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MS-7A98

EATX

Ver: 20
305mm*272mm

Kabylake Platform

CPU:

Kabylake S

System Chipset:

Z370 PCH_H

Onboard Chip:

*HD Audio Codec:ALC1220*2*

CLK Gen :IDT6V41606BNLG8

*LAN-KILLIER LAN E2500*3*

*FAN CTL:NCT7802*2*

SIO:NTC6795D

MCU:R5F104GDAFB #V0

Dual Flash ROM: SPI 64 MB X2

*USB31:ASM3142*2*

USB HUB:ASM1074

Main Memory:

*DDRIV (5000MHz) * 4 (Dual Channel)*

ACPI:

MPS

PWM:

IMVP8 -IR35201

Expansion Slots:

*PCI Express (X16) Slot * 1*

*PCI Express (X8) Slot * 1*

*PCI Express (X4) Slot * 1*

*PCI Express (X1) Slot * 1*

Other:

*SATA3.0 *6*

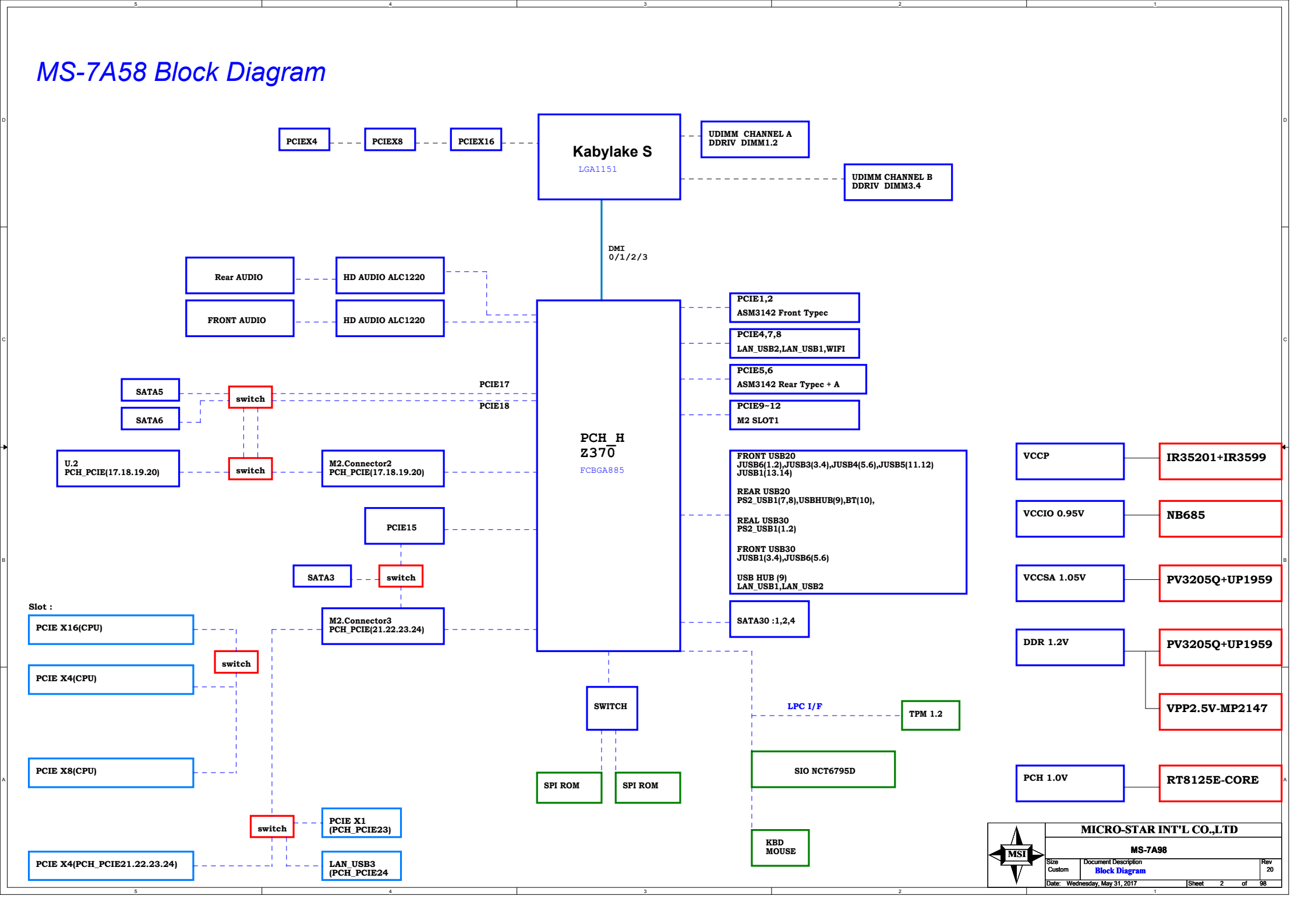
*REAL USB3.0 *7+TYPEC*1*

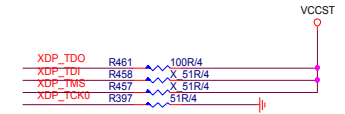
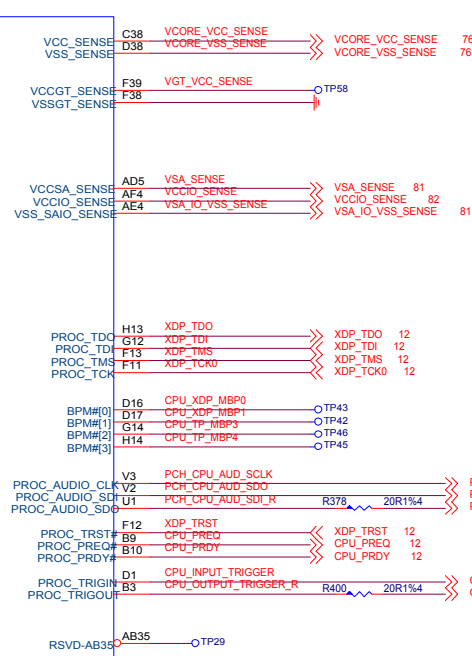
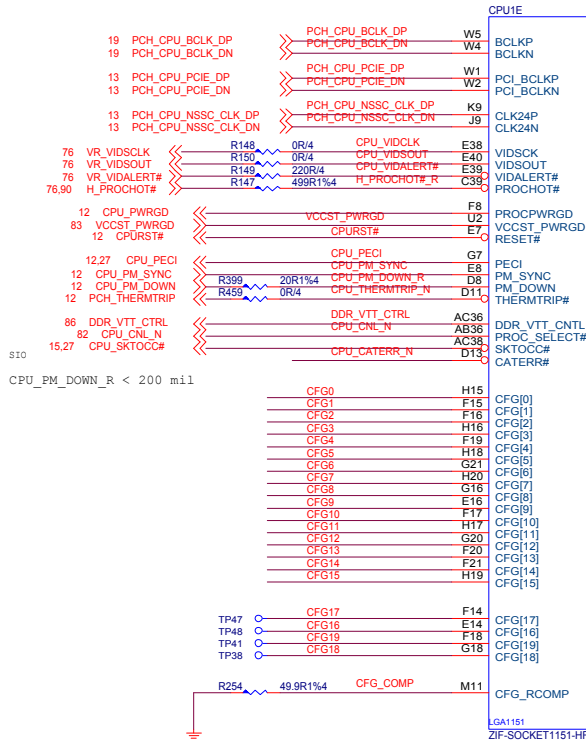
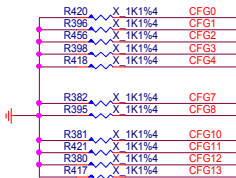
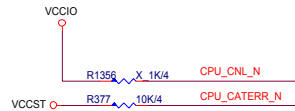
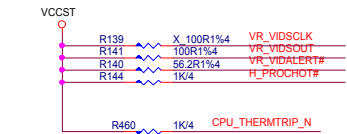
*FRONT USB3.0 *4+TYPEC*1*



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MS-7A58 Block Diagram



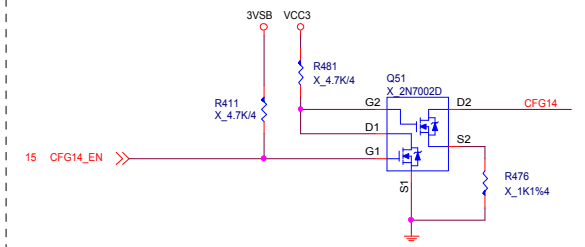
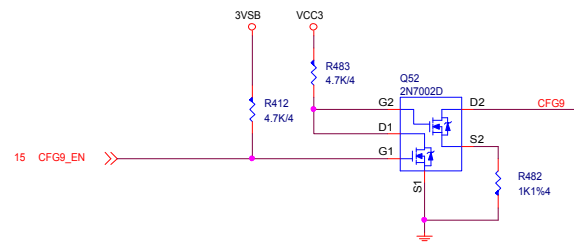
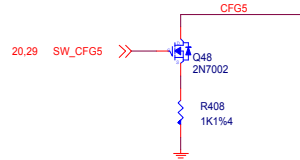


Close CPU <1100 mil
1000 mil < CPU_XDP_MBP0~1 < 6000 mil



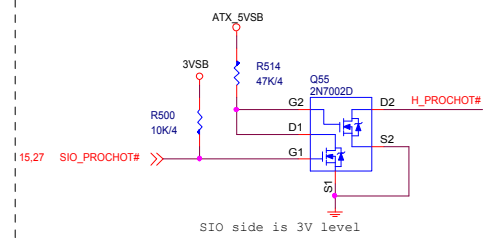
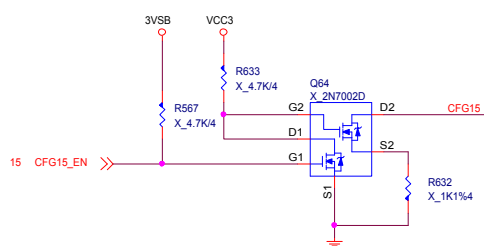
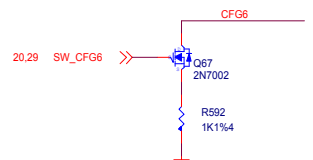
X8 and X4 Ctrl

ENABLE#	X8	X4	SLOT2	SLOT5	SLOT7
0	0	0	X8	X4	X4
0	1	0	X8	X8	X0
1	0	0	None	None	None
1	1	1	X16	X0	X0



CFG Strap

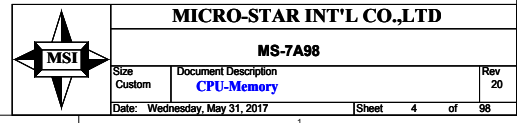
CFG Table			
	HIGH	LOW	DESCRIPTION
0	No Lock	Lock	PCU PLL lock
1			RSVD
2	NORM	REVERSE	PEG LANE REVERSAL
3			RSVD
4	DISABLE	ENABLE	eDP
5	DISABLE	ENABLE	PEG0CFGSEL[0]
6	DISABLE	ENABLE	PEG0CFGSEL[1]
7	RESET#	RTOS REQ	PEG TRFTR TRAINING
8			RSVD
9	PRESENT	NO PRESENT	SVID PRESENT
10			RSVD
11			RSVD
12			RSVD
13			RSVD
14	RSVD		
15	RSVD		

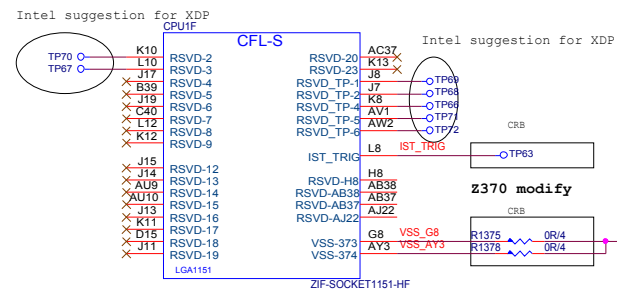
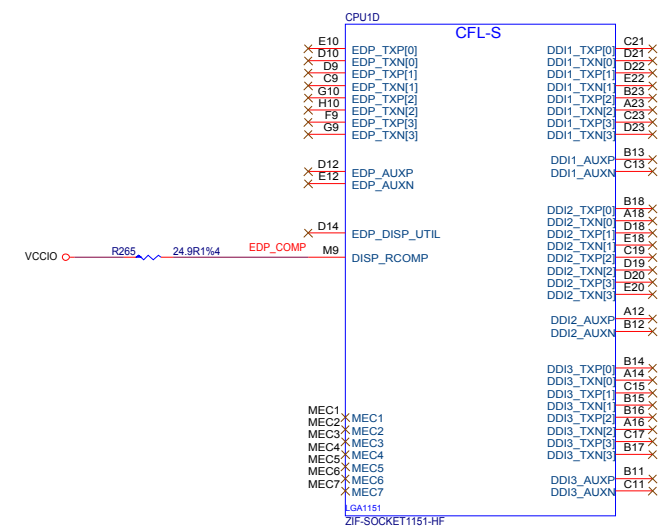
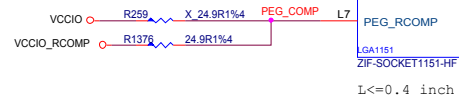
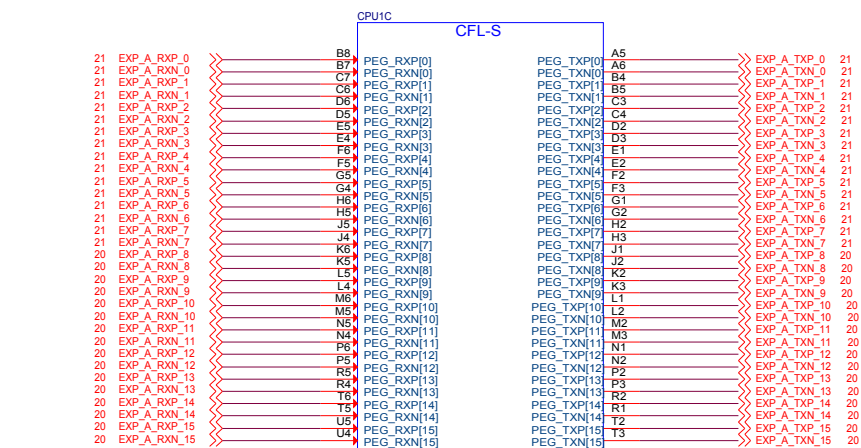


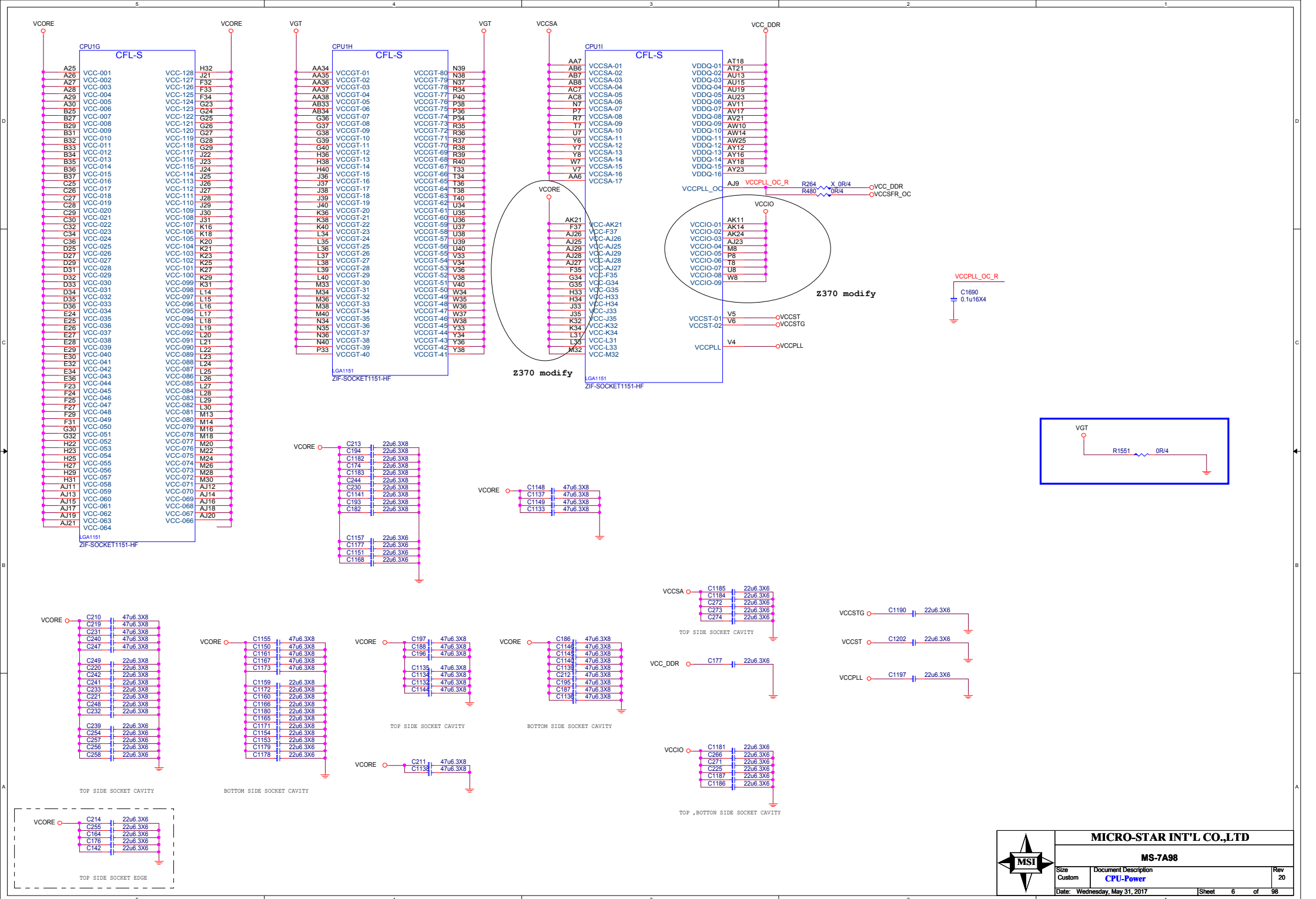
SIO side is 3V level

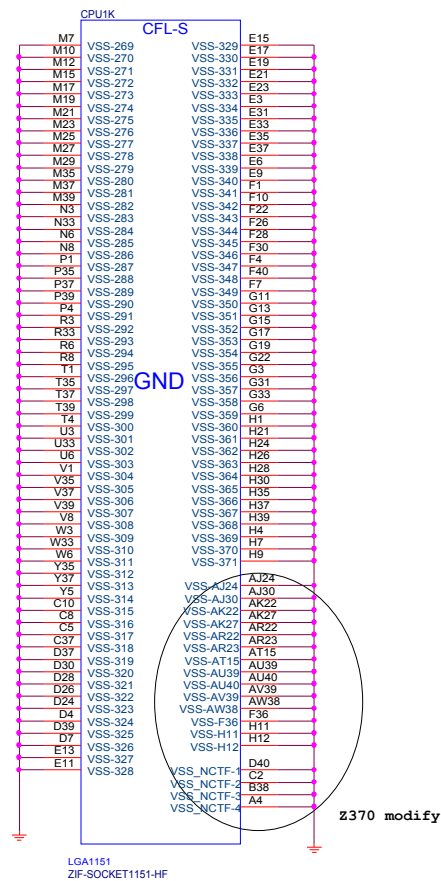
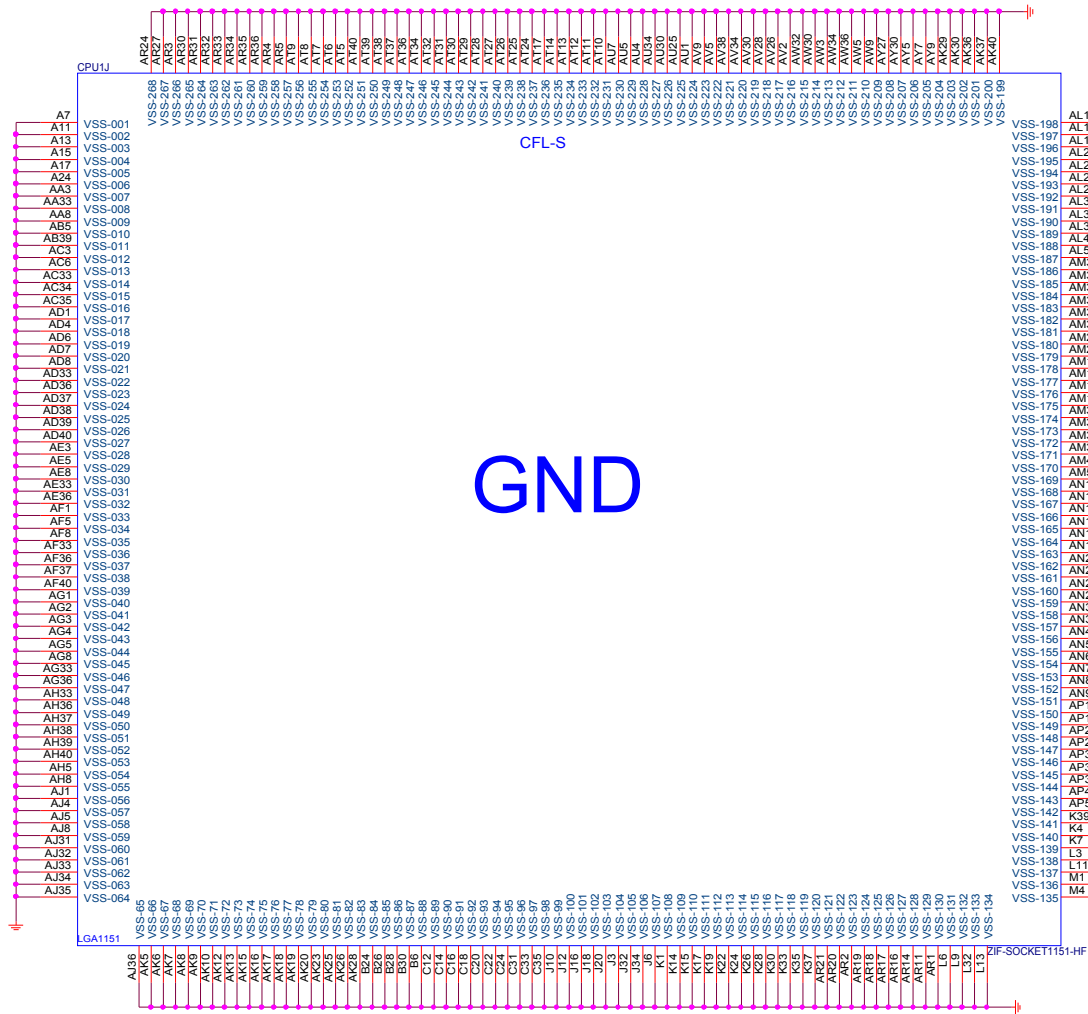
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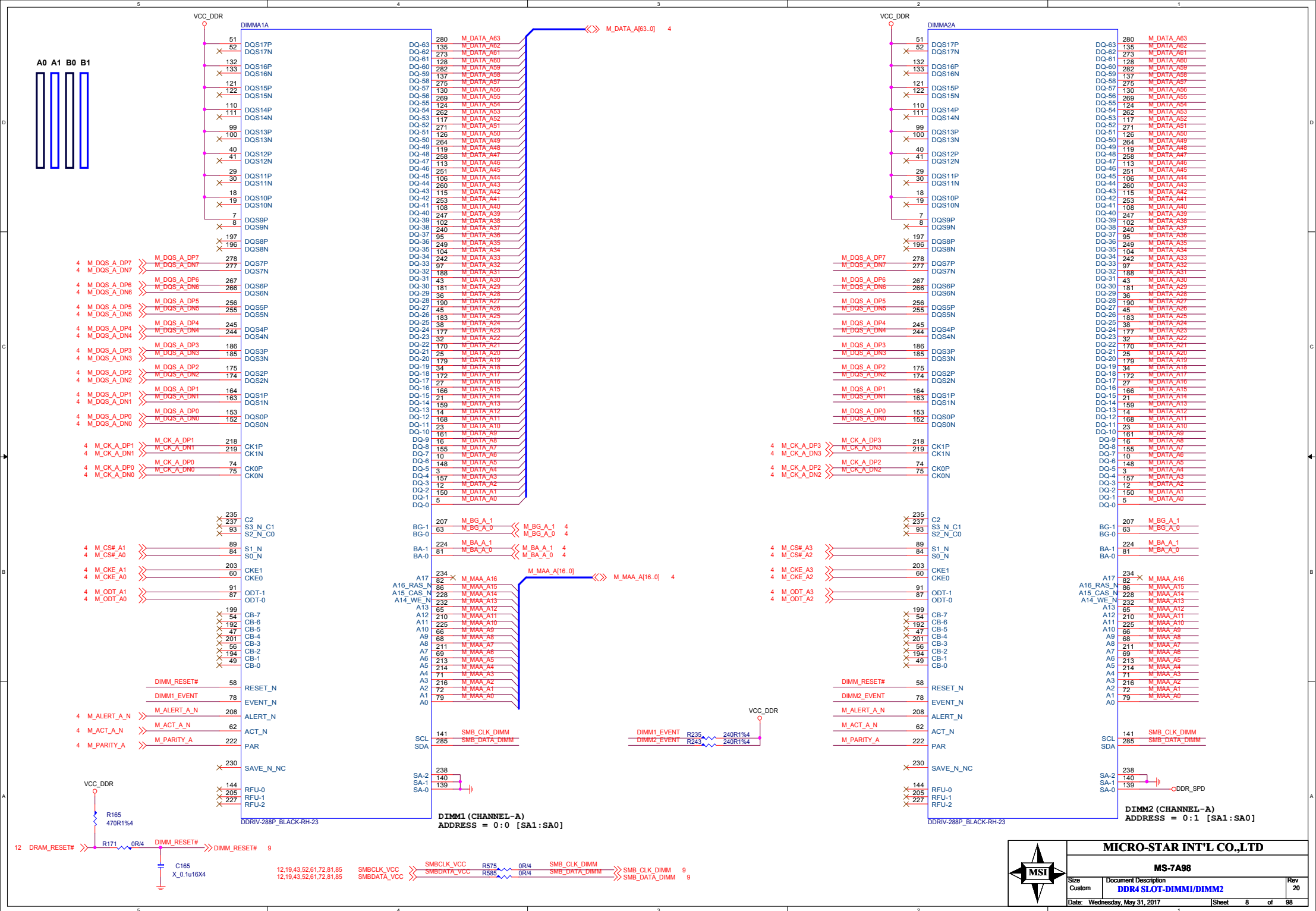
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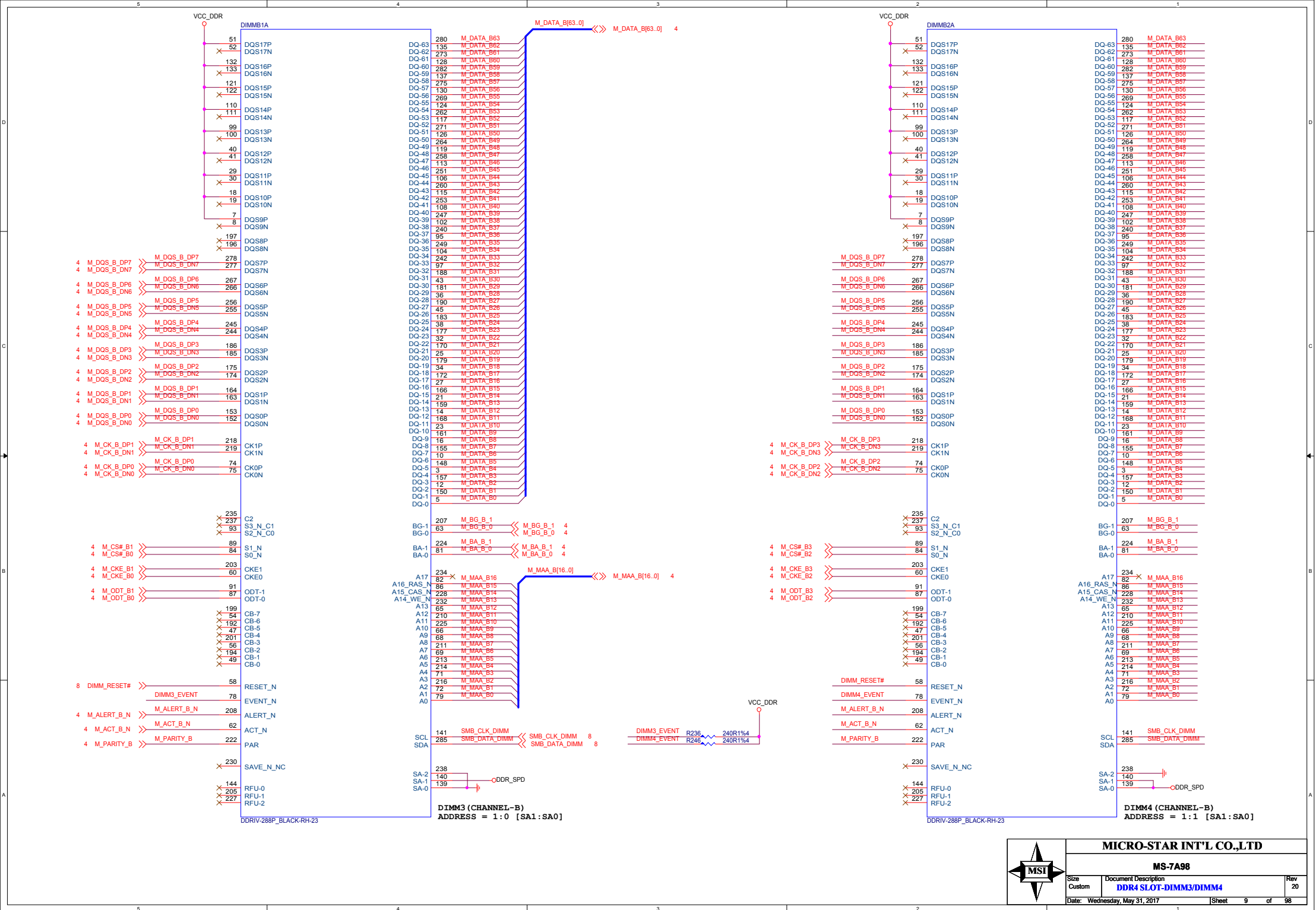


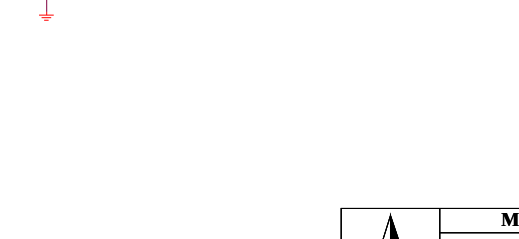
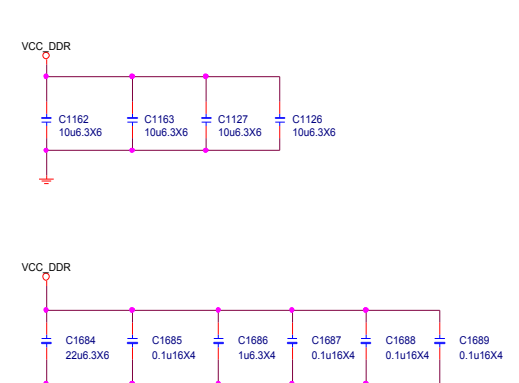
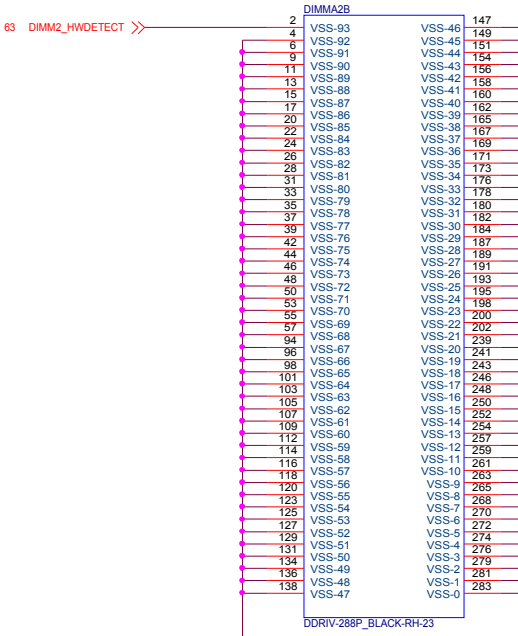
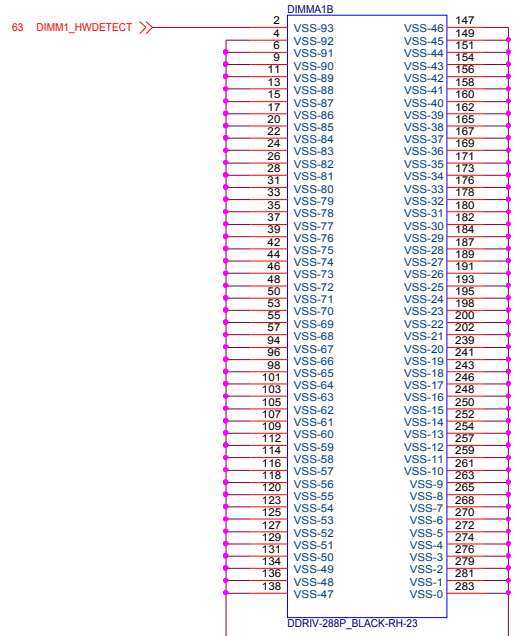
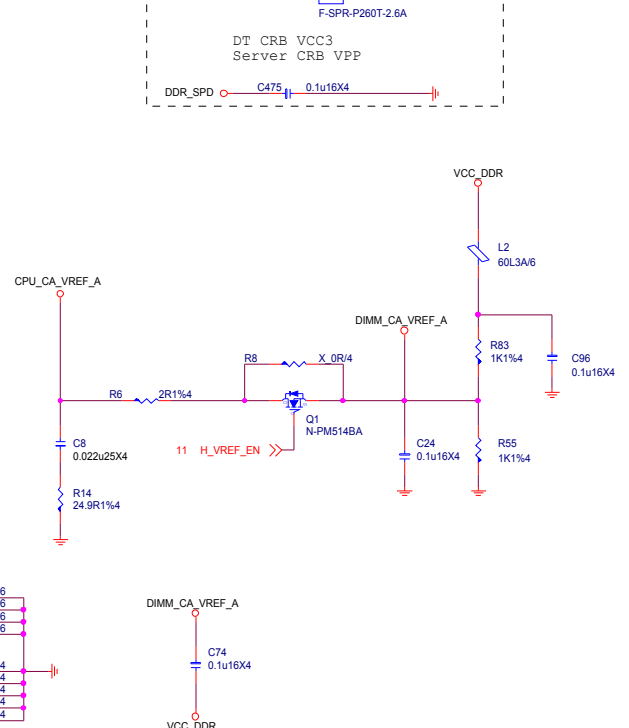
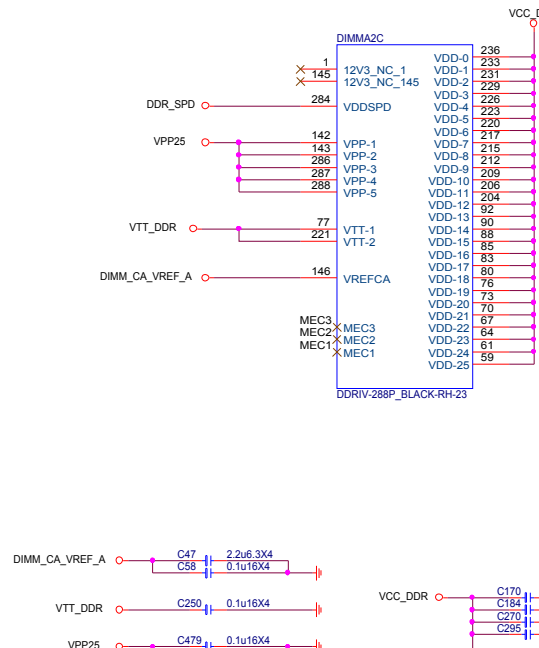
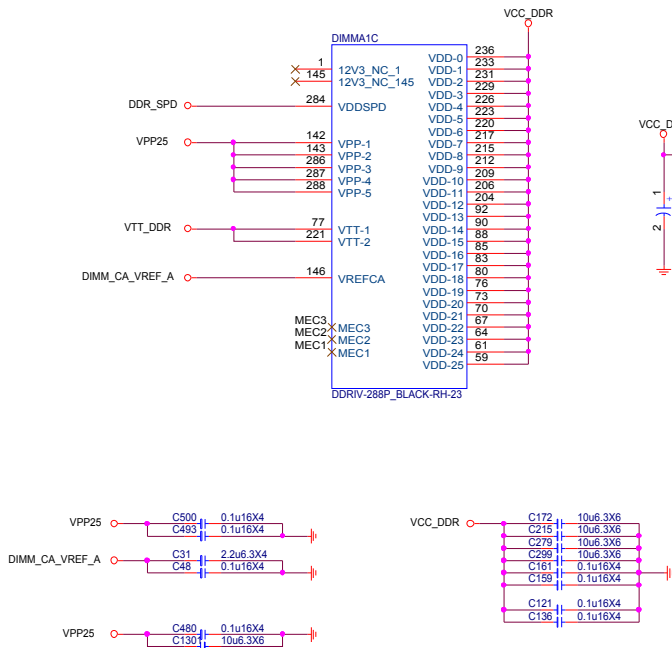


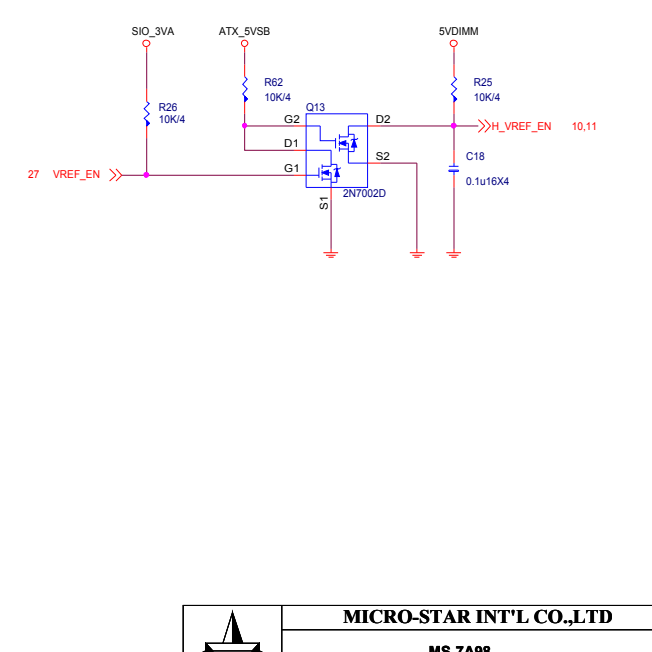
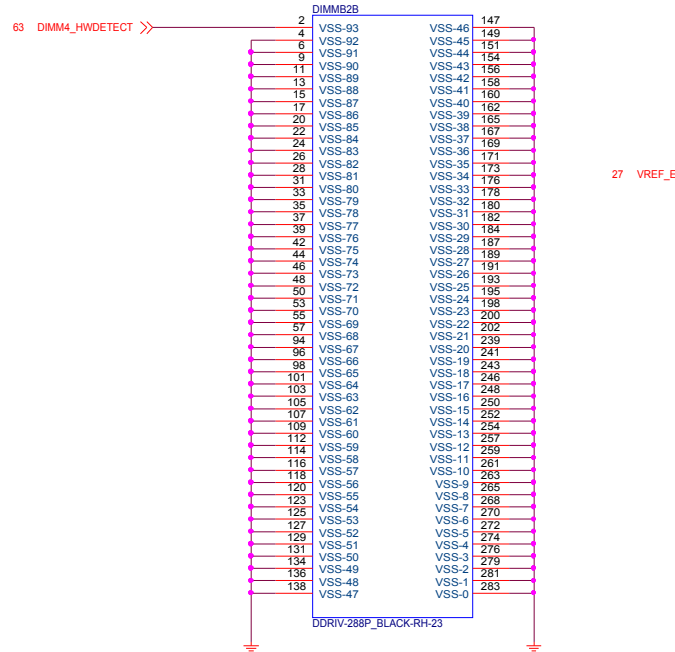
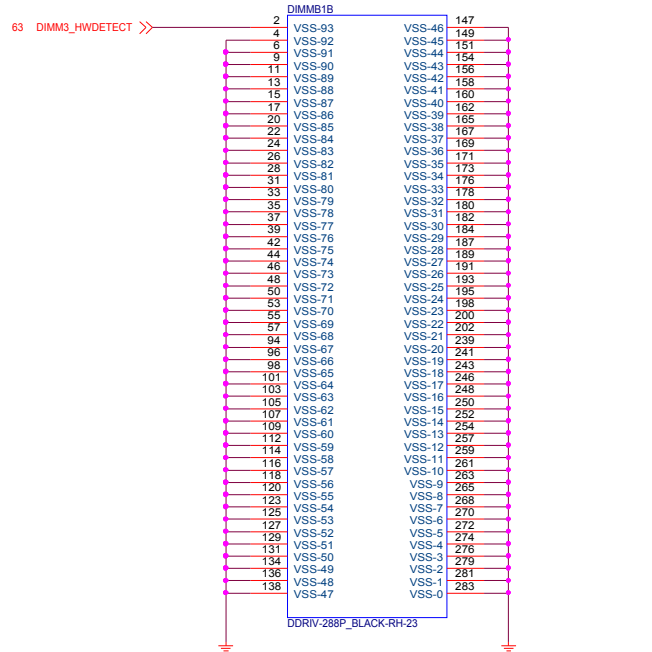
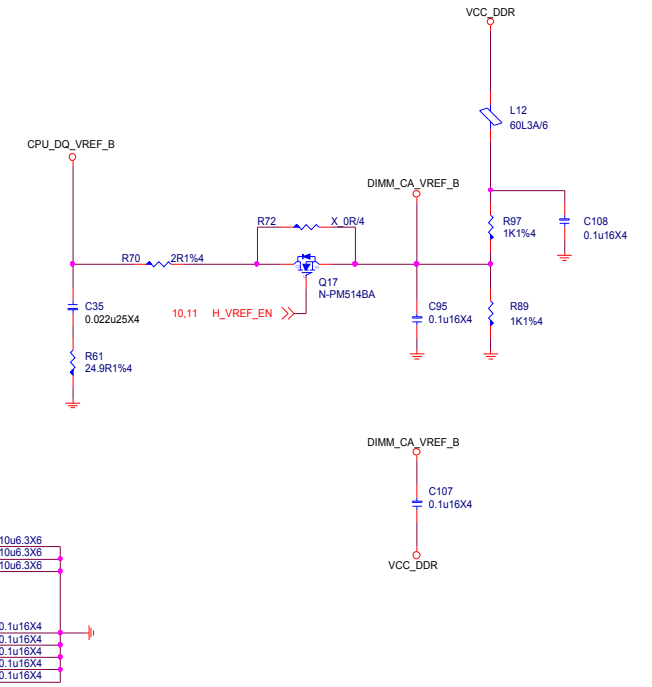
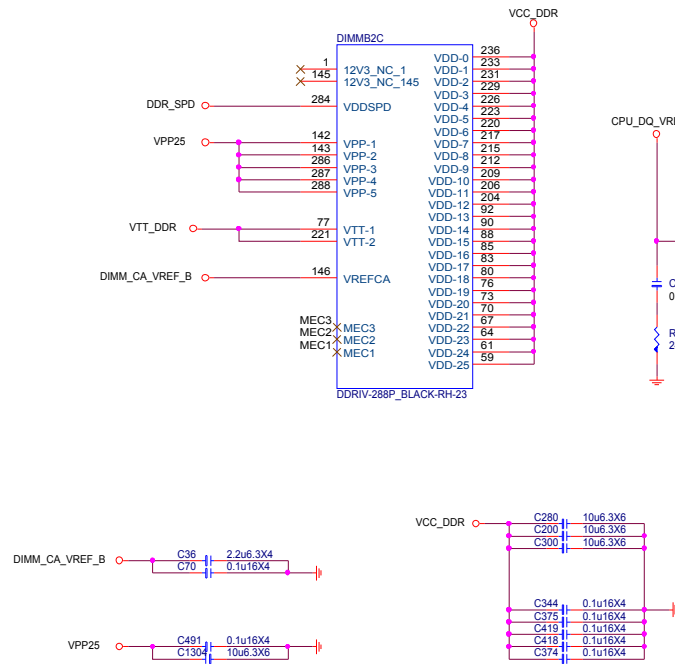
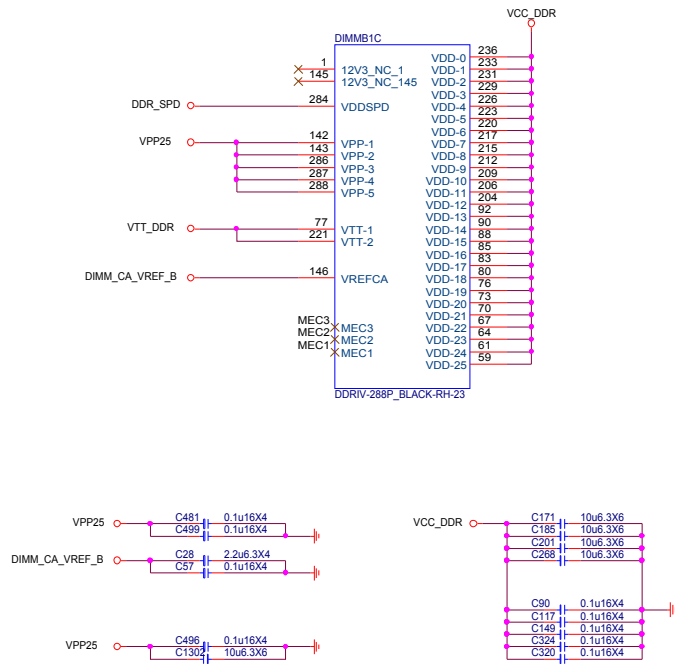


