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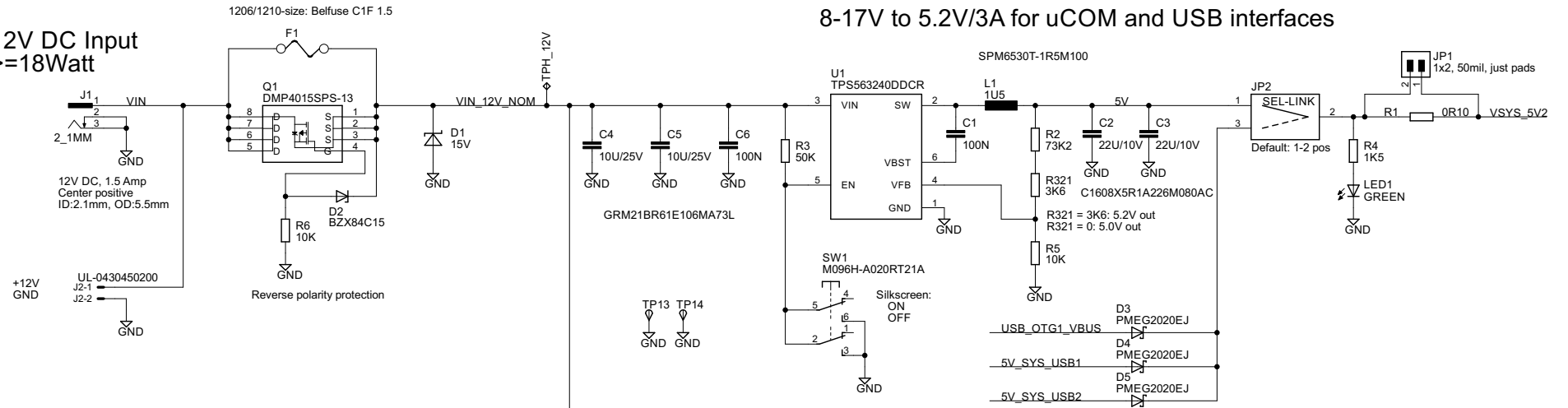
UL = UnLoaded = normally not mounted component.

Default jumper settings are indicated in the schematic.
However, always check jumper positions on actual boards
since there is no guarantee that all jumpers are in default place.

<div>Rev C1</div> <div>Added control for powerdown of M.2 E-key.</div>
<div>Rev C</div> <div>Added dual CAN transceivers.</div> <div>Added R324 (fix rework in previous rev.)</div> <div>Changed 24/16-bit color mapping to LCD (added J44/JP47).</div> <div>Added support for 5 inch LCD with CTP (changed J14).</div> <div>Added support for iMX93 UART over JTAG pins.</div>
<div>Rev B</div> <div>Added R311/R312 and JP35. Delete R152.</div> <div>Delete Q24, added D39/D41/D42. Added U30.</div> <div>Delete U38/U39, added U40/U41.</div> <div>Delete D7/U2, added Q29/Q30.</div> <div>Delete JP8/JP9, add J14 and J38. Change J15.</div> <div>Adding SPI support for the M.2 E-key connector.</div>
<div>Rev PB3</div> <div>Replace D35 with U38 and D36 with U39.</div> <div>Updated LED driving of J25. Update U36 package.</div> <div>Updated current measurements (JP4-JP7/JP29/JP34/JP43)</div>
<div>Rev PB1-PB2</div> <div>Removed one camera interface.</div> <div>Separate power supply to M.2 interfaces.</div> <div>Replaced MIPI-to-LVDS bridge with new design.</div>
<div>Rev A</div> <div>First release</div>
<div><div> Embedded Artists</div><div>(C) Embedded Artists AB</div></div> <div>TITLE: uCOM Carrier board rev C1</div> <div>Document Number:</div> <div><div>Date: 2024-01-29 12:04:30</div><div>Sheet: 1/26</div></div>

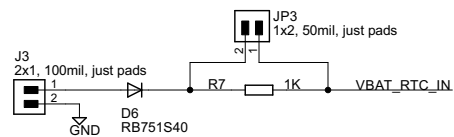
Powering

12V DC Input
 $\geq 18\text{Watt}$

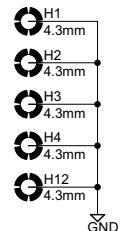
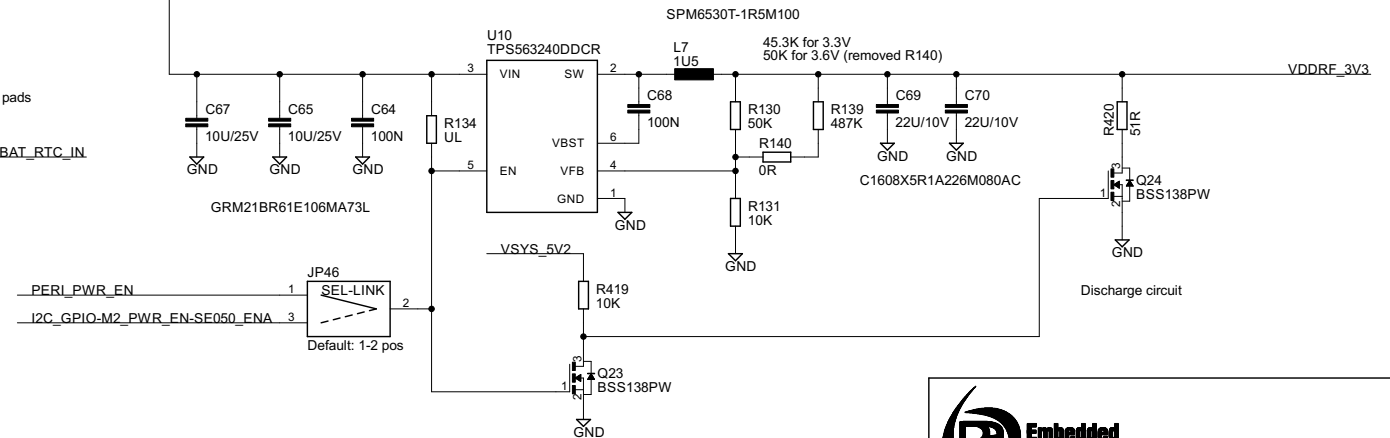


8-17V to 5.2V/3A for uCOM and USB interfaces

VBAT input



8-17V to 3.3V/3A for M.2 interfaces (wireless modules)



GND connectors
 (Keystone 5016K)

