

R-CarD3 System Evaluation Board "Draak"

RTP0RC77995SEB0010S

Rev0.29

Preliminary

CONFIDENTIAL

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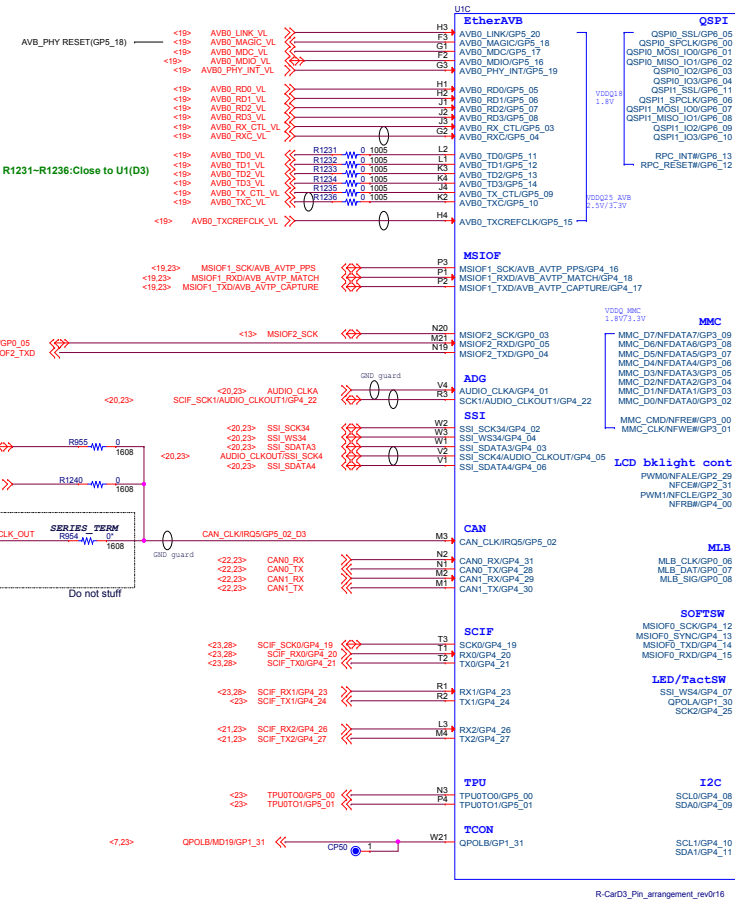
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Layout Note:  
Following signals need Ground guard.

AUDIO\_CLKA  
SCIF\_SCK1/AUDIO\_CLKOUT1/GP4\_22  
AUDIO\_CLKOUT/SSI\_SCK4  
CAN\_CLK/IRQ5/GP5\_02\_D3 until X13-pin3

MMC0\_CLK,eMMC\_CLK\_18  
AVB0\_TXCREFCLK\_VL  
AVB0\_TXC\_VL  
AVB0\_RXC\_VL  
QSPI0\_SPCLK\_18  
QSPI1\_SPCLK\_18

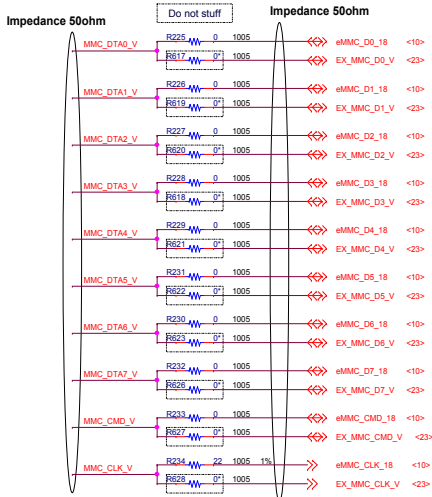


R-CarD3\_Pin\_arrangement\_rev016

Layout Note:  
As short as possible from U1(D3) to two Rxxx.

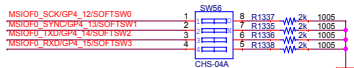


Want level

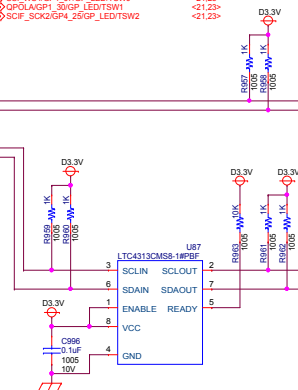


Layout Note:  
Following signals need Ground guard.

