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MS-7B17

ATX

Ver: 10...

CFL Platform

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



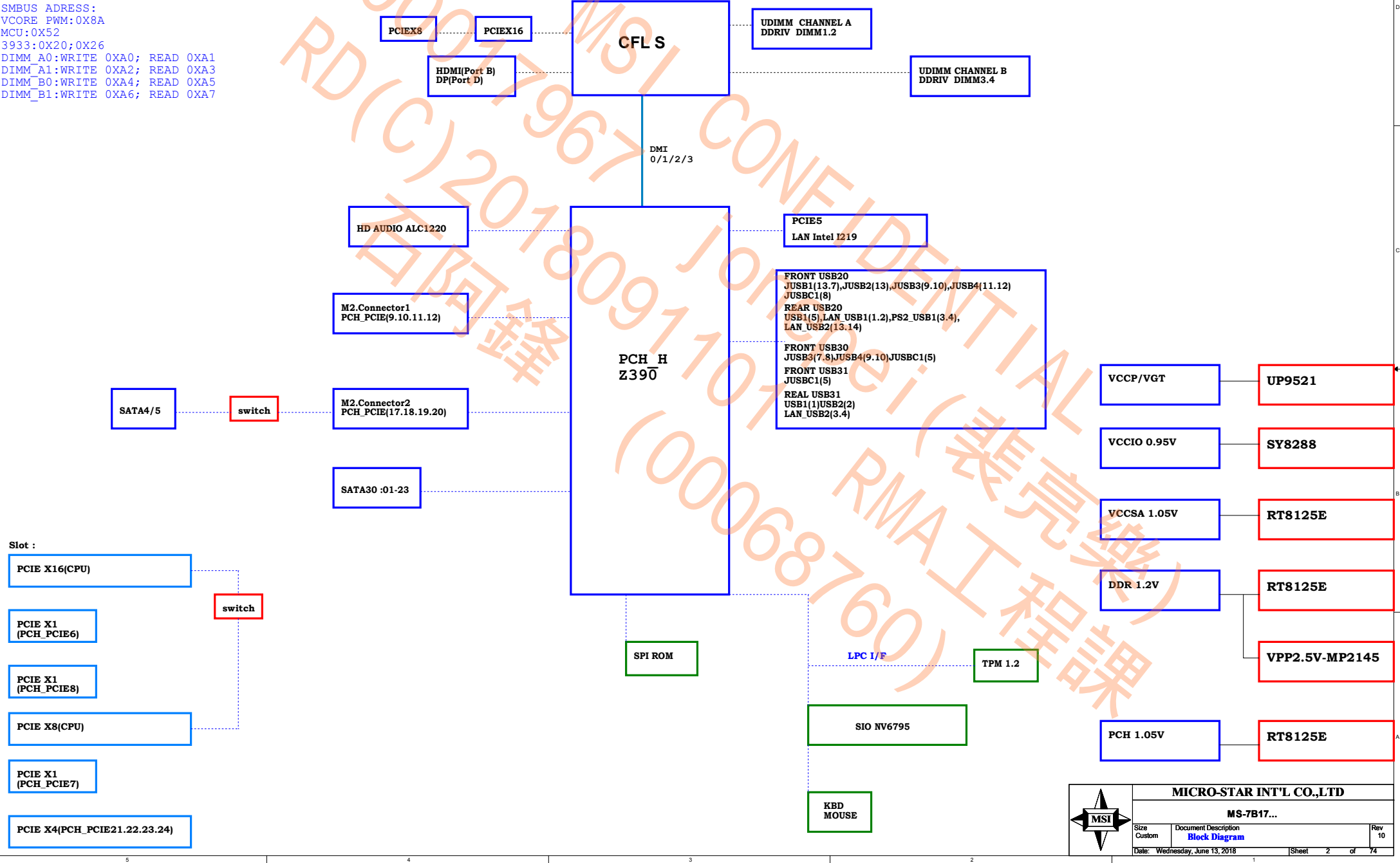
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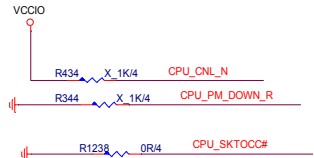
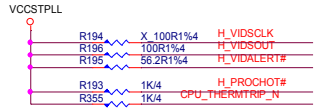
MS-7B17...

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MS-7B17 Block Diagram

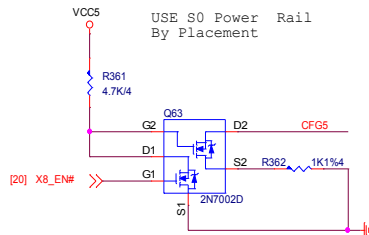
SMBUS ADDRESS:
VCORE_PWM:0X8A
MCU:0X52
3933:0X20;0X26
DIMM_A0:WRITE 0XA0; READ 0XA1
DIMM_A1:WRITE 0XA2; READ 0XA3
DIMM_B0:WRITE 0XA4; READ 0XA5
DIMM_B1:WRITE 0XA6; READ 0XA7





CFG Strap

CFG Table		
	HIGH	LOW
0	NORM	STALL
1	NORM	PCBLESS
2	NORM	REVERSE
3	ENABLE	DISABLE
4	DISABLE	ENABLE
5	DISABLE	ENABLE
6	DISABLE	ENABLE
7	RESET#	BIOS REQ
8	DISABLE	ENABLE
9	PRESENT	NO PRESENT
10	ACTIVATE	NO ACTIVATE
11	DC COUPLED	AC COUPLED
12	SPT	NOT SPT
13	SVID	FIXED
14	RSVD	
15	RSVD	



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CPU-Control/MISC/CFG

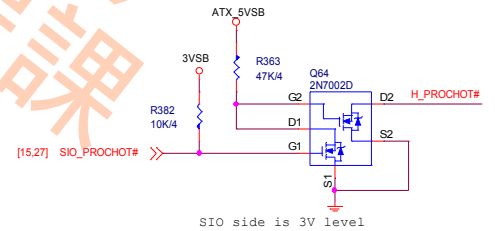
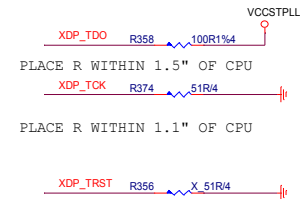
Rev 10

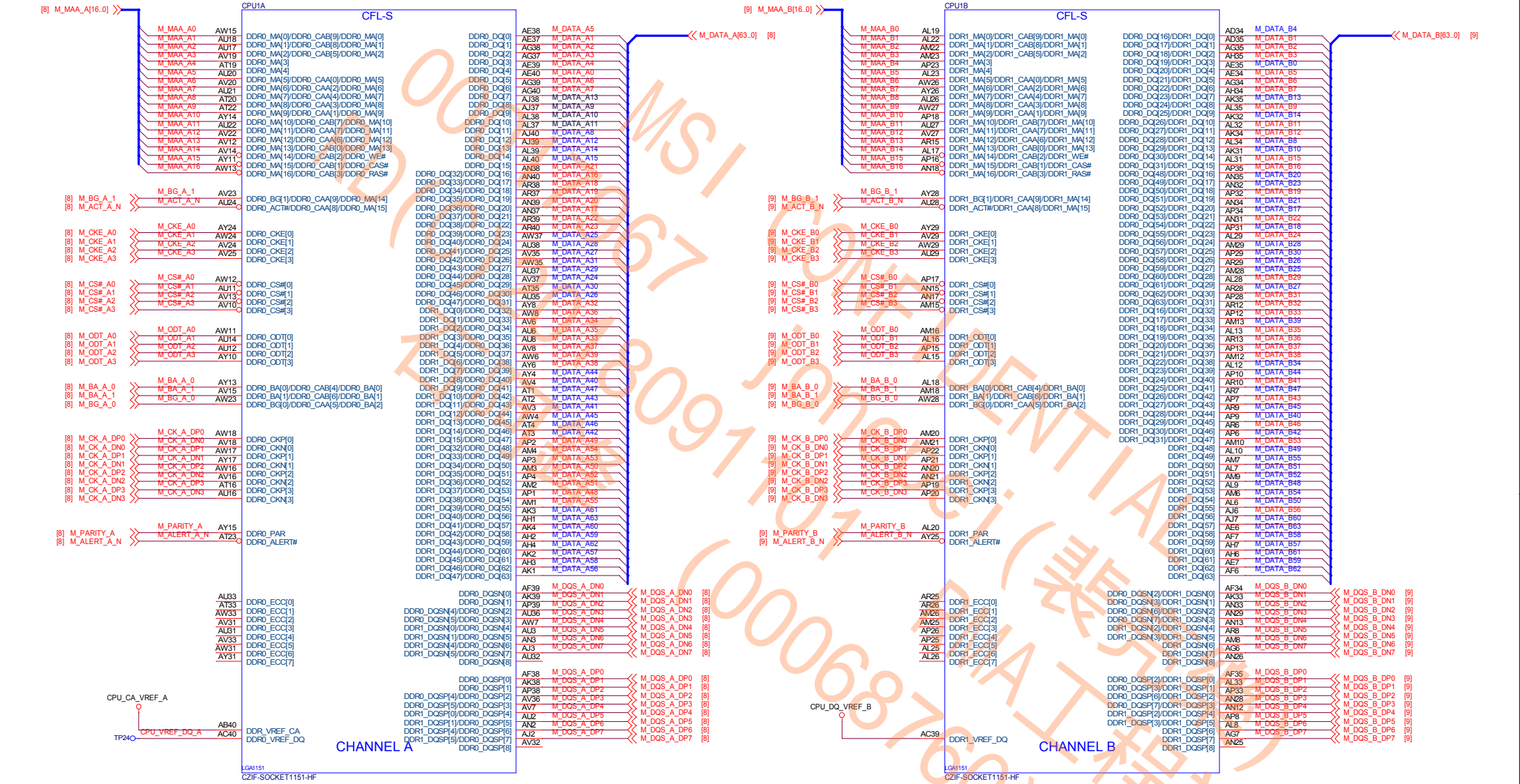
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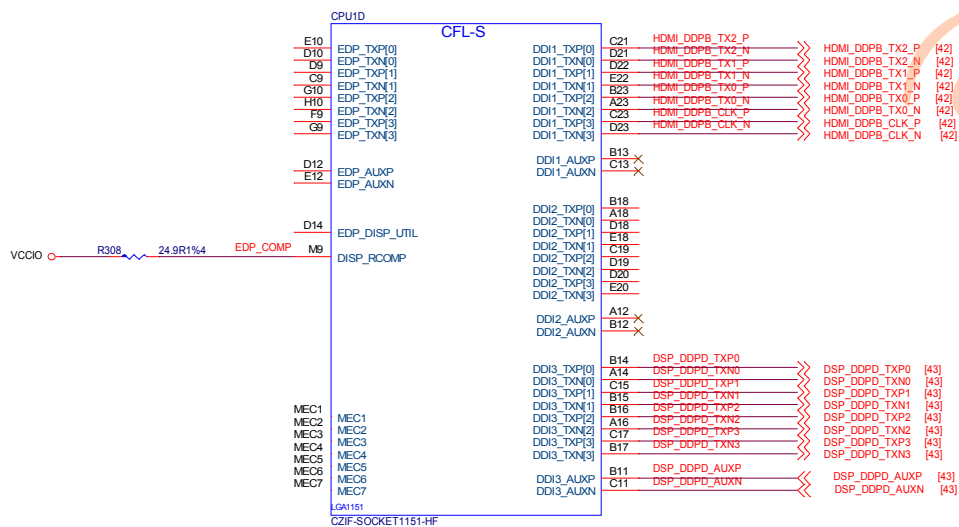
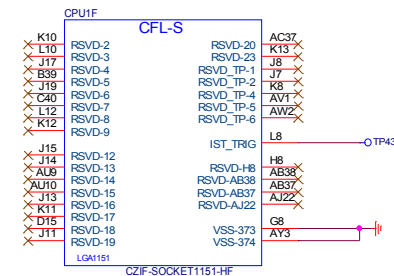
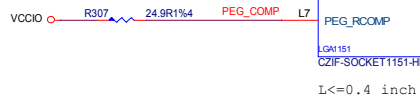
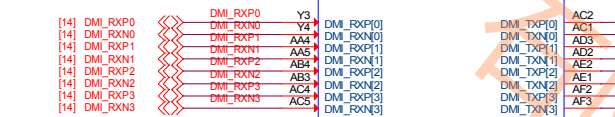
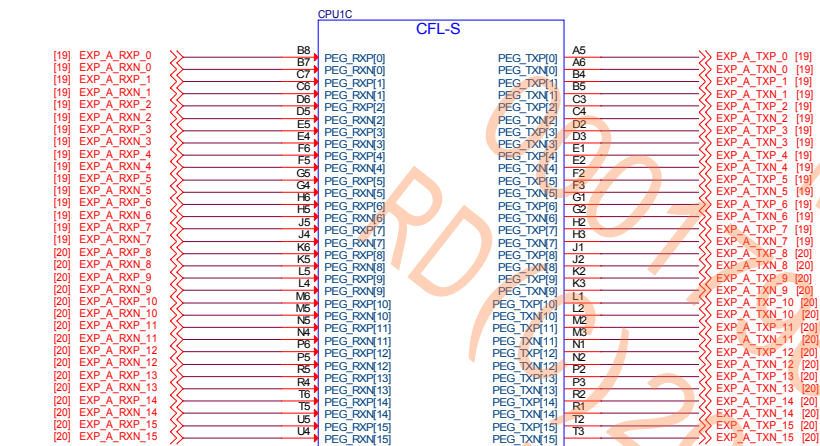
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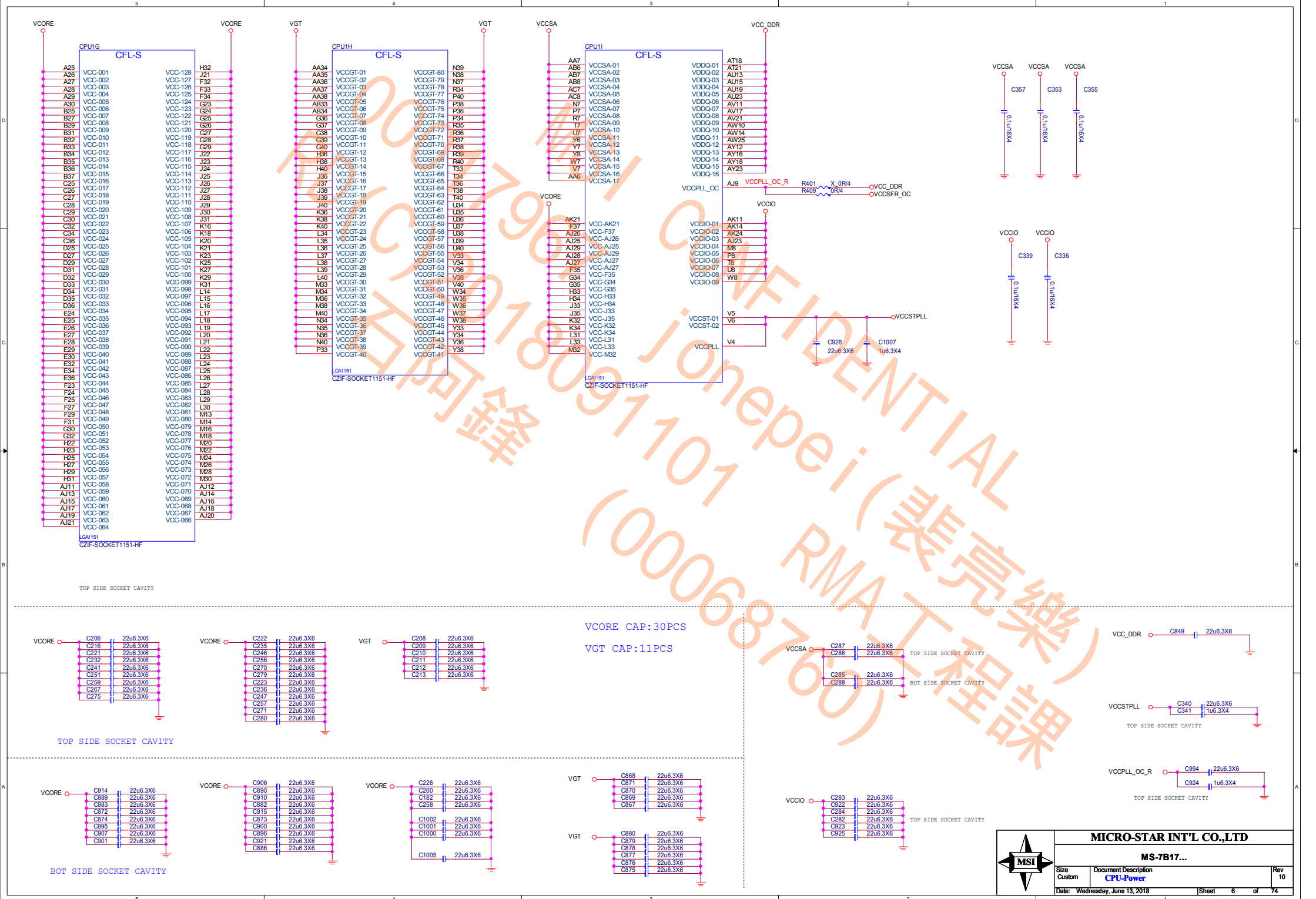
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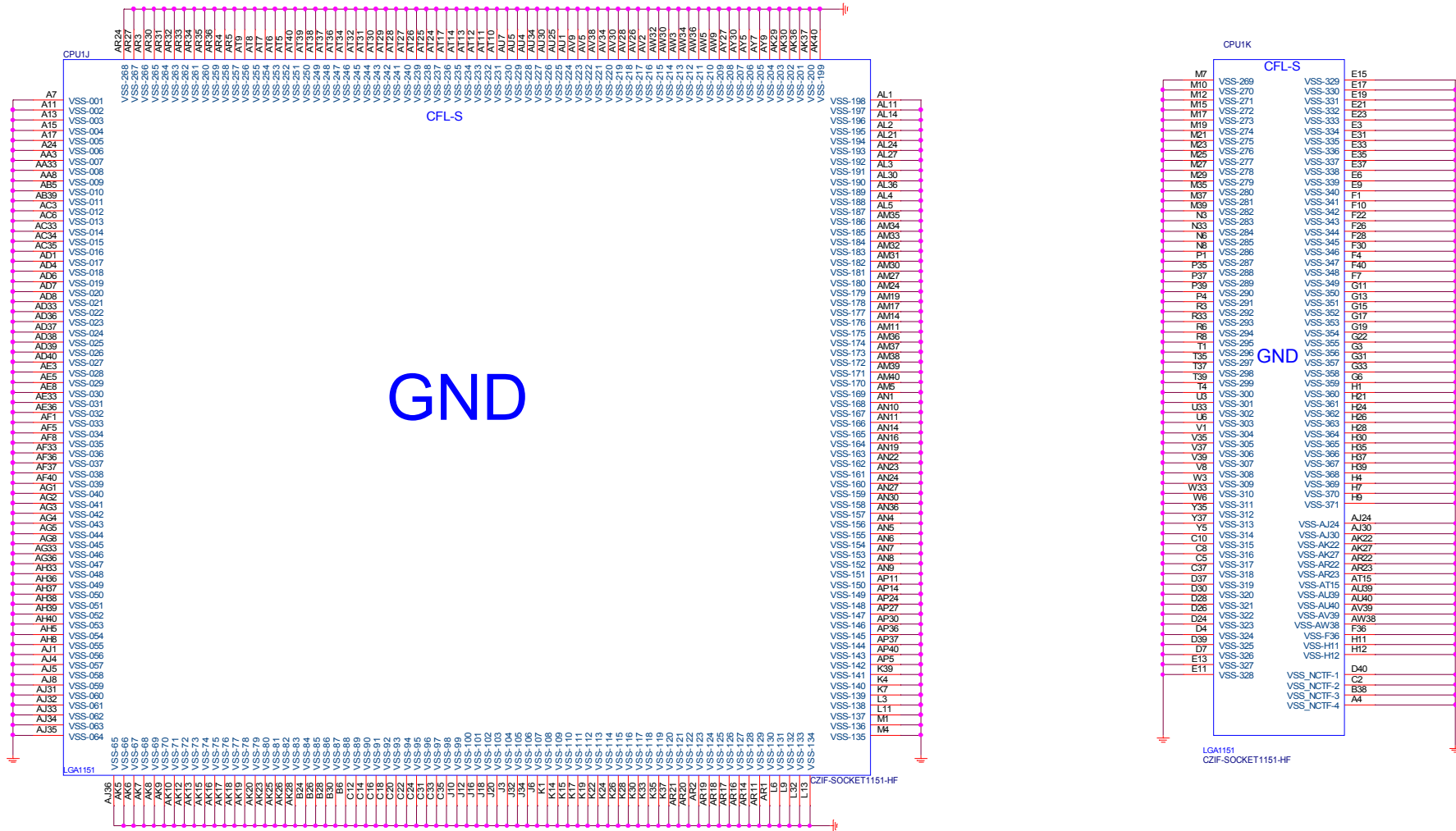
Sheet 3 of 74

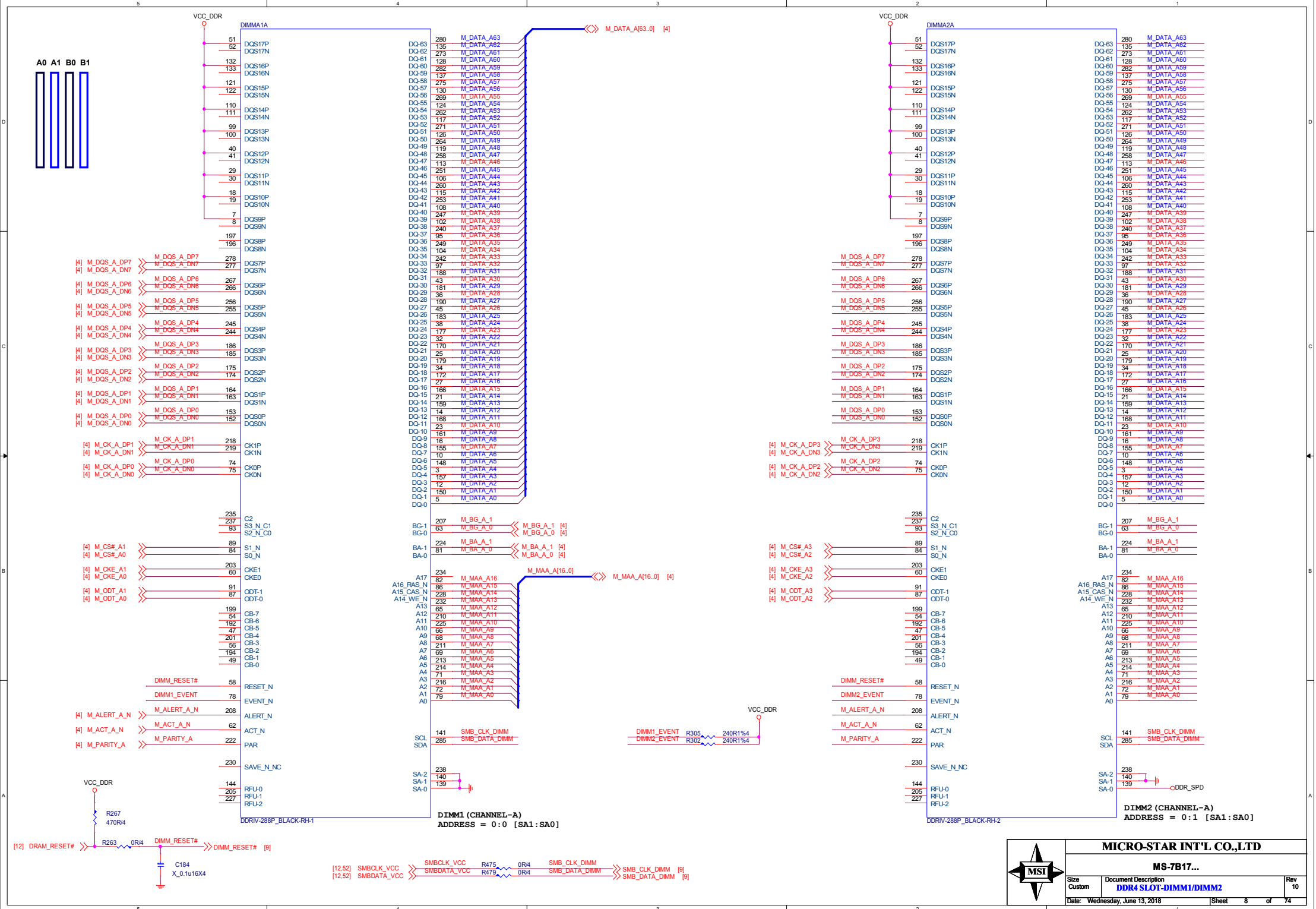


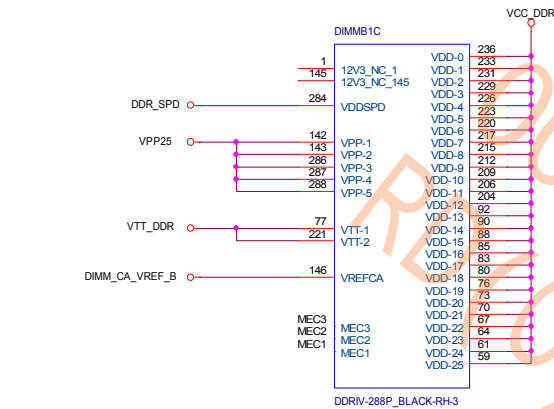


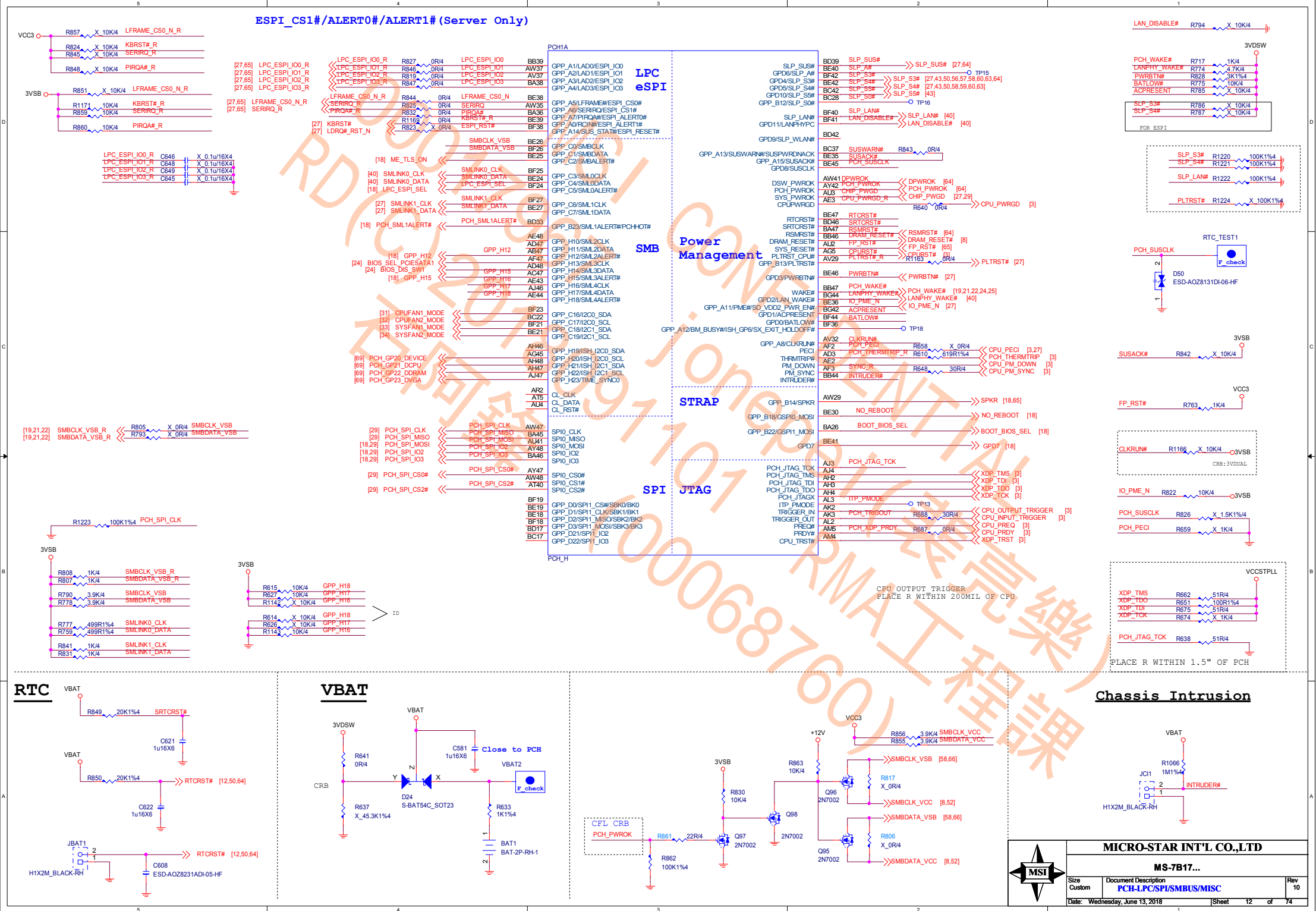






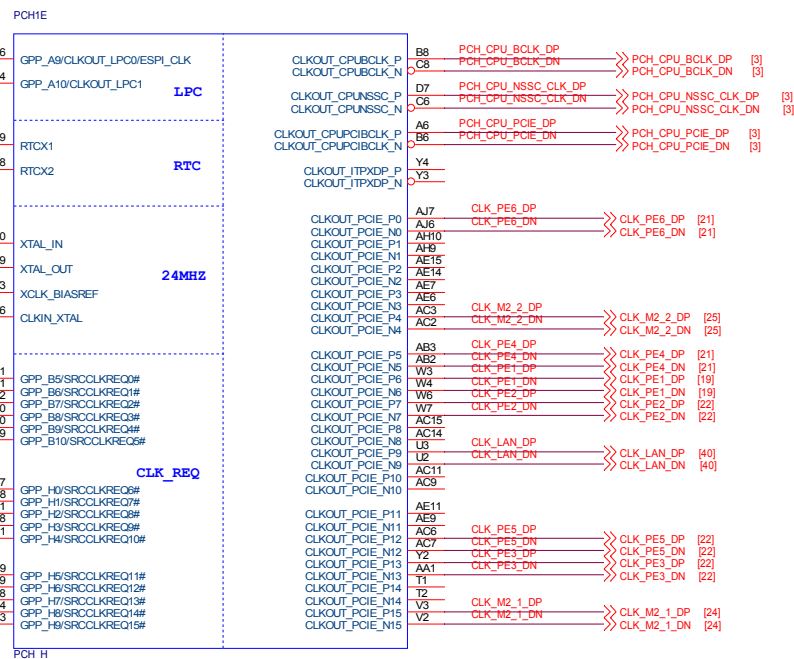
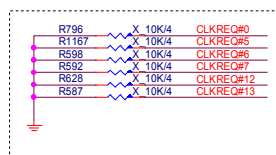
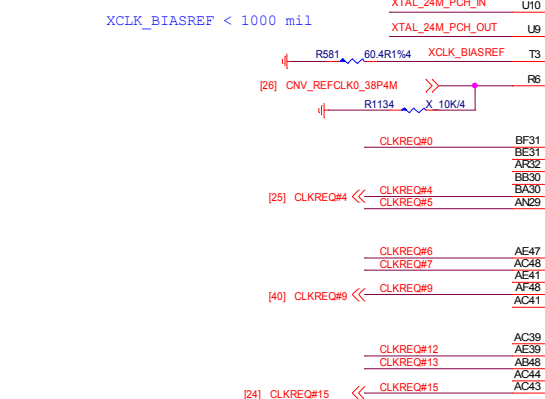
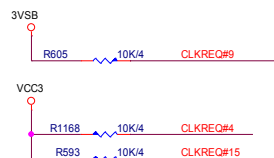
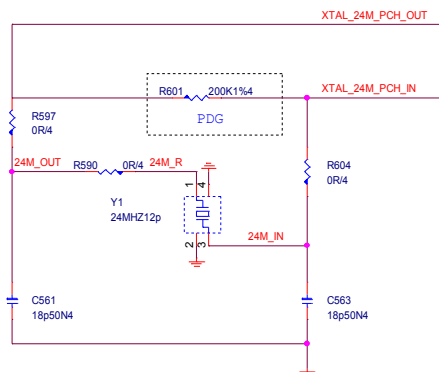
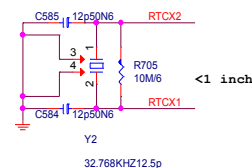




