Koruza-CM

CONTENTS:

Version Revision:

v0.3 - 30.03.2017.

DESIGN CONSIDERATIONS

DESIGN NOTE:
Example text for informational design notes.

DESIGN NOTE:
Example text for critical design notes.

LAYOUT NOTE:
Example text for critical layout guidelines.

Koruza	www.koruza.net
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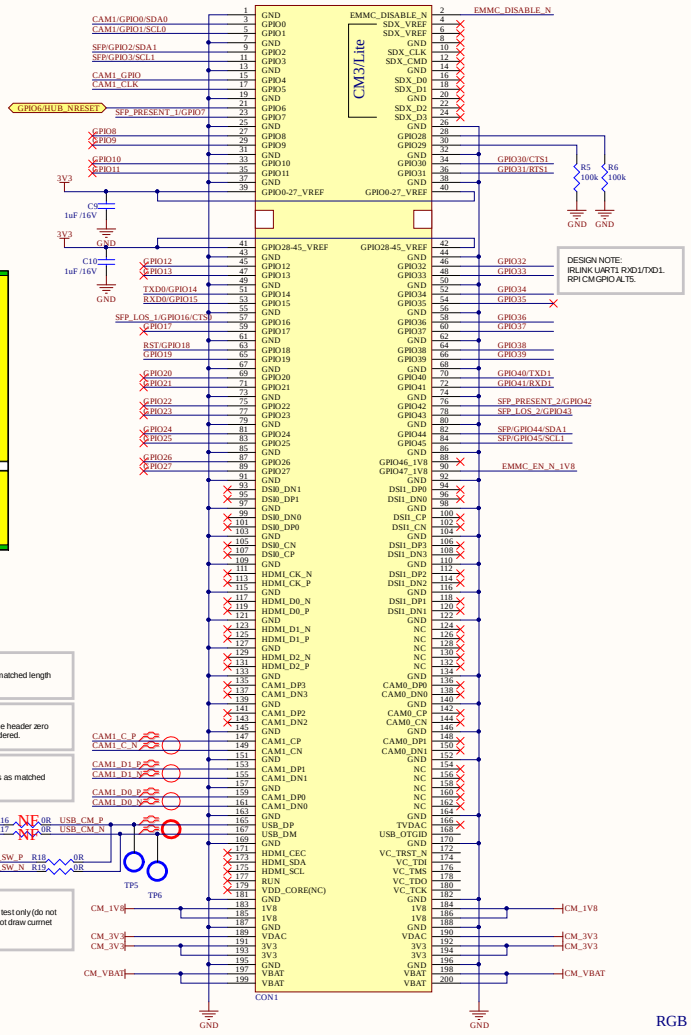
KORUZA-CM

www.koruza.net



DESIGN NOTE:
Route red ringed signals as matched length 100R differential pair

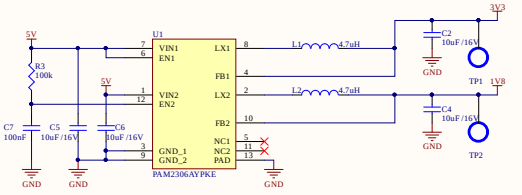
DESIGN NOTE:
For USB to be connected to the header zero ohm resistors need to be soldered.

DESIGN NOTE:
Route red bold-ringed signals as matched length 90R differential pair.

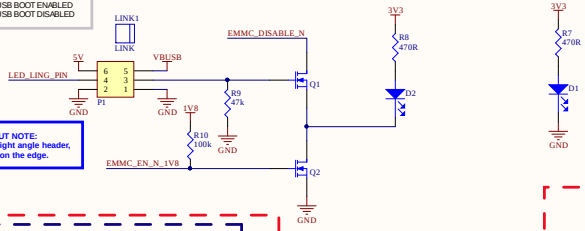
DESIGN NOTE:
VDD_CORE used for module test only (do not use in normal operation, do not draw current form this part)

DESIGN NOTE:
IRLINK UART1 RXD1/TXD1.
RPI CM GPIO ALTS.

