematic symbol to polarised one for C3 C15 C30
- -Changed C11 from 1806[0603] to 1206 package

TODO
- -Connect free FPGA pins to GND

Title: CHANGELOG		Author: Alexis Jeandet	
Size: A4	Number: LFR-172200-FM	Revision: 01.08	
Date: 16/10/2014	Time: 20:25:32	Sheet 2 of 12	
Contact: alexis.jeandet@lpp.polytechnique.fr			
File: F:\Missions\Satellites\SolarOrbiter\LFR\PCB\QM\QM_CHANGELOG.SchDoc			

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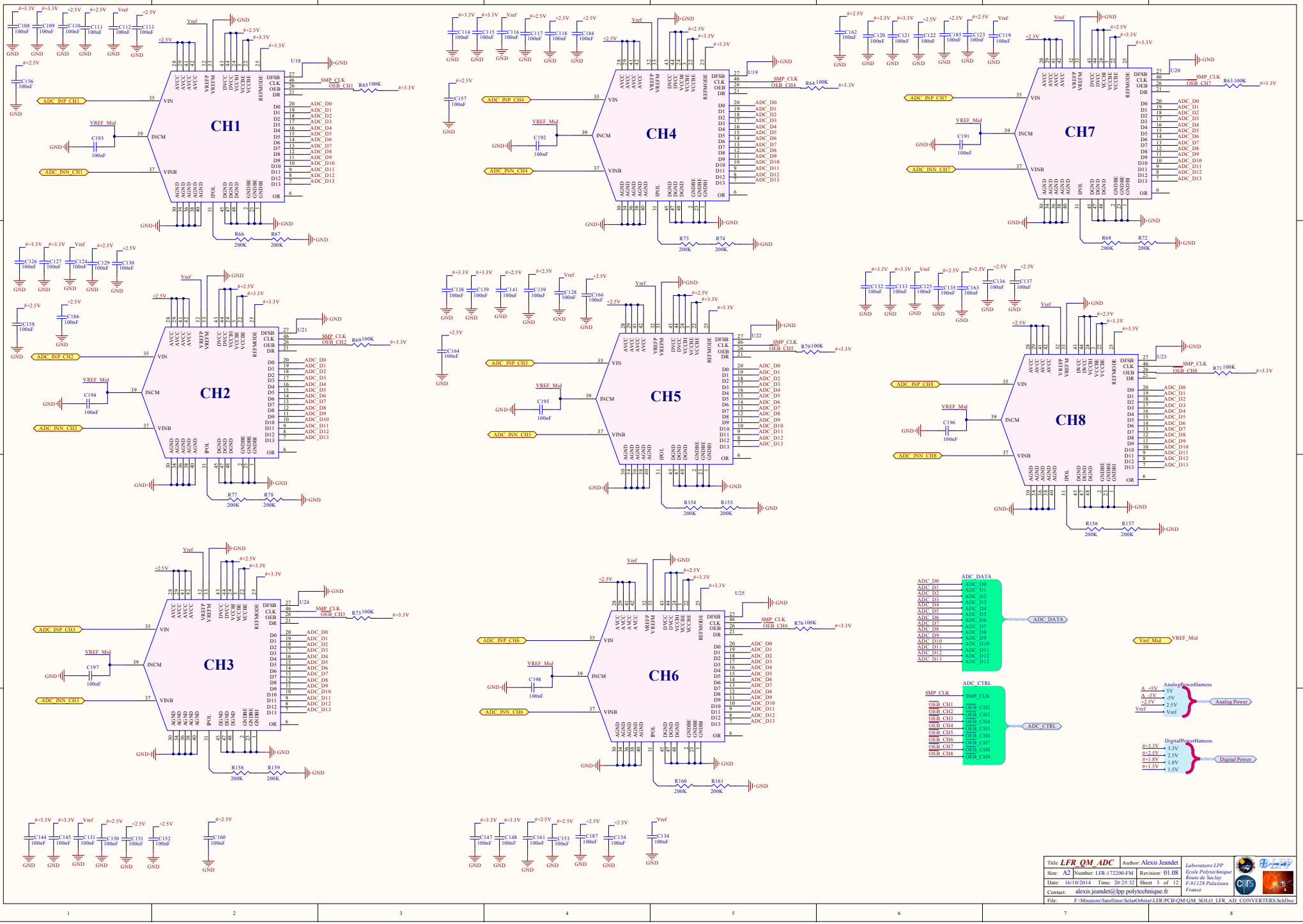
CH1
CH2
CH3
CH4
CH5
CH6
CH7
CH8
ADC_DATA
ADC_CTRL
Analog Power
Digital Power
Title LFR_QM_ADC
Author: Alexis Jeandet
Size: A2
Number: LFR-172200-FM
Revision: 01.08
Date: 16/10/2014
Time: 20:25:32
Sheet 3 of 12
Contact: alexis.jeandet@lpp.polytechnique.fr
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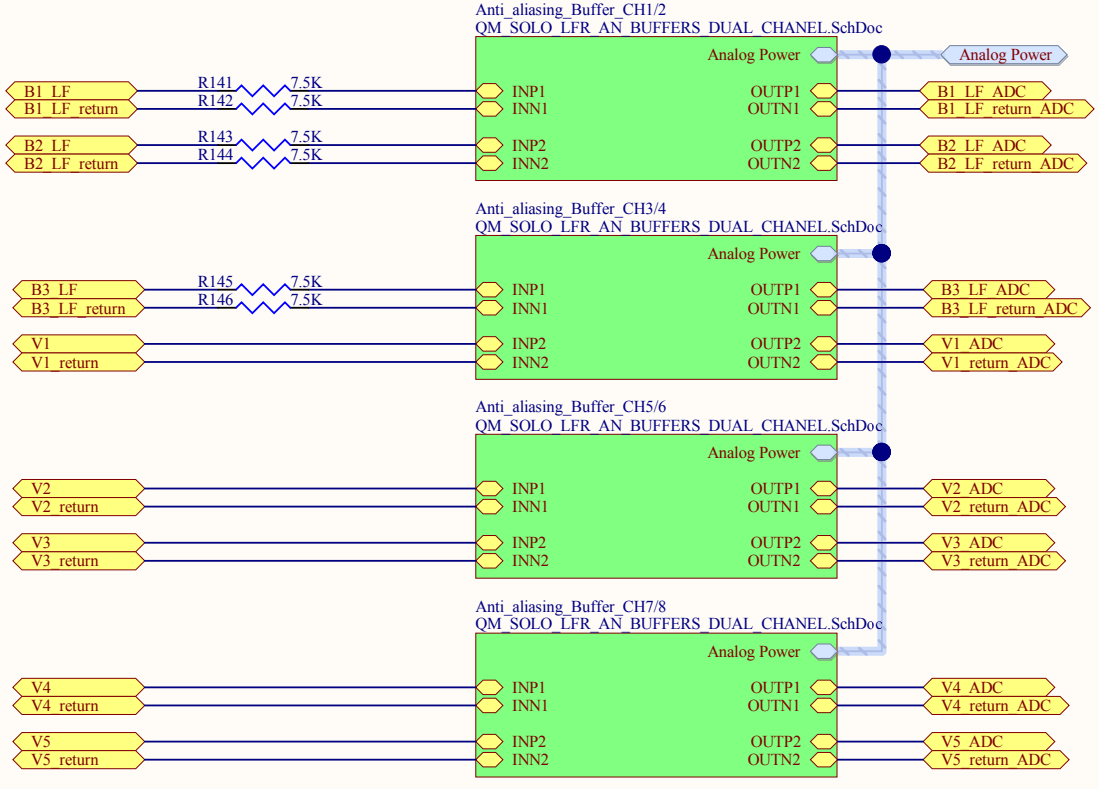

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Size: A4	Number: LFR-172200-FM	Revision: 01.08	
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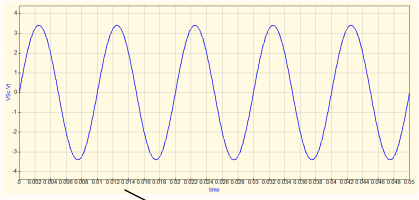

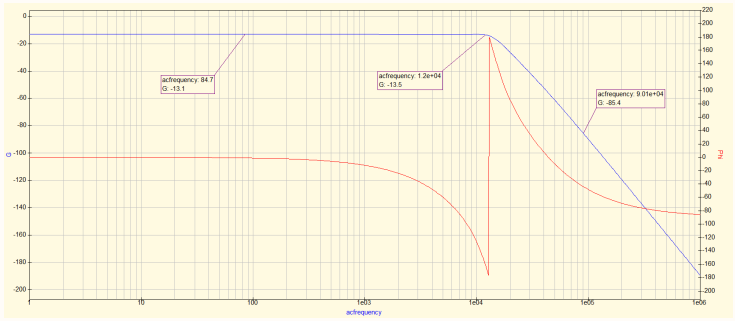

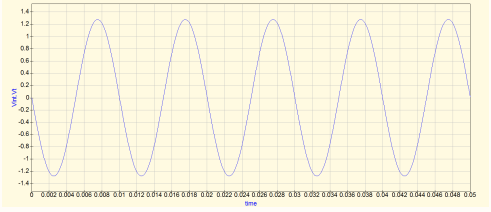

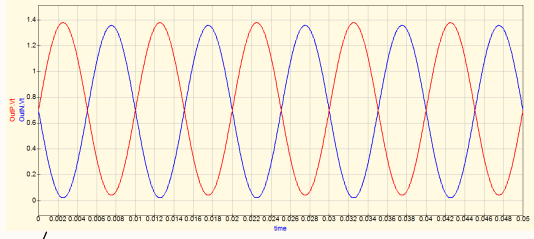

GND
C48 2.2nF
R27 3160
C46 1nF
A_+5V
INP1
INN1
R30 12K
R34 12K
U14A LT1352CS8
A_-5V
C50 2.2nF
R36 3160
C51 1nF
R31 13K
C49 5.6nF
R28 6.8K
C47 270pF
R32 13K
Vref
R35 20K
U14B LT1352CS8
R37 10K
C52 100nF
R57 1K
OUTP1
C68 Cap Semi 3.9nF

R38 6.8K
R39 6.8K
R40 6.8K
U15A LT1352CS8
R41 6.8K
C53 100nF
R58 1K
OUTN1
C69 Cap Semi 3.9nF

R42 3160
C54 1nF
C56 2.2nF
INP2
INN2
R45 12K
R49 12K
U16A LT1352CS8
C58 2.2nF
R51 3160
C59 1nF
R46 13K
C57 5.6nF
R43 6.8K
C55 270pF
R47 13K
R50 20K
U16B LT1352CS8
R52 10K
C60 100nF
R59 1K
OUTP2
C70 Cap Semi 3.9nF

R53 6.8K
R54 6.8K
R55 6.8K
U15B LT1352CS8
R56 6.8K
C61 100nF
R60 1K
OUTN2
C71 Cap Semi 3.9nF

C62 Cap Semi 100nF
C64 Cap Semi 100nF
C63 Cap Semi 100nF
C65 Cap Semi 100nF
C66 Cap Semi 100nF
C67 Cap Semi 100nF

AnalogPowerHarness
A_+5V
A_-5V
+2.5V
Vref
5V
-5V
2.5V
Vref
Analog Power

Title	LFR_QM_BUFF	Author:	Alexis Jeandet
Size:	A3	Number:	LFR-172200-FM
Revision:	01.08		
Date:	16/10/2014	Time:	20:25:32
Sheet	5 of 12		
Contact:	alexis.jeandet@lpp.polytechnique.fr		
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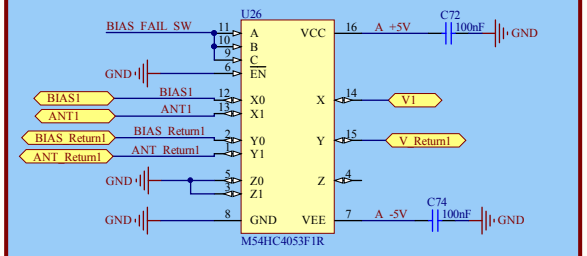
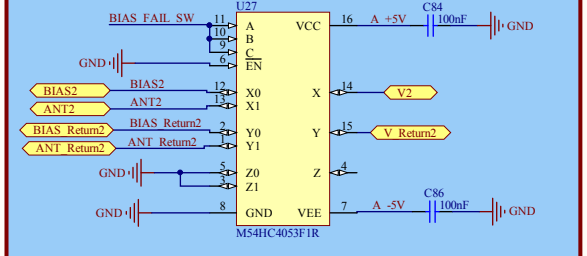
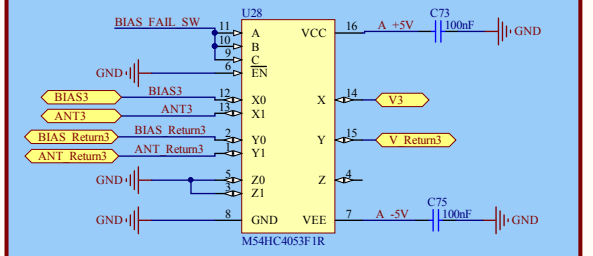
BIAS1/ANT1 Channel



