

POLARFIRE EVAL KIT

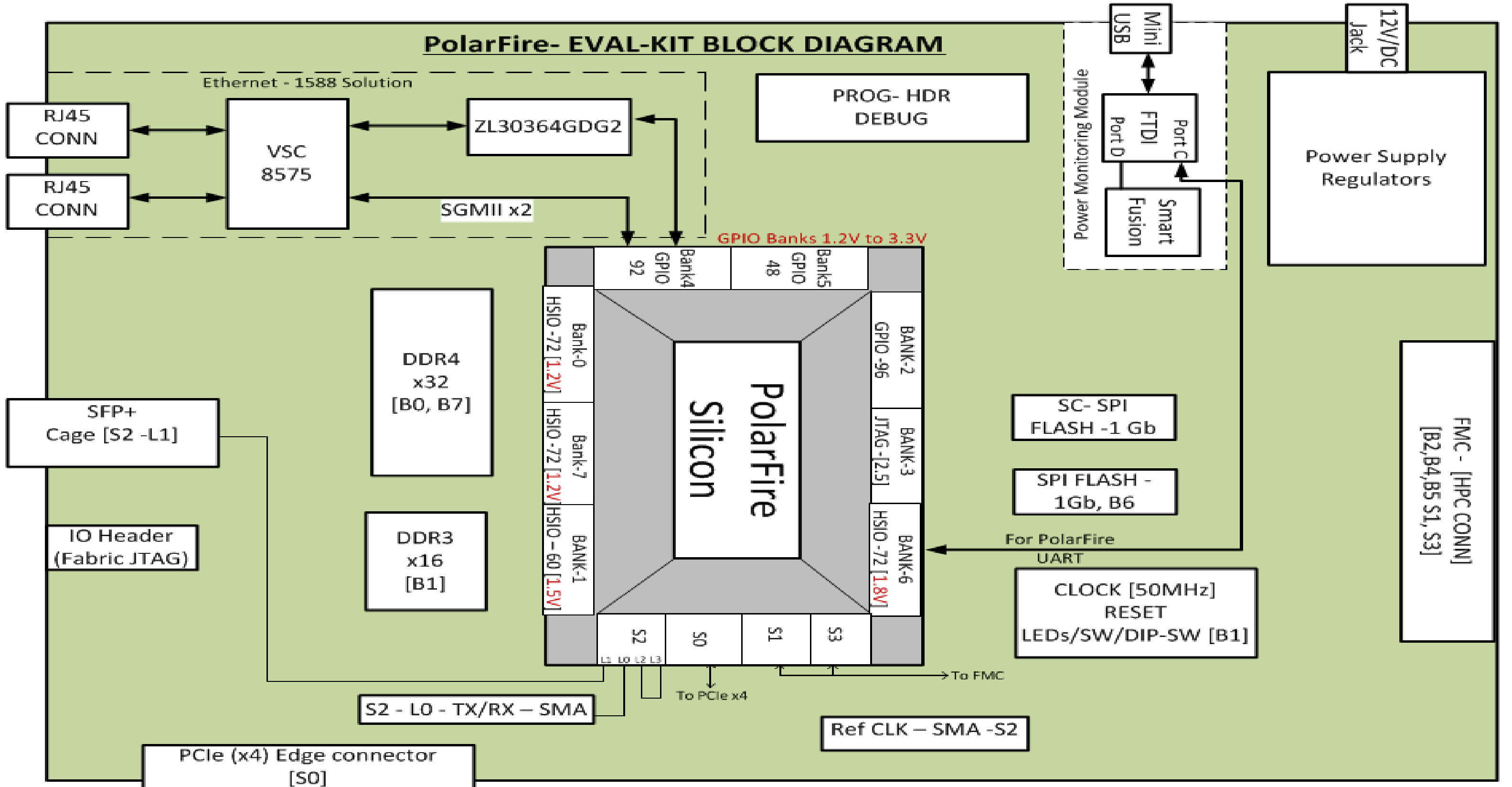
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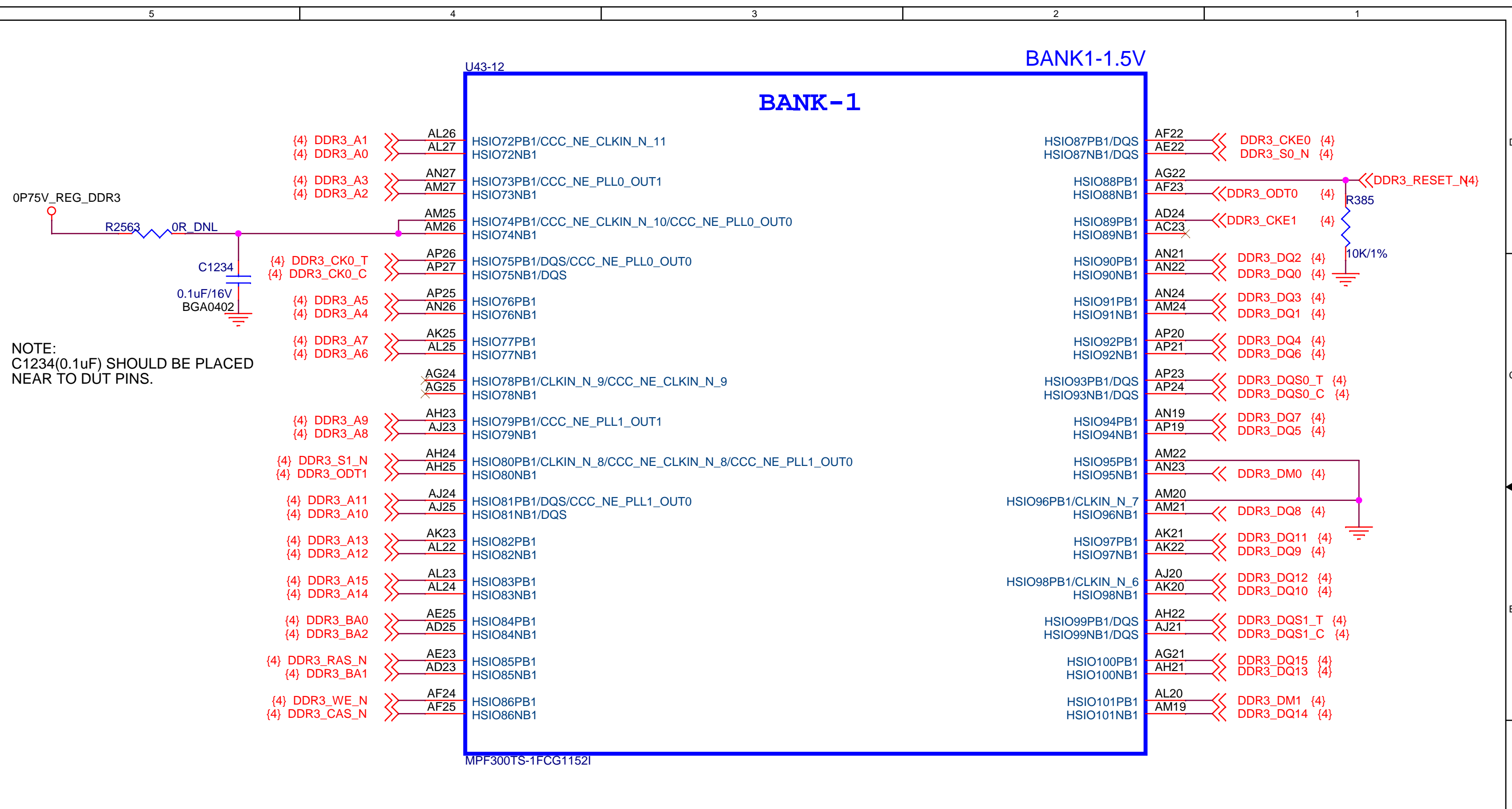
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Rev	Part Number:		
D	MICROSEMI	DVP-100-000481-001	PACTRON: 305-PD-17-0215
Originator:		GHURU KUMARAVELU	
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BLOCK DIAGRAM

PolarFire- EVAL-KIT BLOCK DIAGRAM



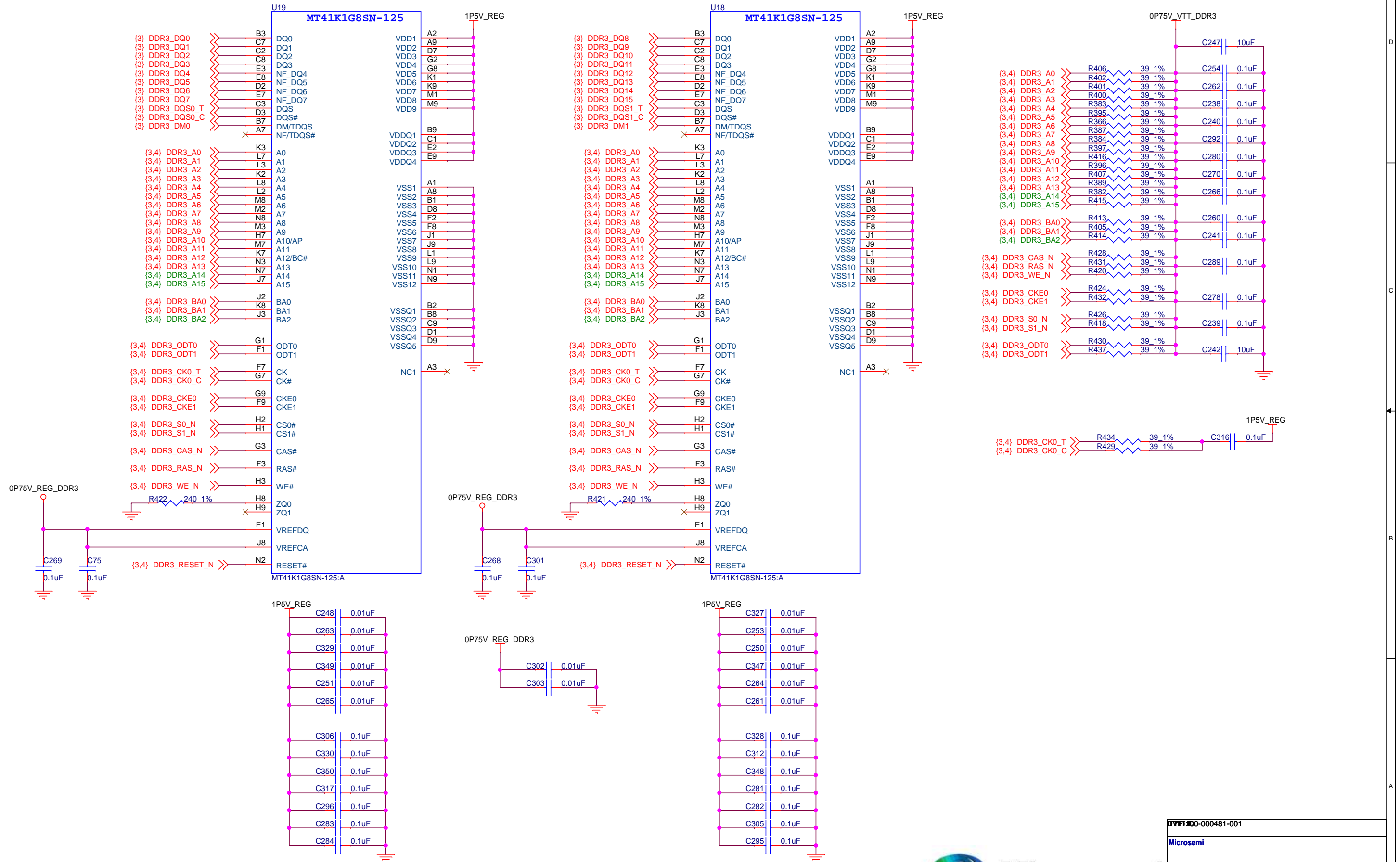
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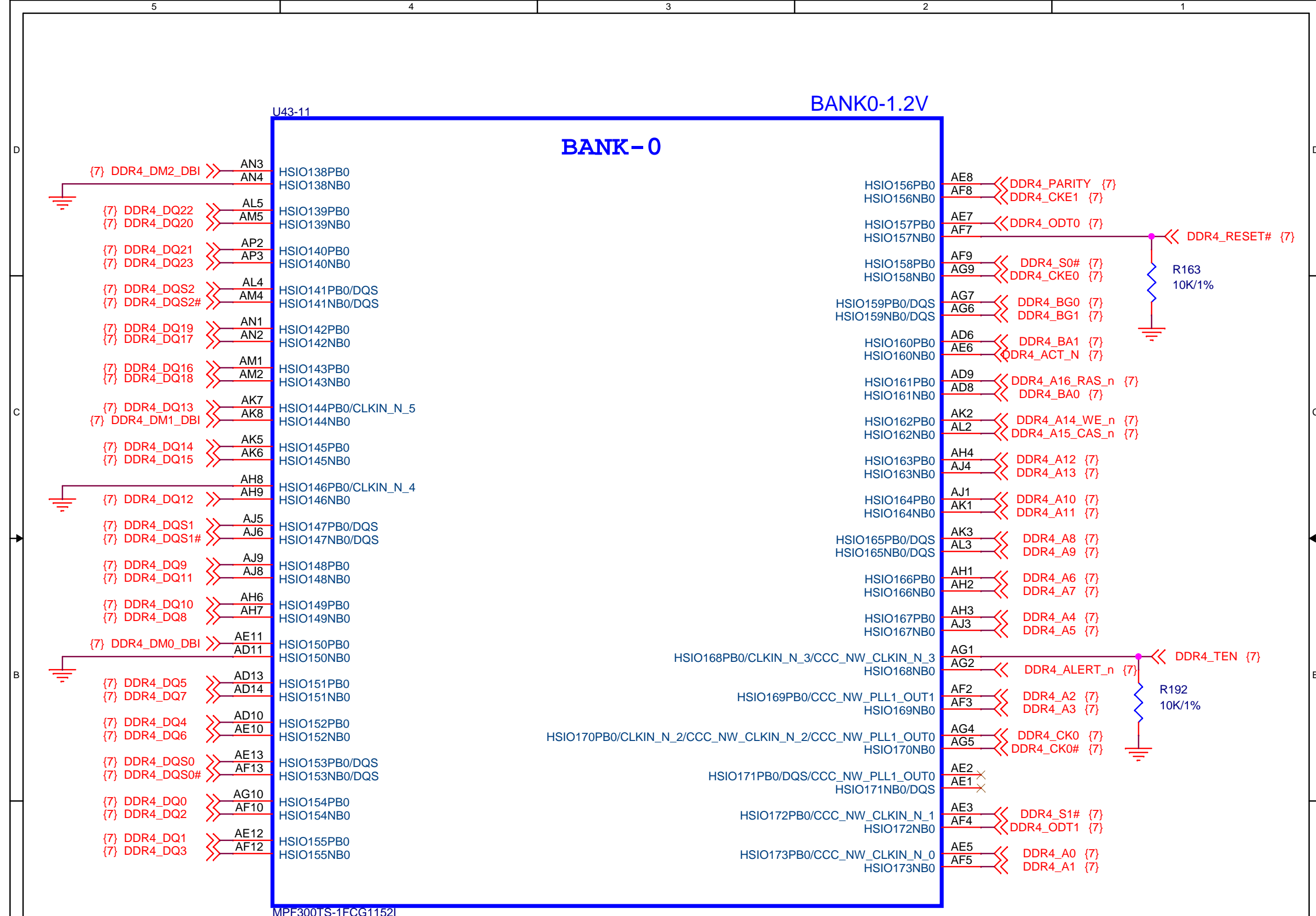
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DDR3 MEMORY-BANK1

VTT TERMINATION



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BANK-0

BANK0-1.2V

U43-11

MPF3001S-1FCG1152I

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OP6V_REG_DDR4

R2564 OR_DNL

C1236

0.1uF/16V

NOTE:
C1236(0.1uF) SHOULD BE PLACED
NEAR TO DUT PINS.

U43-17

BANK-7

BANK7-1.2V

AN18 AP18 HSIO102PB7
HSIO102NB7

AL17 AM16 HSIO103PB7
HSIO103NB7

AN16 AP16 HSIO104PB7
HSIO104NB7

AL18 AL19 HSIO105PB7/DQS
HSIO105NB7/DQS

AM17 AN17 HSIO106PB7
HSIO106NB7

AK17 AK18 HSIO107PB7
HSIO107NB7

AN14 AP15 HSIO108PB7
HSIO108NB7

AP13 AP14 HSIO109PB7
HSIO109NB7

AM14 AM15 HSIO110PB7
HSIO110NB7

AN12 AN13 HSIO111PB7/DQS
HSIO111NB7/DQS

AL13 AM12 HSIO112PB7
HSIO112NB7

AL15 AL14 HSIO113PB7
HSIO113NB7

AD21 AE21 HSIO114PB7
HSIO114NB7

AF19 AF18 HSIO115PB7
HSIO115NB7

AE20 AD20 HSIO116PB7
HSIO116NB7

AD18 AE18 HSIO117PB7/DQS
HSIO117NB7/DQS

AF20 AG20 HSIO118PB7
HSIO118NB7

AC18 AD19 HSIO119PB7
HSIO119NB7

HSIO120PB7 AP10
HSIO120NB7 AP11

HSIO121PB7 AN9
HSIO121NB7 AP9

HSIO122PB7 AK11
HSIO122NB7 AL12

HSIO123PB7/DQS AM11
HSIO123NB7/DQS AN11

HSIO124PB7 AM9
HSIO124NB7 AM10

HSIO125PB7 AK10
HSIO125NB7 AL10

HSIO126PB7 AF17
HSIO126NB7 AG16

HSIO127PB7 AD17
HSIO127NB7 AE17

HSIO128PB7 AF15
HSIO128NB7 AG15

HSIO129PB7/DQS AE16
HSIO129NB7/DQS AD16

HSIO130PB7 AF14
HSIO130NB7 AG14

HSIO131PB7 AD15
HSIO131NB7 AE15

HSIO132PB7 AK13
HSIO132NB7 AK12

HSIO133PB7 AJ14
HSIO133NB7 AJ13

HSIO134PB7 AJ10
HSIO134NB7 AJ11

HSIO135PB7/DQS AH14
HSIO135NB7/DQS AH13

HSIO136PB7 AG12
HSIO136NB7 AH12

HSIO137PB7 AG11
HSIO137NB7 AH11

HPC_CLK3_BIDIR_P_B7 {9}
HPC_CLK3_BIDIR_N_B7 {9}

DDR4_DM3_DBI {7}

DDR4_DQ29 {7}
DDR4_DQ31 {7}

DDR4_DQ28 {7}
DDR4_DQ30 {7}

DDR4_DQS3 {7}
DDR4_DQS3# {7}

DDR4_DQ25 {7}
DDR4_DQ27 {7}

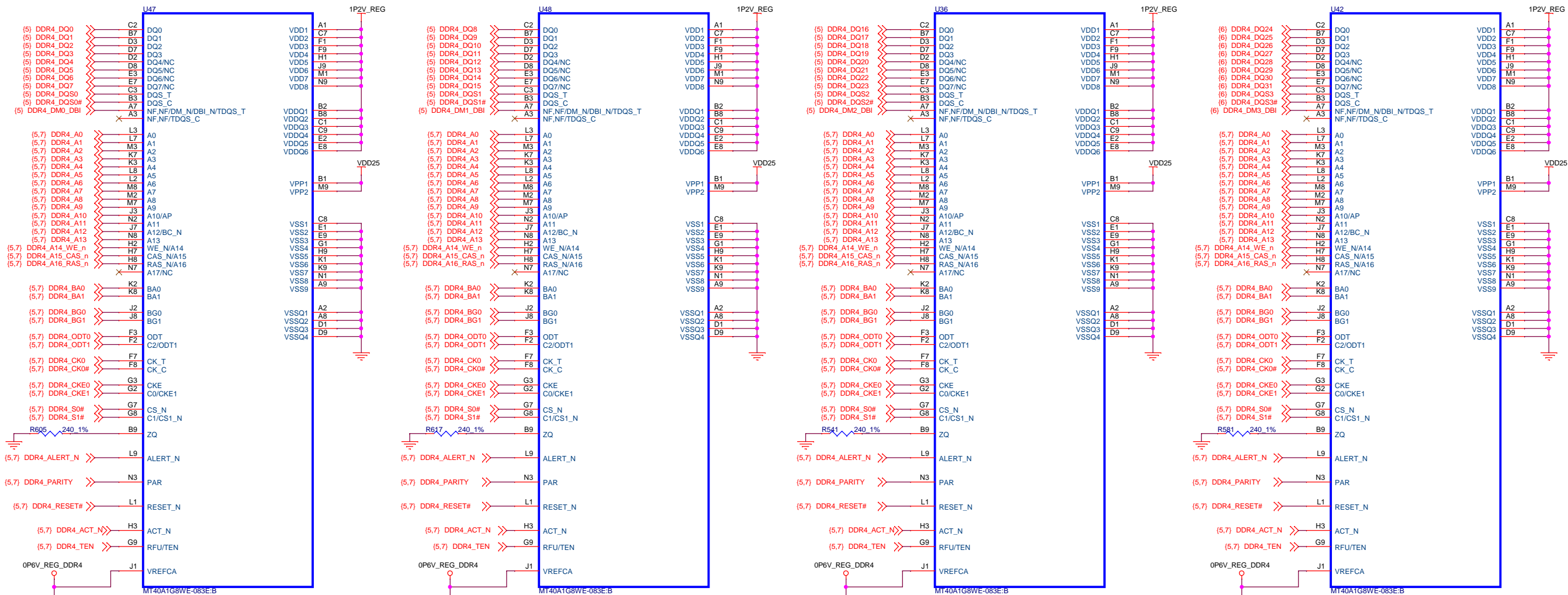
DDR4_DQ26 {7}
DDR4_DQ24 {7}

MPF300TS-1FCG1152I

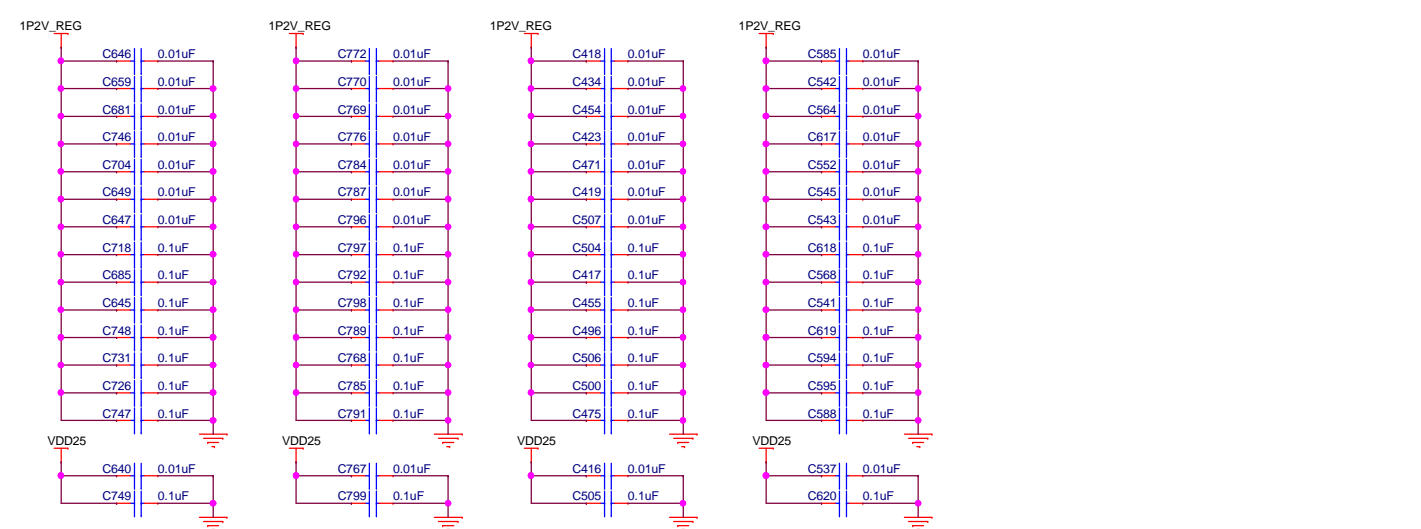
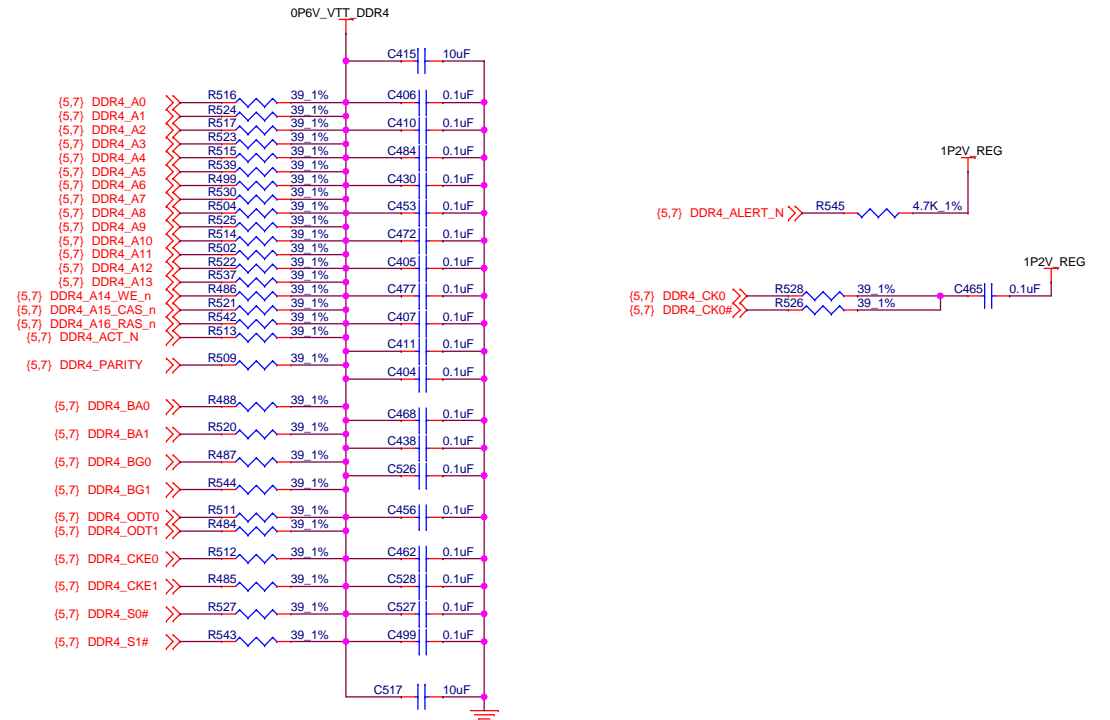
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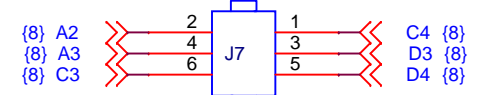
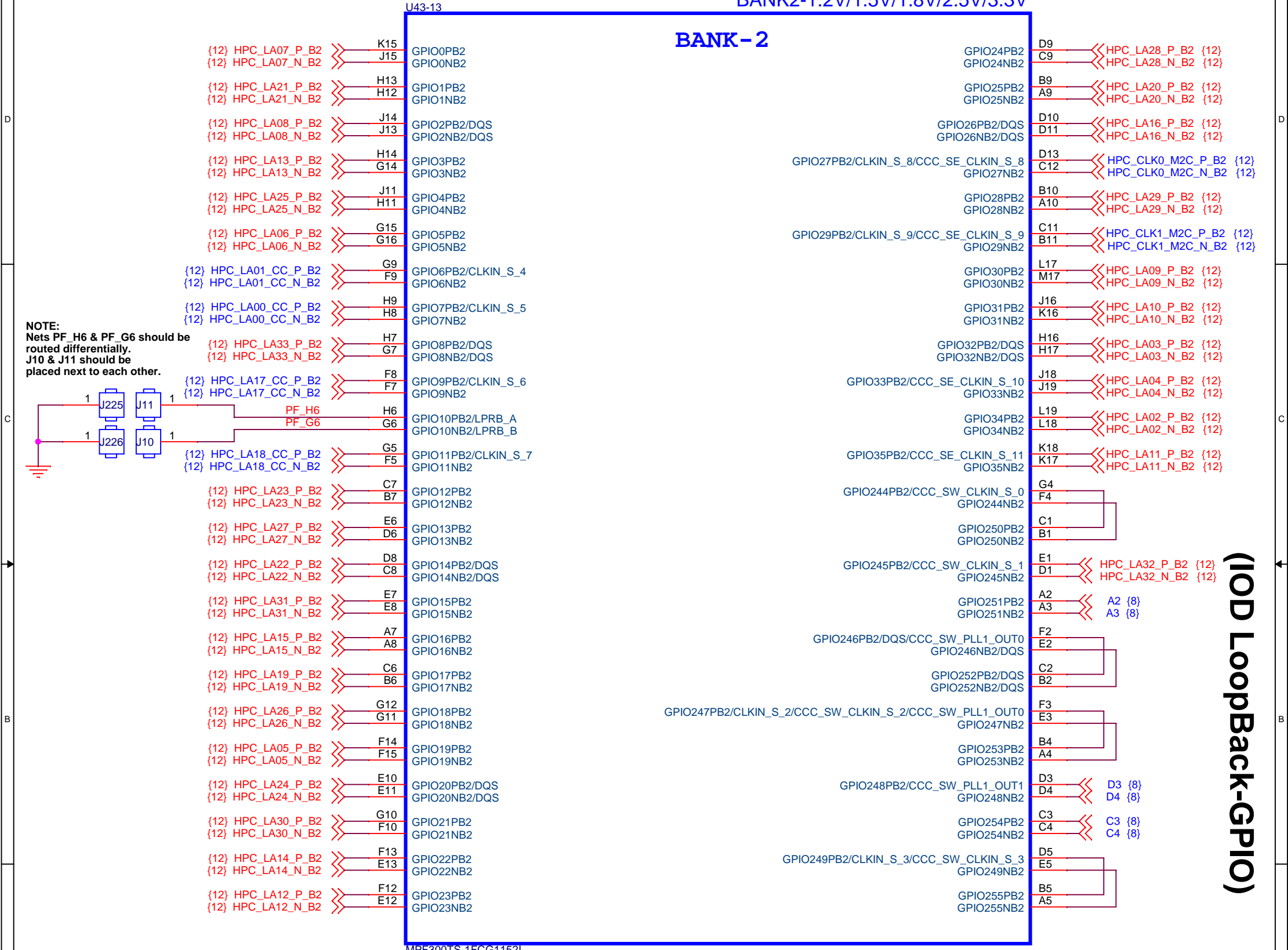
DDR4 MEMORY-BANK0&7



