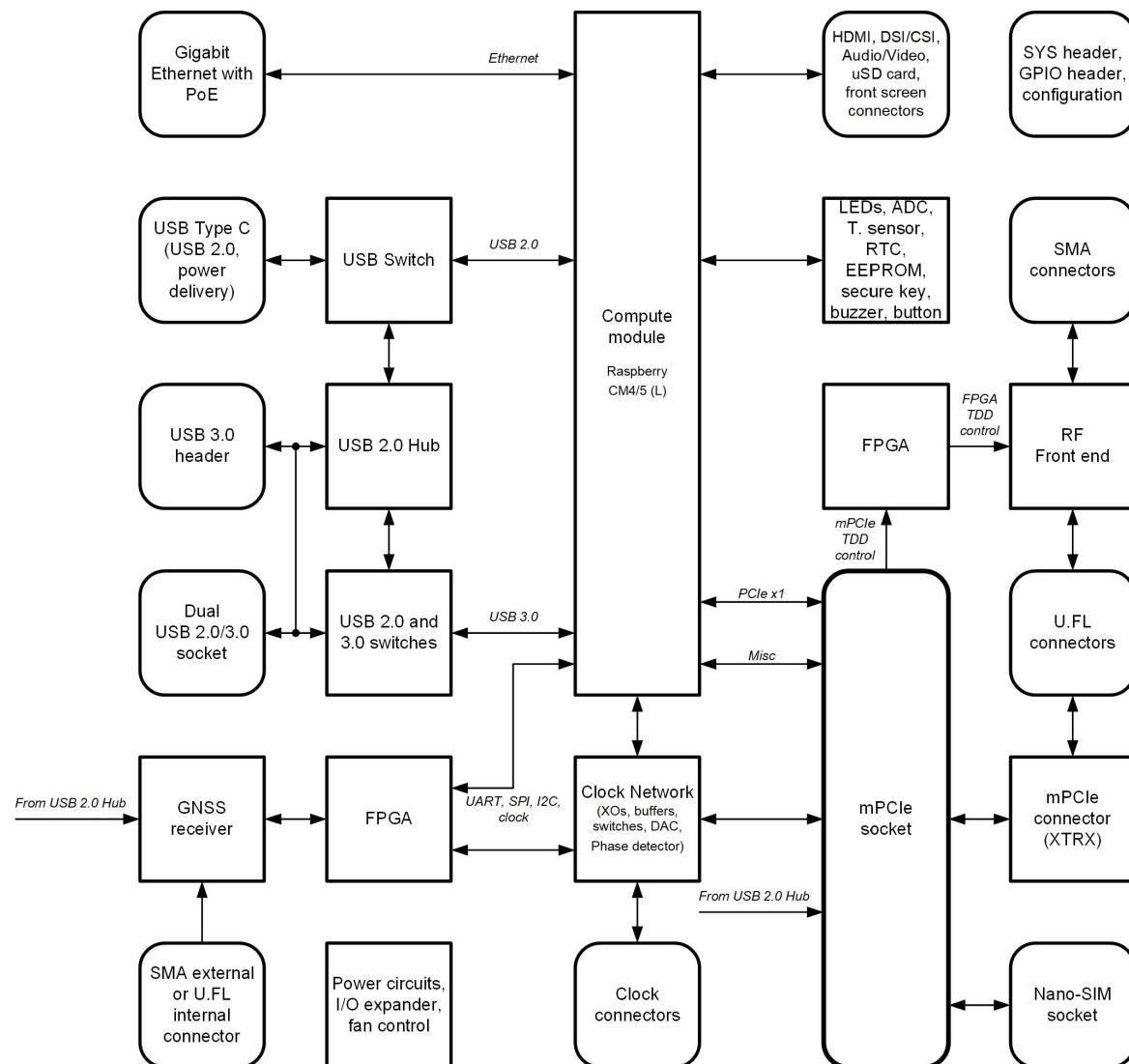


Block diagram



Project name: **LimePSB-RPCM_1v4.PrbPcb**

Title: **Block diagram**

Version: 1.4

Variant: Default

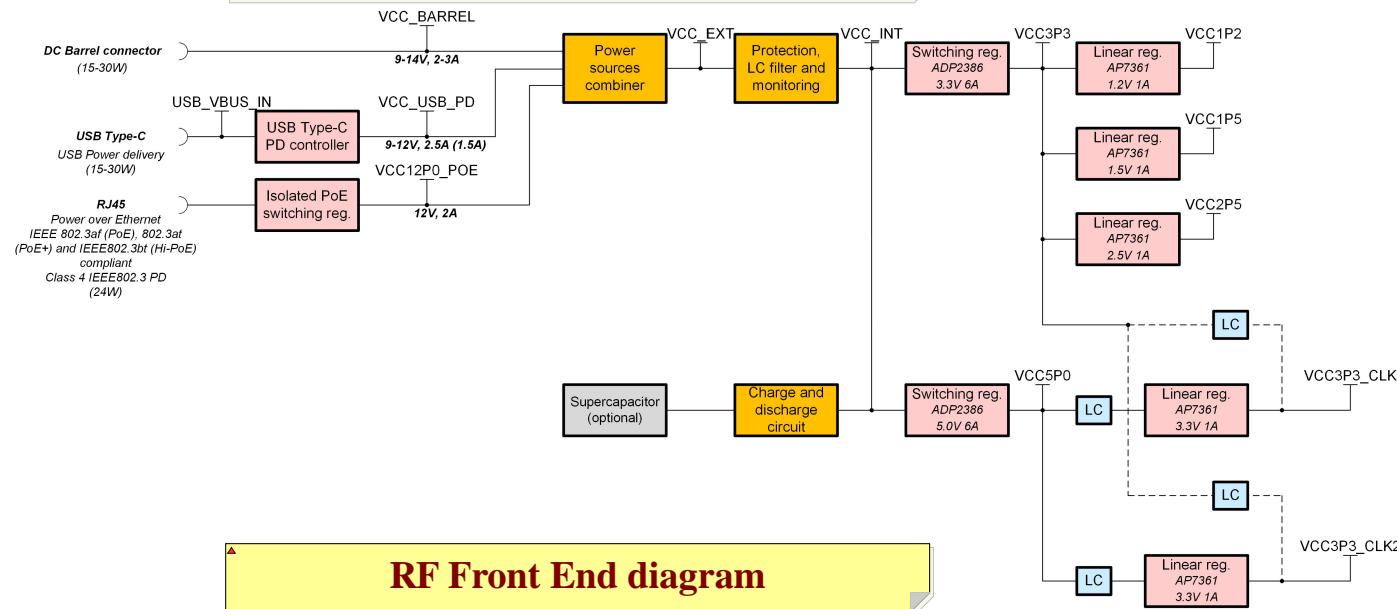
Date: 2025-06-20 Time: 12:49:34 Sheet 1 of 15

File: 01_Block_diag.SchDoc

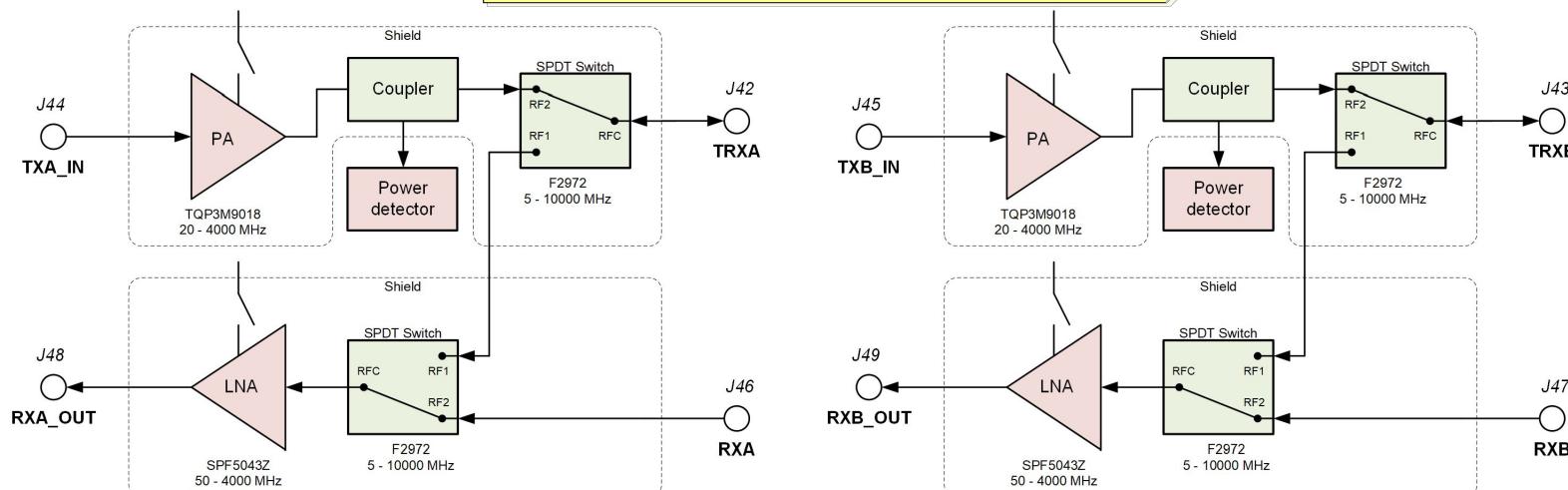
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Guildford GU2 7YG
Surrey
United Kingdom