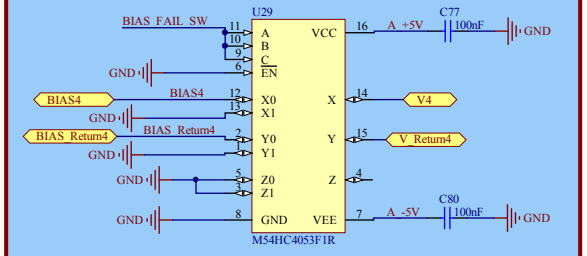
BIAS2/ANT2 Channel



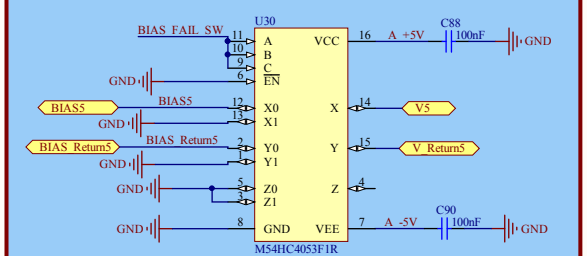
BIAS3/ANT3 Channel

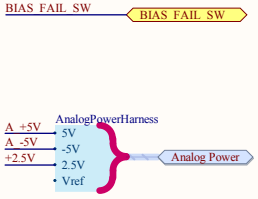


BIAS4 Channel



BIAS5 Channel





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Size: A3	Number: LFR-172200-FM	Revision: 01.08	
Date: 16/10/2014	Time: 20:25:33	Sheet 6 of 12	
Contact: alexis.jeandet@lpp.polytechnique.fr			
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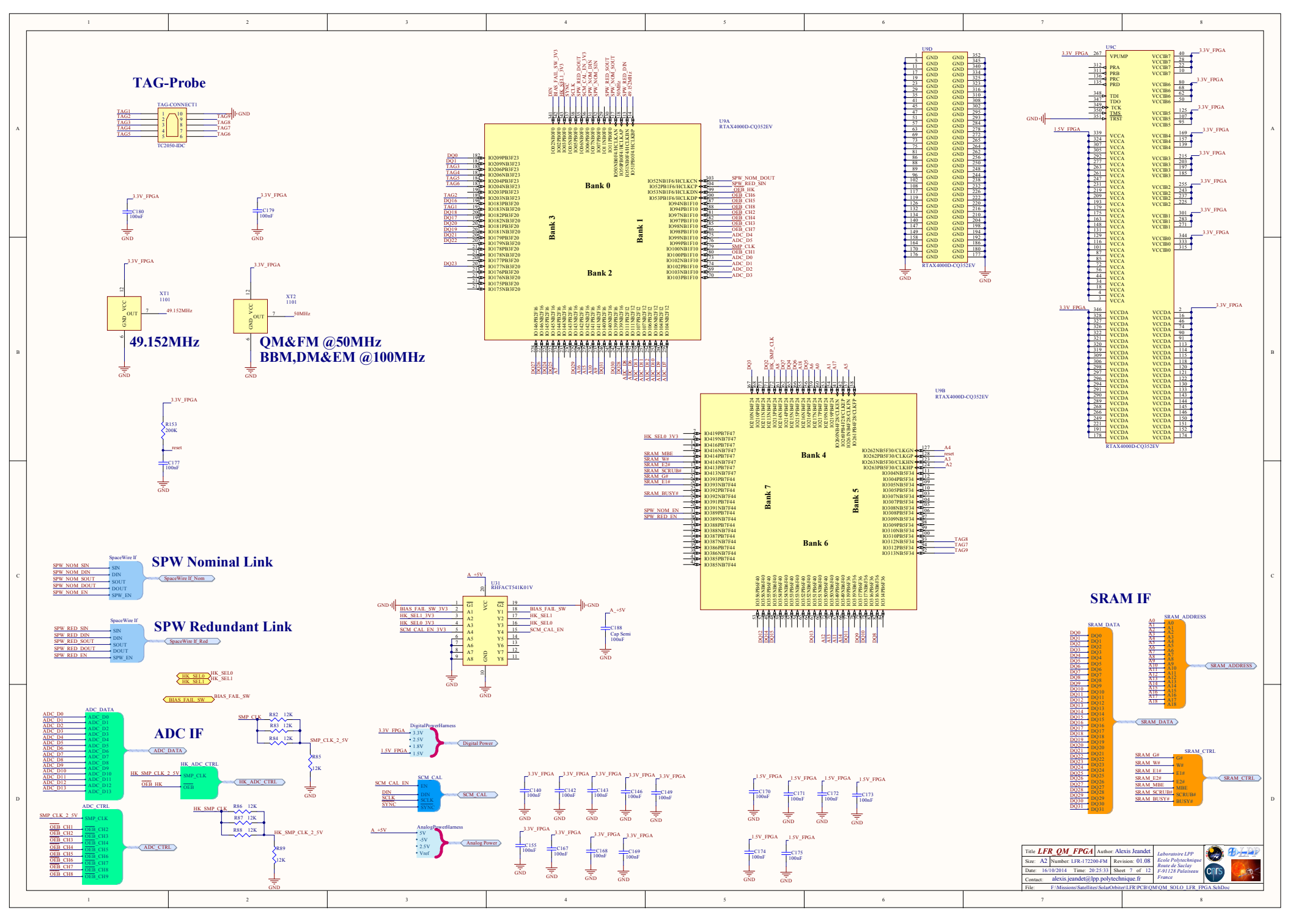
TAG-Probe
TAG-CONNECT1
TC2050-IDC
U9A
RTAX4000D-CQ352EV
Bank 0
Bank 1
Bank 2
Bank 3
U9D
U9C
U9B
Bank 4
Bank 5
Bank 6
Bank 7
XT1
1101
49.152MHz
XT2
1101
50MHz
49.152MHz
QM&FM @50MHz
BBM,DM&EM @100MHz
R153
200K
C177
100nF
reset
SPW Nominal Link
SPW Redundant Link
SpaceWire If
SpaceWire If_Nom
SpaceWire If_Red
ADC IF
ADC_DATA
ADC_CTRL
HK_ADC_CTRL
SMP_CLK_2_5V
HK_SMP_CLK_2_5V
DigitalPowerHarness
Digital Power
SCM_CAL
AnalogPowerHarness
Analog Power
U31
RHFACT541K01V
SRAM IF
SRAM_DATA
SRAM_ADDRESS
SRAM_CTRL
Title LFR_QM_FPGA
Author: Alexis Jeandet
Size: A2
Number: LFR-172200-FM
Revision: 01.08
Date: 16/10/2014
Time: 20:25:33
Sheet 7 of 12
Contact: alexis.jeandet@lpp.polytechnique.fr
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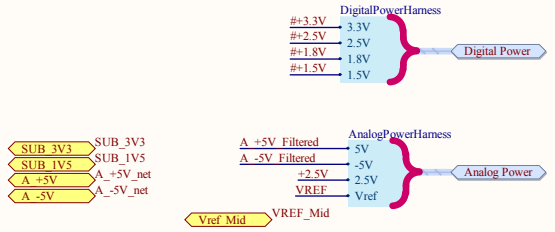
Characterization

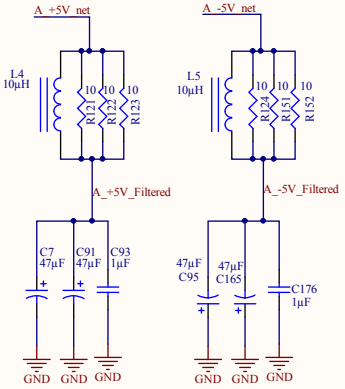
Power-Up Characterization

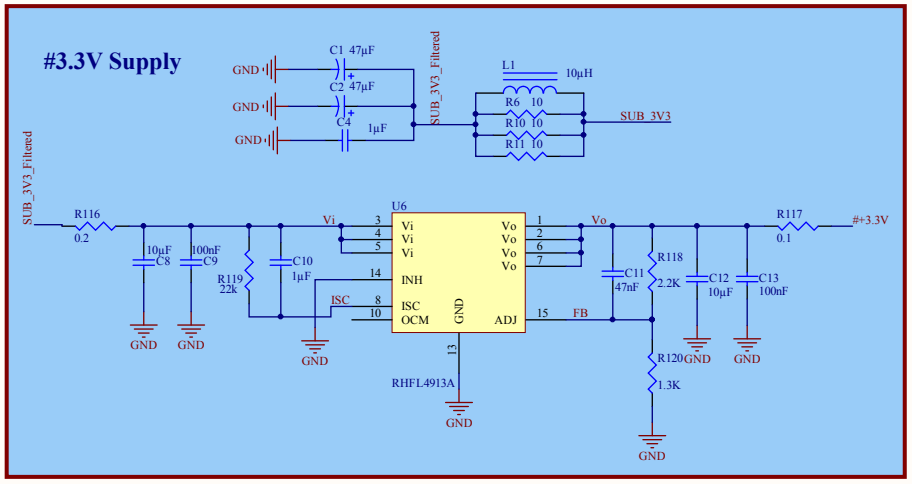
Power supplies for the RTAX-S/SL devices can power up in any sequence. Figure 1 and Figure 2 show the power-up characteristics for the different sequencing between VCCA (1.5 V) and VCCDA/VCCIBx (3.3 V). No significant transient current (>5 mA) is observed with either sequence.

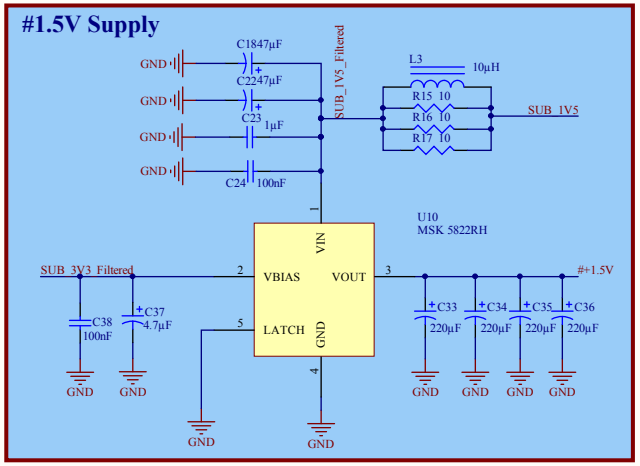
Uses Rev H for MSK5822 and MSK5810 regulators documentation!

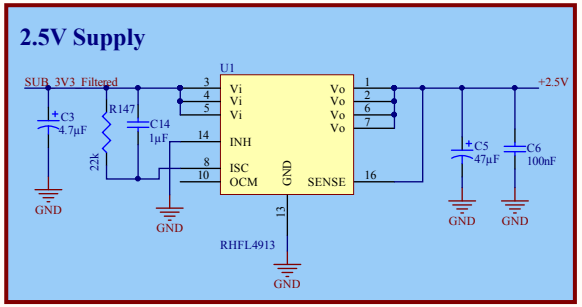
220uF => TAZ-H package
47uF => TAZ-H package
4.7uF => TAJ-B package

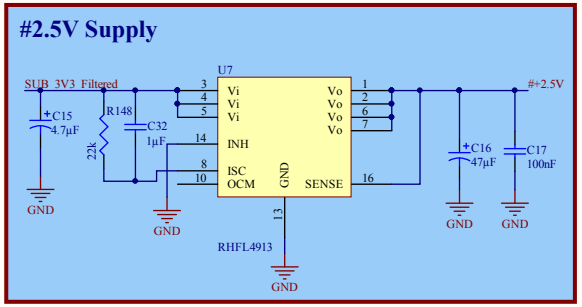


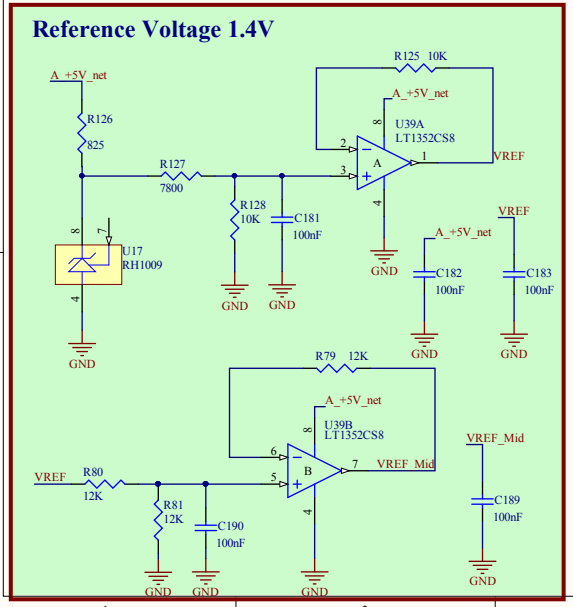


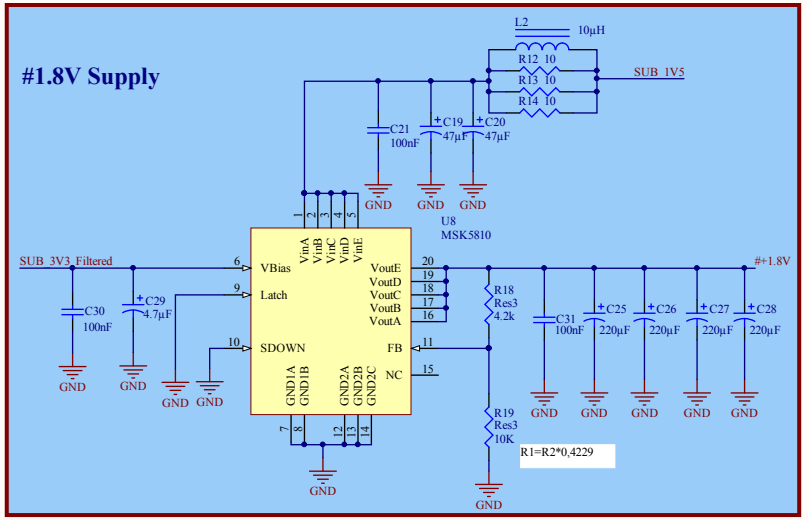












Title	*LFR_QM_PWR*	Author:	Alexis Jeandet
Size:	A3	Number: LFR-172200-FM	Revision: 01.08
Date:	16/10/2014	Time: 20:25:33	Sheet 8 of 12
Contact:	alexis.jeandet@lpp.polytechnique.fr		
File:	F:\Missions\Satellites\SolarOrbiter\LFR\PCB\QM\QM_SOLO_LFR_POWER_REG.SchDoc		

