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MS-7C76

M-ATX: 243.84mm*243.84mm

Ver: 1.1

CML Platform

CPU:

Comet lake S

System Chipset:

Z490 PCH_H

Onboard Chip:

HD Audio Codec:ALC1220P

LAN-Intel I225V 2.5G

SIO:NCT6687

Flash ROM: SPI 128 MB X1

Main Memory:

DDRIV (2667MHz) * 4 (Dual Channel)

ACPI:

LDO

PWM:

IMVP8 -RT3609BE

Expansion Slots:

PCI Express (X16) Slot * 1

PCI Express (X8) Slot * 1

PCI Express (X1) Slot * 2

M2 (X4) Slot * 2

Other:

SATA3.0 *4

USB2.0 *6

REAL USB3.1 *2+TYPEC*1

FRONT USB3.0 *2+TYPEC*1

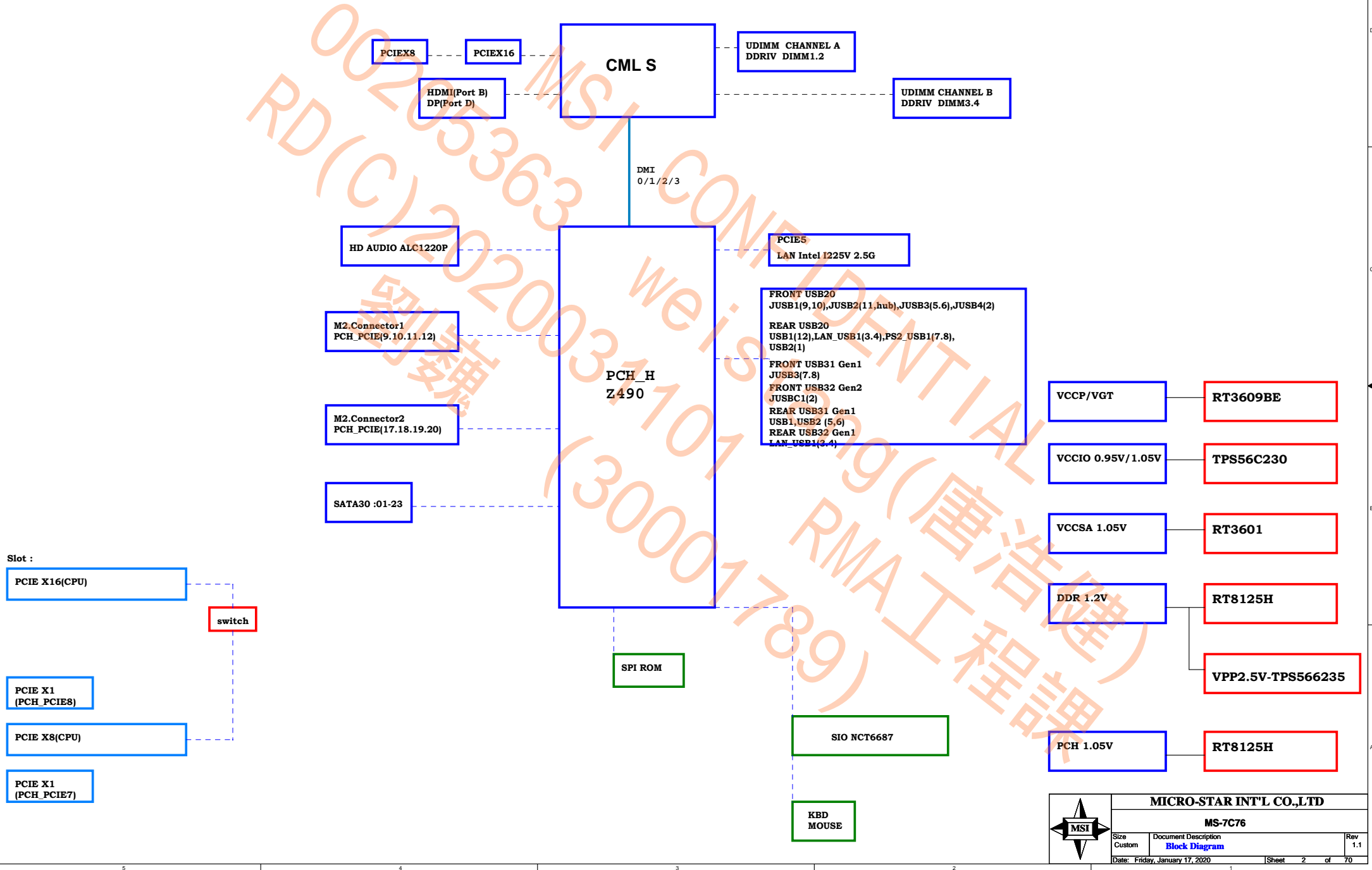


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MS-7C76

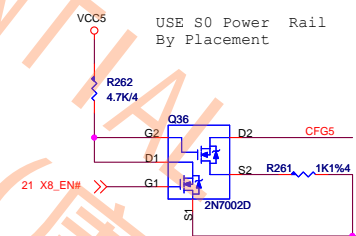
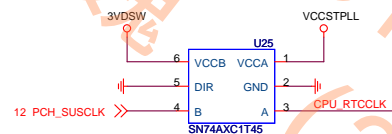
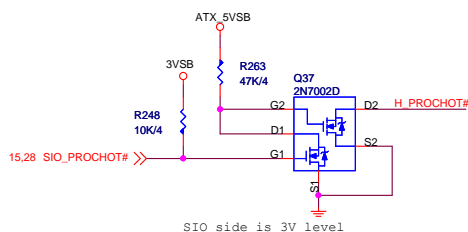
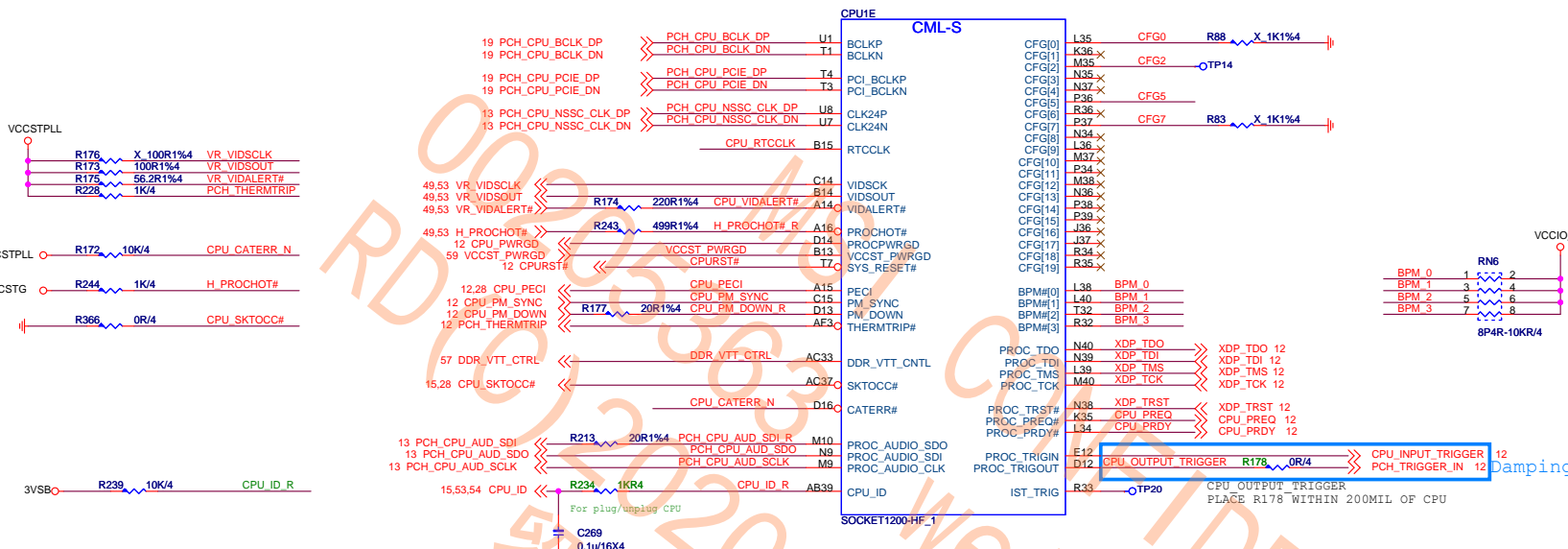
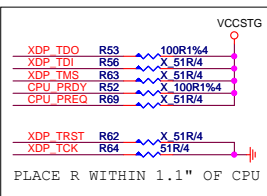
| Size | Document Description | Rev |
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| Custom | Cover Sheet | 1.1 |
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MS-7C76 Block Diagram



CFG Strap

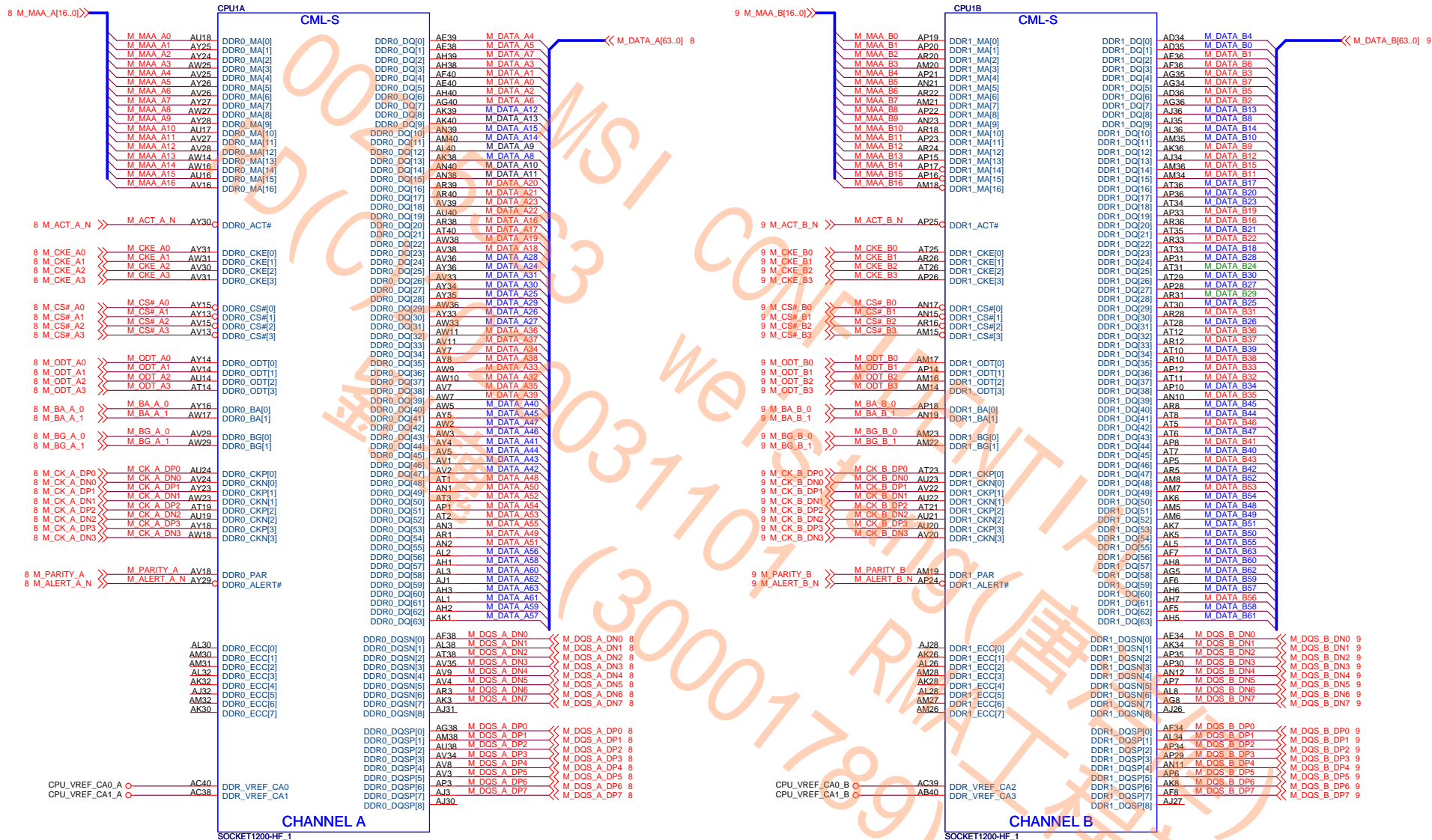
| CFG Table | | |
|-----------|------------------|-------------------|
| | HIGH | LOW |
| 0 | Normal Operation | PCU PLL lock |
| 1 | | RSVD |
| 2 | NORM | REVERSE |
| 3 | | PEG LANE REVERSAL |
| 4 | DISABLE | ENABLE |
| 5 | DISABLE | ENABLE |
| 6 | DISABLE | ENABLE |
| 7 | RESET# | BIOS REQ |
| 8 | | RSVD |
| 9 | PRESENT | NO PRESENT |
| 10 | | RSVD |
| 11 | | RSVD |
| 12 | | RSVD |
| 13 | | RSVD |
| 14 | | RSVD |
| 15 | | RSVD |
| 16 | | RSVD |
| 17 | | RSVD |
| 18 | | RSVD |
| 19 | | RSVD |

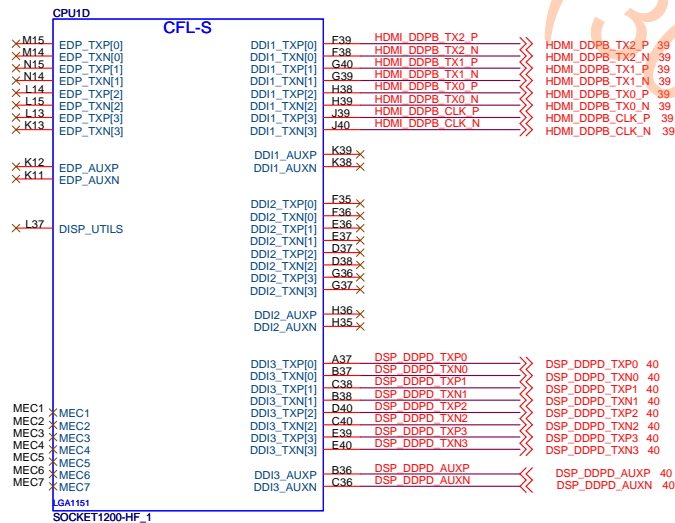
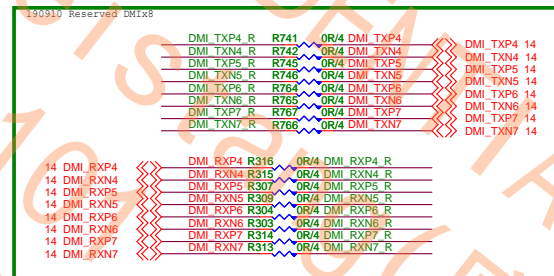
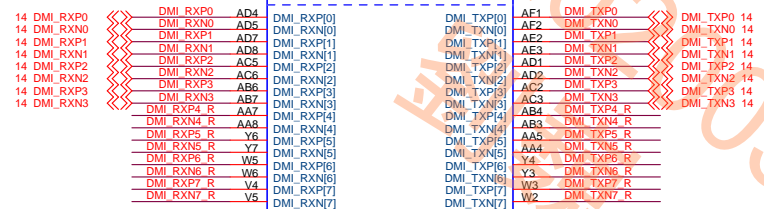
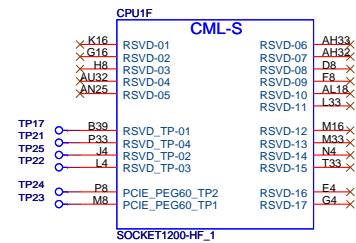
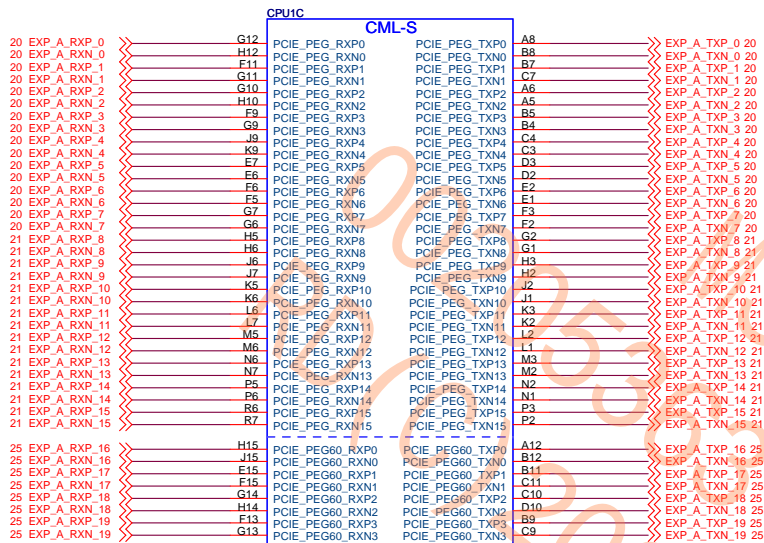


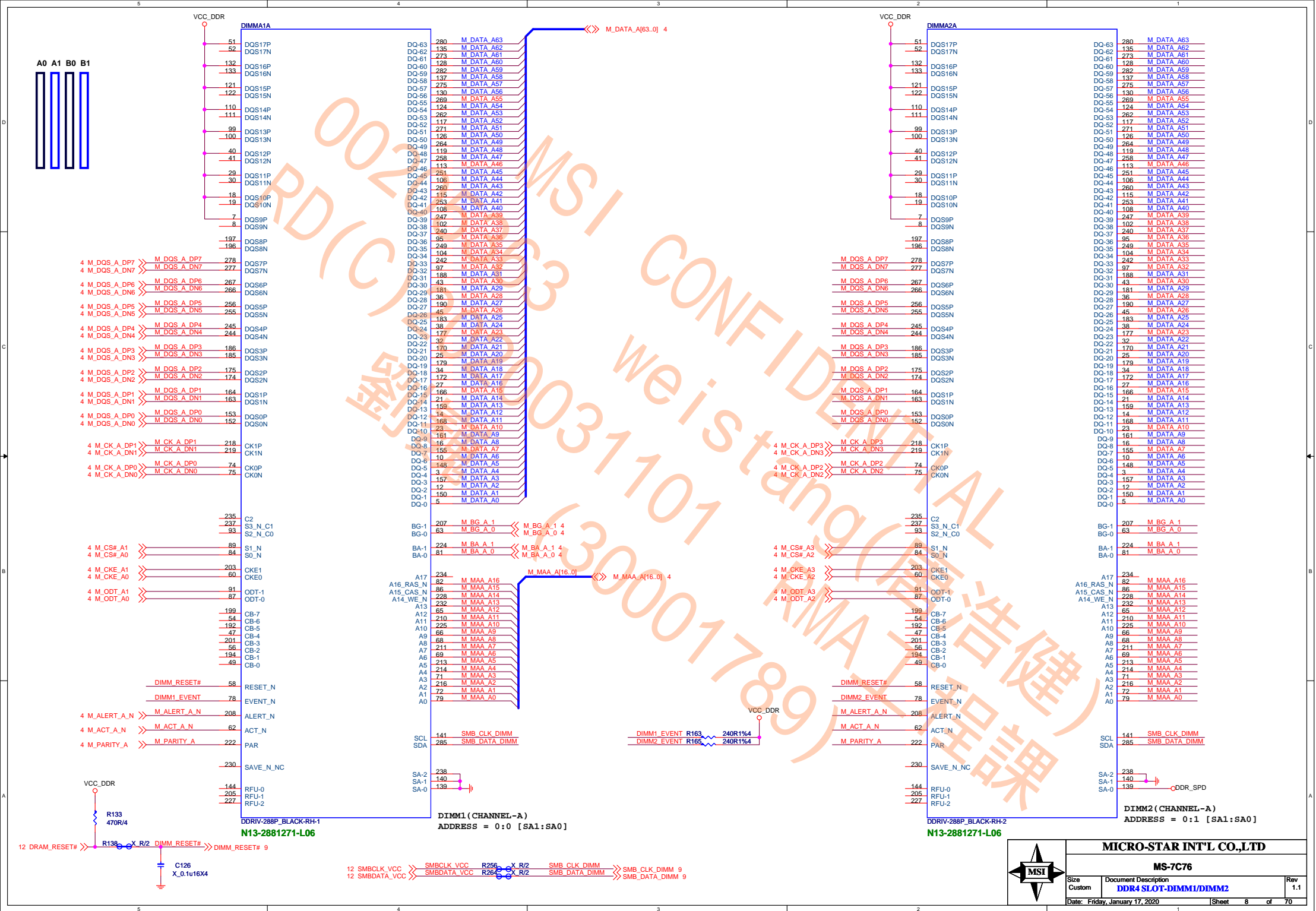
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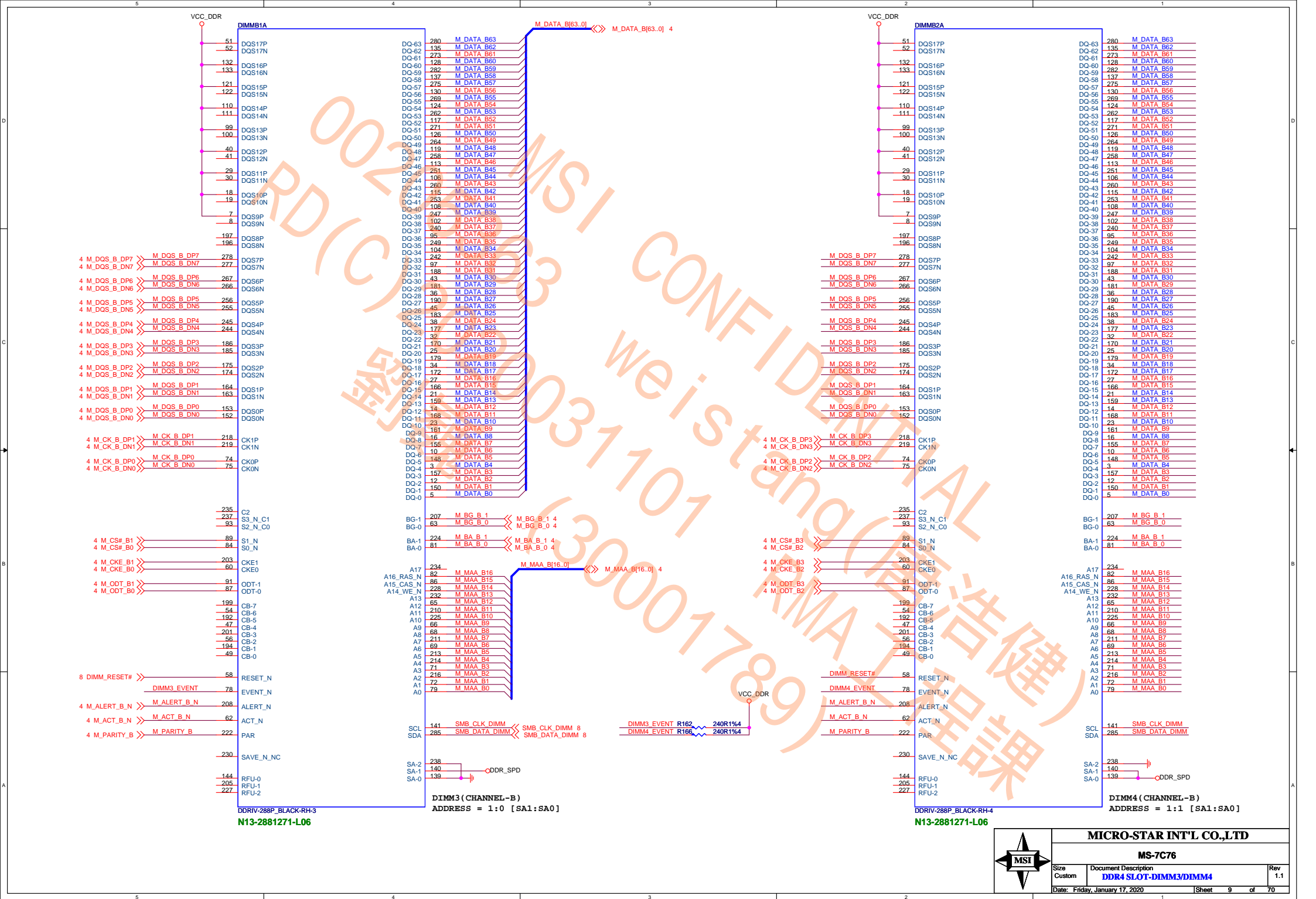
MS-7C76

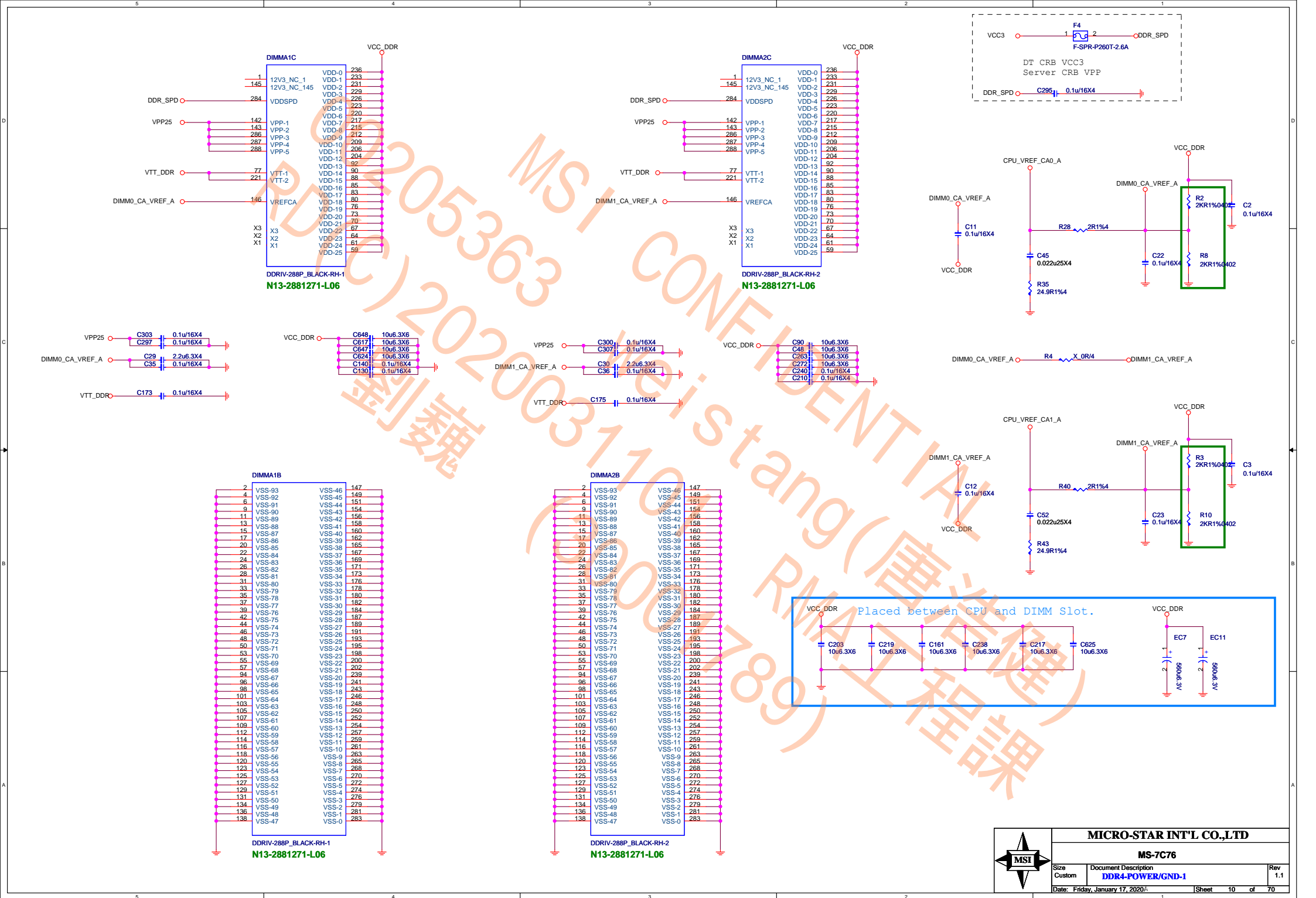
| Size | Document Description | Rev |
|--------|--------------------------|---------------|
| Custom | CPU-Control/MISC/CFG | 1.1 |
| Date: | Friday, January 17, 2020 | Sheet 3 of 70 |

