

AM6442 PROCESSOR CARD

EPCB-6039-D-00



Schematics Drafted in : Allegro Design entry CIS 17.4

REV	Revision Notes	Designer	Reviewer	Date
A0-01	DRAFT RELEASE	Valiant	Valiant	07-04-2023

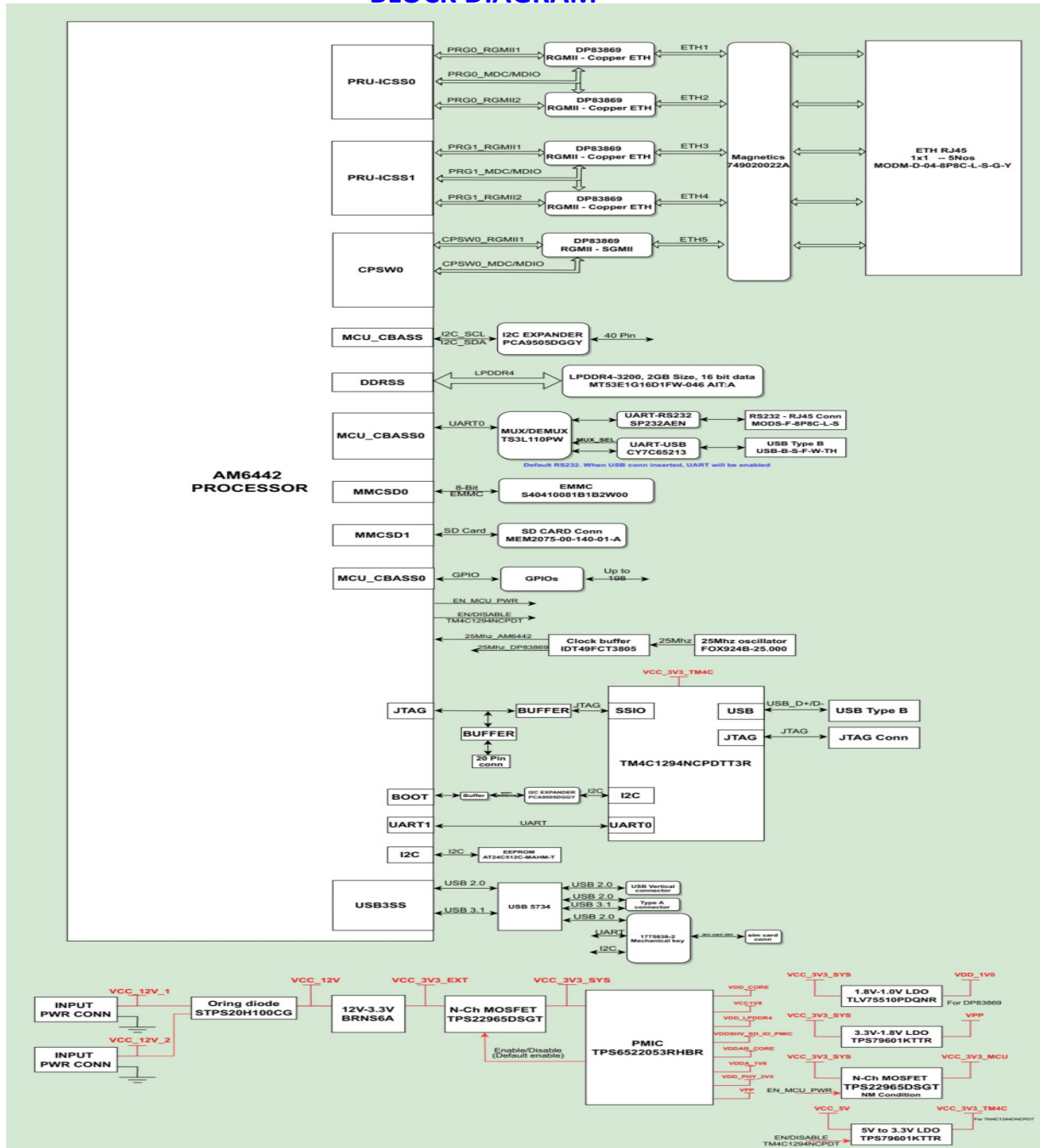
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AM6442 PROCESSOR CARD

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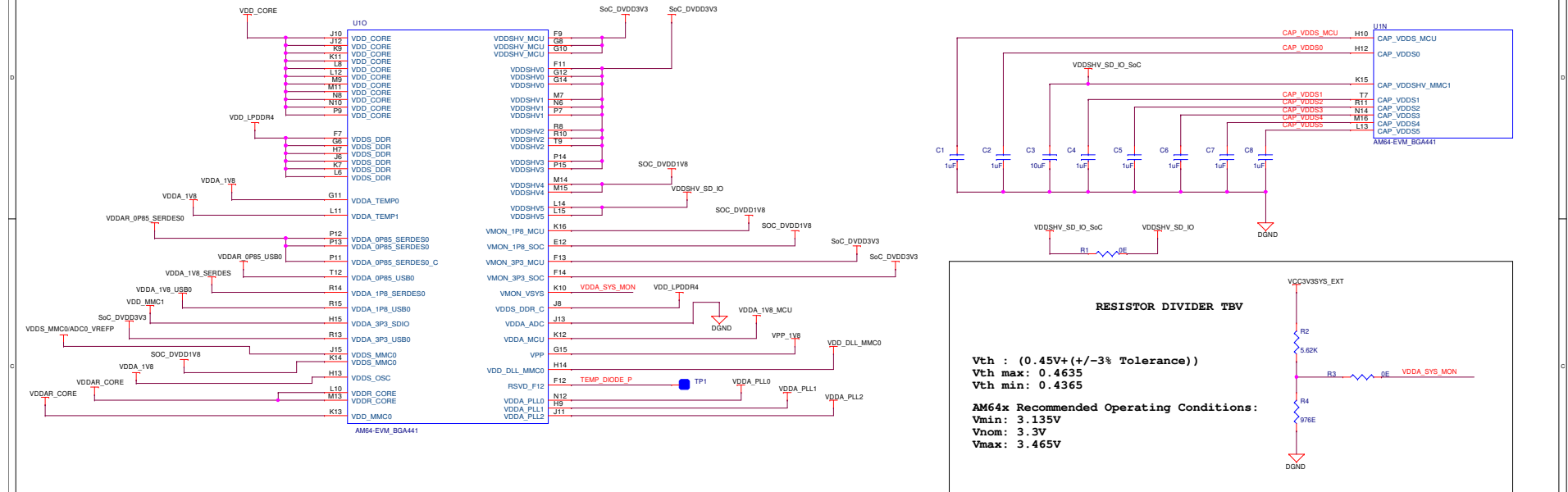
BLOCK DIAGRAM



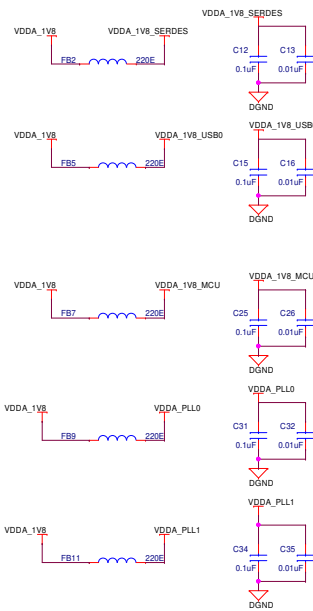
AM6442 PROCESSOR CARD

	C	Title: BLOCK DIAGRAM	
	Assy No: AM6442 PROCESSOR CARD		Rev: A1
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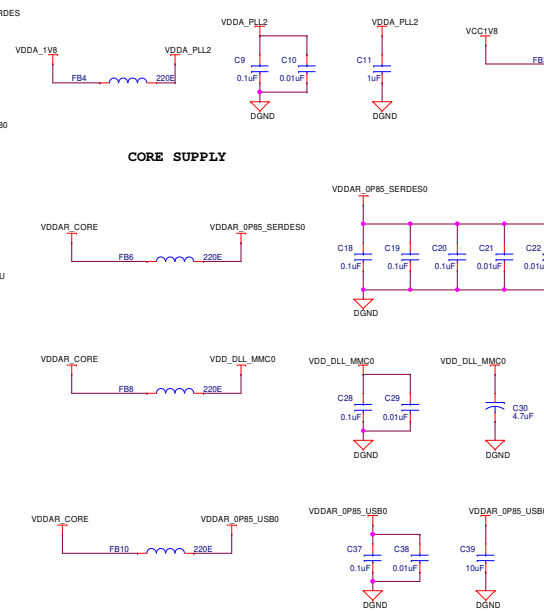
SOC POWER



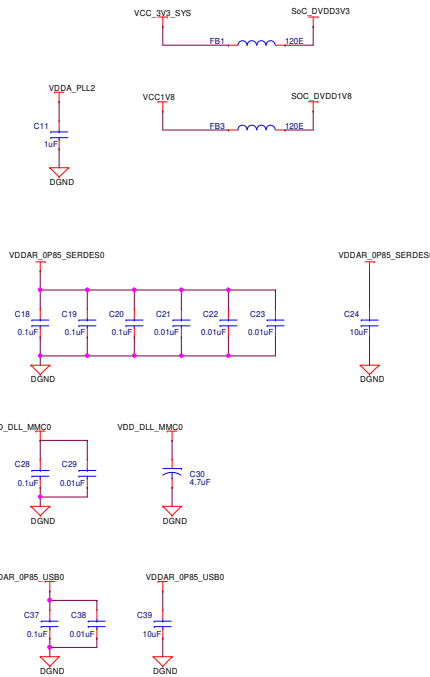
1.8V Analog SUPPLY



1.8V Analog SUPPLY

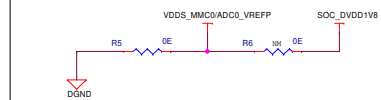


CORE SUPPLY



PG2.0 Changes

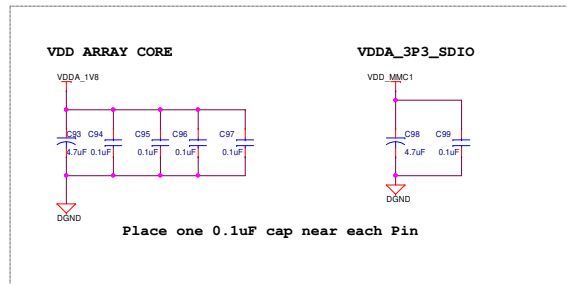
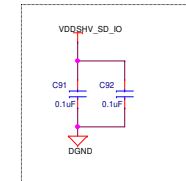
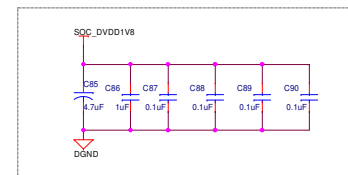
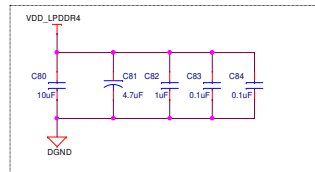
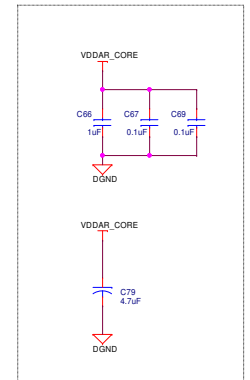
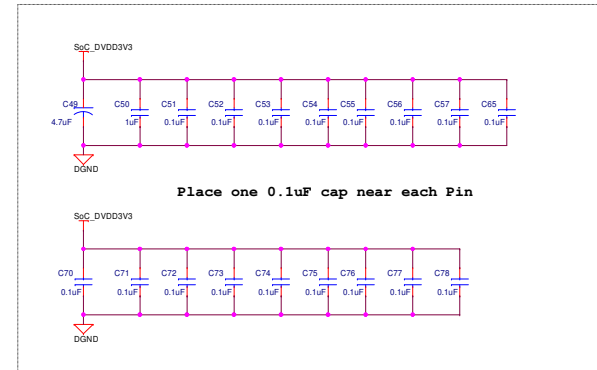
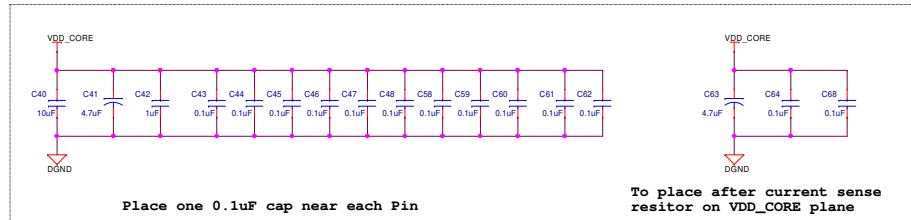
If SR1.0 is installed, mount R522 and make R521 as DNI
If SR2.0 is installed, mount R521 and make R522 as DNI