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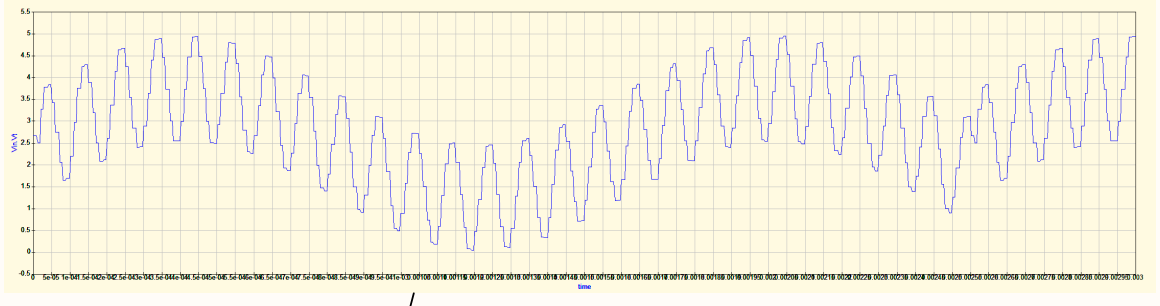
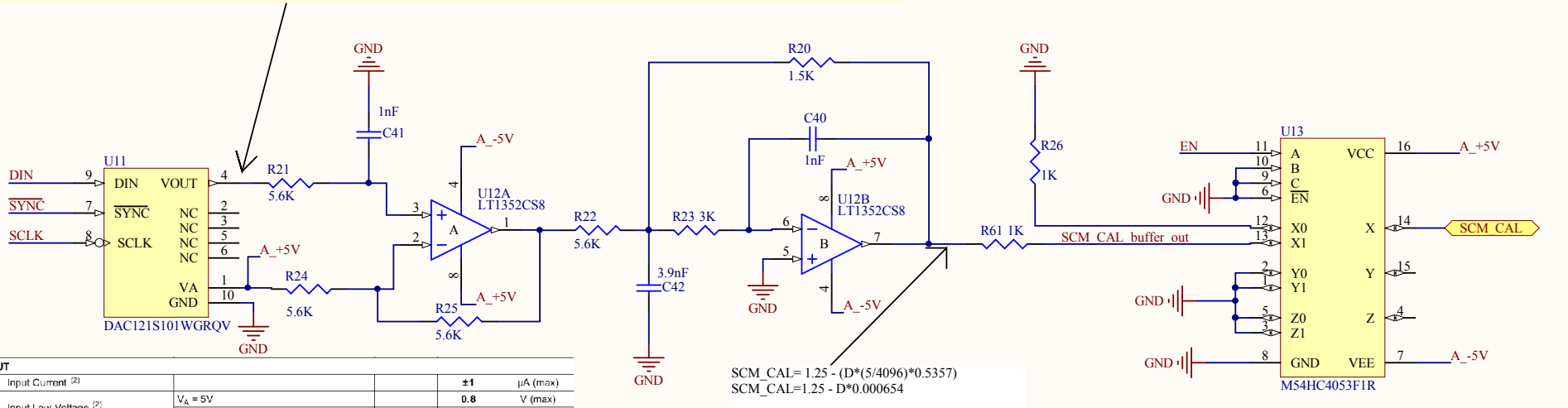
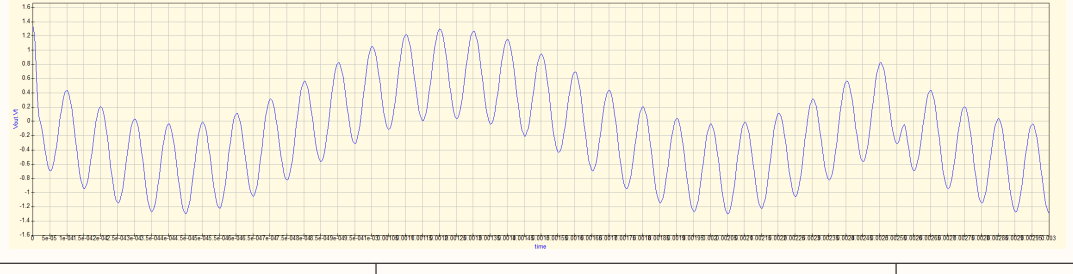
REQ-RPW-LFR-4706 LFR shall deliver a calibration signal to the SCM. This signal will be the sum of two sinus waves, at different frequencies f1 = 625 Hz and f2 = 10 kHz, with amplitudes of 500 mVpp, a sampling frequency of [TBD], a resolution of 8 bits and a duration of 4 s.
When not used, the calibration signal will be tied to ground (TBC) via an analog switch.





LOGIC INPUT					
I_{IN}	Input Current [2]			±1	µA (max)
V_{IL}	Input Low Voltage [2]	V_A = 5V		0.8	V (max)
		V_A = 3V		0.5	V (max)
V_{IH}	Input High Voltage [2]	V_A = 5V		2.4	V (min)
		V_A = 3V		2.1	V (min)
C_{IN}	Input Capacitance [2]			3	pF (max)



Title	LFR_QM_CAL	Author:	Alexis Jeandet
Size:	A4	Number: LFR-172200-FM	Revision: 01.08
Date:	16/10/2014	Time: 20:25:33	Sheet 9 of 12
Contact:	alexis.jeandet@lpp.polytechnique.fr		
File:	F:\Missions\Satellites\SolarOrbiter\LFR\PCB\QM\QM_SOLO_LFR_SCM_CAL.SchDoc		

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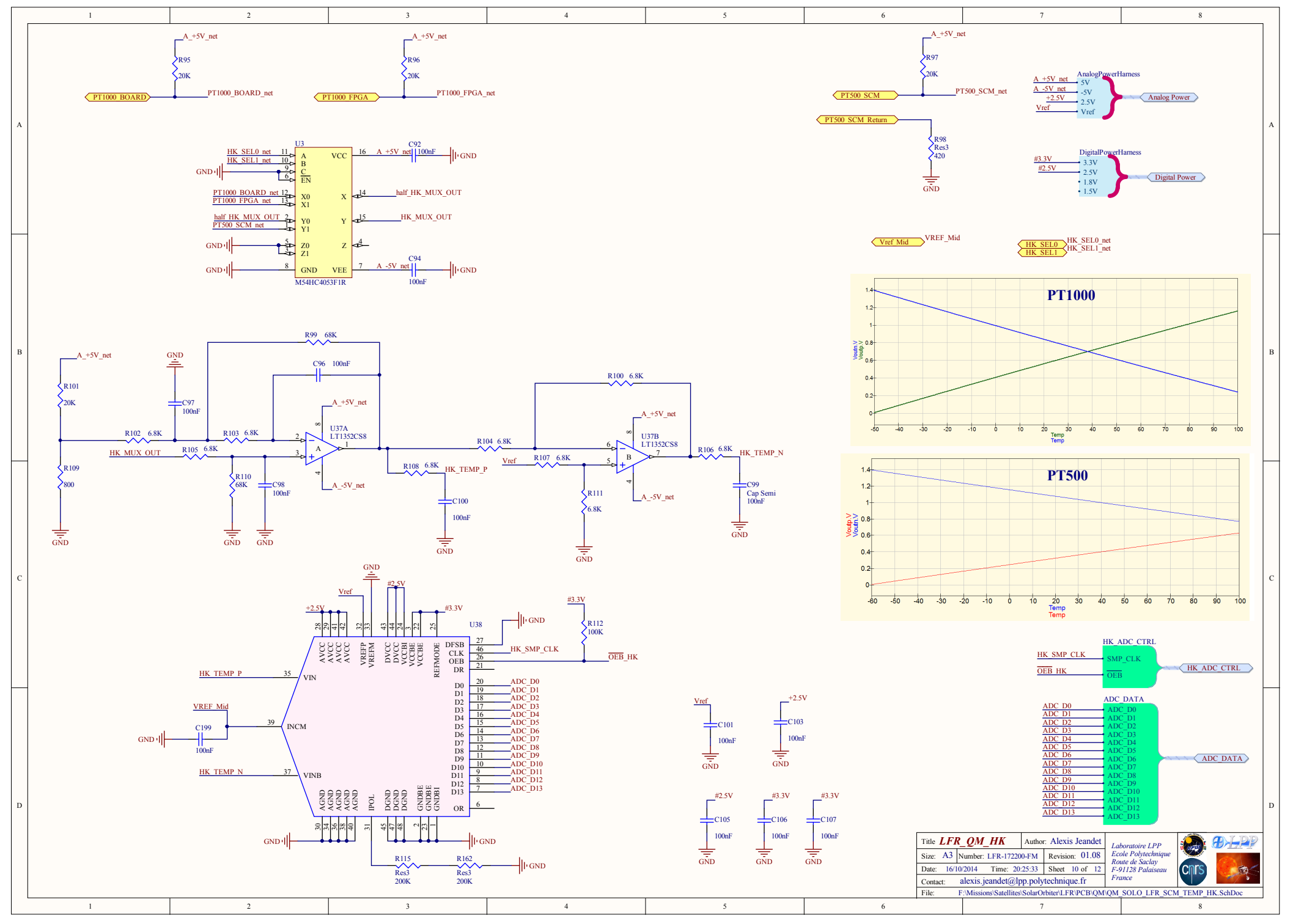
A_+5V_net
R95
20K
PT1000_BOARD
PT1000_BOARD_net
R96
PT1000_FPGA
PT1000_FPGA_net
R97
PT500_SCM
PT500_SCM_net
PT500_SCM_Return
R98
Res3
420
GND
AnalogPowerHarness
A_+5V_net
A_-5V_net
+2.5V
Vref
5V
-5V
2.5V
Vref
Analog Power
DigitalPowerHarness
#3.3V
#2.5V
3.3V
2.5V
1.8V
1.5V
Digital Power
U3
HK_SEL0_net
HK_SEL1_net
PT1000_BOARD_net
PT1000_FPGA_net
half_HK_MUX_OUT
PT500_SCM_net
HK_MUX_OUT
C92
100nF
C94
100nF
M54HC4053F1R
Vref_Mid
VREF_Mid
HK_SEL0
HK_SEL1
HK_SEL0_net
HK_SEL1_net
PT1000
PT500
Voutn V
Voutp V
Temp
R99 68K
C96 100nF
R100 6.8K
R101
20K
C97
100nF
R102 6.8K
R103 6.8K
R104 6.8K
R105 6.8K
R106 6.8K
R107 6.8K
R108 6.8K
R109
800
R110
68K
C98
100nF
C99
Cap Semi
100nF
C100
100nF
R111
6.8K
U37A
LT1352CS8
U37B
LT1352CS8
HK_MUX_OUT
HK_TEMP_P
HK_TEMP_N
Vref
U38
HK_SMP_CLK
OEB_HK
R112
100K
HK_TEMP_P
HK_TEMP_N
VREF_Mid
C199
100nF
VIN
INCM
VINB
IPOL
ADC_D0
ADC_D1
ADC_D2
ADC_D3
ADC_D4
ADC_D5
ADC_D6
ADC_D7
ADC_D8
ADC_D9
ADC_D10
ADC_D11
ADC_D12
ADC_D13
C101
C103
C105
C106
C107
Res3
200K
R115
R162
HK_ADC_CTRL
SMP_CLK
OEB
ADC_DATA
Title LFR_QM_HK
Author: Alexis Jeandet
Size: A3
Number: LFR-172200-FM
Revision: 01.08
Date: 16/10/2014
Time: 20:25:33
Sheet 10 of 12
Contact: alexis.jeandet@lpp.polytechnique.fr
File: F:\Missions\Satellites\SolarOrbiter\LFR\PCB\QM\QM_SOLO_LFR_SCM_TEMP_HK.SchDoc
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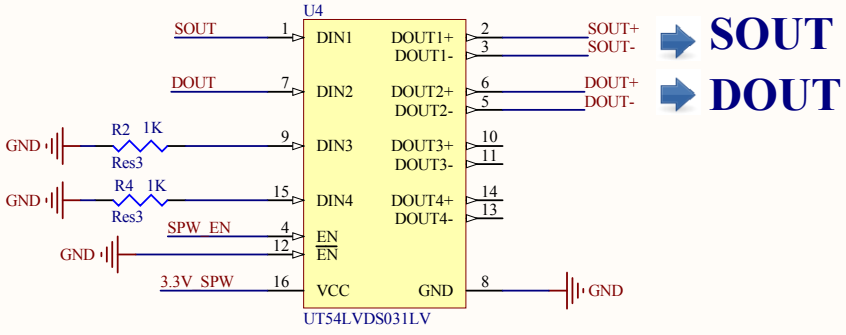

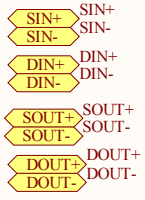

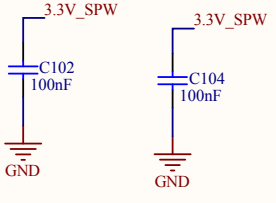

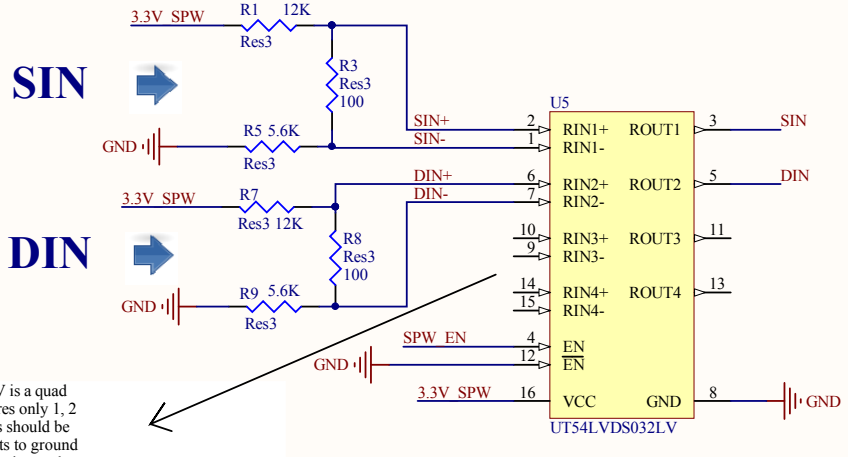

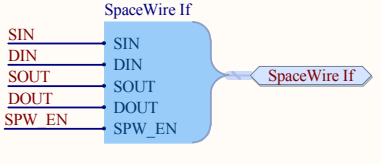

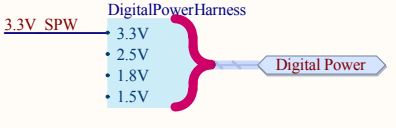

1. Open Input Pins. The UT54LVDS032LV is a quad receiver device, and if an application requires only 1, 2 or 3 receivers, the unused channel(s) inputs should be left OPEN. Do not tie unused receiver inputs to ground or any other voltages. The input is biased by internal high value pull up and pull down resistors to set the output to a HIGH state. This internal circuitry will guarantee a HIGH, stable output state for open inputs.

