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MS-7816

Intel -SharkBay plamform Z87

ATX

Ver: 21(243.84x304.8)

CPU:

Haswell LGA1150

System Chipset:

Lynx Point Z87

Onboard Chip:

HD Audio Codec:ALC1150

LAN- Killer E2205

SIO:Nuvoton 6779D

Flash ROM: SPI 64 MB & SPI 128 MB (H87&B85)

Main Memory:

DDRIII (1066/1333/1600MHz) * 4 (Dual Channel)

ACPI:

UPI

PWM:

UP1649 6 Phase

Expansion Slots:

Other:

PCI Express (X16) Slot * 1

PCI Express (X1) Slot * 2

PCI Express (X4) Slot * 1

PCI Slot * 3

SATA3.0 x6(PCH)

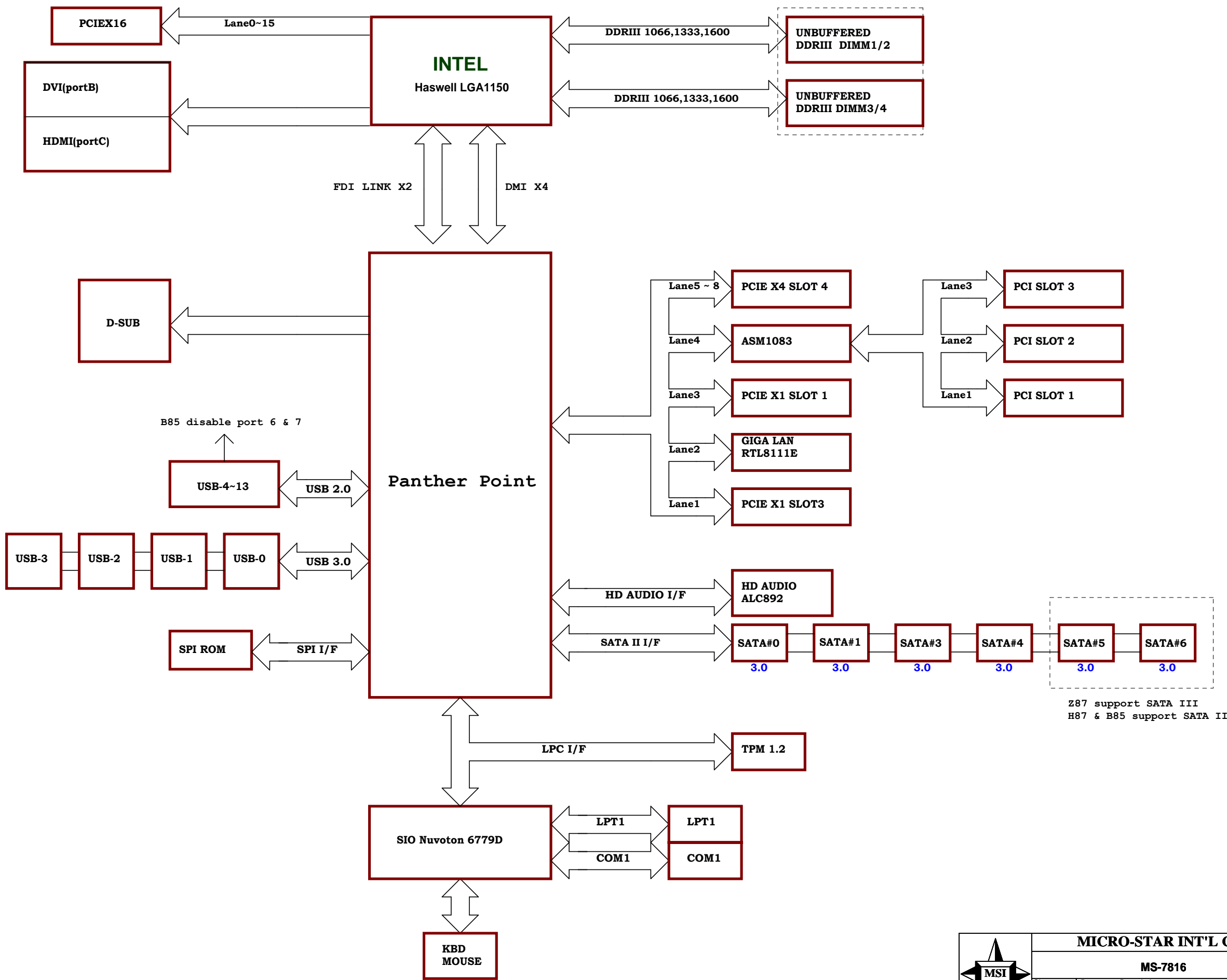
REAL USB2.0 *6

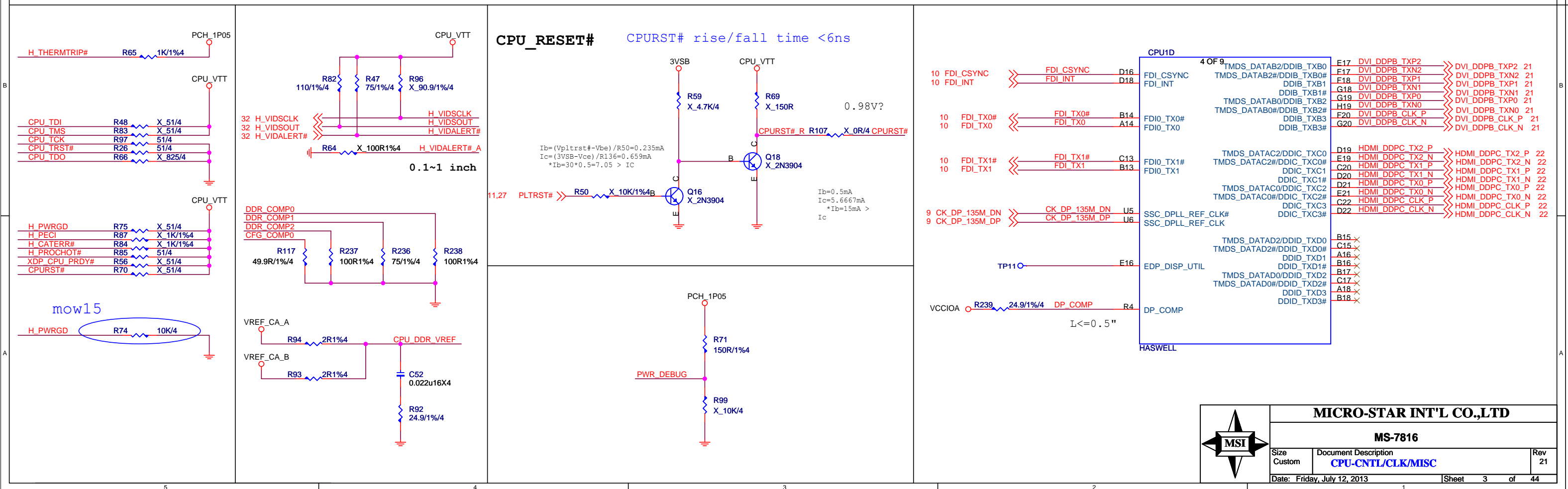
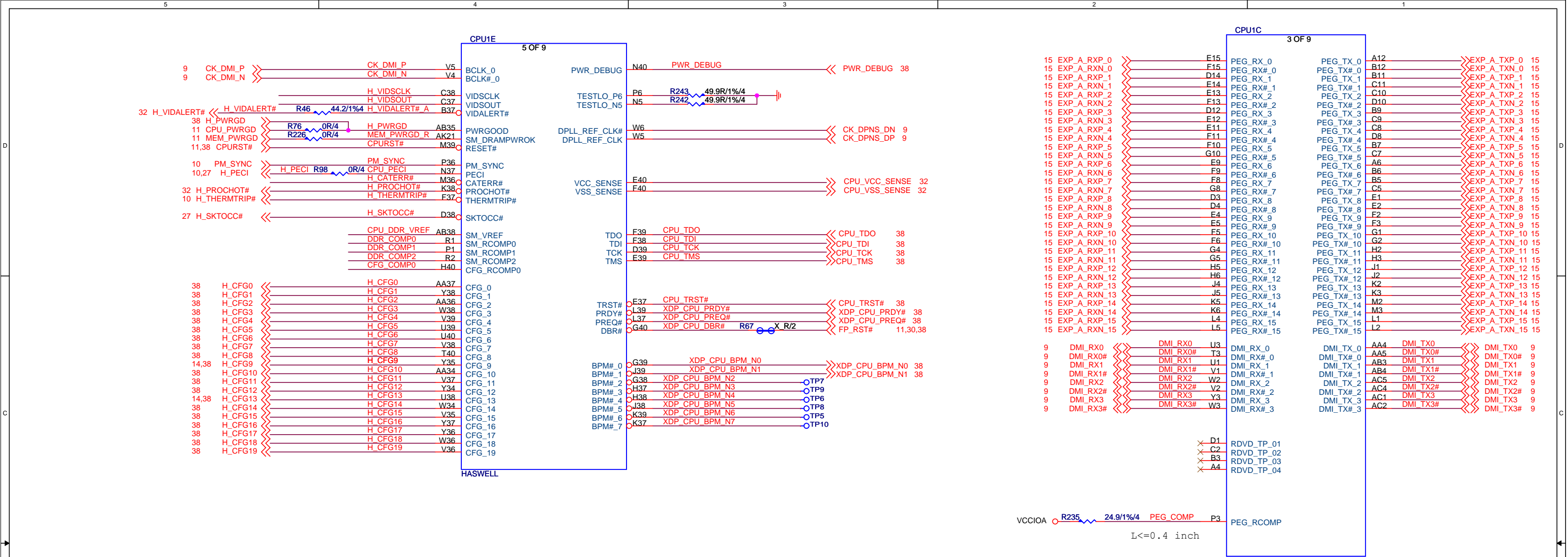
FRONT USB2.0 *4(B85 Disable 2 port)

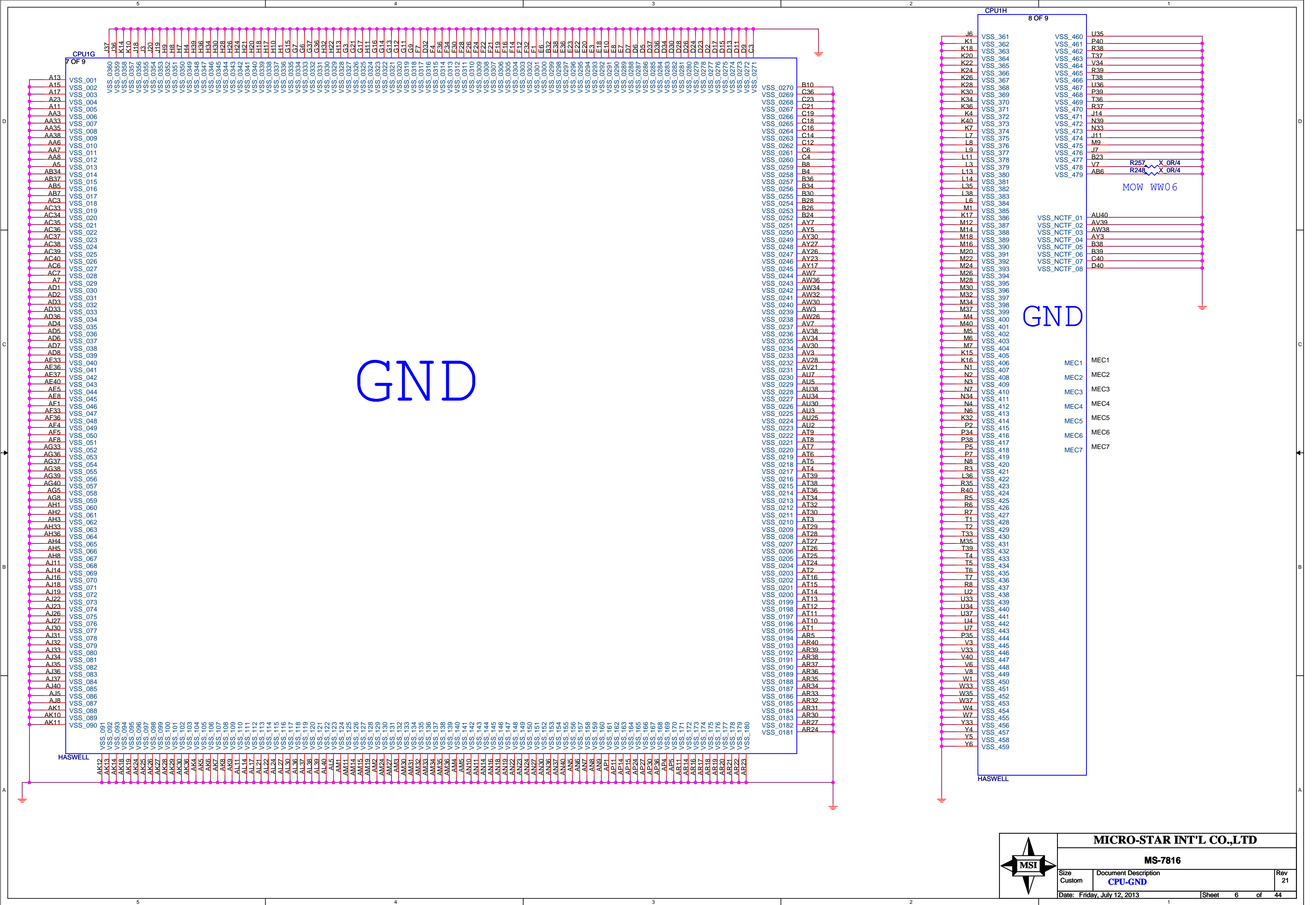
REAL USB3.0 *2

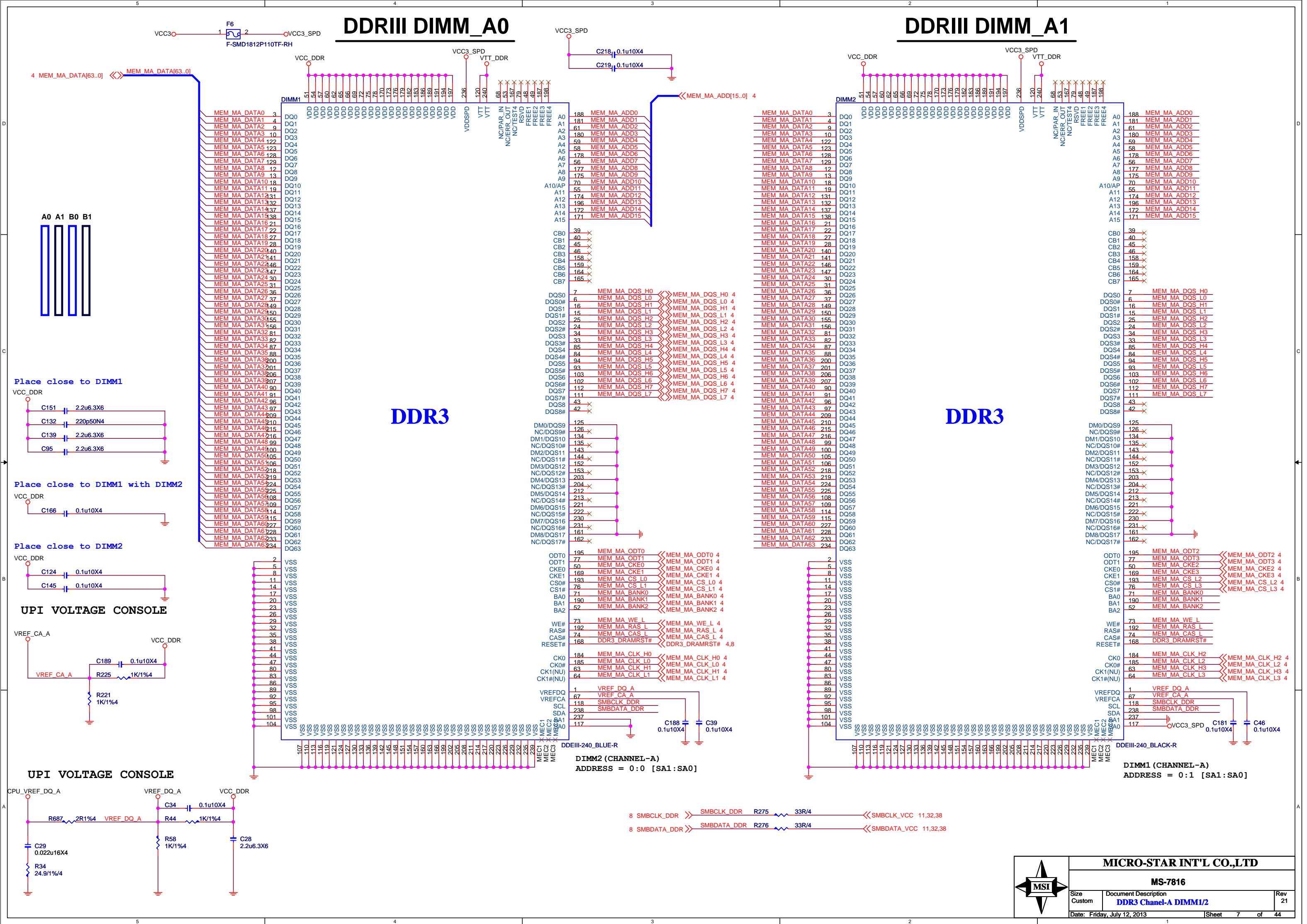
FRONT USB3.0 *2

MS-7816 Block Diagram

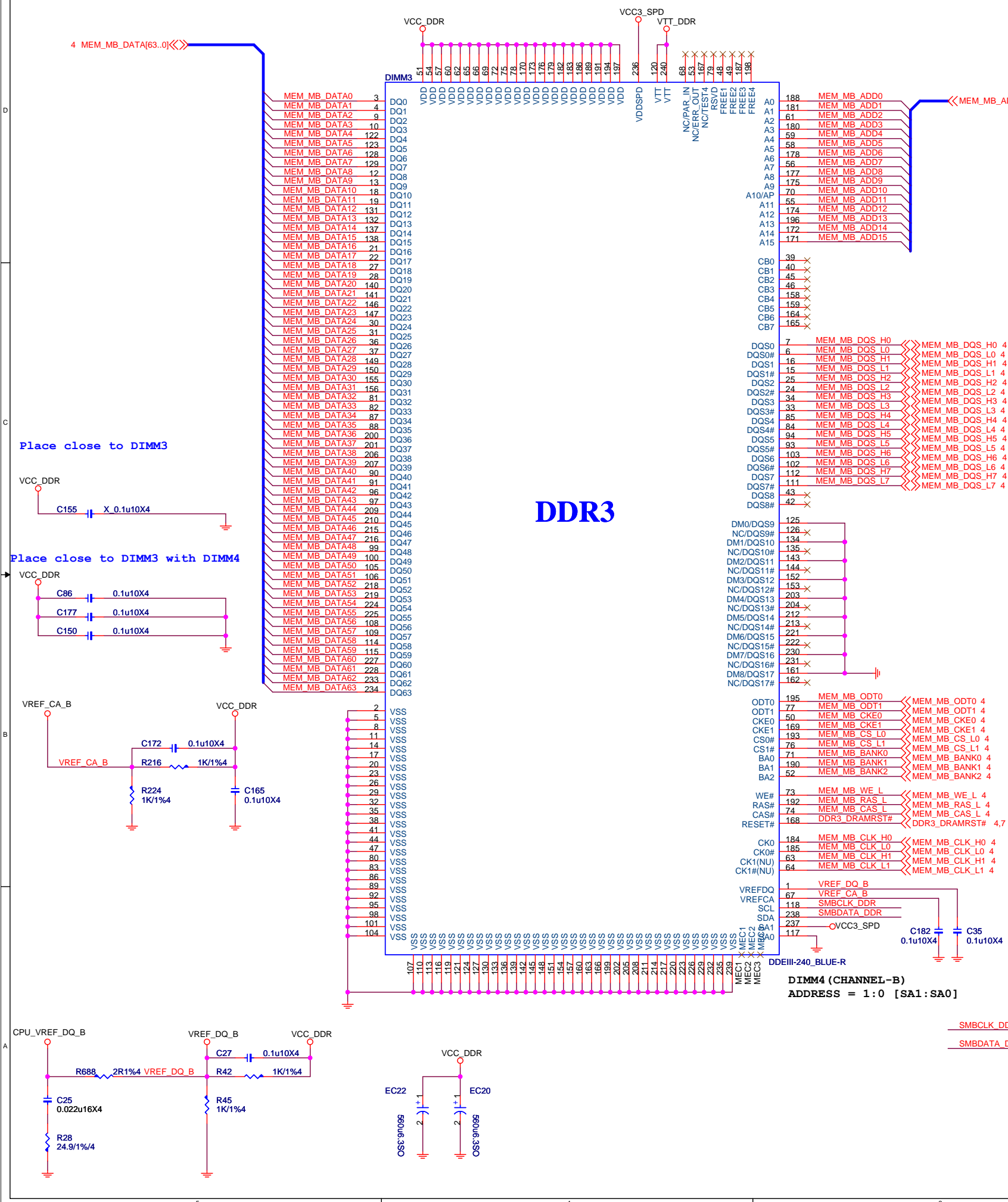




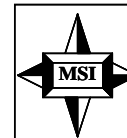
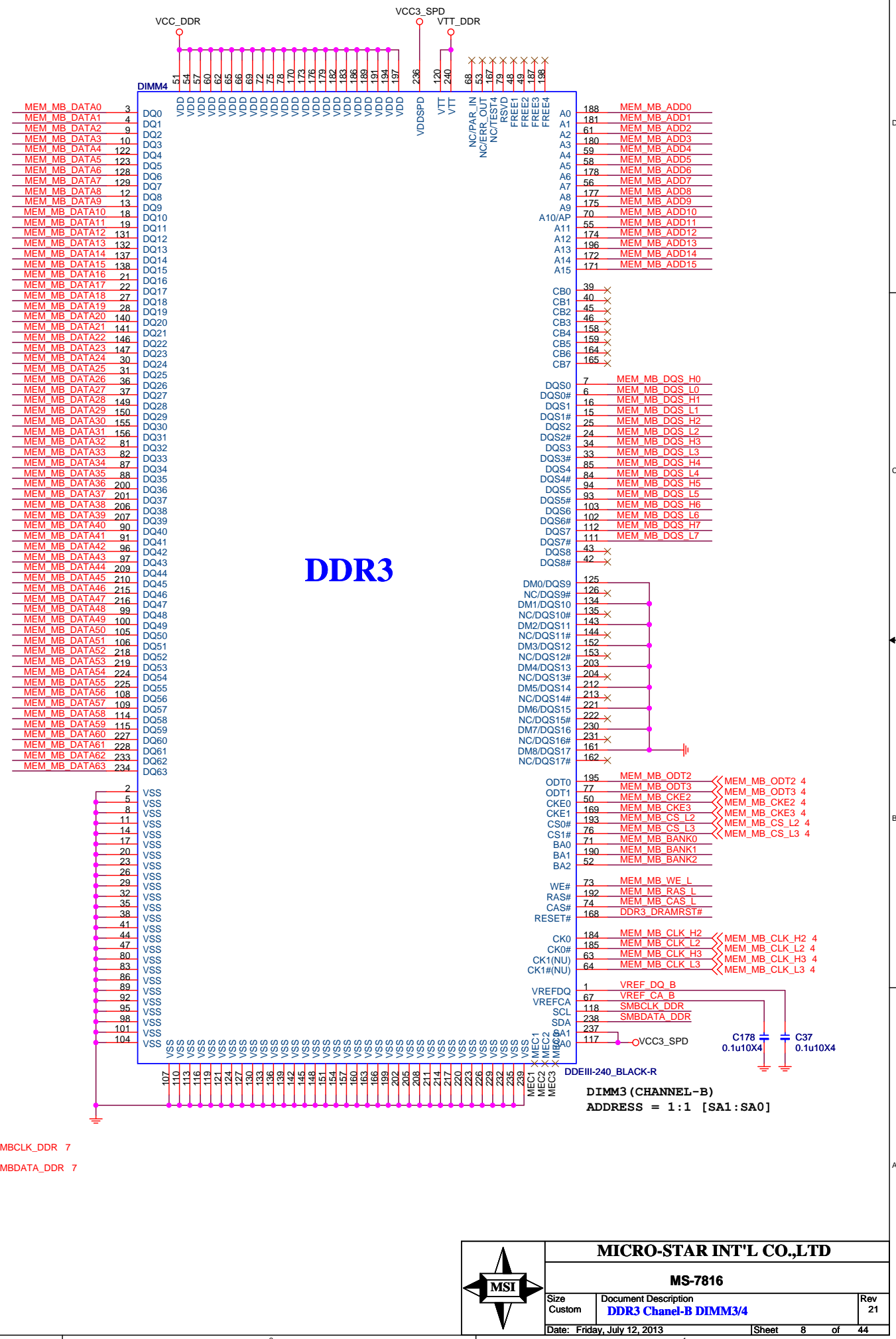