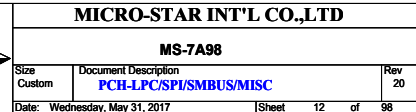
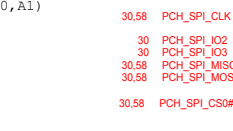
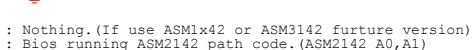




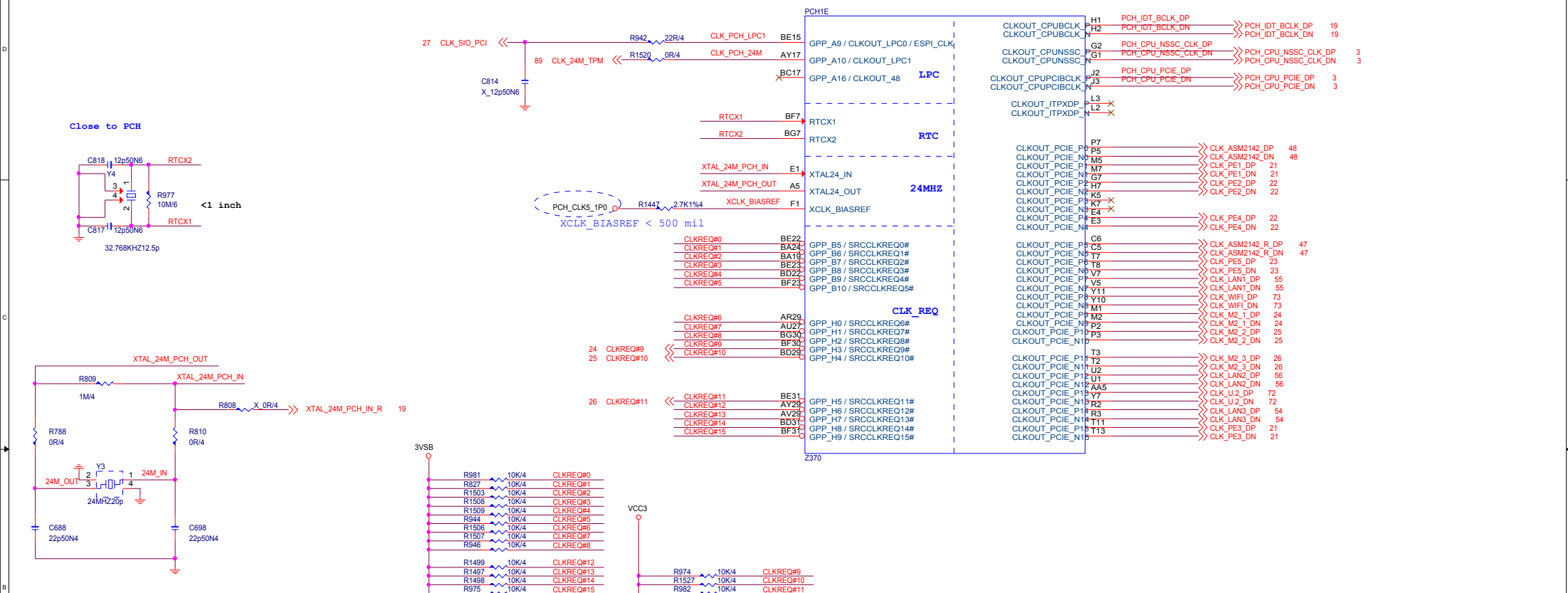




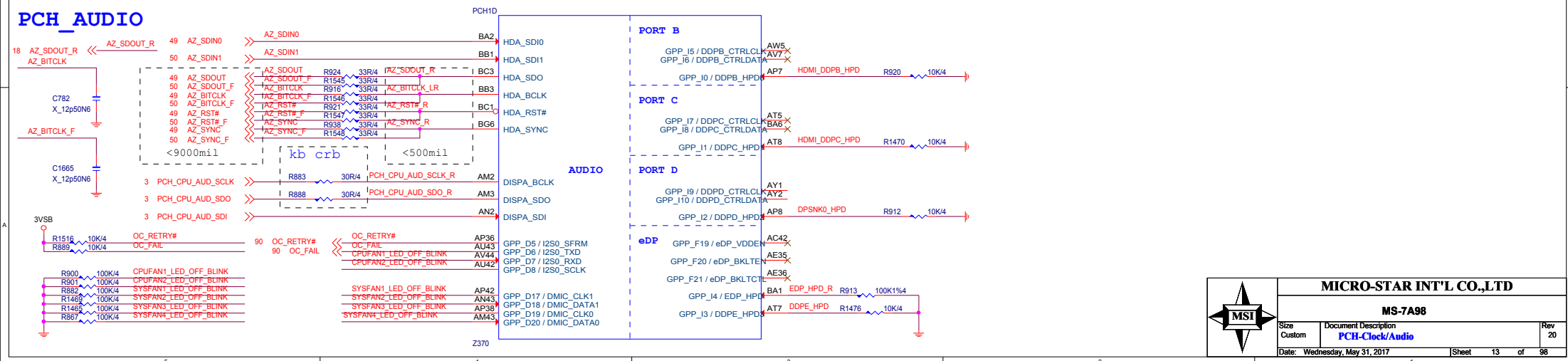




PCH CLK



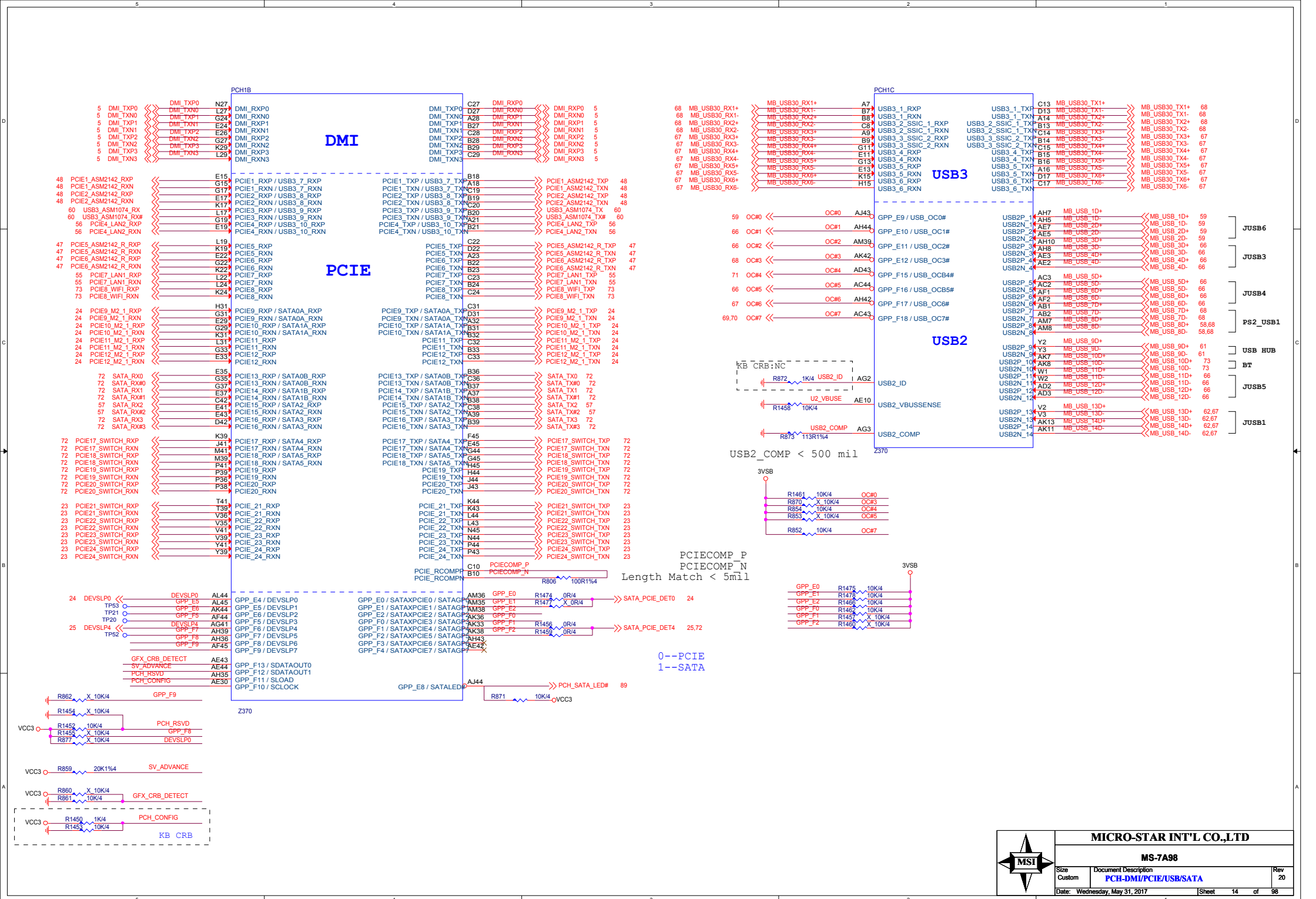
PCH AUDIO



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Used ESPI(GPPA) GPIO Group A will be come 1.8V leve)

GPIO

SMI

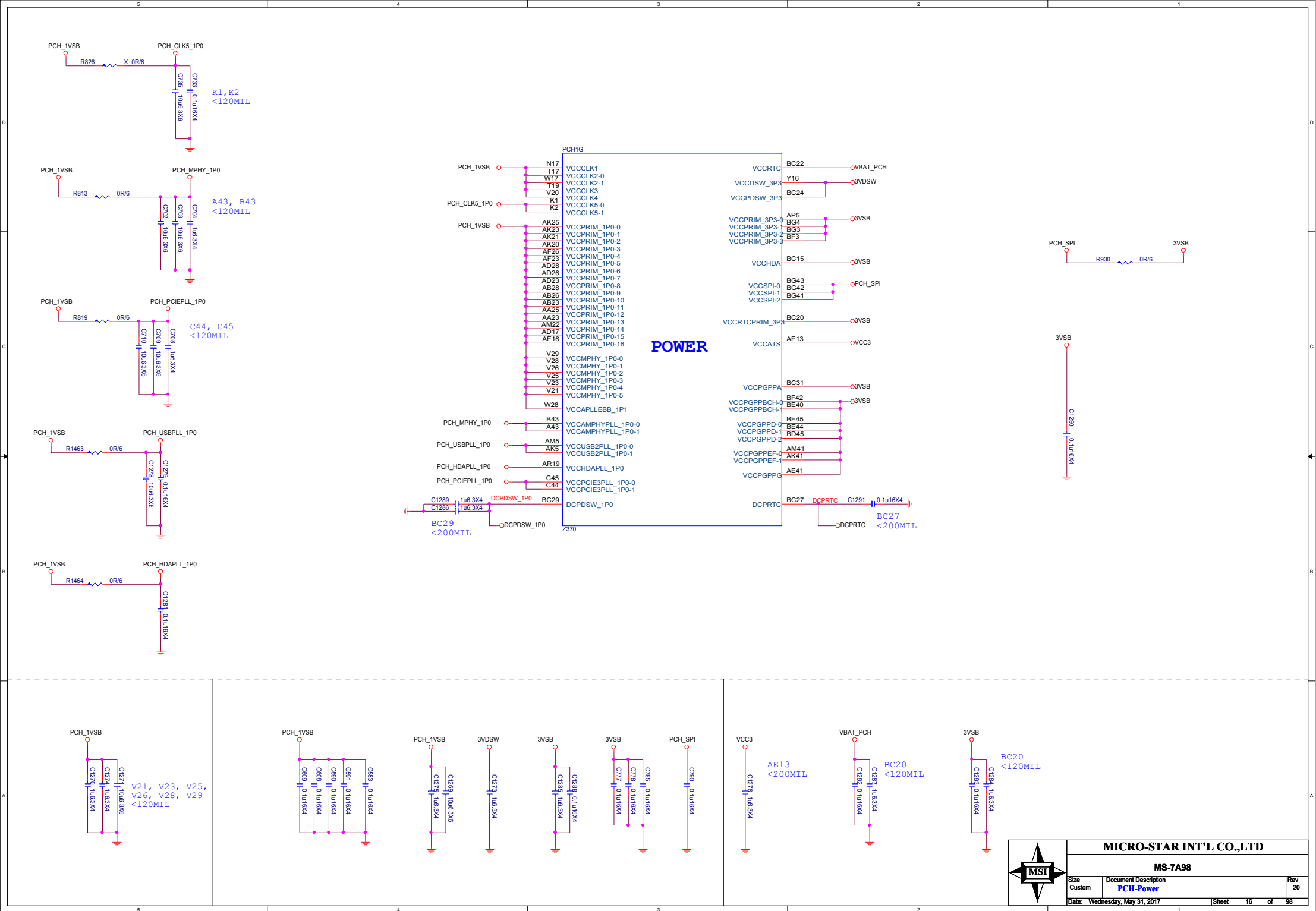
BIOS Select USE



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VSS

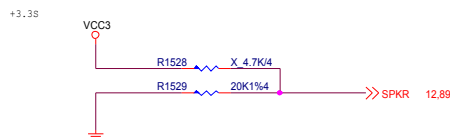


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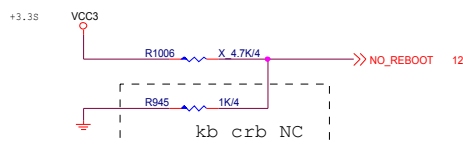
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TOP Swap



Internal pull-down is disabled after PLTRST#

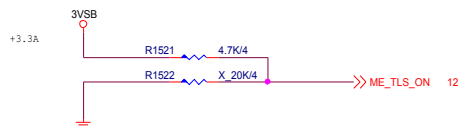
No Reboot



0 : DISABLE (Default)
1 : ENABLE

Internal pull-down is disabled after PLTRST#

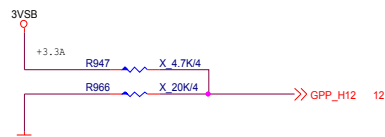
AMT and SBA with confidentiality



0 : DISABLE
1 : ENABLE (Default)

Internal pull-down is disabled after RSMRST

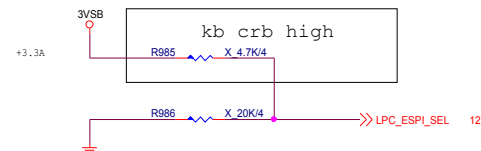
ESPI FLASH SHARING MODE



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

Internal pull-down is disabled after RSMRST

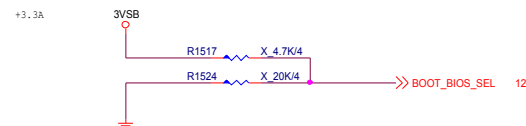
LPC eSPI Mode



0 : LPC
1 : eSPI

Internal pull-down is disabled after RSMRST

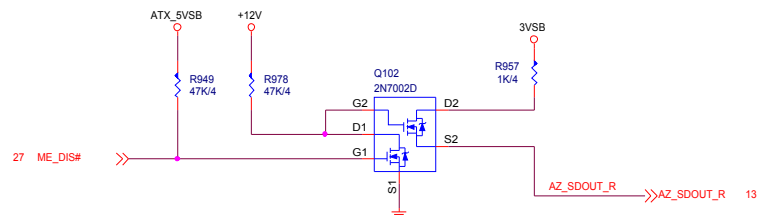
Boot BIOS



0 : SPI
1 : LPC

Internal pull-down is disabled after PLTRST

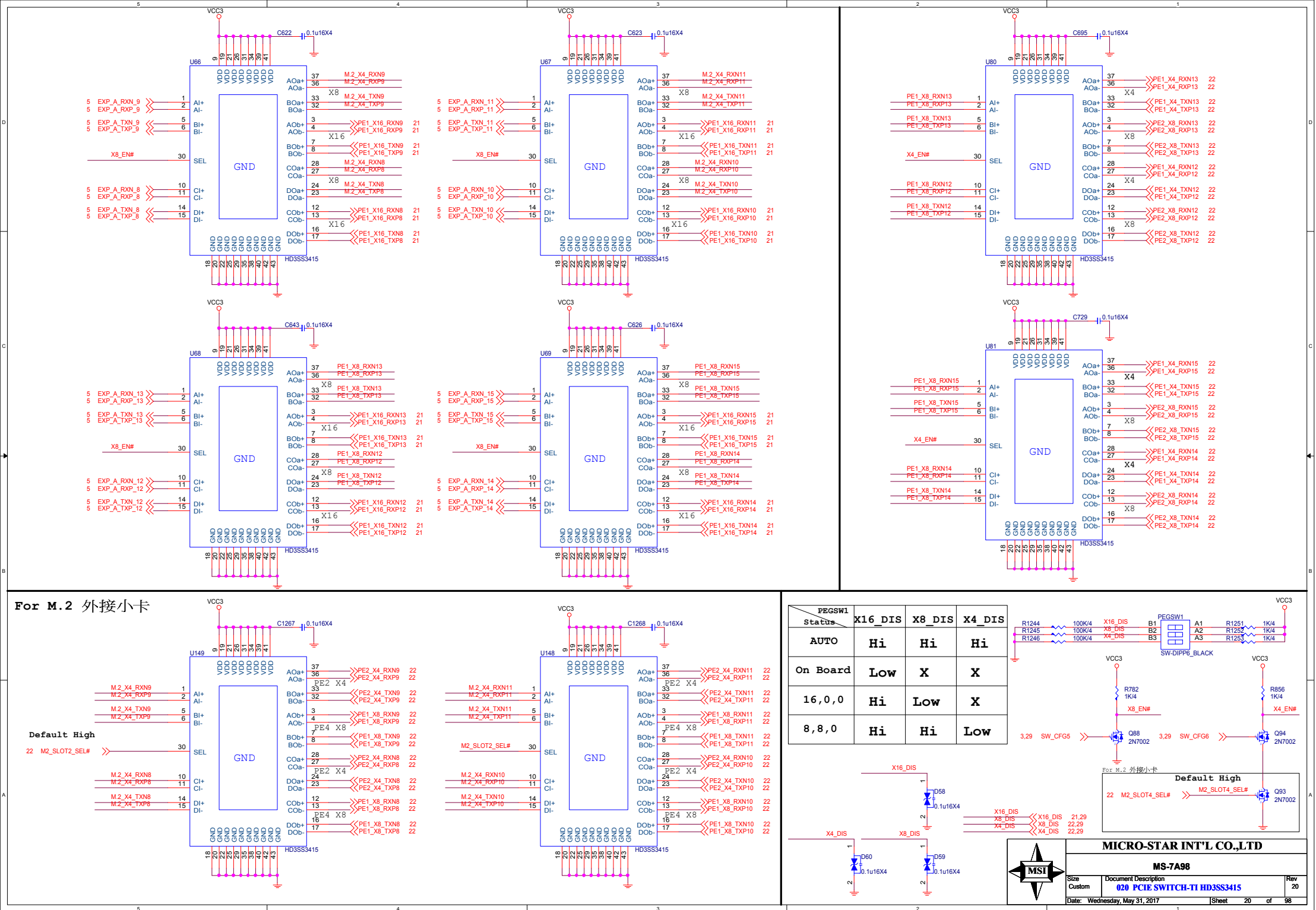
HDA_SDO

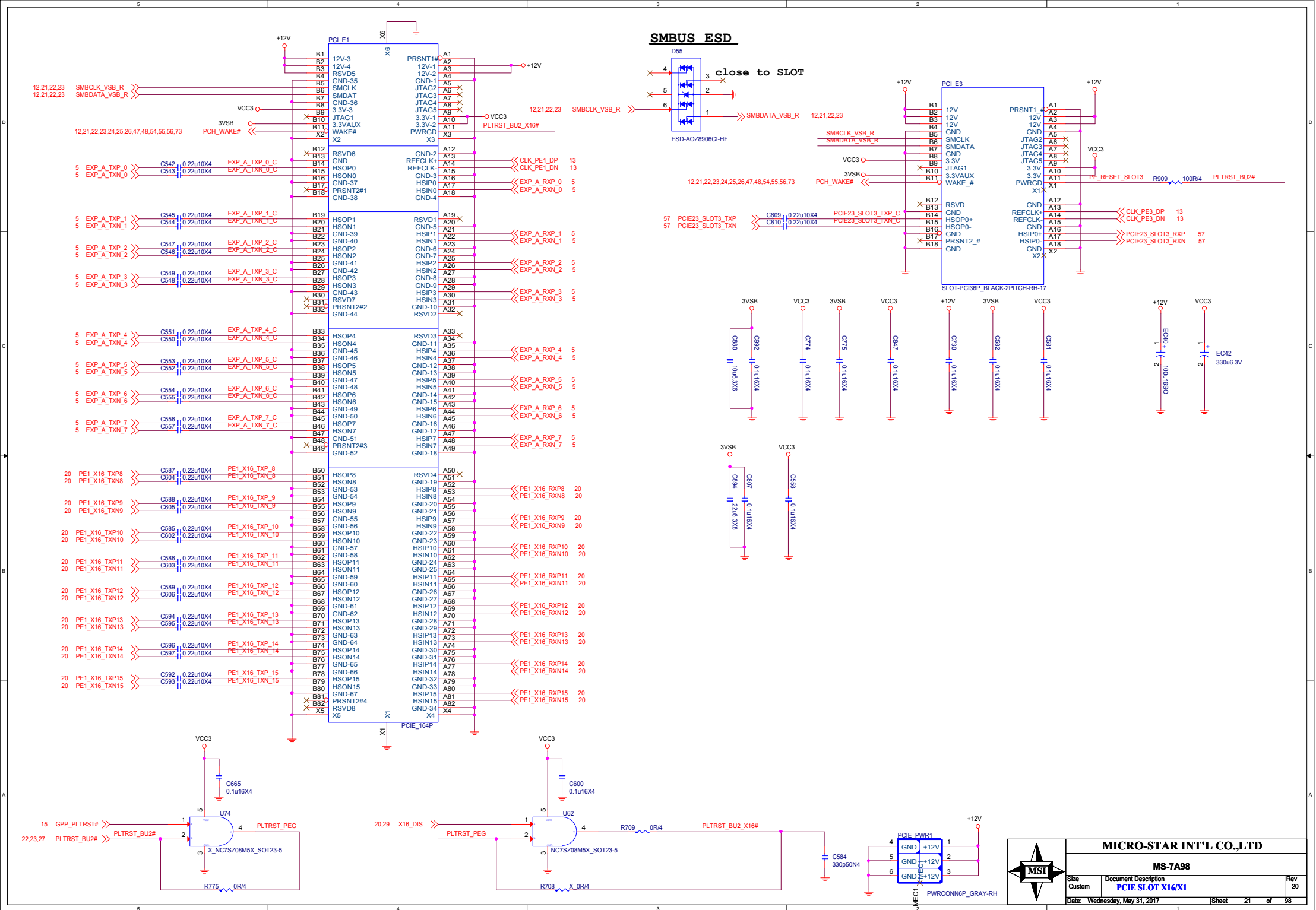


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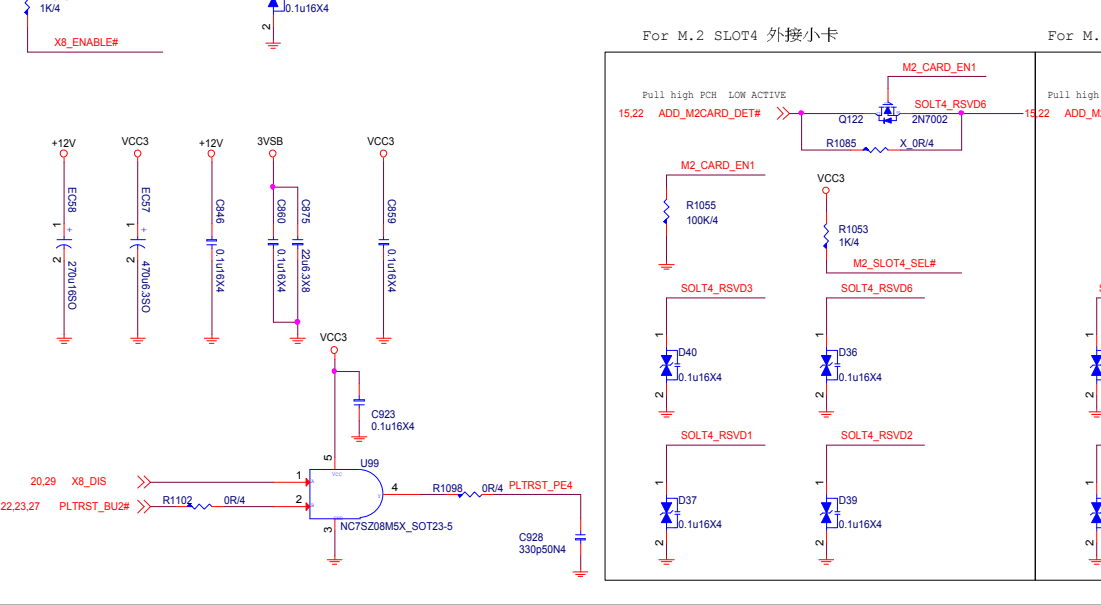
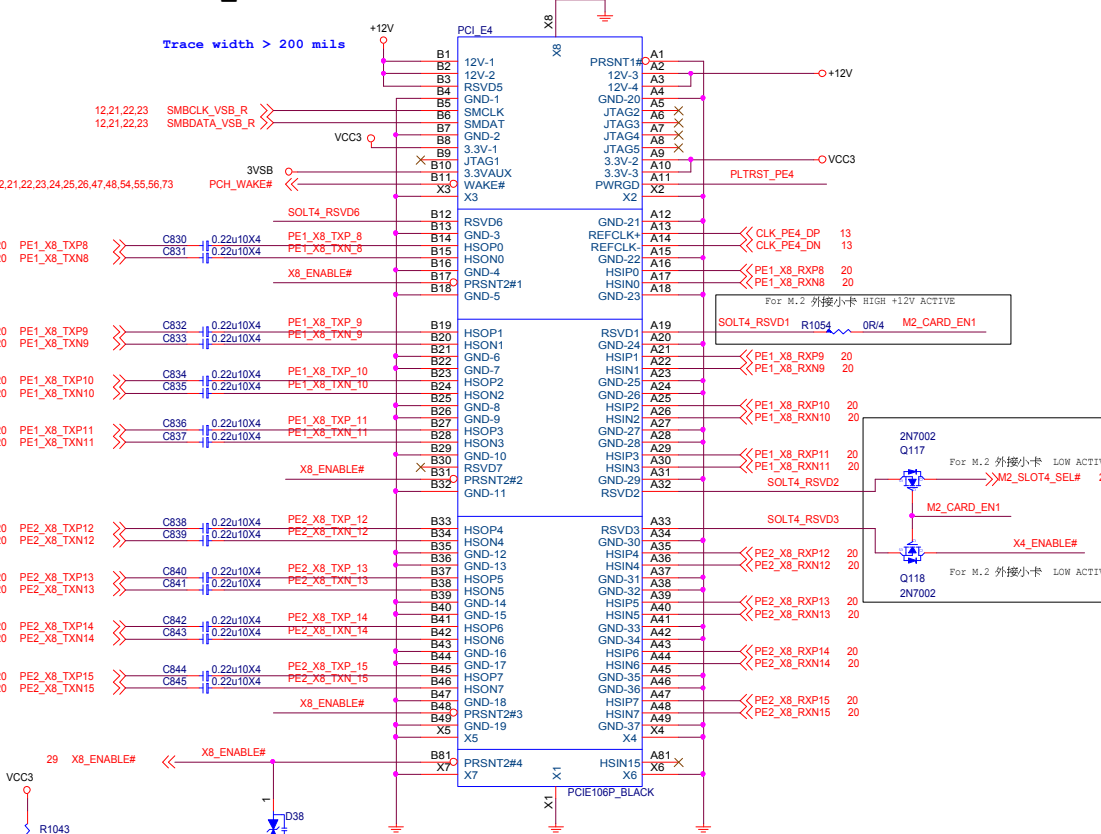
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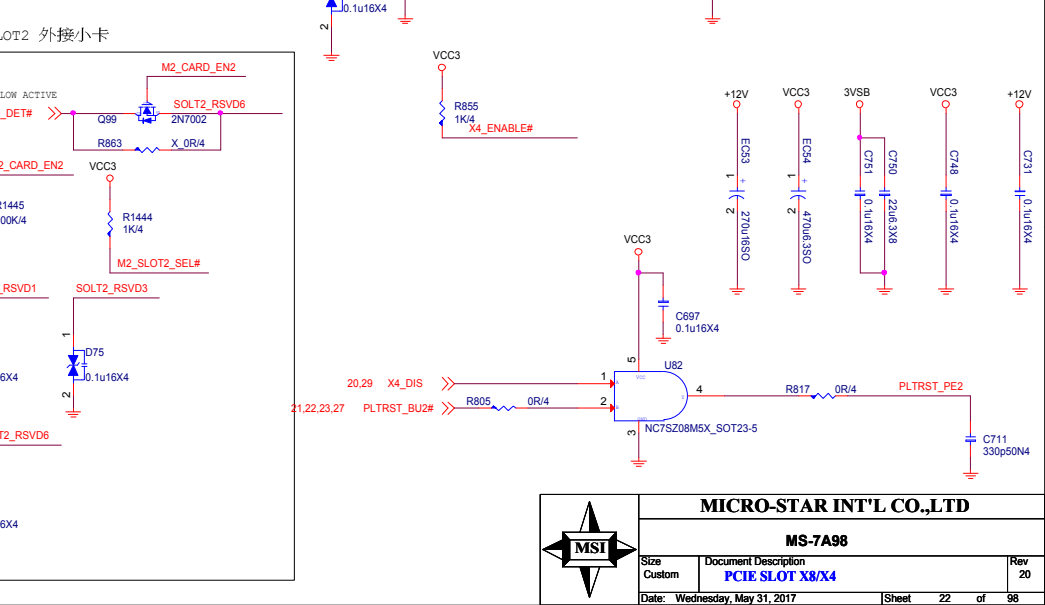
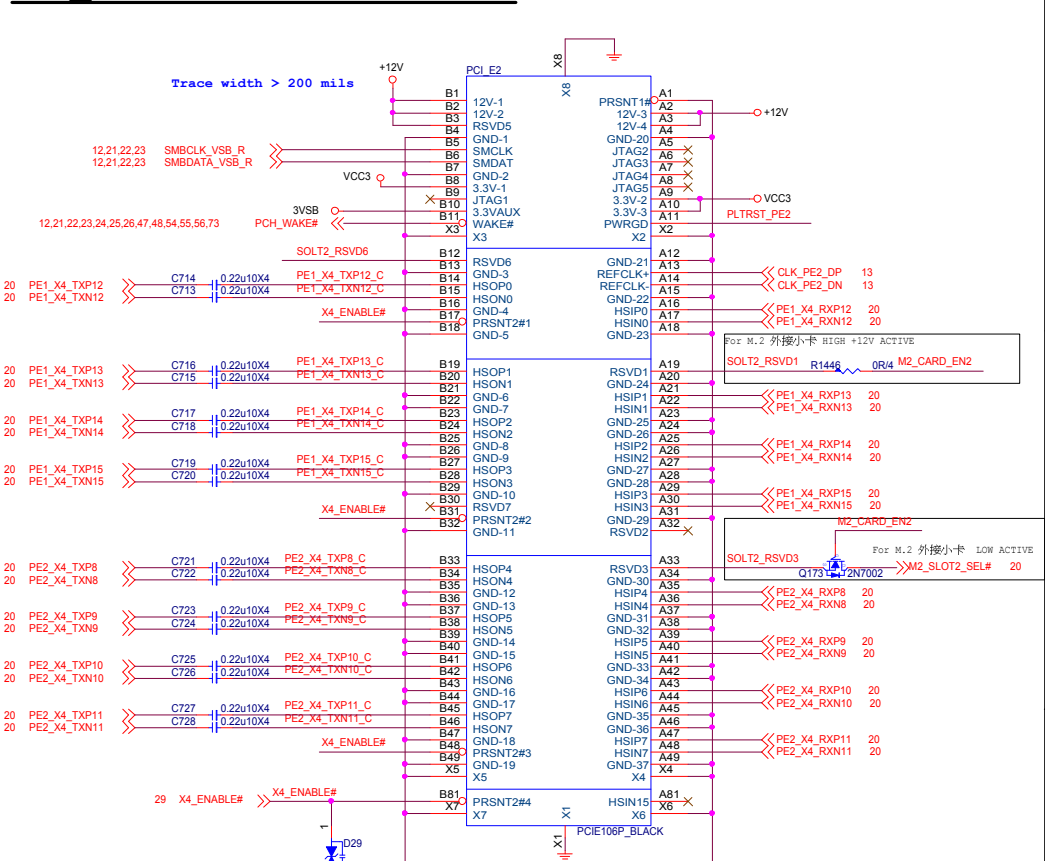




PCI Express X8 Slot
(Share with PCI_E x16 Slots)

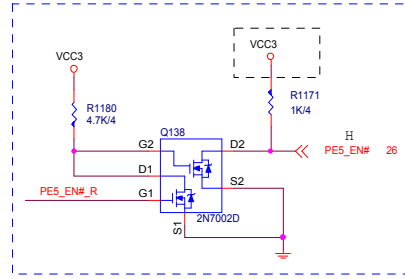
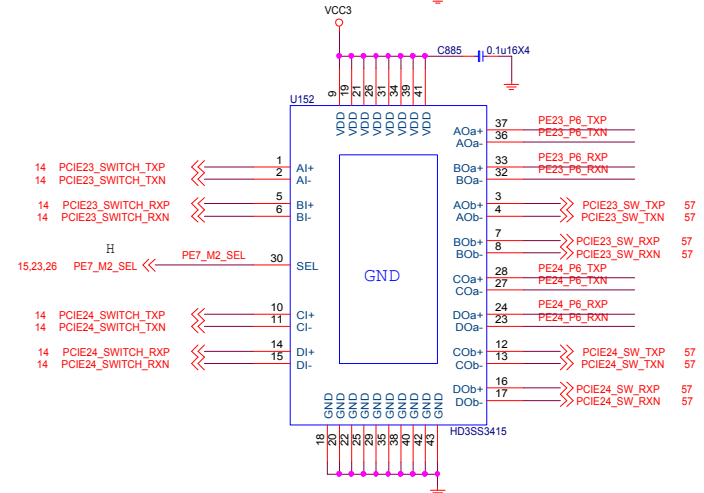
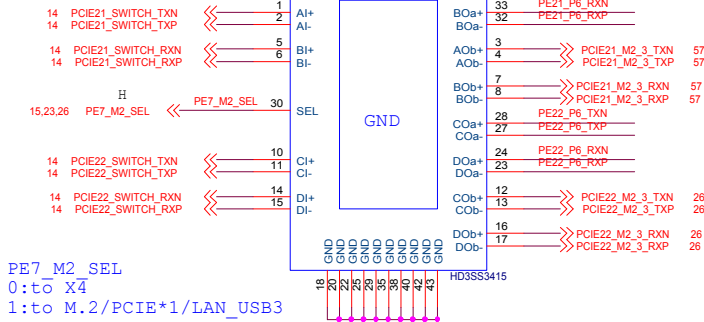
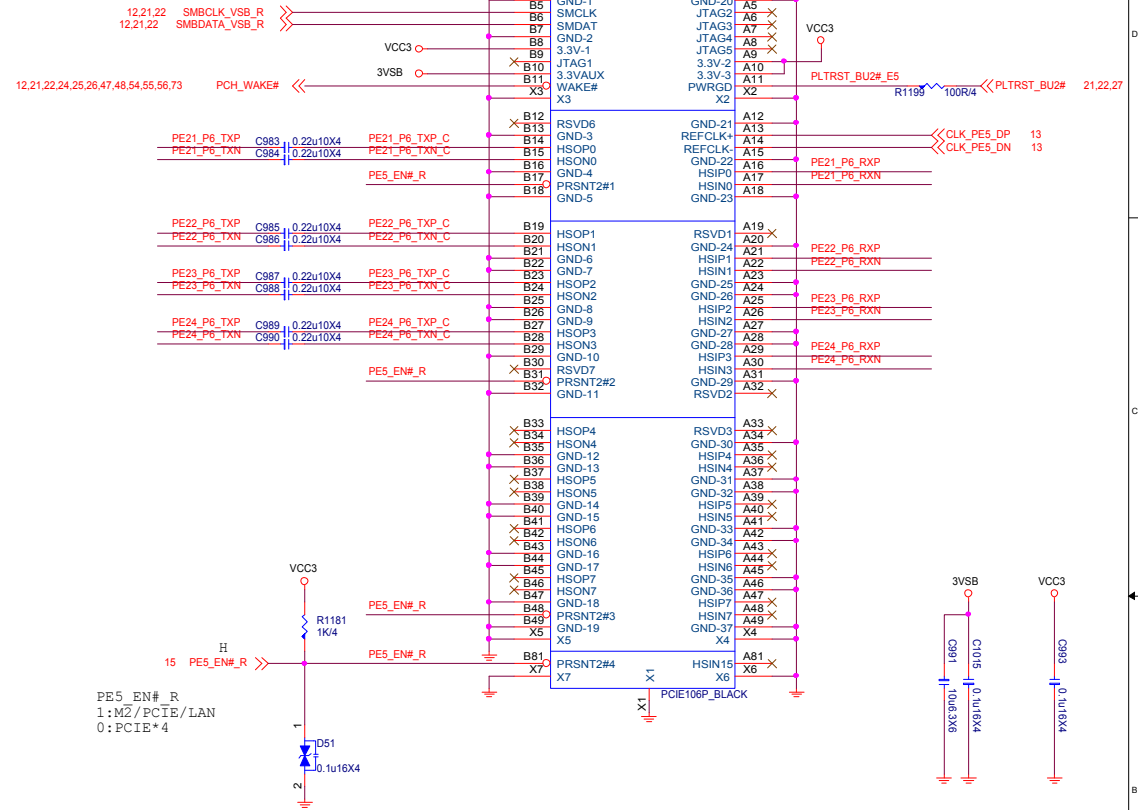


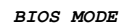
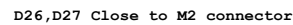
PCI Express X4 Slot (by CPU)



PCH PCI Express X4 Slot

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

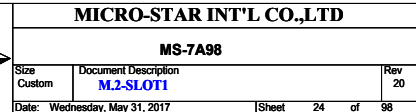




M2_COVER2

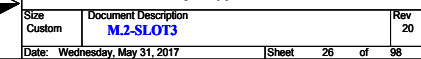
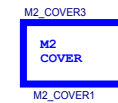
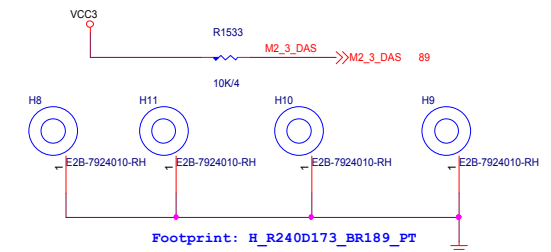
M2_COVER

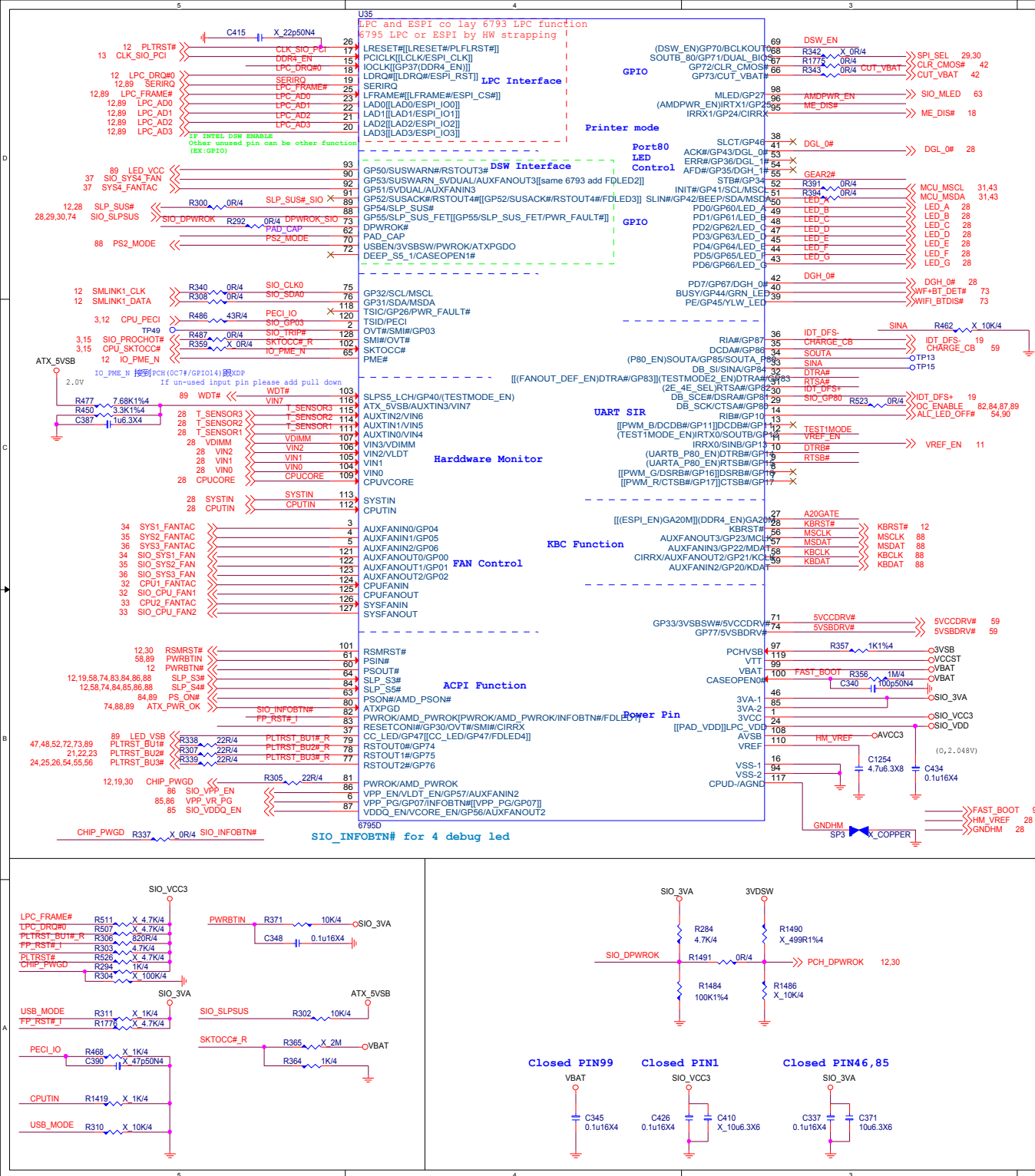
M2_COVER1





DIS_SW	BIOS_SEL_PCIEM2	BIOS_SATA_SEL	
0	GPI	0	SATA
0	1	1	M2-SATA
0	0	GPI	M2-PCIE
0	1	GPI	PCIEX4
GPI	GPI	GPI	AUTO

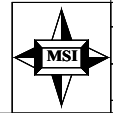
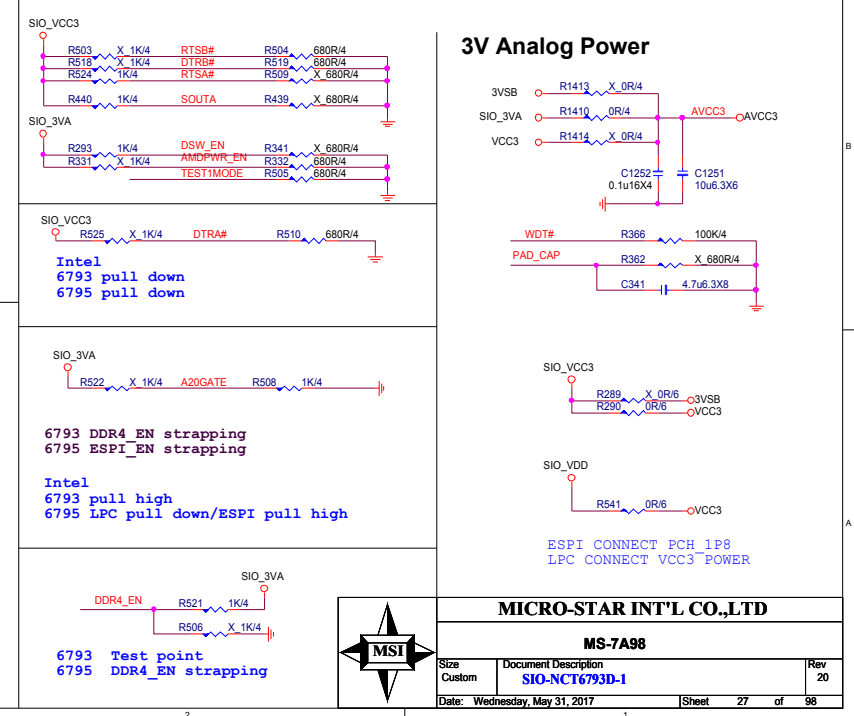