cf :http://www.aeroflex.com/ams/pagesproduct/datasheets/LVDSReceiver3v.pdf

Title: *LFR_QM_SPW*		Author: Alexis Jeandet	
Size: A4	Number: LFR-172200-FM		Revision: 01.08
Date: 16/10/2014	Time: 20:25:33		Sheet 11 of 12
Contact: alexis.jeandet@lpp.polytechnique.fr			
File: F:\Missions\Satellites\SolarOrbiter\LFR\PCB\QM\QM_SOLO_LFR_SPW_IF.SchDoc			

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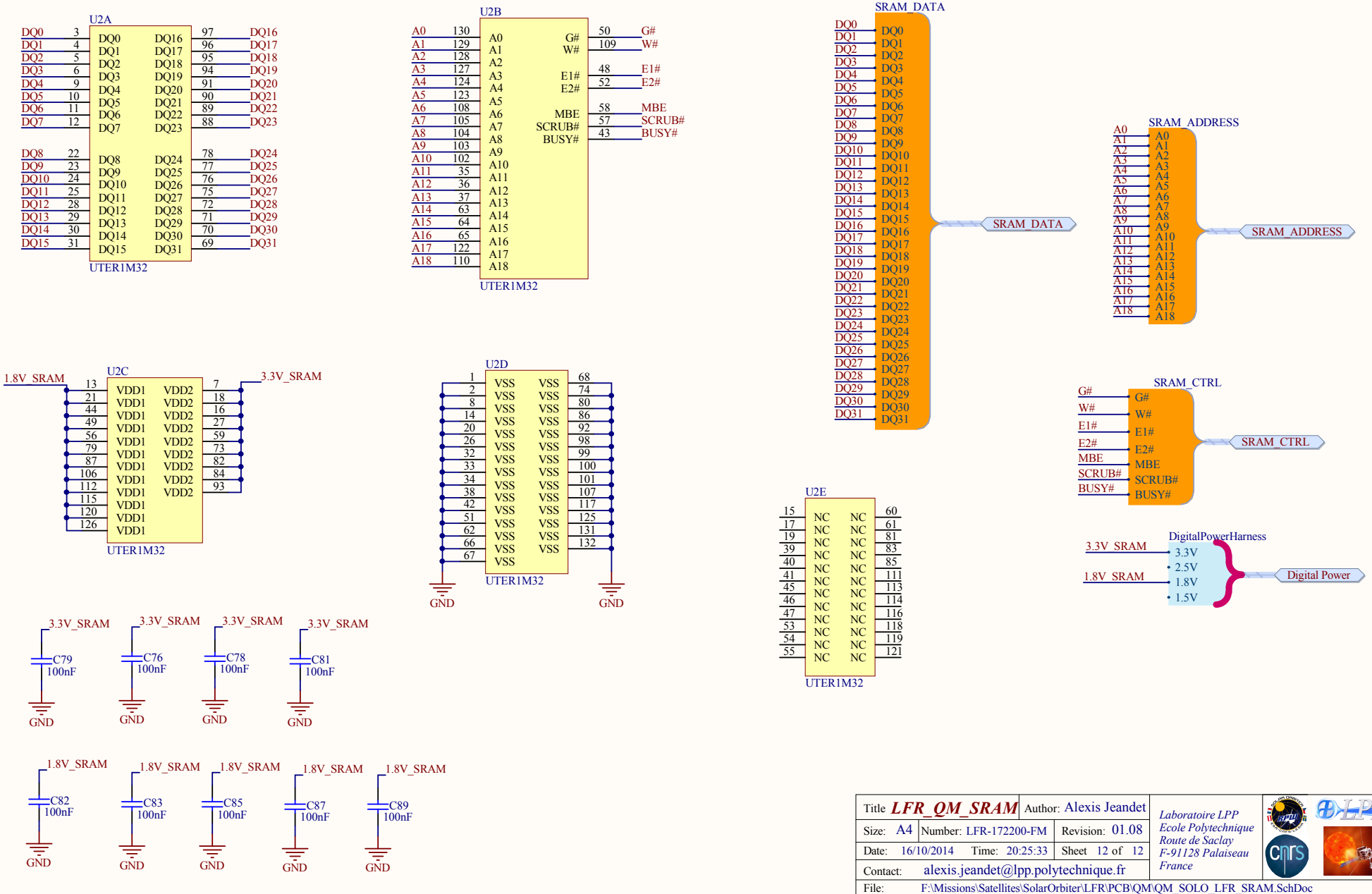

Title	*LFR_QM_SRAM*	Author: Alexis Jeandet	
Size: A4	Number: LFR-172200-FM	Revision: 01.08	
Date: 16/10/2014	Time: 20:25:33	Sheet 12 of 12	
Contact:	alexis.jeandet@lpp.polytechnique.fr		
File:	F:\Missions\Satellites\SolarOrbiter\LFR\PCB\QM\QM_SOLO_LFR_SRAM.SchDoc		