TP1

GND



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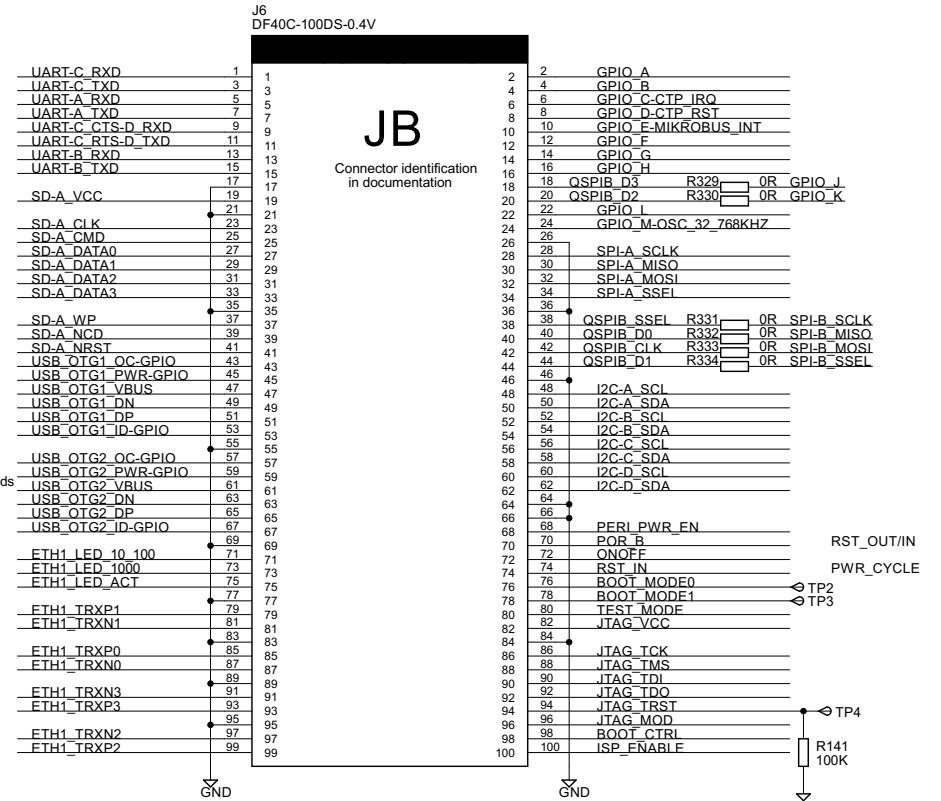
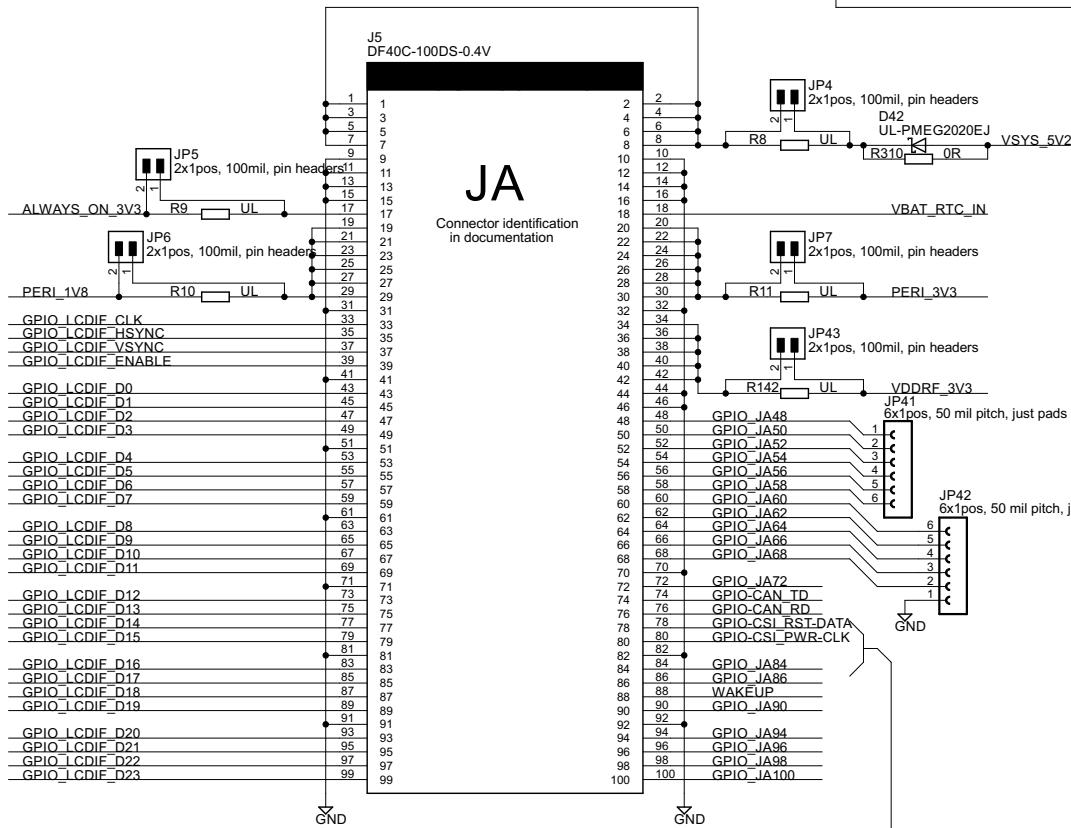
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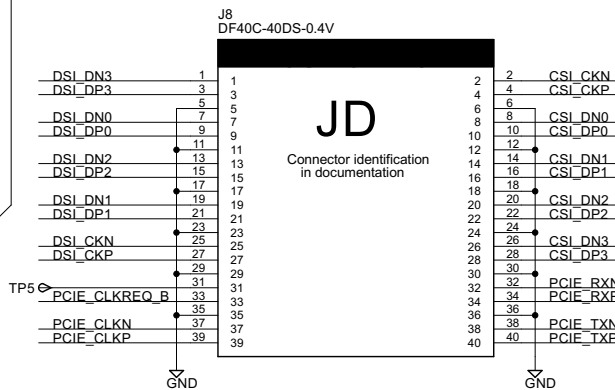
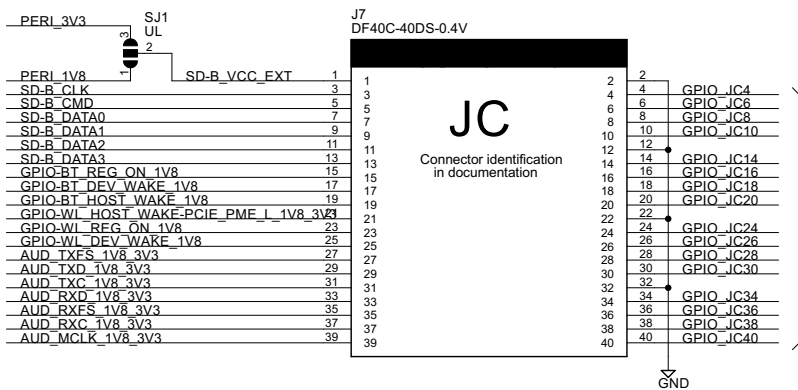
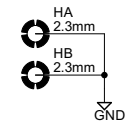
Sheet: 2/26

uCOM Connectors



To Expansion Connector J38 (page 9)

Mounting Holes "A" and "B"



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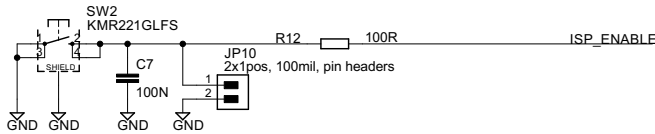
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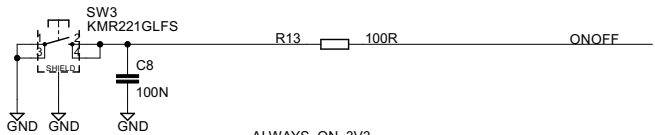
Sheet: 3/26

Push-buttons and Boot control

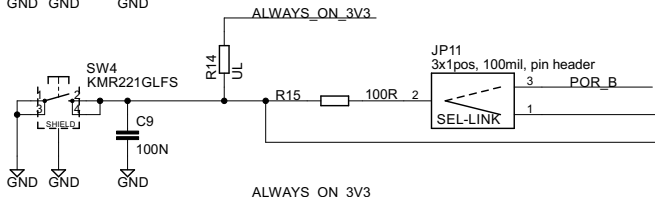
ISP Enable push-button and jumper



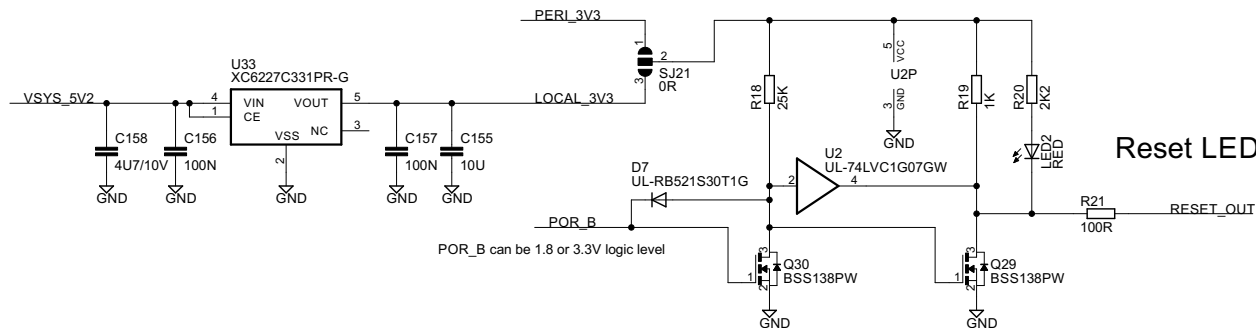
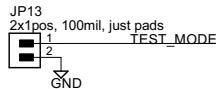
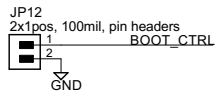
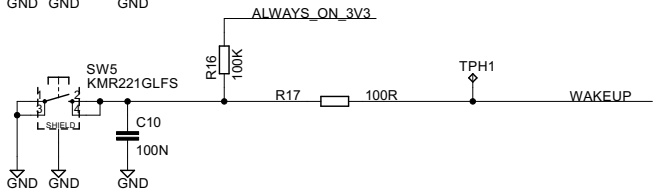
ONOFF push-button



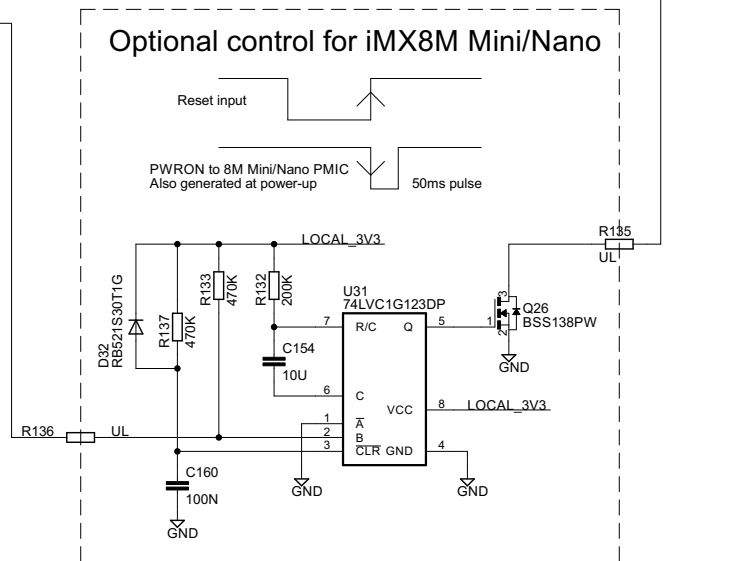
Reset push-button



Wakeup push-button



Reset LED



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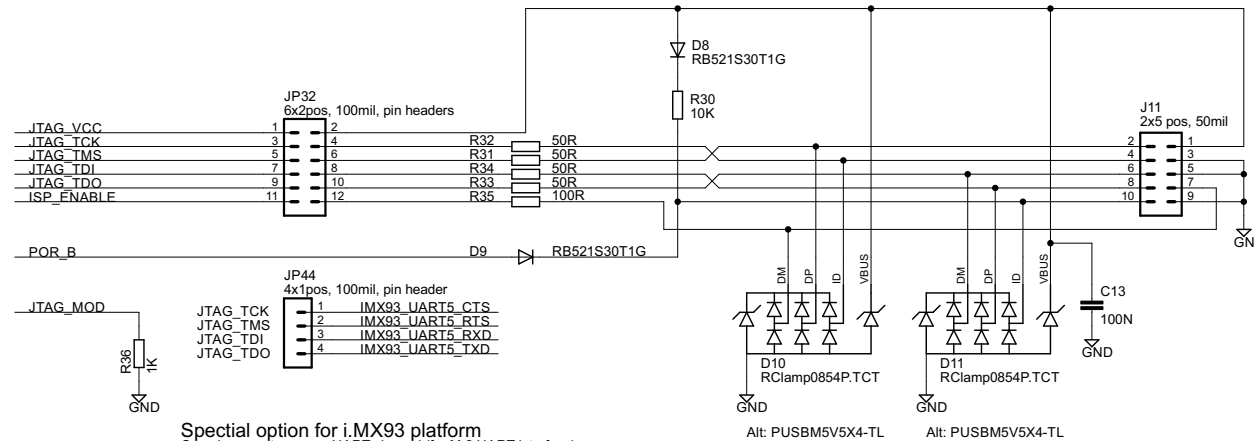
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JTAG Debug Interface and Optional QSPI