POWER ON STRAPPING PIN FOR NCT6793/6795

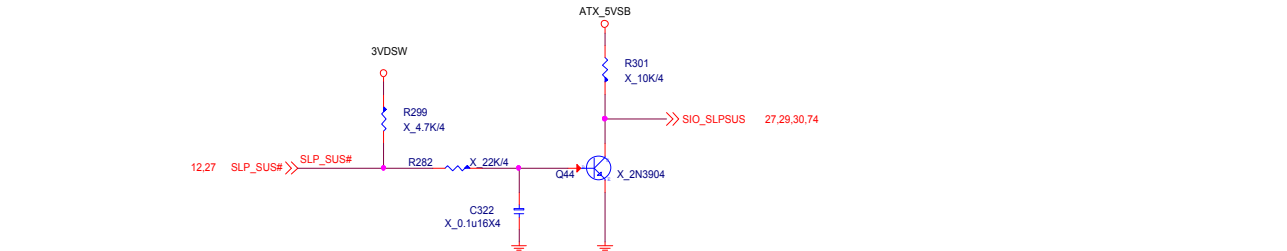
PIN	6793/6795 NAME	Circuit NAME	0	1	Strap Point
9	UARTA_P80_EN	RTSB#	DISABLE UARTA80	ENABLE UARTA80	LRESET
10	UARTB_P80_EN	DTRB#	DISABLE UARTB80	ENABLE UARTB80	LRESET
12	TEST1MODE_EN	TEST1MODE	DISABLE TEST1MODE	ENABLE TEST1MODE	LRESET
15	6793 test point 6795 DDR4_EN	6793 test point 6795 DDR4_EN	6793 NA 6795 Disable	6793 NA 6795 Enable	
27	6793 DDR4_EN 6795 ESPI_EN	A20GATE	6793 Disable 6795 Disable	6793 Enable 6795 Enable	
31	2E_4E_SEL	RTSA#	I/O ADDRESS 2E	I/O ADDRESS 4E	LRESET
32	6793 TESTMOD2_EN 6795 FANOUT_DEF_EN	DTRA#	6793 disable 6795 default 50%	6793 Enable 6795 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
103	TESTMODE_EN	WDT#	DISABLE TESTMODE	ENABLE TESTMODE	INTERNAL RSMRST

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

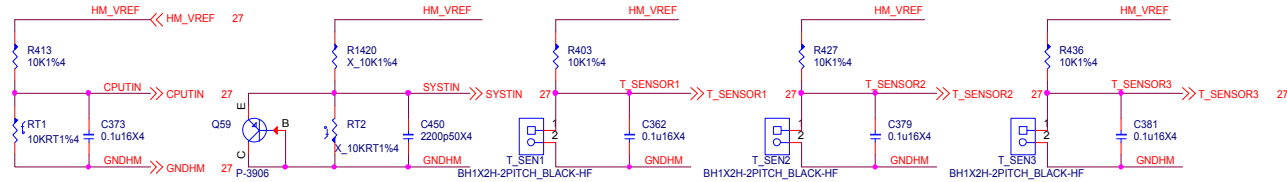


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Custom	SIO-NCT6793D-1	20
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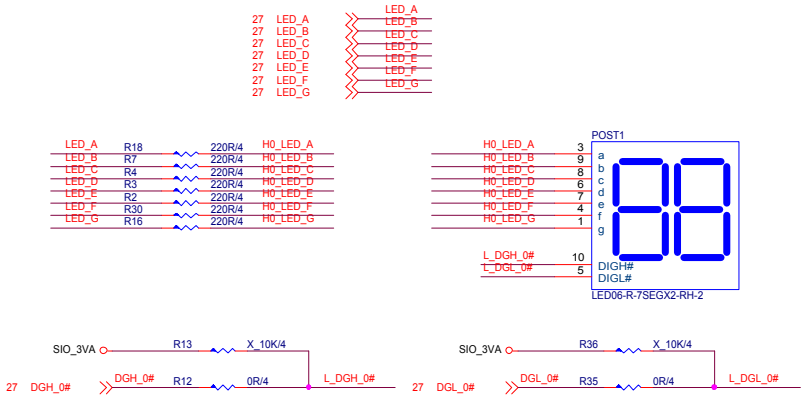
SLP_SUS Co-lay circuit



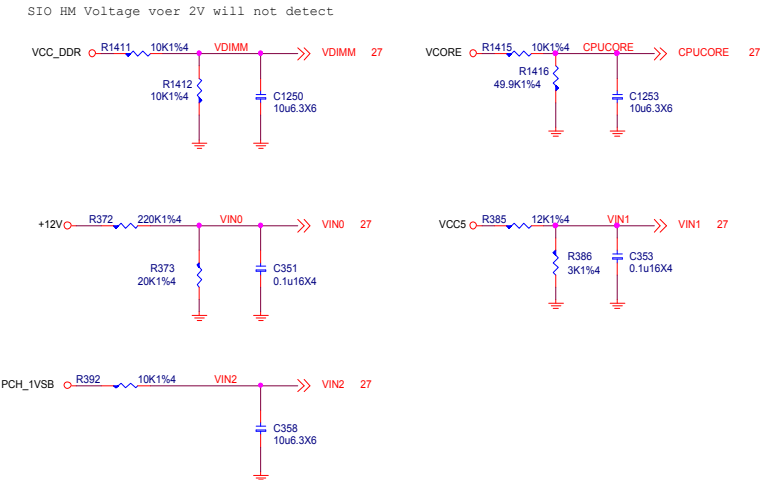
THERMAL SENSOR

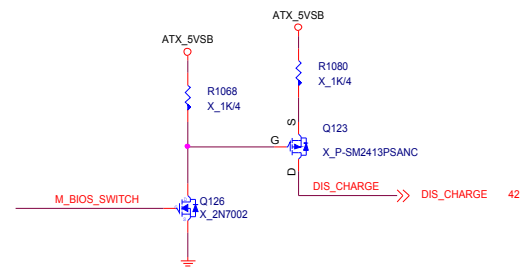
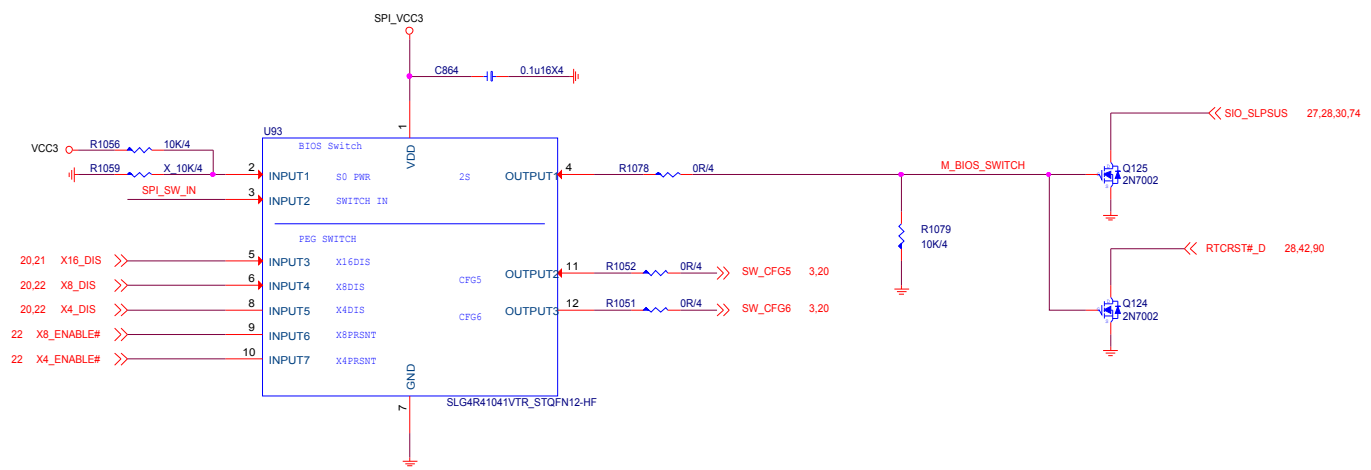
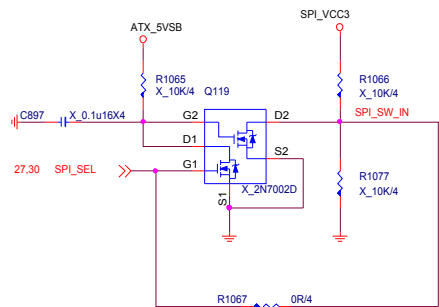


DEBUG LED



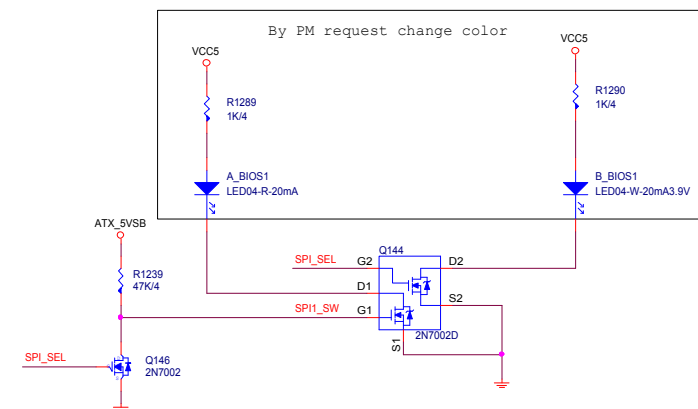
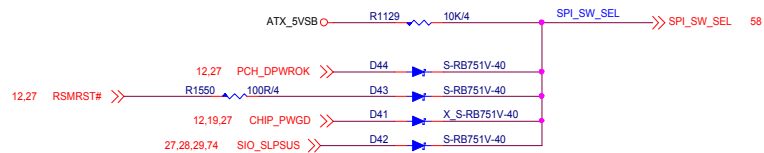
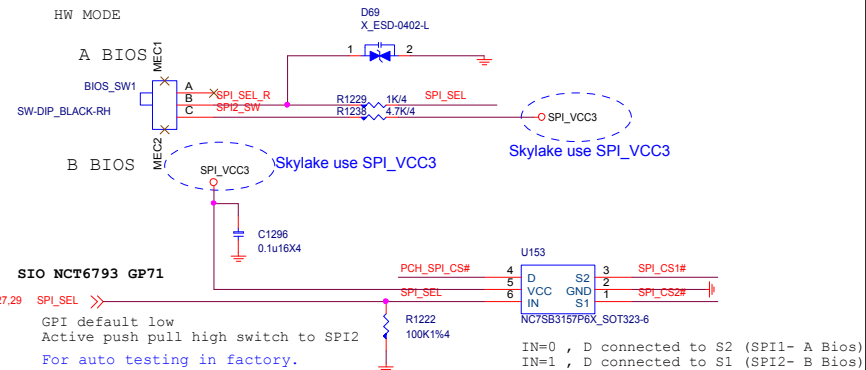
HW Monitor - Voltage





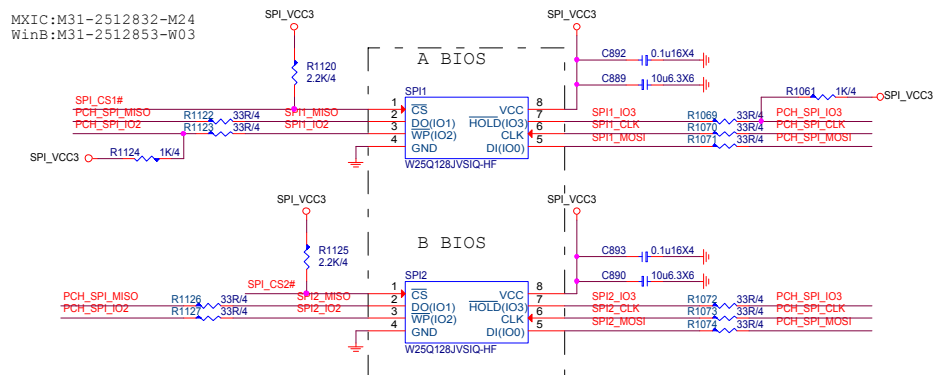
MICRO-STAR INT'L CO.,LTD		
MS-7A98		
Size Custom	Document Description Dual bios control-Silego	Rev 20
Date: Wednesday, May 31, 2017	Sheet 29 of 98	

Part Number: N31-2061341-H06

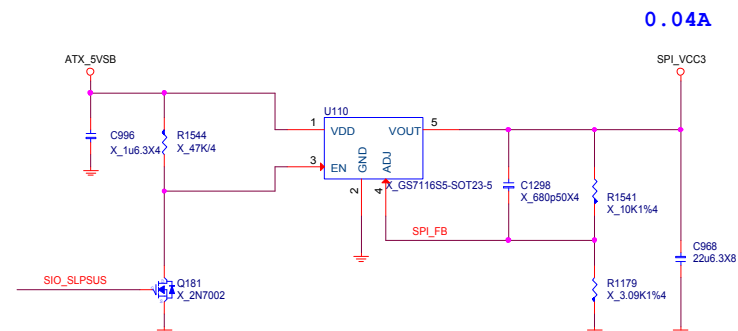


SPI FLASH ROM

Place close to SB.



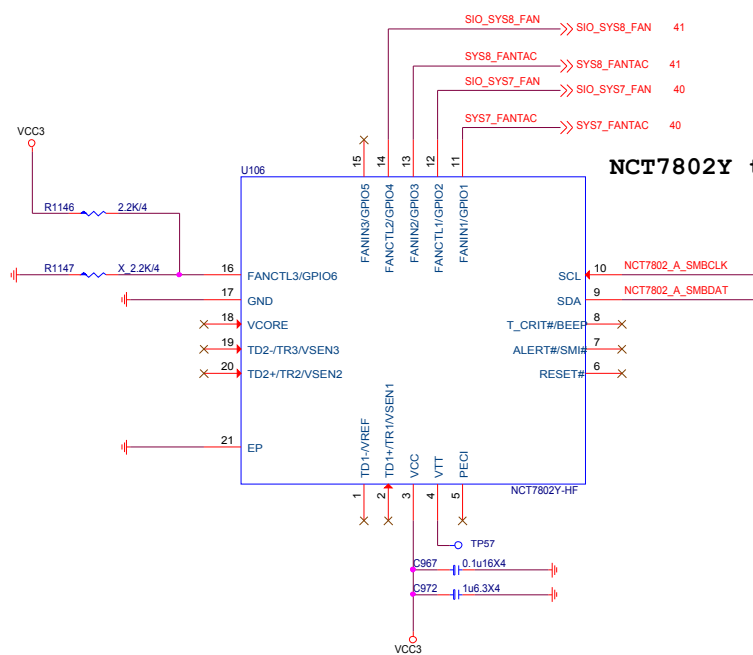
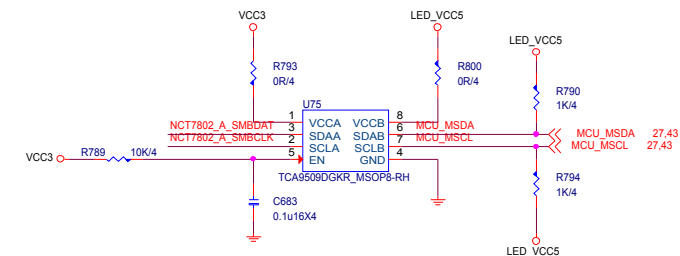
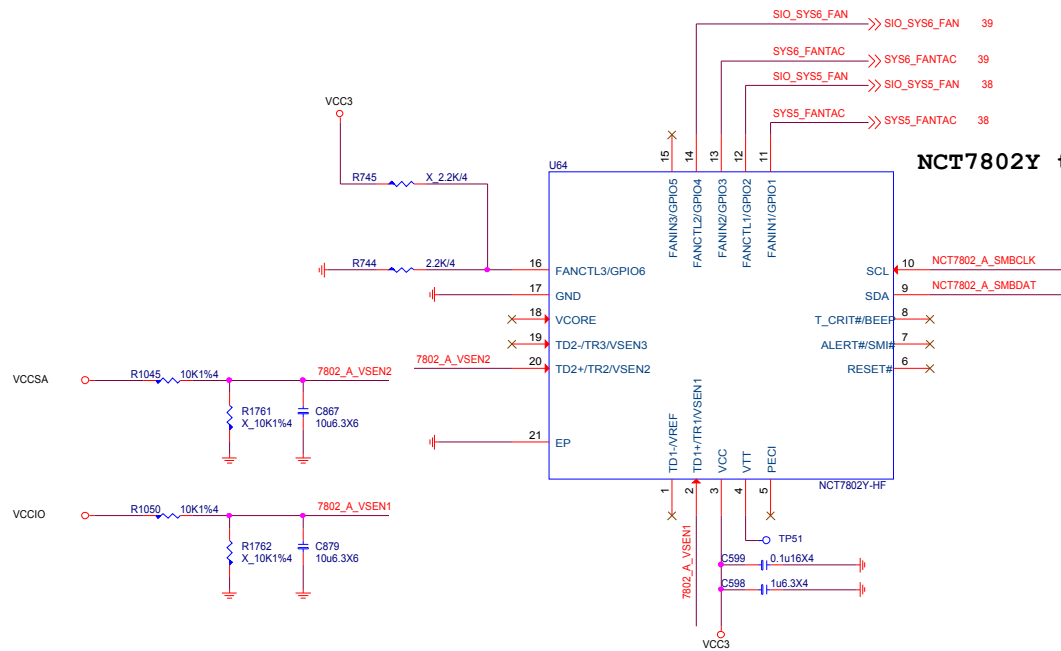
*SPI_CLK & SPI_MOSI must be length matched to within 500mils. < 6 inch
*SPI_CLK & SPI_CS0# must be length matched to within 500mils.



MICRO-STAR INT'L CO.,LTD

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Size Custom	Document Description Dual BIOS	Rev 20
Date: Wednesday, May 31, 2017		Sheet 30 of 98

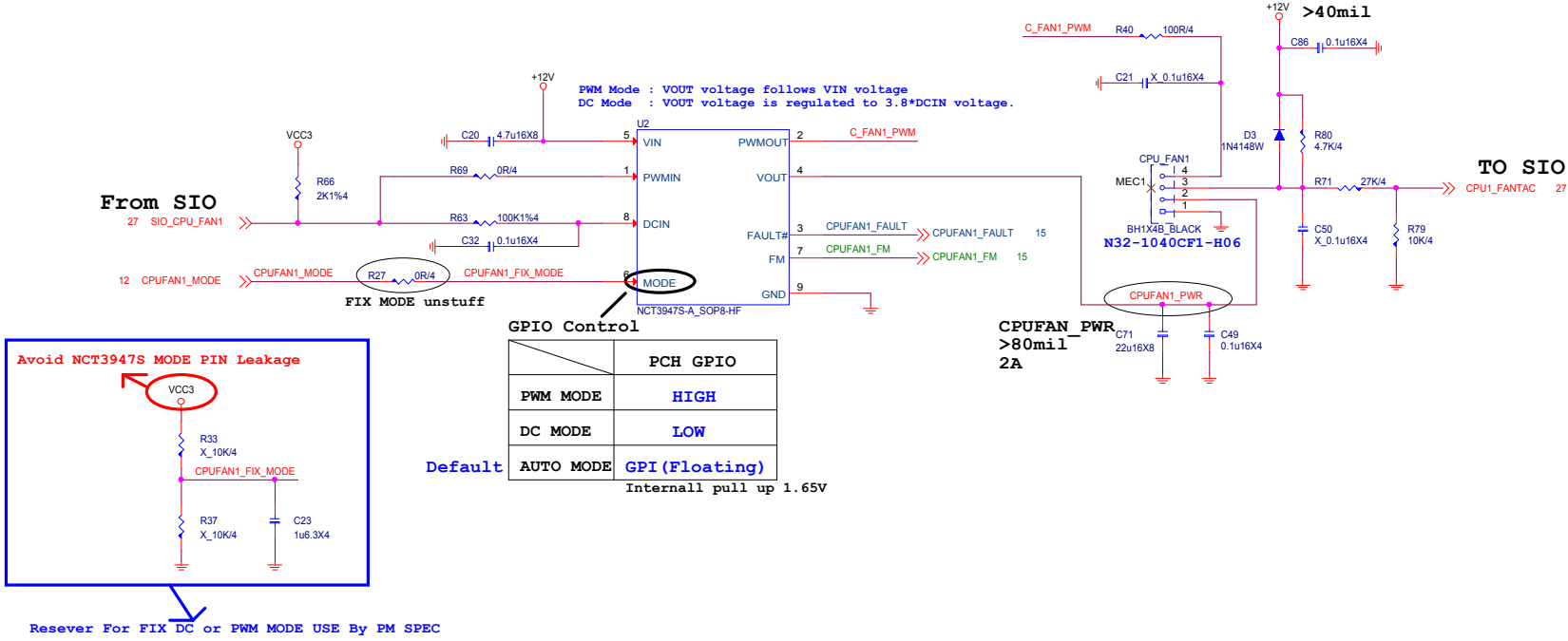


MICRO-STAR INT'L CO.,LTD

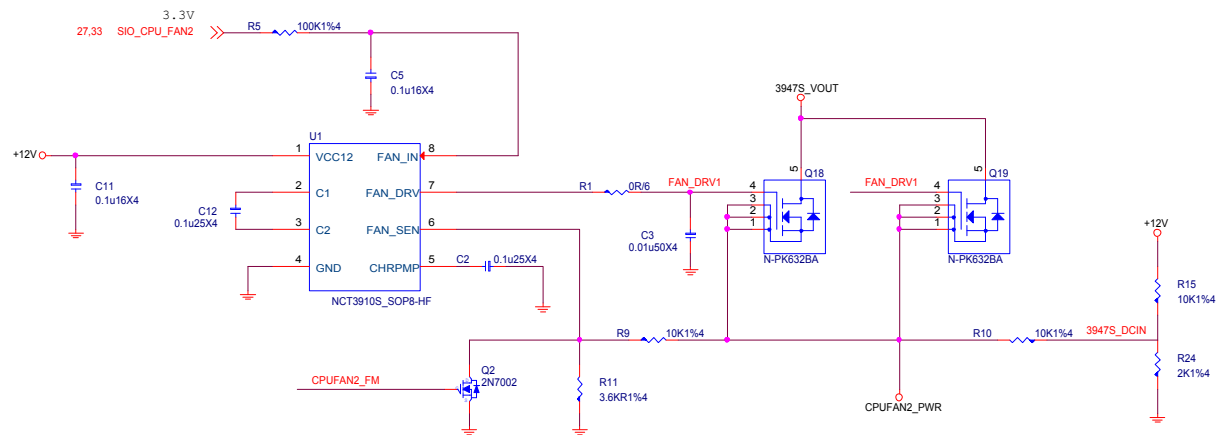
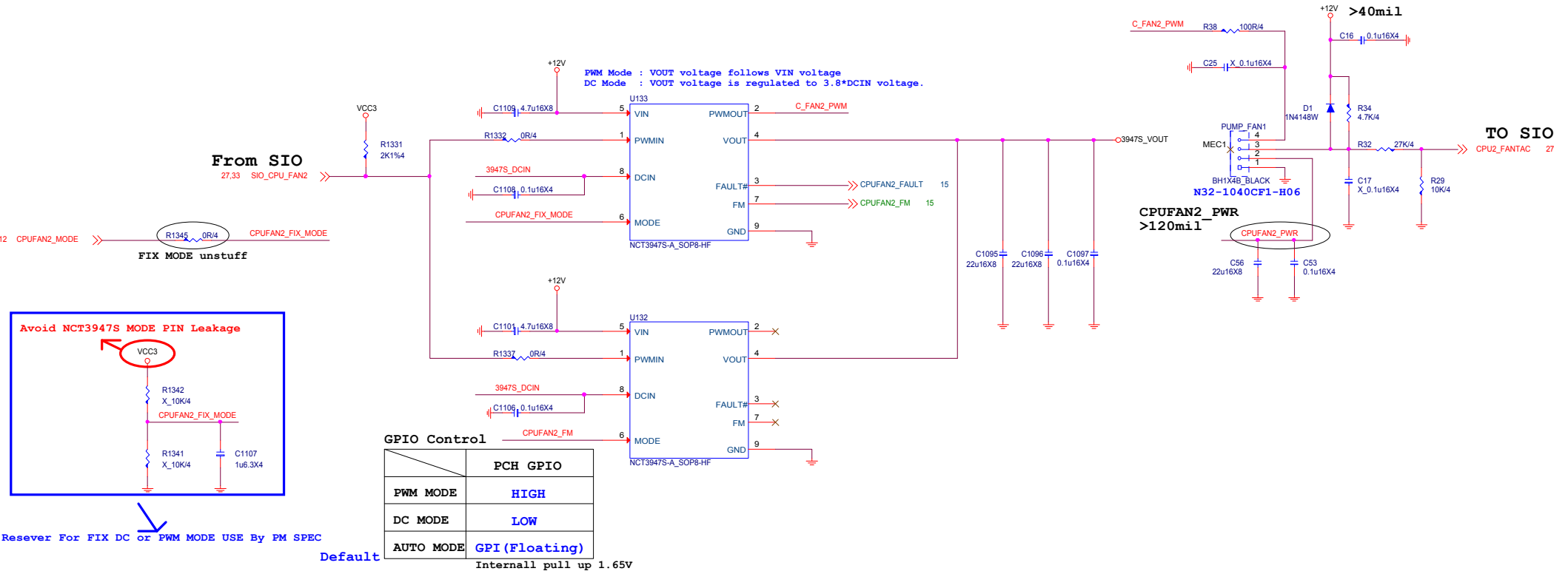
MS-7A98

Size	Document Description	Rev
Custom	NCT7802Y FAN CONTROLLE	20
Date: Wednesday, May 31, 2017	Sheet 31 of 98	

TYPE J : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO



TYPE J : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO

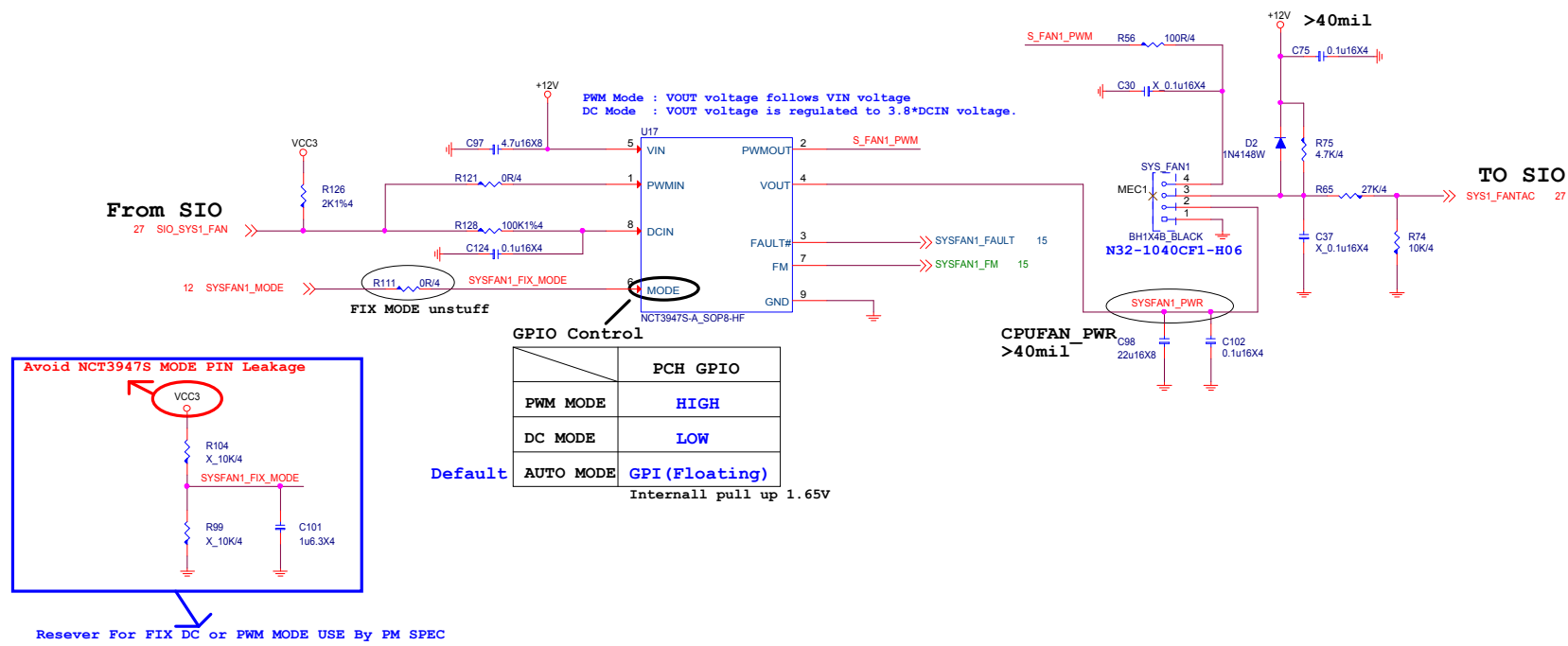


MICRO-STAR INT'L CO.,LTD

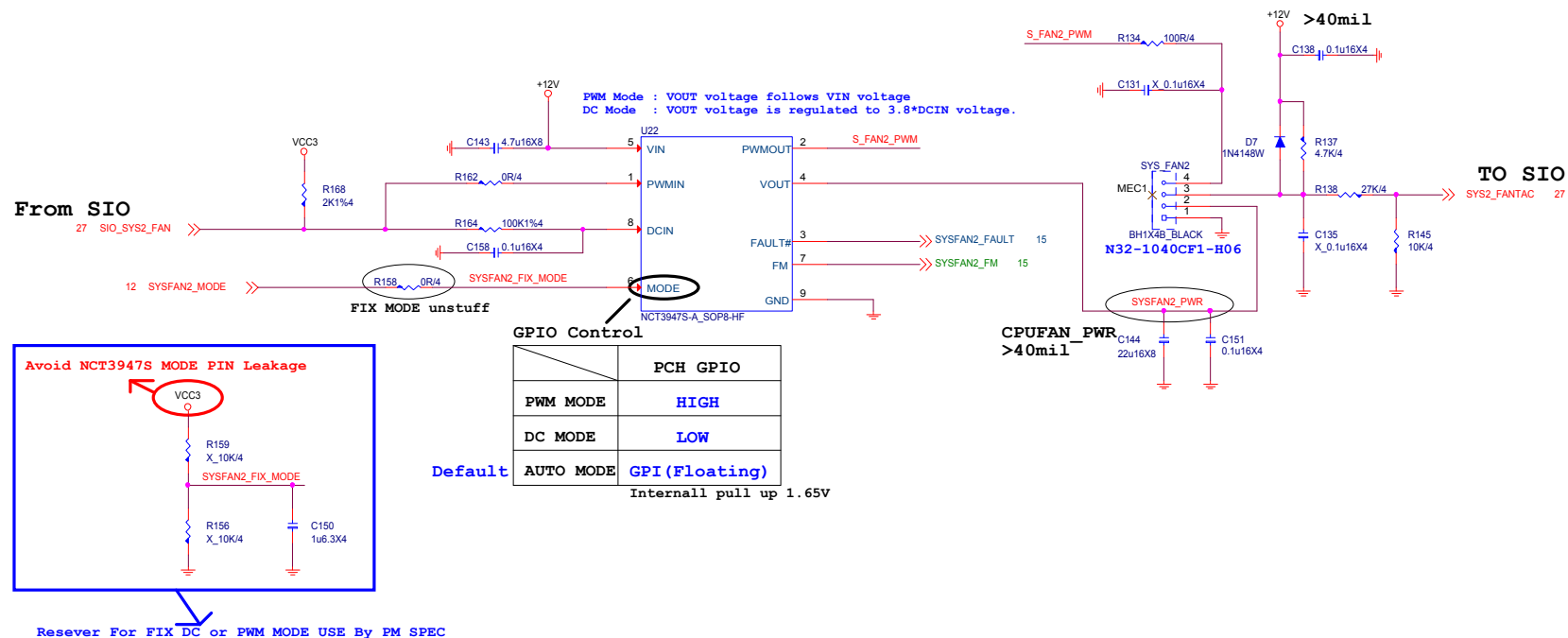
MS-7A98

Size Custom	Document Description PUMP_FAN1	Rev 20
Date: Wednesday, May 31, 2017	Sheet 33 of 98	

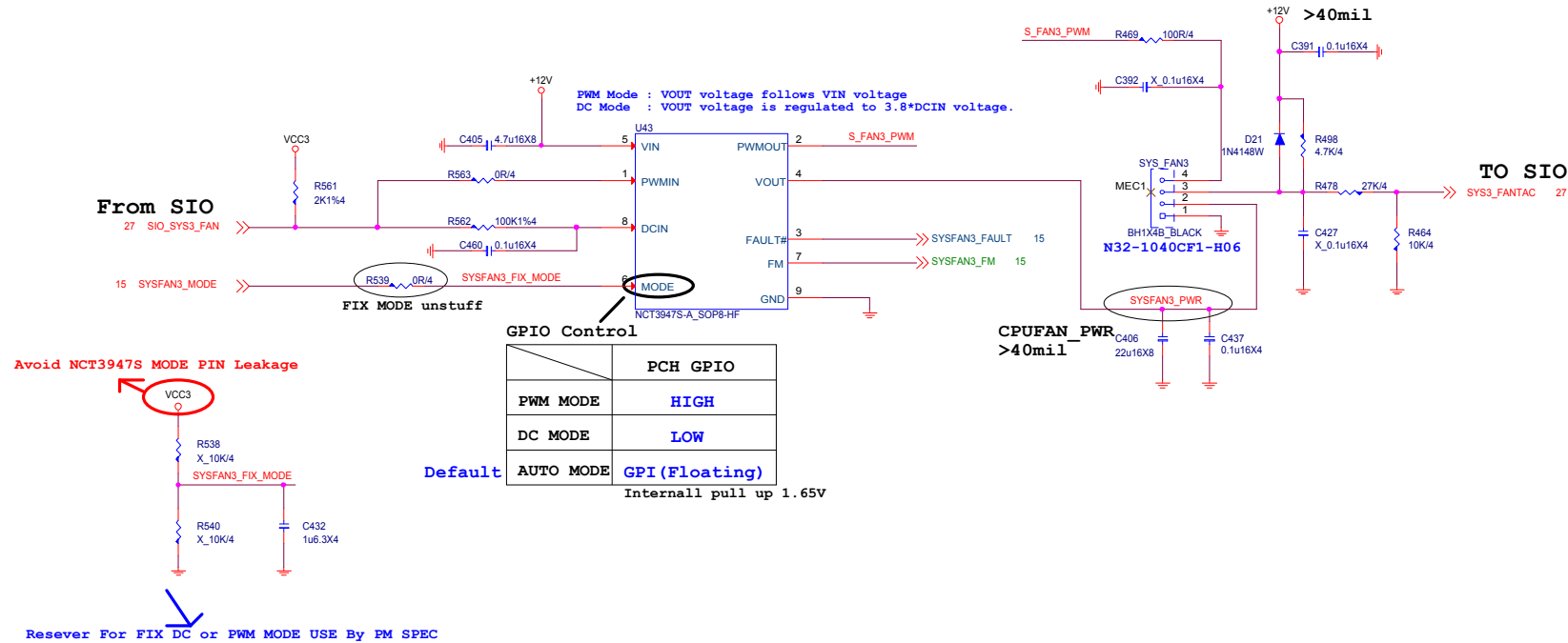
TYPE J : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO



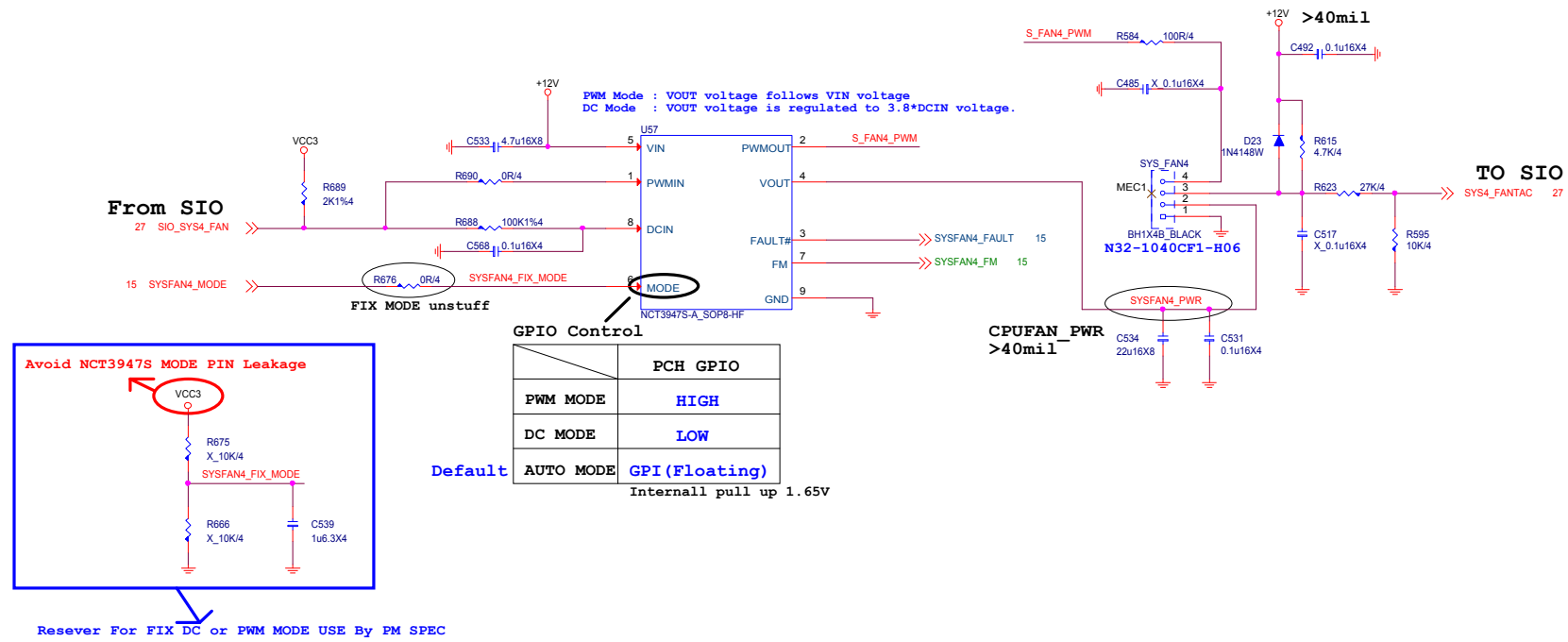
TYPE J : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO



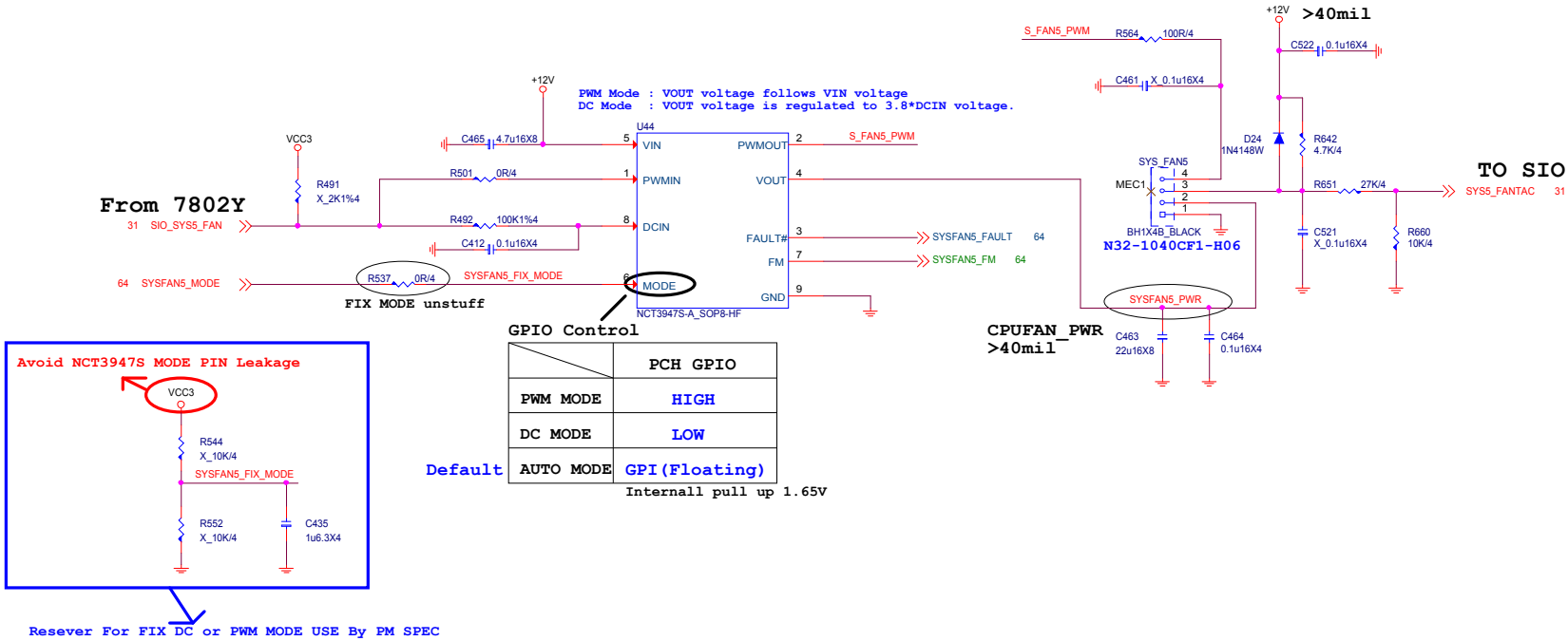
TYPE J : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO



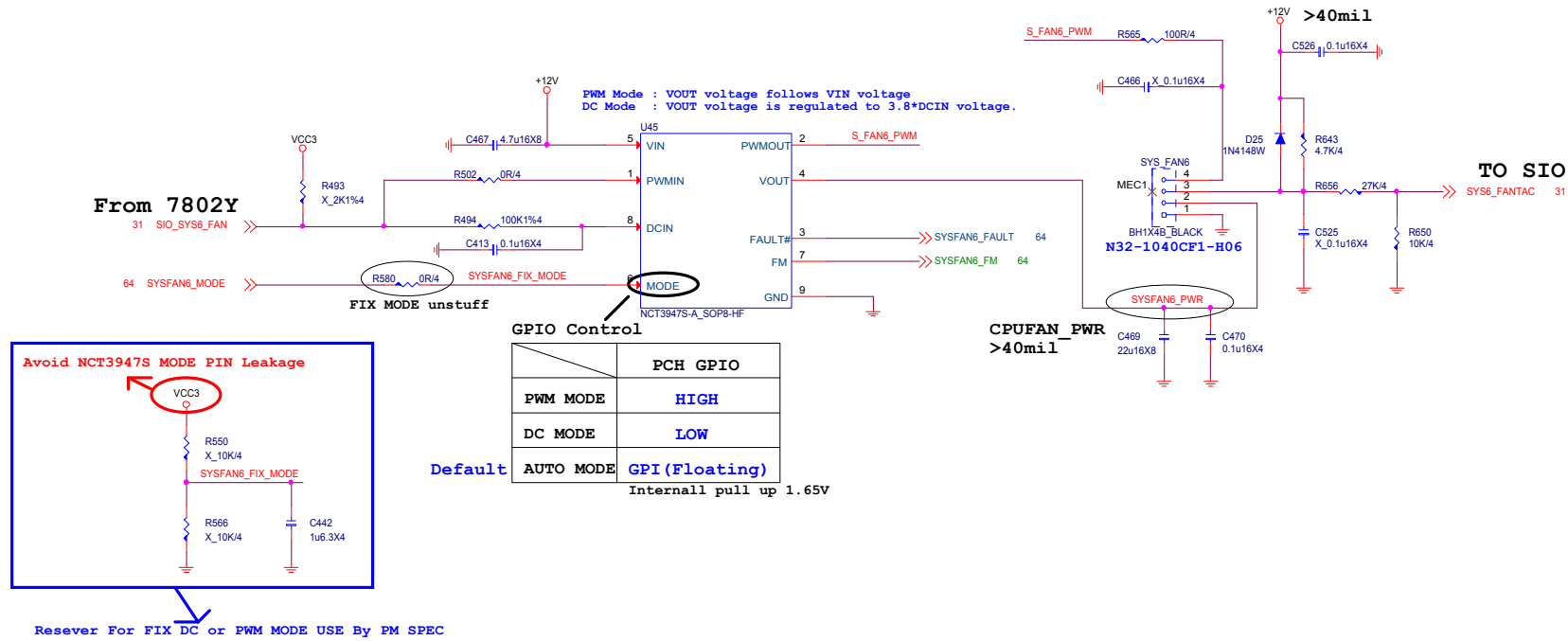
TYPE J : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO



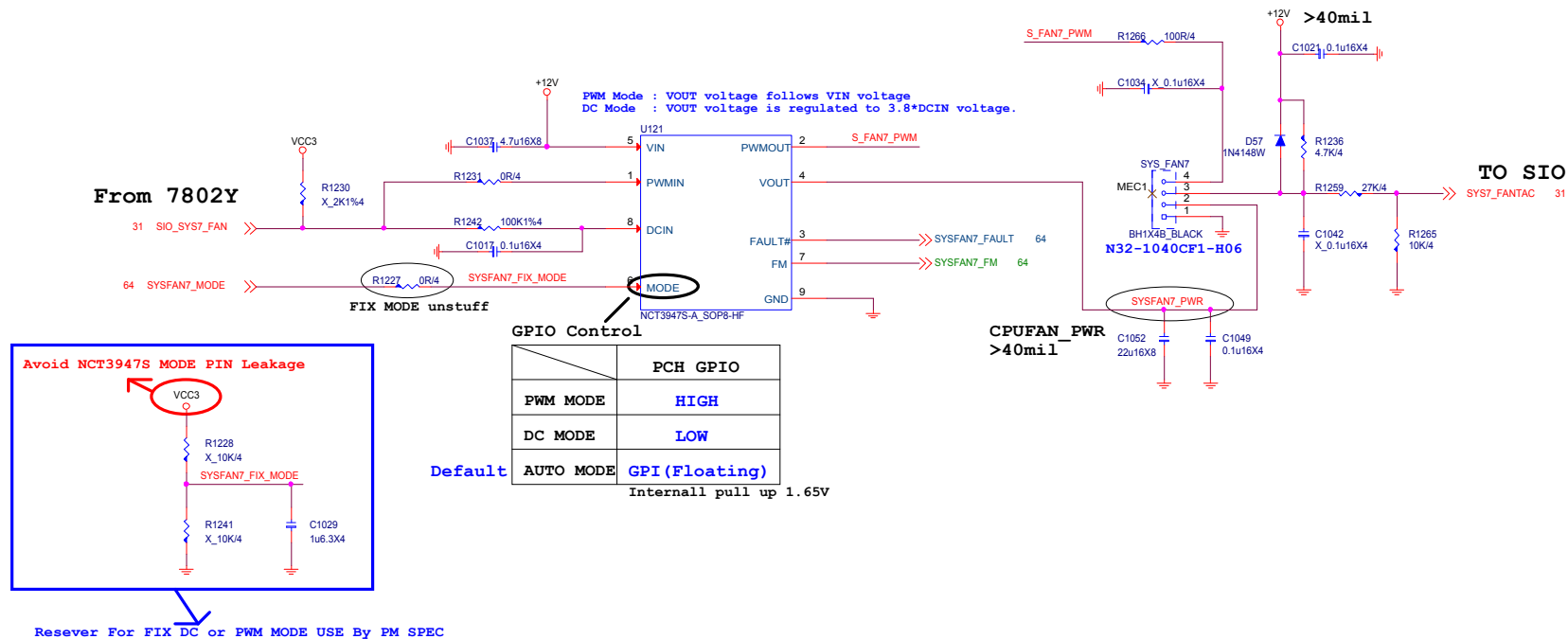
TYPE J : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO



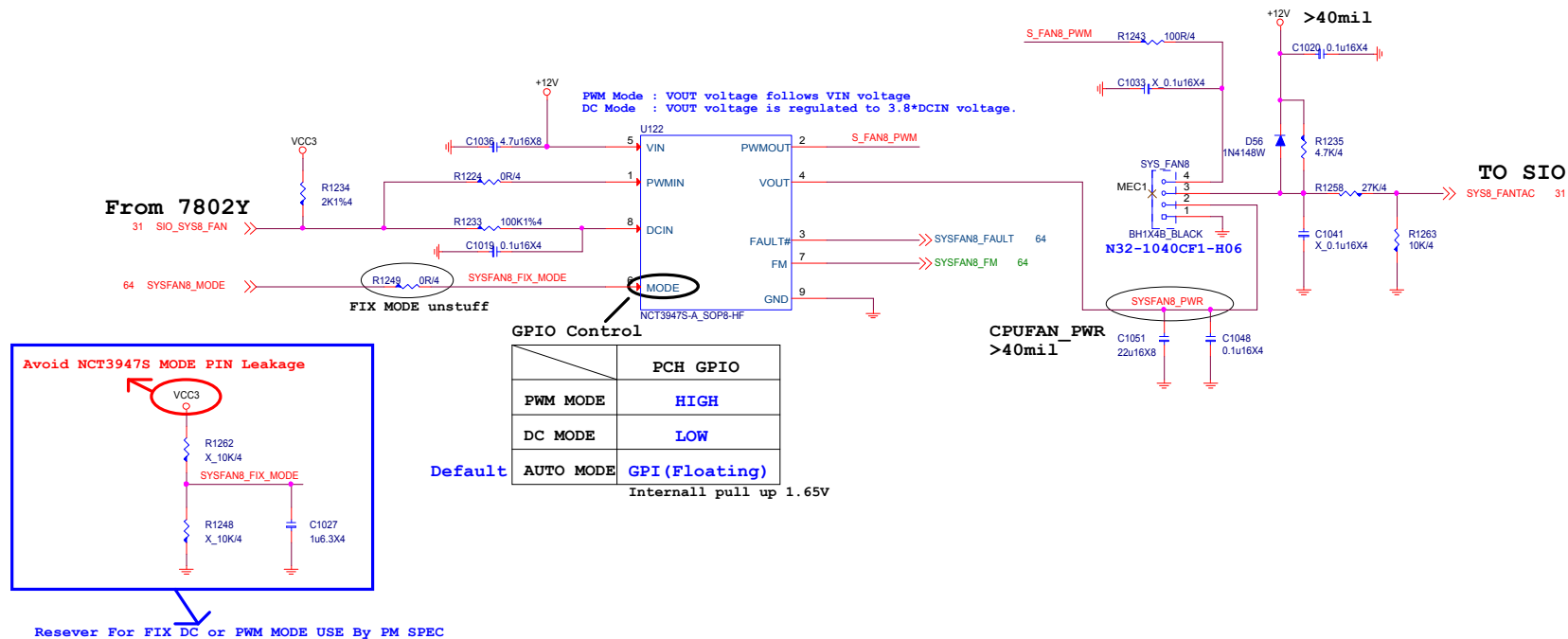
TYPE J : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO



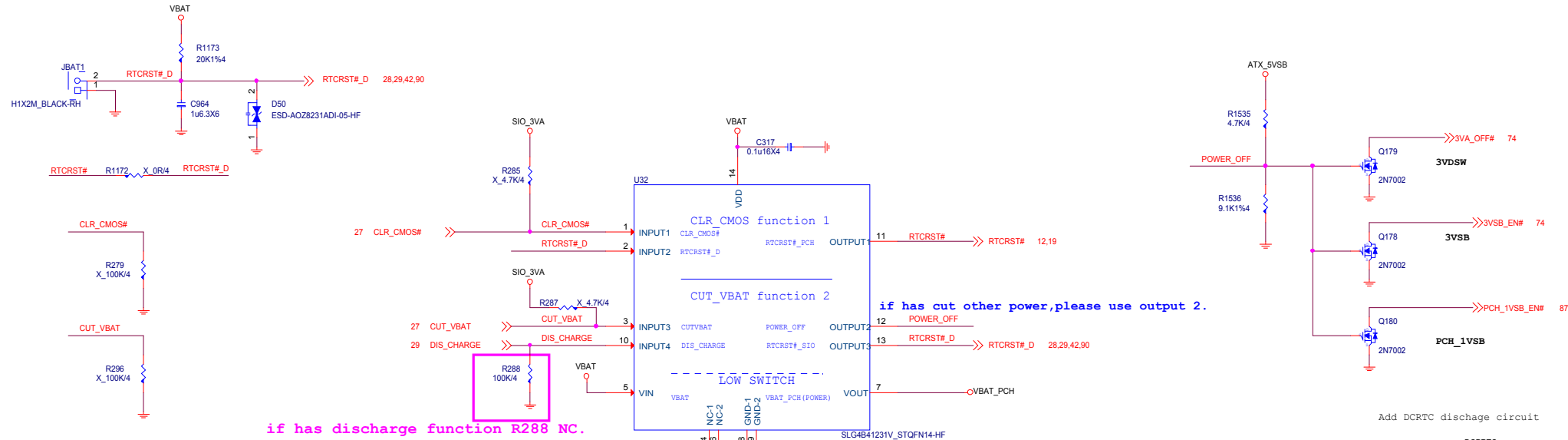
TYPE J : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO



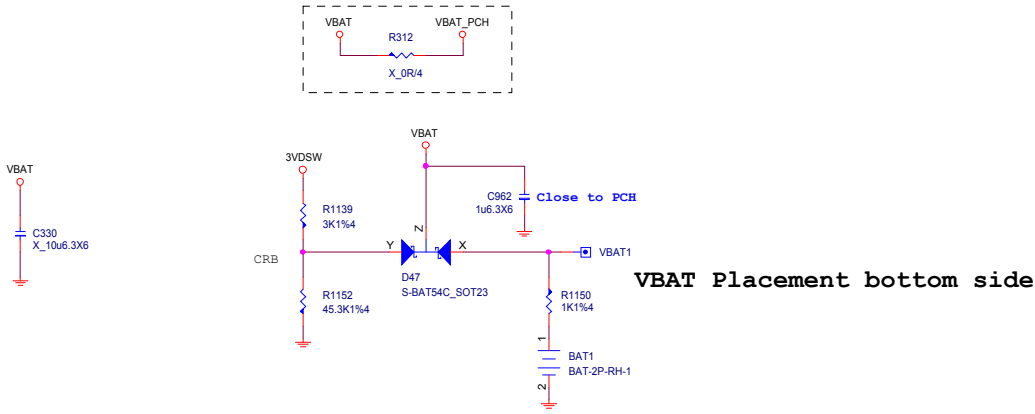
TYPE J : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO



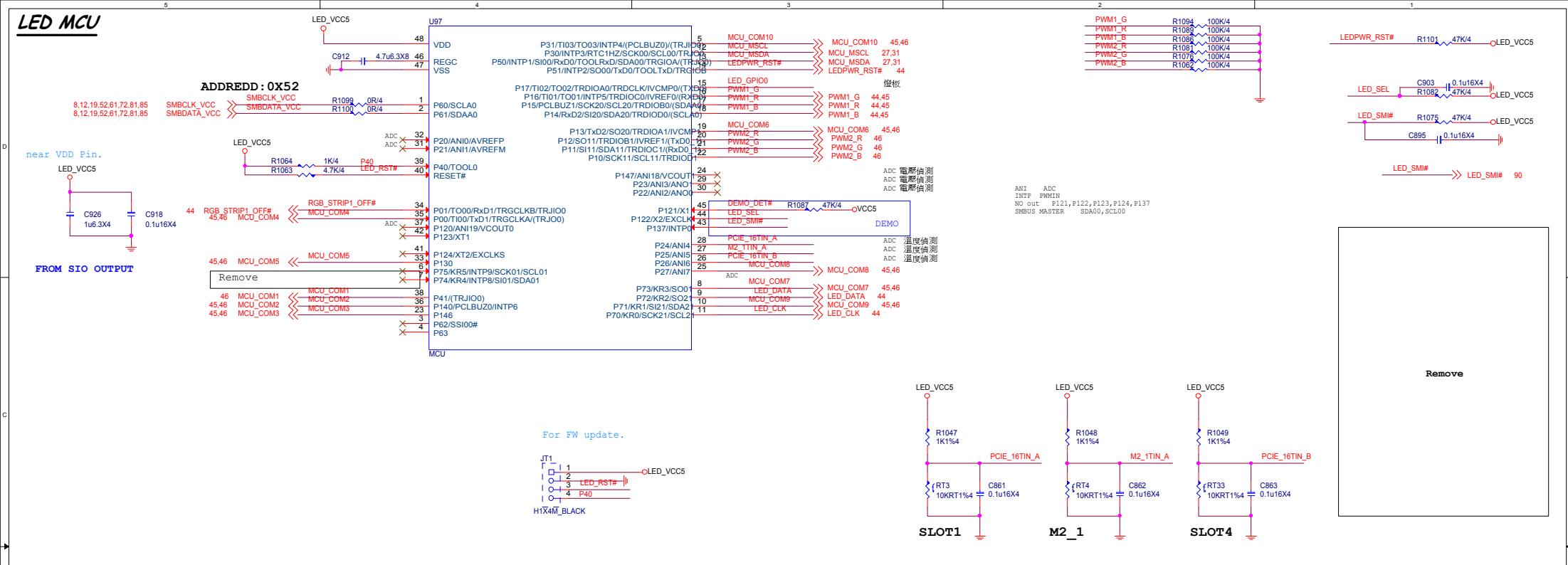
CUT VBAT



VBAT

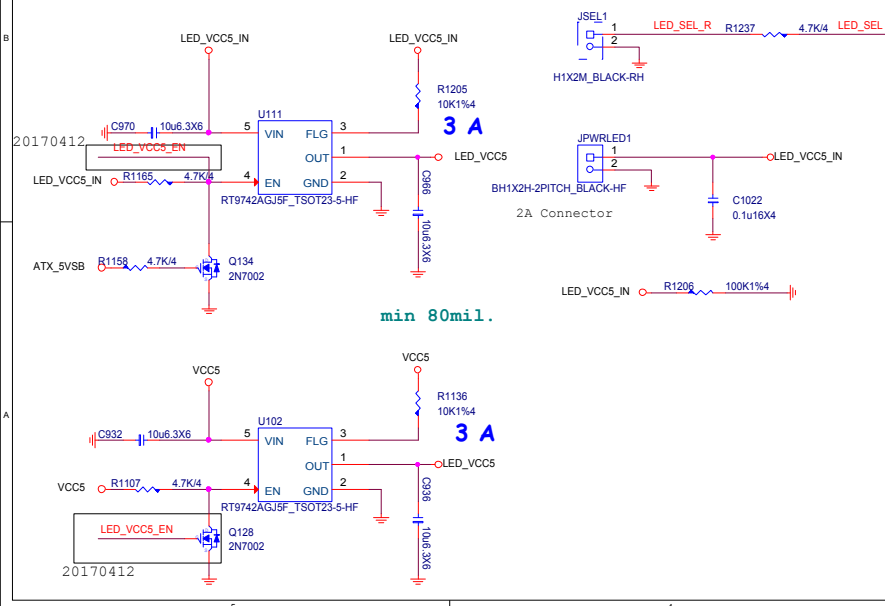


LED MCU



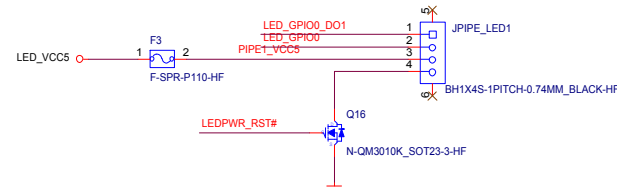
EXTERNAL POWER INPUT

Total 42 Pcs LED=2.52A



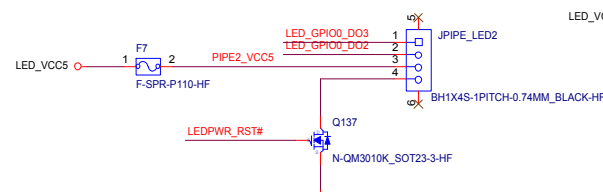
MOS Cover LED

8PCS LED*0.06A=0.48A



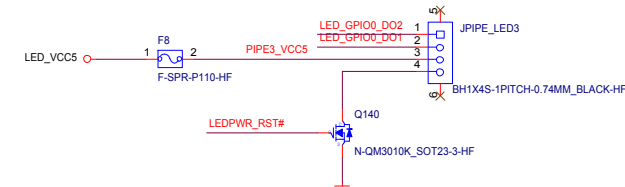
PCH HEATSINK LED

8PCS LED *0.06=0.48A

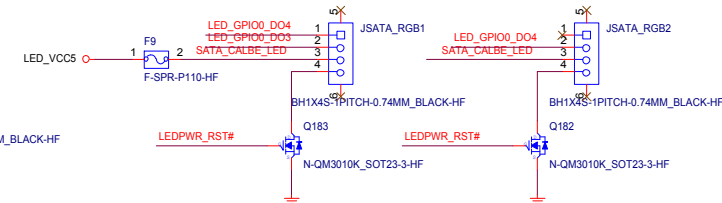


AUDIO Cover LED

5PCS LED*0.06A=0.3A



SATA CABLE LED

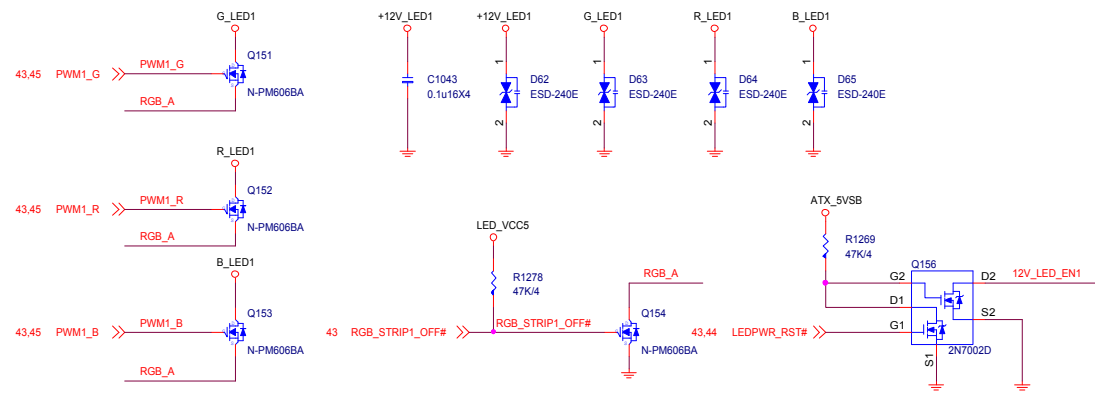


MICRO-STAR INT'L CO.,LTD

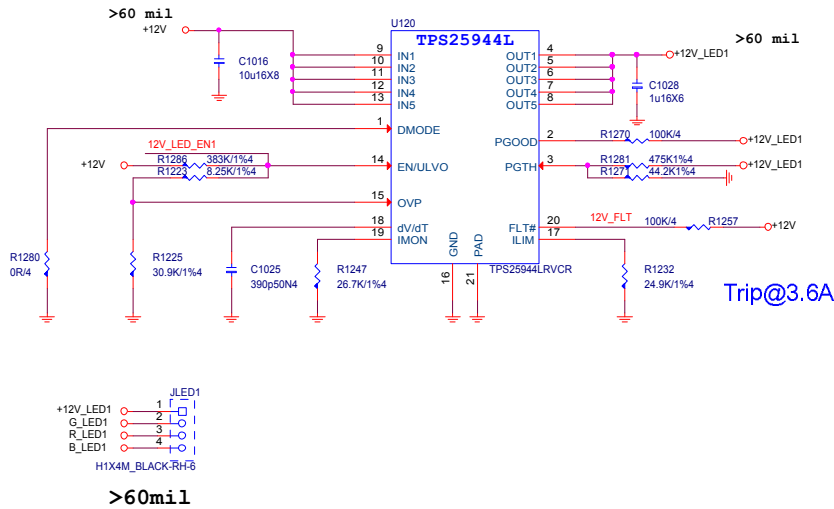
MS-7A98

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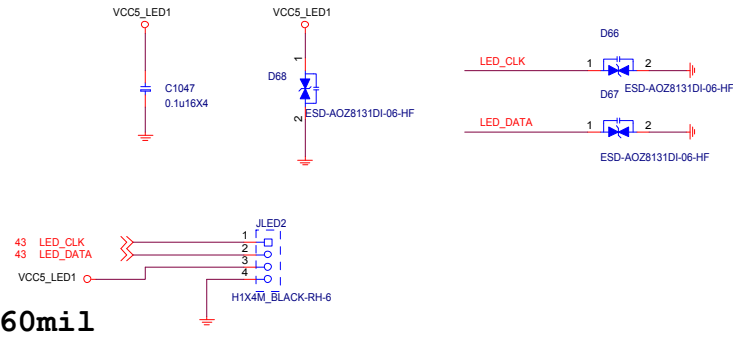
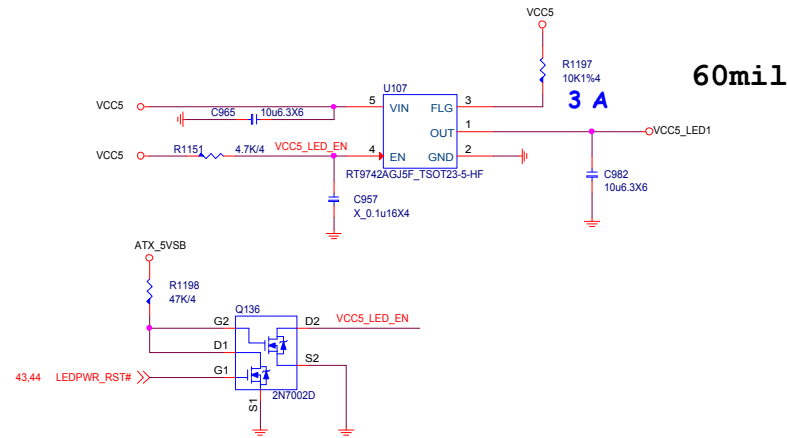
LED STRIPLINE



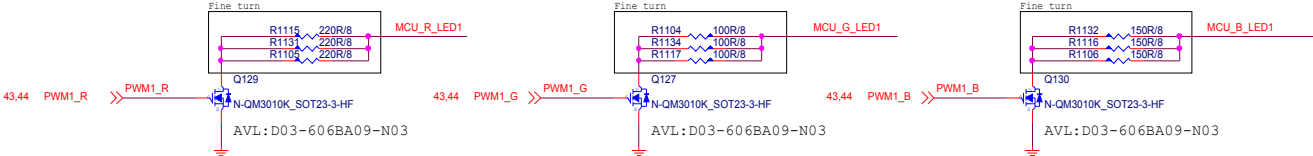
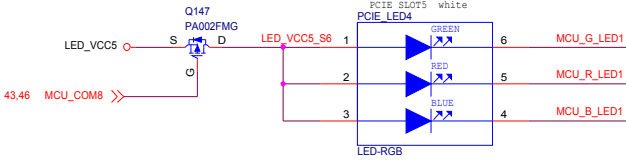
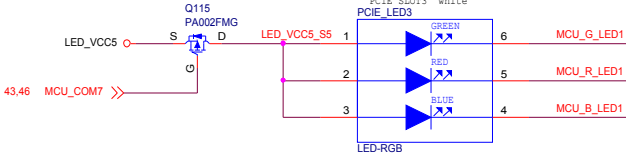
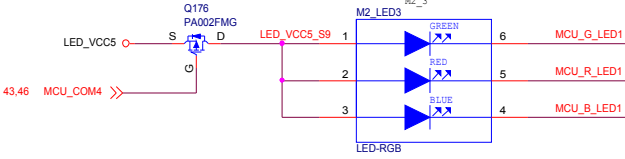
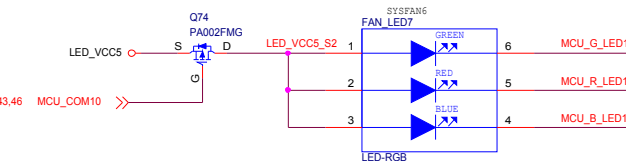
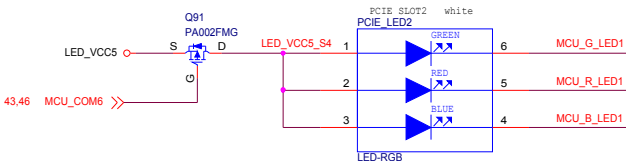
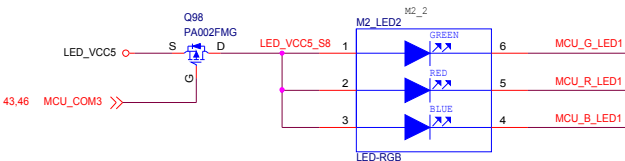
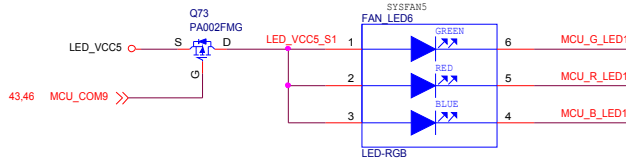
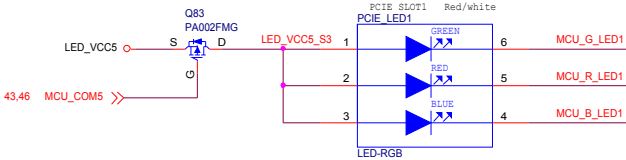
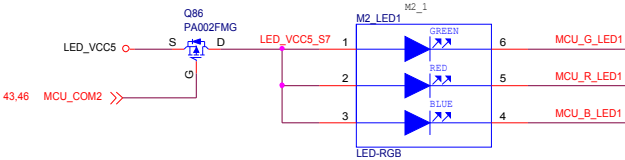
外接LED 燈條 (RGB)
---- PCB 文字面 (JLED1)
---- 手冊 註明 RGB 接頭支援標準 5050 RGB LED 燈條 (12V/G/R/B) , 燈條總輸出電流限制為3安培 (12 伏特) ,
長度限制為2公尺 (待7A20驗證)



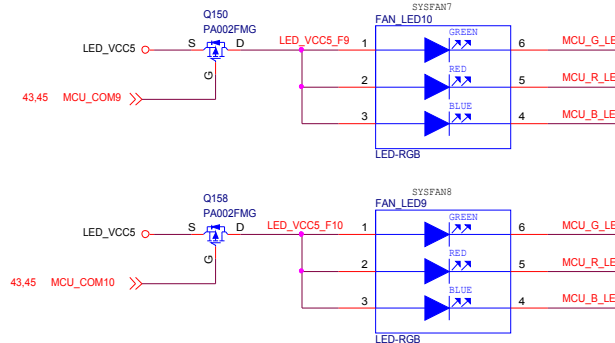
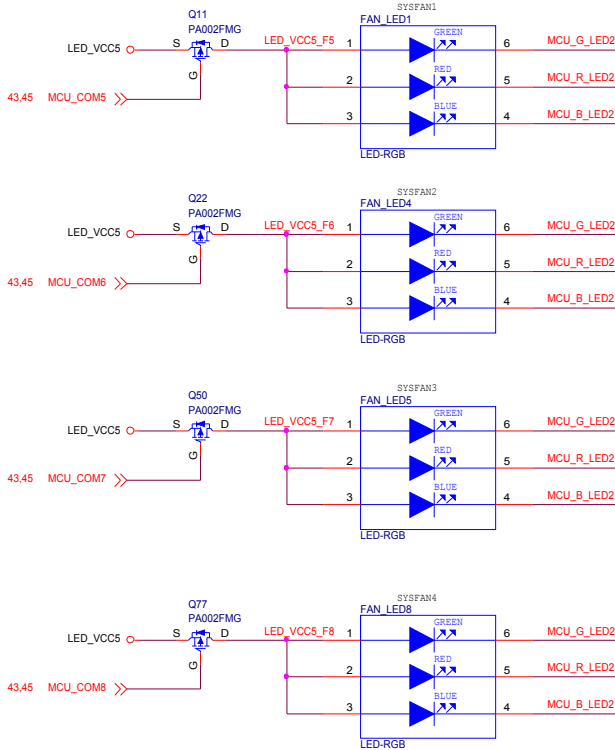
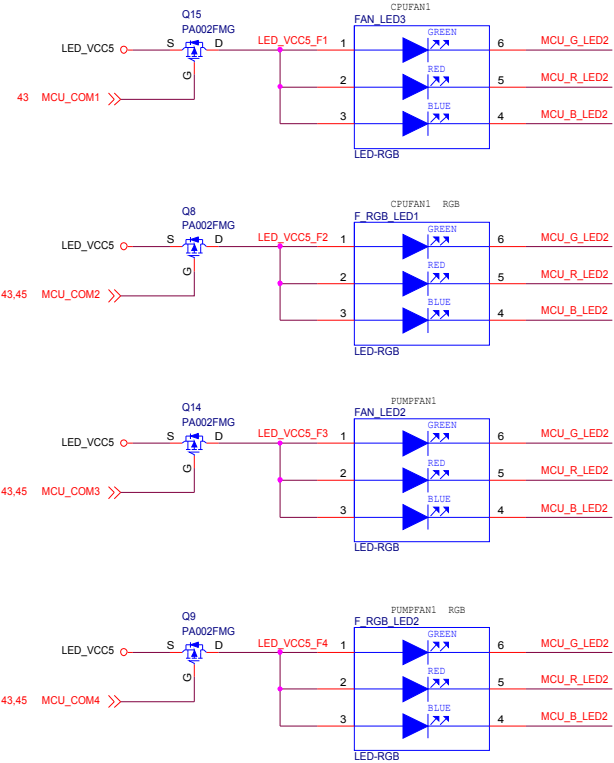
LED STRIPLINE



9PCS LED*0.06=0.54A



10PCS LED*0.06=0.6A

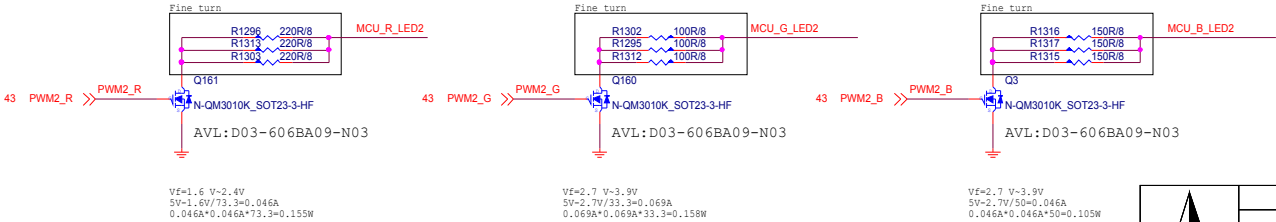


F_RGB_LED1 active reference
F_RGB_LED4 active reference

Default

Input PWM singal	65% Duty	65%~85% Duty	85% Duty
G %	0	0->100	100
R %	100	100->0	0
B %	0	0->100->0	0

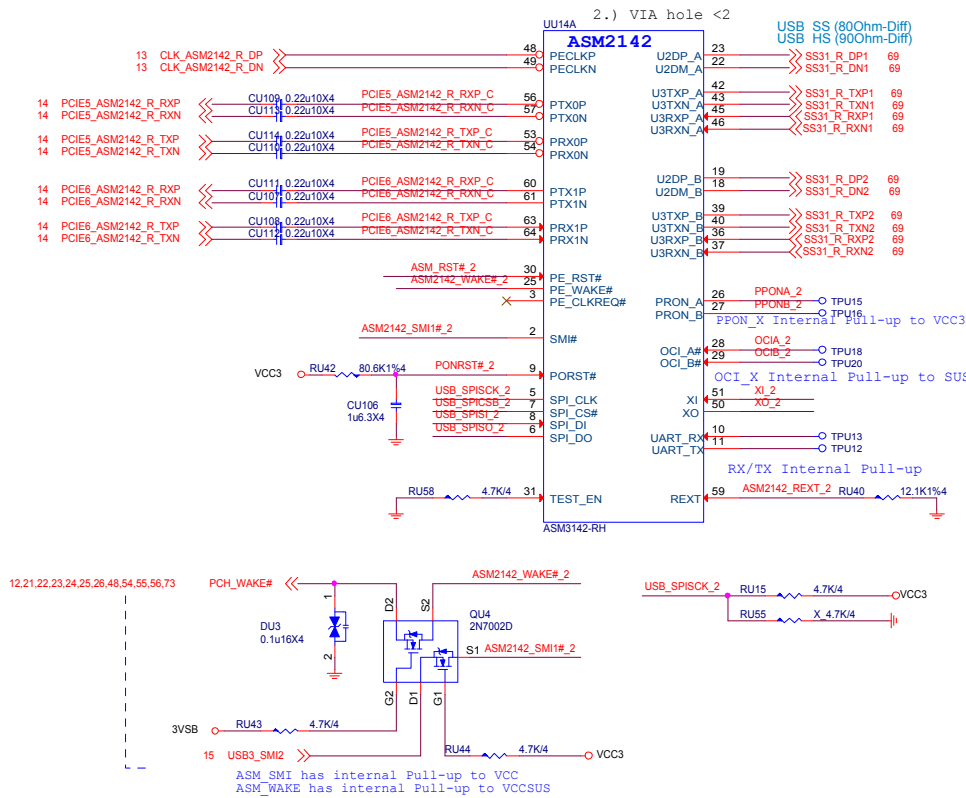
GPIO			State
IN2	IN1	INO	
0	0	0	65% 紅 85% 綠
0	0	1	65% 藍 85% 綠
0	1	0	65% 紅 85% 藍
0	1	1	65% 綠 85% 藍
1	0	0	65% 綠 85% 紅
1	0	1	65% 藍 85% 紅
1	1	0	NA
1	1	1	NA



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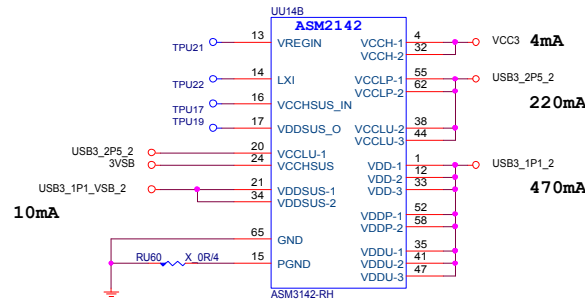
MS-7A98

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Date: Wednesday, May 31, 2017	Sheet 46 of 98	

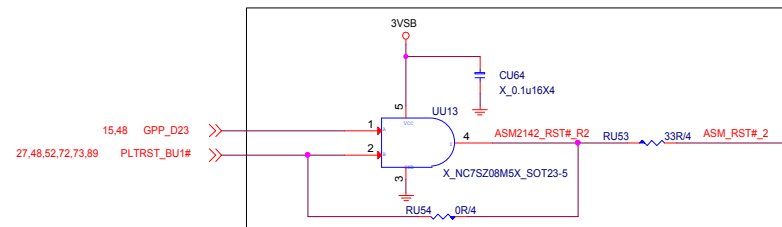


Power Consumption

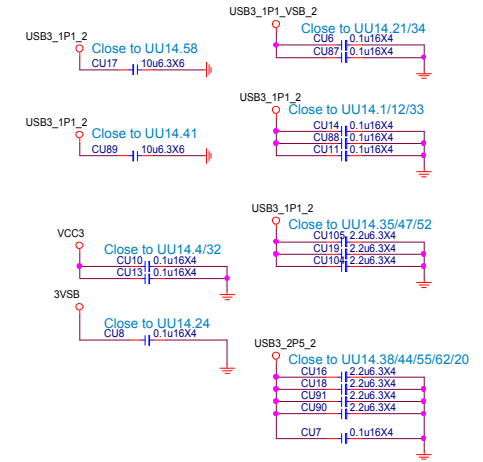
	3.3V	3.3VSUS	2.5V	1.1V	1.1VSUS	Unit
ASM3142	TbD	TbD	TbD	TbD	TbD	mA
ASM2142	4	9	220	470	10	mA



ASM3142 remove

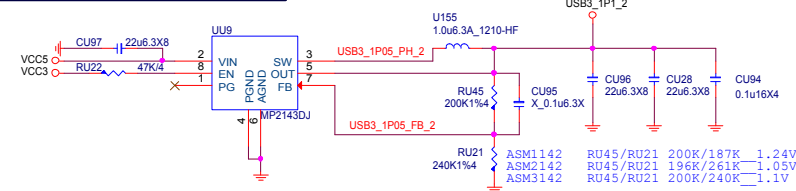


ASM2142 U13 stuff RU53 unstuff
ASM1142 U13 unstuff RU53 stuff
ASM3142 U13 & CU64 unstuff
Reset control for ASM2142 only.

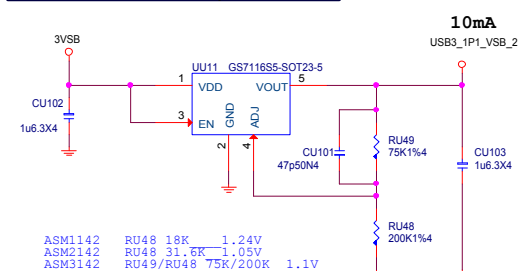


UREXT,PEUREXT(W/S): 10/7
OCIA,OCIB,PPONA,PPONB(W/S): 5/8
XO/XI (95hm-Diff,Spacing 30mil)

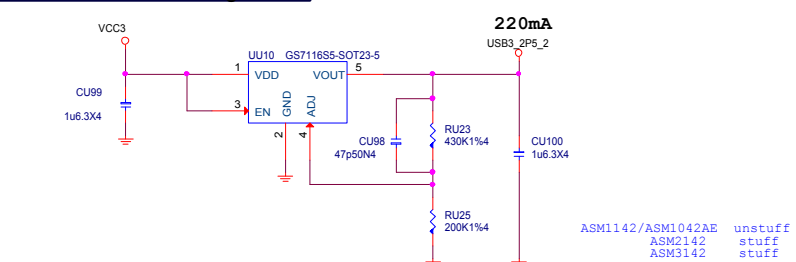
ASM3142 1.1v Core Power



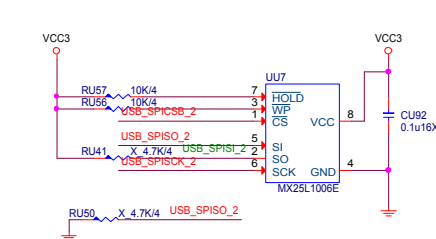
ASM3142 1.1v Suspend Power



ASM3142 2.5v Analog Power



EEPROM



ASM1142 U13 M31-2551222-M24 (512K bit)
ASM2142 U13 M31-2510222-M24 (1M bit)

MICRO-STAR INT'L CO.,LTD
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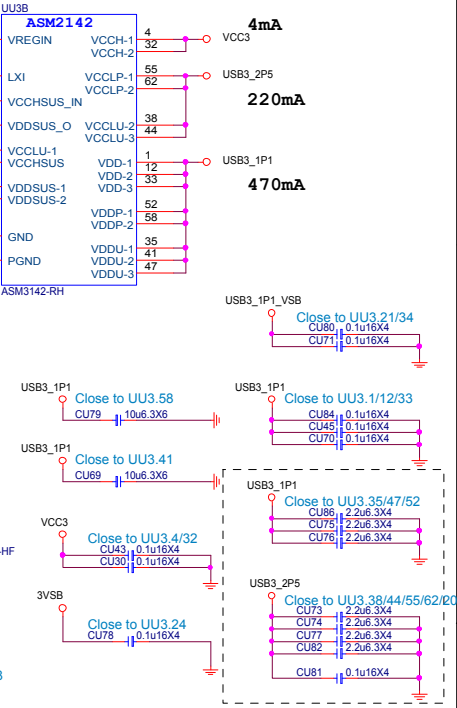
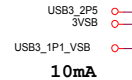
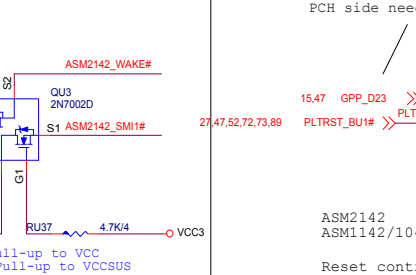
Size	Document Description	Rev
Custom	USB3.1-ASM3142AE-Rear	20