MMC\_CLK\_V,eMMC\_CLK\_18,EX\_MMC\_CLK\_V



For LCD Backlight Control



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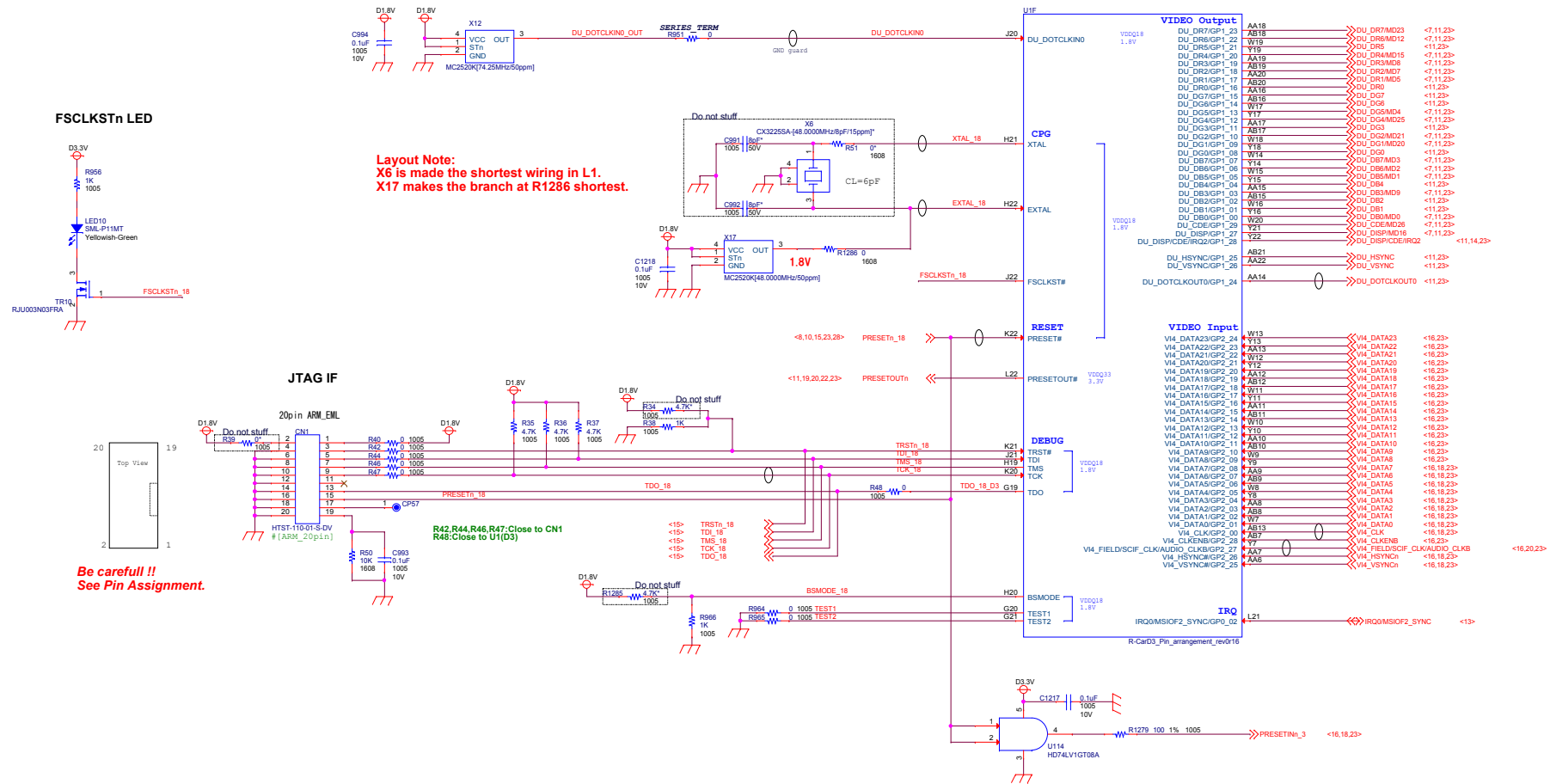
**Layout Note:**  
Following signals need Ground guard.

```

DU_DOTCLKIN0 until X12 3pin
DU_DOTCLKOUT0
VI4_CLK

XTAL_18,EXTAL_18
PRESETn_18
TCK_18

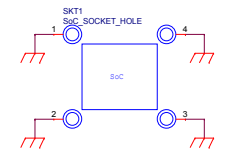
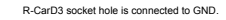
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R-CarD3\_USB/LVDS

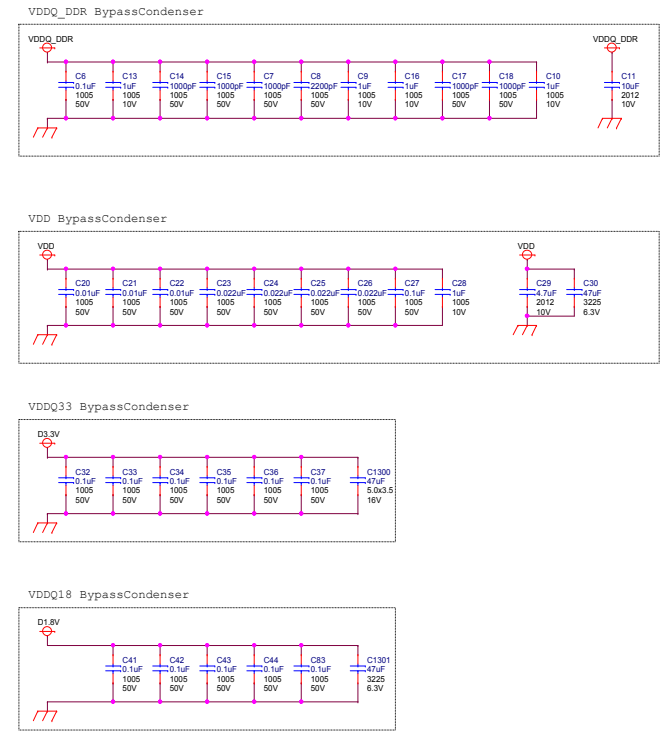
Title			
R-Card3 System Evaluation Board(Draak)			
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MCK0,MCK0\_N

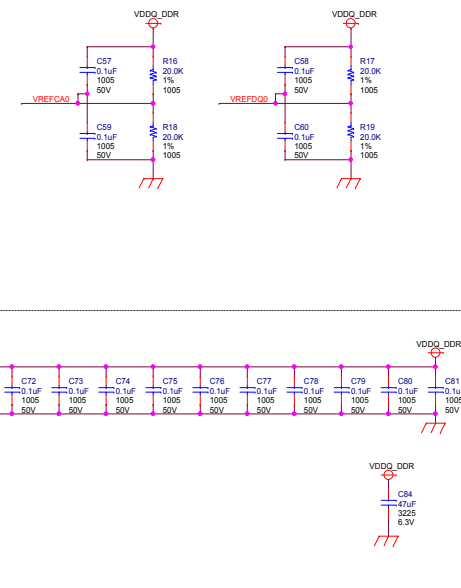


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MCK0,MCK0\_N

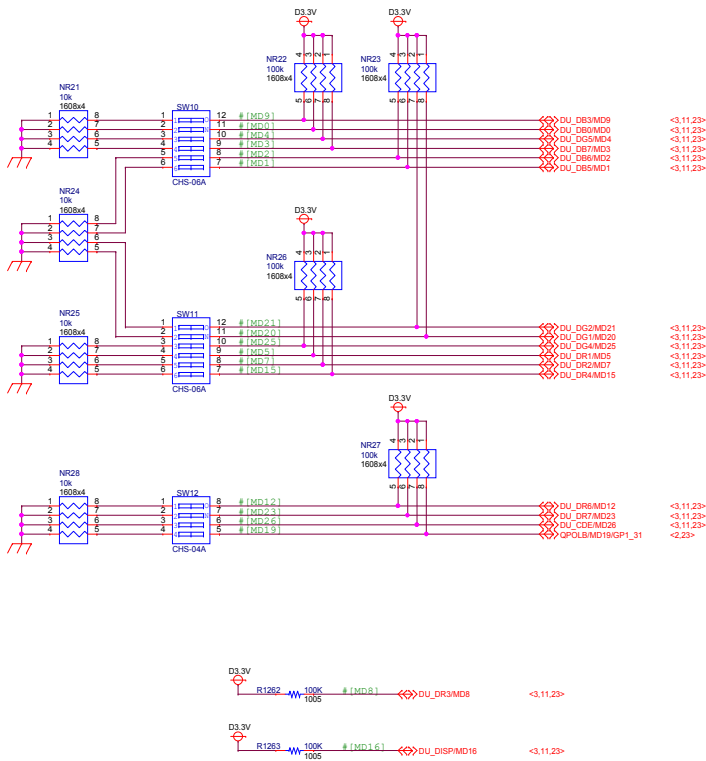


**Layout Note:**  
For differential termination,  
Location resistance "R20,R21"  
Location capacitor "C82"  
Pin near the M1 of CK / CK# .

Layout Note:  
Mode switches must be placed on Top Layer.

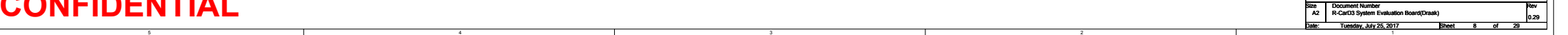
Layout Note:  
MD\* Line reduce a stub as much as possible.

