MS-7C89

ATX
Ver: 1.1

CML Platform

CPU:

Comet lake S 65W

System Chipset:

H410 PCH_V

Onboard Chip:

HD Audio Codec : ALC892
LAN : INTEL I219
SIO : NTC5887
Flash ROM: SPI 128 MB X1

VGA Output:

HDMI Port
DVI Port
VGA Port

Main Memory:

*DDRIV (2666MHz) * 2*

PWM:

IMVP8 -RT3607BC

ACPI:

LDO

Expansion Slots:

*PCI Express (X16) Slot * 1*
*PCI Express (X1) Slot * 1*
*M.2 Slot * 1*
*Intel WIFI * 1*

Other:

*SATA3.0 *4*
*PS2 * 1*
*REAL USB3.1 *2*
REAL USB2.0 LAN_USB
*FRONT USB3.1 *2*
*FRONT USB2.0 *4*

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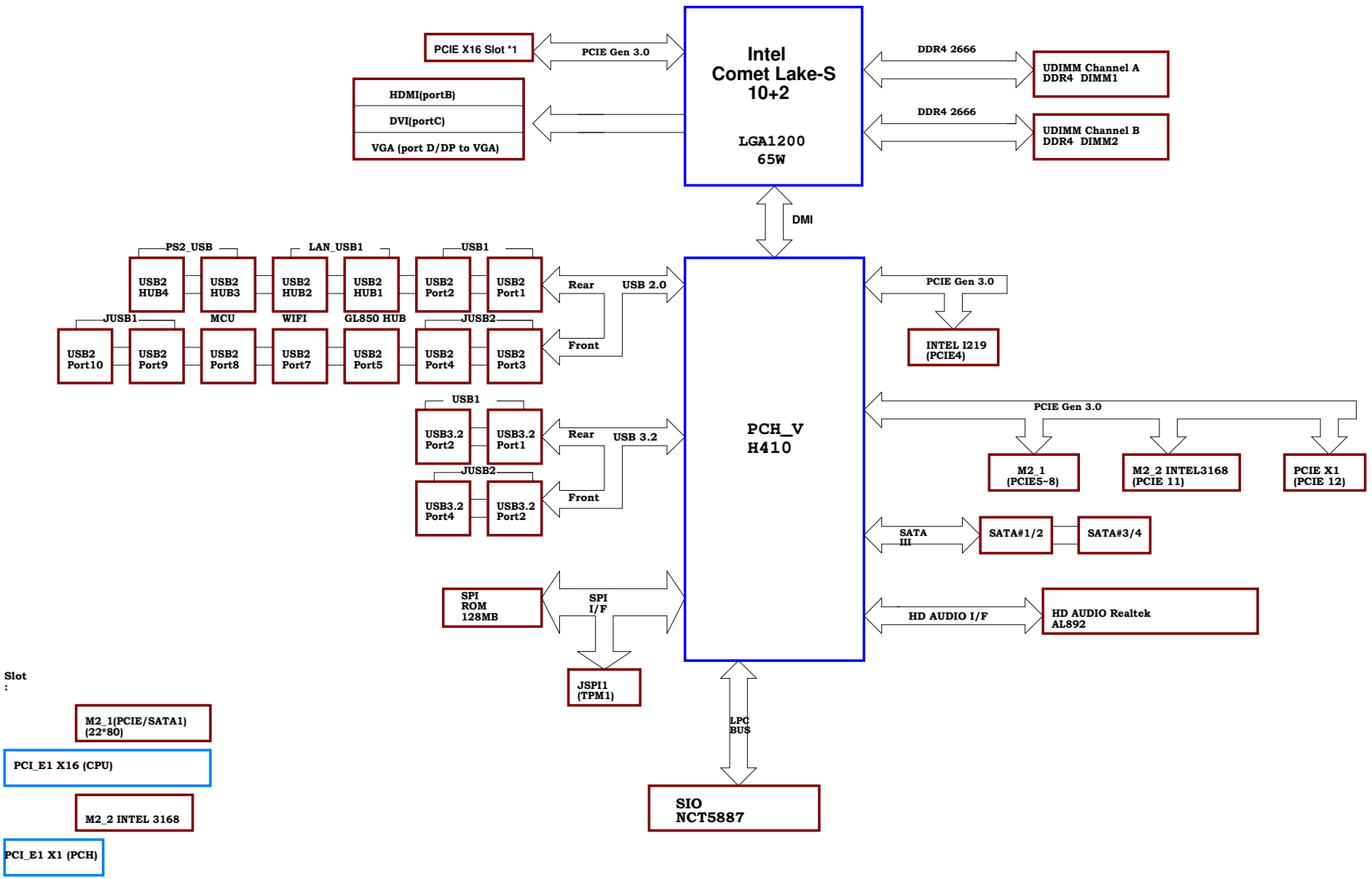
MS-7C86 Block Diagram



Slot
:

- M2_1(PCIE/SATA1) (22*80)
- PCI_E1 X16 (CPU)
- M2_2 INTEL 3168
- PCI_E1 X1 (PCH)

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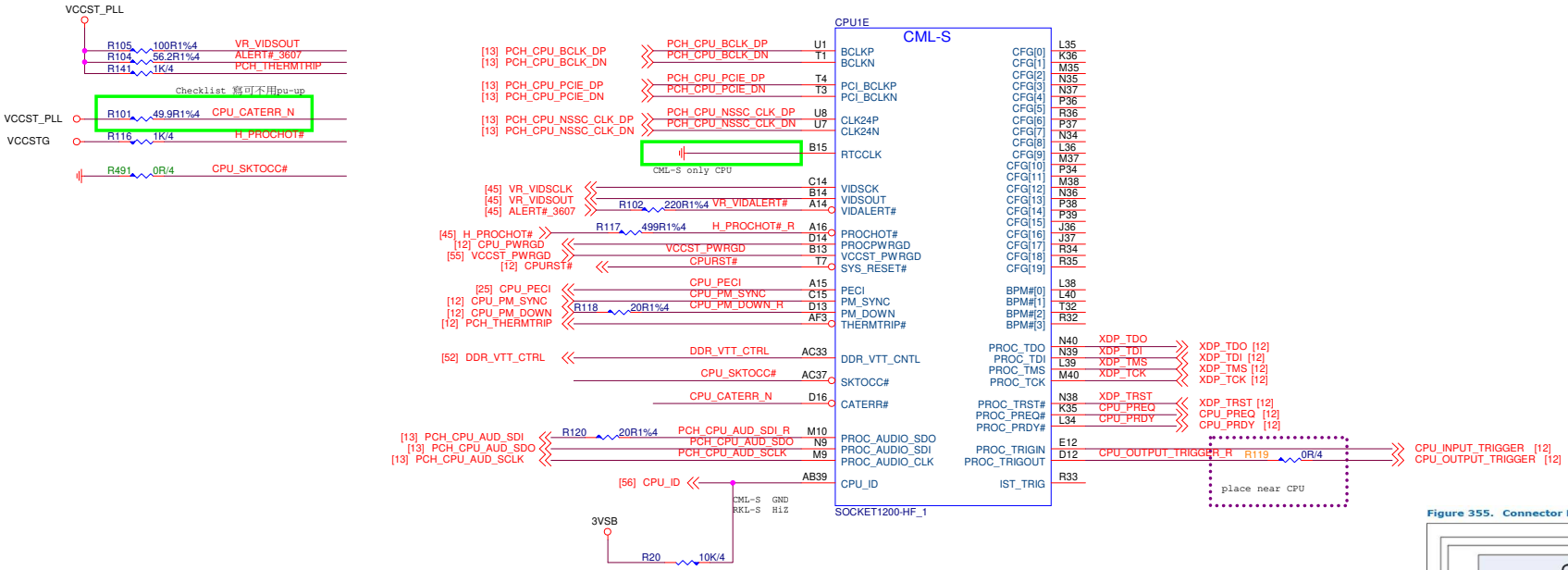
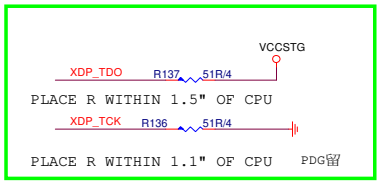




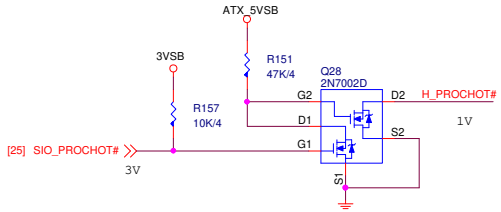
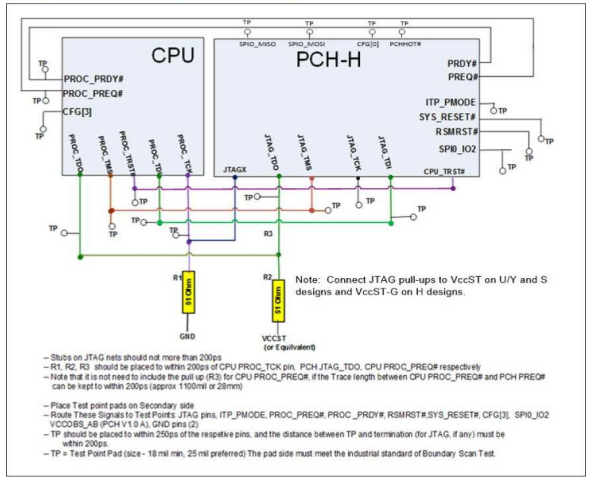


Figure 355. Connector Less Routing Topology



CFG Strap

CFG Table

	HIGH	LOW	DESCRIPTION
0	No stall	Stall	PCU PLL lock
1			RSVD
2	NORM	REVERSE	PEG_LANE_REVERSAL
3			RSVD
4	DISABLE	ENABLE	eDP
5			PCIE Bifurcation
6			PCIE Bifurcation
7	Follow RESET#	Wait for BIOS	PEG_TRAINING
8			RSVD
9			RSVD
10			RSVD
11			RSVD
12			RSVD
13			RSVD
14			RSVD
15			RSVD
16			RSVD
17			RSVD
18			RSVD
19			RSVD

CFG5 CFG6 ENABLE#		SLOT	SLOT	SLOT
X8	X4			
0	0	X8	X4	X4
0	1	X8	X8	X0
1	0	RSVD	RSVD	RSVD
1	1	X16	X0	X0

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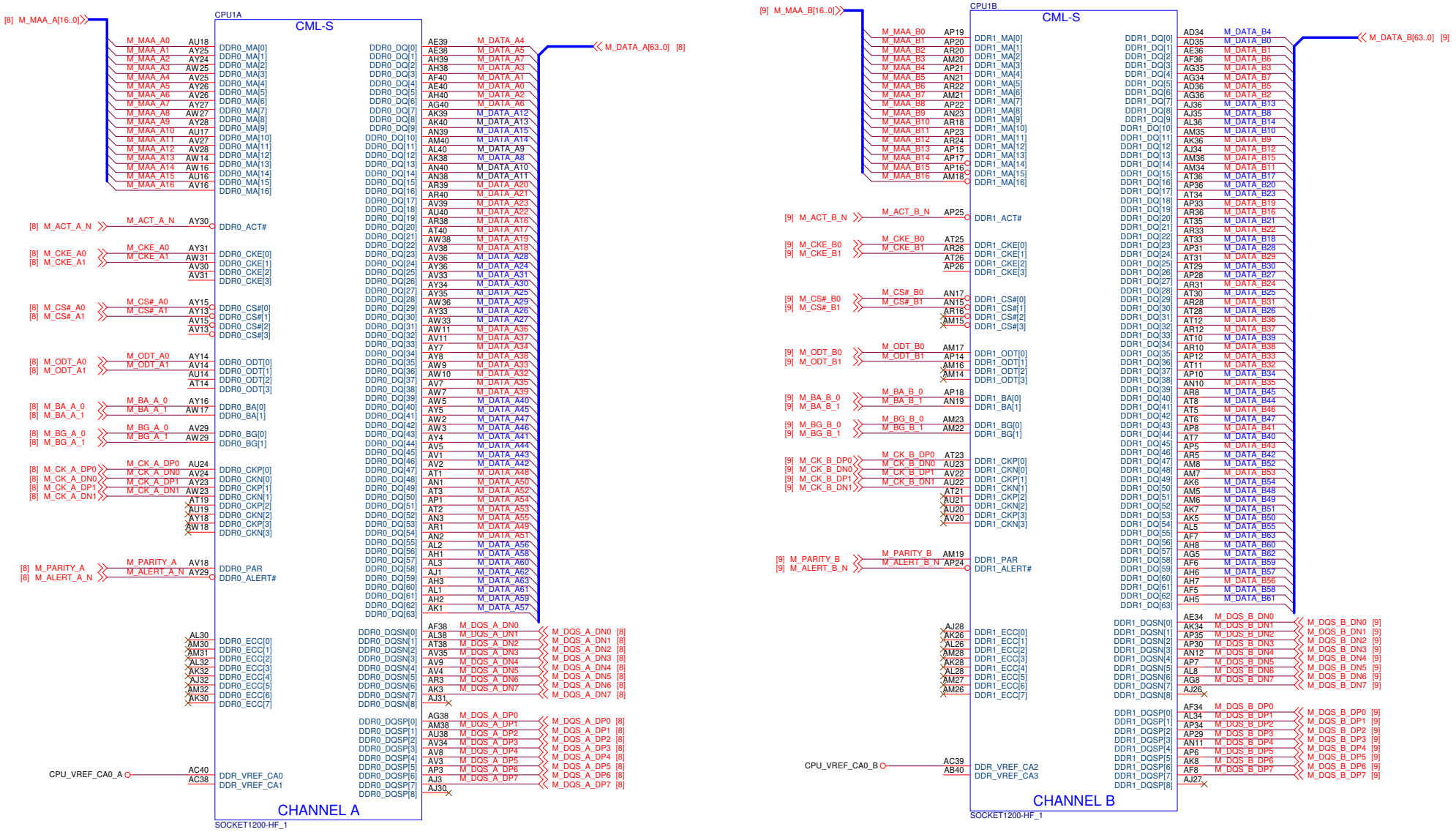

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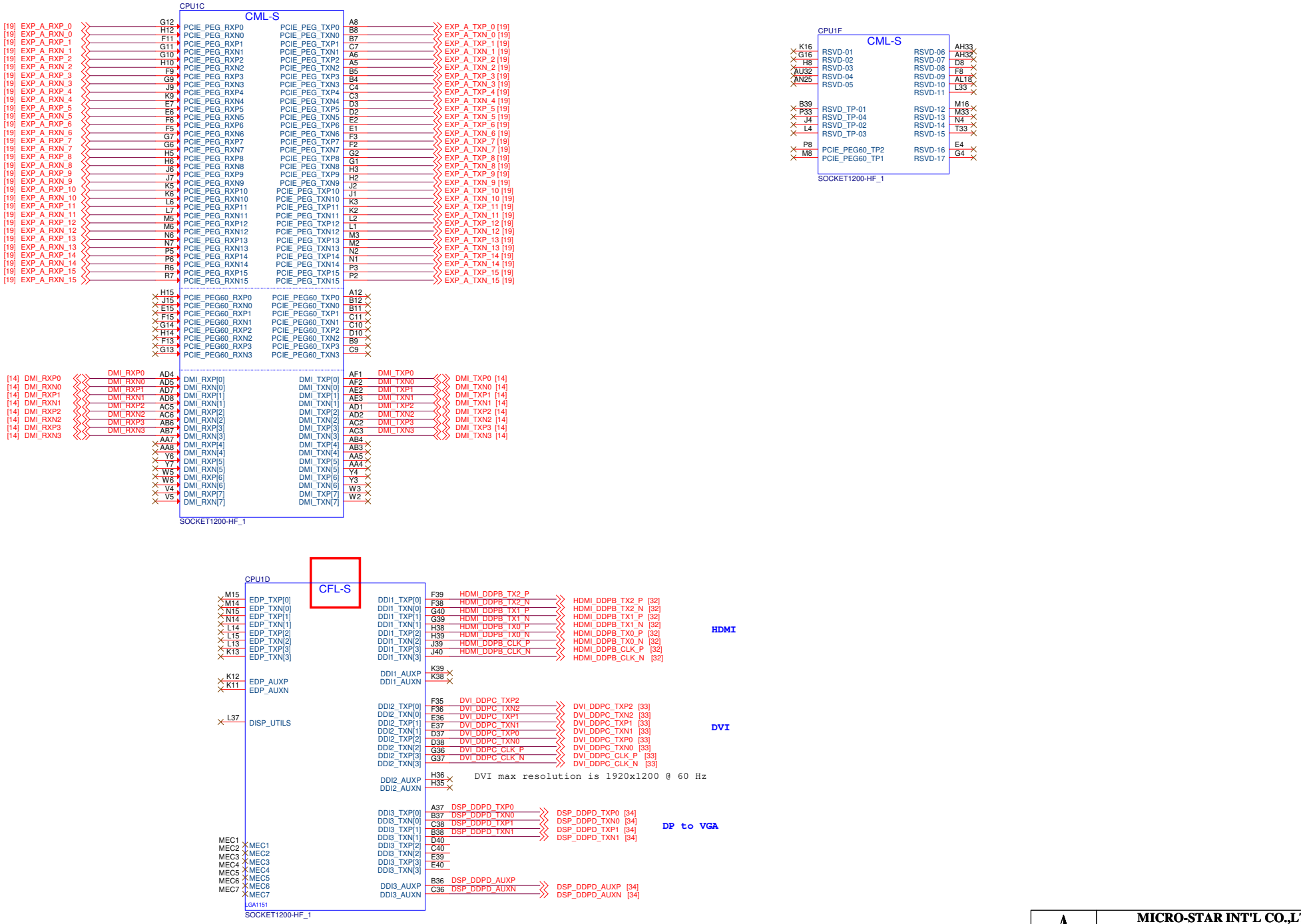
CPU1C
CML-S
PCIE_PEG_RXP0
PCIE_PEG_RXN0
PCIE_PEG_RXP1
PCIE_PEG_RXN1
PCIE_PEG_RXP2
PCIE_PEG_RXN2
PCIE_PEG_RXP3
PCIE_PEG_RXN3
PCIE_PEG_RXP4
PCIE_PEG_RXN4
PCIE_PEG_RXP5
PCIE_PEG_RXN5
PCIE_PEG_RXP6
PCIE_PEG_RXN6
PCIE_PEG_RXP7
PCIE_PEG_RXN7
PCIE_PEG_RXP8
PCIE_PEG_RXN8
PCIE_PEG_RXP9
PCIE_PEG_RXN9
PCIE_PEG_RXP10
PCIE_PEG_RXN10
PCIE_PEG_RXP11
PCIE_PEG_RXN11
PCIE_PEG_RXP12
PCIE_PEG_RXN12
PCIE_PEG_RXP13
PCIE_PEG_RXN13
PCIE_PEG_RXP14
PCIE_PEG_RXN14
PCIE_PEG_RXP15
PCIE_PEG_RXN15
PCIE_PEG_TXP0
PCIE_PEG_TXN0
PCIE_PEG_TXP1
PCIE_PEG_TXN1
PCIE_PEG_TXP2
PCIE_PEG_TXN2
PCIE_PEG_TXP3
PCIE_PEG_TXN3
PCIE_PEG_TXP4
PCIE_PEG_TXN4
PCIE_PEG_TXP5
PCIE_PEG_TXN5
PCIE_PEG_TXP6
PCIE_PEG_TXN6
PCIE_PEG_TXP7
PCIE_PEG_TXN7
PCIE_PEG_TXP8
PCIE_PEG_TXN8
PCIE_PEG_TXP9
PCIE_PEG_TXN9
PCIE_PEG_TXP10
PCIE_PEG_TXN10
PCIE_PEG_TXP11
PCIE_PEG_TXN11
PCIE_PEG_TXP12
PCIE_PEG_TXN12
PCIE_PEG_TXP13
PCIE_PEG_TXN13
PCIE_PEG_TXP14
PCIE_PEG_TXN14
PCIE_PEG_TXP15
PCIE_PEG_TXN15
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PCIE_PEG60_RXN0
PCIE_PEG60_RXP1
PCIE_PEG60_RXN1
PCIE_PEG60_RXP2
PCIE_PEG60_RXN2
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PCIE_PEG60_RXN3
PCIE_PEG60_TXP0
PCIE_PEG60_TXN0
PCIE_PEG60_TXP1
PCIE_PEG60_TXN1
PCIE_PEG60_TXP2
PCIE_PEG60_TXN2
PCIE_PEG60_TXP3
PCIE_PEG60_TXN3
DMI_RXP0
DMI_RXN0
DMI_RXP1
DMI_RXN1
DMI_RXP2
DMI_RXN2
DMI_RXP3
DMI_RXN3
DMI_TXP0
DMI_TXN0
DMI_TXP1
DMI_TXN1
DMI_TXP2
DMI_TXN2
DMI_TXP3
DMI_TXN3
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SOCKET1200-HF_1
CPU1F
CML-S
RSVD-01
RSVD-02
RSVD-03
RSVD-04
RSVD-05
RSVD_TP-01
RSVD_TP-04
RSVD_TP-02
RSVD_TP-03
PCIE_PEG60_TP2
PCIE_PEG60_TP1
RSVD-06
RSVD-07
RSVD-08
RSVD-09
RSVD-10
RSVD-11
RSVD-12
RSVD-13
RSVD-14
RSVD-15
RSVD-16
RSVD-17
SOCKET1200-HF_1
CPU1D
CFL-S
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EDP_TXN[0]
EDP_TXP[1]
EDP_TXN[1]
EDP_TXP[2]
EDP_TXN[2]
EDP_TXP[3]
EDP_TXN[3]
EDP_AUXP
EDP_AUXN
DISP_UTILS
DDI1_TXP[0]
DDI1_TXN[0]
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DDI1_TXN[1]
DDI1_TXP[2]
DDI1_TXN[2]
DDI1_TXP[3]
DDI1_TXN[3]
DDI1_AUXP
DDI1_AUXN
DDI2_TXP[0]
DDI2_TXN[0]
DDI2_TXP[1]
DDI2_TXN[1]
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DDI2_TXN[3]
DDI2_AUXP
DDI2_AUXN
DDI3_TXP[0]
DDI3_TXN[0]
DDI3_TXP[1]
DDI3_TXN[1]
DDI3_TXP[2]
DDI3_TXN[2]
DDI3_TXP[3]
DDI3_TXN[3]
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DDI3_AUXN
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HDMI_DDPB_TX2_N
HDMI_DDPB_TX1_P
HDMI_DDPB_TX1_N
HDMI_DDPB_TX0_P
HDMI_DDPB_TX0_N
HDMI_DDPB_CLK_P
HDMI_DDPB_CLK_N
DVI_DDPC_TXP2
DVI_DDPC_TXN2
DVI_DDPC_TXP1
DVI_DDPC_TXN1
DVI_DDPC_TXP0
DVI_DDPC_TXN0
DVI_DDPC_CLK_P
DVI_DDPC_CLK_N
DSP_DDPD_TXP0
DSP_DDPD_TXN0
DSP_DDPD_TXP1
DSP_DDPD_TXN1
DSP_DDPD_AUXP
DSP_DDPD_AUXN
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HDMI_DDPB_CLK_N [32]
HDMI
DVI_DDPC_TXP2 [33]
DVI_DDPC_TXN2 [33]
DVI_DDPC_TXP1 [33]
DVI_DDPC_TXN1 [33]
DVI_DDPC_TXP0 [33]
DVI_DDPC_TXN0 [33]
DVI_DDPC_CLK_P [33]
DVI_DDPC_CLK_N [33]
DVI
DVI max resolution is 1920x1200 @ 60 Hz
DSP_DDPD_TXP0 [34]
DSP_DDPD_TXN0 [34]
DSP_DDPD_TXP1 [34]
DSP_DDPD_TXN1 [34]
DP to VGA
DSP_DDPD_AUXP [34]
DSP_DDPD_AUXN [34]
MEC1
MEC2
MEC3
MEC4
MEC5
MEC6
MEC7
LGA1151
SOCKET1200-HF_1
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MS-7C89
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CPU-PEG/Display/RSD
Rev
1.1
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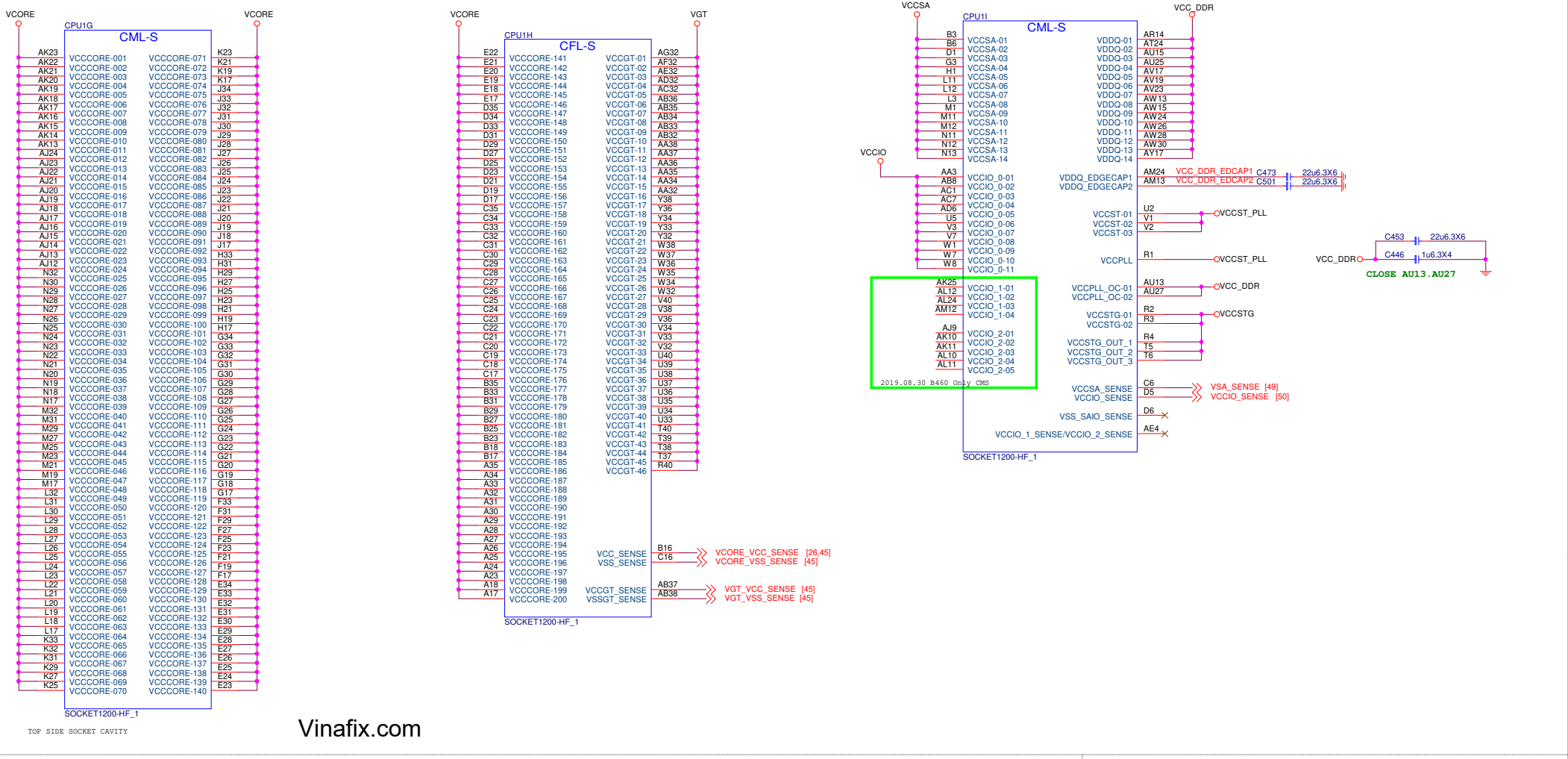

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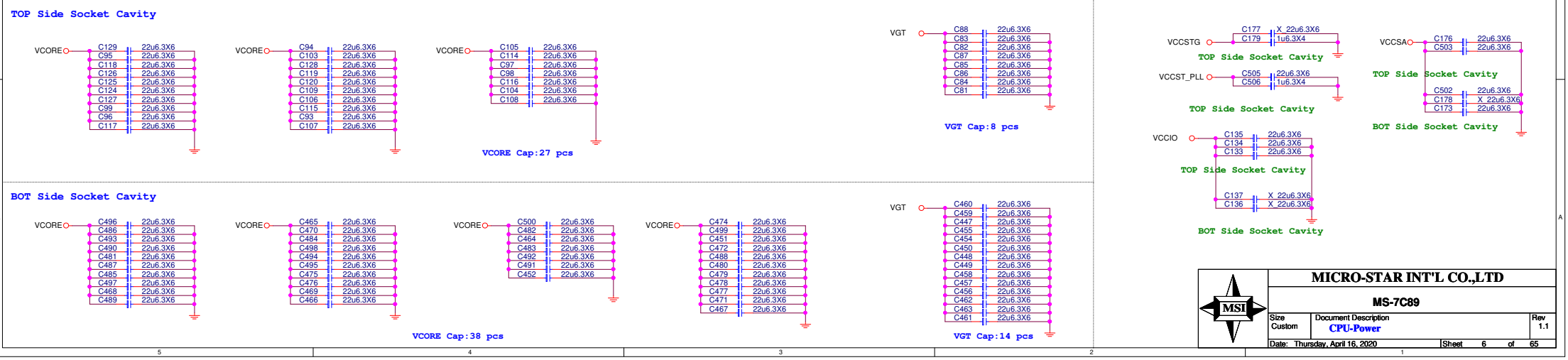

