

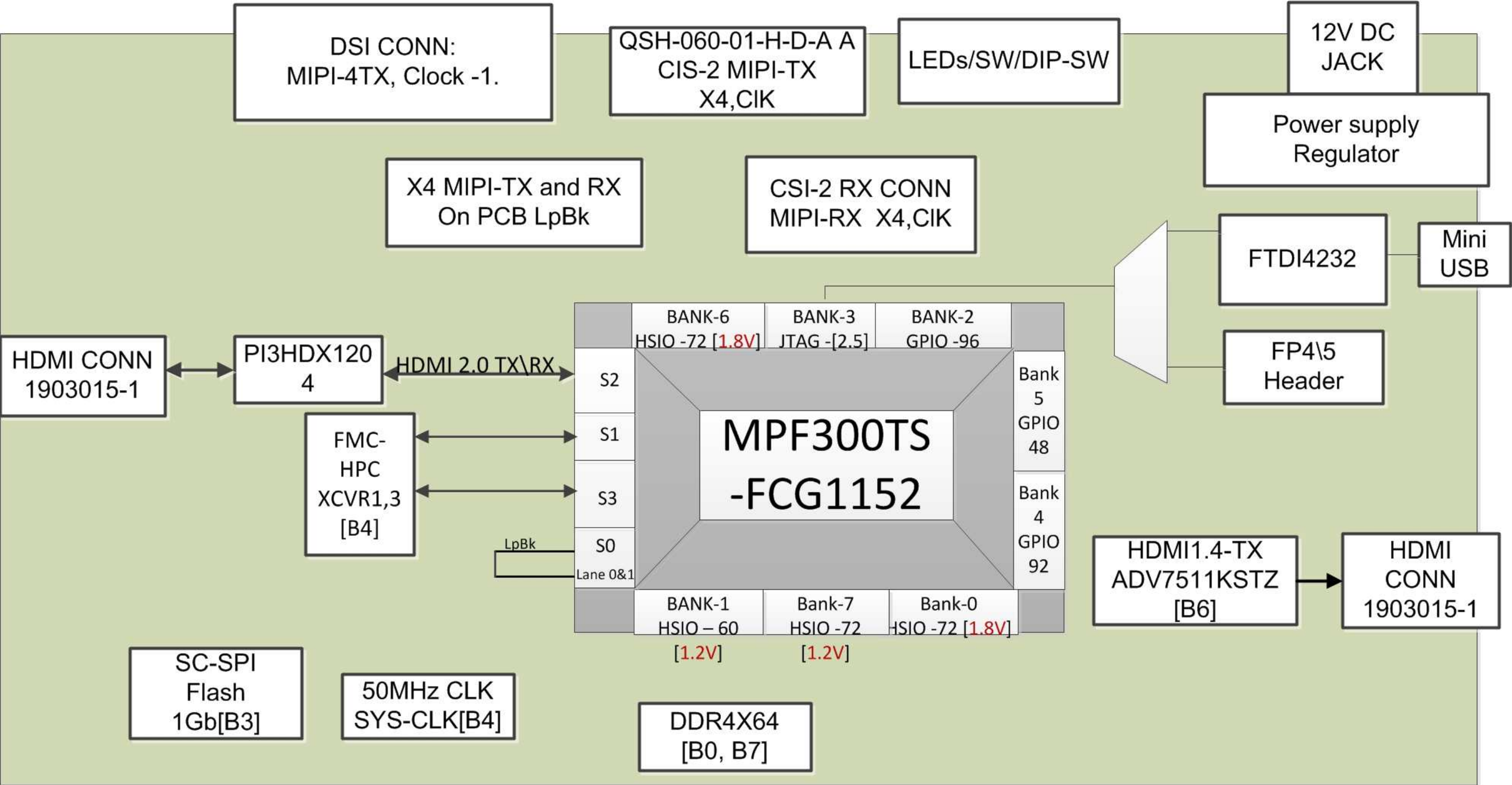
# POLARFIRE VIDEO KIT

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| 14      | BANK1-HSIO-1.8V           | 29      | POWER SUPPLIES-9-12            |
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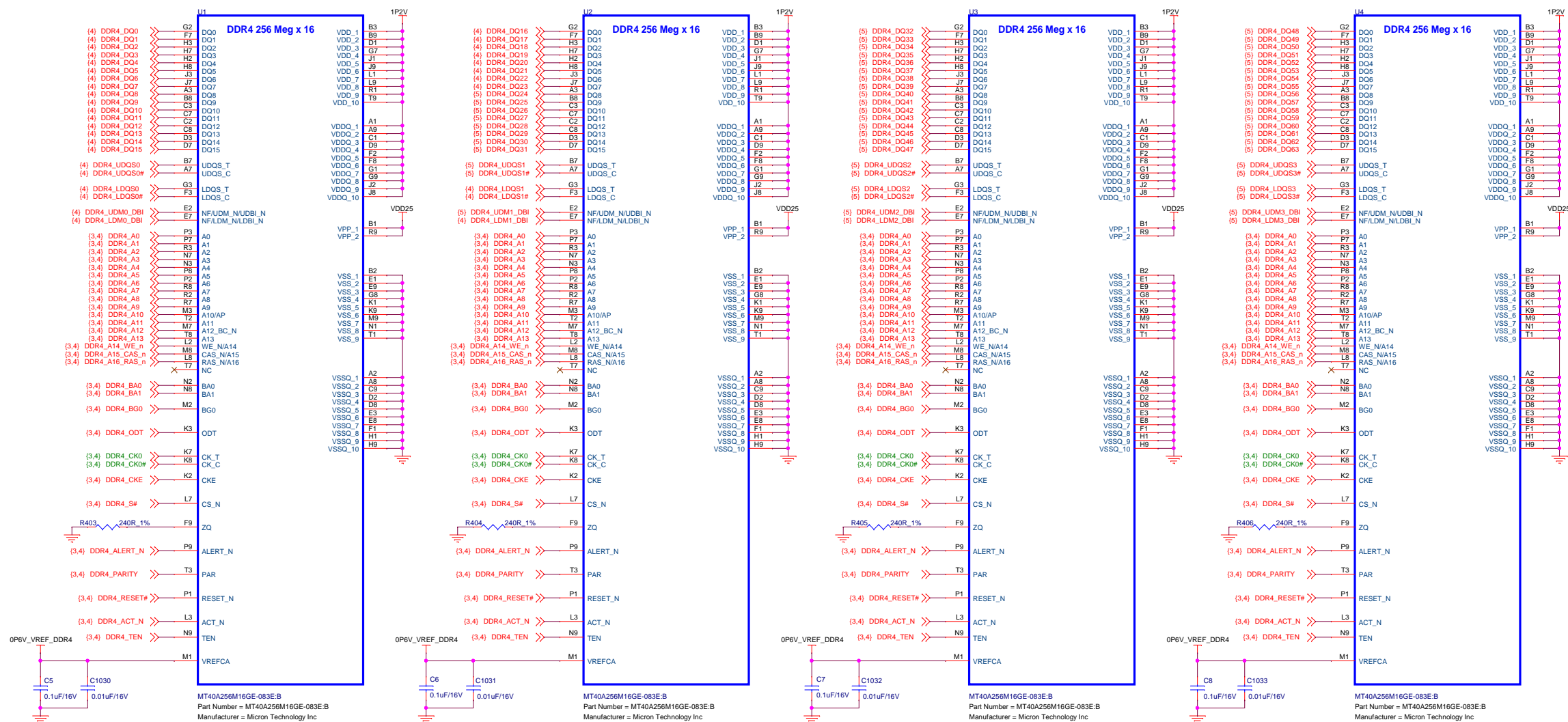
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| Project Name:       |                              |          |
| POLARFIRE_VIDEO_KIT |                              |          |
| Rev                 | Part Number:                 |          |
| 1                   | MICROSEMI DVP-100-000512-001 | PACTRON: |
| Originator:         |                              |          |
| GHURU KUMARAVELU    |                              |          |
| Size                | Date:                        |          |
| Custom              | Wednesday, June 13, 2018     |          |
| Sheet               |                              | 1 of 29  |

# BLOCK DIAGRAM

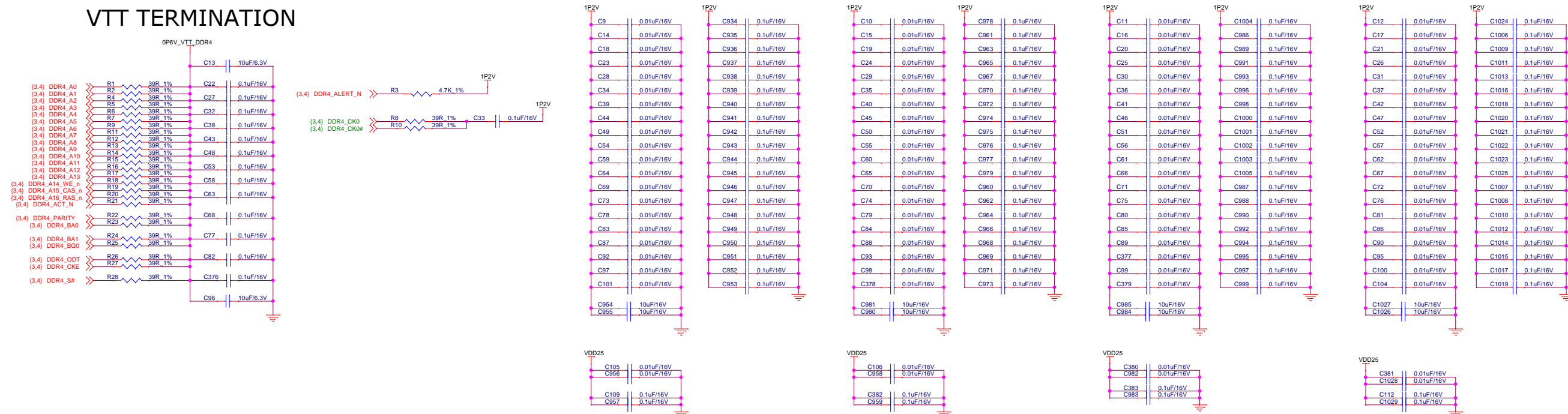


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| SIZE Custom                    | DOCUMENT NO. DVP-100-000512-001 | REV 1 |
| DATE: Wednesday, June 13, 2018 | SH 2 OF 29                      |       |

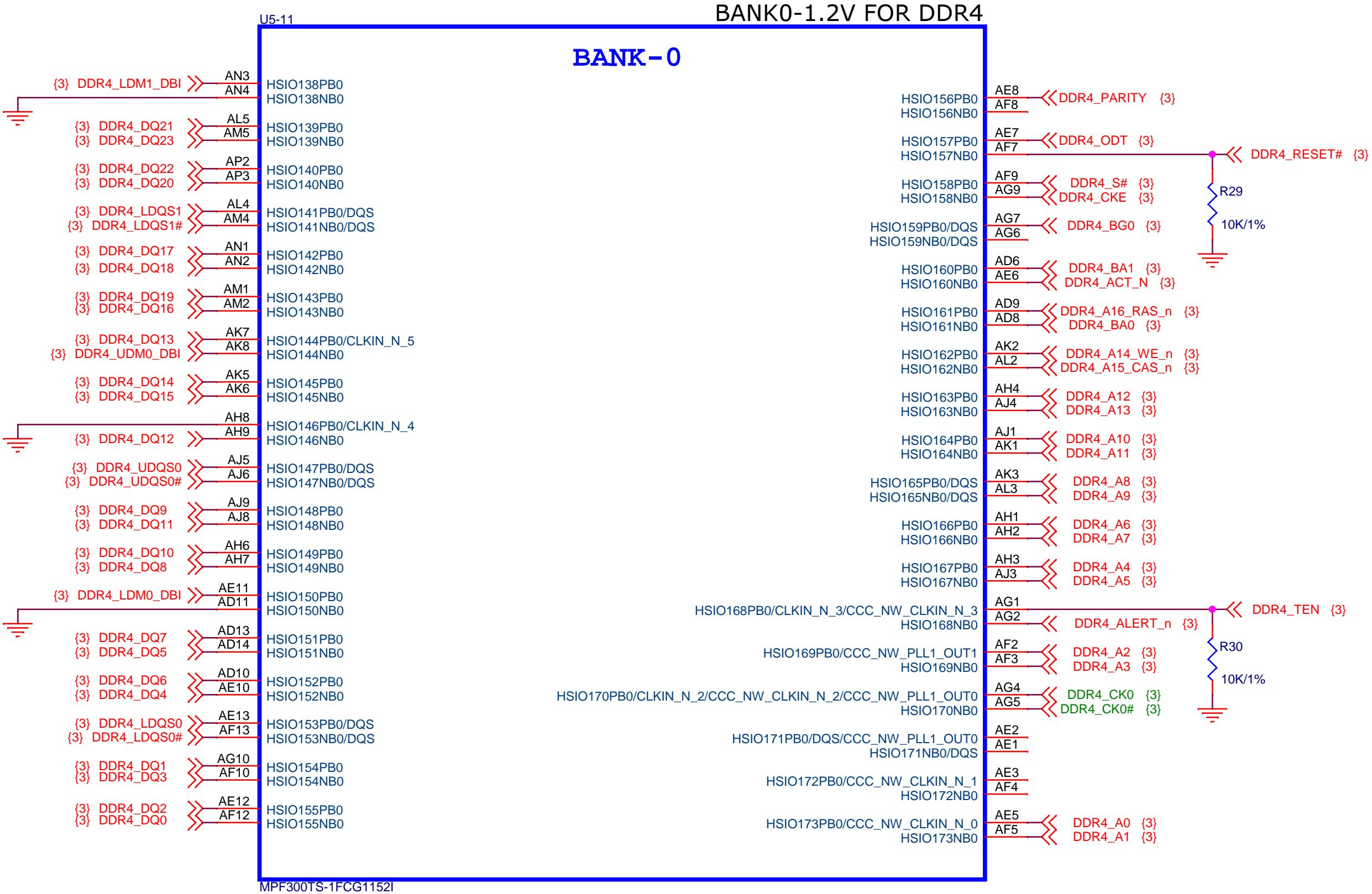
## DDR4 MEMORY-BANK0&7



## VTT TERMINATION

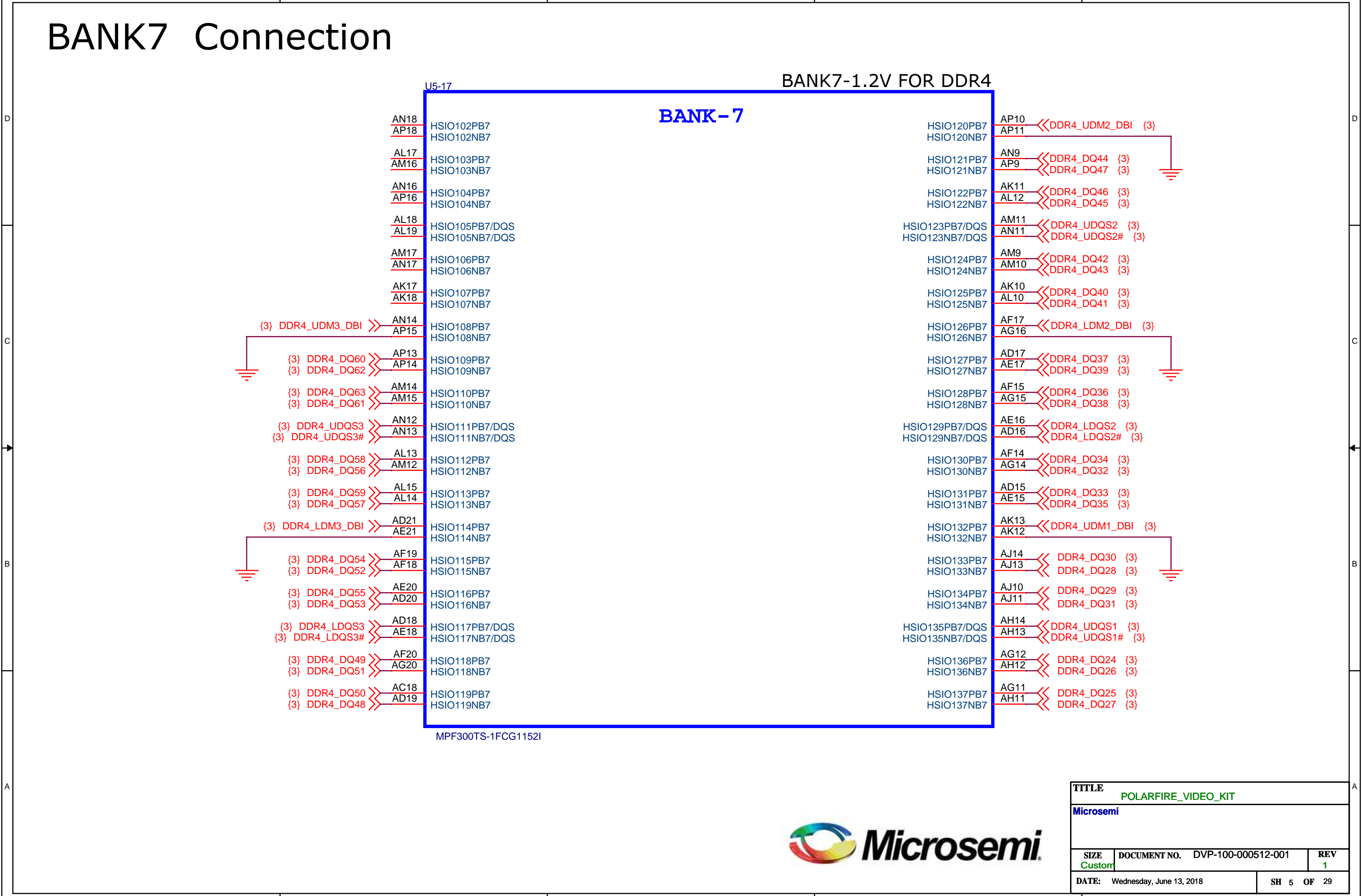


BANK0 Connection



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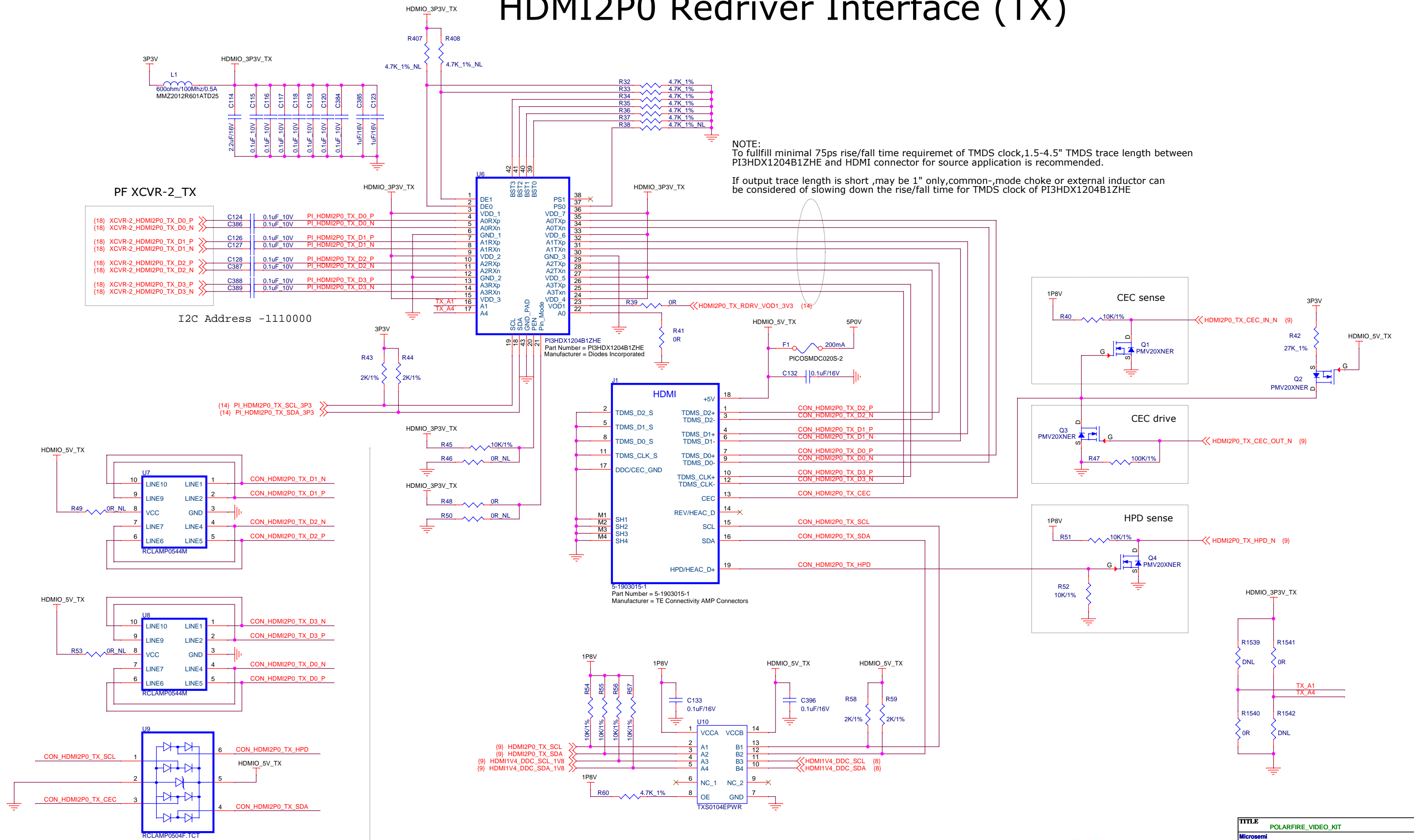
BANK7 Connection



|                          |                    |     |    |
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| Wednesday, June 13, 2018 |                    | 5   | 29 |