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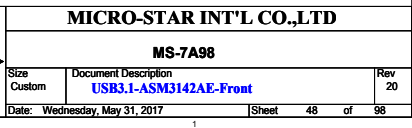
```

3VSB ○ RU38 4.7K/4
15 USB3_SMI1 >>
ASM_SMI has interna
ASM_WAKE has intern

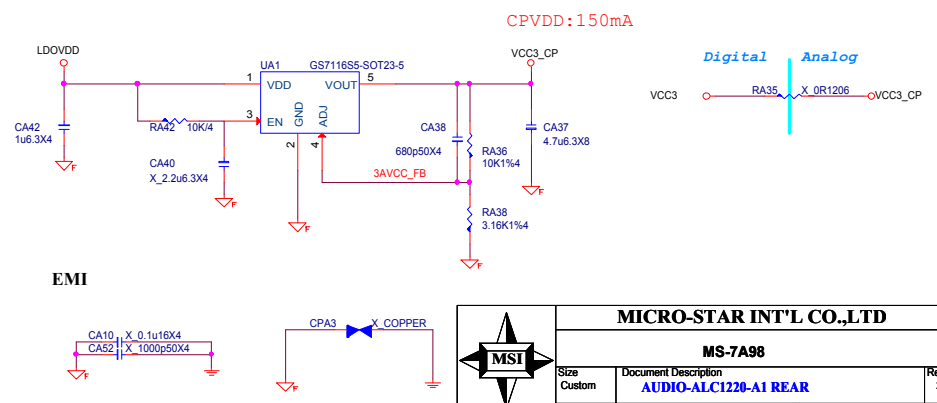
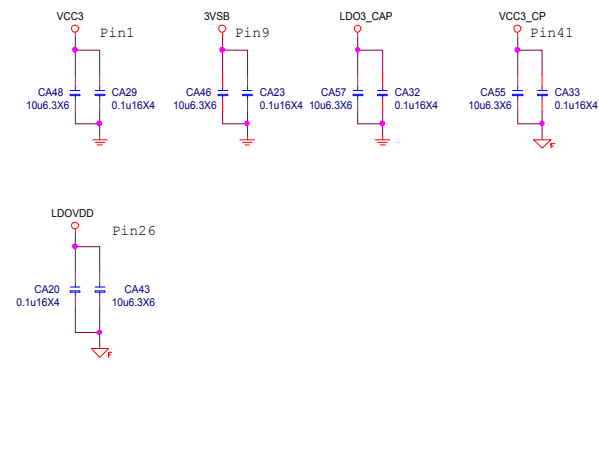
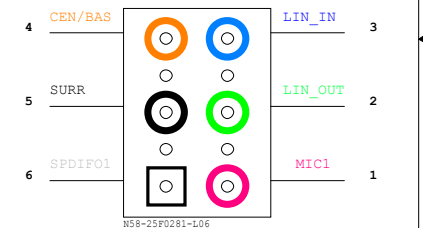
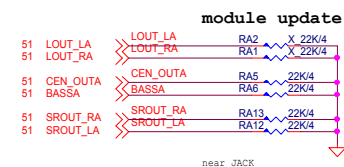
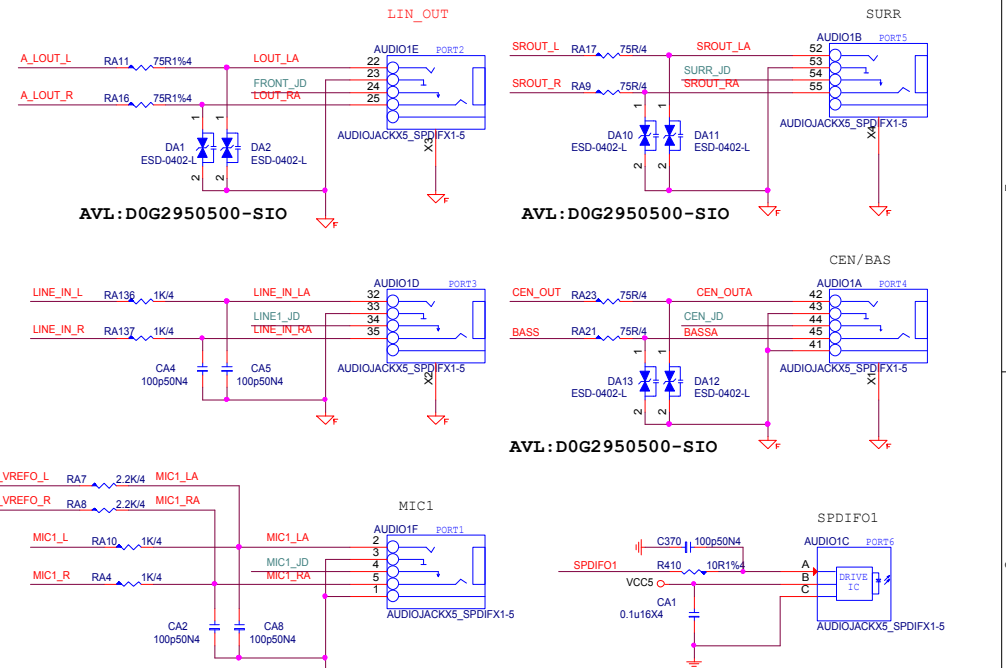
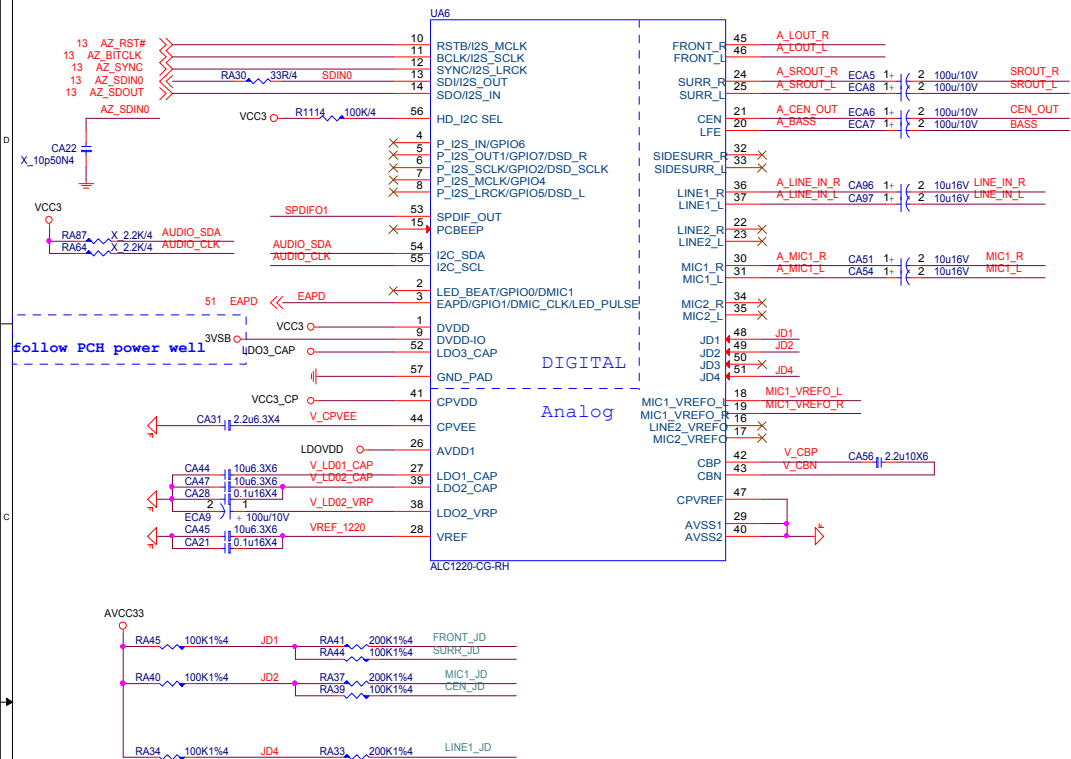
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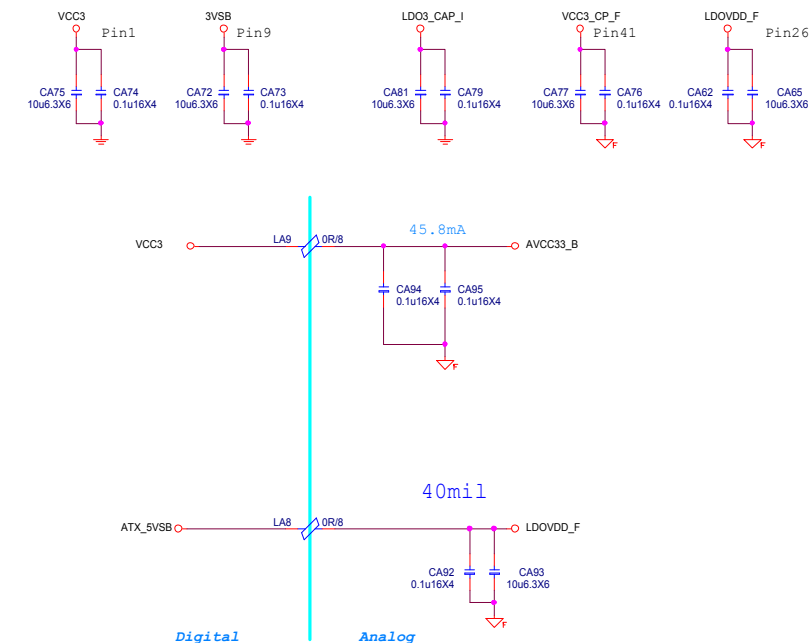
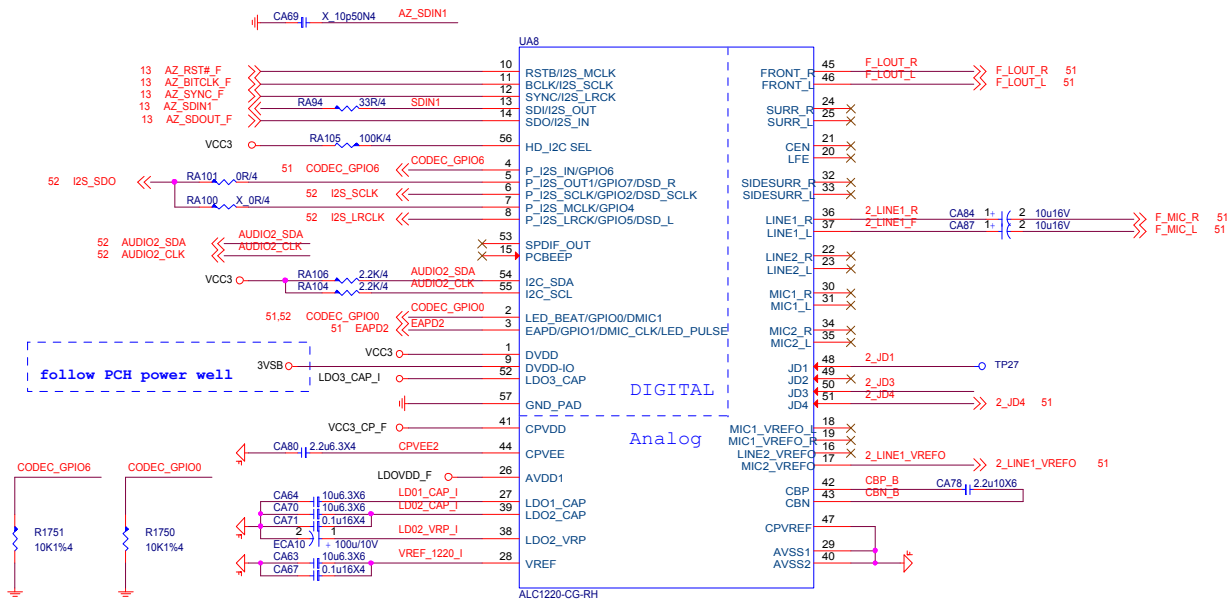
ASMI142 M31-2551222-M24 (512K bit)
 ASMI2142 M31-25L1022-M24 (1M bit)



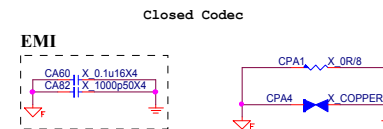
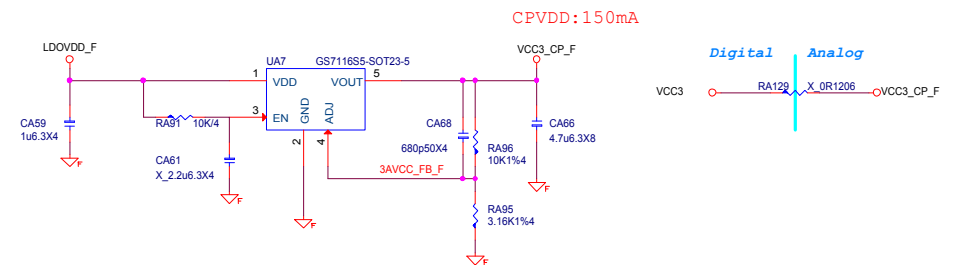
ALC1220



ALC1220

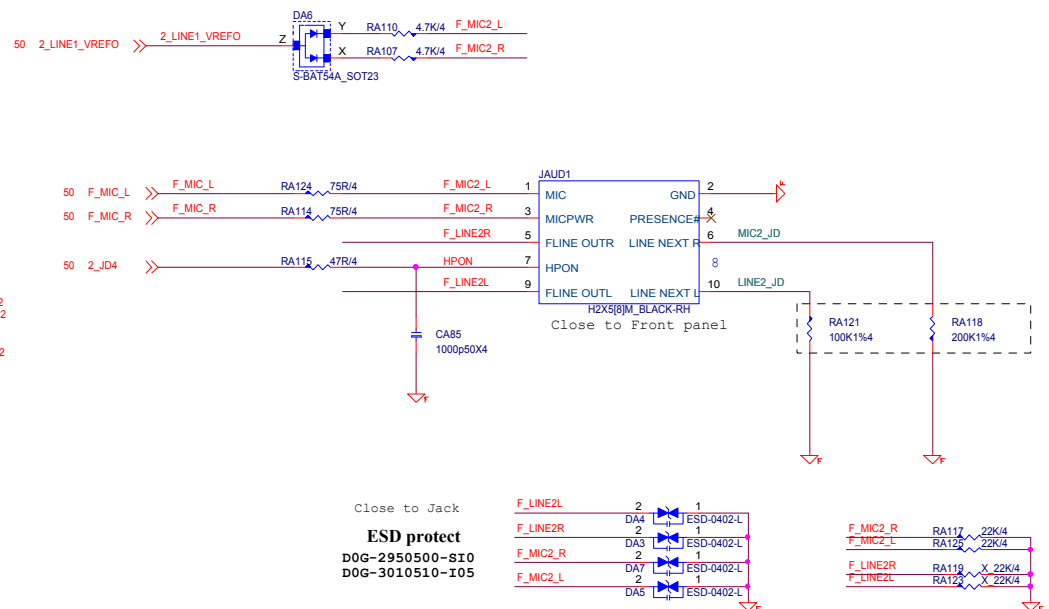
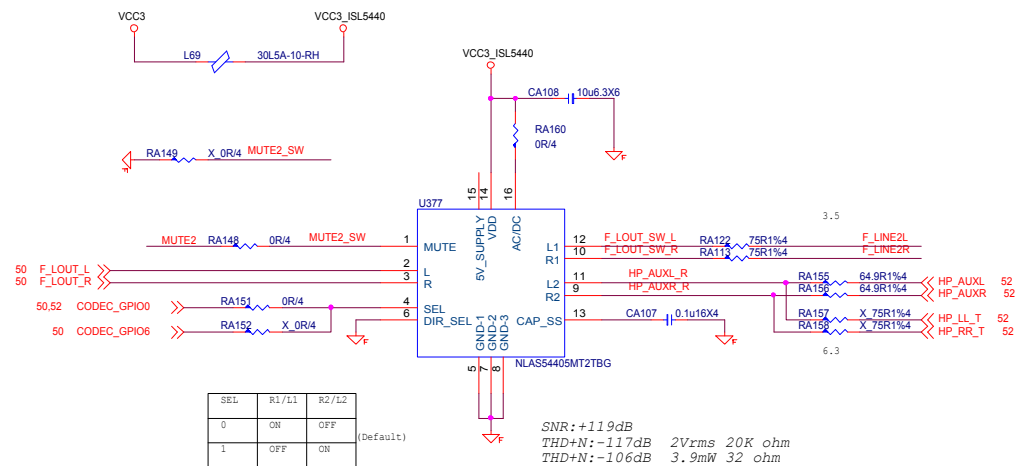


CPVDD POWER:ATX5VSB will Leakage to CVDD by ALC1220, so CVDD must keep 3.3V



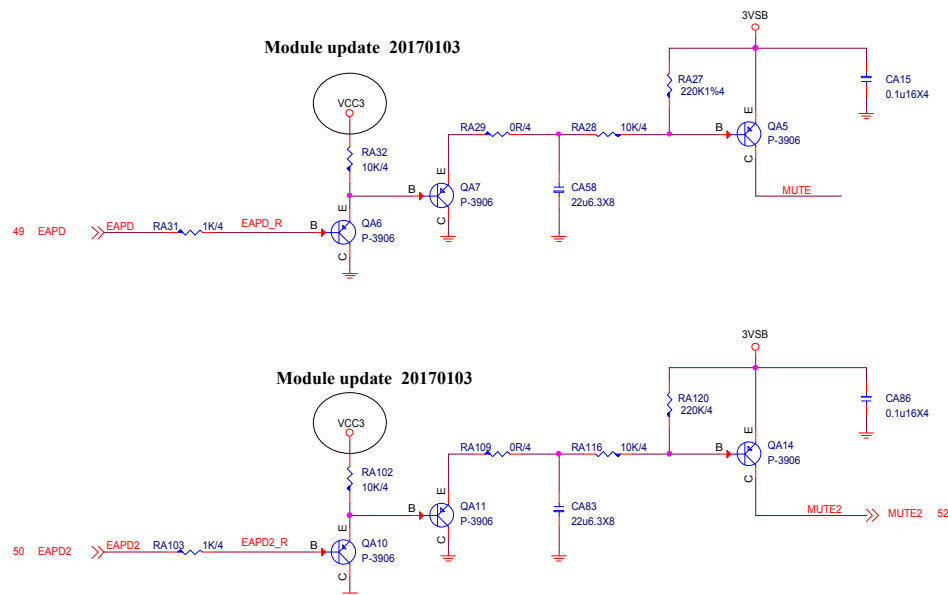
MICRO-STAR INT'L CO.,LTD		
MS-7A98		
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Custom	AUDIO-ALC1220-B1 FRONT	20
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Analog Switch For 6.3mm & 3.5mm Jack Impedance sensing



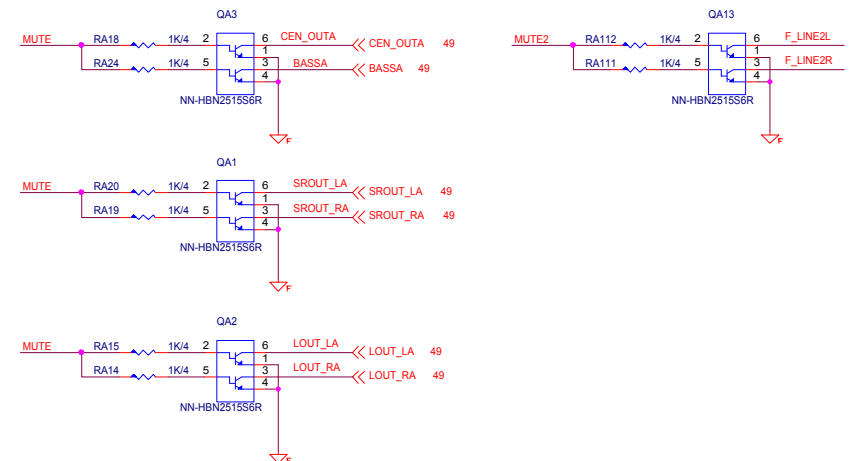
Rear Line OUT De-POP circuit
(De-pop circuit for Rear Line out & Front Headphone out)

Digital



(add de-pop circuit by PM spec or customer request,
NOTE: add de-pop circuit need to change CA6,CA7, CA12, CA13, CA23, CA24 to TVS)

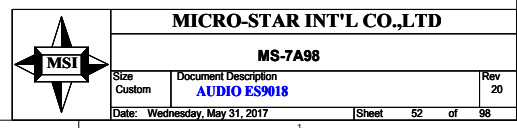
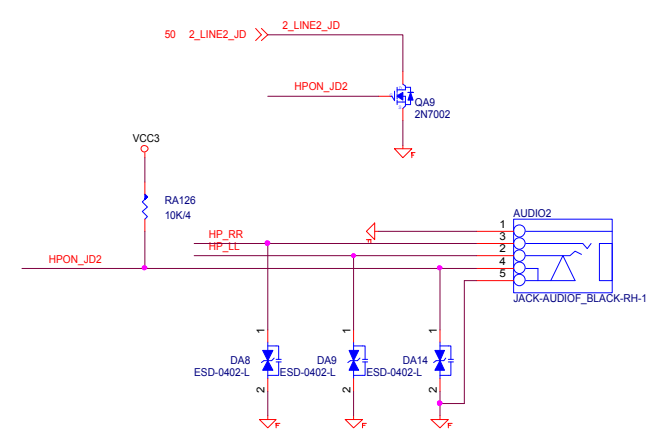
Analog

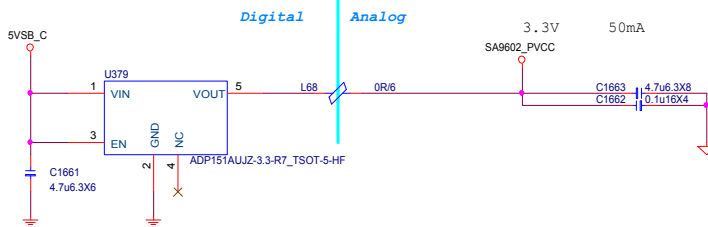
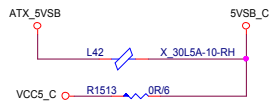
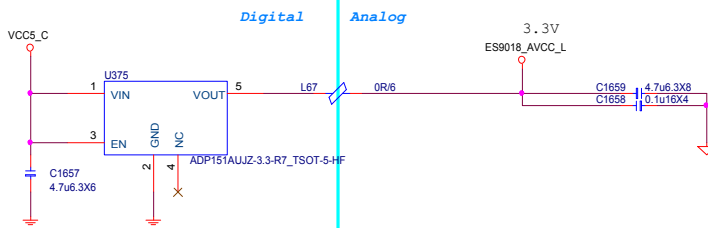
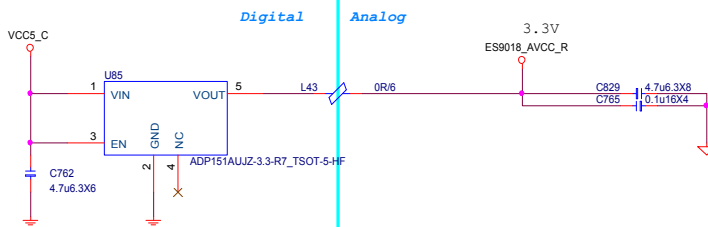
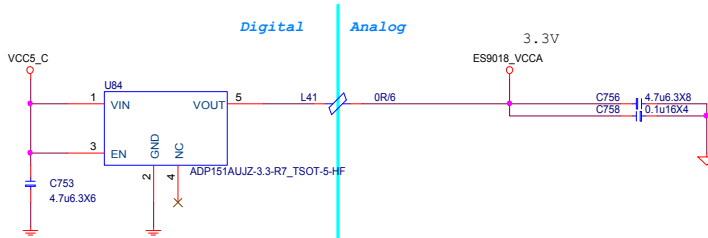
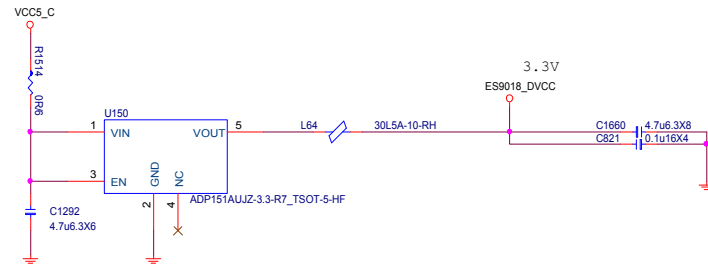
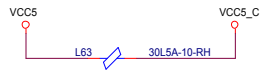


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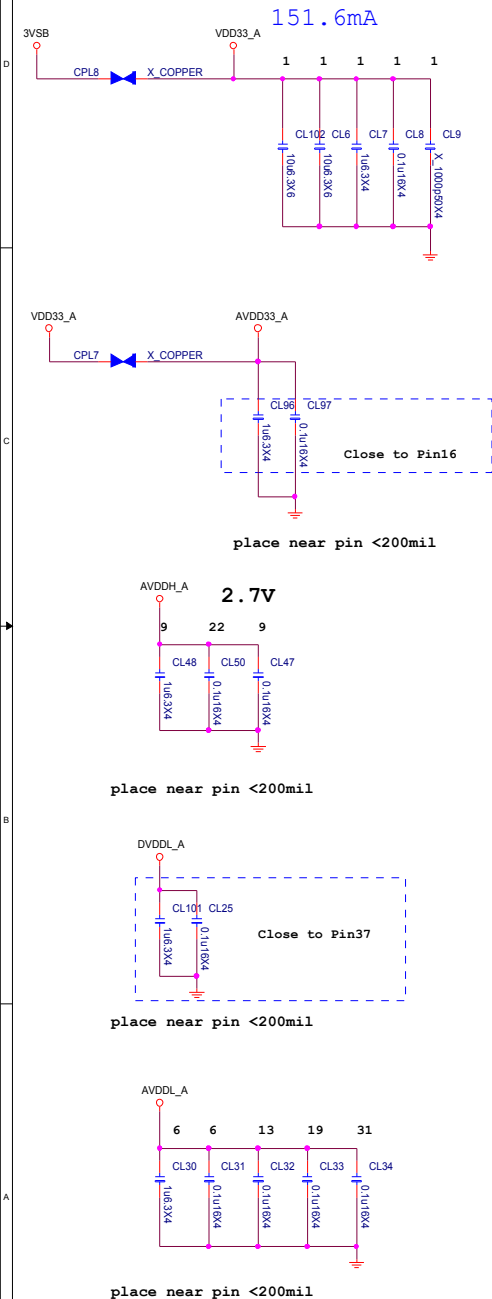
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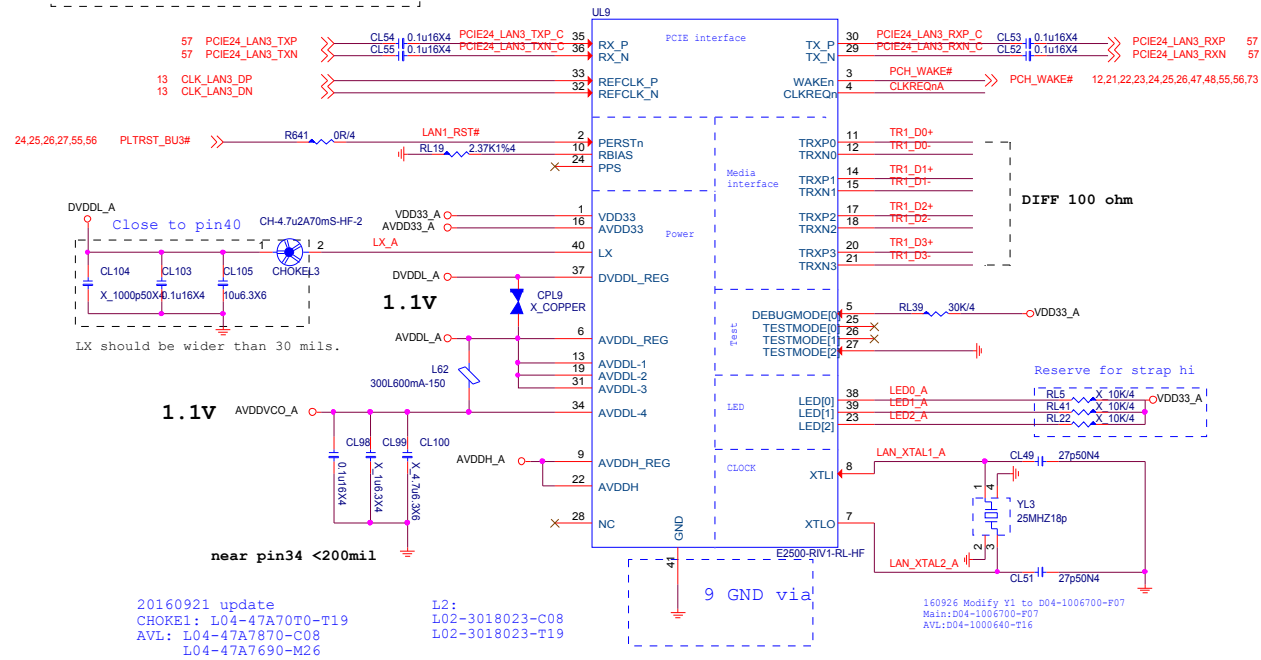




E2500 GIGA LAN



PIN2:
AMD platform connect to PCIE_RST#,
don't connect to A-RST#.
INTEL platform connect to PLT_RST#,



note:

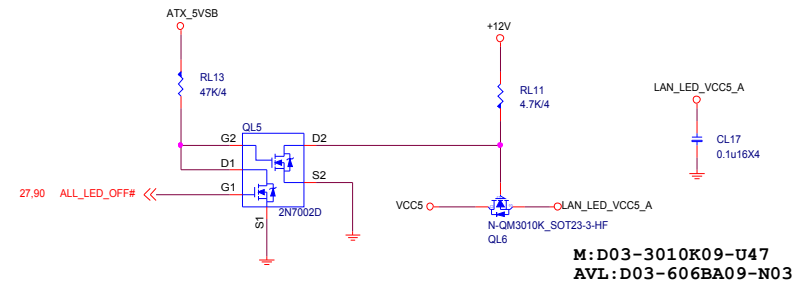
LED0:
1=High core voltage
0=Low core voltage

LED1:
1=SWR mode
0=LDO mode

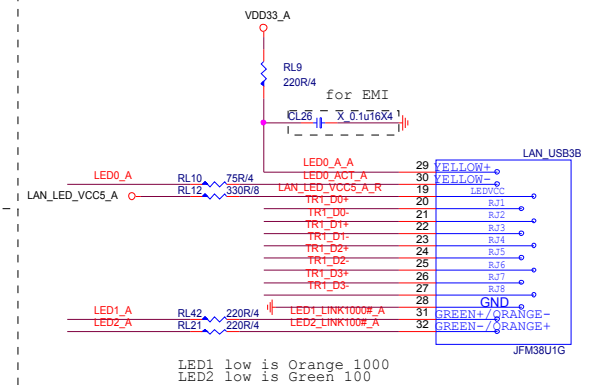
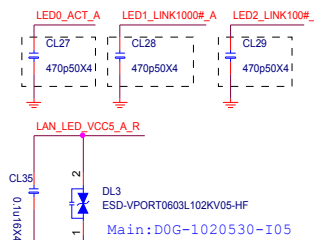
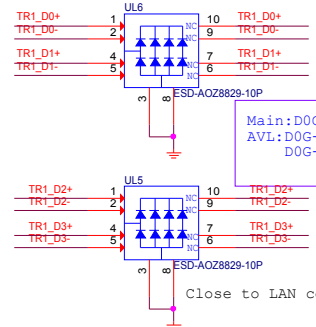
LED2:
1=25MHz clock
0=48MHz clock

VDD33 >= 30mils;
AVDD33 >= 30mils;
AVDDH >= 20mils;
AVDDL >= 20mils;
DVDDL >= 20mils;
Pin LX to L1 >= 30mils.

LED ON/OFF by SIO



EMC



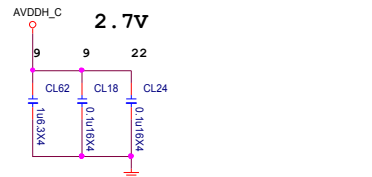
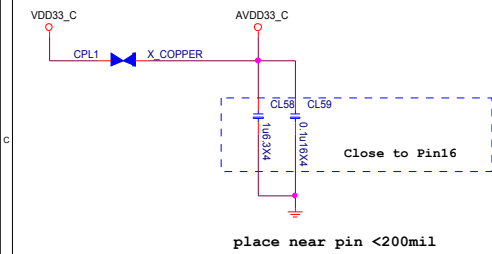
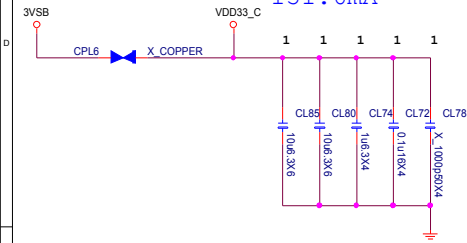
MICRO-STAR INT'L CO.,LTD

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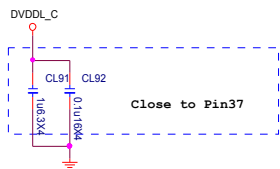
Size	Document Description	Rev
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E2500 GIGA LAN

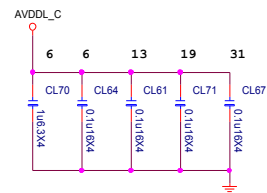
151.6mA



place near pin <200mil

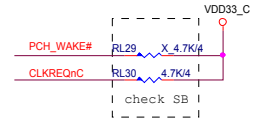
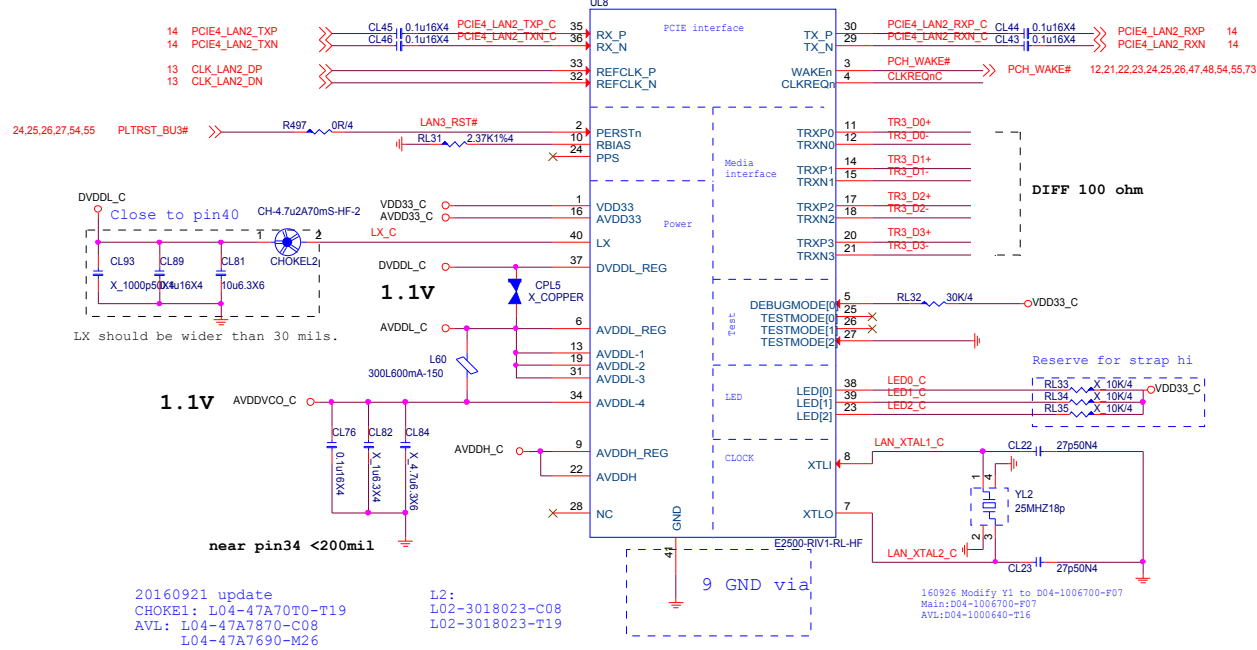


place near pin <200mil



place near pin <200mil

PIN2:
AMD platform connect to PCIE_RST#,
don't connect to A-RST#.
INTEL platform connect to PLT_RST#,



note:

LED0:
1=High core voltage
0=Low core voltage

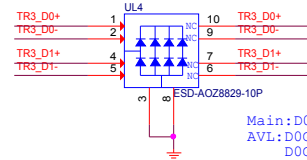
LED1:
1=SWR mode
0=LDO mode

LED2:
1=25MHz clock
0=48MHz clock

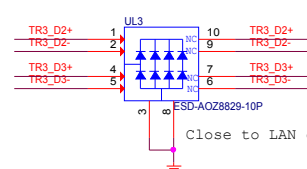
VDD33 >= 30mils;
AVDD33 >= 30mils;
AVDDH >= 20mils;
AVDDL >= 20mils;
DVDDL >= 20mils;
Pin LX to L1 >= 30mils.

LED ON/OFF by SIO

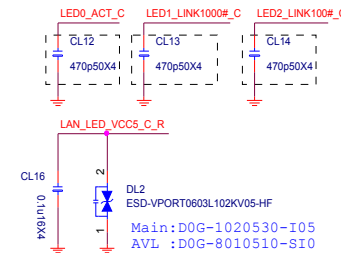
EMC



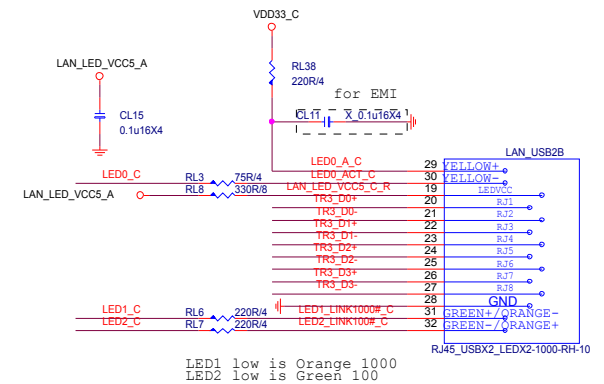
Main:D0G-06A030C-A68
AVL:D0G-05A0300-II14
D0G-45B031C-005



Close to LAN conn.



Close to LAN conn.



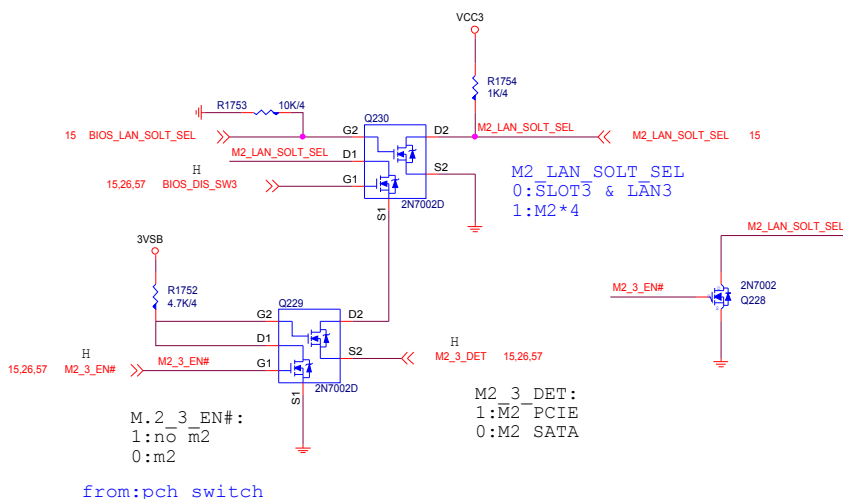
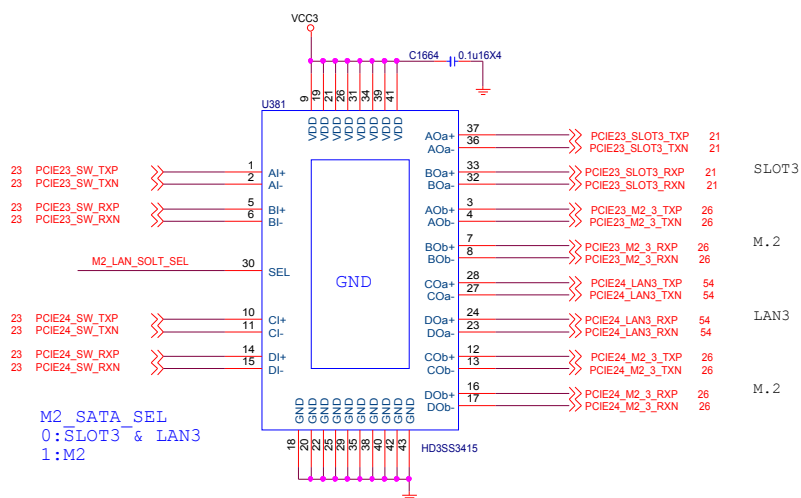
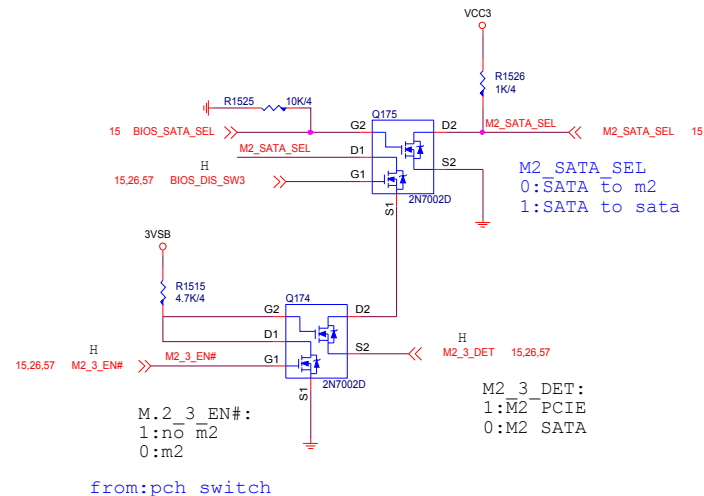
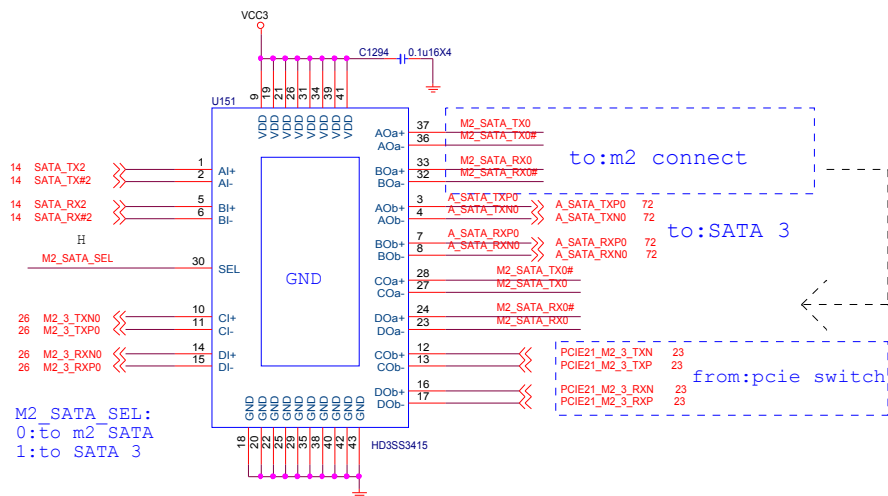
LED1 low is Orange 1000
LED2 low is Green 100



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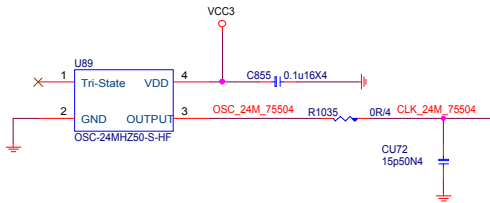
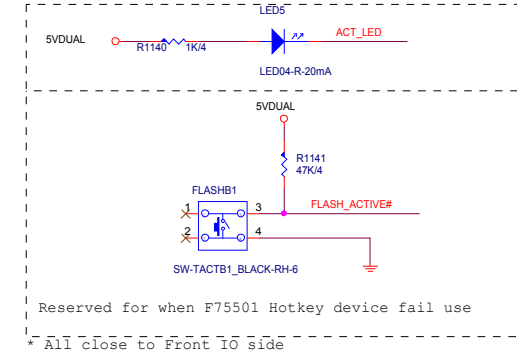
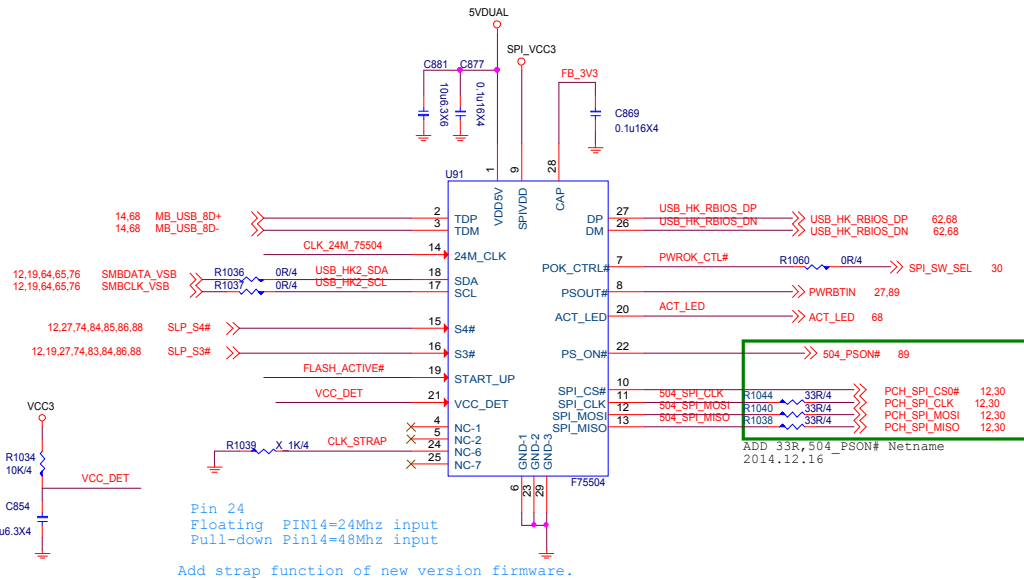
M2 LAN SOLT SEL
0:SLOT3 & LAN3
1:M2*4



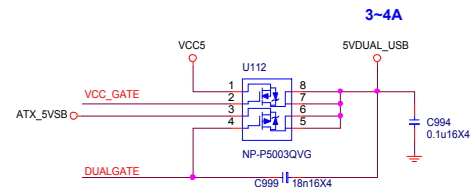
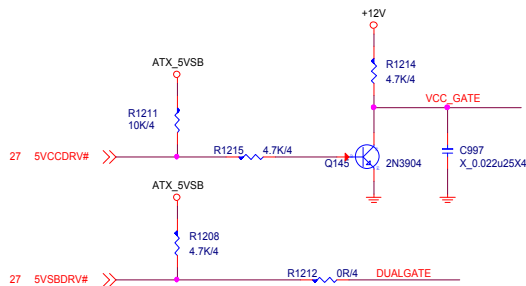
MICRO-STAR INT'L CO.,LTD

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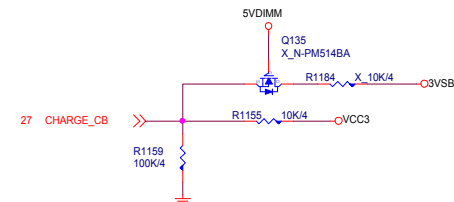
Size	Document Description	Rev
