MS-7A98

EATX

Ver: 22

305mm*272mm

Kabylake Platform

CPU:

COFFEE LAKE S

System Chipset:

Z370 PCH_H

Onboard Chip:

*HD Audio Codec:ALC1220*2*
*LAN-KILLIER LAN E2500*3*
SIO:NTC6795D
Dual Flash ROM: SPI 64 MB X2
USB HUB:ASM1074

CLK Gen :IDT6V41606BNLG8
*FAN CTL:NCT7802*2*
MCU:R5F104GDAFB #V0
*USB31:ASM3142*2*

Main Memory:

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

ACPI:

MPS

PWM:

IMVP8 -IR35201

Expansion Slots:

*PCI Express (X16) Slot * 1*
*PCI Express (X8) Slot * 1*
*PCI Express (X4) Slot * 1*
*PCI Express (X1) Slot * 1*

Other:

*SATA3.0 *6*
*REAL USB3.0 *7+TYPEC*1*
*FRONT USB3.0 *4+TYPEC*1*

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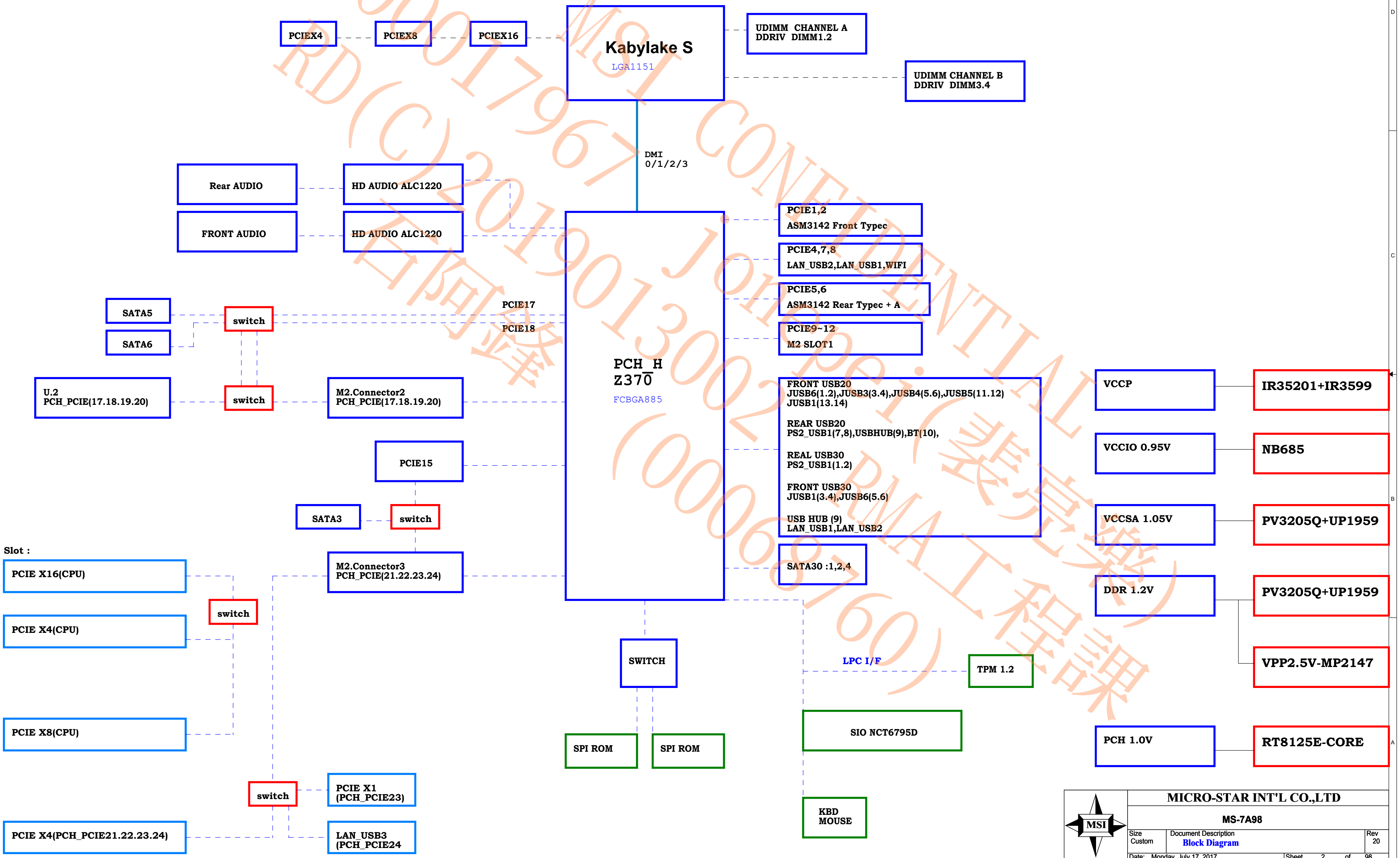
MS-7A58 Block Diagram



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Size	Document Description	Rev
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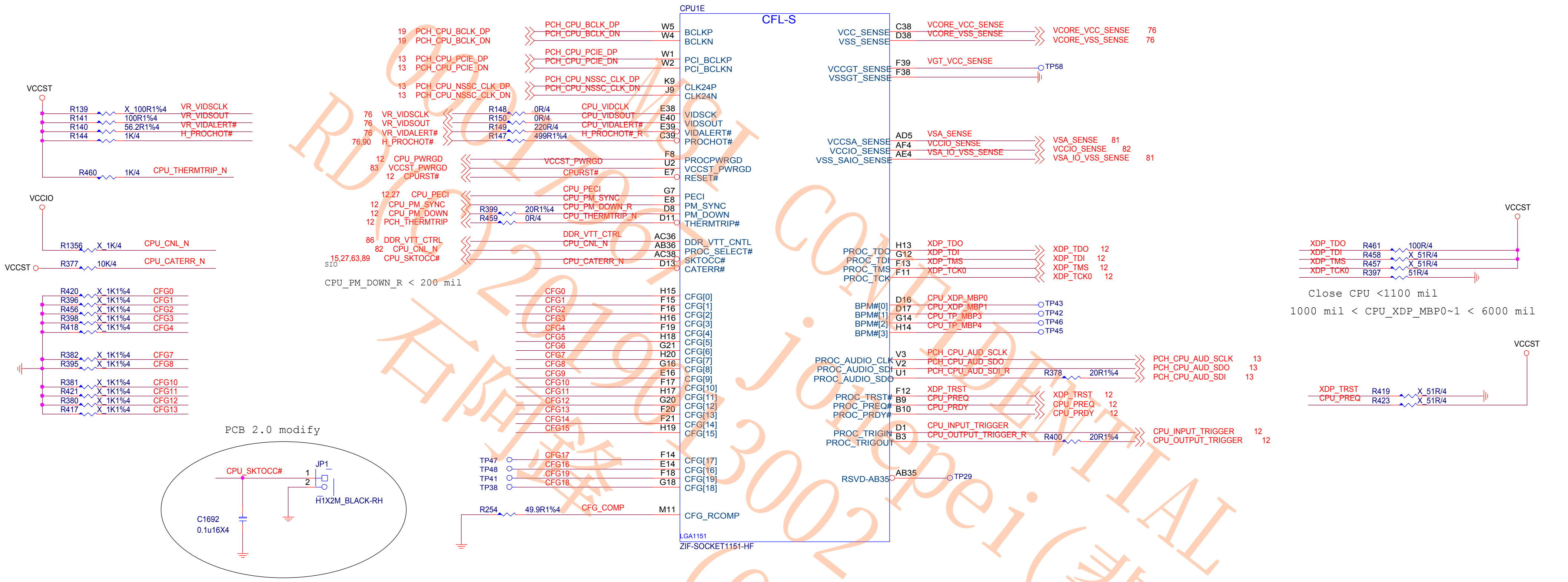
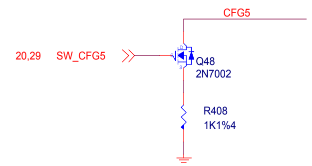
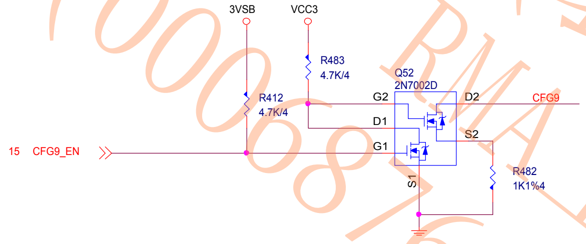
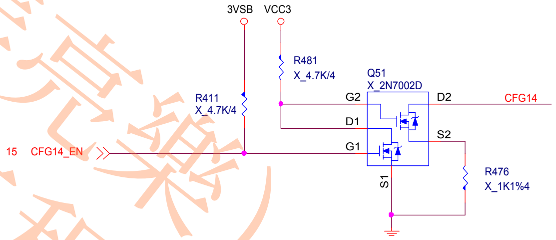


X8 and X4 Ctrl

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



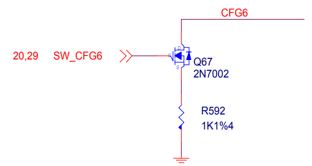


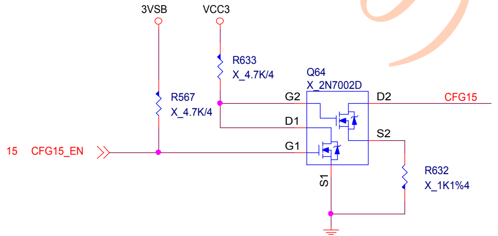


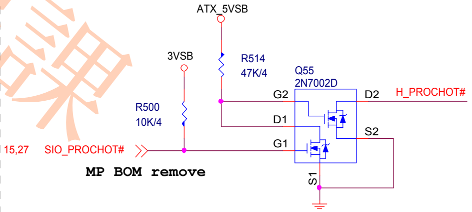
CFG Strap

CFG Table

	HIGH	LOW	DESCRIPTION
0	No Lock	Lock	PCU PLL lock
1			RSVD
2	NORM	REVERSE	PEG_LANE_REVERSAL
3			RSVD
4	DISABLE	ENABLE	eDP
5	DISABLE	ENABLE	PEG0CFGSEL[0]
6	DISABLE	ENABLE	PEG0CFGSEL[1]
7	RESET#	BIOS REQ	PEG_DEFER_TRAINING
8			RSVD
9	PRESENT	NO PRESENT	SVID PRESENT
10			RSVD
11			RSVD
12			RSVD
13			RSVD
14	RSVD		
15	RSVD		







MP BOM remove

SIO side is 3V level

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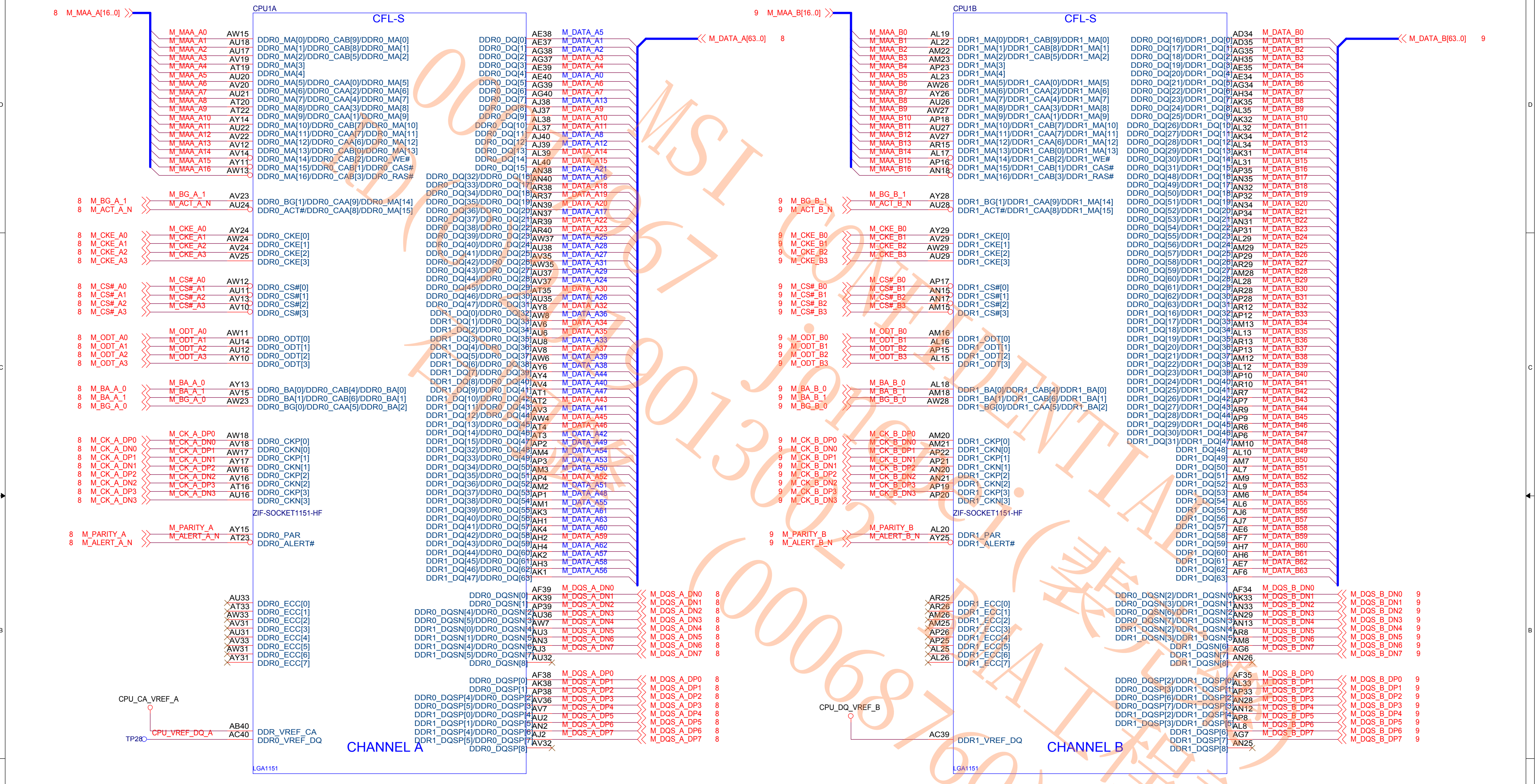
SOCKET PN N12-151A010-L06



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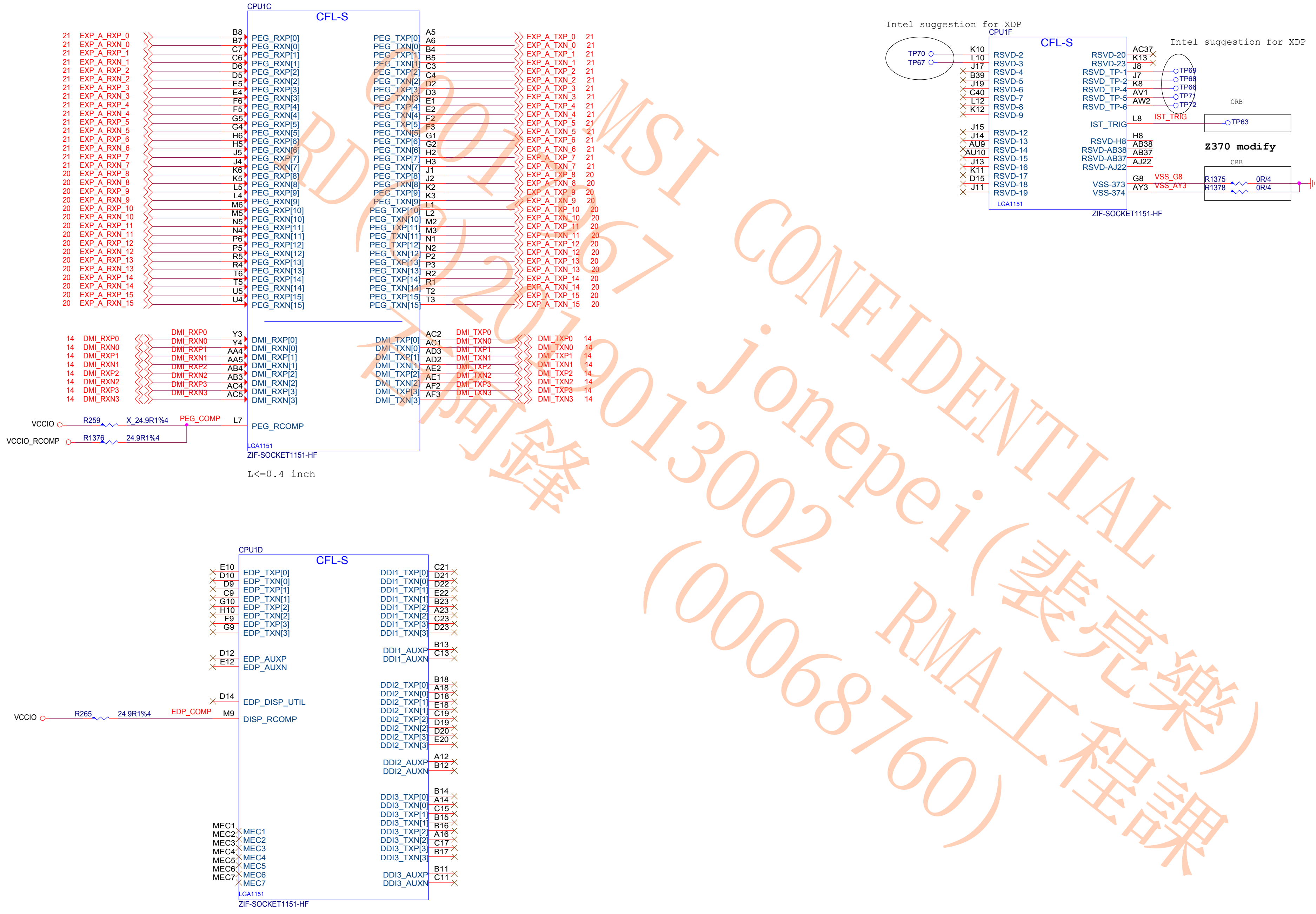