MODE SW



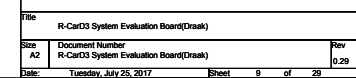
MODE\_SW

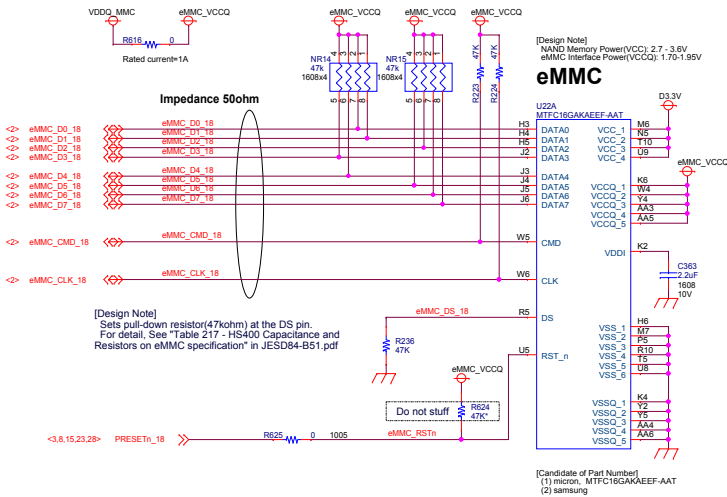
R-CarD3 System Evaluation Board(Draak)		
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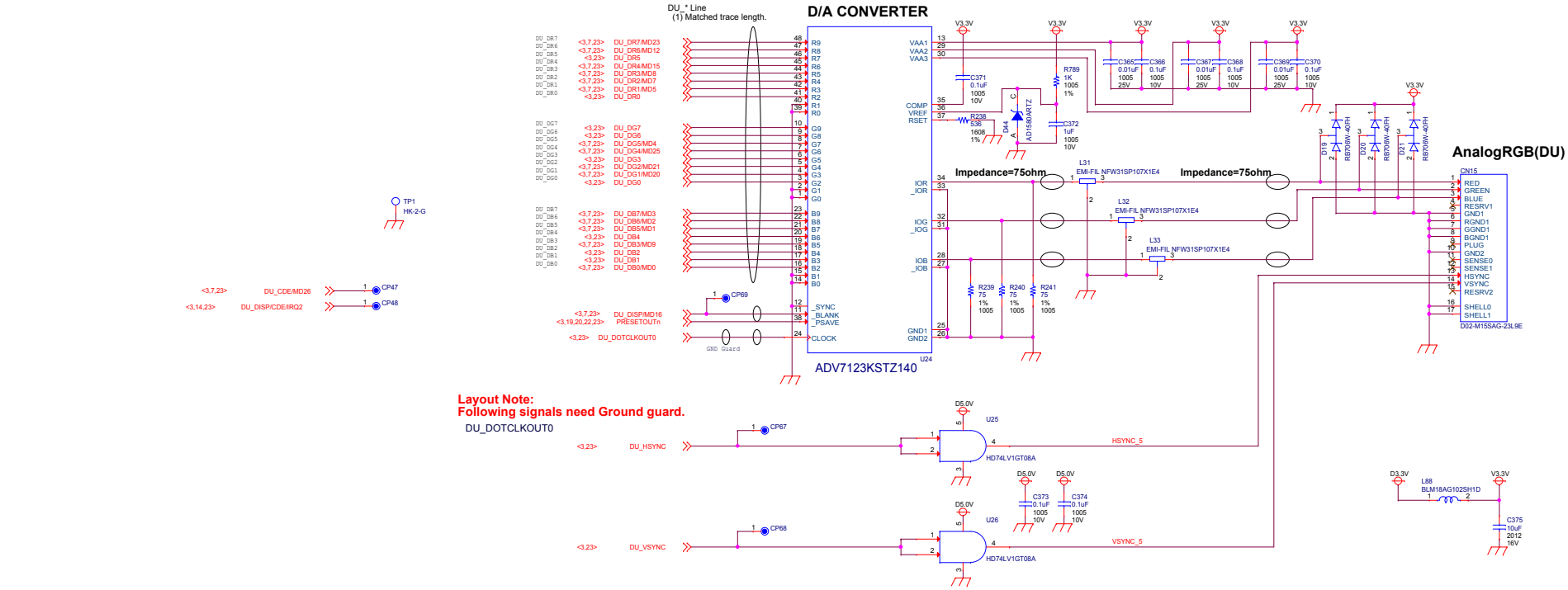
USB2.0



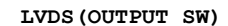


This eMMC(U22) is used by 1.8V.

U22B		MTFC16GAKAEFF-AAT	
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NC	2	NC	66
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NC	4	NC	68
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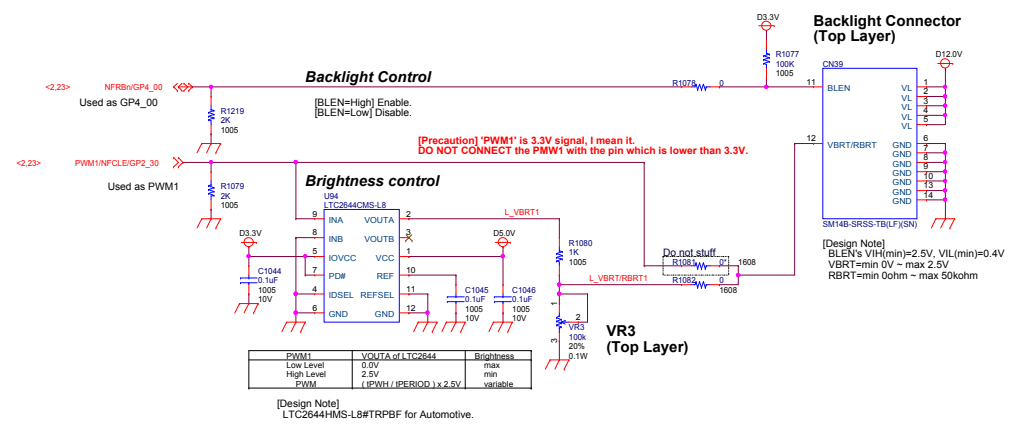
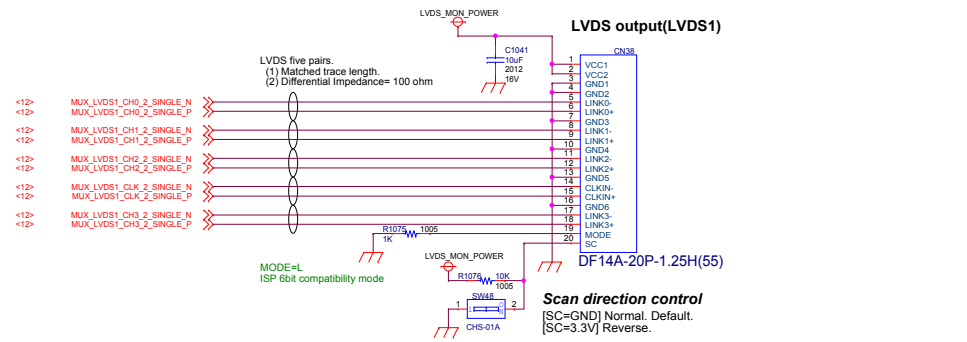
## LVDS1 SW



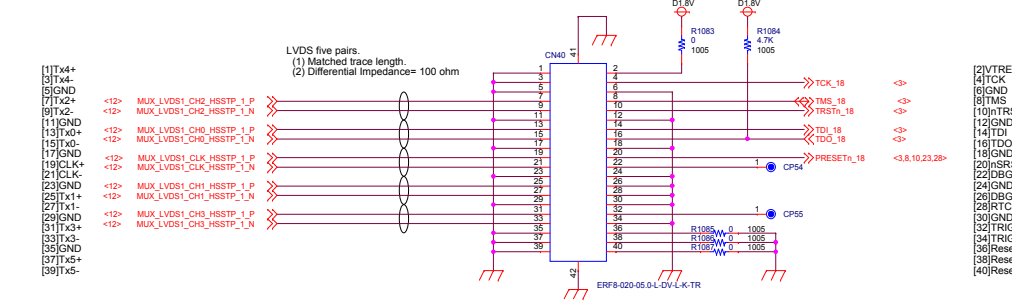


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#[HSSTP 40pin]  
HSSTP Connector(LVDS1 OUT)  
(Top Layer)



Be carefull !!  
See Pin Assignment.

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Layout Note:  
Connect the shell of 10029449-001RLF with ground.  
The 10029449-001RLF has four through holes.

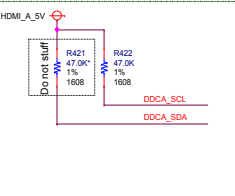
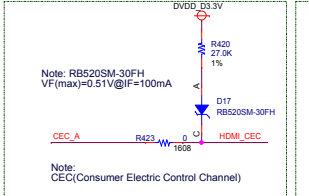
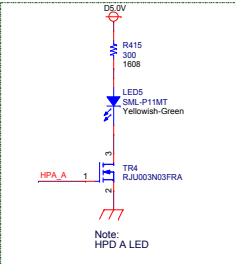
