

Page 2: Powering
Page 3: uCOM Connectors
Page 4: Push-buttons and Boot control
Page 5: I2C GPIO Expander and user LEDs and button
Page 6: JTAG Debug Interface and Optional QSPI
Page 7: Parallel LCD interface
Page 8: Expansion Connectors
Page 9: 100/10Mbps Ethernet-PHY Adapter for RT1064 uCOM
Page 10: 100/10Mbps Ethernet-PHY Adapter for RT1176 uCOM
Page 11: MIPI-DSI Display Interfaces
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Page 13: Camera Interface
Page 14: Ethernet Interface for on-board PHY
Page 15: USB OTG and USB C Interface
Page 16: USB Host Interface and Hub
Page 17: UART-to-USB bridge interfaces
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Page 23: M.2 (NGFF) Key B Connector (USB Host and PCIe Interfaces)
Page 24: MIPI-DSI to HDMI/LVDS Adapter (reference schematic - not included)

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.

Rev PB3

Replace D35 with U38 and D36 with U39.
Updated LED driving of J25. Update U36 package.
Updated current measurements (JP4-JP7/JP29/JP34/JP43)

Rev PB1-PB2

Removed one camera interface.
Separate power supply to M.2 interfaces.
Replaced MIPI-to-LVDS bridge with new design.

Rev A

First release



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TITLE: uCOM Carrier board rev PB3

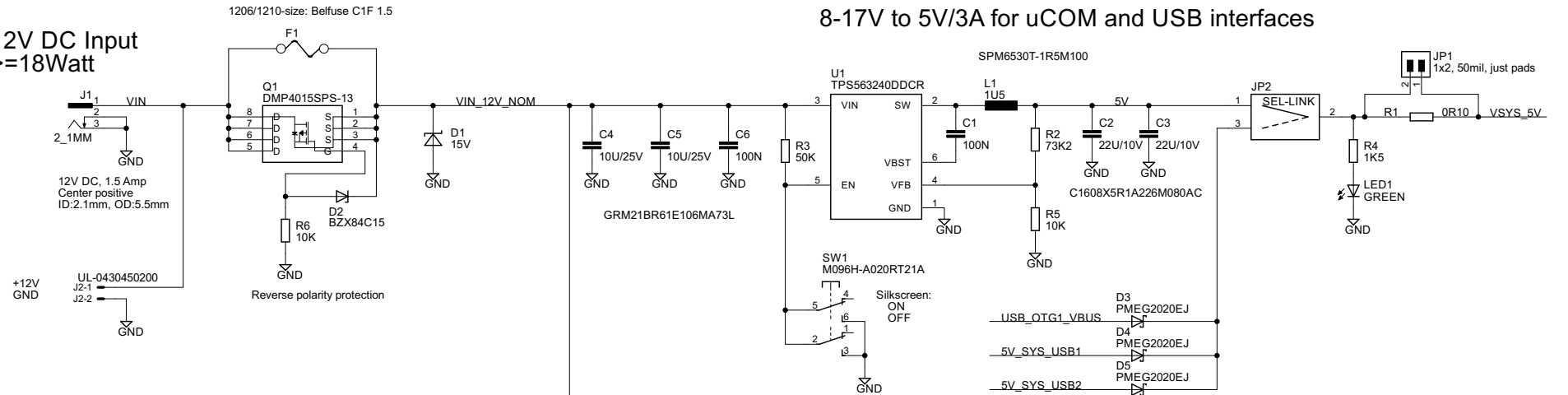
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Date: 2022-08-14 23:40:42

Sheet: 1/24

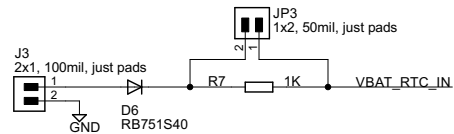
Powering

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

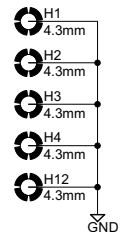
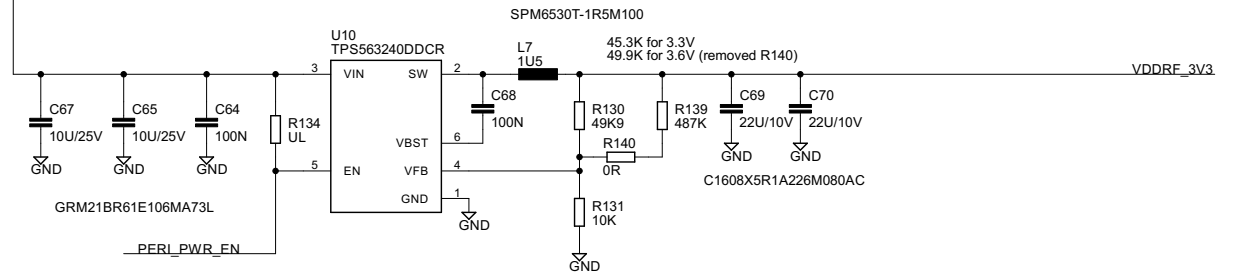


8-17V to 5V/3A for uCOM and USB interfaces

VBAT input



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



GND connectors
 (Keystone 5016K)

TP1

GND



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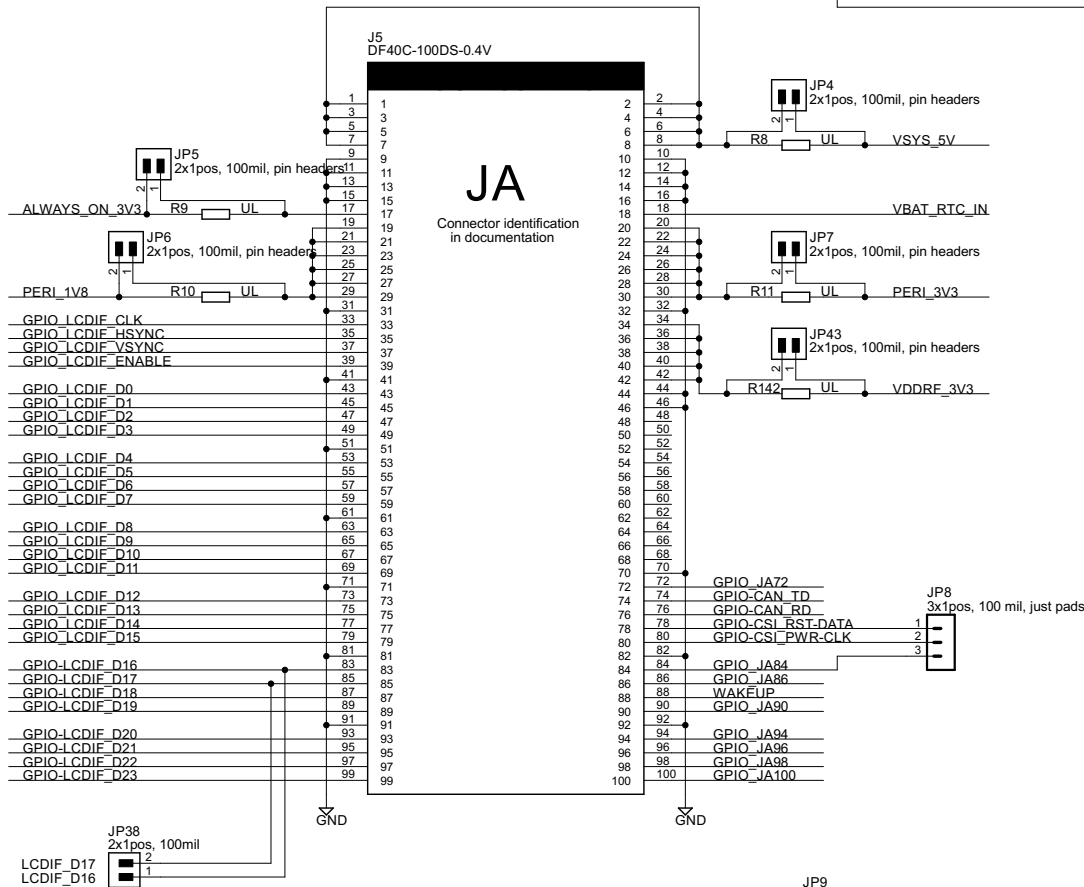
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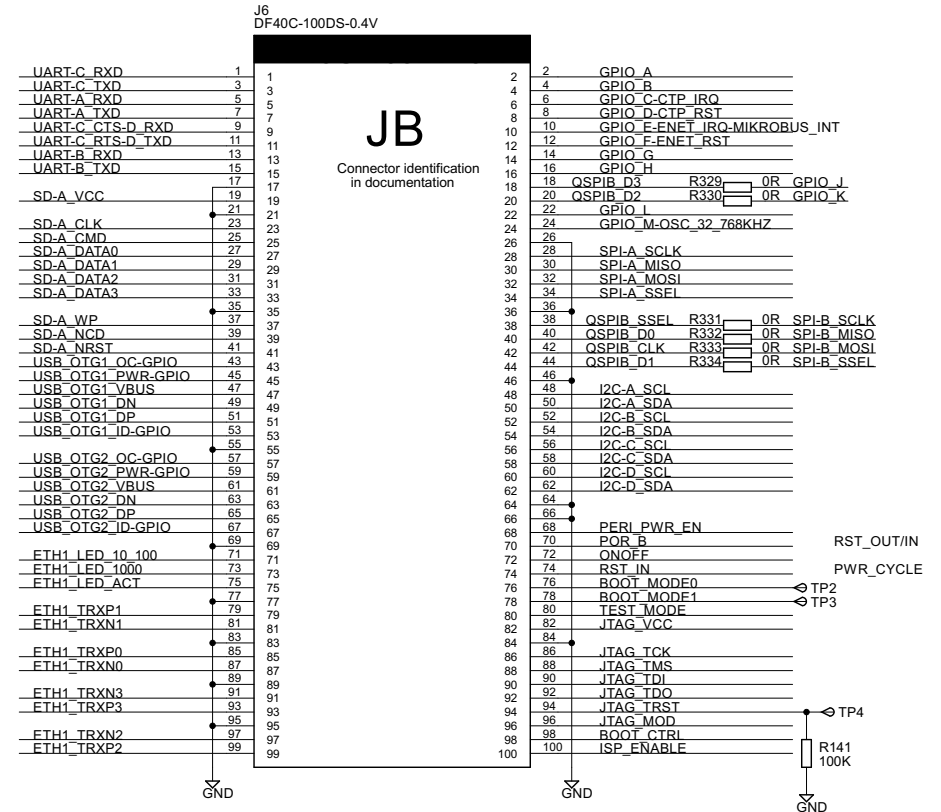
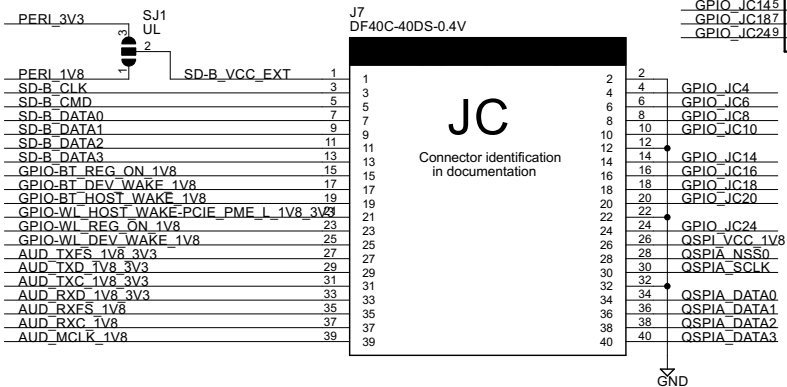
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Sheet: 2/24

