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MS-7B17

CFL Platform

ATX

Ver: 11

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*

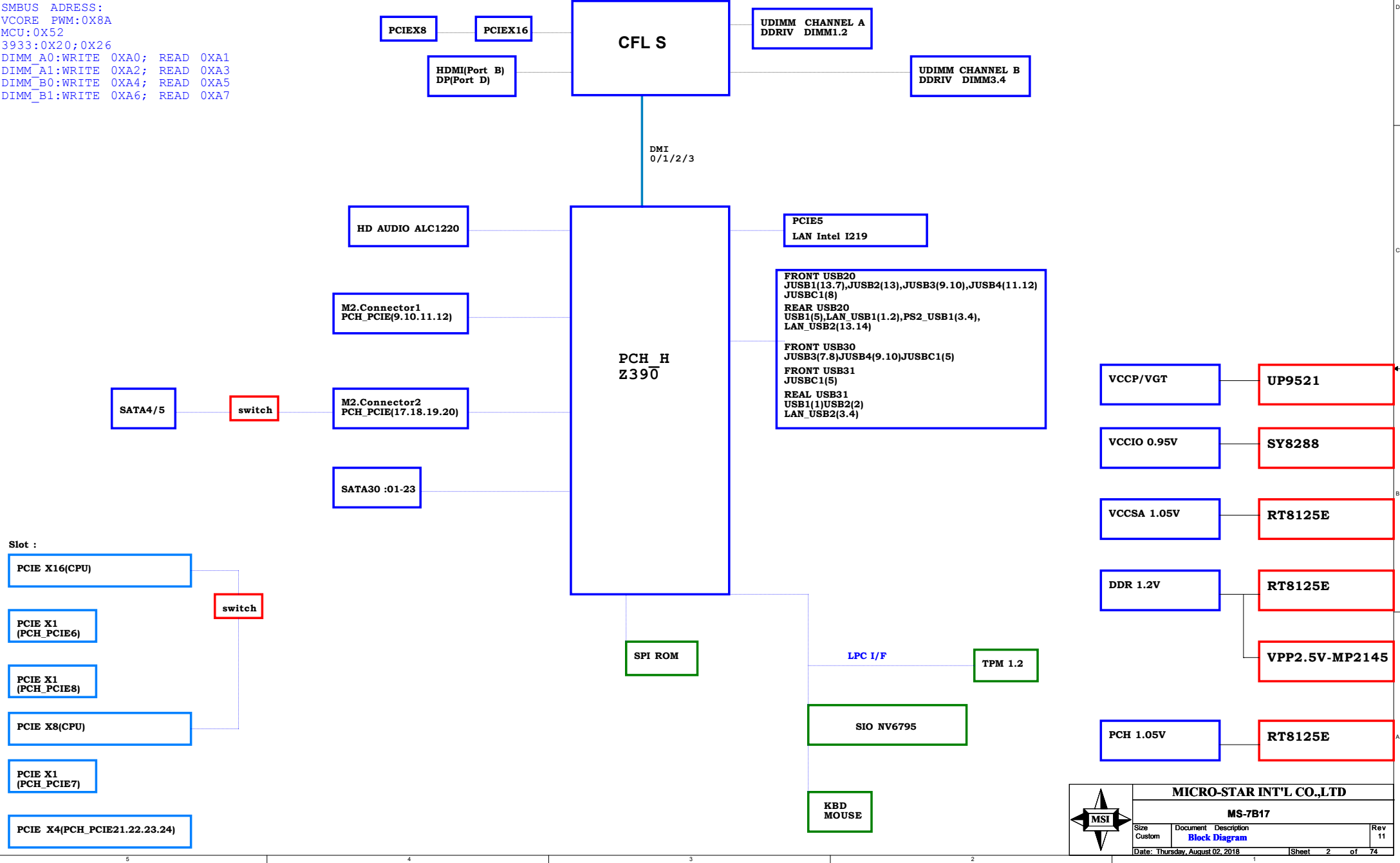
*REAL USB3.0 *5+TYPEC*1*

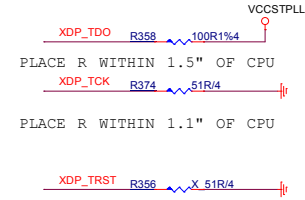
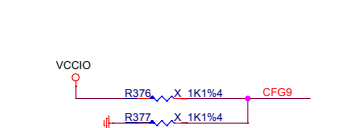
*FRONT USB3.0 *3+TYPEC*1*

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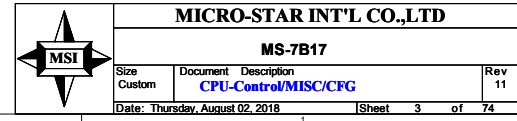
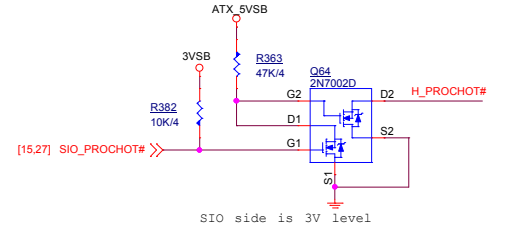
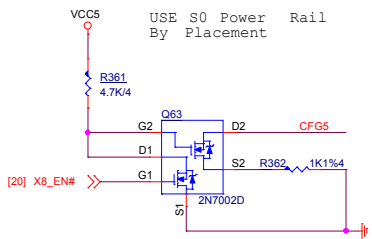
MS-7B17 Block Diagram

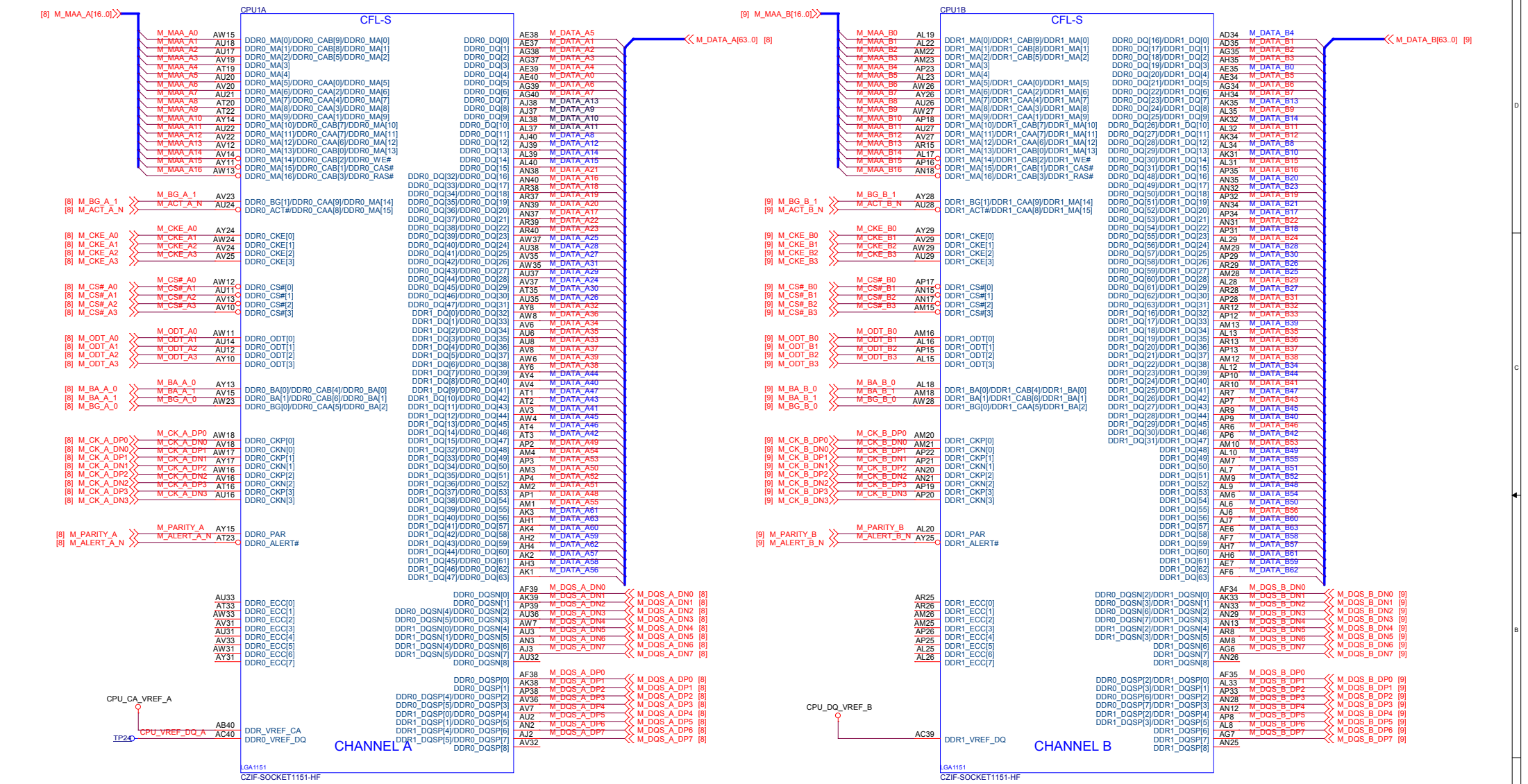
SMBUS ADDRESS:
VCORE PWM:0X8A
MCU:0X52
3933:0X20;0X26
DIMM_A0:WRITE 0XA0; READ 0XA1
DIMM_A1:WRITE 0XA2; READ 0XA3
DIMM_B0:WRITE 0XA4; READ 0XA5
DIMM_B1:WRITE 0XA6; READ 0XA7

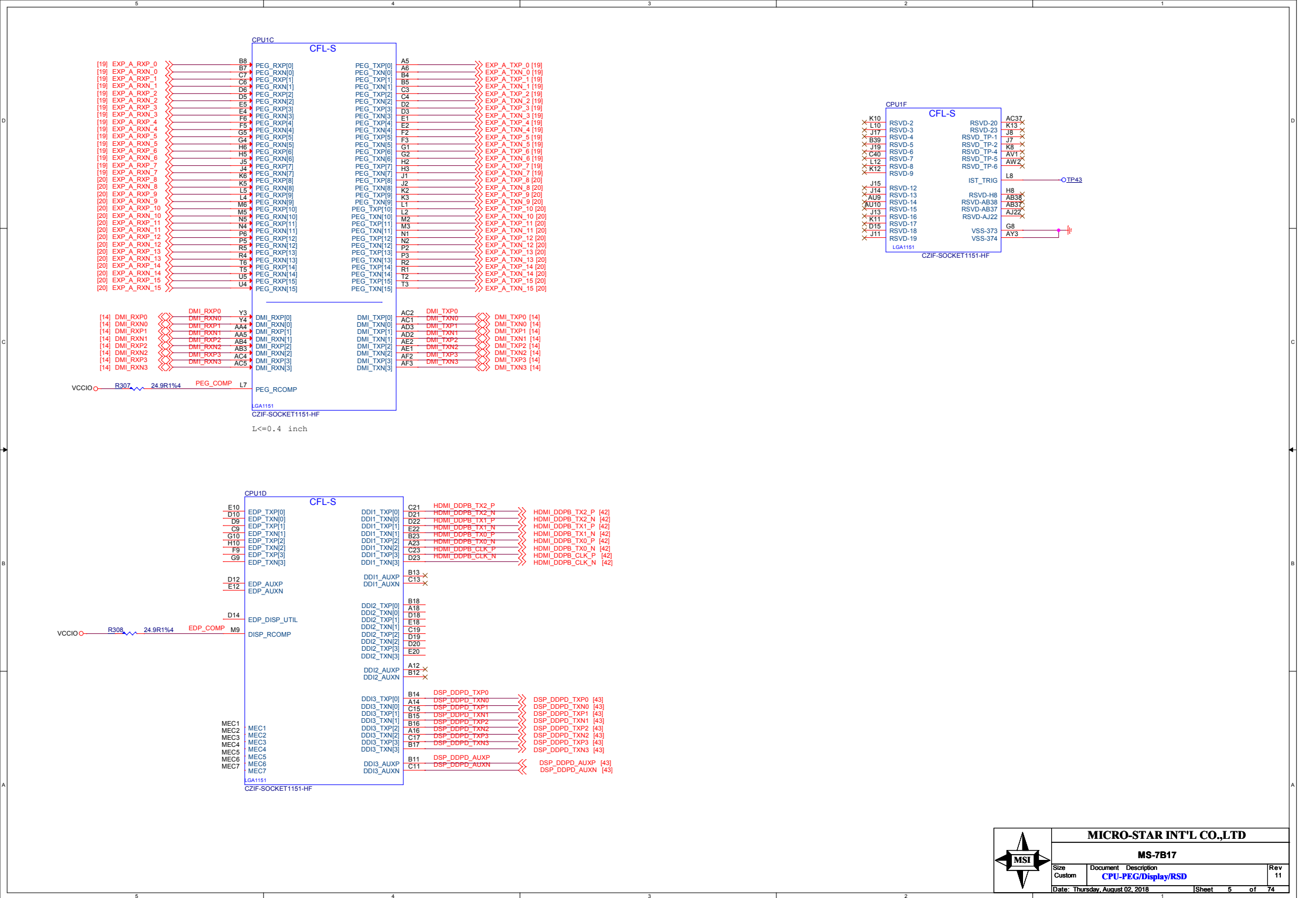


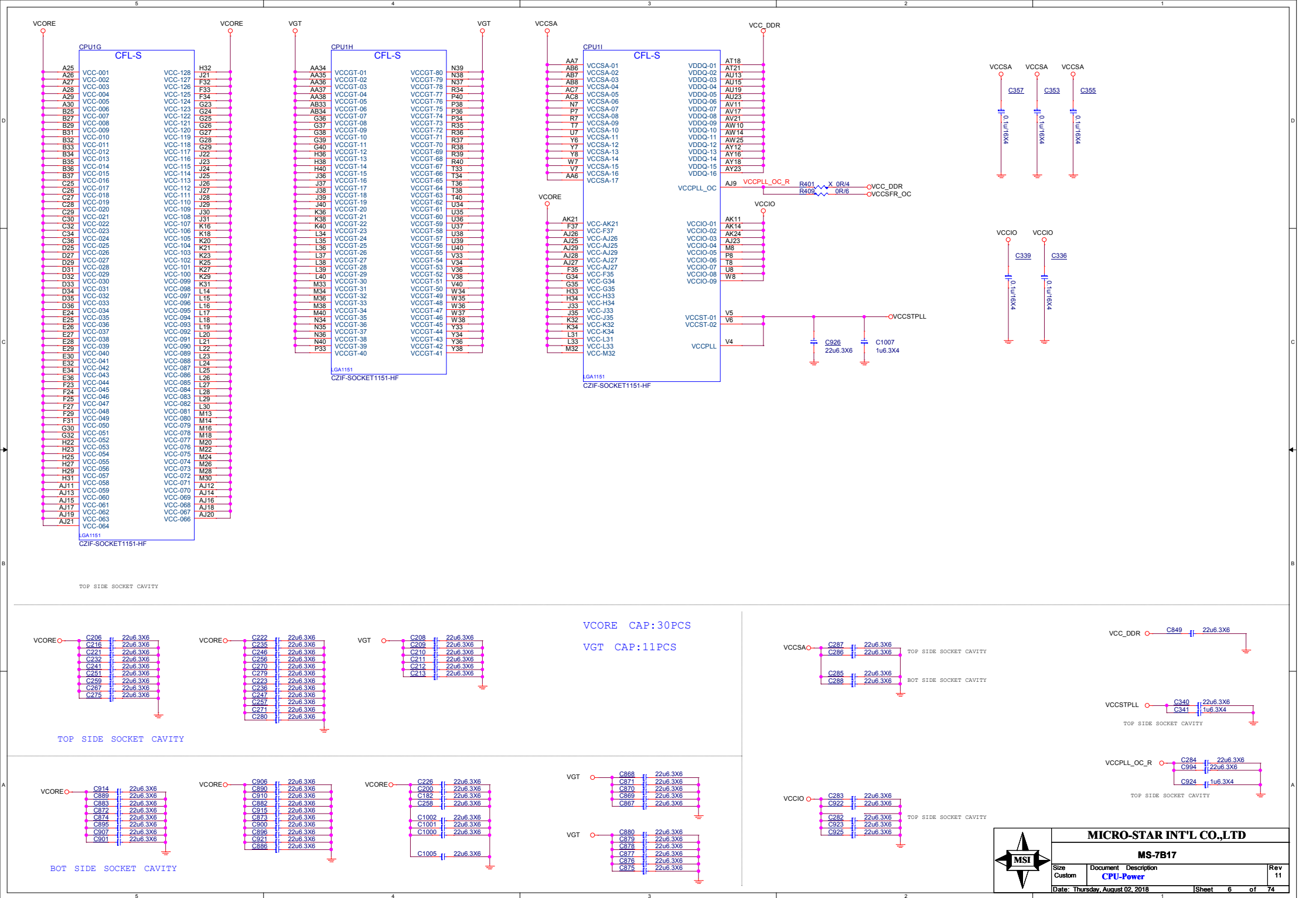



CFG Table			
	HIGH	LOW	DESCRIPTION
0	NORM	STALL	EAR
1	NORM	PCWLESS	PCWLESS MODE
2	NORM	REVERSE	PE2 LANE REVERSAL
3	ENABLE	DISABLE	DEBUG
4	DISABLE	ENABLE	PD PRESENCE
5	DISABLE	ENABLE	PGCFG_CSR[0]
6	DISABLE	ENABLE	PGCFG_CSR[1]
7	CSG#	CSG REQ	PE2 CSER TRAINING
8	DISABLE	ENABLE	CFG UNLOCK
9	PRESENT	NO PRESENT	SVID NOT PRESENT
10	ACTIVATE	NO ACTIVATE	SAFE MODE BOOT
11	DC COUPLED	AC COUPLED	DMI AC
12	SPT	NOT SPT	PCH TYPE
13	SVID	FIXED	VCCSA SVID
14	RSVD		
15	RSVD		