AM6442 PROCESSOR CARD

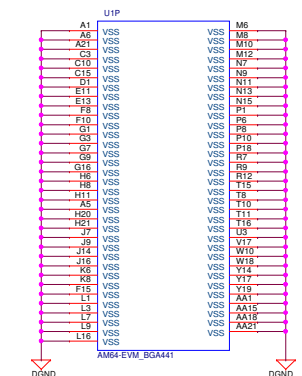
	c	Title : SOC POWER	
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SOC POWER DECAPS



Place one 0.1uF cap near each Pin

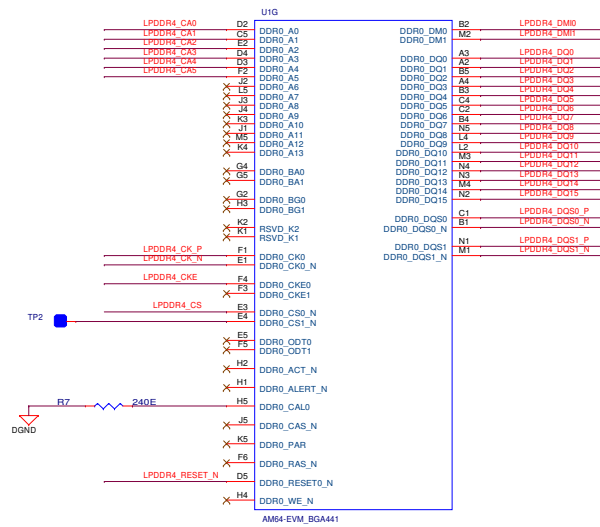
SOC POWER - VSS



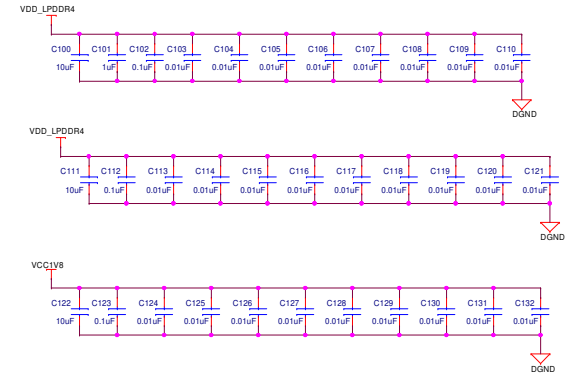
AM6442 PROCESSOR CARD

	Title : SOC POWER CAPS	
	Asy No : AM642 PROCESSOR CARD	Rev: A1
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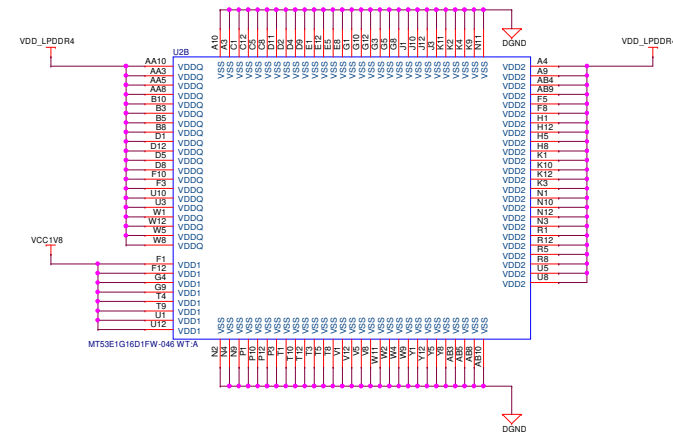
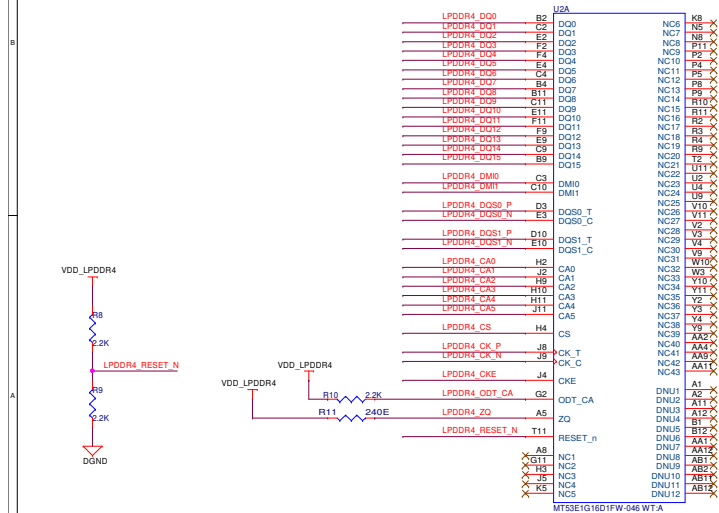
SOC LPDDR4 INTERFACE



LPDDR4 POWER DECAPS

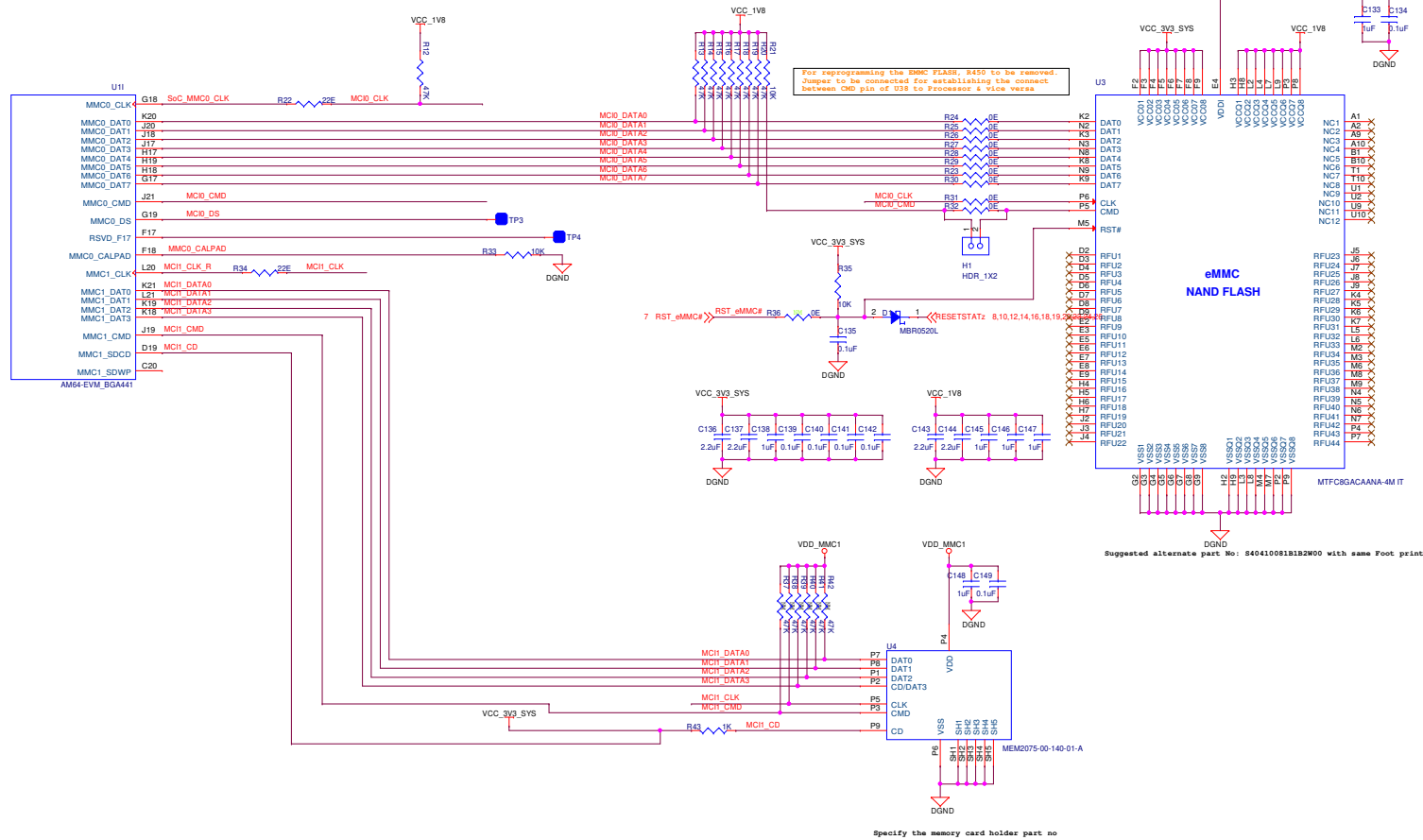


LPDDR4 DEVICE

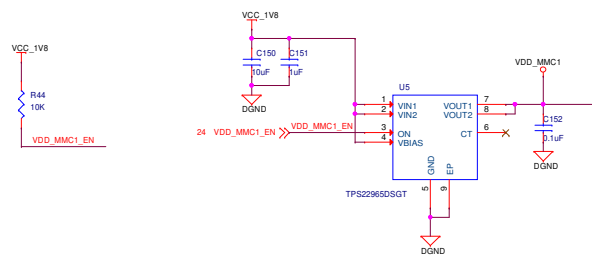


AM6442 PROCESSOR CARD

	Title : LPDDR4 INTERFACE
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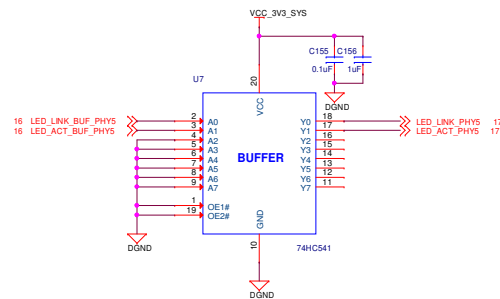
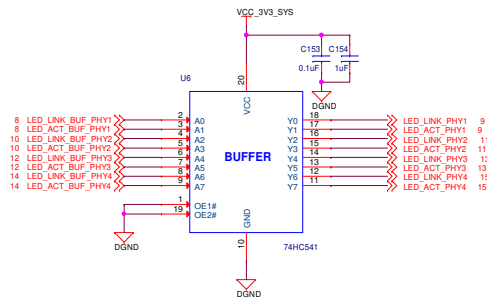
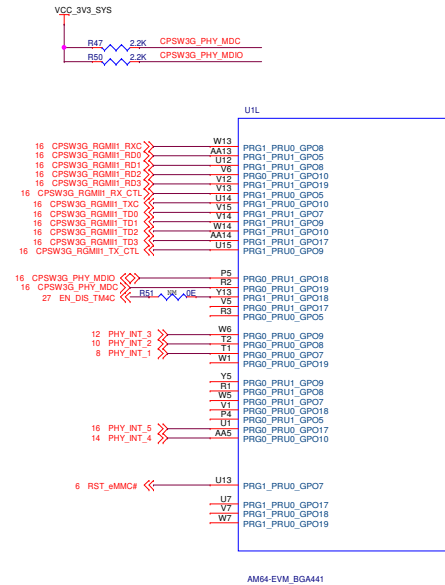
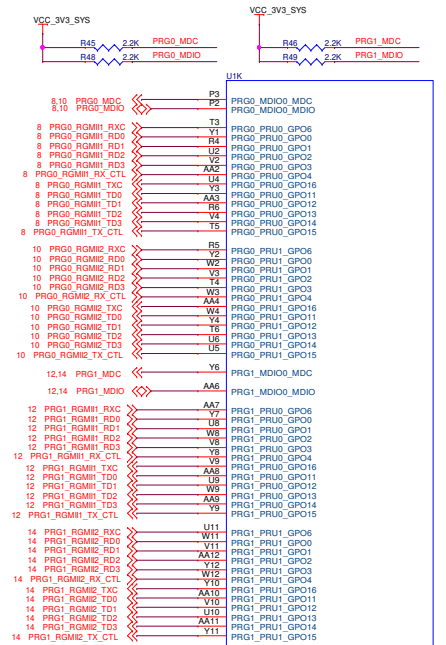
1.8V POWER SWITCH