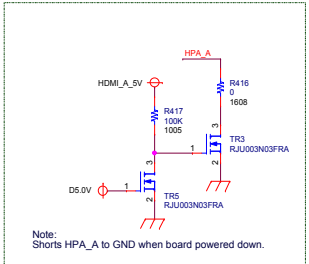
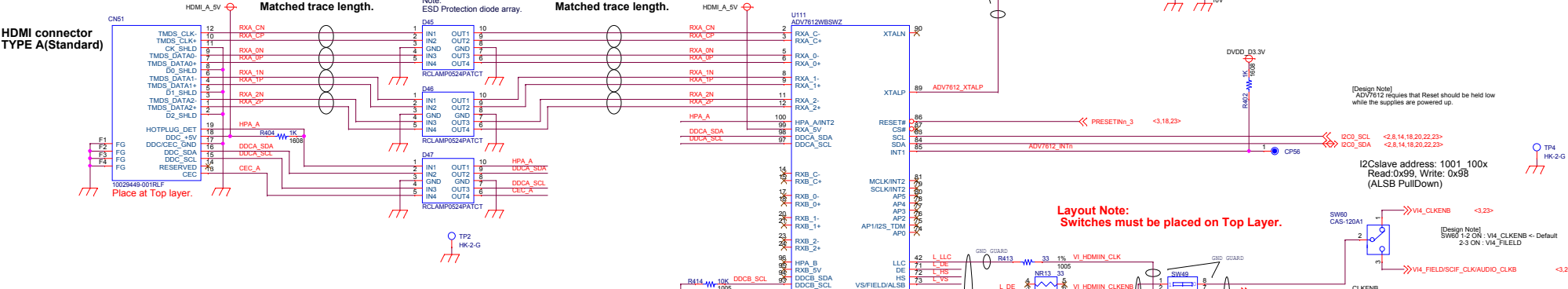
Layout Note:  
Connect INx with OUTx under the RCLAMP0524. See below figure.

TMDs four pairs  
Differential Impedance  
100ohm +/-10%  
Matched trace length.

TMDs four pairs  
Differential Impedance  
100ohm +/-10%  
Matched trace length.

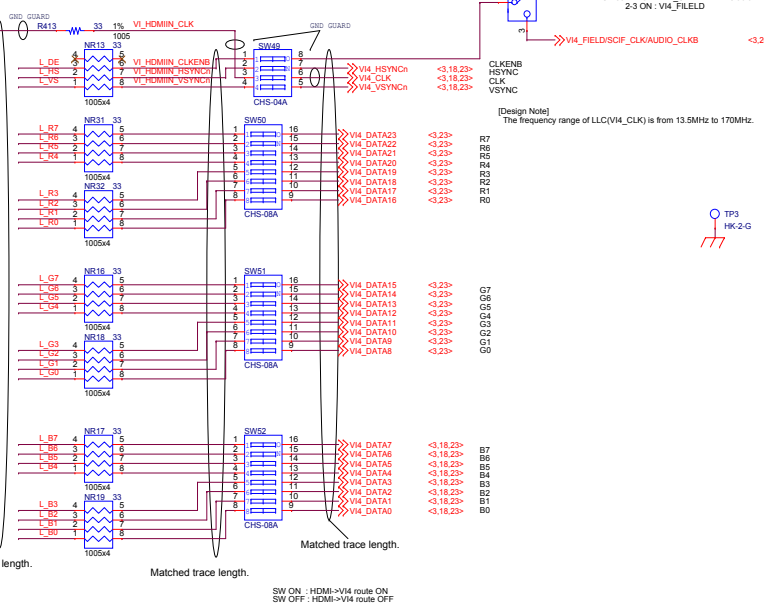
Place at Top layer.  
Note: I2C slave address  
ALSB=0: 0x98 for write, 0x99 for read  
ALSB=1: 0x9A for write, 0x9B for read

Layout Note:  
Following signals need Ground guard.  
ADV7612\_XTALP(until X15)  
L\_LLC -> Vi4\_CLK



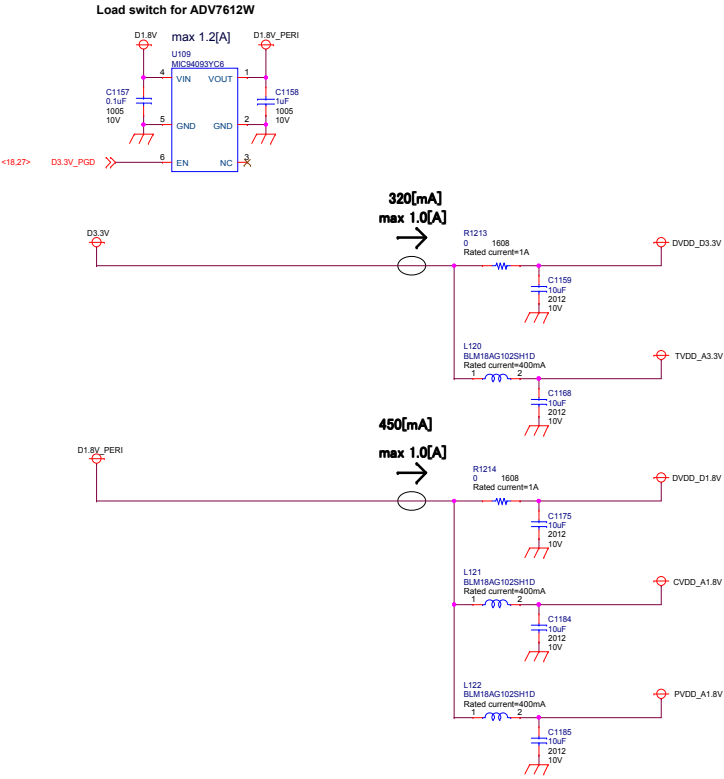
Layout Note:  
The ADV7612 has EXPOSED PAD(pin0) at bottom side.  
Connect that EXPOSED PAD(pin 0) to the GND.

Layout Note:  
Switches must be placed on Top Layer.

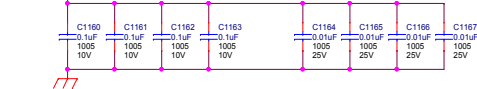


VI4 (HDMI\_IN)

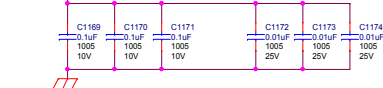




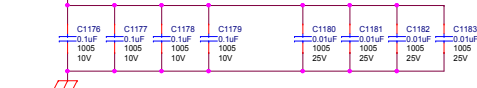
Layout Note:  
DVDDIO Decoupling - As close to DVDDIO pins of ADV7612 as possible



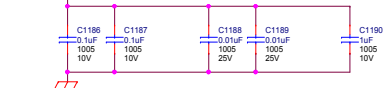