VTT TERMINATION



BANK-2



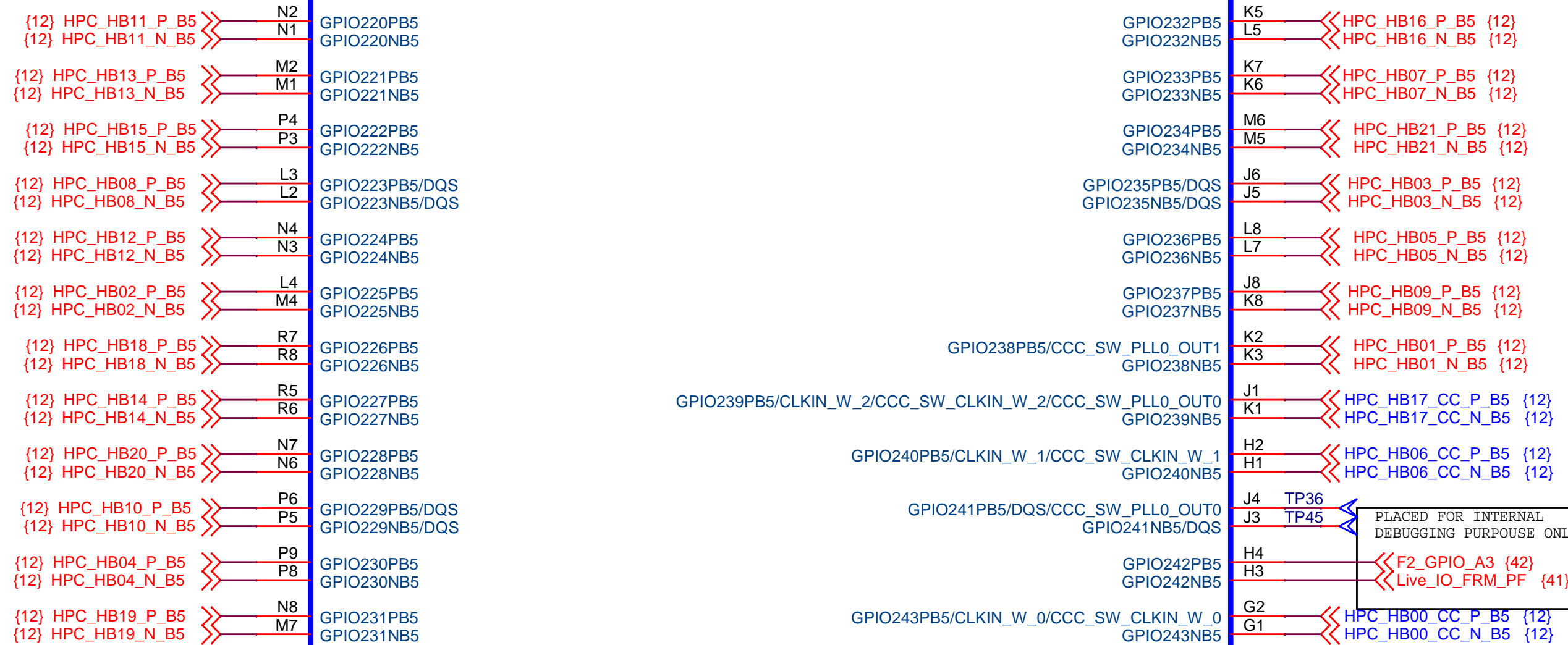
HEADER 3X2

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BANK5-1.2V/1.5V/1.8V/2.5V/3.3V

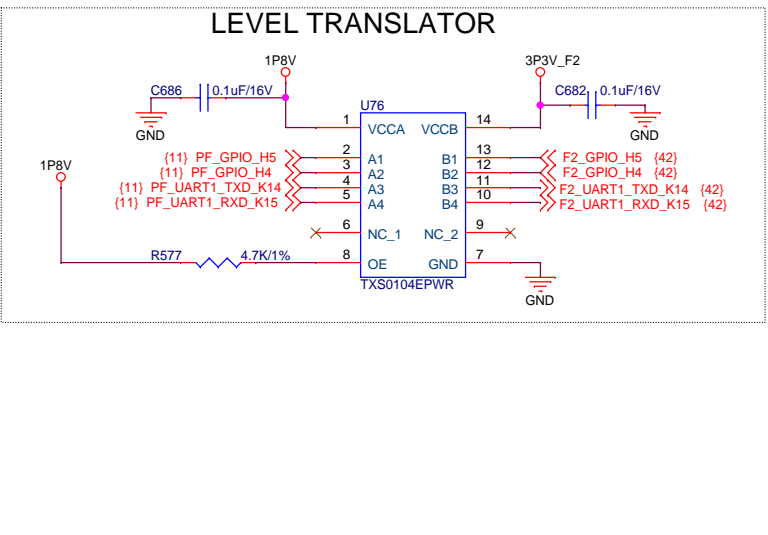
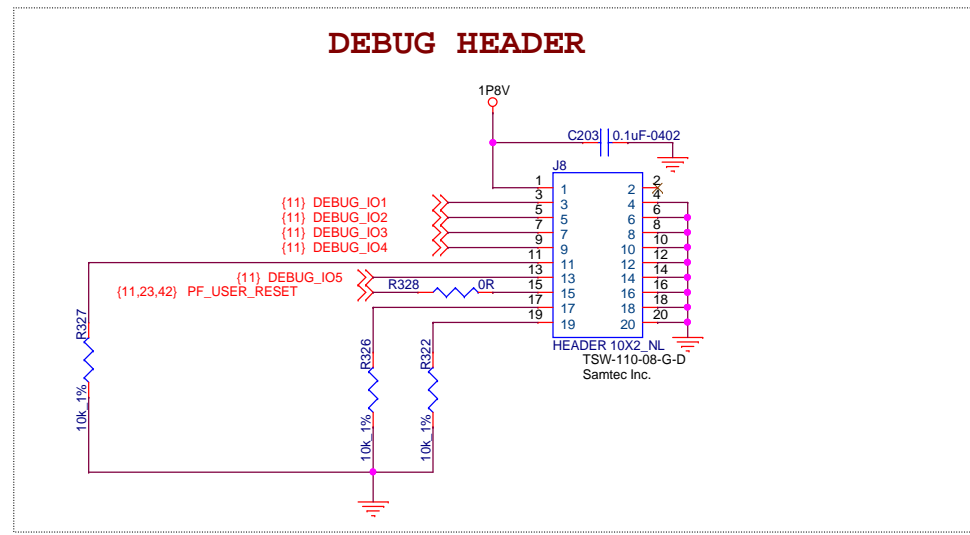
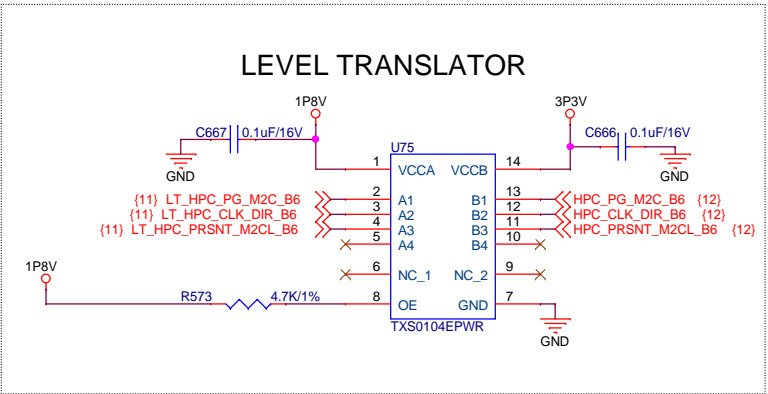
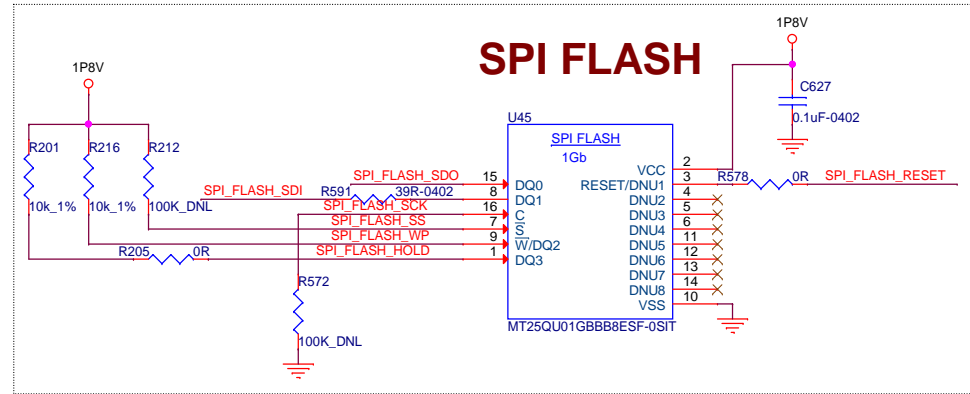
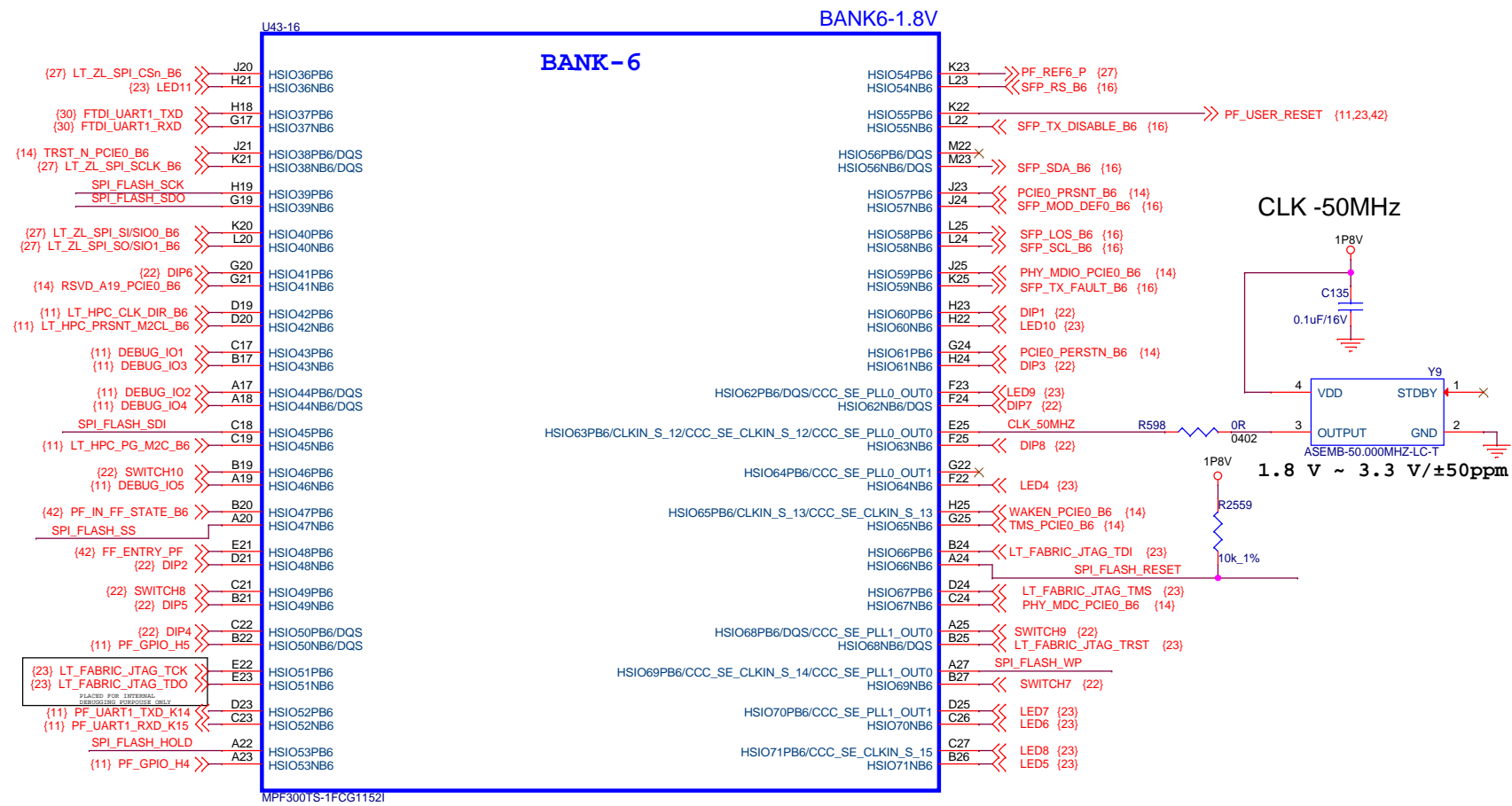
BANK-5



PLACED FOR INTERNAL
DEBUGGING PURPOSE ONLY

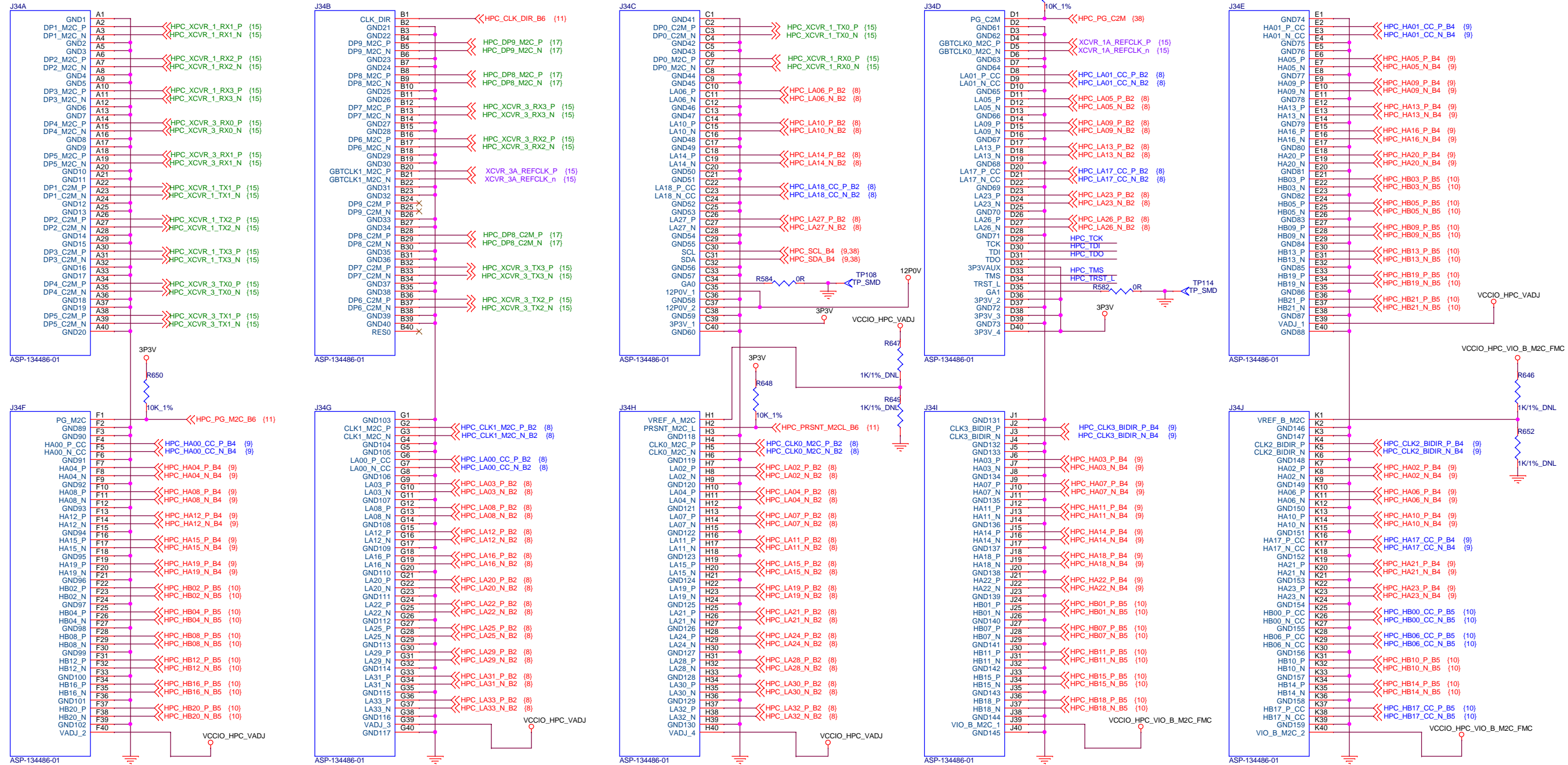


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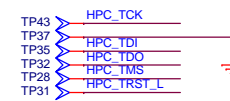
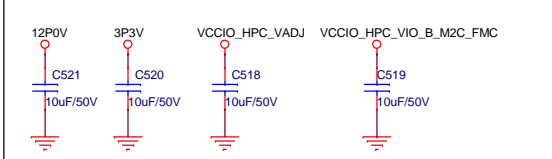


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FMC CONNECTOR(HPC)



DECOUPLING CAPACITORS



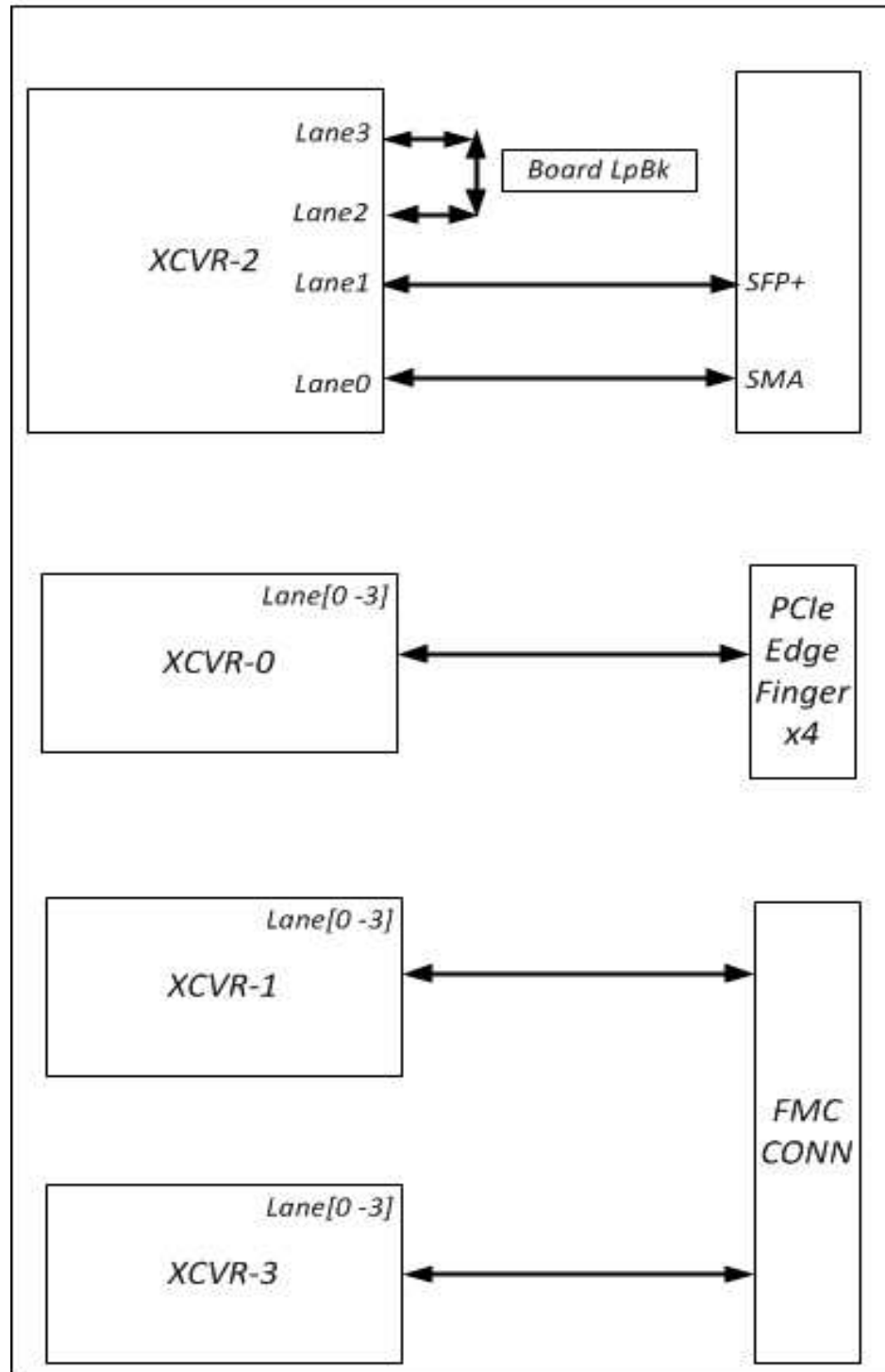
- NOTE:**
- 1.FMC HPC LA ,HA and HB bank IO's support maximum of 3.3V.
 - 2.The Supporting Voltages of FMC HPC(VCCIO_HPC_VADJ) are 1.2V,1.5V,1.8V, 2.5V and 3.3V.