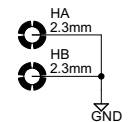
uCOM Connectors



For iMX RT1176 Ethernet: connect to JP37 on adapter board



Mounting Holes "A" and "B"



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TITLE: uCOM Carrier board rev PB3

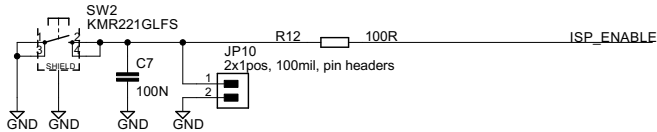
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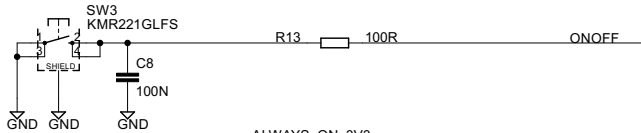
Sheet: 3/24

Push-buttons and Boot control

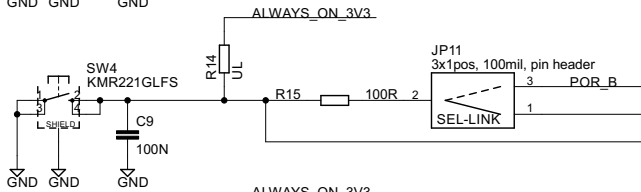
ISP Enable push-button and jumper



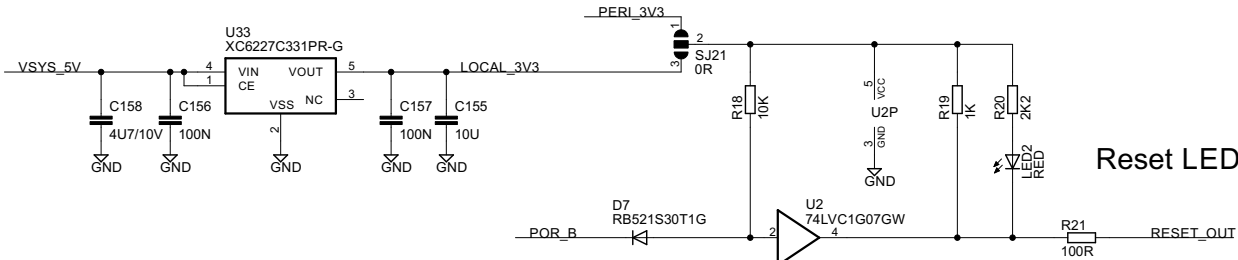
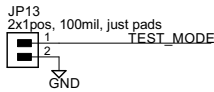
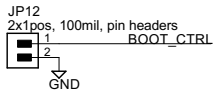
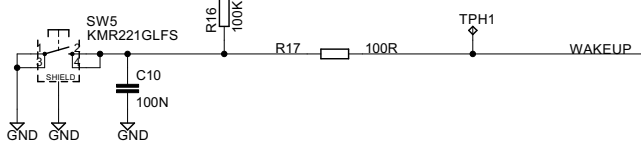
ONOFF push-button



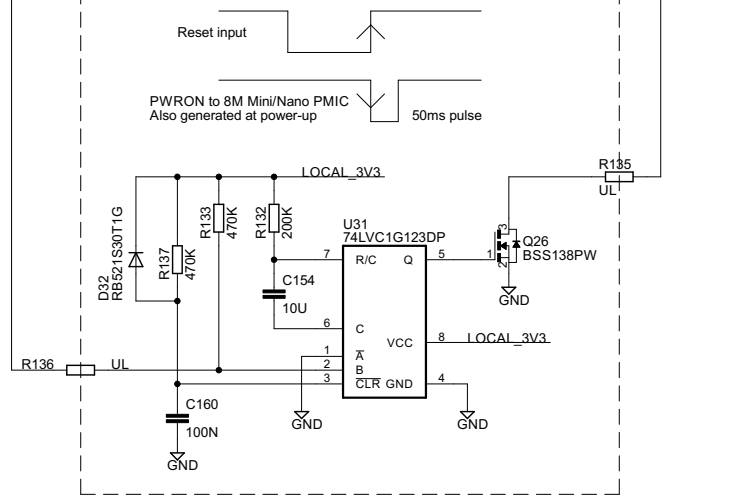
Reset push-button



Wakeup push-button



Can be 1.8 or 3.3V logic level



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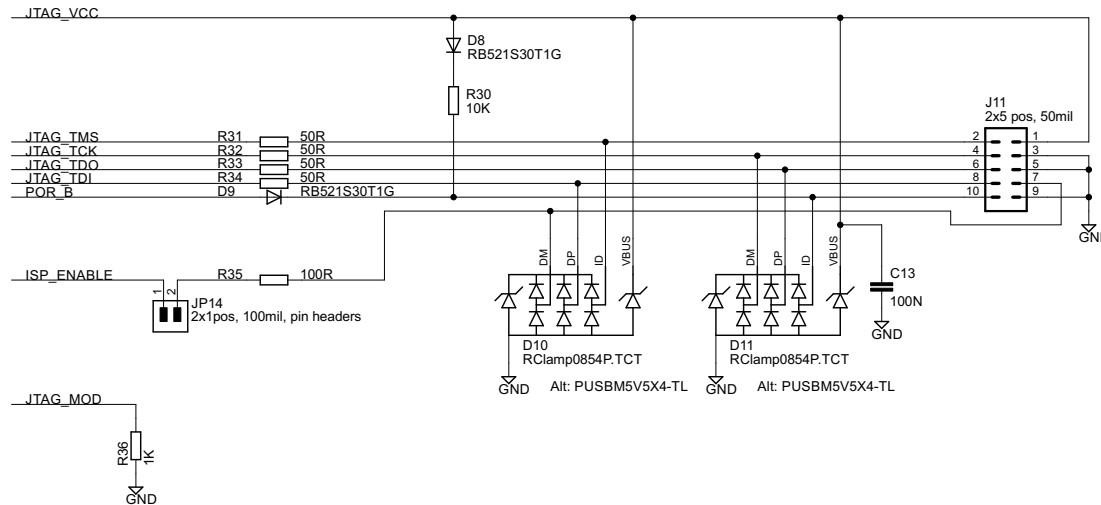
TITLE: uCOM Carrier board rev PB3