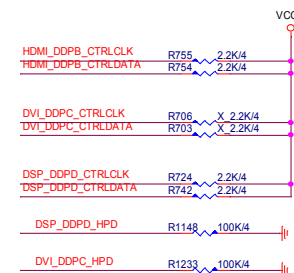
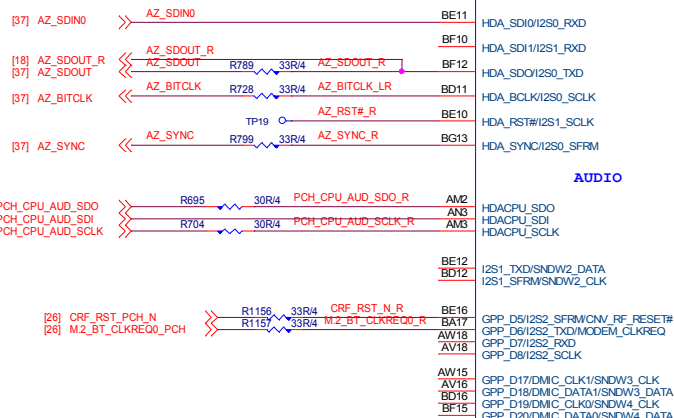
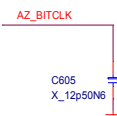


PCH_CLK

Close to PCH



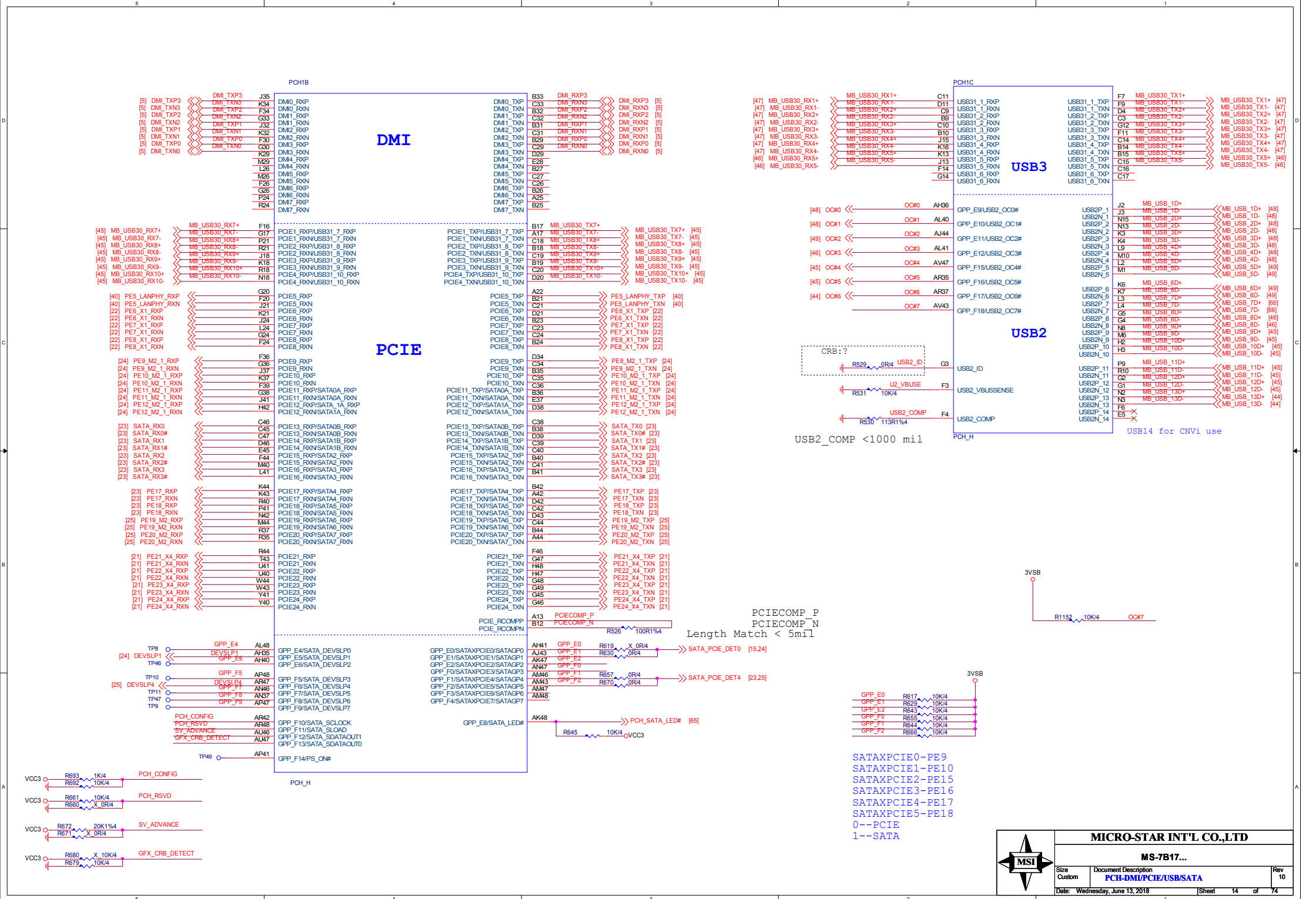
PCH AUDIO



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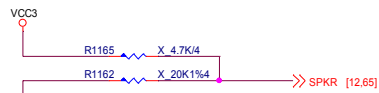
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0001-007 MS-7B17... CONFIDENTIAL
RD(C) 001809101 jonepei (00068 RMA 001809101 jonepei)



TOP Swap



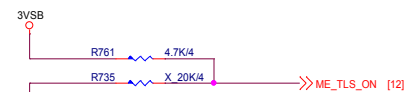
Internal pull-down is disabled after PLTRST#

No Reboot



0 : DISABLE (Default)
1 : ENABLE

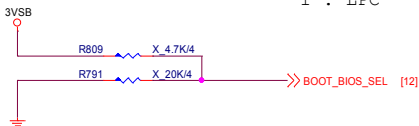
AMT and SBA with confidentiality



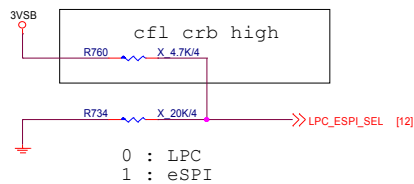
0 : DISABLE
1 : ENABLE (Default)

Boot BIOS

0 : SPI
1 : LPC

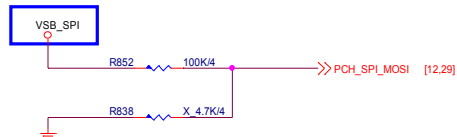


LPC eSPI Mode

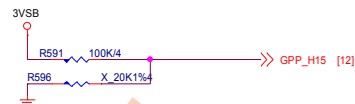


0 : LPC
1 : eSPI

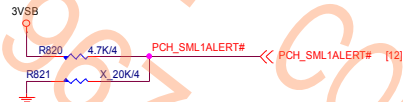
Reserved



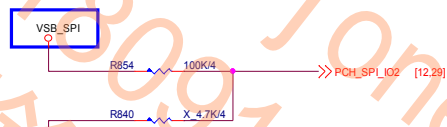
Reserved



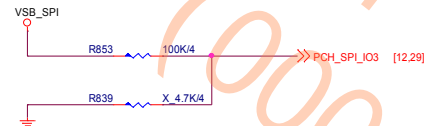
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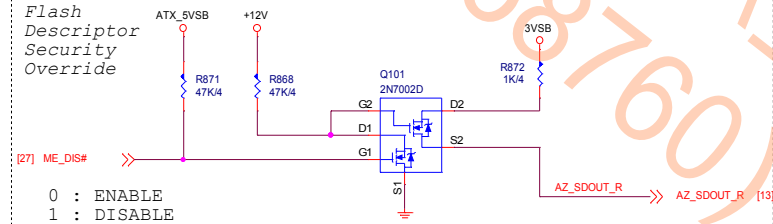
Reserved



Reserved

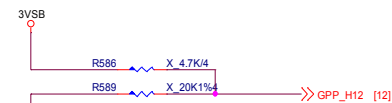


Flash Descriptor Security Override



0 : ENABLE
1 : DISABLE

eSPI FLASH SHARING MODE



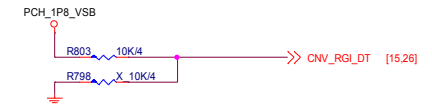
0 : MASTER ATTACHED FLASH SHARING
1 : SLAVE ATTACHED FLASH SHARING

eSPI FLASH SHARING MODE



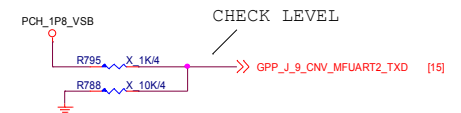
XTAL FREQUENCY SELECTION
1 = 24MHZ (25MHZ WHEN XTAL FREQ DIVIDER NON ZERO)
0 = 38.4/19.2MHZ

Modem Reference Clock Source Select



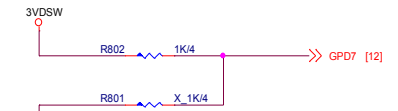
MODEM AND NFC REFERENCE CLOCK SOURCE SELECT
1 = CLKIN XTAL LCP
0 = XTAL_IN (CNP AND LCP SHARE XTAL)

1.8V VCCPSPI



SELECT THE SPI BIOS FLASH INTERFACE OPERATING VOLTAGE
0 = VCCPSPI IS CONNECTED TO 3.3V RAIL - DEFAULT
1 = VCCPSPI IS CONNECTED TO 1.8V RAIL
PCH HAS INTERNAL 20K PD

Reserved



XTAL INPUT MODE
0 = XTAL INPUT IS SINGLE-ENDED
1 = XTAL INPUT IS DIFFERENTIAL
PCH HAS INTERNAL 20K PD



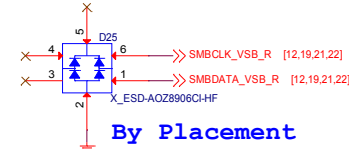
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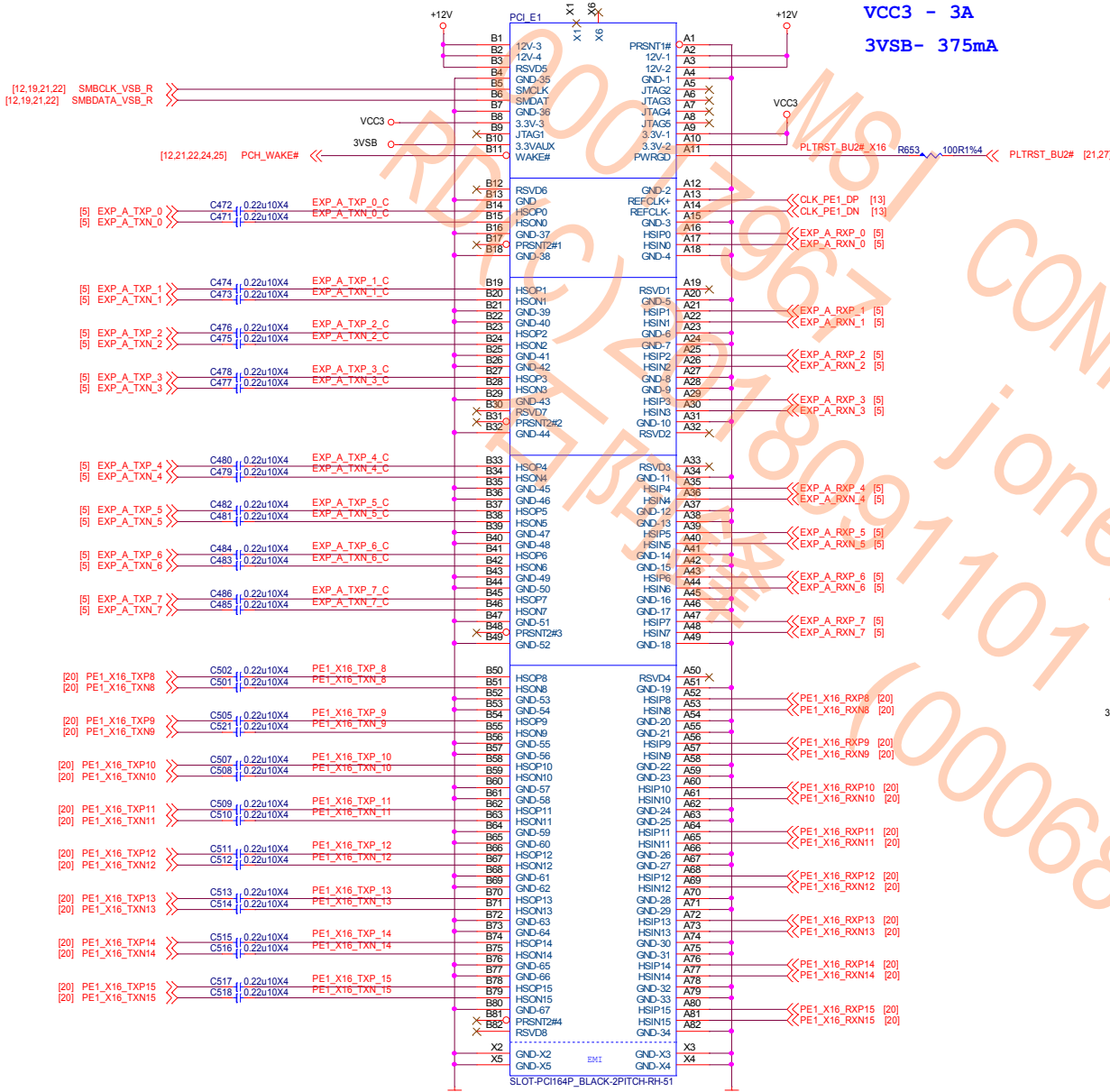
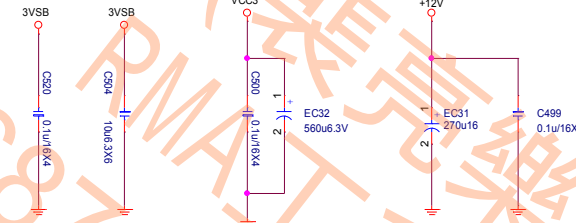
12V - 5.5A
VCC3 - 3A
3VSB- 375mA

SMBUS ESD

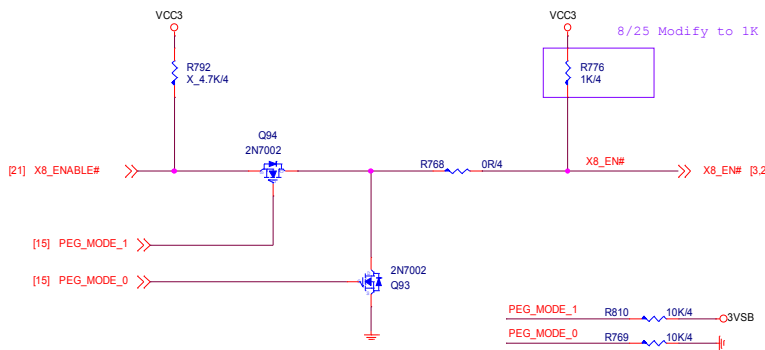
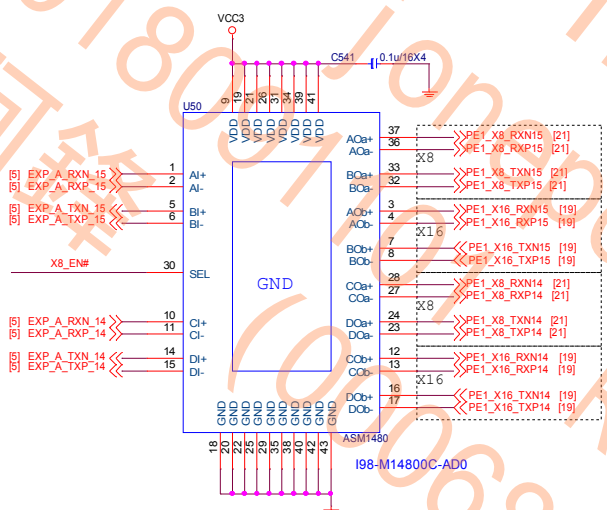
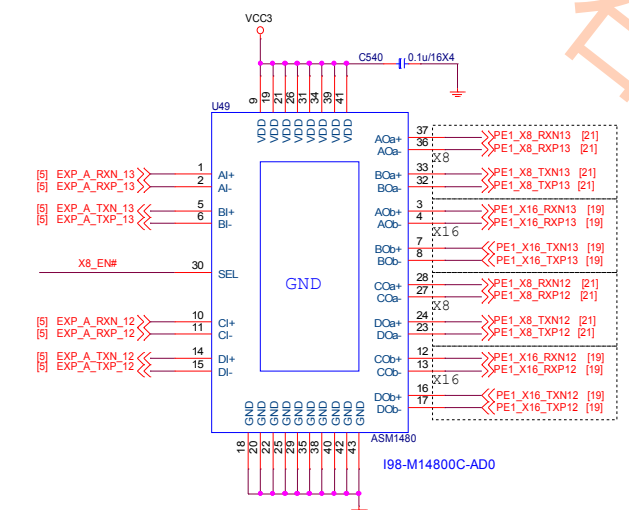
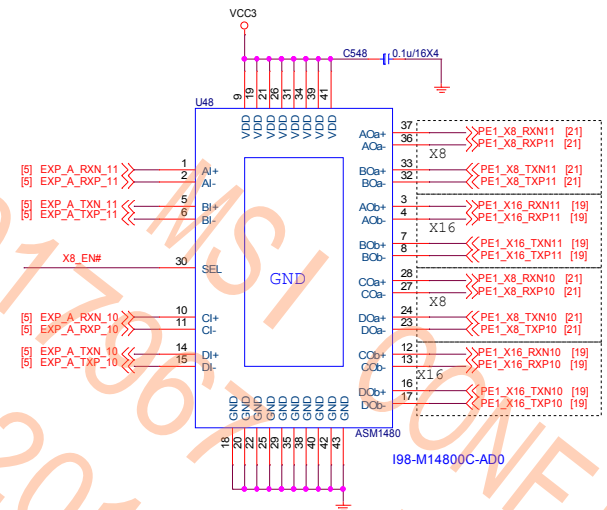
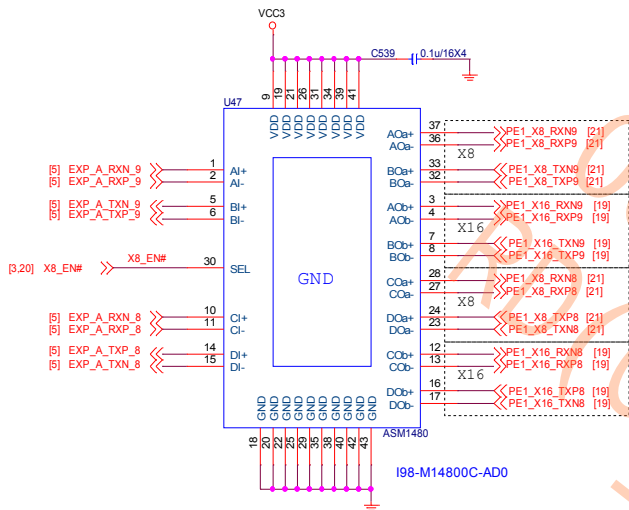


Main: DOG-05A0529-A68
AVL: DOG-45B0510-I14

By Placement



0901 Modify PCI_E1_PIN X2.X3.X4.X5 Connect to GND



MODE_1

0: BIOS MODE
1: HW MODE (Default)

HW MODE

PCB Status	MODE_0	MODE_1
AUTO	0	1

If USE HW MODE
GPP_G0 & GPP_G1 programming to GPI

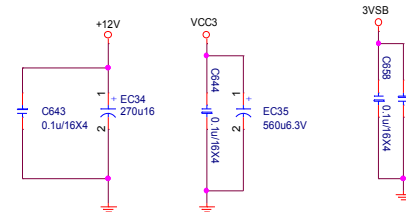
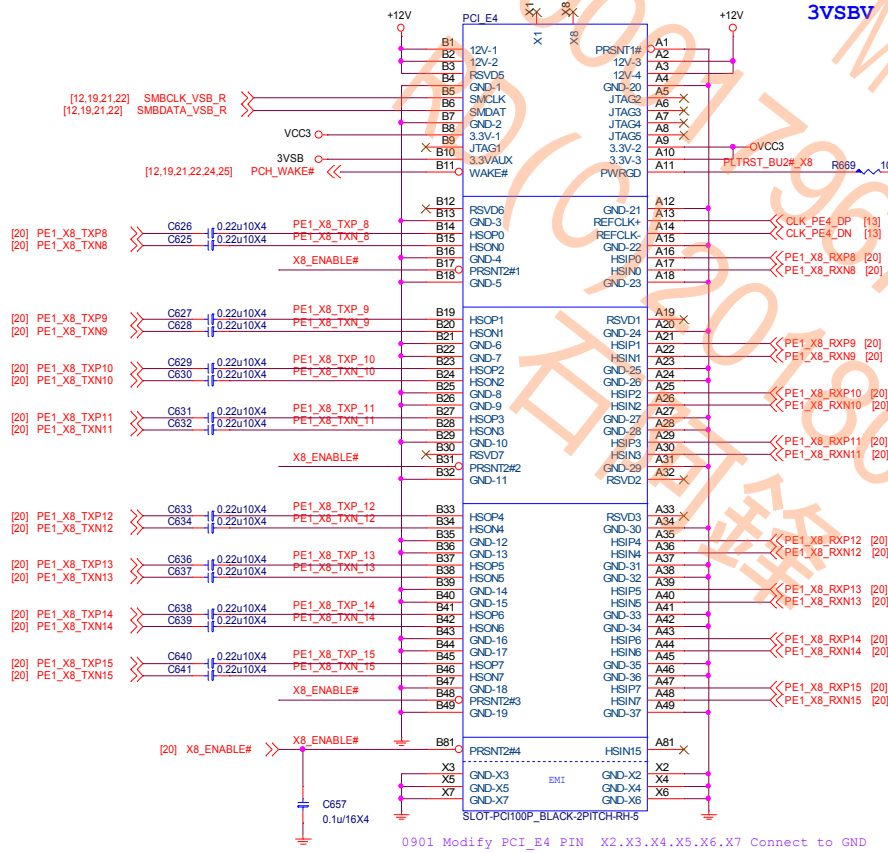
If USE BIOS MODE
GPP_G0 & GPP_G1 programming to GPO

BIOS MODE

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

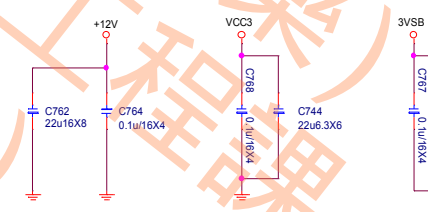
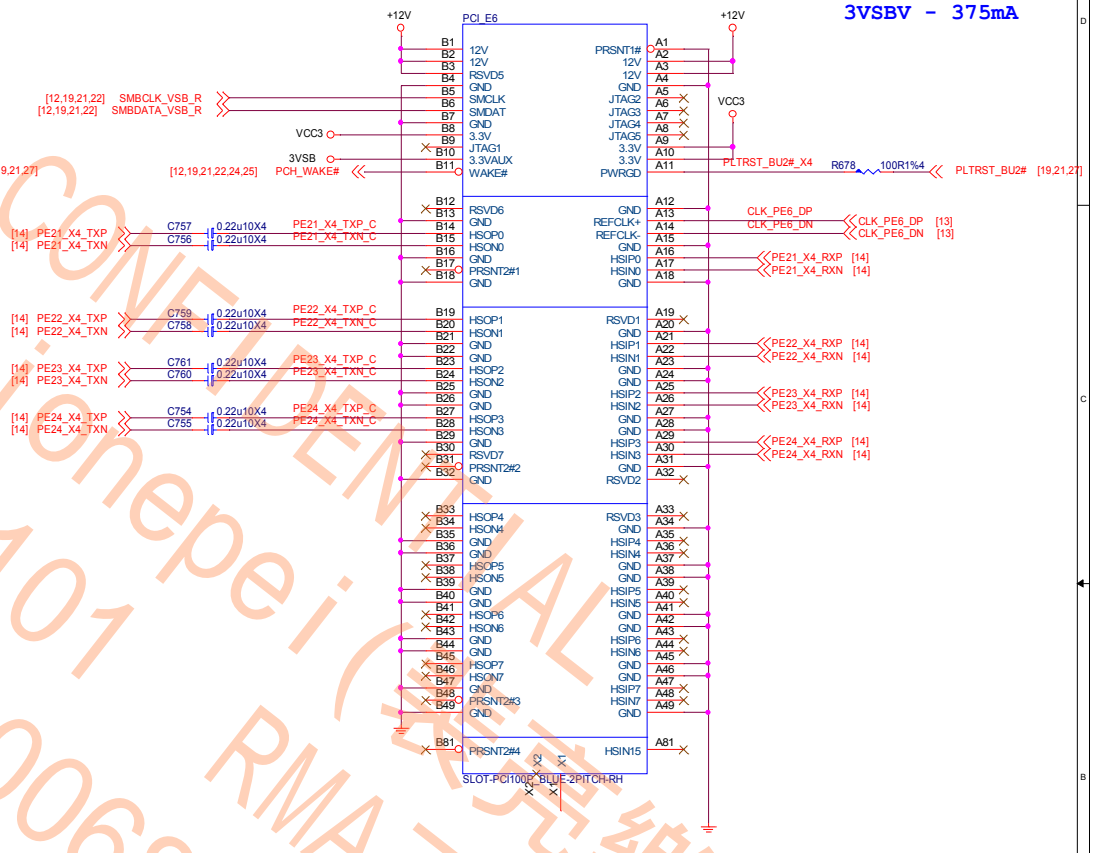
PCI Express X8 Slot