AM6442 PROCESSOR CARD

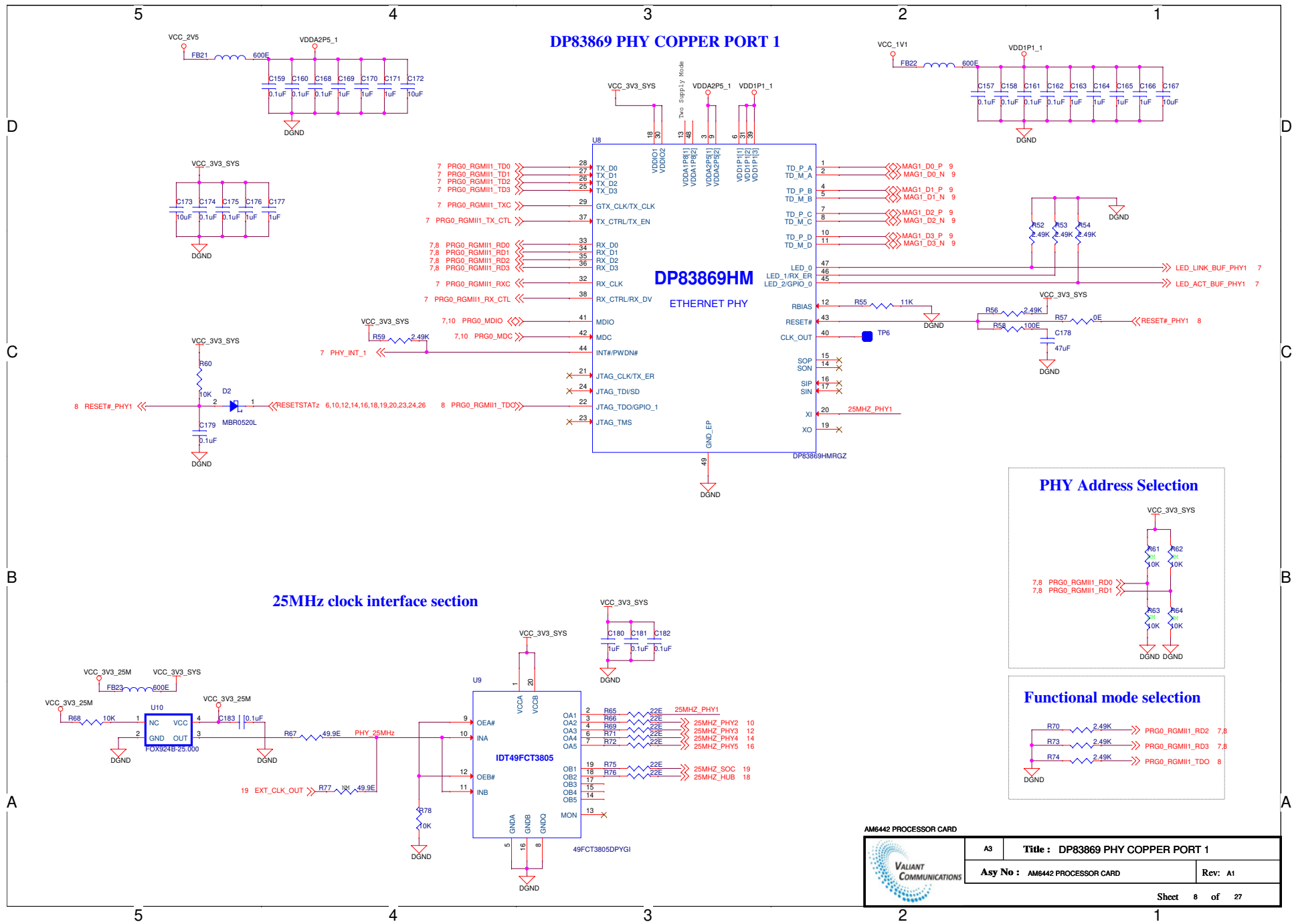
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ETHERNET SECTION



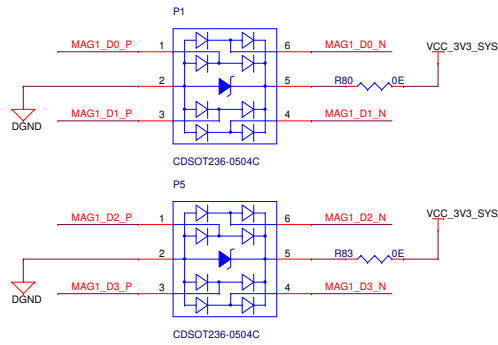
AM6442 PROCESSOR CARD

 VALIANT COMMUNICATIONS	C	Title : ETH SECTION		
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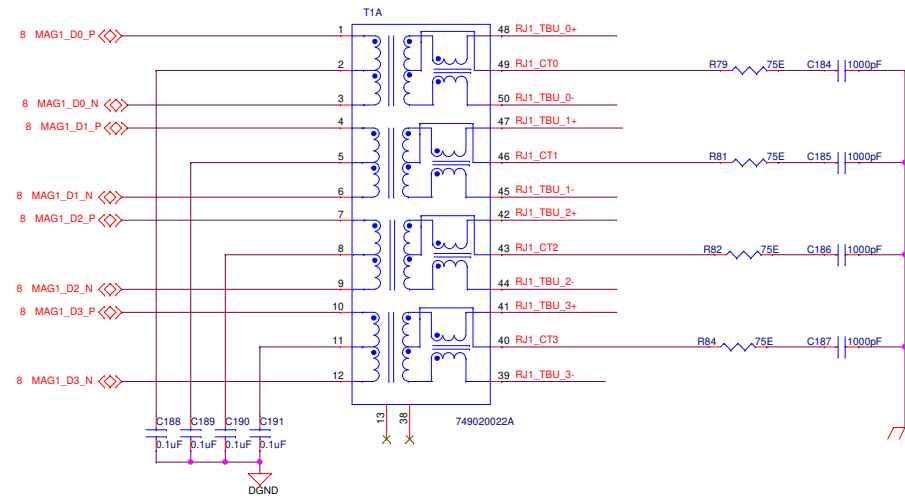


PORT 1 ETH CONNECTOR SECTION

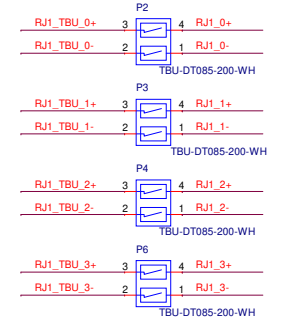
TVS PROTECTION



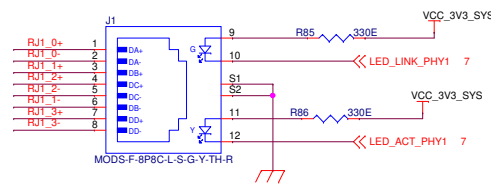
MAGNETICS



TBU PROTECTION



PORT 1



AM6442 PROCESSOR CARD

 VALIANT COMMUNICATIONS	A3	Title : MAGNETICS & CONN_COPPER 1	
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DP83869 PHY COPPER PORT 2

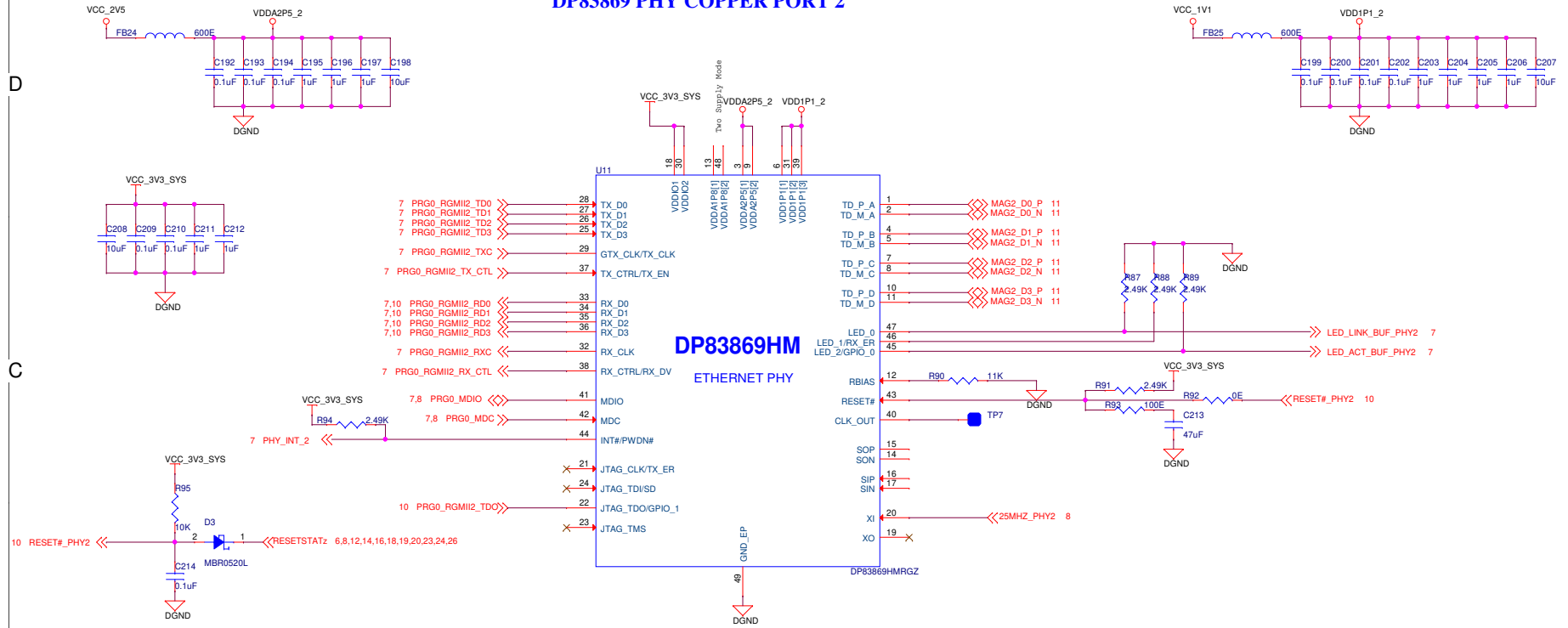
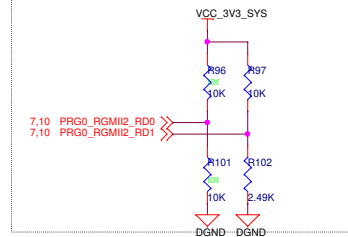


