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MS-7B18

CFL Platform

ATX

Ver: 1.1

CPU:

Coffee lake S

System Chipset:

Z390 PCH_H

Onboard Chip:

HD Audio Codec:ALC892

LAN-Intel I219

LAN-Intel I211

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 (X4) Slot * 2*

*PCI Express (X1) Slot * 2*

*M2 (X4) Slot * 2*

*CNVI Slot * 1*

Other:

*SATA3.0 *6*

*USB2.0 *6*

*REAL USB3.1 Gen2 *3+TYPEC*1*

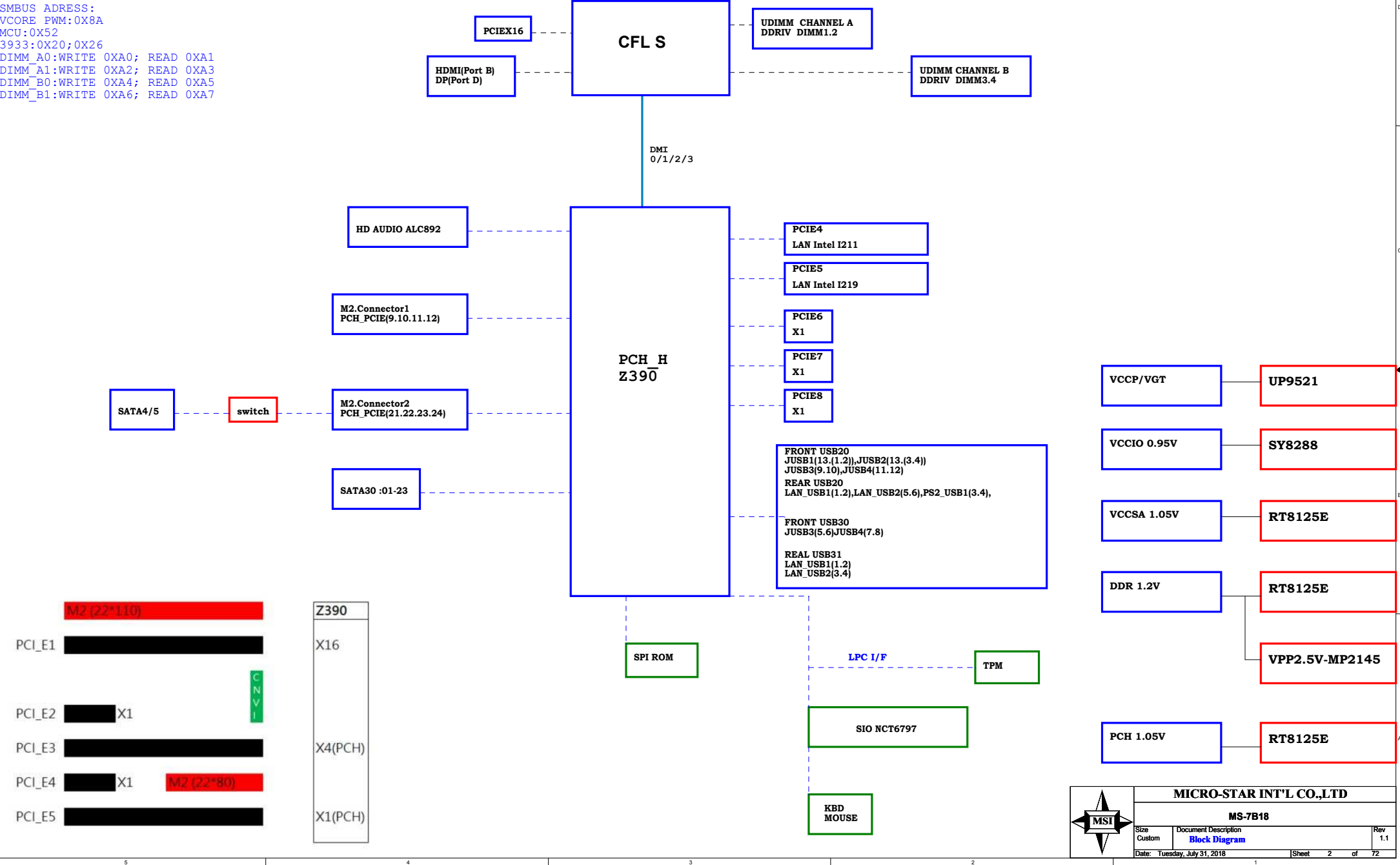
*FRONT USB3.1 Gen1 *4*

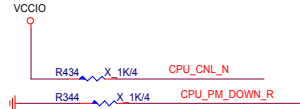
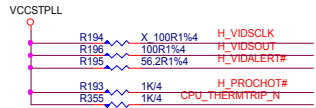


MICRO-STAR INT'L CO.,LTD		
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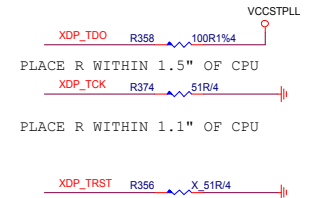
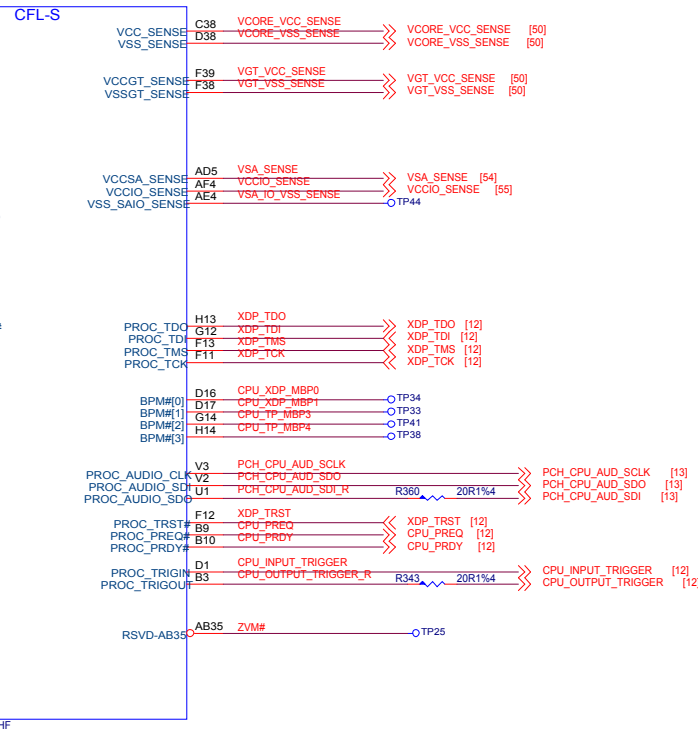
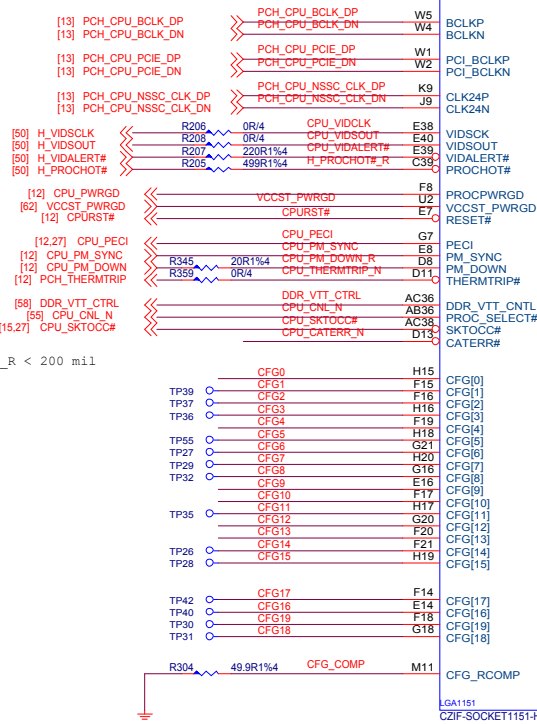
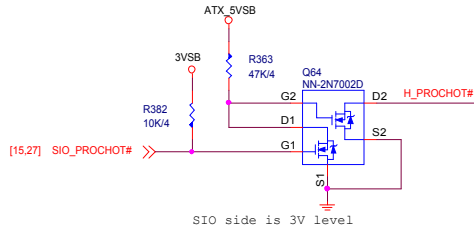
MS-7B18 Block Diagram

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





2018/05/09 Eric mail



CFG Strap

CFG Table

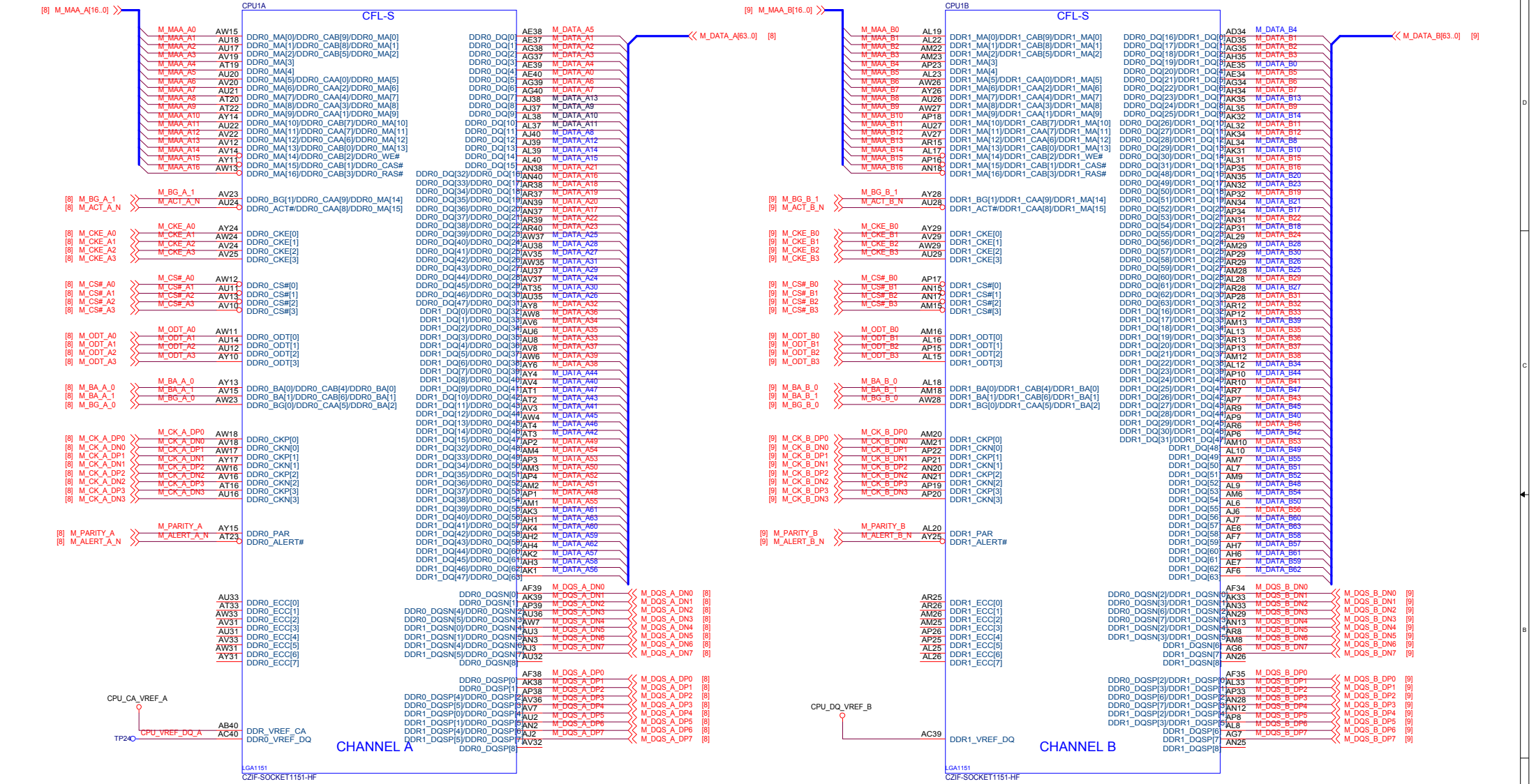
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0	NORM	STALL	EAR
1	NORM	PCHLESS	PCHLESS MODE
2	NORM	REVERSE	PEG LANE REVERSAL
3	ENABLE	DISABLE	DEBUG
4	DISABLE	ENABLE	DP PRESENCE
5	DISABLE	ENABLE	PEG0CFGSEL[0]
6	DISABLE	ENABLE	PEG0CFGSEL[1]
7	RESET#	SIO5 FREQ	PEG DRIVER TRAINING
8	DISABLE	ENABLE	CFG UNLOCK
9	PRESENT	NO PRESENT	SVID NOT PRESENT
10	ACTIVATE	NO ACTIVATE	SAFE MODE BOOT
11	DC COUPLED	AC COUPLED	DMT AC
12	SPT	NOT SPT	PCH TYPE
13	SVID	FIXED	VCCSA SVID
14	RSVD		
15	RSVD		

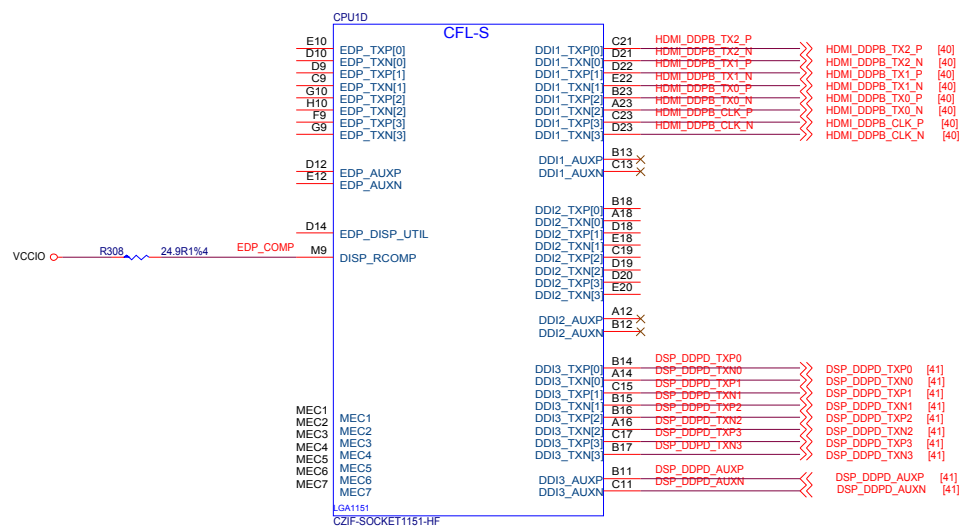
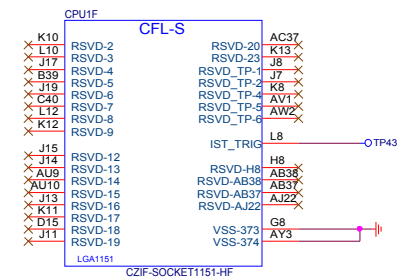
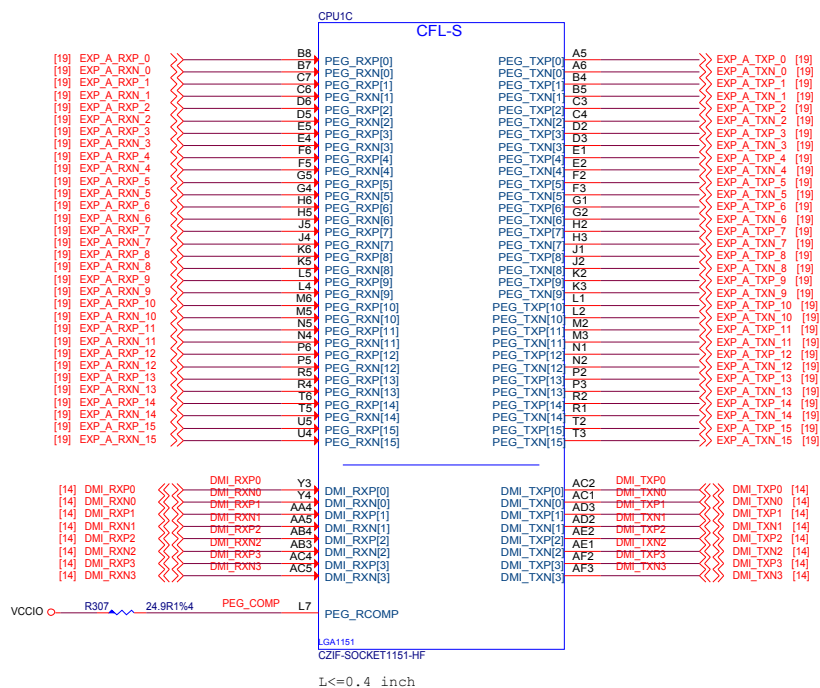


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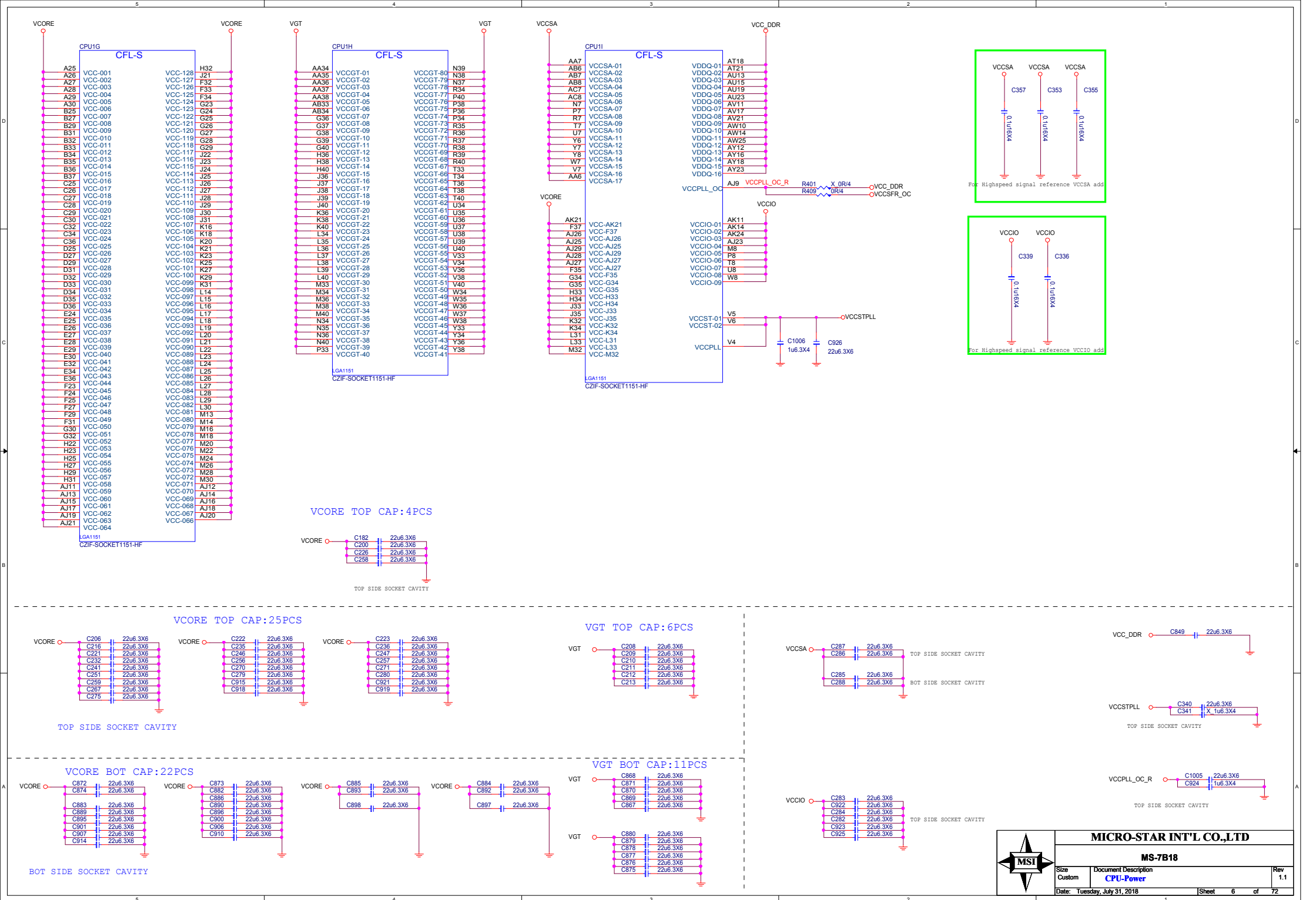