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

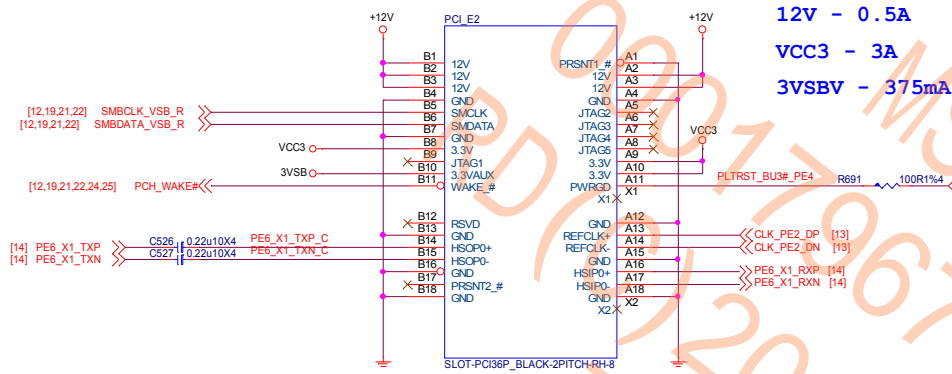


PCI Express X4 Slot

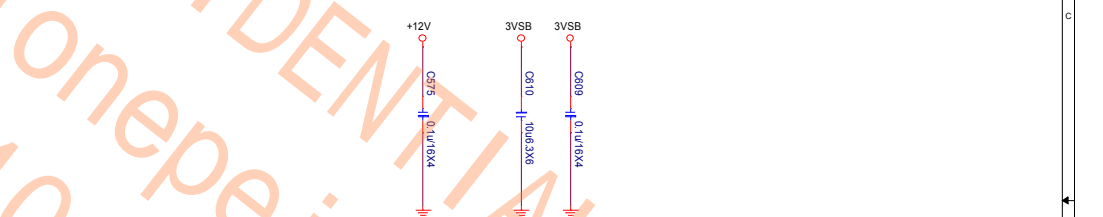
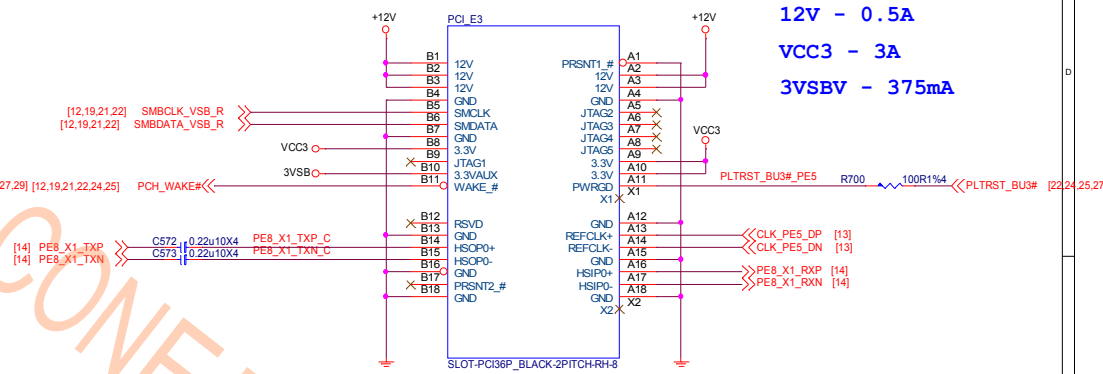
12V - 2.1A
VCC3 - 3A
3VSBV - 375mA



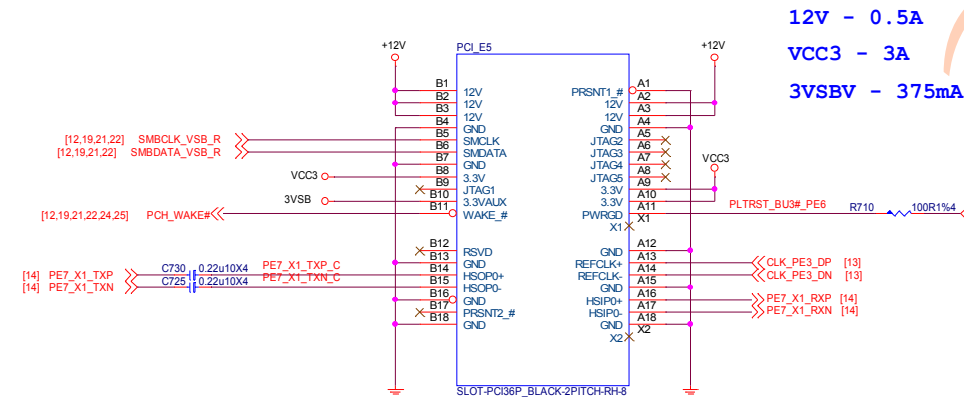
2016.08.25 Modify to N11-0360211-F02



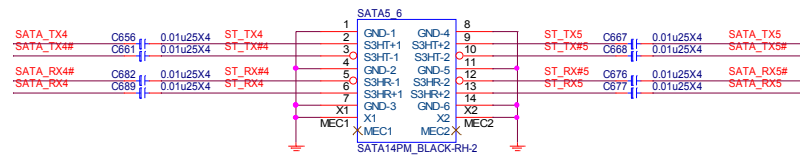
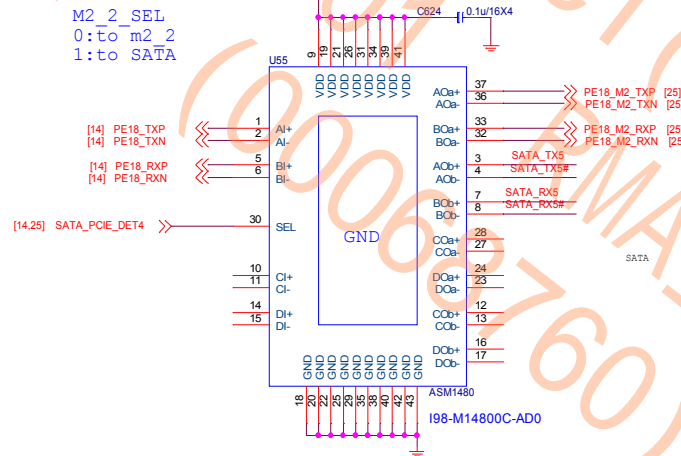
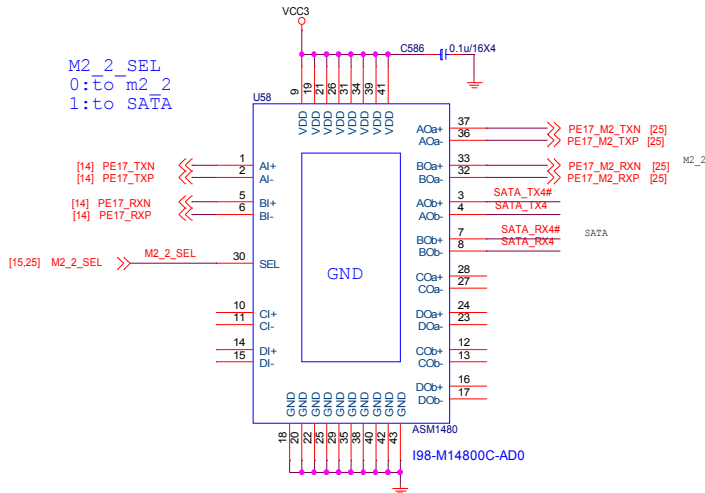
2016.08.25 Modify to N11-0360211-F02



2016.08.25 Modify to N11-0360211-F02



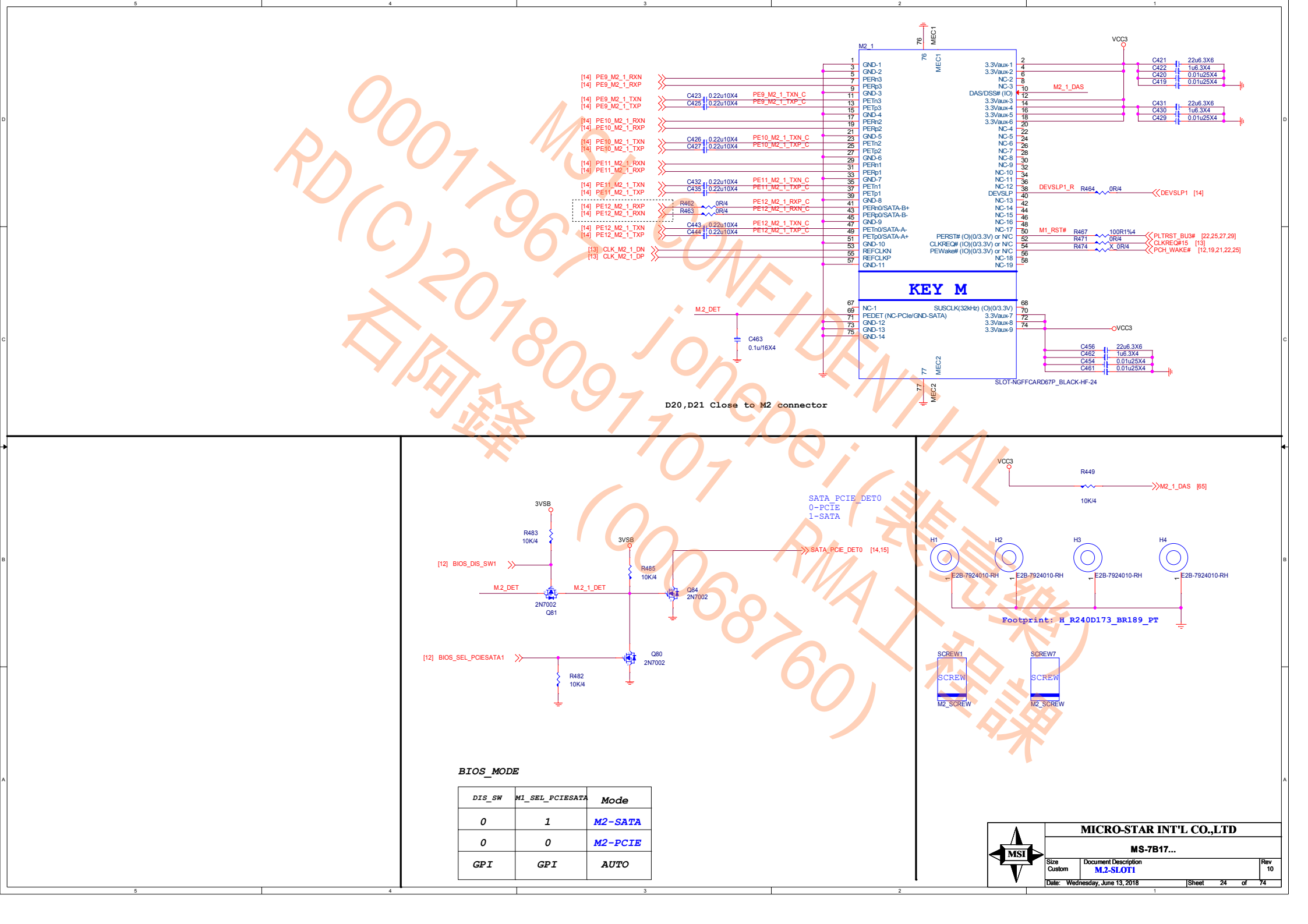
SATA Connector



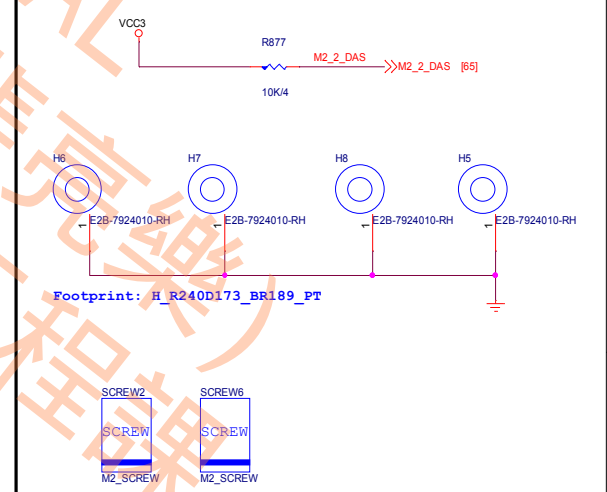
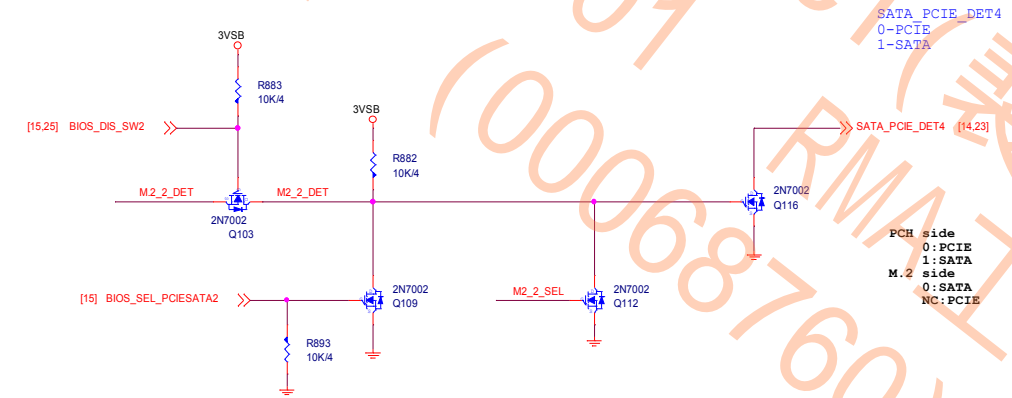
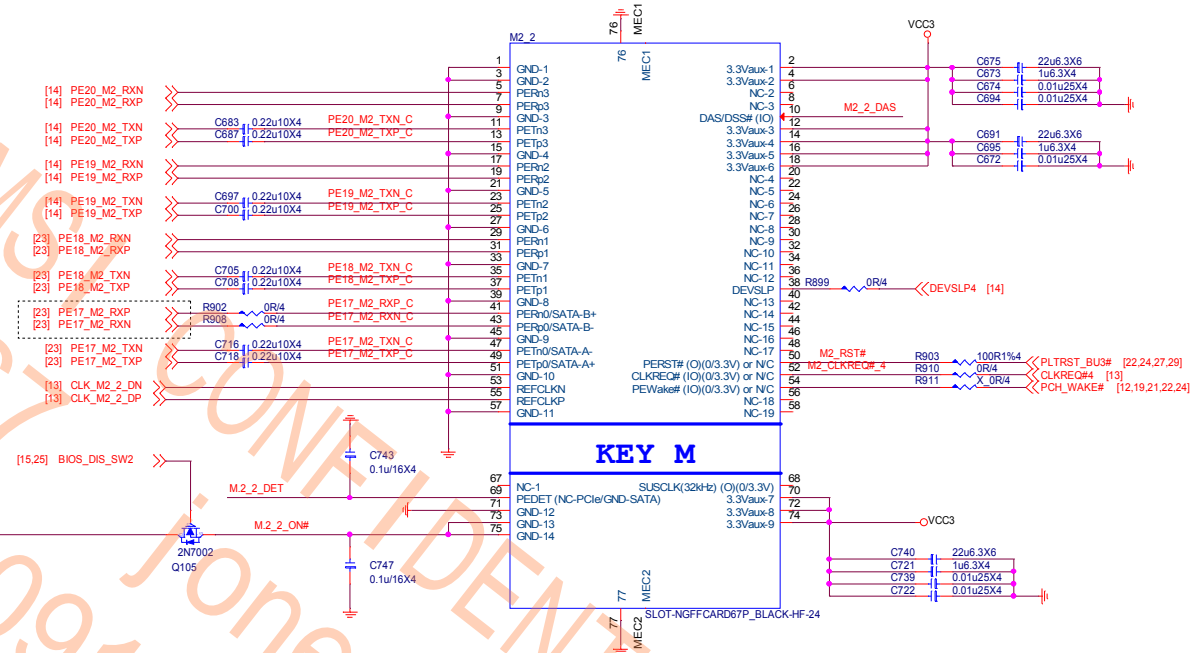
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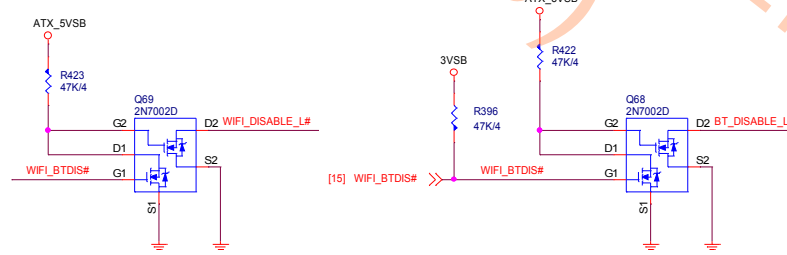
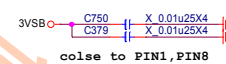
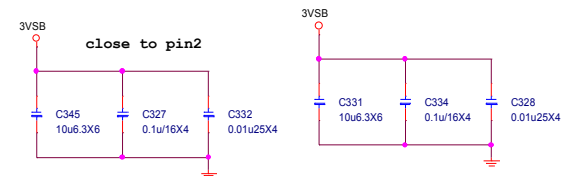
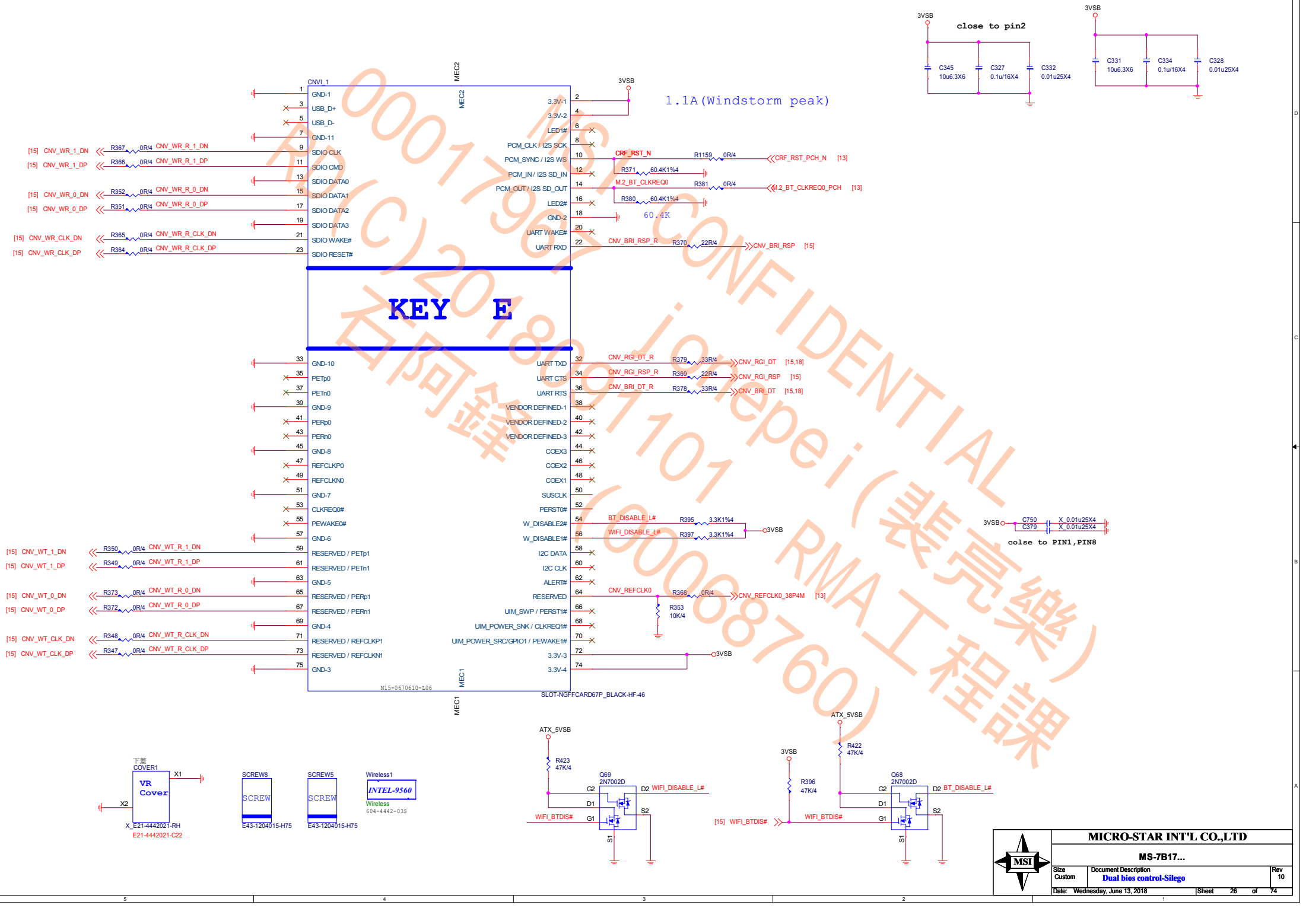


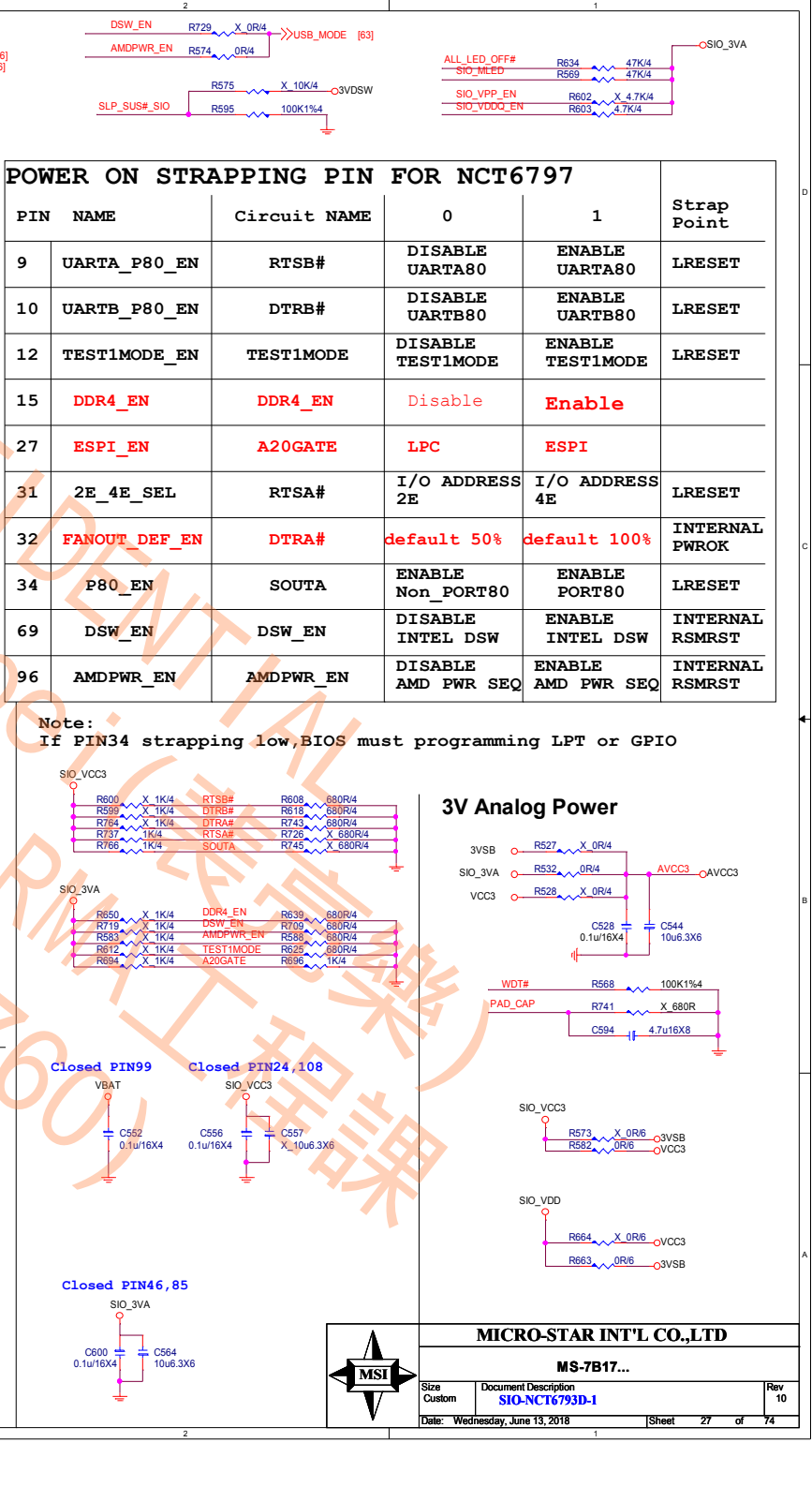
00017961
RD(C)2018091101
石阿鋒



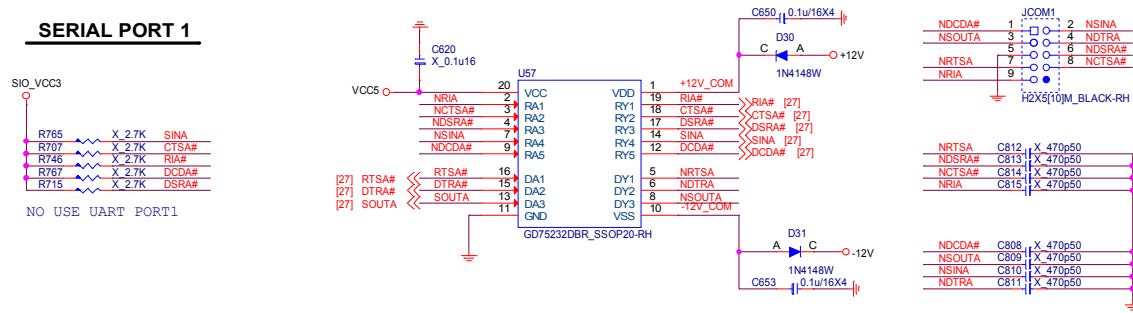
BIOS_MODE

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

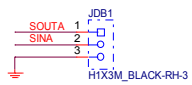




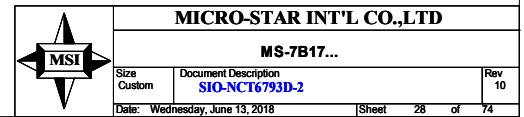
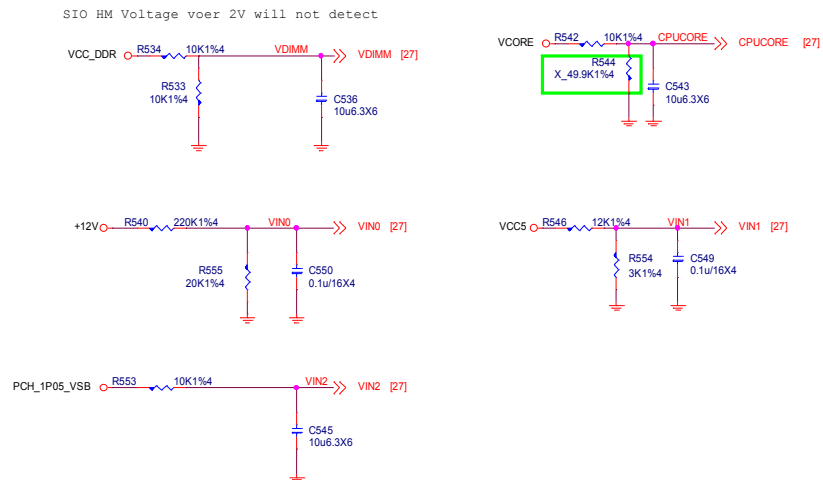
SERIAL PORT 1



BIOS DEBUG



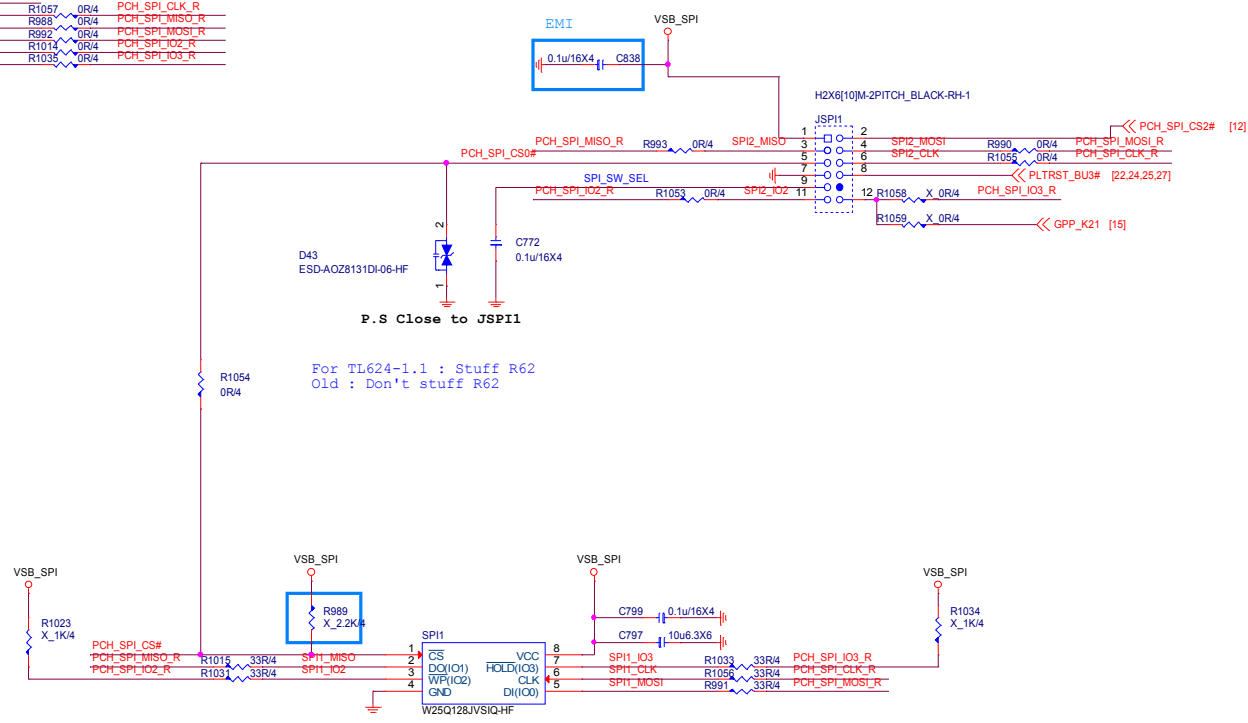
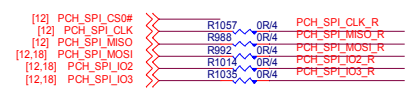
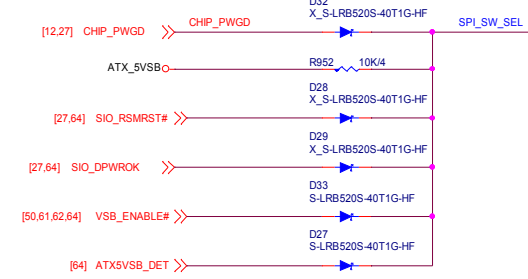
HW Monitor - Voltage