Document Number:

Date: 2022-08-14 23:40:42

Sheet: 4/24

JTAG Debug Interface and Optional QSPI



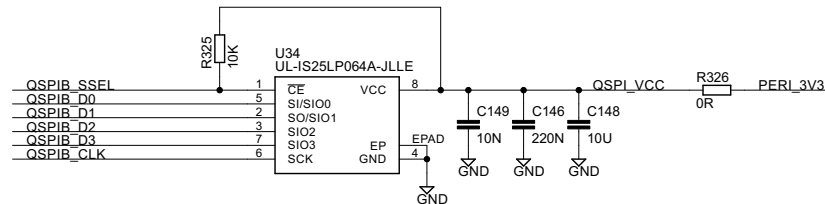
ARM 10-pin interface Serial Wire Mode
10 pos (50 mil pitch) connector

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

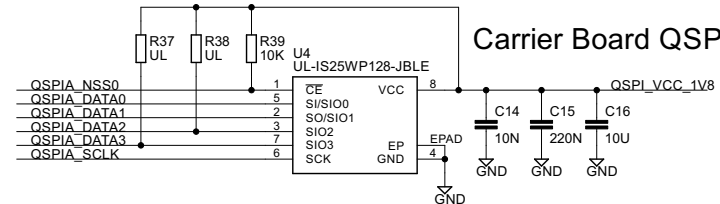
ARM 10-pin interface JTAG Mode

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)



Carrier Board QSPI



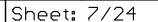
(C) Embedded Artists AB

TITLE: uCOM Carrier board rev PB3

Document Number:

Date: 2022-08-14 23:40:42

Sheet: 6/24



Expansion Connector

Connector "A"
(in silkscreen on PCB)

Dual row xx-pos 50 mil pitch matrix

PERI_5V	J15-2
PERI_3V3	J15-3
	J15-4
	J15-5
	J15-6
GPIO-LCDIF_D16	J15-7
GPIO-LCDIF_D17	J15-8
GPIO-LCDIF_D18	J15-9
GPIO-LCDIF_D19	J15-10
GPIO-LCDIF_D20	J15-11
GPIO-LCDIF_D21	J15-12
GPIO-LCDIF_D22	J15-13
GPIO-LCDIF_D23	J15-14
GPIO_A	J15-15
GPIO_B	J15-16
GPIO_C-CTP_IRQ	J15-17
GPIO_D-CTP_RST	J15-18
GPIO_F-ENET_IRQ-MIKROBUS_INT	J15-19
GPIO_F-ENET_RST	J15-20
GPIO_G	J15-21
	J15-22
SPI-A_SCLK	J15-23
SPI-A_MISO	J15-24
SPI-A_MOSI	J15-25
SPI-A_SSEL	J15-26
UART-C_CTS-D_RXD	J15-27
UART-C_RTS-D_TXD	J15-28
UART-B_RXD	J15-29
UART-B_TXD	J15-30
I2C-A_SCL	J15-31
I2C-A_SDA	J15-32
I2C-B_SCL	J15-33
I2C-B_SDA	J15-34
I2C-C_SCL	J15-35
I2C-C_SDA	J15-36
GPIO-CAN_TD	J15-37
GPIO-CAN_RD	J15-38
GPIO-CS1_RST-DATA	J15-39
GPIO-CS1_PWR-CLK	J15-40
GPIO_JA84	J15-41
RESET_OUT	J15-42
RST_IN	J15-43
	J15-44
UART-C_RXD	J15-45
UART-C_TXD	J15-46
UART-A_RXD	J15-47
UART-A_TXD	J15-48
SPI-B_SCLK	J15-49
SPI-B_MISO	J15-50
SPI-B_MOSI	J15-51
SPI-B_SSEL	J15-52
I2C-D_SCL	J15-53
I2C-D_SDA	J15-54
GPIO_H	J15-55
GPIO_J	J15-56
GPIO_K	J15-57
GPIO_L	J15-58
GPIO_M-QSC_32_768KHZ	J15-59
USB_OTG1_OC-GPIO	J15-60
USB_OTG1_ID-GPIO	J15-61
USB_OTG2_OC-GPIO	J15-62
USB_OTG2_ID-GPIO	J15-63
USB_OTG2_PWR-GPIO	J15-64
SD-A_WP	J15-65
WAKEUP	J15-66
PERI_PWR_EN	J15-67
GPIO_JA72	J15-68
GPIO_JA86	J15-69
GPIO_JA90	J15-70
GPIO_JA94	J15-71
GPIO_JA96	J15-72
GPIO_JA98	J15-73
GPIO_JA100	J15-74
PERI_3V3	J15-75
PERI_1V8	J15-76
	J15-77
	J15-78
AUD_TXFS_1V8_3V3	J15-79
AUD_TXD_1V8_3V3	J15-80
AUD_RXD_1V8_3V3	J15-81
AUD_RXFS_1V8	J15-82
AUD_RXC_1V8	J15-83
AUD_MCLK_1V8	J15-84
	J15-85
	J15-86

GND



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TITLE: uCOM Carrier board rev PB3

Document Number:

Date: 2022-08-14 23:40:42

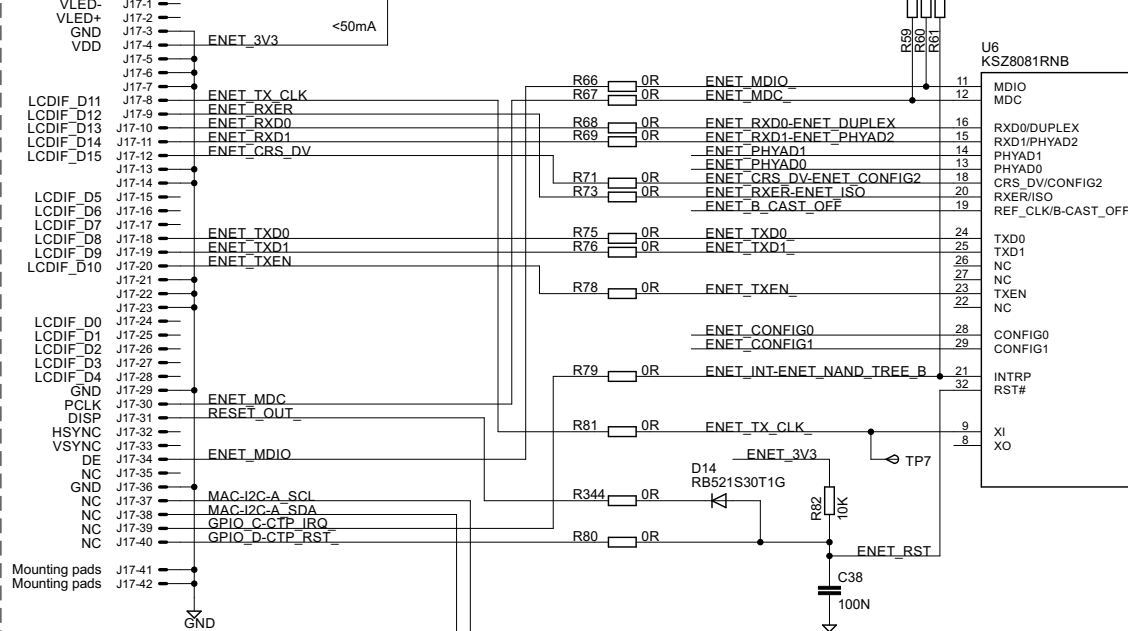
Sheet: 8/24

100/10Mbps Ethernet-PHY Adapter for RT1064 uCOM

Separate adapter board

Connector "D"
(in silkscreen on PCB)
(for RT1064)

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



RJ45 Connector with
integrated magnetics

1Kbit I2C-E2PROM with EU1-48

Nway Auto-Negotiation

Pull-up (default) = Enable
Pull-down = Disable

Speed mode

Pull-up (default) = 100Mbps
Pull-down = 10Mbps

DUPLEX mode

Pull-up (default) = Half Duplex
Pull-down = Full Duplex

Interface mode: RMII

Pull-up = PHY Address 0 set as unique PHY addr
Pull-down (default) = PHY Address 0 set as
broadcast PHY addr

NAND Tree Mode

Pull-up (default) = Disable
Pull-down = Enable

PHY ADDR: 00-010 (2)
Address = 00-xxx

Interface mode: RMII

001 = RMII
101 = RMII Back-to-Back

Isolate more: enabled

Pull-up = Enable
Pull-down (default) = Disable



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TITLE: uCOM Carrier board rev PB3

Document Number:

Date: 2022-08-14 23:40:42

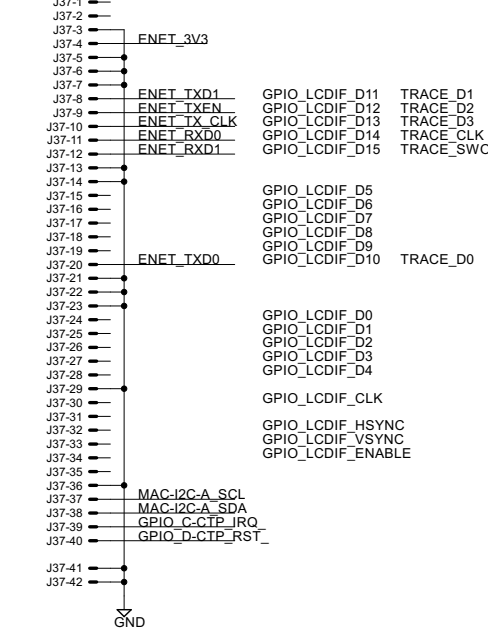
Sheet: 9/24

100/10Mbps Ethernet-PHY Adapter for RT1176 uCOM

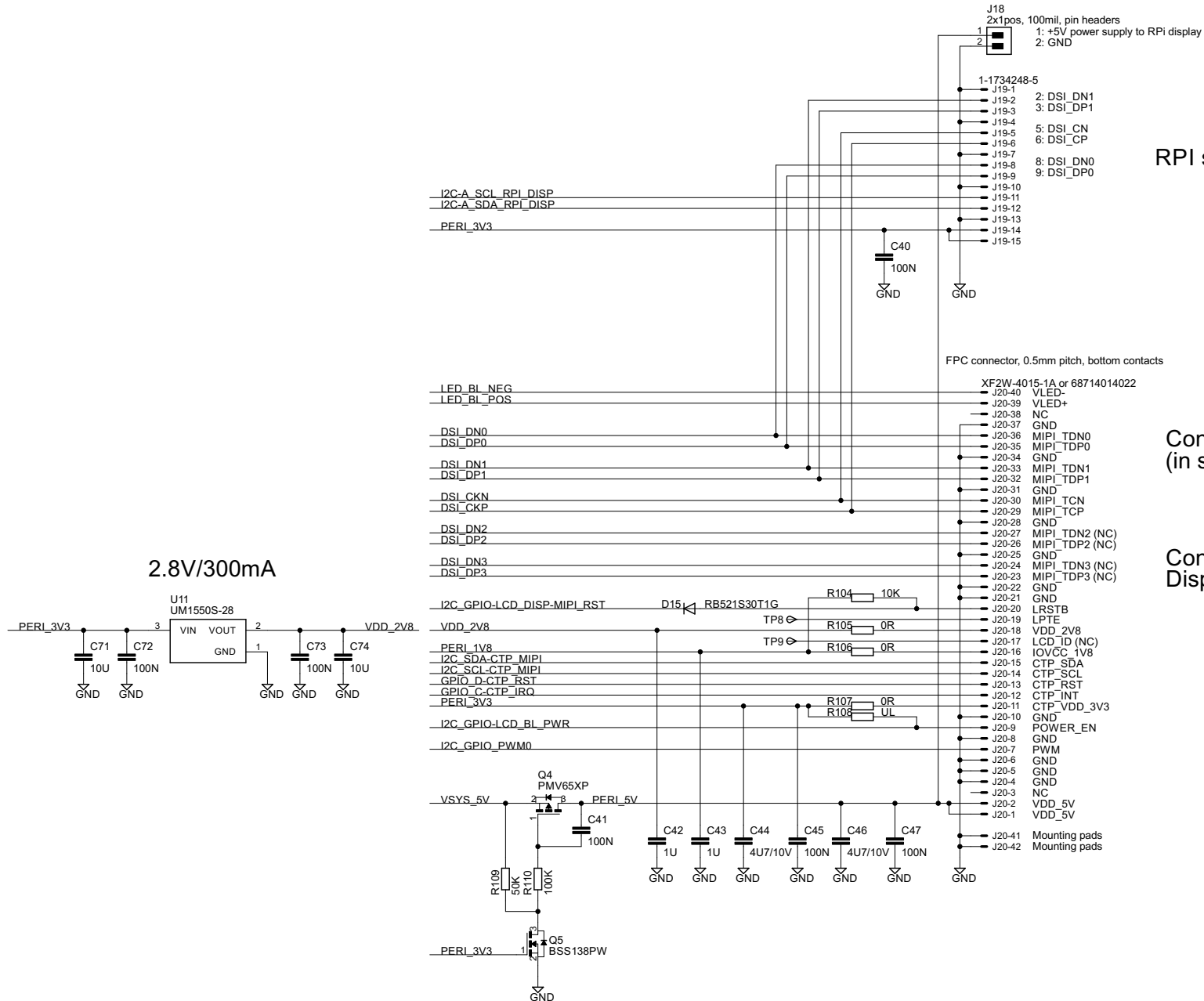
Separate adapter board (from previous schematic page)

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

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



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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TITLE: uCOM Carrier board rev PB3

Document Number:

Date: 2022-08-14 23:40:42

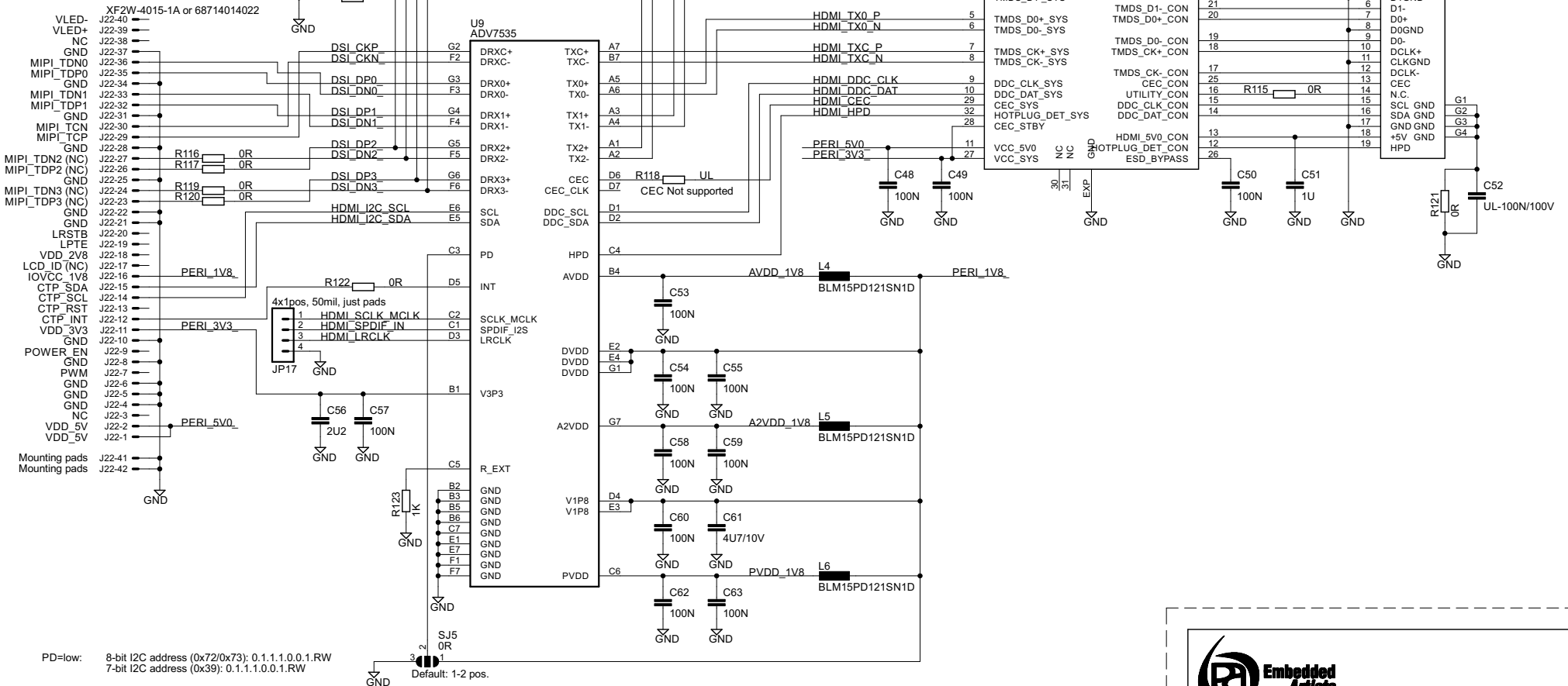
Sheet: 11/24

MIPI-DSI to HDMI Adapter

Separate adapter board

Connector "C"
(in silkscreen on PCB)