Power diagram



RF Front End diagram



* All RF switches are controlled by the same signal RF_SW_TDD

Project name: LimePSB-RPCM_1v4.PnjPcb

Title: Power + RF Front End diagram

Version: 1.4 Variant: Default

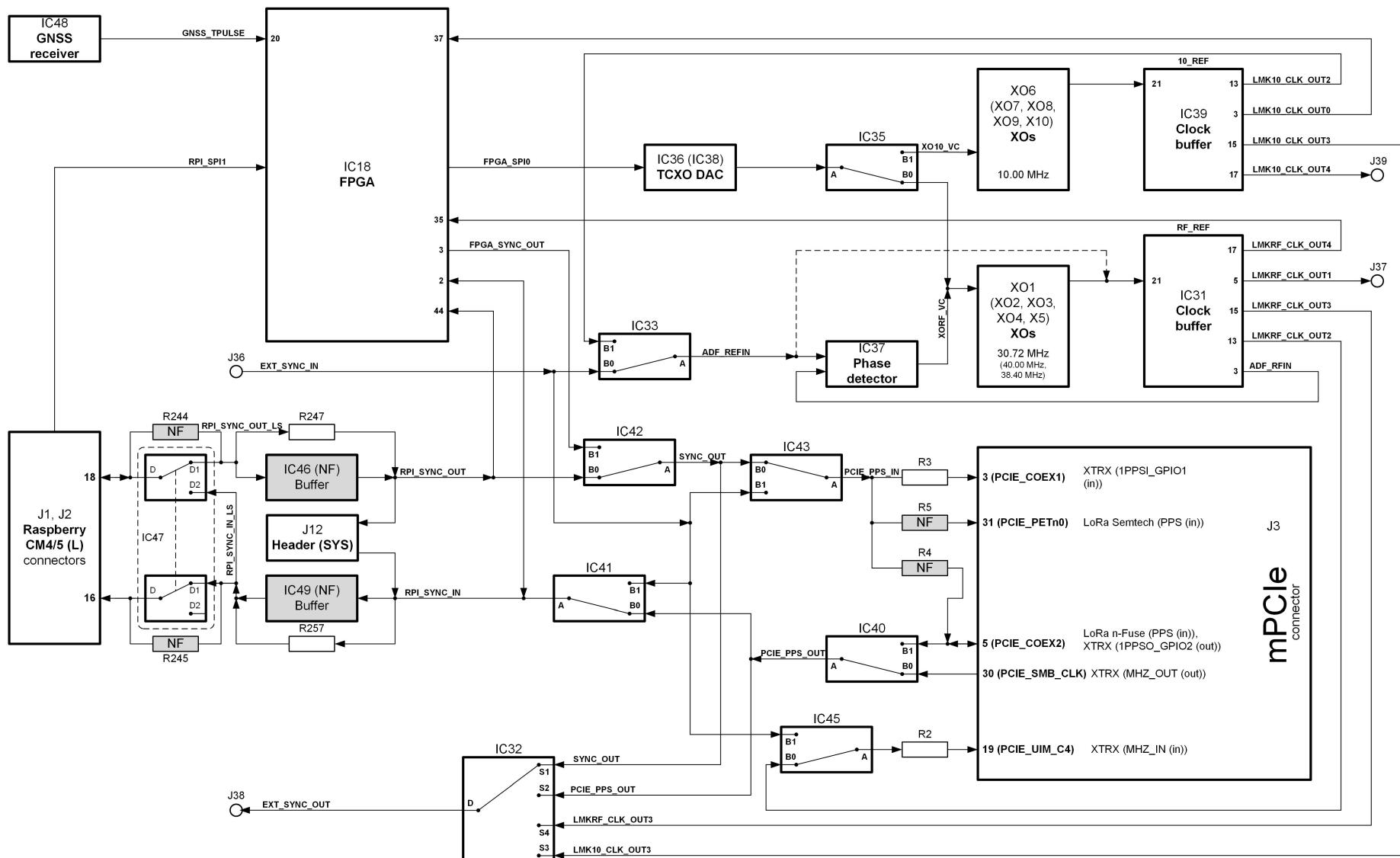
Date: 2025-06-20 Time: 12:49:34 Sheet 2 of 15

File: 02_Power_RFFE_diag.SchDoc Size: A4

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Surrey
United Kingdom



Clock diagram

Project name: **LimePSB-RPCM_1v4.PrbPcb**Title: **Clock diagram**

Version: 1.4 Variant: Default

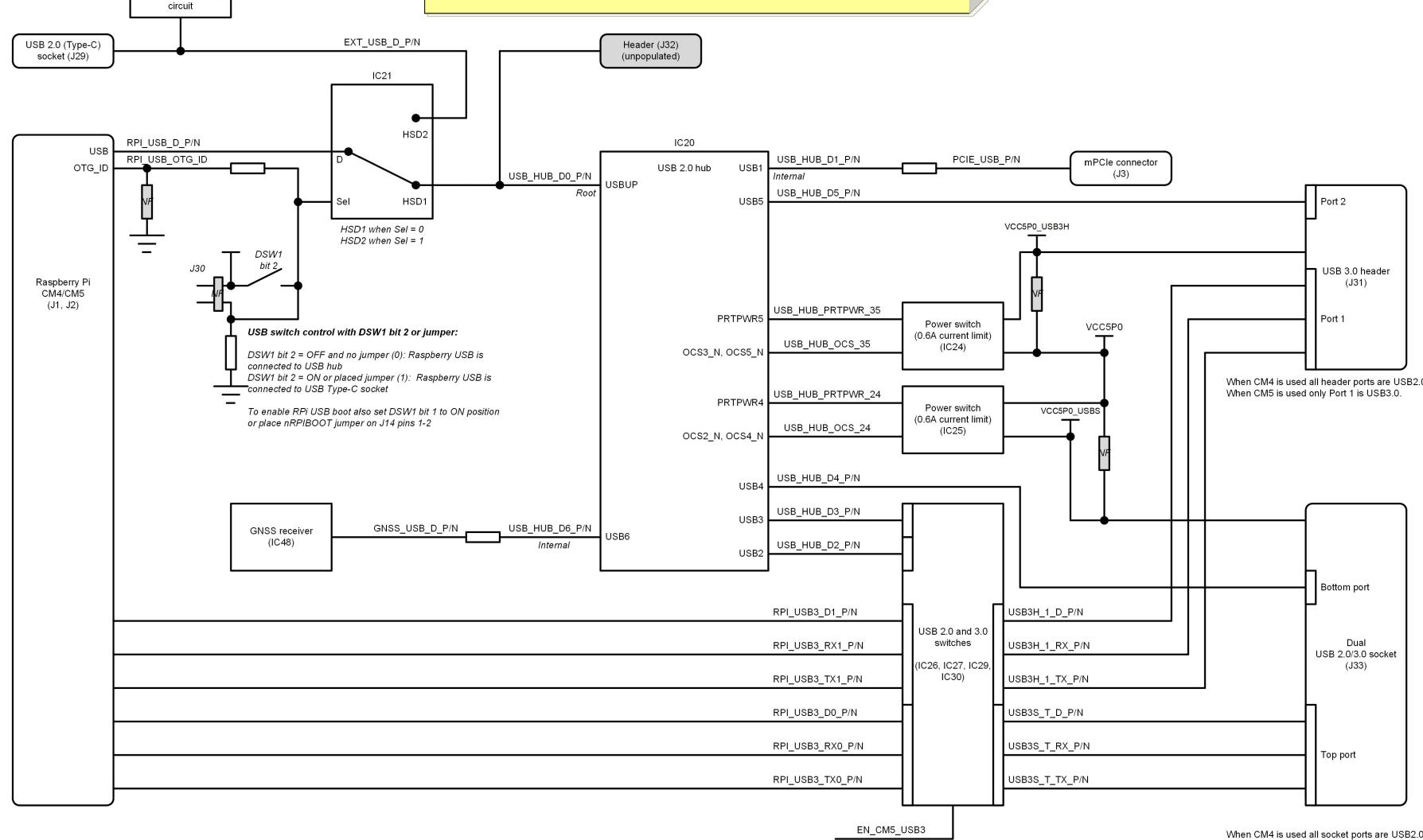
Date: 2025-06-20 Time: 12:49:34 Sheet 3 of 15