Custom	M2/SATA SWITCH	20
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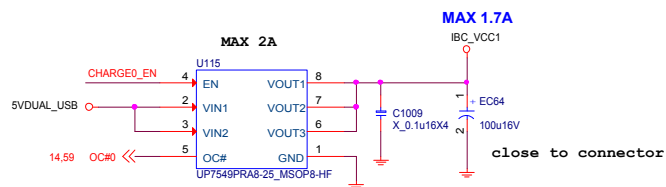
5VDUAL_USB



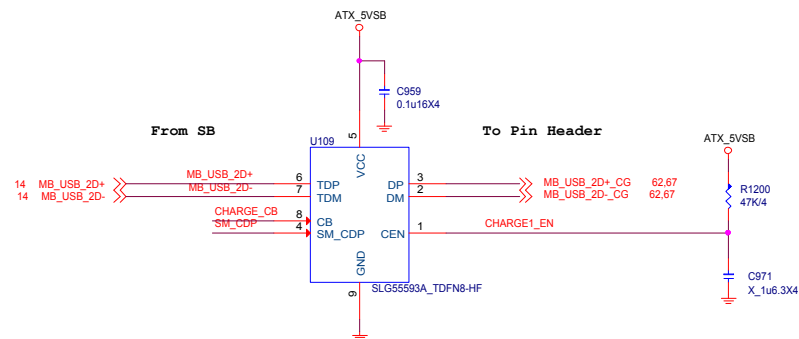
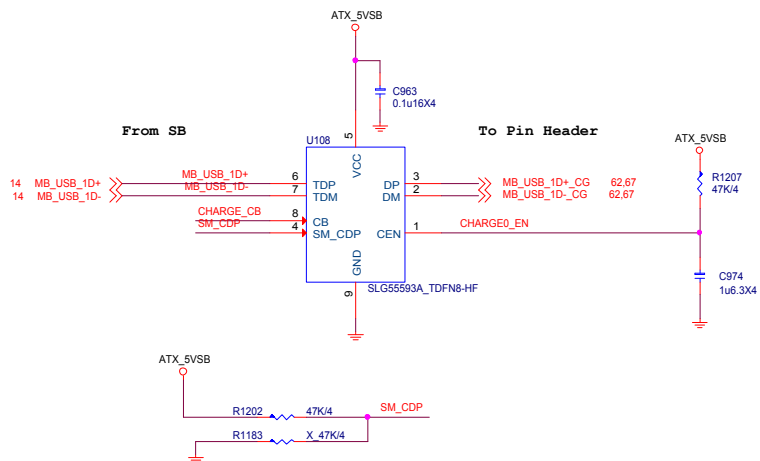
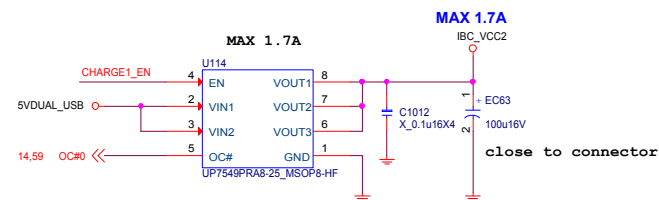
Pin power : I_3VSB
Register power : I_3VSB
Register reset : I_3VSB



USB POWER PORT 0 For USB Charging



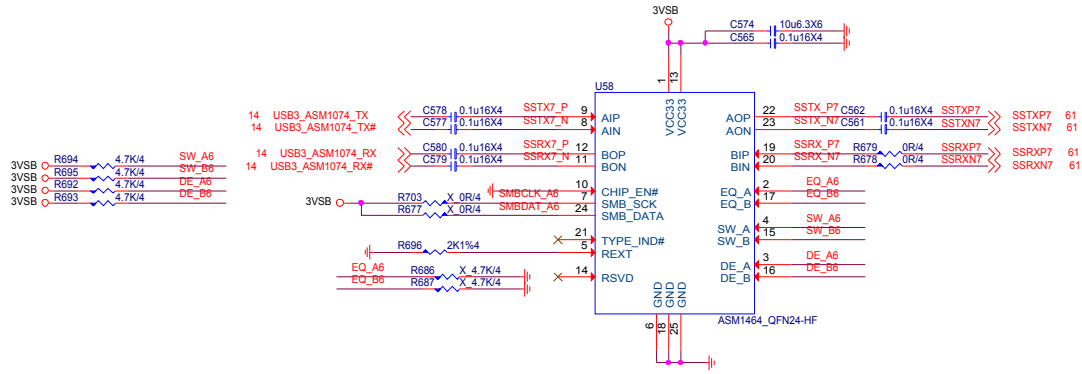
USB POWER PORT 1 For USB Charging

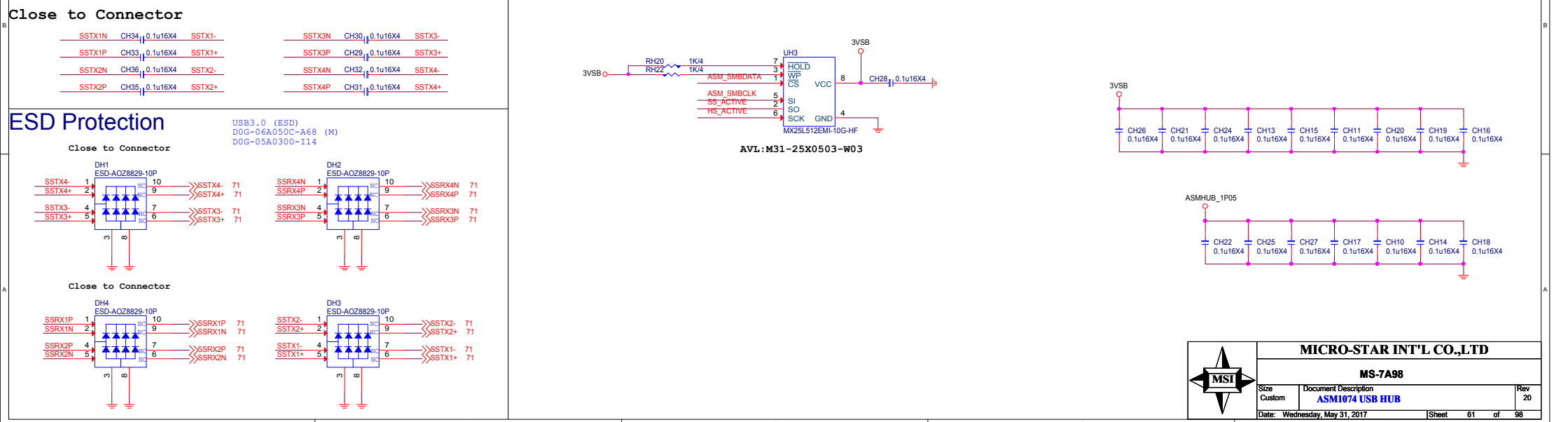
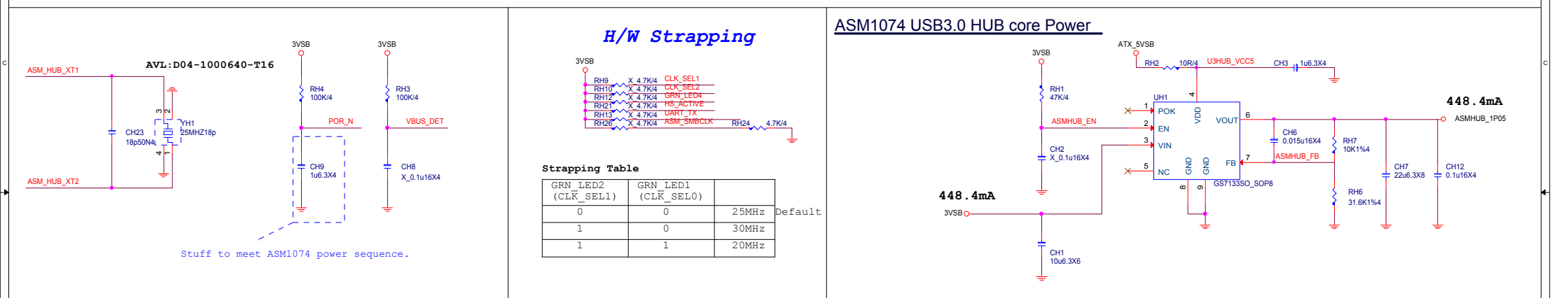
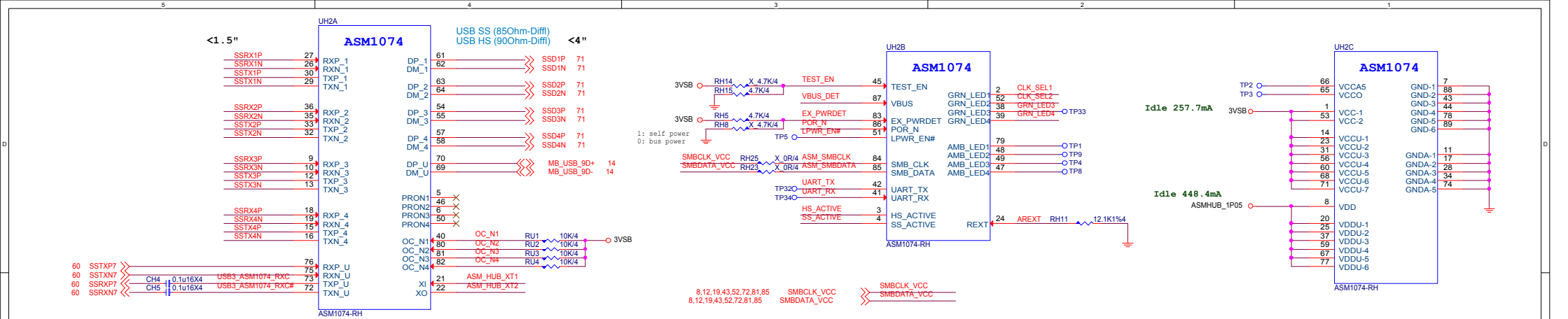


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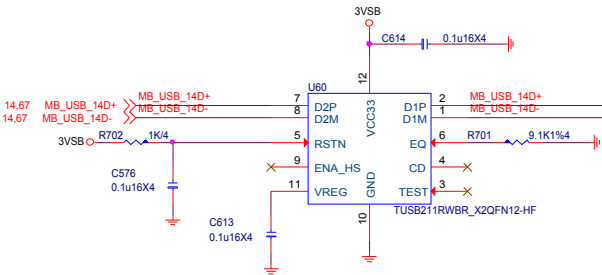
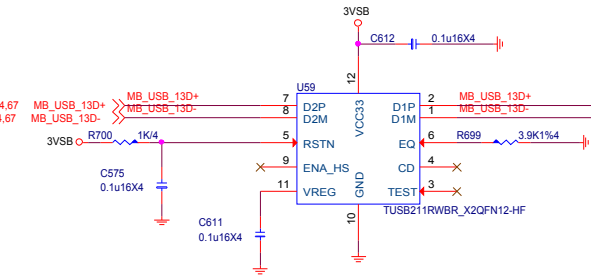
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Size	Document Description	Rev
Custom	USB CHARGE_SLG55593A	20
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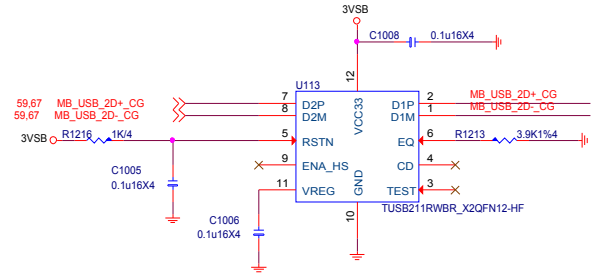
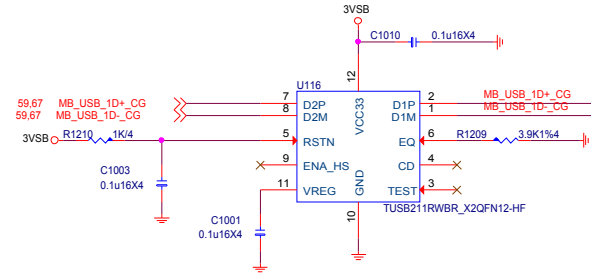




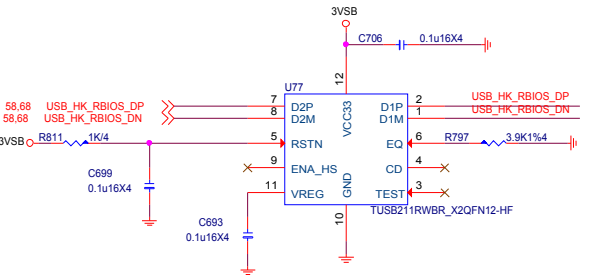
USB2.0 FRONT VR PORT JUSB1



USB2.0 FRONT CHARG PORT JUSB6



USB2.0 REAR PS2 PORT

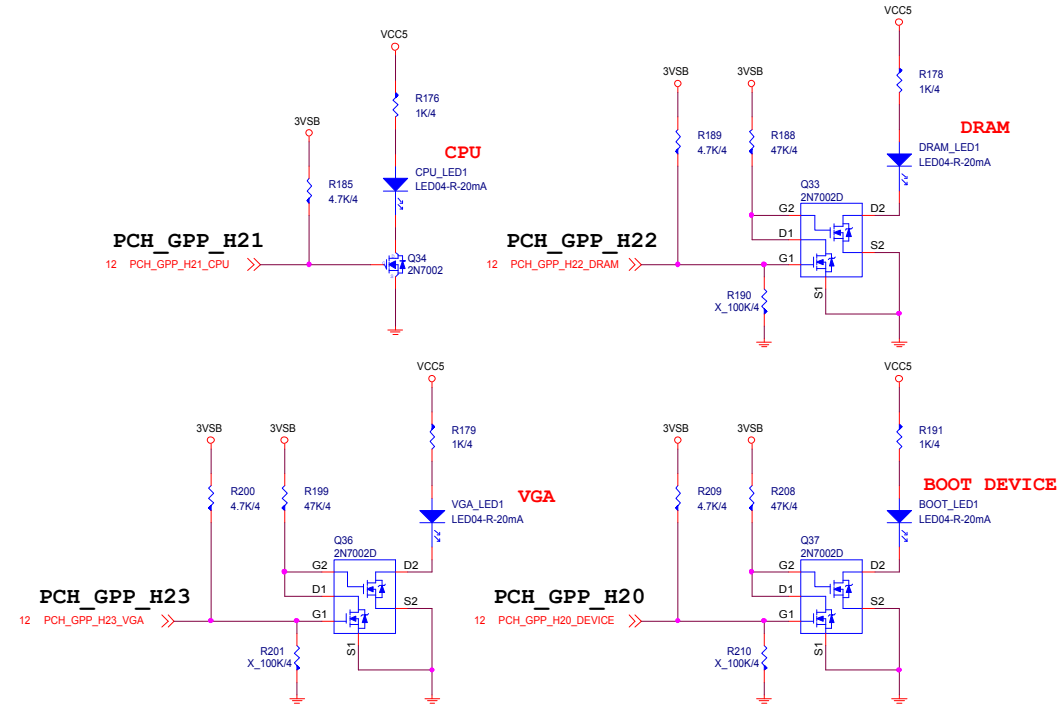


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Custom	USB2 Ridriver TUSB211	20
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EZ DEBUG LED



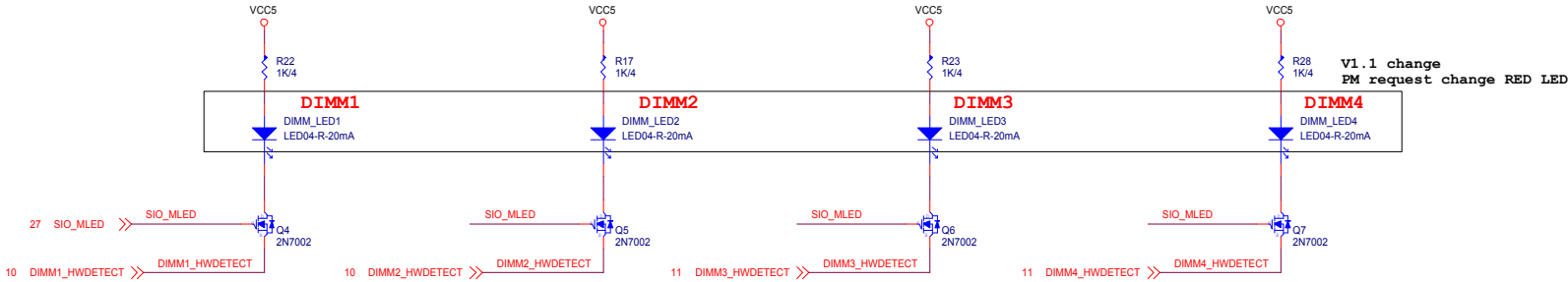
LED
紅 : D0C-040P100-H91
AVL: D0C-040S500-E07

LED
白 : D0C-040T200-H91
AVL: D0C-040S200-E07

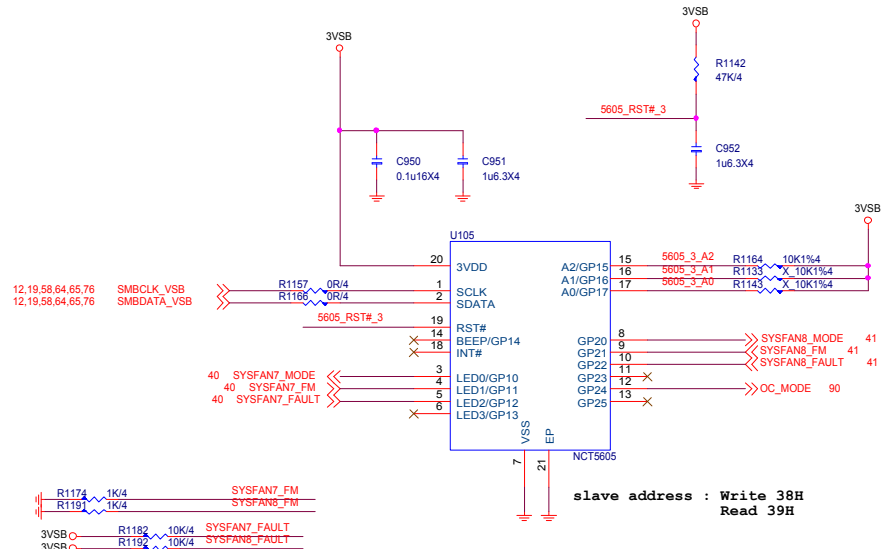
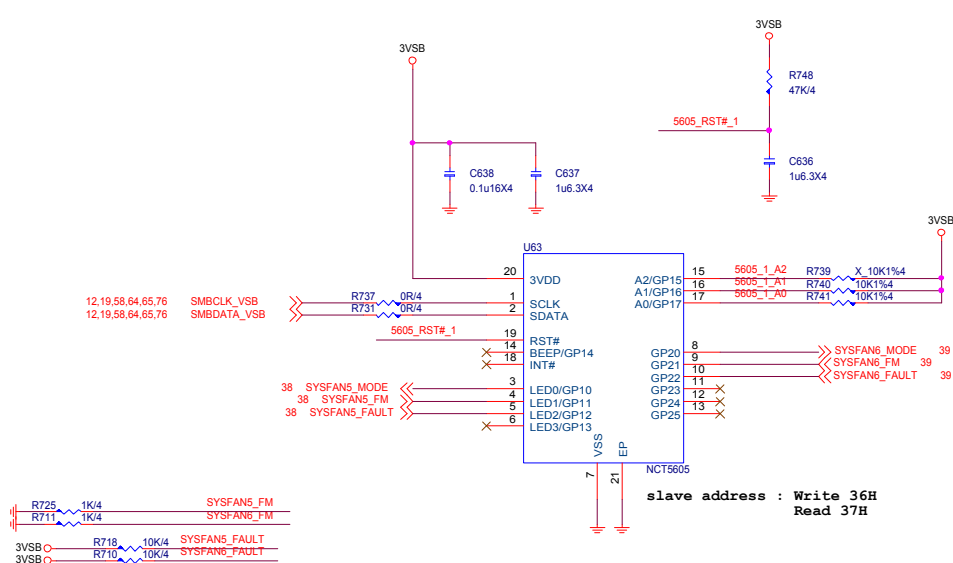
GPIO LED	GPP_H21	GPP_H22	GPP_H23	GPP_H20
亮	GPI PULL HIGH	GPO PO LOW	GPO PO LOW	GPO PO LOW
滅	GPO LOW	GPO HIGH (default HIGH)	GPO HIGH (default HIGH)	GPO HIGH (default HIGH)

- 關機斷電狀態下，4個LED先維持default全暗，開機通電後：
1. 首先進行CPU checkCPU LED 亮，check PASS後則CPU LED滅掉。
 2. 接著依序進行Memory /memory LED亮check PASS後則memory LED滅掉。
 3. VGA的check/VGA LED亮，check PASS後則VGA LED滅掉。
 4. BOOT DEVICE的check/BOOT LED亮，check PASS後則BOOT LED滅掉。
 5. 因此最後正常順利開機後，四個LED燈都是滅掉的。
(系統重啟或其他原因造成系統重開機，則LED仍按上述行為動作)

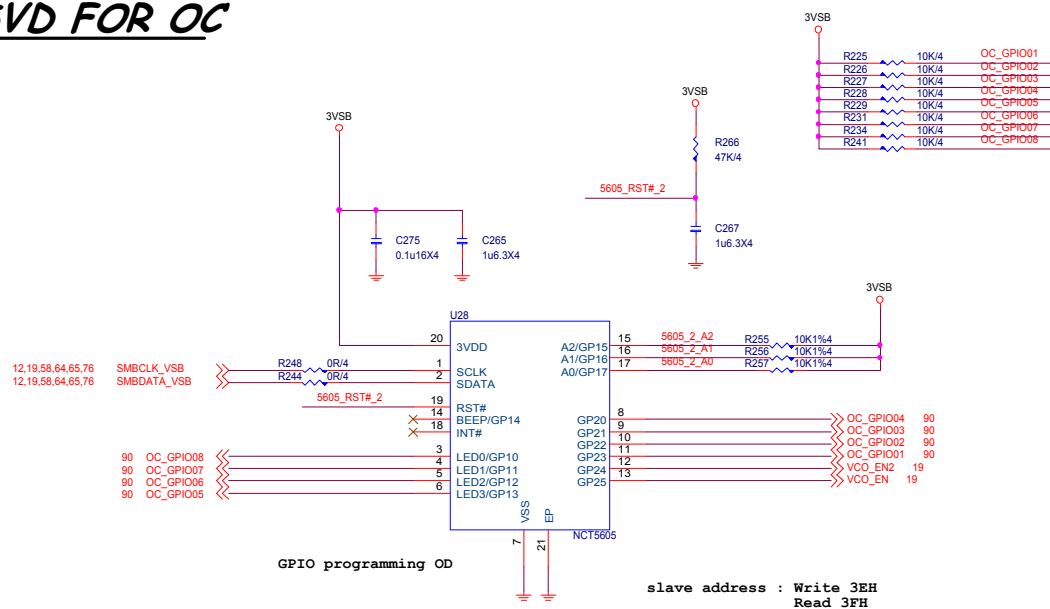
DIMM SLOT LED



FAN GPIO



RSVD FOR OC



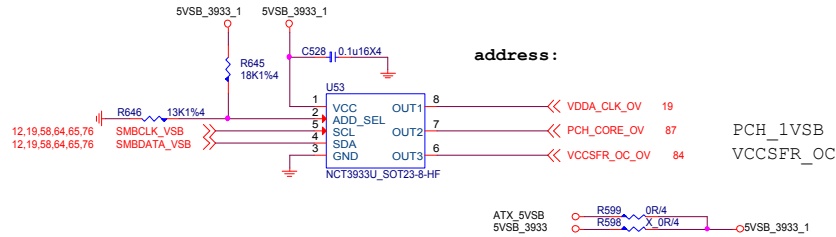
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Size Custom	Document Description GPIO IC-NCT5605	Rev 20
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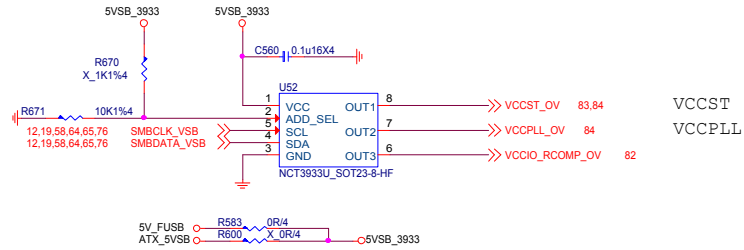
UPI VOLTAGE CONSOLE

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



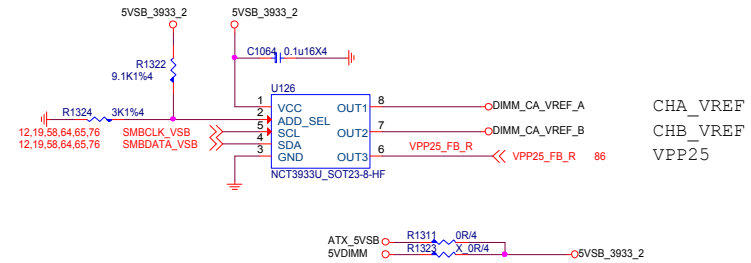
UPI VOLTAGE CONSOLE

0x2A: RH=9.1K, RL=3K



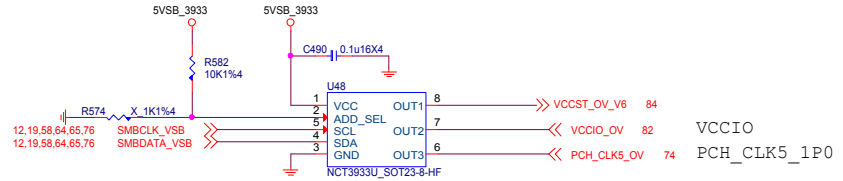
UPI VOLTAGE CONSOLE

0x28: RH=9.1K, RL=3K



UPI VOLTAGE CONSOLE

0x20: RH=18K, RL=13K



UPI VOLTAGE CONSOLE

0x20: RH=10K, RL=OPEN

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

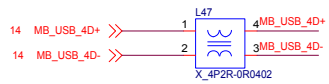
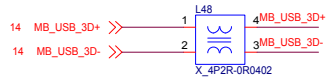


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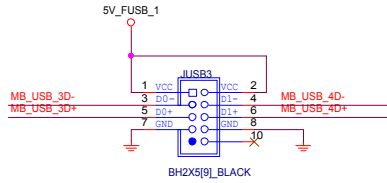
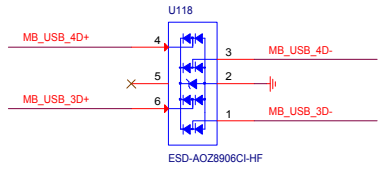
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Size	Document Description	Rev
Custom	OV-NCT3933	20
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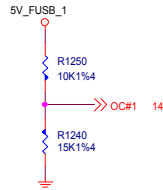
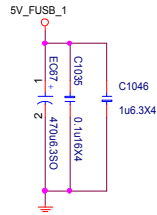
FRONT USB PORT 3,4



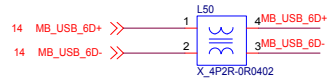
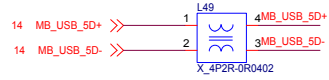
0R:R3C-0000012-W08



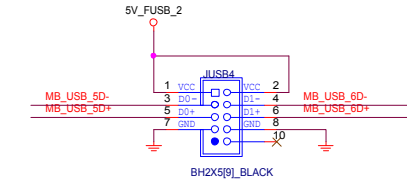
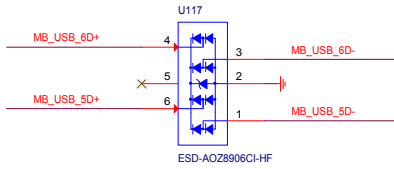
close to JUSB3



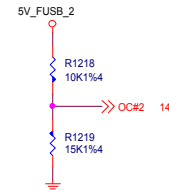
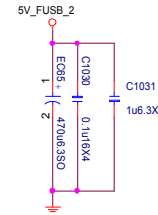
FRONT USB PORT 5,6



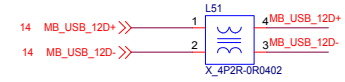
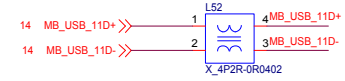
0R:R3C-0000012-W08



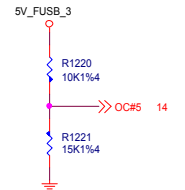
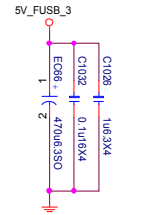
close to JUSB4

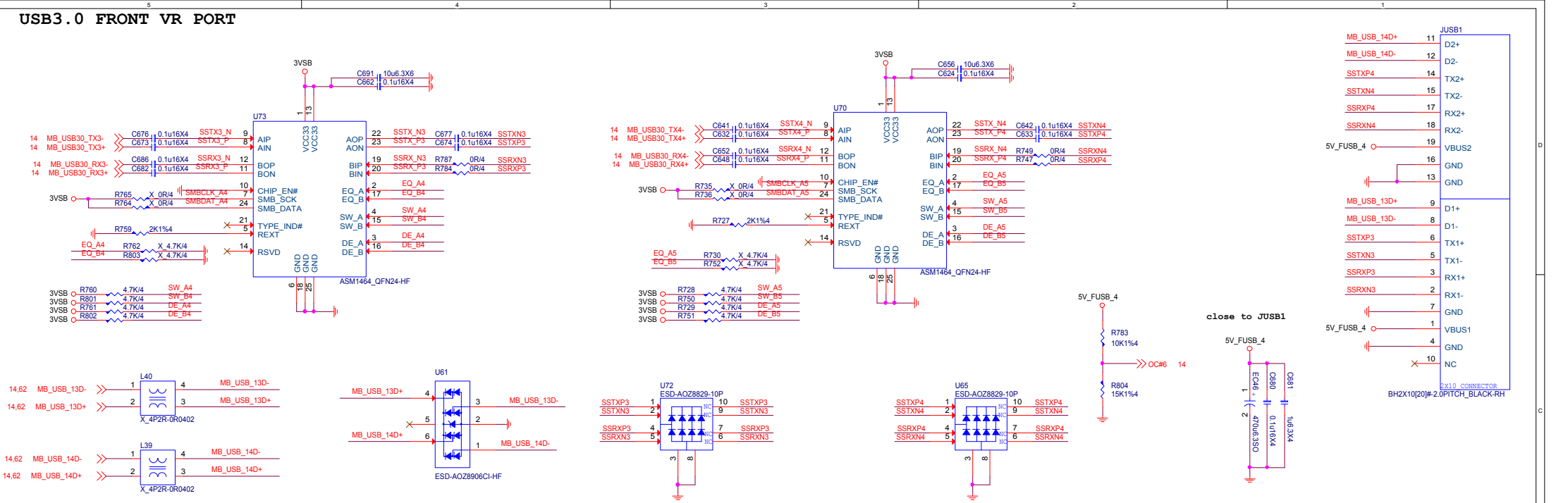


FRONT USB PORT 11,12



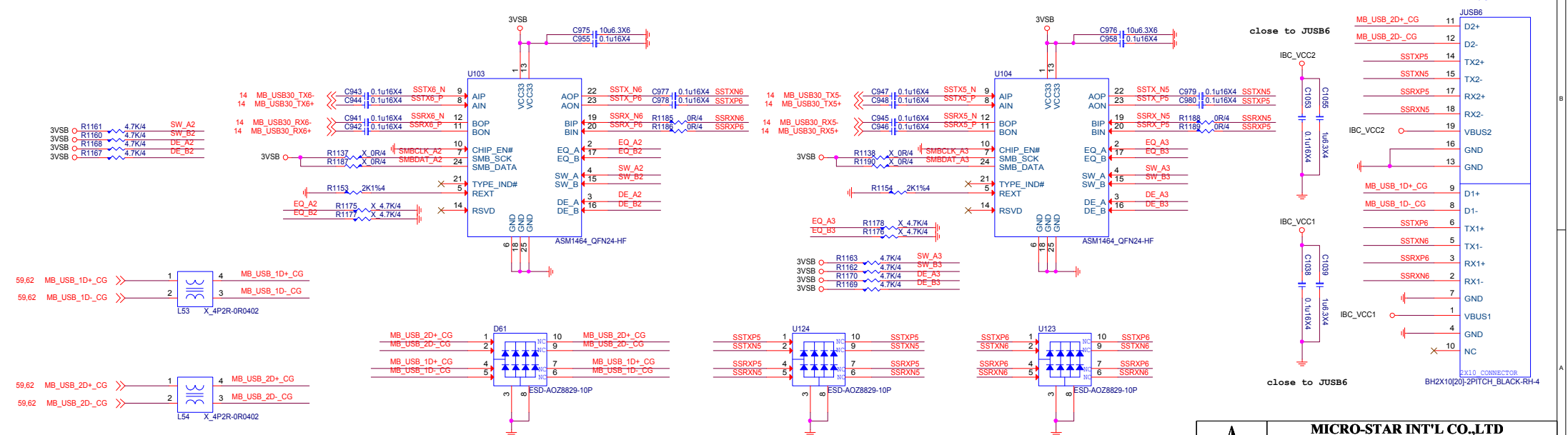
close to JUSB5





FRONT USB30 PORT 0,1,13,14

USB3.0 FRONT CHARG PORT

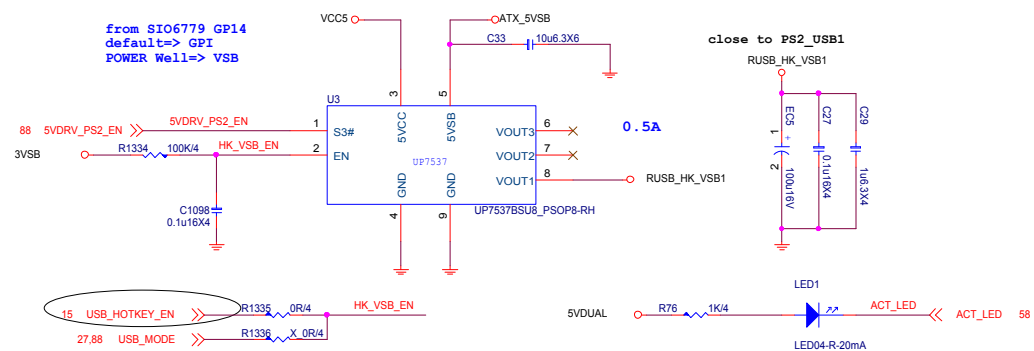
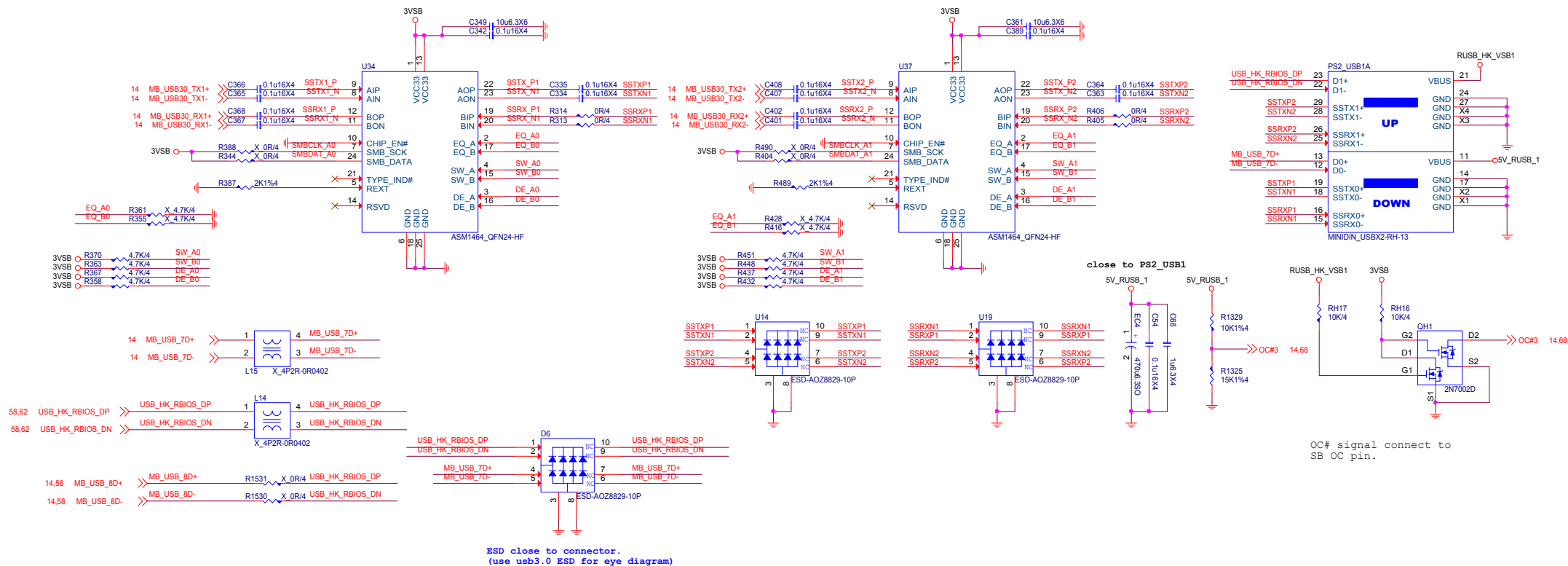


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USB30 PORT 0,1,4,5

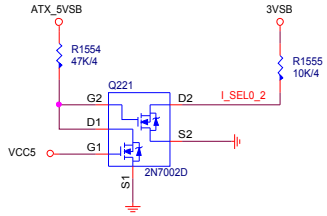


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Size Custom	Document Description Rear USB3 PS2 connector	Rev 20
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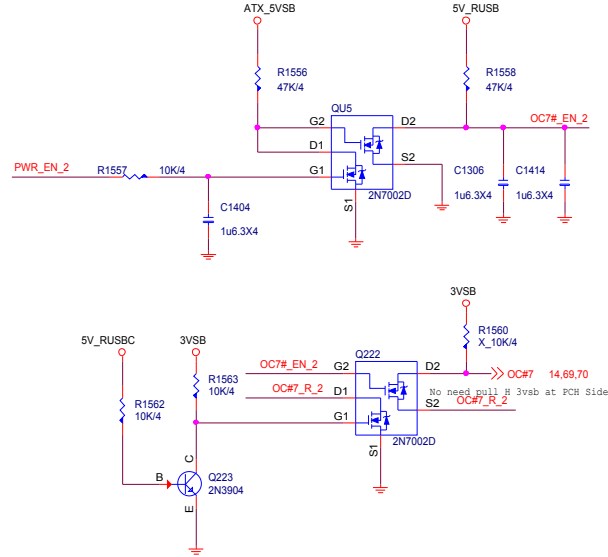
Current Mode



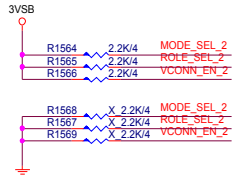
0	X	Default for 900mA
1	0	1.5A @5V
1	1	3A @5V

