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MS-7B16

ATX

Ver: 10

CFL Platform

CPU:

Coffee lake S

System Chipset:

H370/B360 PCH_H

Onboard Chip:

HD Audio Codec:ALC1220

LAN-Intel I219

SIO:NTC6797

Flash ROM: SPI 16 MB X1

Main Memory:

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

ACPI:

LDO

PWM:

IMVP8 -RT3607

Expansion Slots:

*PCI Express (X16) Slot * 1*
*PCI Express (X4) Slot * 1*
*PCI Express (X1) Slot * 4*

Other:

*SATA3.0 *6*
*USB2.0 *6*
*REAL USB3.0 *5+TYPEC*1*
*FRONT USB3.0 *4+TYPEC*1*

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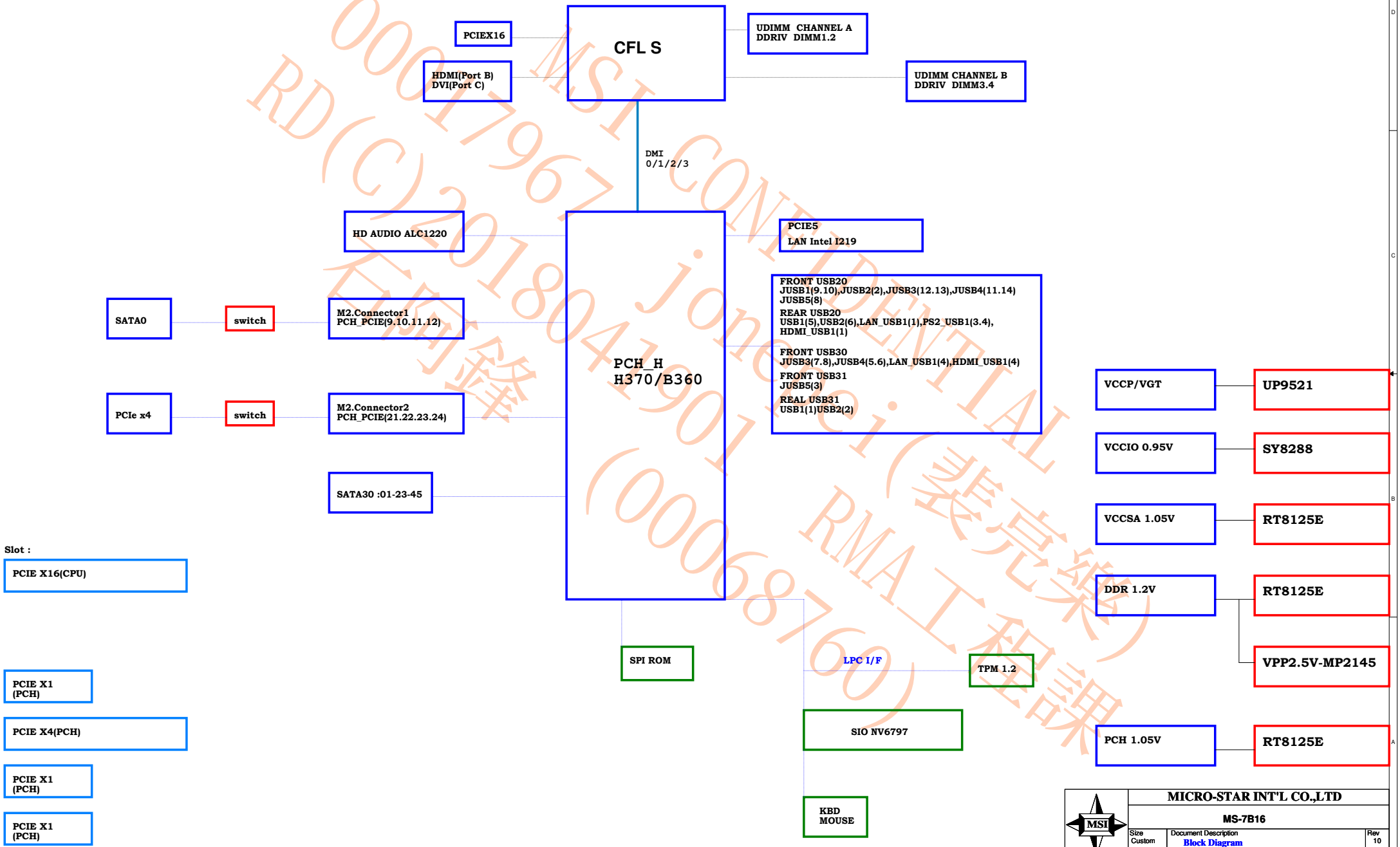
MS-7B16 Block Diagram



MICRO-STAR INT'L CO.,LTD	
MS-7B16	
Size: Custom	Document Description: Block Diagram
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CFG Strap

CFG Table

	HIGH	LOW	DESCRIPTION
0	NORM	STALL	EAR
1	NORM	PCHLESS	PCHLESS MODE
2	NORM	REVERSE	PEG_LANE_REVERSAL
3	ENABLE	DISABLE	DEBUG
4	DISABLE	ENABLE	DP_PRESENCE
5	DISABLE	ENABLE	PEG0CFGSEL[0]
6	DISABLE	ENABLE	PEG0CFGSEL[1]
7	RESET#	BIOS REQ	PEG_DEFER_TRAINING
8	DISABLE	ENABLE	CFG UNLOCK
9	PRESENT	NO PRESENT	SVID NOT PRESENT
10	ACTIVATE	NO ACTIVATE	SAFE MODE BOOT
11	DC COUPLED	AC COUPLED	DMI AC
12	SPT	NOT SPT	PCH TYPE
13	SVID	FIXED	VCCSA SVID
14	RSVD		
15	RSVD		

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	MS-7B16		
Size: Custom	Document Description: CPU-Control/MISC/CFG		Rev: 10
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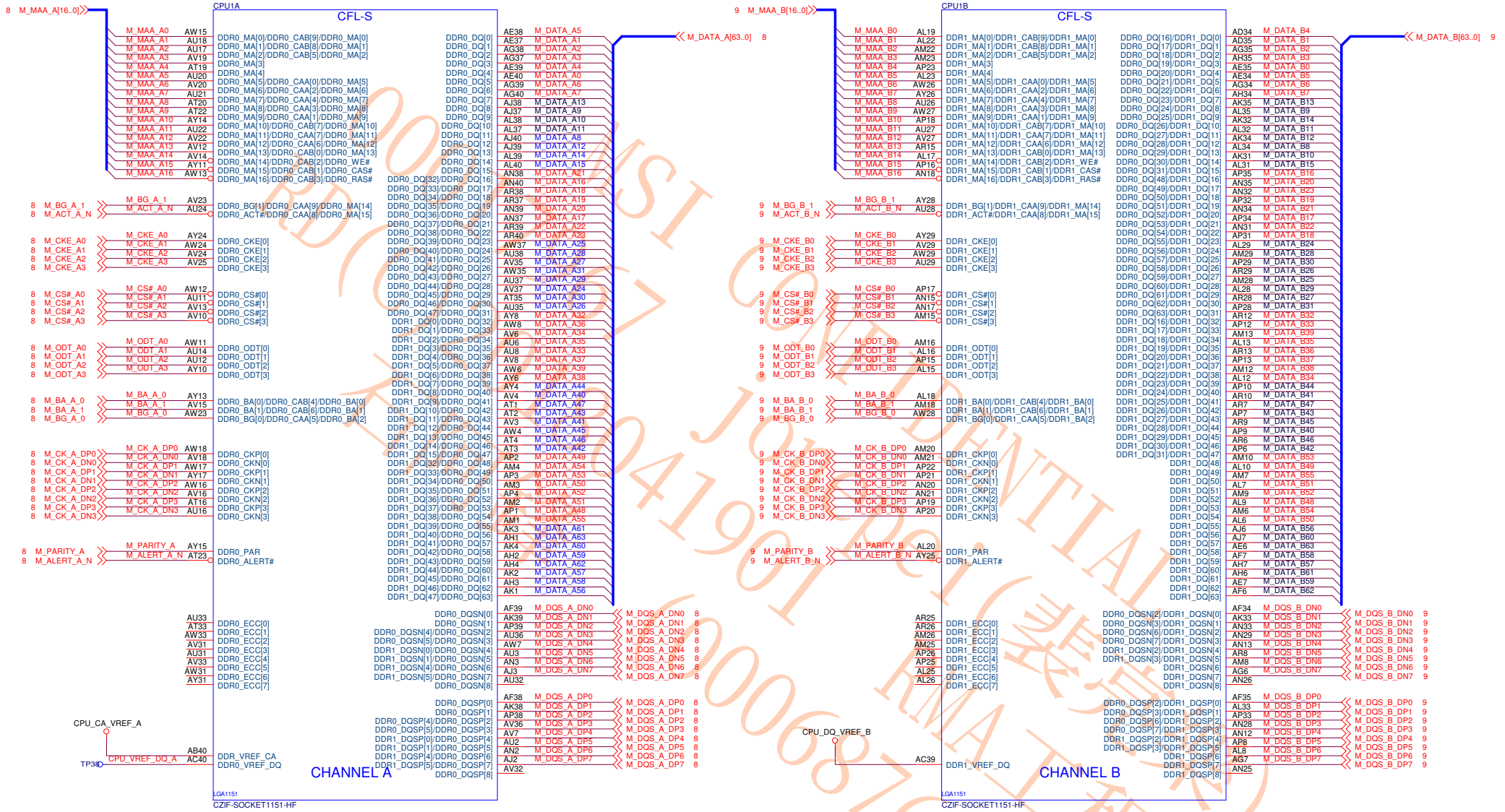
SOCKET PN N12-151A010-L06



MICRO-STAR INT'L CO.,LTD		
MS-7B16		
Size: Custom	Document Description: CPU-Memory	Rev: 10
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MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7B16	
Size: Custom	Document Description: CPU-PEG/Display/RSD	Rev: 10
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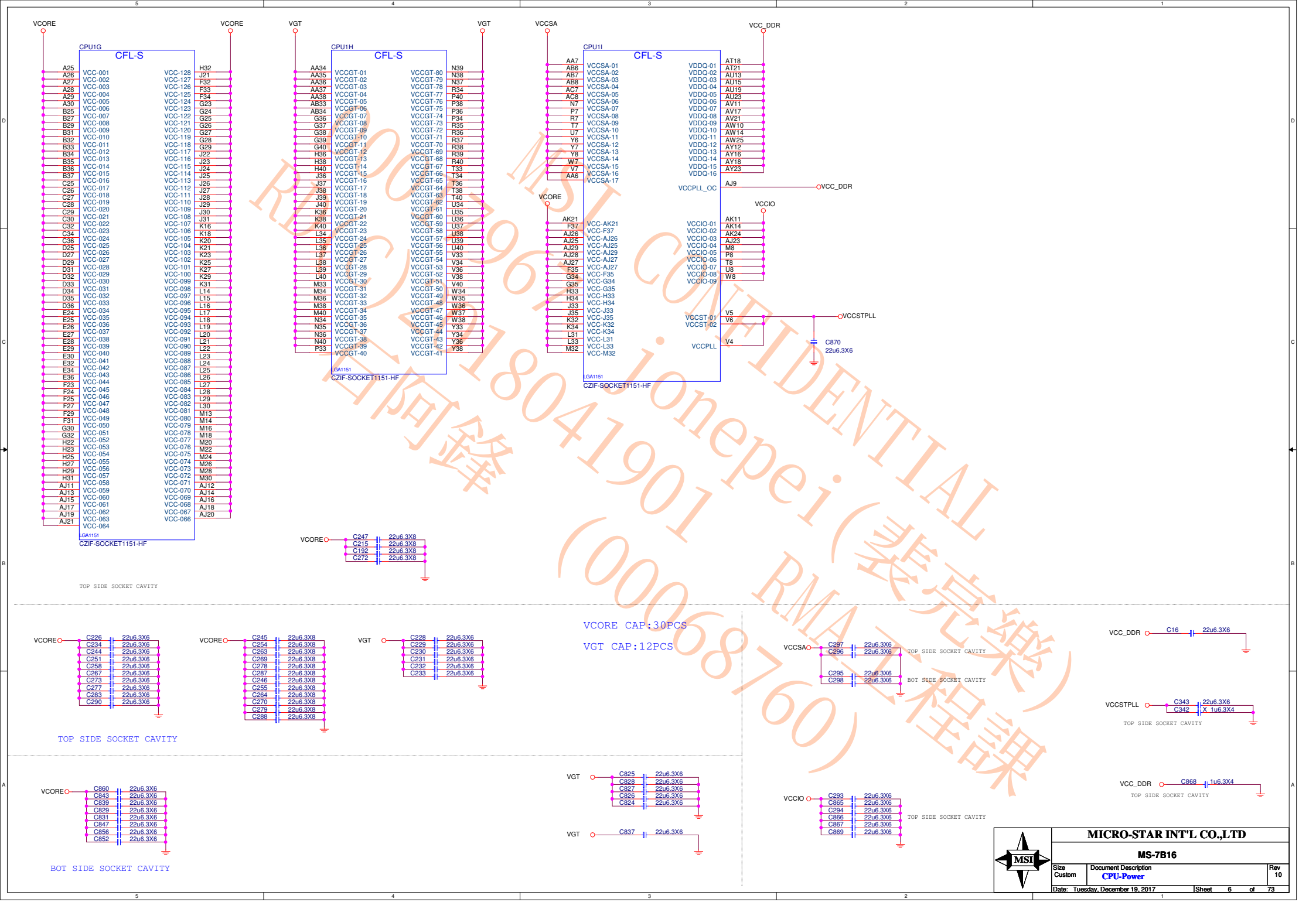

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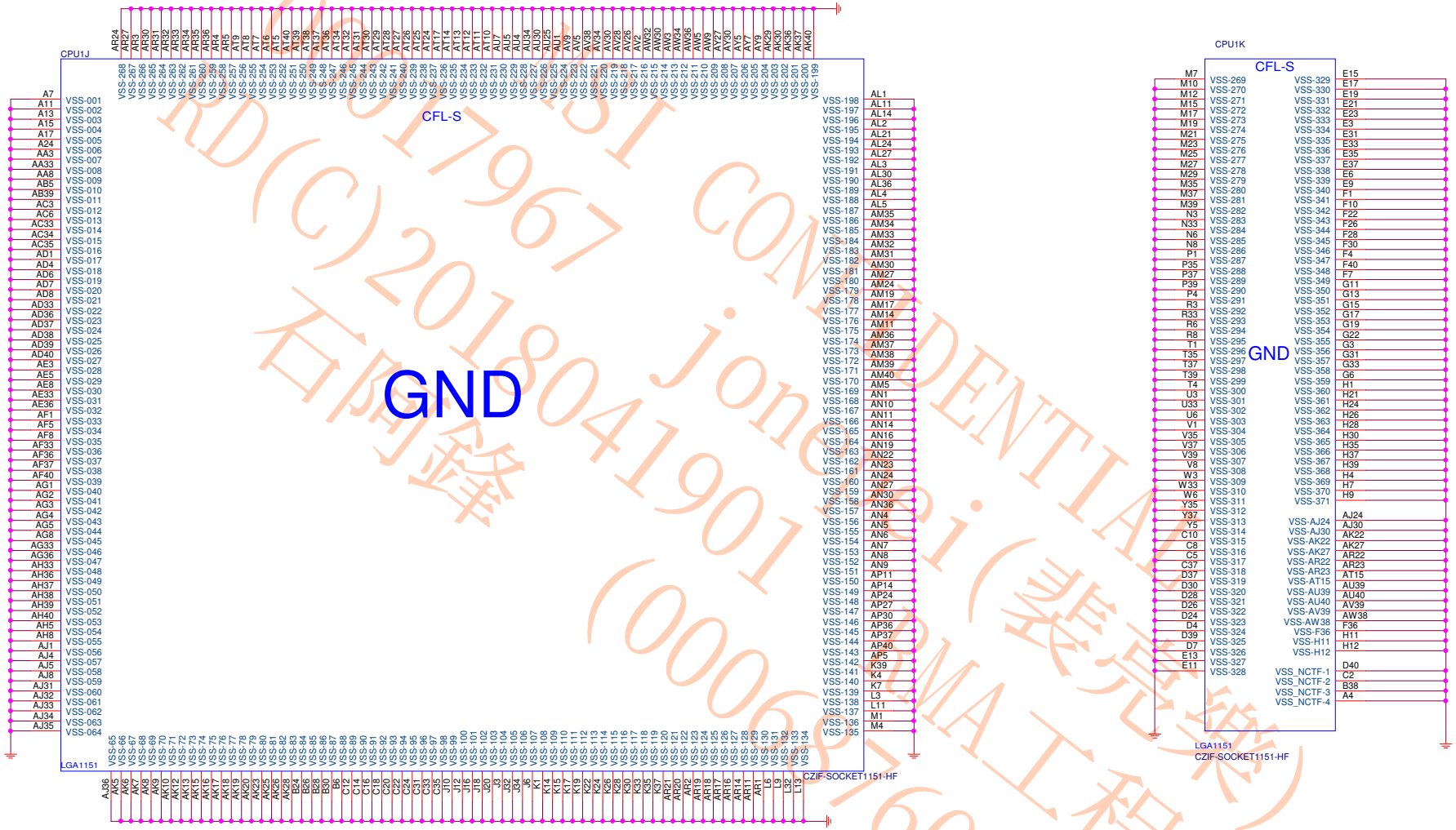
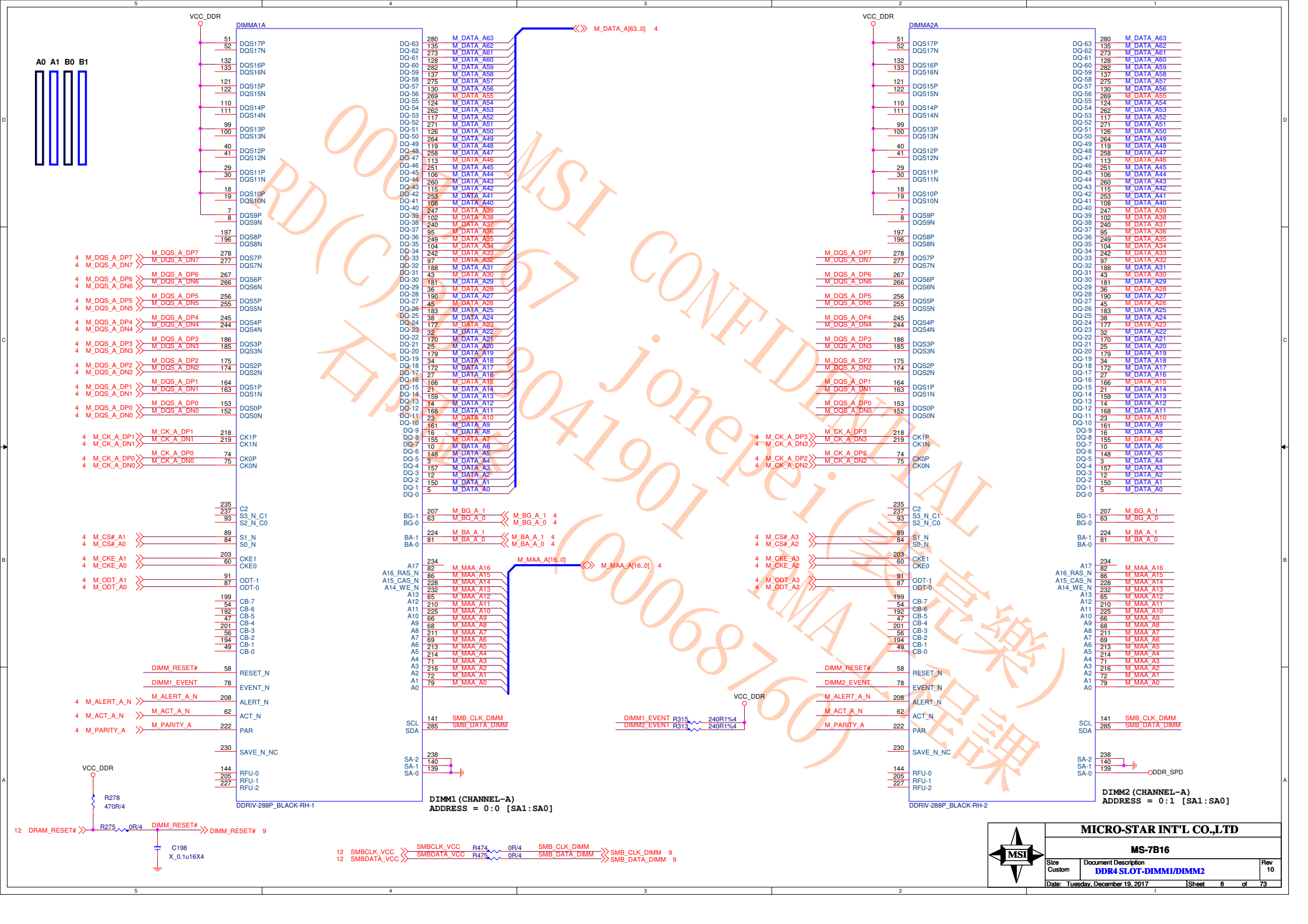
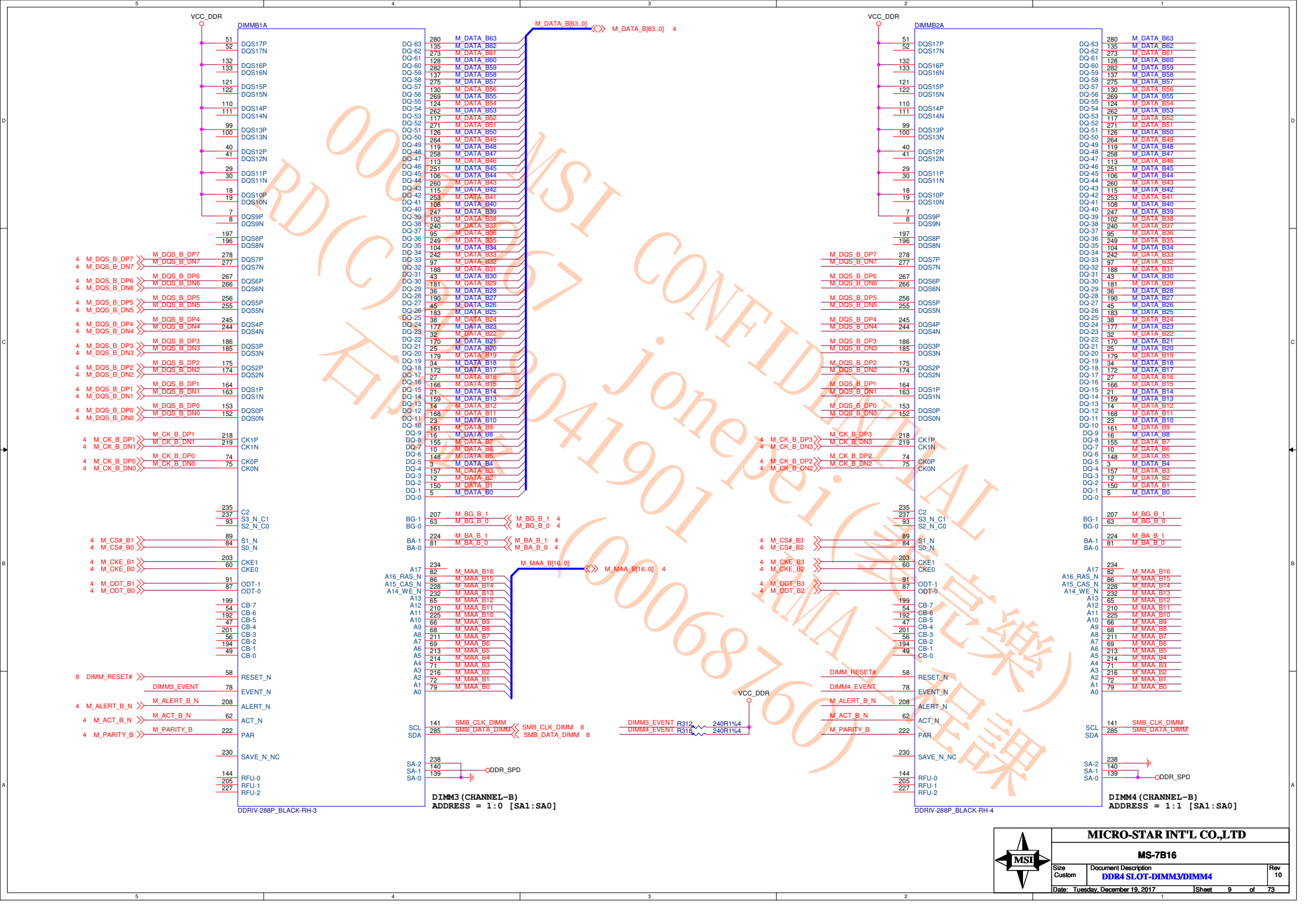
MS-7B16		
Size: Custom	Document Description: CPU-Power	Rev: 10
Date: Tuesday, December 19, 2017	Sheet 6 of 73	



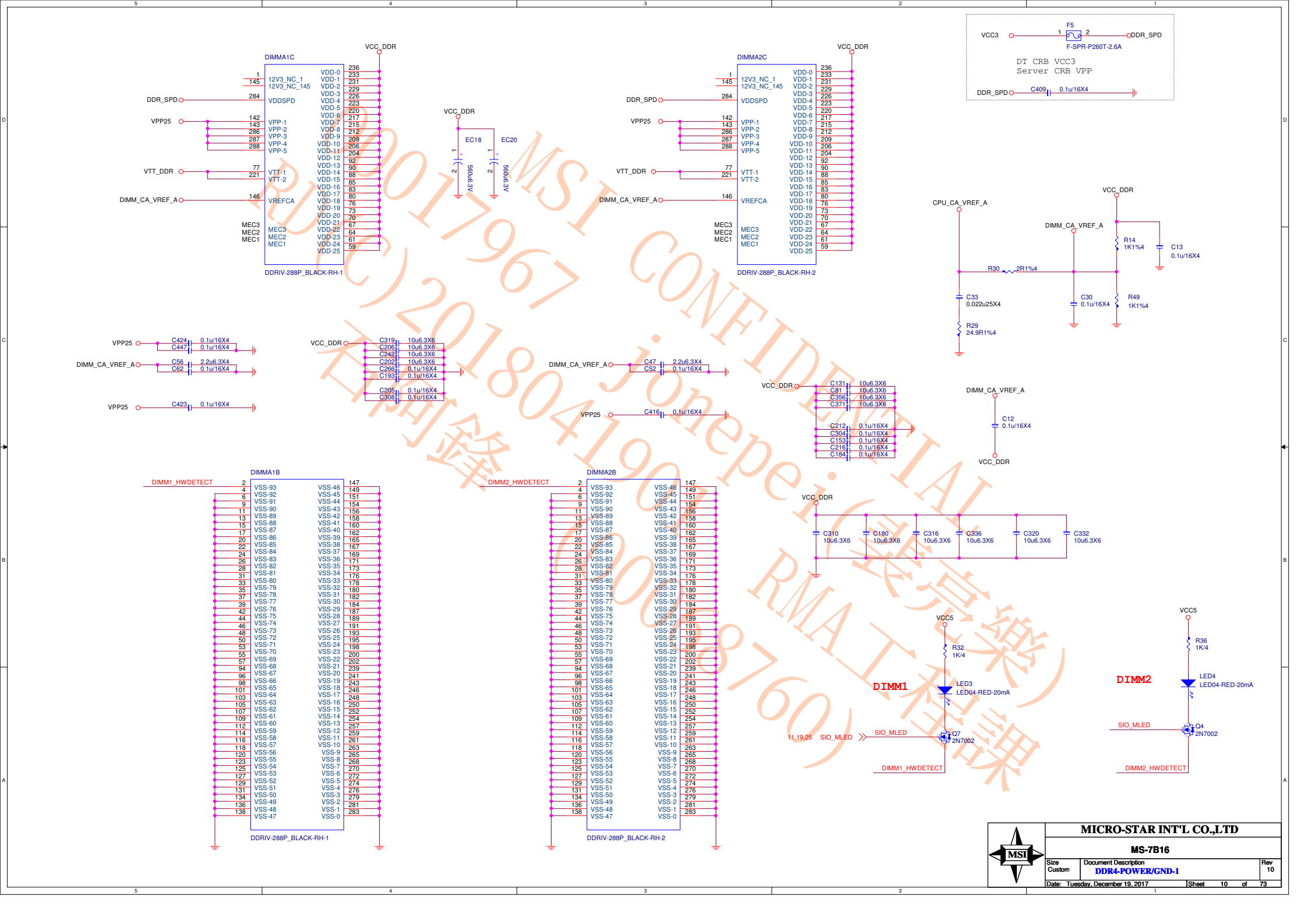
MICRO-STAR INT'L CO.,LTD		
MS-7B16		
Size: Custom	Document Description: CPU-GND	Rev: 10
Date: Tuesday, December 19, 2017	Sheet 7 of 73	



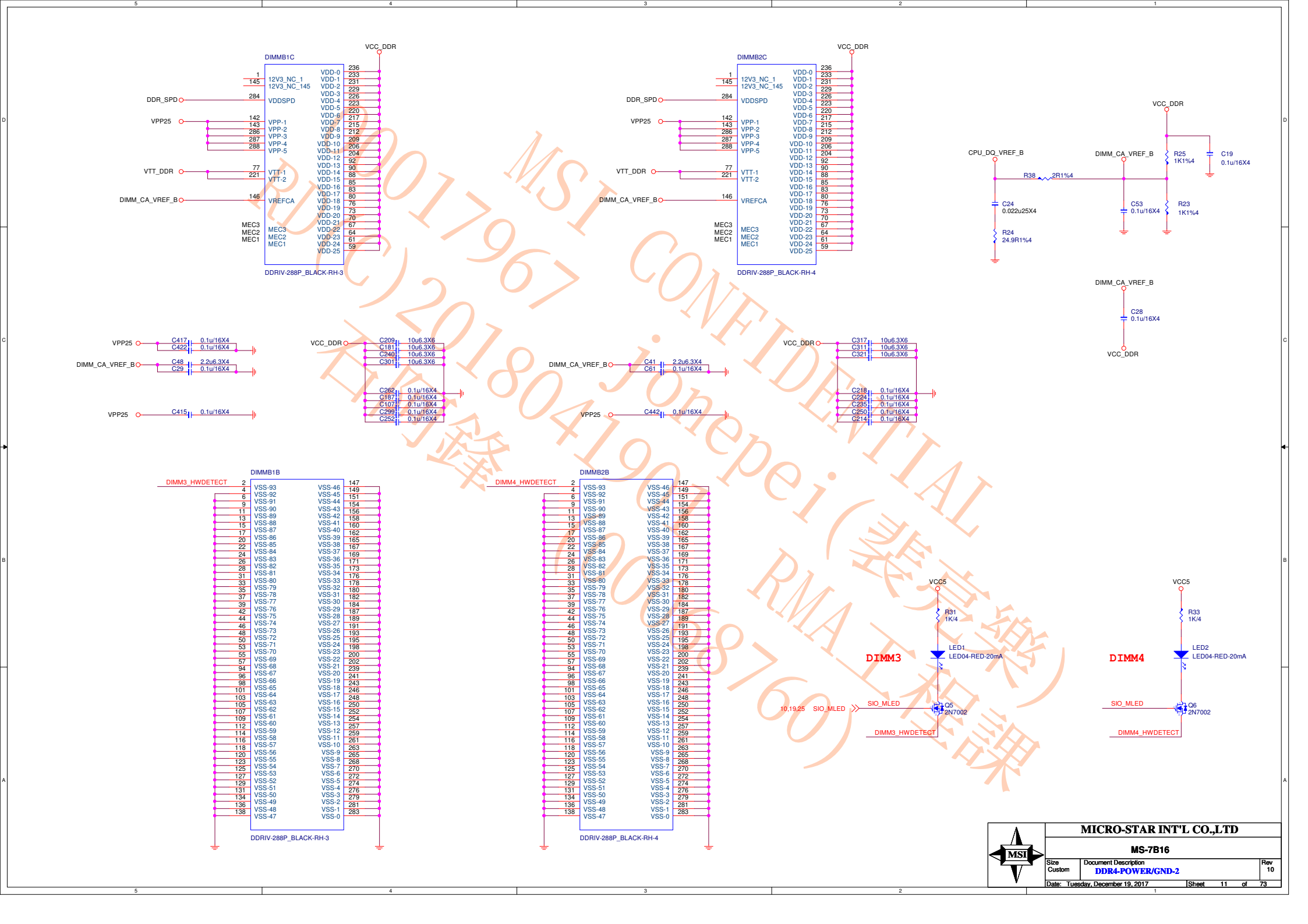
MICRO-STAR INT'L CO.,LTD		
MS-7B16		
Size: Custom	Document Description: DDR4 SLOT-DIMM1/DIMM2	Rev: 10
Date: Tuesday, December 19, 2017	Sheet 8 of 73	



MICRO-STAR INT'L CO.,LTD	
MS-7B16	
Size: Custom	Document Description: DDR4 SLOT-DIMM3/DIMM4
Rev: 10	
Date: Tuesday, December 19, 2017	Sheet 9 of 73



MICRO-STAR INT'L CO.,LTD	
MS-7B16	
Size: Custom	Document Description: DDR4-POWER/GND-1
Rev: 10	
Date: Tuesday, December 19, 2017	Sheet 10 of 73



MICRO-STAR INT'L CO.,LTD		
MS-7B16		
Size: Custom	Document Description: DDR4-POWER/GND-2	Rev: 10
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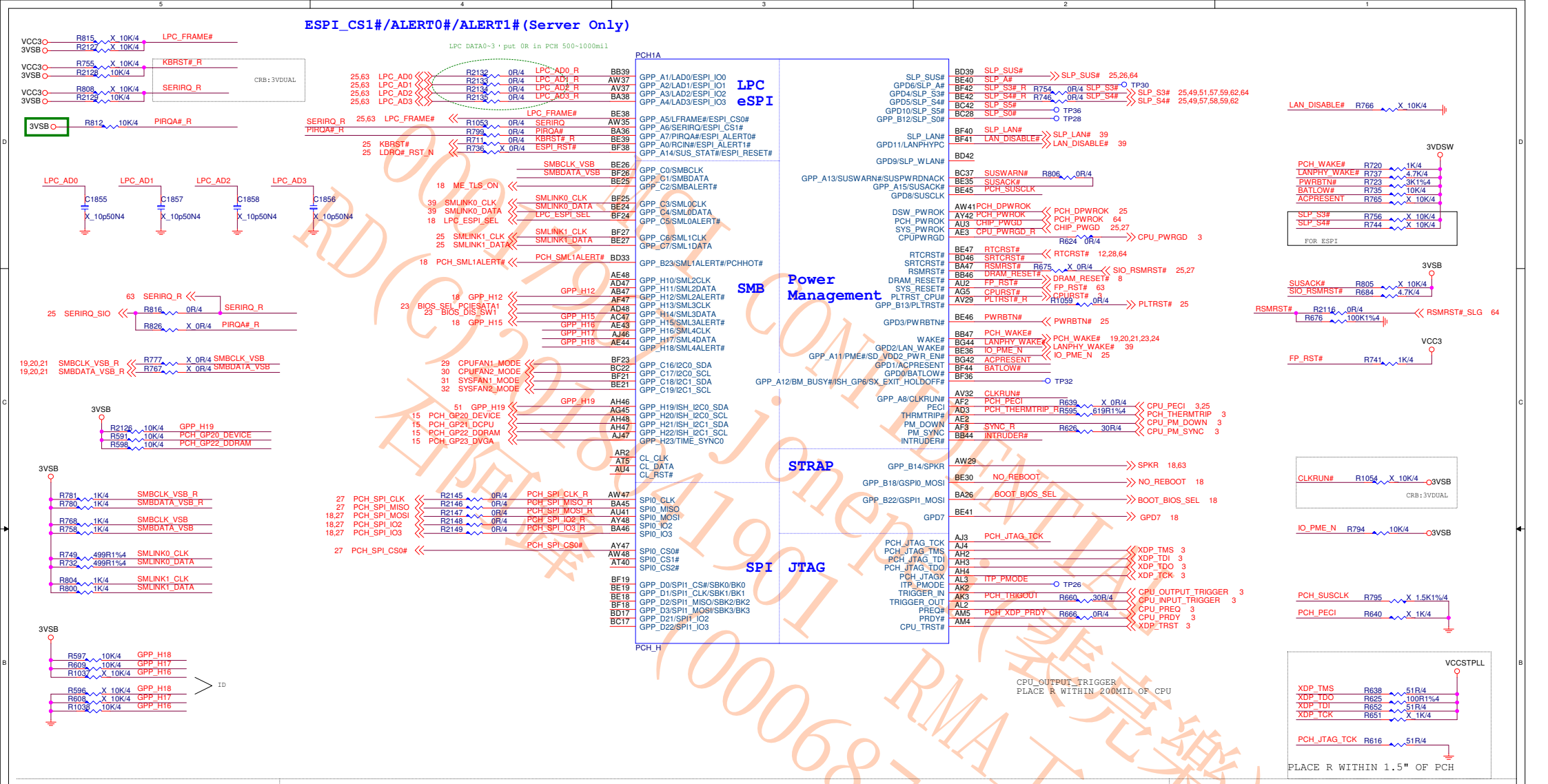
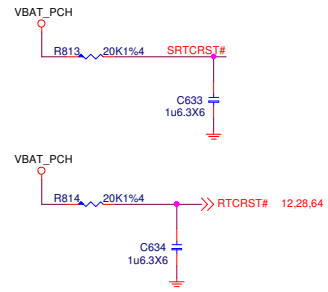
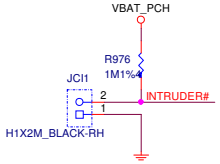
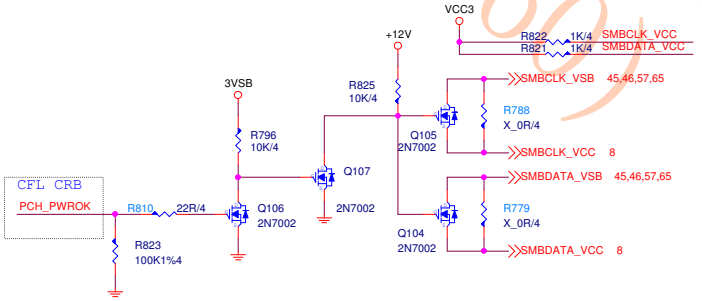