DDRIII DIMM_B0



DDRIII DIMM_B1

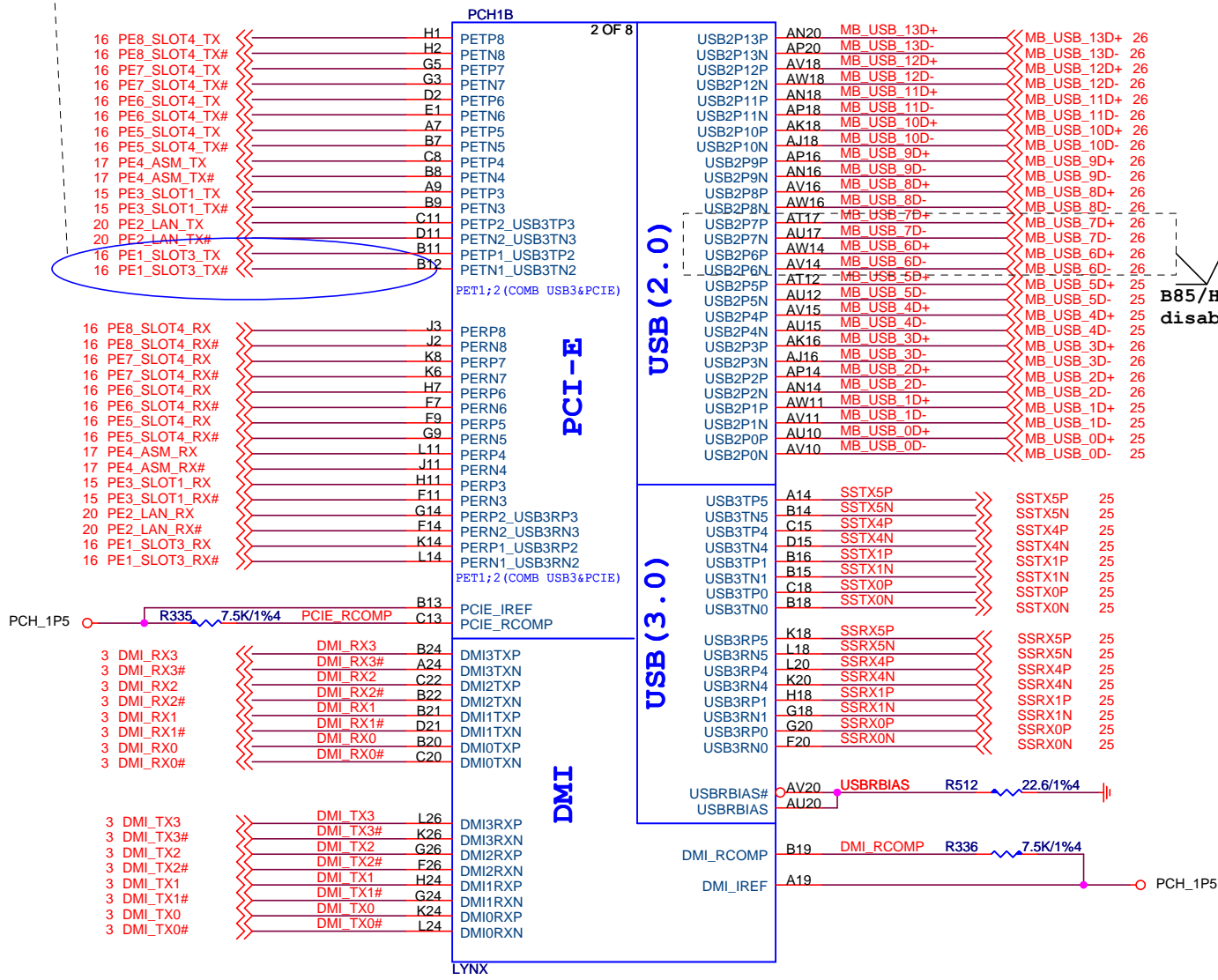


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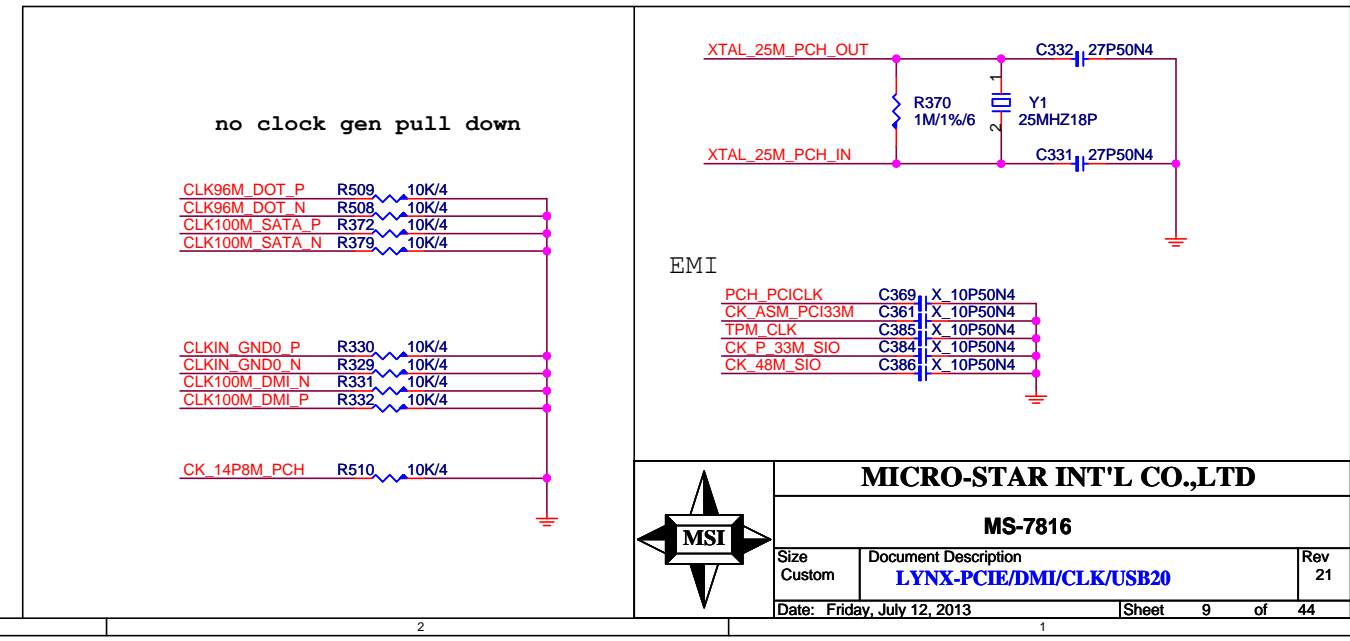
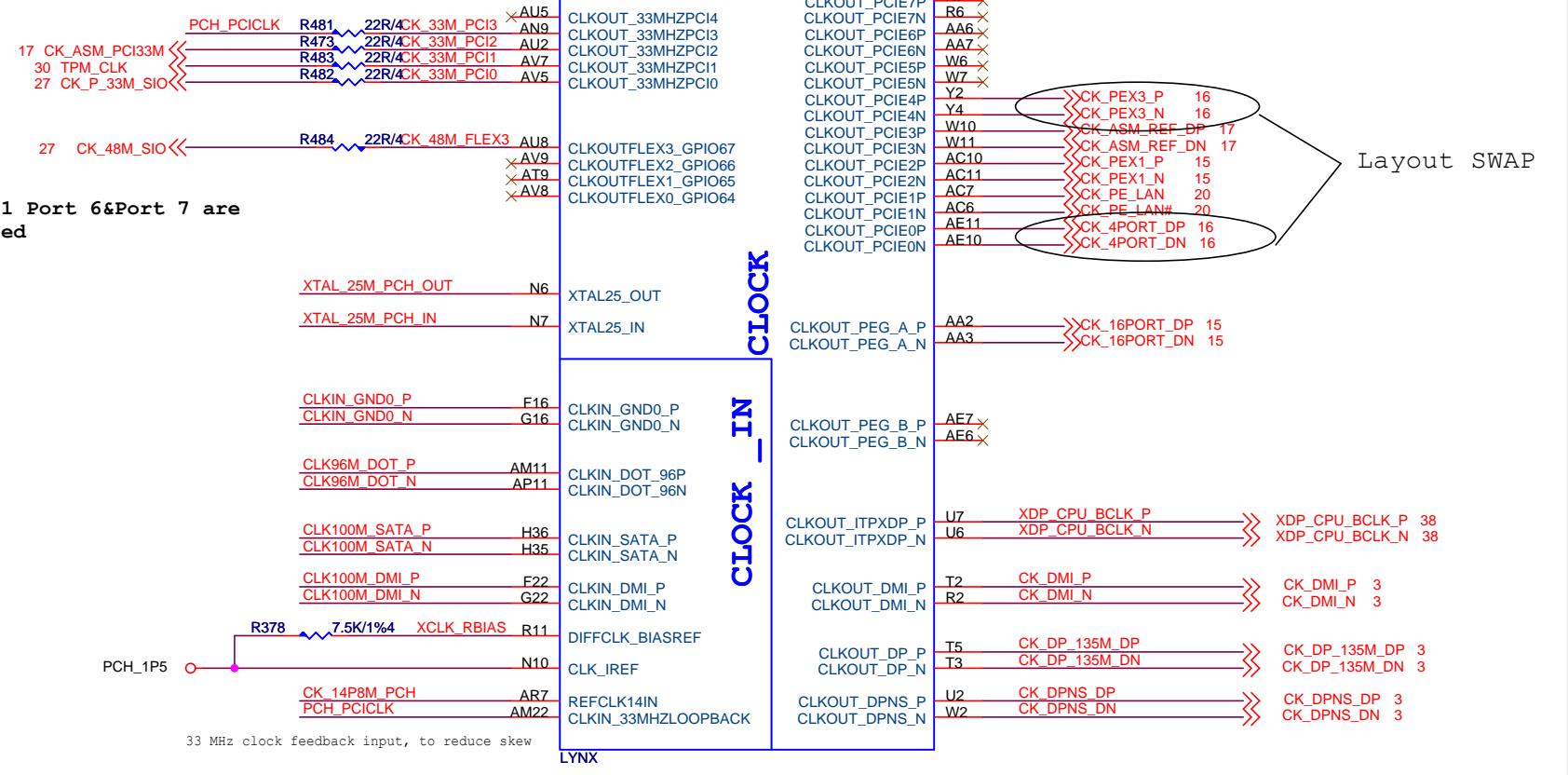
MS-7816

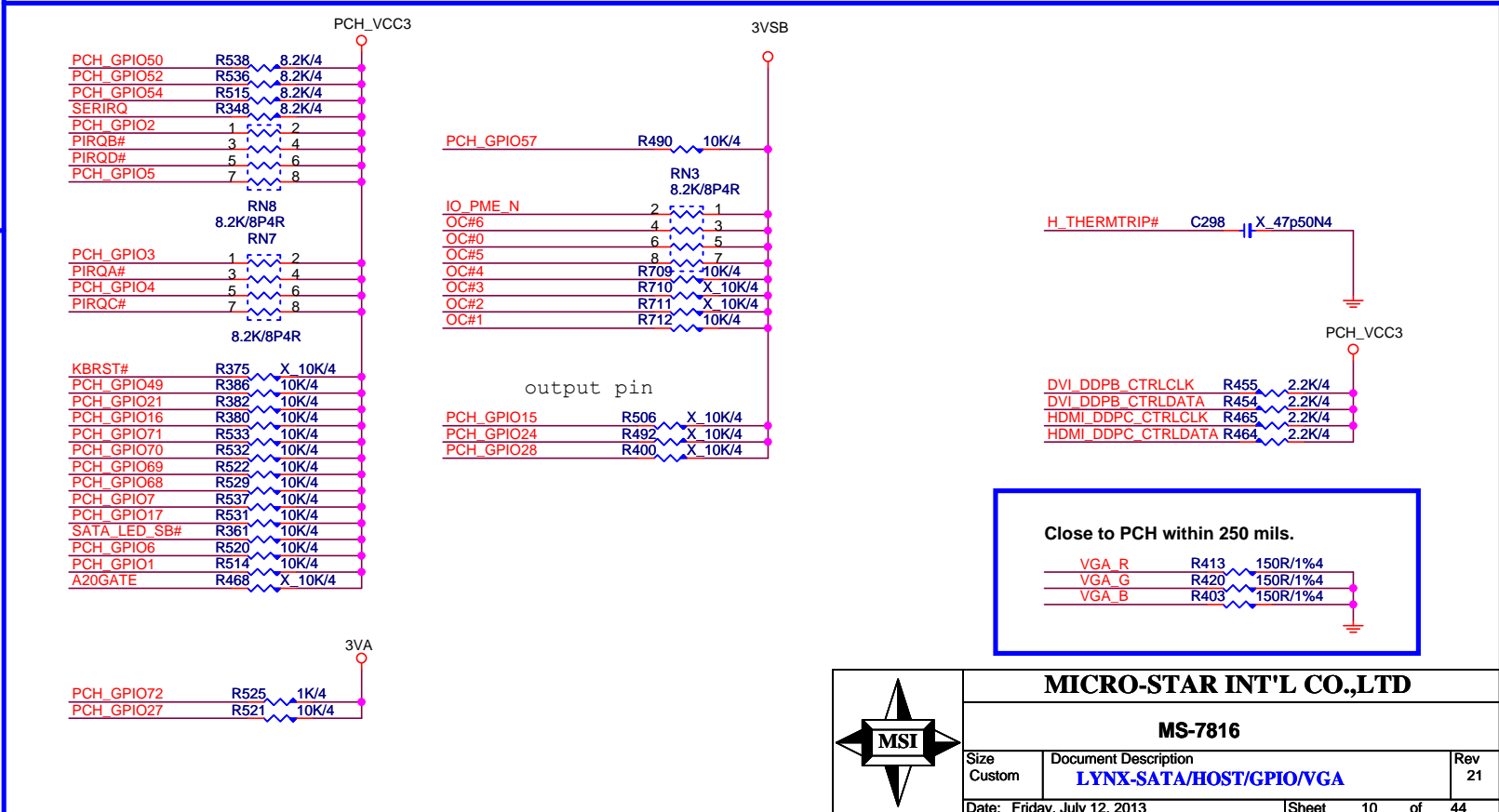
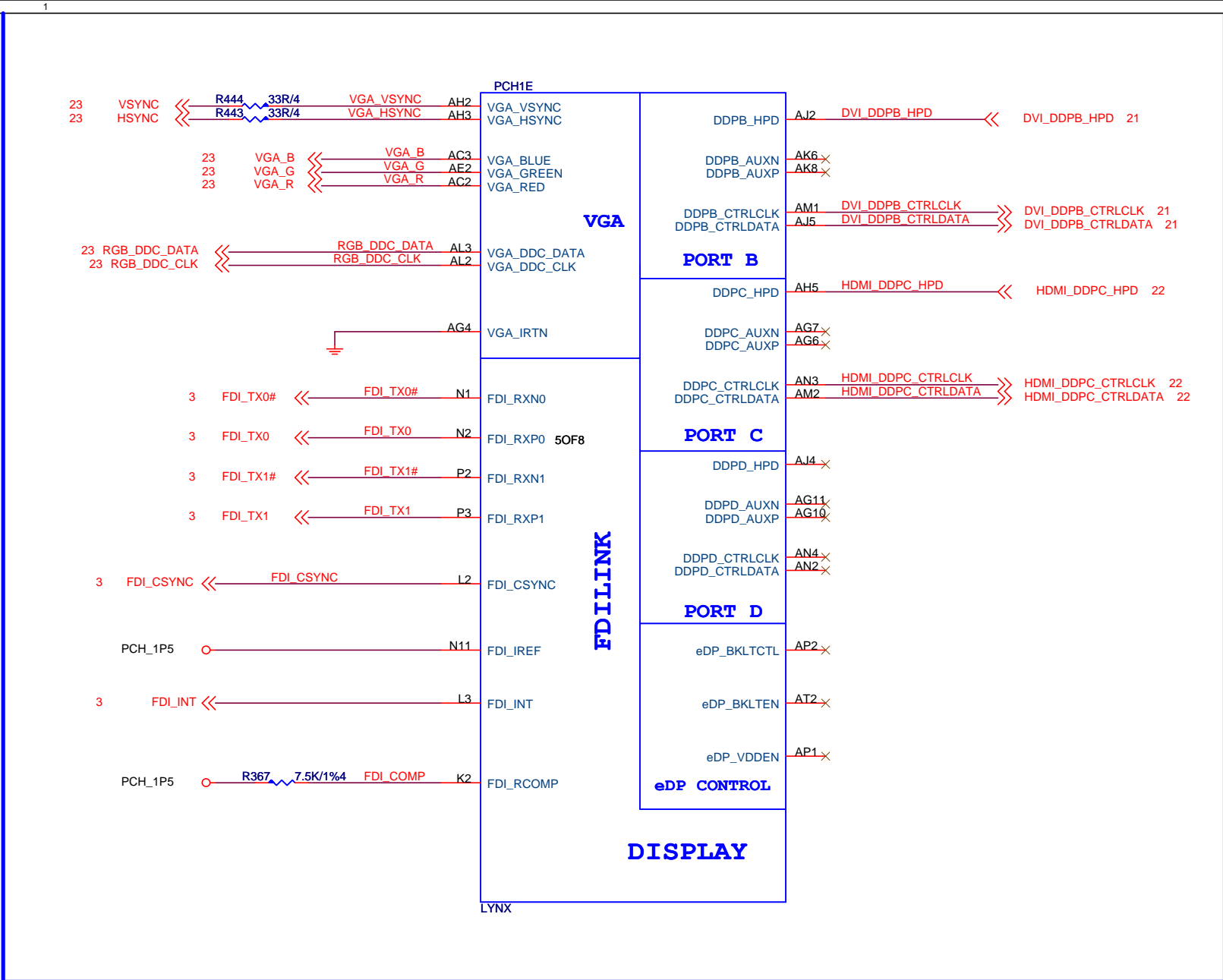
Size Custom	Document Description DDR3 Chanel-B DIMM3/4	Rev 21
Date: Friday, July 12, 2013	Sheet 8 of 44	

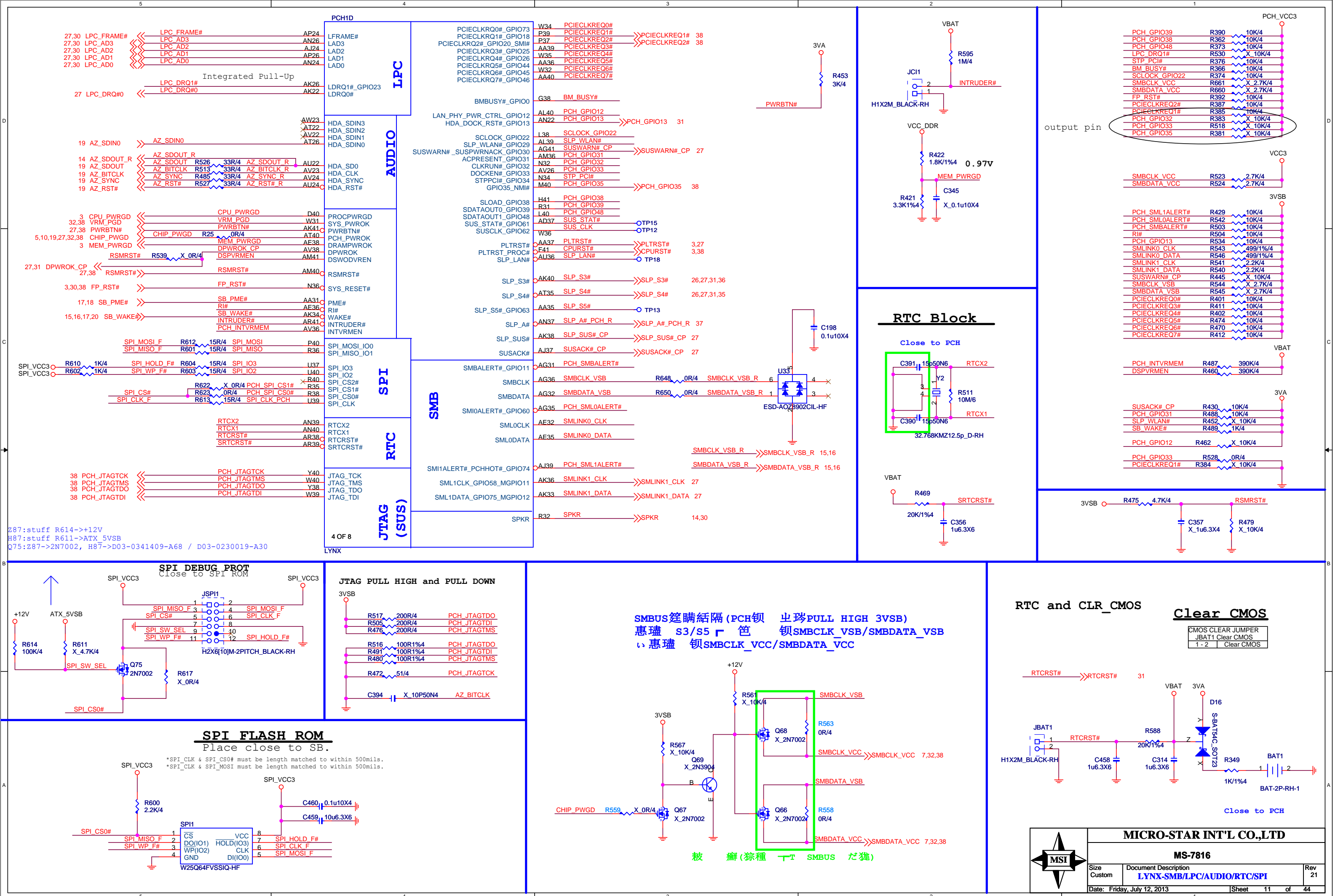
PCIE Port 0 requires a link corresponding to the PCIE Device. (Because the Pcie port0 then the Device to open the Enable / Disable option in the bios interface.)

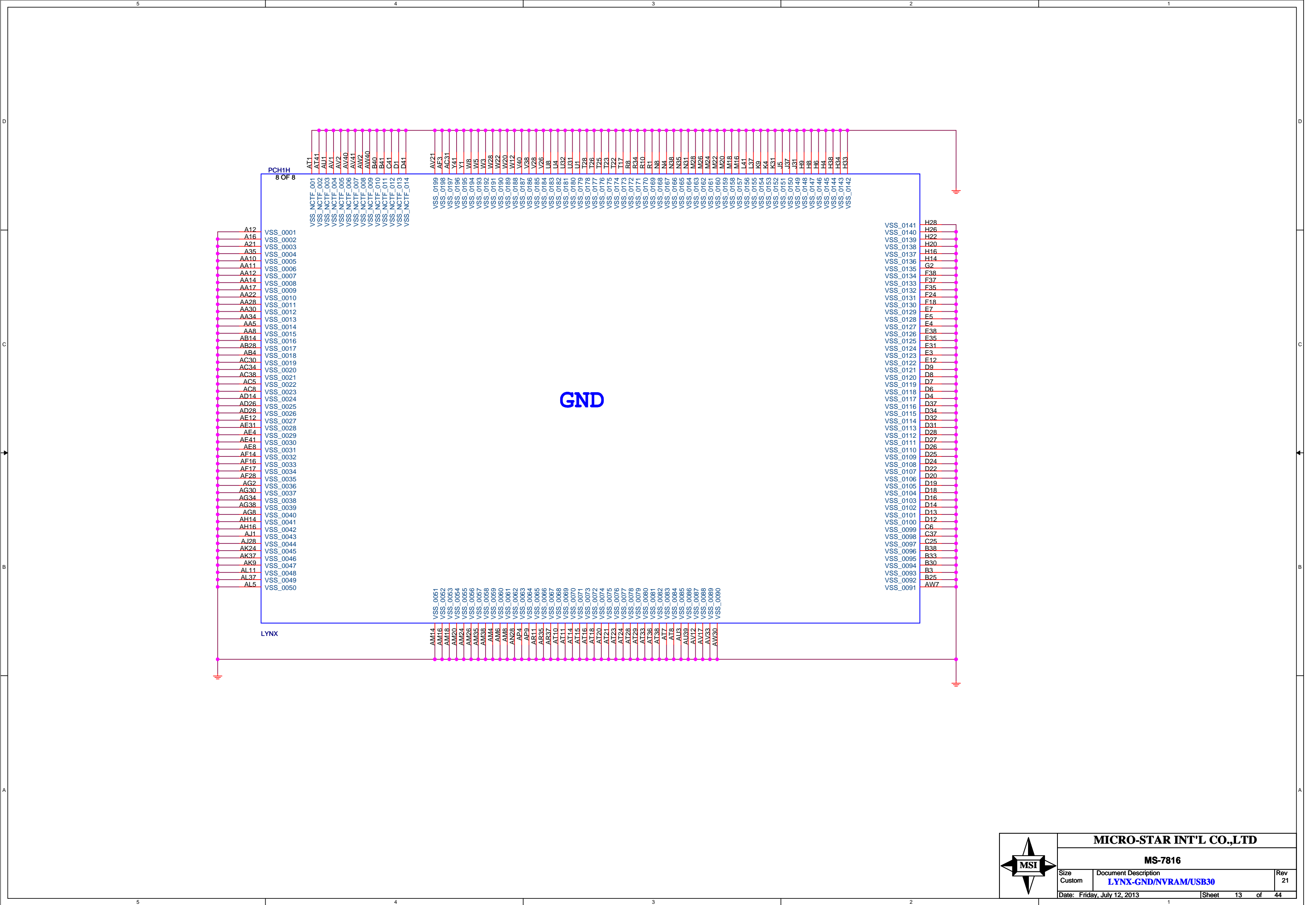


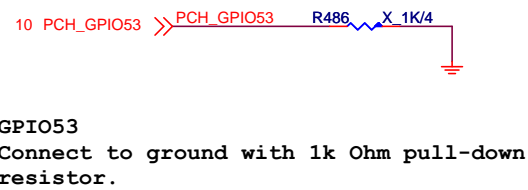
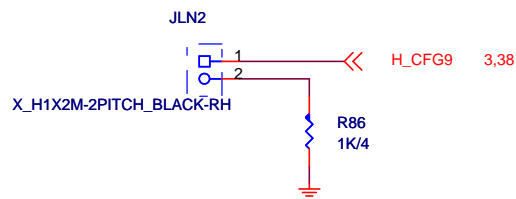
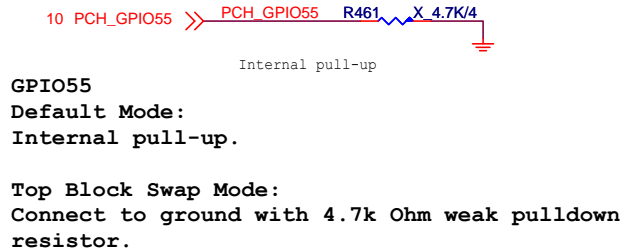
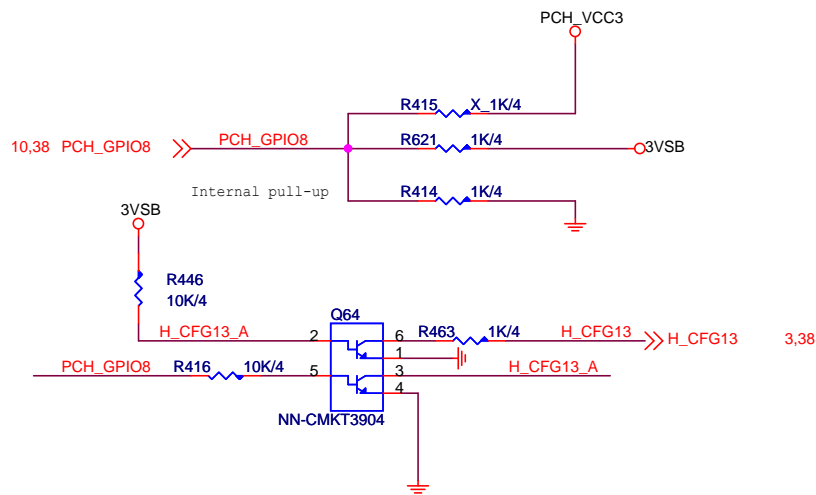
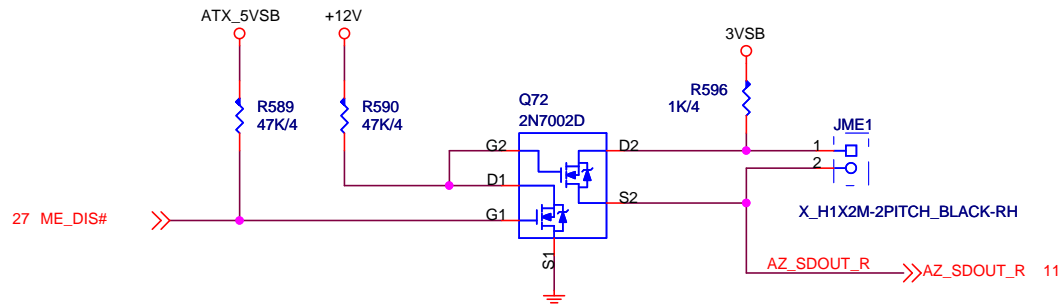
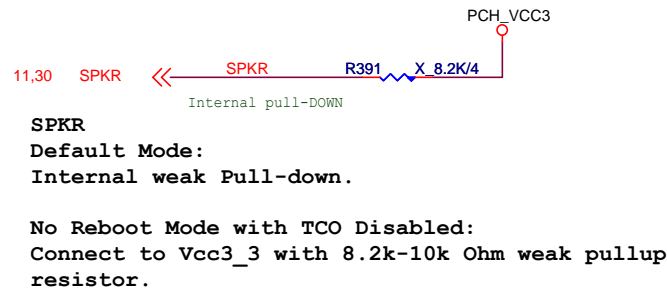
B85/H81 Port 6 & Port 7 are disabled



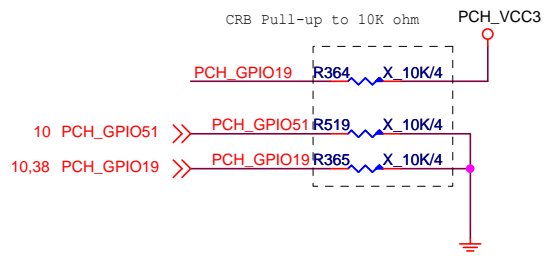








For Sx power Cycling May Fail Due to SVID Logic Race Condition Within the Processor



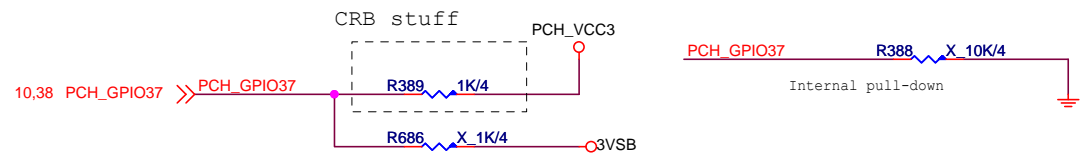
Default (SPI):
Left both SATA1GP/GPIO19 and GPIO51 floating.
No pull up required.

Boot from PCI:
Connect SATA1GP/GPIO19 to ground with 1k Ohm pull-down resistor.
Leave GPIO51 Floating.

Boot from LPC:
Connect both SATA1GP/GPIO19 and GPIO51 to ground with 1k Ohm pull-down resistor.

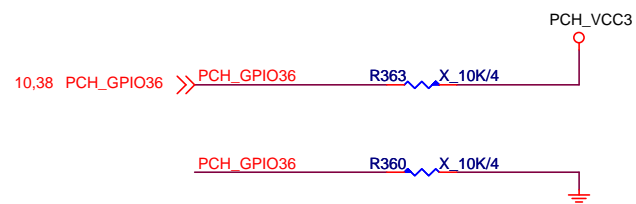
BOOT DEVICE	GPIO51	GPIO19
LPC	0	0
SPI	1	1

Default



Enable TLS:
Pull up with 1k Ohm to VccSus3.3.

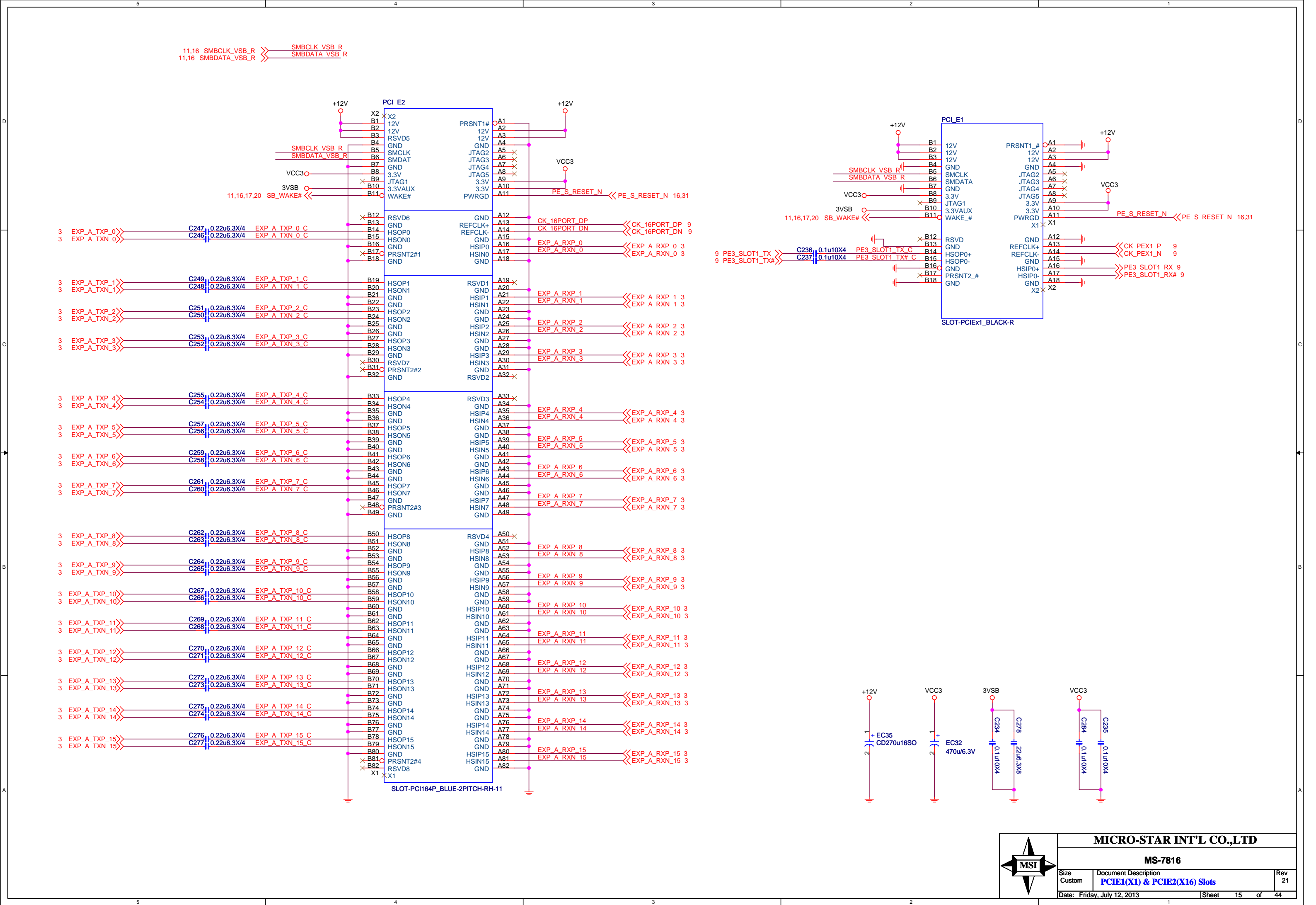
Default (Disable TLS):
Leave NC. Internal pull down.



