

# MIMXRT595-EVK

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## Revision History

| Rev. Code | Date     | Description  |
|-----------|----------|--|
| A         | 20190311 | First release  |
| B         | 20190516 | 1. Remove Q14 and related resistor<br>2. Add level translator for nRESET<br>3. Optimize MIPI power supply<br>4. VDDIO_2 is compatible with two power domains-3V3 and 1V8<br>5. Change VDDIO_3 from 1.8V to 3.3V<br>6. Change eMMC IO power domain<br>7. Change SD card supply<br>8. Change analog MFC circuit<br>9. Change LED brightness<br>10. Change FlexIO LCD and arduino IO power domain to 3.3V<br>11. Add disable circuits for external UART<br>12. Optimize reset circuit |
|           | 20190705 | 1. Add AMP function<br>2. Change power supply of SD card   |
|           | 20190709 | 1. add jumpers J29 and J30 instead of resistors R168 and R159  |
|           | 20190726 | 1. Merge the VDD_IO and VDDD to a single supply for U109 and U114, and removed C52 and C299.   |
|           | 20190731 | 1. Optimize PMIC circuit, and add L25 for FRO function   |
| B1        | 20190906 | 1. Modify typo, this is a non-electrical change.   |
| C         | 20200221 | 1. add load switch for SD card powe cycle<br>2. change DDC U103 for M.2 supply<br>3. add low Vf diode D28 for I2C communication<br>4. add load switch for M.2<br>5. optimize link2 debug buffer<br>6. add on board dmic  |
|           | 20200306 | 1. optimize de-coupling capacitors<br>2. optimize mcu symbol   |
| C1        | 20200423 | 1. correct j-trace interface<br>2. optimaize SDIO0 bus   |
| D         | 20201016 | 1. Connected VDDIO_2 to MCU_1V8<br>2. Updated the symbol for MIMXRT595SFFOC using updated MUX table<br>3. Added a note for the External DMIC connector connection<br>4. Added a note for JTAG connection<br>5. Removed U116 (Only support Low Voltage SD Card now; No boot support)<br>6. Updated R179 and R180 for 5V VBUS detect (Previously using 3V VBUS detect)<br>7. U117 uses new GPIO (PIO4_0)   |
| D1        | 20210111 | 1. Change R547, R548 with RES 12K (470-30955) from 4.7K (470-82064).   |
| D2        | 20210607 | 1. Change J39, J40 to USB205FB-C1013224  |
| D3        | 20211310 | U6 making into DNP   |

| Block         | Net Name         | Design Voltage | Design Current      |
|---------------|------------------|----------------|---------------------|
| USB Connector | USB_HS_BUST_VBUS | 5.0V           | 0.5A/0.5A/1.5A(max) |
|               | USB_BATT_VDD     | 5.0V           | 0.5A/0.5A           |
|               | USB_BATT_VDD     | 5.0V           | 0.5A/0.5A           |
| Diode         | SWC_S00          | 1.0V           | 0.5A/0.5A           |
| PMIC          | PMIC_LDO1_OUT    | 1.8V(default)  | 0.01A               |
|               | PMIC_LDO2_OUT    | 3.3V(default)  | 0.25A               |
|               | PMIC_LDO3_OUT    | 1.0V(default)  | 0.25A               |
|               | PMIC_LDO4_OUT    | 1.8V(default)  | 0.5A                |
| IC0           | VCC_VP           | 3.3V           | 1.0A                |
|               | VCC_VP           | 1.8V           | 1.0A                |
| DDC Buck      | DDC_VDD          | 3.3V           | 2.0A                |
| Load Switch   | SDC_VDD          | 3.3V           | -                   |

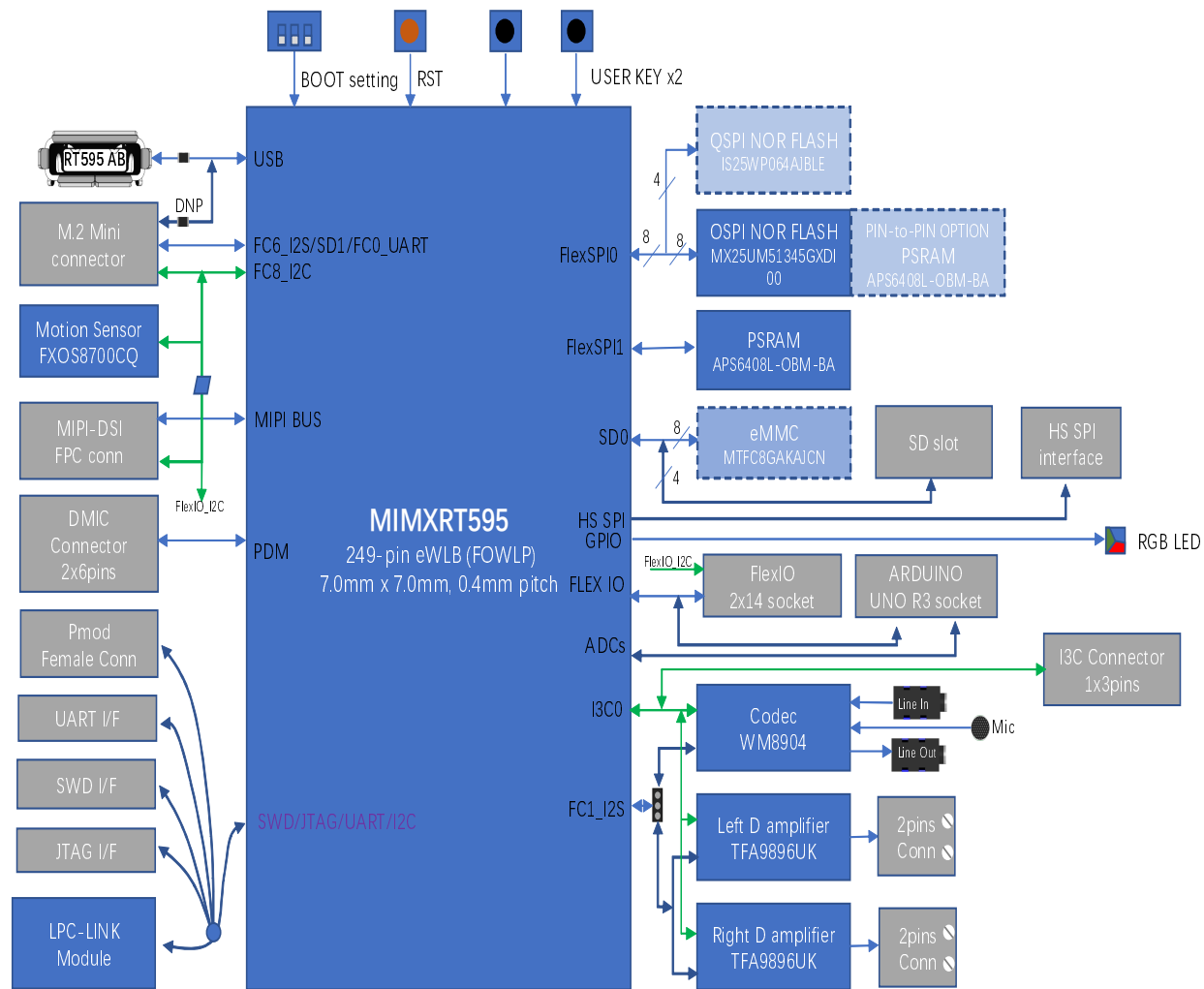
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| REF DES   | ASSY OPT | PAGE NAME              |
|---|----------|------------------------|
| SS2,R149,SS4,C337,R750,R153,SS1,SS3,R150,C336,L25,J37,R154  | DNP      | 05_SYSTEM_POWER        |
| R656  | DNP      | 06_RT595_POWER         |
| R679,R536   | DNP      | 07_RT595_IO            |
| R456,R697,R457,R431,R430,R500,R693,R695,R691,R359,R700,R701,R458,R427,R692,R434,R694,R696,R429,R358,R790,R688,R699,R432 | DNP      | 08_MEMORY              |
| C324  | DNP      | 09_AUDIO_CODEC         |
| R57,R52,R653,R746,R652  | DNP      | 10_AUDIO_AMP           |
| R140,R139,R137,R138,U6  | DNP      | 11_ACC_LED_BUTTON_UNO  |
| C239,R478,R495,R494,R499,R546,R477,R490,R476,R545   | DNP      | 12_MIPI_DSI            |
| C321,C354,R671,Y8,R788,R712   | DNP      | 13_M2_FXIO_DMIC_I3C_IF |
| JS17,J35  | DNP      | 14_PMOD_ISP            |
| R12,JP30,R15,R734,R5  | DNP      | 16_LINK2_DEBUG         |
| R125,R659   | DNP      | 17_SWD_BUF             |