Layout Note:  
TVDD Decoupling - As close to TVDD pins(pin4, pin7, pin10) of ADV7612 as possible



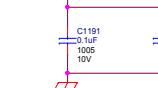
Layout Note:  
DVDD Decoupling - As close to DVDD pins of ADV7612 as possible



Layout Note:  
CVDD Decoupling - As close to CVDD pins(pin1, pin13) of ADV7612 as possible



Layout Note:  
PVDD Decoupling - As close to PVDD pins of ADV7612 as possible

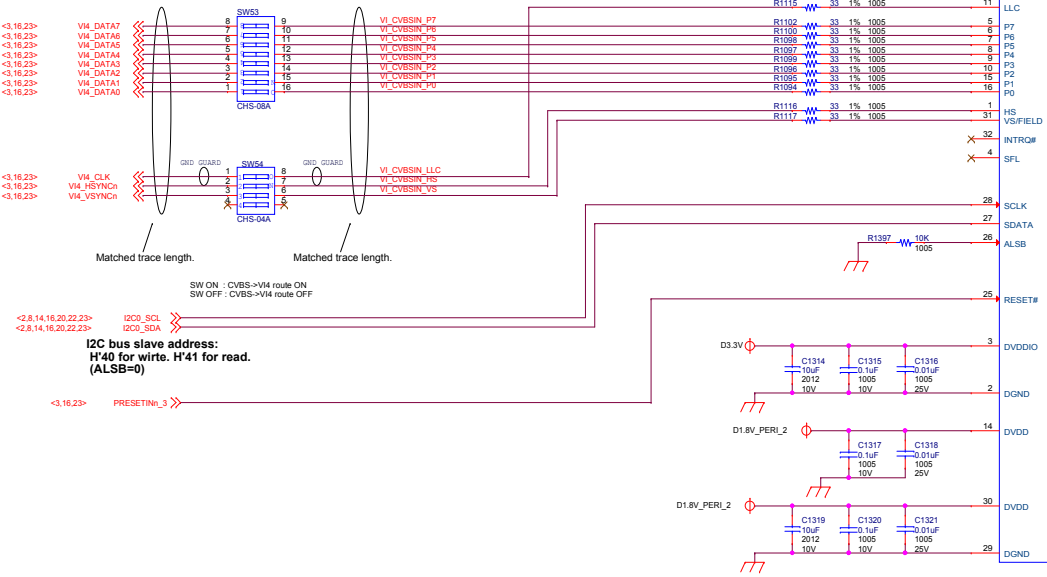


File		
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Layout Note:  
Following signals need Ground guard.

ADV7180W\_XTALI(until X16)  
VI\_CVBSSIN\_LLC -> VI4\_CLK  
CN42 -> U41 19pin

Layout Note:  
Switches must be placed on Top Layer.



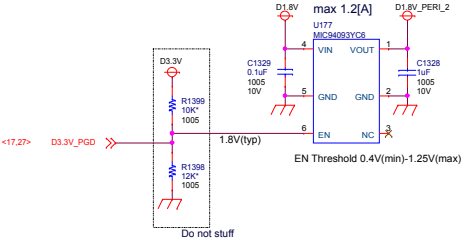
Layout Note:  
LOCATE CLOSE TO, AND  
ON THE SAME PLANE  
AS THE ADV7180.

Impedance 75ohm  
Video Input Ch1 Connector

Layout Note:  
KEEP CLOSE TO THE ADV7180  
AND ON THE SAME PLANE OF PCB  
AS THE ADV7180.

Layout Note:  
ADV7180WBCP32Z has a exposed pad at bottom side.  
Connect to GND(Digital GND).

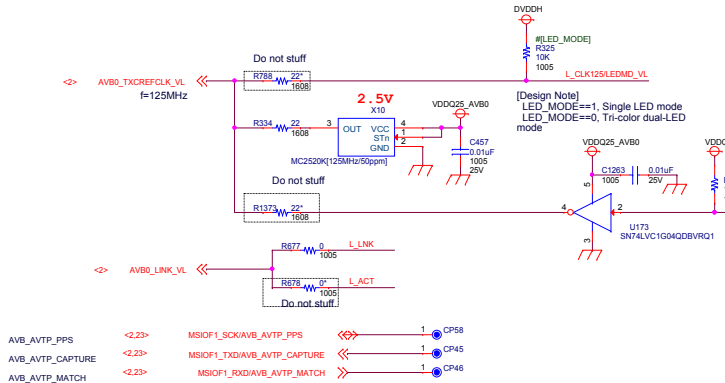