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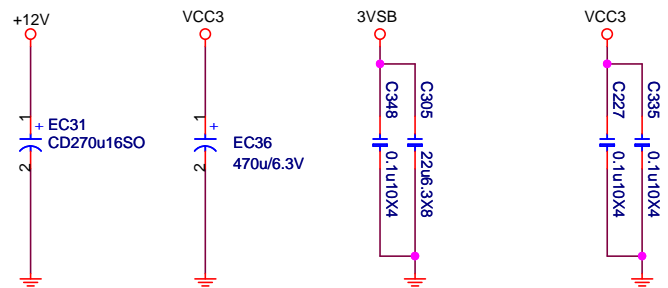
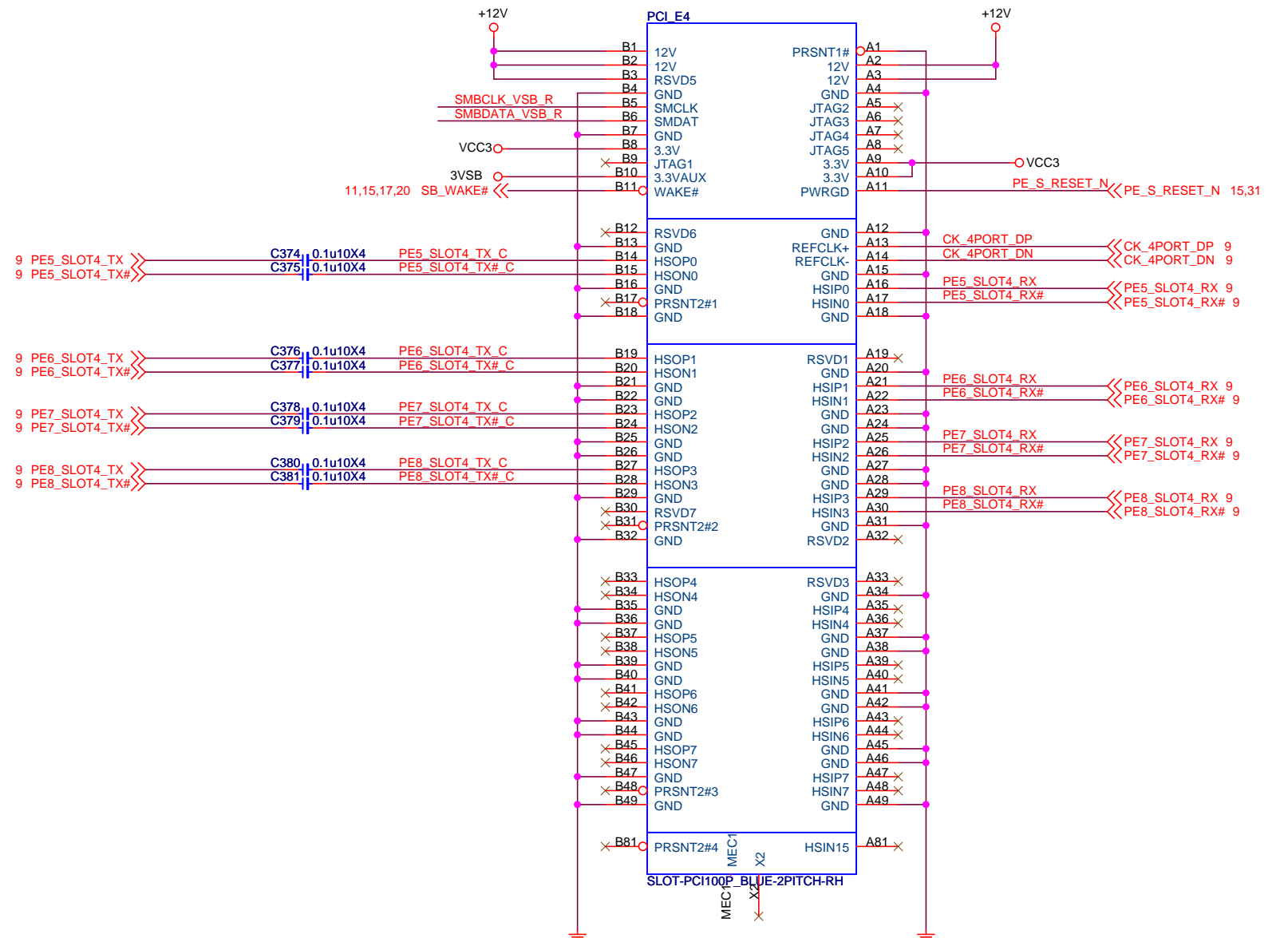
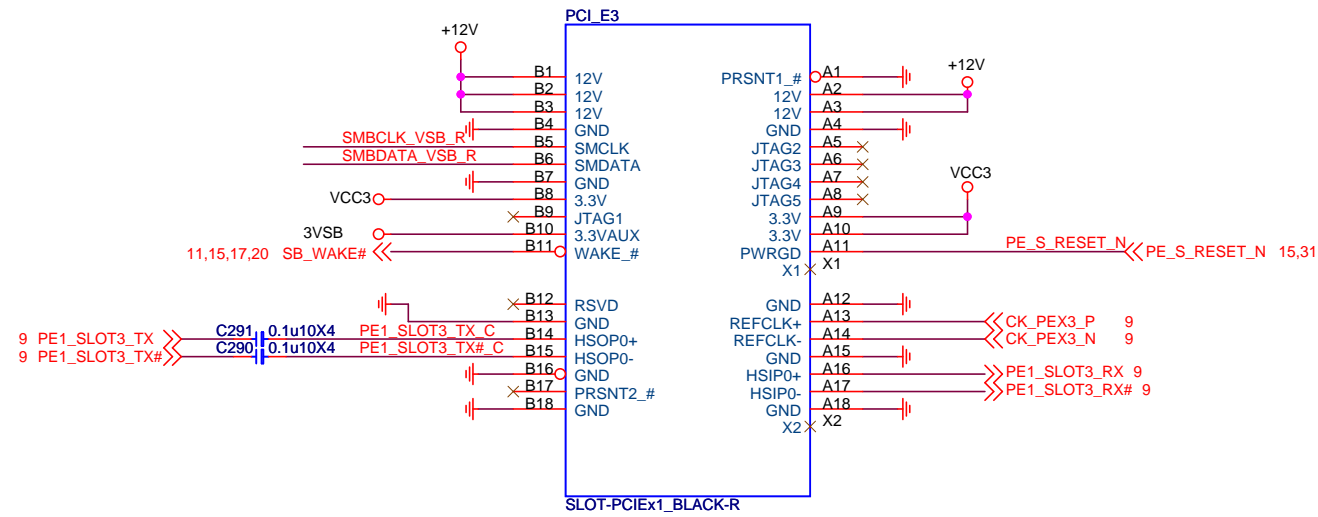
MS-7816

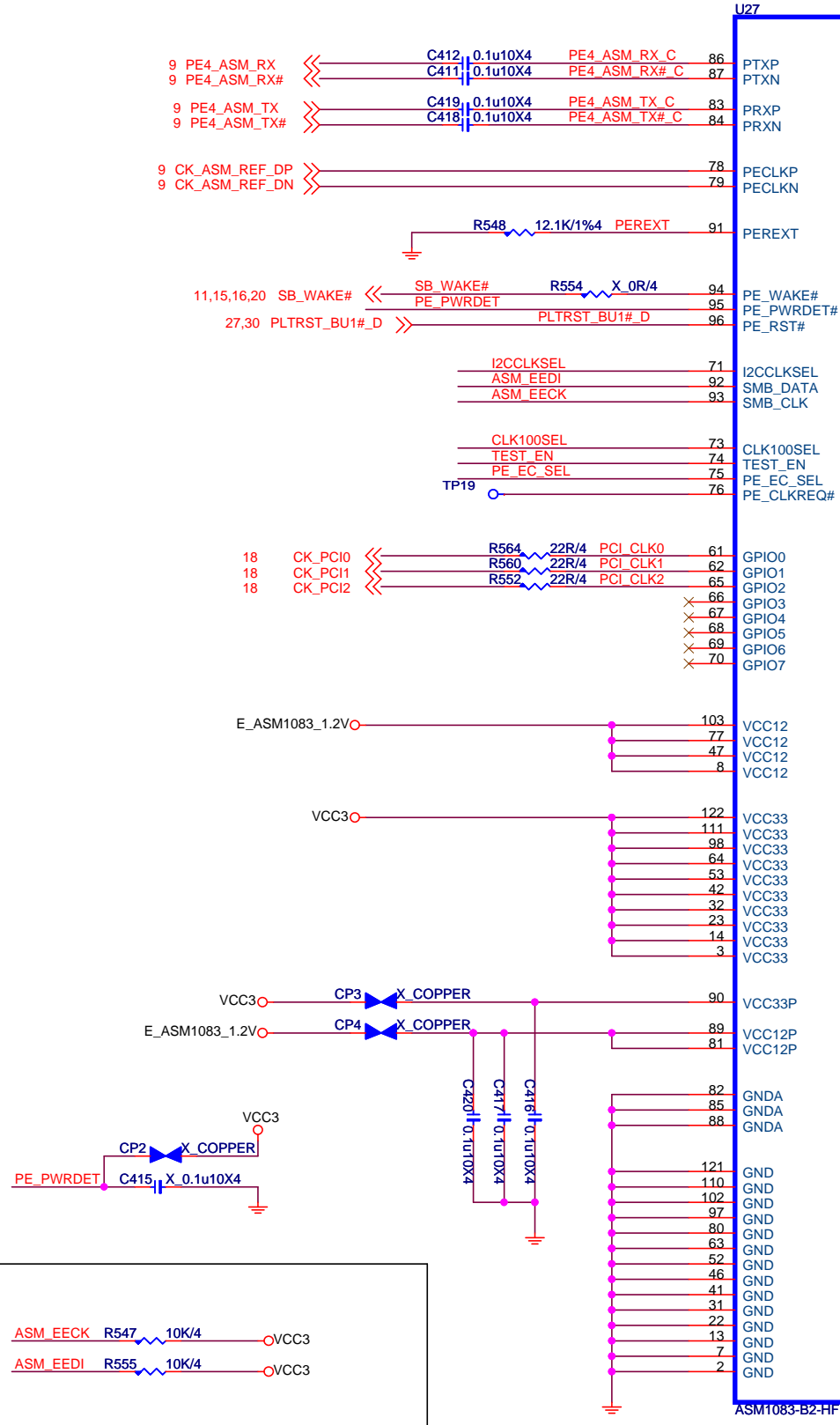
Size Custom	Document Description LYNX-Strap	Rev 21
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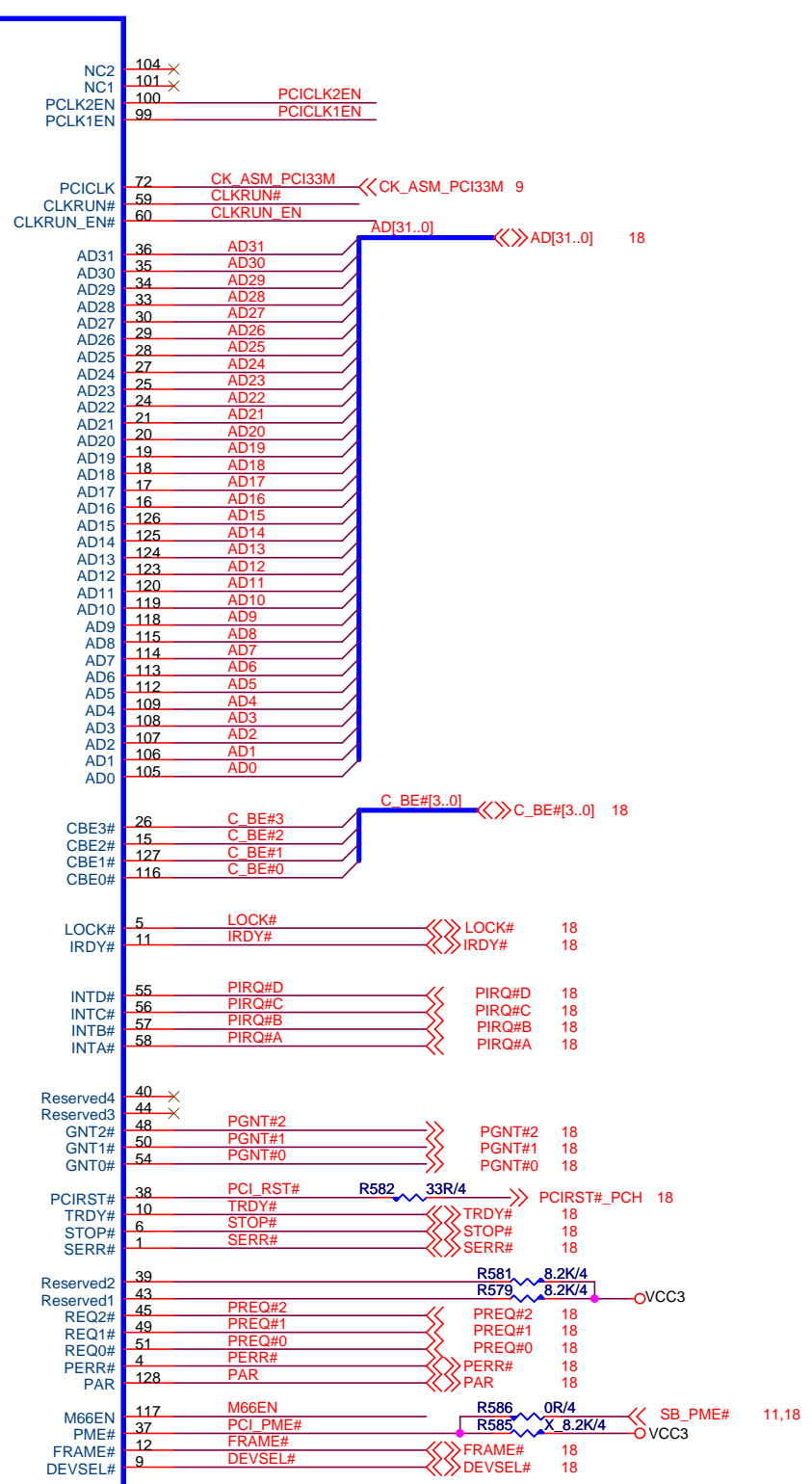
11,15 SMBCLK_VSB_R >>> SMBCLK_VSB_R
11,15 SMBDATA_VSB_R >>> SMBDATA_VSB_R

PCI Express X4 Slot

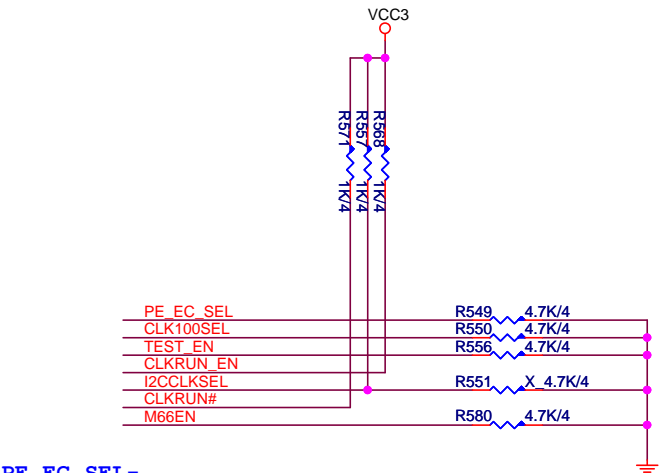




ASM1083



H/W Strapping



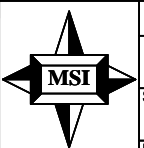
PE_EC_SEL-
"H" for Express Card mode
"L" for PCIe Riser Card mode

CLK100SEL-
"H" for PECLK input only
"L" for PECLK & PCICLK input

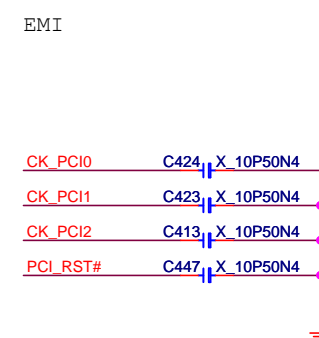
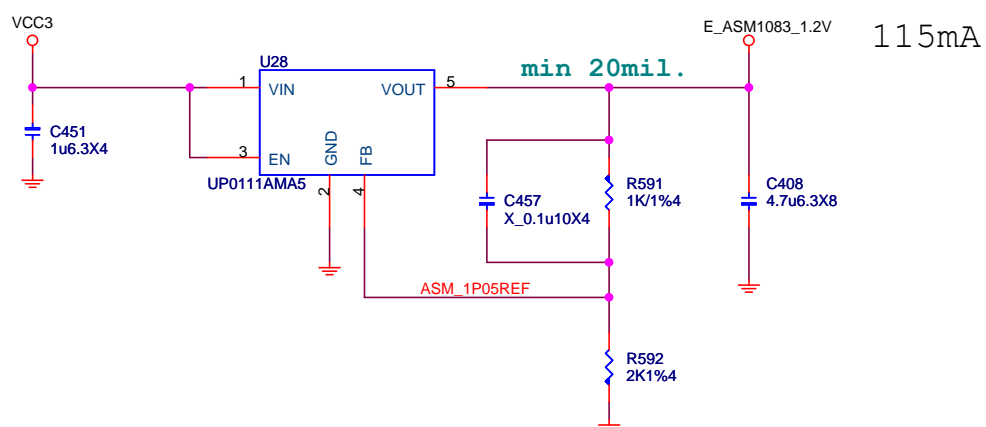
TEST_EN-
"H" for Test Mode Enable
"L" for Test Mode Disable

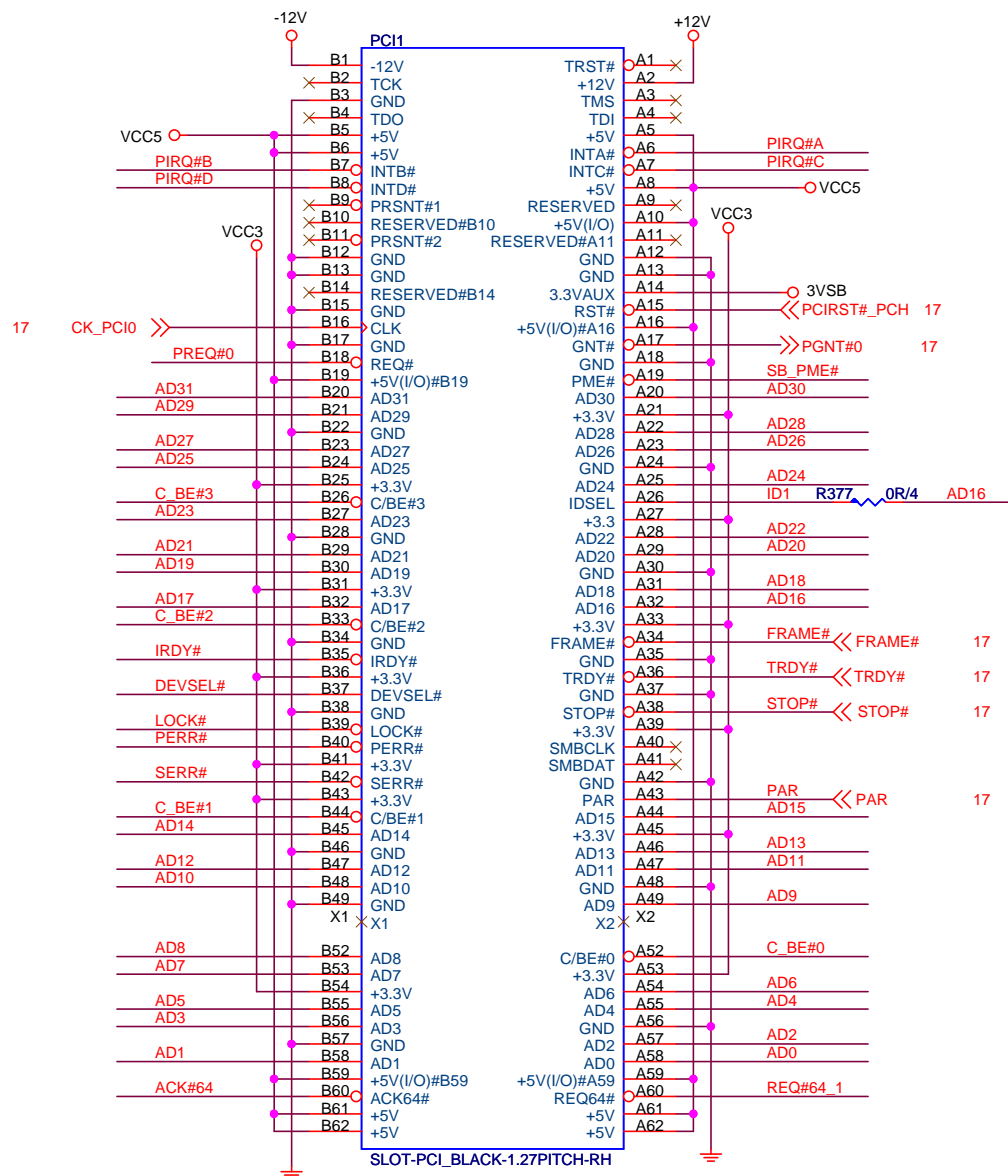
CLKRUN_EN-
"H" for CLKRUN Mode Disable
"L" for CLKRUN Mode Enable

I2CCLKSEL-
"H" is 135KHz I2CCLK
"L" is 67.5KHz I2CCLK



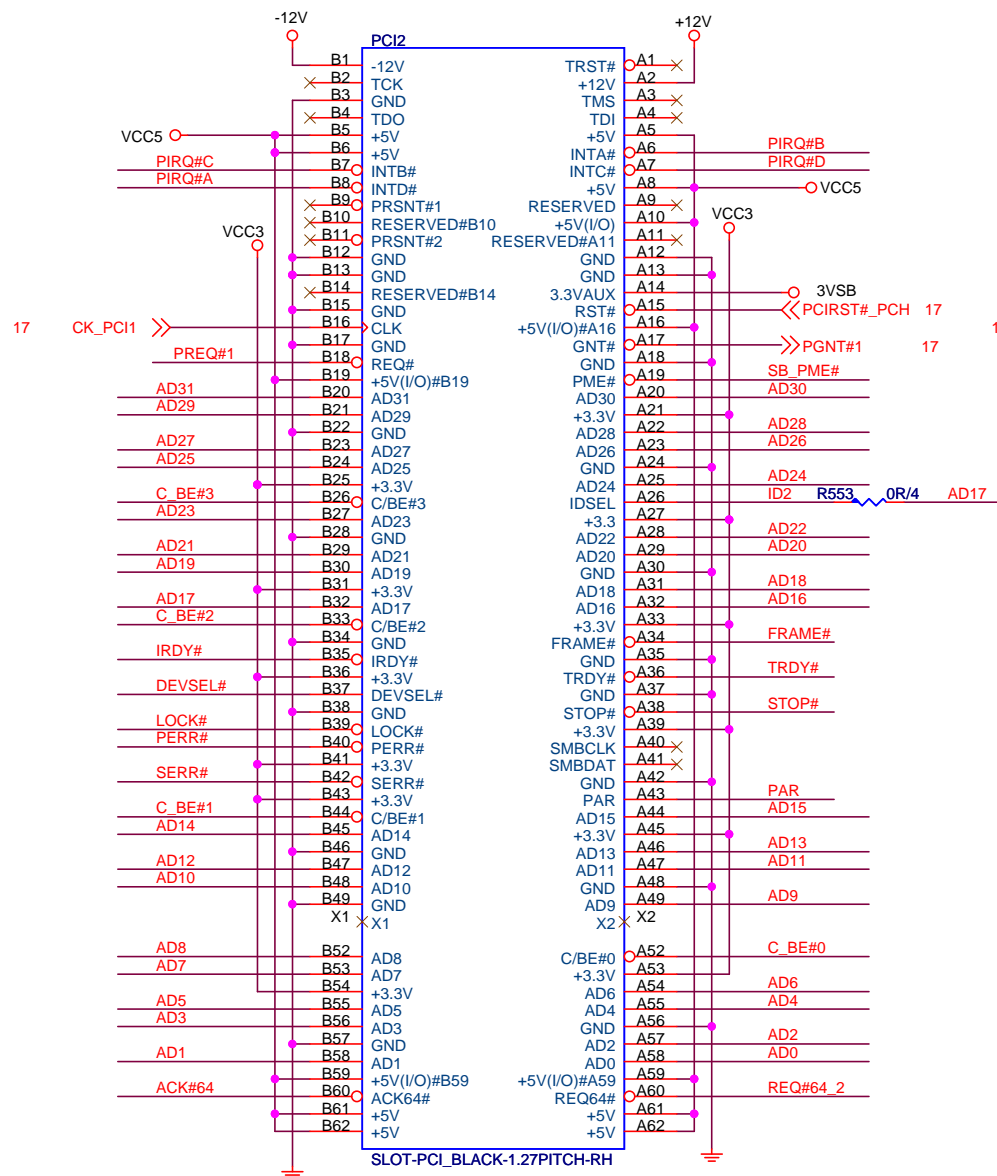
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MS-7816		
Size Custom	Document Description ASM1083 PCI Bri.	Rev 21
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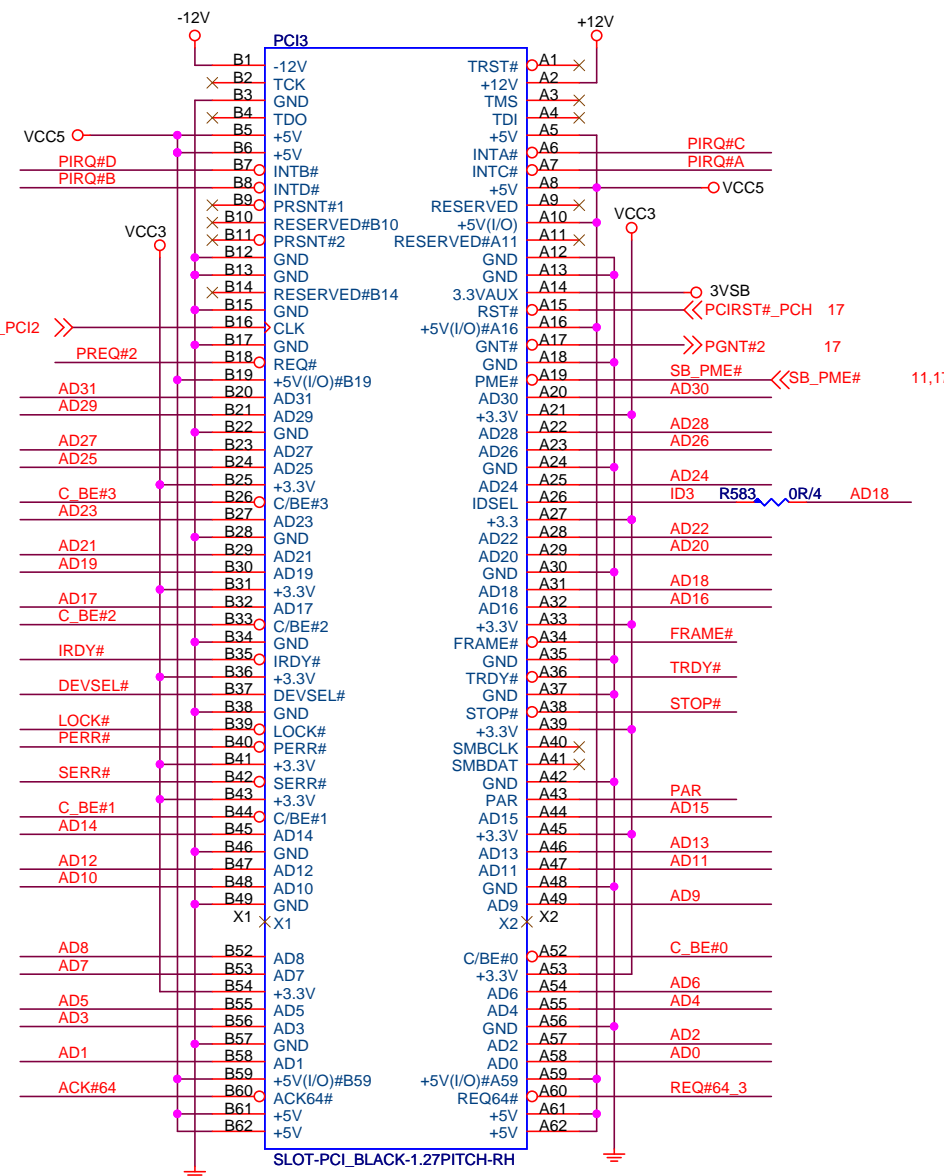
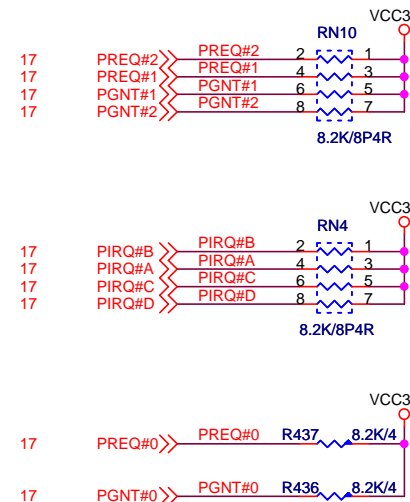
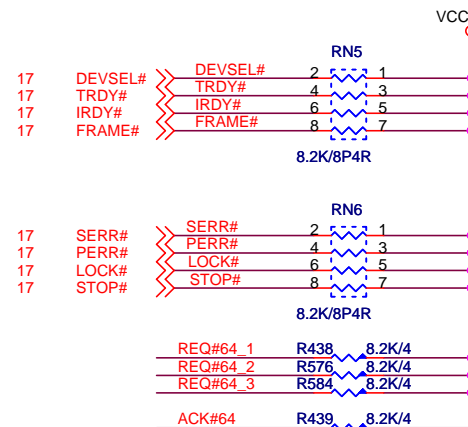
IDSEL = AD16
MASTER = PREQ#0
PIRQ#A