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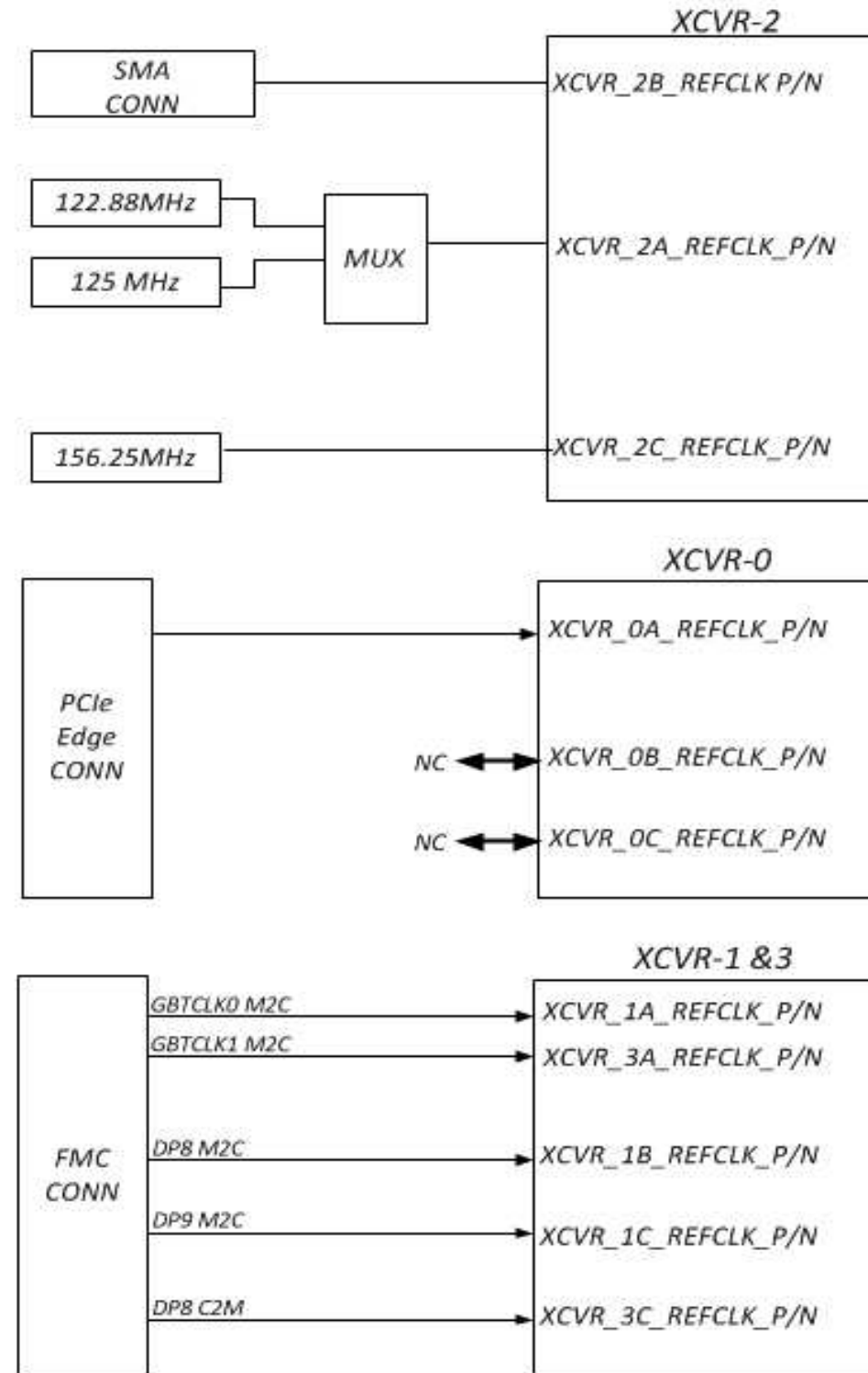


TRANSCEIVER BLOCK DIAGRAM

Transceiver Block Allocations

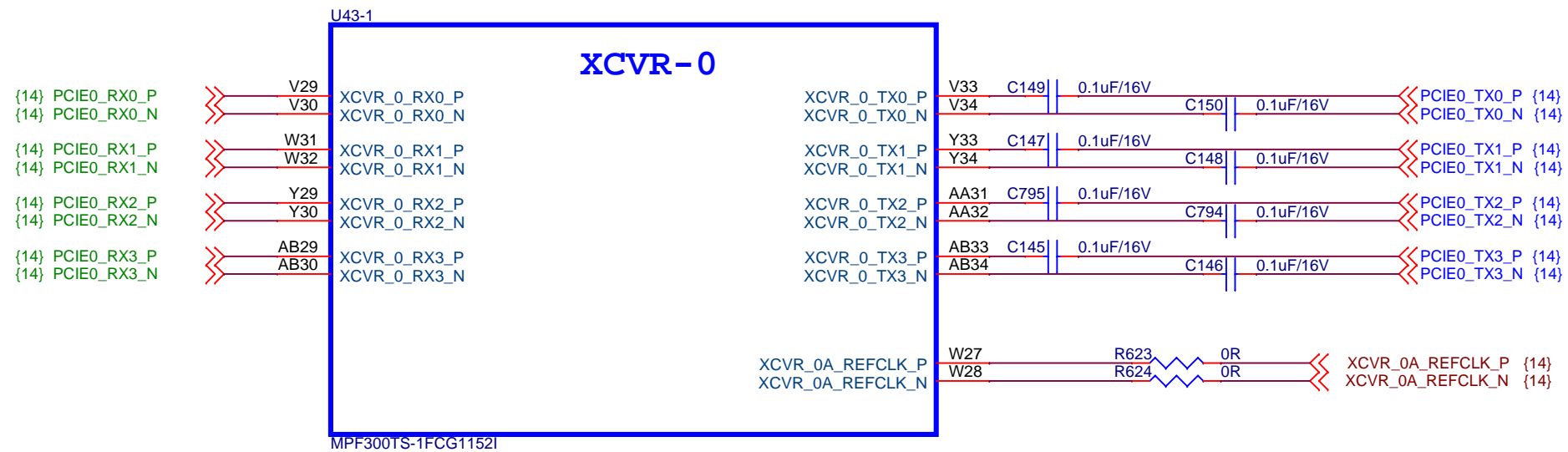


Transceiver Blocks clock scheme

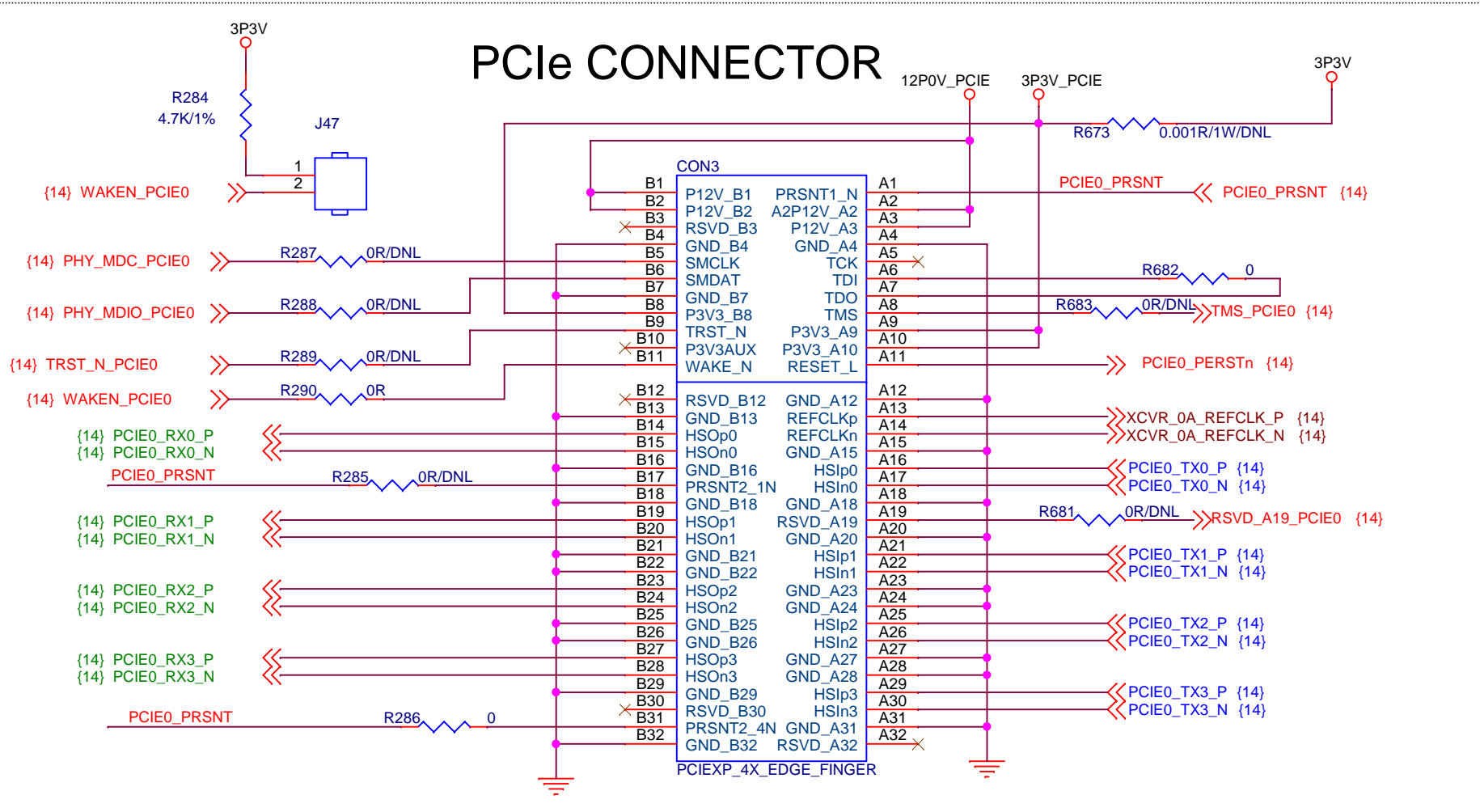


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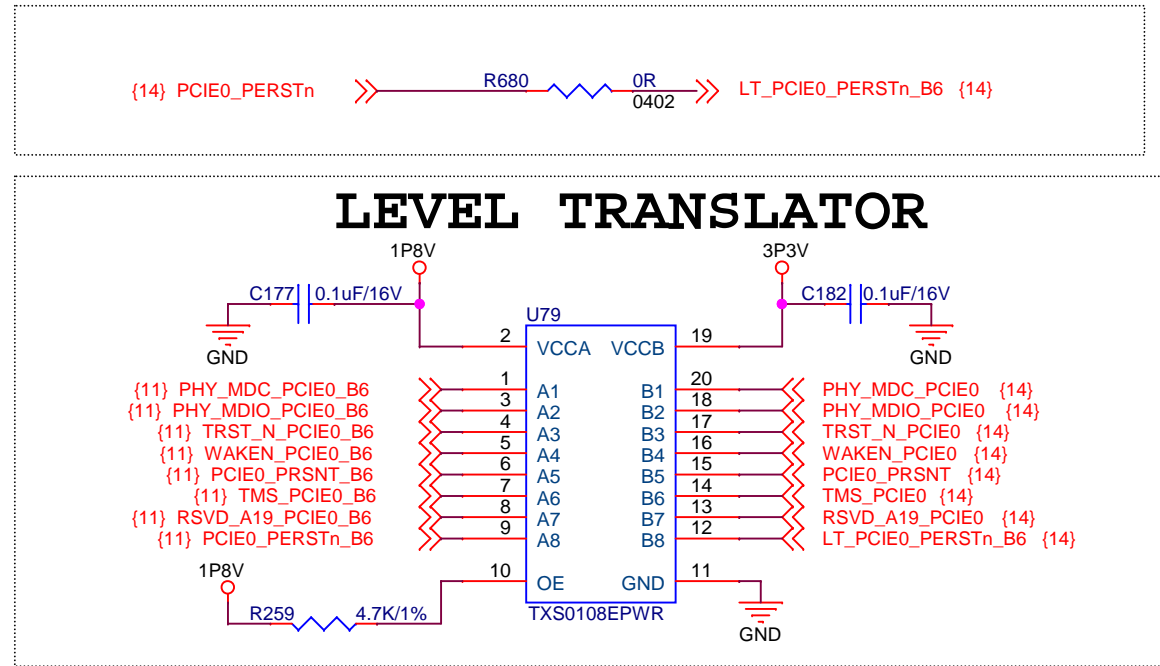
TRANSCEIVER 0



PCIe CONNECTOR

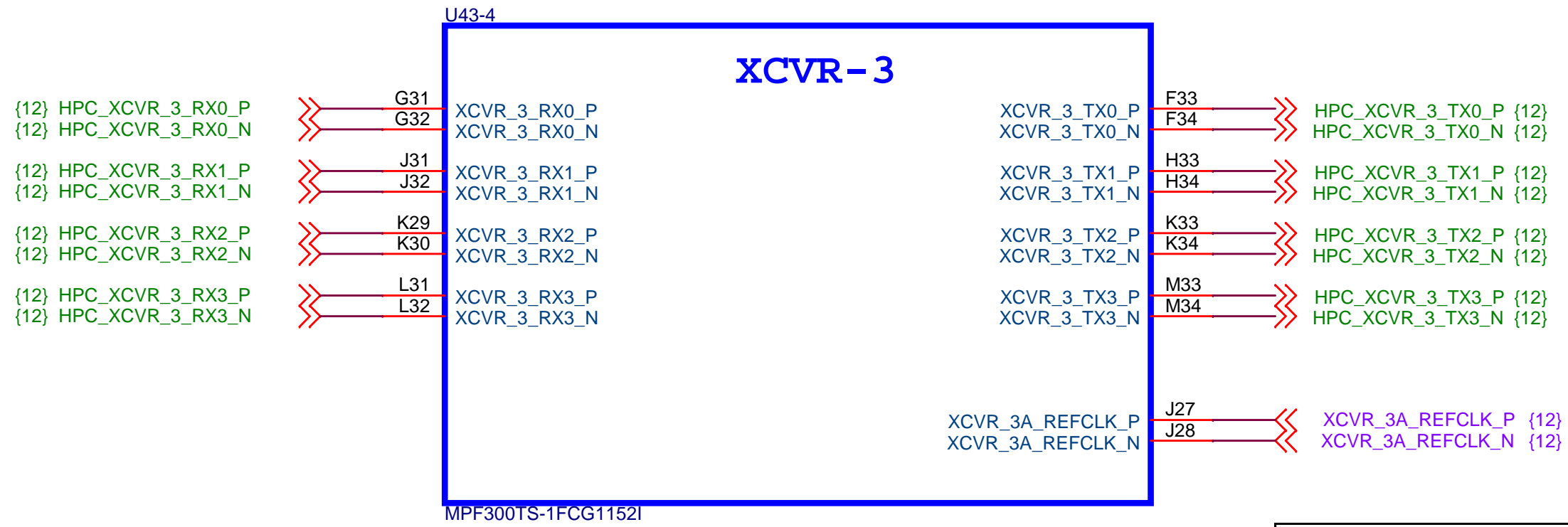
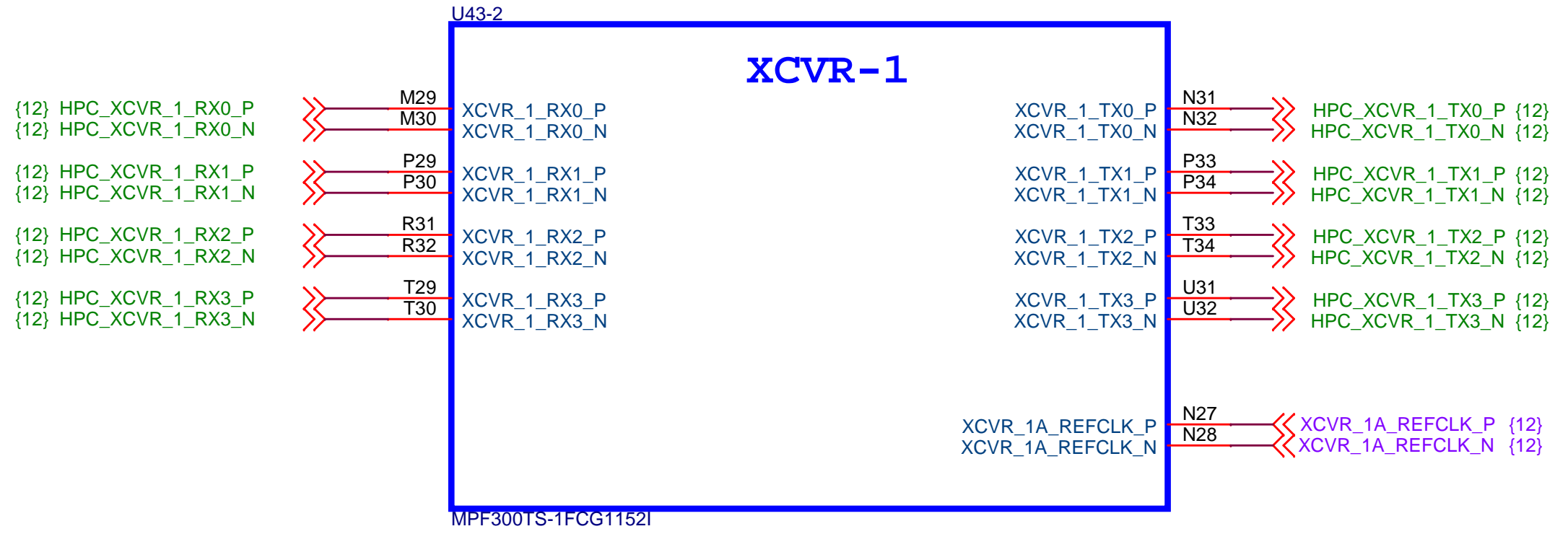


LEVEL TRANSLATOR



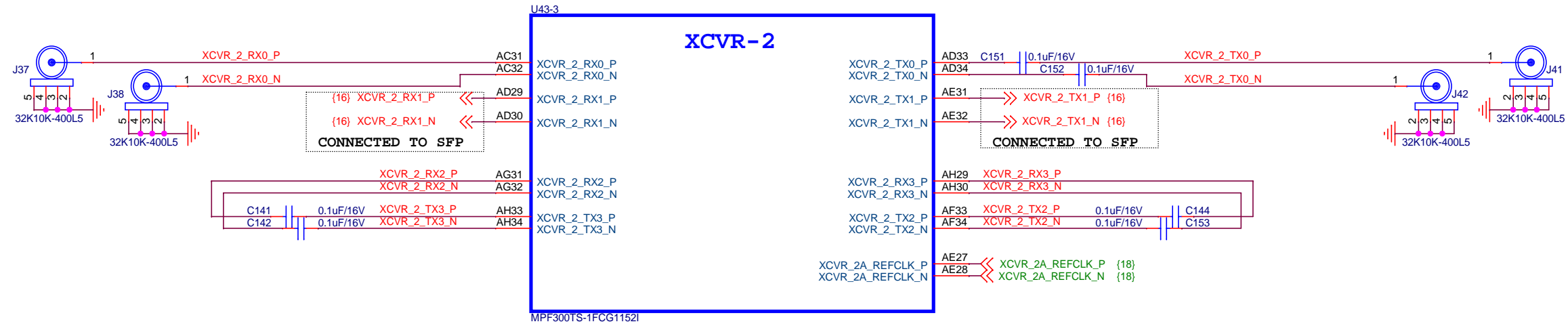
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TRANSCEIVER-1 & TRANSCEIVER-3

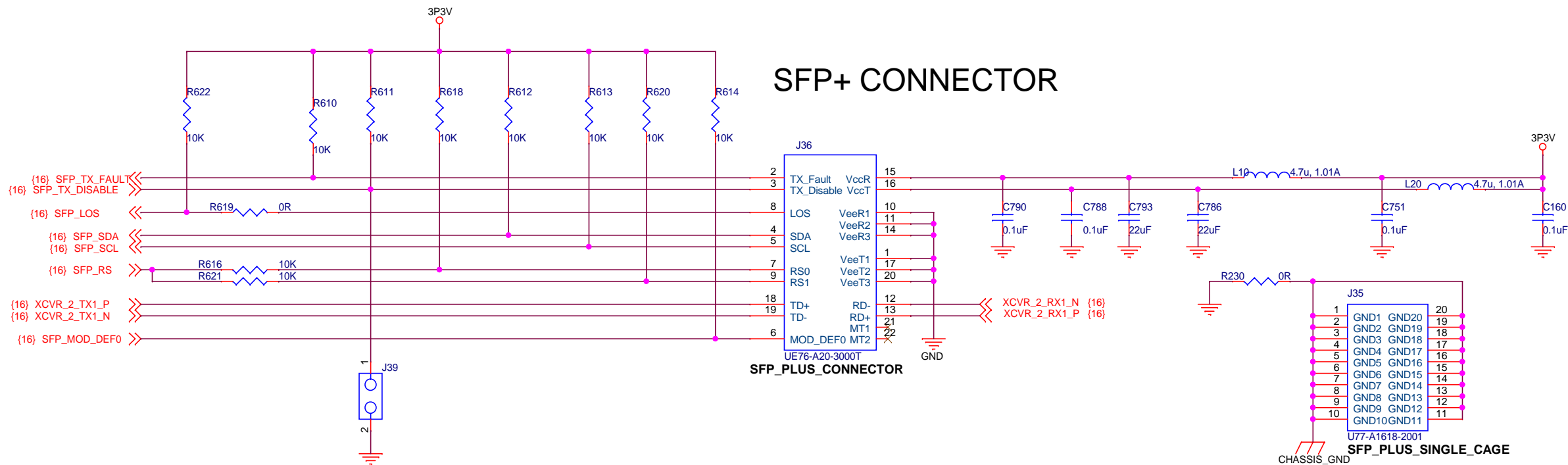


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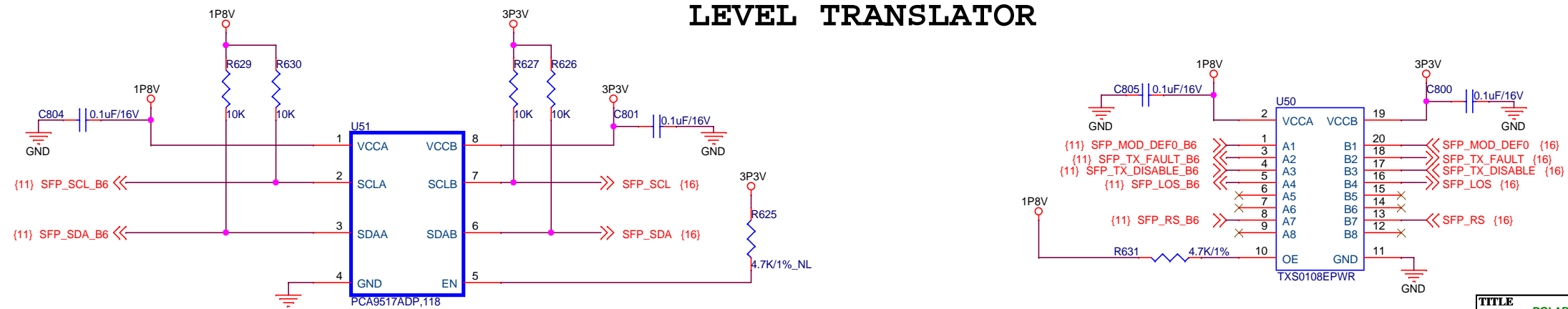
TRANSCEIVER 2



SFP+ CONNECTOR



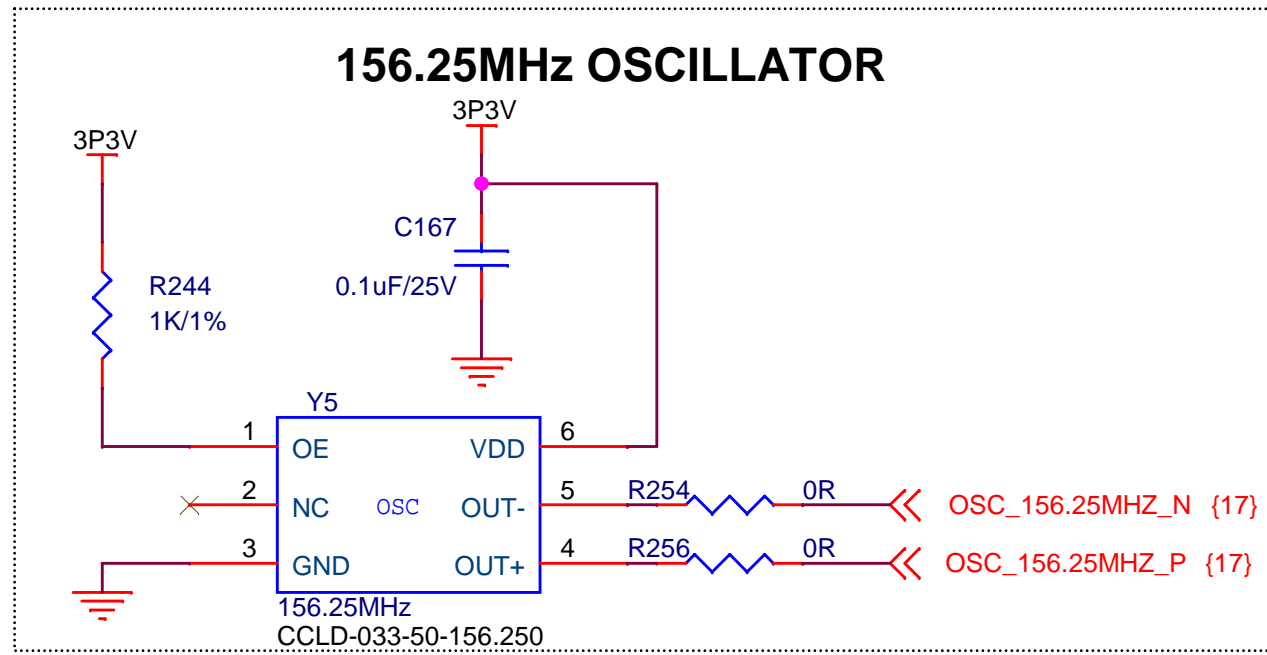
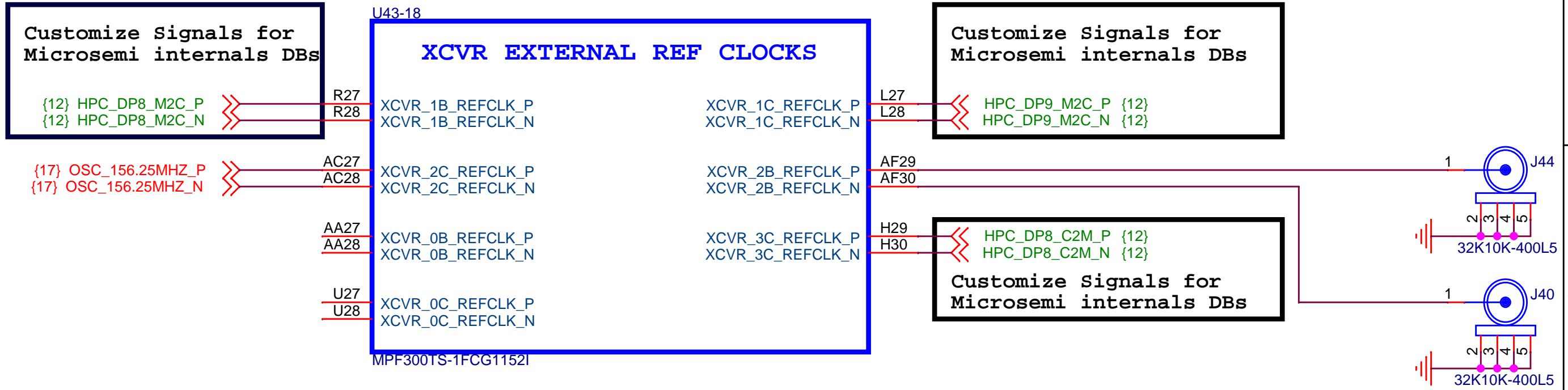
LEVEL TRANSLATOR