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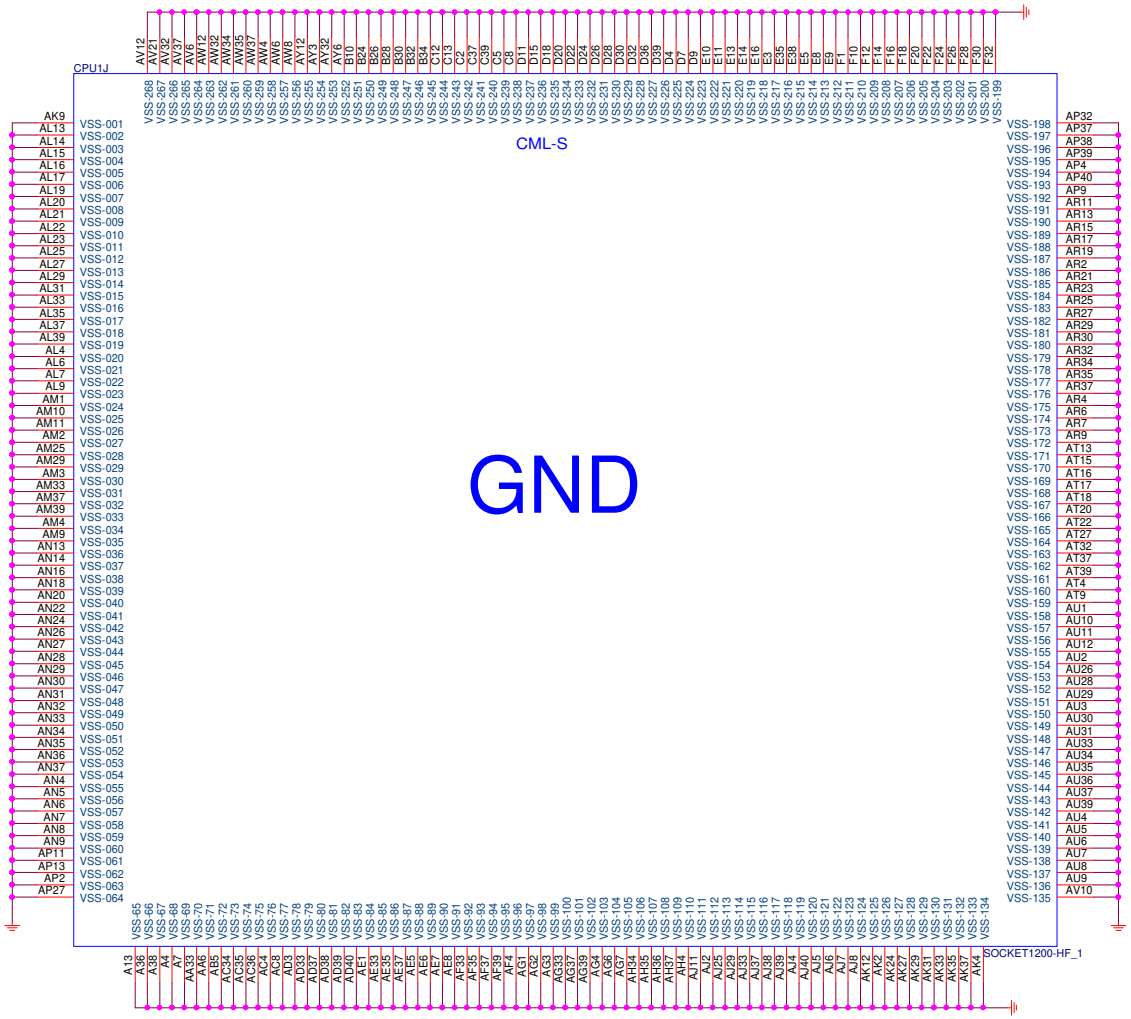

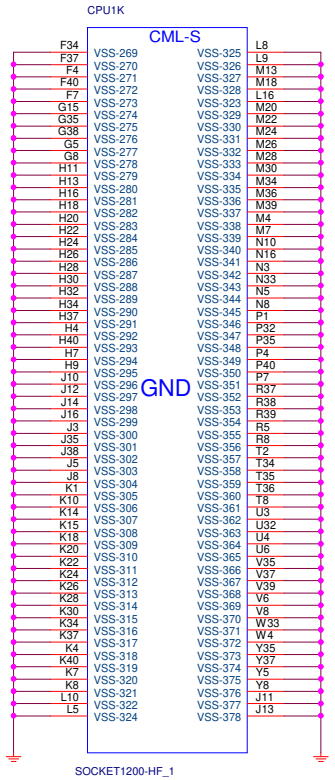

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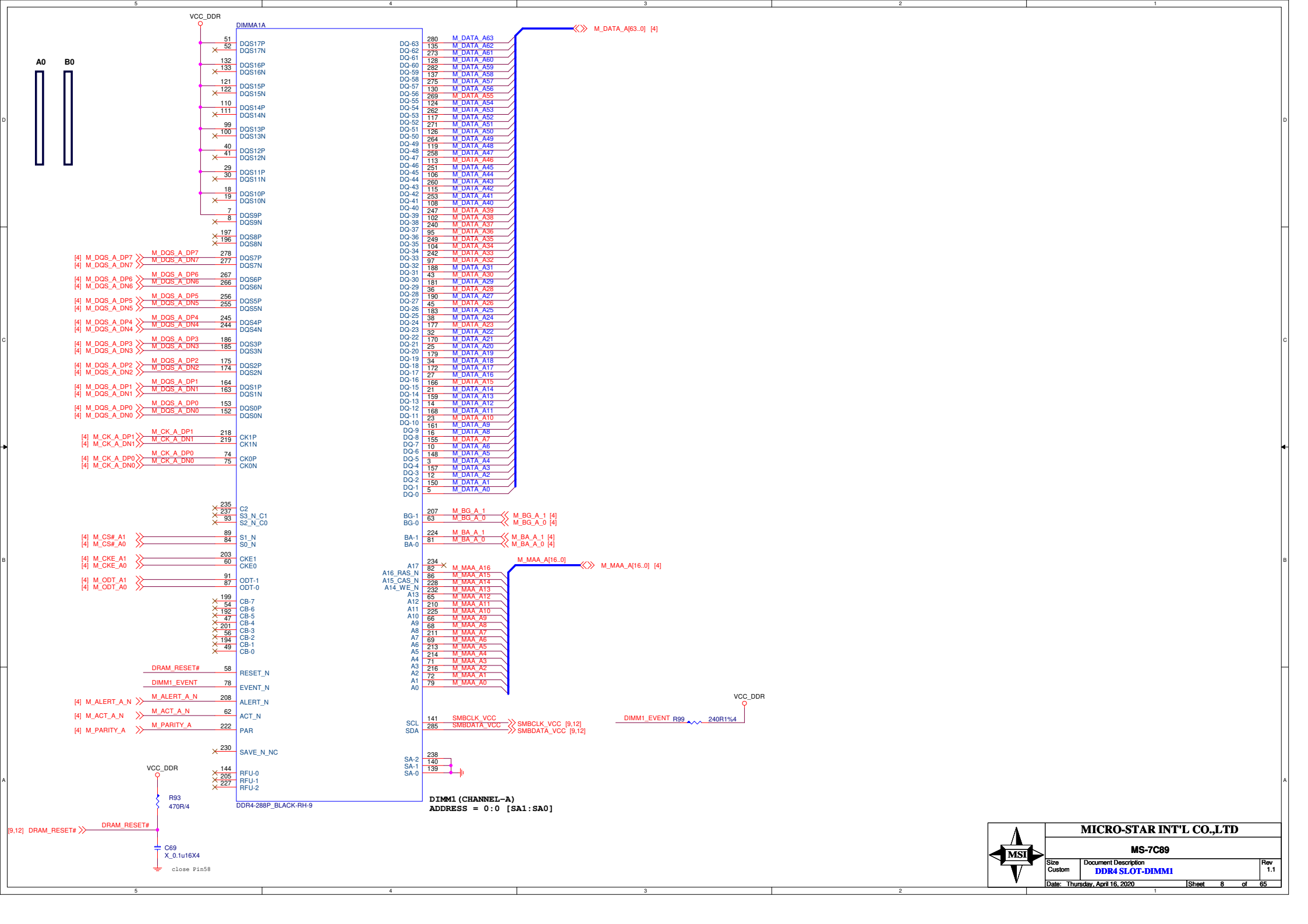

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Rev: 1.1	
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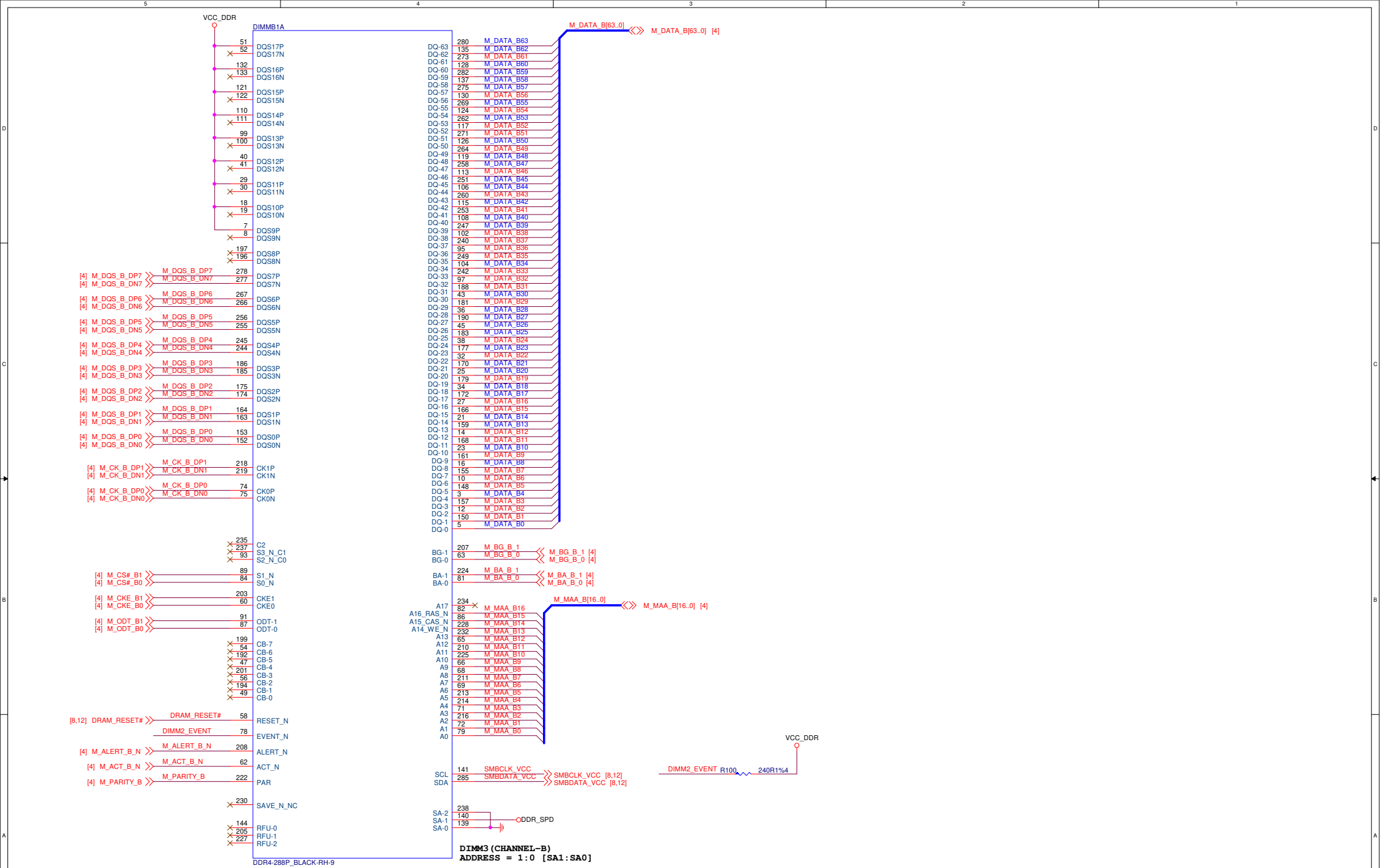

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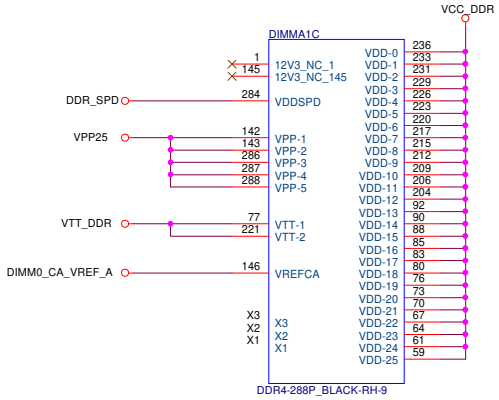

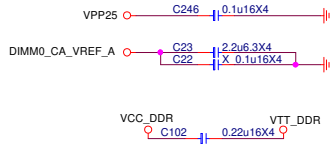

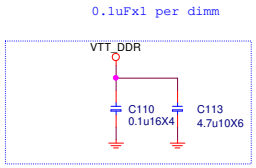

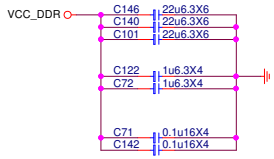

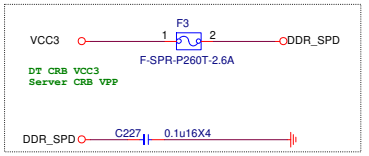

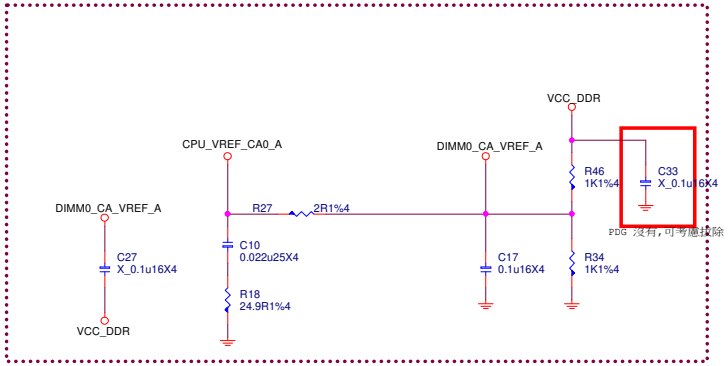

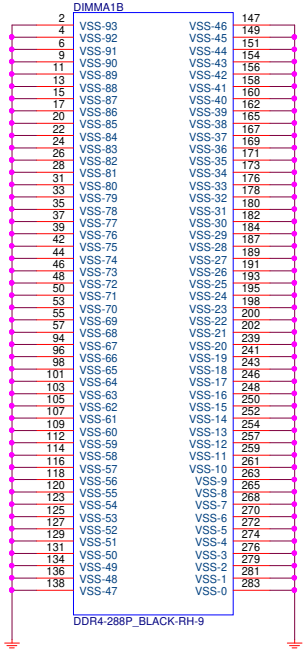

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	MS-7C89	
Size: Custom	Document Description: DDR4-POWER/GND-1	Rev: 1.1
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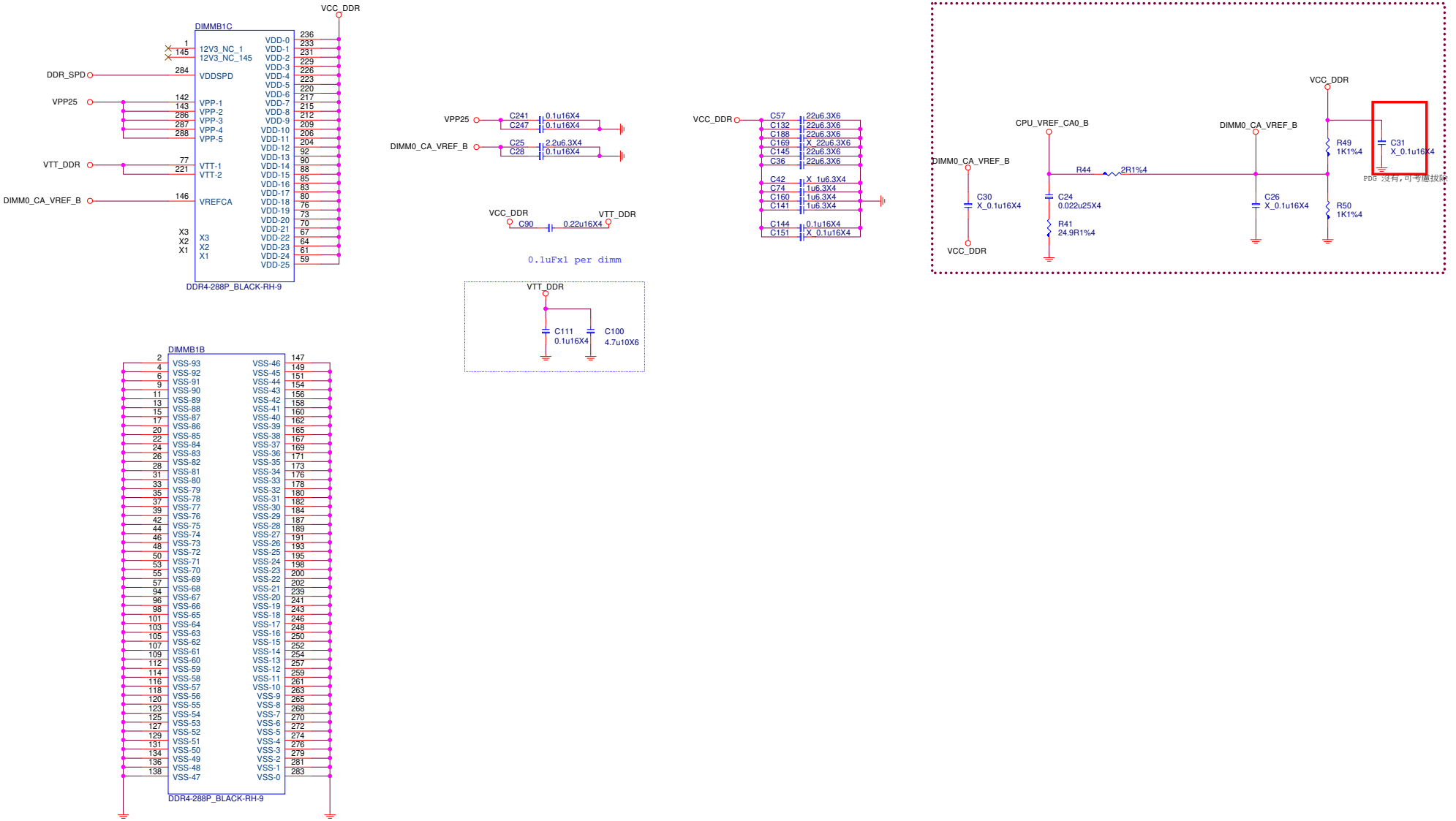

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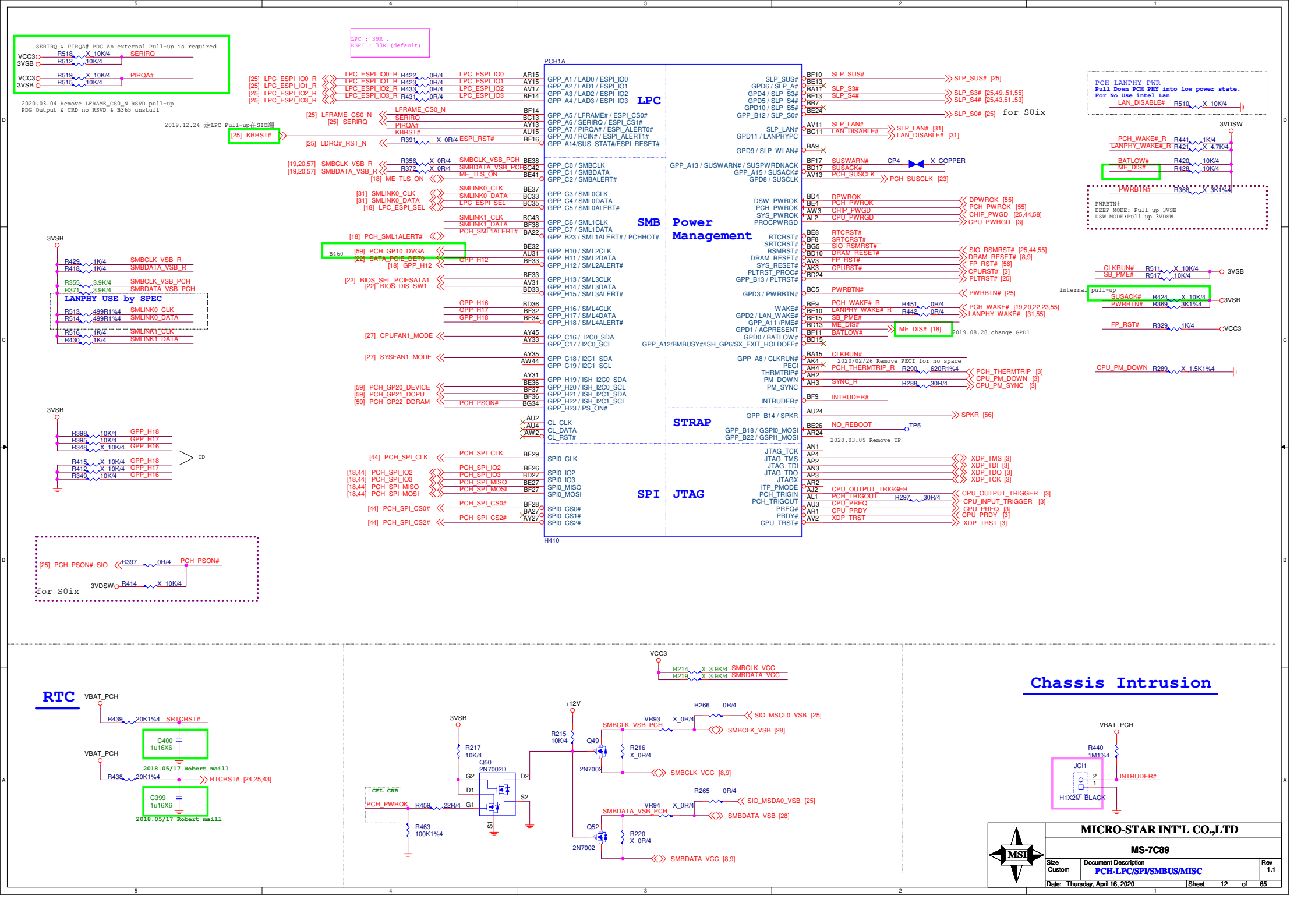
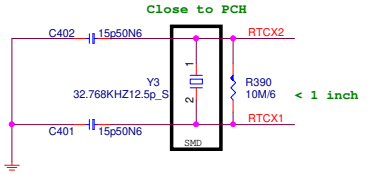
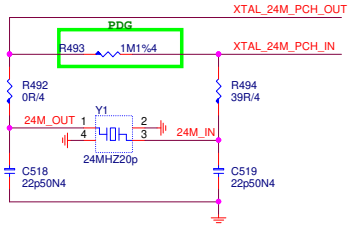
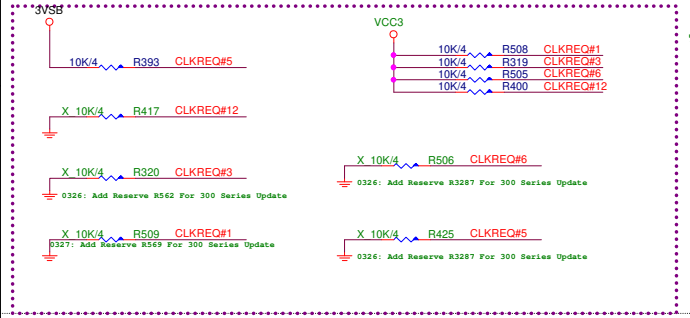
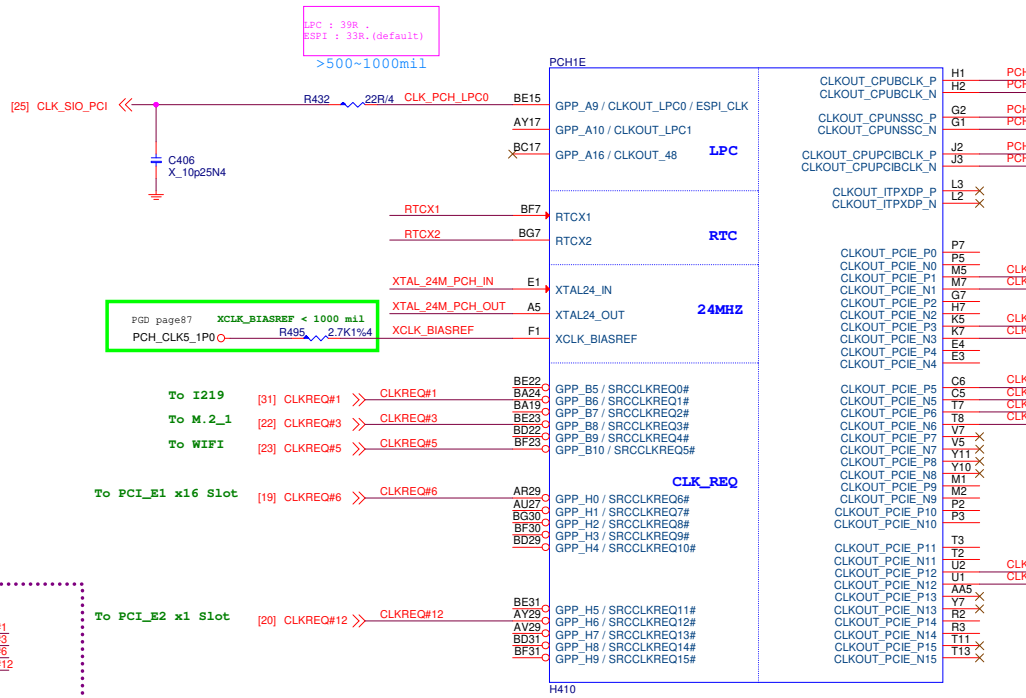

SERIRQ & PIRQA# PDG An external Pull-up is required
2020.03.04 Remove LFRAME_CS0_N RSVD pull-up
PDG Output & CRD no RSVD & B365 unstuff
2019.12.24 走LPC Pull-up在SIO端
LPC : 39R .
ESPI : 33R.(default)
PCH1A
LPC
SMB
Power Management
STRAP
SPI
JTAG
H410
for S0ix
LANPHY USE by SPEC
PCH LANPHY PWR
Pull Down PCH PHY into low power state.
For No Use intel Lan
2020/02/26 Remove PECI for no space
2020.03.09 Remove TP
2019.08.28 change GPD1
RTC
2018.05/17 Robert maill
Chassis Intrusion
MICRO-STAR INT'L CO.,LTD
MS-7C89
PCH-LPC/SPI/SMBUS/MISC

PCH_CLK









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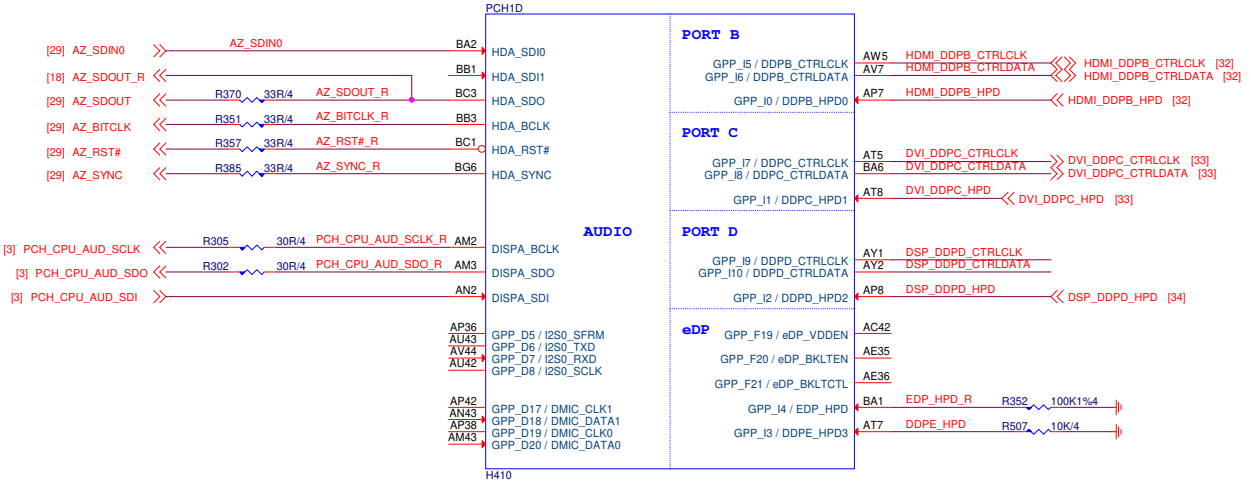
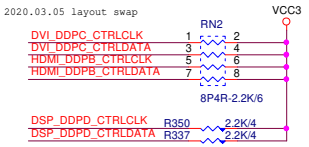
PCH_AUDIO