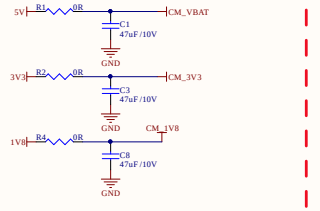
Power



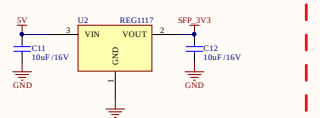
DESIGN NOTE:
Jumper position:
3-2 = USB BOOT ENABLED
2-1 = USB BOOT DISABLED



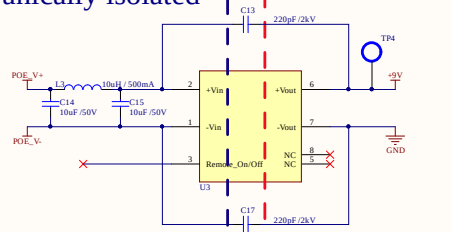
LAYOUT NOTE:
Dula right angle header, place on the edge.

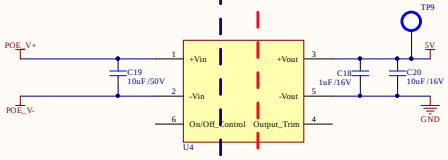


SFP Power supplay



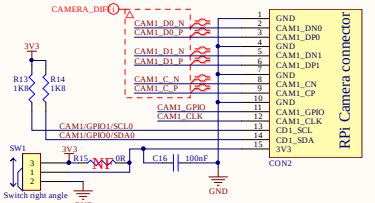
Galvanically isolated



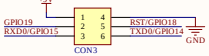


DESIGN NOTE:
This board supports 3V3 voltage level on the IO pins.
It is powered with passive PoE, +24V, and it is galvanically isolated, due to two isolated DC-DC converters.

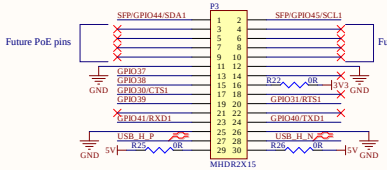
Koruza Camera connector



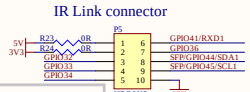
Koruza move driver connector



Koruza GPIO connector

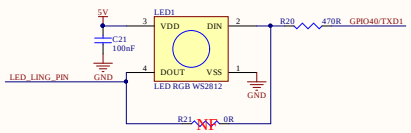


IR Link connector



DESIGN NOTE:
IRLINK UART1 RXD1/TXD1.
GPIO 32/33

RGB Status LED



DESIGN NOTE:
If RGB LED is soldered, zero ohm resistor should not be fited.

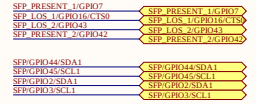
LAYOUT NOTE:
LED Ring connector need to be paced on the front edge of the board, to be easy accessible.