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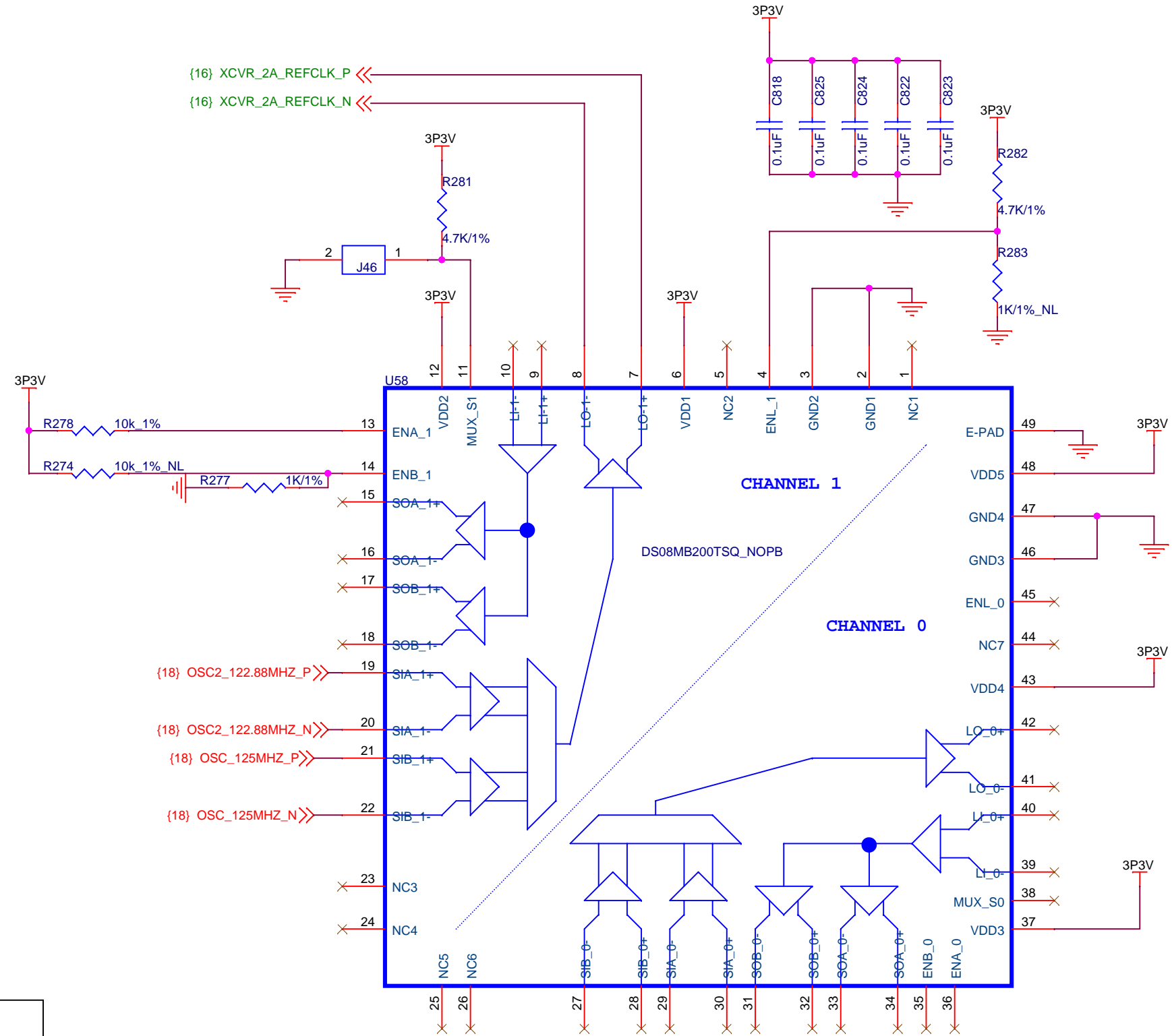
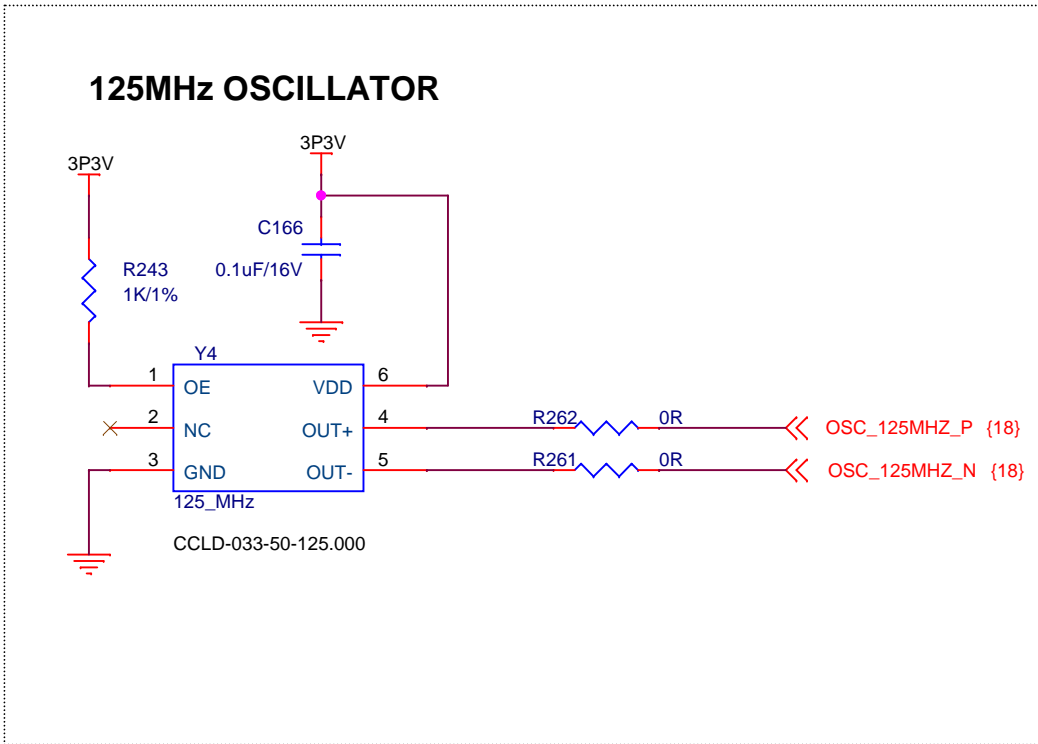
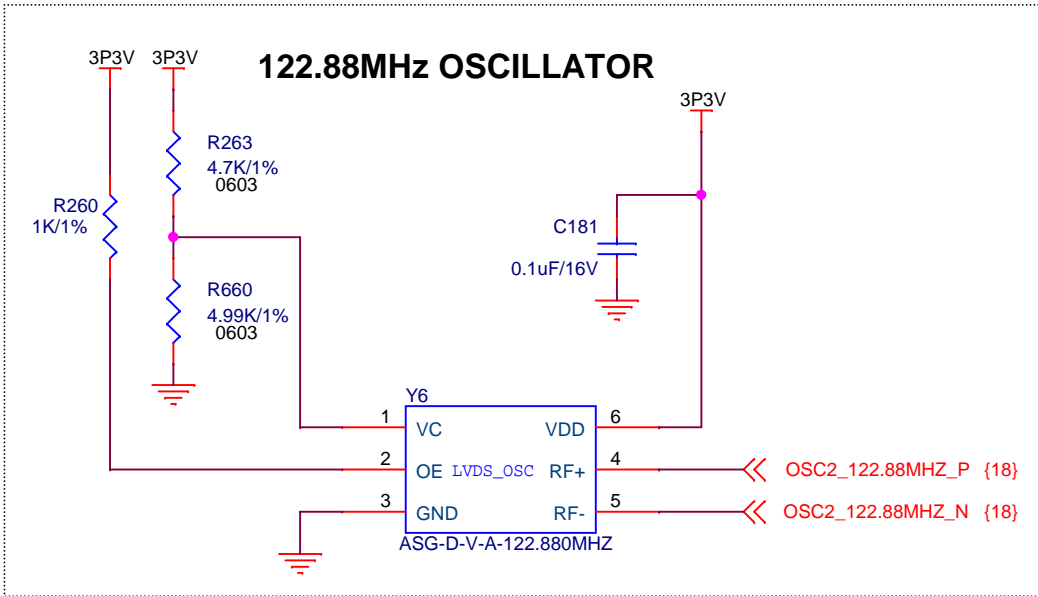
TRANSCEIVER EXTERNAL REF CLOCKS



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TRANSCEIVER REF CLOCKS



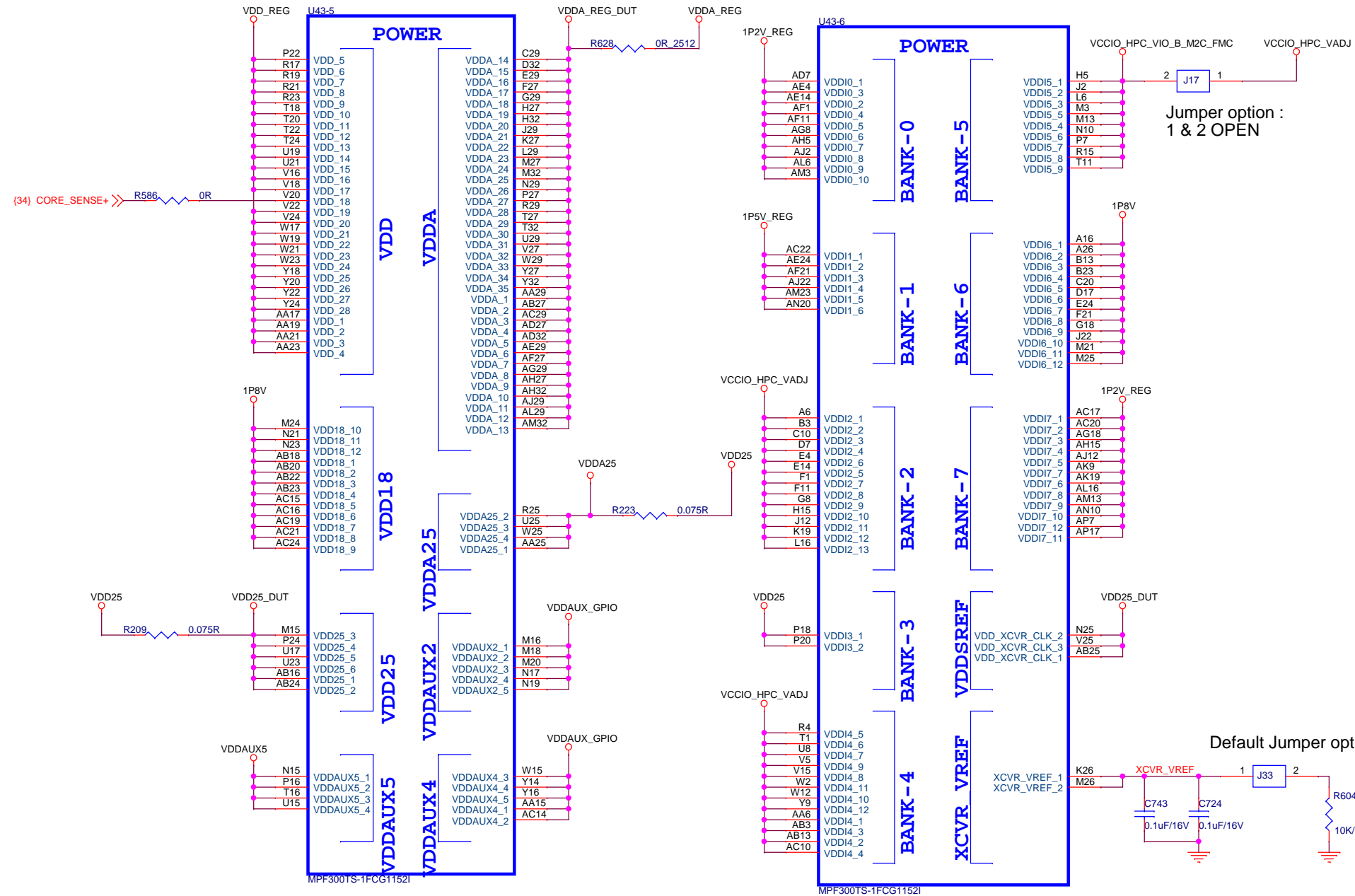
CHANNEL1

ENL1	MUX S1-J46	XCVR_2A_INT_REFCLK
L	X	X
H	L	Osc-125MHz
H	H	Osc2-122.88MHz

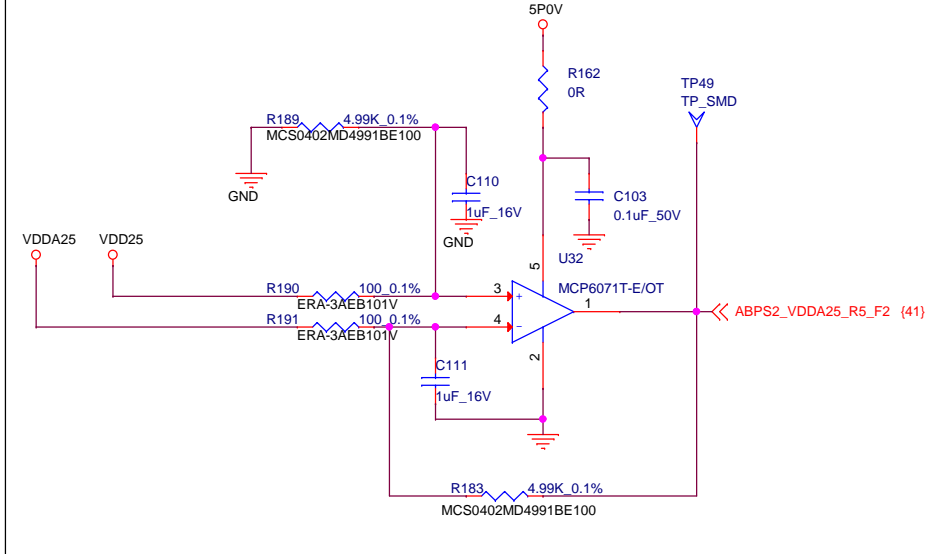


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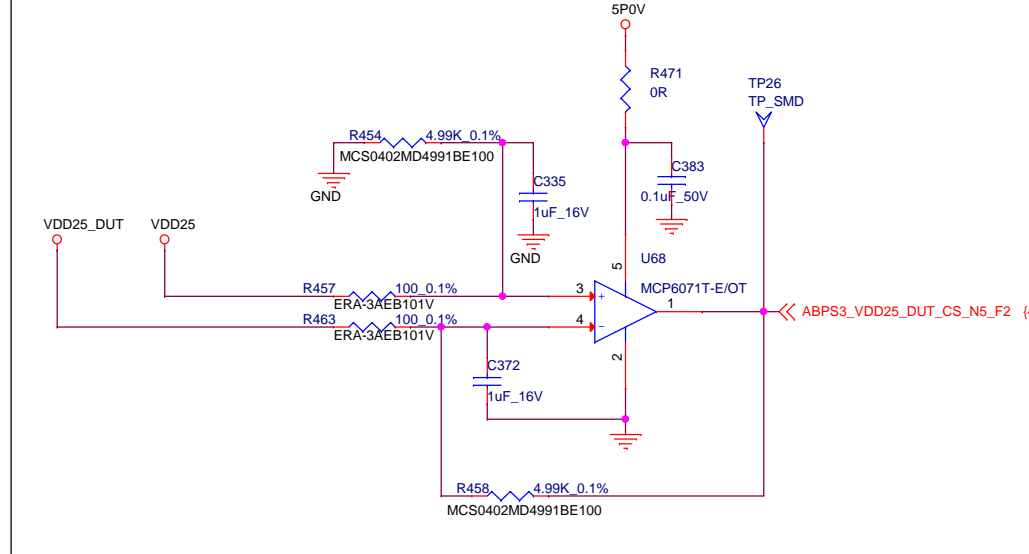
POWER CONNECTIONS



VDDA25 CURRENT SENSE CIRCUIT

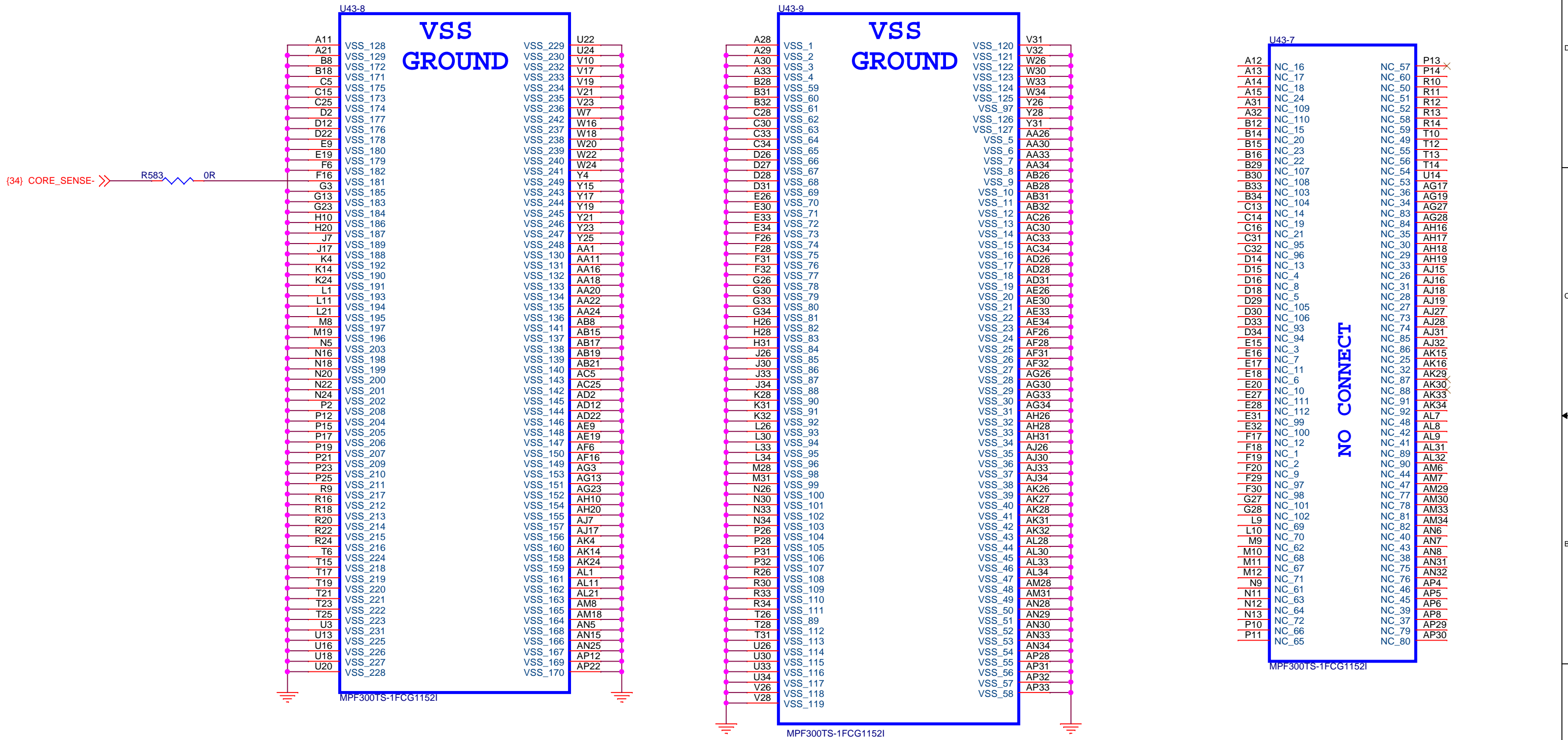


VDD25 CURRENT SENSE CIRCUIT



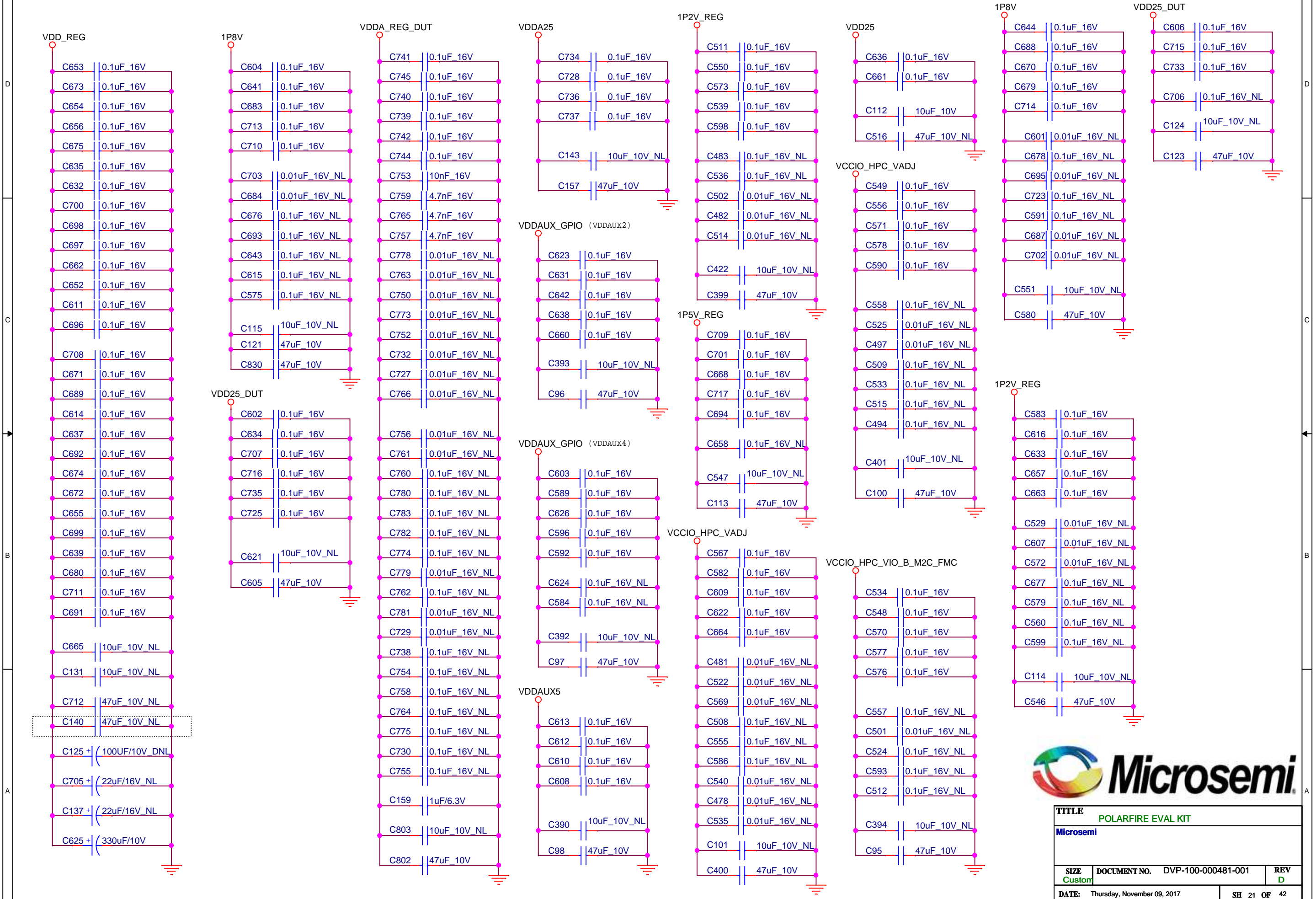
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GROUND & NC CONNECTION



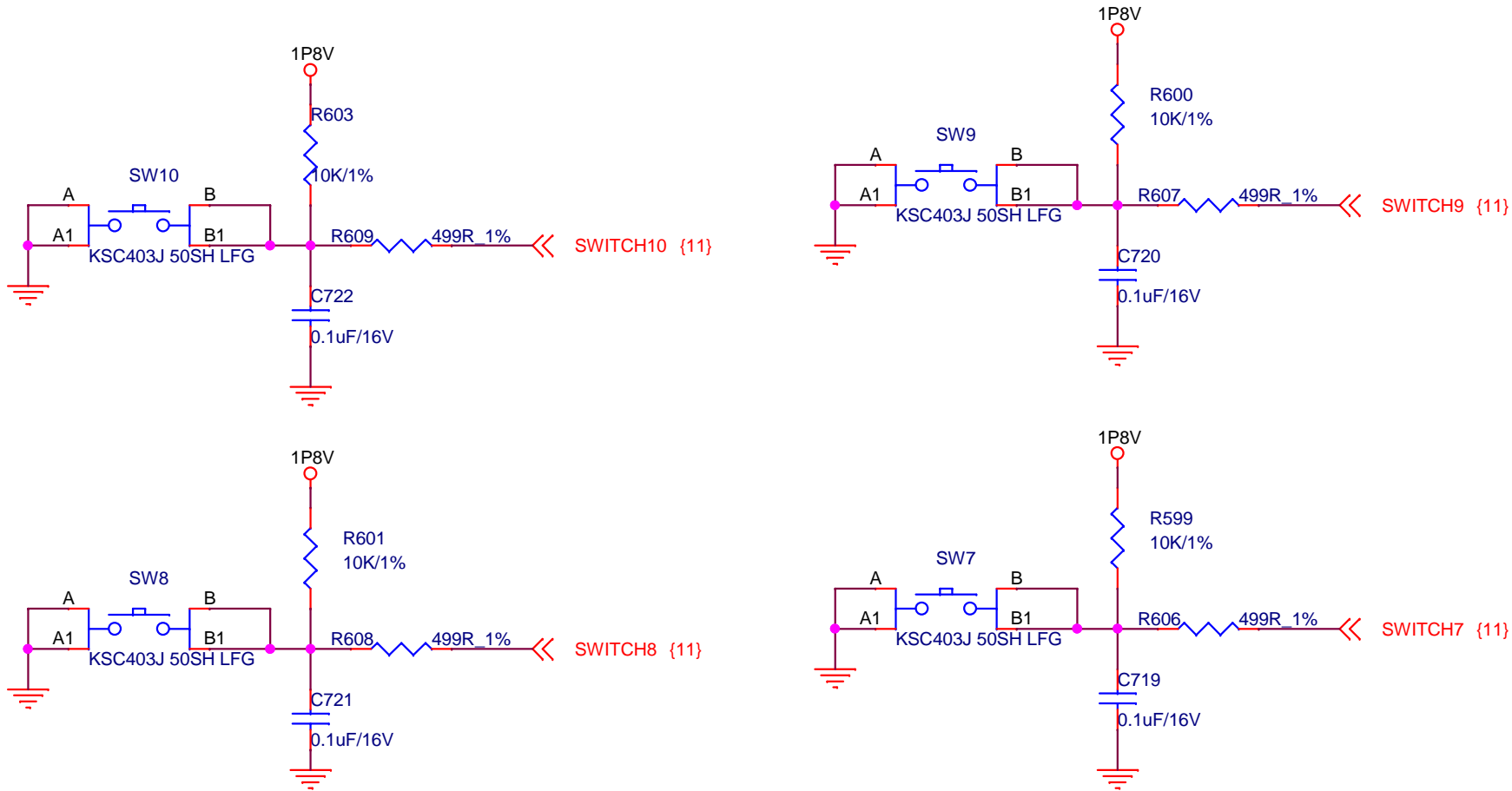
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DECOUPLING CAPACITORS



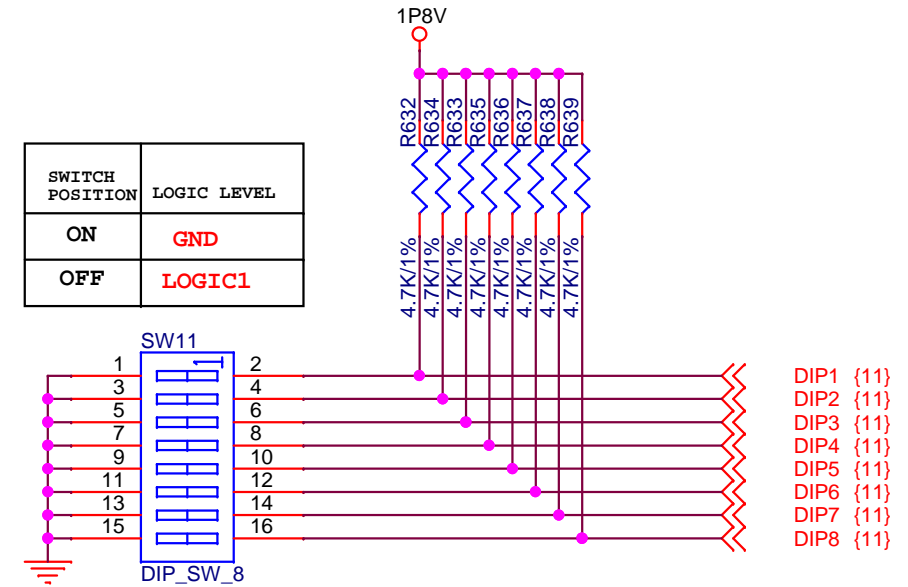
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DEBUG CIRCUITRY



PUSH BUTTON SWITCH CONNECTION TABLE

NET NAME	FPGA PIN NO	FPGA PIN NAME	BANK
SWITCH10	B19	HSIO46PB6	BANK-6
SWITCH8	C21	HSIO49PB6	BANK-6
SWITCH9	A25	HSIO68PB6/DQS/CCC_SE_PLL1_OUT0	BANK-6
SWITCH7	B27	HSIO69NB6	BANK-6