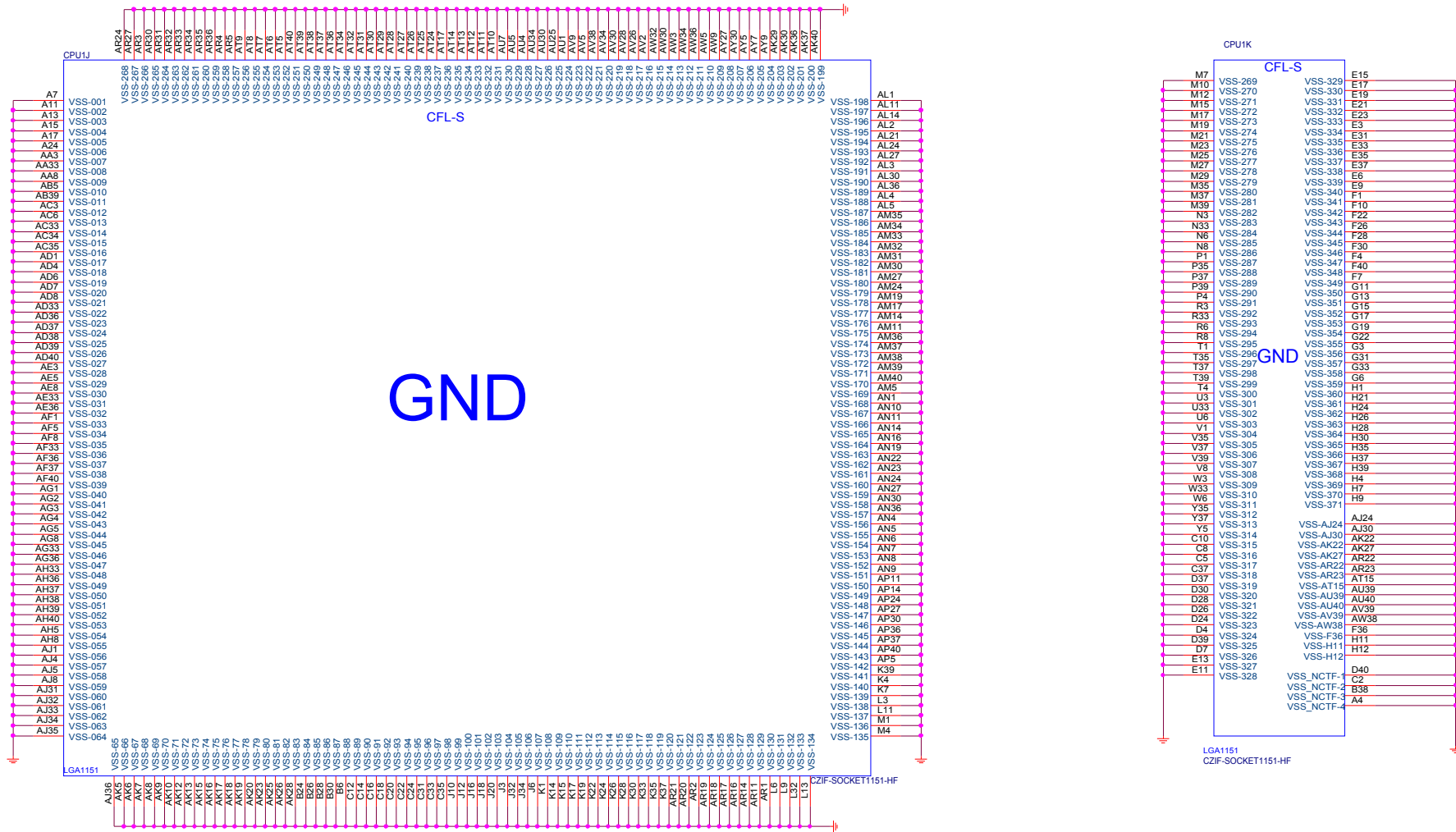


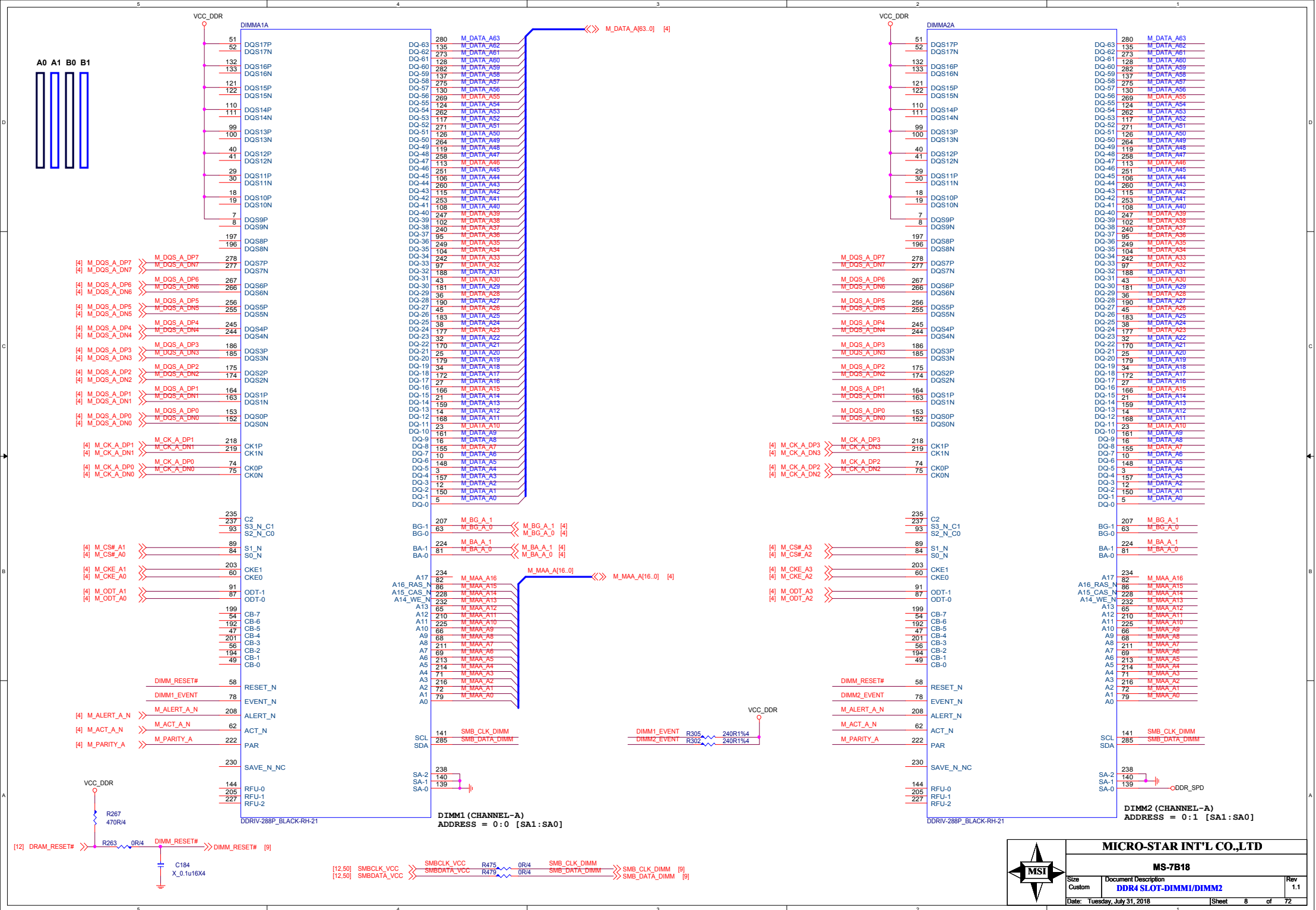
MICRO-STAR INT'L CO.,LTD

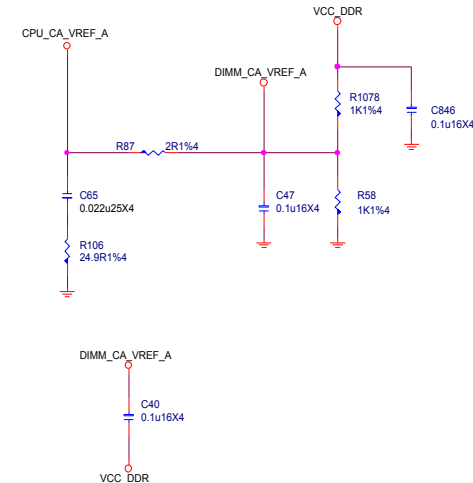
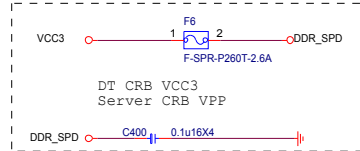
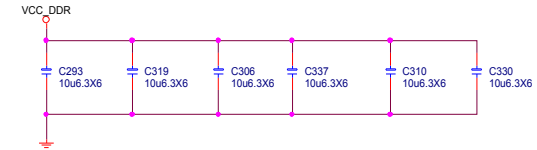
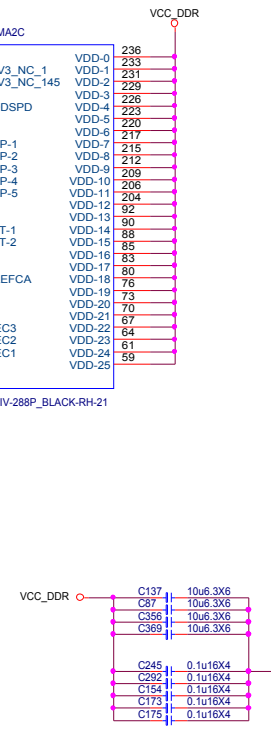
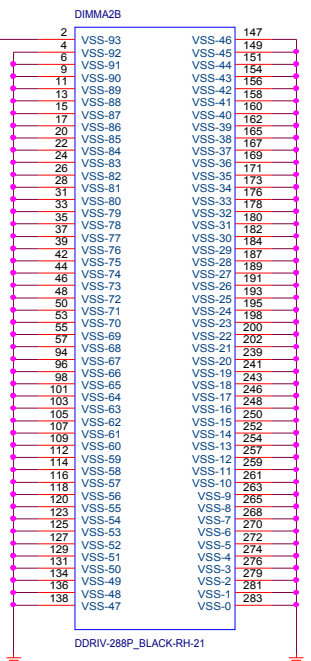
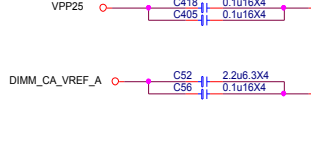
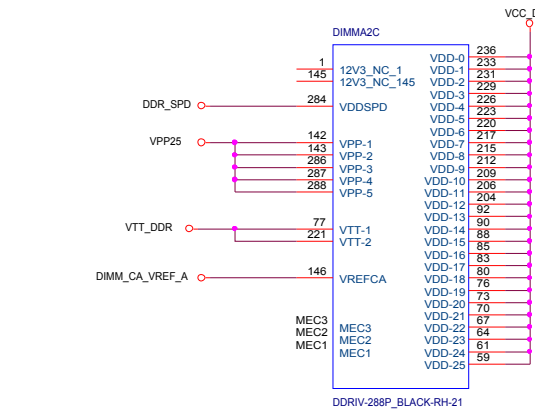
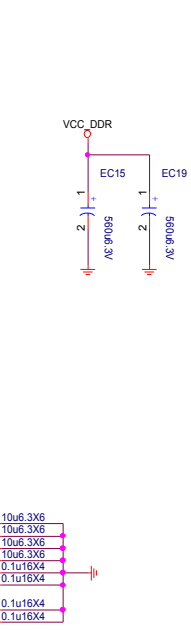
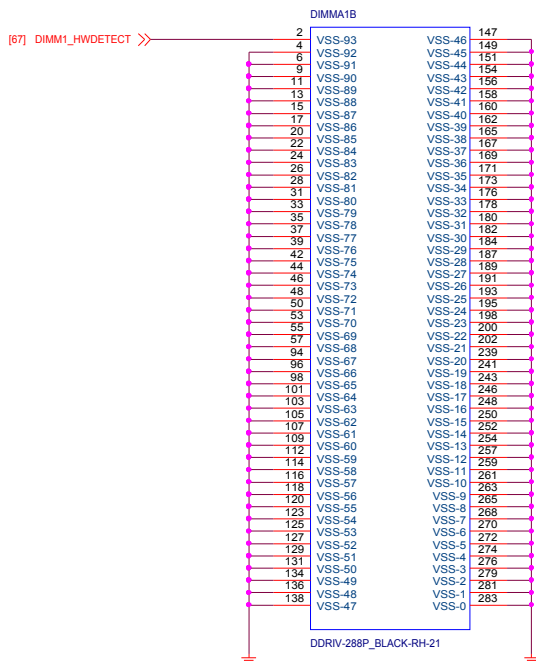
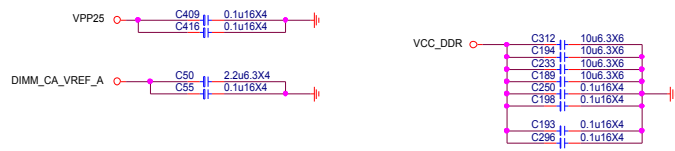
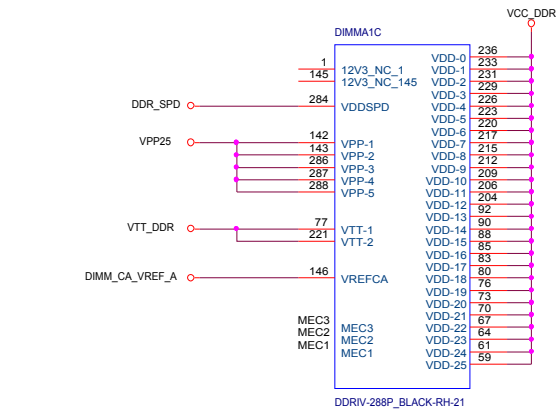
MS-7B18

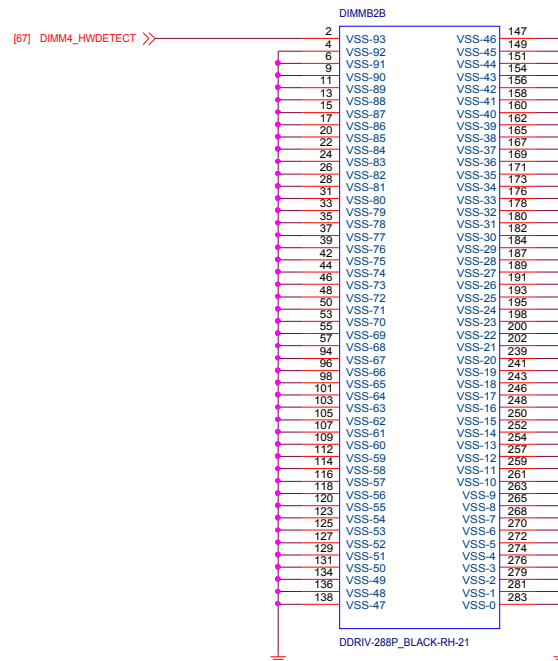
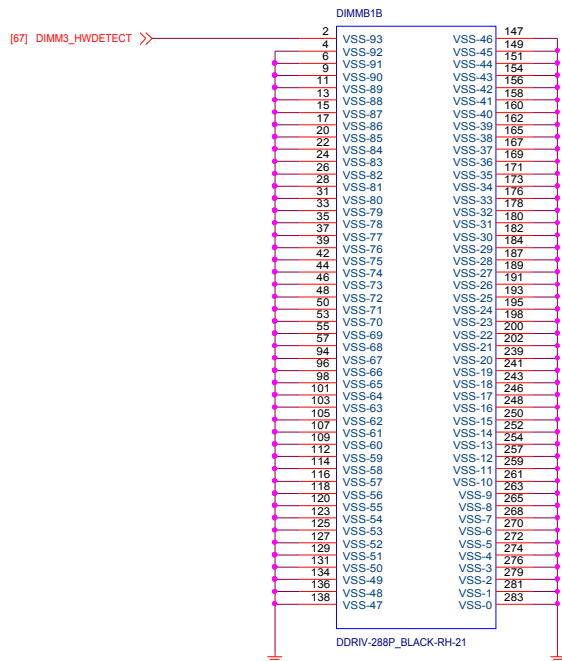
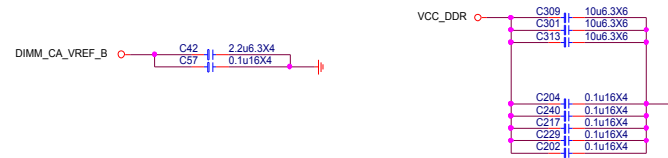
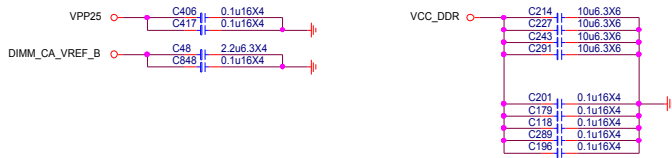
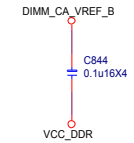
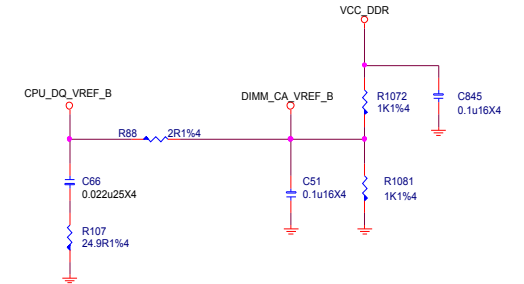
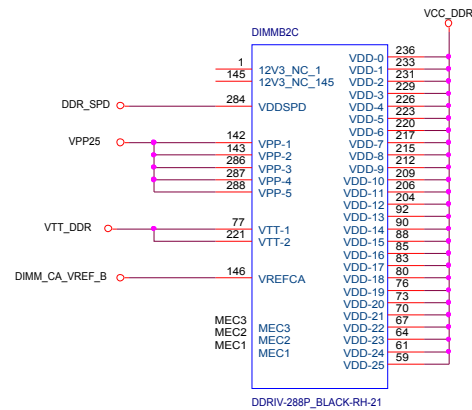
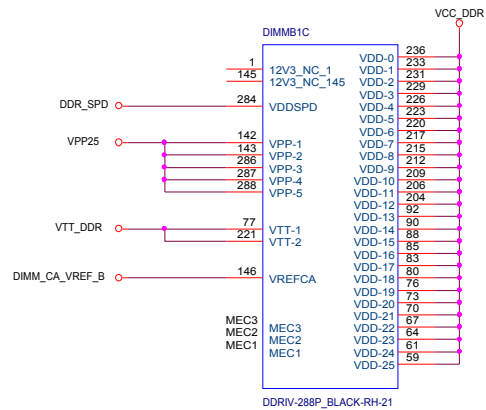
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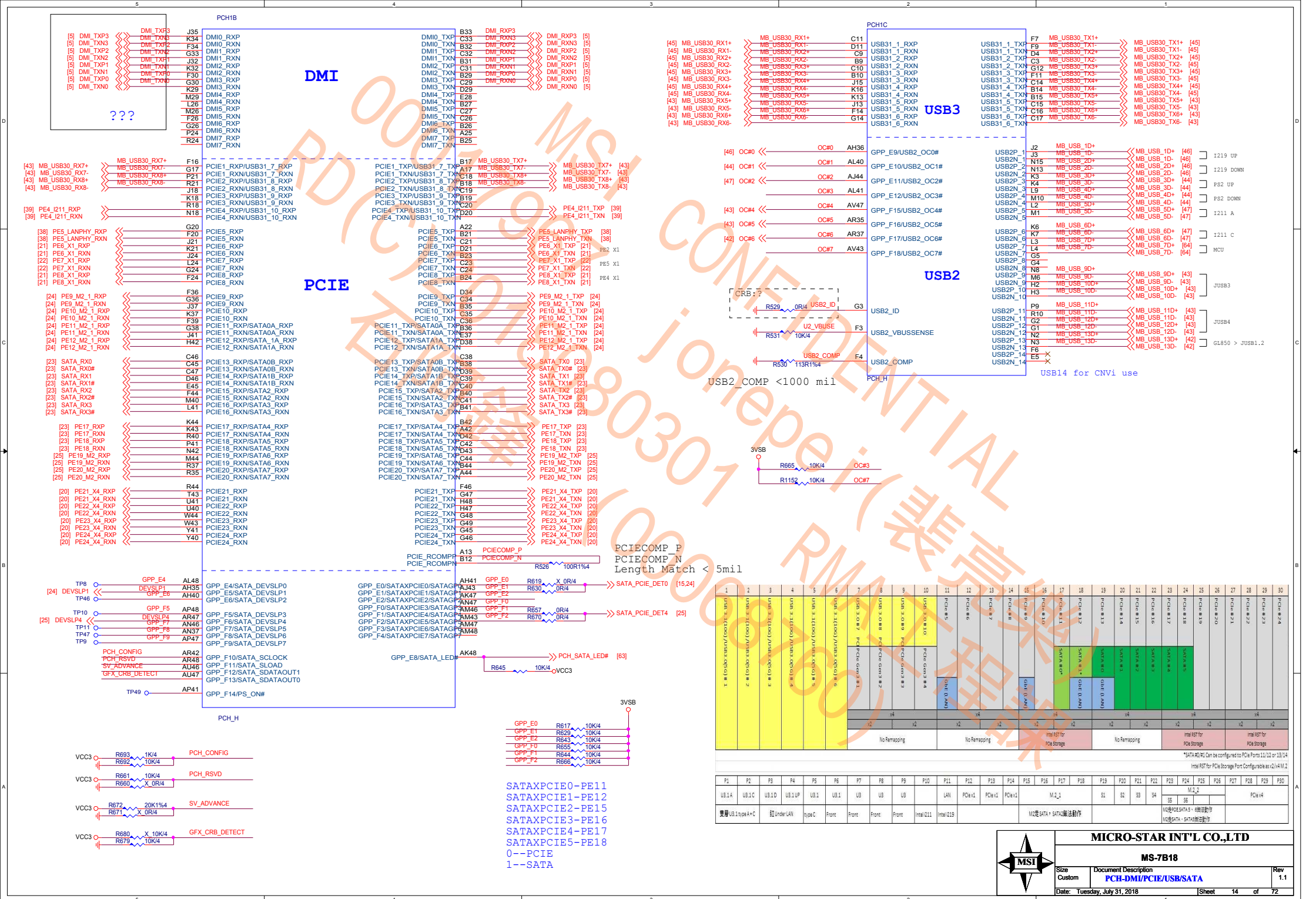


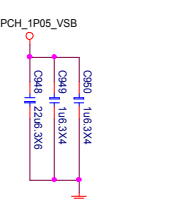
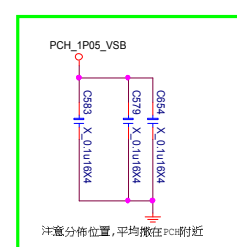
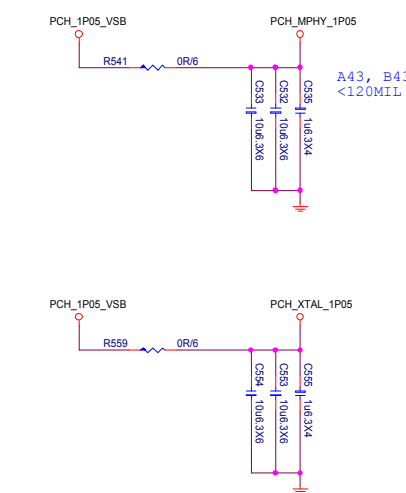


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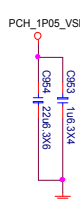
MS-7B18

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Custom	DDR4-POWER/GND-2	1.1
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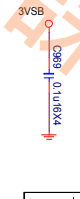
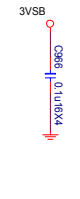
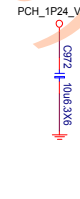
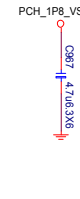
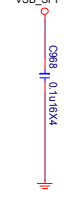
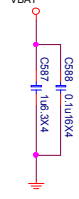
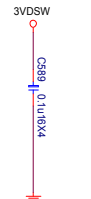
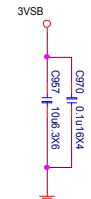
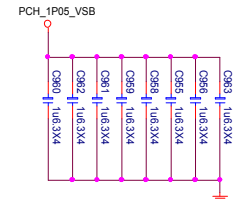




CLOSE TO B1/B2/B3/C1/C2



CLOSE TO U26/U29

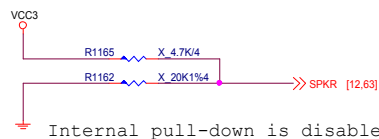


MICRO-STAR INT'L CO.,LTD		
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Custom	PCH-Power	1.1
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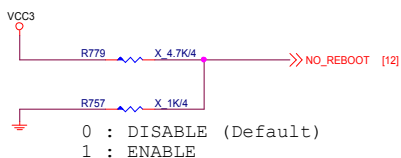
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RD(C)
0018080301
CONFIDENTIAL
jonepei
RMA
00068000



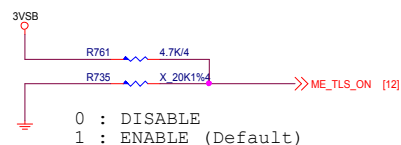
TOP Swap



No Reboot

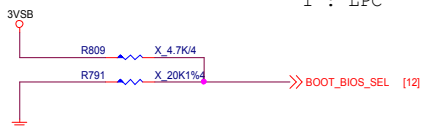


AMT and SBA with confidentiality

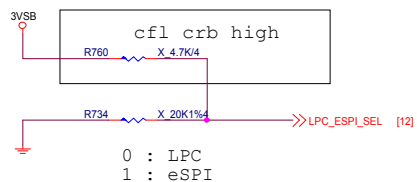


Boot BIOS

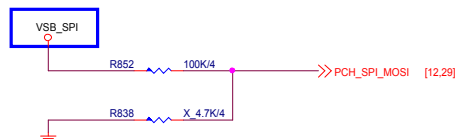
0 : SPI
1 : LPC



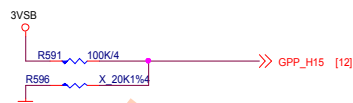
LPC eSPI Mode



Reserved



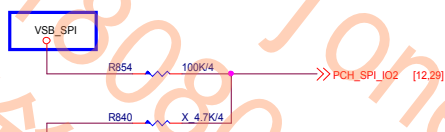
Reserved



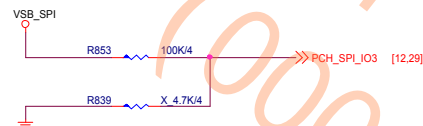
Reserved



Reserved

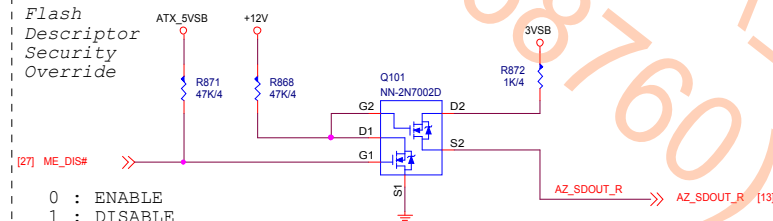


Reserved

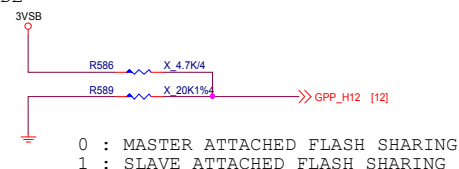


Flash Descriptor Security Override

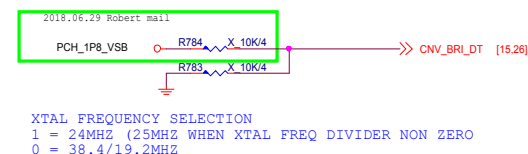
0 : ENABLE
1 : DISABLE



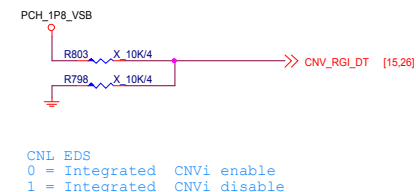
eSPI FLASH SHARING MODE



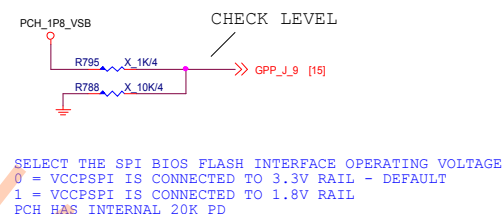
eSPI FLASH SHARING MODE



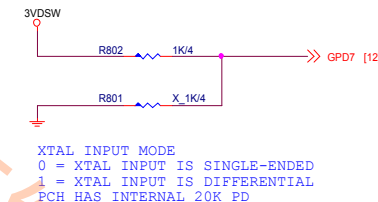
Modem Reference Clock Source Select



1.8V VCCPSPI



Reserved



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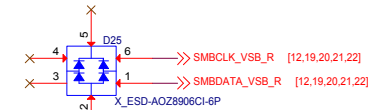
MS-7B18

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PCI Express X16 Slot

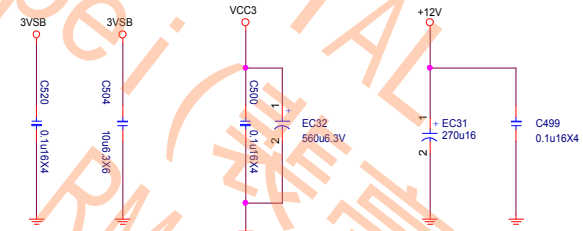
12V - 5.5A
VCC3 - 3A
3VSB- 375mA

SMBUS ESD



By Placement

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



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



MICRO-STAR INT'L CO.,LTD

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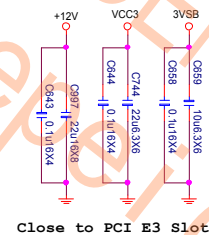
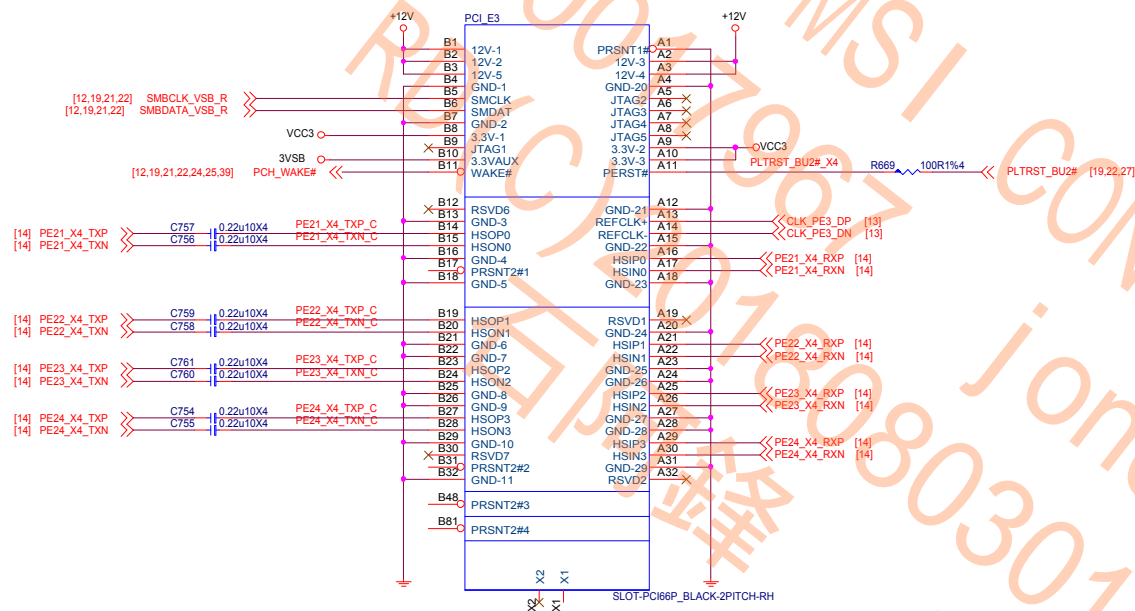
Size	Document Description	Rev
Custom	PCI_E SLOT (X16)	1.1
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PCI Express X4 Slot

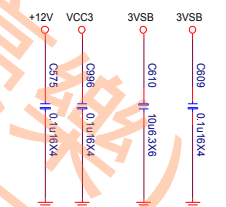
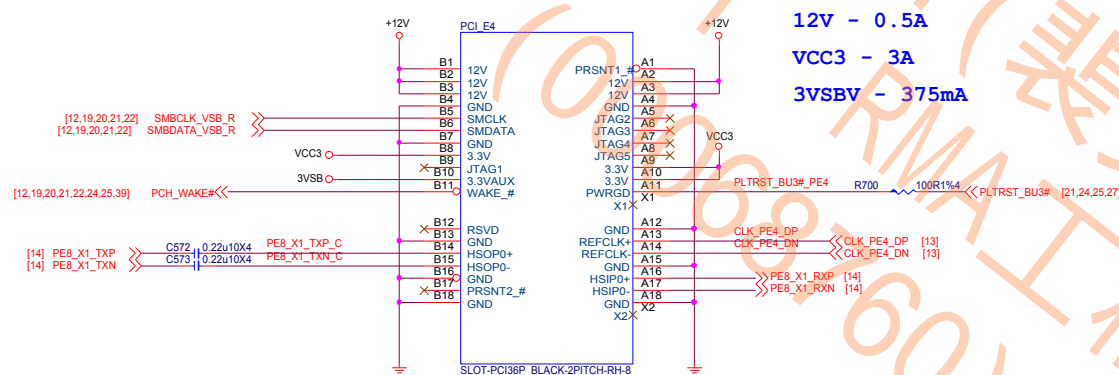
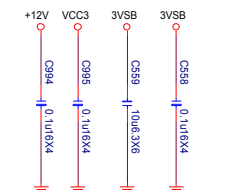
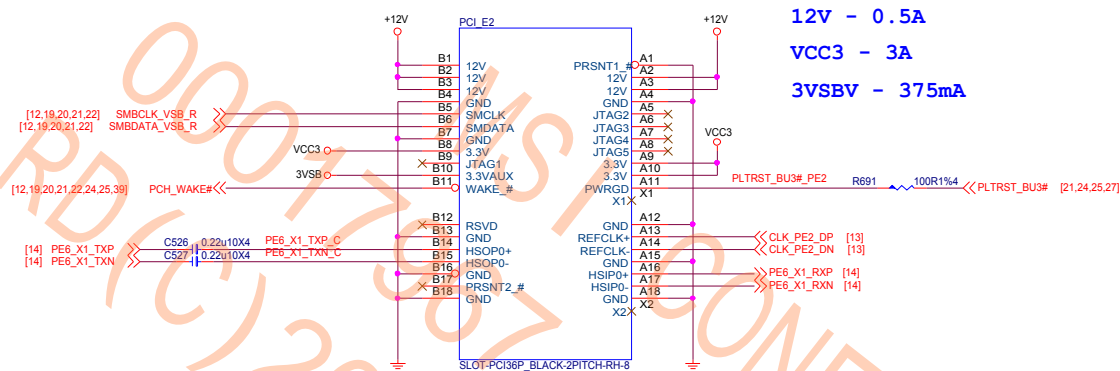
12V - 2.1A

