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MS-7B17

CFL Platform

ATX

Ver: 20

CPU:

Coffee lake S

System Chipset:

Z390 PCH_H

Onboard Chip:

HD Audio Codec:ALC1220P

LAN-Intel I219

SIO:NTC6797

Flash ROM: SPI 128 MB X1

Main Memory:

DDRIV (5000MHz) * 4 (Dual Channel)

ACPI:

LDO

PWM:

IMVP8 -UPI9521

Expansion Slots:

PCI Express (X16) Slot * 1

PCI Express (X8) Slot * 1

PCI Express (X4) Slot * 1

PCI Express (X1) Slot * 3

M2 (X4) Slot * 2

Other:

SATA3.0 *6

USB2.0 *7

REAL USB3.0 *5+TYPEC*1

FRONT USB3.0 *3+TYPEC*1



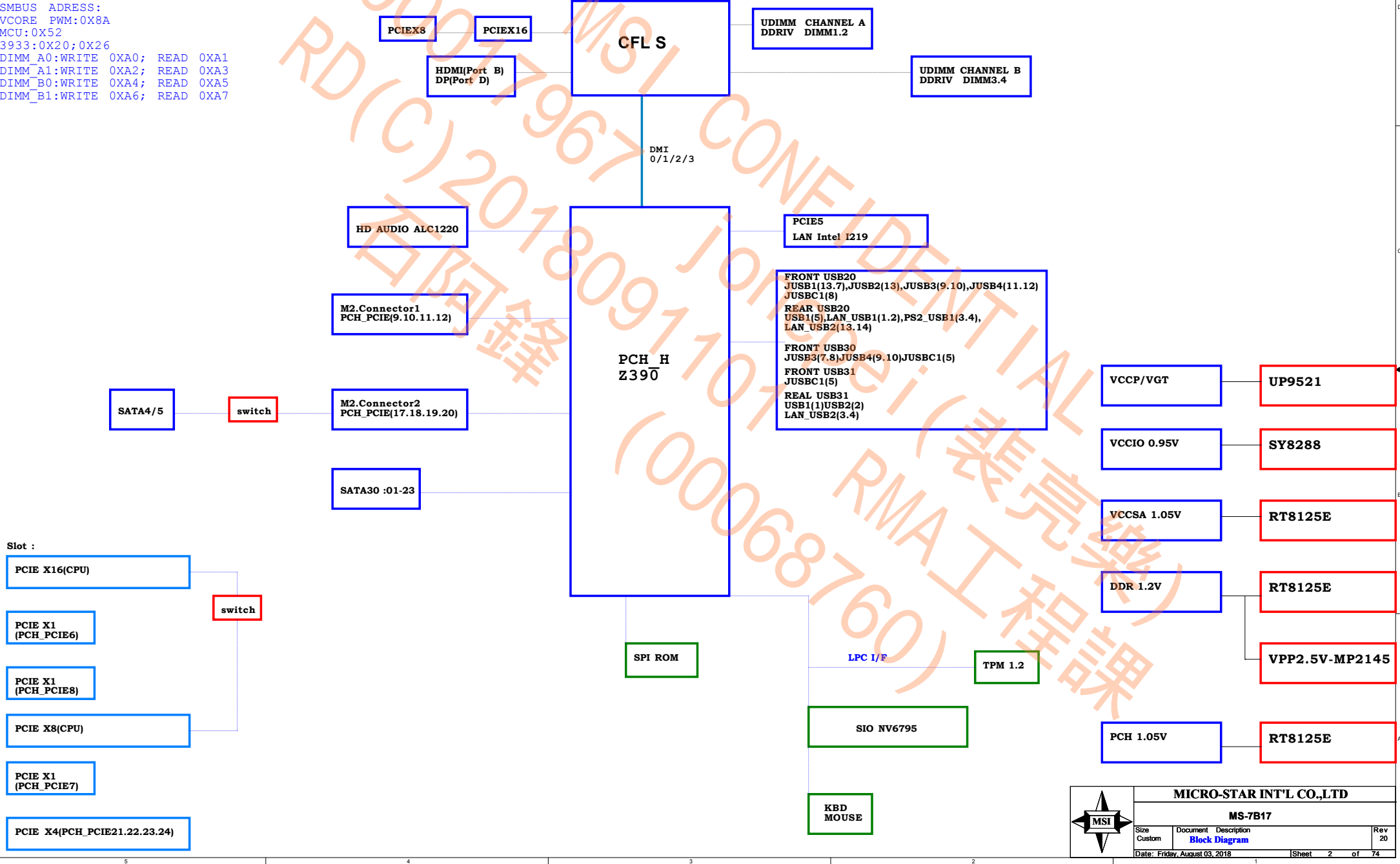
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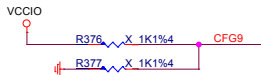
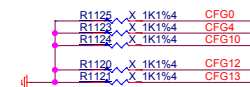
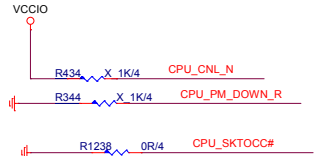
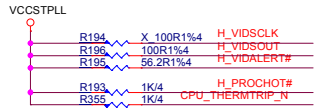
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MS-7B17 Block Diagram

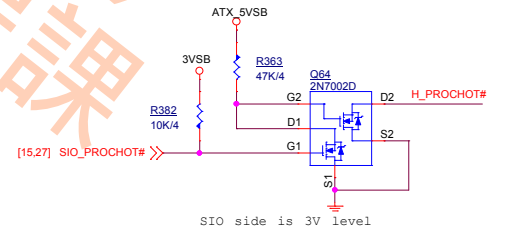
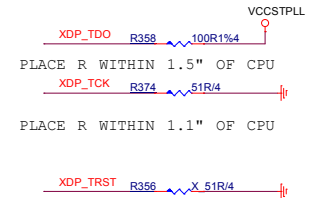
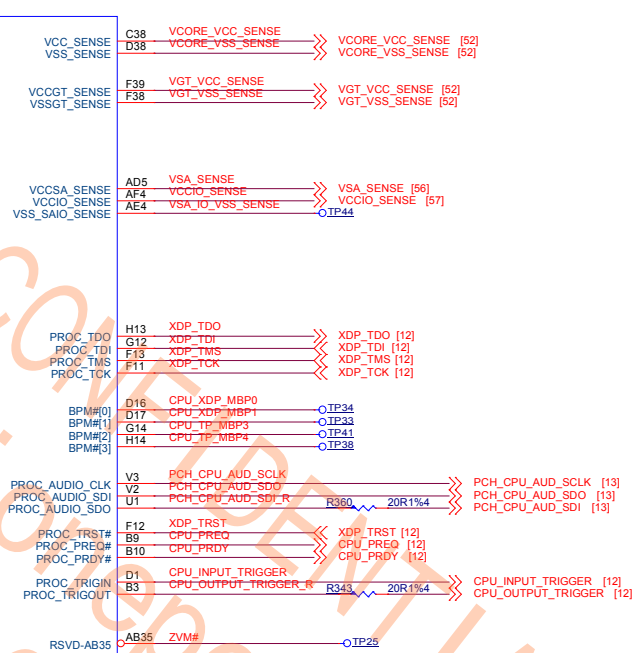
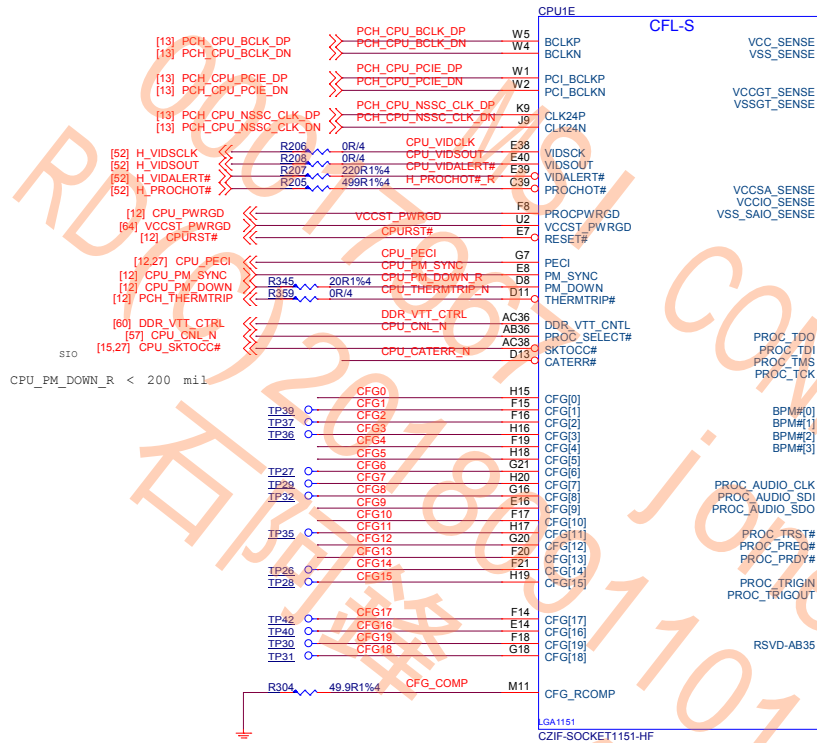
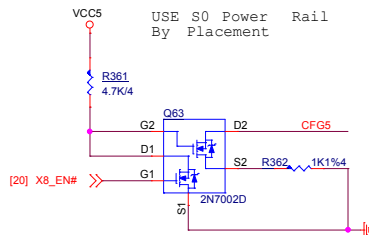
SMBUS ADDRESS:
VCORE PWM:0X8A
MCU:0X52
3933:0X20;0X26
DIMM_A0:WRITE 0XA0; READ 0XA1
DIMM_A1:WRITE 0XA2; READ 0XA3
DIMM_B0:WRITE 0XA4; READ 0XA5
DIMM_B1:WRITE 0XA6; READ 0XA7





CFG Strap

CFG Table			
	HIGH	LOW	DESCRIPTION
0	NORM	STALL	EAR
1	NORM	PCHLESS	PCHLESS MODE
2	NORM	REVERSE	PEG LANE REVERSAL
3	ENABLE	DISABLE	DEBUG
4	DISABLE	ENABLE	DP PRESENCE
5	DISABLE	ENABLE	PEGOCFGSEL[0]
6	DISABLE	ENABLE	PEGOCFGSEL[1]
7	RESET#	BIOS REQ	PEG DEFER TRAINING
8	DISABLE	ENABLE	CFG UNLOCK
9	PRESENT	NO PRESENT	SVID NOT PRESENT
10	ACTIVATE	NO ACTIVATE	SAFE MODE BOOT
11	DC COUPLED	AC COUPLED	DMI AC
12	SPT	NOT SPT	PCN TYPE
13	SVID	FIXED	VCCSA SVID
14	RSVD		
15	RSVD		

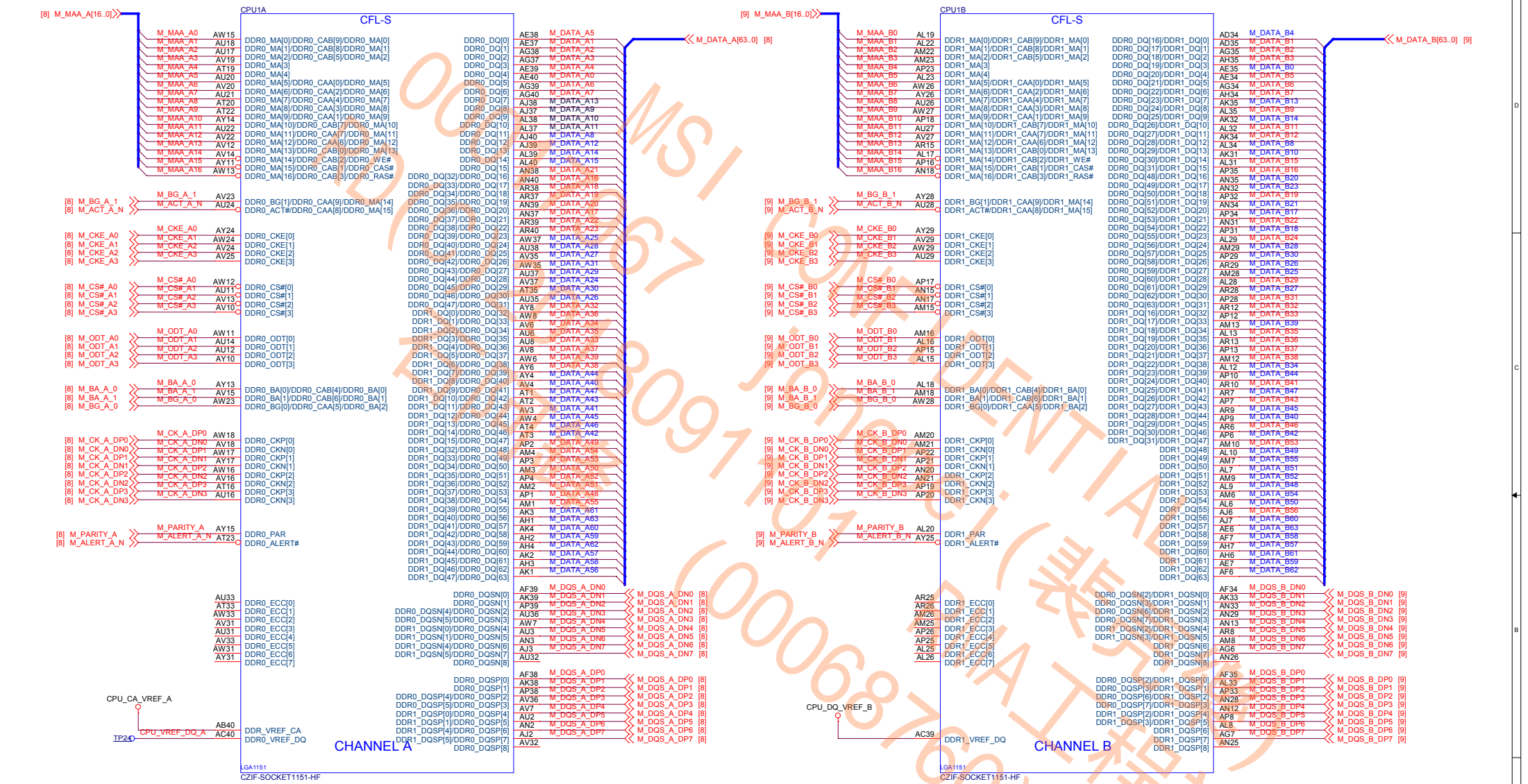


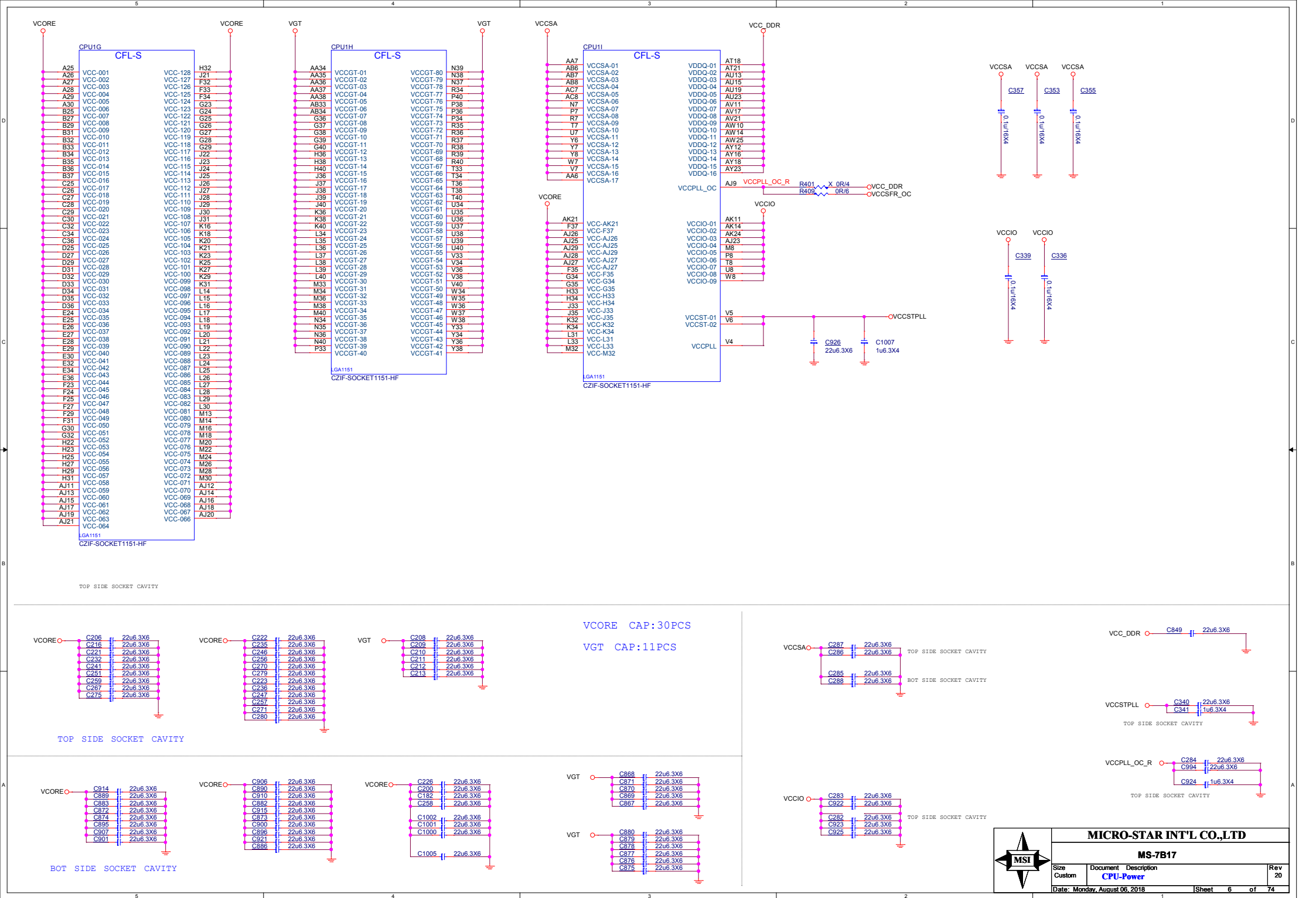
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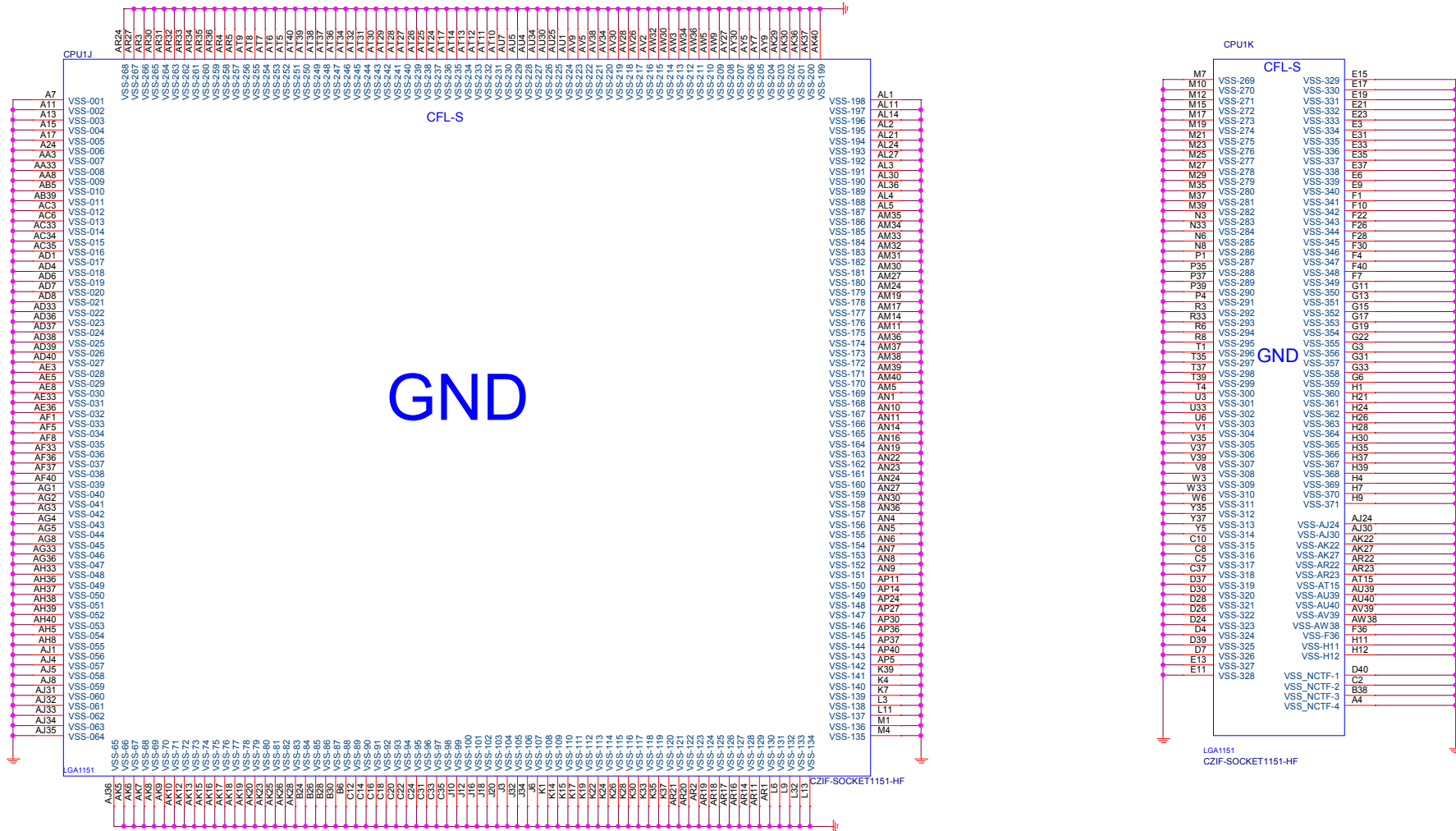
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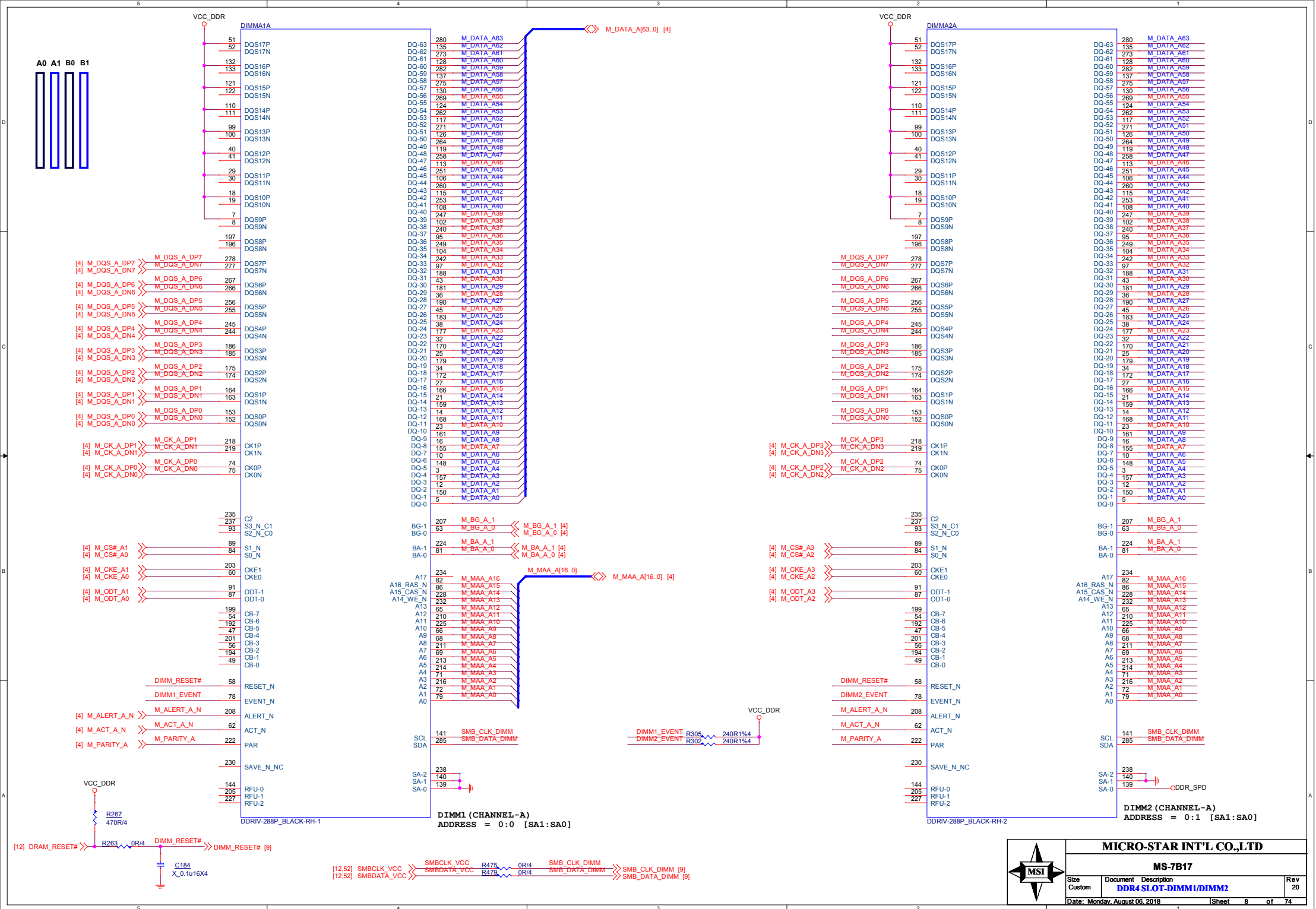
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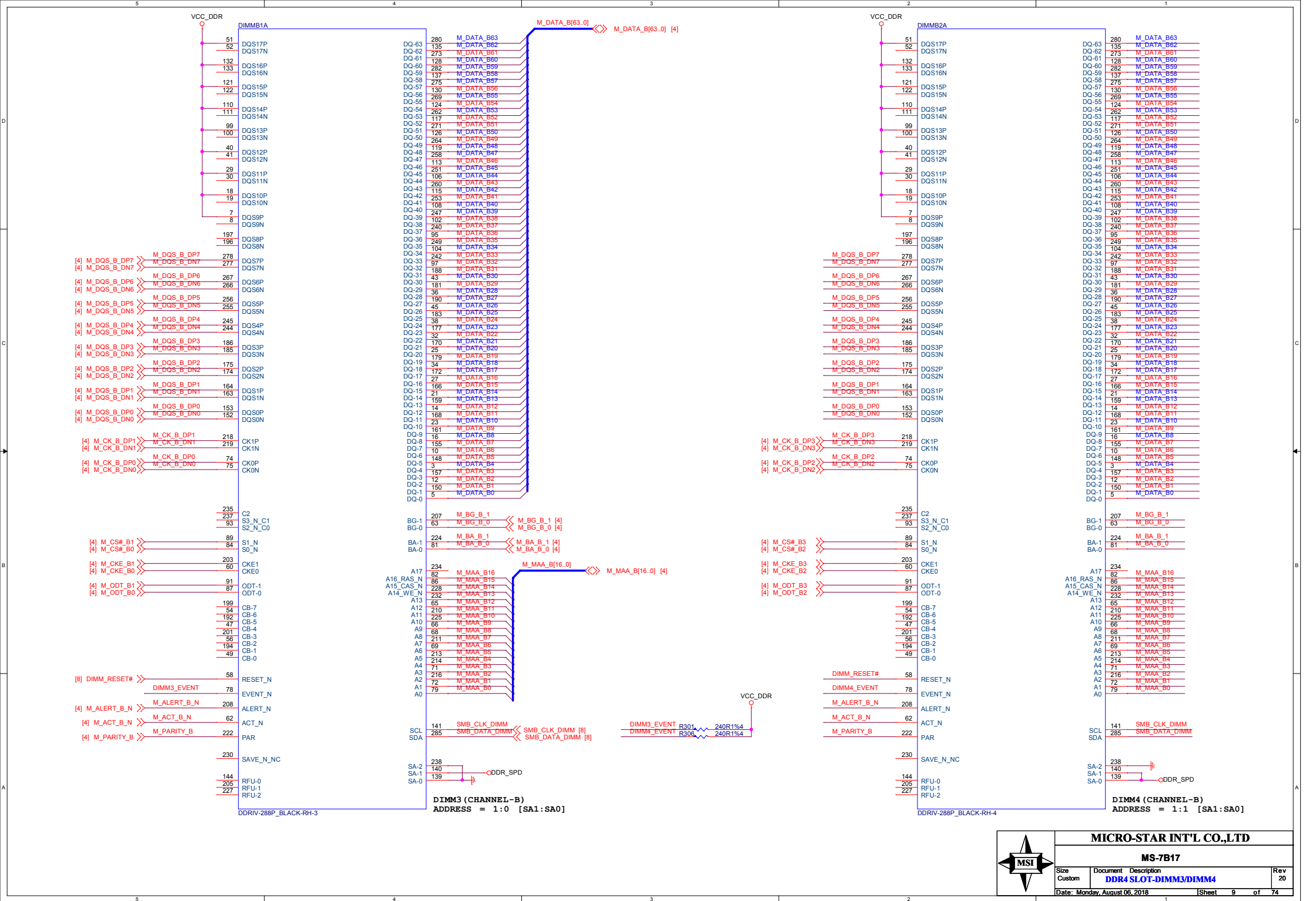
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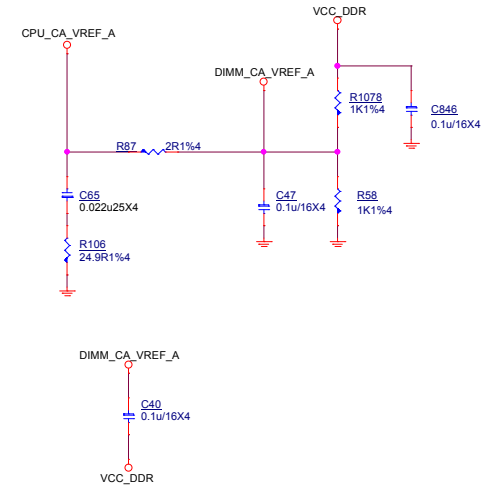
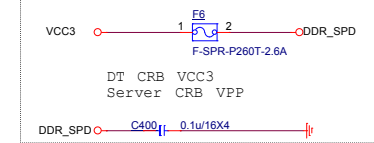
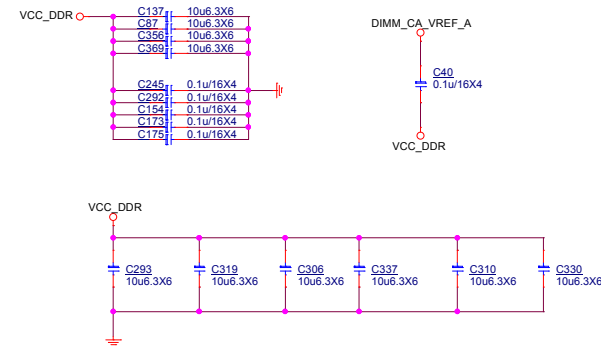
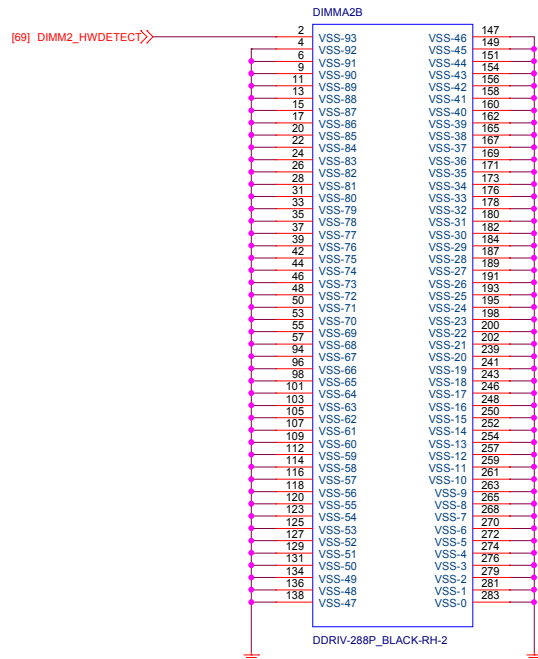
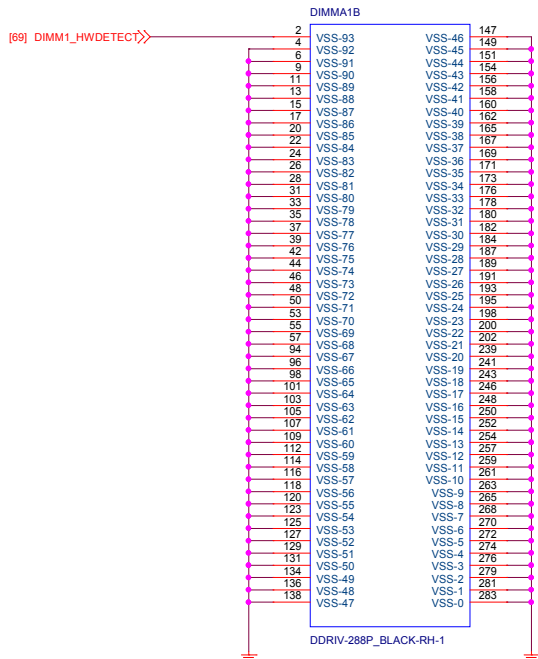
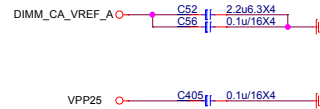
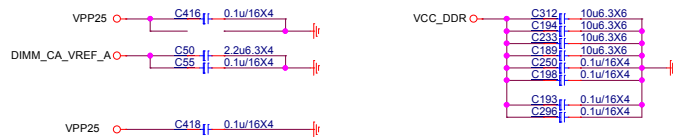
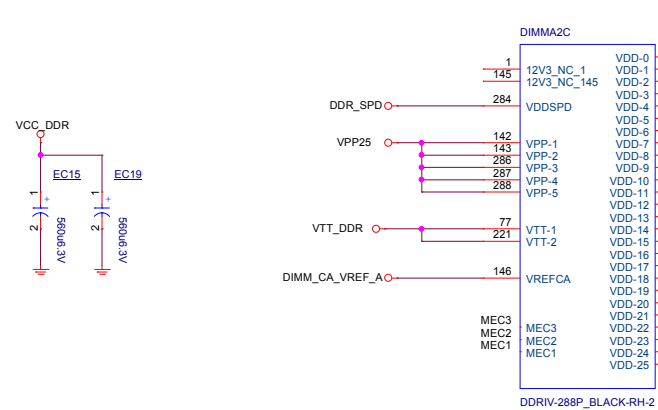
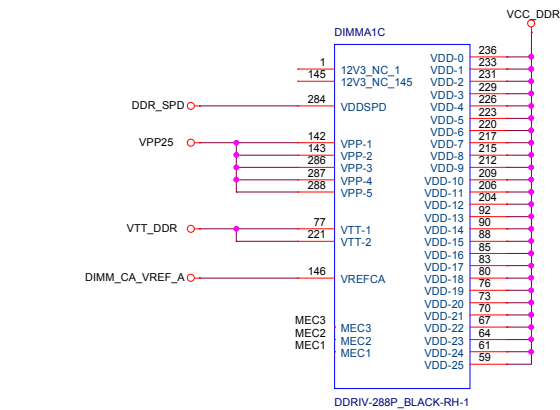


