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MS-7B28

ATX:234mm*185mm

Intel -CoffeeLake-S plamform

CPU:

LGA1151
CPU POWER PAK *4Phase
GT POWER PAK *2 Phase

Onboard Chip:

SIO: NUVOTON 5567
HD Audio Codec: ALC887
LAN: INTEL I219V
Flash ROM: SPI 64 MB
CUT VBAT:SLG4B41231

Main Memory:

DDR4 * 2 (Dual Channel)

ACPI:

5VDAUL:uP7501
5VDIMM:uP7501
3VSB:GS7133+N MOS
1P8_VSB:GS7166
3VDSW:L11831
VCCSTPLL:GS7133

Expansion Slots:

PCI Express (X16) Slot * 1
PCI Express (X1) Slot * 2

System Chipset:

H310

PWM:

VCORE - RT3607	138A
VGT- RT3607	45A
DDR - RT8231	11.525A
DDR VPP25- MP2143	1.12A
PCH(1.05V) - RT8125E	10.743A
VCCSA - RT8125E	11.1A
VCCIO - SY8288	6.4A

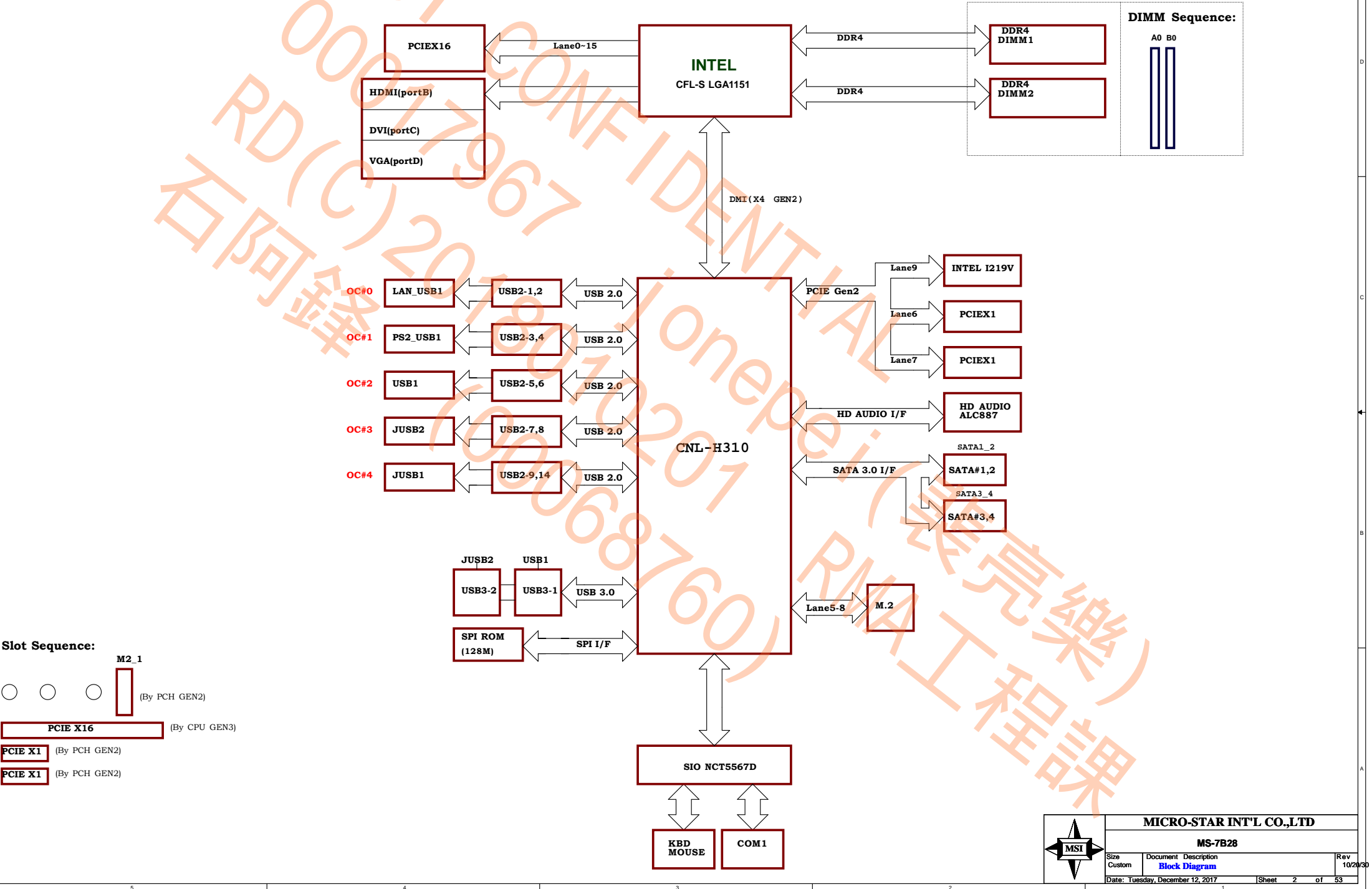


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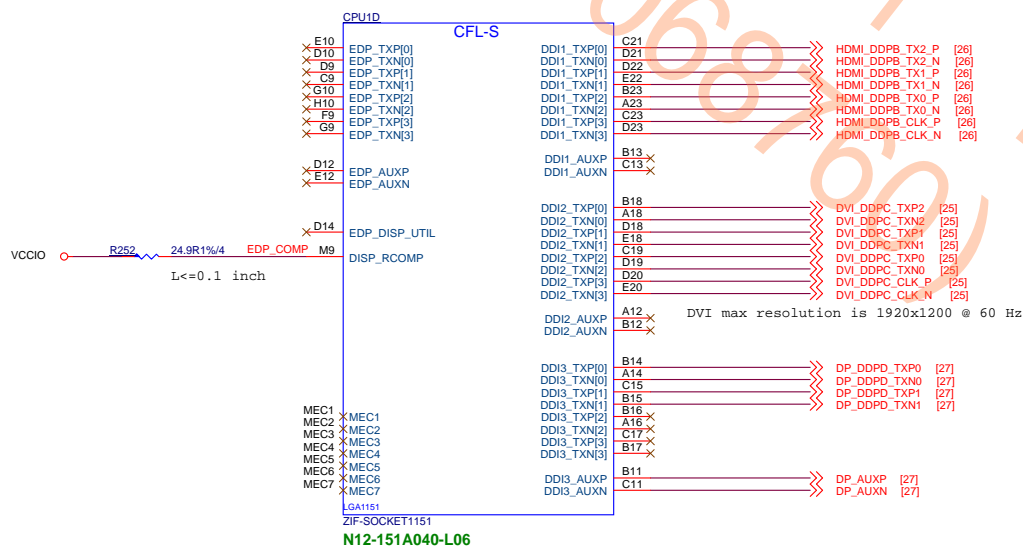
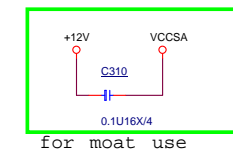
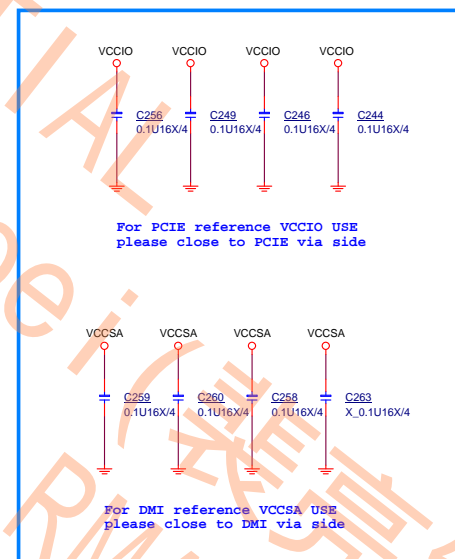
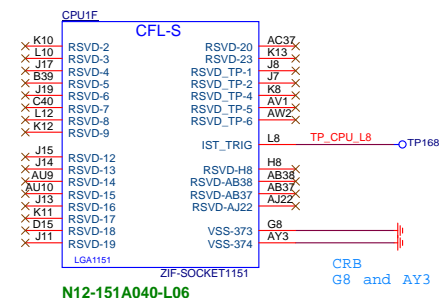
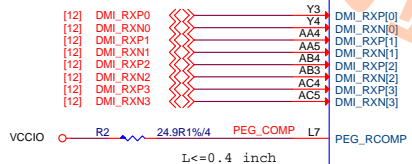
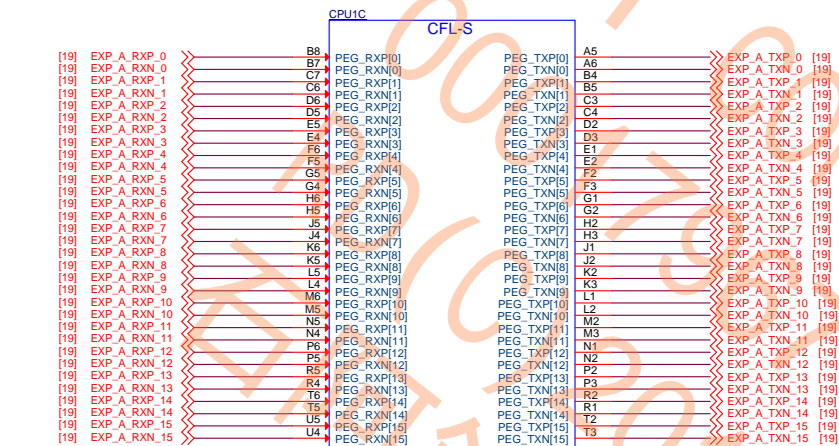
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Custom	Cover Sheet		10/20/30
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Block Diagram

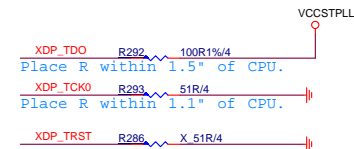




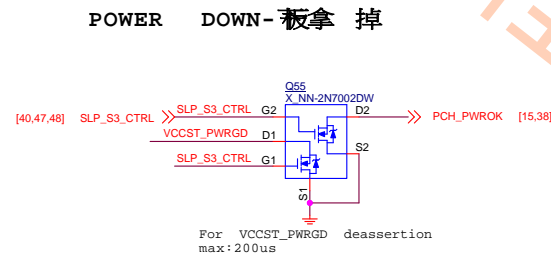
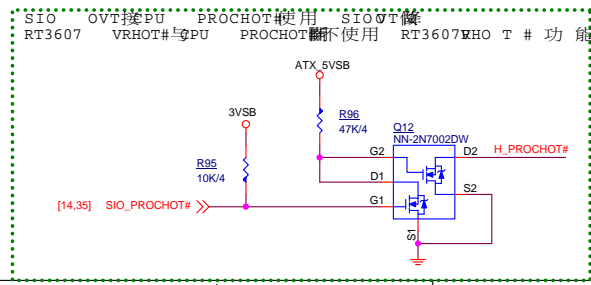
Size Custom	Document Description CPU-Memory	Rev 10/20/30
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MS-7B28			
Size	Document	Description	Rev
Custom		CPU-PEG/Display	10/20/30
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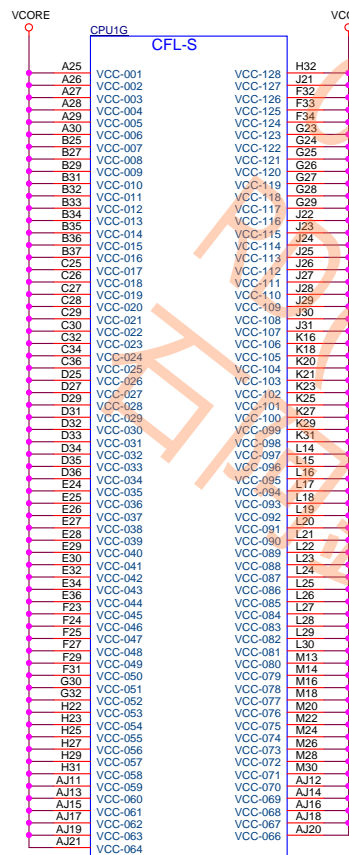
	HIGH	LOW	DESCRIPTION
0	No Lock	Lock	PCU PLL Lock
1			RSVD
2	NGM	REVERSE	PEG_LANE_REVERSAL
3			RSVD
4	DISABLE	ENABLE	eDP
5	DISABLE	ENABLE	PGD0CFGSEL[0]
6	DISABLE	ENABLE	PGD0CFGSEL[1]
7	RESET#	BIOS REQ	PEG_DEFER_TRAINING
8			RSVD
9			RSVD
10			RSVD
11			RSVD
12			RSVD
13			RSVD
14	RSVD		
15	RSVD		



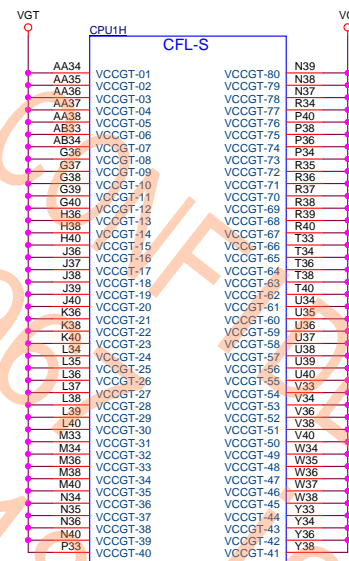
MICRO-STAR INT'L CO.,LTD

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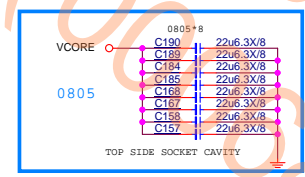
Size Custom	Document Description CPU-Control/MISC/CFG/Audio	Rev 10/20/30
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LGA1151
ZIF-SOCKET1151
N12-151A040-L06

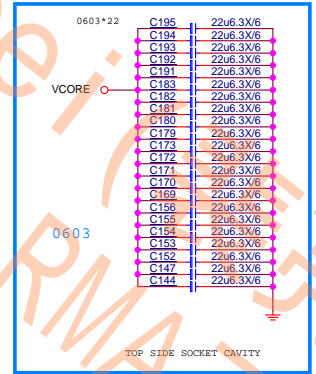


LGA1151
ZIF-SOCKET1151
N12-151A040-L06



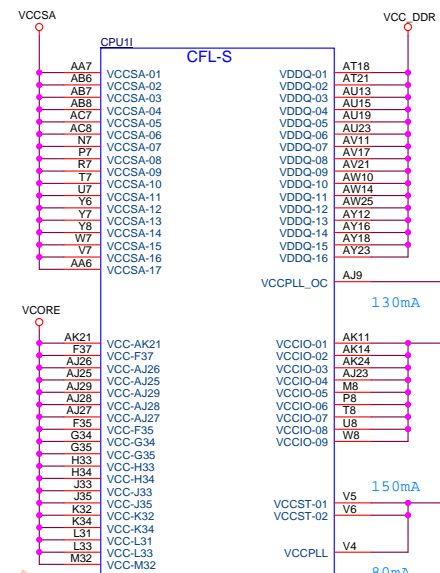
0805

TOP SIDE SOCKET CAVITY

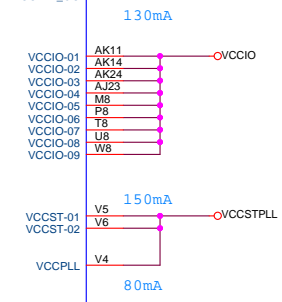
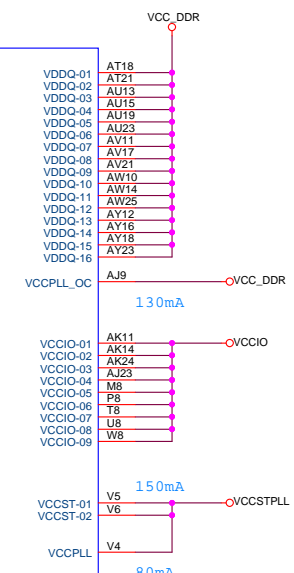


0603

TOP SIDE SOCKET CAVITY



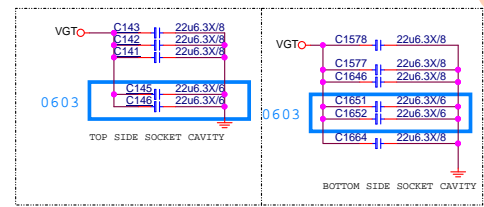
LGA1151
ZIF-SOCKET1151
N12-151A040-L06



130mA

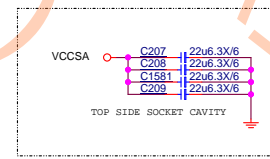
150mA

80mA

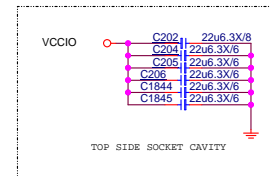


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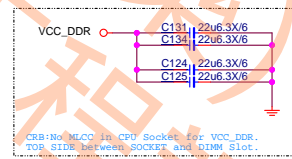
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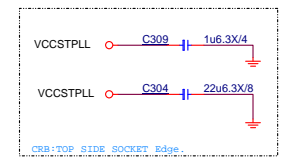
TOP SIDE SOCKET CAVITY



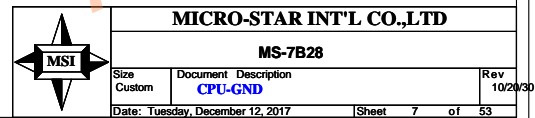
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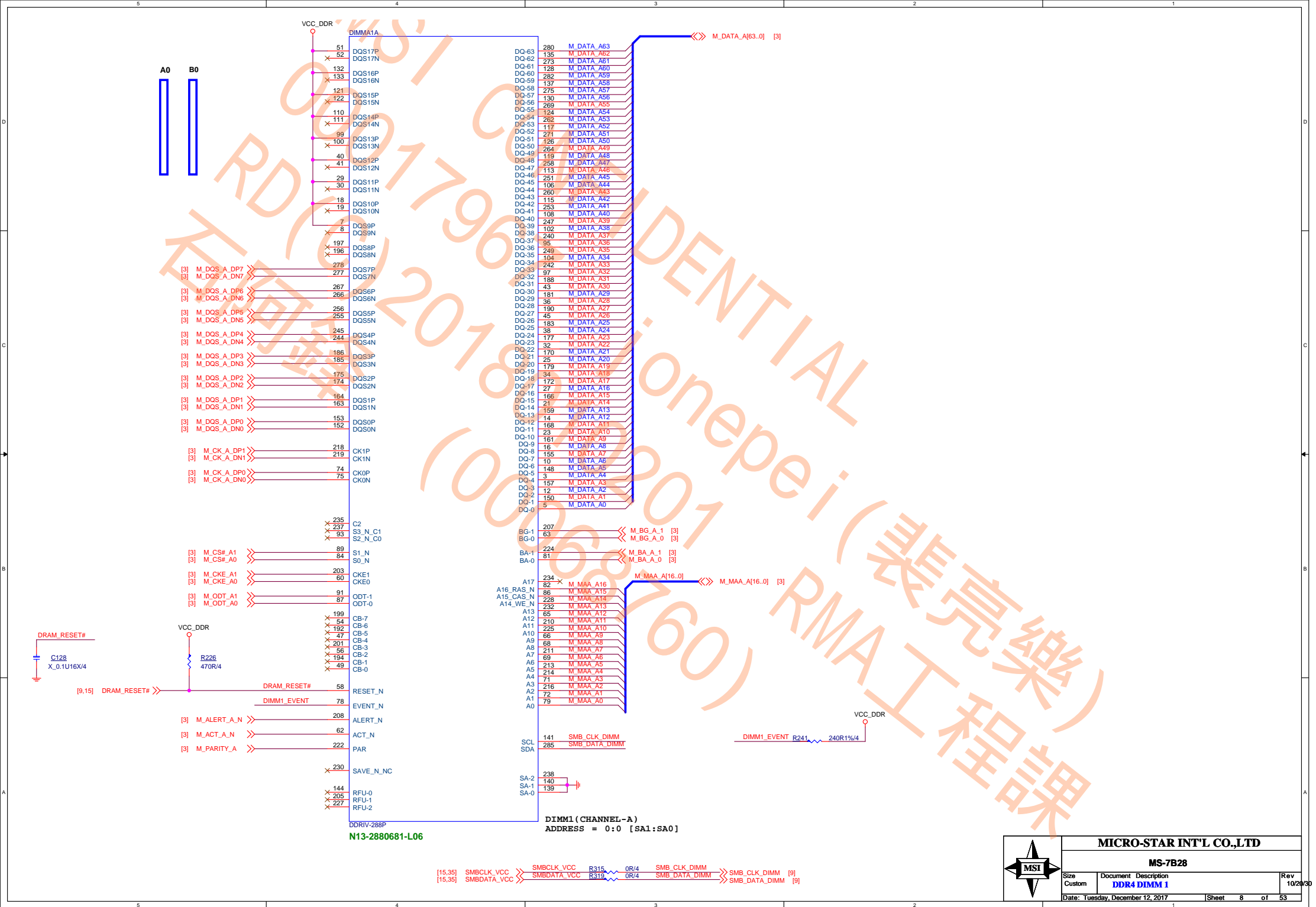