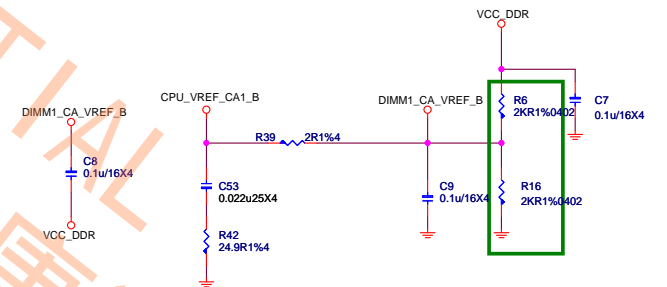
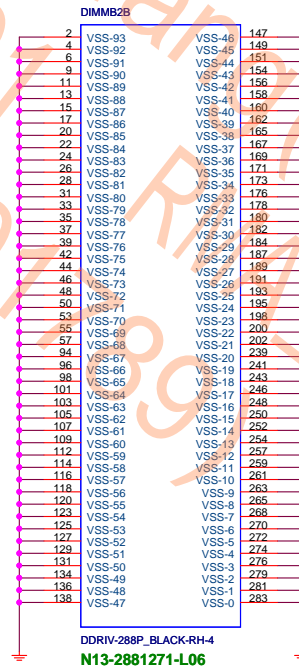
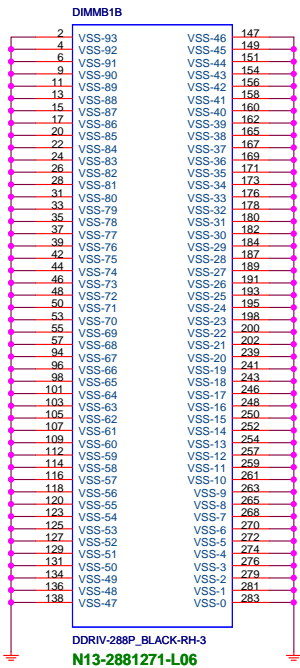
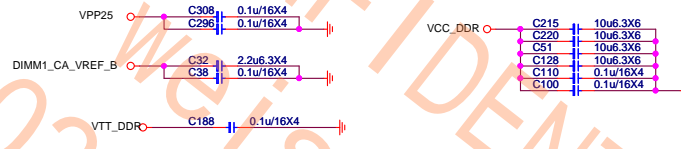
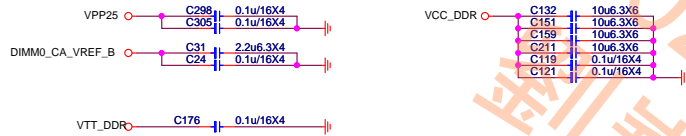
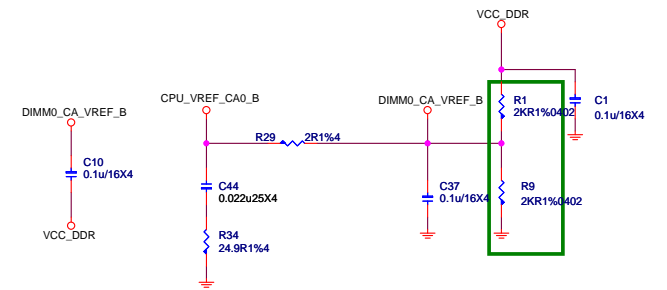
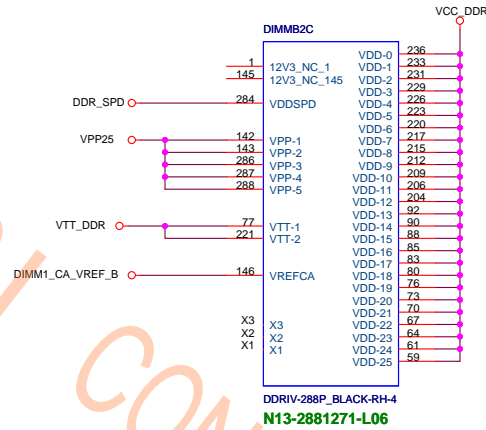
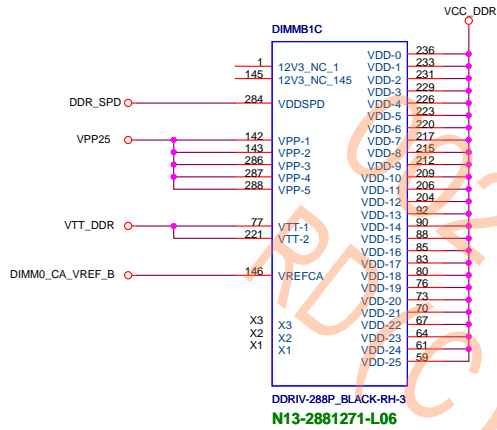




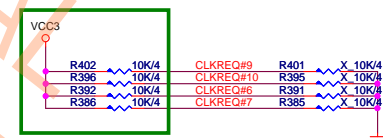
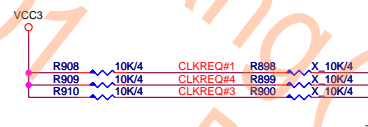
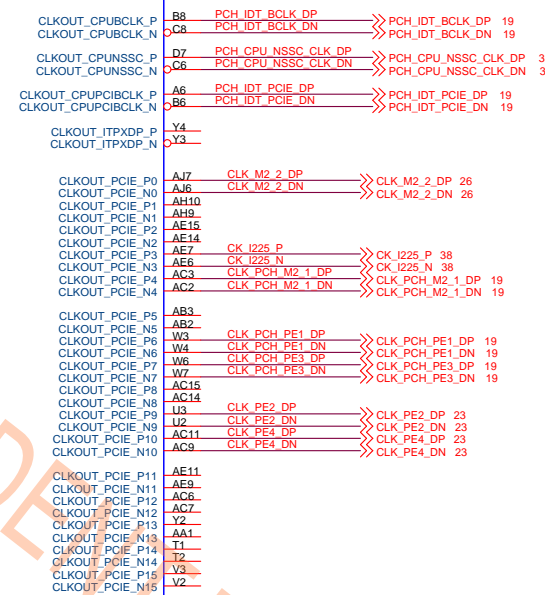
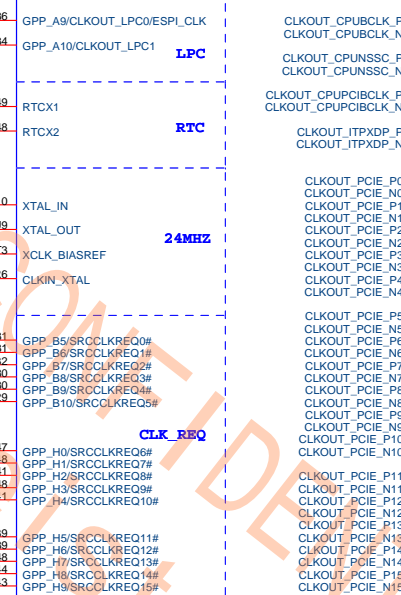
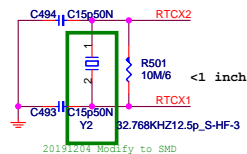




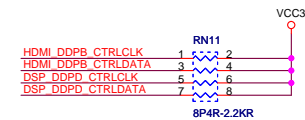
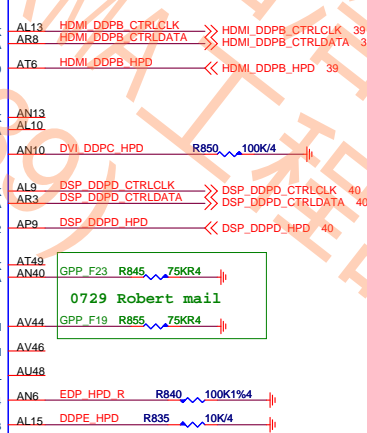
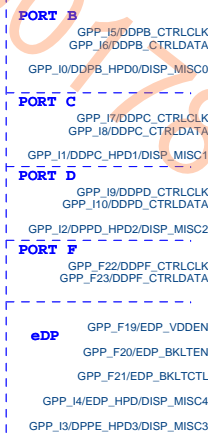
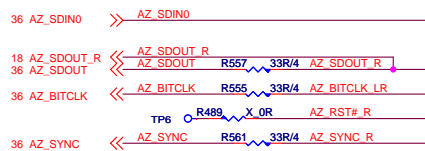




PCH_CLK



PCH_AUDIO



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| | | |
|--------------------------------|--|----------------|
| Size Custom | Document Description PCH-Clock/Audio/DISPLAY | Rev 1.1 |
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PCH1F

BE33 GPP_A16/CLKOUT_48
BD38 GPP_A17/SD_VDD1_PWR_EN#/ISH_GP7
BF35 GPP_A18/ISH_GP0
BD34 GPP_A19/ISH_GP1
BE34 GPP_A20/ISH_GP2
BA33 GPP_A21/ISH_GP3
AW32 GPP_A22/ISH_GP4
AV34 GPP_A23/ISH_GP5

BE29 GPP_B0/GSPI0_CS1#
BF33 GPP_B1/GSPI1_CS1#/TIME_SYNC1
BE32 GPP_B2/VRALERT#
BF32 GPP_B3/CPU_GP2
BC33 GPP_B4/CPU_GP3

AP29 GPP_B11/I2S_MCLK
BE26 GPP_B15/GSPI0_CS0#
BF29 GPP_B16/GSPI0_CLK
BD29 GPP_B17/GSPI0_MISO

BE23 GPP_C8/UART0_RXD
BD24 GPP_C9/UART0_TXD
BA24 GPP_C10/UART0_RTS#
AP24 GPP_C11/UART0_CTS#
AU24 GPP_C12/UART1_RXD/ISH_UART1_RXD
AP21 GPP_C13/UART1_TXD/ISH_UART1_TXD
AW24 GPP_C14/UART1_RTS#/ISH_UART1_RTS#
BD21 GPP_C15/UART1_CTS#/ISH_UART1_CTS#

BD20 GPP_C20/UART2_RXD
BE20 GPP_C21/UART2_TXD
AW21 GPP_C22/UART2_RTS#
AV21 GPP_C23/UART2_CTS#

BE15 GPP_D4/ISH_I2C2_SDA/I2C3_SDA/SBK4/BK4
BA20 GPP_D9/ISH_SPI_CS#/GSP12_CS0#
BB20 GPP_D10/ISH_SPI_CLK/GSP12_CLK
BB16 GPP_D11/ISH_SPI_MISO/GP_BSSB_CLK/GSP12_MISO
AN18 GPP_D12/ISH_SPI_MOSI/GP_BSSB_DI/GSP12_MOSI
BE17 GPP_D13/ISH_UART0_RXD/I2C2_SDA
BE17 GPP_D14/ISH_UART0_TXD/I2C2_SCL
AR18 GPP_D15/ISH_UART0_RTS#/GSP12_CS1#/CNV_WFEN
BE14 GPP_D16/ISH_UART0_CTS#/CNV_WOEN
GPP_D23/ISH_I2C2_SCL/I2C3_SCL

AL47 GPP_E3/CPU_GP0
AM45 GPP_E7/CPU_GP1

AV6 GPP_J0/CNV_PA_BLANKING
AY3 GPP_J1/CPU_C10_GATE#
AW3 GPP_J2
AT10 GPP_J3
AV4 GPP_J4/CNV_BRI_DT/UART0B_RTS#
AY2 GPP_J5/CNV_BRI_RSP/UART0B_RXD
BA4 GPP_J6/CNV_RGI_DT/UART0B_TXD
AV3 GPP_J7/CNV_RGI_RSP/UART0B_CTS#
AW2 GPP_J8/CNV_MFUART2_RXD
AU9 GPP_J9/CNV_MFUART2_TXD
AR13 GPP_J11/A4WP_PRESENT

BD1 GPPJ_RCOMP_1P8_1
BE1 GPPJ_RCOMP_1P8_2
BE2 GPPJ_RCOMP_1P8_3
BE5 SD_1P8_RCOMP
BE4 SD_3P3_RCOMP

PCH_H

GPP_G0/SD_CMD
GPP_G1/SD_DATA0
GPP_G2/SD_DATA1
GPP_G3/SD_DATA2
GPP_G4/SD_DATA3
GPP_G5/SD_CD#
GPP_G6/SD_CLK
GPP_G7/SD_WP

GPP_K0
GPP_K1
GPP_K2
GPP_K3
GPP_K4
GPP_K5
GPP_K6
GPP_K7
GPP_K8
GPP_K9
GPP_K10
GPP_K11

GPP_K12/GSXDOOUT
GPP_K13/GSXDOLOAD
GPP_K14/GSXDOIN
GPP_K15/GSXRESET#
GPP_K16/GSXCLK
GPP_K17/ADR_COMPLETE
GPP_K18/NMI#
GPP_K19/SMI#
GPP_K20
GPP_K21
GPP_K22/IMGCLKOUT0
GPP_K23/IMGCLKOUT1

RSVD-1
RSVD-2
RSVD-3
RSVD-4
RSVD-5
RSVD-6
RSVD-7
RSVD-8
RSVD-9
RSVD-10
RSVD-11
RSVD-12
RSVD-13
RSVD-14

TP-1
TP-2

CNV_WR_CLKP
CNV_WR_CLKN
CNV_WR_D0P
CNV_WR_D0N
CNV_WR_D1P
CNV_WR_D1N
CNV_WT_CLKP
CNV_WT_CLKN
CNV_WT_D0P
CNV_WT_D0N
CNV_WT_D1P
CNV_WT_D1N
CNV_WT_RCOMP

BA1 CNV_WT_RCOMP

Follow Nick GPIO table0826

AW13 PEG_MODE_0_21
BE9 PEG_MODE_1_21

BIOS_SEL_PCIESATA2_26

BIOS_DIS_SW2_26

AP3 GPP_I11
AP2 GPP_I12
AN4 GPP_I13
AM7 GPP_I14

GPP_K0
20190904 For I225 LAN DISABLE

Removed GPP_K12/K16(JTBT Function)

Removed GPP_K23(JRTD3_PWR_EN)

BIOS Select

USE R479 X 10K/4 GPP_I12 R481 10K/4
R473 X 10K/4 GPP_I13 R478 10K/4
R472 X 10K/4 GPP_I14 R471 10K/4

GPP_I12
AC:1;NO AC:0

GPP_K0 R368 X 10K/4
GPP_K17 R377 X 10K/4
GPP_K18 R376 X 10K/4
GPP_K19 R375 X 10K/4

TEST_SETUP_MENU R380 10K/4
R381 X 10K/4

3VSB
R554 10K/4 GPP_B2
R568 10K/4 CPU_ID_CHECK

R869 1K/4 PCB_ID R863 100KR4
0731: add for BIOS detect PCB Vender

2091125 400S update
R972 X 10K/4 PCH_MCU_LED_RST#

CPUFAN1_FM R829 1K/4
PUMPFAN1_FM R833 1K/4

3VSB
R490 10K/4 USB3_SMI1

PCH_1P8_VSB R868 X 75KR1/4 C10_GATE#

PCH_1P8_VSB R494 20K/4 CNV_BRI_RSP
PCH_1P8_VSB R493 20K/4 CNV_RGI_RSP

54 C10_GATE#

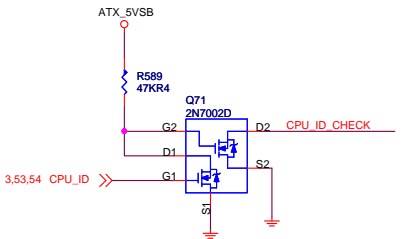
18.27 CNV_BRI_DT
27 CNV_BRI_RSP
18.27 CNV_RGI_DT
27 CNV_RGI_RSP

18 GPP_J_9_CNV_MFUART2_TXD

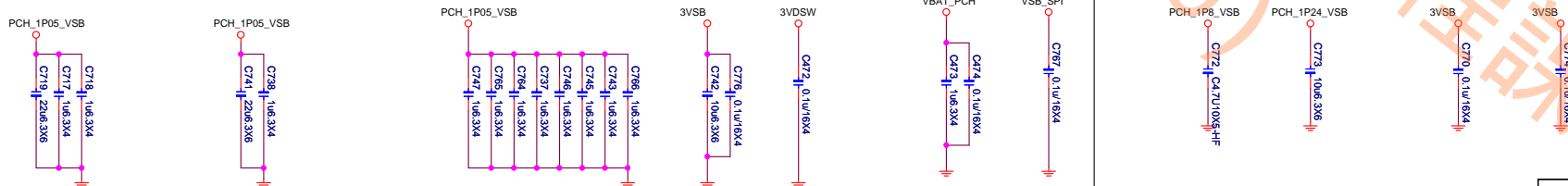
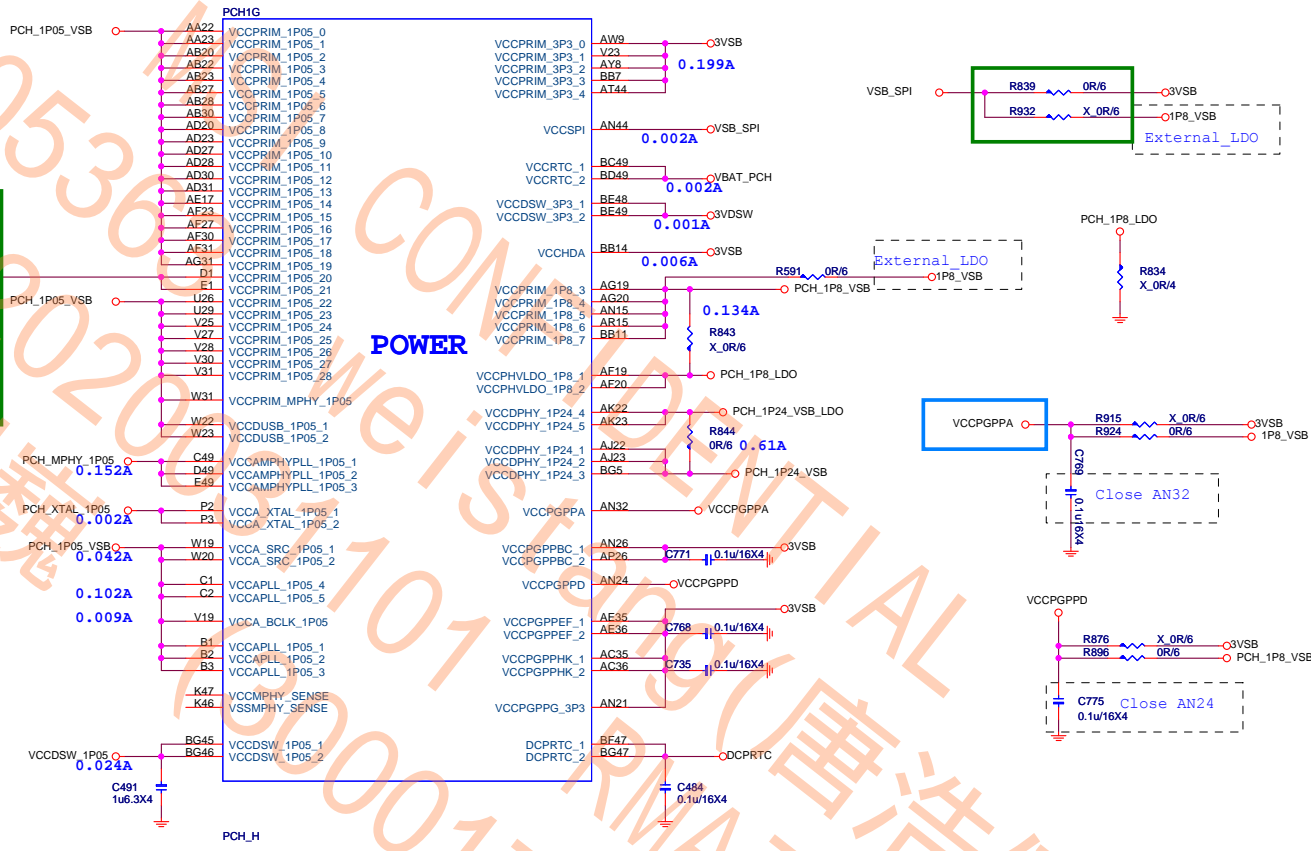
R841 75KR4 GPP_J11

200R1/4 R866 GPPJ_RCOMP

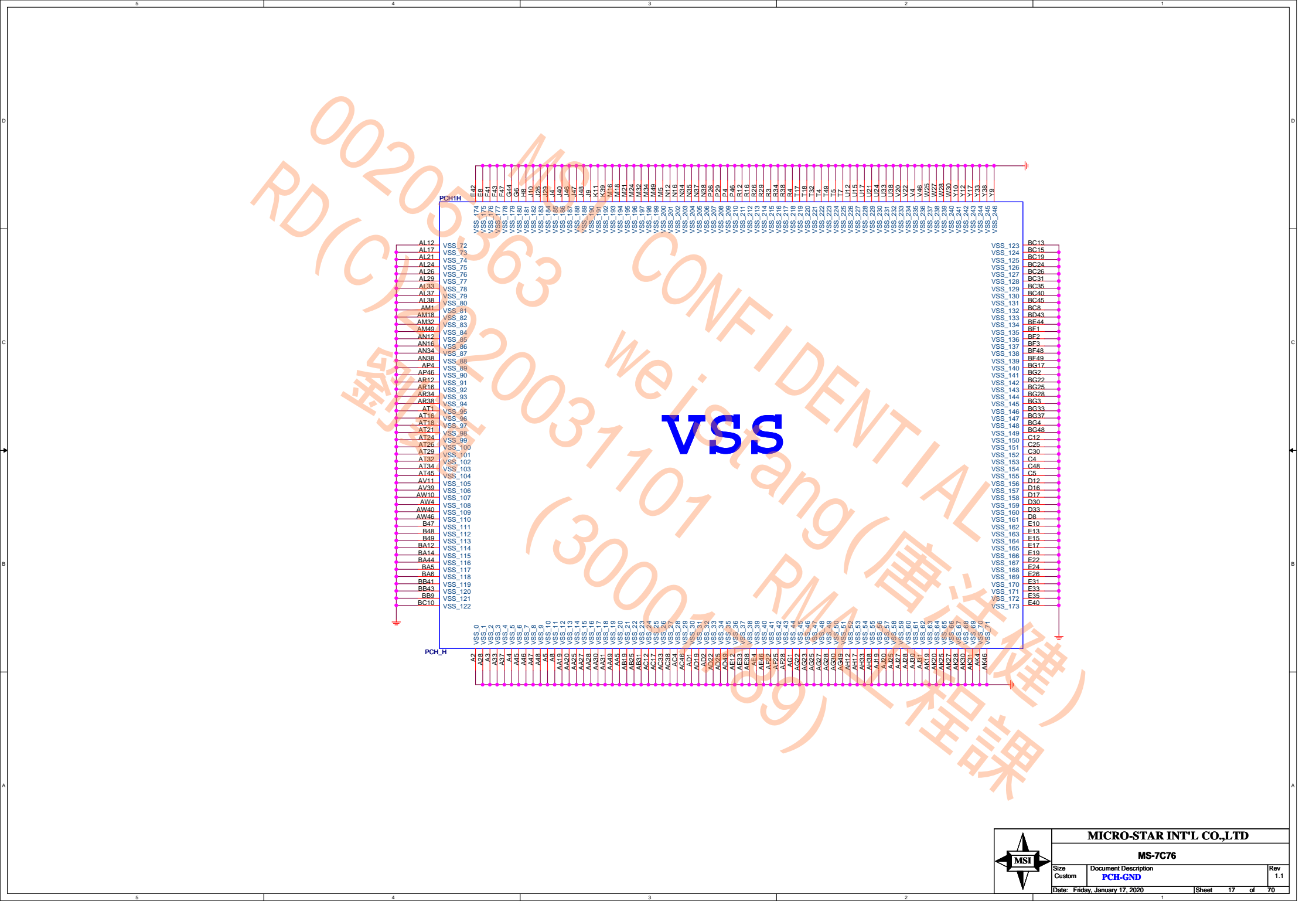
200R1/4 R865 1P8_RCOMP
200R1/4 R867 3P3_RCOMP



