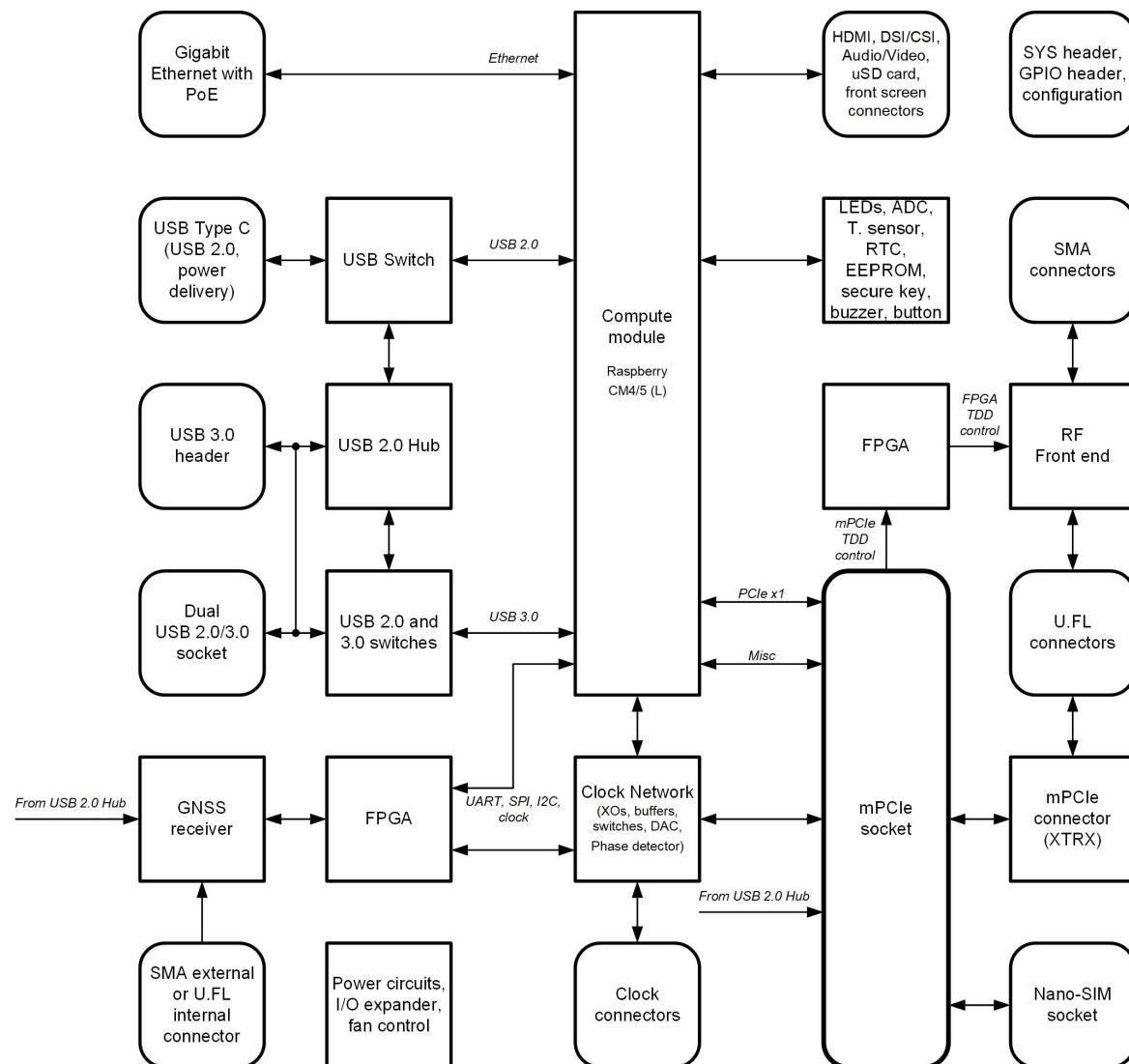


## Block diagram



Project name: **LimePSB-RPCM\_1v4.PrbPcb**

Title: **Block diagram**

Version: 1.4

Variant: Default

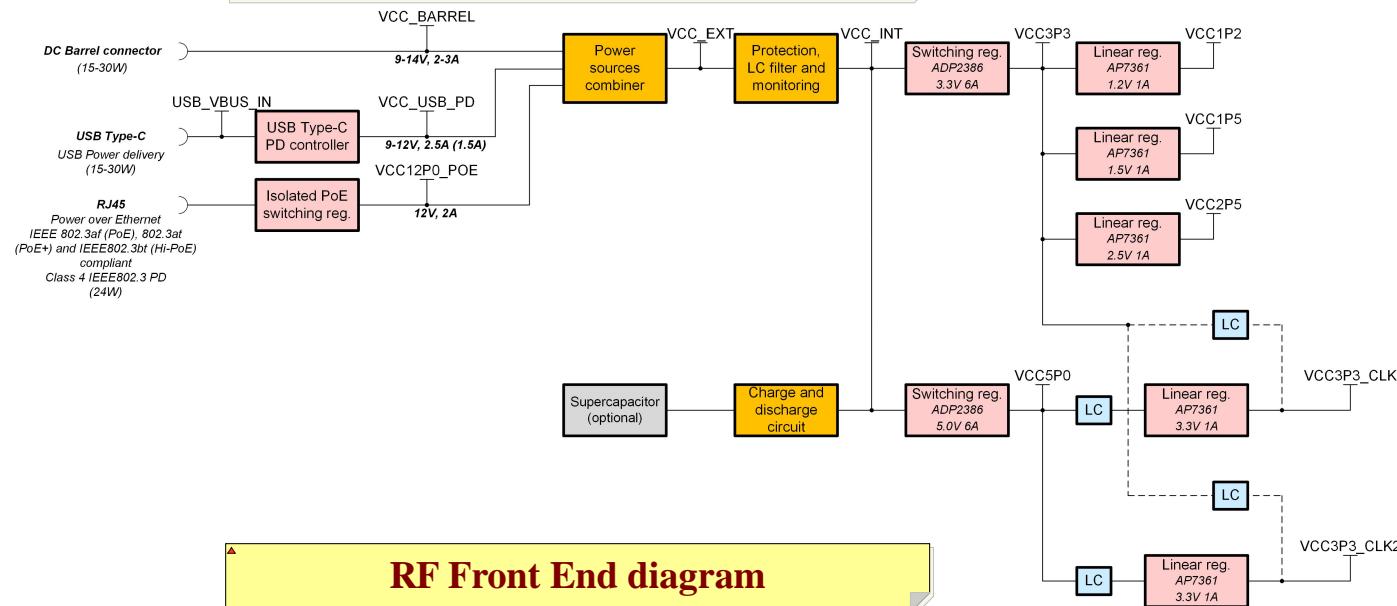
Date: 2025-06-02 Time: 12:22:58 Sheet 1 of 15

File: 01\_Block\_diag.SchDoc

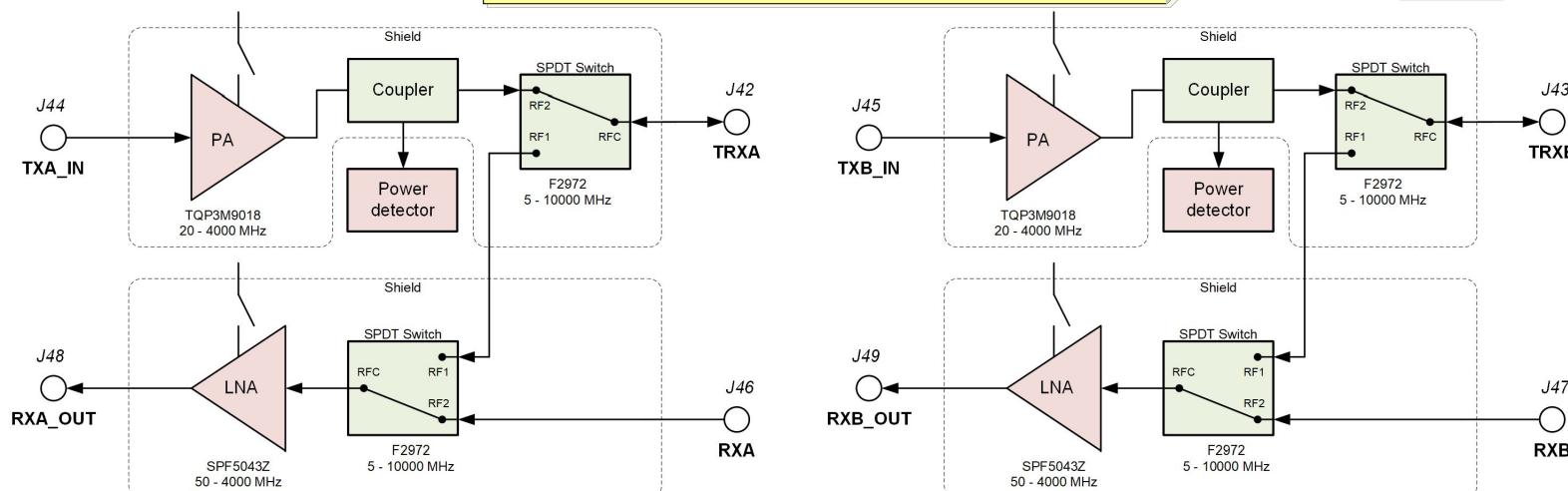
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Surrey Tech Centre  
Guildford GU2 7YG  
Surrey  
United Kingdom