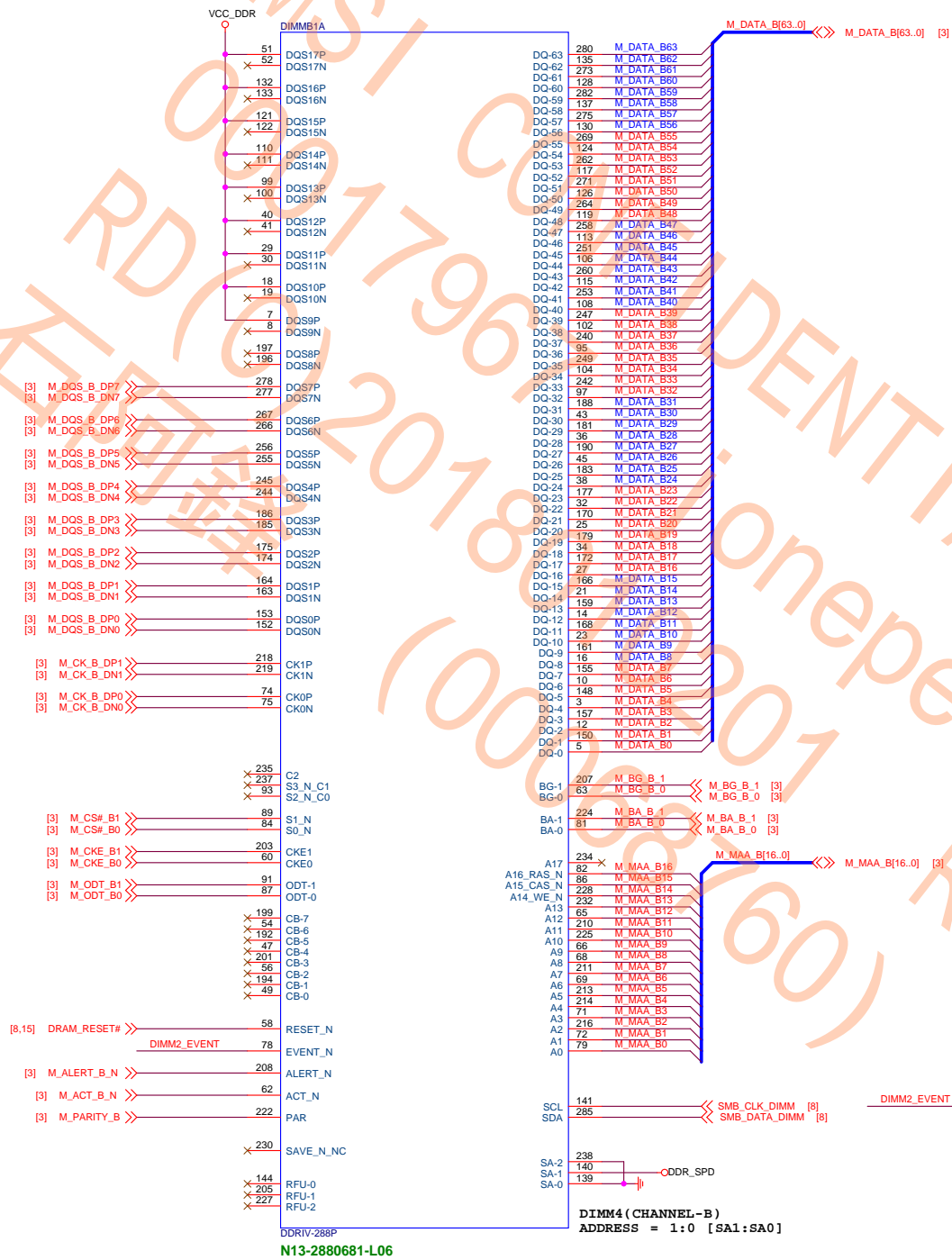
TOP SIDE SOCKET CAVITY



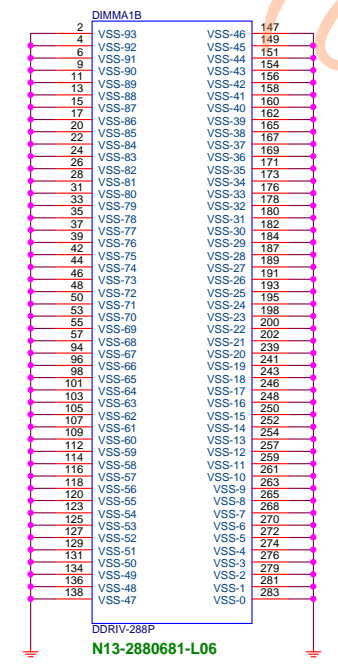
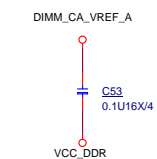
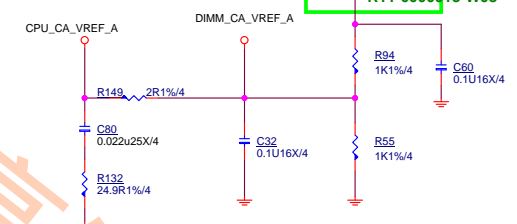
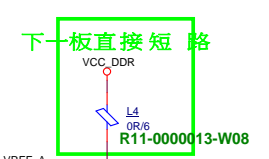
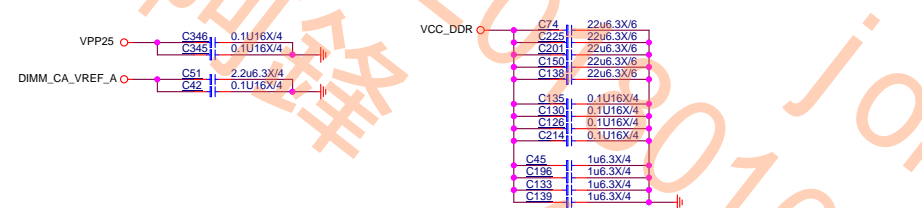
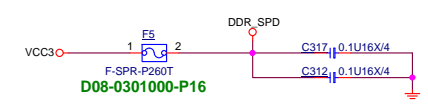
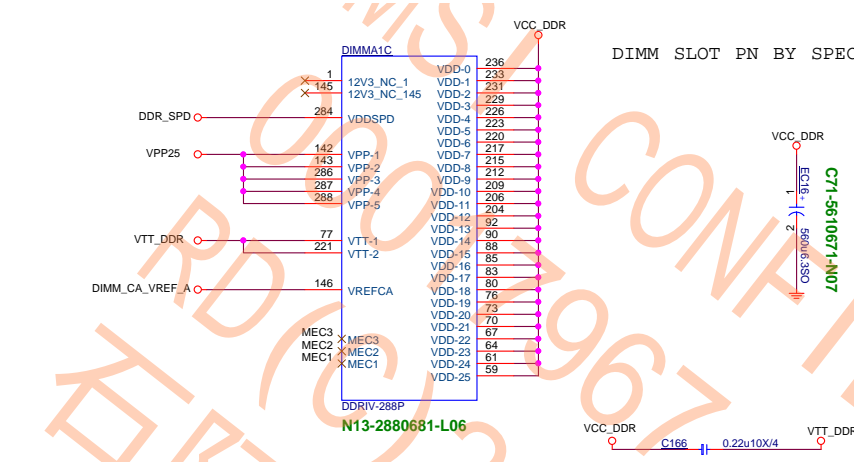
TOP SIDE SOCKET CAVITY

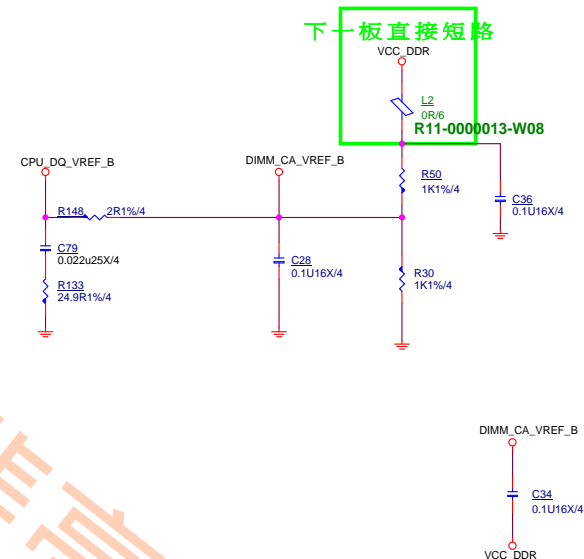
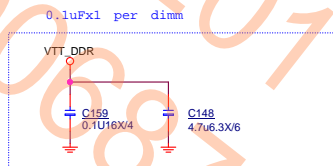
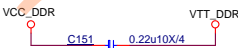
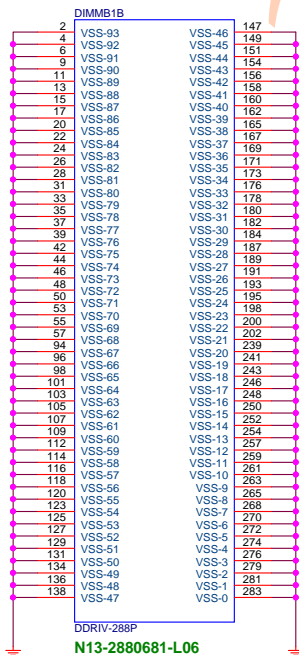
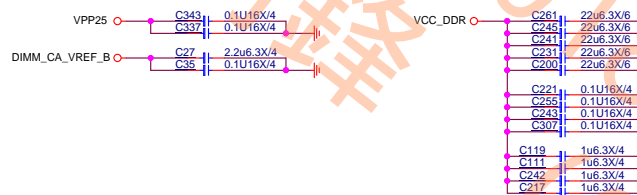
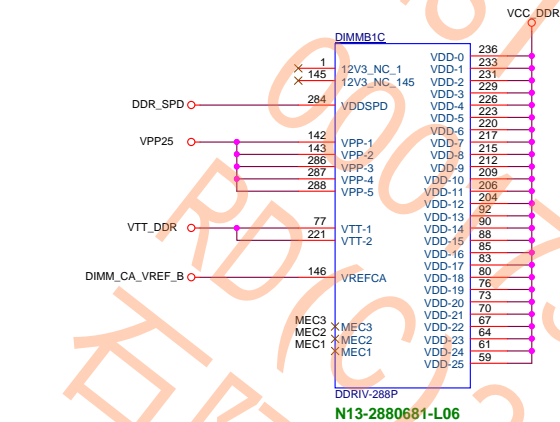






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RMA 工程課

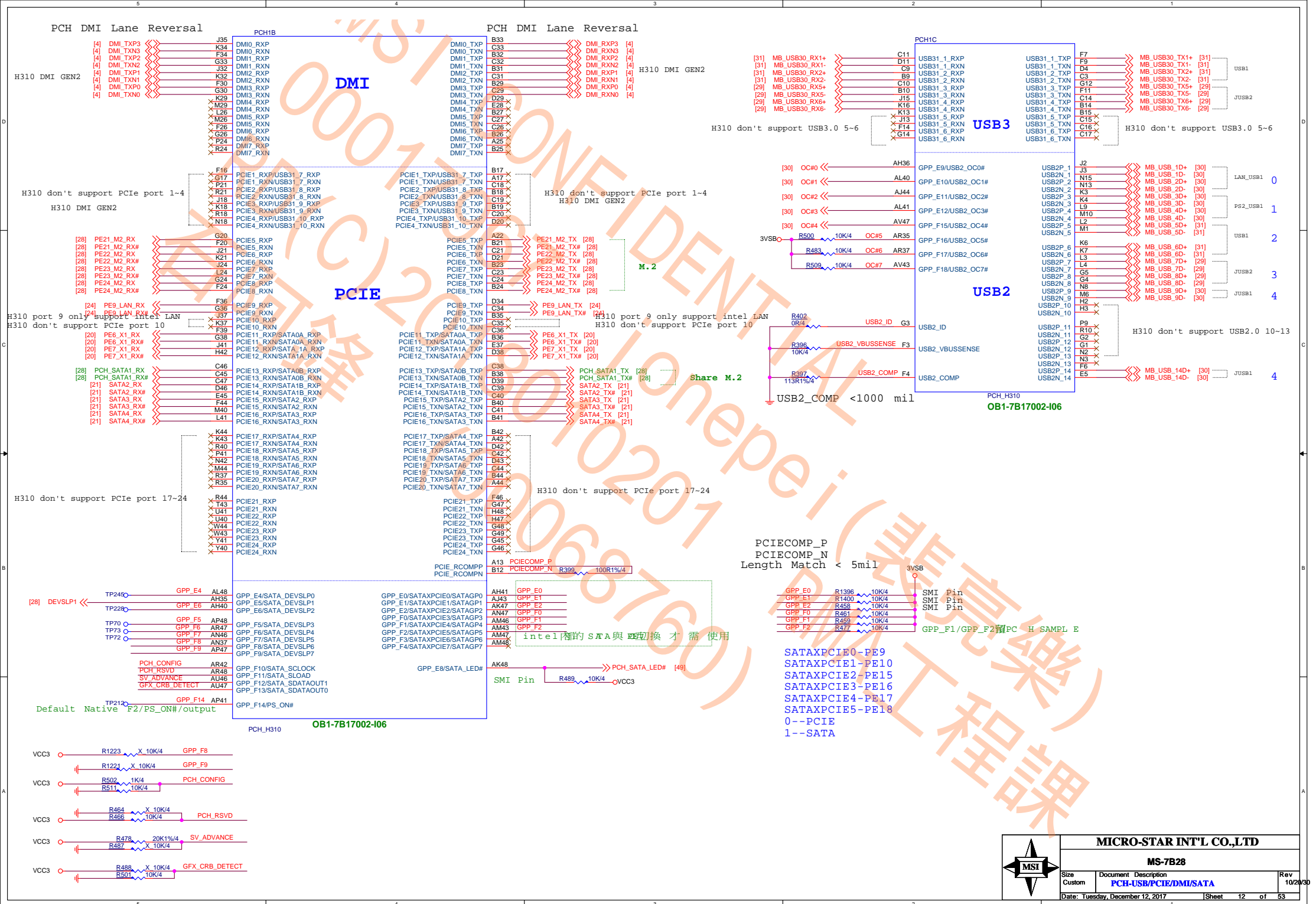




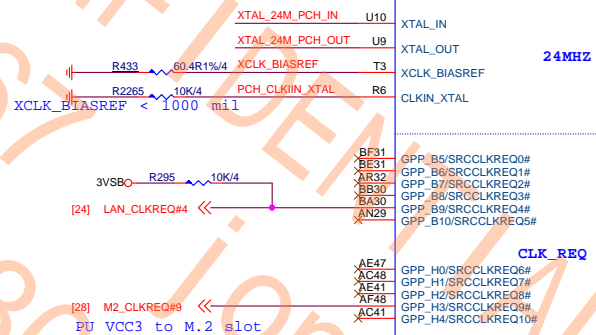
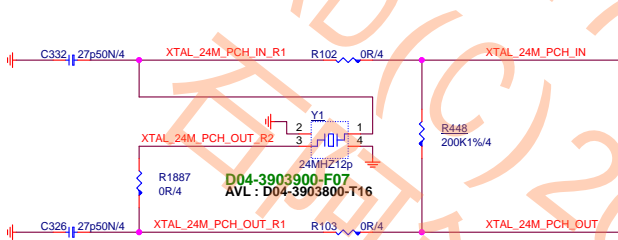
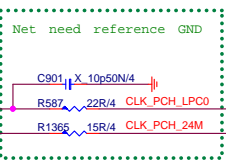
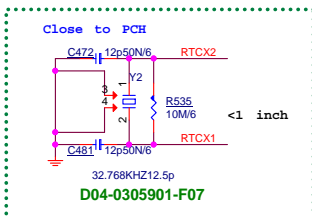
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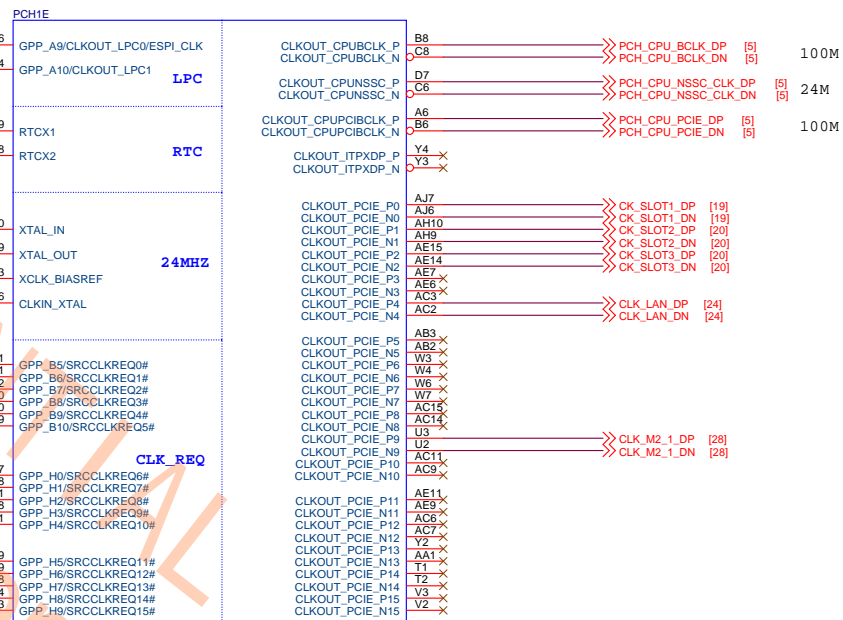
Size	Document	Description	Rev
Custom	DDR4-POWER/GND-2		10/20/30
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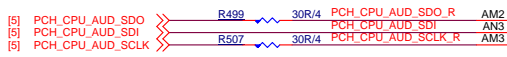
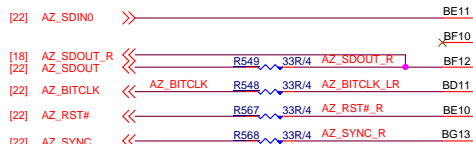
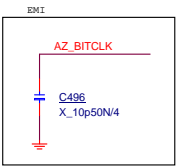
RTC Block



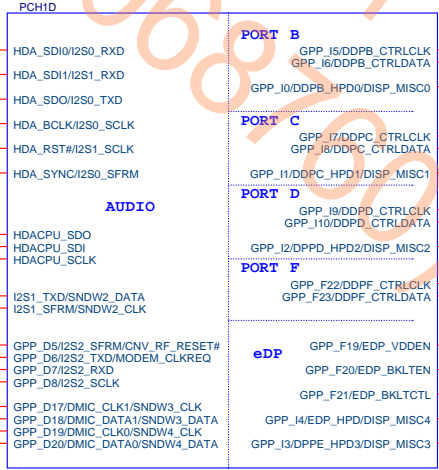
[24] LAN_CLKREQ#4 << PU VCC3 to M.2 slot



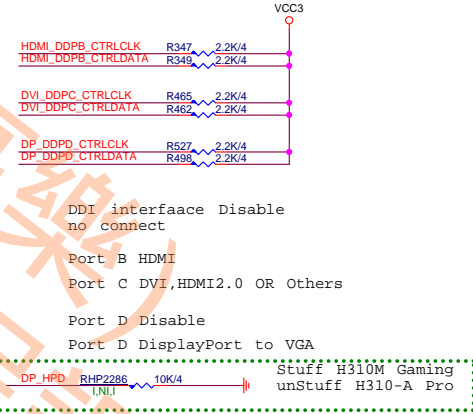
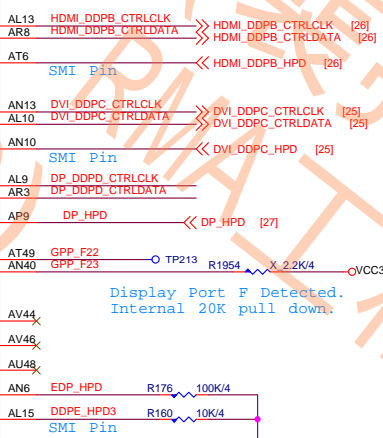
PCH_H310
OB1-7B17002-106



Default Native F3/CNV_RF_R_ESET#.
Default Native F3/MODEM_CLKREQ.