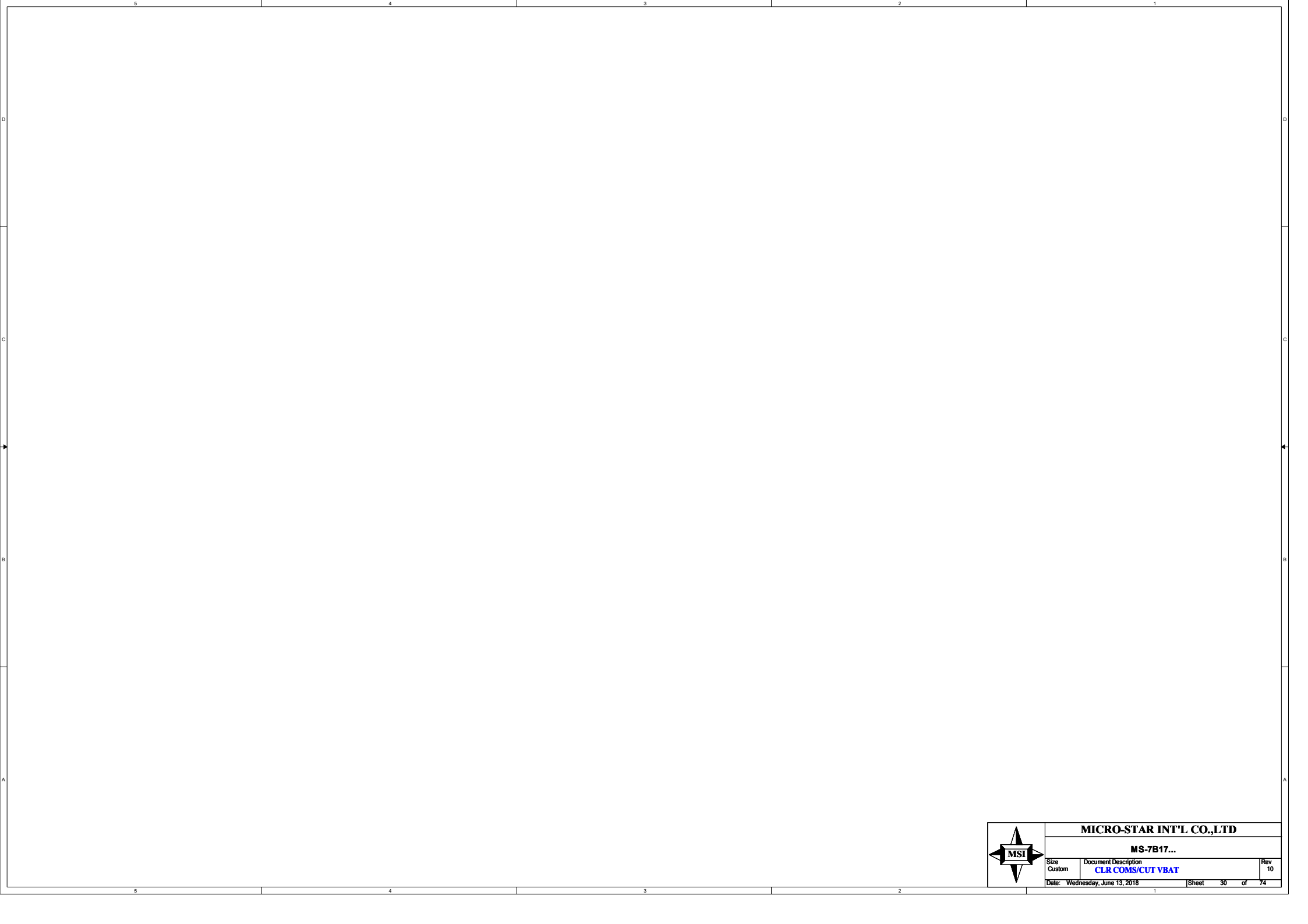


Module Stuff CHIP_PWGD,
But PCH_PWROK may ramp up before CHIP_PWGD.

0825 Add D48, unstuff D33

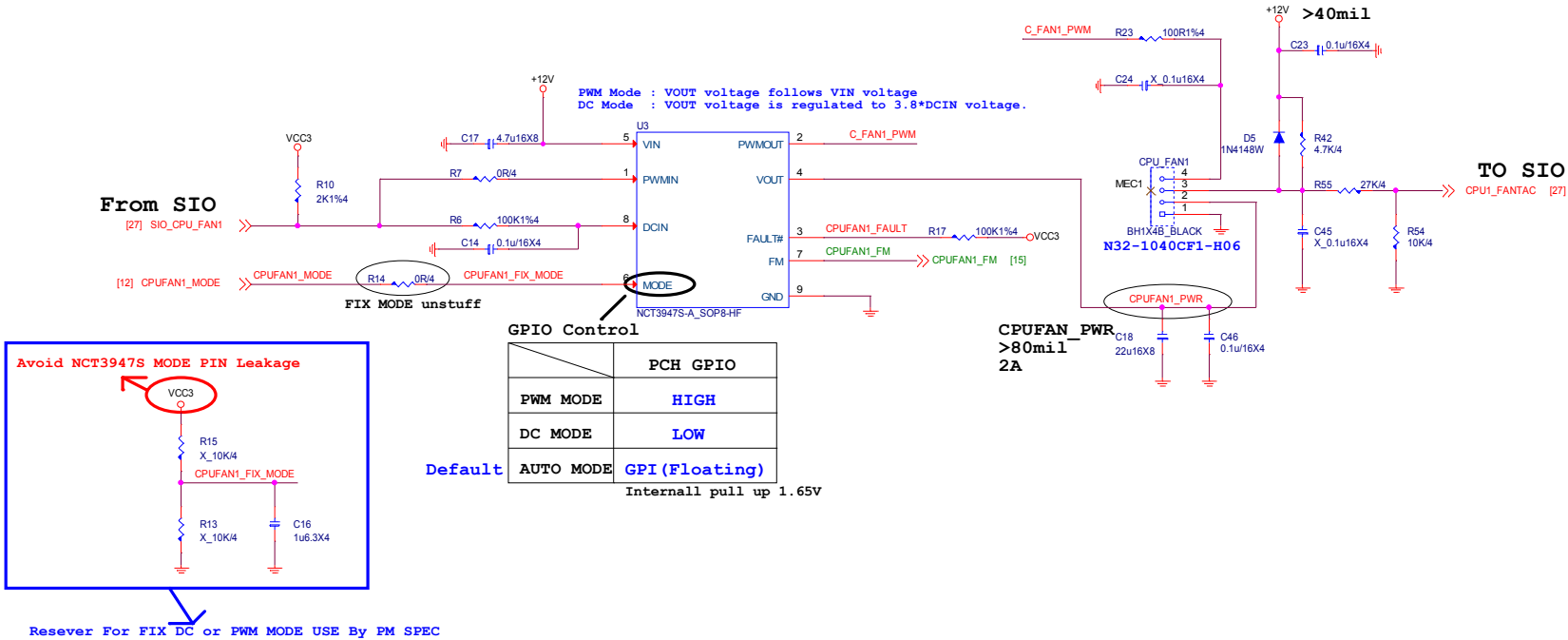
For TL624 1.1



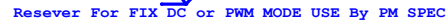


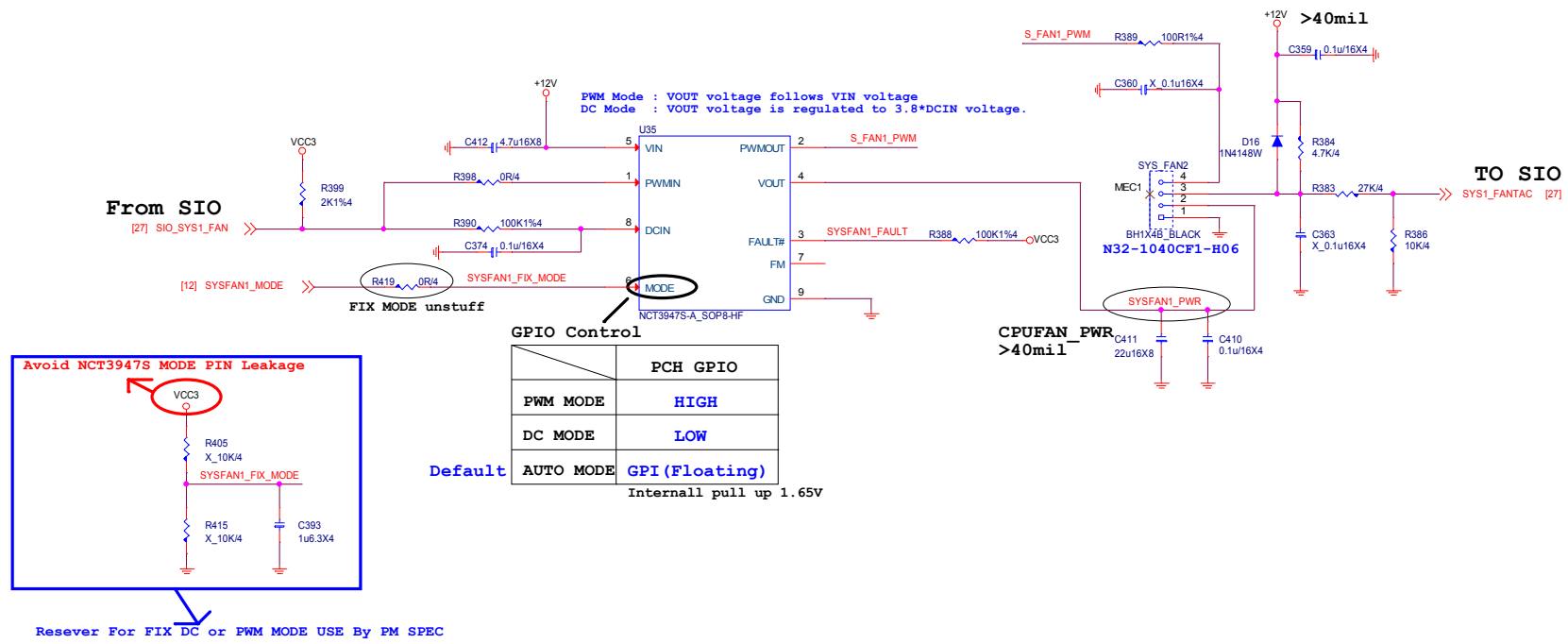
MICRO-STAR INT'L CO.,LTD			
MS-7B17...			
Size Custom	Document Description CLR COMS/CUT VBAT		Rev 10
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TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE
1.Mode GPIO BIOS can swtich PWM/DC MODE



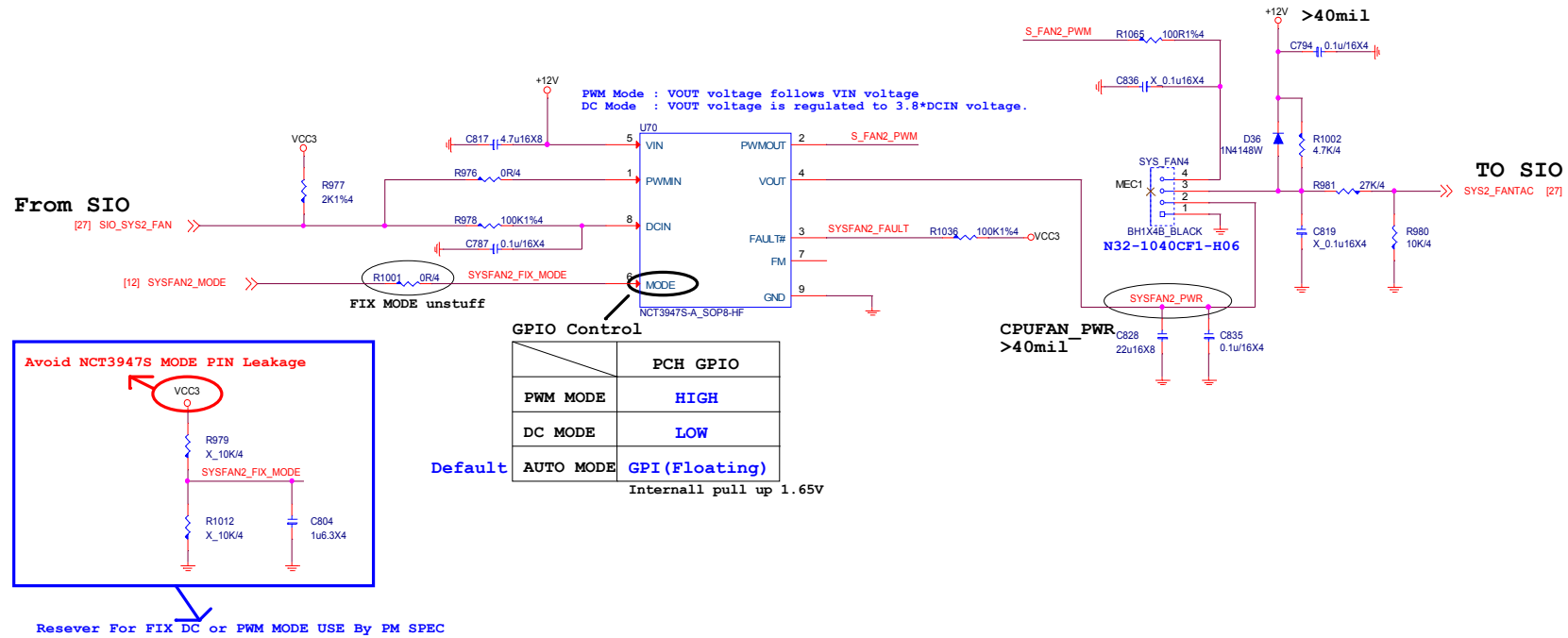
1.Mode GPIO BIOS can swtich PWM/DC MODE





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

1.Mode GPIO BIOS can swtich PWM/DC MODE

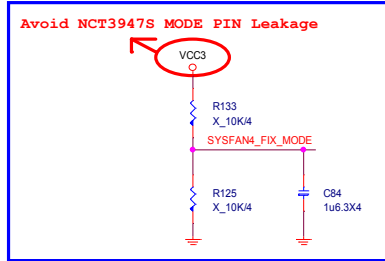
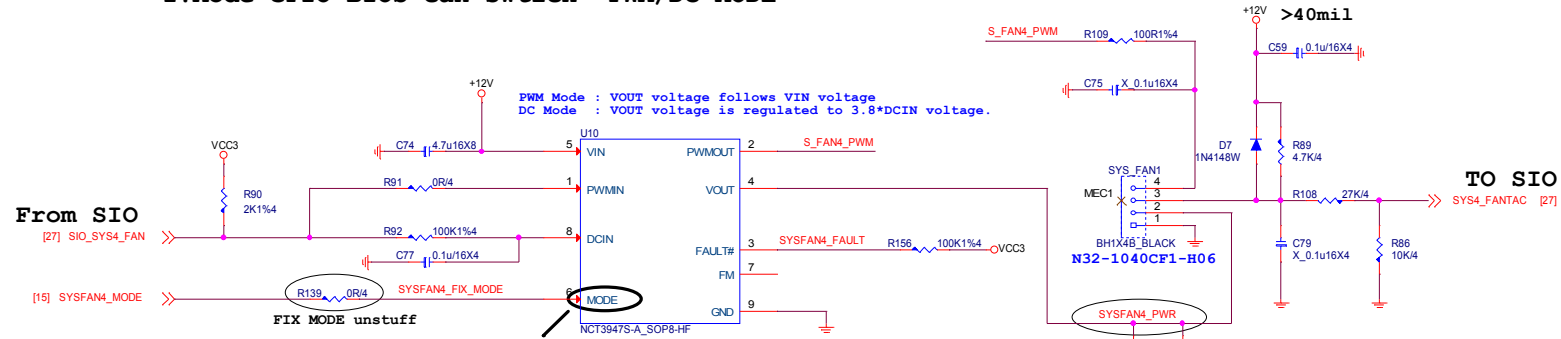


1.Mode GPIO BIOS can swtich PWM/DC MODE

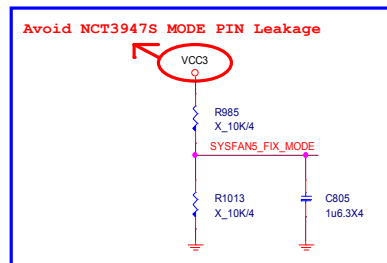
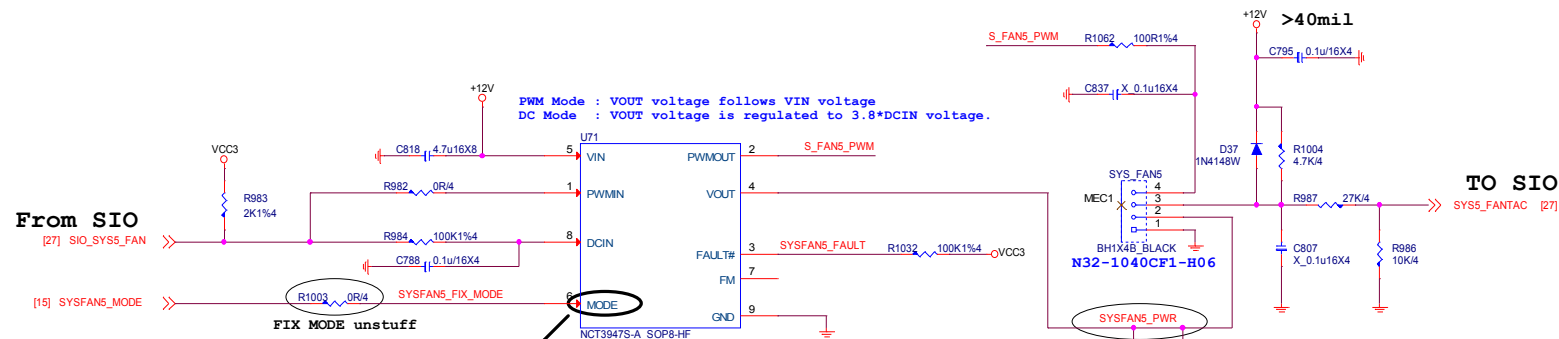


TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can swtich PWM/DC MODE

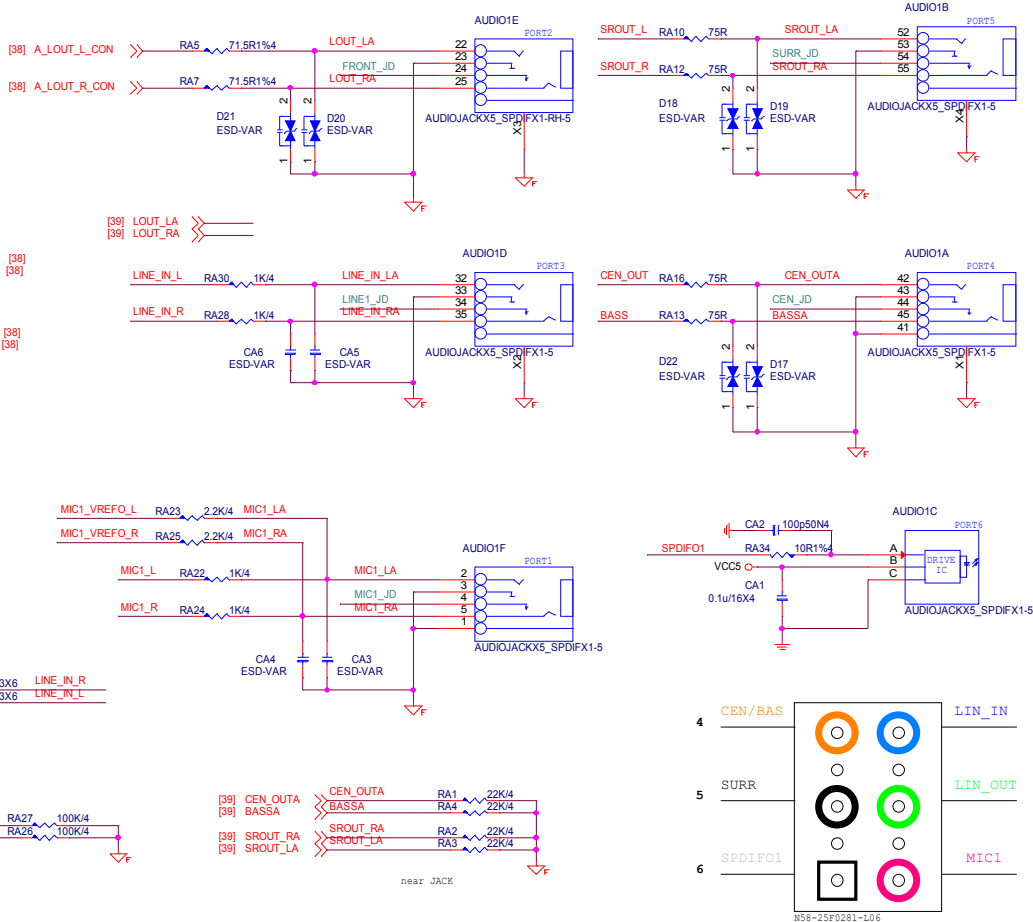
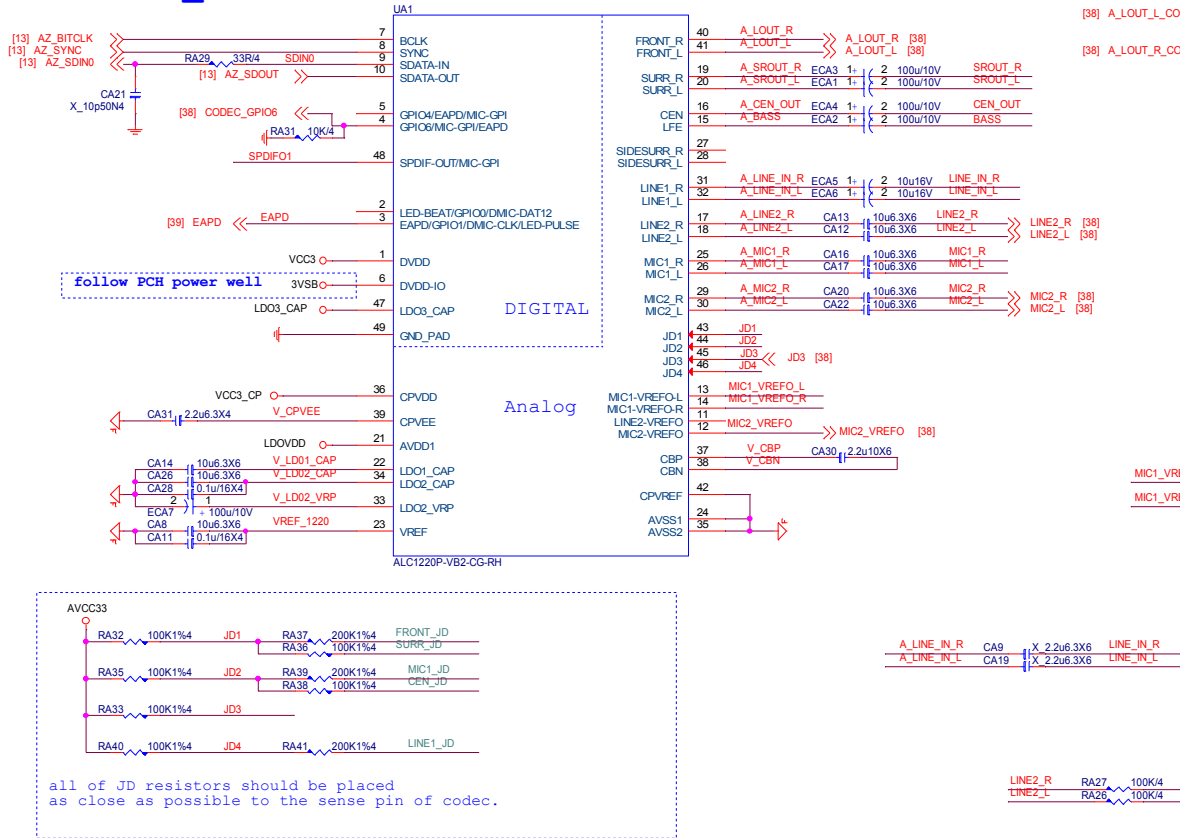


Resever For FIX DC or PWM MODE USE By PM SPEC

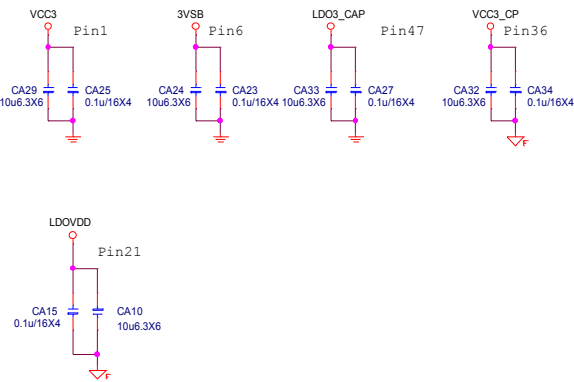


Resever For FIX DC or PWM MODE USE By PM SPEC

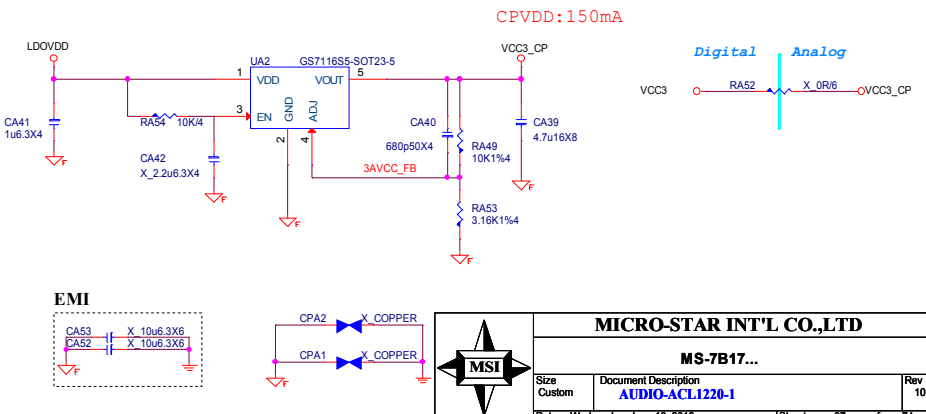
ALC1220P_VB-48PIN

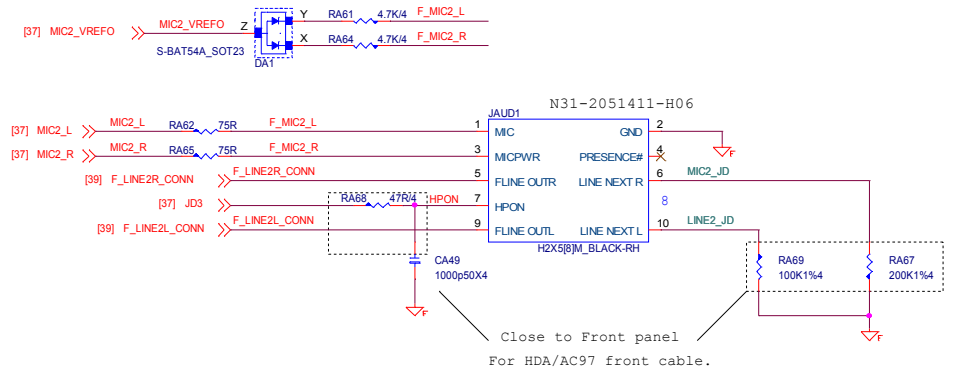
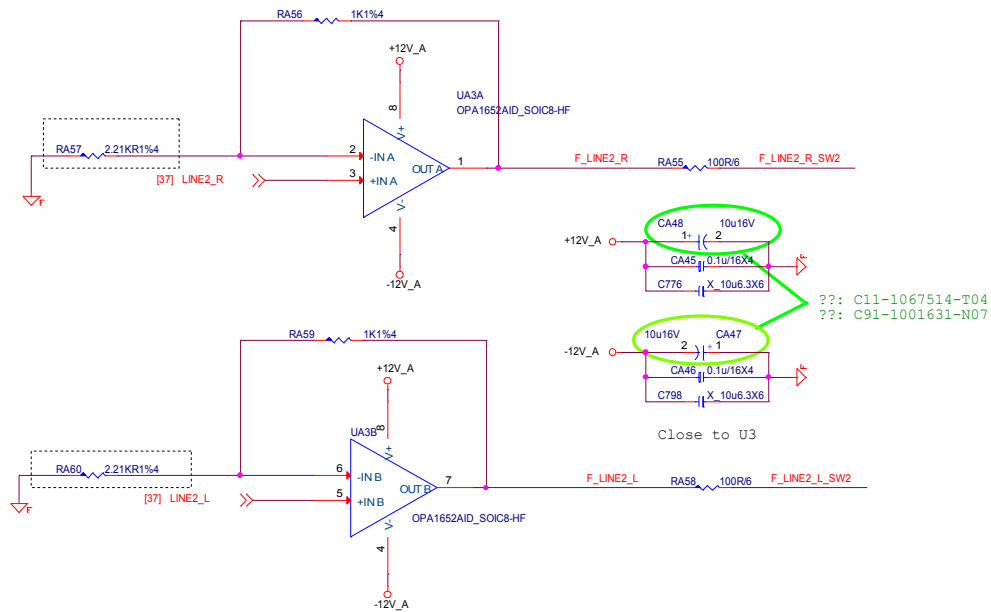