RTC



Chassis Intrusion





防止當可能BIOS把SIO DSW DISABLE的時候
造成AC POWER LOSS時,有可能產生RSMRST#異常動作
導致NO POWER的ISSUE
1.0 移除

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MS-7B16		
Size: Custom	Document Description: PCH-LPC/SPI/SMBUS/MISC	Rev: 10
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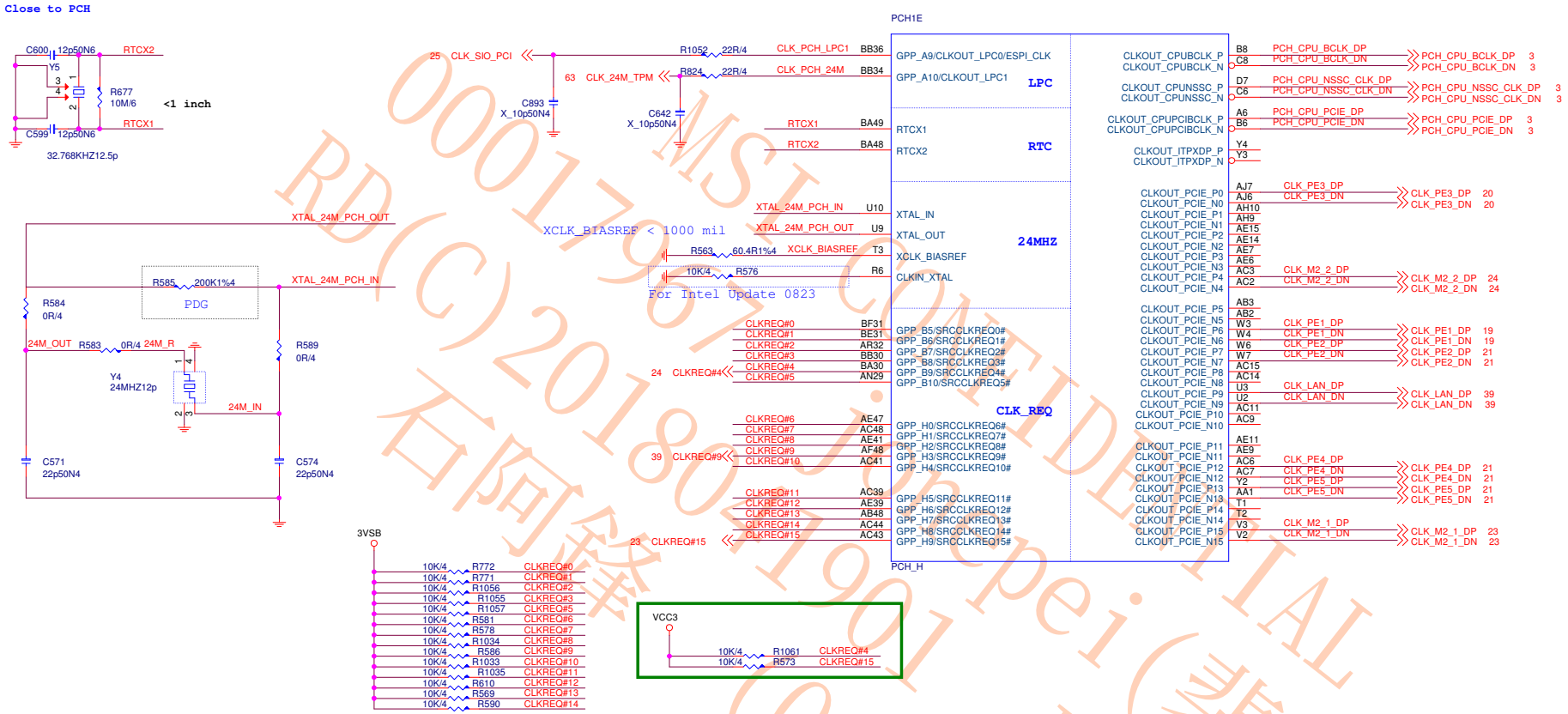
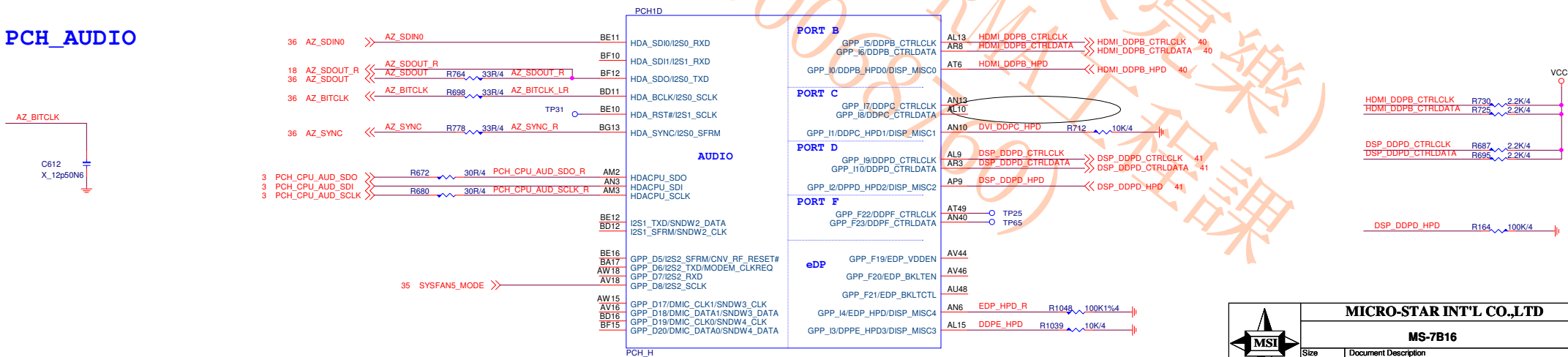
PCH_CLK



PCH_AUDIO



MICRO-STAR INT'L CO.,LTD

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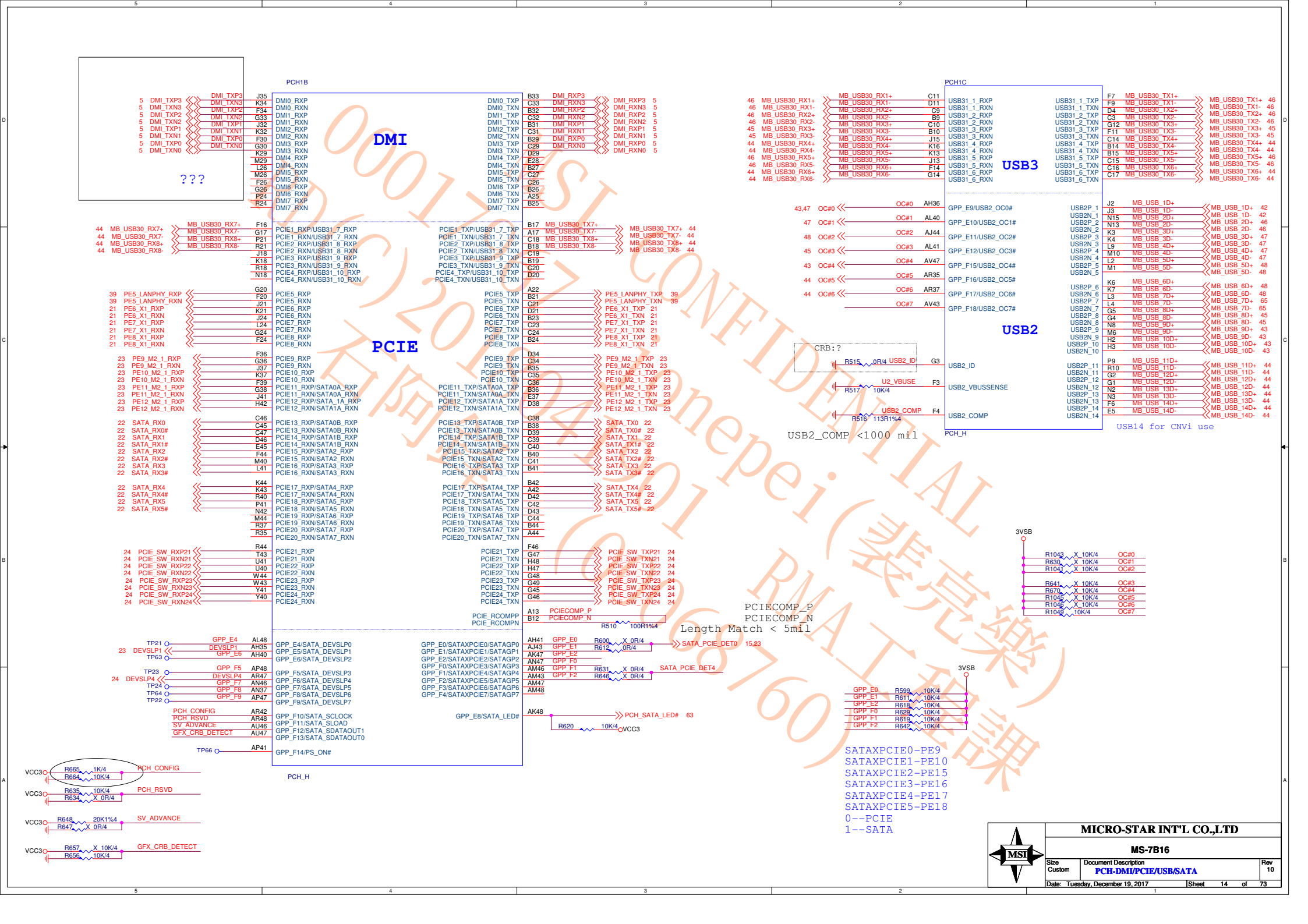
Size: Custom | Document Description: PCH-Clock/Audio | Rev: 10

Date: Tuesday, December 19, 2017 | Sheet 13 of 73


PCH1B
DMI
PCIE
PCH_H
PCH1C
USB3
USB2
CRB:?
USB2_COMP <1000 mil
PCIECOMP_P
PCIECOMP_N
Length Match < 5mil
USB14 for CNVi use
SATAXPCIE0-PE9
SATAXPCIE1-PE10
SATAXPCIE2-PE15
SATAXPCIE3-PE16
SATAXPCIE4-PE17
SATAXPCIE5-PE18
0--PCIE
1--SATA
MICRO-STAR INT'L CO.,LTD
MS-7B16
PCH-DMI/PCIE/USB/SATA
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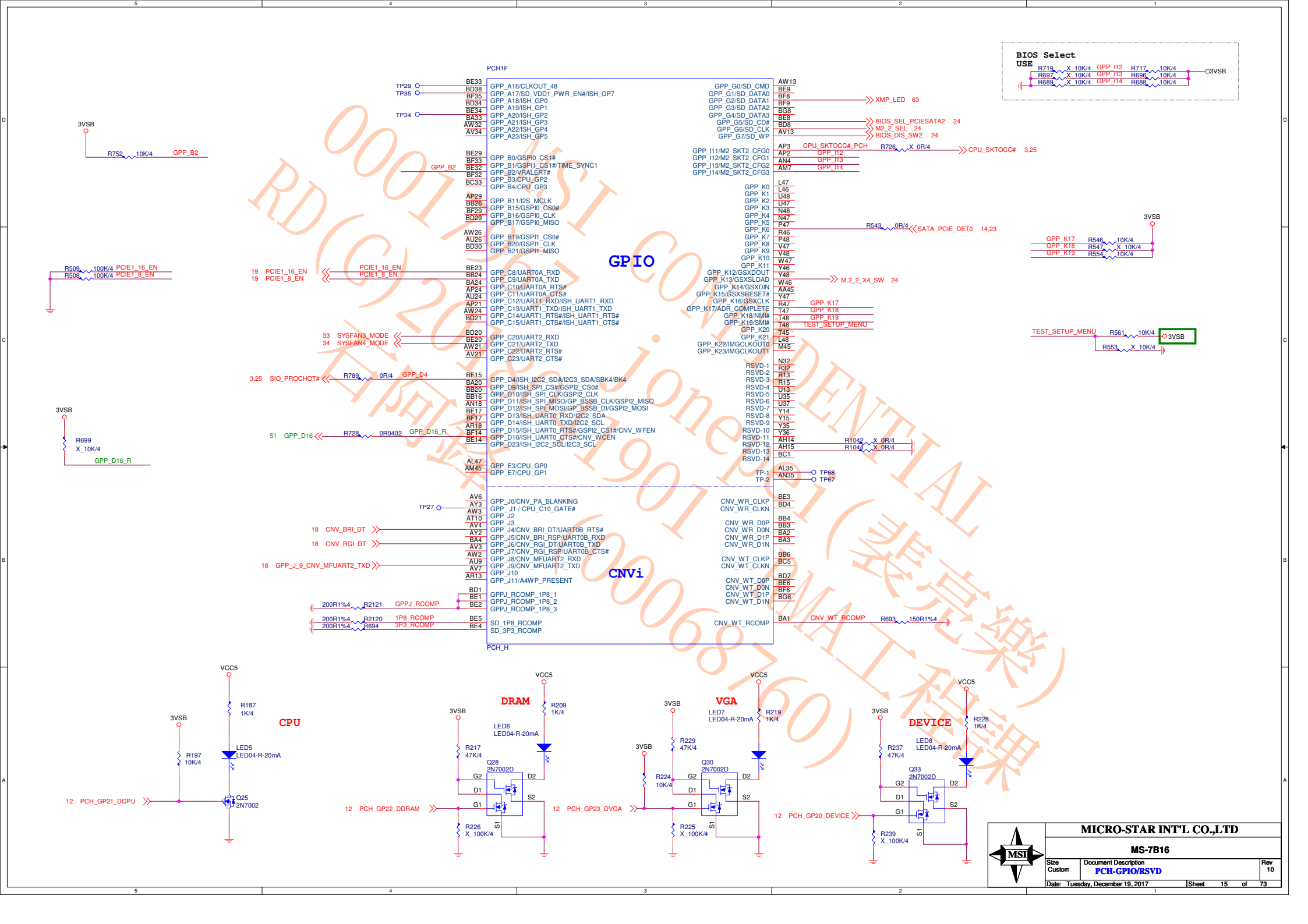
BIOS Select
USE
R719 X_10K/4 GPP_I12
R697 X_10K/4 GPP_I13
R689 X_10K/4 GPP_I14
R717 10K/4
R696 10K/4
R688 10K/4
3VSB
PCH1F
GPIO
CNVi
PCH_H
GPP_A16/CLKOUT_48
GPP_A17/SD_VDD1_PWR_EN#/ISH_GP7
GPP_A18/ISH_GP0
GPP_A19/ISH_GP1
GPP_A20/ISH_GP2
GPP_A21/ISH_GP3
GPP_A22/ISH_GP4
GPP_A23/ISH_GP5
GPP_B0/GSPI0_CS1#
GPP_B1/GSPI1_CS1#/TIME_SYNC1
GPP_B2/VRALERT#
GPP_B3/CPU_GP2
GPP_B4/CPU_GP3
GPP_B11/I2S_MCLK
GPP_B15/GSPI0_CS0#
GPP_B16/GSPI0_CLK
GPP_B17/GSPI0_MISO
GPP_B19/GSPI1_CS0#
GPP_B20/GSPI1_CLK
GPP_B21/GSPI1_MISO
GPP_C8/UART0A_RXD
GPP_C9/UART0A_TXD
GPP_C10/UART0A_RTS#
GPP_C11/UART0A_CTS#
GPP_C12/UART1_RXD/ISH_UART1_RXD
GPP_C13/UART1_TXD/ISH_UART1_TXD
GPP_C14/UART1_RTS#/ISH_UART1_RTS#
GPP_C15/UART1_CTS#/ISH_UART1_CTS#
GPP_C20/UART2_RXD
GPP_C21/UART2_TXD
GPP_C22/UART2_RTS#
GPP_C23/UART2_CTS#
GPP_D4/ISH_I2C2_SDA/I2C3_SDA/SBK4/BK4
GPP_D9/ISH_SPI_CS#/GSPI2_CS0#
GPP_D10/ISH_SPI_CLK/GSPI2_CLK
GPP_D11/ISH_SPI_MISO/GP_BSSB_CLK/GSPI2_MISO
GPP_D12/ISH_SPI_MOSI/GP_BSSB_DI/GSPI2_MOSI
GPP_D13/ISH_UART0_RXD/I2C2_SDA
GPP_D14/ISH_UART0_TXD/I2C2_SCL
GPP_D15/ISH_UART0_RTS#/GSPI2_CS1#/CNV_WFEN
GPP_D16/ISH_UART0_CTS#/CNV_WCEN
GPP_D23/ISH_I2C2_SCL/I2C3_SCL
GPP_E3/CPU_GP0
GPP_E7/CPU_GP1
GPP_J0/CNV_PA_BLANKING
GPP_ J1 / CPU_C10_GATE#
GPP_J2
GPP_J3
GPP_J4/CNV_BRI_DT/UART0B_RTS#
GPP_J5/CNV_BRI_RSP/UART0B_RXD
GPP_J6/CNV_RGI_DT/UART0B_TXD
GPP_J7/CNV_RGI_RSP/UART0B_CTS#
GPP_J8/CNV_MFUART2_RXD
GPP_J9/CNV_MFUART2_TXD
GPP_J10
GPP_J11/A4WP_PRESENT
GPPJ_RCOMP_1P8_1
GPPJ_RCOMP_1P8_2
GPPJ_RCOMP_1P8_3
SD_1P8_RCOMP
SD_3P3_RCOMP
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_I11/M2_SKT2_CFG0
GPP_I12/M2_SKT2_CFG1
GPP_I13/M2_SKT2_CFG2
GPP_I14/M2_SKT2_CFG3
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/GSXDOUT
GPP_K13/GSXSLOAD
GPP_K14/GSXDIN
GPP_K15/GSXSRESET#
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
XMP_LED 63
BIOS_SEL_PCIESATA2 24
M2_2_SEL 24
BIOS_DIS_SW2 24
CPU_SKTOCC#_PCH R726 X_0R/4 CPU_SKTOCC# 3,25
R543 0R/4 SATA_PCIE_DET0 14,23
M.2_2_X4_SW 24
TEST_SETUP_MENU
R1042 X_0R/4
R1044 X_0R/4
TP68
TP67
R693 150R1%4
3VSB
R752 10K/4 GPP_B2
R509 100K/4 PCIE1_16_EN
R508 100K/4 PCIE1_8_EN
19 PCIE1_16_EN
19 PCIE1_8_EN
33 SYSFAN3_MODE
34 SYSFAN4_MODE
3,25 SIO_PROCHOT#
R789 0R/4 GPP_D4
R699 X_10K/4 GPP_D16_R
51 GPP_D16
R728 0R0402 GPP_D16_R
18 CNV_BRI_DT
18 CNV_RGI_DT
18 GPP_J_9_CNV_MFUART2_TXD
200R1%4 R2121 GPPJ_RCOMP
200R1%4 R2120 1P8_RCOMP
200R1%4 R694 3P3_RCOMP
GPP_K17 R546 10K/4
GPP_K18 R547 X_10K/4
GPP_K19 R554 10K/4
TEST_SETUP_MENU R561 10K/4
R553 X_10K/4
CPU
DRAM
VGA
DEVICE
VCC5
R187 1K/4
LED5 LED04-R-20mA
R197 10K/4
Q25 2N7002
12 PCH_GP21_DCPU
R209 1K/4
LED6 LED04-R-20mA
R217 47K/4
Q28 2N7002D
R226 X_100K/4
12 PCH_GP22_DDRAM
LED7 LED04-R-20mA
R219 1K/4
R229 47K/4
Q30 2N7002D
R224 10K/4
R225 X_100K/4
12 PCH_GP23_DVGA
R228 1K/4
LED8 LED04-R-20mA
R237 47K/4
Q33 2N7002D
R239 X_100K/4
12 PCH_GP20_DEVICE
MICRO-STAR INT'L CO.,LTD
MS-7B16
Size Custom
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PCH-GPIO/RSVD
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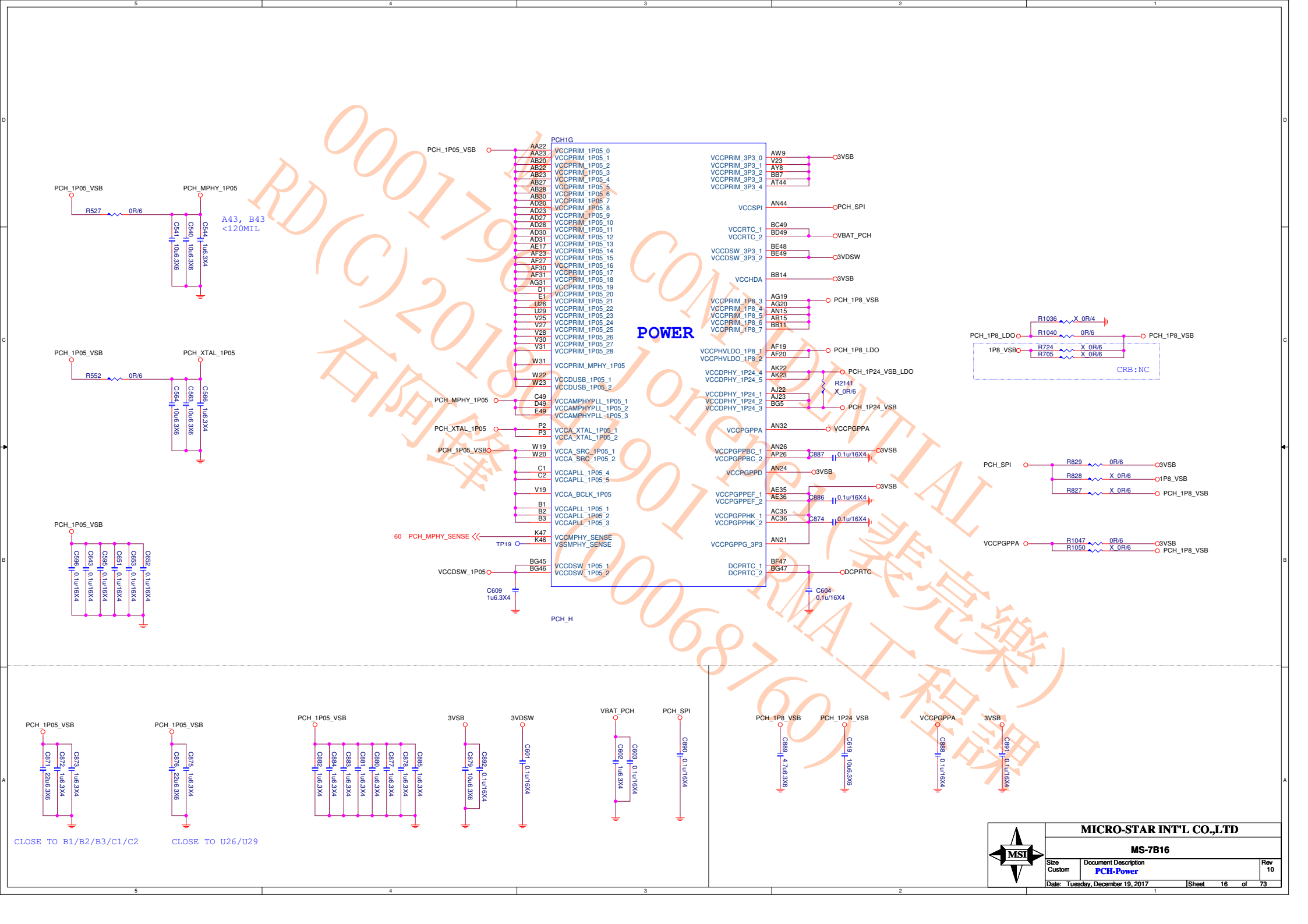

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MS-7B16		
Size: Custom	Document Description: PCH-Power	Rev: 10
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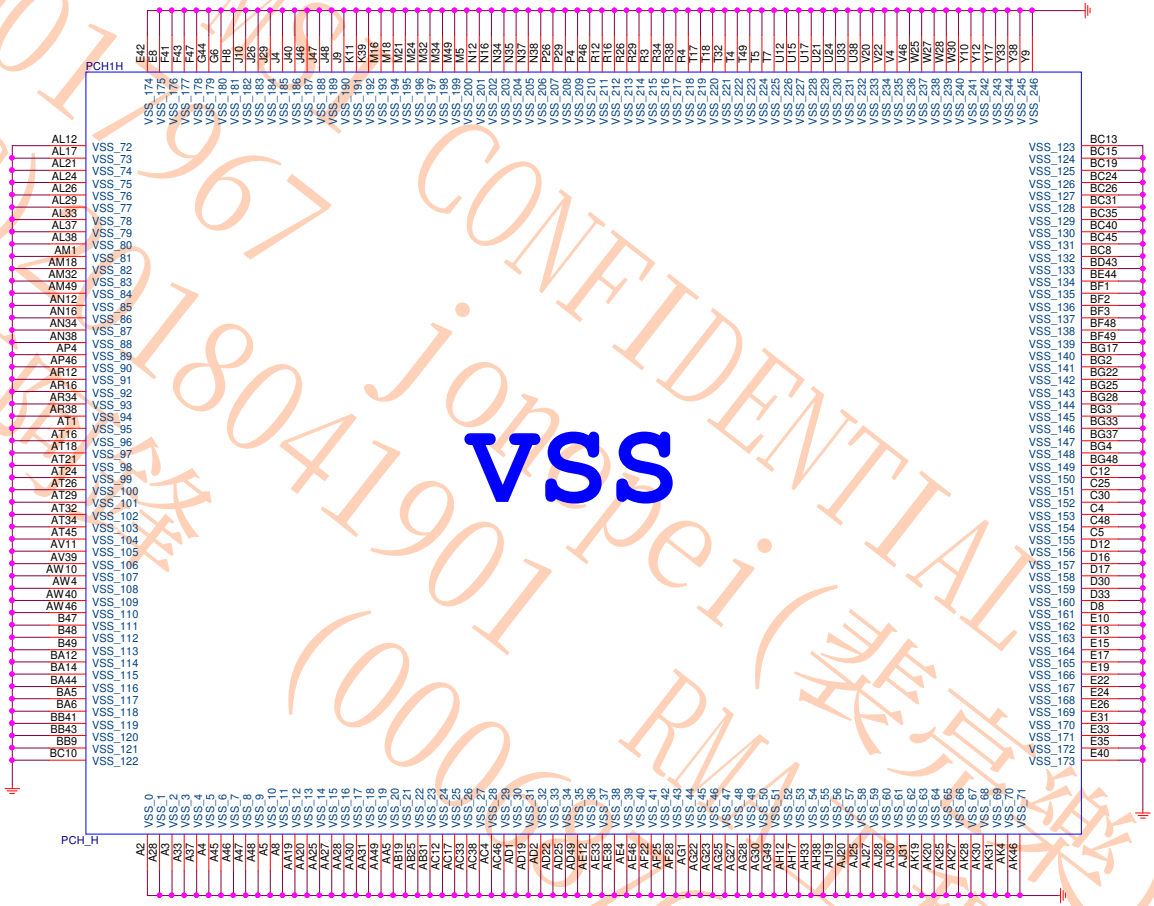

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MS-7B16	
Size: Custom	Document Description: PCH-GND
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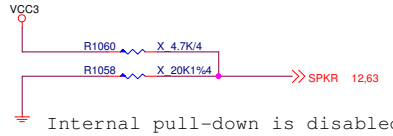
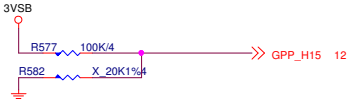
TOP Swap

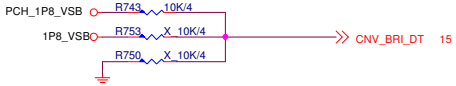


Internal pull-down is disabled after PLTRST#

Reserved

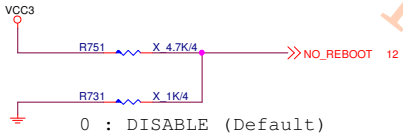


ESPI FLASH SHARING MODE



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

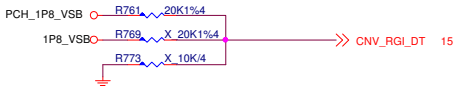
No Reboot



0 : DISABLE (Default)
1 : ENABLE

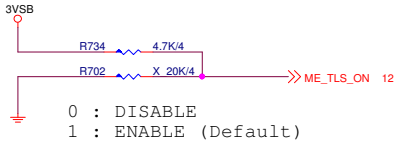
Reserved

Modem Reference Clock Source Select



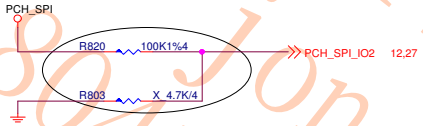
MODEM AND NFC REFERENCE CLOCK SOURCE SELECT
1 = CLKIN_XTAL_LCP
0 = XTAL_IN (CNP AND LCP SHARE XTAL)

AMT and SBA with confidentiality

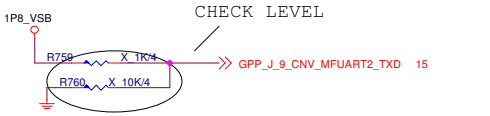


0 : DISABLE
1 : ENABLE (Default)

Reserved



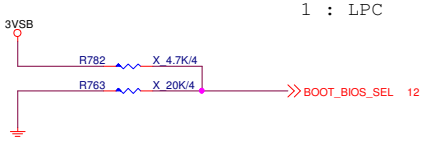
1.8V VCCPSPI



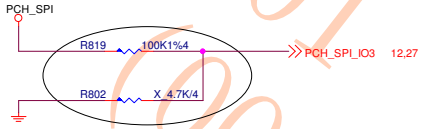
SELECT THE SPI BIOS FLASH INTERFACE OPERATING VOLTAGE
0 = VCCPSPI IS CONNECTED TO 3.3V RAIL - DEFAULT
1 = VCCPSPI IS CONNECTED TO 1.8V RAIL
PCH HAS INTERNAL 20K PD

Boot BIOS

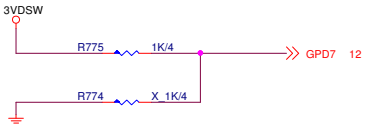
0 : SPI
1 : LPC



Reserved

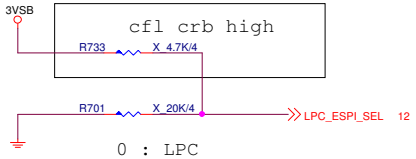


Reserved



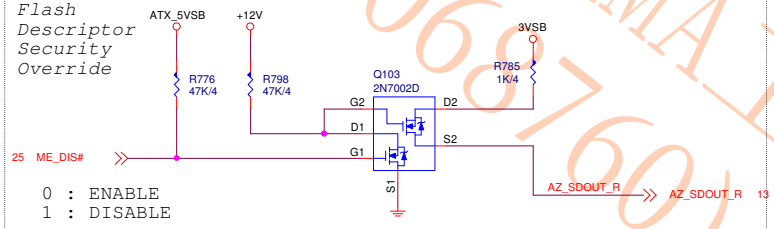
XTAL INPUT MODE
0 = XTAL INPUT IS SINGLE-ENDED
1 = XTAL INPUT IS DIFFERENTIAL
PCH HAS INTERNAL 20K PD

LPC eSPI Mode



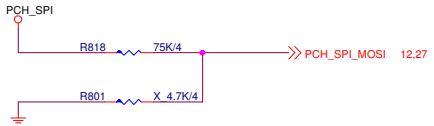
0 : LPC
1 : eSPI

Flash Descriptor Security Override

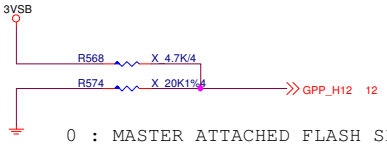


0 : ENABLE
1 : DISABLE

Reserved



ESPI FLASH SHARING MODE



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

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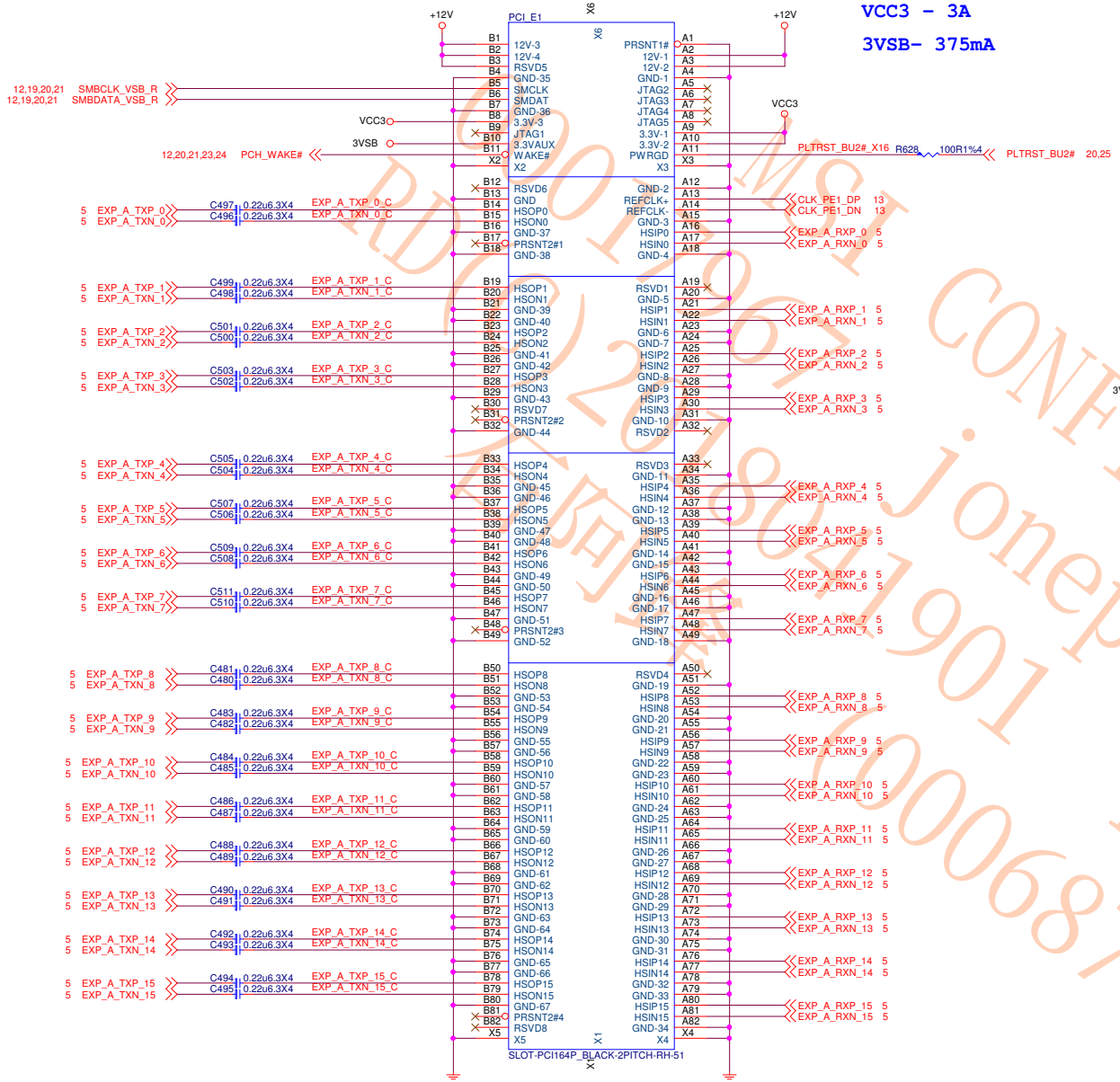
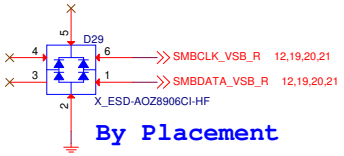
12V - 5.5A
VCC3 - 3A
3VSB- 375mA