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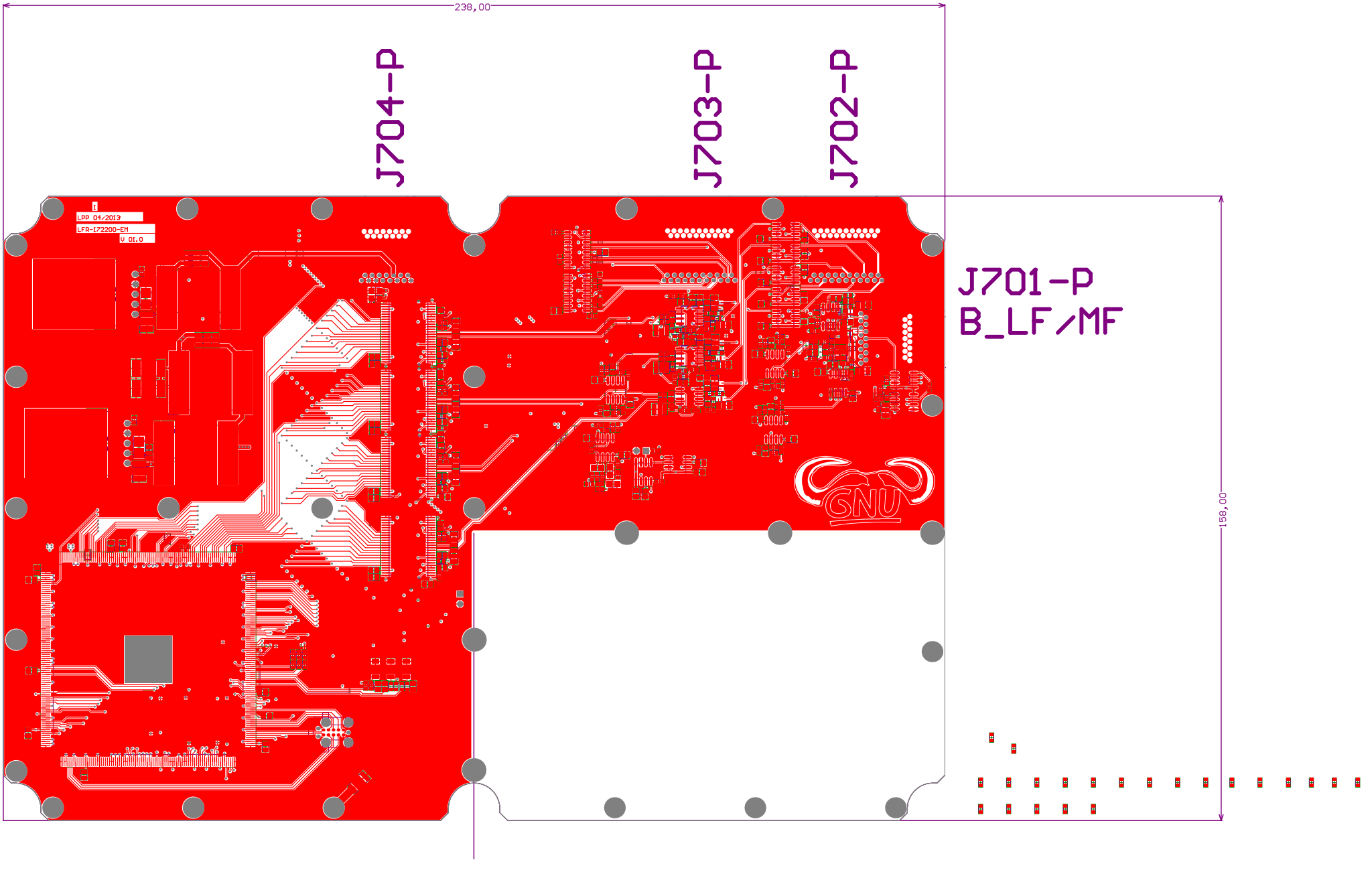
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J704-P
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J702-P
J701-P
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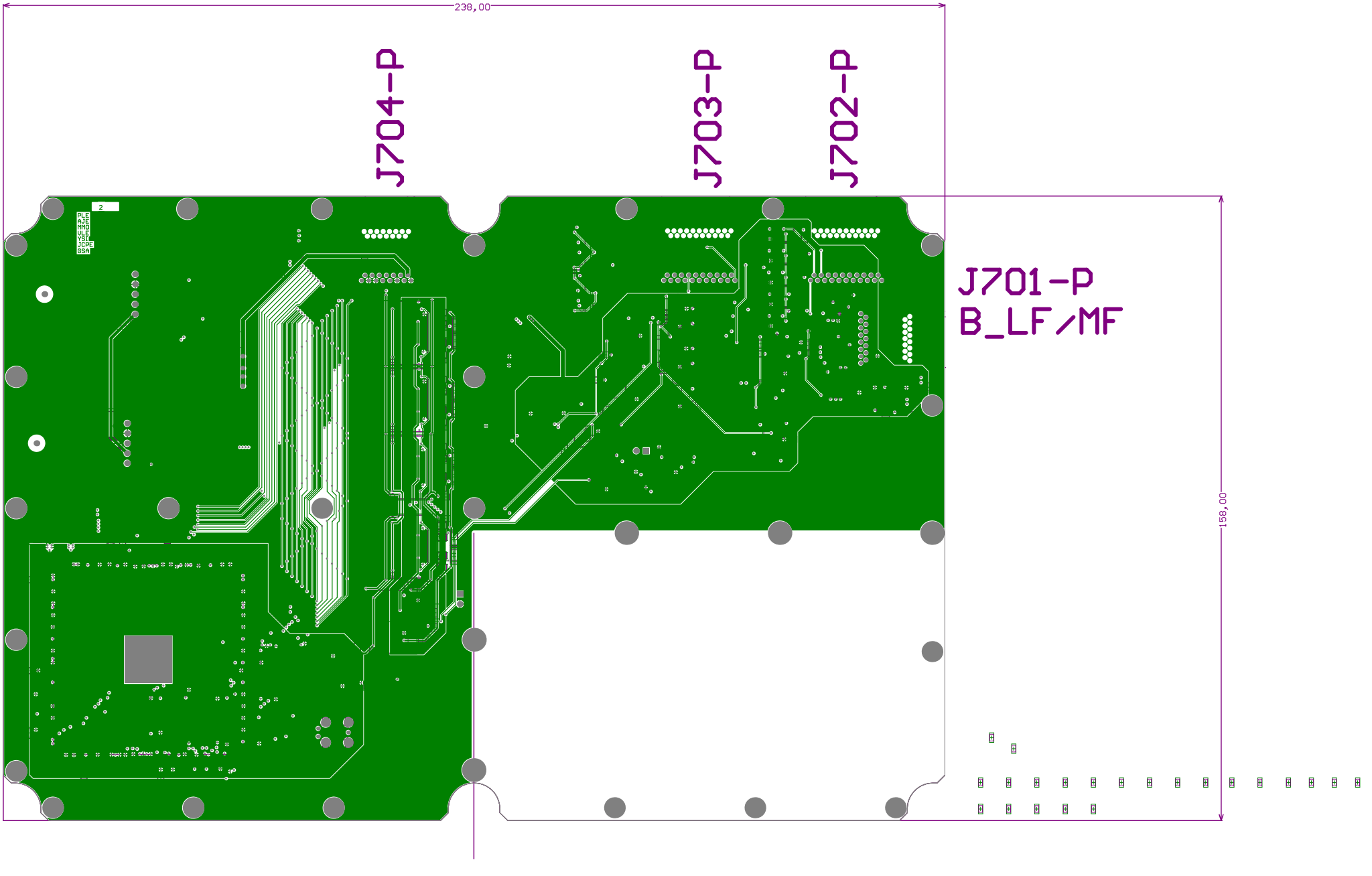
LPP 04/2013
LFR-172200-EM
V 01.0
GNU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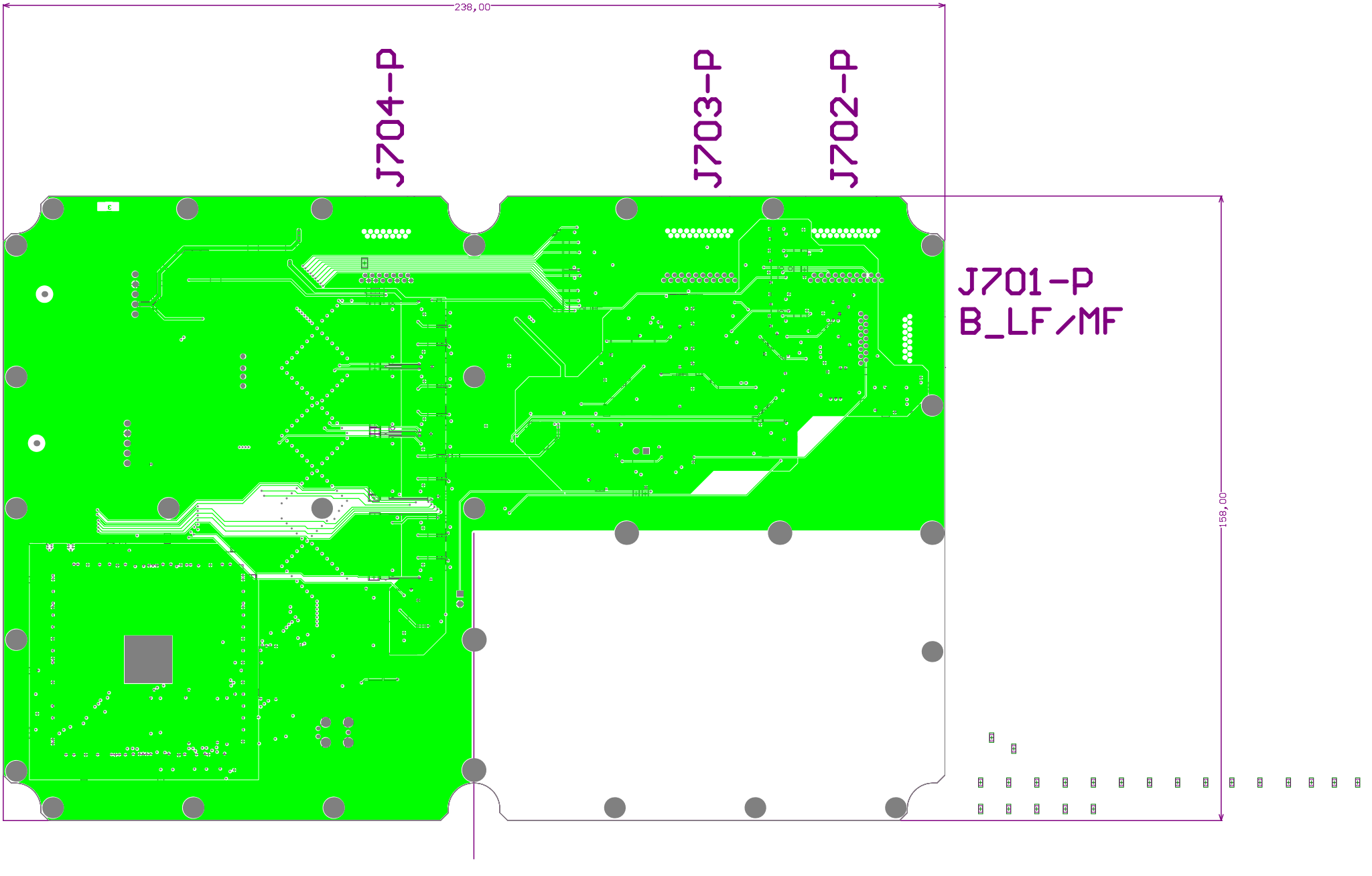
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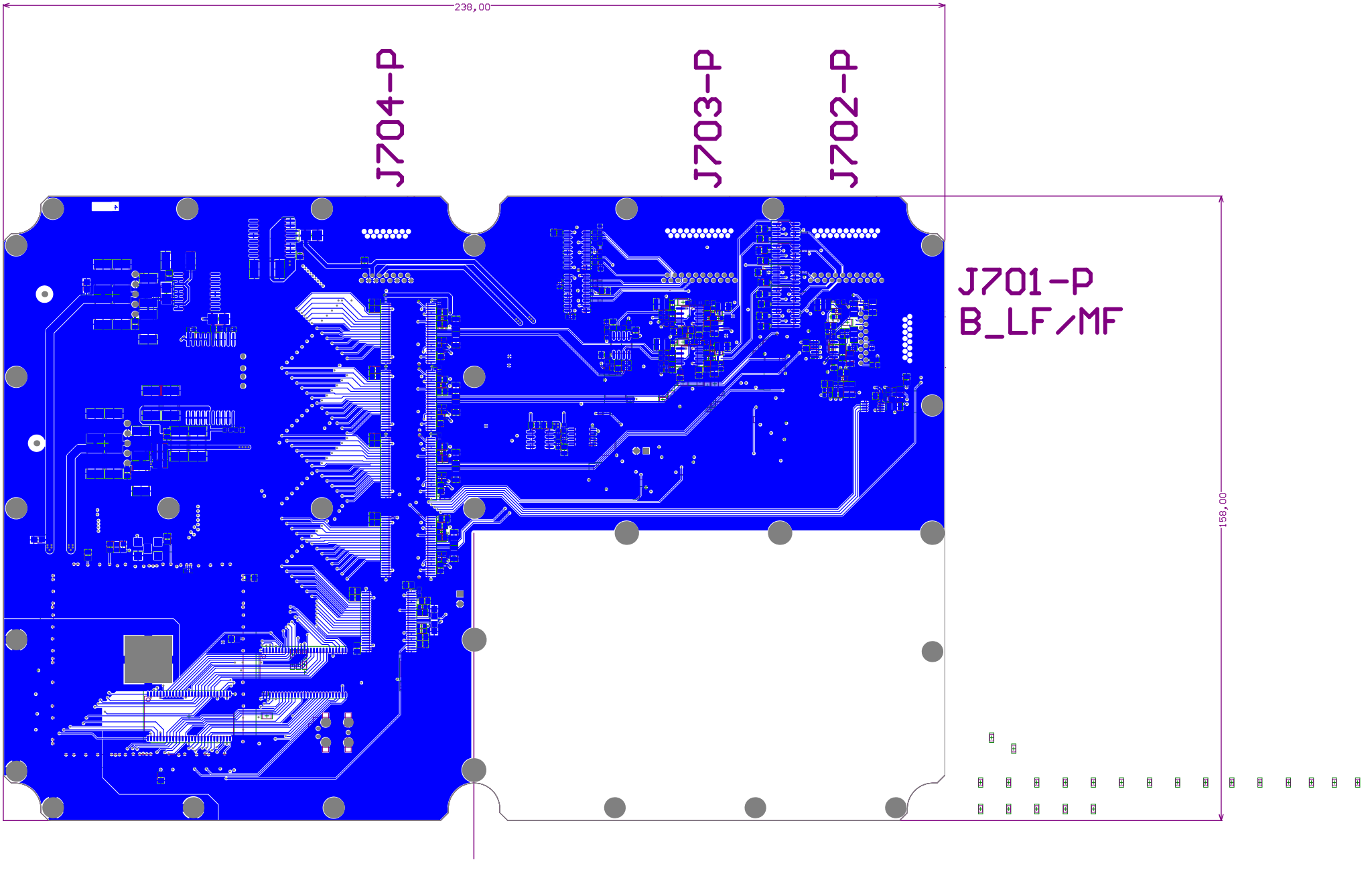
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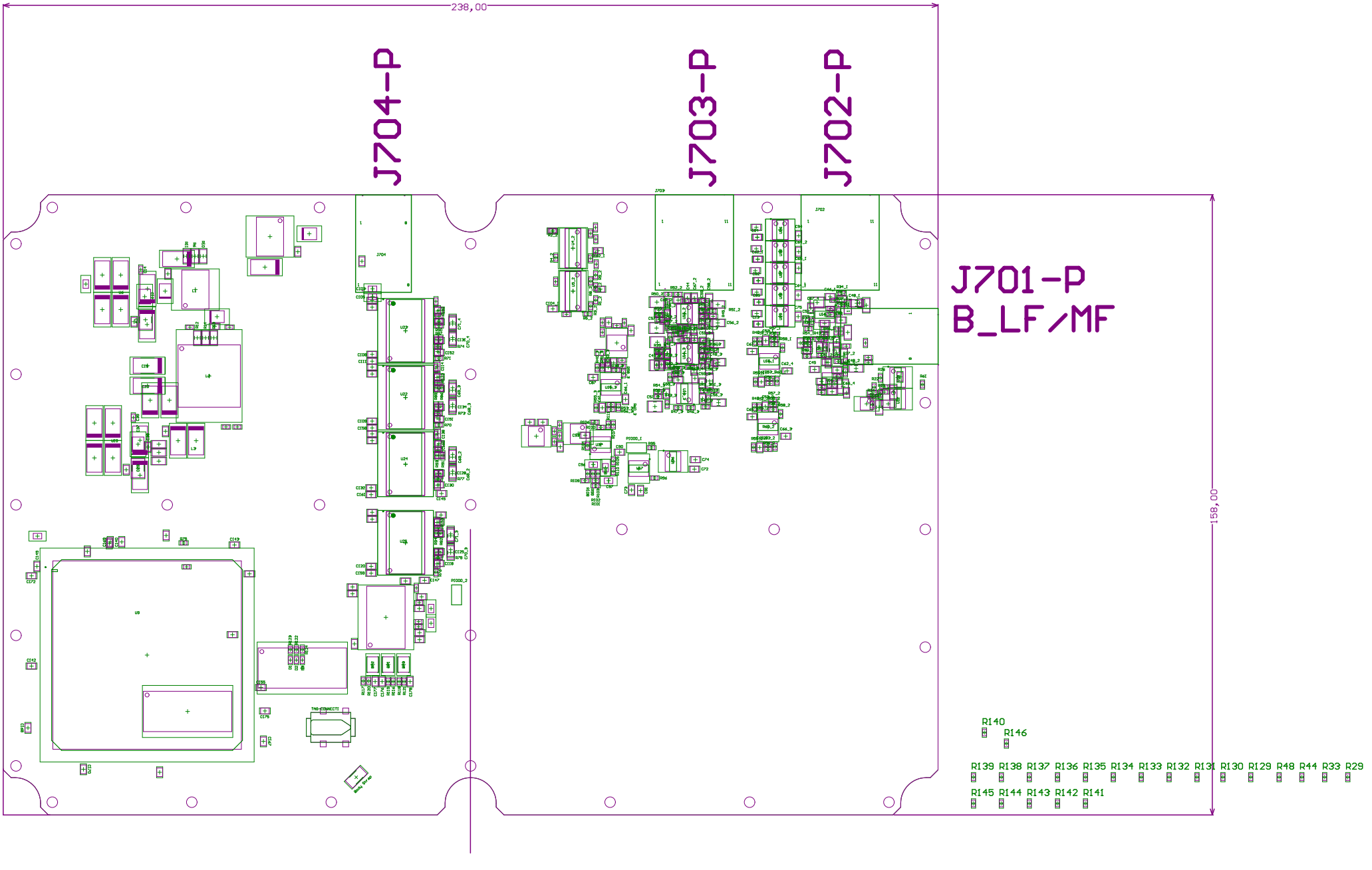
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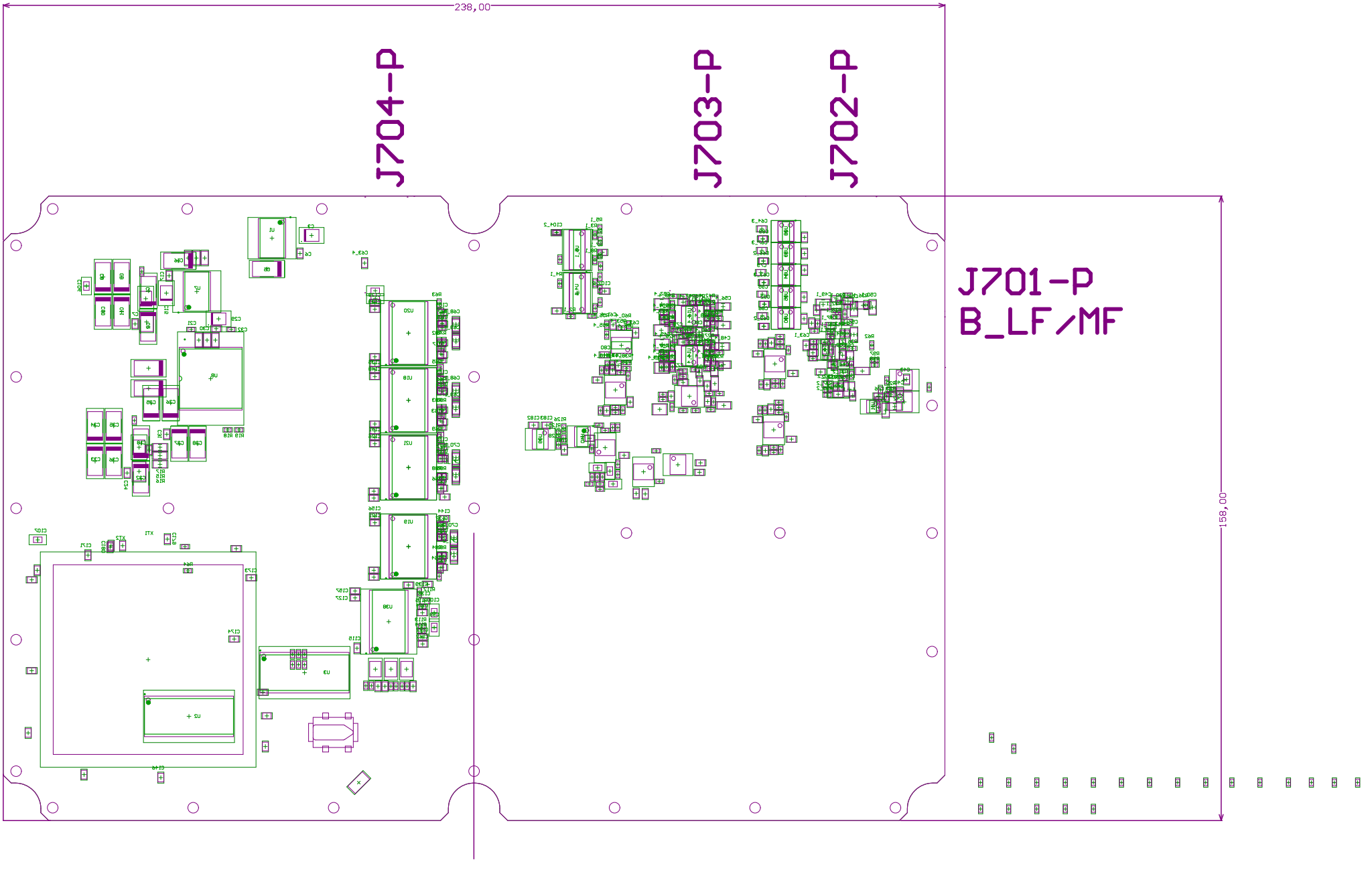
R140
R146
R139 R138 R137 R136 R135 R134 R133 R132 R131 R130 R129 R48 R44 R33 R29
R145 R144 R143 R142 R141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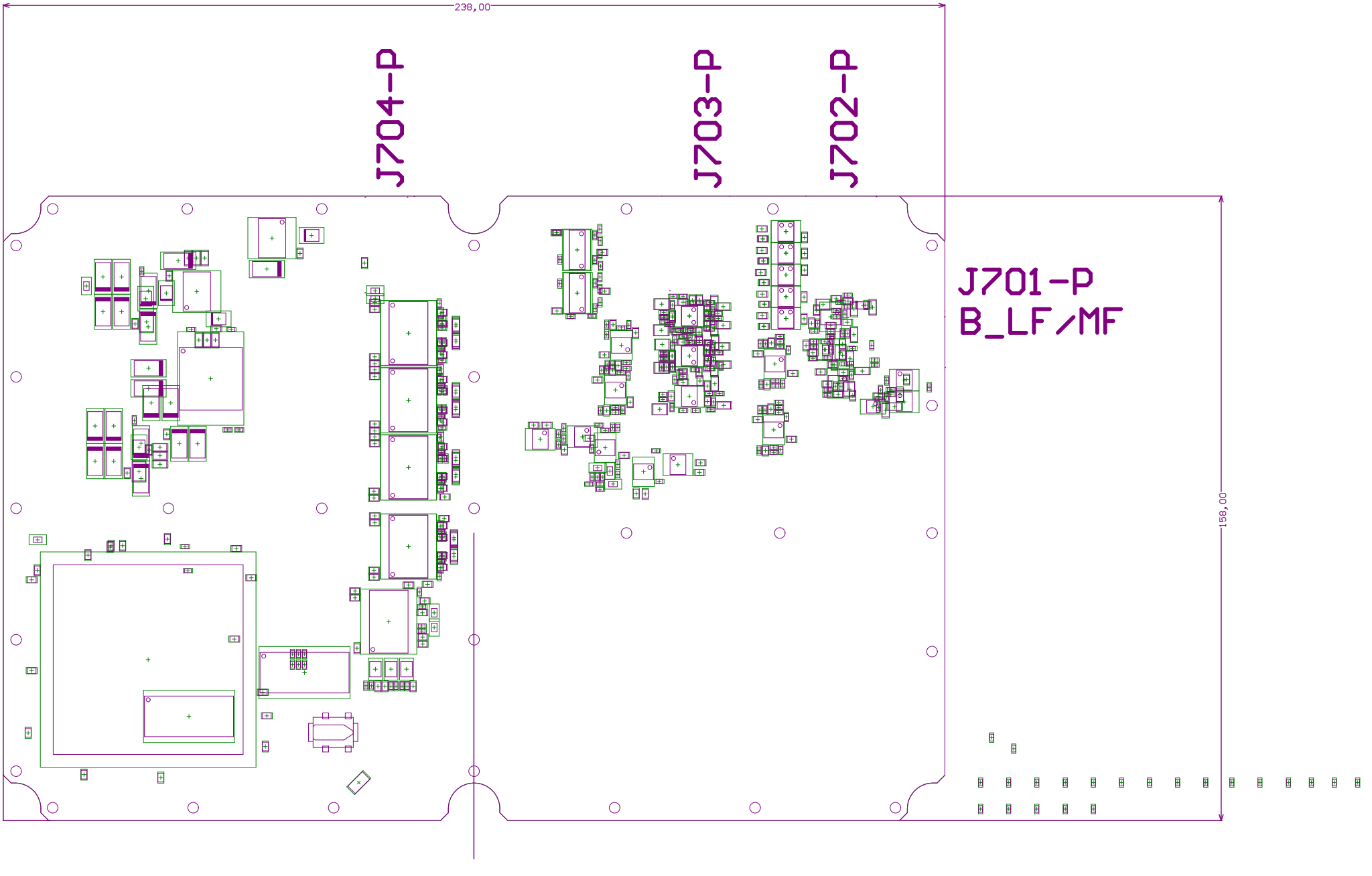
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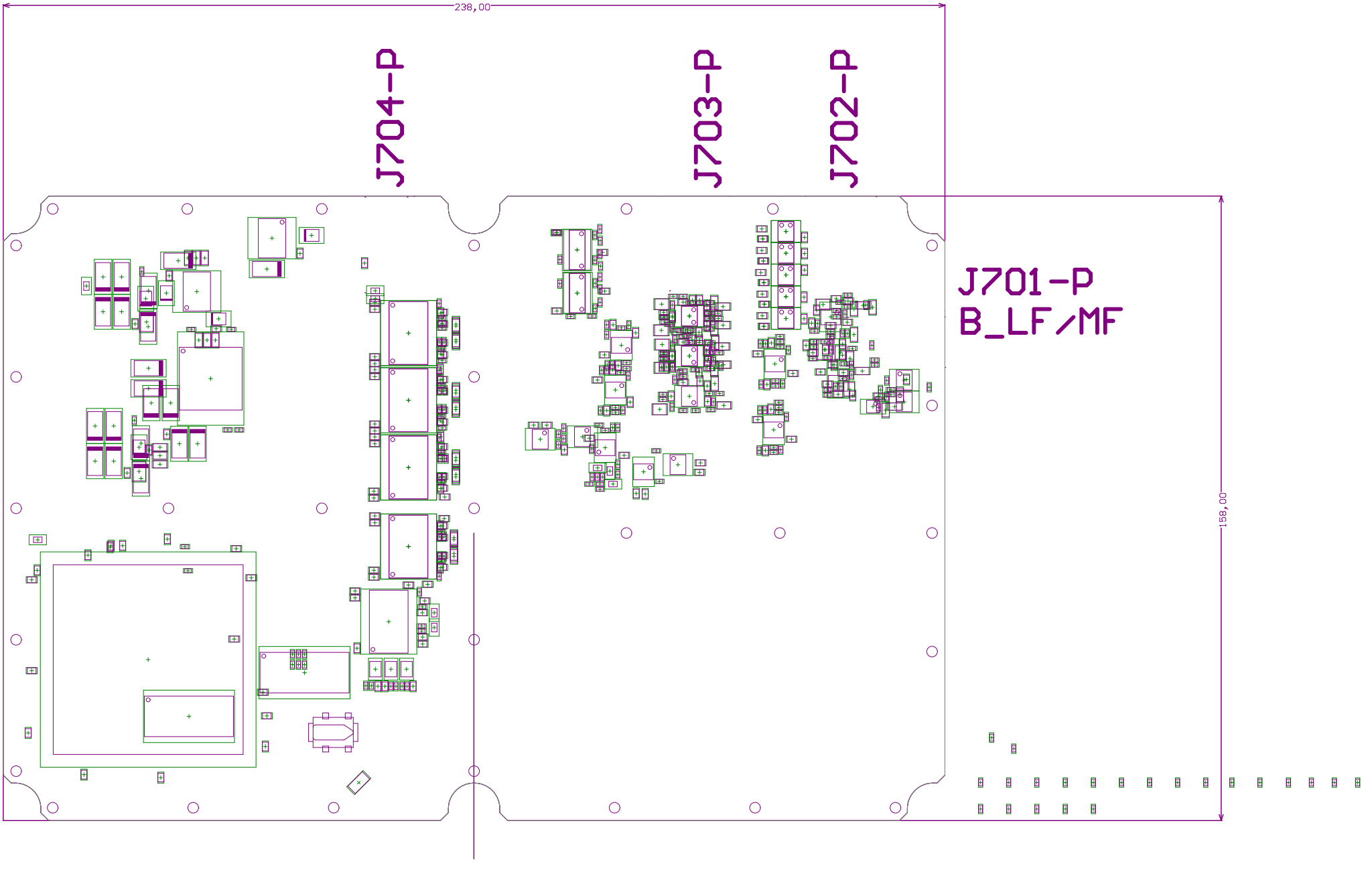
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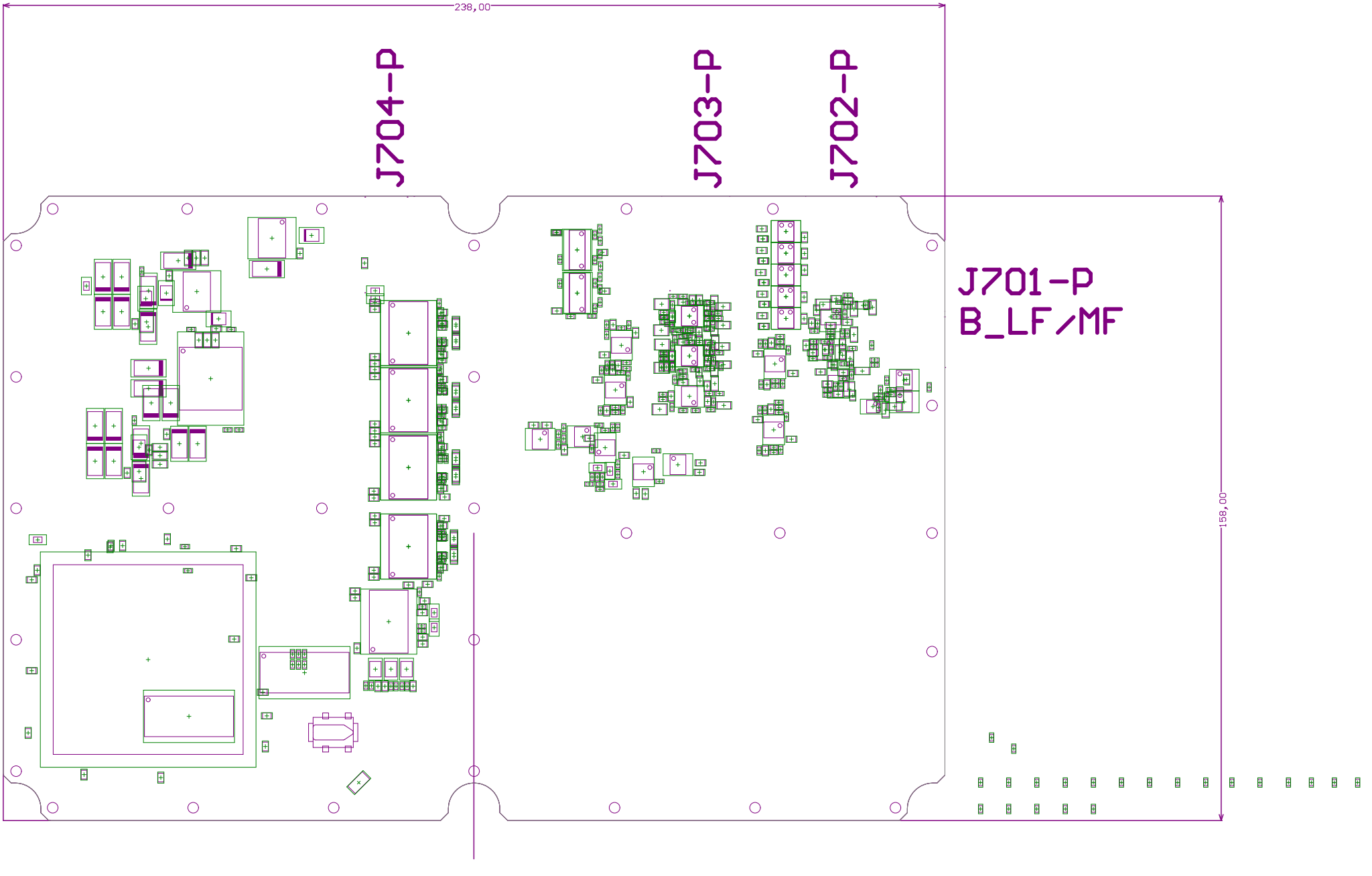
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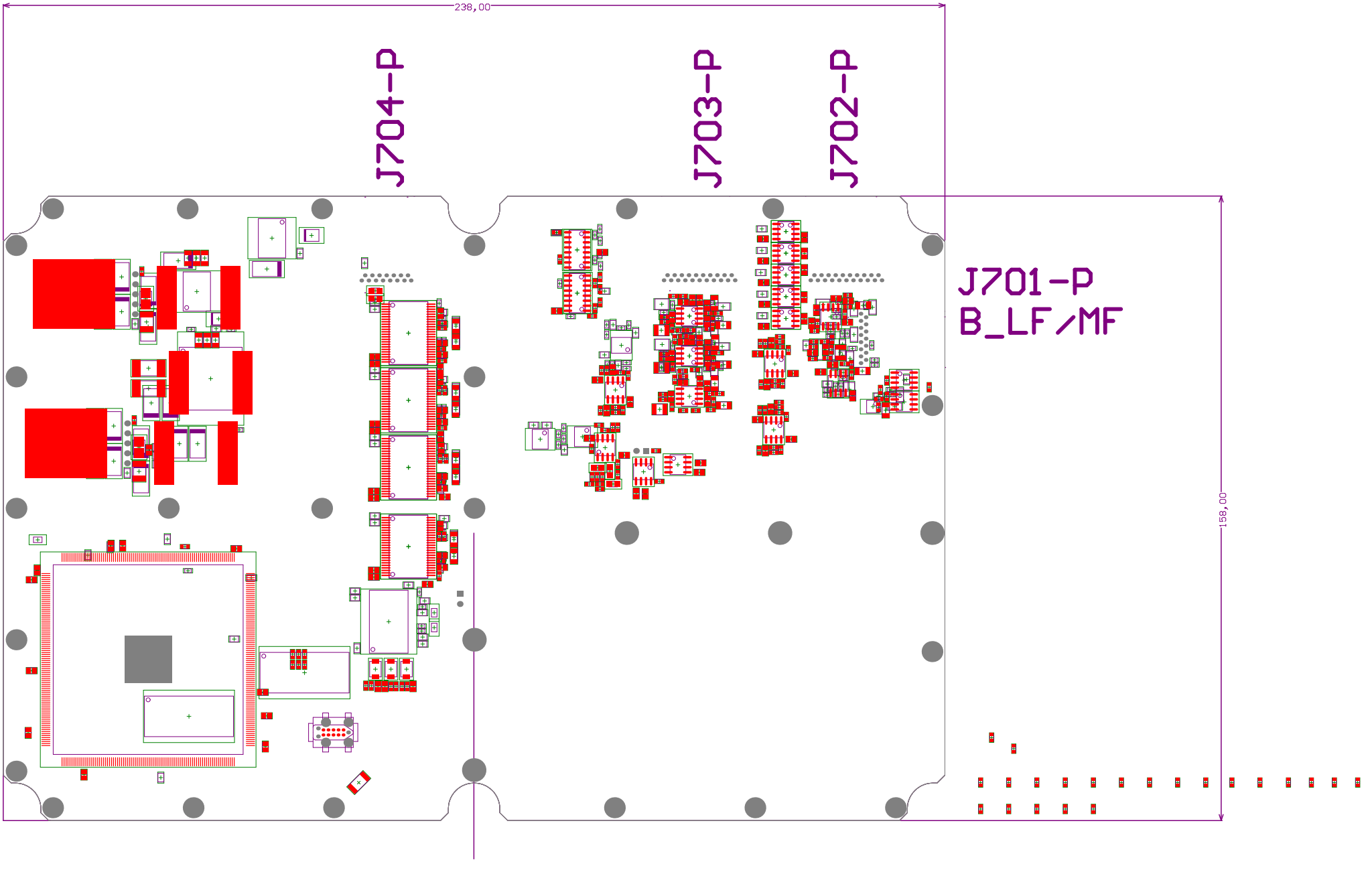
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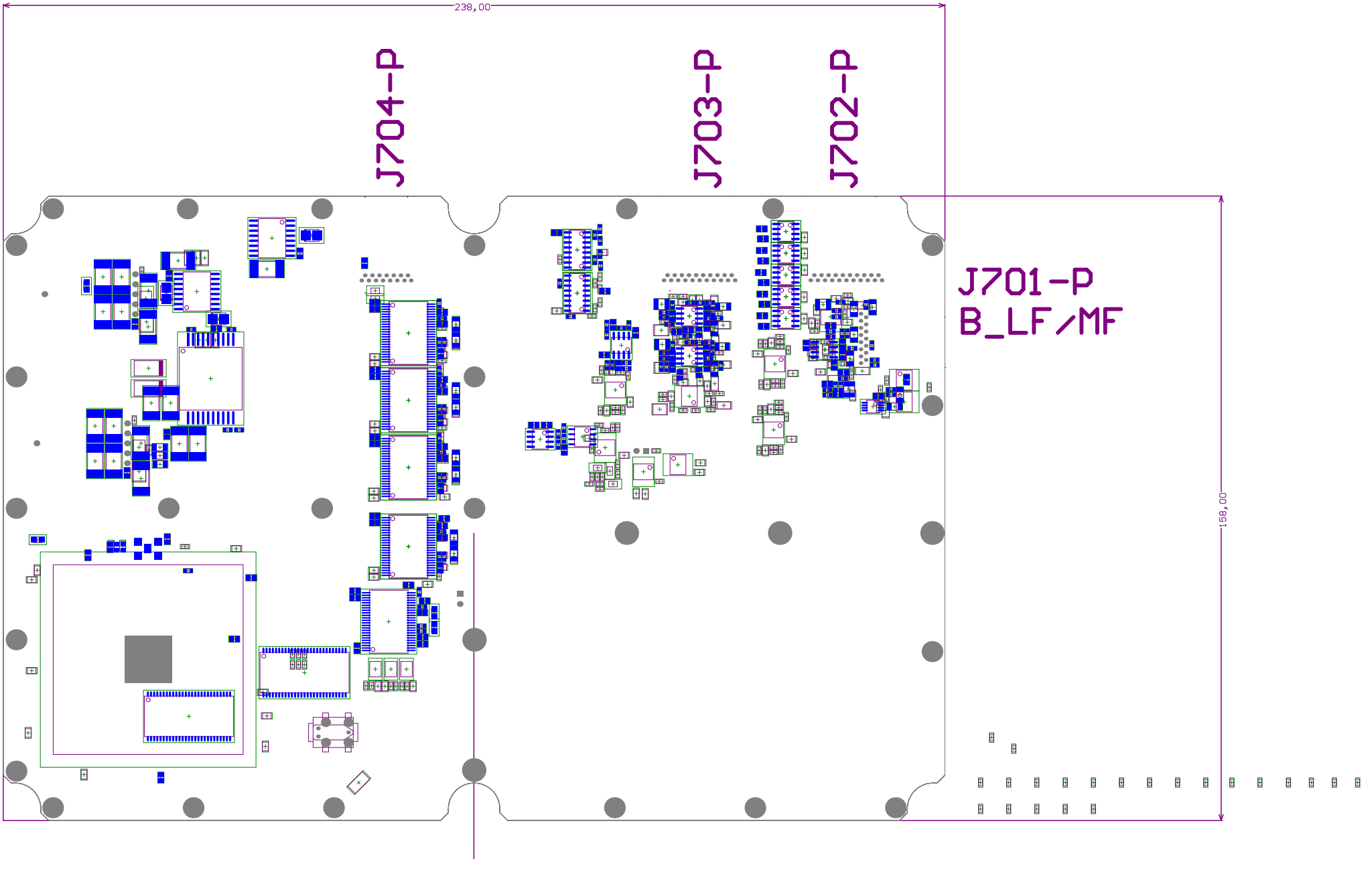
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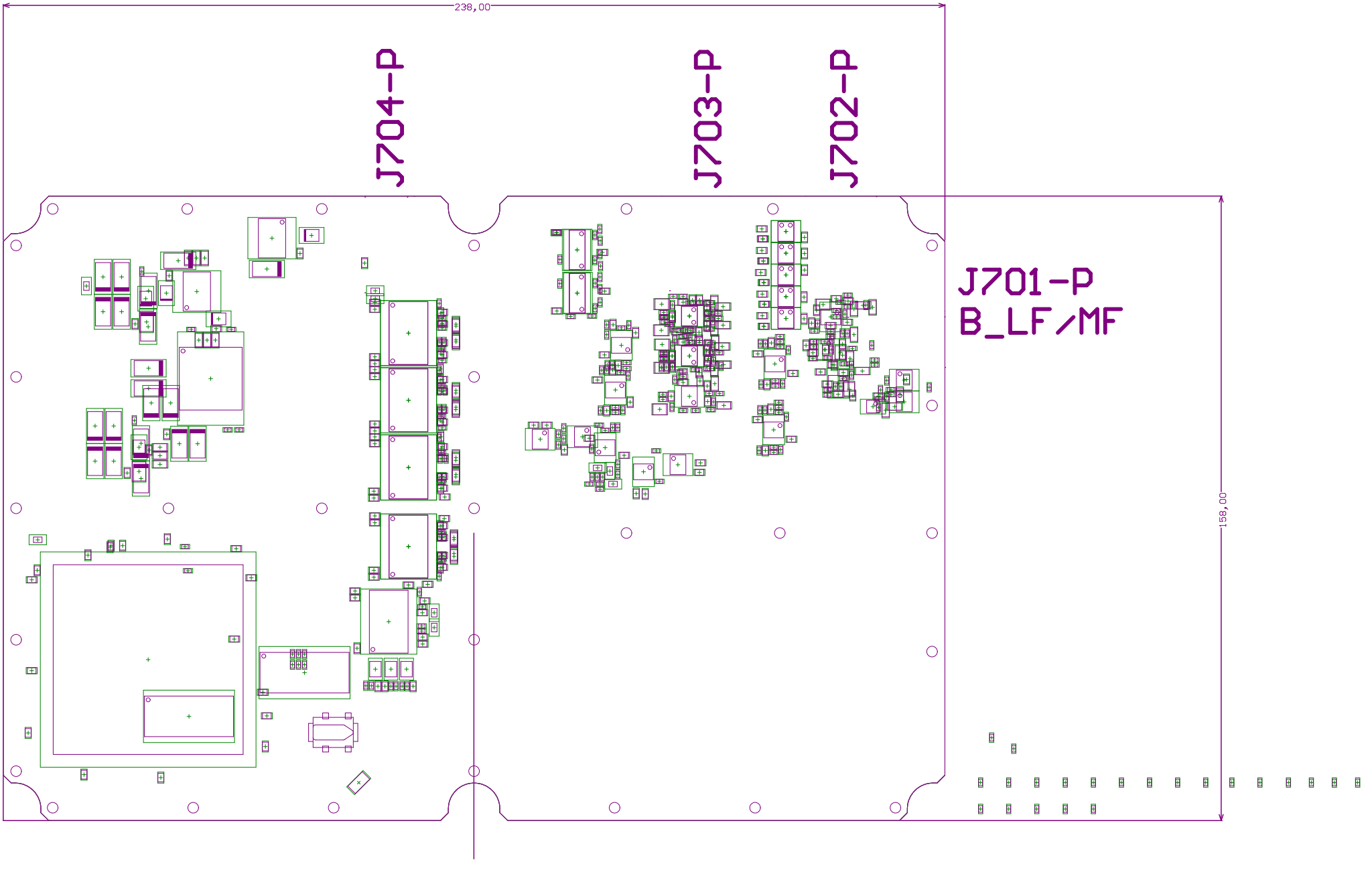
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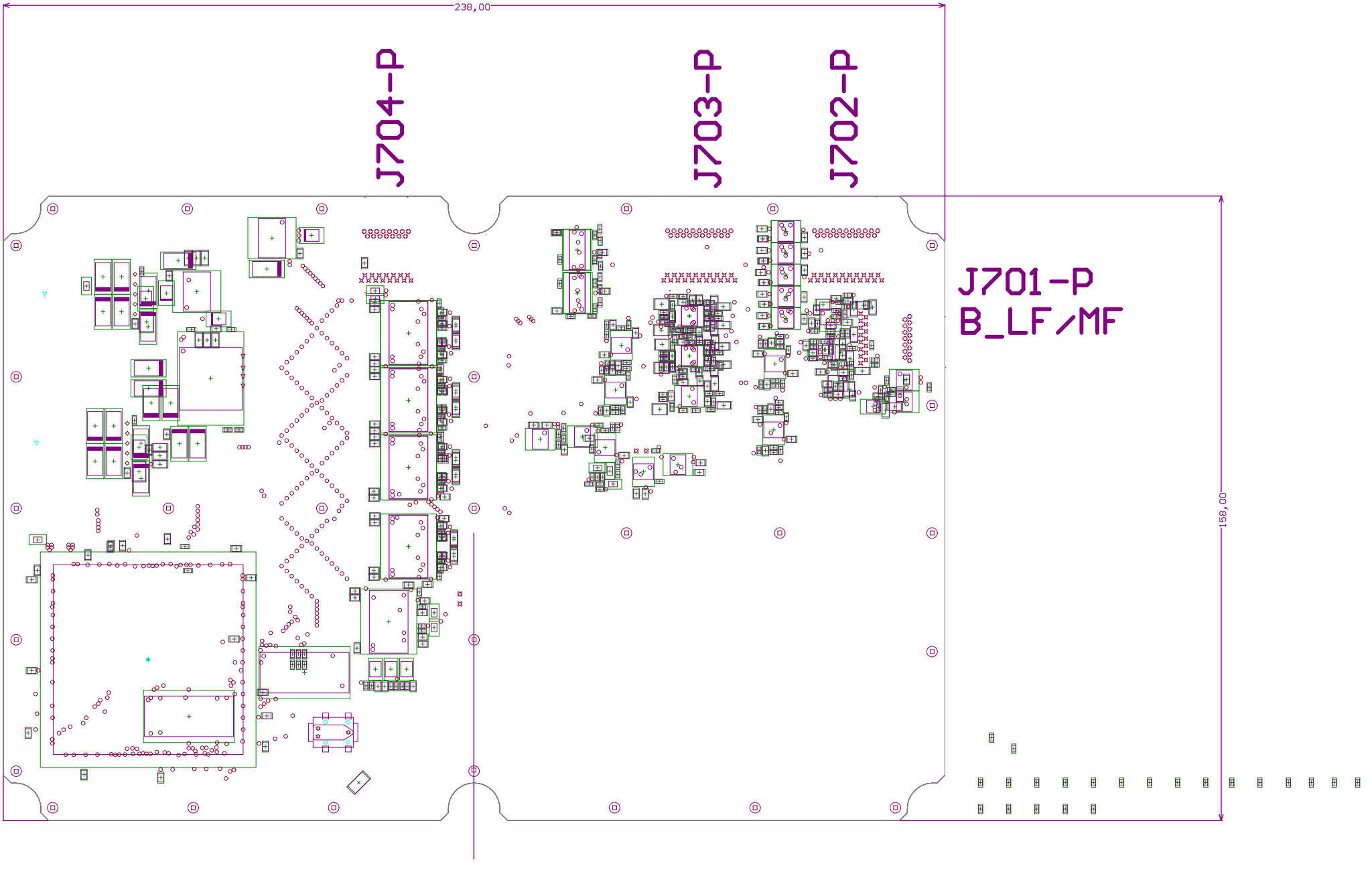
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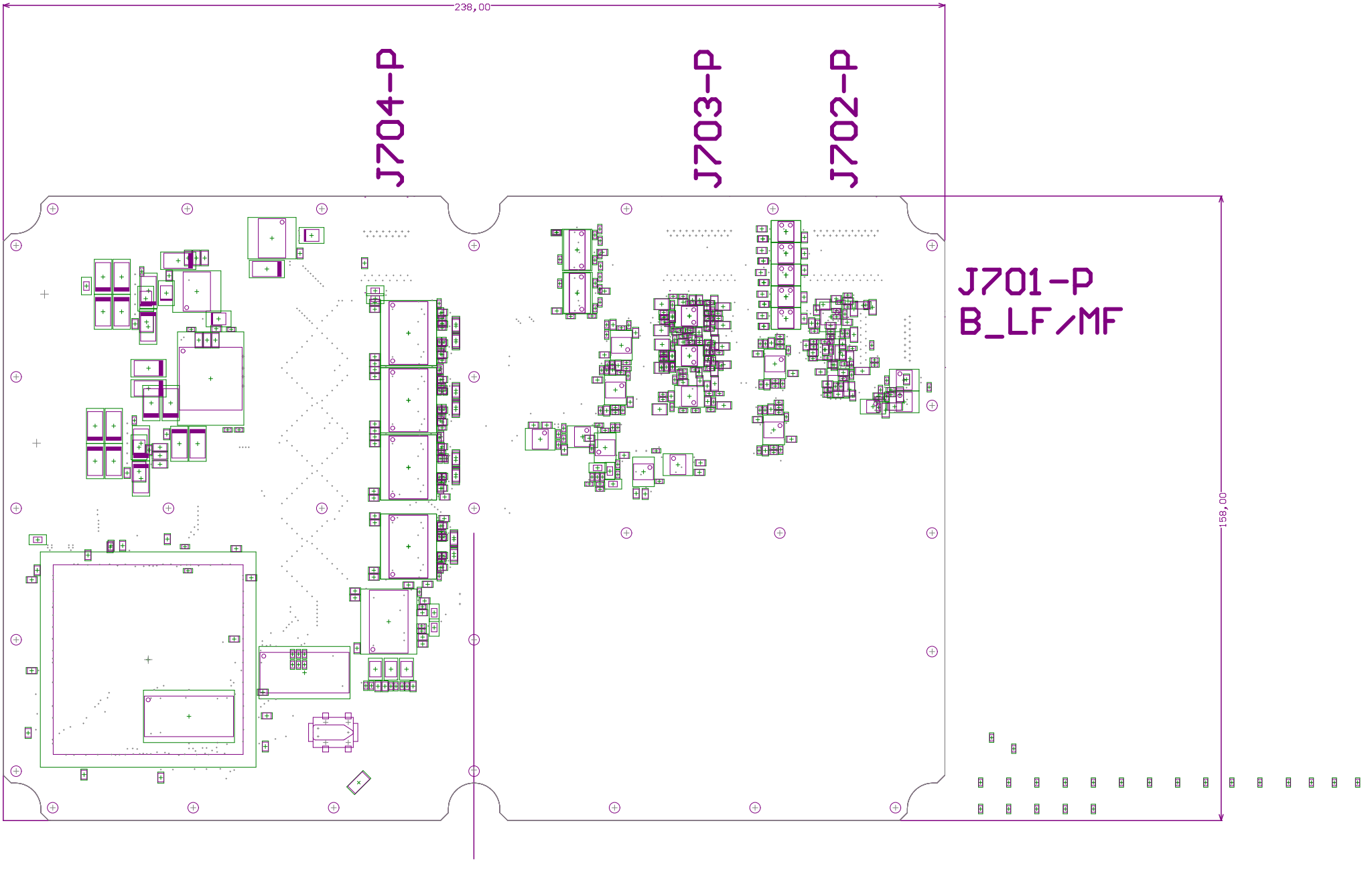
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Comment	Description	Designator	Footprint	LibRef	Quantity	Value
Cap Pol TAZH	Polarized Capacitor AV TAZ H package	C1, C2, C5, C7, C16, C18, C1 C20, C22, C91, C95, C165	TAZ-H	Cap Pol TAZH	12	47µF
Cap Pol TAZH	Polarized Capacitor AV TAZ H package	C3, C15, C29, C37	TAJ-B	Cap Pol TAZH	4	4.7µF
Cap Semi	Capacitor (Semiconductor SIM Model)	C4, C10, C14, C23, C32, C93 C176	1812	Cap Semi	7	1µF