Table 12. Functional Mode Strap Table

PIN NAME	STRAP NAME	PIN #	DEFAULT	OPMO DE_2	OPMO DE_1	OPMO DE_0	FUNCTIONAL MODES
JTAG_TDO/GPI_O_1	OPMODE_0	22	0	0	0	0	RGMII to Copper(100Base-T/100Base-TX/10Base-Te)
RX_D3	OPMODE_1	35	0	0	1	0	RGMII to 100Base-FX
				0	1	1	RGMII-SGMII Bridge Mode
				1	0	0	100Base-T to 100Base-X
				1	0	1	100Base-T to 100Base-FX
				1	1	1	SGMII to Copper(100Base-T/100Base-TX/10Base-Te)
				1	1	1	JTAG for boundary scan

PHY Address Selection



Functional mode selection



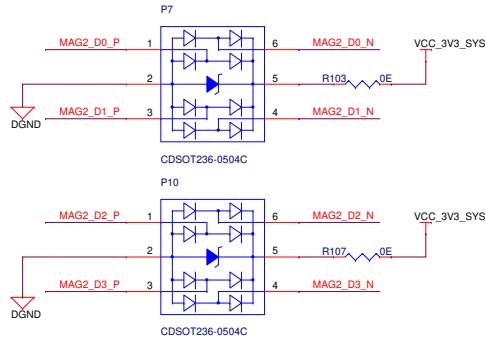
AM6442 PROCESSOR CARD

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	Asy No : AM6442 PROCESSOR CARD	Rev: A1

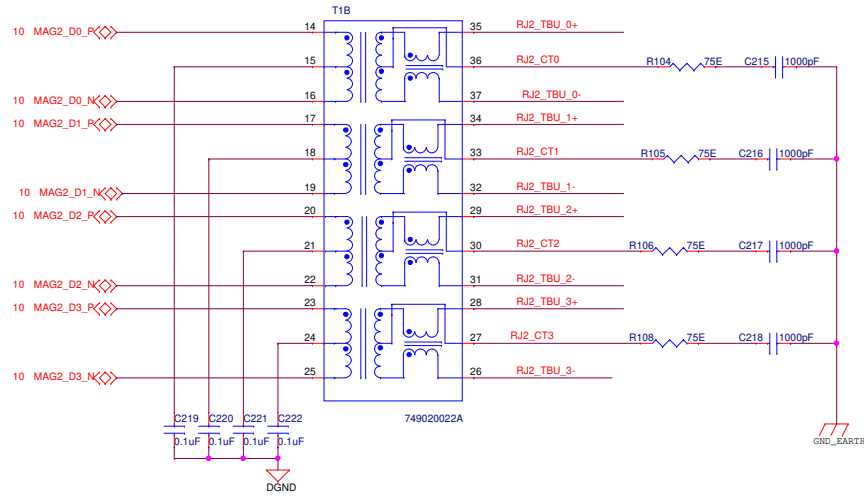
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PORT 2 ETH CONNECTOR SECTION

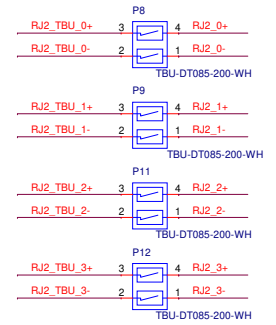
TVS PROTECTION



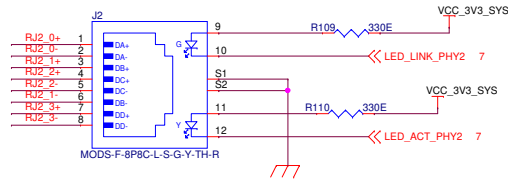
MAGNETICS



TBU PROTECTION



PORT 2



AM6442 PROCESSOR CARD

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	Asy No : AM6442 PROCESSOR CARD		Rev: A1
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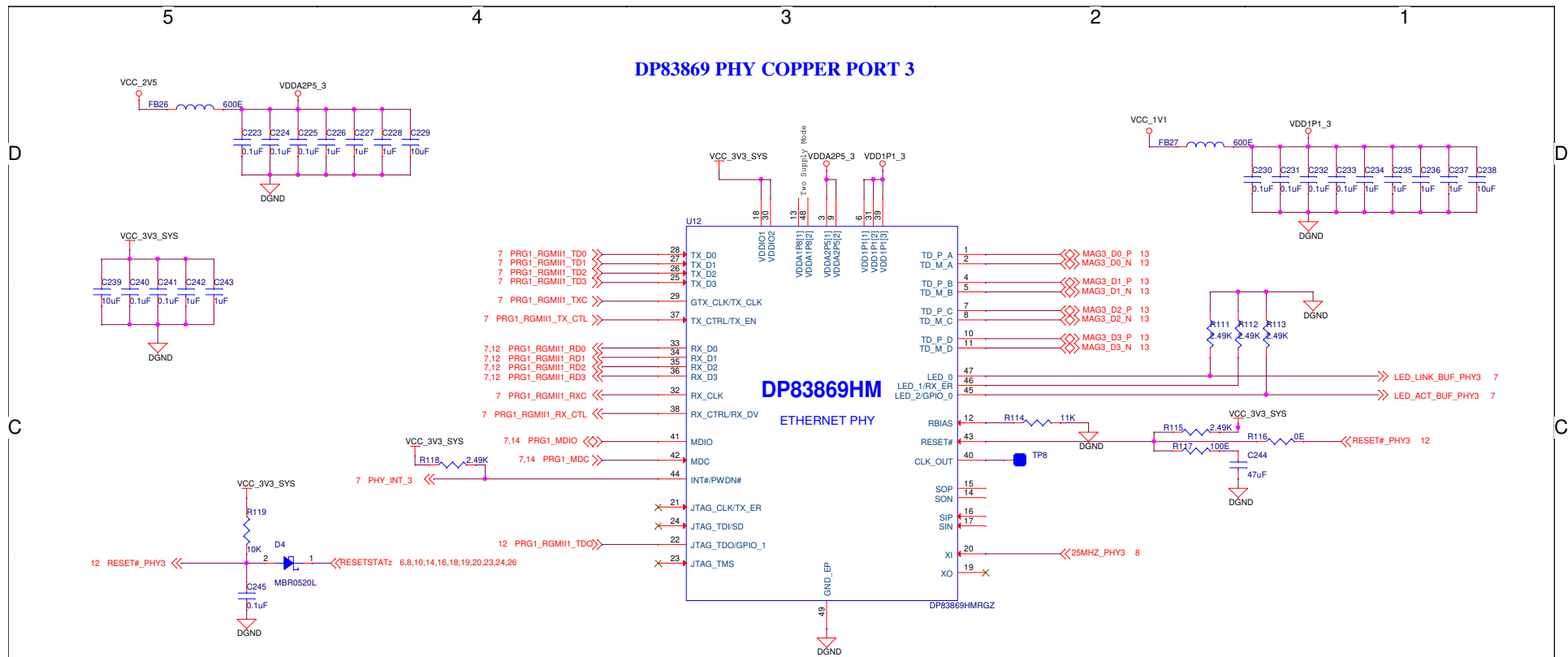
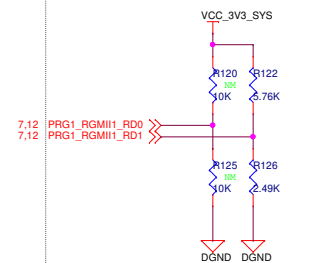


Table 12. Functional Mode Strap Table

PIN NAME	STRAP NAME	PIN #	DEFAULT	OPMO DE_2	OPMO DE_1	OPMO DE_0	FUNCTIONAL MODES
JTAG_TDO/GPIO_1	OPMODE_0	22	0	0	0	0	RGMII to Copper(1000Base-T/100Base-TX/10Base-Te)
				0	0	1	RGMII to 1000Base-X
RX_D3	OPMODE_1	36	0	0	1	0	RGMII to 100Base-FX
				0	1	1	RGMII-SGMII Bridge Mode
RX_D2	OPMODE_2	35	0	1	0	0	1000Base-T to 1000Base-X
				1	0	1	100Base-T to 100Base-FX
				1	1	1	SGMII to Copper(1000Base-T/100Base-TX/10Base-Te)
				1	1	1	JTAG for boundary scan

PHY Address Selection



Functional mode selection



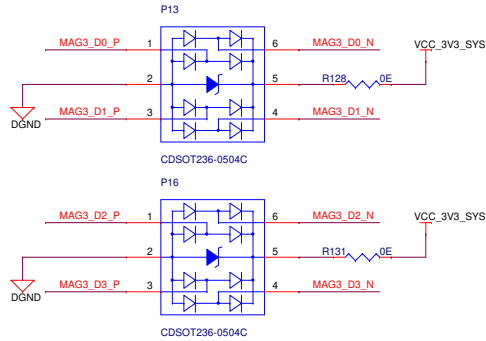
AM6442 PROCESSOR CARD



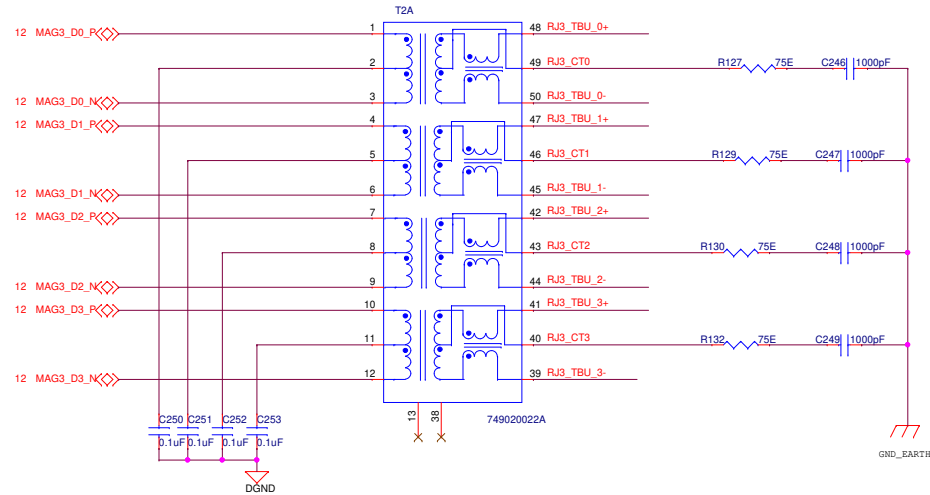
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Asy No : AM6442 PROCESSOR CARD		Rev: A1

PORT 3 ETH CONNECTOR SECTION

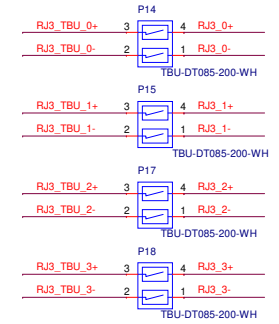
TVS PROTECTION



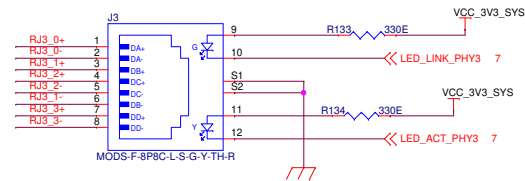
MAGNETICS



TBU PROTECTION



PORT 3



AM6442 PROCESSOR CARD

 VALIANT COMMUNICATIONS	A3	Title : MAGNETICS&CONN_COPPER 3	
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DP83869 PHY - SFP PORT 4