1.5A under S3 mode
3A under S0 mode

VBUS OC#



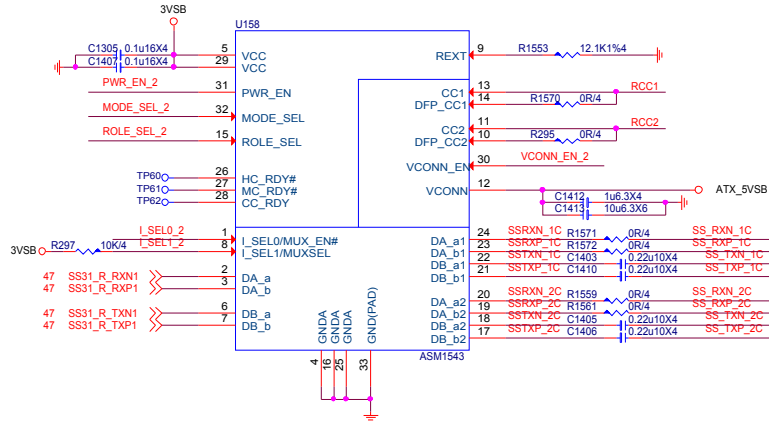
USB Type-C MUX with Configuration Channel (CC)



MODE_SEL	
1	CCL MODE (default)
0	Mux MODE

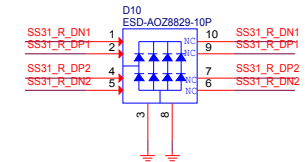
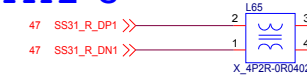
ROLE_SEL	
1	DFP role (default)
0	UFP role

VCONN_EN	
1	enable
0	disable

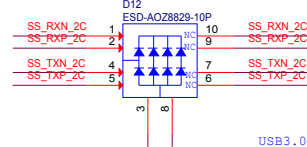
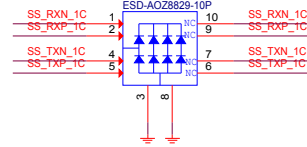


3 A
min 80mil.

TYPE-C



ESD Protection
NEAR CONNECTOR

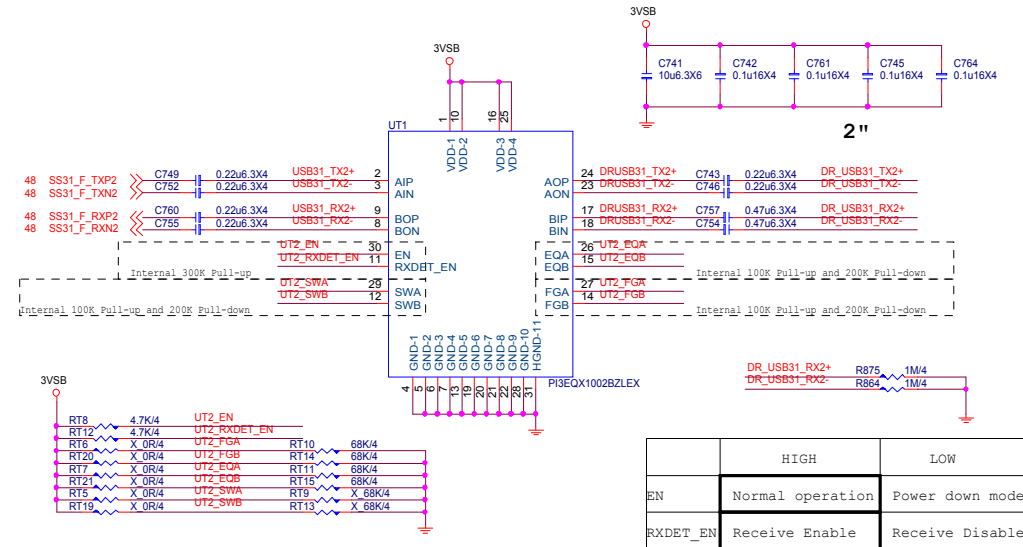
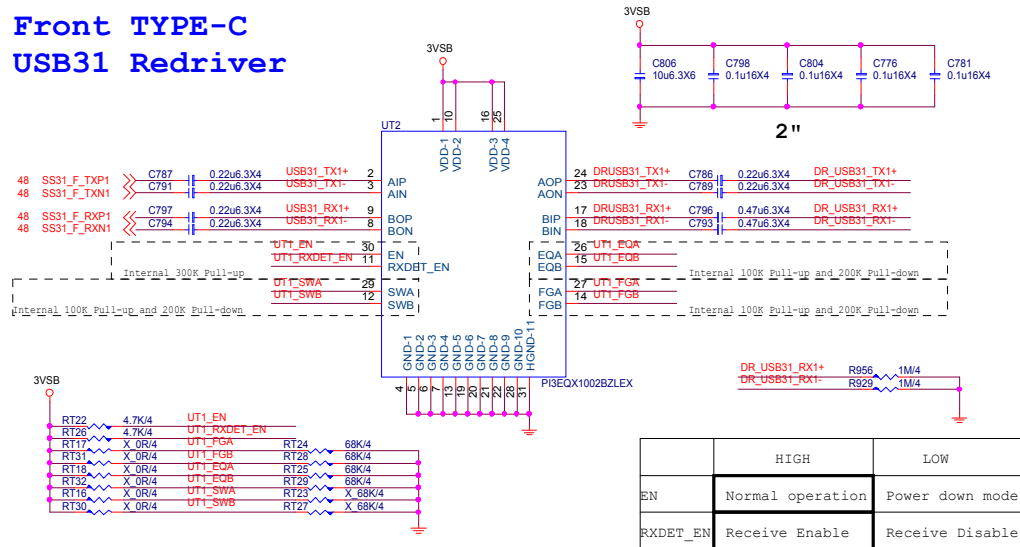


USB3.0
DOG-06A050C-A68 Main
DOG-05A0300-I14 AVL
DOG-45B031C-005 AVL



MICRO-STAR INT'L CO.,LTD		
MS-7A57		
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Front TYPE-C
USB31 Redriver



	HIGH	LOW
EN	Normal operation	Power down mode
RXDET_EN	Receive Enable	Receive Disable

	HIGH	LOW
EN	Normal operation	Power down mode
RXDEN_EN	Receive Enable	Receive Disable

EQA/B are the selection pins for the equalization selection

	Equalizer setting (dB)	
<i>EQAB</i>	@2.5GHz	@5GHz
0	5.1	10.9
R	1.9	6.7
F	3.5	8.9 (Default)
1	6.8	13.1

Flat Gain Setting:

FGA/B are the selection bits for the DC gain

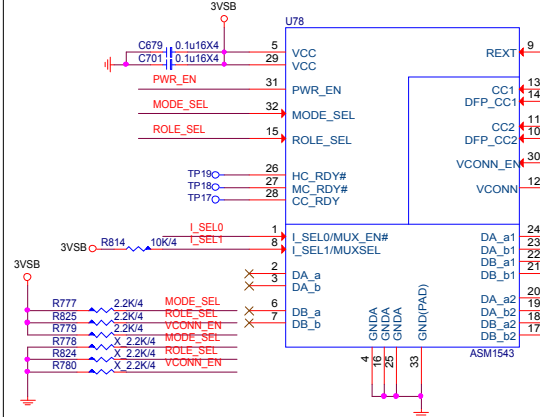
	Flat Gain Settings
$FGdB$	dB
0	-3
R	-1.5
F	0 (Default)
1	+2

-1dB compression point linear Swing Setting:

SWA/B are the selection bits for the output linear swing setting

Output Linear Swing Settings	
SWLBS	mppd
0	800
R	1200
F	1000 (Default)
1	1100

USB Type-C MUX with Configuration Channel (CC)



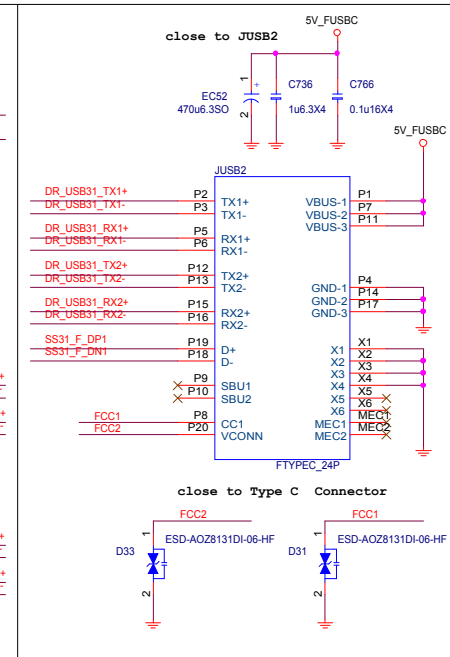
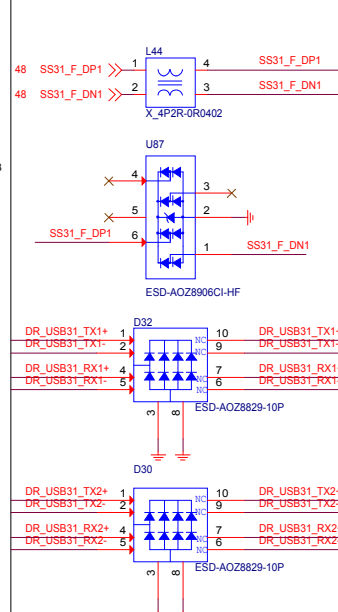
VCONN_EN	
1	enable
0	disable

MODE_SEL	
1	CCL MODE (default)
0	Mux MODE

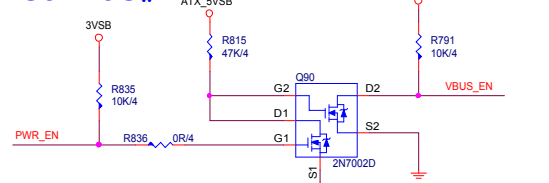
ROLE_SEL	
1	DFP role (default)
0	UFP role

ESD Protection

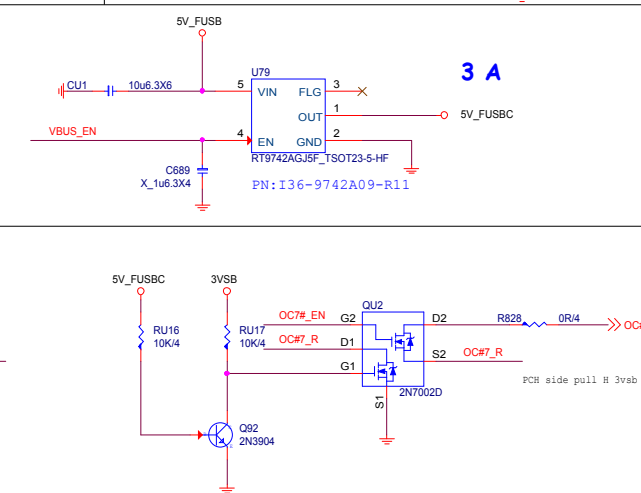
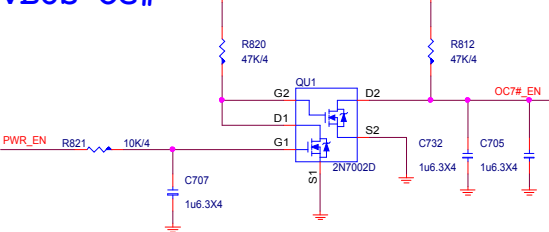
NEAR CONNECTOR



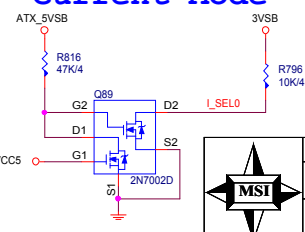
VCOM OC#



VBUS_OC#



Current Mode



0	X	Default for 900mA
1	0	1.5A @5V
1	1	3A @5V

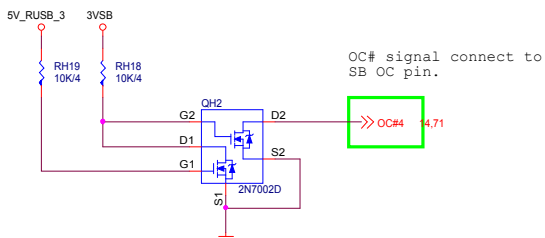
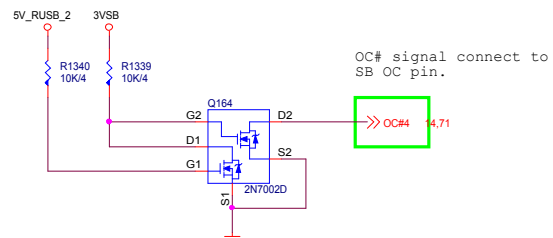
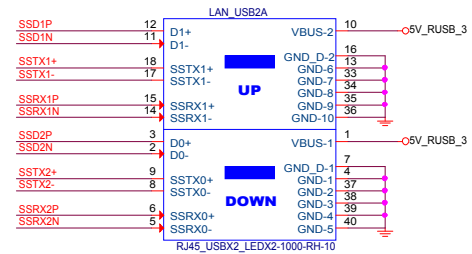
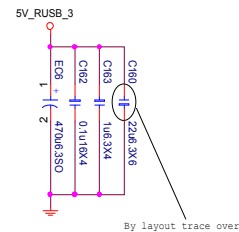
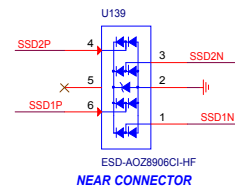
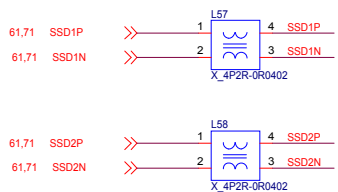
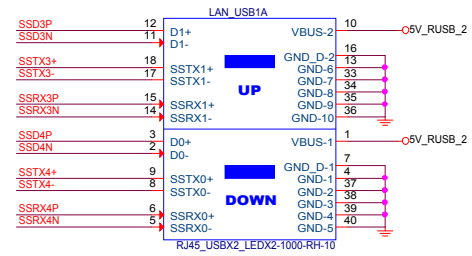
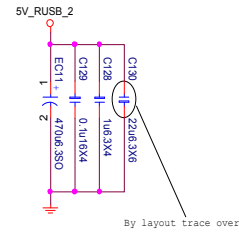
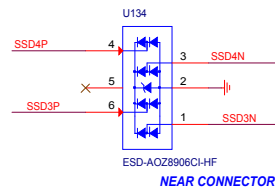
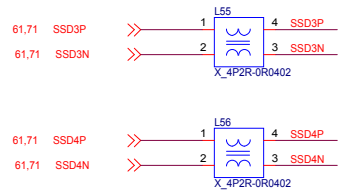
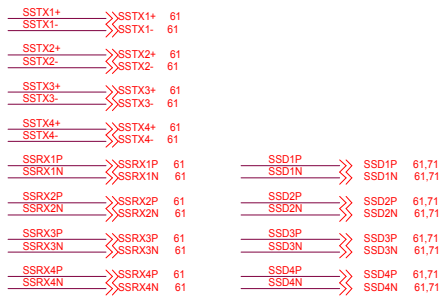
1.5A under S3 mode
3A under S0 mode

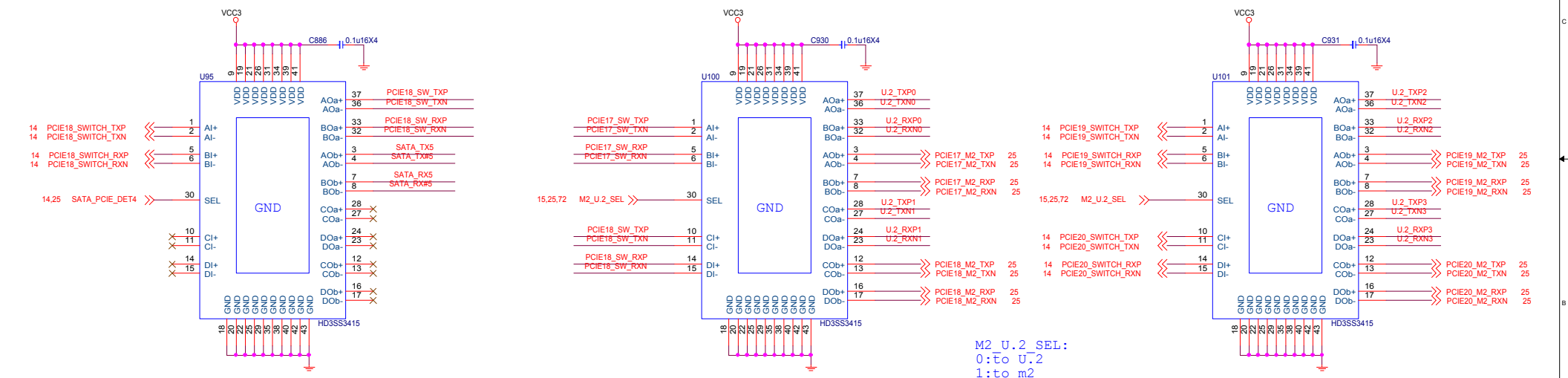
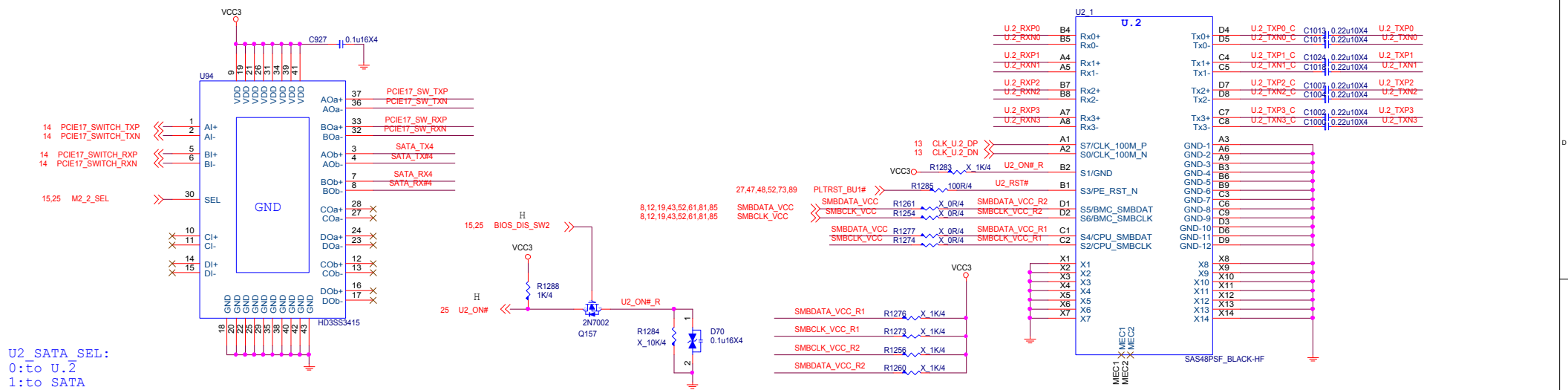


MICRO-STAR INT'L CO.,LTD

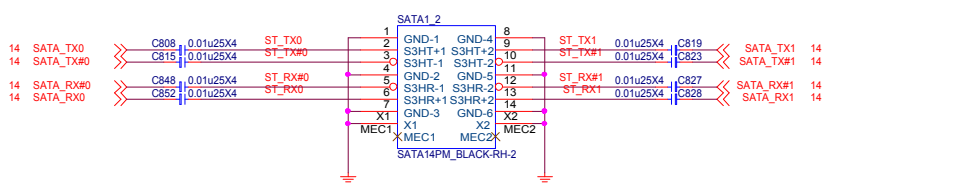
MS-7A57

Size	Document Description	Rev
Custom	Front USB TYPEC CONN	20
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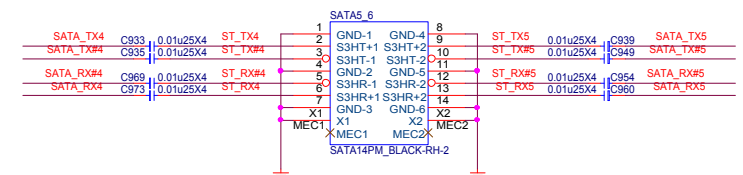




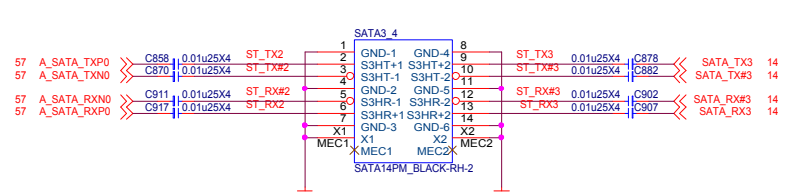
SATA 6G PORT 0.1



SATA 6G PORT 4.5



SATA 6G PORT 2.3



MICRO-STAR INT'L CO.,LTD

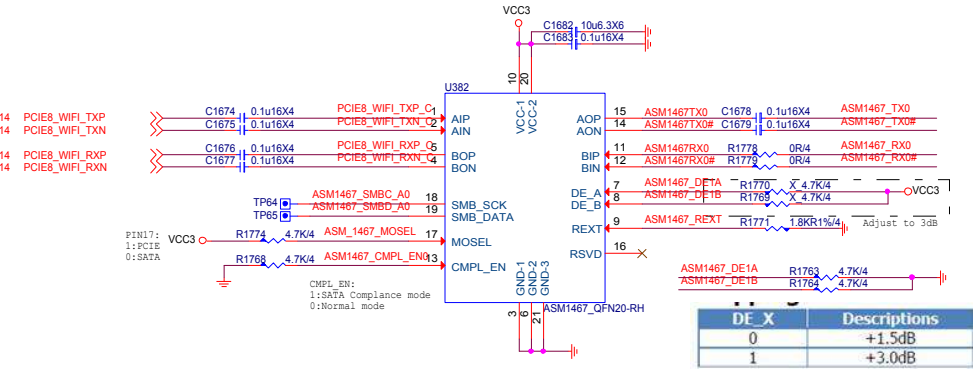
MS-7A98

Size Custom Document Description **U2/SATA-Connector** Rev 20

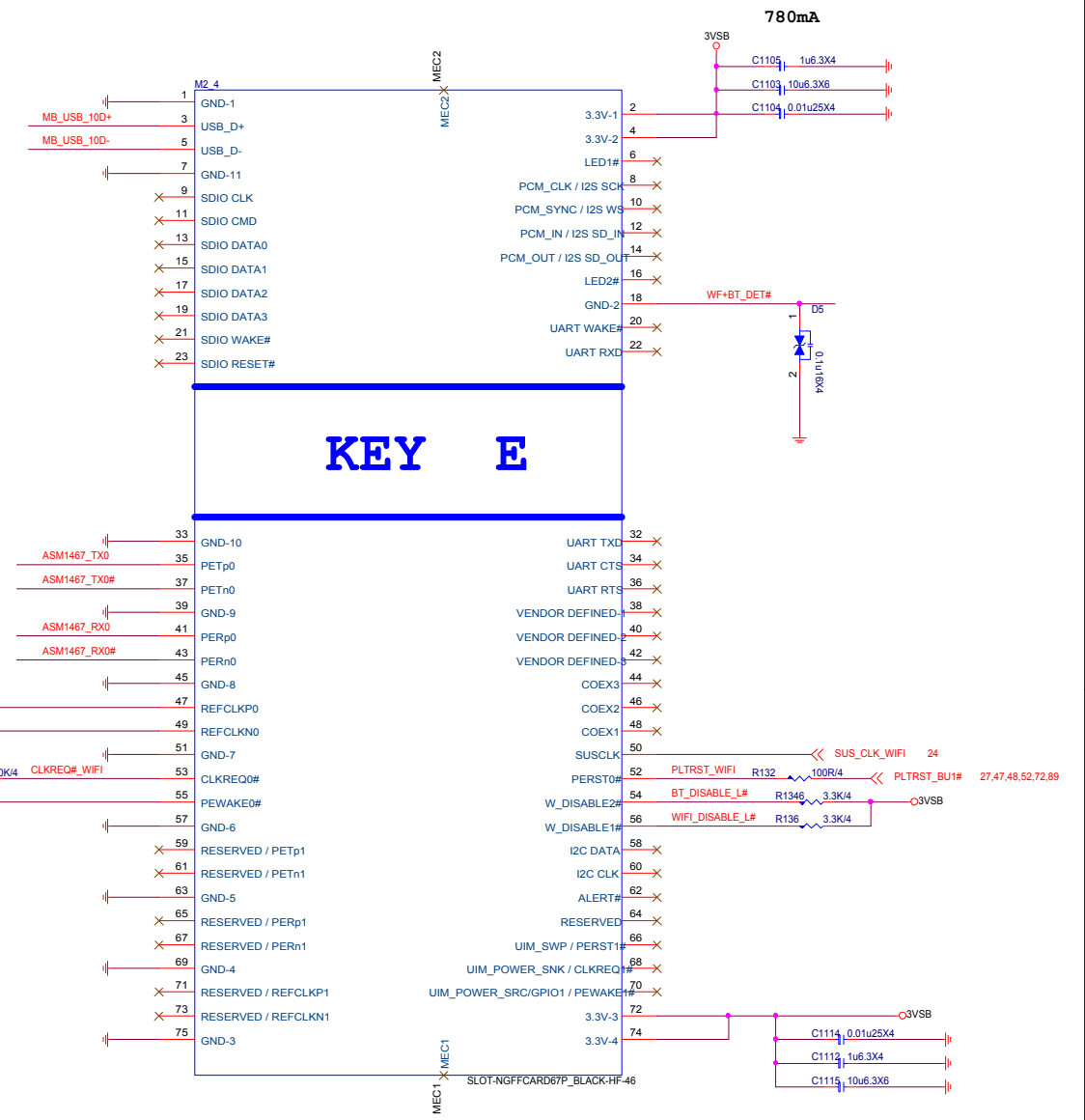
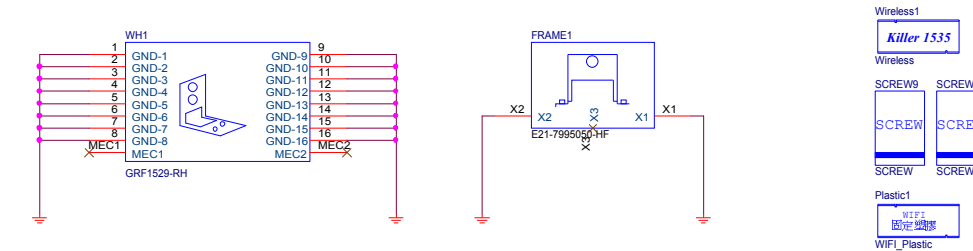
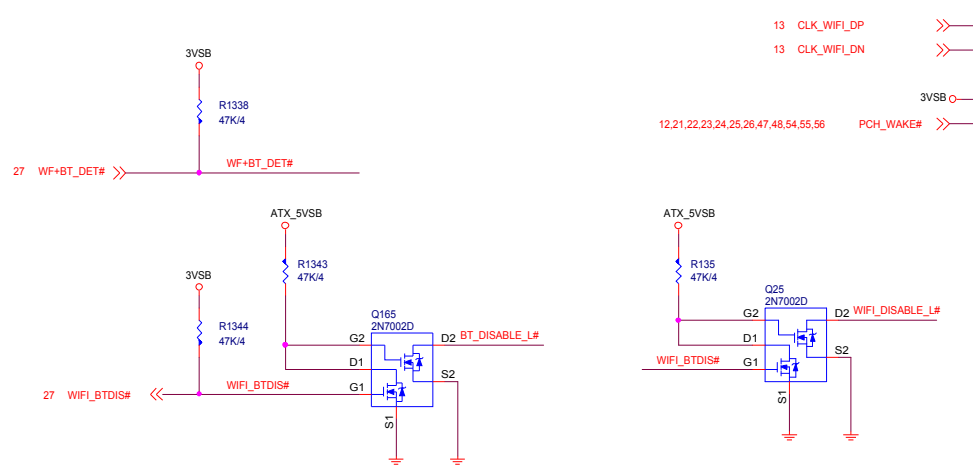
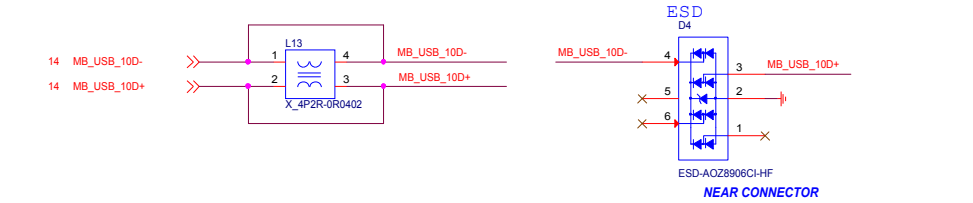
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PCIE REDRIVER


MAX 130mA



DE_X	Descriptions
0	+1.5dB
1	+3.0dB

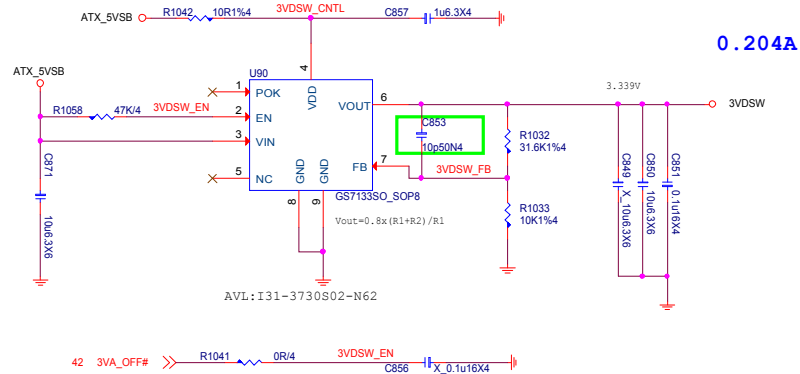


10uF+0.1uF+0.01uF at one end of socket in support of 3.3 V3V pins 2 and 4.
10uF+0.1uF+0.01uF at the other end of the socket in support of 3.3 V3V pins 70 and 72.

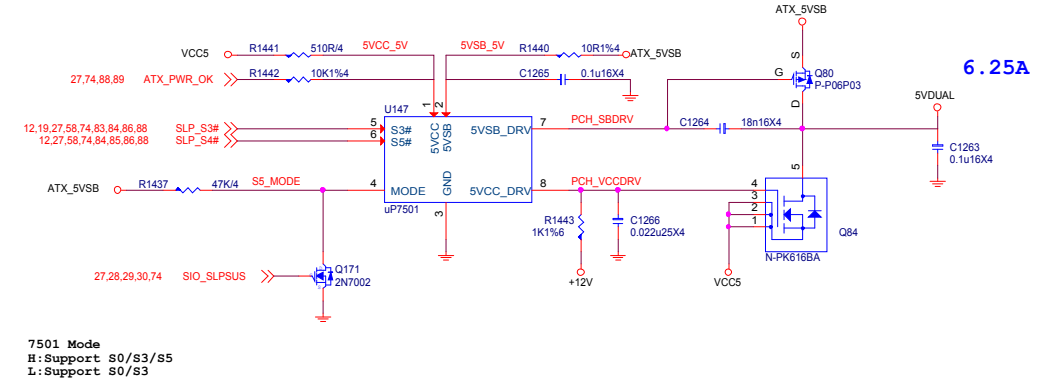


MICRO-STAR INT'L CO.,LTD		
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Custom	WIFI+BT Connector	20
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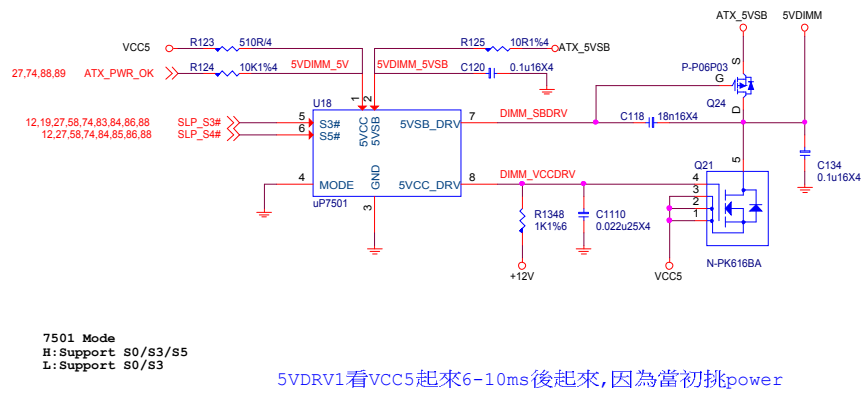
3VDSW



5VDUAL

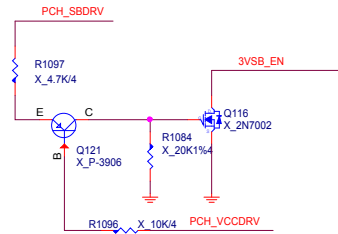
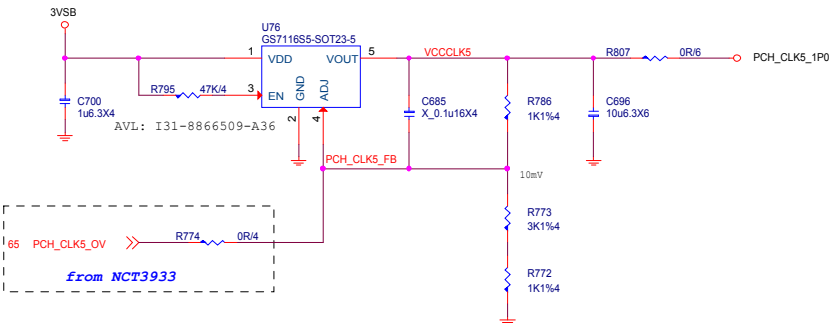
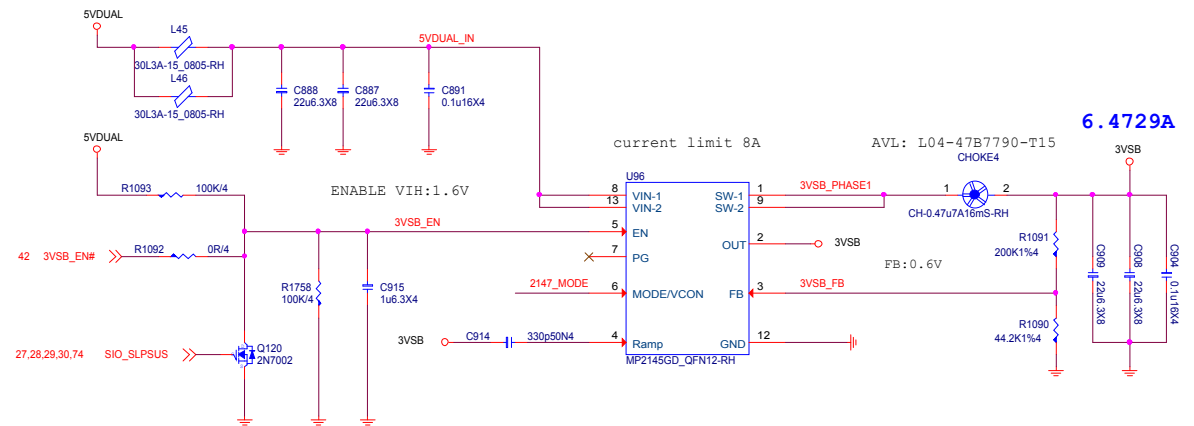


5VDIMM FOR DDR



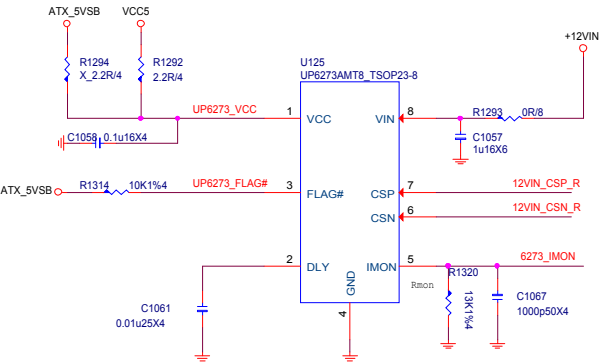
3VSB

for OC & Gaming



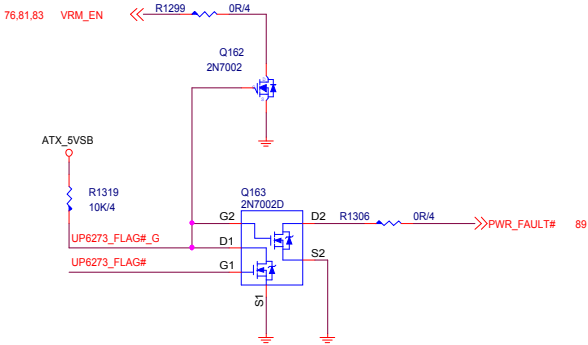
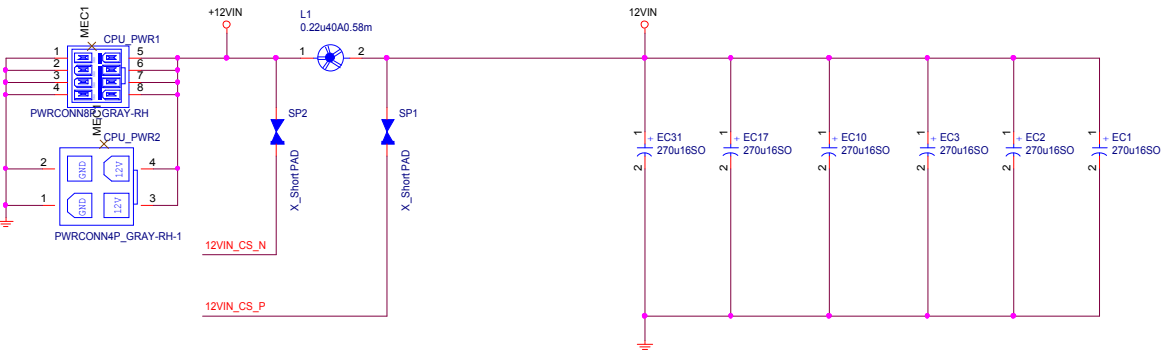
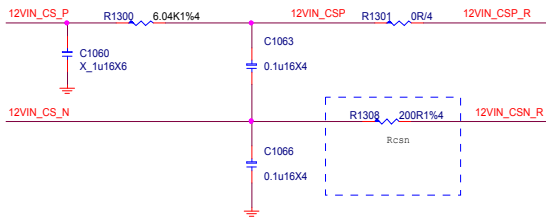
防G3-->S5底下5VSBDRV2瞬间有电变没电,使得下一级电压爬升有drop

POWER METER

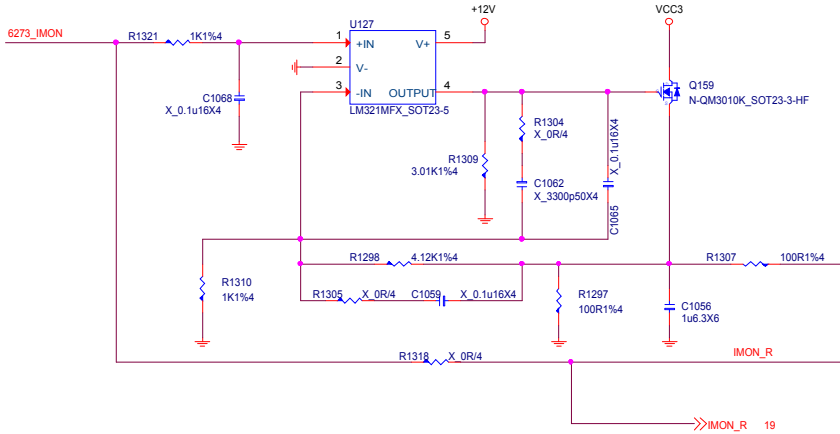


$$I_{in} = \frac{V_{mon} \cdot R_{csn}}{R_{mon} \cdot R_{dc}}$$
$$V_{mon} = 1.2$$

can change OCP trigger level by Rcsn and Rmon
$$I_{in} = 1.2 \cdot 200 / (13 \cdot 0.58) = 31.8A$$

