

VAR-AM33CustomBoard



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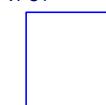
Disclaimer:

SchematicS are for reference only.
 Variscite LTD provides no warranty for the use of
 these schematics.
 Schematics are subject to change without notice.

Revision History

| | |
|------------|--|
| Rev 1.0 | Initial |
| Rev 1.02 | Major changes: LCD buffer added for SOM protection GPMC mux changed Back light connector added LVDS connector pinout change |
| Rev 1.02A | Compatible to DVK with wired 1.02 PCB , refer to Ver 1.1 as a design reference |
| Rev 1.11 | Major changes: VAR-SOM-AMM33 GPIO3_9 Replaced with GPIO3_4 USB Power limiter to 5V G.PHY 125Mhz clock topology update BUS Mux IC changed to resistor assembly option User button added G.PHY external delay lines added |
| Rev 1.11 A | 10K pull up on GPMC CLK , added . Indicating 1.11 PCB revision |
| Rev 1.11 B | VAR-SOM-AM33 Pin 105,130- connected to GND Adding RX1 in parallel to D4 - Setting USB ID pin to 1.8V Max Do not use UART1 / MMC1 in case of on-som Wifi/BT module presense notification USB power distribution pull ups removed. USB port 4 power distribution fixed. |
| Rev 1.11 C | VAR-SOM-AM33 symbol pin 72 updated SPI1 muxing recommendation fix |
| Rev 1.11 D | VAR-SOM-AM33 pin 60 is N.C |
| Rev 1.11 E | I2C1 pull-ups not required MMC0_CMD pulled-up |
| Rev 1.11 F | L3 changed to 15uH |
| Rev 1.11 G | R11 / R12 changed to 100nf. Working as differential pairs fits TI original Alsamixer settings, both in Linux and Android |
| Rev 1.21 | USB OTG scheme chagned, according to revised TI datasheet |

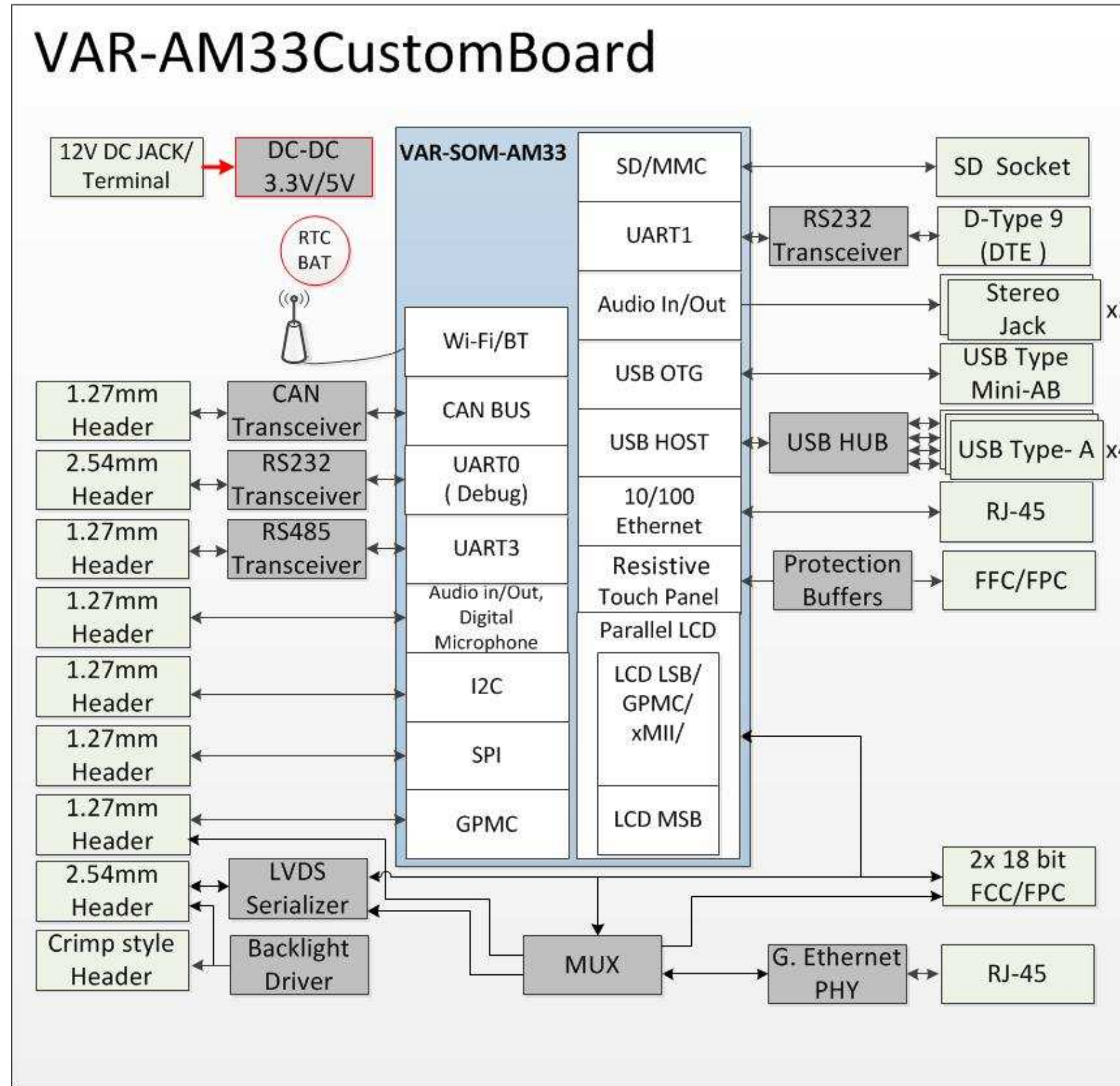
VPC1



PCB

| | | | |
|--------------------------------|--|--------------------------------|------------|
| Title 01. Cover | | | |
| Size A3 | Document Number VAR-AM33Customboard | Project VAR-AM33Customboard | Rev 1.2 |
| Designer: <Designer> | | Approved By: <Approved By> | |
| Date: Wednesday, June 04, 2014 | | Sheet 1 of 10 | |

02 - Block Diagram



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| | | | |
|---------------------------------|--|--------------------------------|------------|
| Title 02. Block Diagram | | | |
| Size A3 | Document Number VAR-AM33Customboard | Project VAR-AM33Customboard | Rev 1.2 |
| Designer: <Designer> | | Approved By: <Approved By> | |
| Date: Sunday, December 15, 2013 | | Sheet 2 of 10 | |

03. VAR-SOM-AM33



Important note:
LCD signals are sampled internally at boot time. Use as input only when u-boot is up and running. Check note 3 at section 3.1.

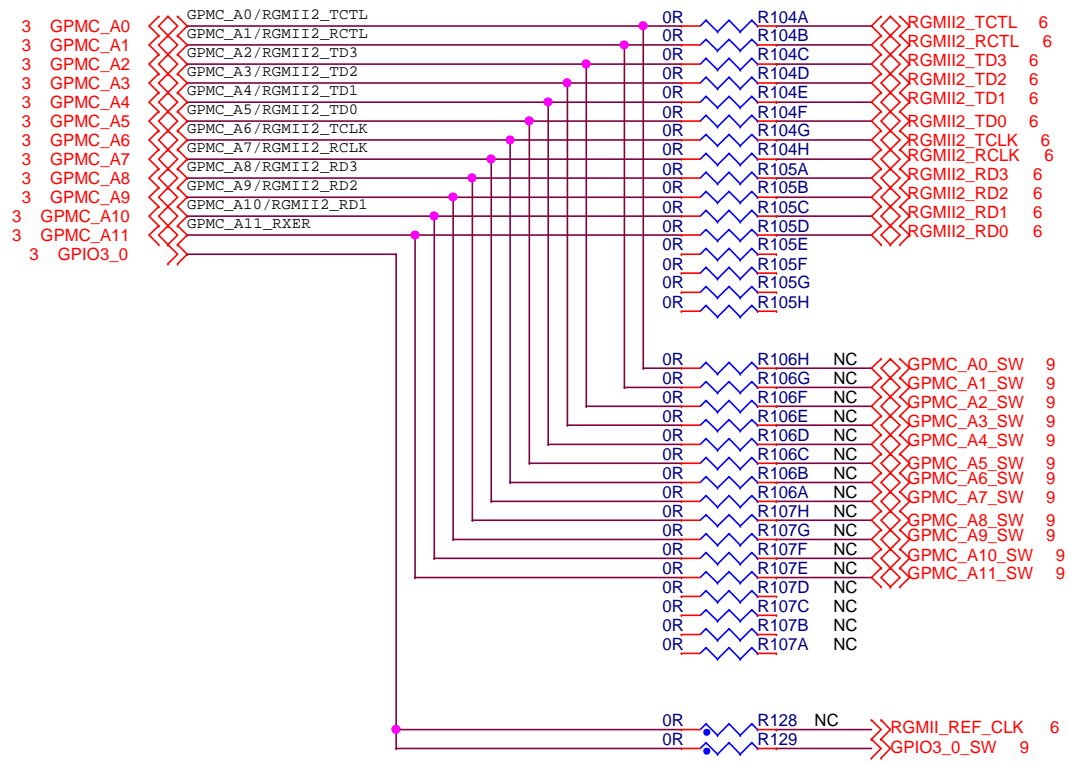
Do not use MMC1 / UART1 interfaces in case Wifi/BT module is present on SOM.