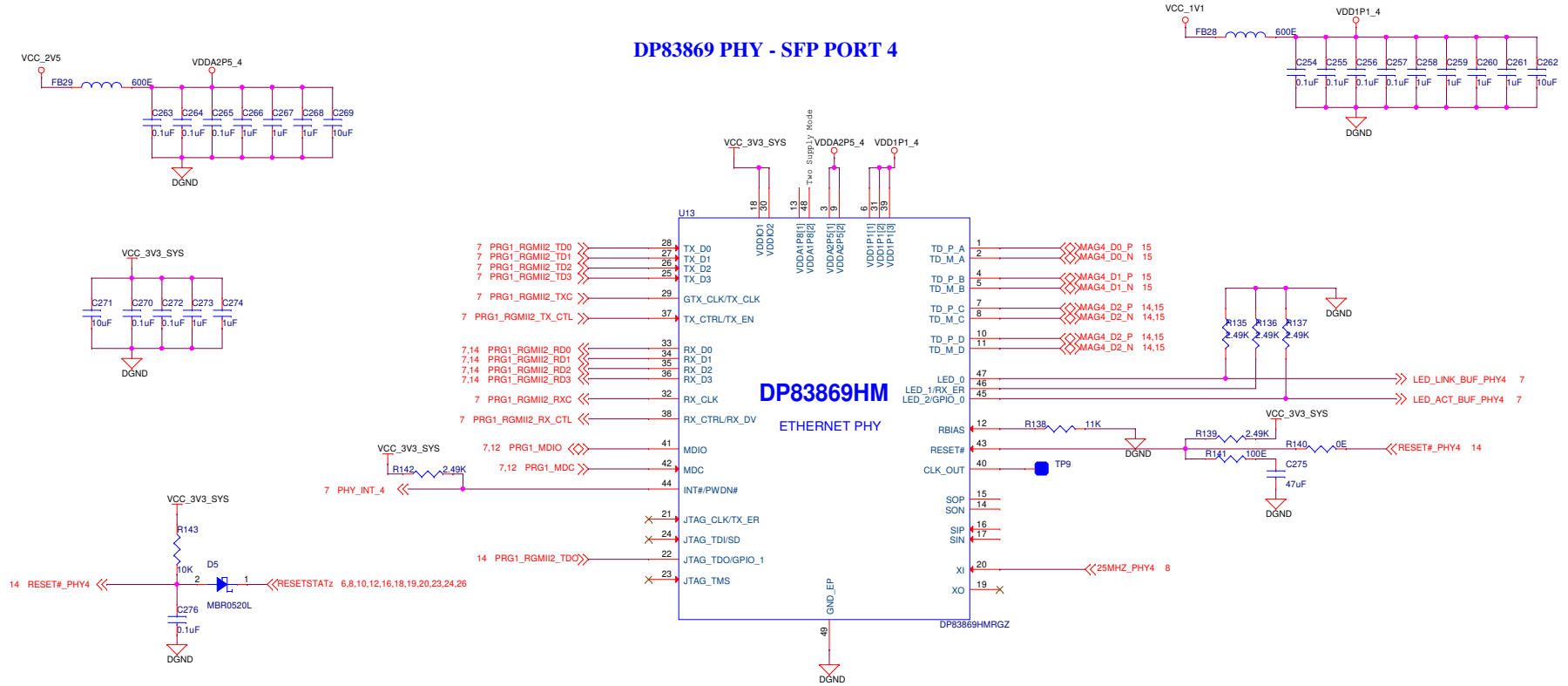
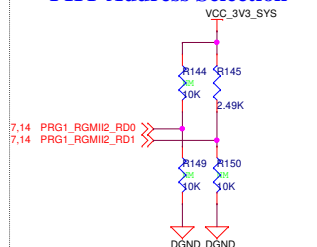


Table 12. Functional Mode Strap Table

PIN NAME	STRAP NAME	PIN #	DEFAULT	OPMO DE_2	OPMO DE_1	OPMO DE_0	FUNCTIONAL MODES
JTAG_TDO/GPI_O_1	OPMODE_0	22	0	0	0	0	RGMII to Copper(100Base-T/100Base-TX/10Base-Te)
				0	0	1	RGMII to 1000Base-X
RX_D3	OPMODE_1	36	0	0	1	0	RGMII to 100Base-FX
				0	1	1	RGMII-SGMII Bridge Mode
RX_D2	OPMODE_2	35	0	1	0	0	1000Base-T to 1000Base-X
				1	0	1	100Base-T to 100Base-FX
				1	1	1	SGMII to Copper(1000Base-T/100Base-TX/10Base-Te)
							JTAG for boundary scan

PHY Address Selection



Functional mode selection

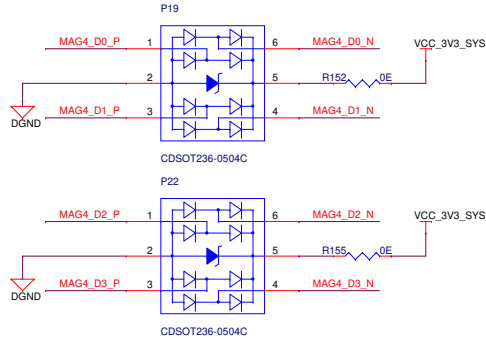


AM6442 PROCESSOR CARD

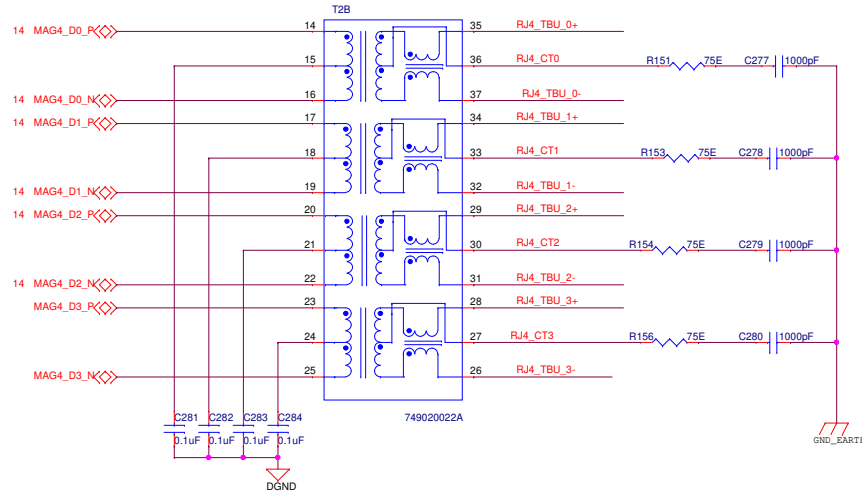
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	Asy No : AM6442 PROCESSOR CARD		Rev: A1

ETHERNET RJ45 MAGNETICS & CONNECTOR INTERFACE 4

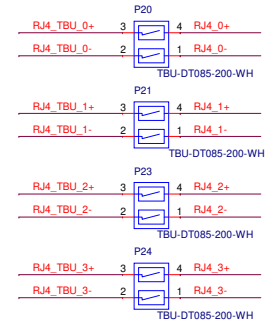
TVS PROTECTION



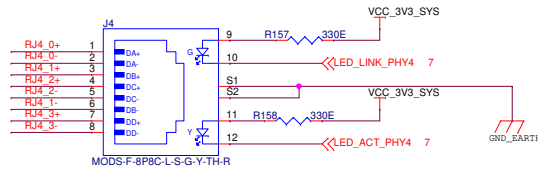
MAGNETICS



TBU PROTECTION



PORT4 COPPER PORT



AM6442 PROCESSOR CARD

 VALIANT COMMUNICATIONS	A3	Title : MAGNETICS&CONN_COPPER 4	
	Asy No : AM6442 PROCESSOR CARD		Rev: A1
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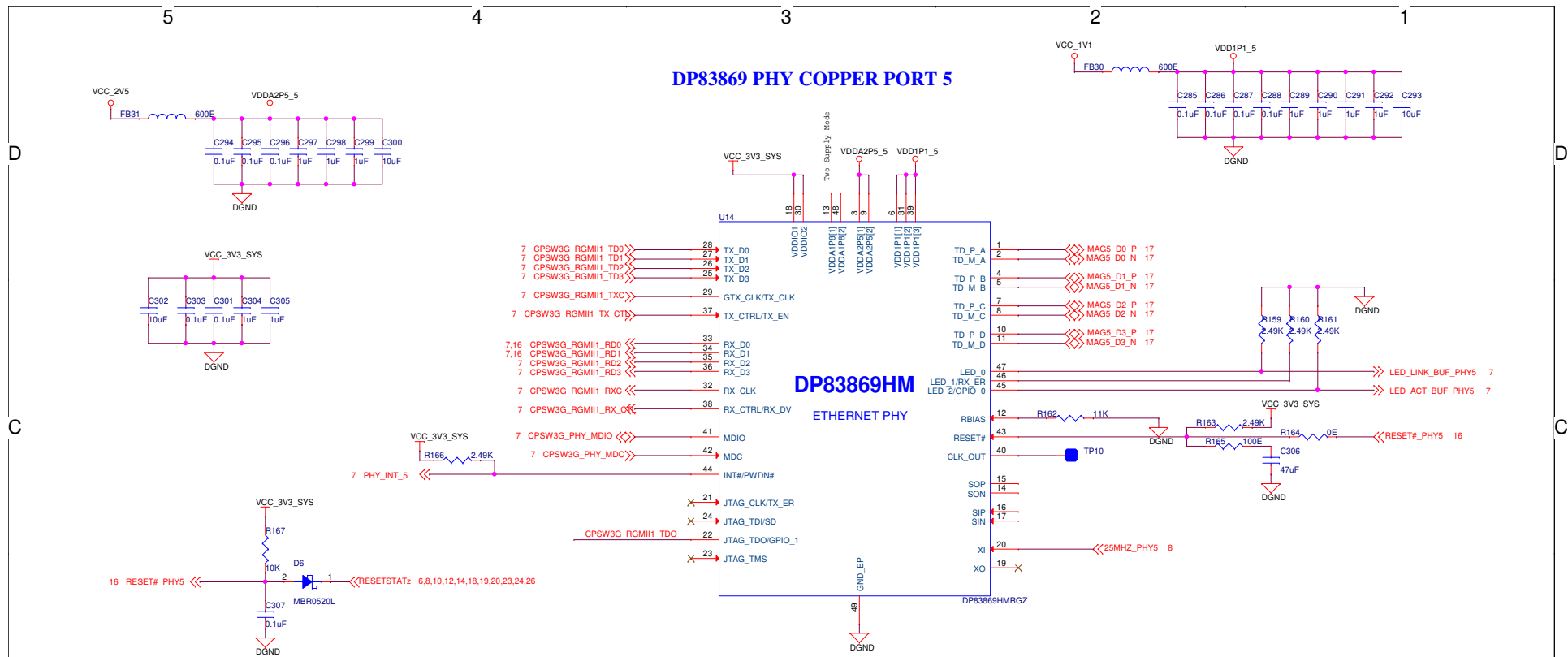
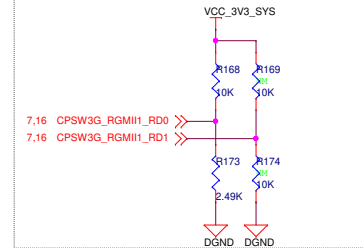