Closed Codec

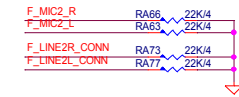
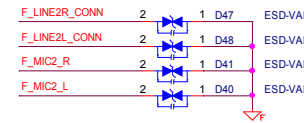


CPVDD POWER: ATX5VSB will Leakage to CVDD by ALC1220, so CVDD must keep 3.3V

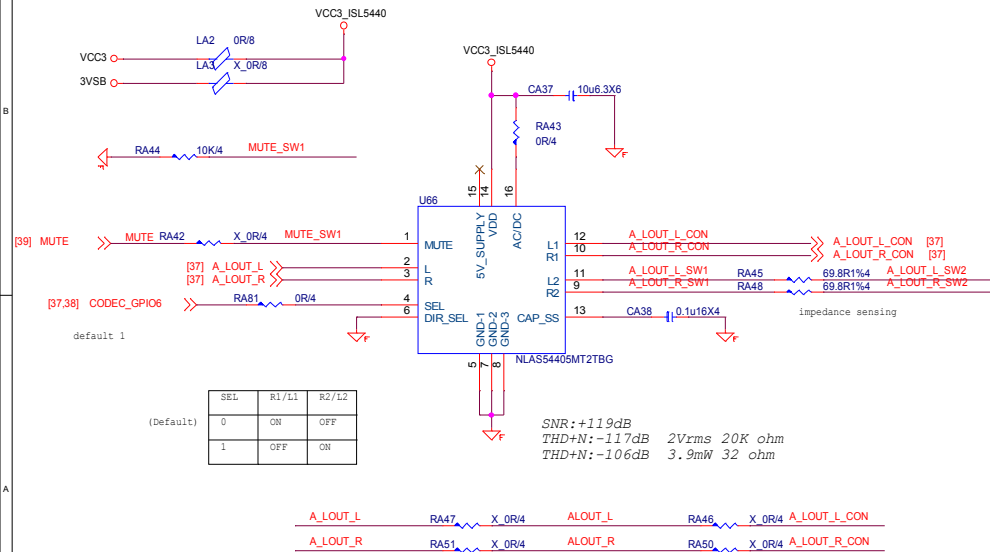




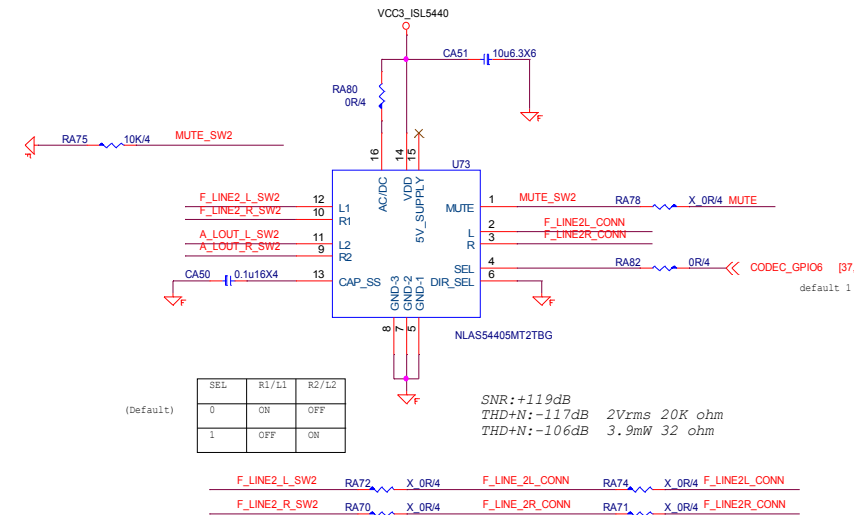
Close to Jack
ESD protect



Along SW1

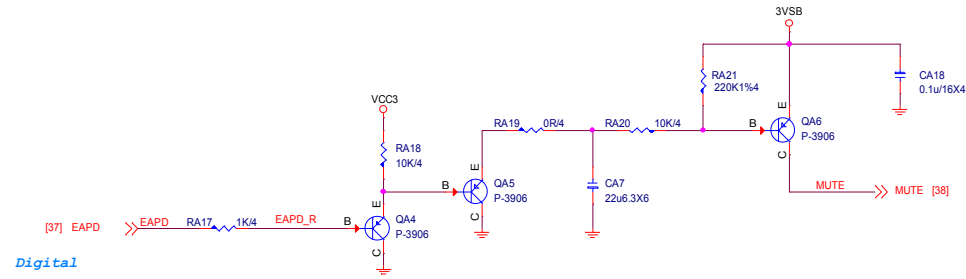


Along SW2



Rear Line OUT De-POP circuit

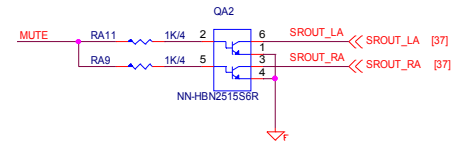
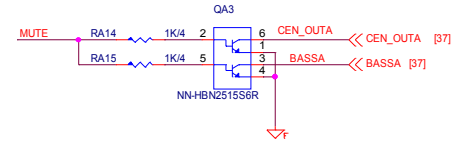
(De-pop circuit for Rear Line out & Front Headphone out)



Analog



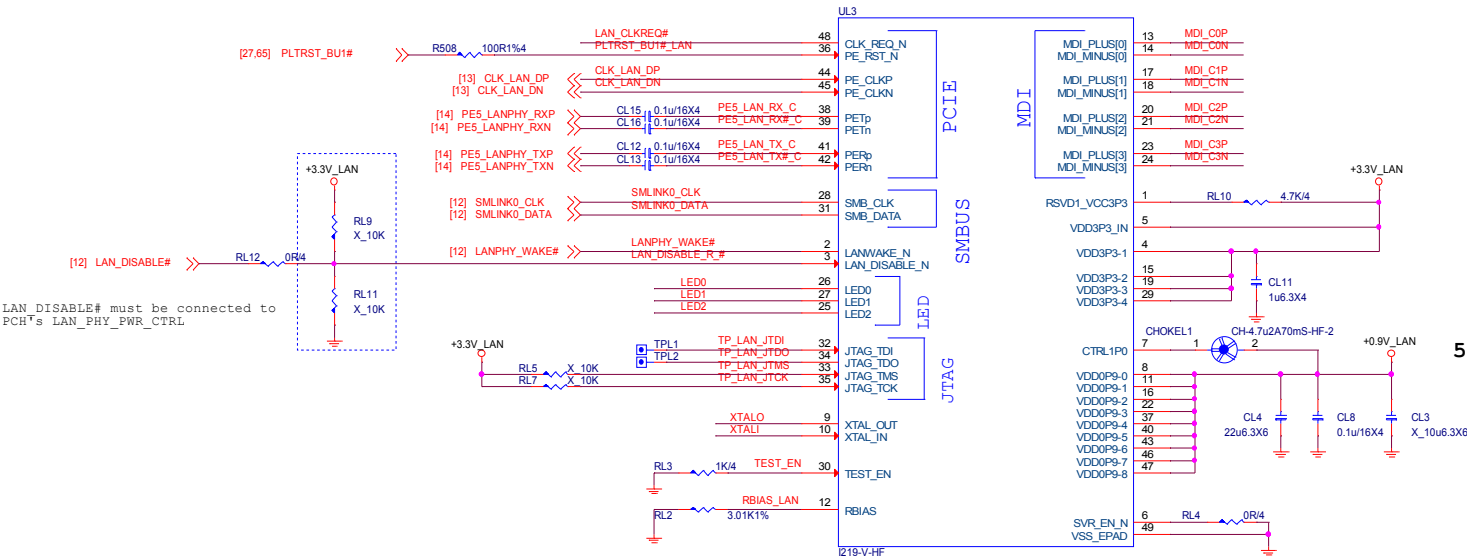
(add de-pop circuit by PM spec or customer request,
NOTE: add de-pop circuit need to change SROUT_LA, SROUT_RA, CEN_OUTA, BASSA to TVS)



Intel Lan- i219

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

LAN Connector



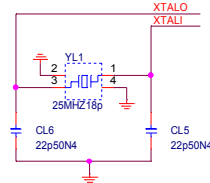
500mA

For EMI

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

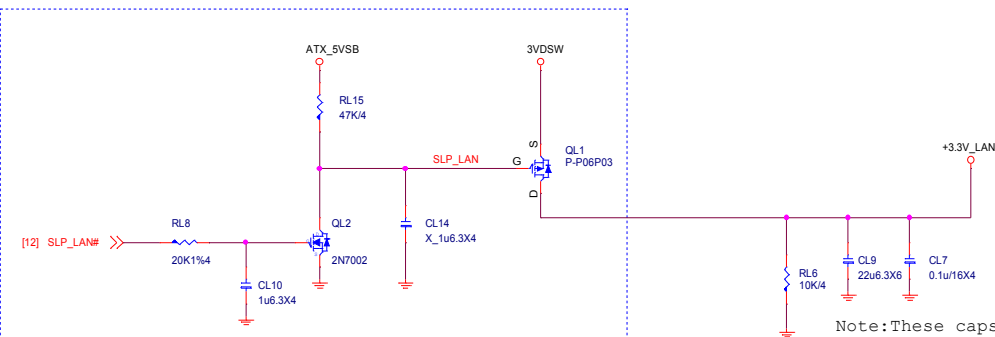


AVL:D04-1005700-SC6



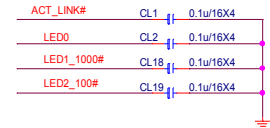
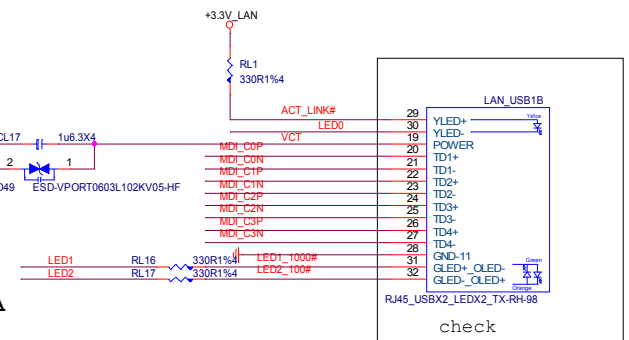
The 10Kohm pull-up resistor (RL18) of CLK_REQ_N is connected to 3.3V_Suspend/Core/etc. power well, depending on the power well of PCH's input PCIECLKRQ<n> buffer.

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

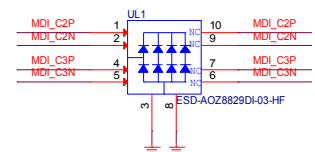
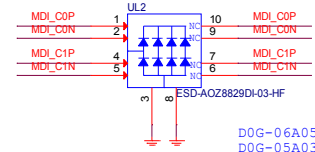


+3.3V LAN
I218:132mA
I219:542mW

Note:These caps closed to PHY



UL2&UL3 close to connector



Do not pair MDI0 and MDI1 on the same TVSdevice (avoid LAN POE connecting issue).
Otherpairing combination is ok.



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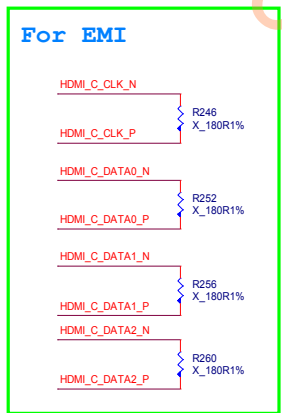
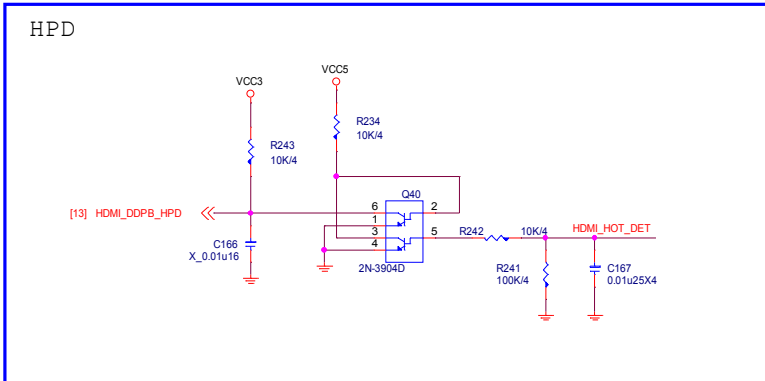
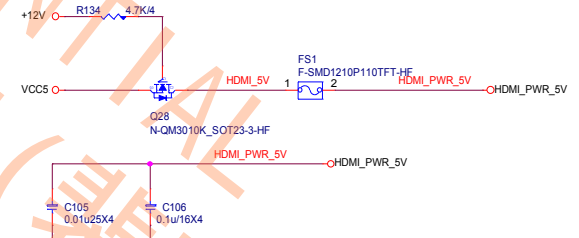
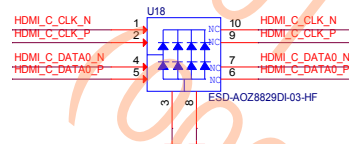
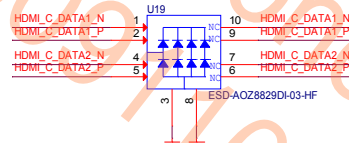
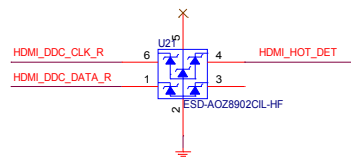
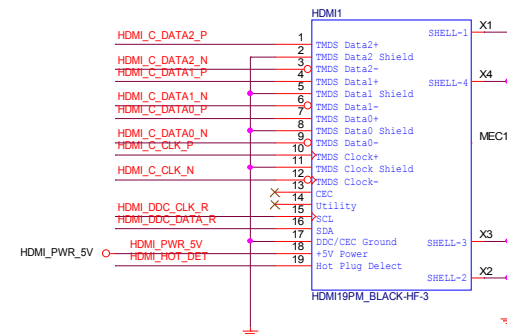
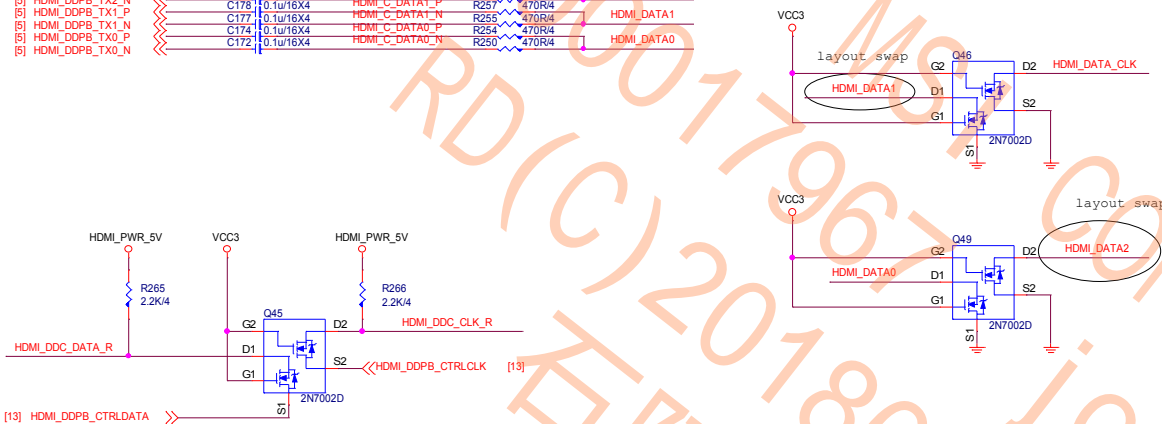
5	4	3	2	1
D				D
C				C
B				B
A				A
5	4	3	2	1

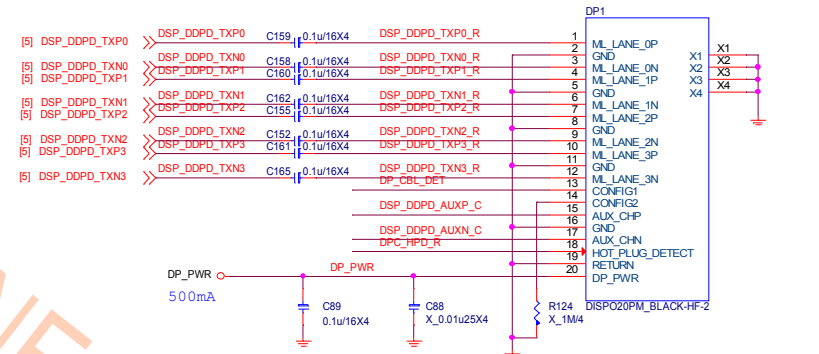
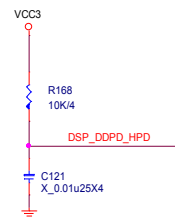
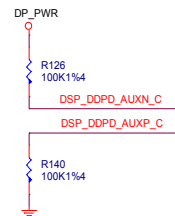
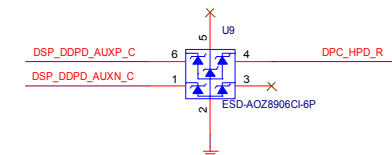
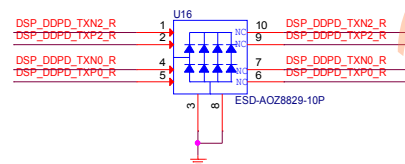
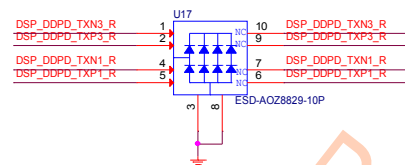


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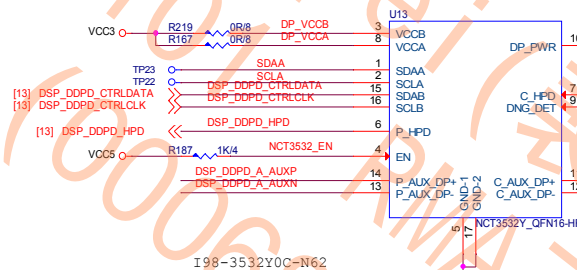
HDMI, DVI : 1920x1200 at 60 Hz (16:10 WUXGA)

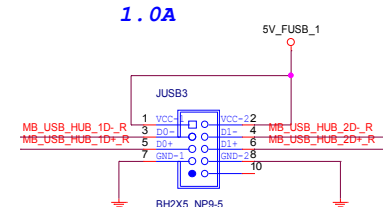
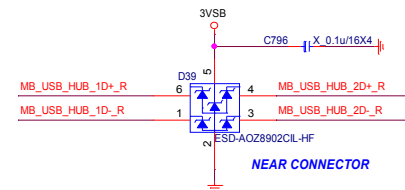
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[5] HDMI_DDPB_CLK_N	C170	0.1u/16X4	HDMI_C_CLK_N	R245	470R/4	
[5] HDMI_DDPB_TX2_P	C183	0.1u/16X4	HDMI_C_DATA2_P	R262	470R/4	HDMI_DATA2
[5] HDMI_DDPB_TX2_N	C181	0.1u/16X4	HDMI_C_DATA2_N	R259	470R/4	
[5] HDMI_DDPB_TX1_P	C178	0.1u/16X4	HDMI_C_DATA1_P	R257	470R/4	HDMI_DATA1
[5] HDMI_DDPB_TX1_N	C177	0.1u/16X4	HDMI_C_DATA1_N	R255	470R/4	
[5] HDMI_DDPB_TX0_P	C174	0.1u/16X4	HDMI_C_DATA0_P	R254	470R/4	HDMI_DATA0
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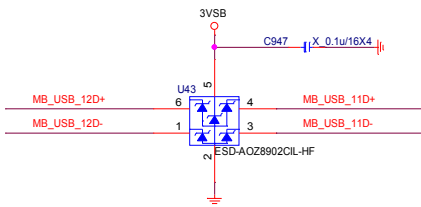
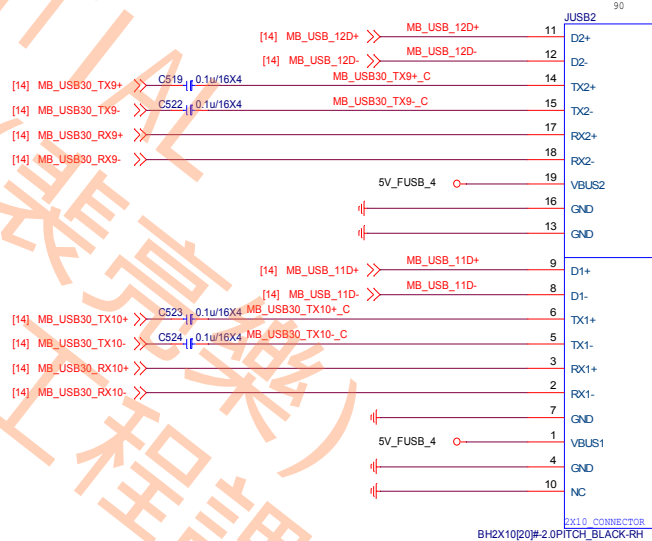
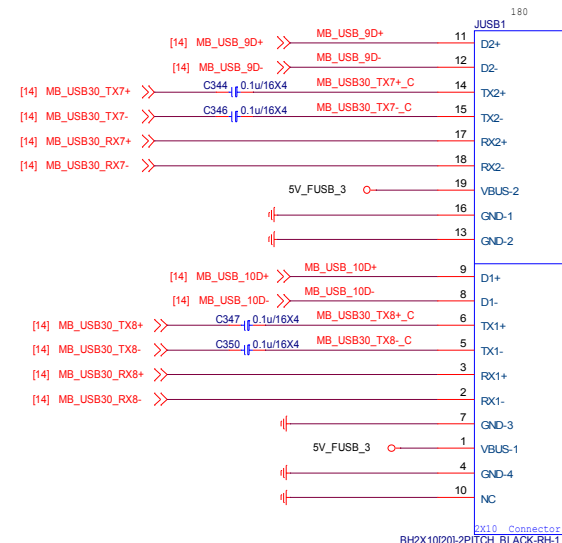
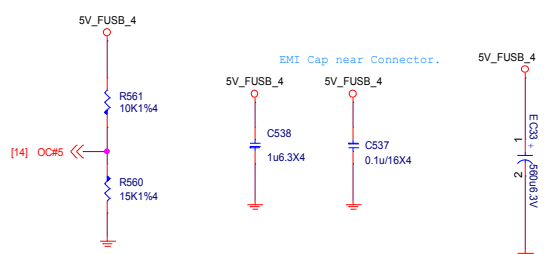
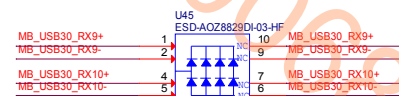
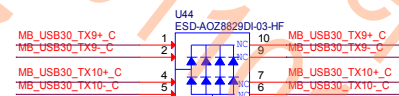
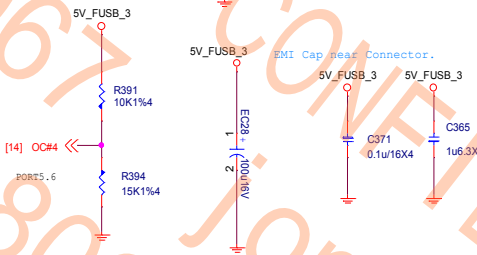
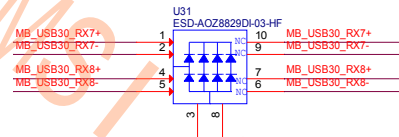
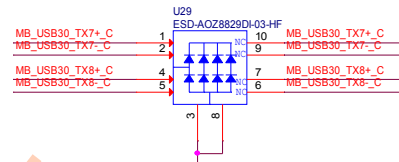
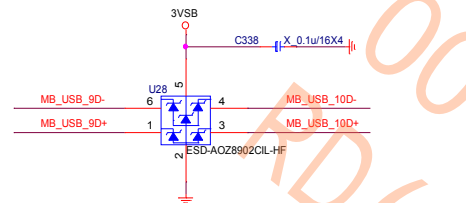