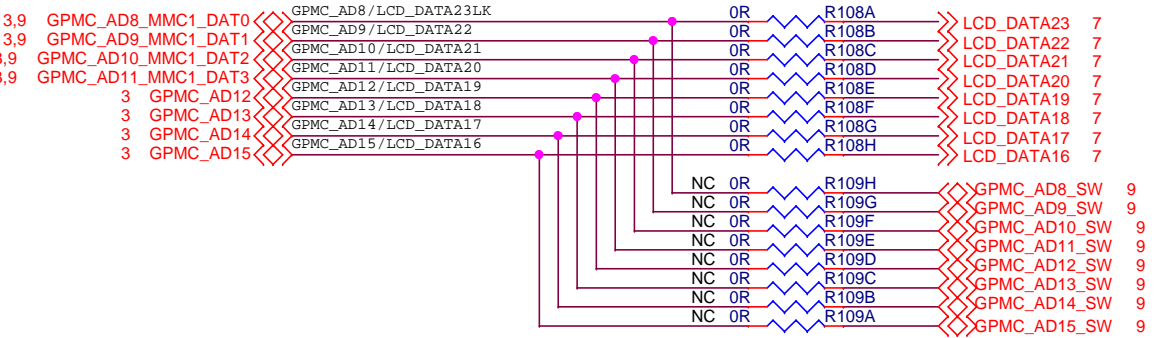
| | | | |
|-------------------------------------|--|--------------------------------|------------|
| Title 03. VAR-SOM-AM33 | | | |
| Size A2 | Document Number VAR-AM33Customboard | Project VAR-AM33Customboard | Rev 1.2 |
| Designer: -Designer- | Approved By: -Approved By- | | |
| Date: Thursday, October 15, 2015 | Sheet 3 | of 10 | |

04. BUS MUXING ,Display Buffer

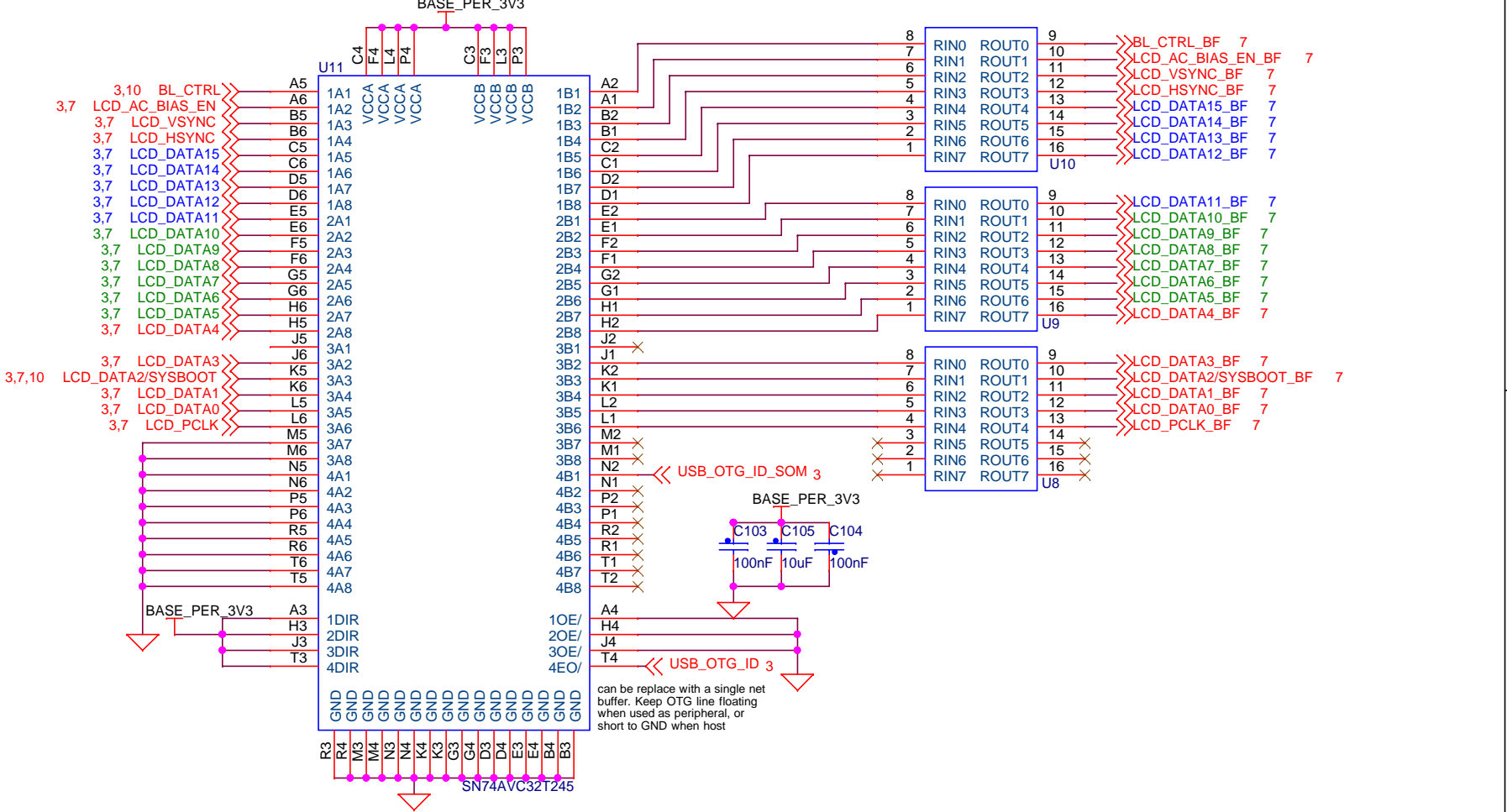
BYTE0,1: RGMII2 \ GPMC



LCD LSB \ GPMC



Display Buffer



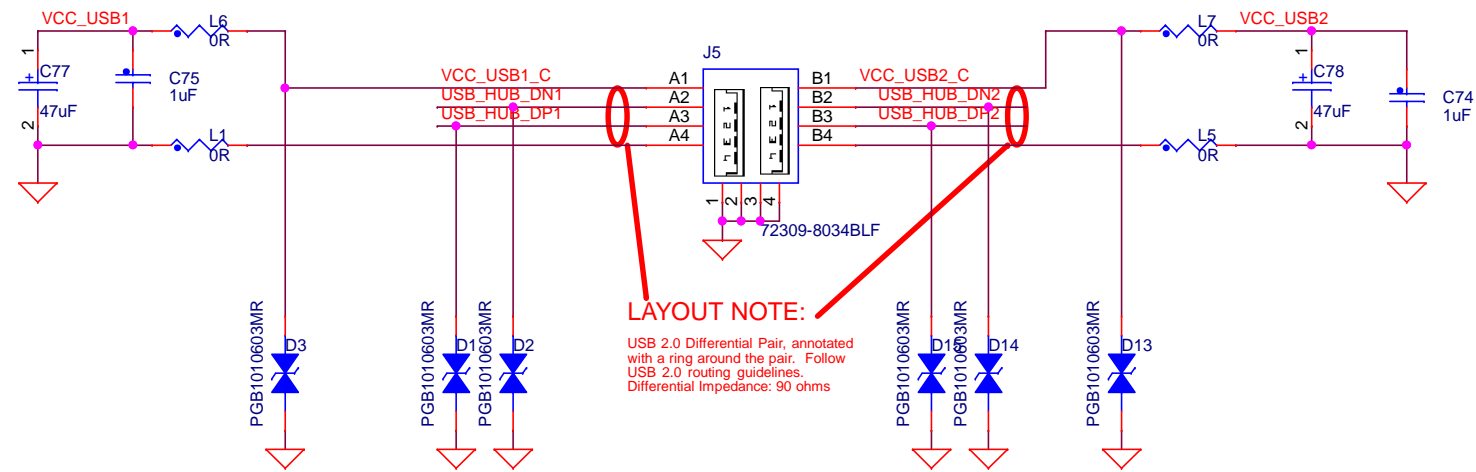
Title
 04. BUS MUXING ,Display Buffer

| | | | |
|---------------------------------------|---|---------------------------------------|-------------------|
| Size A3 | Document Number VAR-AM33Customboard | Project VAR-AM33Customboard | Rev 1.2 |
| Designer: <Designer> | | Approved By: <Approved By> | |
| Date: Wednesday, June 04, 2014 | | Sheet 4 of 10 | |