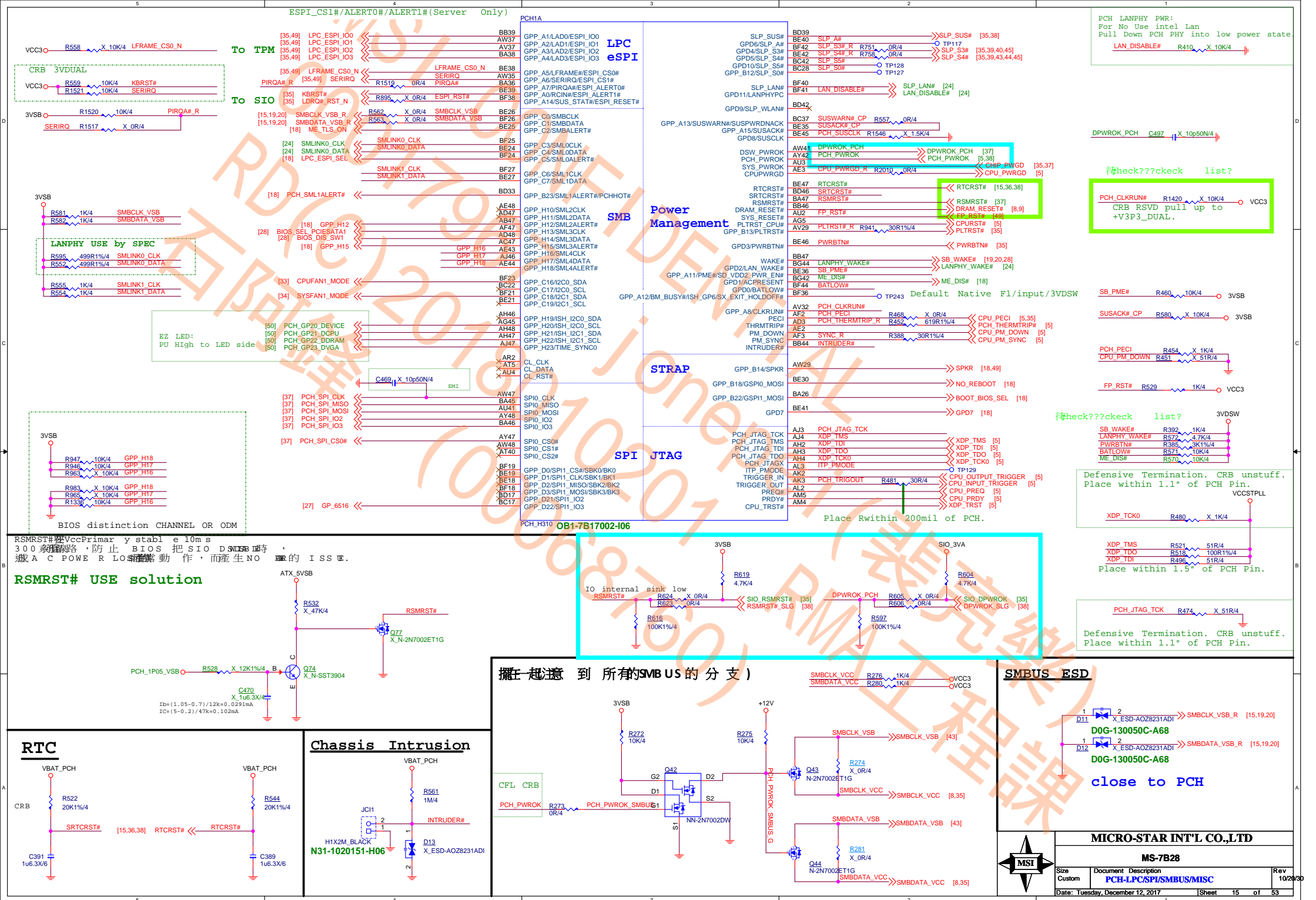


PCH_H310
OB1-7B17002-106



Schematic Cfg	Project
CFG1-7B38-H310 (H310M GAMING PLUS) ver.1.0	V A
CFG1-7B38-H310-APRO (H310-A Pro) ver.2.0	X B
CFG1-7B38-H310 (H310-A GAMING ARCTIC) ver.3.0	V C

MICRO-STAR INT'L CO.,LTD			
MS-7B28			
Size	Document	Description	Rev
Custom		PCH-Audio/Display/Clock	10/20/30
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VSS

OB1-7B17002-I06

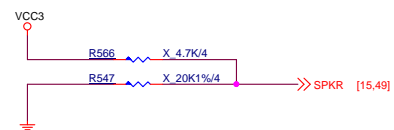


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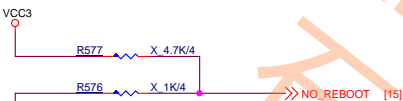
Size	Document	Description	Rev
Custom		PCH-GND	10/20/00
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TOP Swap



Internal pull-down 20K is disabled after PLTRST#

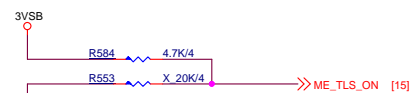
No Reboot



0 : DISABLE (Default)
1 : ENABLE

Internal pull-down 20K is disabled after PLTRST#

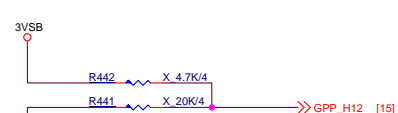
AMT and SBA with confidentiality



0 : DISABLE
1 : ENABLE (Default)

Internal pull-down 20K is disabled after RSMRST

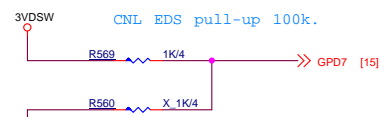
ESPI FLASH SHARING MODE



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

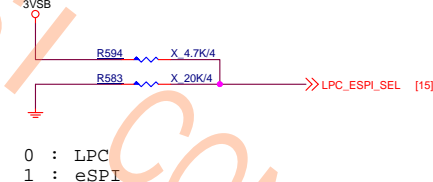
Internal pull-down 20K is disabled after RSMRST

Reserved



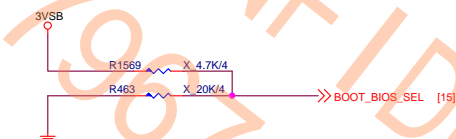
XTAL INPUT MODE
0 = XTAL INPUT IS SINGLE-ENDED
1 = XTAL INPUT IS DIFFERENTIAL
PCH HAS INTERNAL 20K PD

LPC eSPI Mode



0 : LPC
1 : eSPI

Boot BIOS

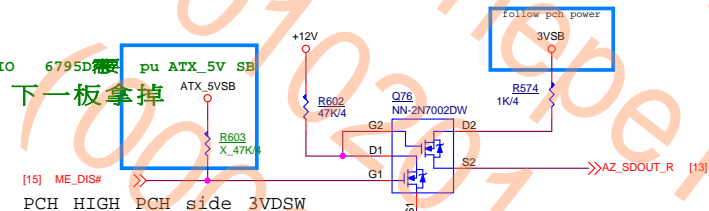


0 : SPI
1 : LPC

Internal pull-down 20K is disabled after PLTRST

HDA_SDO

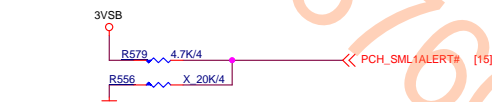
ME flash by GPIO



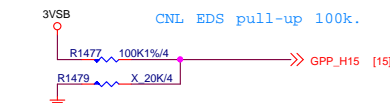
[15] ME_DIS#

PCH HIGH PCH side 3VDSW

Reserved

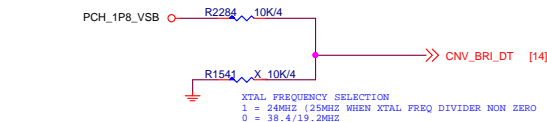


Reserved

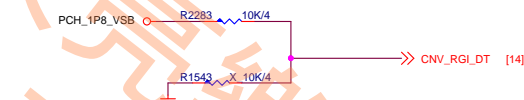


VCCSPI 3.3V, Internal pull-down.

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



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



CNL EDS
1 = Integrated CNVi enable
0 = Integrated CNVi disable



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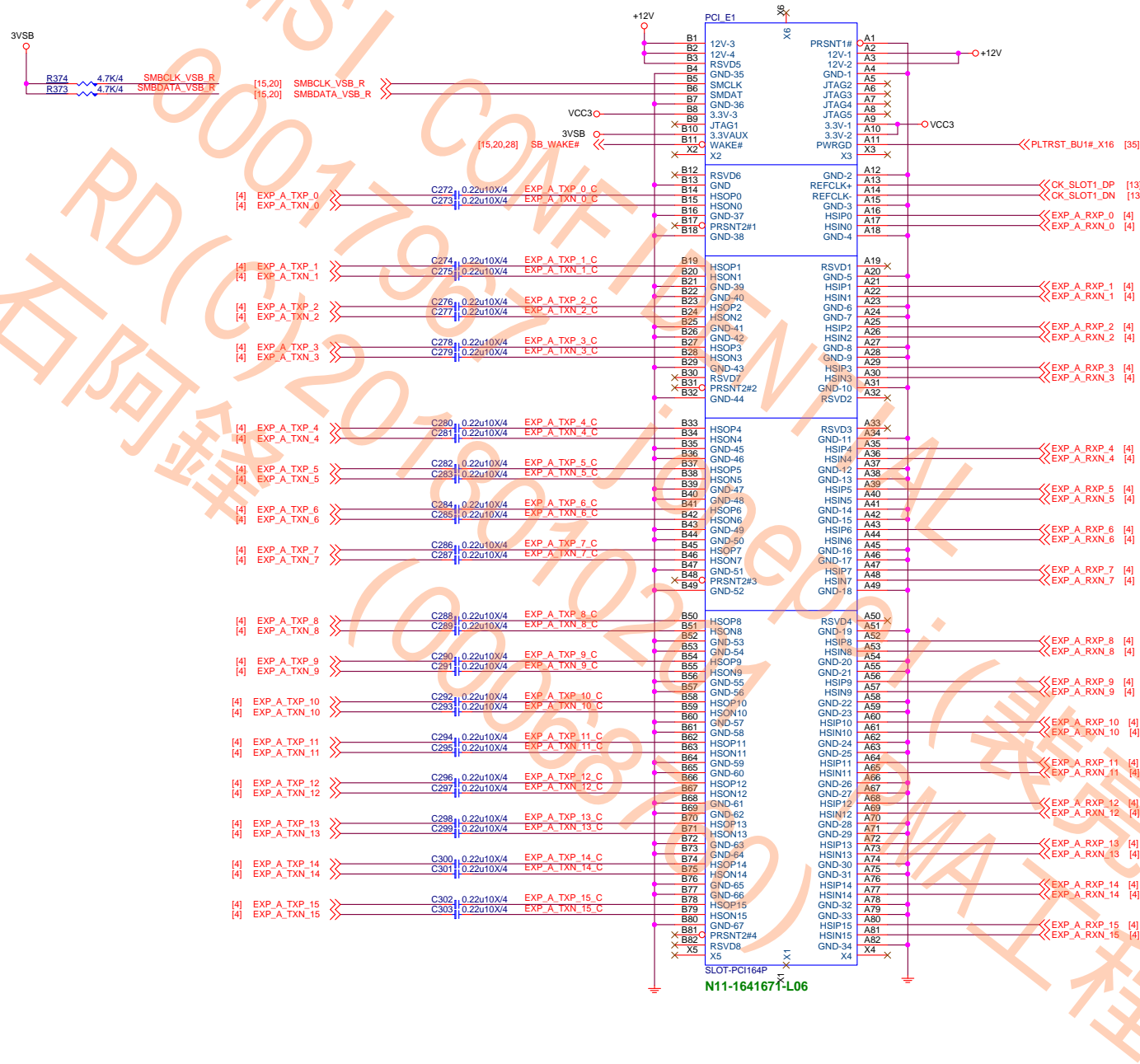
MS-7B28

Size	Document	Description	Rev
Custom		PCH-Strap	10/20/30
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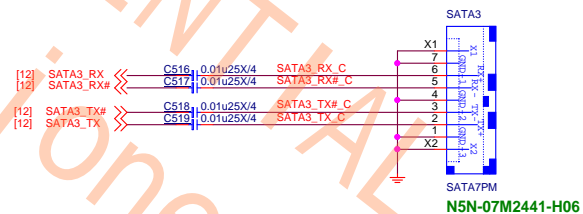
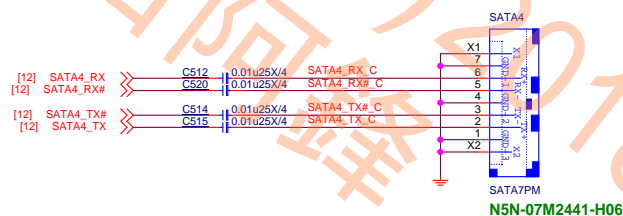
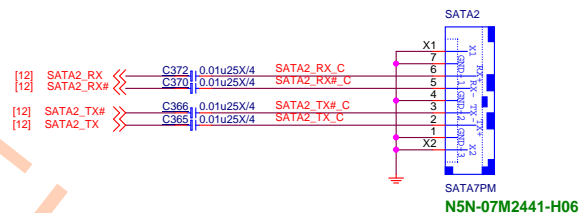
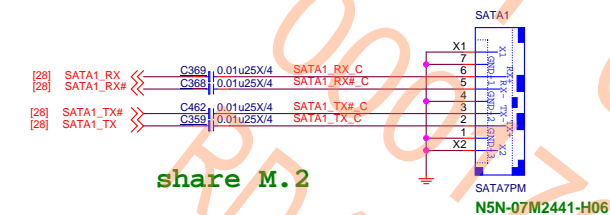
C71-2711761-N07

C71-5610671-N07

C394 10u6.3X/6



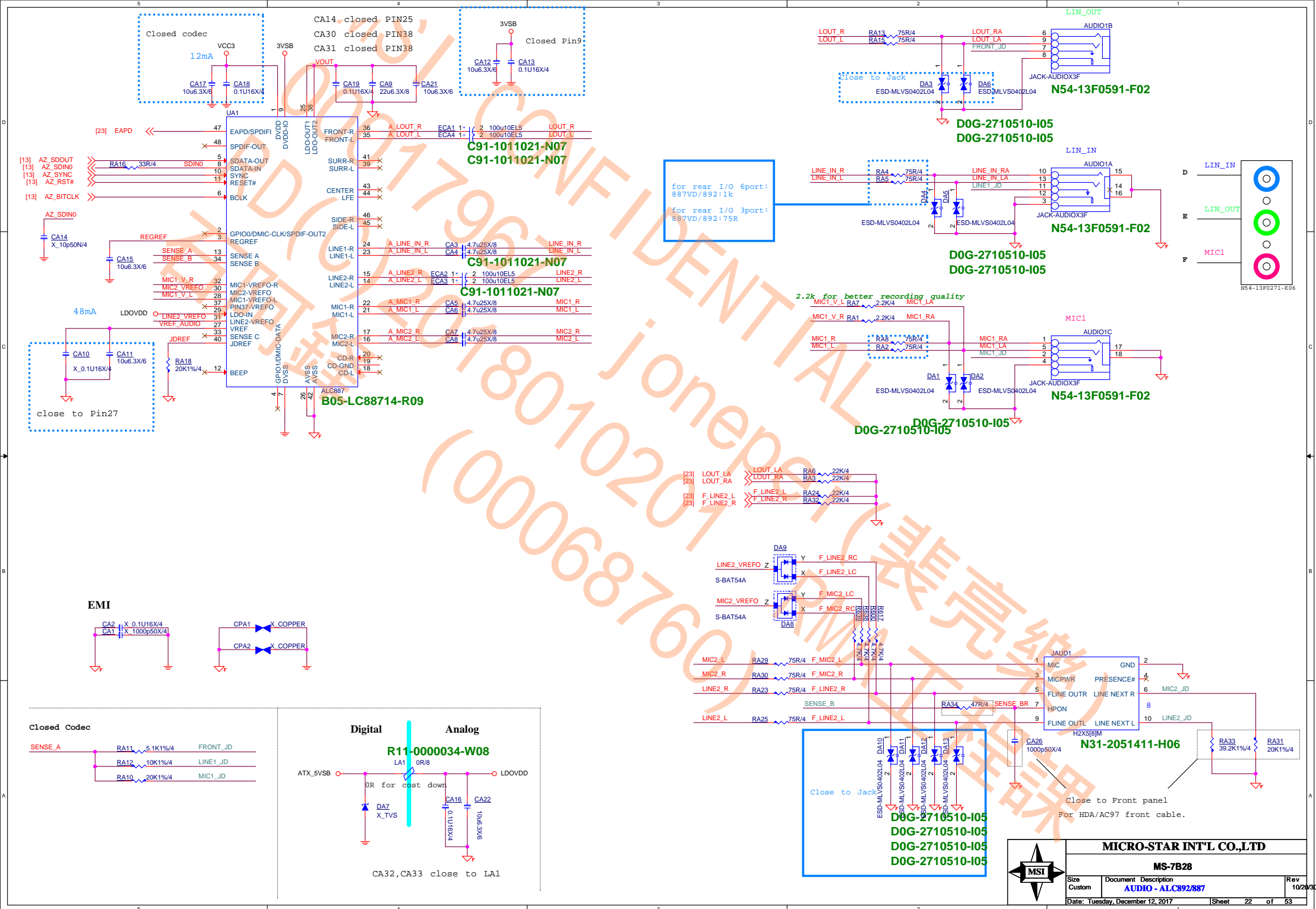
SATA 6G



MICRO-STAR INT'L CO.,LTD

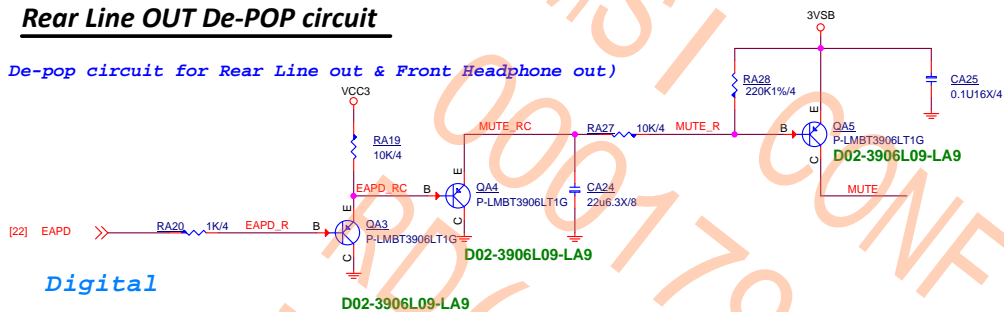
MS-7B28

Size	Document	Description	Rev
Custom		SATA connector	10/2/30
Date: Tuesday, December 12, 2017			Sheet 21 of 53