FPC connector, 0.5mm pitch, bottom contact



PD=low: 8-bit I2C address (0x72/0x73): 0.1.1.1.0.0.1.RW
7-bit I2C address (0x39): 0.1.1.1.0.0.1.RW

PD=high: 8-bit I2C address (0x7A/0x7B): 0.1.1.1.0.1.RW
7-bit I2C address (0x3D): 0.1.1.1.0.1.RW


**Embedded
Artists**

(C) Embedded Artists AB

TITLE: uCOM Carrier board rev PB3

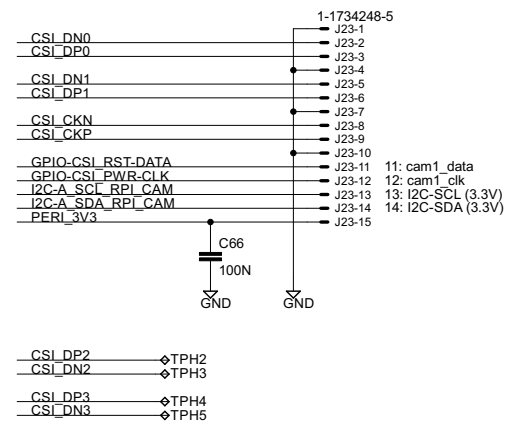
Document Numbers:

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Sheet: 12/24

Camera Interface

RPI serial camera (MIPI)



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TITLE: uCOM Carrier board rev PB3

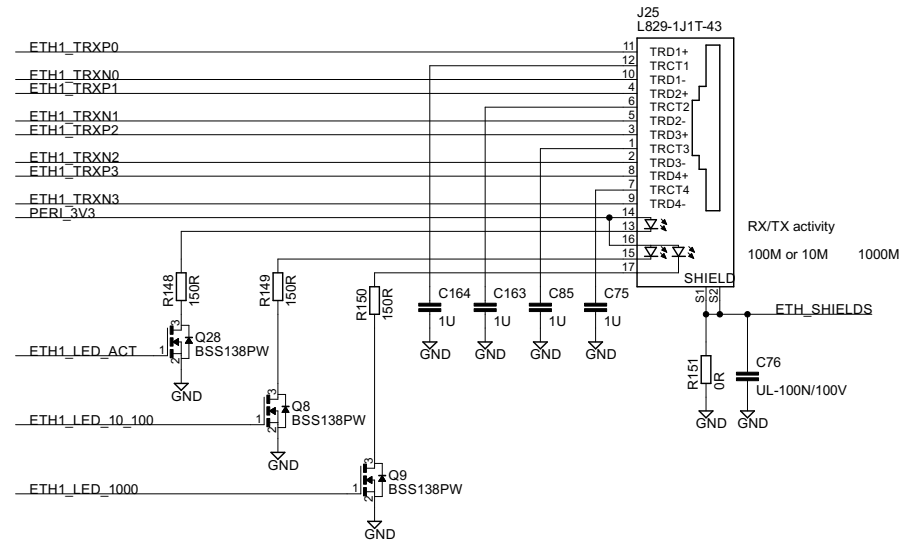
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Ethernet Interface for on-board PHY

Ethernet Interface



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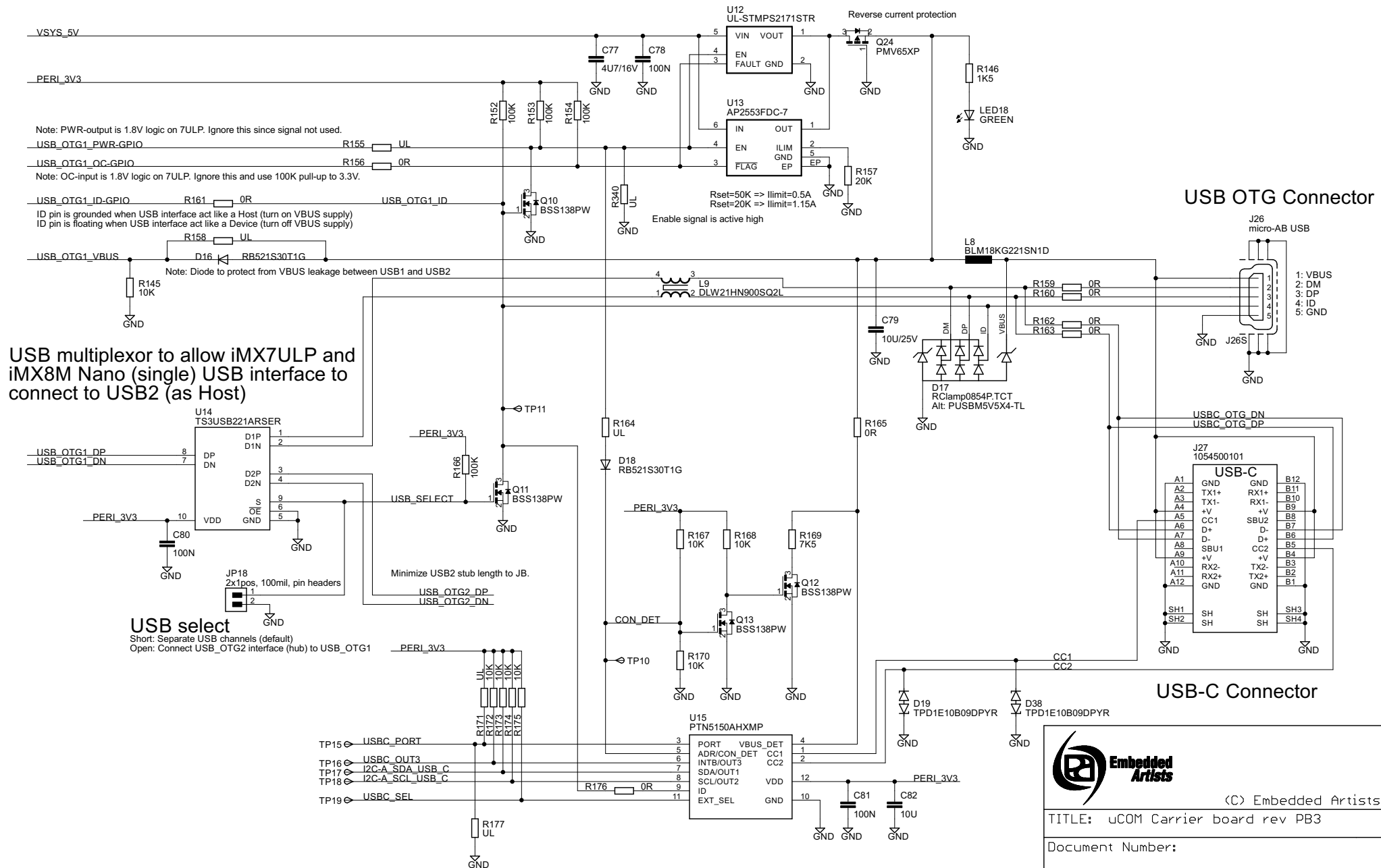
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Document Number:

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USB OTG and USB C Interface



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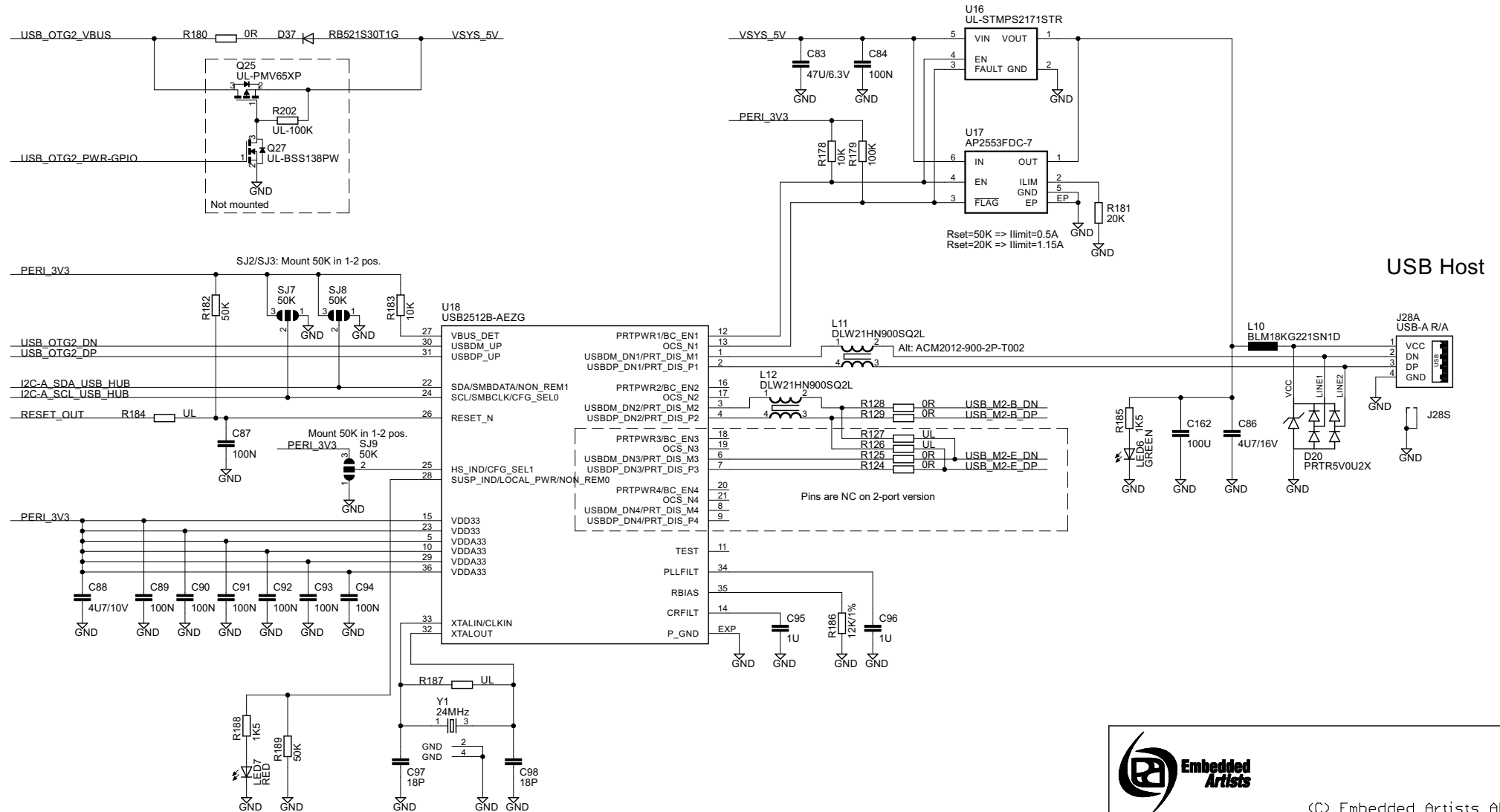
TITLE: uCOM Carrier board rev PB3

Document Number:

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USB Host Interface and Hub



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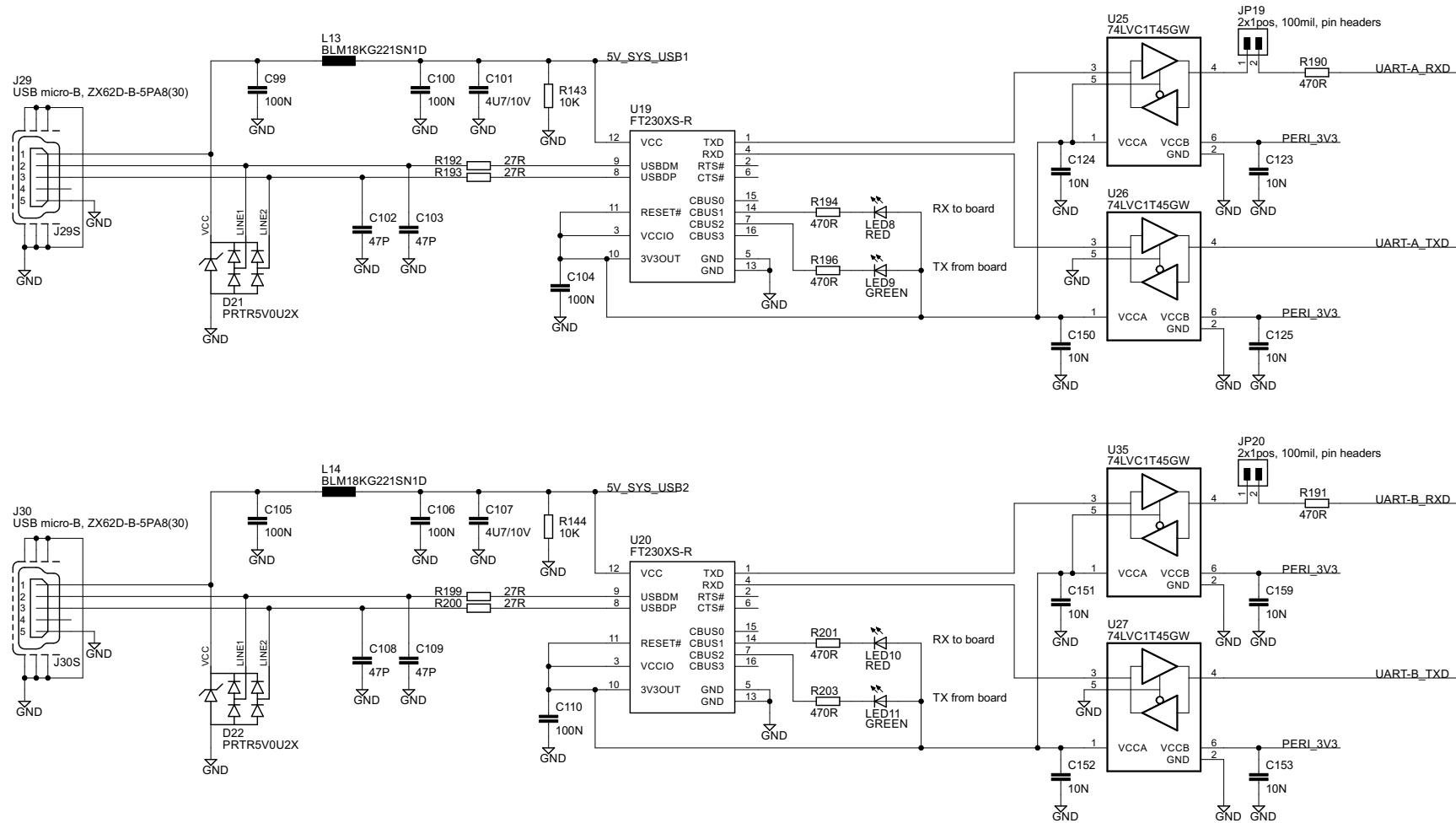
TITLE: uCOM Carrier board rev PB3

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Sheet: 16/24

UART-to-USB bridge interfaces



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TITLE: uCOM Carrier board rev PB3

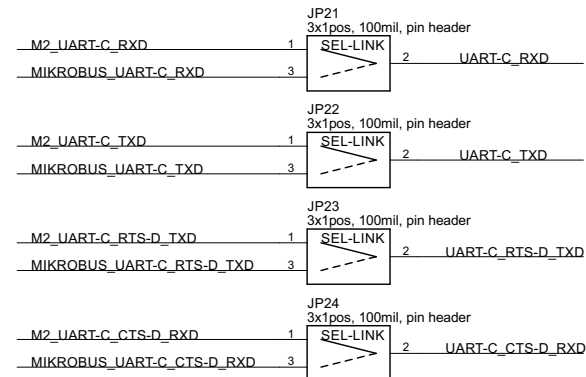
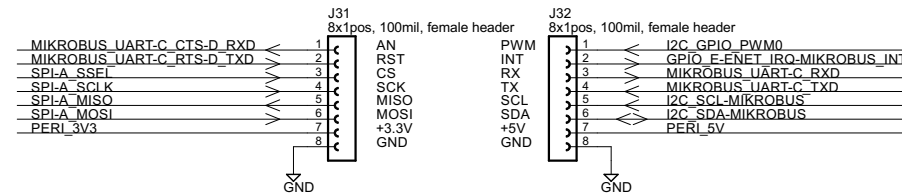
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Sheet: 17/24

Mikrobus/Click Module Interface

Mikrobus/Click Module Interface



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TITLE: uCOM Carrier board rev PB3

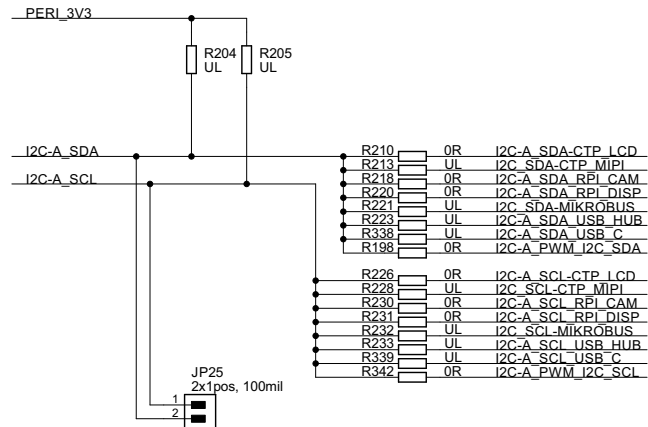
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Date: 2022-08-14 23:40:42