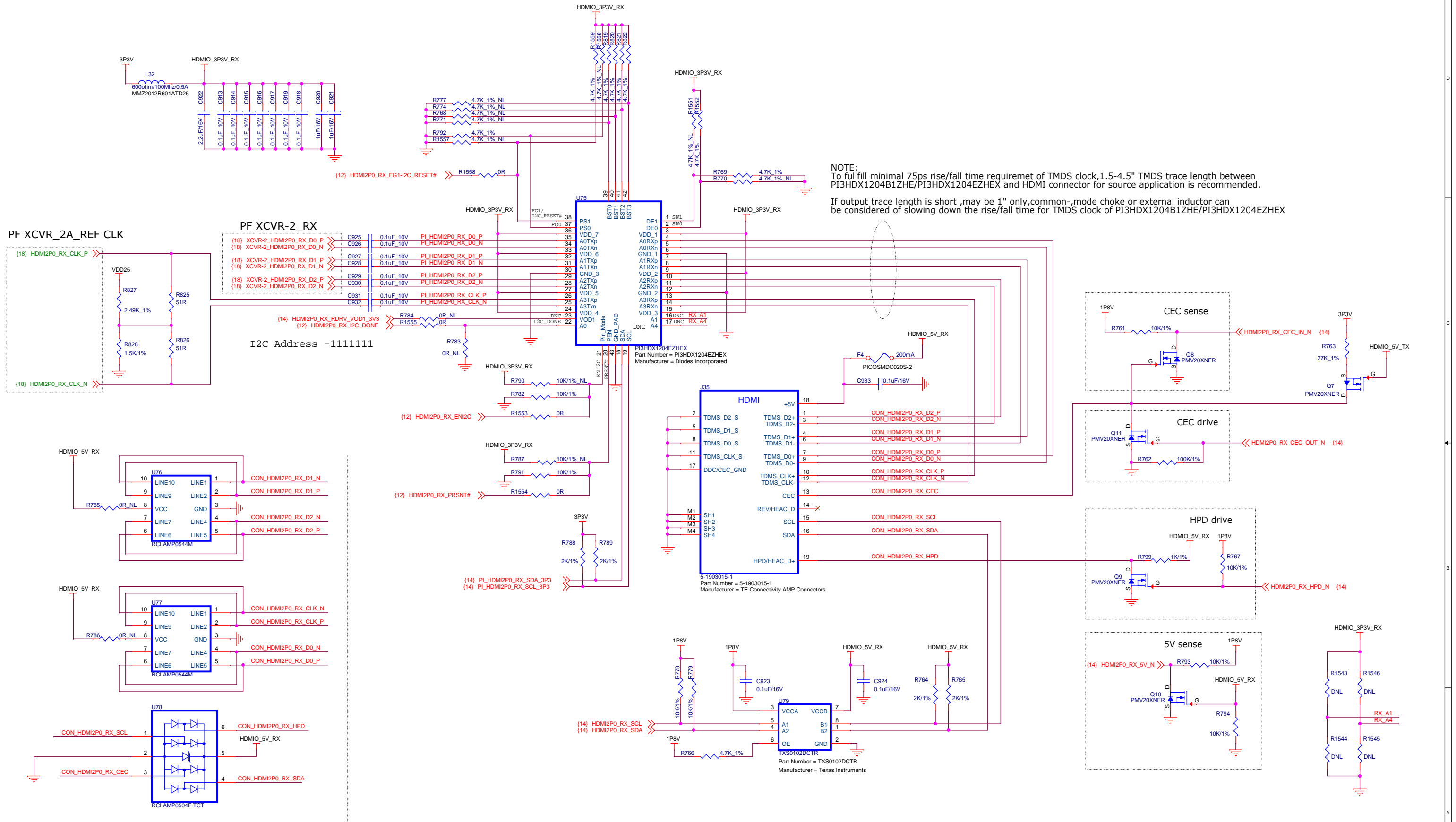


# HDMI2P0 Redriver Interface (TX)



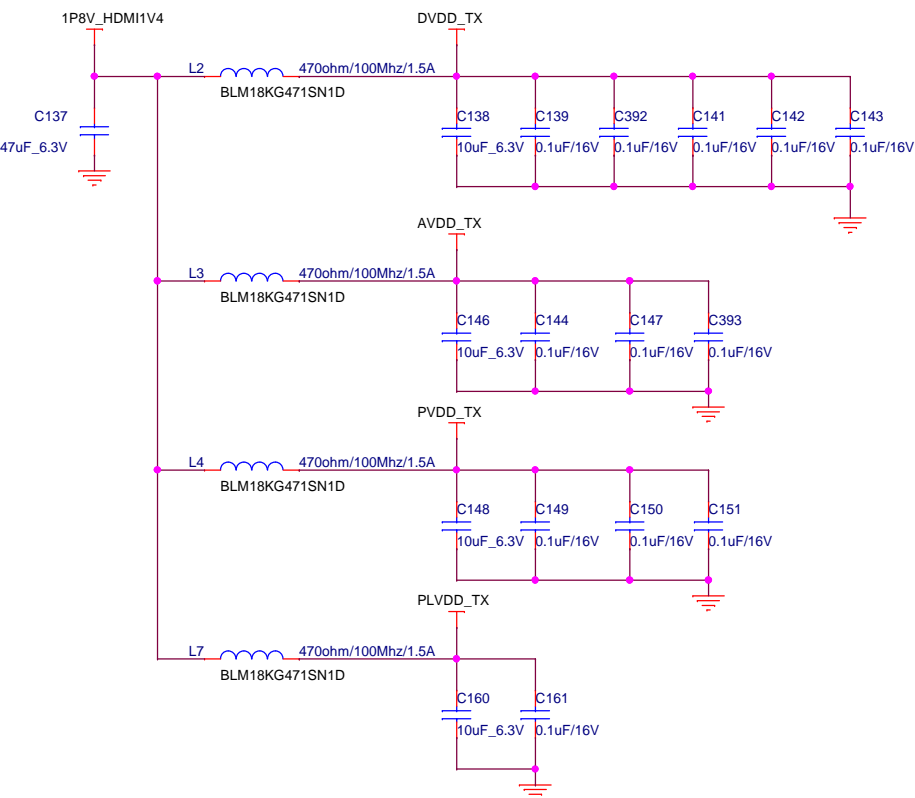
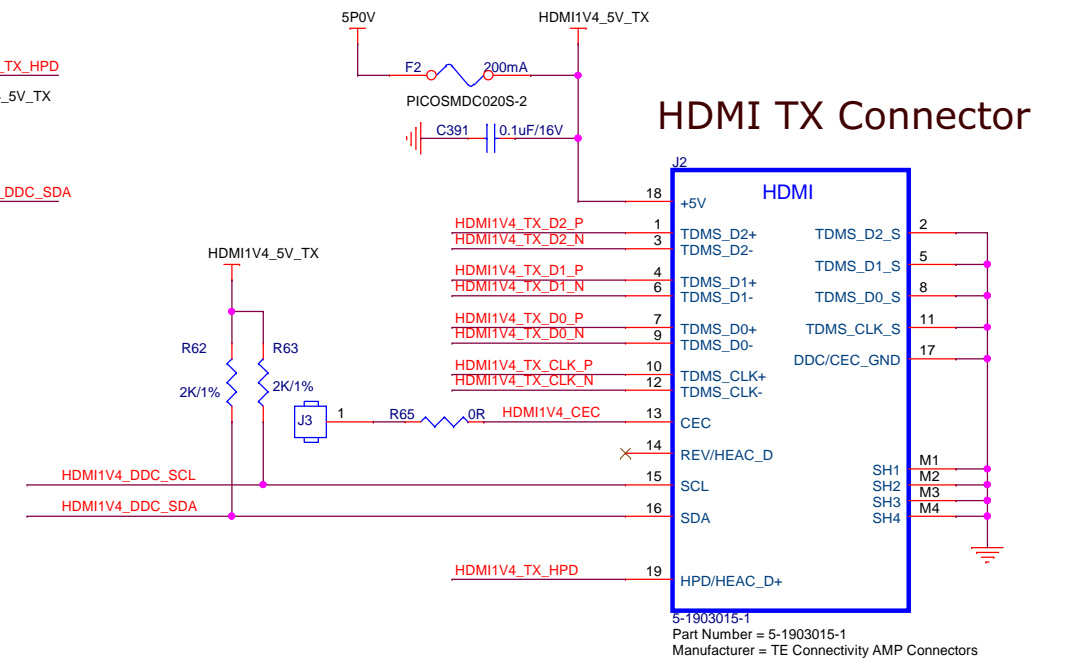
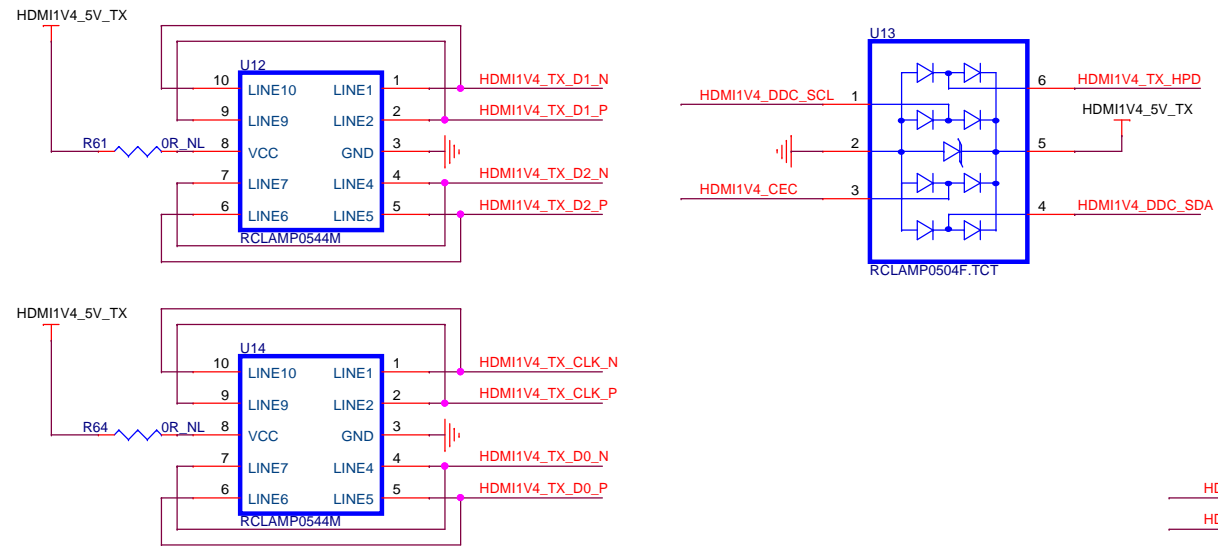
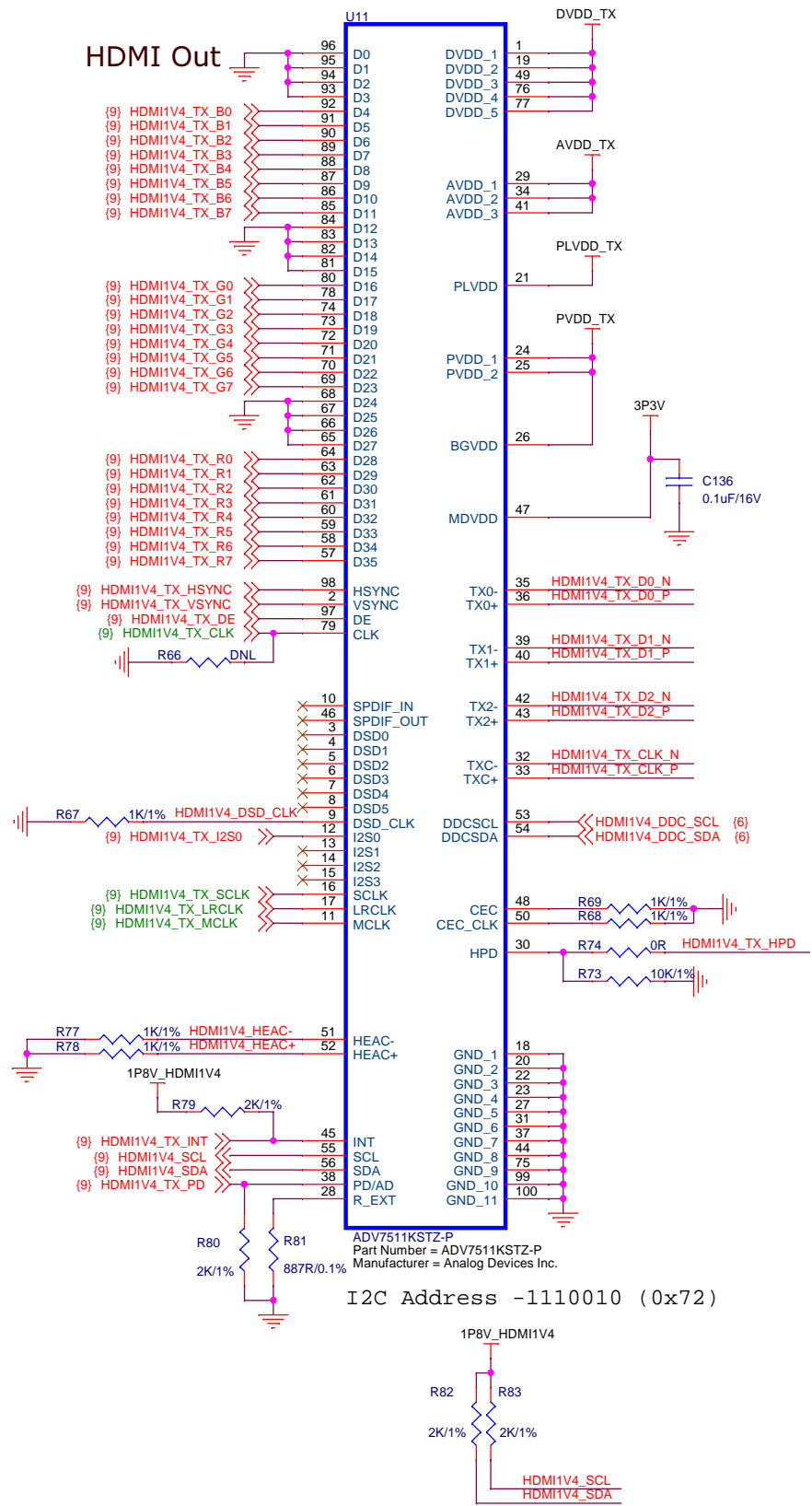
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| SIZE                | DOCUMENT NO.             | DVP-100-000512-001 | REV        |
| Custom              |                          |                    | 1          |
| DATE:               | Wednesday, June 13, 2018 |                    | SH 6 OF 29 |

# HDMI2P0 Redriver Interface (RX)

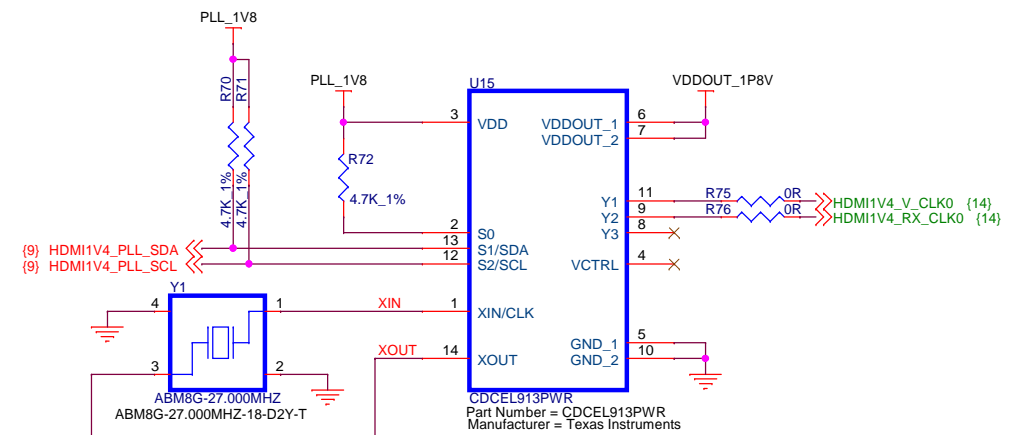


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| SIZE                | DOCUMENT NO. | DVP-100-000512-001       | REV        |
| Custom              |              |                          | 1          |
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# HDMI1V4 Transmitter Interface