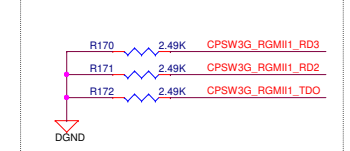
Table 12. Functional Mode Strap Table

PIN NAME	STRAP NAME	PIN #	DEFAULT	OPMO DE_2	OPMO DE_1	OPMO DE_0	FUNCTIONAL MODES
JTAG_TDO/GPIO_1	OPMODE_0	22	0	0	0	0	RGMII to Copper(1000Base-T/100Base-TX/10Base-T)
				0	0	1	RGMII to 1000Base-X
RX_D3	OPMODE_1	36	0	0	1	0	RGMII to 100Base-FX
				0	1	1	RGMII-SGMII Bridge Mode
RX_D2	OPMODE_2	35	0	1	0	0	1000Base-T to 1000Base-X
				1	0	1	100Base-T to 100Base-FX
				1	1	1	SGMII to Copper(1000Base-T/100Base-TX/10Base-T)
				1	1	1	JTAG for boundary scan

PHY Address Selection



Functional mode selection



AM6442 PROCESSOR CARD



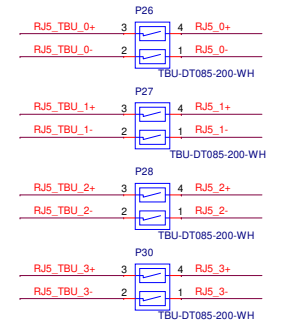
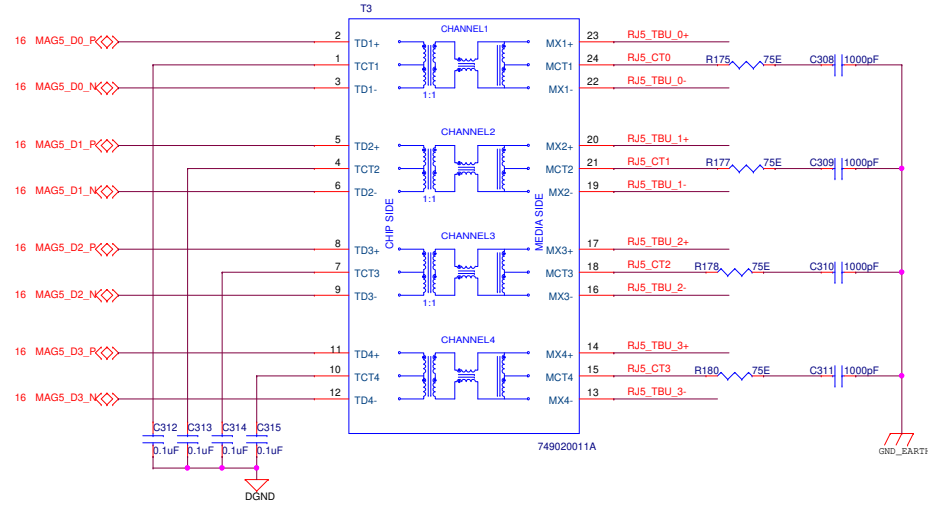
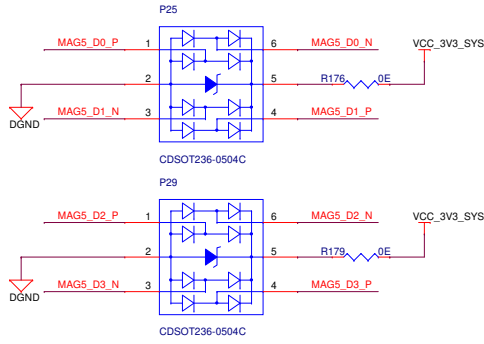
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Asy No : AM6442 PROCESSOR CARD	Rev: A1

PORT 5 ETH CONNECTOR SECTION

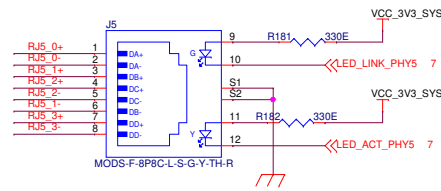
MAGNETICS

TBU PROTECTION

TVS PROTECTION



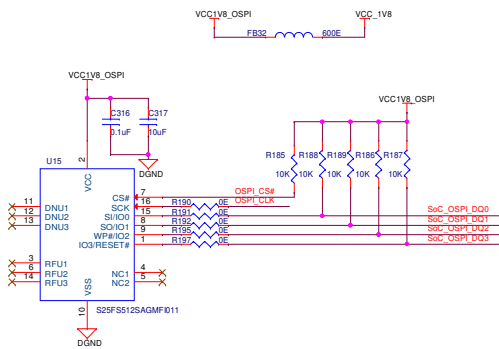
PORT5 COPPER PORT



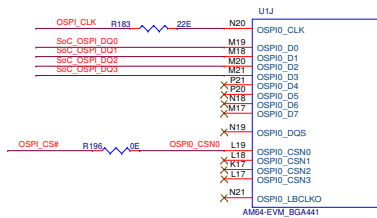
AM6442 PROCESSOR CARD

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	Asy No : AM6442 PROCESSOR CARD		Rev: A1
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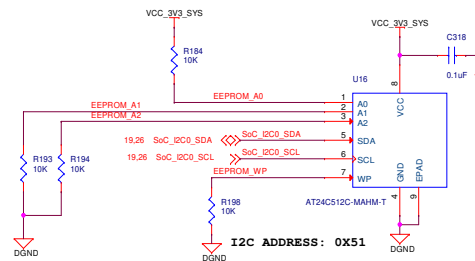
OSPI FLASH



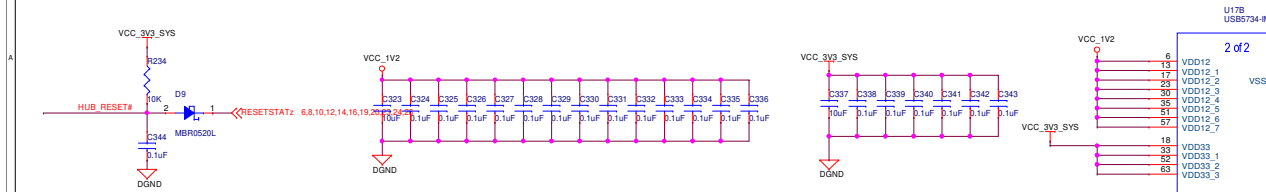
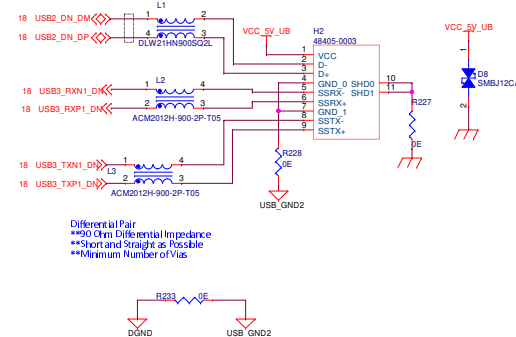
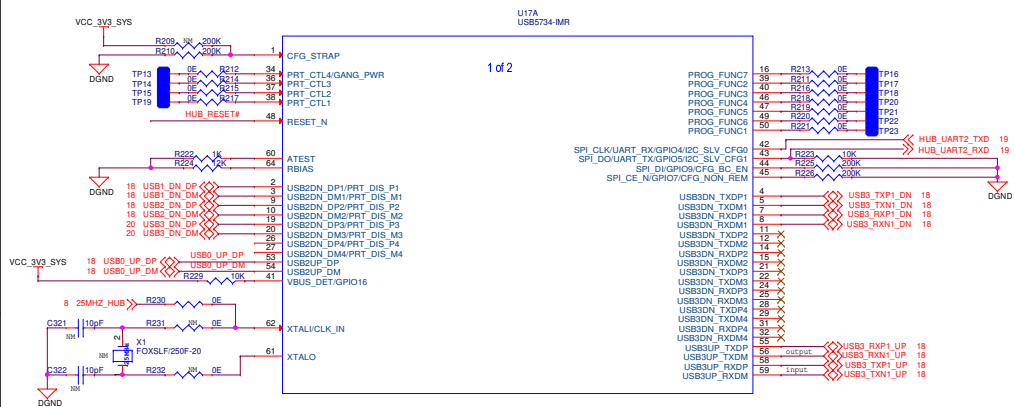
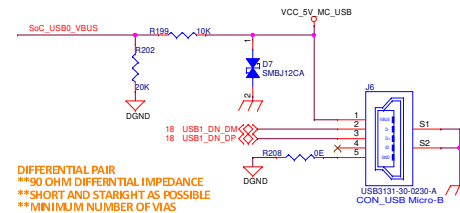
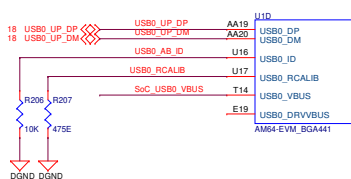
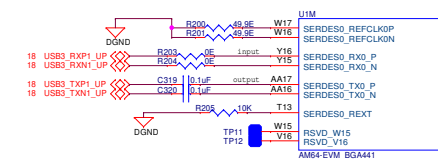
SOC OSPI INTERFACE