Cap Semi	Capacitor (Semiconductor SIM Model)	C30, C31, C38, C39, C43, C4 C45, C52U1, C52U2, C52U3 C52U4, C53U1, C53U2, C53U3, C53U4, C60U1, C60U2, C60U3, C60U4, C61U1, C61U2, C61U3, C61U4, C62U1, C62U2, C62U3, C62U4, C63U1, C63U2, C63U3, C63U4, C64U1, C64U2, C64U3, C64U4, C65U1, C65U2, C65U3, C65U4, C66U1, C66U2, C66U3, C66U4, C67U1, C67U2, C67U3, C67U4, C72, C73, C74, C75, C76, C77, C78, C79, C80, C8 C82, C83, C84, C85, C86, C8 C88, C89, C90, C92, C94, C9 C97, C98, C99, C100, C101, C102U1, C102U2, C103, C104U1, C104U2, C105, C106, C107, C108, C109, C110, C111, C112, C113, C114, C115, C116, C117, C118, C119, C120, C121, C122, C123, C124, C125, C126, C127, C128, C129, C130, C131, C132, C133, C134, C135, C136, C137, C138, C139, C140, C141, C142, C143, C144, C145,	C0805	Cap Semi	177	100nF
Cap Semi	Capacitor (Semiconductor SIM Model)	C8, C12	C1206	Cap Semi	2	10µF
Cap Semi	Capacitor (Semiconductor SIM Model)	C11	C1206	Cap Semi	1	47nF
Cap Pol TAZH	Polarized Capacitor AV TAZ H package	C25, C26, C27, C28, C33, C3 C35, C36	TAZ-H	Cap Pol TAZH	8	220µF
Cap Semi	Capacitor (Semiconductor SIM Model)	C40, C41, C46U1, C46U2, C46U3, C46U4, C51U1, C51U2, C51U3, C51U4, C54U1, C54U2, C54U3, C54U4, C59U1, C59U2,	C1206	Cap Semi	18	1nF
Cap Semi	Capacitor (Semiconductor SIM Model)	C42, C68U1, C68U2, C68U3 C68U4, C69U1, C69U2, C69U3, C69U4, C70U1, C70U2, C70U3, C70U4, C71U1, C71U2, C71U3,	C1206	Cap Semi	17	3.9nF
Cap Semi	Capacitor (Semiconductor SIM Model)	C47U1, C47U2, C47U3, C47U4, C55U1, C55U2, C55U3, C55U4	C0805	Cap Semi	8	270pF
Cap Semi	Capacitor (Semiconductor SIM Model)	C48U1, C48U2, C48U3, C48U4, C50U1, C50U2, C50U3, C50U4, C56U1, C56U2, C56U3, C56U4, C58U1, C58U2, C58U3,	C1206	Cap Semi	16	2.2nF
Cap Semi	Capacitor (Semiconductor SIM Model)	C49U1, C49U2, C49U3, C49U4, C57U1, C57U2, C57U3, C57U4	C1210	Cap Semi	8	5.6nF
Cap Semi	Capacitor (Semiconductor SIM Model)	C178	C0805	Cap Semi	1	33nF
Cap Semi	Capacitor (Semiconductor SIM Model)	C200, C201, C202, C203	1812	Cap Semi	4	4.7µF
D Connector 15	Receptacle Assembly, 15 Position	J701, J704	Micro-D 15 - BOT	D Connector 15	2	