DP_VCCB trace don't less than 30 mil

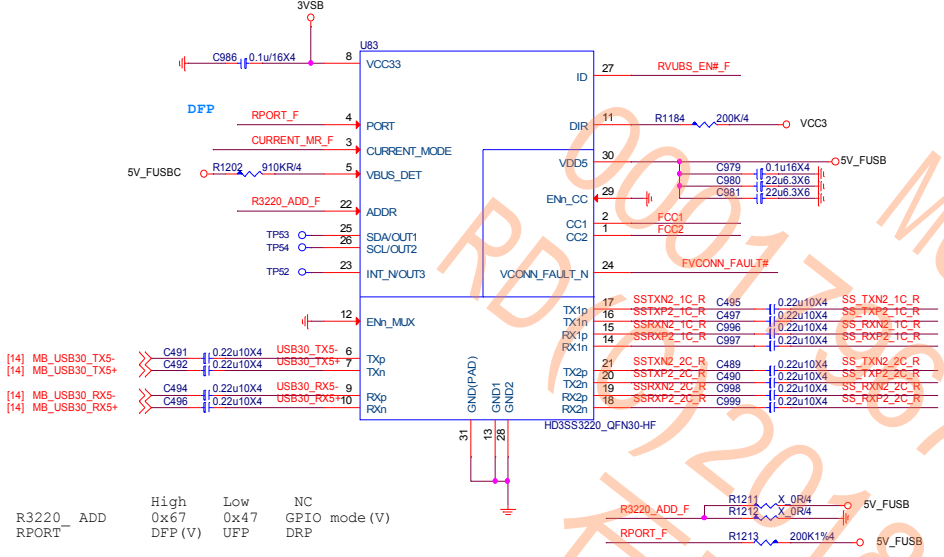


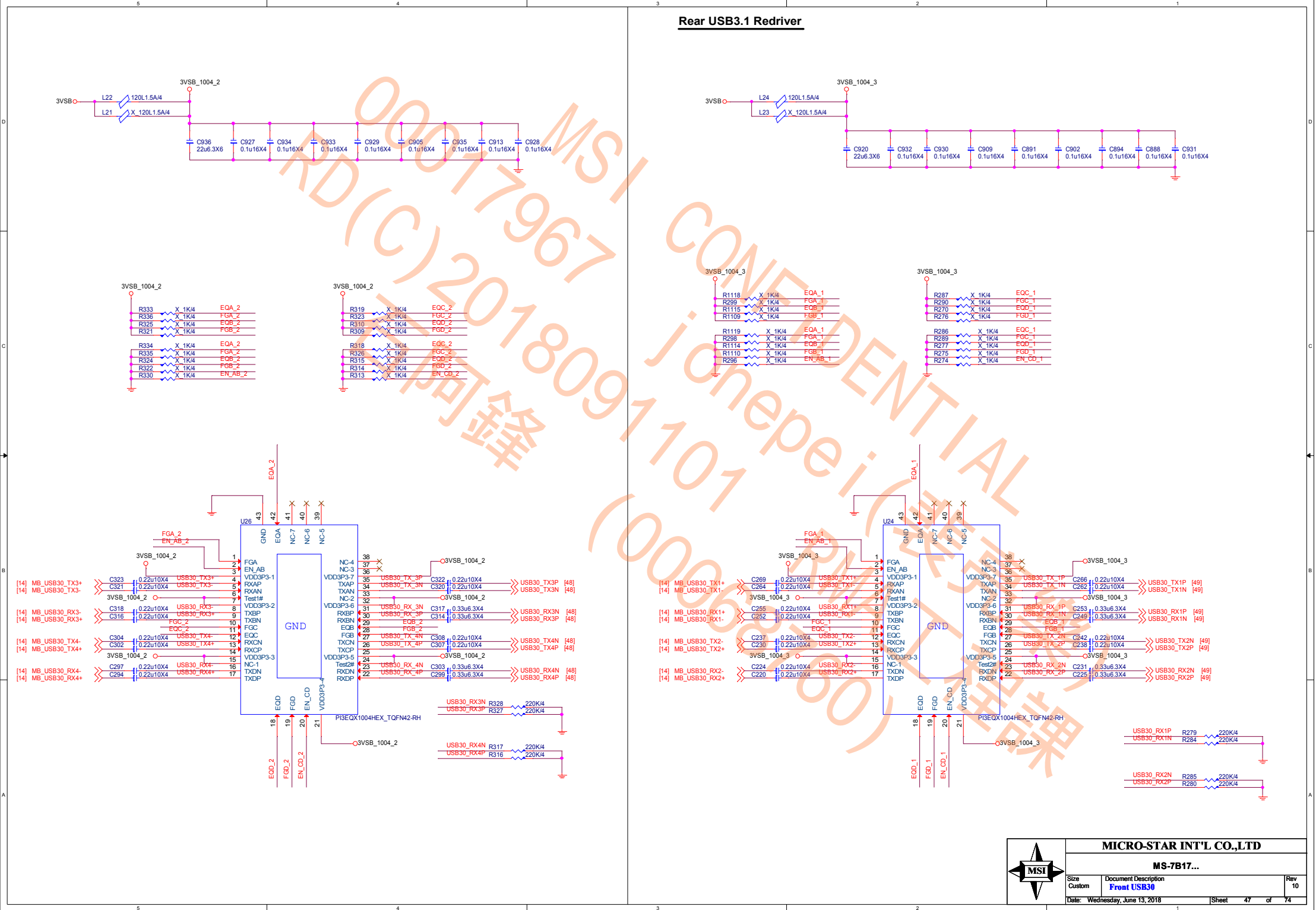


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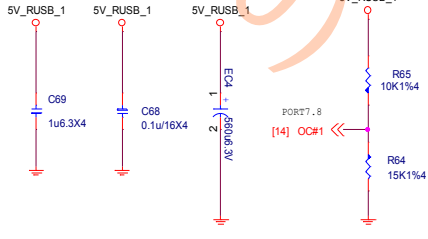
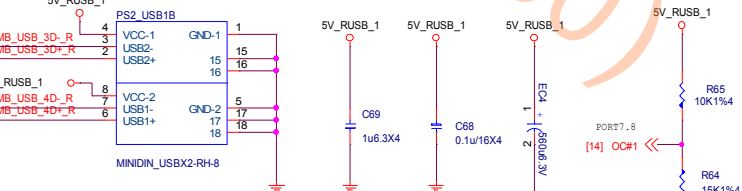
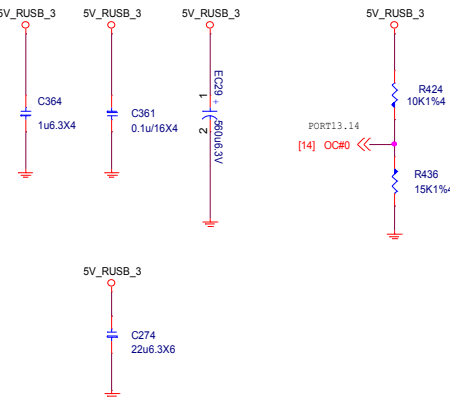
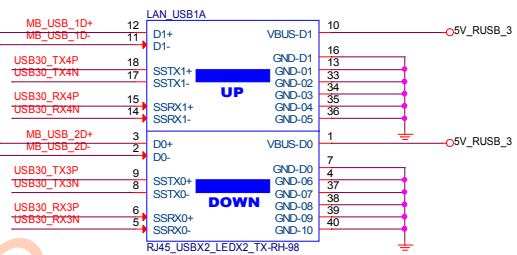
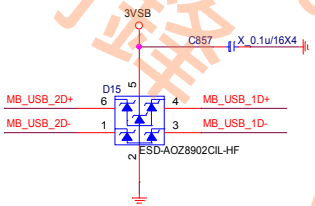
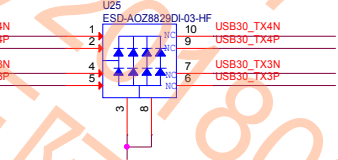
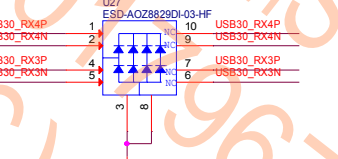
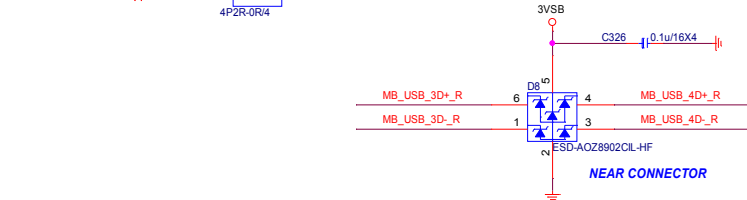
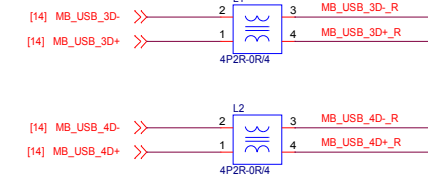
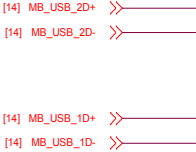



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LAN USB2.0 &3.0





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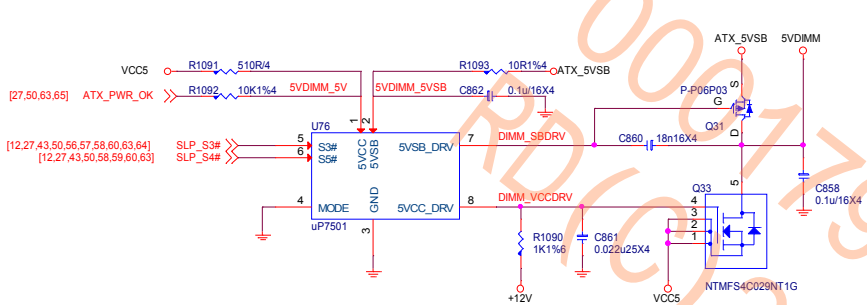
MS-7B17...

Size	Document Description	Rev
Custom	Real USB&PS2	10

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5VDIMM FOR DDR

4.8A



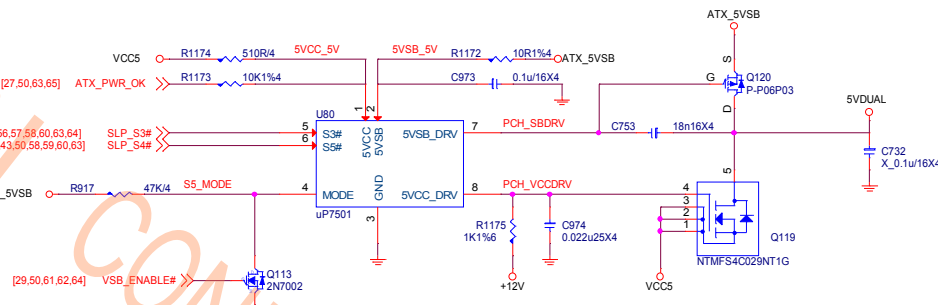
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7501 Mode
H:Support S0/S3/S5
L:Support S0/S3

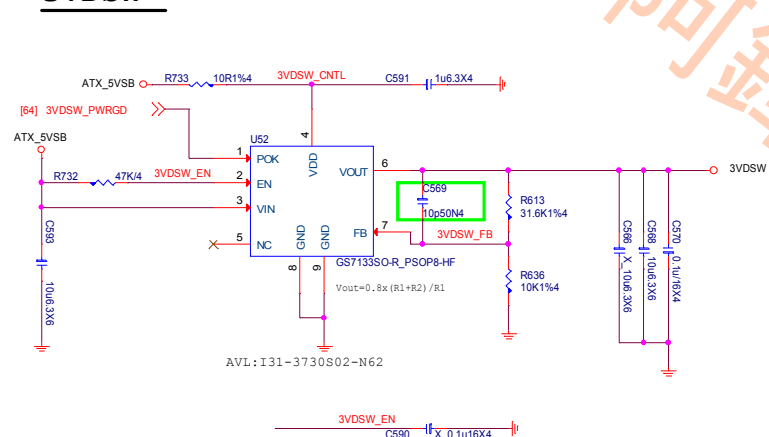
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5VDUAL

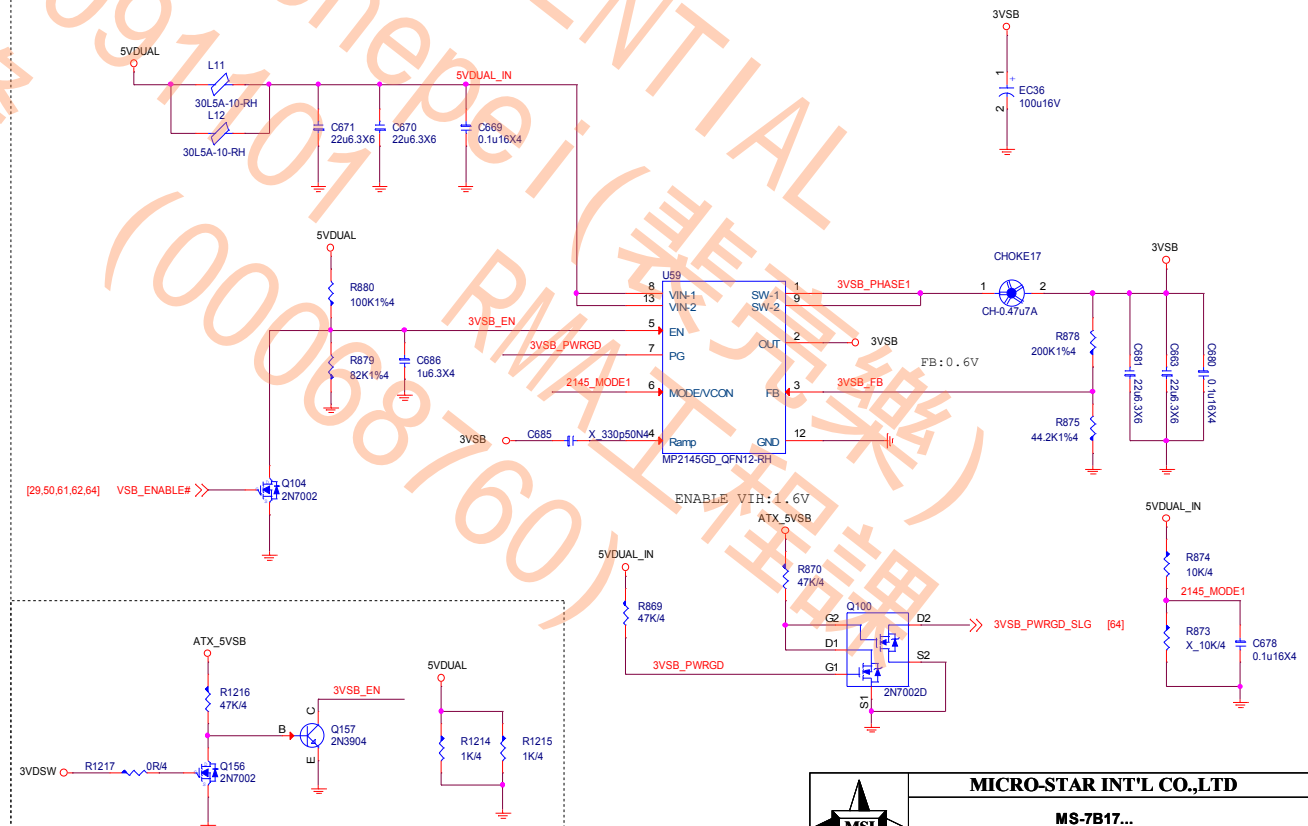
6.25A



3VDSW 0.512A



3VSB cost down 4.7A



for S5-G3 3VSB EN ISSUE



MICRO-STAR INT'L CO.,LTD

MS-7B17...

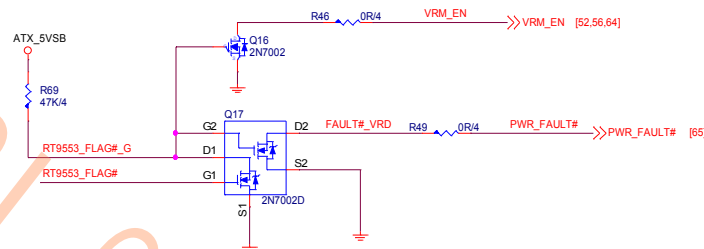
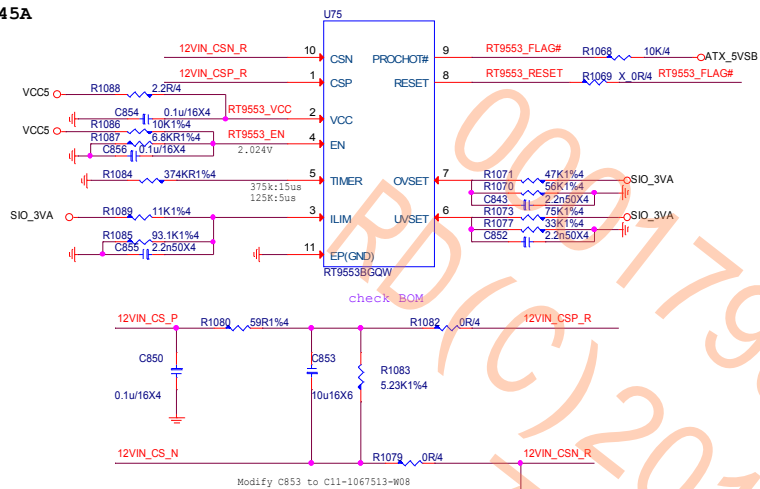
Size	Custom
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	Document Description ACPI-MPS
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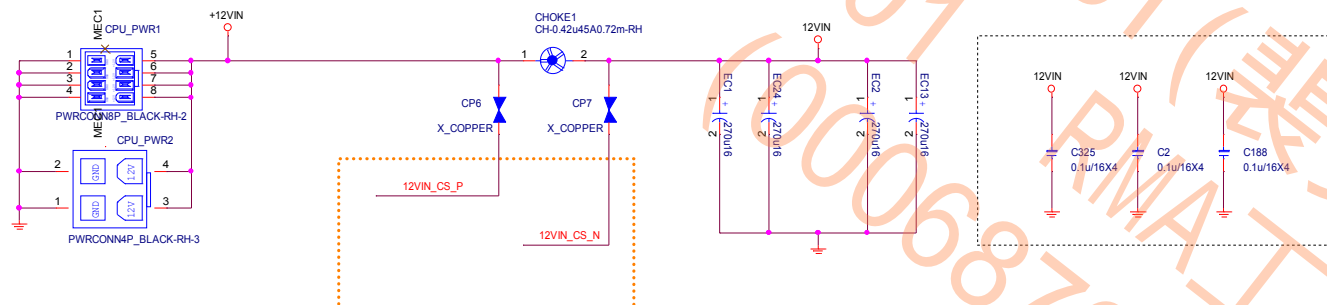
OCP:45A
Real OCP:45A



OCP: 45A
Real OCP: 45A

R17+R18>100k Vsio 3va= 3.38V Rdcr= 0.5 mohm

```
I3933_imon*[R17*R18/(R17+R18)]= Istep* Rdcr*100
I3933_imon= 10uA/step
Istep=4.968A
```

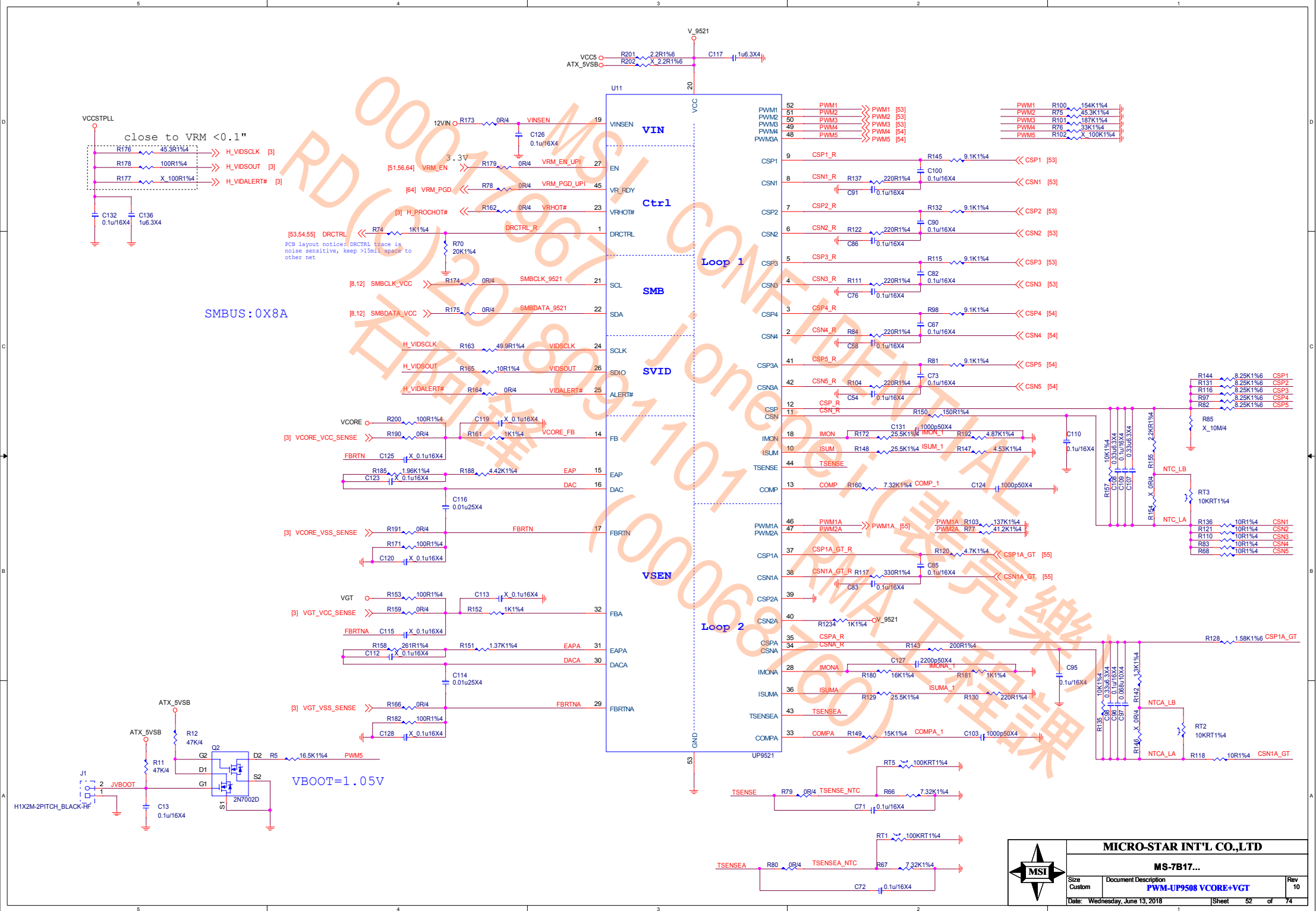


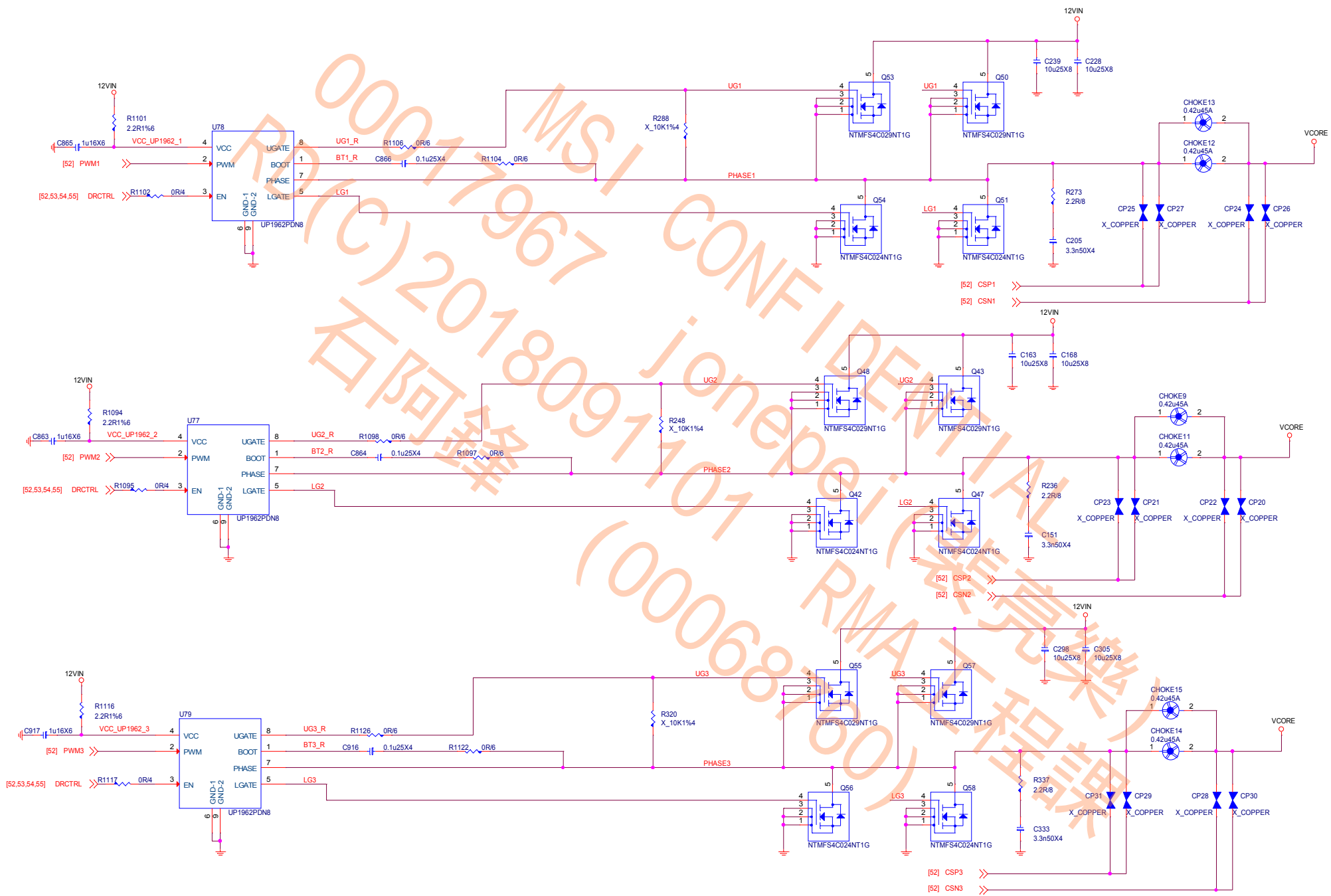
MICRO-STAR INT'L CO.,LTD

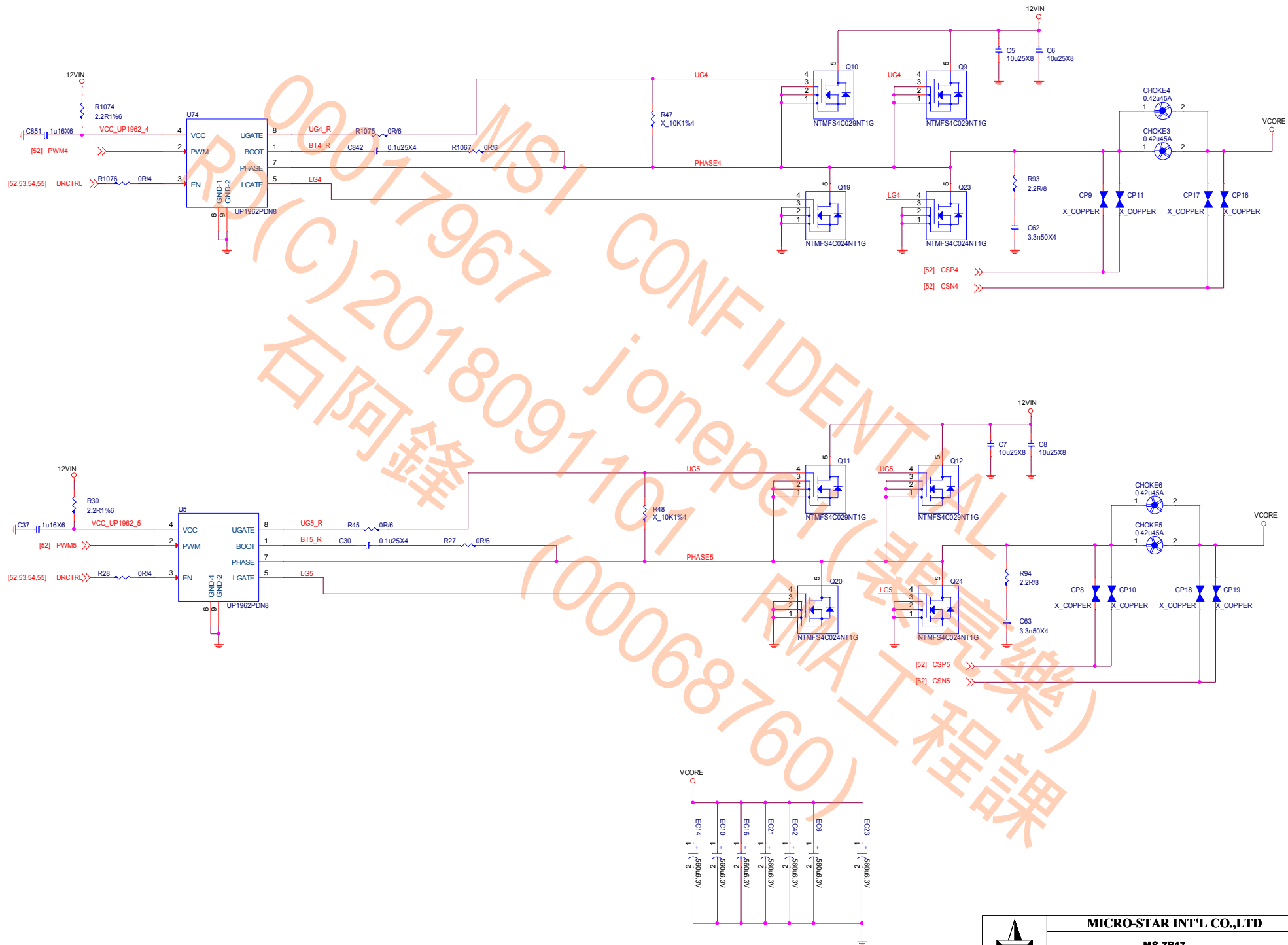
MS-7B17...

