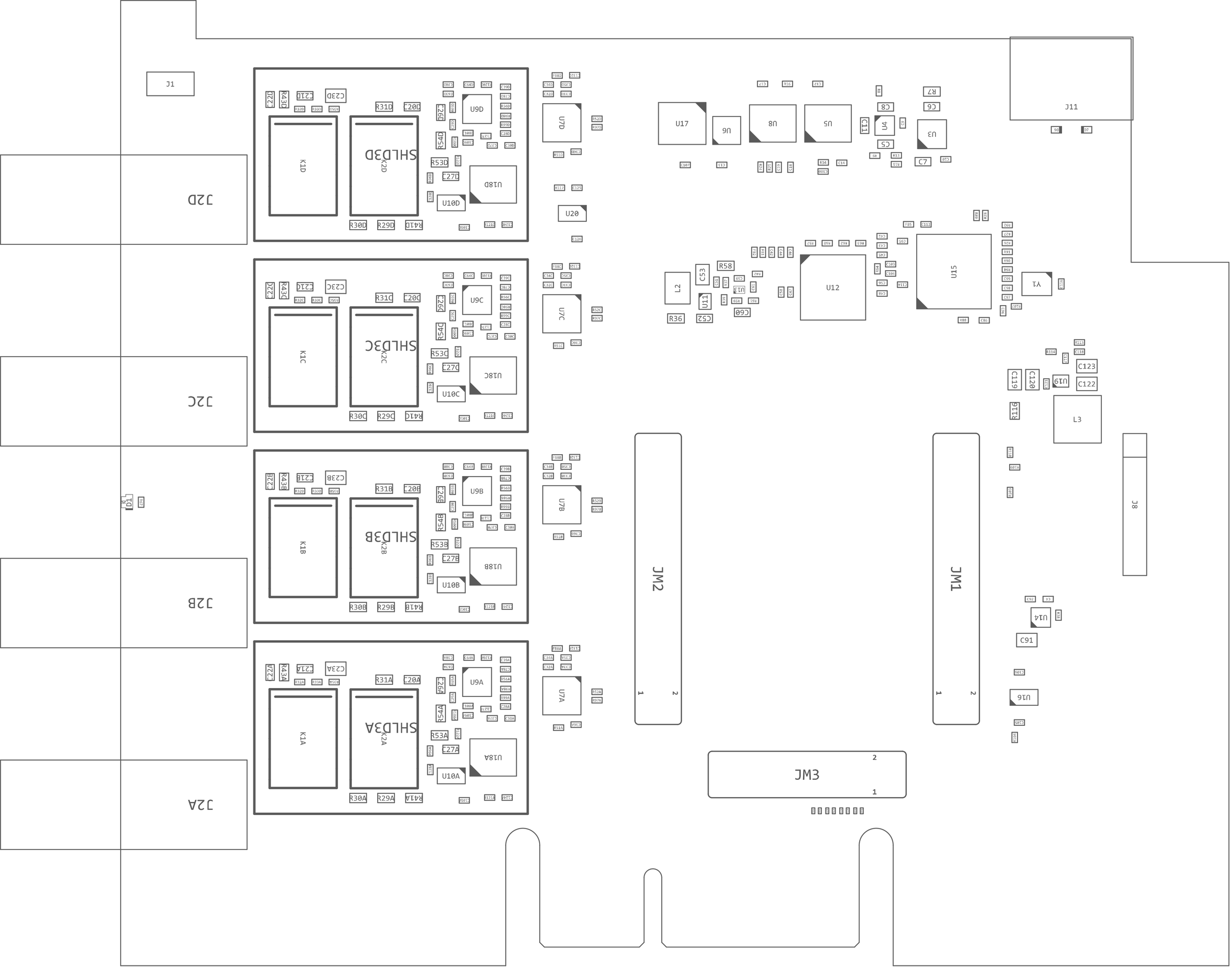
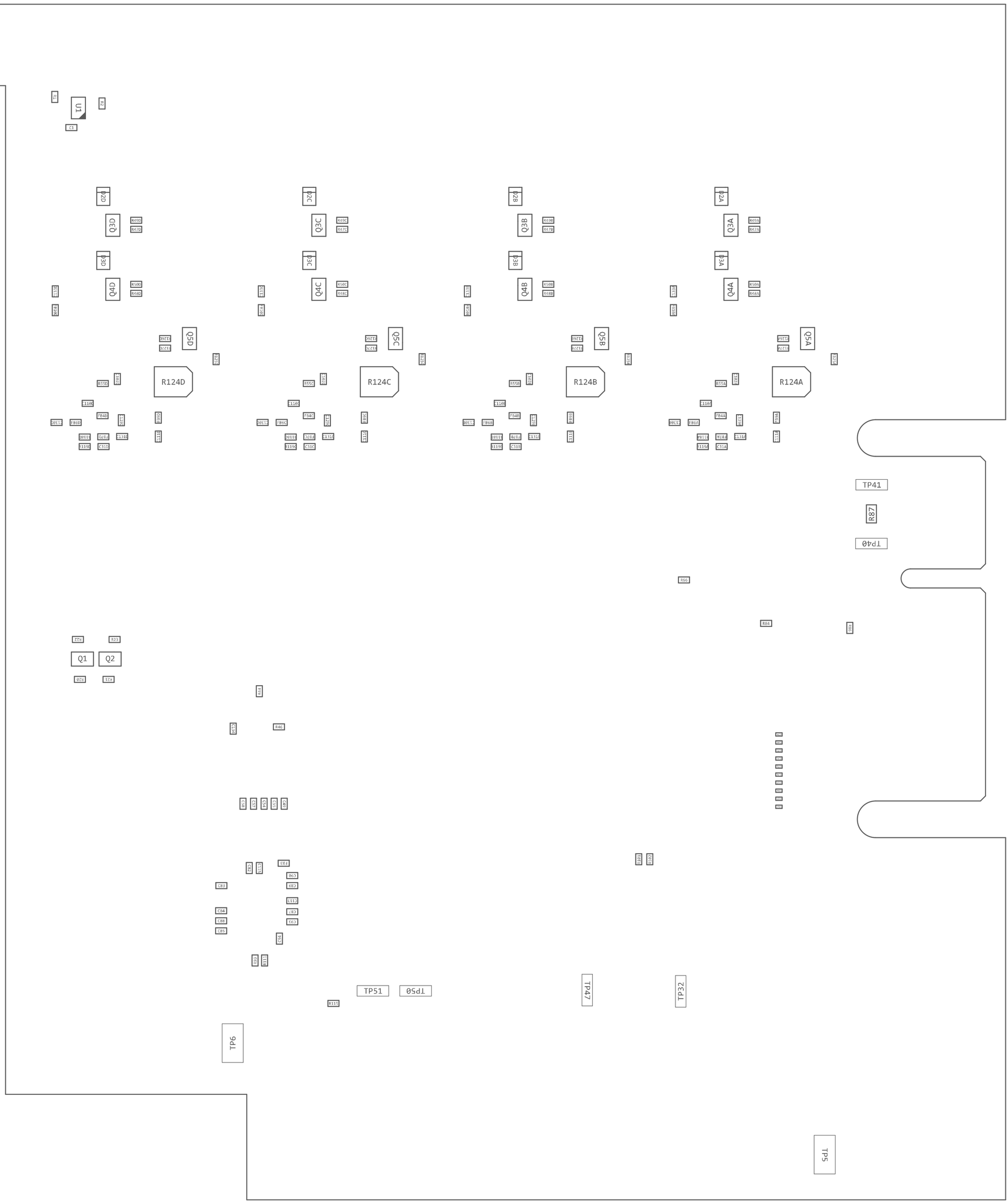
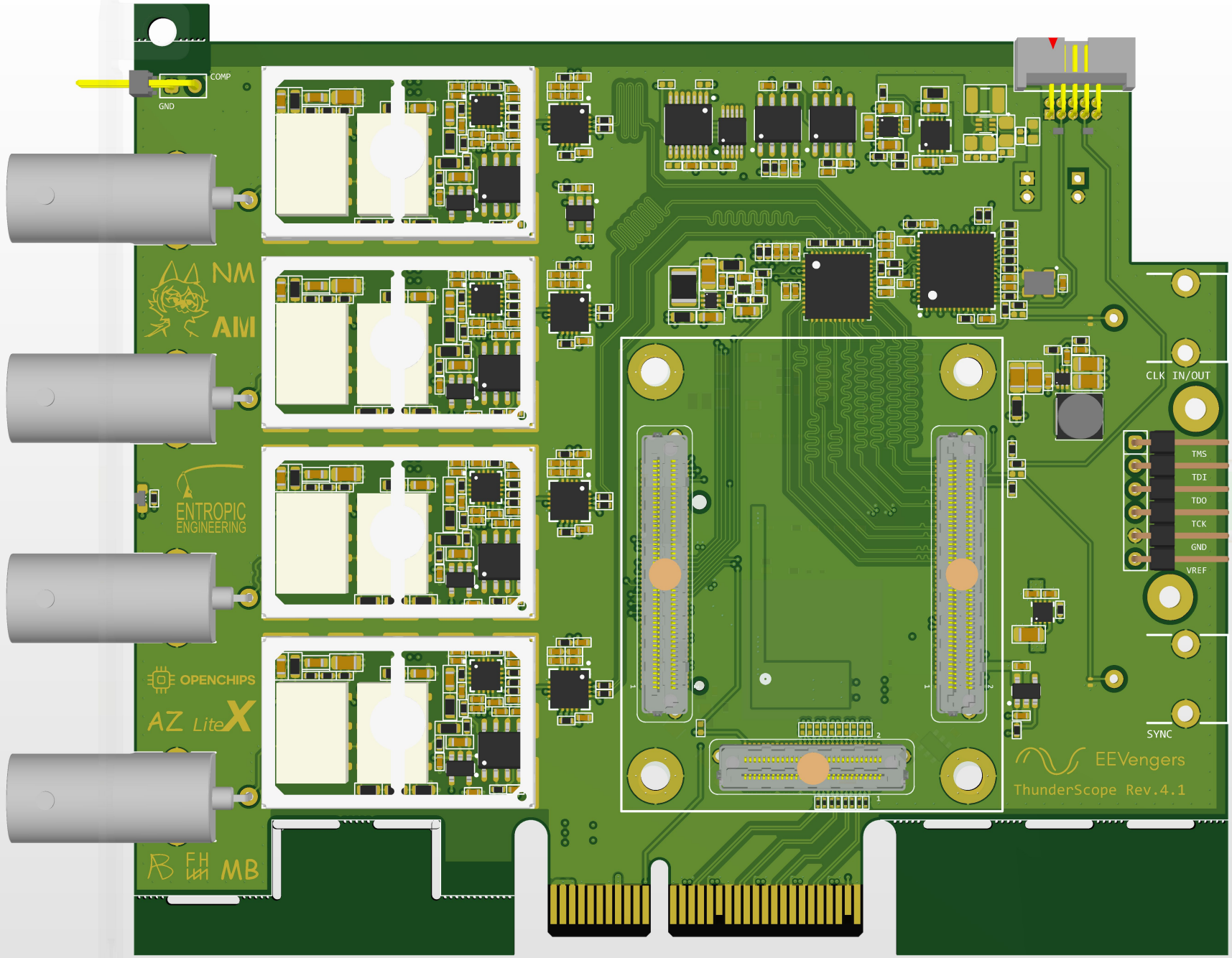
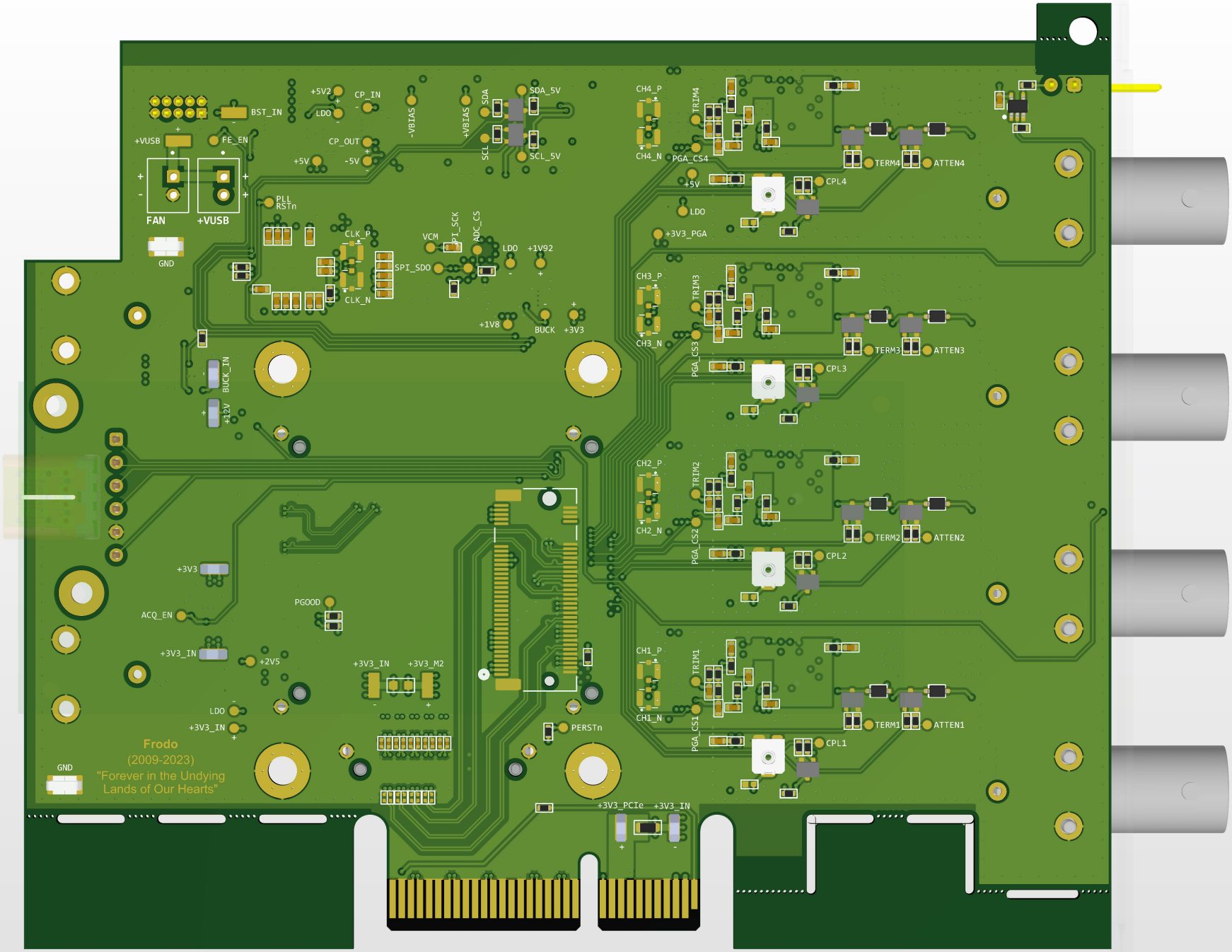
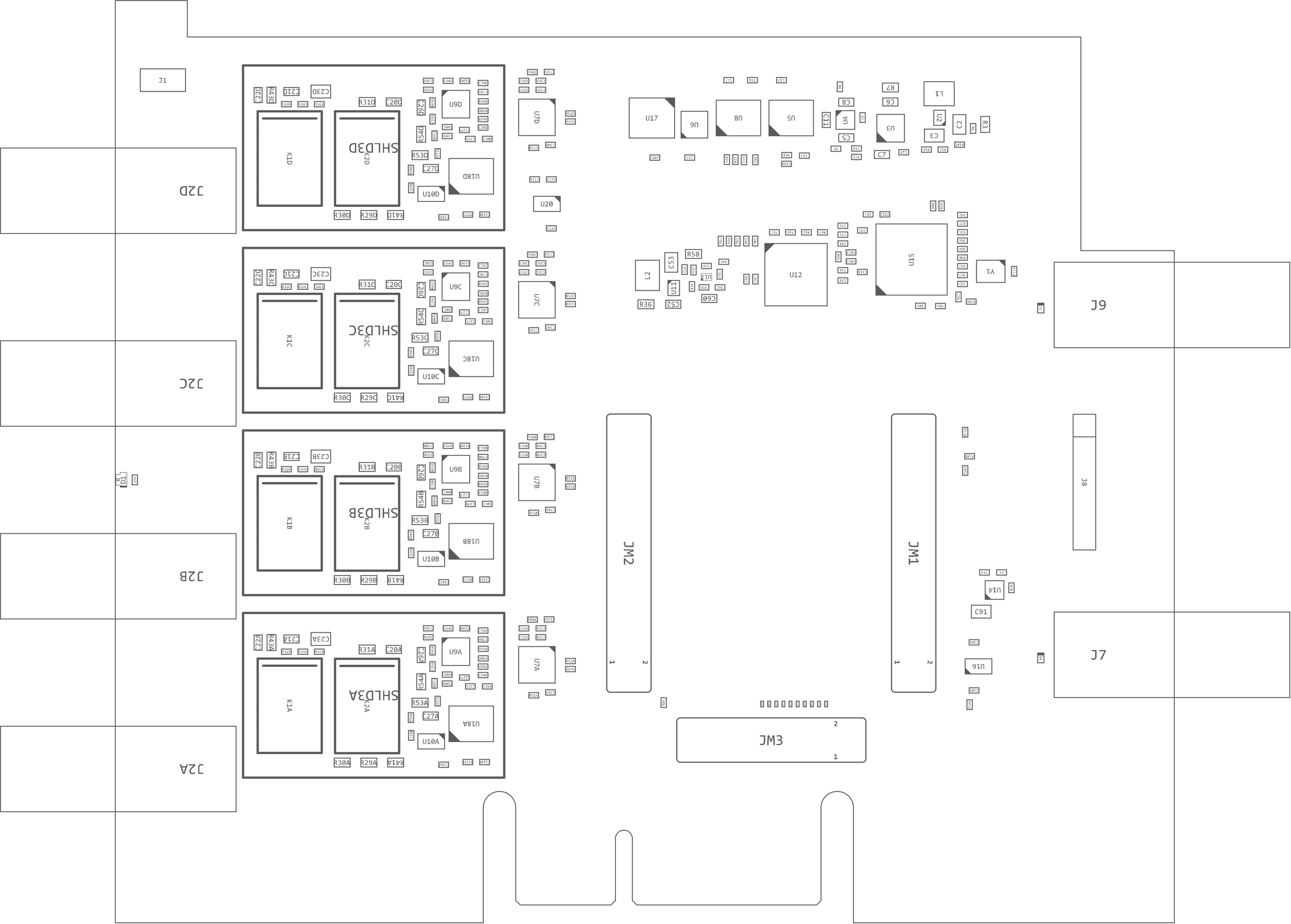
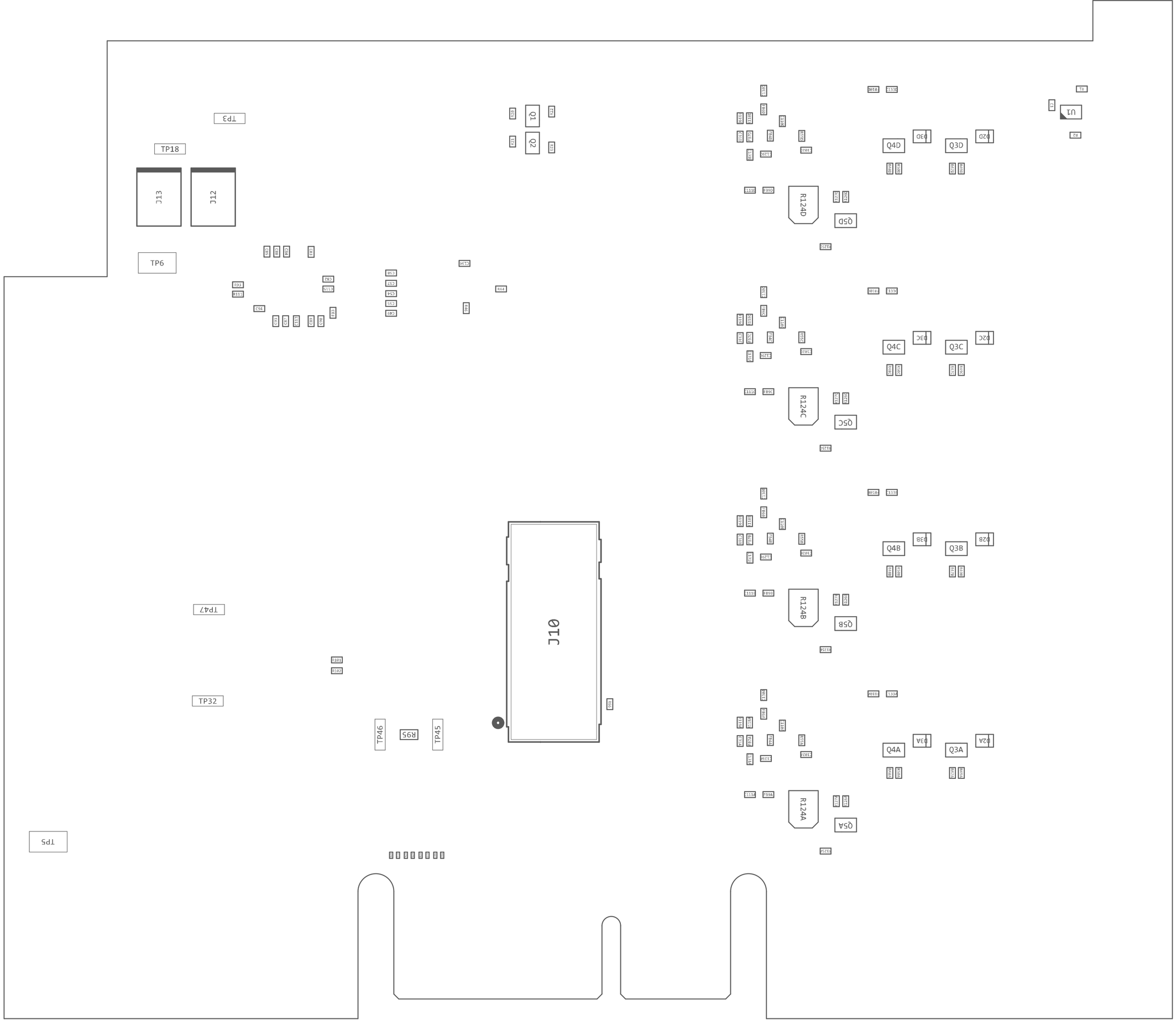

J1
J2D
J2C
J2B
J2A
D1
SHLD3D
K1D
K2D
R30D
R29D
R41D
U10D
U18D
U6D
U7D
R31D
C20D
C22D
R43D