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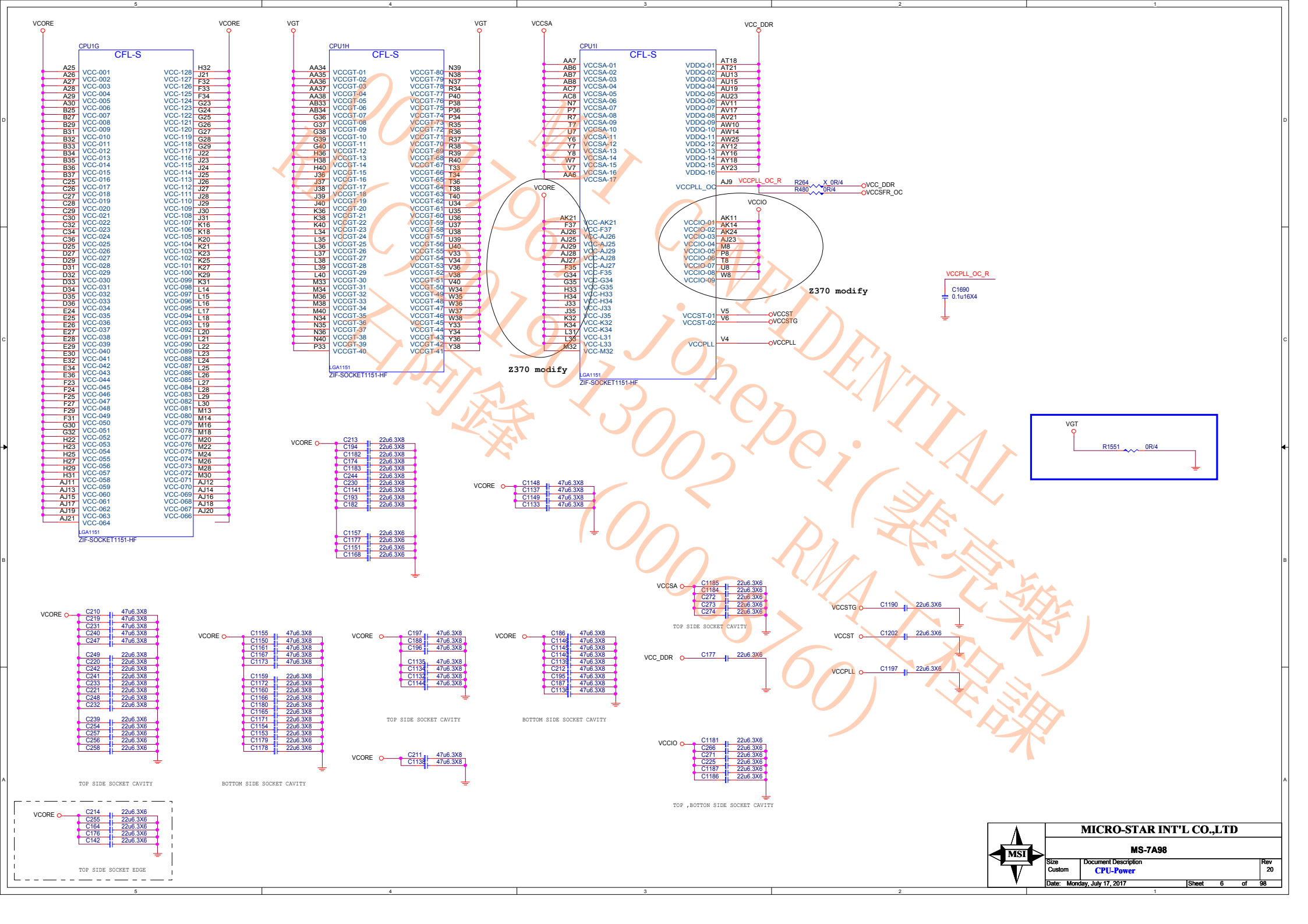
CPU1G
CFL-S
ZIF-SOCKET1151-HF
CPU1H
CFL-S
ZIF-SOCKET1151-HF
CPU1I
CFL-S
ZIF-SOCKET1151-HF
Z370 modify
Z370 modify
VCCPLL_OC_R
C1690
0.1u16X4
R1551
0R/4
TOP SIDE SOCKET CAVITY
BOTTOM SIDE SOCKET CAVITY
TOP SIDE SOCKET CAVITY
BOTTOM SIDE SOCKET CAVITY
TOP SIDE SOCKET CAVITY
TOP ,BOTTON SIDE SOCKET CAVITY
TOP SIDE SOCKET EDGE
MICRO-STAR INT'L CO.,LTD
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CPU-Power
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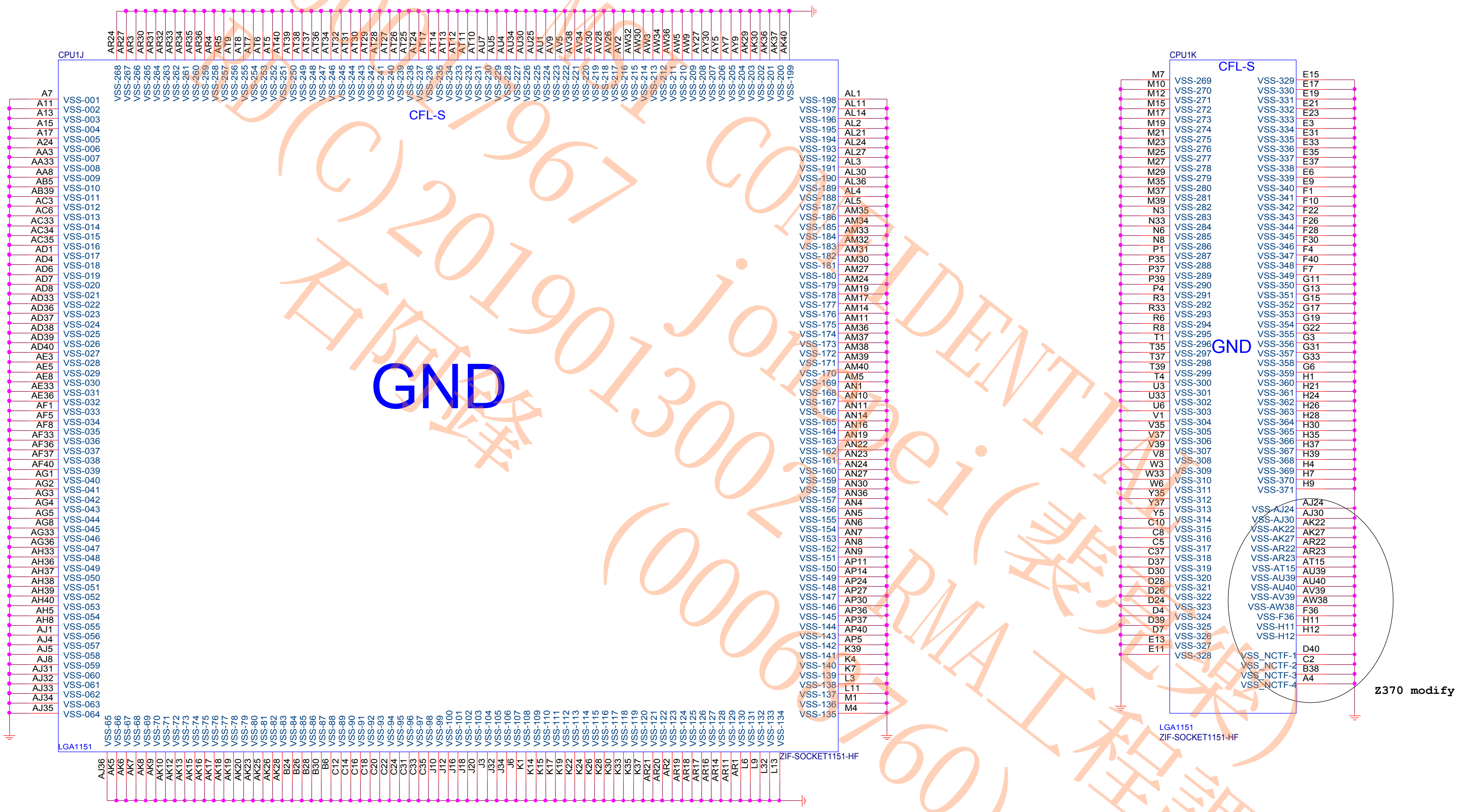

MICRO-STAR INT'L CO.,LTD		
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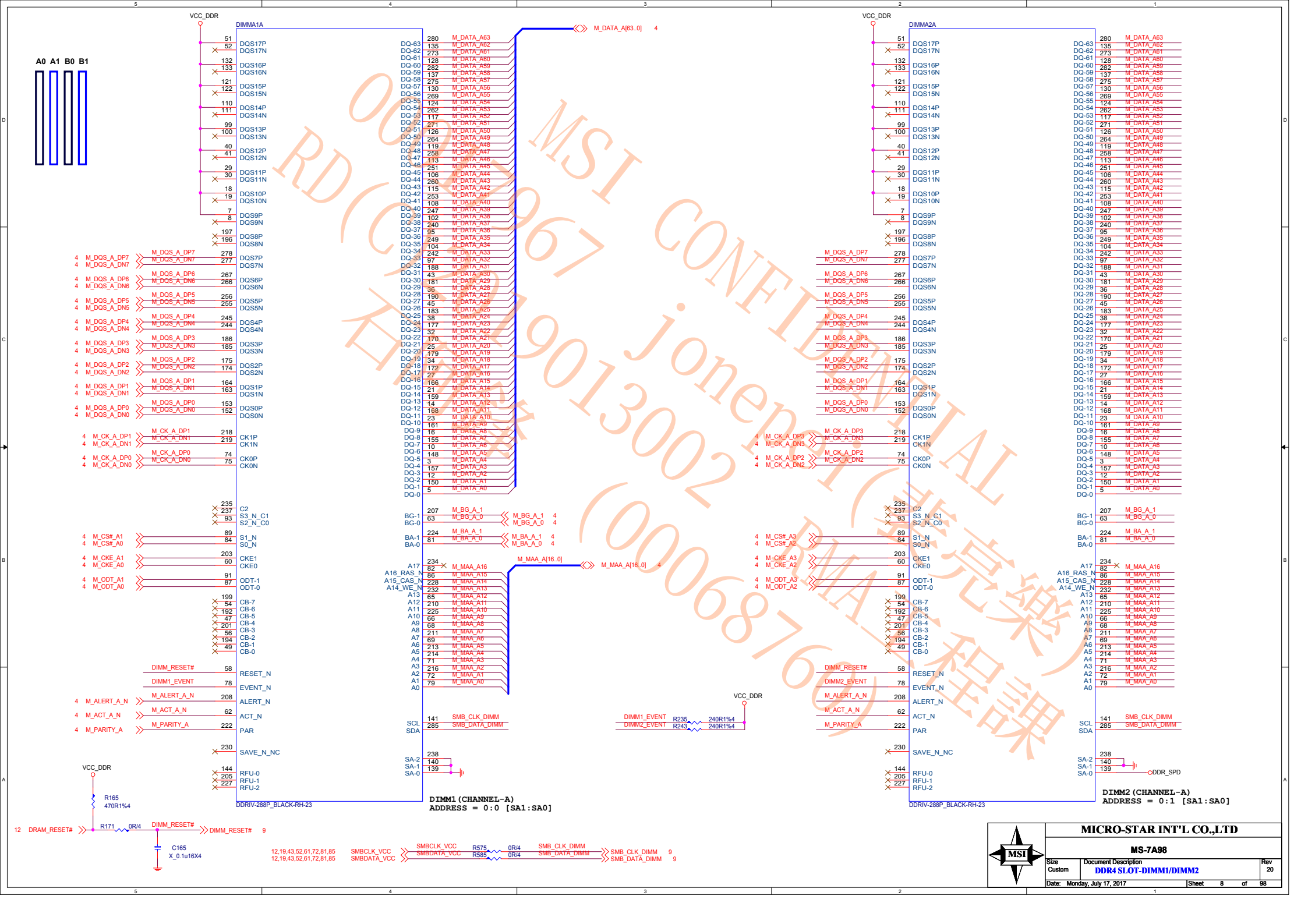
A0 A1 B0 B1
VCC_DDR
DIMMA1A
DDRIV-288P_BLACK-RH-23
DIMM1(CHANNEL-A)
ADDRESS = 0:0 [SA1:SA0]
VCC_DDR
DIMMA2A
DDRIV-288P_BLACK-RH-23
DIMM2(CHANNEL-A)
ADDRESS = 0:1 [SA1:SA0]
M_DATA_A[63..0]
M_MAA_A[16..0]
DIMM1_EVENT
DIMM2_EVENT
R235 240R1%4
R243 240R1%4
R165 470R1%4
R171 0R/4
DRAM_RESET#
DIMM_RESET#
C165 X_0.1u16X4
SMBCLK_VCC
SMBDATA_VCC
R575 0R/4
R585 0R/4
SMB_CLK_DIMM
SMB_DATA_DIMM
DDR_SPD
MICRO-STAR INT'L CO.,LTD
MS-7A98
Size Custom
Document Description DDR4 SLOT-DIMM1/DIMM2
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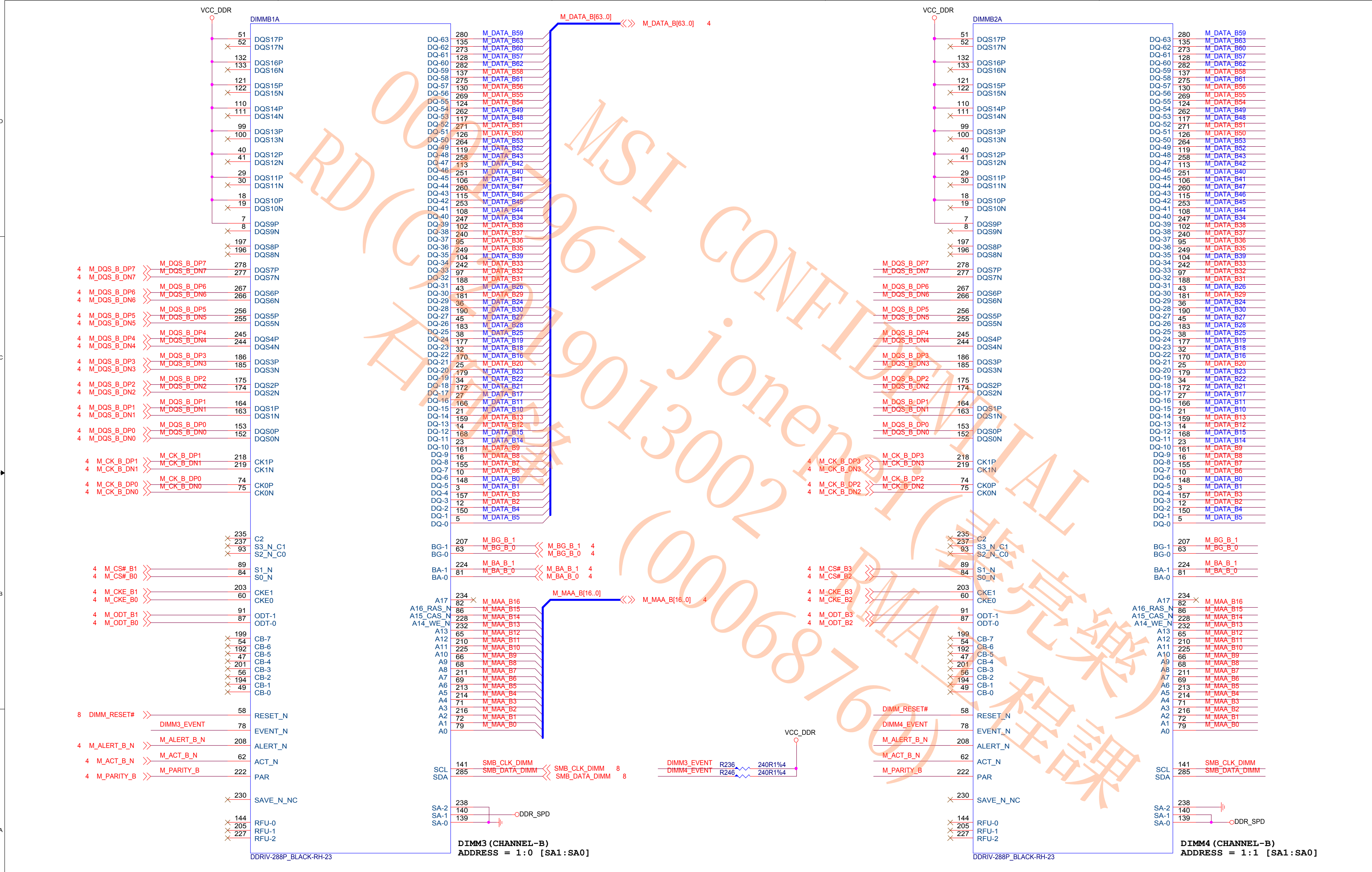

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Size	Document Description	Rev
Custom	DDR4 SLOT-DIMM3/DIMM4	20

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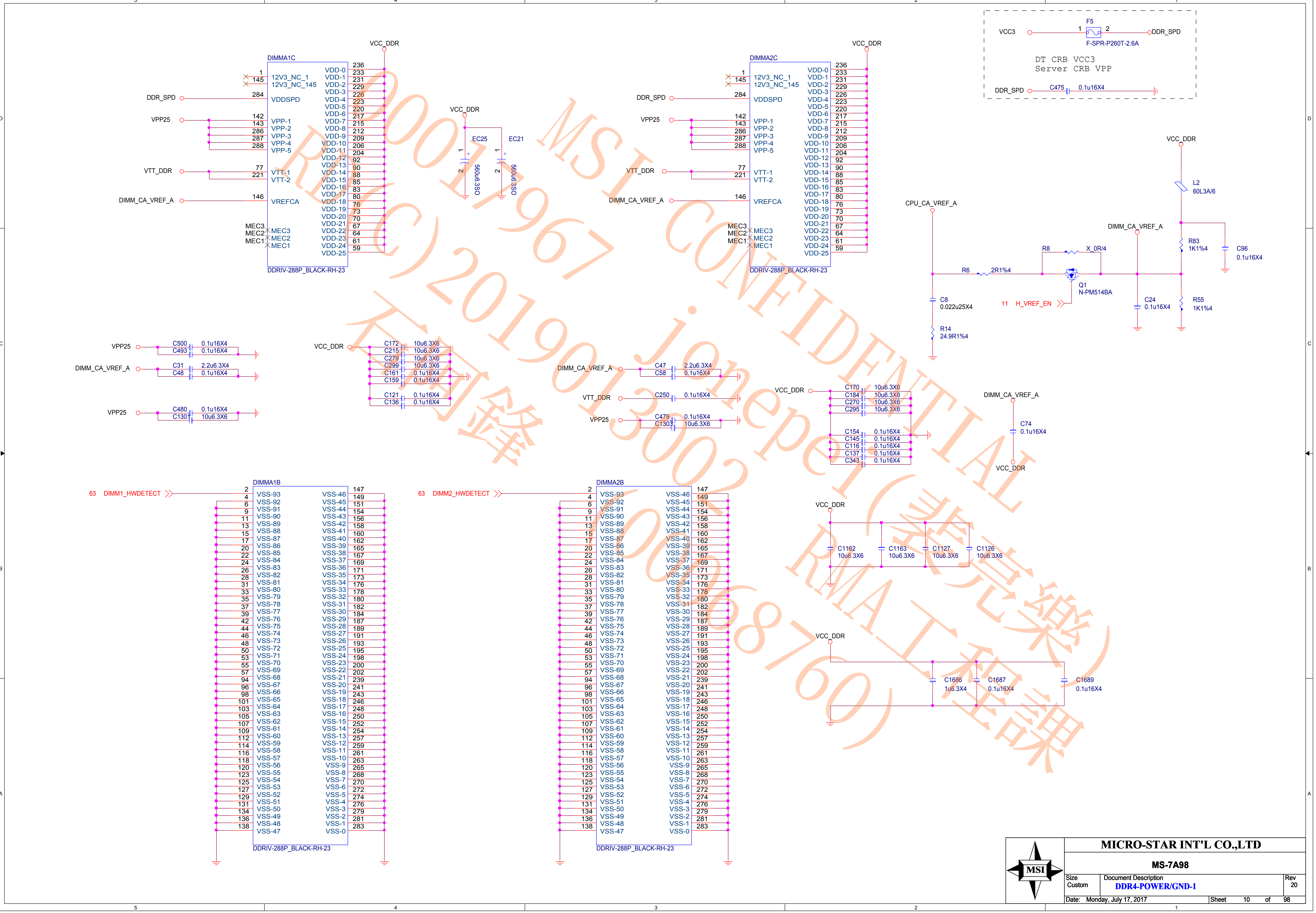
DIMMA1C
DDRIV-288P_BLACK-RH-23
12V3_NC_1
12V3_NC_145
VDDSPD
VPP-1
VPP-2
VPP-3
VPP-4
VPP-5
VTT-1
VTT-2
VREFCA
MEC3
MEC2
MEC1
VDD-0 … VDD-25
VCC_DDR
DDR_SPD
VPP25
VTT_DDR
DIMM_CA_VREF_A
EC25
EC21
560u6.3SO
DIMMA2C
DDRIV-288P_BLACK-RH-23
F5
F-SPR-P260T-2.6A
VCC3
DT CRB VCC3
Server CRB VPP
C475 0.1u16X4
L2 60L3A/6
CPU_CA_VREF_A
R8 X_0R/4
R6 2R1%4
Q1 N-PM514BA
H_VREF_EN
C8 0.022u25X4
R14 24.9R1%4
C24 0.1u16X4
R83 1K1%4
R55 1K1%4
C96 0.1u16X4
C500 0.1u16X4
C493 0.1u16X4
C31 2.2u6.3X4
C48 0.1u16X4
C480 0.1u16X4
C1301 10u6.3X6
C172 10u6.3X6
C215 10u6.3X6
C279 10u6.3X6
C299 10u6.3X6
C161 0.1u16X4
C159 0.1u16X4
C121 0.1u16X4
C136 0.1u16X4
C47 2.2u6.3X4
C58 0.1u16X4
C250 0.1u16X4
C479 0.1u16X4
C1303 10u6.3X6
C170 10u6.3X6
C184 10u6.3X6
C270 10u6.3X6
C295 10u6.3X6
C154 0.1u16X4
C145 0.1u16X4
C116 0.1u16X4
C137 0.1u16X4
C343 0.1u16X4
C74 0.1u16X4
DIMMA1B
DIMM1_HWDETECT
VSS-0 … VSS-93
DDRIV-288P_BLACK-RH-23
DIMMA2B
DIMM2_HWDETECT
C1162 10u6.3X6
C1163 10u6.3X6
C1127 10u6.3X6
C1126 10u6.3X6
C1686 1u6.3X4
C1687 0.1u16X4
C1689 0.1u16X4
MSI
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MS-7A98
Size Custom
Document Description DDR4-POWER/GND-1
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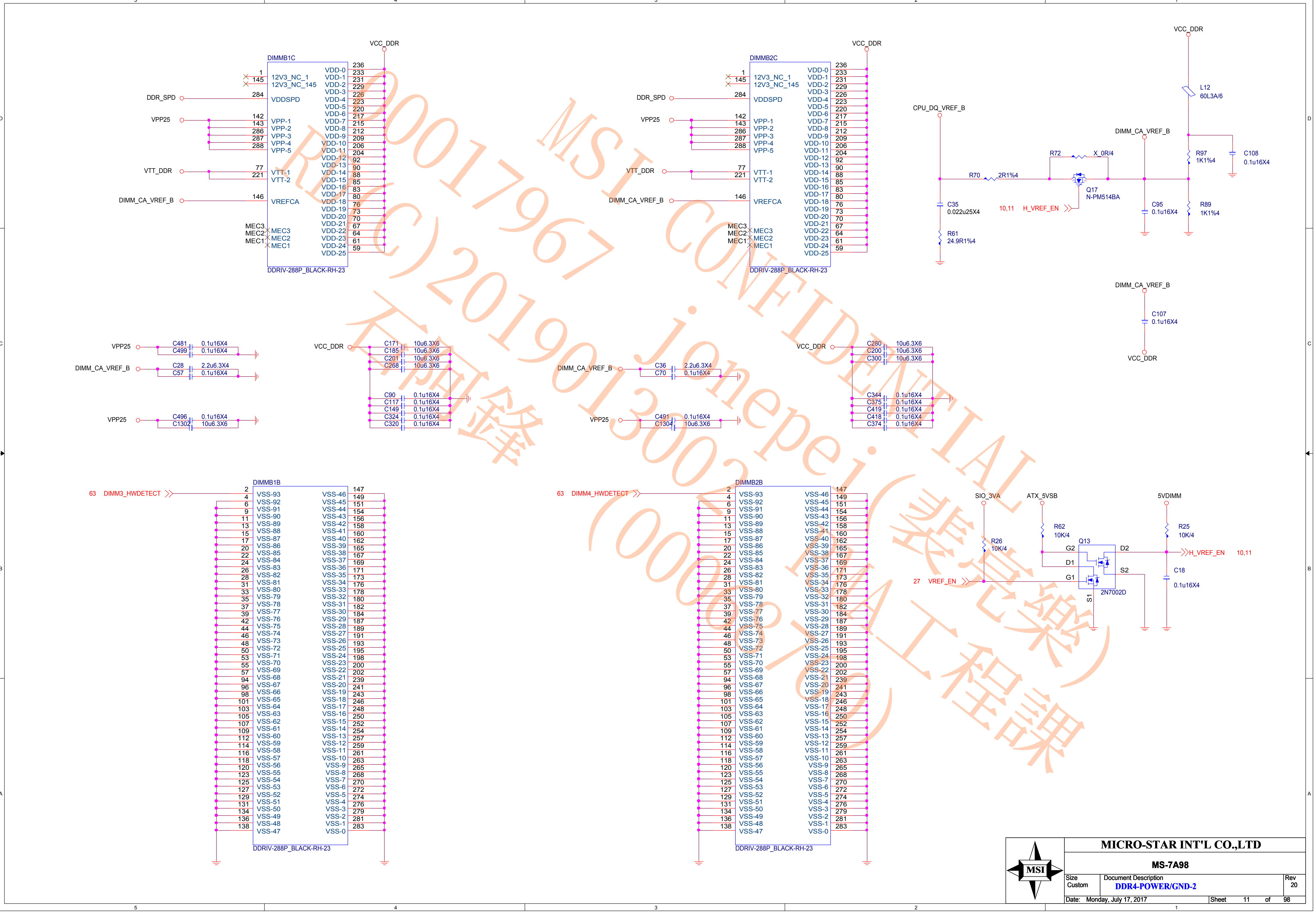