VCC3 - 3A

3VSBV - 375mA



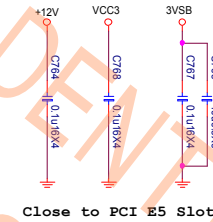
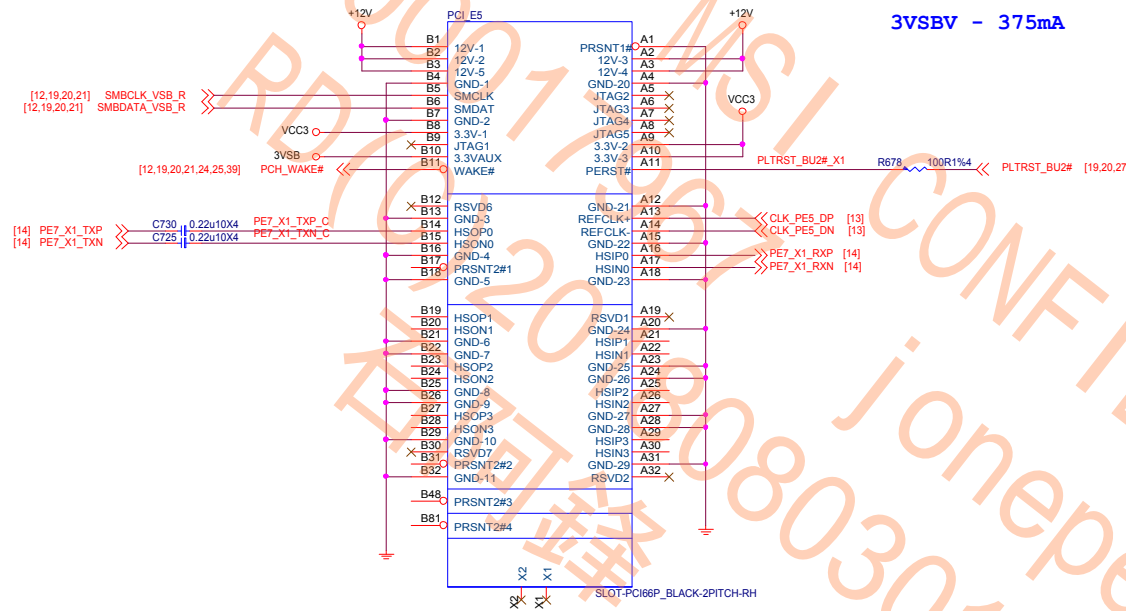
Close to PCI E3 Slot



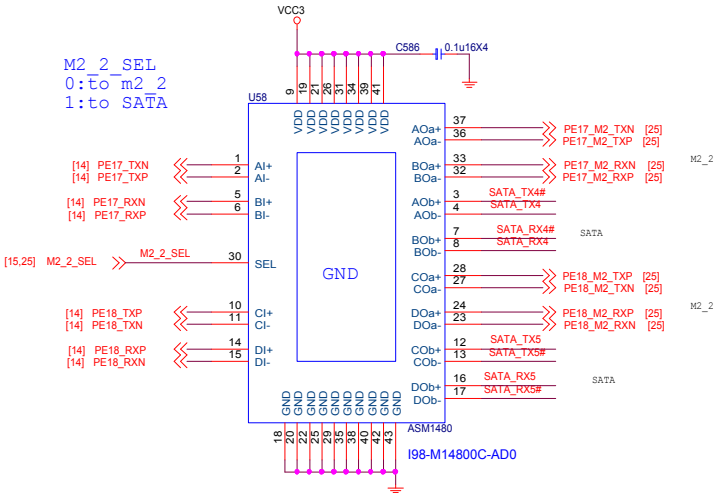
MICRO-STAR INT'L CO.,LTD		
MS-7B18		
Size	Document Description	Rev
Custom	PCIE SLOT (X1)	1.1
Date: Tuesday, July 31, 2018	Sheet 21 of 72	

PCI Express X1 Slot

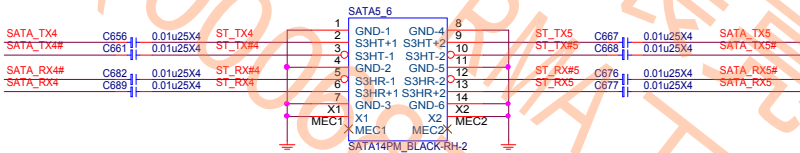
12V - 0.5A
VCC3 - 3A
3VSBV - 375mA

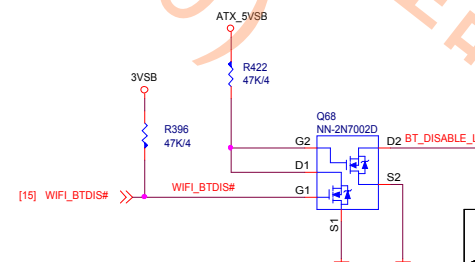
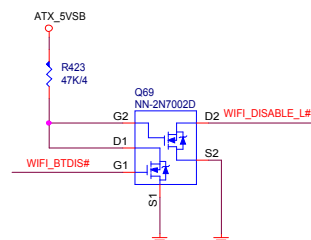
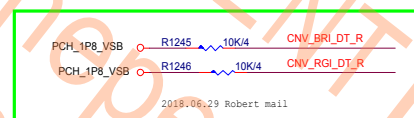
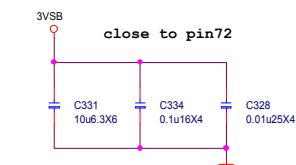
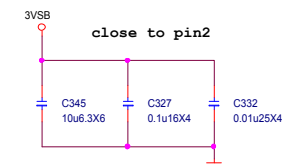
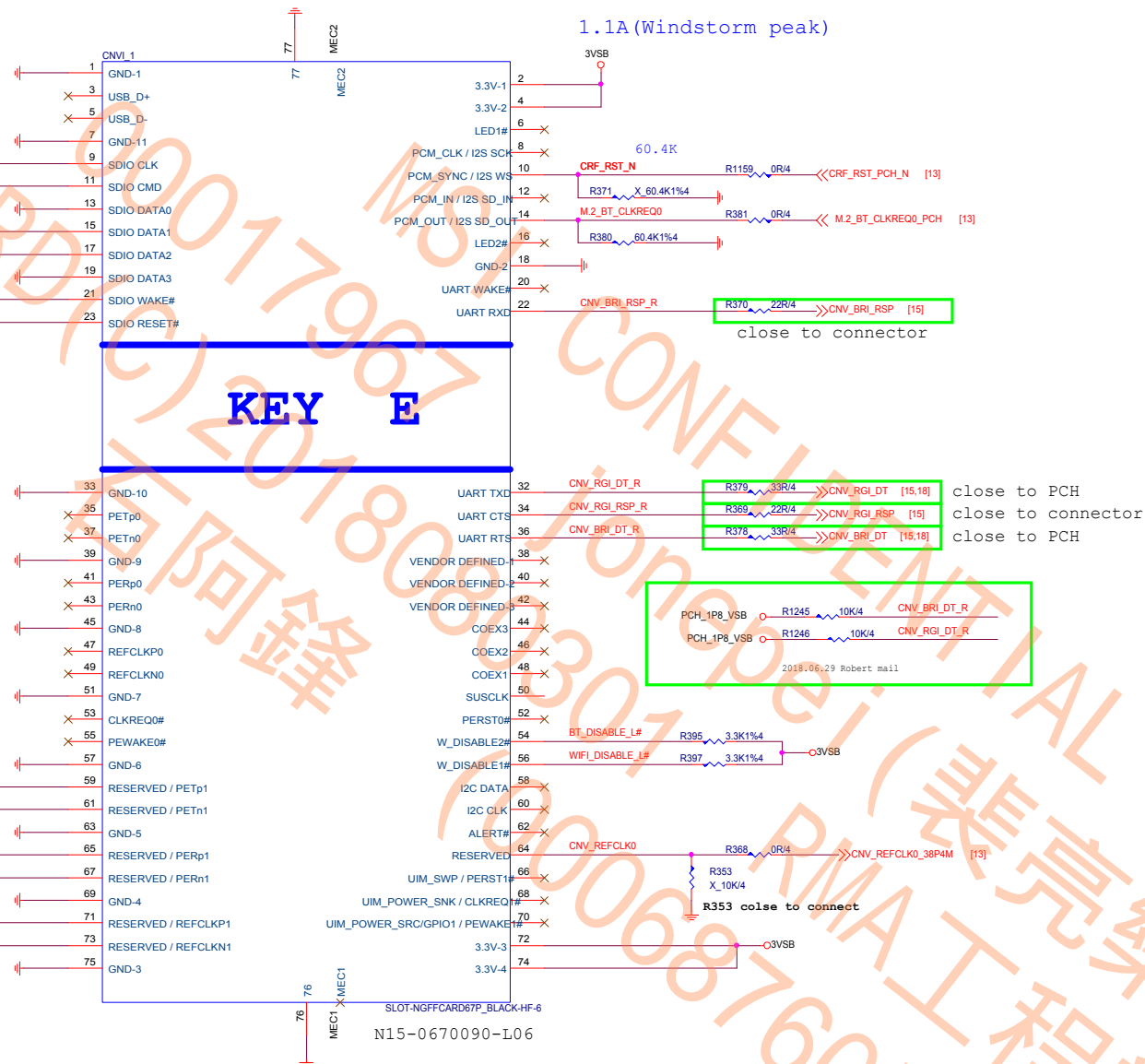
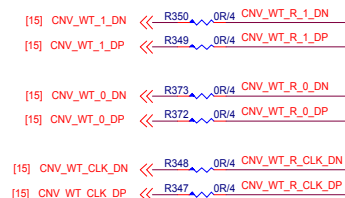


SATA Connector



7B18 2018.04.24 PM Spec modify when M2-SATA Port SATA5,6 no function





SCREW5

SCREW

E43-1305031-P65

2018.01.19

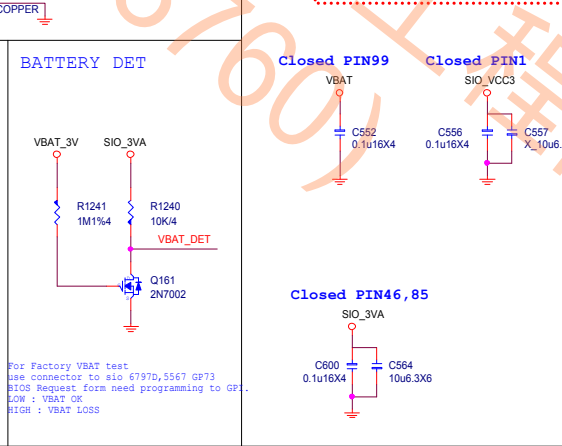
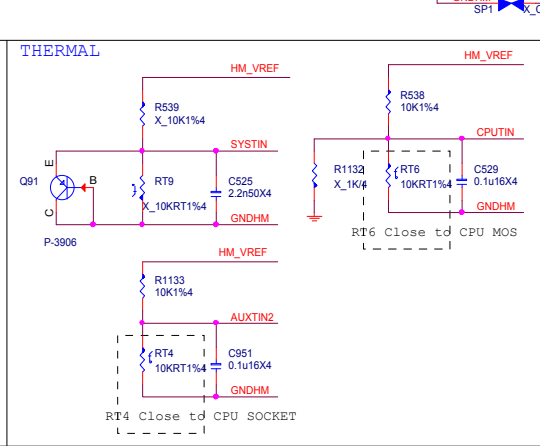
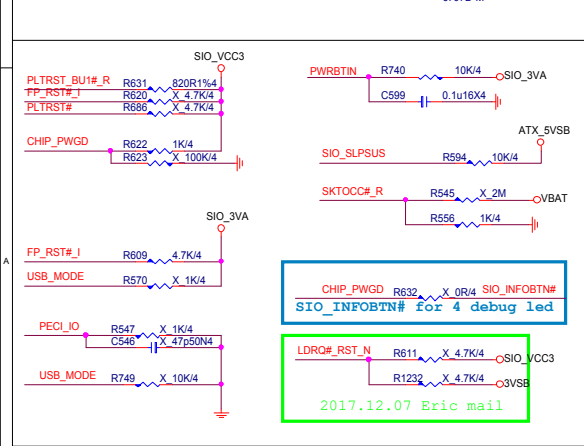
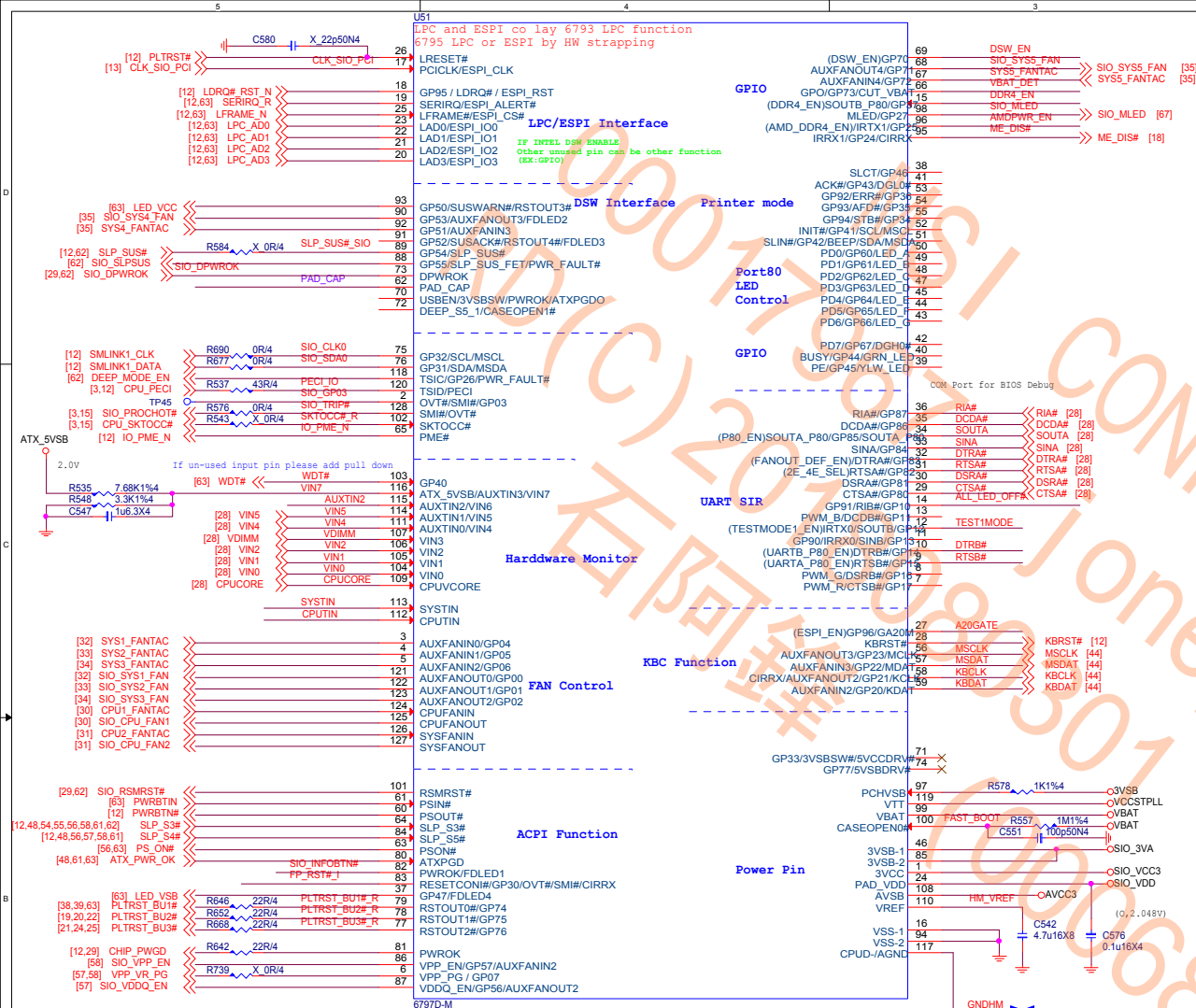
需確認



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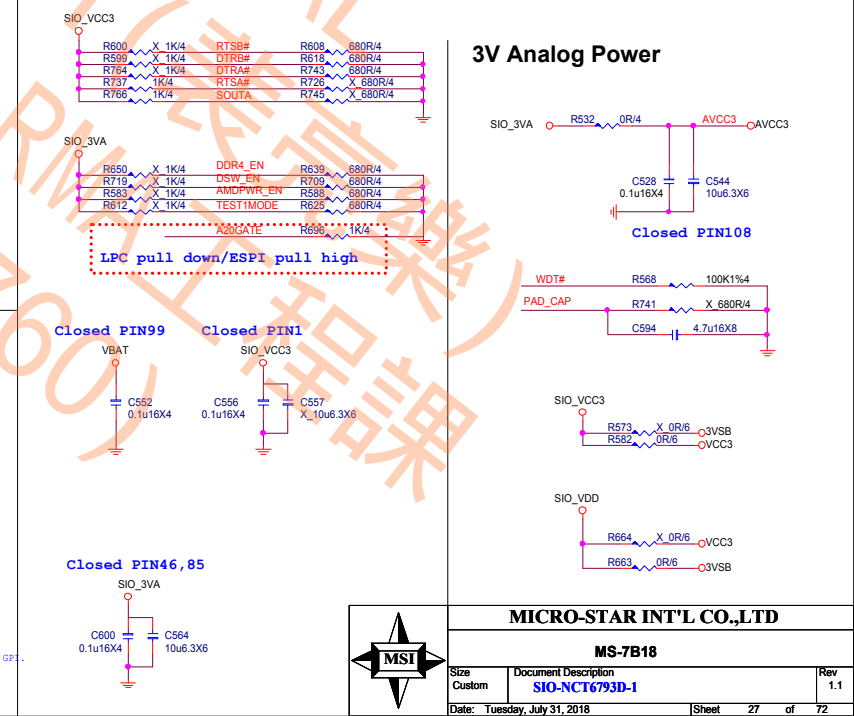
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Date: Tuesday, July 31, 2018		Sheet 26 of 72



POWER ON STRAPPING PIN FOR NCT6797					
PIN	NAME	Circuit	NAME	0	1
9	UARTA_P80_EN	RTSB#	DISABLE UARTA80	ENABLE UARTA80	LRESET
10	UARTB_P80_EN	DTRB#	DISABLE UARTB80	ENABLE UARTB80	LRESET
12	TEST1MODE_EN	TEST1MODE	DISABLE TEST1MODE	ENABLE TEST1MODE	LRESET
15	DDR4_EN	DDR4_EN	Disable	Enable	
27	ESPI_EN	A20GATE	LPC	ESPI	
31	2E_4E_SEL	RTSA#	I/O ADDRESS 2E	I/O ADDRESS 4E	LRESET
32	FANOUT_DEF_EN	DTRA#	default 50%	default 100%	INTERNAL PWROK
34	P80_EN	SOUTA	ENABLE Non_PORT80	ENABLE PORT80	LRESET
69	DSW_EN	DSW_EN	DISABLE INTEL DSW	ENABLE INTEL DSW	INTERNAL RSMRST
96	AMDPWR_EN	AMDPWR_EN	DISABLE AMD PWR SEQ	ENABLE AMD PWR SEQ	INTERNAL RSMRST

Note:
If PIN34 strapping low, BIOS must programming LPT or GPIO

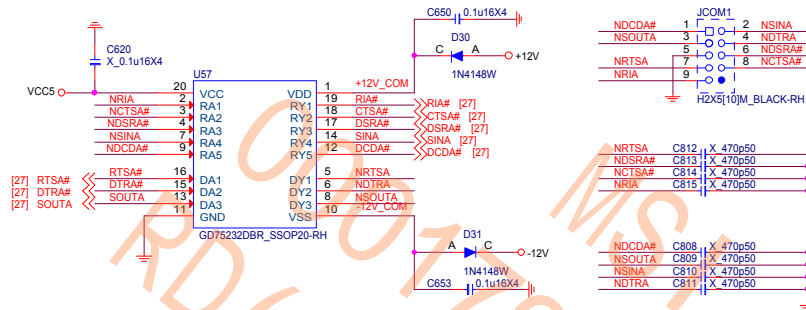


SERIAL PORT 1

SIO_VCC3

R765 X 2.7K SINA
R707 X 2.7K CTSA#
R746 X 2.7K RIA#
R767 X 2.7K DCD#
R715 X 2.7K DSRA#

NO USE UART PORT1

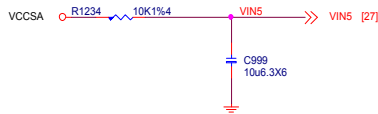
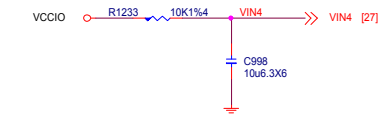
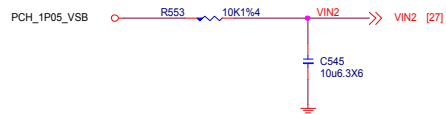
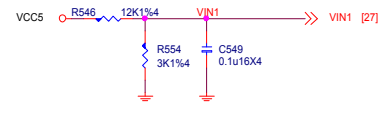
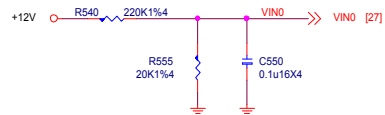
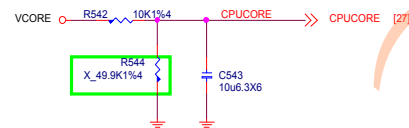
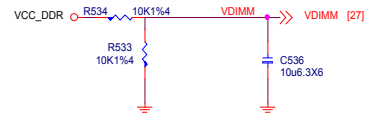


RSMRST# USE solution

2017.11.30 robert_mail remove

HW Monitor - Voltage

SIO HM Voltage voer 2V will not detect



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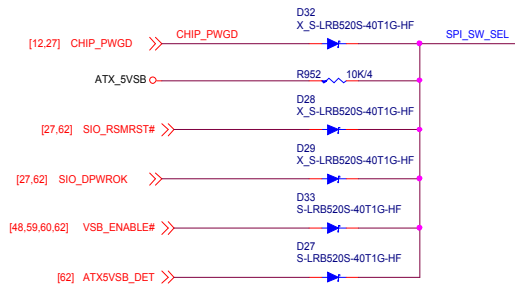
Size	Document Description	Rev
Custom	SIO-NCT6793D-2	1.1
Date: Tuesday, July 31, 2018	Sheet 28 of 72	

Note: ROM & JSPi1 Reference GND

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

0825 Add D48, unstuff D33

For TL624 1.1

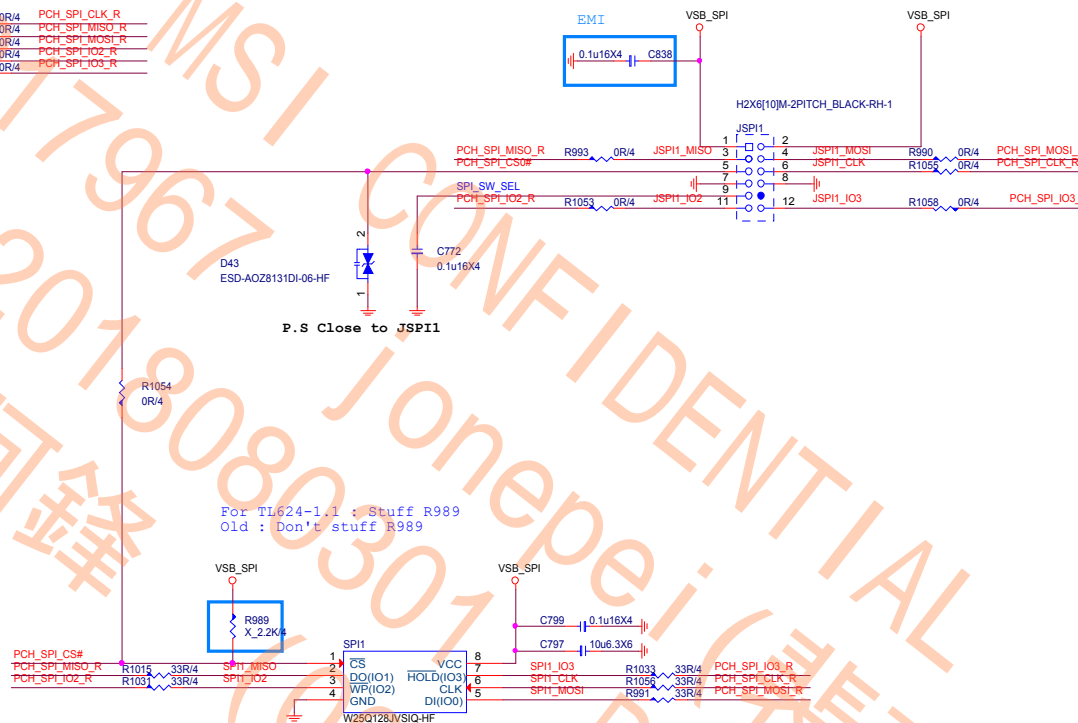


For TL624-1.1

SKYLAKE : Stuff D10/D17/R353

B85/H87 : Stuff D8/D9/R353

Others : Stuff R272



For TL624-1.1 : Stuff R989
Old : Don't stuff R989



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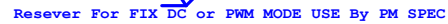
MS-7B18