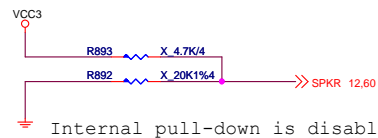
Base: 7.169
Total: 12.413



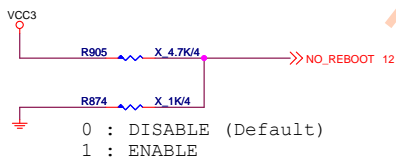
CLOSE TO U26/U29



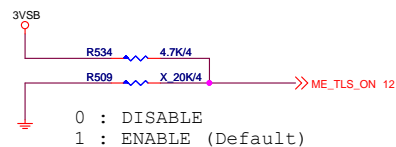
TOP Swap



No Reboot

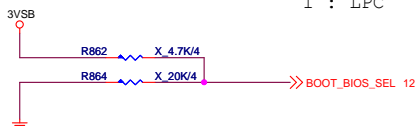


AMT and SBA with confidentiality

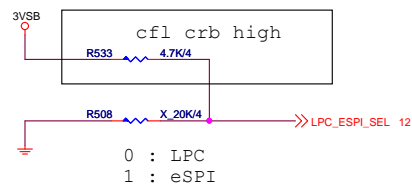


Boot BIOS

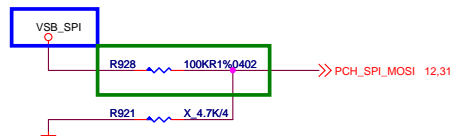
0 : SPI
1 : LPC



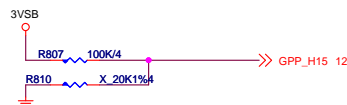
LPC eSPI Mode



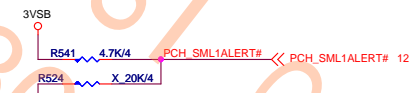
Reserved



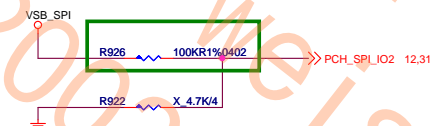
Reserved



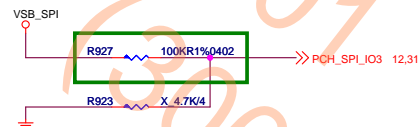
Reserved



Reserved



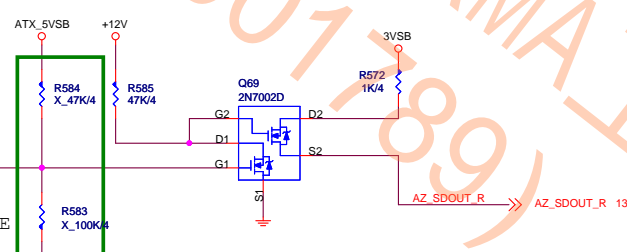
Reserved



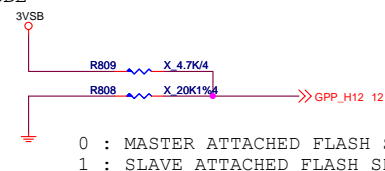
Flash Descriptor Security Override

12 ME_DIS#

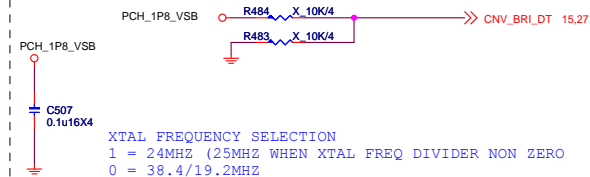
0 : ENABLE
1 : DISABLE



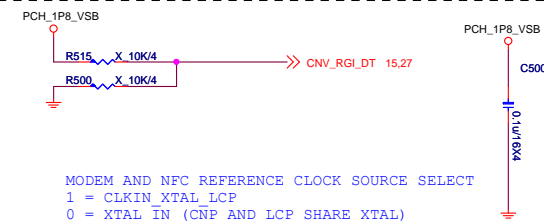
ESPI FLASH SHARING MODE



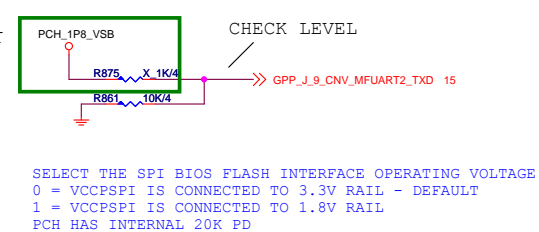
ESPI FLASH SHARING MODE



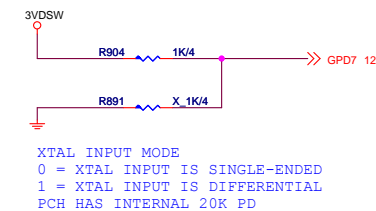
Modem Reference Clock Source Select



1.8V VCCPSPI



Reserved



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| Size | Document Description | Rev |
|--------------------------------|----------------------|-----|
| Custom | PCH-Strap | 1.1 |
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12,20,22,23,61 SMBCLK_VSB_R
12,20,22,23,61 SMBDATA_VSB_R

20,22,23 SLOT_WAKE#

13 CLKREQ#
5 EXP_A_TXP_0 C707 CO.22u16X4 EXP_A_TXP_0 C
5 EXP_A_TXN_0 C706 CO.22u16X4 EXP_A_TXN_0 C
CLKREQ# R306 X_OR/4 PCIE1 PRSNT2#

5 EXP_A_TXP_1 C705 CO.22u16X4 EXP_A_TXP_1 C
5 EXP_A_TXN_1 C704 CO.22u16X4 EXP_A_TXN_1 C

5 EXP_A_TXP_2 C703 CO.22u16X4 EXP_A_TXP_2 C
5 EXP_A_TXN_2 C702 CO.22u16X4 EXP_A_TXN_2 C

5 EXP_A_TXP_3 C701 CO.22u16X4 EXP_A_TXP_3 C
5 EXP_A_TXN_3 C700 CO.22u16X4 EXP_A_TXN_3 C

PCIE1 PRSNT2#

5 EXP_A_TXP_4 C698 CO.22u16X4 EXP_A_TXP_4 C
5 EXP_A_TXN_4 C697 CO.22u16X4 EXP_A_TXN_4 C

5 EXP_A_TXP_5 C697 CO.22u16X4 EXP_A_TXP_5 C
5 EXP_A_TXN_5 C696 CO.22u16X4 EXP_A_TXN_5 C

5 EXP_A_TXP_6 C695 CO.22u16X4 EXP_A_TXP_6 C
5 EXP_A_TXN_6 C694 CO.22u16X4 EXP_A_TXN_6 C

5 EXP_A_TXP_7 C693 CO.22u16X4 EXP_A_TXP_7 C
5 EXP_A_TXN_7 C692 CO.22u16X4 EXP_A_TXN_7 C

PCIE1 PRSNT2#

21 PE1_X16_TXP8 C356 CO.22u16X4 PE1_X16_TXP_8
21 PE1_X16_TXN8 C355 CO.22u16X4 PE1_X16_TXN_8

21 PE1_X16_TXP9 C362 CO.22u16X4 PE1_X16_TXP_9
21 PE1_X16_TXN9 C361 CO.22u16X4 PE1_X16_TXN_9

21 PE1_X16_TXP10 C377 CO.22u16X4 PE1_X16_TXP_10
21 PE1_X16_TXN10 C376 CO.22u16X4 PE1_X16_TXN_10

21 PE1_X16_TXP11 C379 CO.22u16X4 PE1_X16_TXP_11
21 PE1_X16_TXN11 C380 CO.22u16X4 PE1_X16_TXN_11

21 PE1_X16_TXP12 C371 CO.22u16X4 PE1_X16_TXP_12
21 PE1_X16_TXN12 C372 CO.22u16X4 PE1_X16_TXN_12

21 PE1_X16_TXP13 C373 CO.22u16X4 PE1_X16_TXP_13
21 PE1_X16_TXN13 C374 CO.22u16X4 PE1_X16_TXN_13

21 PE1_X16_TXP14 C368 CO.22u16X4 PE1_X16_TXP_14
21 PE1_X16_TXN14 C367 CO.22u16X4 PE1_X16_TXN_14

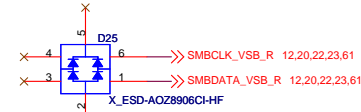
21 PE1_X16_TXP15 C365 CO.22u16X4 PE1_X16_TXP_15
21 PE1_X16_TXN15 C366 CO.22u16X4 PE1_X16_TXN_15

PCIE1 PRSNT2#

PCI_E1
SLOT-PCI164P_BLACK-2PITCH-RH-73
N11-1641981-L06
SLOT_PCIEXP164_22P

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

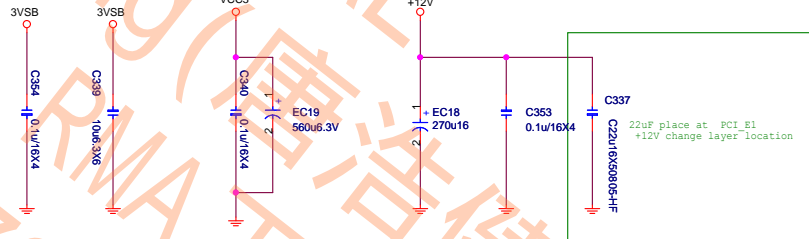
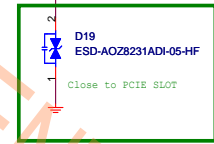
SMBUS ESD



By Placement

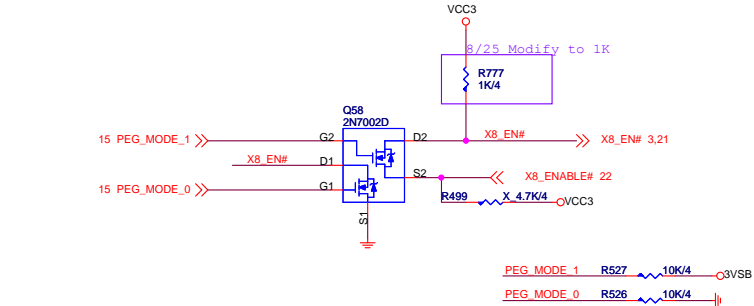
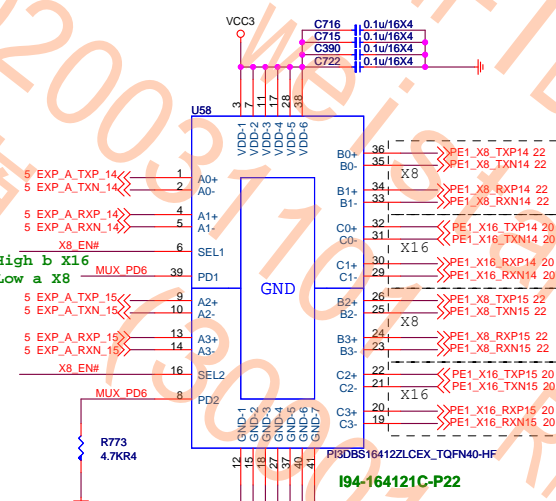
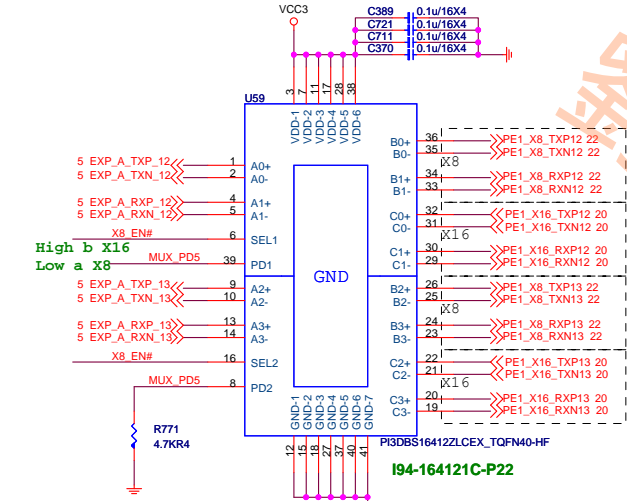
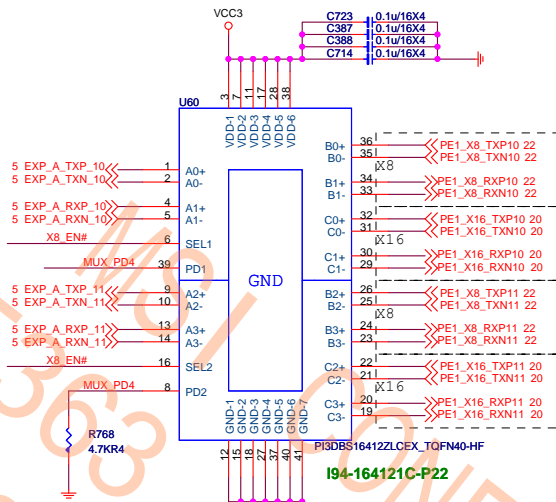
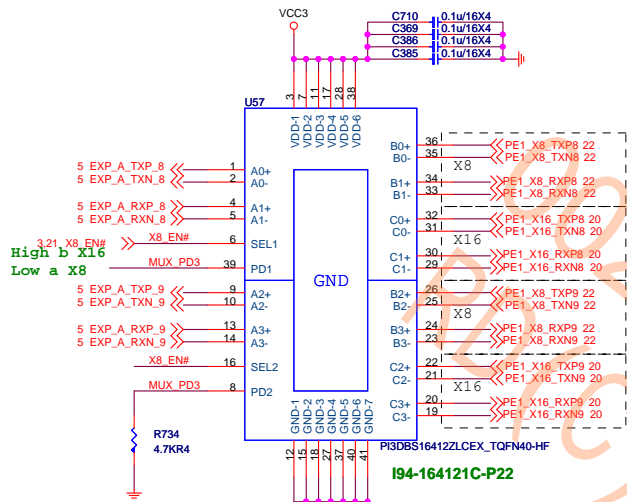
Main:D0G-05A0529-A68
AVL:D0G-45B0510-I14

12,25,26,29,38 PCH_WAKE# R335 X_R/2 SLOT_WAKE# 20,22,23



22uF place at PCIE_E1
+12V change layer location

| | | | |
|--------------------------|---------------------------|-------|----------|
| MICRO-STAR INT'L CO.,LTD | | | |
| MS-7C76 | | | |
| Size | Document Description | | Rev |
| Custom | PCIE SLOT (X16) | | 1.1 |
| Date: | Friday, January 17, 2020/ | Sheet | 20 of 70 |



MODE_1

0: BIOS MODE
1: HW MODE (Default)

HW MODE

| Status | MODE_0 | MODE_1 |
|--------|--------|--------|
| AUTO | 0 | 1 |

If USE HW MODE
GPP_G0 & GPP_G1 programming to GPI

If USE BIOS MODE
GPP_G0 & GPP_G1 programming to GPO

BIOS MODE

| PCH Status | MODE_0 | MODE_1 |
|------------|--------|--------|
| 16,0 | 0 | 0 |
| 8,8 | 1 | 0 |



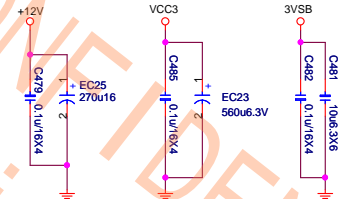
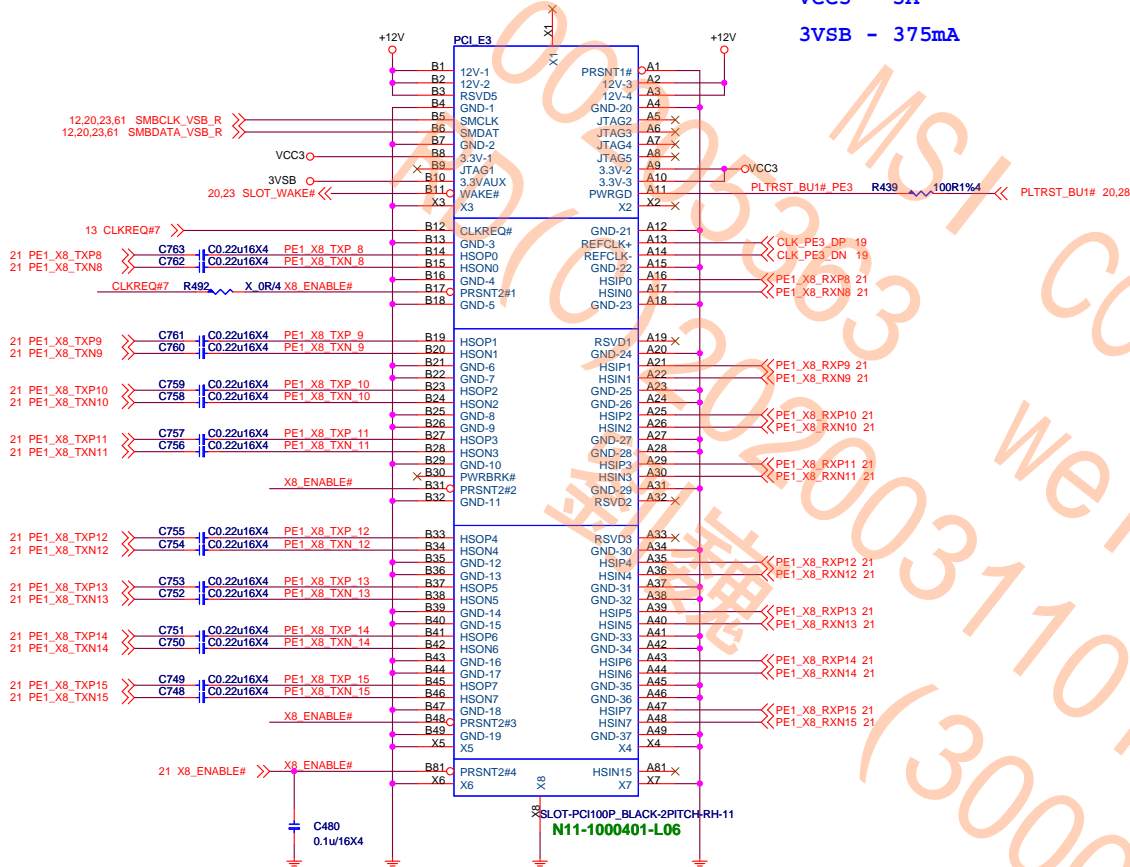
| MICRO-STAR INT'L CO.,LTD | | |
|--------------------------------|----------------------------------|---------|
| MS-7C76 | | |
| Size Custom | Document Description PCIE SWITCH | Rev 1.1 |
| Date: Friday, January 17, 2020 | Sheet 21 of 70 | |

PCI_Express X8 Slot

12V - 2.1A

VCC3 - 3A

3VSB - 375mA



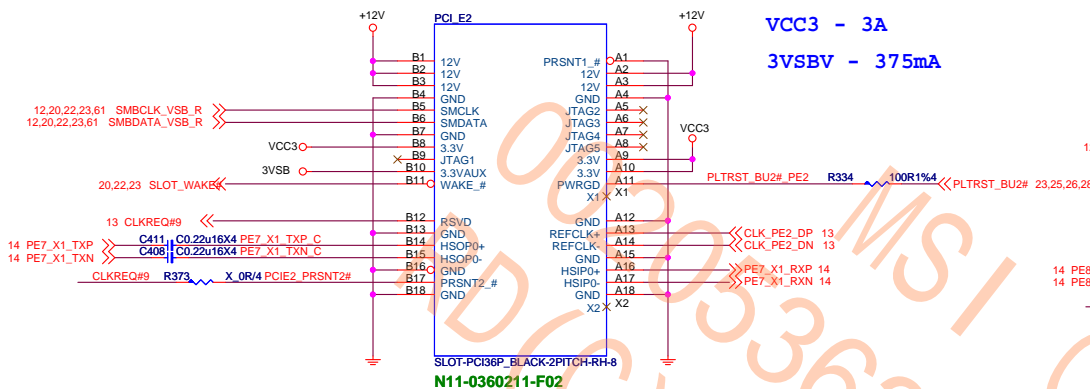
MICRO-STAR INT'L CO.,LTD

MS-7C76

| Size | Document Description | Rev |
|--------------------------------|----------------------|-----|
| Custom | PCIE SLOT-CPU(X8) | 1.1 |
| Date: Friday, January 17, 2020 | Sheet 22 of 70 | |

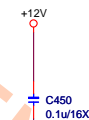
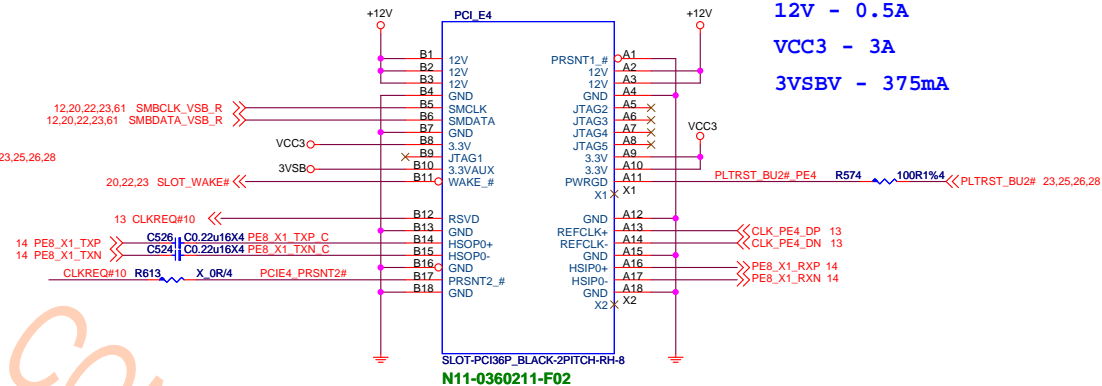
2016.08.25 Modify to N11-0360211-F02

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



2016.08.25 Modify to N11-0360211-F02

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



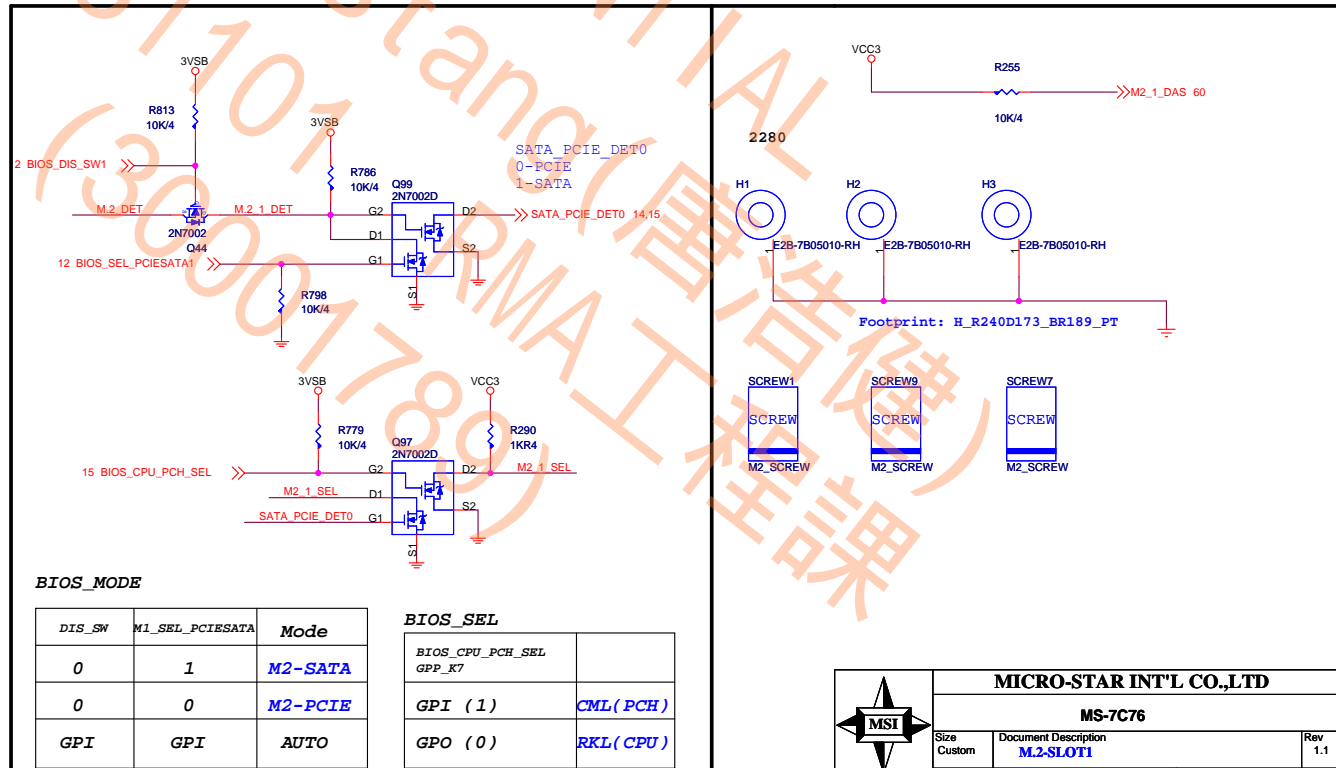
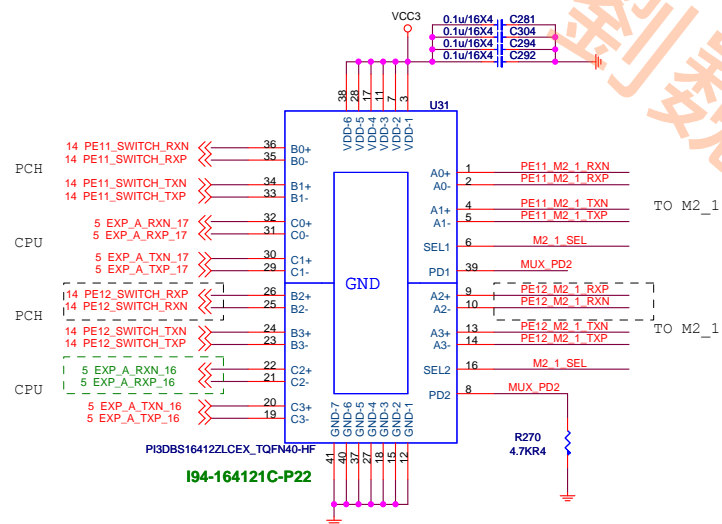
MICRO-STAR INT'L CO.,LTD