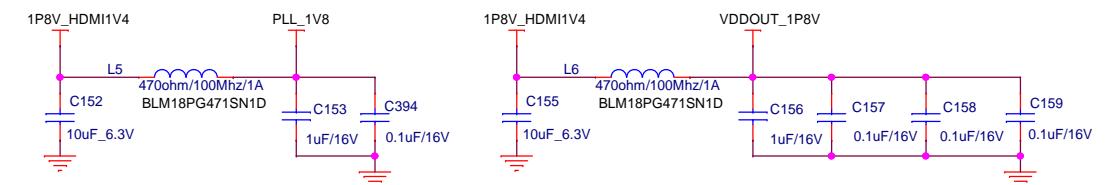
# Clock Synthesizer



I2C Address -1100101

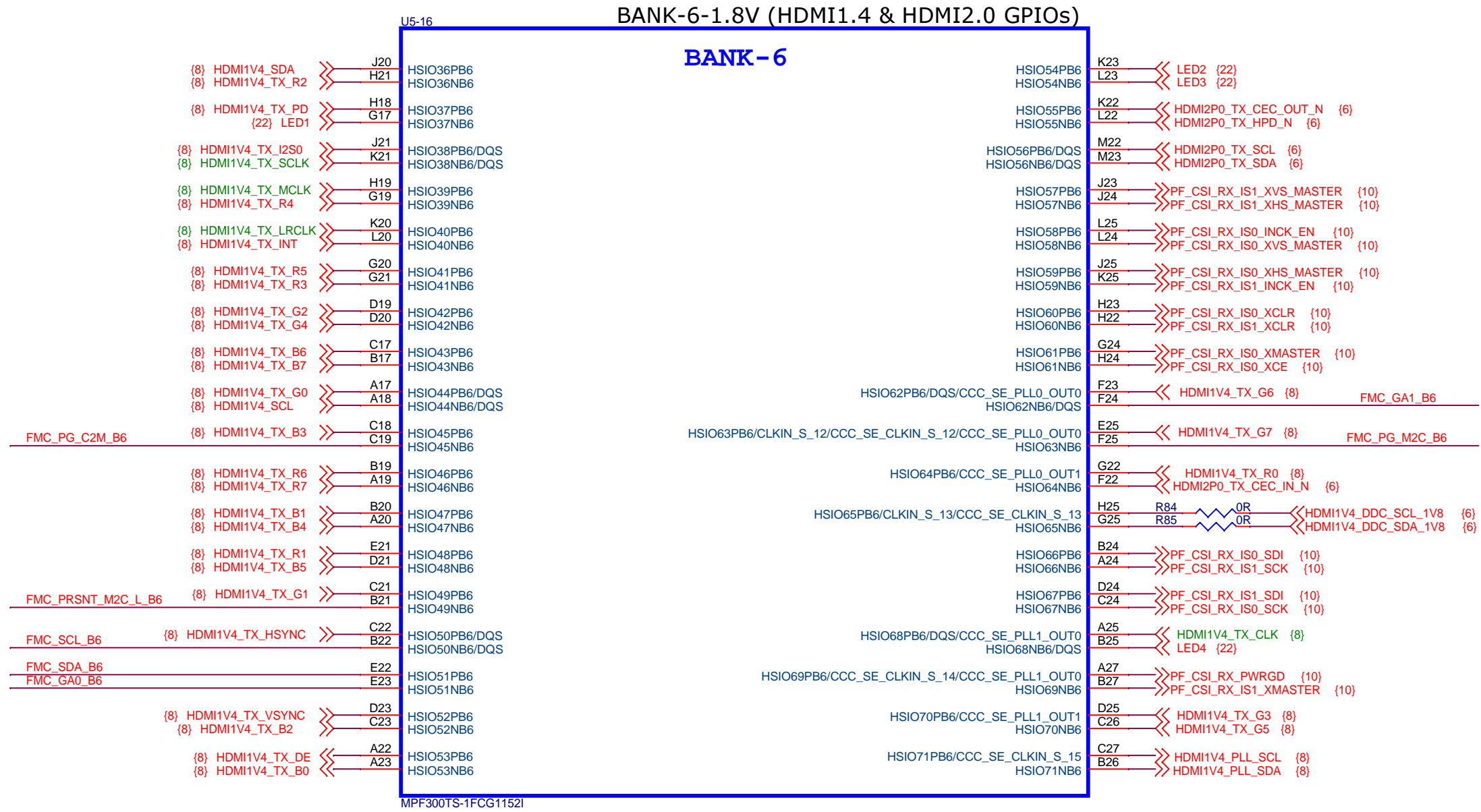
## NOTE

HDMI1V4\_V\_CLK0 & HDMI1V4\_RX\_CLK0 SHOULD BE ASSIGN TO CCC OF PF

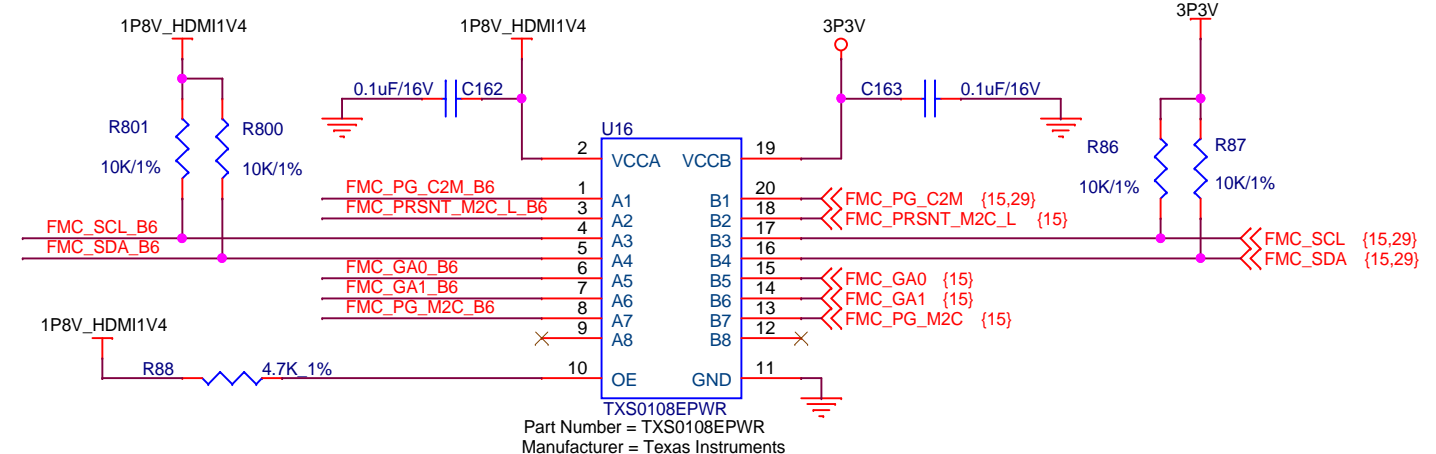




BANK6 Connection

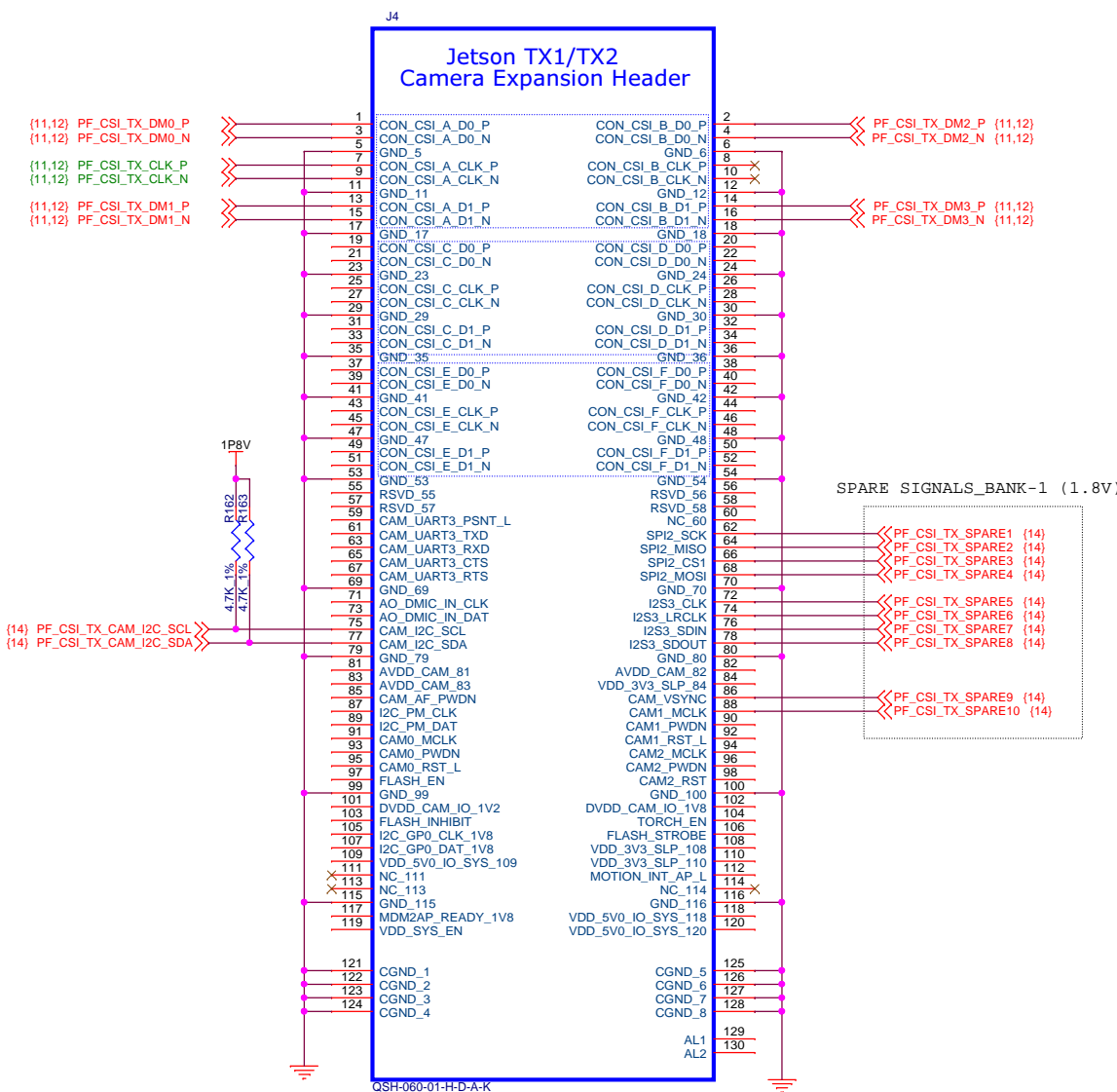


Level Translator - FMC Signals

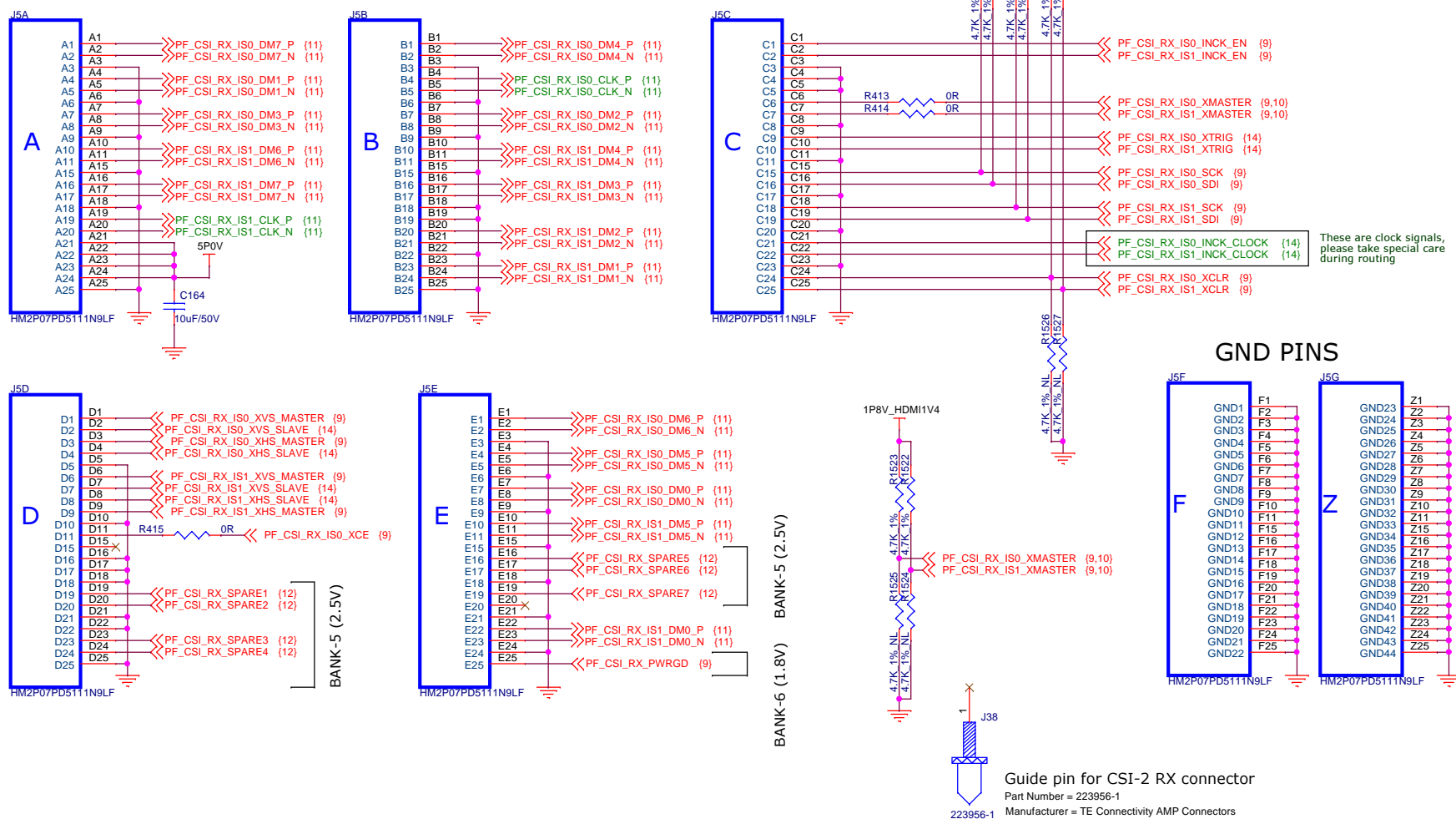


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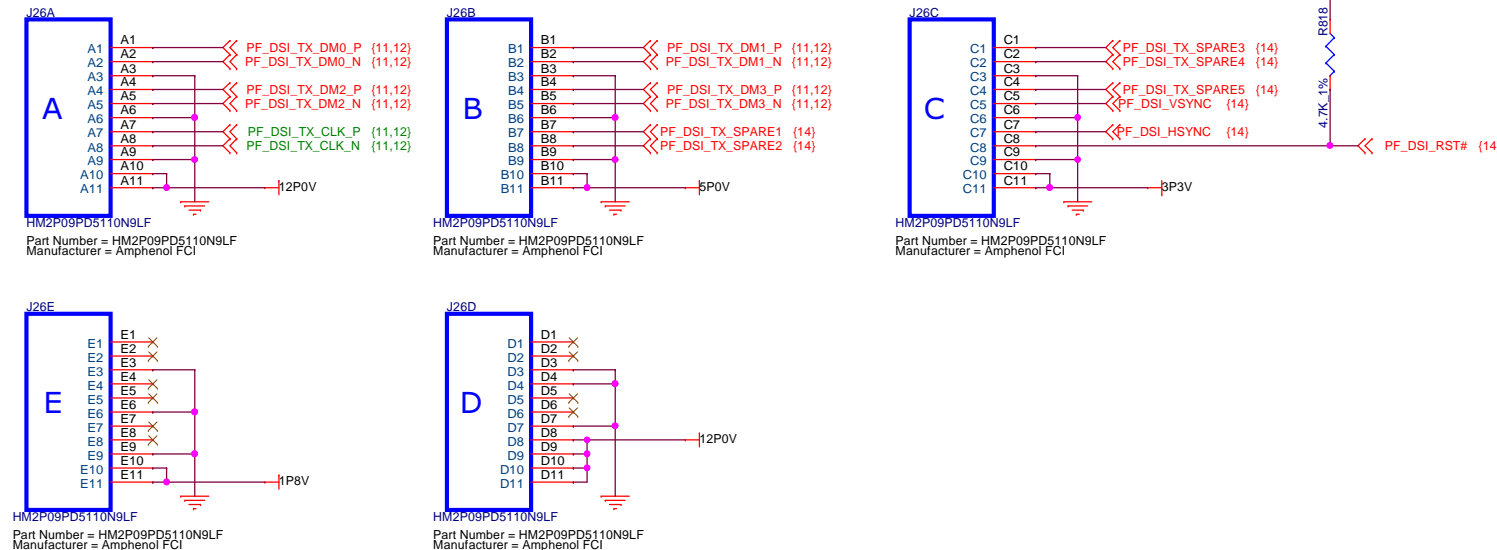
# CSI-2 TX To Jetson TX1/TX2 Camera Expander



# CSI-2 RX Image Sensor Interface



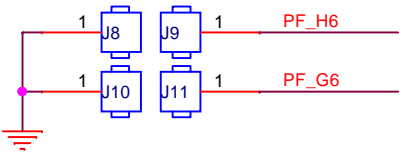
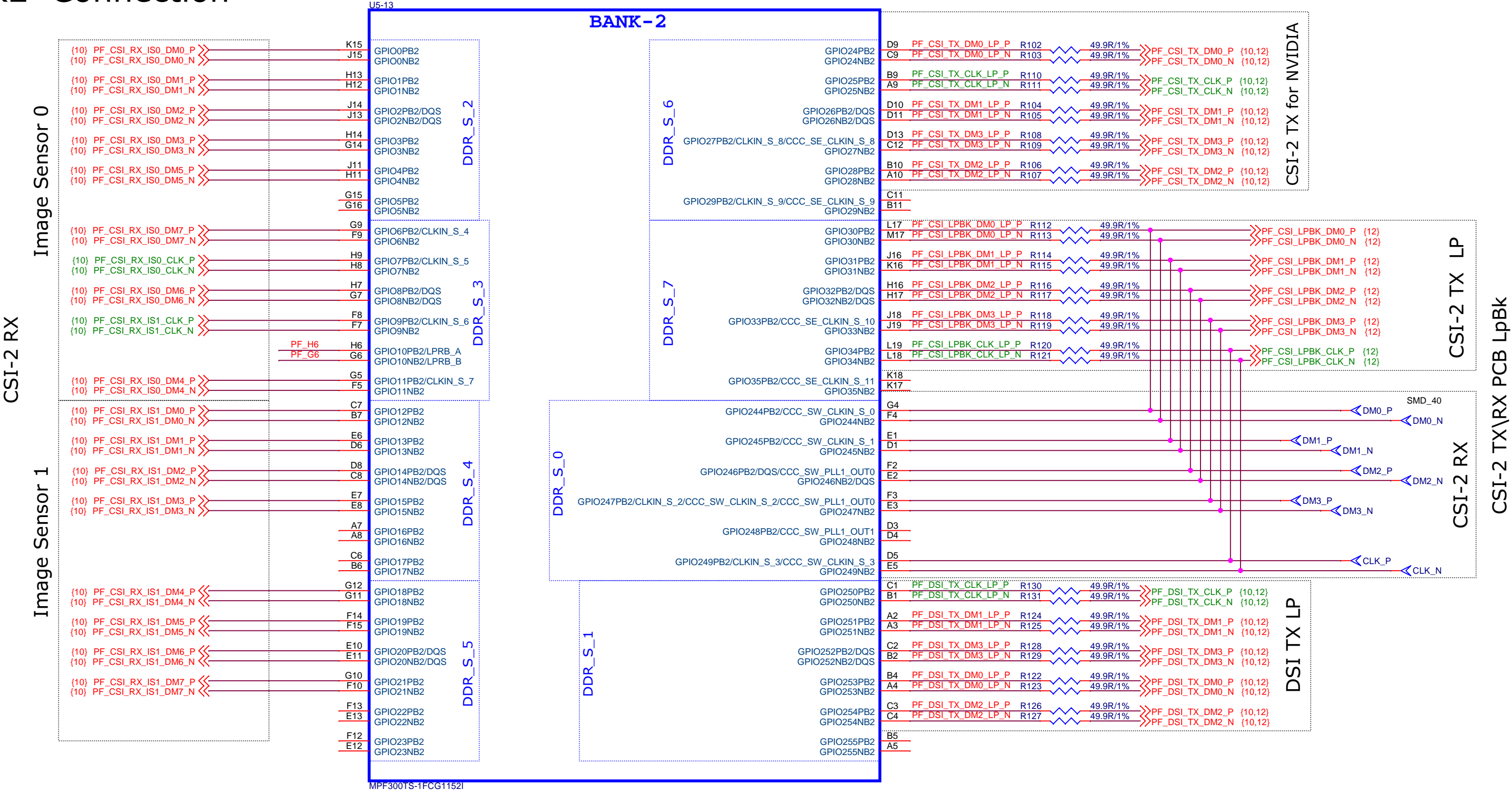
# DSI TX Display Interface



|                     |                          |                    |          |
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| Microsemi           |                          |                    |          |
| SIZE                | DOCUMENT NO.             | DVP-100-000512-001 | REV      |
| Custom              |                          |                    | 1        |
| DATE:               | Wednesday, June 13, 2018 | SH                 | 10 OF 29 |

BANK2 Connection

BANK-2-1P2V (LVCMOS12 FOR MIPI), VDDAUX2=2.5/3.3V

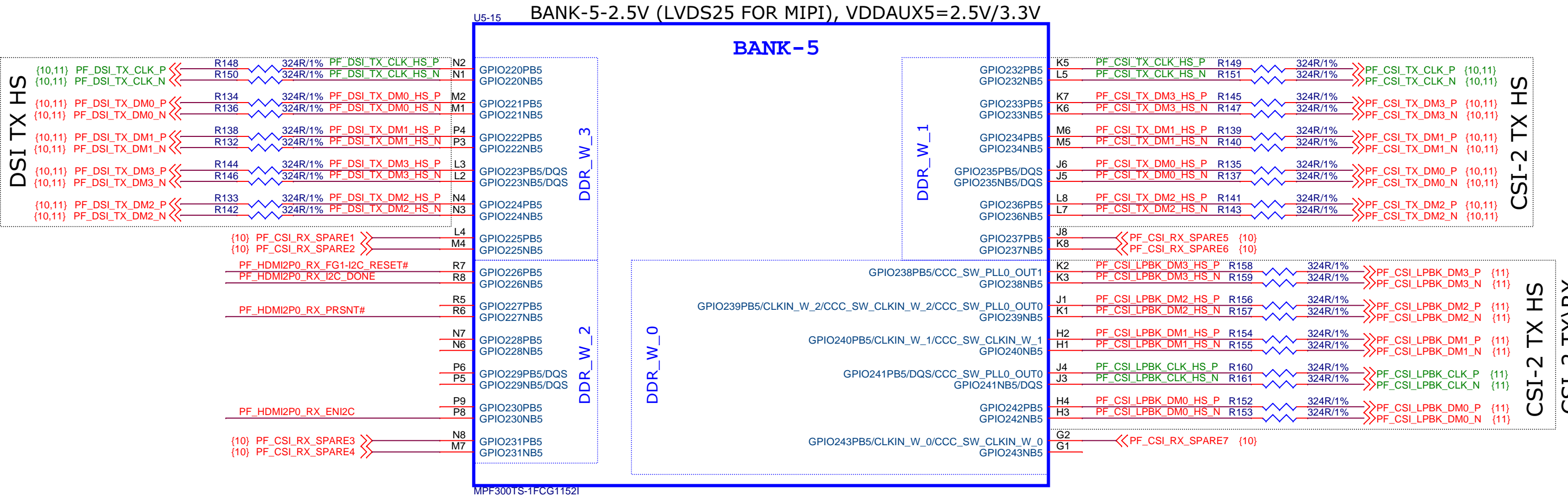


NOTE:  
Nets PF\_H6 & PF\_G6 should be  
routed differentially.  
J9 & J11 should be  
placed next to each other.