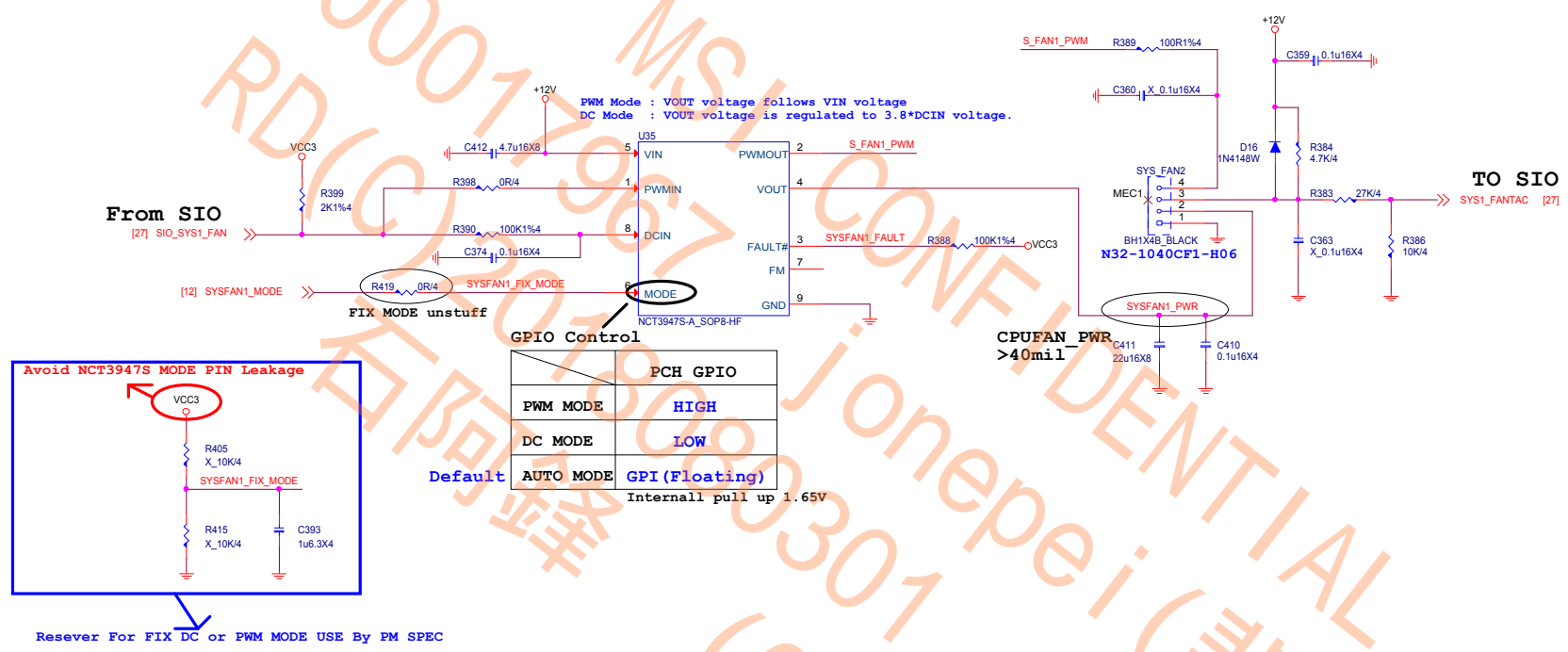
Size	Document Description	Rev
Custom	Dual BIOS	1.1
Date: Tuesday, July 31, 2018	Sheet 29 of 72	

1.Mode GPIO BIOS can swtich PWM/DC MODE

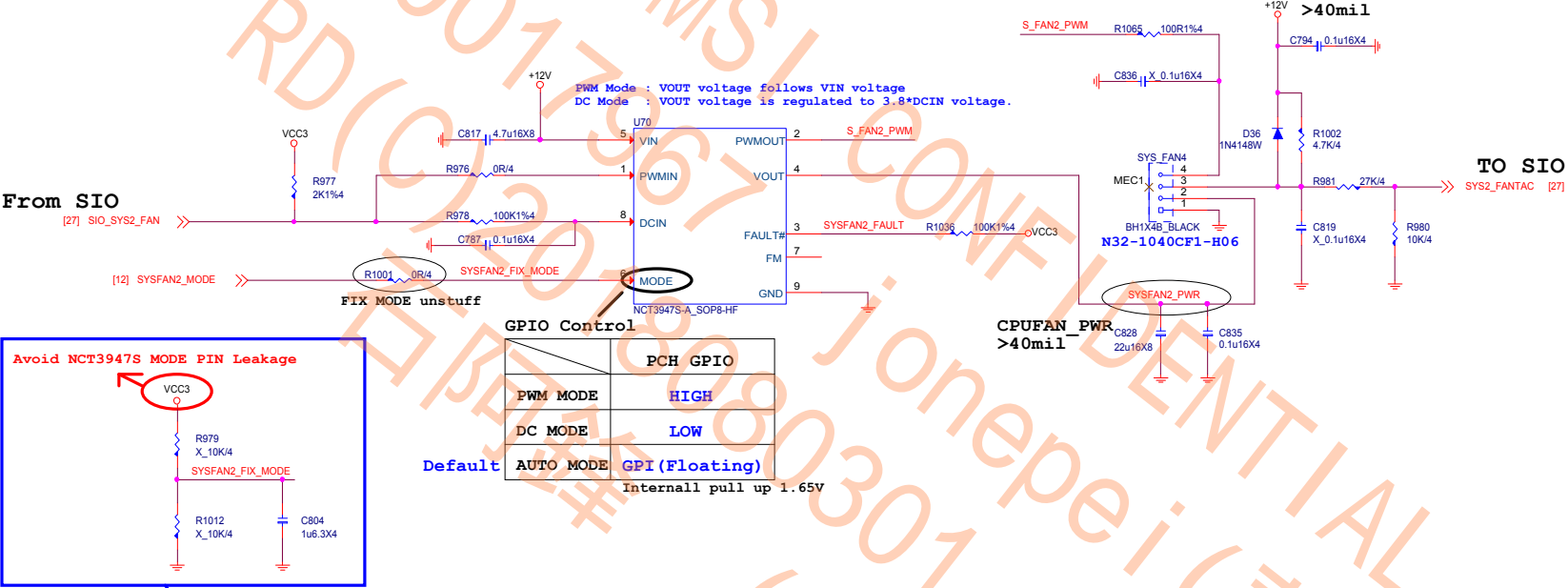


1.Mode GPIO BIOS can swtich PWM/DC MODE



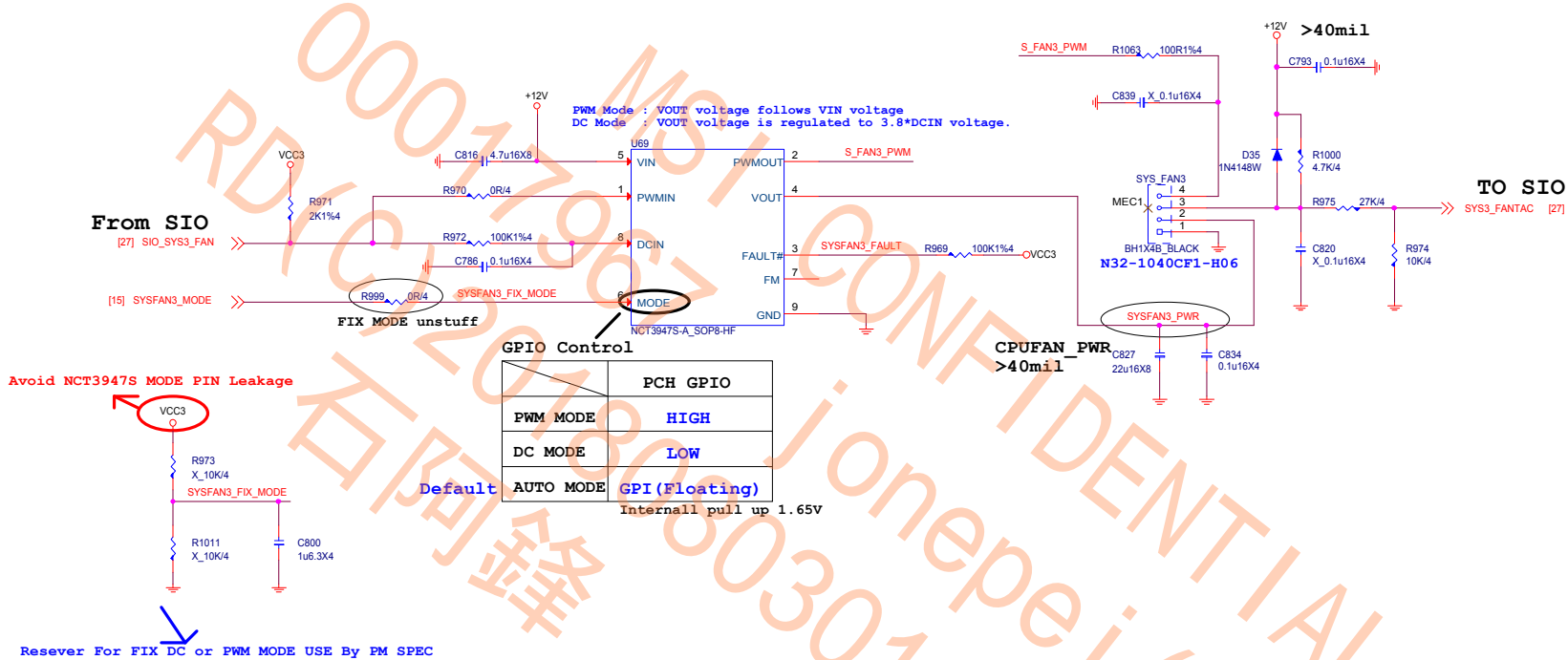


TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE
1.Mode GPIO BIOS can switch PWM/DC MODE



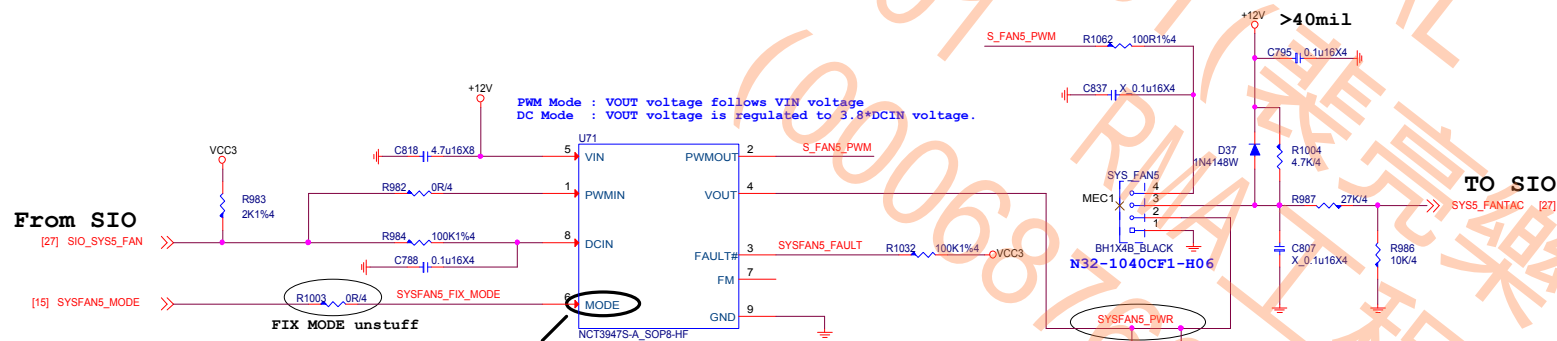
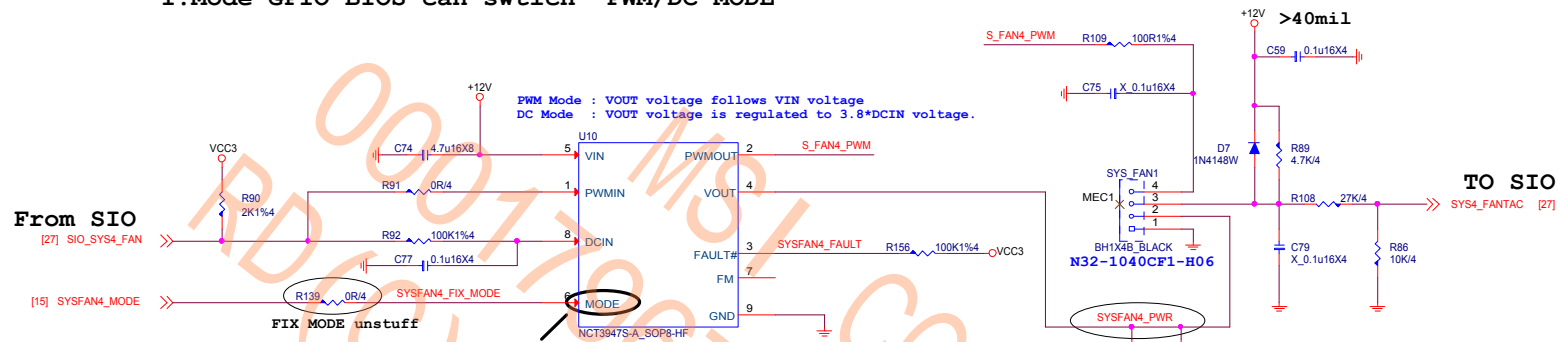
Resever For FIX DC or PWM MODE USE By PM SPEC

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

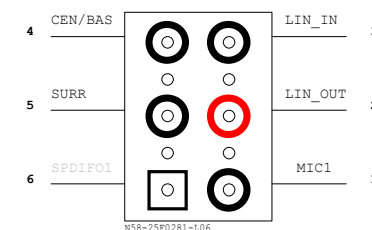
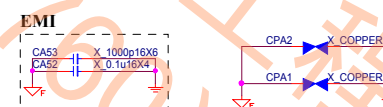
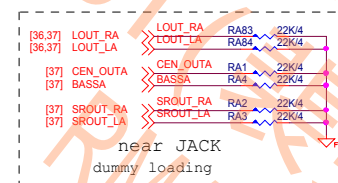
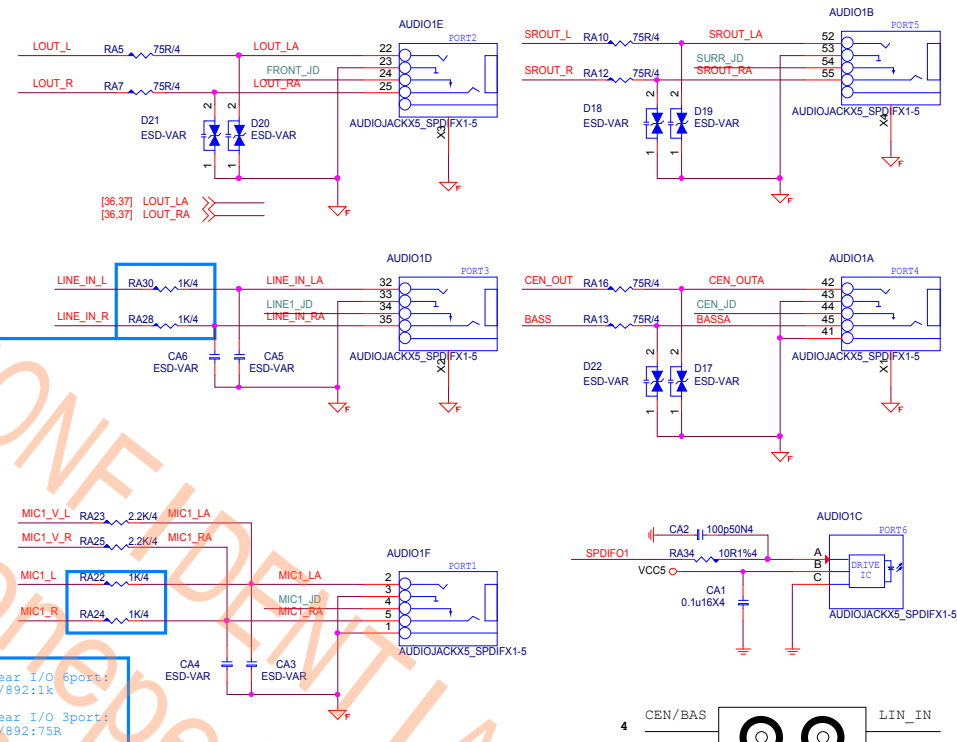
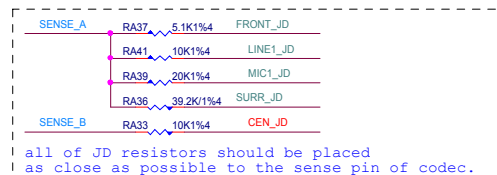
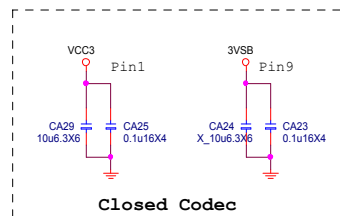
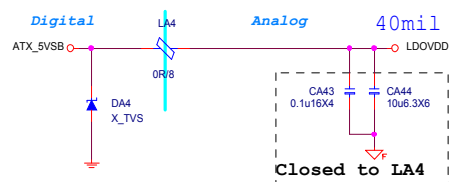
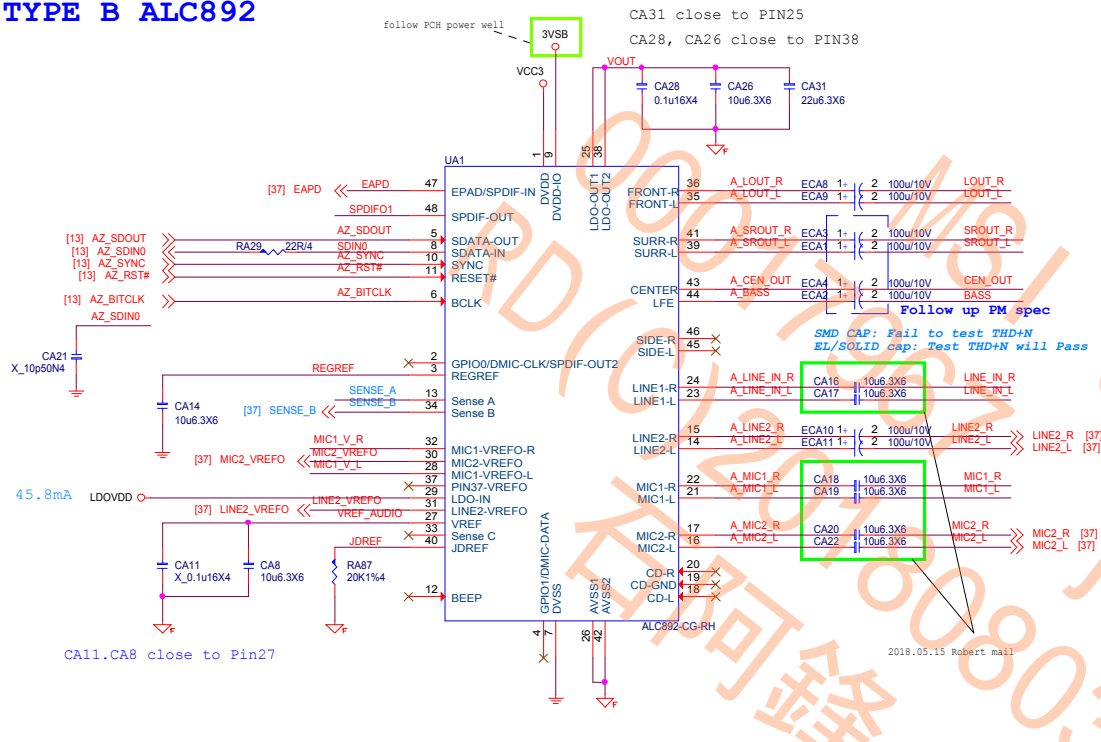


TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can swtich PWM/DC MODE



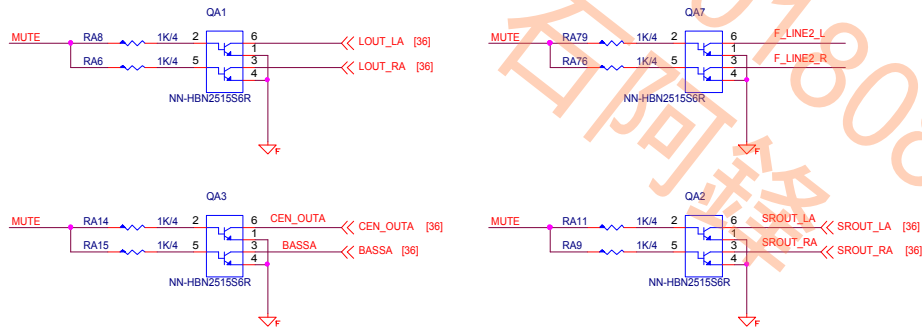
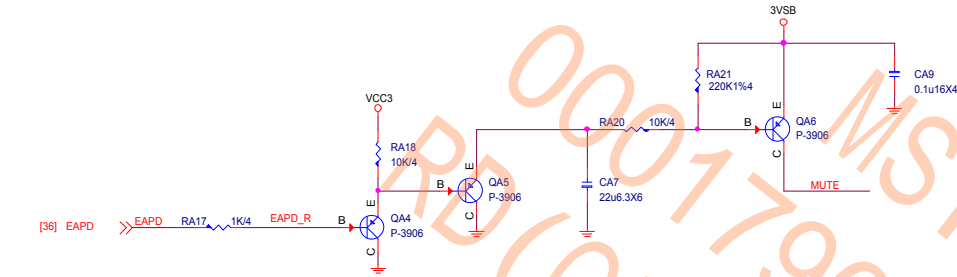
TYPE B ALC892



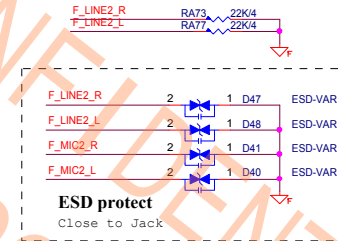
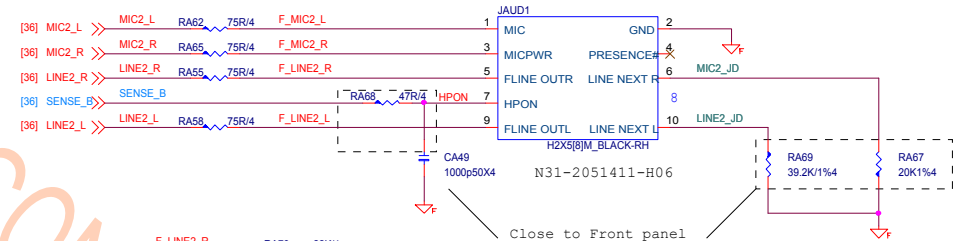
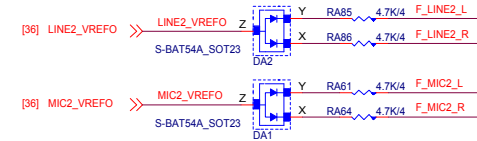
Rear Line OUT De-POP circuit
 (De-pop circuit for Rear Line out & Front Headphone out)

Digital

Analog



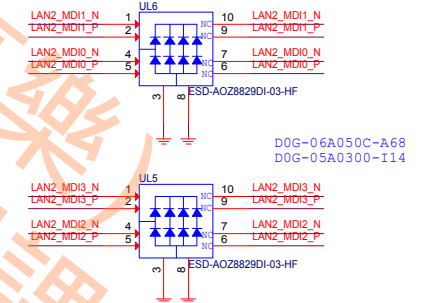
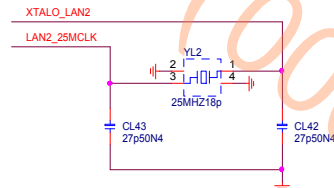
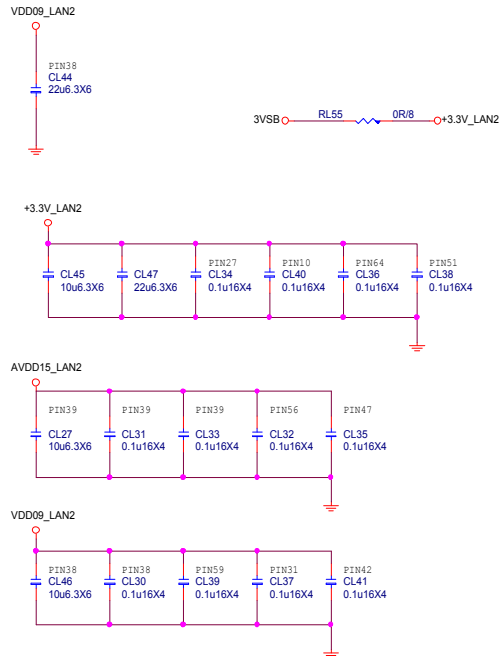
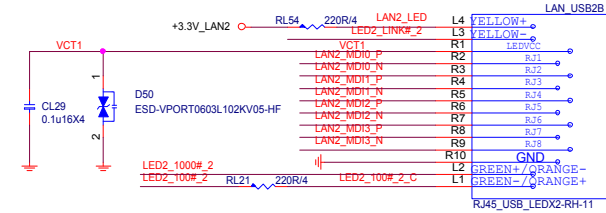
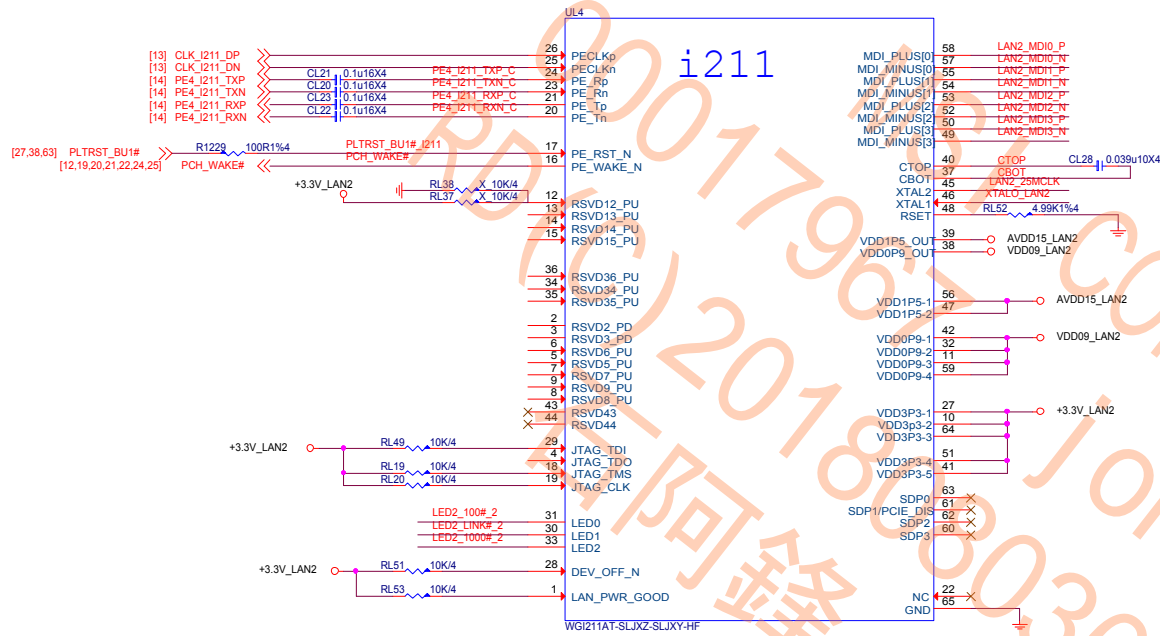
Audio moat is transparent and width 40mil



Close to Front panel
For HDA/AC97 front cable.