## 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

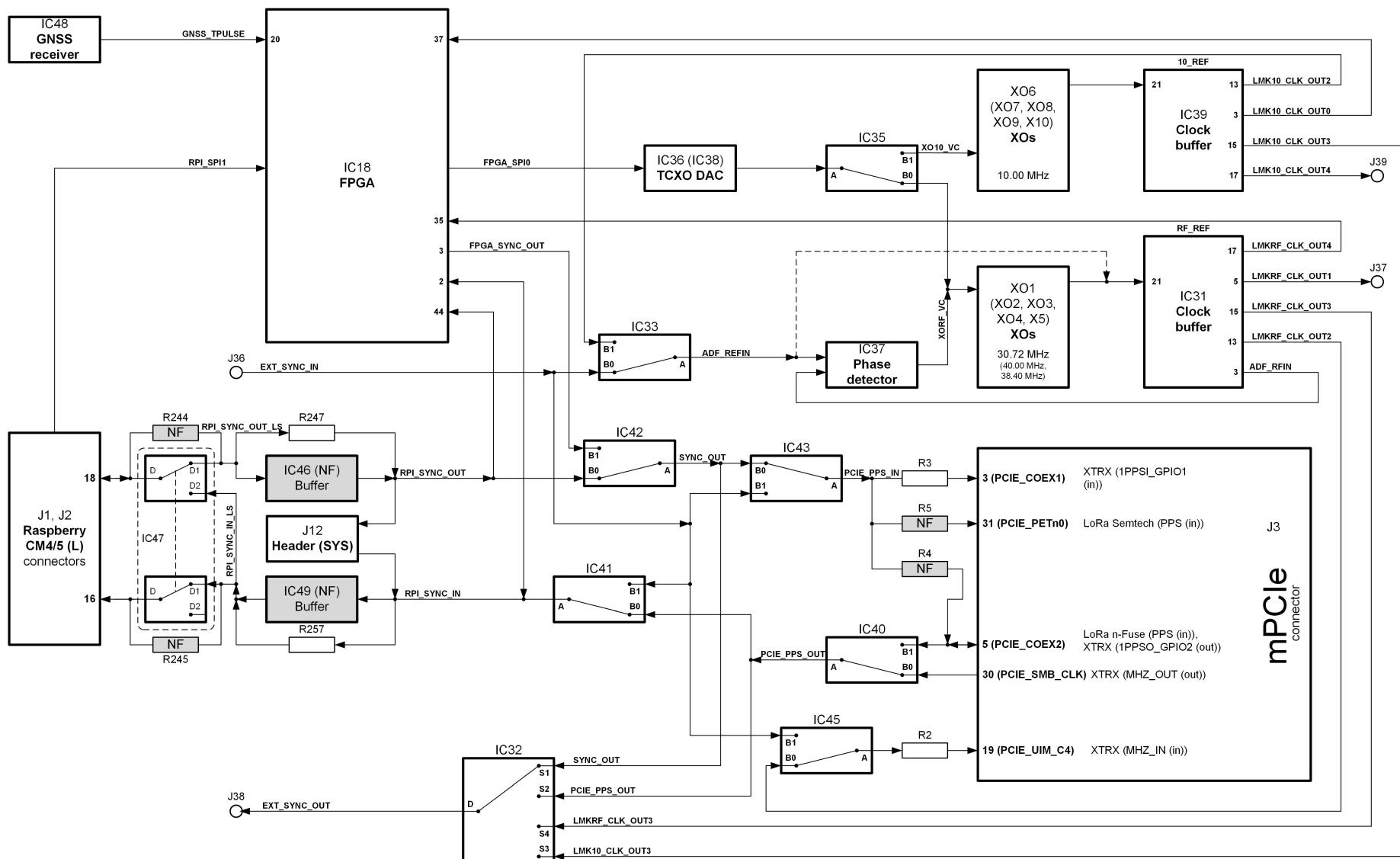
Date: 2025-06-02 Time: 12:22:58 Sheet 2 of 15

File: 02\_Power\_RFFE\_diag.SchDoc Size: A4

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Guildford GU2 7YG  
Surrey  
United Kingdom



## Clock diagram

Project name: **LimePSB-RPCM\_1v4.PrbPcb**Title: **Clock diagram**

Version: 1.4 Variant: Default

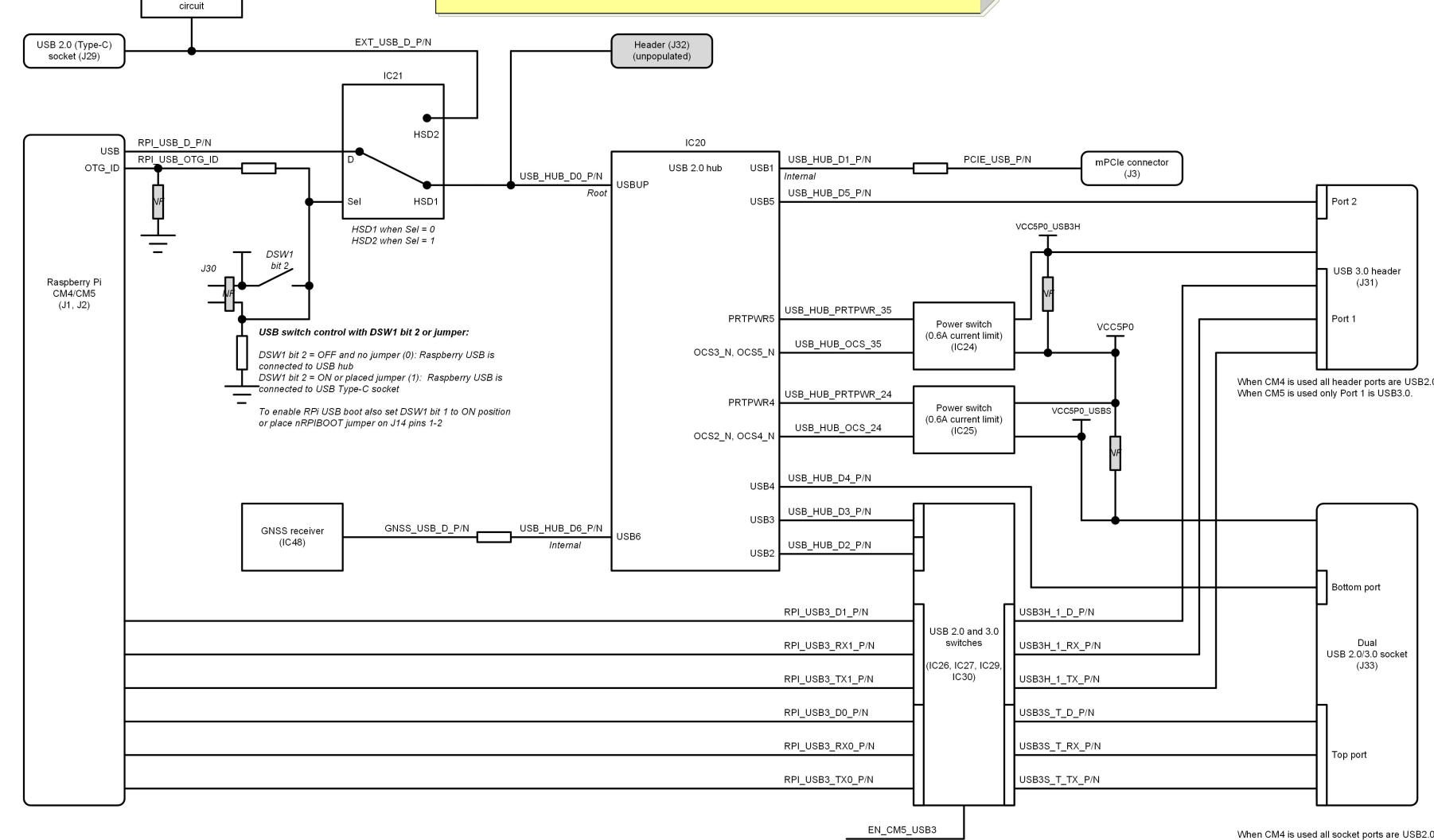
Date: 2025-06-02 Time: 12:22:58 Sheet 3 of 15

File: 03\_Clock\_diag.SchDoc

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Surrey Tech Centre  
Guildford GU2 7YG  
Surrey  
United Kingdom