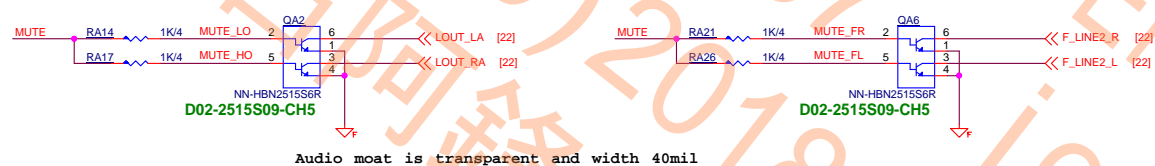


Rear Line OUT De-POP circuit

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

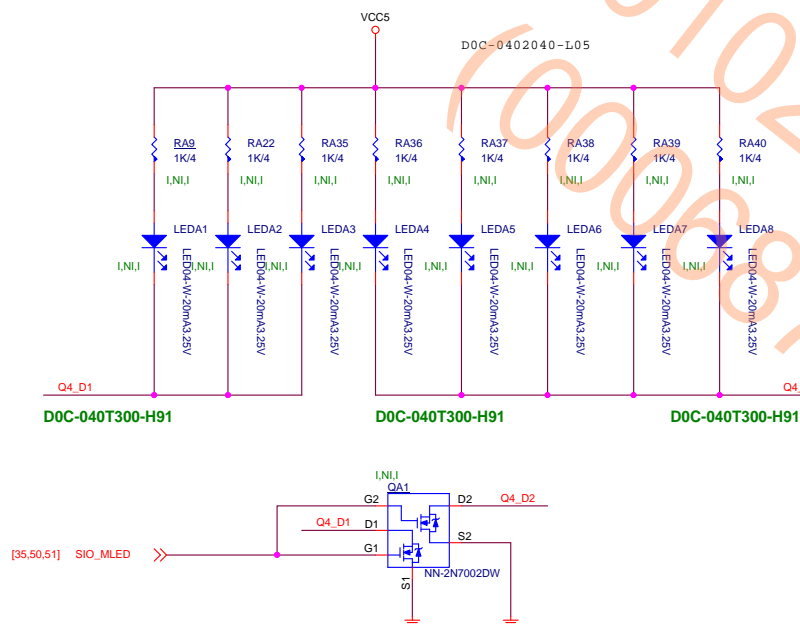


Analog



Audio moat is transparent and width 40mil

Audio LED



Schematic Cfg	Project	
CFG1-7B38-H310 (H310M GAMING PLUS) ver.1.0	V	A
CFG1-7B38-H310-APRO (H310-A Pro) ver.2.0	X	B
CFG1-7B38-H310 (H310-A GAMING ARCTIC) ver.3.0	V	C



MICRO-STAR INT'L CO.,LTD

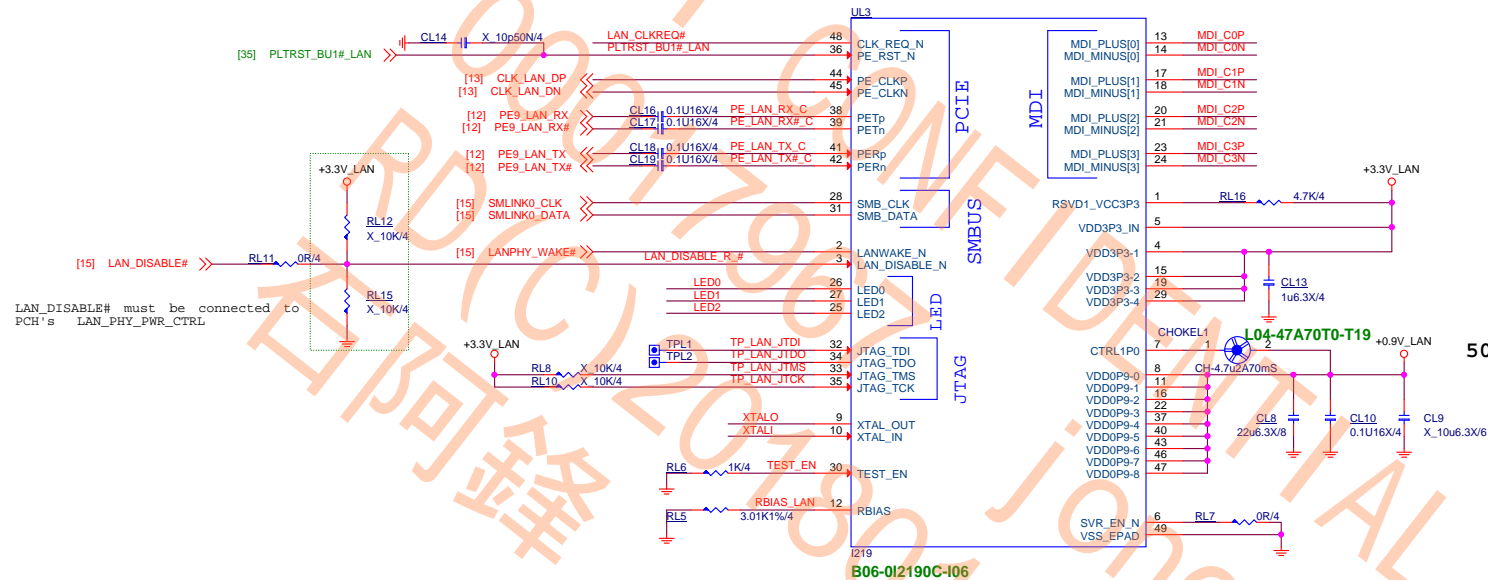
MS-7B28

Size	Document Description
Custom	AUDIO - depop circuit

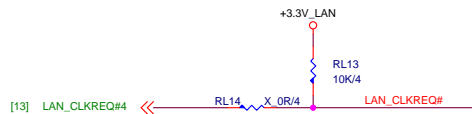
Rev	10/20/30
-----	----------

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Intel Lan- I219

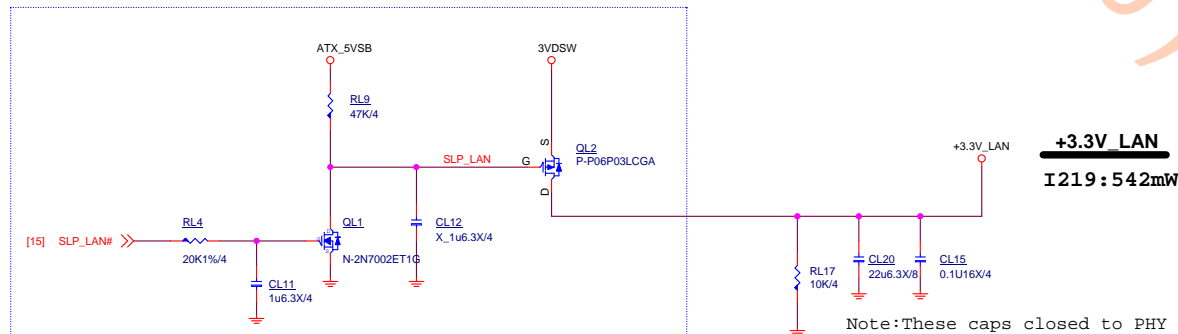


PCH's PCIECLKRQ<n> port mustbe mapped to PCH's PET/R<n+1>port.
If CLK_REQ_N is not used, pin48 is pulled up 10KR to 3.3V_LAN

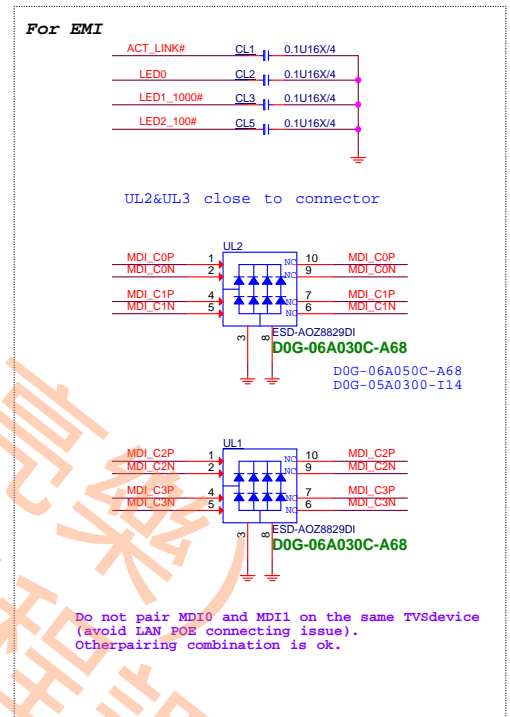
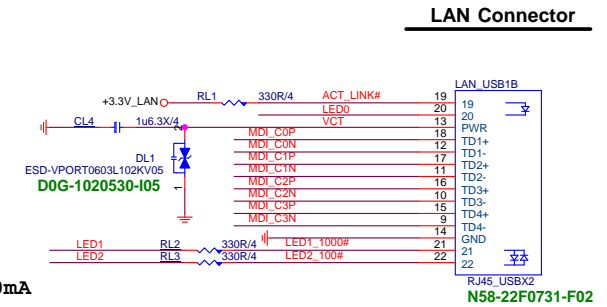


The 10Kohm pull-up resistor (RL18) of CLK_REQ_N is connected to 3.3V Suspend/Core/etc. power well, depending on the power well of PCH's input PCIECLKRQ<n> buffer.

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



Note: These caps closed to PHY



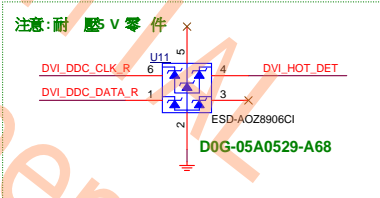
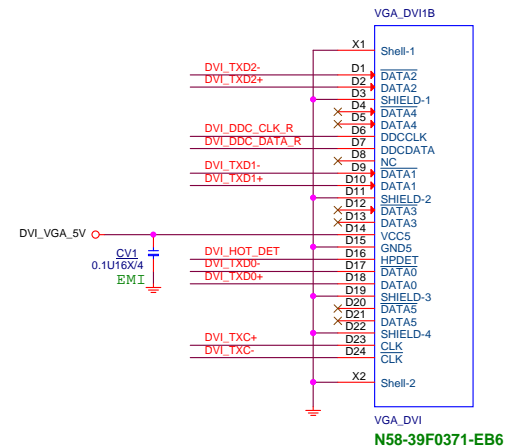
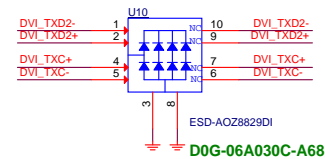
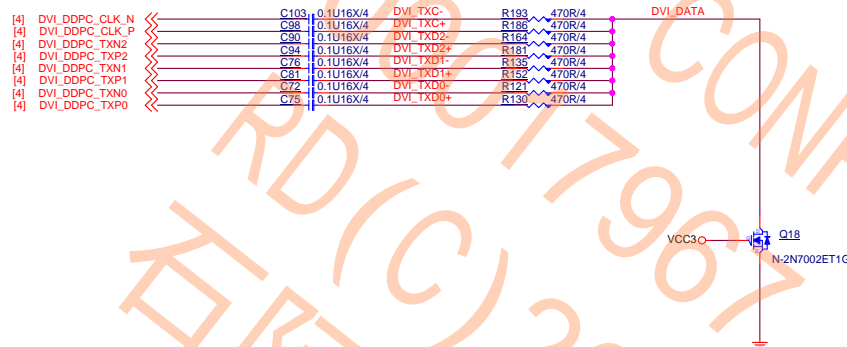
MICRO-STAR INT'L CO.,LTD

MS-7B28

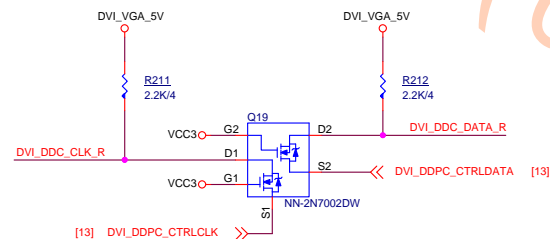
Size Custom	Document Description LAN - I219	Rev 10/20/30
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DVI level shifter

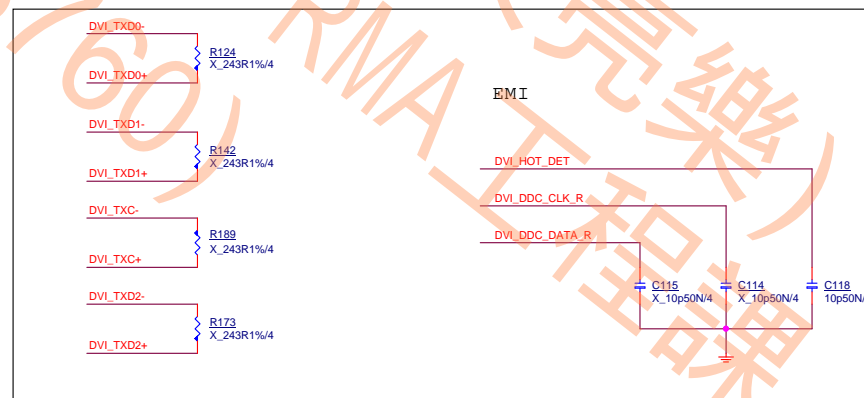
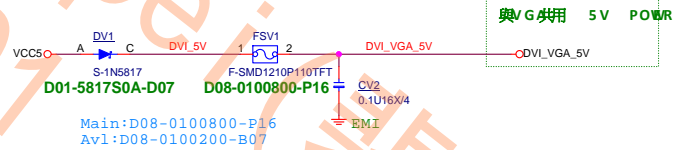
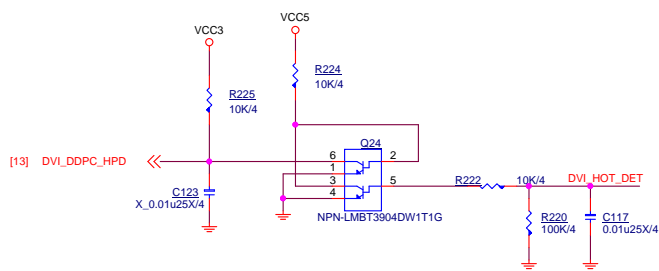
VGA: resolution of 2048x1536 pixels with 32-bit color at 75 Hz (4:3 QXGA)



LEVEL SHIFT using I2C Repeater



HPD

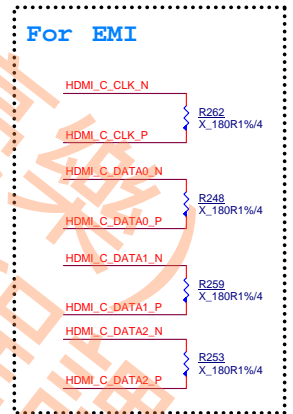
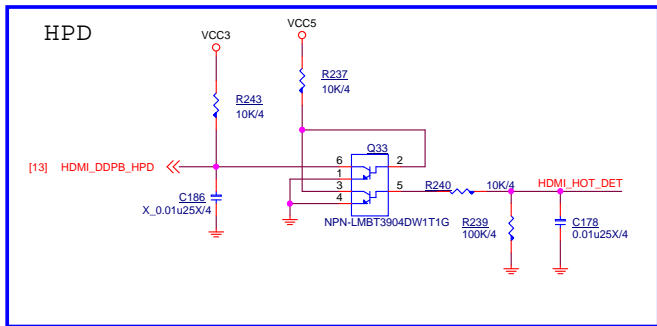
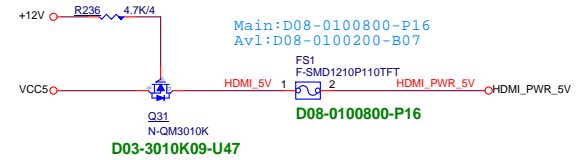
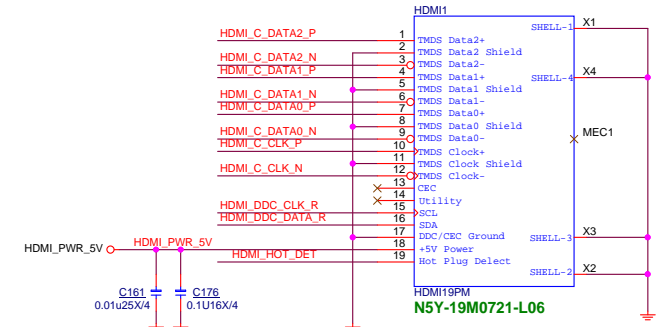
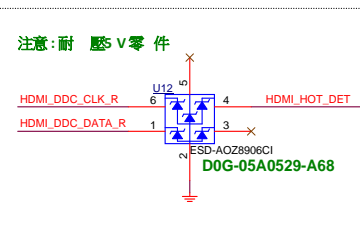
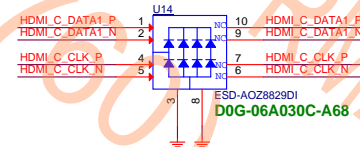
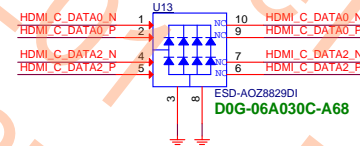
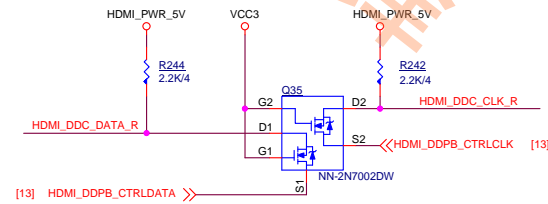
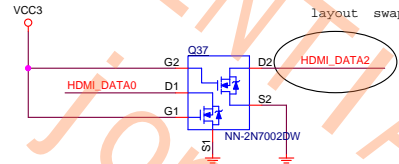
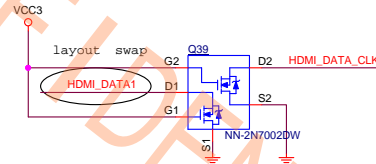
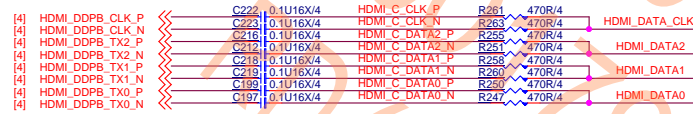


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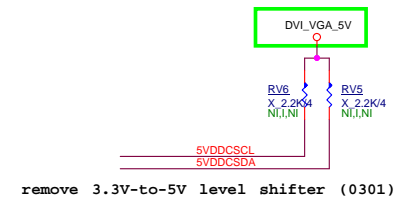
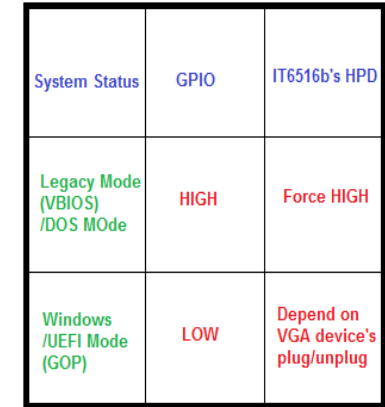
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Custom	DVI		10/20/30
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HDMI, DVI : 1920x1200 at 60 Hz (16:10 WUXGA)