Mounting holes

Mounting holes 7.4mm pad 3.2mm drill
BOARD MOUNTING HOLES
ONE IN EACH CORNER

Fiducials

Fiducials 2x TOP



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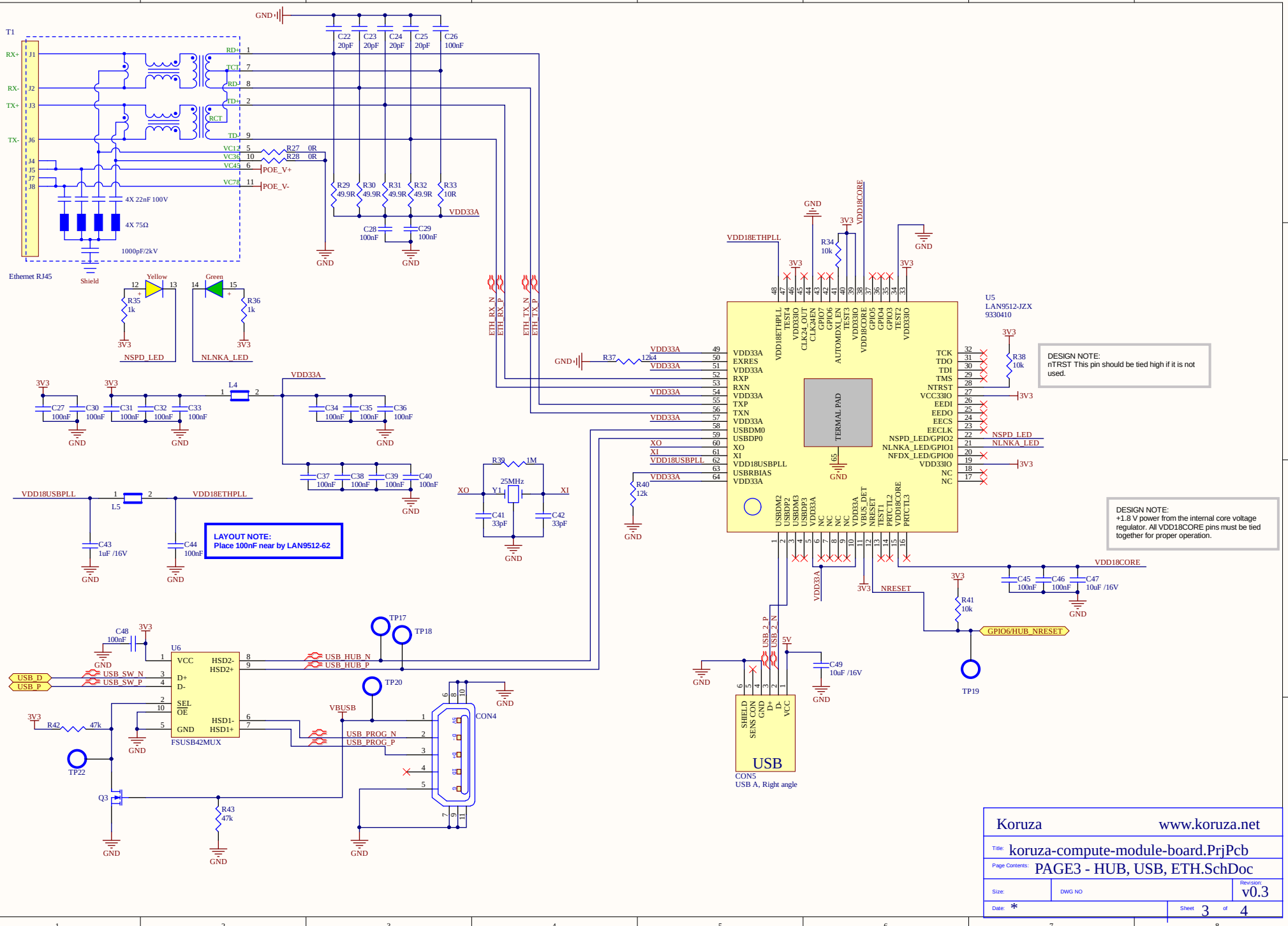
T1
Ethernet RJ45
Shield
4X 22nF 100V
4X 75Ω
1000pF/2kV
POE_V+
POE_V-
R27 0R
R28 0R
R29 49.9R
R30 49.9R
R31 49.9R
R32 49.9R
R33 10R
C22 20pF
C23 20pF
C24 20pF
C25 20pF
C26 100nF
C28 100nF
C29 100nF
VDD33A
GND
Yellow
Green
R35 1k
R36 1k
NSPD_LED
NLNKA_LED
3V3
ETH_RX_N
ETH_RX_P
ETH_TX_N
ETH_TX_P
U5
LAN9512-JZX
9330410
VDD18ETHPLL
VDD18CORE
TERMAL PAD
R34 10k
R37 12k4
R38 10k
R40 12k
DESIGN NOTE:
nTRST This pin should be tied high if it is not used.
DESIGN NOTE:
+1.8 V power from the internal core voltage regulator. All VDD18CORE pins must be tied together for proper operation.
L4
L5
C27 100nF
C30 100nF
C31 100nF
C32 100nF
C33 100nF
C34 100nF
C35 100nF
C36 100nF
C37 100nF
C38 100nF
C39 100nF
C40 100nF
C43 1uF /16V
C44 100nF
VDD18USBPLL
VDD18ETHPLL
LAYOUT NOTE:
Place 100nF near by LAN9512-62
R39 1M
25MHz
Y1
C41 33pF
C42 33pF
XO
XI
C45 100nF
C46 100nF
C47 10uF /16V
NRESET
R41 10k
GPIO6/HUB_NRESET
TP19
C49 10uF /16V
5V
USB_2_P
USB_2_N
USB
CON5
USB A, Right angle
U6
FSUSB42MUX
C48 100nF
R42 47k
R43 47k
Q3
TP17
TP18
TP20
TP22
USB_HUB_N
USB_HUB_P
USB_SW_N
USB_SW_P
USB_D
USB_P
VBUSB
USB_PROG_N
USB_PROG_P
CON4
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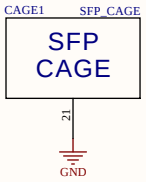
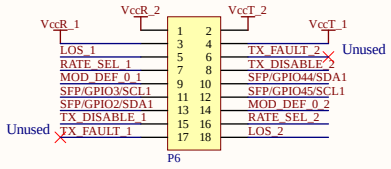
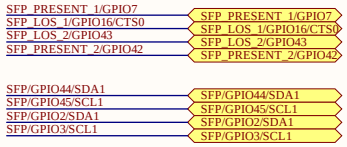
Rigid to Flex PCB connection