Sheet: 18/24

I2C Connections

I2C-A

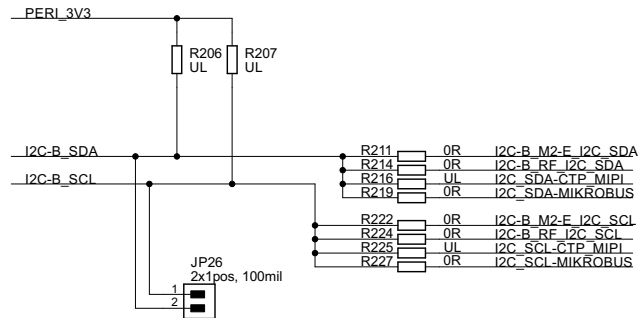


64kbit E2PROM on uCOM: 24LC64
8-bit I2C address (0xAA/0xAB): 1.0.1.0.1.1.RW
7-bit I2C address (0x55): 1.0.1.0.1.0.1

Optional 1Kbit I2C-E2PROM with EUI-48: 24AA025E48T
8-bit I2C address (0xA6/0xA7): 1.0.1.0.0.1.1.RW
7-bit I2C address (0x53): 1.0.1.0.0.1.1

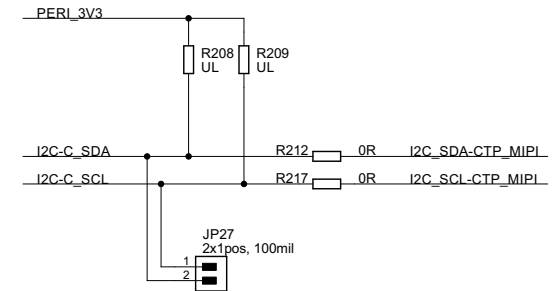
GPIO expander: PCA9530
8-bit I2C address (0xC2/0xC3): 1.1.0.0.0.0.ADDR.RW
7-bit I2C address (0x61): 1.1.0.0.0.0.ADDR

I2C-B

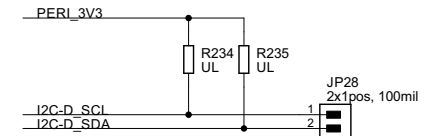


GPIO expander: PCA6416A
8-bit I2C address (0x42/0x43): 0.1.0.0.0.0.ADDR.RW
7-bit I2C address (0x21): 0.1.0.0.0.0.ADDR

I2C-C



I2C-D



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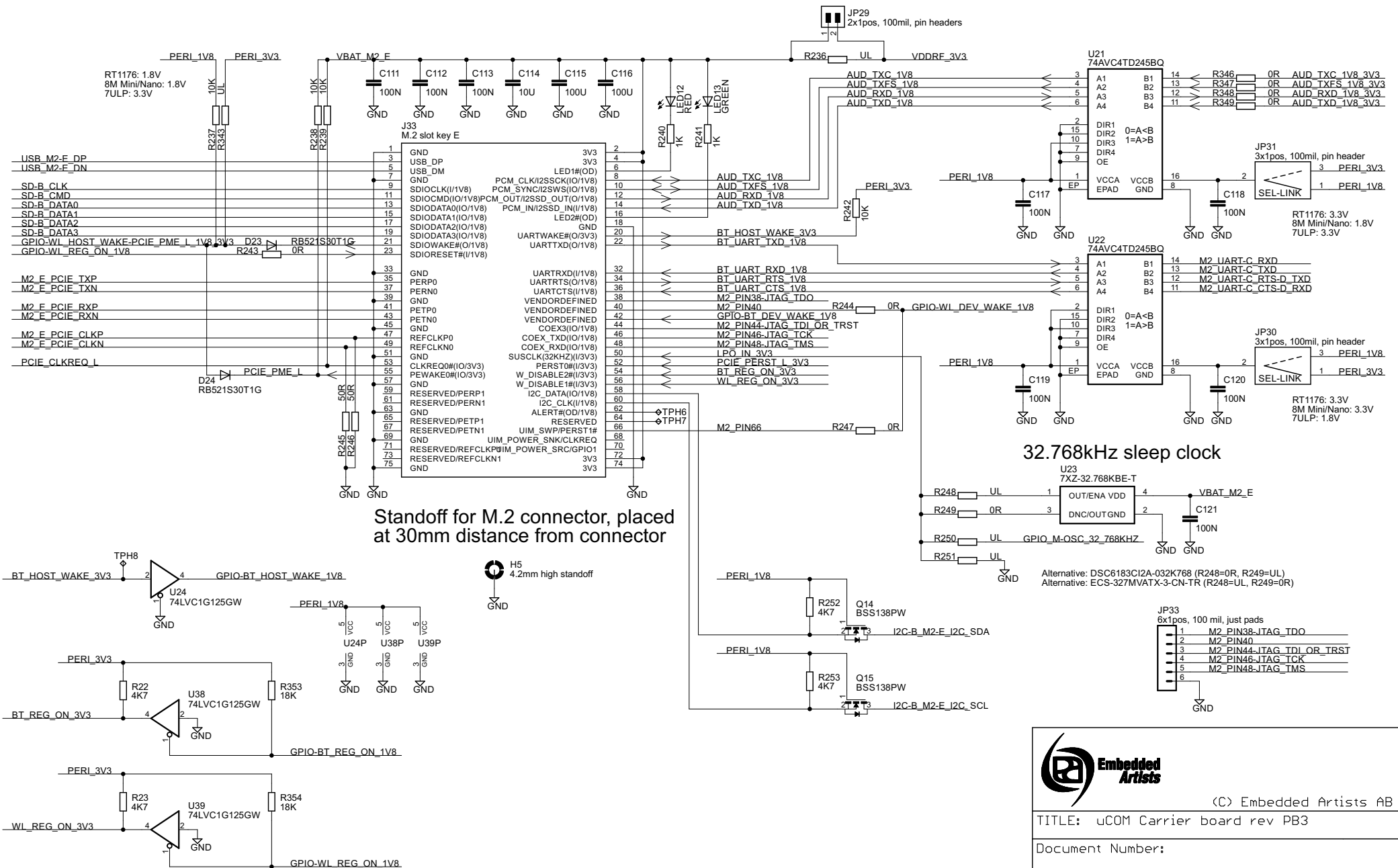
TITLE: uCOM Carrier board rev PB3

Document Number:

Date: 2022-08-14 23:40:42

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M.2 (NGFF) Key E Connector



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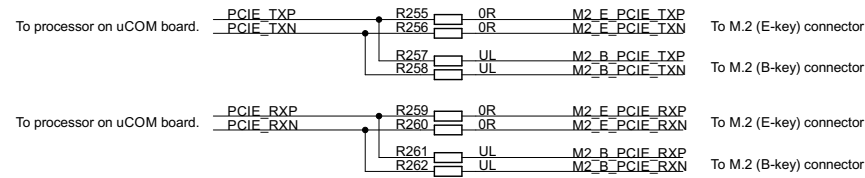
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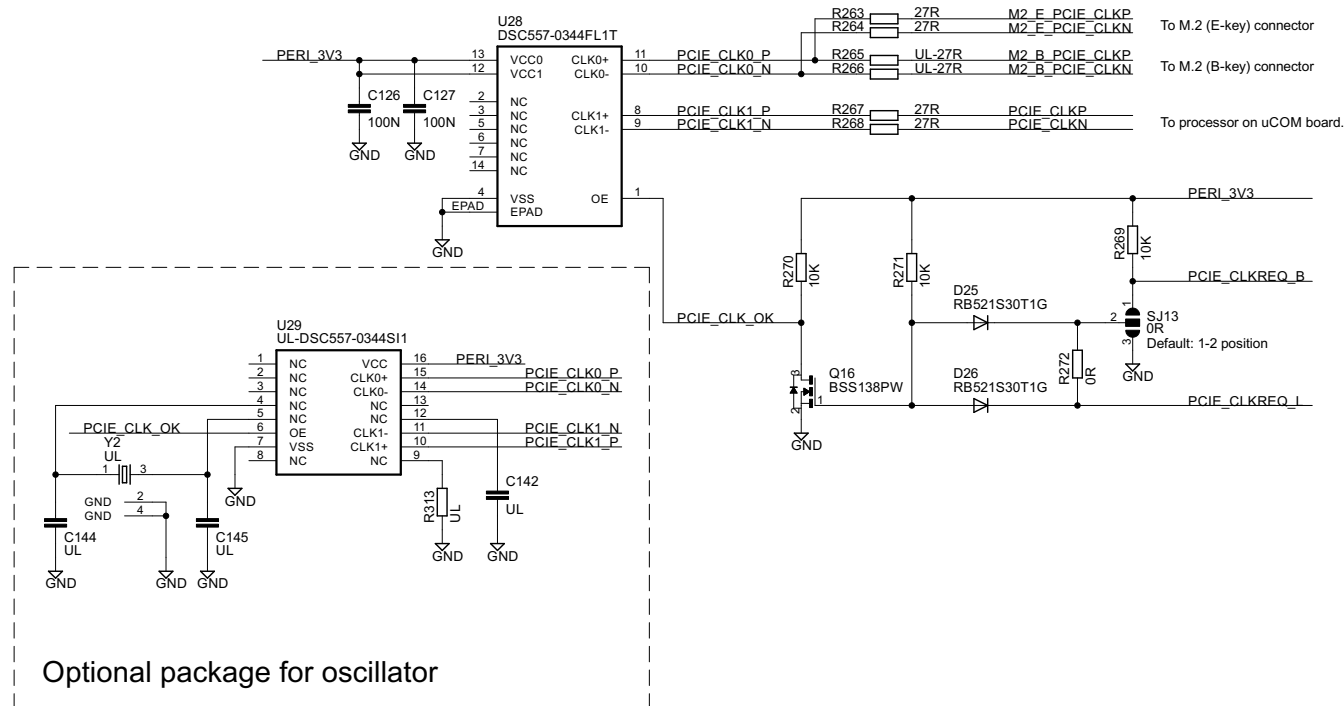
Date: 2022-08-14 23:40:42