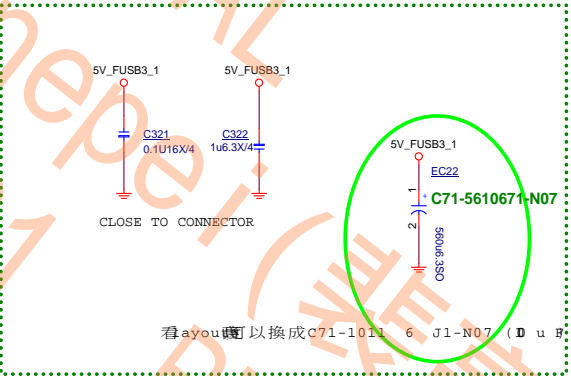
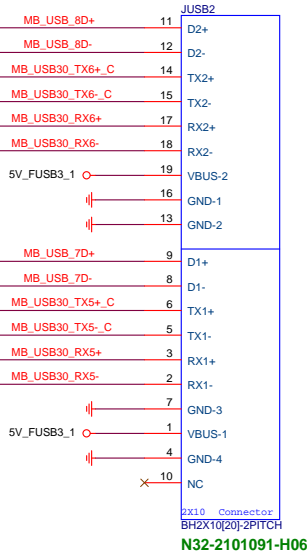
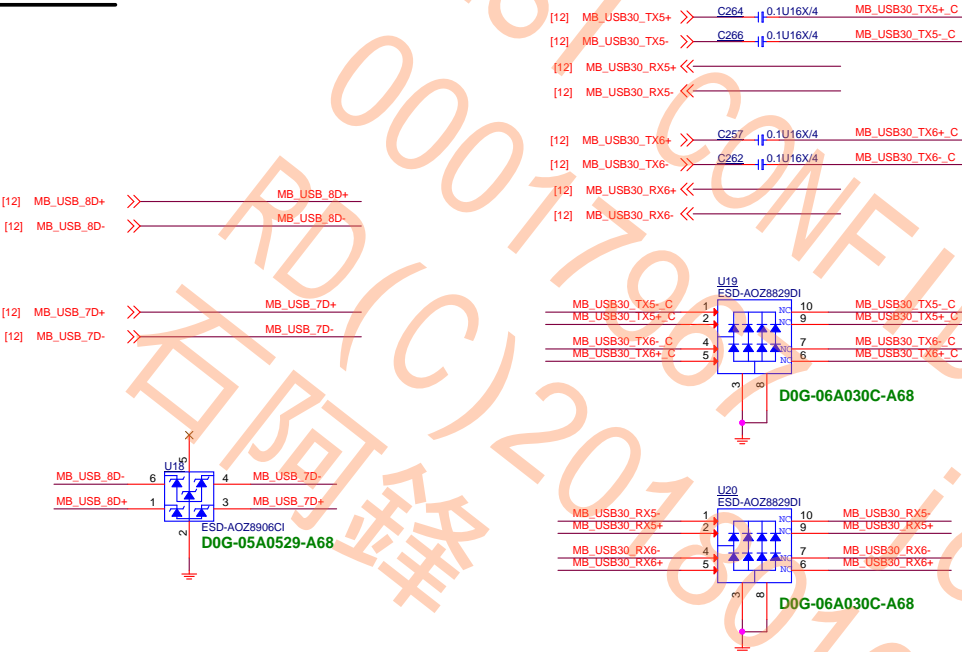


If connect to eDP port,must confirm whether it support hot plug detection HPD and re-auxtraining

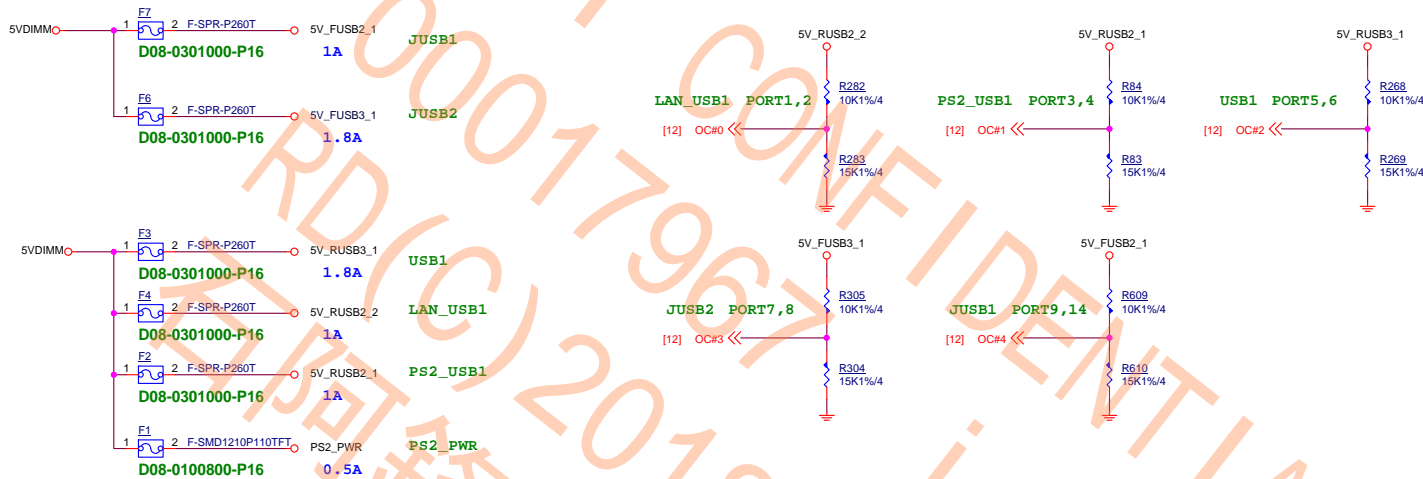
[illegible]

Size Custom	Document Description VGA - IT6516	Rev 10/20/30
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Front JUSB3 port 7,8

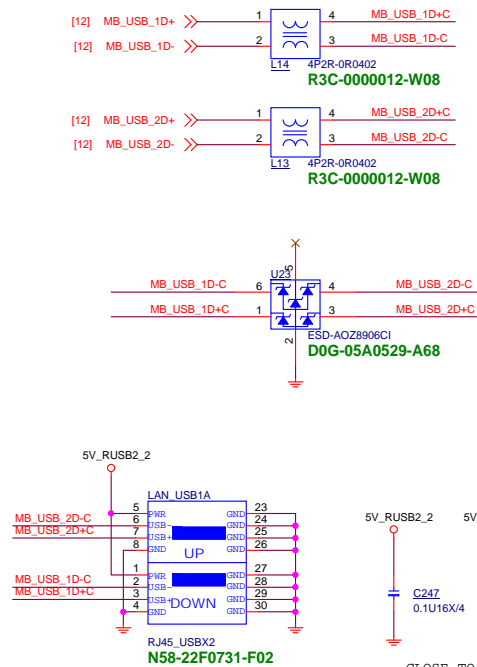


MICRO-STAR INT'L CO.,LTD			
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Size	Document	Description	Rev
Custom		Front USB3.0 Connector	10/20/30
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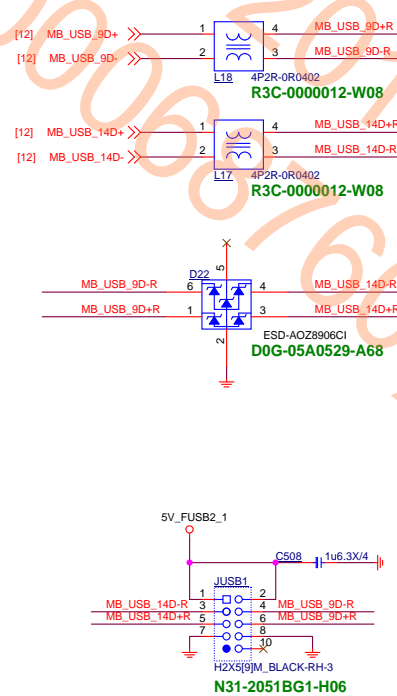


USB CONN	USB POWER	PCH PORT	OC# SIGNAL
LAN_USB1	5V_RUSB2_2	Port1,2	OC#0
PS2_USB1	5V_RUSB2_1	Port3,4	OC#1
USB1	5V_RUSB3_1	Port5,6	OC#2
JUSB2	5V_FUSB3_1	Port7,8	OC#3
JUSB1	5V_FUSB2_1	Port9,14	OC#4

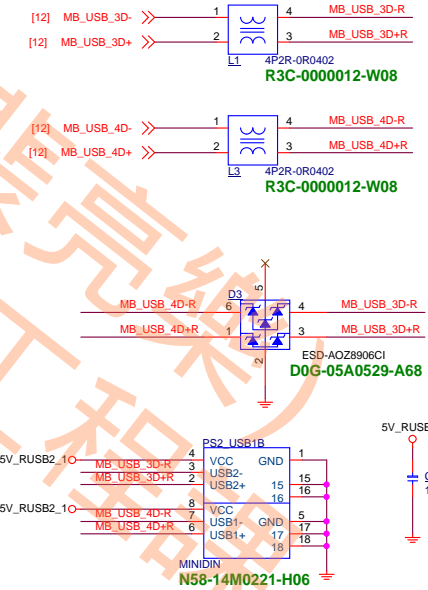
Rear USB1 port 1,2



JUSB1 PORT 9,14



PS2_USB1 PORT 3,4

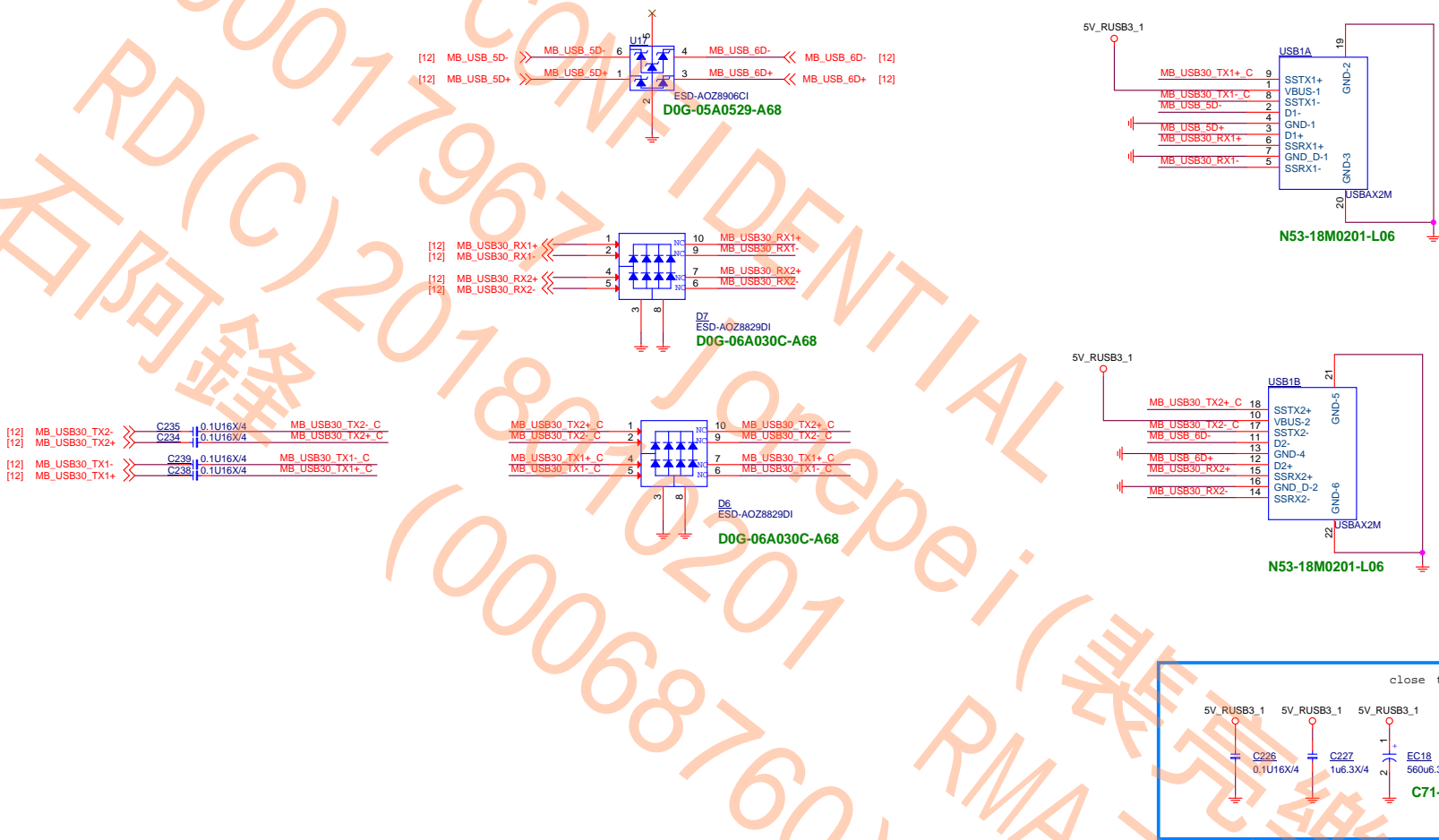


MICRO-STAR INT'L CO.,LTD

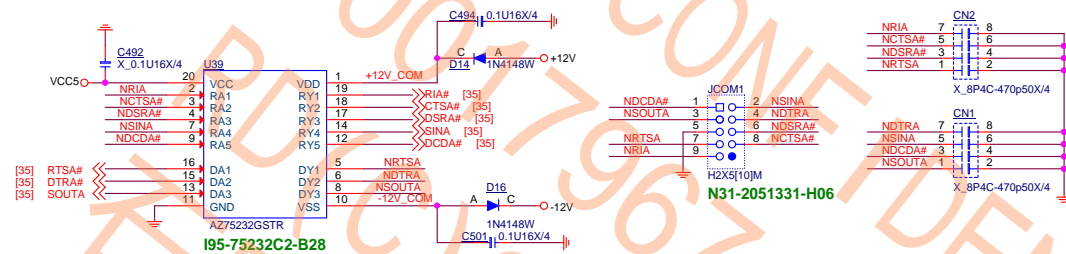
MS-7B28

Size Custom Document Description Rev
 Date: Tuesday, December 12, 2017 USB2.0 Connector 10/29/30
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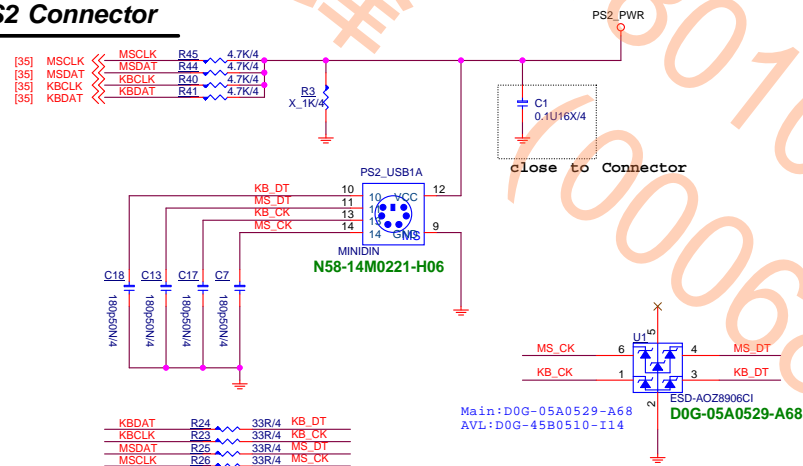
REAR USB1 Connect



SERIAL PORT 1



PS2 Connector

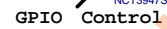


MICRO-STAR INT'L CO.,LTD

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Size	Document	Description	Rev
Custom	SERIAL POR/PS2		10/29/30
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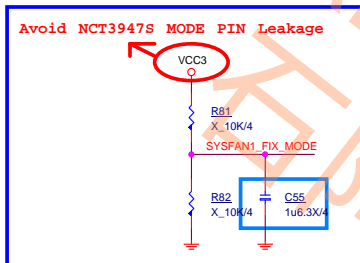
GPIO 自由 I/O 切換 PW M/DC MO DE



Internall pull up 1.65V



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



From SIO

[35] SIO_SYS1_FAN

[15] SYSFAN1_MODE

FIX MODE unstuff

R74 0R/4

SYSFAN1_FIX_MODE

C50 0.1U16X/4

R76 100K1%/4

SIO_SYS1_FAN_R

R62 0R/4

SIO_SYS1_FAN_C

C15 4.7u25X/8

C69 Close to U1 PINS

+12V

VCC3

R79 2K/4

U5

VIN

PWMOUT

2

SYS1_FAN_PWM

VOUT

4

SYSFAN1_PWR

PWMIN

1

DCIN

8

SYSFAN1_FAULT

Fault(OD)

3

Reserved-1

7

Reserved-2

PM (PP)

9

GND

6

MODE

NCT3947S

I22-3947S12-N62

GPIO Control

MODE(PIN6)

PWM MODE HIGH

DC MODE LOW

Default AUTO MODE GPI(Floating)

Internal pull up 1.65V

colay NCT3961

OCSET R1

1.2~1.8A 100K default

2.2~2.8A 49.9K OC SET By PM SPEC

3.2~3.8A 10K 20170428

VCC3

R35 100K/4

SYSFAN1_FAULT

C11 22u16X/8

C22 0.1U16X/4

Close to FAN Connector

N32-1040CF1-H06

BH1X4B

MEC1

SYS_FAN1

4

3

2

1

SYS1_FAN_PWM

R36 100R/4

SYS1_FAN_PWM

D1 1N4148W

C24 0.1U16X/4

R19 4.7K/4

R15 27K/4

SYS1_FANTAC

R

C8 0.1U16X/4

R14 10K/4

TO SIO

SYS1_FANTAC [35]

+12V

>40mil

CPUFAN_PWR>40mil

DC Mode : VOUT voltage is regulated to 3.8*DCIN voltage.

PWM Mode : VOUT voltage follows VIN voltage

R C 濾用 誤差 會 太大

0001-2018010201

(00068760)

RMA工程課

MSI

MS-7B28

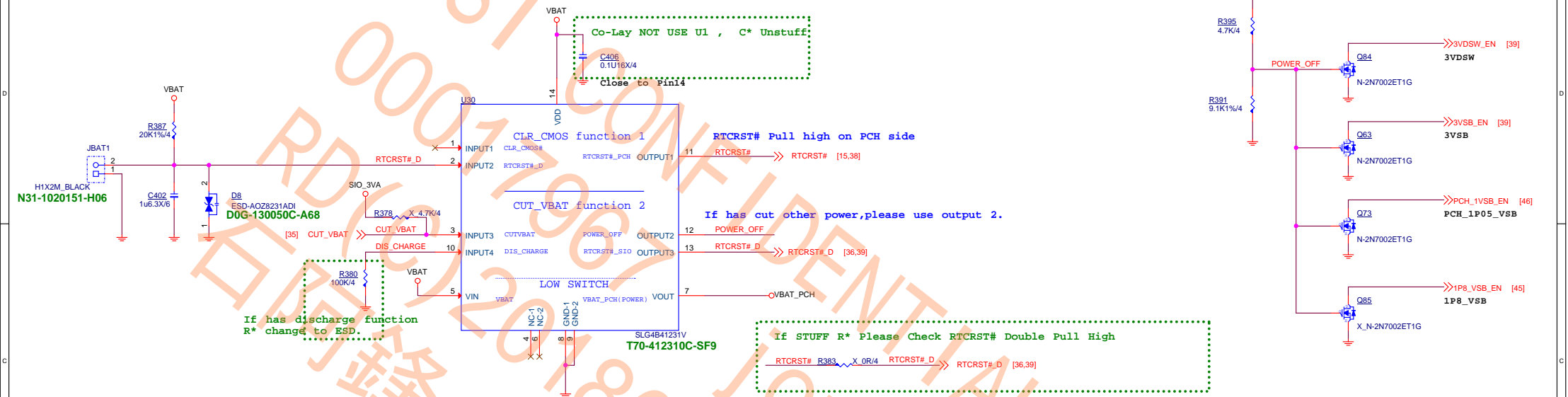
SYSTEM FAN

Rev 10/20/30

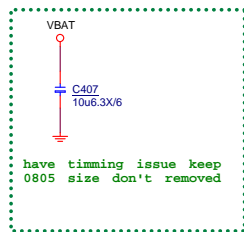
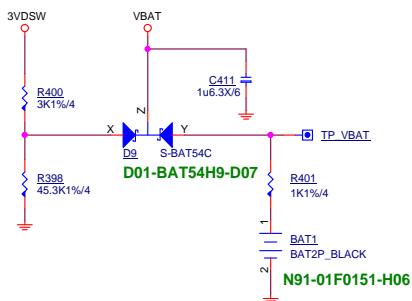
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Cut VBAT



VBAT



Function 1		
IN		OUT
INPUT1	INPUT2	OUTPUT1
0	1	1
1	0	0
1	1	0
0	0	0

Default

Function 2				
IN		OUT		
INPUT3 & lowswitch EN	INPUT4	OUTPUT2	OUTPUT3	VOUT
0	0	0	1	1
1	0	1	1	0 (discharge)
0	1	1	0	0 (discharge)
1	1	1	0	0 (discharge)