C21D
C23D
SHLD3C
K1C
K2C
R30C
R29C
R41C
U10C
U18C
U6C
U7C
R31C
C20C
C22C
R43C
C21C
C23C
SHLD3B
K1B
K2B
R30B
R29B
R41B
U10B
U18B
U6B
U7B
R31B
C20B
C22B
R43B
C21B
C23B
SHLD3A
K1A
K2A
R30A
R29A
R41A
U10A
U18A
U6A
U7A
R31A
C20A
C22A
R43A
C21A
C23A
U20
U17
U6
U8
U5
U4
U3
C11
C5
C8
C6
R7
C7
J11
U15
U12
L2
C53
R58
U11
U13
C52
R36
C60
Y1
L3
C119
C120
U19
C122
C123
R114
J8
JM2
JM1
JM3
U14
C91
U16

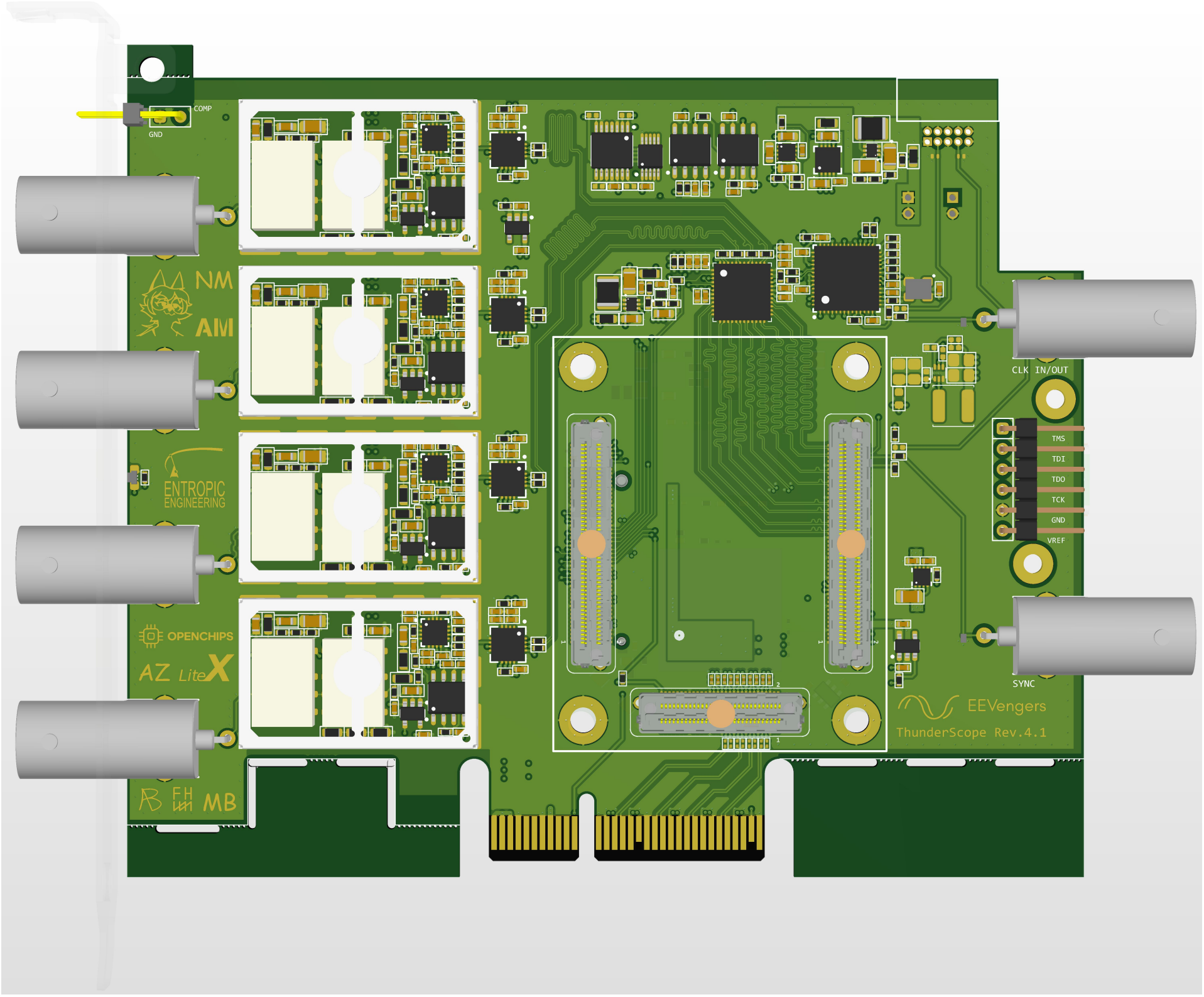

U1
Q3D
Q3C
Q3B
Q3A
Q4D
Q4C
Q4B
Q4A
Q5D
Q5C
Q5B
Q5A
R124D
R124C
R124B
R124A
TP41
R87
TP40
Q1
Q2
TP51
TP50
TP47
TP32
TP6
TP5

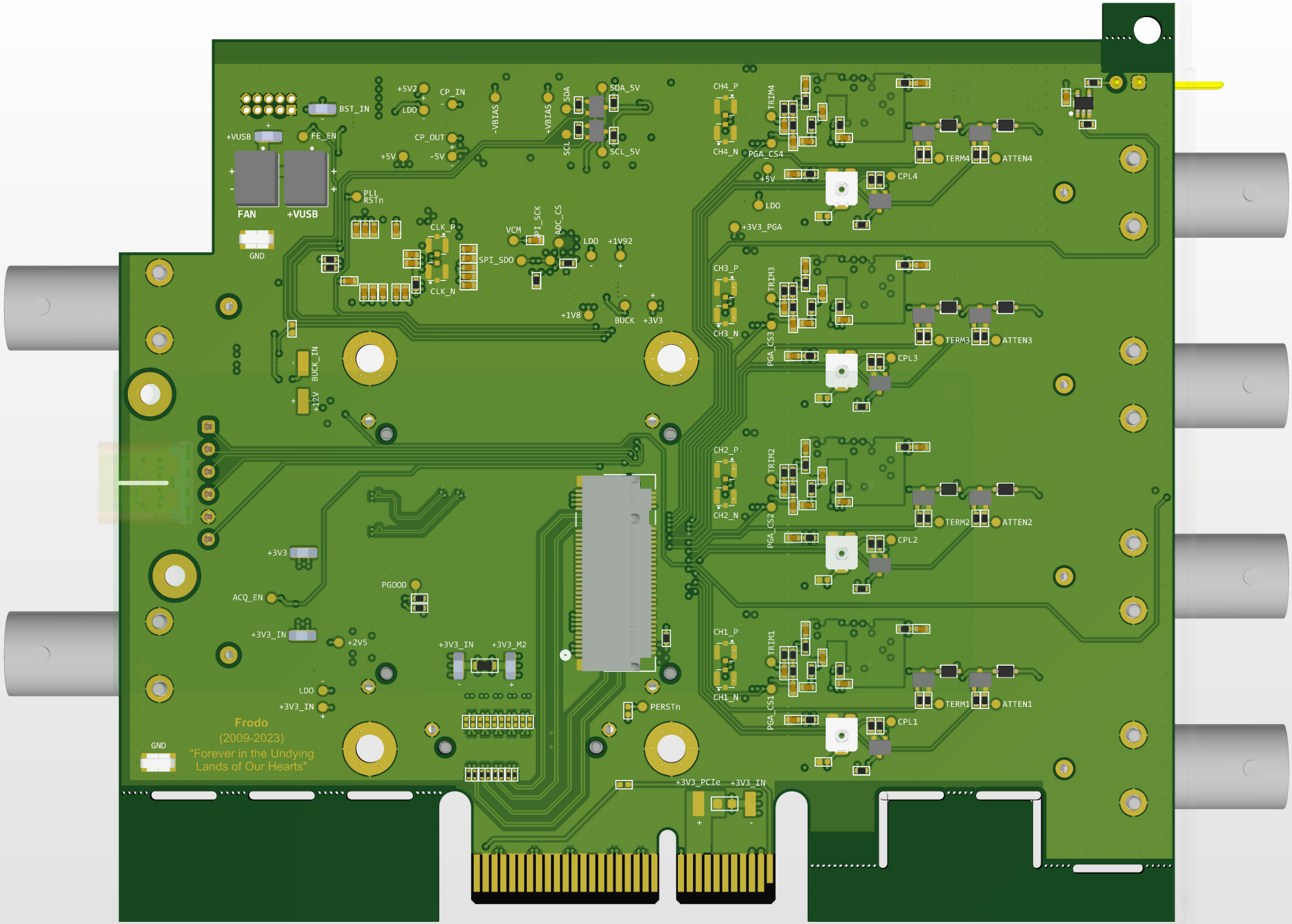

COMP
GND
NM
AM
ENTROPIC
ENGINEERING
OPENCHIPS
AZ LiteX
FH
MB
CLK IN/OUT
TMS