SFP Cage Rigid to flex connector

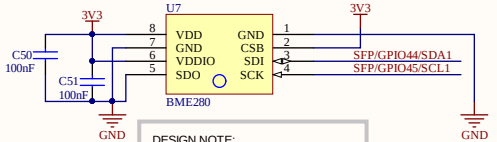


Koruza SFP rigid to flex GPIO connector



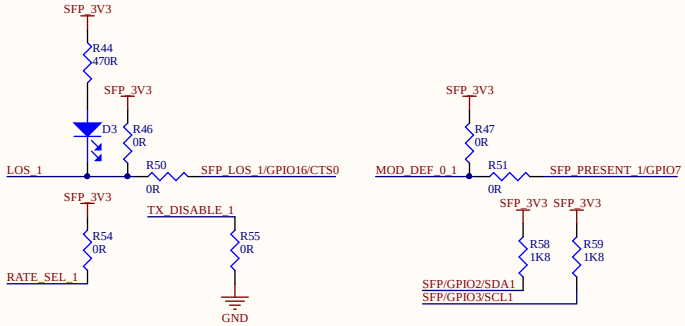


Environment sensor
Temperature, humidity, presure

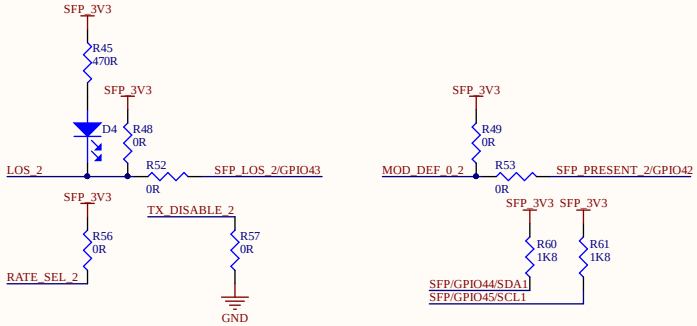


DESIGN NOTE:
I2C address bit 0 GND: '0'; VDDIO: '1'.
BME280 I2C address: 1110110 (0x76)

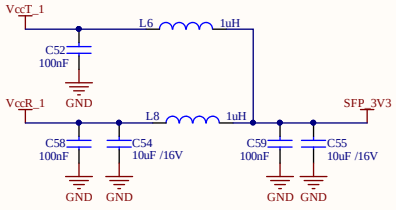
SFP1 GPIO config



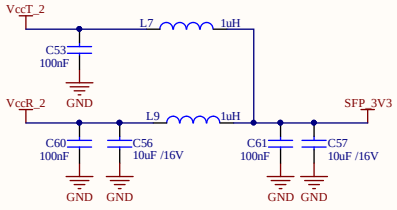
SFP2 GPIO config



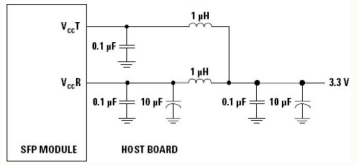
SFP1 Power filtering network



SFP2 Power filtering network



DESIGN NOTE:
Note: Inductors with DC resistance of less than 1 © should be used in order to maintain the required voltage at the SFP input pin at 3.3V. When the recommended supply filtering circuit is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30 mA greater than the steady state value.