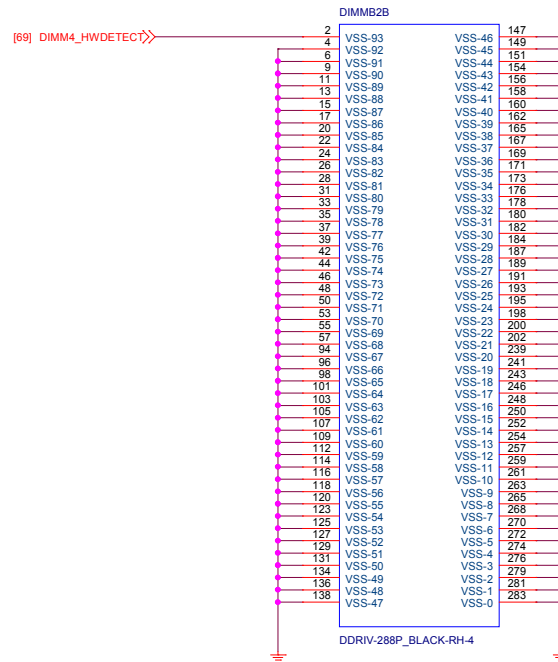
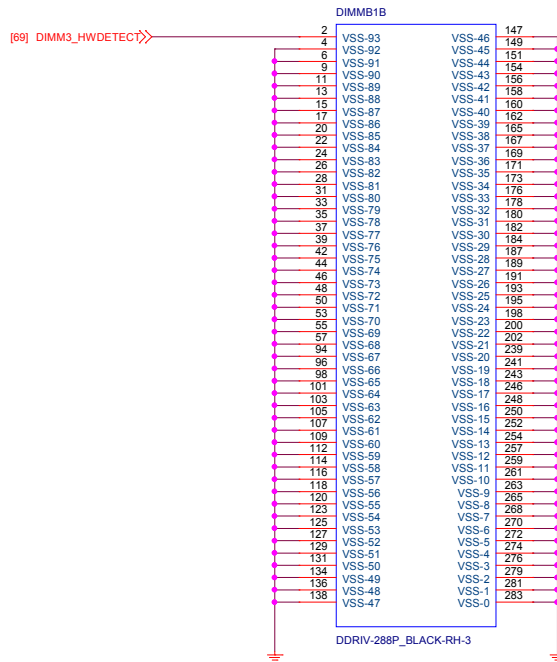
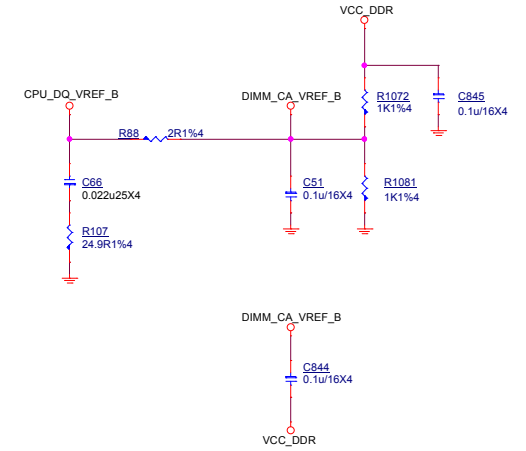
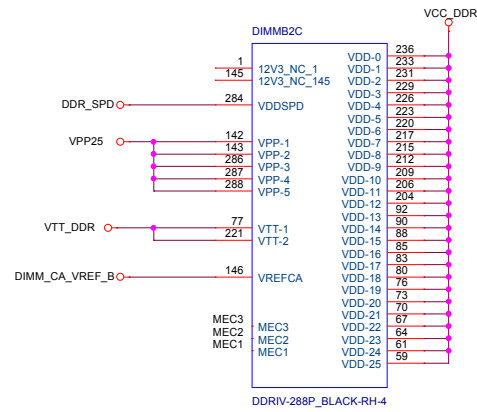
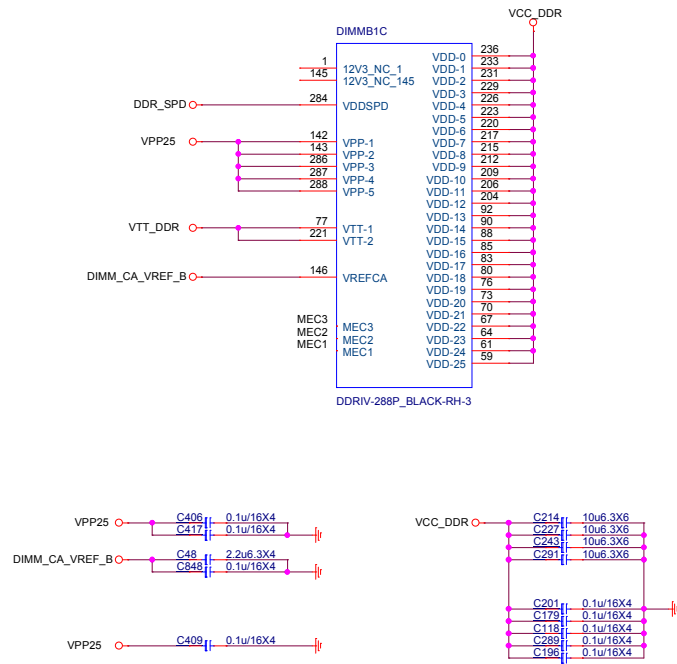








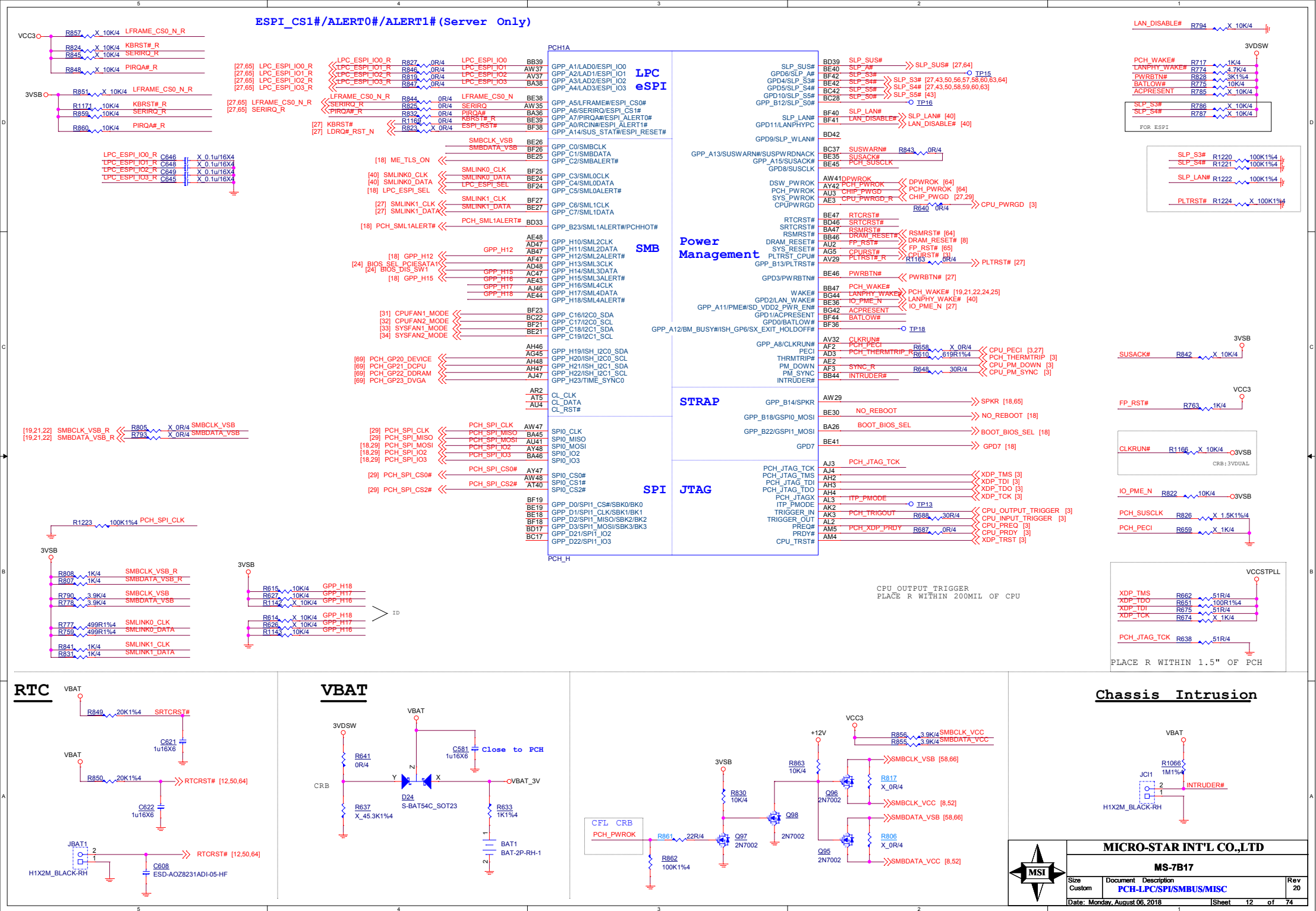




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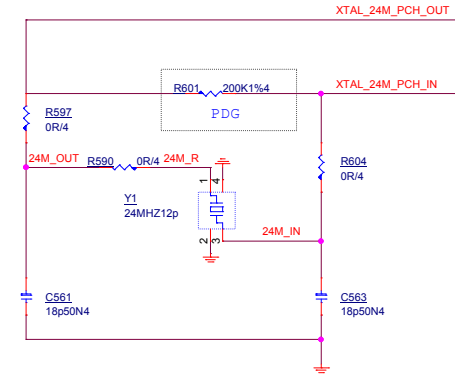
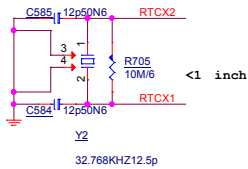
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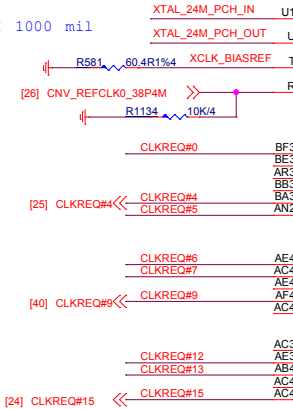


PCH_CLK

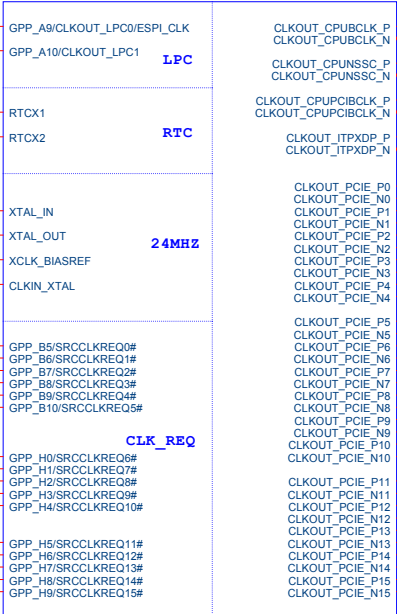
Close to PCH



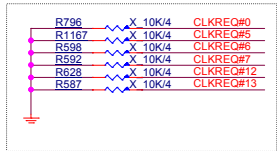
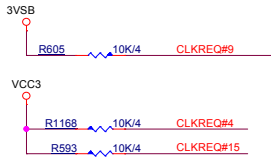
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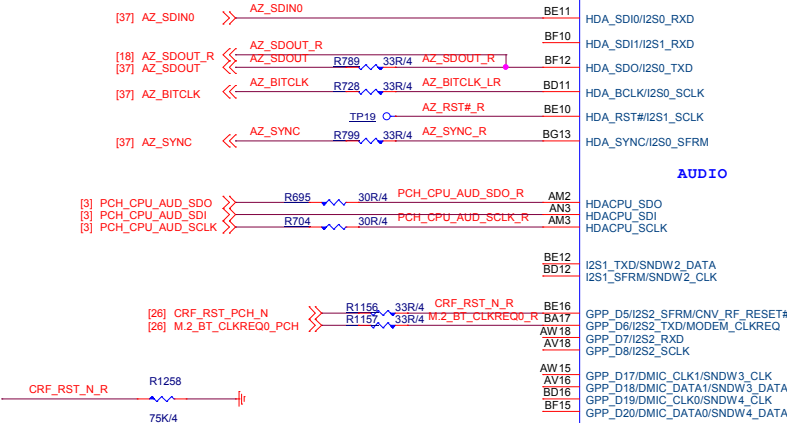
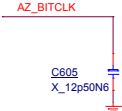
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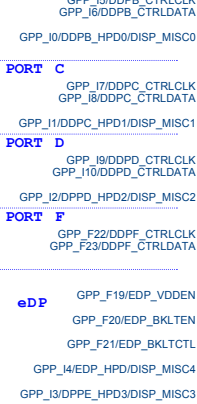
PCH_H



PCH_AUDIO



PCH1D



PCH_H

PORT B



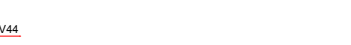
PORT C



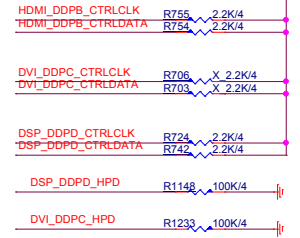
PORT D



PORT F



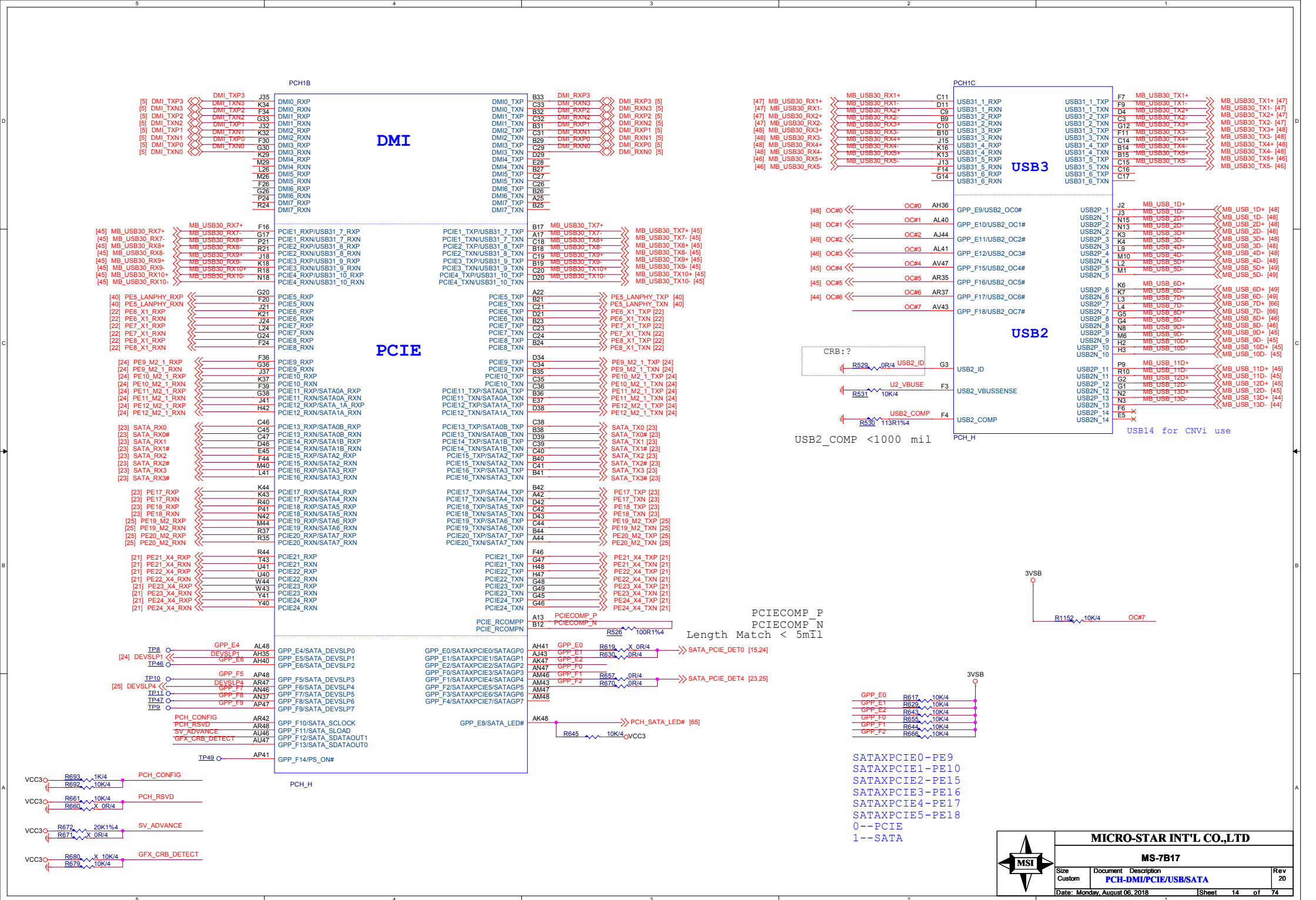
eDP

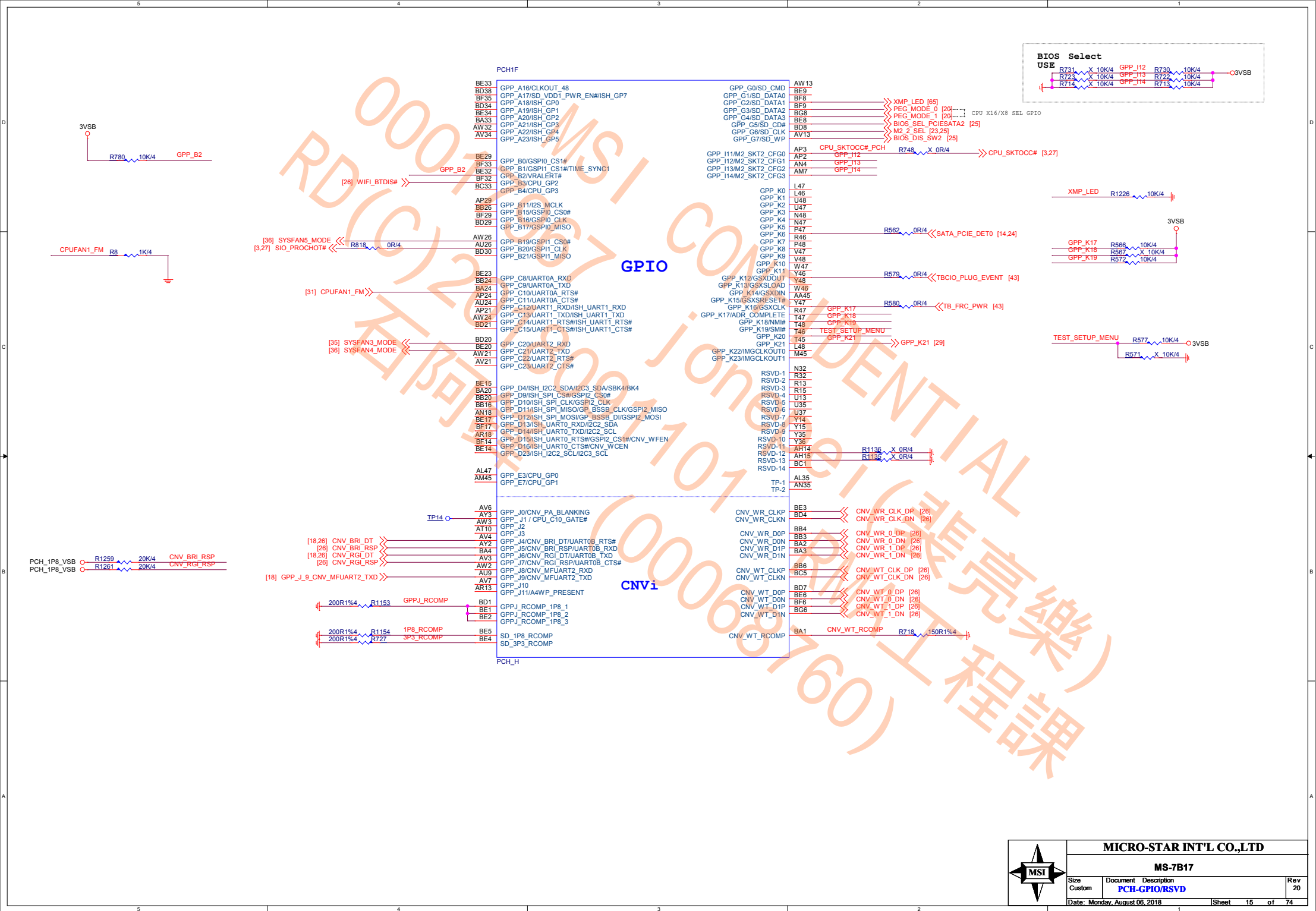


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Custom		PCH-Clock/Audio	20
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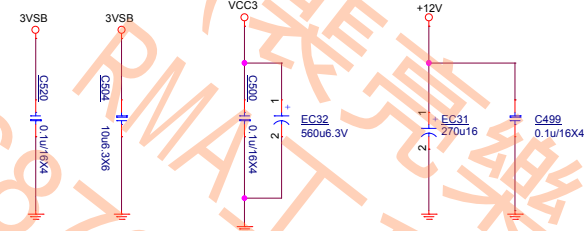
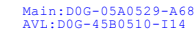



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RD(C) 01809101 jonepei (00068 RMA 0001809101)

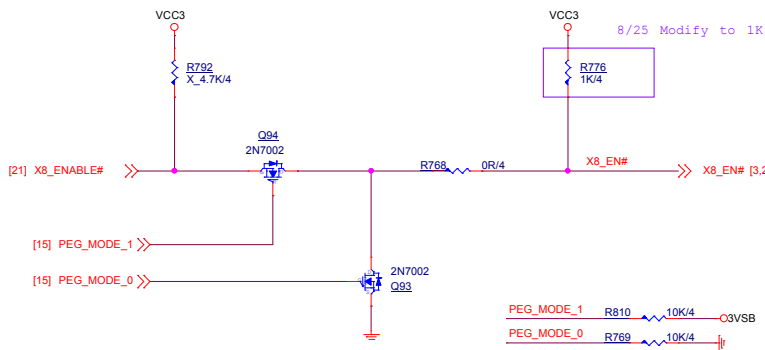
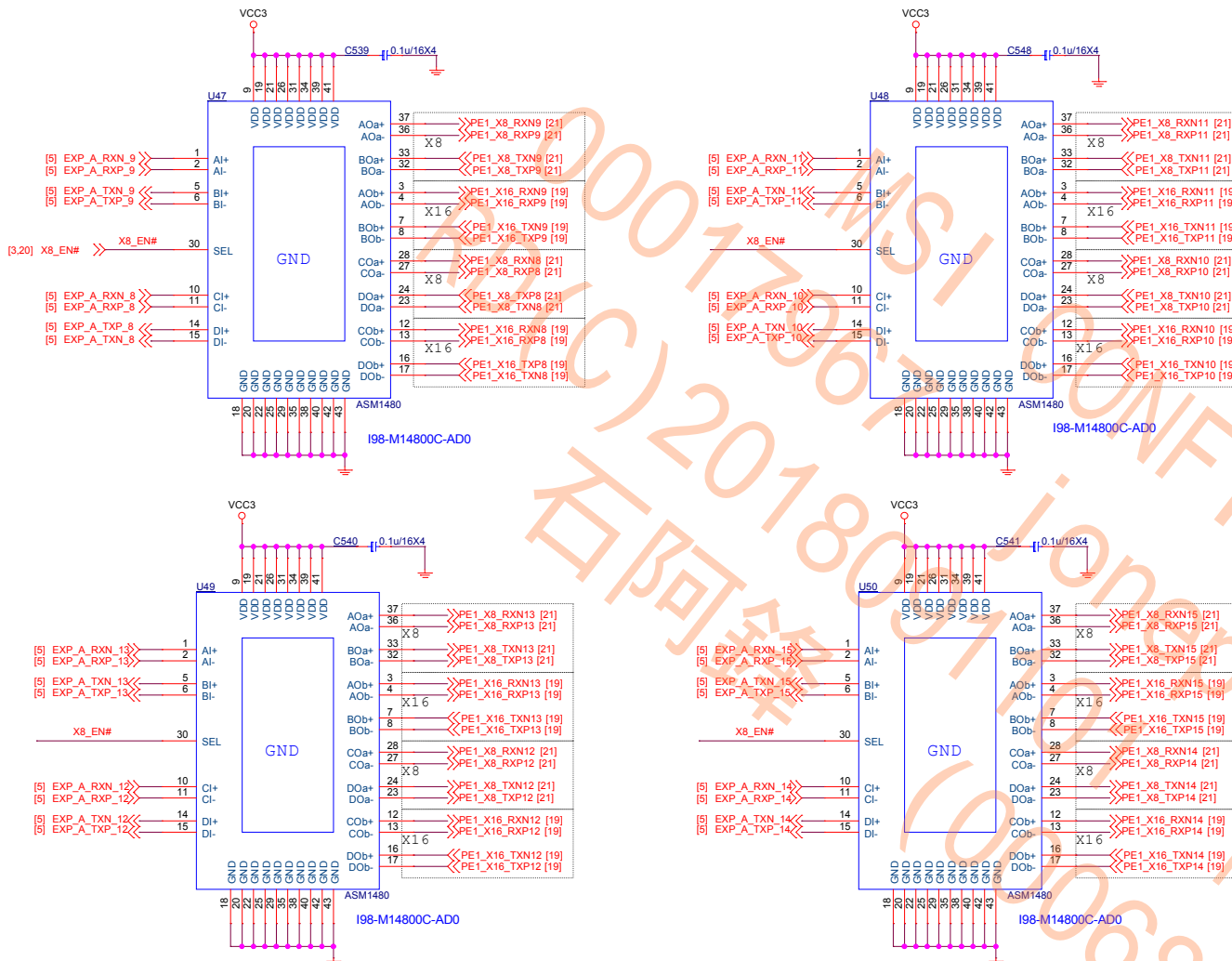
VSS



3VSB- 375mA



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MODE_1

0: BIOS MODE
1: HW MODE (Default)

HW MODE

PCH Status	MODE_0	MODE_1
AUTO	0	1

If USE HW MODE
GPP_G0 & GPP_G1 programming to GPI

If USE BIOS MODE
GPP_G0 & GPP_G1 programming to GPO

BIOS MODE

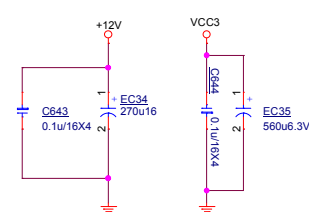
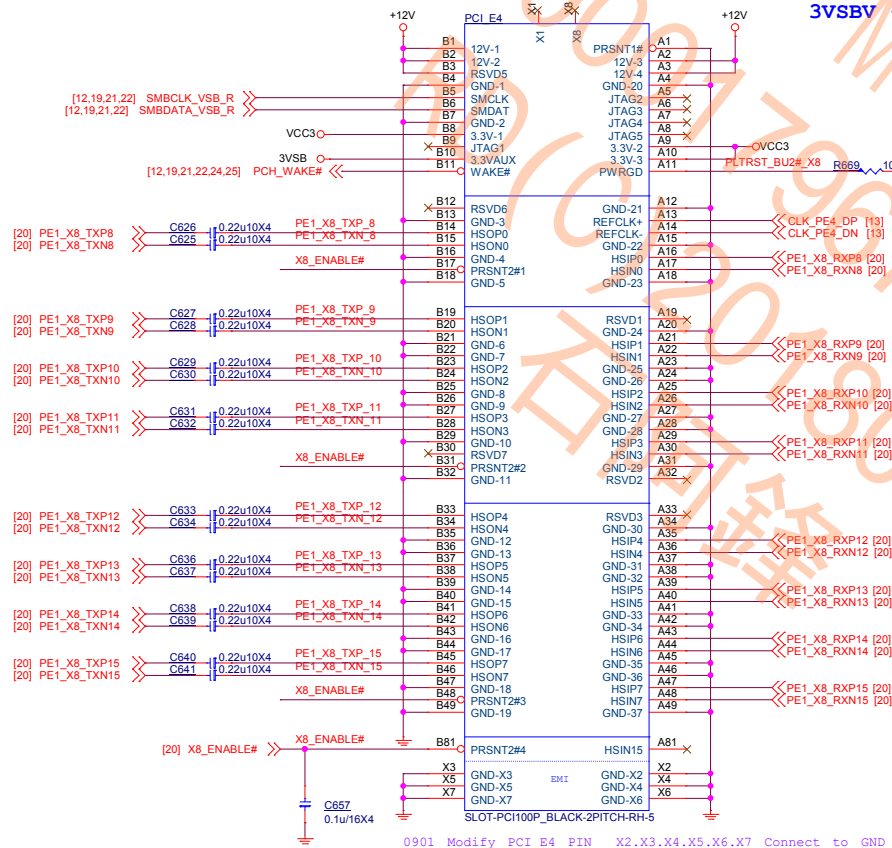
PCH Status	MODE_0	MODE_1
16, 0	0	0
8, 8	1	0