## USB diagram



Project name: **LimePSB-RPCM\_1v4.PpjPcb**

Title: **USB diagram**

Version: 1.4 Variant: Default

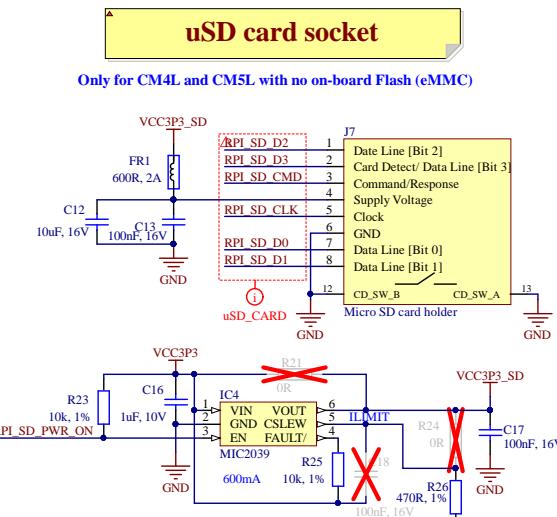
Date: 2025-06-02 Time: 12:22:59 Sheet 4 of 15

File: 04\_USB\_diag.SchDoc Size: A4

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United Kingdom

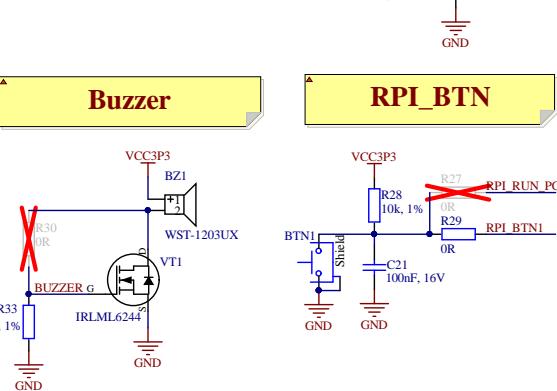




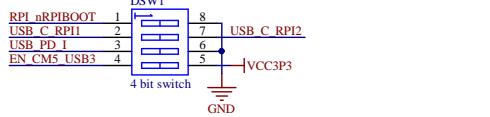


## **uSD card socket**

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



## DIP switch

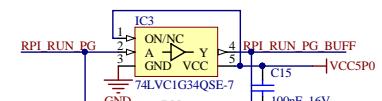
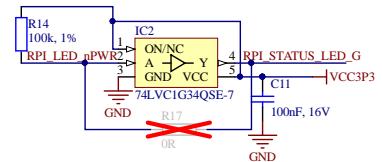


Bit 1: RPi boot source:  
OFF: RPi boots from eMMC/uSD (default).  
ON: Booting from eMMC will be stopped and booting will be transferred to RPi boot which is via USB.

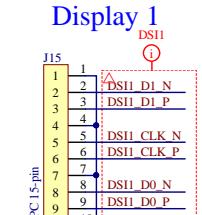
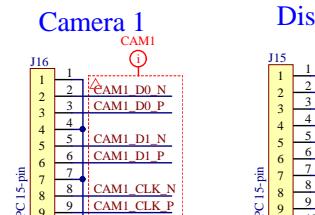
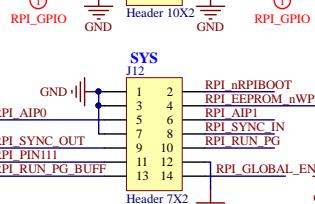
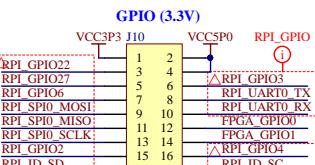
**Bit 2: RPi USB 2.0 port mux control:**  
OFF: RPi USB is connected to USB hub (default).  
ON: RPi USB is connected to USB C connector.

Bit 3: USB C PD current configuration:  
OFF: I=2.5A (default).  
ON: I=1.5A.

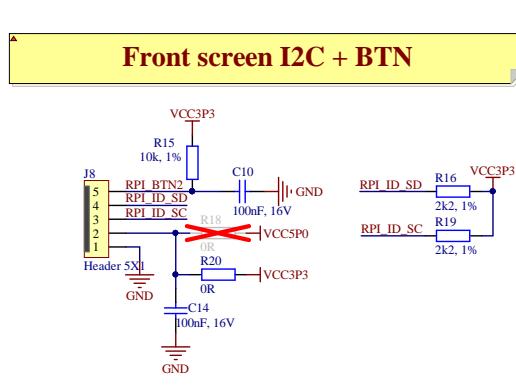
Bit 4: Enable CM5 USB3 ports:  
OFF: all ports are connected to USB 2.0 hub (for CM4).  
ON: USB header Port 1 and USB socket Top port are connected to CM5 USB3.0 lines (for CM5).  
Also this line controls RPI\_PIN11 mux.



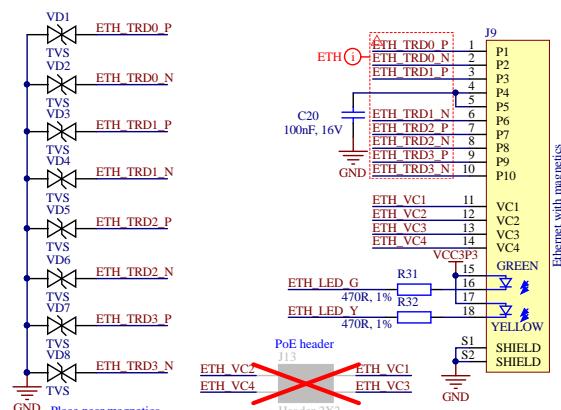
## GPIO ans SYS headers



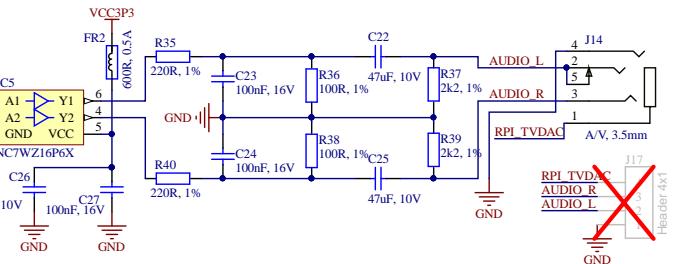
For CM5 CAM1 and DSI1 signals become dual-purpose and can be used for either a CSI camera or a DSI display.



## Front screen I2C + BTN



#### Analog audio + Composite video out

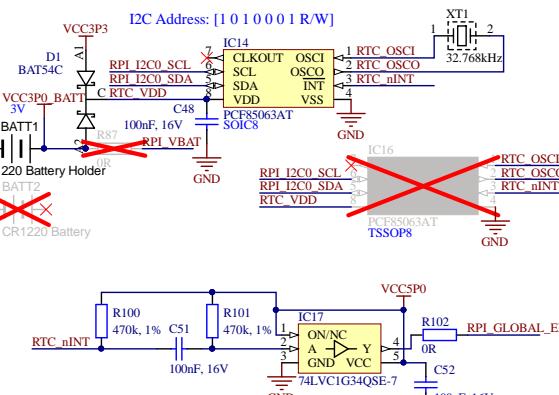
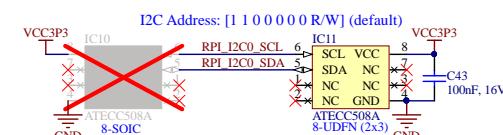
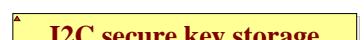
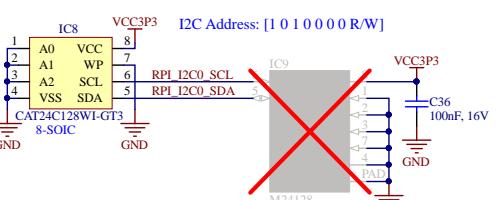
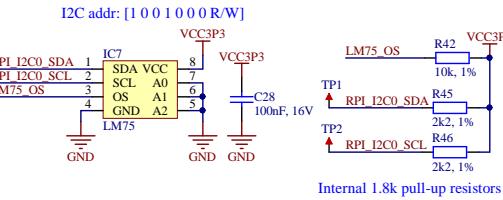


Project name: **LimePSB-RPCM**, Lv1 PriPC

Title: *Misc 1*

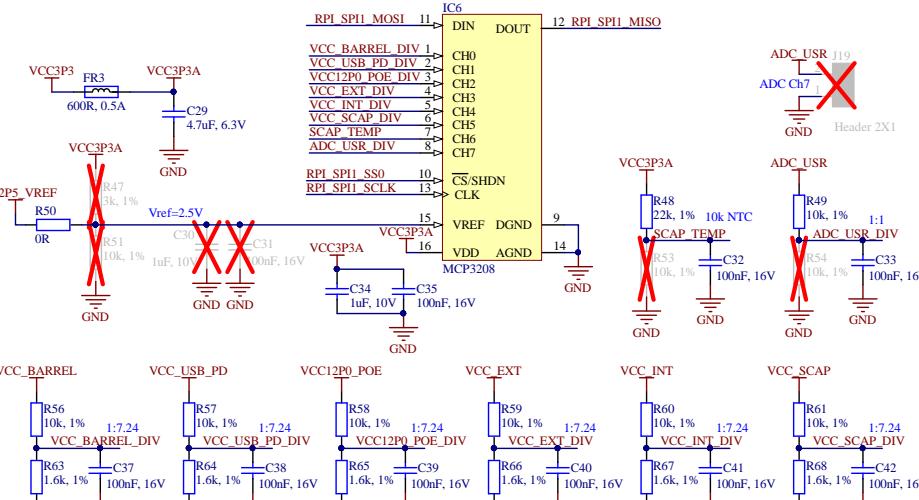
*Lime Microsystems  
Surrey Tech Centre  
Guildford GU2 7YG  
Surrey  
United Kingdom*