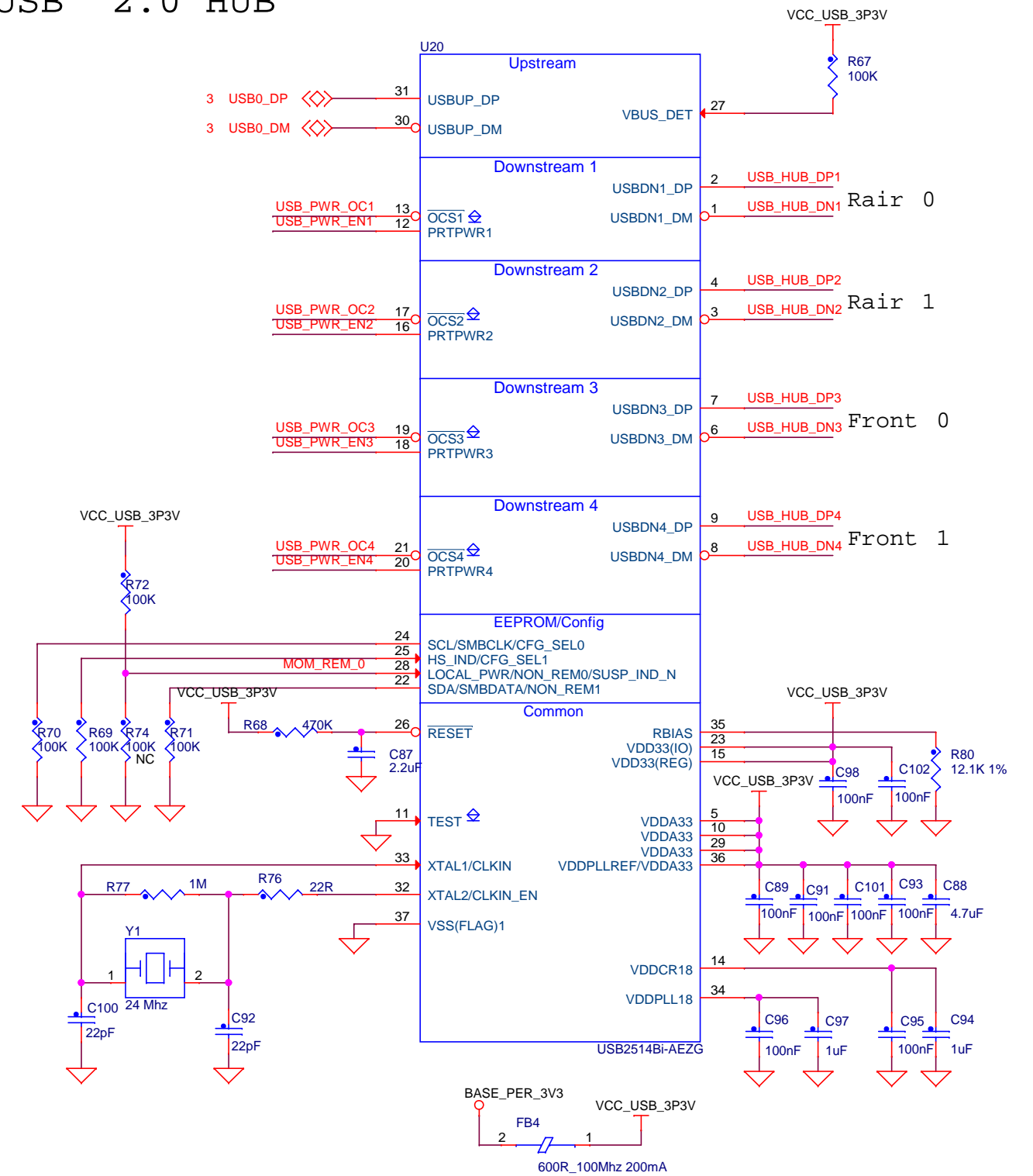
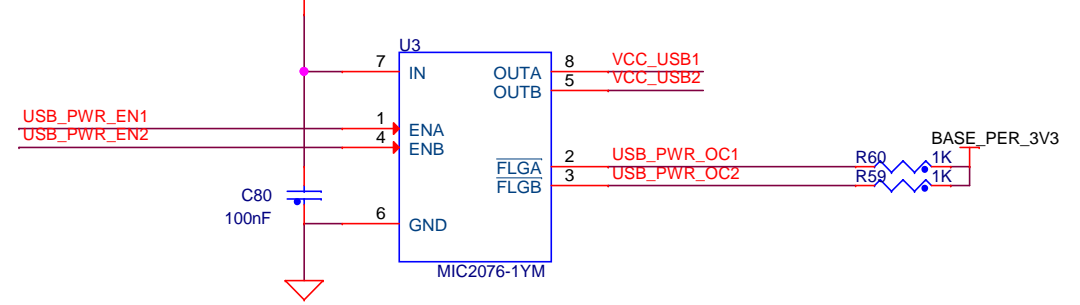
5. USB

USB 2.0 HUB

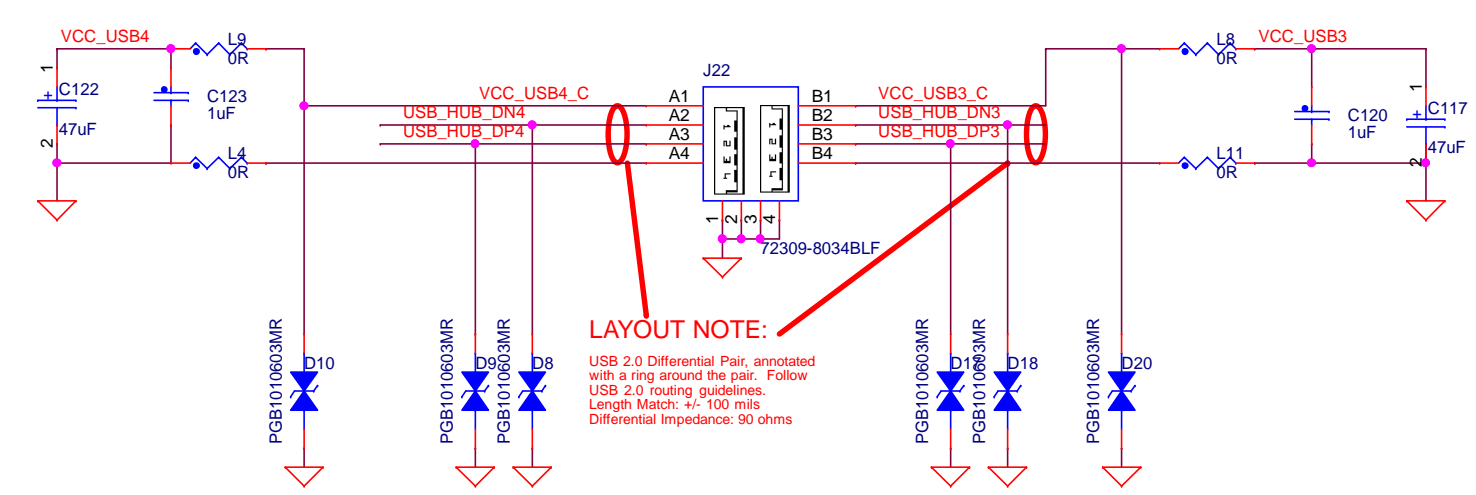
USB PORT 1-2 : 2 x USB 2.0 Host-Dual Type A Rear Panel



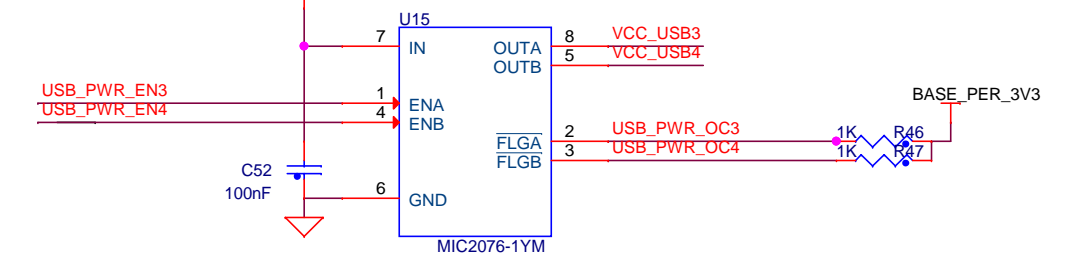
Power Distribution



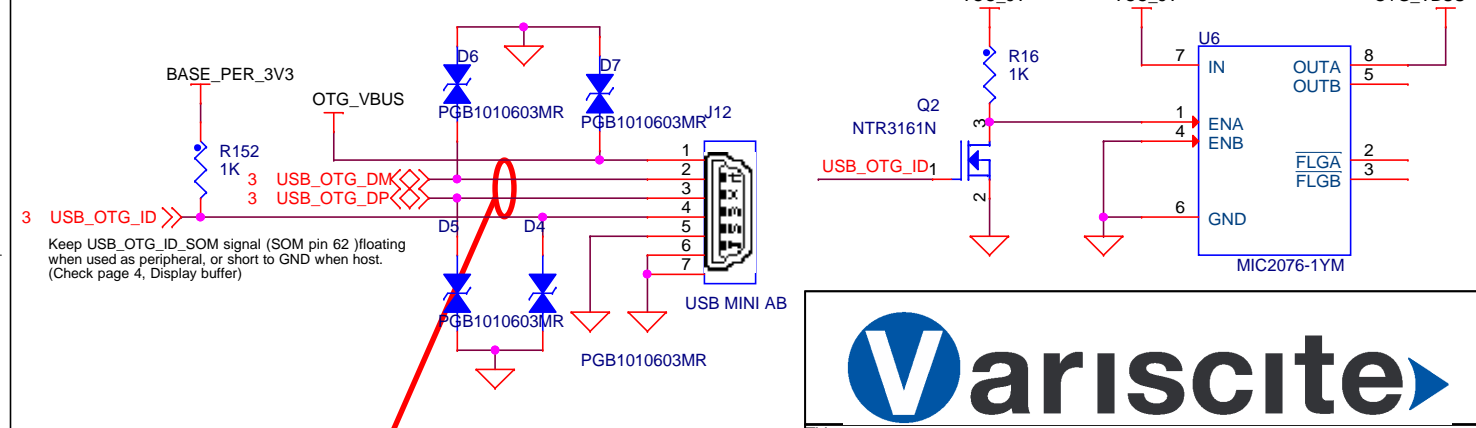
USB PORT 3-4 : 2 x USB 2.0 Host-Dual Type A Front Panel