File: 03_Clock_diag.SchDoc

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USB diagram



Project name: **LimePSB-RPCM_1v4.PpjPcb**

Title: **USB diagram**

Version: 1.4 Variant: Default

Date: 2025-06-20 Time: 12:49:34 Sheet 4 of 15

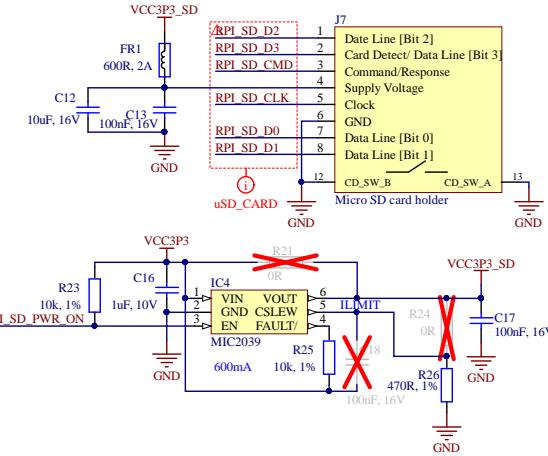
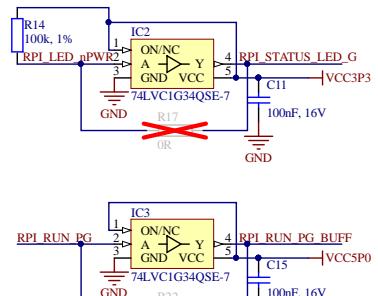
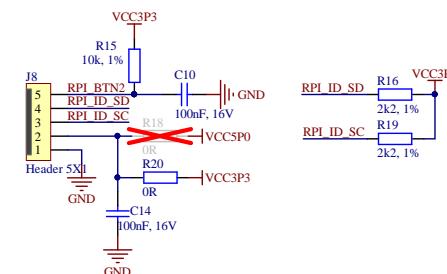
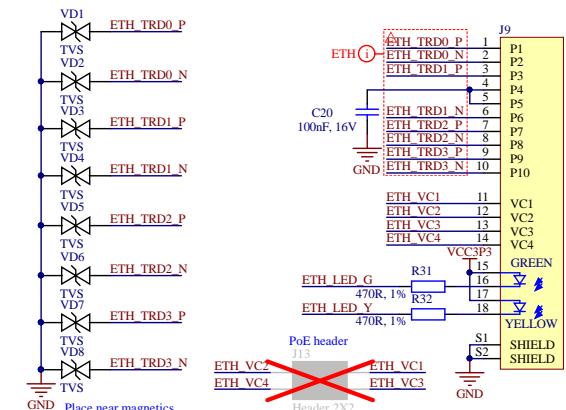
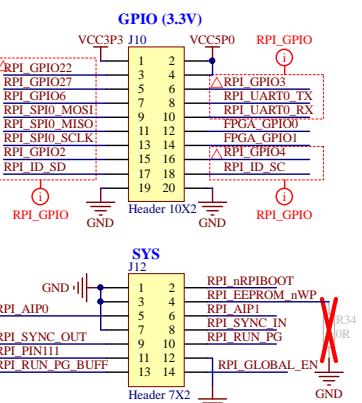
File: 04_USB_diag.SchDoc Size: A4

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Misc 1**uSD card socket**

Only for CM4L and CM5L with no on-board Flash (eMMC)

**Buffers, level converters****Front screen I2C + BTN****Gigabit Ethernet (RJ45) connector****GPIO ans SYS headers**

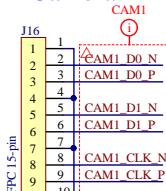
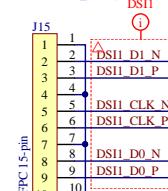
nRPI_BOOT: During boot if this pin is low booting from eMMC will be stopped and booting will be transferred to rpi boot which is via USB. Place jumper on pins 1-2.

EEPROM_nWP: can be grounded to prevent writing to the on board EEPROM which stores the bootcode. Place jumper on pins 3-4 or solder R32.

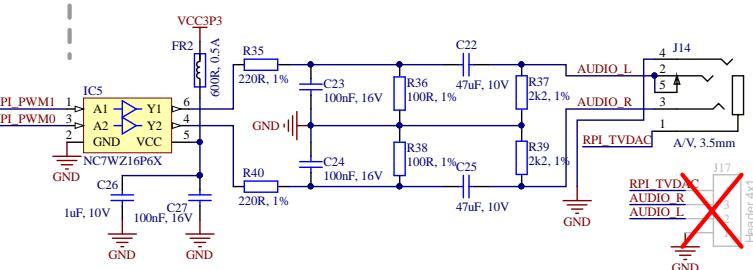
A button between pins 13-14 can be used to wake up compute node from power down.

RUN_PG pin when high signals that the CM4 has started. Driving this pin low resets the module.

A button between pins 10-12 replicates the power button on Raspberry Pi 5. A short press signals that the device should wake up or shut down. A long press forces shutdown.

LVDS (Camera + Display)**Camera 1****Display 1**

For CM5 CAM1 and DSII signals become dual-purpose and can be used for either a CSI camera or a DS1 display.

Analog audio + Composite video out

Project name: **LimePSB-RPCM_Iv4.PrbPcb**

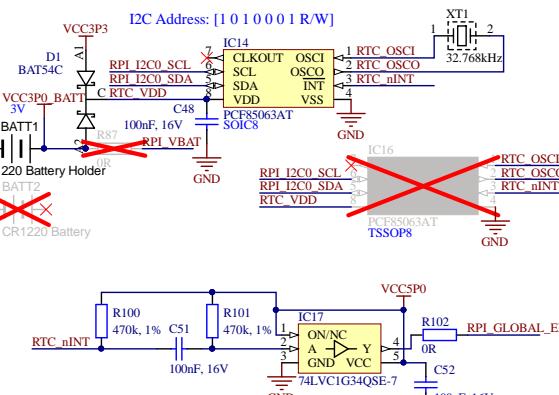
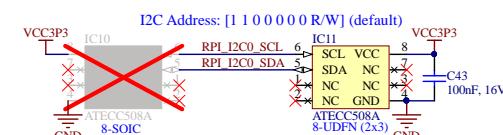
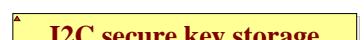
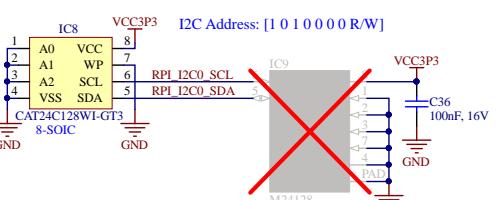
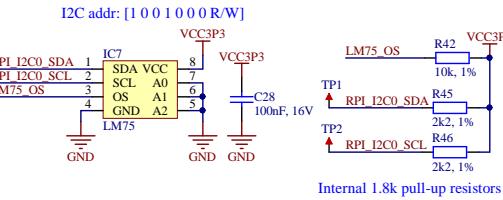
Title: **Misc 1**