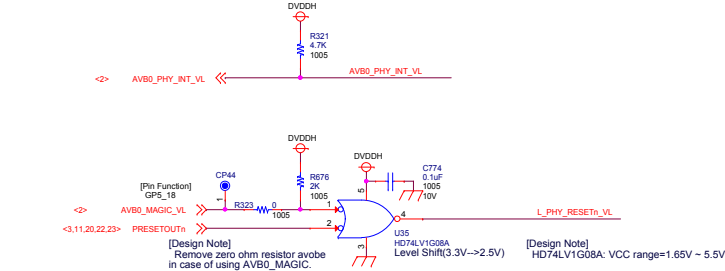
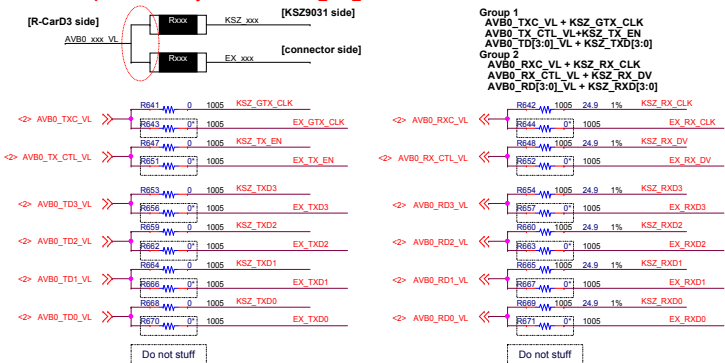
Load switch for ADV7180W



# Preliminary

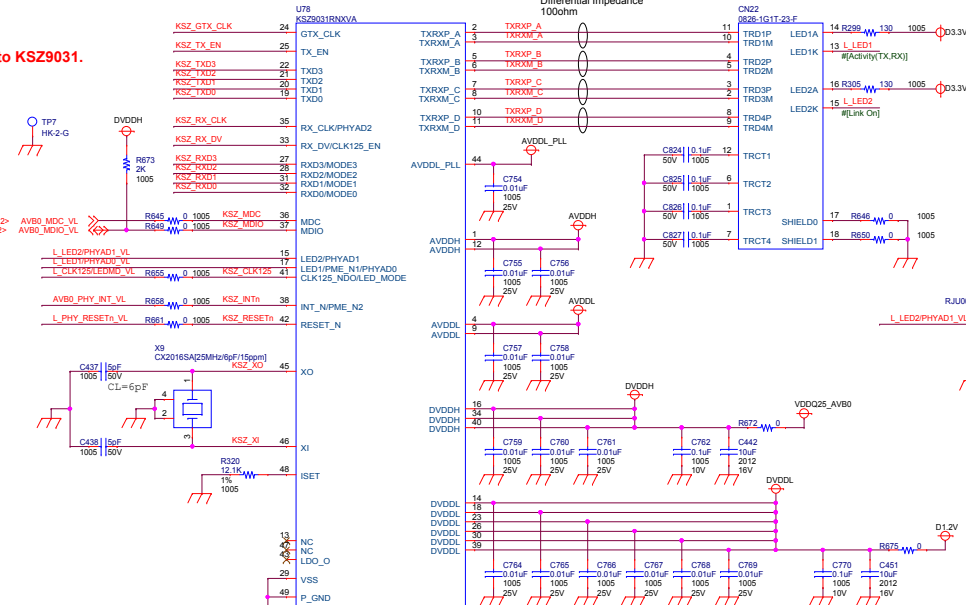
## Ethernet AVB GbPHY and PHY Connector

**Layout Note:**  
As short as possible from junction of AVB0\_XXX\_VL to two Rxxx. (max 250Mbps/pin)



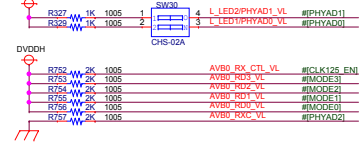
CONFIDENTIAL

### Gigabit Ethernet Transceiver with RGMII Support

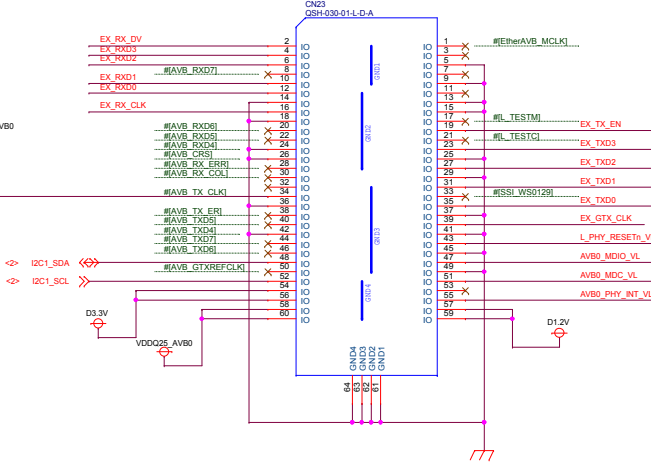


**Layout Note:**  
The KSZ9031RNX has Paddle Ground (pin49) at bottom side. Connect that PAD(pin 49) to the GND.

### Strapping Options for KSZ9031RNX



### Ethernet AVB PHY Connector



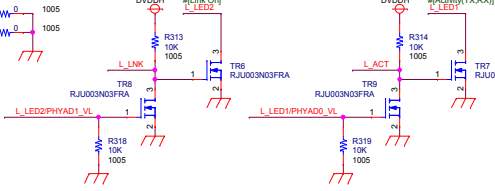
**Layout Note:**  
Following signals need Ground guard.

AVB0\_TXCREFCLK\_VL, CLK125/LEDMD\_VL (125MHz)  
AVB0\_TXC\_VL, KSZ GTX\_CLK, EX GTX\_CLK (125MHz)  
AVB0\_RXC\_VL, KSZ\_RX\_CLK, EX\_RX\_CLK (125MHz)

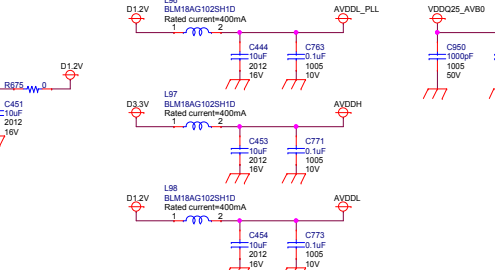
Following pin has pull-down resistor at the initial state.

AVB0\_RX\_CTL, AVB0\_RXC, AVB0\_RXD[3:0]  
AVB0\_TX\_CTL, AVB0\_TXC, AVB0\_TXD[3:0]  