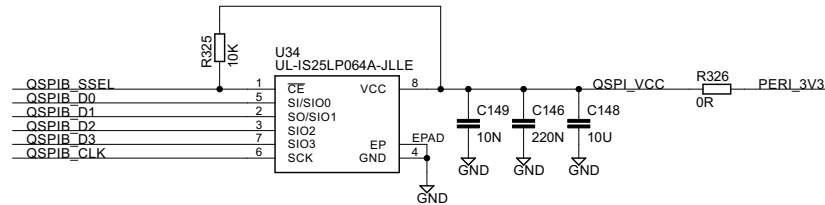
ARM 10-pin interface Serial Wire Mode 10 pos (50 mil pitch) connector

2-SWDIO	1-VCC
4-SWCLK	3-GND
6-SWO	5-GND
8-NIU	7-Optional ISP_ENABLE
10-RESET	9-GND

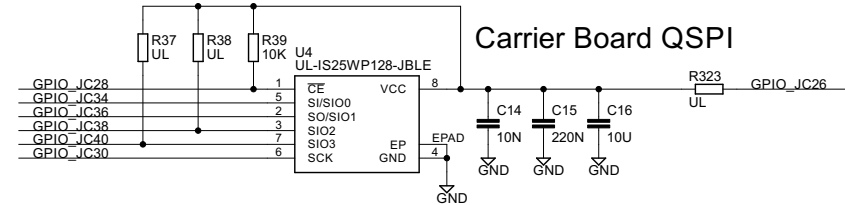
ARM 10-pin interface JTAG Mode

2-TMS	1-VCC
4-TCLK	3-GND
6-TDO	5-GND
8-TDI	7-(RTCK)
10-RESET	9-GND

Pads for carrier board QSPI (for iMX RT1064 uCOM)



Pads for carrier board QSPI (for iMX8M Mini/Nano uCOM)



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Optional Boot Control Pins

JA pin 33 (GPIO_LCDIF_CLK)
JA pin 35 (GPIO_LCDIF_HSYNC)
JA pin 37 (GPIO_LCDIF_VSYNC)
JA pin 39 (GPIO_LCDIF_ENABLE)

JA pin 43 (GPIO_LCDIF_D0)
JA pin 45 (GPIO_LCDIF_D1)
JA pin 47 (GPIO_LCDIF_D2)
JA pin 49 (GPIO_LCDIF_D3)

JA pin 53 (GPIO_LCDIF_D4)
JA pin 55 (GPIO_LCDIF_D5)
JA pin 57 (GPIO_LCDIF_D6)
JA pin 59 (GPIO_LCDIF_D7)

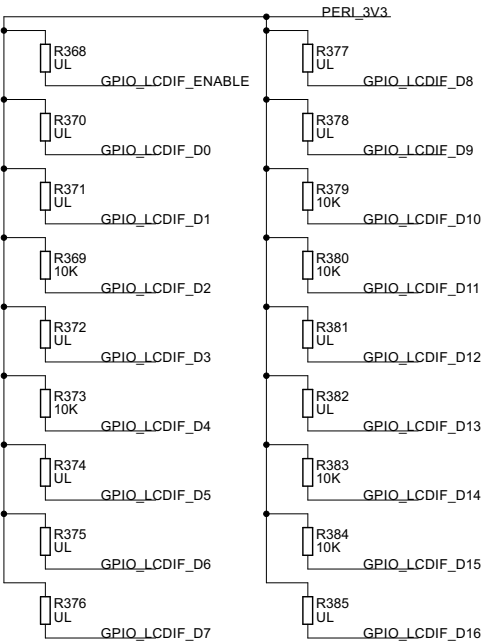
JA pin 63 (GPIO_LCDIF_D8)
JA pin 65 (GPIO_LCDIF_D9)
JA pin 67 (GPIO_LCDIF_D10)
JA pin 69 (GPIO_LCDIF_D11)

JA pin 73 (GPIO_LCDIF_D12)
JA pin 75 (GPIO_LCDIF_D13)
JA pin 77 (GPIO_LCDIF_D14)
JA pin 79 (GPIO_LCDIF_D15)

JA pin 83 (GPIO_LCDIF_D16)
JA pin 85 (GPIO_LCDIF_D17)

iMX8M Mini	RT1064	RT1176
SAI1_TXD0 BT_CFG8-0	MDC MDIO	
SAI1_TXD1 BT_CFG9-0	BT_CFG10	BT_CFG0
SAI1_TXD2 BT_CFG10-0	BT_CFG11	BT_CFG1
SAI1_TXD3 BT_CFG11-1	BT_CFG12	
SAI1_TXD4 BT_CFG12-0	BT_CFG13	
SAI1_TXD5 BT_CFG13-1	BT_CFG14	BT_CFG2
SAI1_TXD6 BT_CFG14-0	BT_CFG15	BT_CFG3
SAI1_TXD7 BT_CFG15-0	BT_CFG16	BT_CFG4
	BT_CFG17	BT_CFG5
SAI1_RXD0 BT_CFG0-0	TX0 BT_CFG20	BT_CFG6
SAI1_RXD1 BT_CFG1-1	TX1 BT_CFG21	BT_CFG7
SAI1_RXD2 BT_CFG2-1	TX_EN BT_CFG22	BT_CFG8
	TX_CLK BT_CFG23	BT_CFG9
SAI1_RXD3 BT_CFG3-0	RX_ER	BT_CFG10
SAI1_RXD4 BT_CFG4-0	RX0	BT_CFG11
SAI1_RXD5 BT_CFG5-1	RX1	
SAI1_RXD6 BT_CFG6-1	RX_EN	
SAI1_RXD7 BT_CFG7-0		RX_EN
		RX_ER

Support access to boot control signals
(default set for iMX8M Mini booting from eMMC)



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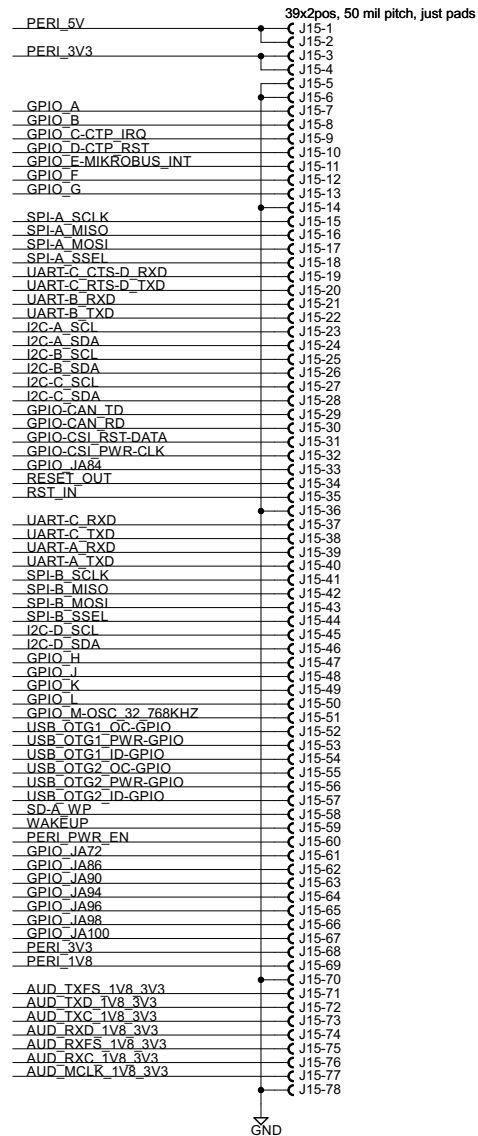
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Connector "A"
(in silkscreen on PCB)

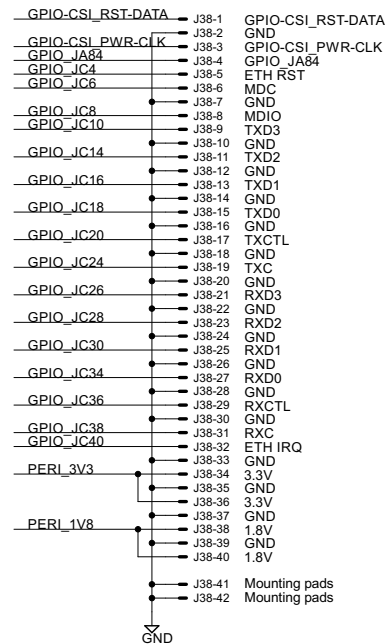
Expansion Connectors

39x2-pos 50 mil pitch matrix



Connector "E"
(in silkscreen on PCB)