| REF DES                                 | JUMPER(DEFAULT) | PAGE NAME             |
|---|-----------------|-----------------------|
| JP23,JS19,JS18,JP21,JP24                | 1-2             | 05_SYSTEM_POWER       |
| JS21,JS20,JS30,JS23,JS25,JS29,JS22,JS24 | 1-2             | 06_RT595_POWER        |
| JS28                                    | 2-3             | 06_RT595_POWER        |
| JS26                                    | 1-2             | 08_MEMORY             |
| JP6,JP27,JP8,JP28,JP29,JP7              | 1-2             | 09_AUDIO_CODEC        |
| JP11                                    | 1-2             | 10_AUDIO_AMP          |
| JP33                                    | 1-2             | 11_ACC_LED_BUTTON_UNO |
| JS9,JS27,JP13                           | 1-2             | 14_PMOD_ISP           |
| JS5,JP1,JS6                             | NONE            | 16_LINK2_DEBUG        |
| JS1,JP17,JP2,JP18,JP19                  | 1-2             | 17_SWD_BUF            |
| JP3                                     | NONE            | 17_SWD_BUF            |
| JP32,JP4                                | NONE            | 18_DEBUG_UART_SPI     |

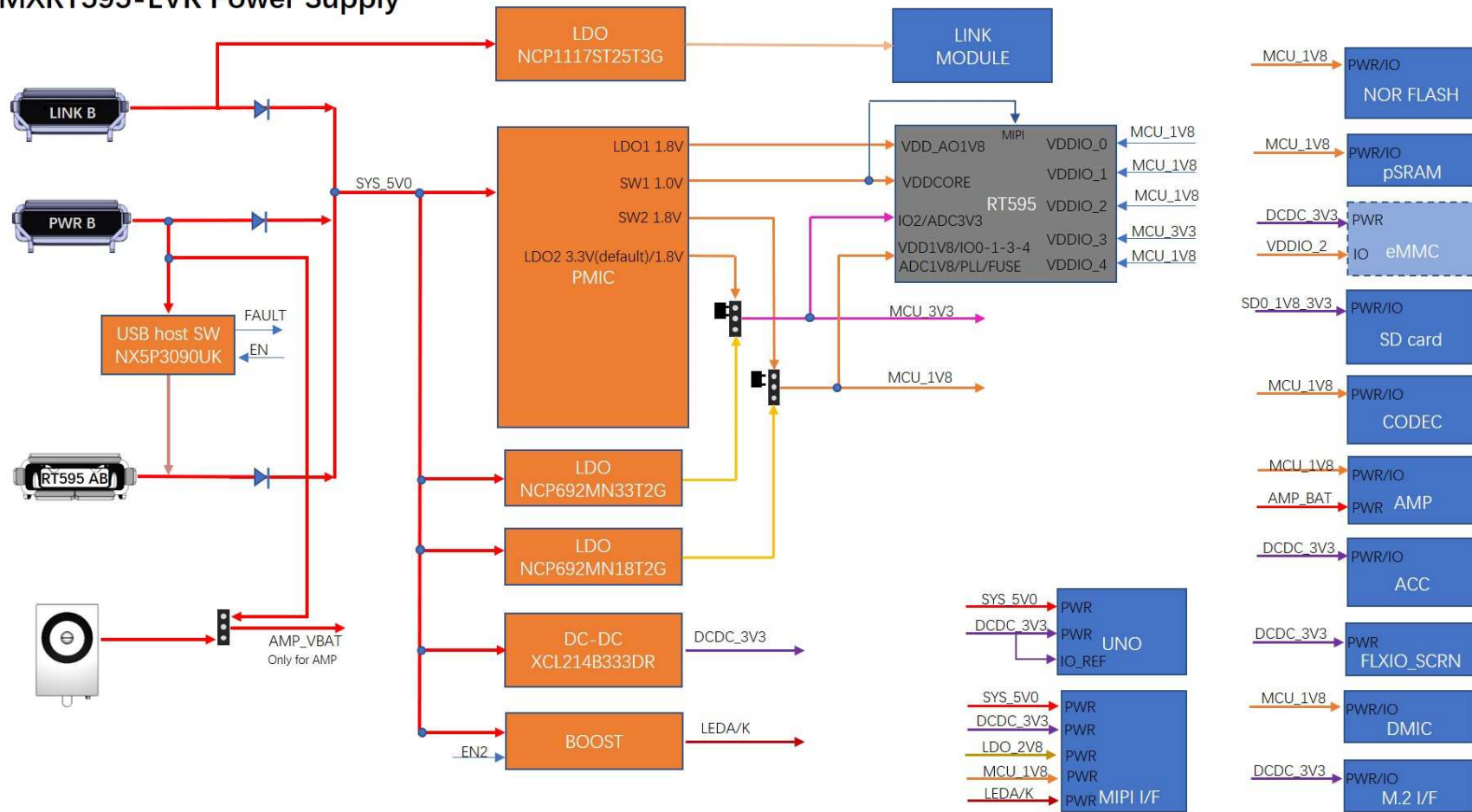


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|-------------------------------------|--|--------|--|
| NXP                                 |  |        |  |
| NXP Classification: CP: BUC: X PUBL |  |        |  |
| Drawing Title: MIMXRT595-EVK        |  |        |  |
| Page Title: Title and Rev History   |  |        |  |
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| Date: Wednesday, October 13, 2021   | Sheet 1 of 18                            |        |  |



|                                     |  |        |      |
|-------------------------------------|--|--------|------|
| PAP Classification: CP              |  | BUK: X | PUBL |
| Drawing Title: <b>MIMXRT595-EVK</b> |  |        |      |
| Page Title: <b>System Diagram</b>   |  |        |      |
| Size C                              | Document Number SCH-45800 PDF: SPF-45800 | Rev 03 |      |
| Date: Wednesday, October 13, 2021   | Sheet 2                                  | of 18  |      |