DIMMB1C
DIMMB2C
DDRIV-288P_BLACK-RH-23
VCC_DDR
DDR_SPD
VPP25
VTT_DDR
DIMM_CA_VREF_B
12V3_NC_1
12V3_NC_145
VDDSPD
VPP-1
VPP-2
VPP-3
VPP-4
VPP-5
VTT-1
VTT-2
VREFCA
MEC3
MEC2
MEC1
CPU_DQ_VREF_B
R70 2R1%4
R72 X_0R/4
Q17 N-PM514BA
C35 0.022u25X4
R61 24.9R1%4
10,11 H_VREF_EN
L12 60L3A/6
R97 1K1%4
C108 0.1u16X4
C95 0.1u16X4
R89 1K1%4
C107 0.1u16X4
C481 0.1u16X4
C499 0.1u16X4
C28 2.2u6.3X4
C57 0.1u16X4
C496 0.1u16X4
C1302 10u6.3X6
C171 10u6.3X6
C185 10u6.3X6
C201 10u6.3X6
C268 10u6.3X6
C90 0.1u16X4
C117 0.1u16X4
C149 0.1u16X4
C324 0.1u16X4
C320 0.1u16X4
C36 2.2u6.3X4
C70 0.1u16X4
C491 0.1u16X4
C1304 10u6.3X6
C280 10u6.3X6
C200 10u6.3X6
C300 10u6.3X6
C344 0.1u16X4
C375 0.1u16X4
C419 0.1u16X4
C418 0.1u16X4
C374 0.1u16X4
DIMMB1B
DIMMB2B
63 DIMM3_HWDETECT
63 DIMM4_HWDETECT
SIO_3VA
ATX_5VSB
5VDIMM
R26 10K/4
R62 10K/4
R25 10K/4
Q13 2N7002D
G2 D2 D1 S2 G1 S1
H_VREF_EN 10,11
27 VREF_EN
C18 0.1u16X4
MSI CONFIDENTIAL
MICRO-STAR INT'L CO.,LTD
MS-7A98
Size Custom
Document Description
DDR4-POWER/GND-2
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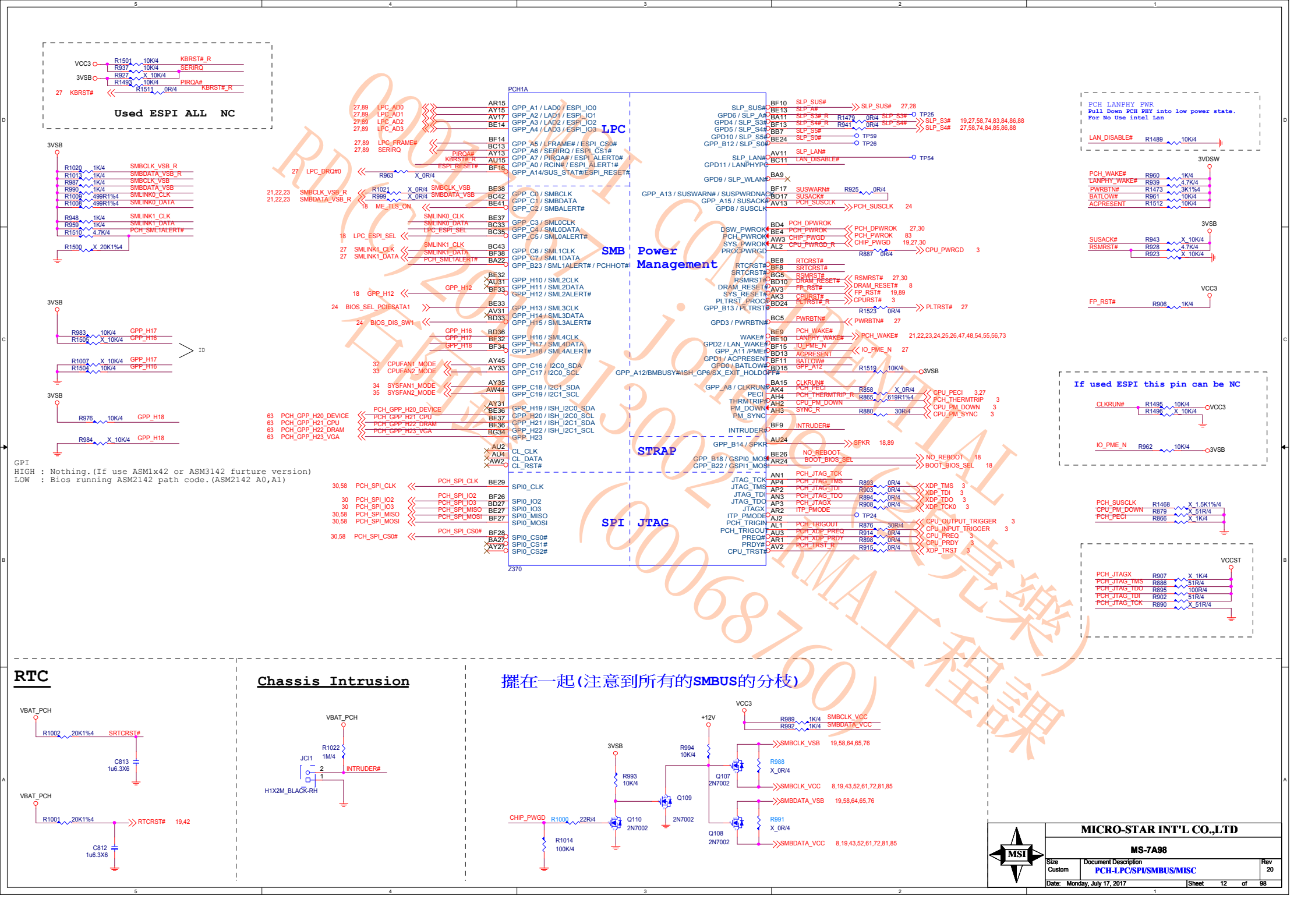
Used ESPI ALL NC
PCH1A
LPC
SMB
Power Management
STRAP
SPI JTAG
Z370
GPI
HIGH : Nothing.(If use ASM1x42 or ASM3142 furture version)
LOW : Bios running ASM2142 path code.(ASM2142 A0,A1)
PCH LANPHY PWR
Pull Down PCH PHY into low power state.
For No Use intel Lan
If used ESPI this pin can be NC
RTC
Chassis Intrusion
擺在一起(注意到所有的SMBUS的分枝)
MICRO-STAR INT'L CO.,LTD
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PCH-LPC/SPI/SMBUS/MISC
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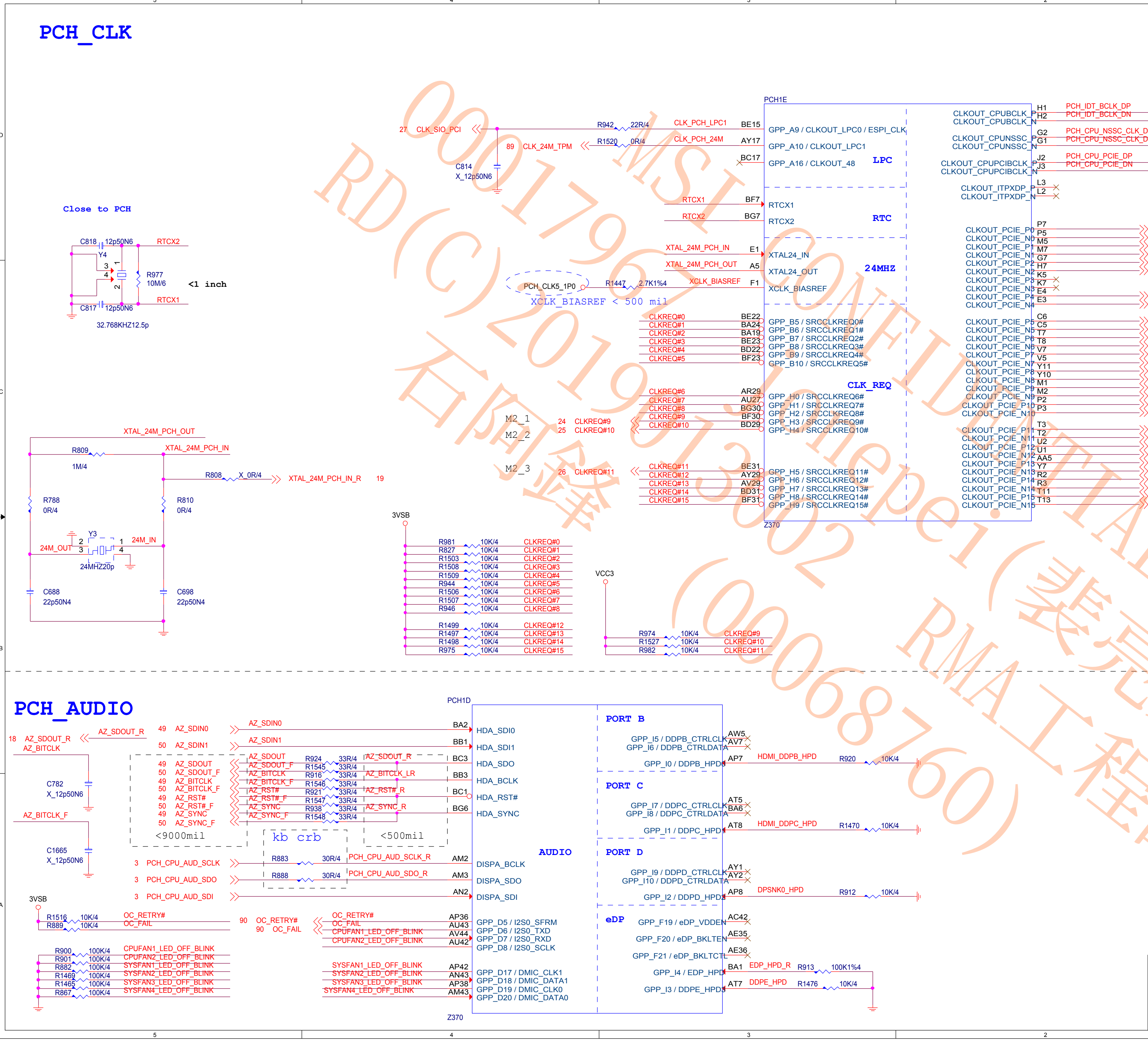

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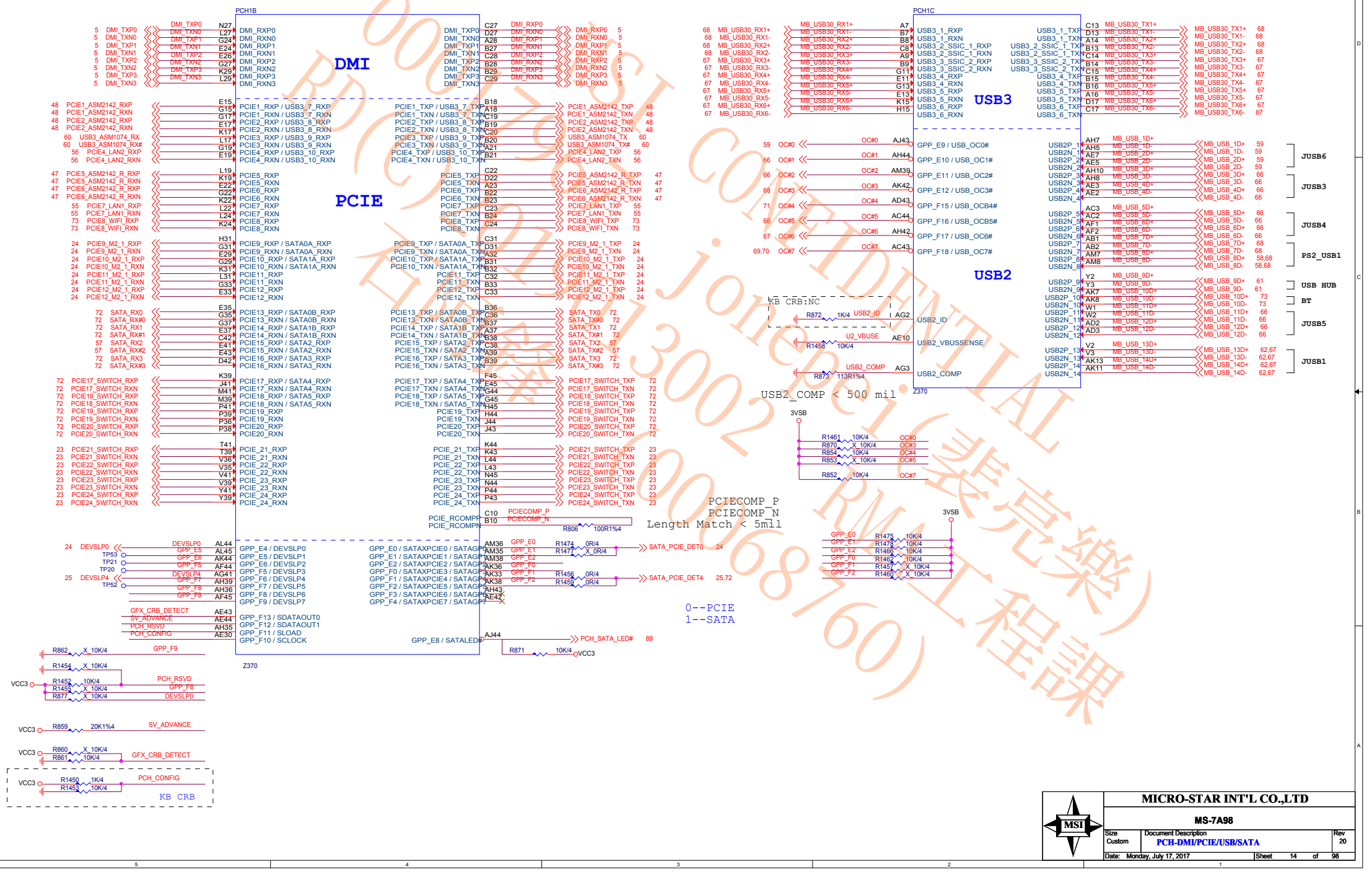
PCH1B
DMI
PCIE
Z370
PCH1C
USB3
USB2
Z370
KB CRB:NC
USB2_COMP < 500 mil
PCIECOMP_P
PCIECOMP_N
Length Match < 5mil
0--PCIE
1--SATA
KB CRB
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PCH-DMI/PCIE/USB/SATA
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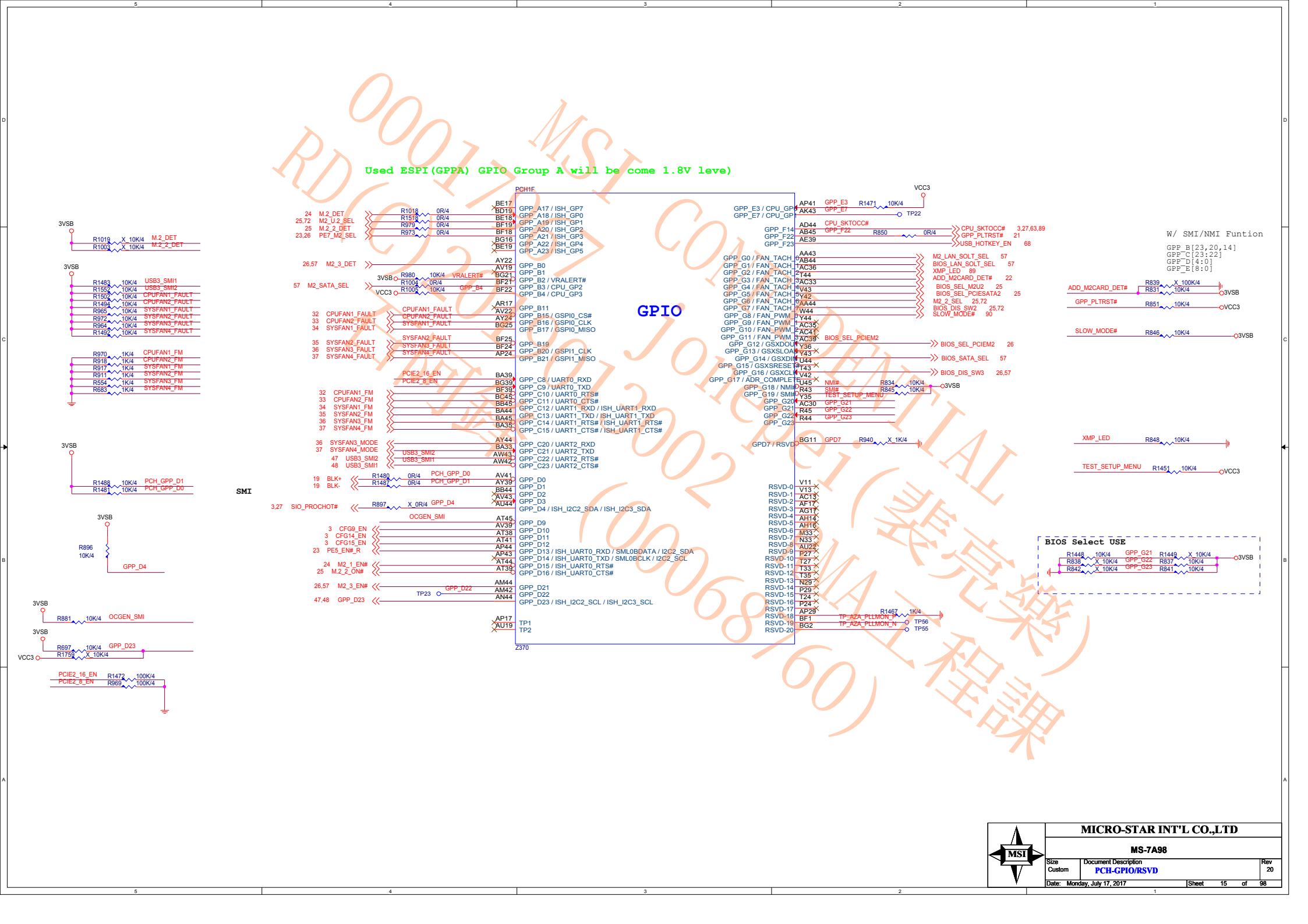
Used ESPI(GPPA) GPIO Group A will be come 1.8V leve)
PCH1F
GPIO
Z370
SMI
W/ SMI/NMI Funtion
GPP_B[23,20,14]
GPP_C[23:22]
GPP_D[4:0]
GPP_E[8:0]
BIOS Select USE
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MS-7A98
PCH-GPIO/RSVD
Size
Custom
Document Description
Rev
20
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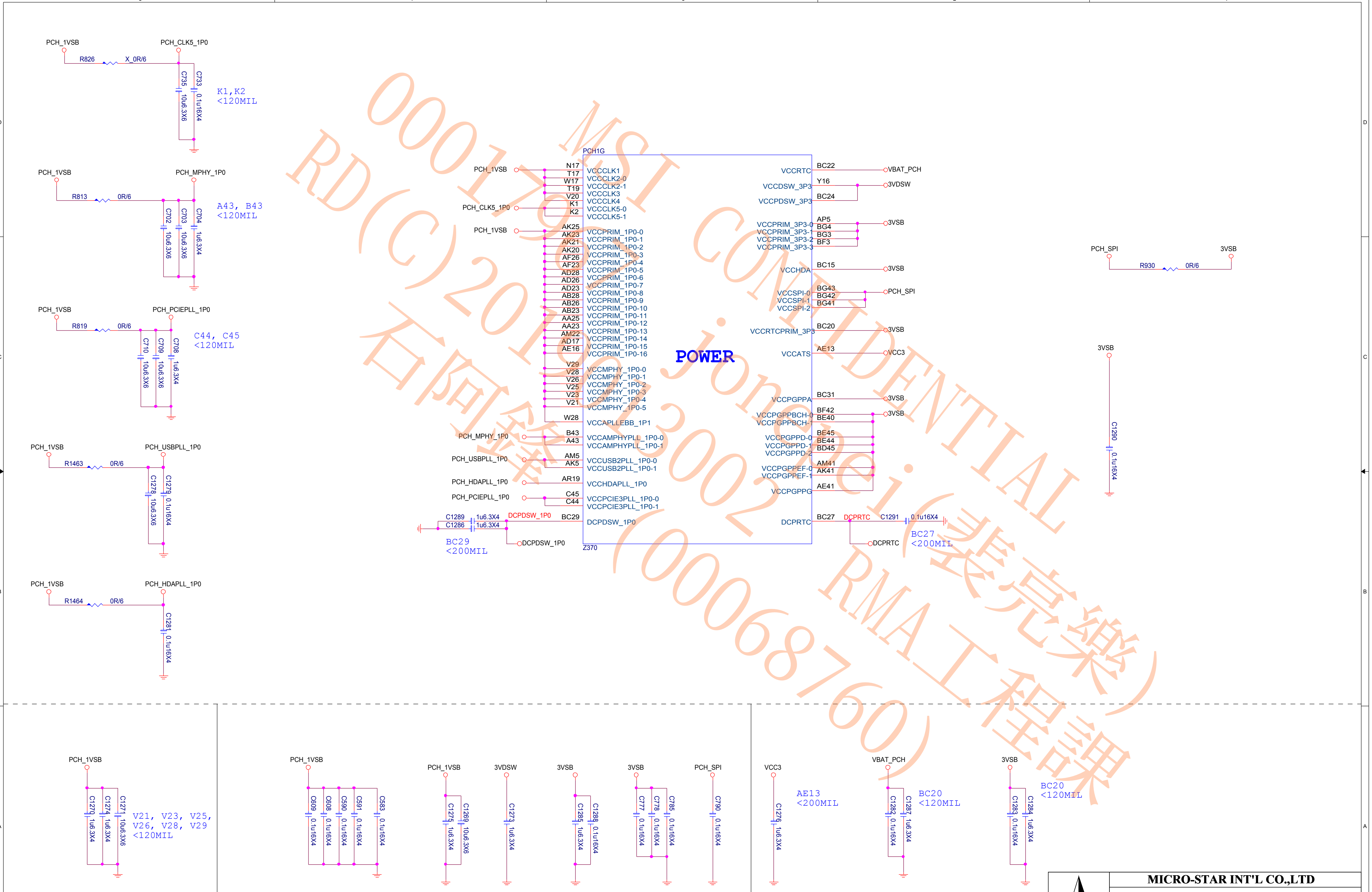