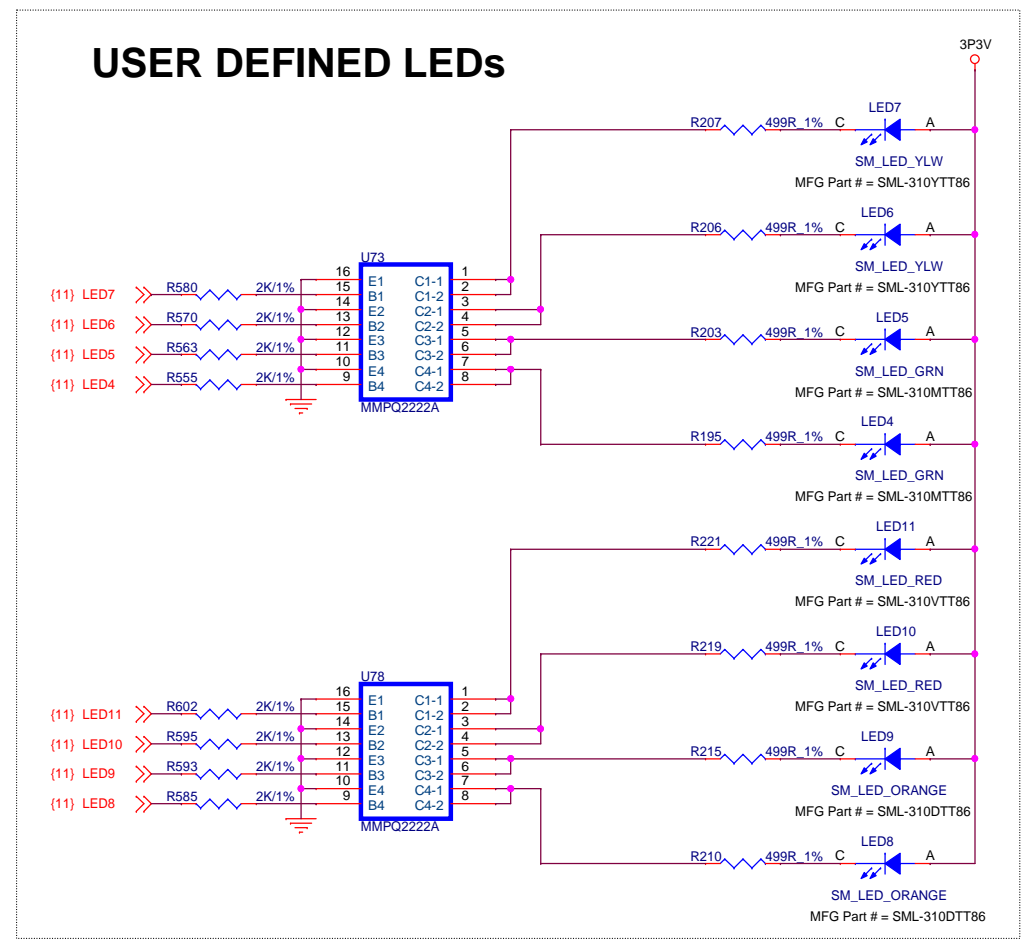
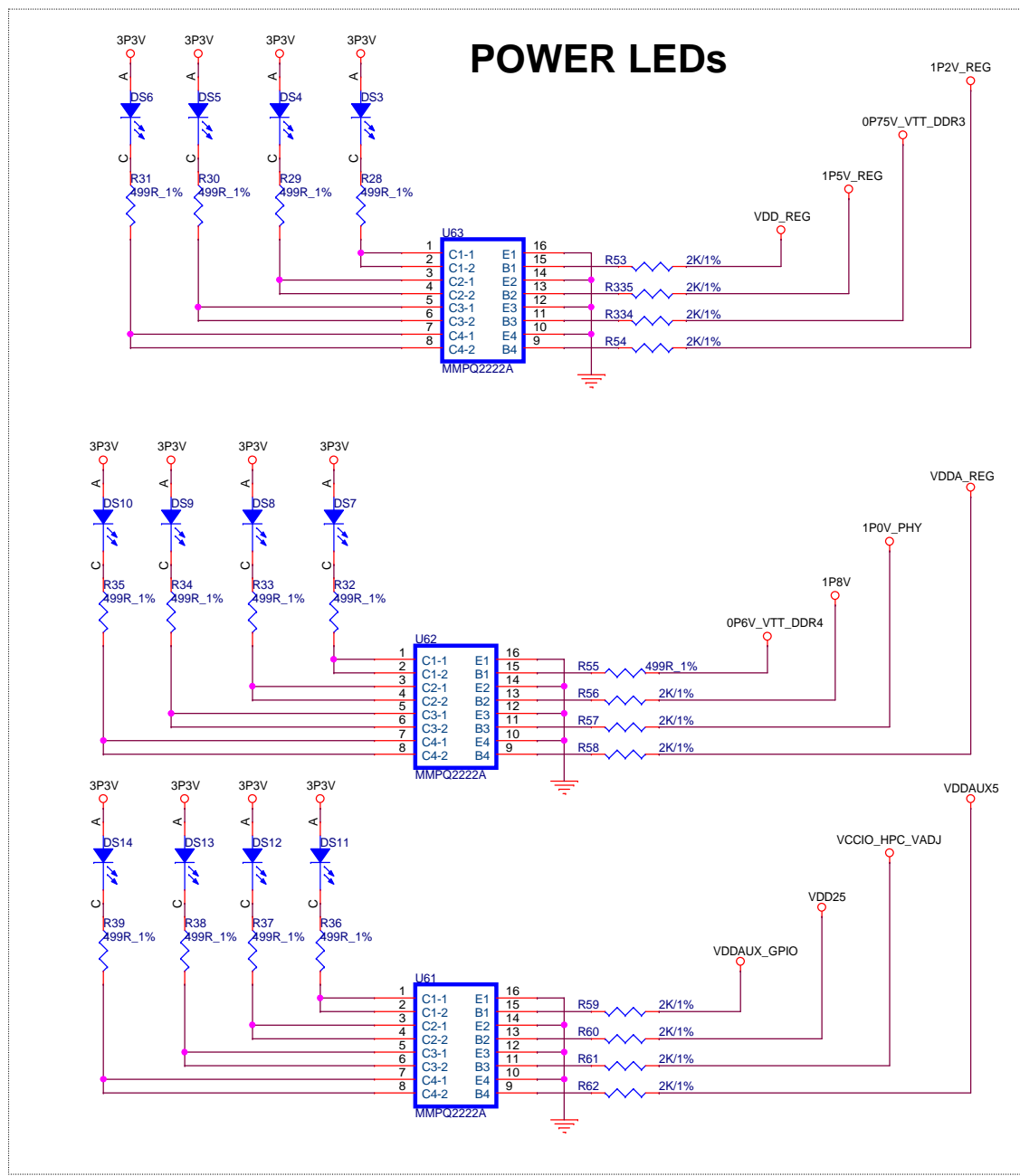


DIP SWITCH CONNECTION TABLE

NET NAME	FPGA PIN NO	FPGA PIN NAME	BANK
DIP1	H23	HSIO60PB6	BANK-6
DIP2	D21	HSIO48NB6	BANK-6
DIP3	H24	HSIO61NB6	BANK-6
DIP4	C22	HSIO50PB6/DQS	BANK-6
DIP5	B21	HSIO49NB6	BANK-6
DIP6	G20	HSIO41PB6	BANK-6
DIP7	F24	HSIO62NB6/DQS	BANK-6
DIP8	F25	HSIO63NB6	BANK-6

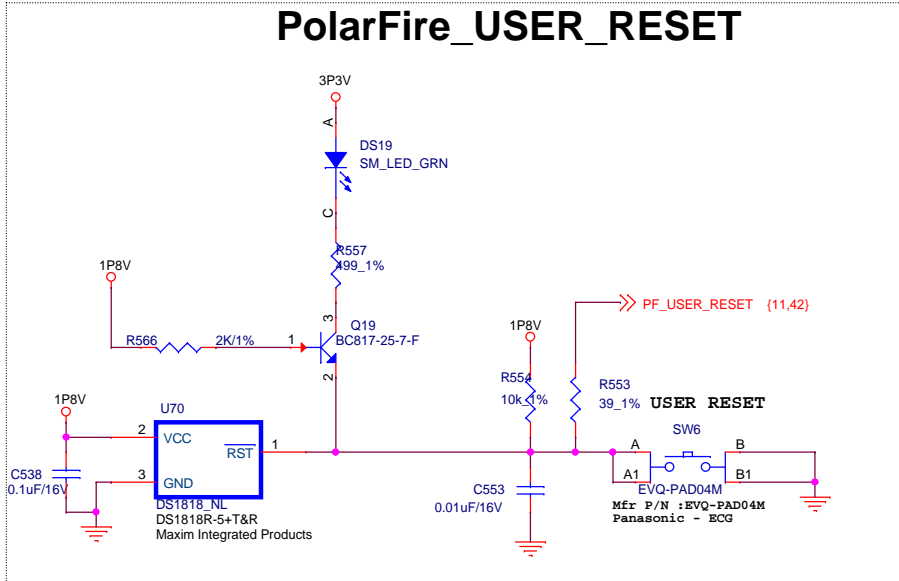
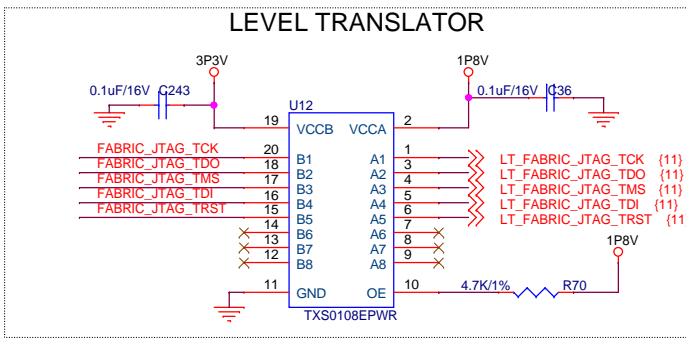
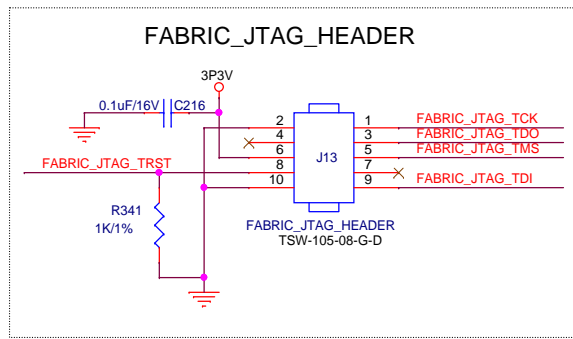


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LED CONNECTION-ACTIVE HIGH

NET NAME	FPGA PIN NO	FPGA PIN NAME	BANK
LED7	D25	HSIO70PB6/CCC_SE_PLL1_OUT1	BANK-6
LED6	C26	HSIO70NB6	BANK-6
LED5	B26	HSIO71NB6	BANK-6
LED4	F22	HSIO64NB6	BANK-6
LED11	H21	HSIO36NB6	BANK-6
LED10	H22	HSIO60NB6	BANK-6
LED9	F23	HSIO62PB6/DQS/CCC_SE_PLL0_OUT0	BANK-6
LED8	C27	HSIO71PB6/CCC_SE_CLKIN_S_15	BANK-6

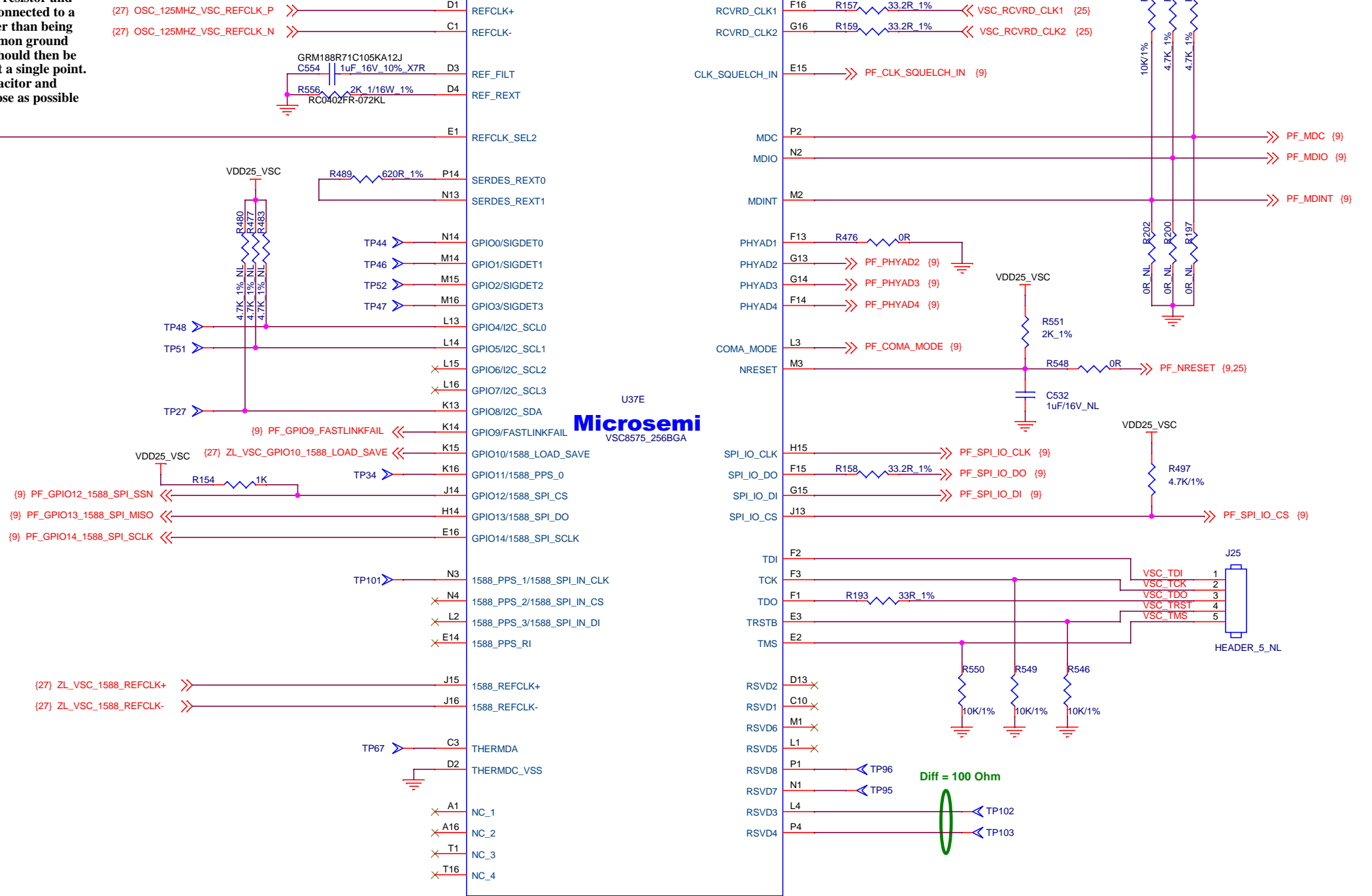
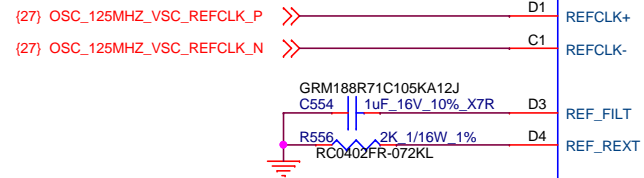
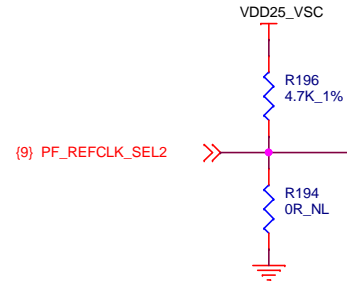


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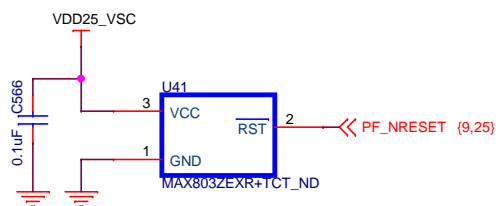
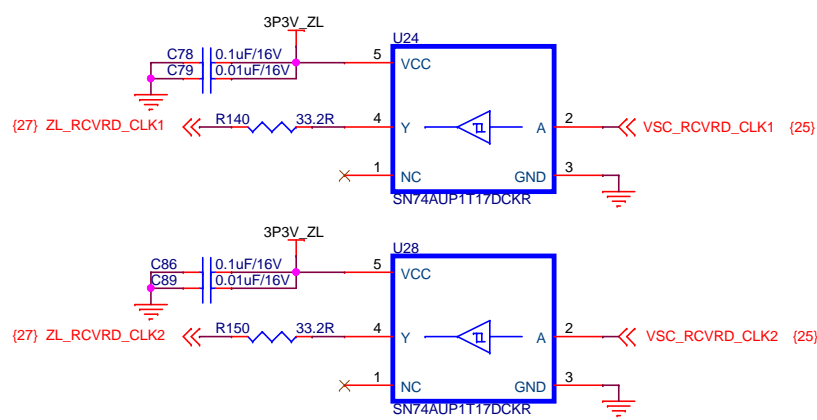
1588 Solution - VSC8575 CONNECTIONS

LAYOUT NOTE FOR RC CIRCUIT R556 & C554:

The ground connections of the resistor and the capacitor should each be connected to a shared PCB signal trace, rather than being connected individually to common ground plane. This PCB signal trace should then be connected to a ground plane at a single point. In addition, the reference capacitor and resistor should be placed as close as possible to the VSC8575

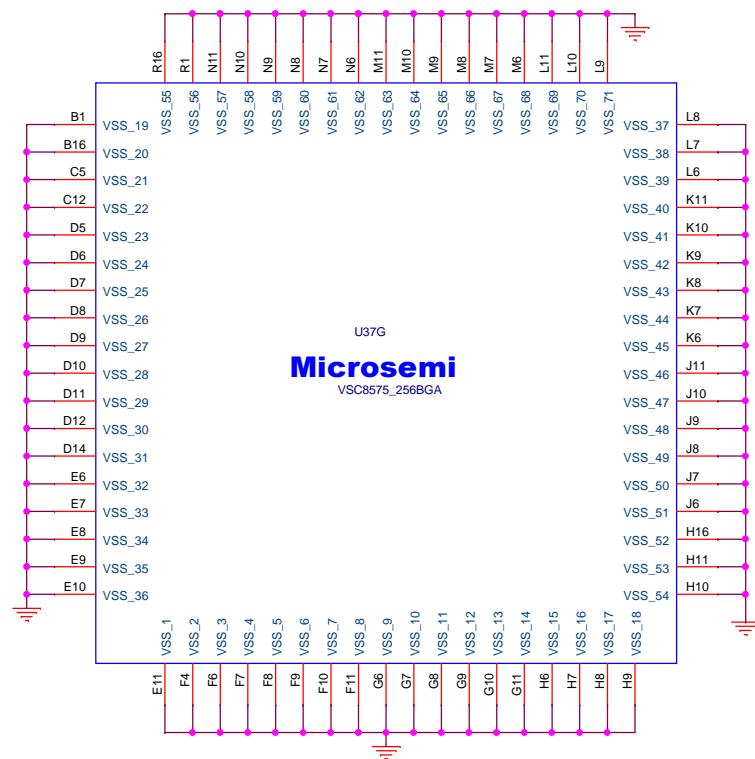
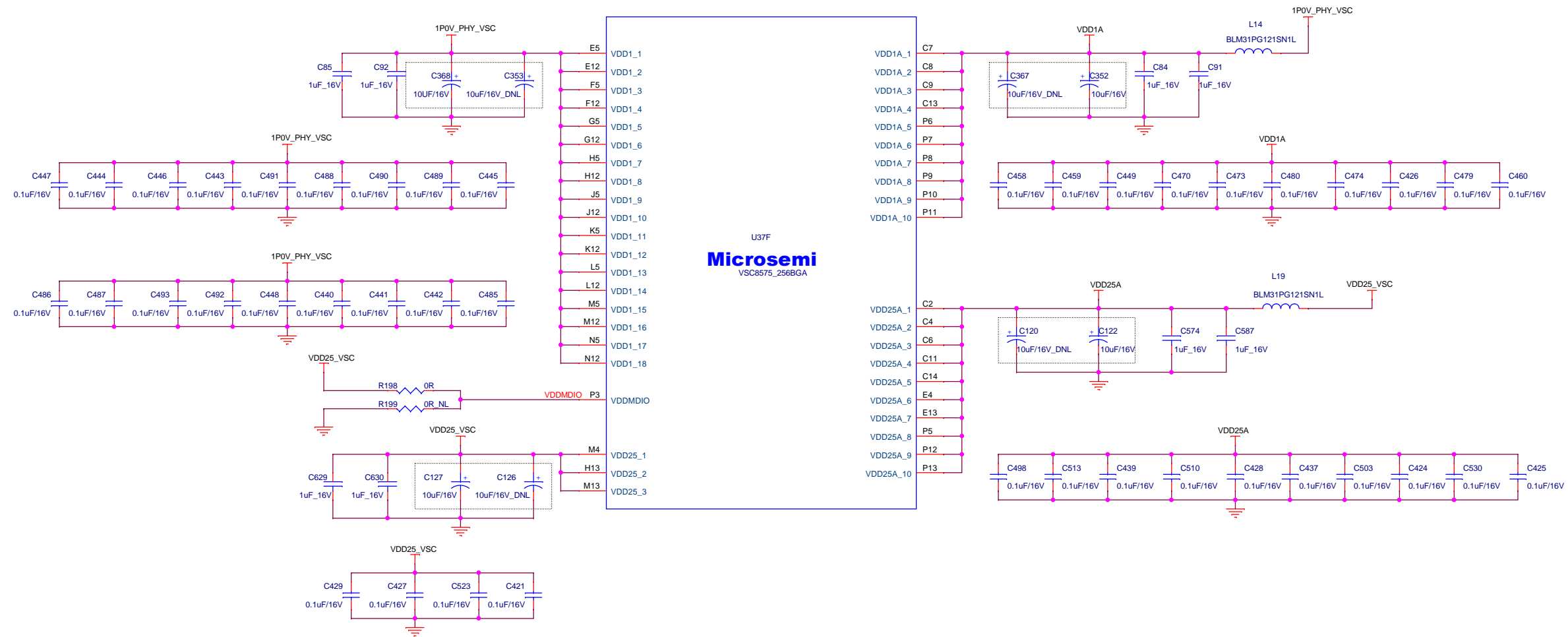