BOARD ID EEPROM

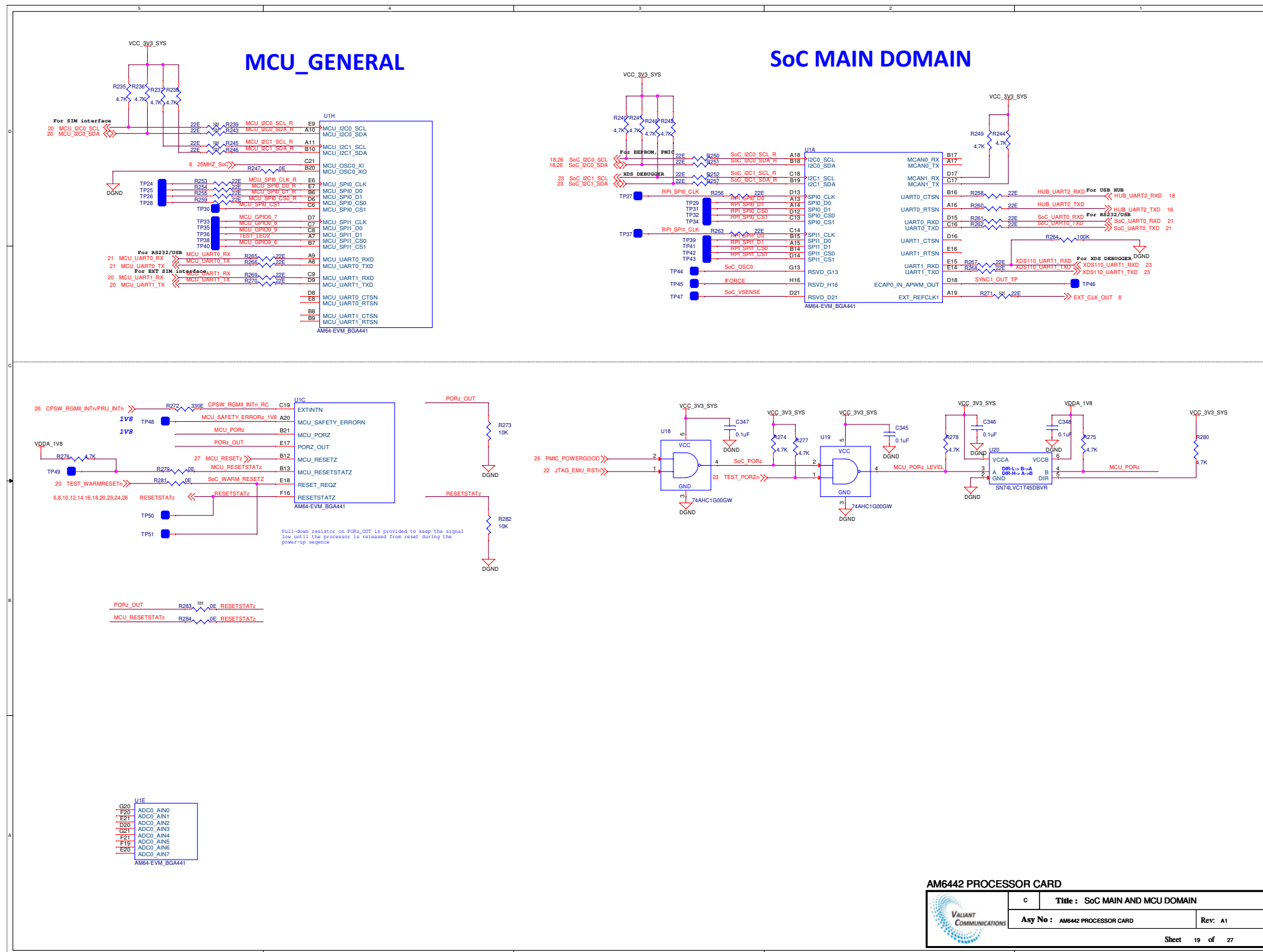


USB 2.0 INTERFACE

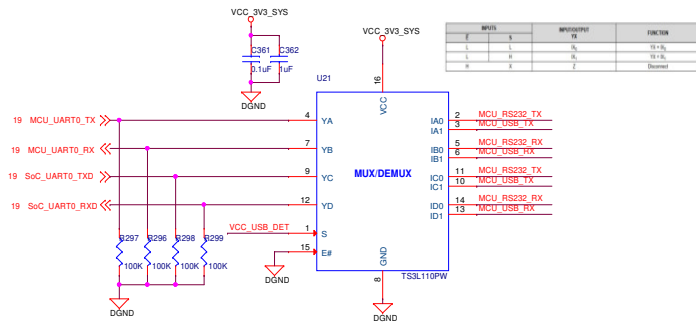


AM6442 PROCESSOR CARD

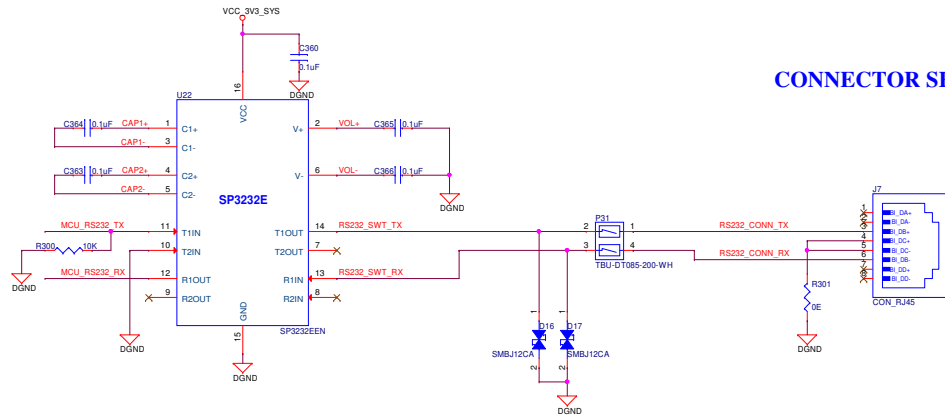
	C	Title: OSPI INTERFACE	
	Assy No: AM6442 PROCESSOR CARD		Rev: A1
Sheet 18 of 27			



MUX FOR SELECTING PROGRAMMER / SWITCH

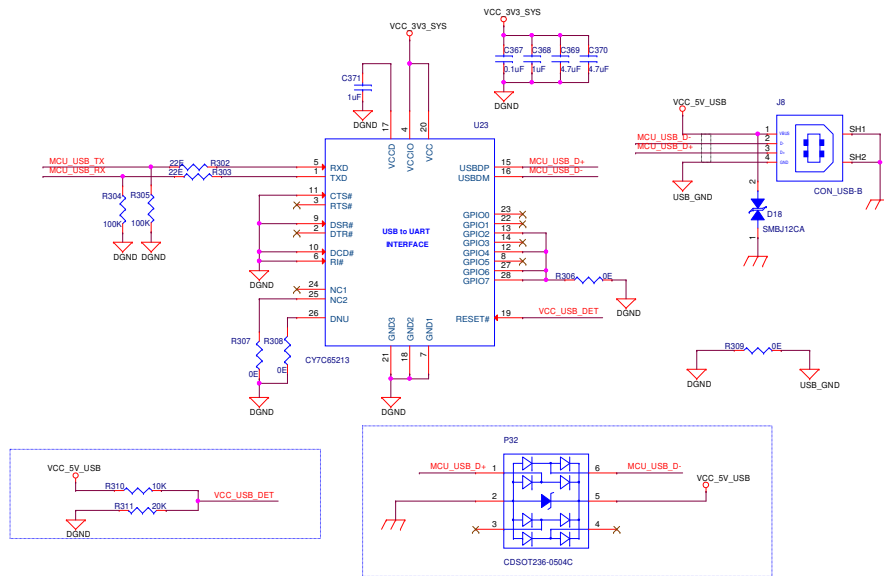


RS232 Transceiver



CONNECTOR SECTION

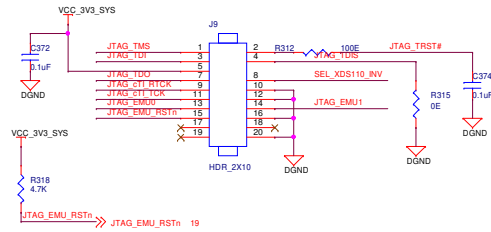
UART-USB TRANSCEIVER



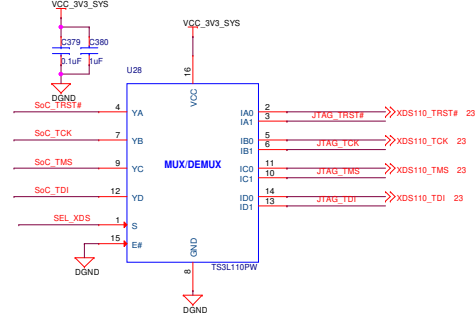
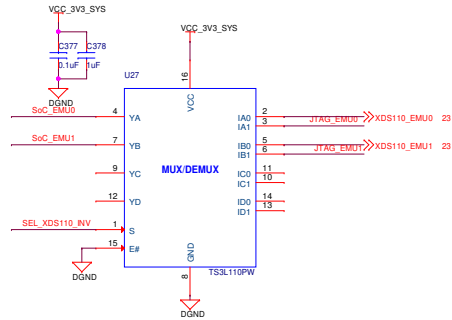
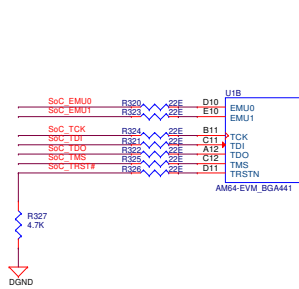
AM6442 PROCESSOR CARD

	Title : MUX_RS232_USB	
	Asy No : AM6442 PROCESSOR CARD	Rev: A1
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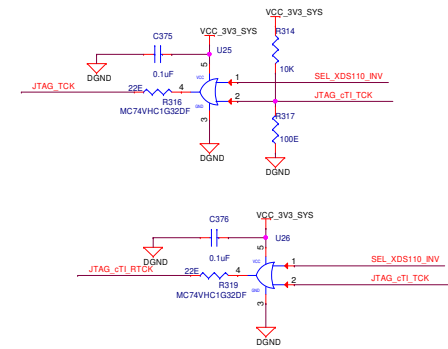
JTAG 20 PIN cTI CONNECTOR



JTAG SoC SECTION



JTAG CLOCK BUFFER

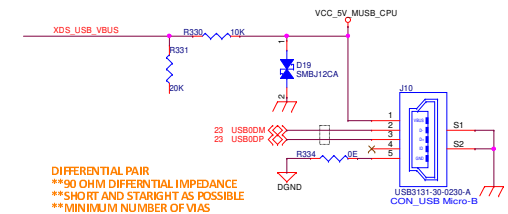
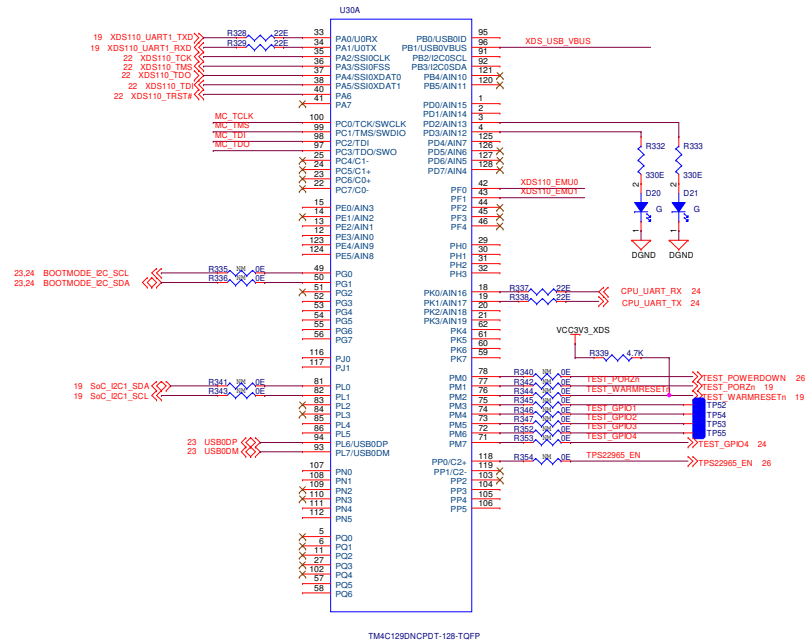


AM6442 PROCESSOR CARD

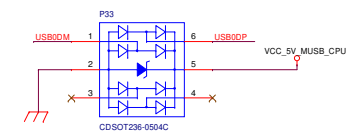
	c	Title : JTAG 20 PIN cTI CONNECTOR	Rev: A1
	Asy No :	AM6442 PROCESSOR CARD	

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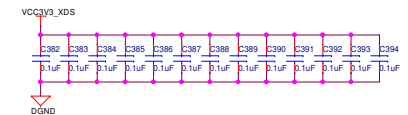
XDS110 DEBUGGER



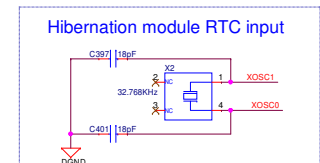
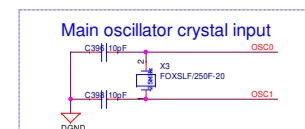
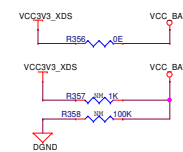
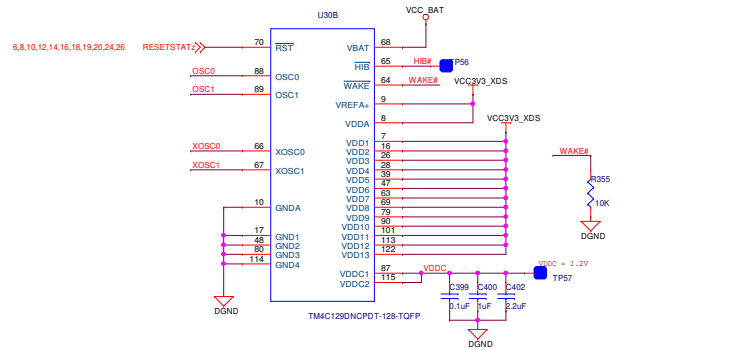
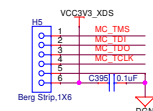
PROTECTION FOR USB-MICRO-B CONNECTOR