Intel Lan- i211

LAN Connector-A+C



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

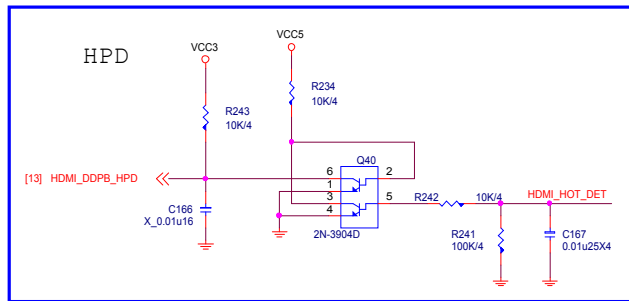
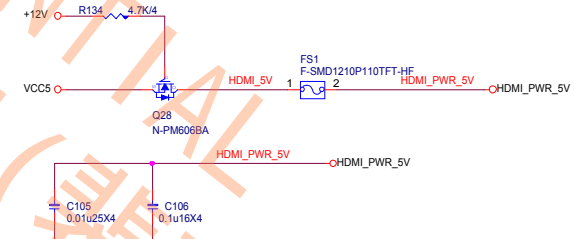
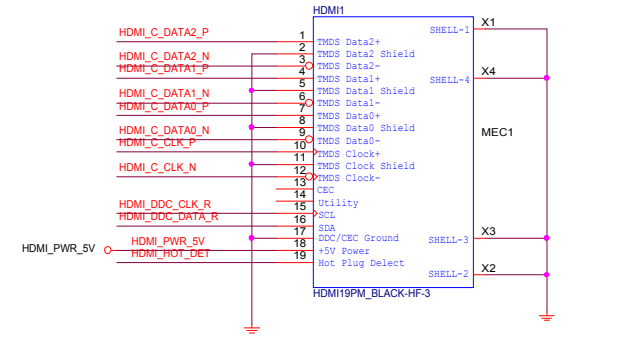
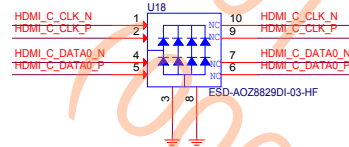
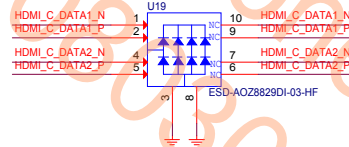
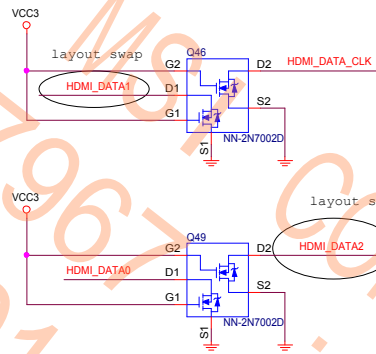
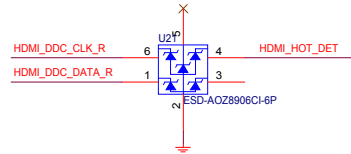
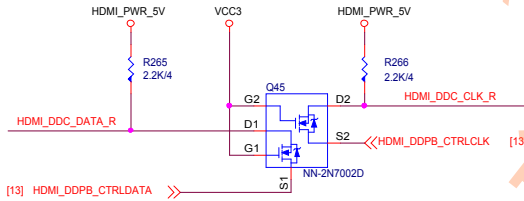
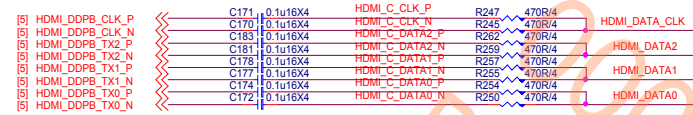
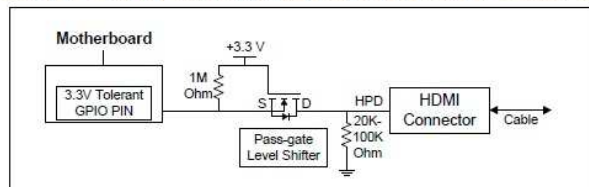
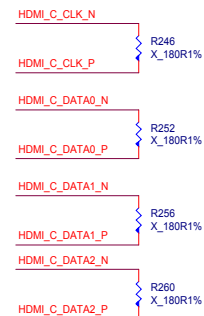


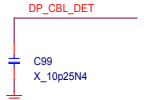
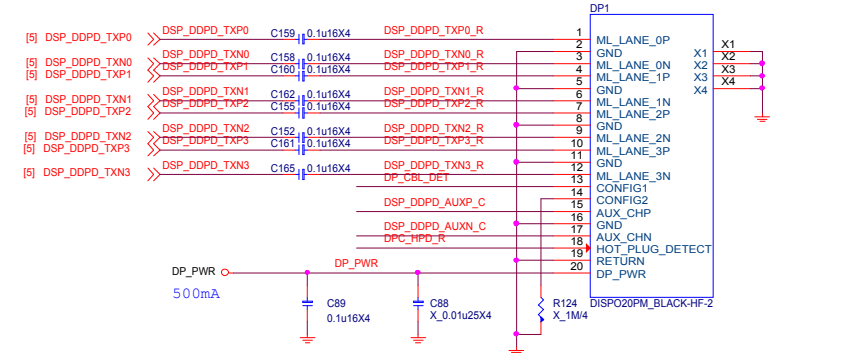
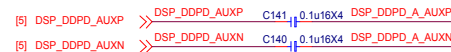
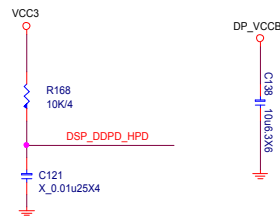
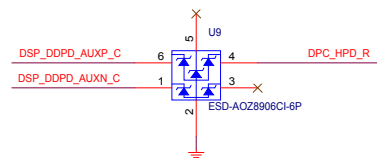
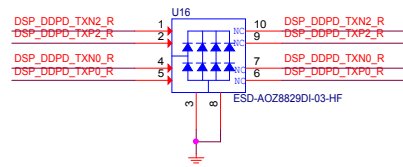
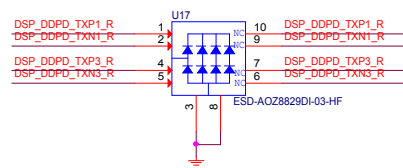
Figure 7-9. HDMI 1.4* HPD Cost Reduced Level Shifter Design Recommendation



Note: 3.3V transistor gate supply must turn off when CPU power is turned off.

For EMI





DP_VCCB trace don't less than 30 mil

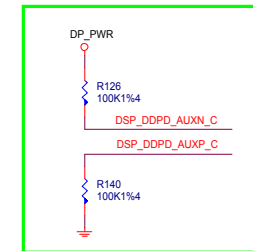
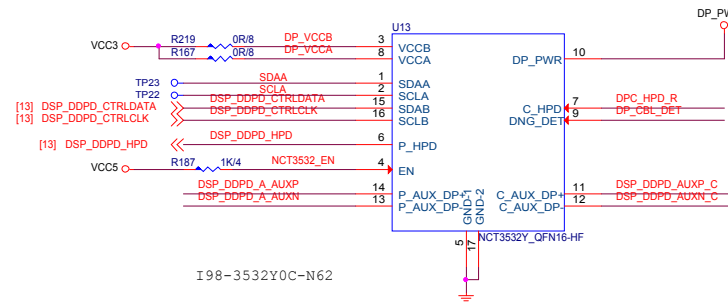
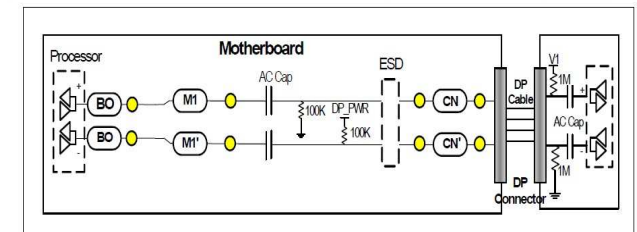
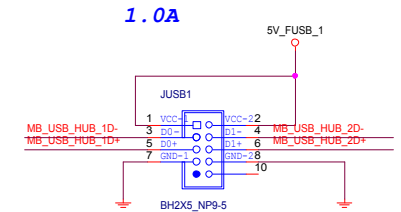
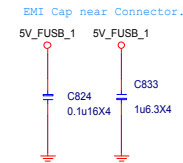
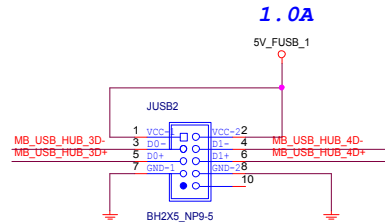
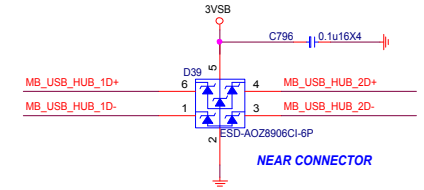
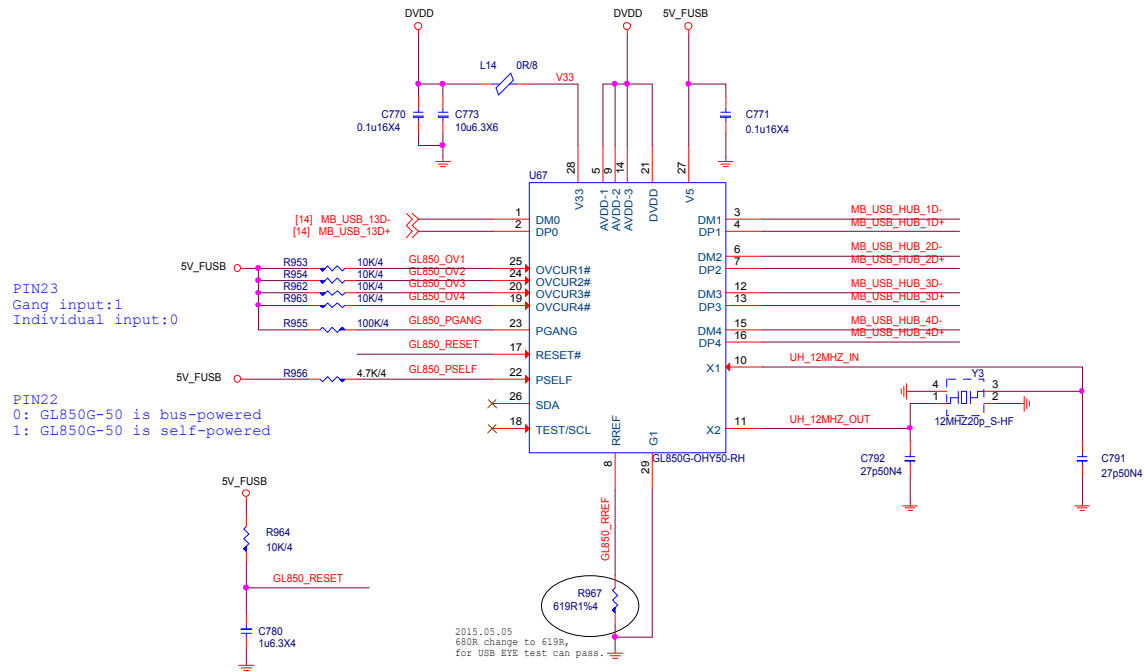


Figure 5-6. DT and AIOCLF DisplayPort* Auxiliary Channel External (Topology A)

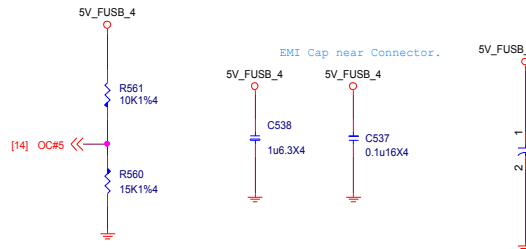
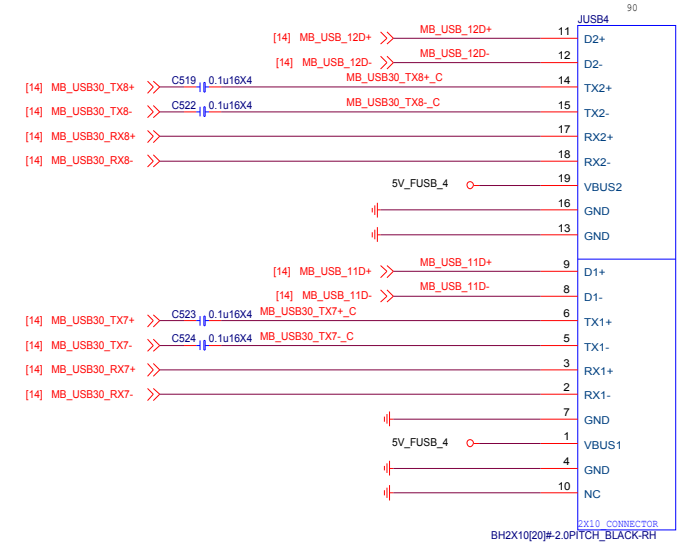
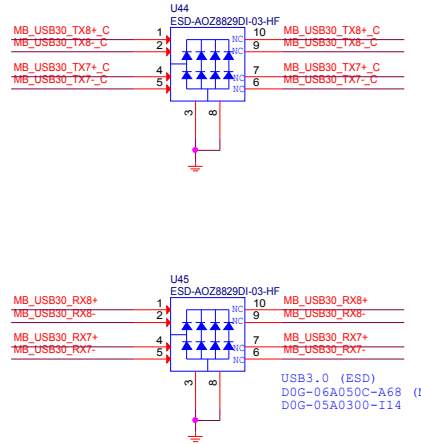
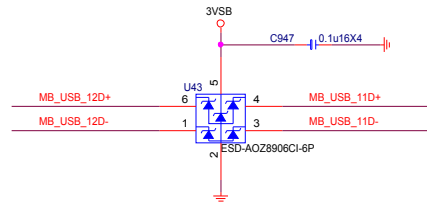
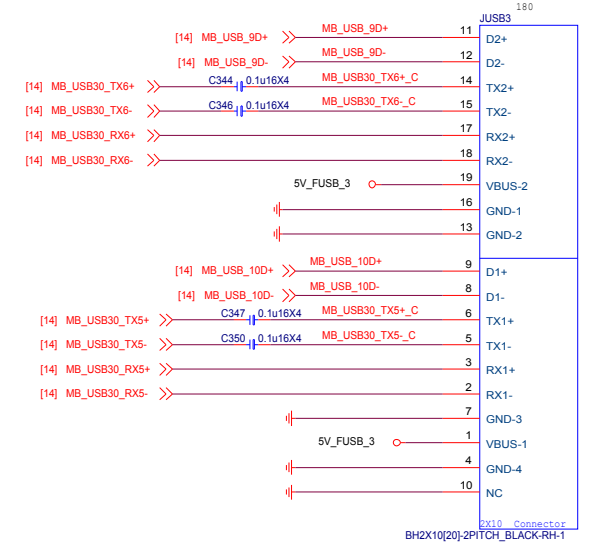
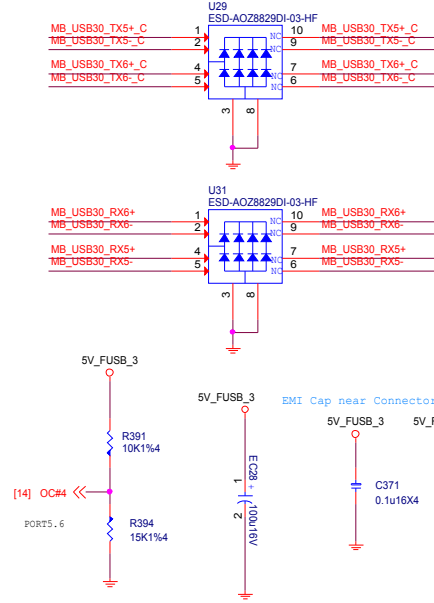
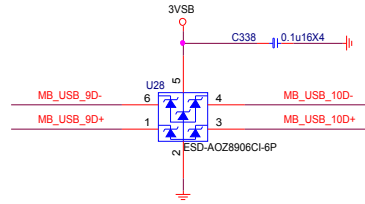




4-port at high-speed mode. --> 58.6mA

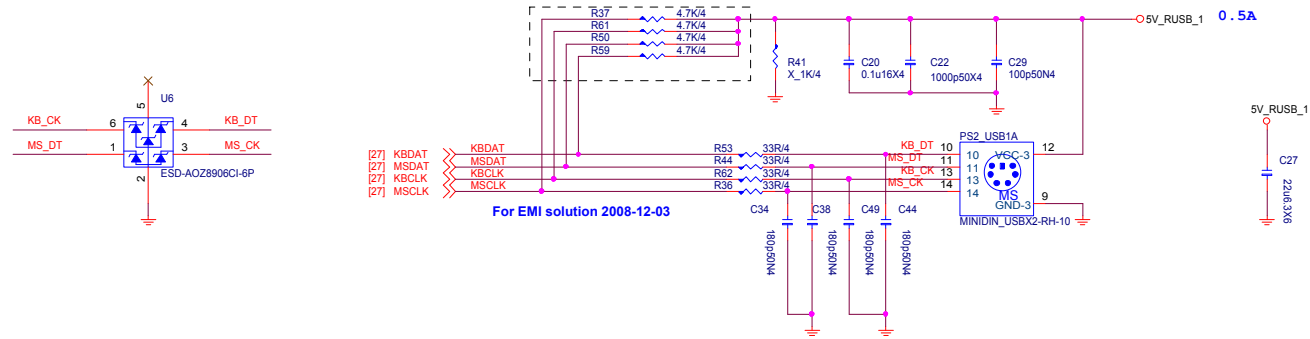


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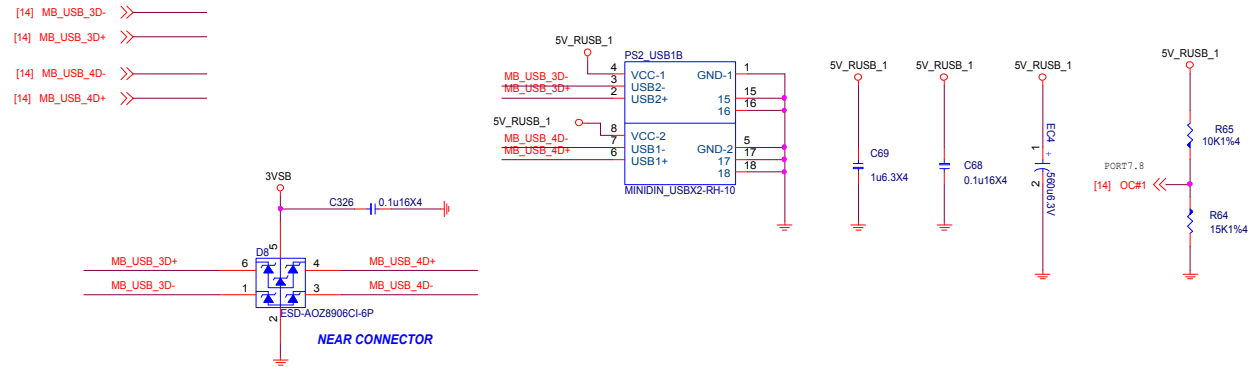


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MS-7B18		
Size	Document Description	Rev
Custom	Front USB30	1.1
Date: Tuesday, July 31, 2018	Sheet 43 of 72	

PS2 KEYBOARD & MOUSE CONNECTOR



PS2-USB



3VSB

R333 X 1K/4 EOA_2
R336 X 1K/4 FGA_2
R326 X 1K/4 EOB_2
R321 X 1K/4 FGB_2

R334 68K1/4 EOA_2
R335 X 1K/4 FGA_2
R324 68K1/4 EOB_2
R322 0R/4 FGB_2
R330 X 1K/4 EN_AB_2

3VSB

R319 X 1K/4 EOC_2
R323 X 1K/4 FGC_2
R310 X 1K/4 EOD_2
R309 X 1K/4 FGD_2

R318 68K1/4 EOC_2
R326 X 1K/4 FGC_2
R315 68K1/4 EOD_2
R314 0R/4 FGD_2
R313 X 1K/4 EN_CD_2

ON RX PASS Jun 07/13 mail

3VSB

L76
120L1.5A-150_0402-HF

C936 22u6.3X6
C927 0.1u16X4
C934 0.1u16X4
C933 0.1u16X4
C929 0.1u16X4
C905 0.1u16X4
C935 0.1u16X4
C913 0.1u16X4
C928 0.1u16X4

3VSB_1004_1



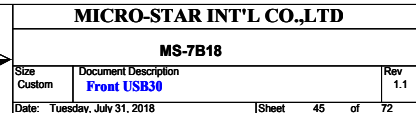
The left diagram shows a green box containing a table of components connected to 3VSB. The components are listed in two columns, with their values and functions specified.

Component	Value	Function
R1118	X 1K/4	EQA_1
R299	X 1K/4	FQA_1
R1115	X 1K/4	EOB_1
R1109	X 1K/4	FOB_1
R1119	68K1%4	EQA_1
R298	X 1K/4	FQA_1
R1114	68K1%4	EOB_1
R1110	OR/4	FOB_1
R296	X 1K/4	EN_AB_1

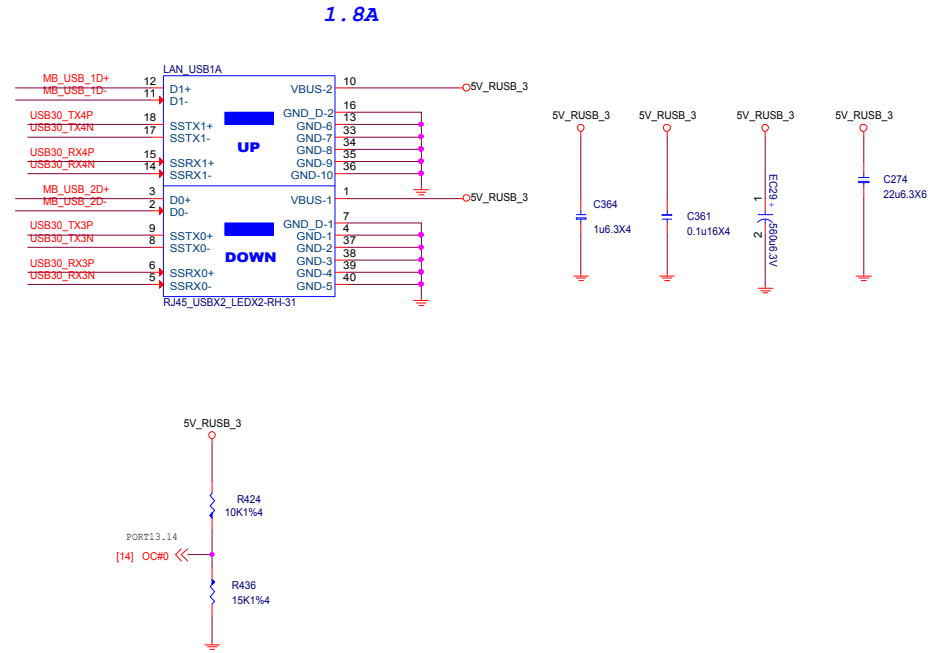
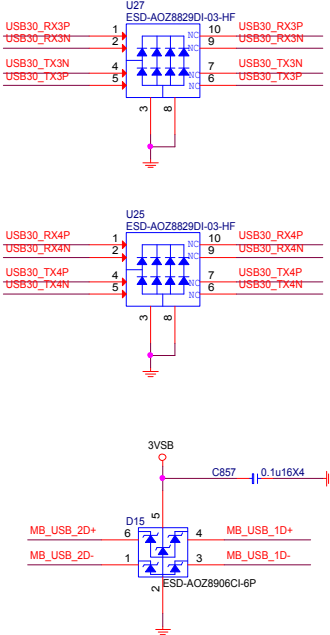
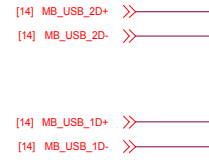
The right diagram shows a detailed schematic of the 3VSB pin connected to a network of capacitors and an inductor. The components are listed in two columns, with their values and functions specified.