Power Distribution



USB 2.0 OTG

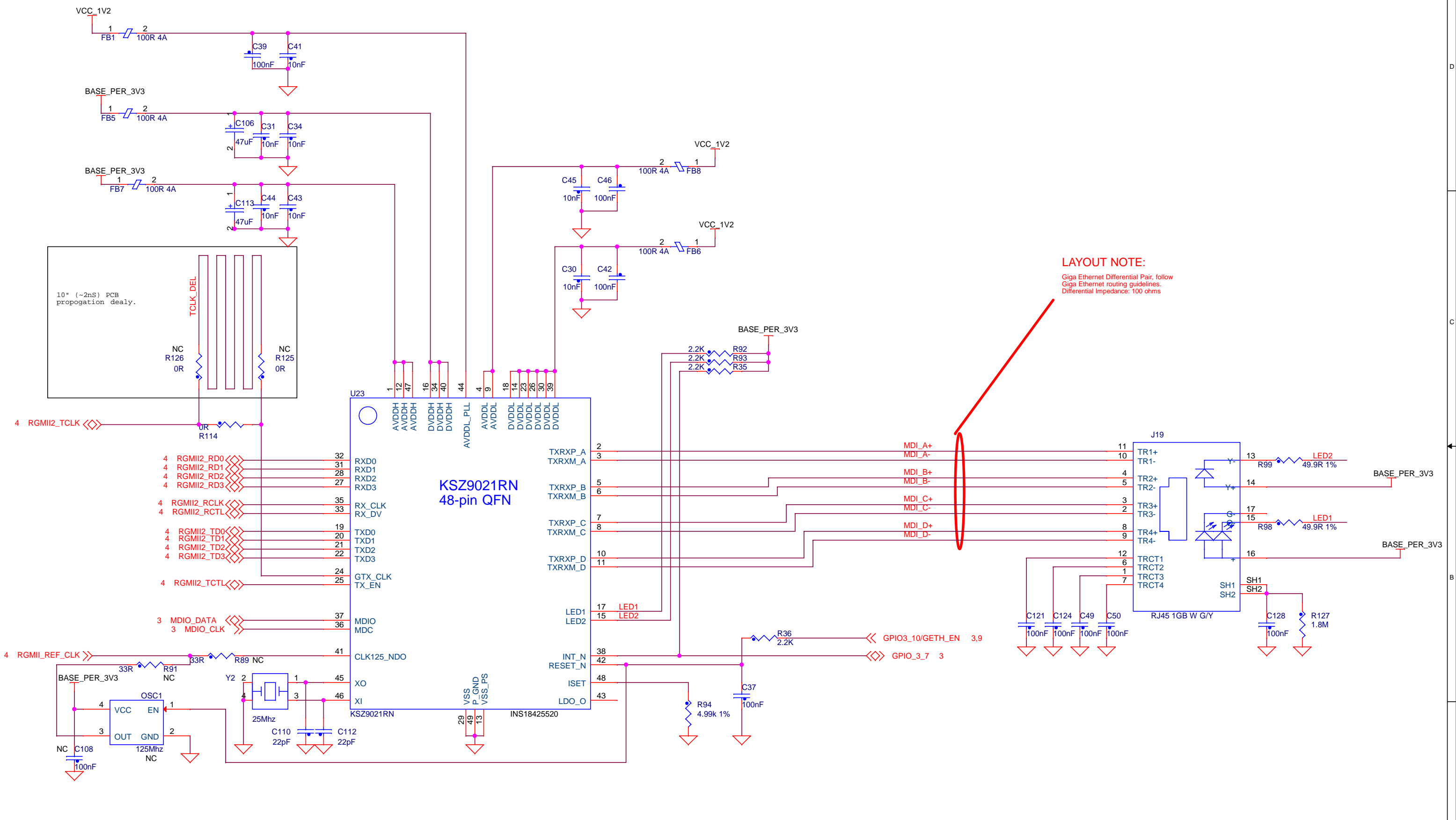


LAYOUT NOTE:
 USB 2.0 Differential Pair, annotated with a ring around the pair. Follow USB 2.0 routing guidelines. Differential Impedance: 90 ohms



| | | | |
|-------------------------------|--------------------------------------|------------------------------|----------|
| Title: 05. USB | | | |
| Size: A3 | Document Number: VAR-AM33Customboard | Project: VAR-AM33Customboard | Rev: 1.2 |
| Designer: <Designer> | Approved By: <Approved By> | | |
| Date: Thursday, June 05, 2014 | Sheet: 5 | of 10 | |