Decoupling Capacitors (MCU)

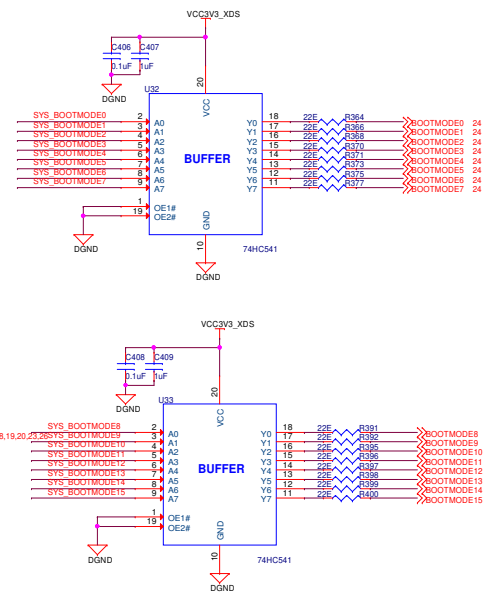


JTAG Connector

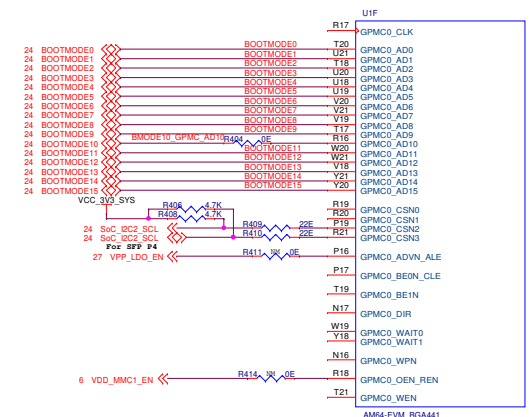


AM6442 PROCESSOR CARD

 VALIANT COMMUNICATIONS	C	Title : XDS110 DEBUGGER	
	Asy No : AM6442 PROCESSOR CARD		Rev: A1
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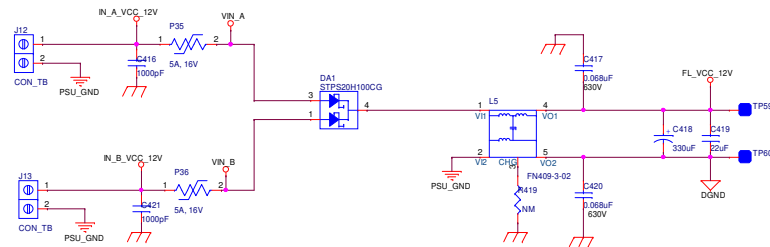
BOOT MODE



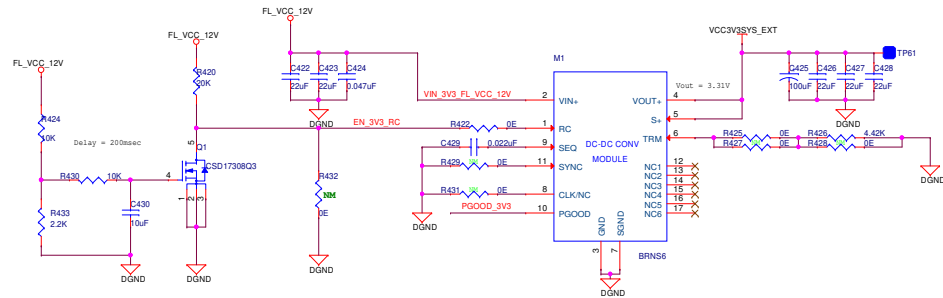
AM6442 PROCESSOR CARD

	C	Title : I2C BOOTSTRAP	
	Asy No : AM642 PROCESSOR CARD		Rev: A1
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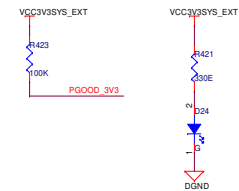
POWER INTERFACE 1



12V TO 3.3V SUPPLY



3.3V STATUS LED



AM6442 PROCESSOR CARD

	Title : POWER SECTION 2 - PMIC	
	Asy No : AM6442 PROCESSOR CARD	Rev: A1
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[illegible]

ON/OFF LOGIC

The diagram illustrates the ON/OFF LOGIC for the TPS652203. It features a 74VHC1G125DTT1G inverter (U36) configured as a buffer. The inverter's VCC pin (pin 4) is connected to the VCC3V3SYS_EXT supply through a 100K resistor (R443) and a 1uF capacitor (C442) to DGND. The inverter's GND pin (pin 5) is connected to DGND through a 100K resistor (R445). The inverter's input (pin 1, labeled DEF) is connected to a red signal line labeled '23 TEST_POWERDOWN'. The inverter's output (pin 4, labeled Y) is connected to a red signal line labeled 'TPS652203_EN'. The inverter is labeled U36 and M74VHC1G125DTT1G.

3V3 POWER SWITCH

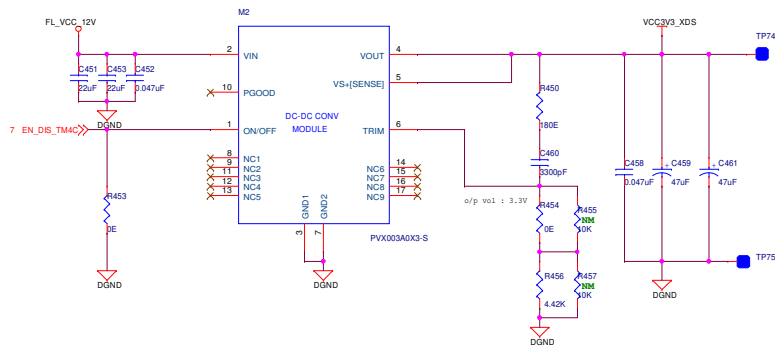
The diagram illustrates a 3V3 power switch circuit. It features a TPS22965SGT (U37) as the main component. The input side is connected to VCC3V3SYS_EXT through a 10uF capacitor (C448). The output side is connected to VCC_3V3_SYS through a 0.1uF capacitor (C450). The TPS22965SGT is configured with VIN1, VIN2, VOUT1, and VOUT2 pins. The output is also connected to a TP3 test point. A 10K resistor is connected between VCC3V3SYS_EXT and ground.

POWER INDICATION LED

The diagram shows a power indication LED circuit. The LED is connected to the VCC_3V3_SYS supply through a 25 ohm resistor. The LED's anode is connected to the LED pin of the MMBT4401L transistor. The transistor's base is connected to a 1K resistor (R446) which is connected to the PMIC_POWERGOOD signal. The transistor's emitter is connected to a 10K resistor (R447) which is connected to D/GND. The transistor's collector is connected to a 30E resistor (R444) which is connected to D/GND.

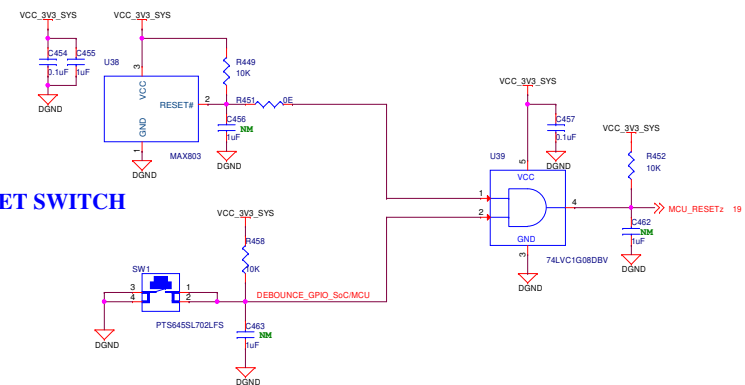
	C	Title : POWER SECTION 2 - PMIC	
	Asy No : AM6442 PROCESSOR CARD		Rev: A1
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12V TO 3.3V

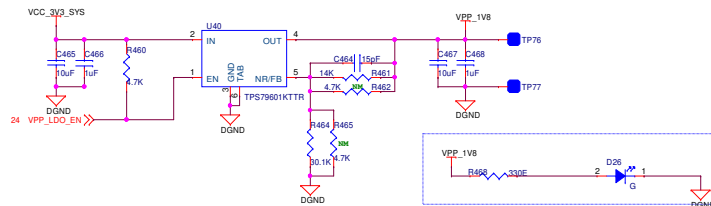


VOLTAGE SUPERVISOR

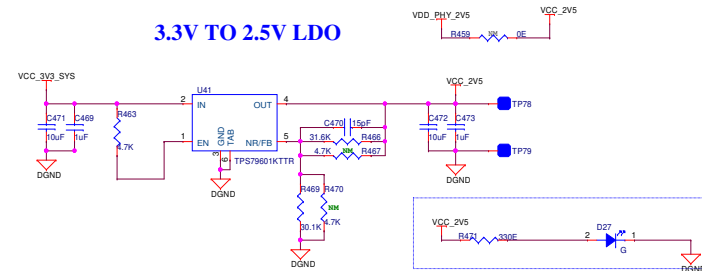
RESET SWITCH



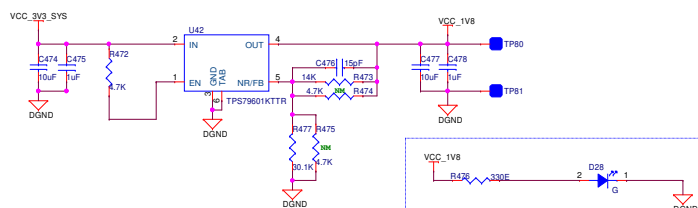
3.3V TO 1.8V LDO (VPP)



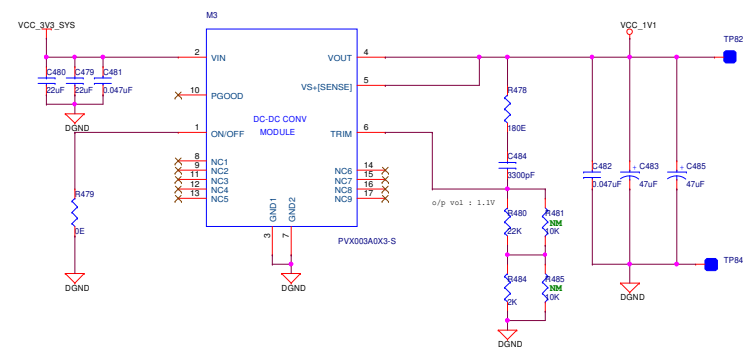
3.3V TO 2.5V LDO



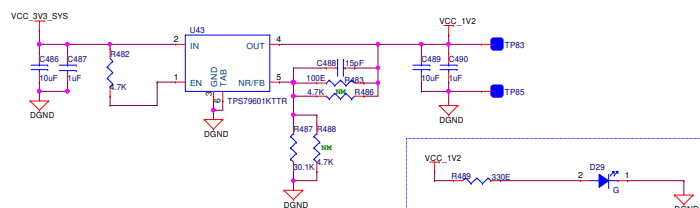
3.3V TO 1.8V LDO



3.3V TO 1.1V SUPPLY



3.3V TO 1.2V LDO



AM6442 PROCESSOR CARD

C	Title : POWER SECTION 3	Rev: A1
Asy No :	AM6442 PROCESSOR CARD	Sheet 27 of 27