Default

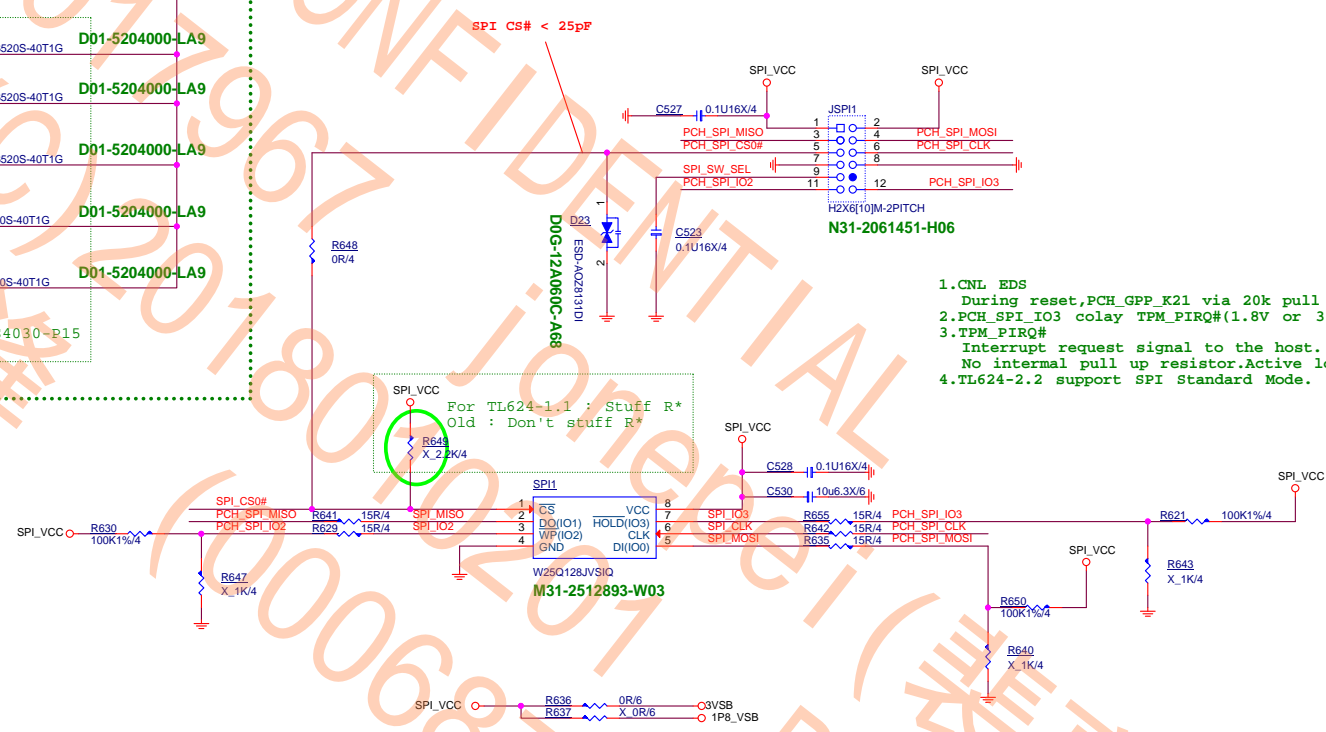
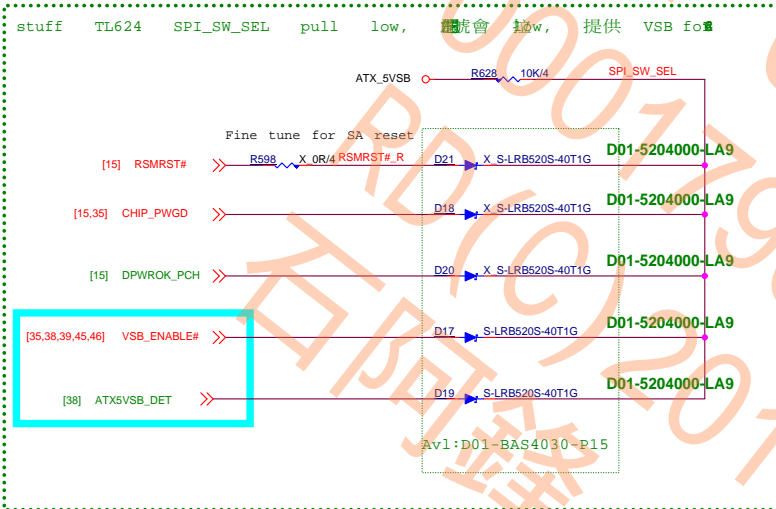


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Size	Document	Description	Rev
Custom	CUT VBAT circuit		10/2/30
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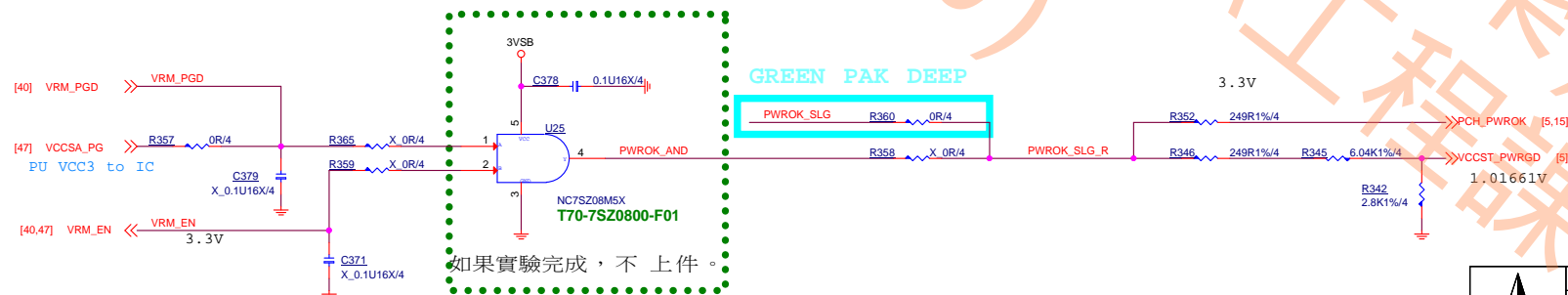
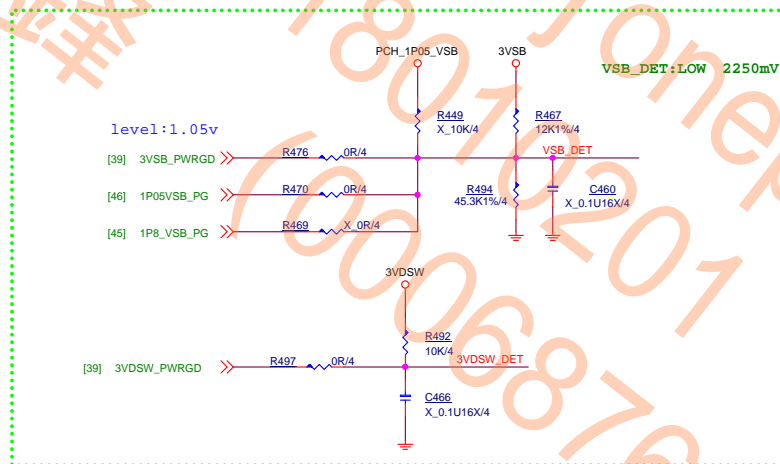
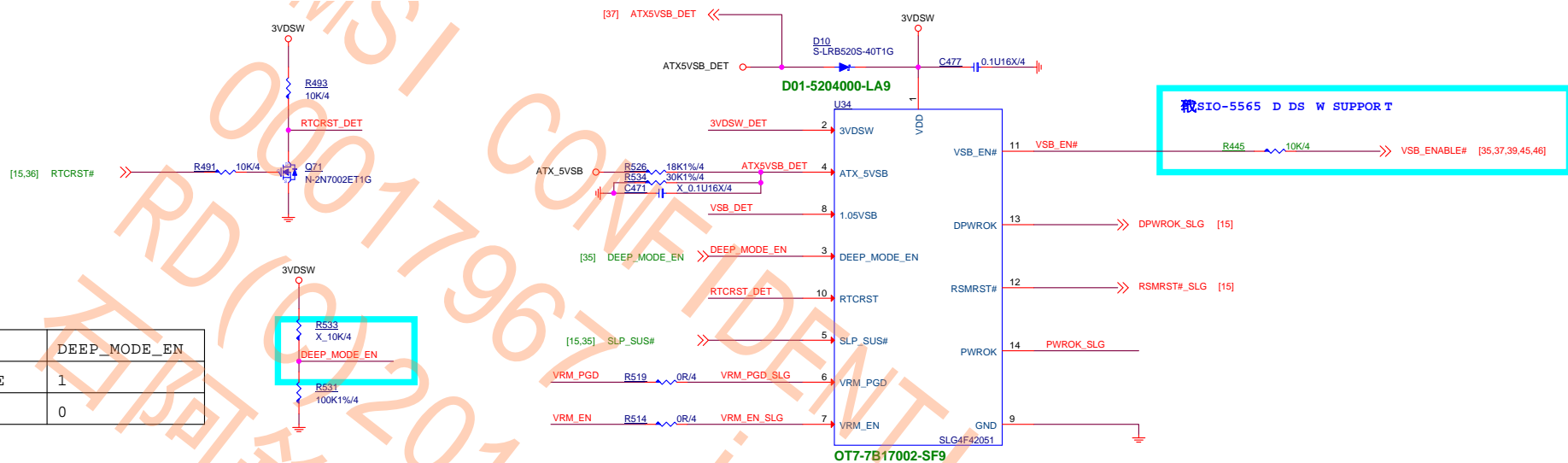
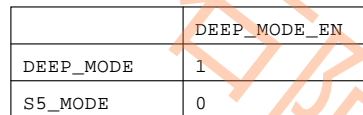
[15] PCH_SPI_MOSI << PCH_SPI_MOSI
[15] PCH_SPI_MISO << PCH_SPI_MISO
[15] PCH_SPI_CLK << PCH_SPI_CLK
[15] PCH_SPI_CS0# << PCH_SPI_CS0#
[15] PCH_SPI_IO2 << PCH_SPI_IO2
[15] PCH_SPI_IO3 << PCH_SPI_IO3



- 1.CNL EDS
During reset,PCH_GPP_K21 via 20k pull up to 3.3V.
- 2.PCH_SPI_IO3 colay TPM_PIRQ#(1.8V or 3.3V,OD)
- 3.TPM_PIRQ#
Interrupt request signal to the host.
No internal pull up resistor.Active low.
- 4.TL624-2.2 support SPI Standard Mode.



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[illegible]

AVL: I31-0866509-A36
I31-7116S09-N03

ATX_5VSB

C416 1u6.3X/4

U31 GS7116S5

VDD VOUT

EN GND ADU

1 2 3 4 5

SIO_3V_A

C421 X 0.1uF6X/4

3V_A_FB

VFB=0.8

R1 R403 10K1%/4

R2 R407 3.16K1%/4

C422 10u6.3X/6

[36] RTCRSts_D

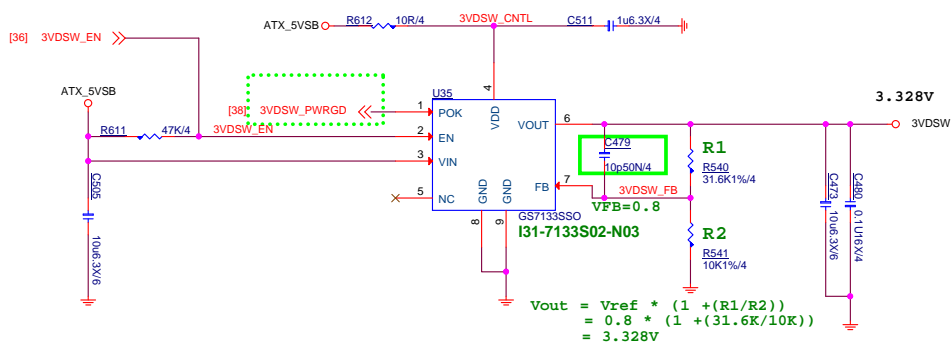
R393 OR/4

SIO_3V_A_EN

C413 X 1u6.3X/4

Vout = Vref * (1 + (R1/R2))
= 0.8 * (1 + (10K/3.16K))
= 3.33V

Intel Lan 不用小顆 C，因為瞬間電會很大。
113mA(PCH)+0.6mA(RTC)+200mA(LAN-I219)+SIO



V5DUAL is power source of IPOSB, 1.8PSB & 3VSB

I32-0750119-U33

D03-P500303-N03

NP-P50030VG

C392 0.018u16X/4

C399 X 0.1U16X/4

UP7501M8

N-2N7002ET1G

O62

R376 47K/4

S5_MODE

ATX_5VSB

[35,39,49] **ATX_PWR_OK**

[15,35,39,40,45] **SLP_S3#**

[15,35,39,43,44,45] **SLP_S4#**

MODE

GND

5VCC_DRV

5VSB_DRV

PCH_VCCDRV

PCH_SBDRV

+12V

R382 1K1%/6

C405 0.022u25X/4

7501 Mode
H:Support
L:Support

S0/S3/S5
S0/S3

ATX_5VSB

R328 47K/4

C352 1u6.3X/4

VCC3

R308 47K/4

C313 1u6.3X/4

Q49

D1

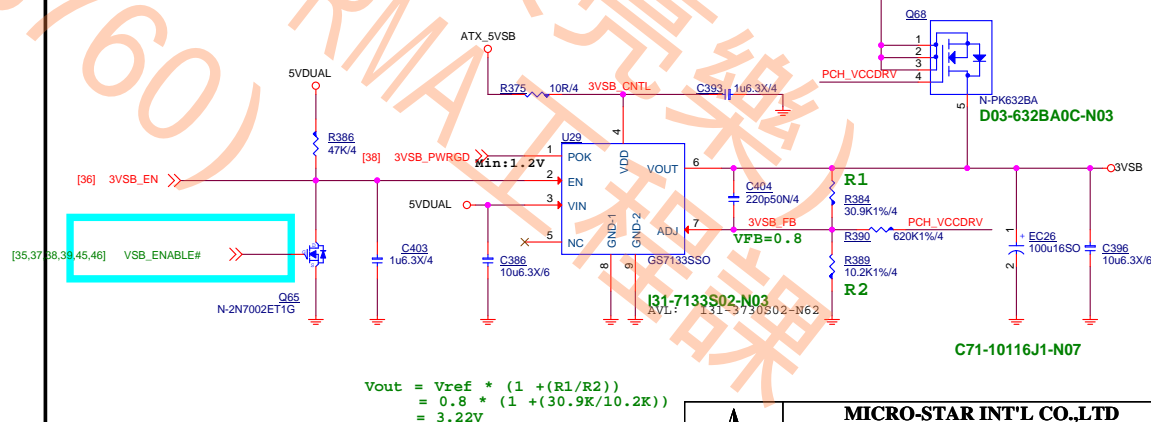
D2

S2

NN-2N7002DW

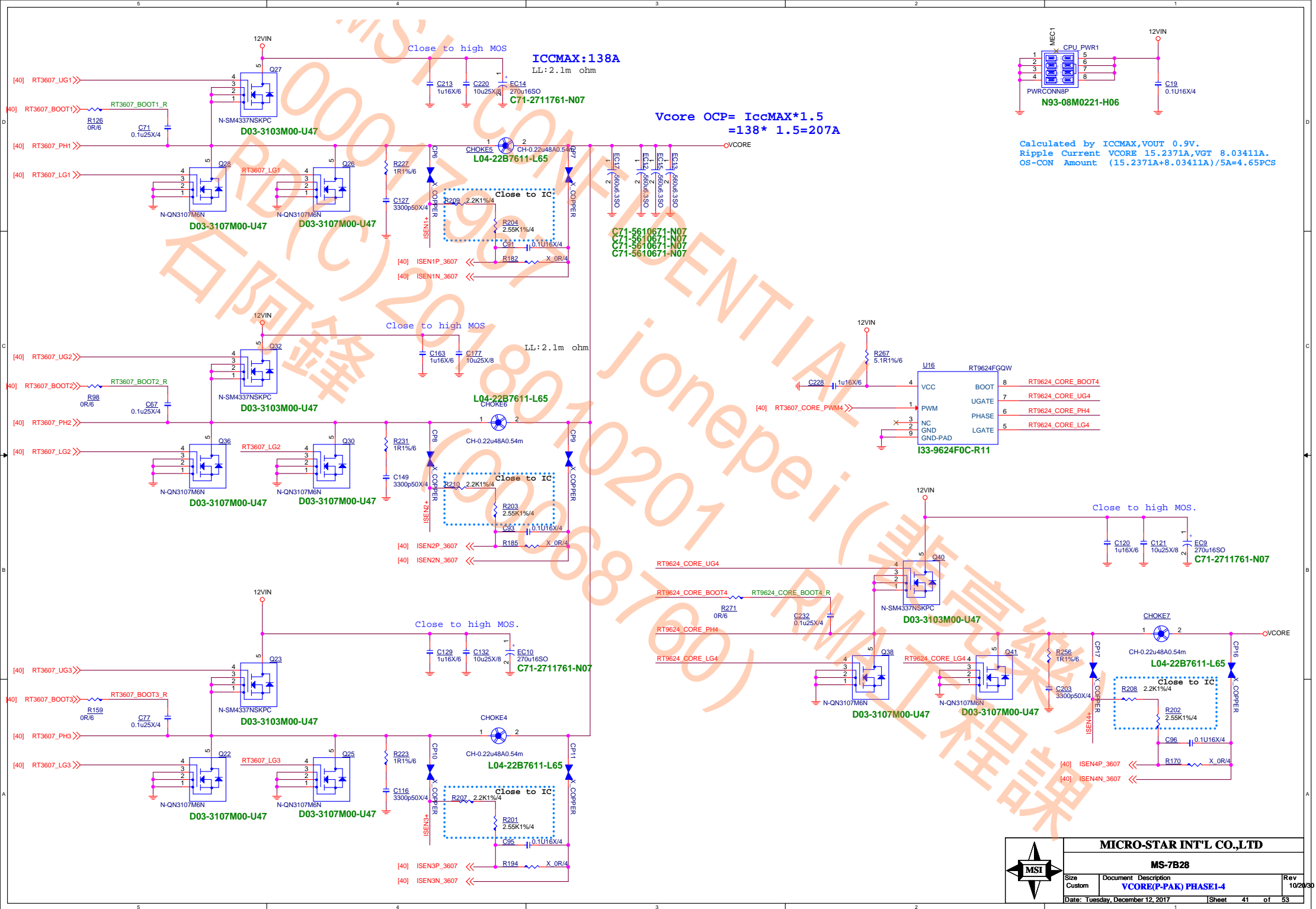
5VCC_5V

For power 700W solution (only for uP7501+uP7506 for 3VSB solution)
The power supply VCC3 delay 12ms after VCC5 assert.
The chip U7501 5VDRV1 work when the VCC5 ready
(When VCC5 up to 4.2V and the 5VDRV1 delay 6ms assert), but
VCC3 not ready and let the 3VSB sequence fail.

$$2.156A(PCH)+1.125A(PE \text{ SLOT} * 3)$$


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VCC_DDR@1.2V/11.525A

DDR4_1.2V 3.3A+ 7.85A+0.375A=11.525A

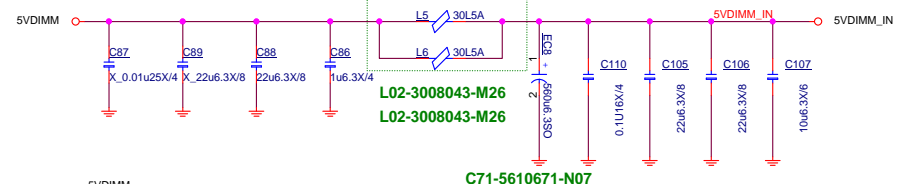
3.3A FOR CPU
10A FOR 2DIMM DDR4
0.375A FOR VTT_DDR

$R_{limit} = I_{limit} * R_{ds} * 10 / 5uA$
 $R_{limit} = 14.9825 * 4 * 10 / 5$

D03-632BA0C-N03
Current limit= $118K * 5uA / (10 / 4mohm) = 14.75A$
 $0.4V < R_{limit} * 5uA < 3V$

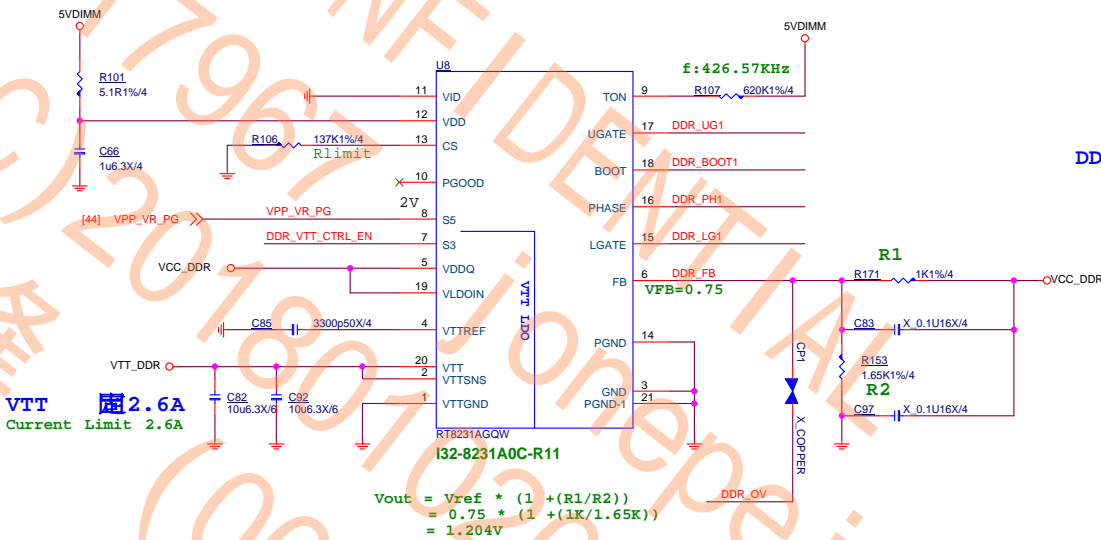
VID	Reference Voltage (V)
H	0.675
L	0.75

Input Current= $(11.525A * 1.2V) / 5V / 0.8 = 3.4575A$
L02-3008043-M26
Over 85°C Rated Current 1.5A.