06. G. Ethernet



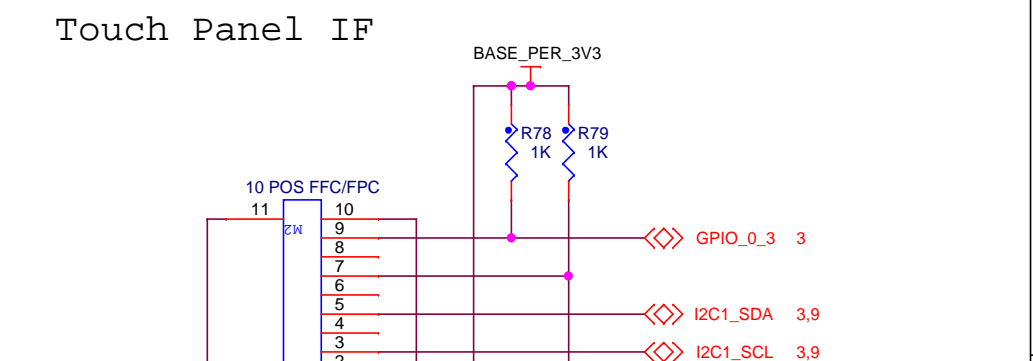
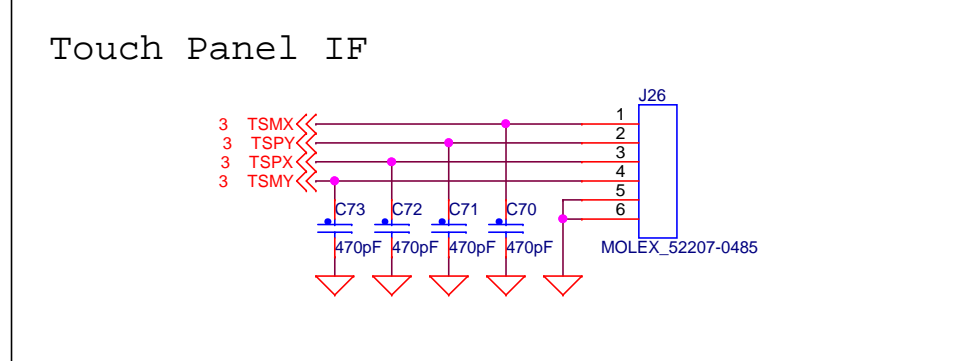
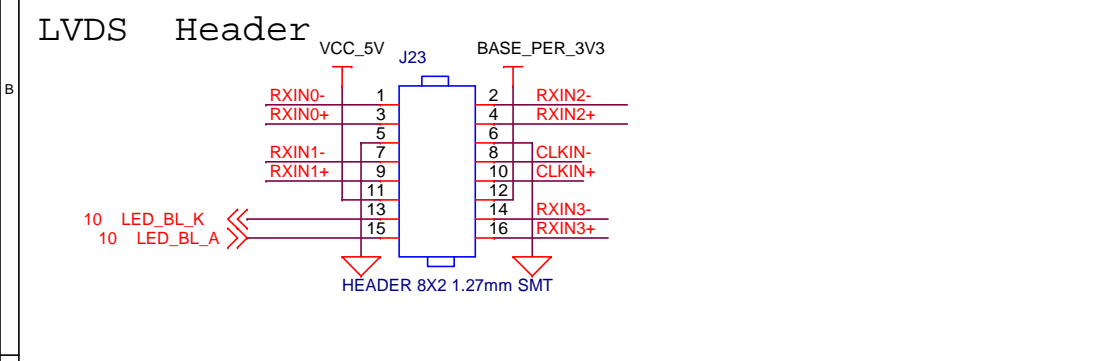
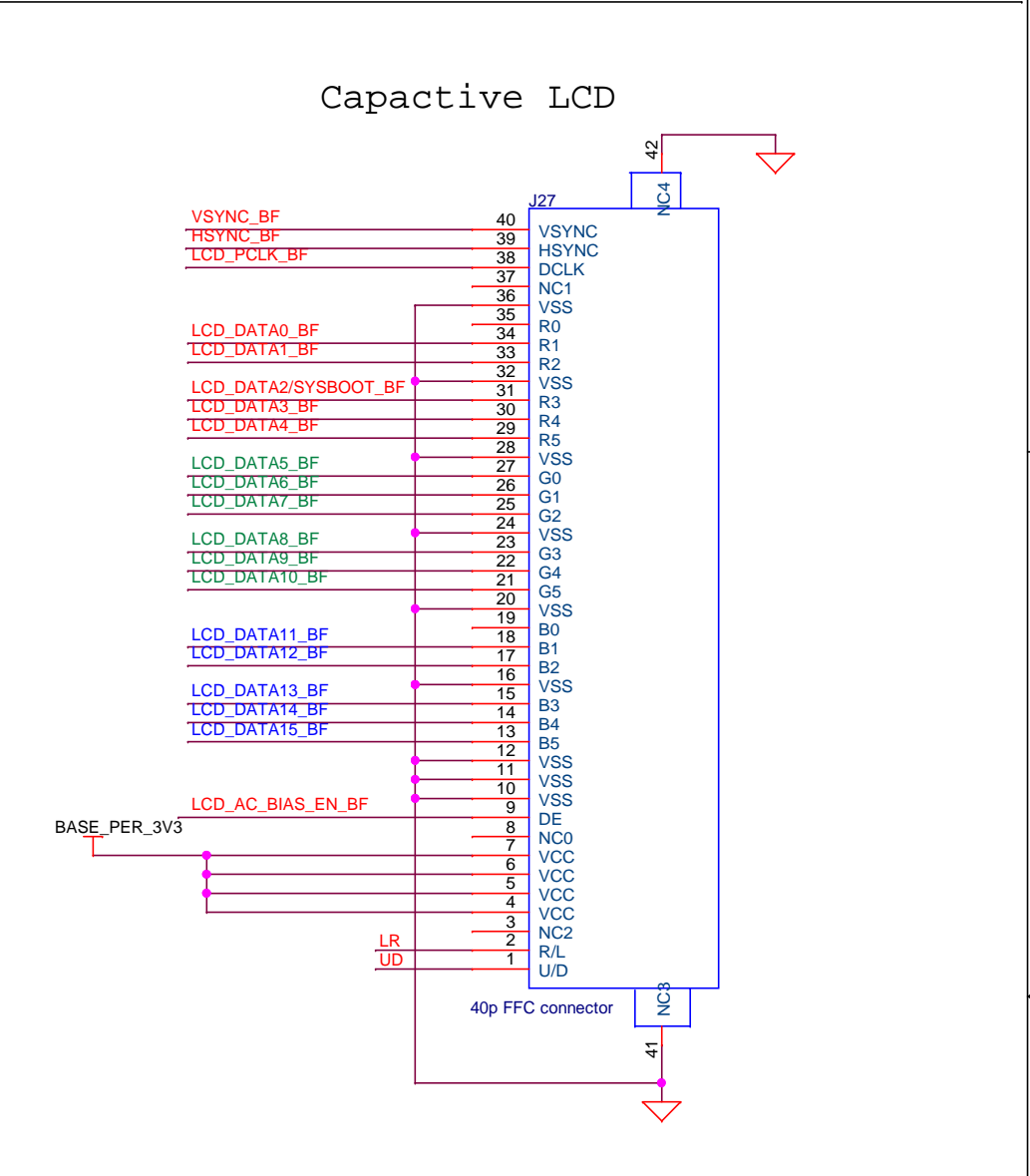
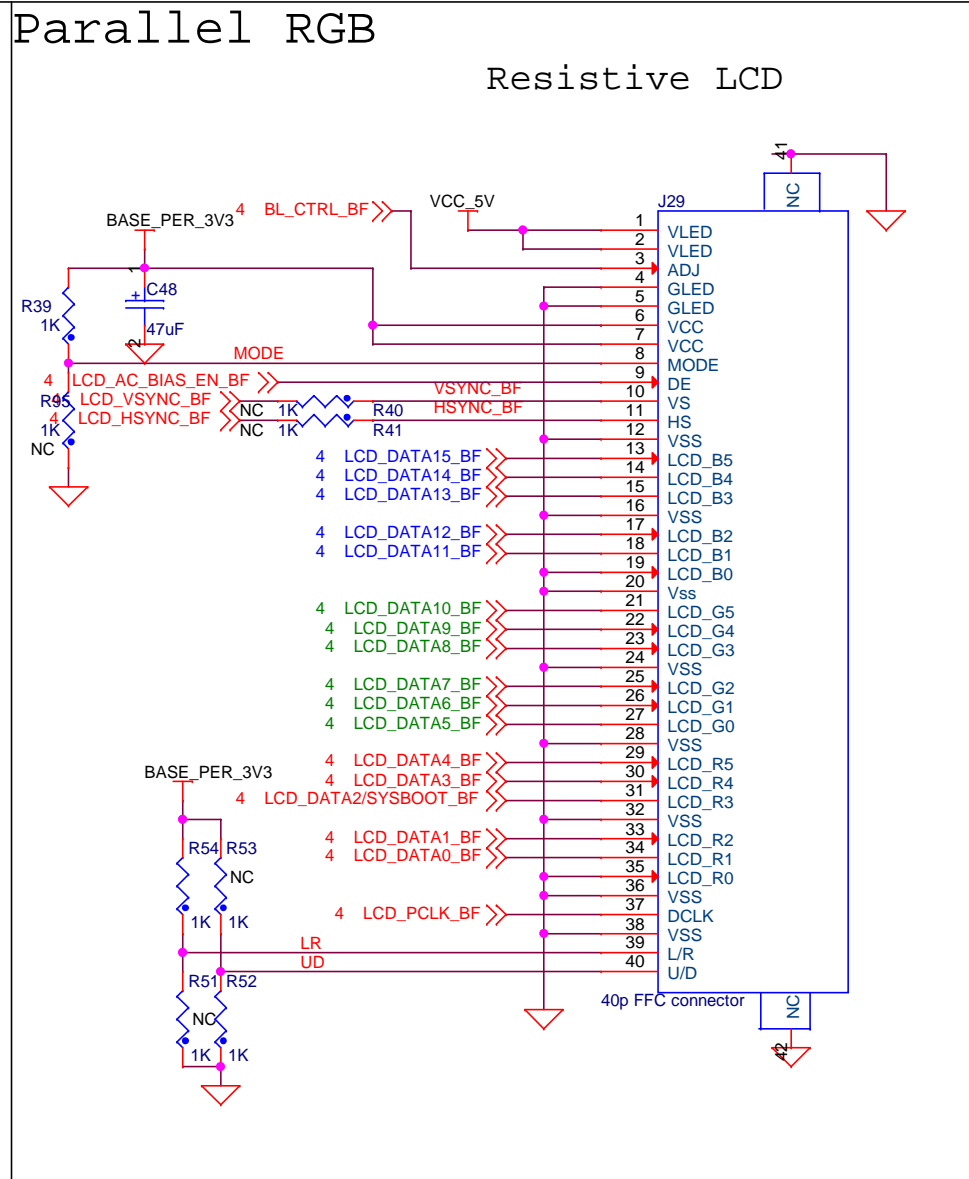
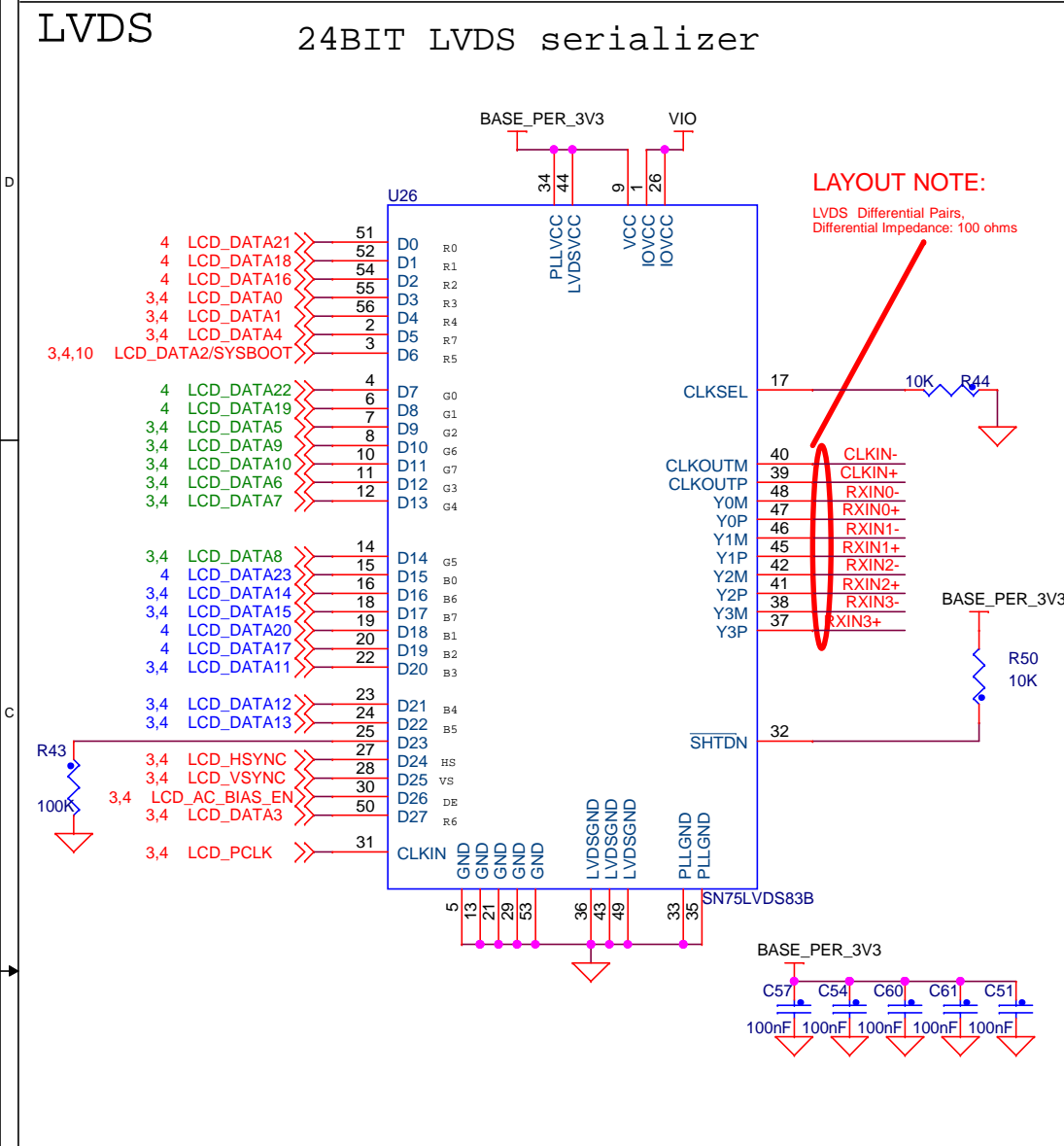
LAYOUT NOTE:
 Giga Ethernet Differential Pair, follow
 Giga Ethernet routing guidelines.
 Differential Impedance: 100 ohms