DDI interfaace Disable
no connect

Port B HDMI

Port C DVI,HDMI2.0 OR Others

Port D DisplayPort to VGA

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Custom	PCH-Clock/Audio	1.1

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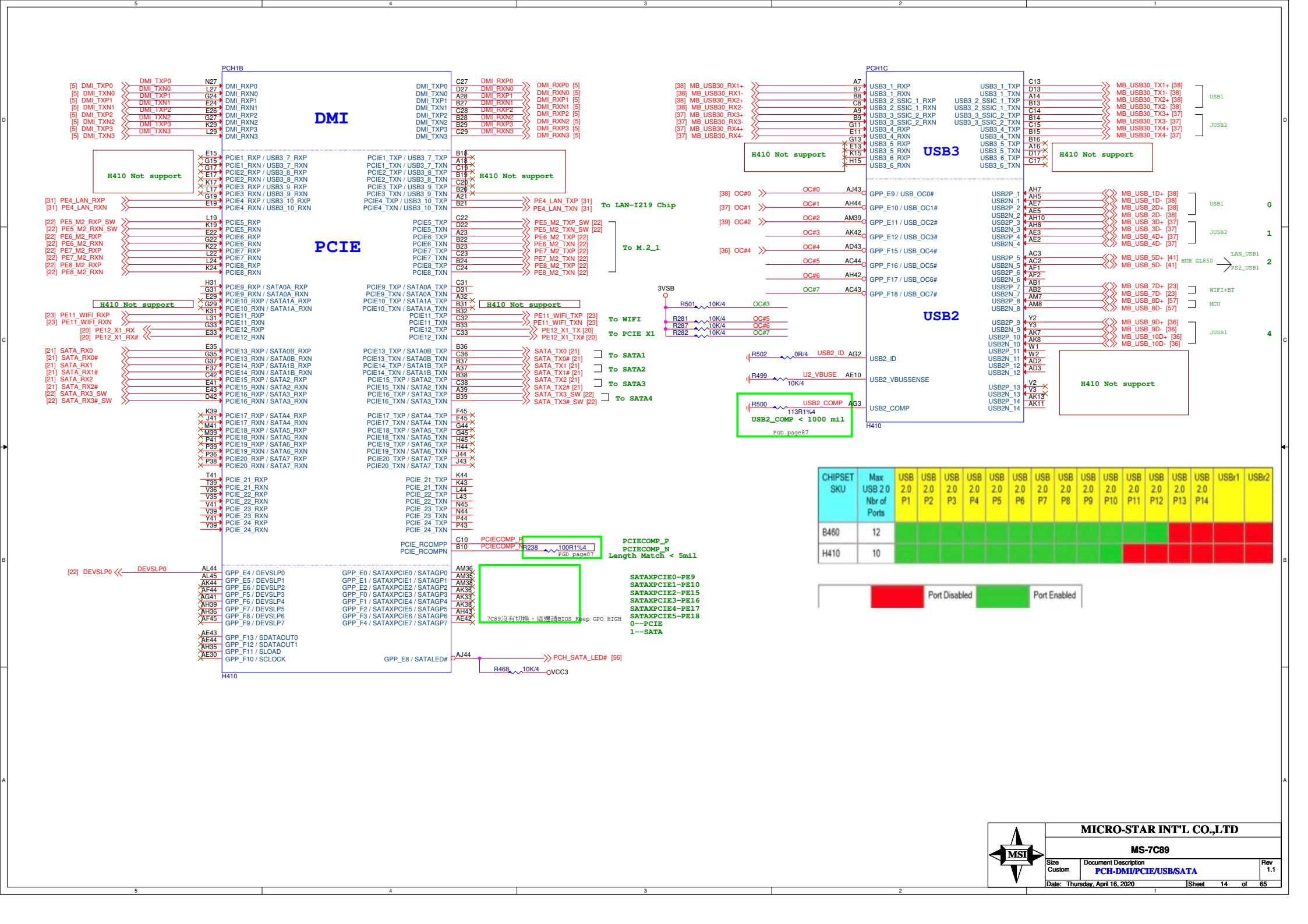
PCH1B
DMI
PCIE
H410 Not support
To LAN-I219 Chip
To M.2_1
To WIFI
To PCIE X1
To SATA1
To SATA2
To SATA3
To SATA4
PCIECOMP_P
PCIECOMP_N
Length Match < 5mil
SATAXPCIE0-PE9
SATAXPCIE1-PE10
SATAXPCIE2-PE15
SATAXPCIE3-PE16
SATAXPCIE4-PE17
SATAXPCIE5-PE18
0--PCIE
1--SATA
7C89沒有切換，這邊請BIOS Keep GPO HIGH
H410
PCH1C
USB3
USB2
USB2_COMP < 1000 mil
H410
CHIPSET SKU
Max USB 2.0 Nbr of Ports
B460
12
H410
10
Port Disabled
Port Enabled
MICRO-STAR INT'L CO.,LTD
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Size
Custom
Document Description
PCH-DMI/PCIE/USB/SATA
Rev
1.1
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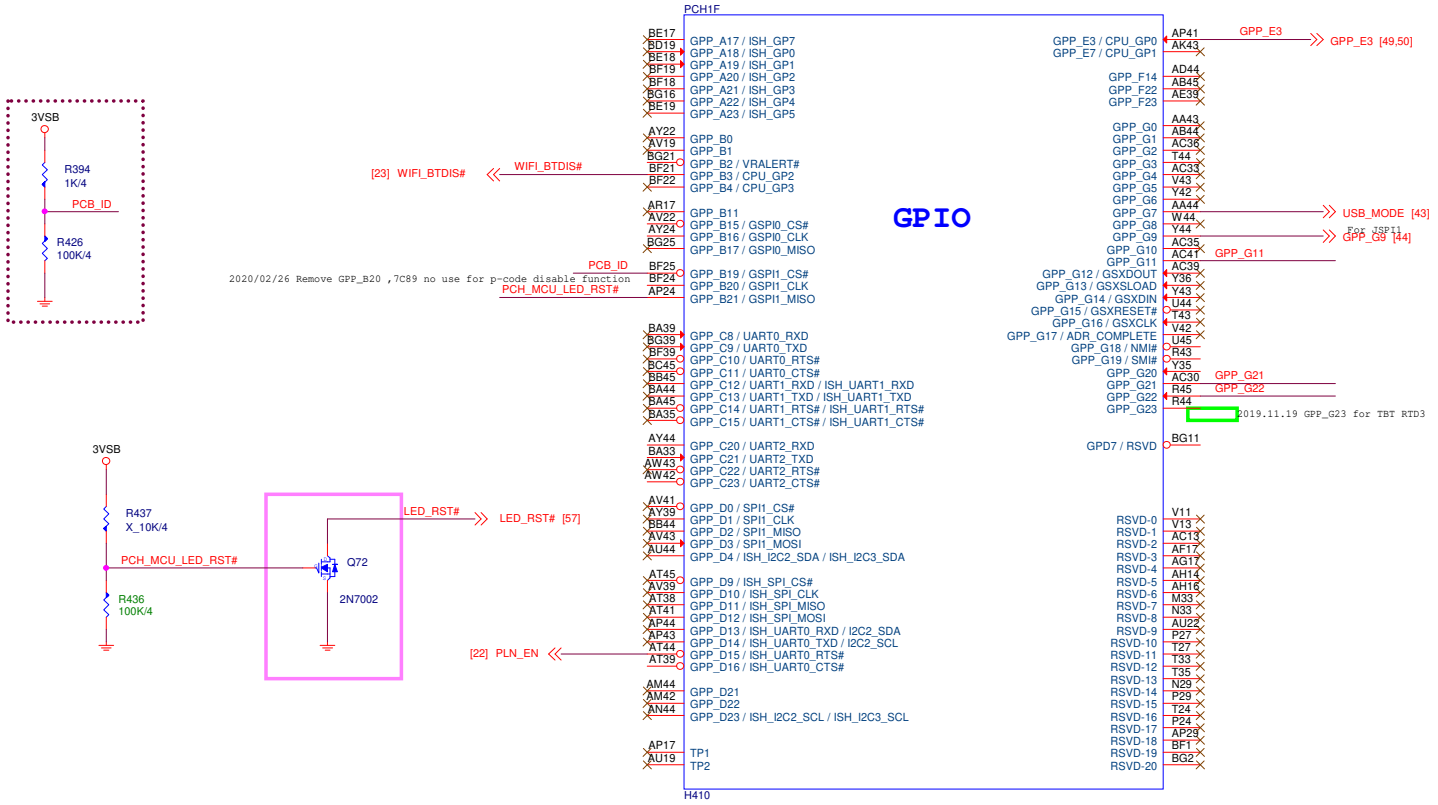
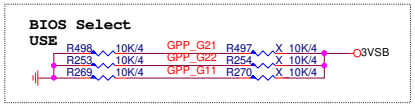
	GPP_G21	GPP_G22	GPP_G11
H410M PRO	0	0	0
H410M-A PRO	0	0	1





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Size: Custom	Document Description: PCH-GPIO/RSVD
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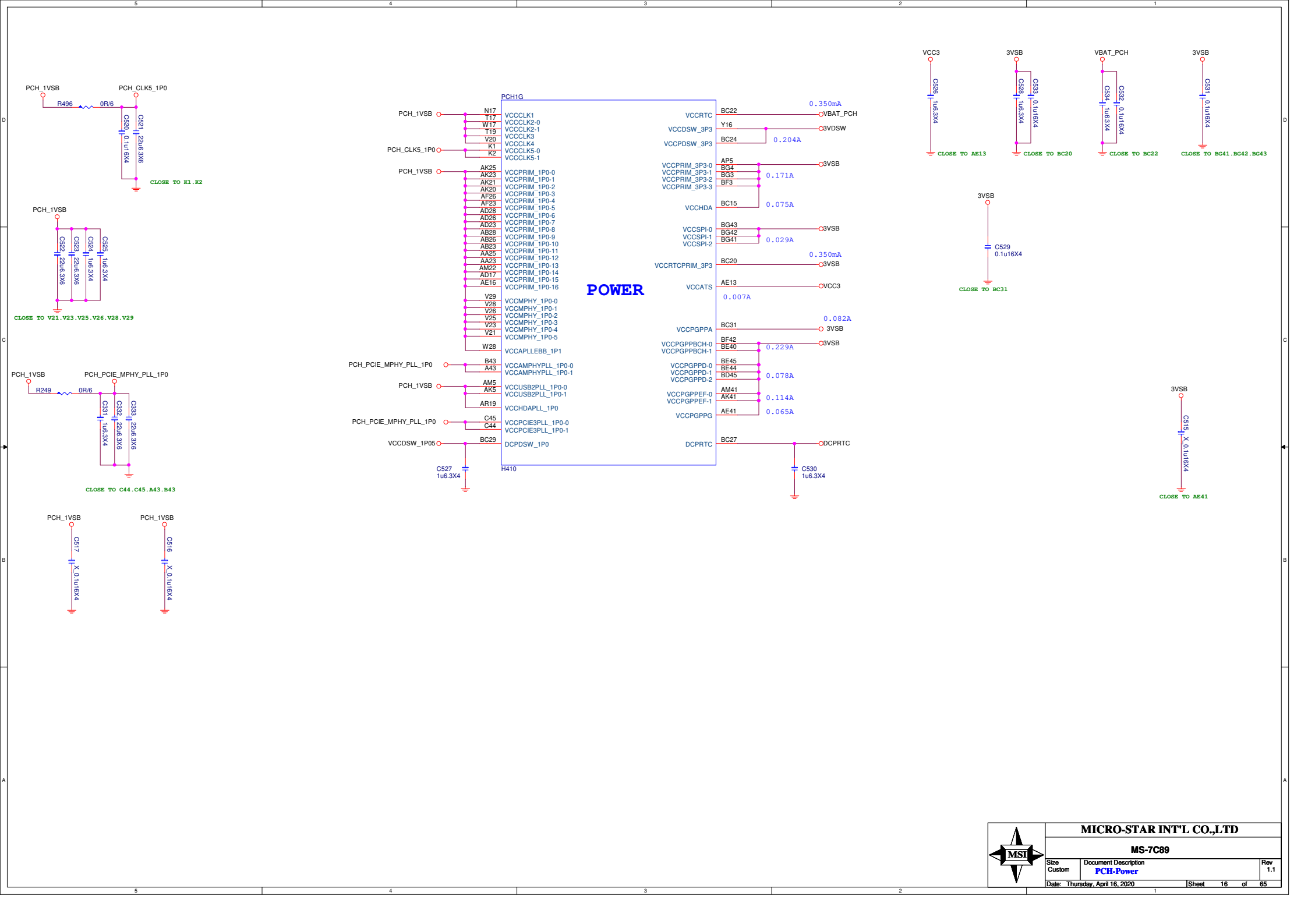

MSI	MICRO-STAR INT'L CO.,LTD	
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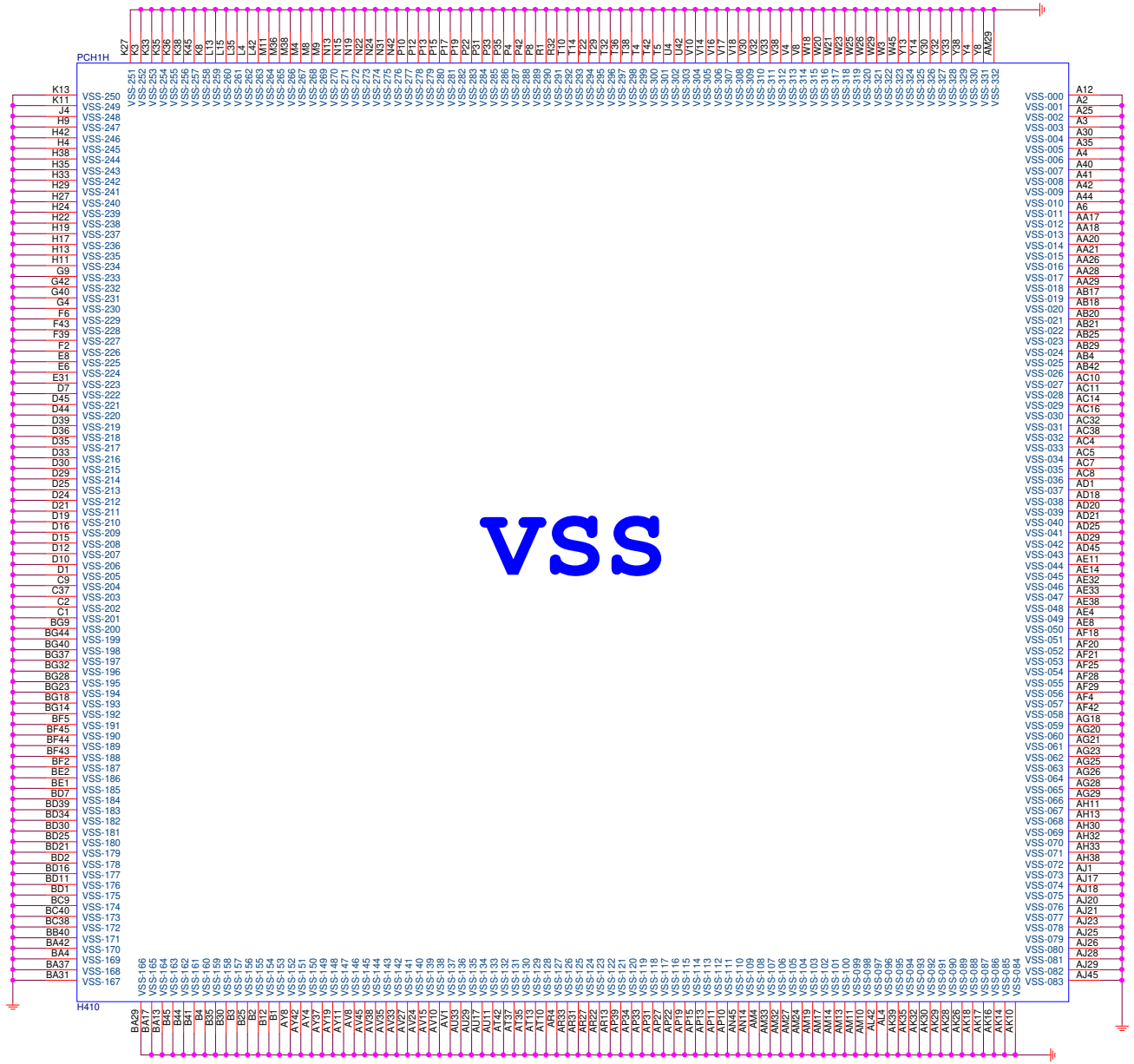

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TOP Swap

GPP_B14

2020/02/26 Follow 7C82 remove

0 : DISABLE (Default)
1 : ENABLE

Internal Pull-down is disabled after PCH_PWROK is high.

No Reboot

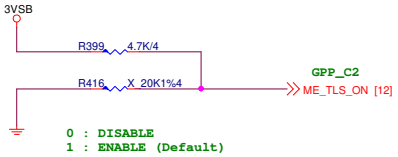
GPP_B18

2020/02/26 Follow 7C82 remove

0 : DISABLE (Default)
1 : ENABLE

Internal Pull-down is disabled after PCH_PWROK is high.

TLS confidentiality



0 : DISABLE
1 : ENABLE (Default)

Internal Pull-down is disabled after RSMRST# de-assert.

Boot BIOS

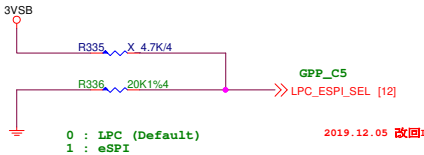
GPP_B22

2020/02/26 Follow 7C82 remove

0 : SPI (Default)
1 : LPC

Internal Pull-down is disabled after PCH_PWROK is high.

LPC eSPI Mode

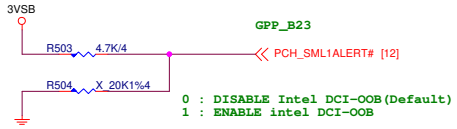


0 : LPC (Default)
1 : eSPI

2019.12.05 改回LPC Mode internal pull-down

Internal Pull-down is disabled after RSMRST# de-assert.

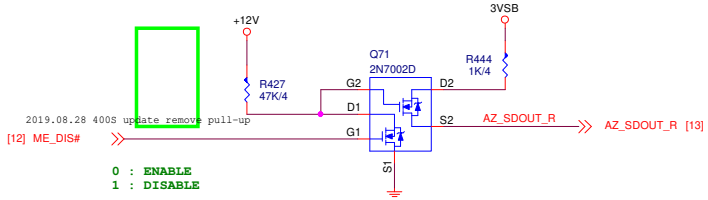
DCI Enable



0 : DISABLE Intel DCI-OOB(Default)
1 : ENABLE intel DCI-OOB

Internal Pull-down is disabled after RSMRST# de-assert.

Flash Descriptor Security Override

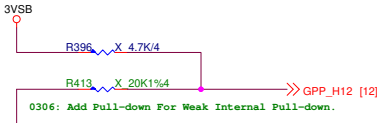


0 : ENABLE
1 : DISABLE

0 : Enable security measures defined in the Flash Descriptor. (Default)
1 : DISABLE:Flash Descritior Decurity(Override).

Internal Pull-down is disabled after PCH_PWROK is high.

ESPI FLASH SHARING MODE



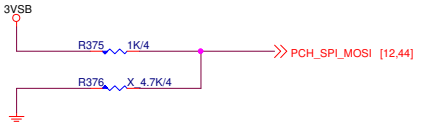
0306: Add Pull-down For Weak Internal Pull-down.

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

Internal Pull-down is disabled after RSMRST# de-assert.

Reserved

CRB 留



Internal Pull-up

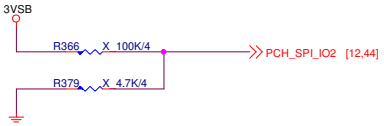
Reserved

CRB 留

Internal Pull-up

Reserved

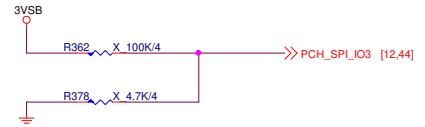
CRB 留



Internal Pull-up

Reserved

CRB 留



Internal Pull-up

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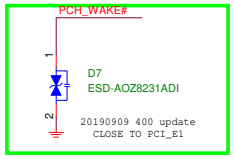
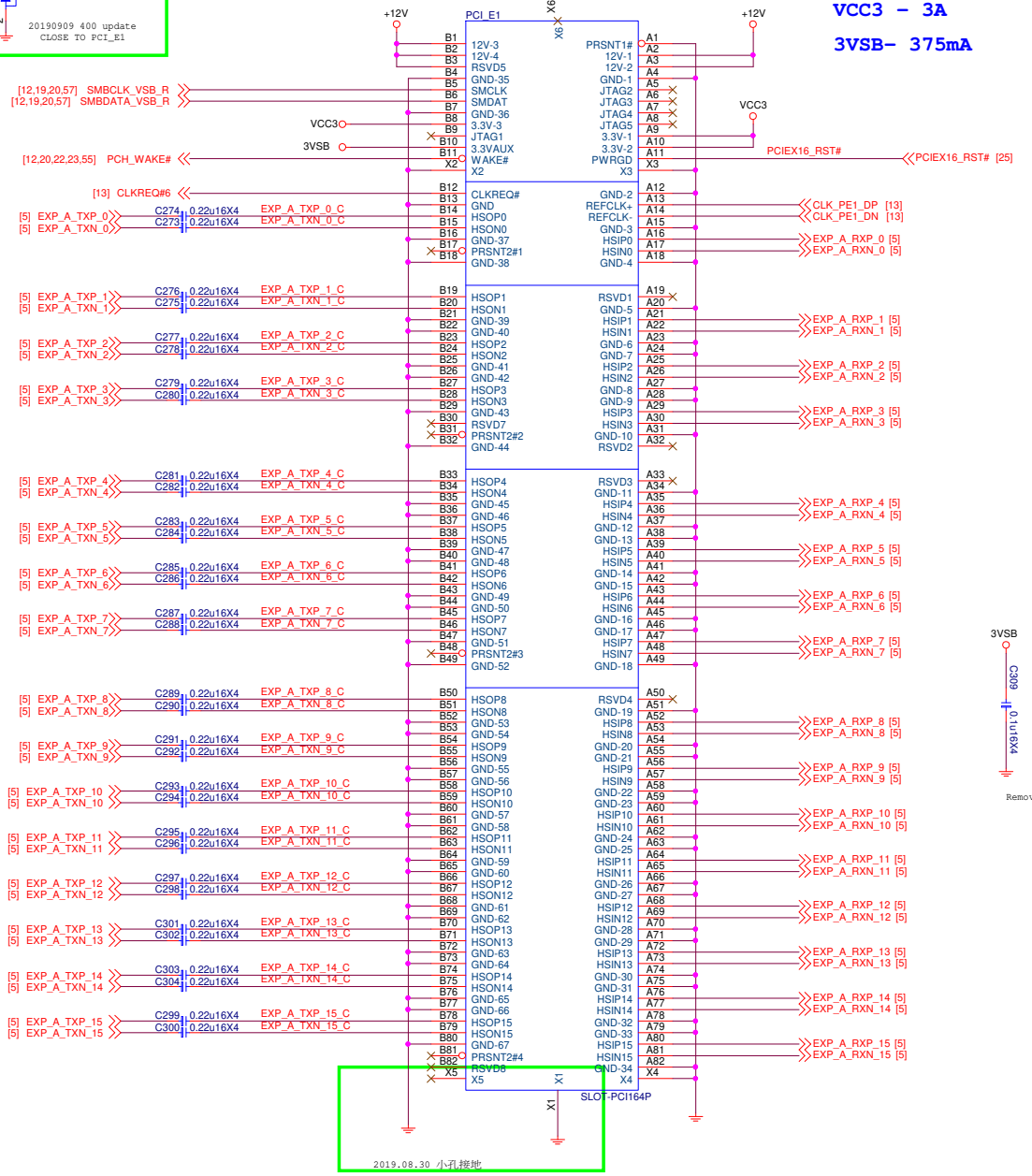
PCI_Express X16 Slot

12V - 5.5A

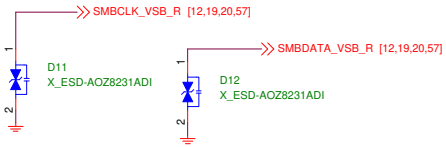
VCC3 - 3A

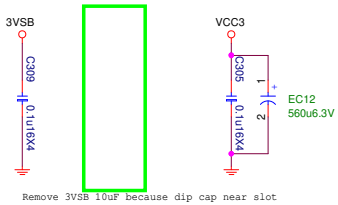
3VSB- 375mA

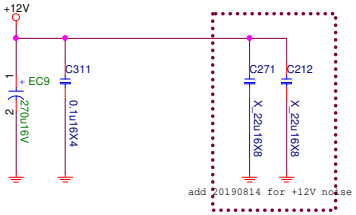




SMBus ESD







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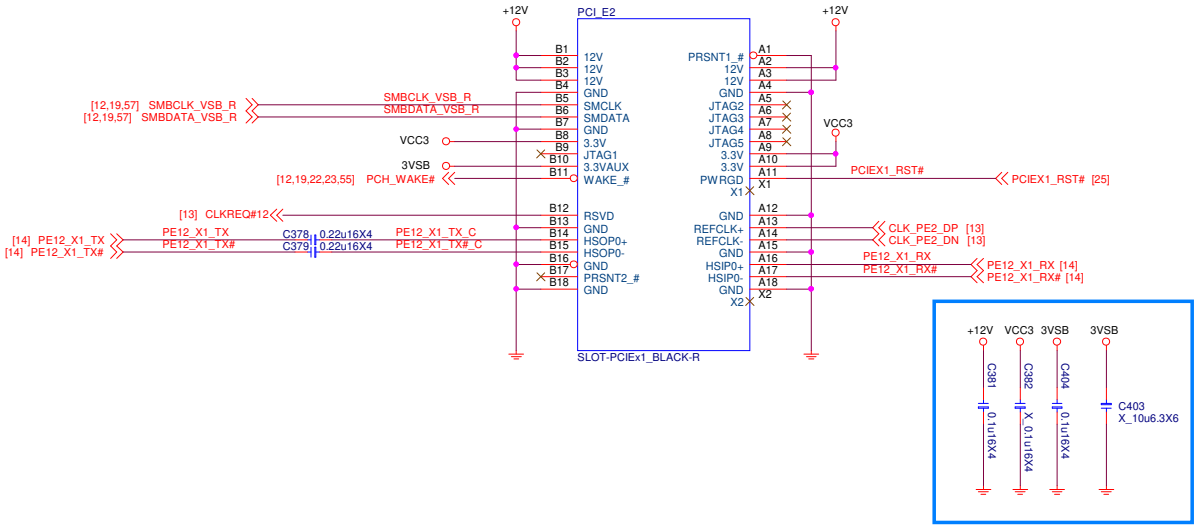
PCIE X1



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Size: Custom	Document Description: M.2-SLOT2	Rev: 1.1
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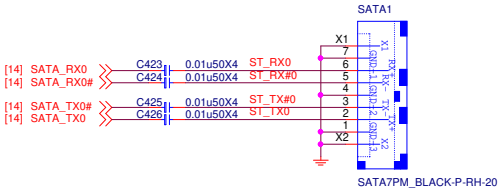
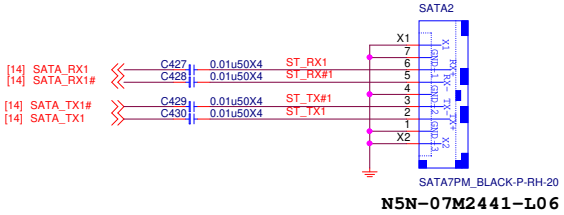
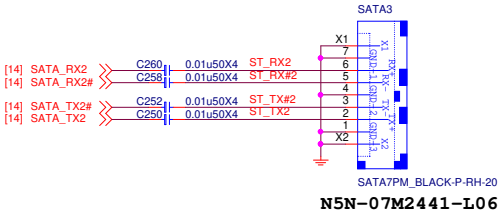
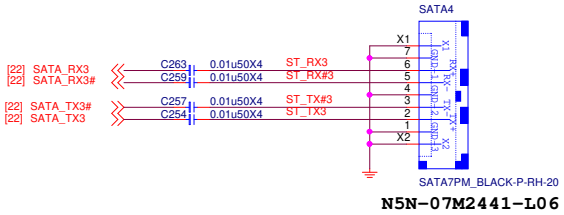
SATA Connector









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Custom	SATA Connector	1.1

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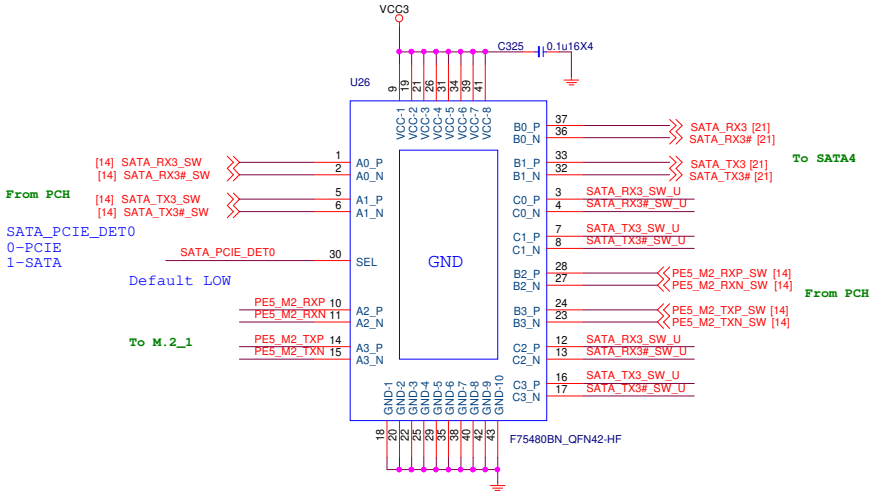
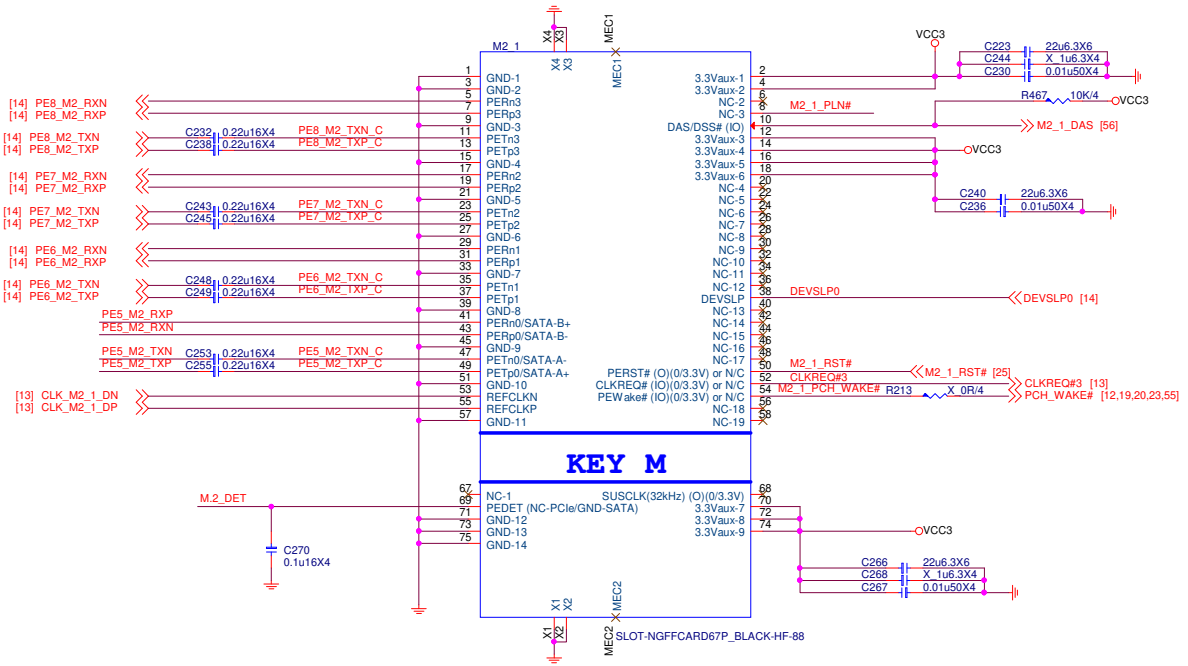
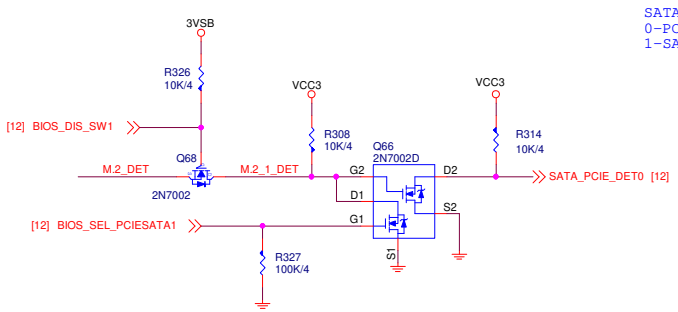
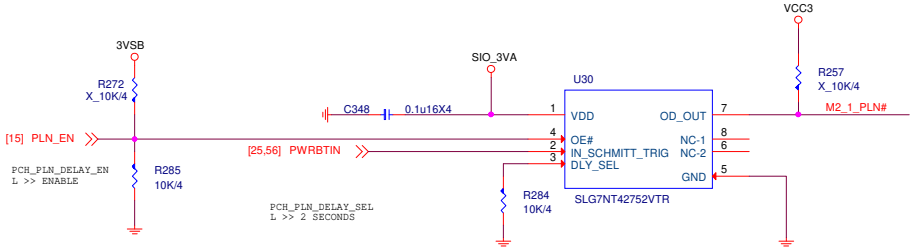
M2_1