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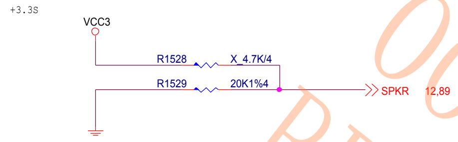
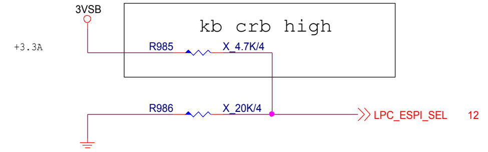
TOP Swap



Internal pull-down is disabled after PLTRST#

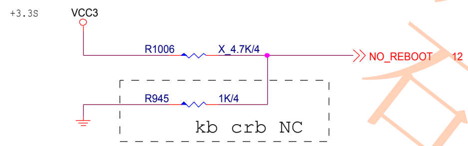
LPC eSPI Mode



0 : LPC
1 : eSPI

Internal pull-down is disabled after RSMRST

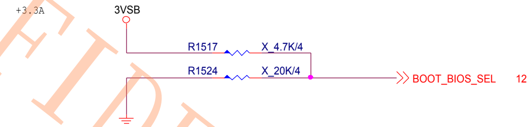
No Reboot



0 : DISABLE (Default)
1 : ENABLE

Internal pull-down is disabled after PLTRST#

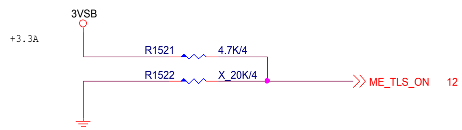
Boot BIOS



0 : SPI
1 : LPC

Internal pull-down is disabled after PLTRST

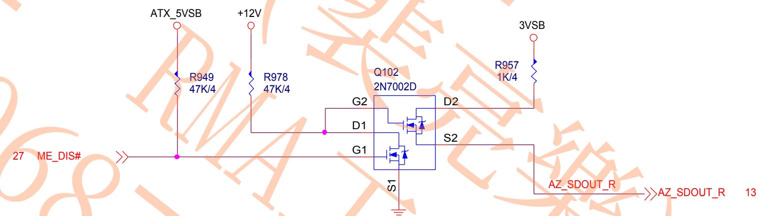
AMT and SBA with confidentiality



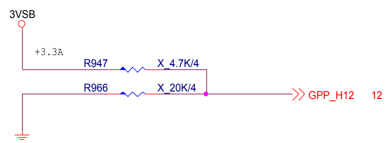
0 : DISABLE
1 : ENABLE (Default)

Internal pull-down is disabled after RSMRST

HDA_SDO



ESPI FLASH SHARING MODE



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

Internal pull-down is disabled after RSMRST

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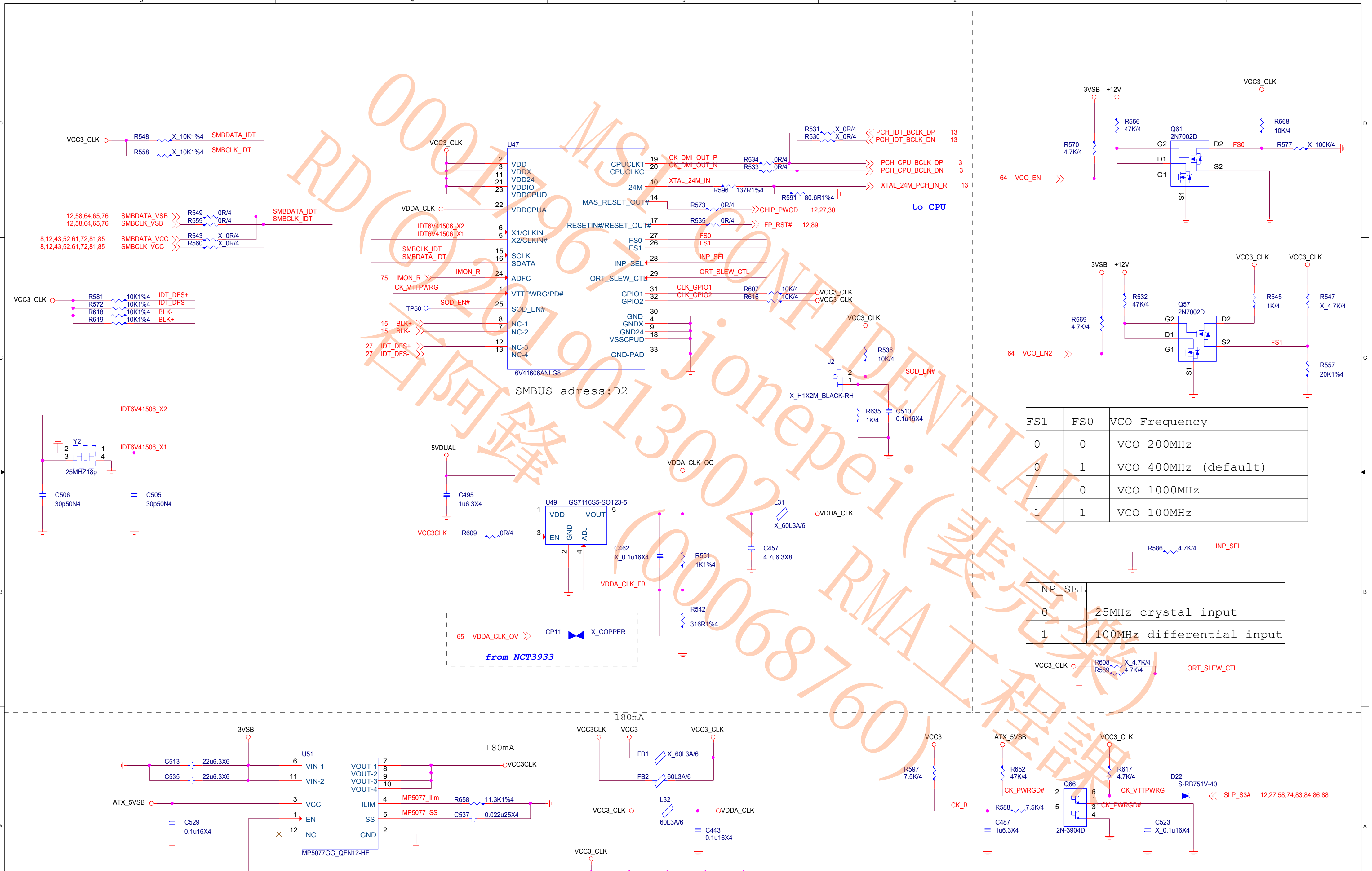

FS1	FS0	VCO Frequency
0	0	VCO 200MHz
0	1	VCO 400MHz (default)
1	0	VCO 1000MHz
1	1	VCO 100MHz

INP_SEL	
0	25MHz crystal input
1	100MHz differential input

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Size: Custom

Document Description: Clock Gen-IDT6V41606BNL

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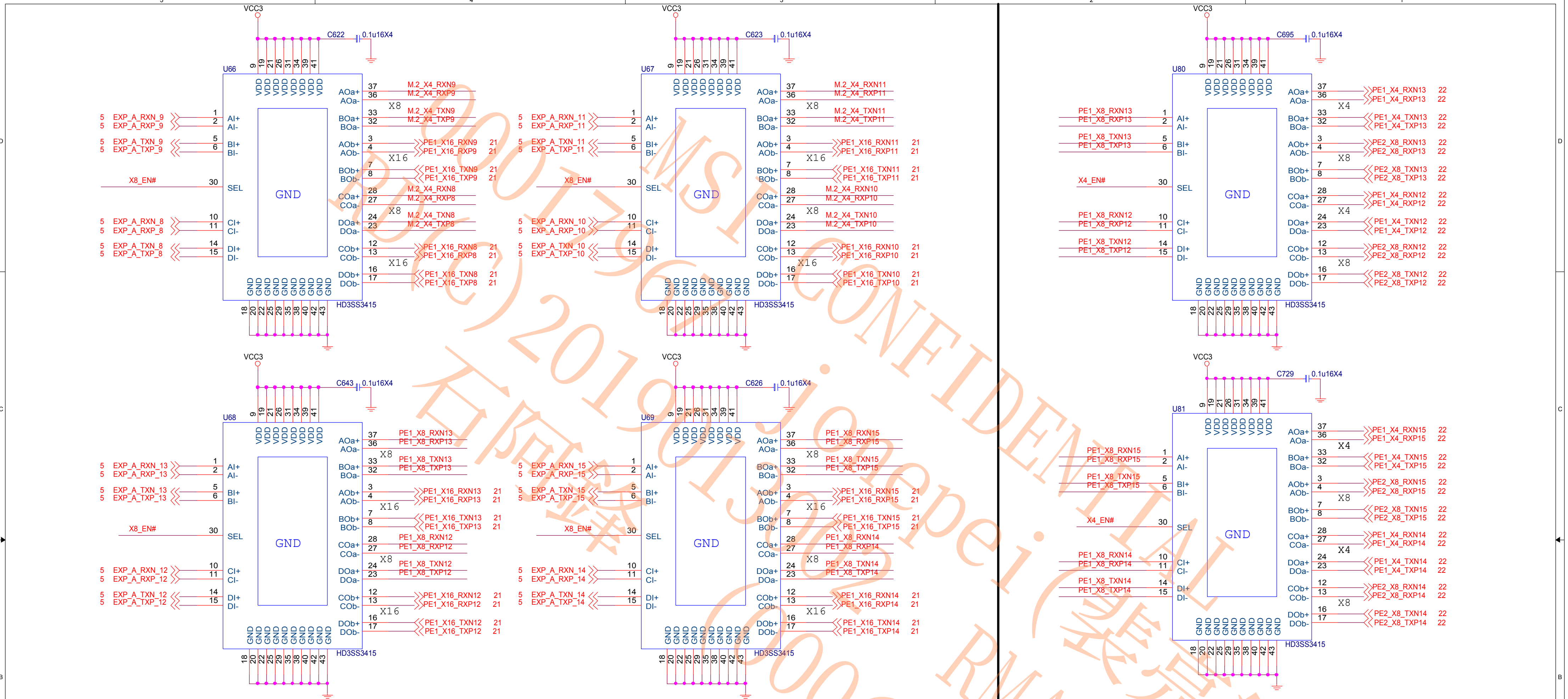
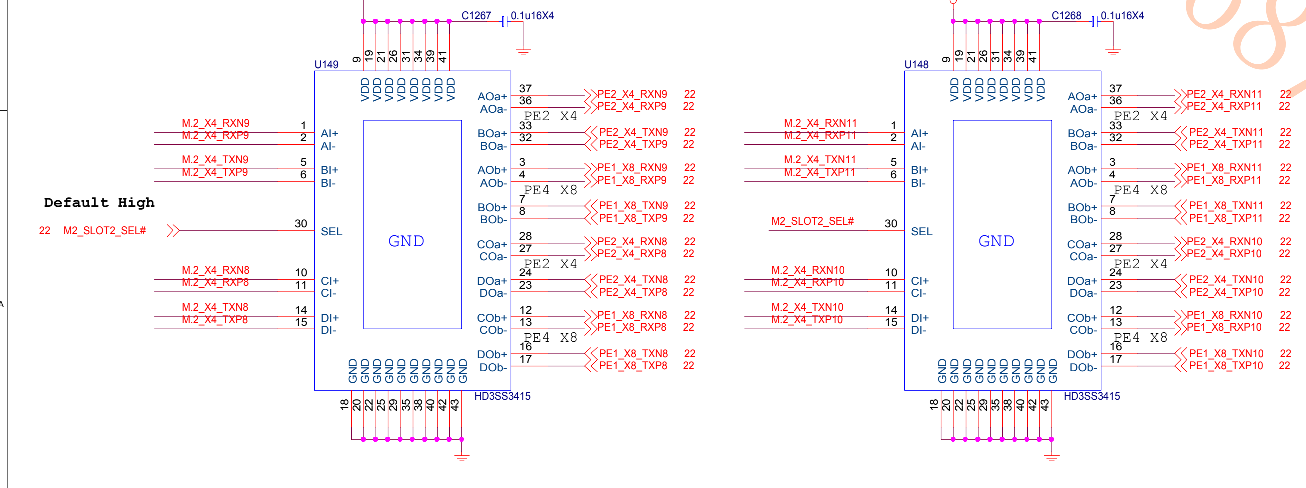
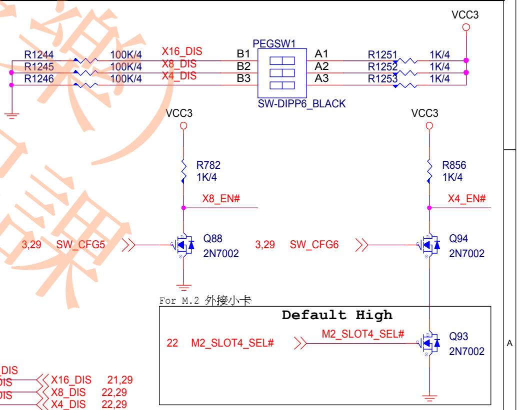
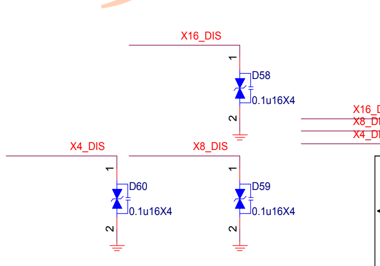


For M.2 外接小卡



PEGSW1 Status	X16_DIS	X8_DIS	X4_DIS
AUTO	Hi	Hi	Hi
On Board	Low	X	X
16,0,0	Hi	Low	X
8,8,0	Hi	Hi	Low





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Custom	020 PCIE SWITCH-TI HD3SS3415	20

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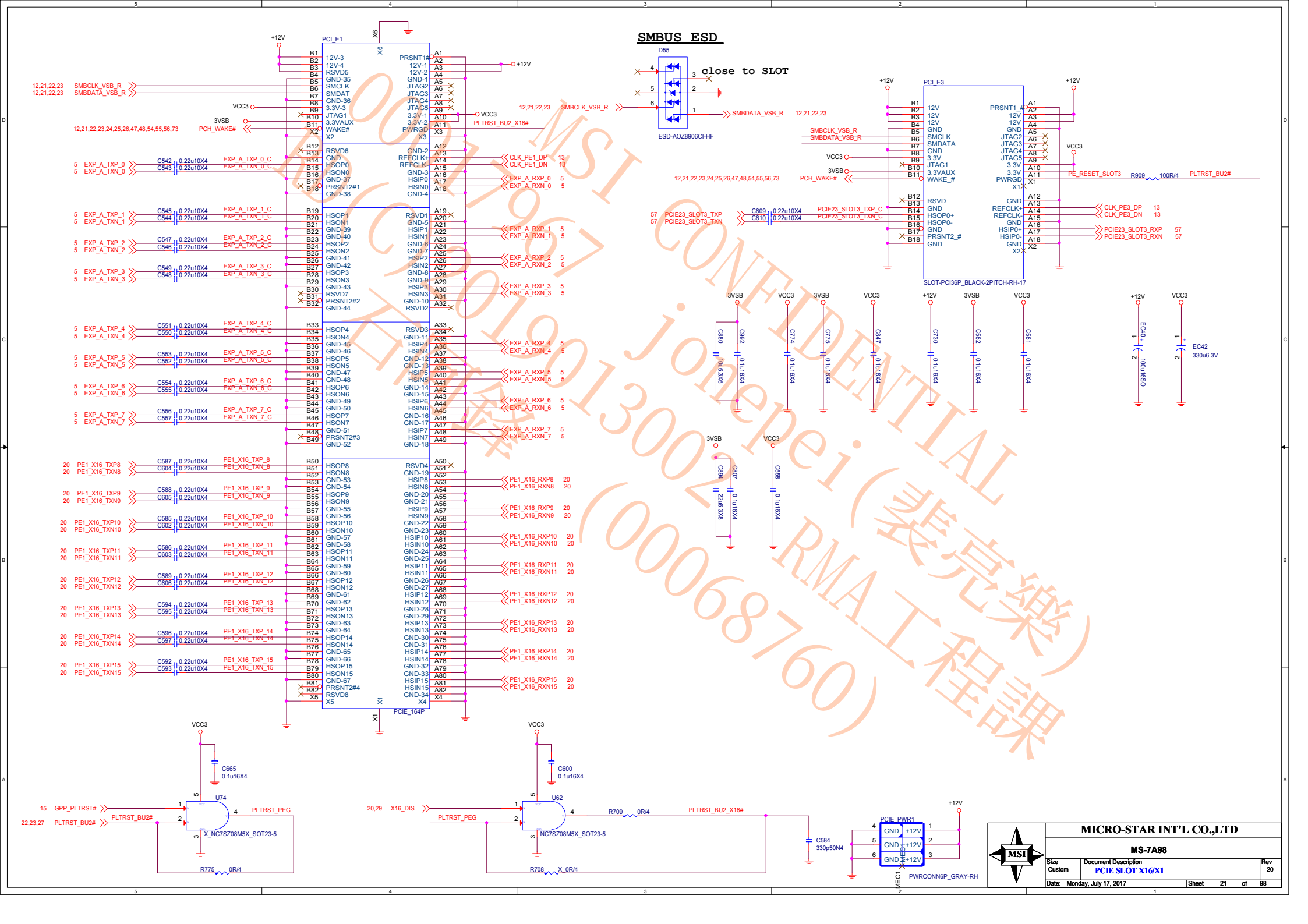
SMBUS ESD
close to SLOT
ESD-AOZ8906CI-HF
PCI_E1
PCIE_164P
PCI_E3
SLOT-PCI36P_BLACK-2PITCH-RH-17
PCIE_PWR1
PWRCONN6P_GRAY-RH
MICRO-STAR INT'L CO.,LTD
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PCIE SLOT X16/X1
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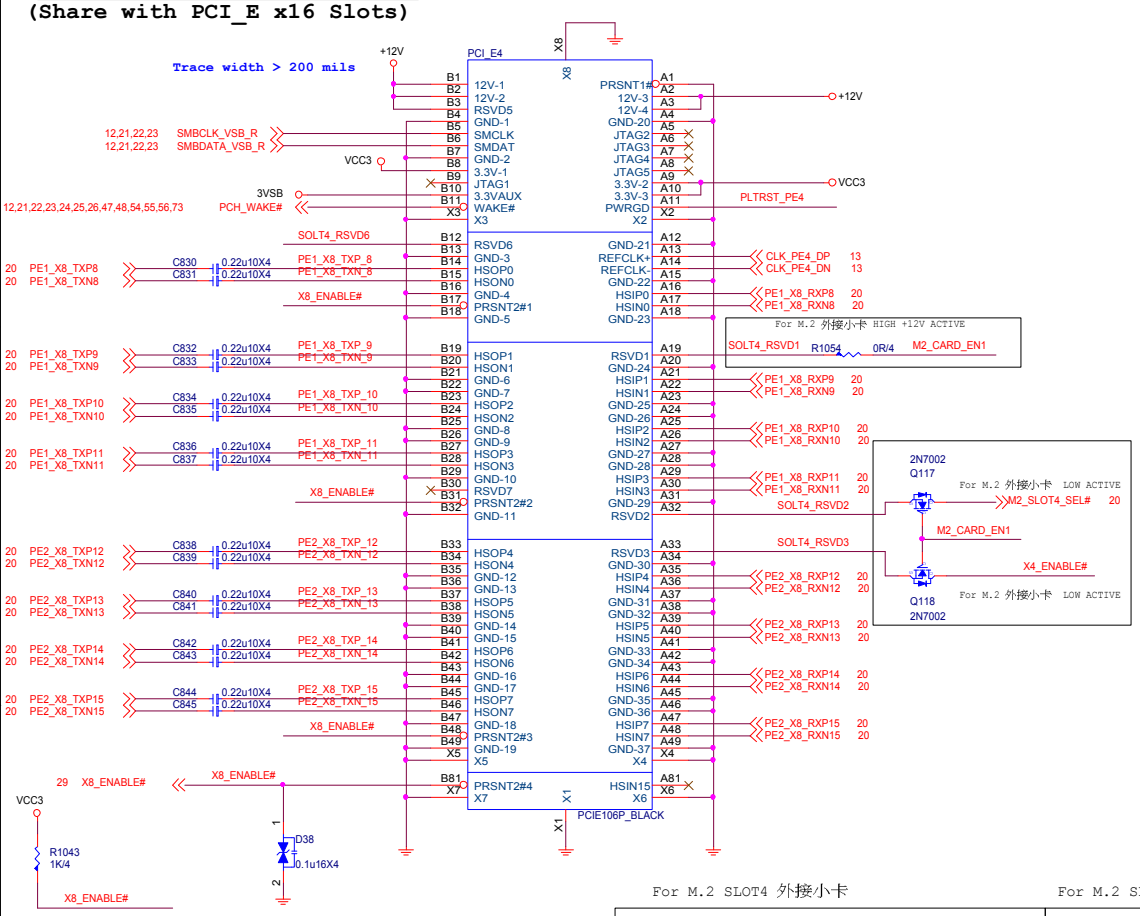
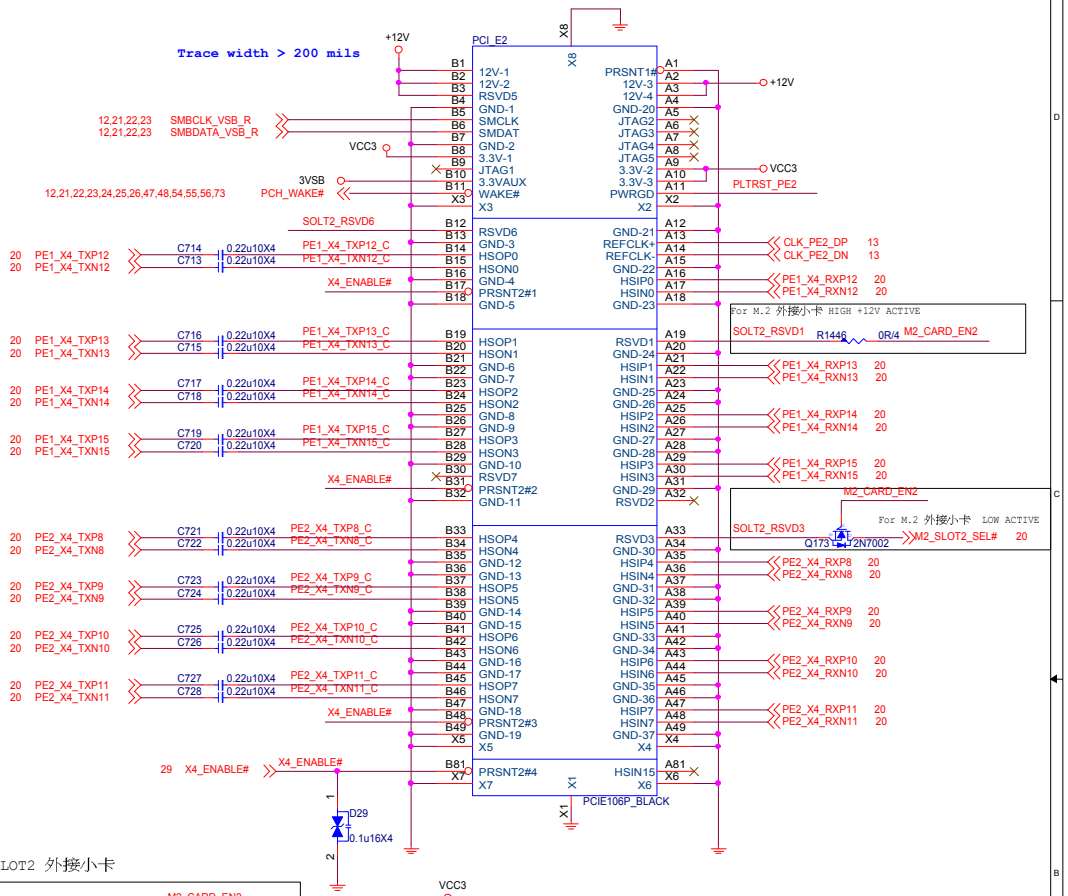
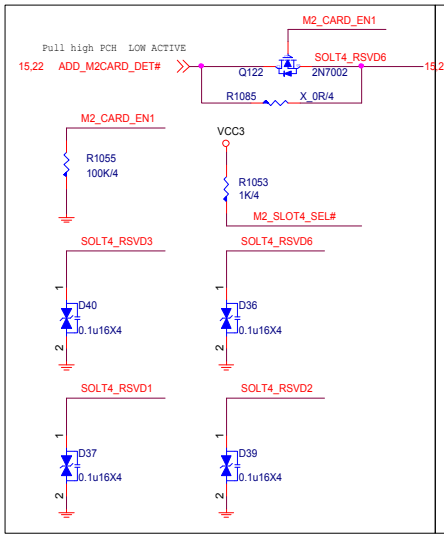
PCI_Express X8 Slot
(Share with PCI_E x16 Slots)