D Connector 21	Receptacle Assembly, 21 Position	J702, J703	Micro-D 21-Bot	D Connector 21	2	
Inductor Iron	Magnetic-Core Induct	L1, L2, L3, L4, L5	Variant02	Inductor Iron	5	10µH
Plug	Plug	P1, P2	PIN1	Plug	2	
Header 2	Header, 2-Pin	P1000U1, P1000U2	HDR1X2	Header 2	2	
Res3	Resistor	R30U1, R30U2, R30U3, R30U4, R34U1, R34U2, R34U3, R34U4, R45U1, R45U2, R45U3, R45U4, R49U1, R49U2, R49U3, R49U4, R79, R80, R81, R82, R83, R84, R85, R86, R87, R8	J1-0603	Res3	31	12K
Res3	Resistor	R2U1, R2U2, R4U1, R4U2, R26, R57U1, R57U2, R57U3 R57U4, R58U1, R58U2, R58U3, R58U4, R59U1, R59U2, R59U3, R59U4, R60U1, R60U2, R60U3, R60U4, R61, R62	J1-0603	Res3	23	1K
Res3	Resistor	R3U1, R3U2, R8U1, R8U2	J1-0603	Res3	4	100
Res3	Resistor	R5U1, R5U2, R9U1, R9U2, R21, R22, R24, R25	J1-0603	Res3	8	5.6K
Res3	Resistor	R6, R10, R11, R12, R13, R14 R15, R16, R17, R121, R122, R123, R124, R151, R152	C1206	Res3	15	10
Res3	Resistor	R18	J1-0603	Res3	1	4.2k
Res3	Resistor	R19, R37U1, R37U2, R37U3 R37U4, R52U1, R52U2, R52U3, R52U4, R125, R128	J1-0603	Res3	11	10K
Res3	Resistor	R20	J1-0603	Res3	1	1.5K
Res3	Resistor	R23	J1-0603	Res3	1	3K
Res3	Resistor	R27U1, R27U2, R27U3, R27U4, R36U1, R36U2, R36U3, R36U4, R42U1, R42U2, R42U3, R42U4, R51U1, R51U2, R51U3,	J1-0603	Res3	16	3160
Res3	Resistor	R28U4, R38U1, R38U2, R38U3, R38U4, R39U1, R39U2, R39U3, R39U4, R40U1, R40U2, R40U3, R40U4, R41U1, R41U2, R41U3, R41U4, R43U1, R43U2, R43U3, R43U4, R53U1, R53U2, R53U3, R53U4, R54U1, R54U2, R54U3, R54U4, R55U1, R55U2, R55U3, R55U4, R56U1, R56U2, R56U3, R56U4, R100, R102, R103,	J1-0603	Res3	49	6.8K
Res3	Resistor	R29, R33, R44, R48, R129, R130, R131, R132, R133, R134, R135, R136, R137, R138, R139, R140, R141, R142, R143, R144, R145,	J1-0603	Res3	22	7.5K
Res3	Resistor	R31U1, R31U2, R31U3, R31U4, R32U1, R32U2, R32U3, R32U4, R46U1, R46U2, R46U3, R46U4, R47U1, R47U2, R47U3,	J1-0603	Res3	16	13K
Res3	Resistor	R35U4, R50U1, R50U2, R50U3, R50U4, R95, R96, R97, R101	J1-0603	Res3	12	20K
Res3	Resistor	R63, R64, R65, R69, R70, R7 R75, R76, R112	J1-0603	Res3	9	100K