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United Kingdom



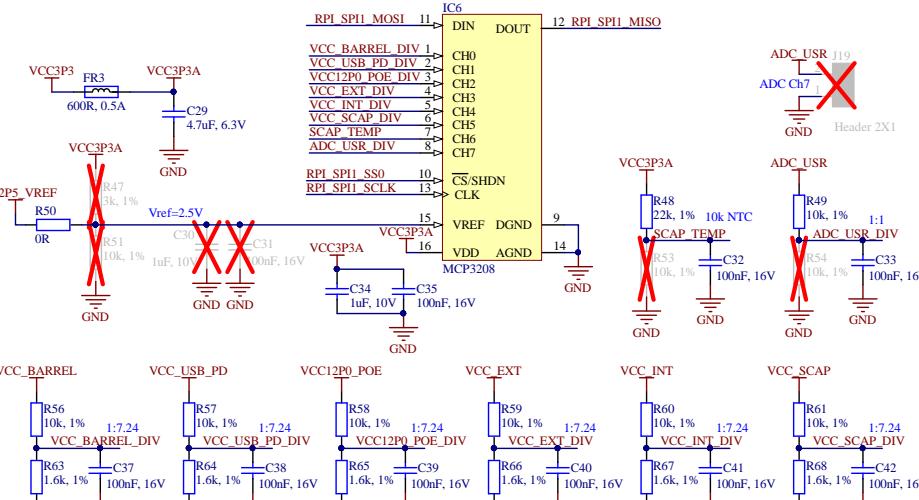
Version: 1.4 Variant: Default

Date: 2025-06-20 Time: 12:49:35 Sheet 6 of 15
File: 06_Misc 1.SchDoc Size: A3

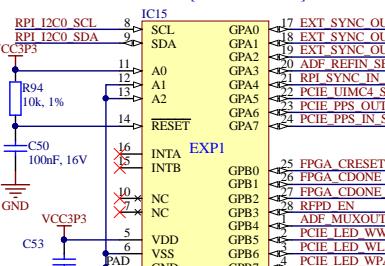
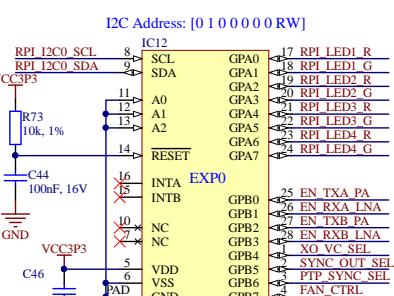


Misc 2

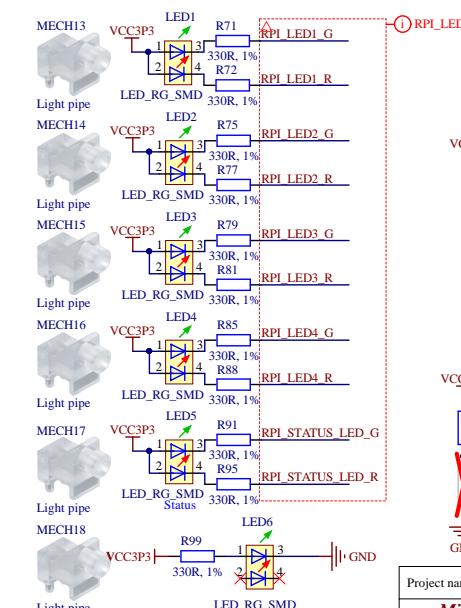
SPI ADC



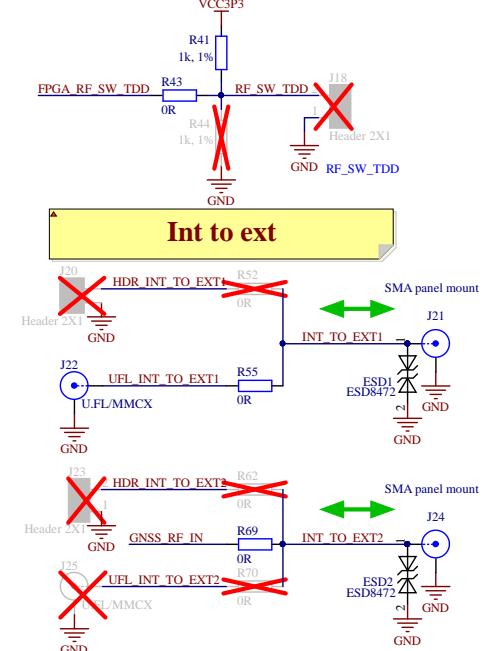
I2C I/O expanders



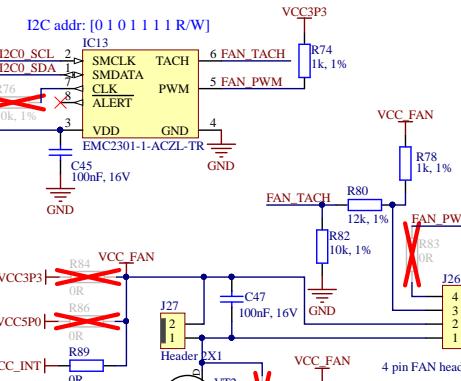
Raspberry Pi LEDs



RFFE TDD control



FAN control



Project name: LimePSB-RPCM_1x4_PriPci

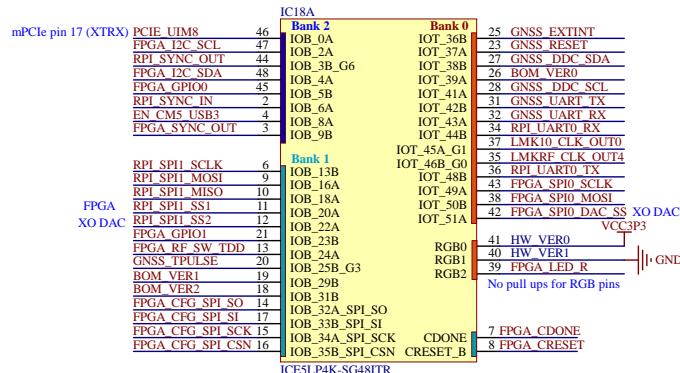
Title: *Misc 2*

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United Kingdom*

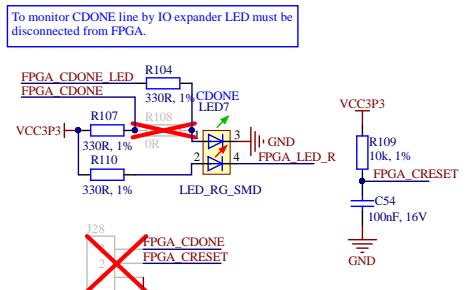


FPGA

FPGA

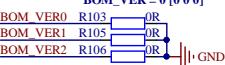


FPGA misc



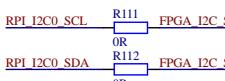
HW_VER, BOM_VER

HW_VER = 1 [0 1]
BOM_VER = 0 [0 0 0]

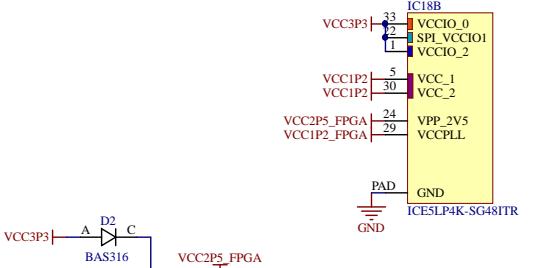


I2C interconnections

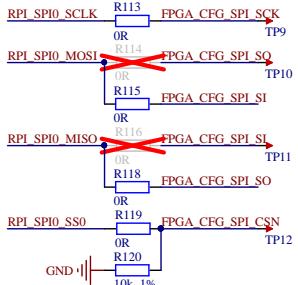
Raspberry I2C0 and FPGA I2C interconnections



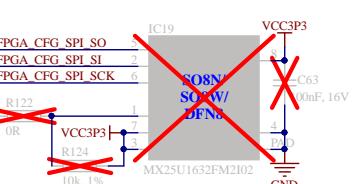
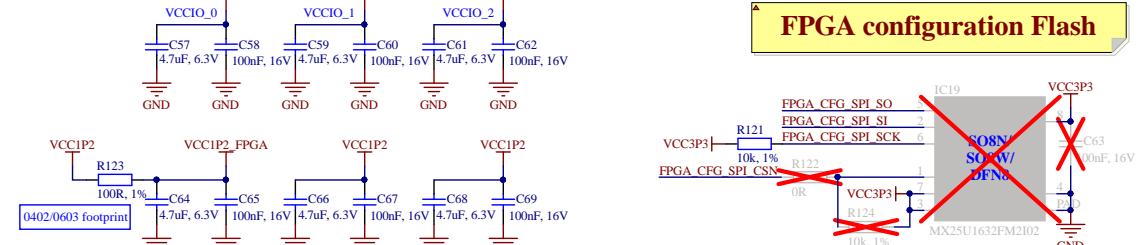
FPGA power



FPGA configuration modes

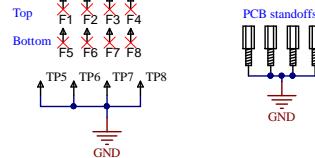


FPGA configuration Flash



Misc

Fiducials



Misc for FAN



12V DC FAN
GND



MECH23
2-pin header



MECH24
Crimp



MECH25
Crimp

MECH26

Screw (M3, 20 mm)



MECH27
Screw (M3, 20 mm)



MECH28
Screw (M3, 20 mm)

Buy packs of 100 pcs. by dividing the required amount by 100 and rounding the resulting number to whole packs.