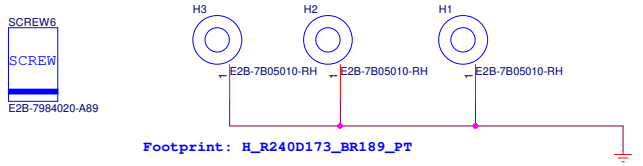






SATA_PCIE_DET0
0-PCIE
1-SATA





BIOS_MODE

GPP_H14	GPP_H13		GPP_H11
BIOS_DIS_SW1	BIOS_SEL_PCIESATA1	Mode	SATA_PCIE_DET0
0	1	M2-SATA	1
0	0	M2-PCIE	0
GPI(1)	GPI(0)	AUTO	

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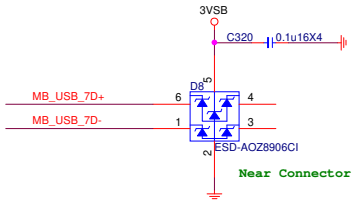
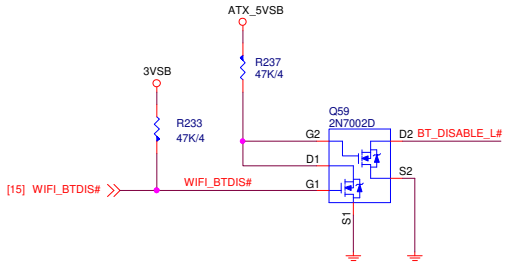
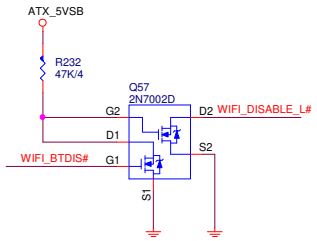
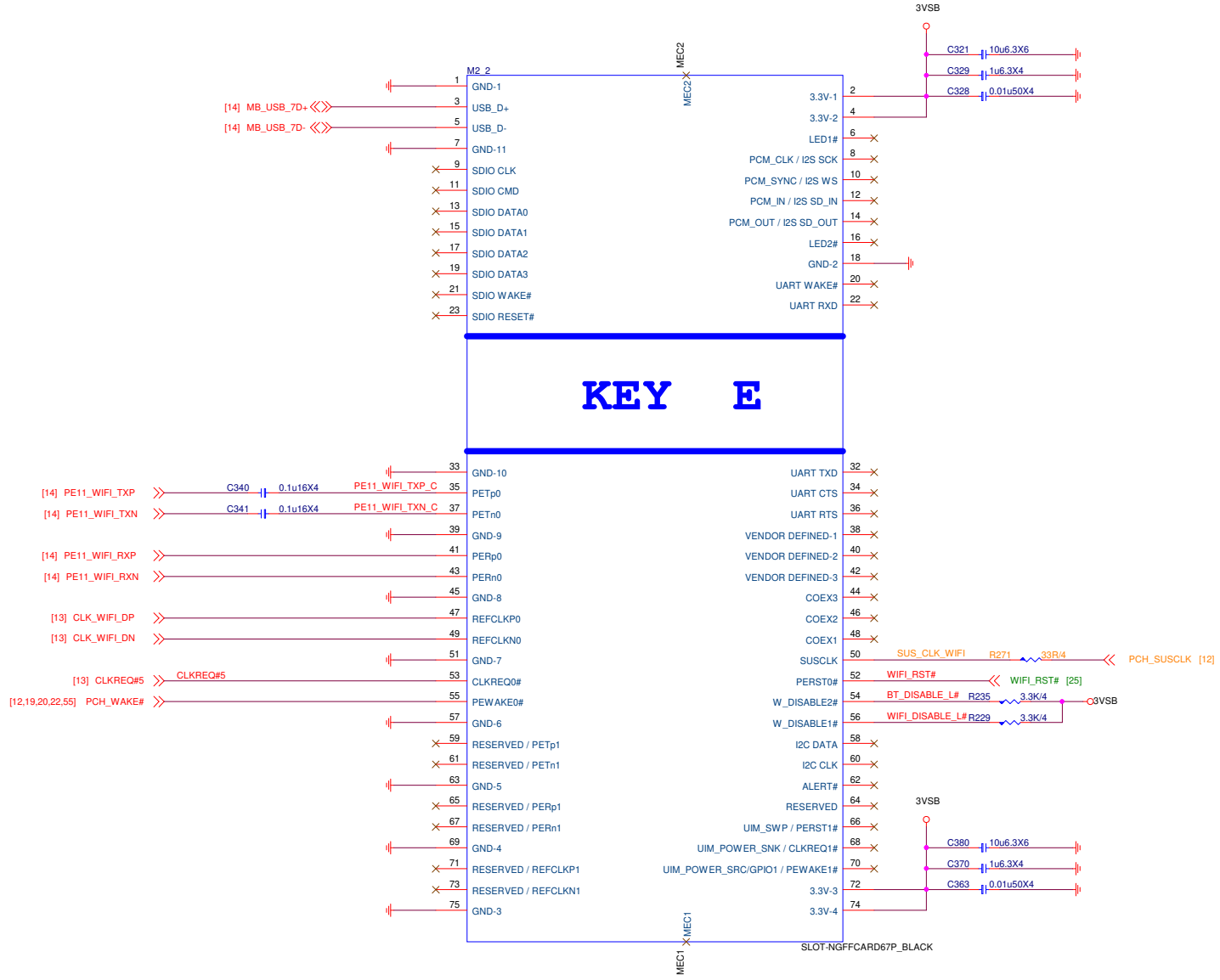
M2_2

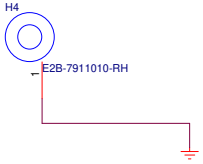






950mA peak 2A





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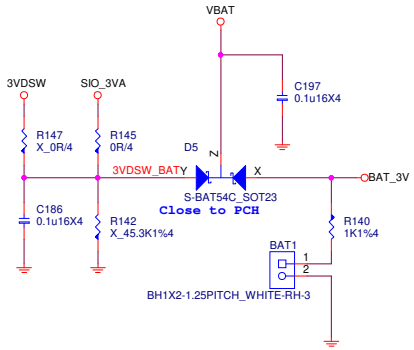
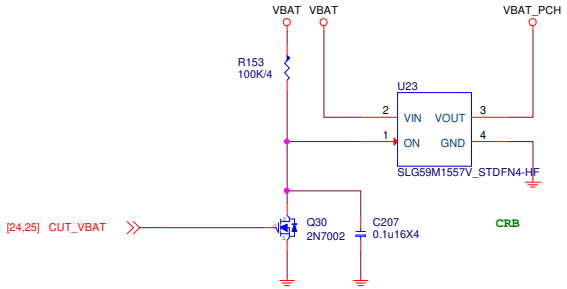
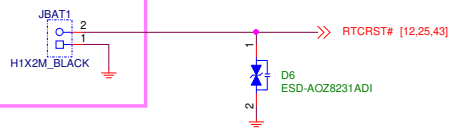
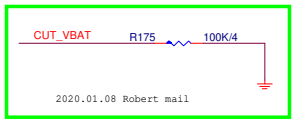
VBAT

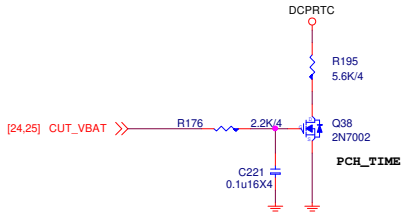




Change to N41-1020151-H06 for Clear CMOS







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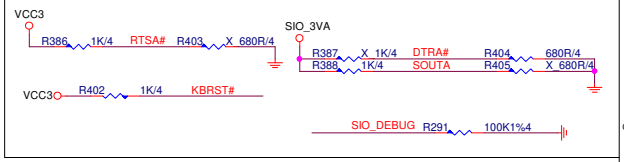
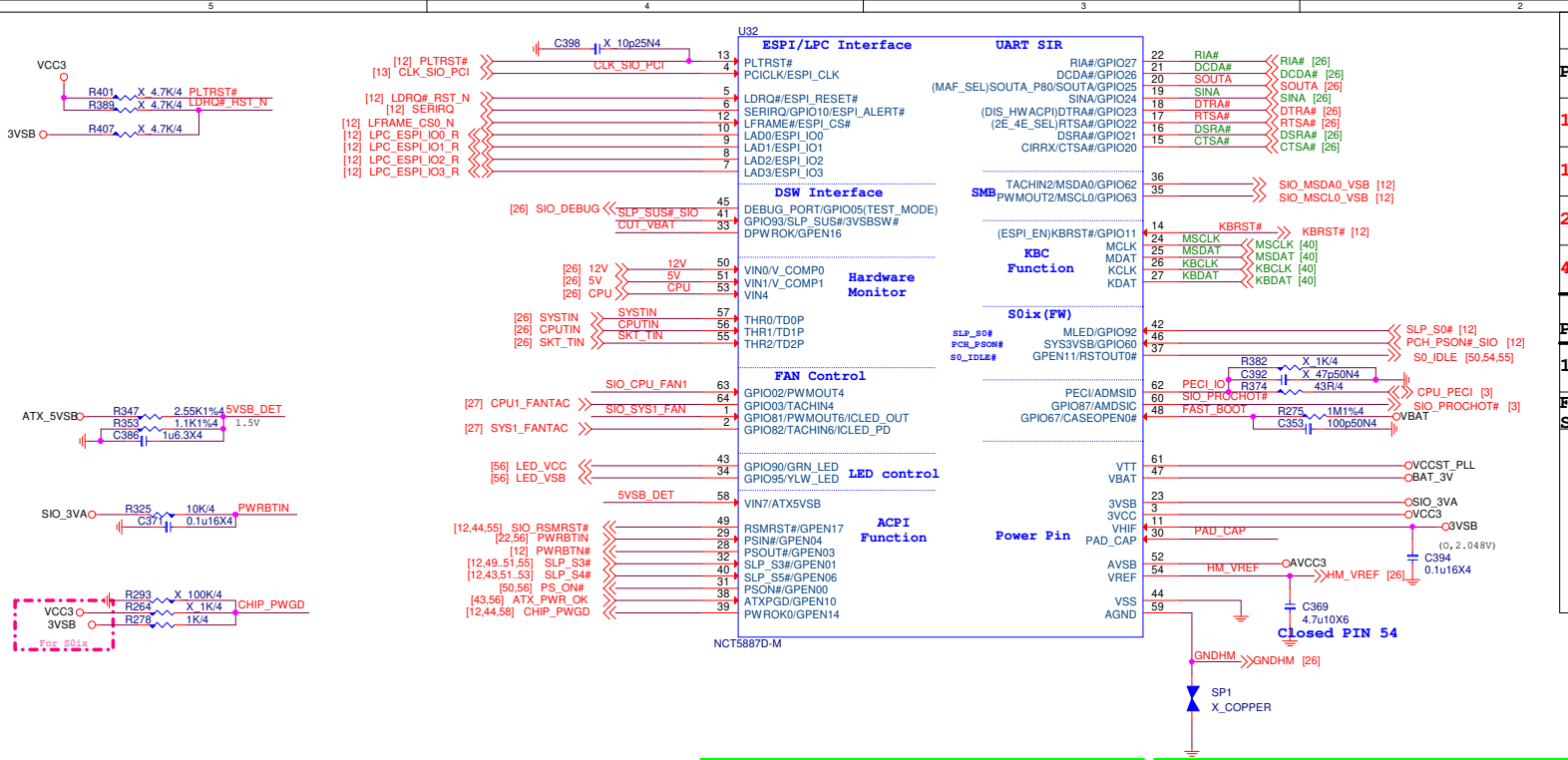
POWER ON STRAPPING PIN FOR NCT5887

PIN	NAME	Circuit NAME	0	1	Strap Point
17	2E_4E_SEL	RTSA#	I/O ADDRESS 2E	I/O ADDRESS 4E	VCC3
18	DIS_HWACPI	DTRA#	HW ACPI enable	HW ACPI disable	3VA
20	MAF_SEL	SOUTA	MAF enable	MAF disable	3VA
45	Test mode	SIO_DEBUG	Pull down 100K	-	NA

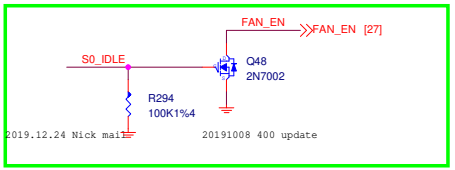
PIN	NAME	Circuit NAME	VCC3	3VA	Strap Point
14	ESPI_EN	KBRST#	LPC(VCC3)	ESPI(3VA)	VCC3 3VA

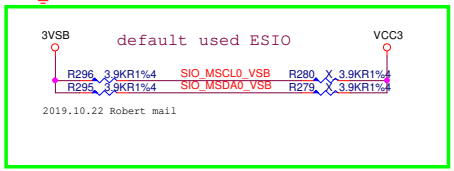
FW SEL DSW_EN default disable





Colay DSW mode
default CUT VBAT

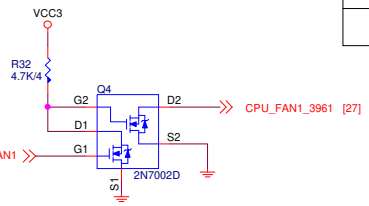


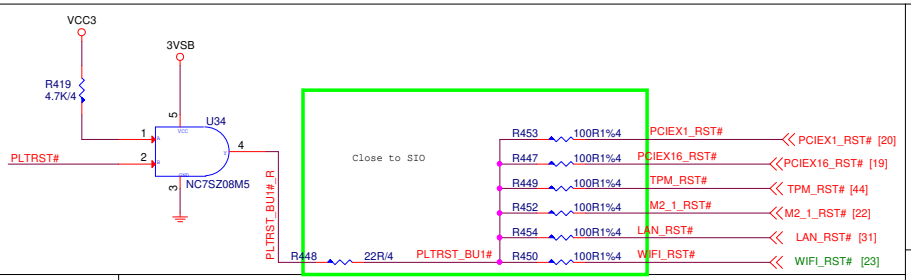


Vinafix.com

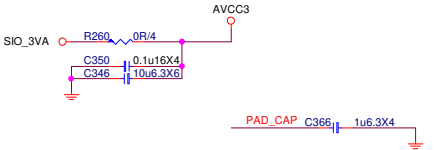
SIO_WAKE

S5	S3	S0
SIO_WAKE#		FAN



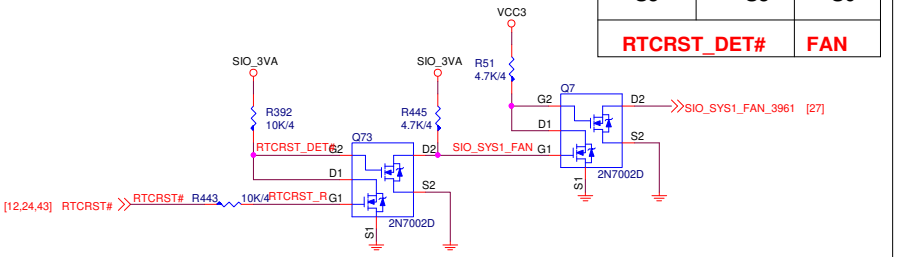


3V Analog Power



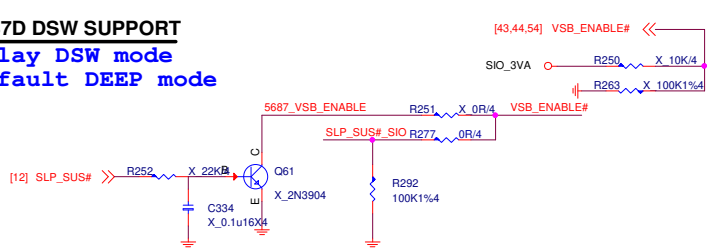
RTCRST DET

S5	S3	S0
RTCRST_DET#		FAN

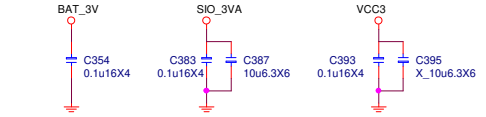


5887D DSW SUPPORT

Colay DSW mode
default DEEP mode



Closed PIN99 Closed PIN46,85 Closed PIN1



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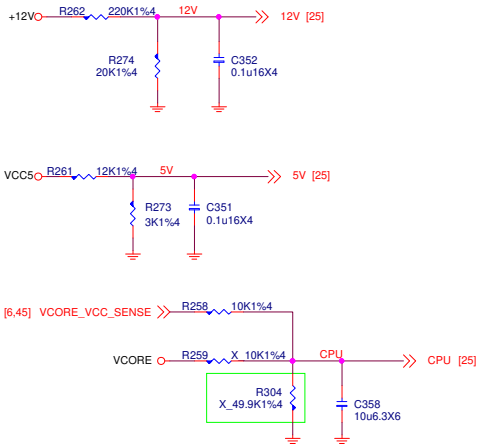
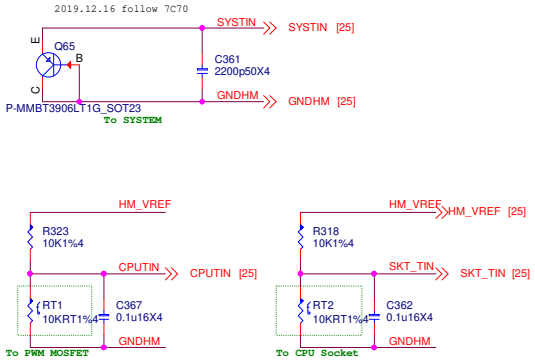
HW Monitor - Voltage

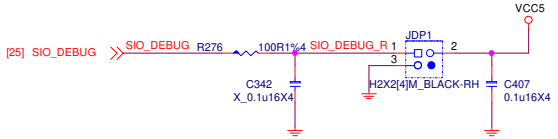
SIO HM Voltage Over 2V will Not Detect



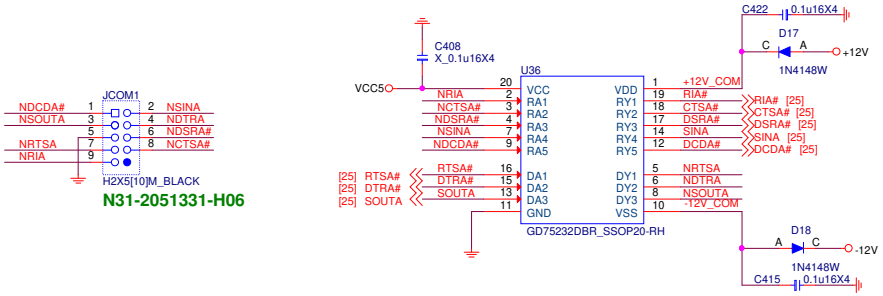
Thermal



DEBUG PORT



COM Port



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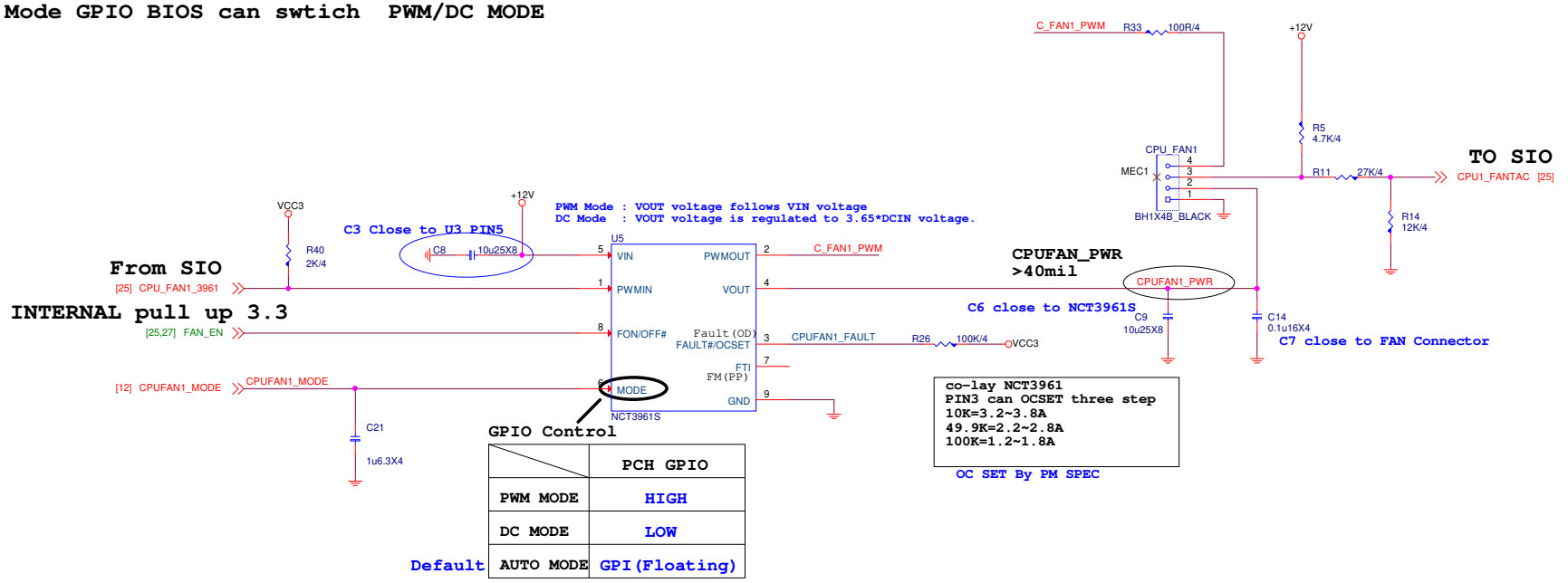
TYPE M : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

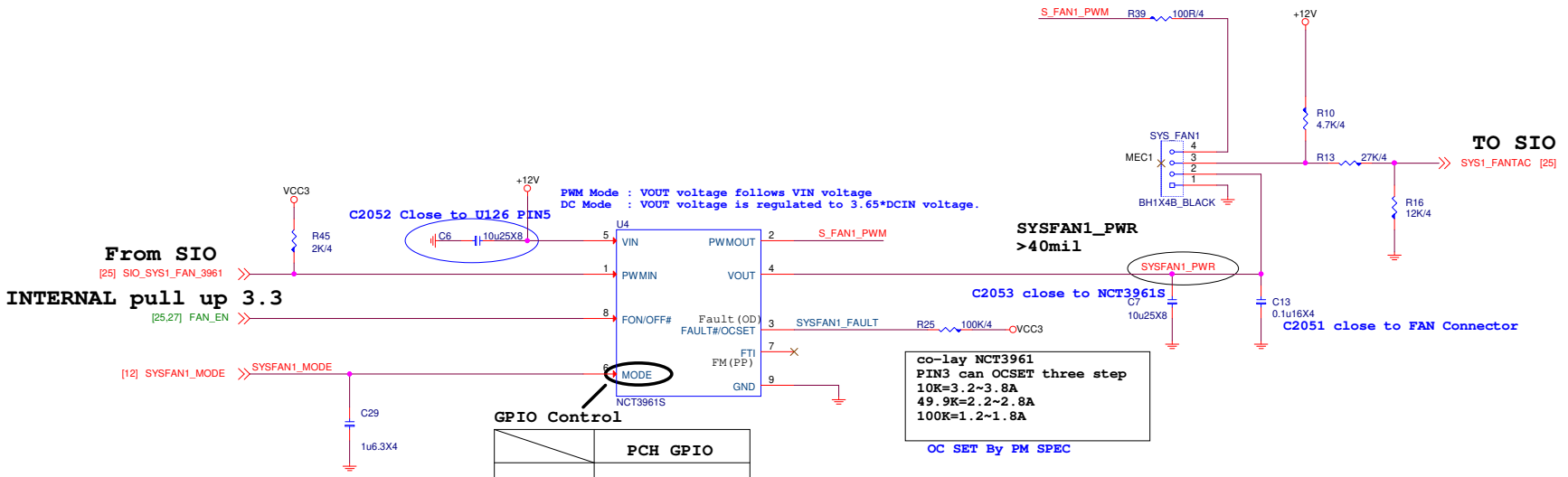
1.Mode GPIO BIOS can swtich PWM/DC MODE



	PCH GPIO
PWM MODE	HIGH
DC MODE	LOW
Default AUTO MODE	GPI (Floating)

TYPE M : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can swtich PWM/DC MODE



	PCH GPIO
PWM MODE	HIGH
DC MODE	LOW
Default AUTO MODE	GPI (Floating)

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Custom	CPU and PUMP FAN	1.1

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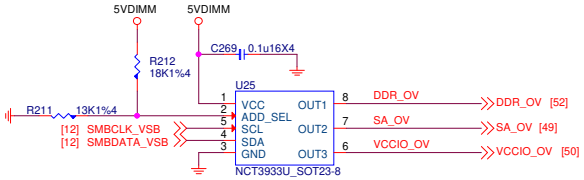
VOLTAGE CONSOLE

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



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ALC892

follow PCH power well

3VSB

CA16 10u6.3X6 CA15 0.1u16X4 Closed PIN9

CA21.CA23 closed PIN25
CA14 close to PIN38

VCC3 CA20 10u6.3X6 CA19 0.1u16X4 Closed PIN1

CA21 0.1u16X4 CA23 22u6.3X6 CA14 10u6.3X6

UA1

ALC892-CG-RH

C91-1011041-P01
ECA1 100u10EL5
ECA3 100u10EL5

C91-1011041-P01
ECA4 100u10EL5
ECA2 100u10EL5

Closed Pin3 CA18 10u6.3X6

Closed Pin 27 CA17 0.1u16X4 CA13 10u6.3X6

RA18 20K1%4

LDOVDD

129mA

LA1 0R/8 R11-0000034-W08

CA22 ESD-MLVS0402L04

CA24 0.1u16X4 CA25 10u6.3X6

CA35,CA36 close to pin29

Closed Codec

RA13 5.1K1%4 FRONT_JD
RA12 10K1%4 LINE1_JD
RA14 20K1%4 MIC1_JD

CA6 0.1u16X4 CA5 1000p50X/4 For EMI

CPA2 COPPER CPA1 COPPER

LOUT_RA RA4 22K/4 LOUT_LA RA3 22K/4

LIN_OUT

AUDIO1B

DA1 DA2 ESD-MLVS0402L04

D0G-2710510-I05

JACK-AUDIOX3F_PK/LIME/LIGHT BU-RH

LIN_IN

AUDIO1A

CA4 100p50N4 CA3 100p50N4

MIC1

AUDIO1C

CA1 100p50N4 CA2 100p50N4

for rear I/O 6port:
887VD/892:1k

for rear I/O 3port:
887VD/892:75R

N54-13F0271-K06

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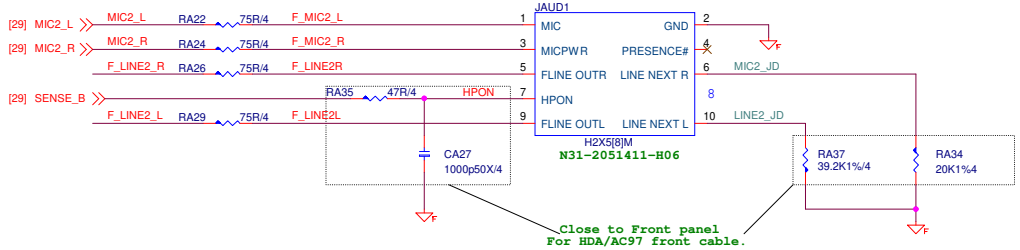
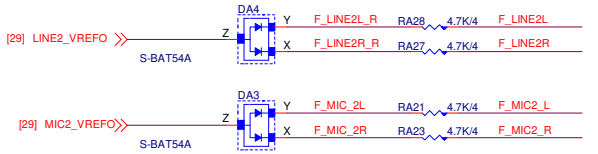
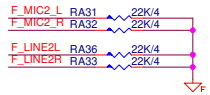
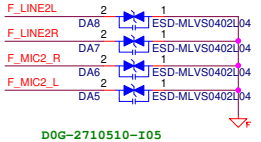