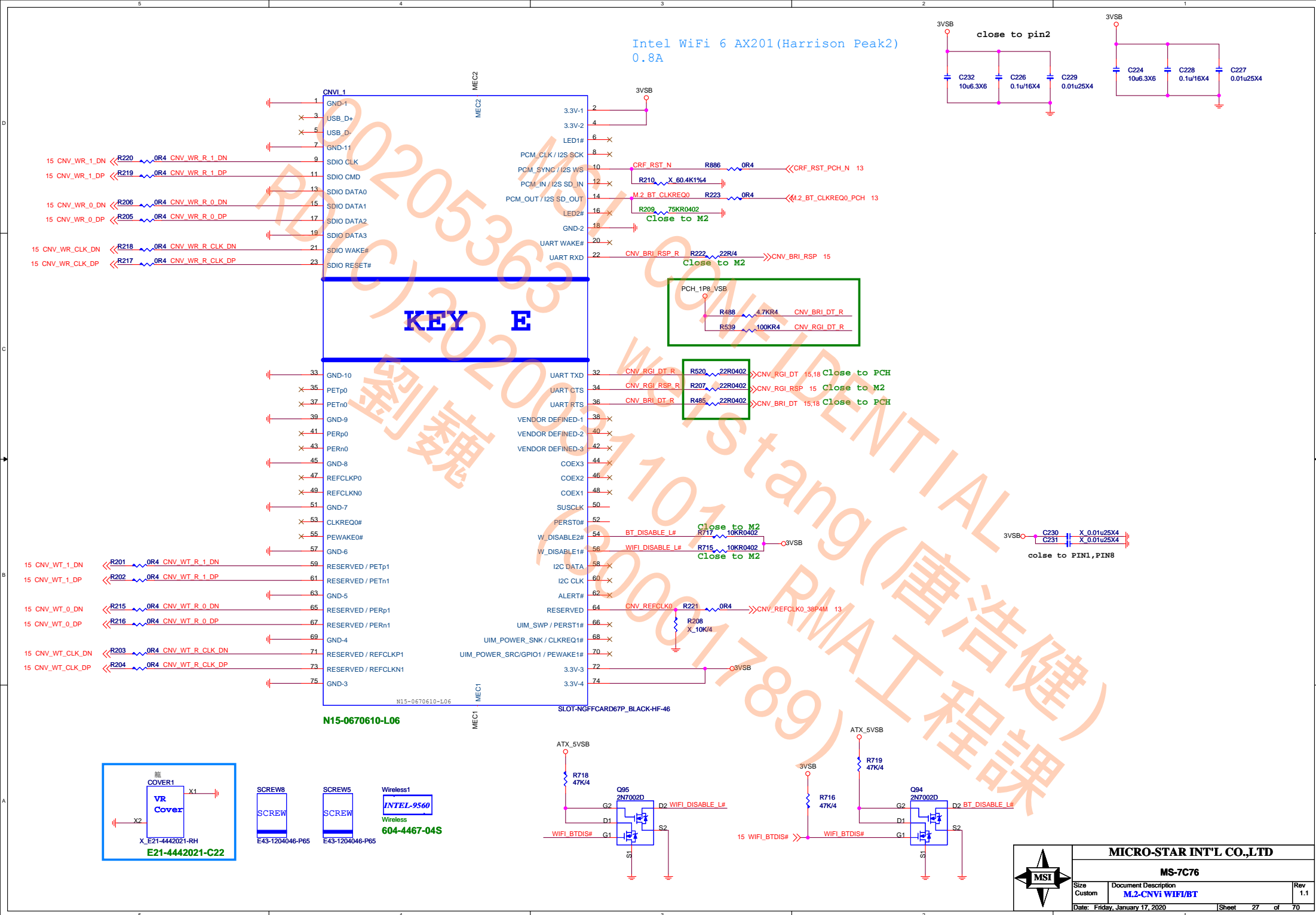
MS-7C76

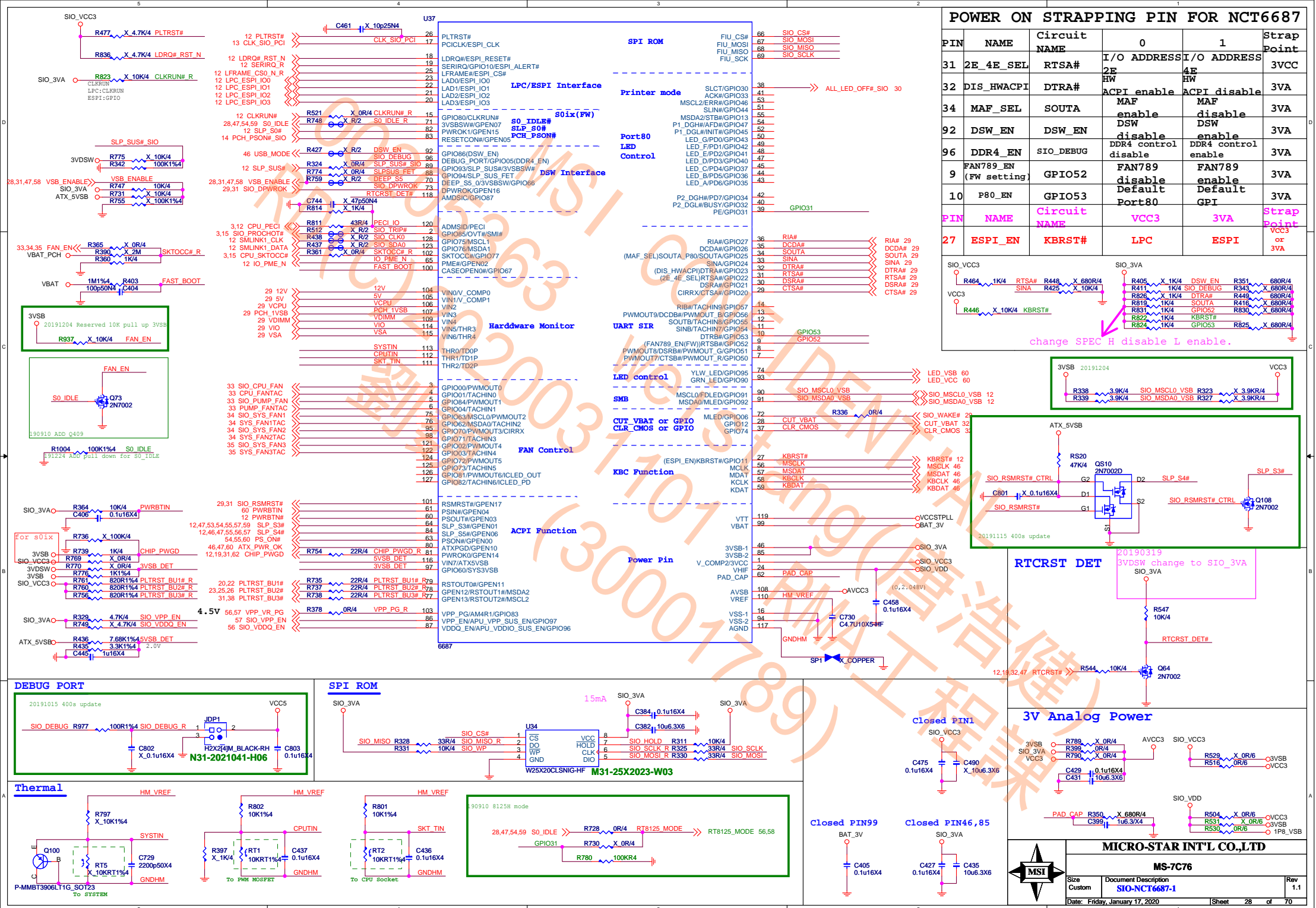
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|--------------------------------|----------------------|-----|
| Size | Document Description | Rev |
| Custom | PCIE SLOT (X1) | 1.1 |
| Date: Friday, January 17, 2020 | Sheet 23 of 70 | |

SATA Connector

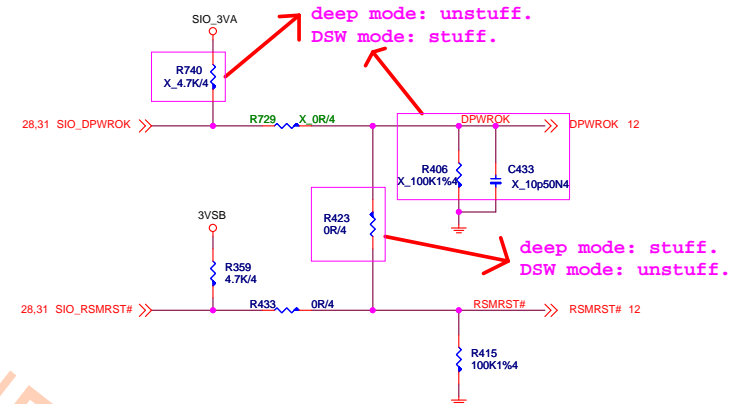
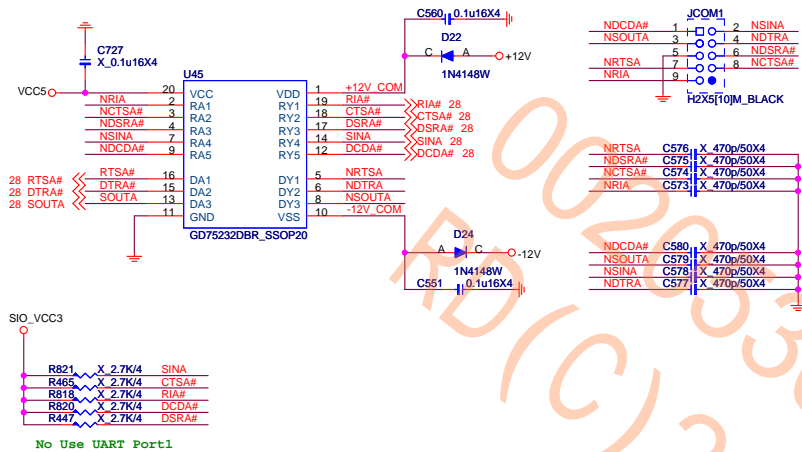






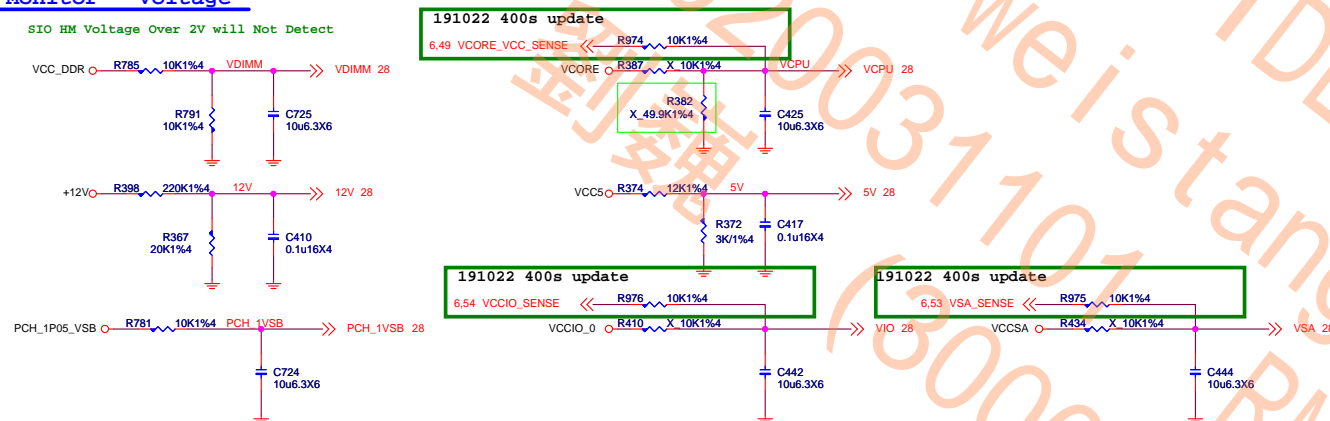


Deep mode/Dsw mode colay

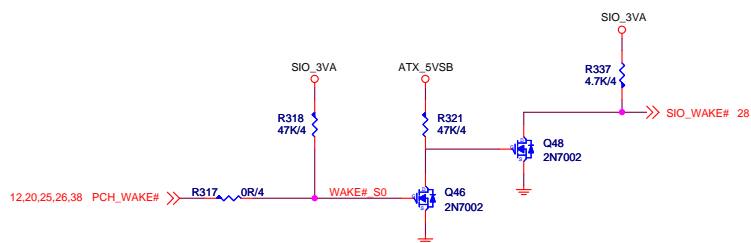


HW Monitor - Voltage

SIO HM Voltage Over 2V will Not Detect



for LAN wake

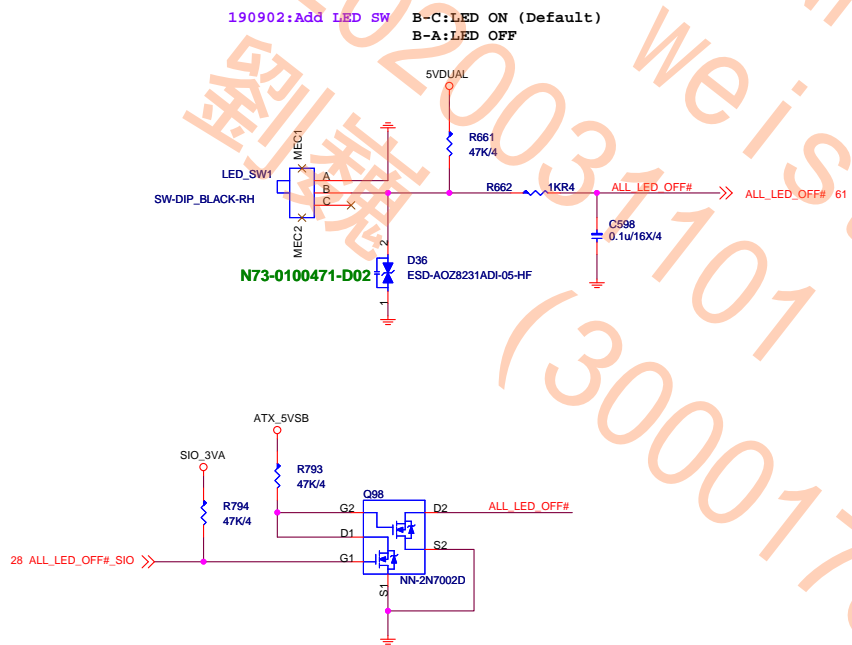


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| | | |
|--------------------------------|--|----------------|
| Size Custom | Document Description SIO-NCT6687-2 | Rev 1.1 |
| Date: Friday, January 17, 2020 | | Sheet 29 of 70 |

00205363 MSI CONFIDENTIAL
RD(C) 2003-101 weistang (唐浩健)
(30001789) RMA工程課

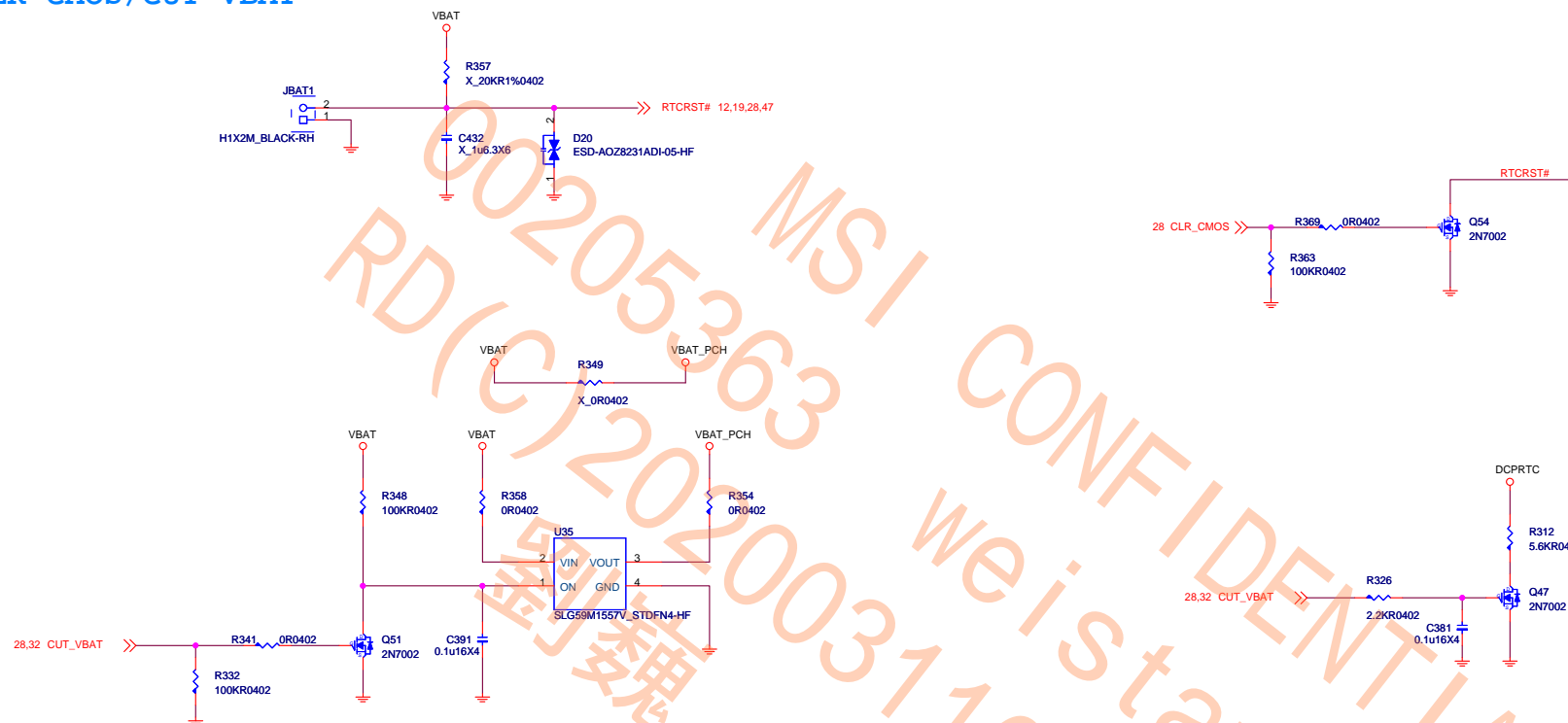


MICRO-STAR INT'L CO.,LTD

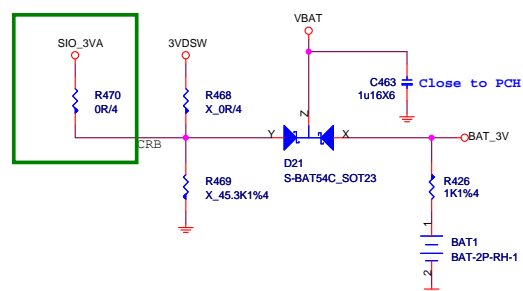
MS-7C76

| Size | Document Description | Rev |
|--------------------------------|----------------------|----------------|
| Custom | LED Switch | 1.1 |
| Date: Friday, January 17, 2020 | | Sheet 30 of 70 |

CLR CMOS/CUT VBAT



VBAT



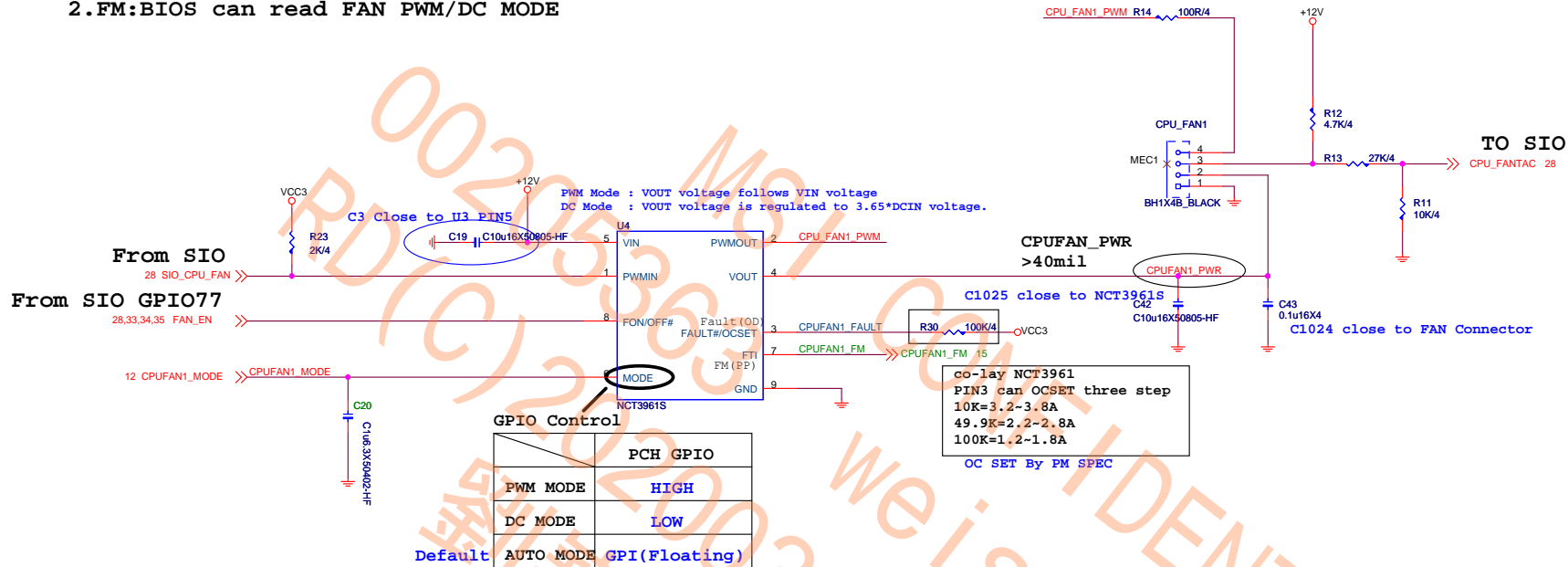
MICRO-STAR INT'L CO.,LTD

MS-7C76

| Size | Document Description | Rev |
|--------------------------------|----------------------|-----|
| Custom | CLR COMS | 1.1 |
| Date: Friday, January 17, 2020 | Sheet 32 of 70 | |

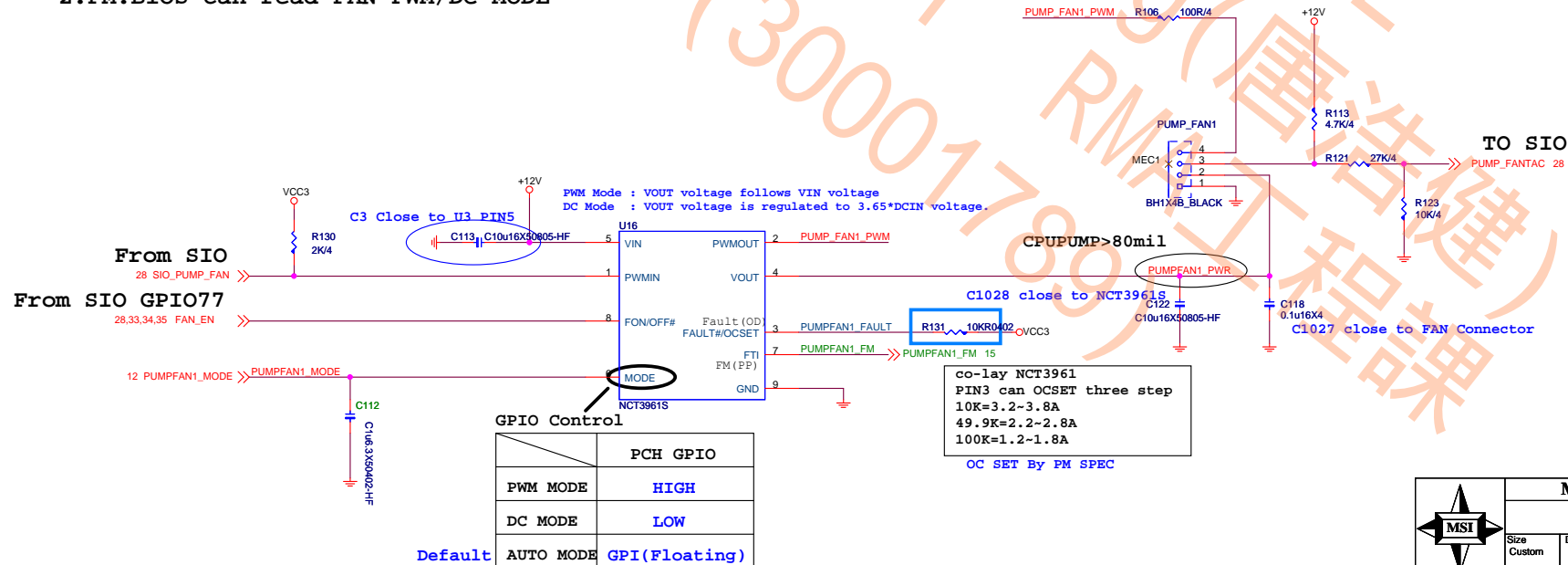
TYPE N : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

- 1.Mode GPIO BIOS can switch PWM/DC MODE
- 2.FM:BIOS can read FAN PWM/DC MODE



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

- 1.Mode GPIO BIOS can switch PWM/DC MODE
- 2.FM:BIOS can read FAN PWM/DC MODE



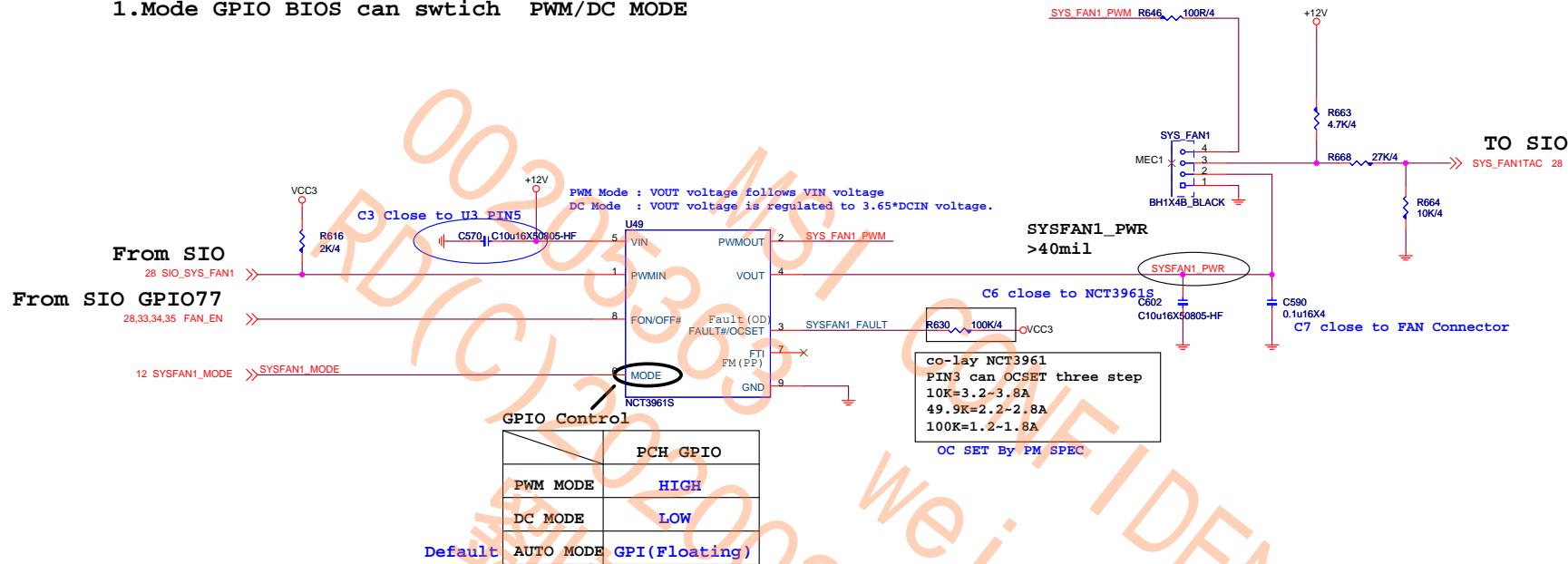
MICRO-STAR INT'L CO.,LTD

MS-7C76

| Size | Document Description | Rev |
|--------------------------------|----------------------|-----|
| Custom | CPU_FAN1/PUMP_FAN1 | 1.1 |
| Date: Friday, January 17, 2020 | Sheet 33 of 70 | |

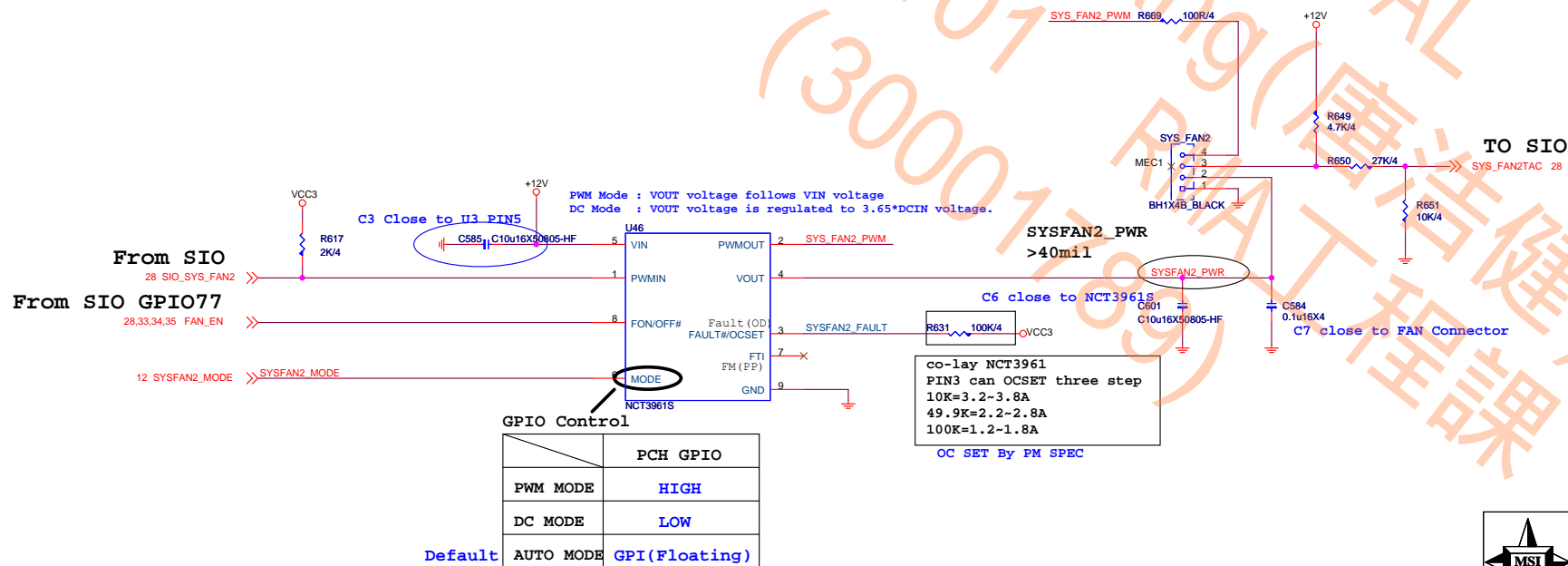
TYPE M : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can swtich PWM/DC MODE