0.5mm pitch, top and bottom contacts
XF2W-4015-1A or 68714014022



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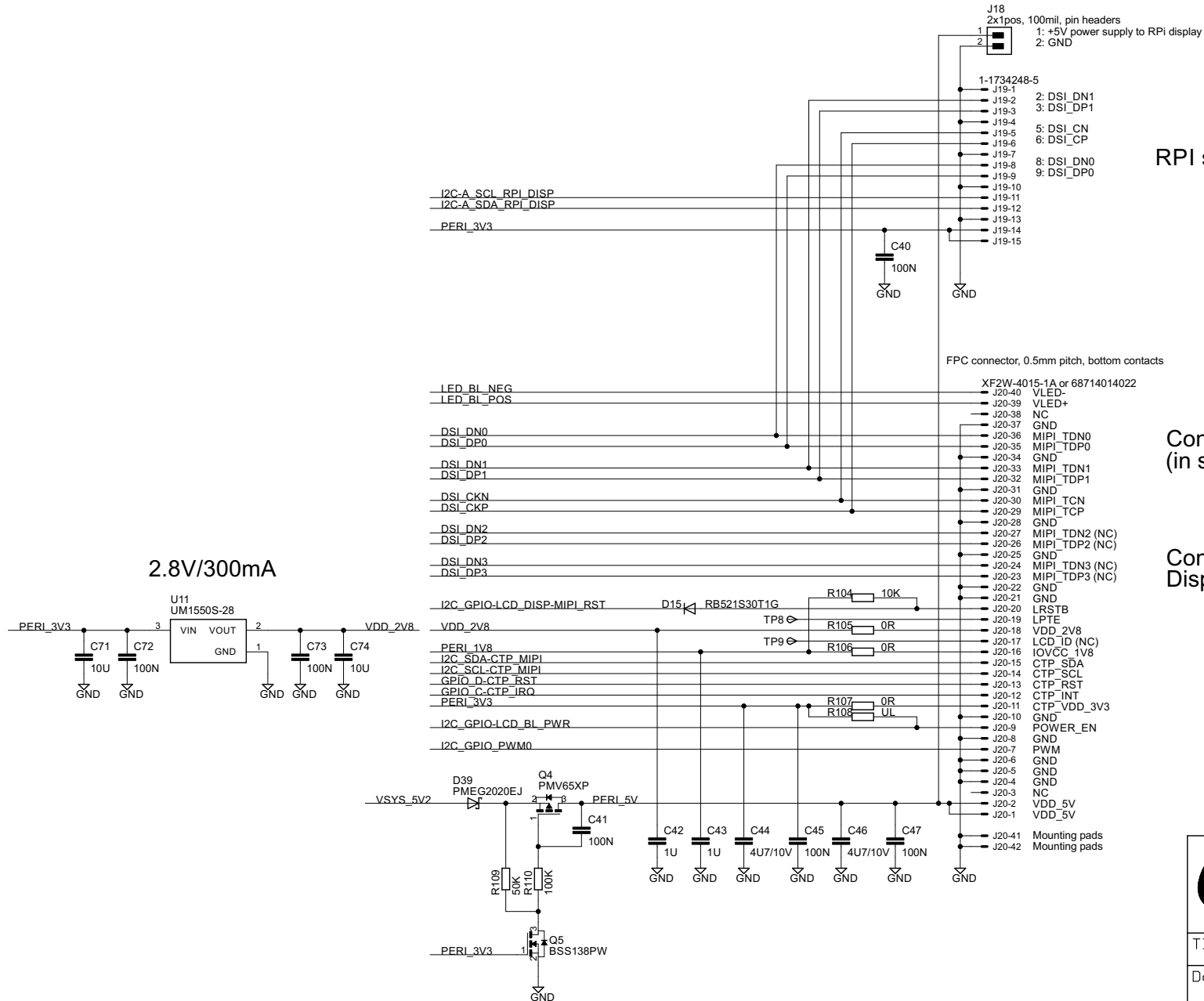
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MIPI-DSI Display Interfaces



RPI serial display (MIPI)

Connector "C"
(in silkscreen on PCB)

Connects to NXP RK055HDMIPI4M
Display: RK055AHD091-CTG(720P)



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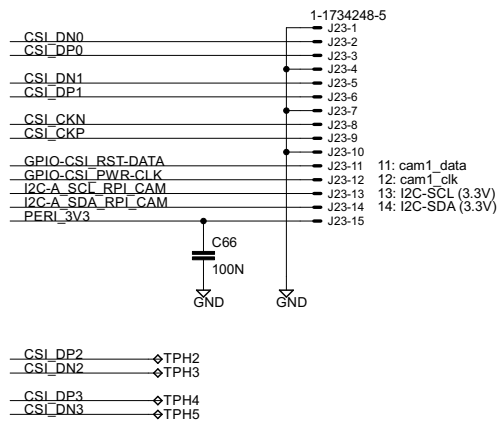
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Camera Interface

RPI serial camera (MIPI)



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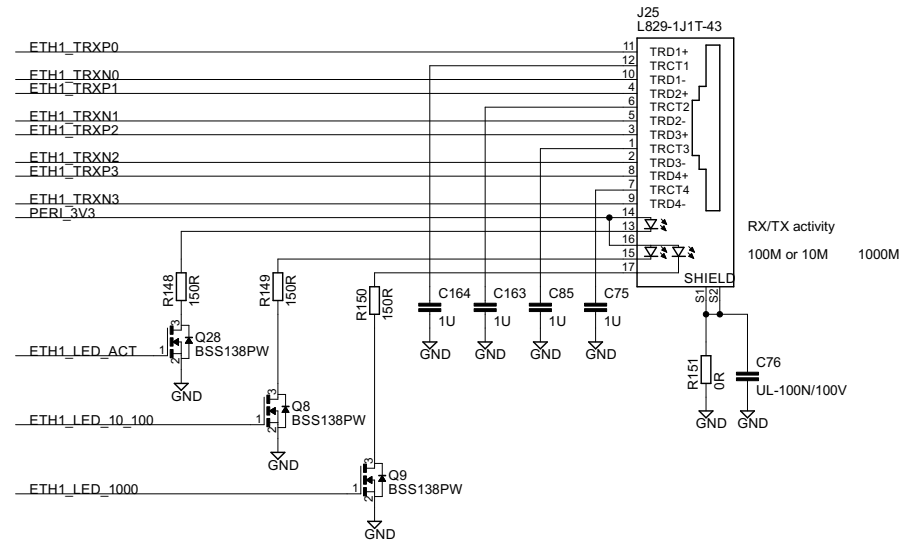
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Ethernet Interface for on-board PHY

Ethernet Interface



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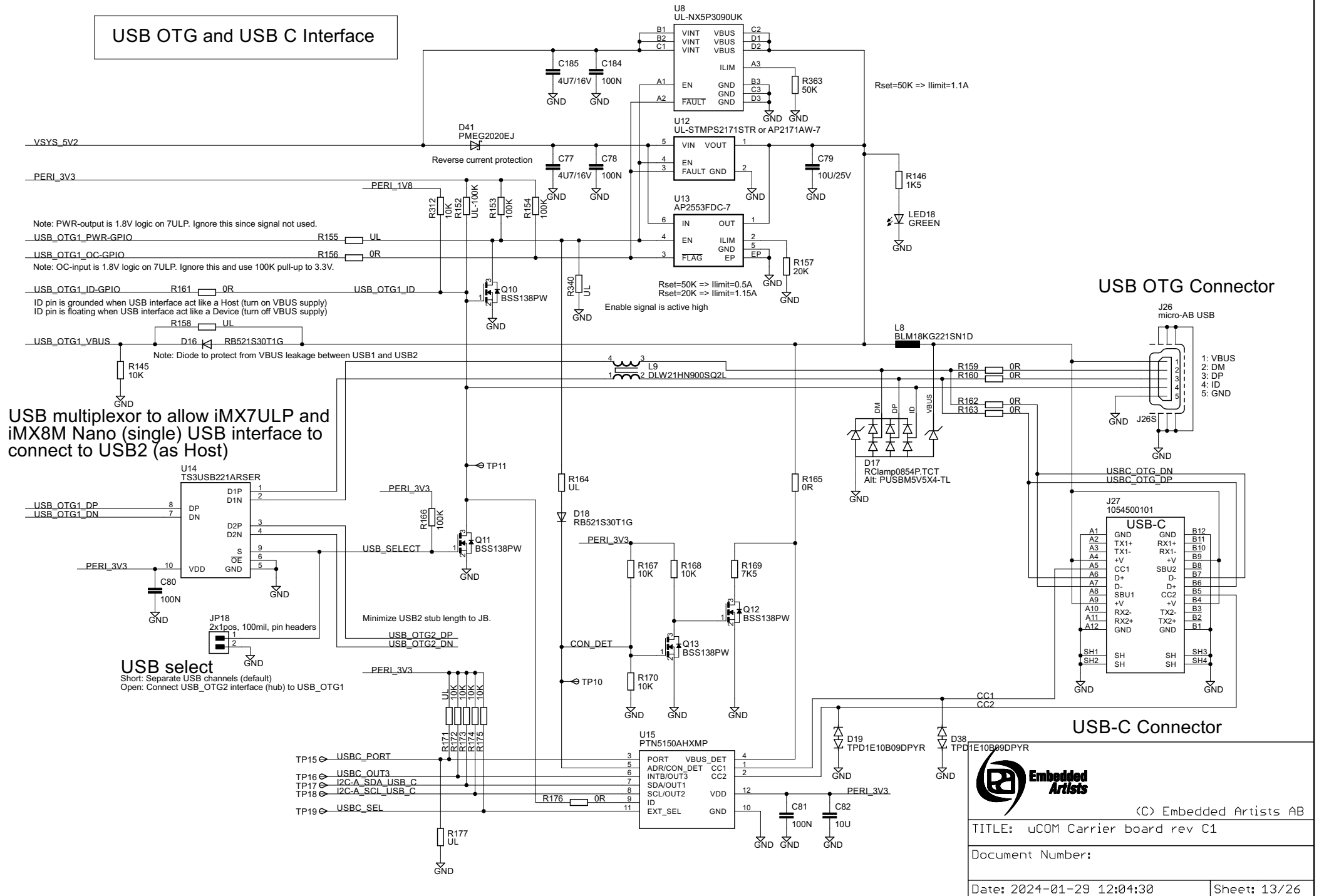
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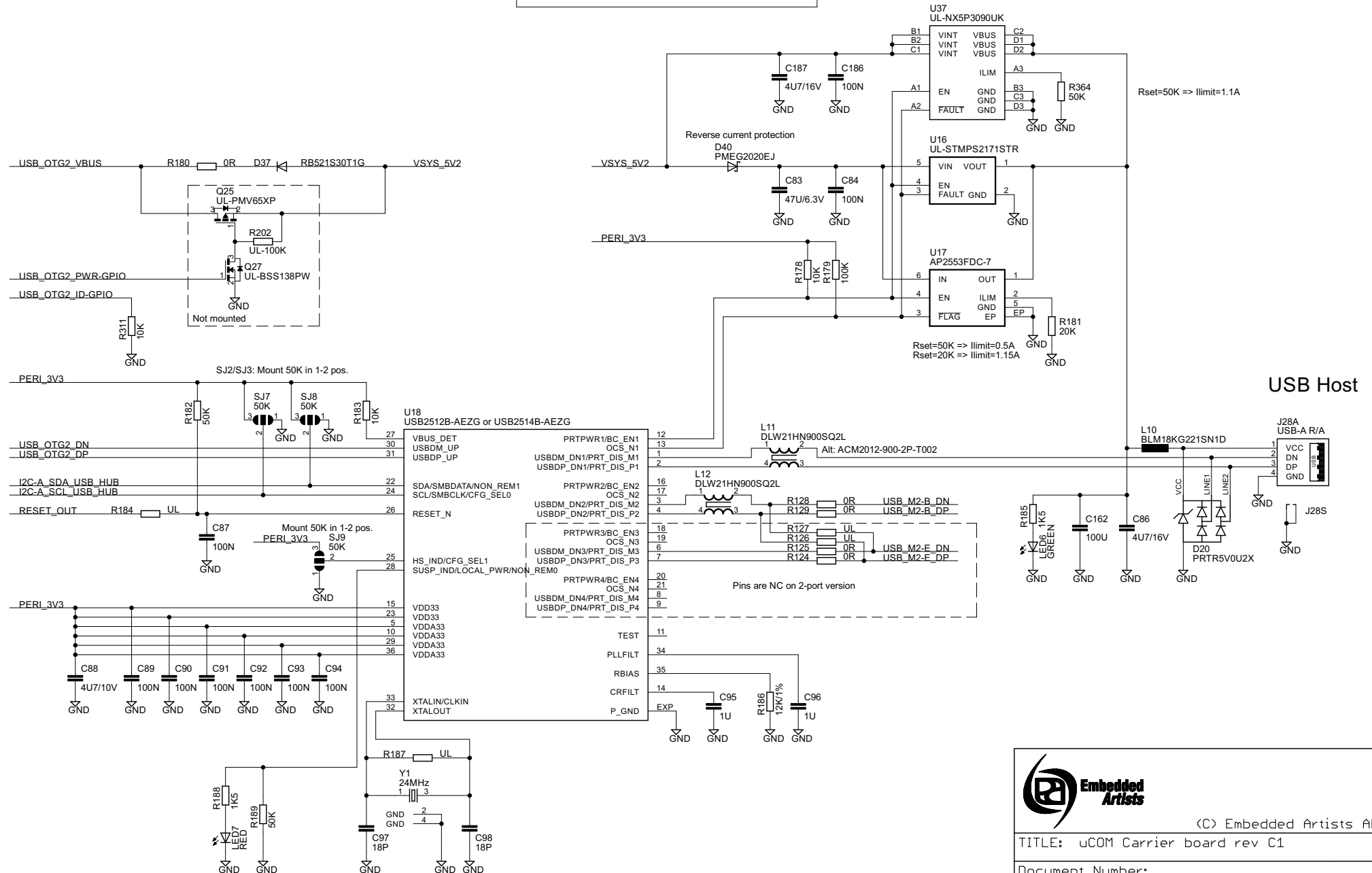
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USB OTG and USB C Interface