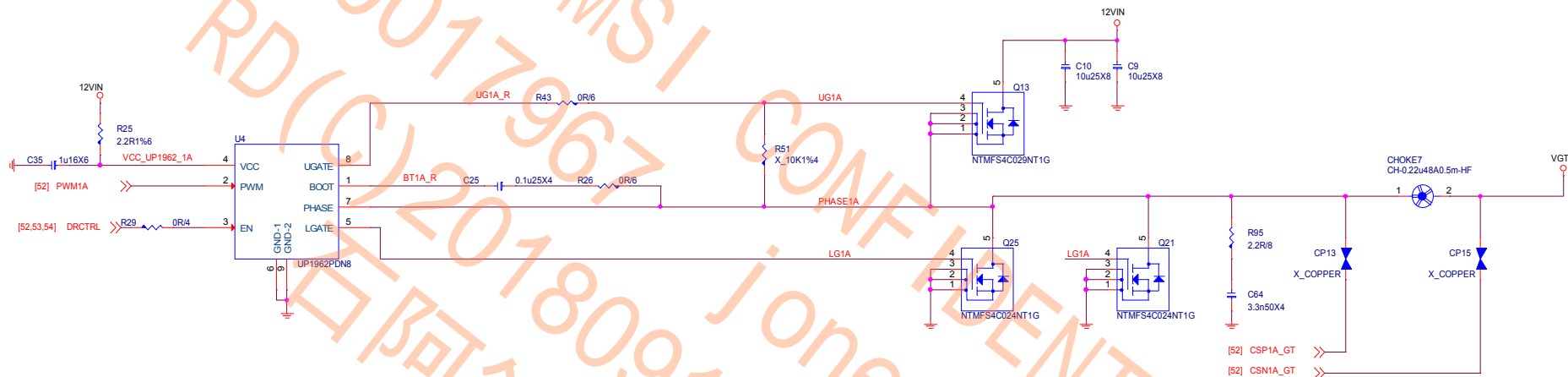
Size Custom	Document Description Rear I/O PS2	Rev 10
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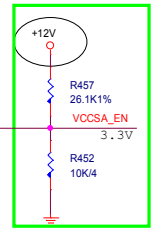


OCP:18A

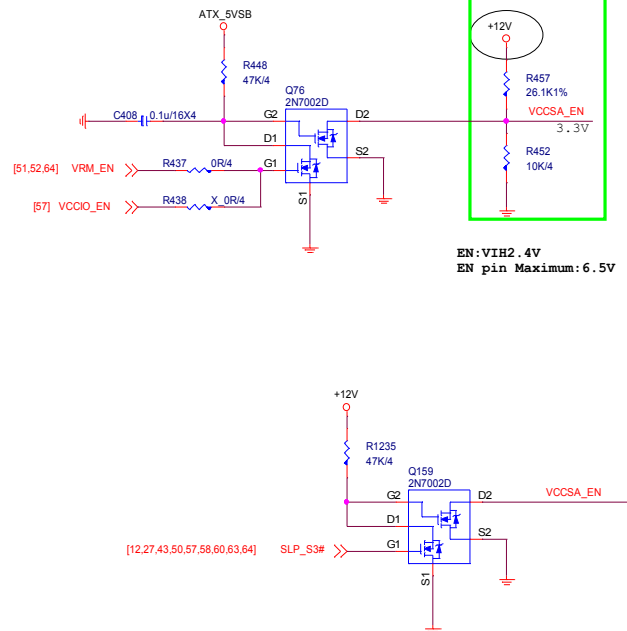
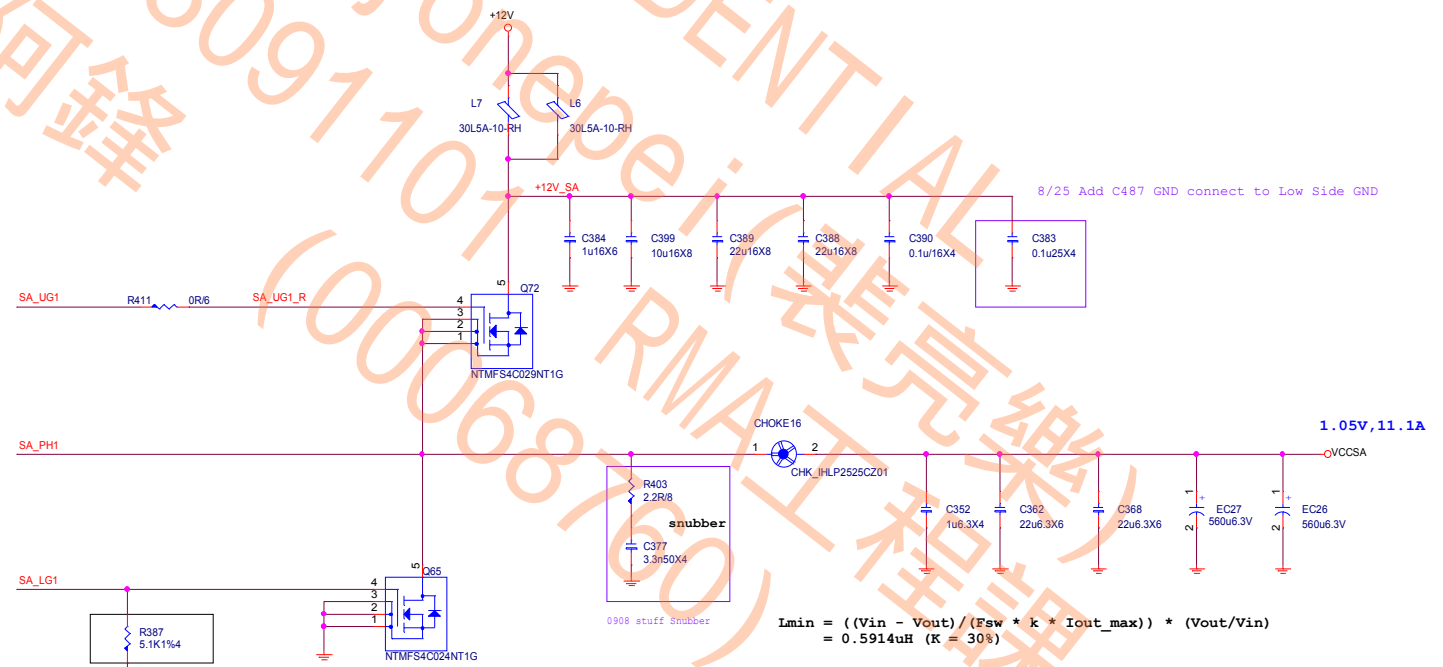
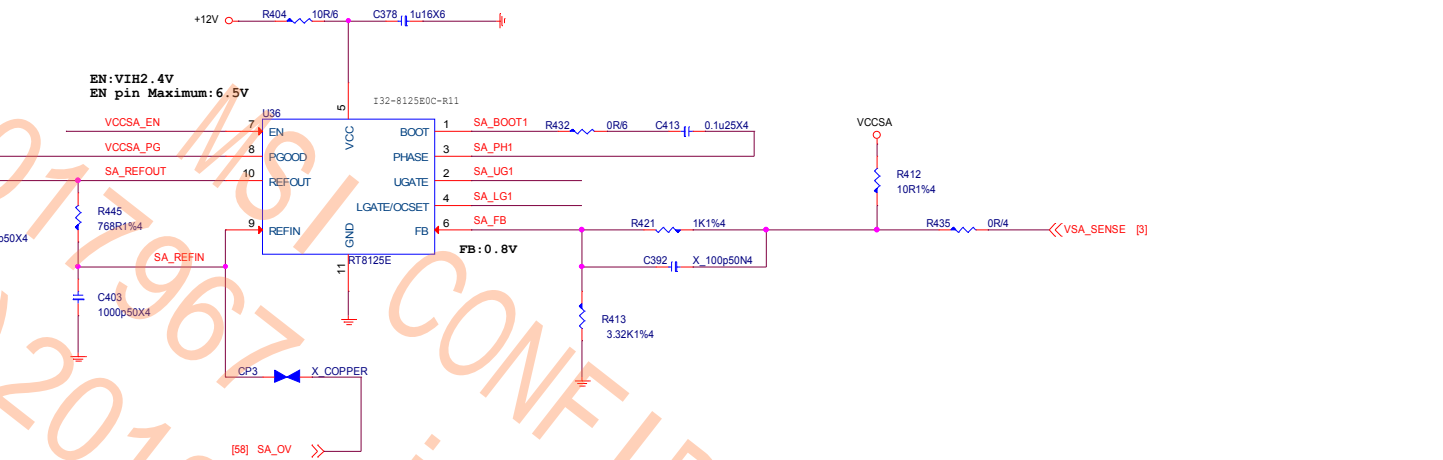
```
Rocset = 1.3 * Imax * Rdson(10V) / Iocset
        = 18.2 * 2.8mohm / 10uA
        = 5.1K
```

Rdson (low) 10V

MOS : 2.8mohm



EN:VIH2.4V
EN pin Maximum:6.5V



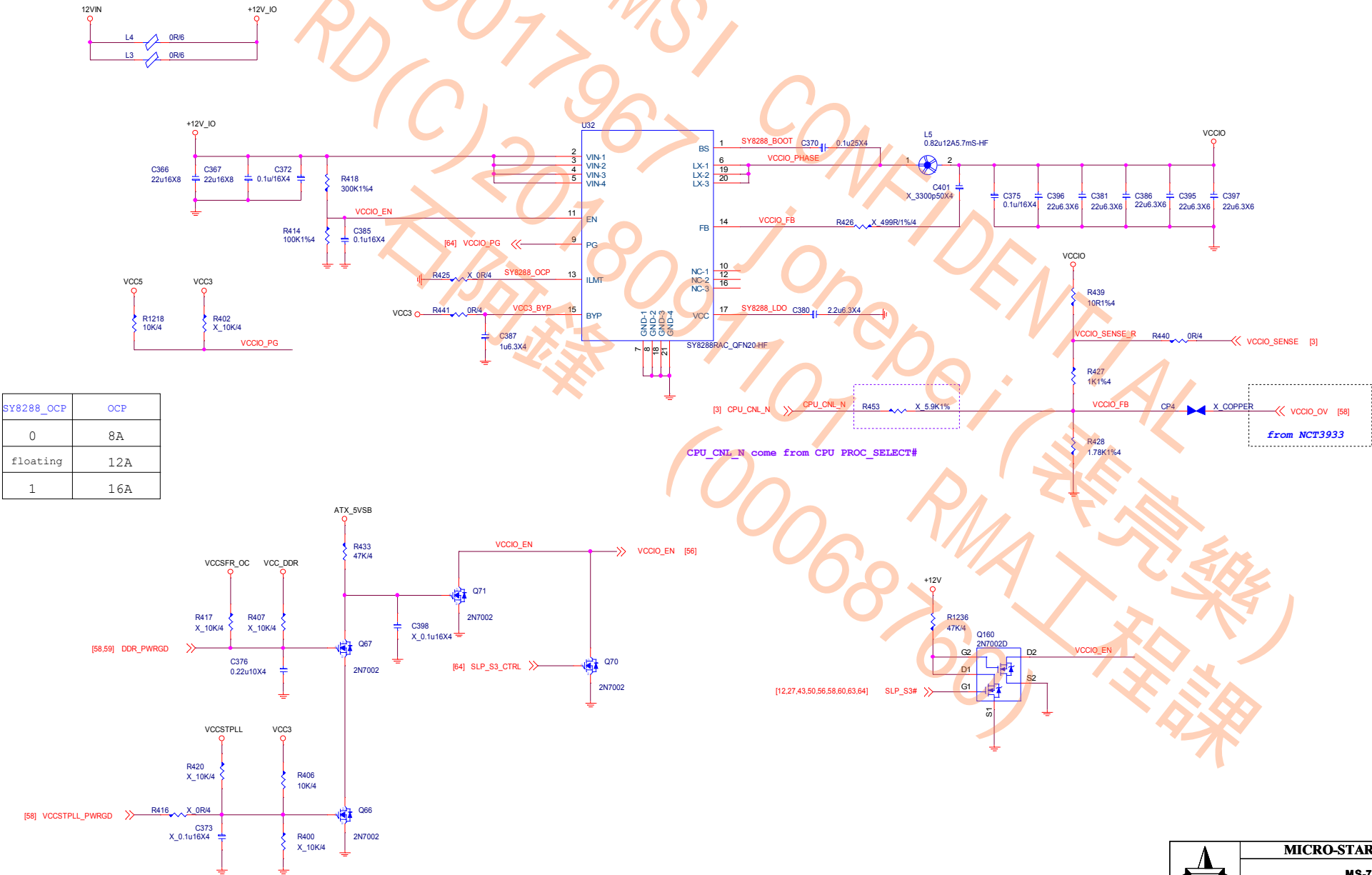
$$L_{min} = ((V_{in} - V_{out}) / (F_{sw} * k * I_{out_max})) * (V_{out} / V_{in})$$
$$= 0.5914 \mu H \quad (K = 30\%)$$



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Size Custom	Document Description CPU PWR-VCCSA-PV3205Q	Rev 10
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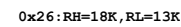
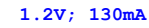


SY8288_OCP	OCP
0	8A
floating	12A
1	16A

1.05V; 230mA



0x20:RH=10K,RL=OPEN



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Size Custom	Document Description CPU PWR-VCCST/PLL	Rev 10
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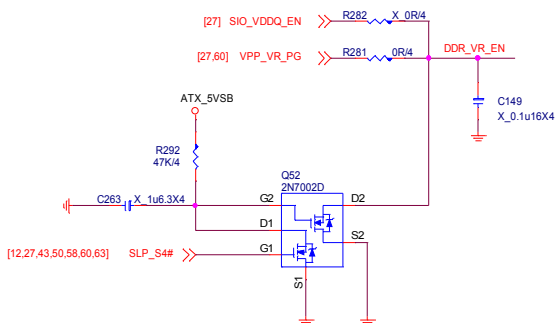
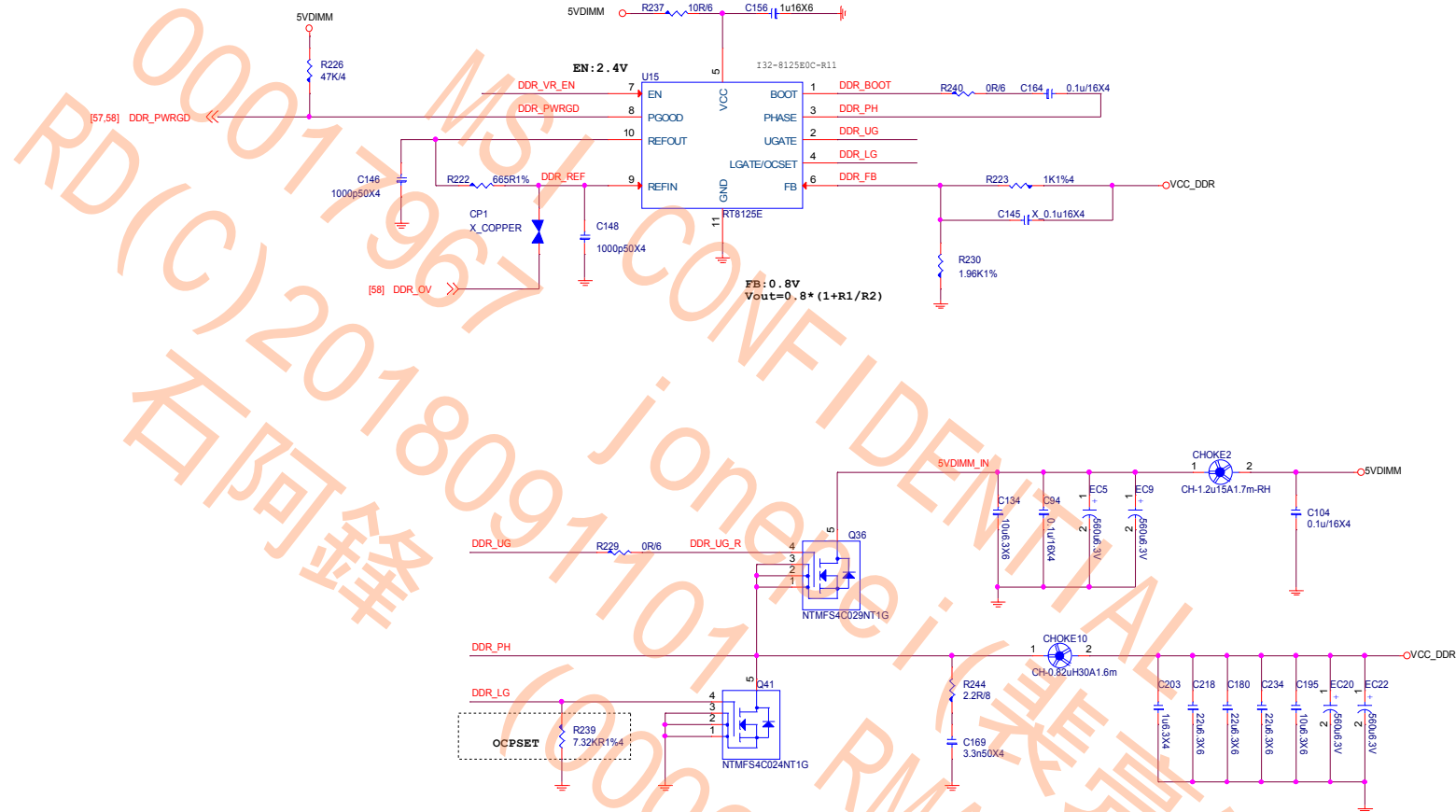
DDR4 Power:1.2V,19.8A OCP:28A

3.3A FOR CPU

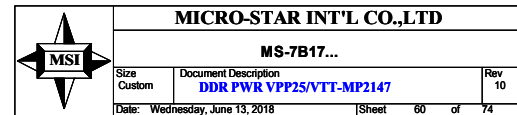
15.7A FOR 4DIMM

0.7A FOR DDR VTT

$$\begin{aligned} \text{Rocset} &= 1.3 * \text{Imax} * \text{Rdson(1ow)} / \text{Iocset} \\ &= 26 * 4\text{mohm} / 10\text{uA} \\ &= 10.3\text{K} \end{aligned}$$



OCP:7.5A

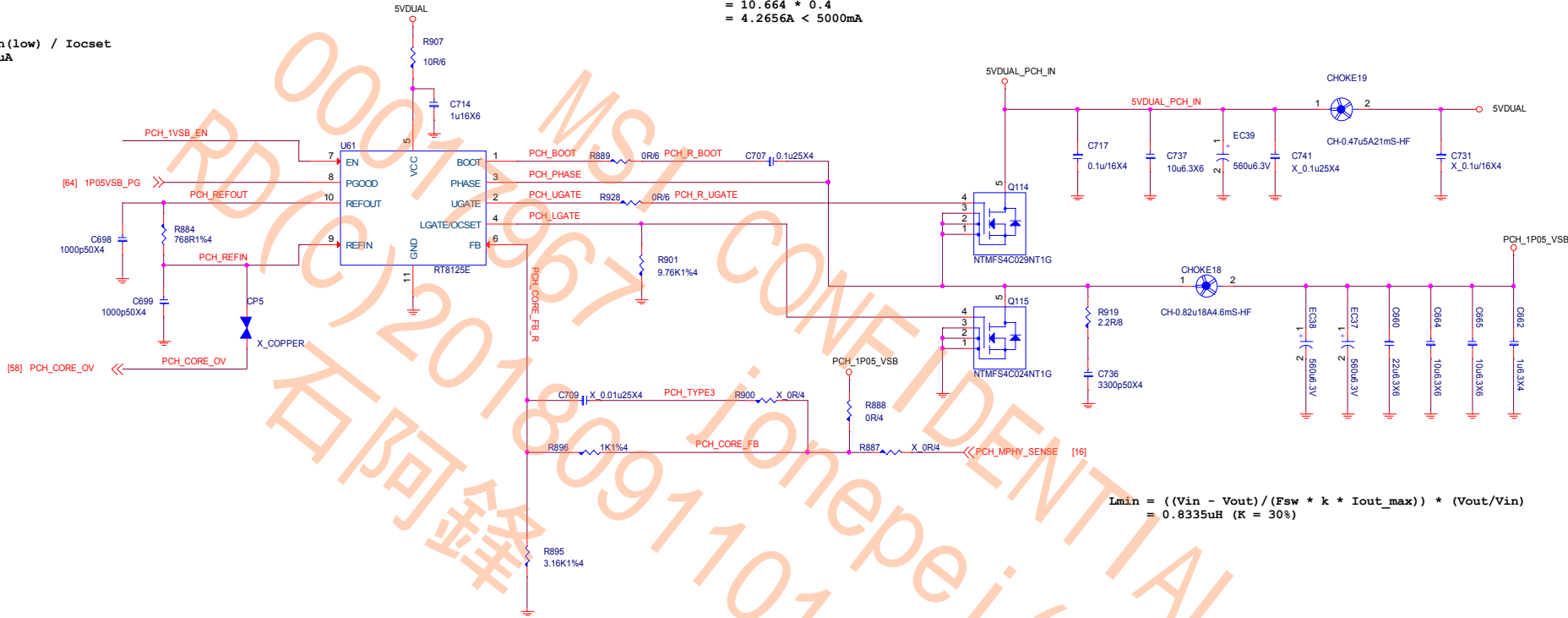


PCH_1VSB Power:1.05V,14A

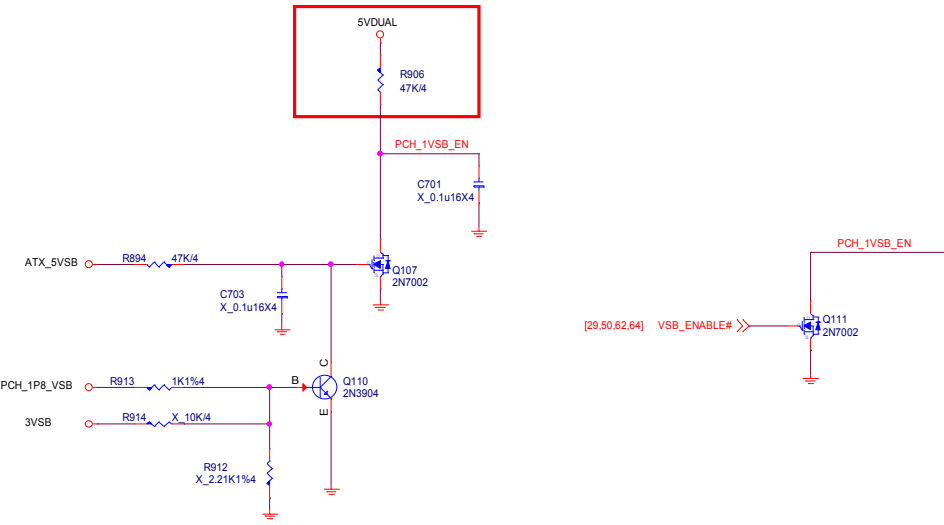
OCP = 18.2A

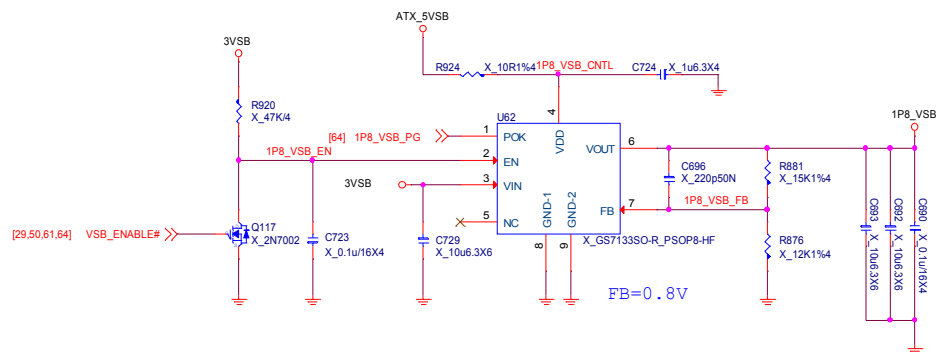
Rocset = 1.3 * I_{max} * R_{dson}(low) / I_{ocset}
= 18.2 * 4mohm / 10uA
= 7.28K

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



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



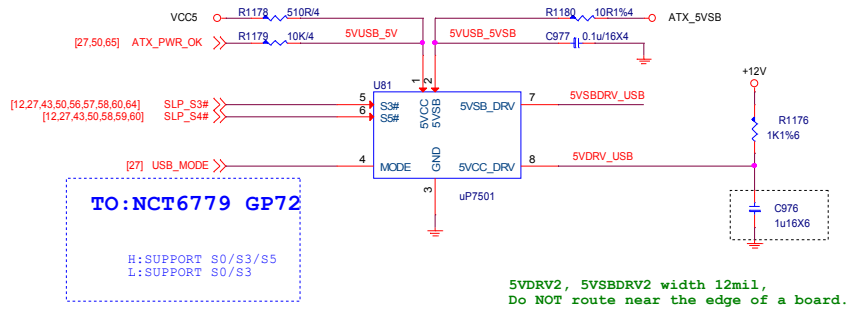


MICRO-STAR INT'L CO.,LTD

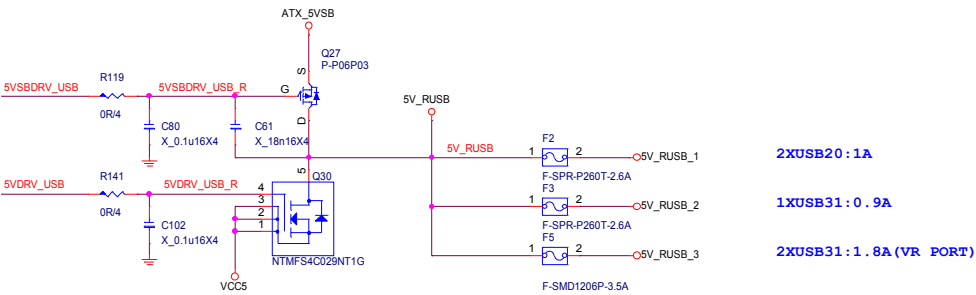
MS-7B17...

Size Custom	Document Description USB Power	Rev 10
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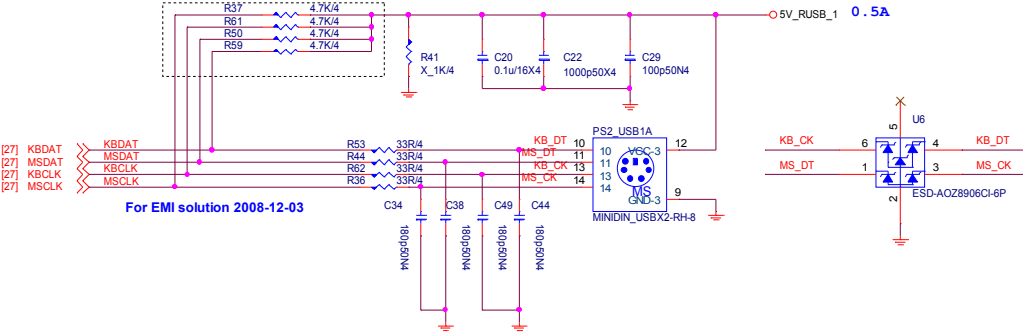
USB POWER



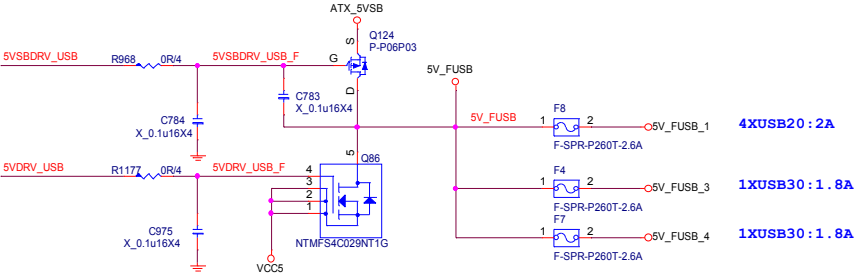
REAR USB PORT POWER

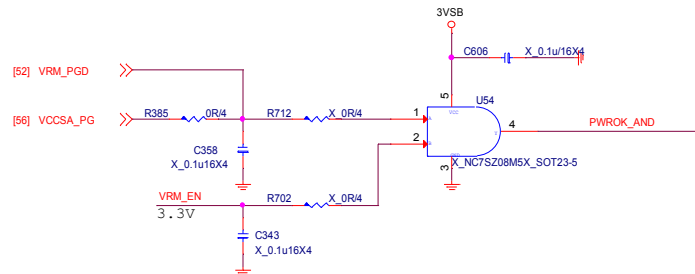
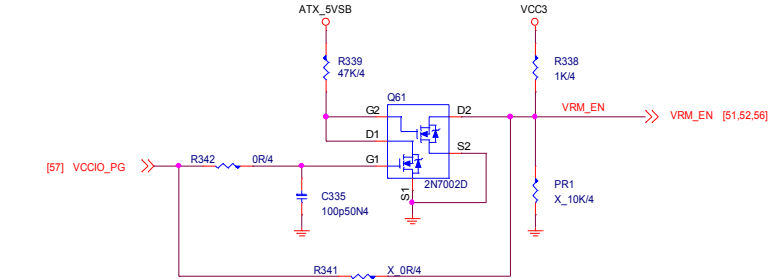


PS2 KEYBOARD & MOUSE CONNECTOR

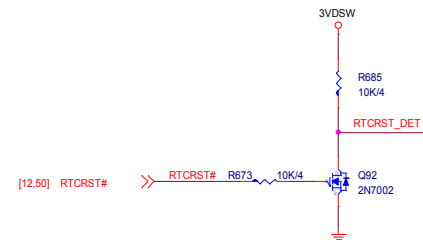
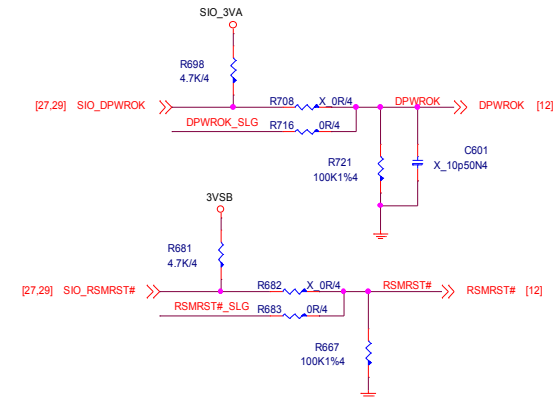
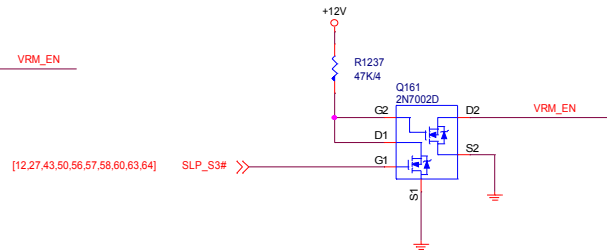
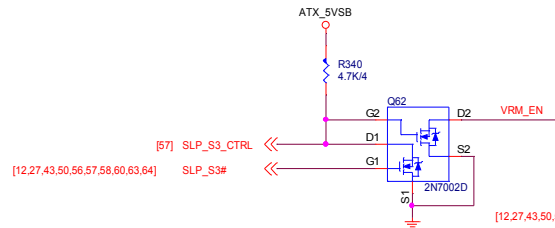


FRONT USB PORT POWER



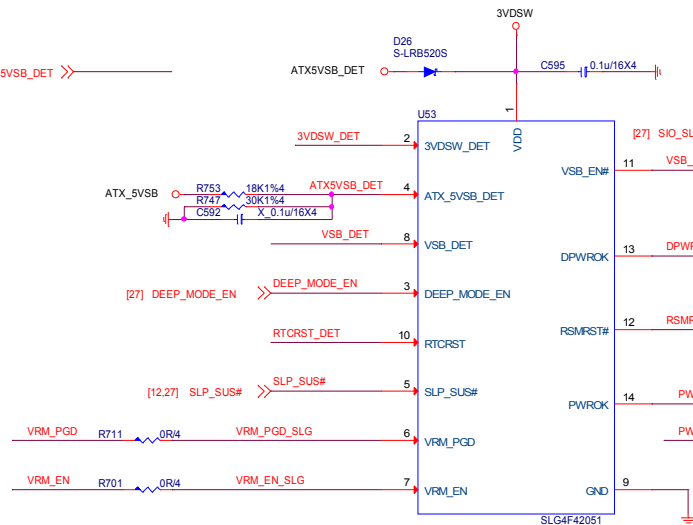
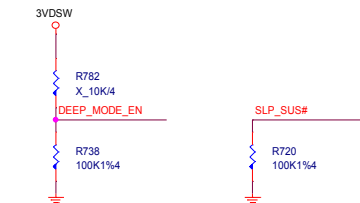