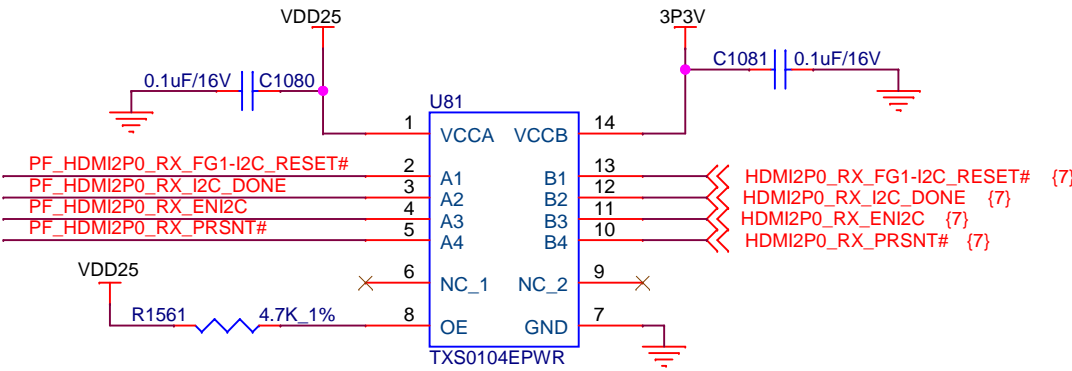


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BANK5 Connection



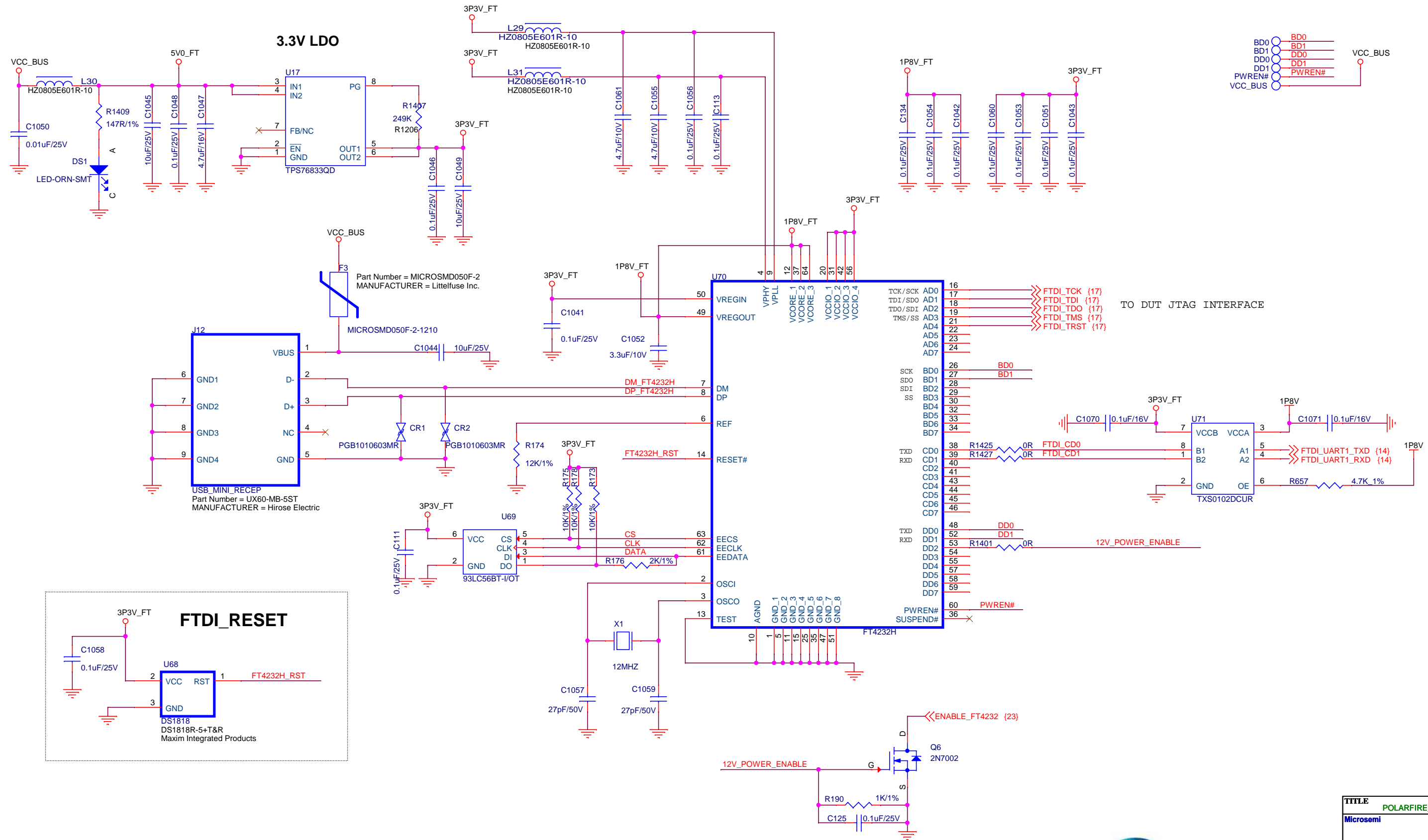
Level Translator - 3.3V Signals



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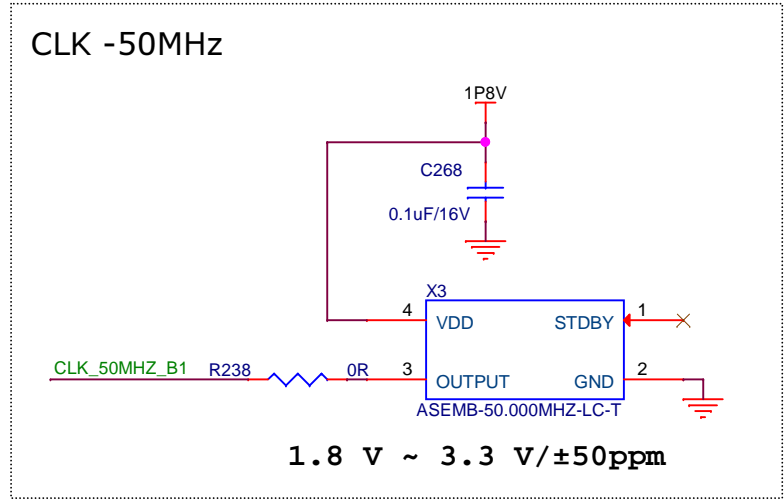
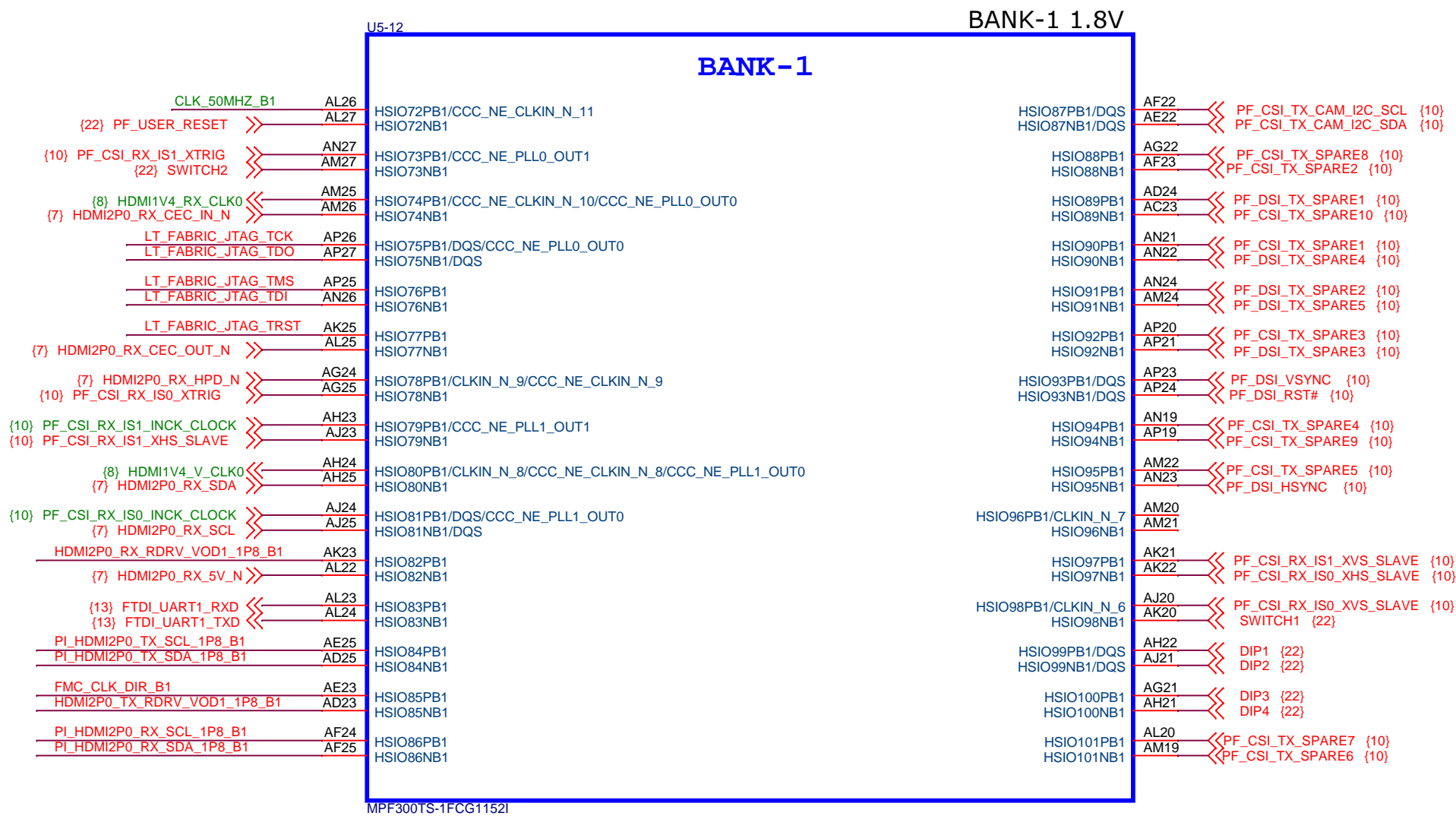


# FT4232H CIRCUITRY

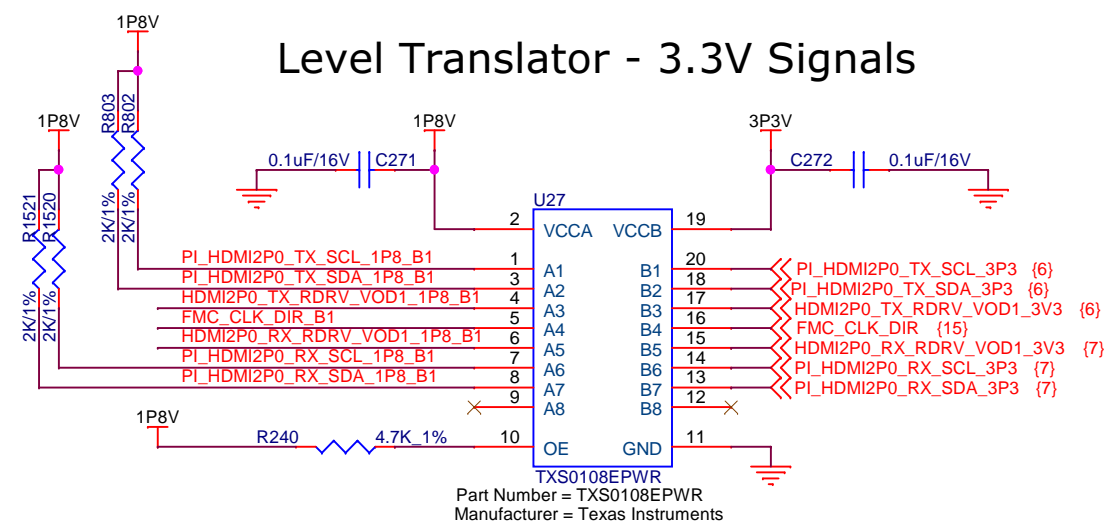




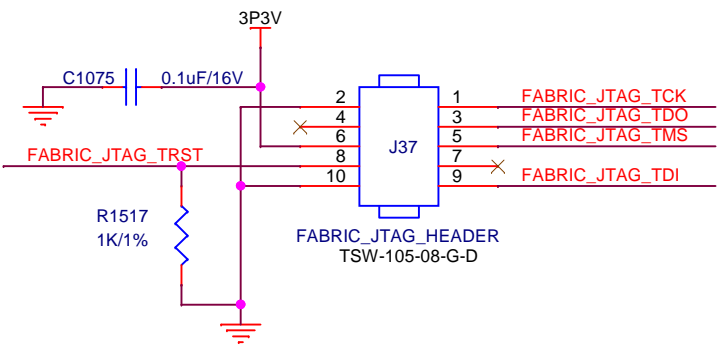
BANK1 Connection



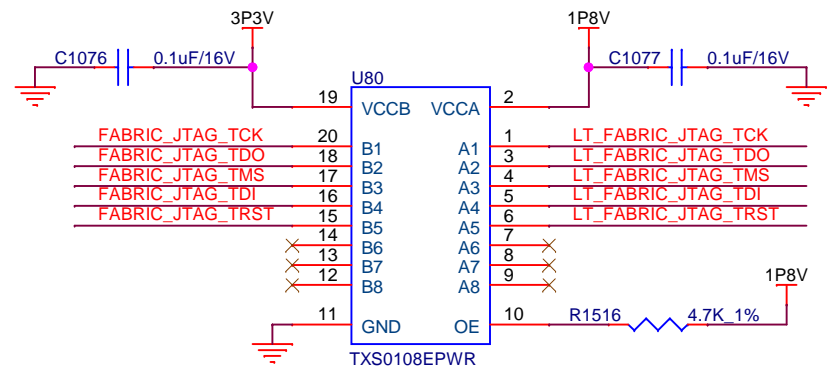
Level Translator - 3.3V Signals



FABRIC\_JTAG\_HEADER

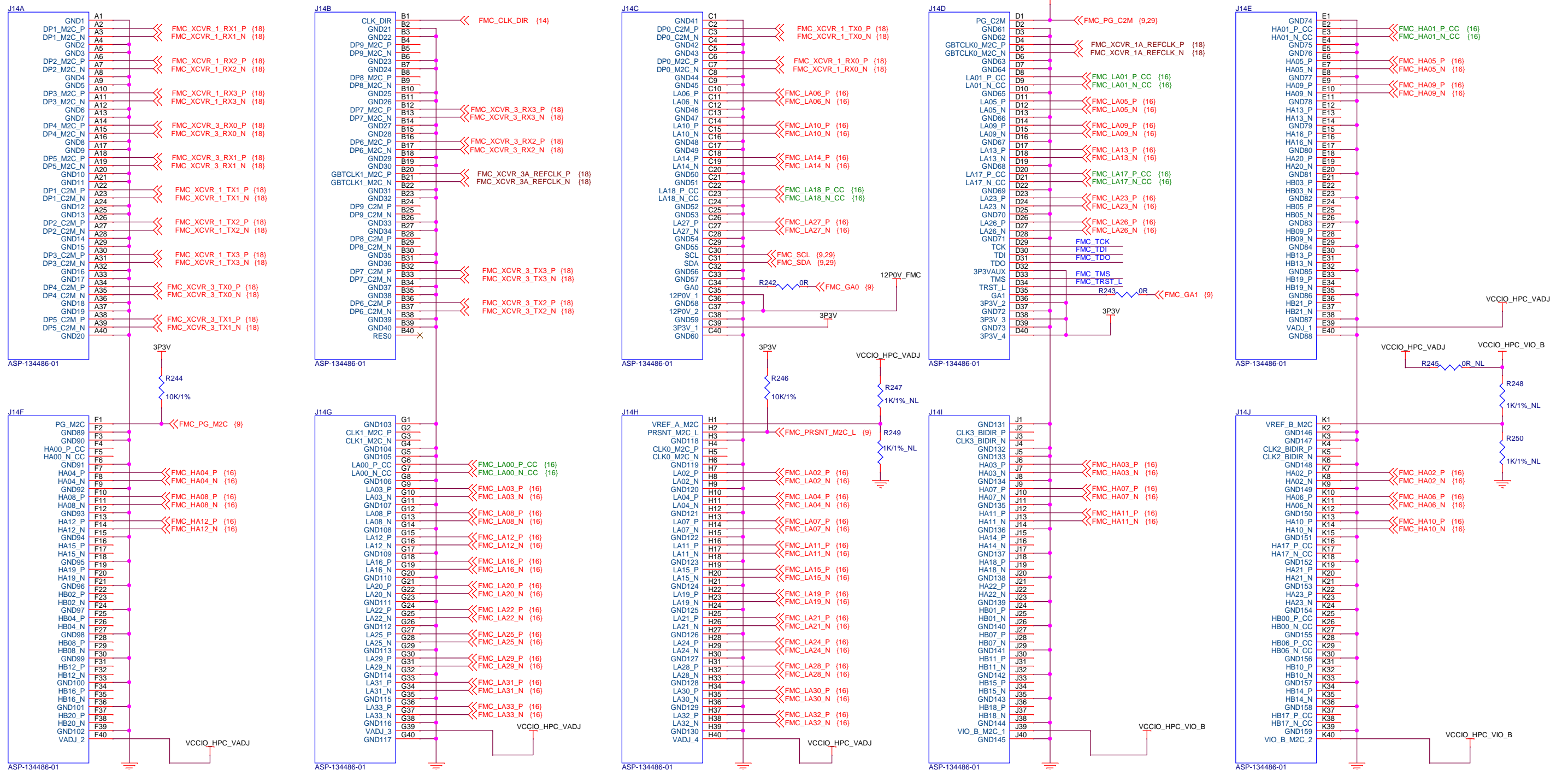


FABRIC\_JTAG\_HEADER-LEVEL TRANSLATOR

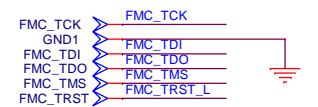
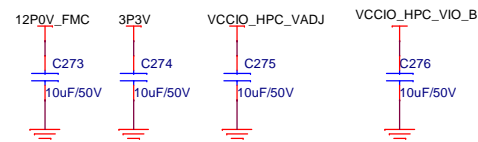


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| SIZE                | DOCUMENT NO. DVP-100-000512-001 | REV         |
| Custom              |                                 | 1           |
| DATE:               | Wednesday, June 13, 2018        | SH 14 OF 29 |