AD[31..0] <<> AD[31..0] 17
 C_BE#[3..0] <<> C_BE#[3..0] 17



IDSEL = AD17
MASTER = PREQ#1
PIRQ#B

PCI PULL-UP / DOWN RESISTORS



IDSEL = AD18
MASTER = PREQ#2
PIRQ#C

PCI slot (X3)

+3.3Vaux (wake) - 1125mA
+3.3Vaux (no wake) - 60mA

+3.3V - 7.6A

+5V - 15A

+12V - 1.5A

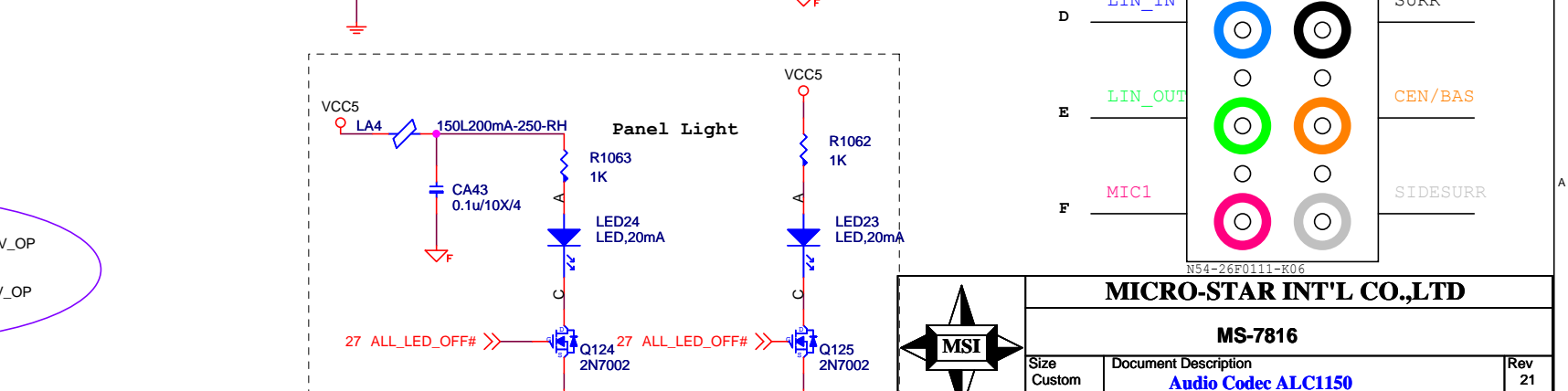
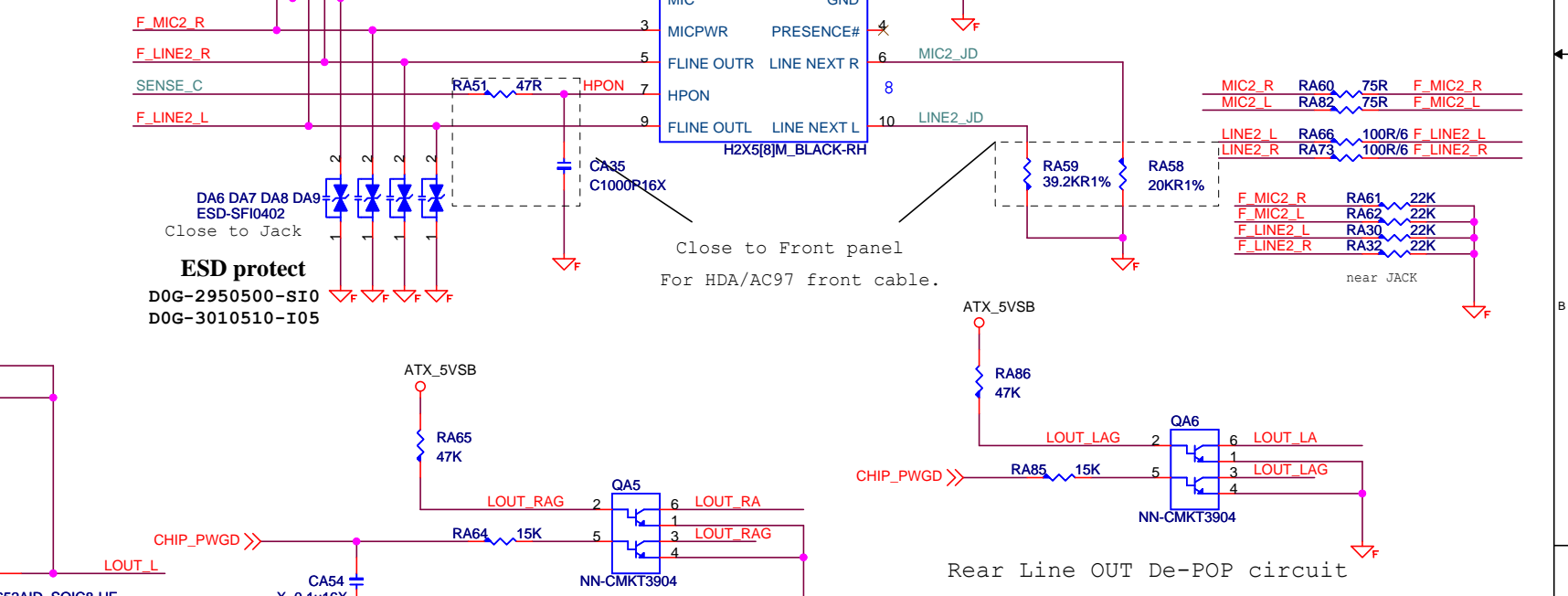
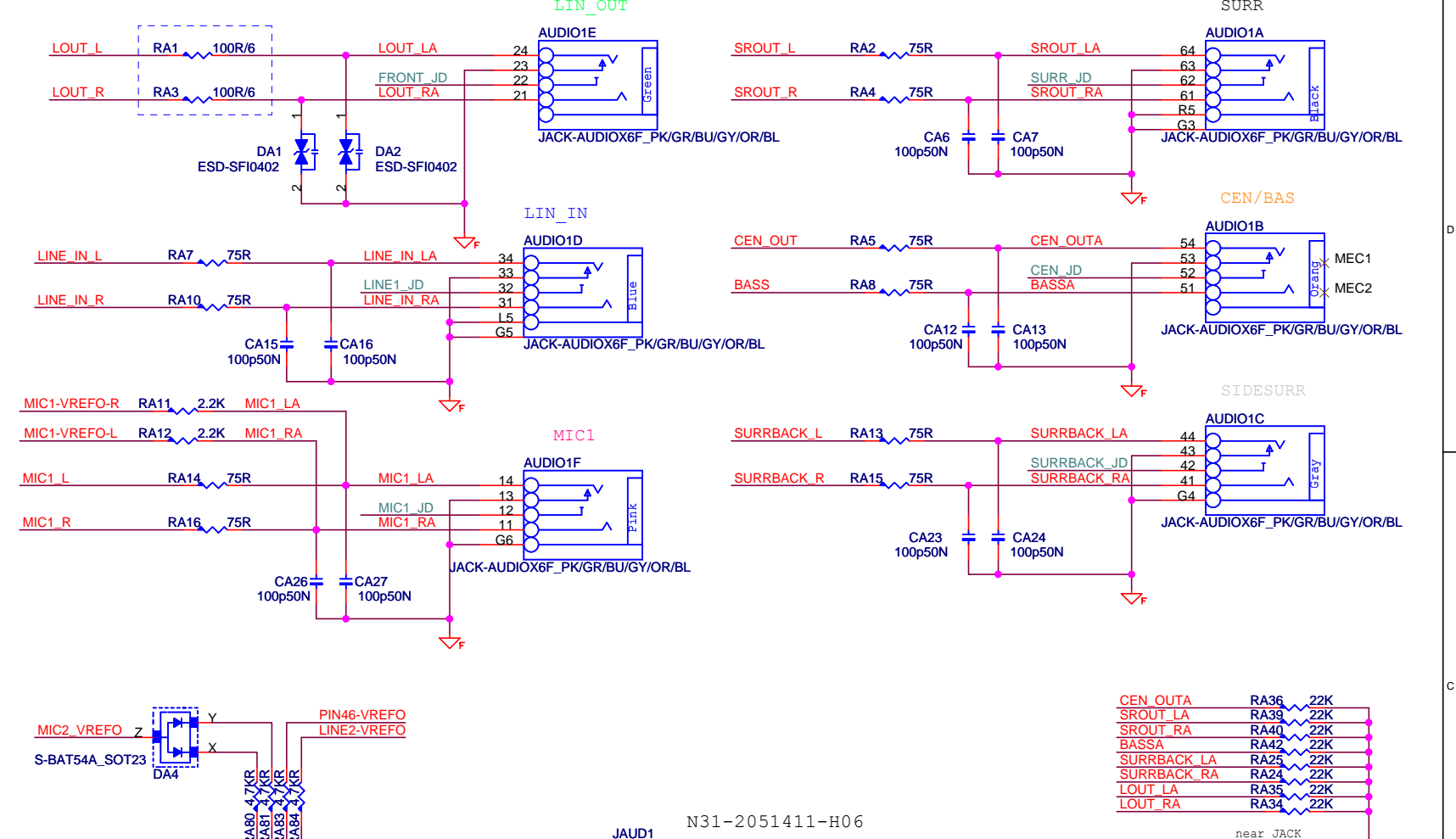
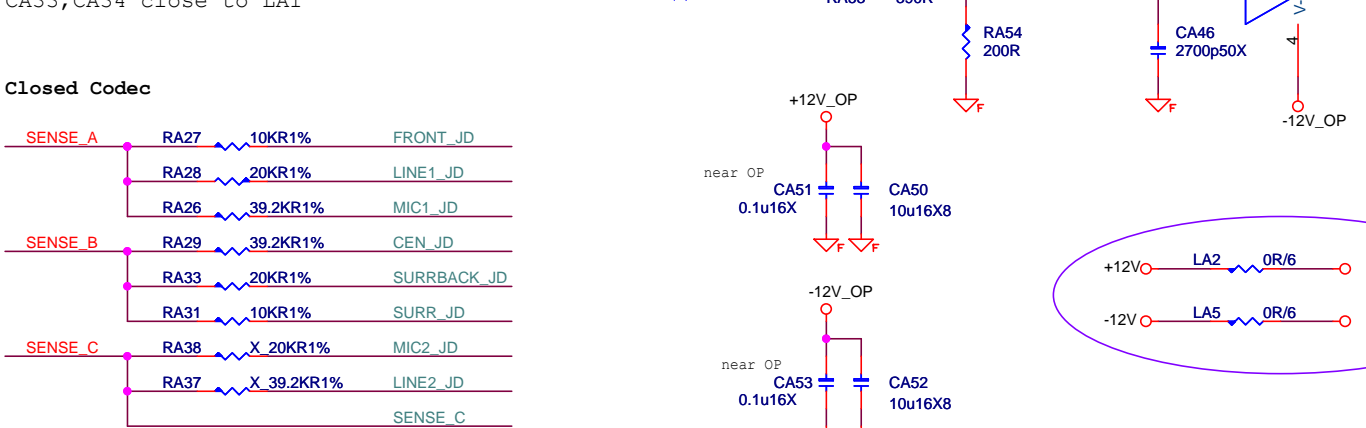
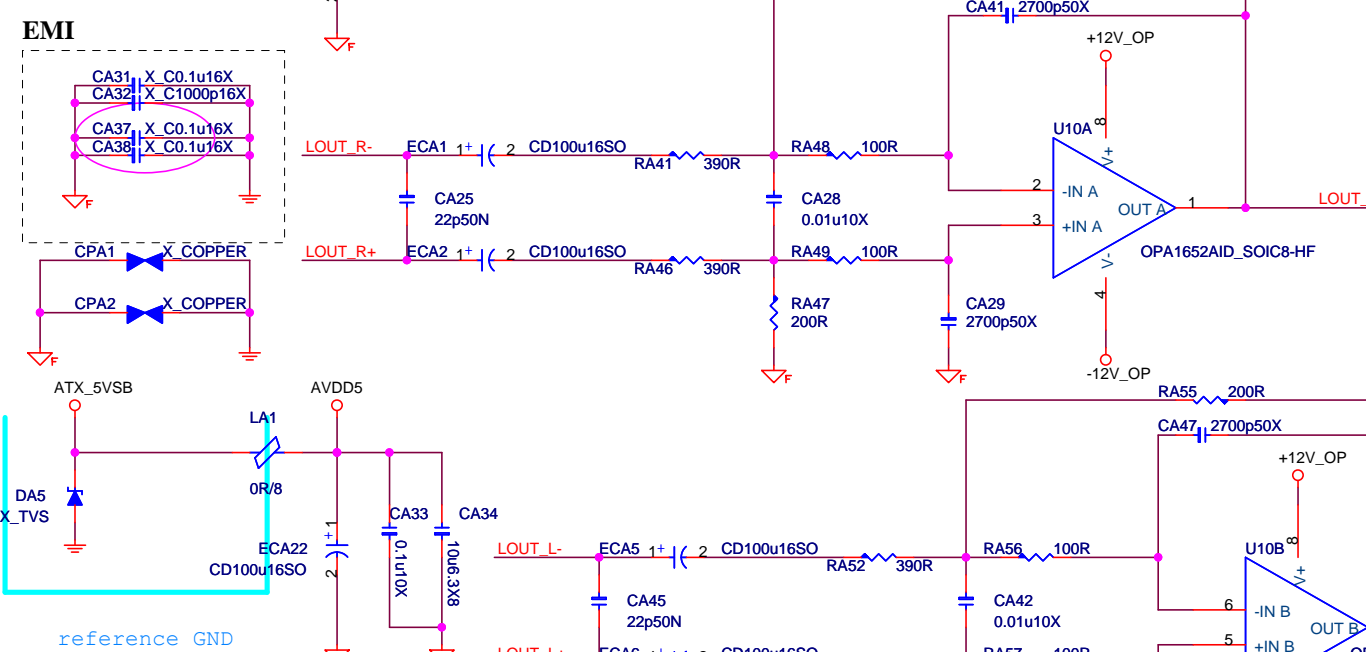
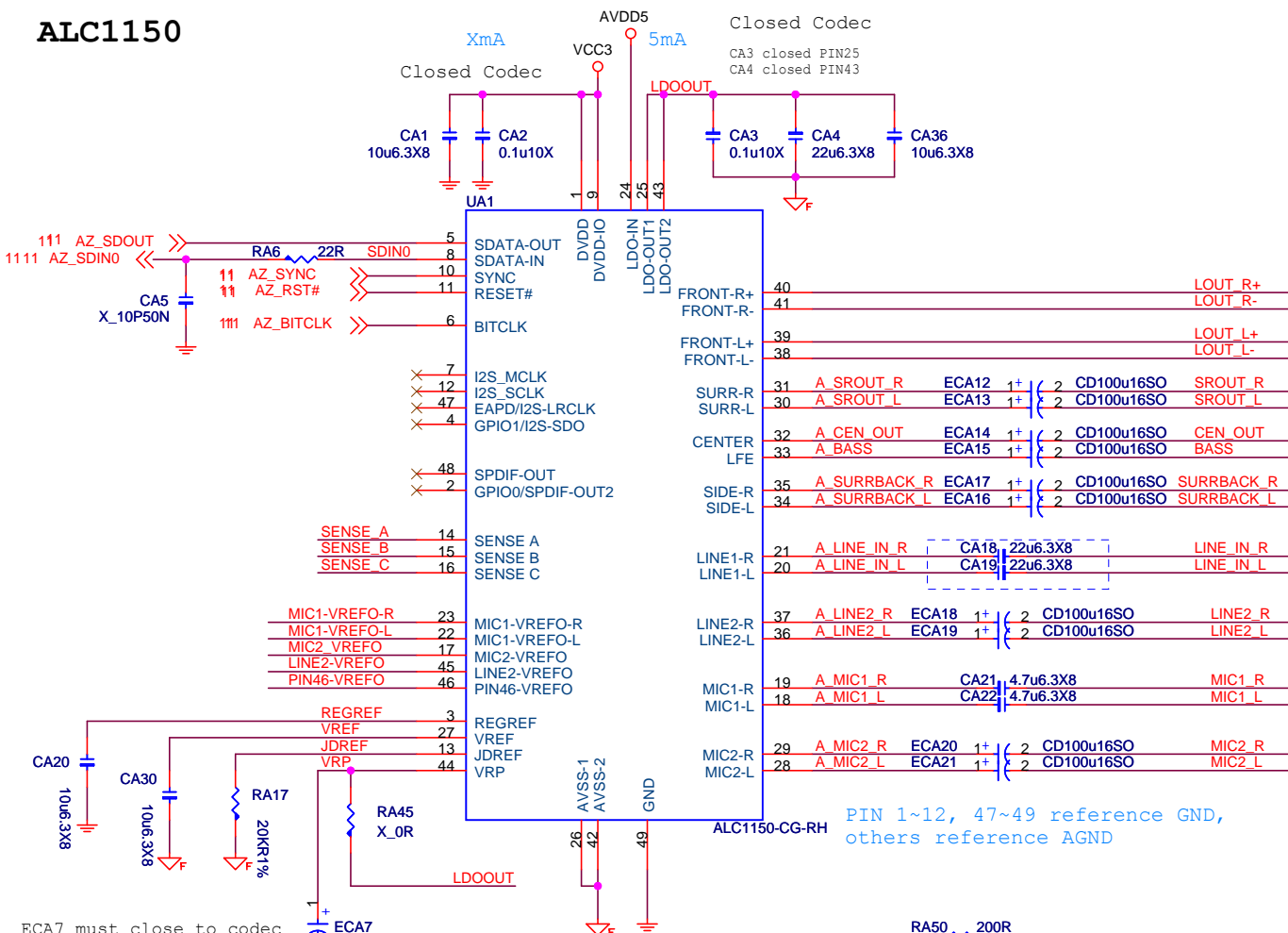


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Size	Document Description	Rev
Custom	PCIx1 Slots	21
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ALC1150



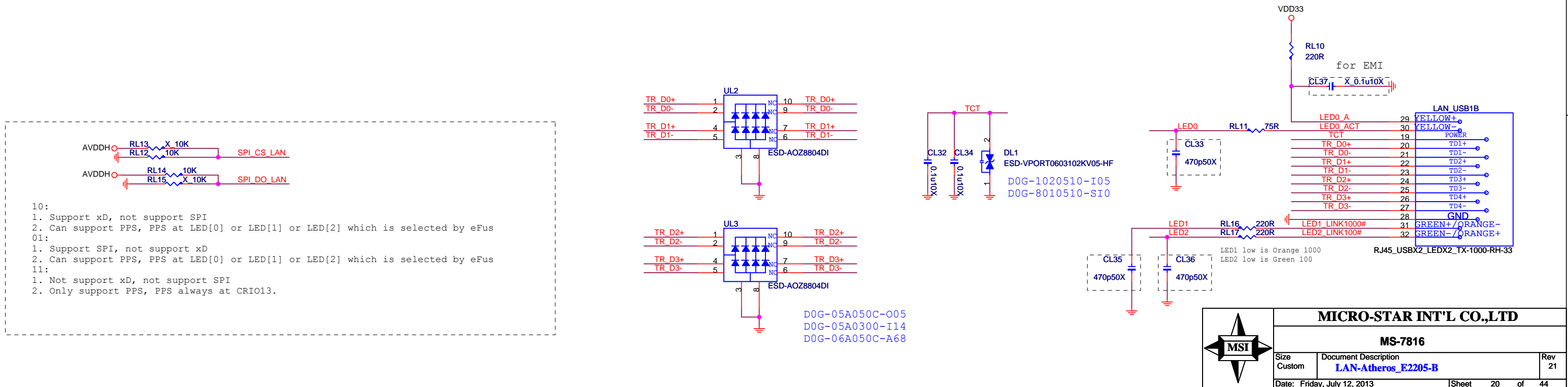
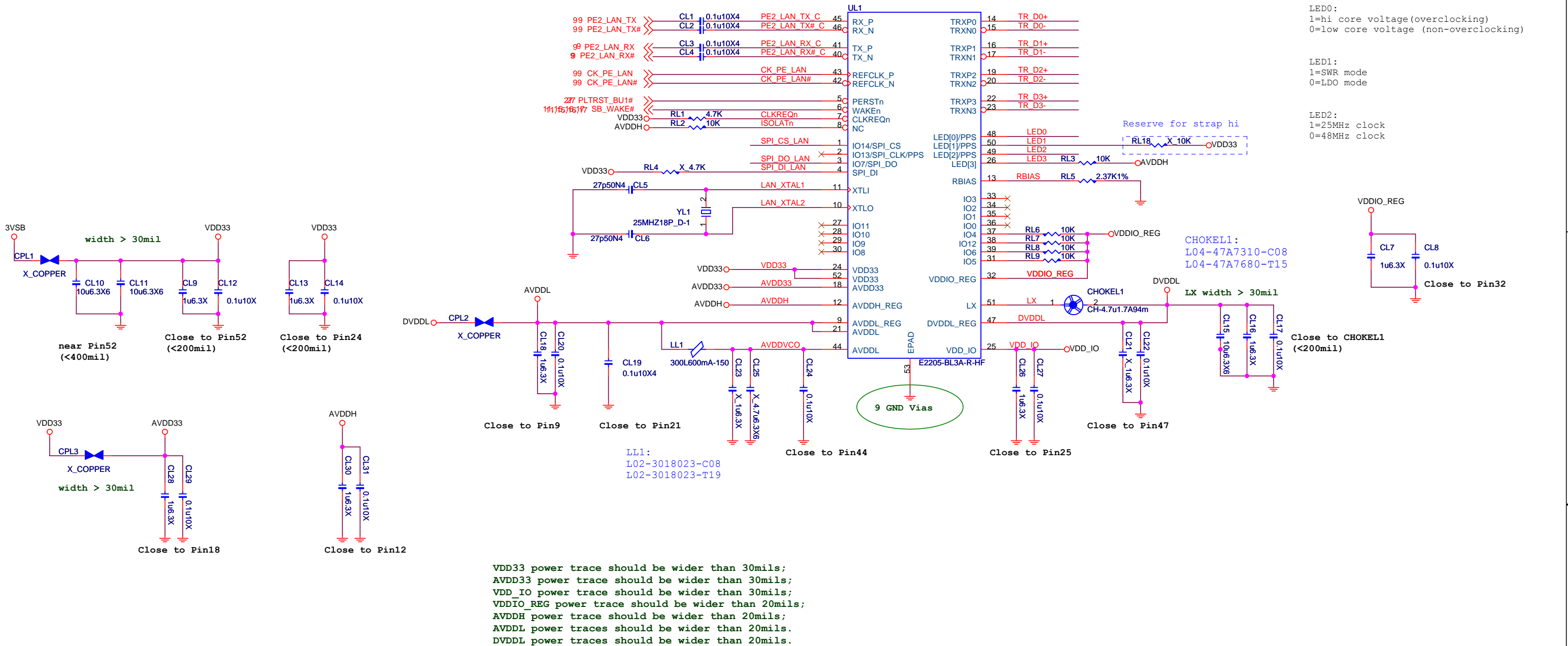
MICRO-STAR INT'L CO.,LTD

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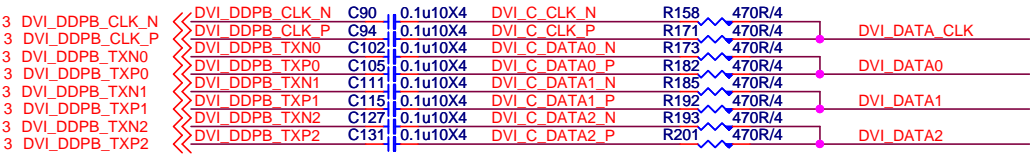
Size: Custom Document Description: **Audio Codec ALC1150** Rev: 21

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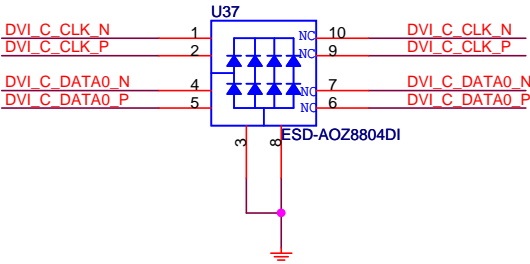
E2205-B Giga LAN



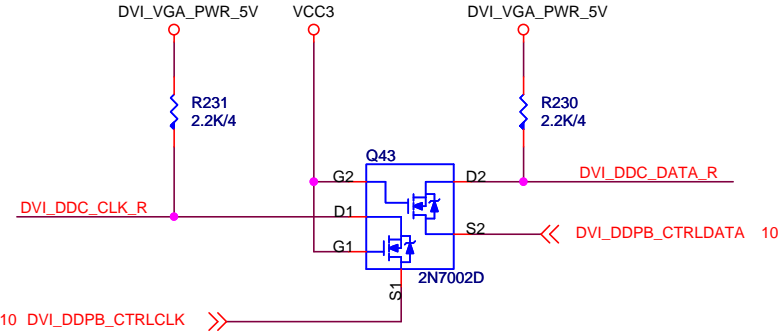
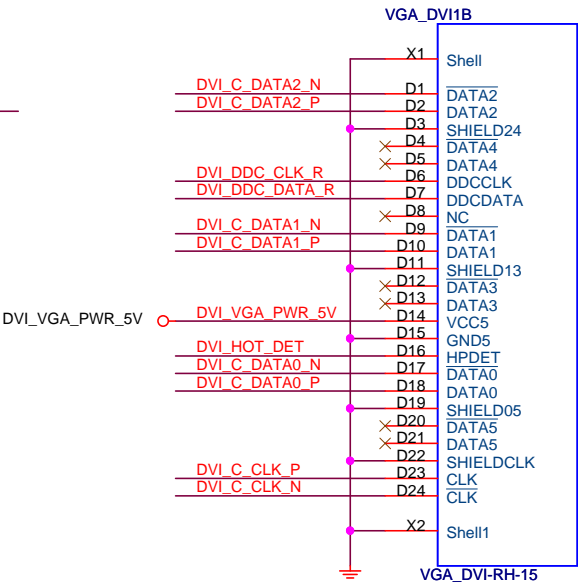
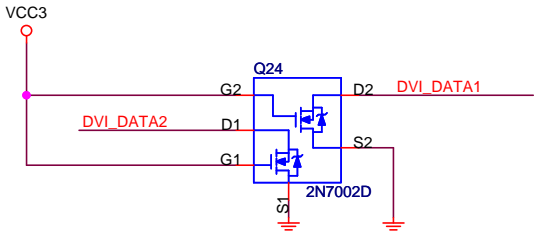
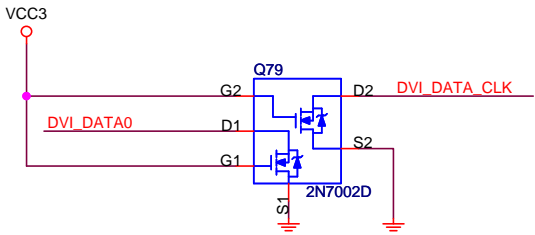
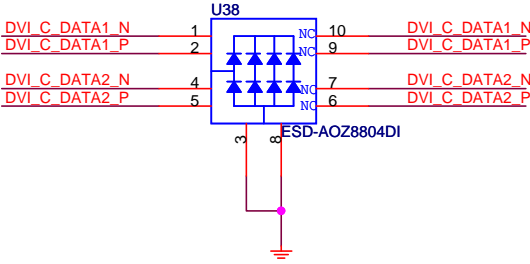
VGA: resolution of 2048x1536 pixels with 32-bit color at 75 Hz (4:3 QXGA)



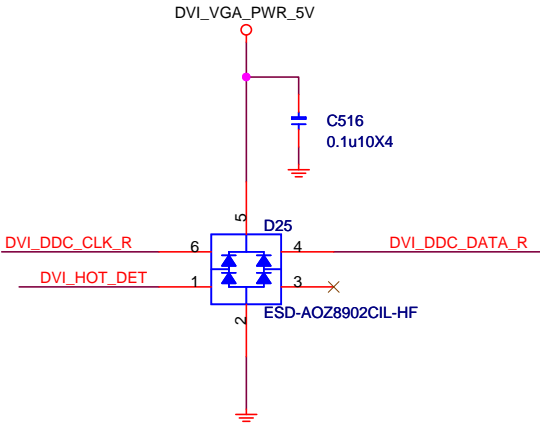
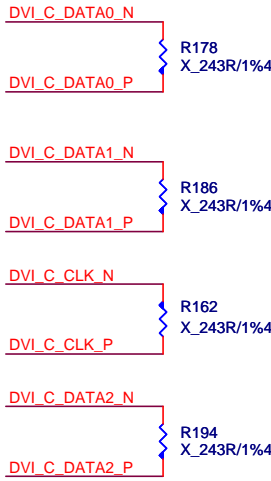
U26 AVL:D0G-05A050C-O05
D0G-06A050C-A68