10* (~2ns) PCB
 propagation delay.
 TCLK_DEL

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| | | | |
|--|--|--------------------------------|------------|
| Title 06. G. Ethernet | | | |
| Size A3 | Document Number VAR-AM33Customboard | Project VAR-AM33Customboard | Rev 1.2 |
| Designer: Sunday, December 15, 2013 | | Approved By: Sheet 6 of 10 | |

07. Display ,Touch



AM335x LCD Color Assignments

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|---|--------|---|---|---|--------|---|---|---|--------|--|
| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | |
| PIXEL_n | | | | | | | | | | | | | | | | | | | | | | | | | |
| B[0] | | G[0] | | R[0] | | B[1] | | G[1] | | R[1] | | B[2] | | R[2] | | B[7:3] | | | | G[7:2] | | | | R[7:3] | |
| 16-bit panel | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24-bit panel | | | | | | | | | | | | | | | | | | | | | | | | | |

Figure 2. RGB888 Mode LCD Controller Output Pin Mapping (LCD_DATA[23:0])

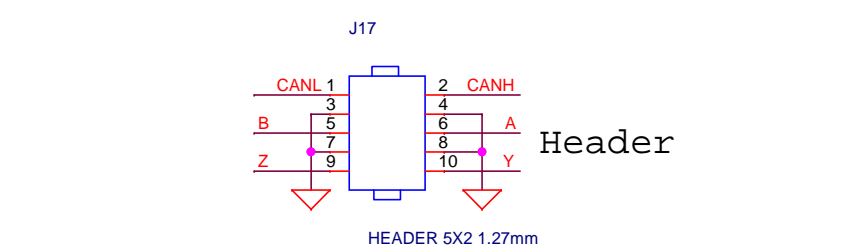
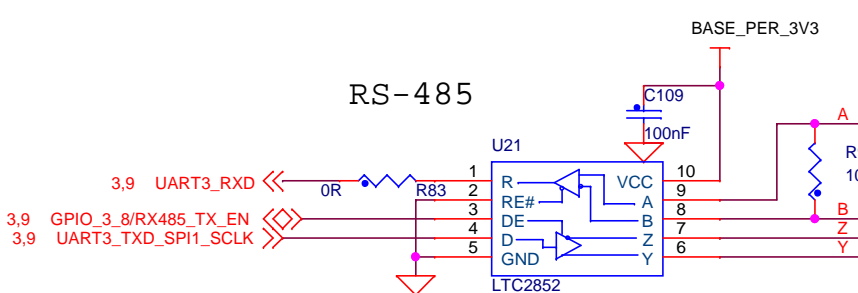
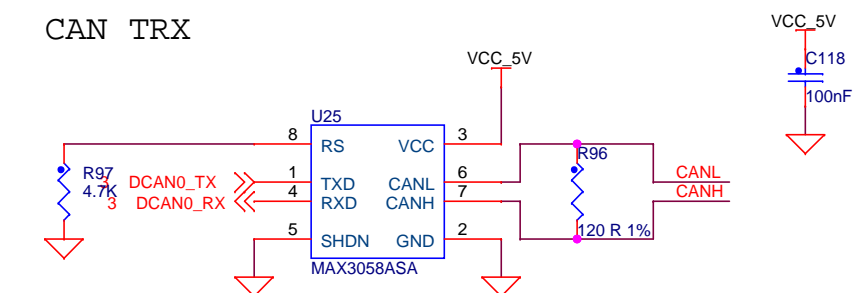
COPY/PASTE WARNING!!!!
THIS IS A BOTTOM SIDE CONNECTOR
IF TOP SIDE CONNECTOR IS USED
MIRROR PINOUT AND USE DIFFERENT
CONNECTOR P/N



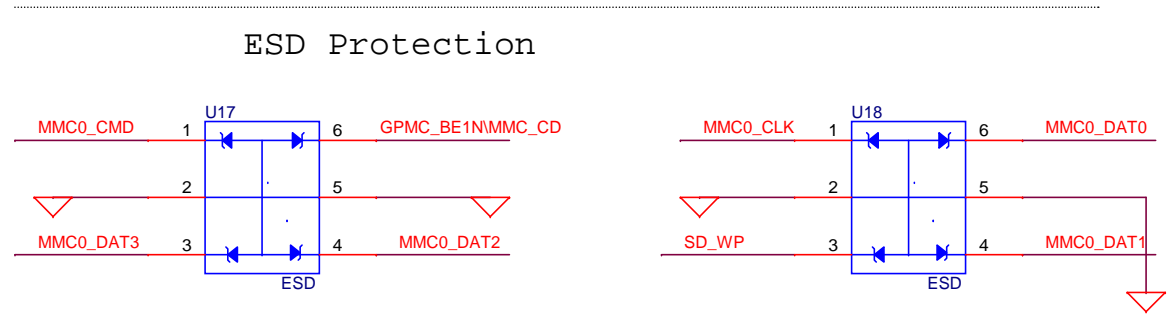
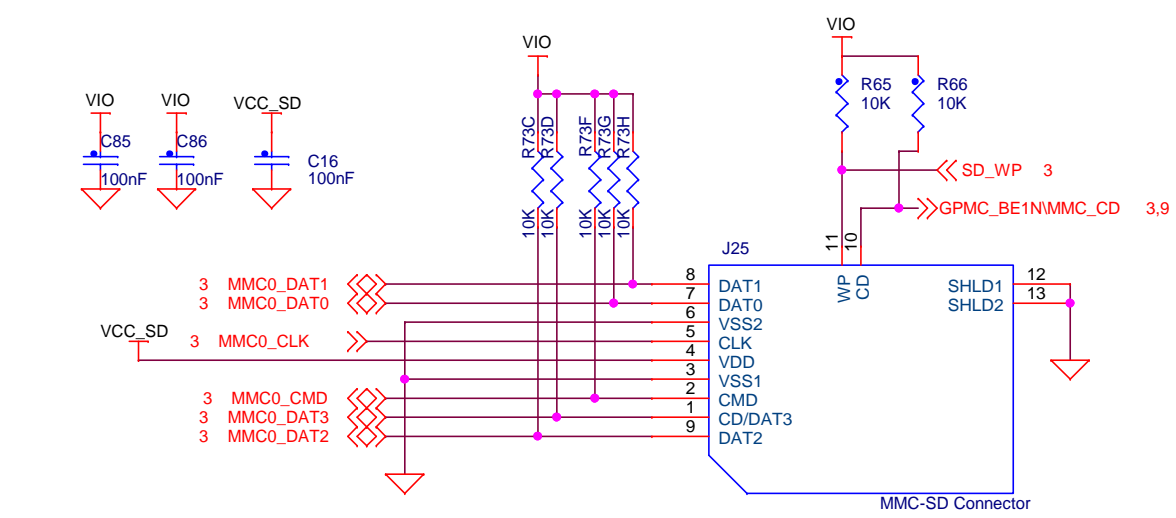
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| Title 07. Display ,Touch | | | |
| Size A3 | Document Number VAR-AM33Customboard | Project VAR-AM33Customboard | Rev 1.2 |
| Designer: <Designer> | | Approved By: <Approved By> | |
| Date: Saturday, June 07, 2014 | | Sheet 7 of 10 | |