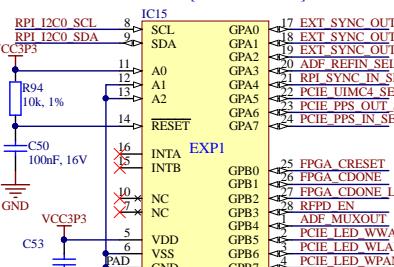
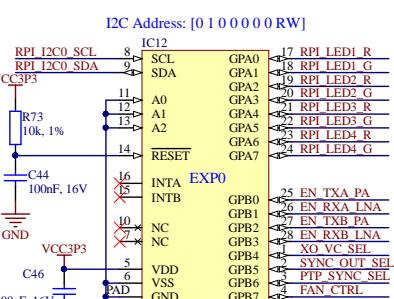


## Misc 2

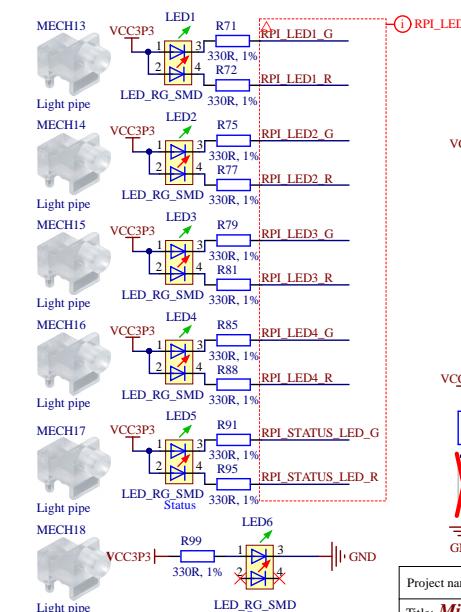
SPI ADC



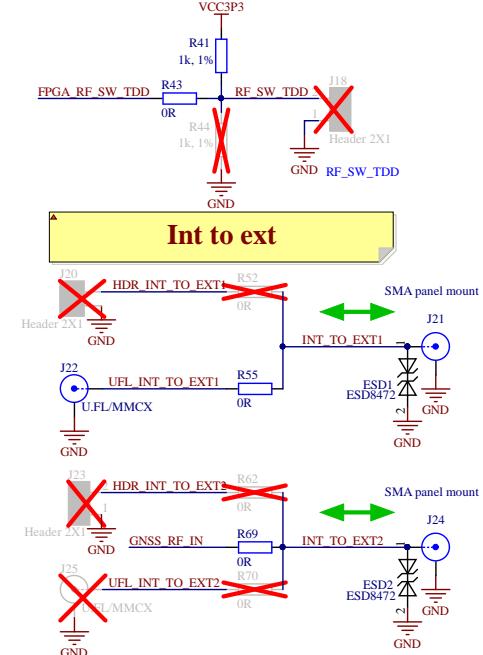
## I2C I/O expanders



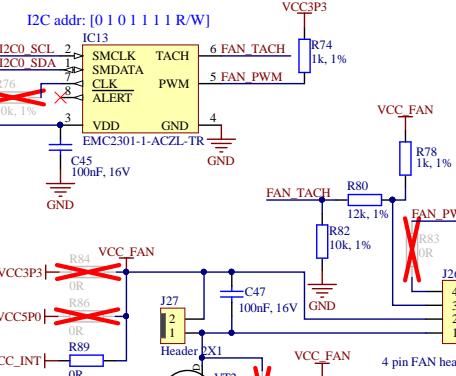
## Raspberry Pi LEDs



RFFE TDD control



FAN control



Project name: **LimePSB-RPCM\_1v4.PrjPcl**

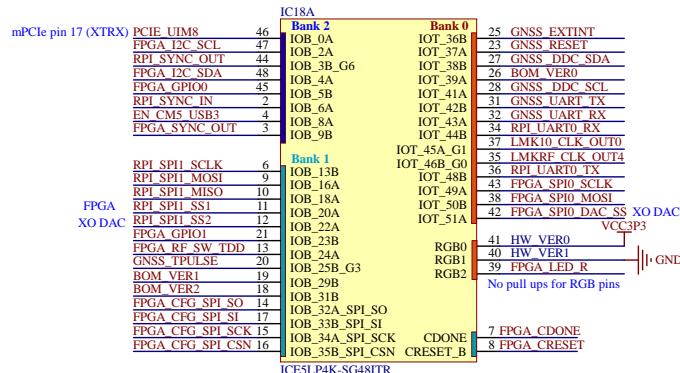
Title: *Misc 2*

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Surrey Tech Centre  
Guildford GU2 7YG  
Surrey  
United Kingdom*

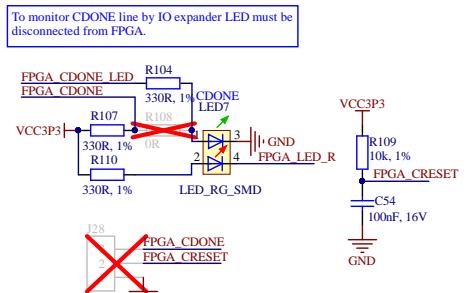


## FPGA

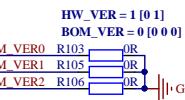
### FPGA



### FPGA misc

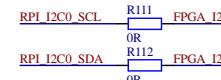


### HW\_VER, BOM\_VER

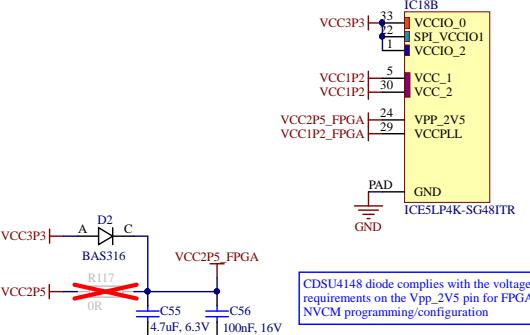


### I2C interconnections

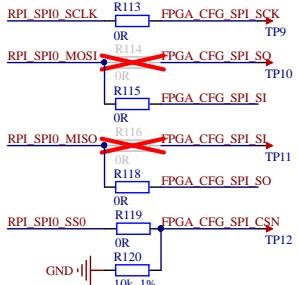
Raspberry I2C0 and FPGA I2C interconnections



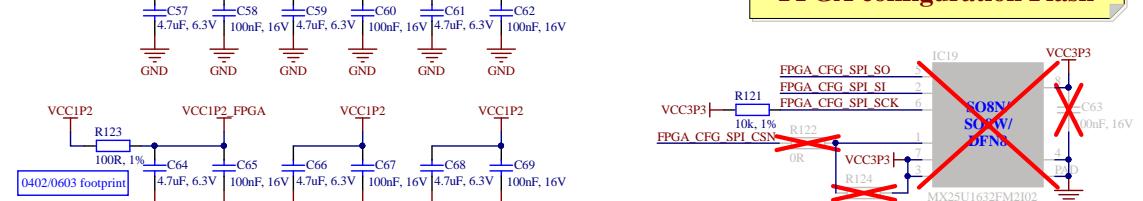
### FPGA power



### FPGA configuration modes

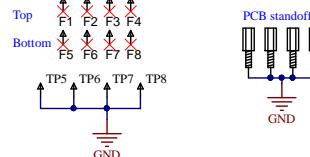


### FPGA configuration Flash



### Misc

Fiducials



### Misc for FAN

FANI



MECH26

MECH27

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)

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**

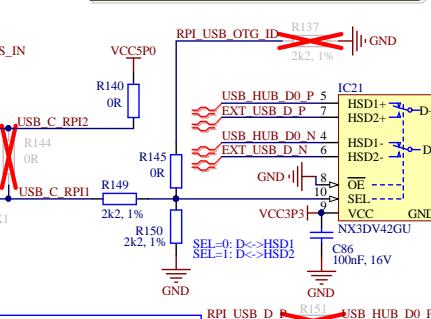
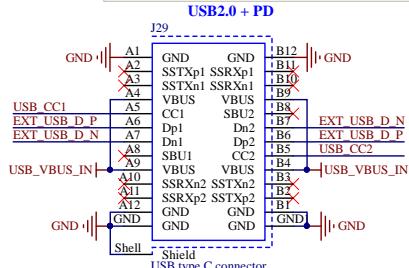
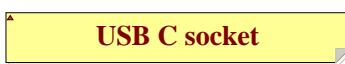
Lime Microsystems