AVB0\_TXCREFCLK, AVB0\_MAGIC, AVB0\_PHY\_INT, AVB0\_LINK

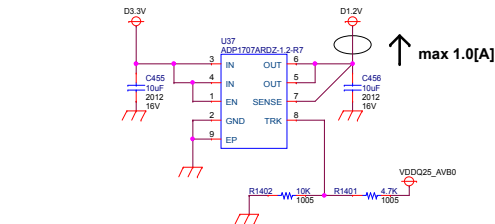
### Controls LEDs in the RJ45 connector



### LC filters for KSZ9031RNX



### Local Regulator for KSZ9031RNX, PHY Connector

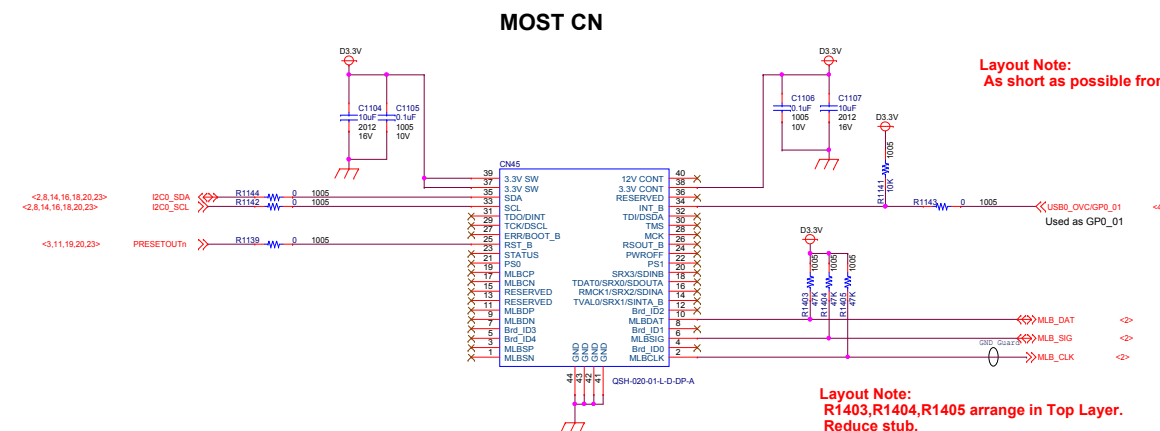


**Layout Note:**  
The ADP1707 has EXPOSED PAD(pin9) at bottom side. Connect that EXPOSED PAD(pin 9) to the GND.

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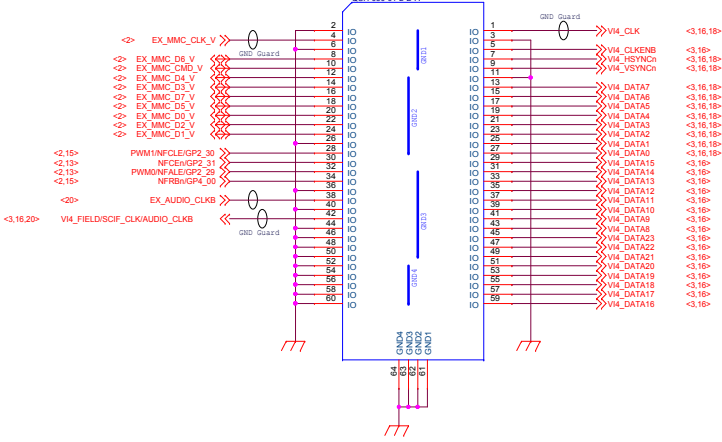
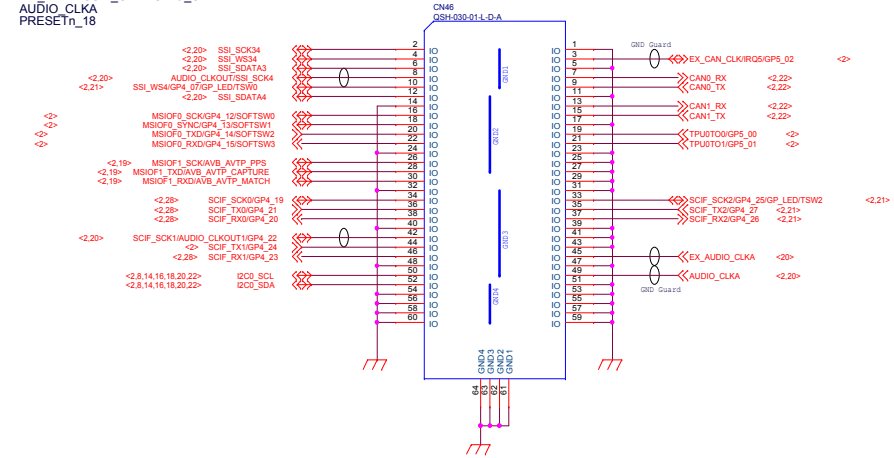
**Layout Note:**  
R1403,R1404,R1405 arrange in Top Layer.  
Reduce stub.

Layout Note:  
Following signals need Ground guard.

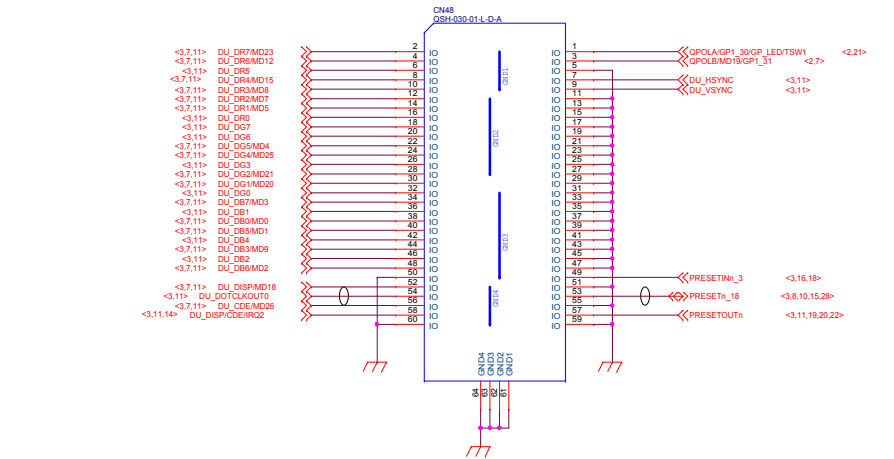
EX\_CAN\_CLK/IRQ5/GP5\_02,  
EX\_MMIO\_CLK\_V,  
V4\_CLK/DU\_DOTCLKOUT0,  
MLB\_CLK,  
EX\_AUDIO\_CLKA  
EX\_AUDIO\_CLKB  
AUDIO\_CLKOUT/SSI\_SCK4  
SCIF\_SCK1/AUDIO\_CLKOUT1/GP4\_22  
V4\_FIELD/SCIF\_CLK/AUDIO\_CLKB  
AUDIO\_CLKA  
PRESETn\_18

#[EXIO\_A]  
EXIO Connector A  
(SSI,MSIOF,SCIF,I2C,CAN,TPU I/F)

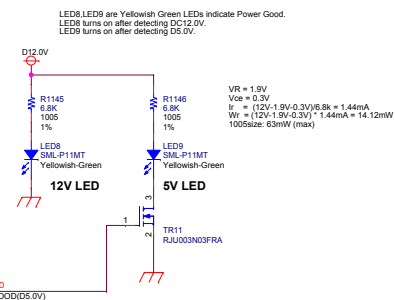
#[EXIO\_B]  
EXIO Connector B  
(eMMC/NAND,V4 I/F)



#[EXIO\_C]  