Component	Value	Function
R287	X 1K/4	EQC_1
R290	X 1K/4	FQC_1
R270	X 1K/4	EQD_1
R276	X 1K/4	FGD_1
R286	68K1%4	EQC_1
R289	X 1K/4	FQC_1
R277	68K1%4	EQD_1
R275	OR/4	FGD_1
R274	X 1K/4	EN_CD_1

ON RX PASS Jun 07/13 mail

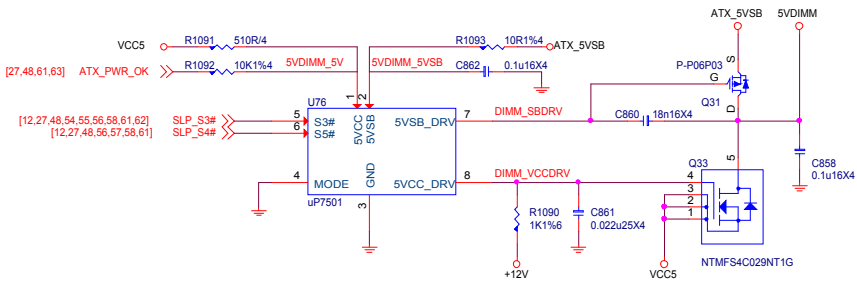


LAN1 USB2.0 &3.0



5VDIMM FOR DDR

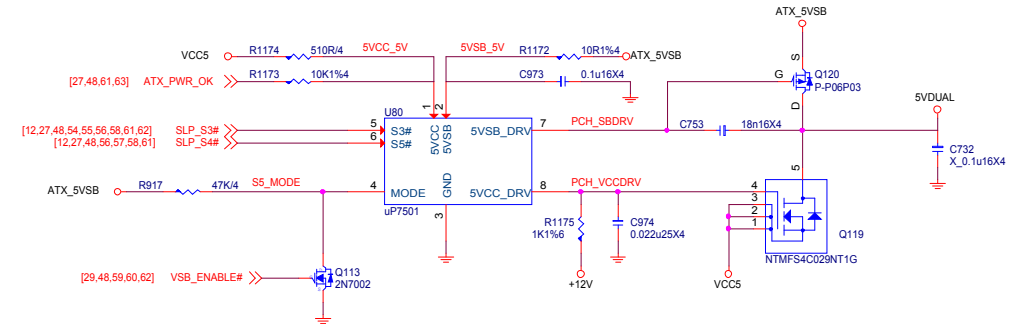
4.8A



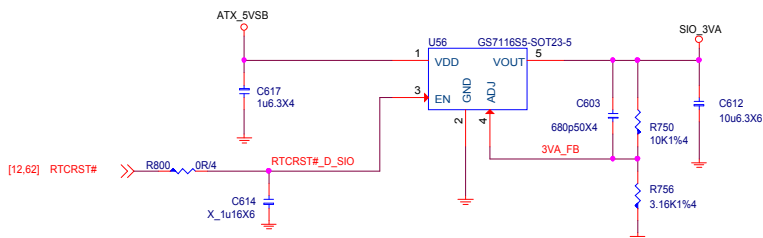
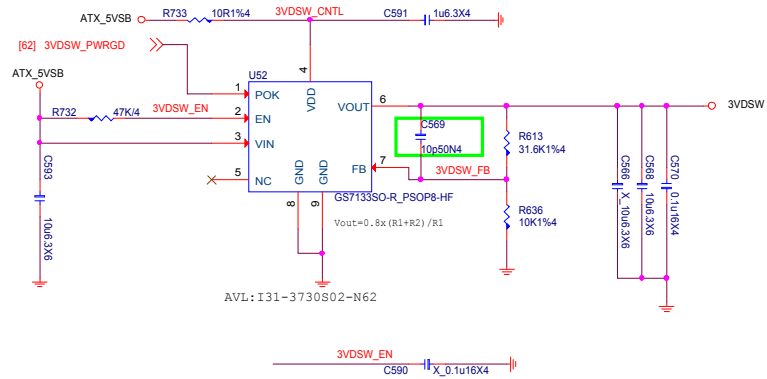
```
7501 Mode
H:Support S0/S3/S5
L:Support S0/S3
```

5VDUAL

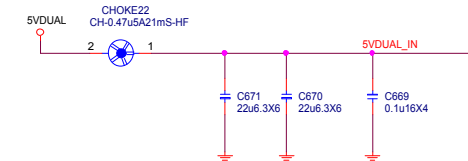
6.25A



3VDSW 0.4A

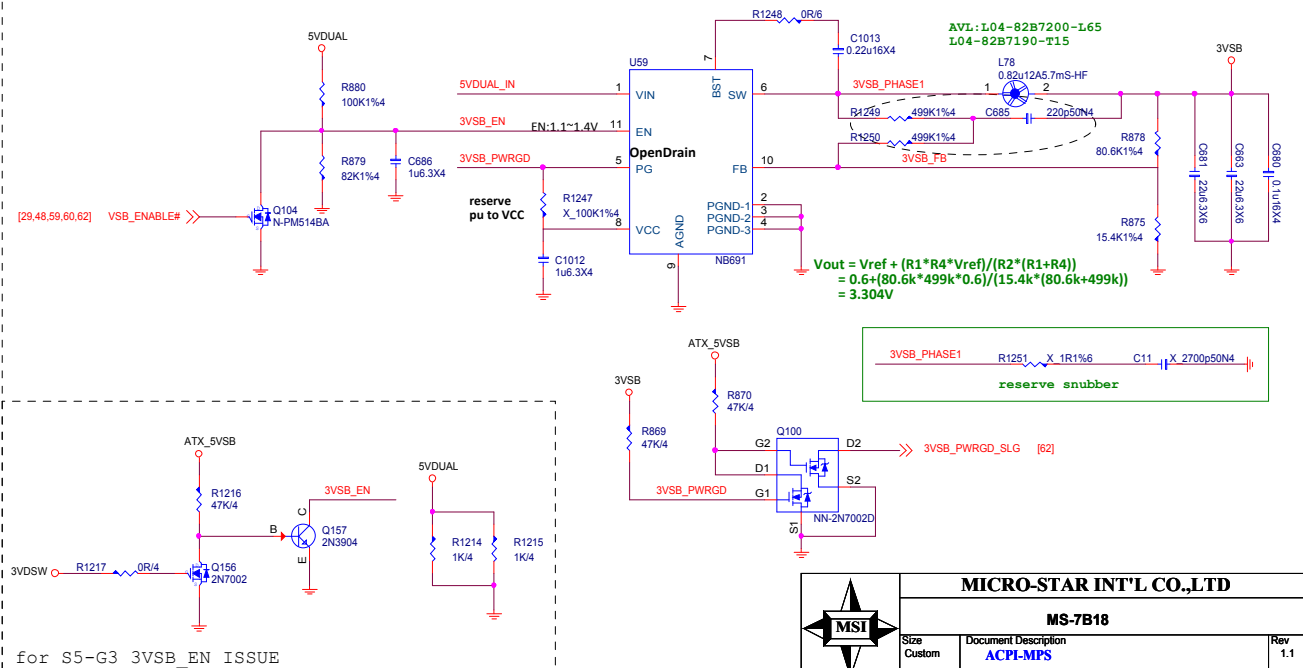
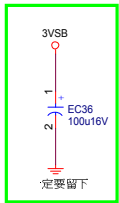


3VSB cost down 6.9A



$$L = \frac{(V_{in} - V_{out})}{(F_{sw} * k * I_{out_max})} * (V_{out}/V_{in})$$
$$= 0.8311 \mu H \text{ (K = 30\%)}$$
$$L = \frac{(V_{in} - V_{out})}{(F_{sw} * k * I_{out_max})} * (V_{out}/V_{in})$$
$$= 0.4987 \mu H \text{ (K = 50\%)}$$

k range : 30%<k<50%

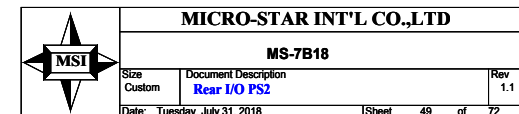
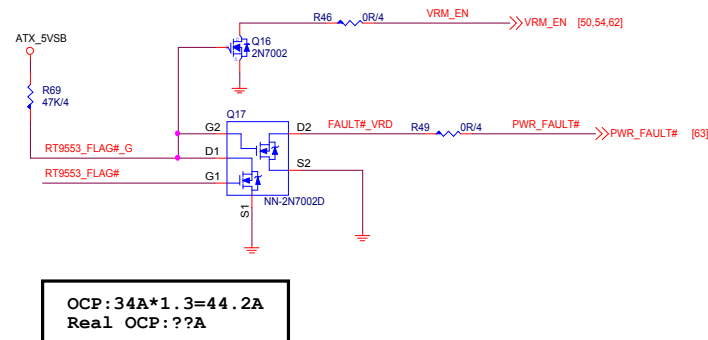


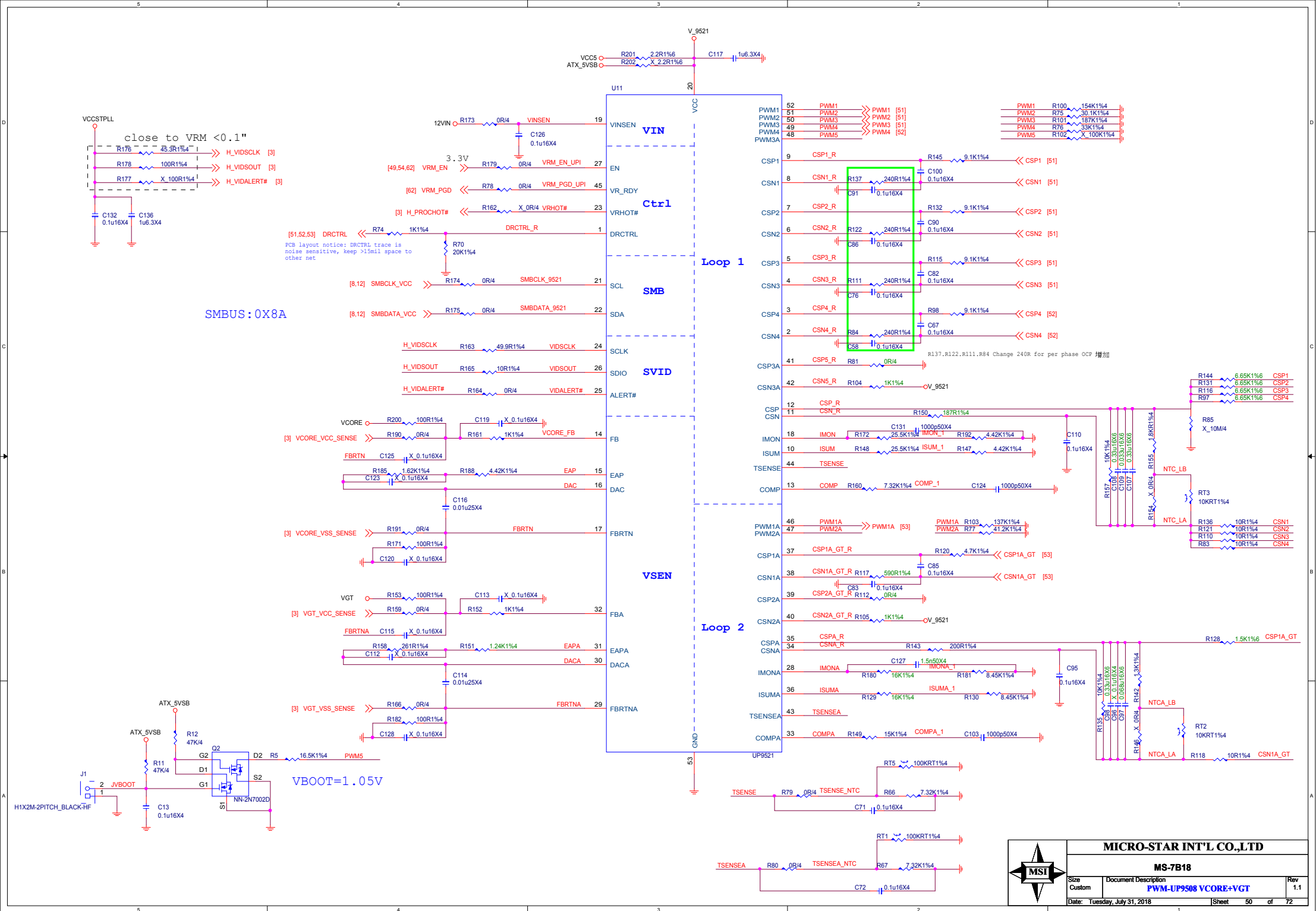
MICRO-STAR INT'L CO.,LTD

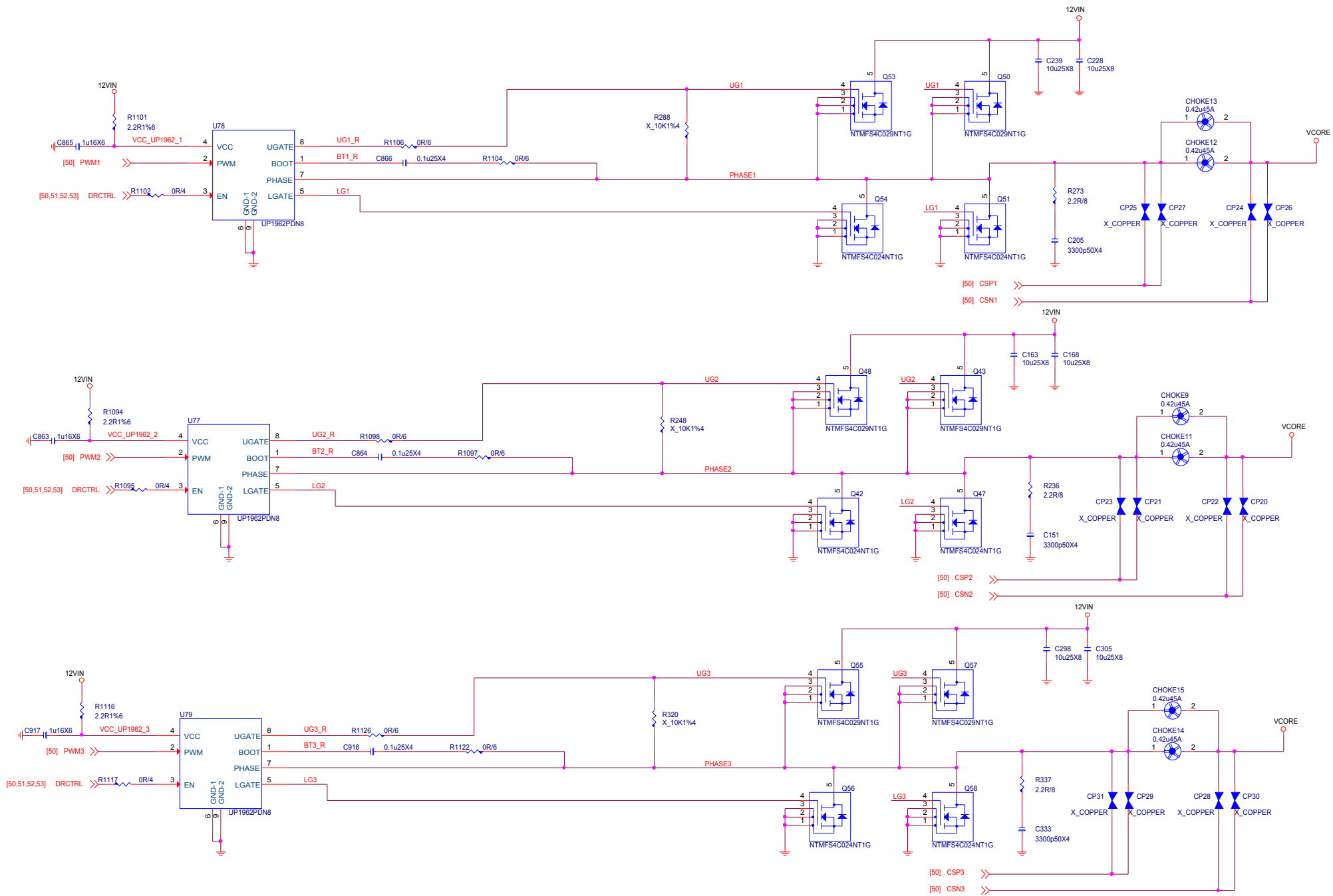
MS-7B18

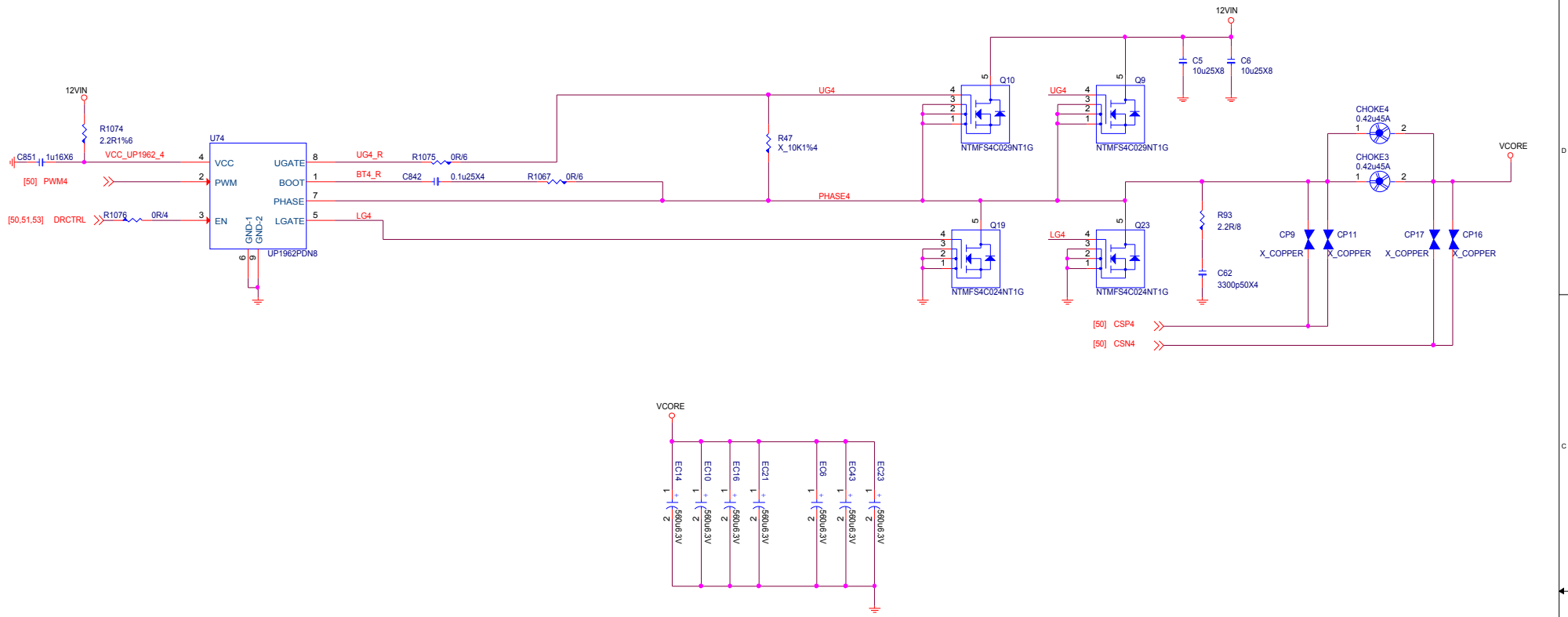
Size Custom	Document Description ACPI-MPS	Rev 1.1
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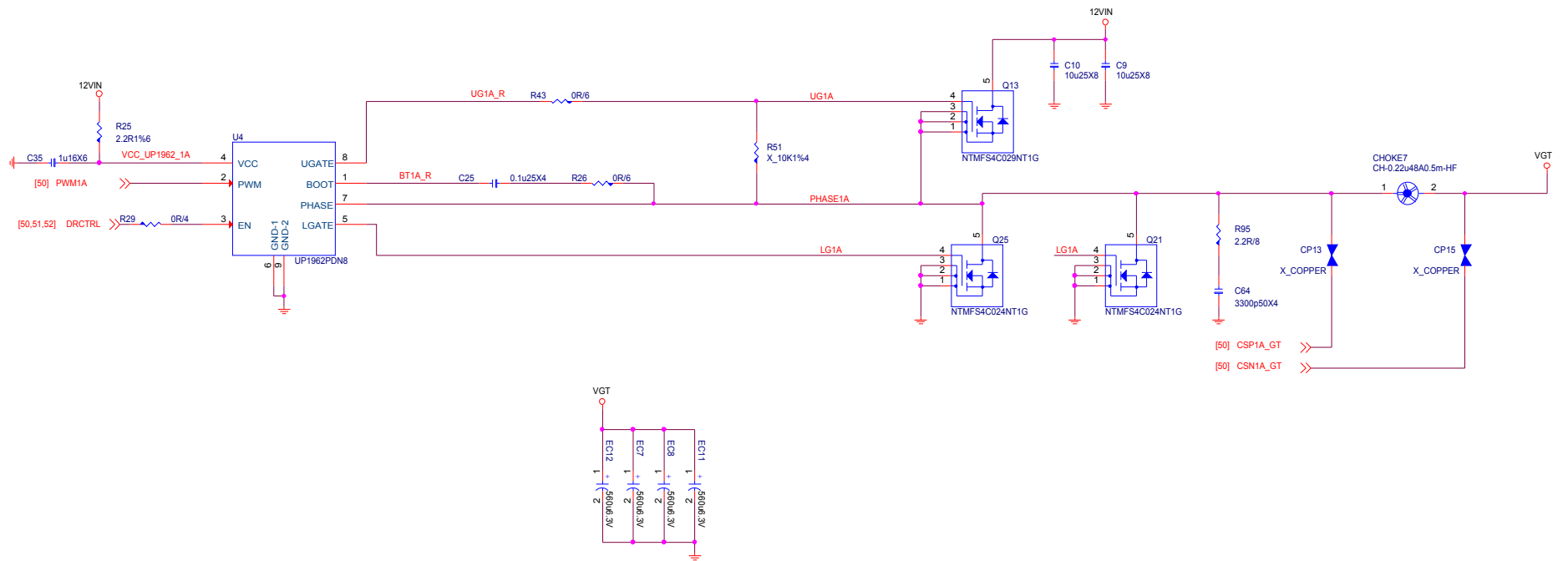
Date: Tuesday, July 31, 2018	Sheet 48 of 72
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Size	Document Description	Rev
Custom	VGT MOS-PHASE 1-2	1.1
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SA Power:1.05V,11.1A

OCP:14.43A

Rocset = $1.3 * I_{max} * R_{dson(10V)} / I_{ocset}$
 = $14.43 * 2.8\text{mohm} / 10\mu\text{A}$
 = 4.04K

Rdson(10V) 10V

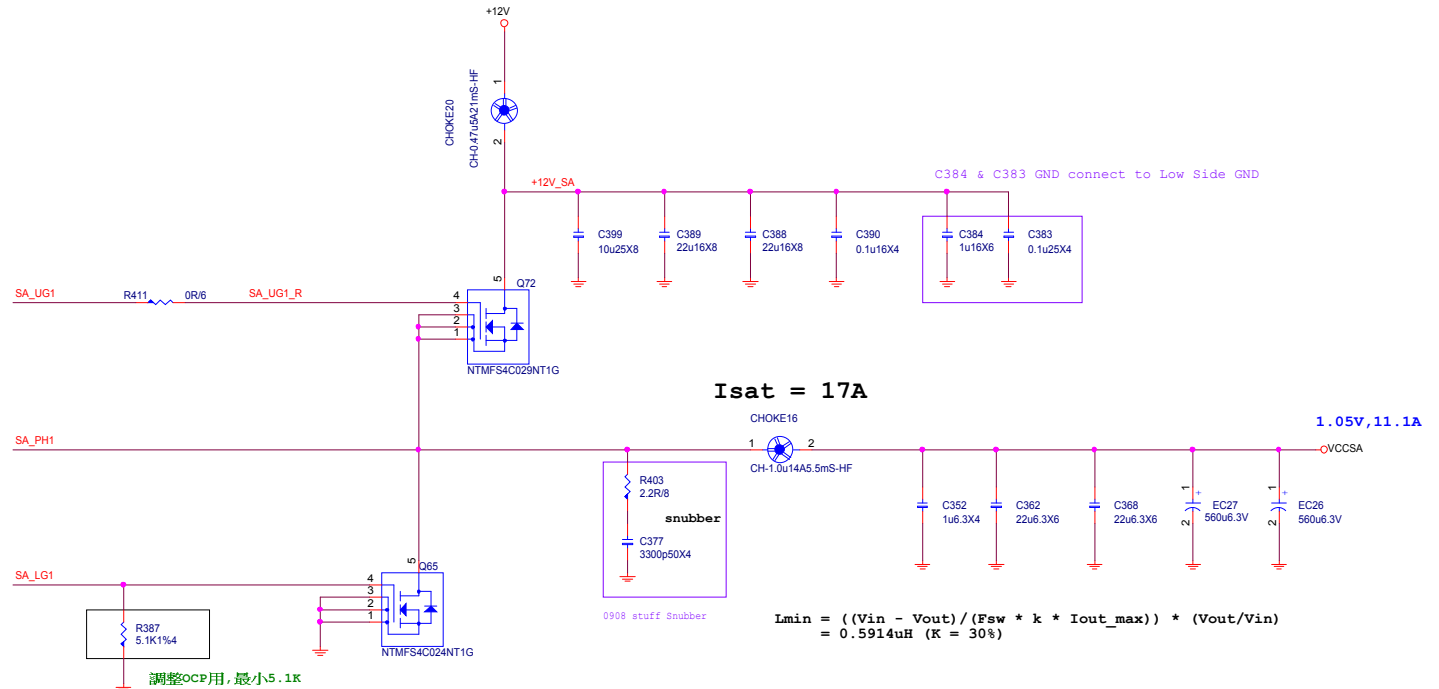
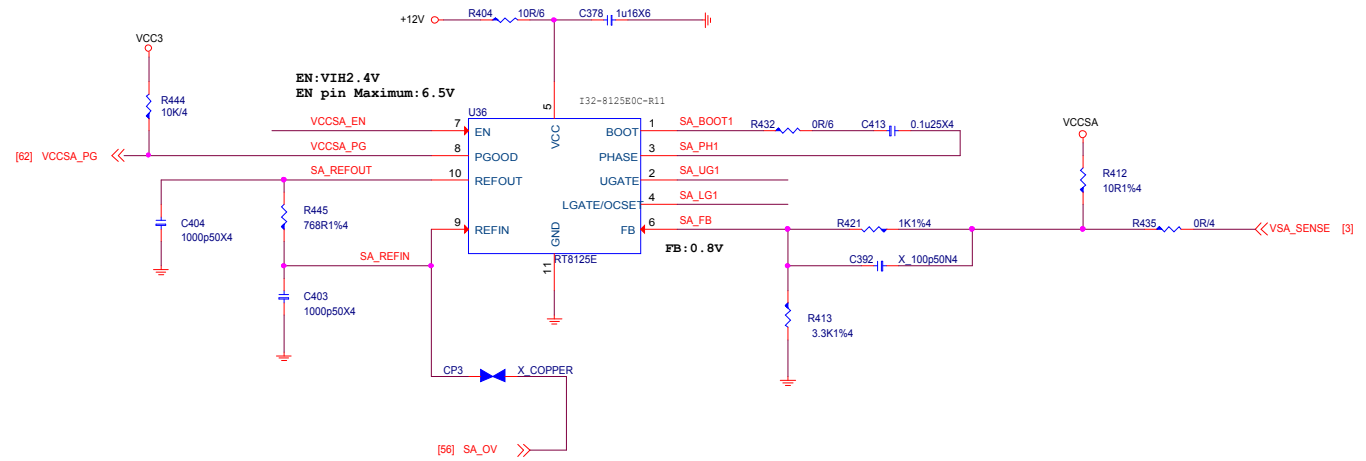
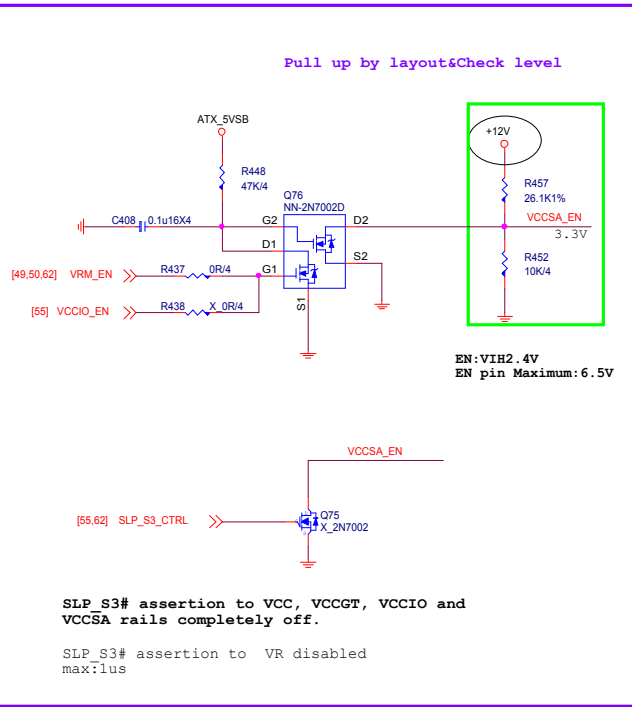
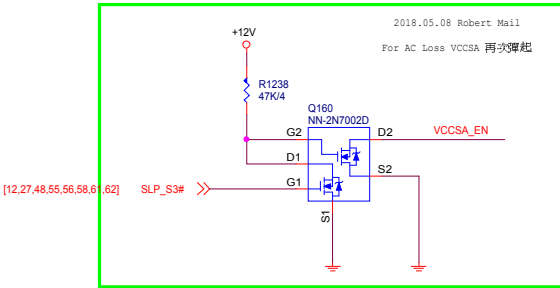
MOS : 2.8mohm