USB Host Interface and Hub



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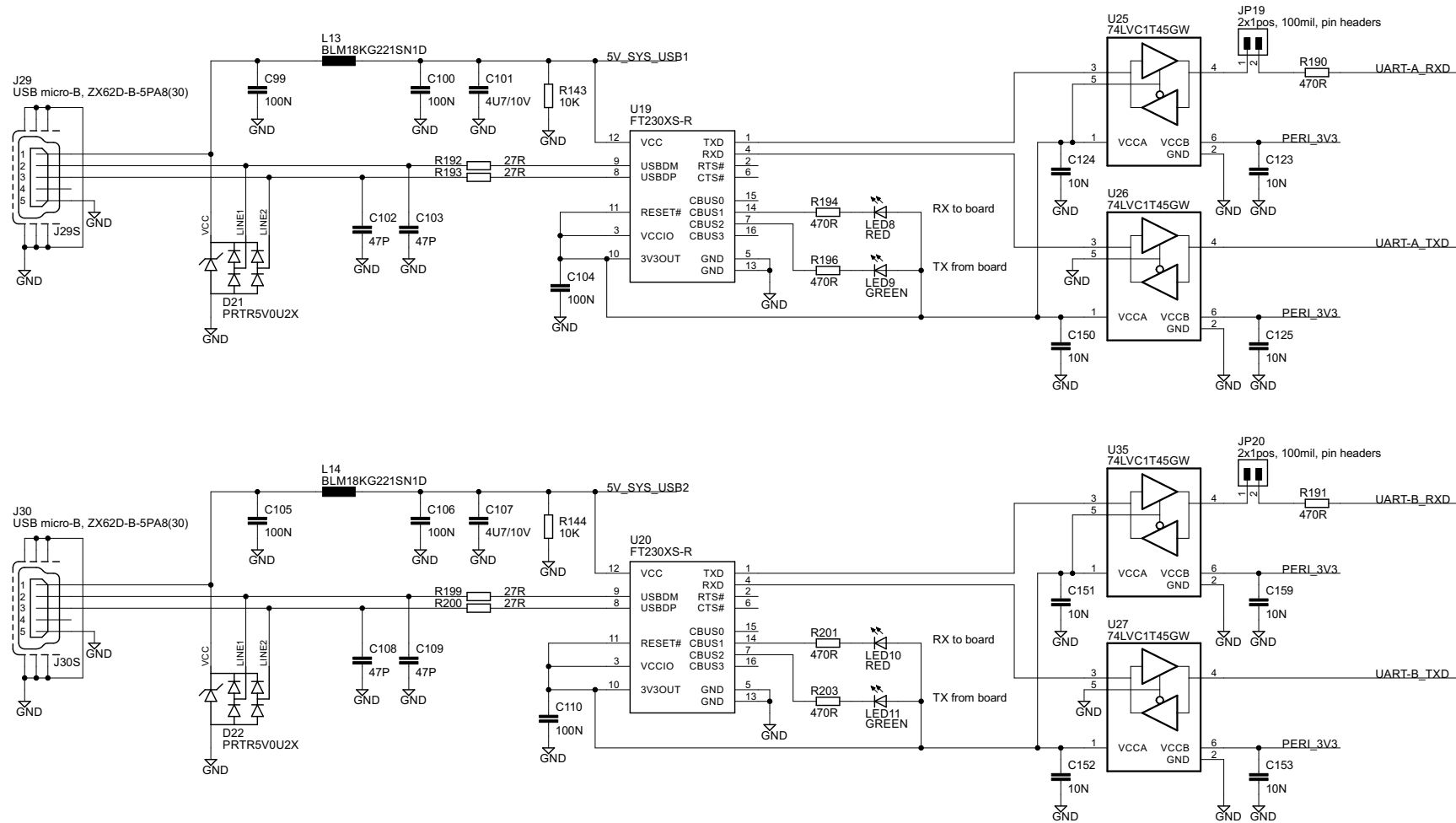
TITLE: uCOM Carrier board rev C1

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UART-to-USB bridge interfaces



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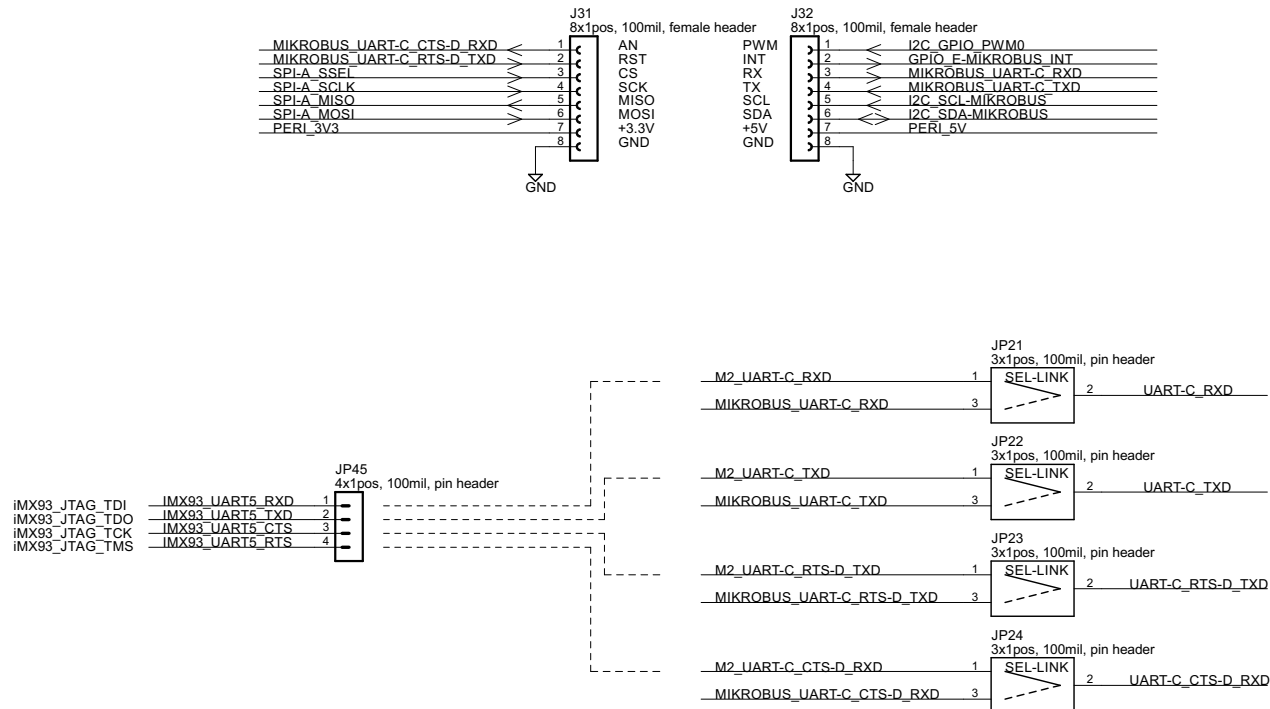
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Mikrobus/Click Module Interface