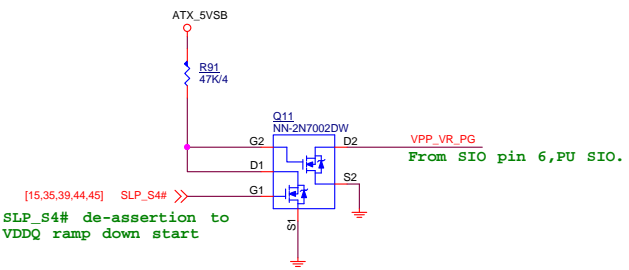


$I_{rms} = I_{out} * \sqrt{(V_{out}/V_{in}) * (1 - (V_{out}/V_{in}))}$
 $= 11.525 * 0.427$
 $= 4.921175A$

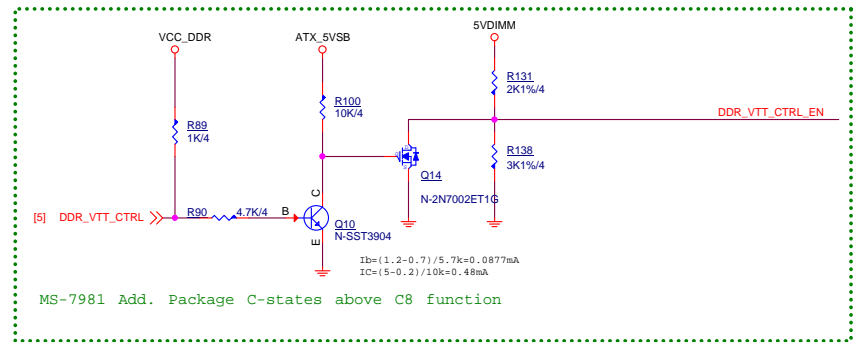
DDR OCP= $R44 * 5uA / 10 / D_{ds}(on)$
 $138k * 5uA / 10 / 3m = 23A$
 $138k * 5uA / 10 / 4.6m = 15A$
MOS $R_{ds}(on)$ 是 $m \sim 4.6m \text{ ohm}$



$V_{out} = V_{ref} * (1 + (R1/R2))$
 $= 0.75 * (1 + (1K / 1.65K))$
 $= 1.204V$

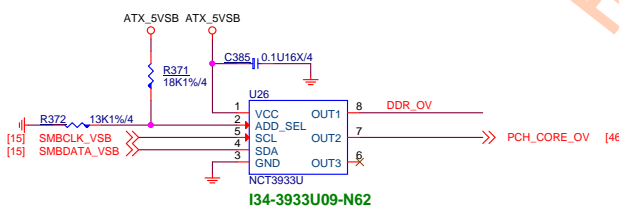


VPP ramp down after VDDQ ramp down



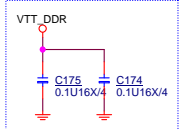
UPI VOLTAGE CONSOLE

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



MAX:11.525A
1.2V

0.1uFx1 per dimm



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VPP25 @2.5V/2A

2DIMM :1.12A FOR
DDR VPP2.5V

DDR VPP 4.8

Switch Frequency
Default 1.2MHz
Current Limit 4.8A.

Input Current= (2A*2.5V)/5V/0.8=1.25A

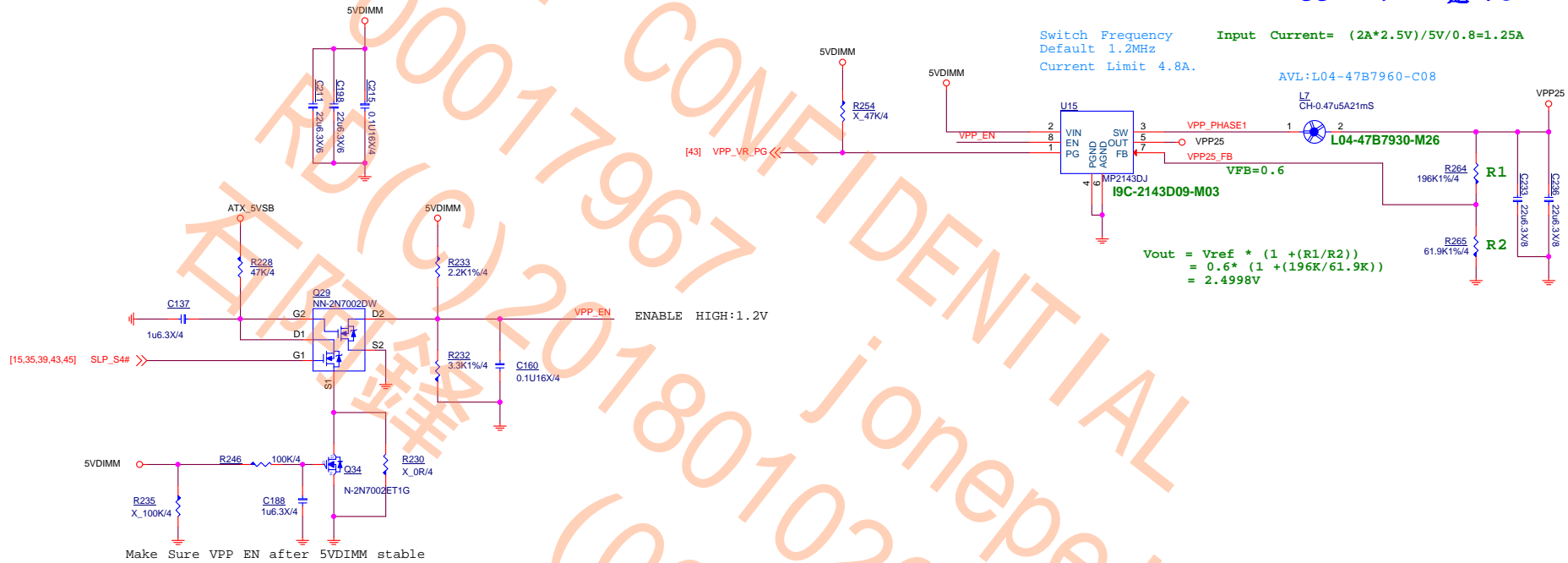
AVL:L04-47B7960-C08

LZ
CH-0.47uA21mS

L04-47B7930-M26

VFB=0.6

$$\begin{aligned} V_{out} &= V_{ref} * (1 + (R1/R2)) \\ &= 0.6 * (1 + (196K/61.9K)) \\ &= 2.4998V \end{aligned}$$

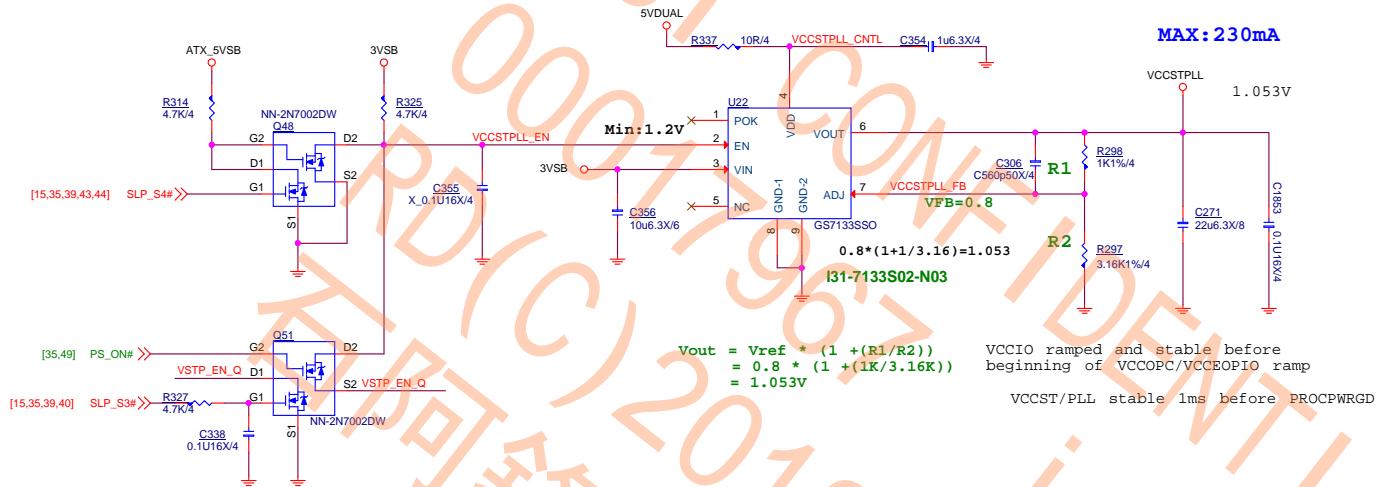


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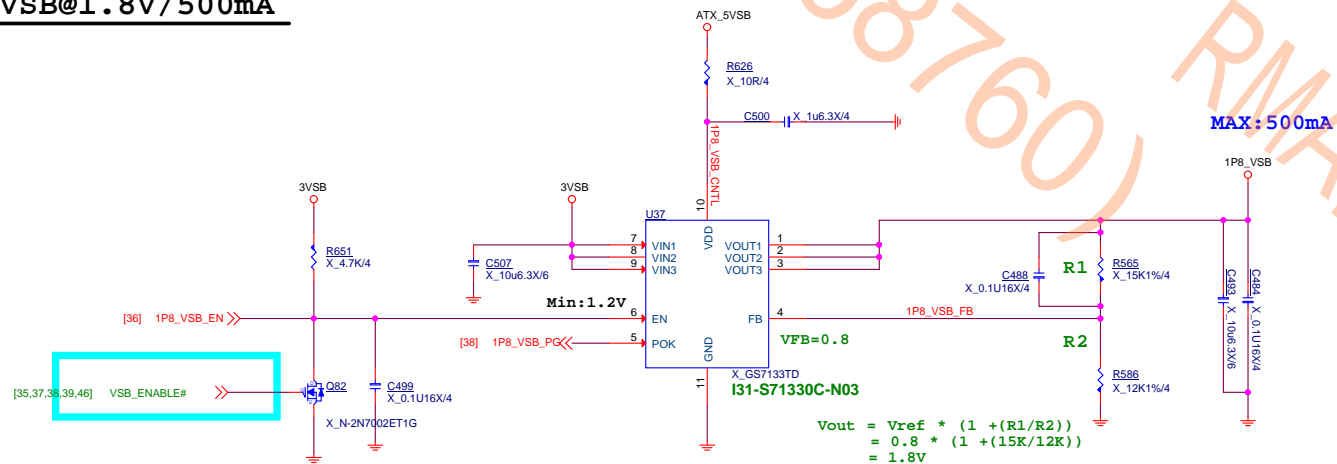
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VCCSTPLL@1.05V/230mA



1P8_VSB@1.8V/500mA



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PCH_1VSB@1.05V/11.981A

D03-632BA0C-N03

Current limit= $5.6k \times 10uA / 4mohm = 14.75A$

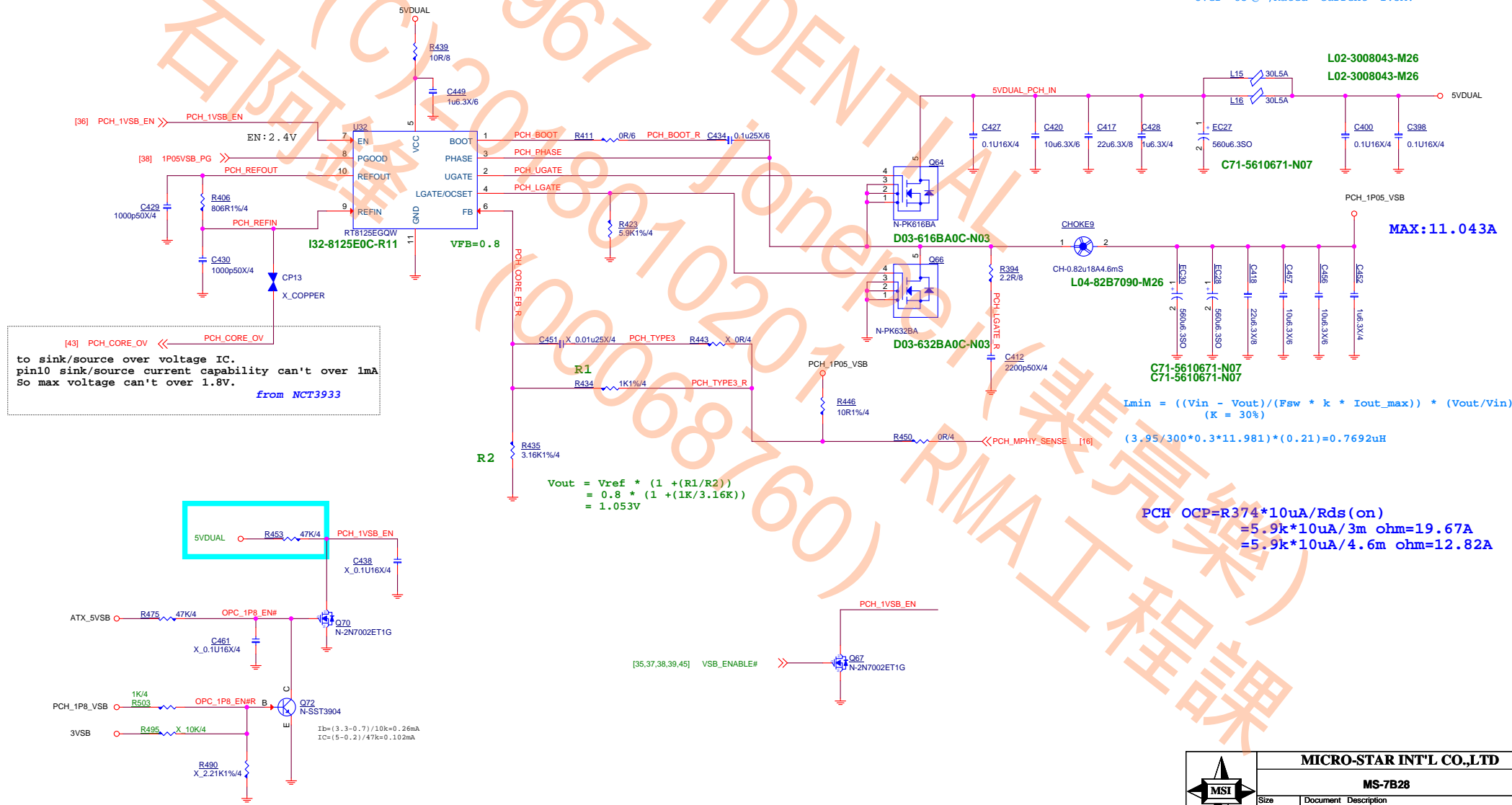
$$I_{rms} = I_{out} \times \sqrt{((V_{out}/V_{in}) \times (1 - (V_{out}/V_{in})))}$$

$$= 11.981 \times 0.407$$

$$= 4.876A$$

$$I_{in} = 11.043A \times 1.05V / 0.8 / 5V = 2.898A$$

Over 85°C ,Rated Current 1.5A.



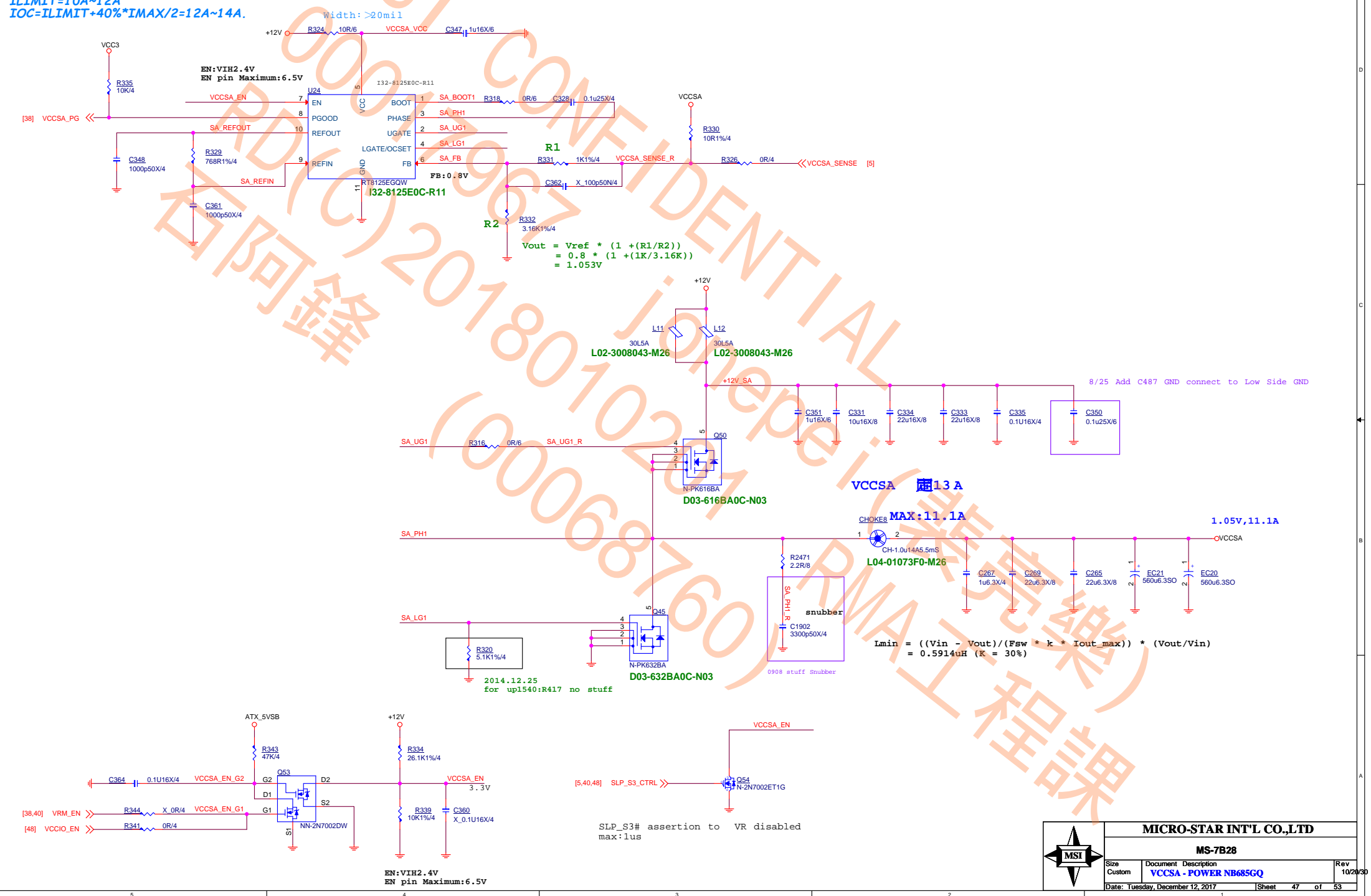
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Custom		PCH Core power	10/20/30
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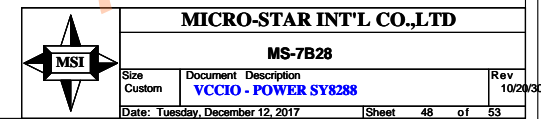
VCCSA@1.05V/11.1A

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

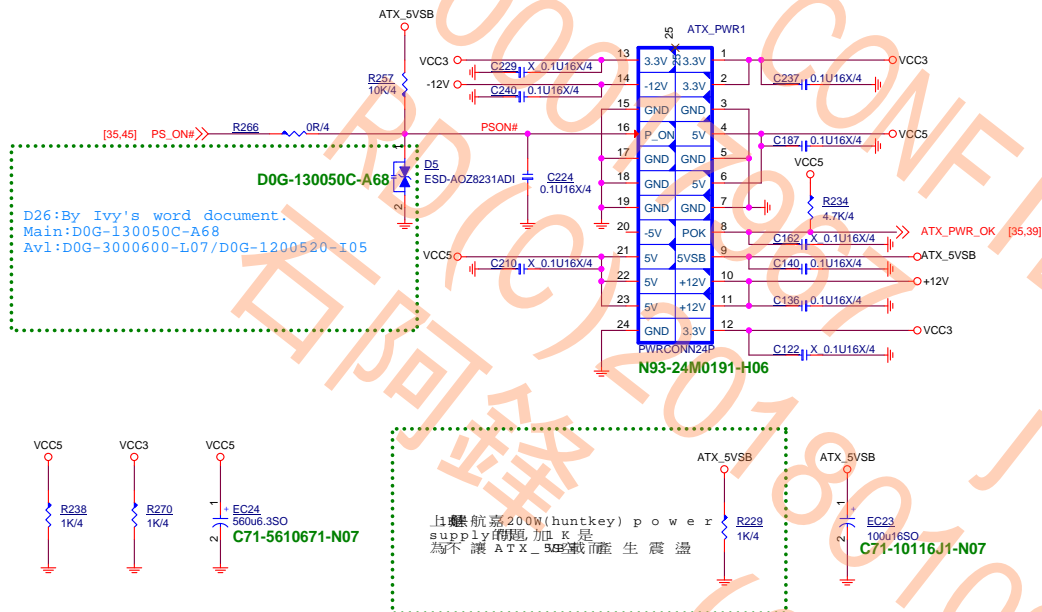


IMAX 10A
ILIMIT=10A~12A
IOC=ILIMIT+40%*IMAX/2=12A~14A.