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United Kingdom

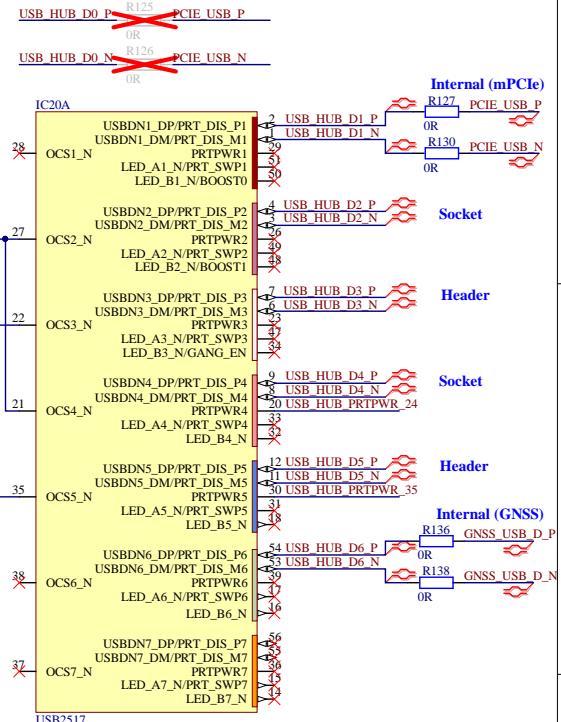
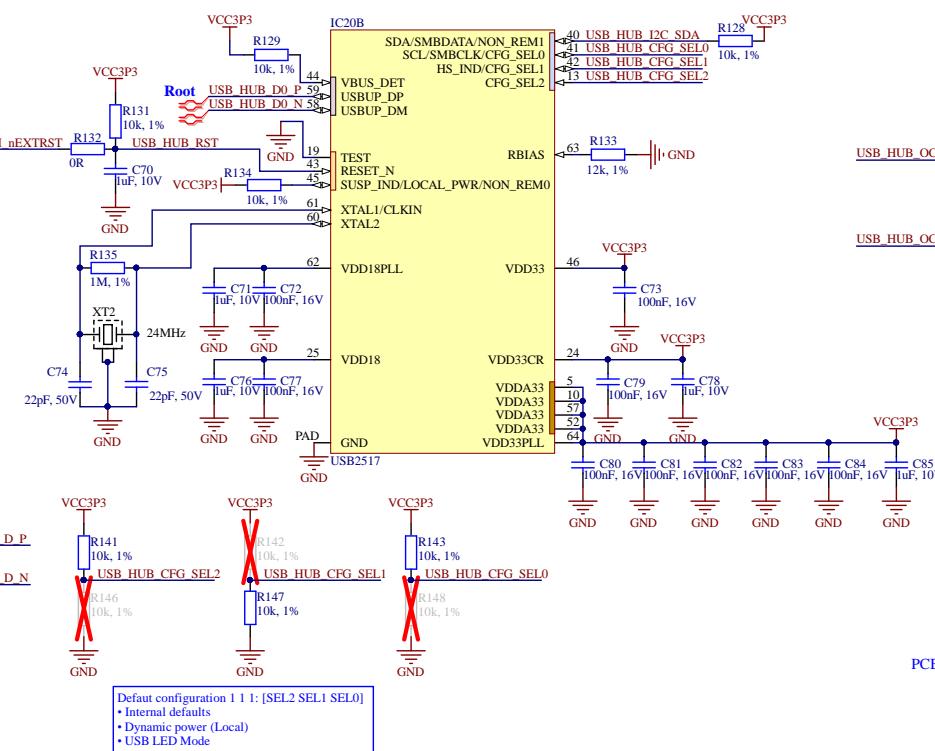
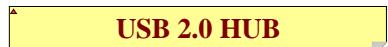
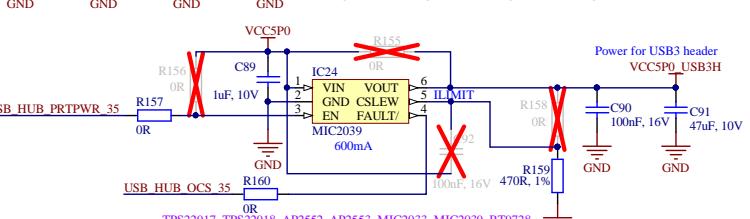
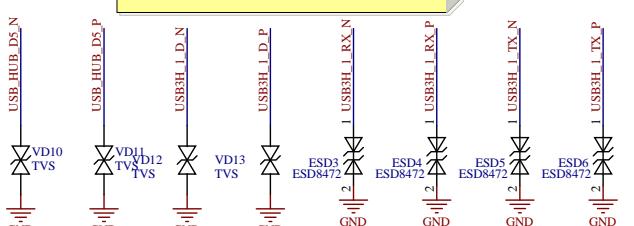
Lime microsystems

Date: 2025-06-02 Time: 12:23:00 Sheet 8 of 15

File: 08 FPGA.SchDoc Size: A3



Place jumper or set DSW1 bit 2 to ON position to switch Raspberry Pi USB from USB hub to USB C. To enable RPi USB boot also place nRPIBOOT jumper on J12 pins 1-2 or set DSW1 bit 1 to ON position.



PCB note: USB differential pair impedance is 90Ω

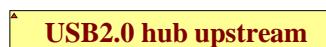
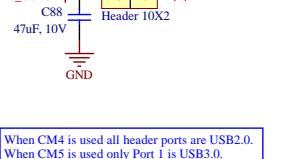
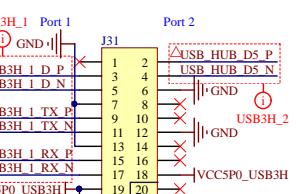
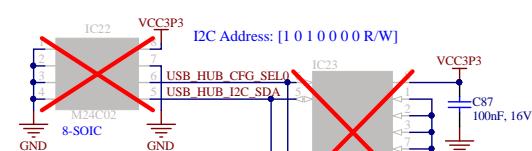
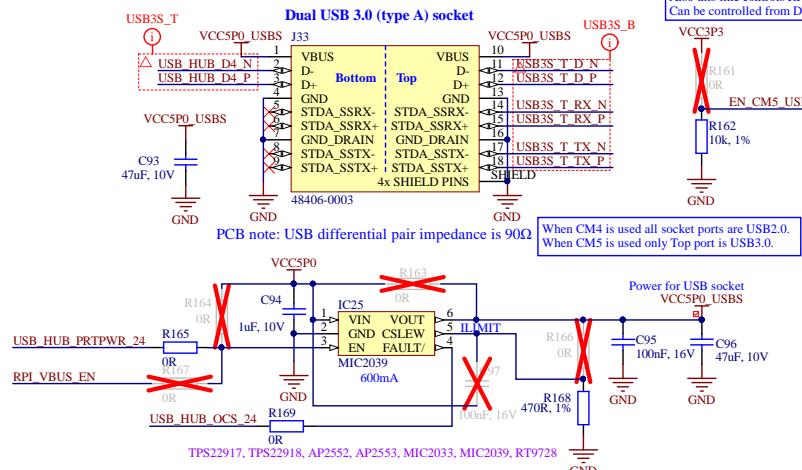


Fig. 1.1.

Project name:	<b>LimePSB-RPCM_Iv4.PrjPcb</b>		
Title:	<b>USB 2.0 hub</b>		
Version:	1.4	Variant:	Default
Date:	2025-06-02	Time:	12:23:00
File:	LimePSB-RPCM_Iv4.PrjPcb	Sheet:	9 of 15