MICRO-STAR INT'L CO.,LTD			
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Custom	PCIE SWITCH		20
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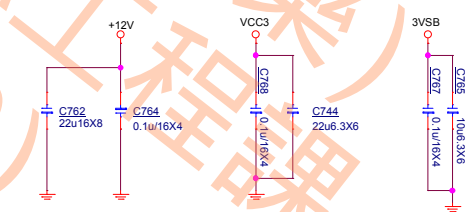
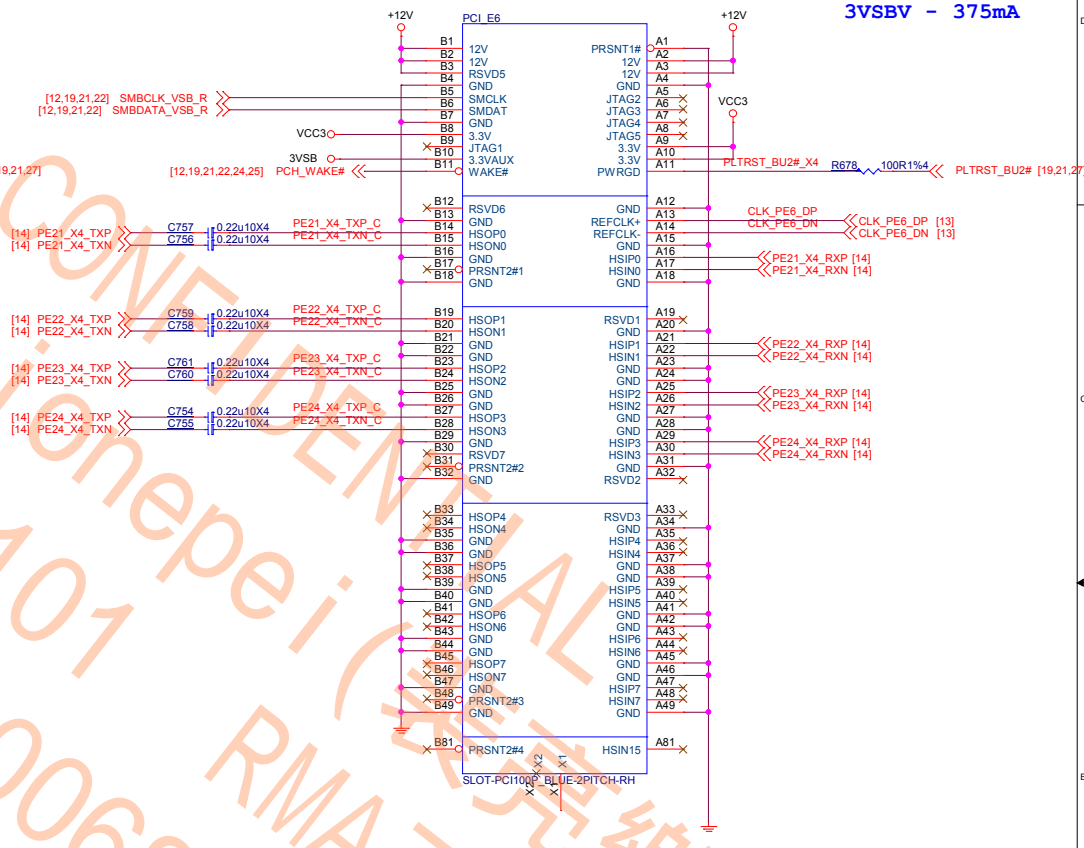
PCI Express X8 Slot

12V - 2.1A
VCC3 - 3A
3VSBV - 375mA

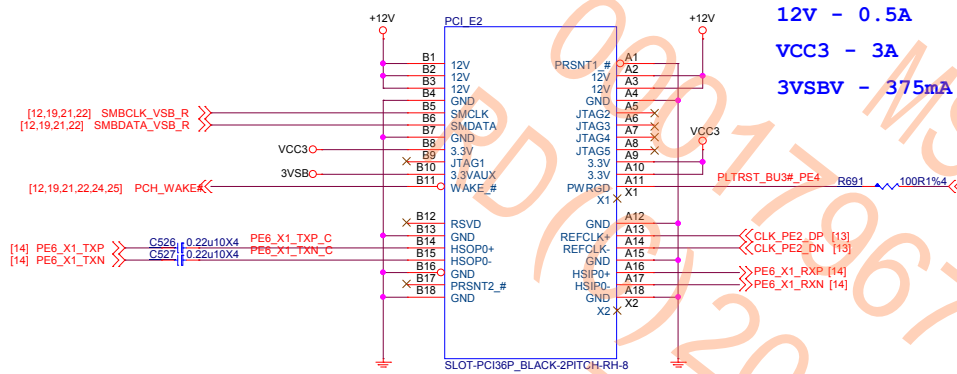


PCI Express X4 Slot

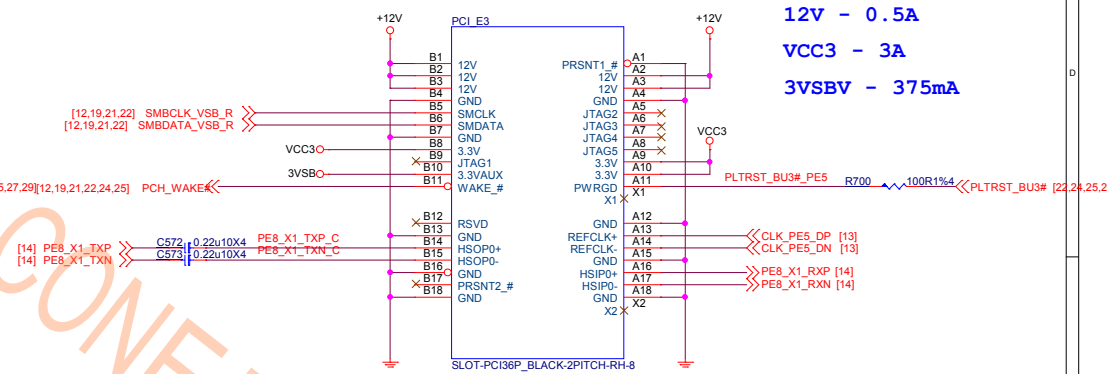
12V - 2.1A
VCC3 - 3A
3VSBV - 375mA



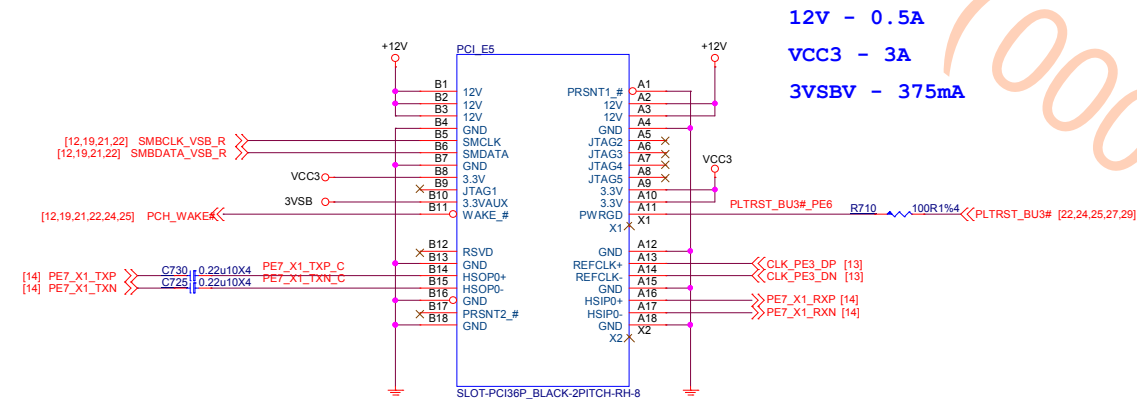
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2016.08.25 Modify to N11-0360211-F02



2016.08.25 Modify to N11-0360211-F02

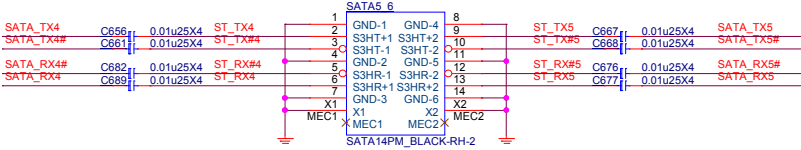
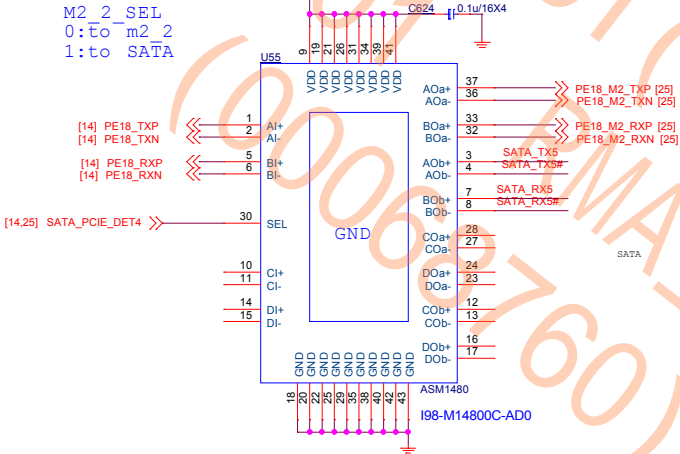
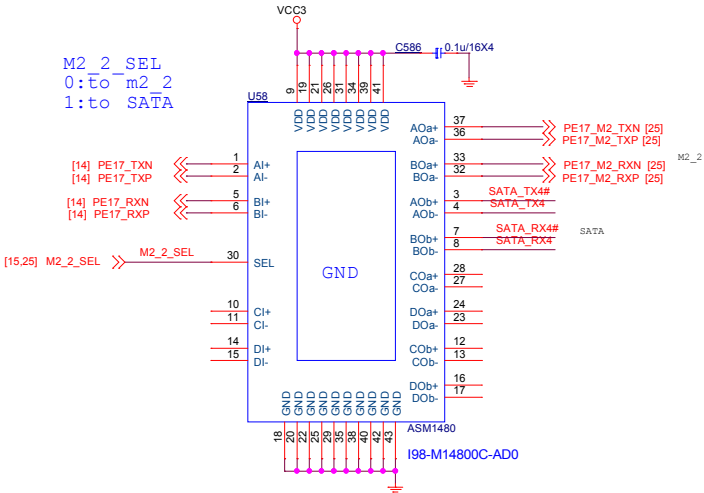



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SATA Connector





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RD(C)2018091101
石阿鋒


BIOS_MODE

GPP_G7	GPP_G6	GPP_G5	
BIOS_DIS_SW	M2_2_SEL	BIOS_SEL_PCIESATA2	Mode
GPI (1)	GPI (1)	GPI (0)	AUTO
0	1	0	SATA5
0	0	1	M2-SATA
0	0	0	M2-PCIE

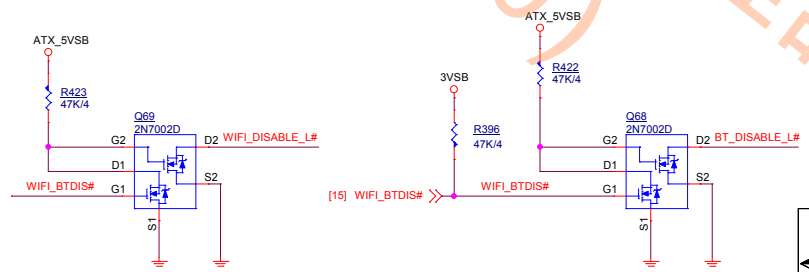
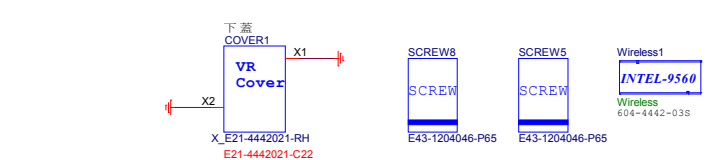
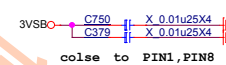
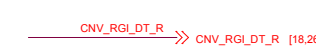
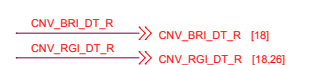
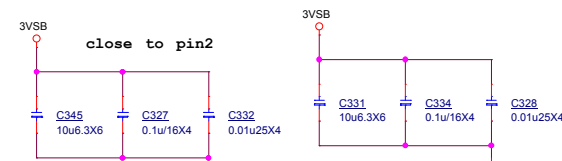
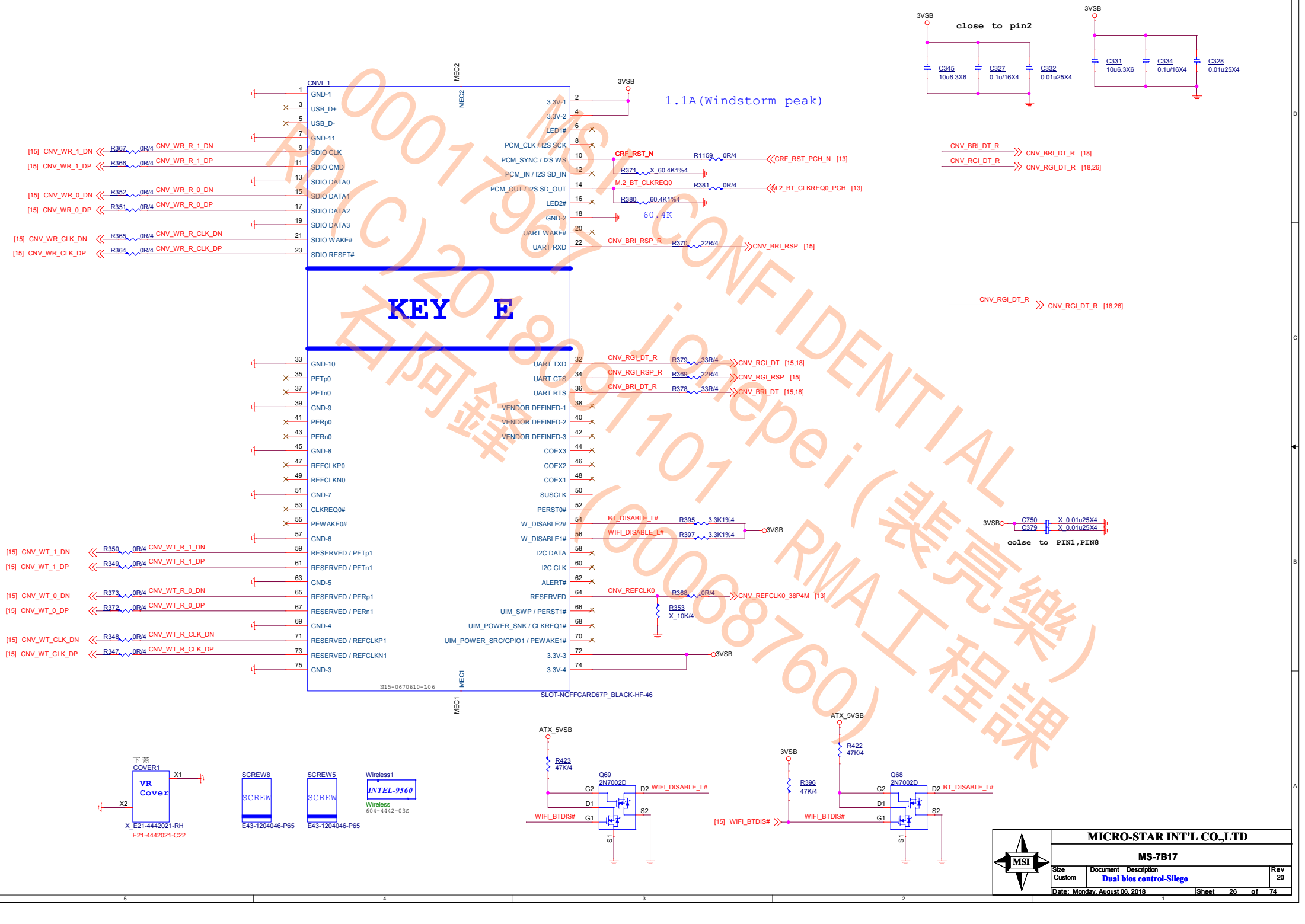
SATA_PCIE_DET4
0-PCIE
1-SATA

PCH side
0:PCIE
1:SATA
M.2 side
0:SATA
NC:PCIE

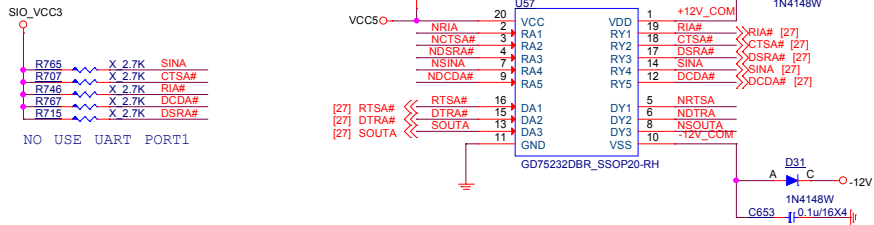
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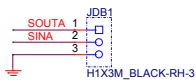
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MS-7B17			
Size	Document	Description	Rev
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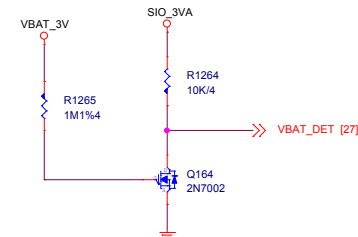
SERIAL PORT 1



BIOS DEBUG

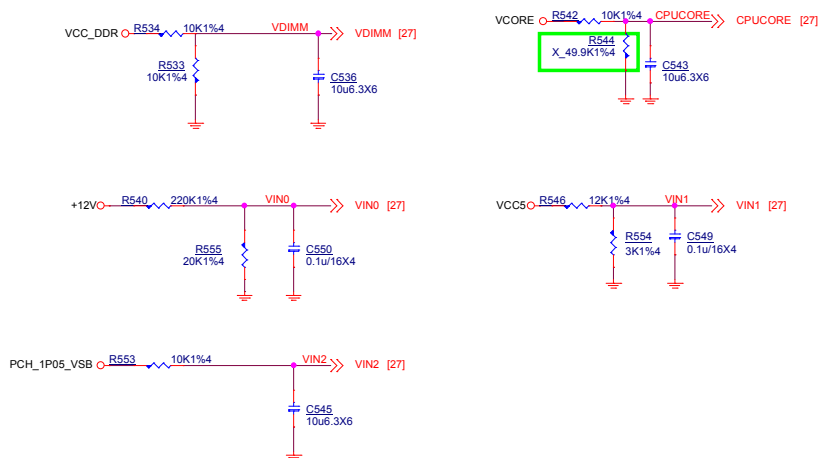


VBAT_DET



HW Monitor - Voltage

SIO HM Voltage voer 2V will not detect

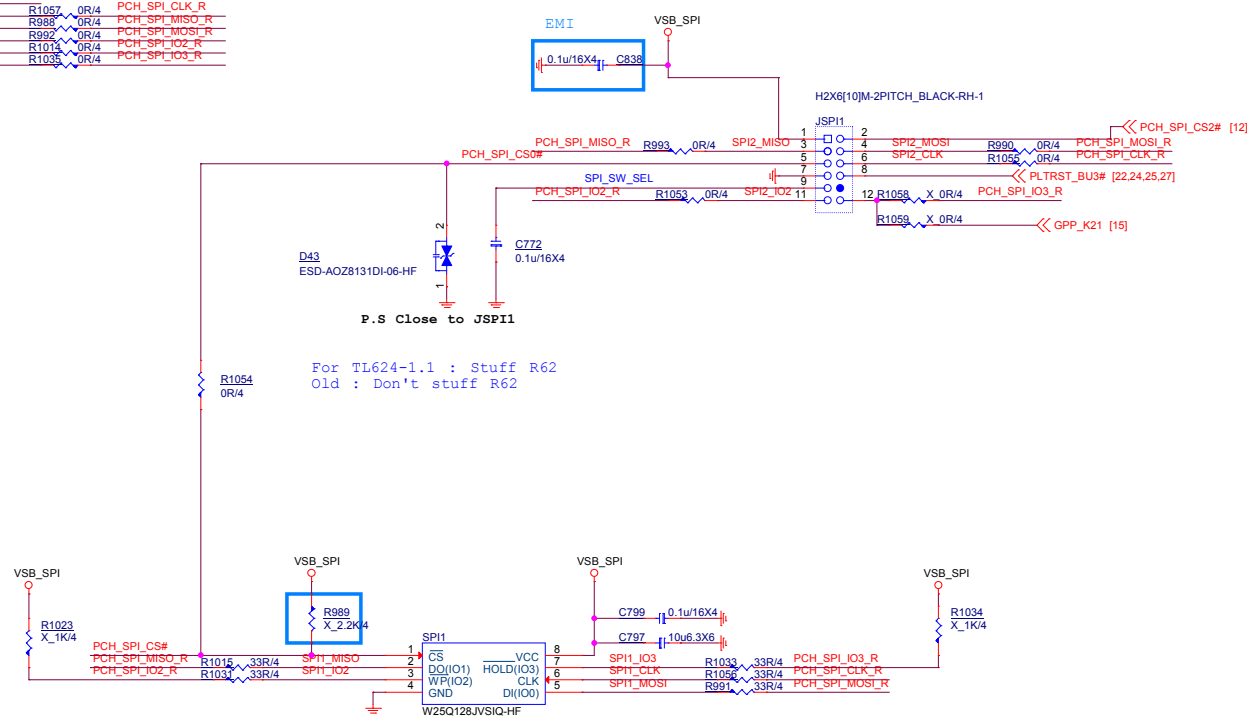
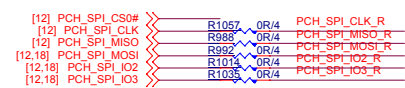
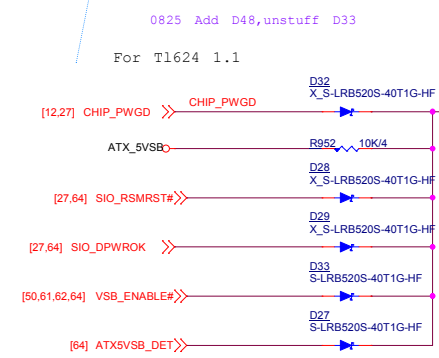


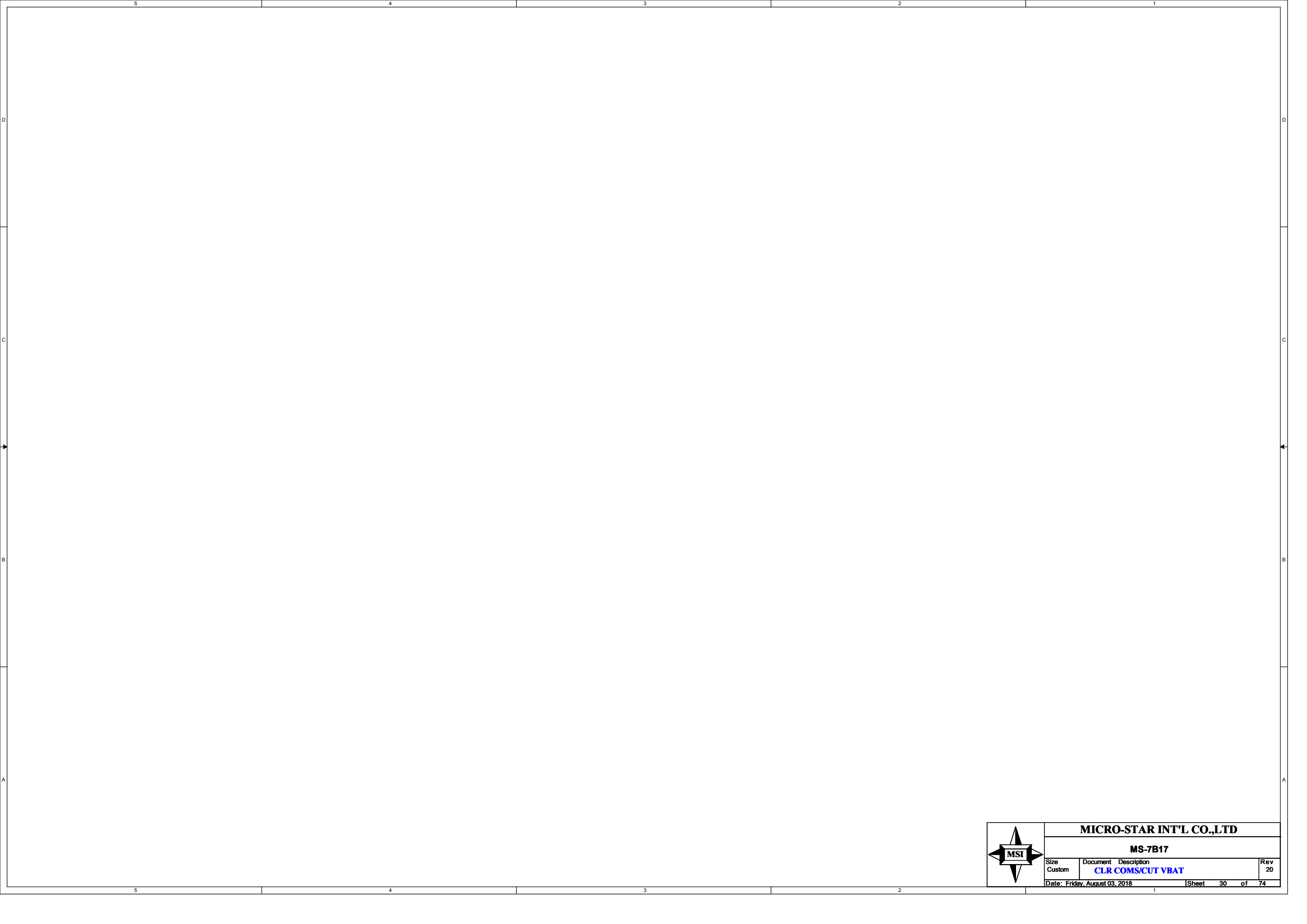
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Module Stuff CHIP_PWGD,
But PCH_PWROK may ramp up before CHIP_PWGD.