# FMC Connection (HPC)



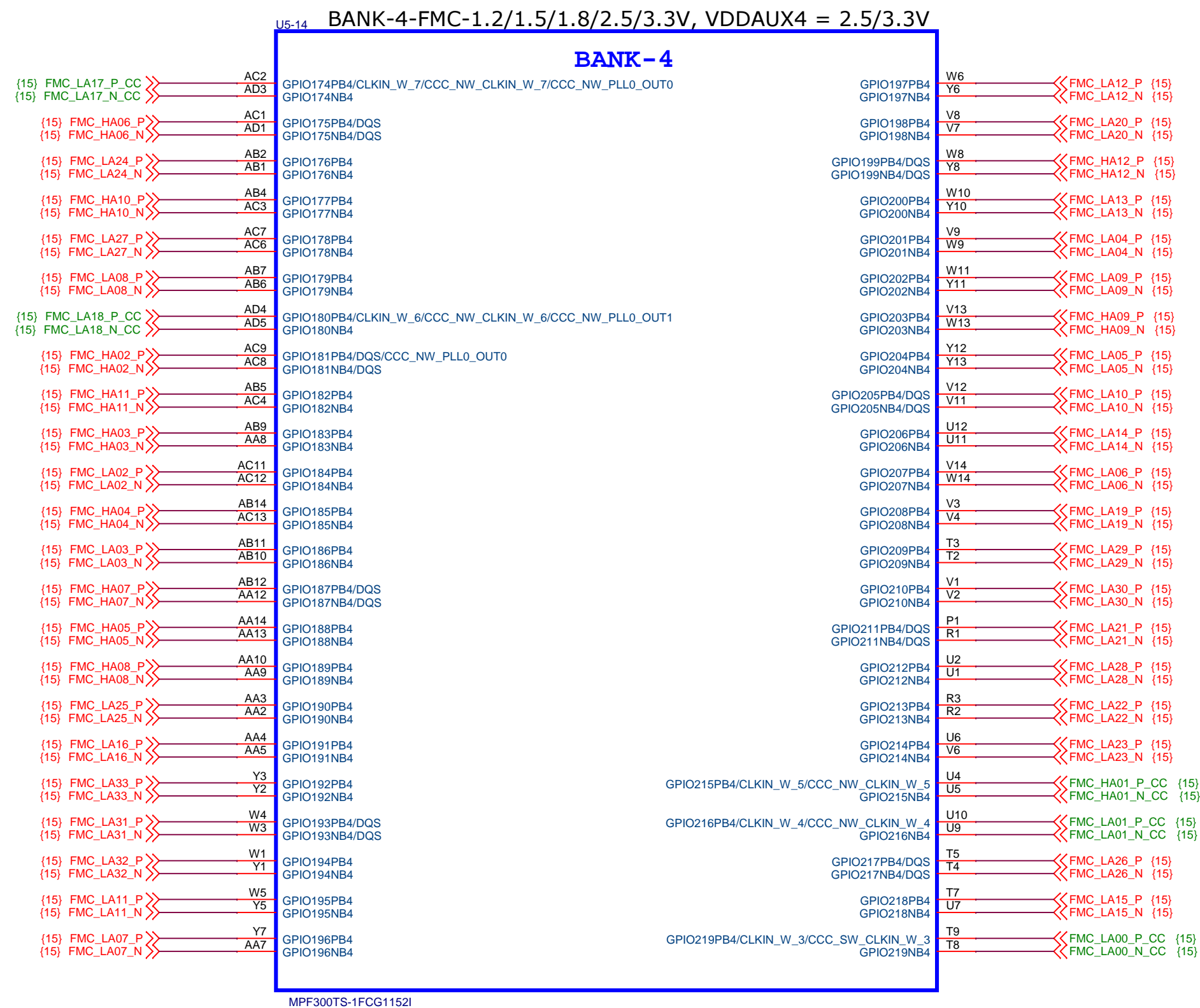
## Decoupling Capacitor



|                     |                          |                    |          |
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| Microsemi           |                          |                    |          |
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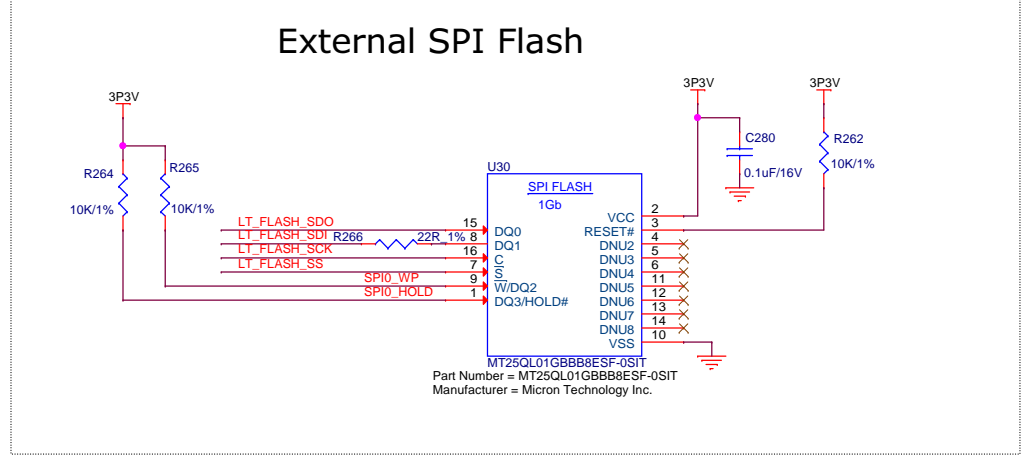
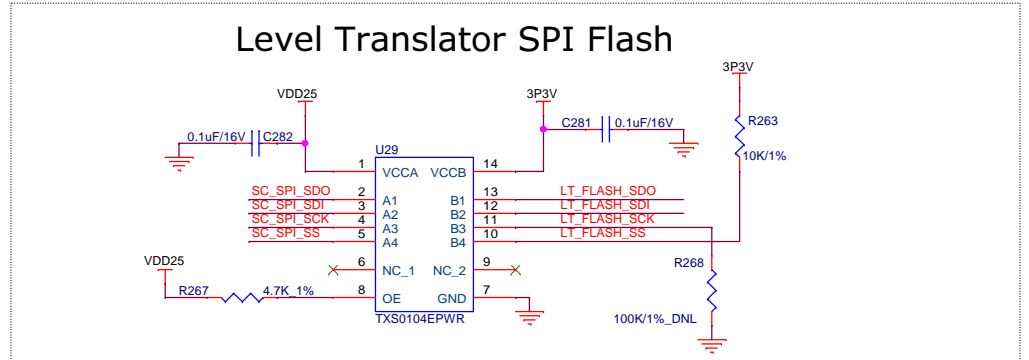
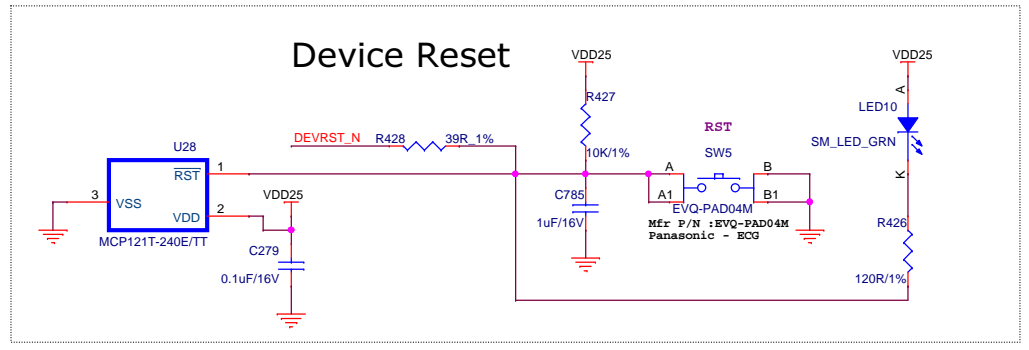
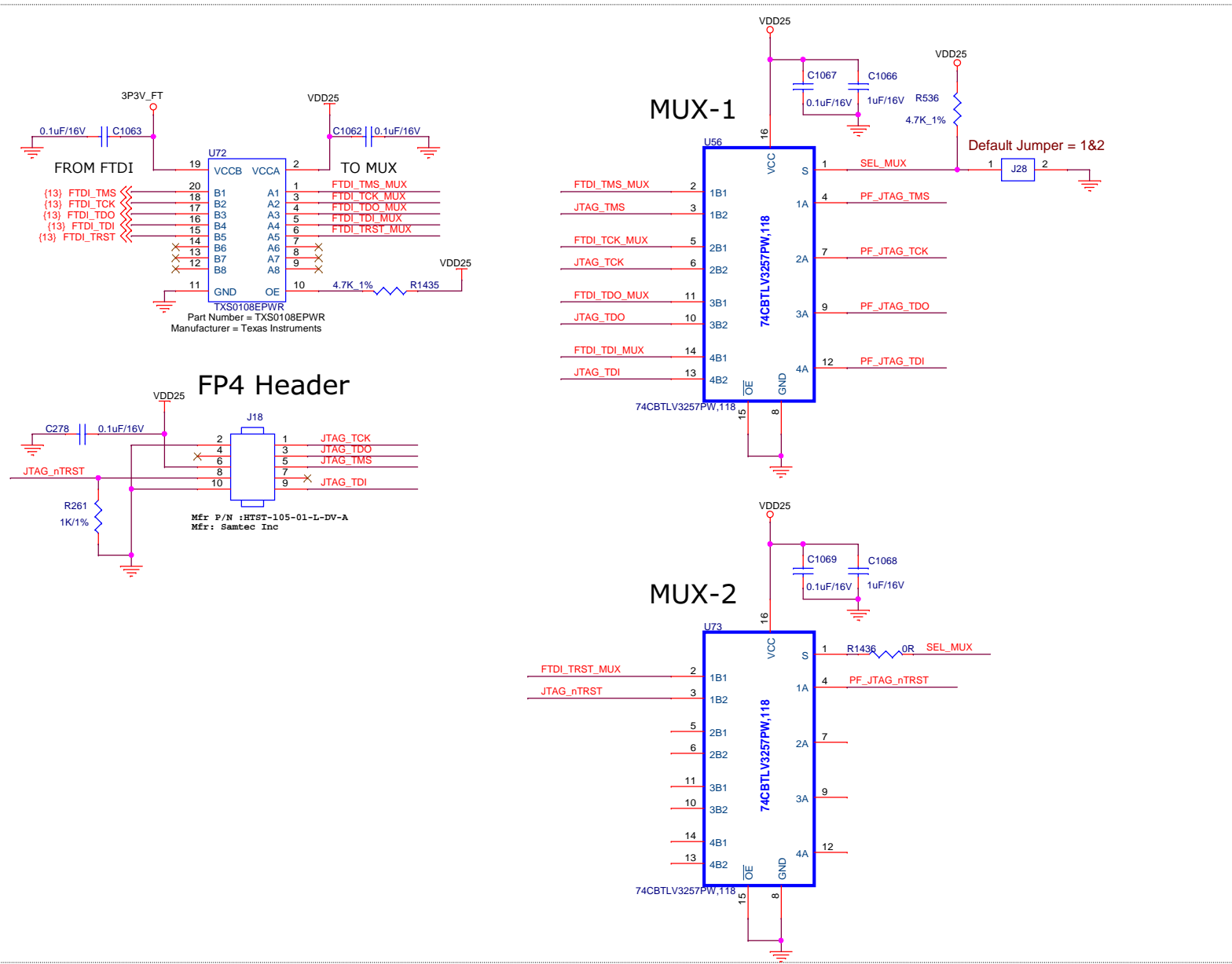
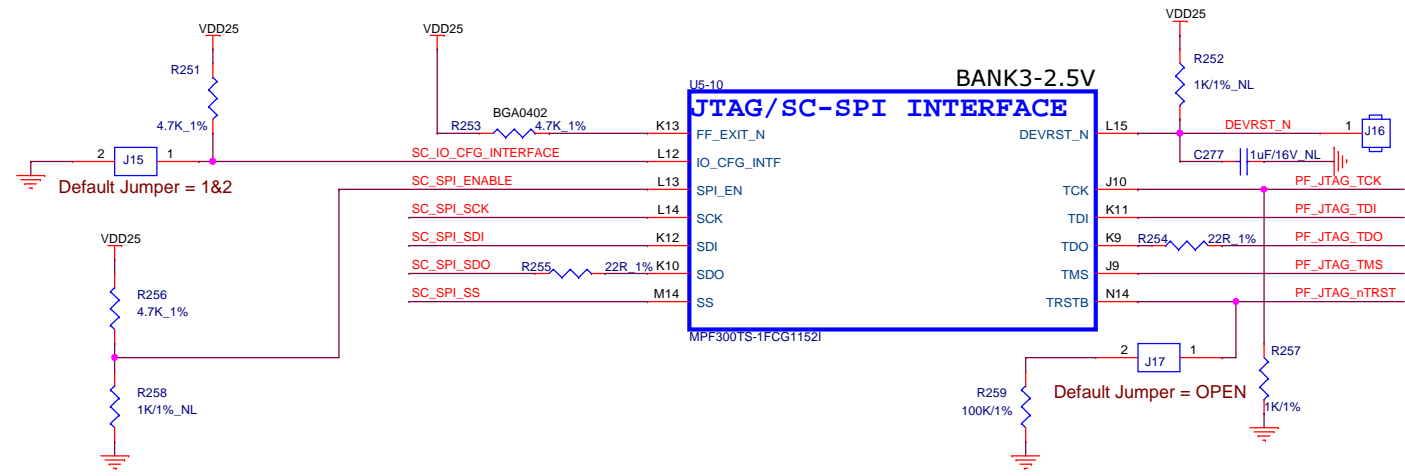


# BANK4 Connection



|                                |                                 |       |  |
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| DATE: Wednesday, June 13, 2018 | SH 16 OF 29                     |       |  |

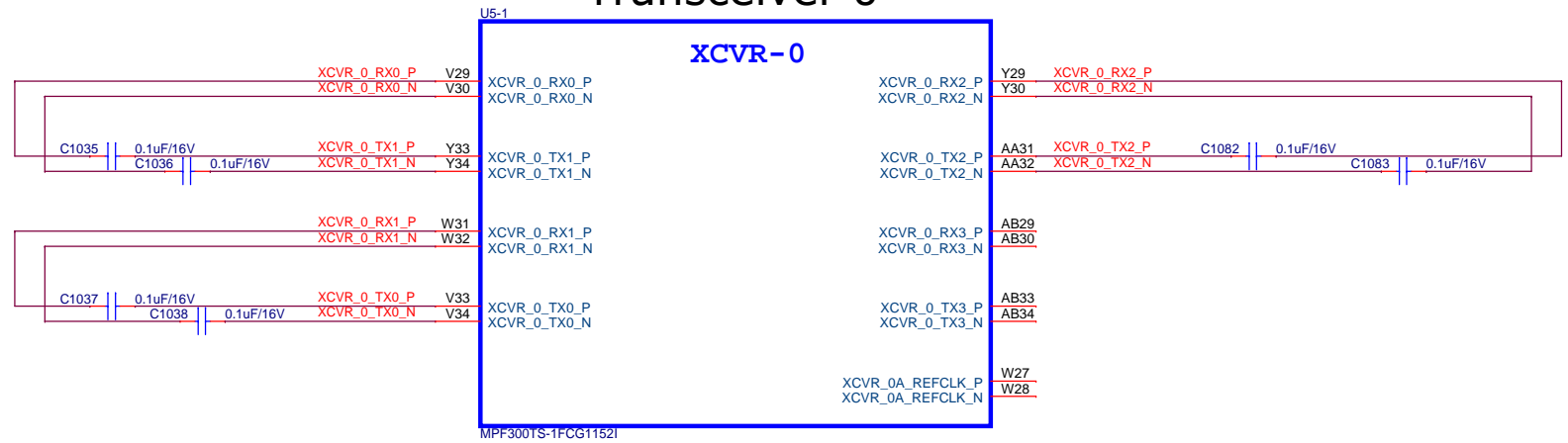
# Programming Section



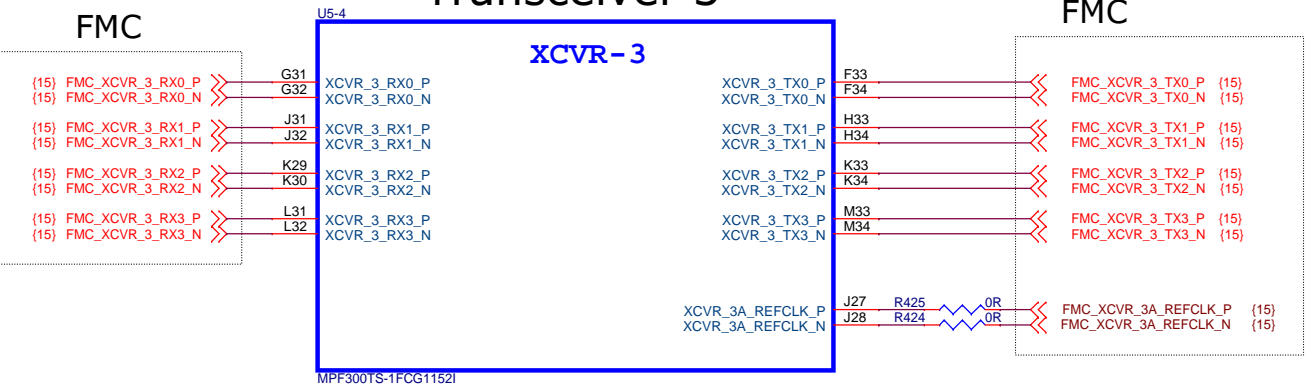
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| SIZE                | DOCUMENT NO.             | DVP-100-000512-001 | REV      |
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| DATE:               | Wednesday, June 13, 2018 | SH                 | 17 OF 29 |