MECH29

Spacer (M3, 12mm)

MECH30

Spacer (M3, 12mm)

MECH31

Spacer (M3, 12mm)

MECH32

Screw (M3, 6 mm)

MECH33

Screw (M3, 6 mm)

MECH34

Screw (M3, 6 mm)

Buy packs of 100 pcs. by dividing the required amount by 100 and rounding the resulting number to whole packs.

Project name: LimePSB-RPCM_Jv4.PrfPcb

Title: **FPGA**

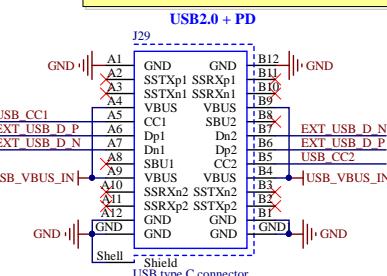
Version: 1.4 Variant: Default

Date: 2025-06-20 Time: 12:49:35 Sheet 8 of 15

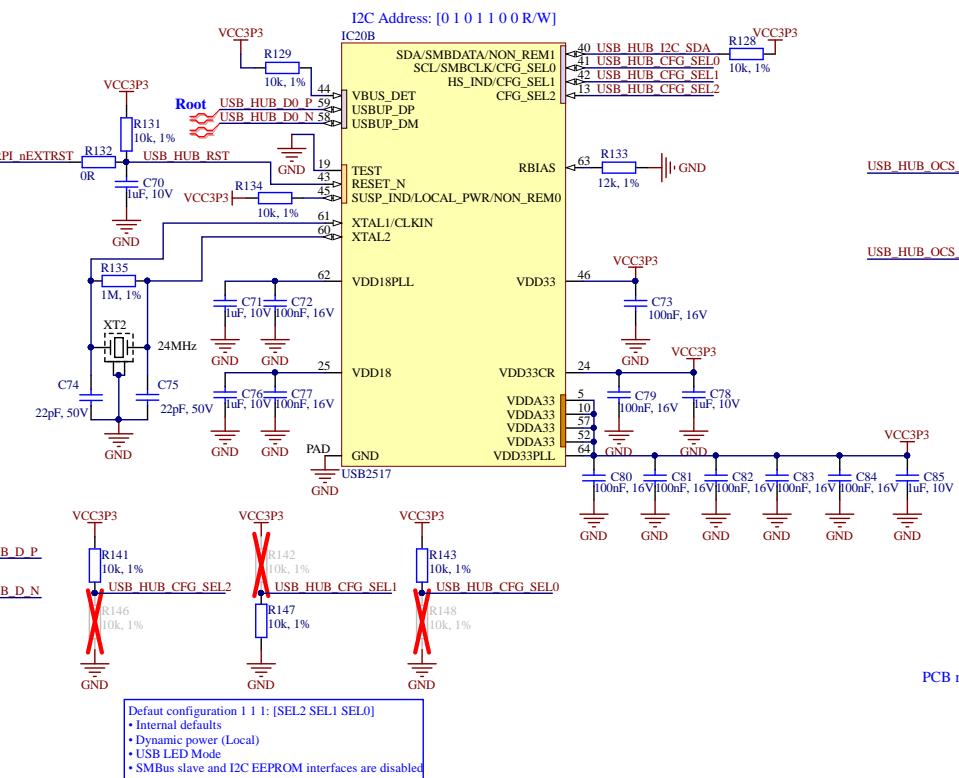
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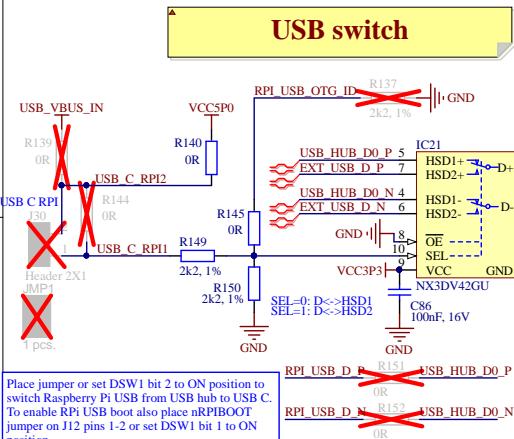
USB C socket



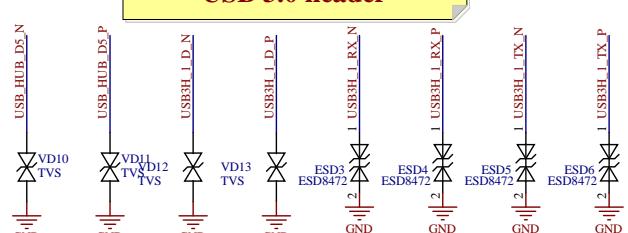
USB 2.0 HUB



USB switch

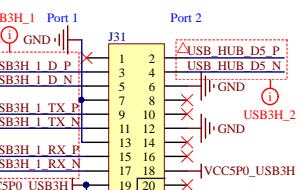


USB 3.0 header



Power for USB3 header
VCCSP0_USB3H

When CM4 is used all header ports are USB2.0.
When CM5 is used only Port 1 is USB3.0.



USB2.0 hub upstream



For debug purposes only

Project name: LimePSB-RPCM_Iv4.PrbPcb

Title: USB 2.0 hub

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Version: 1.4

Variant: Default

Date: 2025-06-20

Time: 12:49:35

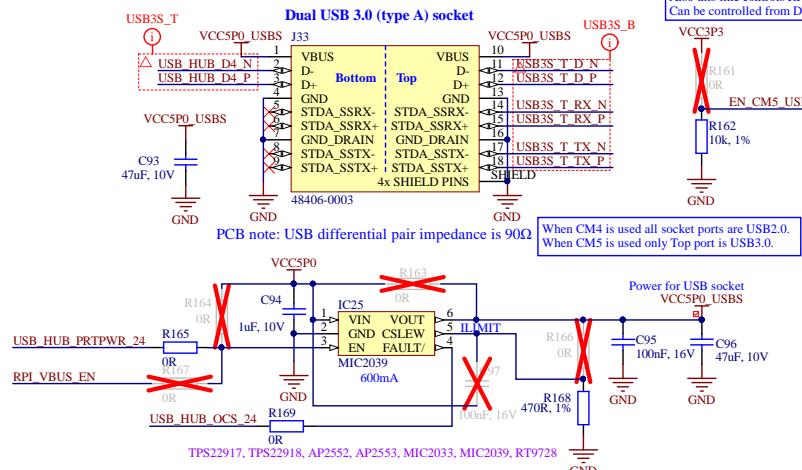
Sheet 9 of 15

File: 09_USB_hub.SchDoc

Size: A3

USB and HDMI sockets

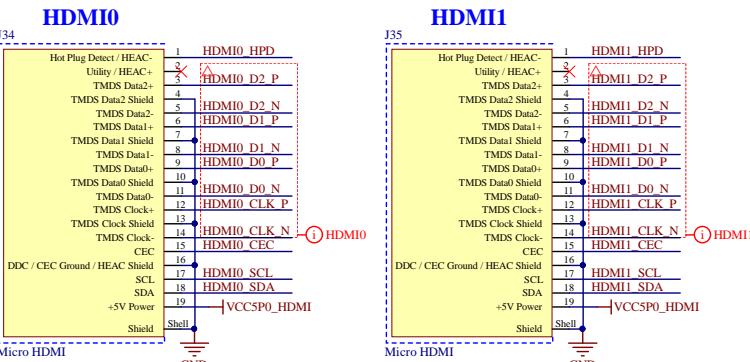
Dual USB 3.0 (type A) socket



EN_CM5_USB3: Enable CM5 USB3 ports:
0: all ports connected to USB 2.0 hub (for CM4)
1: USB header Port 1 and USB socket Top port are connected to CM5 USB3.0 lines (for CM5).
Also this line controls RPL_PIN111 mux.
Can be controlled from DSW1 Bit 4.