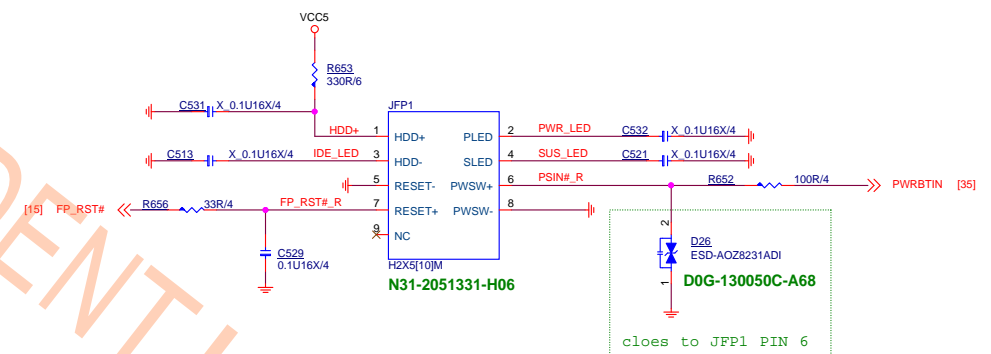
MAX:6.4A



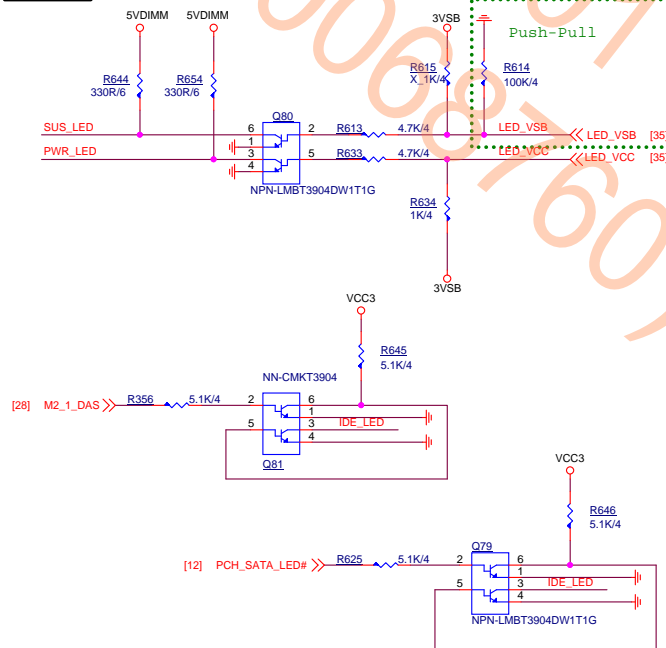
ATX POWER CONNECTOR



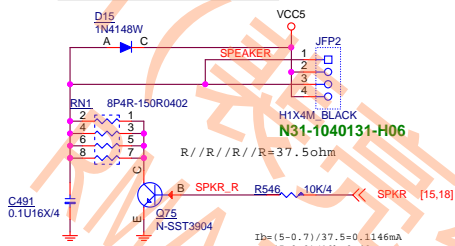
FRONT PANNEL



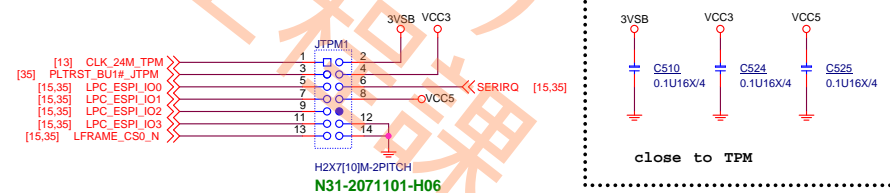
LED



Speaker Pin Header



TPM



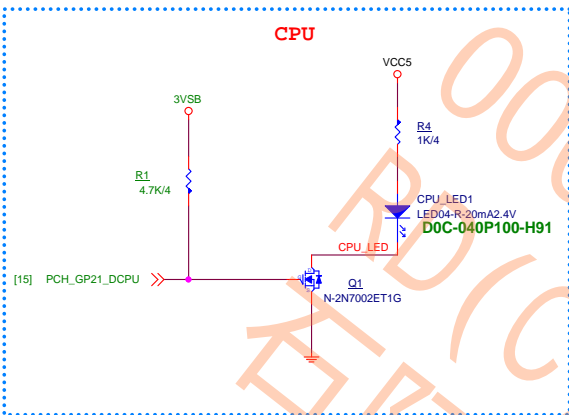
MICRO-STAR INT'L CO.,LTD

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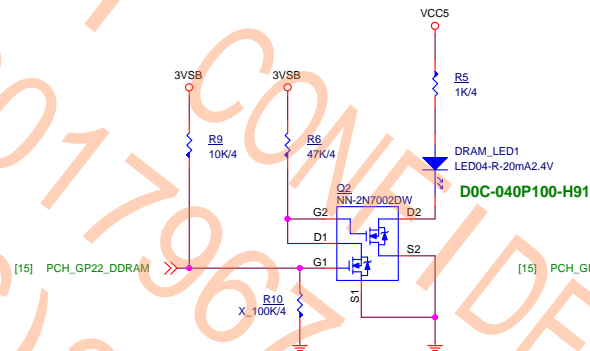
Size Custom	Document Description ATX F_Panel/TPM/MSI_LED	Rev 10/20/30
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EZ DEBUG LED

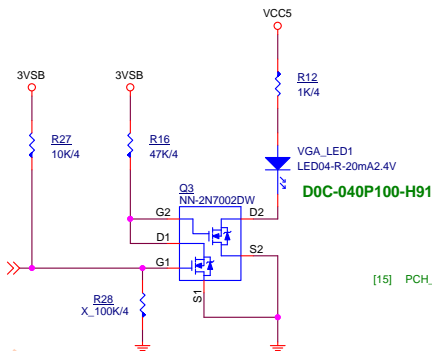
CPU



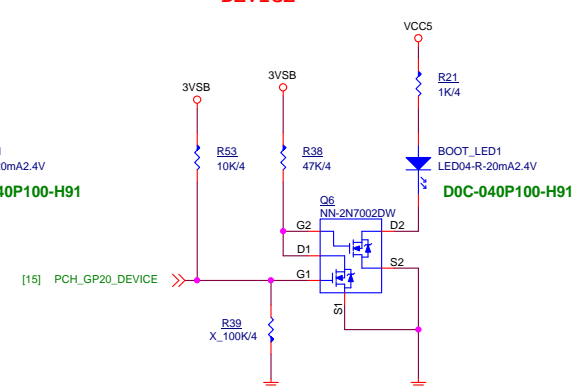
DRAM



VGA



DEVICE



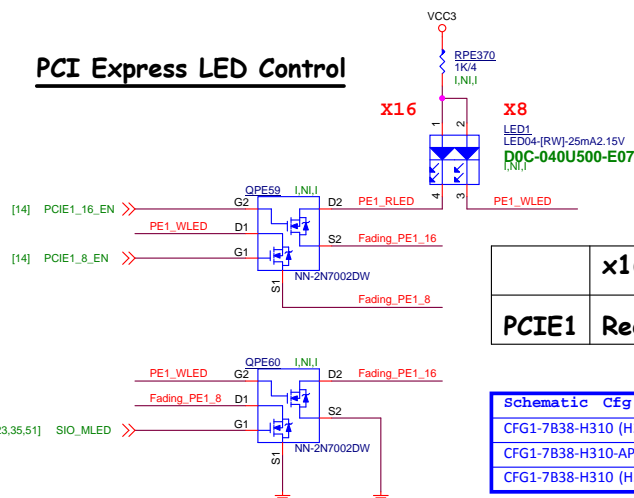
LED	PCH_GP20	PCH_GP21	PCH_GP22	PCH_GP23
亮	NATIVE PULL HIGH	GPO PULL HIGH	GPO PULL HIGH	NATIVE PULL HIGH
滅	NATIVE LOW	GPO LOW (default LOW)	GPO LOW (default LOW)	GPO LOW (default LOW)

LED

RED:D0C-040P100-H91
AVL:D0C-040S500-E07

WHI:D0C-040T200-H91
AVL:D0C-040S200-E07

PCI Express LED Control



	x16	x8
PCIE1	Red	White

Schematic Cfg	Project
CFG1-7B38-H310 (H310M GAMING PLUS) ver.1.0	V A
CFG1-7B38-H310-APRO (H310-A Pro) ver.2.0	X B
CFG1-7B38-H310 (H310-A GAMING ARCTIC) ver.3.0	V C

- 開機斷電狀態下，3個LED先維持 default 暗開機電後
1. 首先進行 CPU check CPU 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. 因此最後正常順利開機後，三個 LED 都滅掉的。
- (系統重啟或其他原因造成系統重開機則重複上述流程)

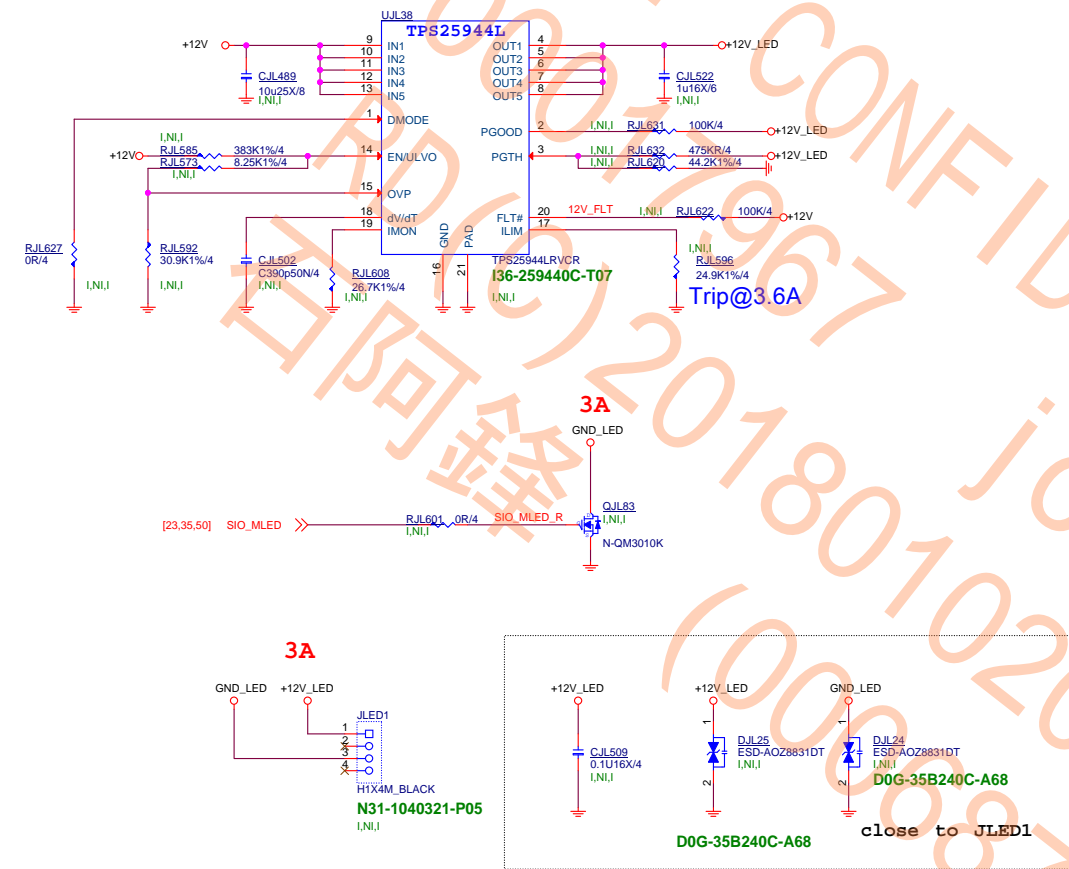


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LED Control by SIO(JLED1)



Schematic Cfg	Project
CFG1-7B38-H310 (H310M GAMING PLUS) ver.1.0	V A
CFG1-7B38-H310-APRO (H310-A Pro) ver.2.0	X B
CFG1-7B38-H310 (H310-A GAMING ARCTIC) ver.3.0	V C

OPTION BOM PARTS

Schematic Cfg	Project
CFG1-7B38-H310 (H310M GAMING PLUS) ver.1.0	A
CFG1-7B38-H310-APRO (H310-A Pro) ver.2.0	B
CFG1-7B38-H310 (H310-A GAMING ARCTIC) ver.3.0	C

5010 Level

A
EZ Debug LED
OPT EZ GPLUS
LED04-R-20mA2-4V_1608-HF
D0C-040P100-H91
Red
PD0-07B2810-E48
PD0-07B2810-G37
OPT PCB GPLUS
7B28_10

B
EZ Debug LED
OPT EZ PRO
LED04-R-20mA2-4V_1608-HF
D0C-040T200-H91
White
PD0-07B2820-E48
PK0-07B2820-G37
OPT PCB PRO
7B28_20

C
EZ Debug LED
OPT EZ GARCTIC
LED04-R-20mA2-4V_1608-HF
D0C-040T200-H91
White
PD0-07B2830-E48
PS0-07B2830-G37
OPT PCB GARCTIC
7B28_30

PCB

5020 Level

A
AUDIO LED
OPT AUDLED GPLUS
LED04-W-20mA3.25V
USB_C1_24_2
D0C-040S600-E07
Red

B
X

C
AUDIO LED
OPT AUDLED GARCTIC
LED04-W-20mA3.9V_1608-RH
USB_C1_24_2
D0C-040T300-H91
White

60 Level

A
REAR U3
OPT REARU3 GPLUS
LANE U3
USBAX2M RED-RH-2
USB_C1_24_2
N53-18M0201-L06

B
REAR U3
OPT REARU3 PRO
LANE U3
USBAX2M BLUE-RH-6
USB_C1_24_2
N53-18M0091-F02

C
REAR U3
OPT REARU3 GARCTIC
LANE U3
USBAX2M RED-RH-2
USB_C1_24_2
N53-18M0201-L06

DDR Slot
OPT DDRLSLOT GPLUS
DDRIV_288P RED-RH-1
DDRIV_D288
N13-2880681-L06

DDR Slot
OPT DDRLSLOT PRO
DDRIV_288P BLACK-RH-21
DDRIV_D288
N13-2880561-L06

DDR Slot
OPT DDRLSLOT GARCTIC
DDRIV_288P BLACK-RH-21
DDRIV_D288
N13-2880521-L06

PCIEx16 Slot
OPT PCIE16 GPLUS
PCIEX_16
SLOT-PCI164P_RED-2PITCH-RH-1
N11-1641671-L06

PCIEx16 Slot
OPT PCIE16 PRO
PCIEX_16
SLOT-PCI164P_BLACK-2PITCH-RH-38
N11-1641221-L06

PCIEx16 Slot
OPT PCIE16 GARCTIC
PCIEX_16
SLOT-PCI164P_WHITE-2PITCH-RH-4
N11-1641601-L06

DVI
OPT VGA GPLUS
VGA
DVI24P_BLACK-RH-17
N5B-24F0771-EB6

DVI
OPT VGA GARCTIC
VGA
DVI24P_BLACK-RH-17
N5B-24F0771-EB6

VGA+DVI
OPT VGADVI PRO
VGA+DVI
VGA_DVI-RH-31
N58-39F0371-EB6

PACK LABEL
OPT LA GPLUS
B310
Label
MKT
G51-M1SPM62-Q13

PACK LABEL
OPT LA PRO
B310
Label
MKT
G51-M1SPM61-Q13

PACK LABEL
OPT LA GARCTIC
B310
Label
MKT
G51-M1SPM60-Q13



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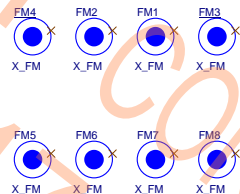
HS_PCH1

PCH
heatsink

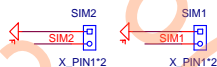
E31-0408580-K08
HS-0408580

申請 中

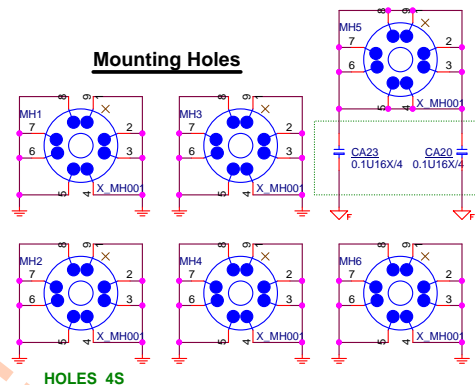
Optical Fiducial Marks-120



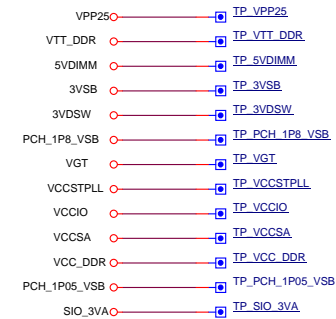
Simulation



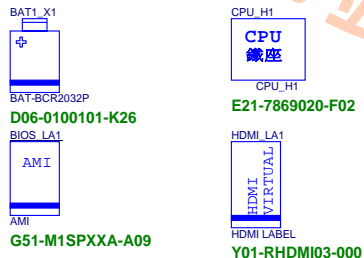
Mounting Holes



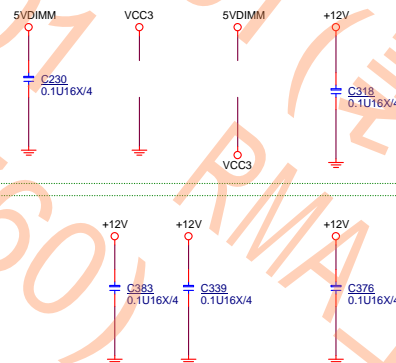
HOLES_4S



Near SIO CHIP



return path



For M2 reference +12V USE
please close to under M2