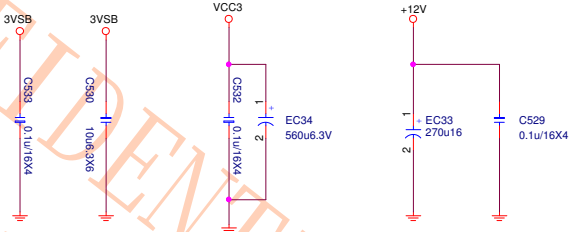
0901 Modify PCI_E1 PIN X2.X3.X4.X5 Connect to GND

SMBUS ESD

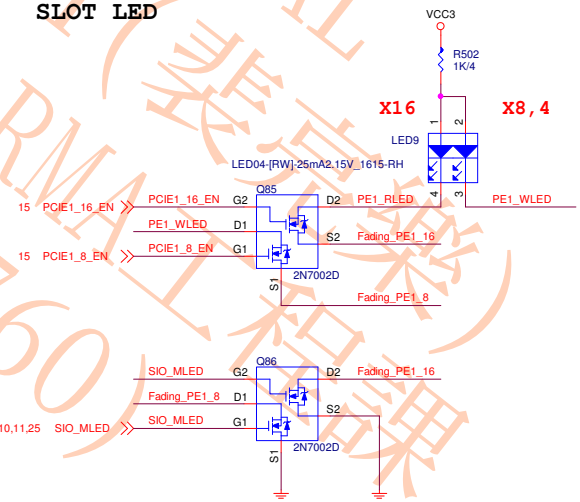


By Placement

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



SLOT LED



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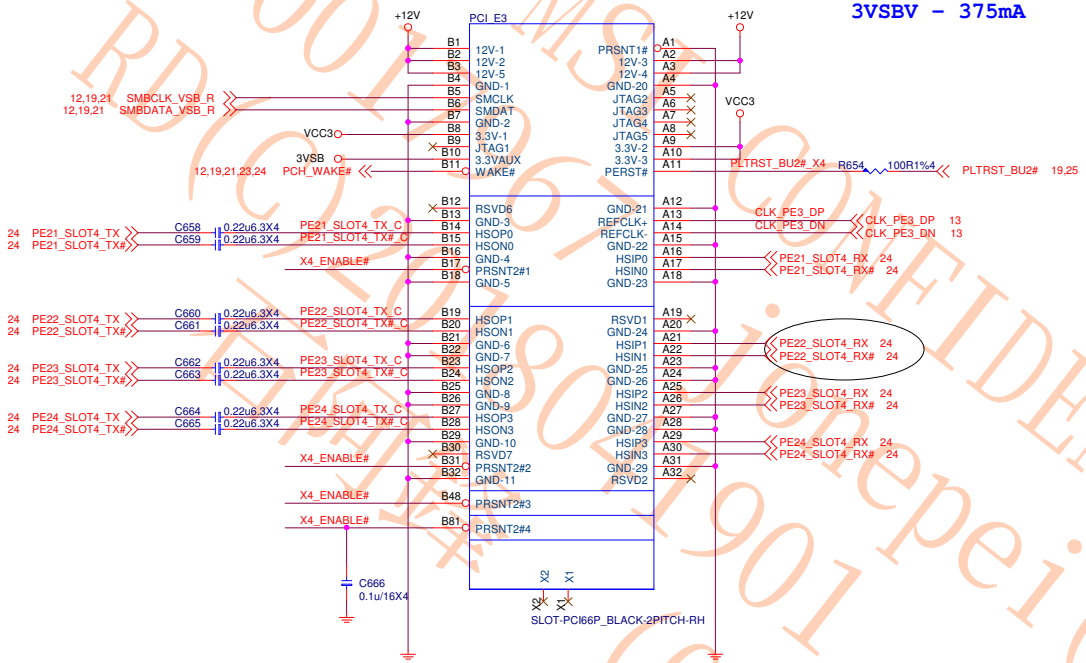
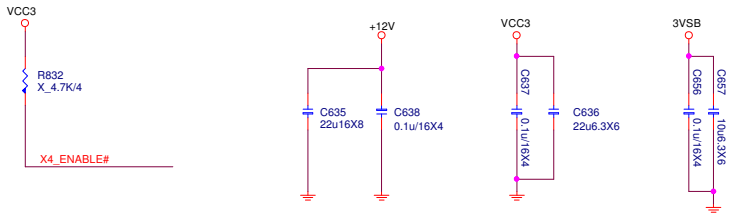
PCI_Express X4 Slot

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





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Size: Custom	Document Description: PCIE SLOT (X4)
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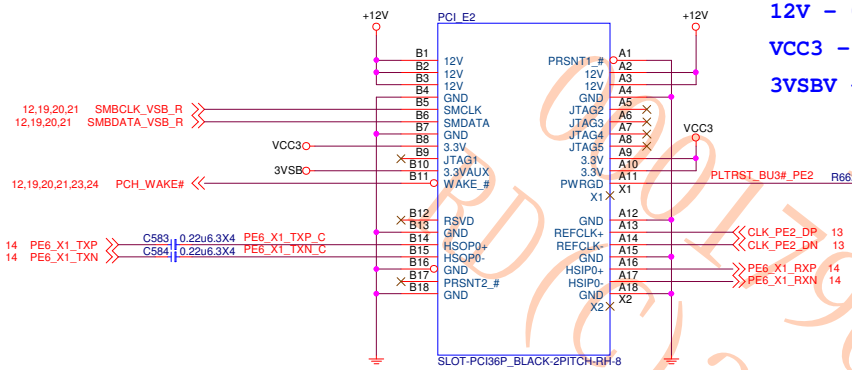
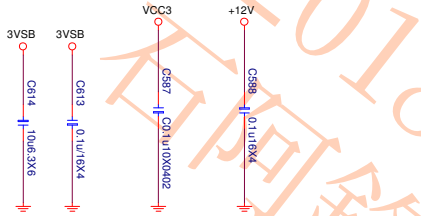
2016.08.25 Modify to N11-0360211-F02

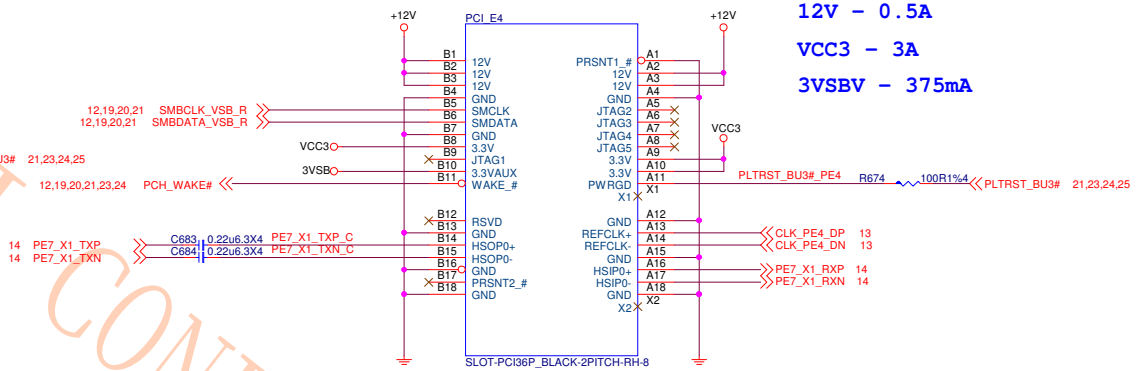
12V - 0.5A
VCC3 - 3A
3VSBV - 375mA

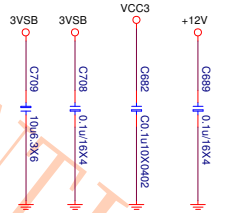




2016.08.25 Modify to N11-0360211-F02

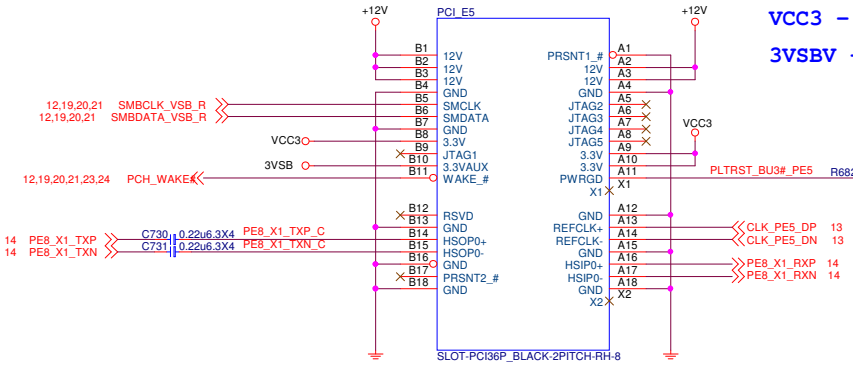
12V - 0.5A
VCC3 - 3A
3VSBV - 375mA

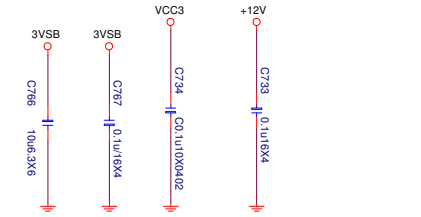




2016.08.25 Modify to N11-0360211-F02

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





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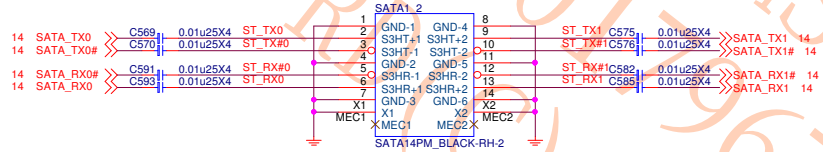
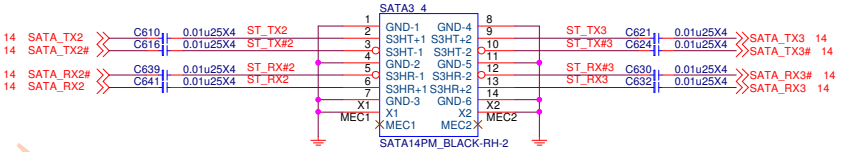
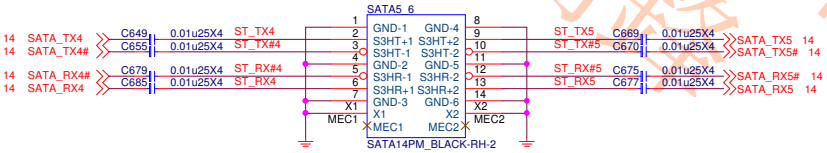
SATA Connector







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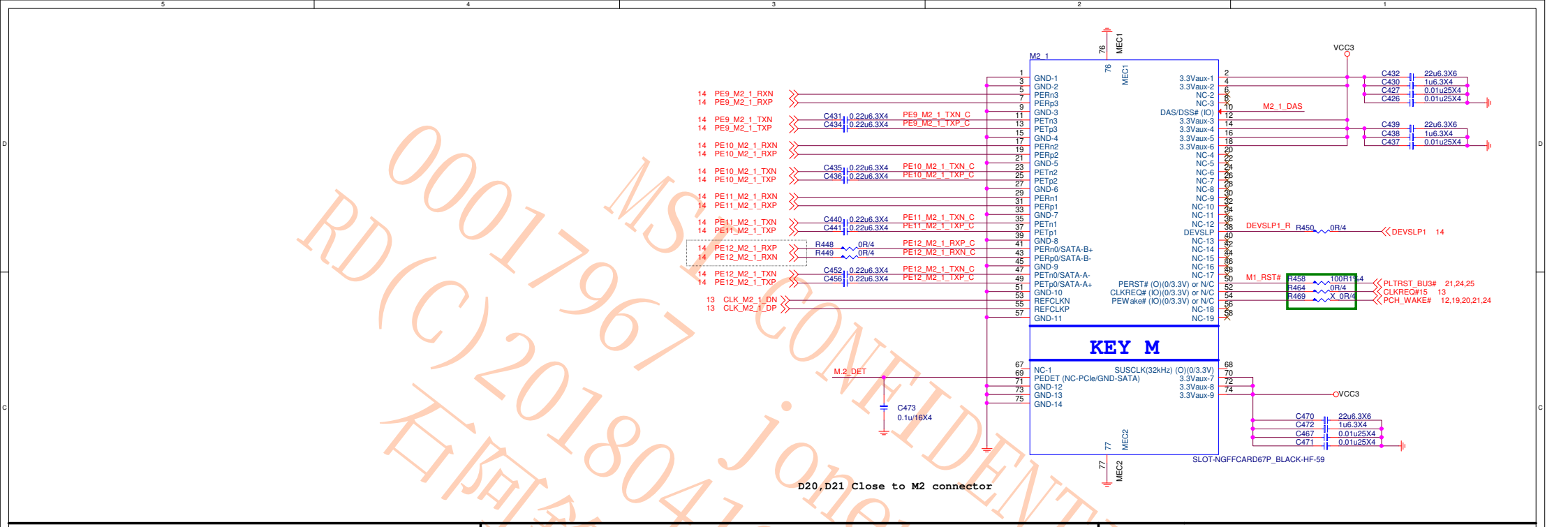

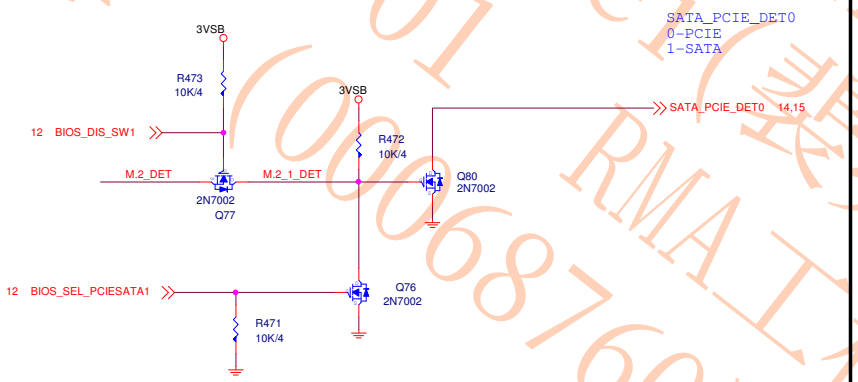

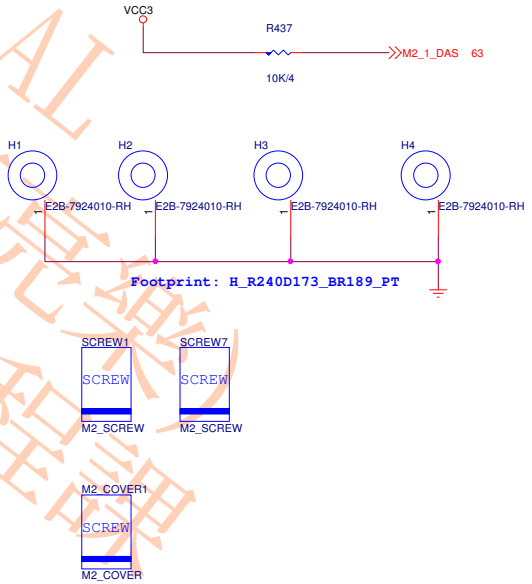

BIOS_MODE

DIS_SW	*M1_SEL_PCIESATA*	*Mode*
0	*1*	*M2-SATA*
0	*0*	*M2-PCIE*
GPI	*GPI*	*AUTO*

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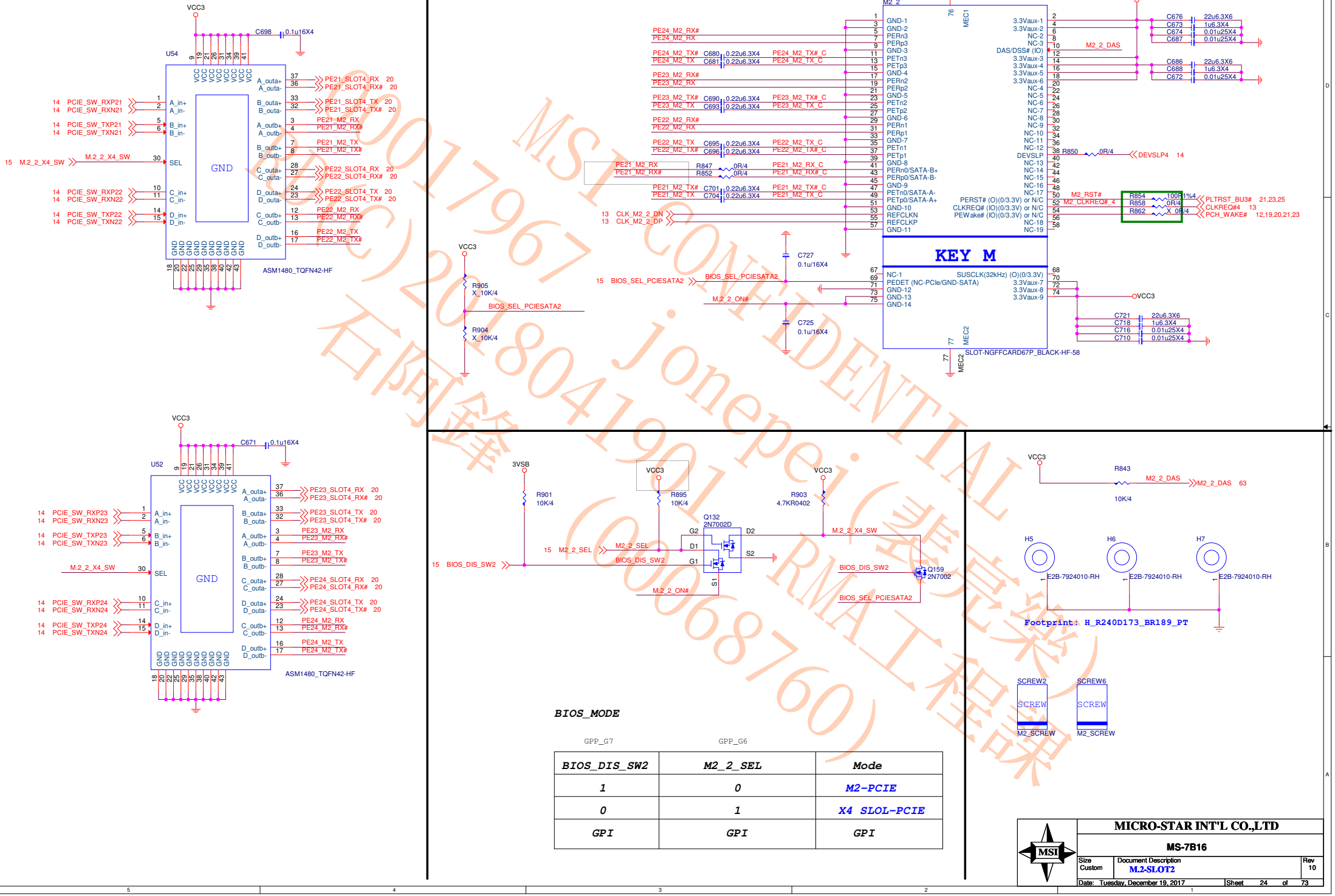

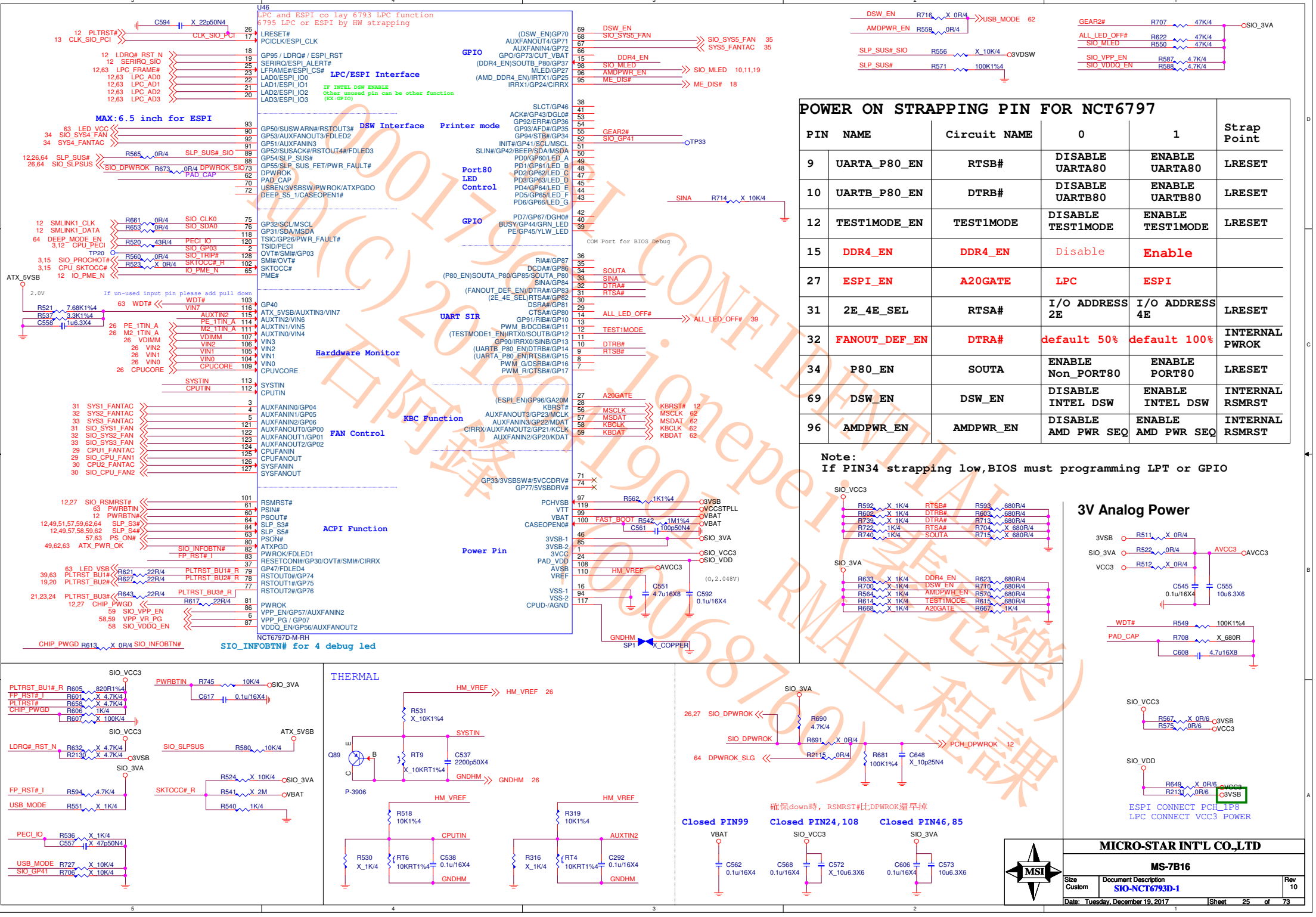

POWER ON STRAPPING PIN FOR NCT6797

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

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

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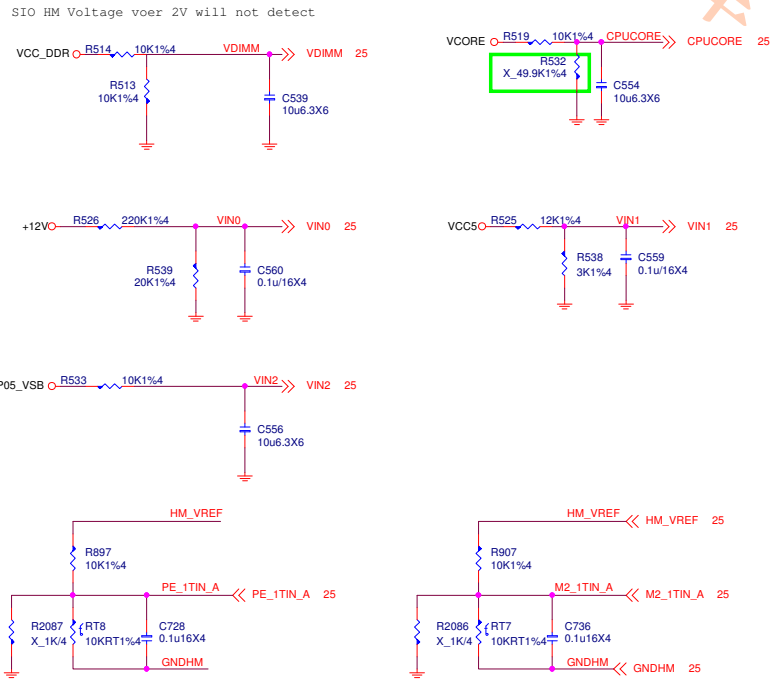
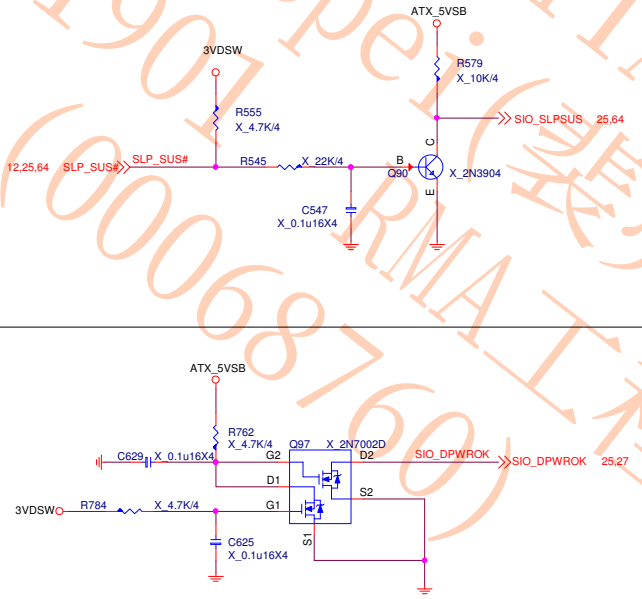
REMOVE SERIAL PORT 1 & BIOS DEBUG

HW Monitor - Voltage



SLP_SUS Co-lay circuit



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MS-7B16		
Size: Custom	Document Description: SIO-NCT6793D-2	Rev: 10
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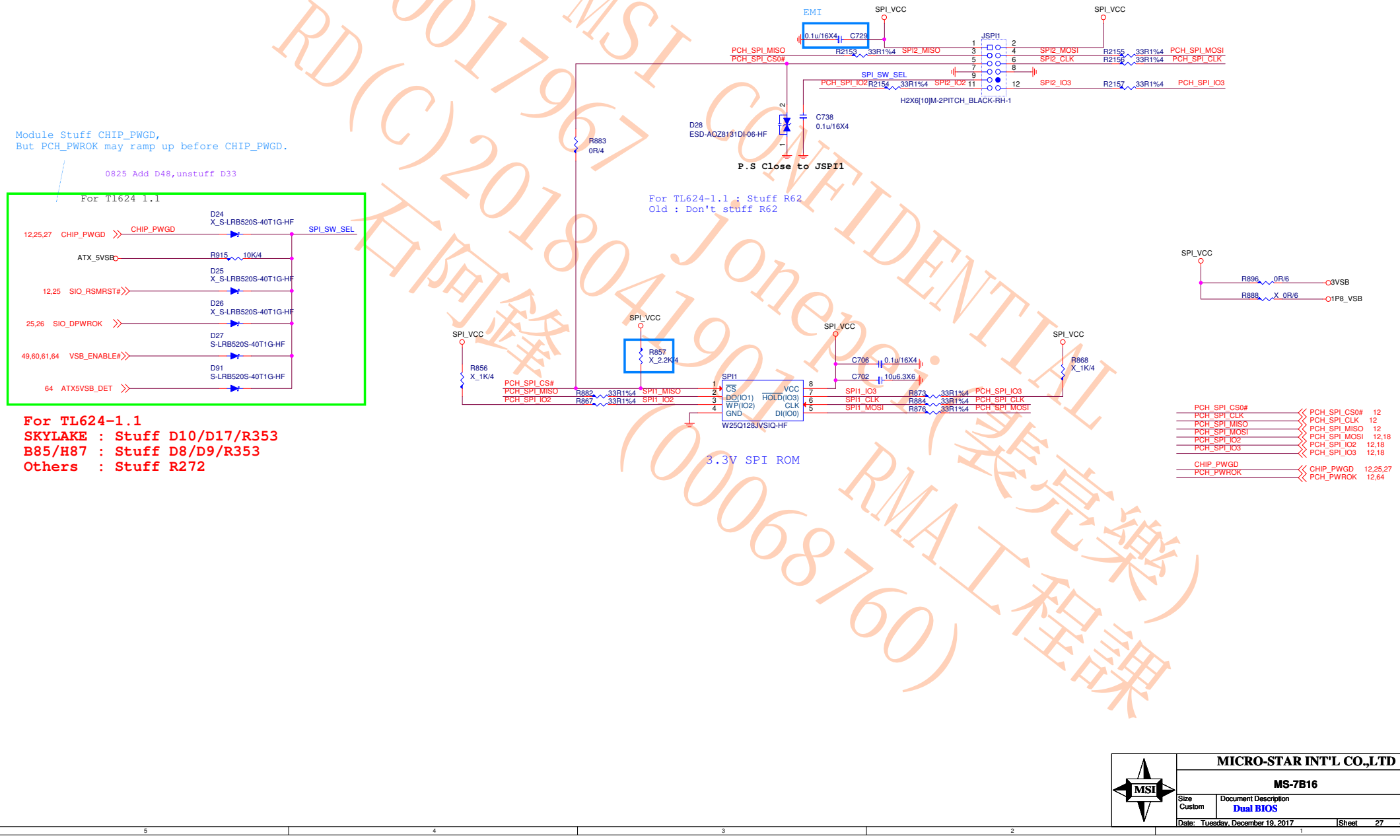

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	MS-7B16	
Size: Custom	Document Description: Dual BIOS	Rev: 10
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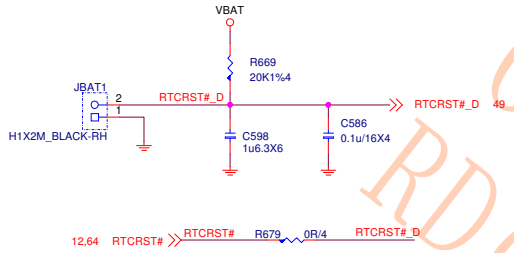
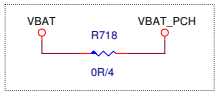
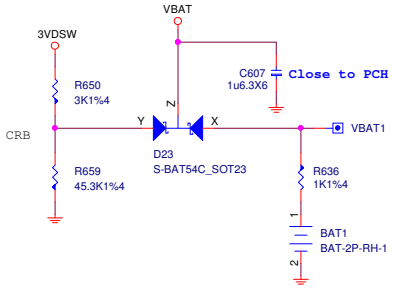
CUT VBAT



VBAT





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MS-7B16		
Size: Custom	Document Description: CLR COMS/CUT VBAT	Rev: 10
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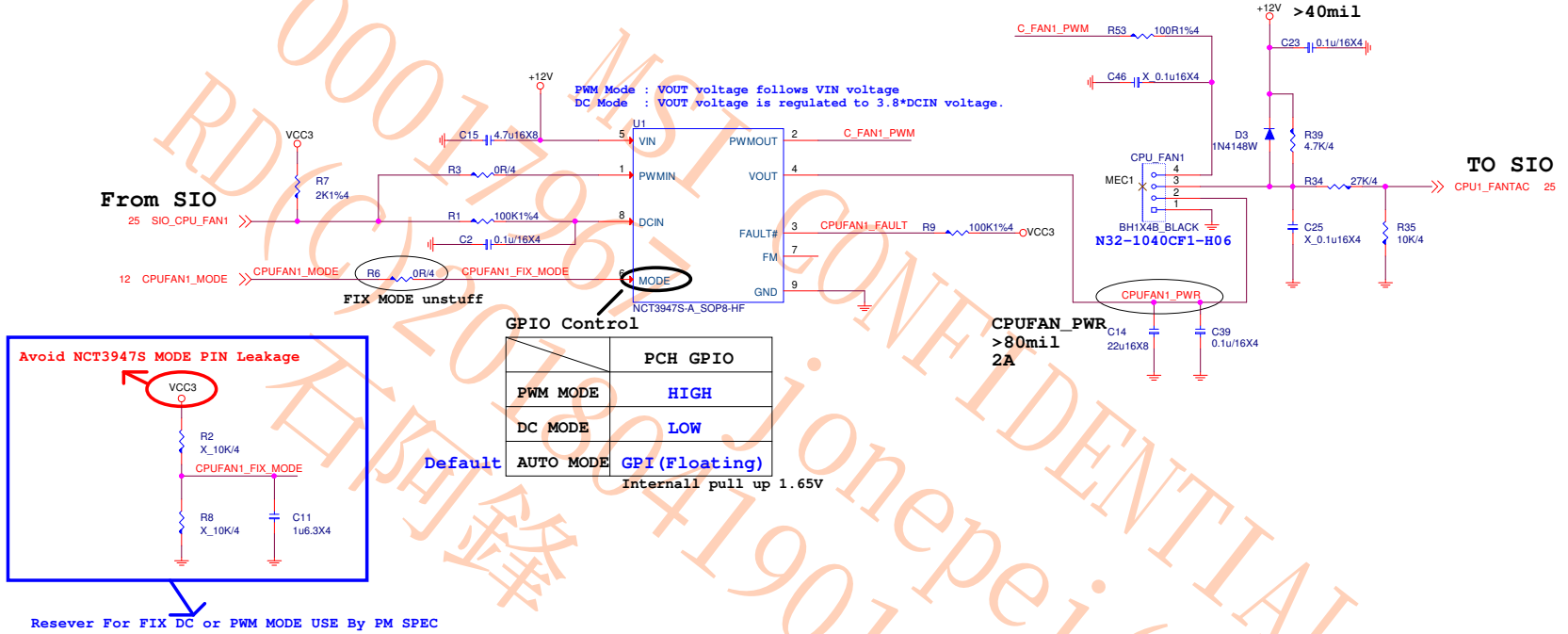
TYPE J : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO



MICRO-STAR INT'L CO.,LTD		
MS-7B16		
Size: Custom	Document Description: CPU FAN1	Rev: 10
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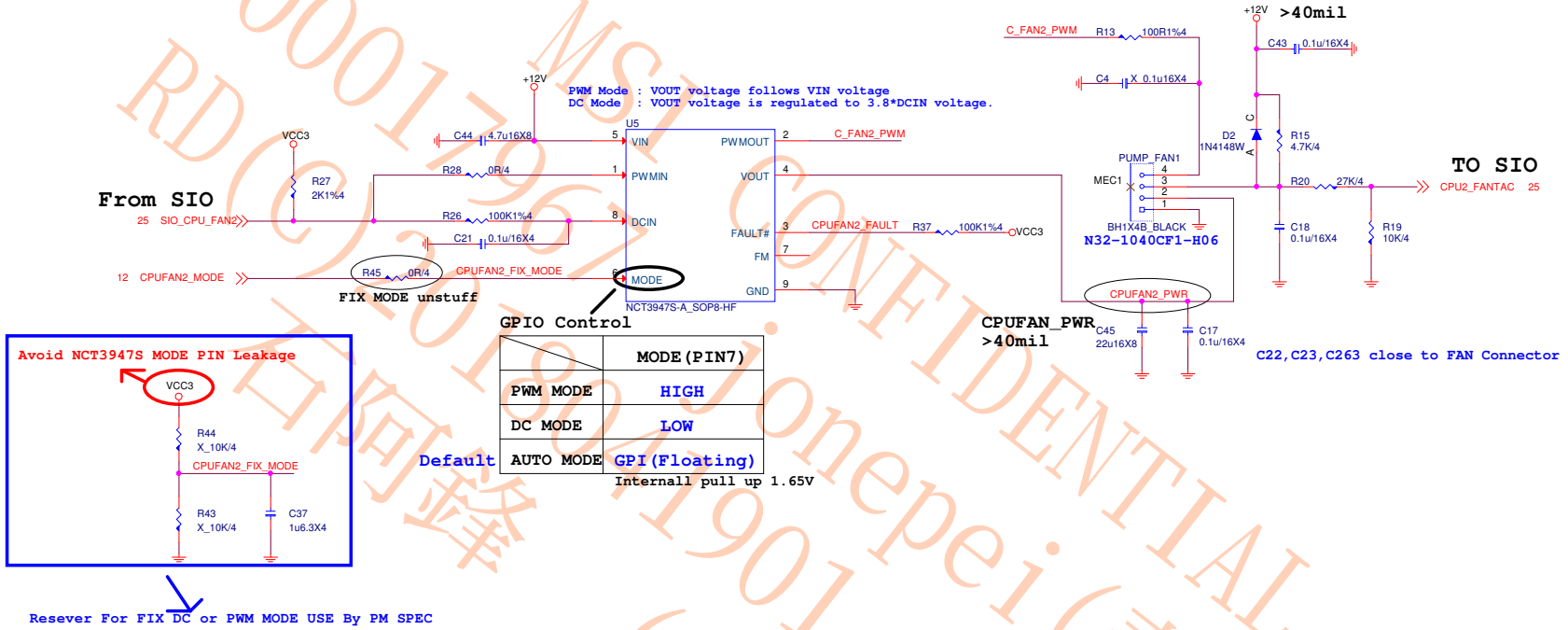
TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can swtich PWM/DC MODE



	MODE(PIN7)
PWM MODE	HIGH
DC MODE	LOW
Default AUTO MODE	GPI(Floating)

Internall pull up 1.65V

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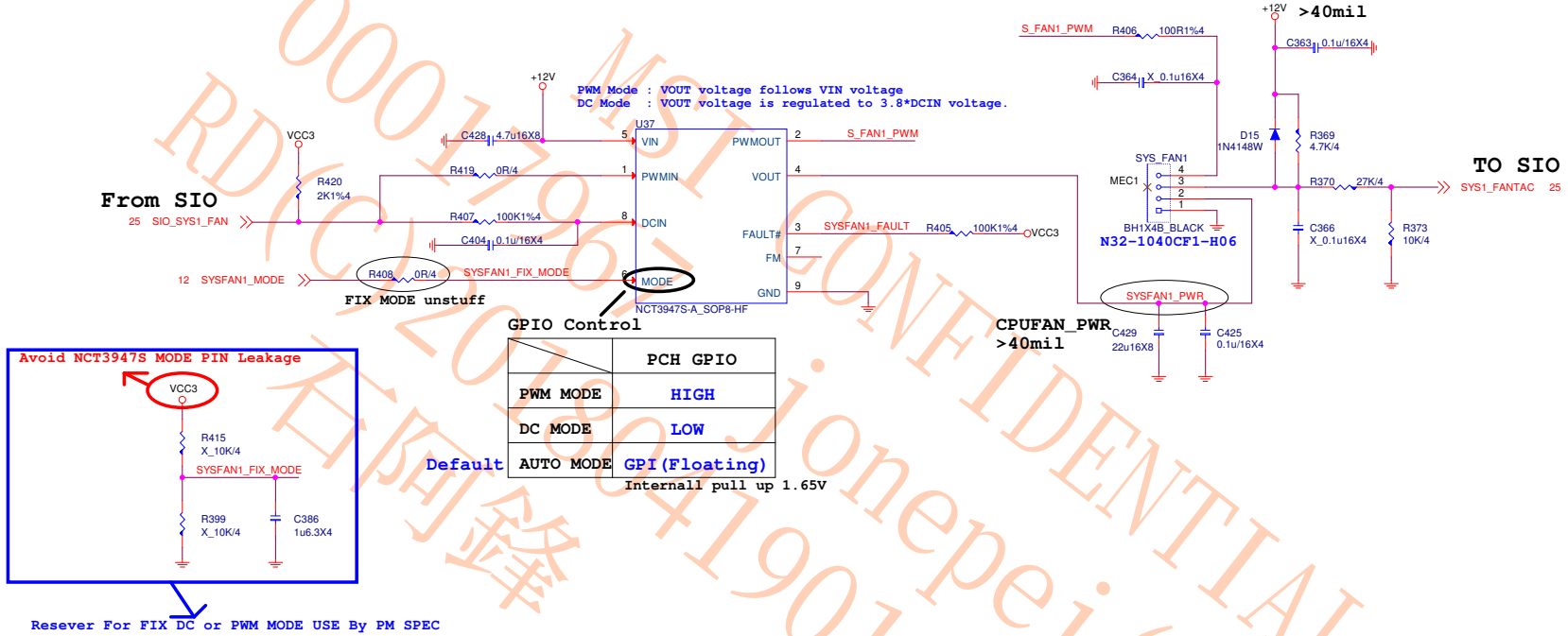

MICRO-STAR INT'L CO.,LTD	
MS-7B16	
Size: Custom	Document Description: SYSTEM FAN1
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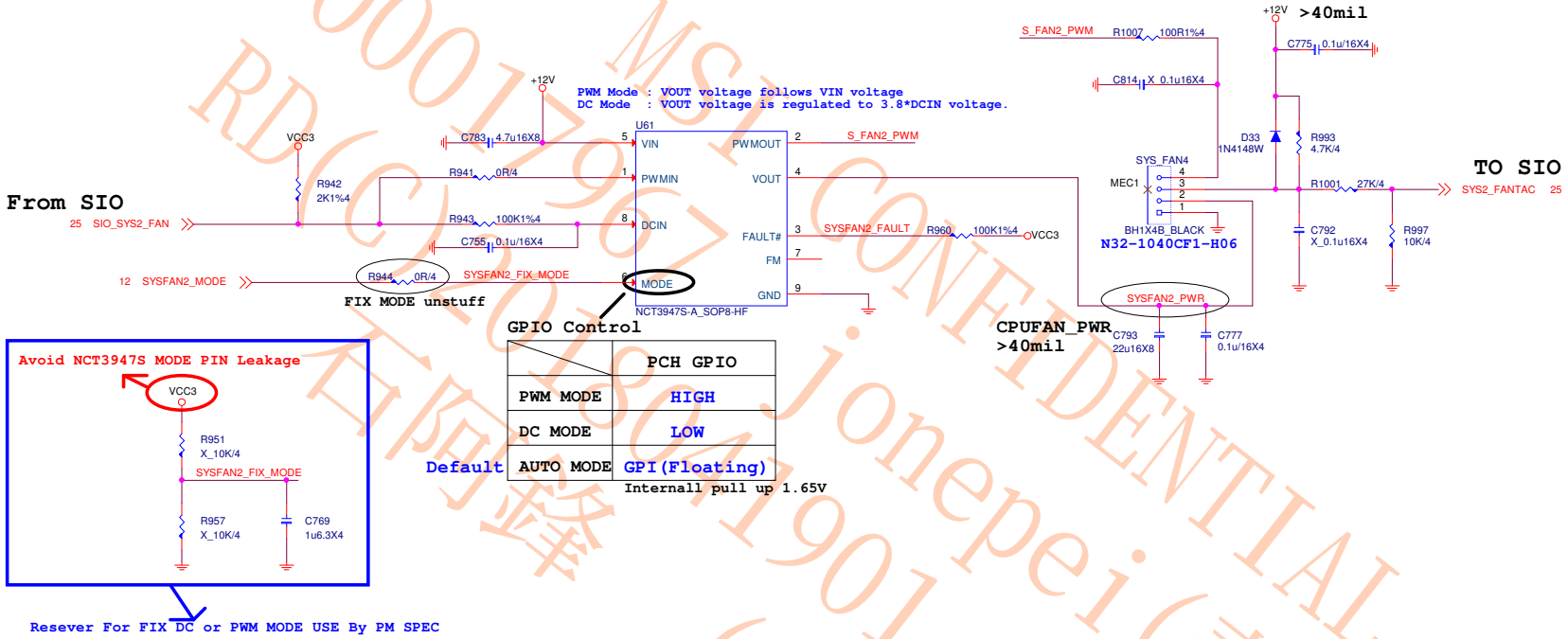
TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE

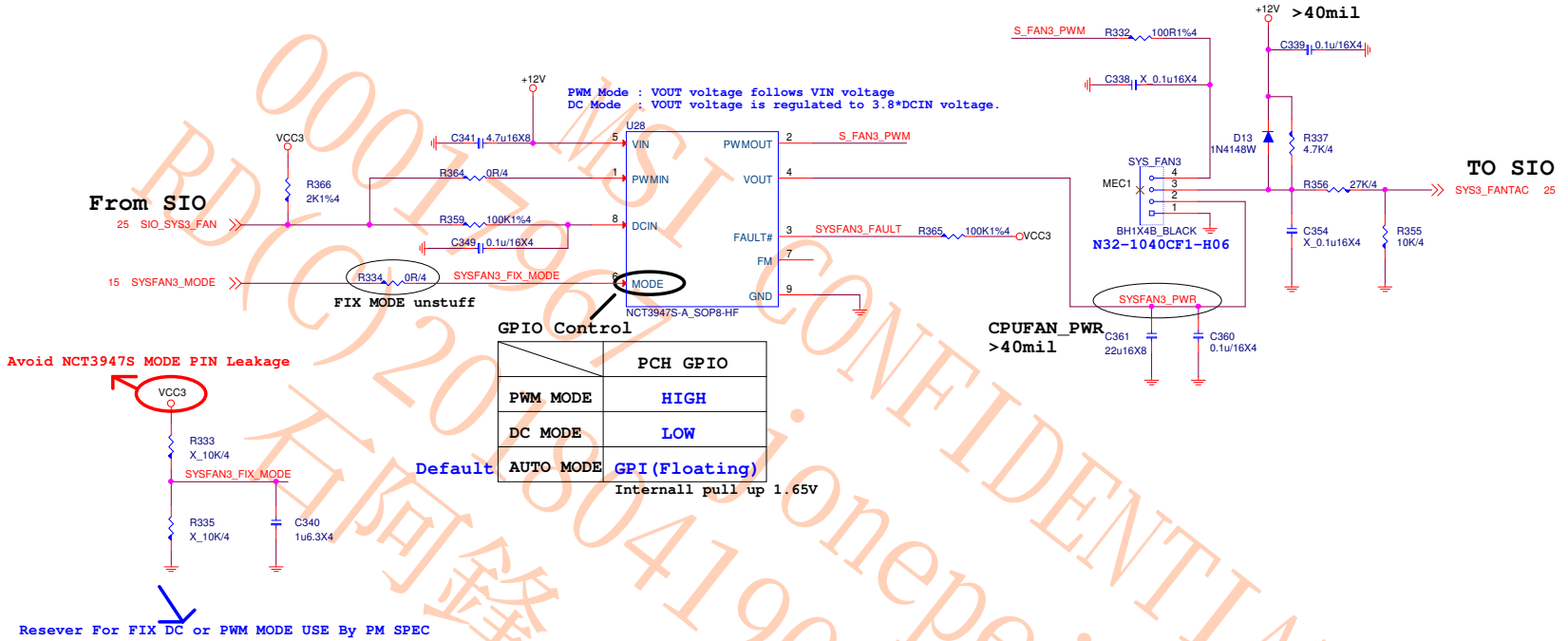
1.Mode GPIO BIOS can swtich PWM/DC MODE



MICRO-STAR INT'L CO.,LTD	
MS-7B16	
Size: Custom	Document Description: SYSTEM FAN2 — Rev: 10
Date: Tuesday, December 19, 2017	Sheet 32 of 73

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

1.Mode GPIO BIOS can swtich PWM/DC MODE



MICRO-STAR INT'L CO.,LTD	
MS-7B16	
Size: Custom	Document Description: SYSTEM FAN3 — Rev: 10
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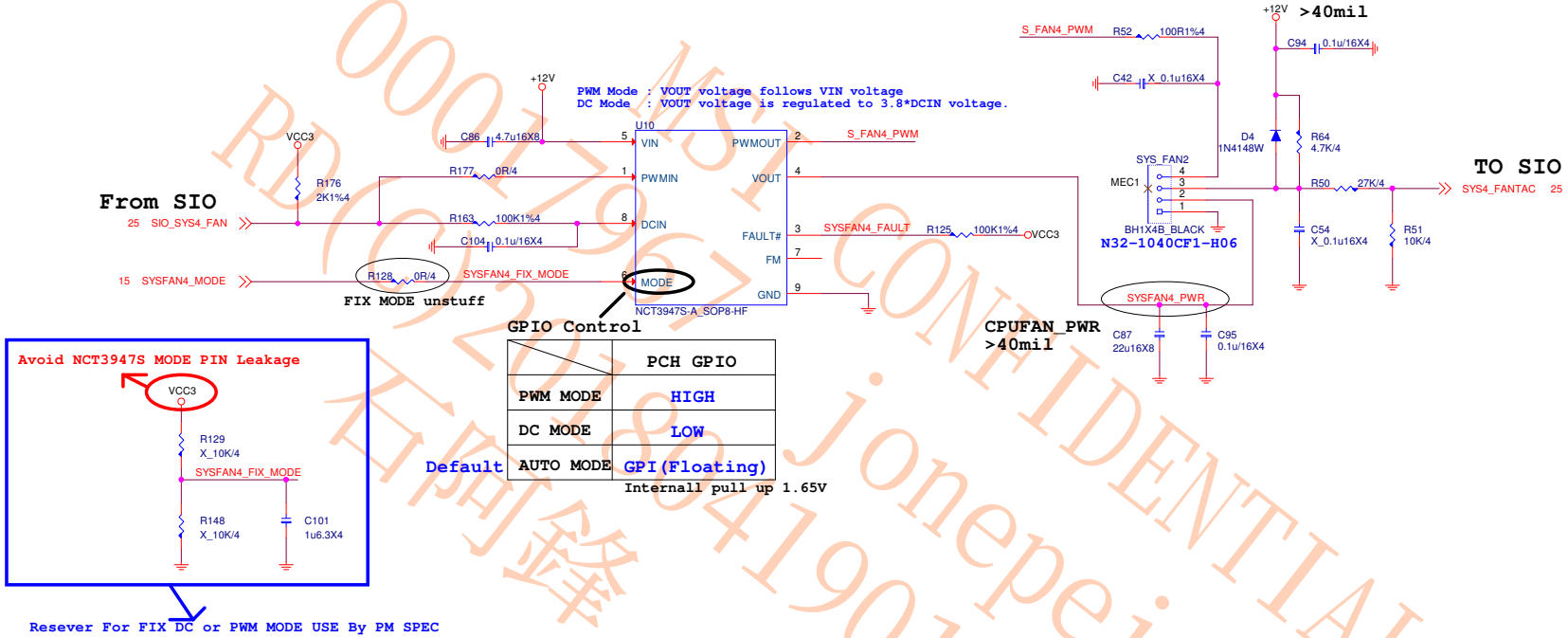
TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can swtich PWM/DC MODE



GPIO Control

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

Internall pull up 1.65V

MICRO-STAR INT'L CO.,LTD	
MS-7B16	
Size: Custom	Document Description: SYSTEM FAN4
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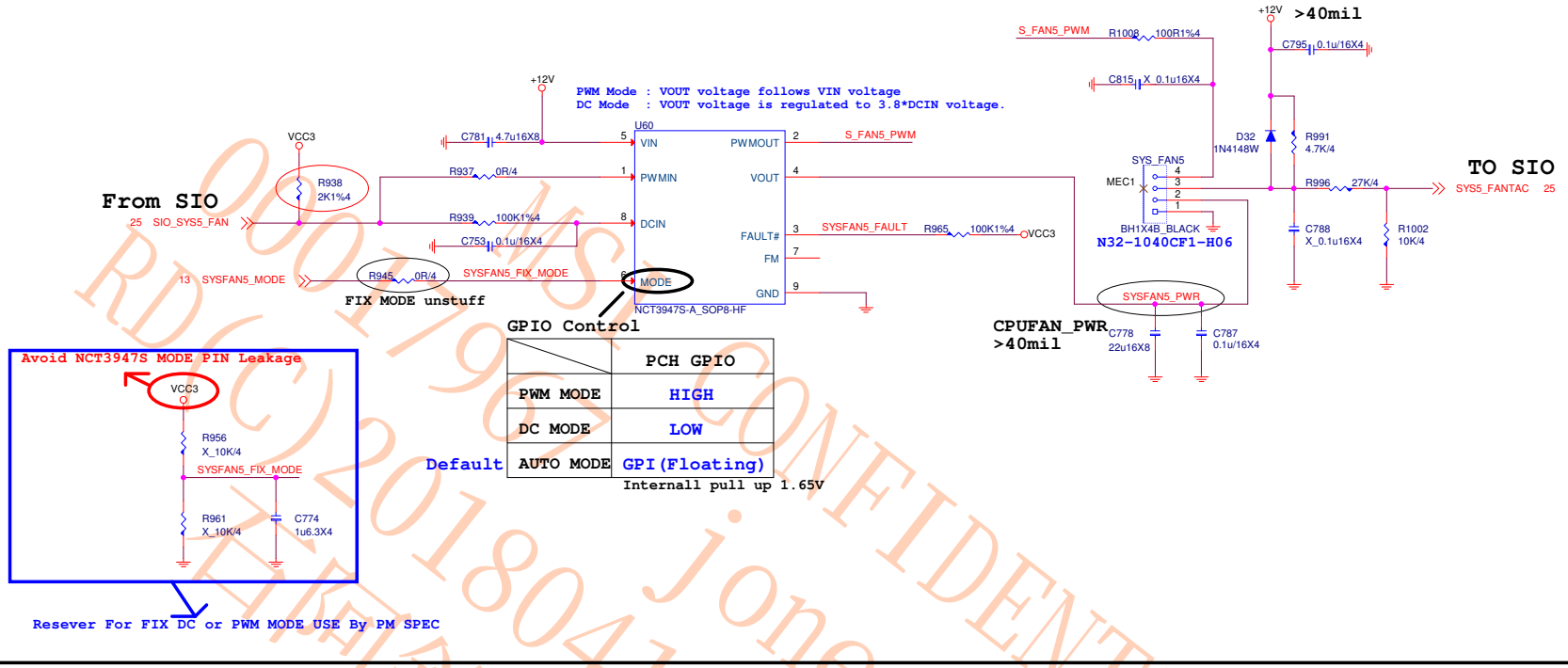

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MS-7B16	
Size: Custom	Document Description: SYSTEM FAN5
Rev: 10	
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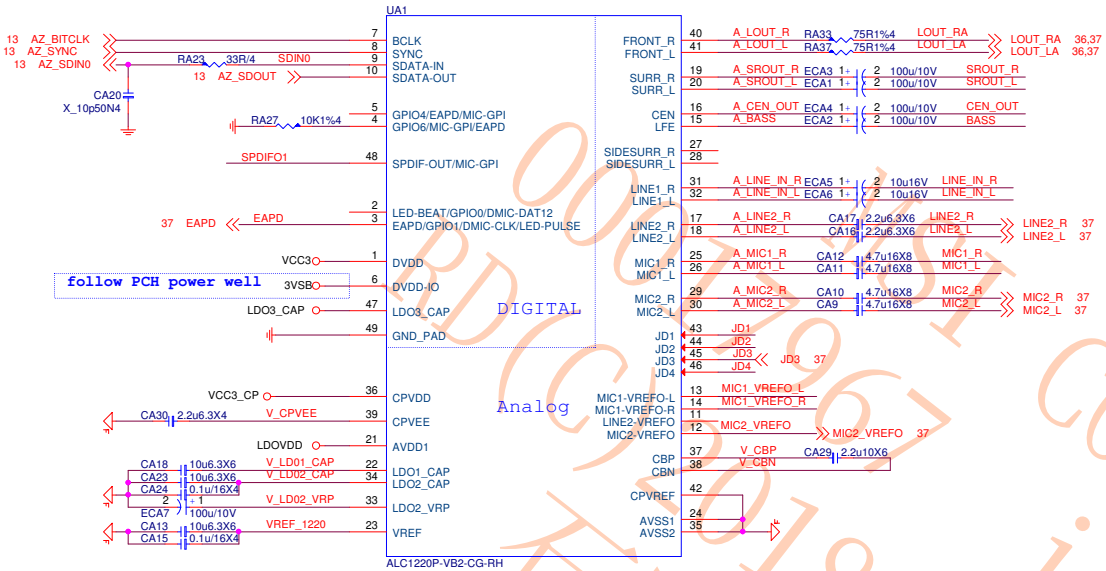
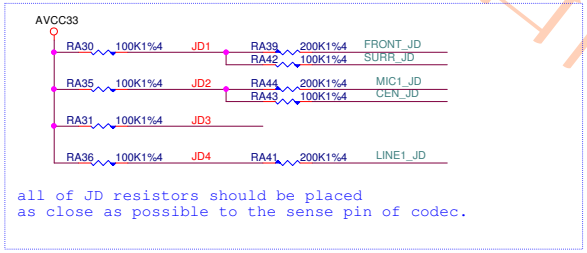
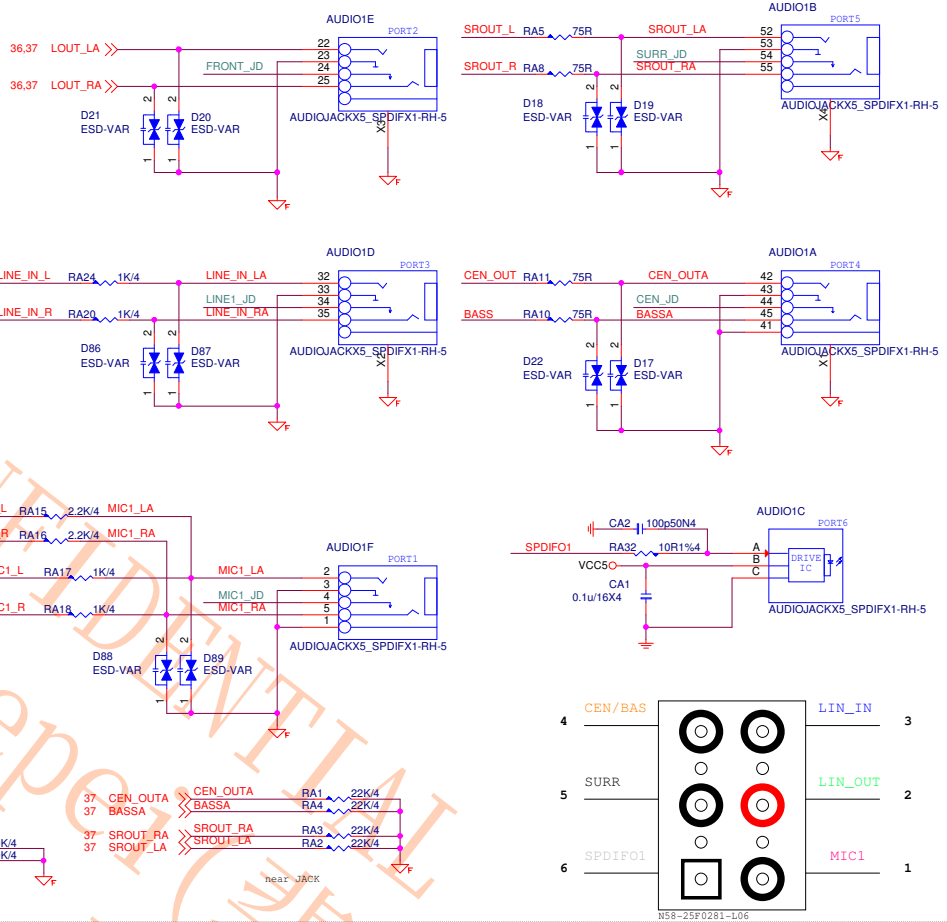
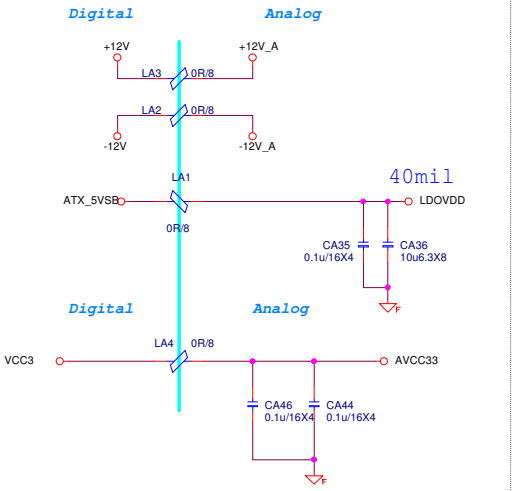
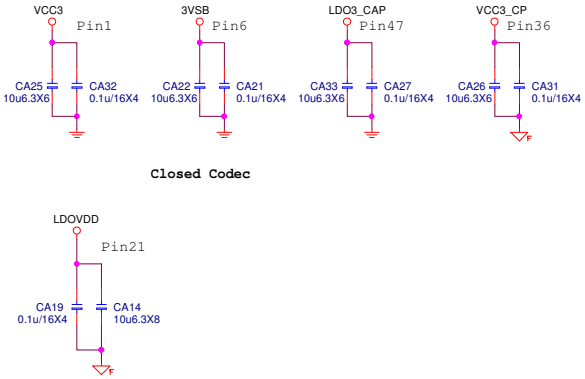
ALC1220P-VB2_48PIN



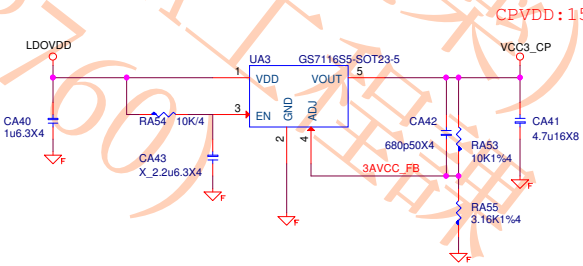


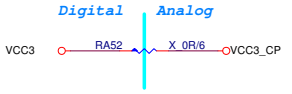






CPVDD POWER:ATX5VSB will Leakage to CVDD by ALC1220, so CVDD must keep 3.3V





EMI

CPA2 X_COPPER

CPA1 X_COPPER

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MS-7B16		
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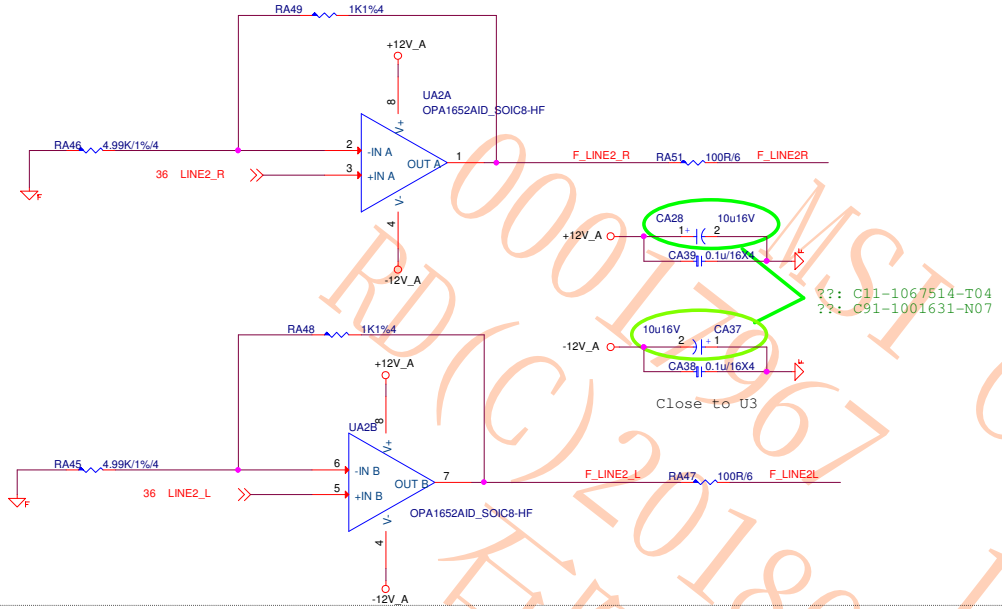
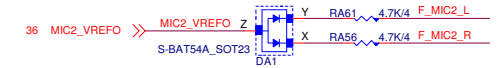
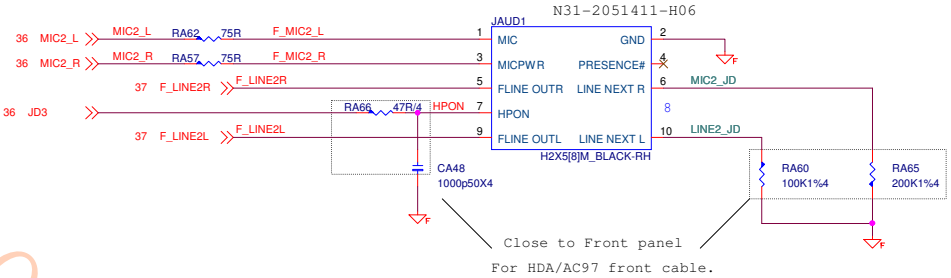
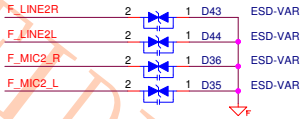






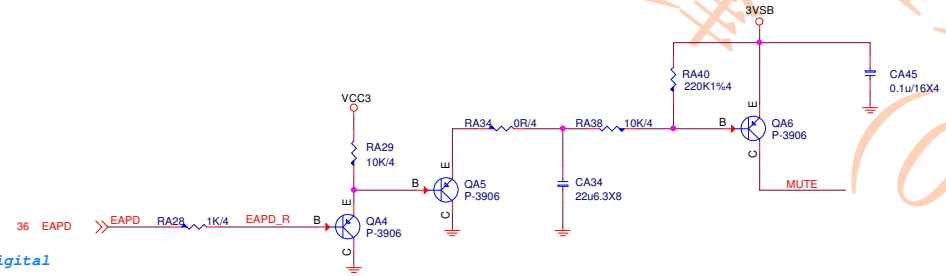
Close to Jack

ESD protect



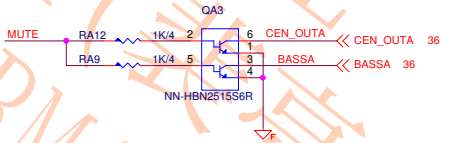
Rear Line OUT De-POP circuit

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

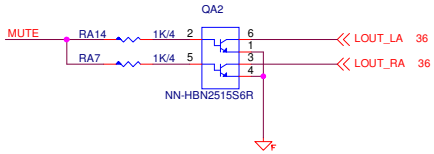


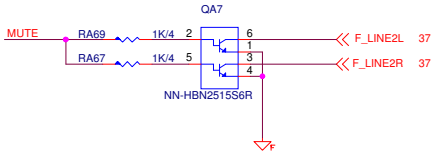
Digital

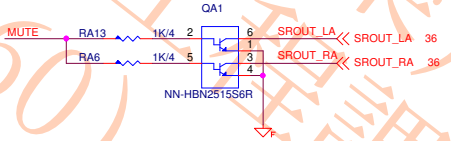
(add de-pop circuit by PM spec or customer request,
NOTE: add de-pop circuit need to change SROUT_LA,SROUT_RA, CEN_OUTA, BASSA to TVS)



Analog







Audio moat is transparent and width 40mil

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Remove Audio impedance sensing 2N7002 circuits

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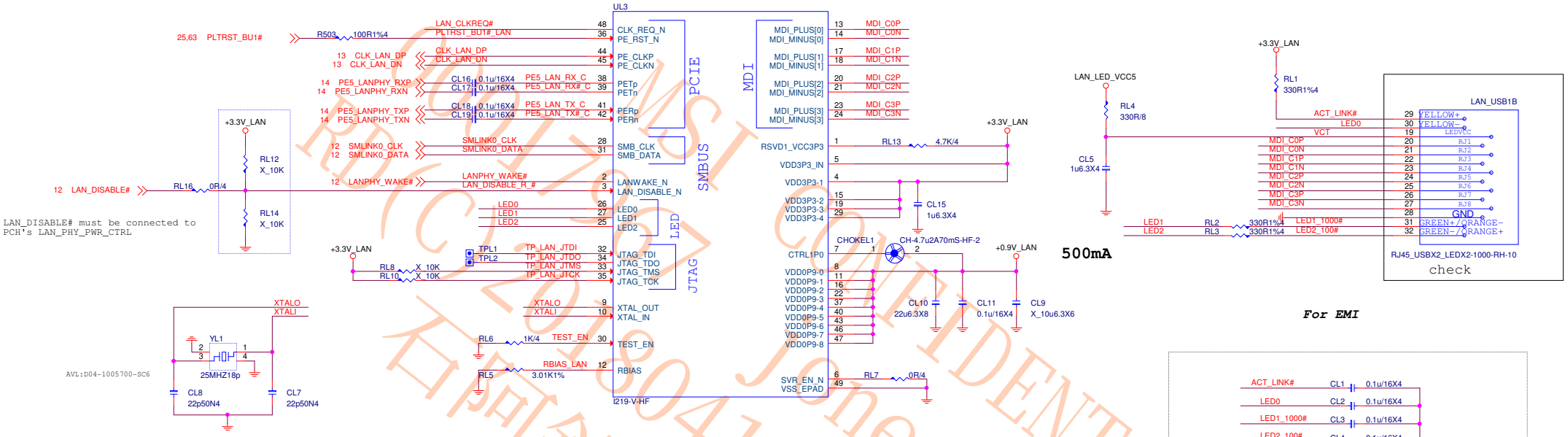
Intel Lan- i219

LAN Connector

8111H:B06-08111CC-R09
8111G:B06-081116C-R09

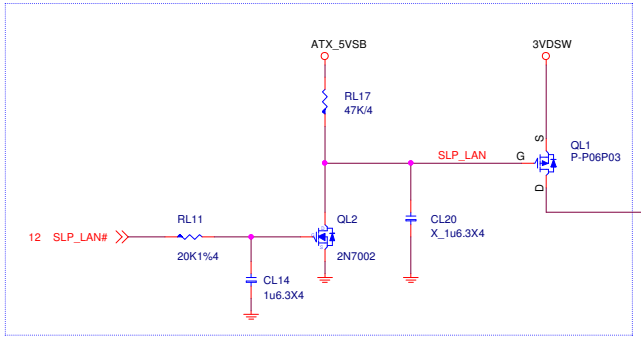


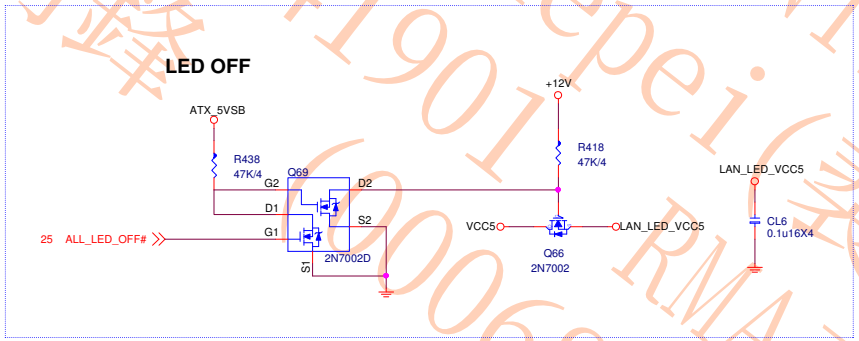
LAN_DISABLE# must be connected to PCH's LAN_PHY_PWR_CTRL

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

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

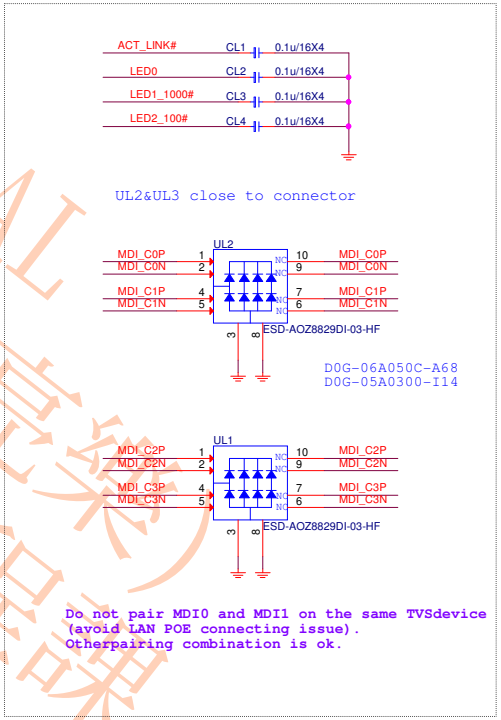
support WOL from Deep Sx:
Power source from 3VA (DSW power) & make sure MAX current is enough to support i218/i219.