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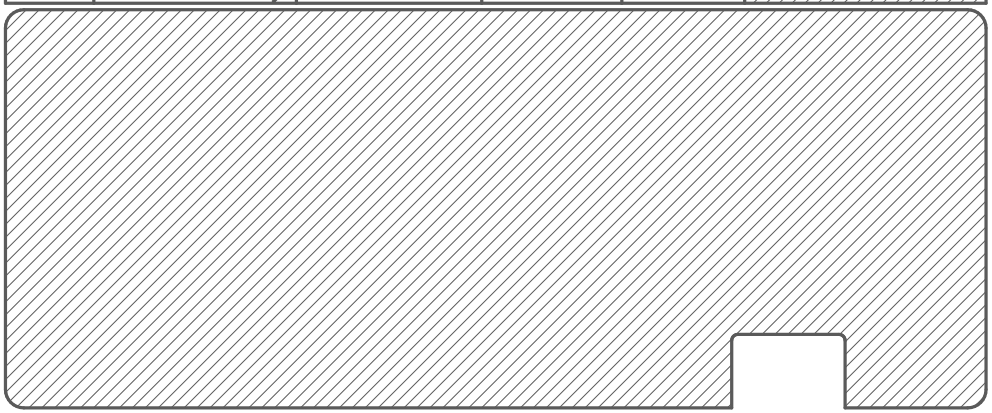
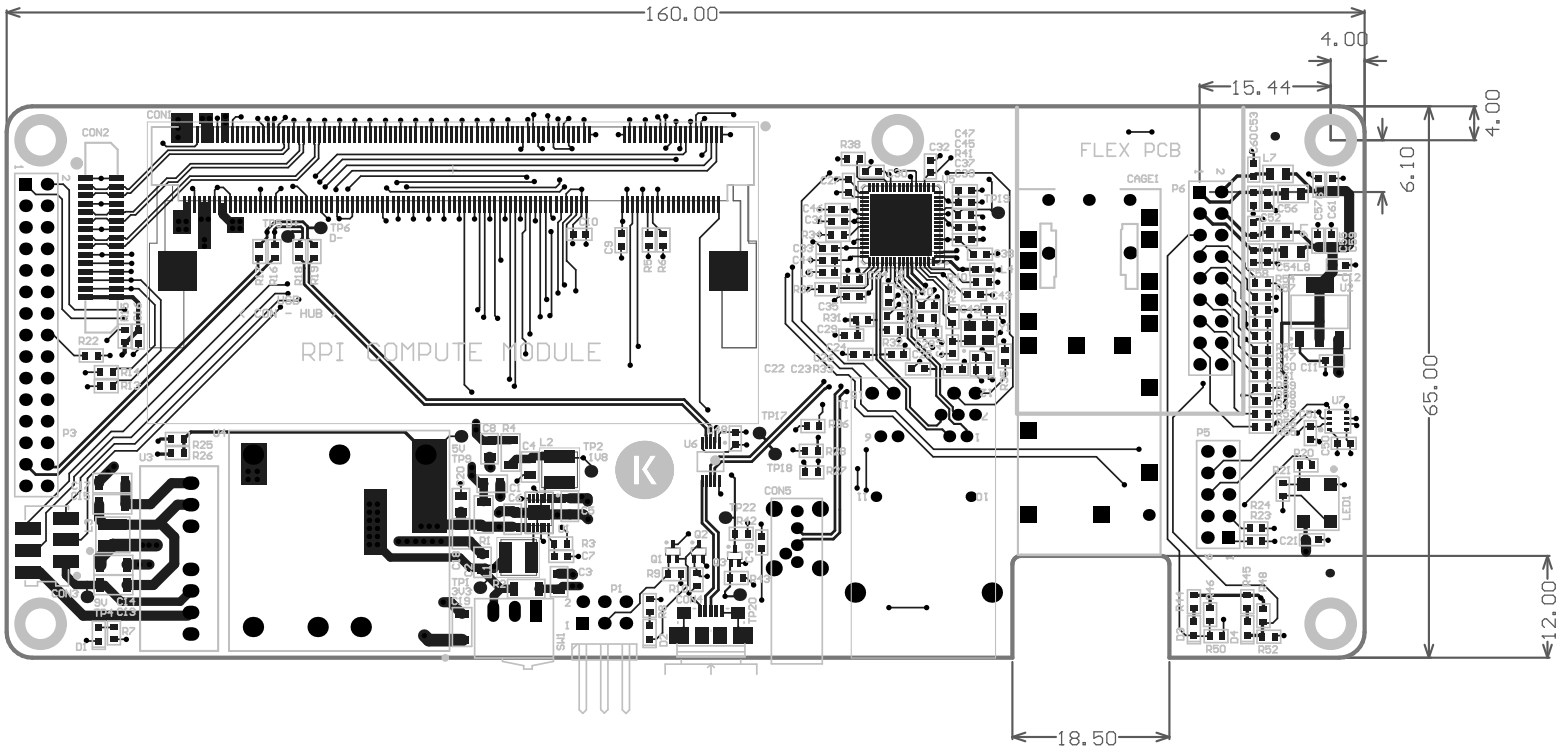
Layer	Name	Material	Thickness	Constant	Board Layer Stack
1	Top Overlay				
2	Top Solder	Solder Resist	0.010mm	3.5	
3	Component Side	Copper	0.040mm		
4	Dielectric 1	FR-4	0.240mm	4.6	
5	Ground Plane	Copper	0.035mm		
6	Dielectric 3	R-1755M	0.400mm	4.6	
7	Power Plane	Copper	0.035mm		
8	Dielectric 4		0.254mm	4.2	
9	Solder Side	Copper	0.040mm		
10	Bottom Solder	Solder Resist	0.010mm	3.5	
11	Bottom Overlay				