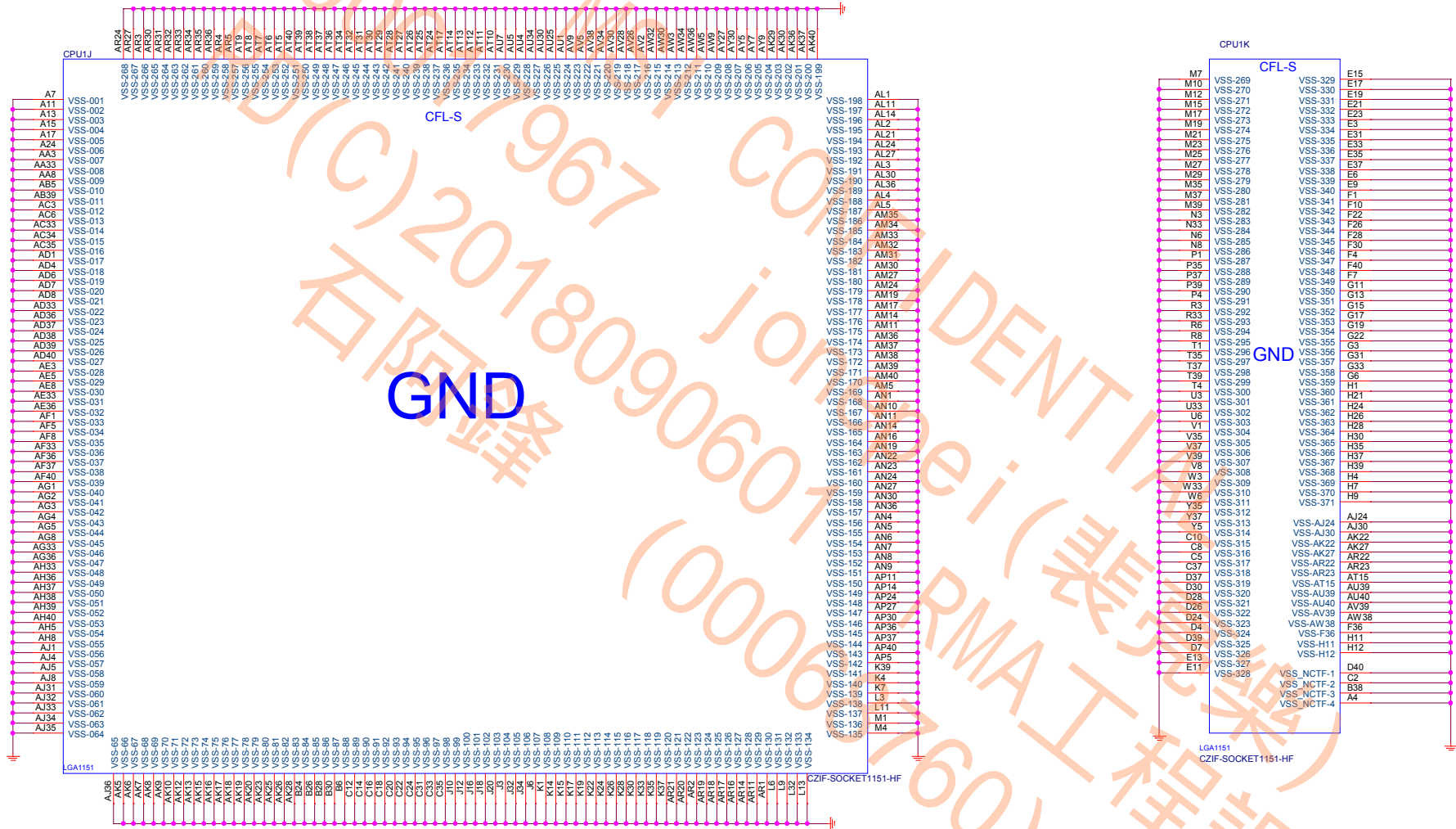


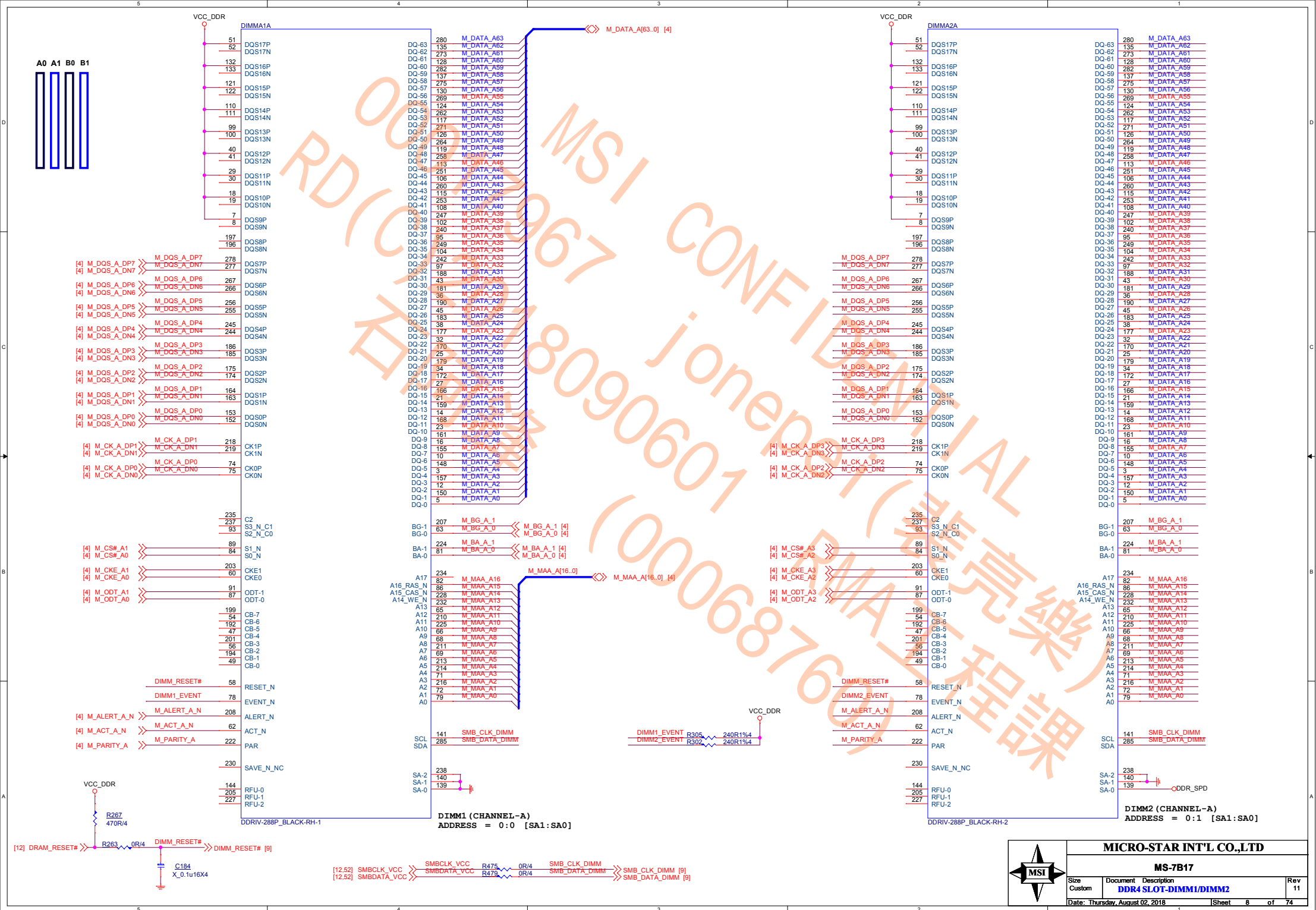


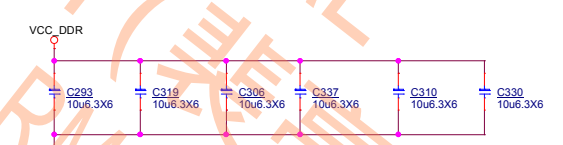
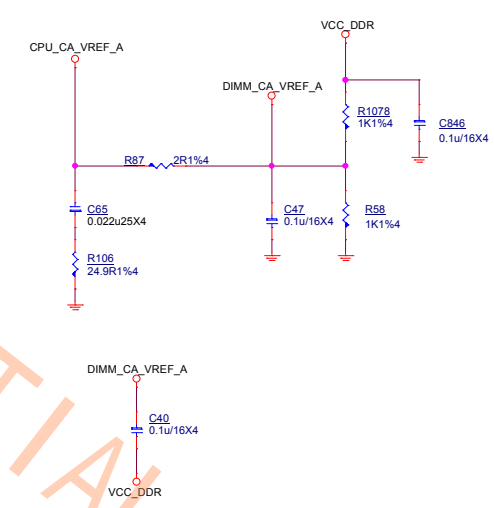
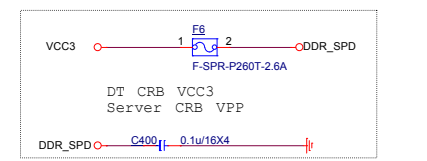
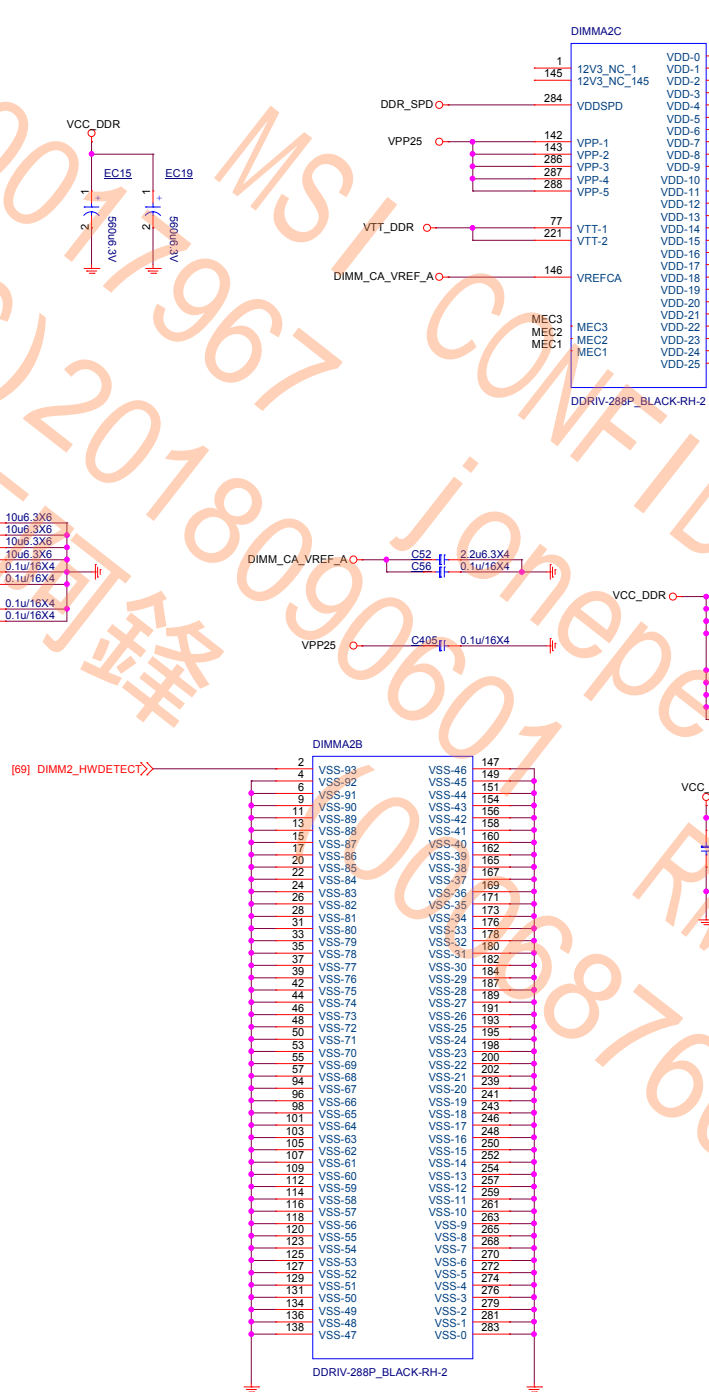
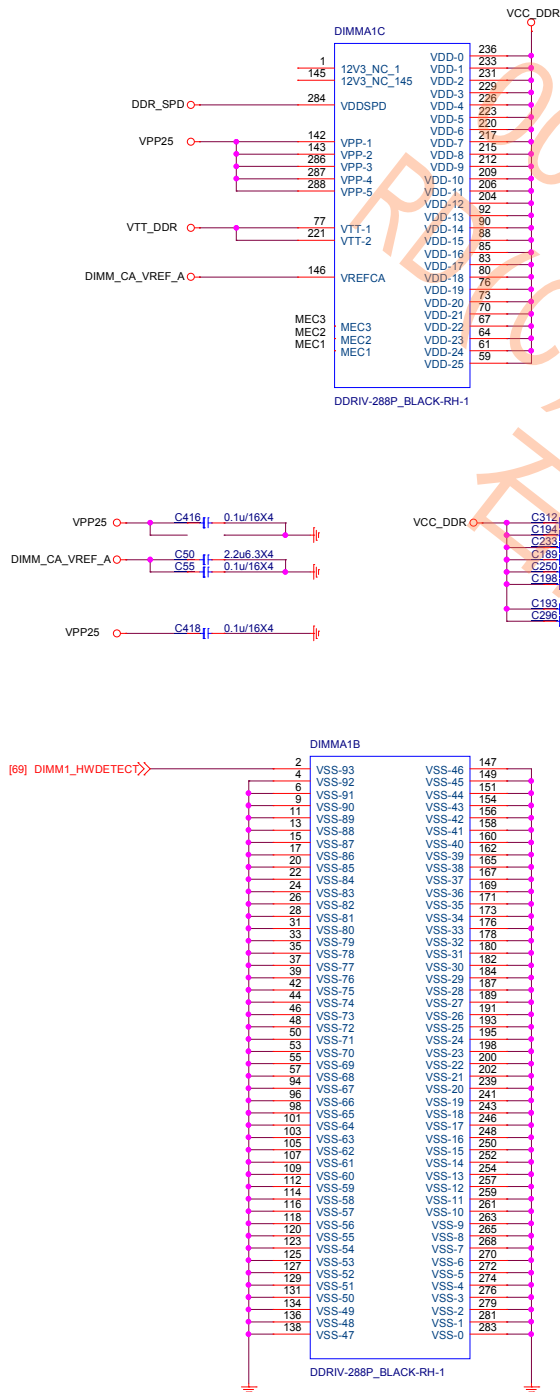


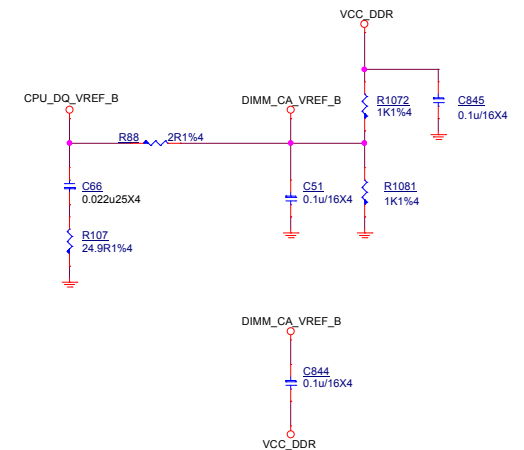
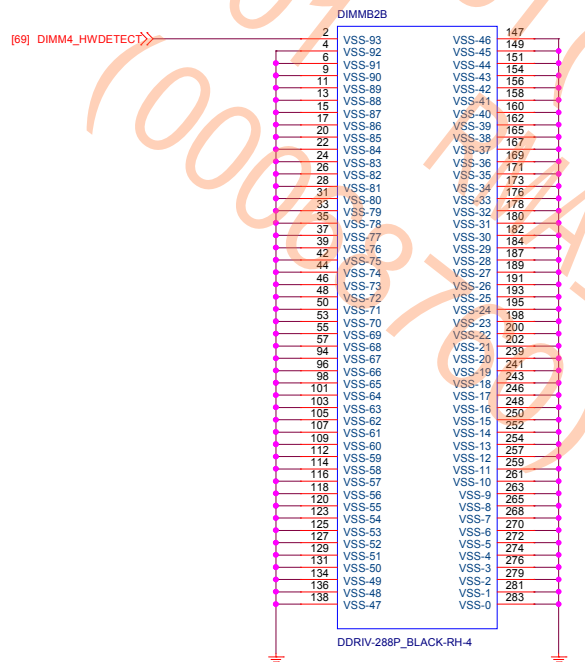
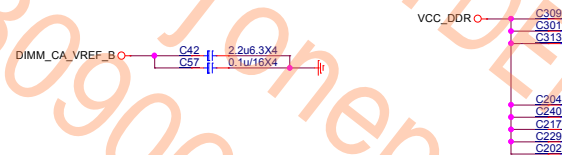
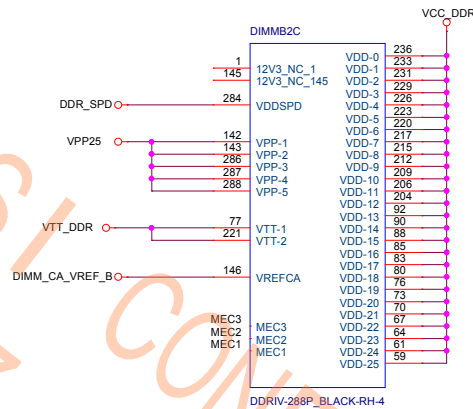
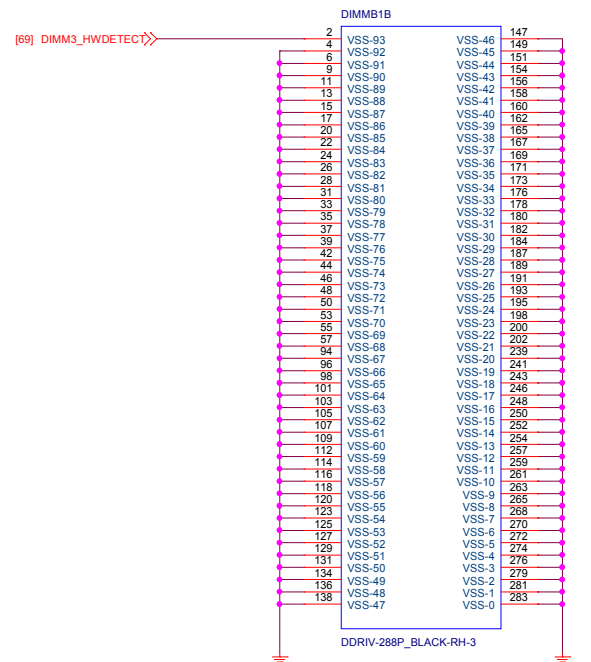
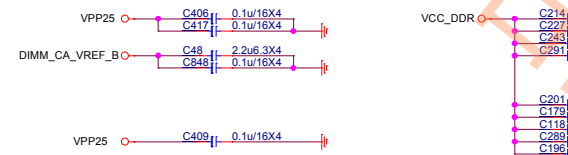
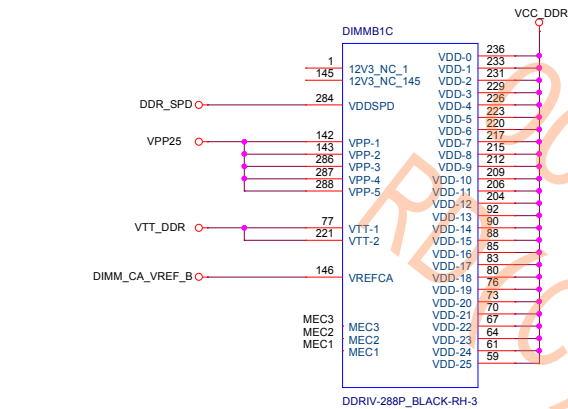


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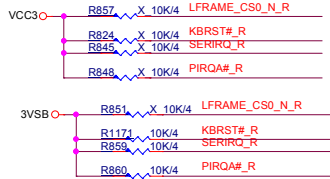






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Custom		DDR4-POWER/GND-2	11
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ESPI_CS1#/ALERT0#/ALERT1# (Server Only)

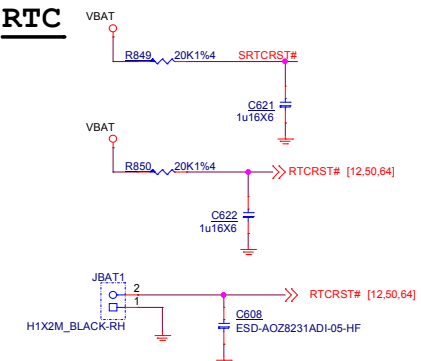
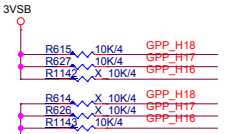
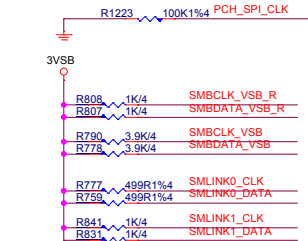


[27.65] LPC_ESPI_I00_R
[27.65] LPC_ESPI_I01_R
[27.65] LPC_ESPI_I02_R
[27.65] LPC_ESPI_I03_R

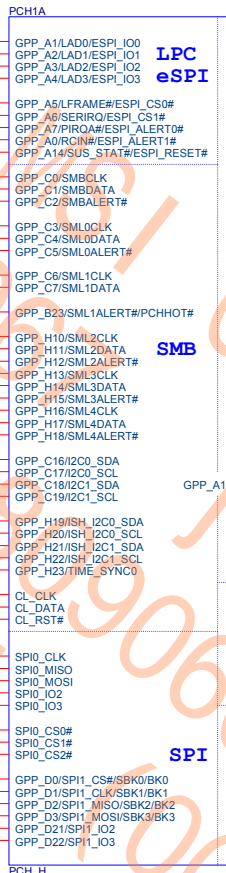
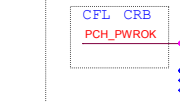
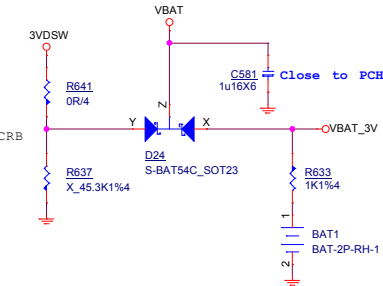
[27.65] LFRAME_CS0_N_R
[27.65] SERIRQ_R

LPC_ESPI_I00_R C646 X 0.1u/16X4
LPC_ESPI_I01_R C648 X 0.1u/16X4
LPC_ESPI_I02_R C649 X 0.1u/16X4
LPC_ESPI_I03_R C645 X 0.1u/16X4

[19.21.22] SMBCLK_VSB_R R805 X 0R/4 SMBCLK_VSB
[19.21.22] SMBDATA_VSB_R R793 X 0R/4 SMBDATA_VSB



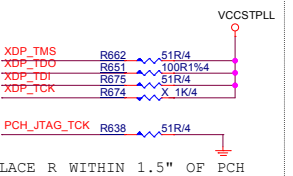
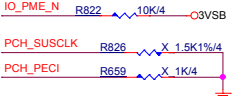
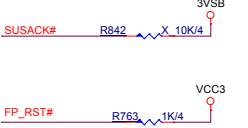
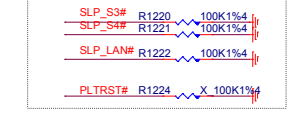
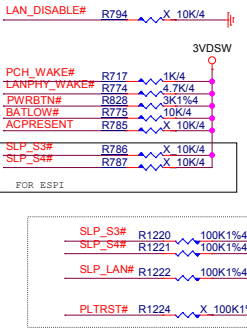
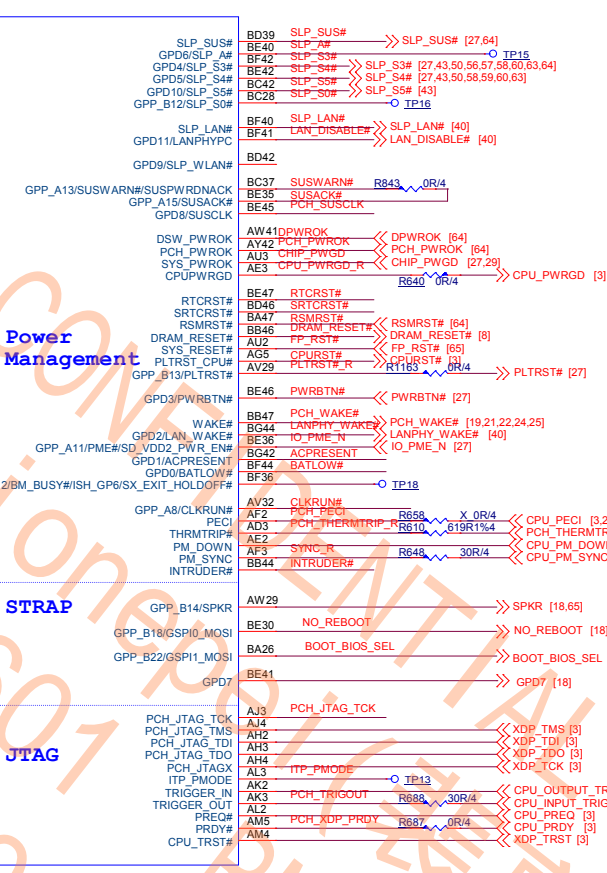
VBAT



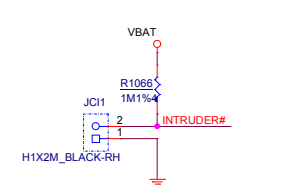
Power Management

STRAP

SPI JTAG



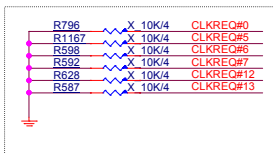
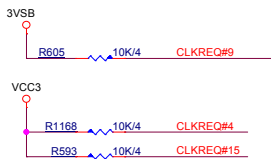
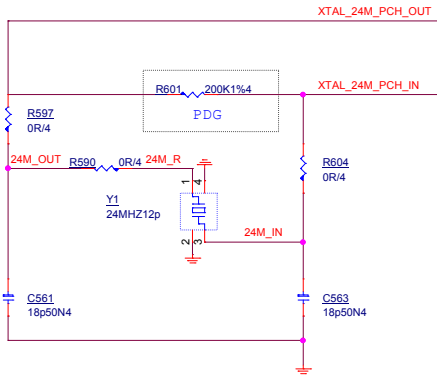
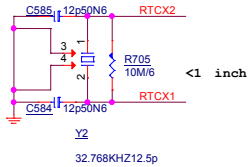
Chassis Intrusion



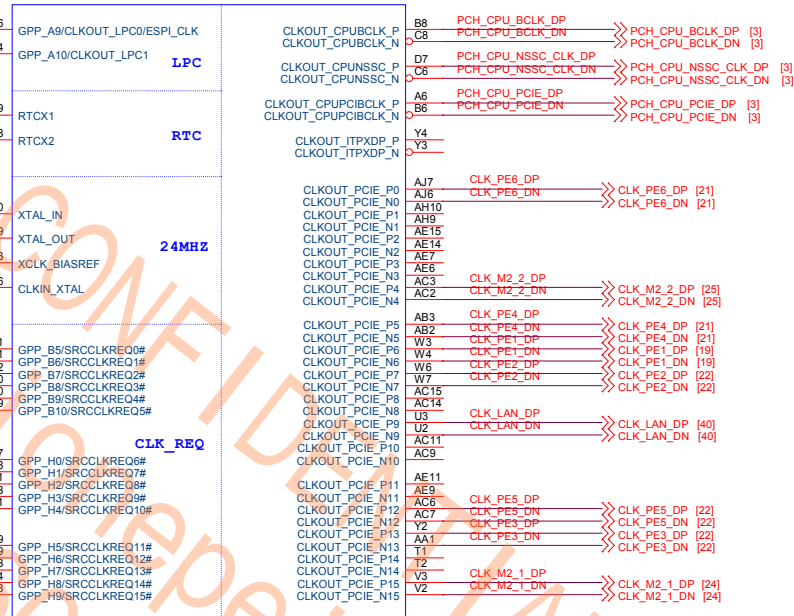
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PCH_CLK

Close to PCH

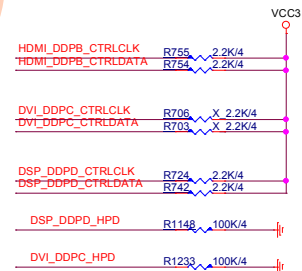
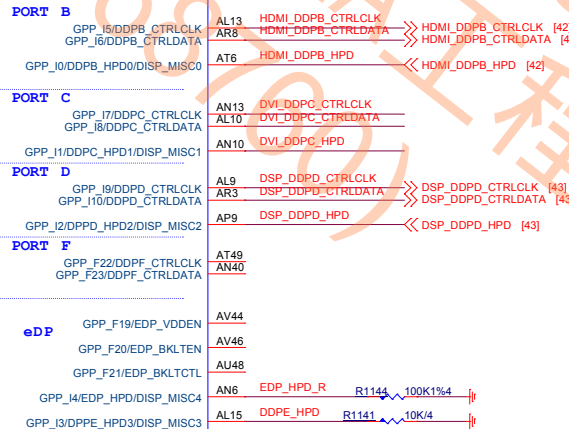
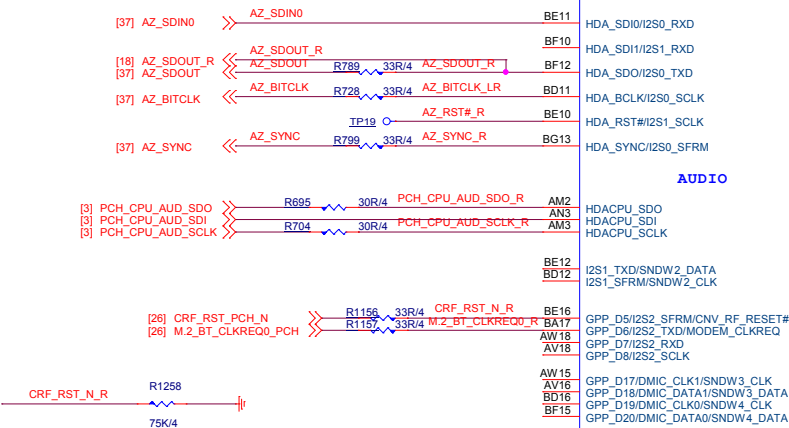


PCH1E



PCH_H

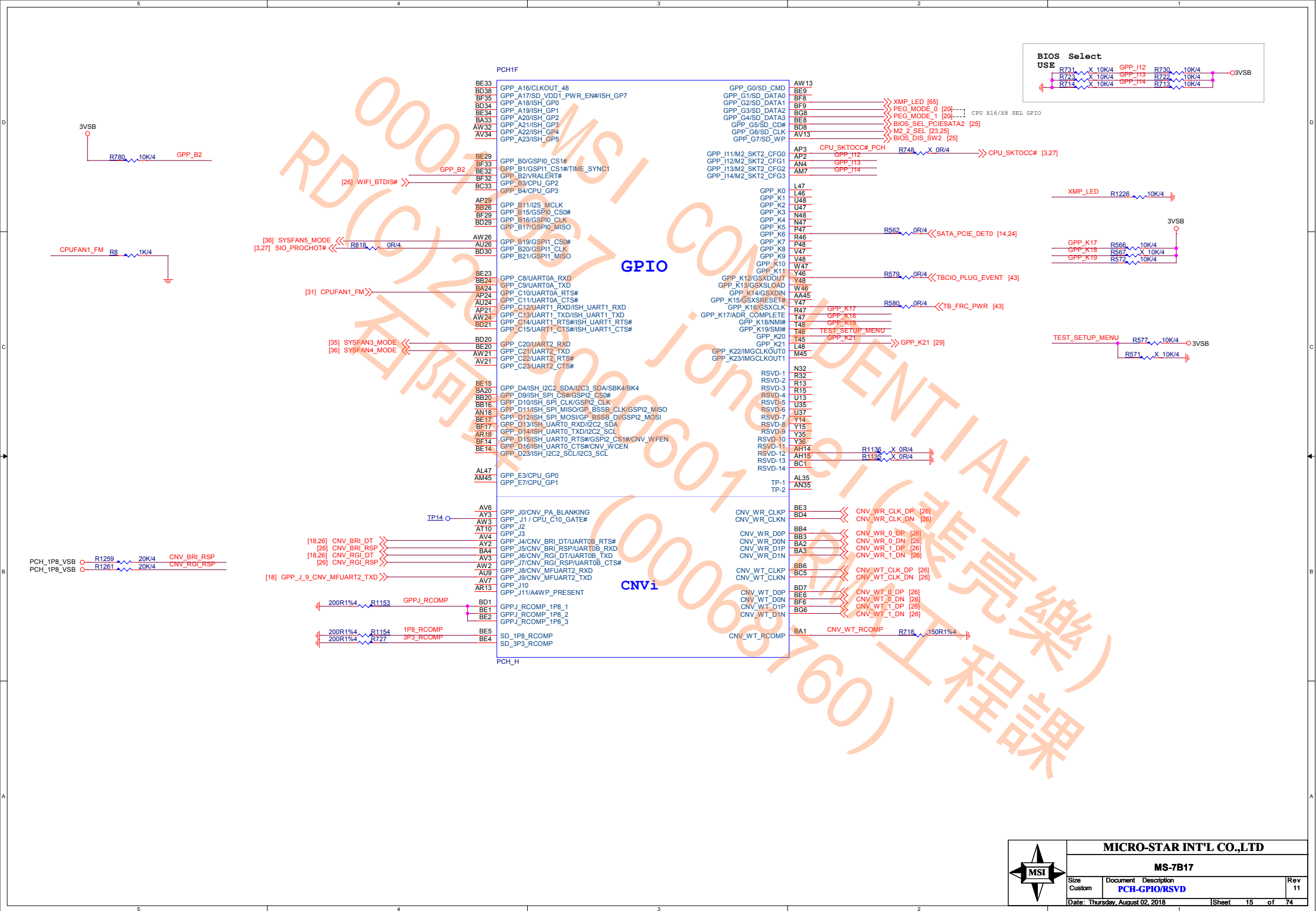
PCH_AUDIO

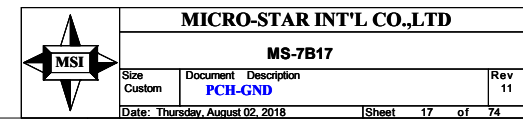


MICRO-STAR INT'L CO.,LTD

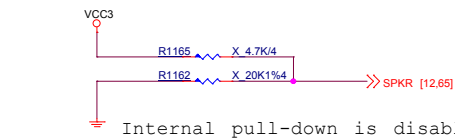
MS-7B17

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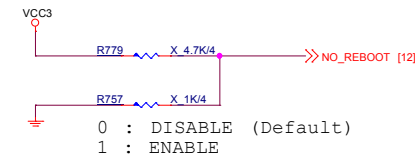