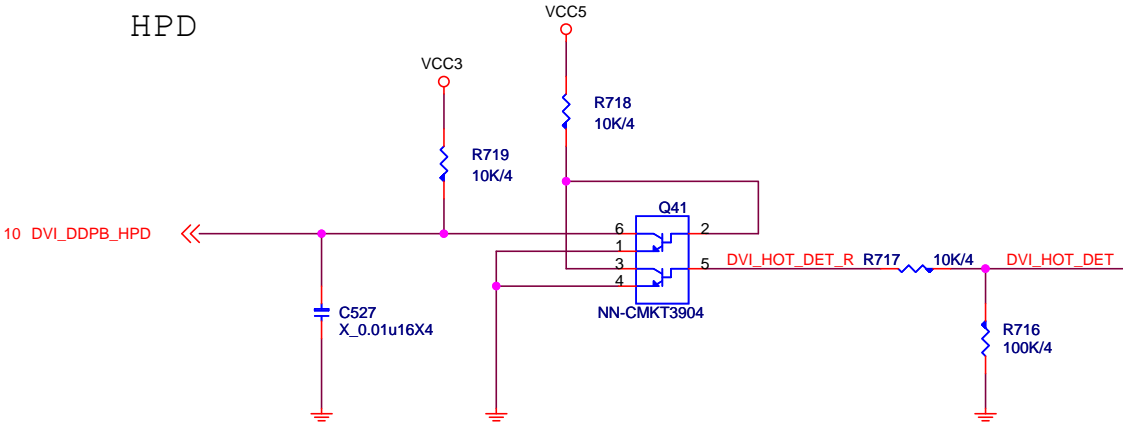
U27 AVL:D0G-05A050C-O05
D0G-06A050C-A68



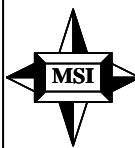
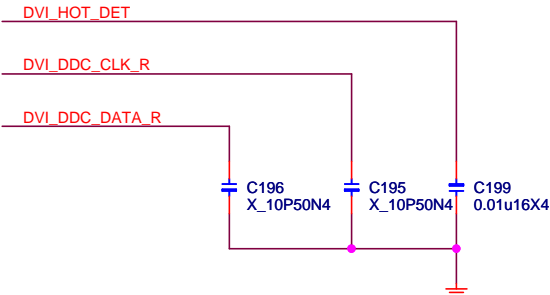
For EMI



HPD



EMI



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Size
Custom

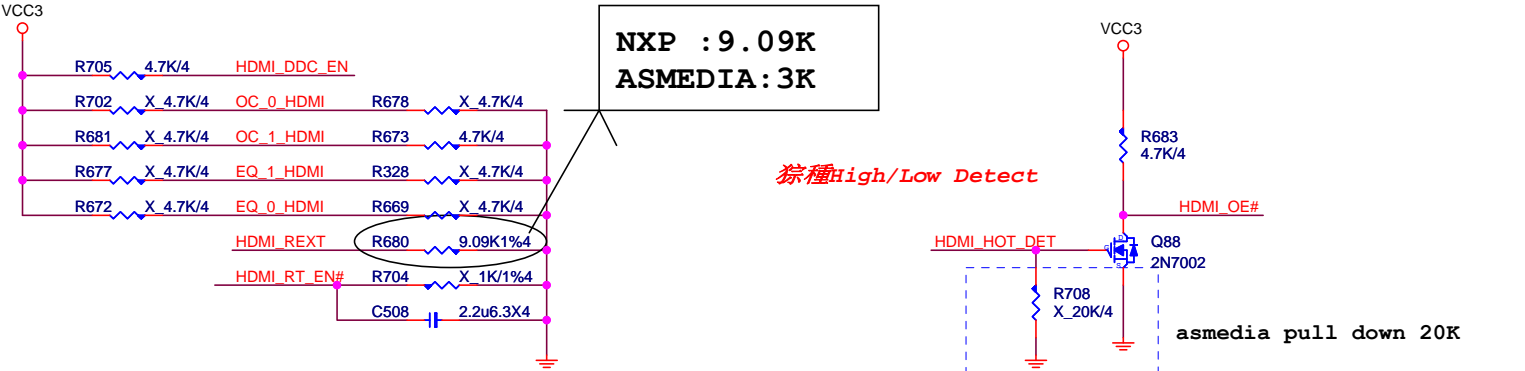
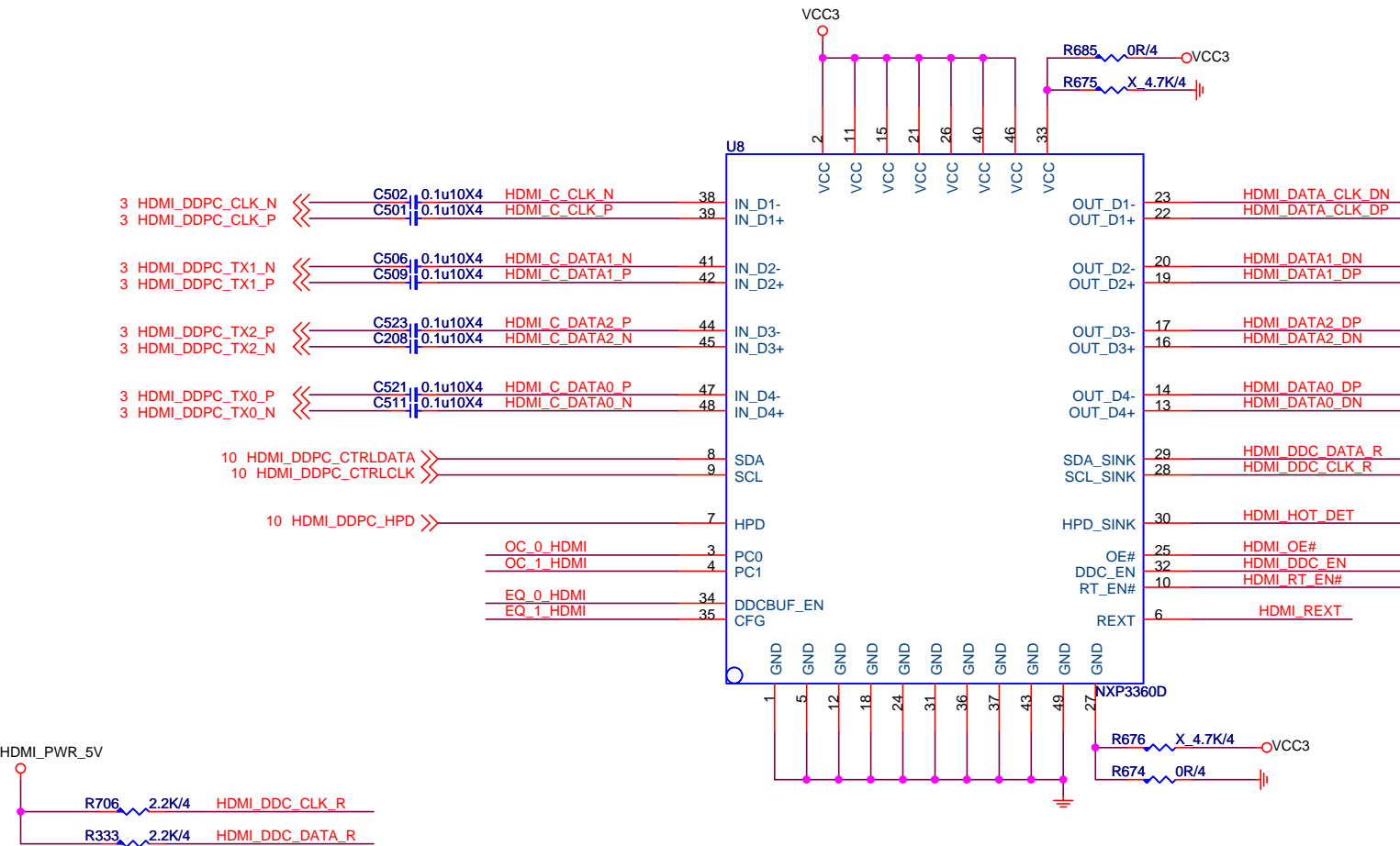
Document Description
DVI Connector

Rev
21

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HDMI level shifter



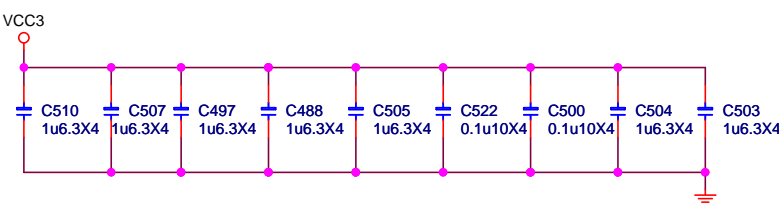
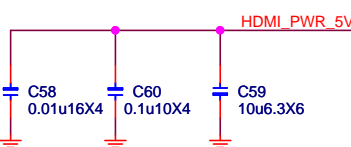
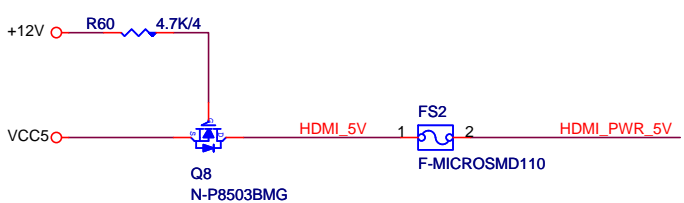
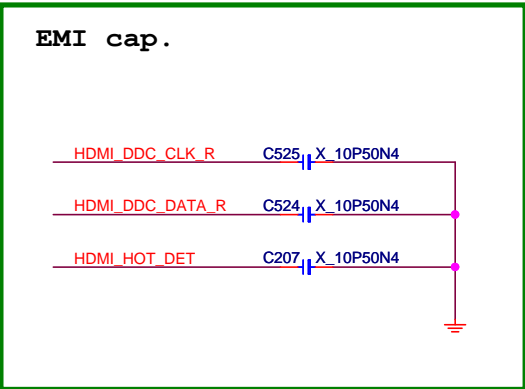
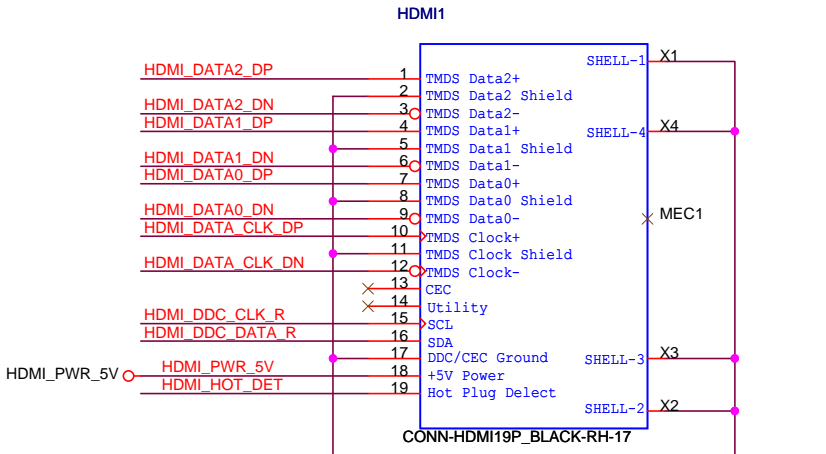
	"0"	"1"
DDC_EN	DDC level shifter disable	DDC level shifter enable
RT_EN#	Input 50 ohm termination resistor enable	the input termination ; resistors are set to high impedances
OE#	enable	the chip is power down and input termination resistors will be at high impedance.
HPD_SINK	disable	enable
DDCBUF_EN	For DDC level shifting configuration, please refer to Table.	
REXT		

[DDC_EN, DDCBUF_EN, OE#]	DDC Passive Switch	DDC Active Buffer
1, 0, X	On	Off
1, 1, 0	Off	On
1, 1, 1	Off	Off
0, X, X	Off	Off

PC1, PC0		note
00	8 dB	internal pull-down at ~500K ohm.
01	4 dB	
10	12 dB	
11	0 dB	

Table 8-1. PCH PCI Express Tx/RX - HDMI Signal Mappings

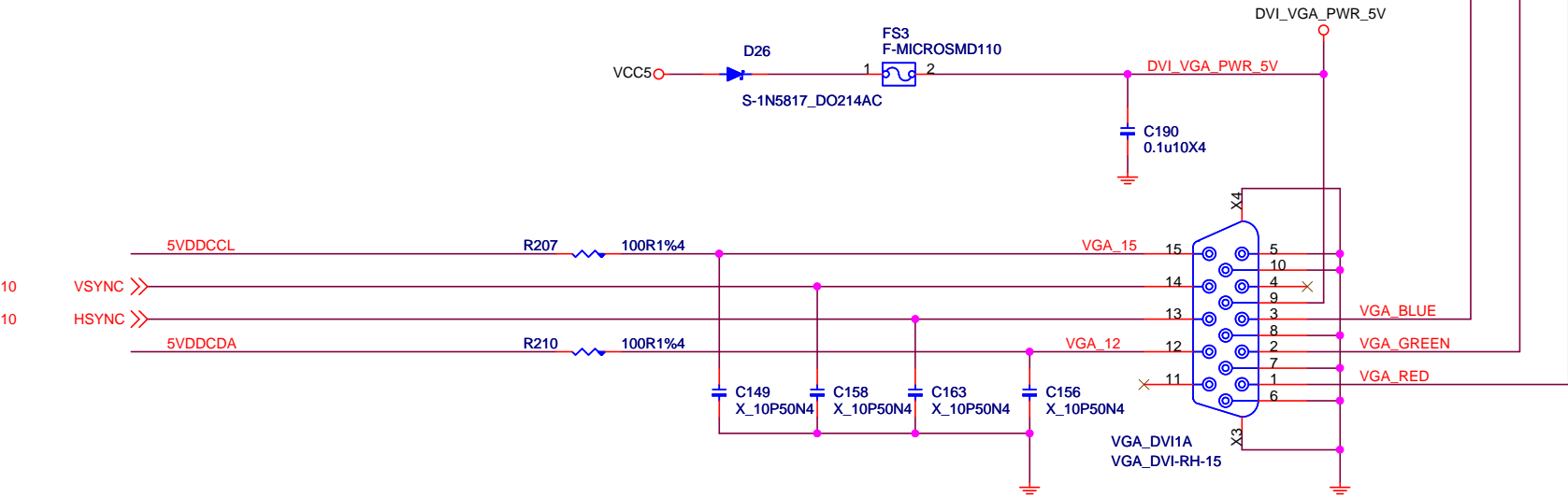
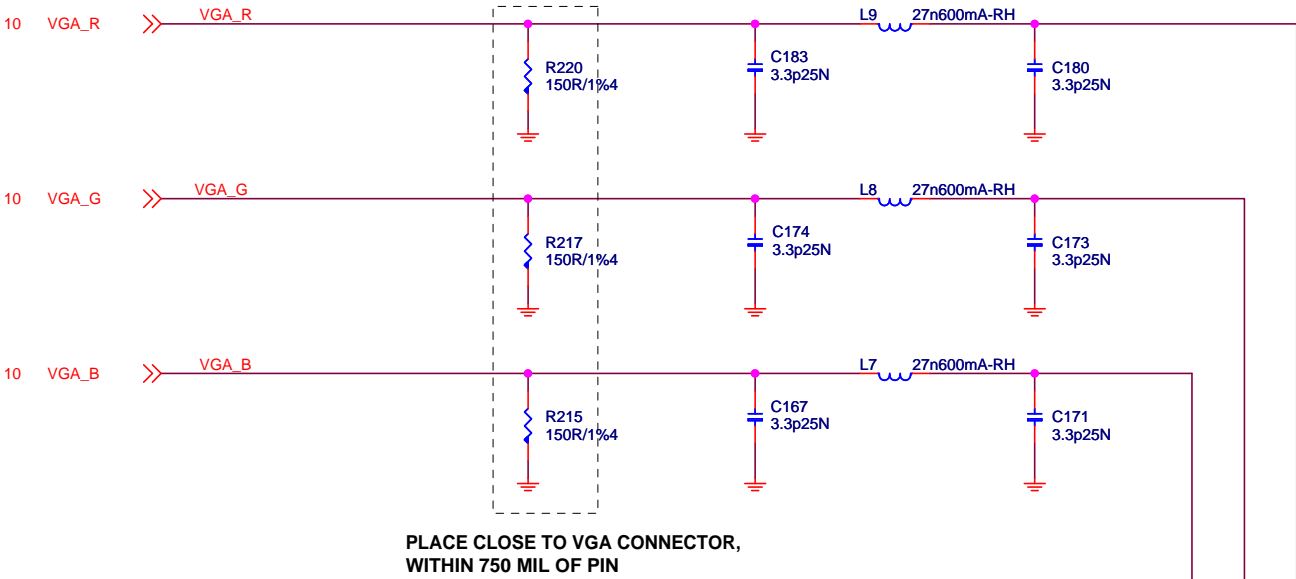
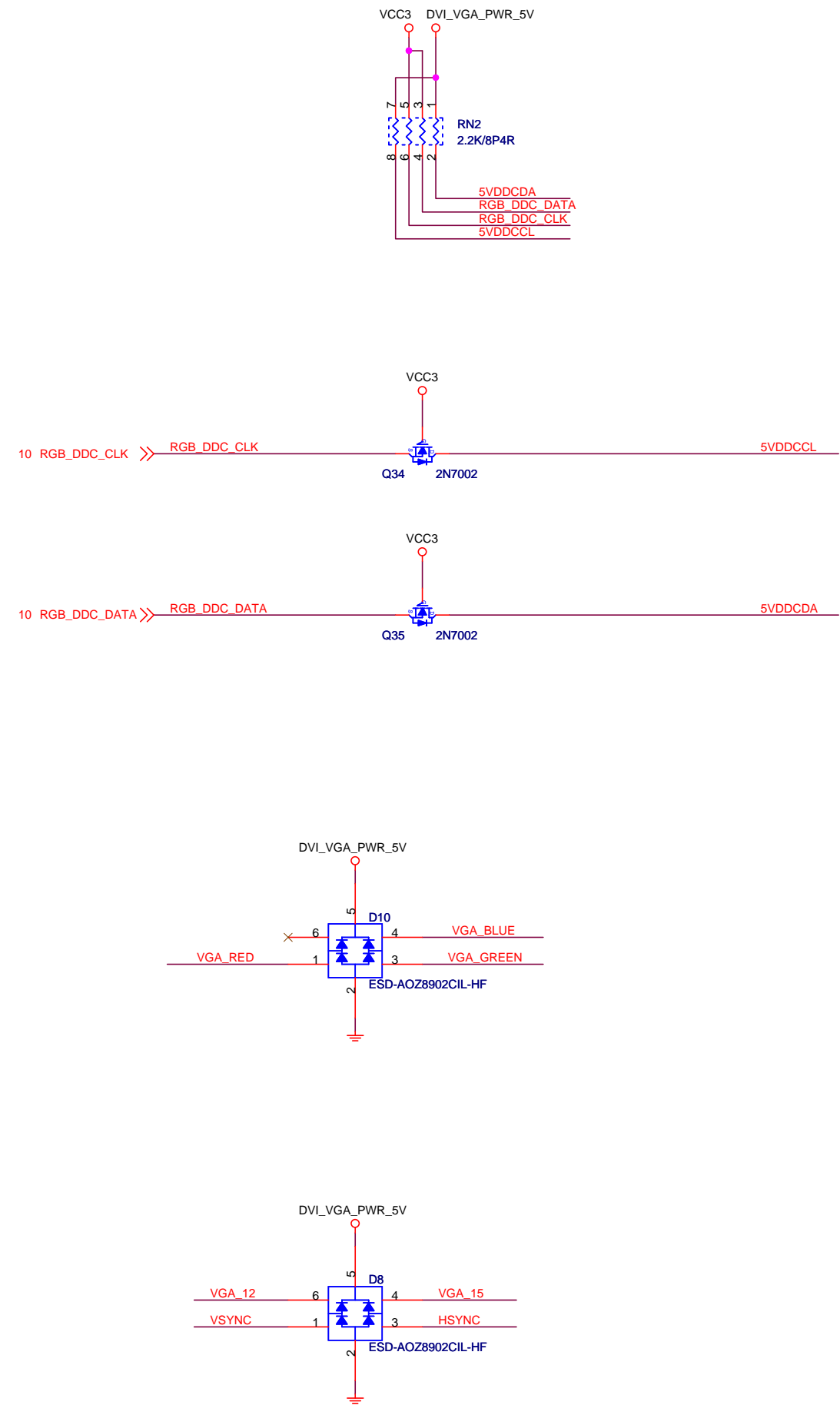
Port	Digital Display Interface Differential Pairs	HDMI Signals	PCH Digital Display Interface Pins
Port B	DDSP_B_TX0_DN	TMDSB_DATA2#	DDPB_0N
	DDSP_B_TX0_DP	TMDSB_DATA2	DDPB_0P
	DDSP_B_TX1_DN	TMDSB_DATA1#	DDPB_1N
	DDSP_B_TX1_DP	TMDSB_DATA1	DDPB_1P
	DDSP_B_TX2_DN	TMDSB_DATA0#	DDPB_2N
	DDSP_B_TX2_DP	TMDSB_DATA0	DDPB_2P
	DDSP_B_TX3_DN	TMDSB_CLK#	DDPB_3N
	DDSP_B_TX3_DP	TMDSB_CLK	DDPB_3P
	DDPB_HPD	DDSP_B_HPD0	Hot plug detect used by HDMI Port B.
	SDVO_CTRLCLK	HDMIB_CTRL_CLK	HDMI DDC lines for Port B
	SDVO_CTRLDATA	HDMIB_CTRL_DATA	



D-Sub

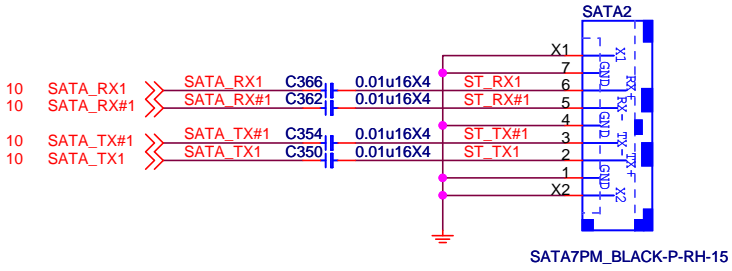
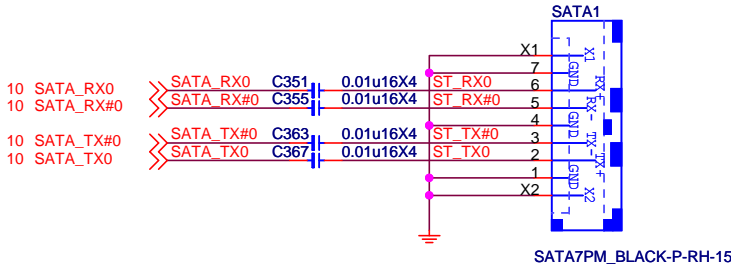
VGA: resolution of 2048x1536 pixels with 32-bit color at 75 Hz (4:3 QXGA)

Levelshift



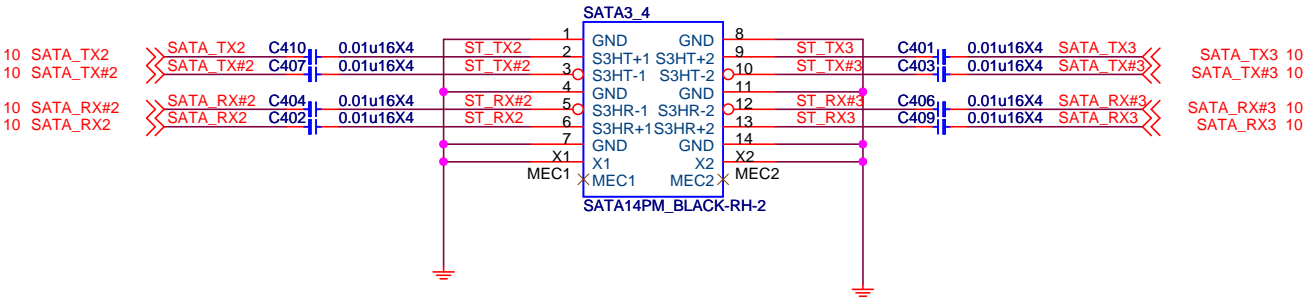
SATA 6G PORT 0,1

3.0 BLACK



SATA 3G PORT 2,3

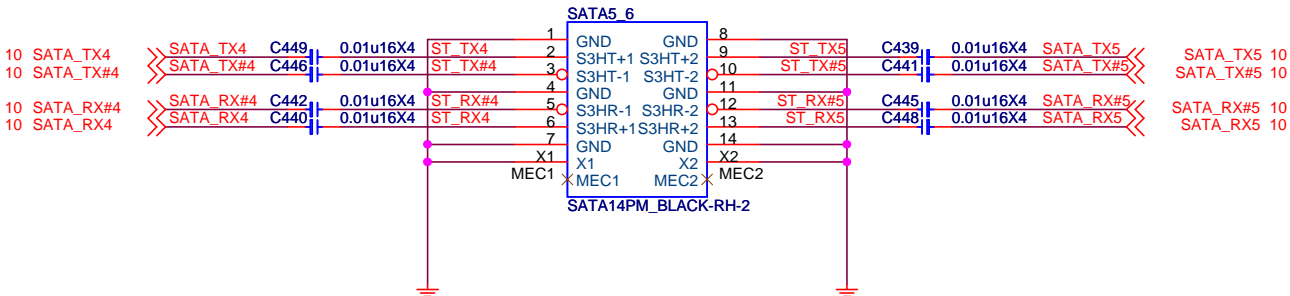
3.0 BLACK

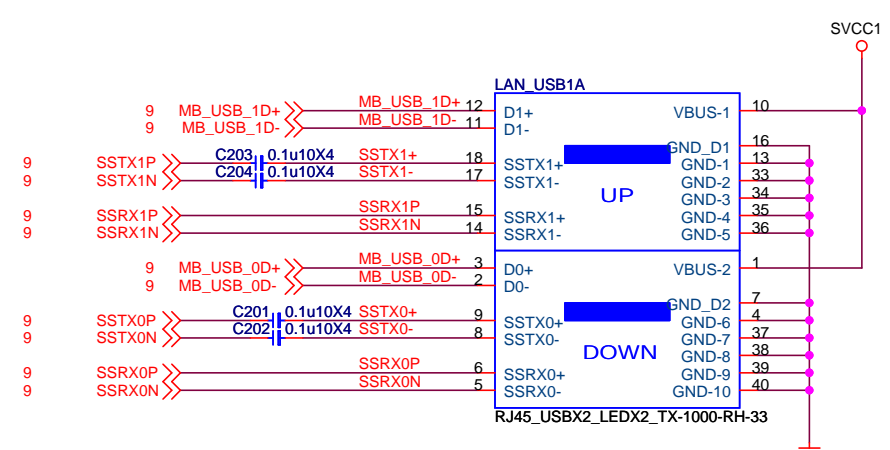
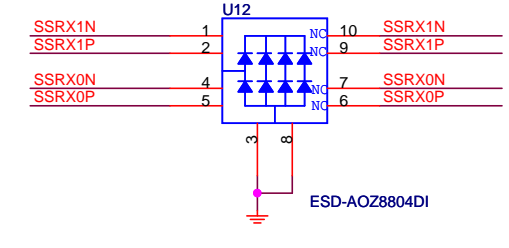
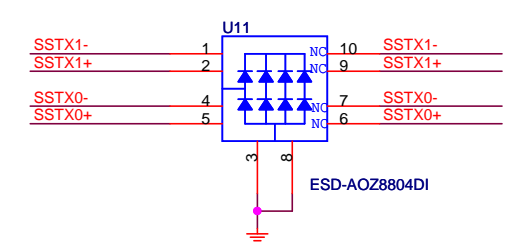
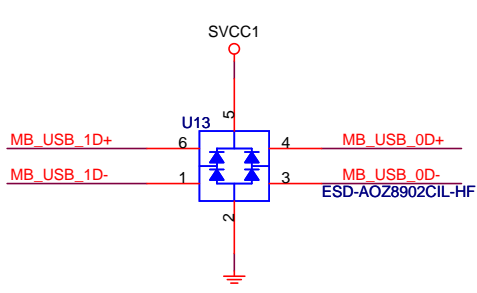
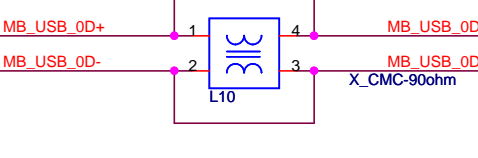
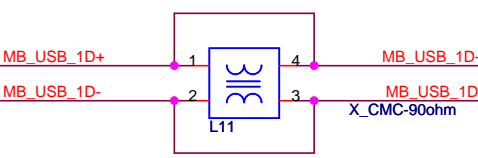
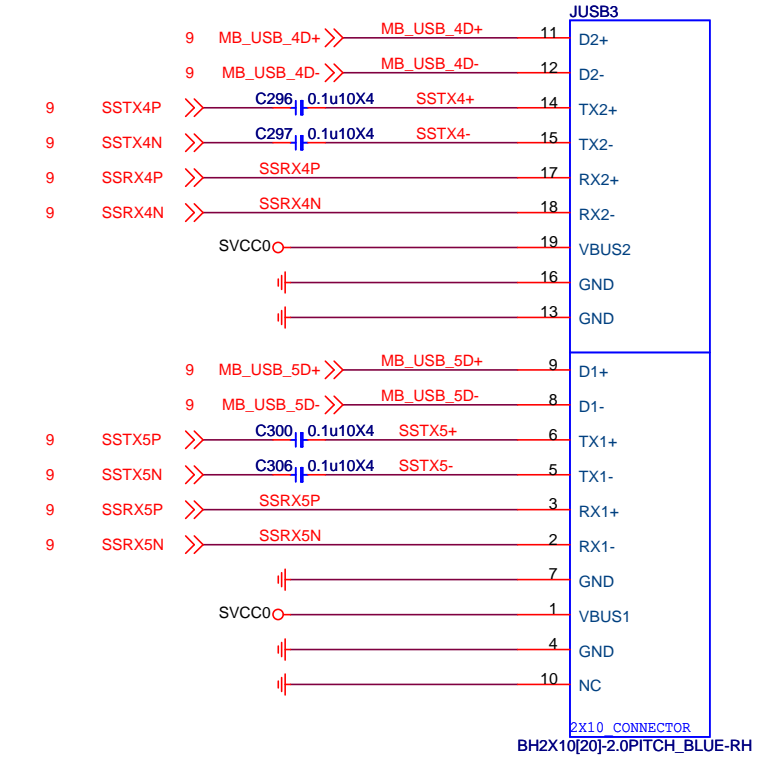
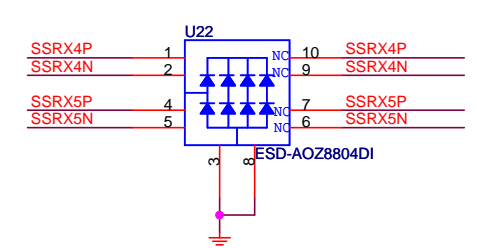
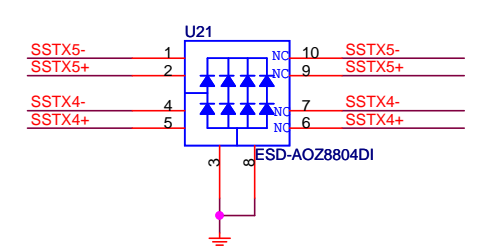
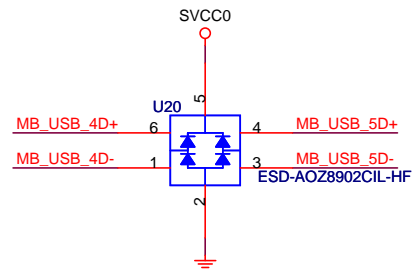
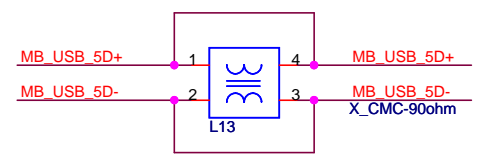
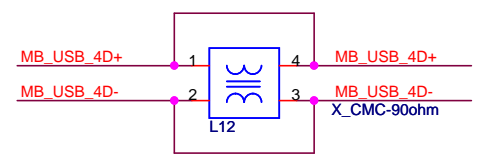