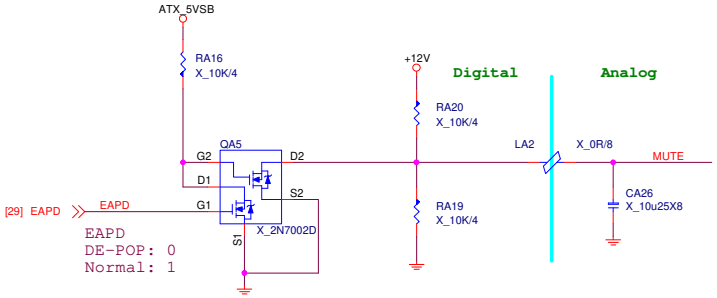


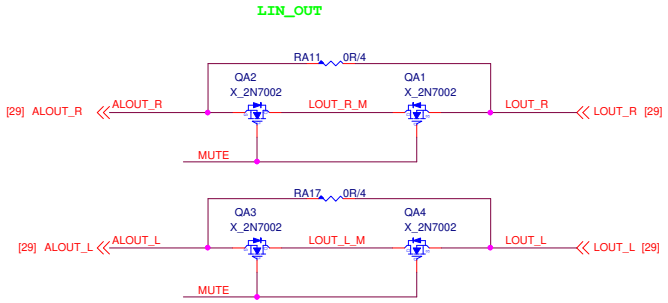
D0G-2710510-I05
Close to Front panel

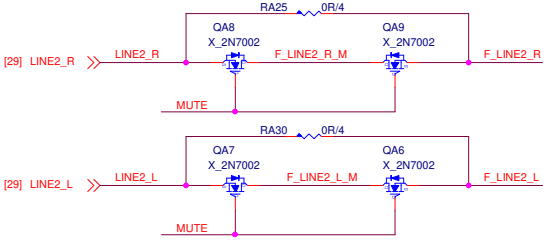
ESD protect

D0G-2710510-I05
AVL:D0G-2950500-SI0

De-POP circuit







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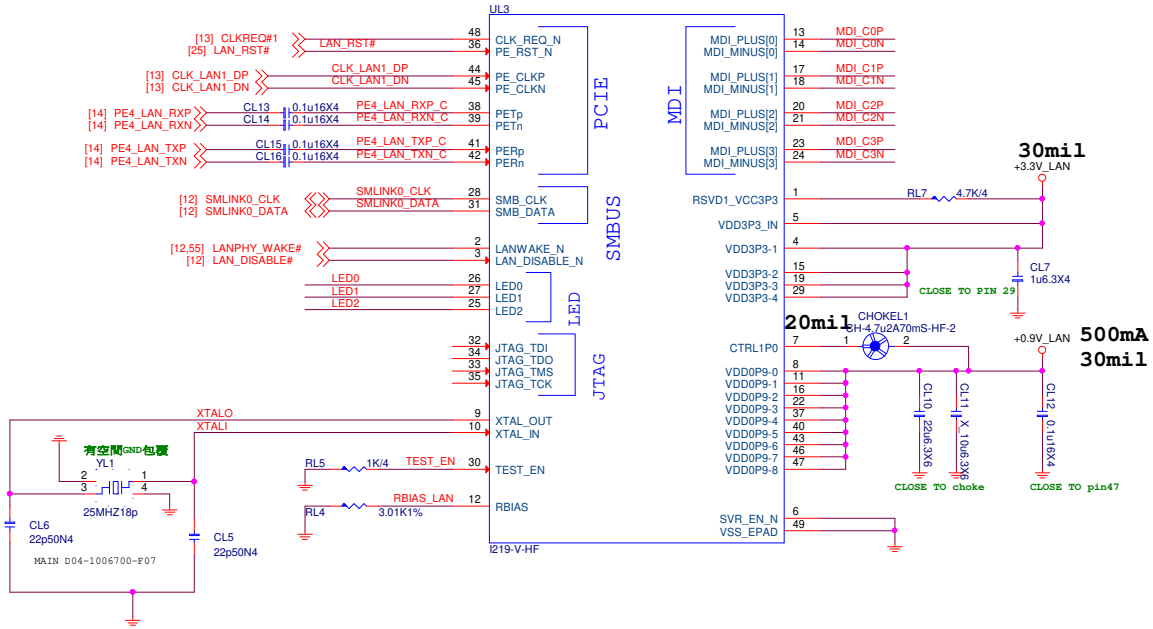
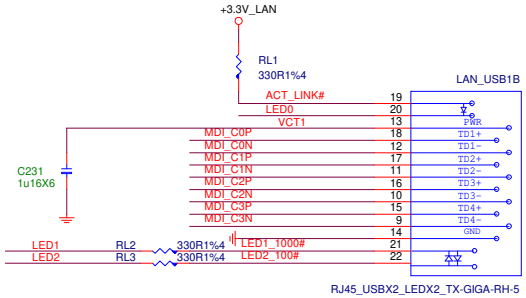
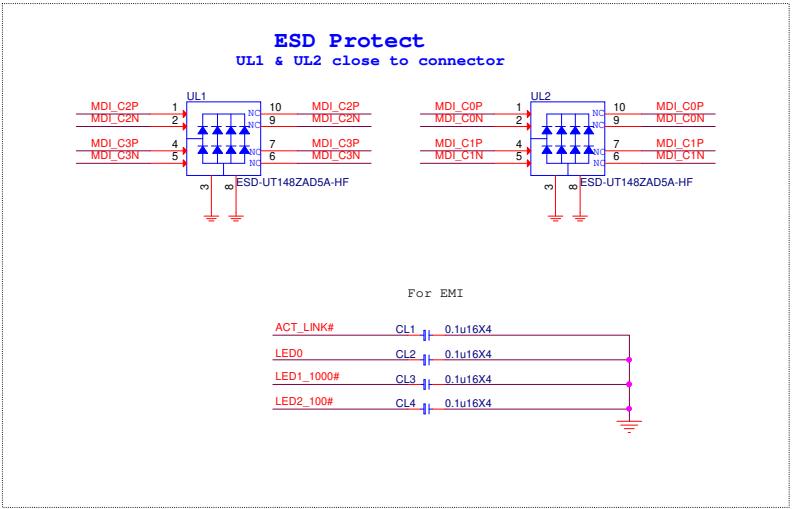
INTEL LAN - I219

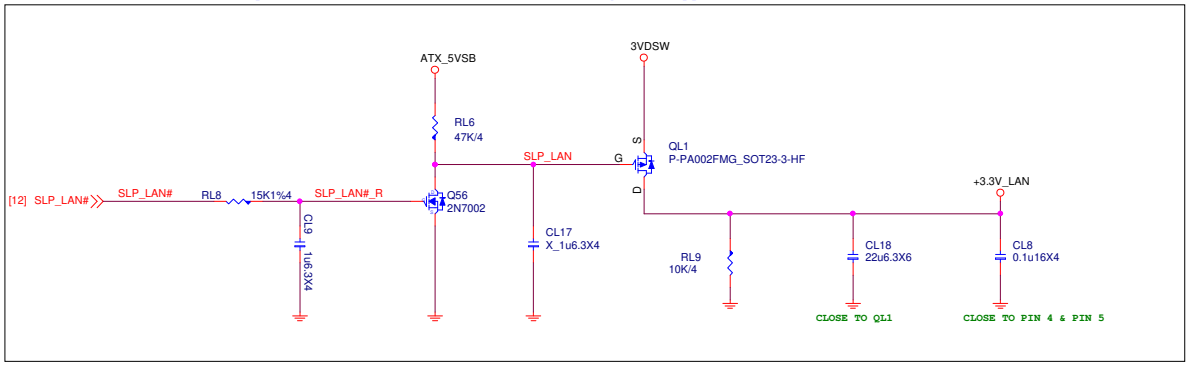


LAN Connector





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



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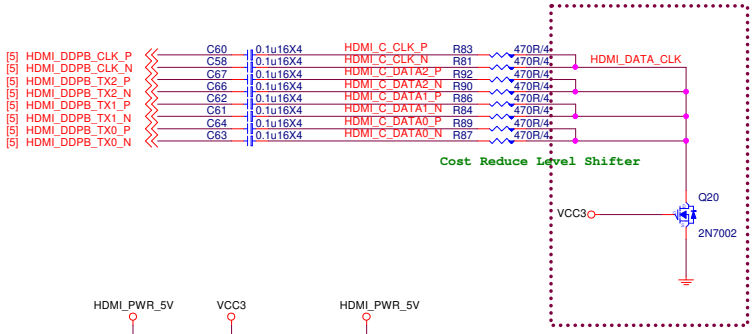
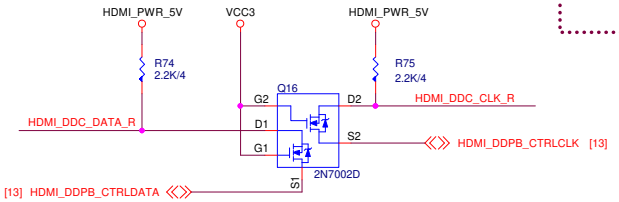
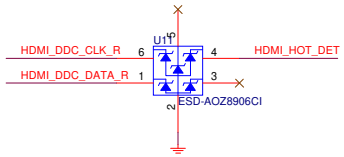
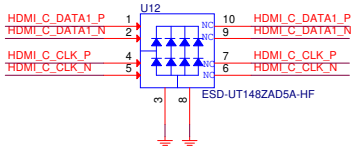
HDMI 1.4b

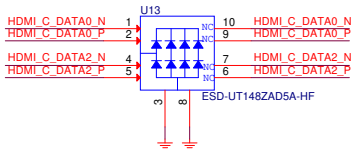
HDMI, DVI : 1920x1200 at 60 Hz (16:10 WUXGA)

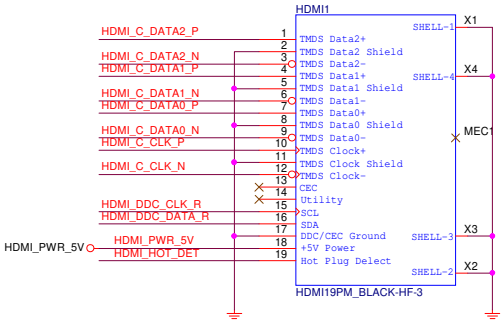




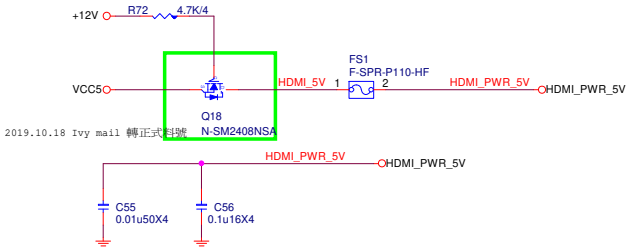




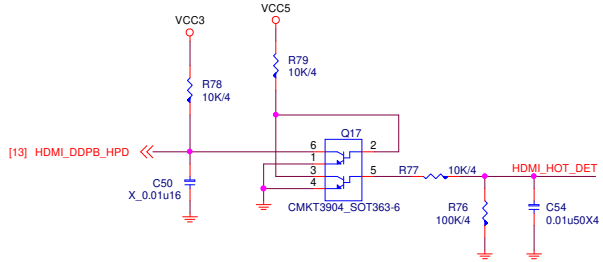




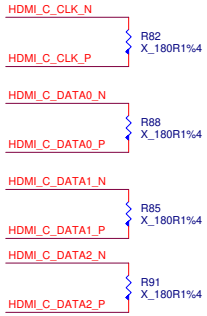
Vinafix.com



Hot Plug



For EMI



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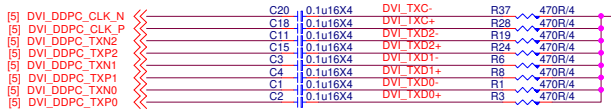
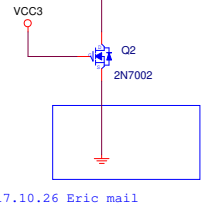
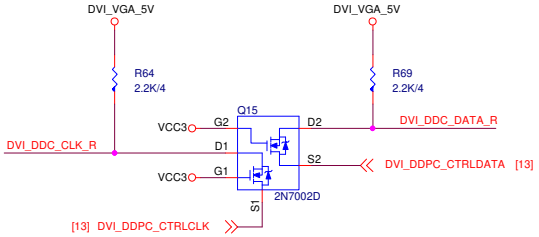
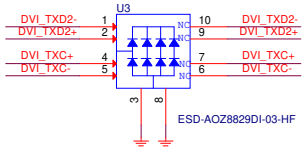
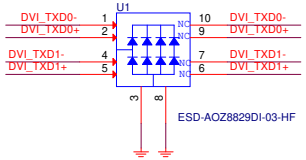
DVI

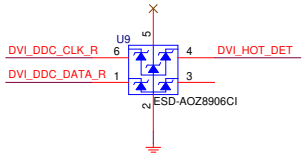


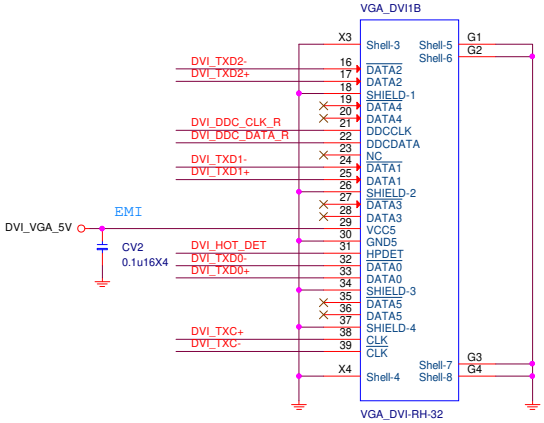


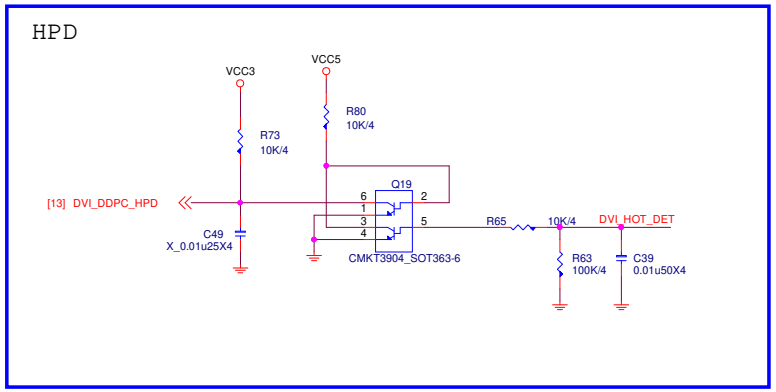


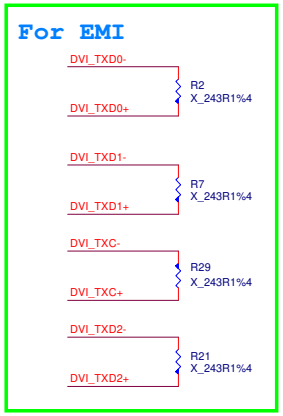


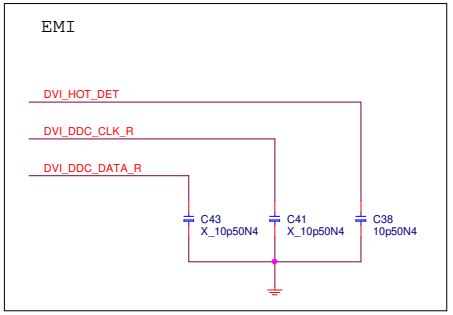












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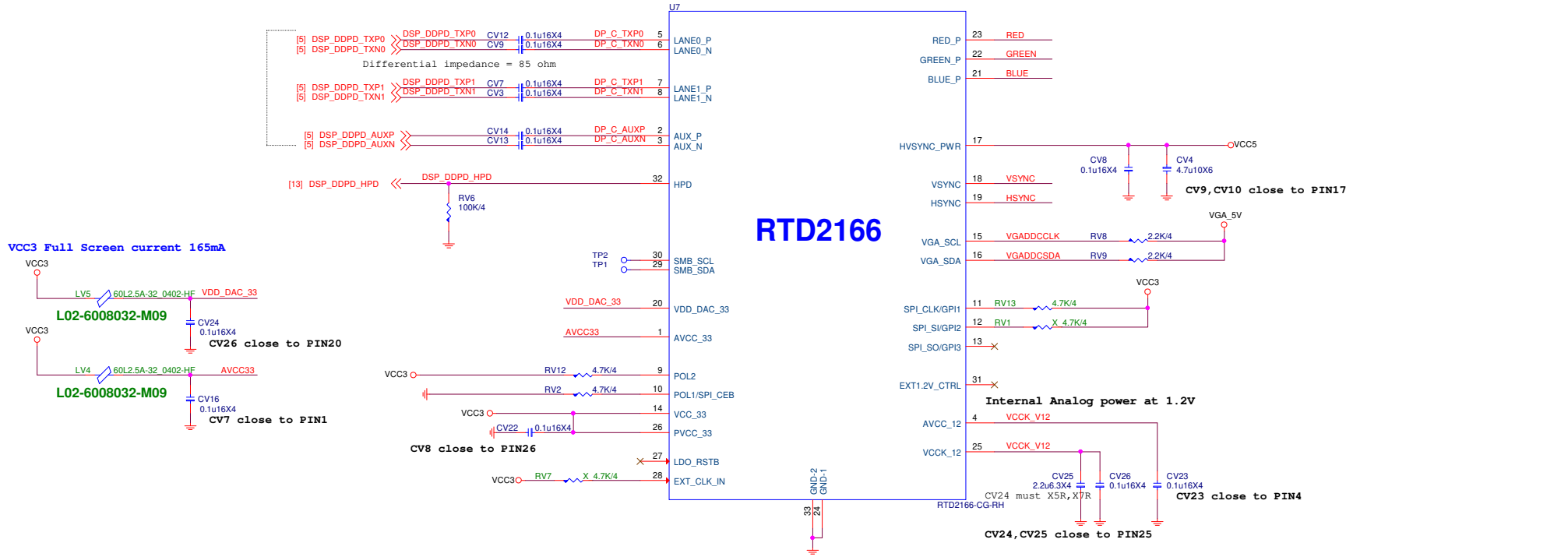
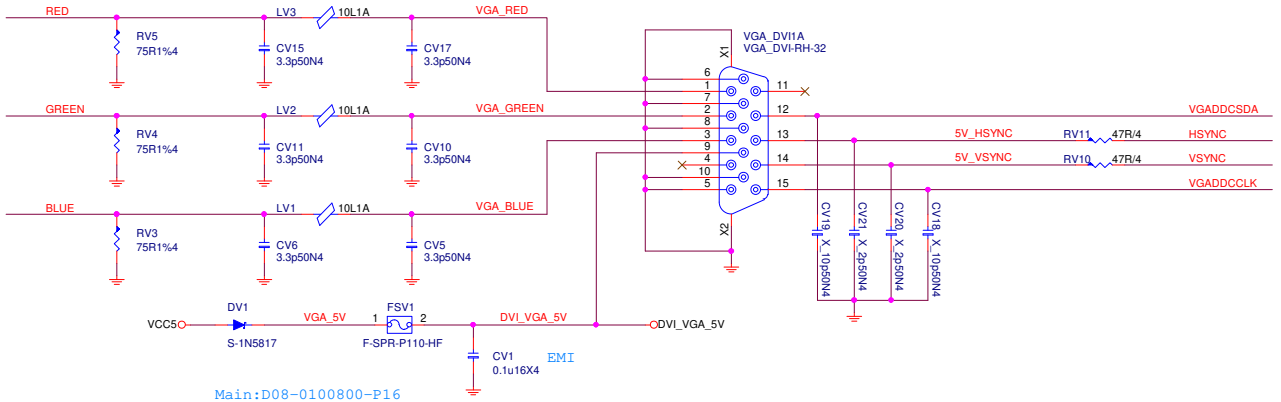
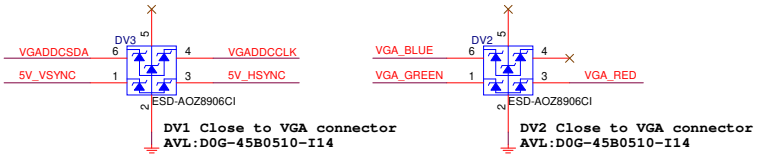
Note: If connect to eDP port,must confirm whether it support hot plug detection HPD and re-auxtraining







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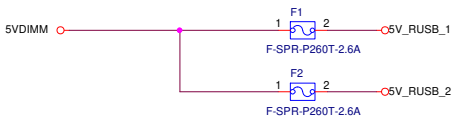
USB Port Power

Total:7.1A

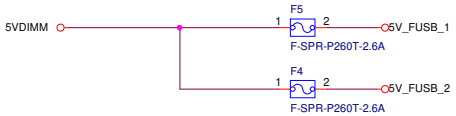
Total:4.3A



USB1: 1.8A

LAN_USB1+PS2_USB1 :0.5+1+1=2.5A

Total:2.8A



JUSB1 : 1A

JUSB2: 1.8A

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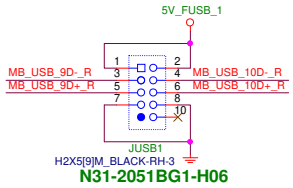
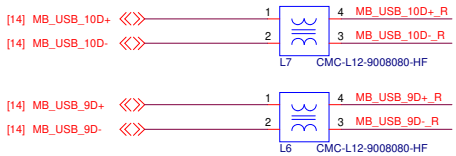
Front USB2.0

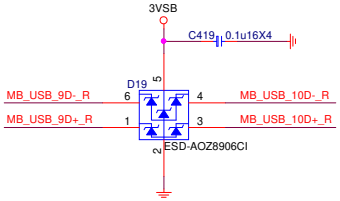
USB2.0 Port9.10

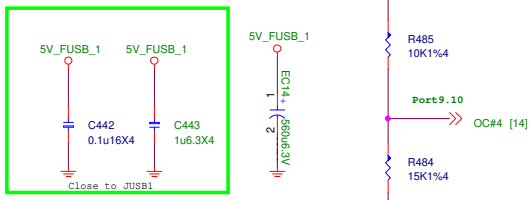
2A



N31-2051BG1-H06







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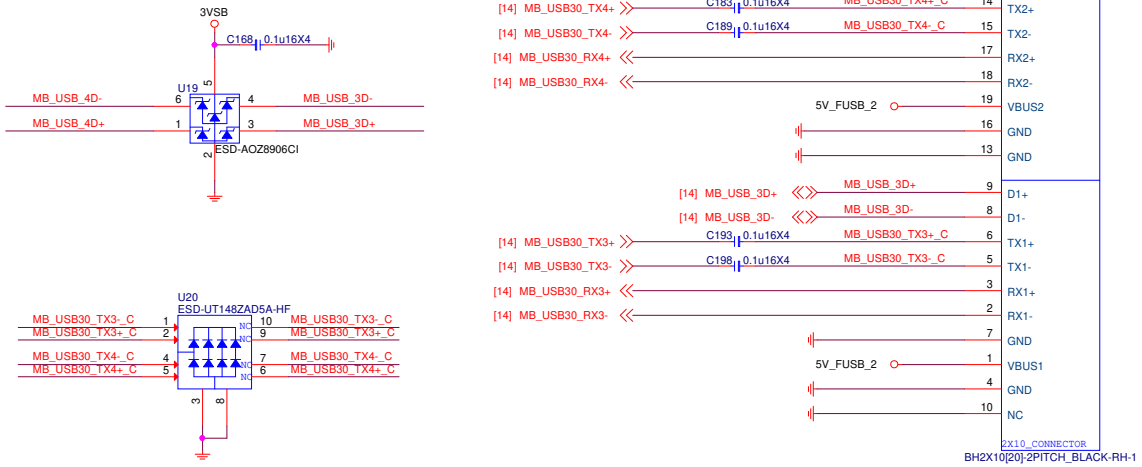
Front USB3.1 Gen1



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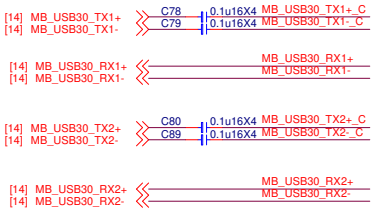
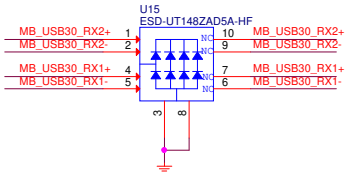
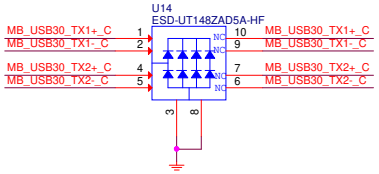
Rear USB3.0

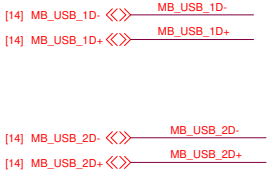
USB3.0 Port1.2
USB2.0 Port1.2

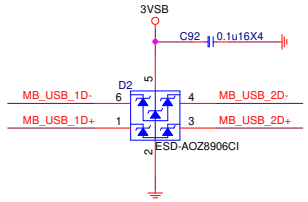
1.8A

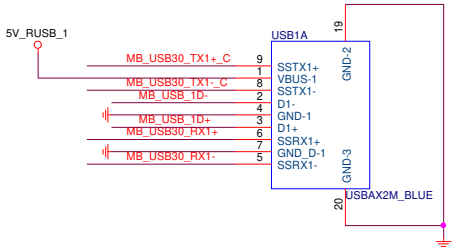


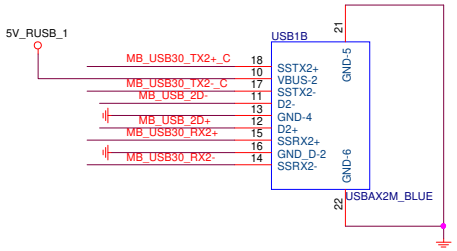


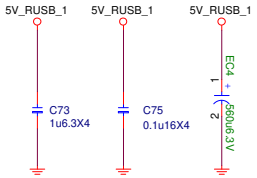


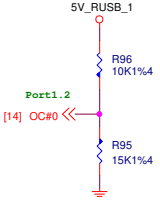












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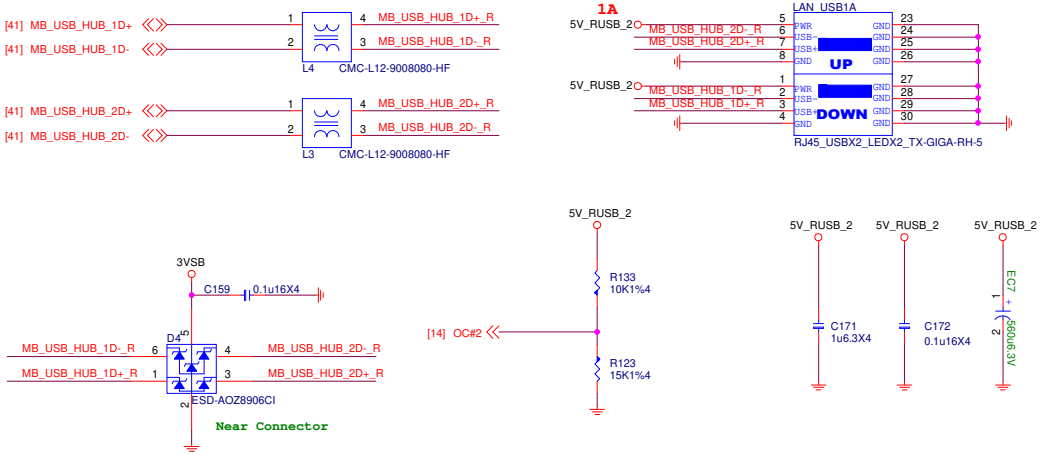
Rear LAN USB2.0

1A

JUSB1 HUB 1 . 2



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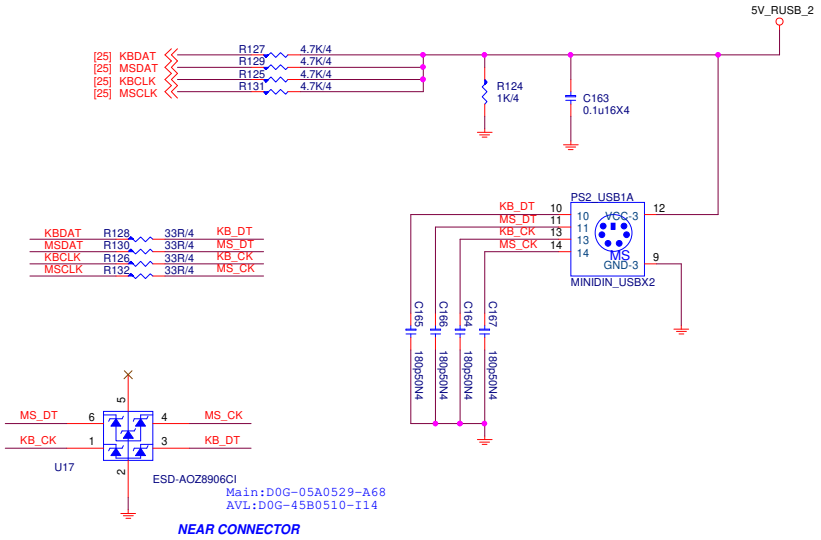
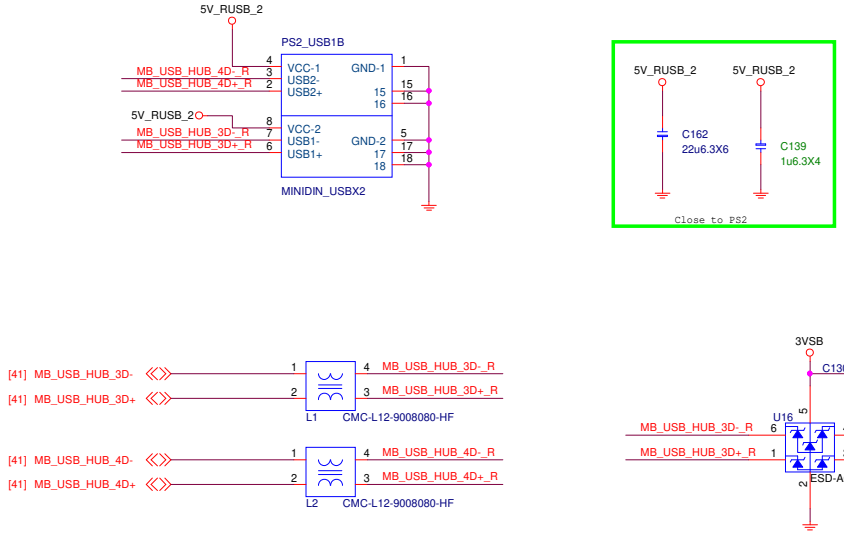
PS2 Connector



PS2 USB Connector

JUSB2 HUB 3.4



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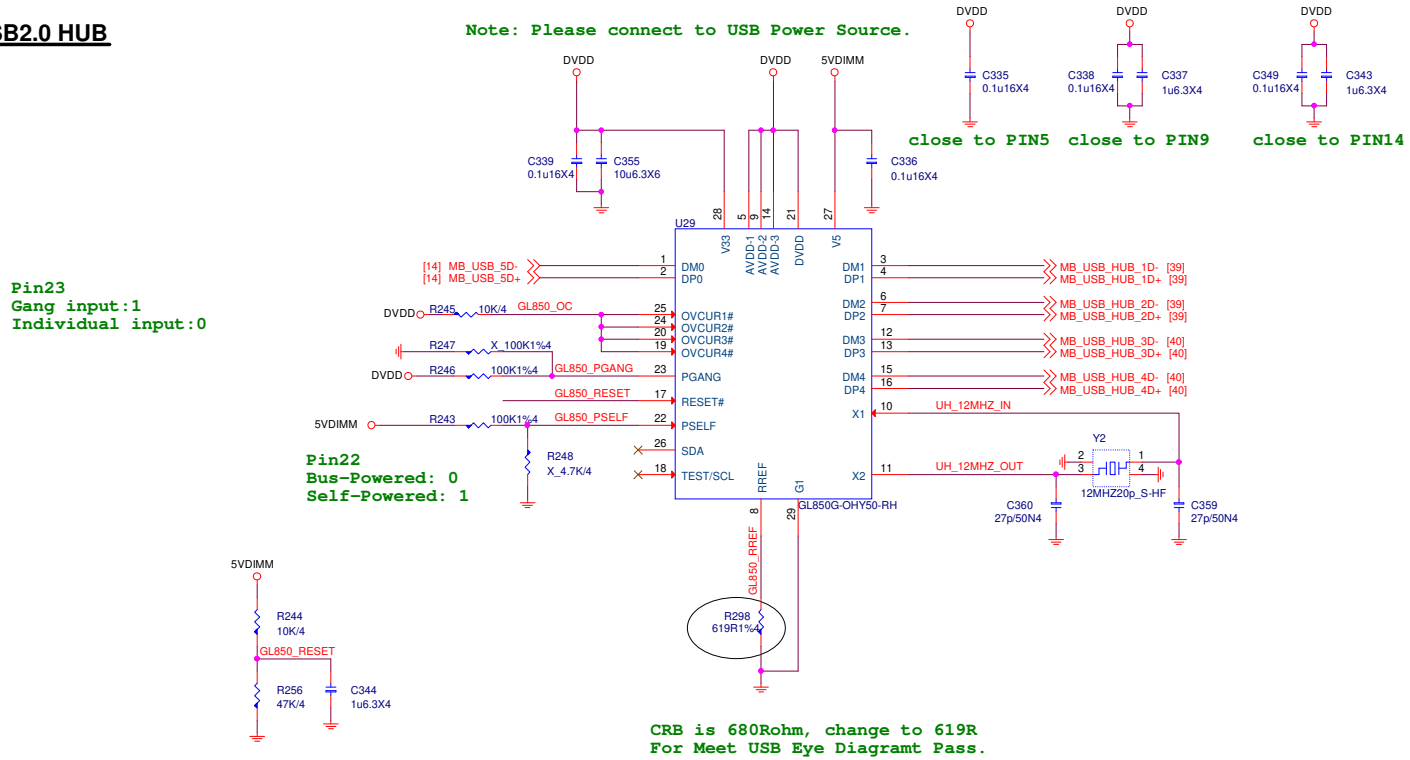
Rear USB2.0 HUB