08. Peripherals

Serial COMM

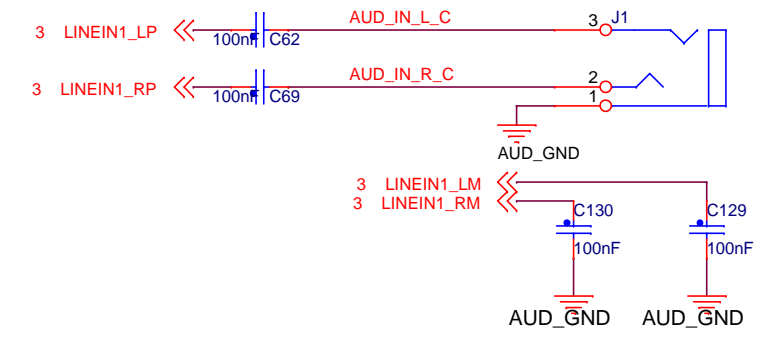


SD-Card

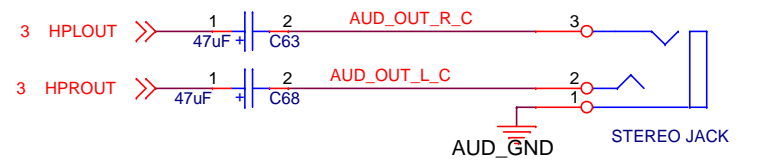


AUDIO

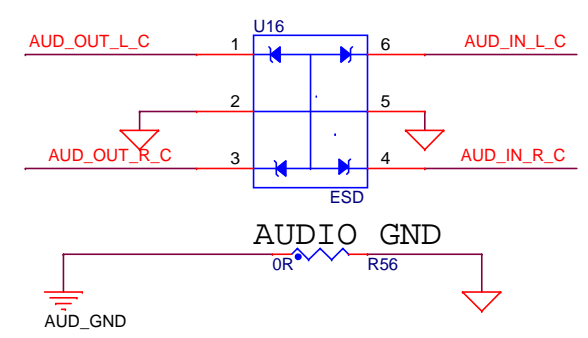
Line In



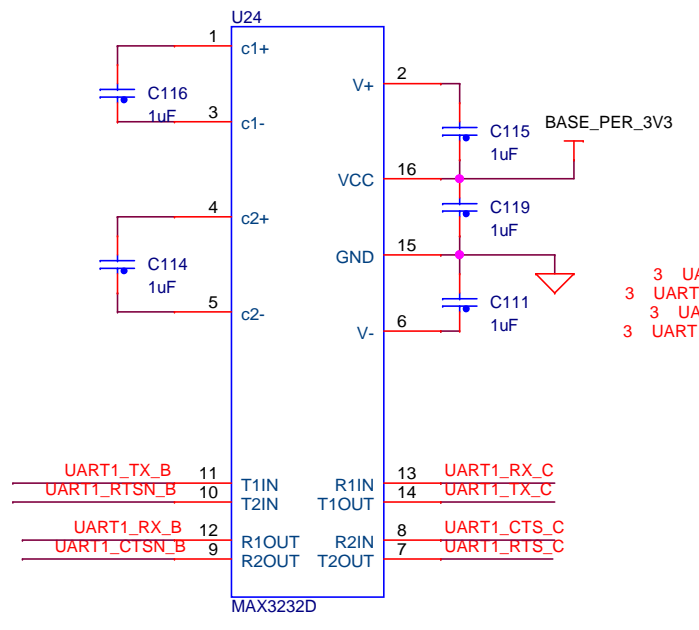
Headphone Out



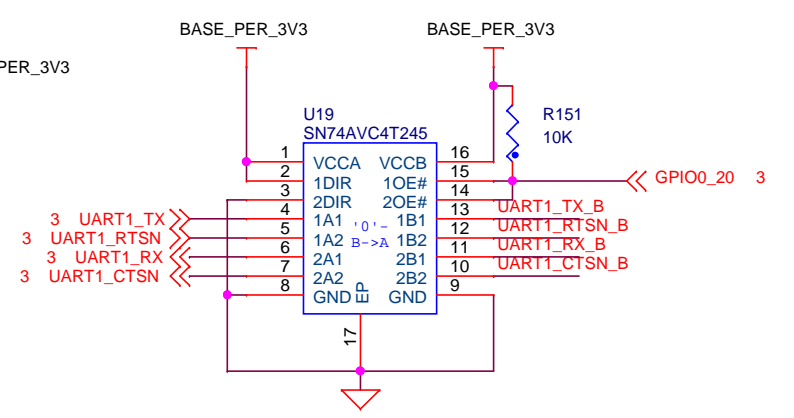
ESD Protection



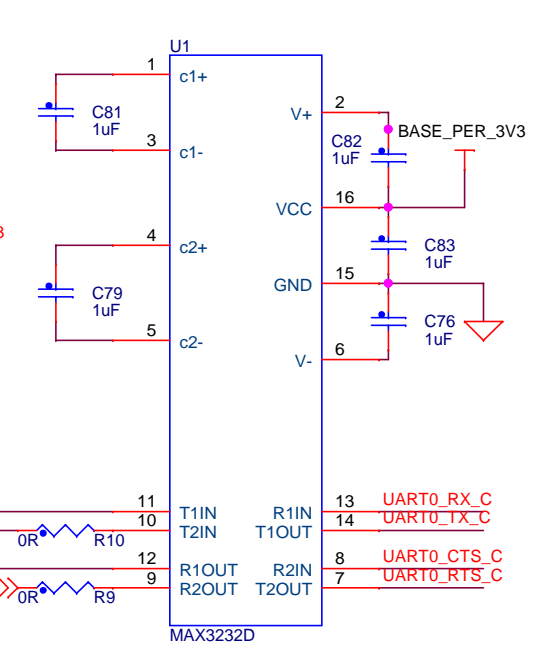
UART1-DTE



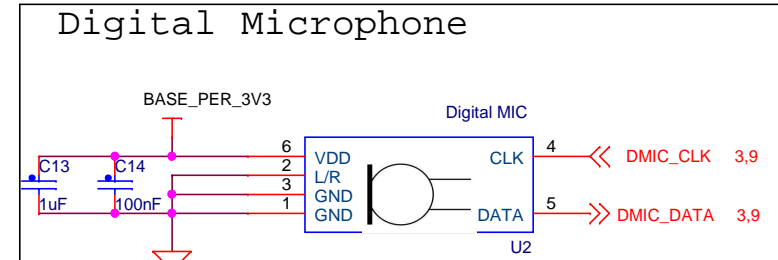
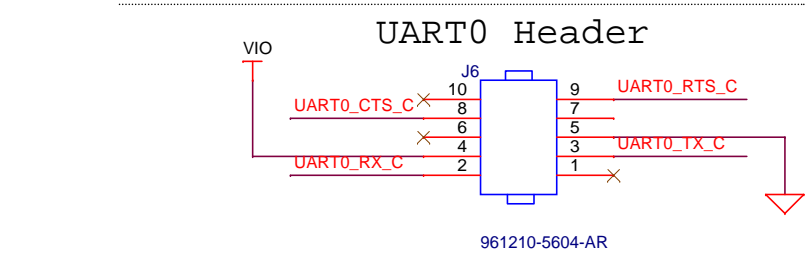
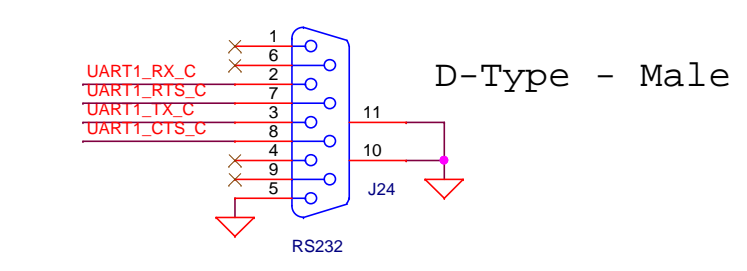
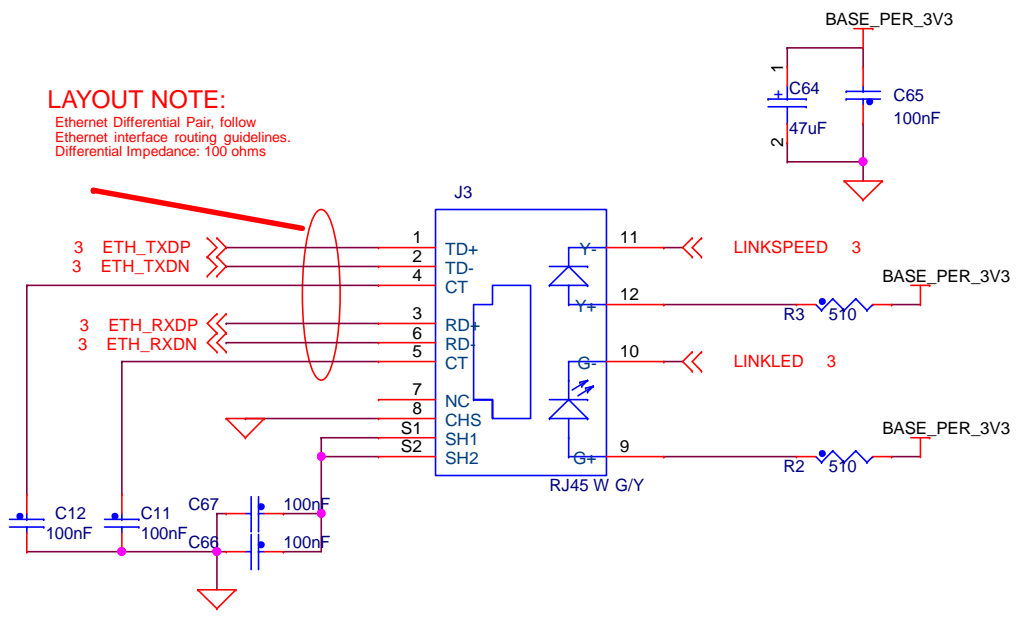
Enable UART1 when on-SOM Bluetooth is not mounted