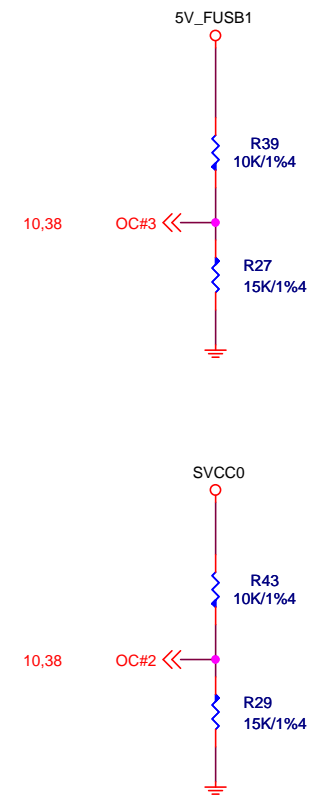
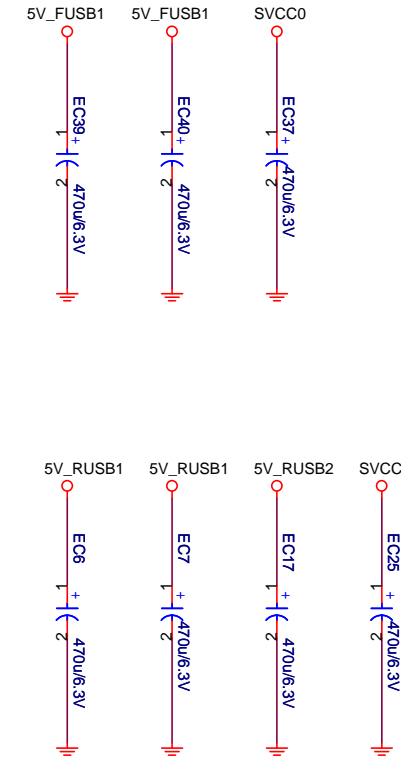
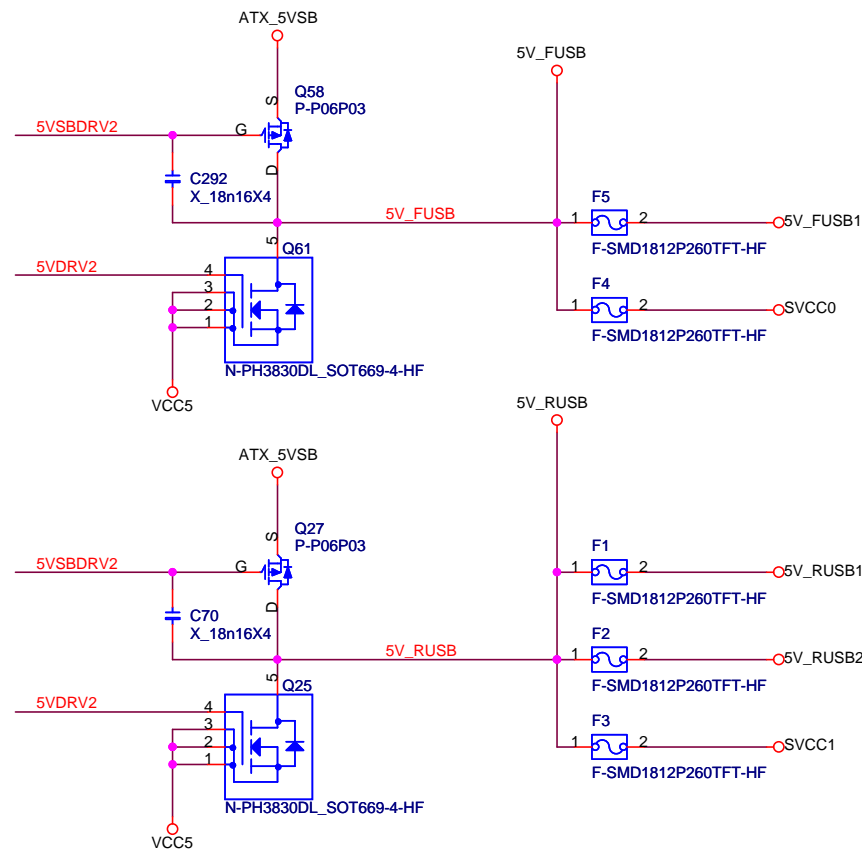
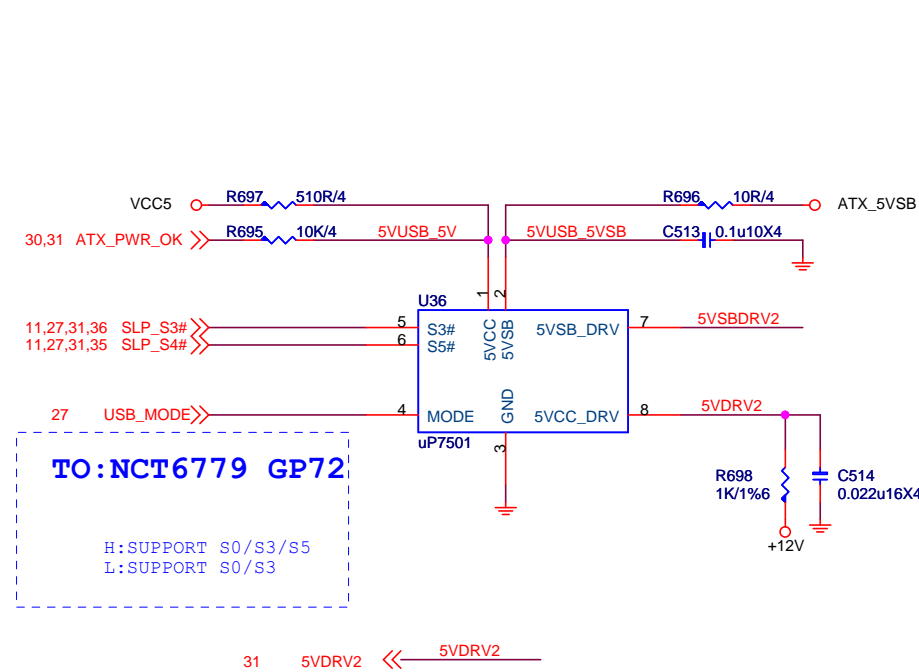
SATA 3G PORT 4,5

Z87,H87 chip support SATA3.0
B85 chip support SATA2.0

3.0 BLACK

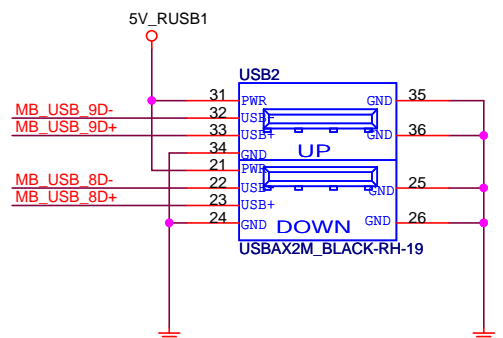
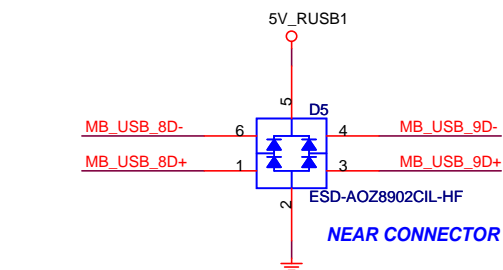
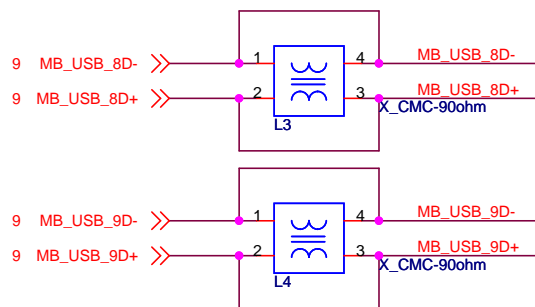




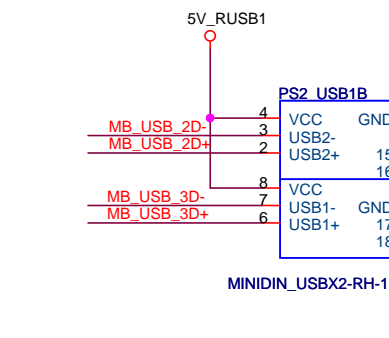
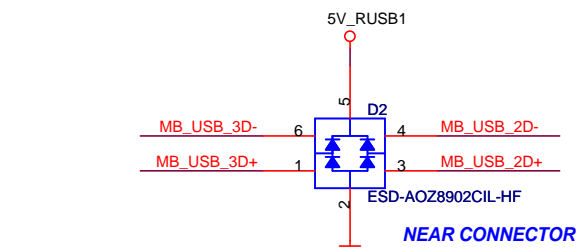
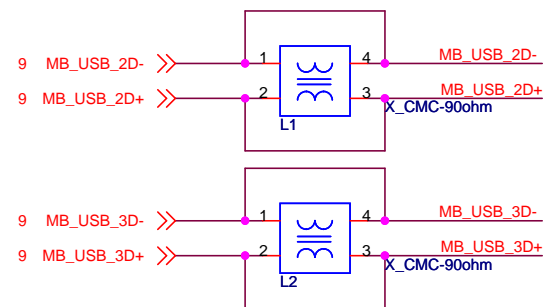


5VDRV1, 5VSBDRV1 width 12mil
D08-0300700-P16 (Itrip=2.6A; 0.015ohm) support 2 USB ports

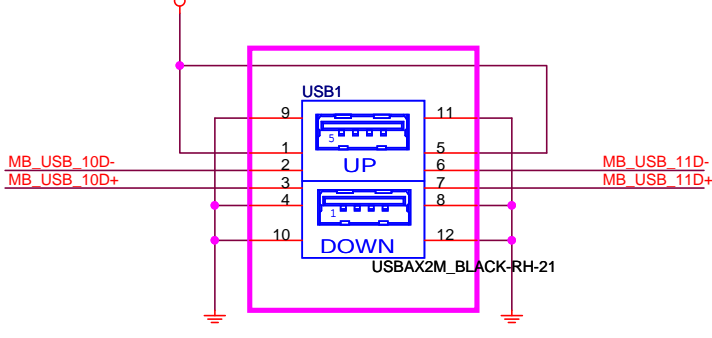
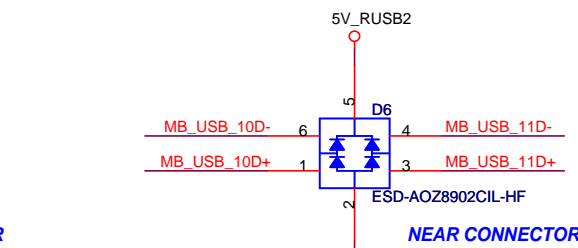
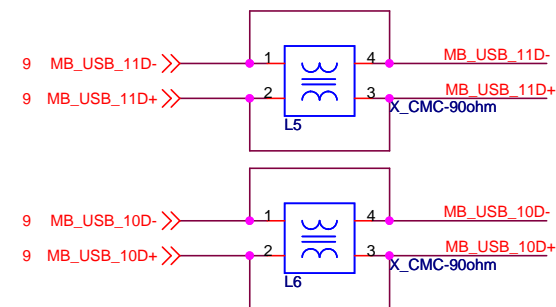
REAR USB PORT 2,3



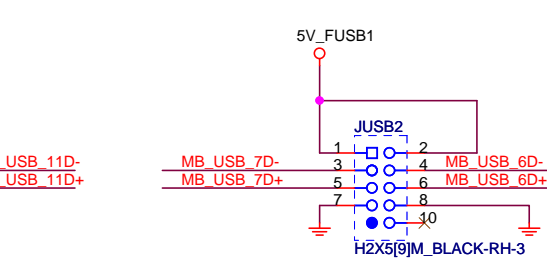
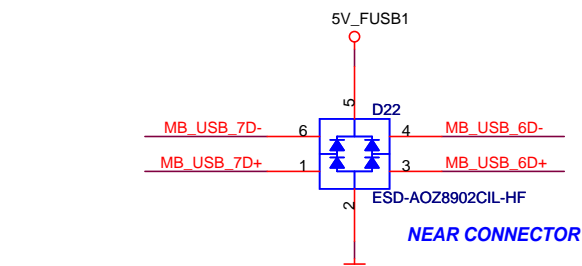
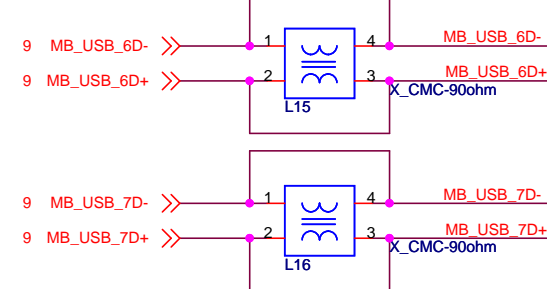
REAR USB PORT 8,9 (With PS2)



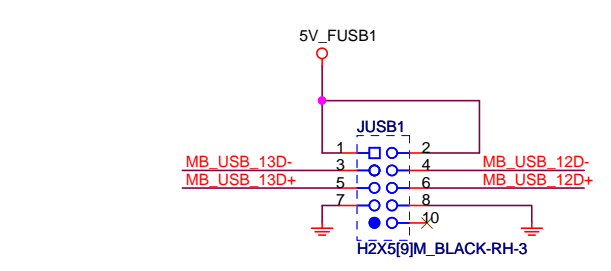
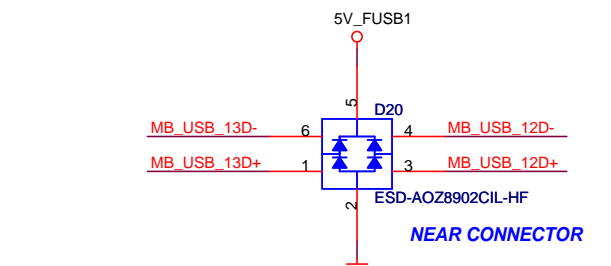
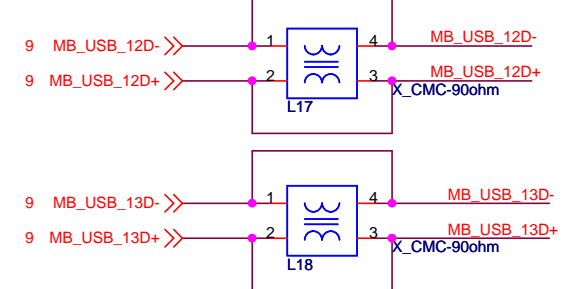
FRONT USB PORT 10,11 (With LAN)



FRONT USB PORT 6,7



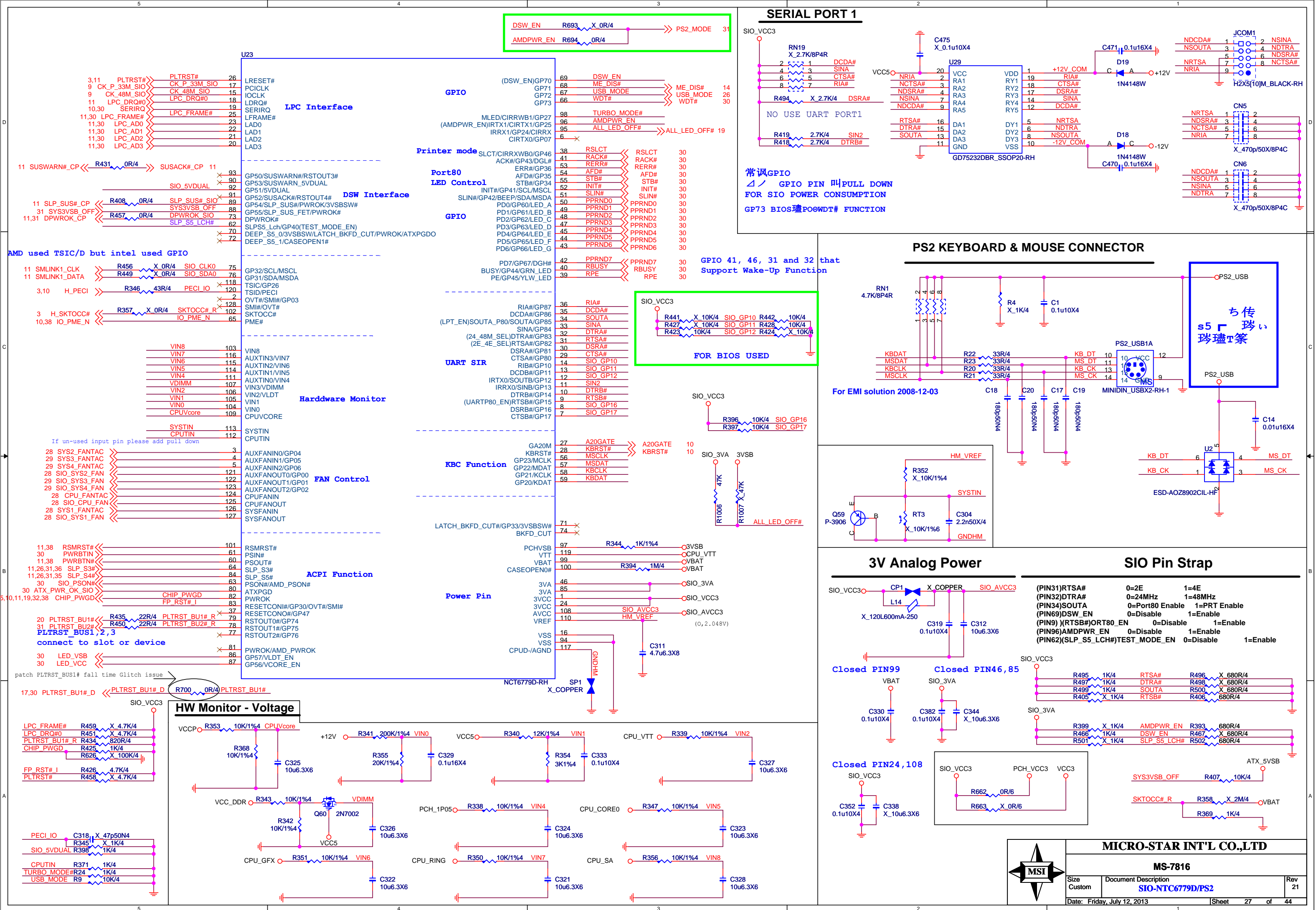
FRONT USB PORT 12,13



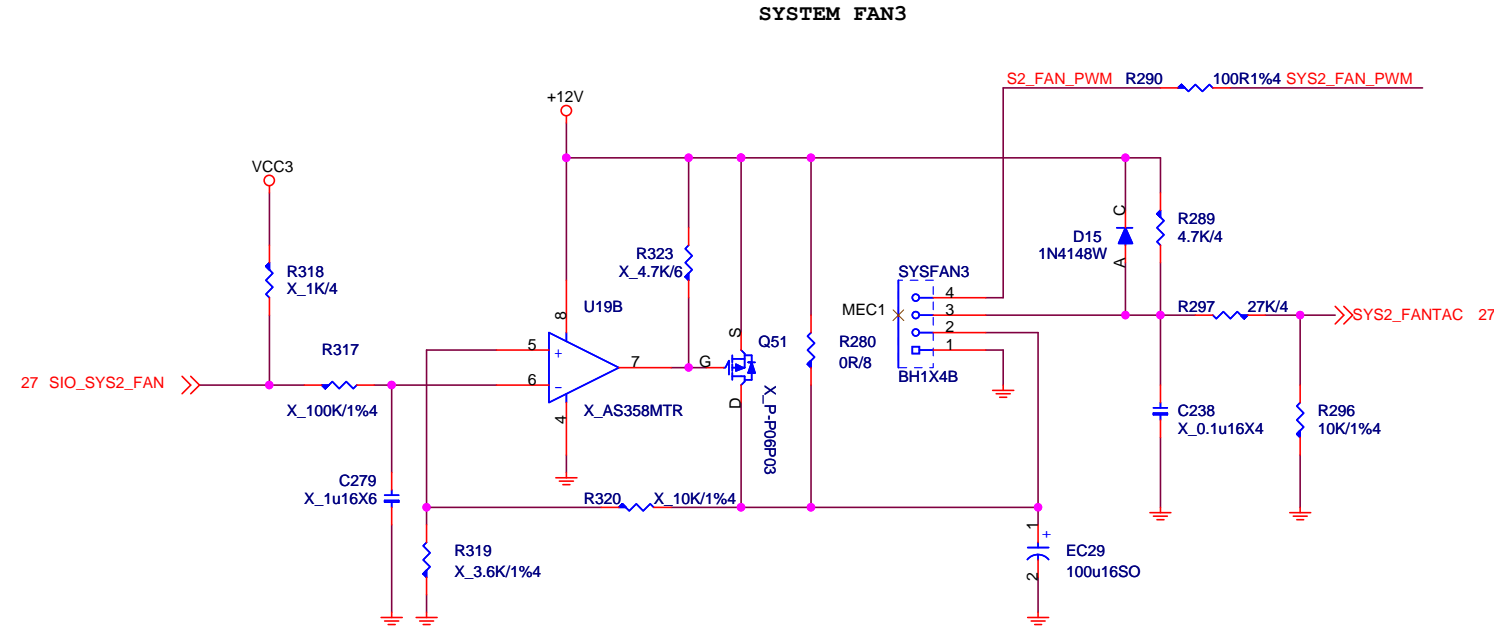
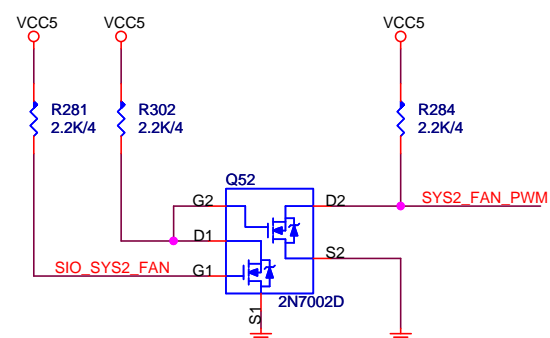
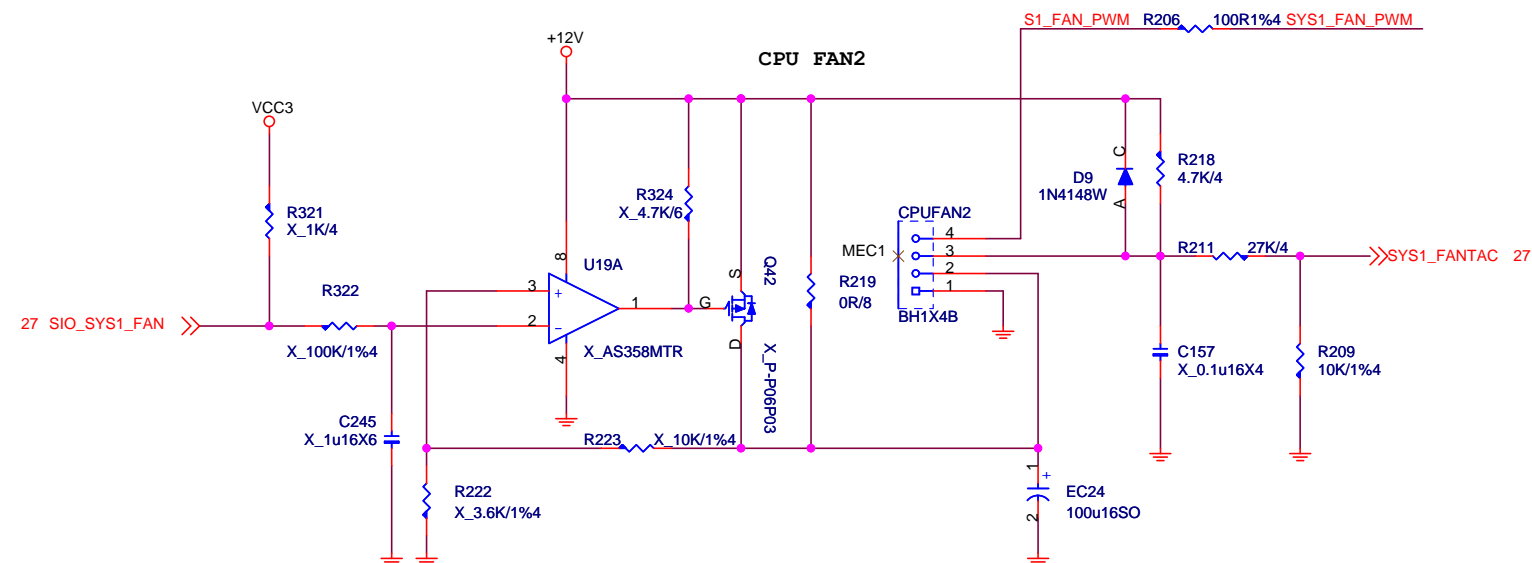
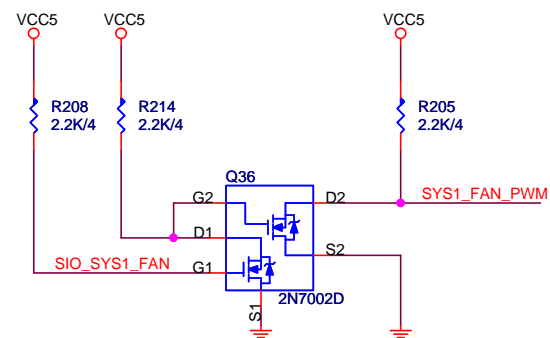
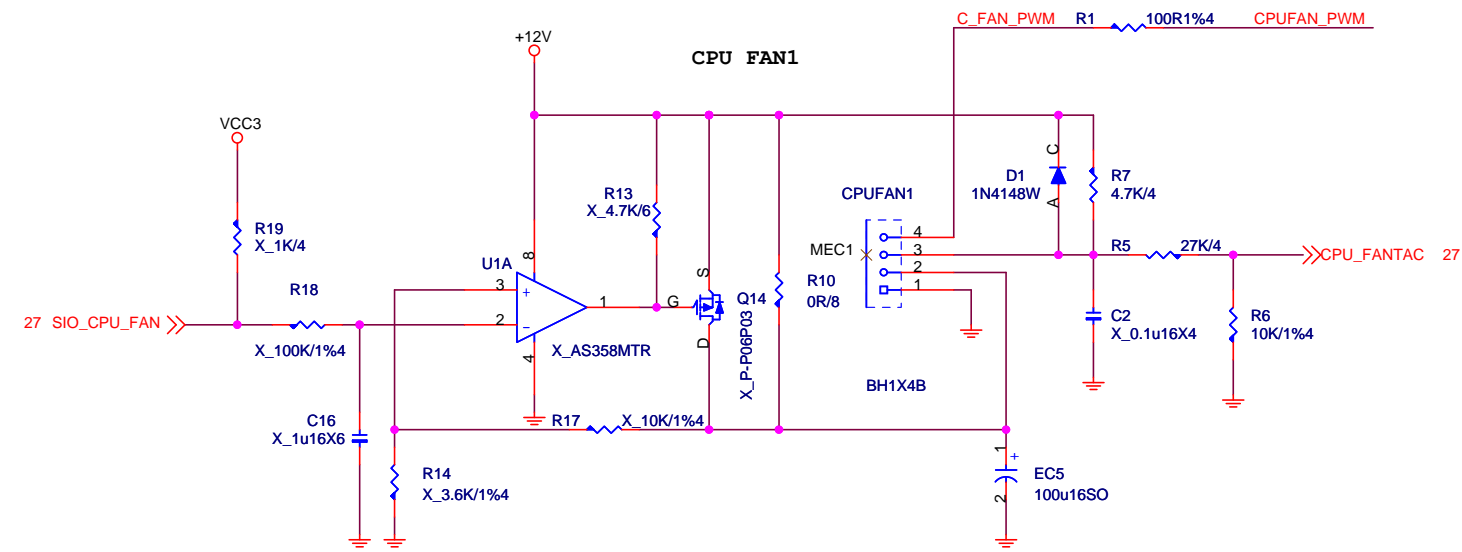
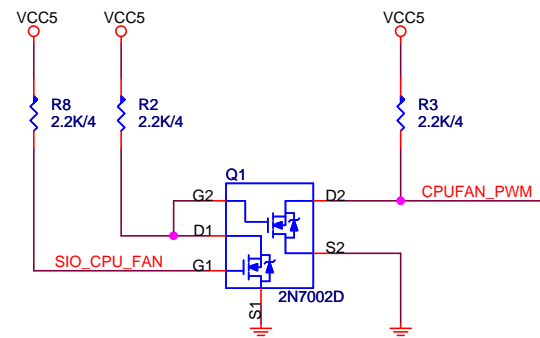
MICRO-STAR INT'L CO.,LTD