BUFFER CIRCUIT CONNECTION



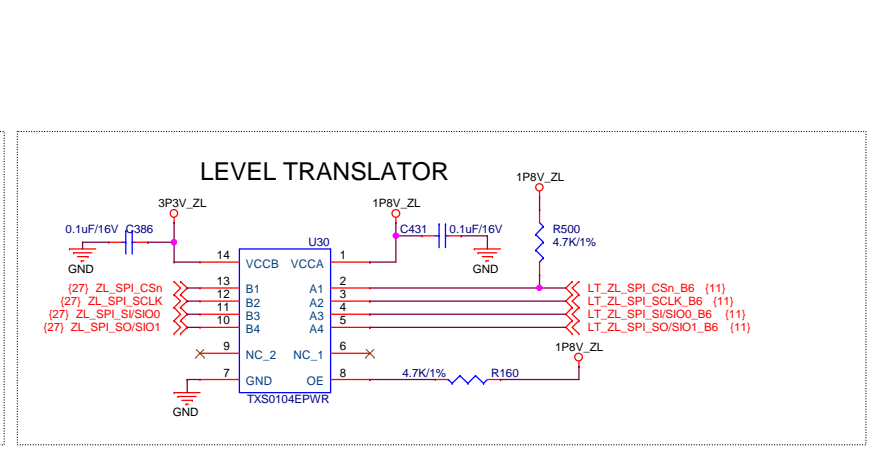
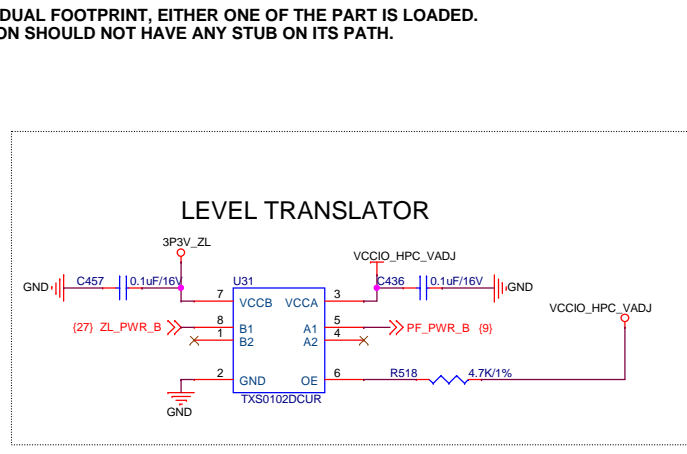
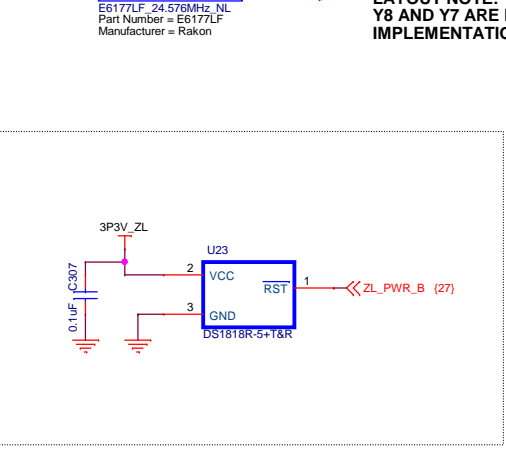
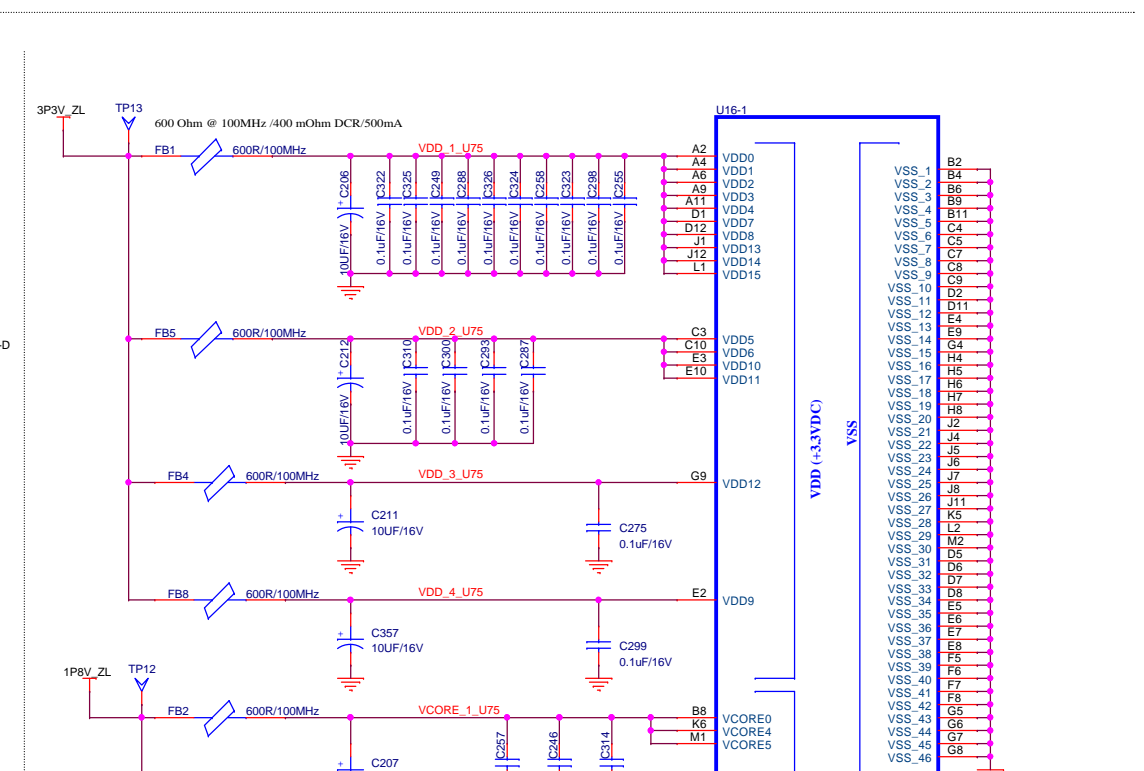
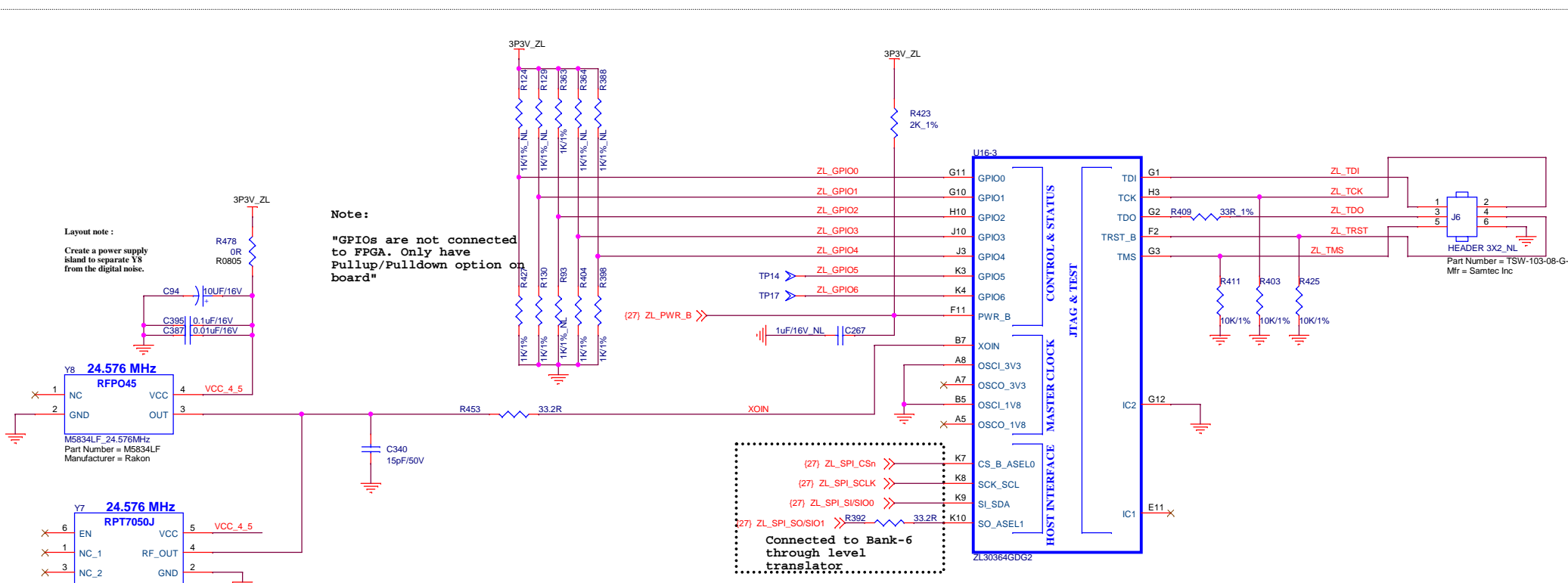
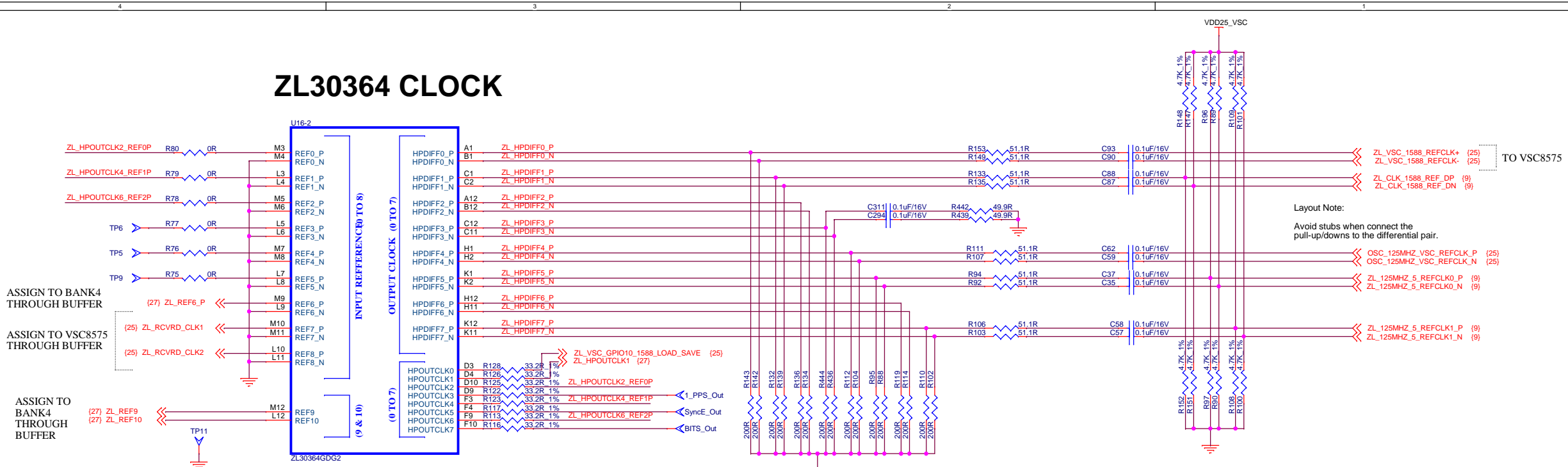
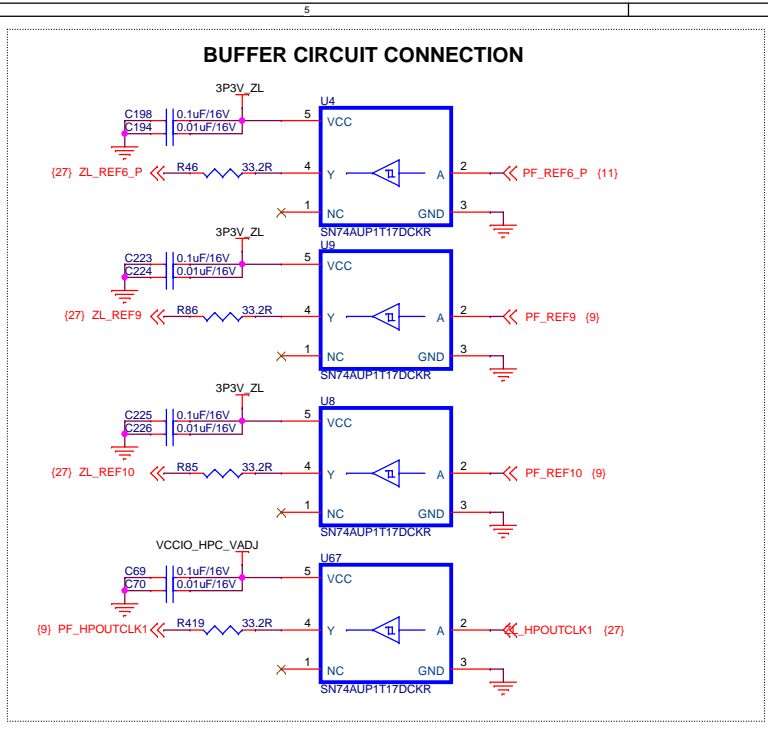
TITLE			
POLARFIRE EVAL KIT			
Microsemi			
SIZE	DOCUMENT NO.	DVP-100-000481-001	REV
Custom			D
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1588 Solution - VSC8575-POWER & GROUND

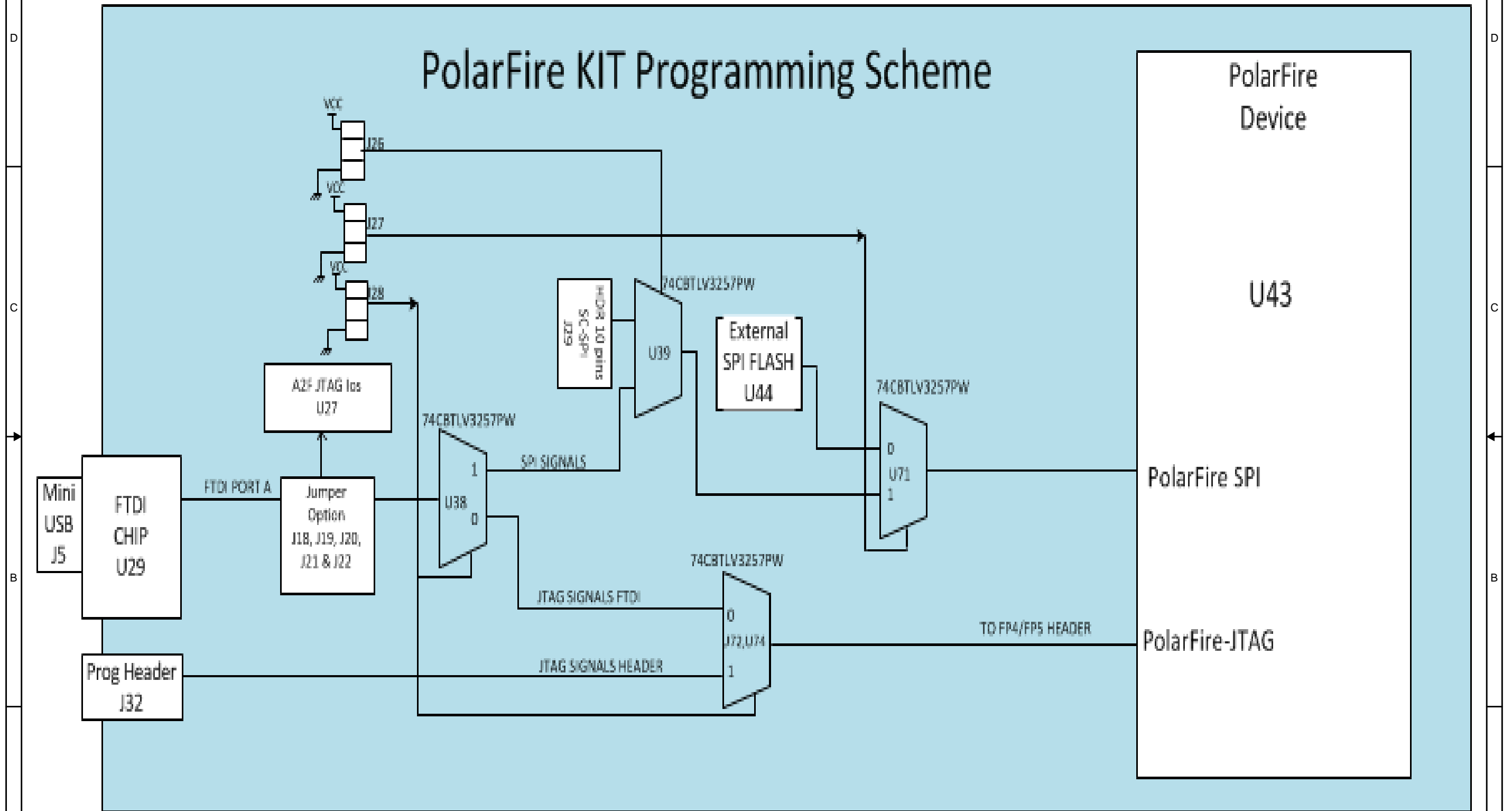


TITLE POLARFIRE EVAL KIT			
Microsemi			
SIZE	DOCUMENT NO.	DVP-100-000481-001	REV
C			D
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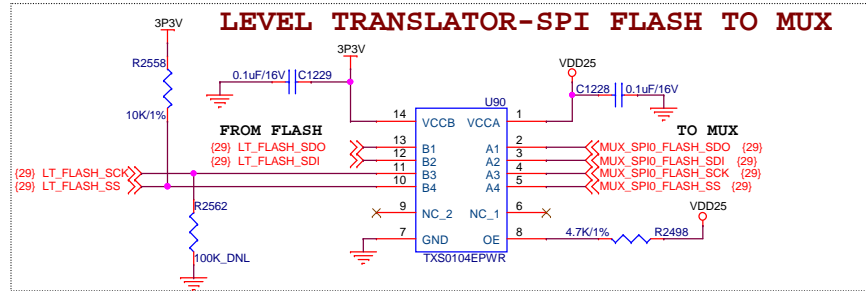
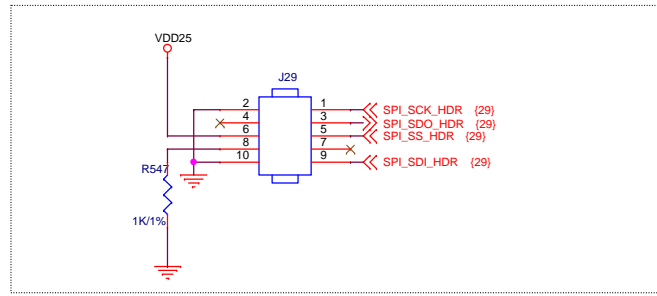


PROGRAMMING SCHEME BLOCK DIAGRAM

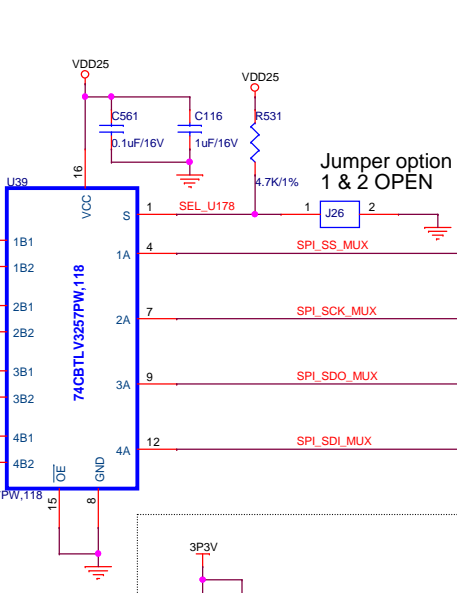
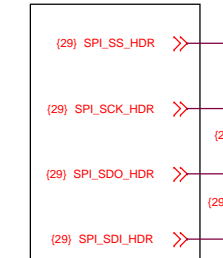


TITLE POLARFIRE EVAL KIT			
Microsemi			
SIZE A	DOCUMENT NO.	DVP-100-000481-001	REV D
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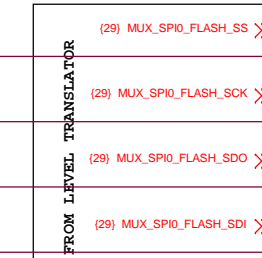
PROGRAMMING SCHEME



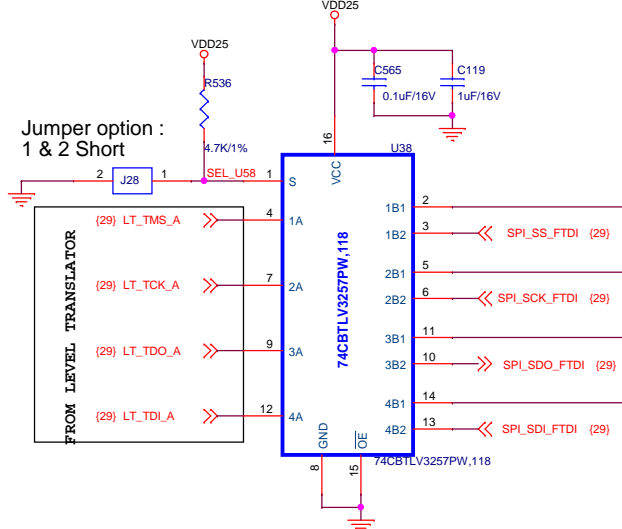
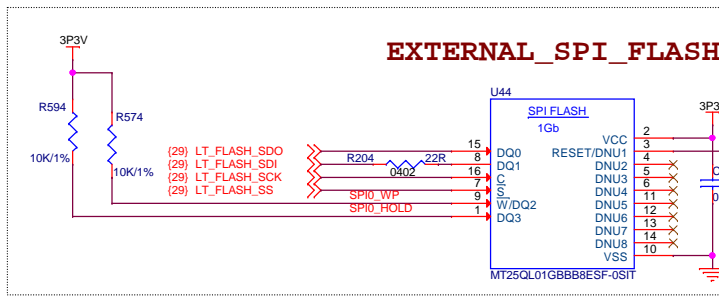
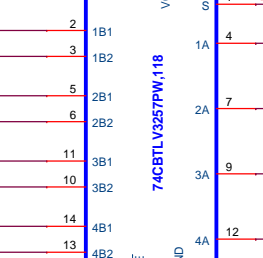
EXTERNAL_SPI_SIGNALS



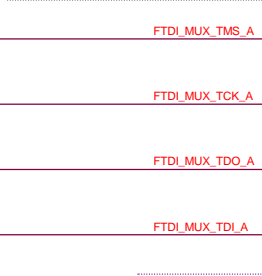
FROM LEVEL TRANSLATOR



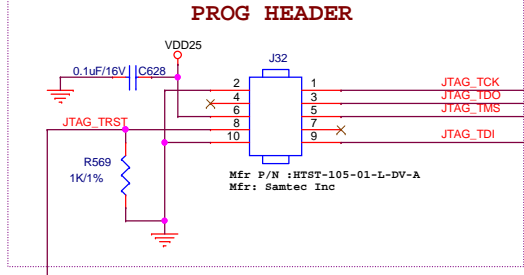
TO MUX



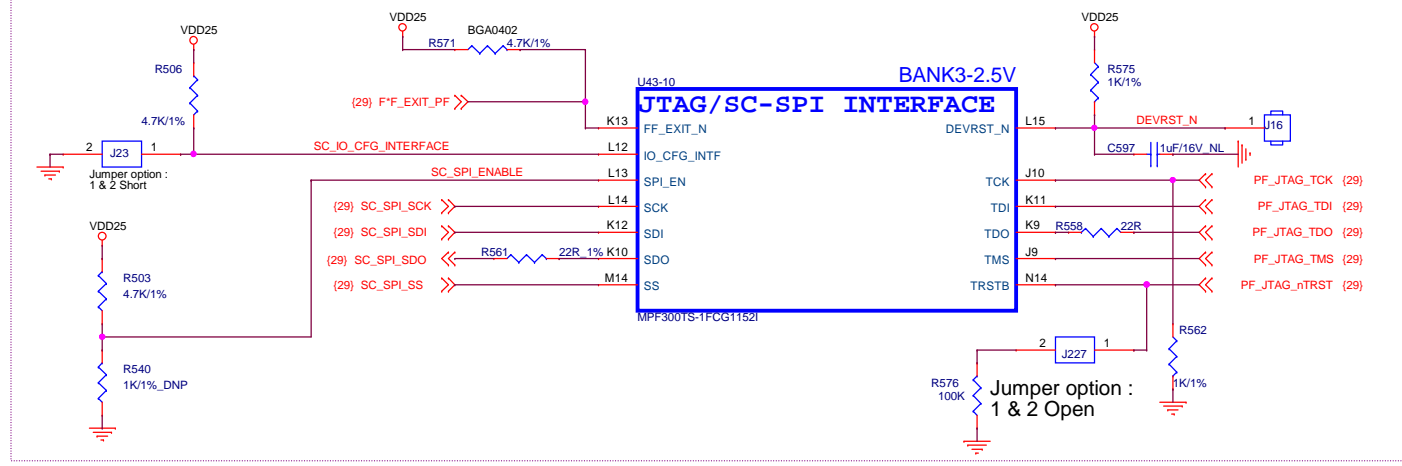
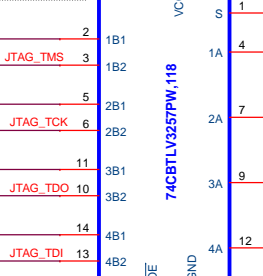
FROM LEVEL TRANSLATOR



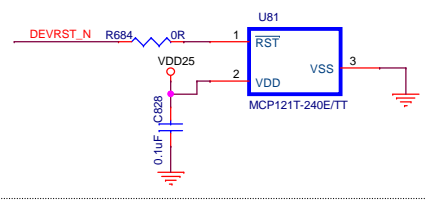
PROG HEADER



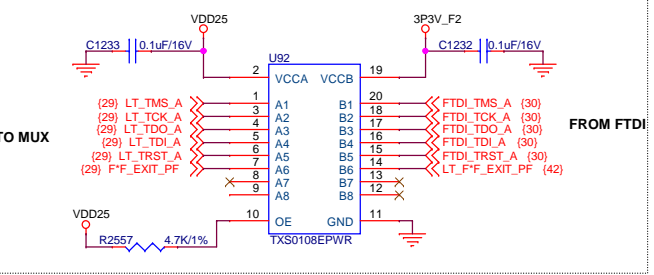
TO MUX



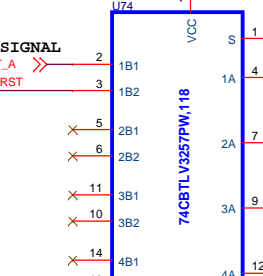
DEVICE_RESET



LEVEL TRANSLATOR



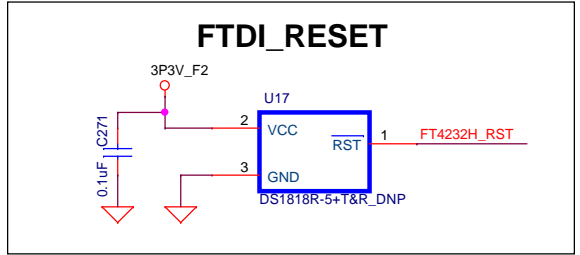
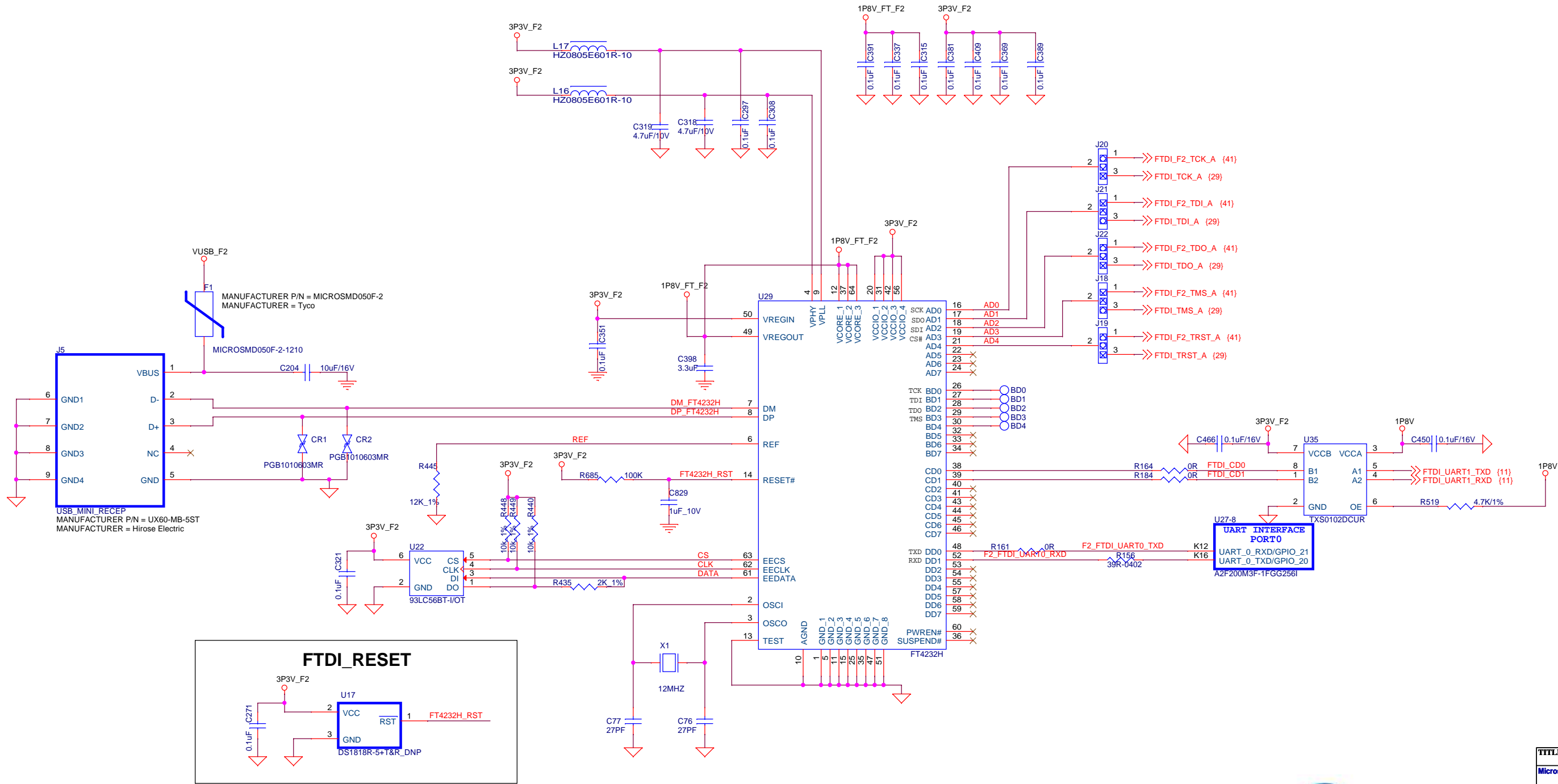
FROM FTDI



SR No	PROG MODE	Jumper		
		J28	J27	J26
1	JTAG Programming using Prog Header	OPEN	X	X
2	JTAG Programming using embedded FP5	SHORT 1-2	X	X
3	SPI Slave programming using embedded FP5	OPEN	OPEN	OPEN
4	IAP programming	X	SHORT 1-2	X
5	Programming External SPI Flash using Prog Header	OPEN	SHORT 1-2	X
6	Programming External SPI Flash using Embedded JTAG	SHORT 1-2	SHORT 1-2	X