Mikrobus/Click Module Interface



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TITLE: uCOM Carrier board rev C1

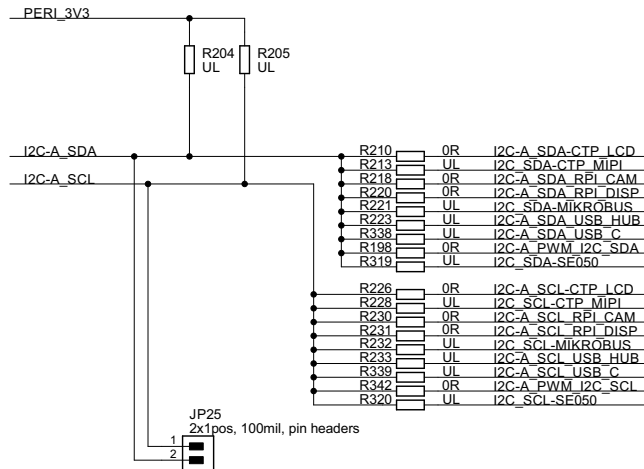
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I2C Connections

I2C-A

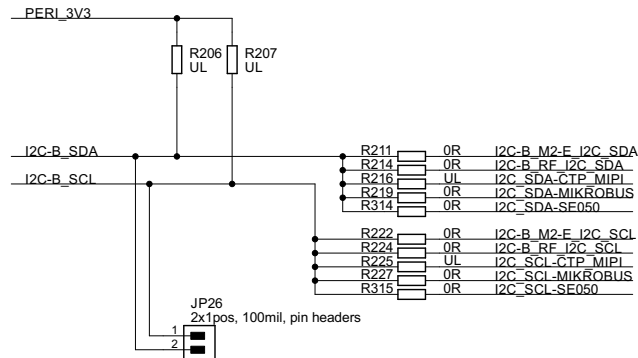


64kbit E2PROM on uCOM: 24LC64
8-bit I2C address (0xAA/0xAB): 1.0.1.0.1.0.1.RW
7-bit I2C address (0x55): 1.0.1.0.1.0.1

Optional 1Kbit I2C-E2PROM with EU1-48: 24AA025E48T
8-bit I2C address (0xA4/0xA5): 1.0.1.0.0.1.0.RW
7-bit I2C address (0x52): 1.0.1.0.0.1.0

GPIO expander: PCA9530
8-bit I2C address (0xC2/0xC3): 1.1.0.0.0.0.ADDR.RW
7-bit I2C address (0x61): 1.1.0.0.0.0.ADDR

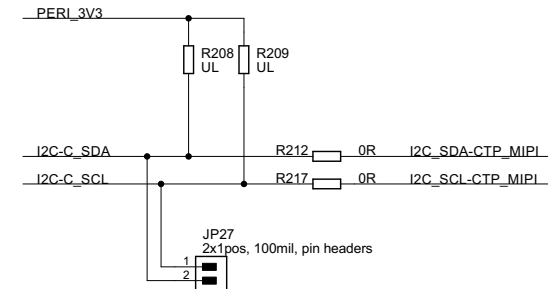
I2C-B



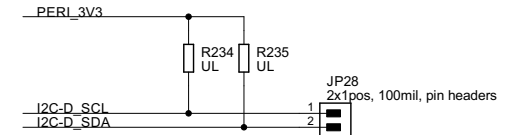
GPIO expander: PCA6416A
8-bit I2C address (0x42/0x43): 0.1.0.0.0.0.ADDR.RW
7-bit I2C address (0x21): 0.1.0.0.0.0.ADDR

GPIO expander: PCA6408A on M.2
8-bit I2C address (0x40/0x41): 0.1.0.0.0.0.0.RW
7-bit I2C address (0x20): 0.1.0.0.0.0.0

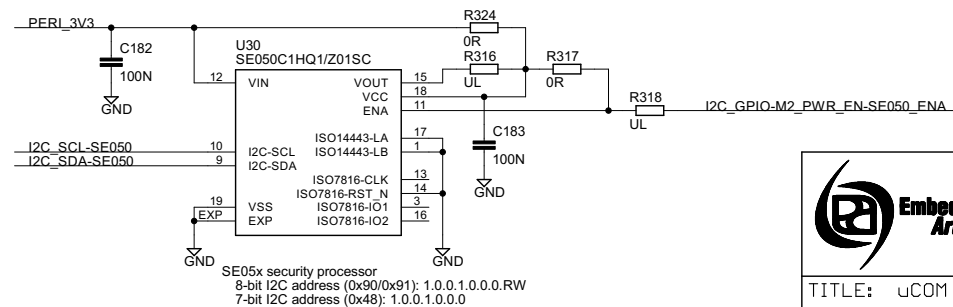
I2C-C



I2C-D



NXP SE050 security processor



SE05x security processor
8-bit I2C address (0x90/0x91): 1.0.0.1.0.0.0.RW
7-bit I2C address (0x48): 1.0.0.1.0.0.0



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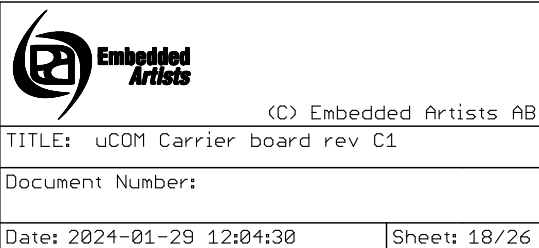
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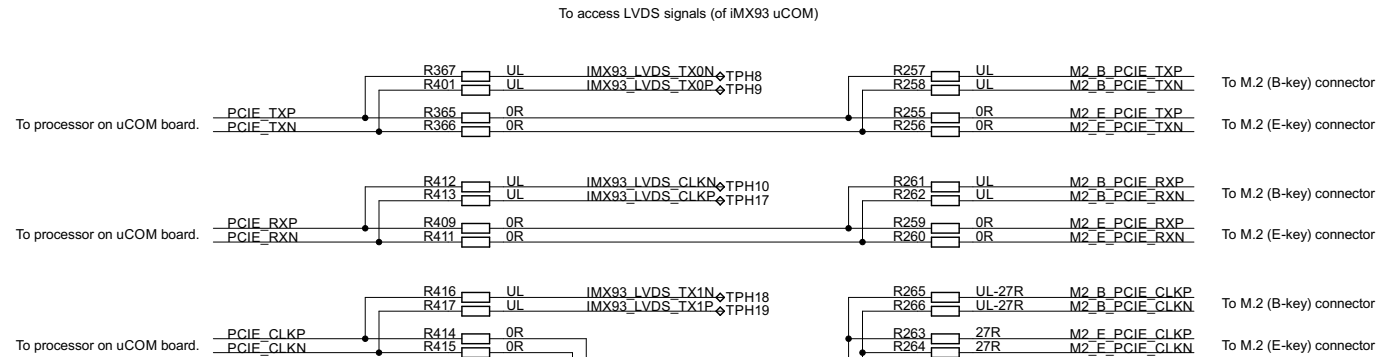
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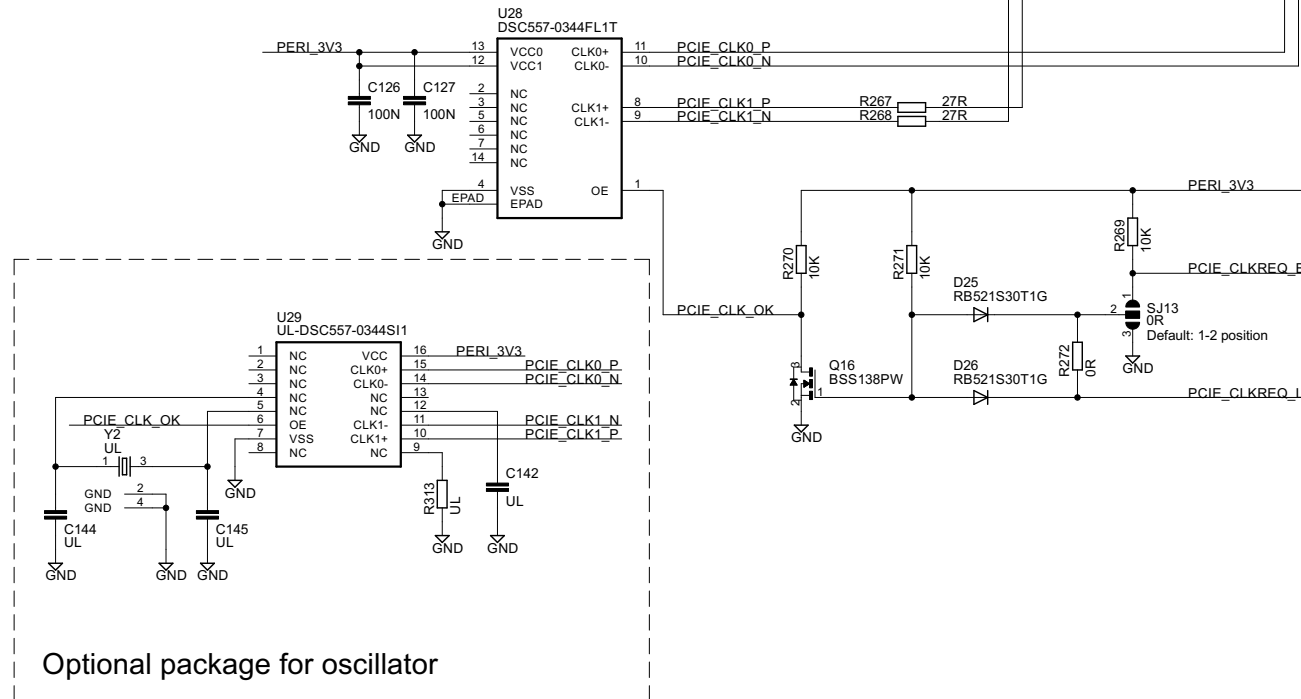
M.2 (NGFF) Key E Connector