TDI
TDO
TCK
GND
VREF
SYNC
EEVengers
ThunderScope Rev.4.1


+VUSB
FAN
+VUSB
GND
BST_IN
FE_EN
+5V2
LDO
CP_IN
CP_OUT
+5V
-5V
-VBIAS
+VBIAS
SDA
SCL
SDA_5V
SCL_5V
PLL
RSTn
CLK_P
CLK_N
SPI_SDO
VCM
SPI_SCK
ADC_CS
LDO
+1V92
+1V8
BUCK
+3V3
BUCK_IN
+12V
CH4_P
CH4_N
PGA_CS4
TRIM4
TERM4
ATTEN4
CPL4
+5V
LDO
+3V3_PGA
CH3_P
CH3_N
PGA_CS3
TRIM3
TERM3
ATTEN3
CPL3
CH2_P
CH2_N
PGA_CS2
TRIM2
TERM2
ATTEN2
CPL2
CH1_P
CH1_N
PGA_CS1
TRIM1
TERM1
ATTEN1
CPL1
+3V3
ACQ_EN
PGOOD
+3V3_IN
+2V5
+3V3_IN
+3V3_M2
LDO
+3V3_IN
PERSTn
GND
+3V3_PCIe
+3V3_IN
Frodo
(2009-2023)
"Forever in the Undying
Lands of Our Hearts"


J1
J2D
J2C
J2B
J2A
J6
J7
J8
JM1
JM2
JM3
SHLD3D
SHLD3C
SHLD3B
SHLD3A
K1D
K2D
K1C
K2C