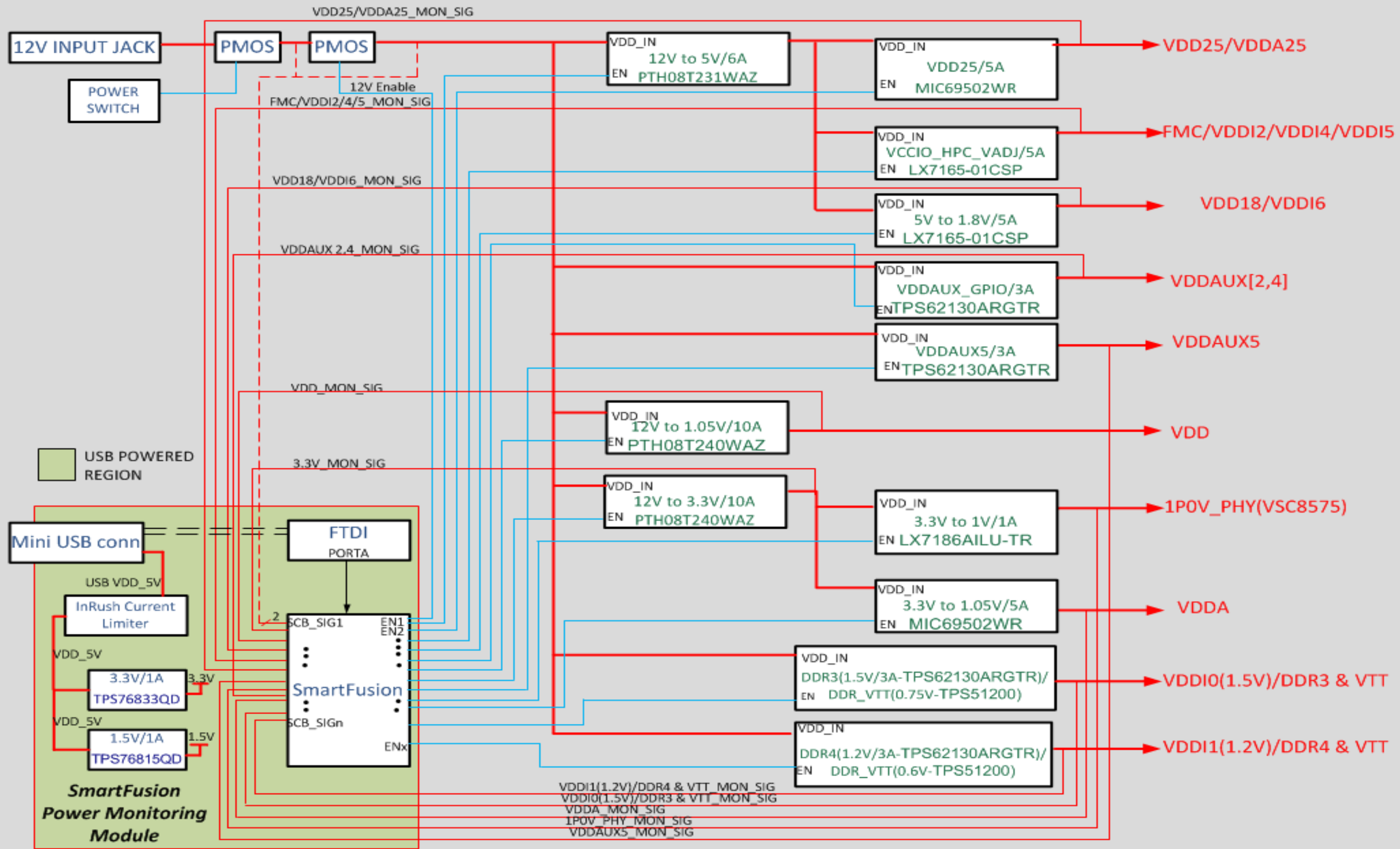
FT4232H INTERFACE



TITLE			
POLARFIRE EVAL KIT			
Microsemi			
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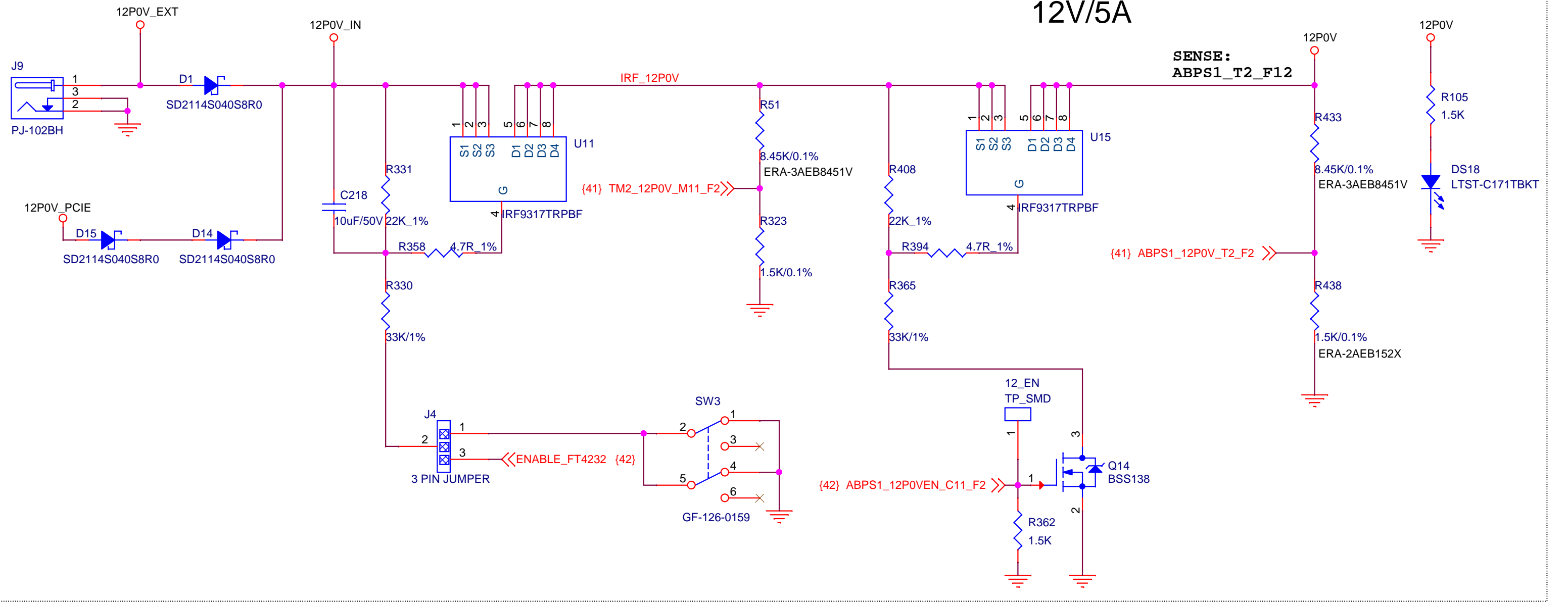
Polarfire Power Management Scheme



TITLE POLARFIRE EVAL KIT			
Microsemi			
SIZE B	DOCUMENT NO. DVP-100-000481-001	REV D	
DATE: Thursday, November 09, 2017	SH 31 OF 42		

12V EXTERNAL SUPPLY

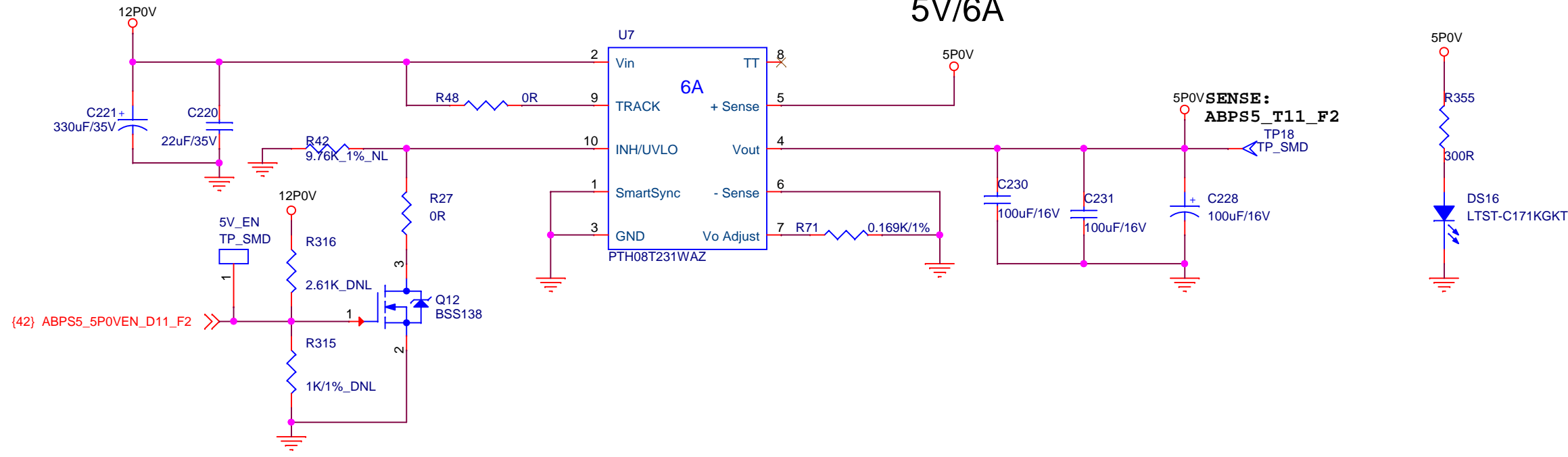
12V/5A



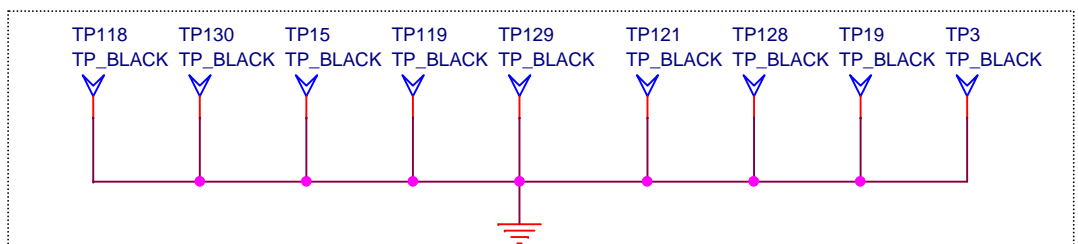
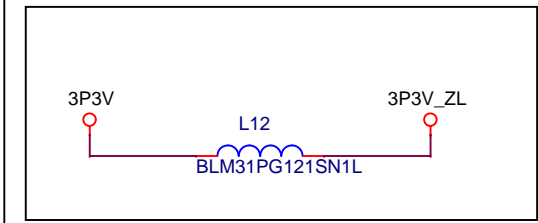
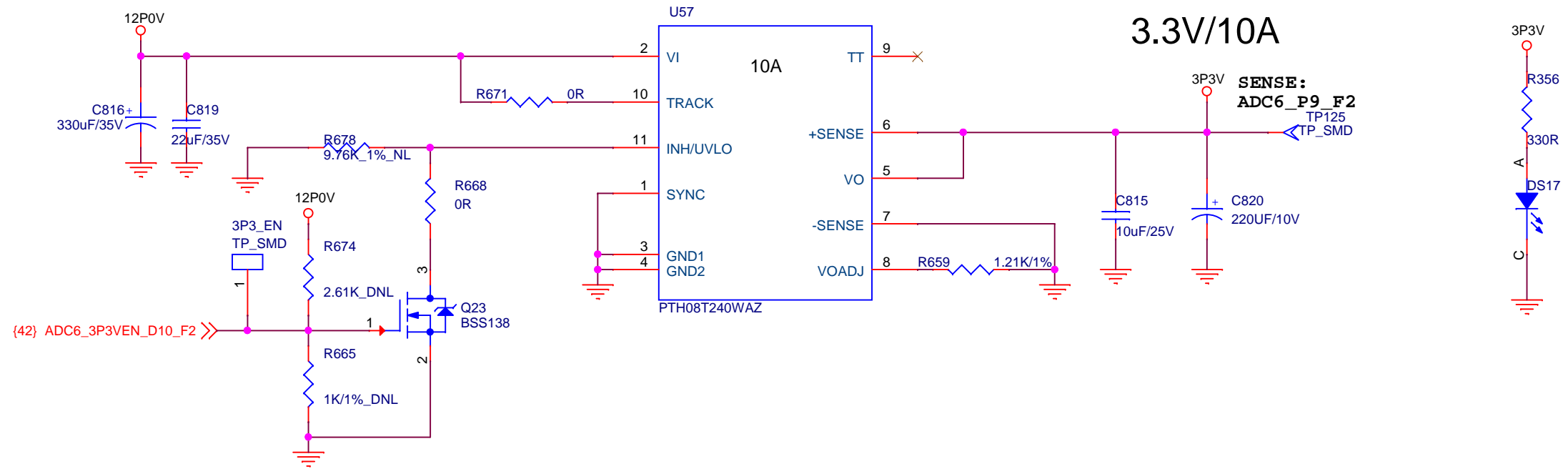
TITLE			
POLARFIRE EVAL KIT			
Microsemi			
SIZE	DOCUMENT NO.	DVP-100-000481-001	REV
Custom			D
DATE:	Thursday, November 09, 2017	SH 32 OF 42	

"POWER SUPPLIES1" - "3.3V" & "5V"

REGULATOR 1: 5V/6A



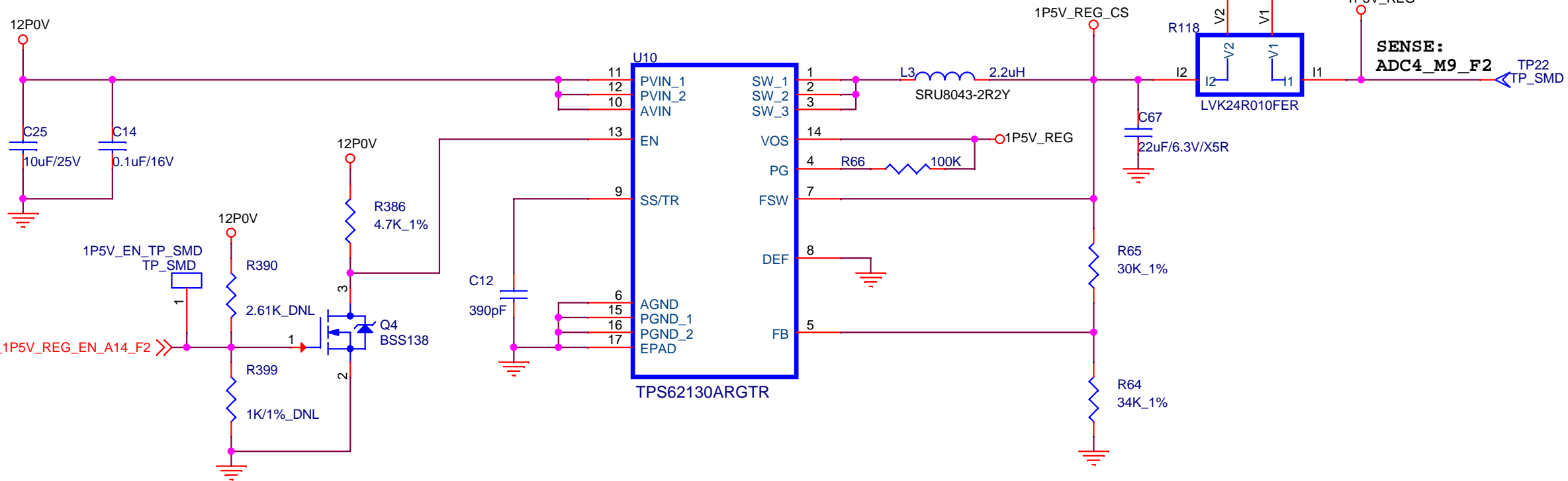
REGULATOR 2: 3.3V/10A



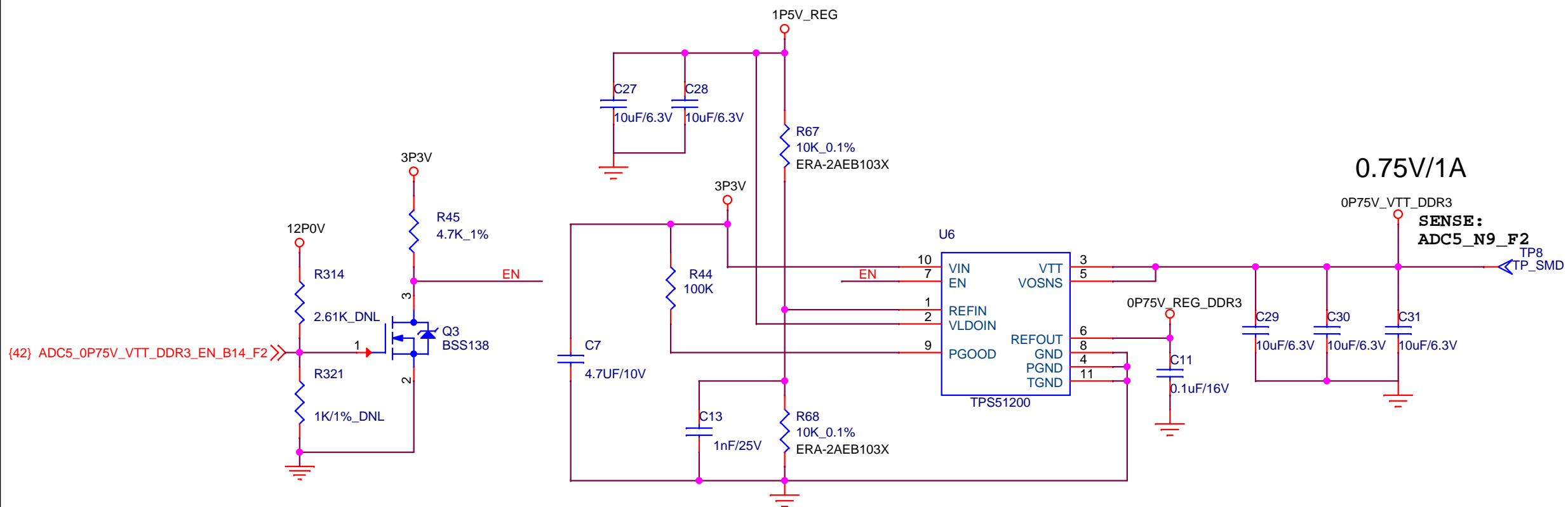
TITLE POLARFIRE EVAL KIT			
Microsemi			
SIZE B	DOCUMENT NO. DVP-100-000481-001	REV D	
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"POWER SUPPLIES3" - "0.75V" & "1.5V"

REGULATOR 4 : 12V to 1.5V/3A



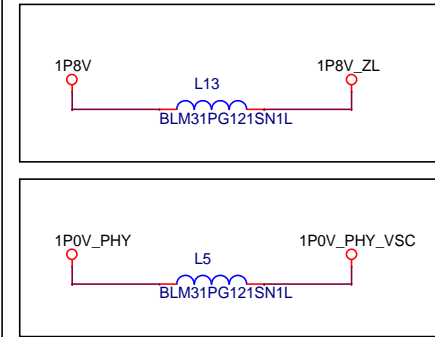
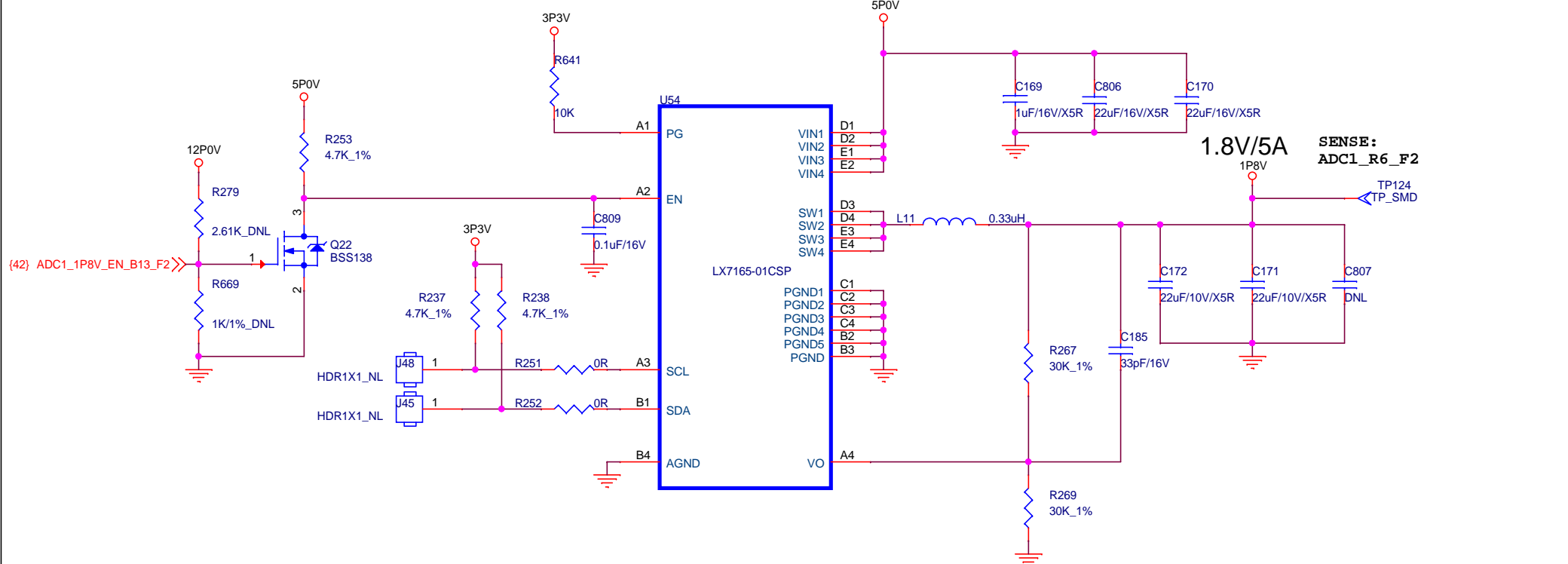
REGULATOR 5: 0.75V FOR DDR3 -VTT SUPPLY



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POLARFIRE EVAL KIT		
Microsemi		
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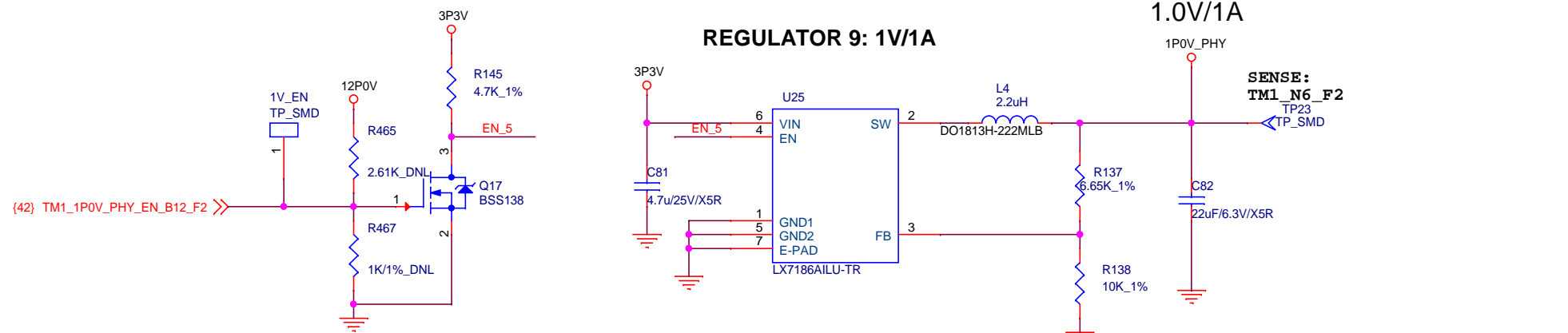
"POWER SUPPLIES5" - "1.05V", "1V" & "1.8V"