# MIMXRT595-EVK Power Supply



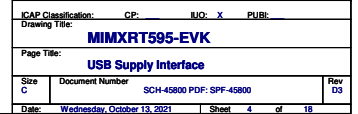
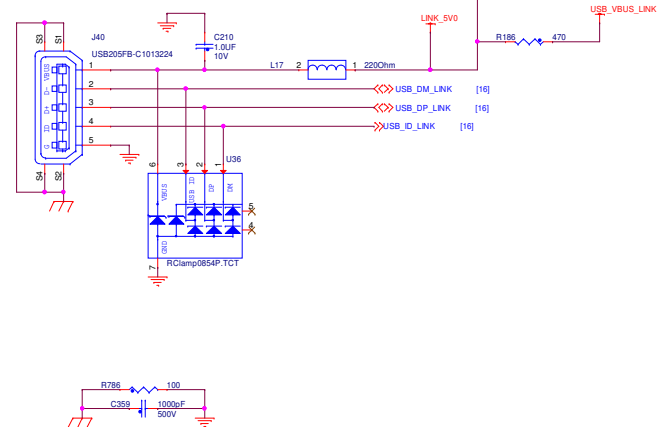
TARGET Hi-SPD  
USB DEVICE / HOST  
MICRO AB



External +5V  
Power only  
Micro-B

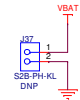


Link  
USB Device  
Micro-B



Battery Holder:  
Option to Connect  
2025/ 2032 Size  
Coin Cell Battery

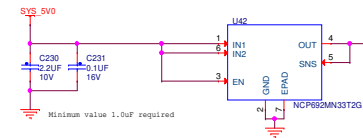
when power supply from Battery,  
need to short J911 (2-3),  
and some functions that belong  
to 5V power domain are limited.



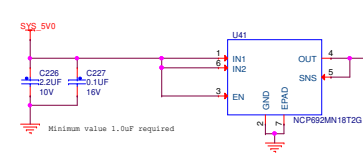
### Programmable Output Voltage Regulation:

1. SW1: Core Buck, 0.5V~1.5V Output, 50mV/step, up to 250mA
2. SW2: System Buck, 1.5V~2.1V/2.7V~3.3V Output, 25mV/step, up to 500mA
3. LDO1: Always ON LDO, 1.70V~1.90V Output, 25mV/step, up to 1mA
4. LDO2: System LDO, 1.5V~2.1V/2.7V~3.3V Output, 25mV/step, up to 250mA

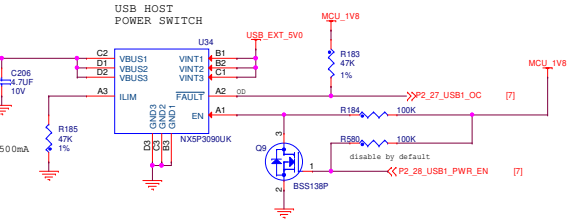
MODE 0 by default  
SW1 = 1.0V for core supply  
SW2 = 1.5V  
LDO1 = 1.8V for RTC always on  
LDO2 = 3.3V



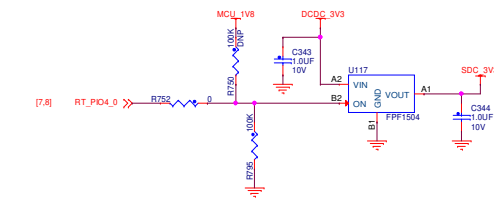
Minimum value 1.0uF required



Minimum value 1.0uF required



Current limit ~500mA



(7.8) RT\_PD0.0

### mcu core supply

1.0V default

PMIC\_SW1\_OUT

PMIC\_SW2\_OUT

1.8V default

PMIC\_SW2\_OUT

reserved for SW2

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

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PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

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PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

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PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

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PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

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MCU\_1V8

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PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

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PMIC\_LDO2\_OUT

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PMIC\_SW2\_OUT

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PMIC\_SW2\_OUT

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PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

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PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

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PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

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PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

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PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

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MCU\_1V8

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PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

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PMIC\_SW2\_OUT

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PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

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PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