PCIe Signal Routing



100MHz clock generator



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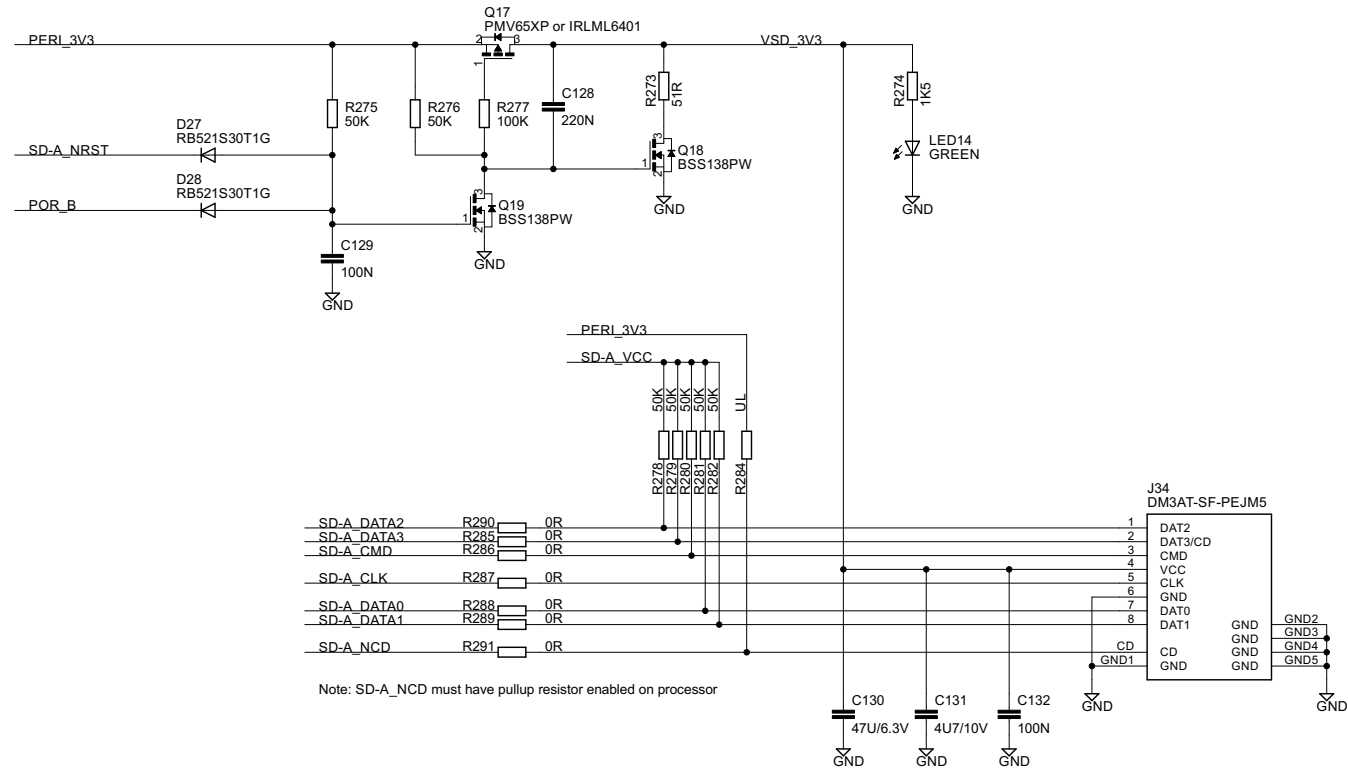
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uSD card interface

Power Switch for SD3.0



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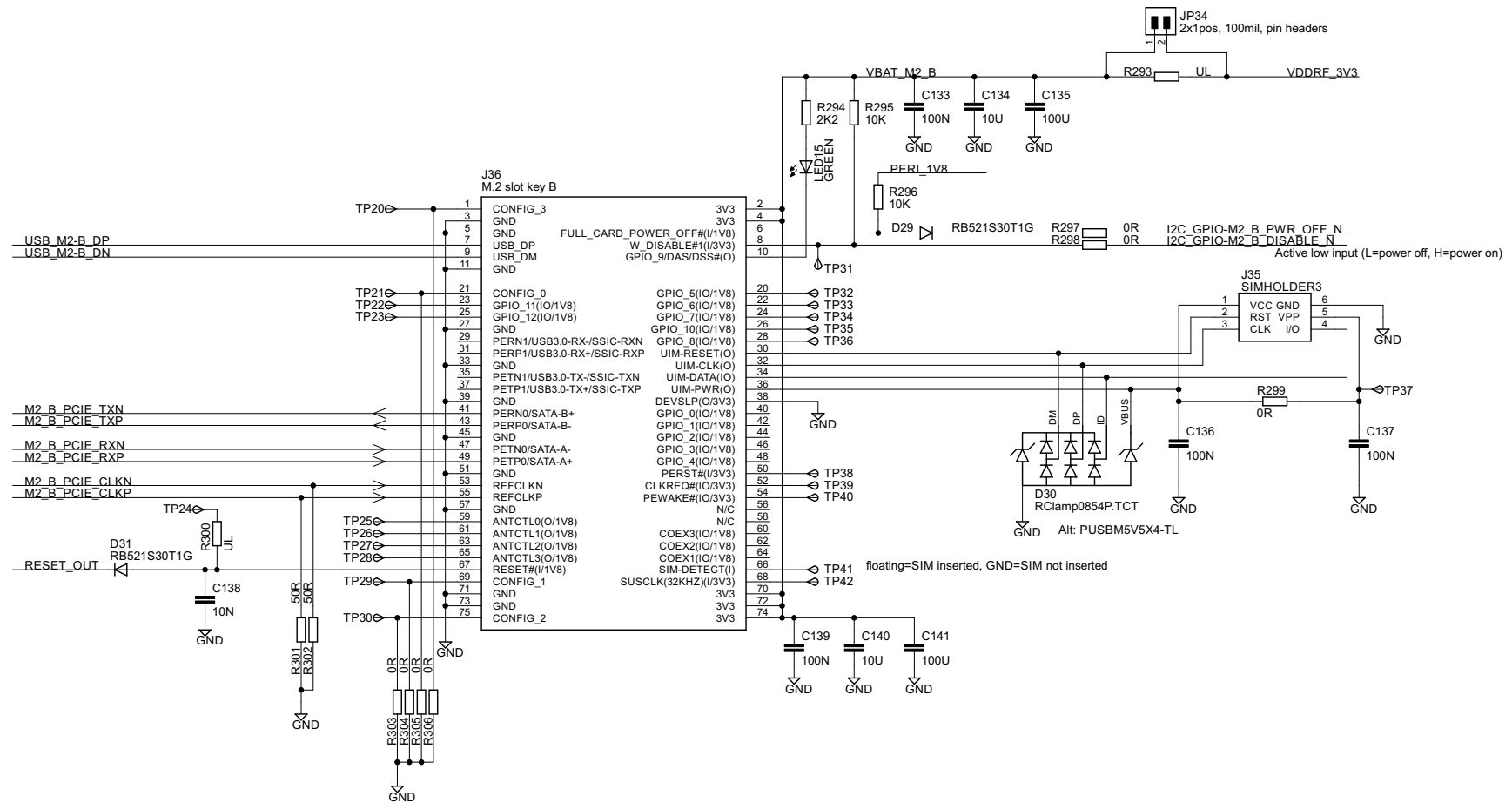
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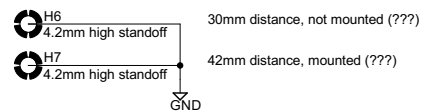
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M.2 (NGFF) Key B Connector (USB Host and PCIe Interfaces)