## USB and HDMI sockets

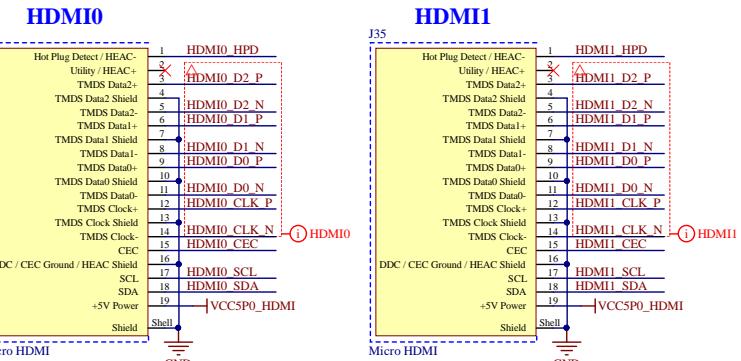
### Dual USB 3.0 (type A) socket



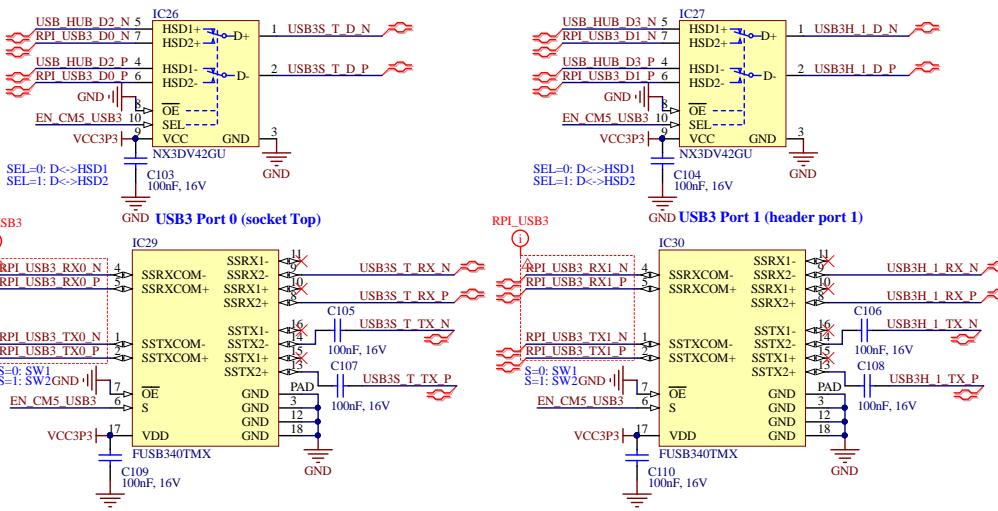
**EN\_CM5\_USB3:** Enable CM5 USB3 ports:  
0: all ports connected to USB 2.0 hub (for CM4)  
1: USB header Port 1 and USB socket Top port are connected to CM5 USB3.0 lines (for CM5).  
Also this line controls RPL\_PIN111 mux.  
Can be controlled from DSW1 Bit 4.

### HDMI sockets

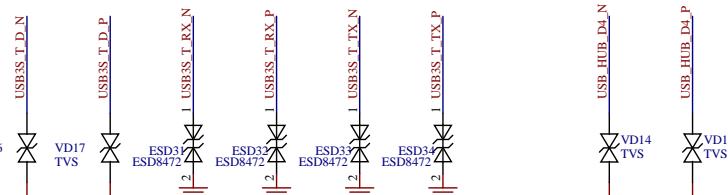
Micro (Type D) HDMI sockets



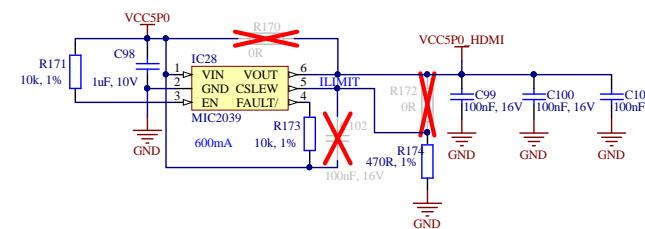
### USB 2.0 and 3.0 switches



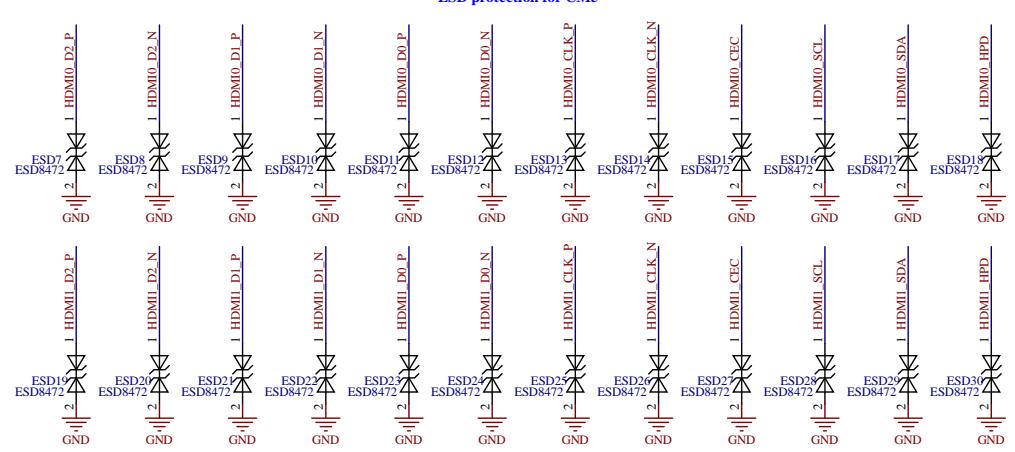
### ESD protection



### Power for HDMI sockets



### ESD protection for CM5



Project name: LimePSB-RPCM\_Jv4.PrjPcb

Title: USB and HDMI sockets

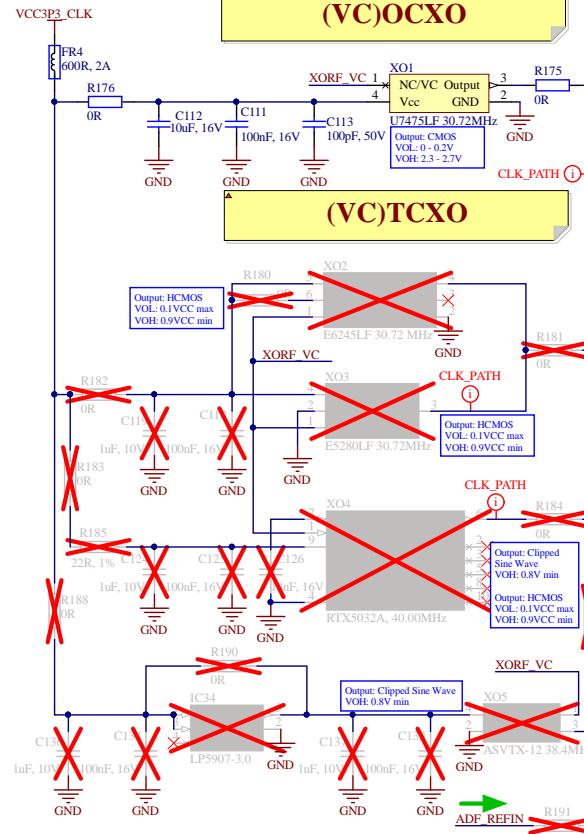
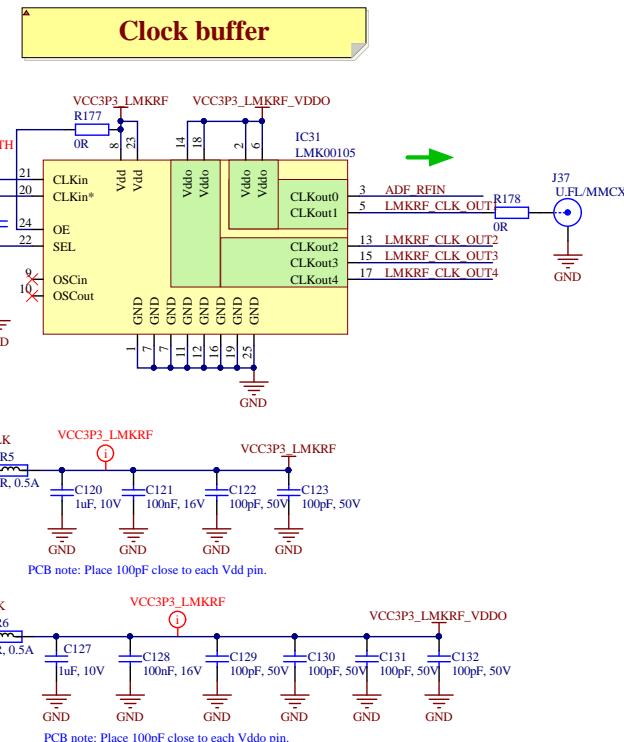
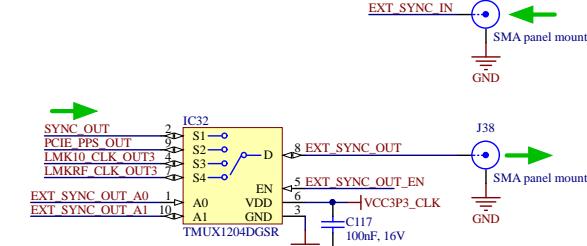
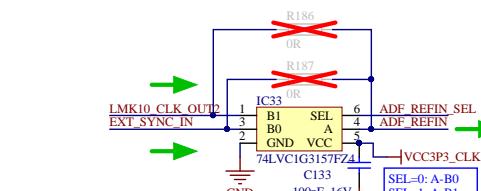
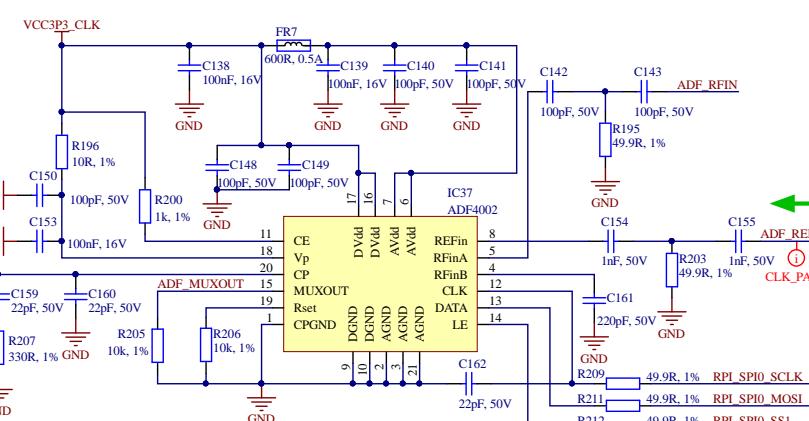
Lime Microsystems  
Surve Tech Centre  
Guildford GU2 7IG  
Surve  
United Kingdom