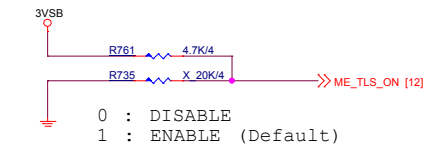
TOP Swap



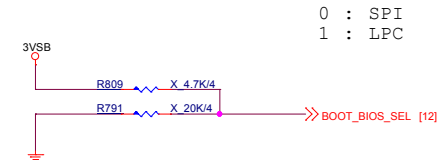
No Reboot



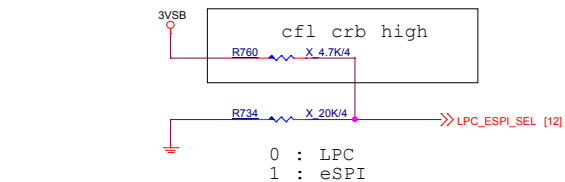
AMT and SBA with confidentiality



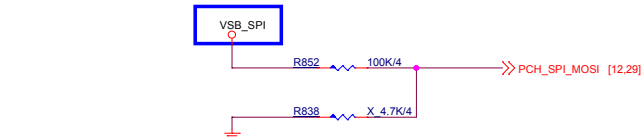
Boot BIOS



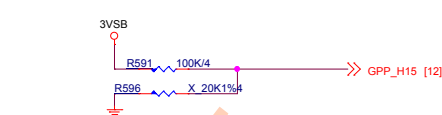
LPC eSPI Mode



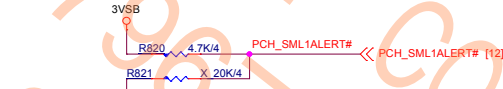
Reserved



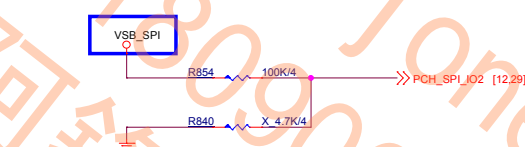
Reserved



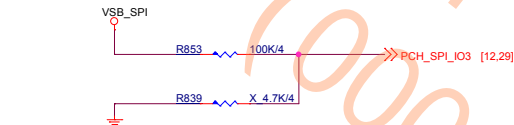
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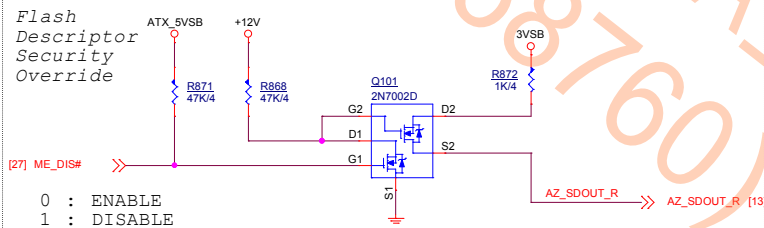
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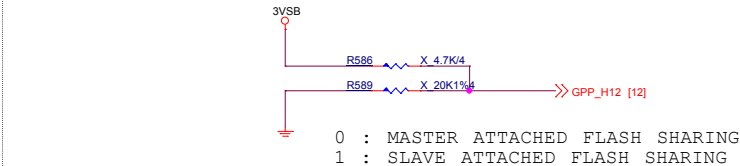
Reserved



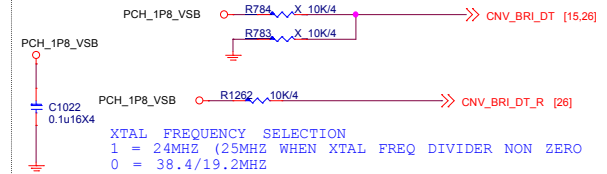
Flash Descriptor Security Override



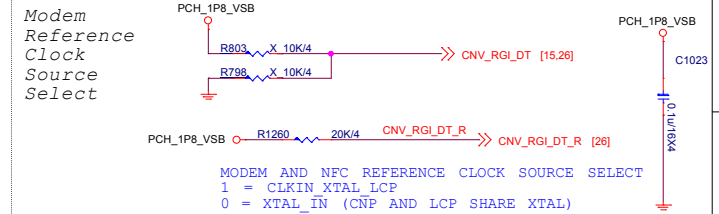
eSPI FLASH SHARING MODE



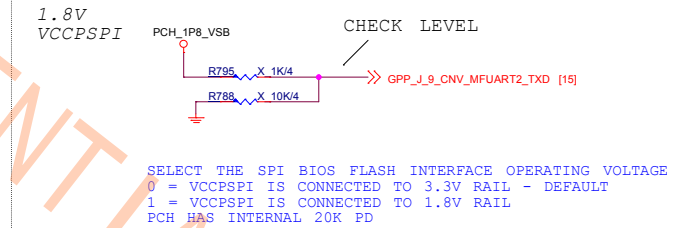
eSPI FLASH SHARING MODE



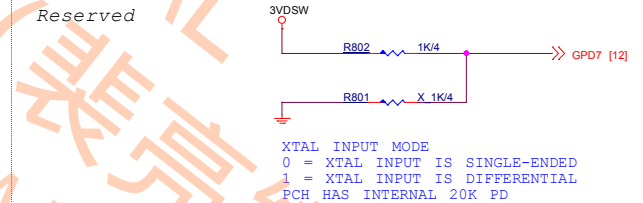
Modem Reference Clock Source Select



1.8V VCCPSPI



Reserved



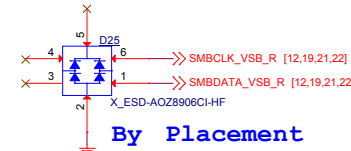
MICRO-STAR INT'L CO.,LTD

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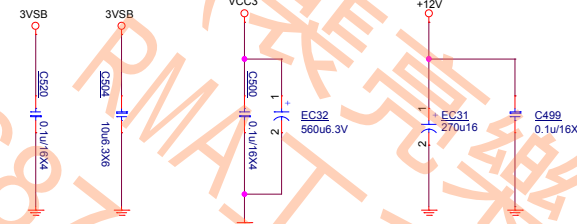
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12V - 5.5A
VCC3 - 3A
3VSB- 375mA


SMBUS ESD

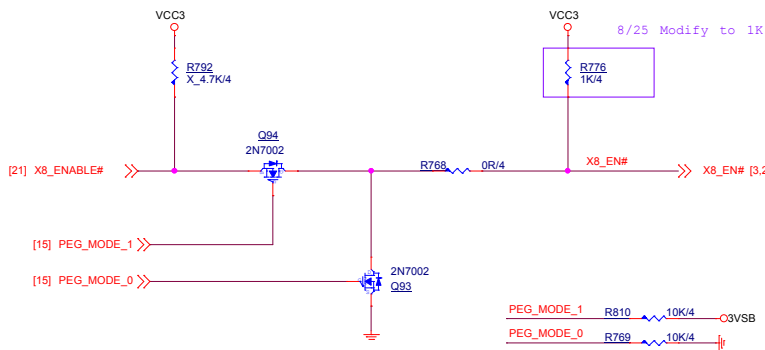
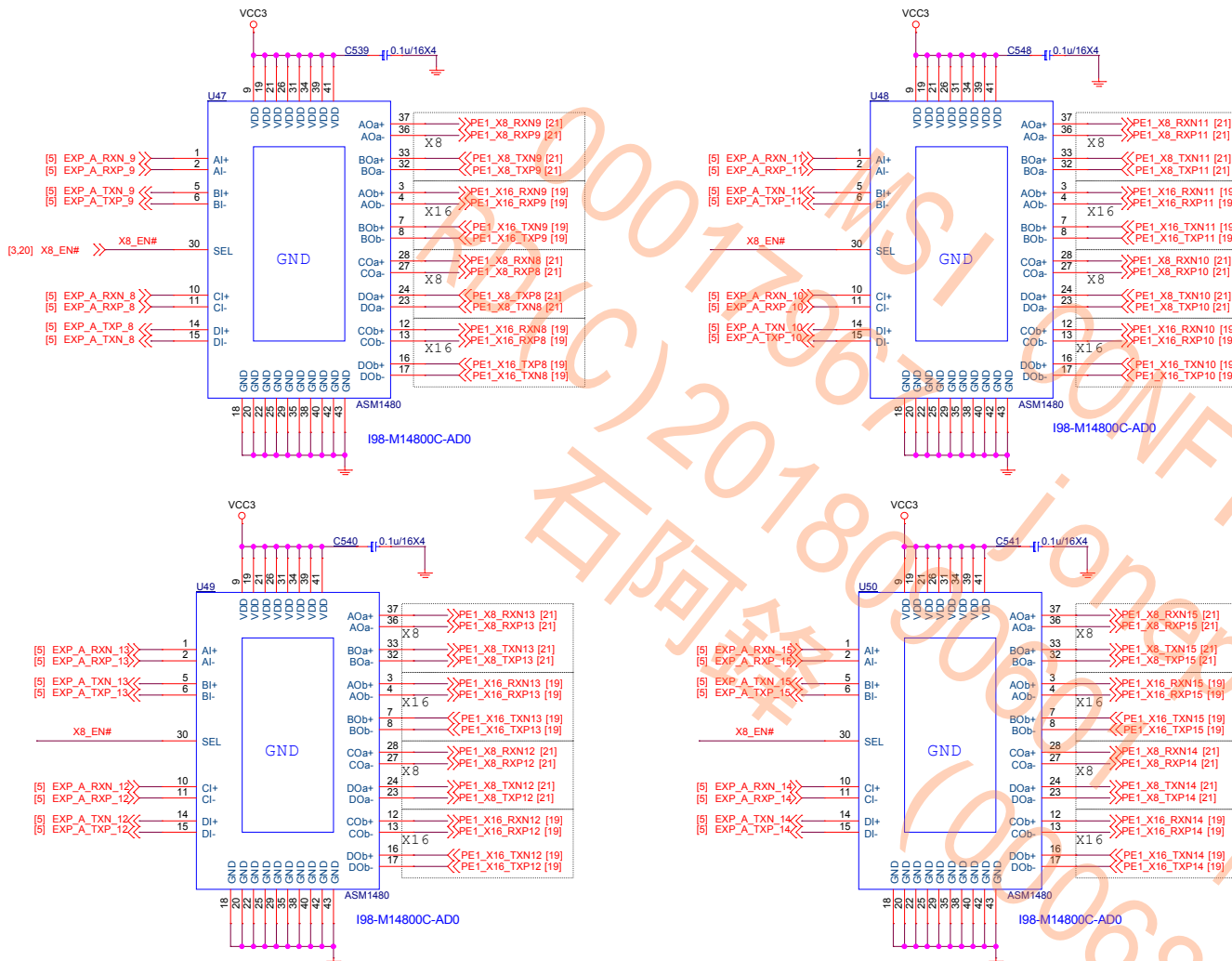


Main: D0G-05A0529-A68
AVL: D0G-45B0510-I14



0901 Modify PCI_E1 PIN X2.X3.X4.X5 Connect to GND

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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

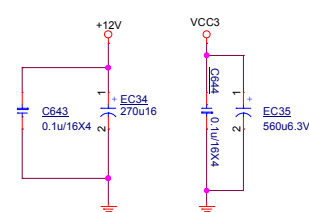
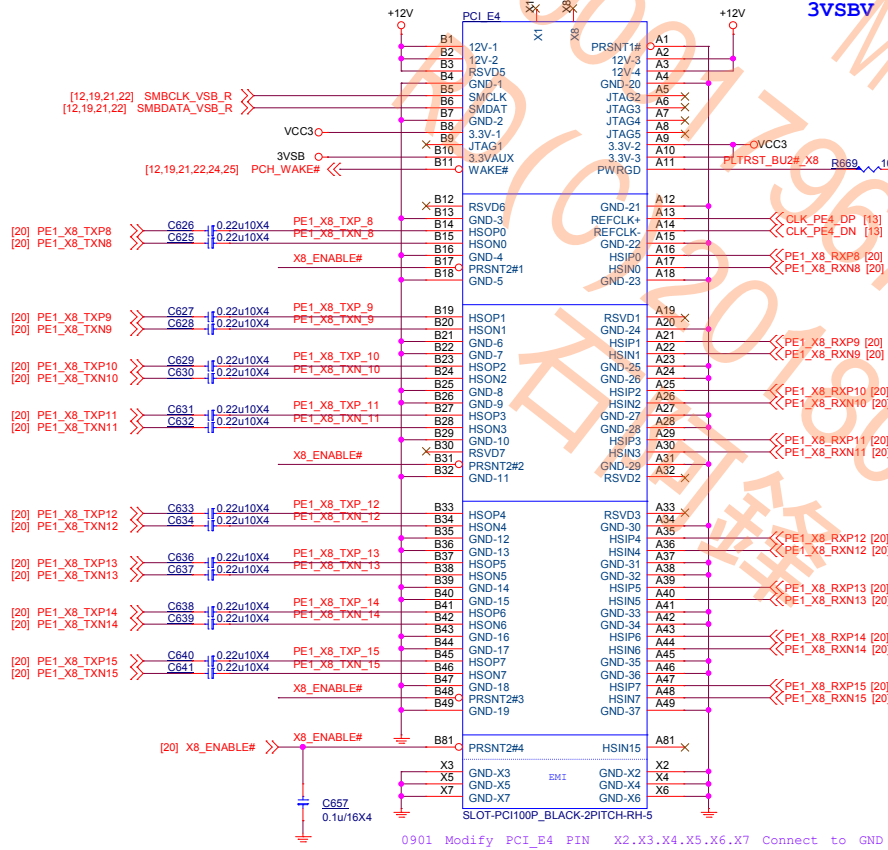
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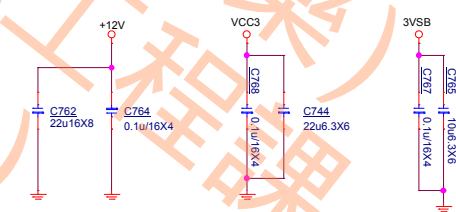
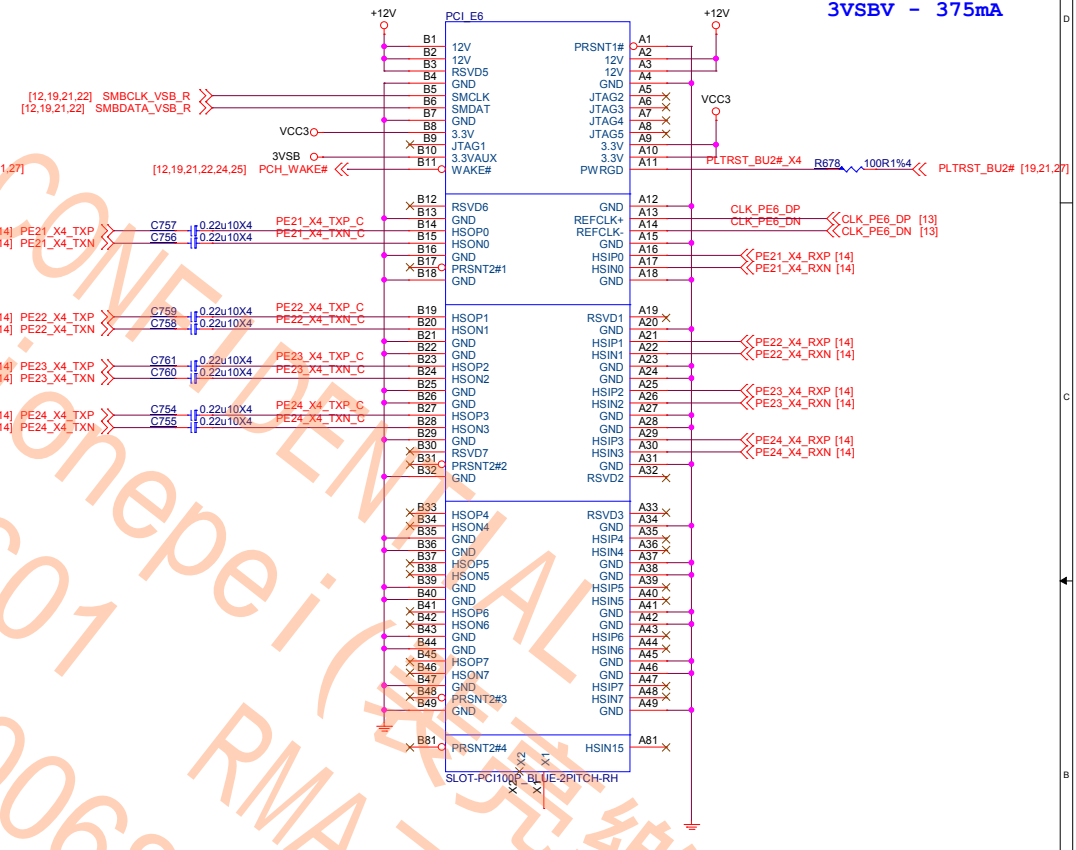
PCI Express X8 Slot

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

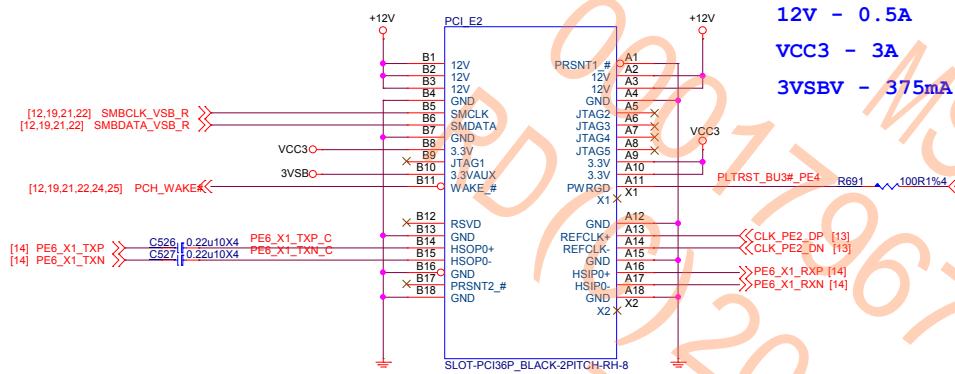


PCI Express X4 Slot

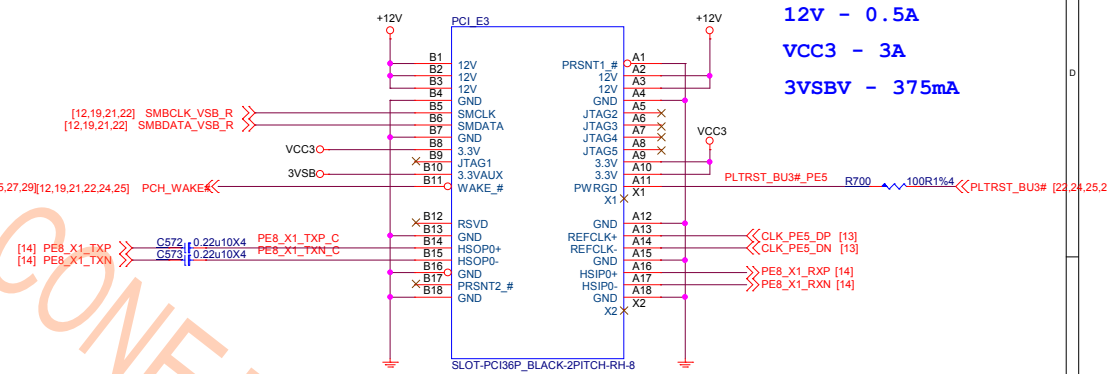
12V - 2.1A
VCC3 - 3A
3VSBV - 375mA



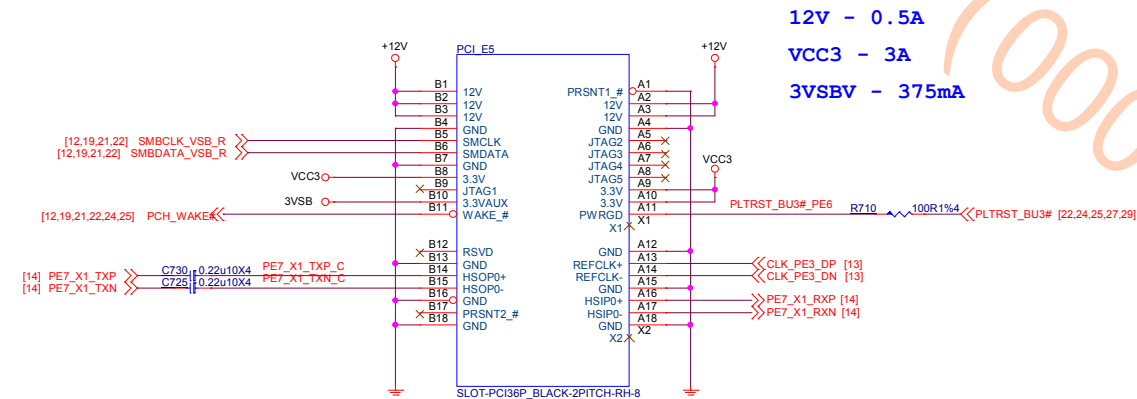
2016.08.25 Modify to N11-0360211-F02



2016.08.25 Modify to N11-0360211-F02



2016.08.25 Modify to N11-0360211-F02

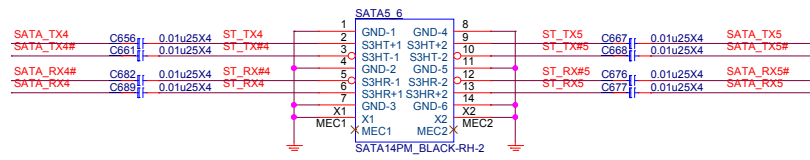
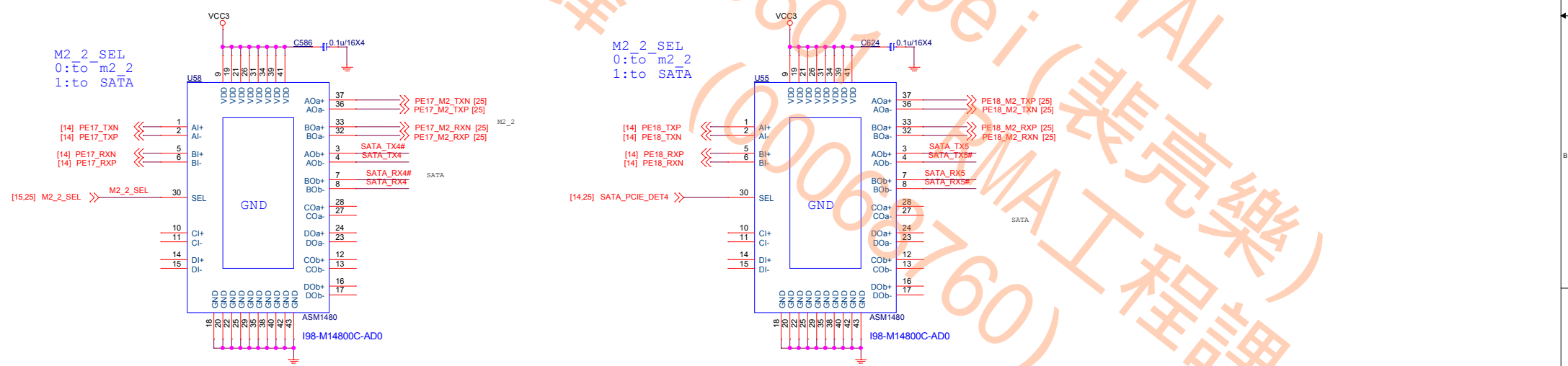



MICRO-STAR INT'L CO.,LTD

MS-7B17

Size	Document	Description	Rev
Custom		PCIE SLOT (X1)	11
Date: Thursday, August 02, 2018		Sheet 22 of 74	

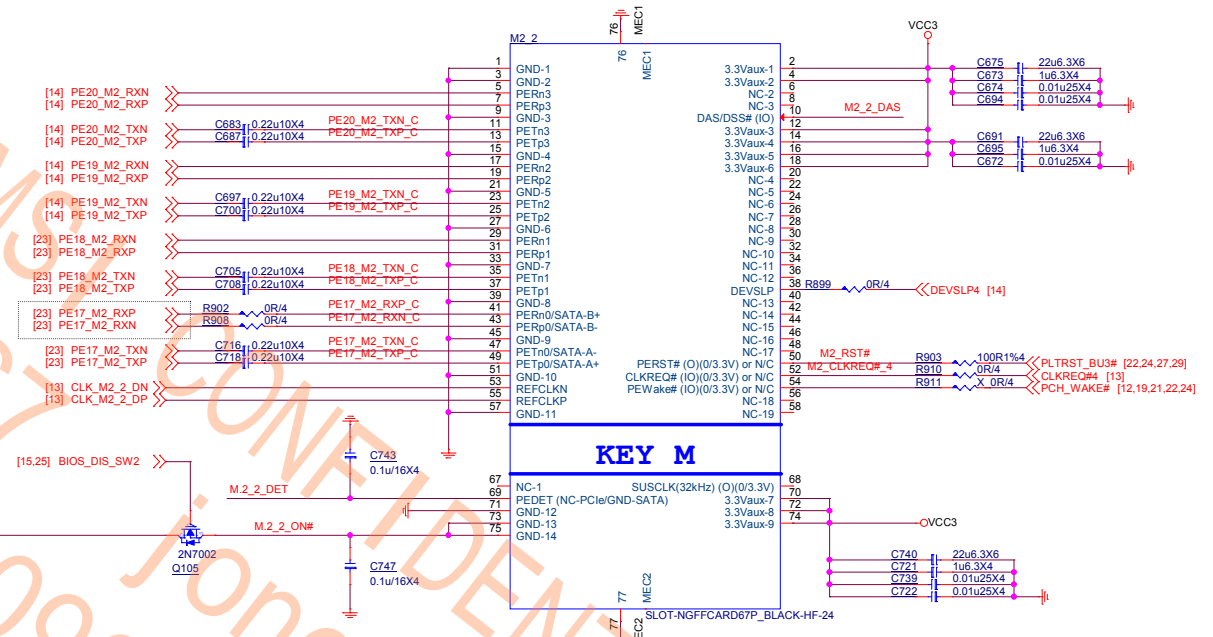
SATA Connector





MICRO-STAR INT'L CO.,LTD			
MS-7B17			
Size	Document	Description	Rev
Custom		SATA Connector	11
Date: Thursday, August 02, 2018		Sheet 23 of 74	