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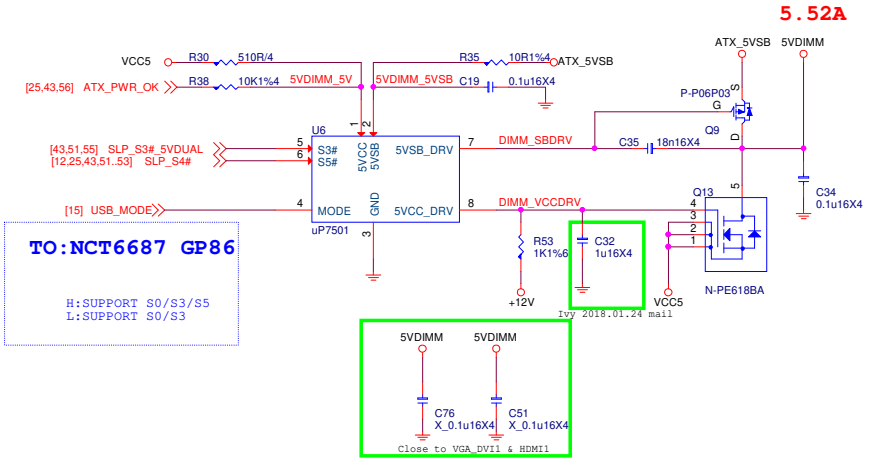
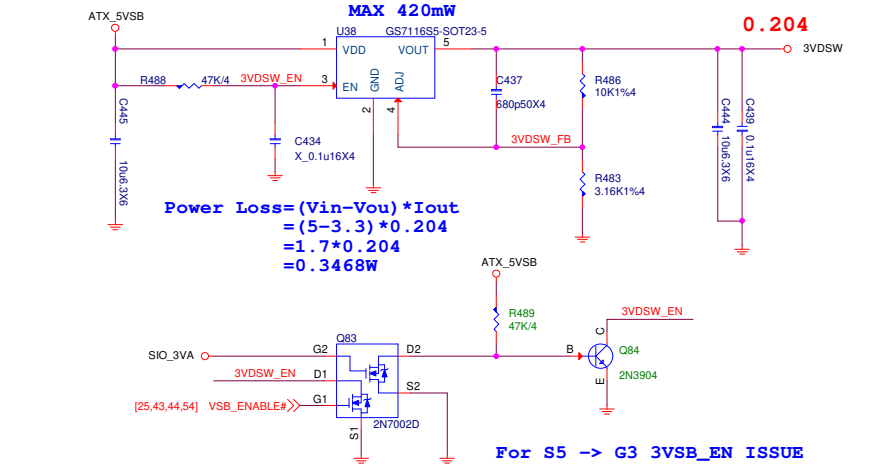
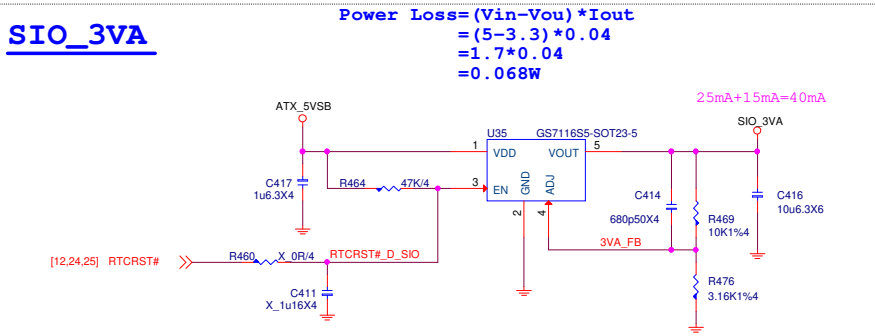
5VDIMM FOR DDR



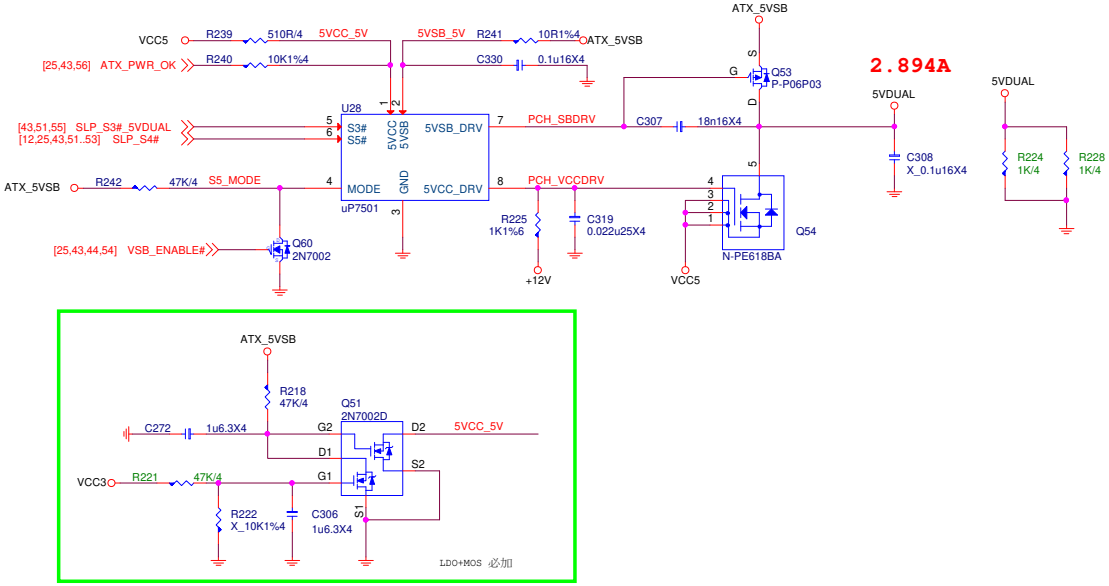
3VDSW



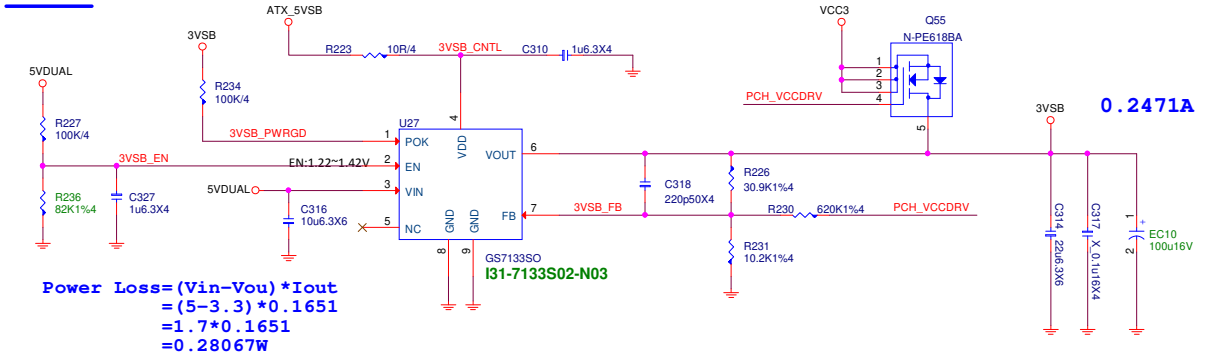
SIO_3VA

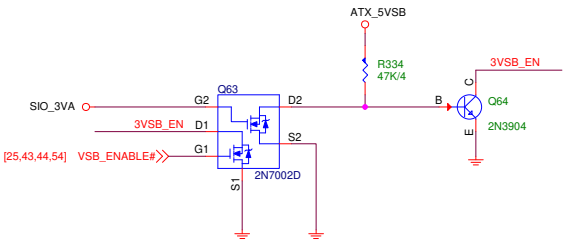


5VDUAL



3VSB





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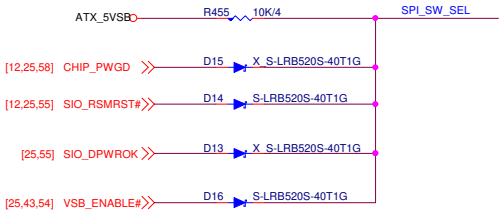
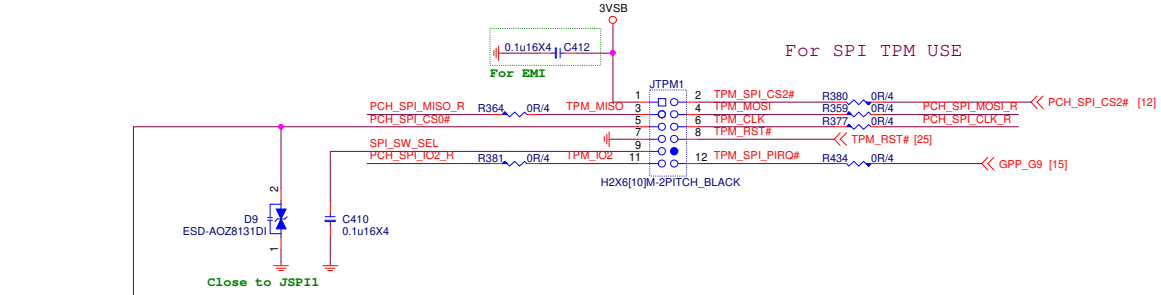
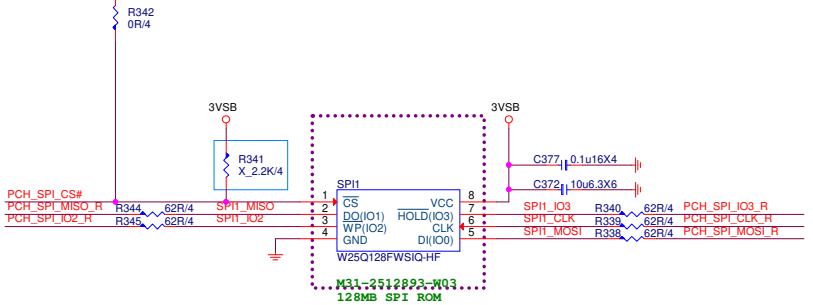
Module Stuff CHIP_PWGD,
But PCH_PWROK may ramp up before CHIP_PWGD.



For TL624-1.
DEEP Mode : Stuff D48/R2517
DSW Mode : Stuff D48/D49/R2517

For SPI TPM USE





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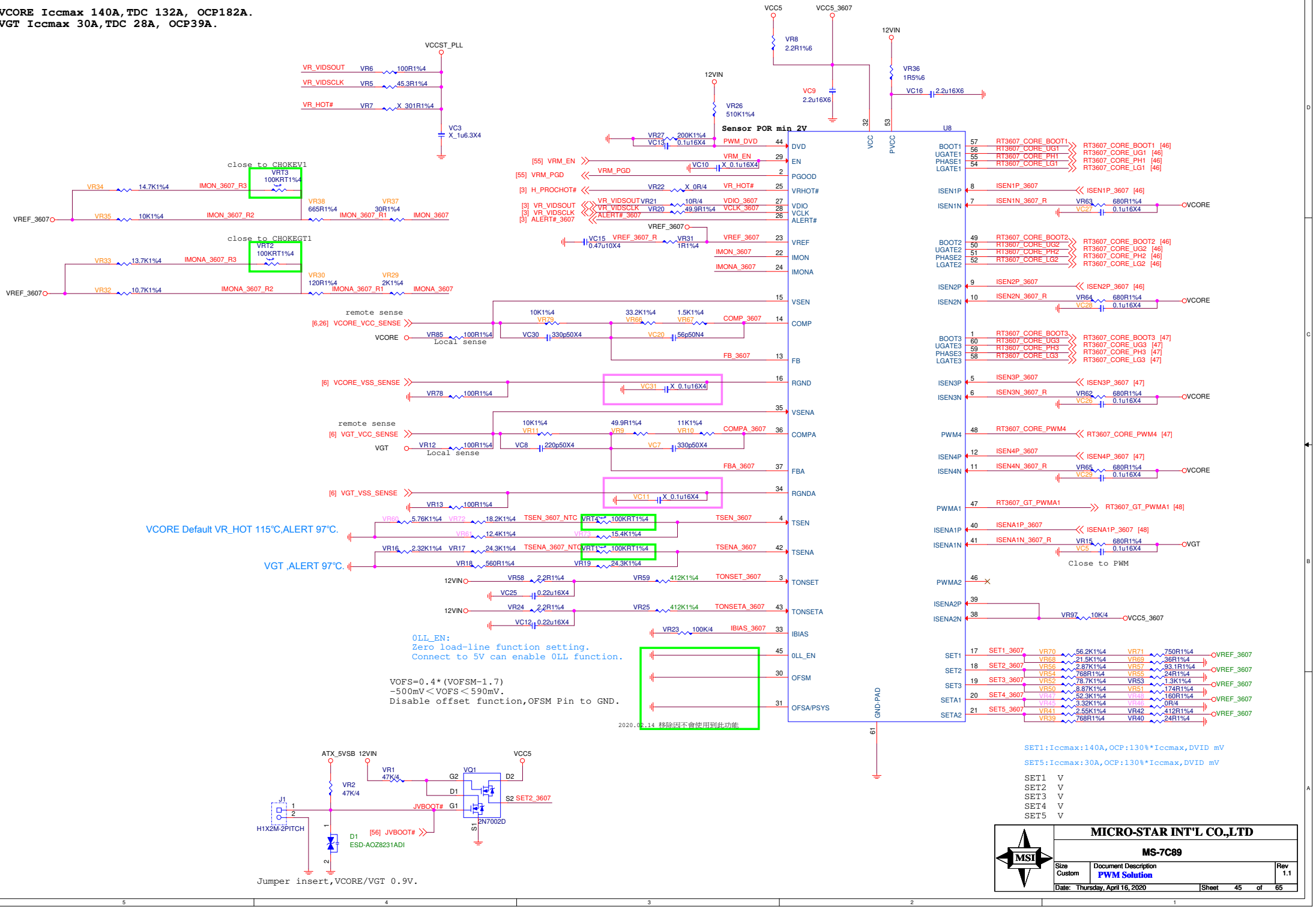
VCORE Iccmax 140A,TDC 132A, OCP182A.
VGT Iccmax 30A,TDC 28A, OCP39A.



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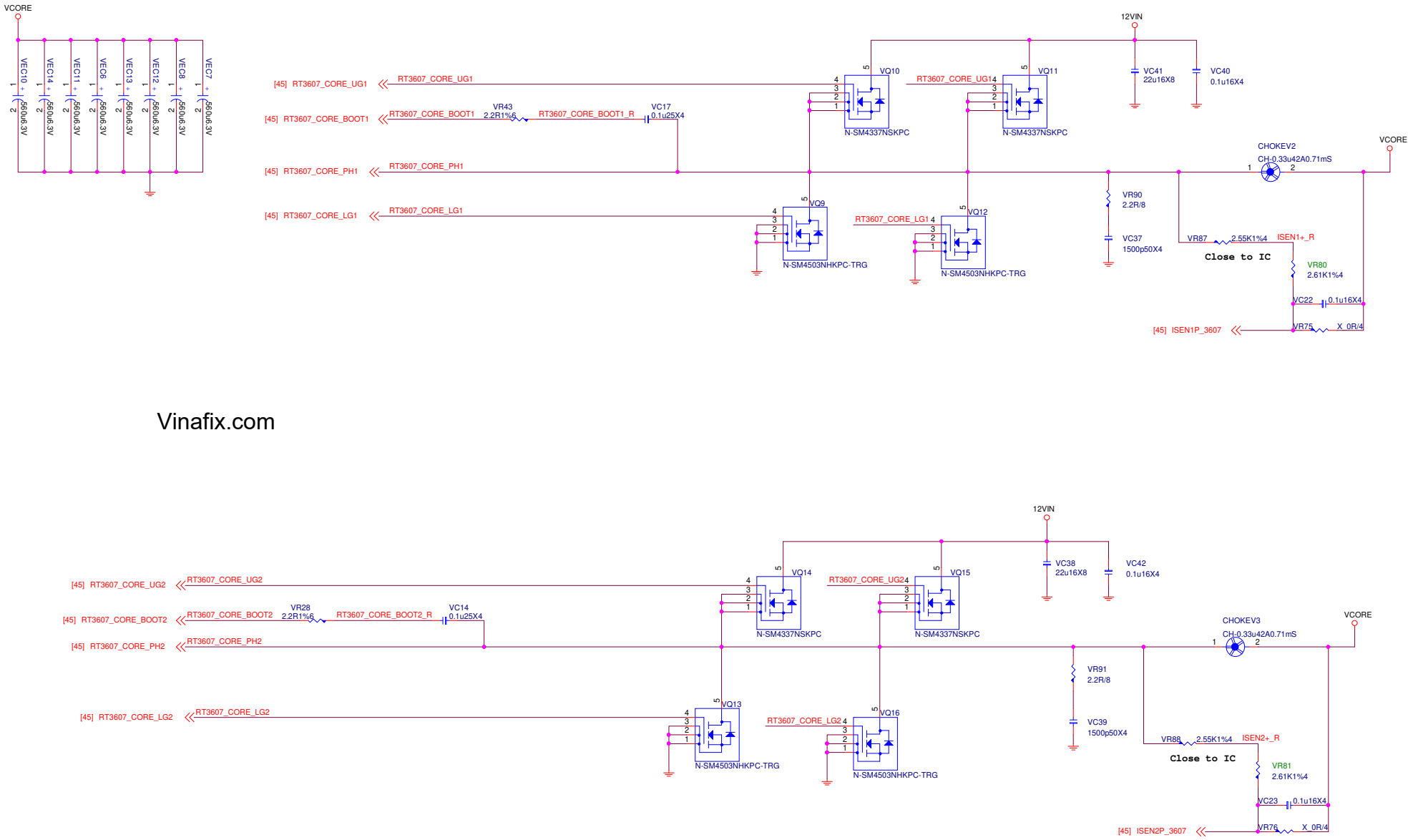

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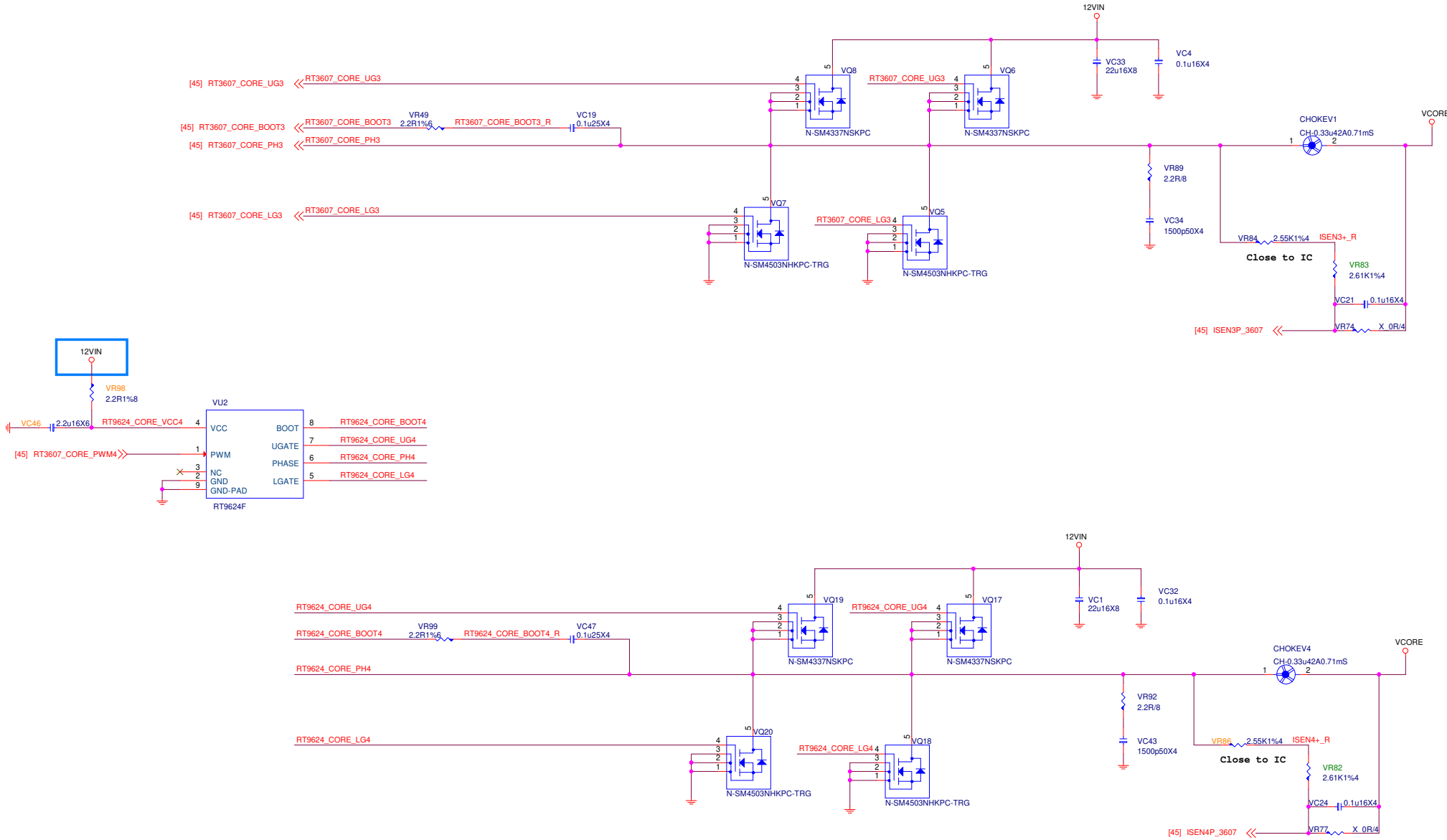

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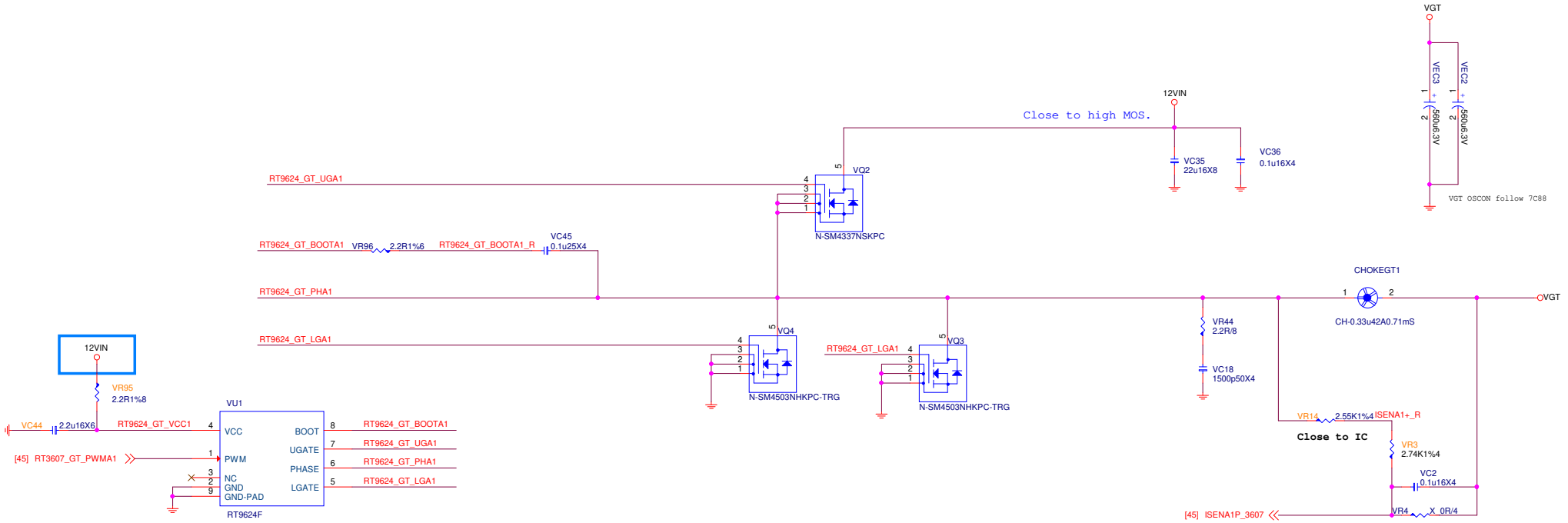
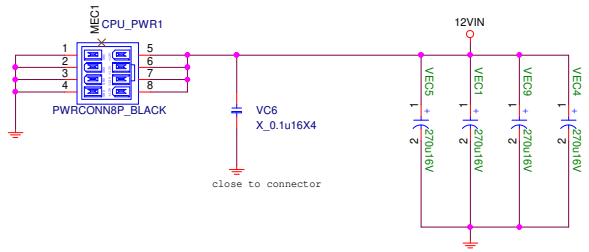


12VIN CONNECTOR



MSI	MICRO-STAR INT'L CO.,LTD	
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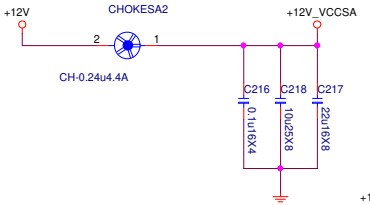
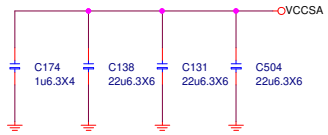
SA Power:1.05V,11.1A

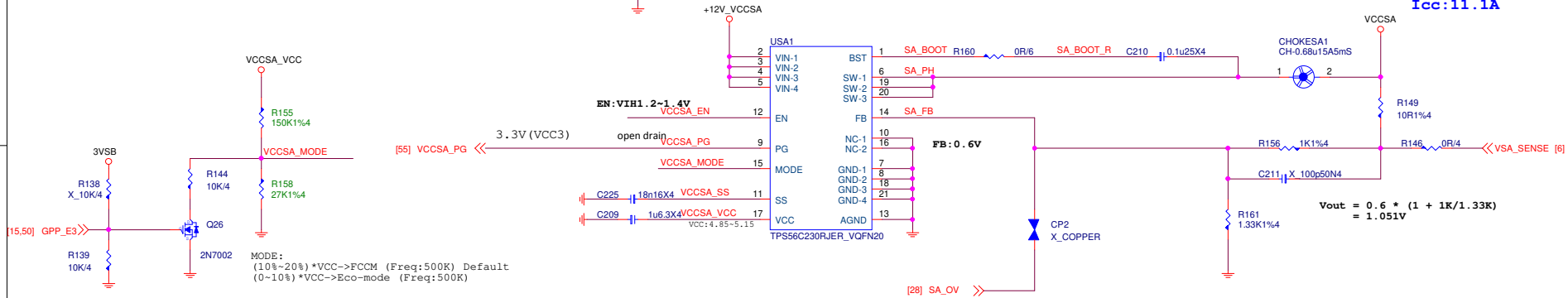
Current limit: 13A~18A, TYP=15A

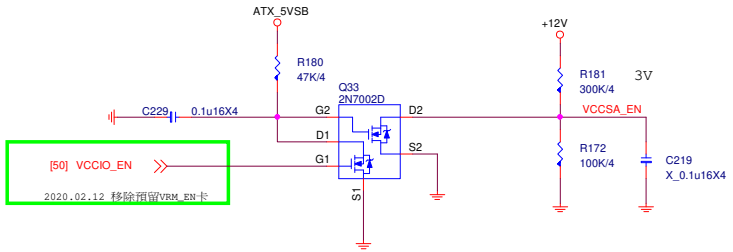


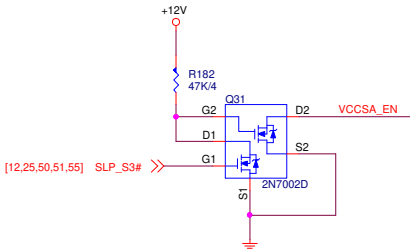
Irms1 = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
= 11.1 * 0.2825
= 3.136A

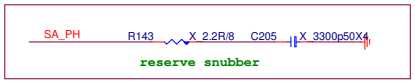


1.05V
Icc:11.1A









SLP_S3# assertion to VCC, VCCGT, VCCIO and VCCSA rails completely off.