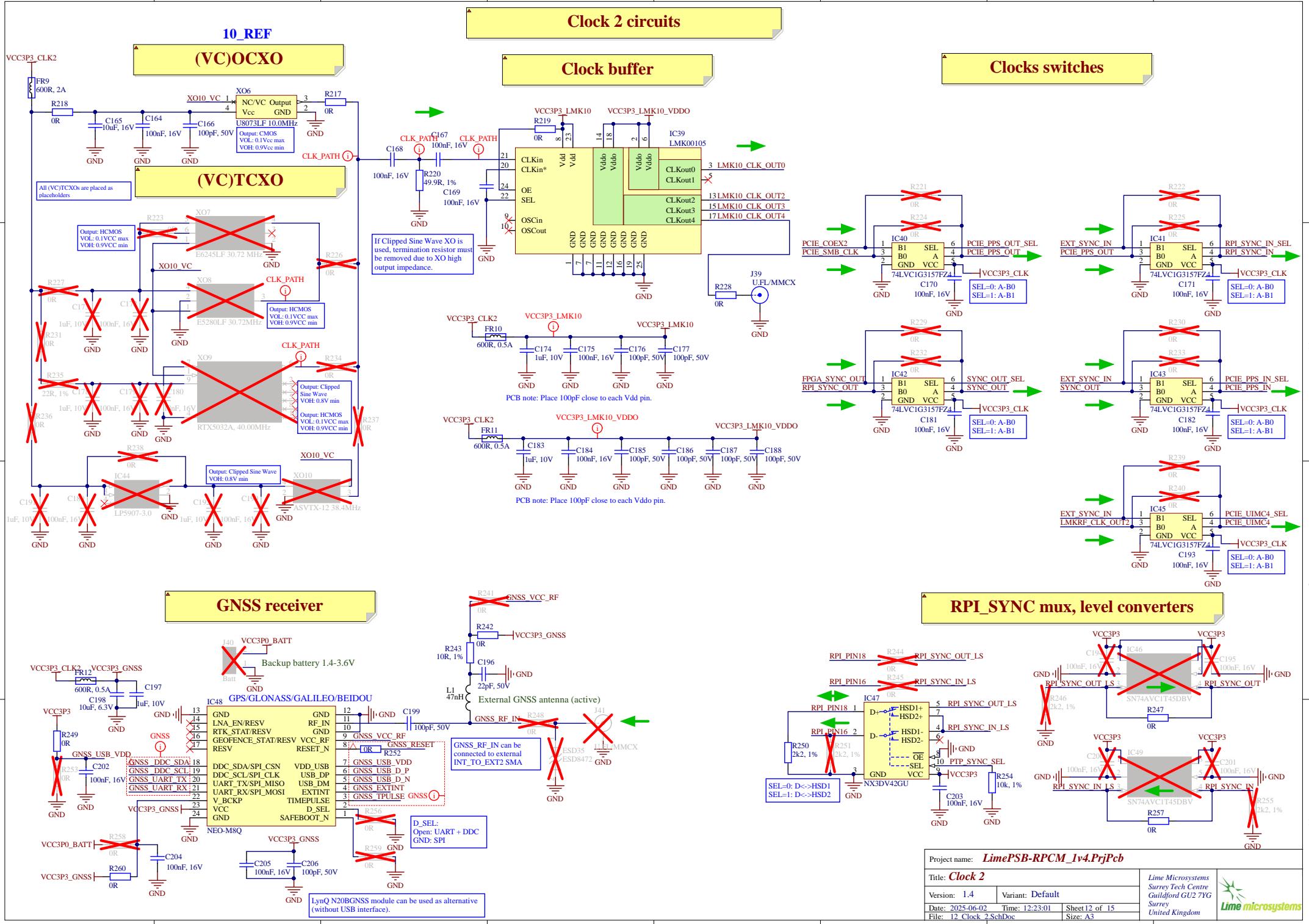


Version: 1.4 Variant: Default

Date: 2025-06-02 Time: 12:23:00 Sheet 10 of 15

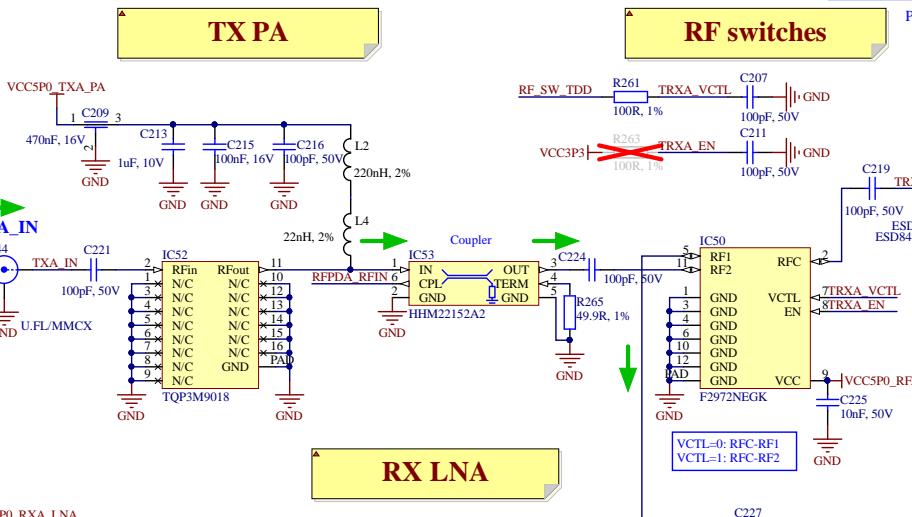
File: 10\_USB\_HDMI.SchDoc Size: A3

**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: **2025-06-02**Time: **12:23:00**Sheet **11** of **15**File: **11\_Clock\_1.SchDoc**Size: **A3**Lime Microsystems  
Survey Tech Centre  
Guildford GU2 7JG  
Survey  
United Kingdom