500mA

For EMI



Do not pair MDI0 and MDI1 on the same TVSdevice (avoid LAN POE connecting issue).
Otherpairing combination is ok.

+3.3V_LAN

I218:132mA
I219:542mW

Note:These caps closed to PHY

MICRO-STAR INT'L CO.,LTD		
MS-7B16		
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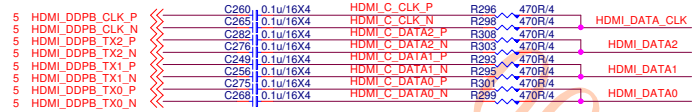
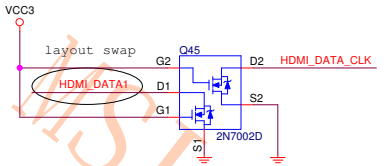
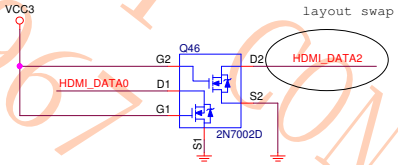
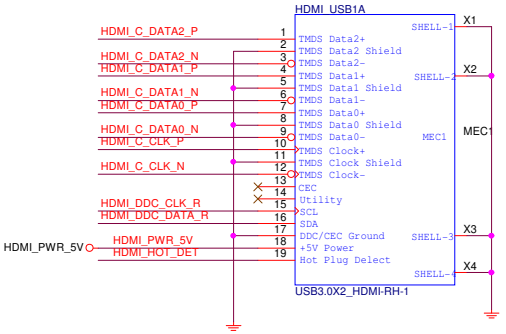
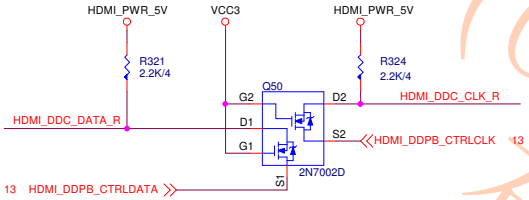
HDMI, DVI : 1920x1200 at 60 Hz (16:10 WUXGA)

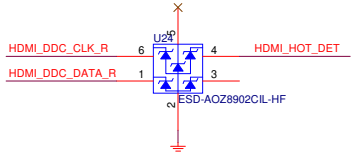


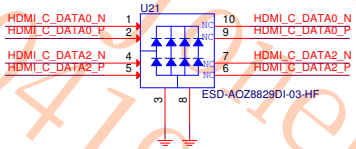


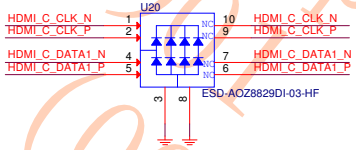


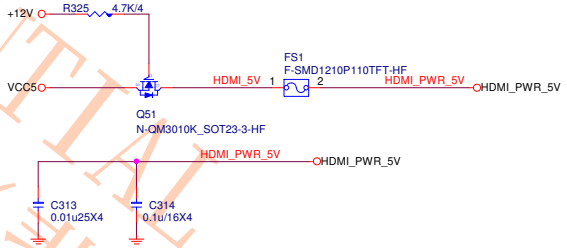




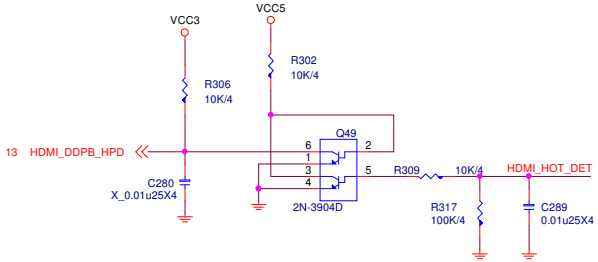




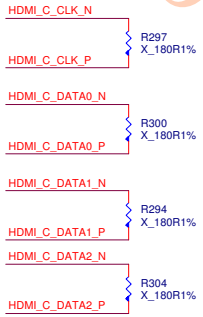




HPD



For EMI



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MS-7B16		
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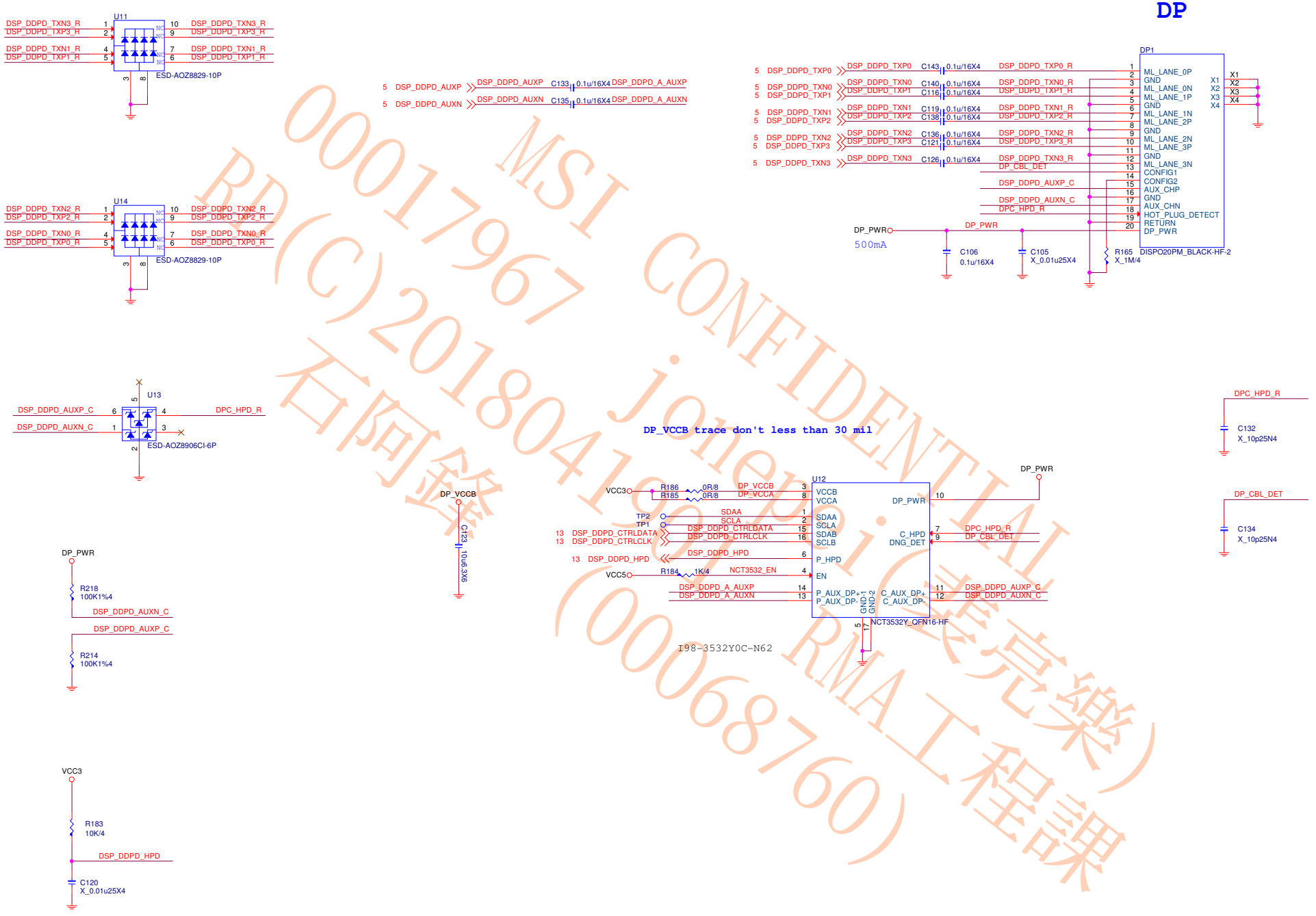
DP



MICRO-STAR INT'L CO.,LTD		
MS-7B16		
Size: Custom	Document Description: DISPLAYPORT CONN	Rev: 10
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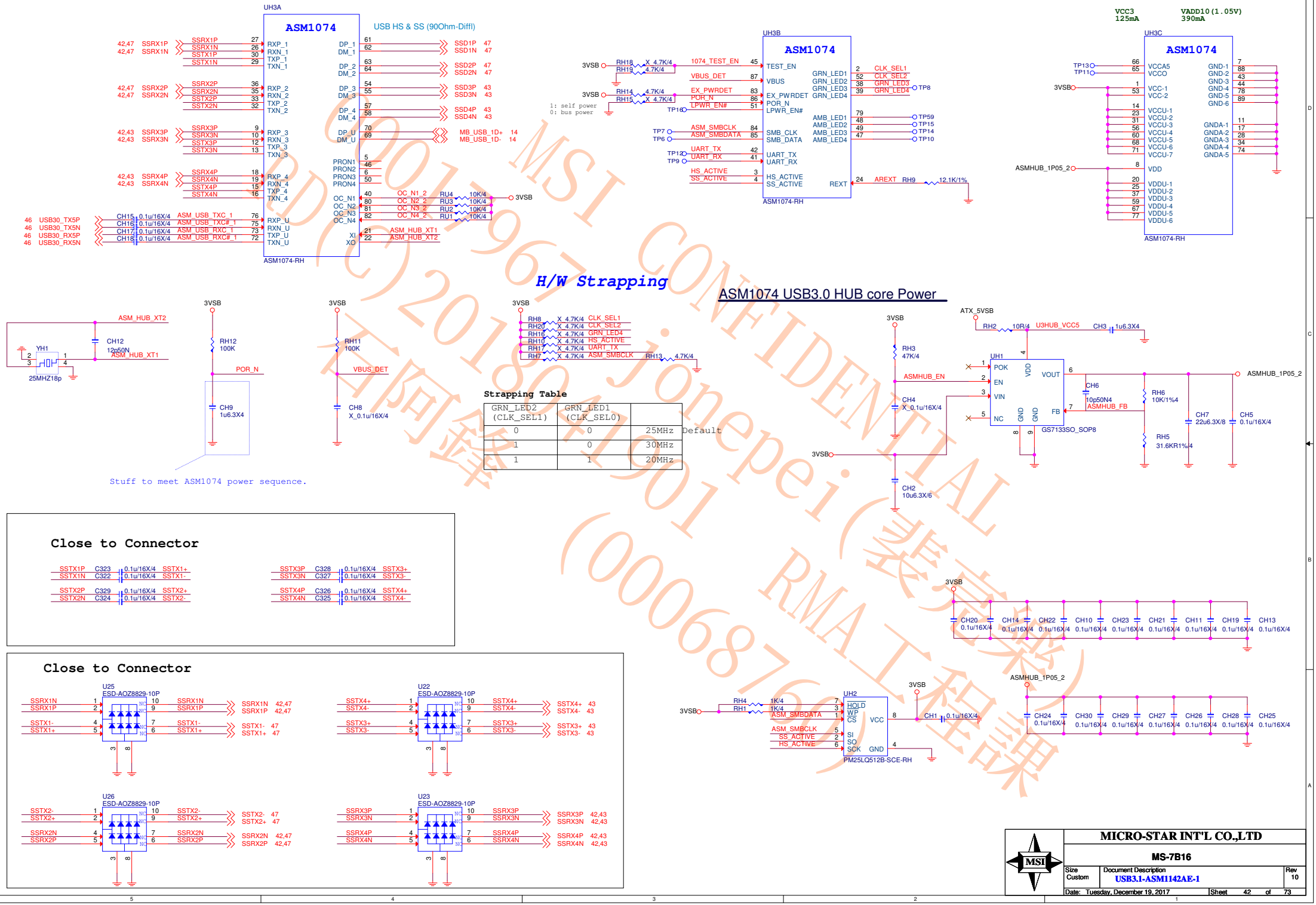

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MS-7B16		
Size: Custom	Document Description: USB3.1-ASM1142AE-1	Rev: 10
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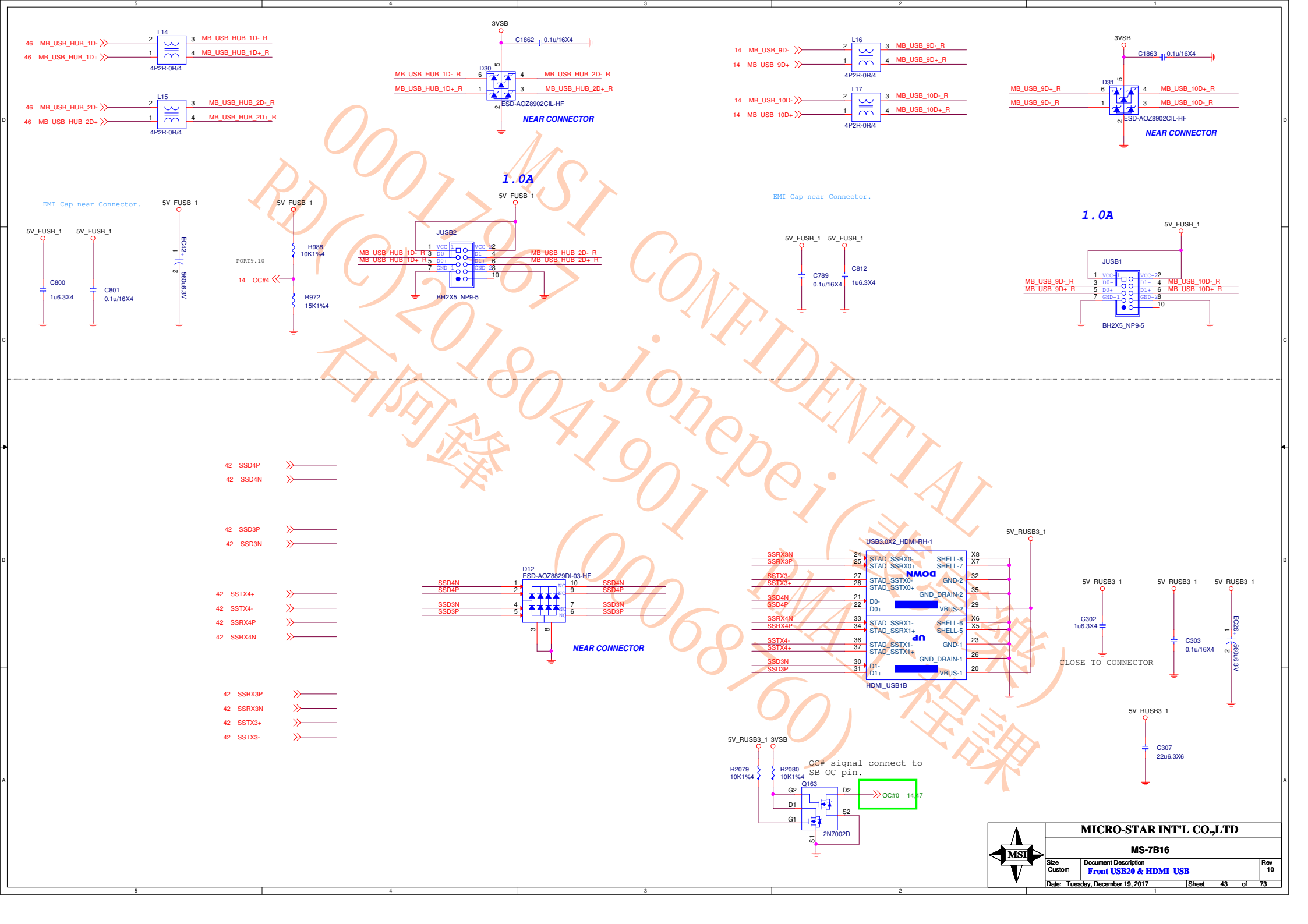

MICRO-STAR INT'L CO.,LTD		
MS-7B16		
Size: Custom	Document Description: Front USB20 & HDMI_USB	Rev: 10
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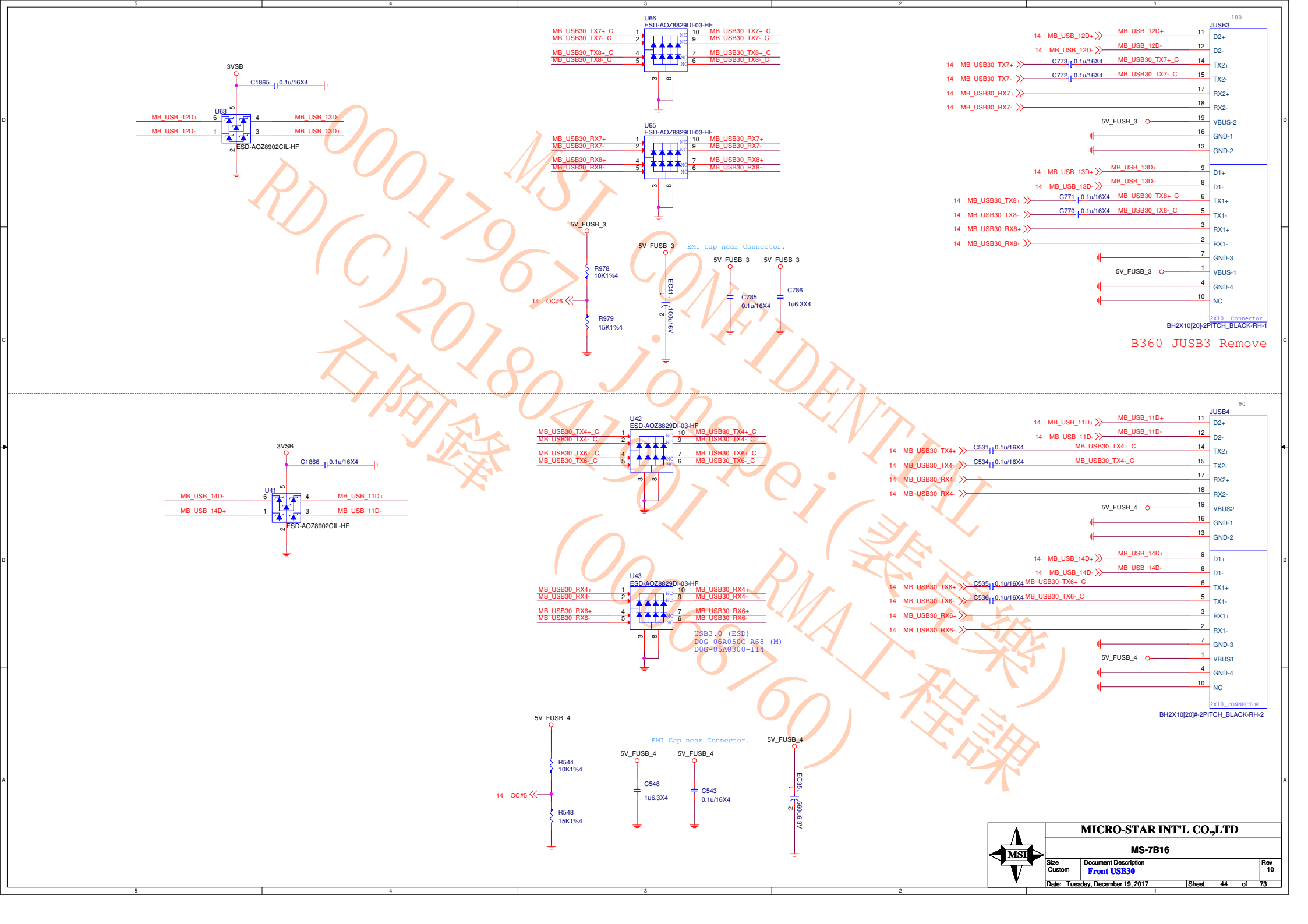
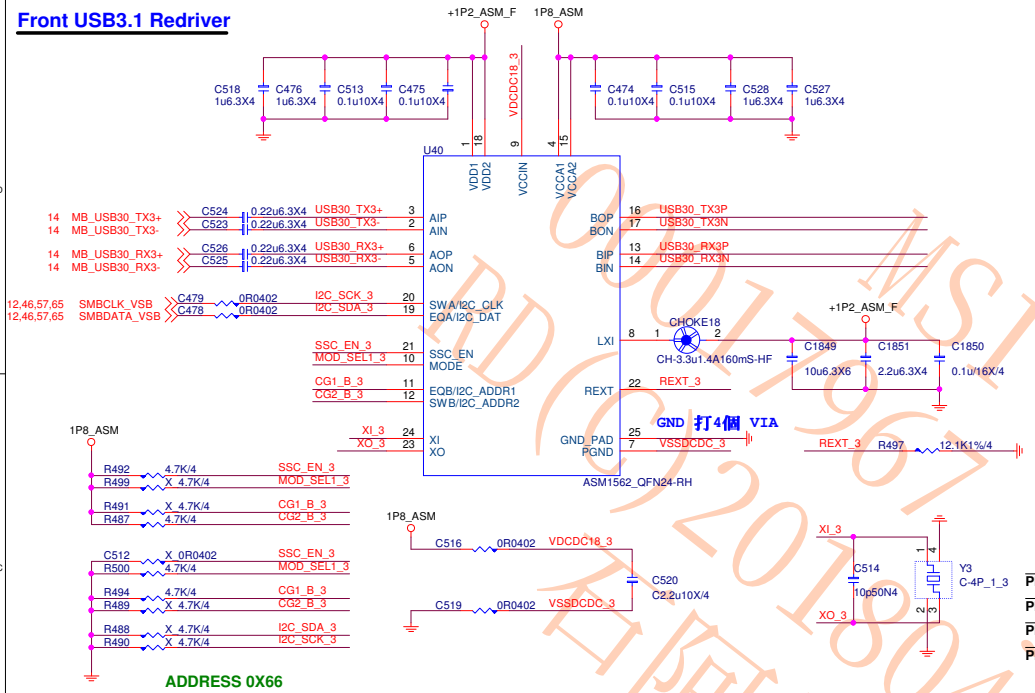
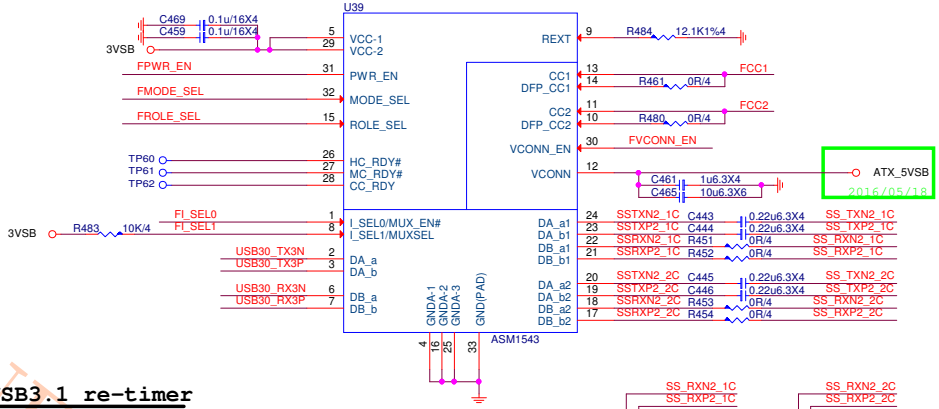


Front USB3.1 Redriver



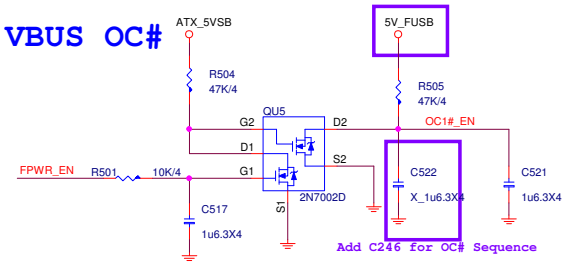
USB 3.1-Type-C



ASM1562 USB3.1 re-timer

ADDRESS	0x62	0X64	0x66	0x68	0x70	0x72	0x74	0x76	0x78
PIN11 RH (KOhm)	4.7K	4.7K	N/A	4.7K	4.7K	N/A	4.7K	4.7K	N/A
PIN11 RL (KOhm)	N/A	4.7K	4.7K	N/A	4.7K	4.7K	N/A	4.7K	4.7K
PIN12 RH (KOhm)	4.7K	4.7K	4.7K	4.7K	4.7K	4.7K	N/A	N/A	N/A
PIN12 RL (KOhm)	N/A	N/A	N/A	4.7K	4.7K	4.7K	4.7K	4.7K	4.7K

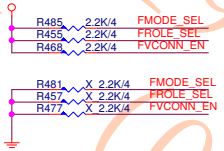
VBUS OC#



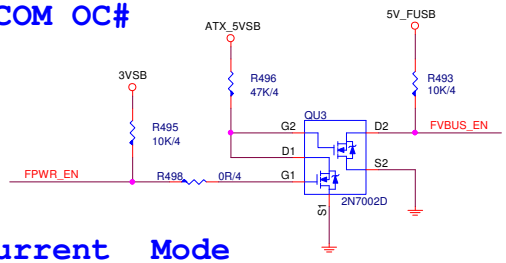
MODE_SEL	
1	OTP MODE (default)
0	Mux MODE

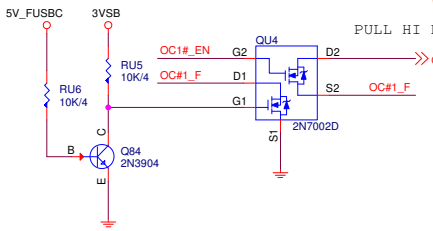
ROLE_SEL	
1	DFP role (default)
0	

VCONN_EN	
1	enable
0	disable

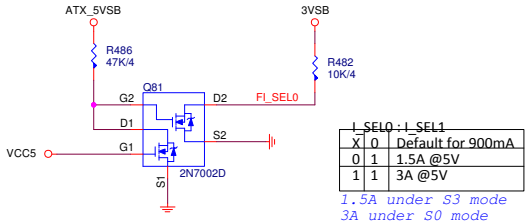


VCOM OC#



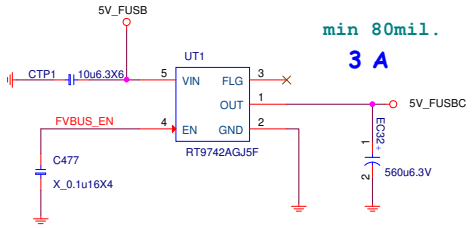


Current Mode

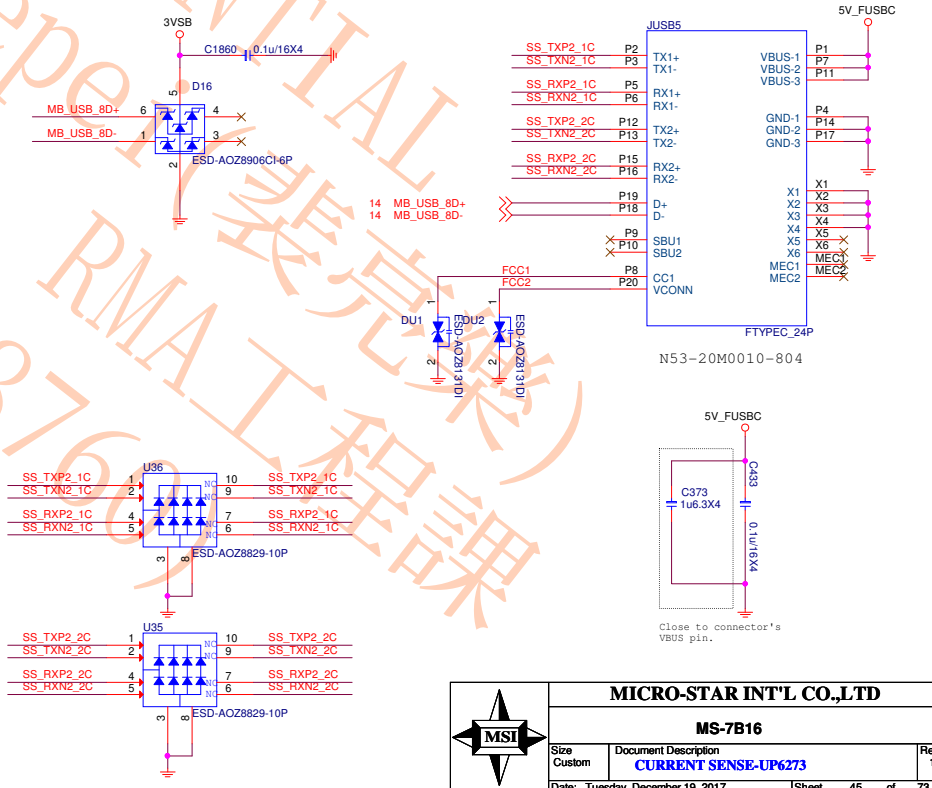


I_SEL0 : I_SEL1		
X	0	Default for 900mA
0	1	1.5A @5V
1	1	3A @5V

1.5A under S3 mode
3A under S0 mode



min 80mil.
3 A



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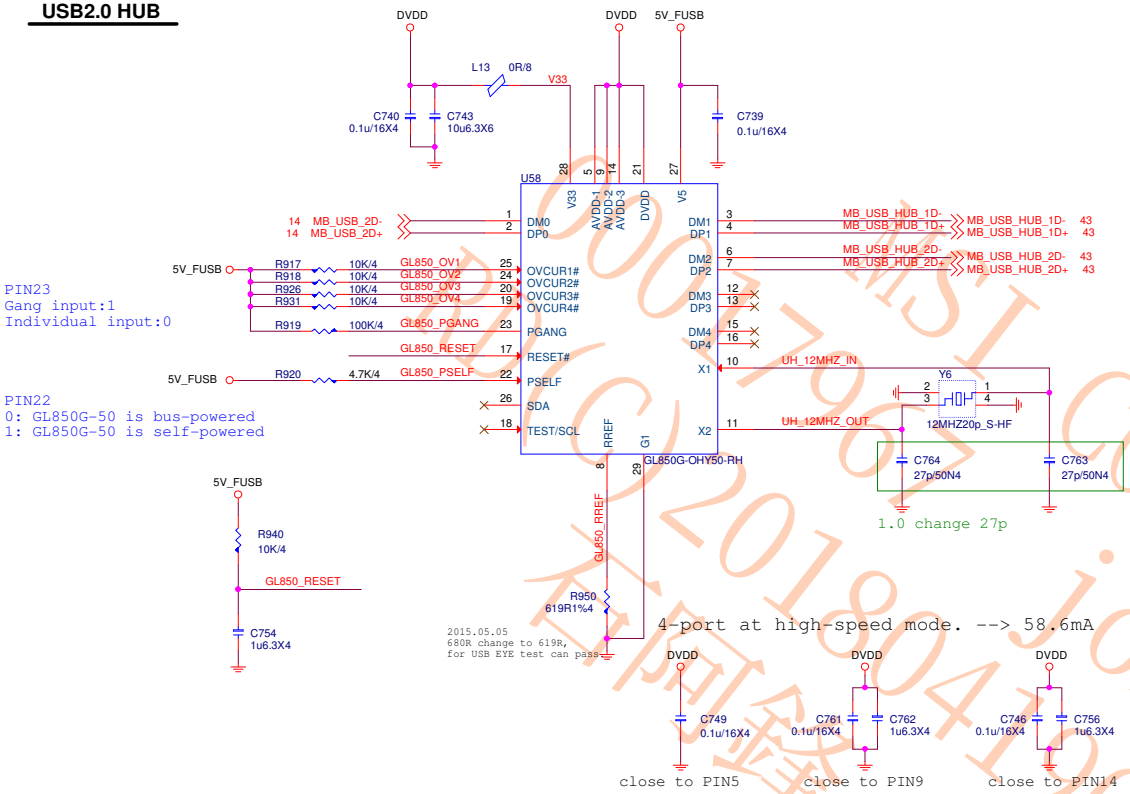
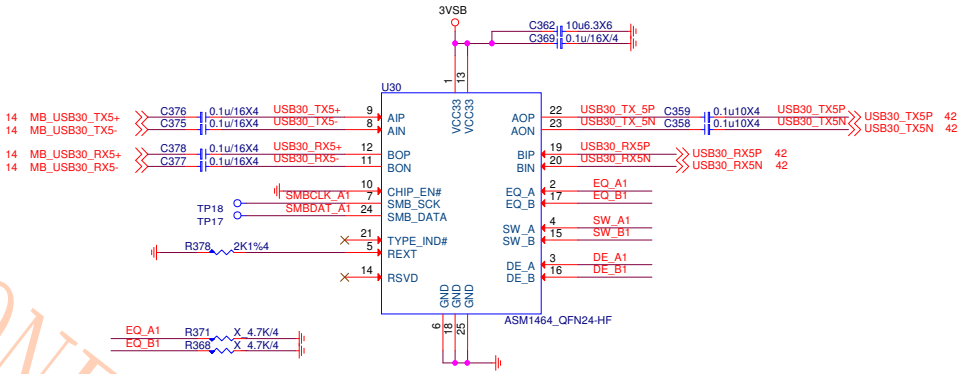
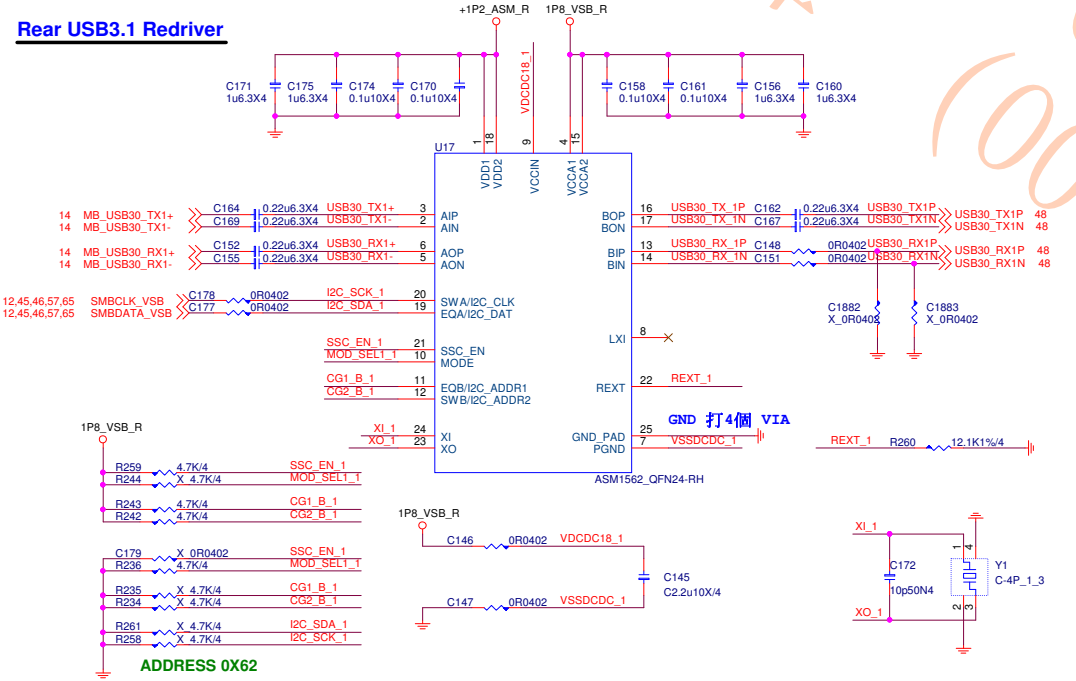
USB2.0 HUB