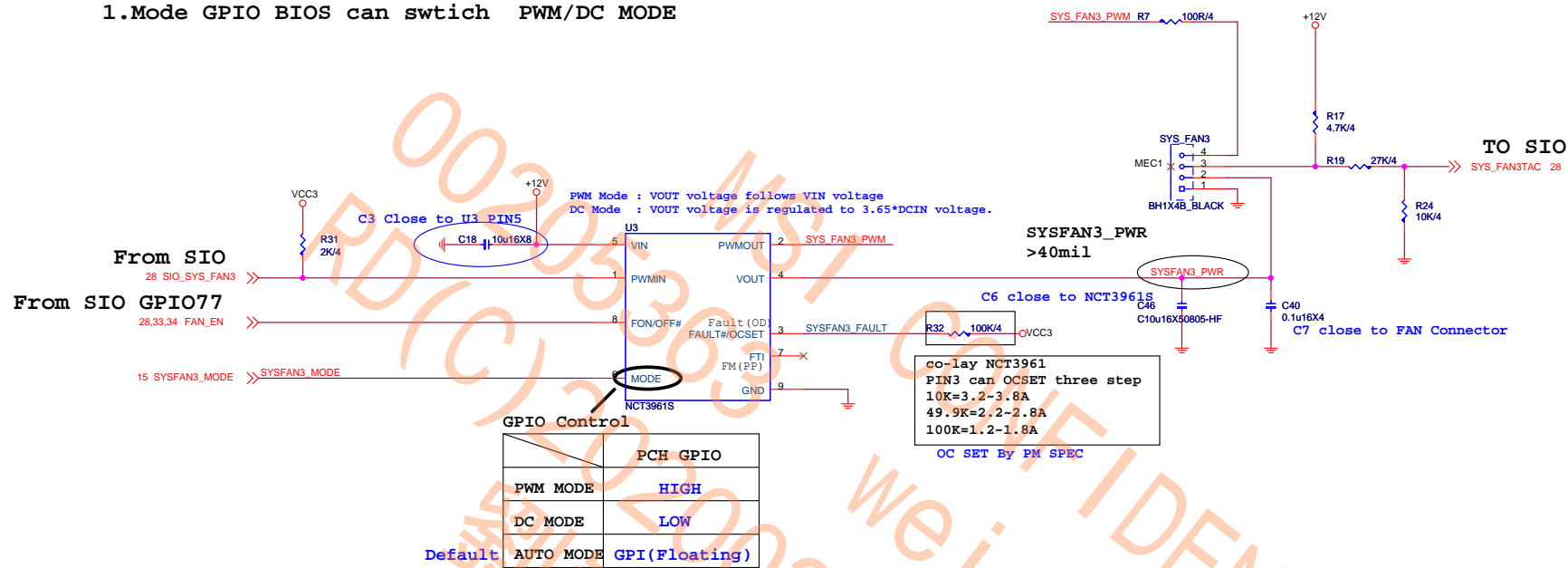
TYPE M : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

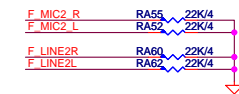
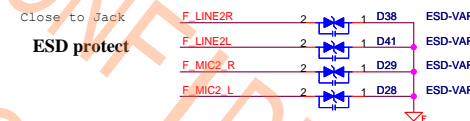
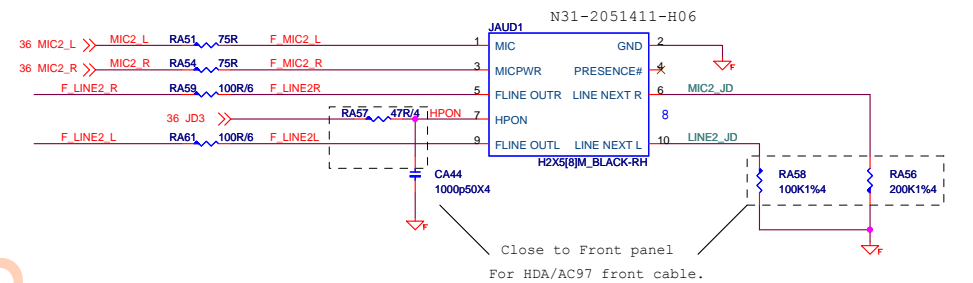
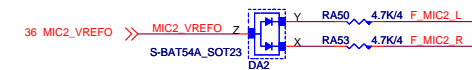
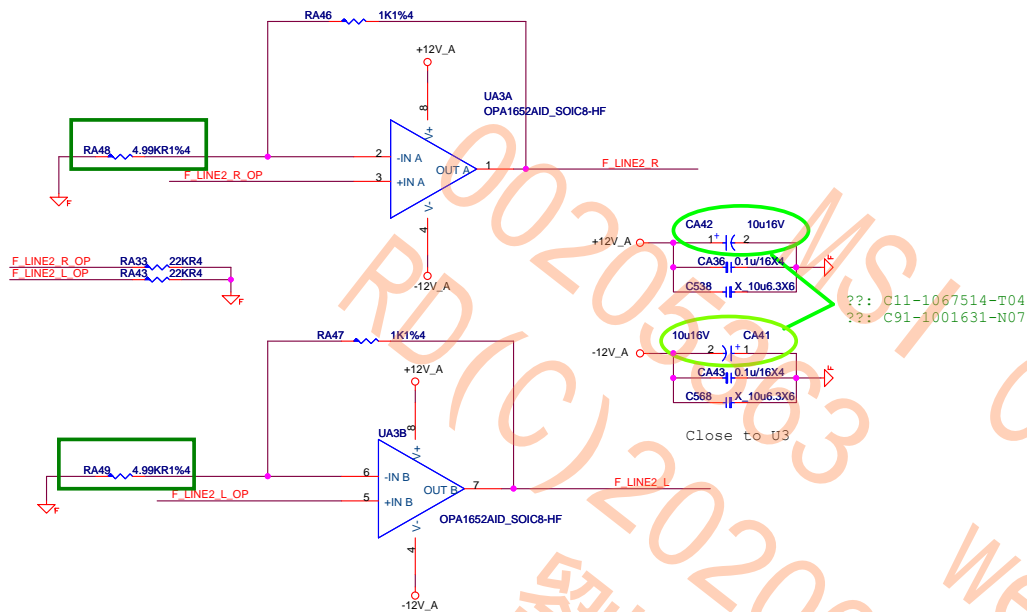
1.Mode GPIO BIOS can swtich PWM/DC MODE



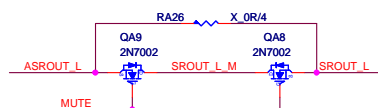
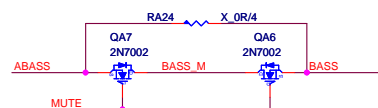
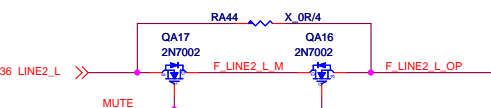
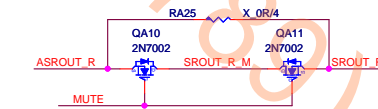
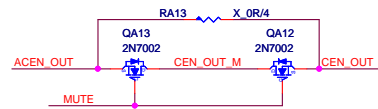
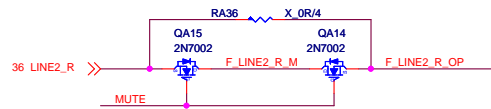
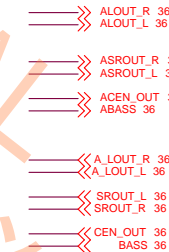
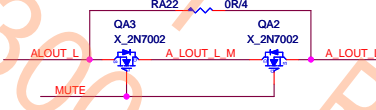
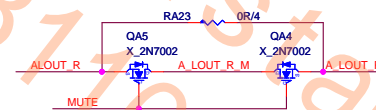
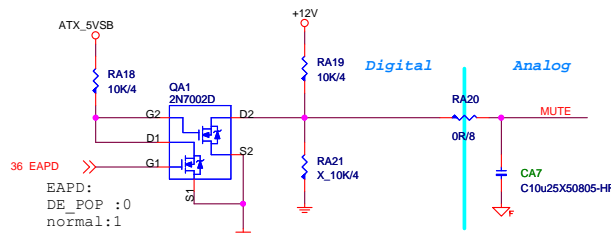
TYPE M : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can switch PWM/DC MODE





Rear Line OUT De-POP circuit



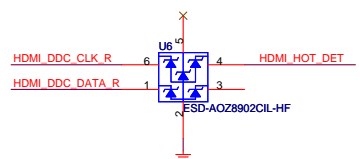
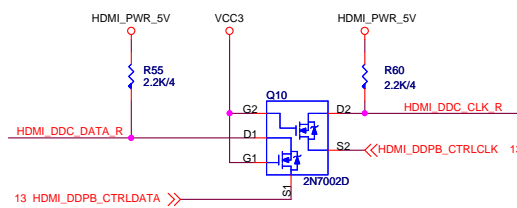
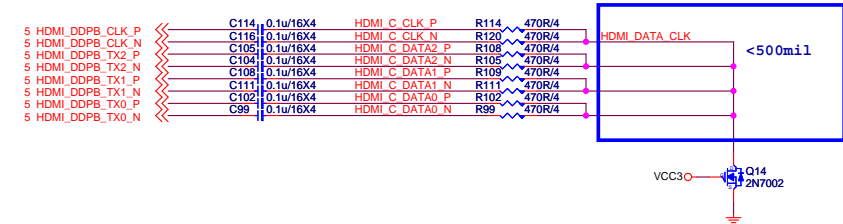
MICRO-STAR INT'L CO.,LTD

MS-7C76

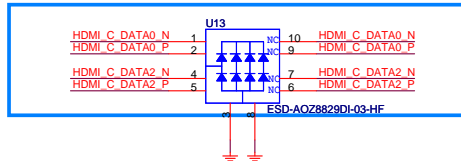
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| Custom | AUDIO-ALC1220P-2 | 1.1 |
| Date: Friday, January 17, 2020 | Sheet 37 of 70 | |

| | | |
|--------------------------------|--|----------------|
| Size Custom | Document Description LAN_RTL8125B 2.5G | Rev 1.1 |
| Date: Friday, January 17, 2020 | | Sheet 38 of 70 |

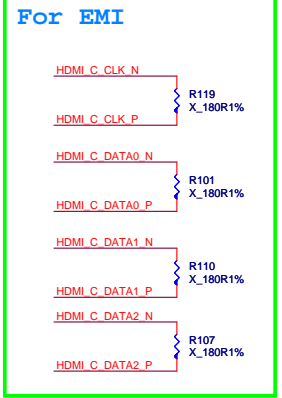
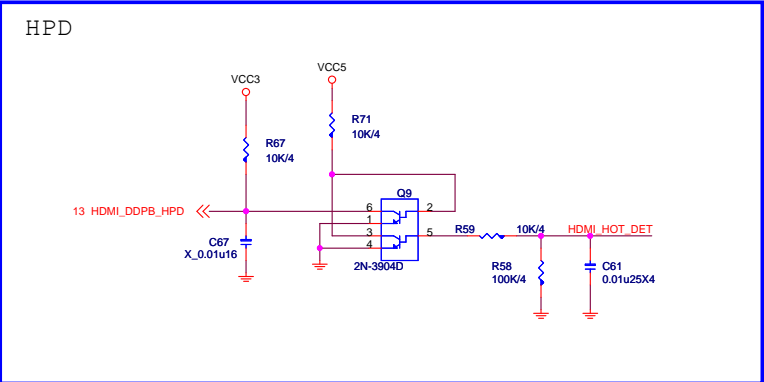
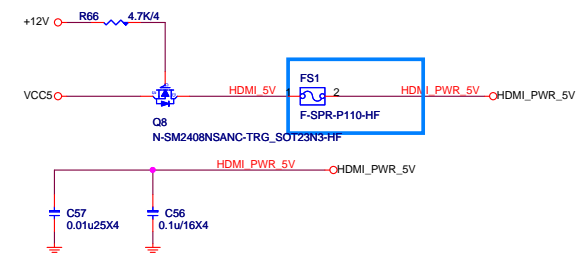
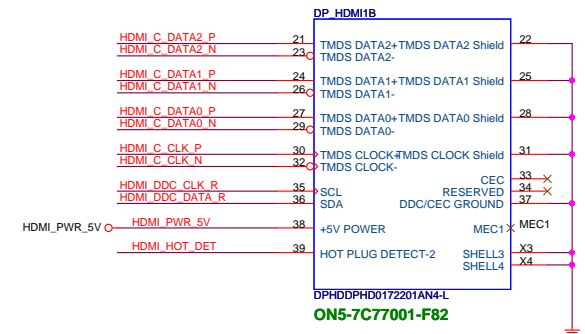
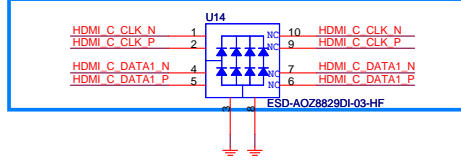
HDMI, DVI : 1920x1200 at 60 Hz (16:10 WUXGA)

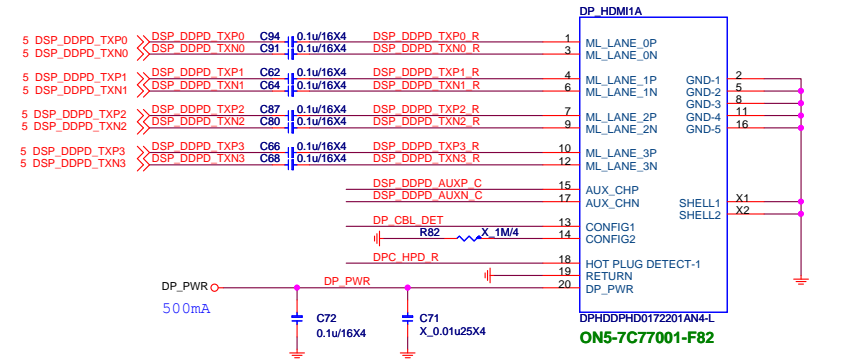
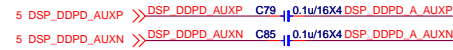
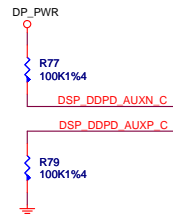
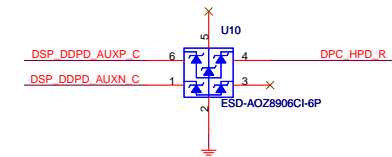
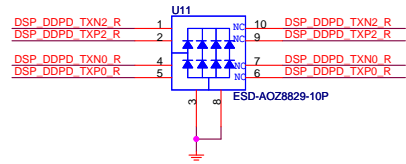
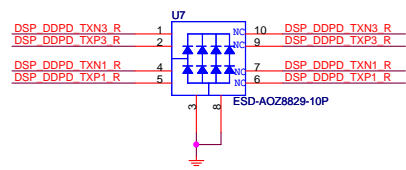


SWAP

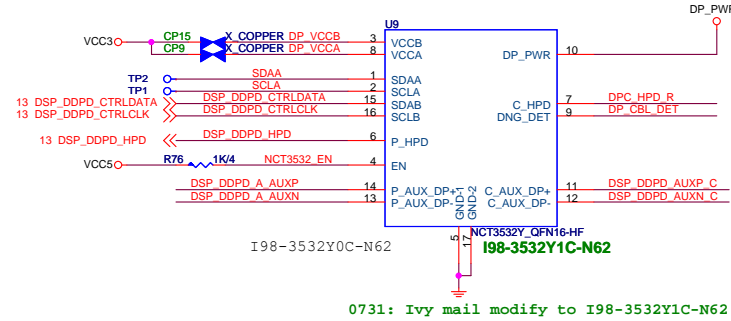


SWAP





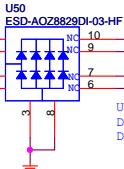
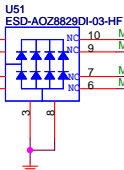
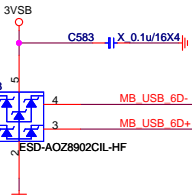
DP_VCCB trace don't less than 30 mil



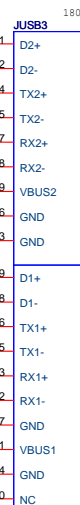
Front USB2.0 - USB2.0 HUB



Front USB3.0 - JUSB3



USB3.0 (ESD)
D0G-06A050C-A68 (M)
D0G-05A0300-I14



N32-2101091-H06

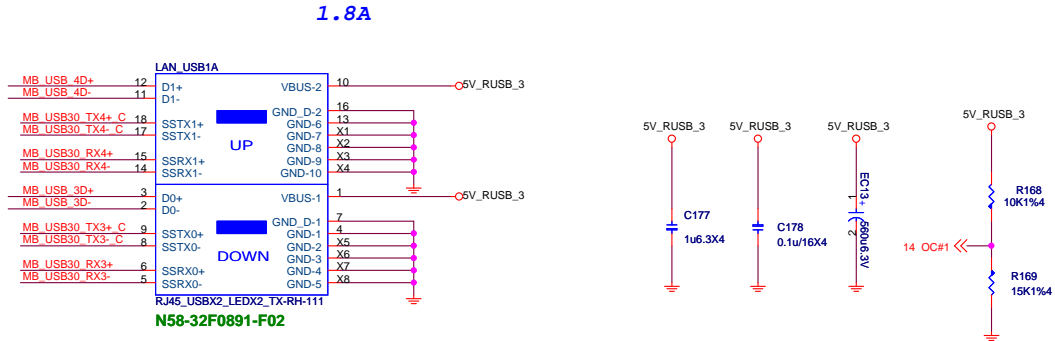
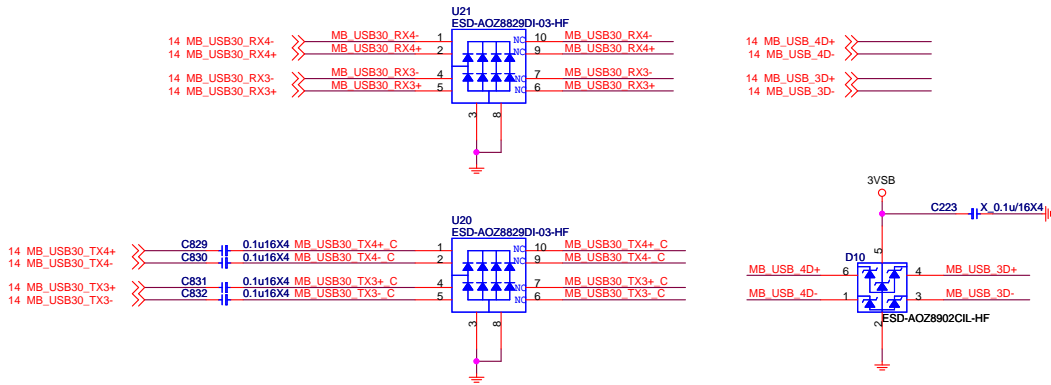


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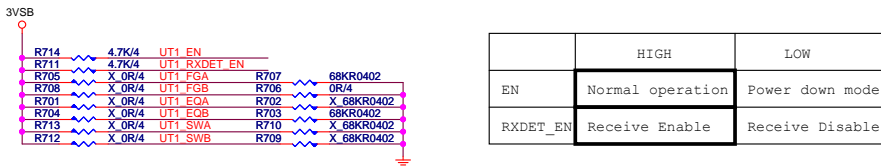
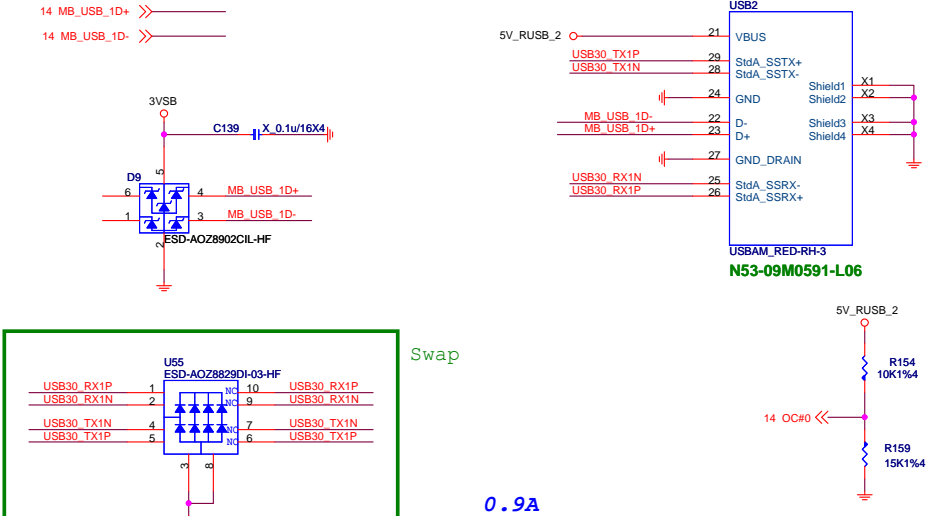
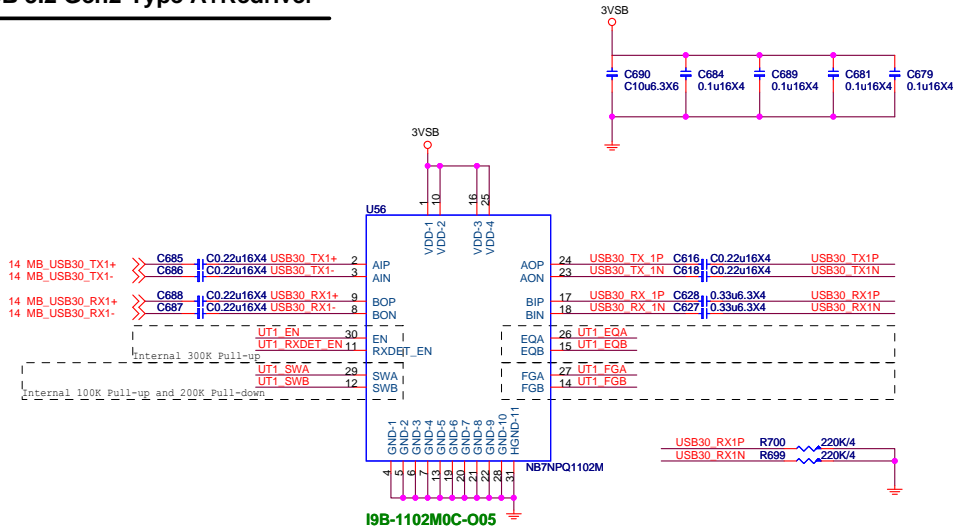
MS-7C76

| | | |
|--------------------------------|--|----------------|
| Size Custom | Document Description Front USB20/USB30 | Rev 1. |
| Date: Friday, January 17, 2020 | | Sheet 41 of 70 |

LAN USB3.0



Rear USB 3.2 Gen2-Type A+Redriver



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

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MS-7C76

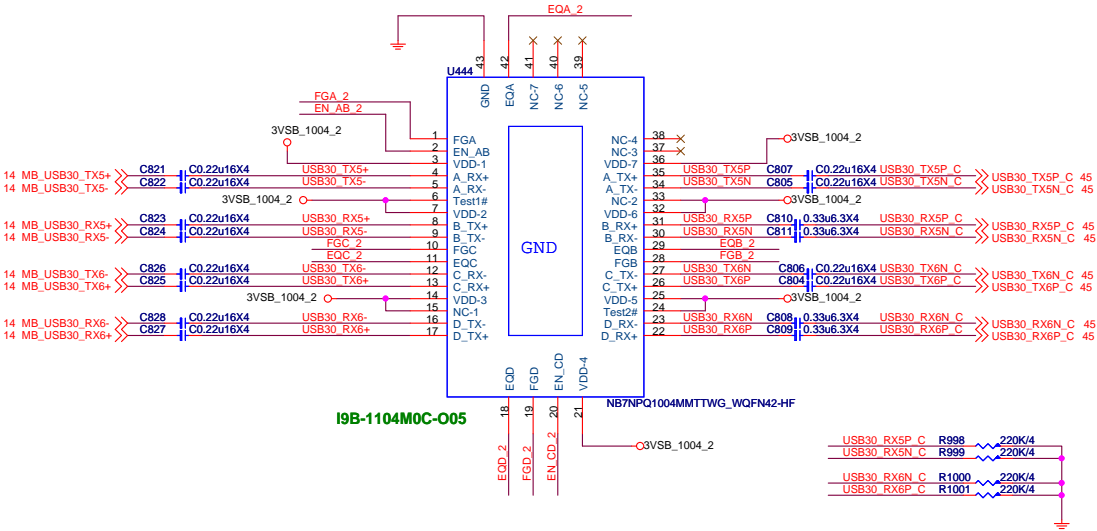
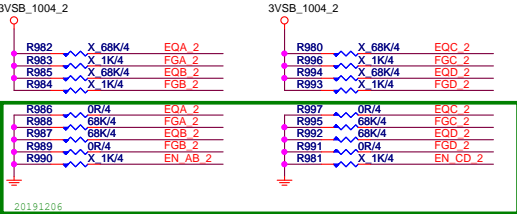
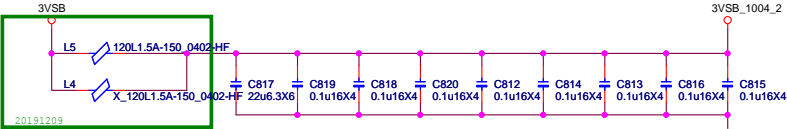
| | | |
|--------------------------------|--|---------|
| Size Custom | Document Description Real USB31 Type A/LAN_USB30 | Rev 1.1 |
| Date: Friday, January 17, 2020 | Sheet 43 of 70 | |

Rear USB31 TYPEC Redriver

| | | EQ | FG |
|-------|---|----|----|
| 5C_TX | A | R | R |
| 5C_RX | B | R | L |
| 6C_TX | C | R | R |
| 6C_RX | D | R | L |