00017967
RD(C)2018090601
石阿鋒



[15,25] BIOS_DIS_SW2

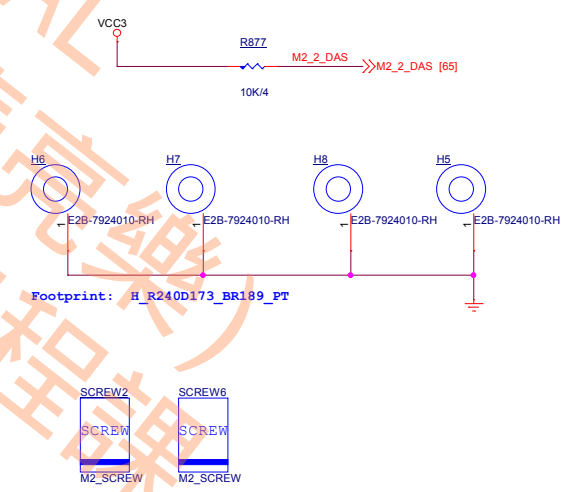
[15] BIOS_SEL_PCIESATA2

BIOS_MODE

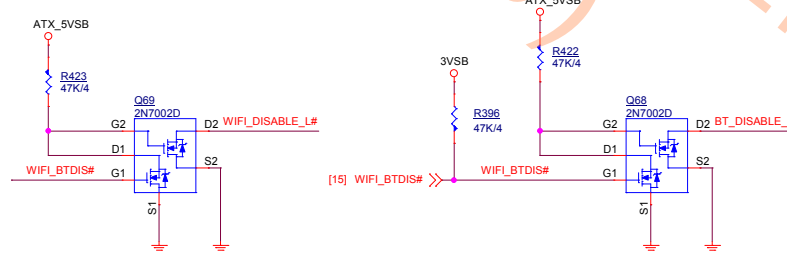
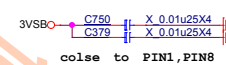
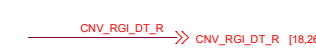
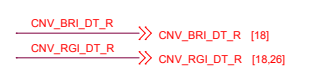
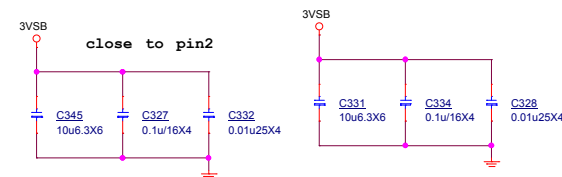
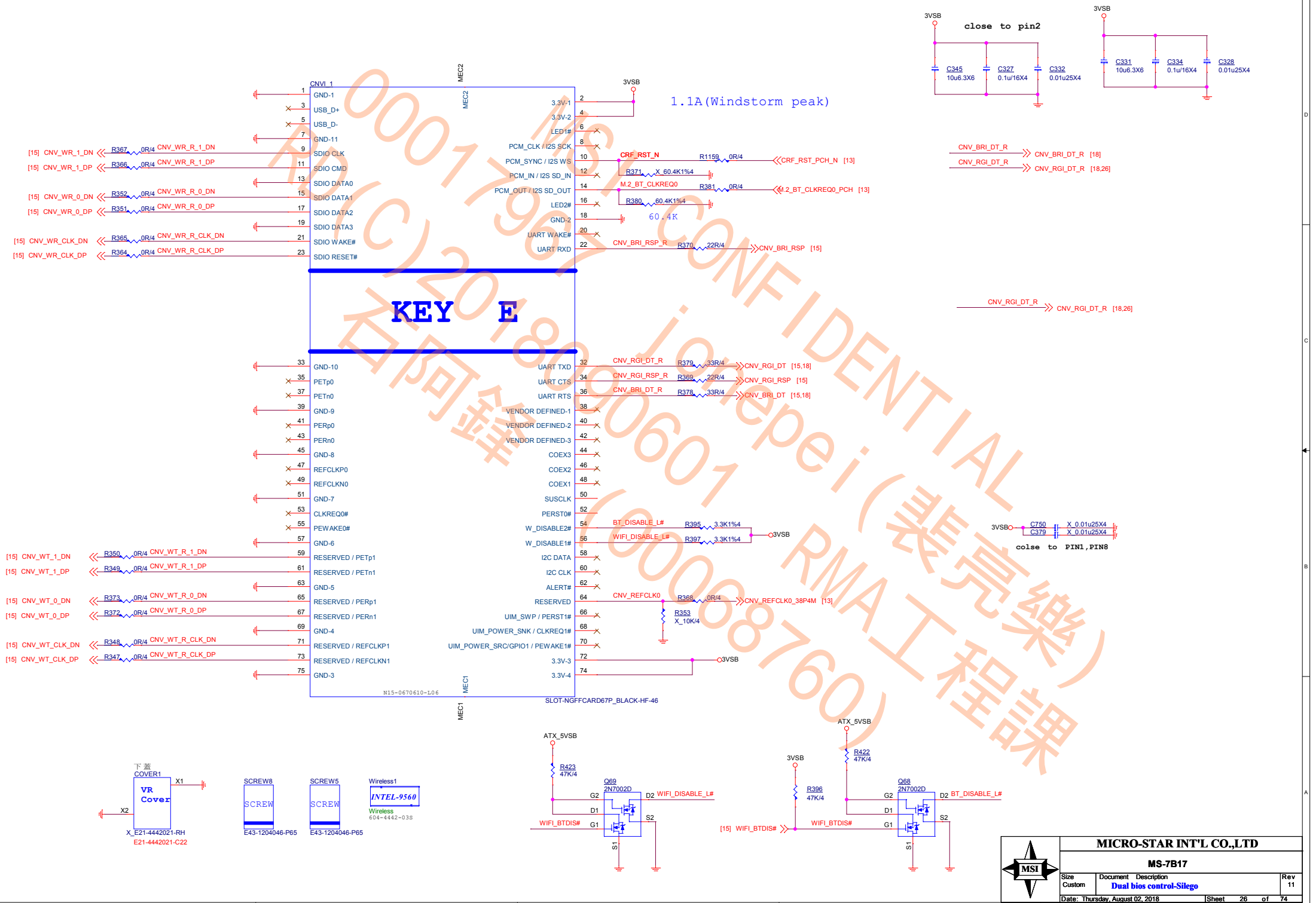
GPP_G7	GPP_G6	GPP_G5	
BIOS_DIS_SW	M2_2_SEL	BIOS_SEL_PCIESATA2	Mode
GPI (1)	GPI (1)	GPI (0)	AUTO
0	1	0	SATA5
0	0	1	M2-SATA
0	0	0	M2-PCIE

SATA_PCIE_DET4
0-PCIE
1-SATA

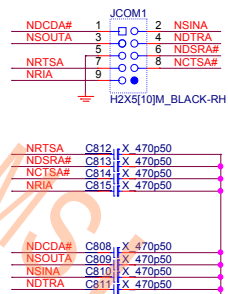
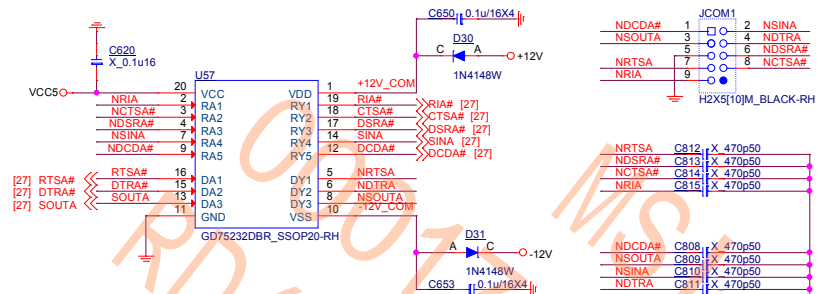
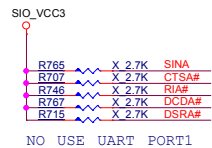
PCH side
0:PCIE
1:SATA
M.2 side
0:SATA
NC:PCIE



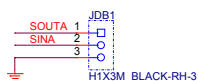
MICRO-STAR INT'L CO.,LTD			
MS-7B17			
Size	Document	Description	Rev
Custom		M2-SLOT2	11
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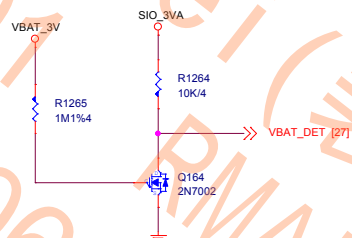
SERIAL PORT 1



BIOS DEBUG

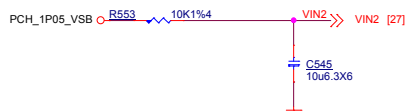
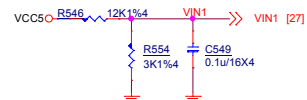
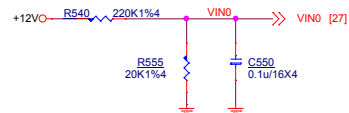
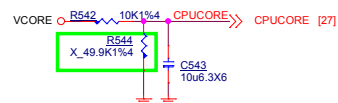
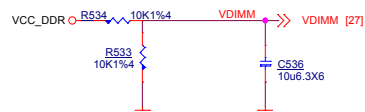


VBAT_DET



HW Monitor - Voltage

SIO HM Voltage voer 2V will not detect



MICRO-STAR INT'L CO.,LTD

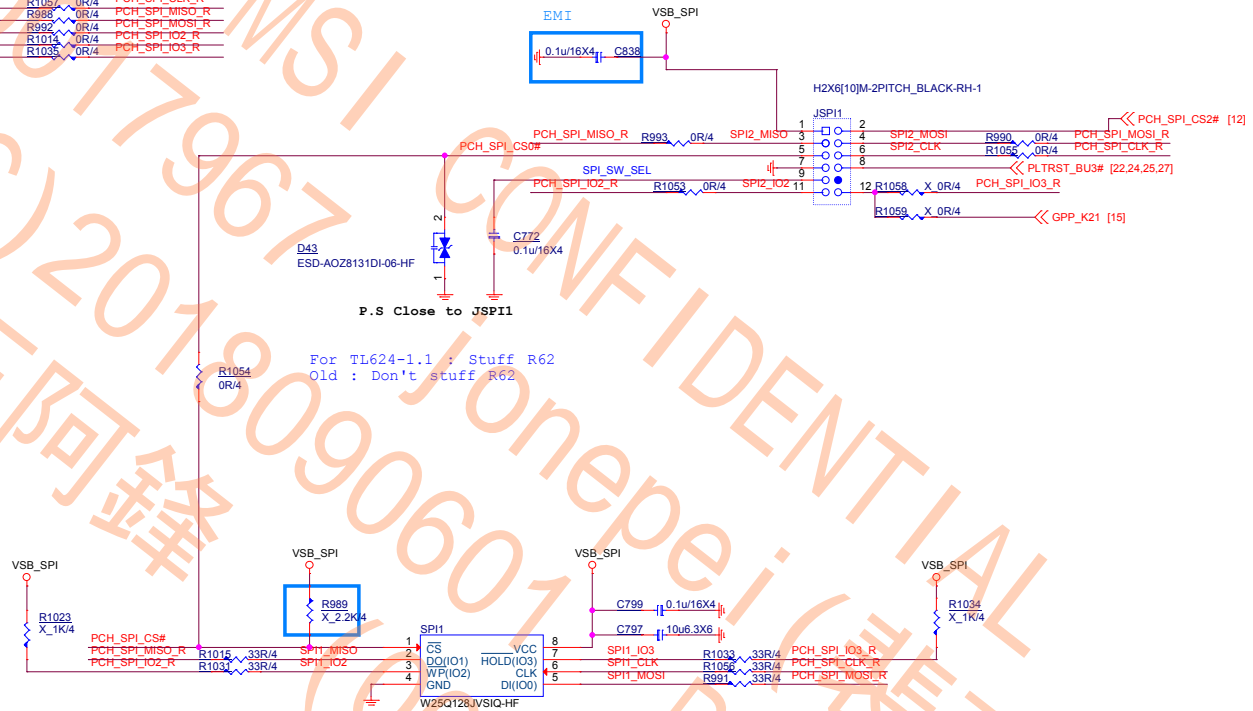
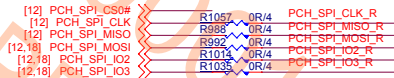
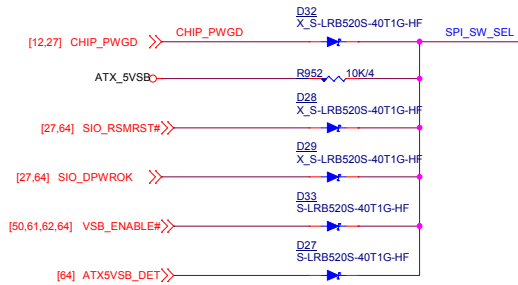
MS-7B17

Size Custom	Document Description SIO-NCT6793D-2	Rev 11
Date: Thursday, August 02, 2018		Sheet 28 of 74

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

0825 Add D48,unstuff D33

For TL624 1.1



MICRO-STAR INT'L CO.,LTD

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Size	Document	Description	Rev
Custom		Dual BIOS	11
Date: Thursday, August 02, 2018		Sheet 29 of 74	

MSI CONFIDENTIAL
00017967 jonepei (裴亮樂)
RD(C)2018090601 RMA工程課
石阿鋒 (00068760)



MICRO-STAR INT'L CO.,LTD

MS-7B17

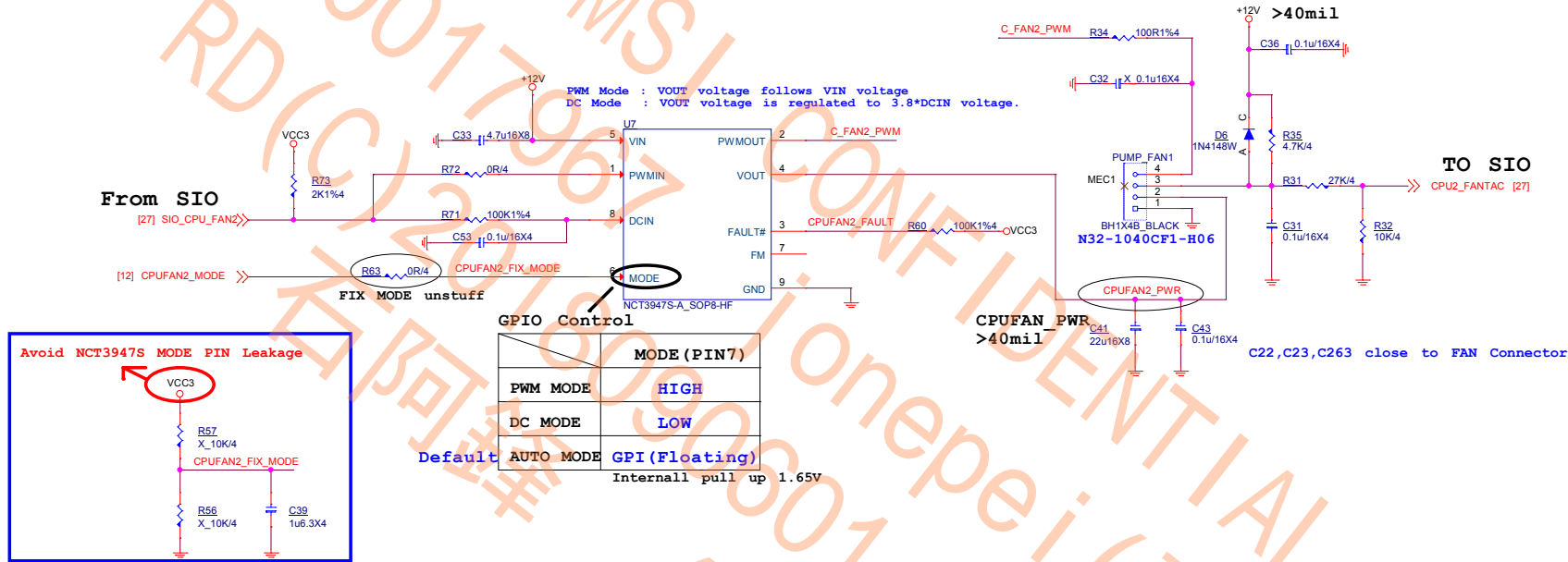
Size	Document	Description	Rev
Custom		CLR COMS/CUT VBAT	11
Date: Thursday, August 02, 2018		Sheet 30 of 74	

1.Mode GPIO BIOS can swtich PWM/DC MODE

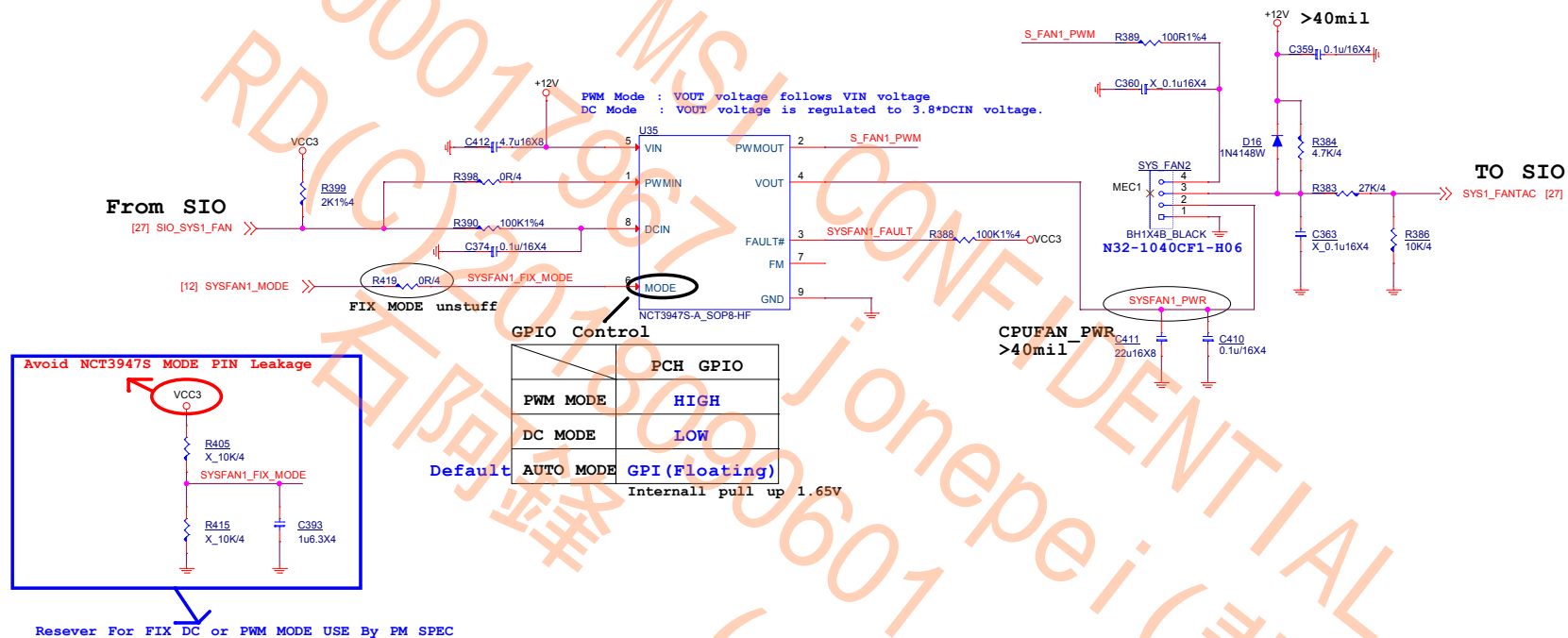


TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE

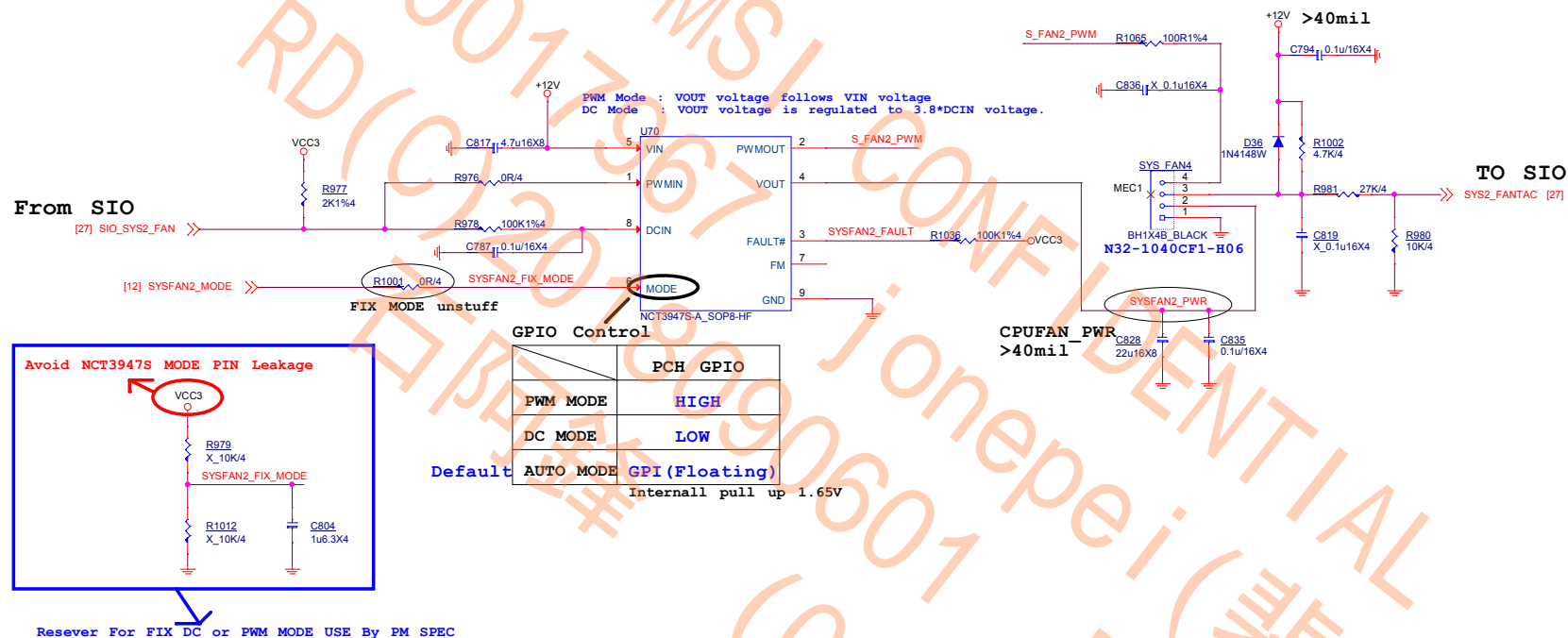
1.Mode GPIO BIOS can switch PWM/DC MODE



Resever For FIX DC or PWM MODE USE By PM SPEC

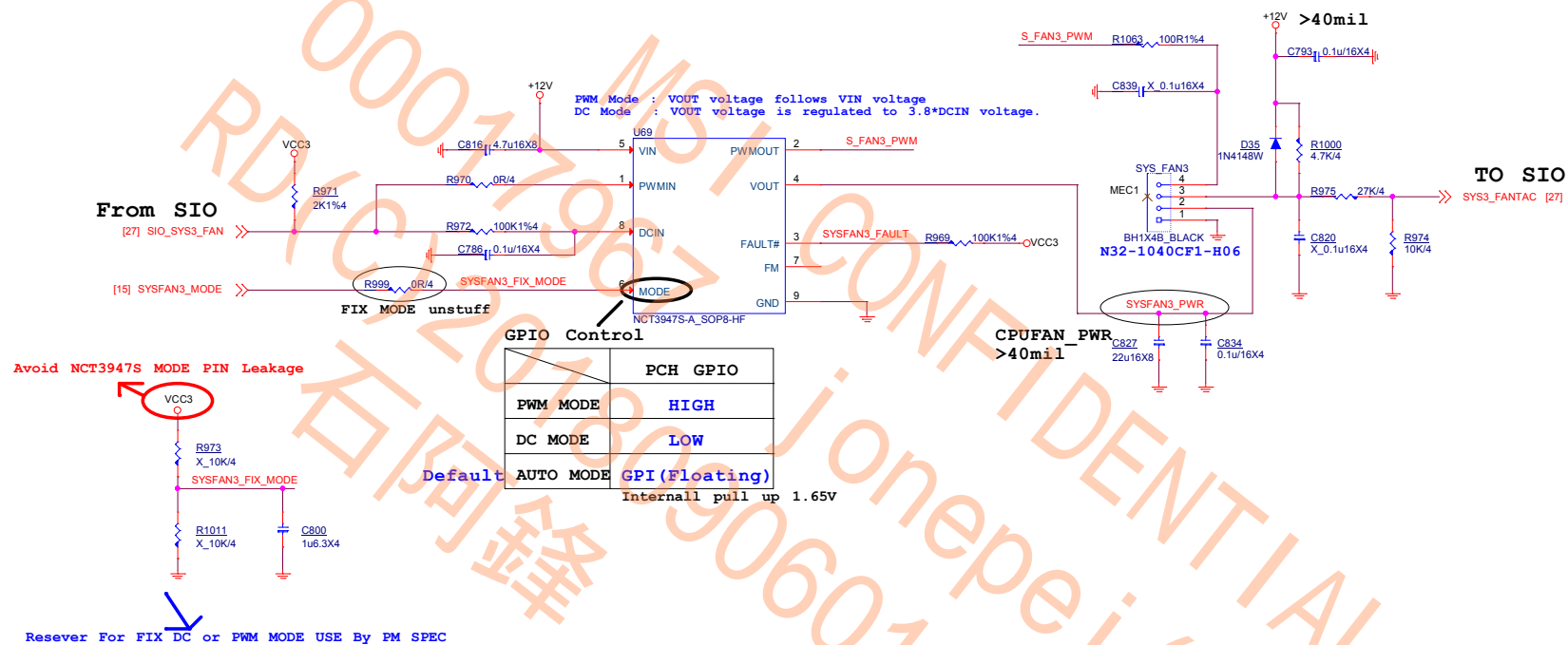


TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE
1.Mode GPIO BIOS can switch PWM/DC MODE



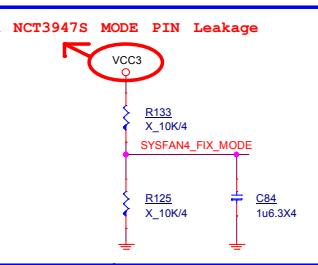
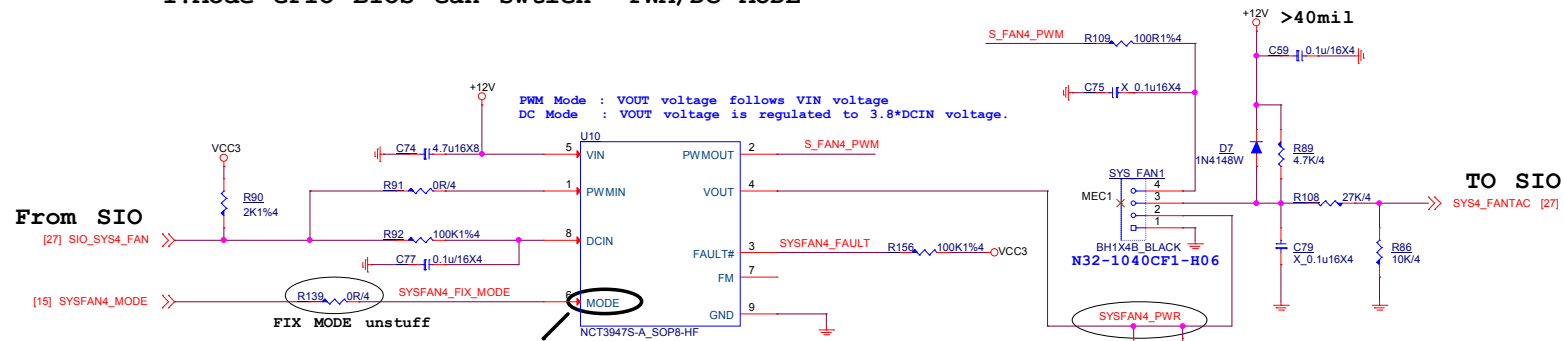
TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can swtich PWM/DC MODE

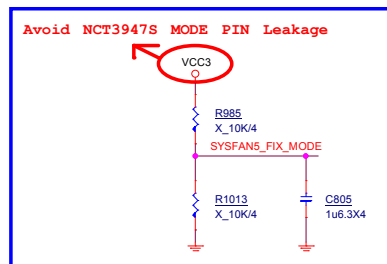
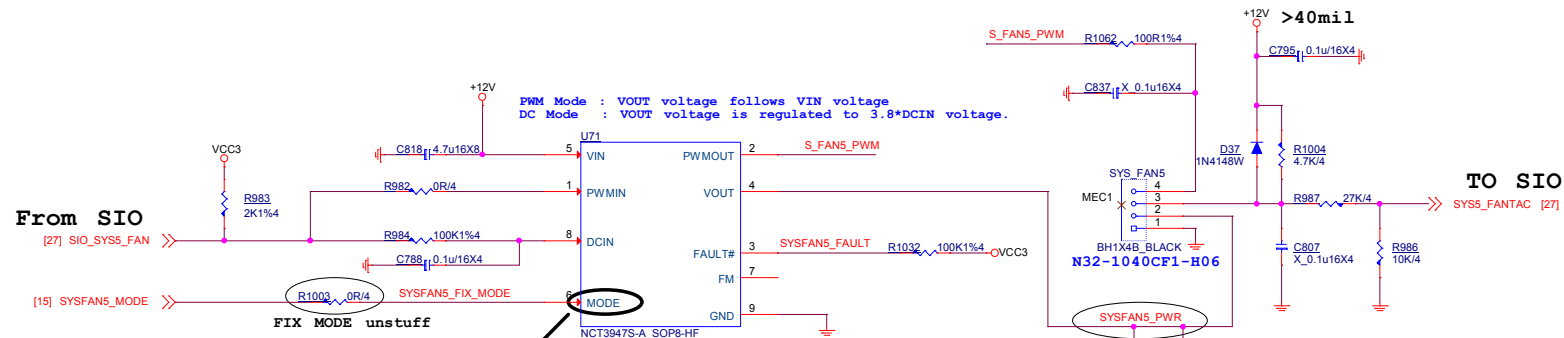


TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can switch PWM/DC MODE

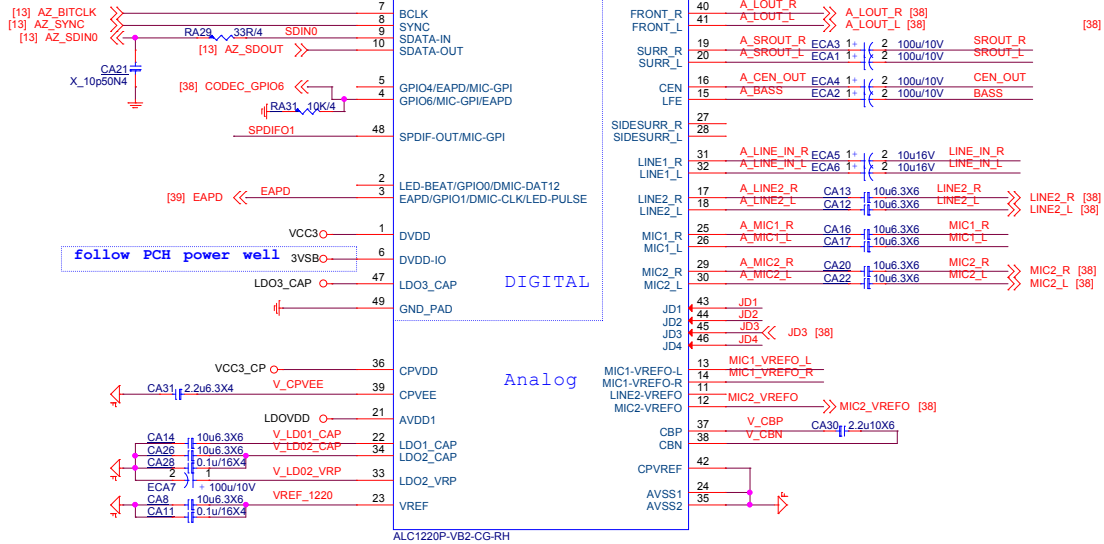


Resever For FIX DC or PWM MODE USE By PM SPEC



Resever For FIX DC or PWM MODE USE By PM SPEC

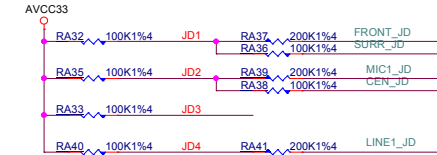
ALC1220P_VB-48PIN



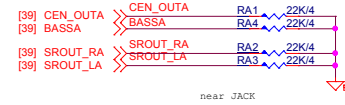
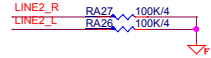
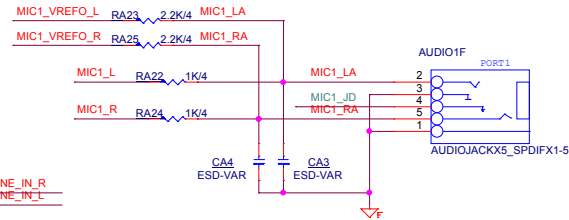
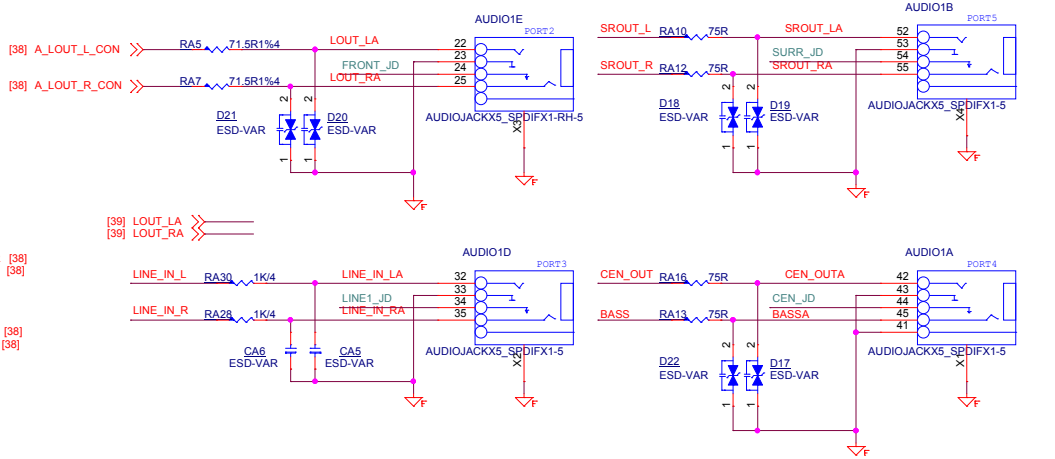
follow PCH power well

DIGITAL

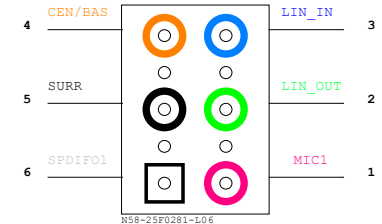
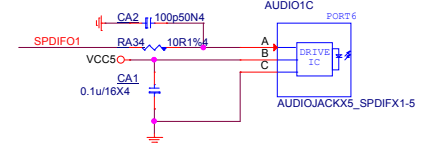
Analog



all of JD resistors should be placed as close as possible to the sense pin of codec.

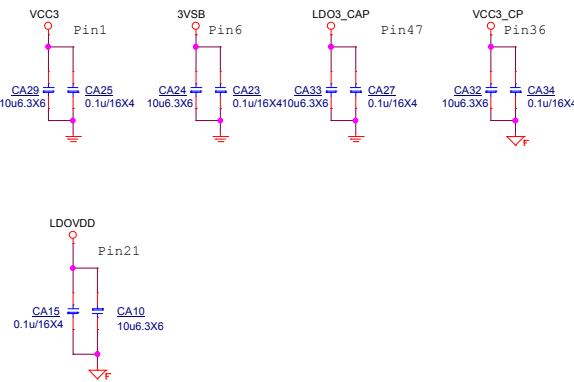


near JACK

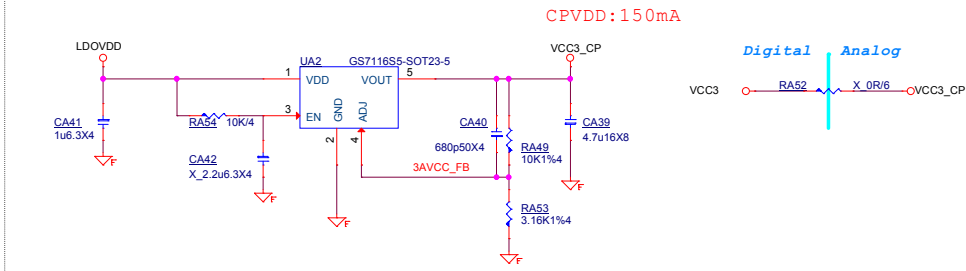


MS8-25P0281-L06

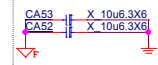
Closed Codec



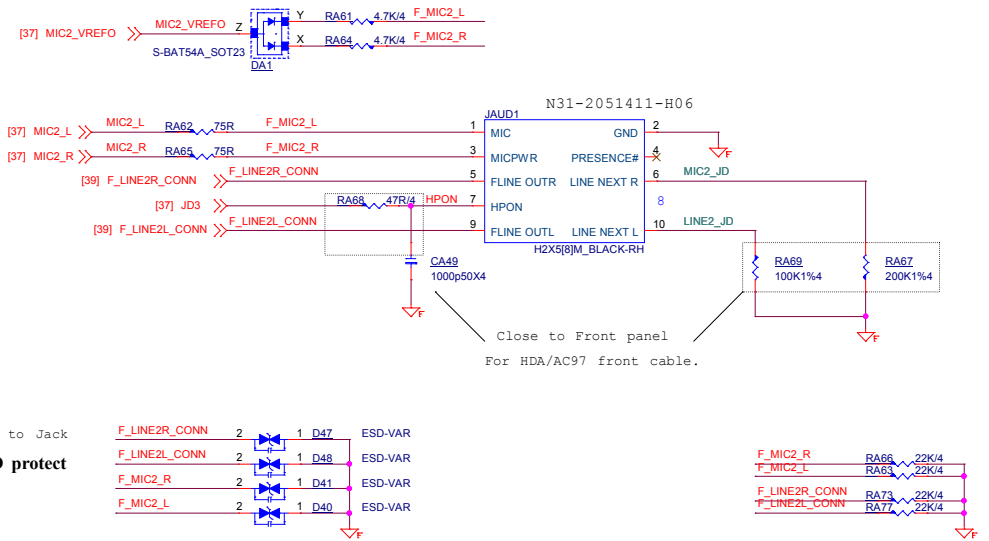
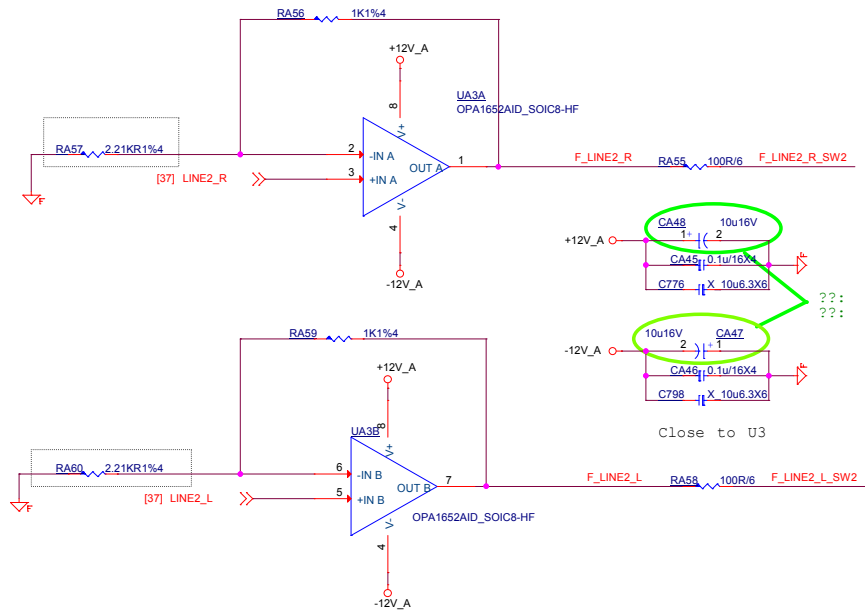
CPVDD POWER:ATX5VSB will Leakage to CVDD by ALC1220, so CVDD must keep 3.3V



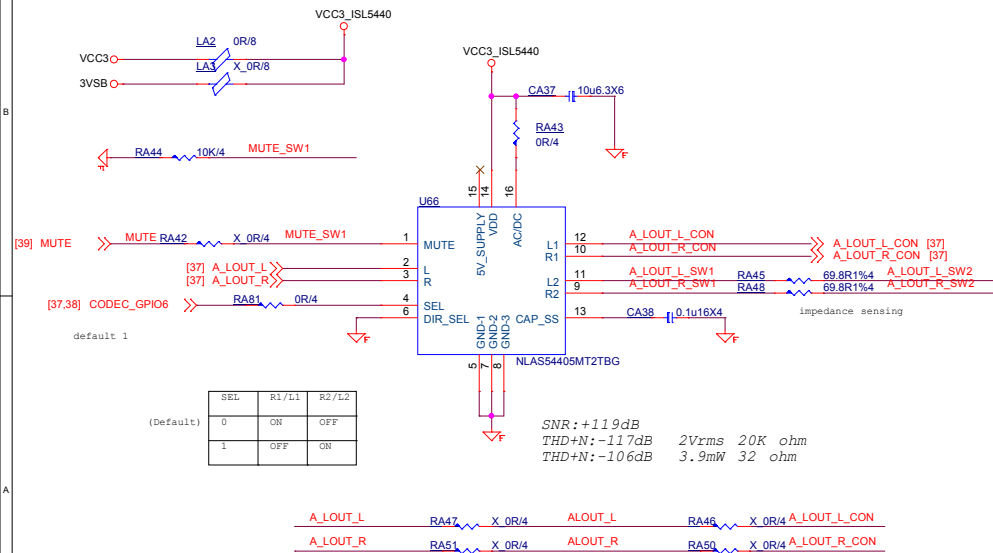
EMI



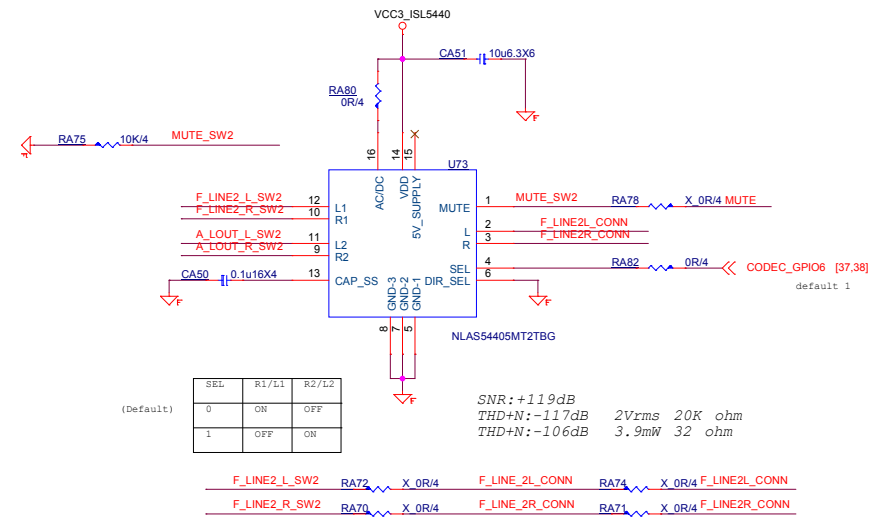
MICRO-STAR INT'L CO.,LTD			
MS-7B17			
Size	Document	Description	Rev
Custom		AUDIO-ACL1220-1	11
Date: Thursday, August 02, 2018		Sheet 37 of 74	



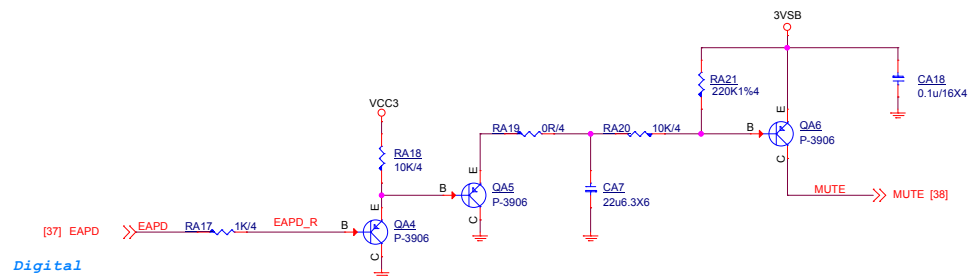
Analong SW1



Analong SW2



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

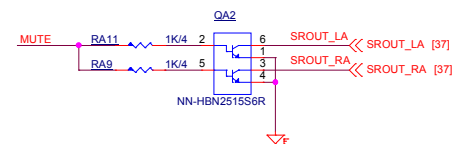
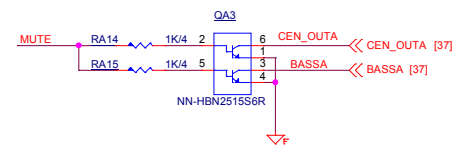


Analog



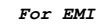
Audio moat is transparent and width 40mil

*(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)*



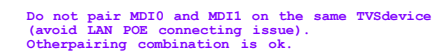
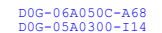
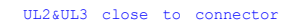
LAN Connector

+3.3V_LAN



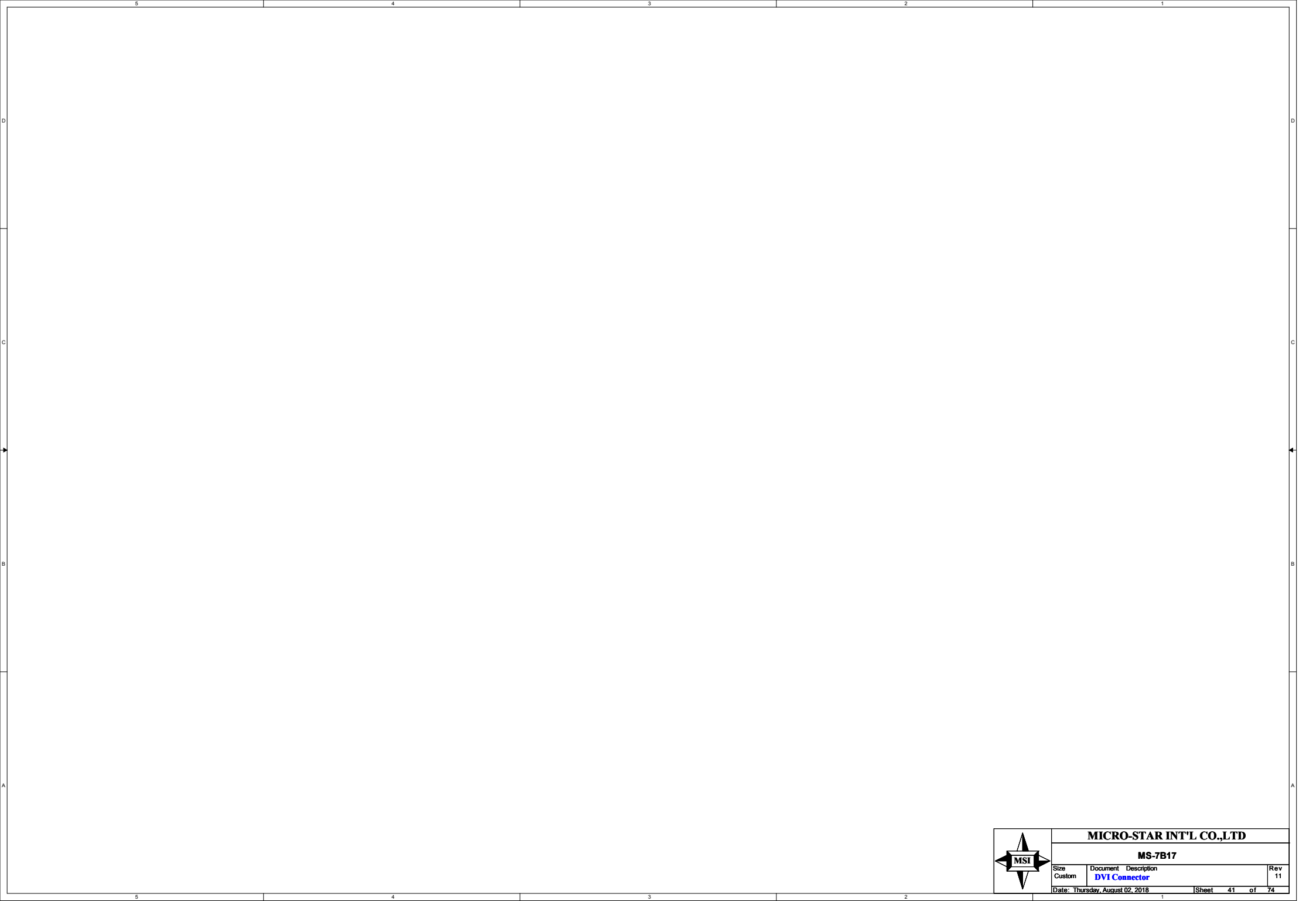
The 10Kohm pull-up resistor (RL18) of CLK_REQ_N is connected to 3.3V Suspend/Core/etc. power well, depending on the power well of PCH's input PCIECLKRQ<n> buffer.


+3.3V LAN
I218:132mA
I219:542mW



MS-7B17

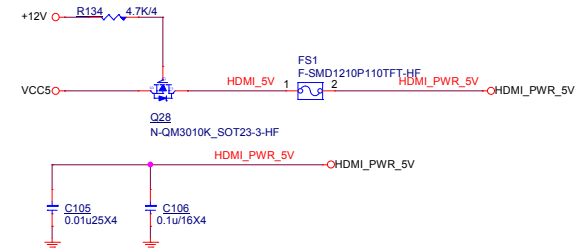
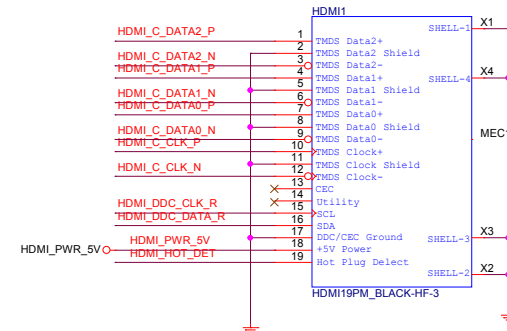
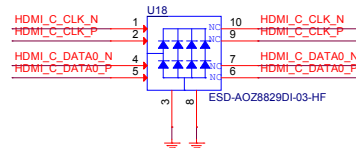
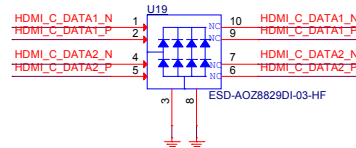
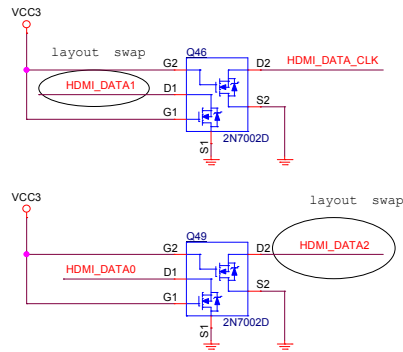
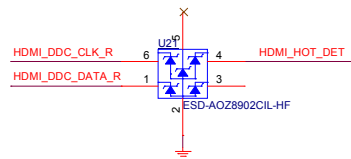
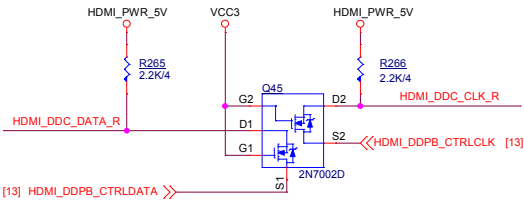
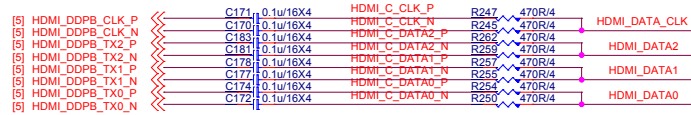
Size Custom	Document Description Intel Lan- i219	Rev 11
Date: Thursday, August 02, 2018		Sheet 40 of 74



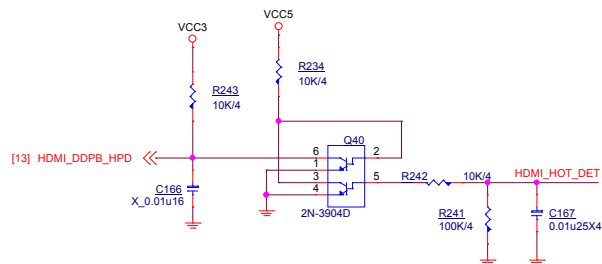


MICRO-STAR INT'L CO.,LTD			
MS-7B17			
Size Custom	Document DVI Connector	Description	Rev 11
Date: Thursday, August 02, 2018		Sheet 41 of 74	

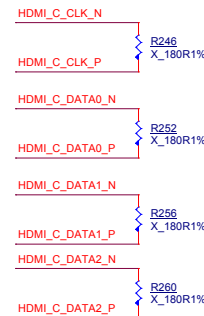
HDMI, DVI : 1920x1200 at 60 Hz (16:10 WUXGA)



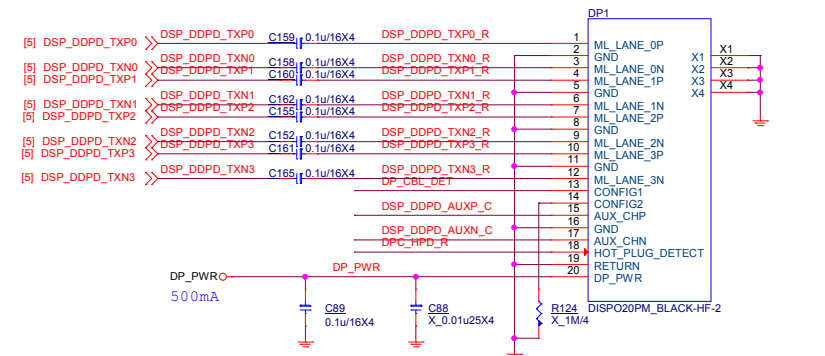
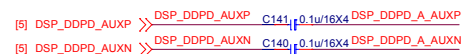
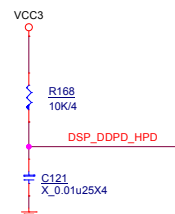
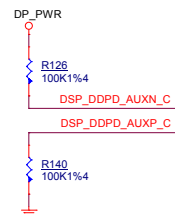
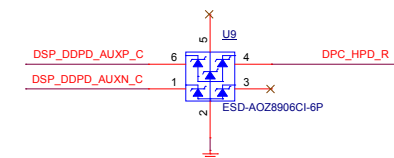
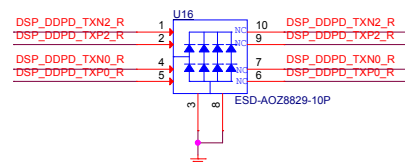
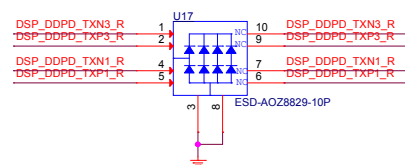
HPD



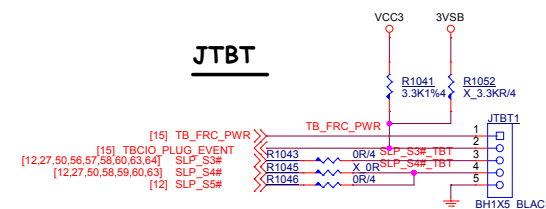
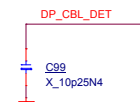
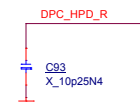
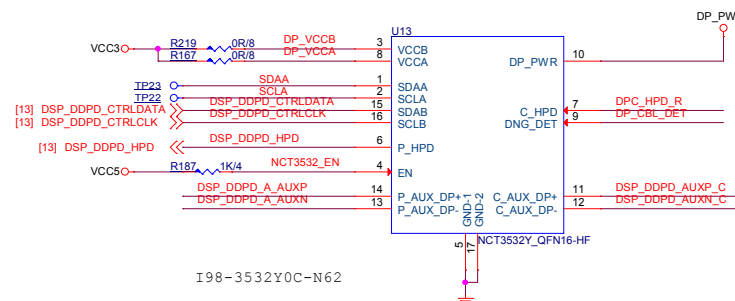
For EMI