Layer	Name	Material	Thickness	Constant	Board Layer Stack
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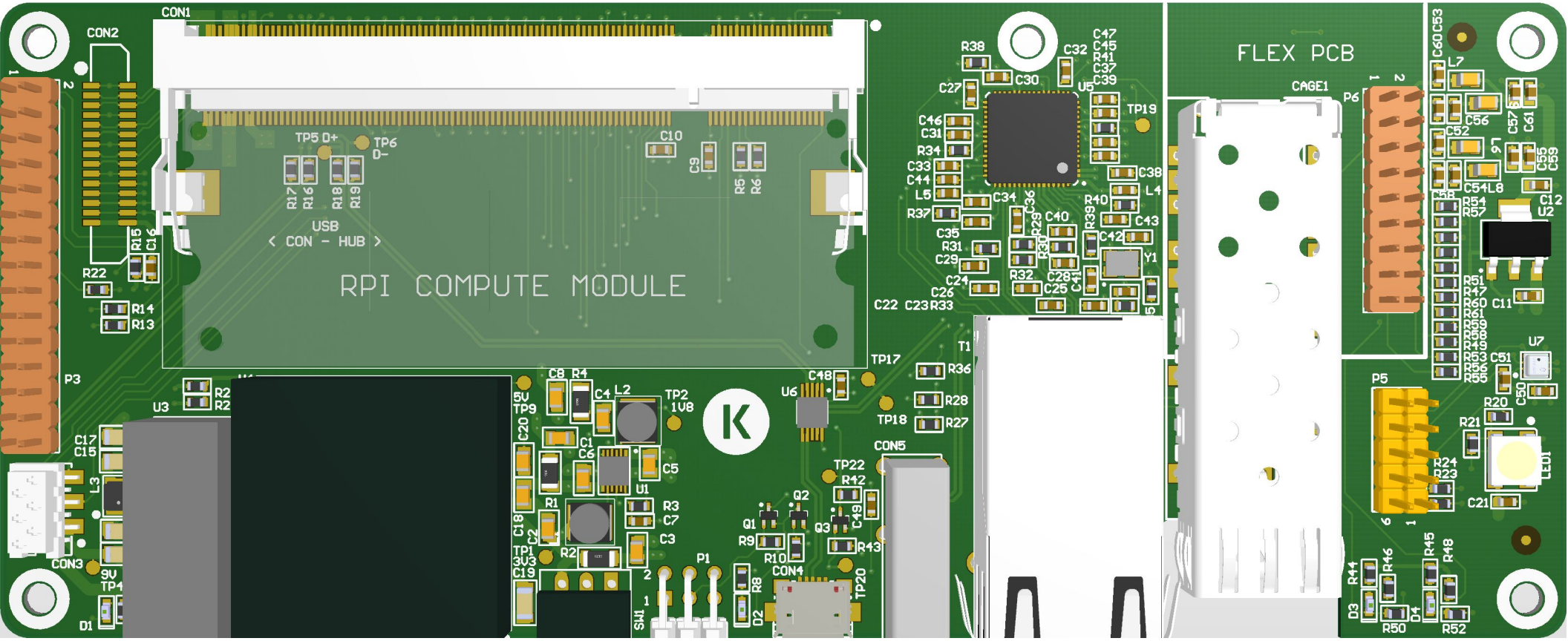
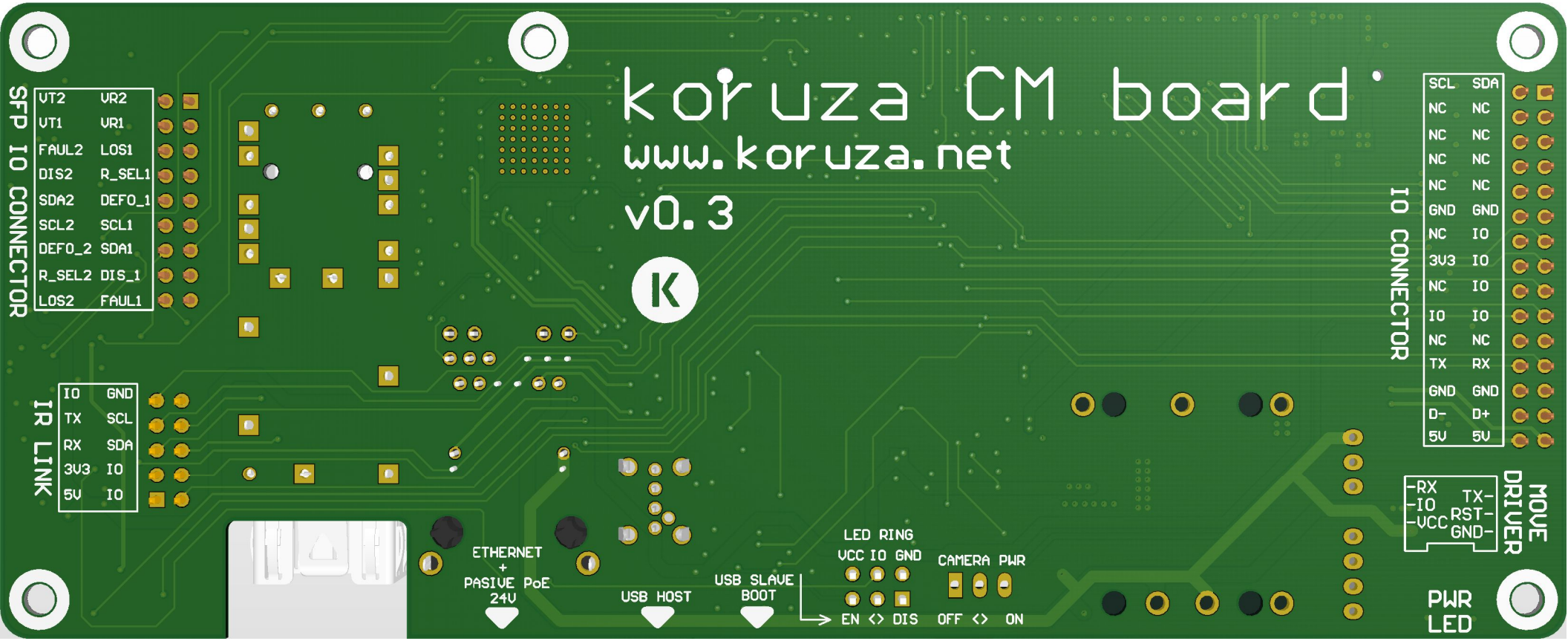