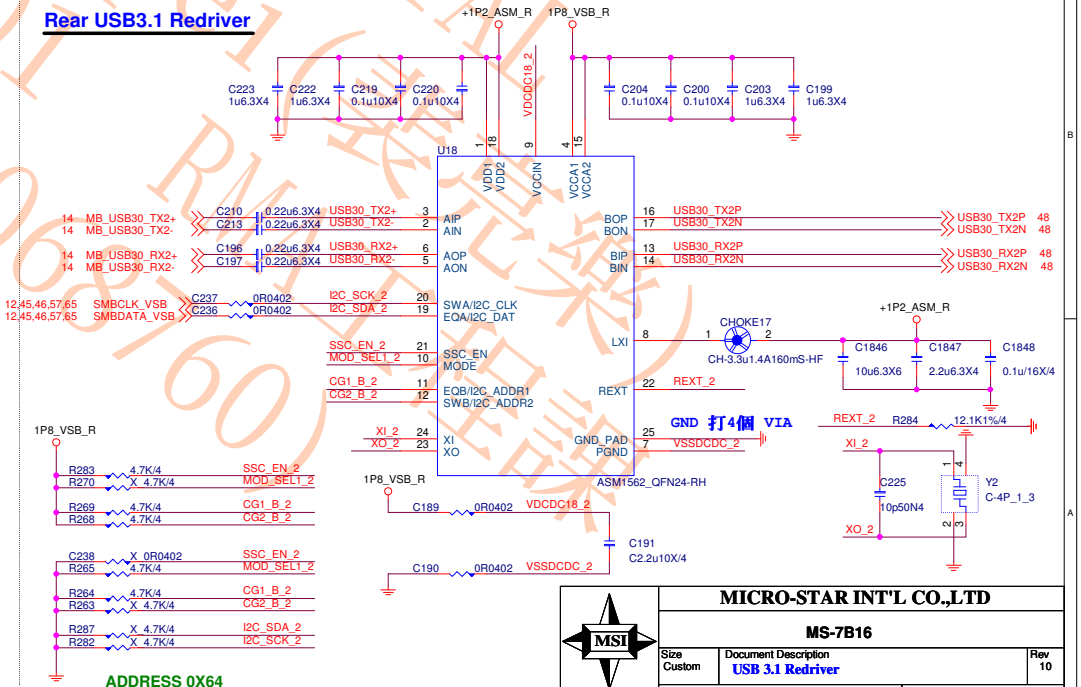
Rear USB3.1 Redriver



Rear USB3.1 Redriver



Rear USB3.1 Redriver



MSI	MICRO-STAR INT'L CO.,LTD	
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LAN USB2.0 &3.0

1.8A

42 SSD2P
42 SSD2N
42 SSD1P
42 SSD1N
42 SSTX2+
42 SSTX2-
42 SSRX2P
42 SSRX2N
42 SSRX1P
42 SSRX1N
42 SSTX1+
42 SSTX1-

D14
ESD-AOZ8829DI-03-HF
NEAR CONNECTOR

LAN_USB1A
UP
DOWN
RJ45_USBX2_LEDX2-1000-RH-10

5V_RUSB_3
C345 1u6.3X4
C352 0.1u/16X4
EC31 560u6.3V
C347 22u6.3X6

3VSB
R2077 10K1%4
R2078 10K1%4
Q162 2N7002D
OC# signal connect to SB OC pin.
OC#0 14,43

14 MB_USB_3D+
14 MB_USB_3D-
L1 4P2R-0R/4
MB_USB_3D+_R
MB_USB_3D-_R

14 MB_USB_4D+
14 MB_USB_4D-
L2 4P2R-0R/4
MB_USB_4D+_R
MB_USB_4D-_R

3VSB
C1859 0.1u/16X4
D5 ESD-AOZ8902CIL-HF
NEAR CONNECTOR

5V_RUSB_1
PS2_USB1B
MINIDIN_USBX2-RH-6
C40 1u6.3X4
C38 0.1u/16X4
EC3 560u6.3V
R40 10K1%4
R41 15K1%4
PORT7.8
14 OC#1

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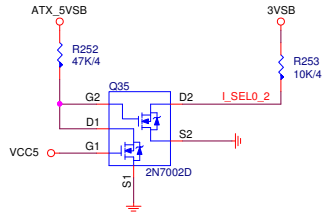
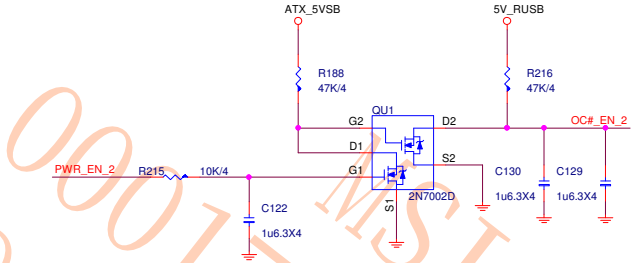
Current Mode

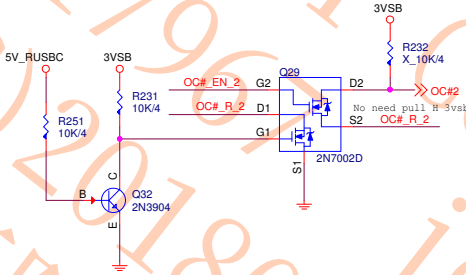


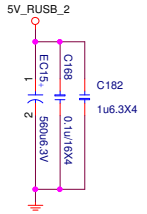
0	X	Default for 900mA
1	0	1.5A @5V
1	1	3A @5V

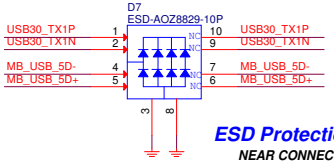
1.5A under S3 mode
3A under S0 mode

VBUS OC#

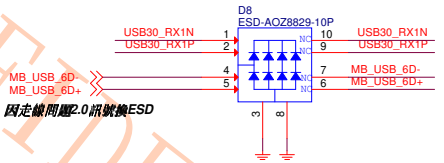


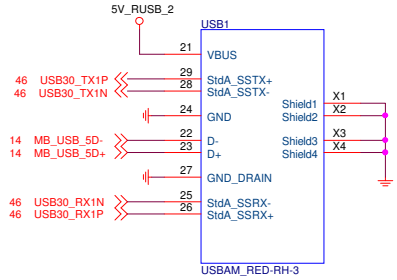


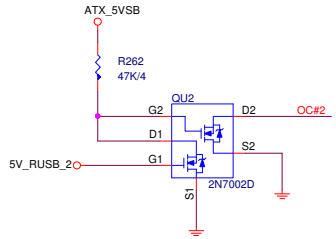




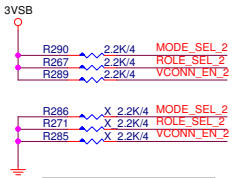
ESD Protection
NEAR CONNECTOR







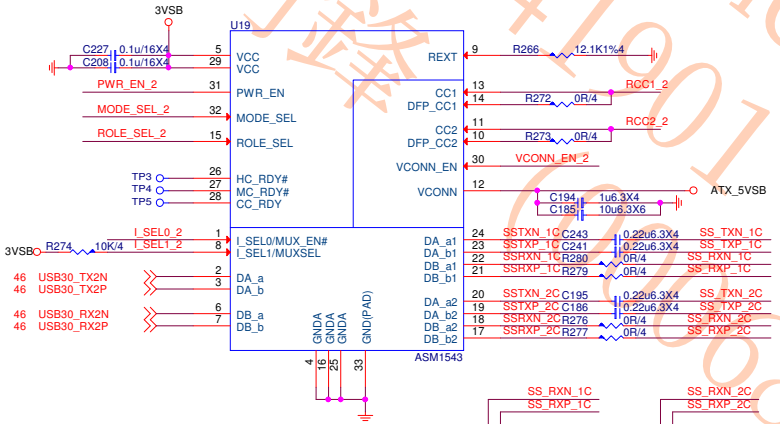
USB Type-C MUX with Configuration Channel (CC)

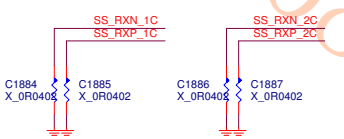


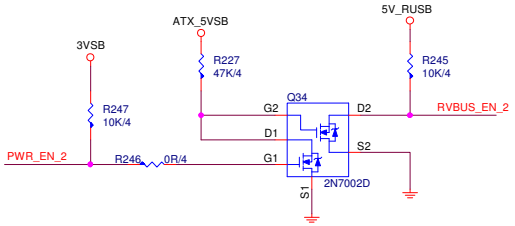
MODE_SEL	
1	CCL MODE (default)
0	Mux MODE

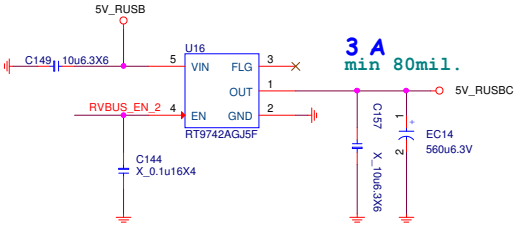
ROLE_SEL	
1	DFP role (default)
0	UFP role

VCONN_EN	
1	enable
0	disable



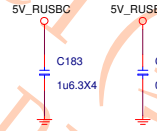


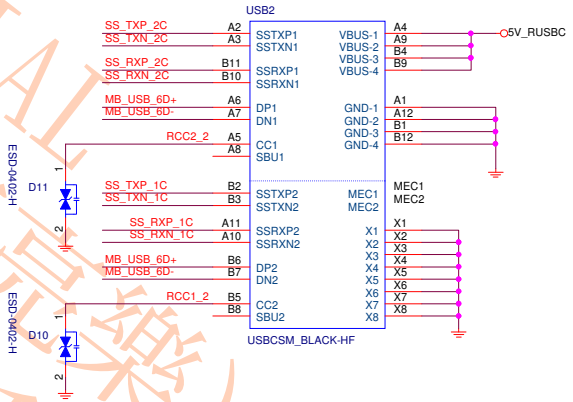


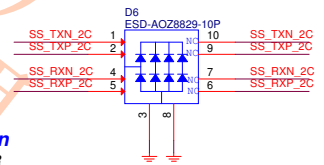


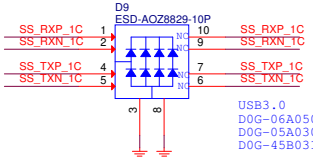
TYPE-C

close to Type C Connector









ESD Protection
NEAR CONNECTOR

USB3.0
D0G-06A050C-A68 Main
D0G-05A0300-I14 AVL
D0G-45B031C-O05 AVL

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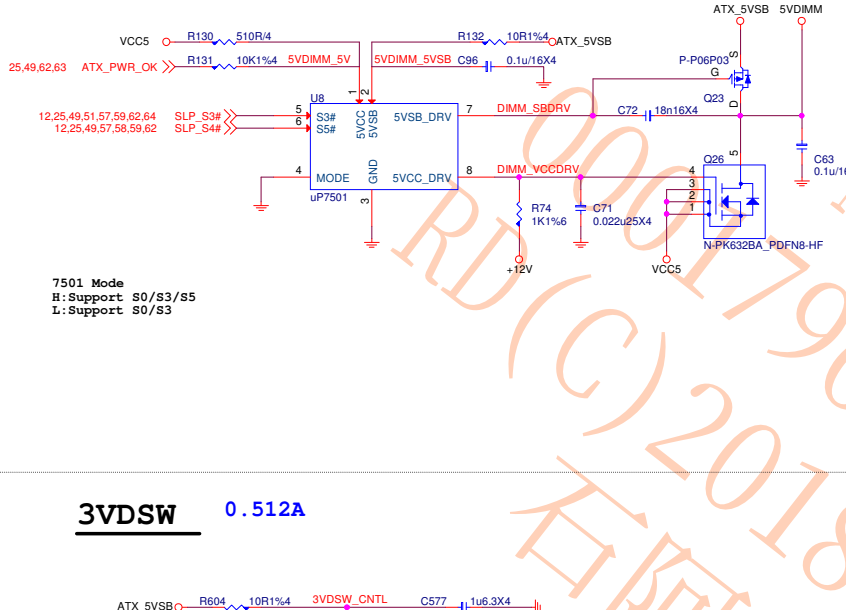
5VDIMM FOR DDR

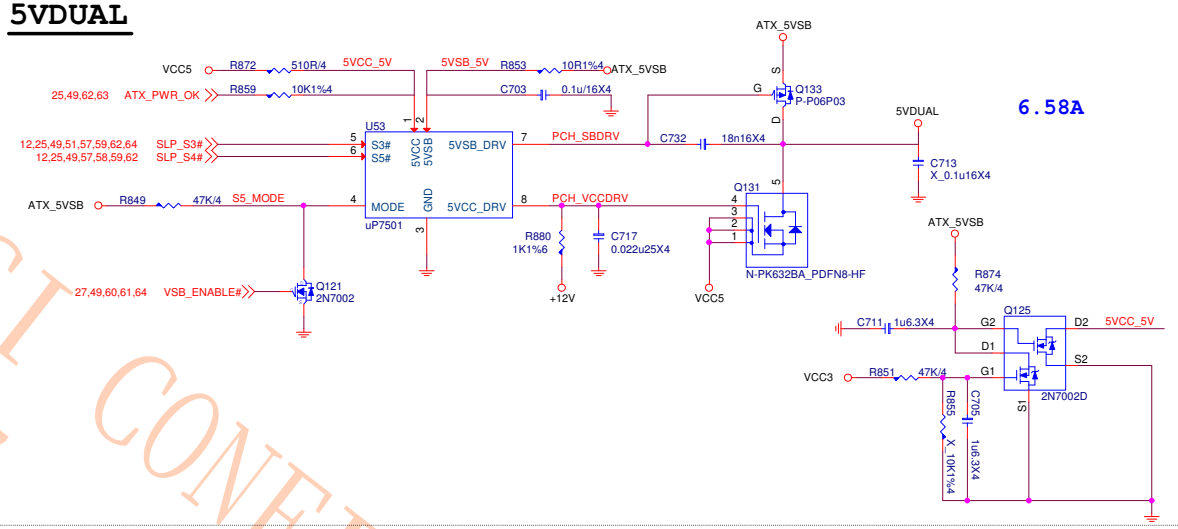
4.8A



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

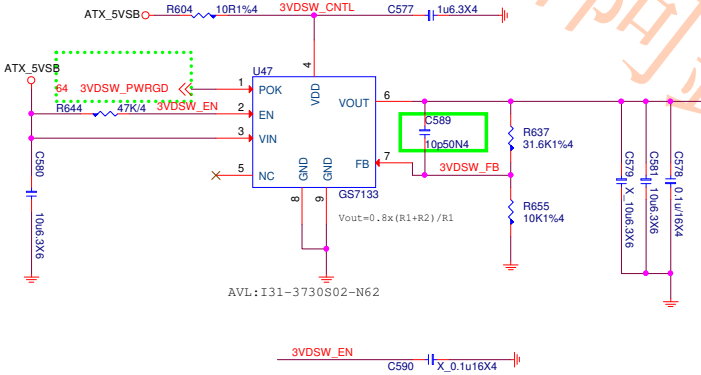
5VDUAL

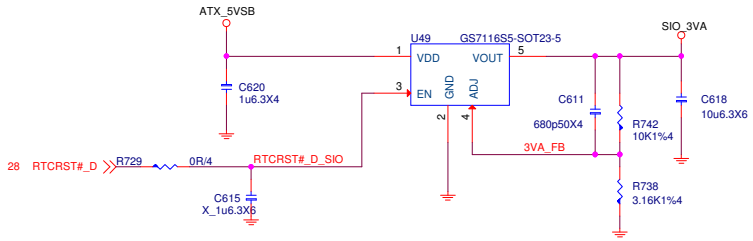
6.58A



3VDSW

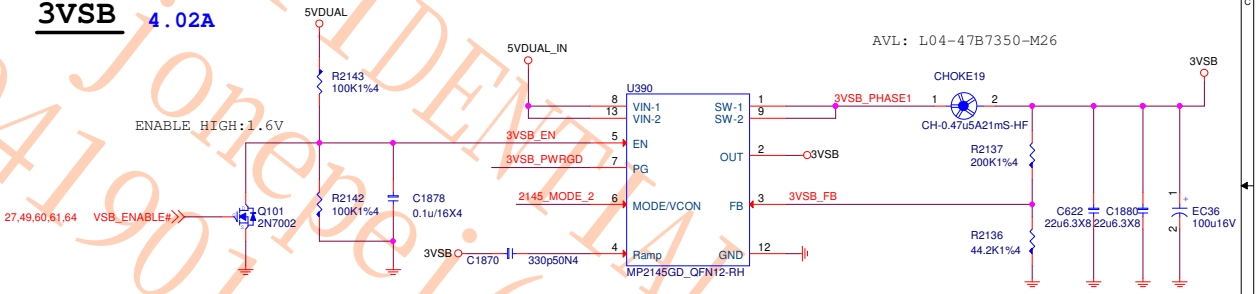
0.512A

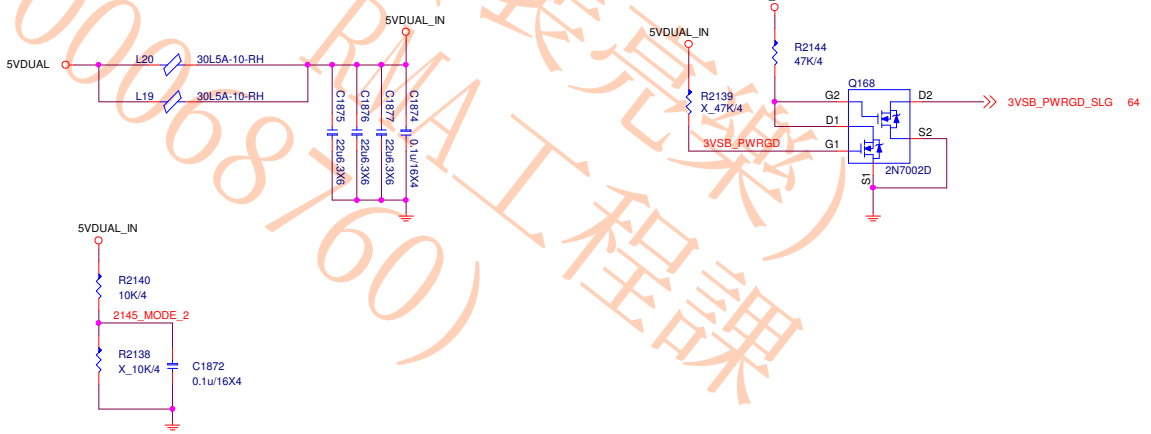




3VSB

4.02A





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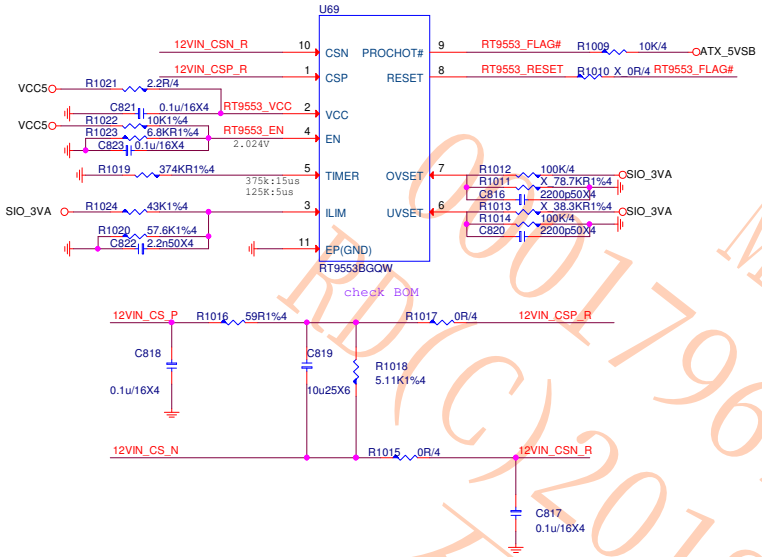
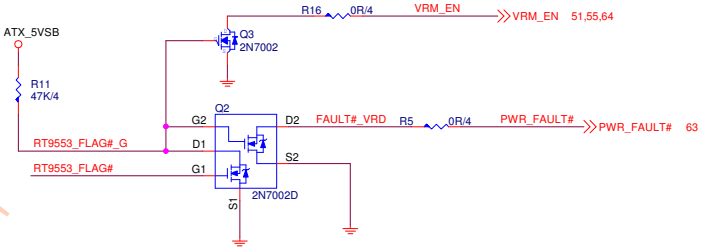
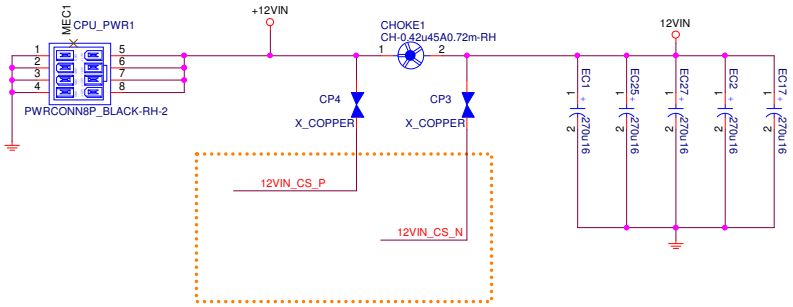
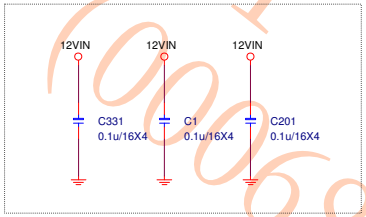




OCP:30A
Real OCP:30.05A
R17+R18>100k Vsio_3va= 3.38V Rdcr= 0.5 mohm

I3933_imon*[R17*R18/(R17+R18)]= Istep* Rdcr*100
I3933_imon= 10uA/step
Istep=4.968A





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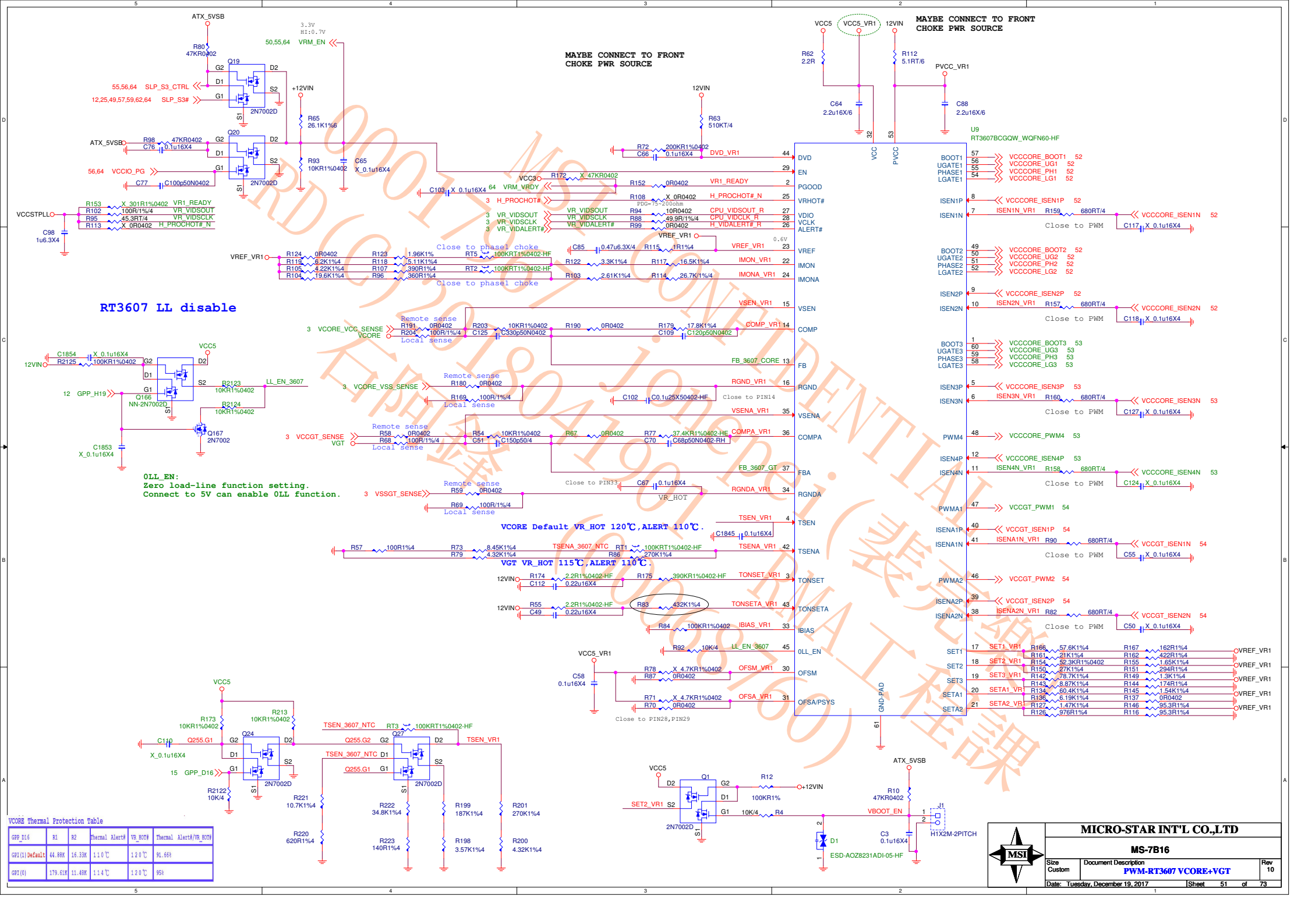
MAYBE CONNECT TO FRONT CHOKE PWR SOURCE
MAYBE CONNECT TO FRONT CHOKE PWR SOURCE
RT3607 LL disable
0LL_EN:
Zero load-line function setting.
Connect to 5V can enable 0LL function.
VCORE Default VR_HOT 120℃,ALERT 110℃.
VGT VR_HOT 115℃,ALERT 110℃.
VCORE Thermal Protection Table
MICRO-STAR INT'L CO.,LTD
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PWM-RT3607 VCORE+VGT
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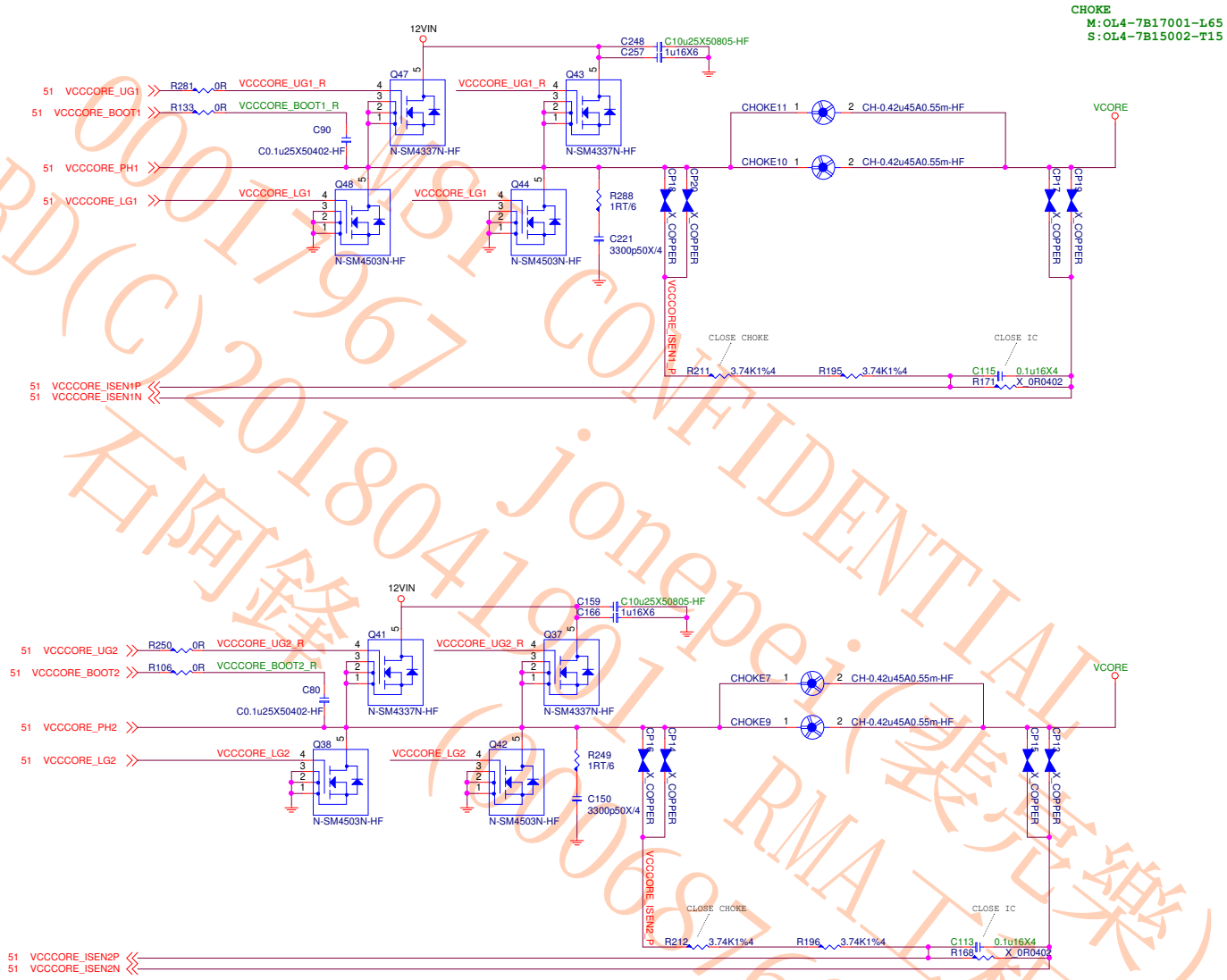

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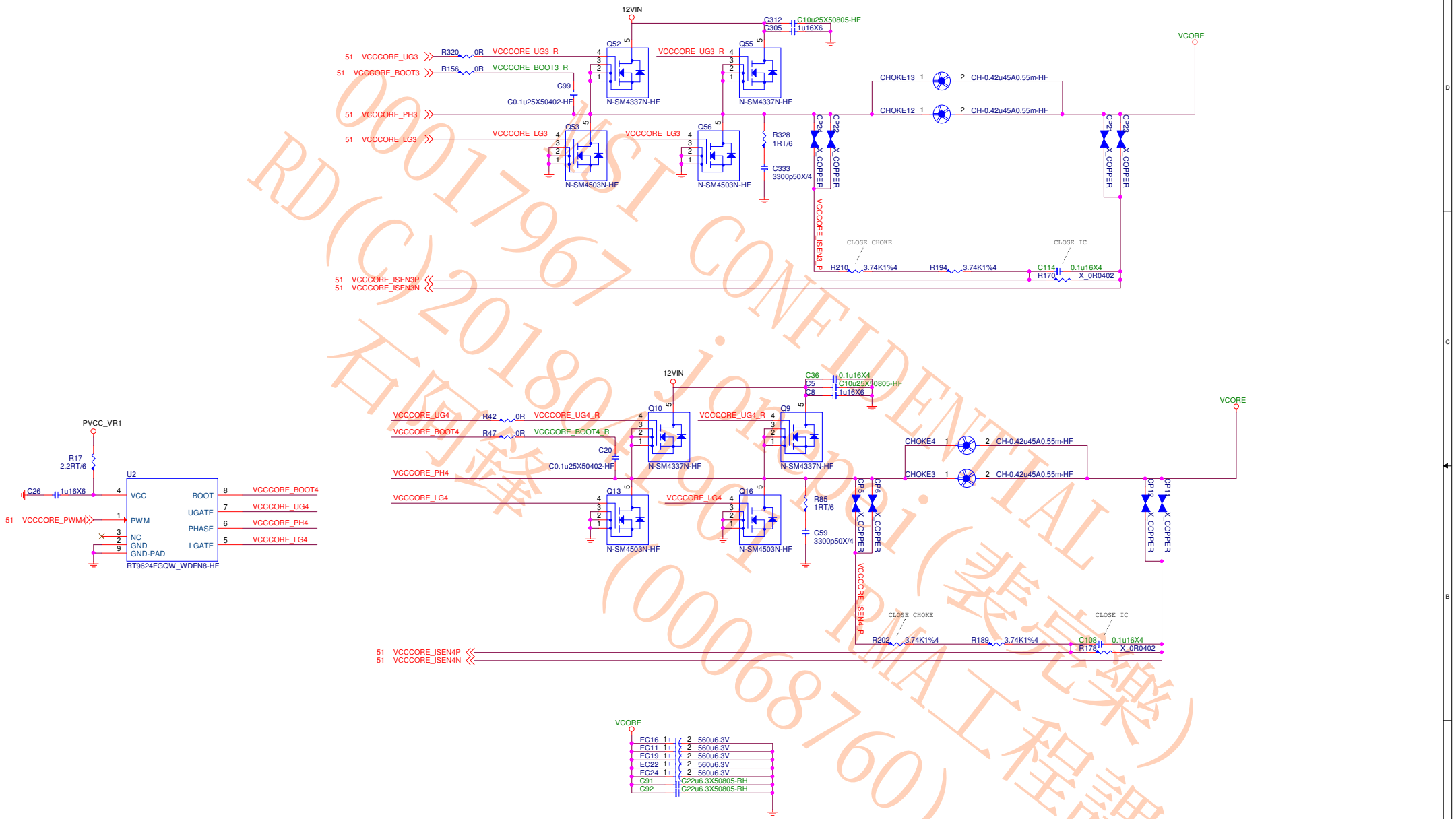

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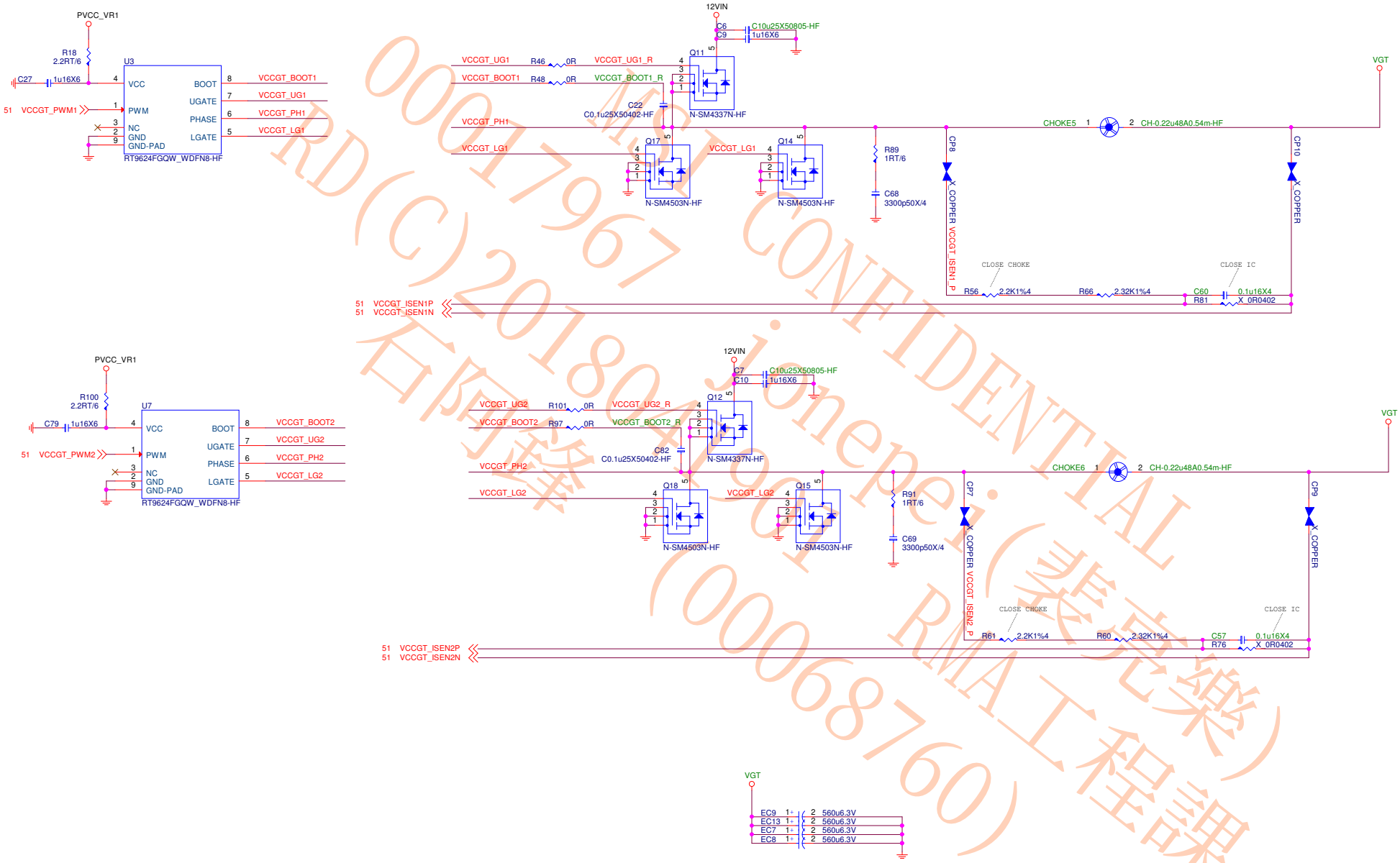
OCP = 75A
95W
ICCMAX=45A
Irms = 9.7857A