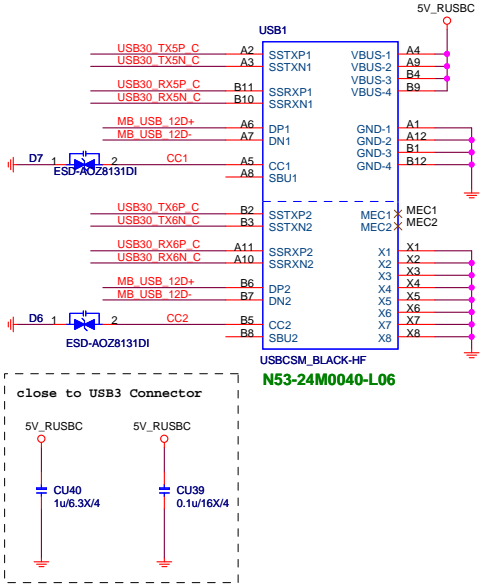
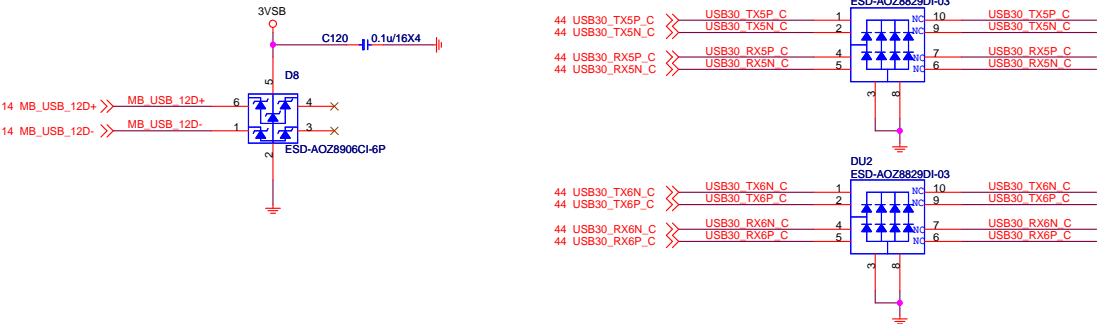
| EQ | dB | |
|----|------|------------|
| 0 | 10.9 | 0 to GND |
| R | 6.7 | 68K to GND |
| F | 8.9 | NC |
| 1 | 13.1 | 0 to VDD |

| FG | dB | |
|----|------|------------|
| 0 | -3.0 | 0 to GND |
| R | -1.5 | 68K to GND |
| F | 0 | NC |
| 1 | 2.0 | 0 to VDD |

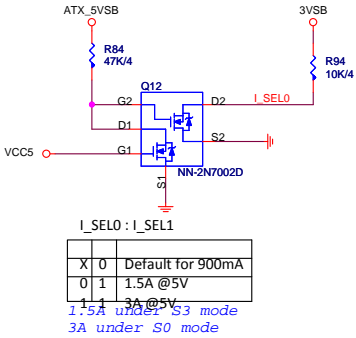


Rear USB 3.1-Type-C

ESD Protection
NEAR CONNECTOR

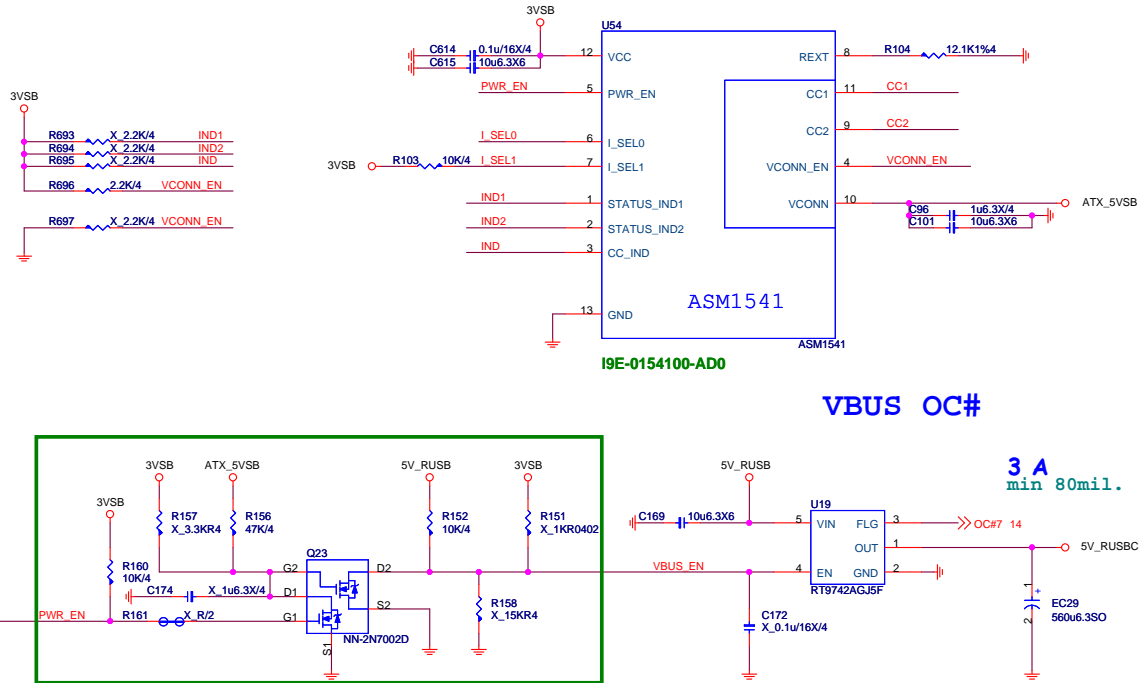


Current Mode



VBUS OC#

3 A
min 80mil.

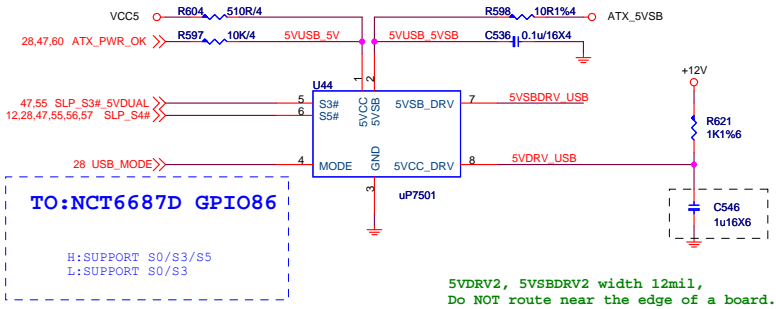


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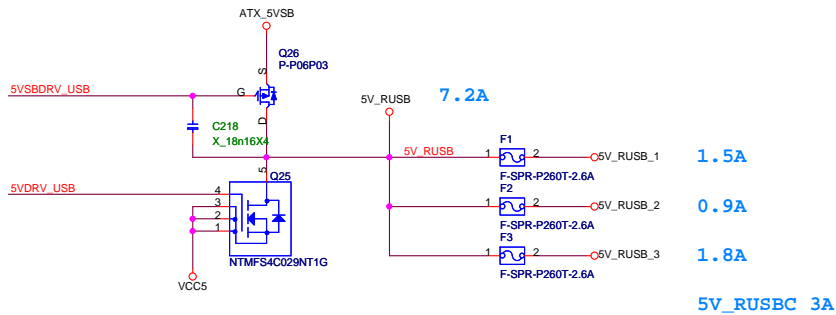
MS-7C76

| Size | Document Description | Rev |
|--------|--------------------------|----------------|
| Custom | Rear USB31 TYPEC | 1.1 |
| Date: | Friday, January 17, 2020 | Sheet 45 of 70 |

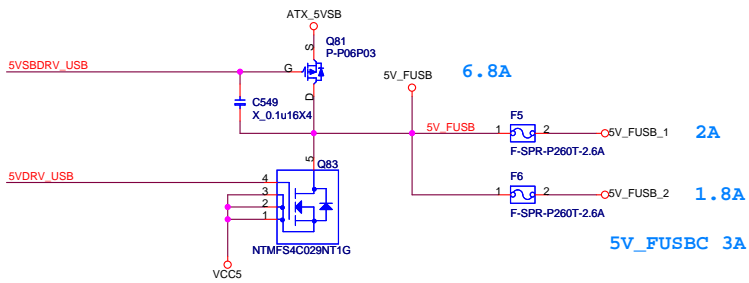
USB POWER



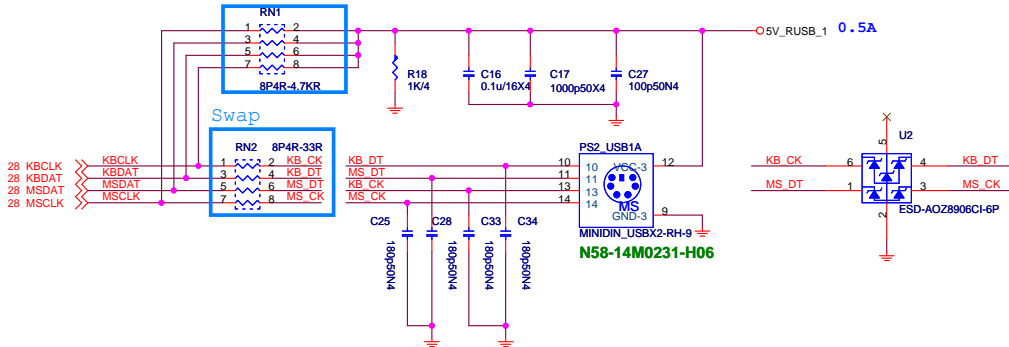
REAR USB PORT POWER



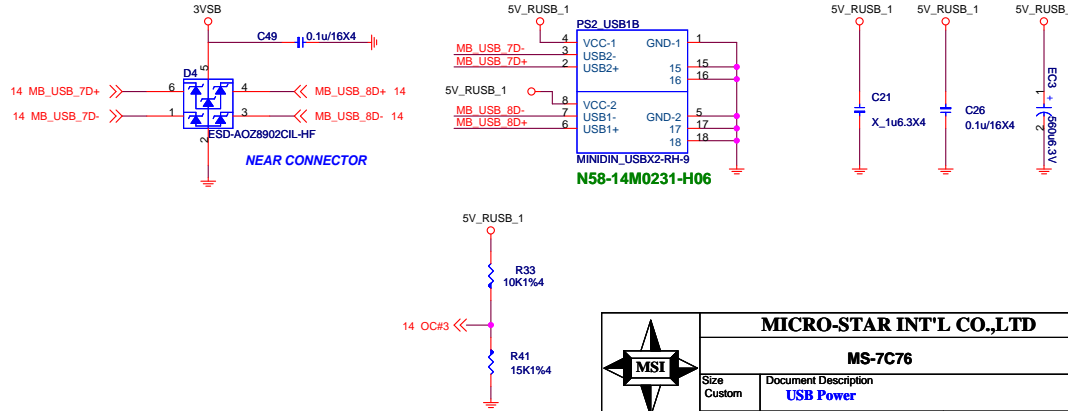
FRONT USB PORT POWER



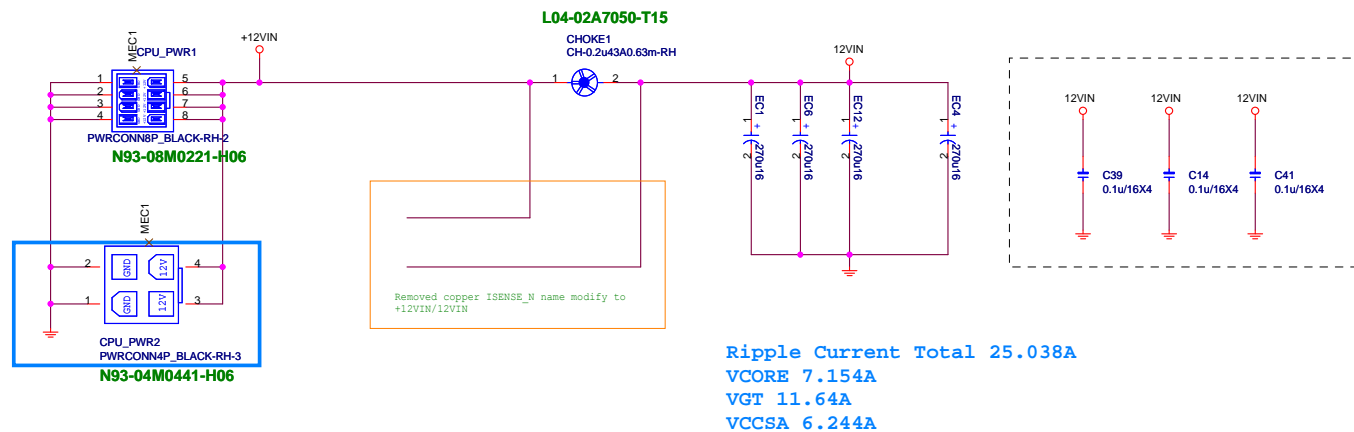
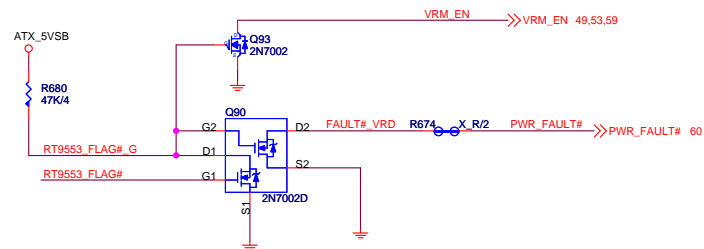
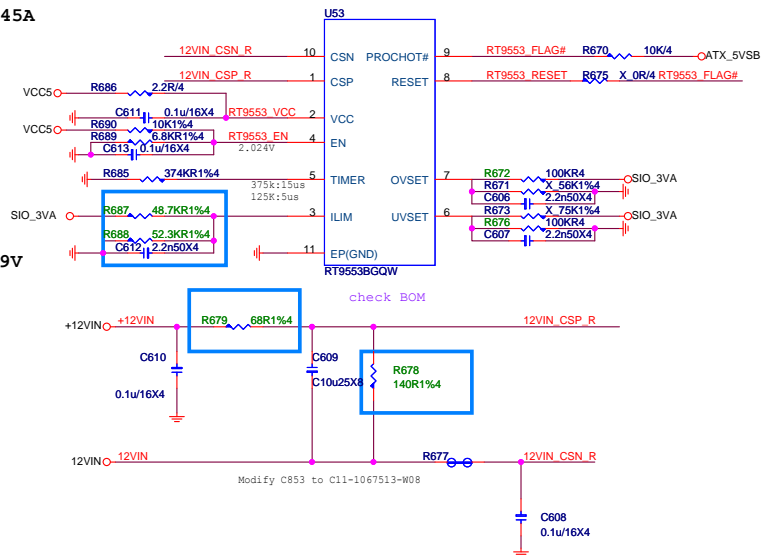
PS2 KEYBOARD & MOUSE CONNECTOR

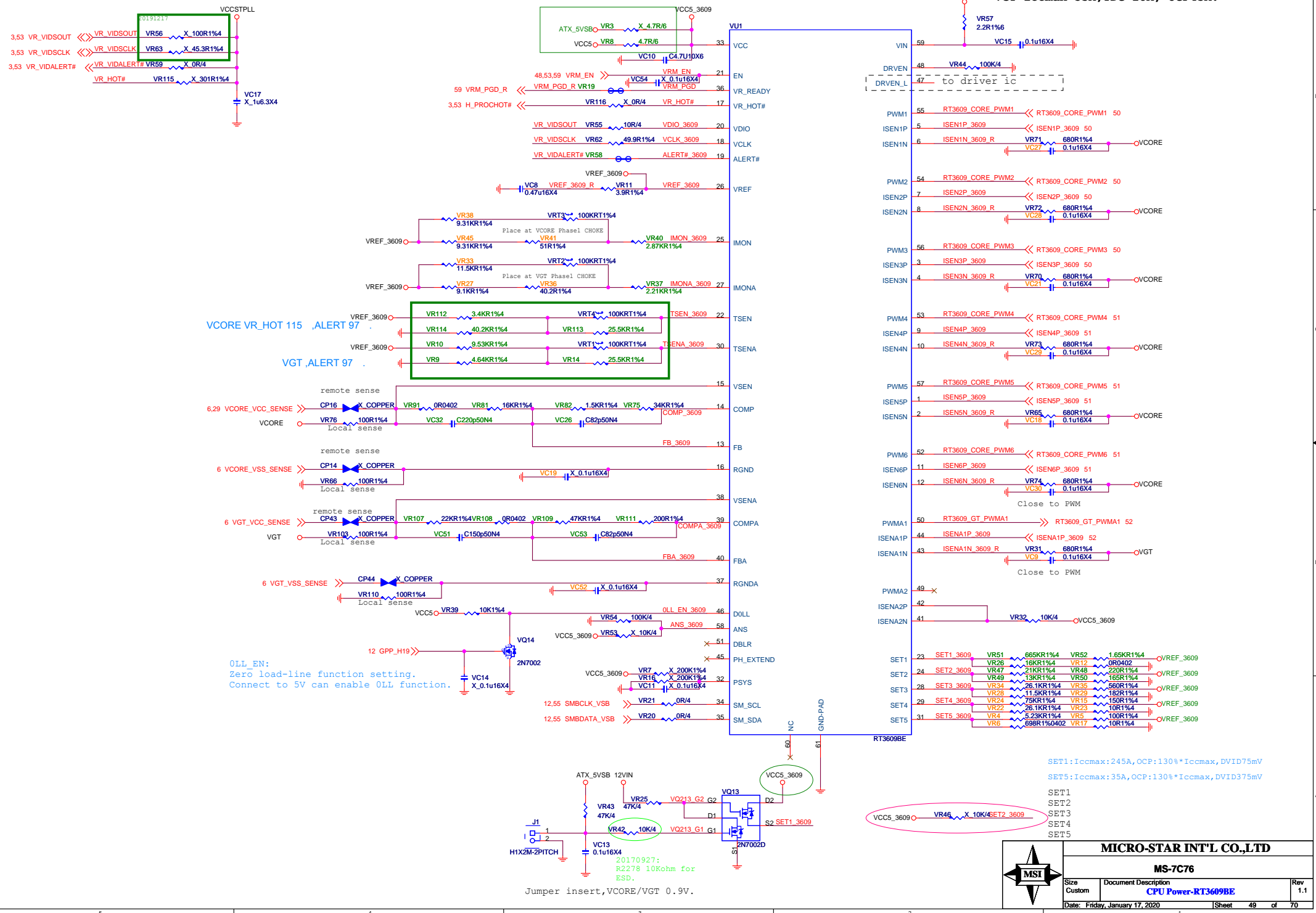


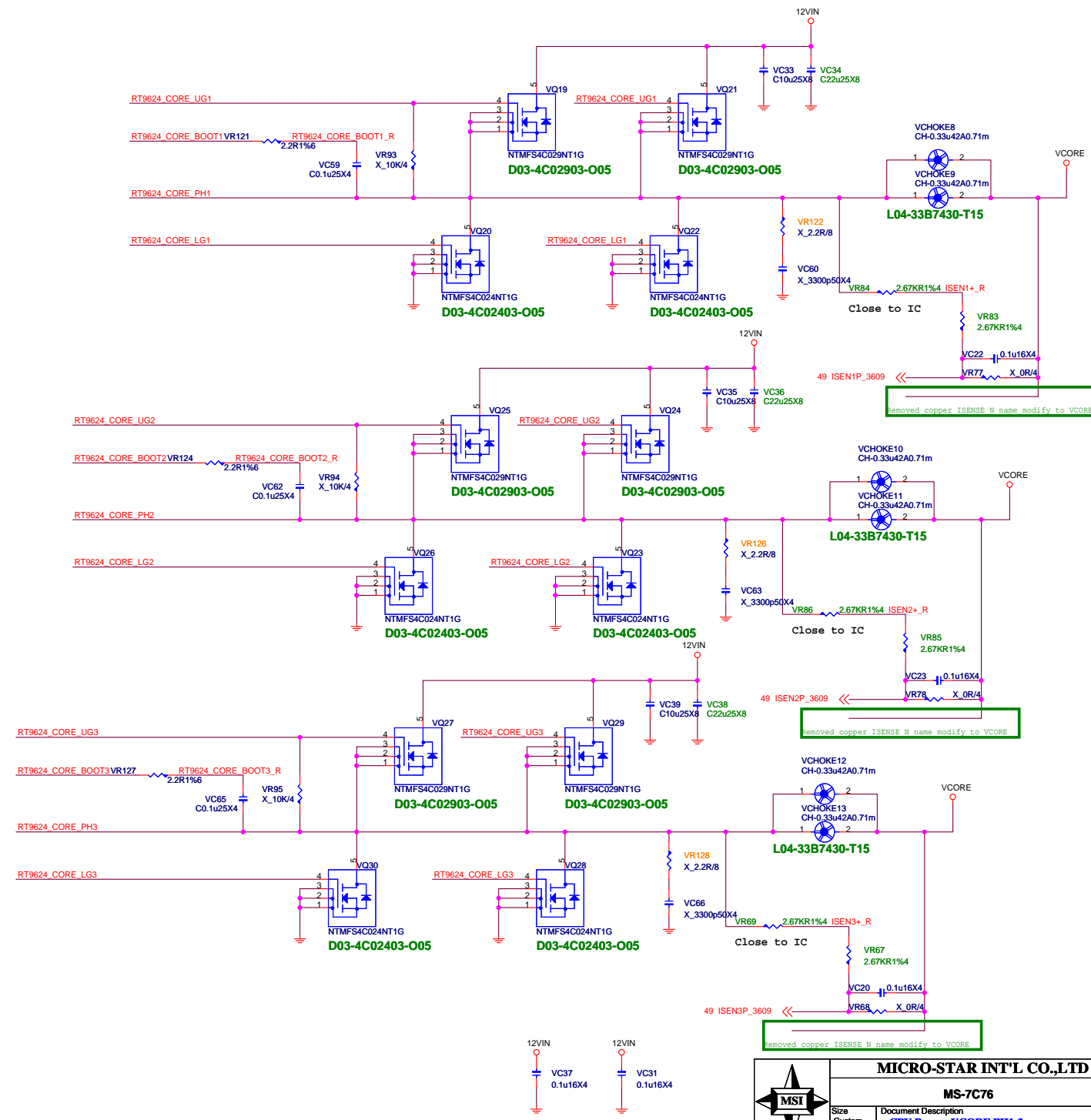
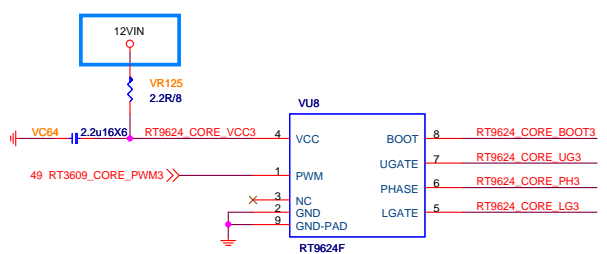
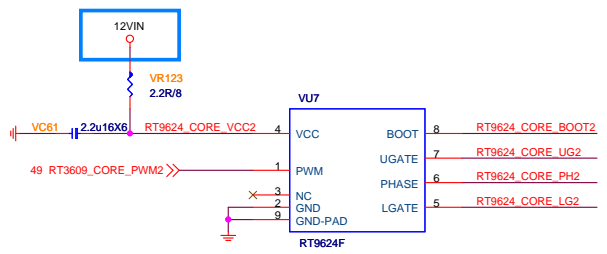
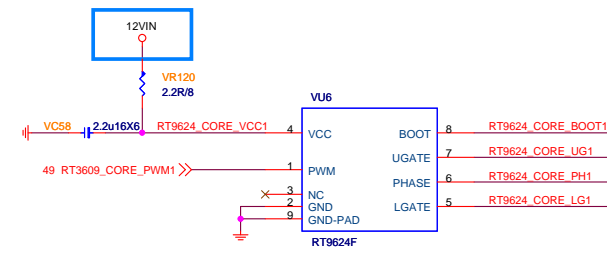
PS2 USB2.0