MCU\_1V8

PMIC\_LDO1\_OUT

PMIC\_LDO2\_OUT

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PMIC\_LDO2\_OUT

PMIC\_SW2\_OUT

MCU\_3V3

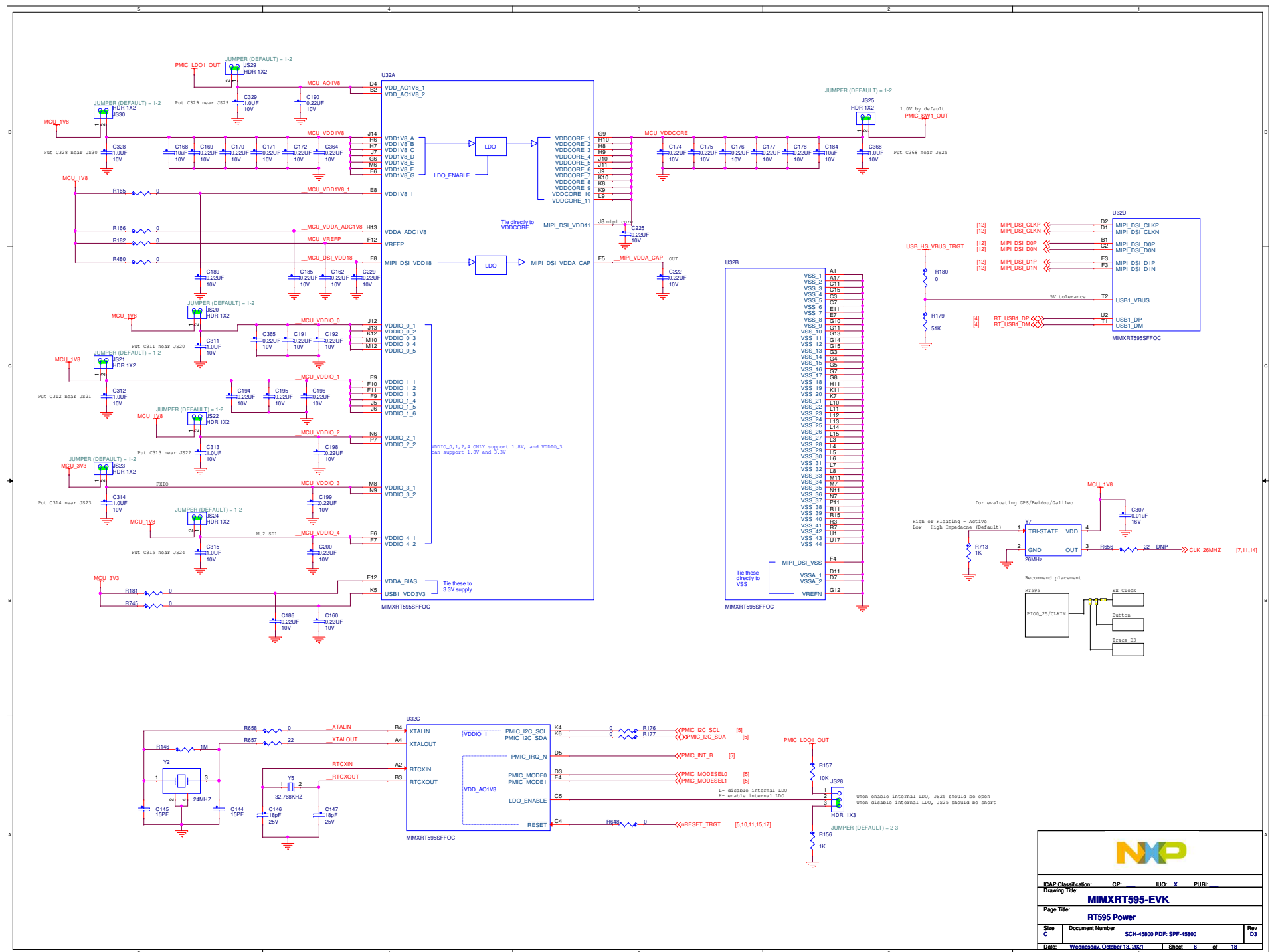
MCU\_1V8

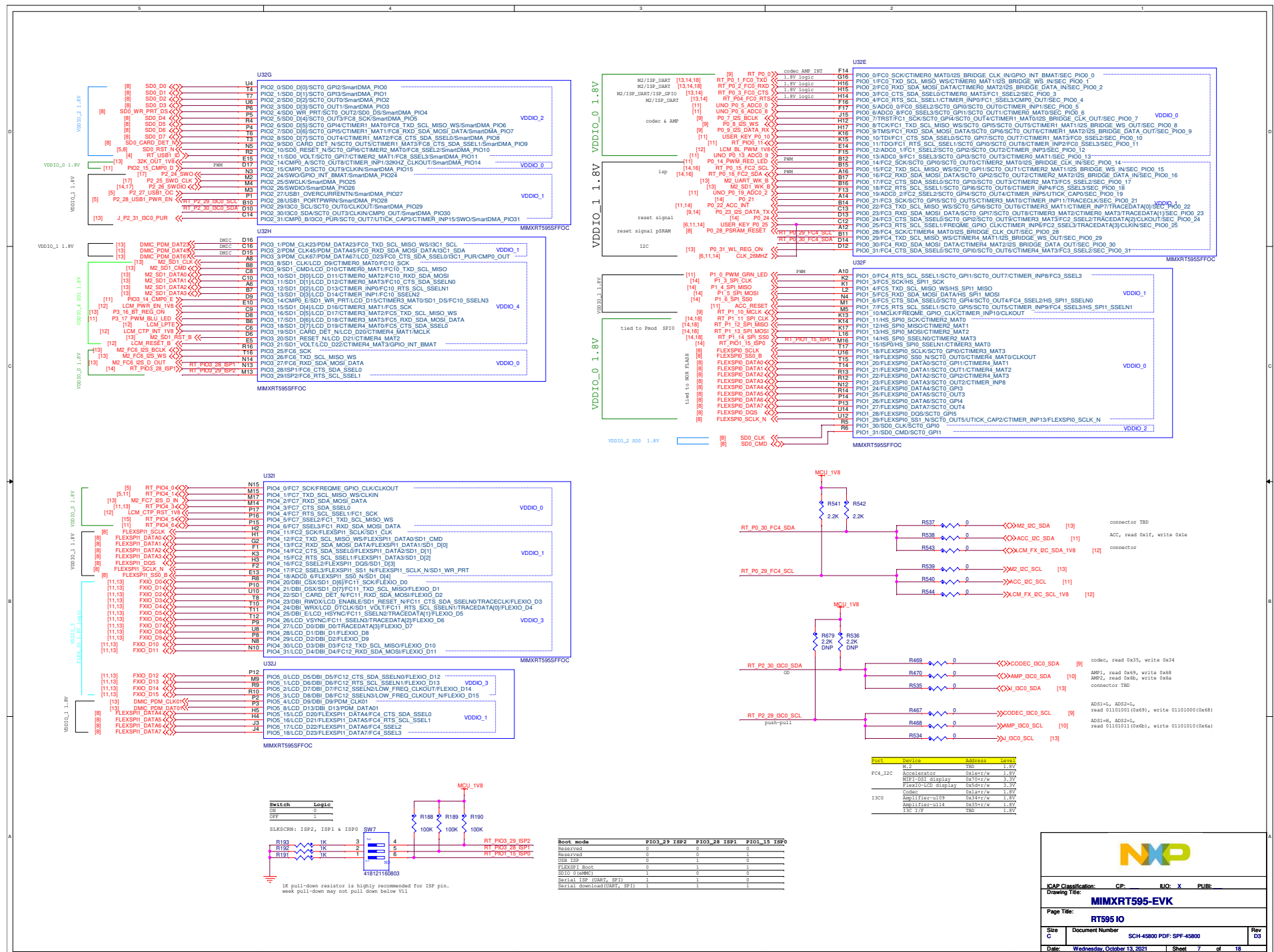
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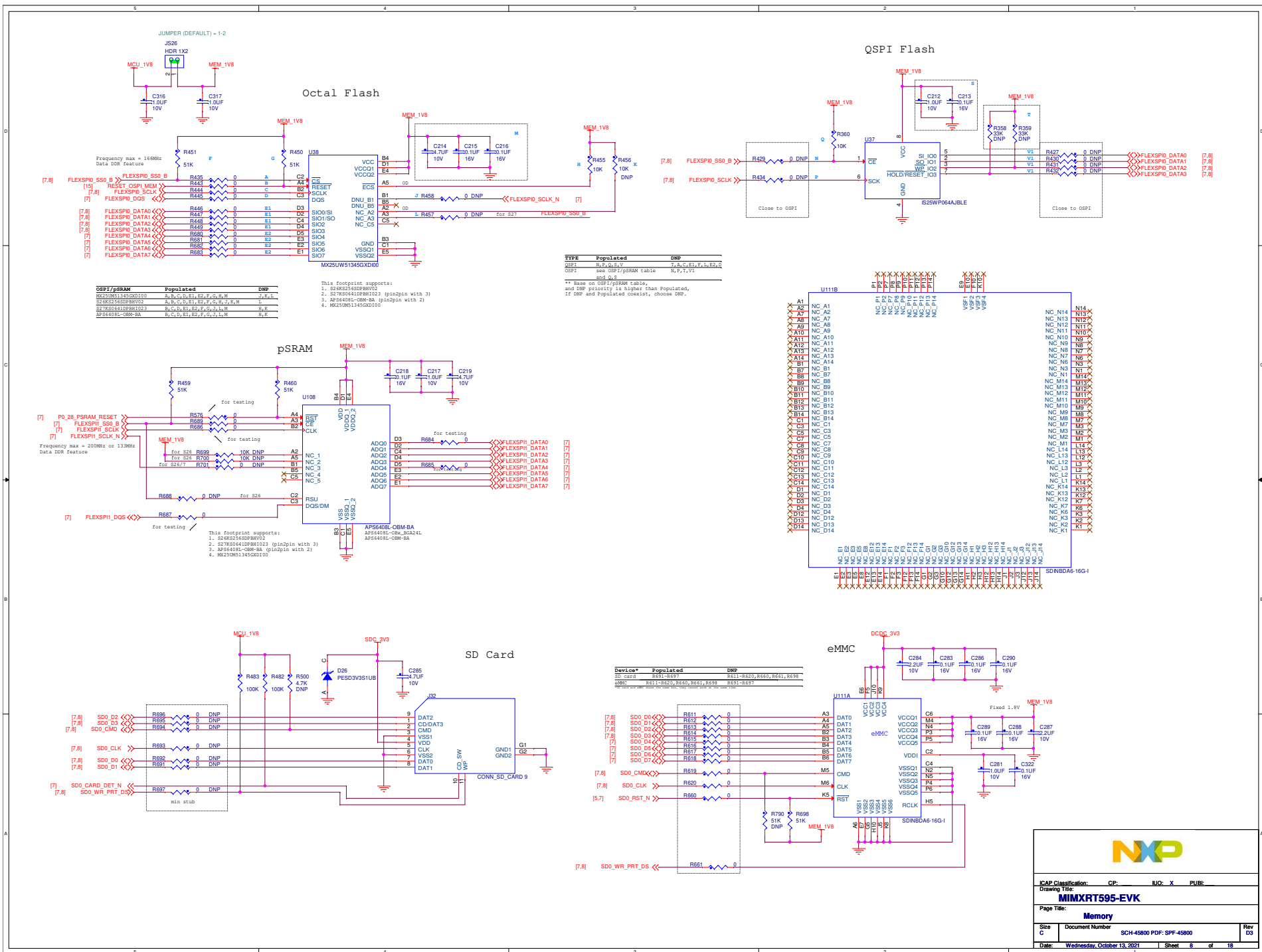
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PMIC\_SW2\_OUT