REGULATOR 8: 1.8V/5A FOR VPP AND VAUX-HSIO BANK

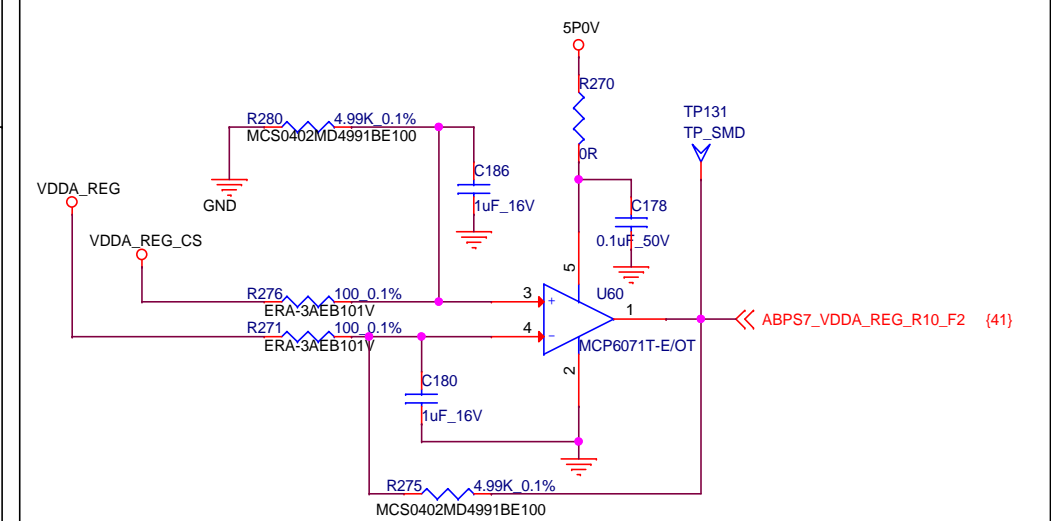


REGULATOR 9: 1V/1A

1.0V/1A

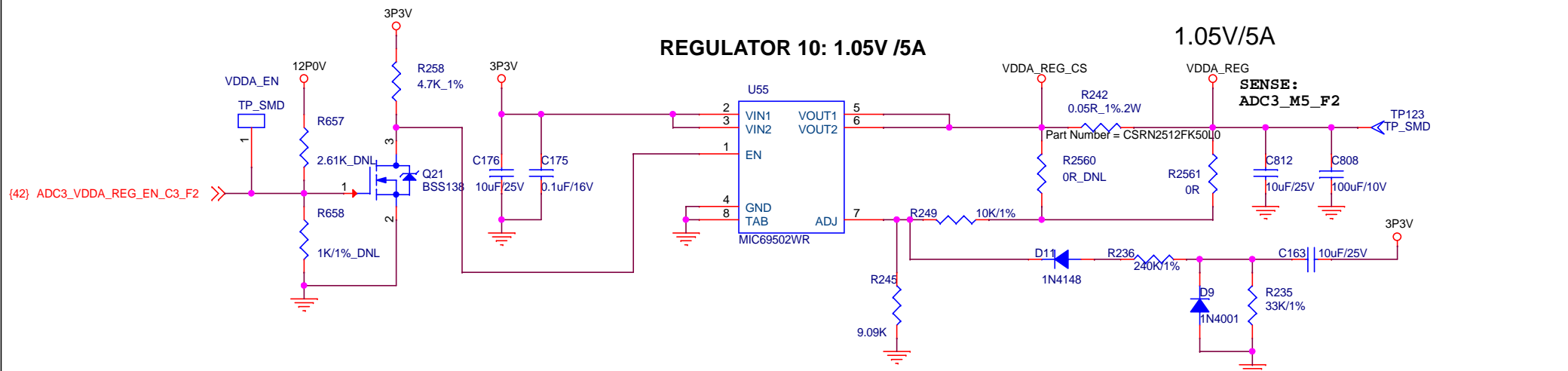


TRANSCEIVER CORE CURRENT SENSE CIRCUIT

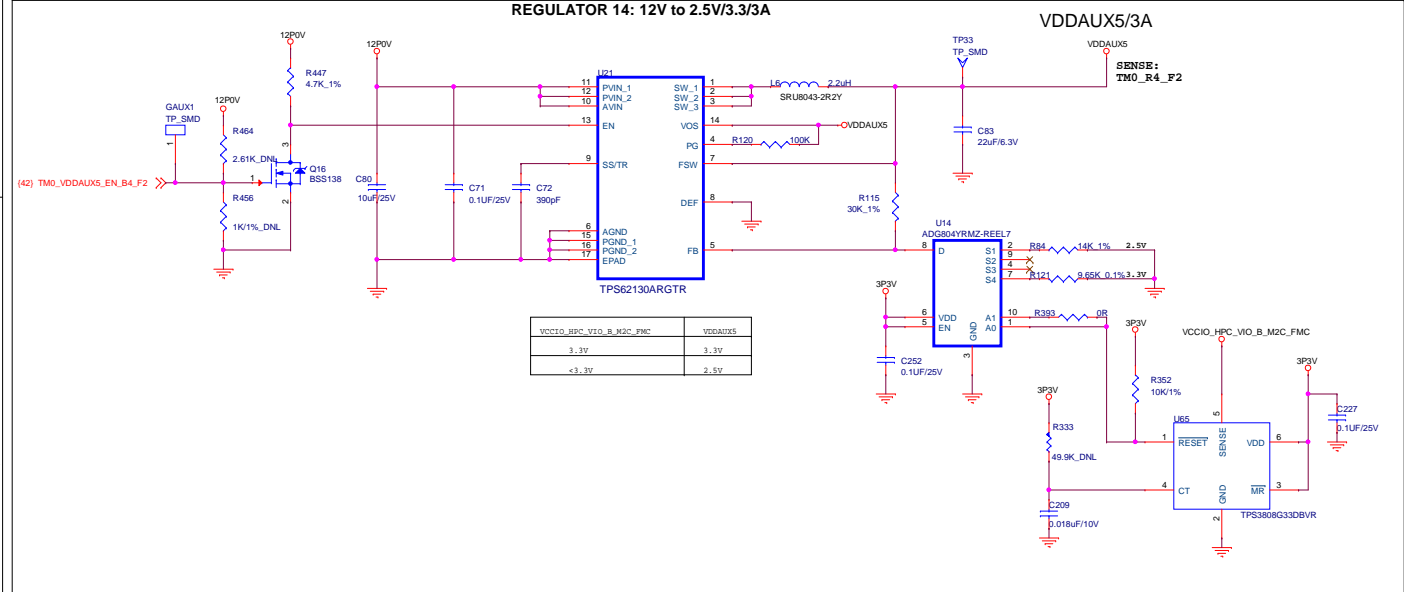
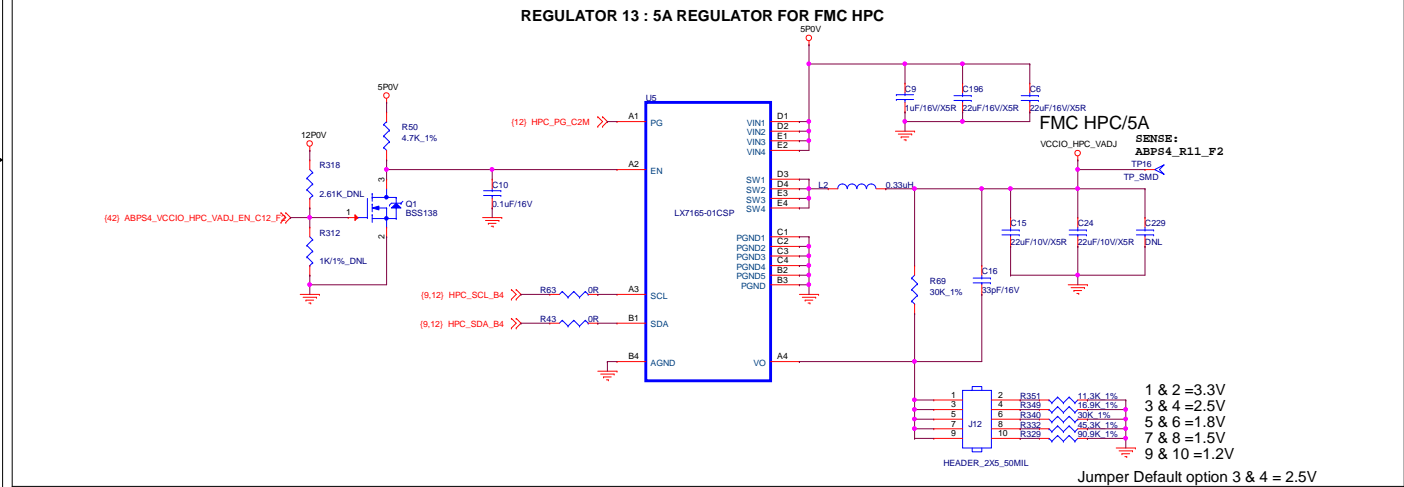
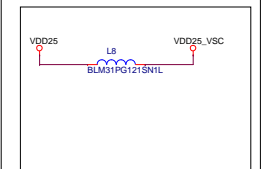
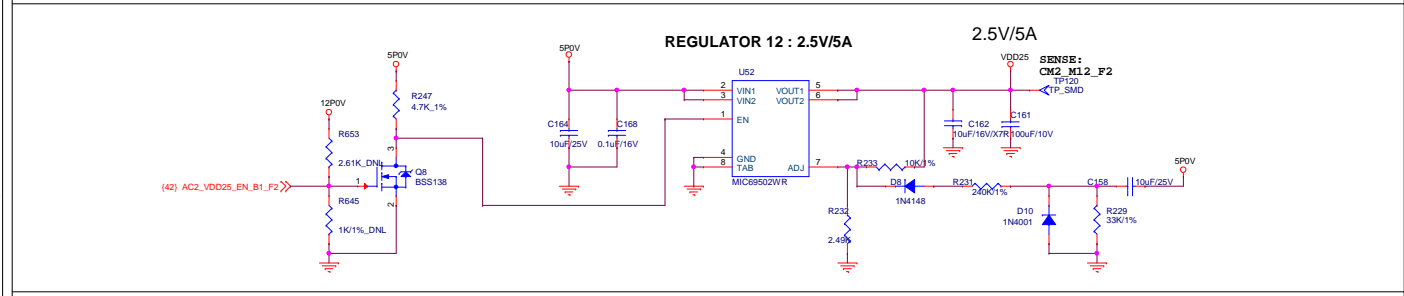
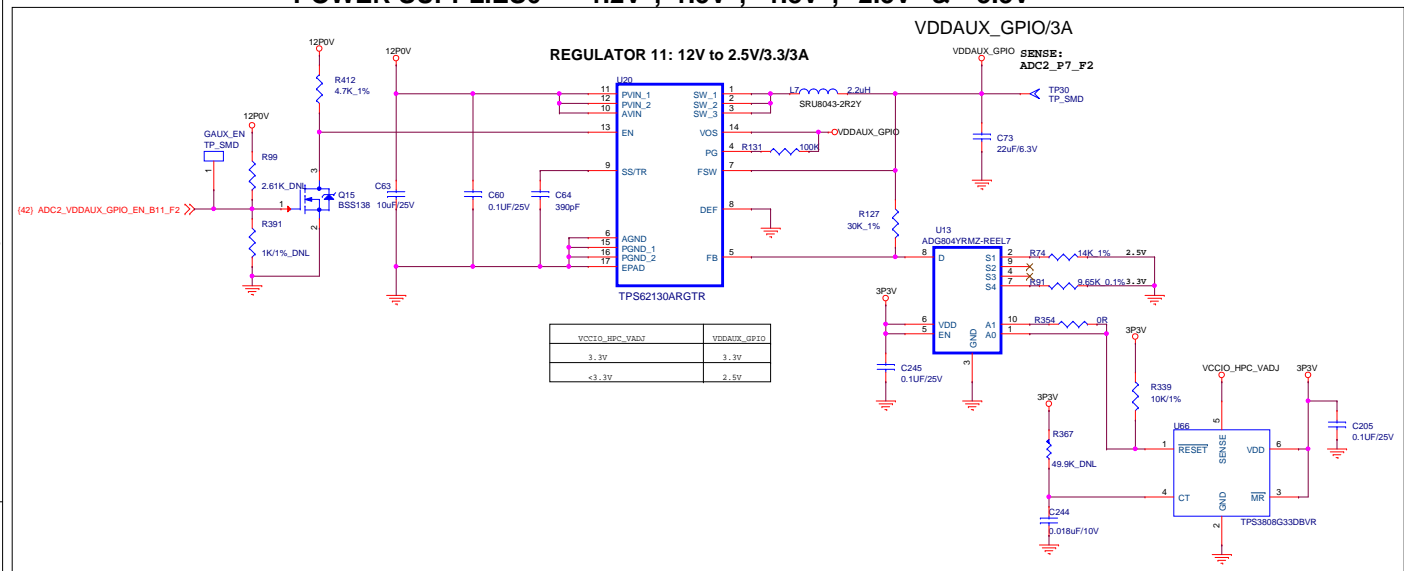


REGULATOR 10: 1.05V /5A

1.05V/5A



"POWER SUPPLIES6" - "1.2V", "1.5V", "1.8V", "2.5V" & "3.3V"



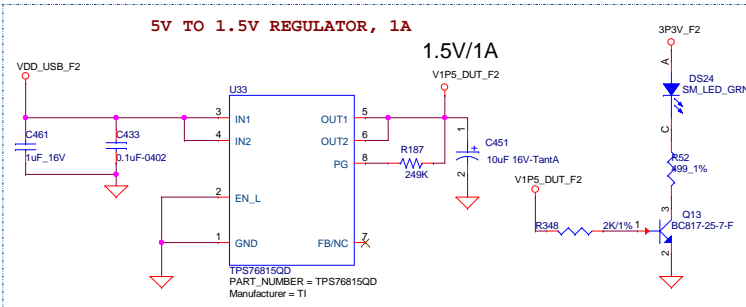
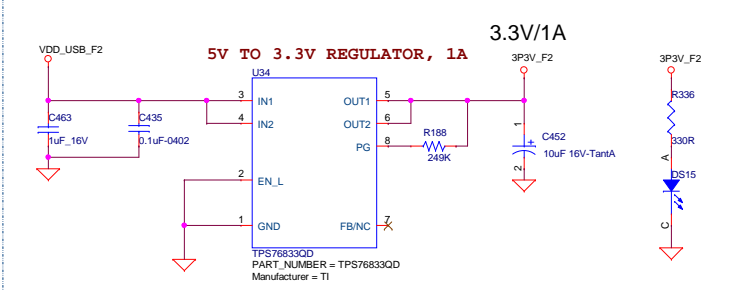
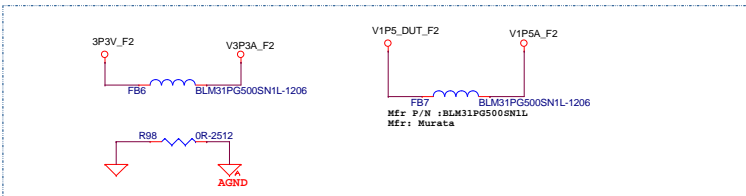
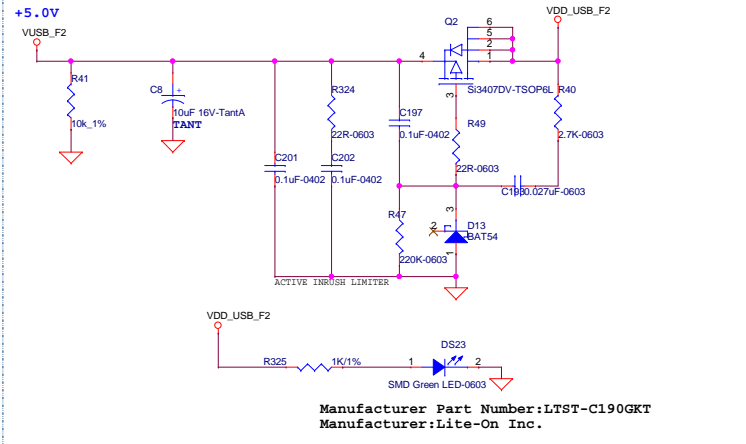
POWER MONITORING SOLUTION USING SmartFusion



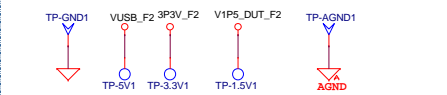
TITLE		
POLARFIRE EVAL KIT		
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SmartFusion POWER SUPPLY

USB ACTIVE IN RUSH LIMITER

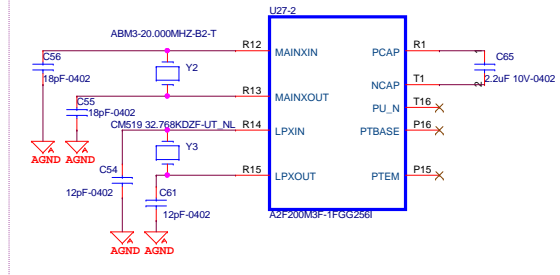


5V, V3P3, V1P5 & GND TEST POINTS

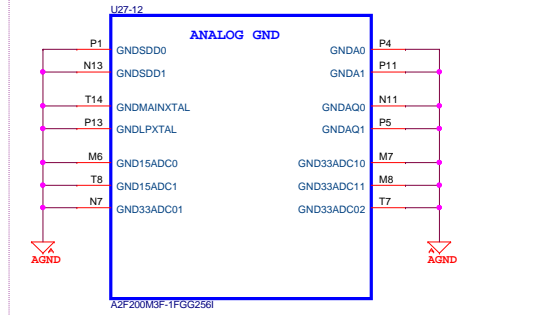


ANALOG PWR & GND

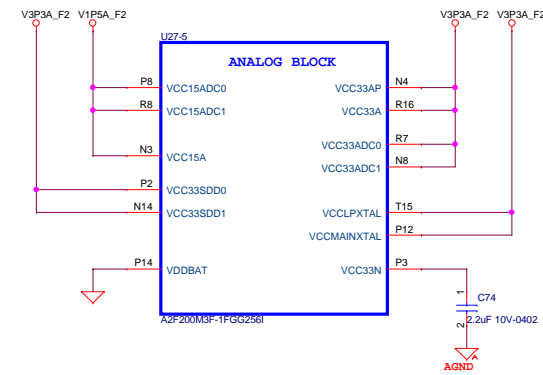
SmartFusion ANALOG BLOCK



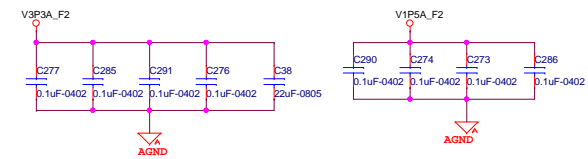
ANALOG GROUND



SmartFusion ANALOG POWER SUPPLY

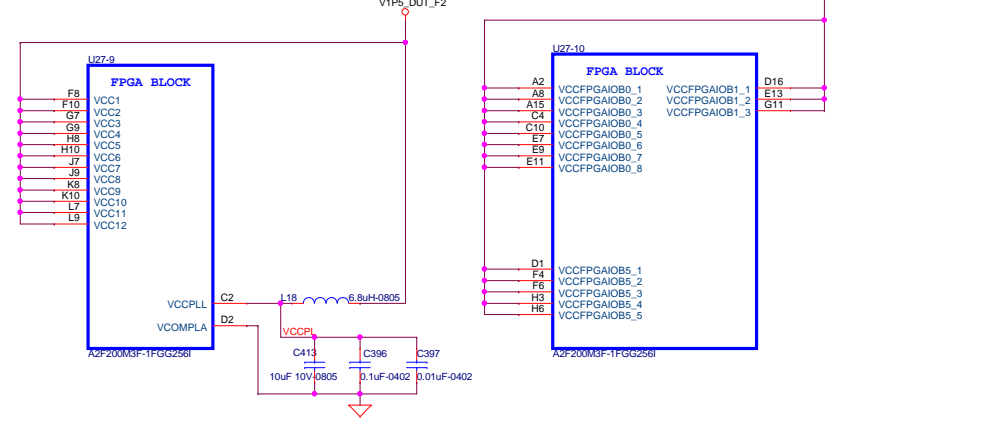


NOTE: PLACE ALL CAPS NEAR DUT BALLS

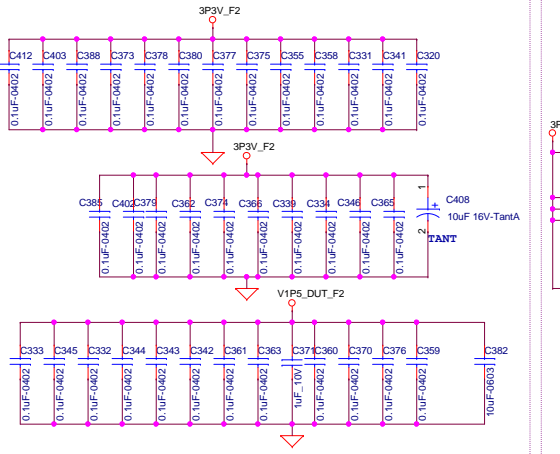


DIGITAL PWR & GND

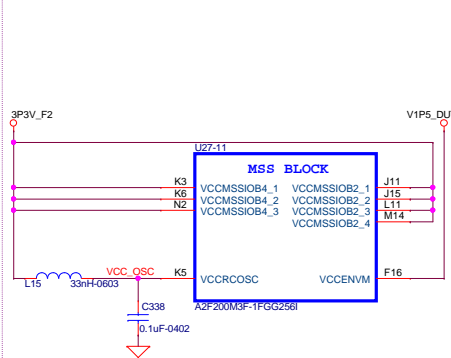
SmartFusion POWER SUPPLY



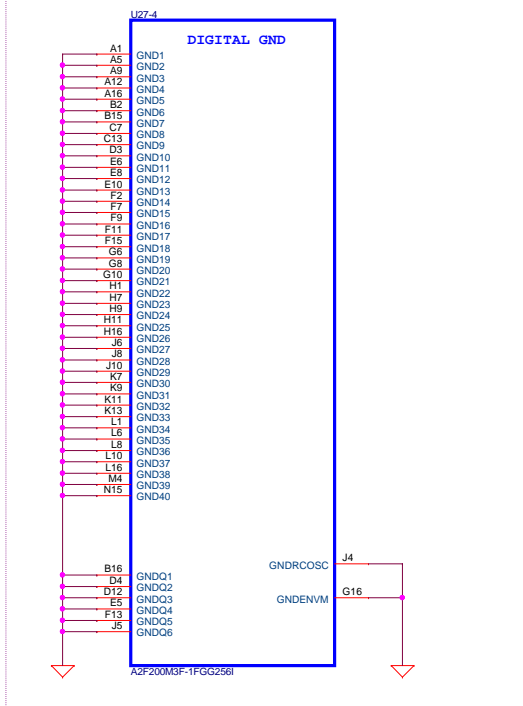
SmartFusion DECOUPLING CAPACITORS



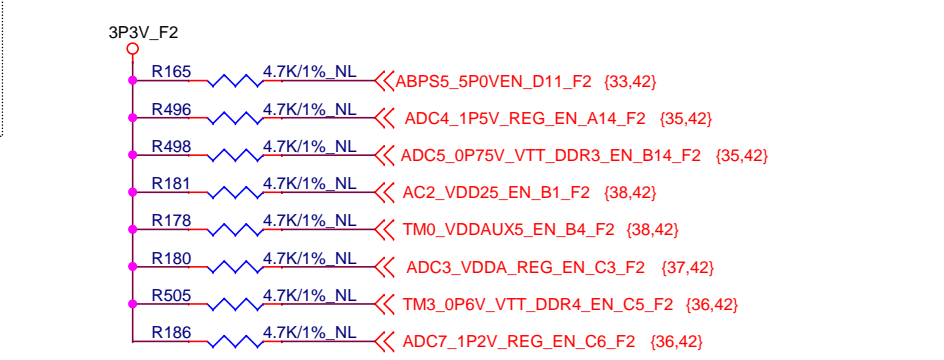
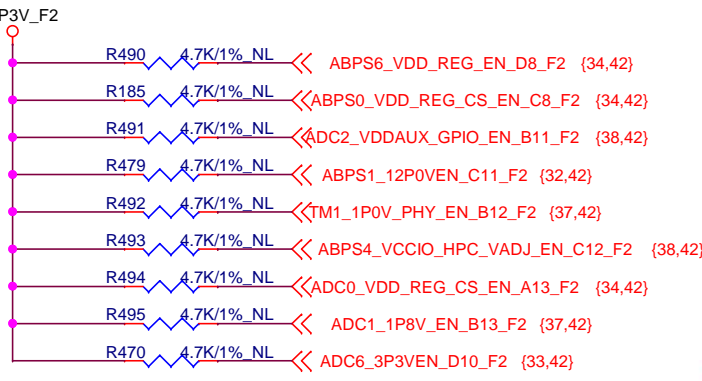
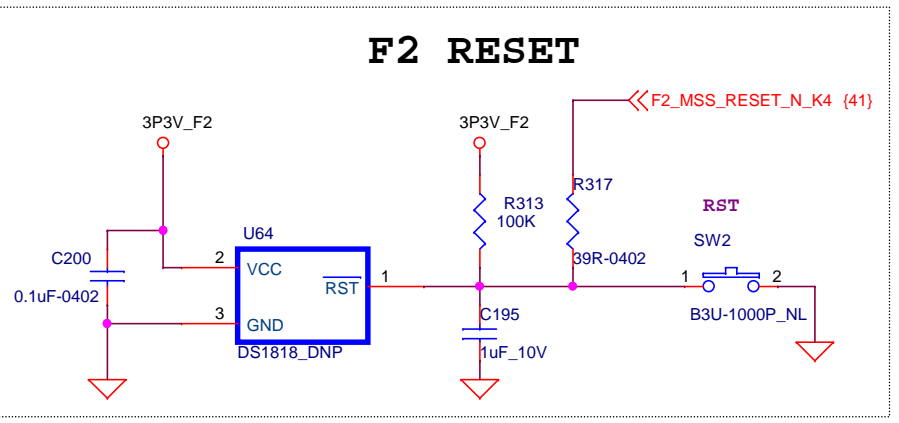
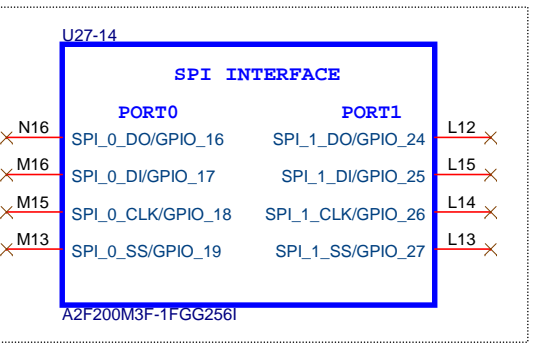
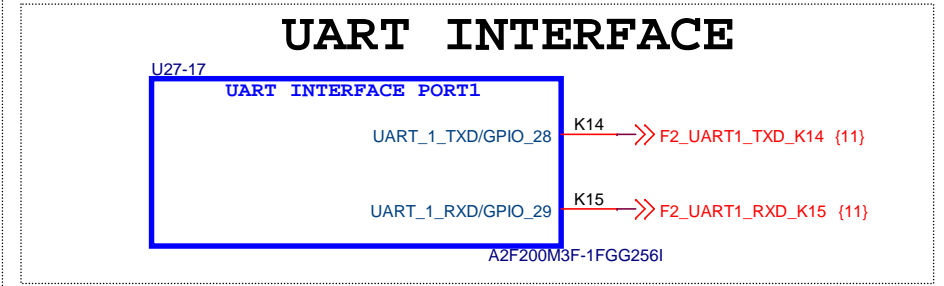
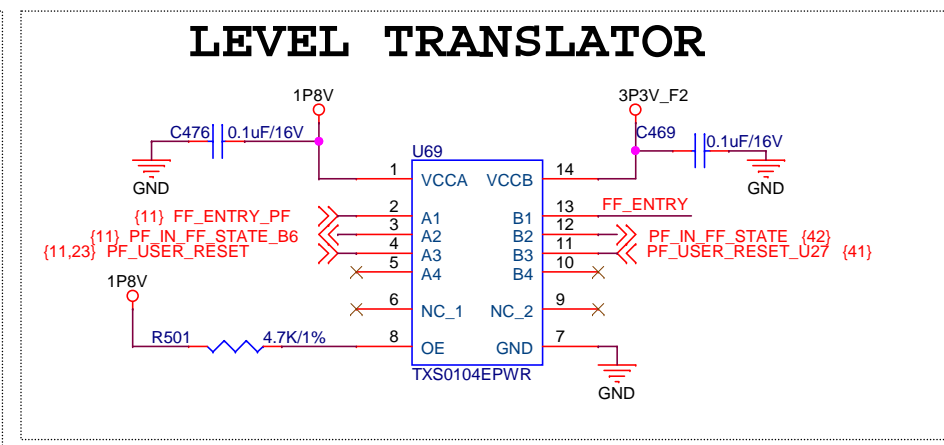
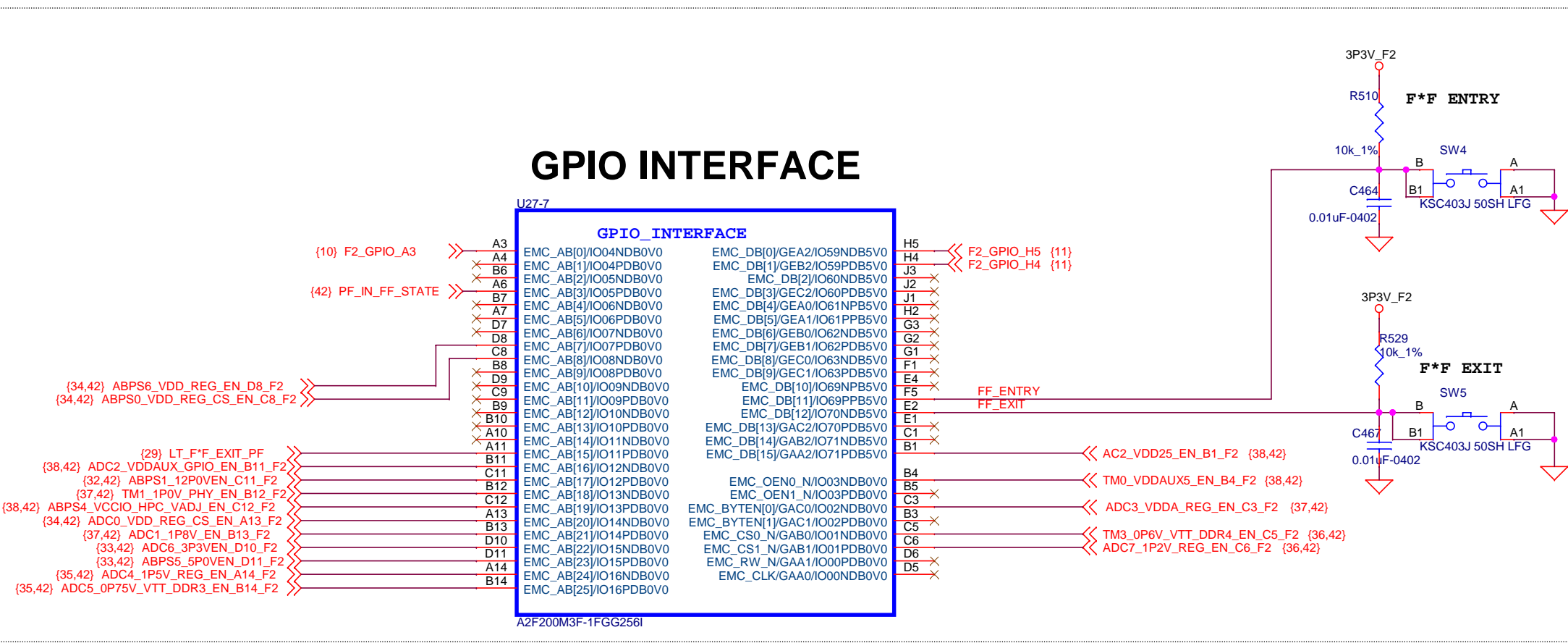
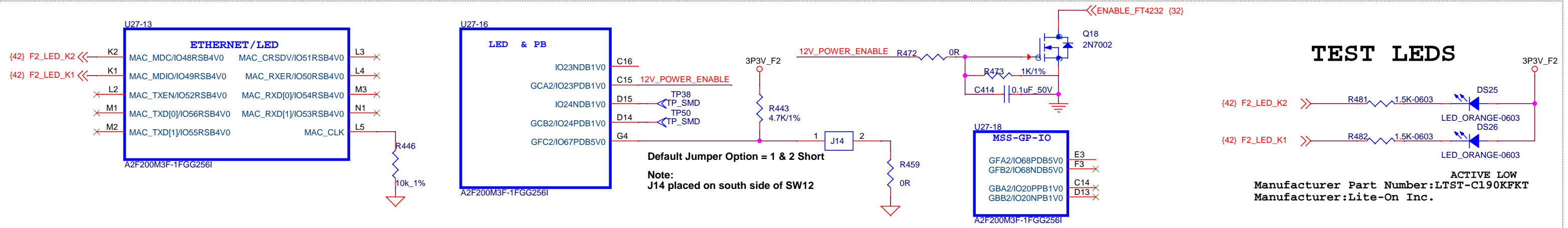
SmartFusion MSS BLOCK POWER SUPPLY



SmartFusion DIGITAL GROUND



USER DEBUG LOGIC



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Microsemi			
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