# Transceiver & External Reference Clocks

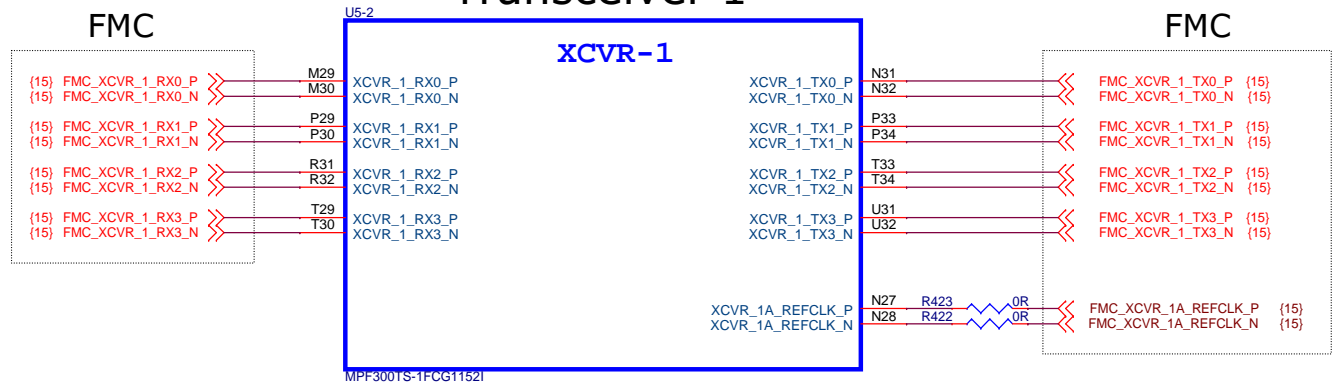
Transceiver 0



Transceiver 3

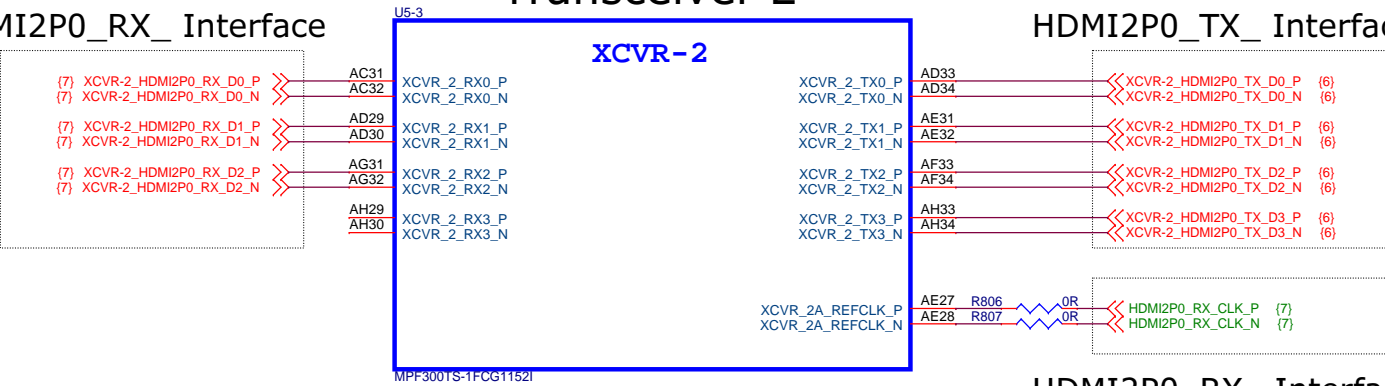


Transceiver 1



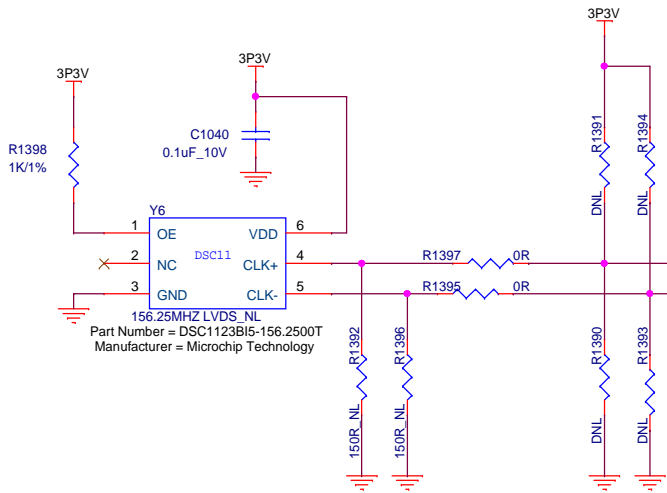
HDMI2P0\_RX\_ Interface

Transceiver 2

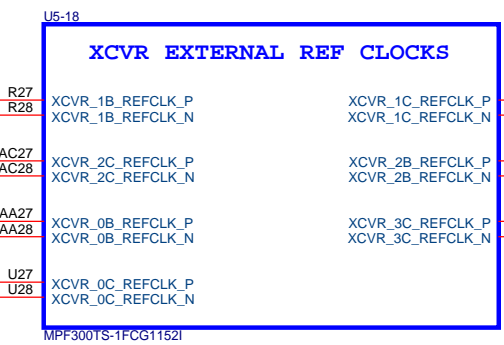


HDMI2P0\_RX\_ Interface

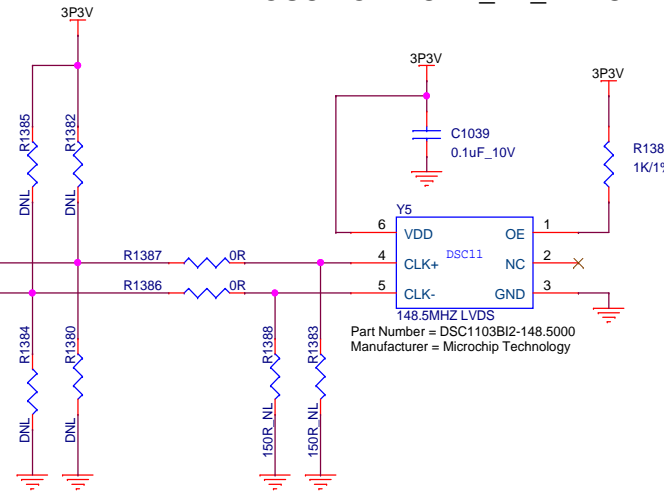
OSC FOR XCVR\_0B\_REFCLK



Transceiver External Reference Clocks



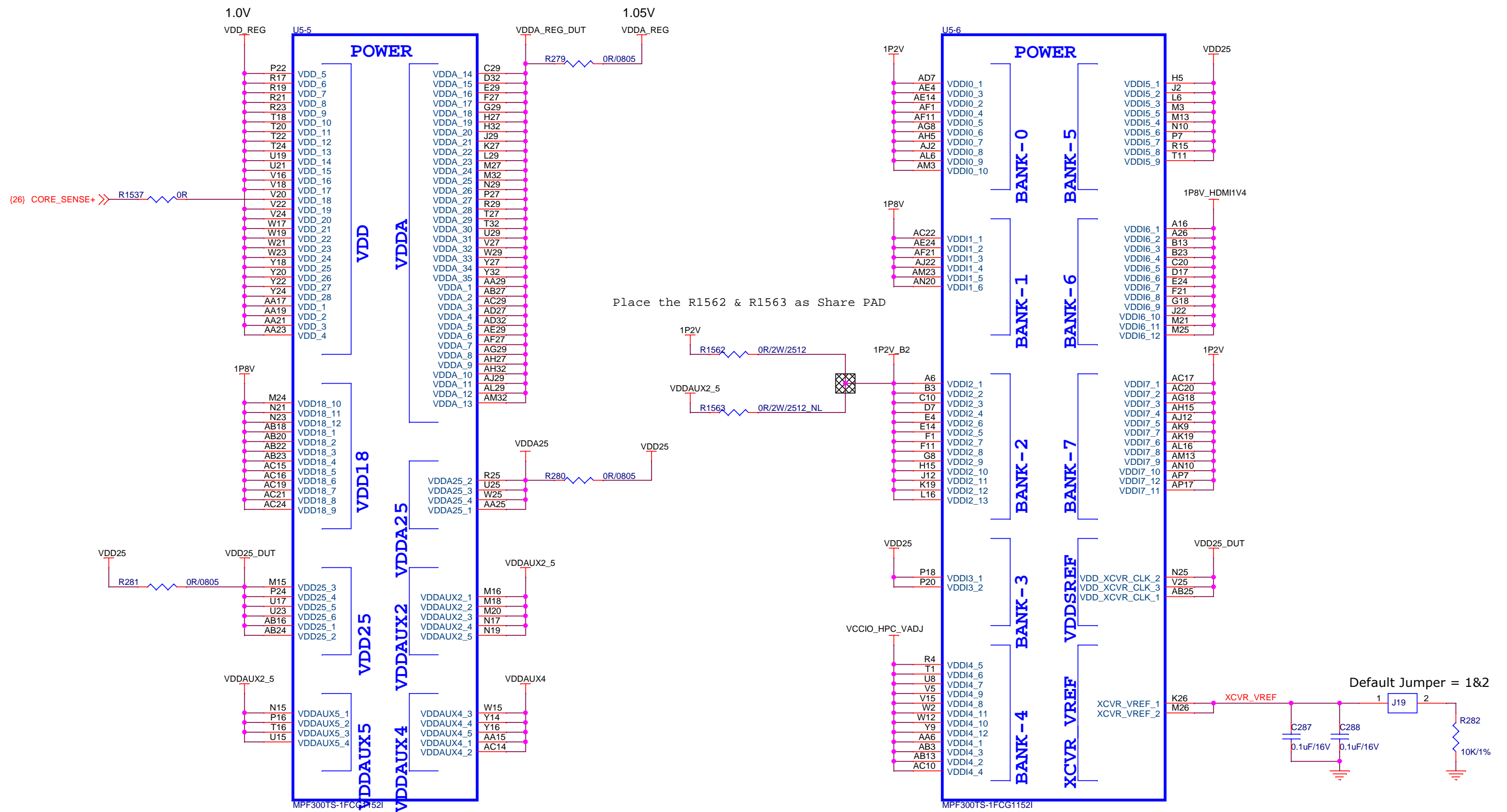
OSC FOR XCVR\_2B\_REFCLK



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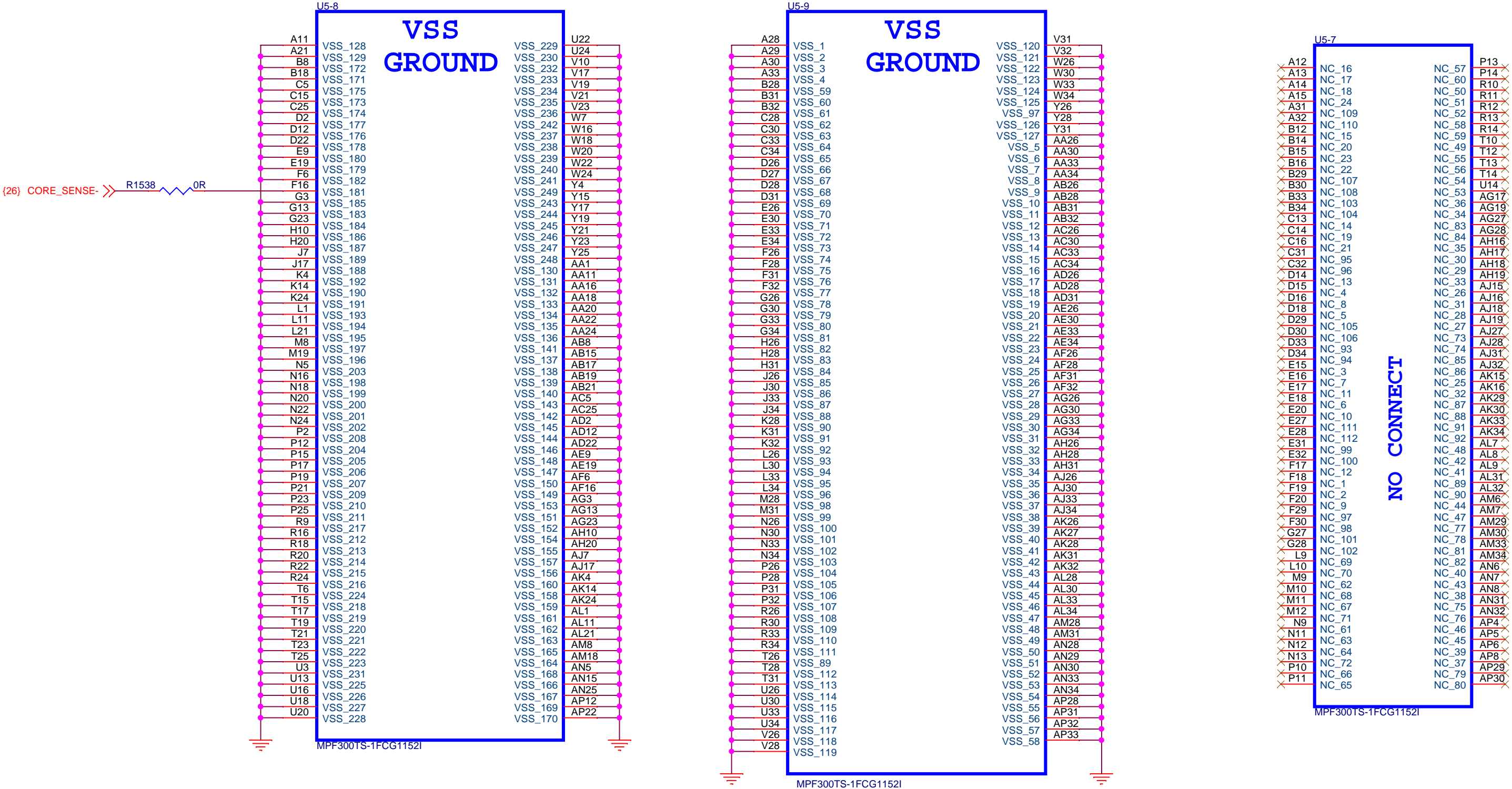


# PolarFire Power Connection



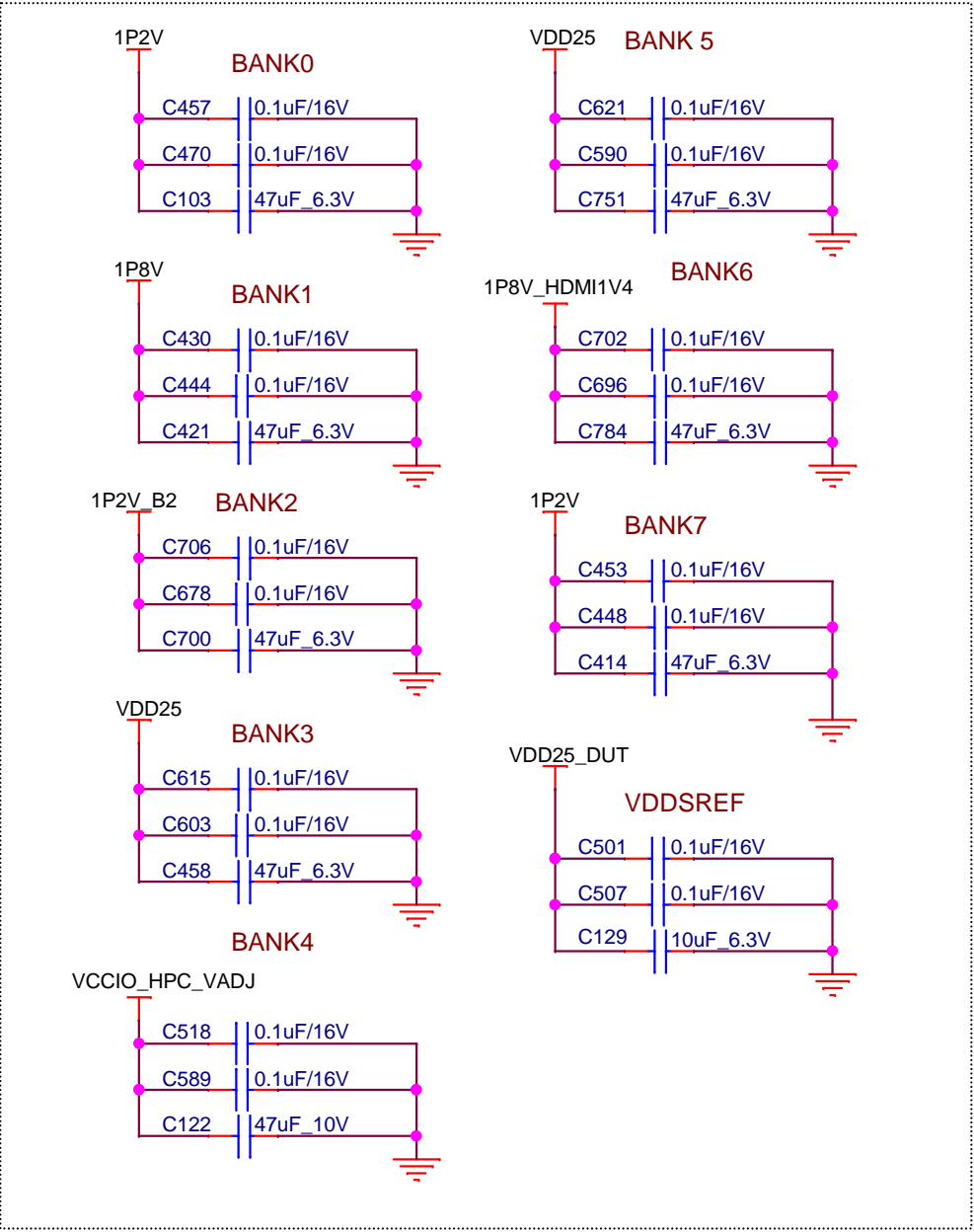
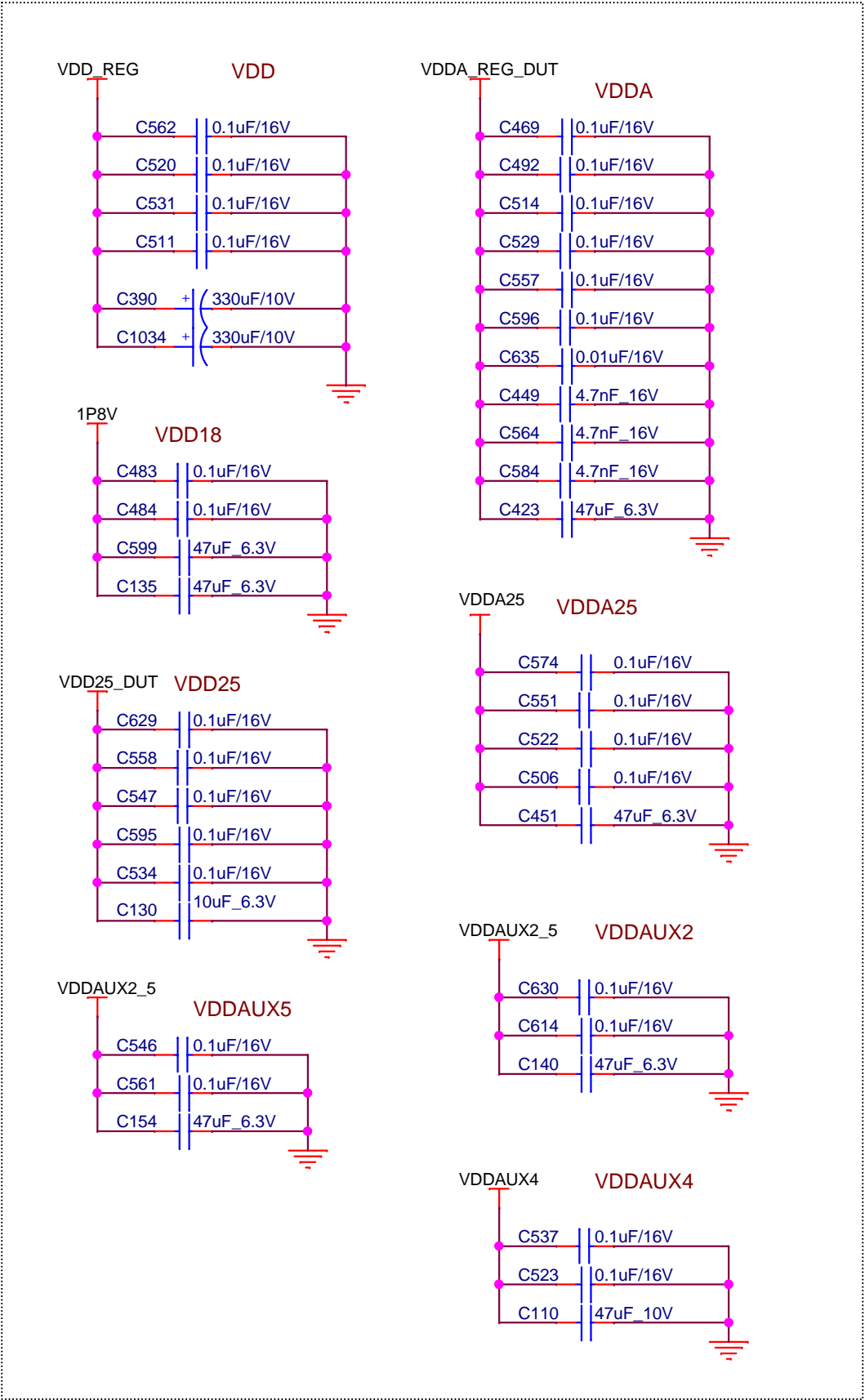
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| Custom                                |                     |                           | 1                  |
| <b>DATE:</b> Wednesday, June 13, 2018 |                     |                           | <b>SH 19 OF 29</b> |