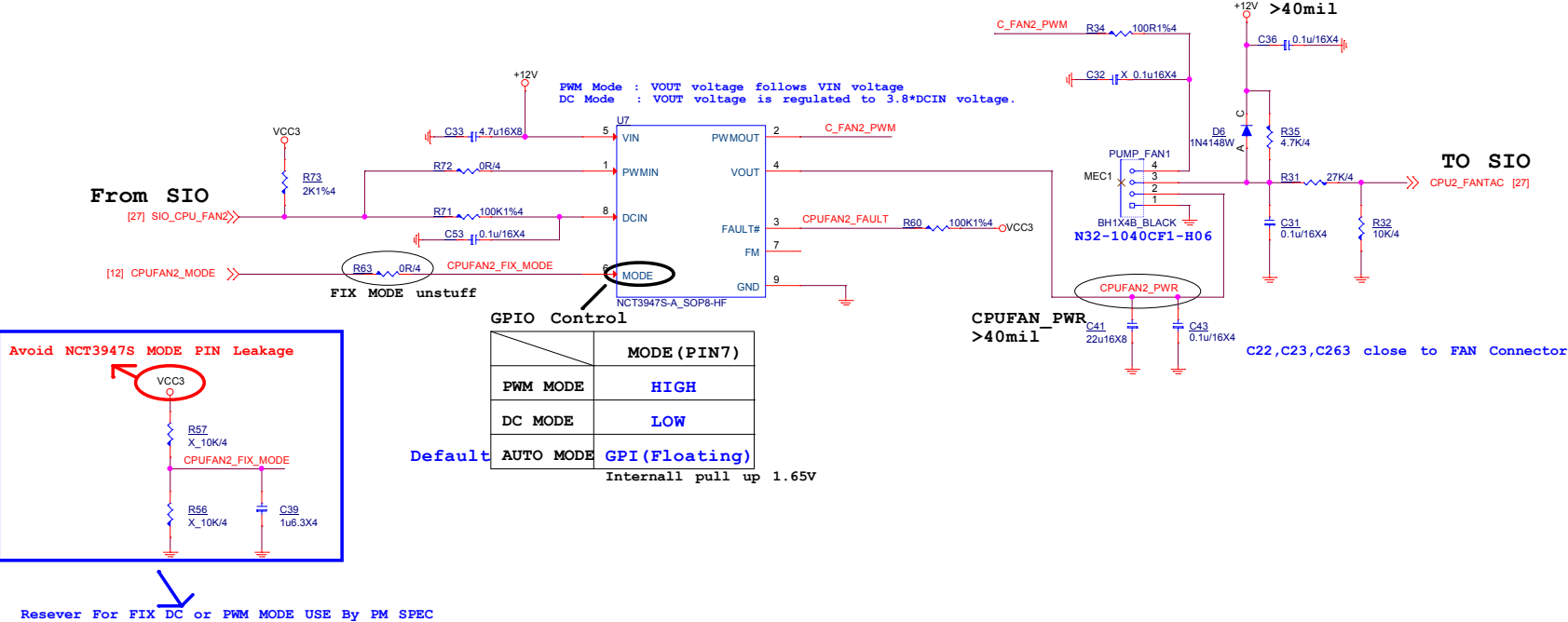
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MS-7B17			
Size	Document	Description	Rev
Custom		CLR COMS/CUT VBAT	20
Date: Friday, August 03, 2018		Sheet	30 of 74

1.Mode GPIO BIOS can swtich PWM/DC MODE



TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE

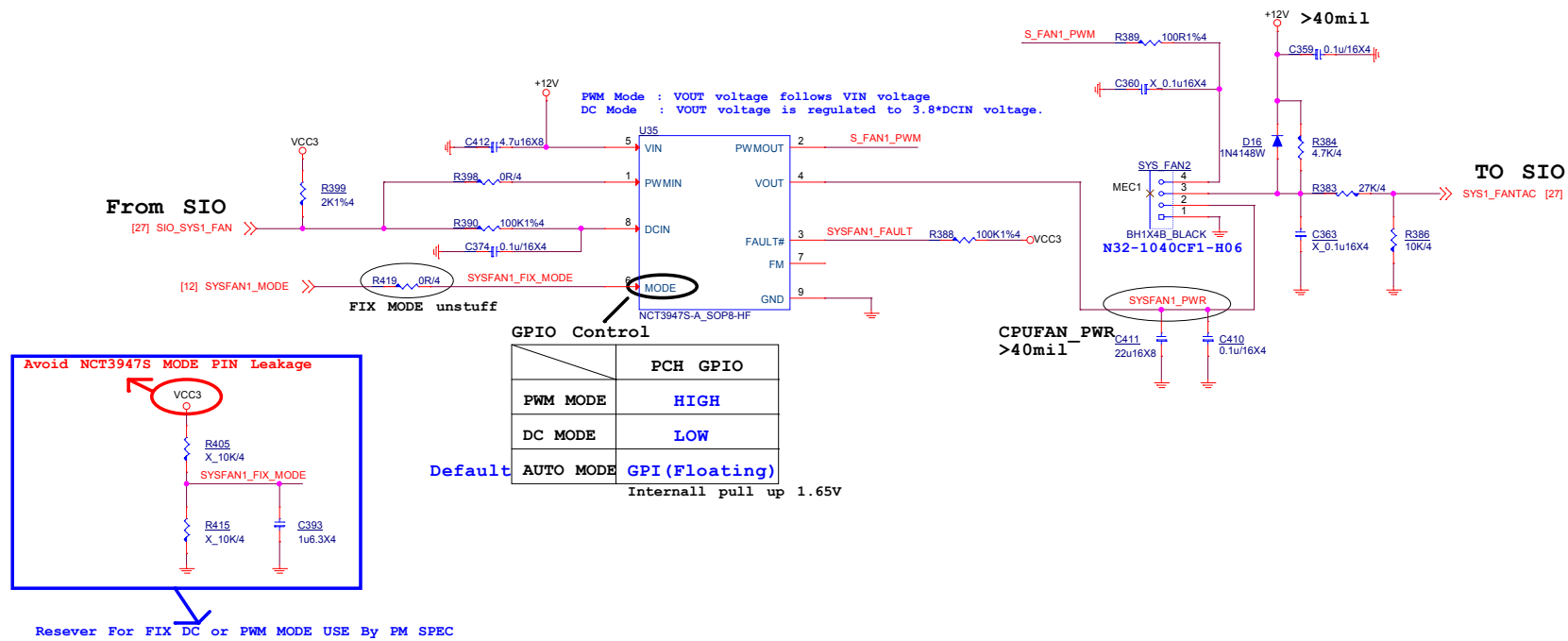
1.Mode GPIO BIOS can switch PWM/DC MODE



Default

	MODE (PIN7)
PWM MODE	HIGH
DC MODE	LOW
AUTO MODE	GPI (Floating)

Internall pull up 1.65v

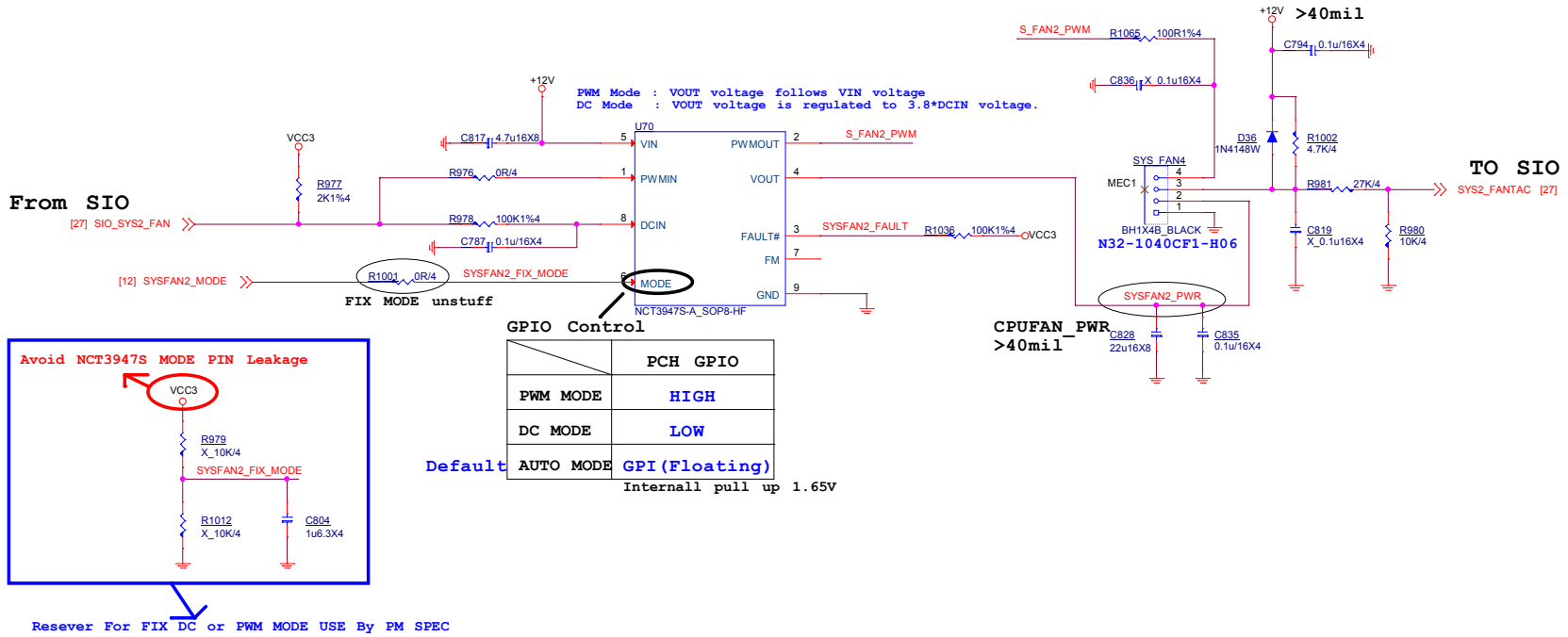


MICRO-STAR INT'L CO.,LTD

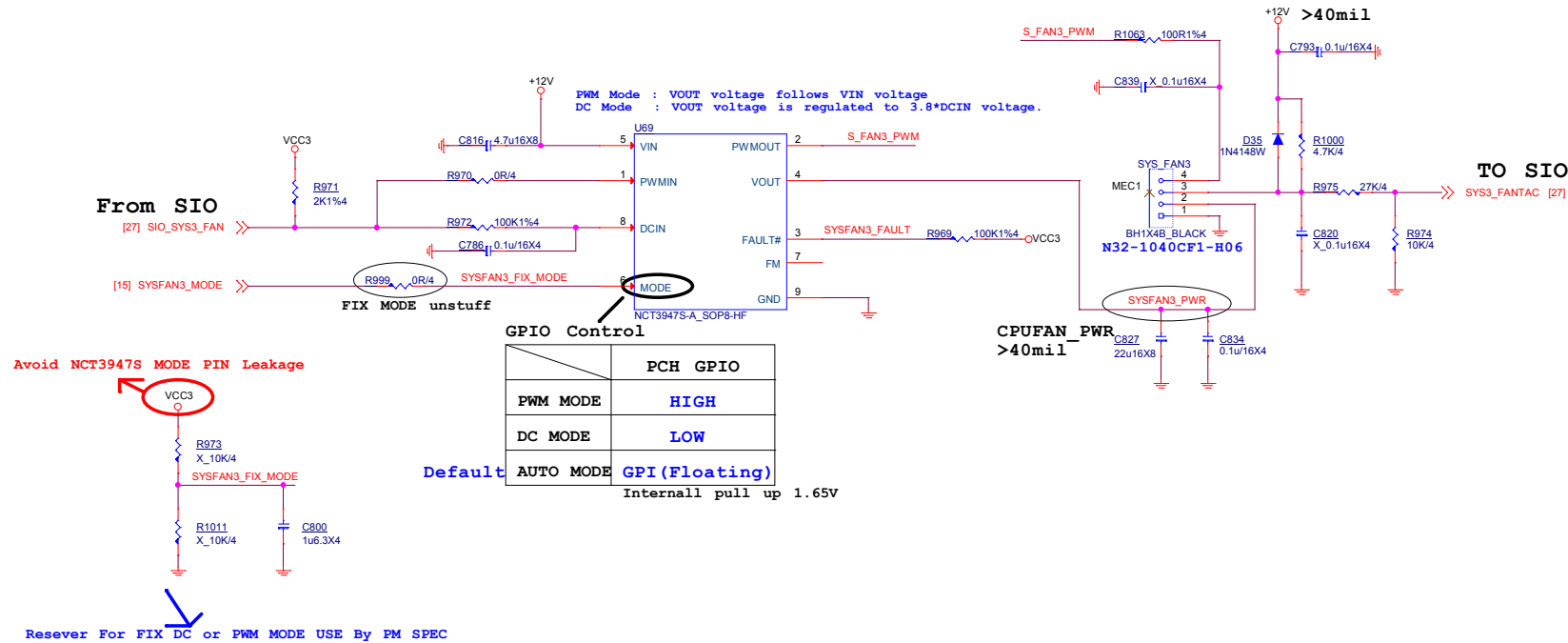
MS-7B17

Size	Document	Description	Rev
Custom		SYSTEM FANI	20
Date: Monday, August 06 2018		Sheet 33 of 74	

TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE
 1.Mode GPIO BIOS can switch PWM/DC MODE

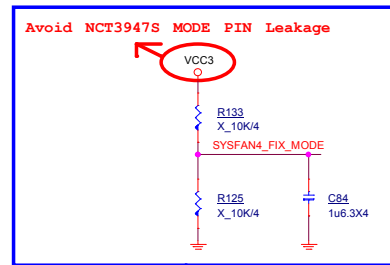
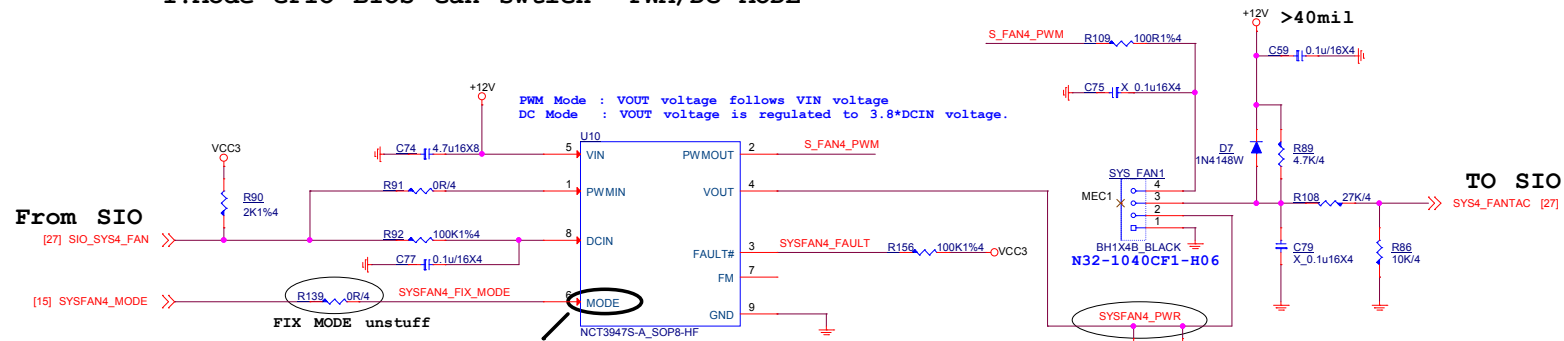


TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE
1.Mode GPIO BIOS can swtich PWM/DC MODE

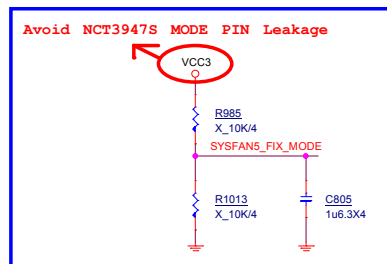
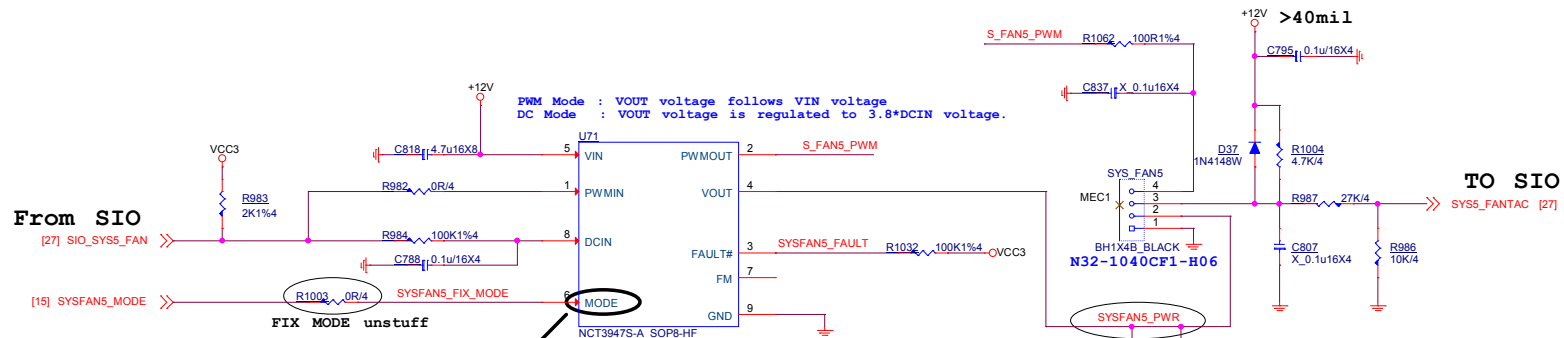


TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can switch PWM/DC MODE

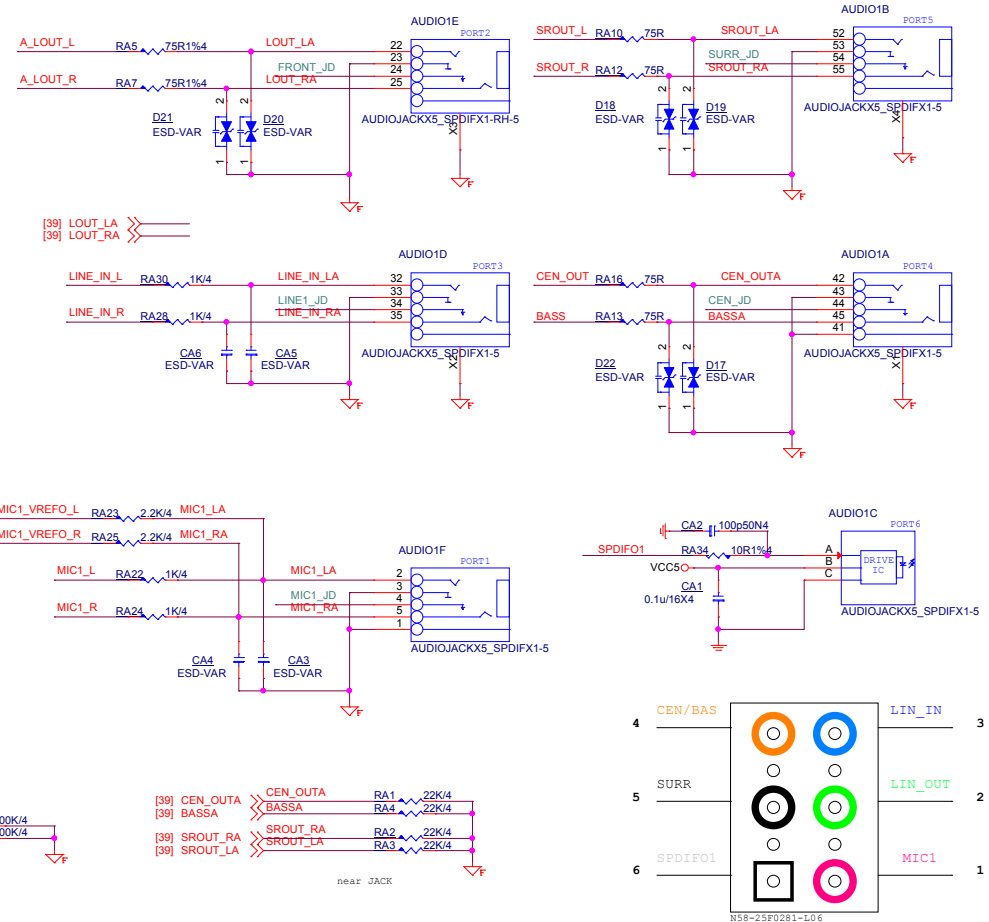
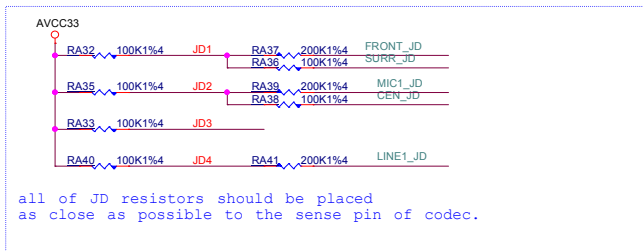
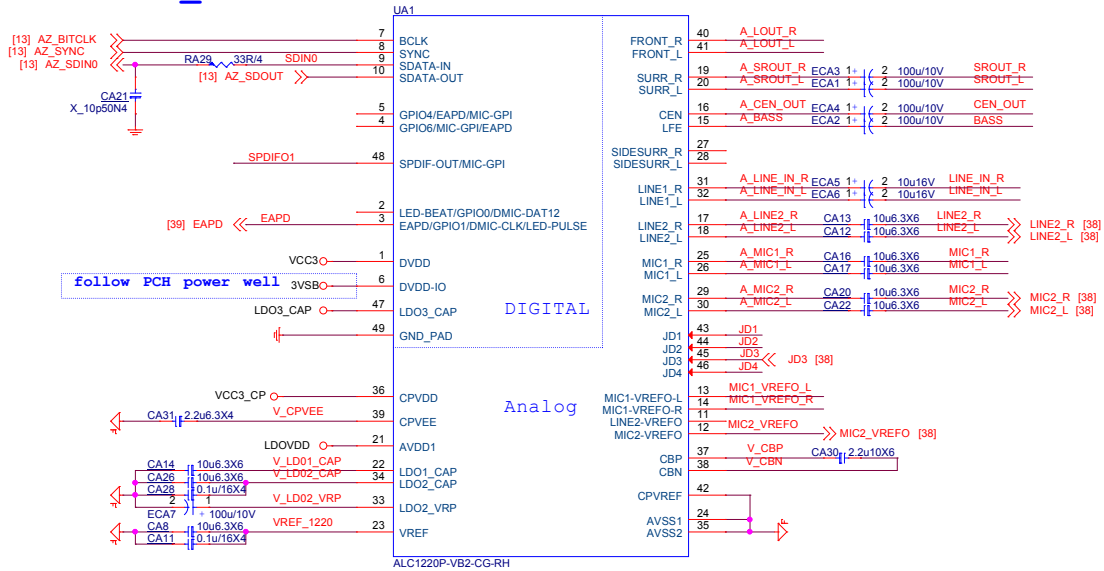


Resever For FIX DC or PWM MODE USE By PM SPEC



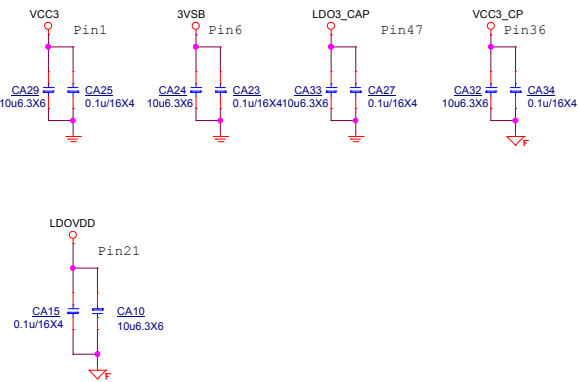
Resever For FIX DC or PWM MODE USE By PM SPEC

ALC1220P_VB-48PIN

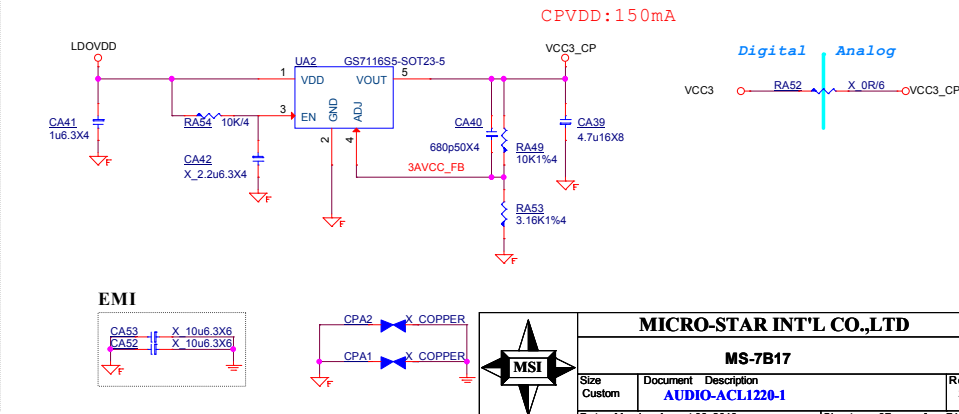


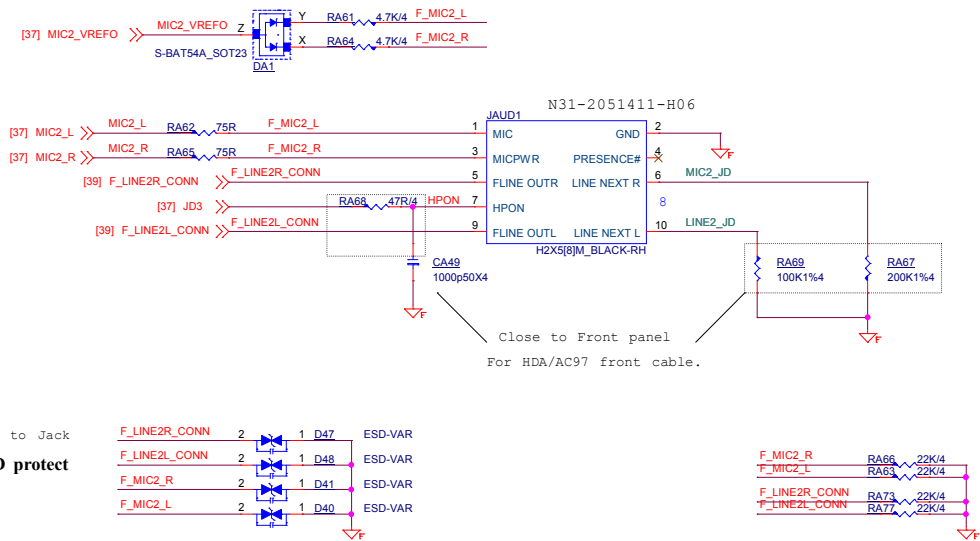
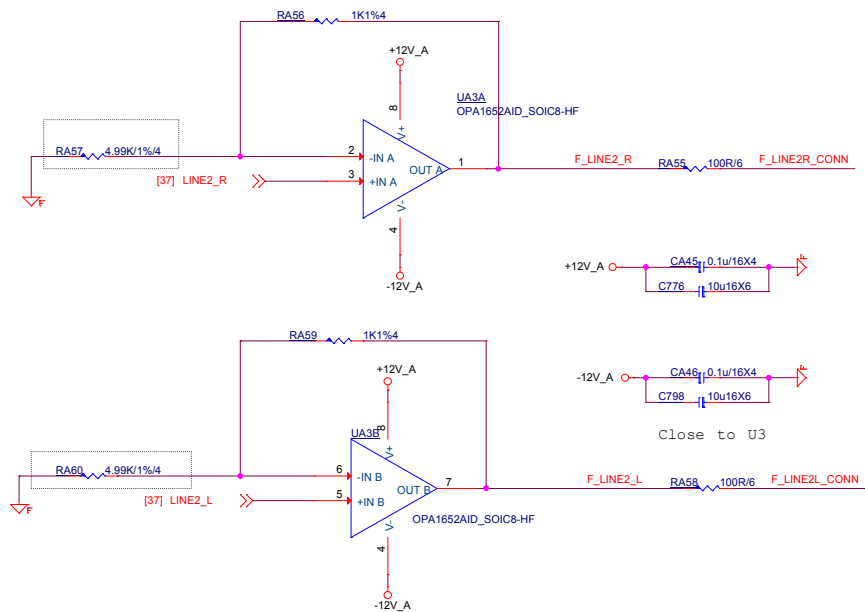
MS8-25P0281-L06

Closed Codec



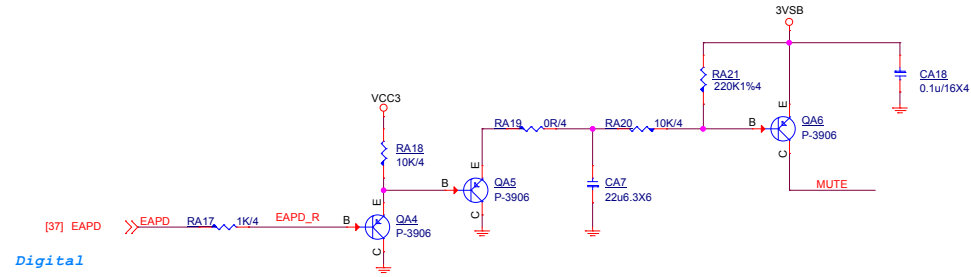
CPVDD POWER:ATX5VSB will Leakage to CVDD by ALC1220, so CVDD must keep 3.3V



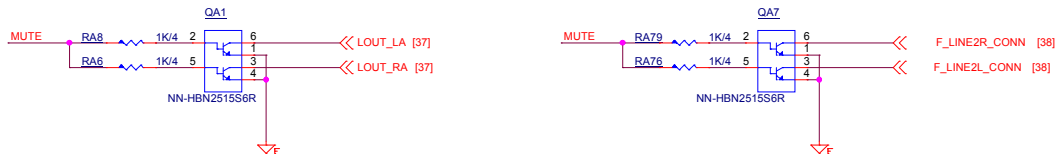


Rear Line OUT De-POP circuit

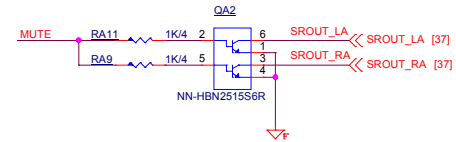
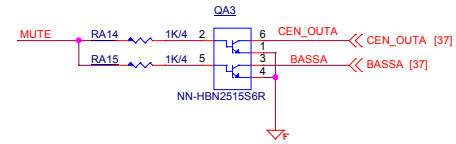
(De-pop circuit for Rear Line out & Front Headphone out)



Analog



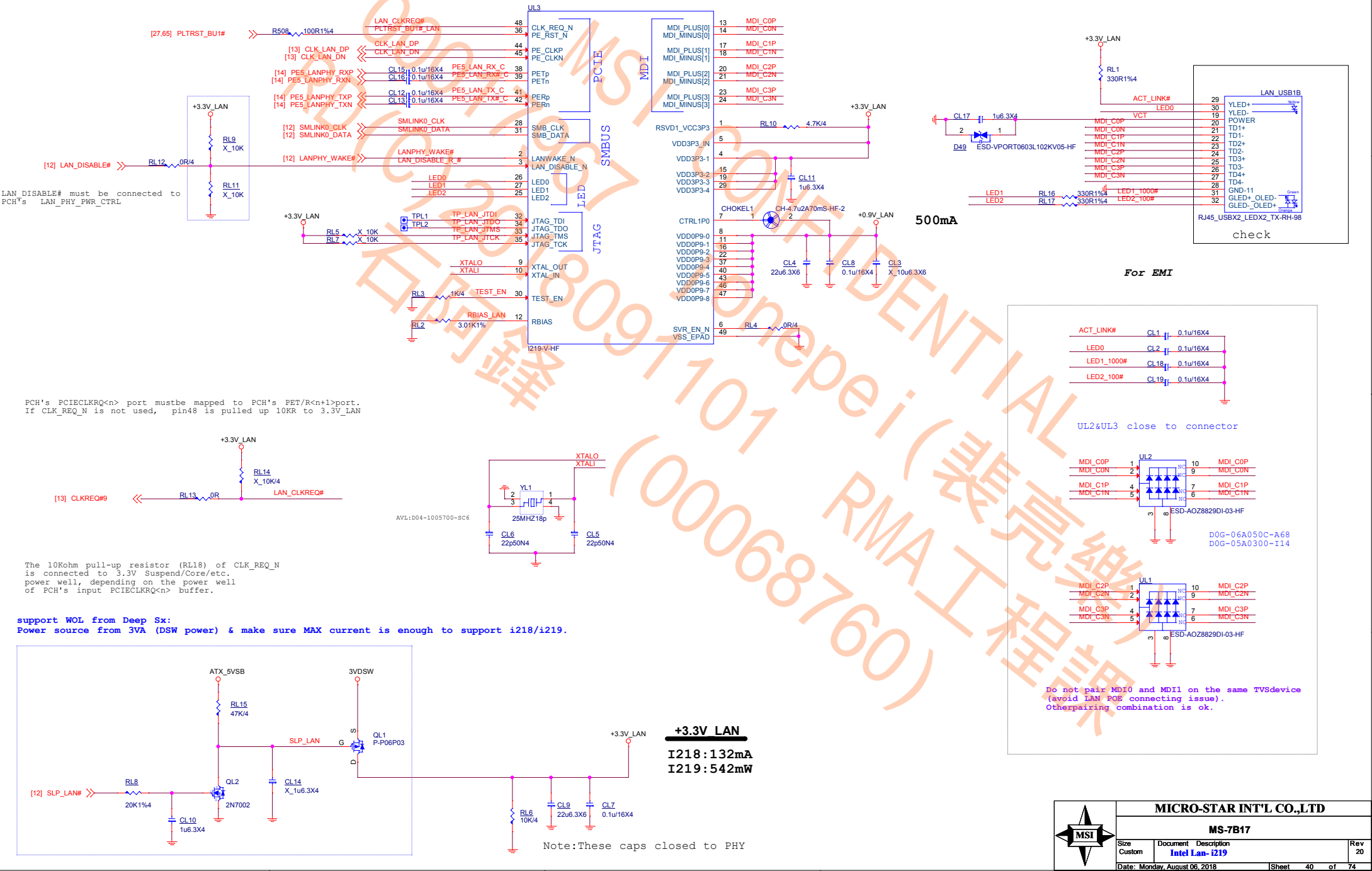
(add de-pop circuit by PM spec or customer request,
NOTE: add de-pop circuit need to change SROUT_LA,SROUT_RA, CEN_OUTA, BASSA to TVS)



Intel Lan- i219

8111H:B06-08111CC-R09
8111G:B06-081116C-R09

LAN Connector



LAN_DISABLE# must be connected to PCH's LAN_PHY_PWR_CTRL


PCH's PCIECLKREQ<n> port must be mapped to PCH's PET/R<n+1>port. If CLK_REQ_N is not used, pin48 is pulled up 10KRR to 3.3V_LAN

The 10Kohm pull-up resistor (RL18) of CLK_REQ_N is connected to 3.3V Suspend/Core/etc. power well, depending on the power well of PCH's input PCIECLKREQ<n> buffer.