UART0-Debug



10/100 Mbps Ethernet

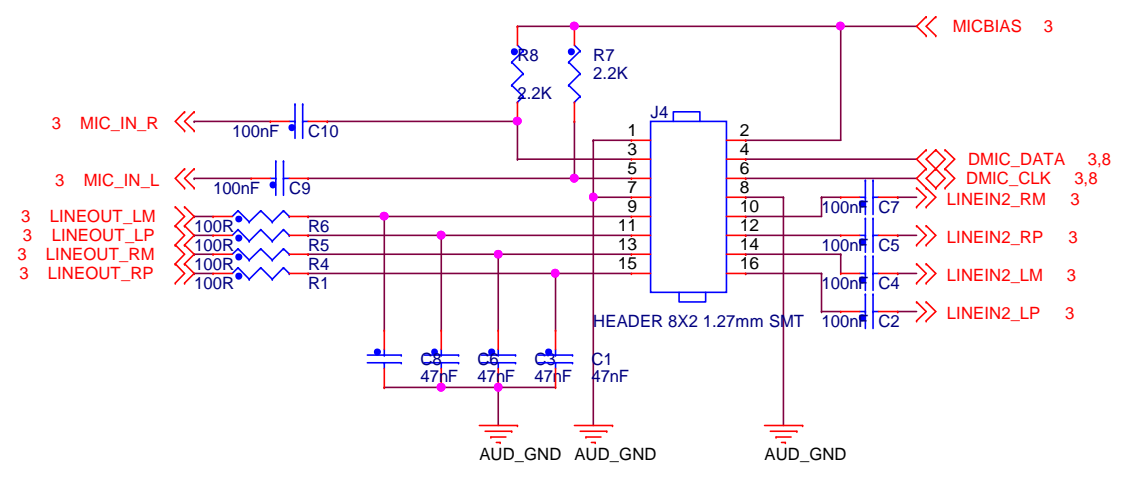


08. Peripherals

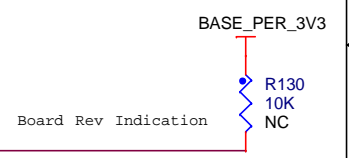
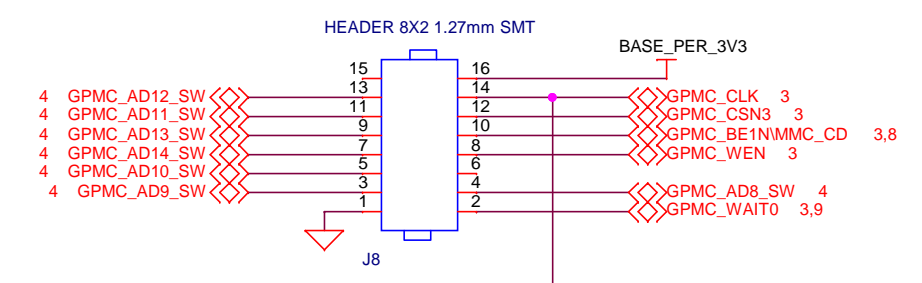
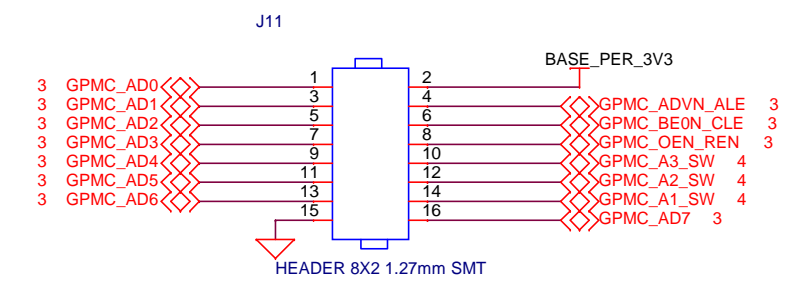
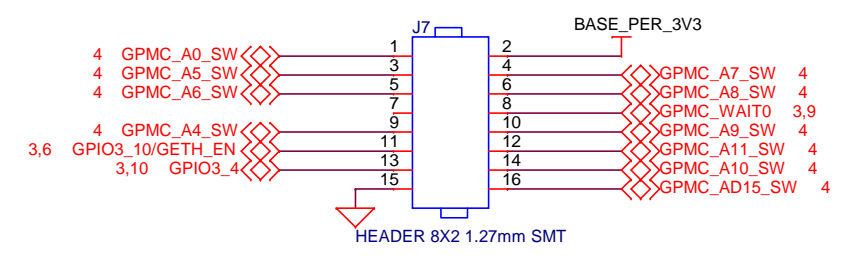
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|---------------------------------|-------------------------------------|-----------------------------|---------|
| Size A3 | Document Number VAR-AM33Customboard | Project VAR-AM33Customboard | Rev 1.2 |
| Designer: <Designer> | Approved By: <Approved By> | | |
| Date: Sunday, December 15, 2013 | Sheet 8 | of 10 | |

09. DVK Exp. Connectors

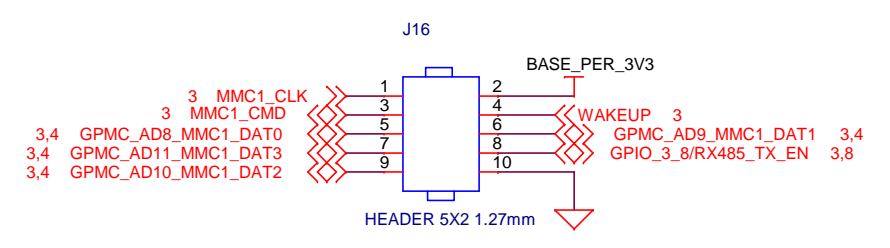
AUDIO



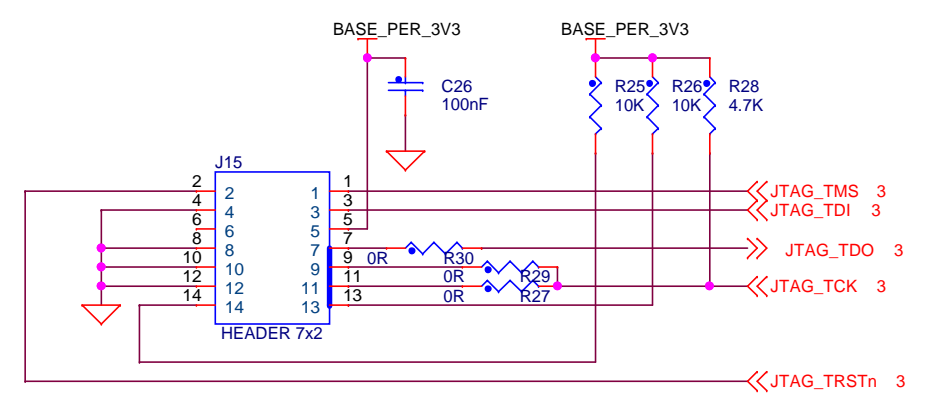
GPMC



SD/MMC



JTAG



Analog Inputs / UART3 / SPI / I2C