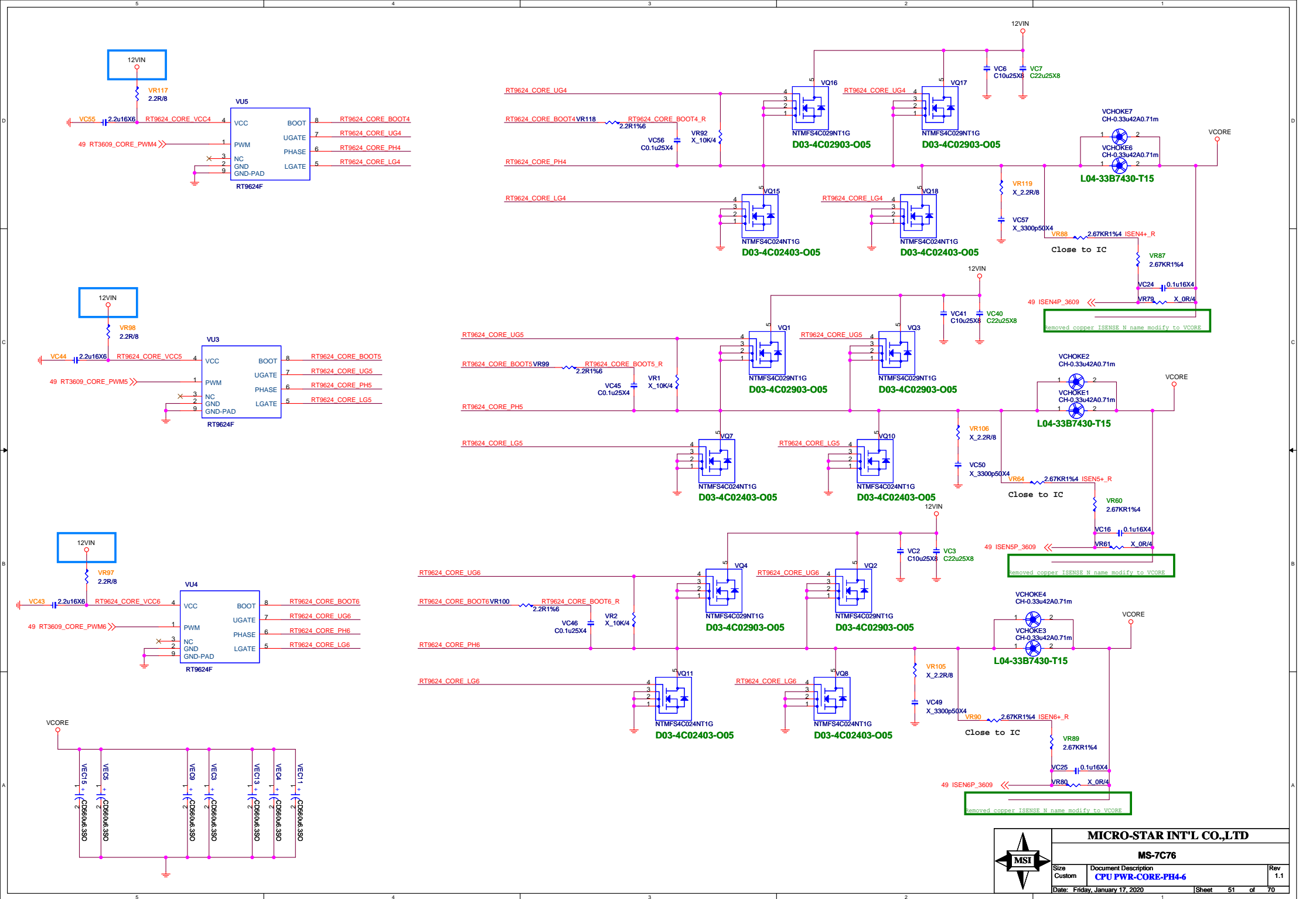


OCP:45A
Real OCP:45A





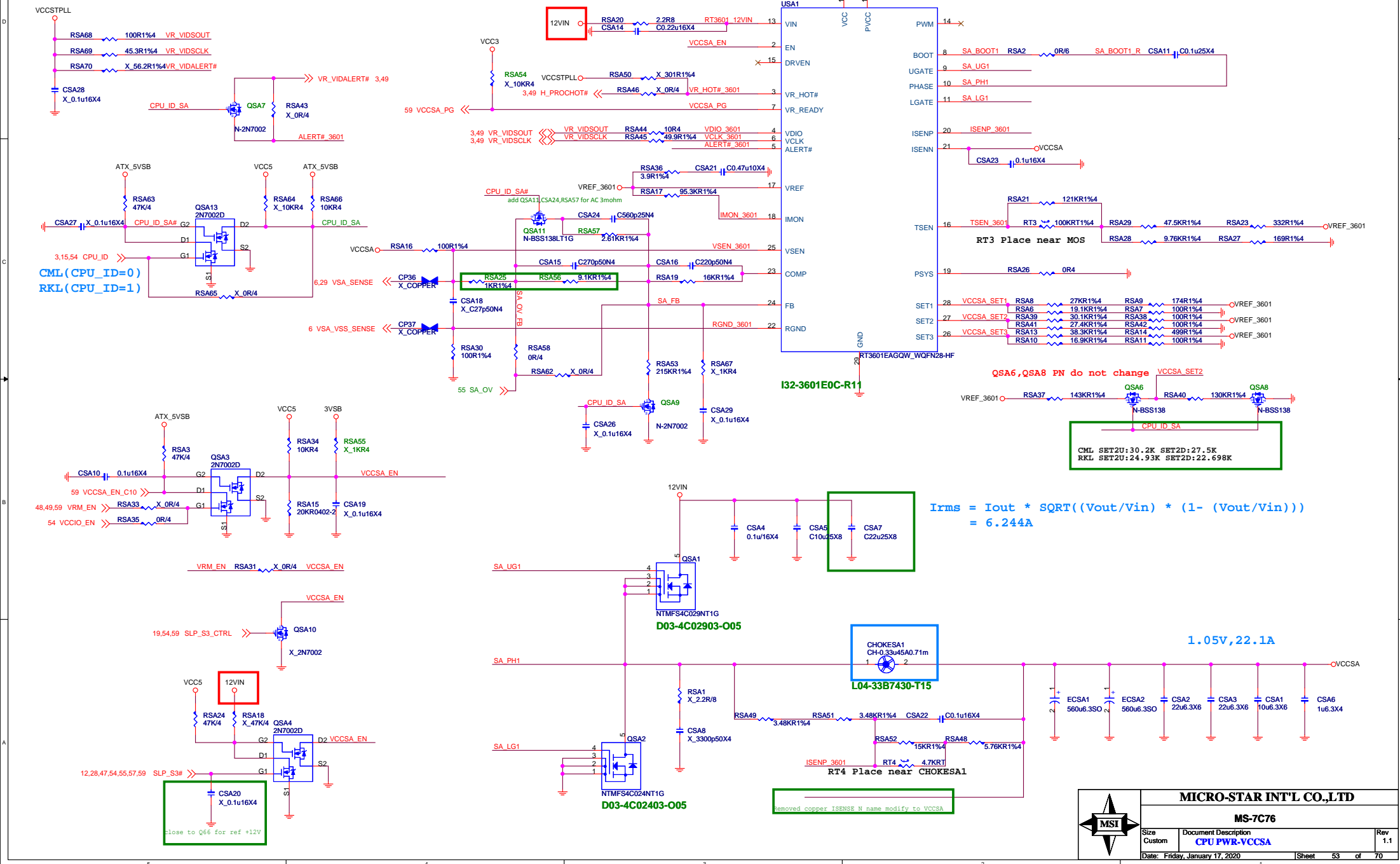




VCCSA

1.05V, ICC_max=11.1A/22.1A

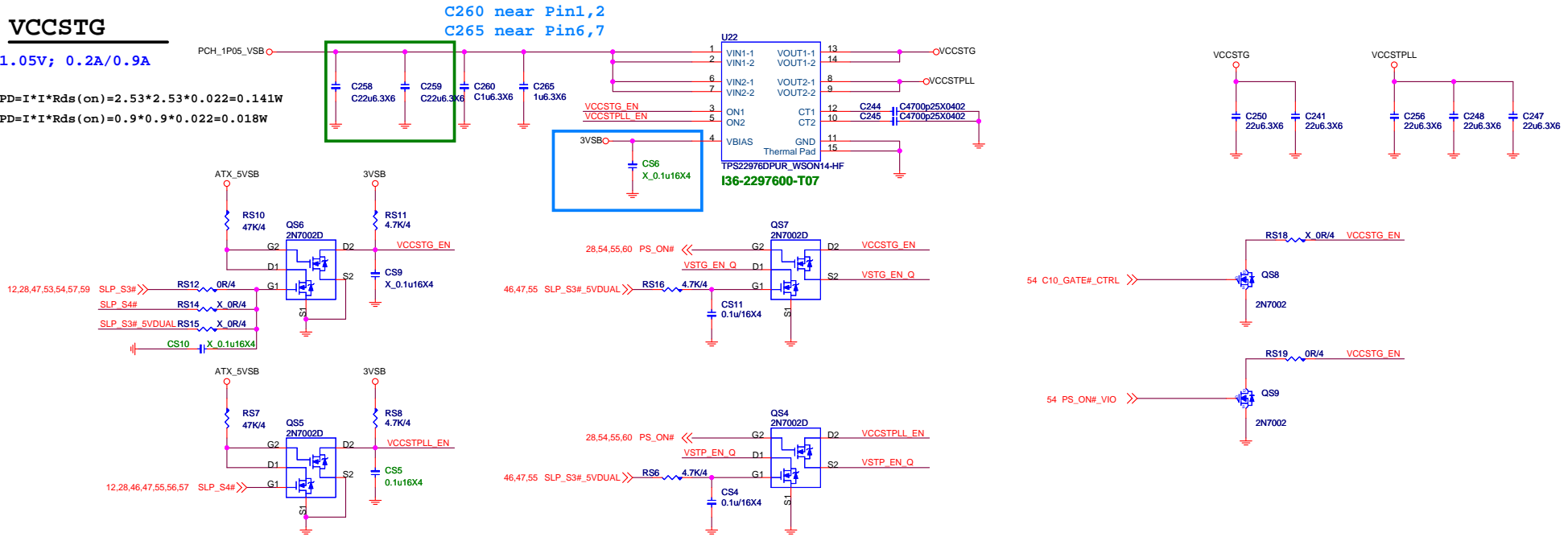
Output CHOKE L04-33B7430-T15 Isat=33A



$$1.05V; 0.92A/2.3A+0.23A=2.53A$$

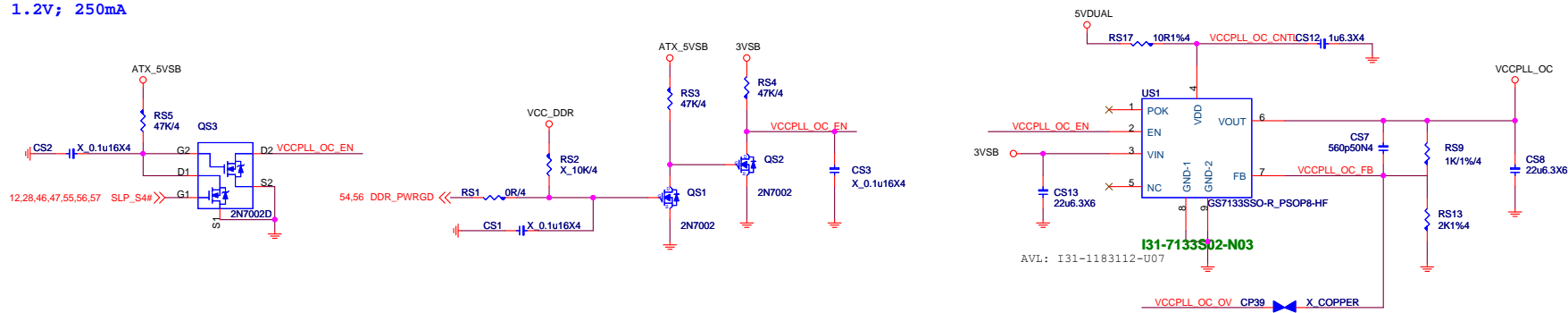
VCCSTG

1.05V; 0.2A/0.9A

$$P_D = I \cdot I \cdot R_{ds(on)} = 2.53 \cdot 2.53 \cdot 0.022 = 0.141 \text{ W}$$
$$PD = I \cdot I \cdot R_{ds(on)} = 0.9 \cdot 0.9 \cdot 0.022 = 0.018W$$


VCCPLL_OC

1.2V; 250mA

$$PD = (3.3V - 1.2V) * 0.25A = 0.525W < 1.33W$$


VOLTAGE CONSOLE

0x20:RH=10K,RL=OPEN

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

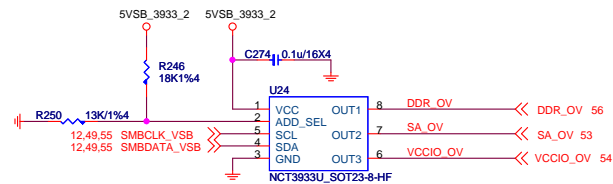
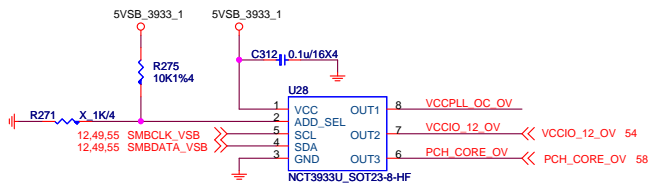
5VDIMM

R237 0R/4

5V_FUSE

R238 X_0R/4

5VSB_3933_2



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| | | |
|--------------------------------|---|----------------|
| Size Custom | Document Description CPU PWR-VCCST/PLL/OV | Rev 1.1 |
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VCC_DDR

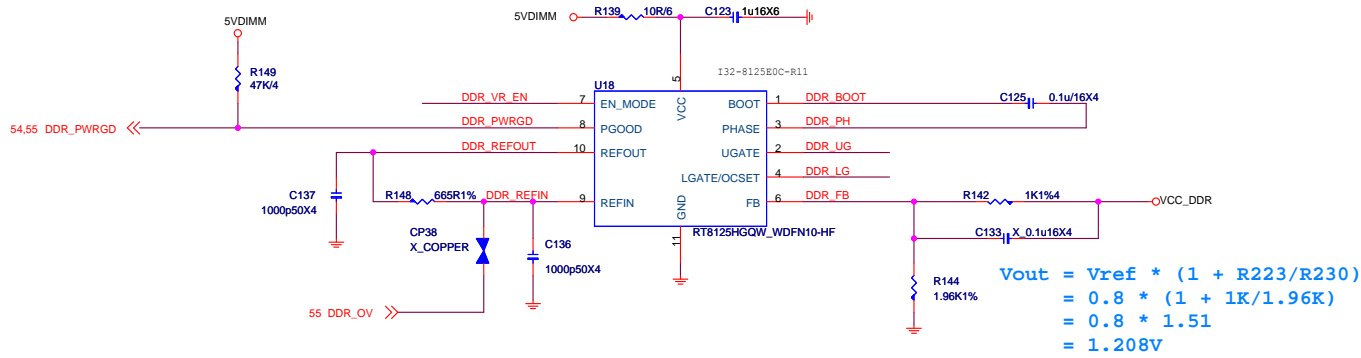
1.2V, ICC_max=14.1A

D03-4C02403-005:3.3~4.0mohm@5V

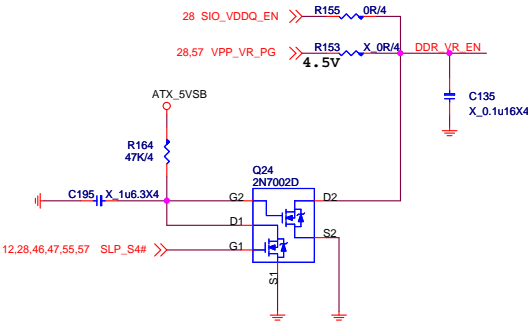
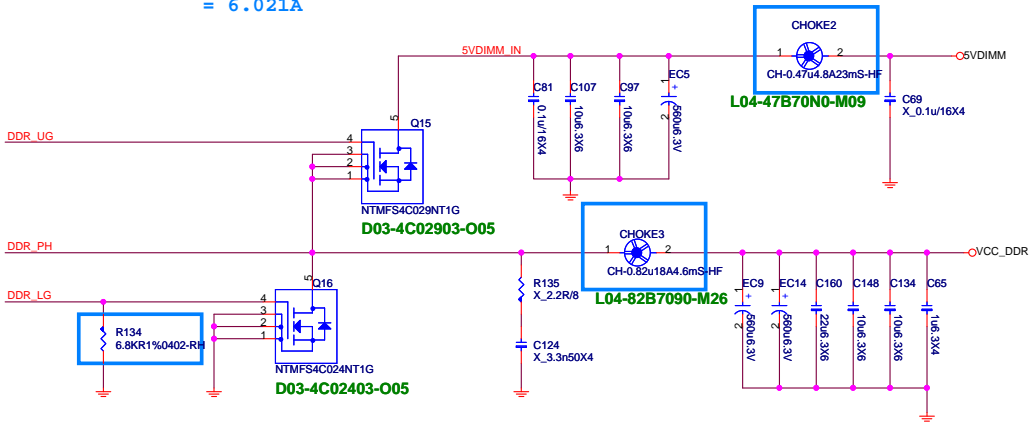
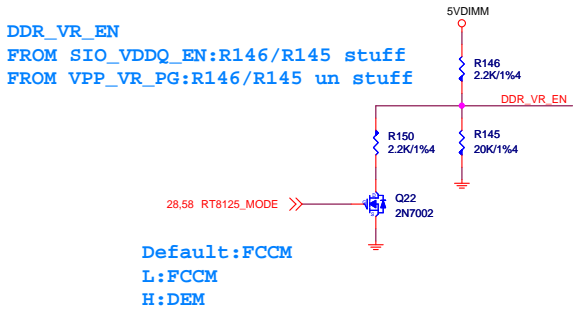
OCP_max=Iocset*Rocset/Rdson(min)
=10uA*6.8k/3.3mohm
=20.6A

OCP_min=Iocset*Rocset/Rdson(max)
=10uA*6.8k/4mohm
=17A

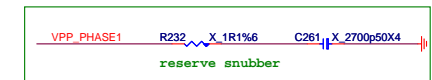
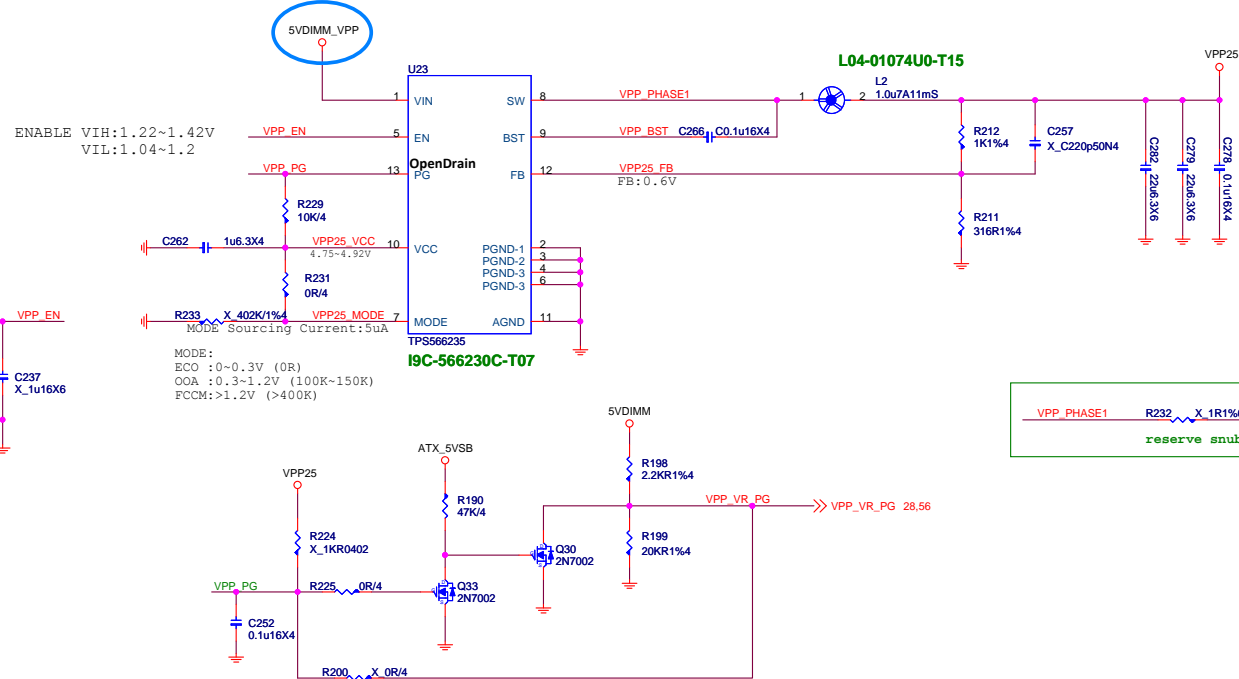
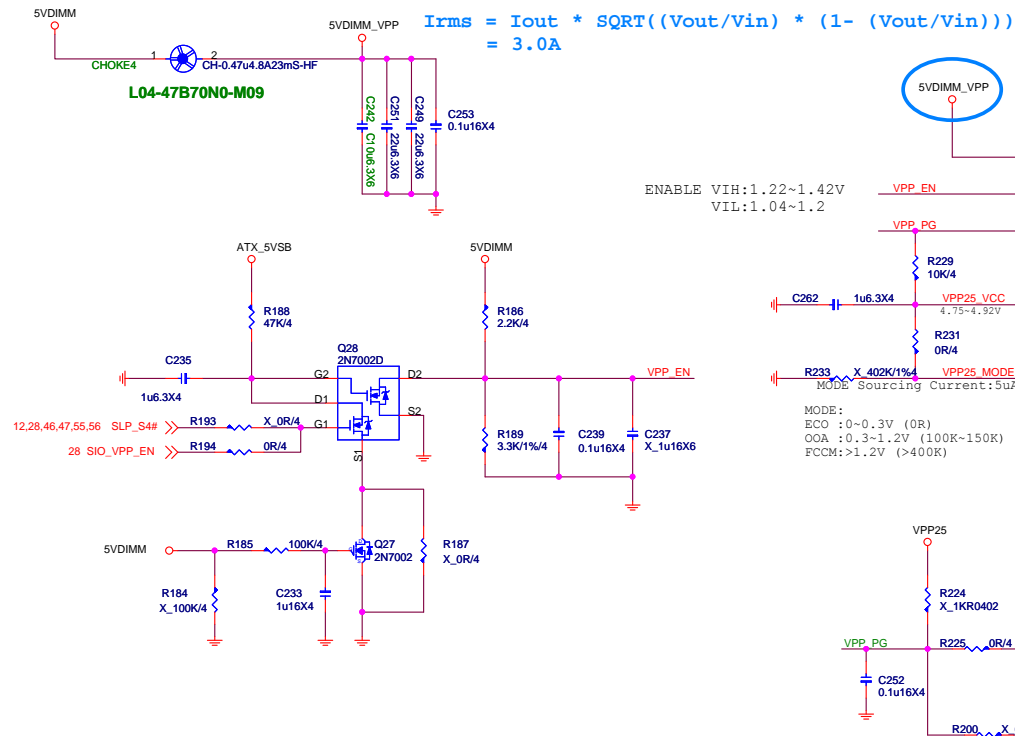
Output CHOKE L04-82B7090-M26 Isat=18A
I=20A, L=0.6uH by L-I Curve.



$$I_{rms} = I_{out} * \sqrt{(V_{out}/V_{in}) * (1 - (V_{out}/V_{in}))}$$
$$= 6.021A$$

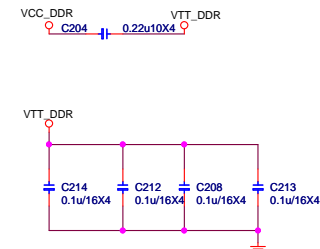
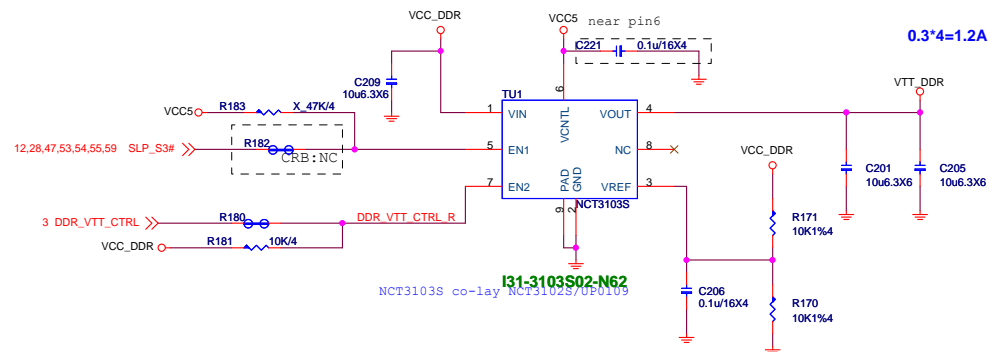


VPP25 Power:2.5V,6A
IC OCP:6.6~8.6A



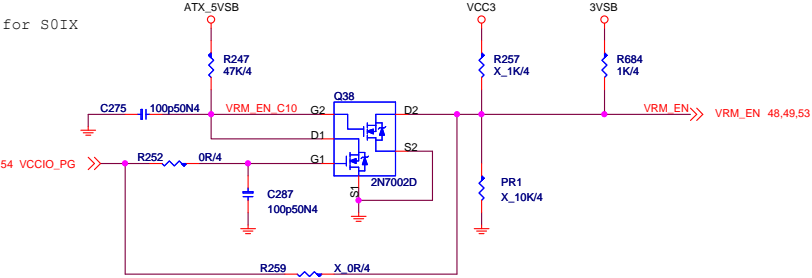
DDR VTT Power

To CPU Copper trace width > 250mils , Fill island behind DIMM > 400mils .
 $PD = (V_{in} - V_{out}) * I_{out} = 0.6 * 1.2 = 0.72W < 1.33W$

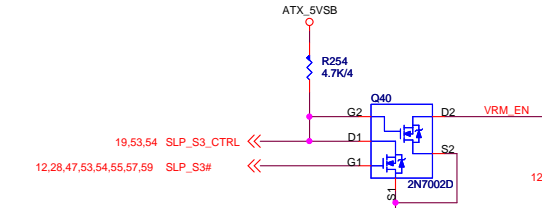
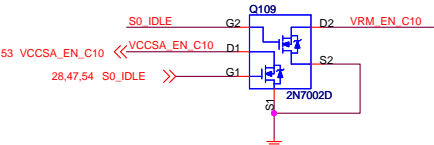


| | | | |
|---------------------------------|---|-------|------------|
| MICRO-STAR INT'L CO.,LTD | | | |
| MS-7C76 | | | |
| Size Custom | Document Description DDR PWR VPP25/VTI-TPS66235 | | Rev 1.1 |
| Date: Friday, January 17, 2020 | | Sheet | 57 of 70 |

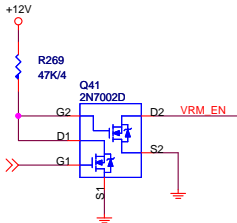
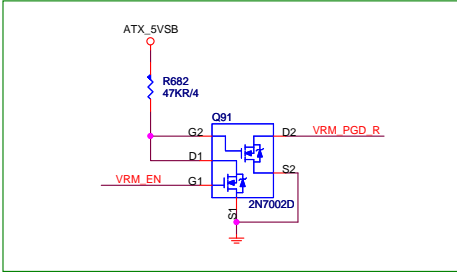
VRM-Sequence



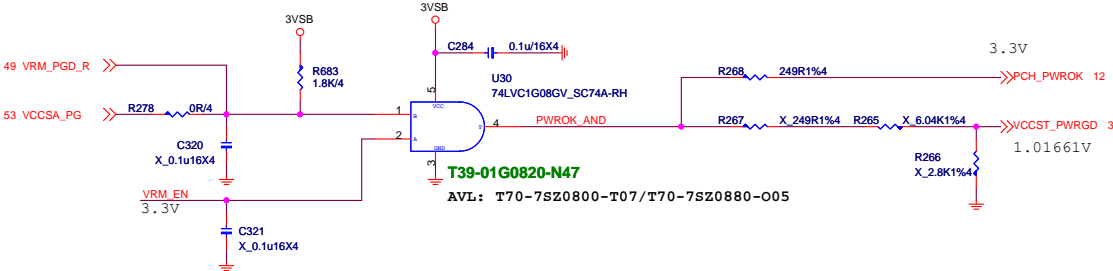
20191217 for VCCSA space reson merger to dual7002



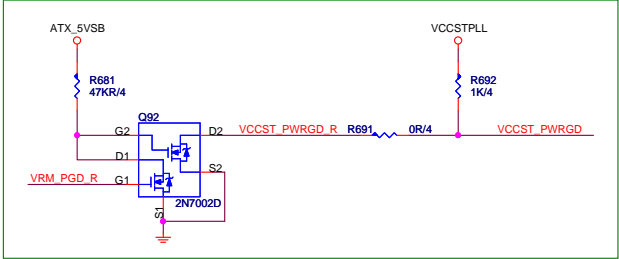
20191008 add VRM_EN control VRM_PWRGD



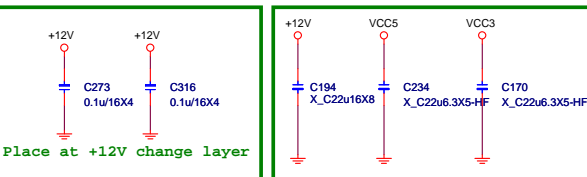
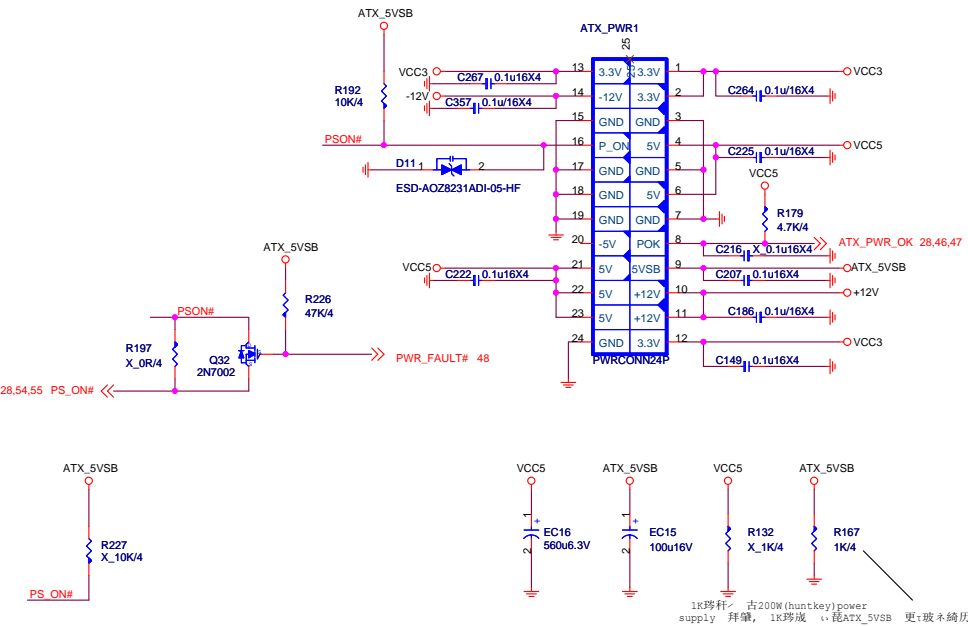
PCH_PWROK/VCCST_PWRGD