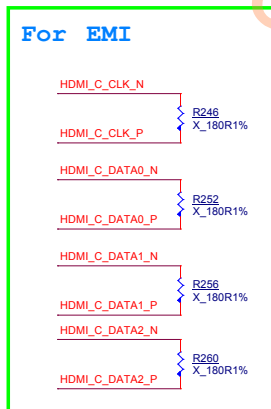
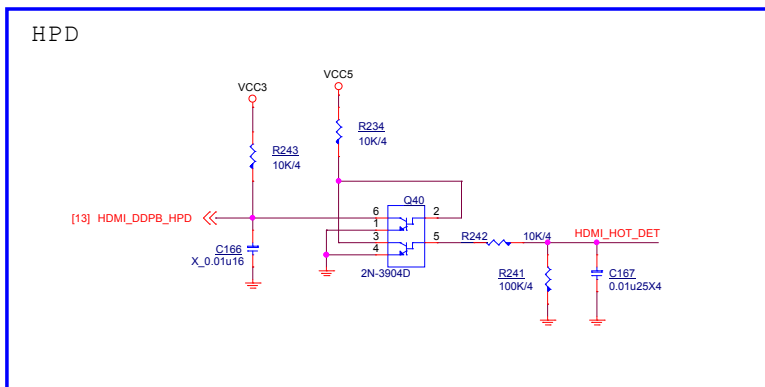
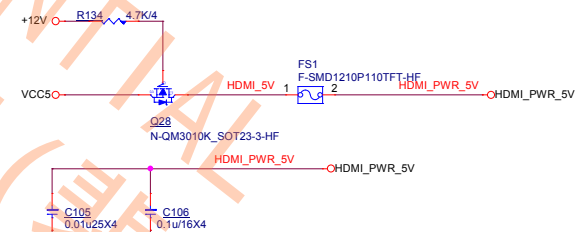
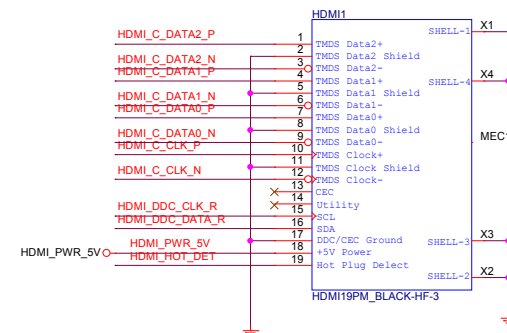
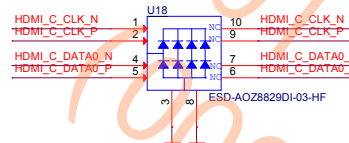
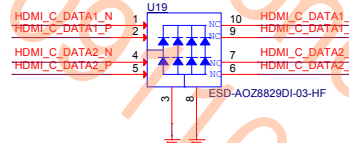
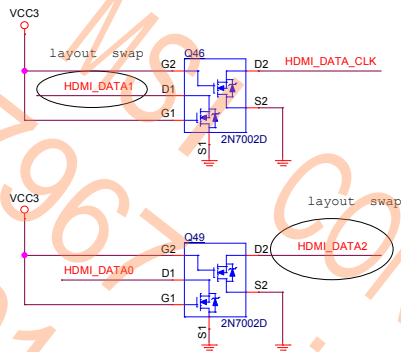
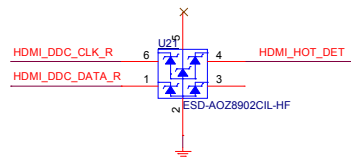
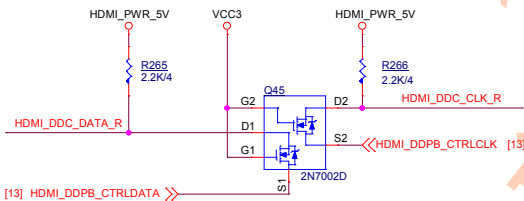
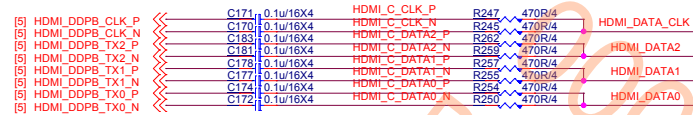
support WOL from Deep Sx:
Power source from 3VA (DSW power) & make sure MAX current is enough to support i218/i219.

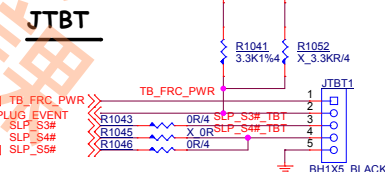
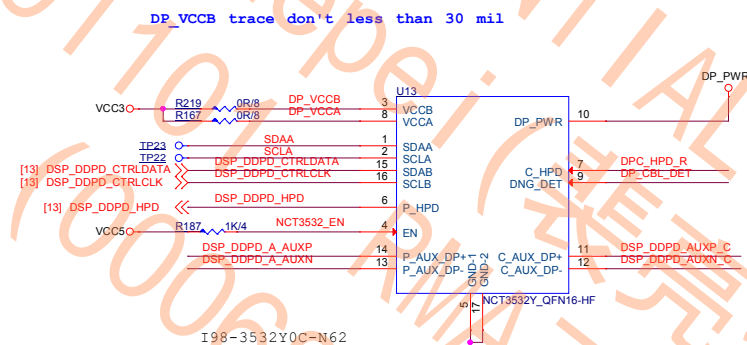
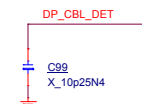
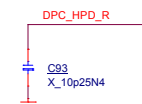
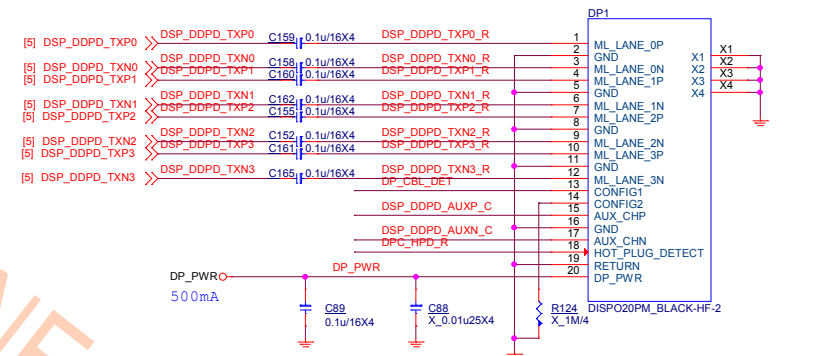
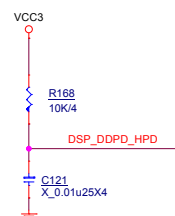
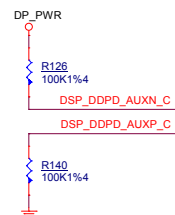
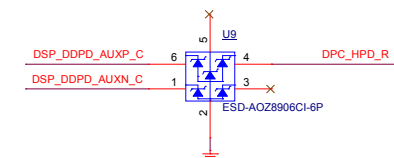
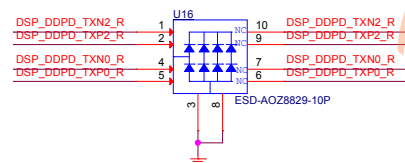
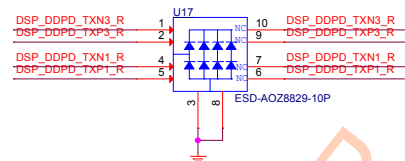
		MICRO-STAR INT'L CO.,LTD		
		MS-7B17		
Size	Custom	Document	Description	Rev
			Intel Lan- i219	20
Date:	Monday, August 06, 2018	Sheet	40 of 74	

MSI CONFIDENTIAL
00017967 jonepei (裴亮樂)
RD(C)2018091101 RMA工程課
石阿鋒 (00068760)

	MICRO-STAR INT'L CO.,LTD		
	MS-7B17		
	Size	Document	Description
	Custom	DVI Connector	
Date: Friday, August 03, 2018		Sheet 41 of 74	Rev 20

HDMI, DVI : 1920x1200 at 60 Hz (16:10 WUXGA)

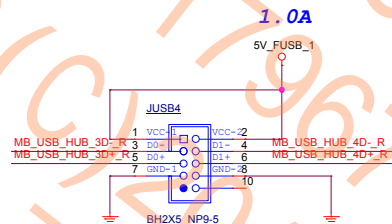
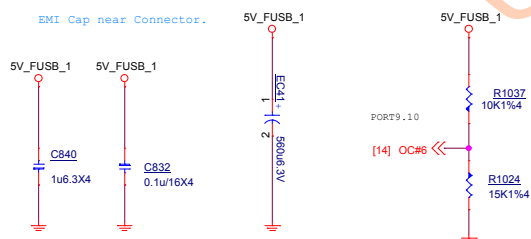
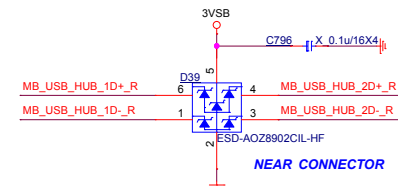
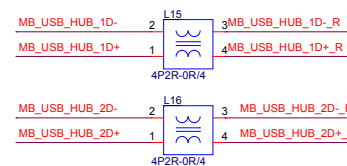
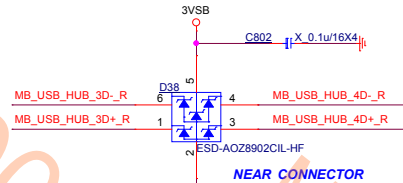
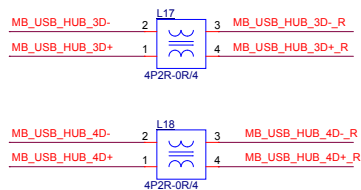




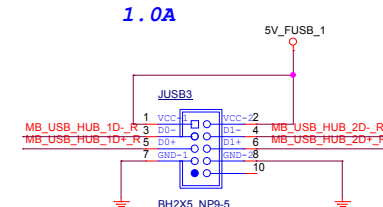
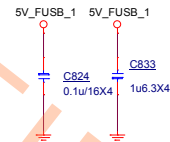
MICRO-STAR INT'L CO.,LTD

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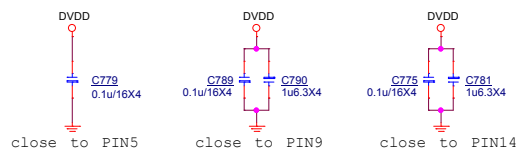


EMI Cap near Connector.



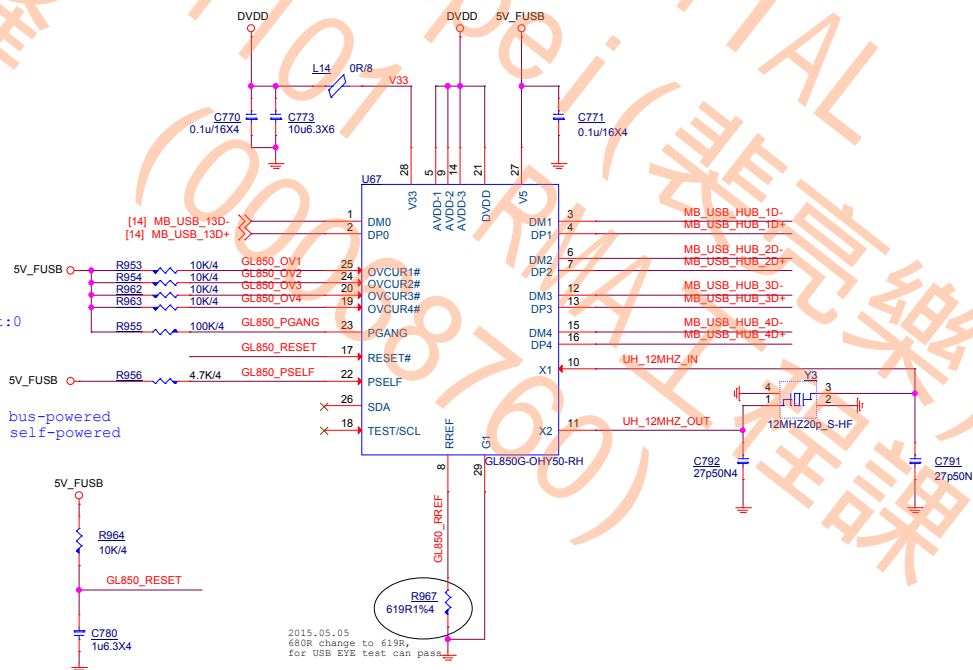
USB2.0 HUB

4-port at high-speed mode. --> 58.6mA



PIN23
Gang input:1
Individual input:0

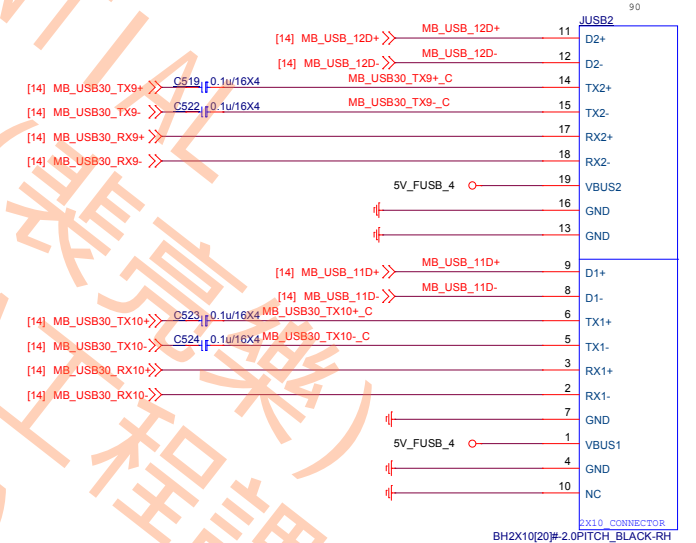
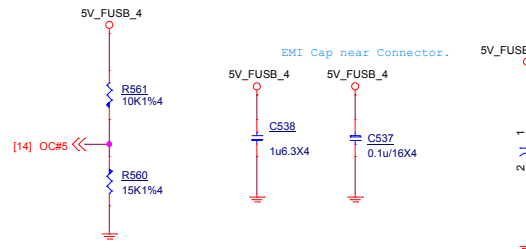
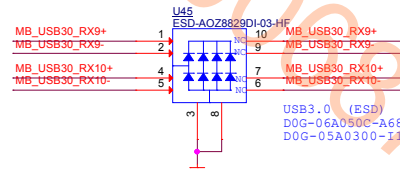
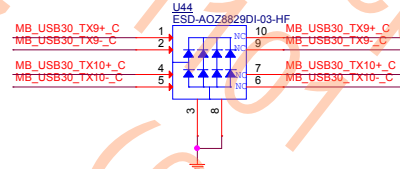
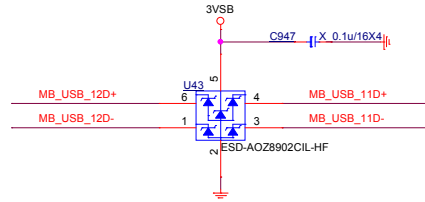
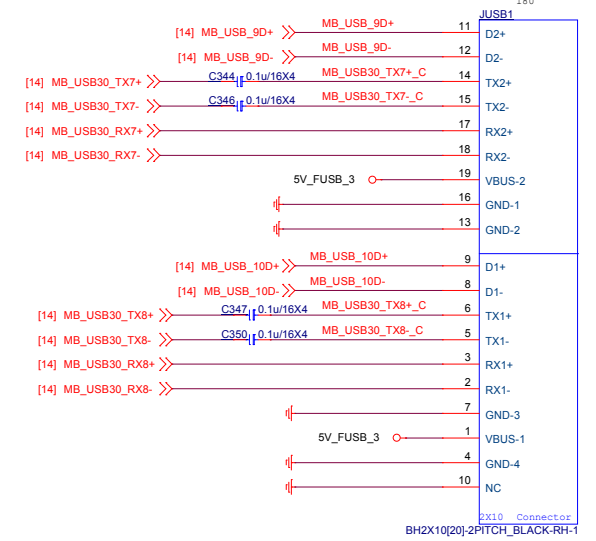
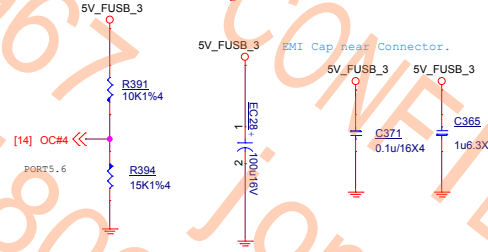
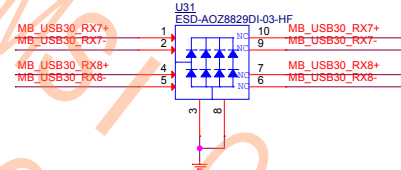
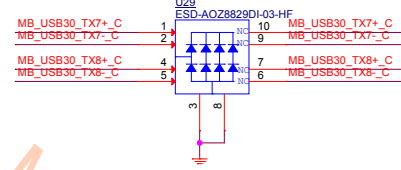
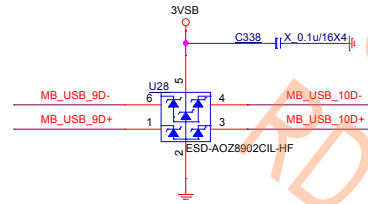
PIN22
0: GL850G-50 is bus-powered
1: GL850G-50 is self-powered

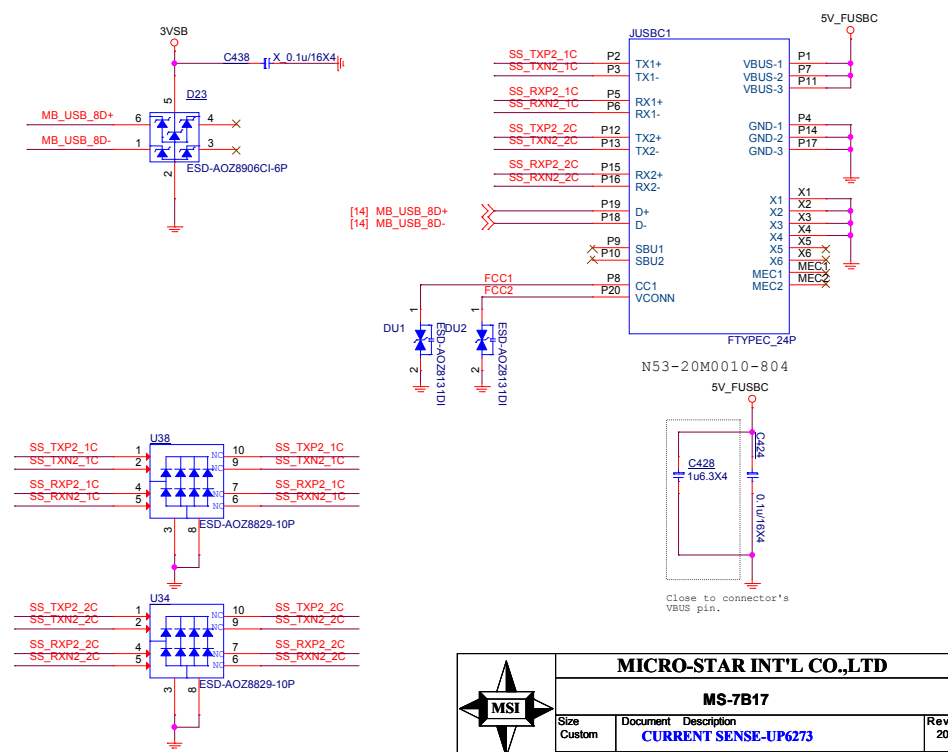
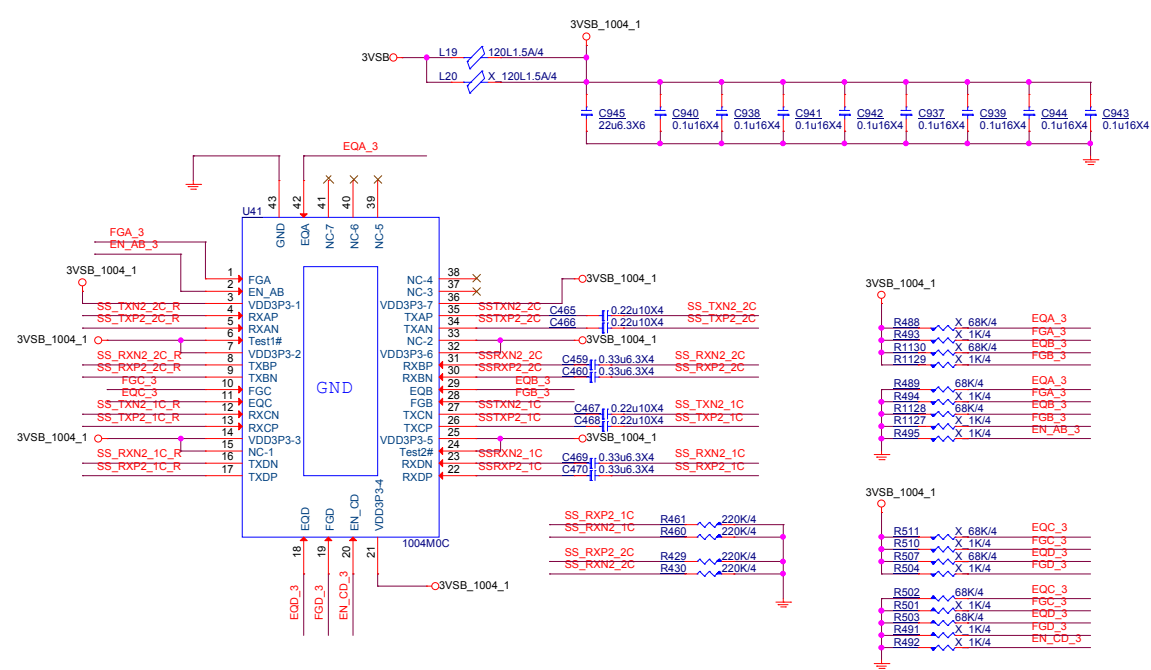


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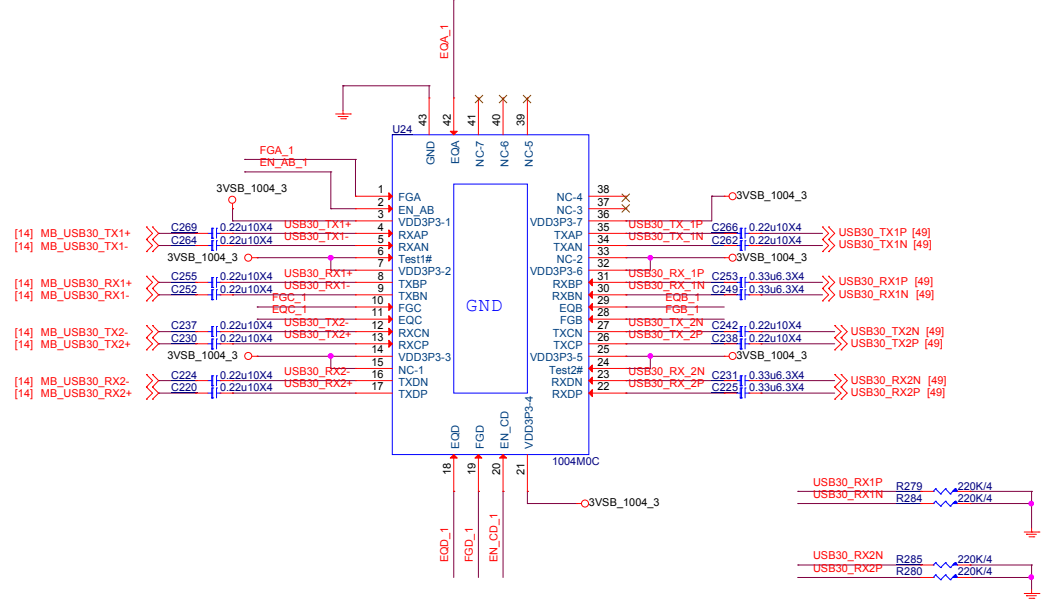
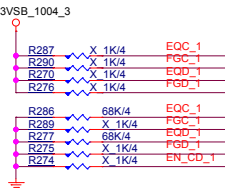
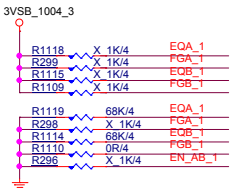
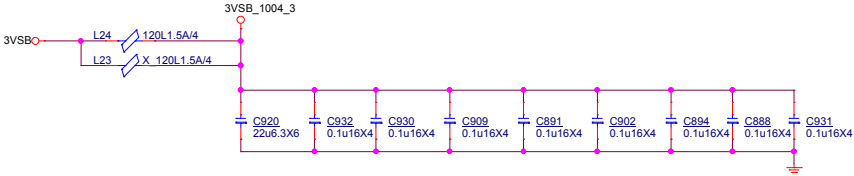
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Rear USB3.1 Redriver





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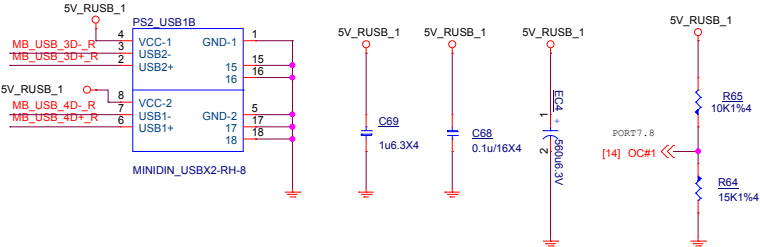
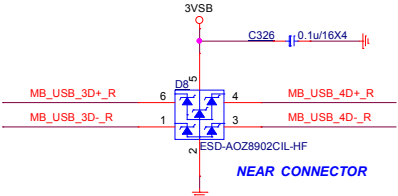
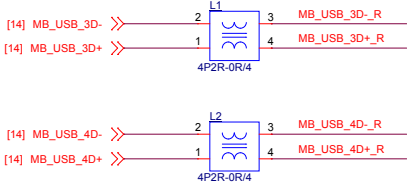
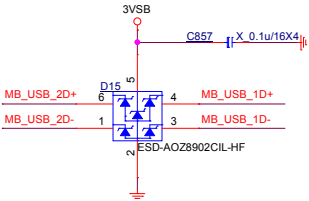
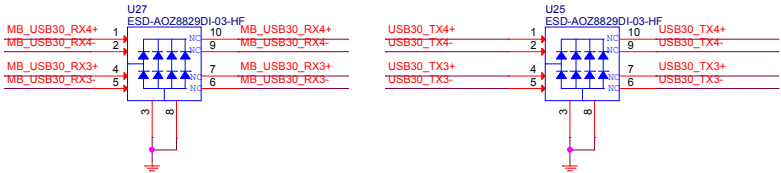
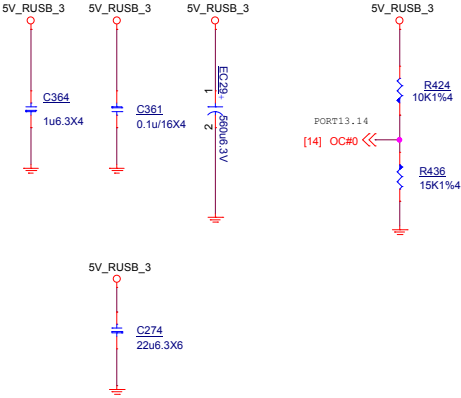
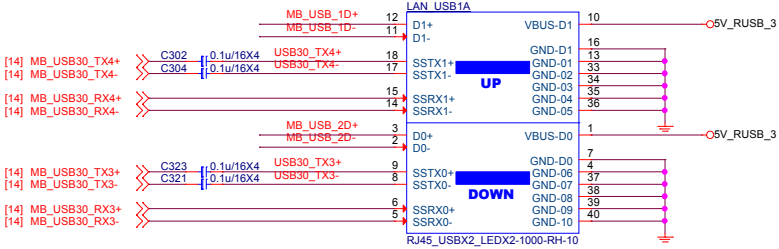
Size	Document	Description	Rev
Custom	Front	USB30	20

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LAN USB2.0 &3.0

[14] MB_USB_2D+ >> _____
[14] MB_USB_2D- >> _____

[14] MB_USB_1D+ >> _____
[14] MB_USB_1D- >> _____

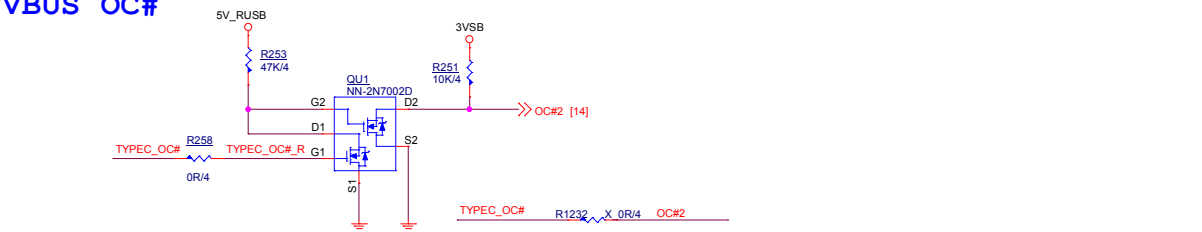


MICRO-STAR INT'L CO.,LTD

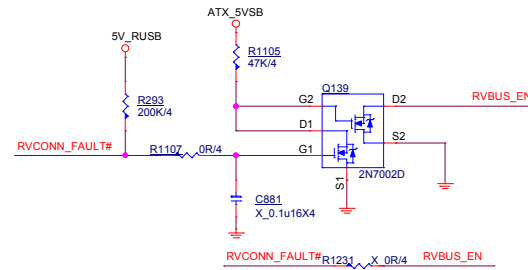
MS-7B17

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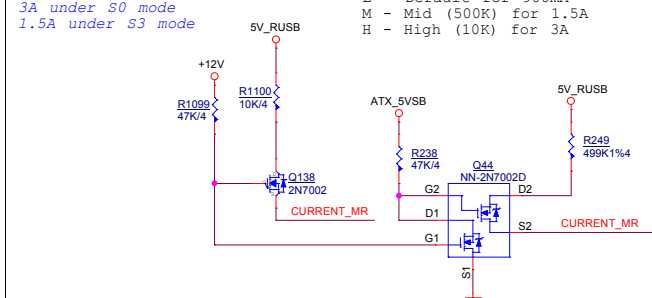
VBUS OC#