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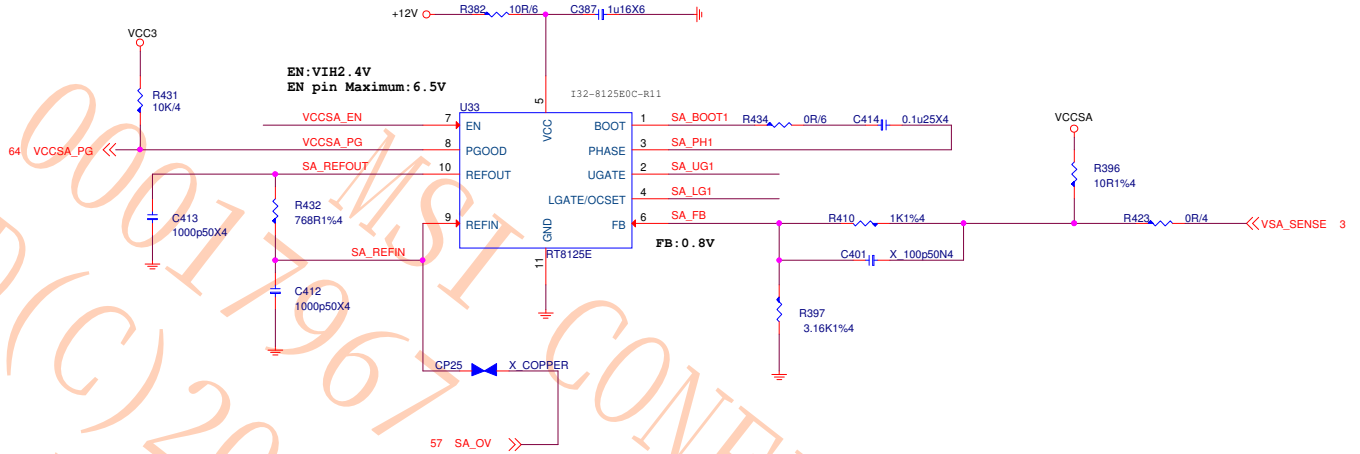
SA Power:1.05V,11.1A

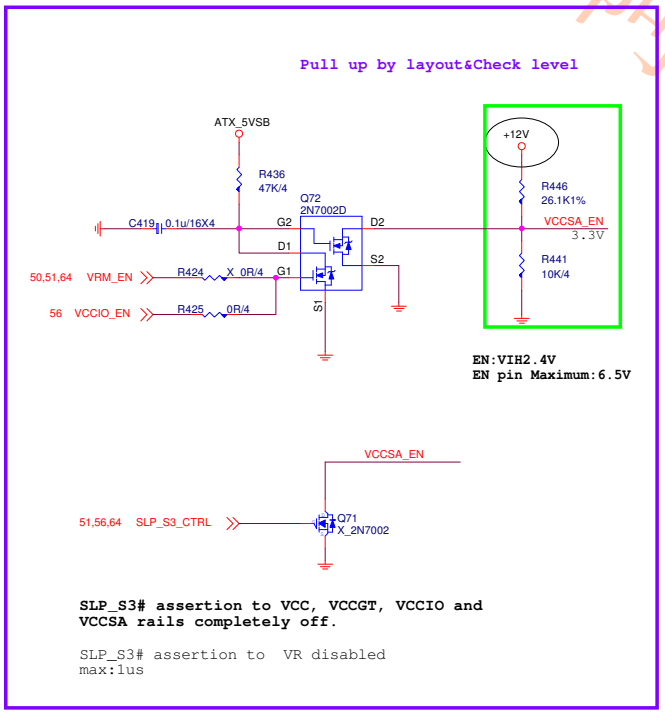
*OCP =11.1A*1.4=15.54A*
*Rocs(R417)=OCP*Rdson(Low side)3.4mohm]/10uA*
=15.54(3.4)mohm/10uA*
=5.2836Kohm

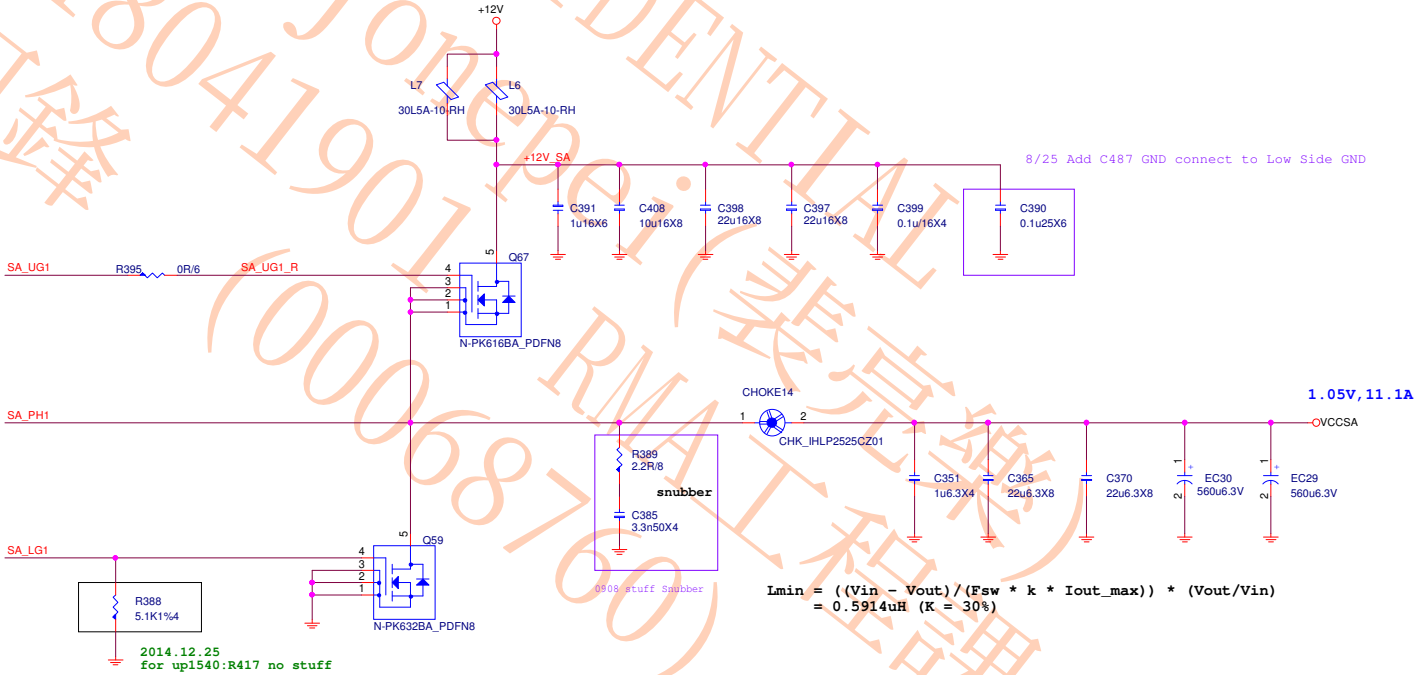
Rocs:5.2836K,OCP:
D03-4C05N03-O05 : 15.76A
D03-632BA0C-N03 : 16.24A
use UBIQ MOS need Check

Rdson(low)10V

D03-4C05N03-O05 : 3.4mohm
D03-632BA0C-N03 : 3.3mohm
D03-3056M00-U47 : 4.2mohm







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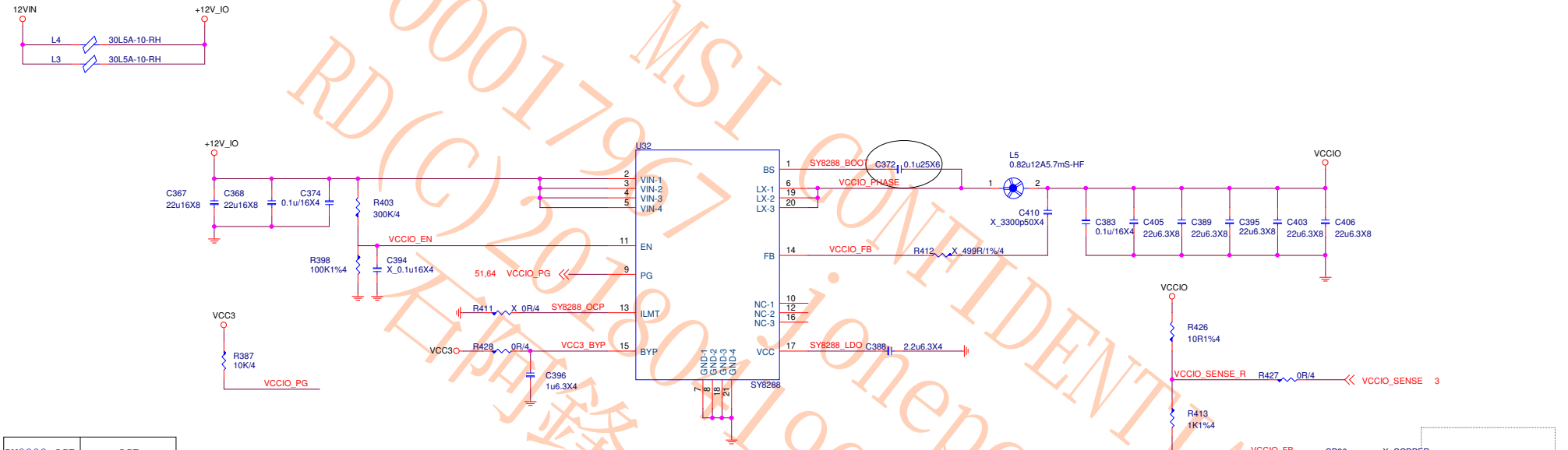
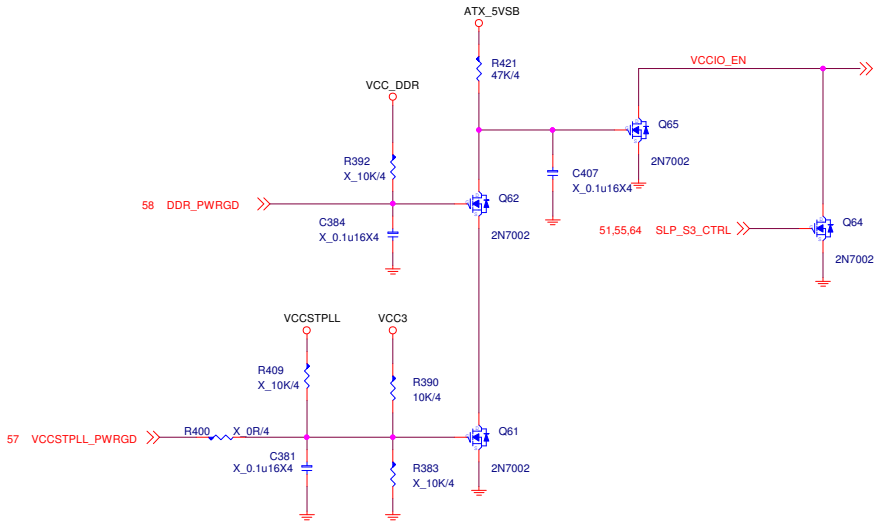
IO Power:0.95V,6.4A

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



SY8288_OCP	OCP
0	8A
floating	12A
1	16A



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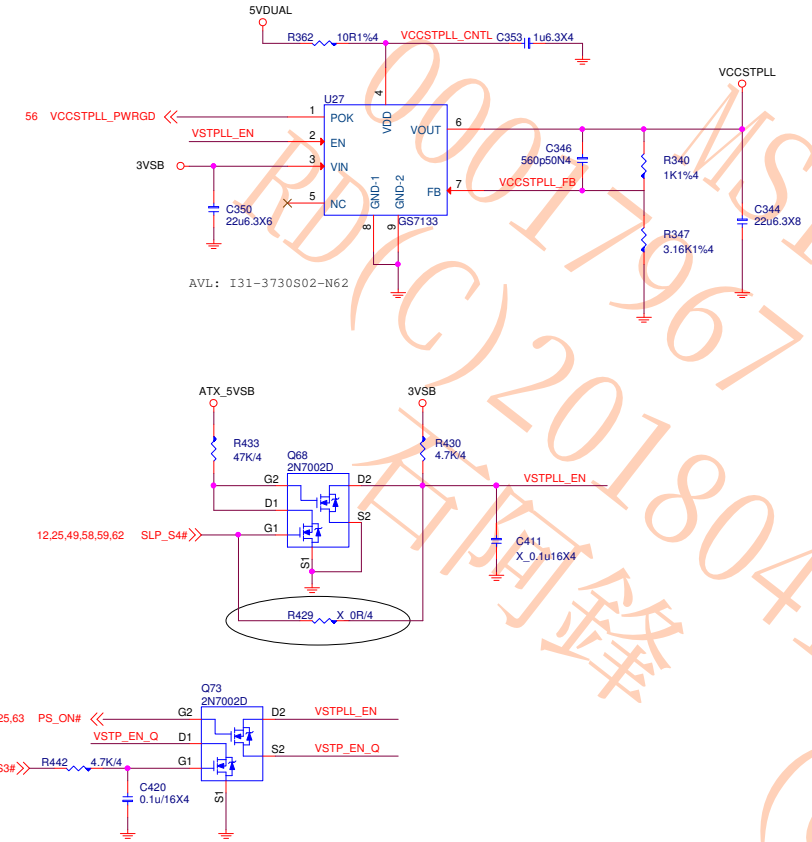
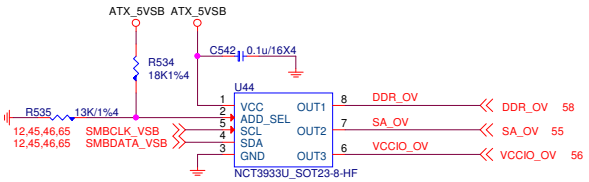
VCCSTPLL

1.05V; 230mA



VOLTAGE CONSOLE

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



VCCPLL_OC

1.2V; 130mA

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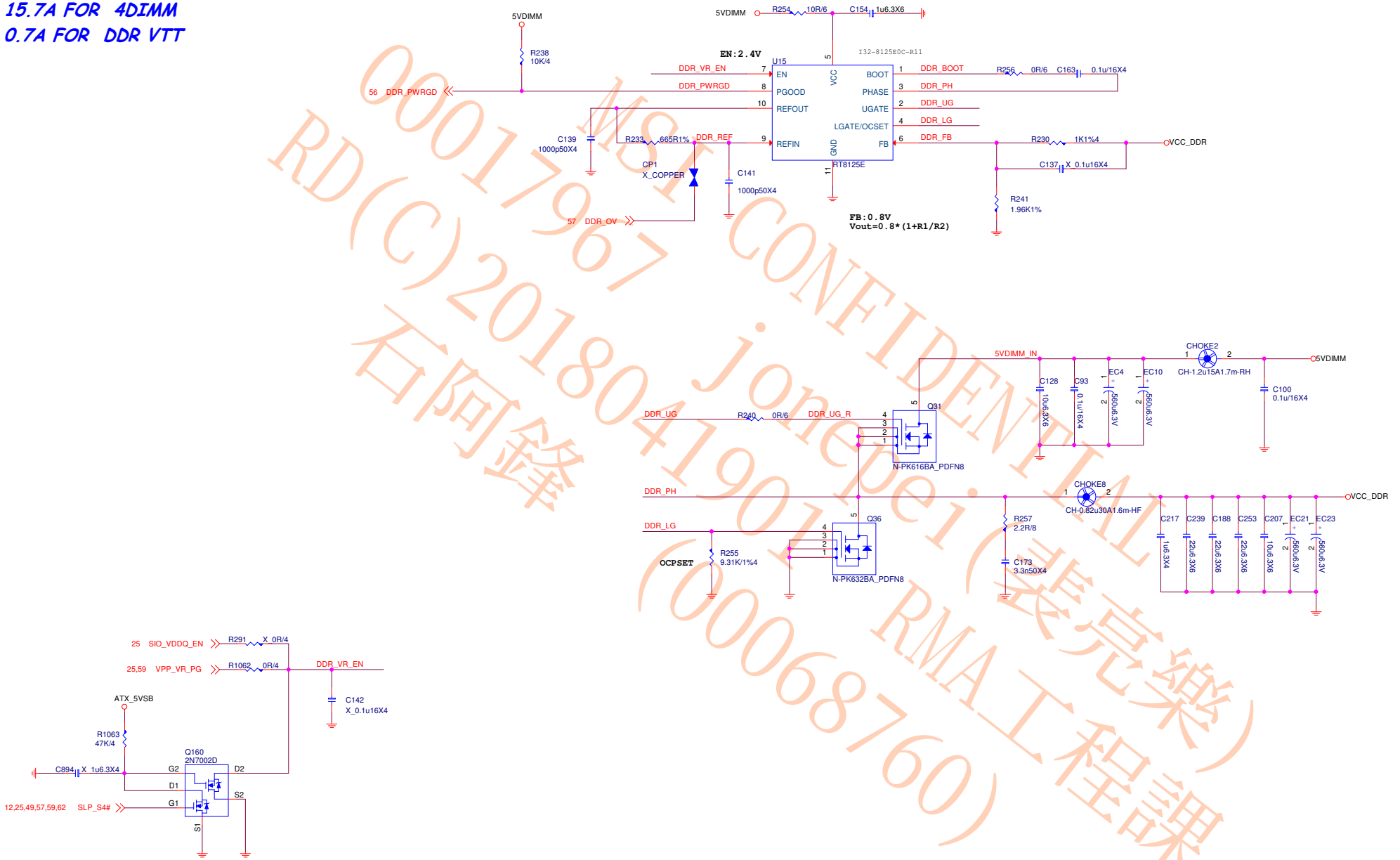
DDR4 Power:1.2V,19.8A *OCP:28A*

3.3A FOR CPU
15.7A FOR 4DIMM
0.7A FOR DDR VTT



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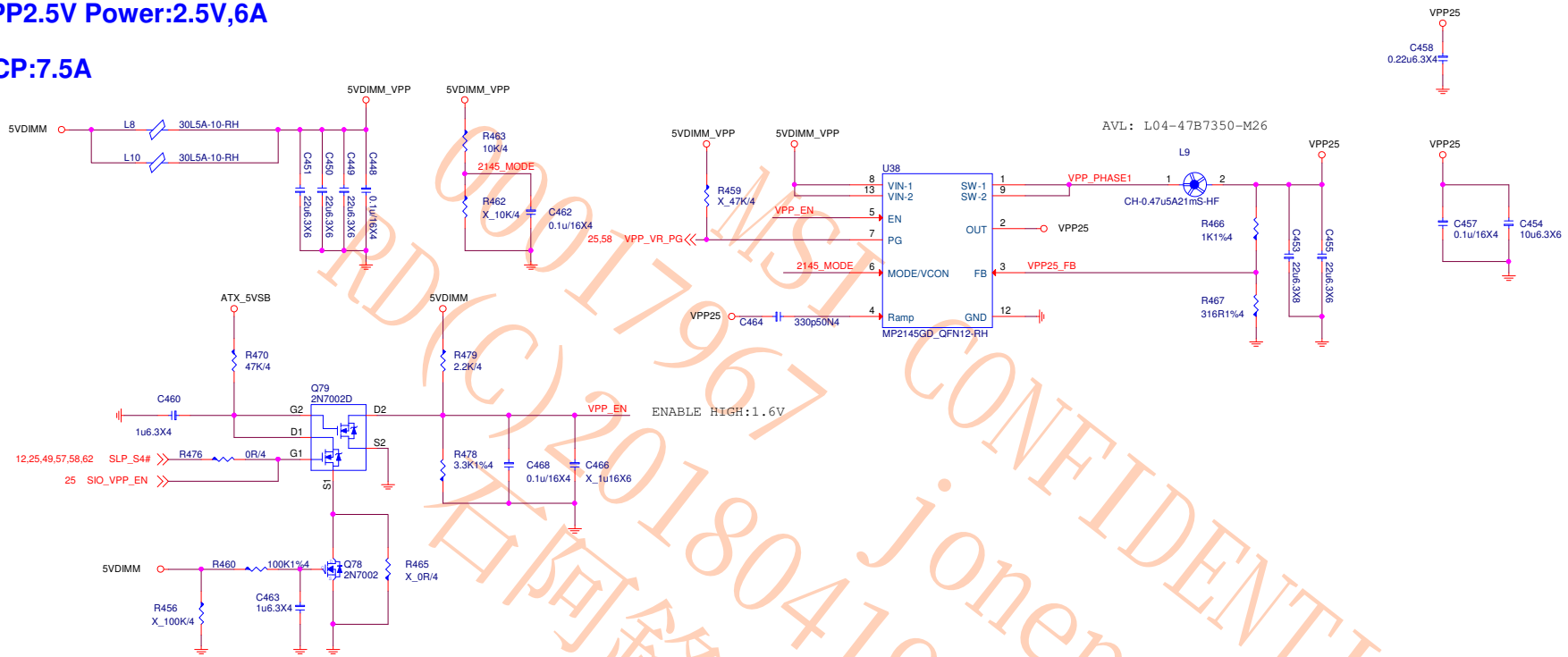
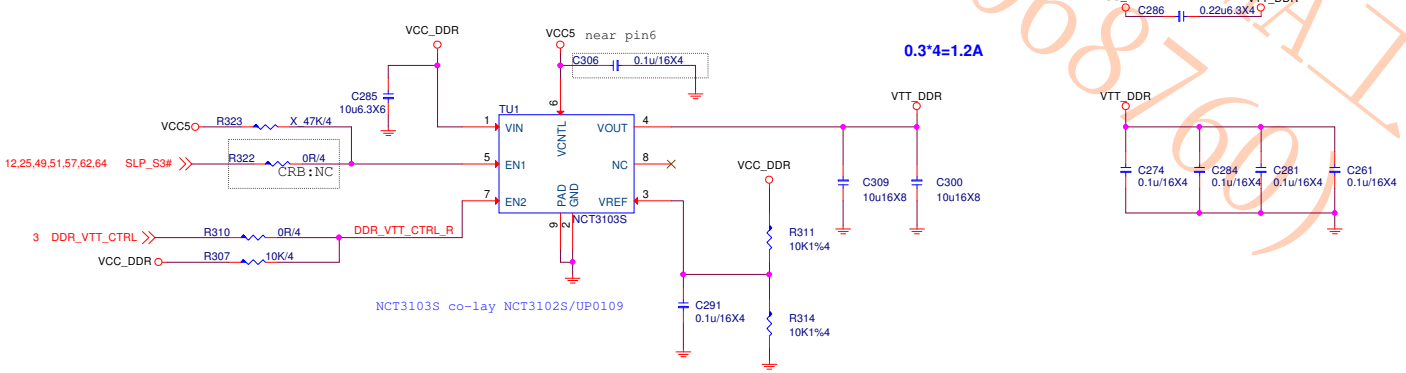
VPP2.5V Power:2.5V,6A

OCP:7.5A



DDR VTT Power

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



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PCH_1VSB Power:1.05V,14A

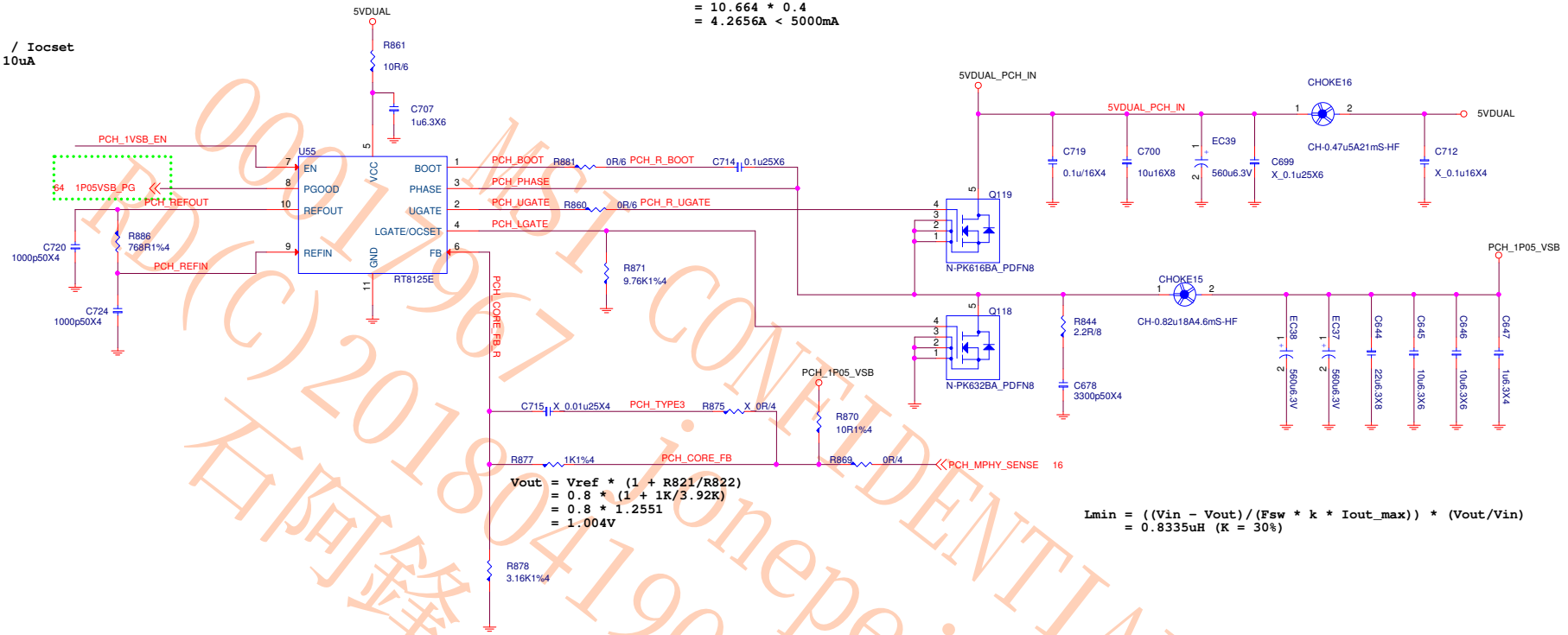
OCP = 19.6A

```
Rocset = 1.5 * Imax * Rdson(low) / Iocset
       = 1.5 * 19.6 * 3.3mohm / 10uA
       = 9.7K
```

Rdson(low)

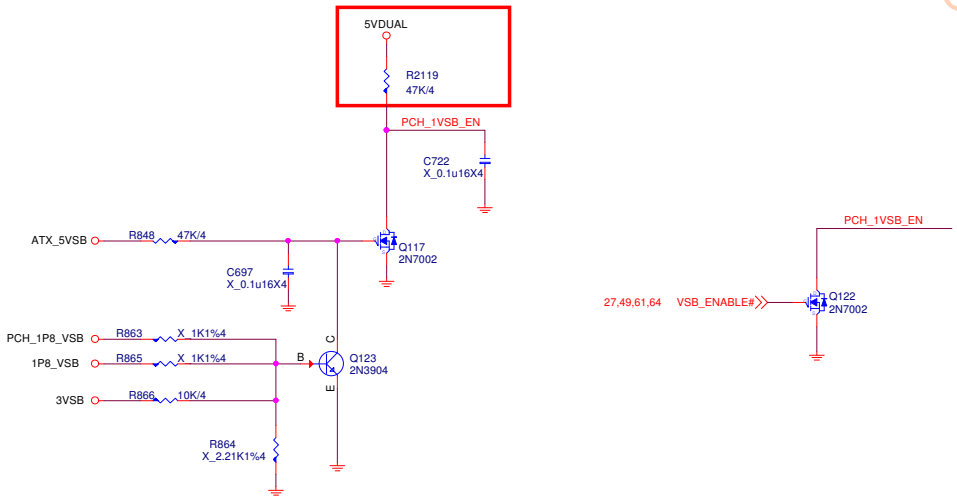
D03-4C05N03-005 : 3.4mohm
D03-632BA0C-N03 : 3.3mohm
D03-3056M00-U47 : 4.2mohm

```
Irms = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
     = 10.664 * 0.4
     = 4.2656A < 5000mA
```




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

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



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Size: Custom	Document Description: PCH POWER-RT8125E	Rev: 10
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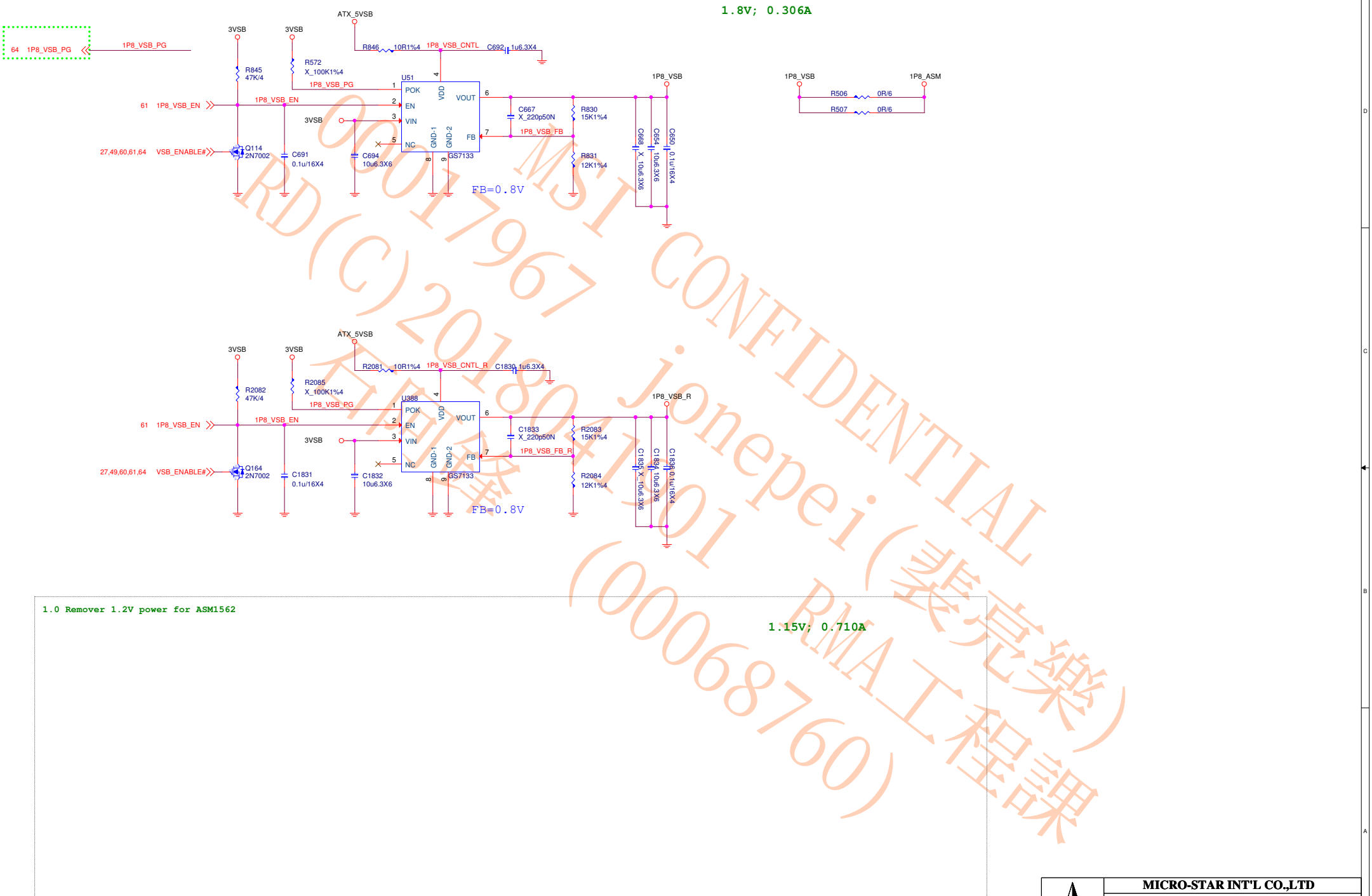

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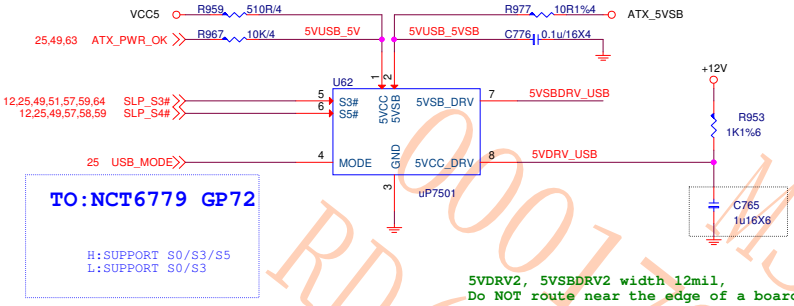
USB POWER

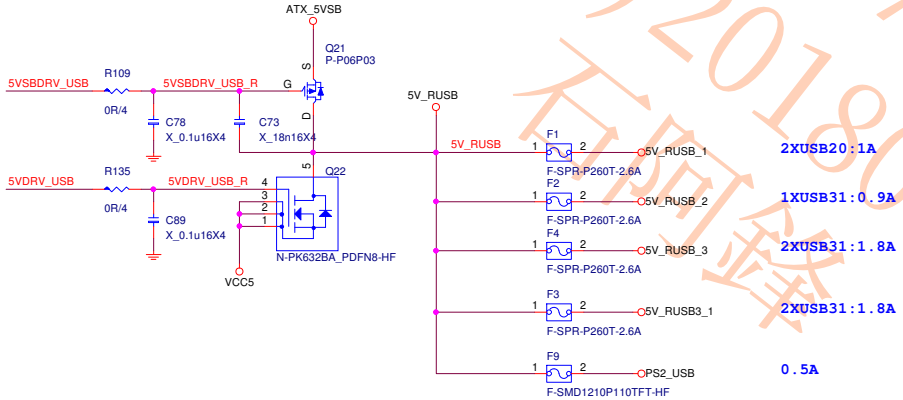


5VDRV2, 5VSBDRV2 width 12mil,
Do NOT route near the edge of a board.