EXIO Connector C  
(DU,TCON I/F)



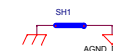
**It is prohibited to supply more than DC12.0V .**



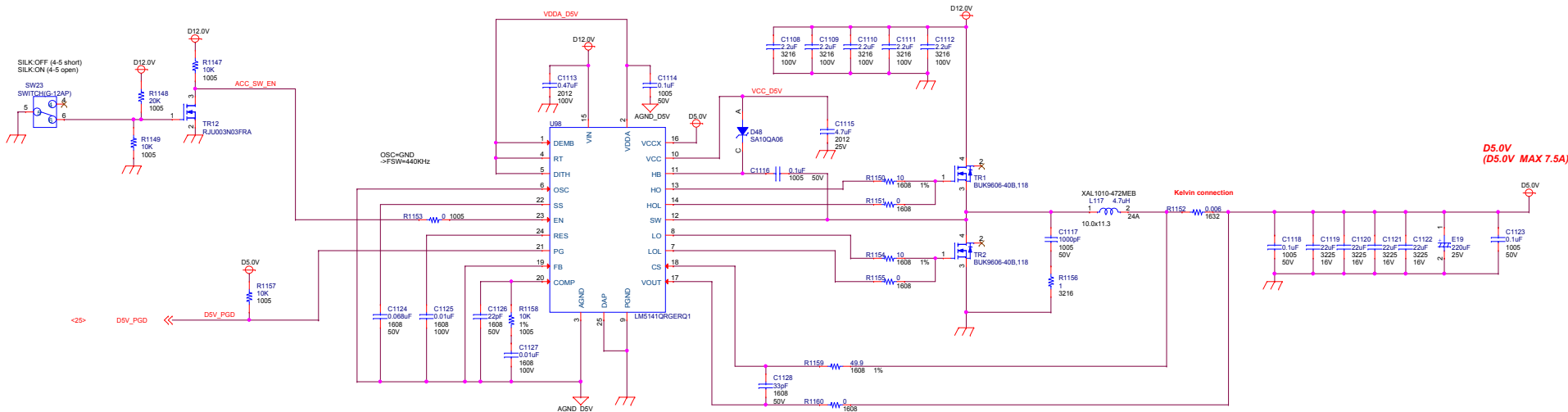
### D5.0V Generate



**Layout Note:**  
**One Point Ground**

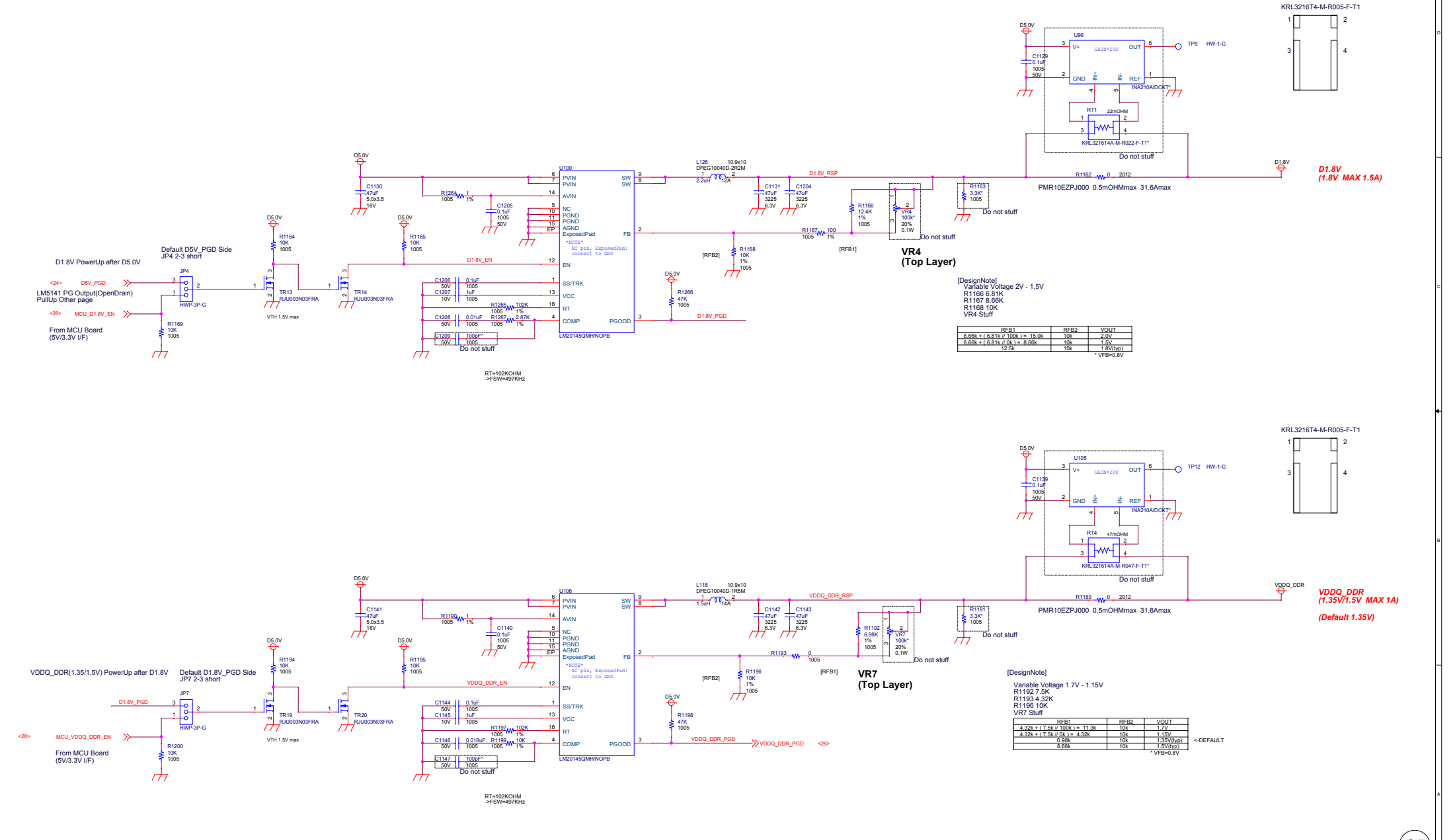


**ACC SW**



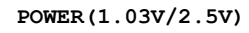
Power IN/5V

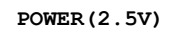




POWER (1.8V/1.35V)

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[illegible]

**D3.3V Power Detect Reset (D3.3V OFF: RESET)**

Threshold 2.64V

CT=H : Td 200mS  
(CT=L : Td 10mS)

**5V Tolerant**

**Manual Reset**  
OFF -> H : NORMAL  
ON -> L : RESET

**SYSTEM Reset LED**

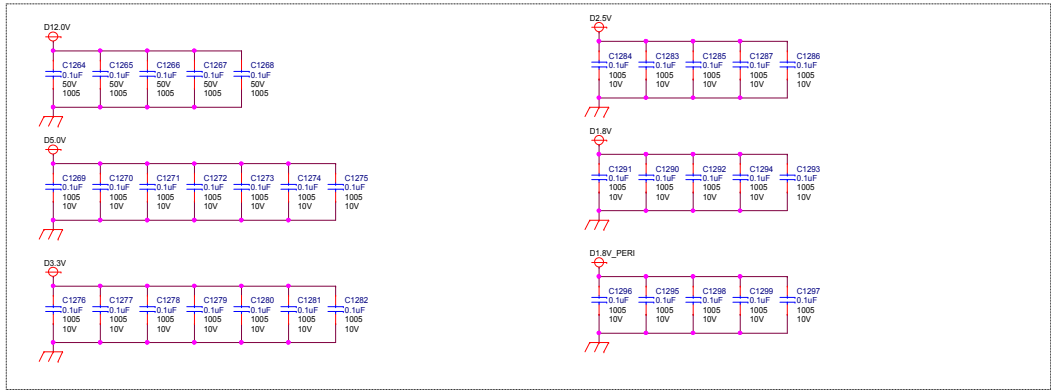
MCU -> D3 RESET (L:RESET)

MCU

VR = 1.9V  
Vce = 0.3V  
If = (5V - 1.9V - 0.3V) / 2.2k = 1.27mA  
If = (5V - 1.9V - 0.3V) / 1.27mA = 3.52mA  
1005Size: 63mm (max)

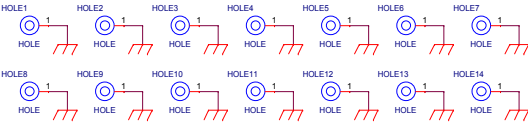
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For EMI.



BOARD HOLE

BOARD hole is connected to GND.



File			
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