Standoffs for M.2 connector, placed at 30mm and 42mm distance from connector



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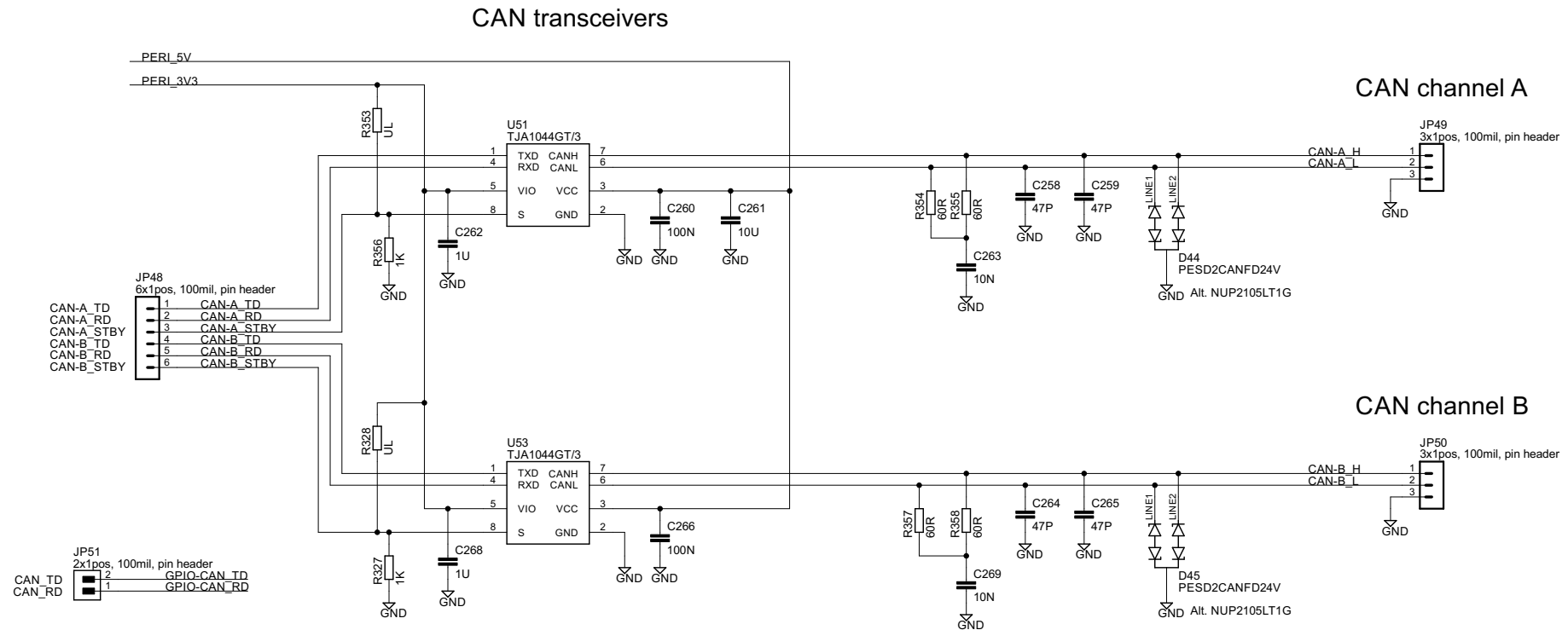
TITLE: uCOM Carrier board rev C1

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Dual CAN transceivers



For iMX93, the two CAN interfaces are available on the following pins and connectors:

CAN1_TX: PDM_CLK (available on J15 pin 29, JP51 pin 2) and SAI1_TXD0 (available on J15 pin 72)
CAN1_RX: PDM_DATA0 (available on J15 pin 30, JP51 pin 1) and SAI1_TXC (available on J15 pin 73)

CAN2_TX: GPIO_IO25 (available on J12 pin 10, JP35 pin 2) and USDHC2_DATA0 (available on J34/R288)
CAN2_RX: GPIO_IO27 (available on J12 pin 12, JP35 pin 4) and USDHC2_DATA1 (available on J34/R289)

For iMX RT1176, the three CAN interfaces are available on the following pins and connectors:

FLEXCAN1_TD: GPIO_AD_06 (available on J15 pin 55), GPIO_DISP_B2_12 (available on JP35 pin 1) and GPIO_DISP_B2_14 (available on JP35 pin 3)
FLEXCAN1_RD: GPIO_AD_07 (available on J15 pin 56), GPIO_DISP_B2_13 (available on JP35 pin 2) and GPIO_DISP_B2_15 (available on JP35 pin 4)

FLEXCAN2_TD: GPIO_AD_00 (available on J15 pin 38 / JP22 pin 2) and GPIO_AD_30 (available on J15 pin 17 / J31 pin 6)
FLEXCAN2_RD: GPIO_AD_01 (available on J15 pin 37 / JP21 pin 2) and GPIO_AD_31 (available on J15 pin 16 / J31 pin 5)

FLEXCAN3_TD: GPIO_LPSR_00 (available on J15 pin 29 / JP51 pin 2)
FLEXCAN3_RD: GPIO_LPSR_01 (available on J15 pin 30 / JP51 pin 1)

For iMX RT1064, the three CAN interfaces are available on the following pins and connectors:

FLEXCAN1_TD: GPIO_AD_B1_08 (available on J15 pin 31, J38 pin 1, J23 pin 11), GPIO_B0_02 (available on J12 pin 32, J40 pin 32), GPIO_SD_B1_02 (available on J15 pin 11, J32 pin 2)
FLEXCAN1_RD: GPIO_AD_B1_09 (available on J15 pin 32, J38 pin 3, J23 pin 12), GPIO_B0_03 (available on J12 pin 33, J40 pin 33), GPIO_SD_B1_03 (available on J15 pin 12)

FLEXCAN2_TD: GPIO_AD_B0_02 (available on J15 pin 53), GPIO_AD_B0_14 (available on J15 pin 29, JP51 pin 2)
FLEXCAN2_RD: GPIO_AD_B0_03 (available on J15 pin 52), GPIO_AD_B0_15 (available on J15 pin 30, JP51 pin 1)

CANFD_TD: GPIO_AD_B0_10 (available on JP32 pin 9), GPIO_AD_B0_14 (available on J15 pin 29, JP51 pin 2)
CANFD_RD: GPIO_AD_B0_11 (available on TP4), GPIO_AD_B0_15 (available on J15 pin 30, JP51 pin 1)



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TITLE: uCOM Carrier board rev C1

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100/10Mbps Ethernet-PHY Adapter for RT1176 uCOM

Separate adapter board (from previous schematic page)

JA pin 33 (GPIO_LCDFIF_CLK)
 JA pin 35 (GPIO_LCDFIF_HSYNC)
 JA pin 37 (GPIO_LCDFIF_VSYNC)
 JA pin 39 (GPIO_LCDFIF_ENABLE)

 JA pin 43 (GPIO_LCDFIF_D0)
 JA pin 45 (GPIO_LCDFIF_D1)
 JA pin 47 (GPIO_LCDFIF_D2)
 JA pin 49 (GPIO_LCDFIF_D3)

 JA pin 53 (GPIO_LCDFIF_D4)
 JA pin 55 (GPIO_LCDFIF_D5)
 JA pin 57 (GPIO_LCDFIF_D6)
 JA pin 59 (GPIO_LCDFIF_D7)

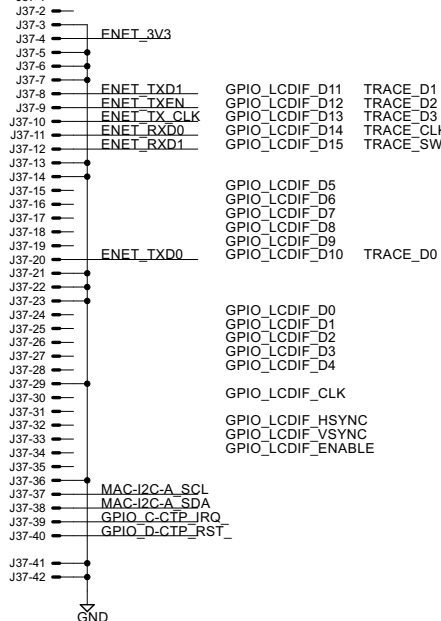
 JA pin 63 (GPIO_LCDFIF_D8)
 JA pin 65 (GPIO_LCDFIF_D9)
 JA pin 67 (GPIO_LCDFIF_D10)
 JA pin 69 (GPIO_LCDFIF_D11)

 JA pin 73 (GPIO_LCDFIF_D12)
 JA pin 75 (GPIO_LCDFIF_D13)
 JA pin 77 (GPIO_LCDFIF_D14)
 JA pin 79 (GPIO_LCDFIF_D15)

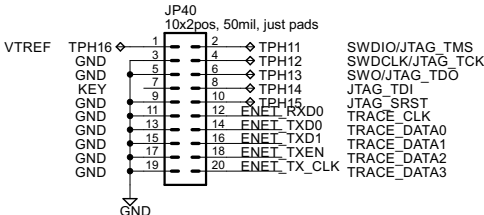
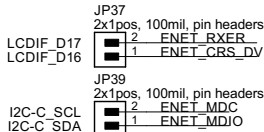
 JA pin 83 (GPIO_LCDFIF_D16)
 JA pin 85 (GPIO_LCDFIF_D17)

Connector "D"
(in silkscreen on PCB)
(for RT1176)

0.5mm pitch, top and bottom contacts
XF2W-4015-1A or 68714014022



Support for accessing iMX RT1176 Trace Signals



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TITLE: uCOM Carrier board rev C1

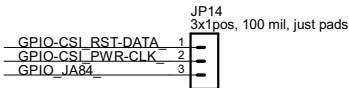
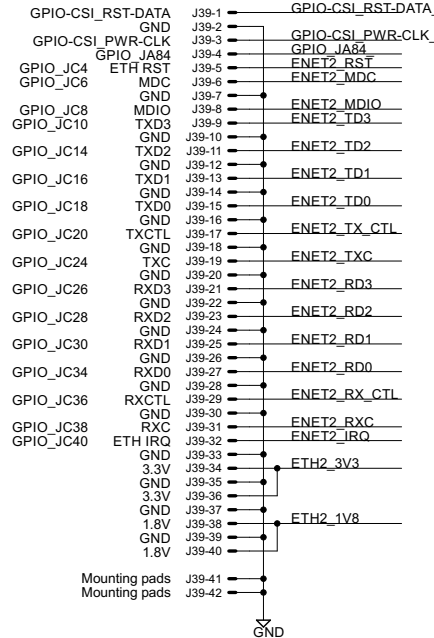
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Gigabit Ethernet-PHY Adapter for i.MX93

0.5mm pitch, top and bottom contacts
XF2W-4015-1A or 68714014022



```
PHYAD[210]: 001
PLLOFF: 0
TXDLY: 0
RXDLY: 1
CFG_EXT: 0 (internal powering of IO pads)
CFG_LDO[10]: 10 for 1.8V
```



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TITLE: uCOM Carrier board rev C1

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