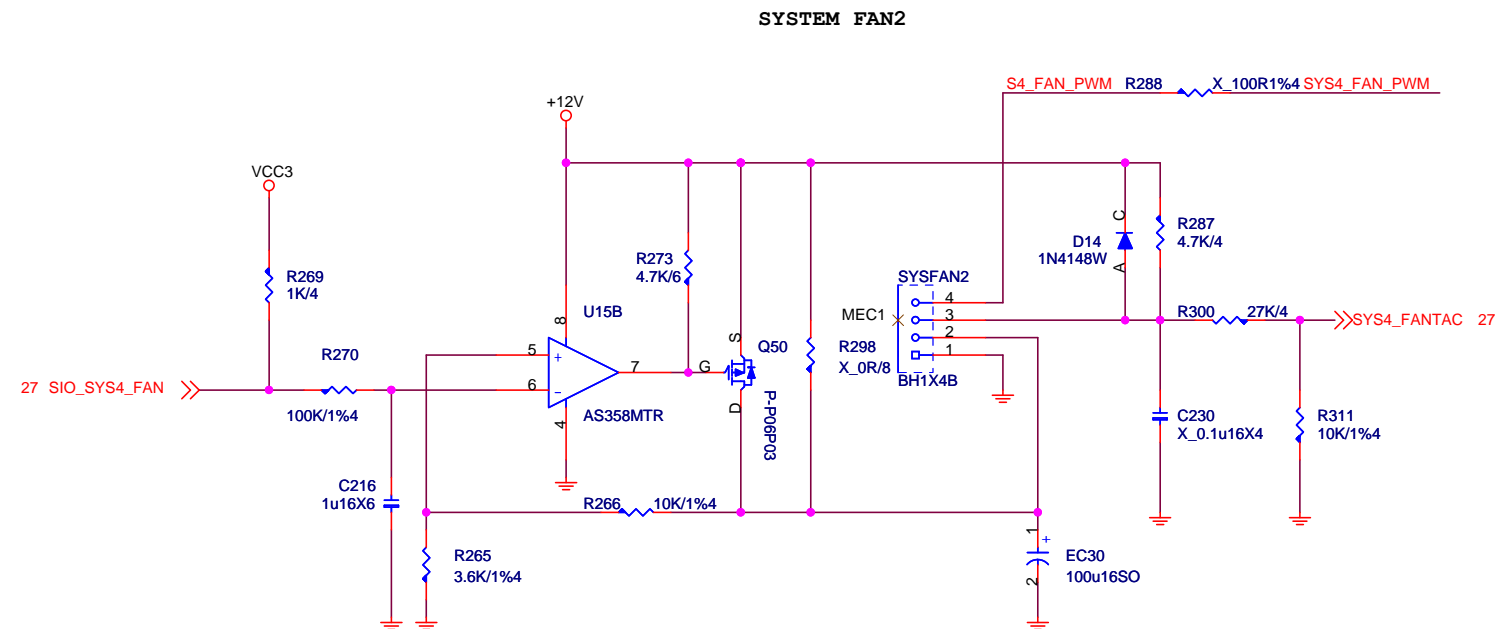
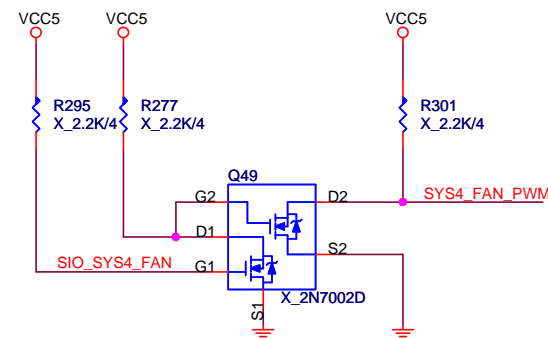
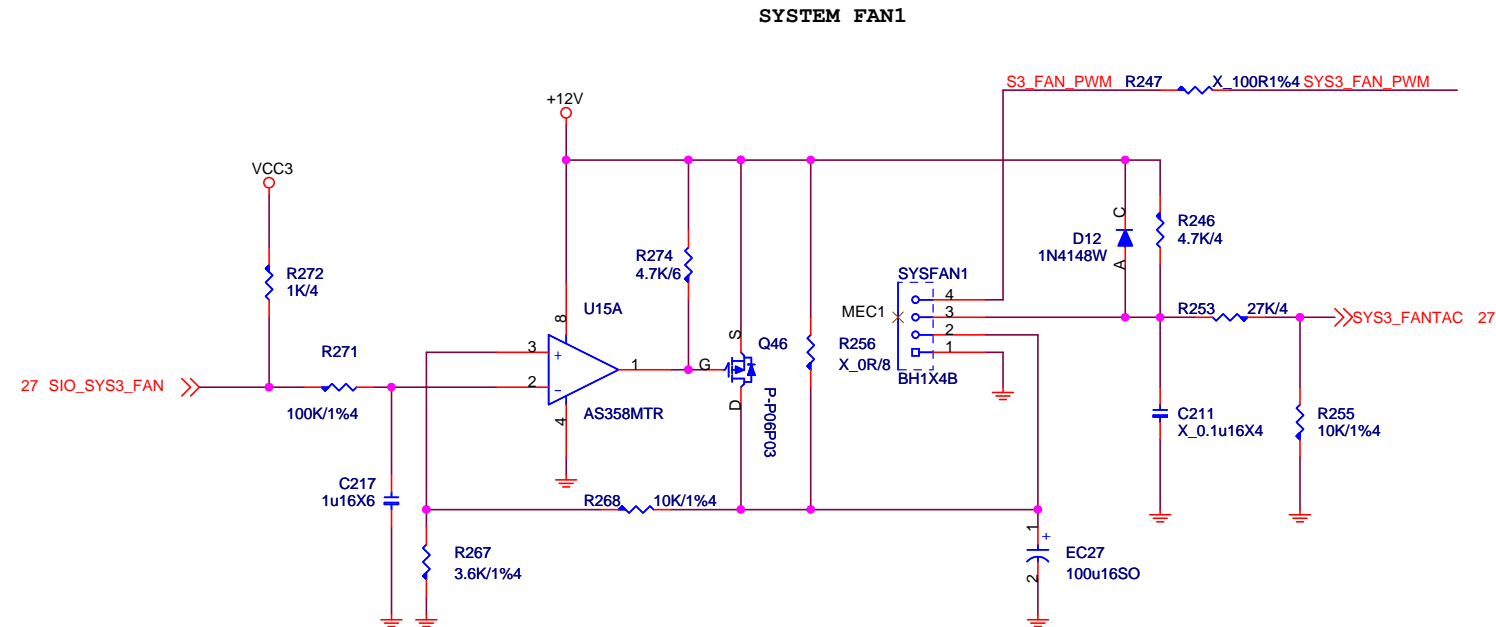
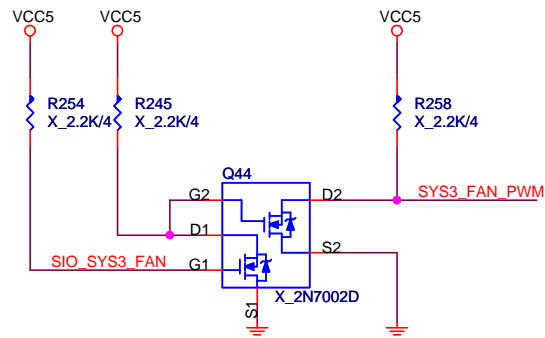
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Size	Document Description	Rev
Custom	Rear I/O & USB2.0 Connector	21
Date: Friday, July 12, 2013	Sheet 26 of 44	



FAN-COUNTROL CIRCUIT





ATX POWER CONNECTOR

ATX POWER CONNECTOR

1K电阻 古200W(huntkey)power supply 拜肇, 1K电阻 い ATX_V5VSB 更: 玻ネ綺历

TPM

9 TPM_CLK >> TPM_CLK 1 JTPM1 2 3VSB

17,27 PLTRST_BU1#_D >> PLTRST_BU1#_D 3 4 VCC3

11,27 LPC_AD0 >> LPC_AD0 5 6 SERIRQ_R R615 0R/4 << SERIRQ 10,27

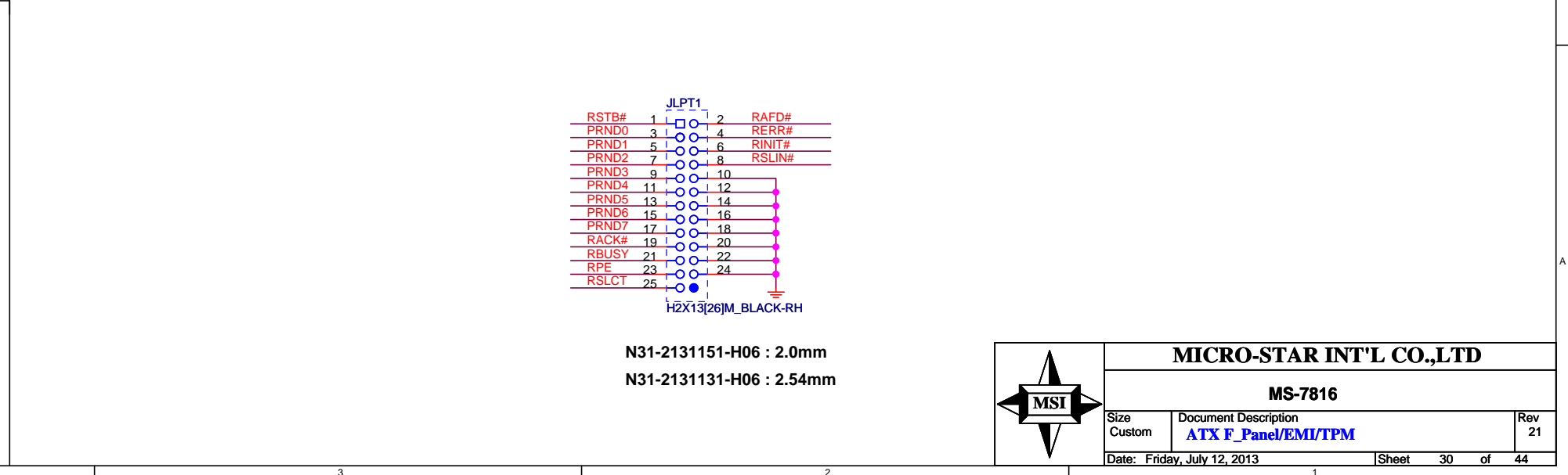
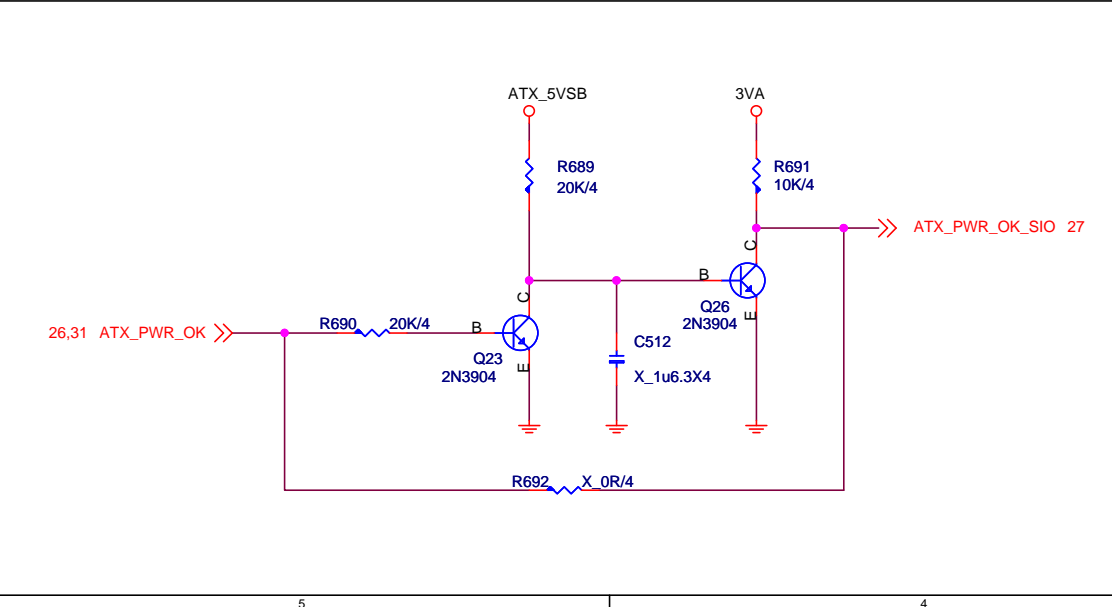
11,27 LPC_AD1 >> LPC_AD1 7 8 VCC5

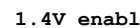
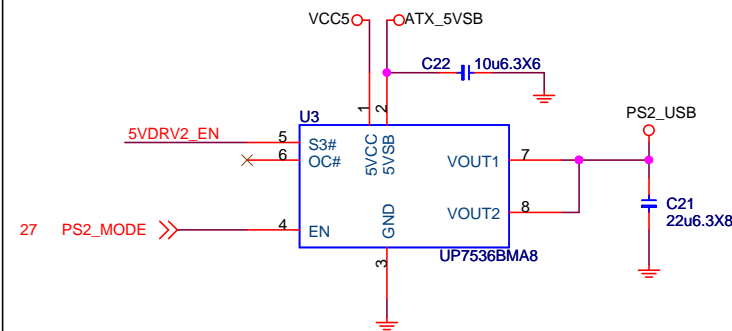
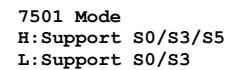
11,27 LPC_AD2 >> LPC_AD2 9

11,27 LPC_AD3 >> LPC_AD3 11 12

11,27 LPC_FRAME# >> LPC_FRAME# 13 14

H2X7[10]M-2PITCH

[illegible]



3VA

ATX_5VSB

C430 1u6.3X4

R575 47K/4

U26 UP0111AMA5

VIN

VOUT

EN

GND

FB

20mA

3VA

C428 4.7u6.3X8

R578 10K/1%4

C431 X_0.1u10X4

3VA_FB

3VSB

R562 X_0R/6

3VA

R577 3.09K/1%4

3.389V

p3VA 粘 3.389V

for NCT6779 Ver.C not stuff

3VA

R572 X_10K/4

C426 X_10u6.3X6

R569 X_4.12K/1%4

C436 X_4.7u6.3X8

Q71 X_2N3904

Q70 X_2N3904

C432 X_1u6.3X4

ATX_5VSB

R573 X_10K/4

3VA

R570 499/1%4

DPWRROK_CP

DPWRROK_CP 11.27

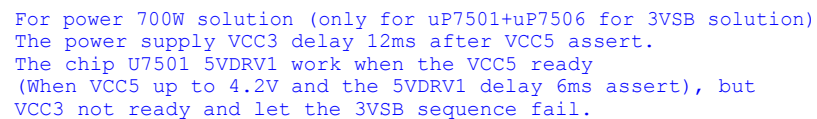
R566 10K/4

3.389Vだ潰=0.813V

2.71Vだ潰=0.65V

DPWRROK 惠 韋 pull down 10k 箒 杆 紅狼BAT 箒 箒 箒

FOR DPWRROK 給3VA POWER DOWN (S5-->G3)

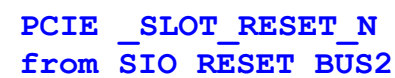


26 5VDRV2

5VDRV2_EN

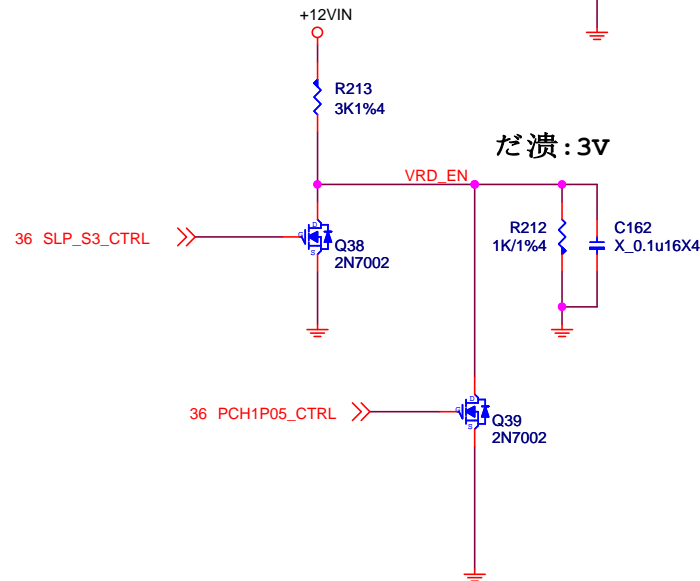
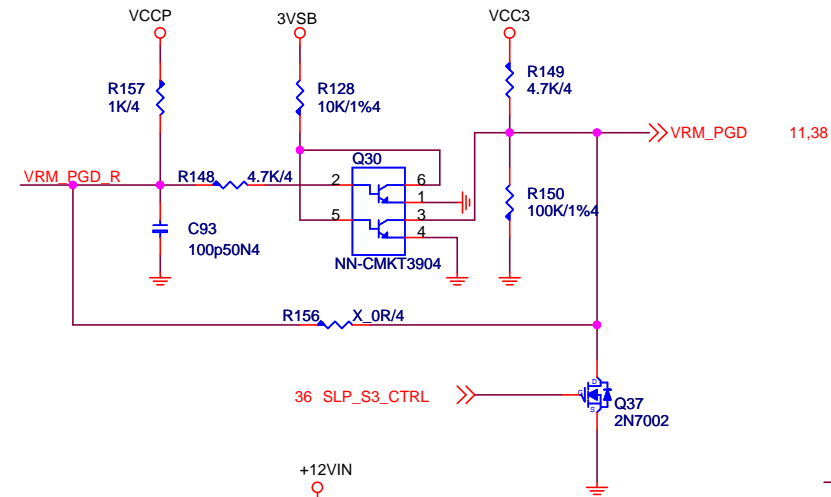
R299 200K/1%4

R294 56K/1%4



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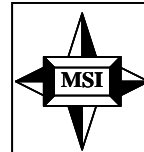
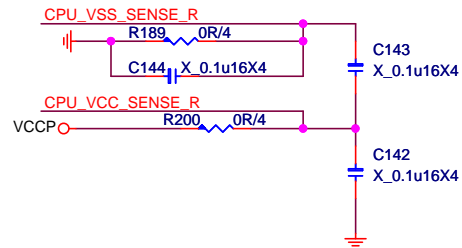
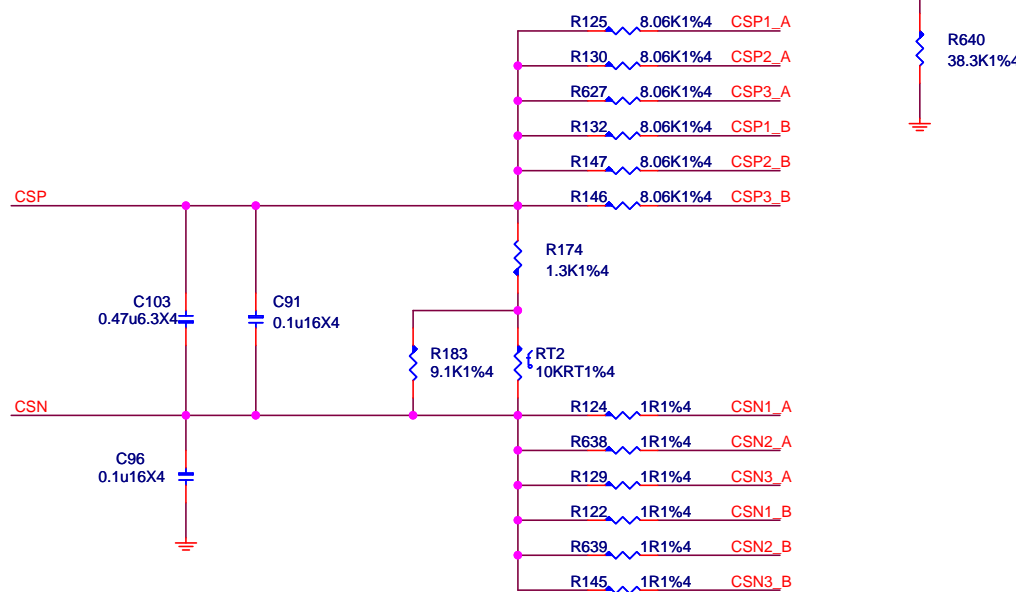
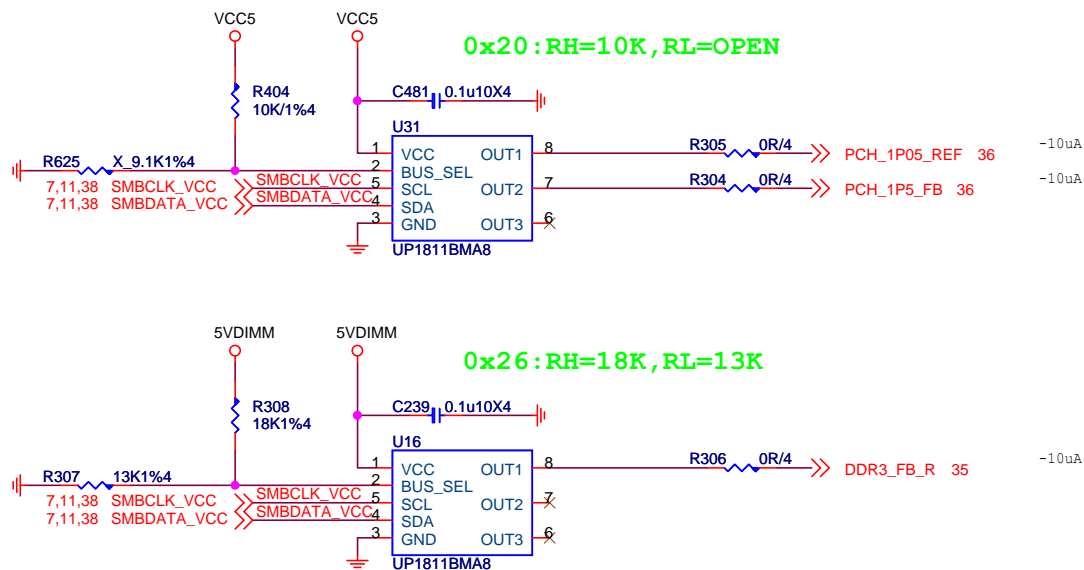
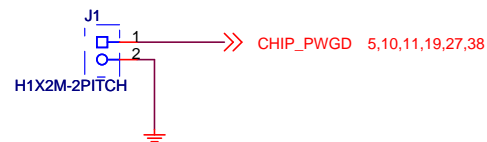
Size Custom	Document Description ACPI controller UPI	Rev 21
Date: Friday, July 12, 2013		Sheet 31 of 44



UPI VOLTAGE CONSOLE

	U16					U31
ADDRESS	0x2A	0x28	0x26	0x24	0x22	0x20
RH (KOhm)	OPEN	3.9	3	2.2	1.3	10
RL (KOhm)	10	1.3	2.3	3	3.9	OPEN
BUS_SEL	0%	25%	40%	60%	75%	100%

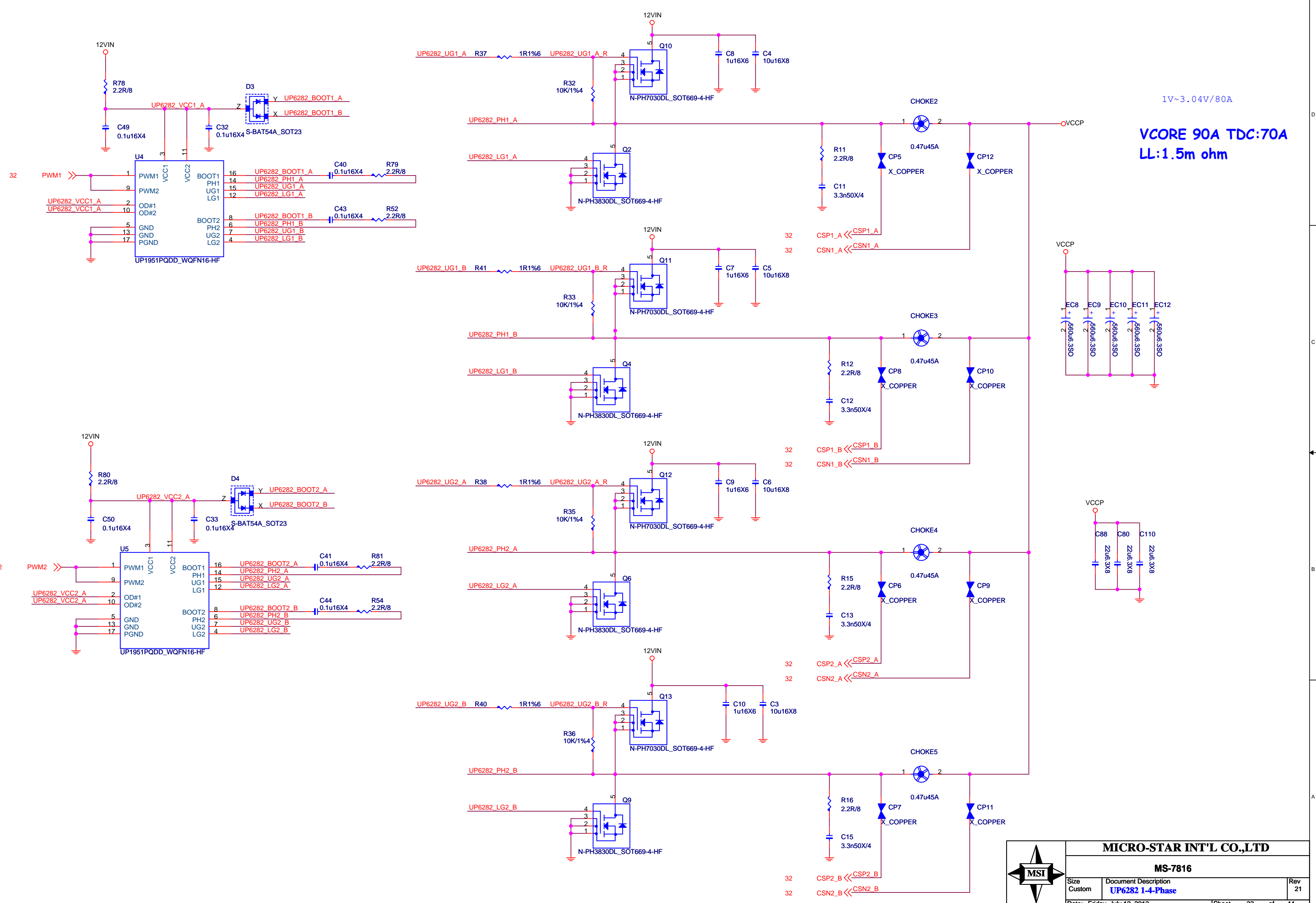
Internal option : 5/32*VCC



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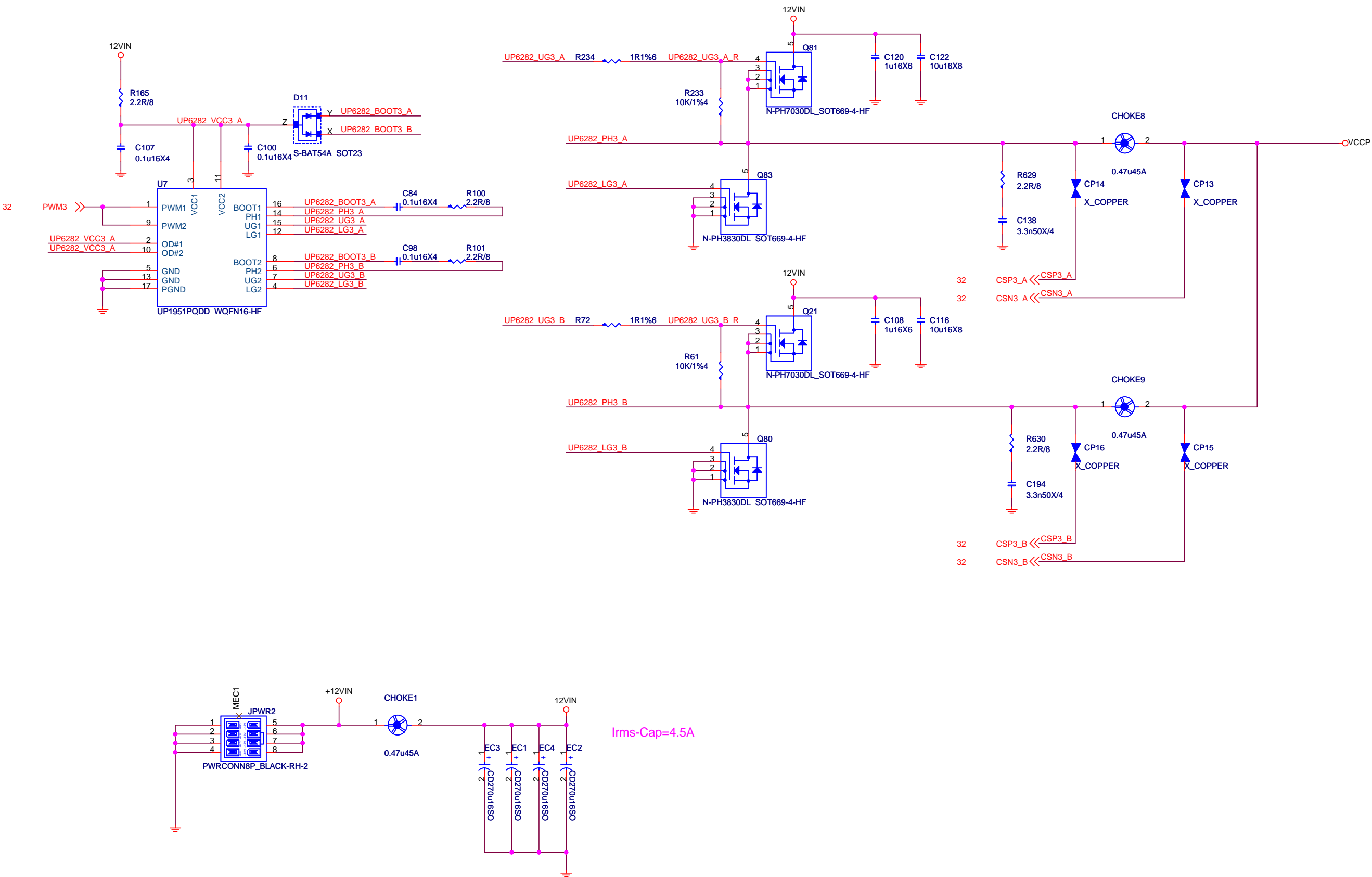
Size	Document Description	Rev
Custom	VRD12 - PWM-UT501	21
Date: Friday, July 12, 2013	Sheet 32 of 44	