# PolarFire Ground & NC Connection



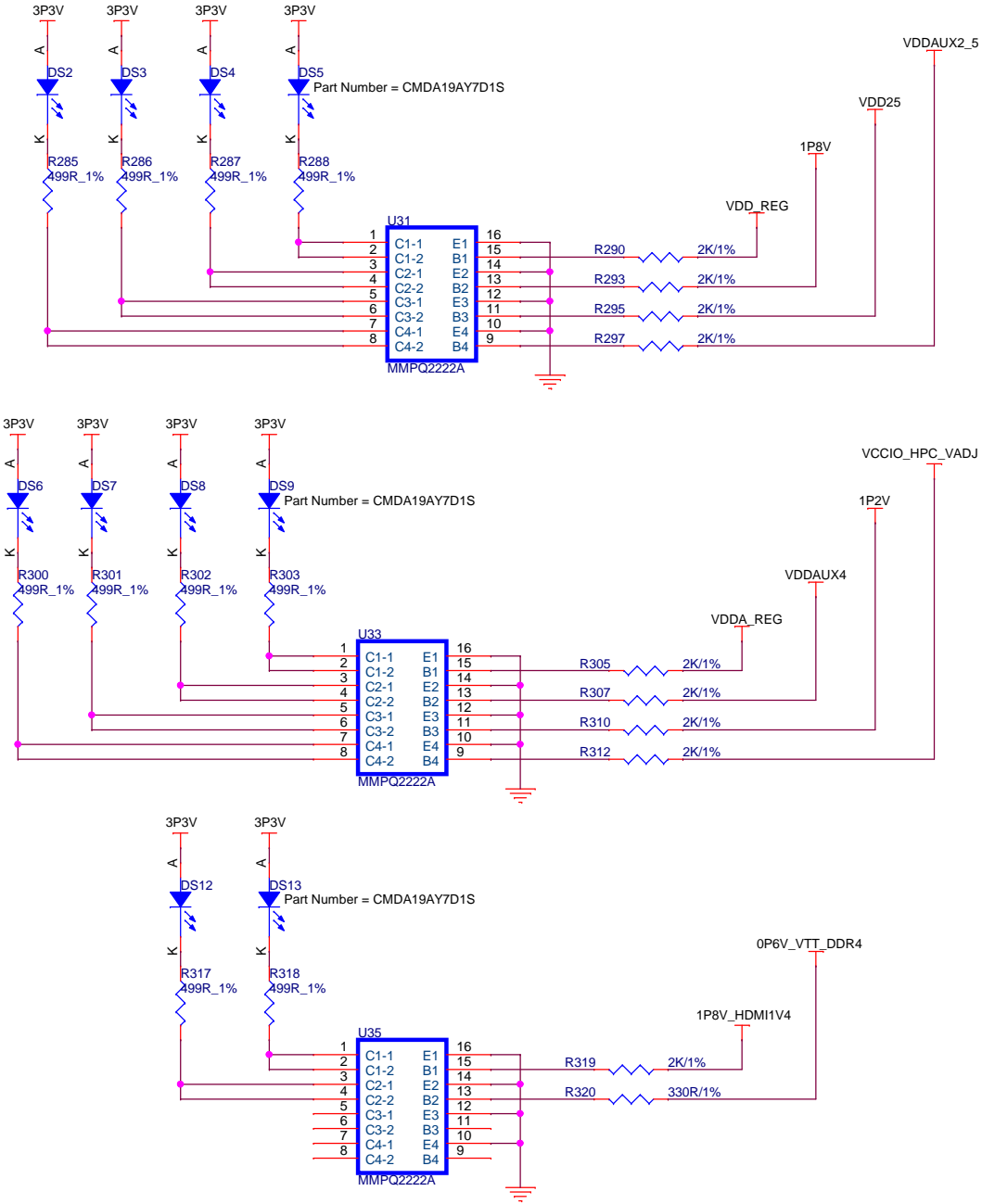
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| SIZE                     | DOCUMENT NO.       | REV         |
| B                        | DVP-100-000512-001 | 1           |
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| Wednesday, June 13, 2018 |                    |             |

# PolarFire Decoupling Capacitors

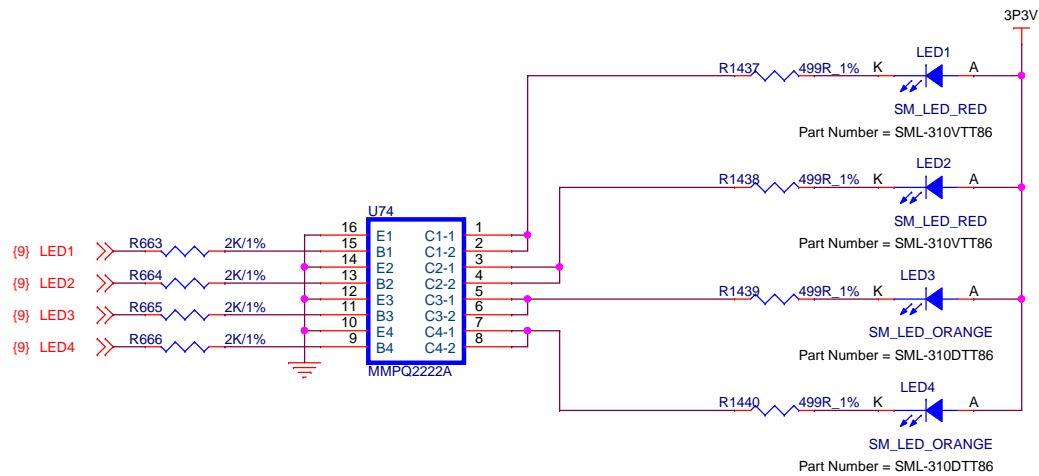


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| DATE:               | Wednesday, June 13, 2018 | SH 21              | OF 29 |

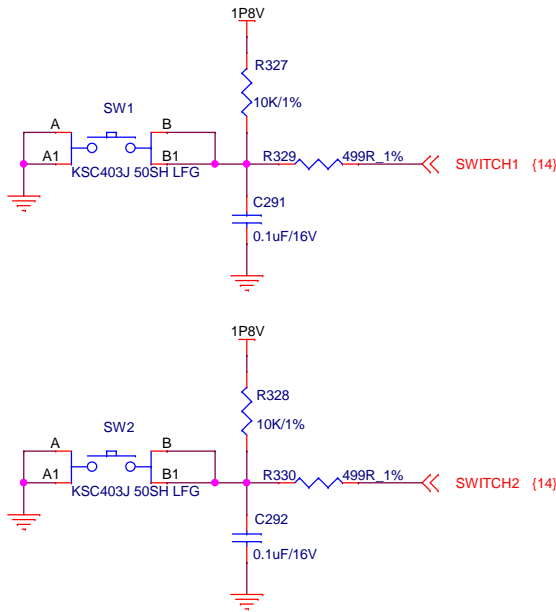
Power LEDs



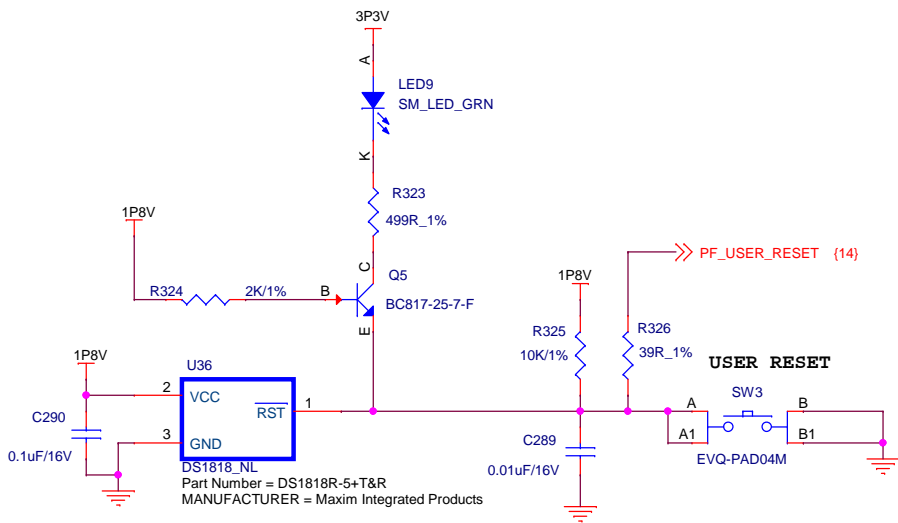
User Defined LEDs



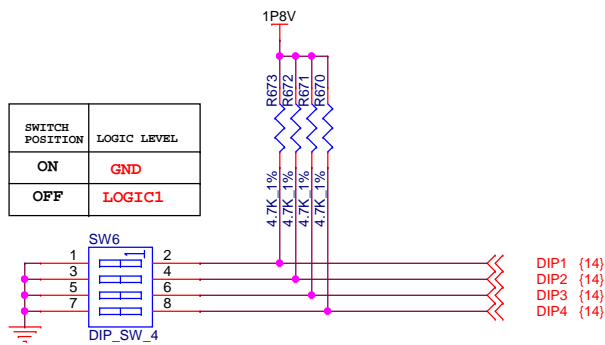
Debug Circuitry



PolarFire User Reset



DIP Switch



|                     |                          |                    |     |
|---------------------|--------------------------|--------------------|-----|
| TITLE               |                          |                    |     |
| POLARFIRE_VIDEO_KIT |                          |                    |     |
| Microsemi           |                          |                    |     |
| SIZE                | DOCUMENT NO.             | DVP-100-000512-001 | REV |
| Custom              |                          |                    | 1   |
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# 12V External Supply @ 5A

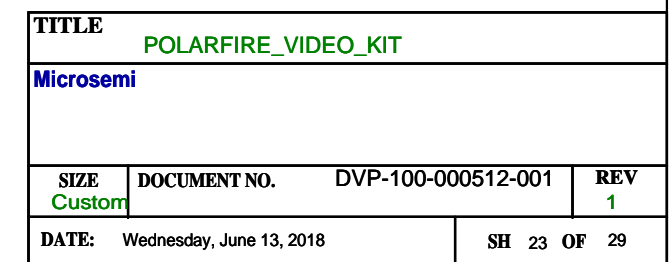
The schematic diagram illustrates a 12V External Supply @ 5A circuit. The circuit includes a 12P0V\_IN input, a 12P0V output, and a 12P0V\_FMC output. The 12P0V output is connected to a MOSFET (U37, IRF9317TRPBF) through a 4.7R\_1% resistor (R332). The MOSFET is driven by a 22K\_1% resistor (R331) connected to the 12P0V\_IN input. A 33K/1% resistor (R333) is connected to the 12P0V output. A 1.5K/1% resistor (R334) is connected to the 12P0V output. A 3 PIN JUMPER (J36) is connected to the 12P0V output. A switch (SW4, GF-126-0159) is connected to the 12P0V output. A diode (D1, SD2114S040S8R0) is connected to the 12P0V\_FMC output. A diode (DS14, LTST-C171TBKT) is connected to the 12P0V output. The circuit is powered by a 12V supply (J20, PJ-102BH).

Key components and settings:

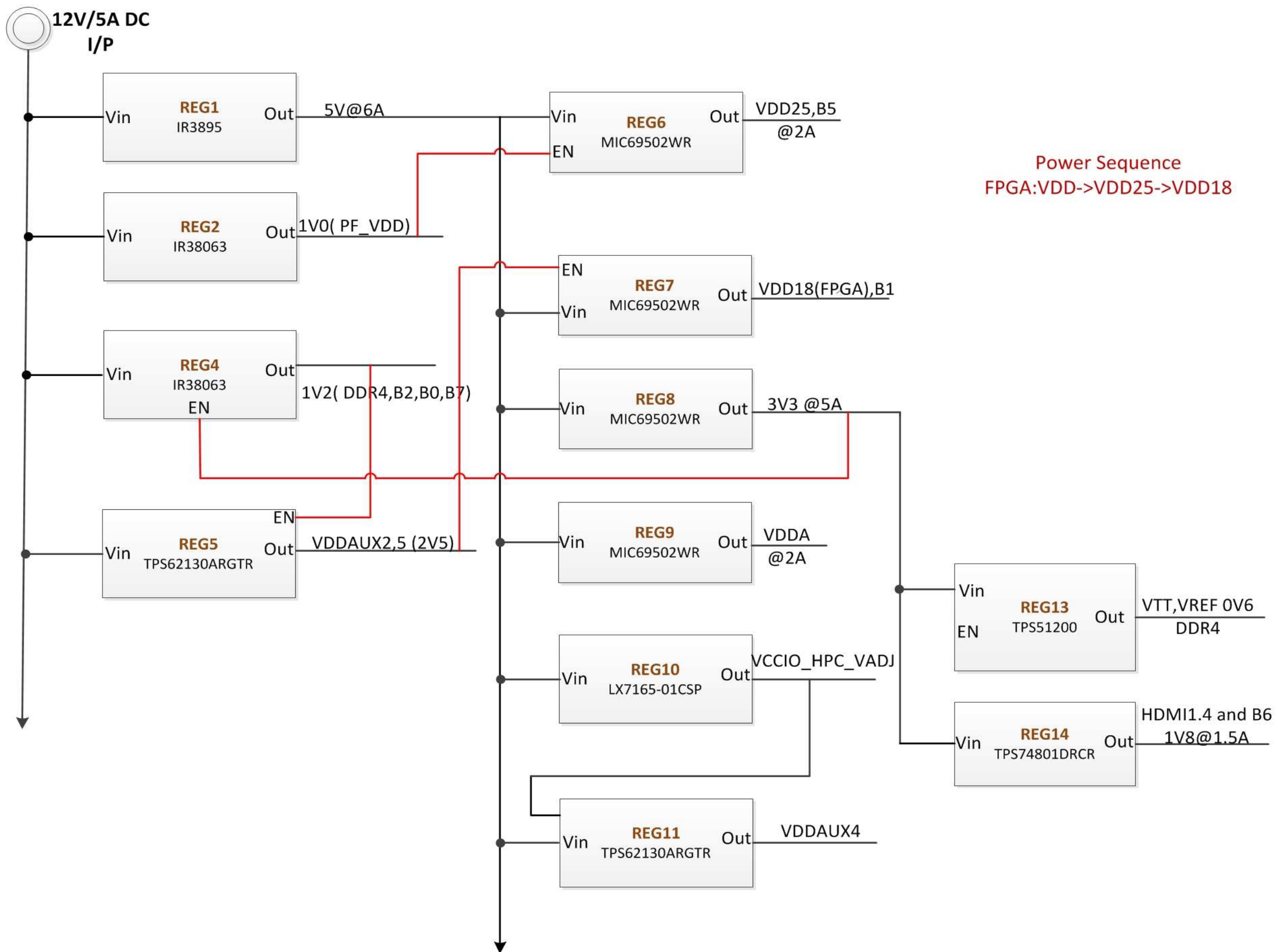
- 12P0V\_IN: Input voltage
- 12P0V: Output voltage
- 12P0V\_FMC: Output voltage
- J20: 12V supply (PJ-102BH)
- R331: 22K\_1% resistor
- R332: 4.7R\_1% resistor
- R333: 33K/1% resistor
- R334: 1.5K/1% resistor
- J36: 3 PIN JUMPER (Default Jumper = 1&2)
- SW4: Switch (GF-126-0159) (Default Switch = 2&3,5&6)
- D1: Diode (SD2114S040S8R0)
- DS14: Diode (LTST-C171TBKT)
- U37: MOSFET (IRF9317TRPBF, Part Number = IRF9317TRPBF, Manufacturer = Infineon Technologies)

DEFAULT JUMPER SETTINGS AT 1 & 2

Default Switch = 2&3,5&6





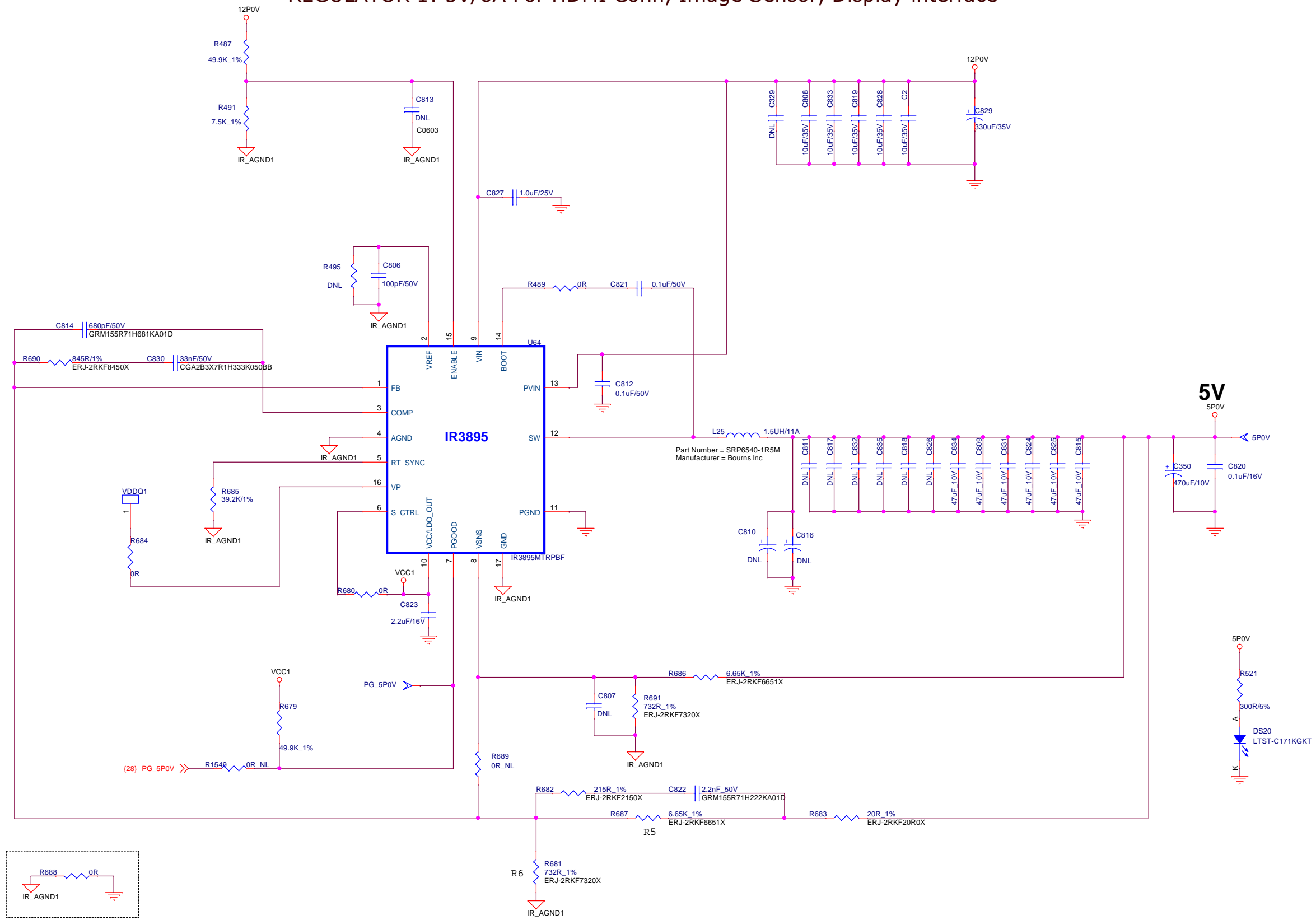


Power Sequence  
FPGA:VDD->VDD25->VDD18



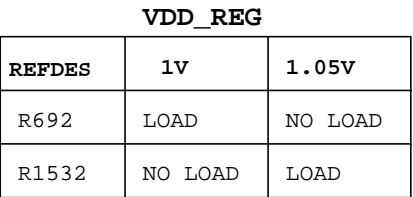
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| POLARFIRE_VIDEO_KIT            |              |                    |     |
| Microsemi                      |              |                    |     |
| SIZE                           | DOCUMENT NO. | DVP-100-000512-001 | REV |
| C                              |              |                    | 2   |
| DATE: Wednesday, June 13, 2018 |              | SH 24 OF 29        |     |

REGULATOR 1: 5V/6A For HDMI Conn, Image Sensor, Display interface

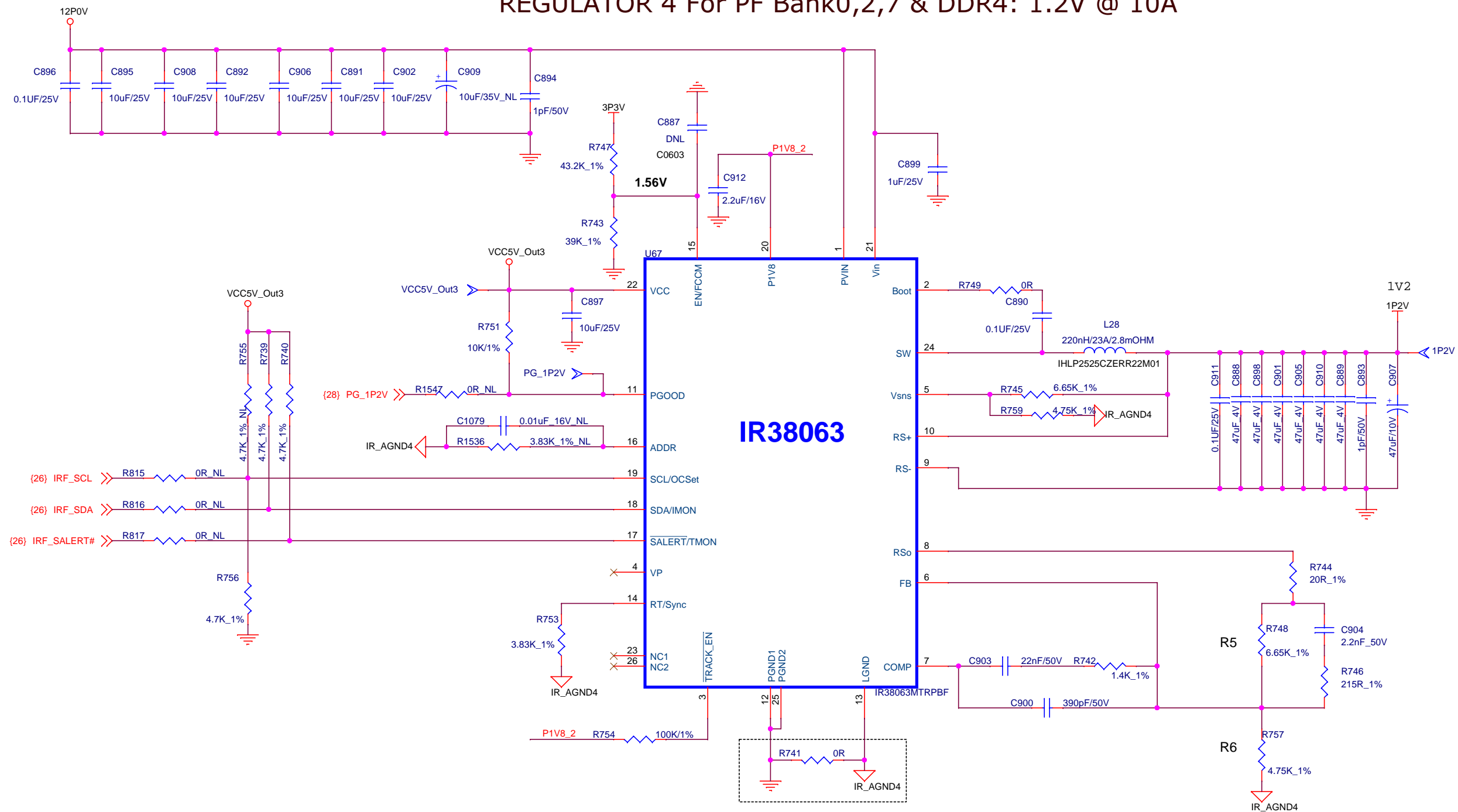


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| Microsemi           |                          |                    |     |
| SIZE                | DOCUMENT NO.             | DVP-100-000512-001 | REV |
| Custom              |                          |                    | 2   |
| DATE:               | Wednesday, June 13, 2018 | SH 25 OF 29        |     |