MCU\_3V3







RAP Classification: CP, IUC: X, PUB:

Drawing Title: **MIMXRT595-EVK**

Page Title: **Memory**

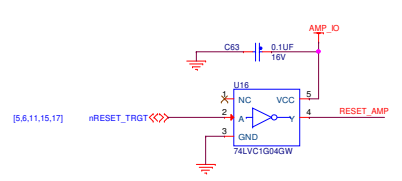
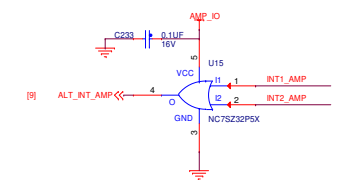
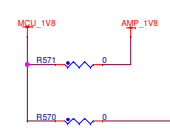
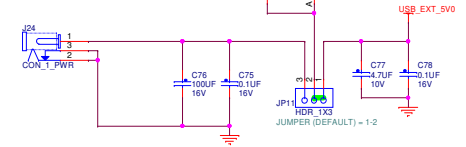
Size C Document Number SCH-45800 PDF: SPF-45800 Rev 03

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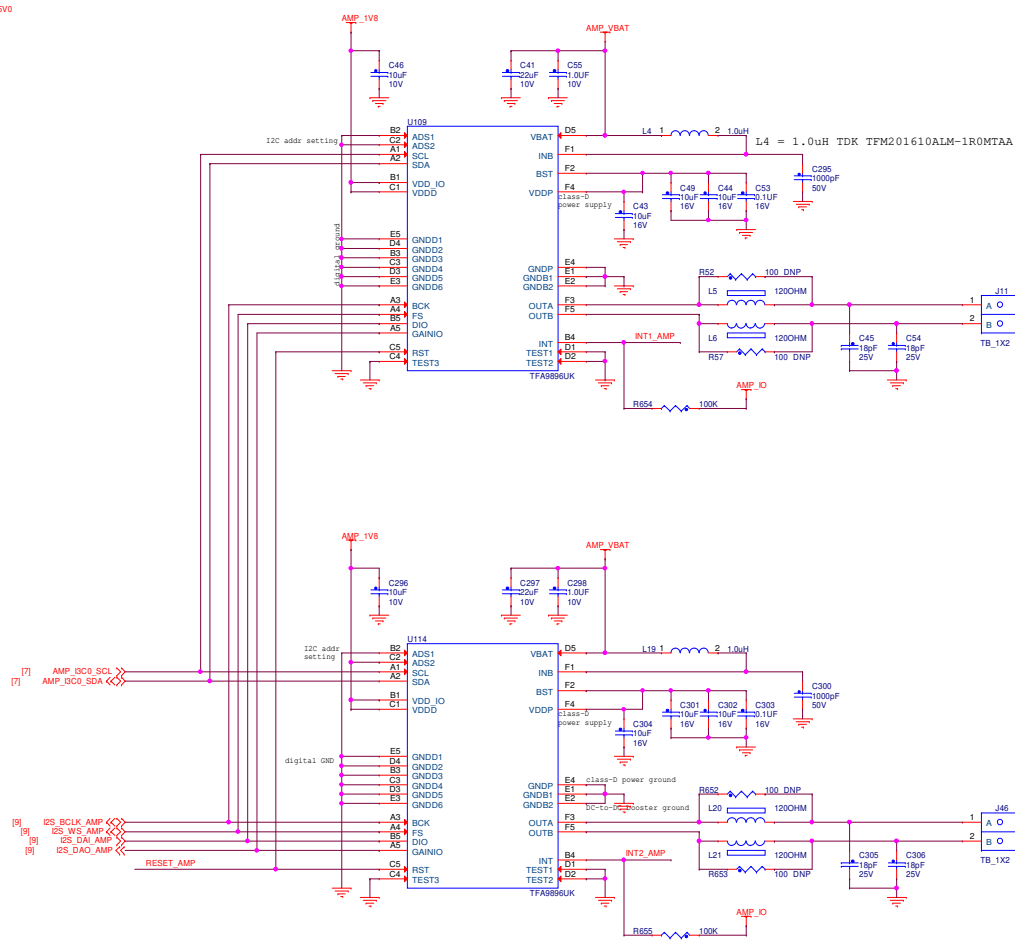




EXTERNAL PWR SUPPLY FOR AMP  
MAX INPUT PWR <5.5V

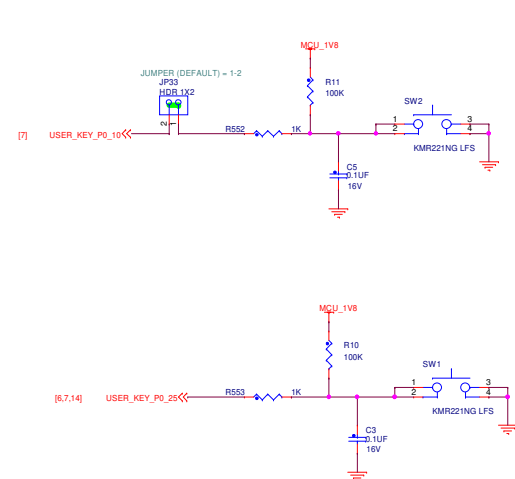
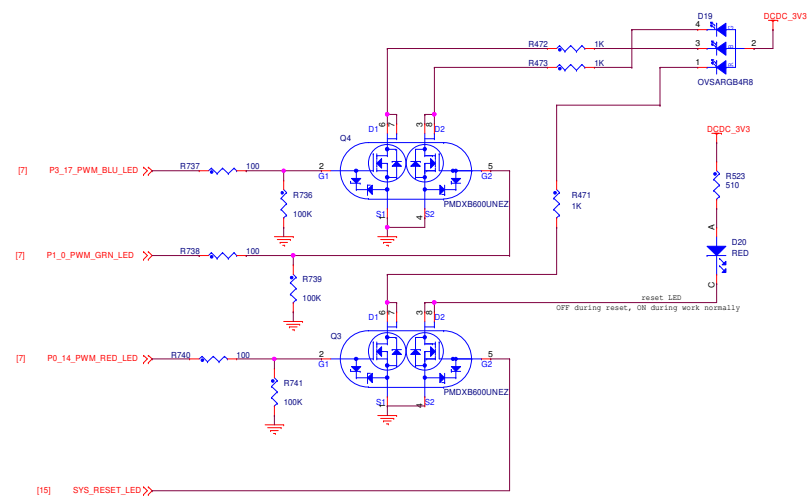