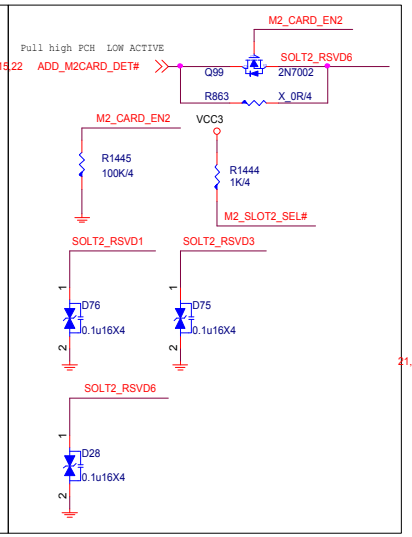
PCI_Express X4 Slot(by CPU)

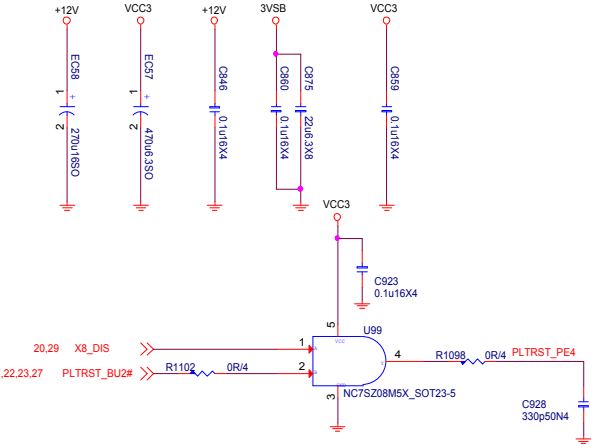


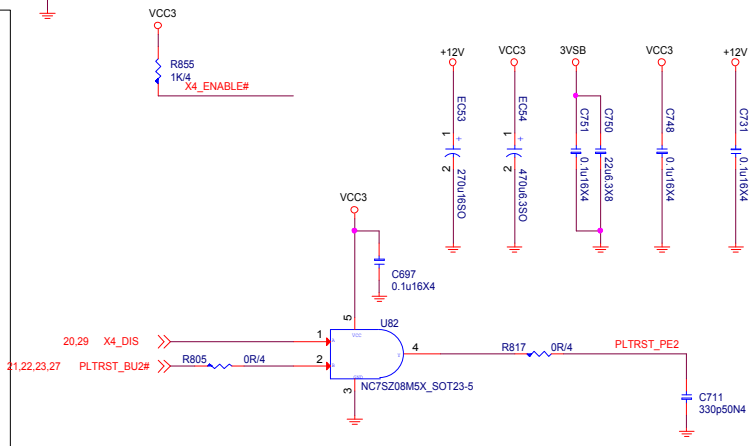
For M.2 SLOT4 外接小卡



For M.2 SLOT2 外接小卡







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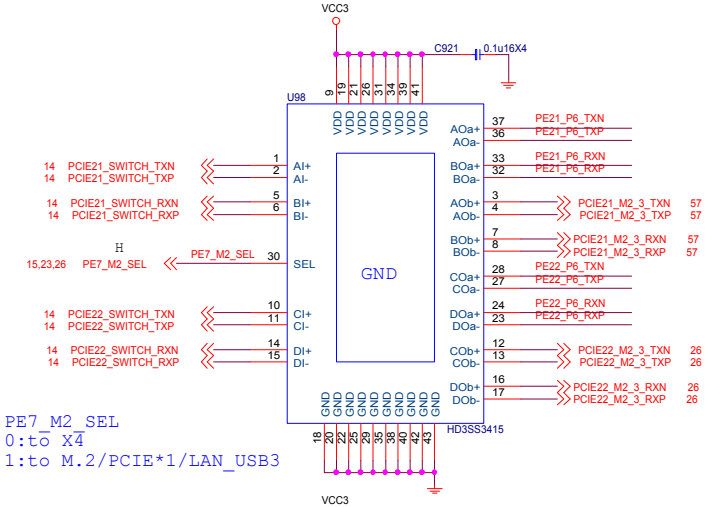
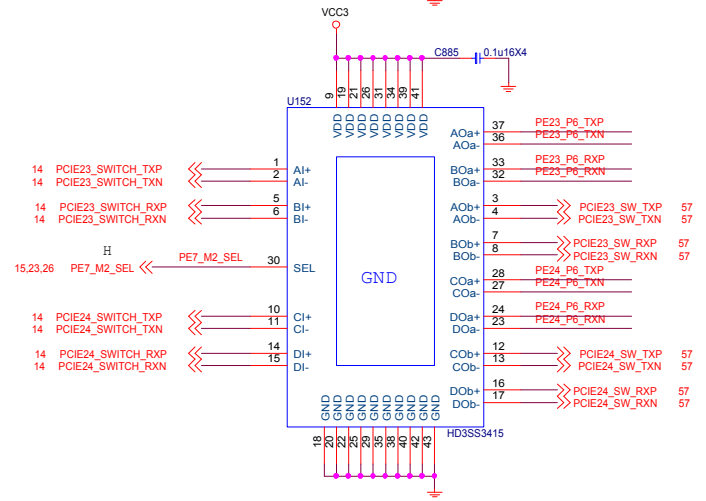
PCH PCI_Express X4 Slot

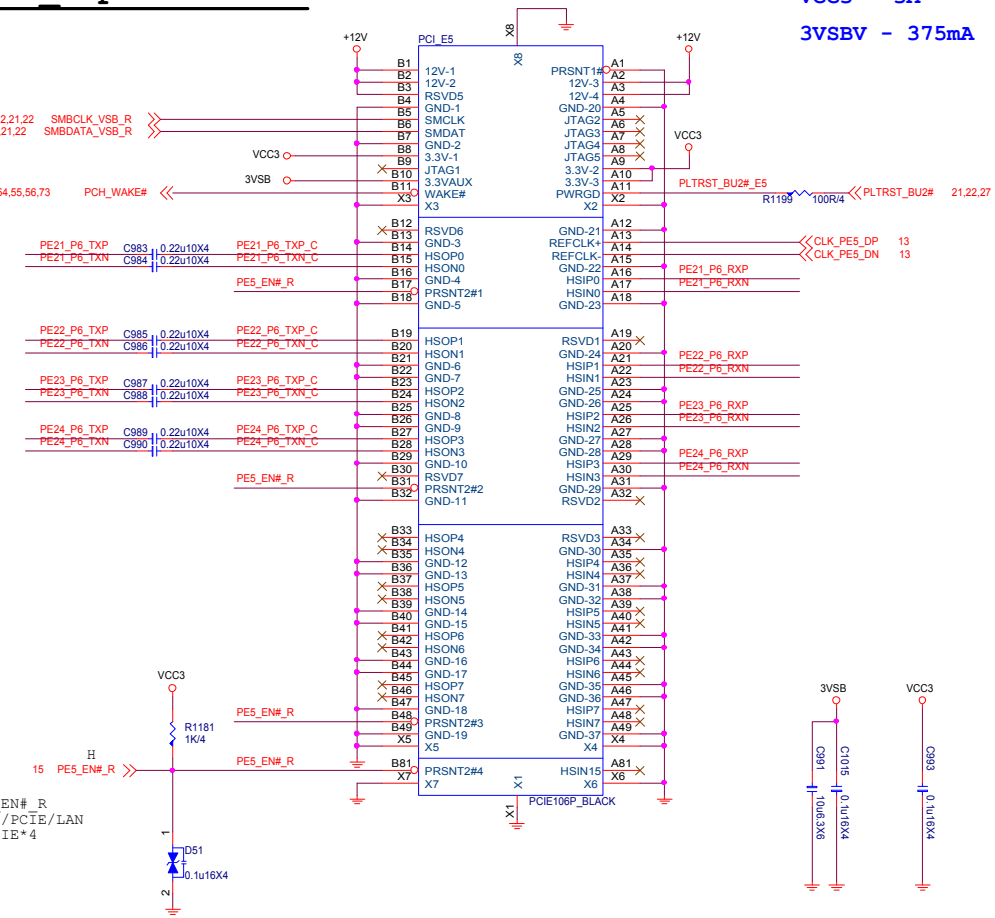
12V - 2.1A

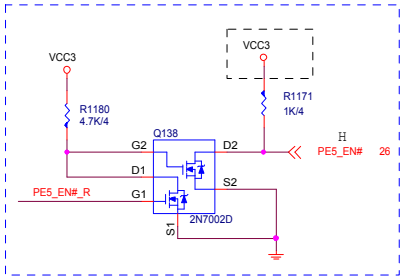
VCC3 - 3A

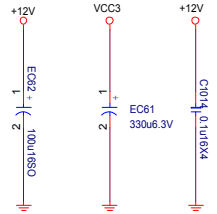
3VSBV - 375mA











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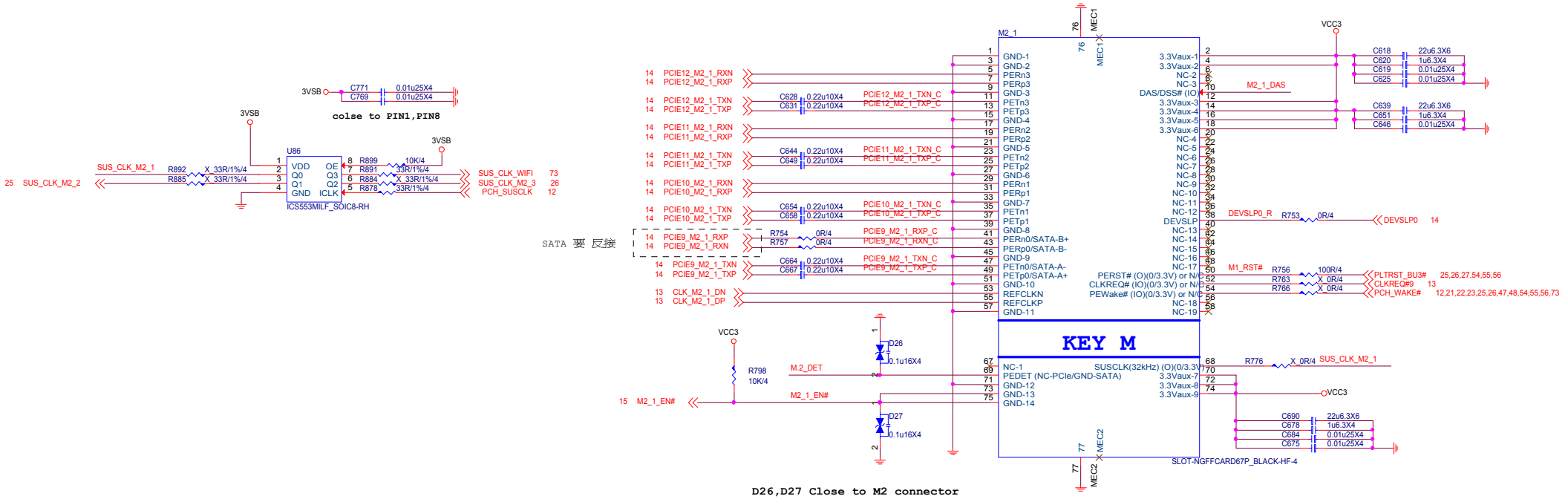
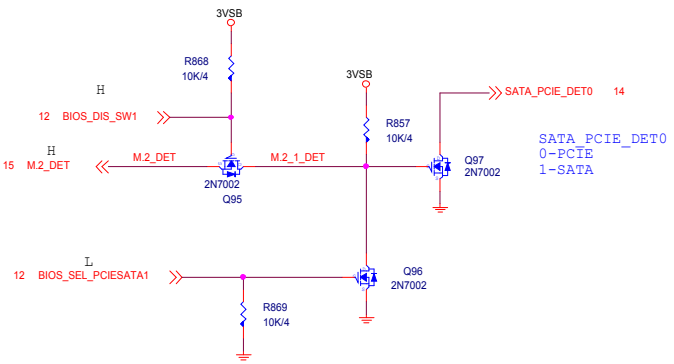
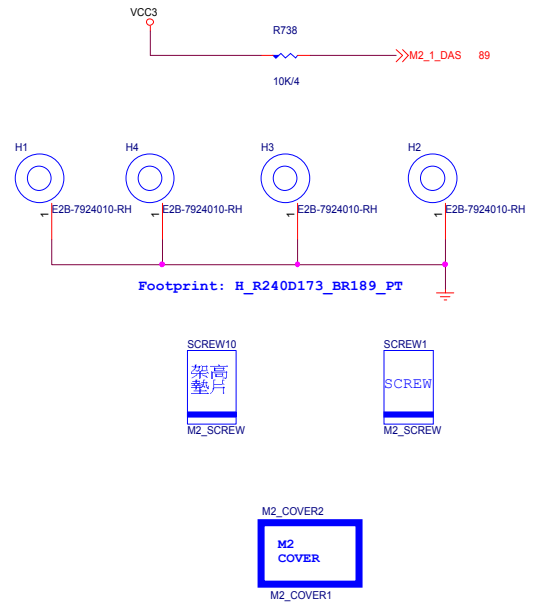




BIOS_MODE

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



MICRO-STAR INT'L CO.,LTD	
MS-7A98	
Size: Custom	Document Description: M.2-SLOT1
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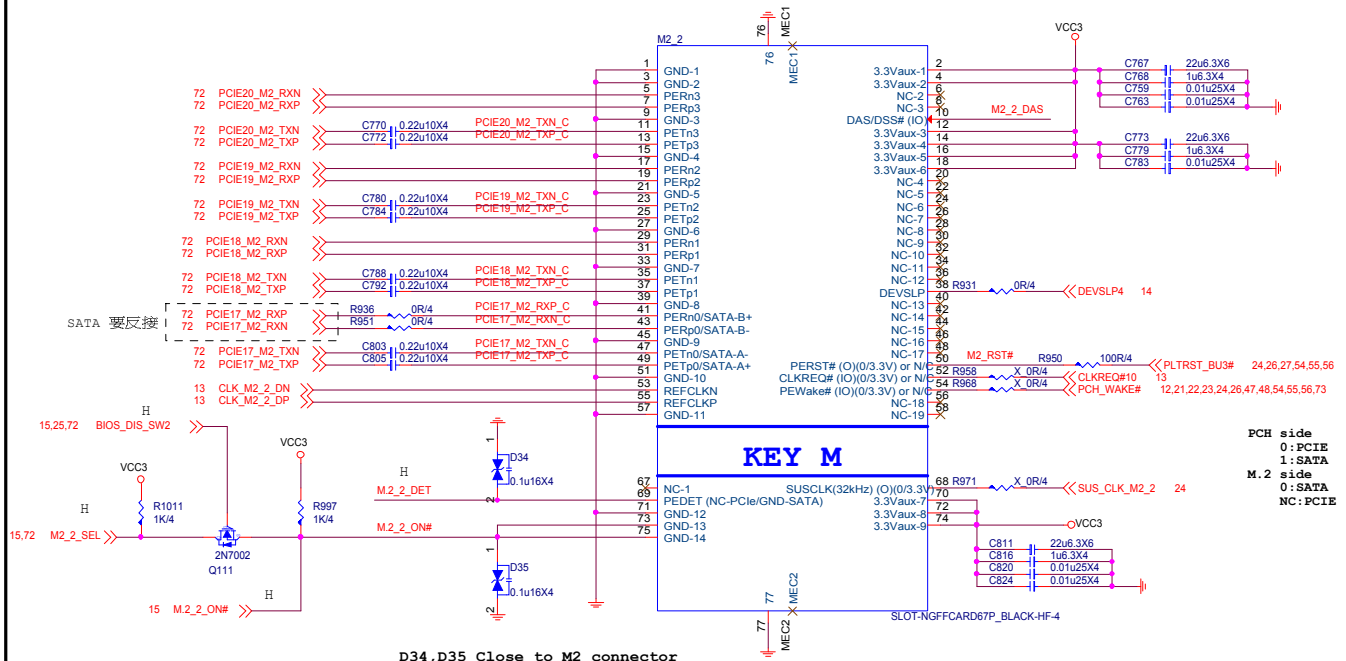
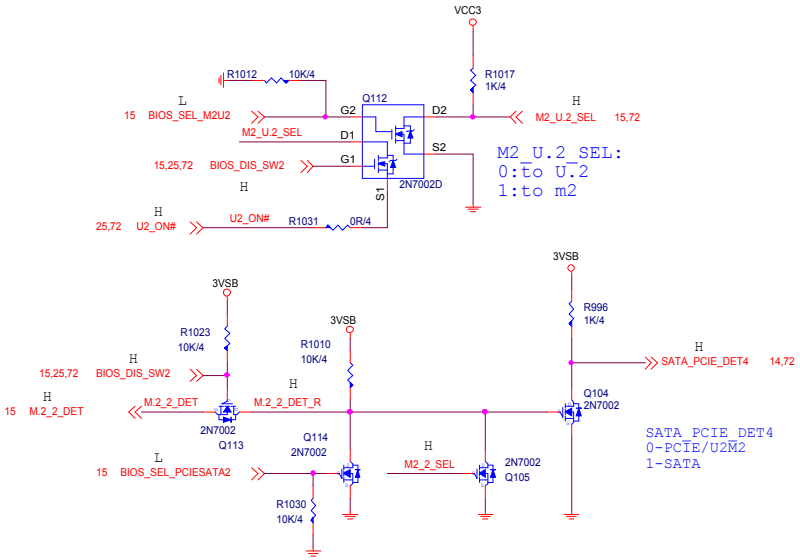
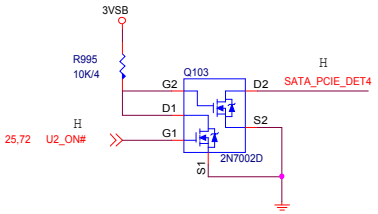
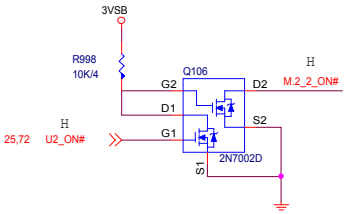
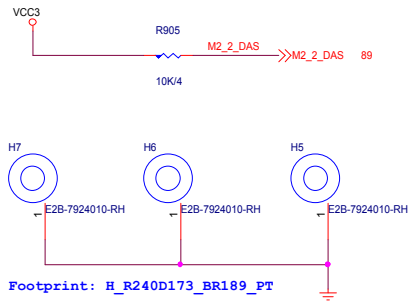