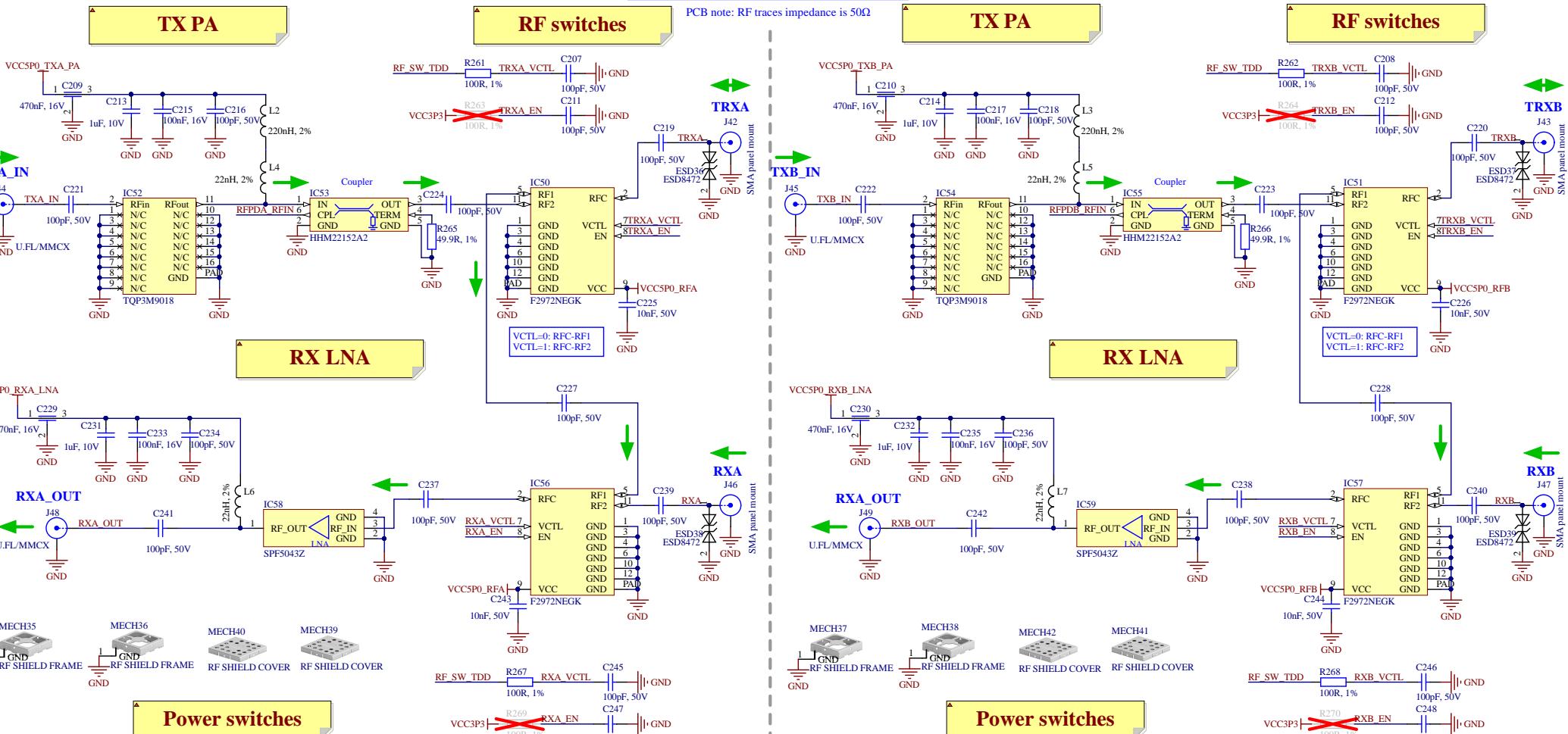


### RF front end

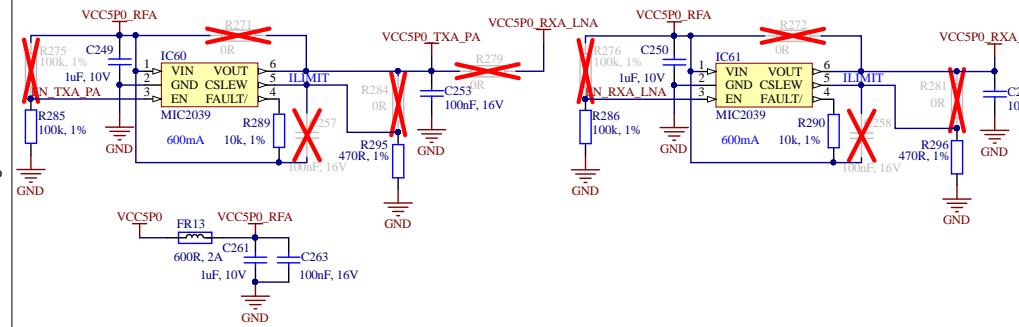
#### Channel A



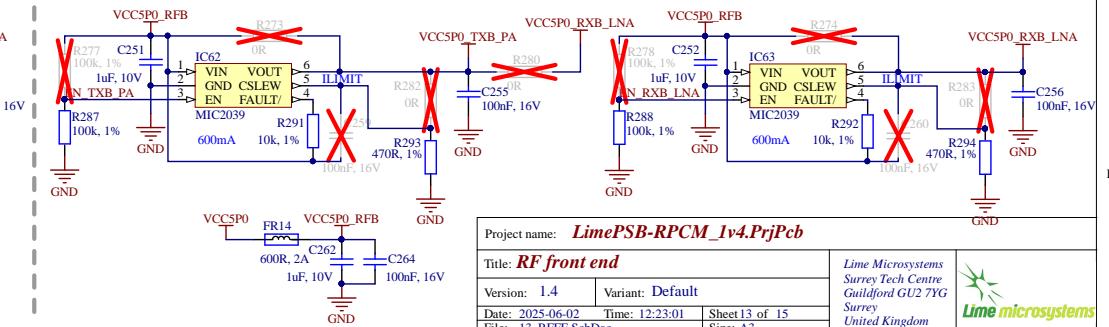
#### Channel B



#### Power switches



#### Power switches



Project name: LimePSB-RPCM\_Jv4.PjrPcb

Title: RF front end

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United Kingdom

Version: 1.4 Variant: Default

Date: 2025-06-02 Time: 12:23:01 Sheet 13 of 15  
File: 13.RFFE.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

OR

VCC\_EXT

D21

MBJ14A

GND

FR15

600R, 2A

R297

OR

C270

22nF, 50V

L8

1uH, 3.2A

C271

10uF, 25V

GND

VCC\_INT

C271

22nF, 50V

GND

VCC\_INT

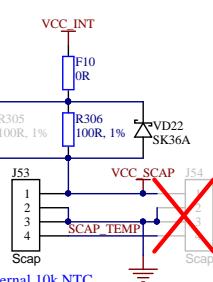
J51

VCC\_EXT

Header 2X1

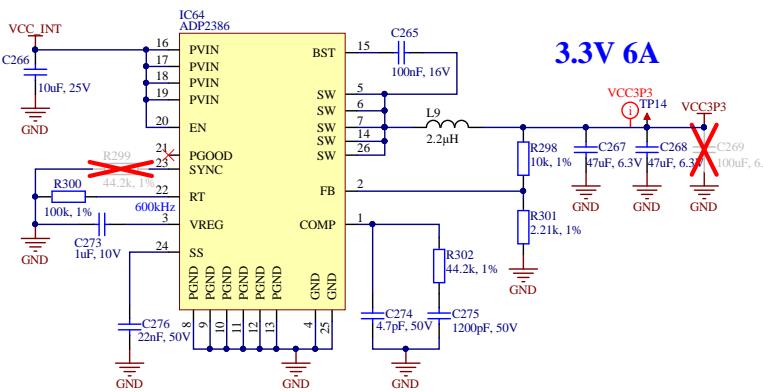
GND

### Supercapacitor

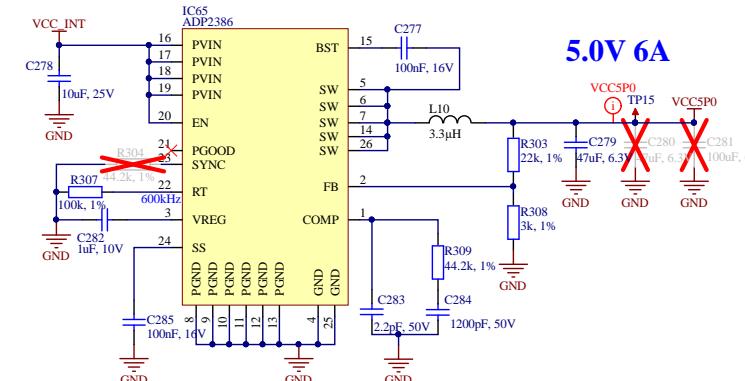


### Switching regulators

**3.3V 6A**

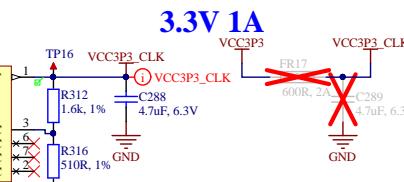


**5.0V 6A**

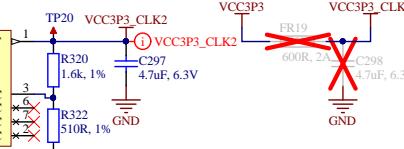


### Linear regulators

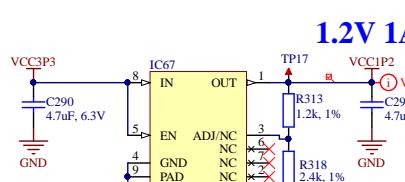
**3.3V 1A**



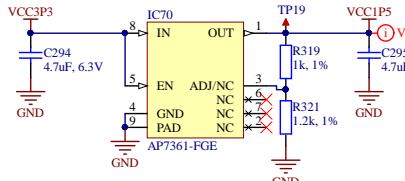
**3.3V 1A**



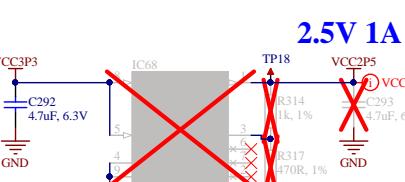
**1.2V 1A**



**1.5V 1A**

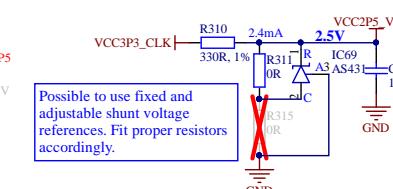


**2.5V 1A**



Optional 2.5V regulator for FPGA NVCM programming/configuration and XO DAC reference.

### Voltage reference (2.5V)



Alternative reference source for XO DAC and ADC

Project name: LimePSB-RPCM\_Iv4.PjrPcb

Title: Power

Lime Microsystems  
Surry Tech Centre  
Guildford GU2 7TG  
Surry  
United Kingdom



Version: 1.4 Variant: Default

Date: 2025-06-02 Time: 12:23:01 Sheet 15 of 15

File: 15\_Power.SchDoc Size: A3