SLP_S3# assertion to VR disabled max:1us

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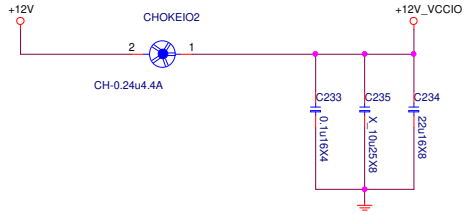
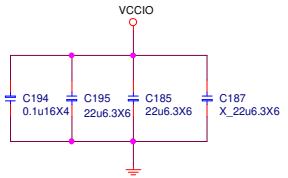
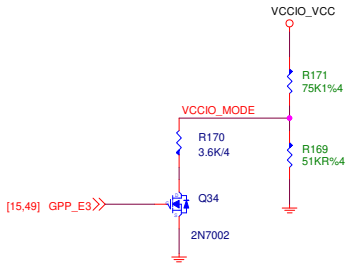
VCCIO Power 0.95,6.4A

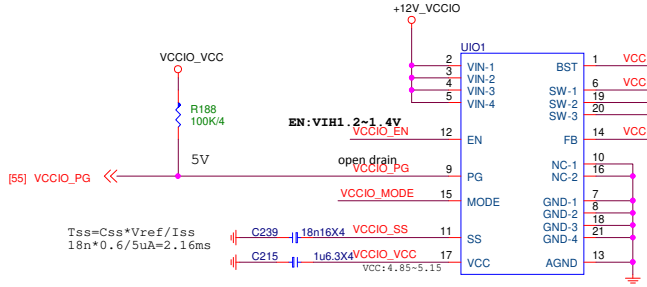
0.95V Icc:6.4A

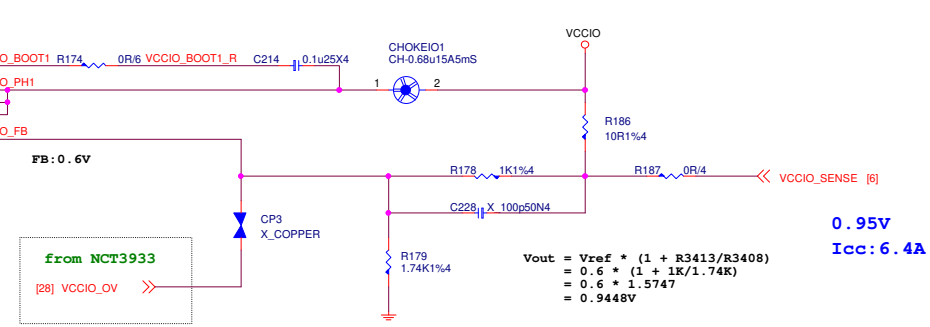


Irms1 = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
= 6.4 * 0.27
= 1.728A





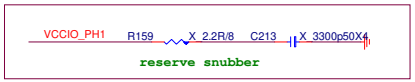


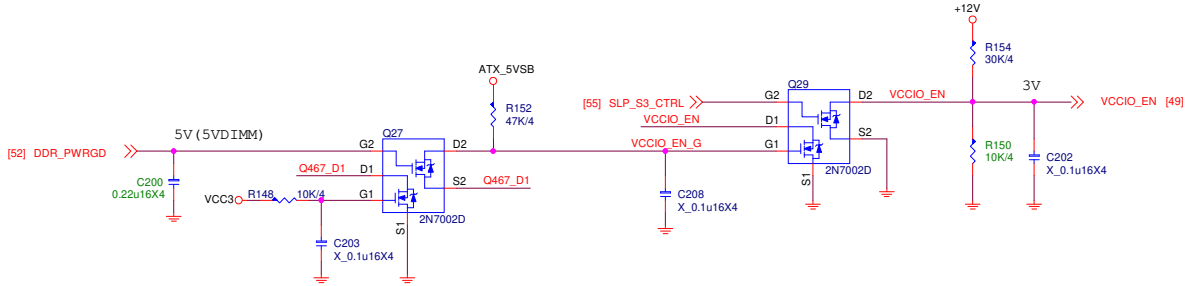


Vout = Vref * (1 + R3413/R3408)
= 0.6 * (1 + 1K/1.74K)
= 0.6 * 1.5747
= 0.9448V

0.95V
Icc:6.4A

MODE:
RM_H:75K,RM_L:51K->FCCM (Freq:800K) Default
RM_H:330K,RM_L:15K->Eco-mode (Freq:800K)





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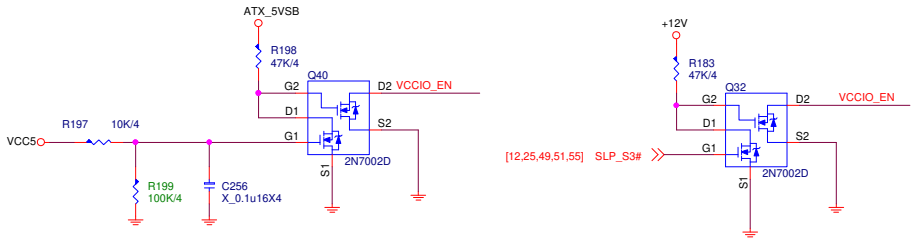

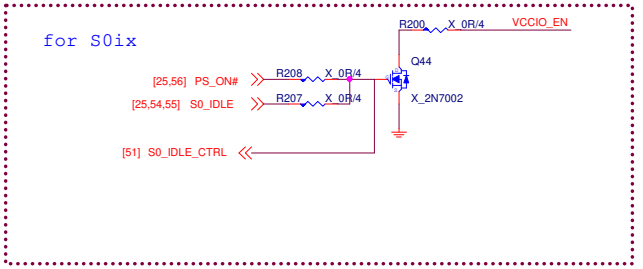

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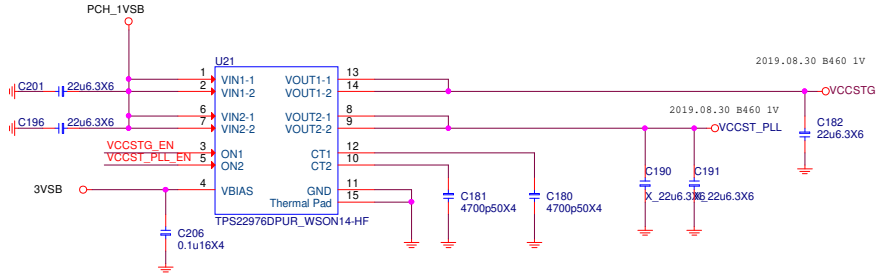
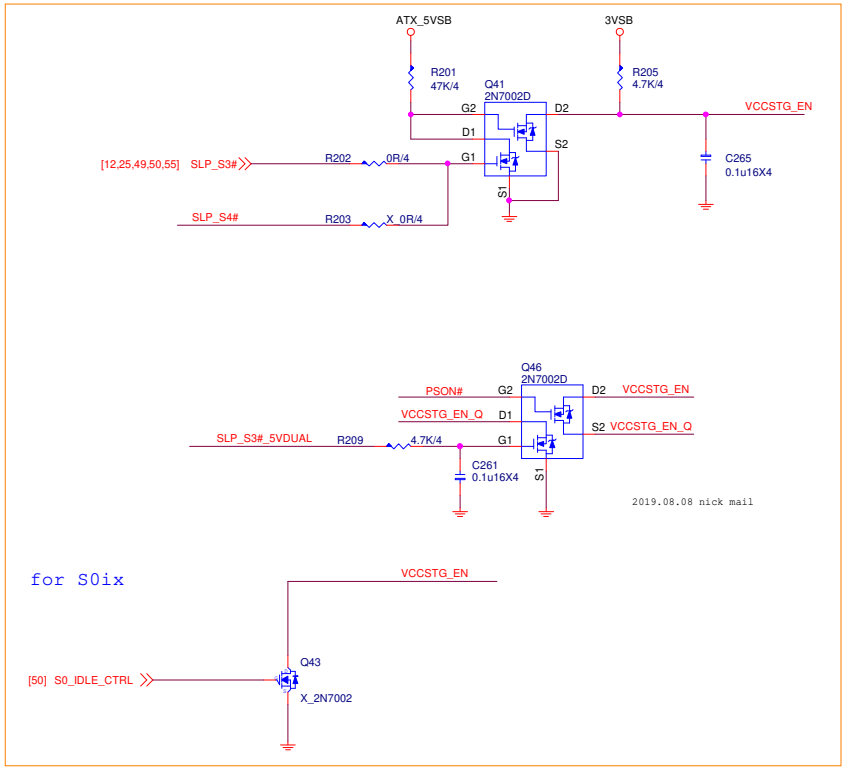
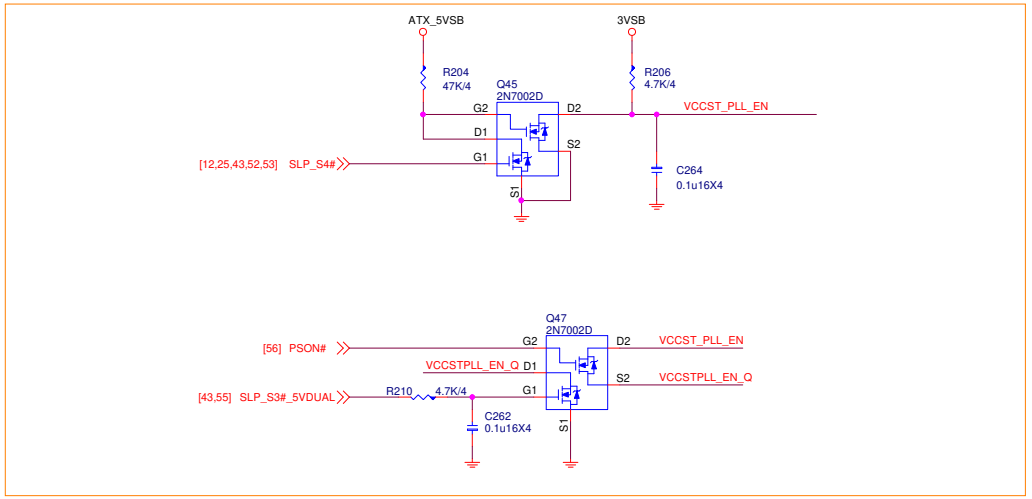
VCCST_PLL 1.0V; 0.45A
VCCSTG 1.0V; 0.2A

Power Loss1=(I*I)*Rds(on)
=(0.45*0.45)*0.022
=0.2025*0.022
=4.455mW

Power Loss2=(I*I)*Rds(on)
=(0.2*0.2)*0.022
=0.04*0.022
=0.88mW







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DDR4 Power:1.2V,12.15A

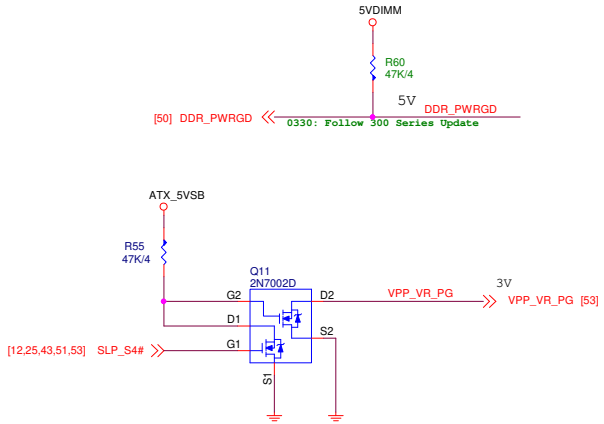
3.7A For CPU
7.85A For 2DIMM
0.375A For DDR VTT

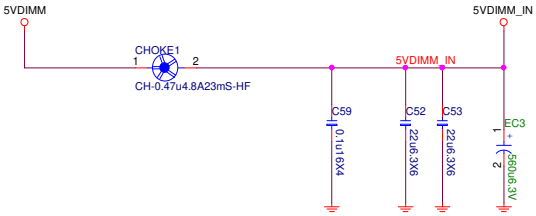
OCP = 12.5~16.6A; Choke Isat=32A

*Rlimit = Llimit * Rds * 10 /5uA*
*= 15.8*3.9*10/5 = 123.24K*

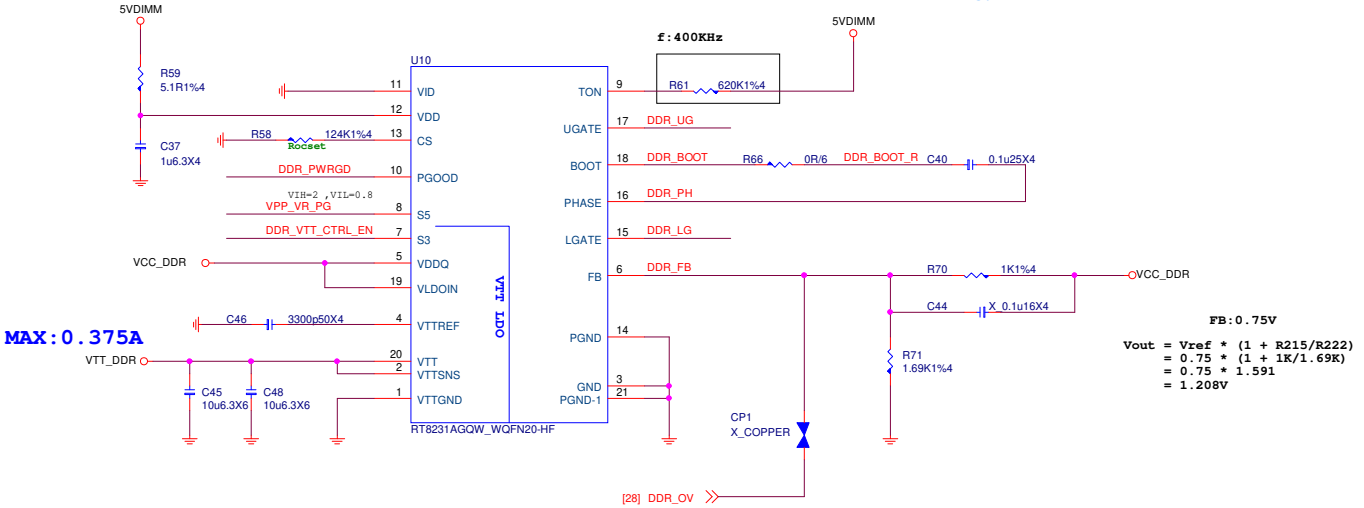
*0.4V<=Rlimit *5uA<=3V*
*123.24*0.005=0.6162*

D03-4503N0C-ST8
*Current limit= 124K*5uA/10/5.1mohm)=12.16A*
*Current limit= 124K*5uA/10/3.9mohm)=15.9A*





Irms = Iout * SQRT((Vout/Vin) * (1-(Vout/Vin)))
=12.15* 0.427
= 5.2A

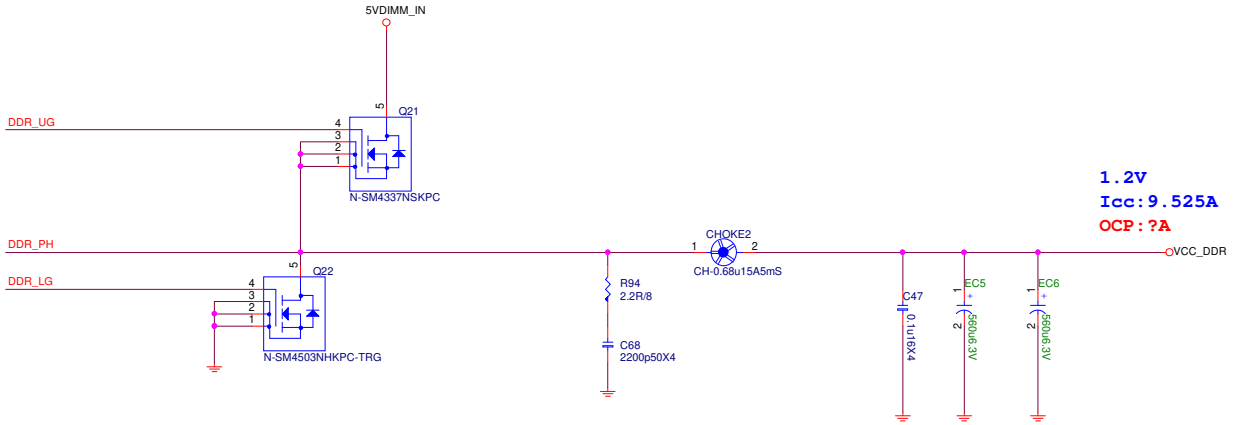


MAX:0.375A

FB:0.75V

Vout = Vref * (1 + R215/R222)
= 0.75 * (1 + 1K/1.69K)
= 0.75 * 1.591
= 1.208V

Irms = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
= 13.5* 0.427
= 5.765A



1.2V
Icc:9.525A
OCP:?A

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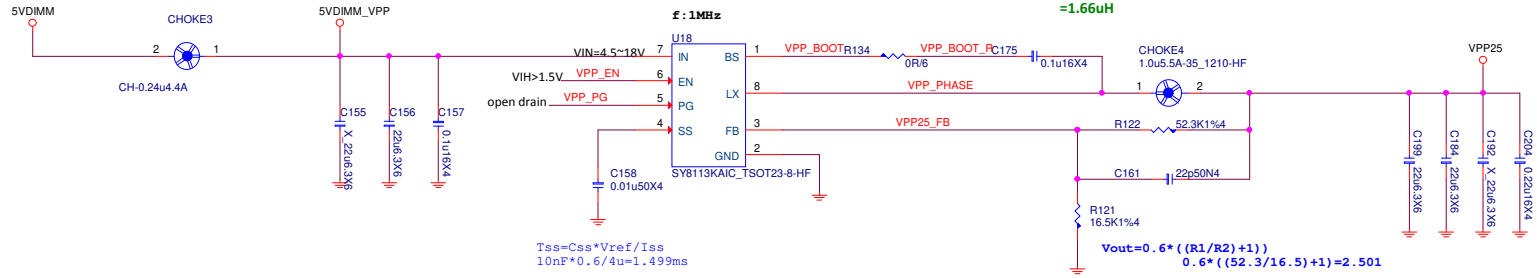
VPP2.5V Power:2.5V,3A

IC OCP:4.6

```
Irms = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
     = 3 * 0.5
     = 1.5A
```

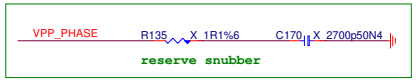
L=(Vout-(1-Vout/Vin))/(Fsw*Iout*0.4)
=1.66uH

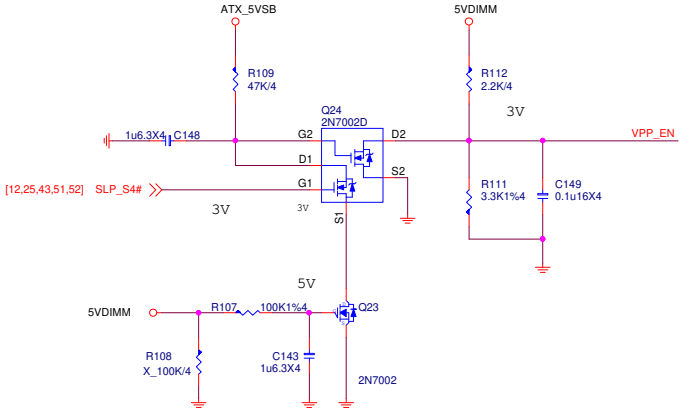
f:1MHz

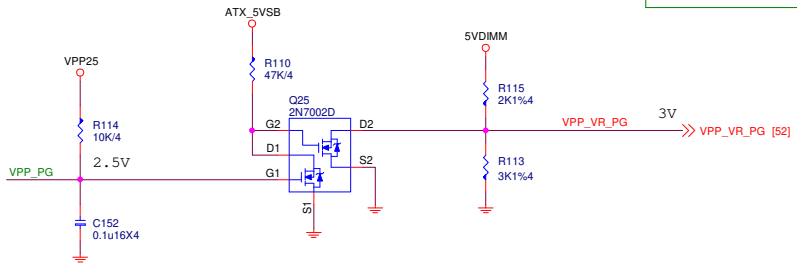


Tss=Css*Vref/Iss
10nF*0.6/4u=1.499ms

Vout=0.6*((R1/R2)+1))
0.6*((52.3/16.5)+1)=2.501







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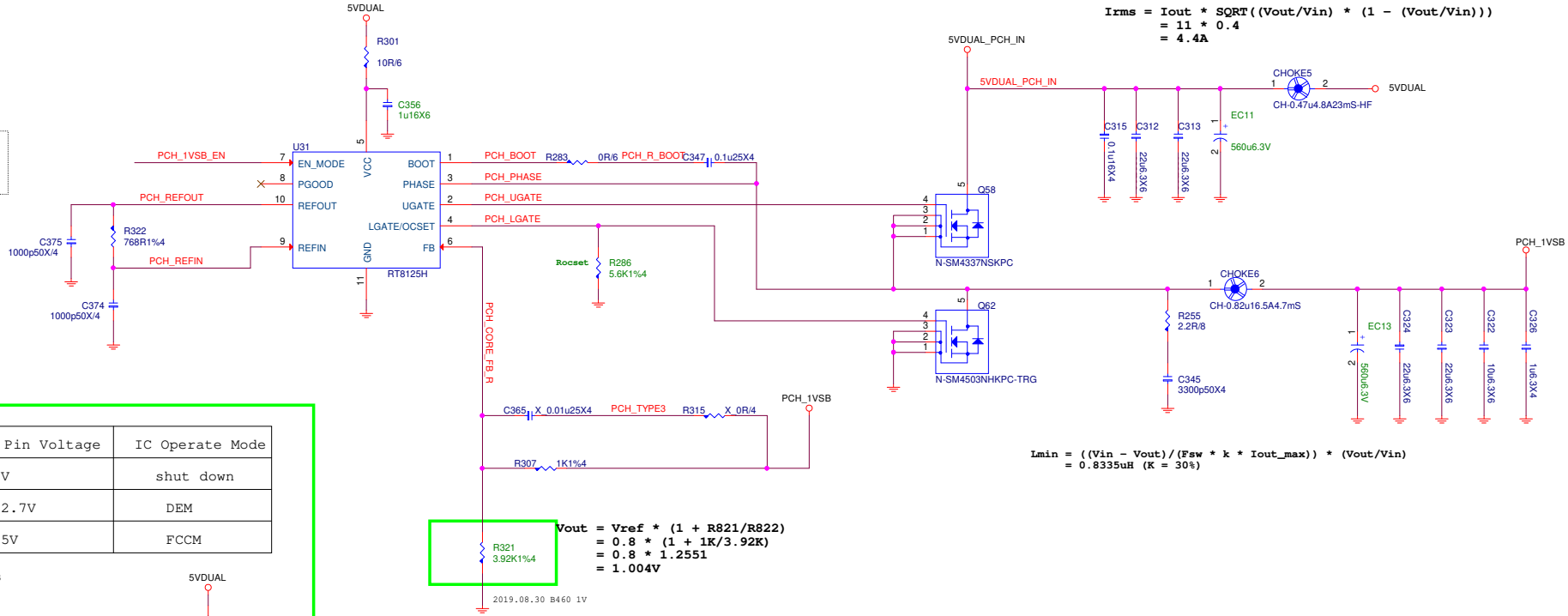
PCH_1VSB Power:1V,9.208+0.65=9.858A

OCP = 11.66~15.55A

Iocp =Rocset* Iocset /Rdson(low)
=5.6K*10uA/3.9m
=14.36A
Iocp =Rocset* Iocset /Rdson(max)
=5.6K*10uA/5.1m
=10.98A

Rdson(Low Side) 5V
D03-4503N0C-ST8:3.9 ~5.1 mohm

Note: Rocset(min)=5K

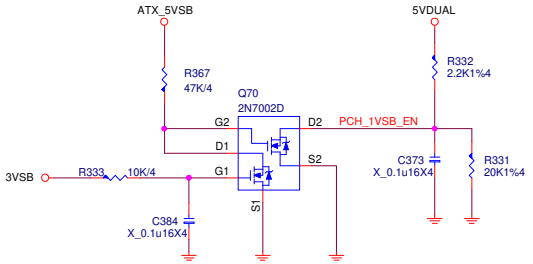


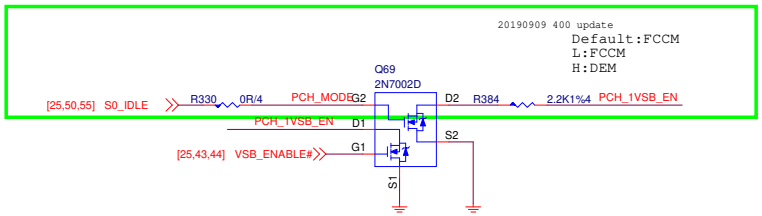
Irms = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
= 11 * 0.4
= 4.4A

Lmin = ((Vin - Vout)/(Fsw * k * Iout_max)) * (Vout/Vin)
= 0.8335uH (K = 30%)

Vout = Vref * (1 + R821/R822)
= 0.8 * (1 + 1K/3.92K)
= 0.8 * 1.2551
= 1.004V

EN_MODE Pin Voltage	IC Operate Mode
<0.4V	shut down
2.1~2.7V	DEM
4.3~5V	FCCM





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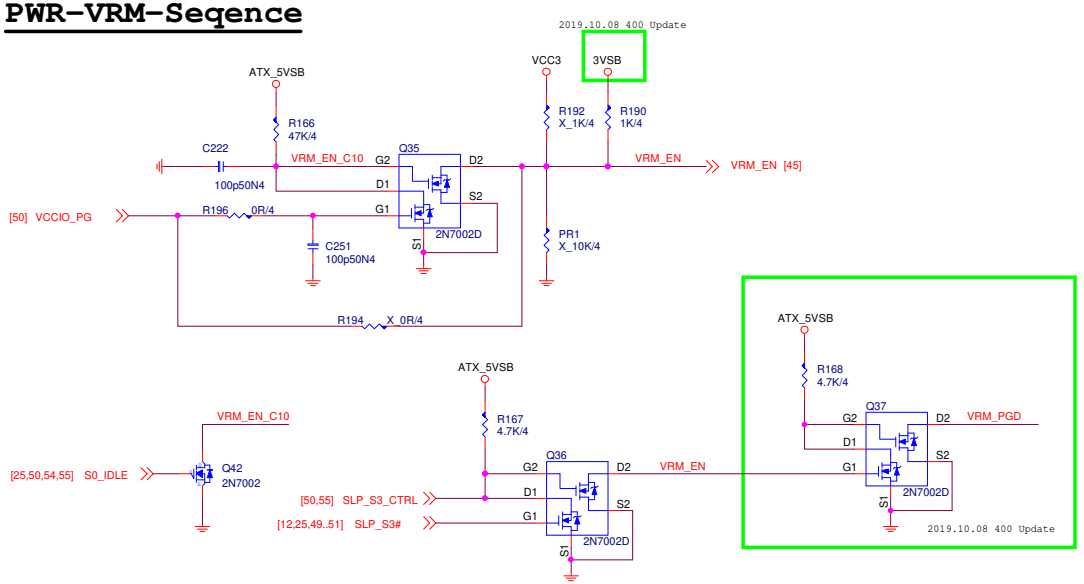
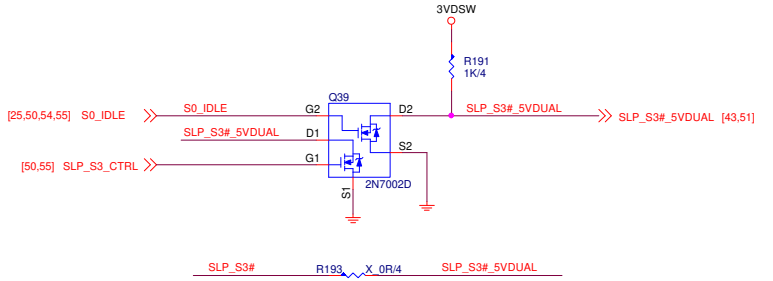
PWR-VRM-Seqence

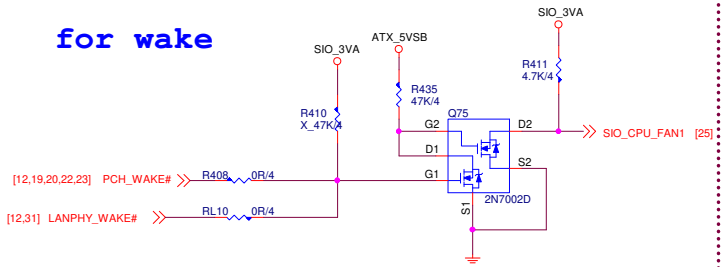


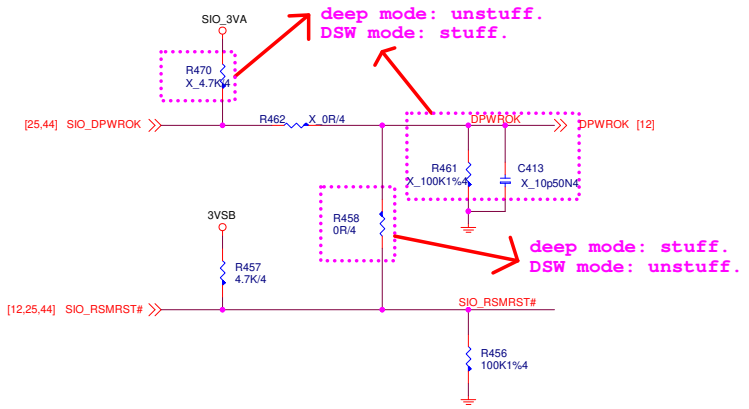
for 5VDIMM and 5VDUAL

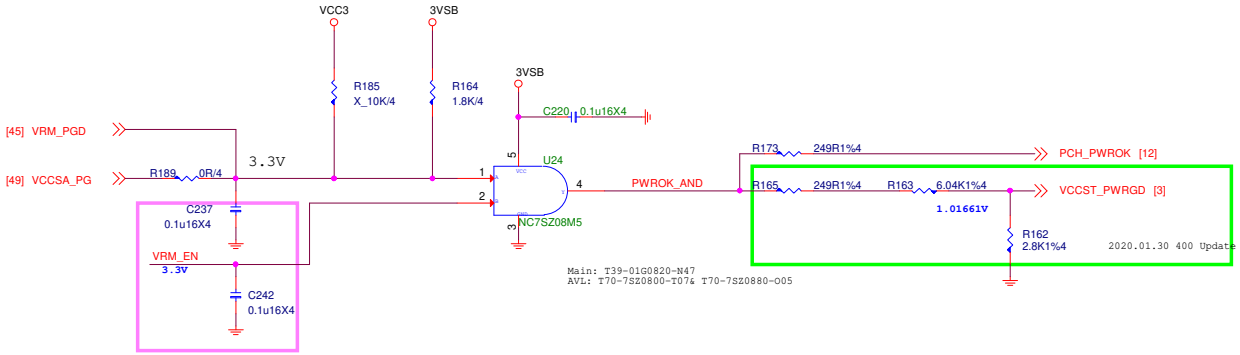
for S0ix



for wake







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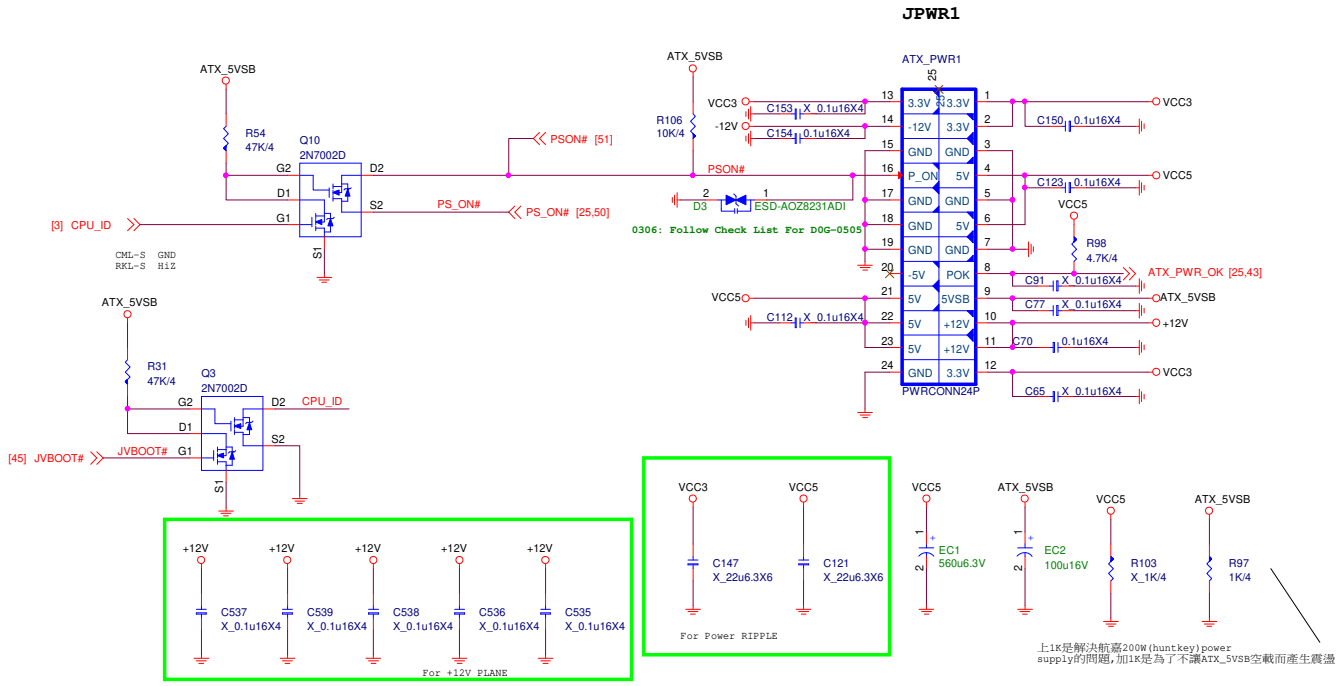
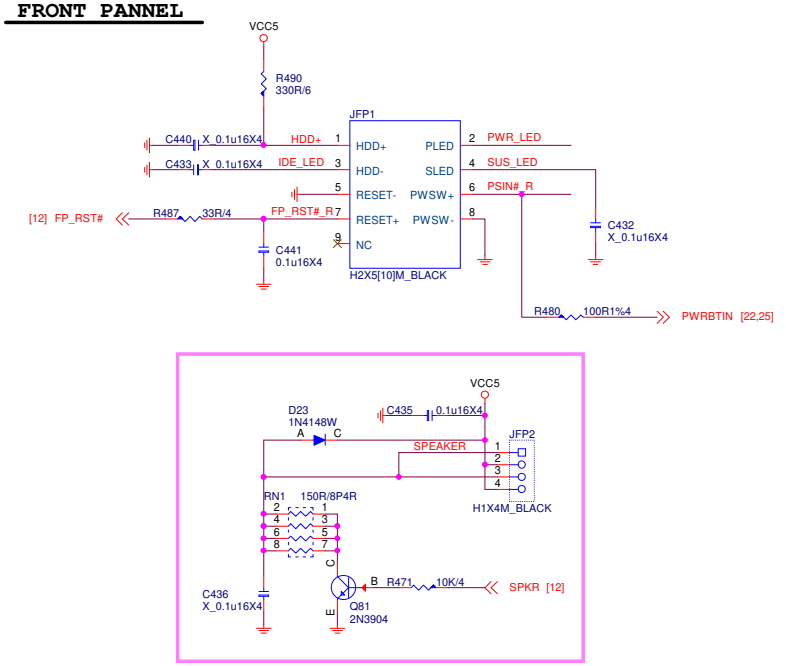
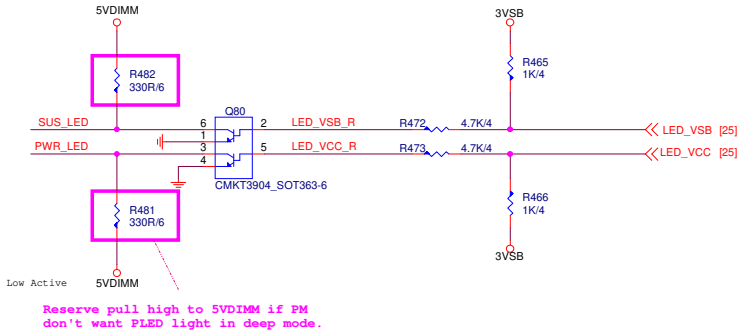
ATX POWER CONNECTOR