1V~3.04V/80A

VCCP 90A TDC:70A

LL:1.5m ohm



DDR Power:1.5V

DDR3_1.5V 4.2A+12A+1.115A+6A=23.315A

4.2A FOR CPU

12A FOR 4DIMM

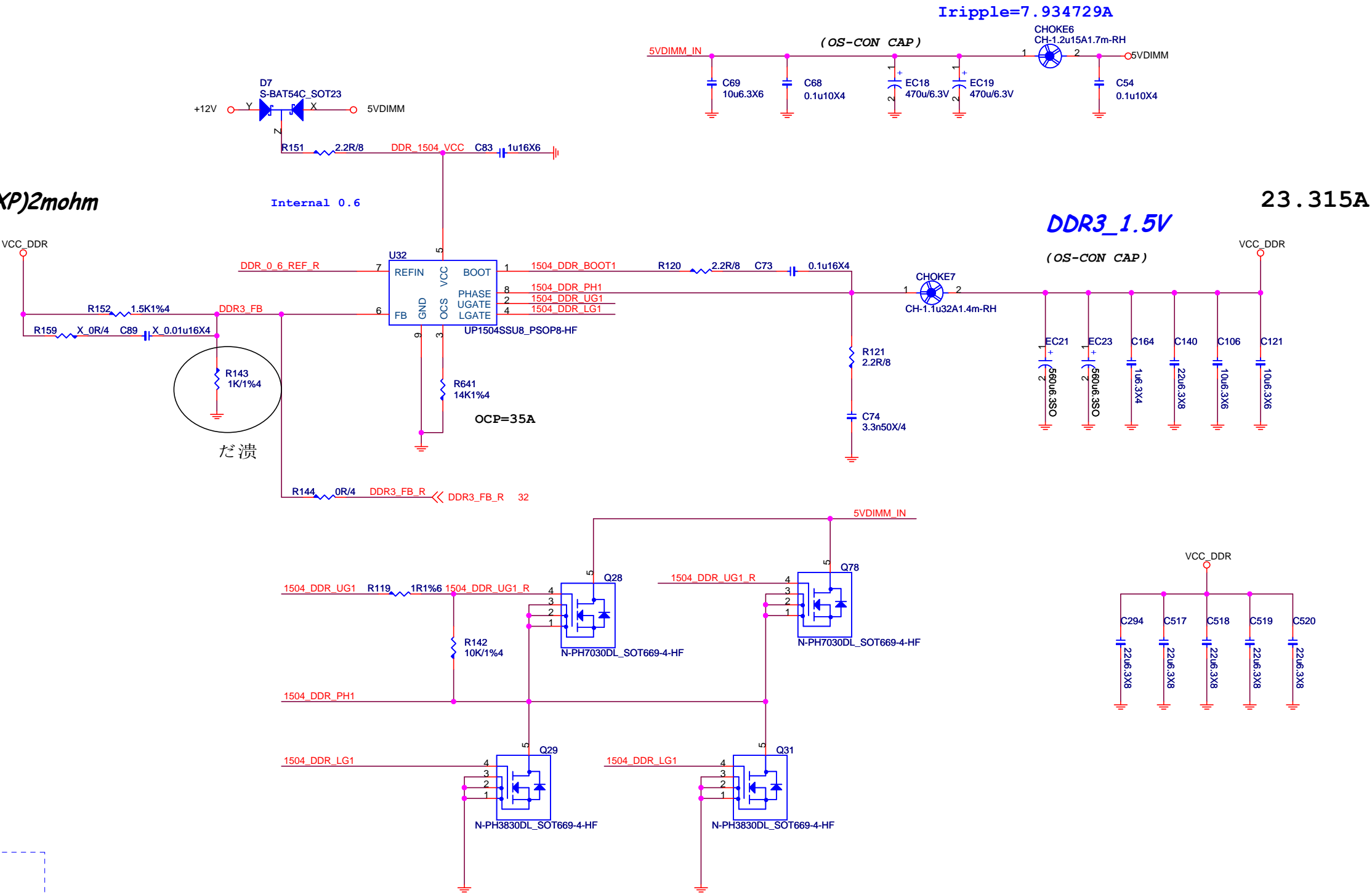
1.115A FOR VTT_DDR

PCH Core 6A

OCP 23.315A*1.5=34.9725A

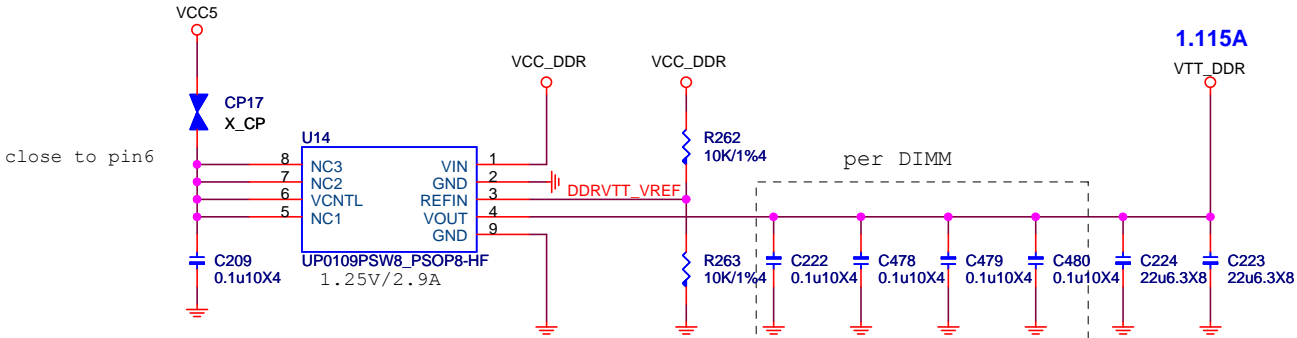
OCP=[20uA*Rocs(R320)]/4*Rdson(Low side NXP)2mohm

R320=14K ohm



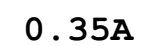
DDR VTT Power

To CPU Copper trace width > 250mils , Fill island behind DIMM > 400mils .



P.S. Only for meet Intel power down sequence.

PCH Core 6A

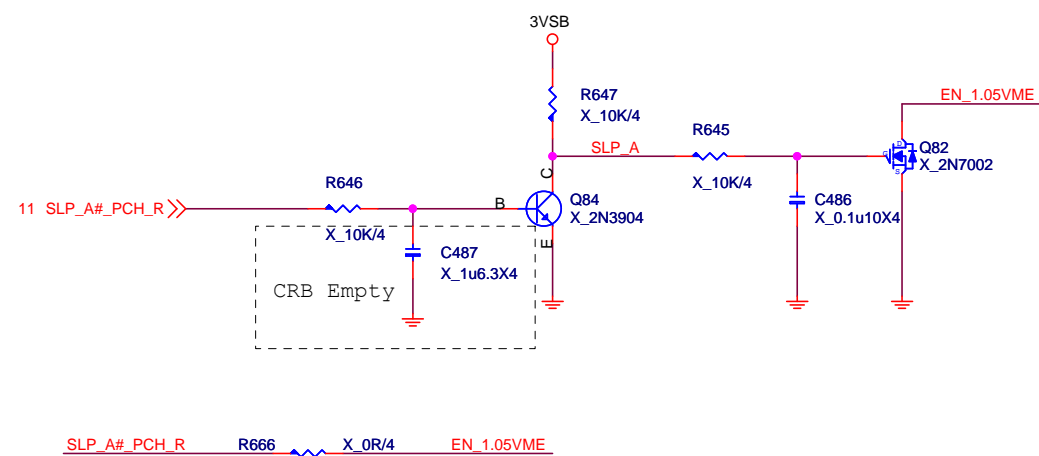


Size Custom	Document Description PCH Power - uP1513 1-Phase MOS	Rev 21
Date: Friday, July 12, 2013	Sheet 36 of 44	

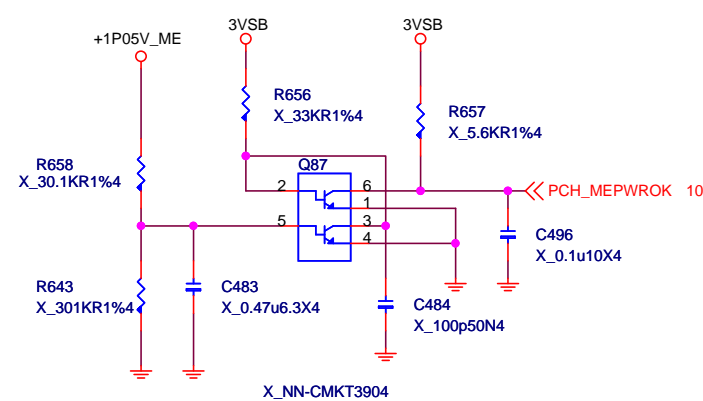
C318,C323,R378,C313,C314,C333,R366 for H87 un stuff
Z87 only stuff R354

SLP_A

ME Power Control

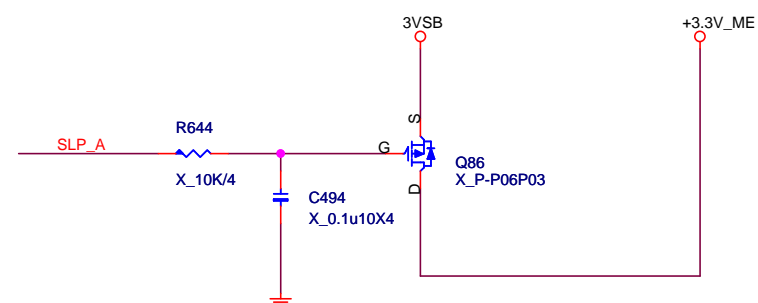


PCH_MEPWROK

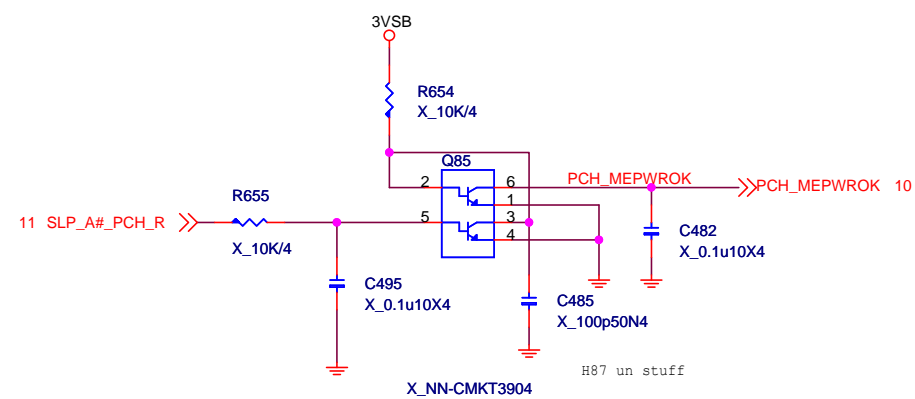
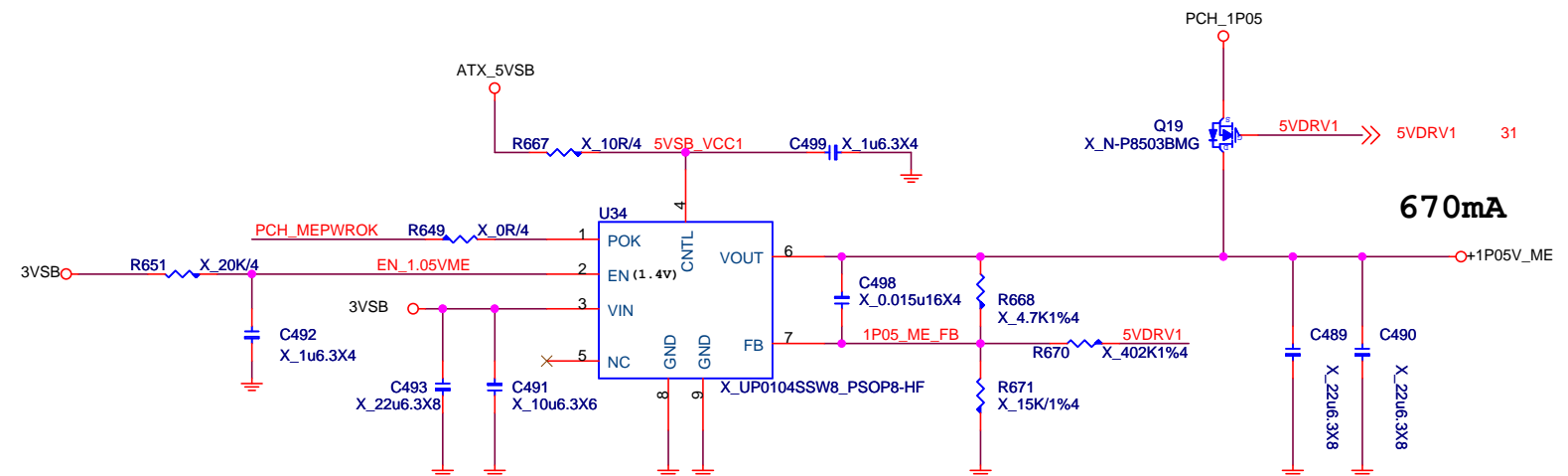


VccASW active to APWROK high 1ms

+3.3V_ME



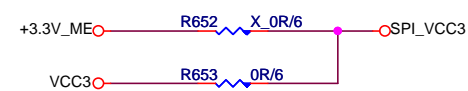
+1.05V_ME(VCCIO_ME)



APWROK falling to VccASW falling 40ns

For INTEL ME BUG

```
Z87->Stuff R653
H87->Stuff R652
```



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Size	Custom
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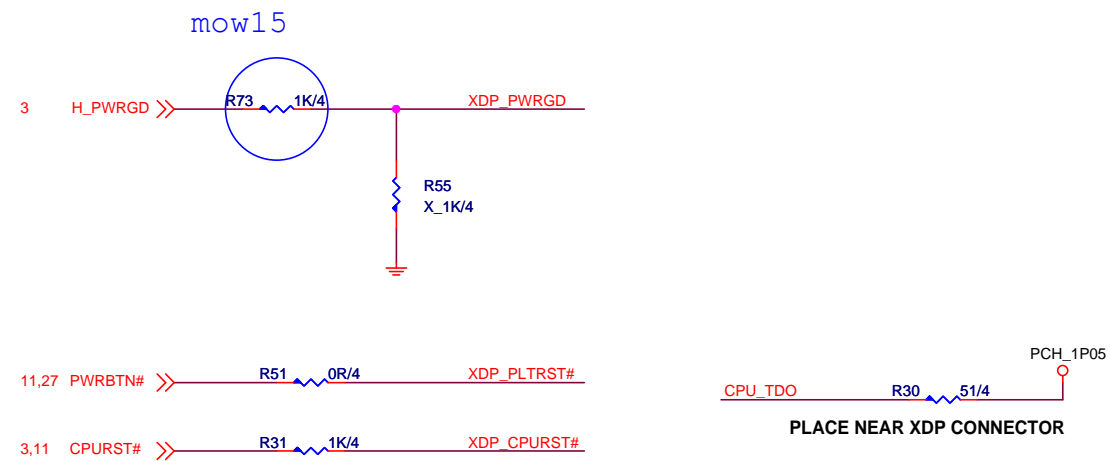
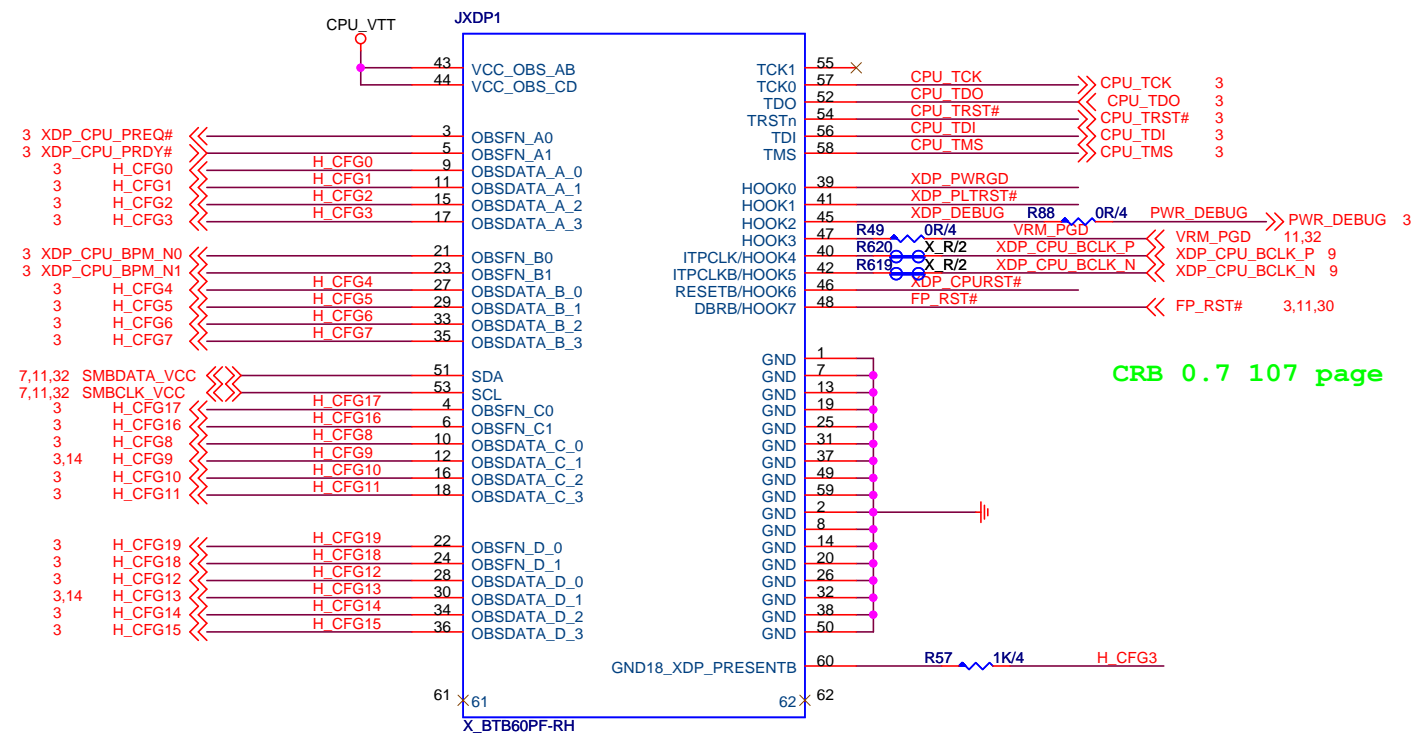
Document Description
ME POWER

Rev
21

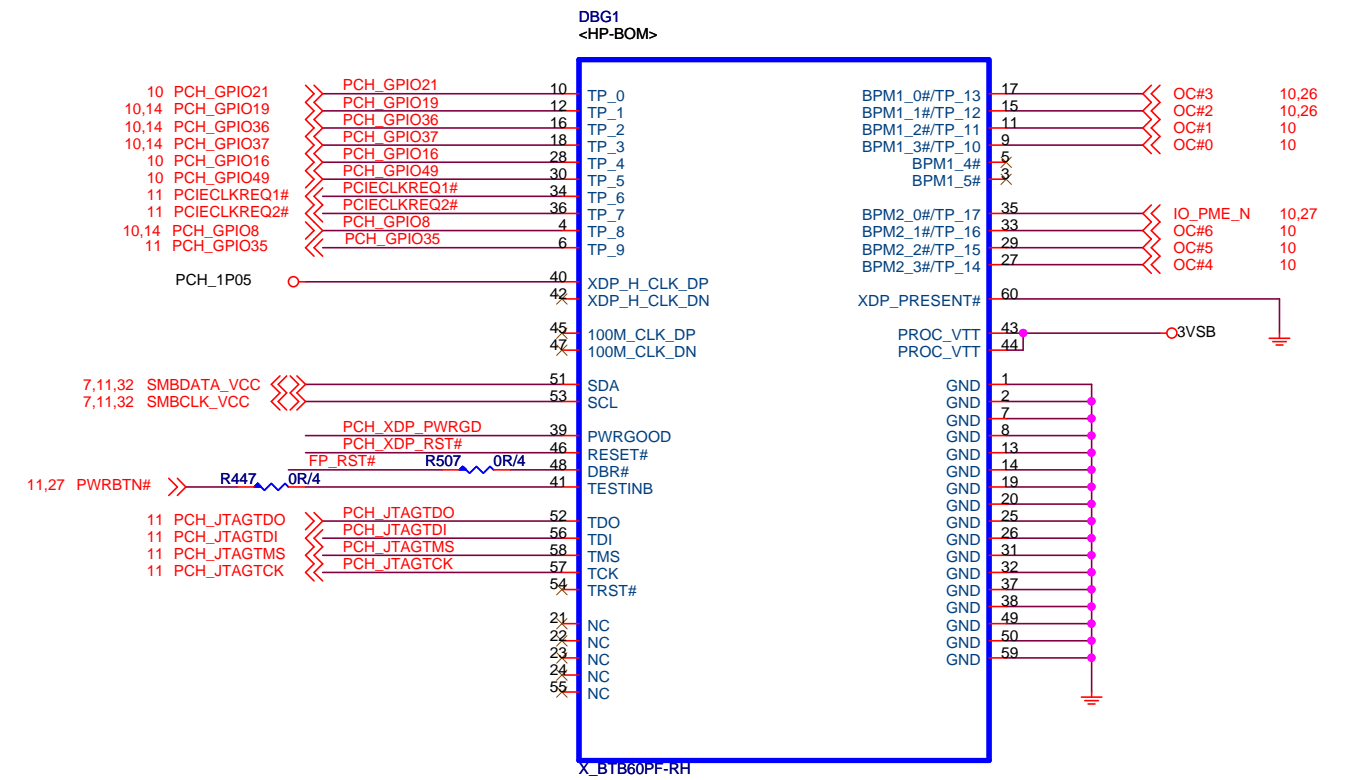
Date: Friday, July 12, 2013

Sheet	37	of	44
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Reserve debug port 5020

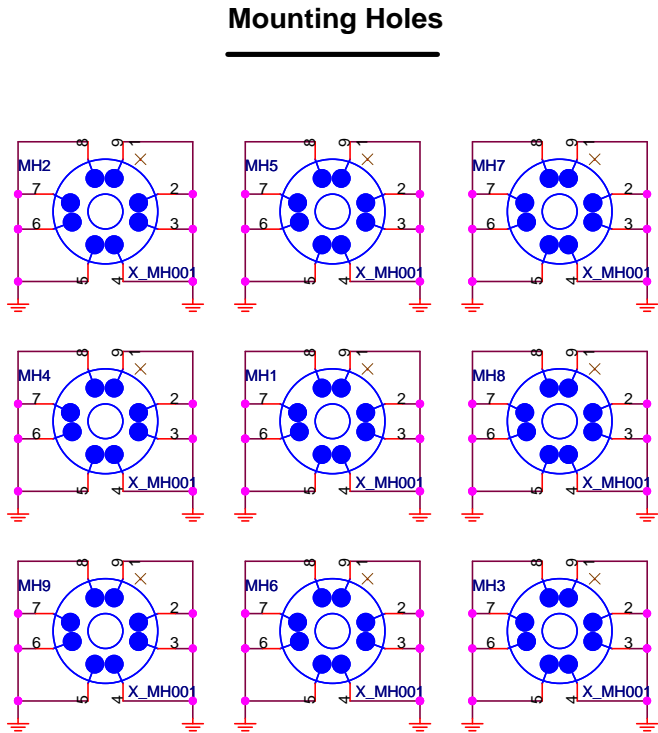
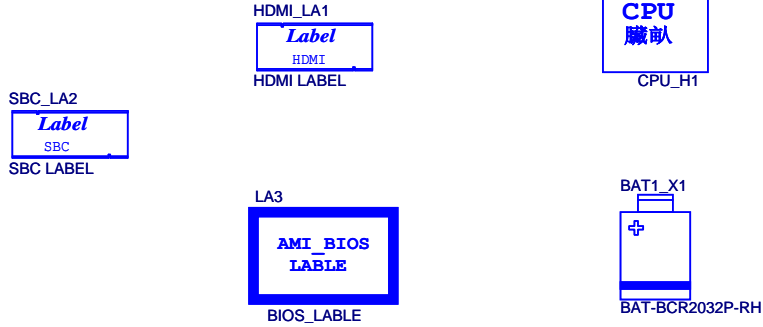


PCH XDP

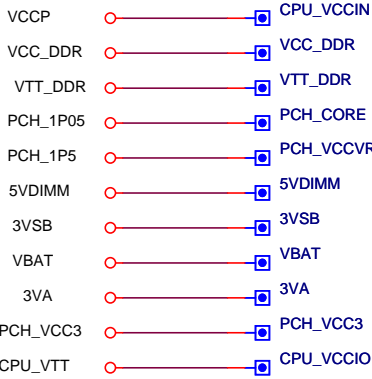


PCH XDP PWRGD/RESET

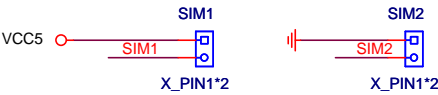




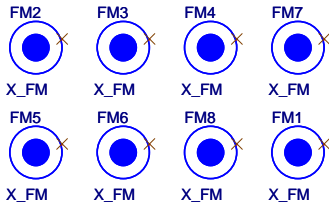
Test point



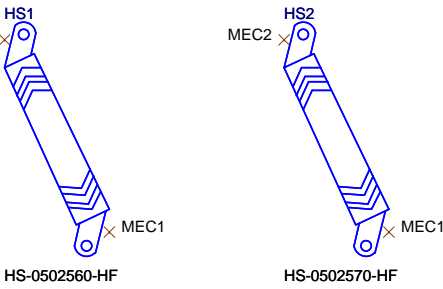
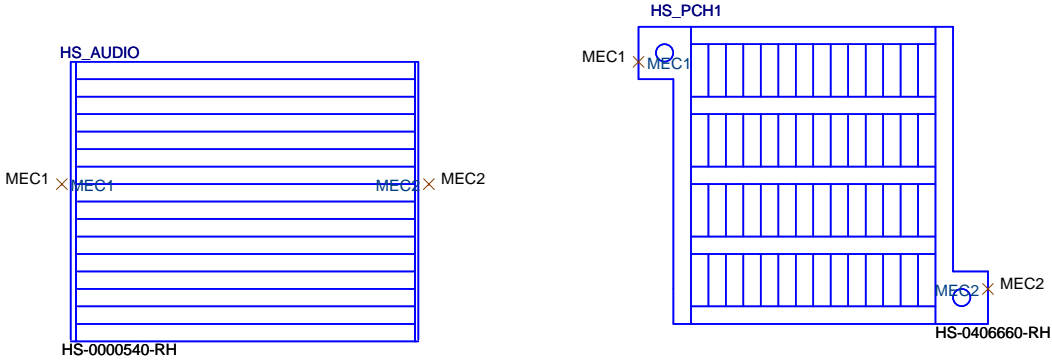
Simulation



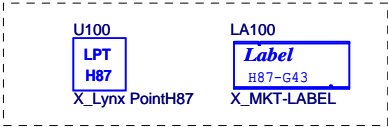
Optical Fiducial Marks-120



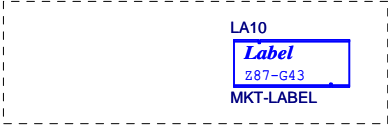
HEATSINK



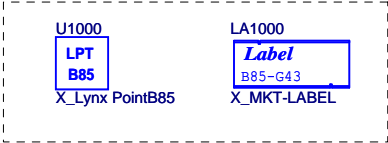
H87 OPT.



Z87 OPT.



B85 OPT.



SPI OPT.