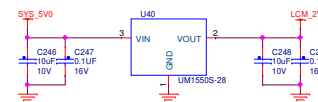
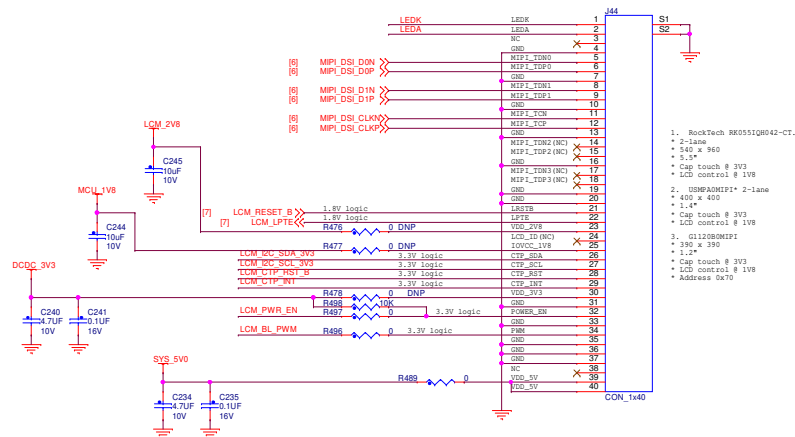
AP L/R

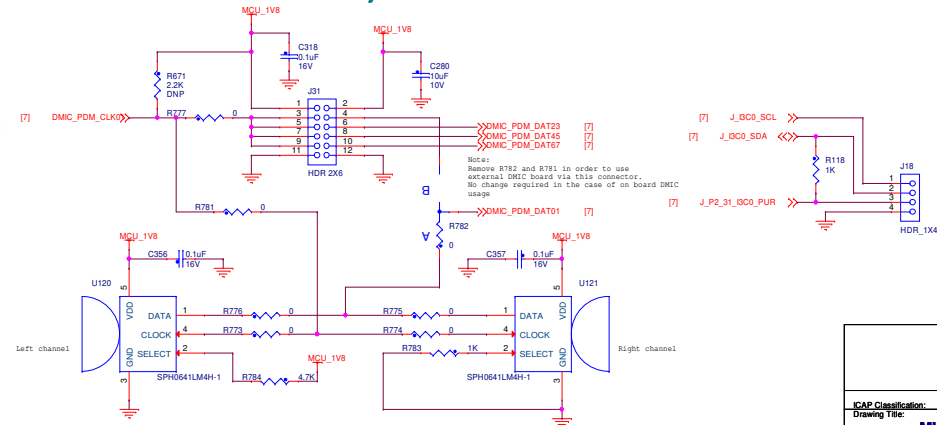
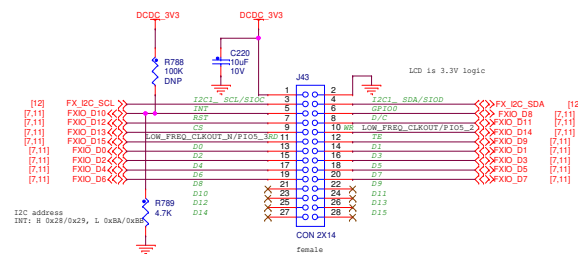
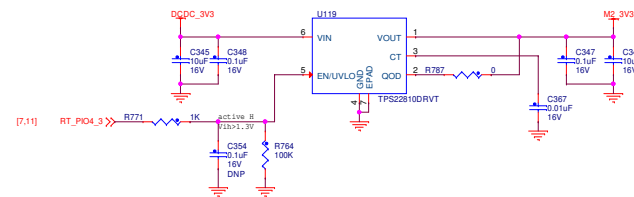



ADS1=0, ADS2=1,  
read 01101001 (0x69), write 01101000 (0x68)  
ADS1=0, ADS2=1,  
read 01101001 (0x69), write 01101000 (0x68)

|  |                             |                          |          |
|--|-----------------------------|--------------------------|----------|
|  |                             |                          |          |
| <b>AP Classification:</b> CP: BUC: X PUBL: |                             |                          |          |
| <b>Drawing Title:</b>                      |                             |                          |          |
| <b>MIMXRT595-EVK</b>                       |                             |                          |          |
| <b>Page Title:</b>                         |                             |                          |          |
| <b>Audio AMP class-D</b>                   |                             |                          |          |
| Size                                       | Document Number             | SCH-45800 PDF: SPF-45800 | Rev      |
| C  |                             |                          | D3       |
| Date:                                      | Wednesday, October 13, 2021 | Sheet                    | 10 of 18 |