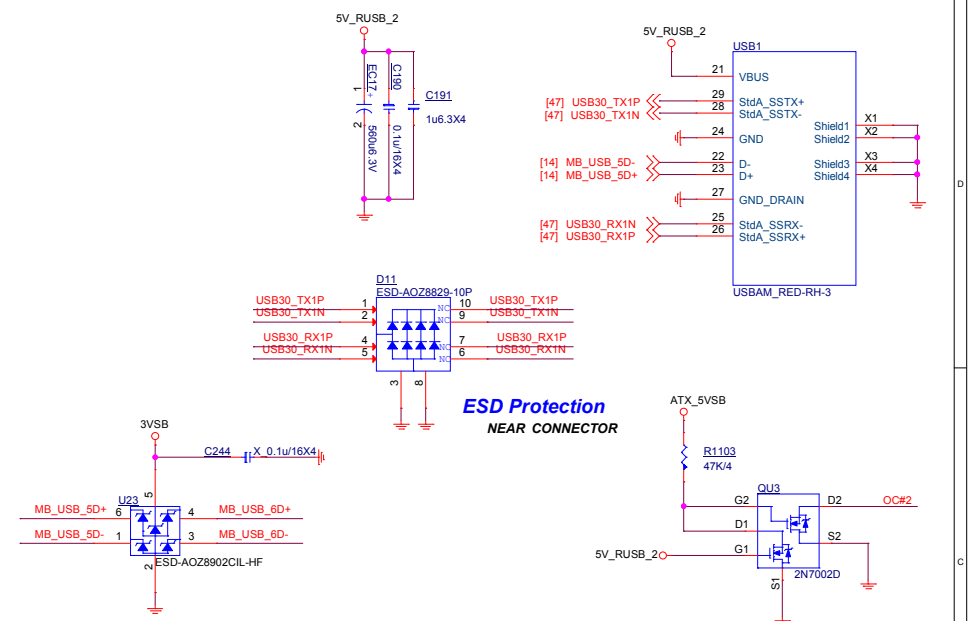
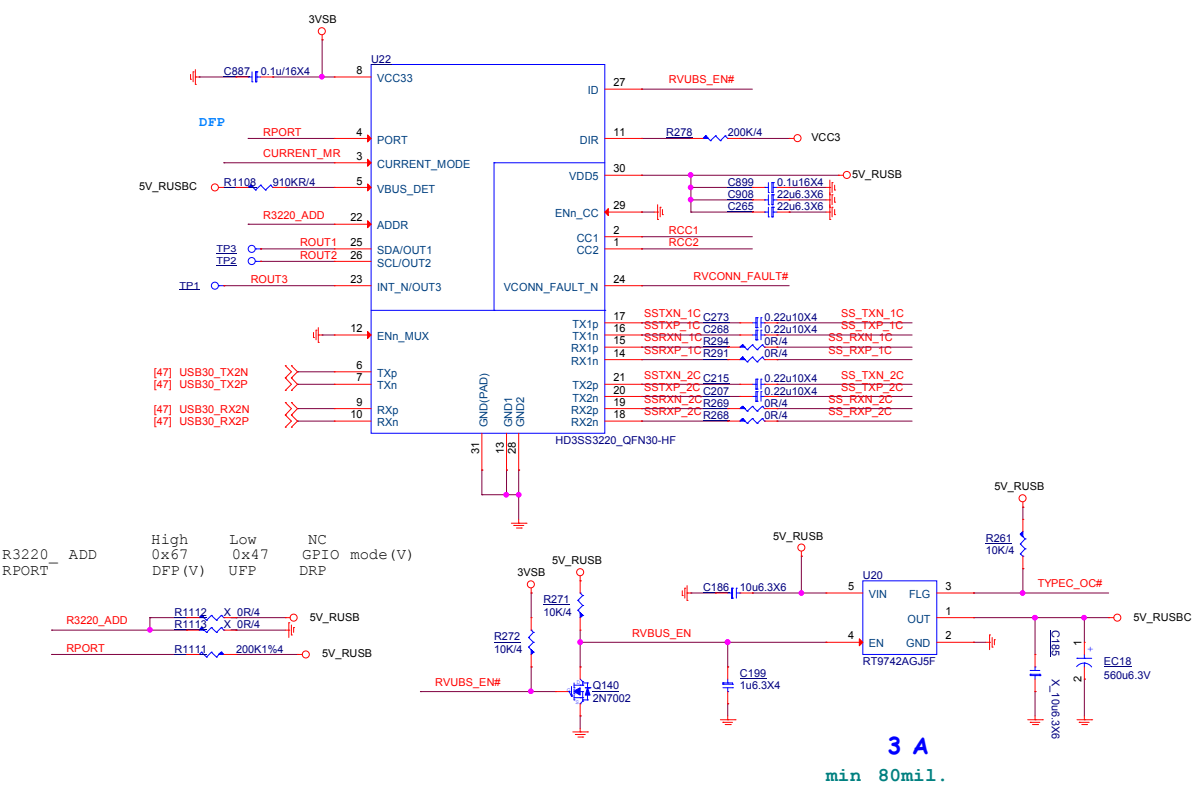
VCONN OC#



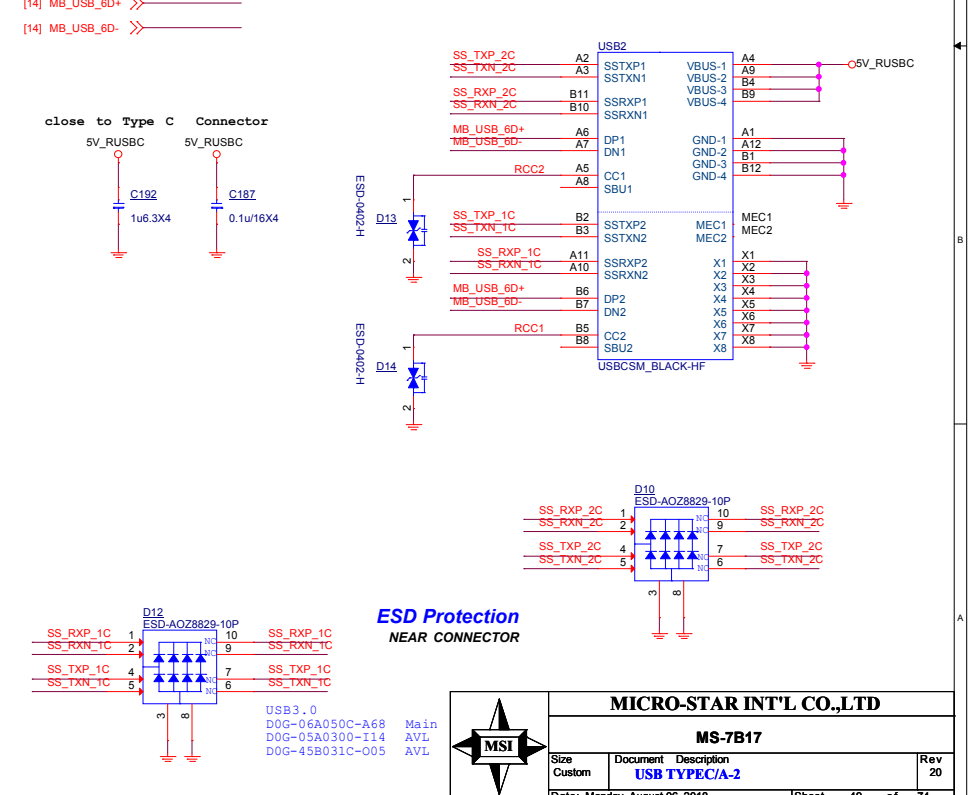
Current Mode




USB Type-C MUX with Configuration Channel (CC)



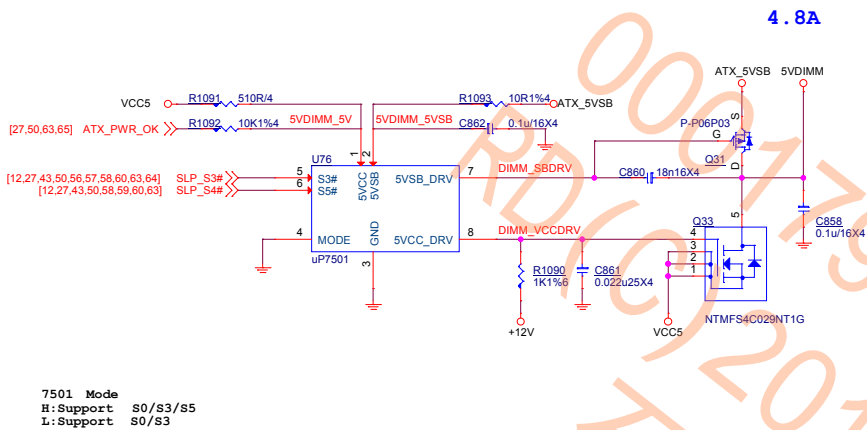
TYPE-C



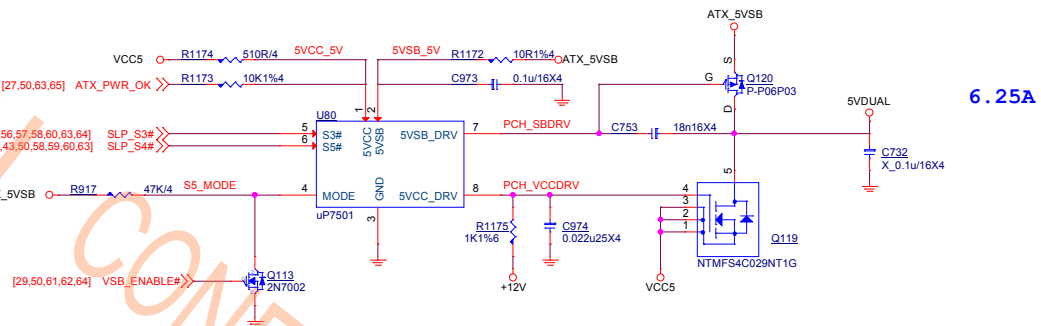


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Size	Document	Description	Rev
Custom		USB TYPE/A-2	20
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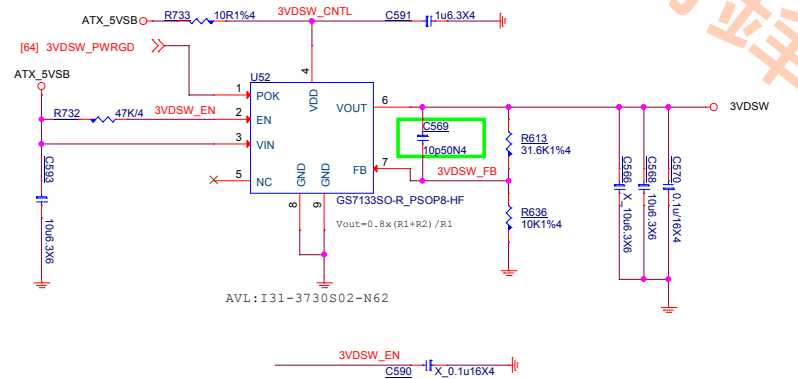
5VDIMM FOR DDR



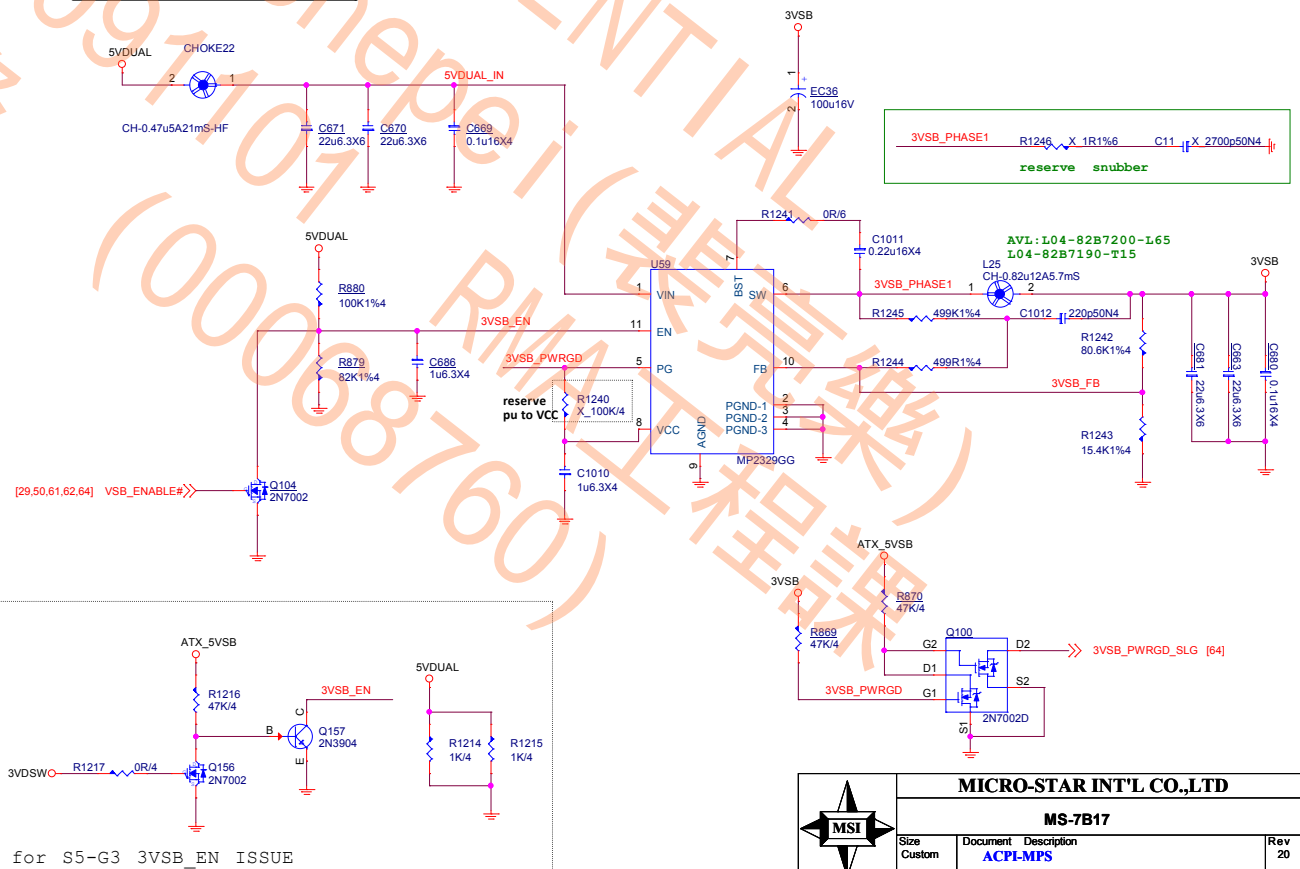
5VDUAL



3VDSW 0.512A



3VSB cost down 4.7A

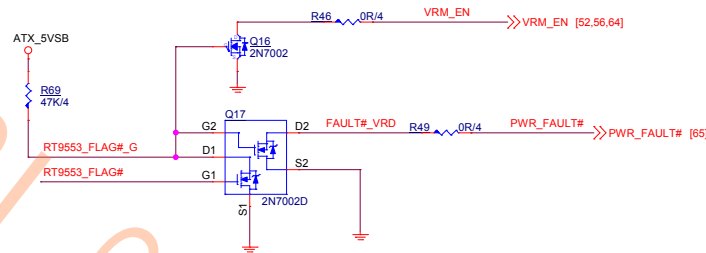
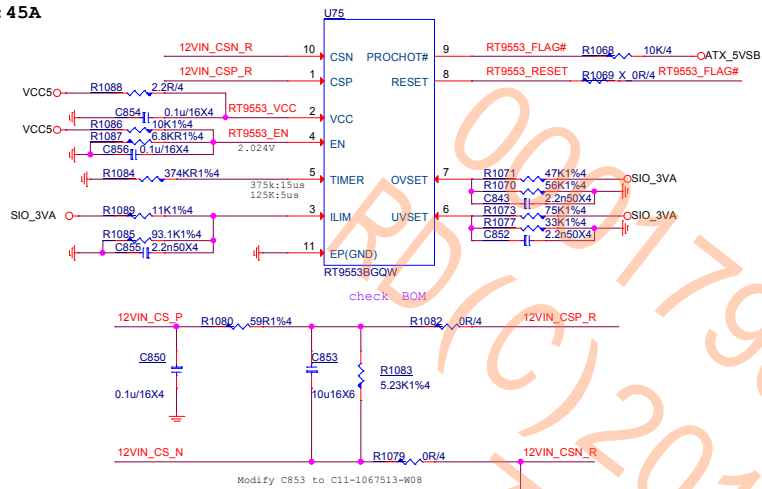


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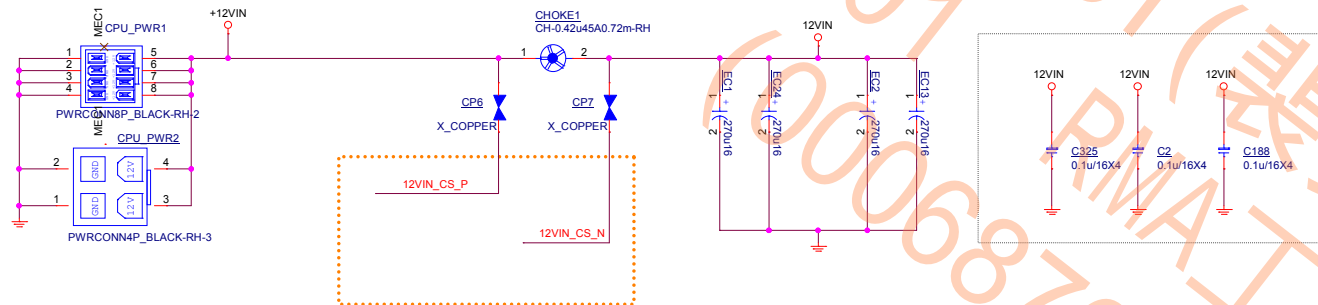
OCP: 45A
Real OCP: 45A

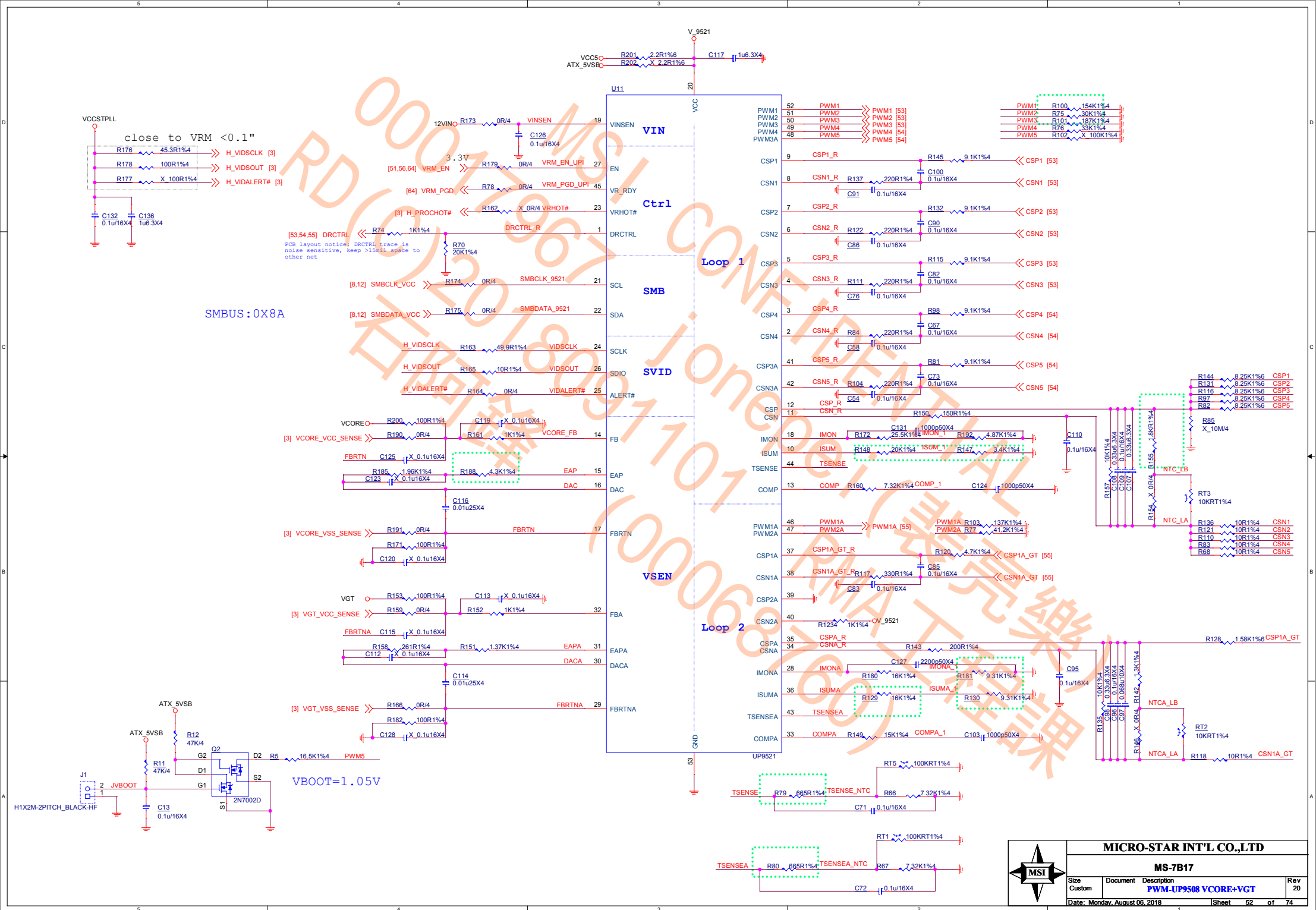


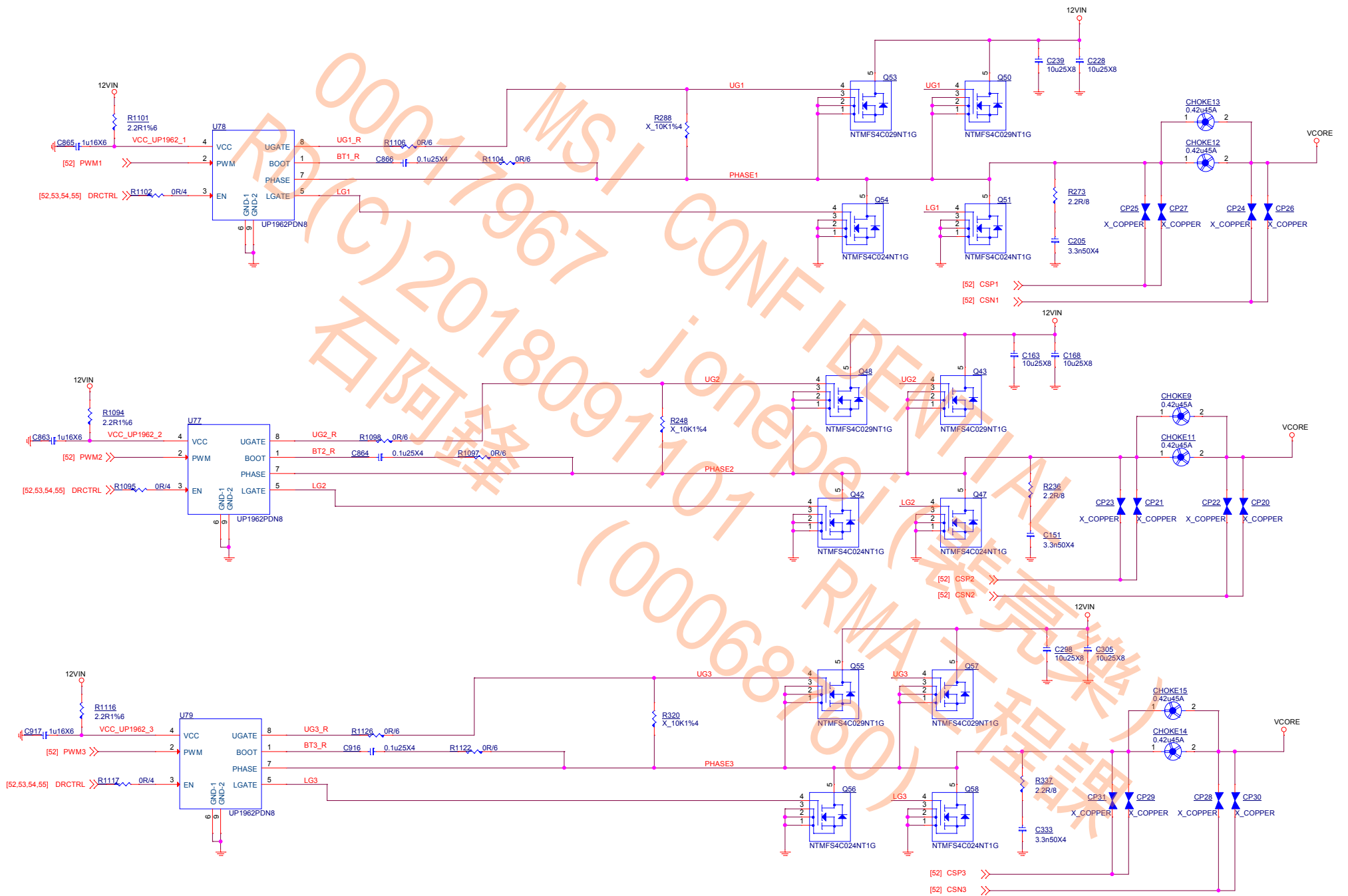
OCP: 45A
Real OCP: 45A

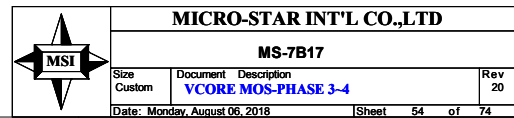
$R17+R18 > 100k$ $V_{sio_3va} = 3.38V$ $R_{dcr} = 0.5 \text{ mohm}$

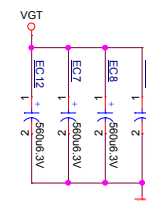
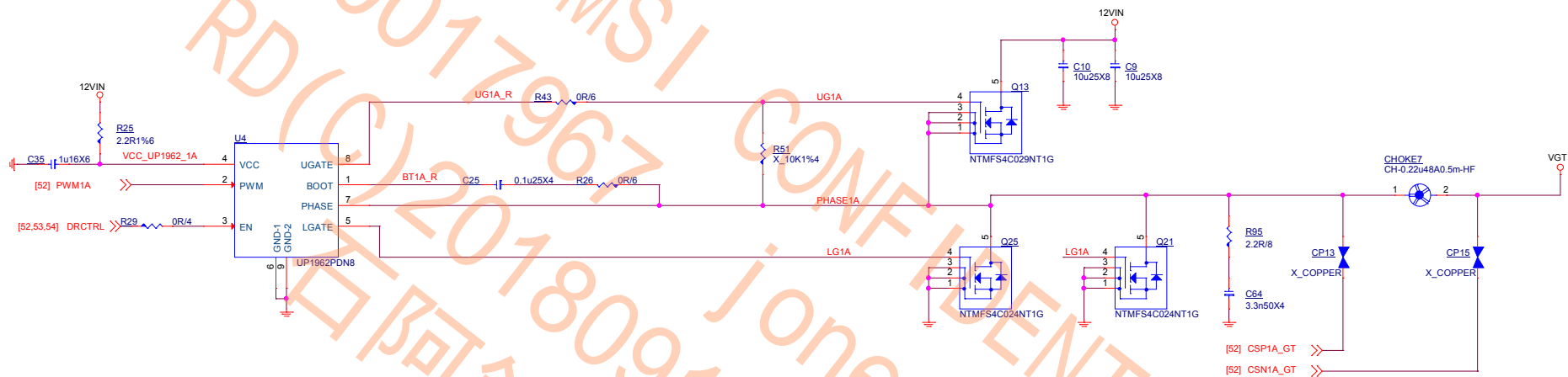
$I3933_imon * [R17 * R18 / (R17 + R18)] = Istep * R_{dcr} * 100$
 $I3933_imon = 10uA/step$
 $Istep = 4.968A$











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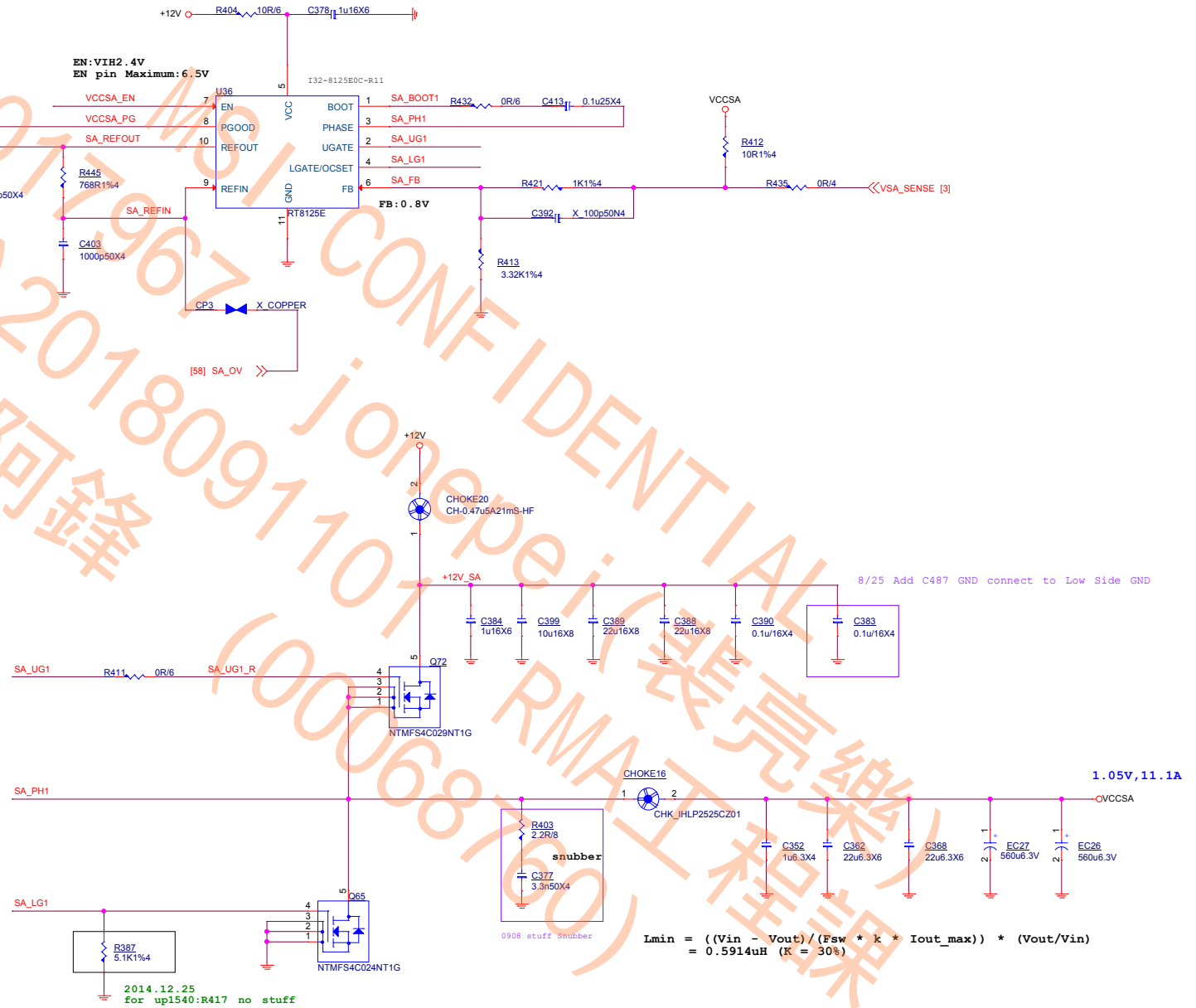
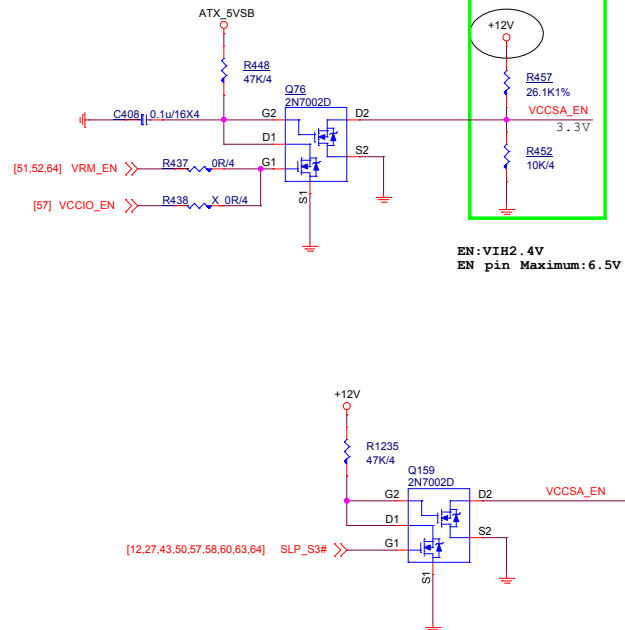
SA Power:1.05V,11.1A

OCF:18A

$$\begin{aligned} R_{ocset} &= 1.3 * I_{max} * R_{dson(10V)} / I_{ocset} \\ &= 18.2 * 2.8\text{mohm} / 10\text{uA} \\ &= 5.1\text{K} \end{aligned}$$