3.3V

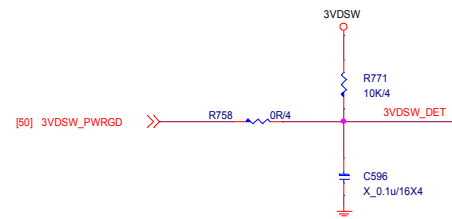


[29] ATX5VSB_DET

	DEEP_MODE_EN
DEEP_MODE	1
S5_MODE	0

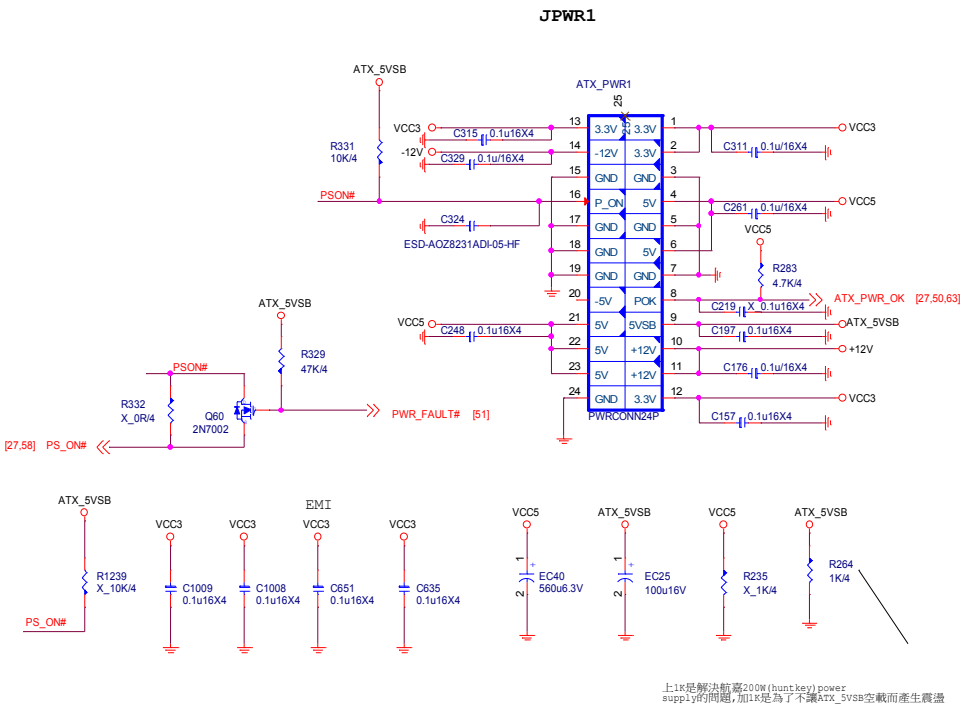


VSB_DET:2250mV

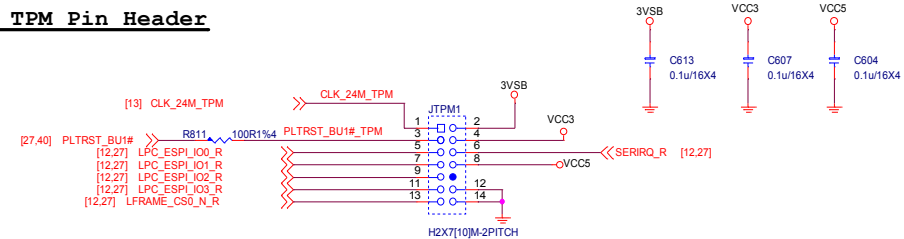


MICRO-STAR INT'L CO.,LTD			
MS-7B17...			
Size	Document Description	Rev	
Custom	CPU PWR-VRM-Sequence	10	
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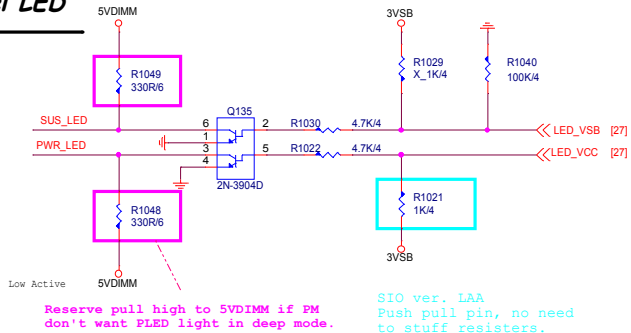
ATX POWER CONNECTOR



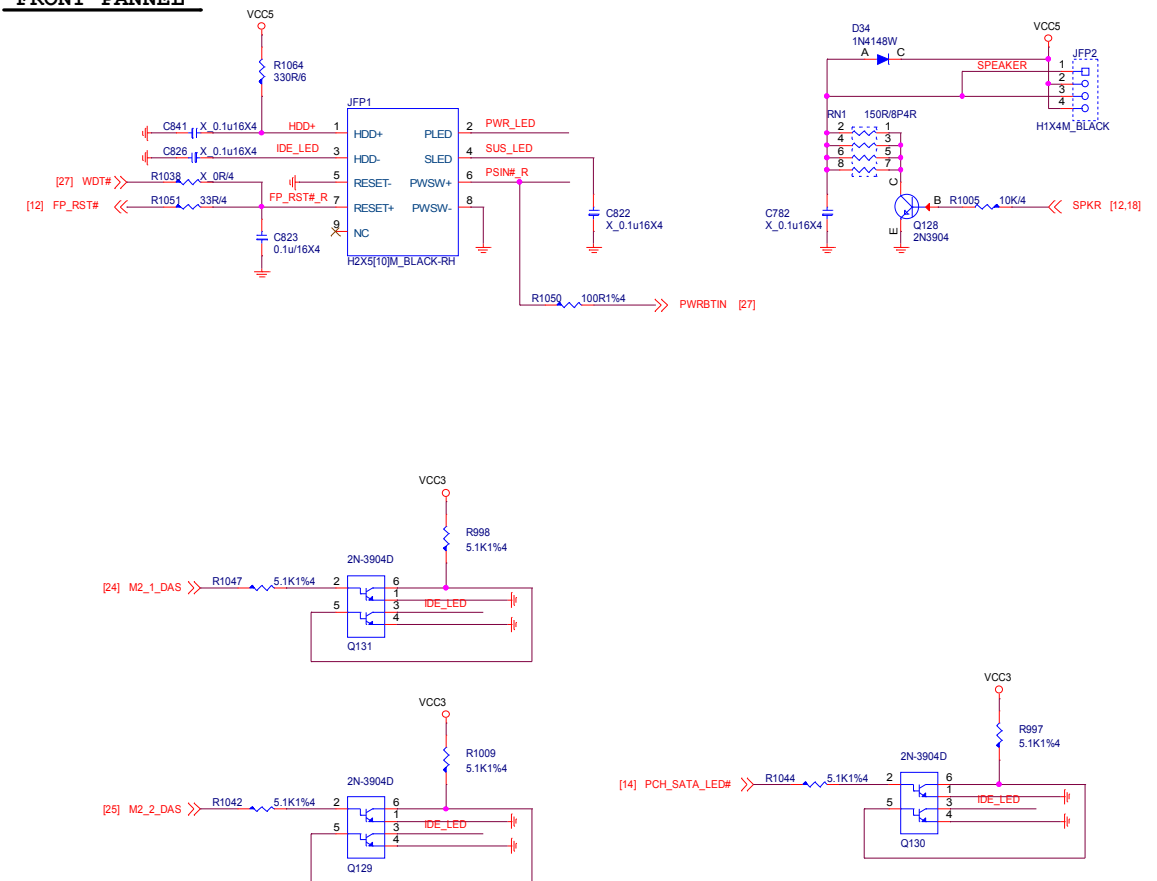
TPM Pin Header



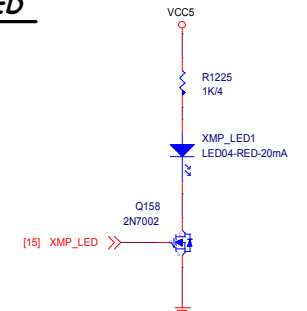
Front Panel LED



FRONT PANNEL



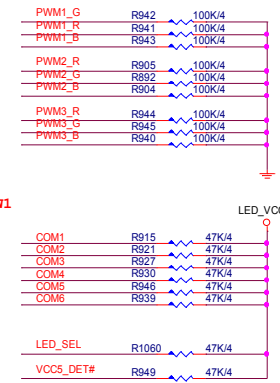
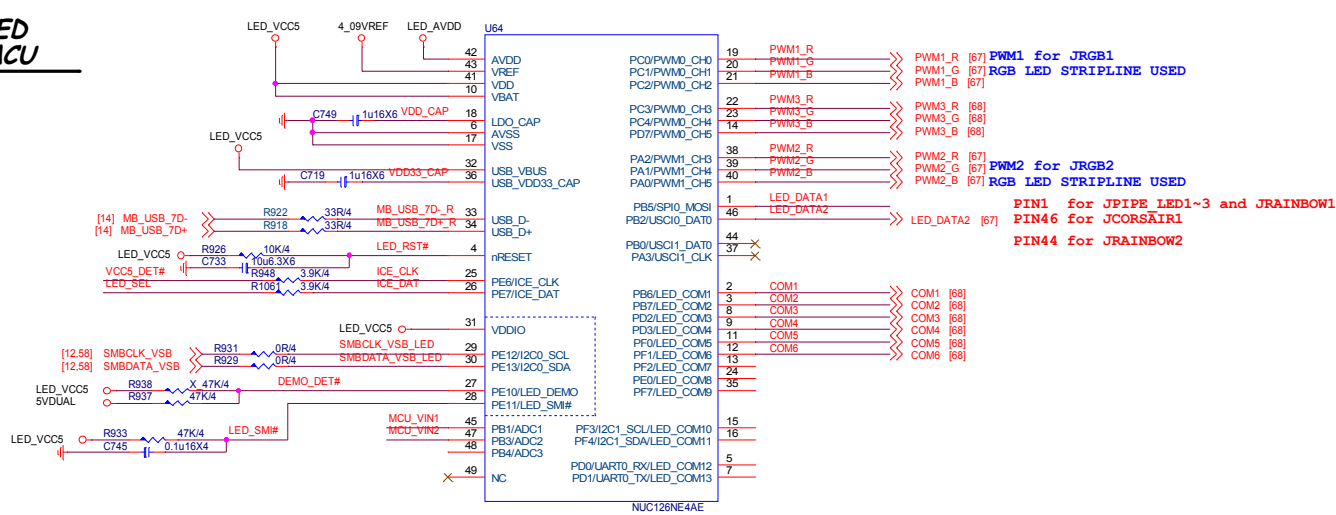
XMP LED



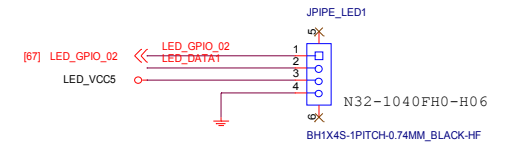
MICRO-STAR INT'L CO.,LTD

MS-7B17...

Size	Document Description	Rev
Custom	ATX Connector/F_Panel	10
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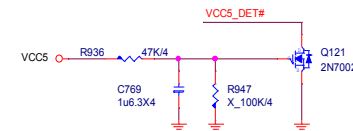
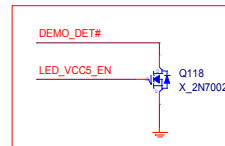
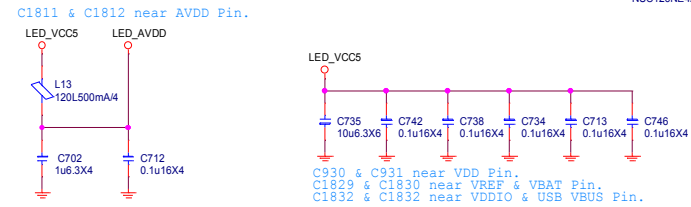
ED
ICU

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

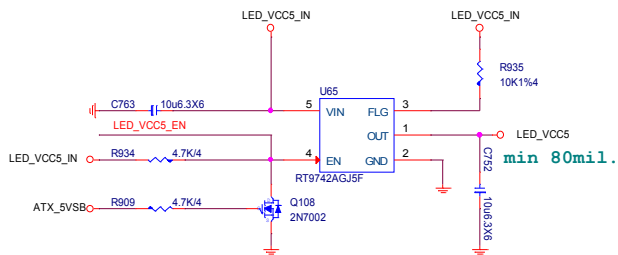


```
JPIPE:PIN1:output ,PIN2:input
```

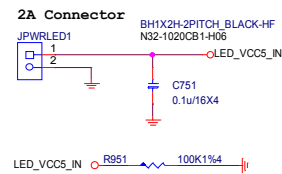
```
PIN2:MCU IN
PIN1:HEATSINK OUT
```



EXTERNAL POWER INPUT

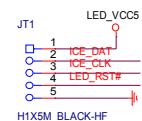


3 A

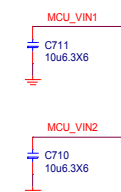
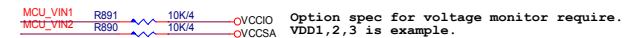
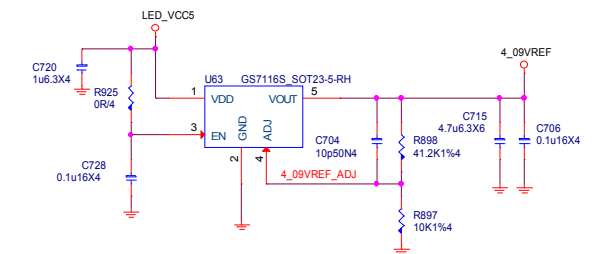


JT1 for FW update

For FW update.

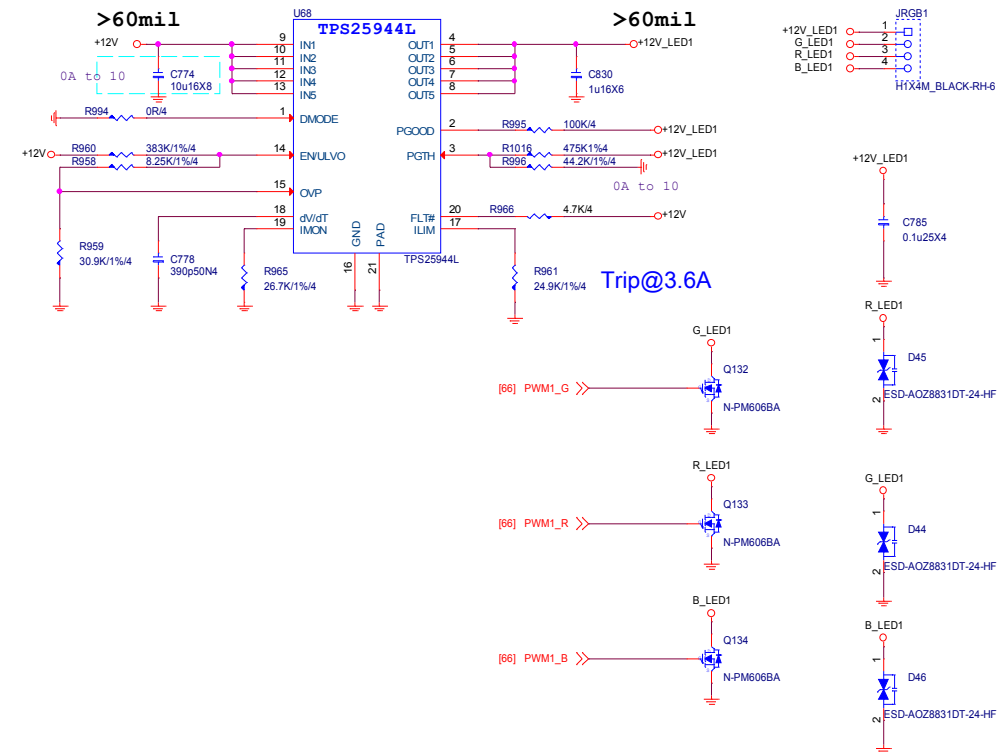


Voltage HW monitor

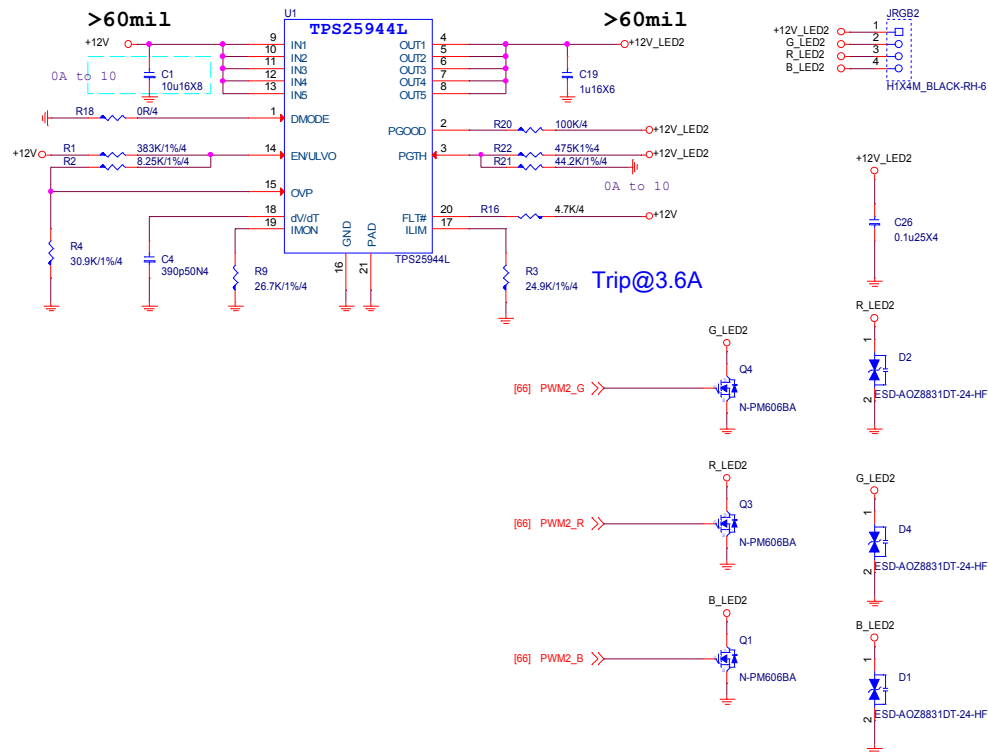


MICRO-STAR INT'L CO.,LTD			
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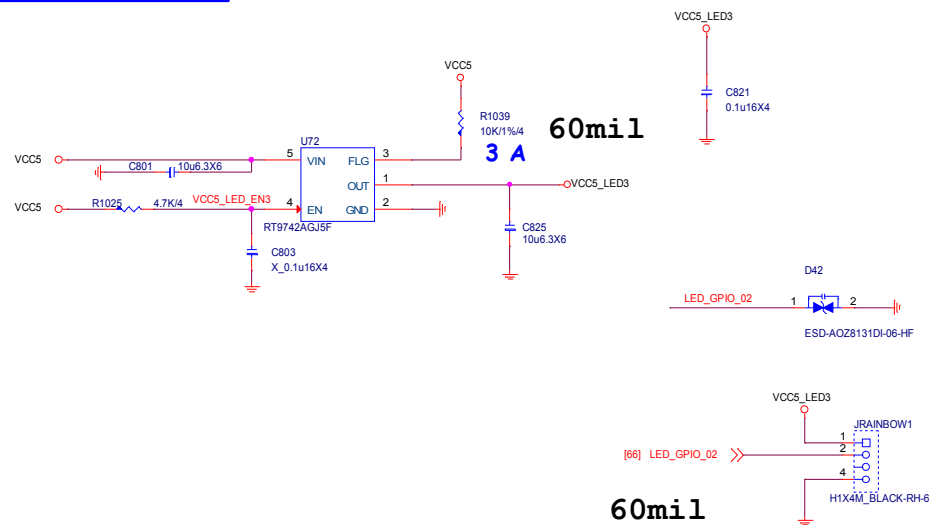
JRGB1



JRGB2



LED STRIPLINE JRAINBOW1



JCORSAIR1

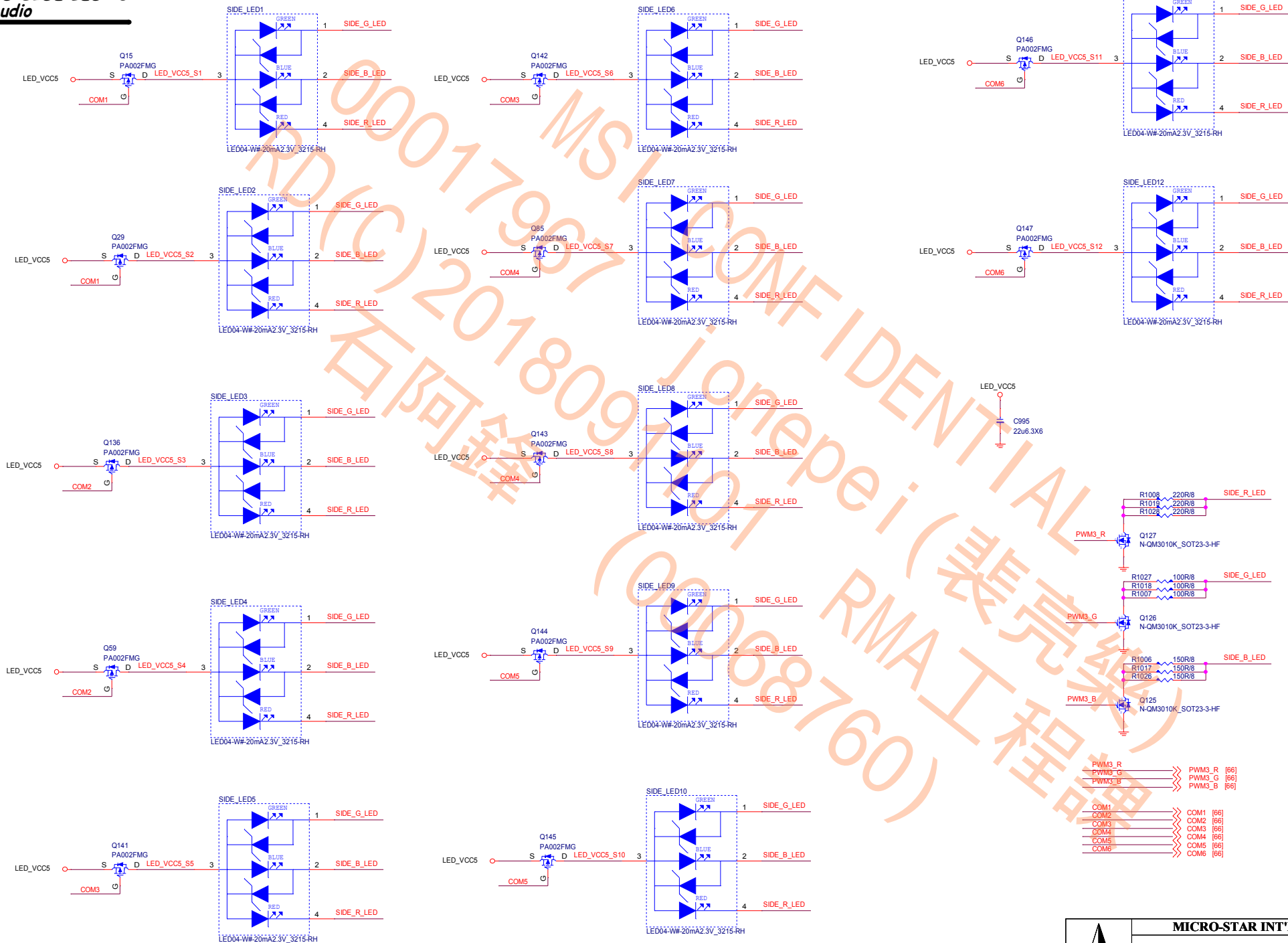


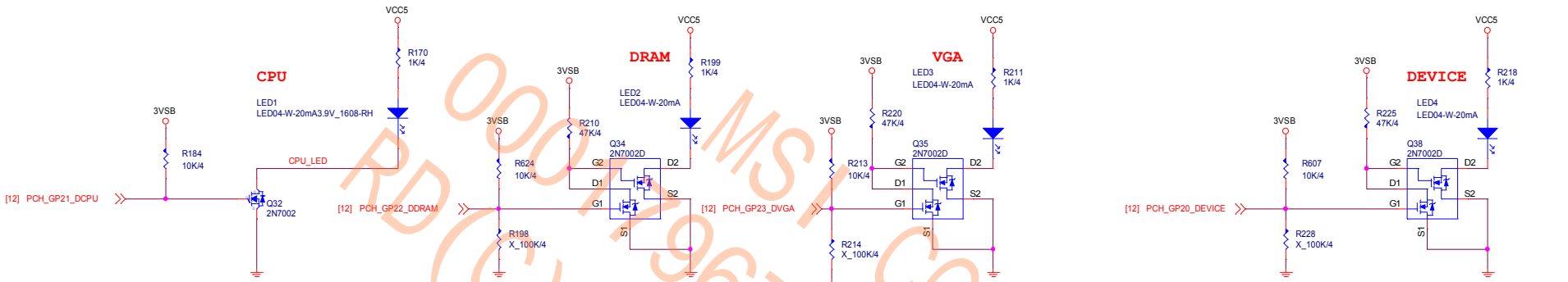
MICRO-STAR INT'L CO.,LTD

MS-7B17...

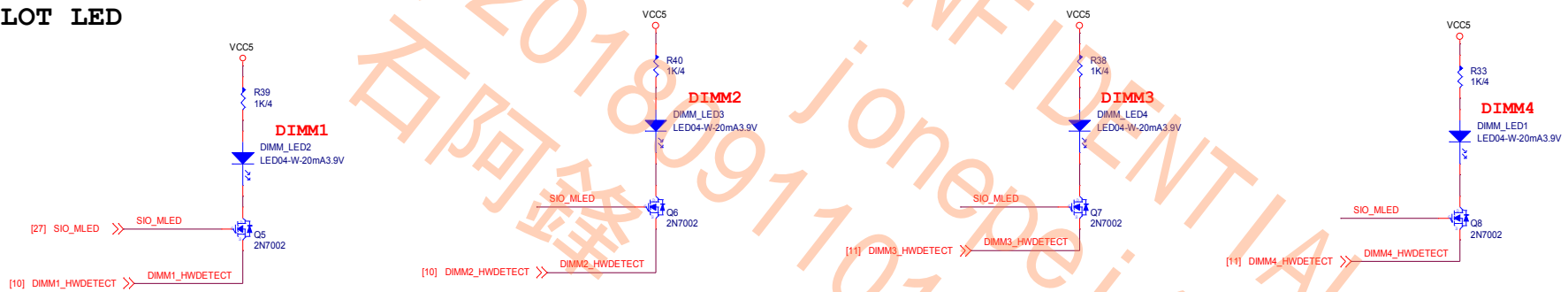
Size	Document Description	Rev
Custom	EMI CAP	10
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BOARD SIDE LED *8 for Audio





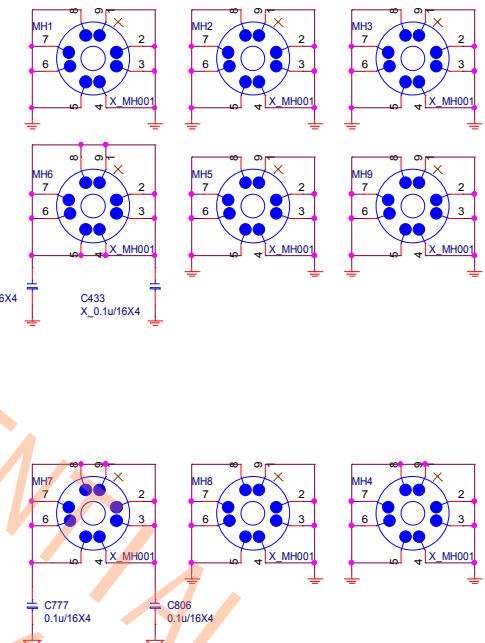
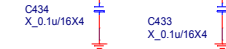
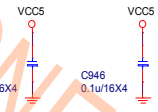
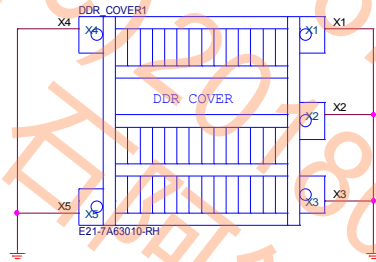
DIMM SLOT LED



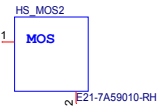
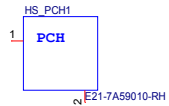
SLOT LED



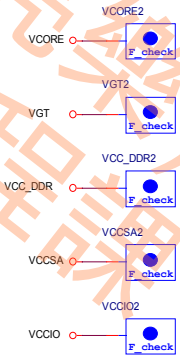
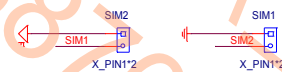
PD0-07B1710-G37, 精成-深圳, 22, 寶安恩斯邁廠 (MSIS)
PD0-07B1710-E48, 競華, 22, 寶安恩斯邁廠 (MSIS)



HEATSINK



Simulation



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

Optical Fiducial Marks-120