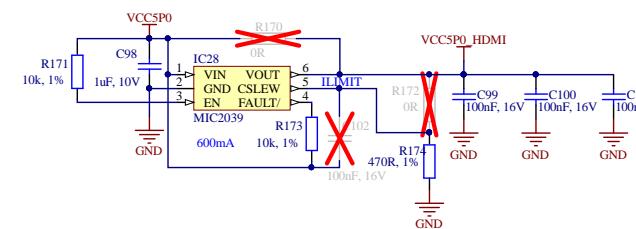
HDMI sockets

Micro (Type D) HDMI sockets

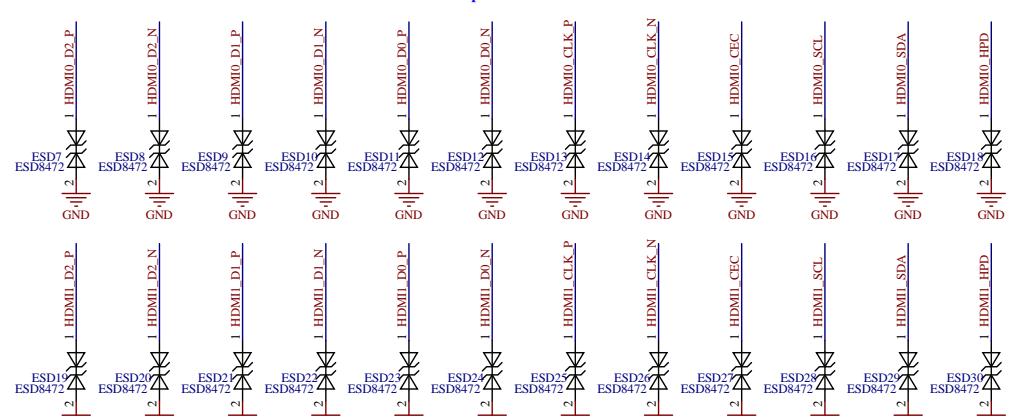


PCB note: make each HDMI group differential traces length equal and impedance of 100Ω

Power for HDMI sockets



ESD protection for CM5



Project name: LimePSB-RPCM_Jv4.PrjPcb

Title: USB and HDMI sockets

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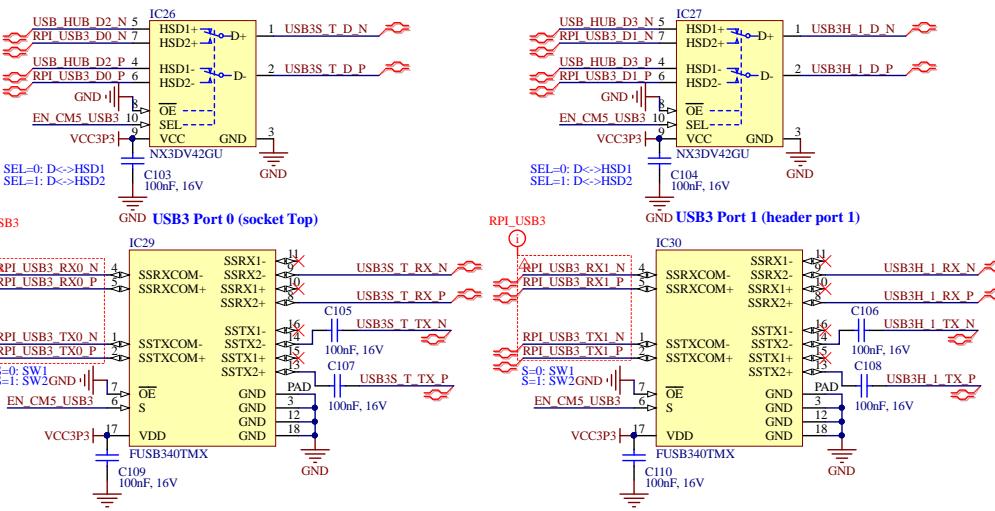
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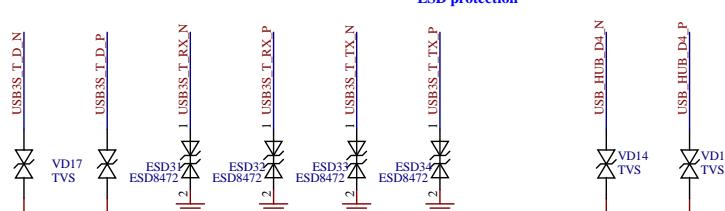
Sheet 10 of 15