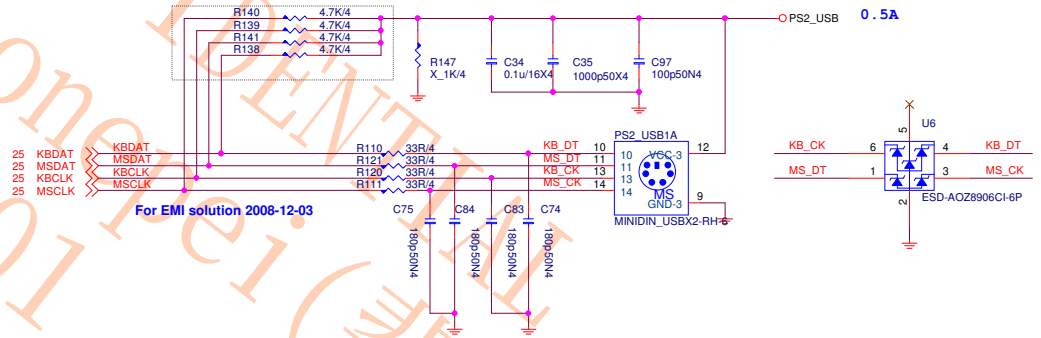
PS2 POWER

USB MODE

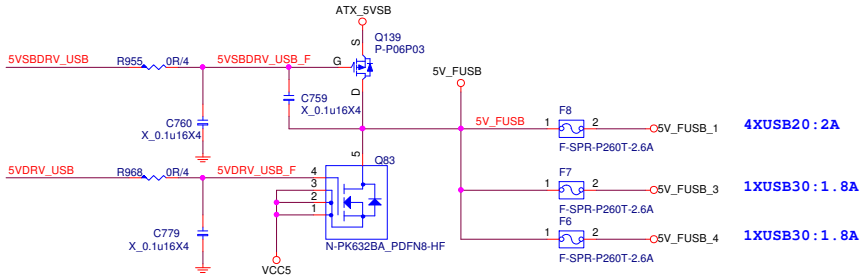
REAR USB PORT POWER



PS2 KEYBOARD & MOUSE CONNECTOR



FRONT USB PORT POWER



MICRO-STAR INT'L CO.,LTD

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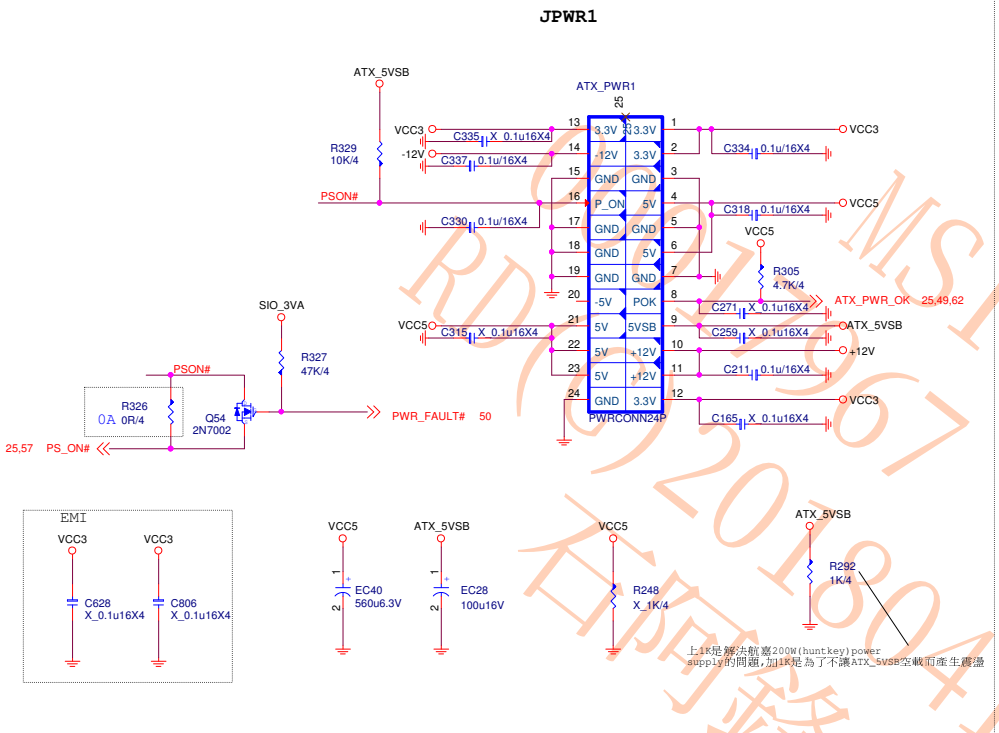
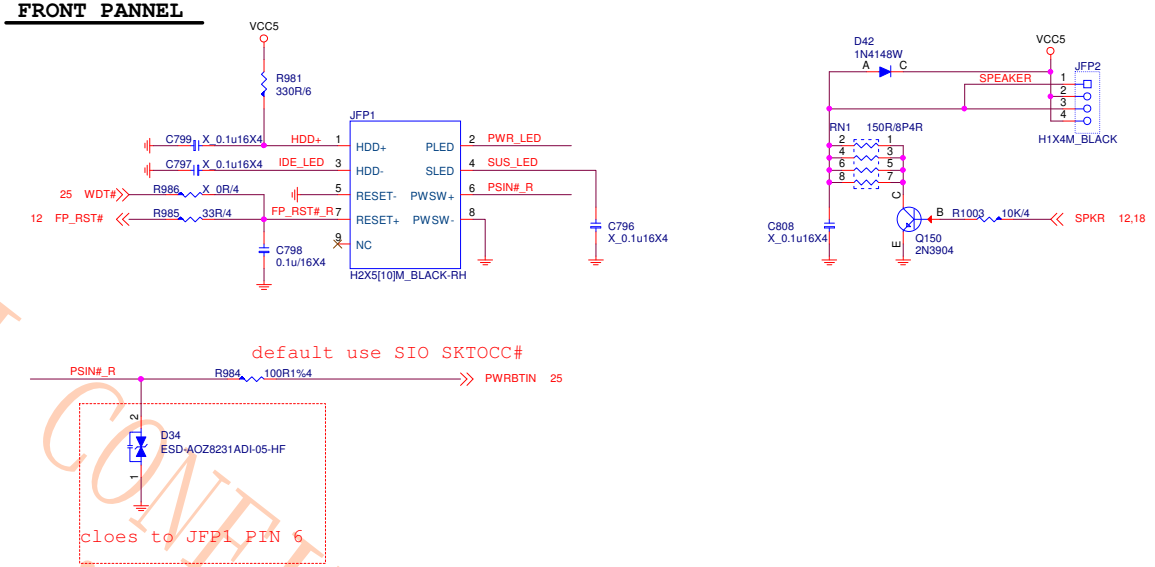
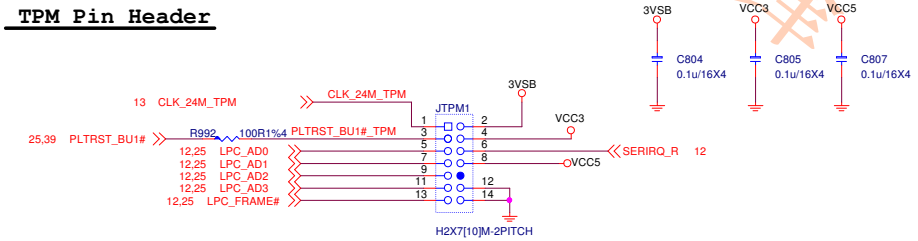
ATX POWER CONNECTOR



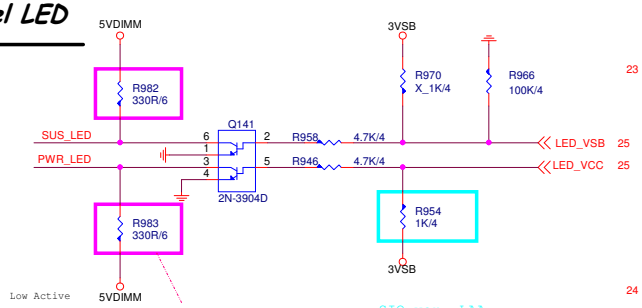
FRONT PANNEL

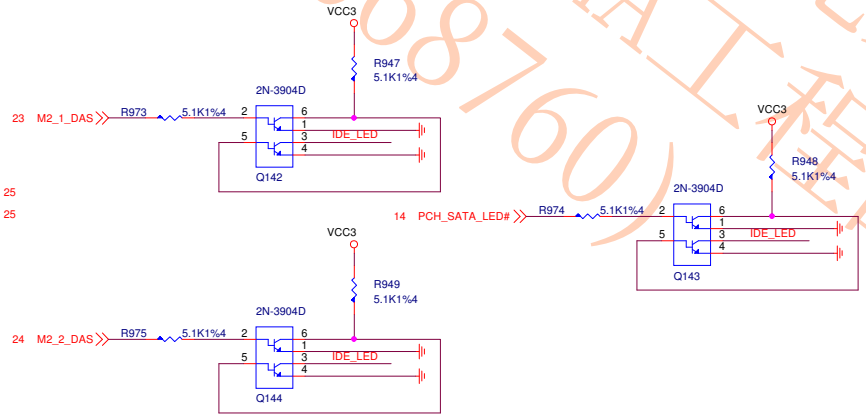


TPM Pin Header

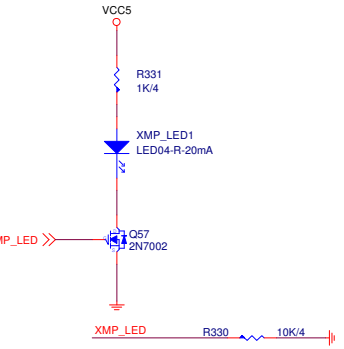


Front Panel LED





XMP LED



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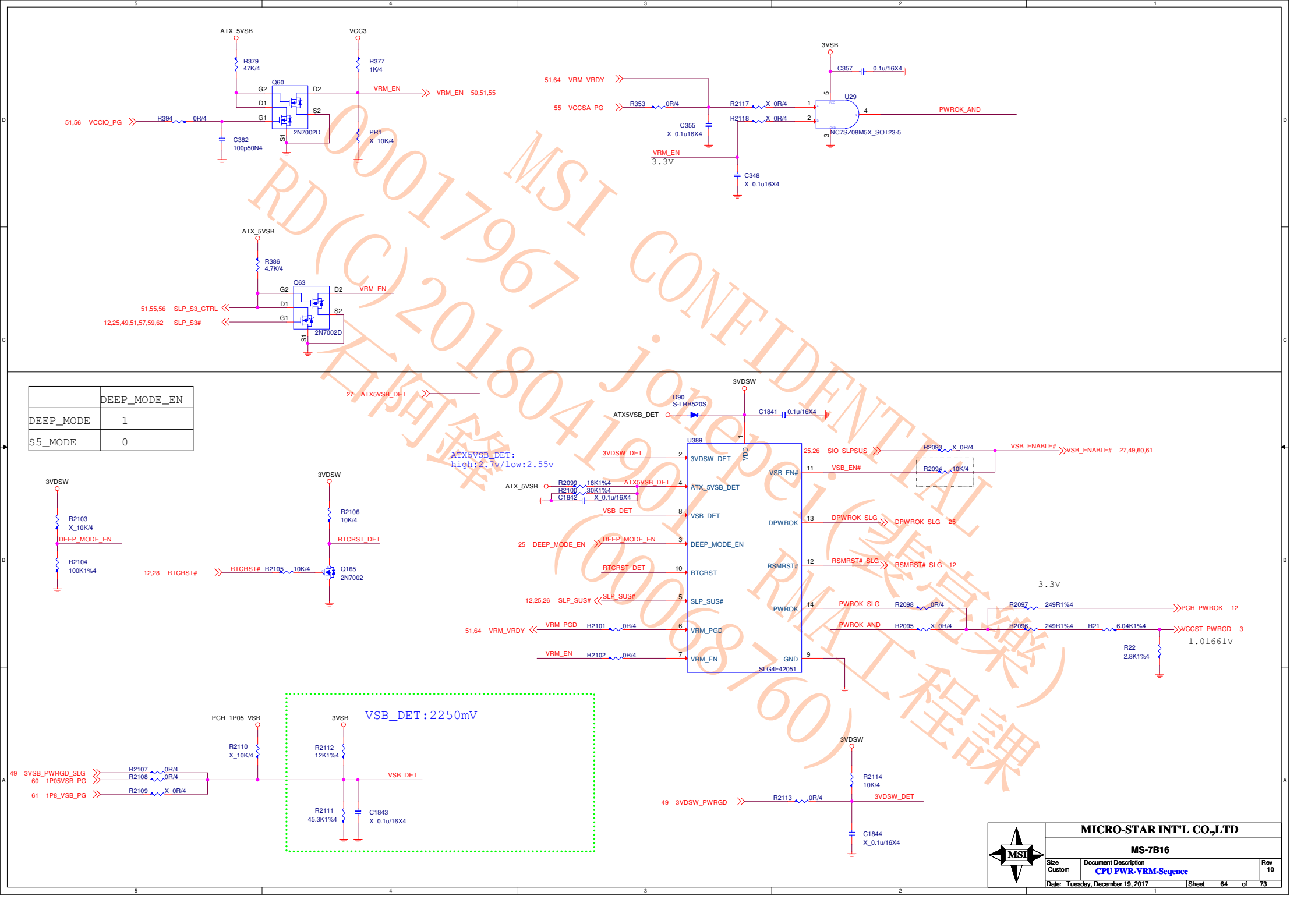

	DEEP_MODE_EN
DEEP_MODE	1
S5_MODE	0

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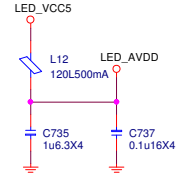
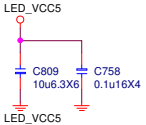
LED MCU

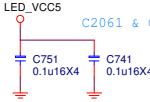
C1811 & C1812 near AVDD Pin.



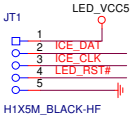
C930 & C931 near VDD Pin.

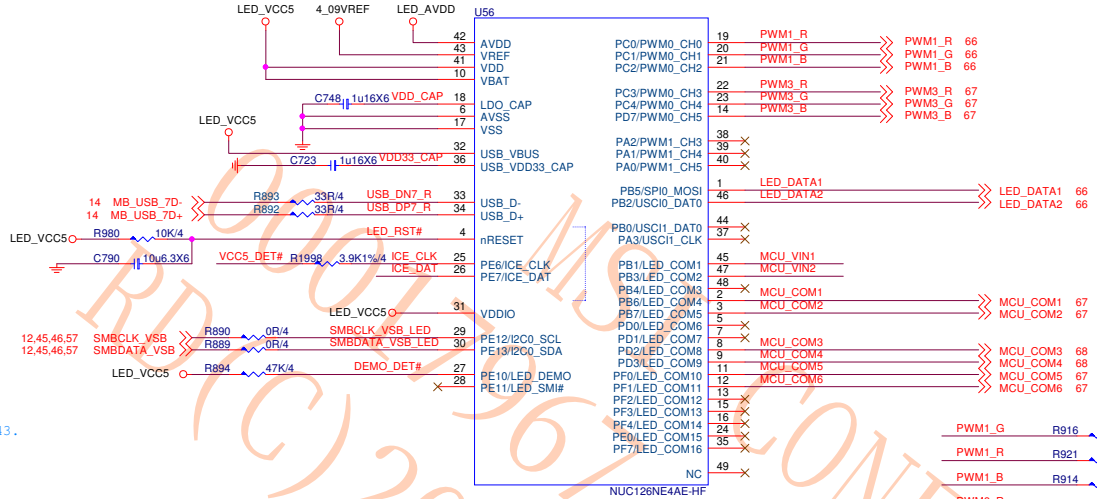


C2061 & C2062 near Pin 10 & 43.

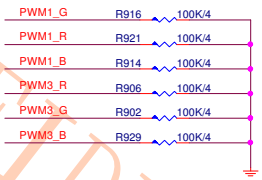


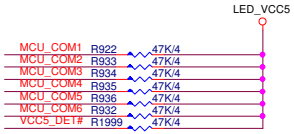
For FW update.



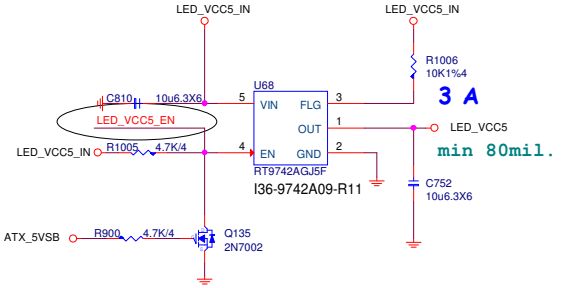


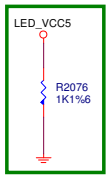
Control	Net Name	PWM USE
PCH	LED_GPIO	PWM3
AUDIO Cover	LED_GPIO_01	No Use
MOS/IO cover	LED_GPIO_02	No Use
LED STRIPLINE	RGB_STRIP_OFF#	PWM1
Board Side LED	COM X~8	PWM2
PCIE Side LED	COM 1~X	PWM1

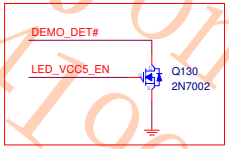




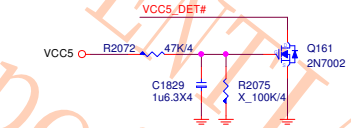
EXTERNAL POWER INPUT

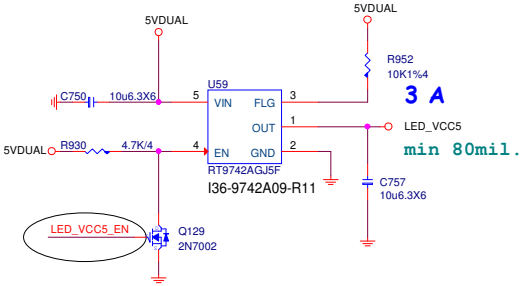






If SPEC hes LED demo function without demo button, DEMO_DET# must pull up to LED_VCC5 and control by LED_VCC5_EN.
PS. R1000 remove, R1457 and Q296 must slodering

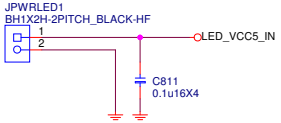




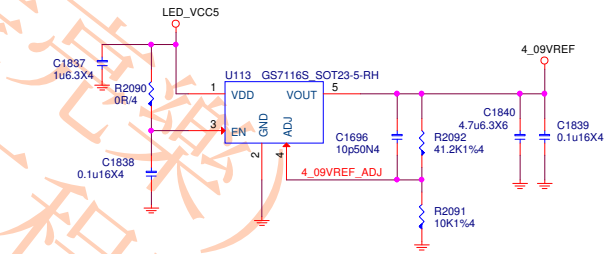
External Power

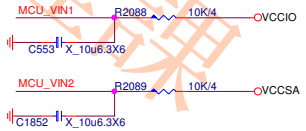
ZA Connector

N32-1020CB1-H06



Voltage HW monitor





Option spec for voltage monitor require.
VDD1,2,3 is example.

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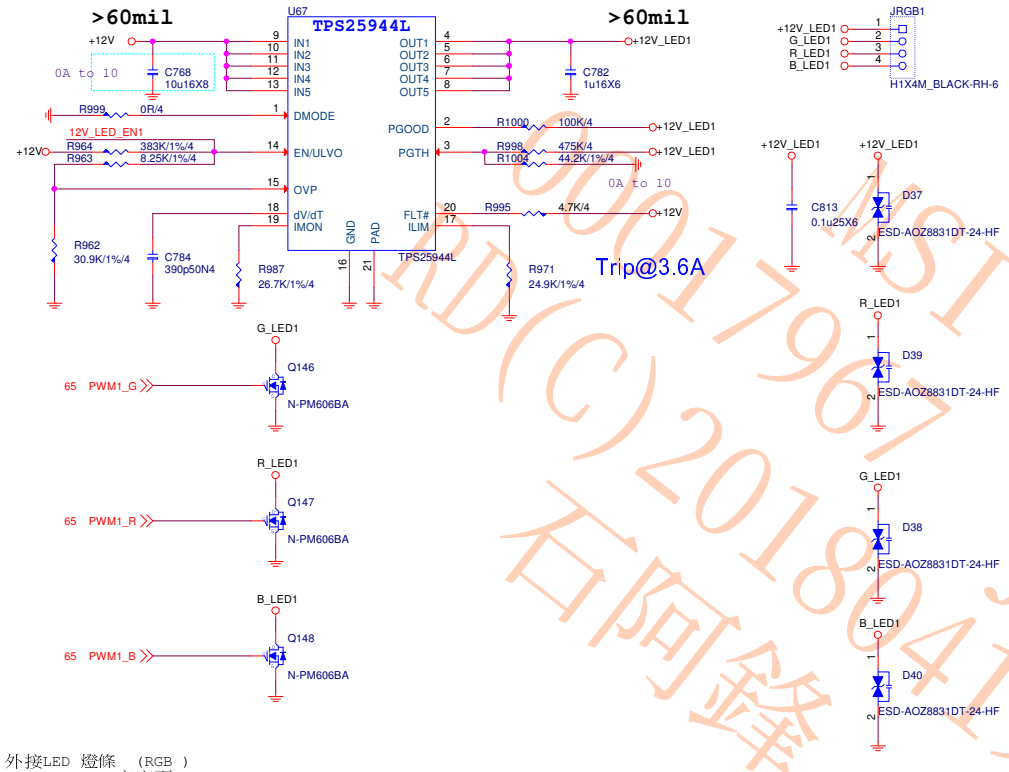
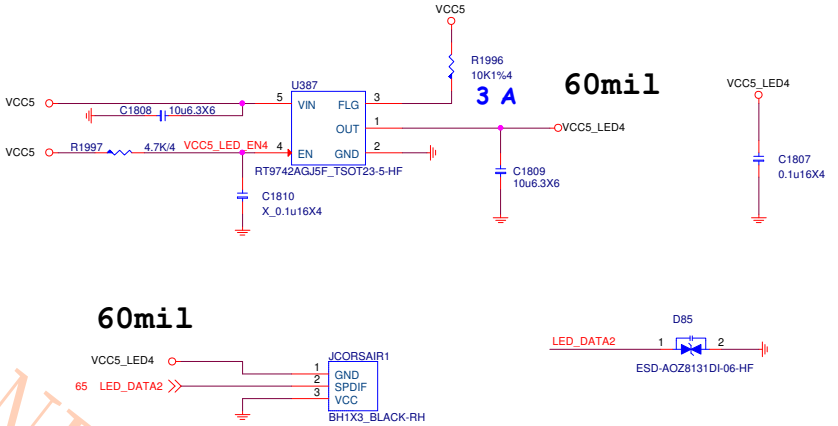
JRGB1

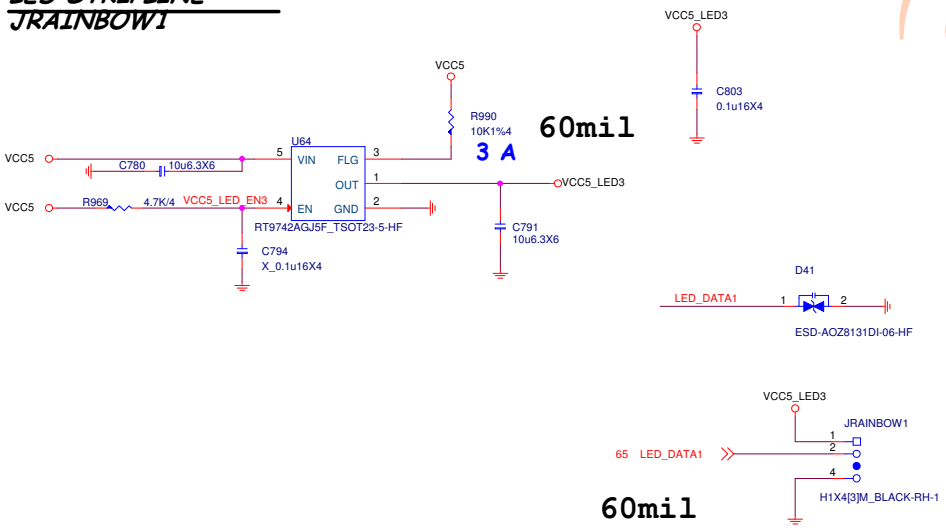


外接LED 燈條 (RGB)
---- PCB 文字面 (JLED1)
---- 手冊 註明 RGB 接頭支援標準 5050 RGB LED 燈條 (12V/G/R/B) , 燈條總輸出電流限制為3安培 (12 伏特) , 長度限制為2公尺

JCORSAIR1



LED STRIPLINE
JRAINBOW1



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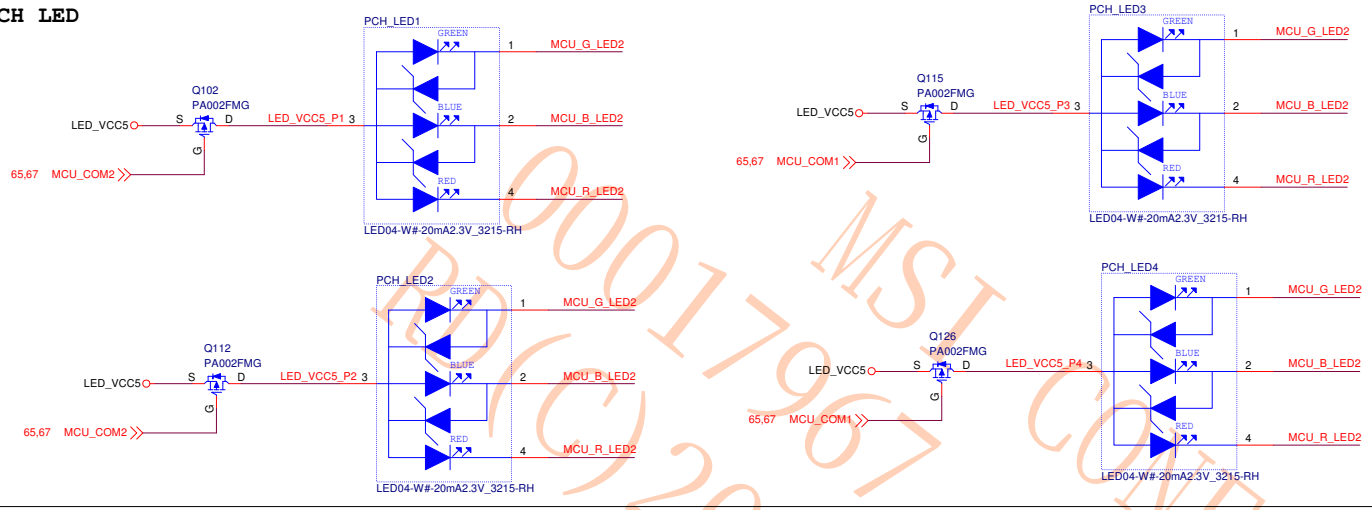
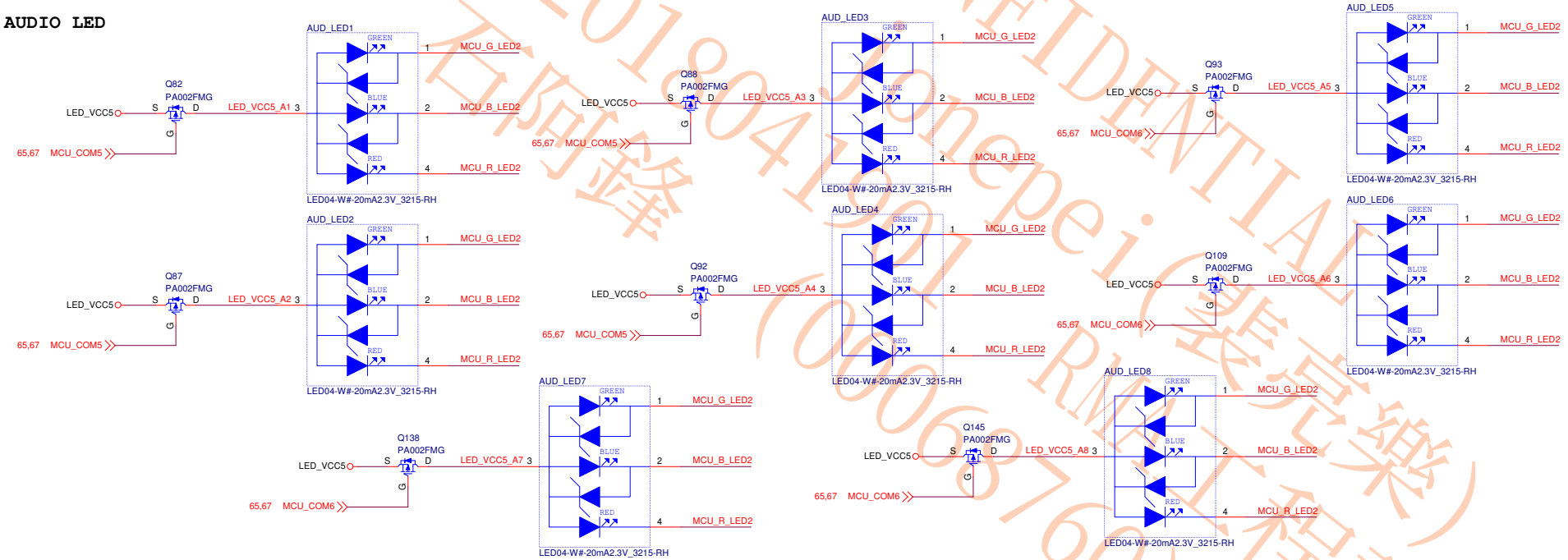
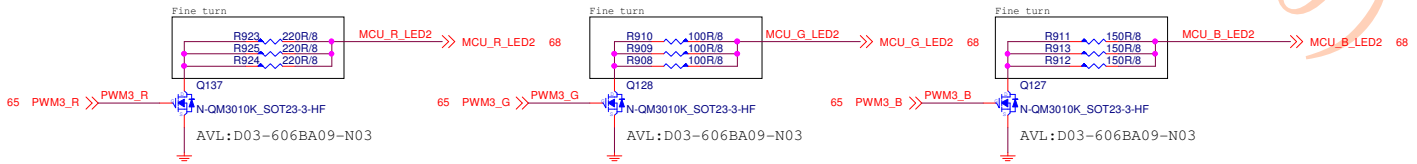
PCH LED



AUDIO LED





Vf=1.6 V~2.4V
5V-1.6V/73.3=0.046A
0.046A*0.046A*73.3=0.155W

Vf=2.7 V~3.9V
5V-2.7V/33.3=0.069A
0.069A*0.069A*33.3=0.158W

Vf=2.7 V~3.9V
5V-2.7V/50=0.046A
0.046A*0.046A*50=0.105W

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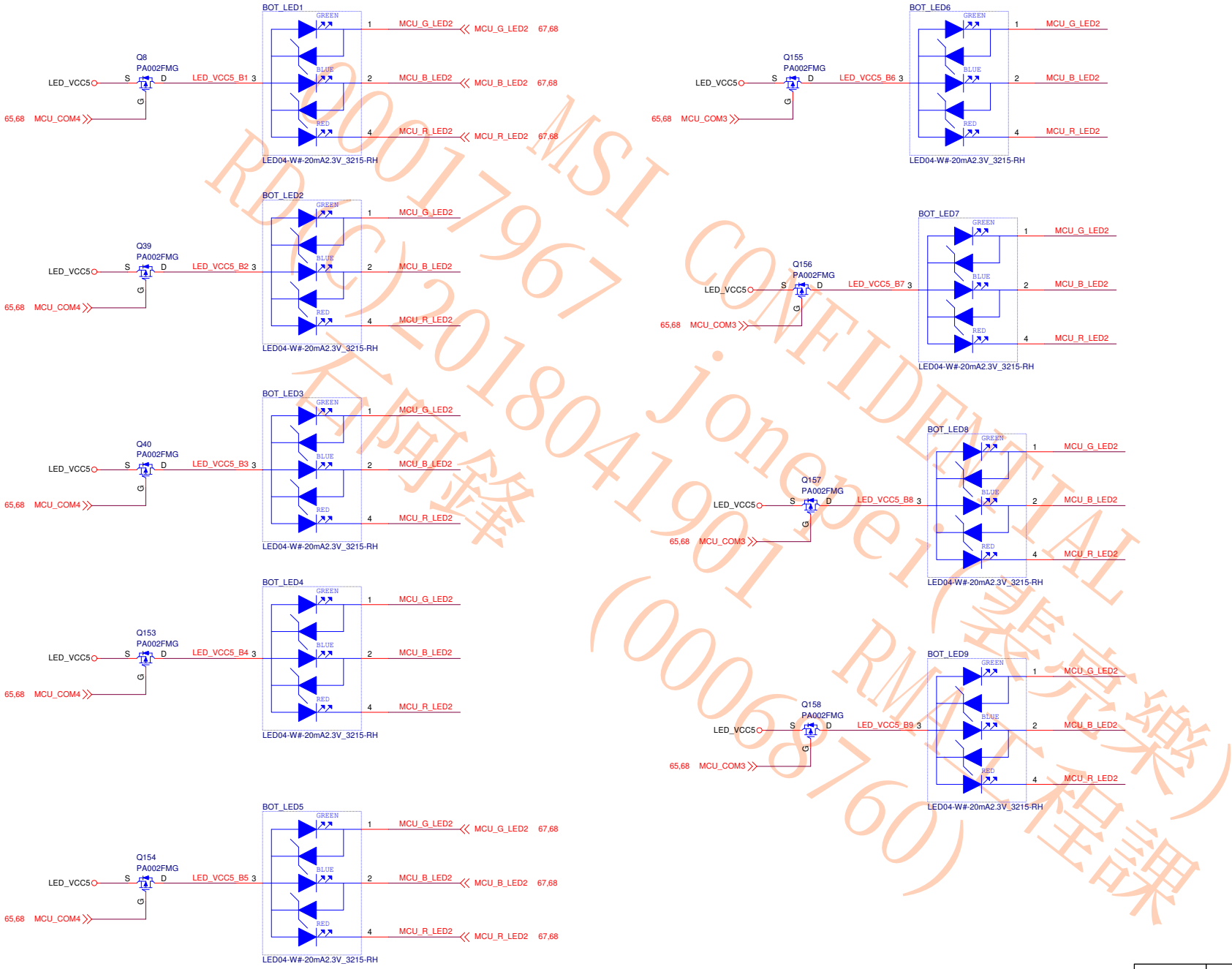
BOTTOM LED



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PCB1

7B16-10

MK_LABLE1

MARKET LABLE

MK_LABLE1

LA10

MKT H370

MKT

Nahimic

Label SLI

Nahimic

Steel

Label SLI

X_Steel series

HDMI_LA1

Label HDMI

HDMI LABEL

CFOS

Label SLI

CFOS

XSplit

Label SLI

X_XSplit

CPU_H1

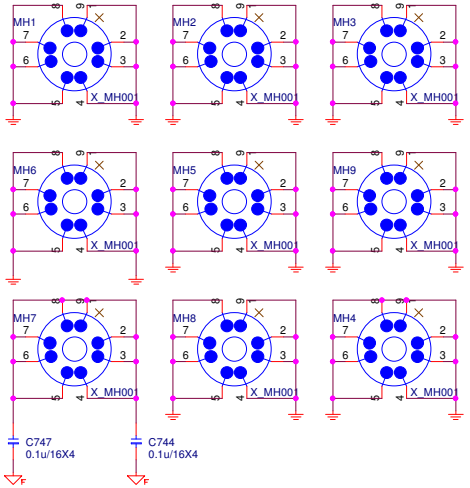
CPU 鍍座

CPU_H1

BAT1_X1

BAT-BCR2032P-RH

Mounting Holes



HEATSINK

HS_AUDIO1

Audio Cover

E21-7A62010-RH

HS_PCH1

PCH Shink

MCE1

MCE2

HS-0409450-RH

MEC1

HS_MOS1

MEC2

HS-0505470-RH

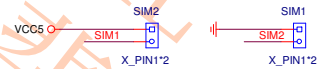
MEC1

HS_MOS2

MEC2

HS-0505480-RH

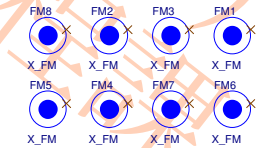
Simulation

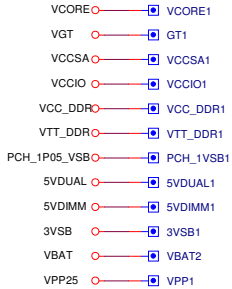


H370 OPT.

B360 OPT.

Optical Fiducial Marks-120





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