RPI COMPUTE MODULE
FLEX PCB
USB
< CON - HUB >
CON1
CON2
CON3
CON4
CON5
CAGE1
P1
P3
P5
P6
SW1
U1
U2
U3
U5
U6
U7
T1
Y1
LED1
TP1 3V3
TP2 1V8
TP4 9V
TP5 D+
TP6 D-
TP9 5V
TP17
TP18
TP19
TP20
TP22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v0.3
SFP IO CONNECTOR
VT2 VR2
VT1 VR1
FAUL2 LOS1
DIS2 R_SEL1
SDA2 DEFO_1
SCL2 SCL1
DEFO_2 SDA1
R_SEL2 DIS_1
LOS2 FAUL1
IR LINK
IO GND
TX SCL
RX SDA
3V3 IO
5V IO
IO CONNECTOR
SCL SDA
NC NC
NC NC
NC NC
GND GND
NC IO
3V3 IO
NC IO
IO IO
NC NC
TX RX
GND GND
D- D+
5V 5V
MOVE DRIVER
-RX TX-
-IO RST-
-VCC GND-
ETHERNET + PASIVE PoE 24V
USB HOST
USB SLAVE BOOT
LED RING
VCC IO GND
EN <> DIS
CAMERA PWR
OFF <> ON
PWR LED