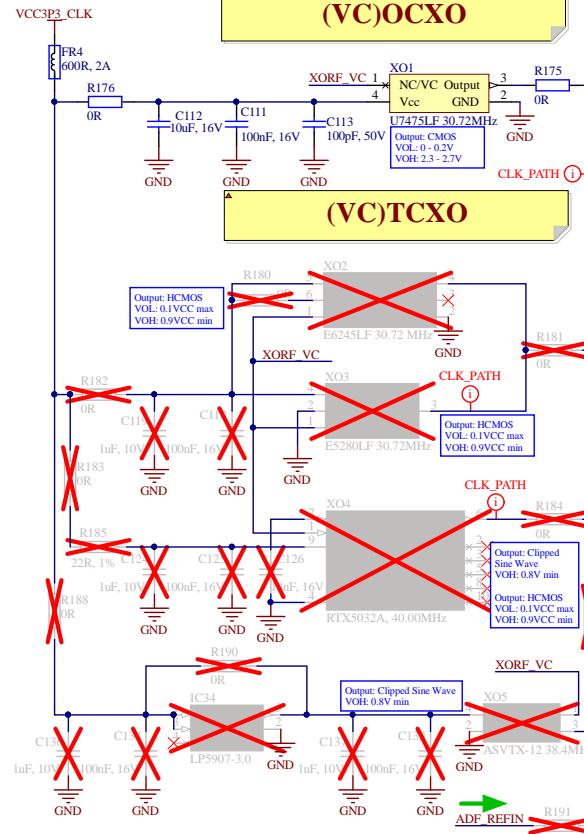
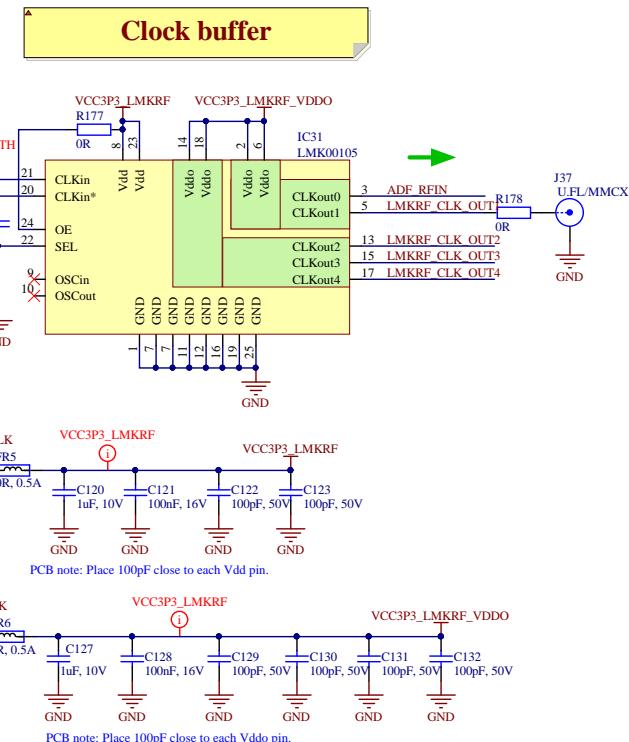
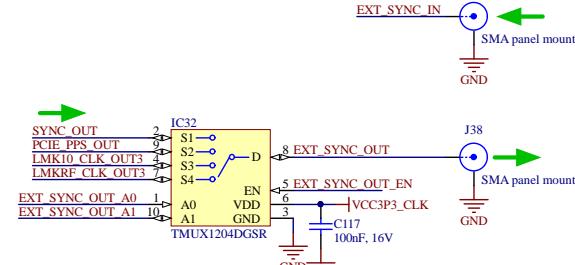
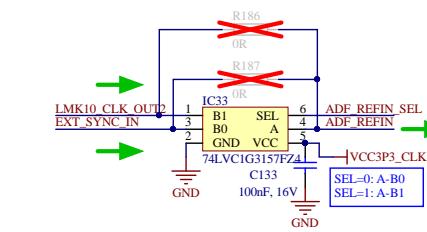
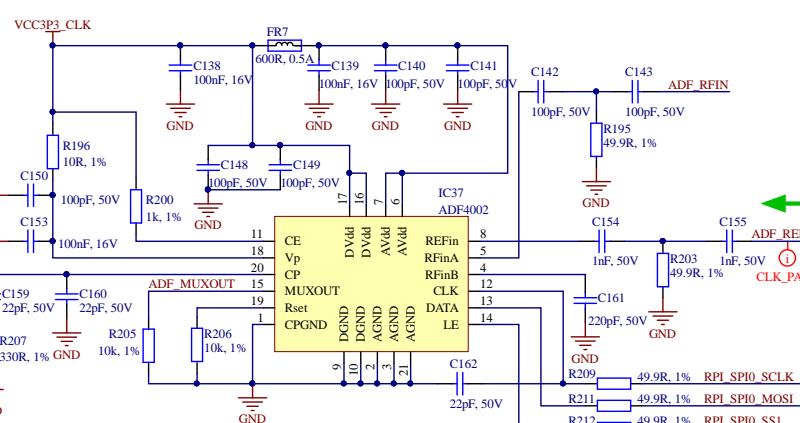
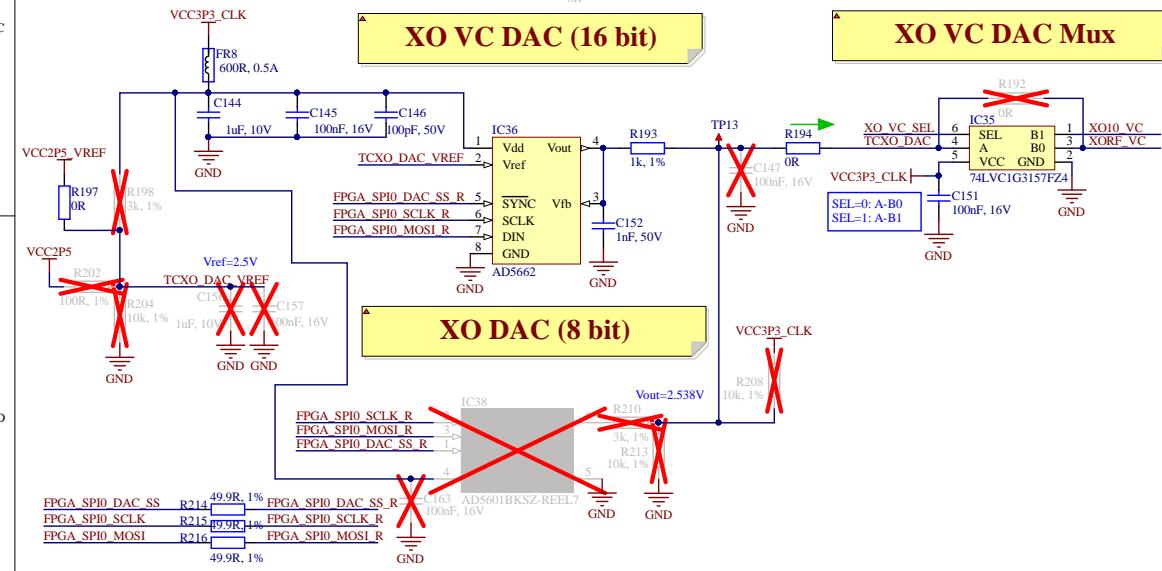
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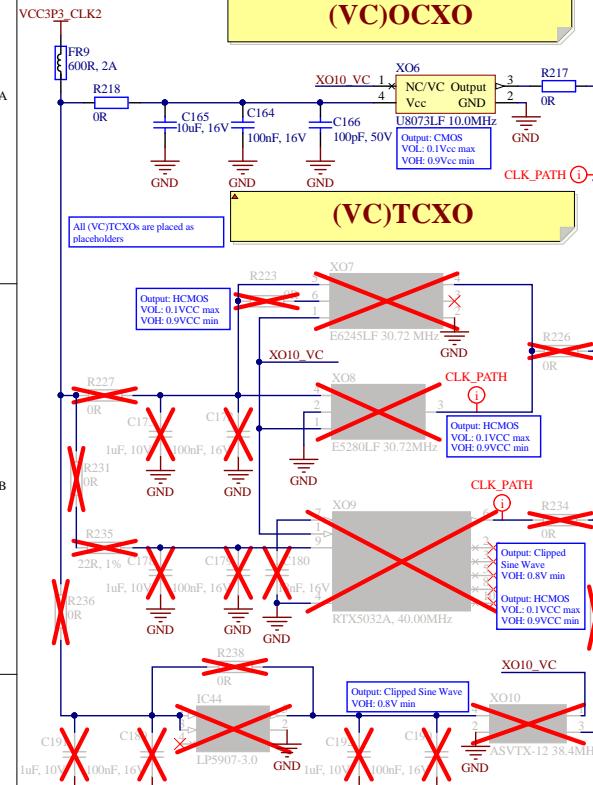
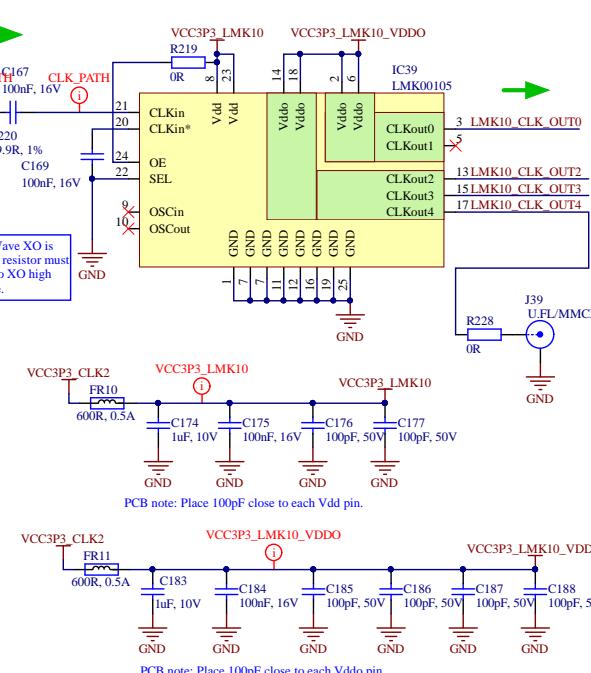
USB 2.0 and 3.0 switches



ESD protection

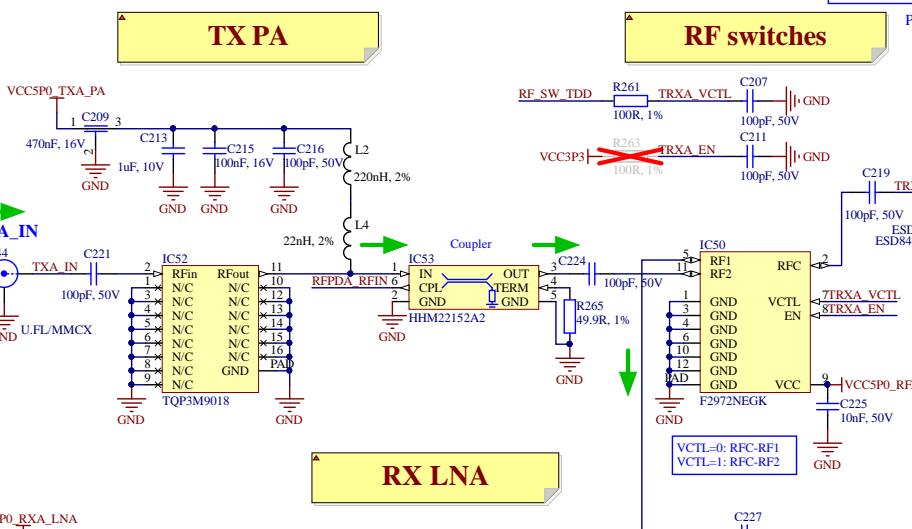


RF_REF**(VC)OCXO****Clock 1 circuits****Clock buffer****EXT_SYNC_IN/OUT****Phase detector REFIN selection****Phase detector**Project name: **LimePSB-RPCM_Iv4.PrjPcb**Title: **Clock 1**Version: **1.4**Variant: **Default**Date: **2025-06-20**Time: **12:49:36**Sheet **11** of **15**File: **11_Clock_1.SchDoc**Size: **A3**Lime Microsystems
Survey Tech Centre
Guildford GU2 7JG
Survey
United Kingdom**XO VC DAC (16 bit)****XO VC DAC Mux****XO DAC (8 bit)****XO VC DAC Mux****XO VC DAC (16 bit)****XO DAC (8 bit)**