## REGULATOR 2 For PF\_VDD: 1.0V/10A

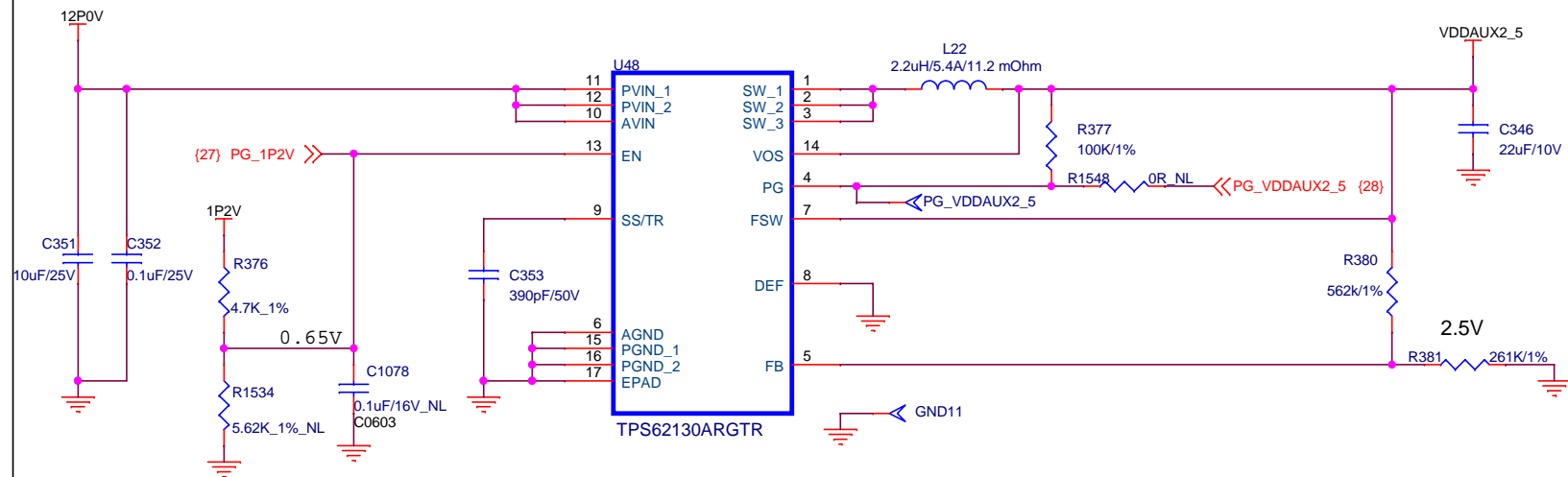


## REGULATOR 4 For PF Bank0,2,7 &amp; DDR4: 1.2V @ 10A

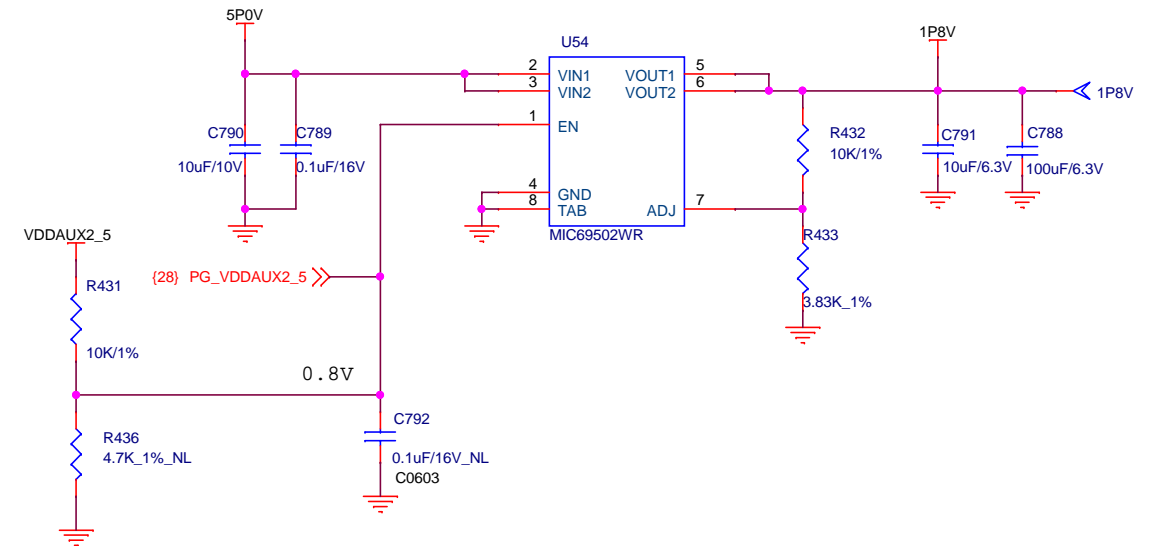


|                                       |                     |                           |                    |
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| POLARFIRE_VIDEO_KIT                   |                     |                           |                    |
| <b>Microsemi</b>                      |                     |                           |                    |
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| <b>DATE:</b> Wednesday, June 13, 2018 |                     |                           | <b>SH 27 OF 29</b> |

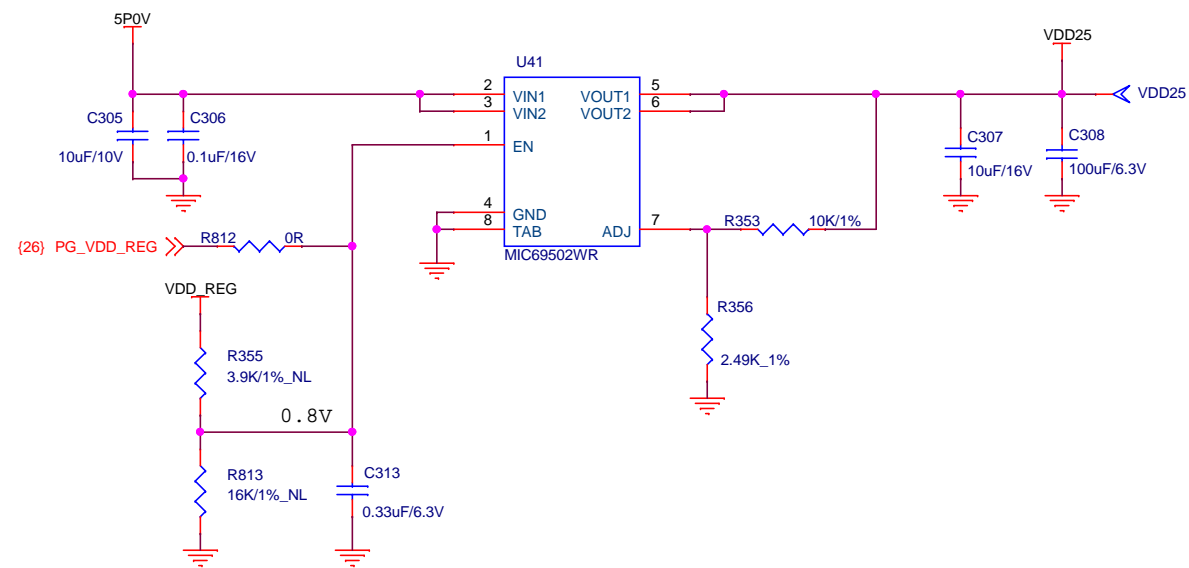
## REGULATOR 5 For PF\_VDDAUX2&5: 2.5 @ 3A



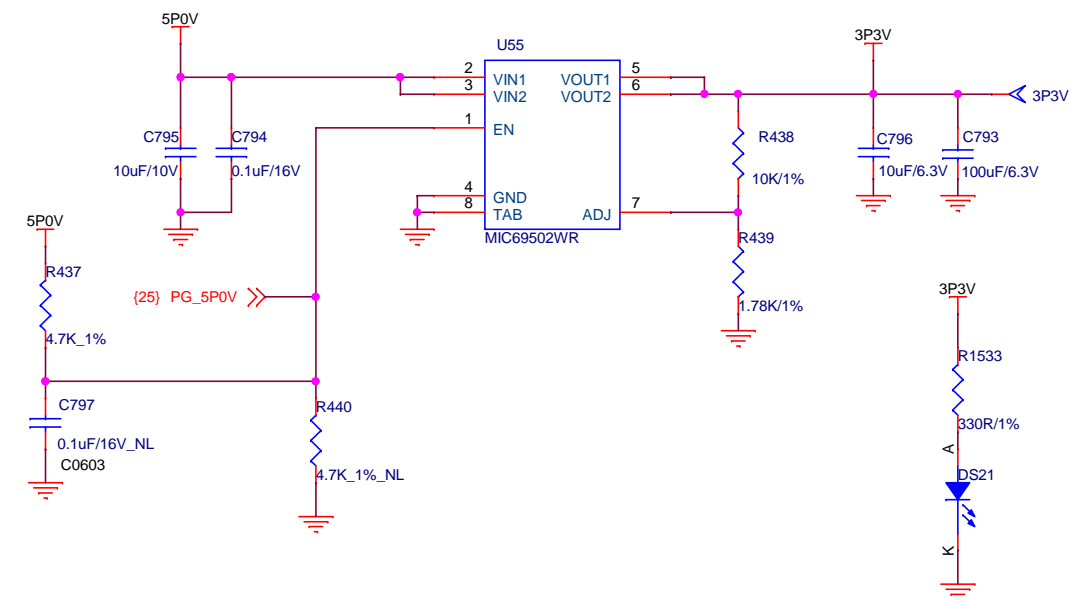
## REGULATOR 7 For VDD18,Bank1: 1.8V @ 5A



## REGULATOR6 For PF\_VDD25, PF\_VDDA25,BANK-5: 2.5V @ 5A



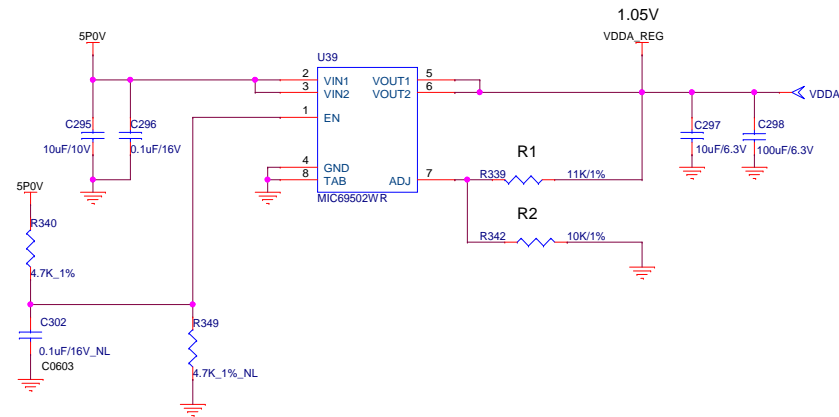
## REGULATOR 8 For HDMI PHY & Peripherals: 3.3V @ 5A



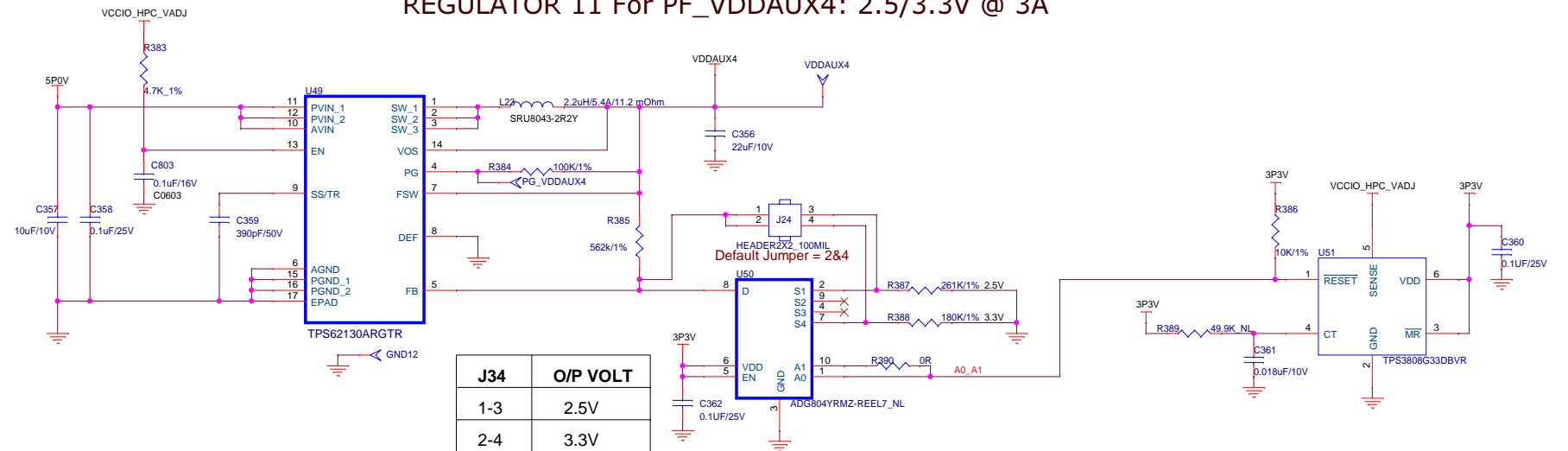
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| TITLE               |                          |                    |          |
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| Microsemi           |                          |                    |          |
| SIZE                | DOCUMENT NO.             | DVP-100-000512-001 | REV      |
| Custom              |                          |                    | 1        |
| DATE:               | Wednesday, June 13, 2018 | SH                 | 28 OF 29 |



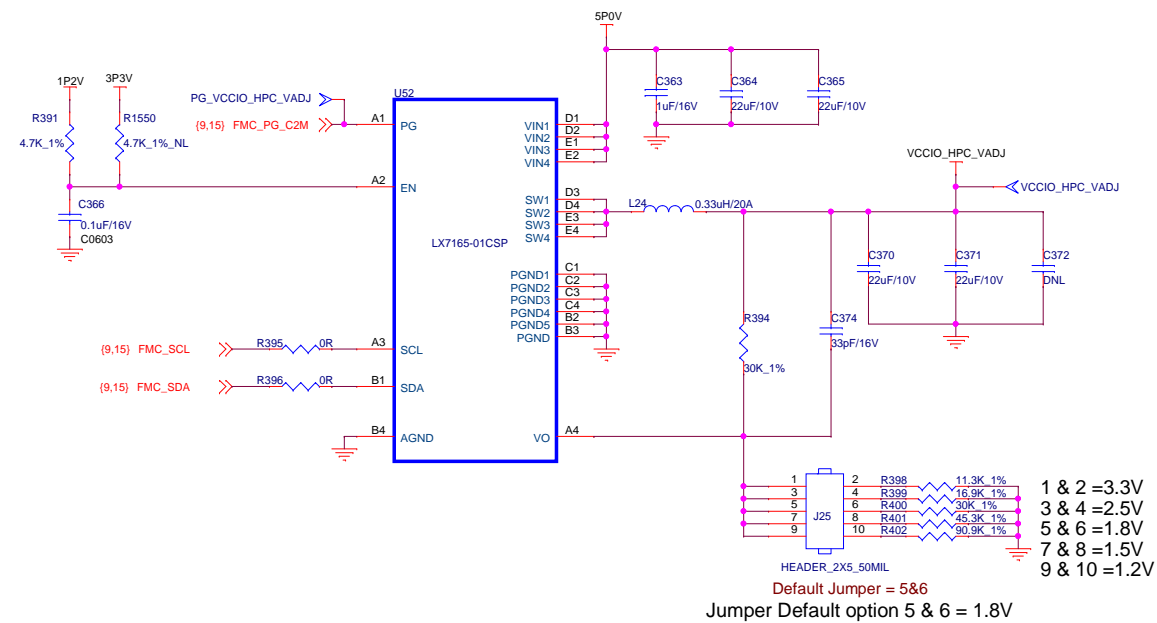
### REGULATOR 9 For PF\_VDDA: 1.05V@ 5A



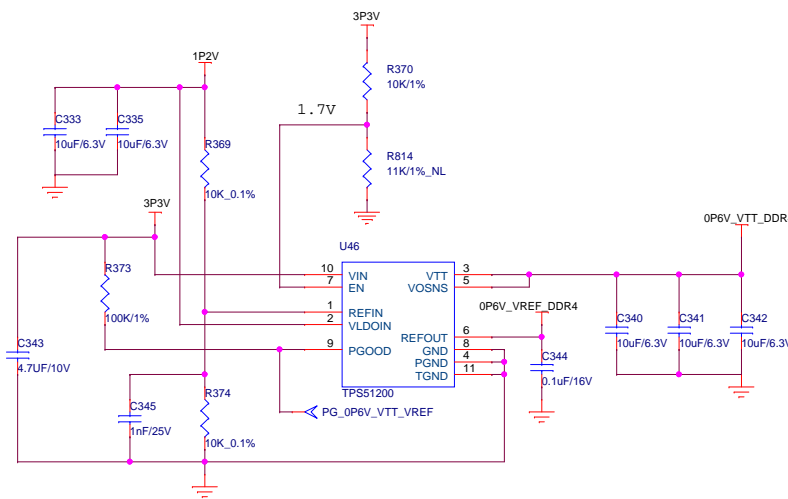
### REGULATOR 11 For PF\_VDDAUX4: 2.5/3.3V @ 3A



### REGULATOR 10 For BANK-4 & HPC FMC: 1.2/1.5/1.8/2.5/3.3V @ 5A



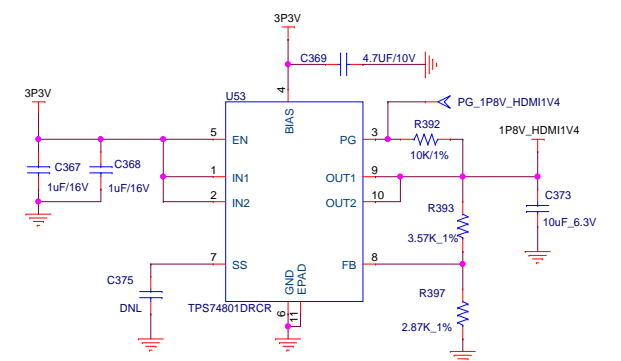
### REGULATOR 13 For VTT & VREF of DDR4: 0.6V



### TEST POINTS FOR GND



### REGULATOR 14 For PF\_Bank6, HDMI1.4 TX 1.8 @ 1.5A



|                                |                                 |       |
|--------------------------------|---------------------------------|-------|
| TITLE POLARFIRE_VIDEO_KIT      |                                 |       |
| Microsemi                      |                                 |       |
| SIZE Custom                    | DOCUMENT NO. DVP-100-000512-001 | REV 1 |
| DATE: Wednesday, June 13, 2018 | SH 29                           | OF 29 |