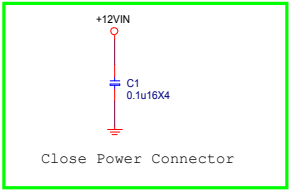


Near PWM IC

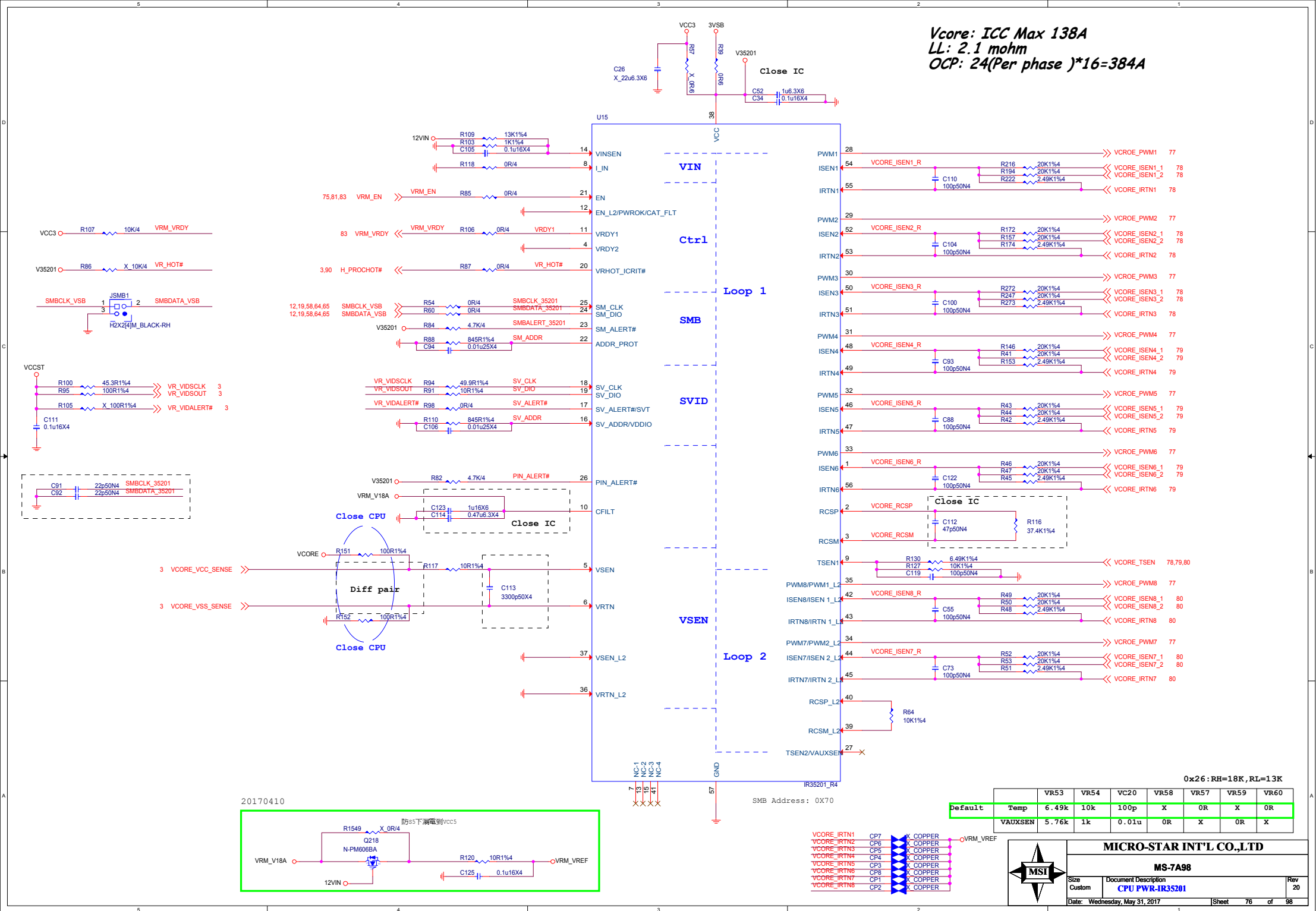


UPI VOLTAGE CONSOLE

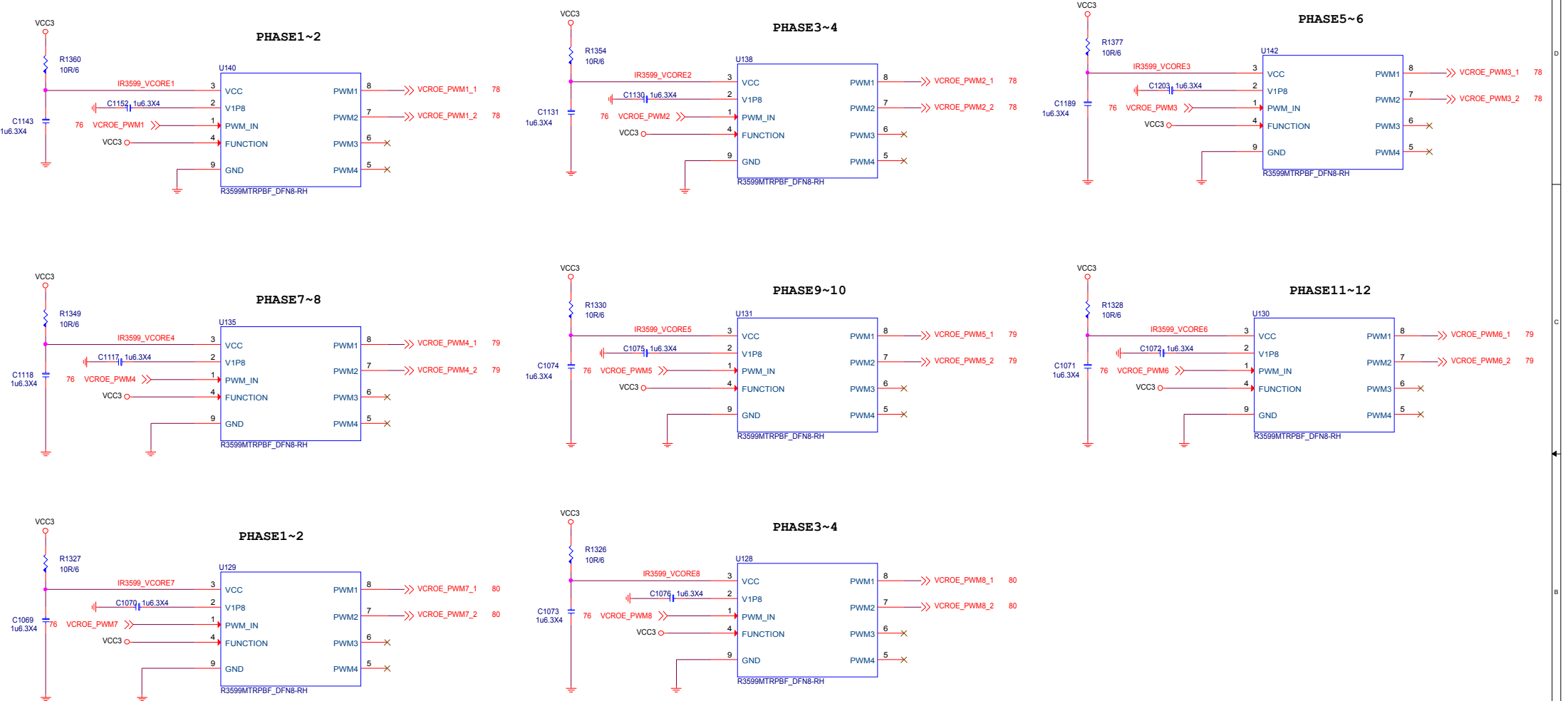
0xD4 : RL=10K												
ADDRESS	0xD4			0xD6			0xD8			0xDA		
	Min	Typ.	Max	Min	Typ.	Max	Min	Typ.	Max	Min	Typ.	Max
BUS_SEL Viotag#0	90	90	110	170	210	250	310	380	450	510	600	690

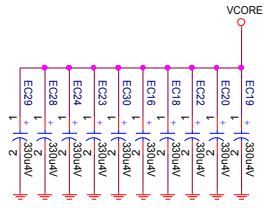
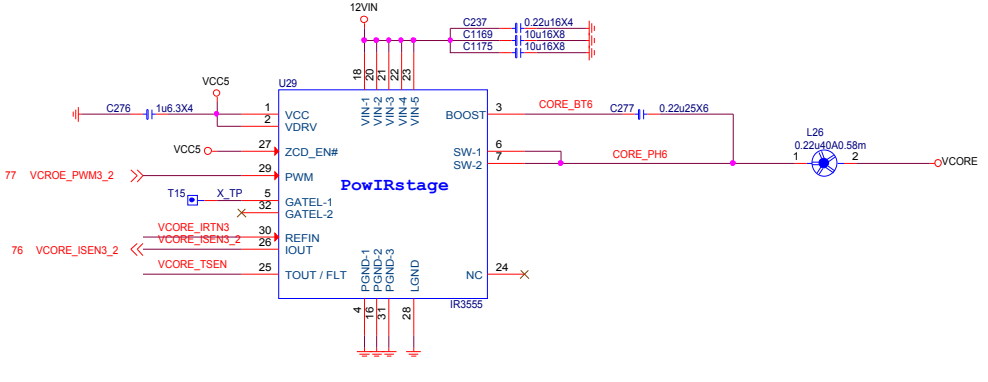
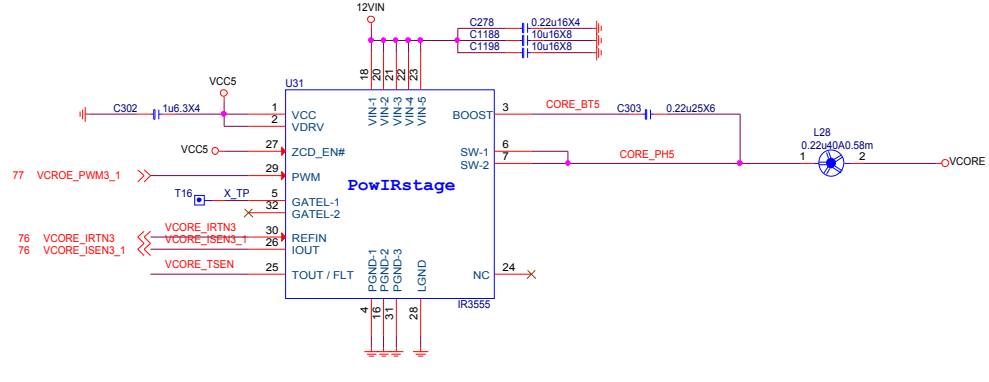
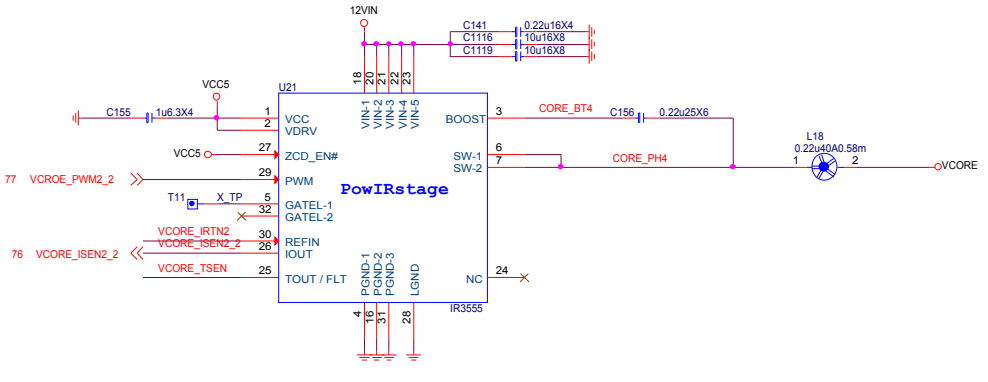
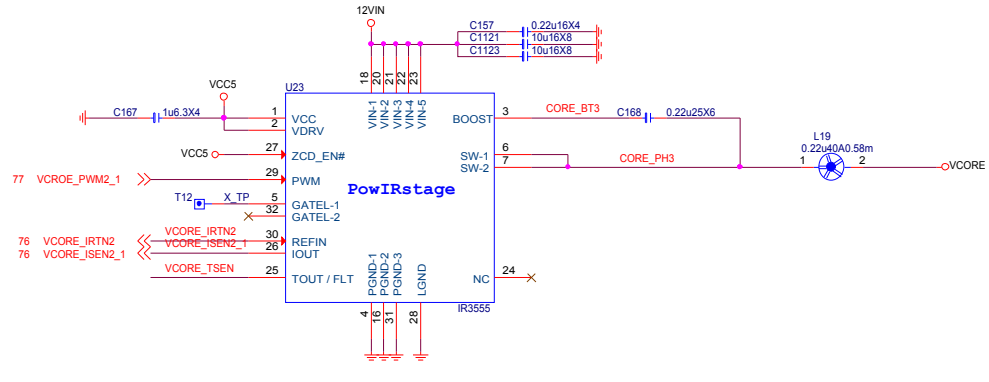
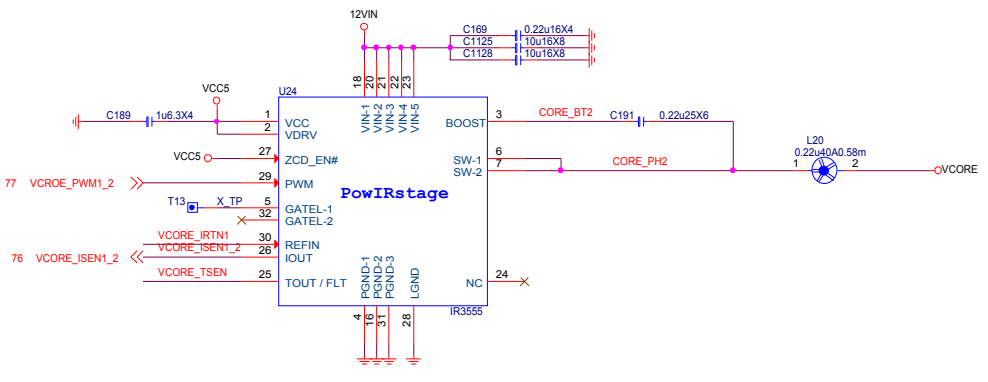
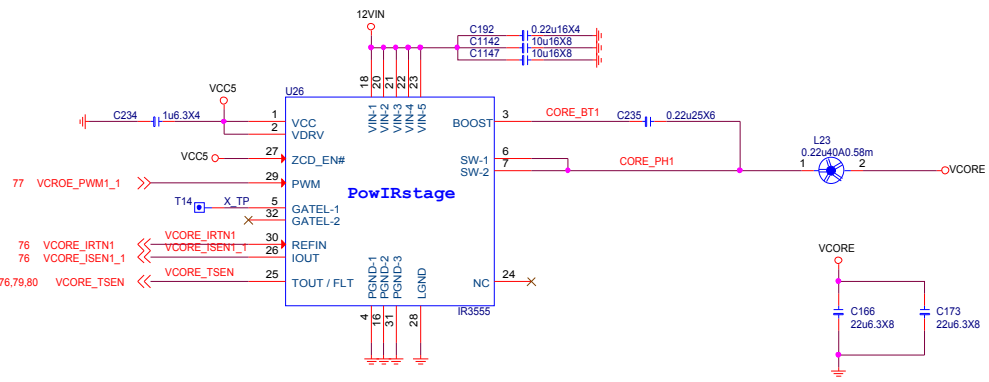


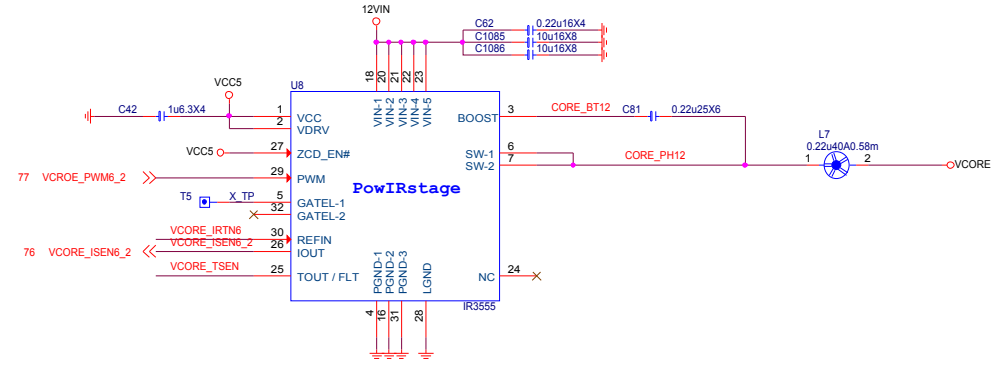
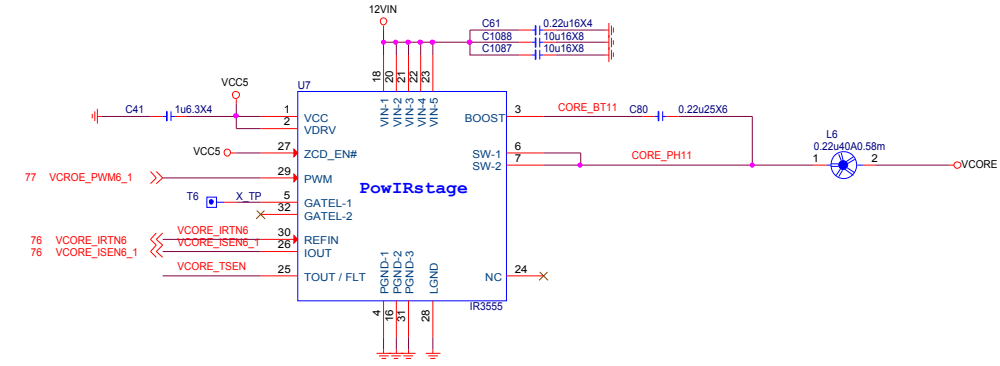
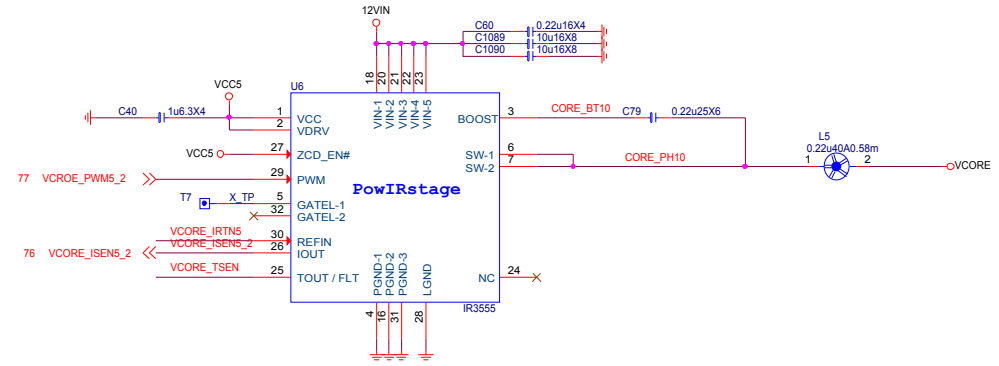
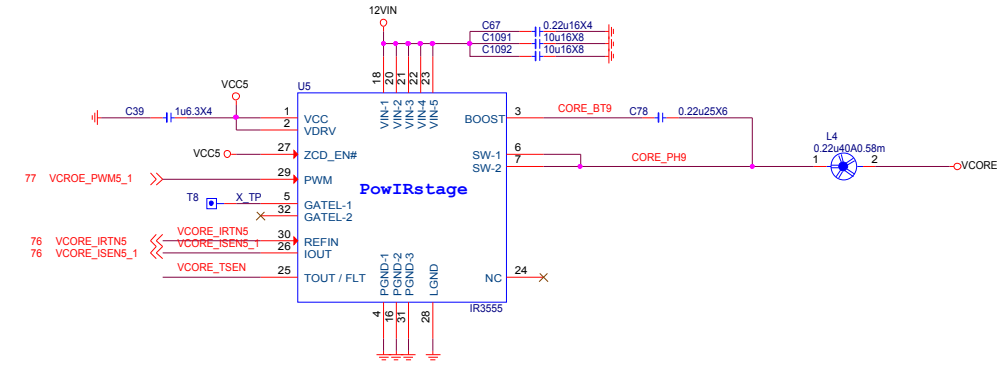
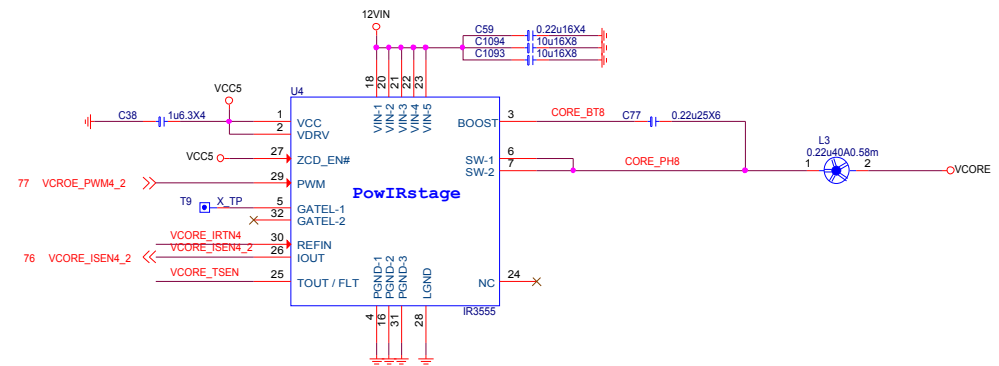
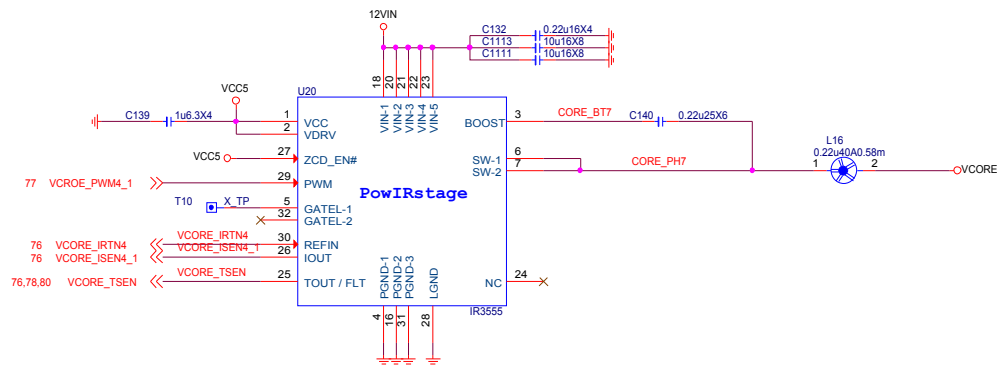
MICRO-STAR INT'L CO.,LTD			
MS-7A98			
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Custom	CURRENT SENSE-UP6273		20
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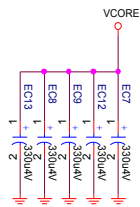
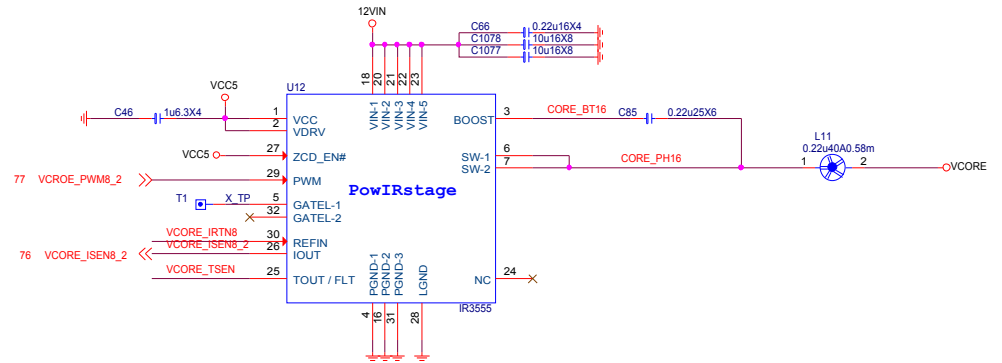
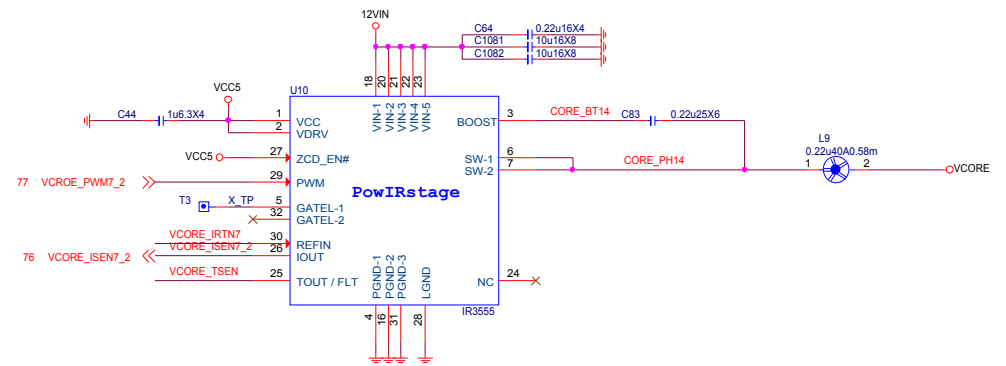


VCORE Double

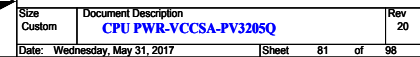








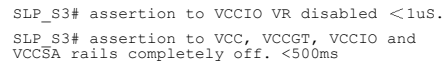
OCP:30A for 2Phase



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

Current Limit :Typ:13A

6.4A



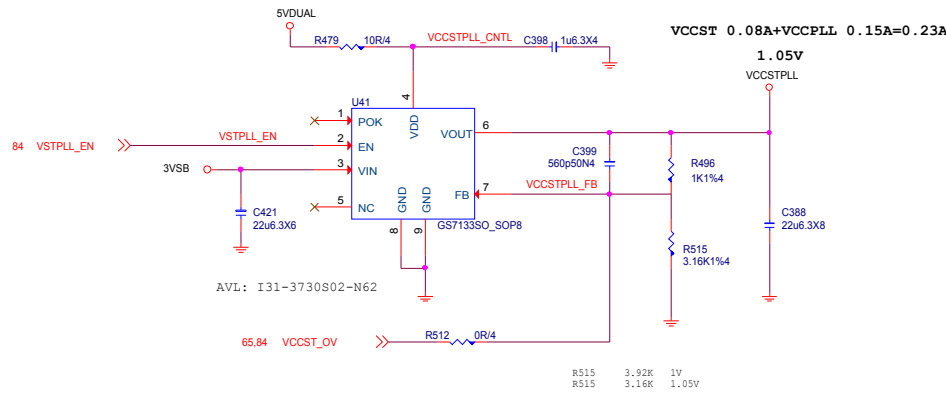
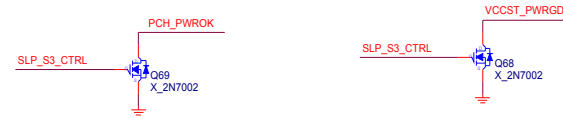
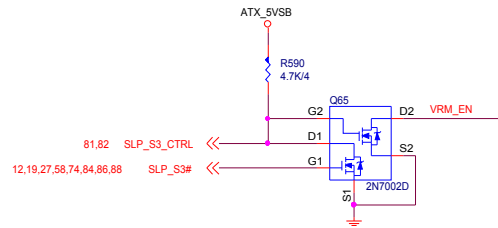
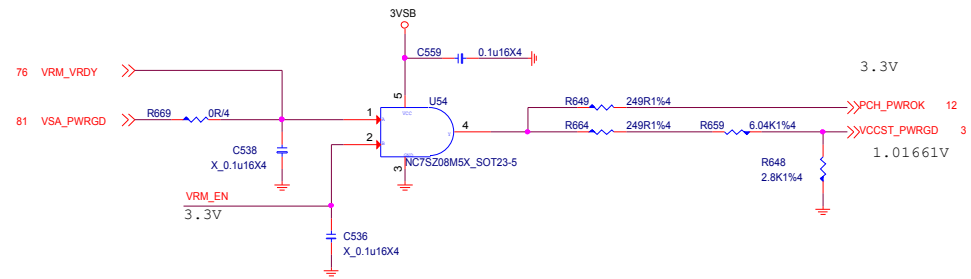
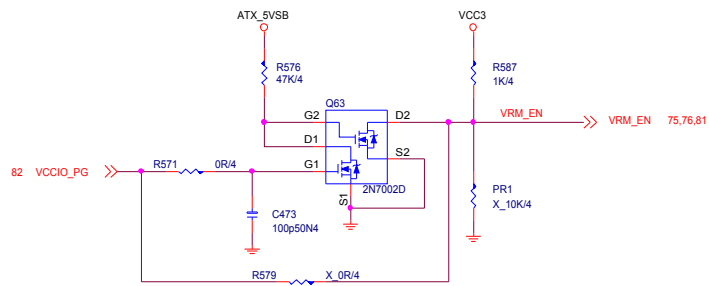
1.0V; 150mA



MS-7A98

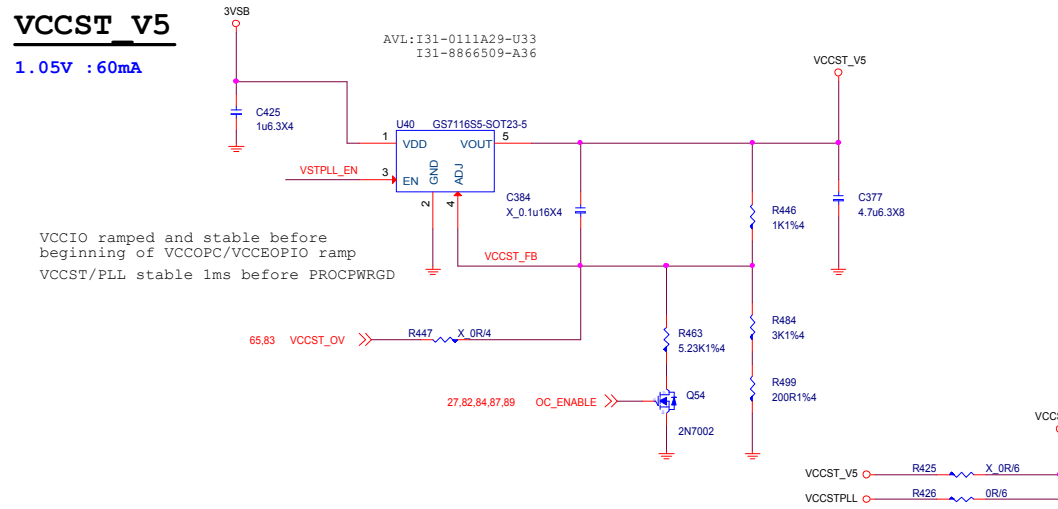
Rev	
20	

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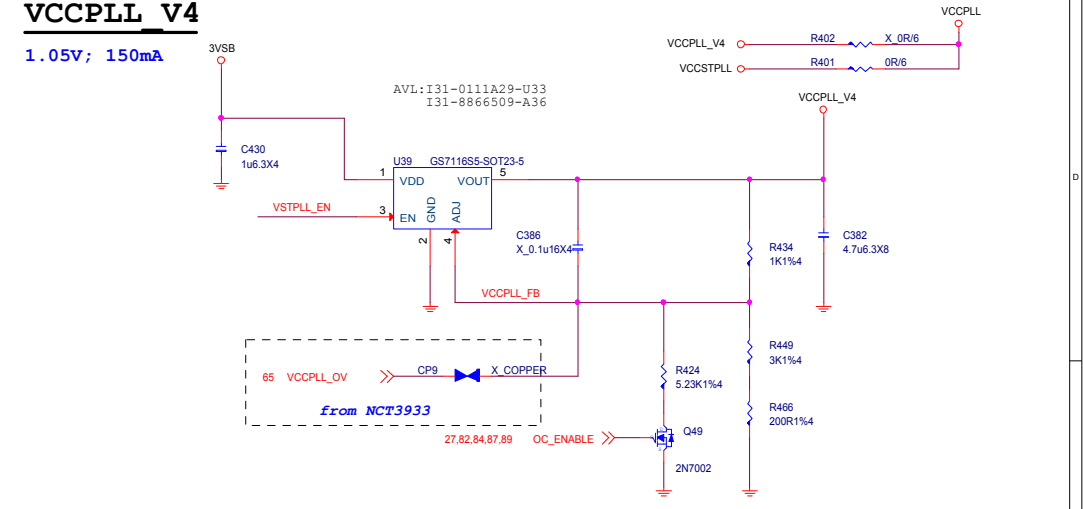
VCCST V5

1.05V : 60mA



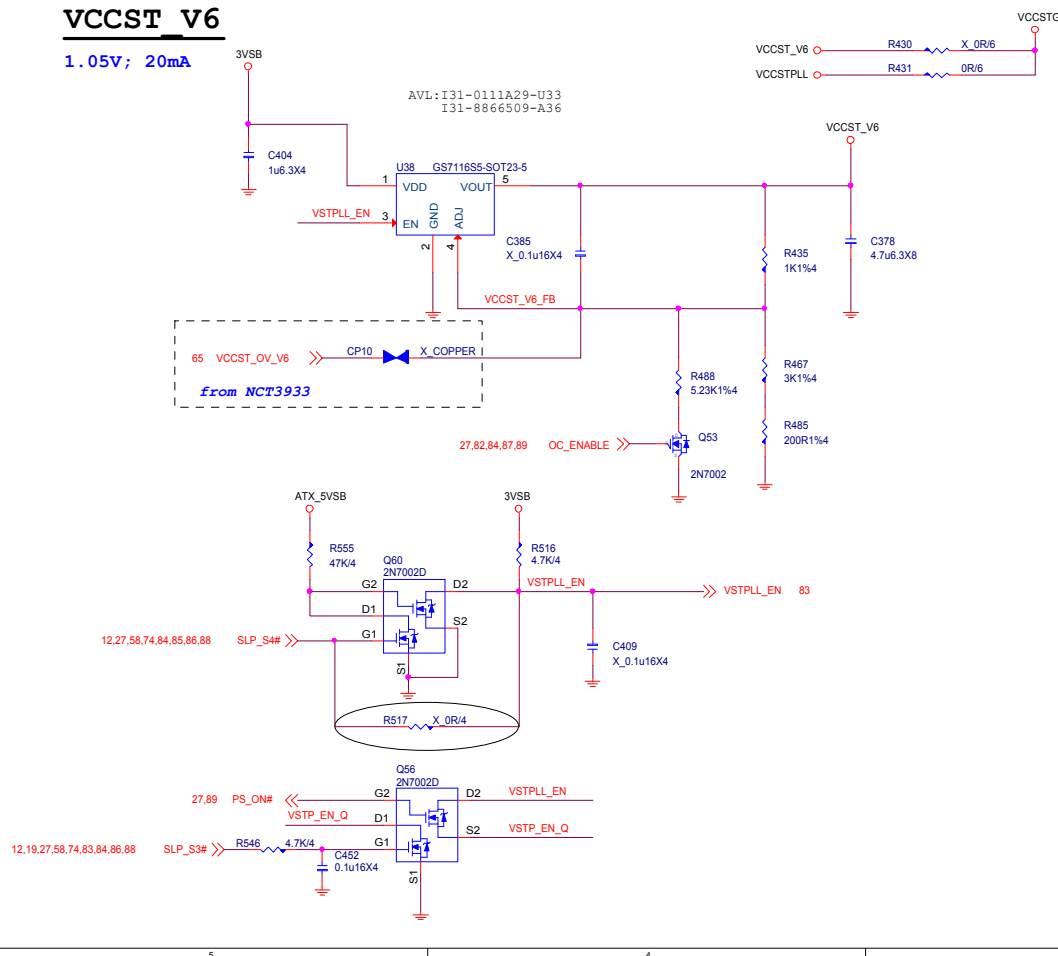
VCCPLL V4

1.05V; 150mA



VCCST V6

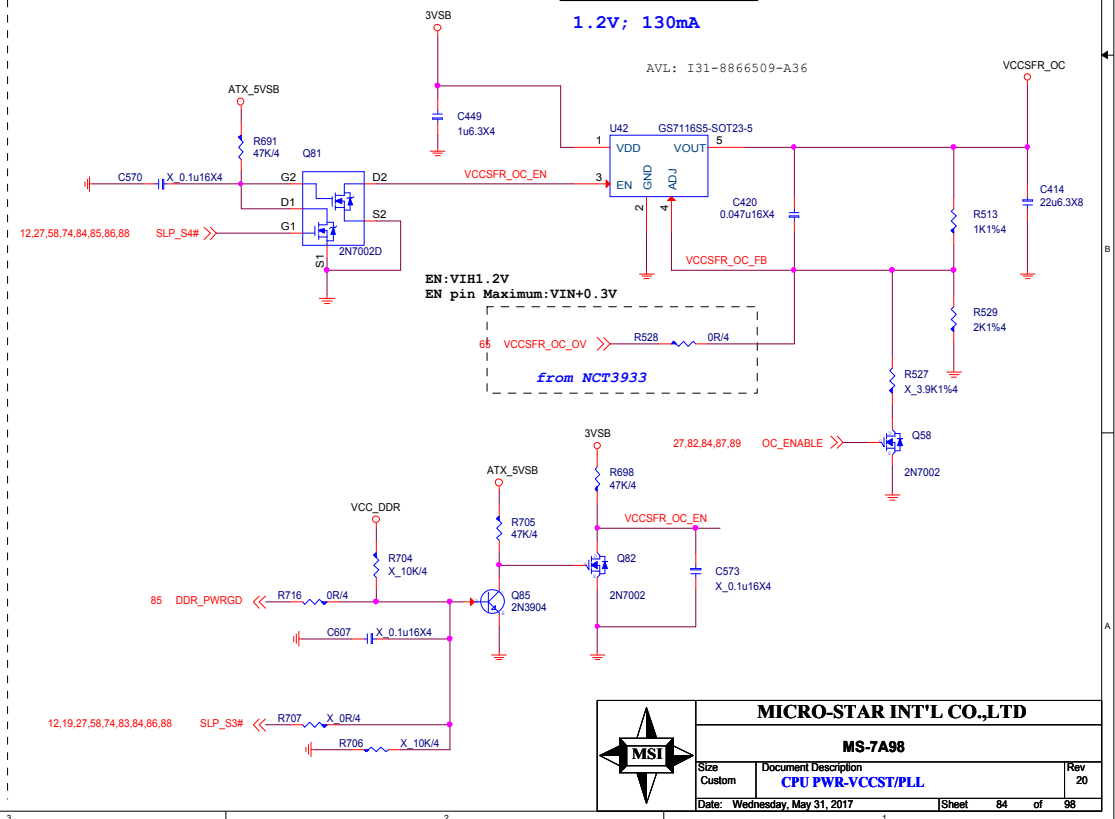
1.05V; 20mA



2014.08.21 update

VCCPLL OC

1.2V; 130mA

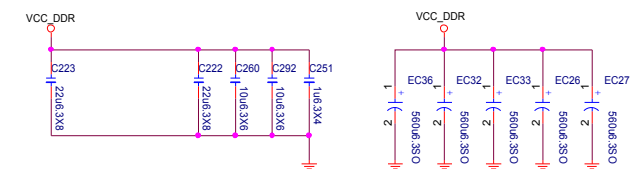
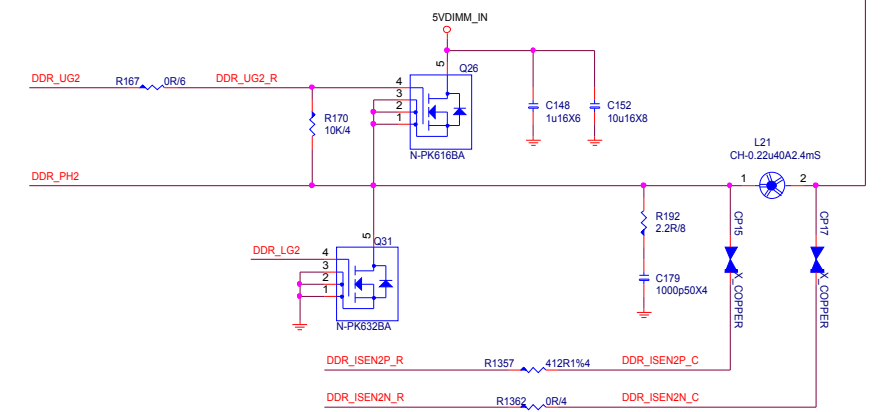
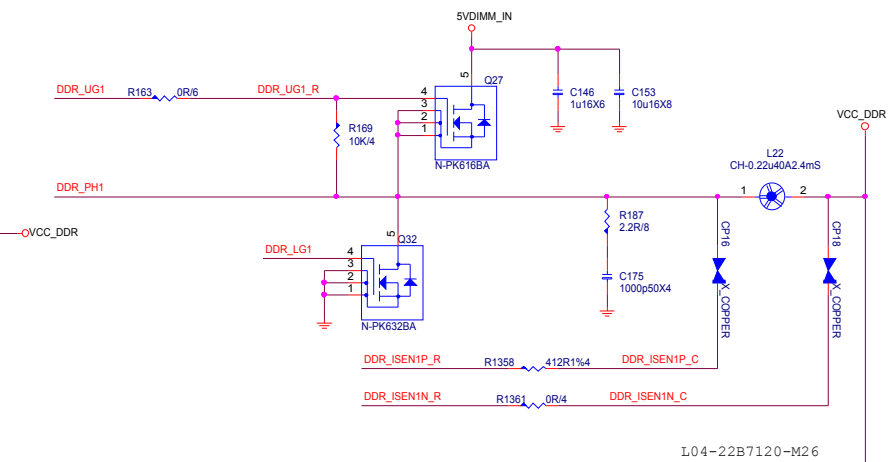
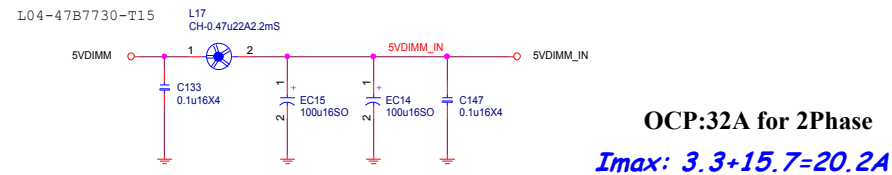
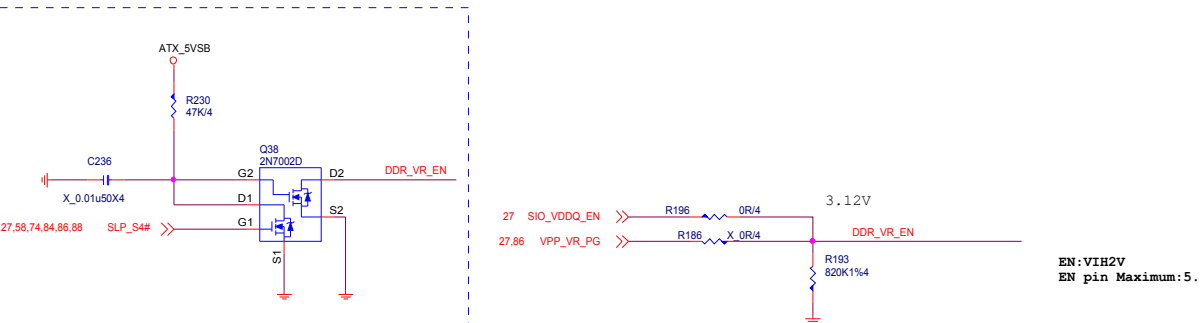
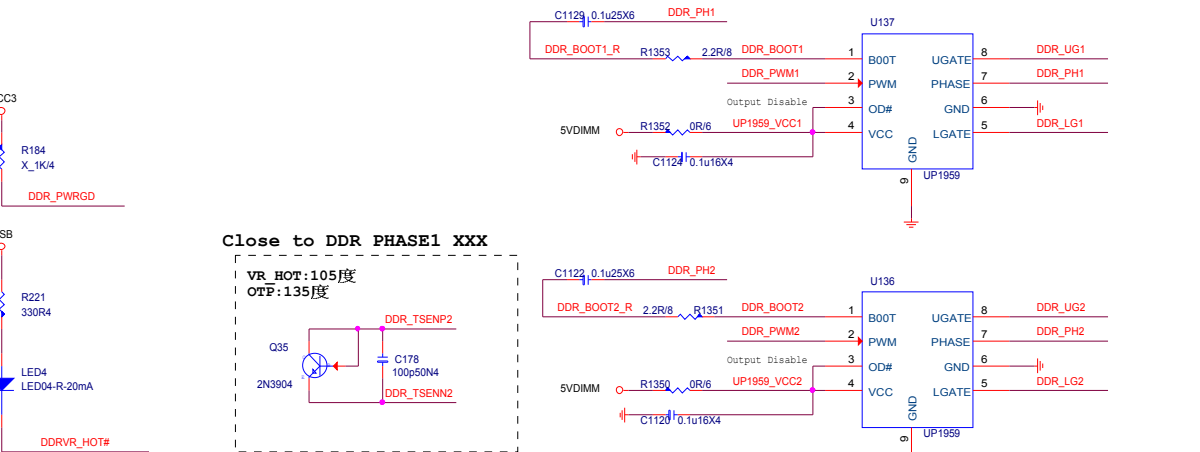


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3.3A FOR CPU
15.7A FOR 4DIMM
1.2A FOR DDR VTT



EN:VIH2V
EN pin Maximum:5.5V,RECOMMENDED:3.6V

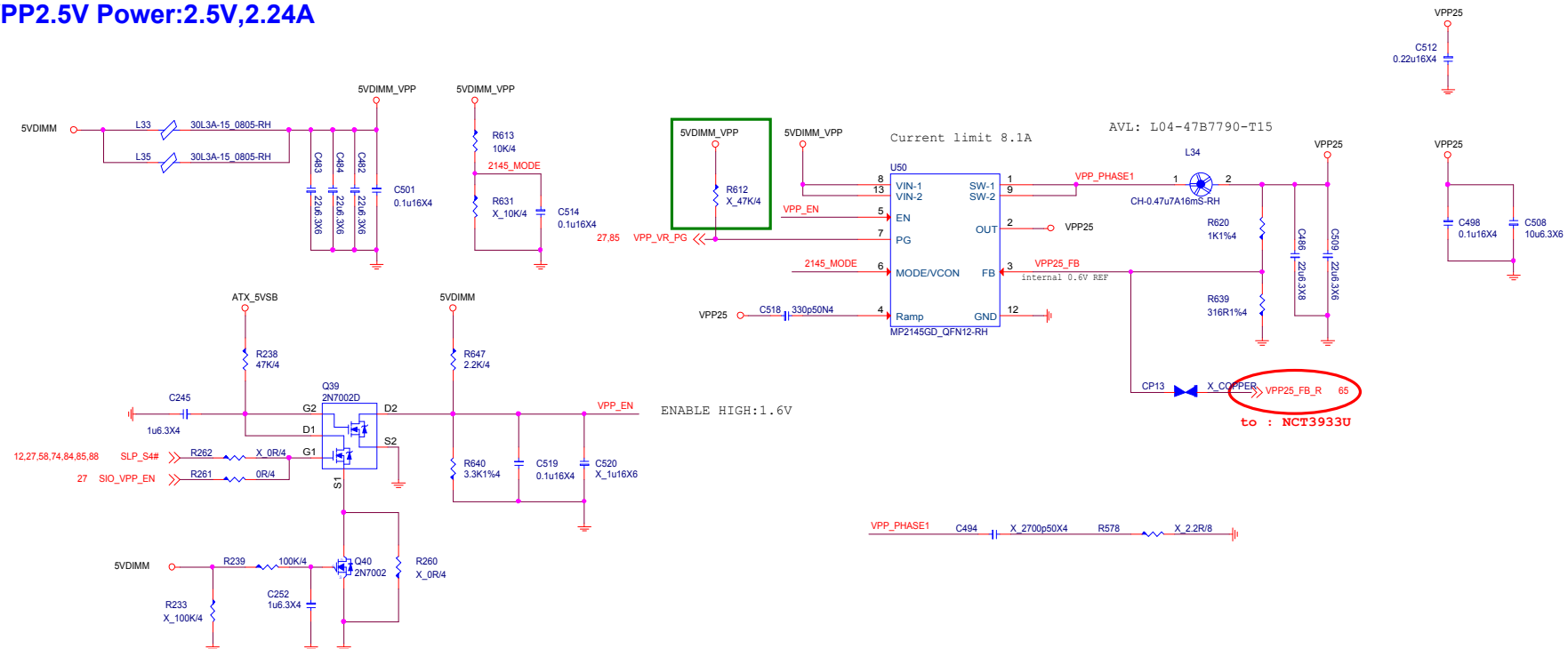


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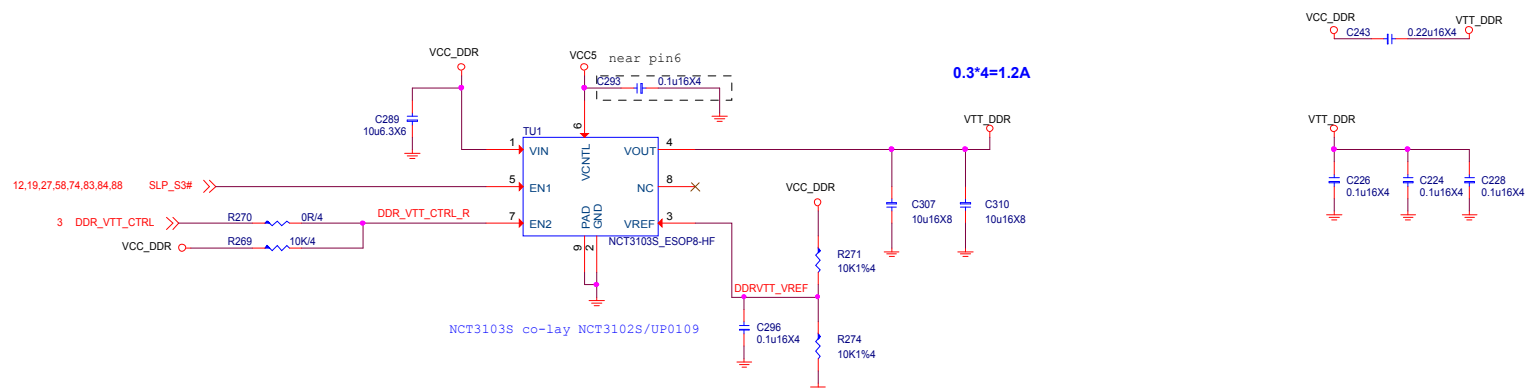
Size Custom	Document Description DDR PWR-PV3205Q	Re 2
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VPP2.5V Power:2.5V,2.24A



DDR VTT Power

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

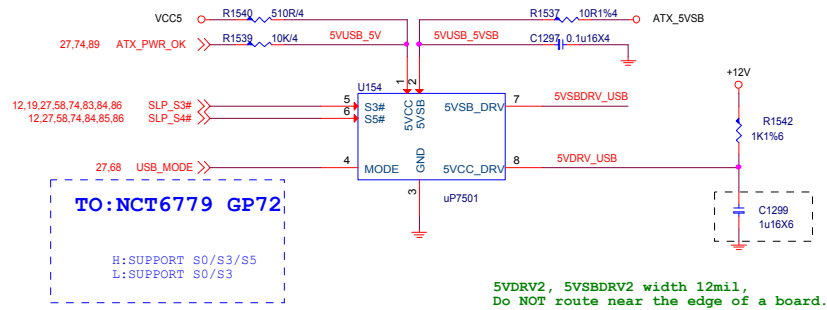


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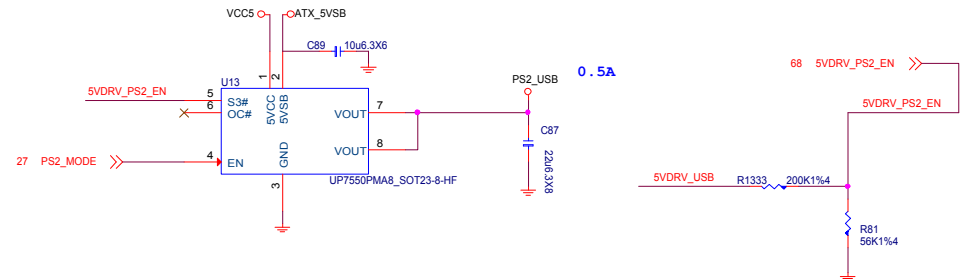
MS-7A98

Size Custom	Document Description DDR PWR VPP25/VT-MP2145	Rev 20
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USB POWER

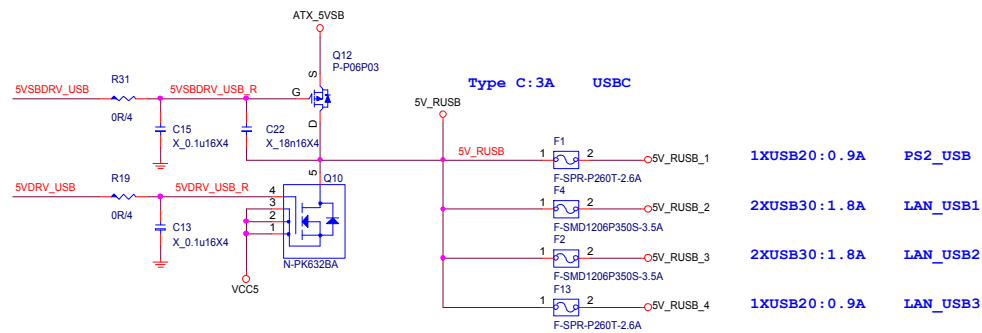


PS2 POWER

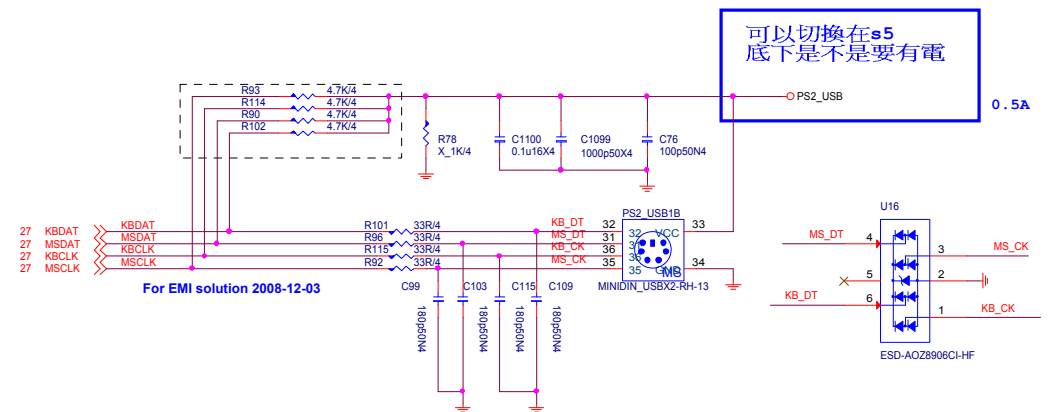


USB MODE

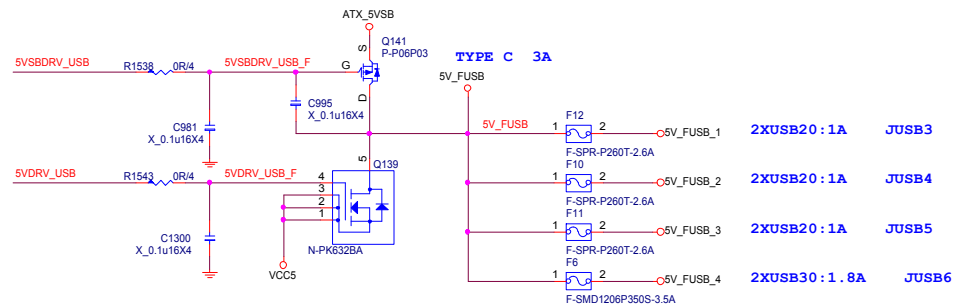
REAR USB PORT POWER



PS2 KEYBOARD & MOUSE CONNECTOR



FRONT USB PORT POWER

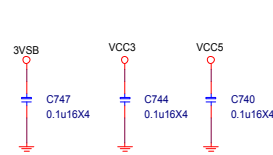
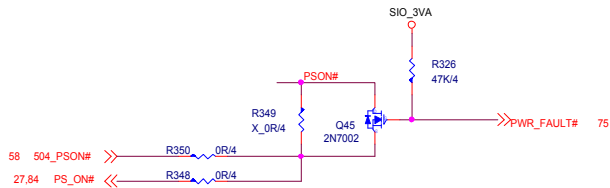


MICRO-STAR INT'L CO.,LTD

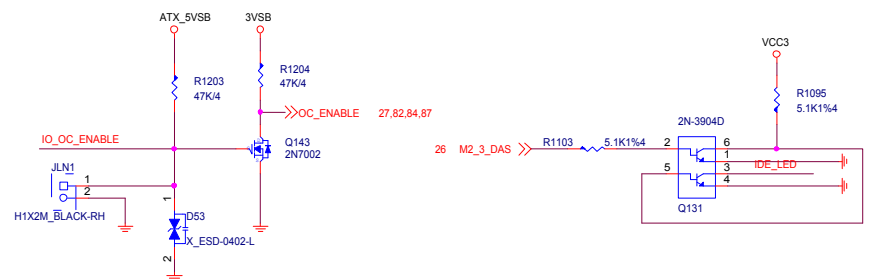
MS-7A98

Size Custom	Document Description USB /PS2 Power	Rev 20
Date: Wednesday, May 31, 2017		Sheet 88 of 98

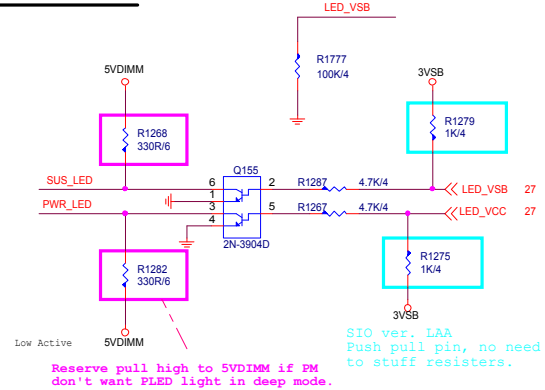
TPM Pin Header



Front Panel LED




XMP LED



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Size Custom	Document Description ATX Connector/F_Panel	Rev 20
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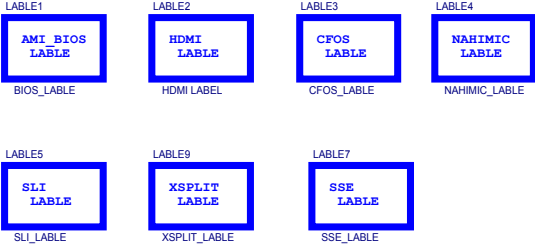
5	4	3	2	1
D				D
C				C
B				B
A				A
5	4	3	2	1



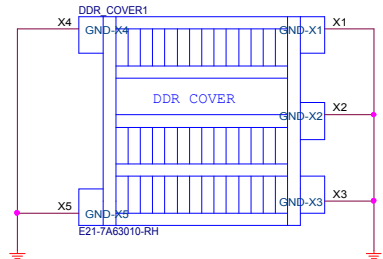
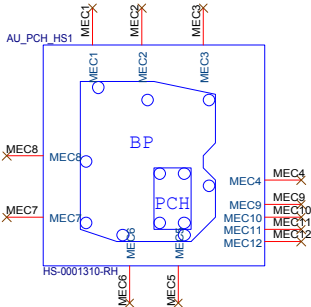
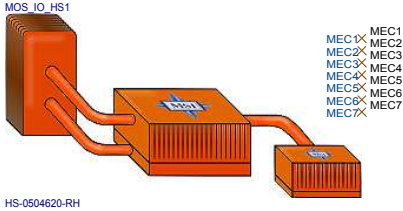
MICRO-STAR INT'L CO.,LTD		
MS-7A98		
Size Custom	Document Description EMI CAP	Rev 20
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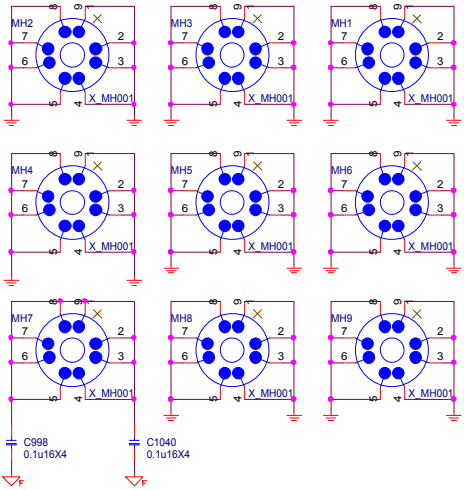
2017/05/262017/06/07PDD-07A9820-G37, 精成 - 深圳, 37, 寶安恩斯通廠 (MSIS) 8, black
2017/05/262017/06/07PDD-07A9820-E48, 興華, 23, 寶安恩斯通廠 (MSIS) 8, black



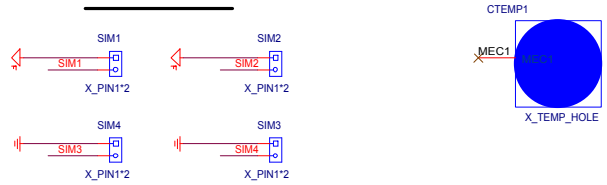
HEATSINK



Mounting Holes



Simulation



Optical Fiducial Marks-120