K1B
K2B
K1A
K2A
U6D
U7D
U8D
U9D
U10D
U18D
U6C
U7C
U8C
U9C
U10C
U18C
U6B
U7B
U8B
U9B
U10B
U18B
U6A
U7A
U8A
U9A
U10A
U18A
U17
U6
U8
U5
U4
U3
U2
U1
U12
U15
U14
U16
U13
U11
U20
L1
L2
Y1
C91
R3
R36
R58
C52
C53
C60


TP3
TP18
J13
J12
TP6
Q1
Q2
U1
Q4D
Q3D
R124D
Q5D
Q4C
Q3C
R124C
Q5C
Q4B
Q3B
R124B
Q5B
Q4A
Q3A
R124A
Q5A
J10
TP47
TP32
TP46
R95
TP45
TP5


COMP
GND
NM
AM
ENTROPIC
ENGINEERING
OPENCHIPS
AZ LiteX
FH
MB
CLK IN/OUT
TMS
TDI
TDO
TCK
GND
VREF
SYNC
EEVengers
ThunderScope Rev.4.1


+5V2
CP_IN
LDO
BST_IN
+VUSB
FE_EN
CP_OUT
+5V
-5V
-VBIAS
+VBIAS
SDA
SCL
SDA_5V
SCL_5V
FAN
+VUSB
GND
PLL
RSTn
CLK_P
CLK_N
VCM
SPI_SCK
ADC_CS
SPI_SDO
LDO
+1V92
+1V8
BUCK
+3V3
BUCK_IN
+12V
CH4_P
CH4_N
TRIM4
PGA_CS4
TERM4
ATTEN4
CPL4
+5V
LDO
+3V3_PGA
CH3_P
CH3_N
TRIM3
PGA_CS3
TERM3
ATTEN3
CPL3
CH2_P
CH2_N
TRIM2
PGA_CS2
TERM2
ATTEN2
CPL2
CH1_P
CH1_N
TRIM1
PGA_CS1
TERM1
ATTEN1
CPL1
+3V3
ACQ_EN
PGOOD
+3V3_IN
+2V5
+3V3_IN
+3V3_M2
LDO
+3V3_IN
PERSTn
GND
Frodo
(2009-2023)
"Forever in the Undying
Lands of Our Hearts"
+3V3_PCIe
+3V3_IN