Sheet: 20/24

PCIe Signal Routing



100MHz clock generator



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TITLE: uCOM Carrier board rev PB3

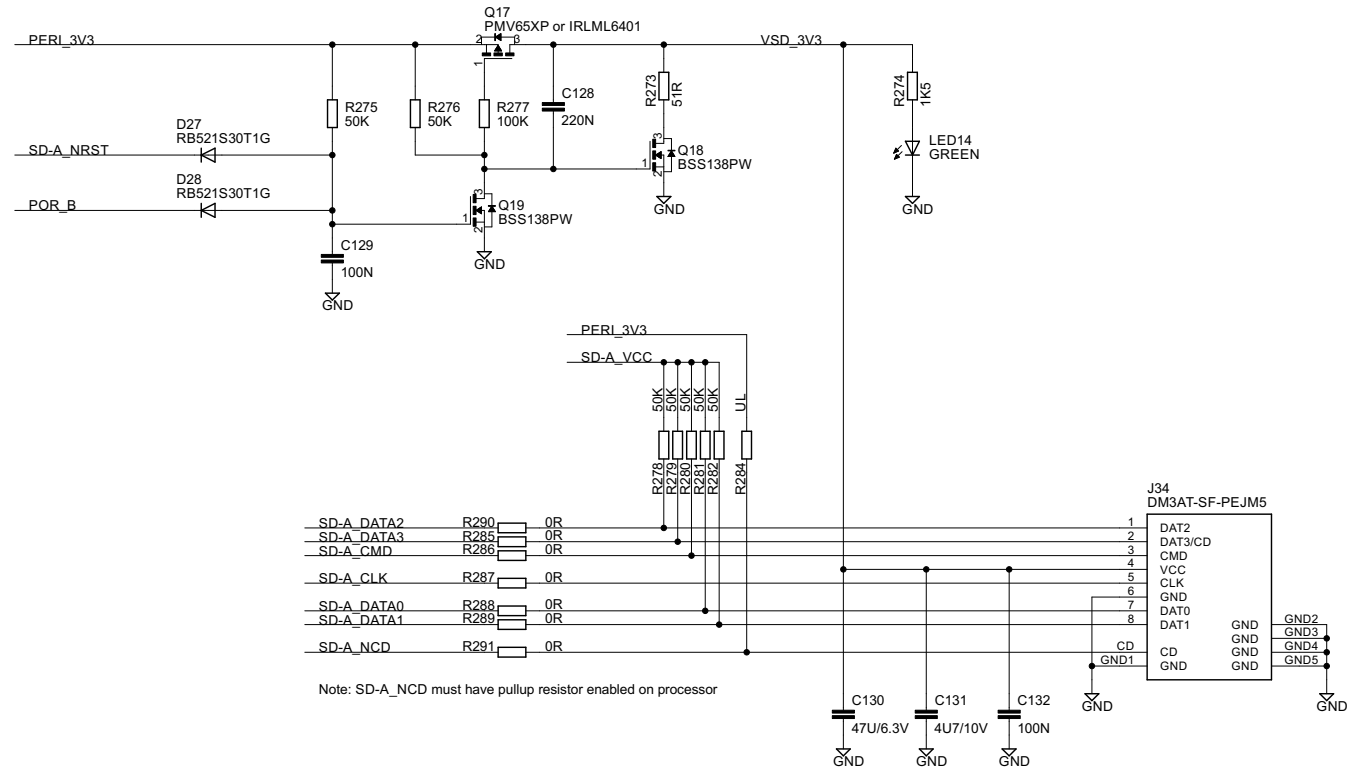
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uSD card interface

Power Switch for SD3.0



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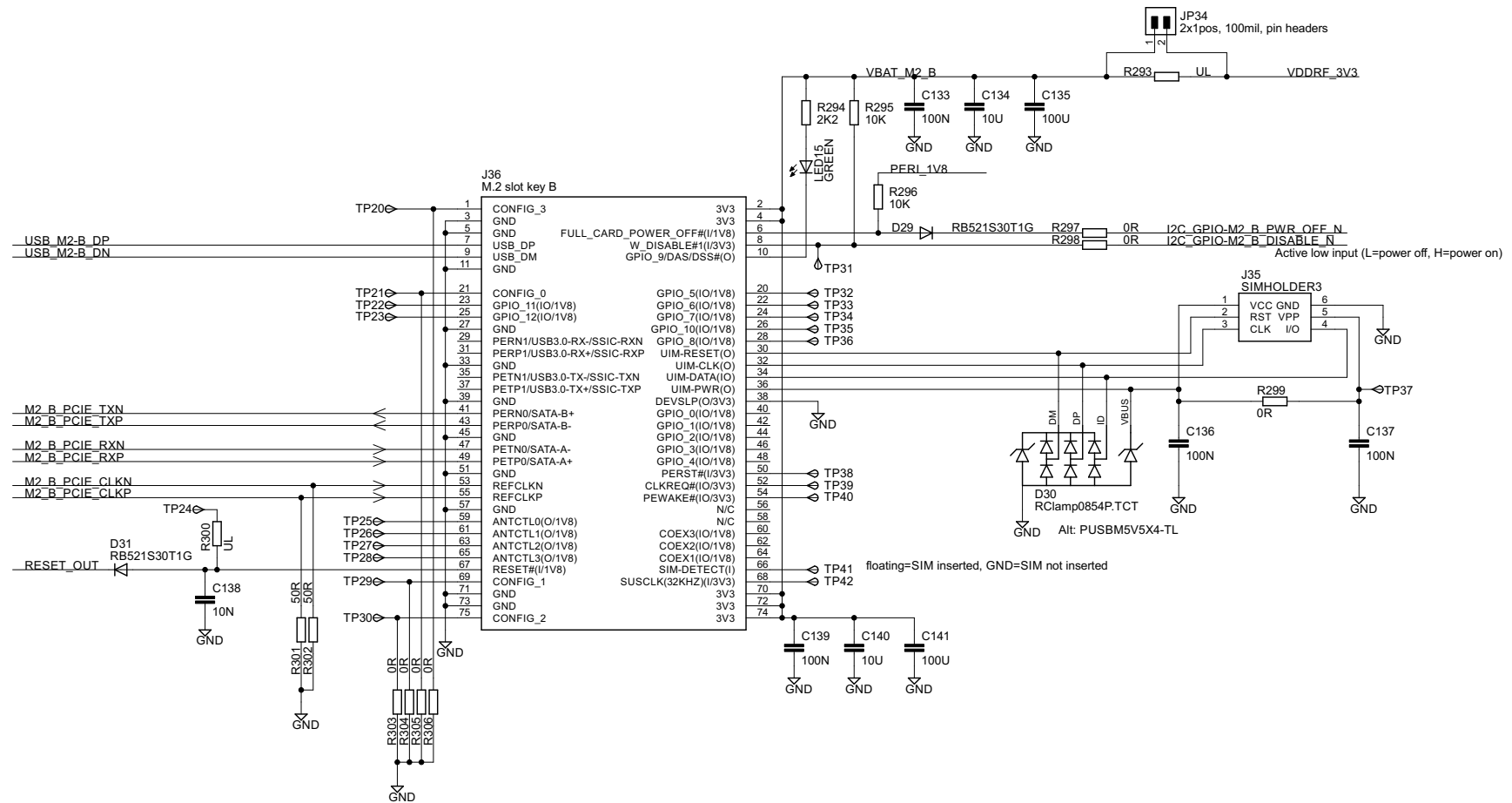
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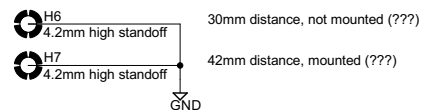
Date: 2022-08-14 23:40:42

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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 PB3

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