Rdson (10V) 10V

MOS :2.8mohm

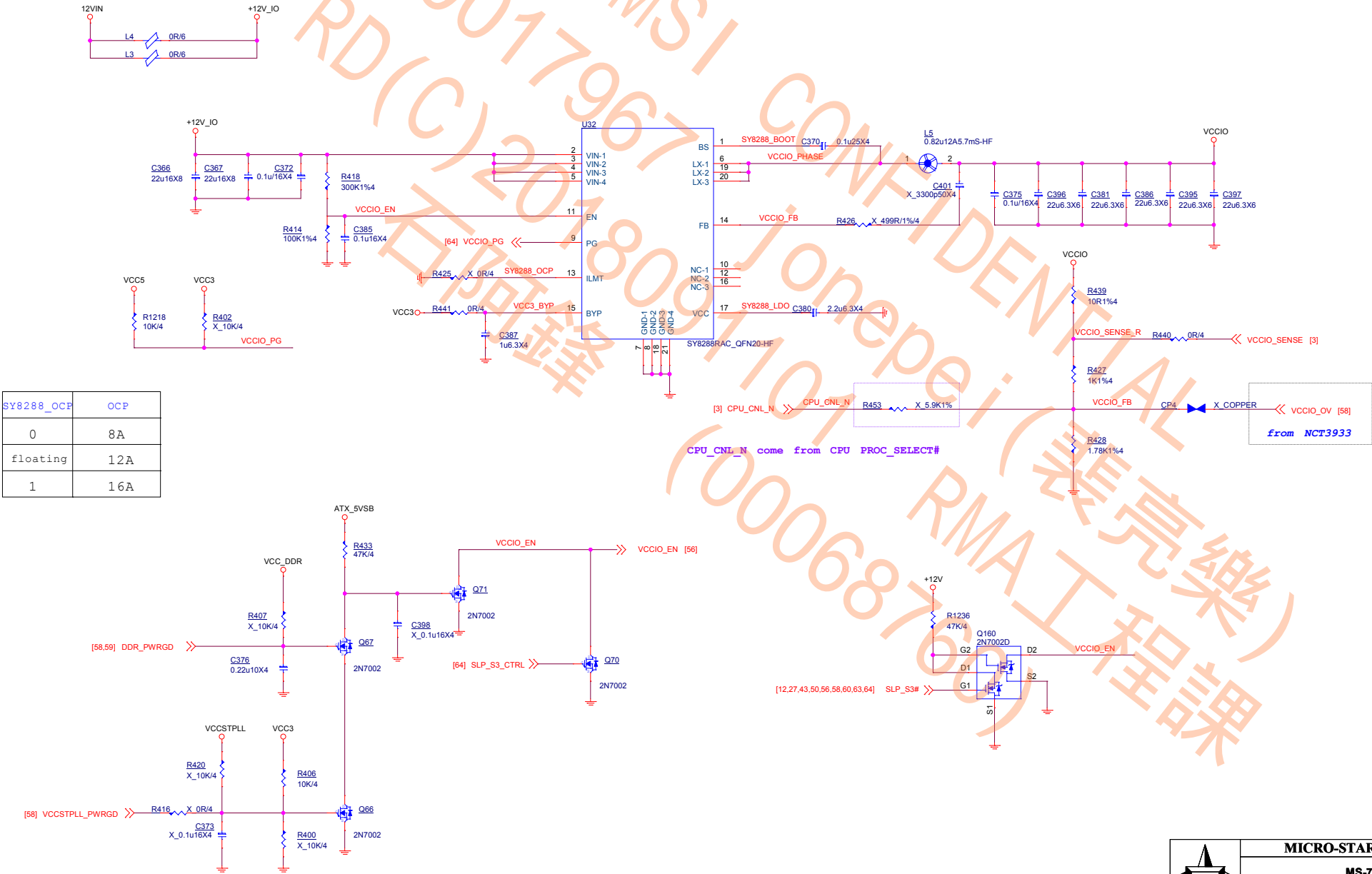


$$\begin{aligned} L_{min} &= ((V_{in} - V_{out}) / (F_{sw} * k * I_{out_max})) * (V_{out} / V_{in}) \\ &= 0.5914\text{uH} (K = 30\%) \end{aligned}$$

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Size	Document	Description	Rev
Custom		CPU PWR-VCCSA-PV3205Q	20
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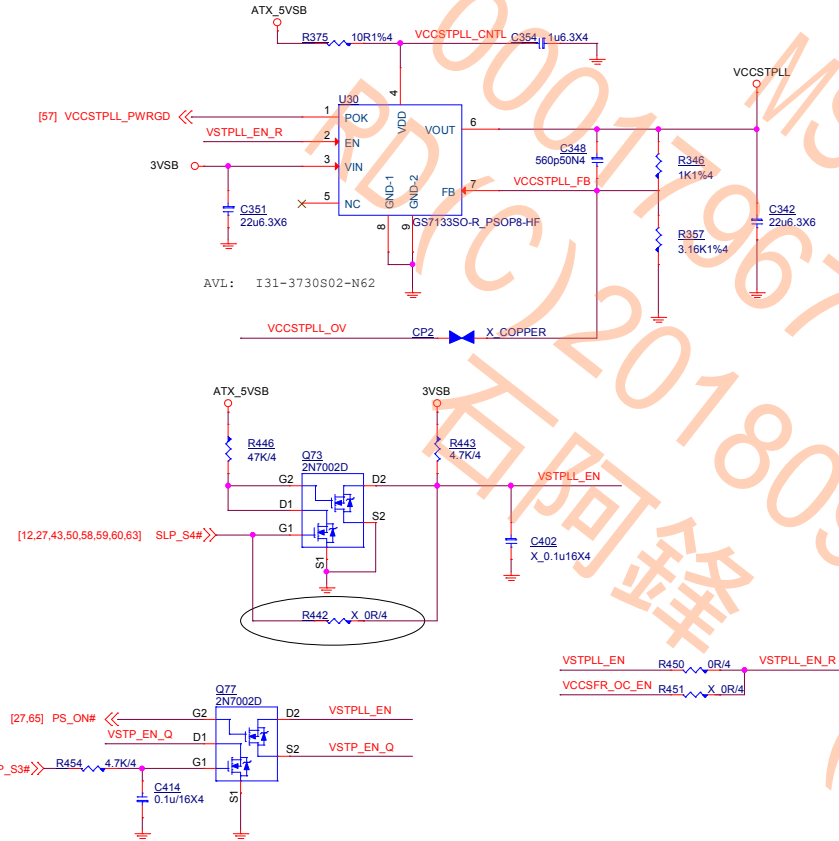
IO Power:0.95V,6.4A

OCP:12A



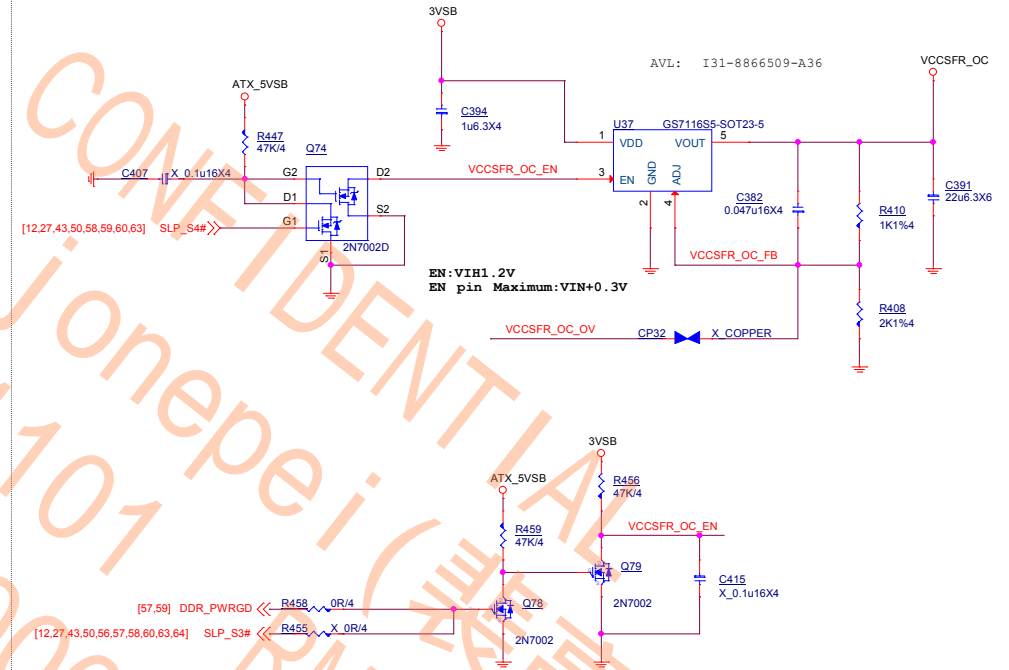
VCCSTPLL

1.05V; 230mA



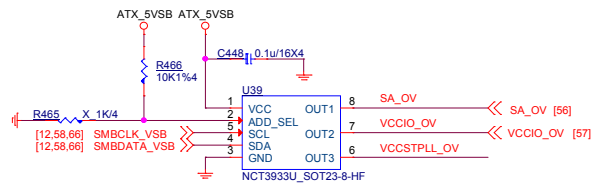
VCCPLL OC

1.2V; 130mA

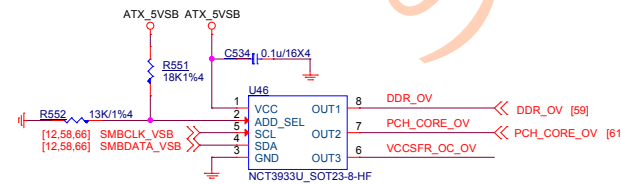


VOLTAGE CONSOLE

0x20: RH=10K, RL=OPEN



0x26: RH=18K, RL=13K



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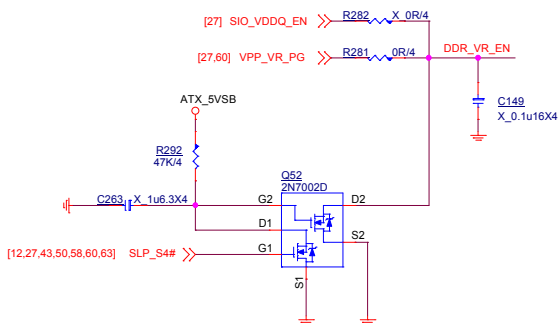
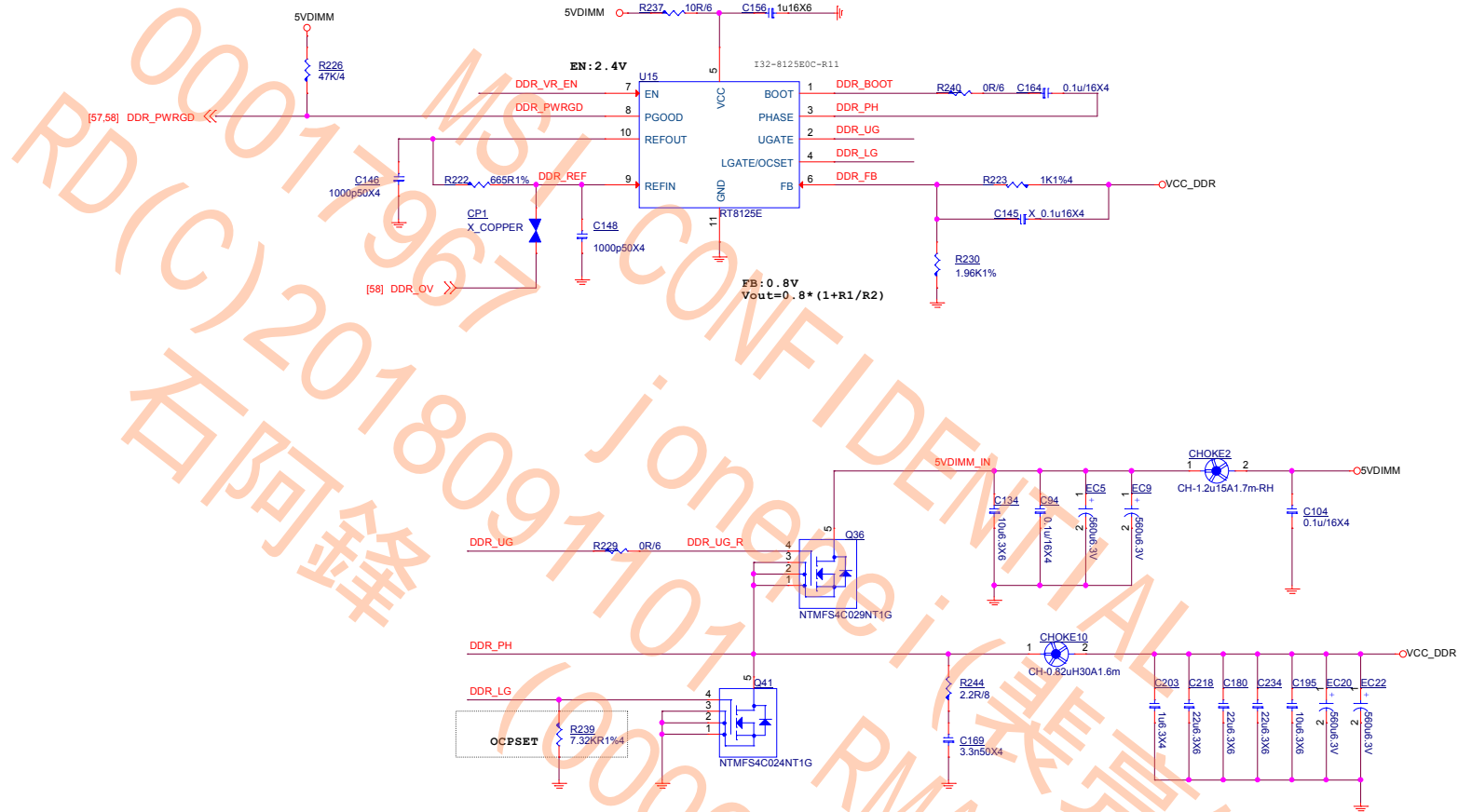
DDR4 Power:1.2V,19.8A OCP:28A

3.3A FOR CPU

15.7A FOR 4DIMM

0.7A FOR DDR VTT

$$\begin{aligned} \text{Rocset} &= 1.3 * \text{Imax} * \text{Rdson(LOW)} / \text{Iocset} \\ &= 26 * 4\text{mohm} / 10\text{uA} \\ &= 10.3\text{K} \end{aligned}$$



OCP:7.5A


$$0.3 \times 4 = 1.2A$$


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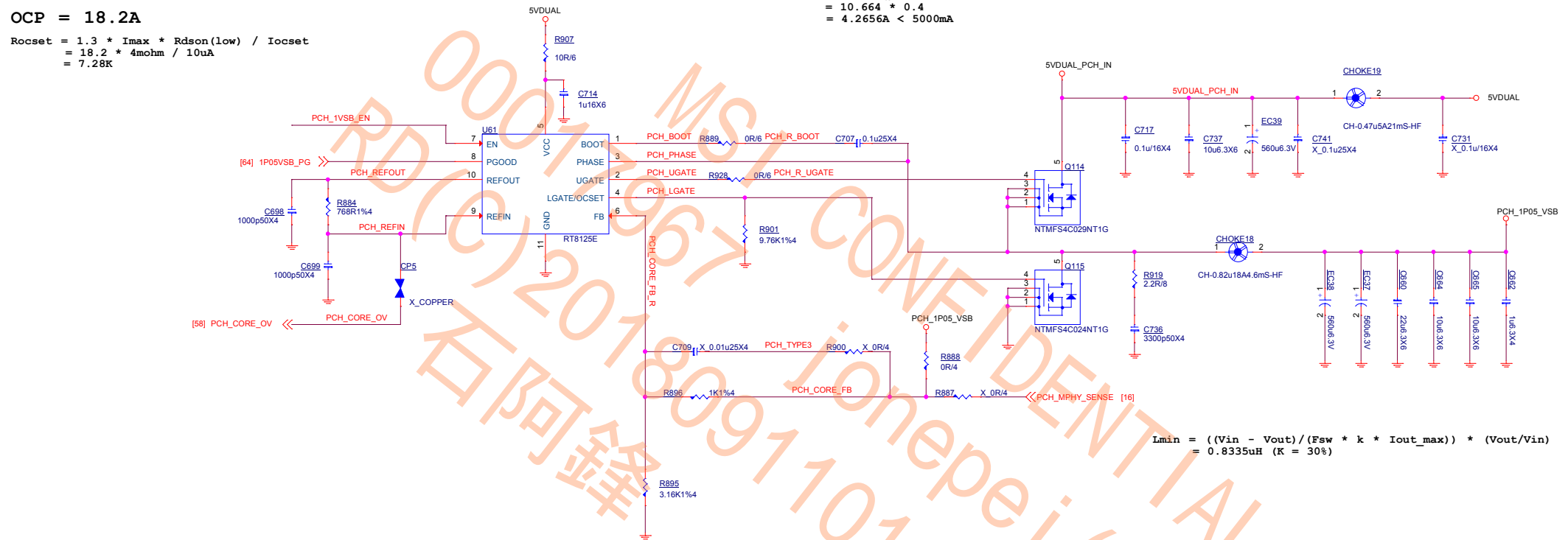
Size Custom	Document Description DDR PWR VPP25/VT-MP2147	Rev 20
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PCH_1VSB Power:1.05V,14A

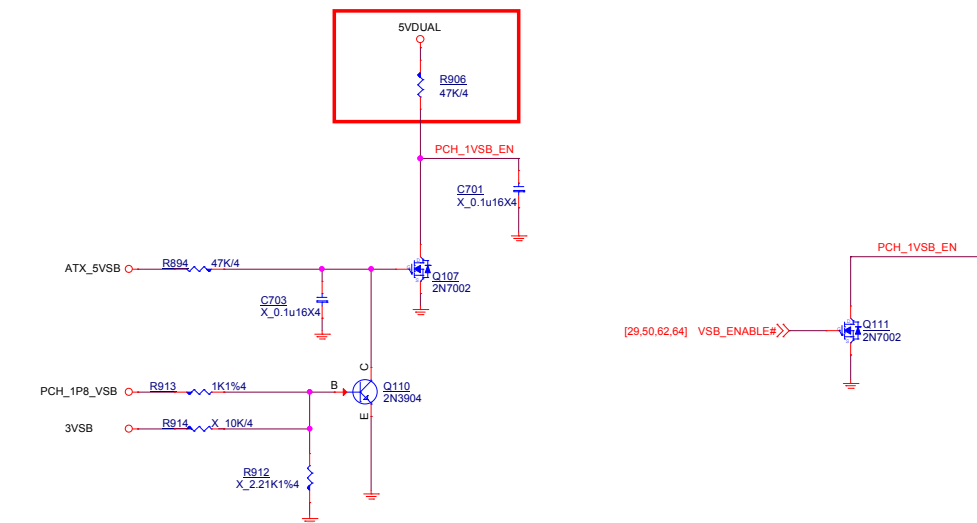
OCP = 18.2A

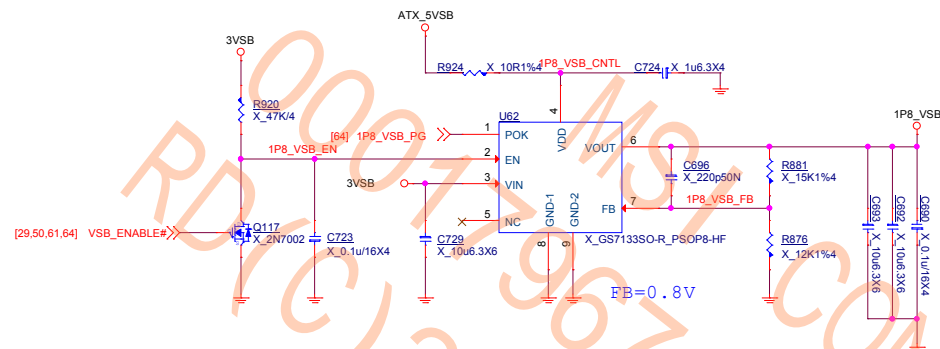
$$\begin{aligned} Rocset &= 1.3 * I_{max} * R_{dson(1ow)} / I_{ocset} \\ &= 18.2 * 4mohm / 10uA \\ &= 7.28K \end{aligned}$$

$$\begin{aligned} I_{rms} &= I_{out} * \sqrt{(V_{out}/V_{in}) * (1 - (V_{out}/V_{in}))} \\ &= 10.664 * 0.4 \\ &= 4.2656A < 5000mA \end{aligned}$$



$$\begin{aligned} I_{min} &= ((V_{in} - V_{out}) / (F_{sw} * k * I_{out_max})) * (V_{out}/V_{in}) \\ &= 0.8335uH \quad (K = 30\%) \end{aligned}$$



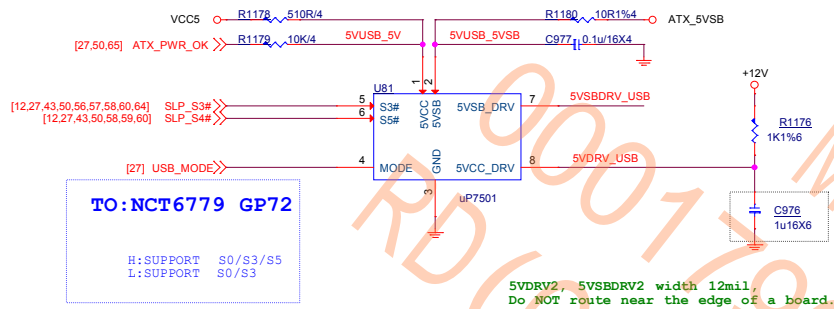


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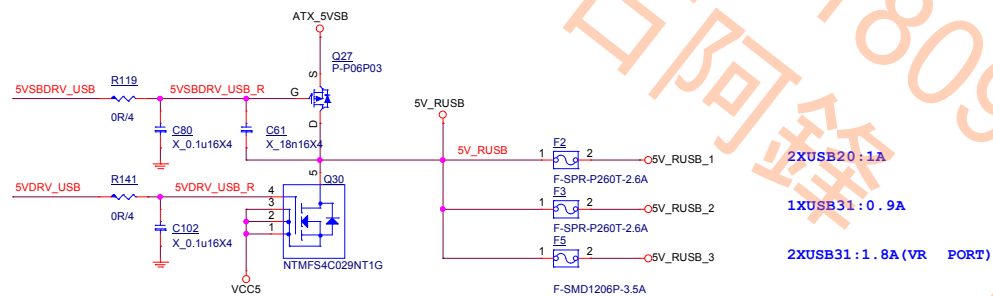
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Custom		USB Power	20
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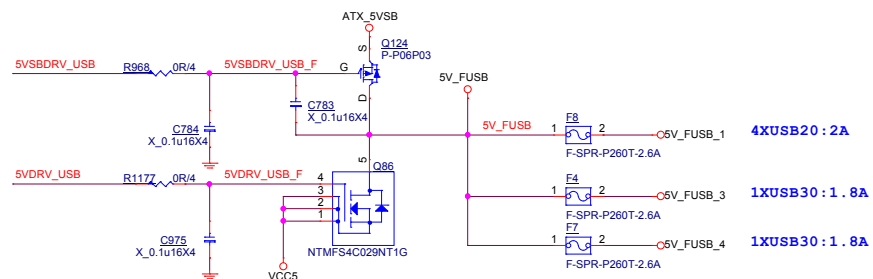
USB POWER



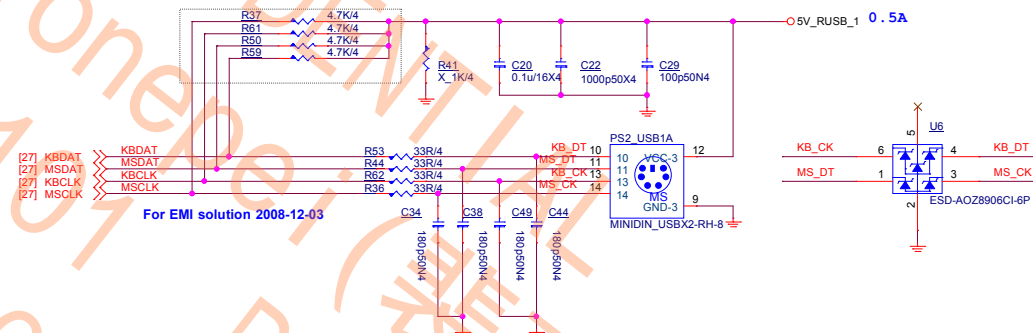
REAR USB PORT POWER



FRONT USB PORT POWER



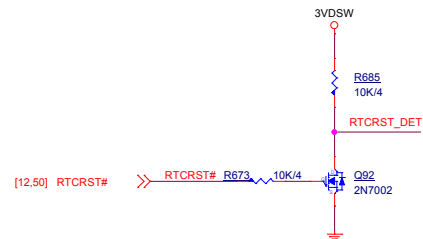
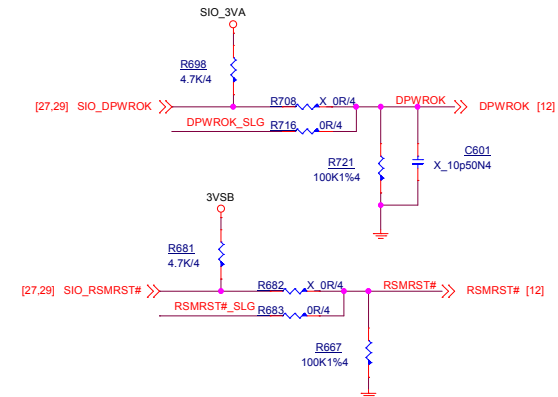
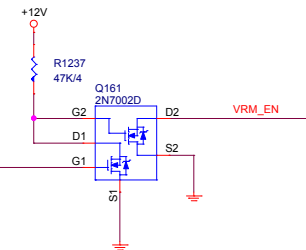
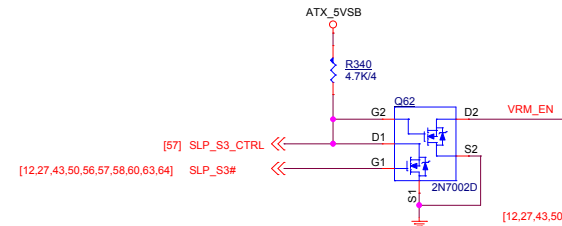
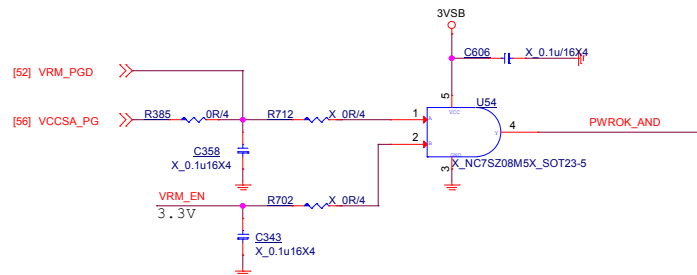
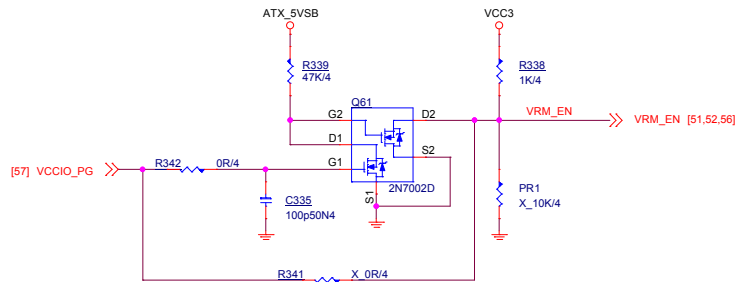
PS2 KEYBOARD & MOUSE CONNECTOR



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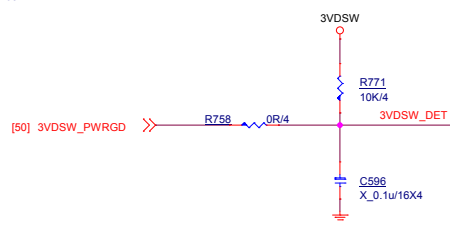
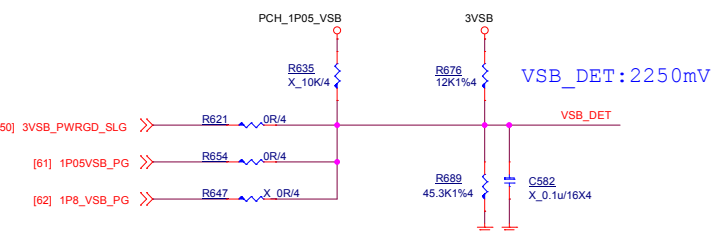
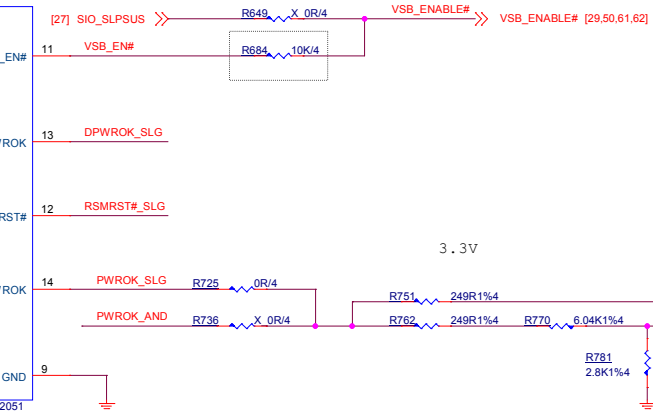
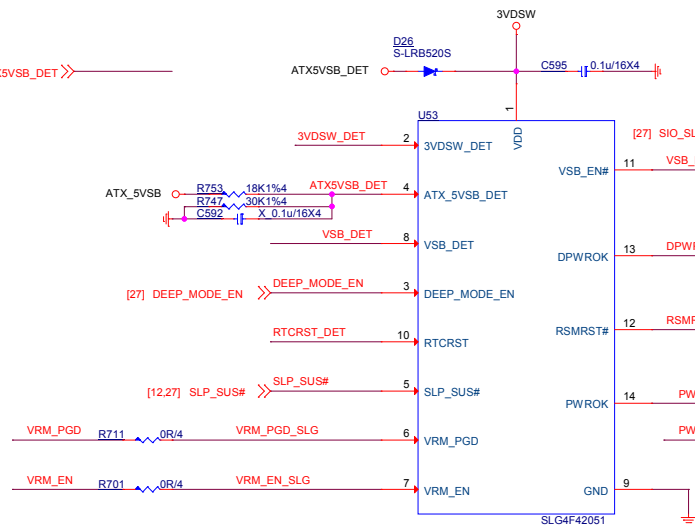
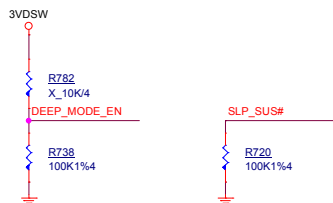
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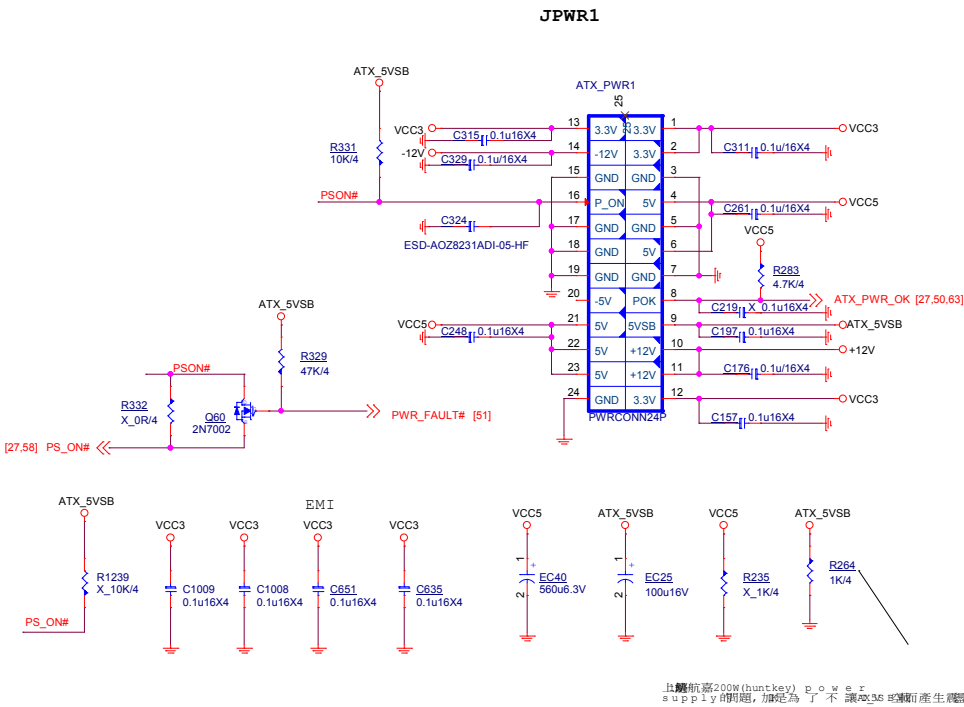
[29] ATX5VSB_DET