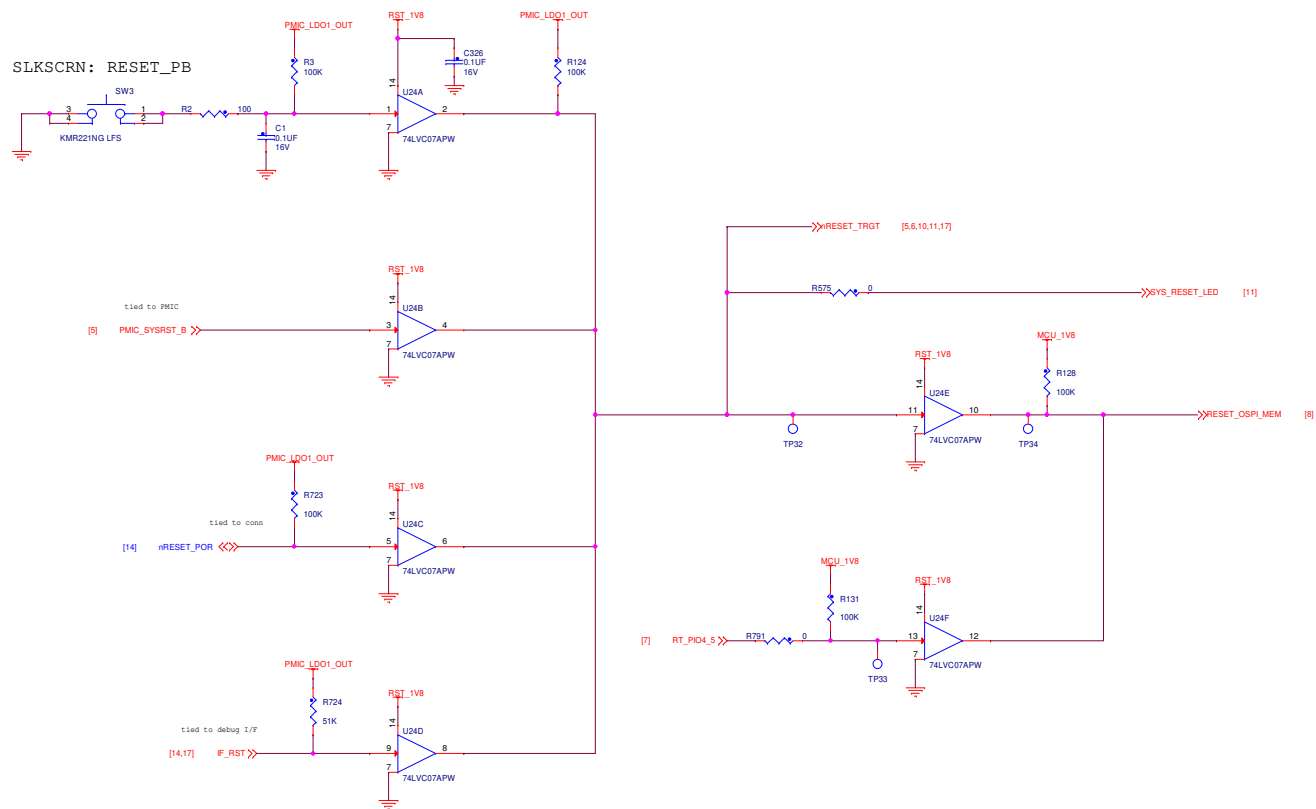


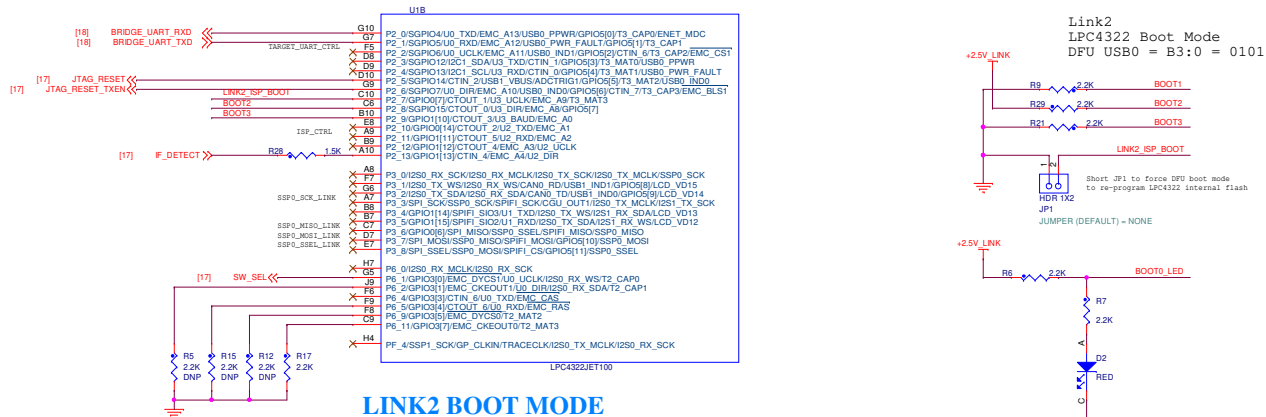
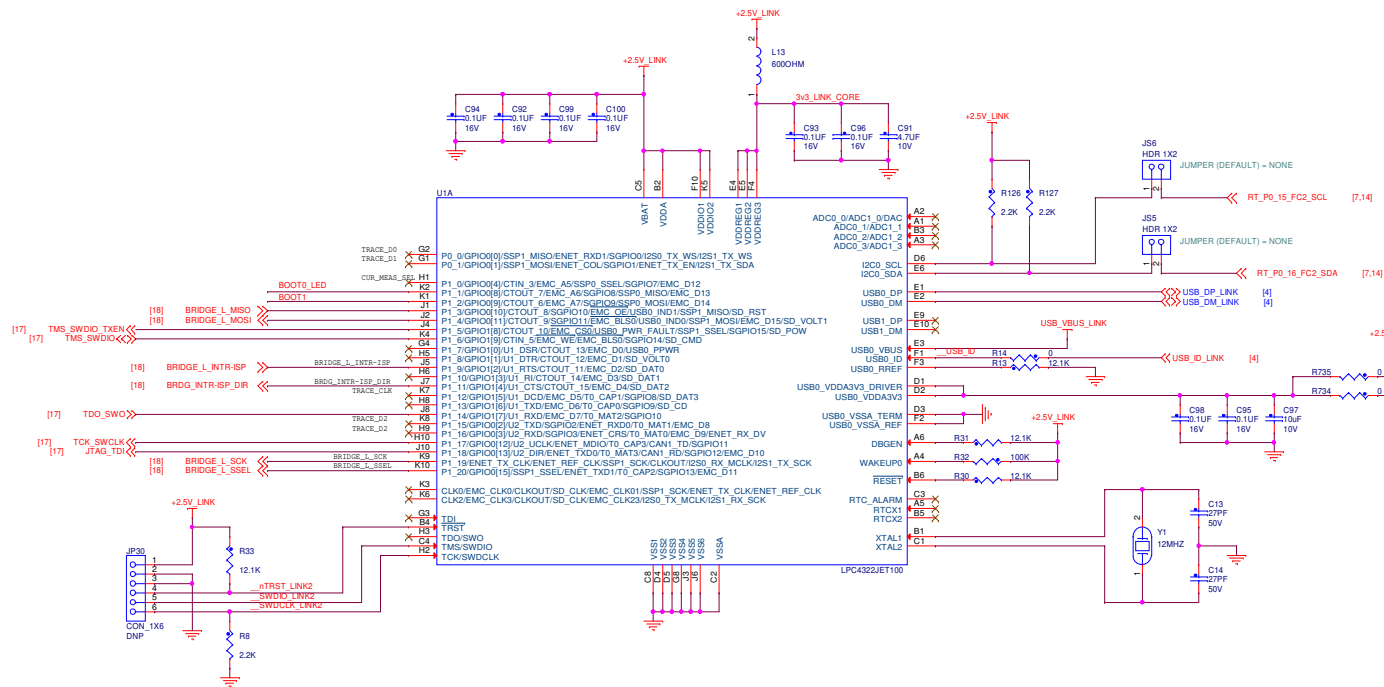




|   |                             |                          |          |
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| ICAP Classification:    CP:    I/O: <u>X</u> PUB: <u>      </u>                       |                             |                          |          |
| Drawing Title: <b>MIMXRT595-EVK</b>   |                             |                          |          |
| Page Title: <b>M2 FXIO DMIC IC3</b>   |                             |                          |          |
| Size C  | Document Number             | SCH-45800 PDF: SPF-45800 |          |
| Date:   | Wednesday, October 13, 2021 | Sheet                    | 13 of 18 |
|   |                             |                          | Rev D3   |

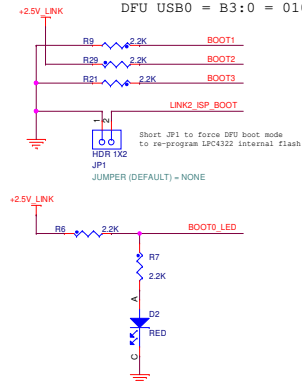






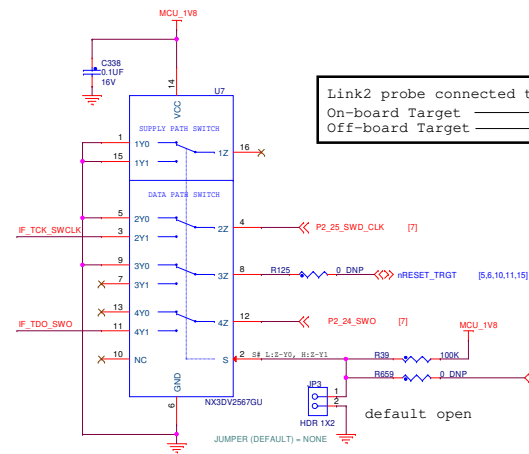
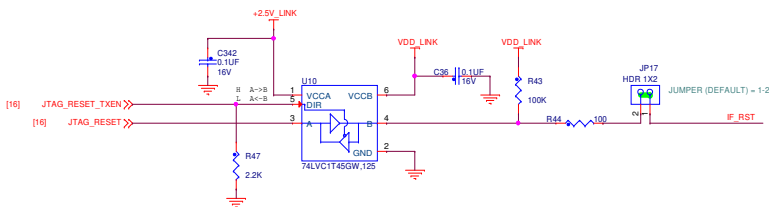
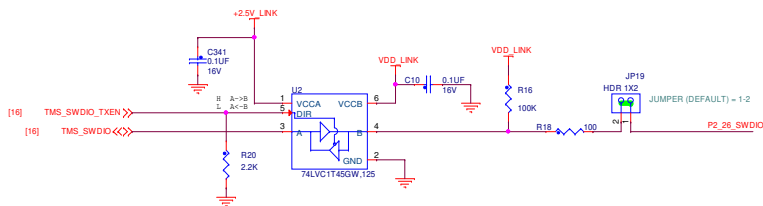
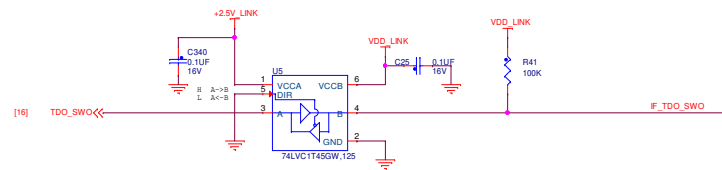
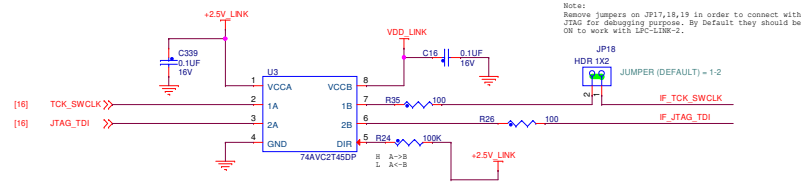
## LINK2 BOOT MODE