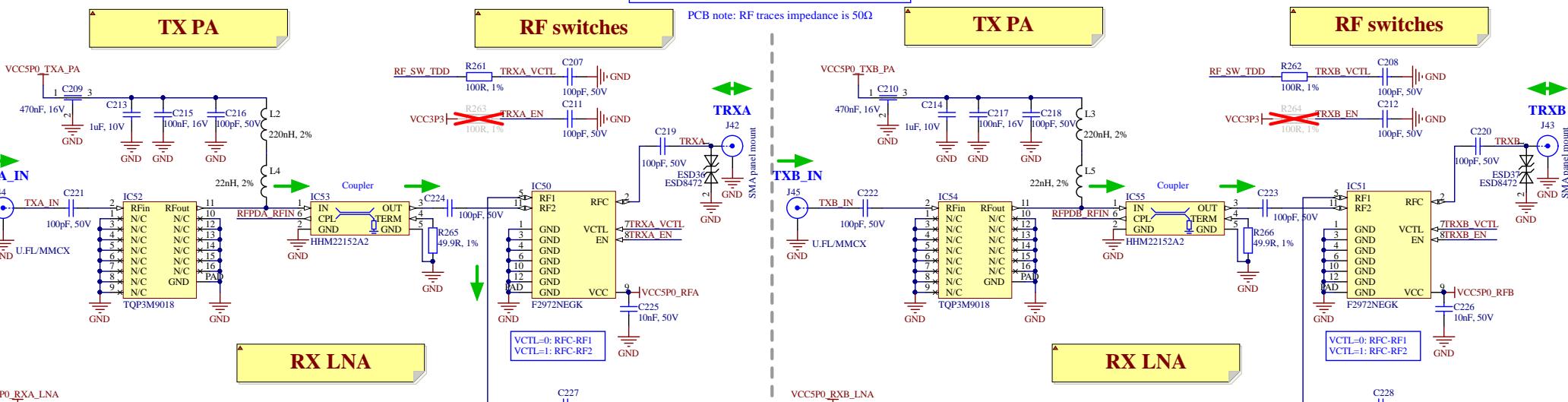
10_REF**Clock 2 circuits****Clock buffer**

RF front end

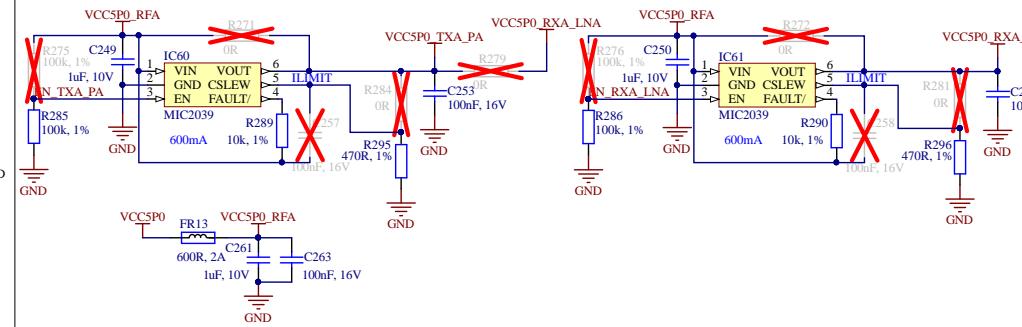
Channel A



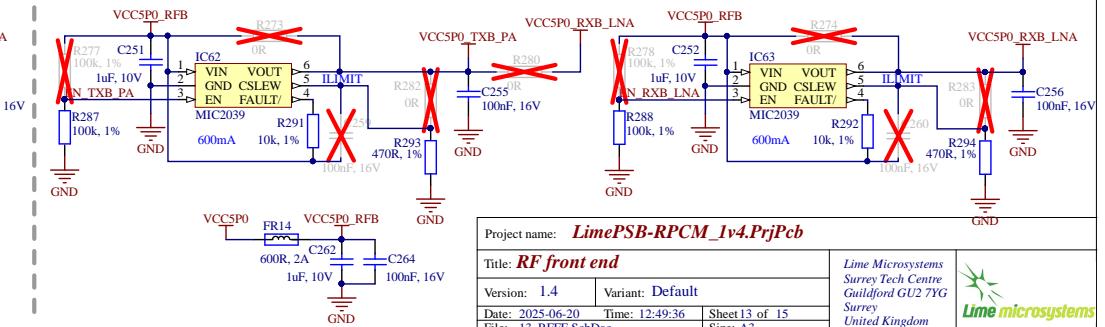
Channel B



Power switches



Power switches



Project name: LimePSB-RPCM_Jv4.PjrPcb

Title: RF front end

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United Kingdom

Lime microsystems

Version: 1.4 Variant: Default

Date: 2025-06-20 Time: 12:49:36 Sheet 13 of 15

File: 13_RFPE.SchDoc Size: A3

Board power circuits

Power input

A
External power supply
Positive polarity

J50 VCC_BARREL

VCC_BARREL

9-14V, 2-3A

VD18

SK36A

FR15

1uH, 3.2A

L8

FR15

600R, 2A

R297

OR

D21

MBJ14A

22nF, 50V

C272

GND

GND

VCC_EXT

FR15

600R, 2A

C270

10uF, 25V

C271

22nF, 50V

GND

GND

VCC_INT

FR15

600R, 2A

C270

10uF, 25V

C271

22nF, 50V

GND

GND

VCC_INT

FR15

600R, 2A

C270

10uF, 25V

C271

22nF, 50V

GND

GND

VCC_INT

FR15

600R, 2A

C270

10uF, 25V

C271

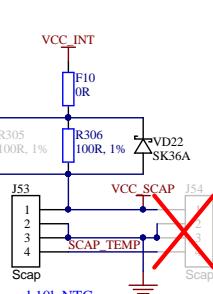
22nF, 50V

GND

GND

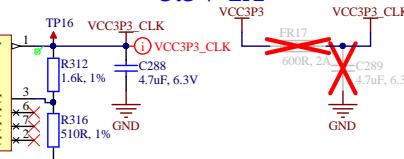
B
Internal 10k NTC

Supercapacitor

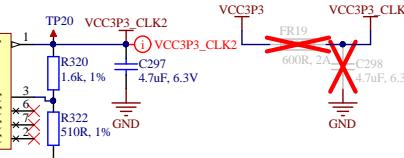


Linear regulators

3.3V 1A

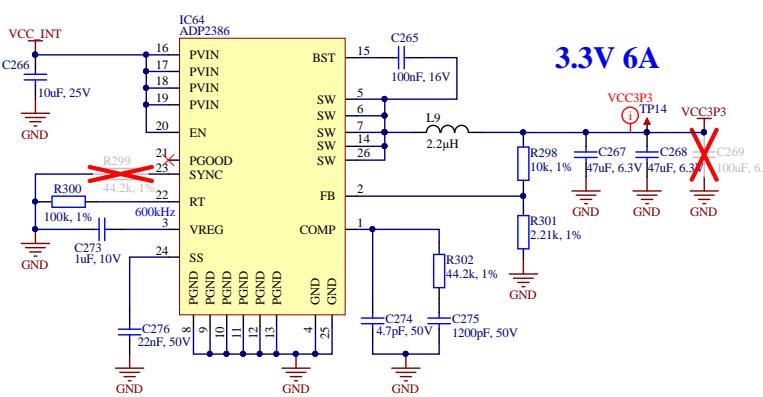


3.3V 1A

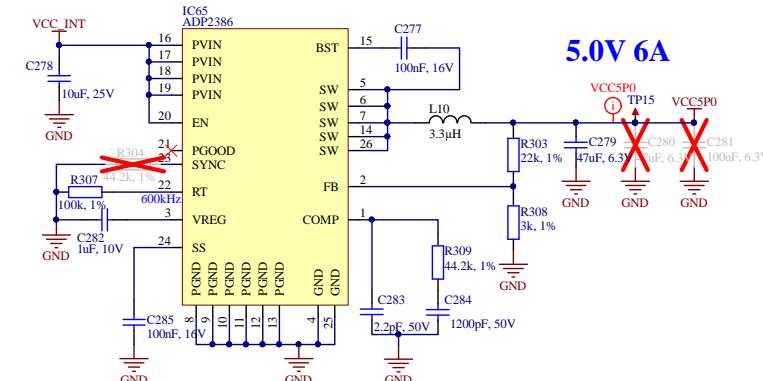


Switching regulators

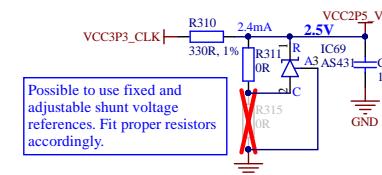
3.3V 6A



5.0V 6A



Voltage reference (2.5V)



Alternative reference source for XO DAC and ADC programming/configuration and XO DAC reference.

Project name: LimePSB-RPCM_Iv4.PjrPcb

Title: Power

Version: 1.4 Variant: Default

Date: 2025-06-20 Time: 12:49:37 Sheet 15 of 15

File: 15_Power.SchDoc Size: A3

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