	DEEP_MODE_EN
DEEP_MODE	1
S5_MODE	0

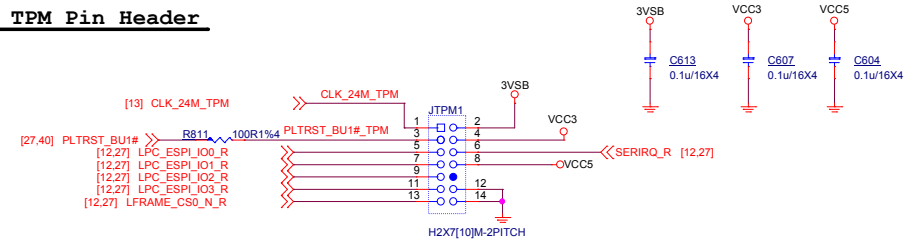


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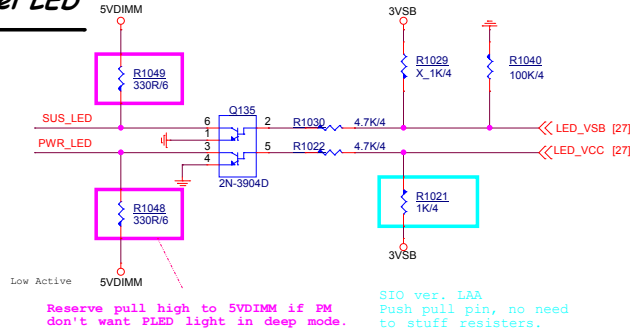
ATX POWER CONNECTOR



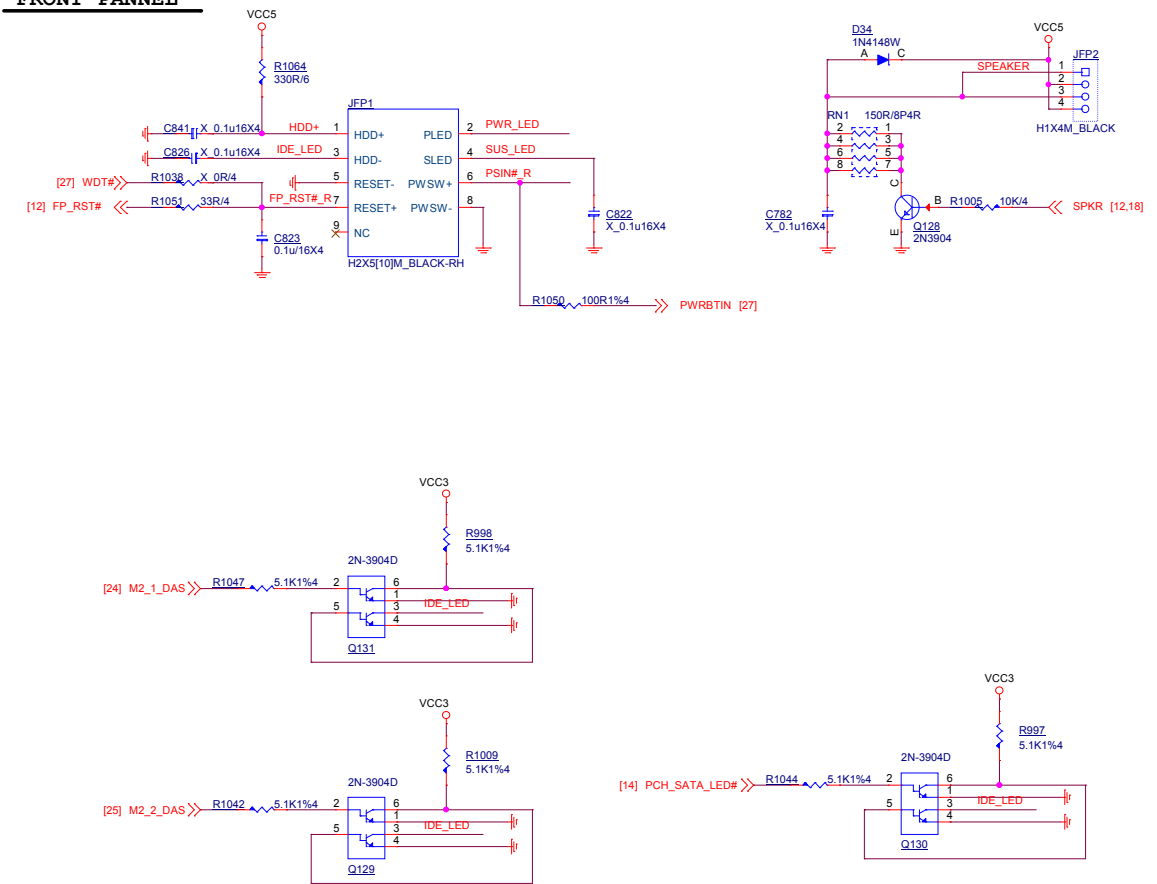
TPM Pin Header



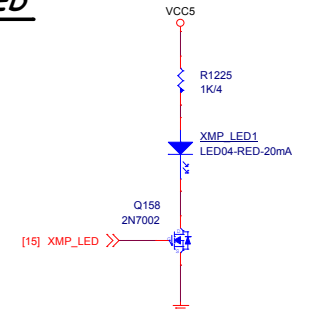
Front Panel LED



FRONT PANNEL



XMP LED

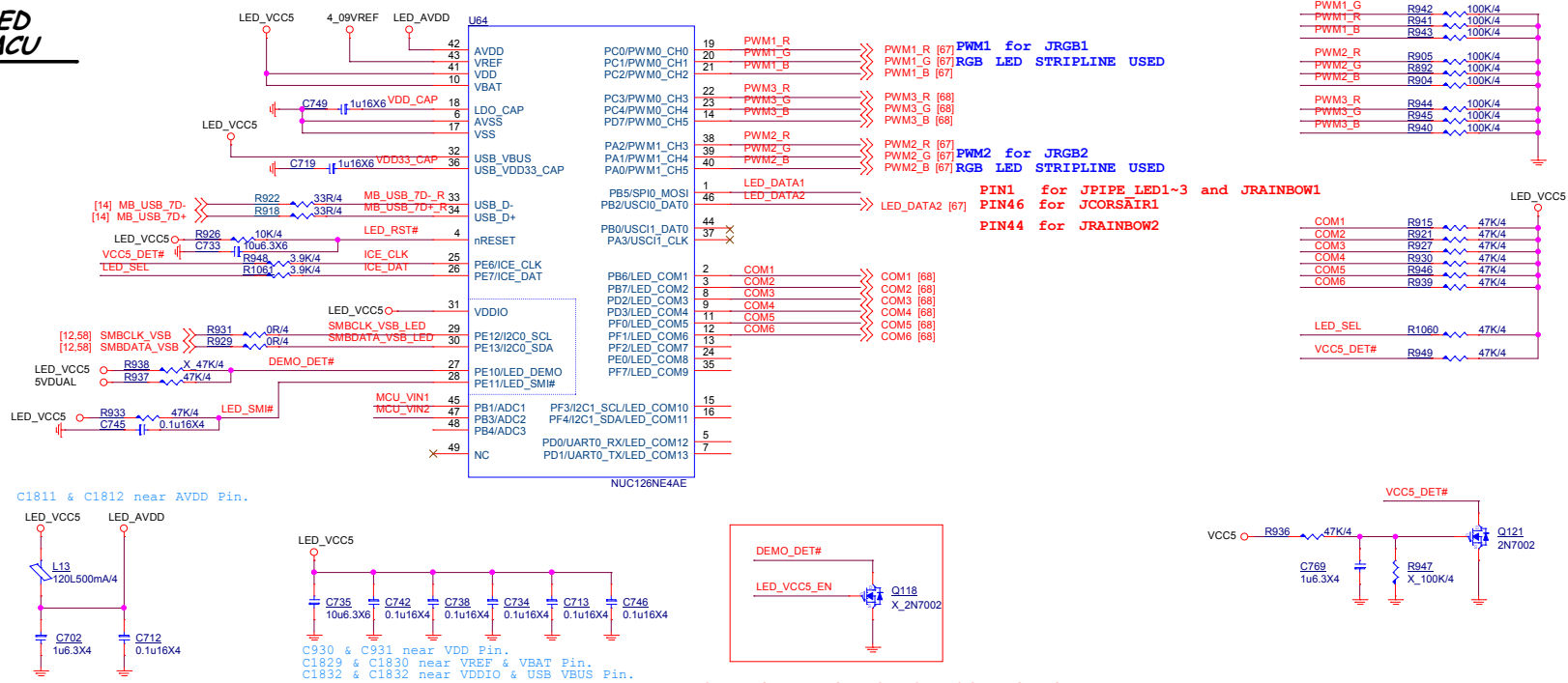


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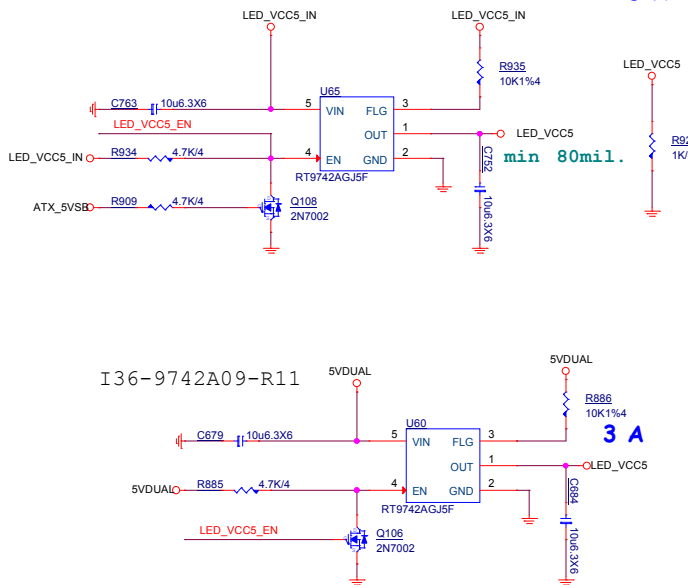
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Custom		ATX Connector/F_Panel	20
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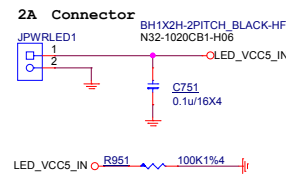
**LED
MCU**



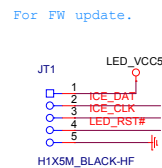
EXTERNAL POWER INPUT



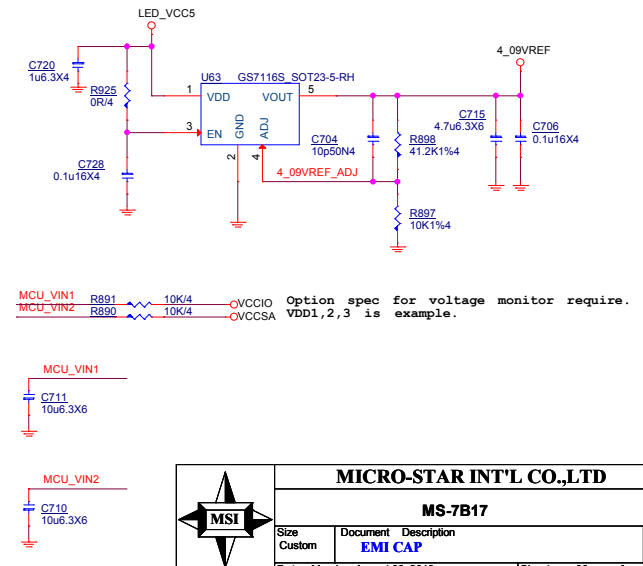
External Power



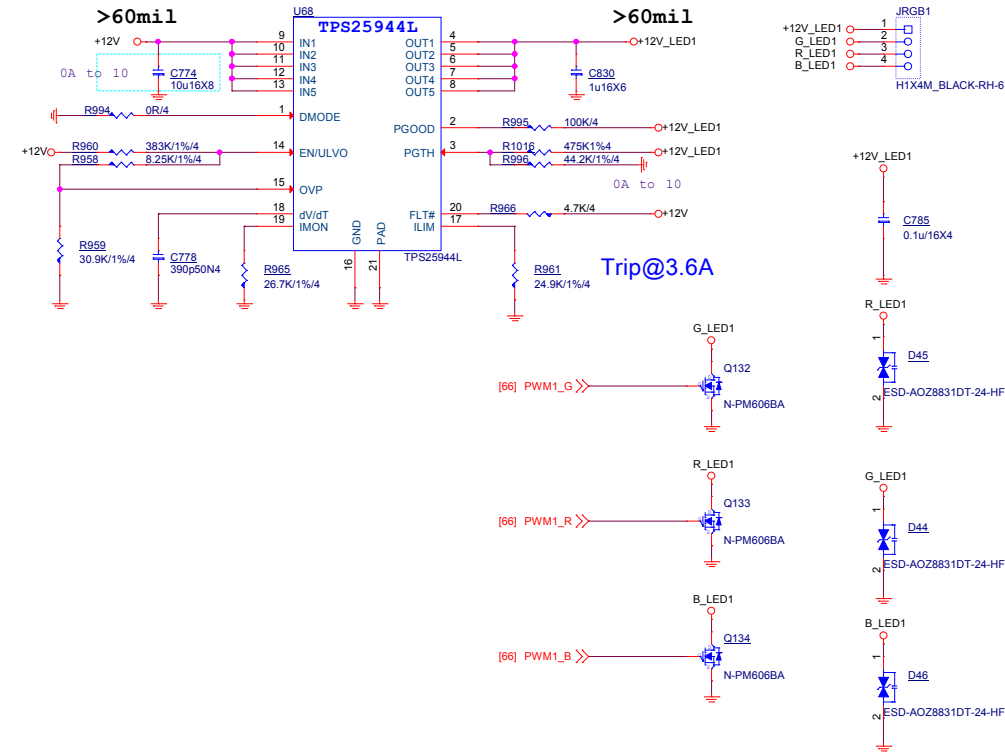
JT1 for FW update



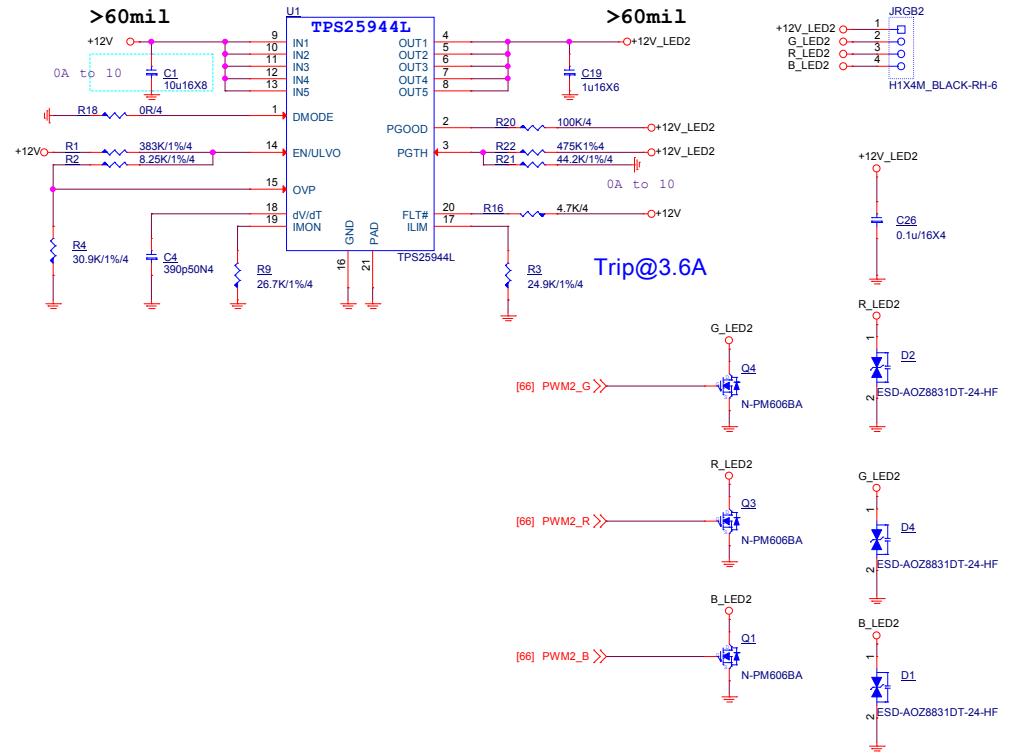
Voltage	HW	monitor
---------	----	---------



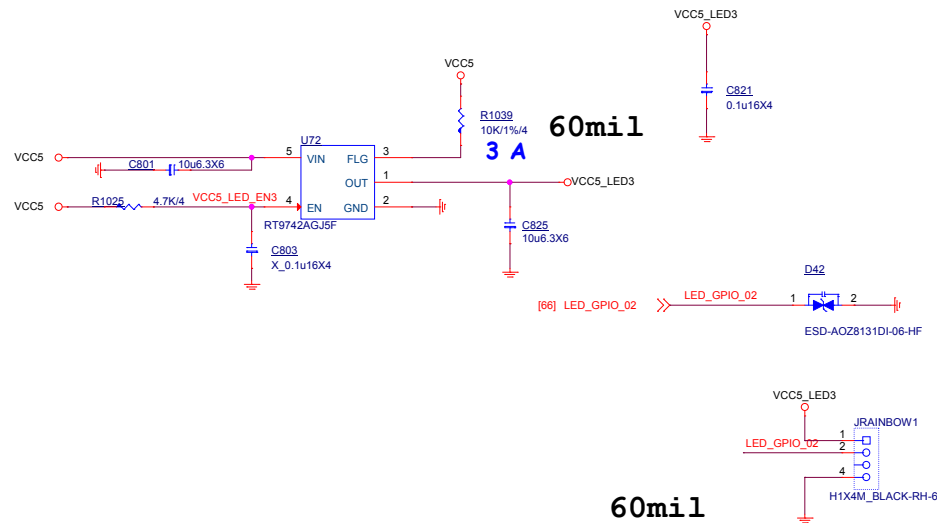
JRGB1



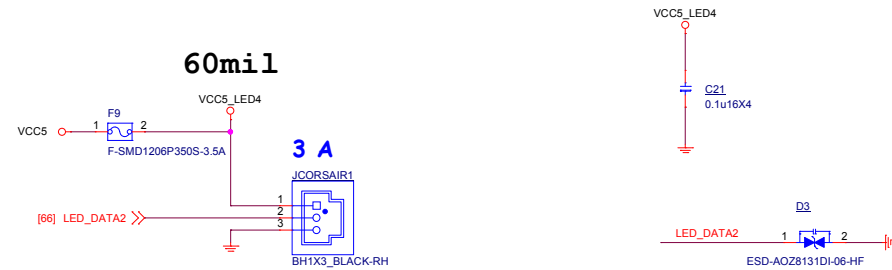
JRGB2



LED STRIPLINE JRAINBOW1



JCORSAIR1

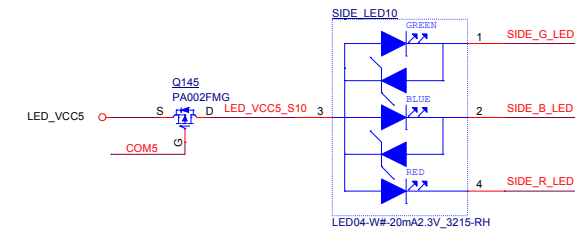
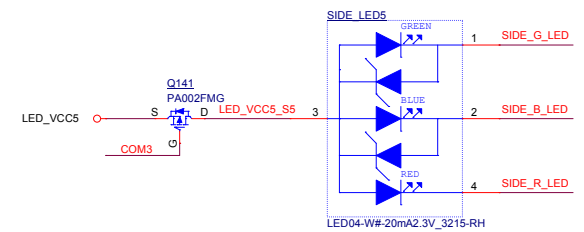
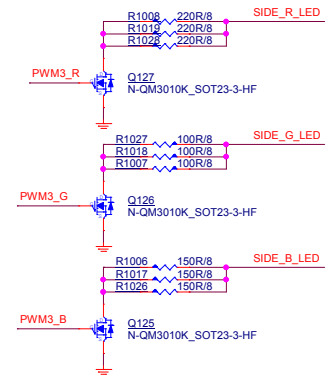
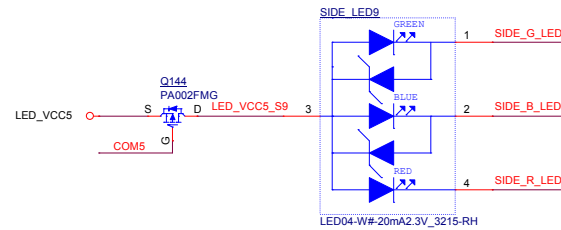
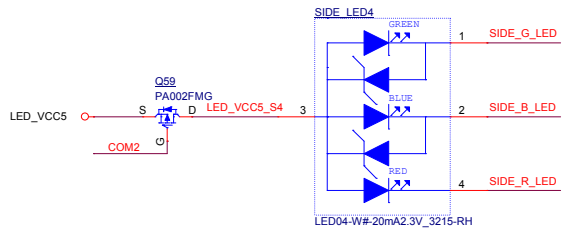
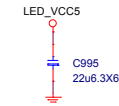
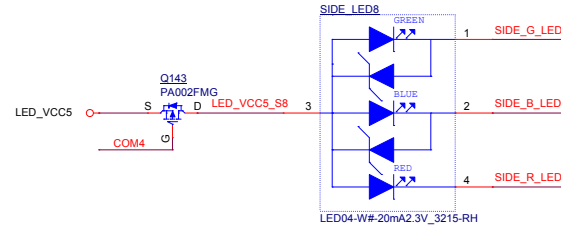
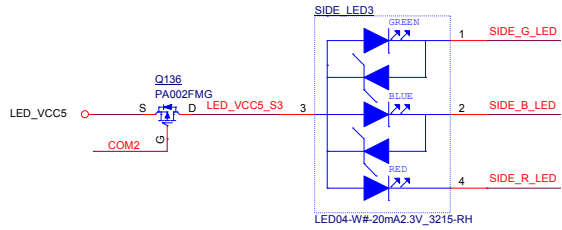
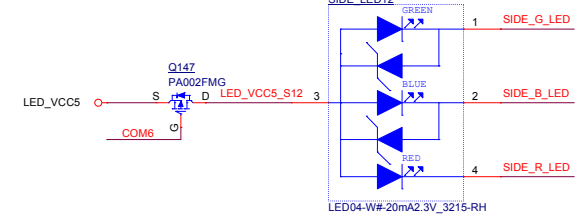
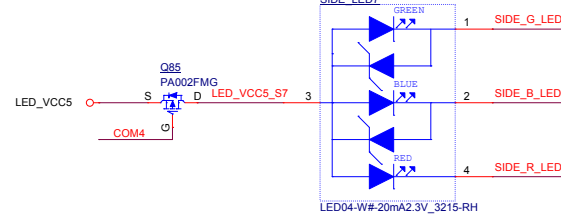
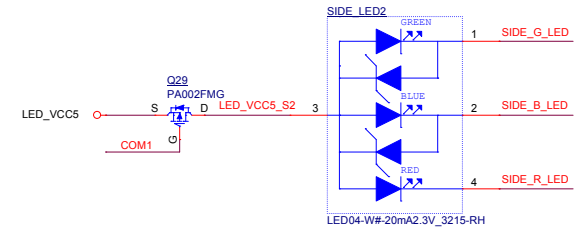
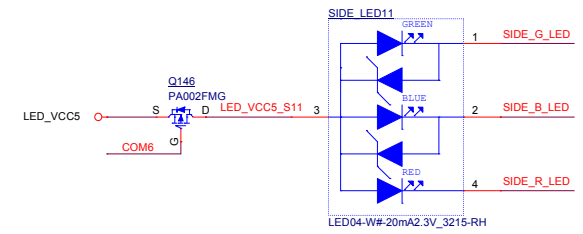
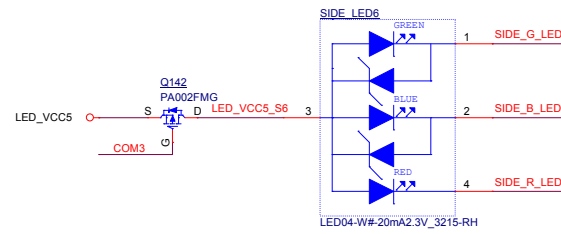
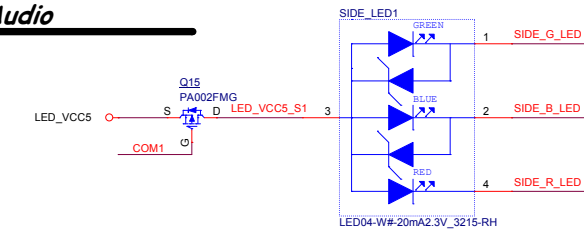


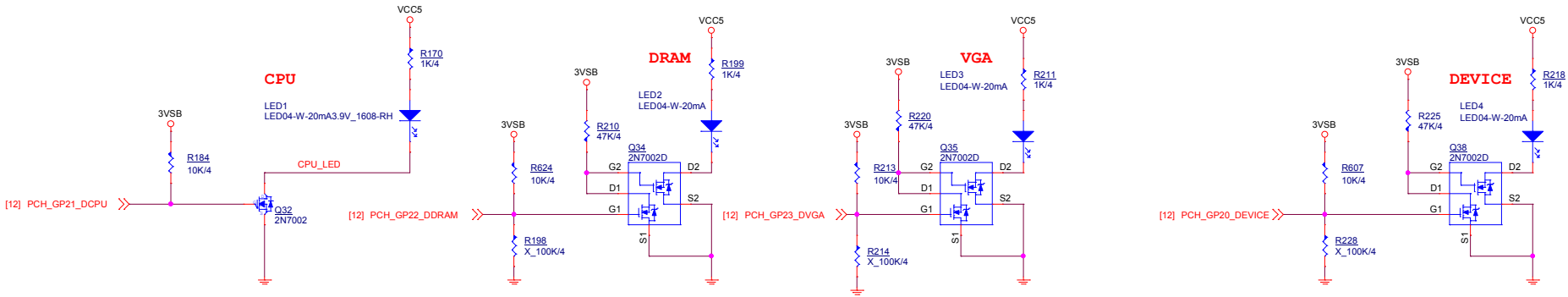
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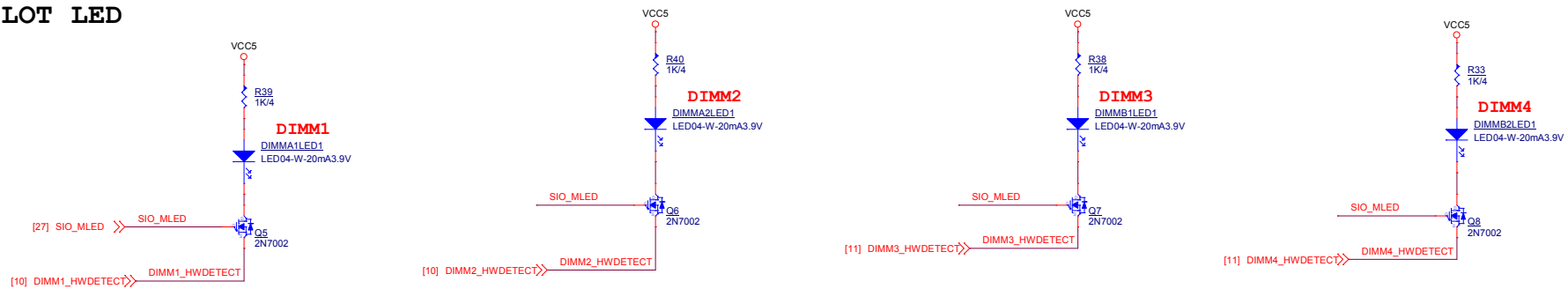
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BOARD SIDE LED *8 for Audio





DIMM SLOT LED



SLOT LED



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PD0-07B1710-G37, 制, 深圳, 2 微, 恩, 斯, 通, S, D
PD0-07B1710-E48, 牌, 2 微, 恩, 斯, 通, 牌, 9



GAMING PRO CARBON AC



HEATSINK



E21-7A62010-RH



E31-0409920-A87

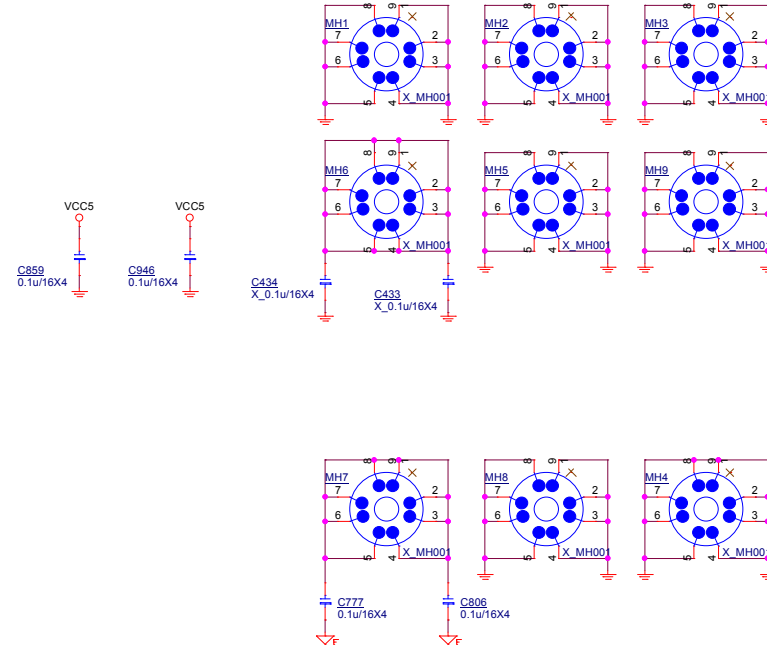


E31-0505990-A87

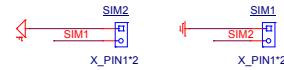


E31-0506000-A87

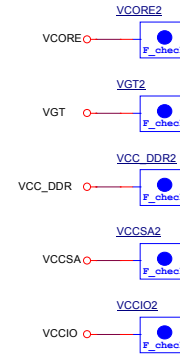
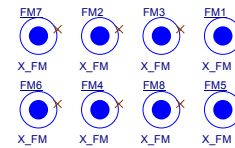
Mounting Holes



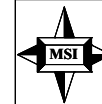
Simulation



Optical Fiducial Marks-120



VCCORE VCCORE1
VGT GT1
VCCSA VCCSA1
VCCIO VCCIO1
VCC_DDR VCC_DDR1
VTT_DDR VTT_DDR1
VPP25 VPP1



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