最低5.1K

D03-4C02403-005

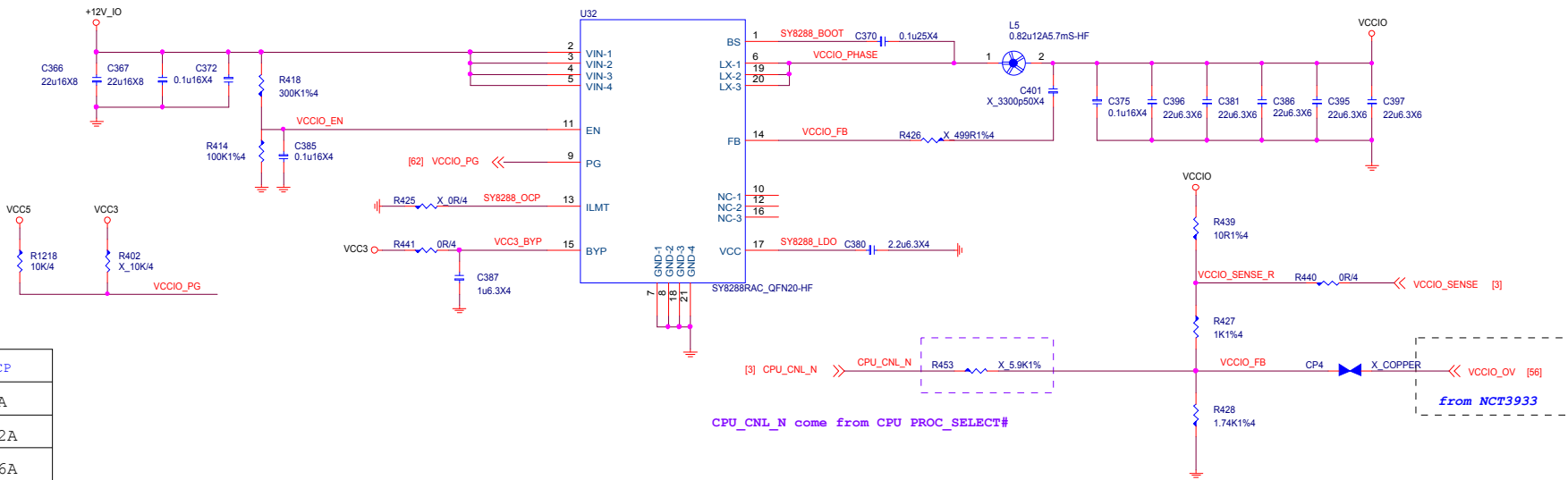
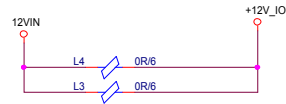
Current limit= $5.1K * 10\mu\text{A} / 2.3\text{mohm}$ = 22.17A

Current limit= $5.1K * 10\mu\text{A} / 2.8\text{mohm}$ = 18.21A

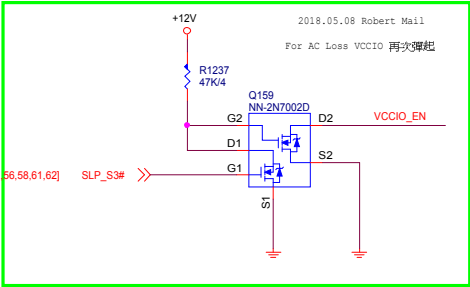
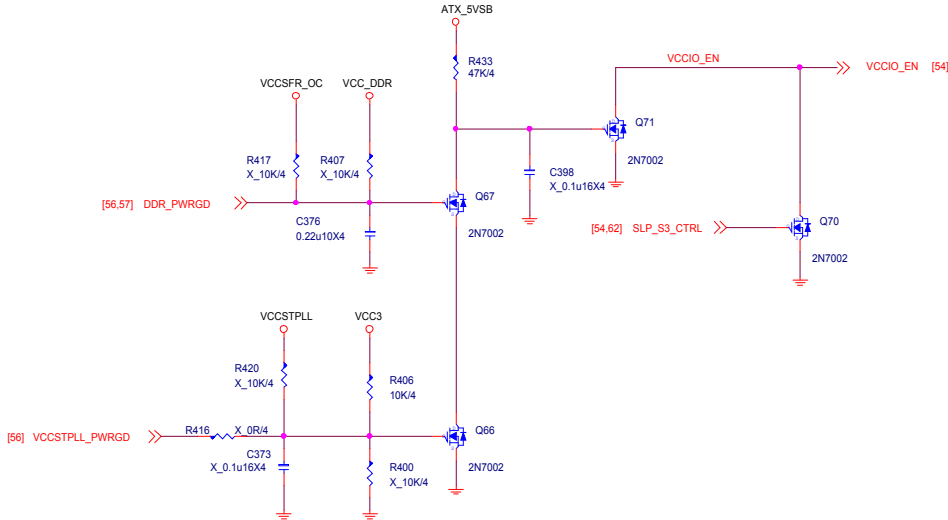


IO Power:0.95V,6.4A

IMAX 10A
ILIMIT=10A~12A
IOC=ILIMIT+40%*IMAX/2=12A~14A.

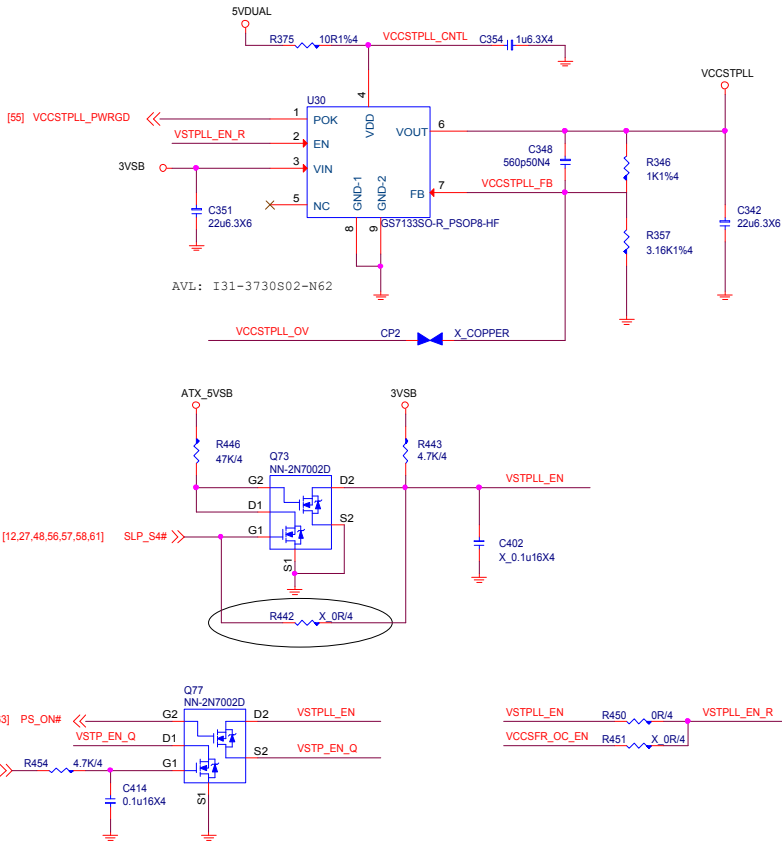


SY8288_OCP	OCP
0	8A
floating	12A
1	16A



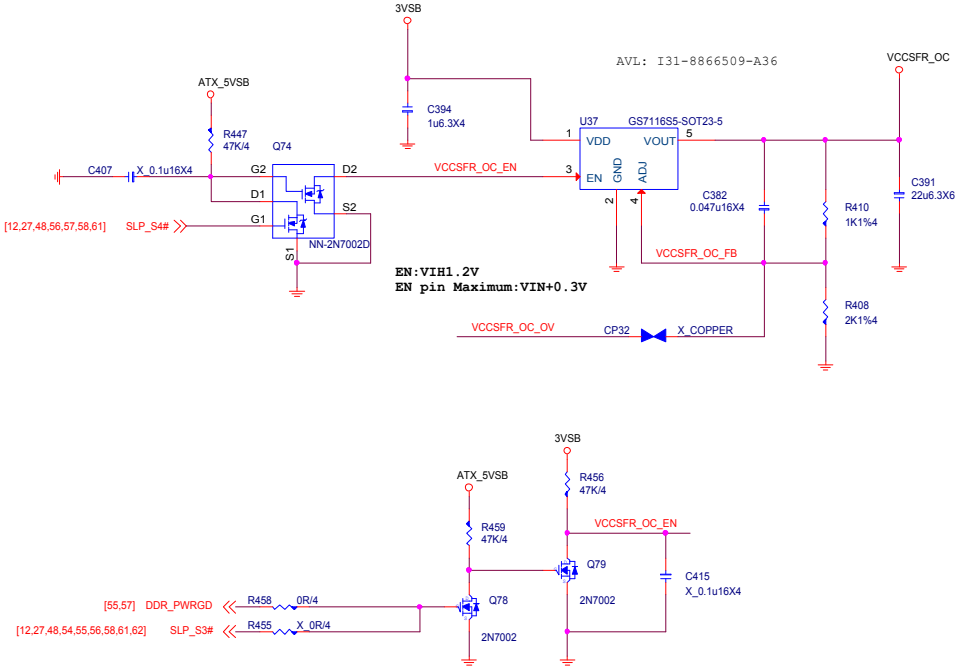
VCCSTPLL

1.05V; 230mA



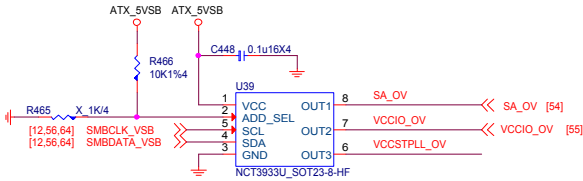
VCCPLL OC

1.2V; 130mA

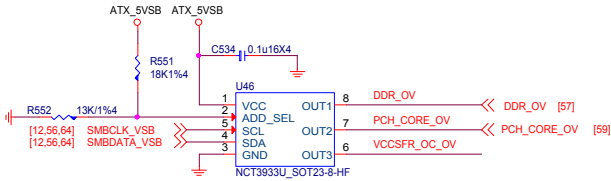


VOLTAGE CONSOLE

0x20:RH=10K,RL=OPEN



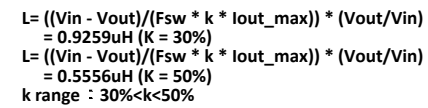
0x26:RH=18K,RL=13K



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Size	Document Description	Rev
Custom	CPU PWR-VCCST/PLL	1.1
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Size Custom	Document Description DDR4 Power-RT8125	Rev 1.1
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OCP:7.5A



Size Custom	Document Description DDR PWR VPP25/VT-MP2147	Rev 1.1
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PCH_1VSB Power:1.05V,14A

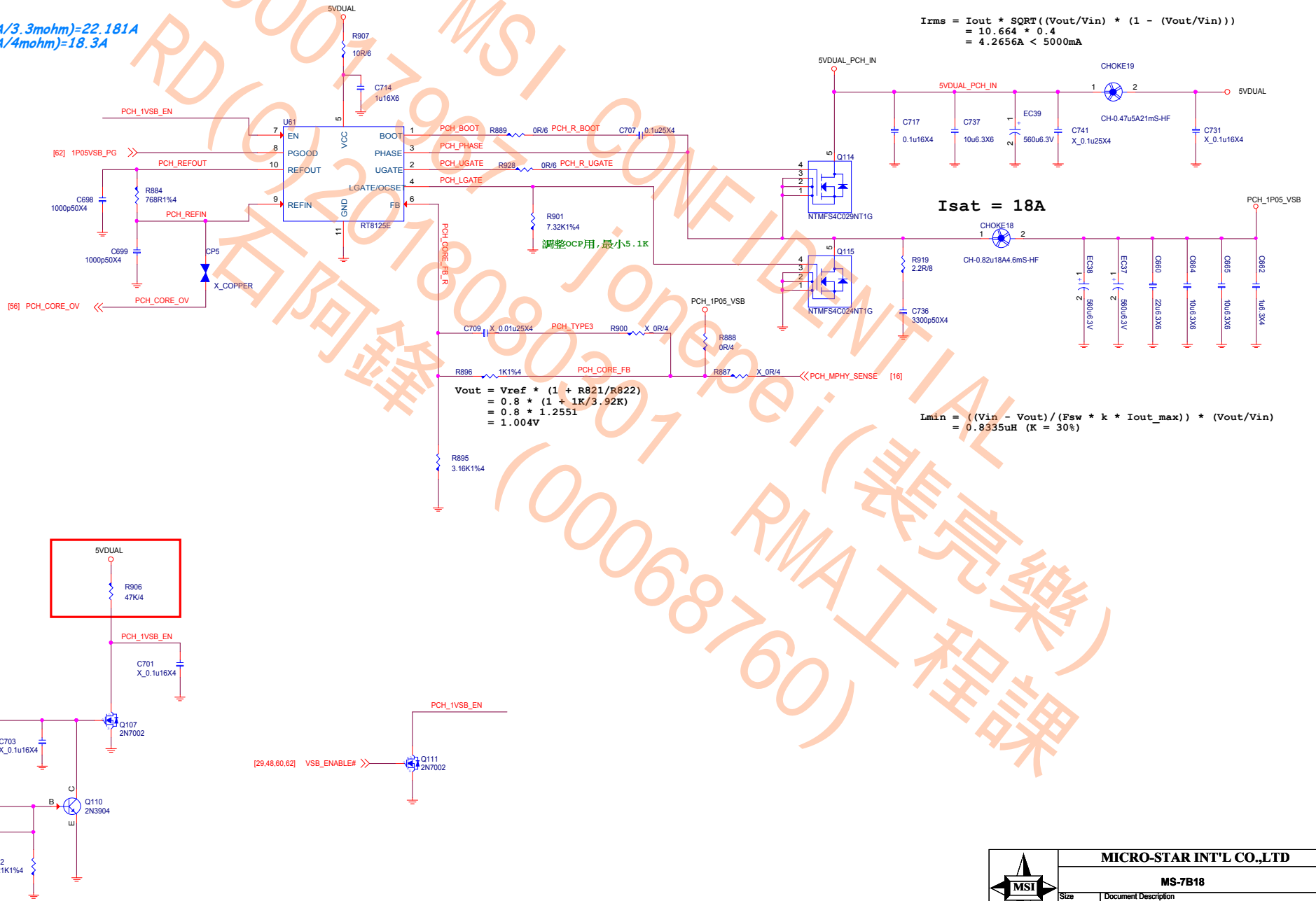
OCP = 18.2A

$R_{ocset} = 1.3 * I_{max} * R_{dson(1ow)} / I_{ocset}$
 $= 18.2 * 4mohm / 10uA$
 $= 7.28K$

D03-4C02403-005
Current limit= $7.32K * 10uA / 3.3mohm = 22.181A$
Current limit= $7.32K * 10uA / 4mohm = 18.3A$

$R_{dson(1ow)} 5V$

D03-4C02403-005 : 4mohm

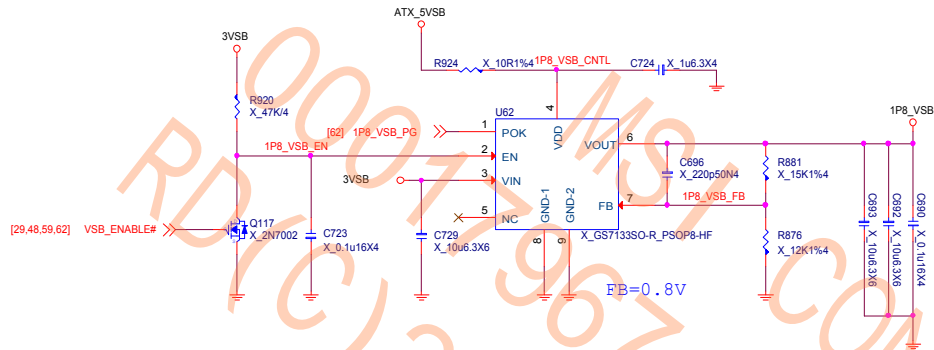


MICRO-STAR INT'L CO.,LTD

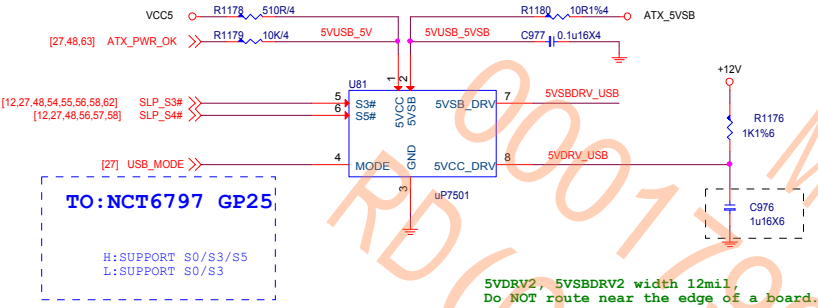
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Size	Document Description	Rev
Custom	PCH POWER-RT8125E	1.1
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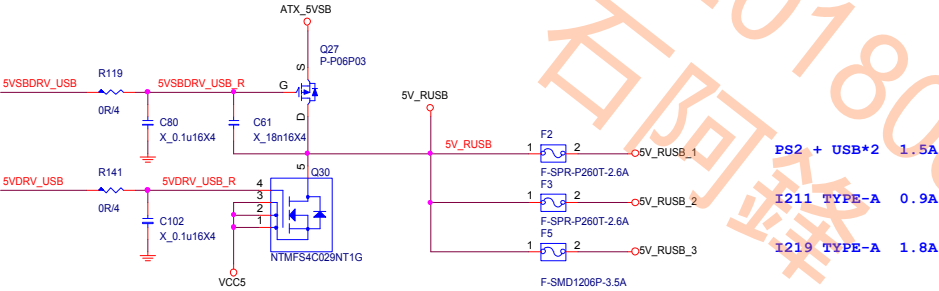
1P8_VSB



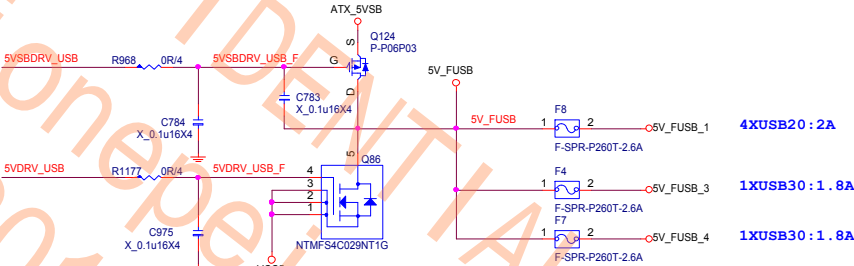
USB POWER

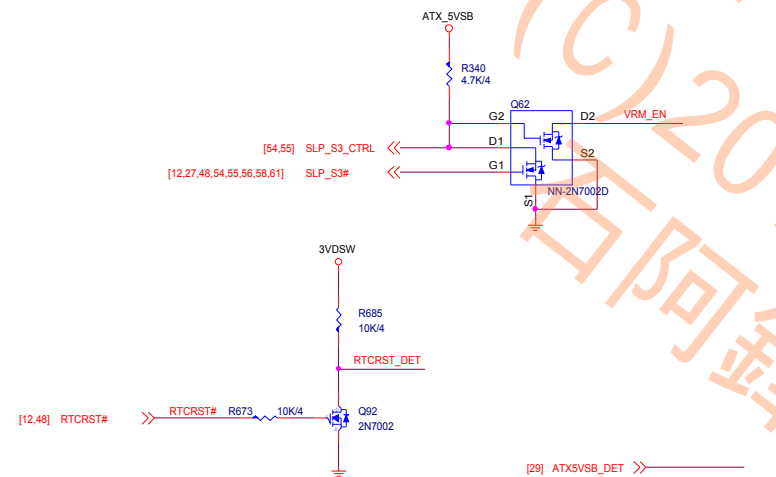
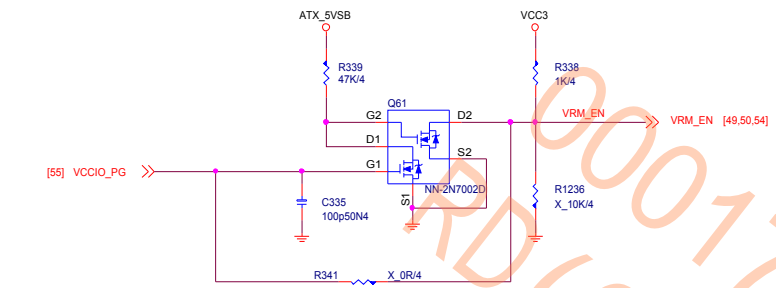


REAR USB PORT POWER

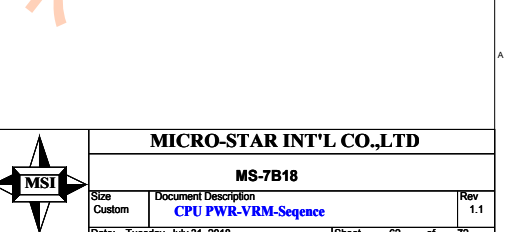
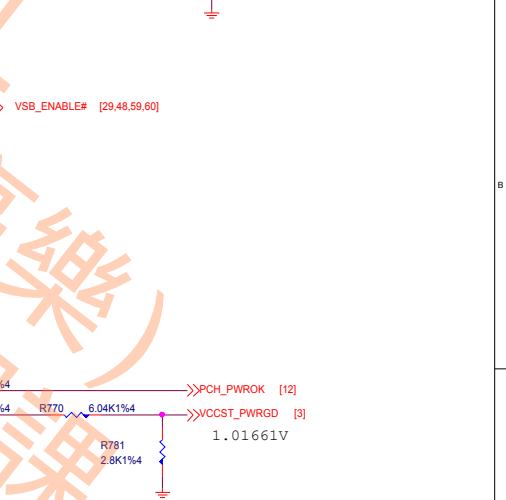
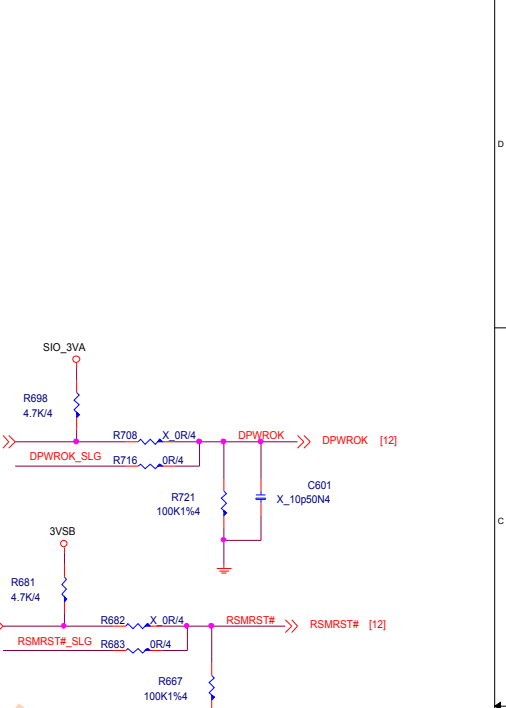
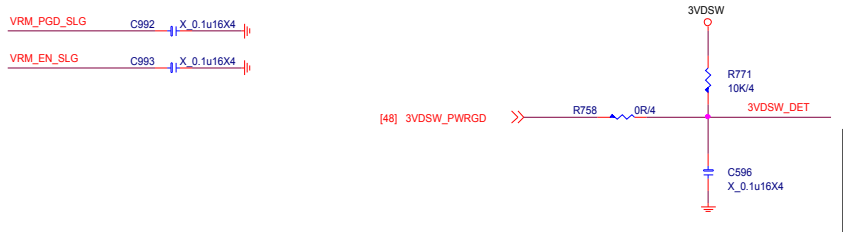
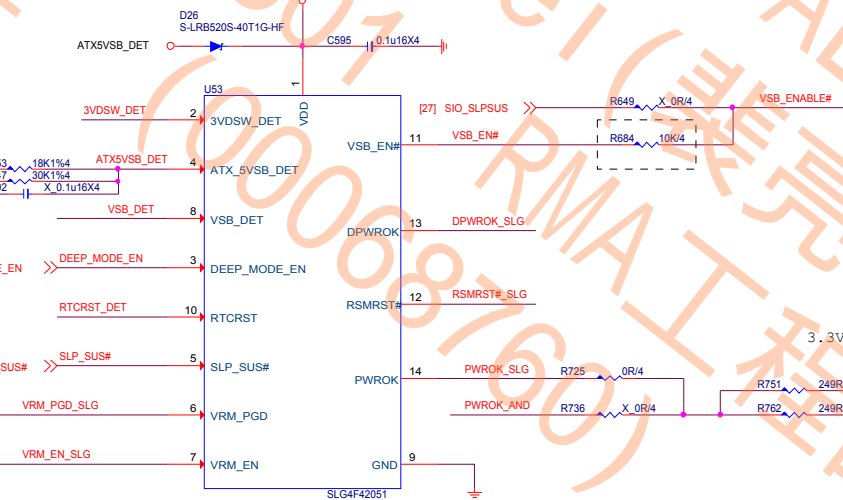
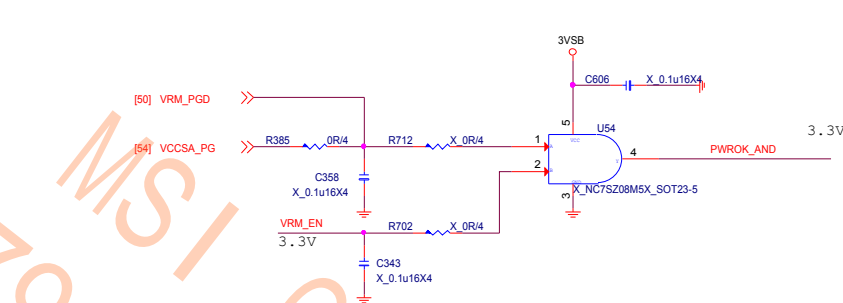
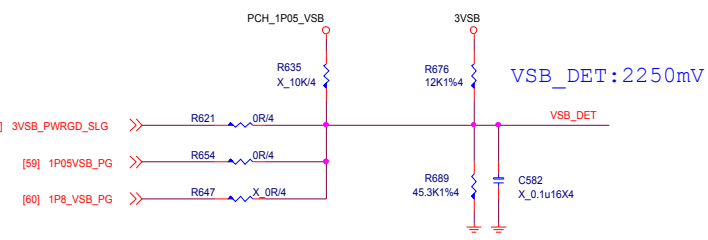
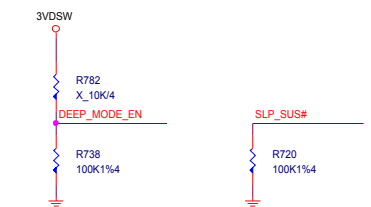