M2 cut power





MICRO-STAR INT'L CO.,LTD		
MS-7A98		
Size: Custom	Document Description: M.2-SLOT2	Rev: 20
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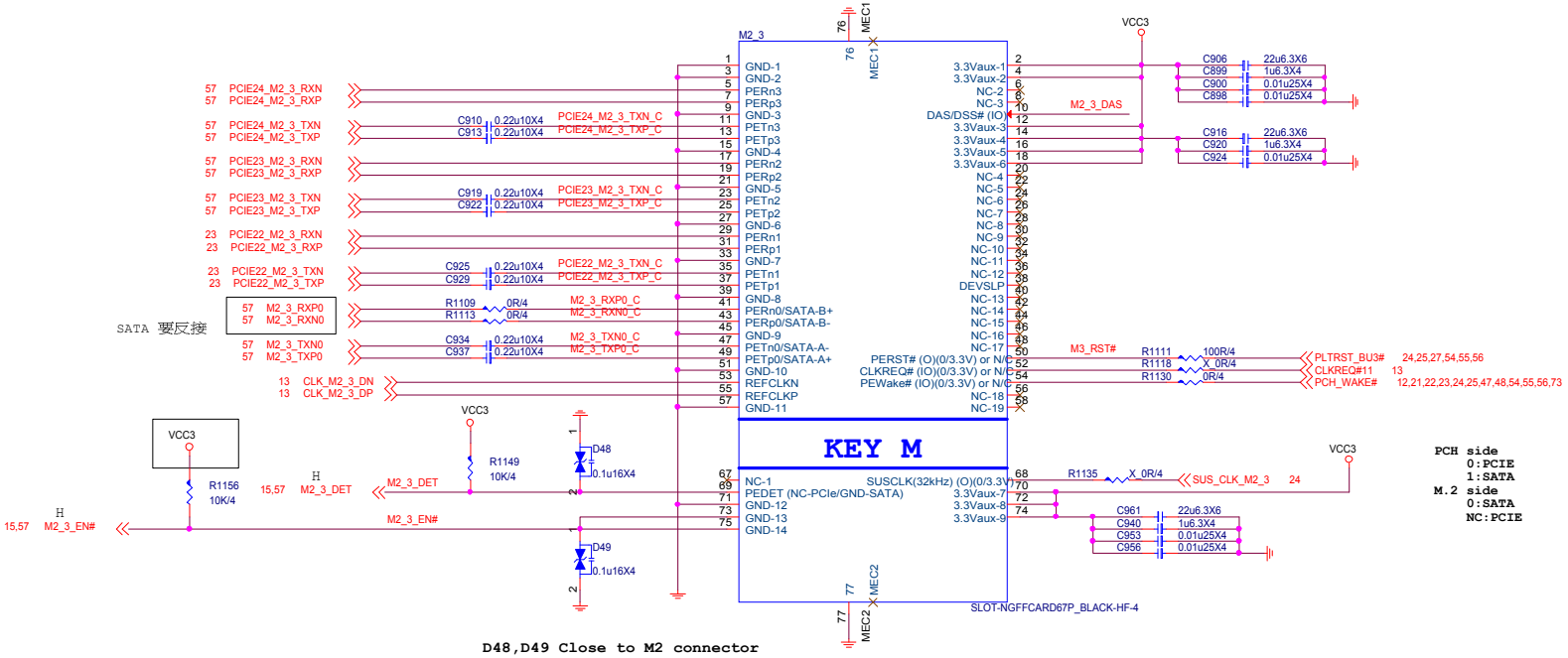
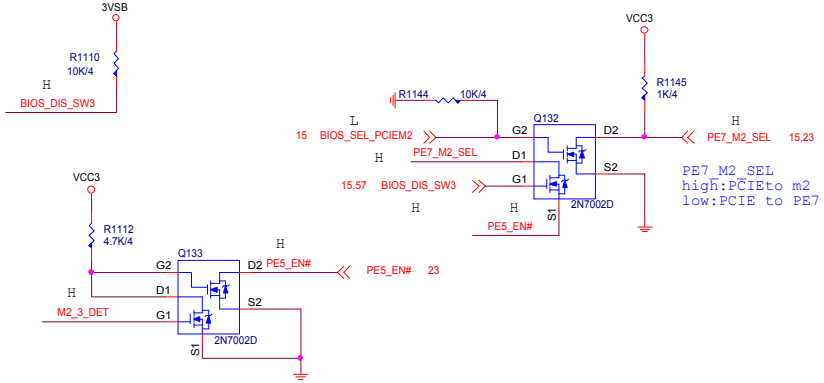
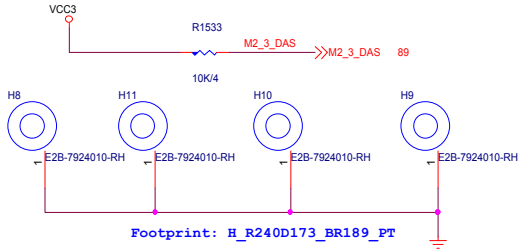
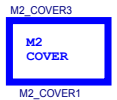


BIOS_MODE

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







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Size: Custom	Document Description: M.2-SLOT3	Rev: 20
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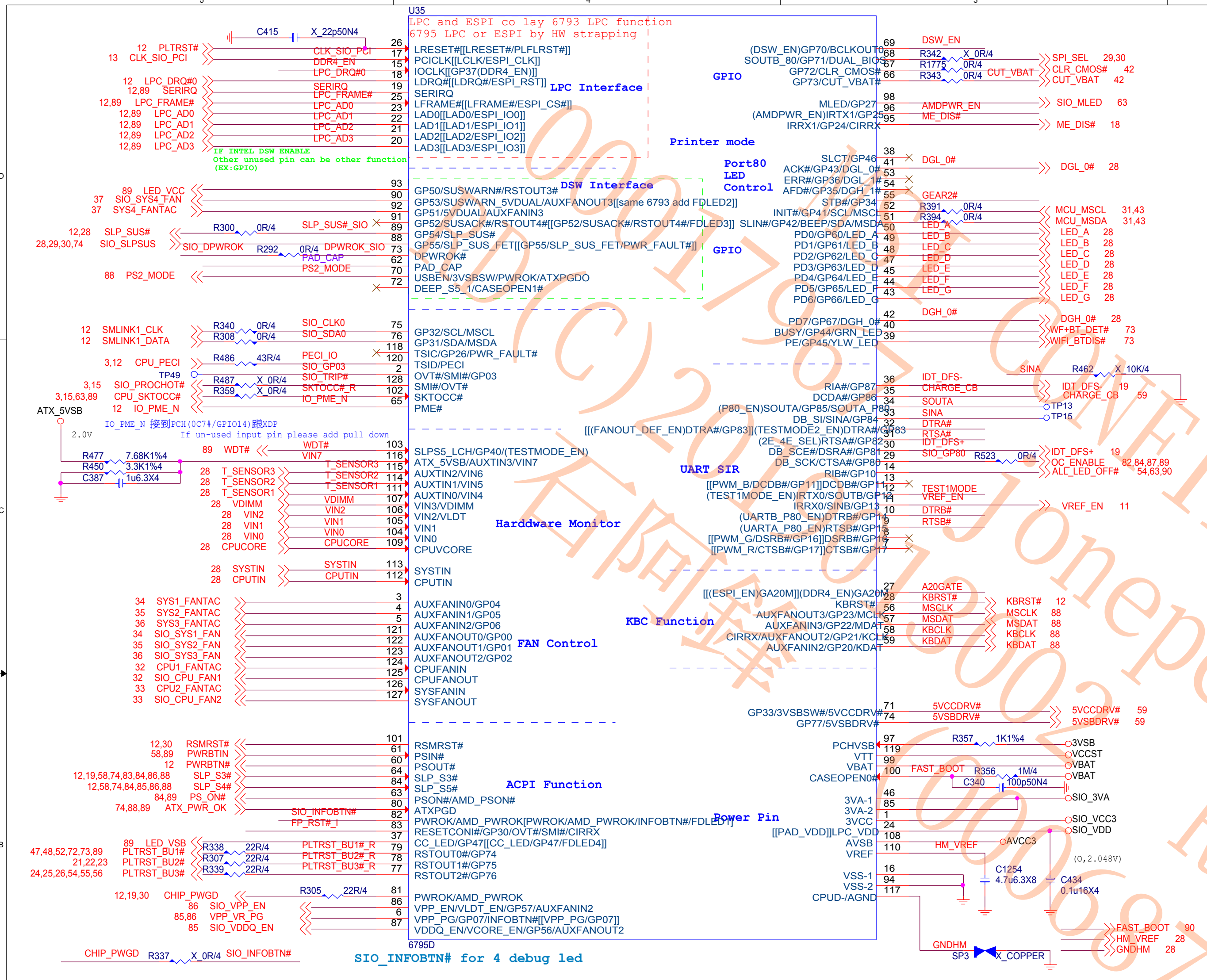
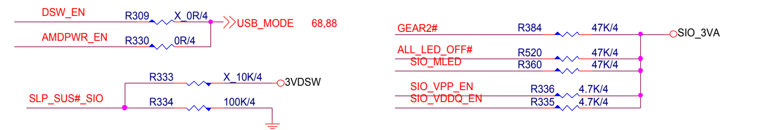
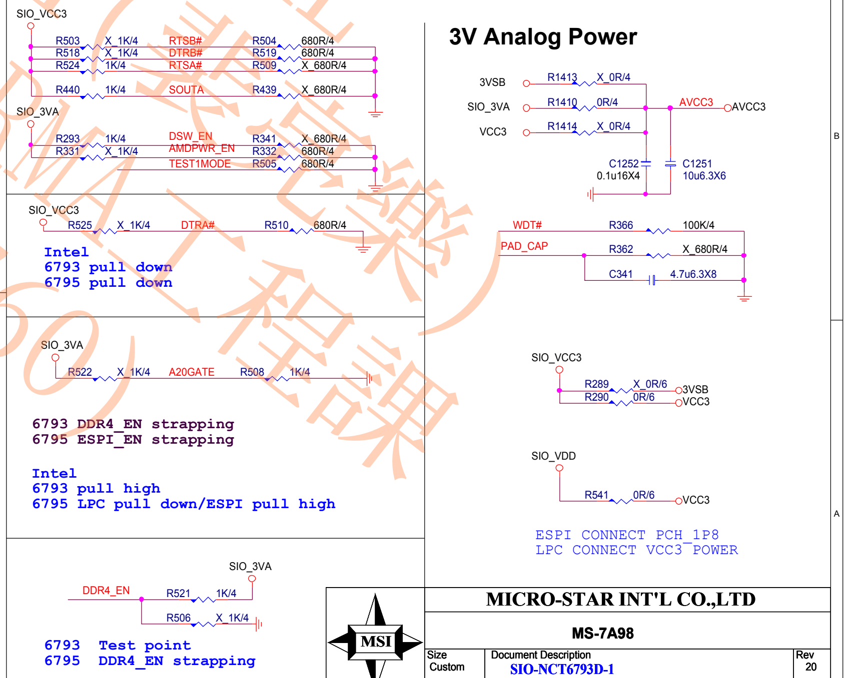


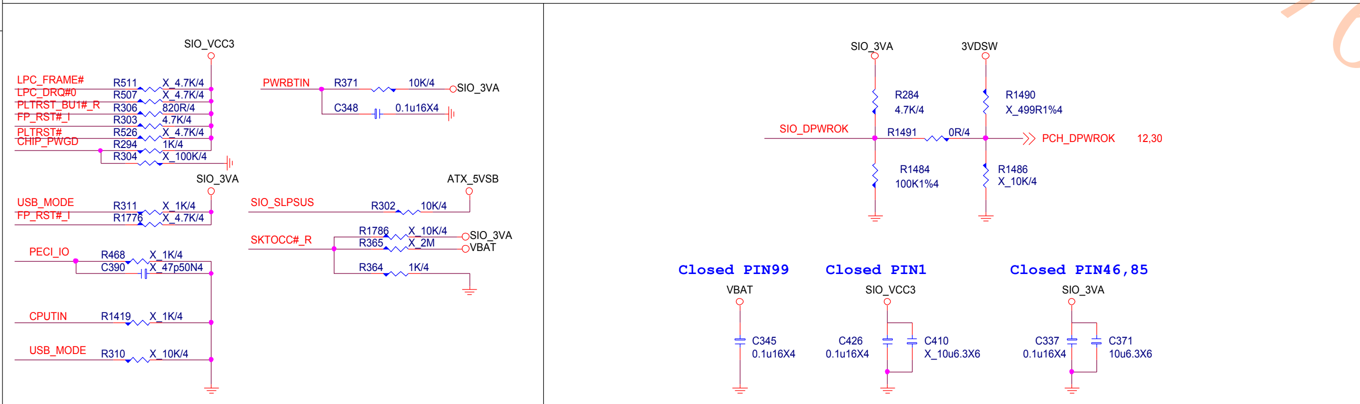


POWER ON STRAPPING PIN FOR NCT6793/6795

PIN	6793/6795 NAME	Circuit NAME	0	1	Strap Point
9	UARTA_P80_EN	RTSB#	DISABLE UARTA80	ENABLE UARTA80	LRESET
10	UARTB_P80_EN	DTRB#	DISABLE UARTB80	ENABLE UARTB80	LRESET
12	TEST1MODE_EN	TEST1MODE	DISABLE TEST1MODE	ENABLE TEST1MODE	LRESET
15	6793 test point 6795 DDR4_EN	6793 test point 6795 DDR4_EN	6793 NA 6795 Disable	6793 NA 6795 Enable	
27	6793 DDR4_EN 6795 ESPI_EN	A20GATE	6793 Disable 6795 Disable	6793 Enable 6795 Enable	
31	2E_4E_SEL	RTSA#	I/O ADDRESS 2E	I/O ADDRESS 4E	LRESET
32	6793 TESTMOD2_EN 6795 FANOUT_DEF_EN	DTRA#	6793 disable 6795 default 50%	6793 Enable 6795 default 100%	INTERNAL PWROK
34	P80_EN	SOUTA	ENABLE Non_PORT80	ENABLE PORT80	LRESET
69	DSW_EN	DSW_EN	DISABLE INTEL DSW	ENABLE INTEL DSW	INTERNAL RSMRST
96	AMDPWR_EN	AMDPWR_EN	DISABLE AMD PWR SEQ	ENABLE AMD PWR SEQ	INTERNAL RSMRST
103	TESTMODE_EN	WDT#	DISABLE TESTMODE	ENABLE TESTMODE	INTERNAL RSMRST

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





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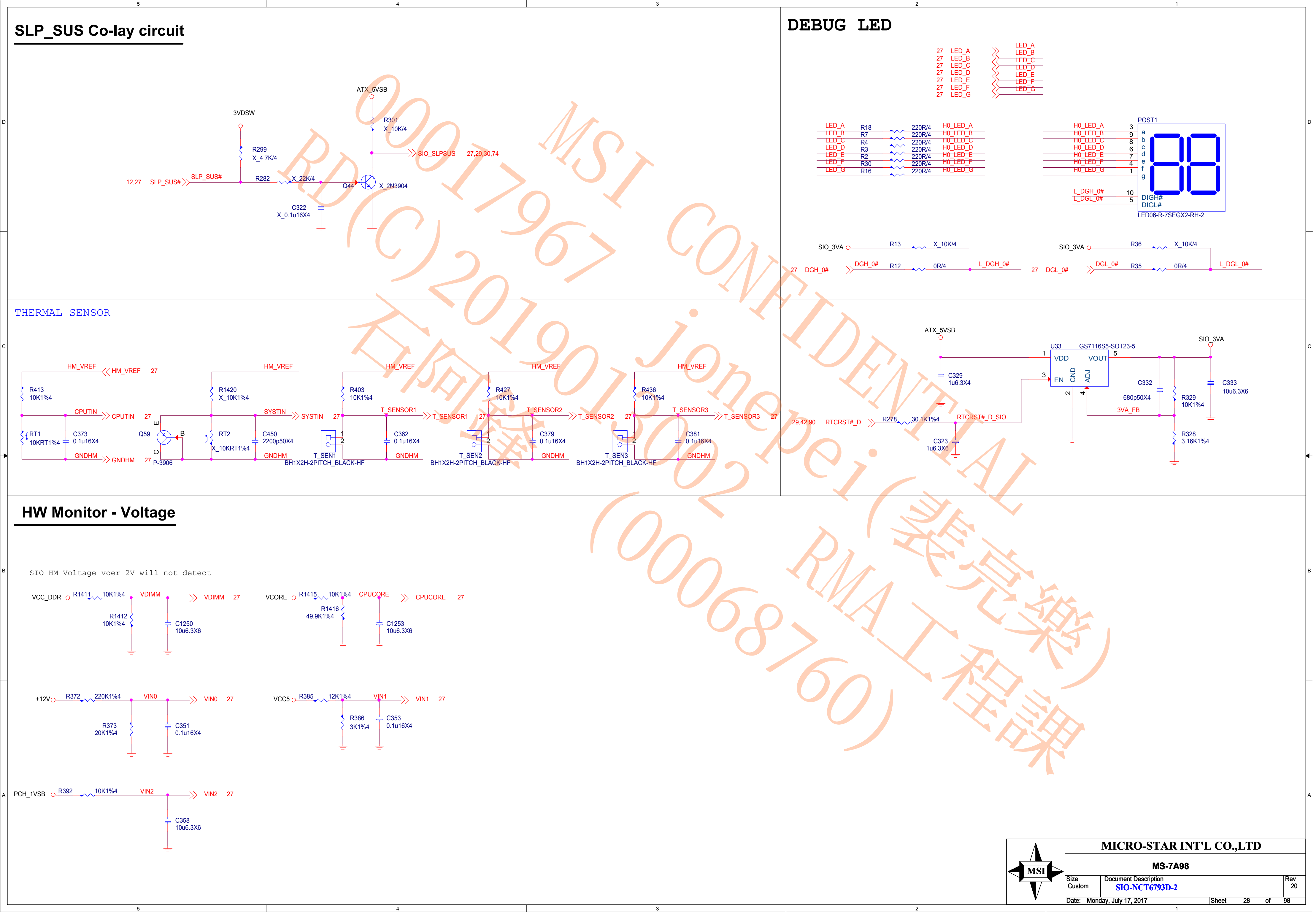
SLP_SUS Co-lay circuit
ATX_5VSB
3VDSW
R301
X_10K/4
R299
X_4.7K/4
SIO_SLPSUS 27,29,30,74
12,27 SLP_SUS# SLP_SUS#
R282 X_22K/4
Q44 X_2N3904
C322
X_0.1u16X4
DEBUG LED
27 LED_A
27 LED_B
27 LED_C
27 LED_D
27 LED_E
27 LED_F
27 LED_G
LED_A R18 220R/4 H0_LED_A
LED_B R7 220R/4 H0_LED_B
LED_C R4 220R/4 H0_LED_C
LED_D R3 220R/4 H0_LED_D
LED_E R2 220R/4 H0_LED_E
LED_F R30 220R/4 H0_LED_F
LED_G R16 220R/4 H0_LED_G
POST1
L_DGH_0#
L_DGL_0#
DIGH#
DIGL#
LED06-R-7SEGX2-RH-2
SIO_3VA R13 X_10K/4
27 DGH_0# DGH_0# R12 0R/4 L_DGH_0#
SIO_3VA R36 X_10K/4
27 DGL_0# DGL_0# R35 0R/4 L_DGL_0#
THERMAL SENSOR
HM_VREF HM_VREF 27
R413 10K1%4
CPUTIN CPUTIN 27
RT1 10KRT1%4
C373 0.1u16X4
GNDHM GNDHM 27
Q59 P-3906
R1420 X_10K1%4
SYSTIN SYSTIN 27
RT2 X_10KRT1%4
C450 2200p50X4
R403 10K1%4
T_SENSOR1 T_SENSOR1 27
C362 0.1u16X4
T_SEN1 BH1X2H-2PITCH_BLACK-HF
R427 10K1%4
T_SENSOR2 T_SENSOR2 27
C379 0.1u16X4
T_SEN2 BH1X2H-2PITCH_BLACK-HF
R436 10K1%4
T_SENSOR3 T_SENSOR3 27
C381 0.1u16X4
T_SEN3 BH1X2H-2PITCH_BLACK-HF
ATX_5VSB
U33 GS7116S5-SOT23-5
VDD VOUT EN GND ADJ
SIO_3VA
C329 1u6.3X4
C332 680p50X4
R329 10K1%4
C333 10u6.3X6
29,42,90 RTCRST#_D
R278 30.1K1%4
RTCRST#_D_SIO
C323 1u6.3X6
3VA_FB
R328 3.16K1%4
HW Monitor - Voltage
SIO HM Voltage voer 2V will not detect
VCC_DDR R1411 10K1%4 VDIMM VDIMM 27
R1412 10K1%4
C1250 10u6.3X6
VCORE R1415 10K1%4 CPUCORE CPUCORE 27
R1416 49.9K1%4
C1253 10u6.3X6
+12V R372 220K1%4 VIN0 VIN0 27
R373 20K1%4
C351 0.1u16X4
VCC5 R385 12K1%4 VIN1 VIN1 27
R386 3K1%4
C353 0.1u16X4
PCH_1VSB R392 10K1%4 VIN2 VIN2 27
C358 10u6.3X6
MSI
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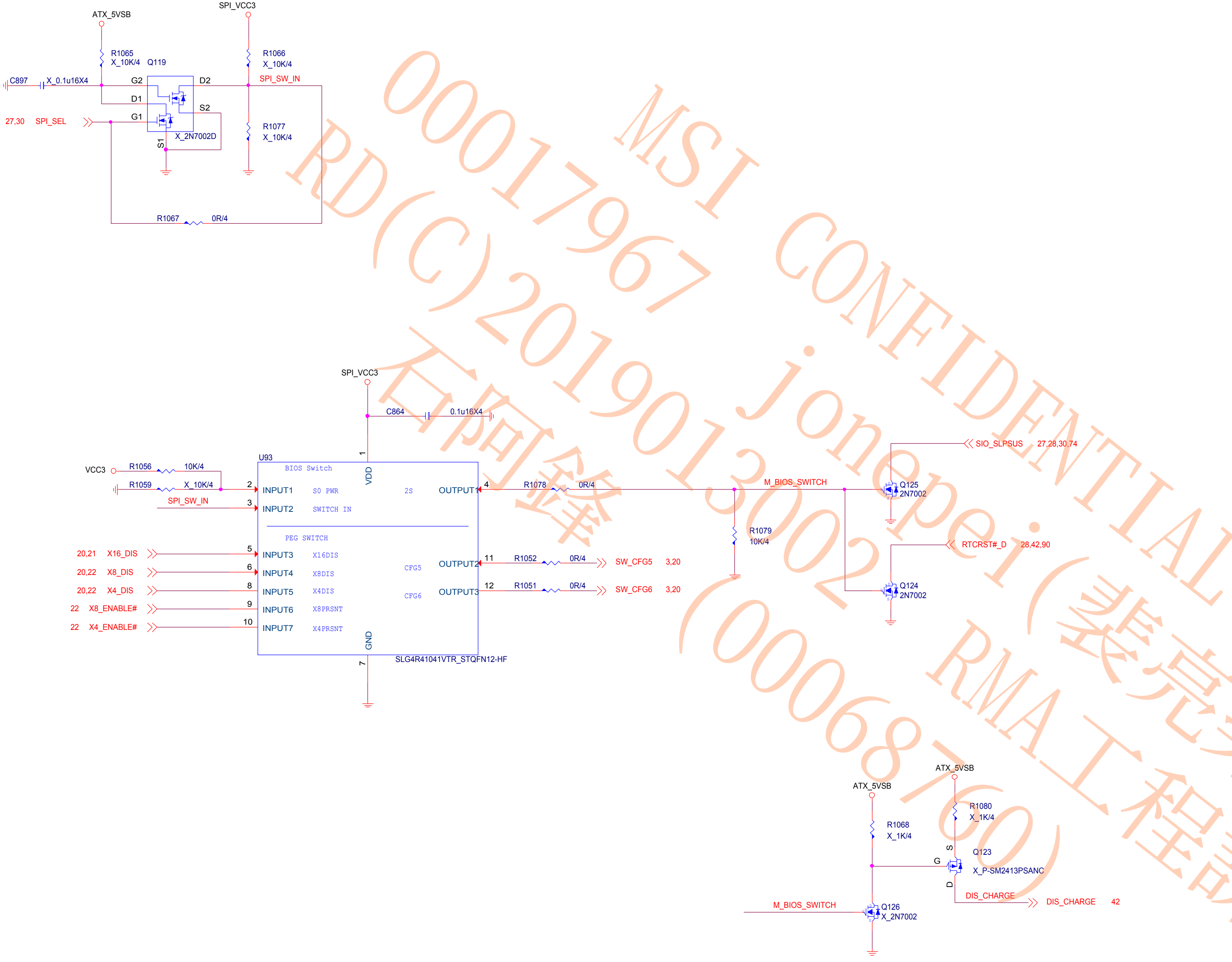