Link2  
LPC4322 Boot Mode  
DFU USB0 = B3:0 = 0101

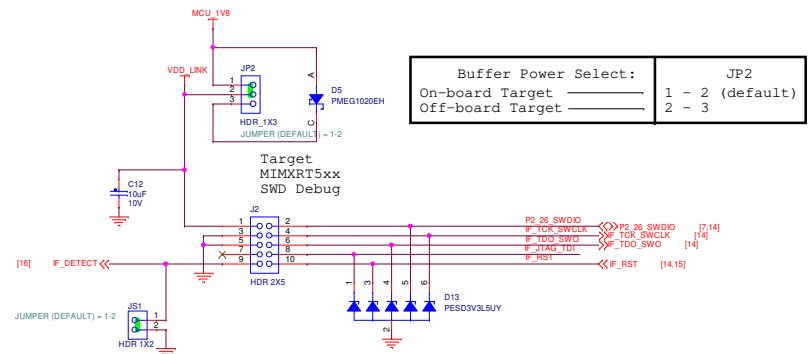


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|-------------------------------------|--|--------|-------|-------------|--------|
| ICAP Classification: CP: _____      |  | BUC: X |       | PUBL: _____ |        |
| Drawing Title: <b>MIMXRT595-EVK</b> |  |        |       |             |        |
| Page Title: <b>Link2 Debug</b>      |  |        |       |             |        |
| Size C                              | Document Number SCH-45800 PDF: SPF-45800 |        |       |             | Rev 03 |
| Date:                               | Wednesday, October 13, 2021              |        | Sheet | 16          | of 18  |





## 10-pin SWD



| Signal Name | Pin Name | Ref Name         | Conn Ref |
|-------------|----------|------------------|----------|
| TCK         | P100-7   | P0-7-123-BCLK    | JP23-2   |
| TDO         | P100-8   | P0-8-123-SW      | JP23-3   |
| TMS         | P100-9   | P0-9-123-DATA_K3 | JP23-4   |
| TDI         | P100-10  | TDI-RES-P0-10    | JP23-5   |
| TDI         | P100-11  | WT-P100-11       | JP47-8   |

\*\*\*If need boundary scan, an external JTAG or on-board JTAG is required and tie to these pins.

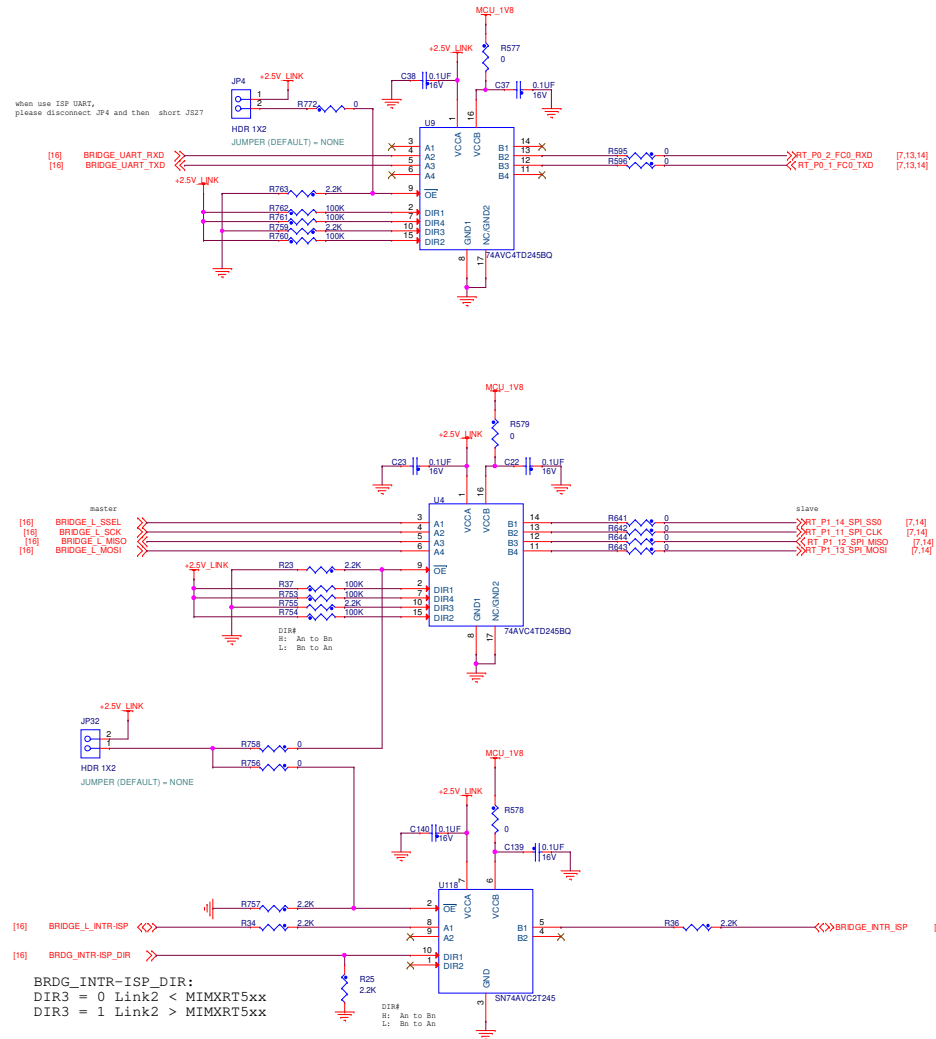


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| PAP Classification: Confidential    |  | Doc: PUB |
| Drawing Title: <b>MIMXRT595-EVK</b> |  |          |
| Page Title: <b>SWD Buffer</b>       |  |          |
| Size C                              | Document Number SCH-45800 PDF: SPF-45800 | Rev 00   |
| Date: Wednesday, October 13, 2021   | Sheet 17 of 18                           |          |

# Link2 Level Translators

Link2 side

Target MIMXRT5xx side



|                                      |  |        |  |
|--------------------------------------|--|--------|--|
| PAP Classification: CP: BUC: X PUBL: |  |        |  |
| Drawing Title: MIMXRT595-EVK         |  |        |  |
| Page Title: Debug Translator         |  |        |  |
| Size C                               | Document Number SCH-45800 PDF: SPF-45800 | Rev 03 |  |
| Date: Wednesday, October 13, 2021    | Sheet 18 of 18                           |        |  |