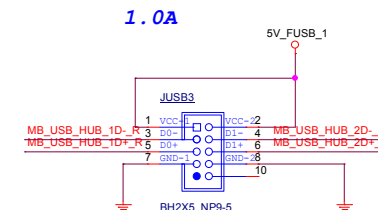
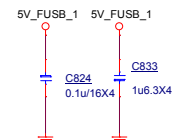
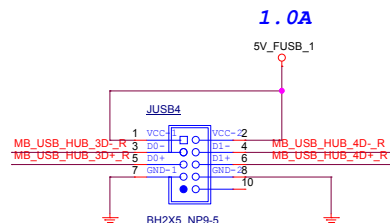
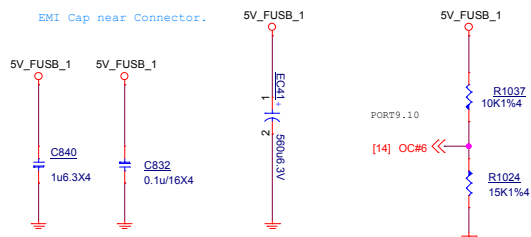
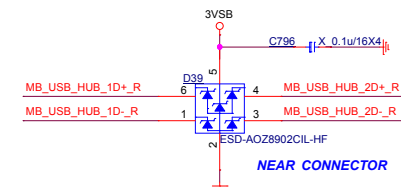
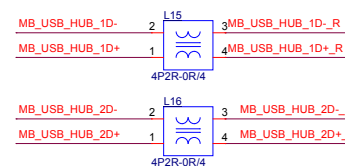
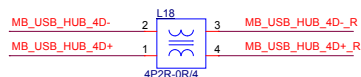
MSI			
MICRO-STAR INT'L CO.,LTD			
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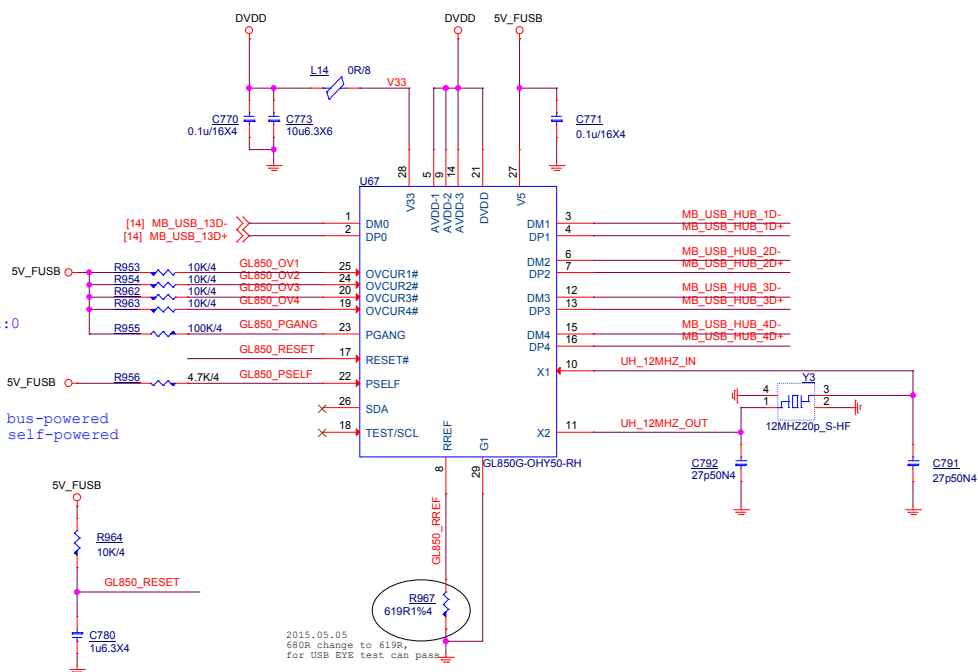
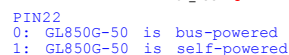
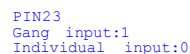
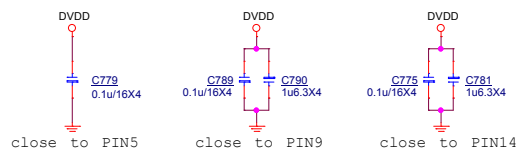
DP VCCB trace don't less than 30 mil



MICRO-STAR INT'L CO.,LTD			
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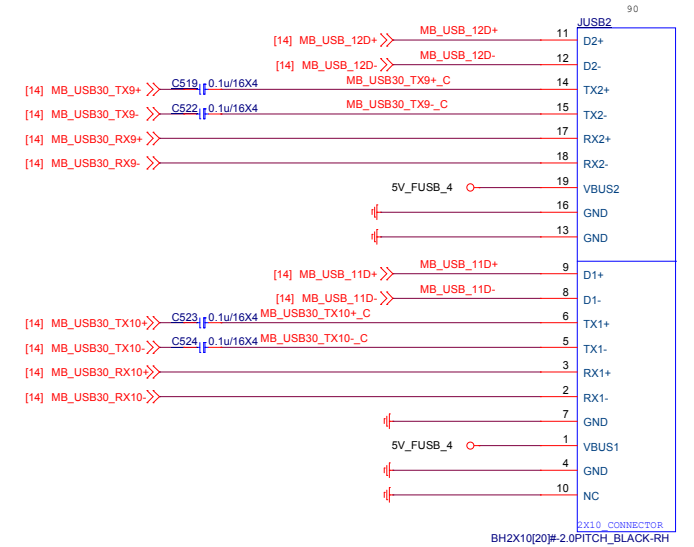
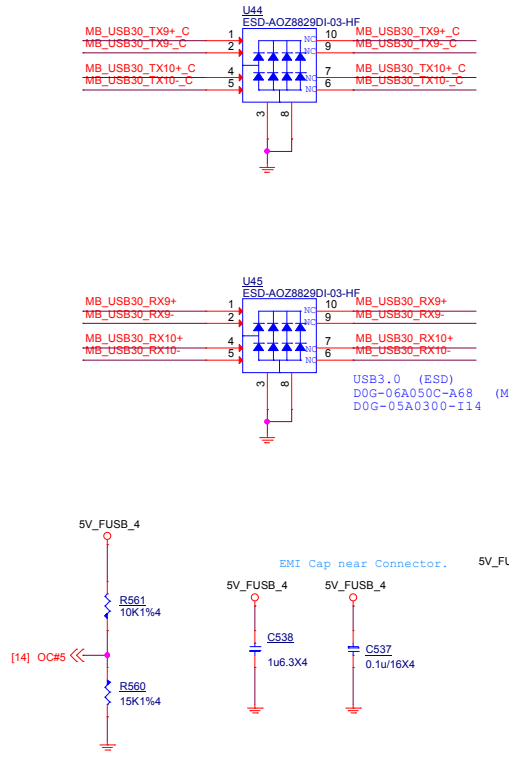
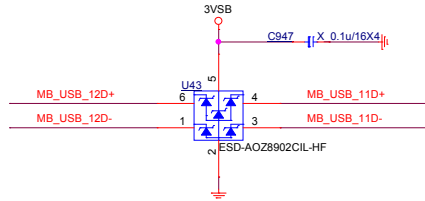
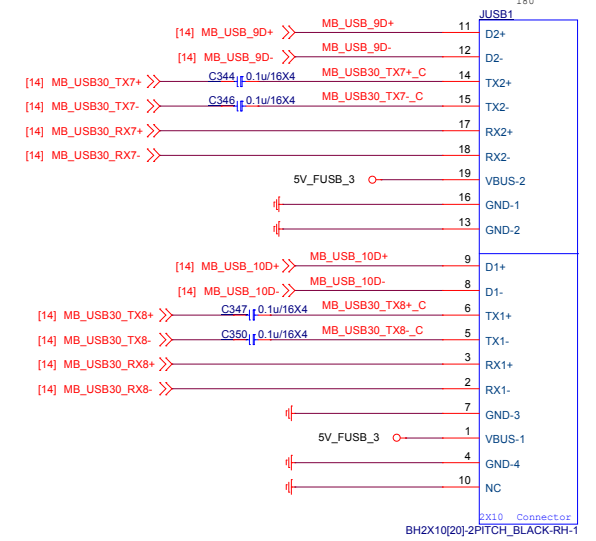
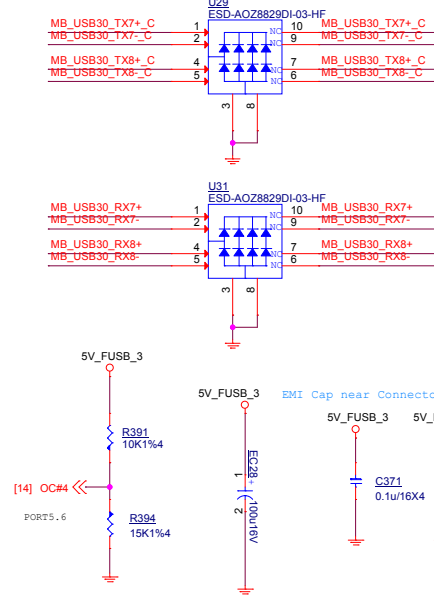
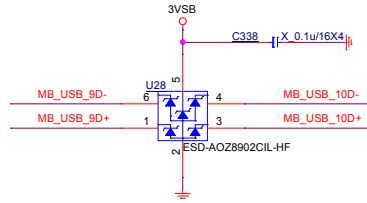


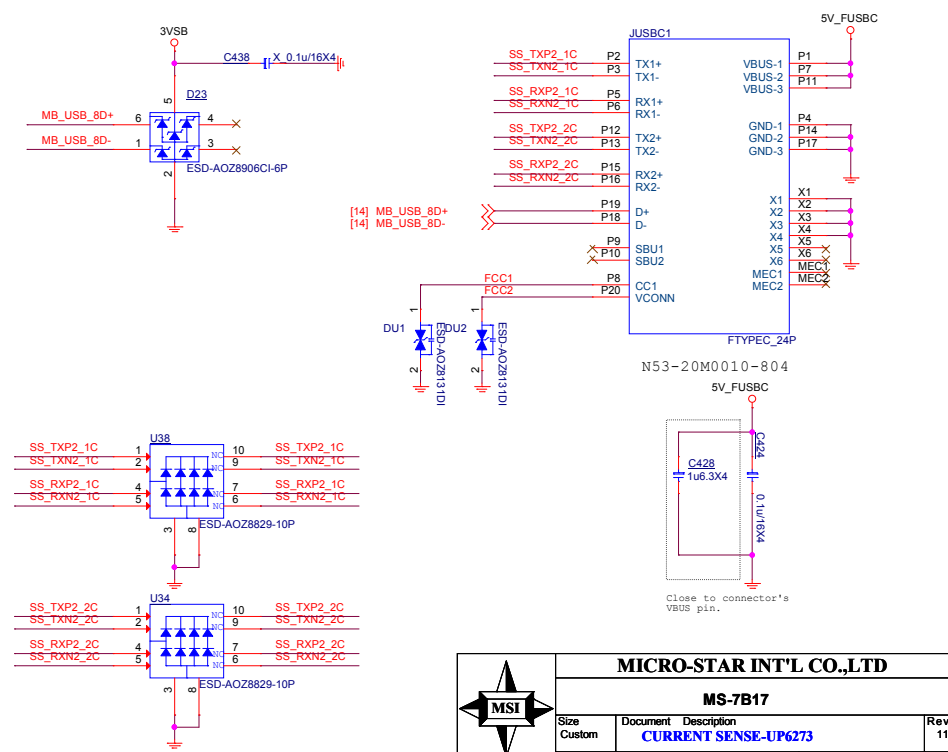
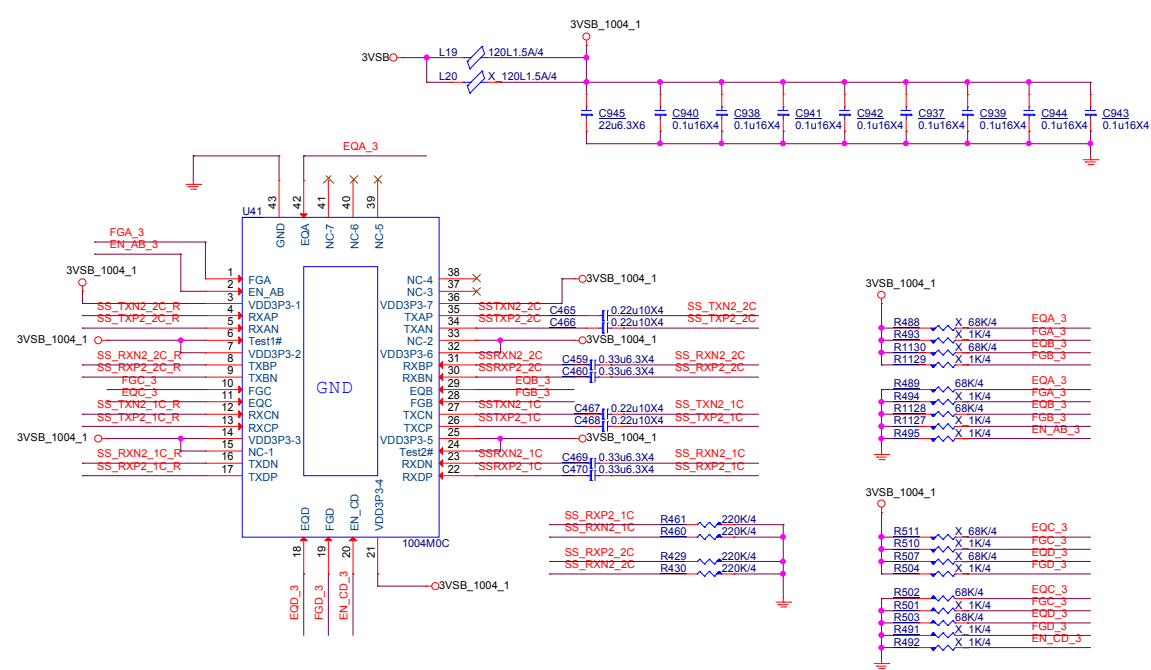
4-port at high-speed mode. --> 58.6mA



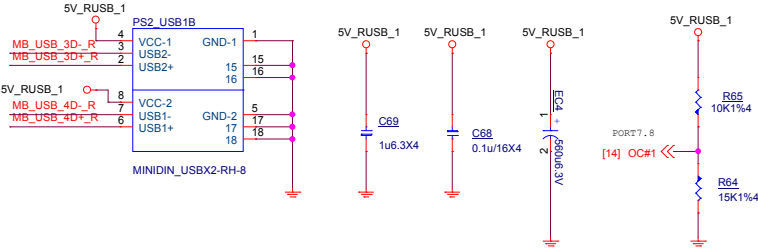
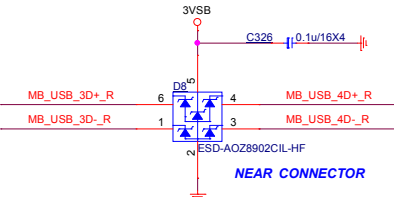
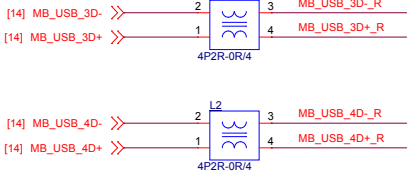
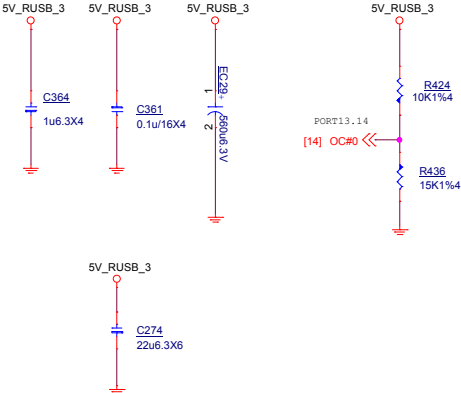
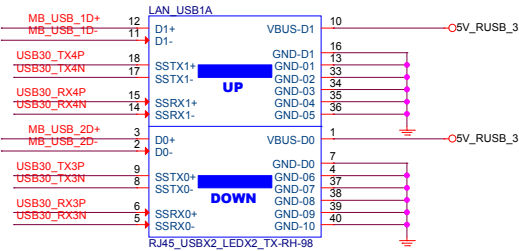
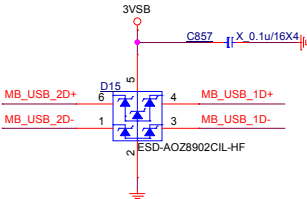
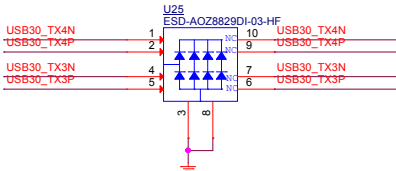
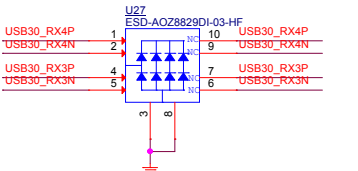
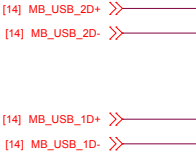
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LAN USB2.0 &3.0



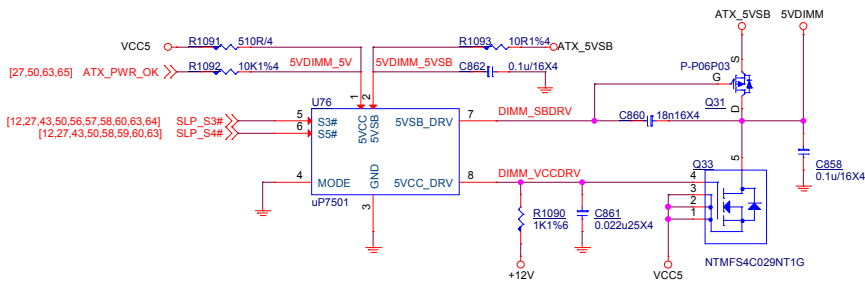
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5VDIMM FOR DDR

4.8A



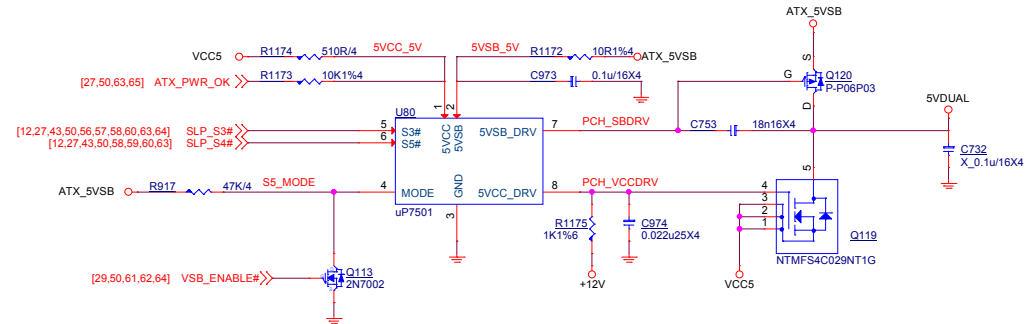
```

7501 Mode
H:Support S0/S3/S5
L:Support S0/S3

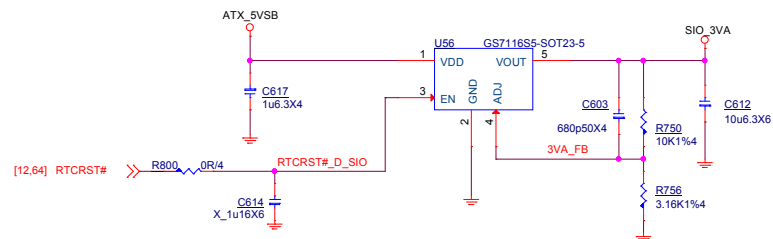
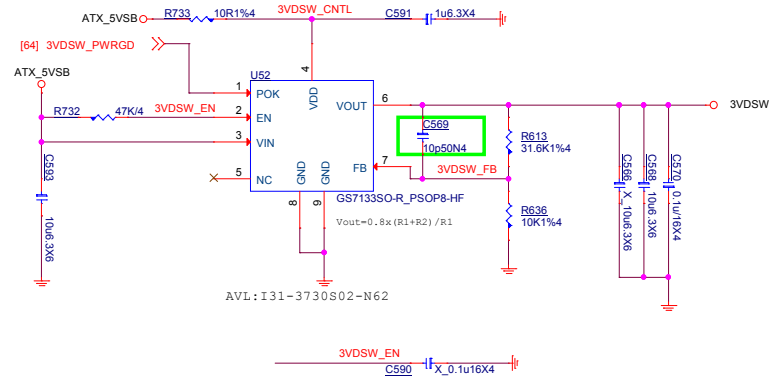
```