Res3	Resistor	R66, R67, R68, R72, R73, R7 R77, R78, R115, R153, R154 R155, R156, R157, R158, R159, R160, R161, R162	J1-0603	Res3	19	200K
Res3	Resistor	R98	J1-0603	Res3	1	420
Res3	Resistor	R99, R110	J1-0603	Res3	2	68K
Res3	Resistor	R109	J1-0603	Res3	1	800
Res3	Resistor	R116	12Z-2010	Res3	1	0.2
Res3	Resistor	R117	12Z-2010	Res3	1	0.1
Res3	Resistor	R118	J1-0603	Res3	1	2.2K
Res3	Resistor	R119, R147, R148	J1-0603	Res3	3	22k
Res3	Resistor	R120	J1-0603	Res3	1	1.3K
Res3	Resistor	R126	J1-0603	Res3	1	825
Res3	Resistor	R127	J1-0603	Res3	1	7800
Res3	Resistor	R150	C1206	Res3	1	49.9
TC2050-IDC		TAG-CONNECT1	TC2050-IDC	TC2050-IDC	1	
RHFL4913	Rad-hard positive fixe voltage regulator	U1, U7	CFP127P1060X272-16N	CMP-00027-A.1	2	
UTER1M32	1Mx32 SRAM	U2		UTER1M32	1	
M54HC4053F1R	Analog Multiplexer/Demultiplexer Triple 2-Channel	U3, U13, U26, U27, U28, U2 U30	DIP16	M54HC4053F1R	7	
UT54LVDS031LV	RAD HARD Low Voltage Quad Driver	U4U1, U4U2		UT54LVDS031LV	2	
UT54LVDS032LV	RAD HARD Low Voltage Quad Receive	U5U1, U5U2		UT54LVDS032LV	2	
RHFL4913A	Rad-hard positive fixe voltage regulator	U6	CFP127P1060X272-16N	RHFL4913A	1	
MSK5810	Microcircuit, Rad Hard Ultre Low Dropout Adjustable Positive Linear Regulator	U8	FP20	MSK5810	1	
RTAX4000D-CQ352EV	RTAX-DSP RadToleran FPGA, 4 Million Equivalent System Gates, 352-Pin CQFP, Standard Speed Grade Class V	U9	CQ352_N	CMP-0178-00068-1	1	
MSK 5822RH	RAD HARD ULTRA LO DROPOUT POSITIVE LINEAR REGULATOR	U10	TO254	MSK 5822RH	1	
DAC121S101WGRQV	Digital-to-Analog Converter with Rail-to Rail Output, 10-pin CerPACK	U11	WG10A_M	CMP-0061-00015-2	1	
LT1352CS8	Dual250µA, 3MHz, 200V/µs Operational Amplifier	U14U4, U15U1, U15U2, U15U3, U15U4, U16U1, U16U2, U16U3, U16U4, U3 U39	S8_N	LT1352CS8	15	
RH1009	Rad Hard 2.5V Reference.	U17		RH1009	1	
RHF1401	Rad-hard 14-bit 30 Msps A/D converter	U18, U19, U20, U21, U22, U23, U24, U25, U38	SOP64P1260X272-48N	CMP-00005-A.1	9	
RHFACT541K01V	OCTAL BUFFER WITH THREE-STATE OUTPUTS, TTL COMPATIBLE INPUTS	U31		RHFACT541K01V	1	
1101	VECTRON Hi-Rel Hybr	XT1, XT2		1101	2	