FRONT USB PORT POWER

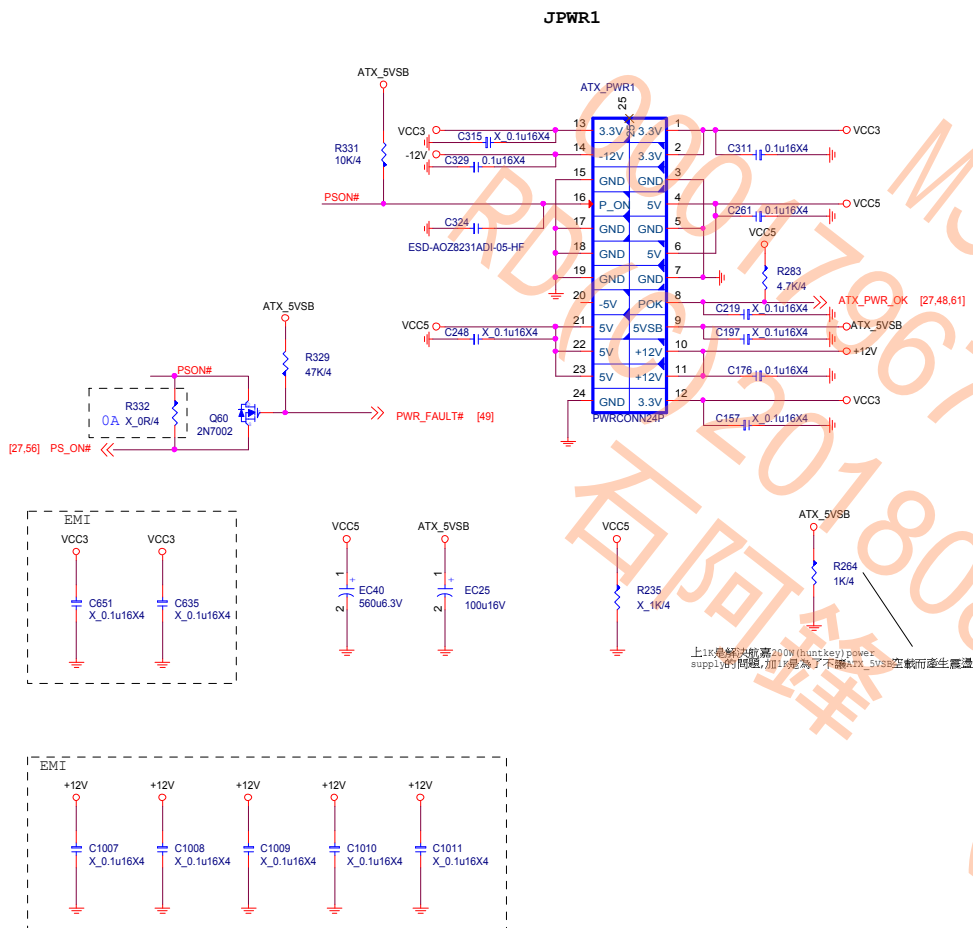




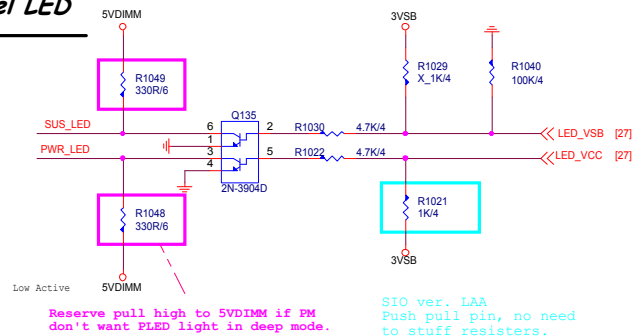
	DEEP_MODE_EN
DEEP_MODE	1
S5_MODE	0



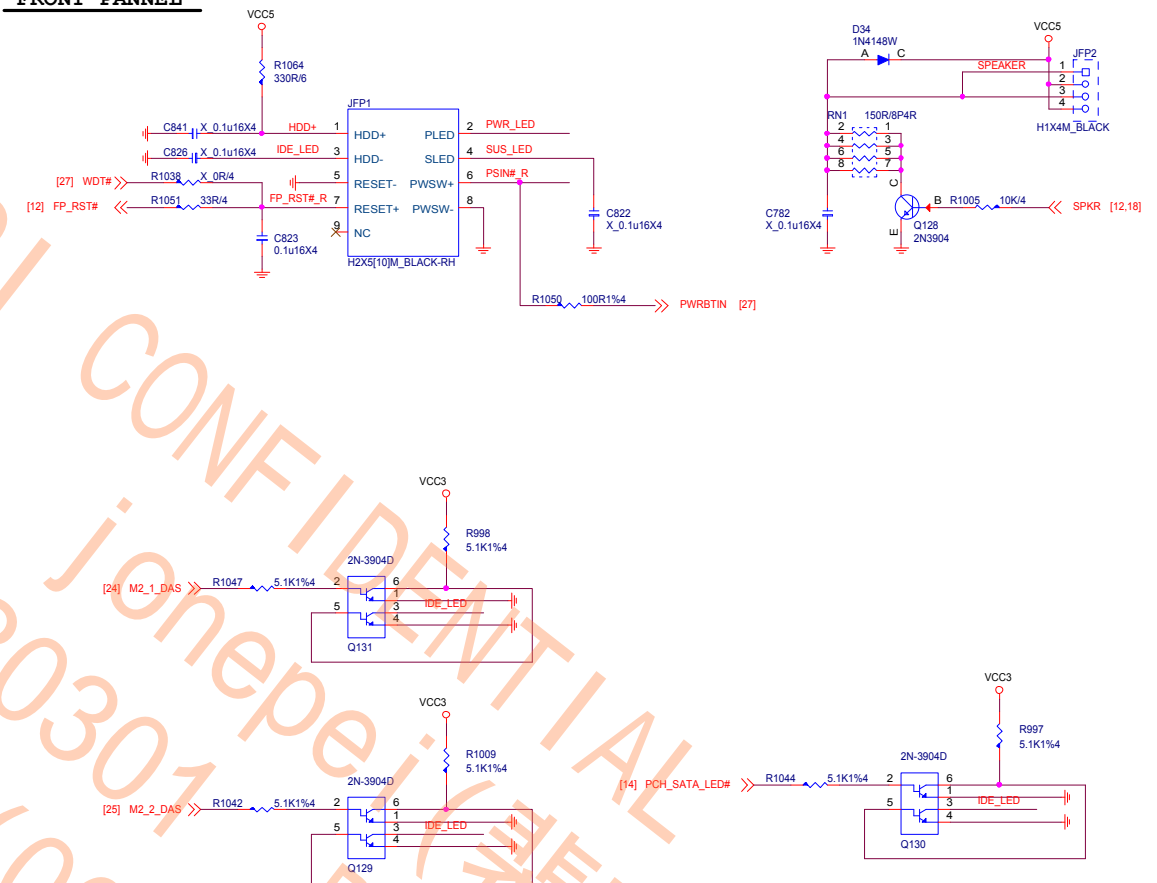
ATX POWER CONNECTOR



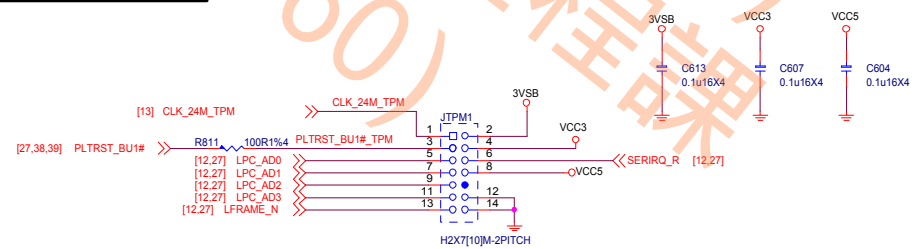
Front Panel LED



FRONT PANNEL



TPM Pin Header

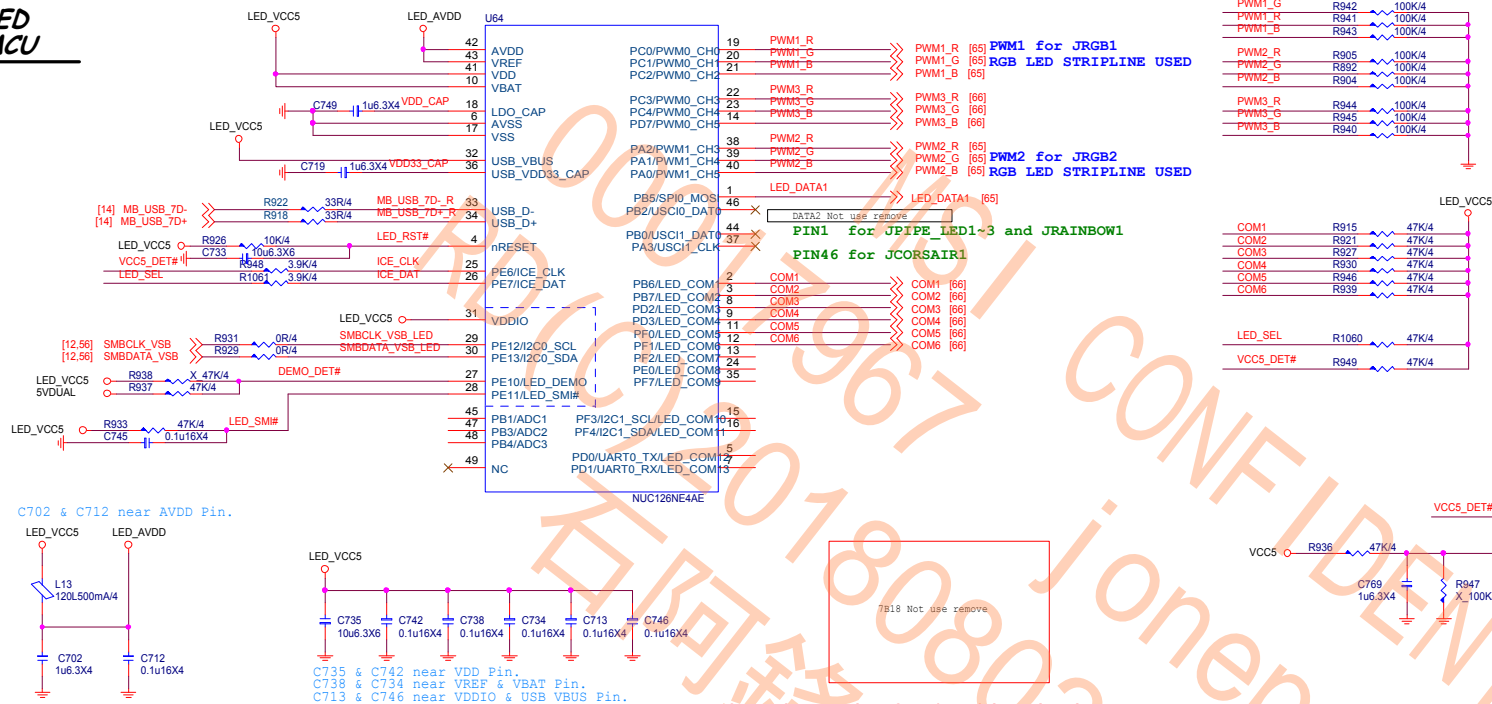


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LED MCU



EXTERNAL POWER INPUT

7B18 Not use remove

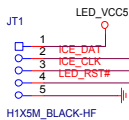
External Power

If SPEC has LED demo function without demo button, DEMO_DET# must pull up to LED VCC5, Q319 need to stuff and control by LED_VCC5_EN. PS. R2069 remove, R2032 and Q319 need to stuff

7B18 Not use remove

JT1 for FW update

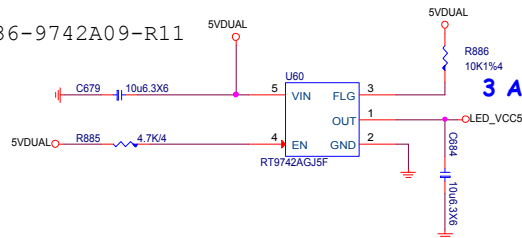
For FW update.



Voltage HW monitor

7B18 Not use remove

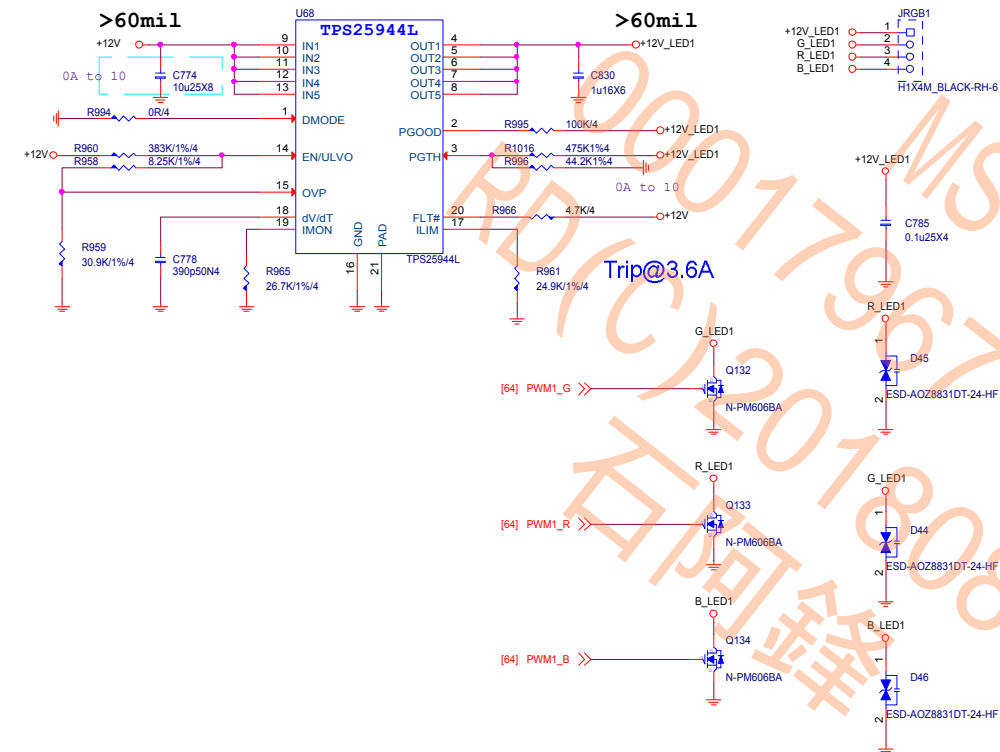
I36-9742A09-R11



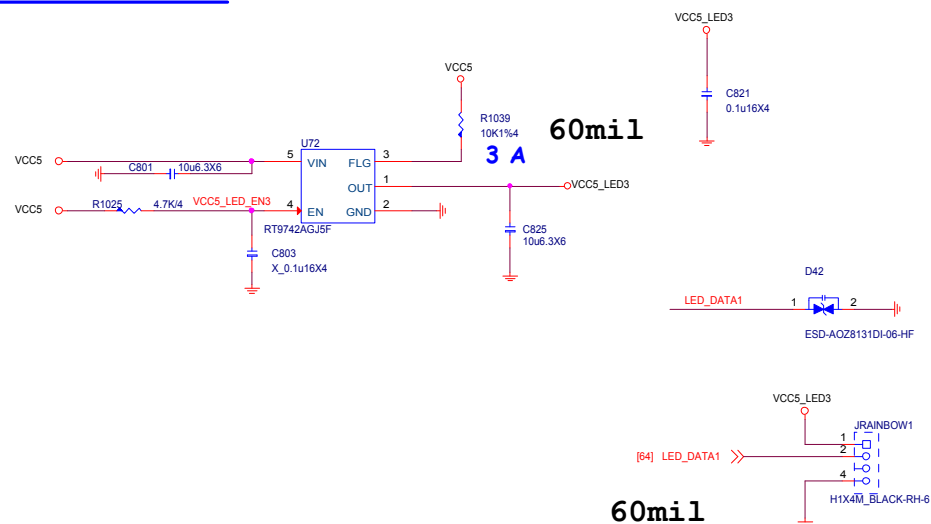
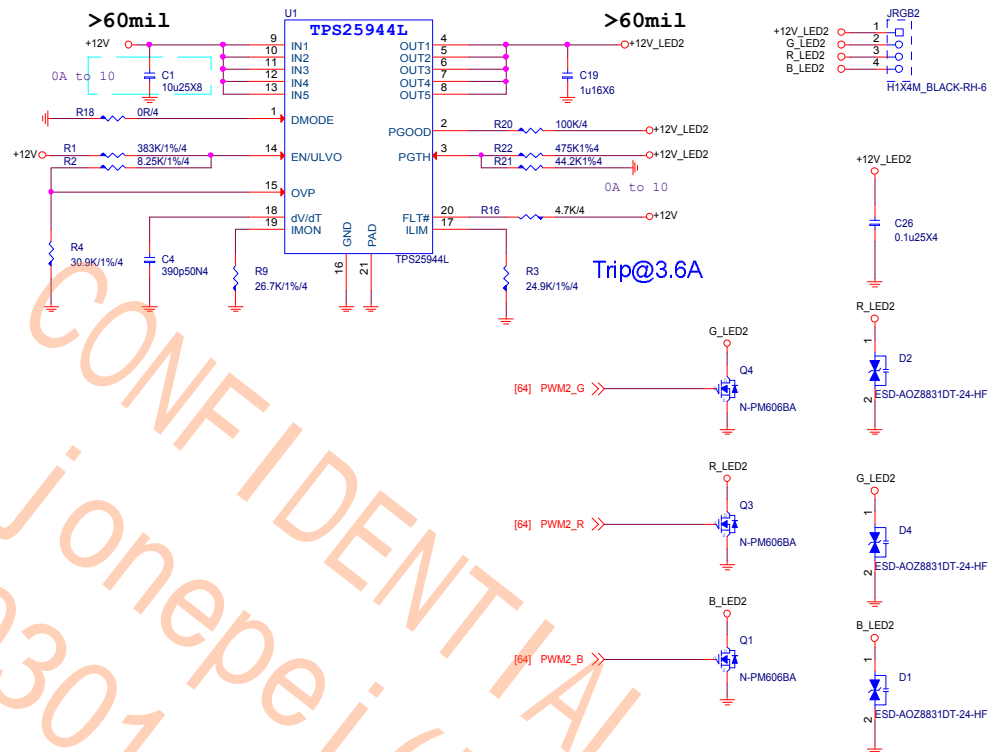
MICRO-STAR INT'L CO.,LTD

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Custom	EMI CAP	1.1
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JRGB1

**LED STRIPLINE
JRAINBOW1**

JRGB2

JCORSAIR1

7B18 Not use remove

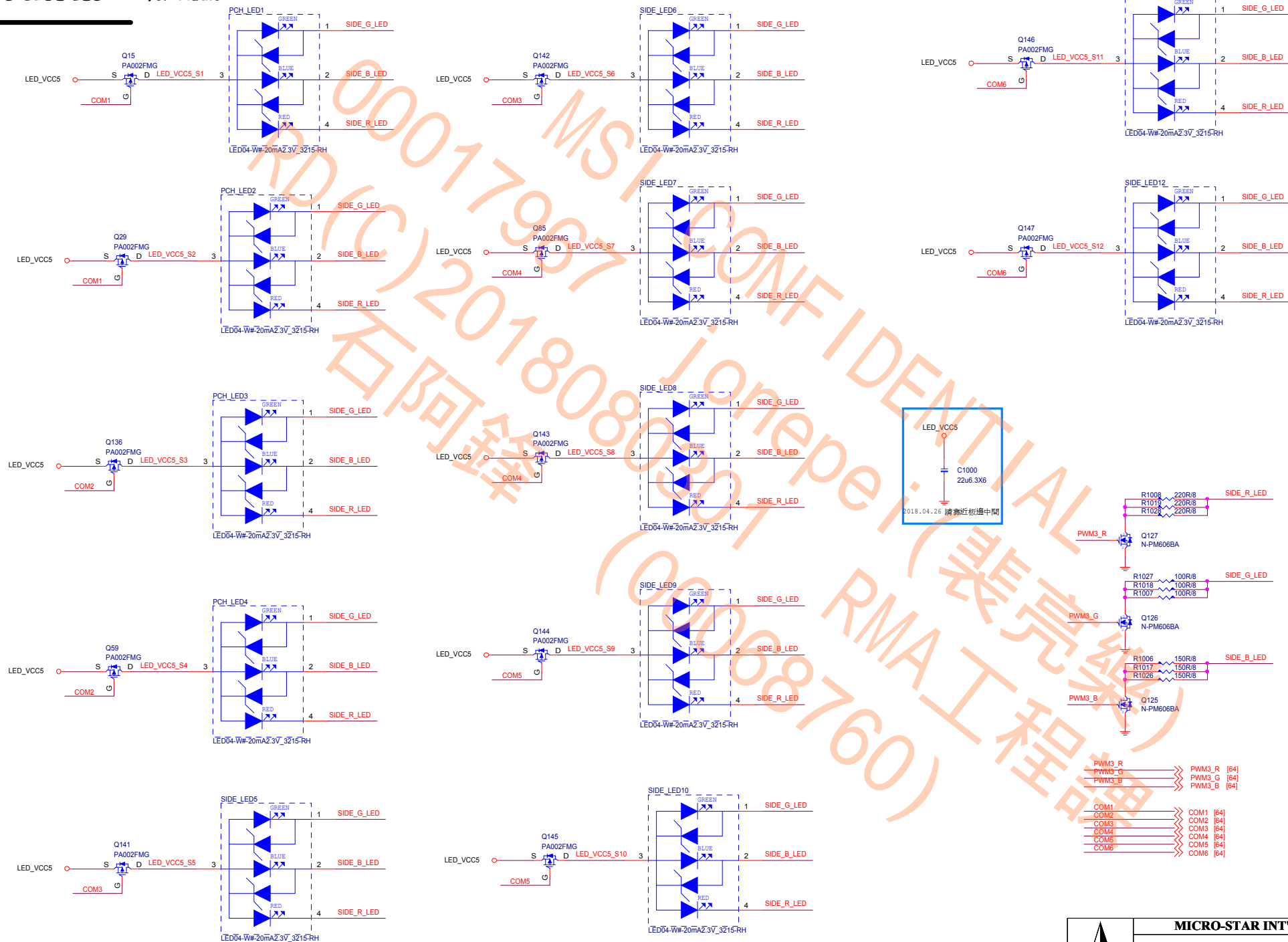


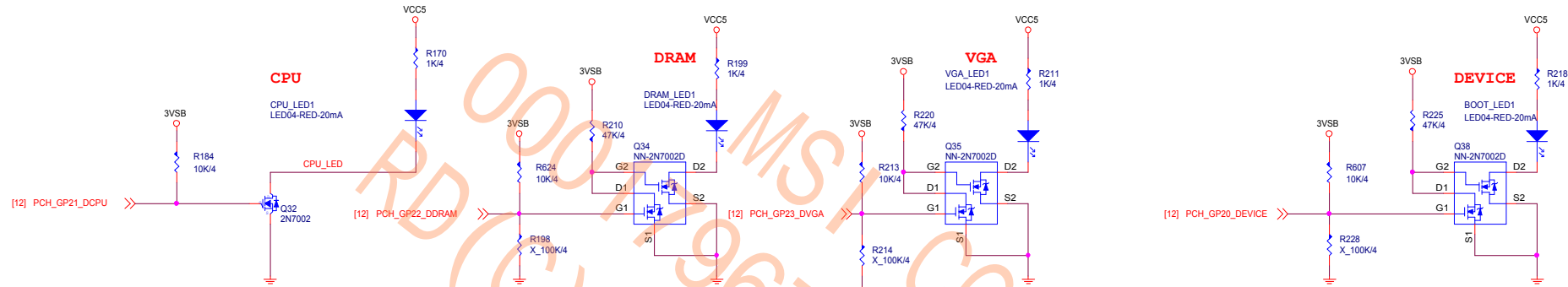
MICRO-STAR INT'L CO.,LTD

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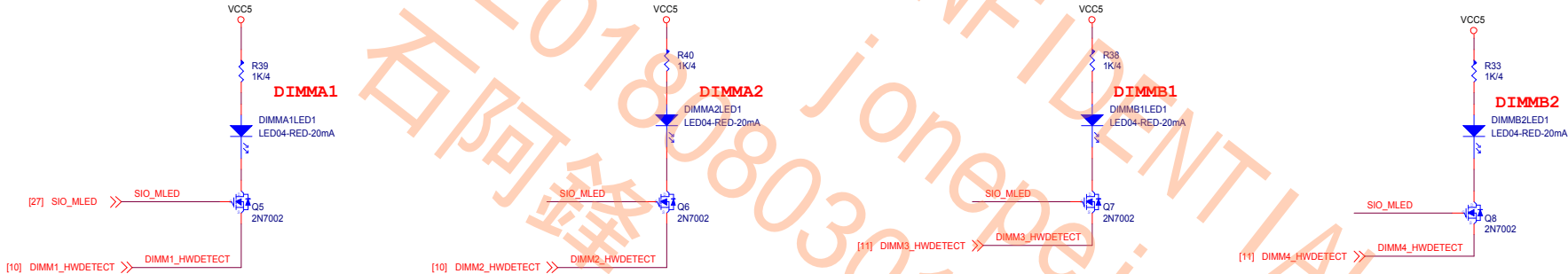
Size Custom	Document Description EMI CAP	Rev 1.1
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BOARD SIDE LED *12 for Audio





DIMM SLOT LED



XMP LED

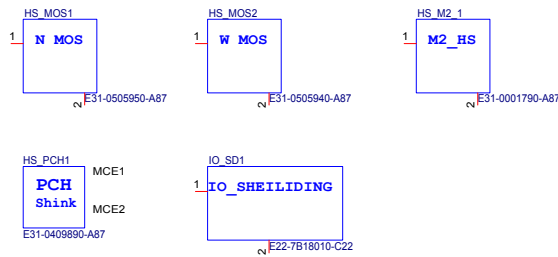




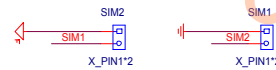
PD0-07B1810-E48
PD0-07B1810-G37



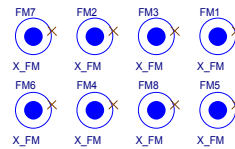
HEATSINK



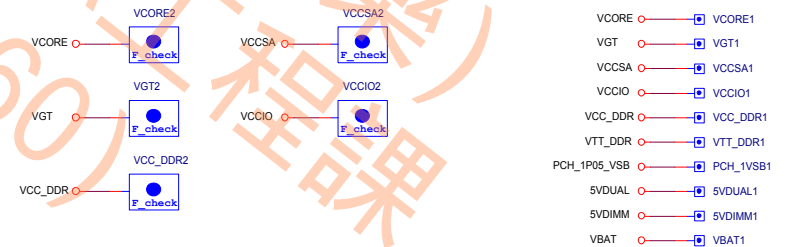
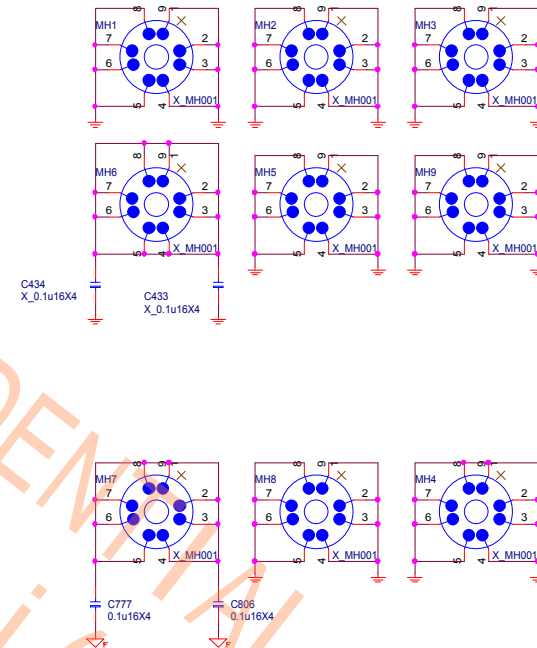
Simulation



Optical Fiducial Marks-120



Mounting Holes



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Custom	Manual Parts	1.1
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