5VDUAL

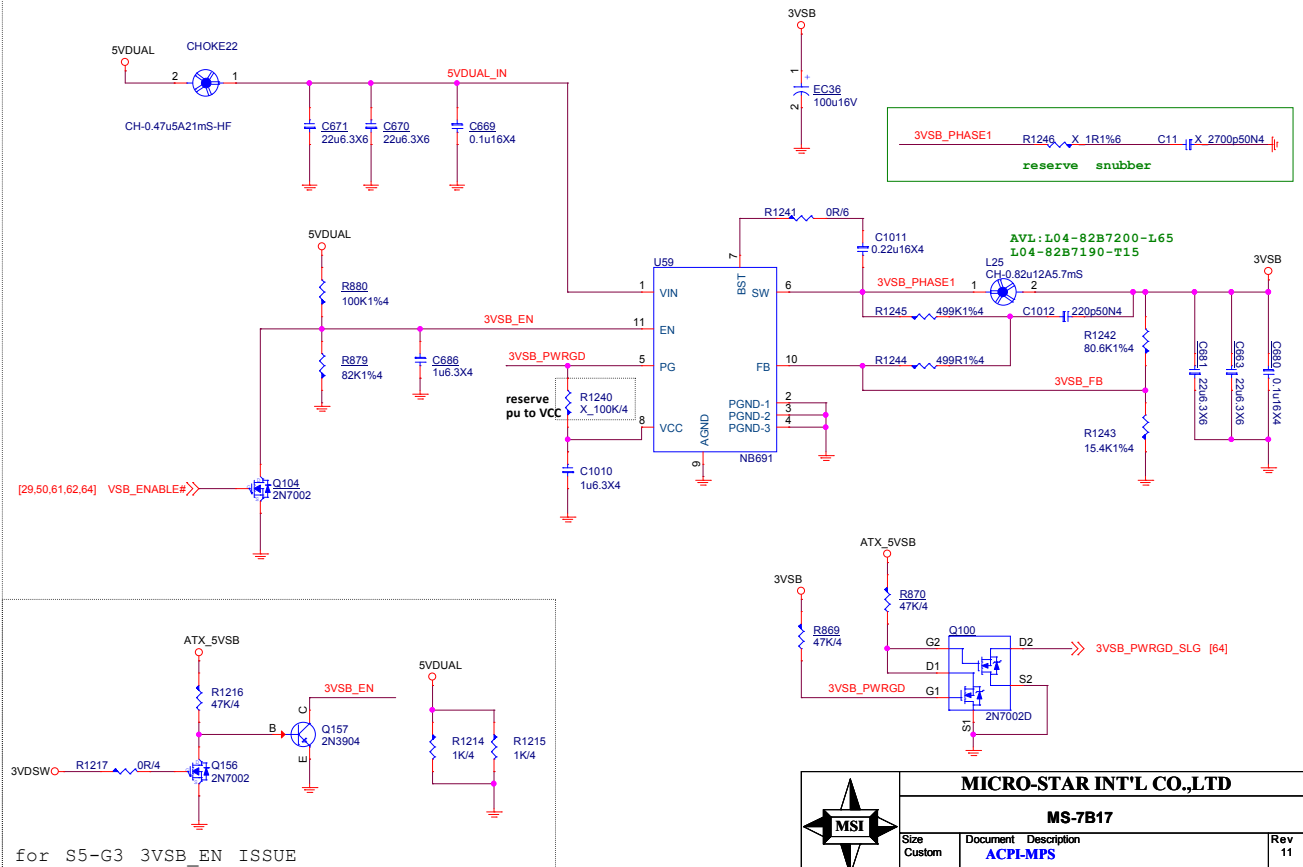
6.25A



3VDSW 0.512A



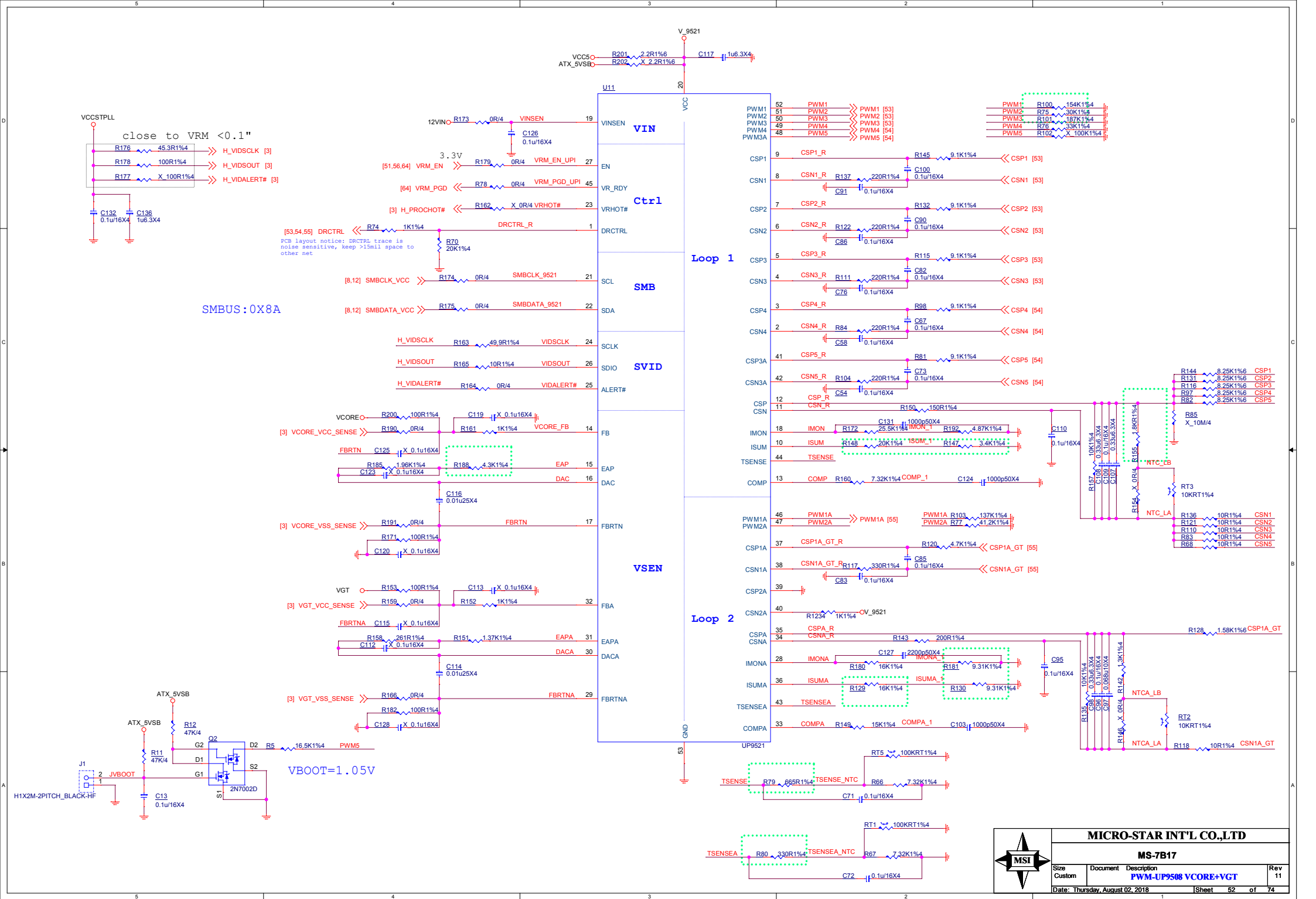
3VSB cost down 4.7A

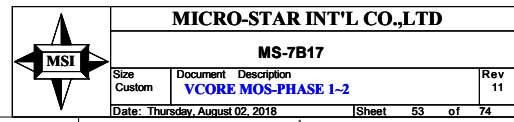


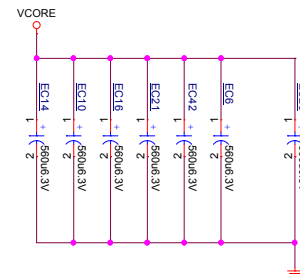
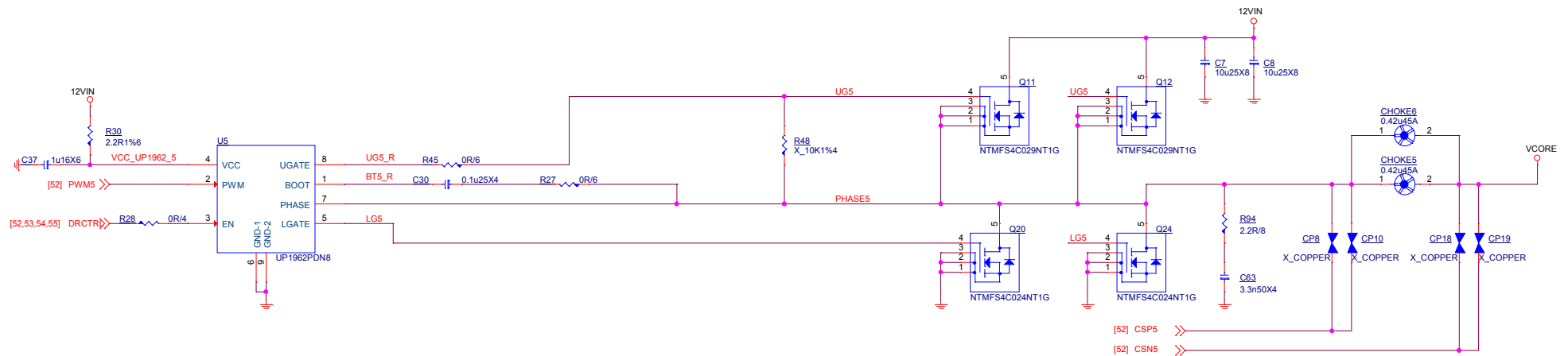
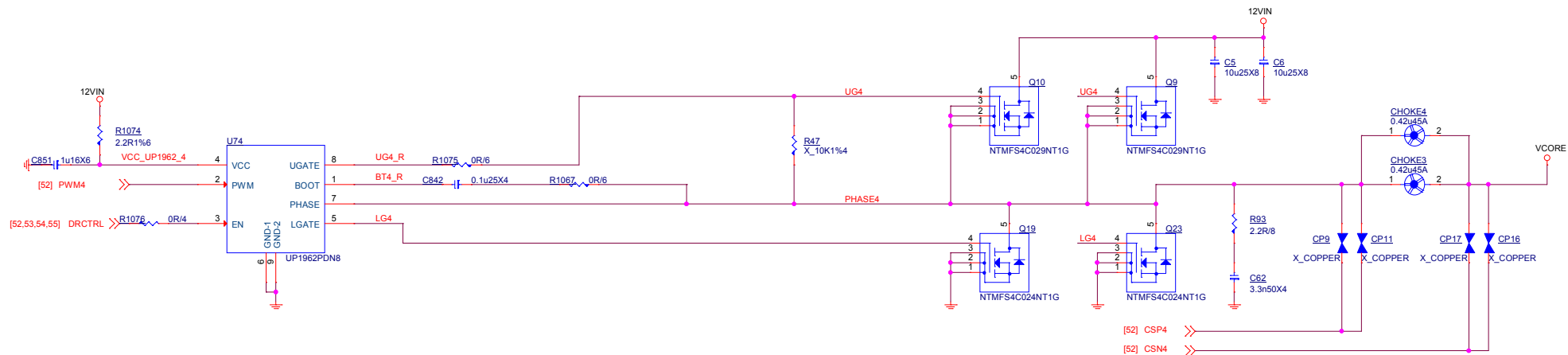
MICRO-STAR INT'L CO.,LTD

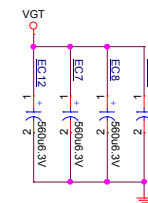
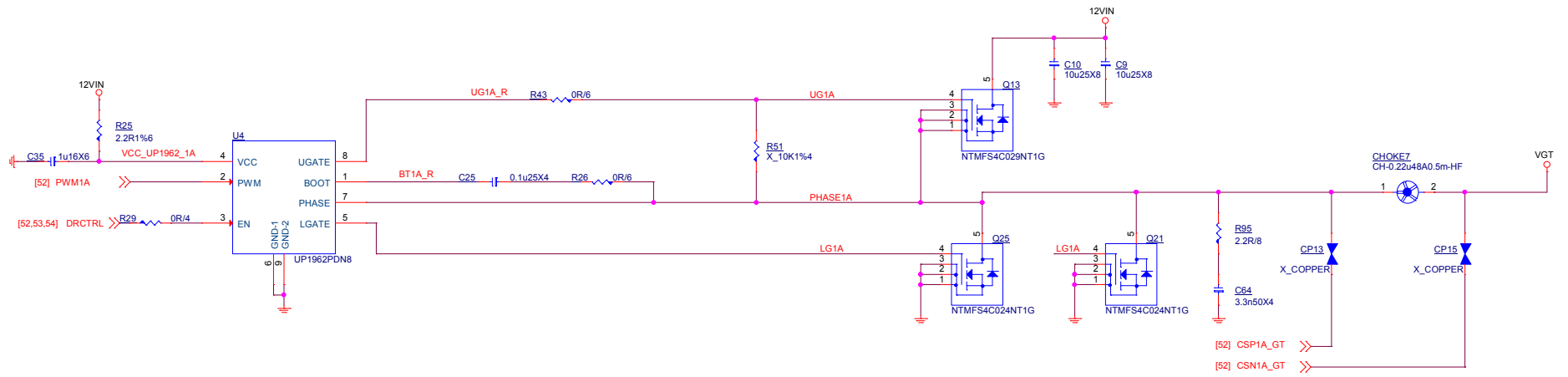
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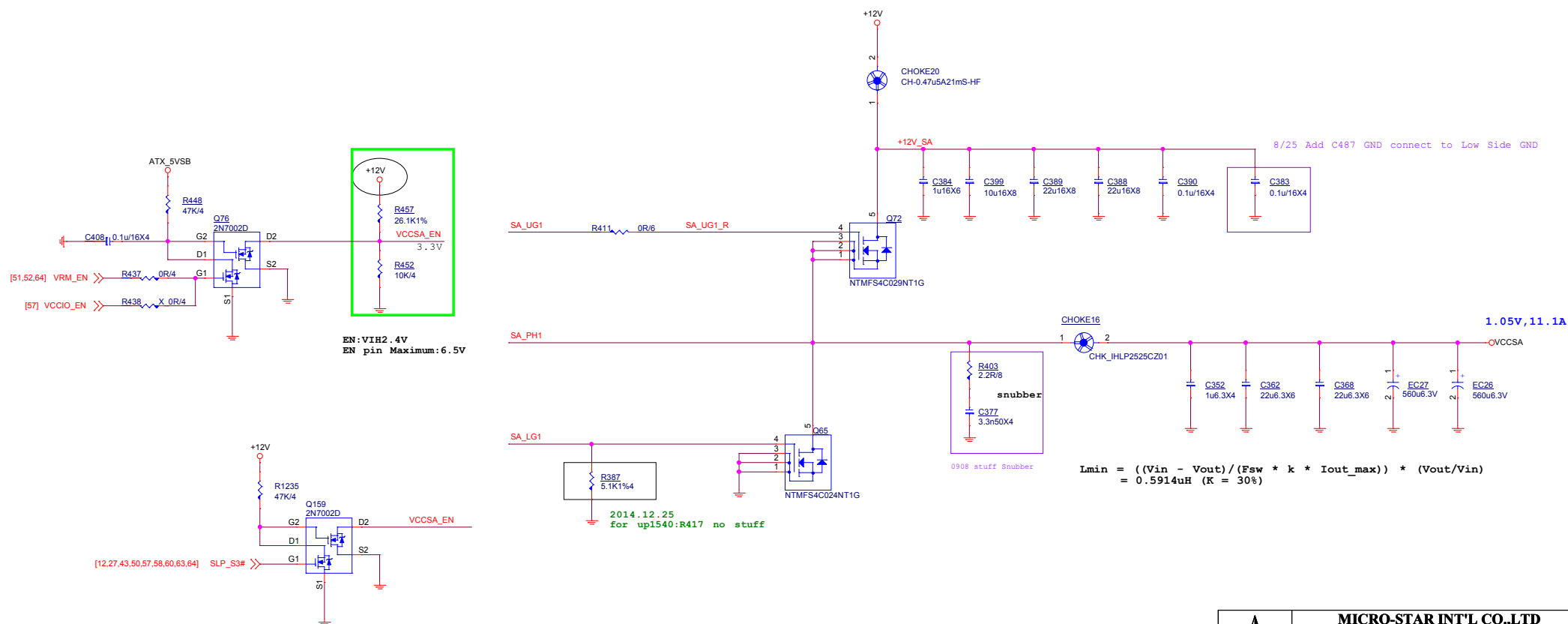
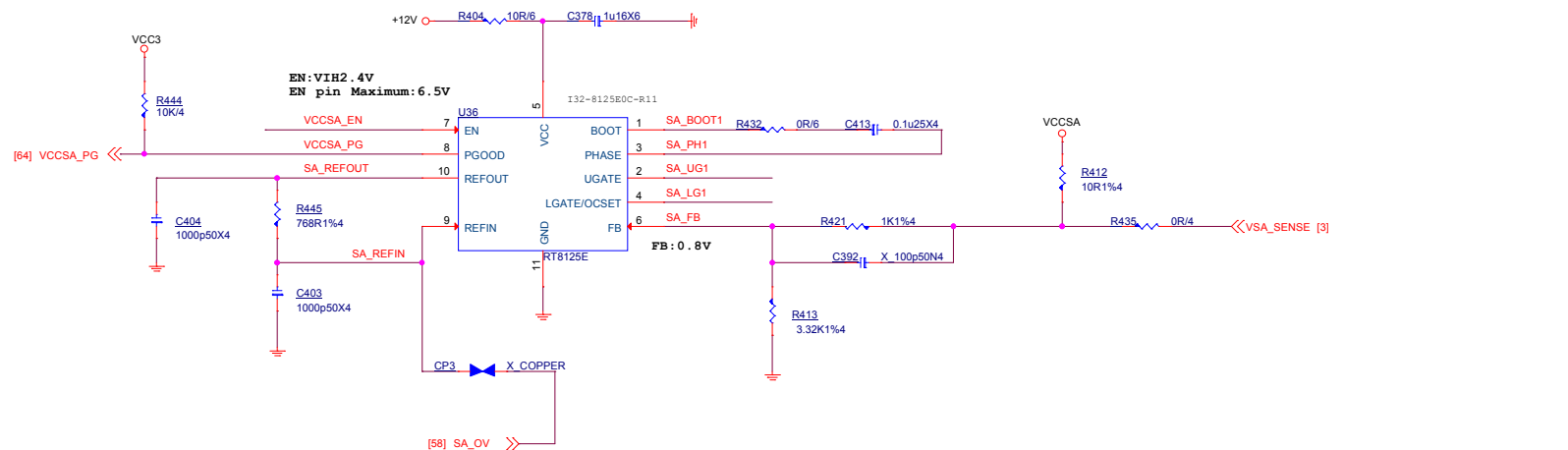
Size	Document	Description	Rev
Custom		VGT MOS-PHASE 1~2	11
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OCP:18A

```
Rocset = 1.3 * Imax * Rdson(low) / Iocset
        = 18.2* 2.8mohm / 10uA
        = 5.1K
```

Rdson (low) 10V

MOS : 2.8mohm

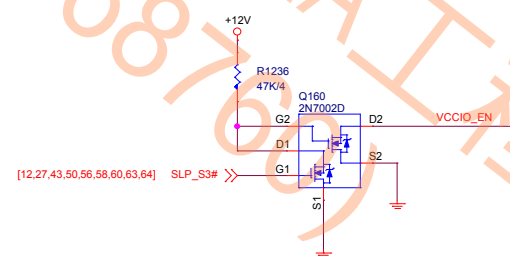
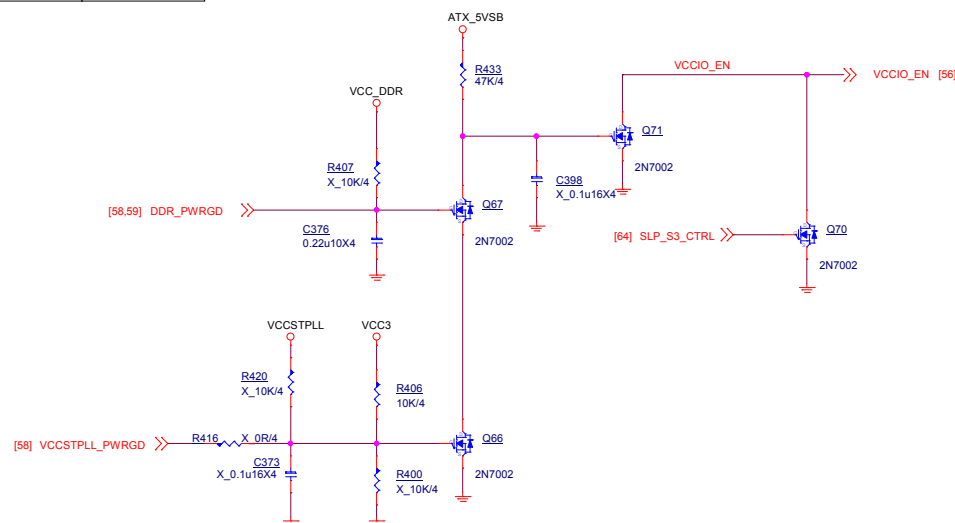
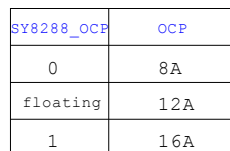


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OCP:12A

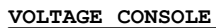


MICRO-STAR INT'L CO.,LTD

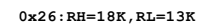
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Size Custom	Document Description CPU PWR-VCCIO-NB685	Rev 11
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1.05V; 230mA



0x20: RH=10K, RL=OPEN

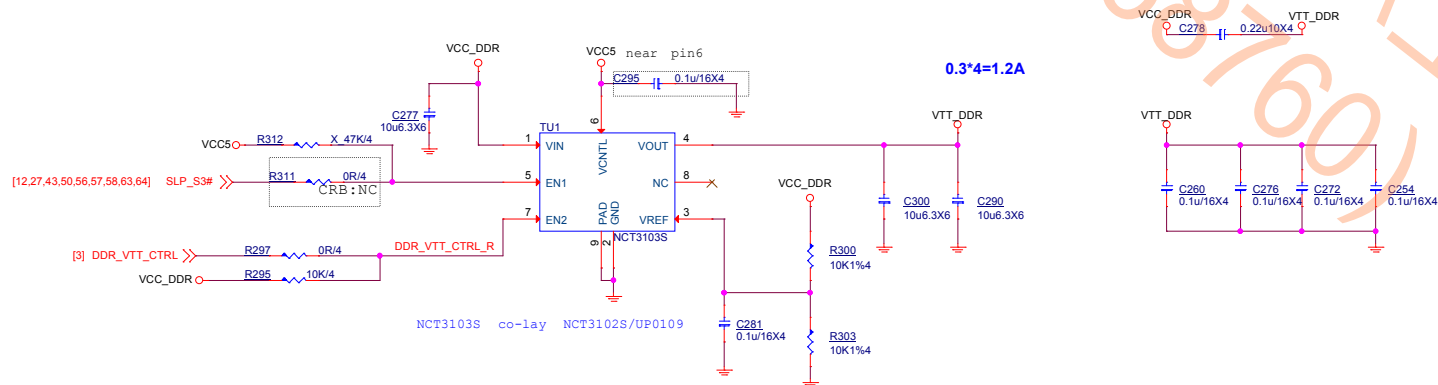


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OCP:7.5A


$$0.3 \times 4 = 1.2A$$


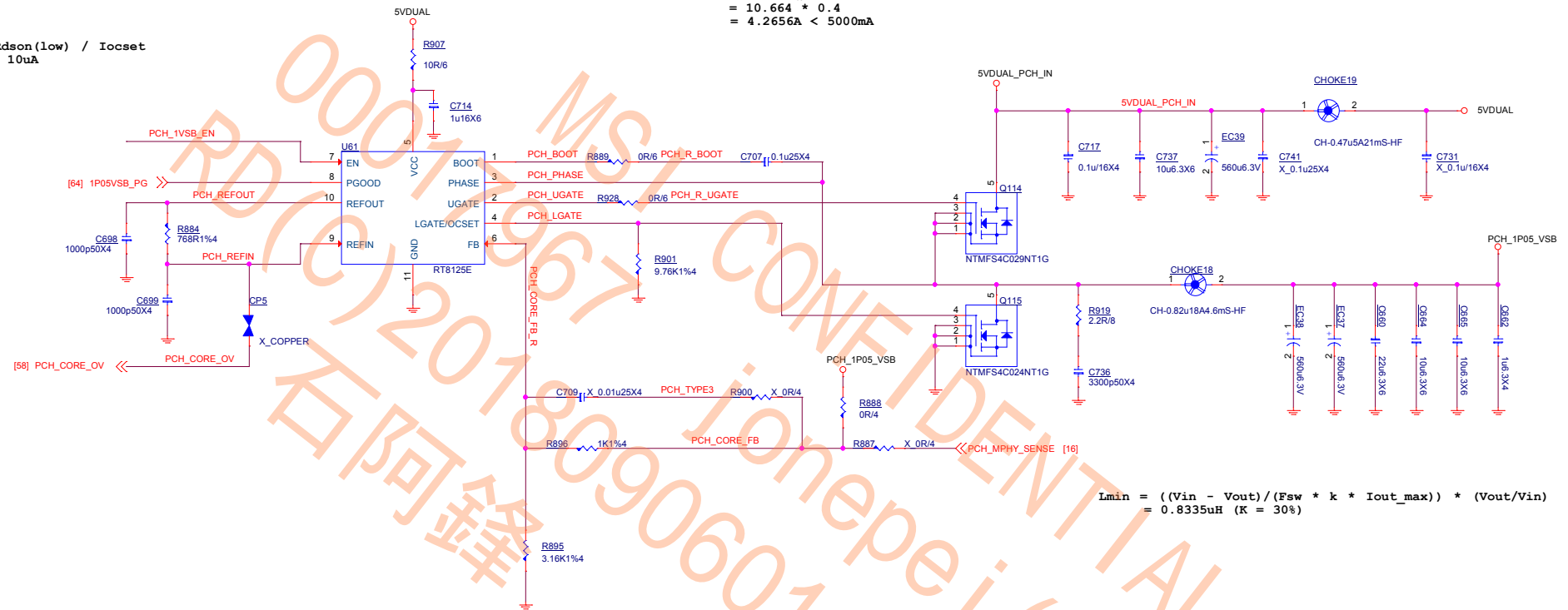
MICRO-STAR INT'L CO.,LTD

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Size Custom	Document Description DDR PWR VPP25/VT-MP2147	Rev 11
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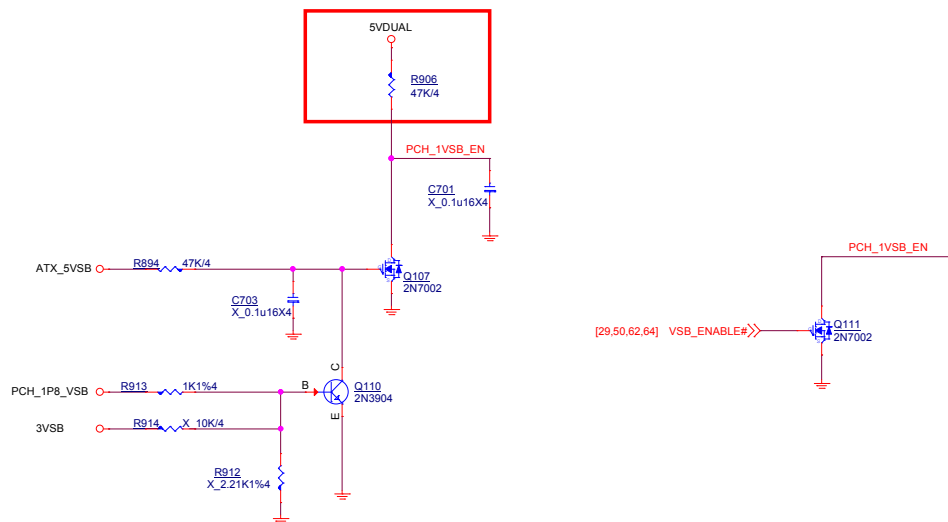
```
Rocset = 1.3 * Imax * Rdson(low) / Iocset
        = 18.2 * 4mohm / 10uA
        = 7.28K
```

```
Irms = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
      = 10.664 * 0.4
      = 4.2656A < 5000mA
```



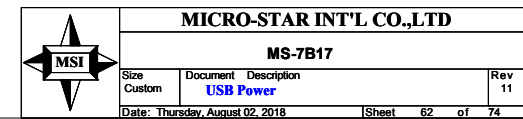
$$L_{min} = ((V_{in} - V_{out}) / (F_{sw} * k * I_{out_max})) * (V_{out} / V_{in})$$

$$= 0.8335 \mu H \quad (K = 30\%)$$

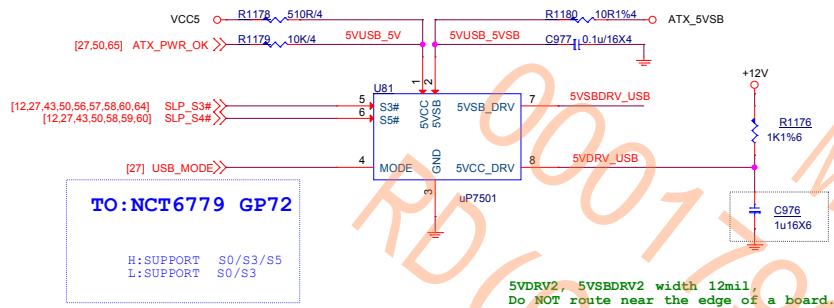


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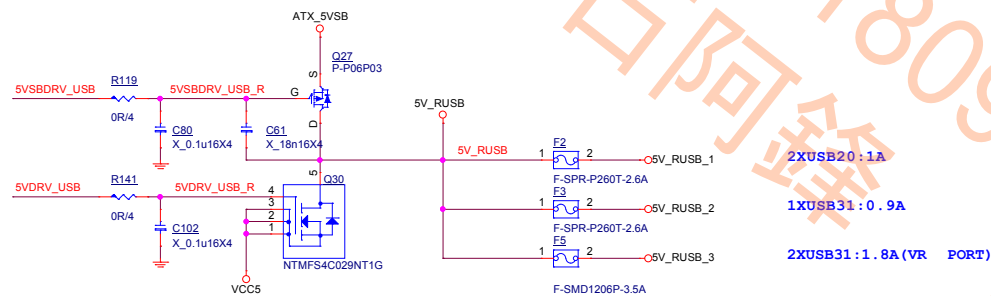
Size Custom	Document Description PCH POWER-RT8125E	Rev 11
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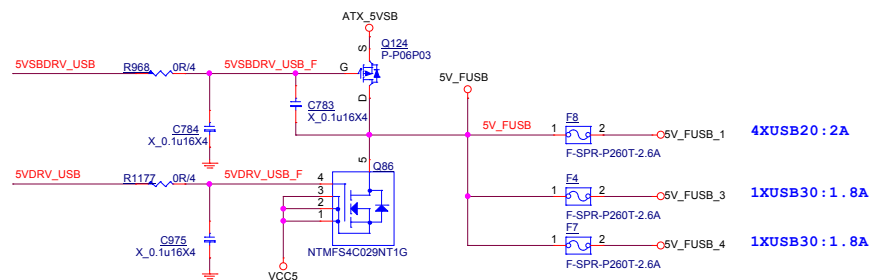
USB POWER