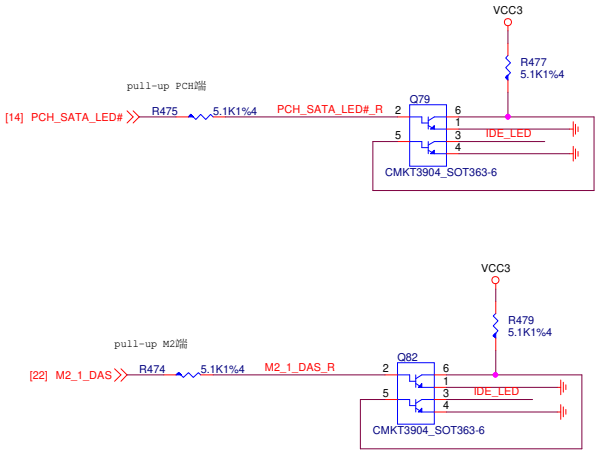


FRONT PANNEL



Front Panel LED





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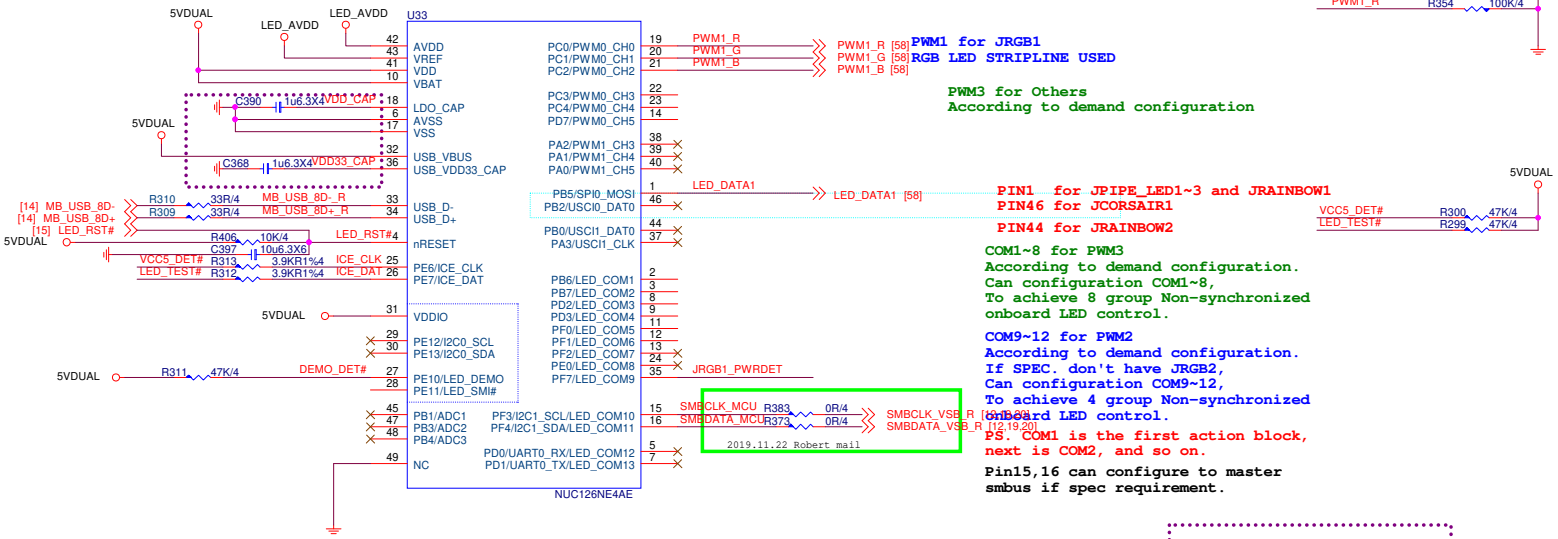
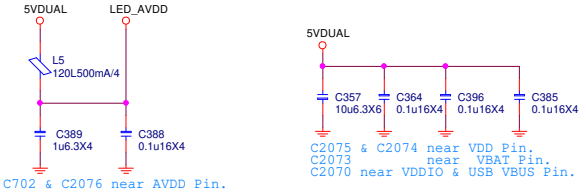
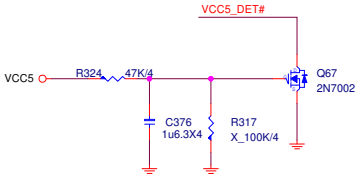
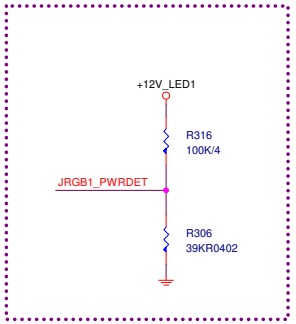
LED MCU

If you use ADC function,need to separate VREF from AVDD and 4_09VREF stuff for VREF.







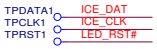


Control	Net Name	PWM USE
PCH	LED_DATA1	No Use
AUDIO Cover	LED_GPIO_01	No Use
MOS/IO cover	LED_GPIO_02	No Use
JRAINBOW1	LED_GPIO_03	No Use
JCORSAIR1	LED_DATA2	No Use
JRGB1/JRGB2	PWM1/ PWM2	PWM1
Board Side LED	COM 1~8	No Use
Board Side LED	COM 9~16	No Use

IF no JPWRLED1 & JPIPE_LED spec

MCU can powered by 5VDUAL directly.
LED_VCC5 replace with 5VDUAL.

JT1 for FW update



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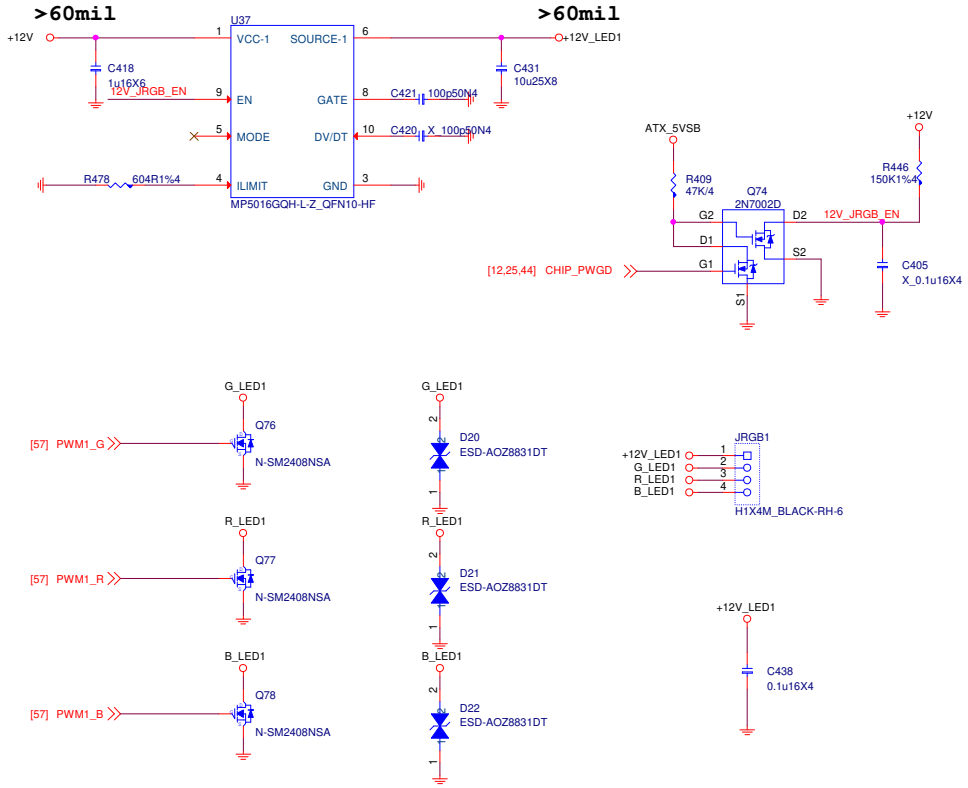
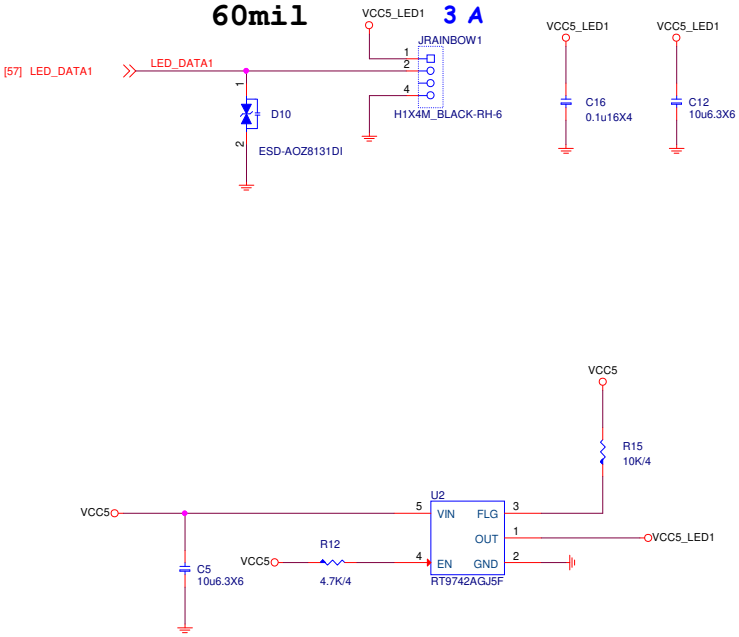
JRGB1



JRAINBOW1 LED



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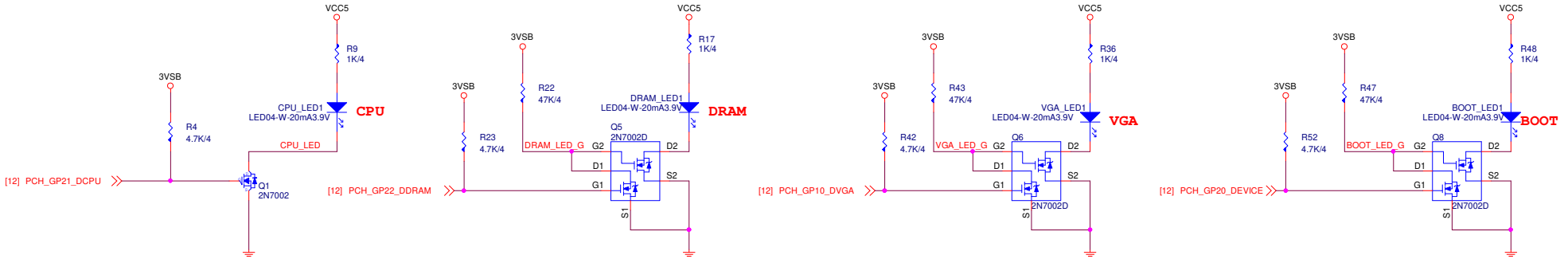
EZ Debug LED



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PCB1

7C89-1.1

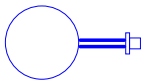
PK0-07C8911-G37
PK0-07C8911-E48

CPU_H1

CPU
鐵座

CPU_H1

BAT1_X2



BAT-CR2032

Heat Sink

HS_PCH1

PCH
Shink

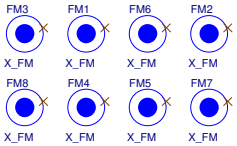
MCE1

MCE2

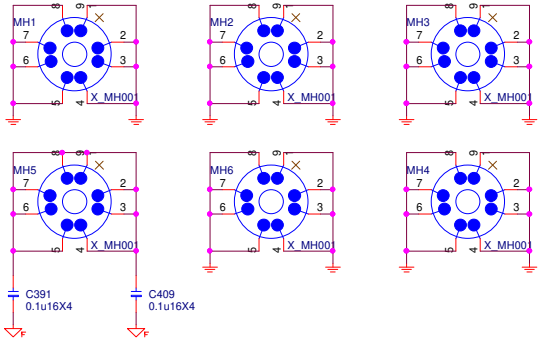
E31-0409430-K08

Simulation

Optical Fiducial Marks-120



Mounting Holes



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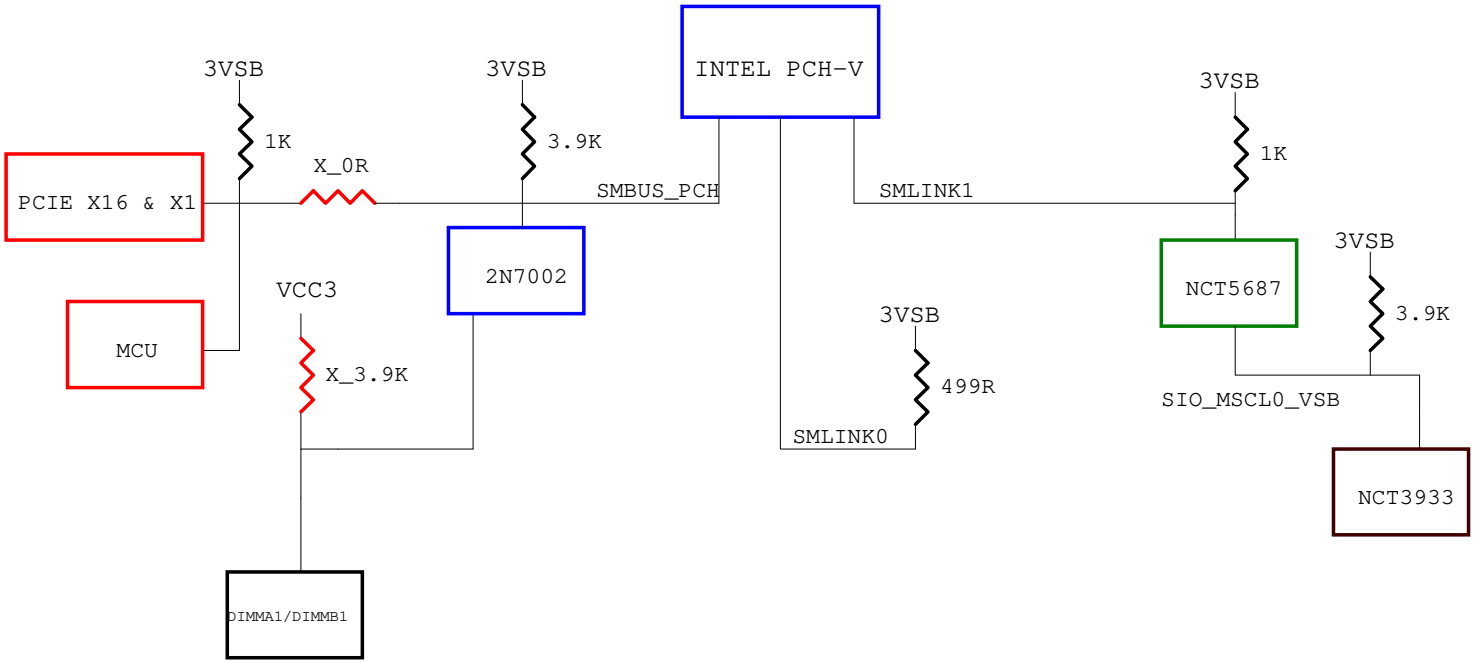

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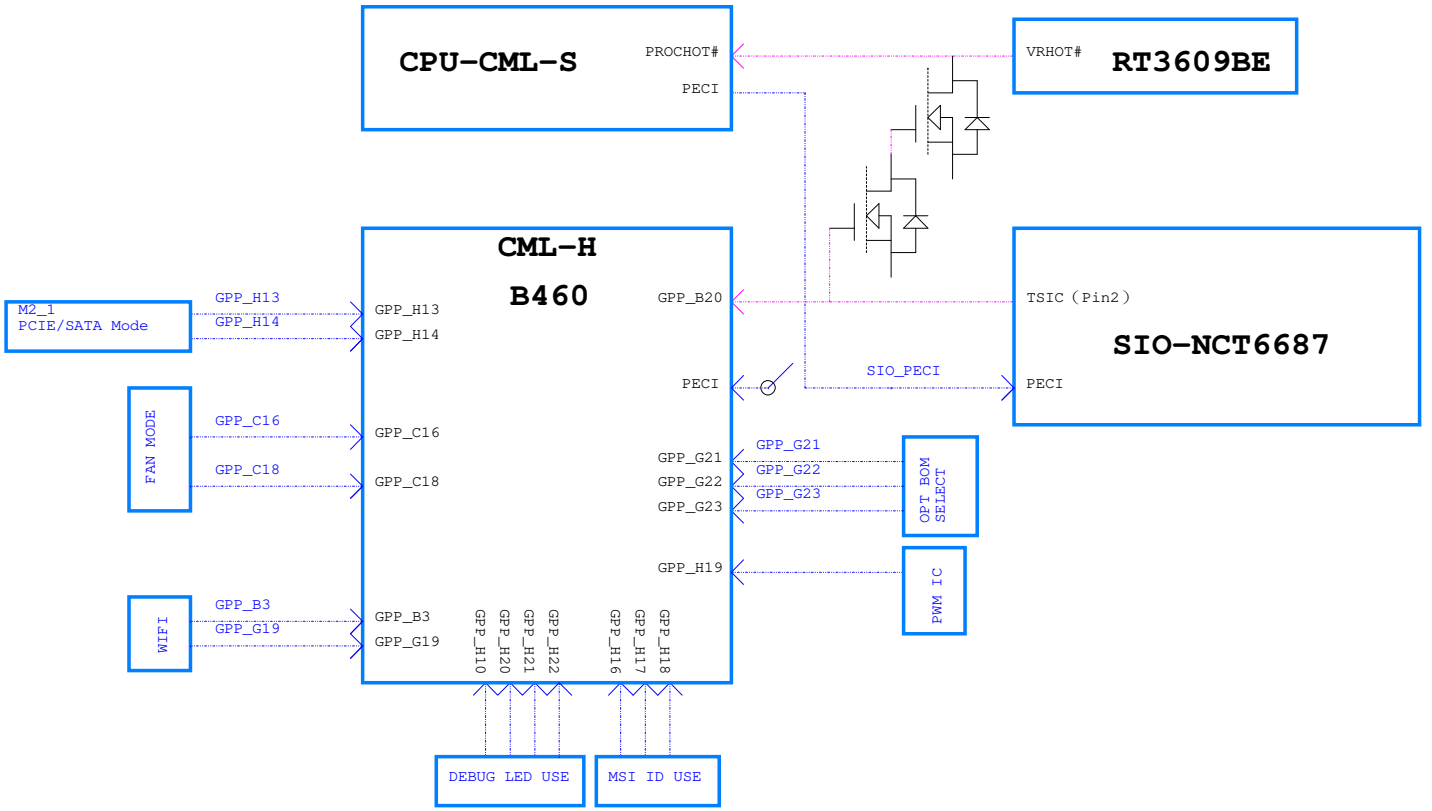
ALL GPIO SUPPORT SCI

GPP_XX	DEFUALT	NMI/SMI
GPP_B14	GPO	Y
GPP_B20	GPI	Y
GPP_B23	GPO	Y
GPP_C22~23	GPI	Y
GPP_D0~4	GPI	Y
GPP_E0~8	GPI	Y
GPP_I0~3	GPI	Y

1.8V or 3.3V
GPP_A0~A23
GPP_B0~B23
GPP_C0~C23
GPP_D0~D23
GPP_E0~E12
GPP_F0~F23
GPP_G0~G23
GPP_H0~H23

3.3V
GPP_I0~I10
GPD0~11



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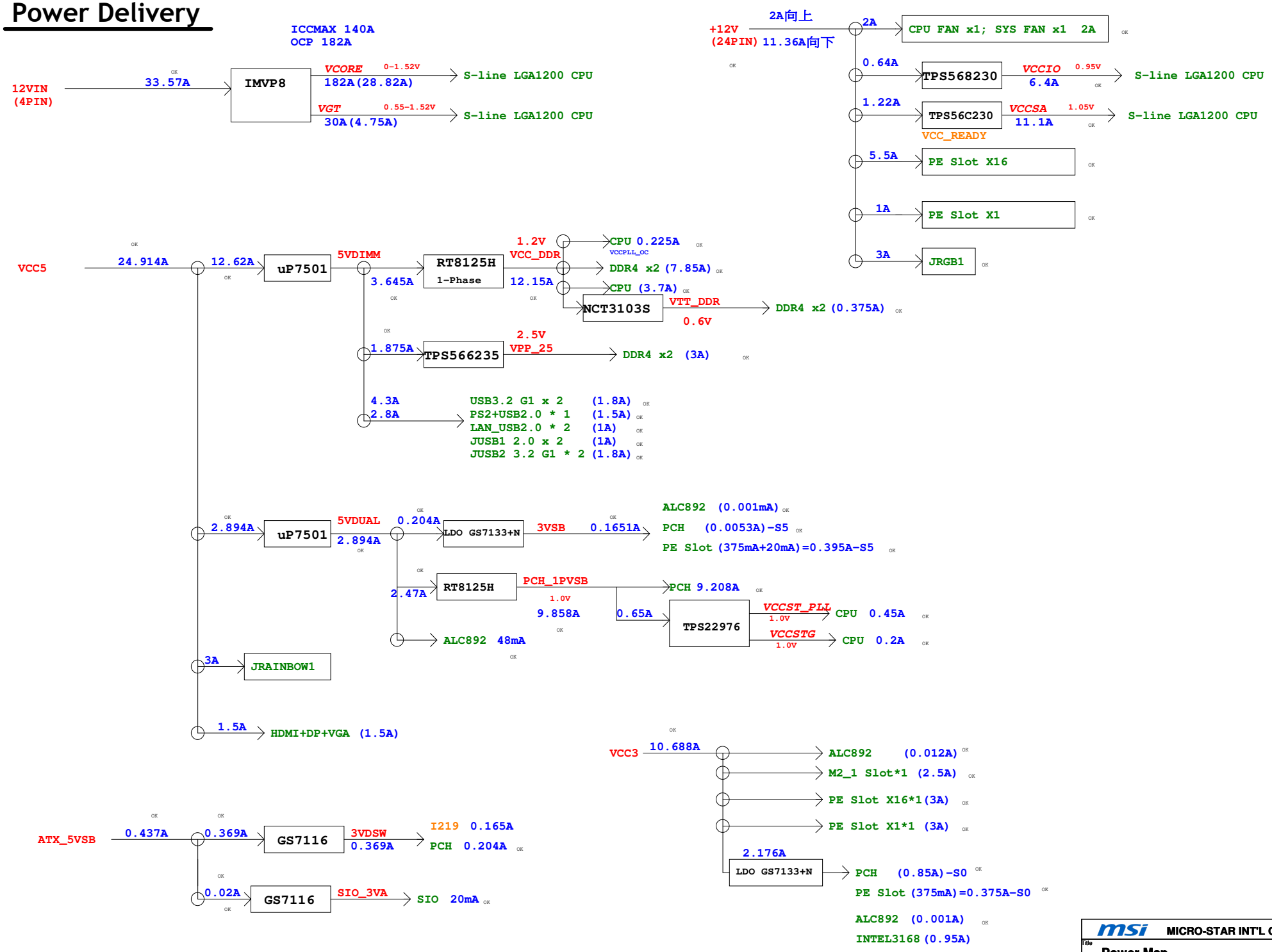
Power Delivery



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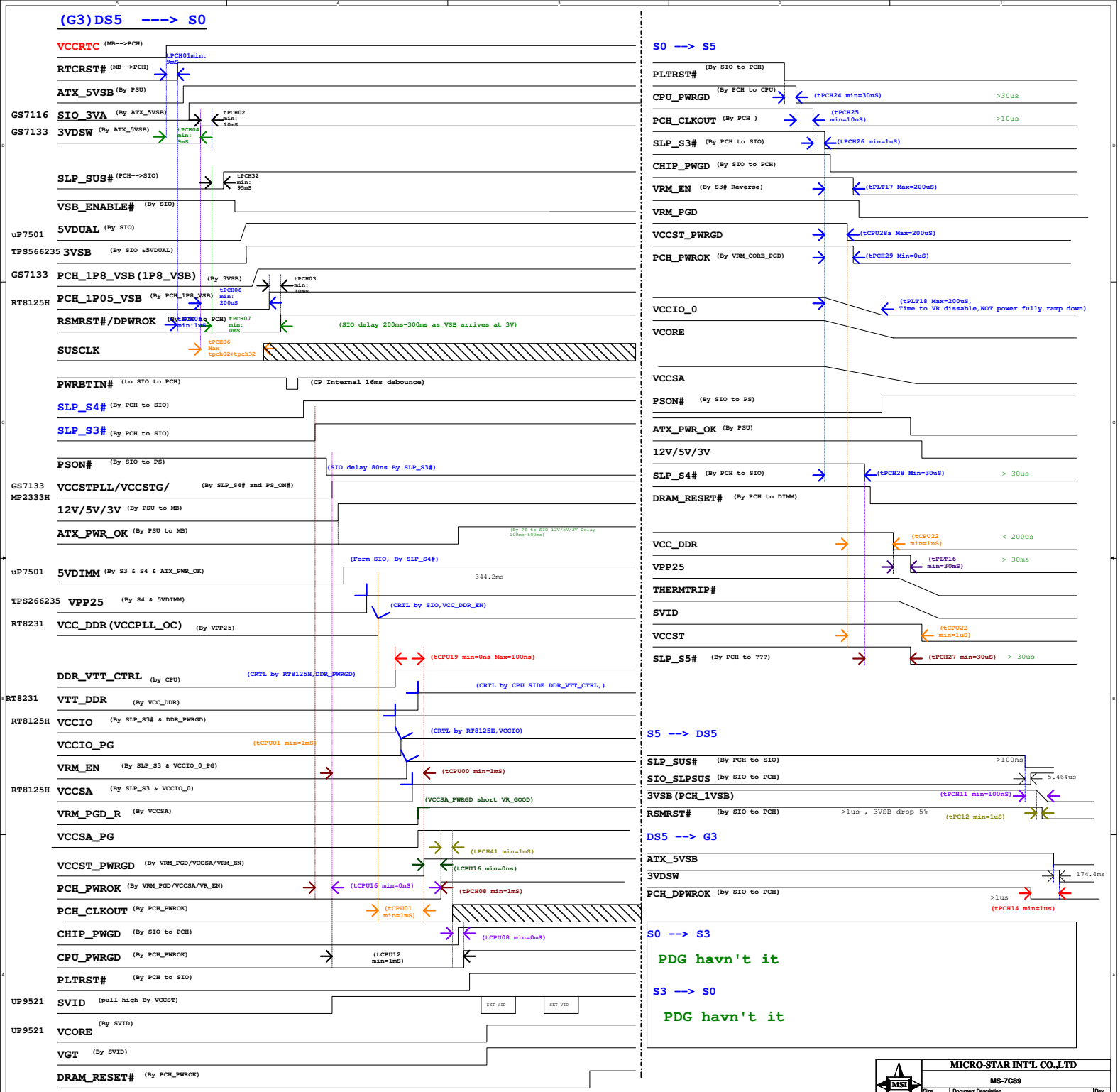

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History

2020.03.20
1.unstuff U30 for M PRO 料來不及到

2020.03.23
1.Y1 Change D04-3902700-F07
2.Stuff U30 M PRO

2020.04.01
1.stuff C242.C237
2.add SCREW6

2020.04.07
1.unstuff VC31.VC11 因VCORE 會誤觸QR
2.VR38 1.74K>>665R for VCORE DC IMON
3.VR80.VR81.VR82.VR83 2.1K>>2.61K for VCORE AC IMON
4.VR29 2.8K>>2K for VGT DC IMON
5.VR3 2.1K>>2.74K for VGT AC IMONA
6. VR47 124K>>52.3K
   VR48 12.4K>>160R
   VR45 8.45K>>3.32K
   VR46 184R>>0R for Pin setting

2020.04.14
1.VR60=5.76K.VR61=12.4K.VR73=15.4K .VR72=18.2K for alert=106度

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