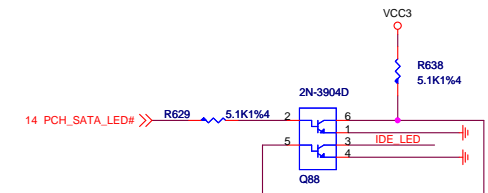
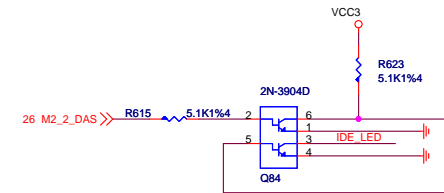
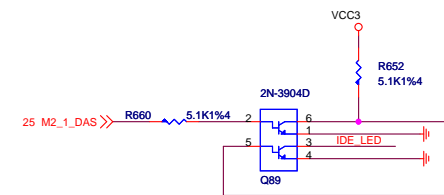
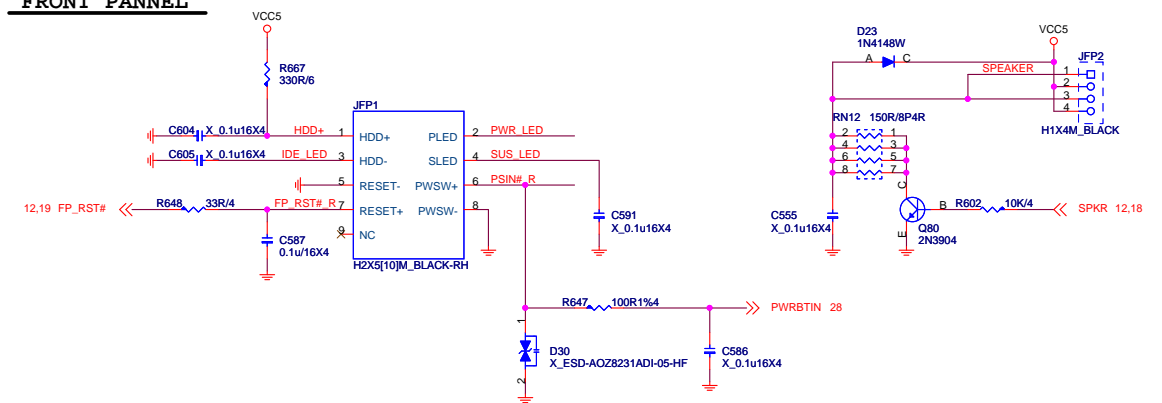
20191008 add Q415 for VCCST_PWRGD Control



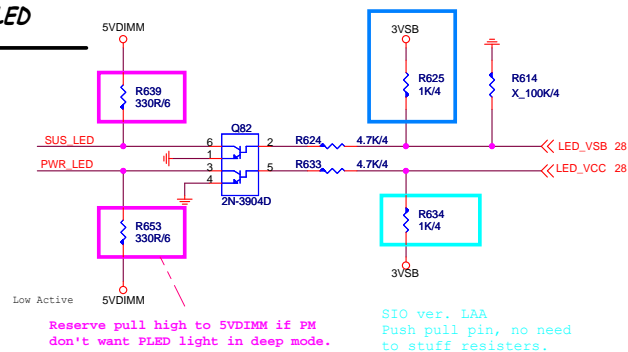
ATX POWER CONNECTOR



FRONT PANNEL



Front Panel LED



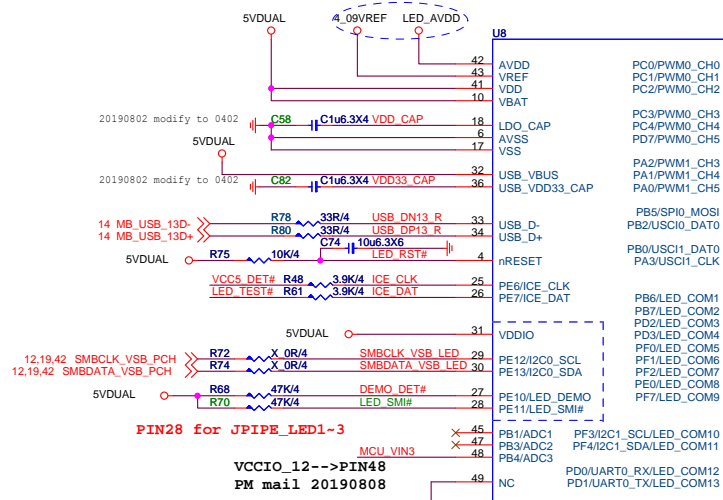
MICRO-STAR INT'L CO.,LTD

MS-7C76

| | | |
|--------------------------------|--|----------------|
| Size Custom | Document Description ATX Connector/F_Panel | Rev 1.1 |
| Date: Friday, January 17, 2020 | | Sheet 60 of 70 |

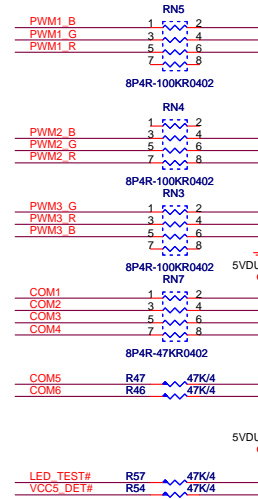
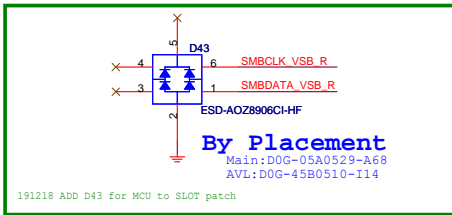
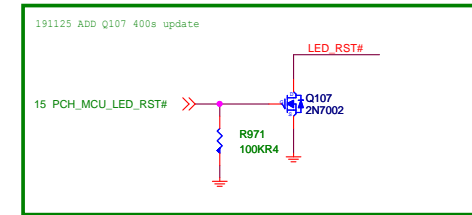
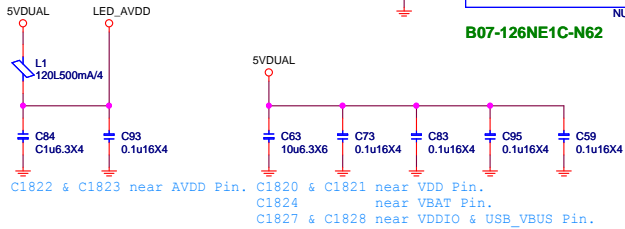
48 PIN LED MCU

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

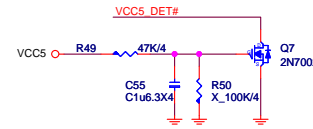


B07-126NE1C-N62

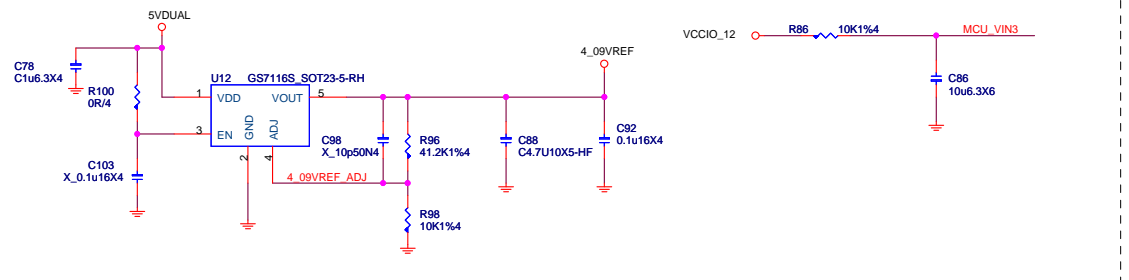
PS. COM1 is the first action block, next is COM2, and so on. Pin15,16 can configure to master smbus if spec requirement.



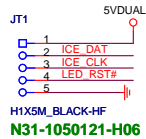
| Control | Net Name | PWM USE |
|----------------|-------------|------------|
| PCH | LED_DATA4 | No Use |
| AUDIO Cover | LED_GPIO_01 | No Use |
| MOS/IO cover | LED_GPIO_02 | No Use |
| JRAINBOW1 | LED_DATA1 | No Use |
| JRAINBOW2 | LED_DATA3 | No Use |
| JCORSAIR1 | LED_DATA2 | No Use |
| JRGB1/JRGB2 | PWM1/ PWM2 | PWM1/ PWM2 |
| Board Side LED | COM 1-6 | PWM3 |
| Board Side LED | COM 9-12 | No Use |



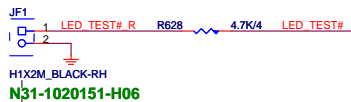
OPTION FOR SPEC HW MONITOR



JT1 for FW update



JF1 for Factory test



Check with LED model spec

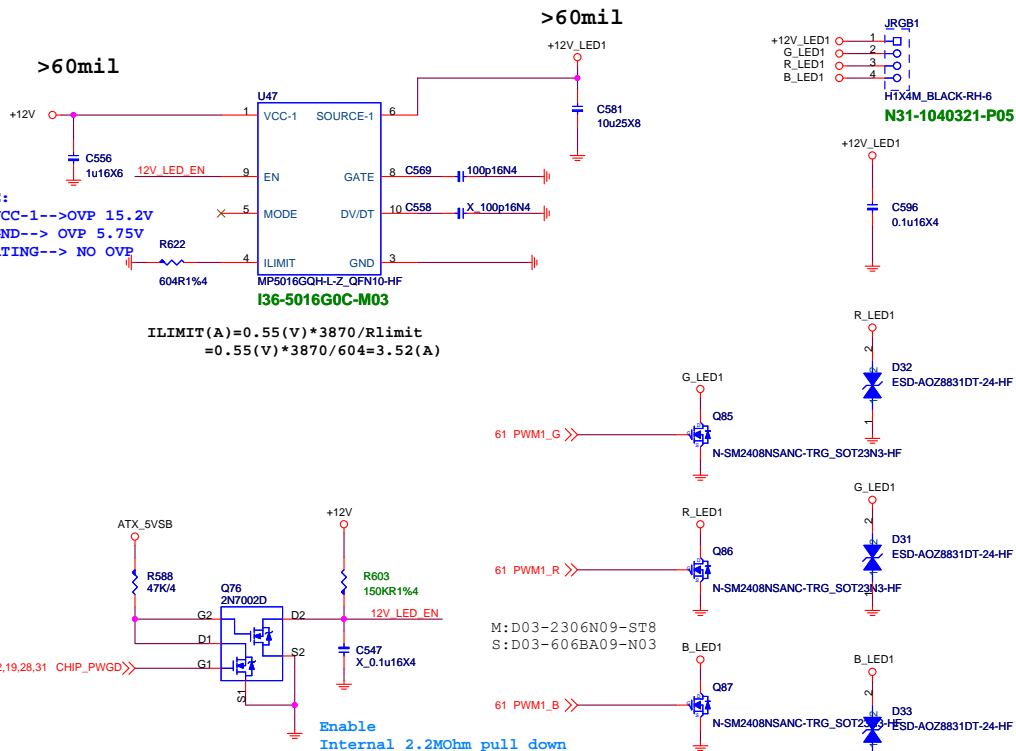


MICRO-STAR INT'L CO.,LTD

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|--------------------------------|----------------------|-----|
| Custom | MCU- LED MCU Control | 1.1 |
| Date: Friday, January 17, 2020 | Sheet 61 of 70 | |

JRGB1

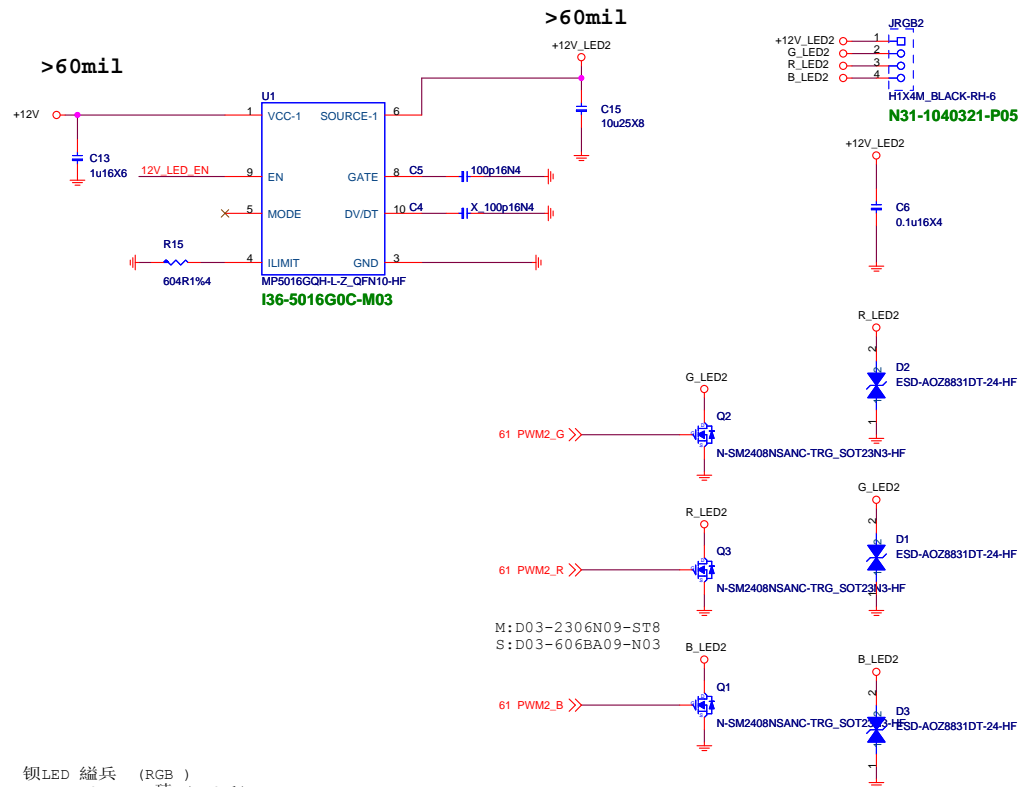


钼LED 繼兵 (RGB)

---- PCB 玆 瑛 (JRGB1)

---- も 薙 RGB 钼繼や穿夾非 5050 RGB LED 繼兵 (12V/G/R/B) , 繼兵照块 篆瑛綜 歳3 蚌 (12 工疚) , 壩苧綜 歳2そへ

JRGB2



钼LED 繼兵 (RGB)

---- PCB 玆 瑛 (JRGB1)

---- も 薙 RGB 钼繼や穿夾非 5050 RGB LED 繼兵 (12V/G/R/B) , 繼兵照块 篆瑛綜 歳3 蚌 (12 工疚) , 壩苧綜 歳2そへ



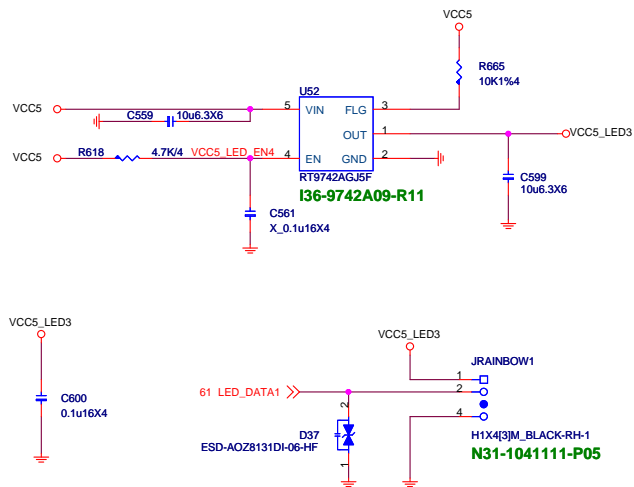
MICRO-STAR INT'L CO.,LTD

MS-7C76

| Size | Document Description | Rev |
|--------------------------------|----------------------|-----|
| Custom | MCU-JRGB1&2 | 1.1 |
| Date: Friday, January 17, 2020 | Sheet 62 of 70 | |

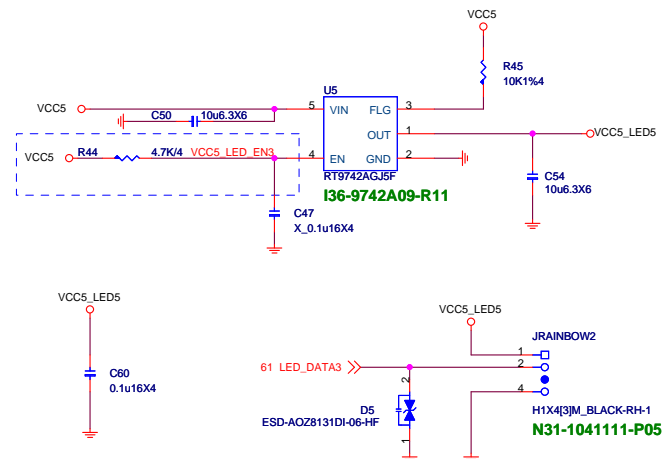
JRAINBOW1 JRAINBOW DEMO WITH USB POWER BANK (By Spec Request)

Removed DEMO support Power circuit



JRAINBOW2 JRAINBOW DEMO WITH USB POWER BANK (By Spec Request)

Removed DEMO support Power circuit

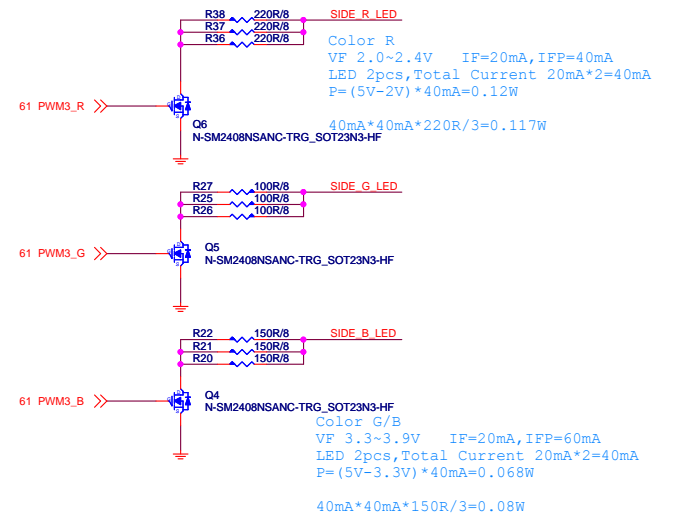
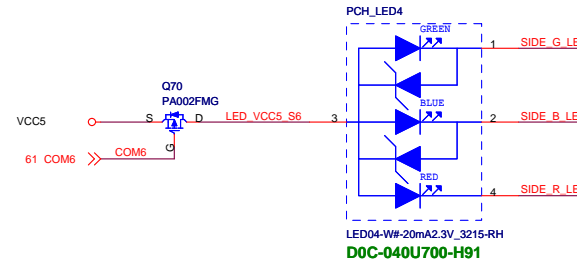
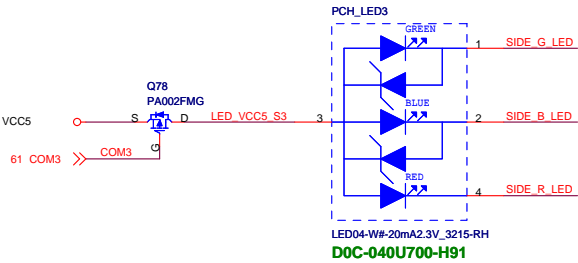
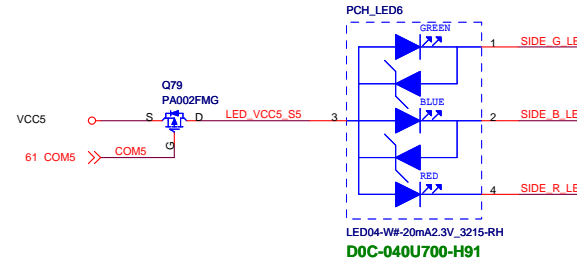
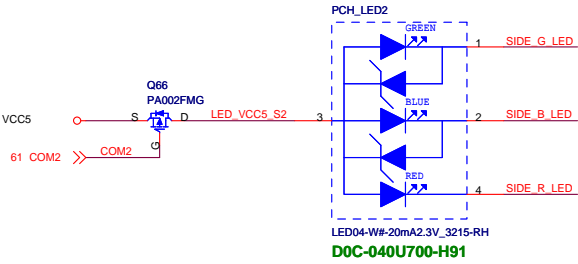
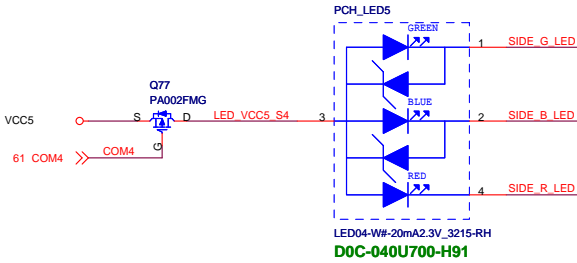
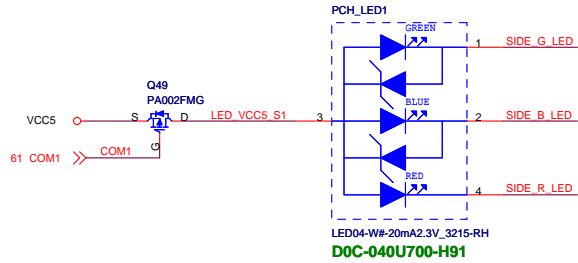


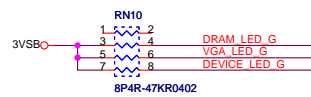
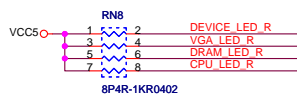
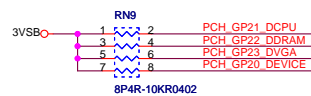
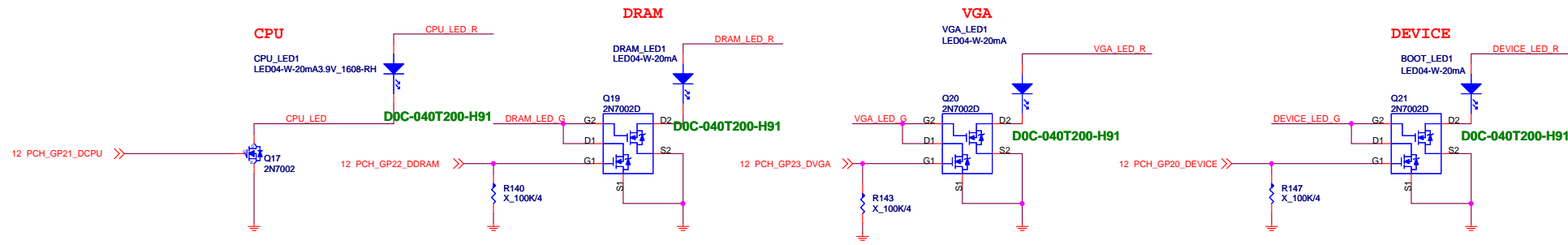
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MS-7C76

| Size | Document Description | Rev |
|--------------------------------|----------------------|----------------|
| Custom | MCU-LED JRAINBOW1&2 | 1.1 |
| Date: Friday, January 17, 2020 | | Sheet 63 of 70 |

BOARD SIDE LED *6







PD0-07C7611-E48, 腳地, 22, 腳 紅 (MSIS)

7C76-11
PD0-07C7611-E48

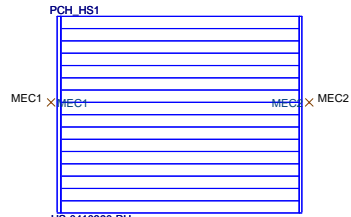


CPU_H1
E21-7C71020-L06

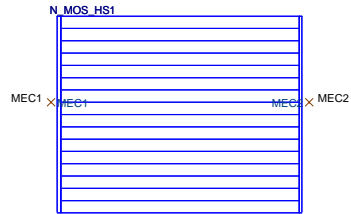


BAT1_X1
BAT-BCR2032P-RH
D06-0100101-P01

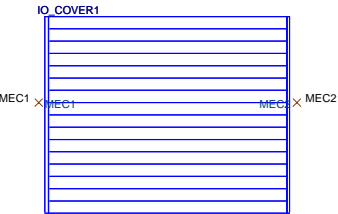
HEATSINK



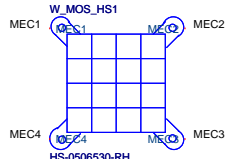
HS-0410390-RH
E31-0410390-A87



HS-0506520-RH
E31-0506520-A87

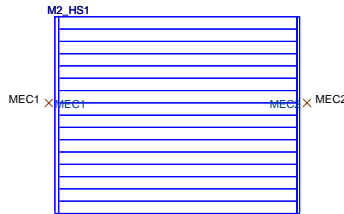


IO_SHIELDING
E22-7C76010-C22



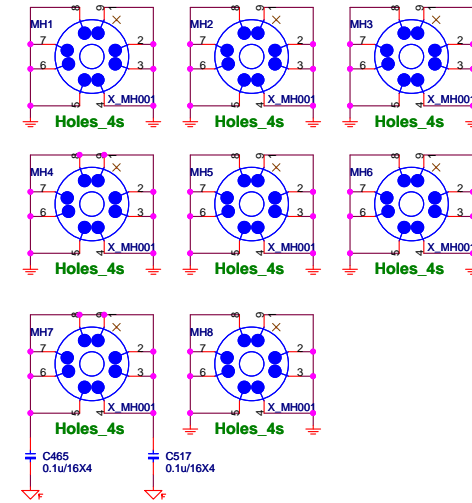
HS-0506530-RH
E31-0506530-A87

M2 Heatsink E31-0002430-A87 no footprint 沈酶教



HS-0002430-RH
E31-0002430-A87

Mounting Holes



TABLE

TABLE1

AMT_BIOS
TABLE

BIOS_LABEL

G51-M1SPXXA-A09

TABLE2

HDMI
TABLE

HDMI_LABEL

Y01-RHDMI03-000

TABLE3

CFOS
TABLE

CFOS_LABEL

Y02-MU00170-CFO

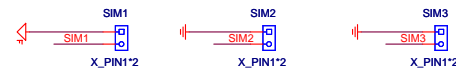
TABLE4

NAHIMIC
TABLE

NAHIMIC_LABEL

Y02-MU00100-NAH

Simulation



Optical Fiducial Marks-120