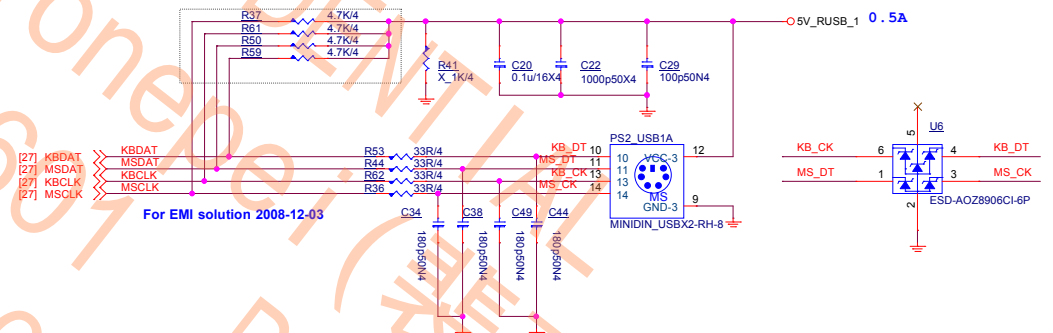
REAR USB PORT POWER



FRONT USB PORT POWER



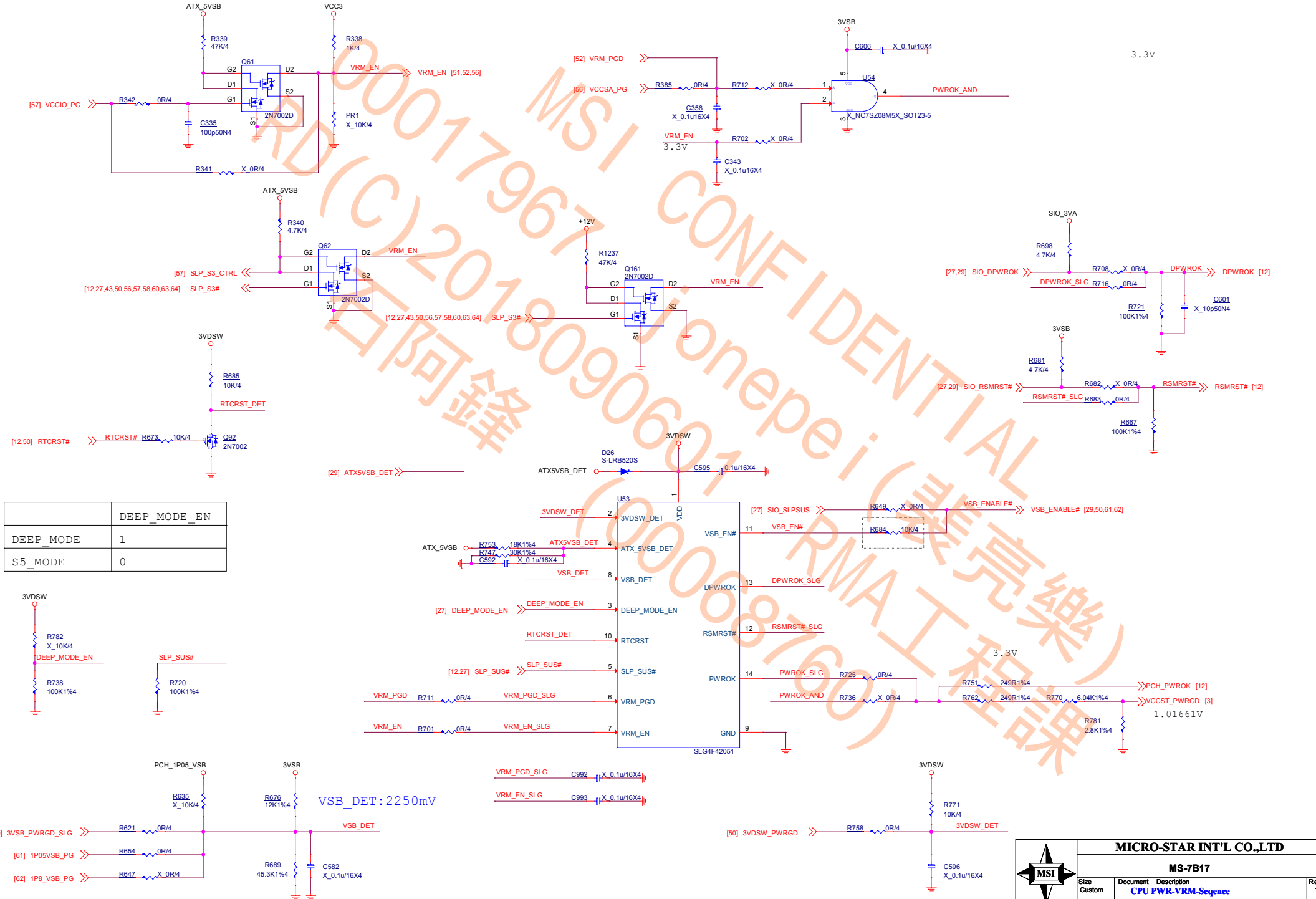
PS2 KEYBOARD & MOUSE CONNECTOR



MICRO-STAR INT'L CO.,LTD

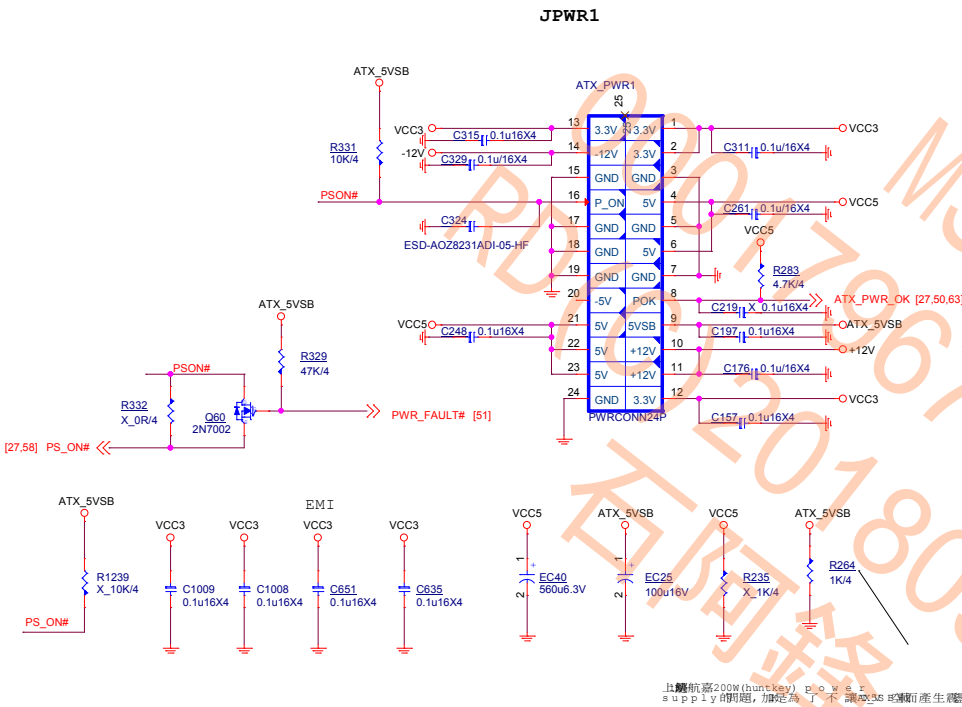
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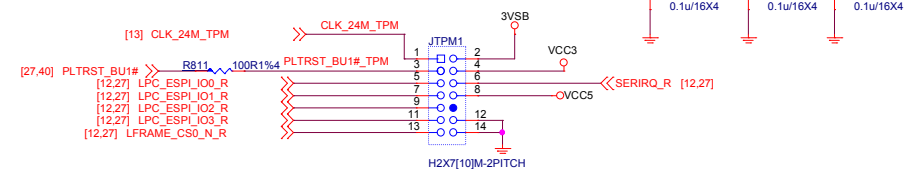


	DEEP_MODE_EN
DEEP_MODE	1
S5_MODE	0

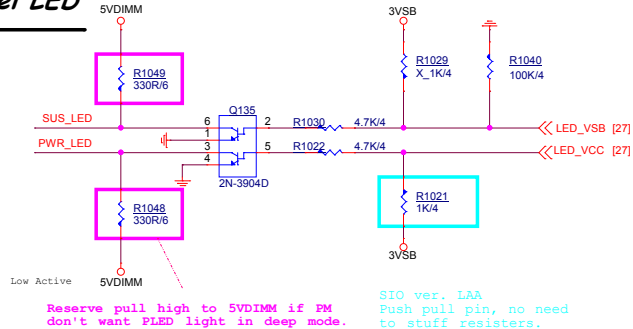
ATX POWER CONNECTOR



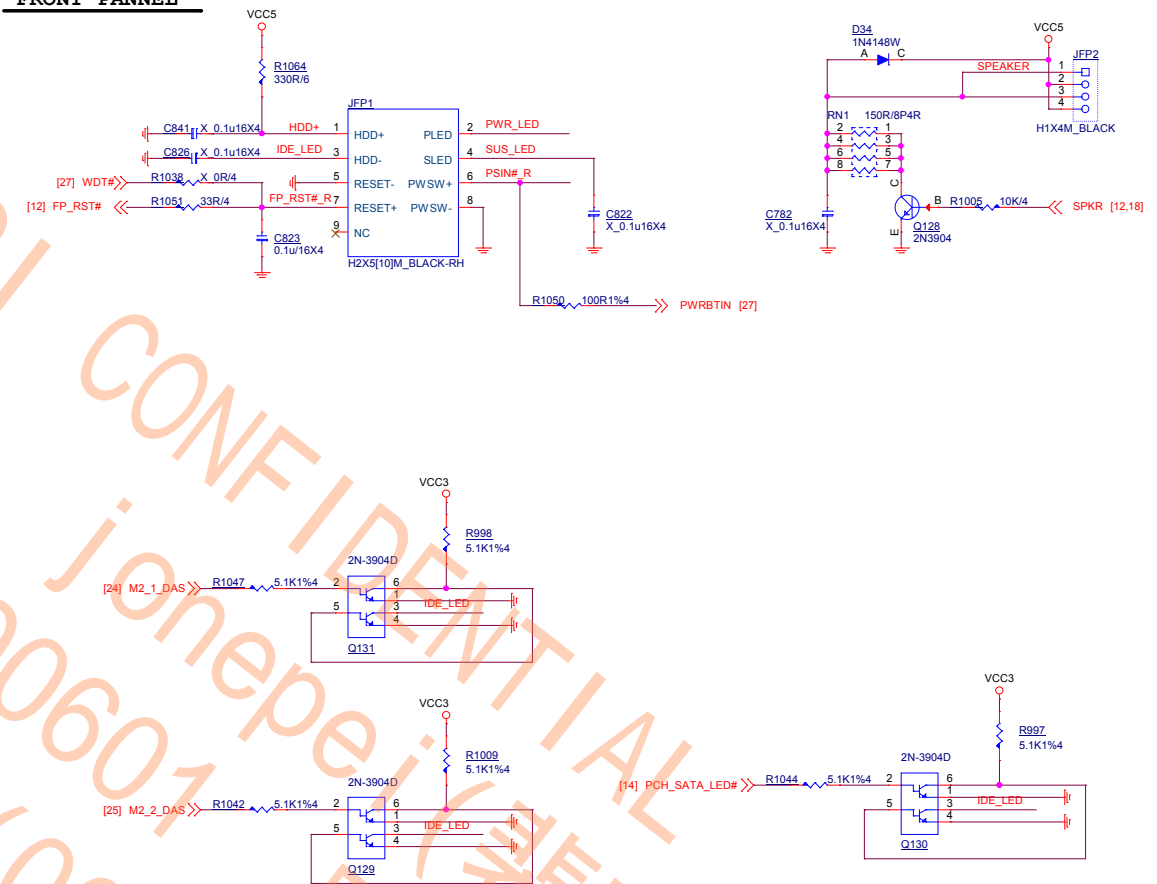
TPM Pin Header



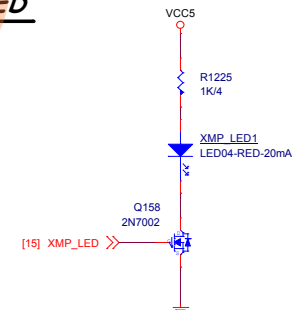
Front Panel LED



FRONT PANNEL

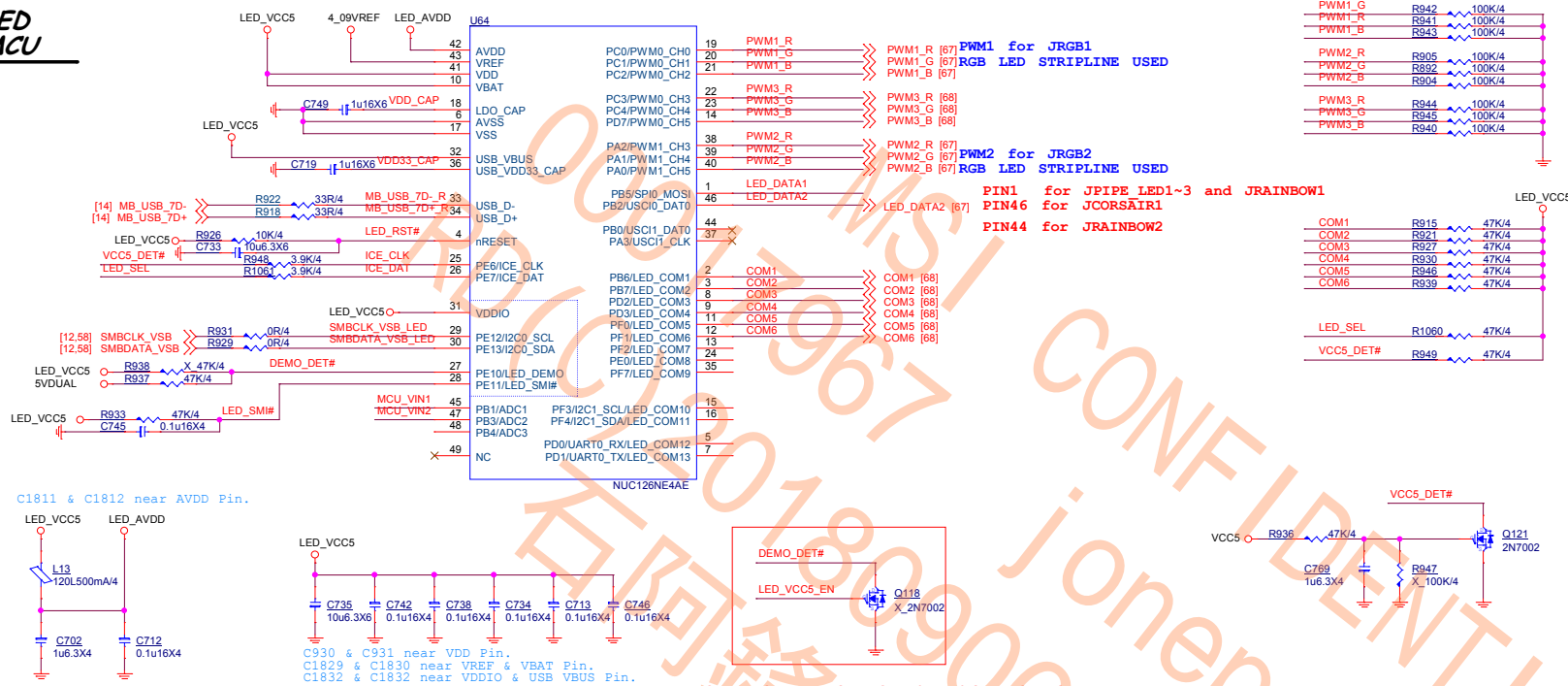


XMP LED

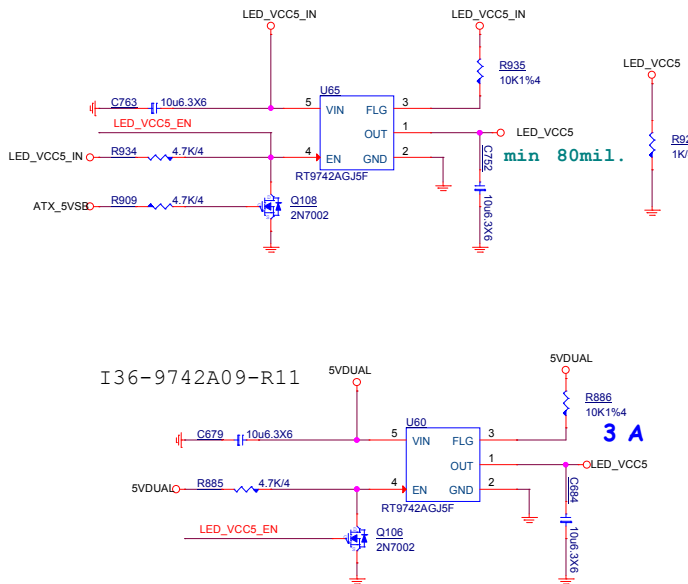


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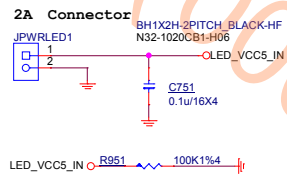
**LED
MCU**



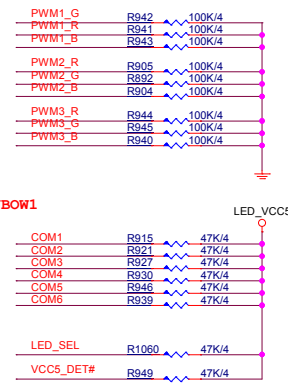
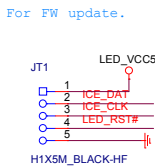
EXTERNAL POWER INPUT



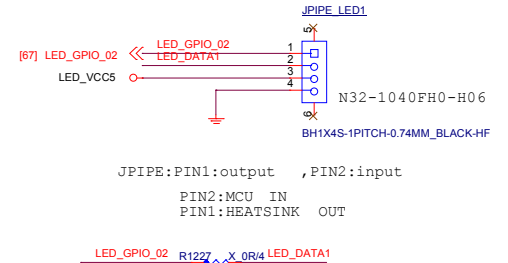
External Power



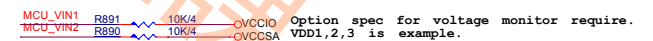
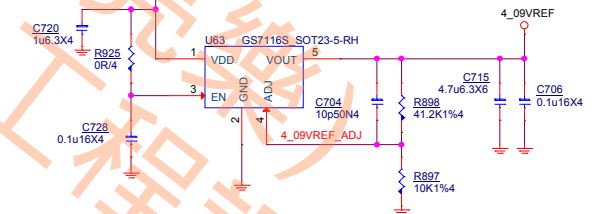
JT1 for FW update



2 AUDIO/IO Cover LED
PCS LED*0.16W=W

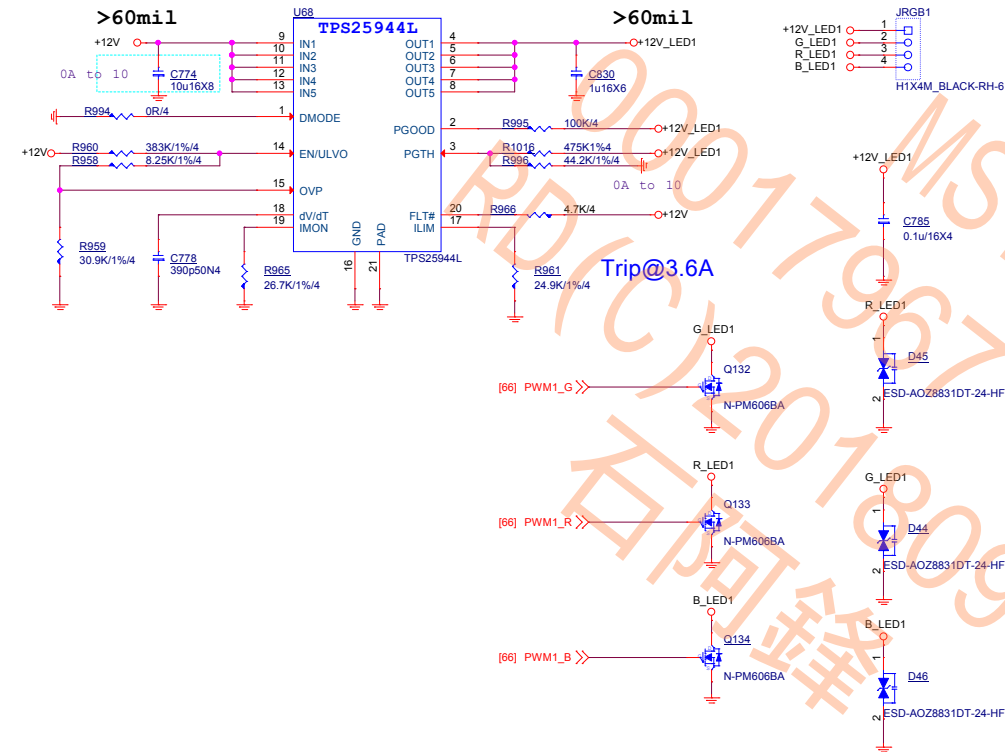


Voltage HW monitor

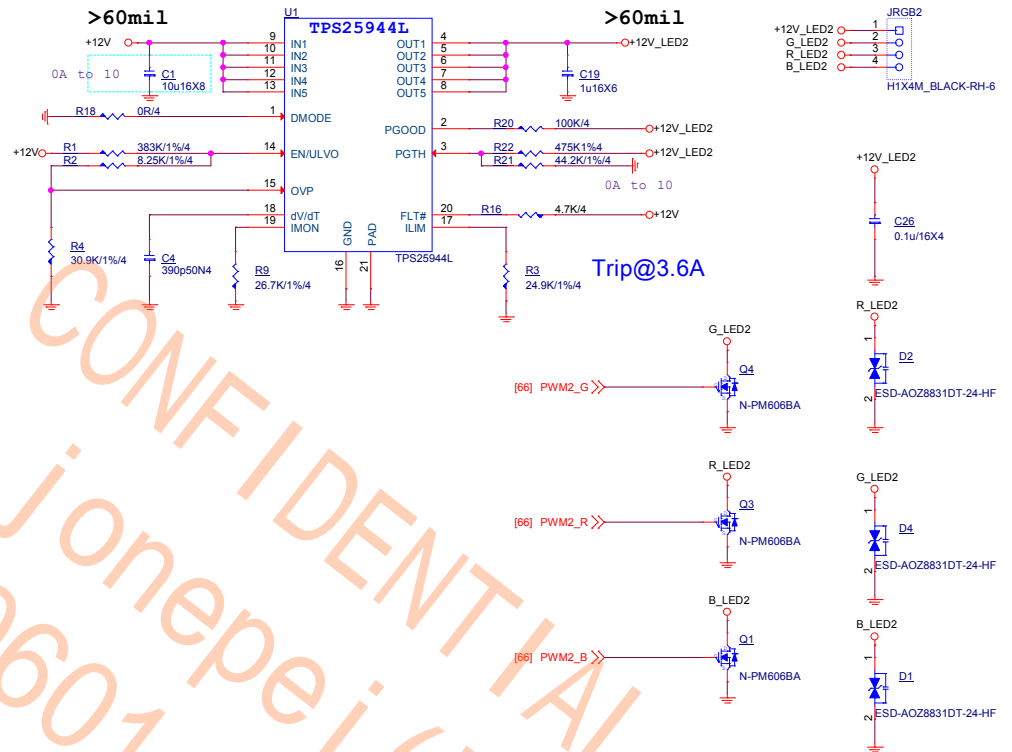


MICRO-STAR INT'L CO.,LTD			
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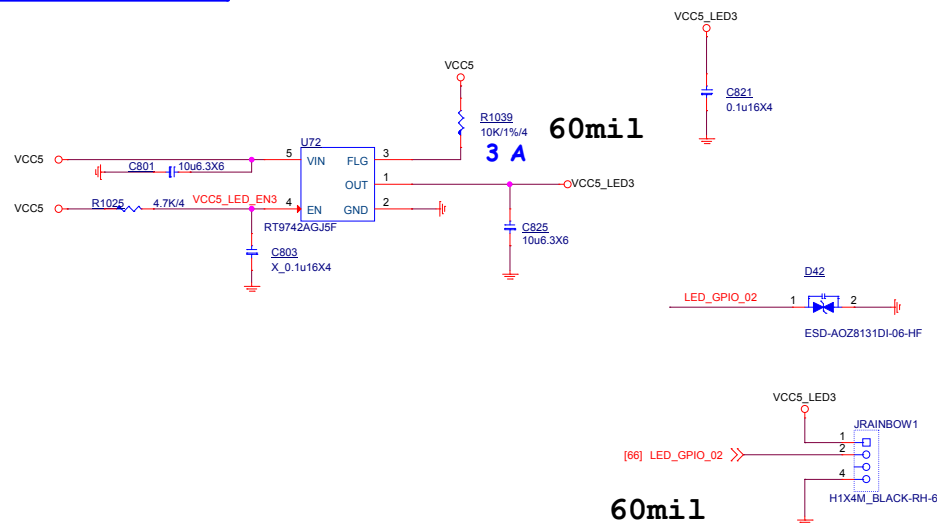
JRGB1



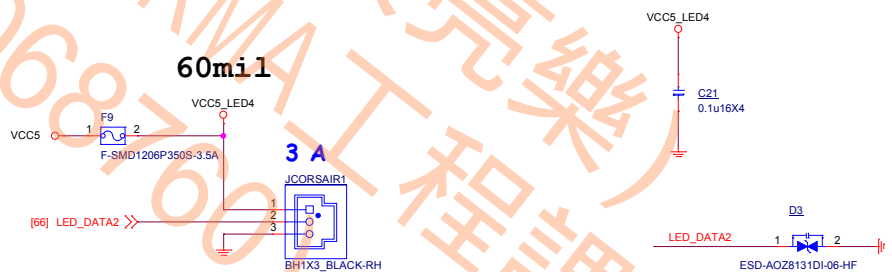
JRGB2



LED STRIPLINE JRAINBOW1



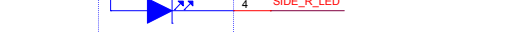
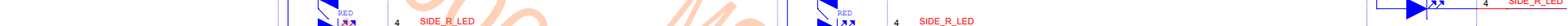
JCORSAIR1

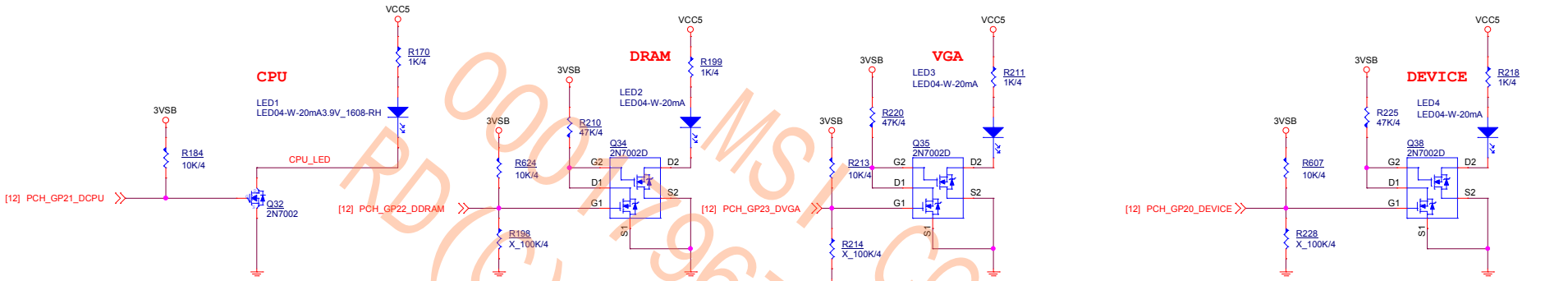


MICRO-STAR INT'L CO.,LTD

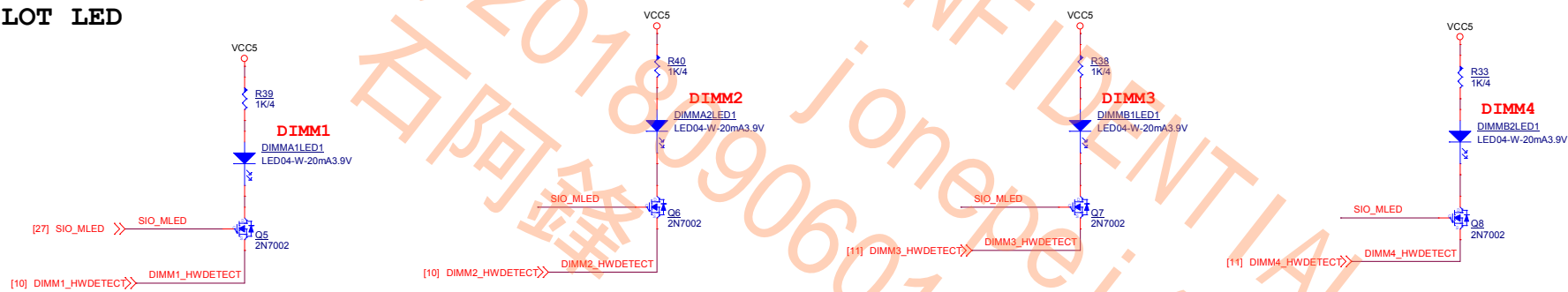
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DIMM SLOT LED



SLOT LED