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Size	Document Description	Rev
Custom	Dual bios control-Silego	20

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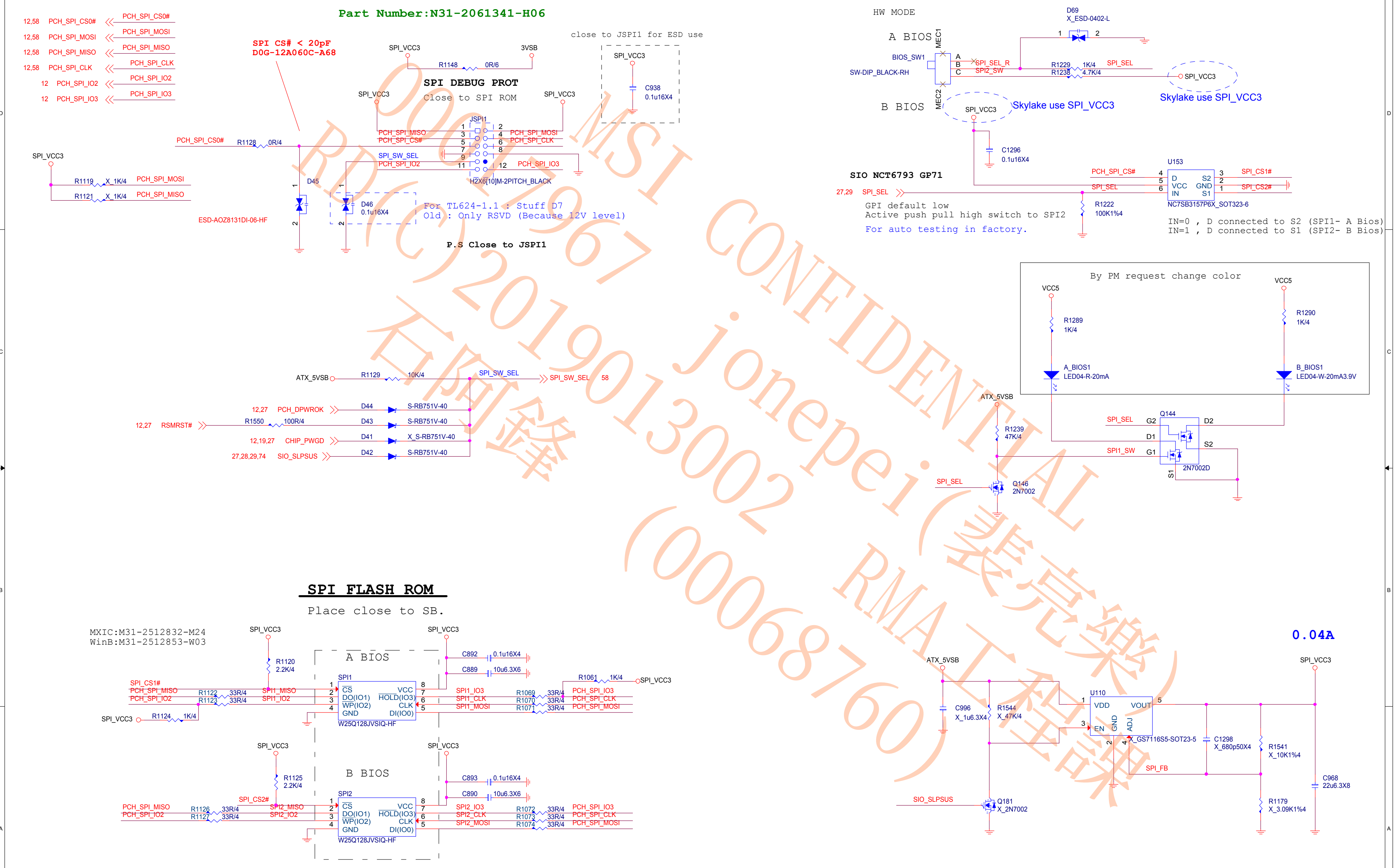

Part Number:N31-2061341-H06
SPI CS# < 20pF
D0G-12A060C-A68
SPI DEBUG PROT
Close to SPI ROM
close to JSPI1 for ESD use
JSPI1
H2X6[10]M-2PITCH_BLACK
PCH_SPI_CS0#
PCH_SPI_MOSI
PCH_SPI_MISO
PCH_SPI_CLK
PCH_SPI_IO2
PCH_SPI_IO3
SPI_VCC3
3VSB
R1148 0R/6
R1128 0R/4
R1119 X_1K/4
R1121 X_1K/4
C938 0.1u16X4
D45
D46 0.1u16X4
ESD-AOZ8131DI-06-HF
For TL624-1.1 : Stuff D7
Old : Only RSVD (Because 12V level)
P.S Close to JSPI1
HW MODE
A BIOS
B BIOS
BIOS_SW1
SW-DIP_BLACK-RH
MEC1
MEC2
D69 X_ESD-0402-L
SPI_SEL_R
SPI2_SW
R1229 1K/4
R1238 4.7K/4
SPI_SEL
Skylake use SPI_VCC3
C1296 0.1u16X4
SIO NCT6793 GP71
U153
NC7SB3157P6X_SOT323-6
SPI_CS1#
SPI_CS2#
R1222 100K1%4
GPI default low
Active push pull high switch to SPI2
For auto testing in factory.
IN=0 , D connected to S2 (SPI1- A Bios)
IN=1 , D connected to S1 (SPI2- B Bios)
By PM request change color
VCC5
R1289 1K/4
R1290 1K/4
A_BIOS1 LED04-R-20mA
B_BIOS1 LED04-W-20mA3.9V
ATX_5VSB
R1129 10K/4
SPI_SW_SEL
PCH_DPWROK
RSMRST#
R1550 100R/4
CHIP_PWGD
SIO_SLPSUS
D44 S-RB751V-40
D43 S-RB751V-40
D41 X_S-RB751V-40
D42 S-RB751V-40
R1239 47K/4
Q144 2N7002D
Q146 2N7002
SPI1_SW
SPI FLASH ROM
Place close to SB.
MXIC:M31-2512832-M24
WinB:M31-2512853-W03
R1120 2.2K/4
R1125 2.2K/4
SPI1
SPI2
W25Q128JVSIQ-HF
CS
DO(IO1)
WP(IO2)
GND
VCC
HOLD(IO3)
CLK
DI(IO0)
R1122 33R/4
R1123 33R/4
R1124 1K/4
R1126 33R/4
R1127 33R/4
C892 0.1u16X4
C889 10u6.3X6
C893 0.1u16X4
C890 10u6.3X6
R1061 1K/4
R1069 33R/4
R1070 33R/4
R1071 33R/4
R1072 33R/4
R1073 33R/4
R1074 33R/4
0.04A
U110
X_GS7116S5-SOT23-5
VDD
VOUT
EN
GND
ADJ
C996 X_1u6.3X4
R1544 X_47K/4
C1298 X_680p50X4
R1541 X_10K1%4
R1179 X_3.09K1%4
C968 22u6.3X8
SPI_FB
Q181 X_2N7002

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

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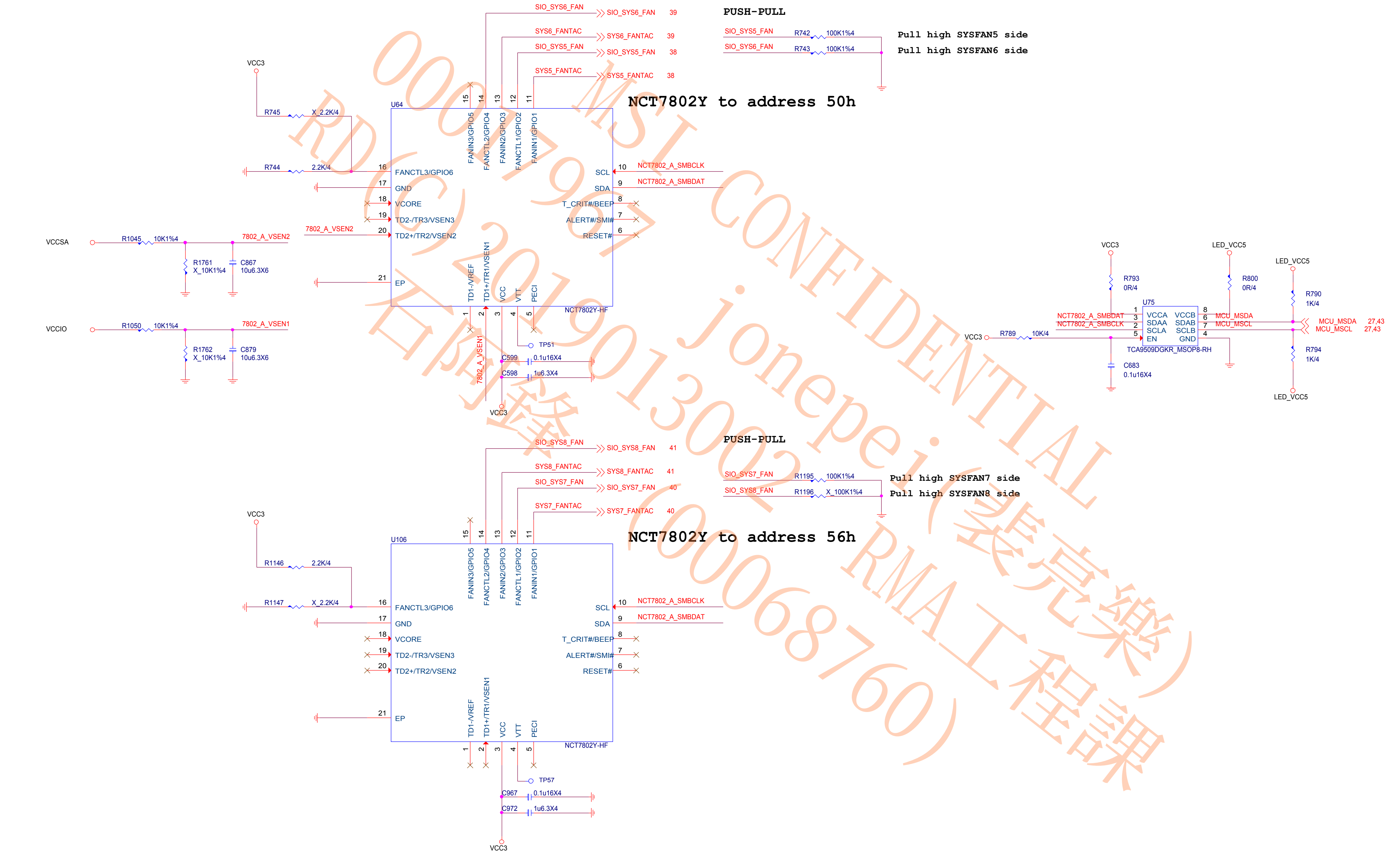

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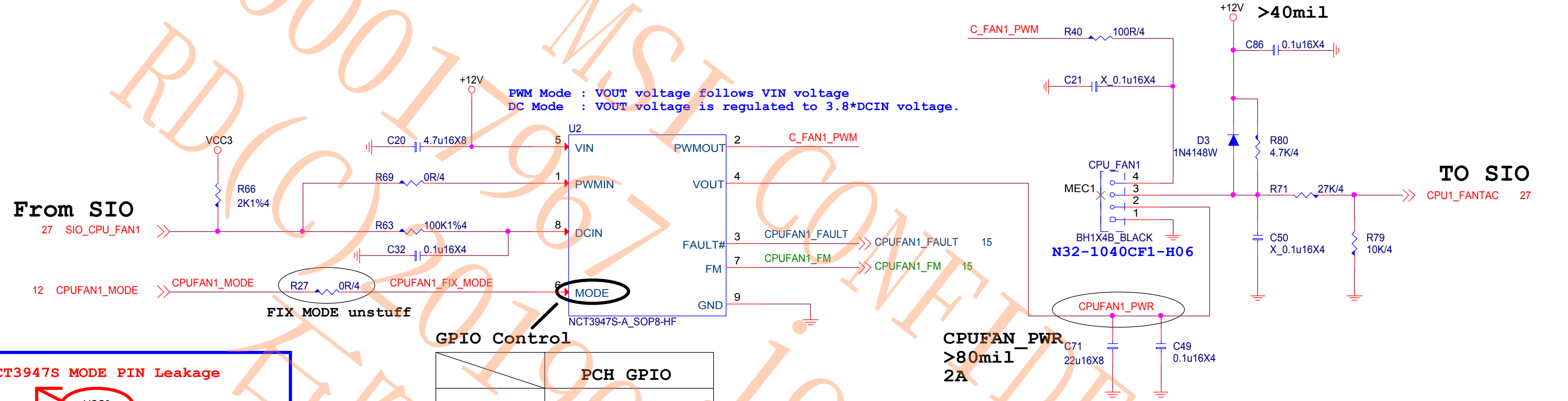
TYPE J : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO

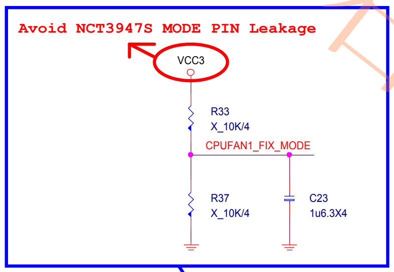


GPIO Control

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

Default

Internall pull up 1.65V



Resever For FIX DC or PWM MODE USE By PM SPEC

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Size Custom	Document Description CPU FAN1	Rev 20
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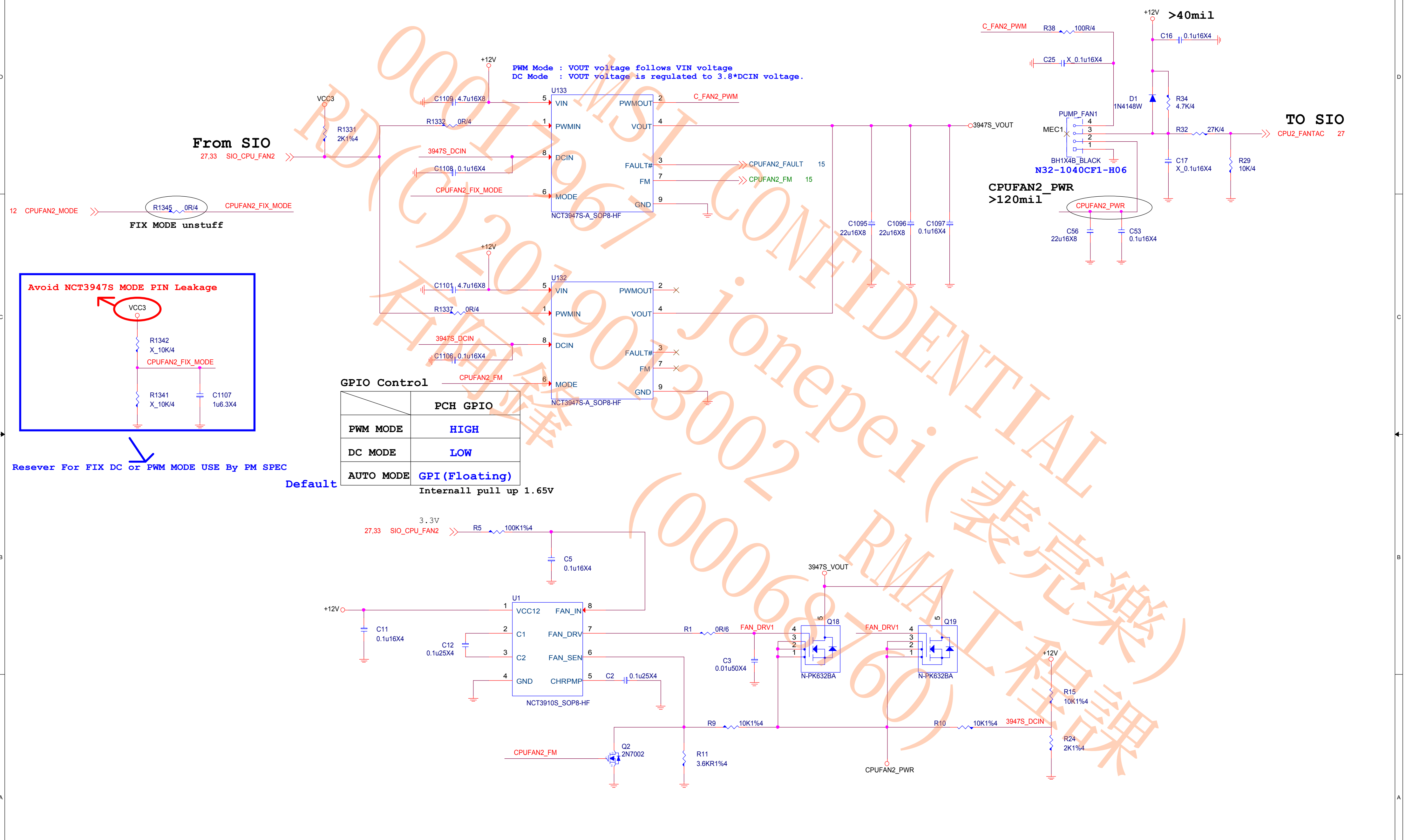
TYPE J : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO



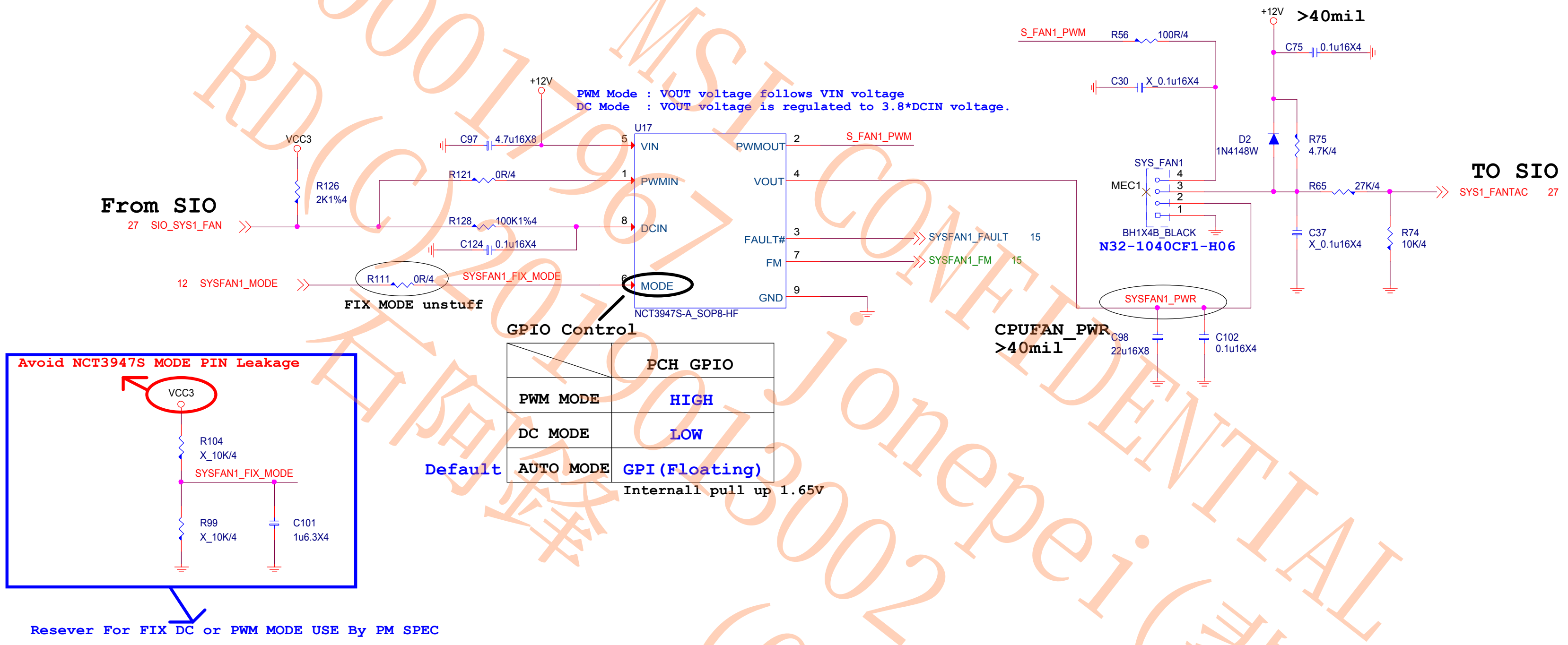
GPIO Control

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

Default

Internall pull up 1.65V

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



GPIO Control

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

Default: AUTO MODE

Internall pull up 1.65V

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MS-7A98

Size	Document Description	Rev
Custom	SYSTEM FAN1	20

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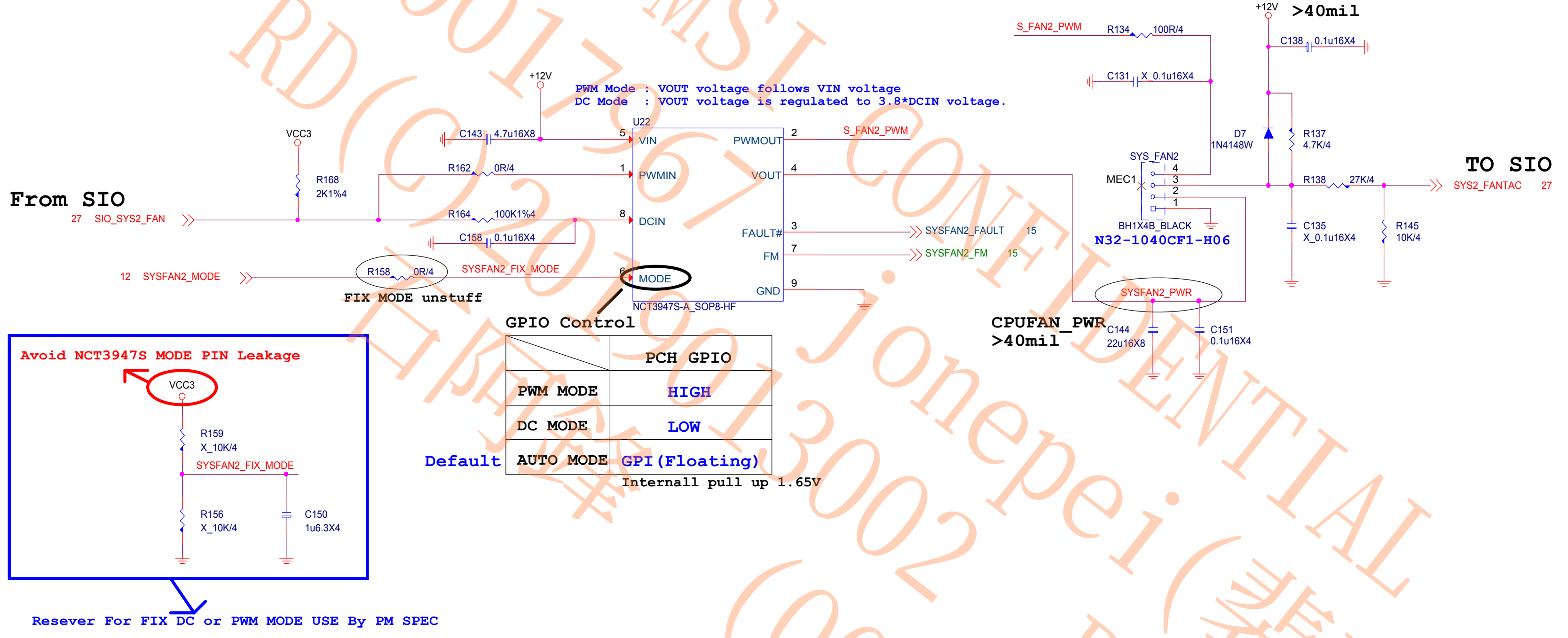
TYPE J : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO



GPIO Control

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

Internall pull up 1.65V

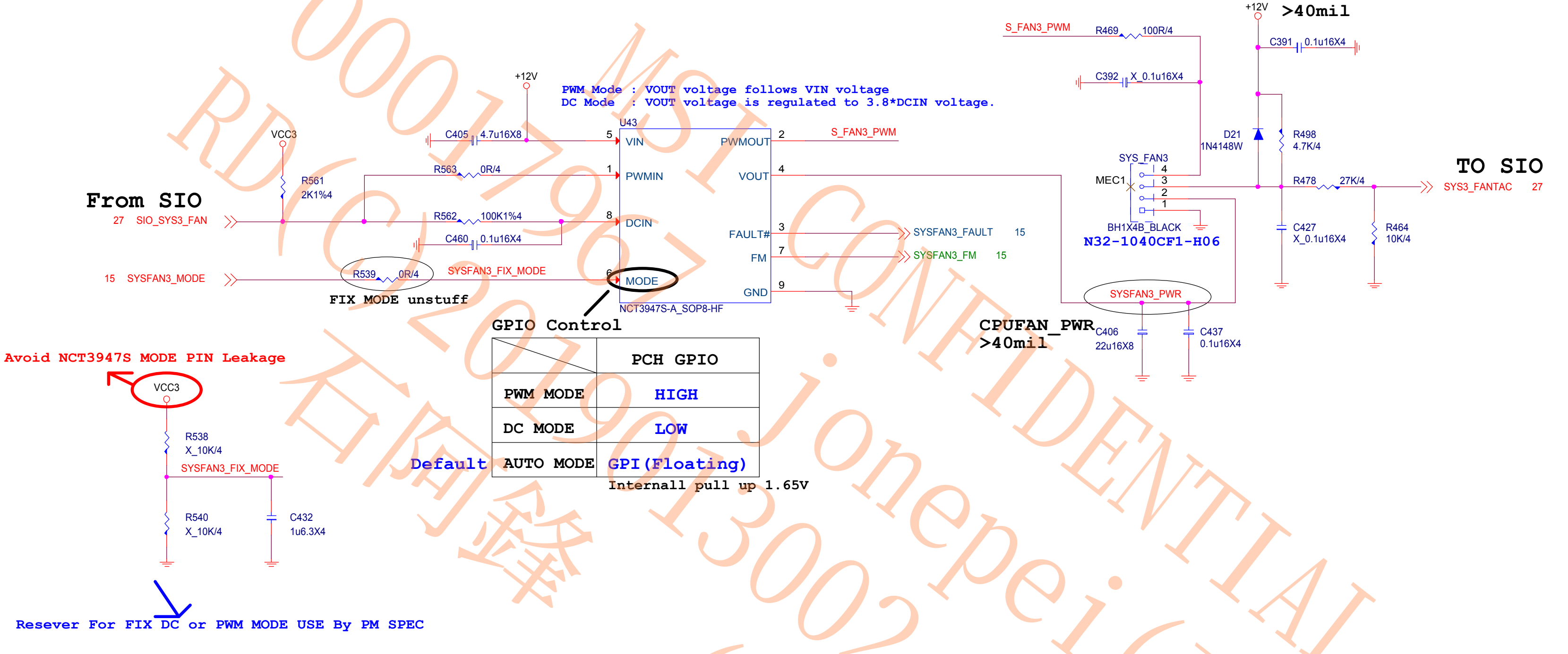
MICRO-STAR INT'L CO.,LTD

MS-7A98

Size	Document Description	Rev
Custom	SYSTEM FAN2	20

Date: Monday, July 17, 2017 Sheet 35 of 98

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



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

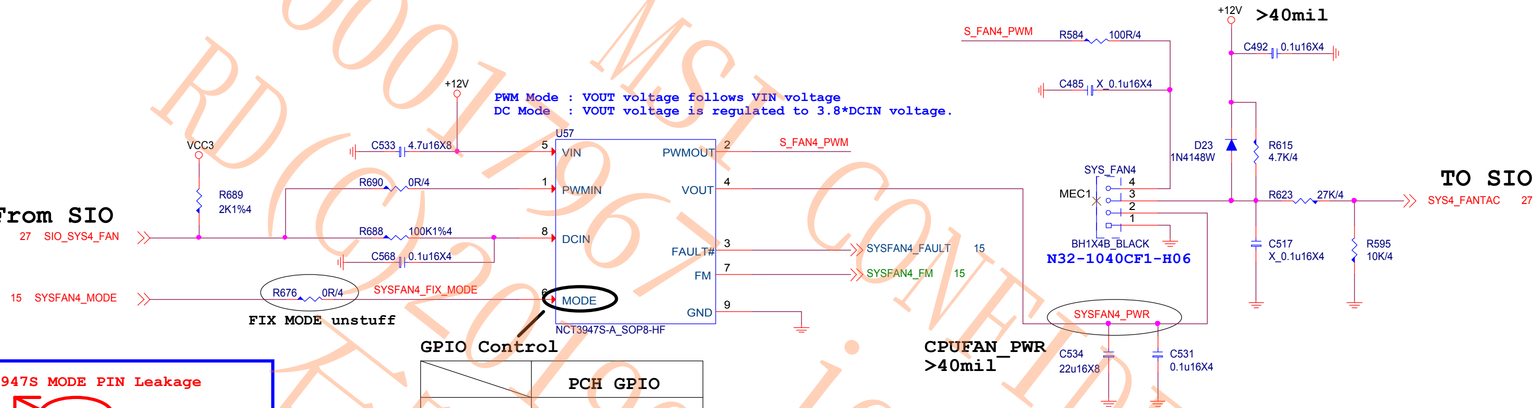
MICRO-STAR INT'L CO.,LTD

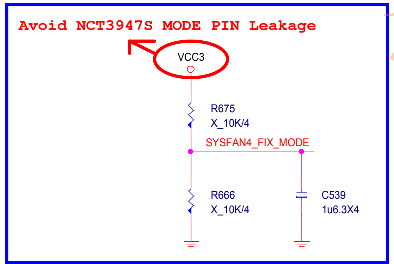
MS-7A98

Size: Custom | Document Description: SYSTEM FAN3 | Rev: 20

Date: Monday, July 17, 2017 | Sheet 36 of 98

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





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

Default — AUTO MODE

Internall pull up 1.65V

Resever For FIX DC or PWM MODE USE By PM SPEC

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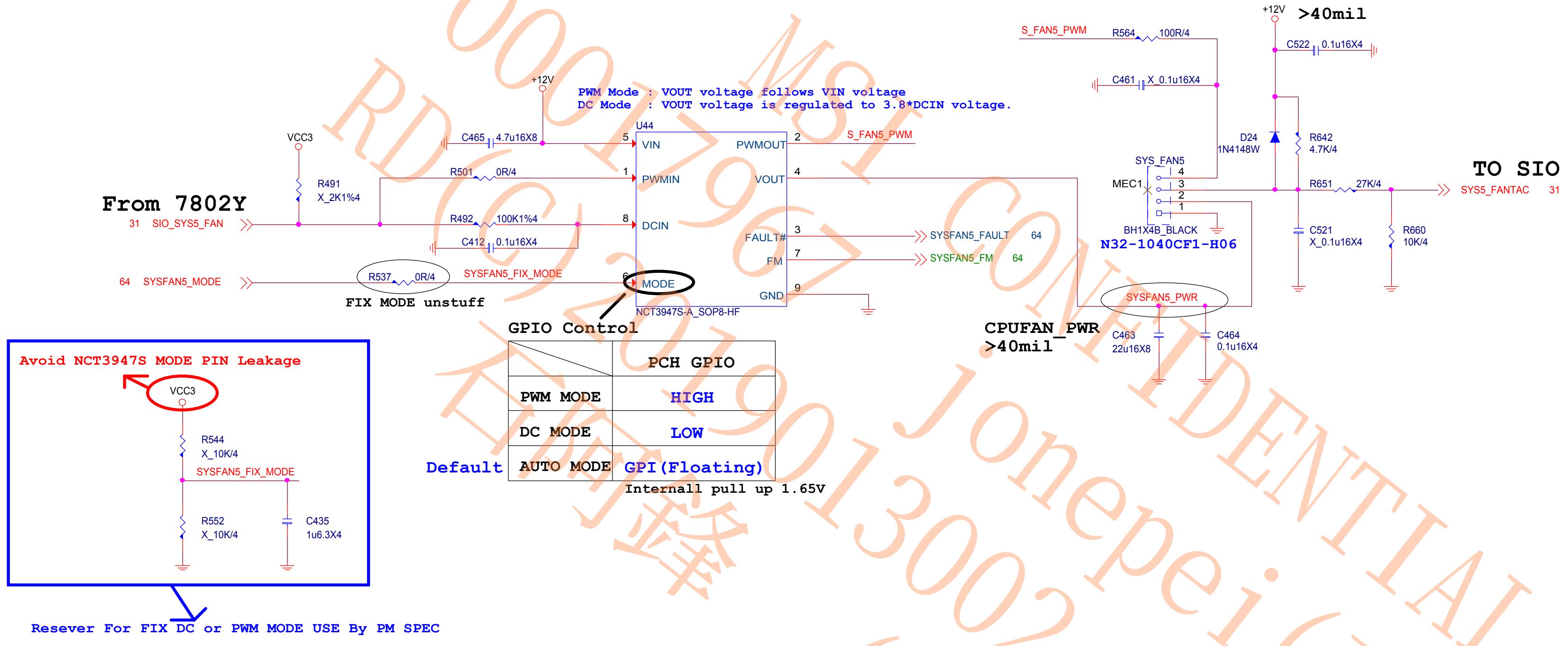
Size: Custom | Document Description: SYSTEM FAN4 | Rev: 20

Date: Monday, July 17, 2017 | Sheet 37 of 98

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



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

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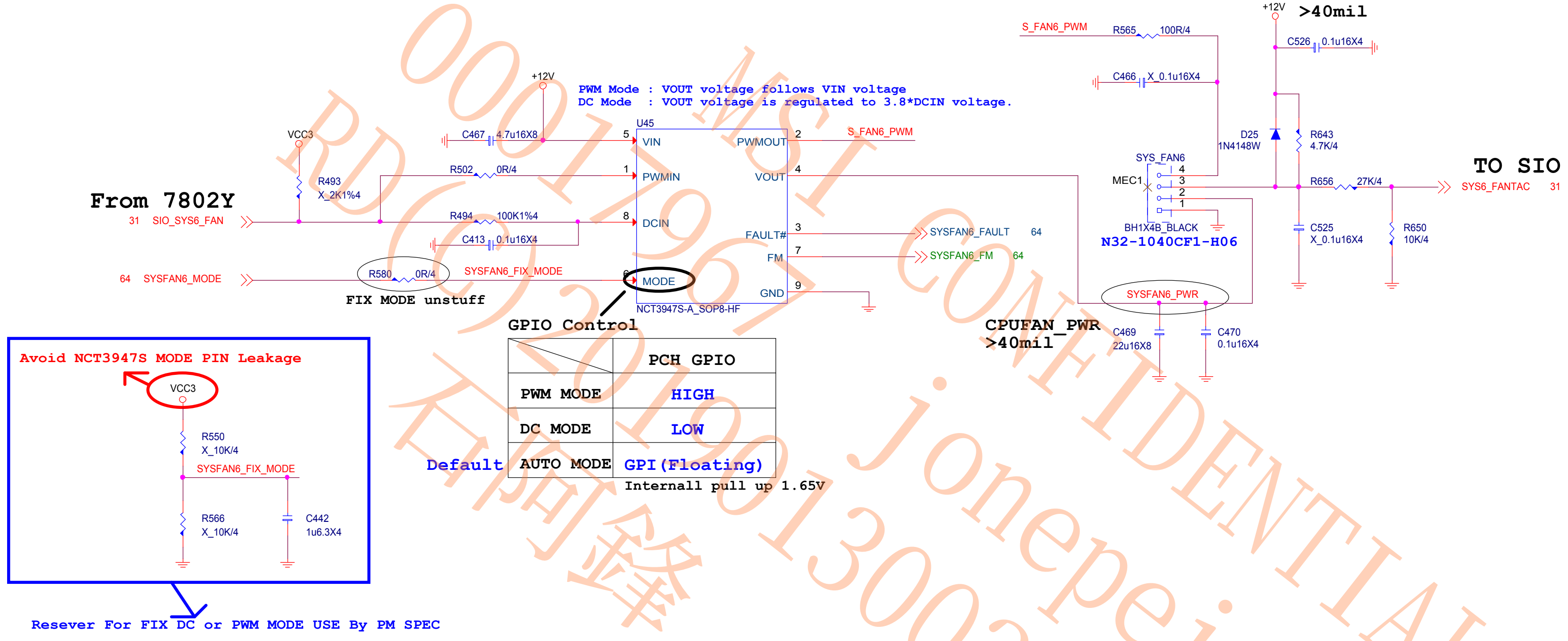
Size	Document Description	Rev
Custom	SYSTEM FAN5	20

Date: Monday, July 17, 2017 Sheet 38 of 98

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



GPIO Control

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

Default: AUTO MODE

Internall pull up 1.65V

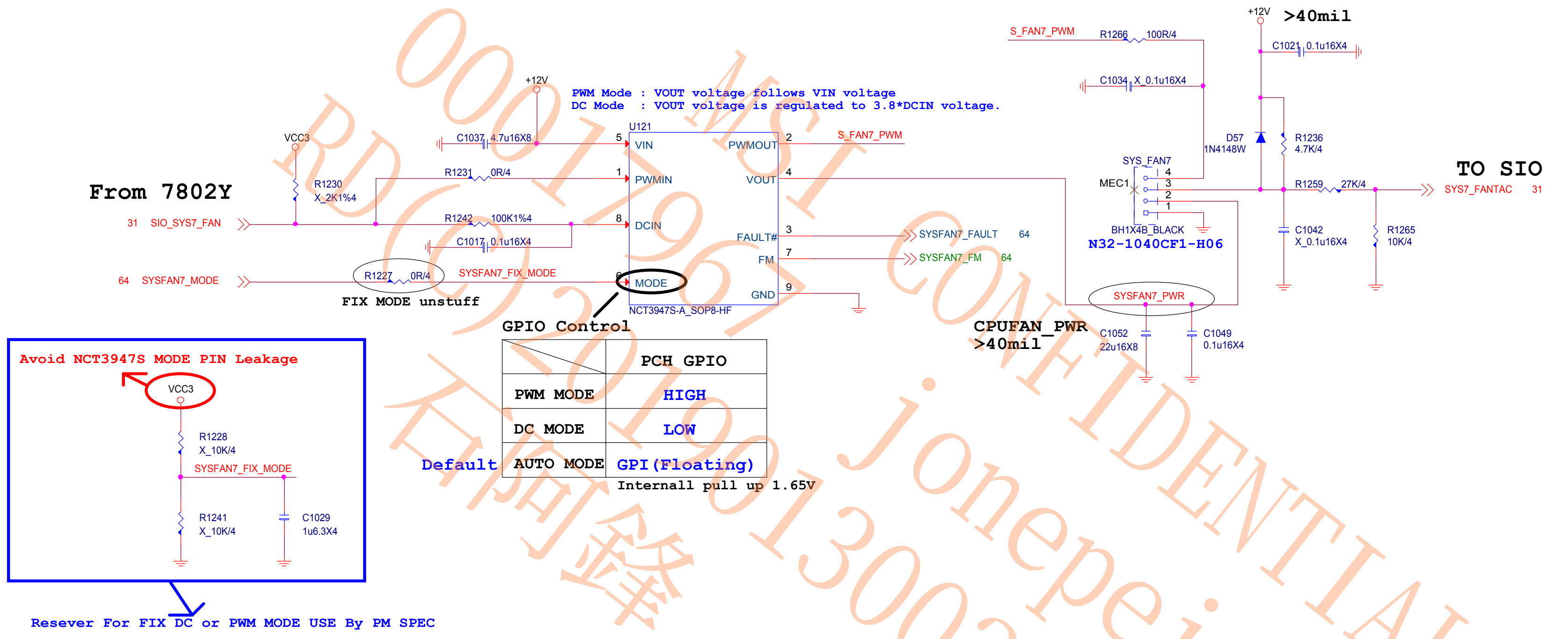
MICRO-STAR INT'L CO.,LTD

MS-7A98

Size: Custom | Document Description: SYSTEM FAN6 | Rev: 20

Date: Monday, July 17, 2017 | Sheet 39 of 98

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



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

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Size	Document Description	Rev
Custom	SYSTEM FAN7	20

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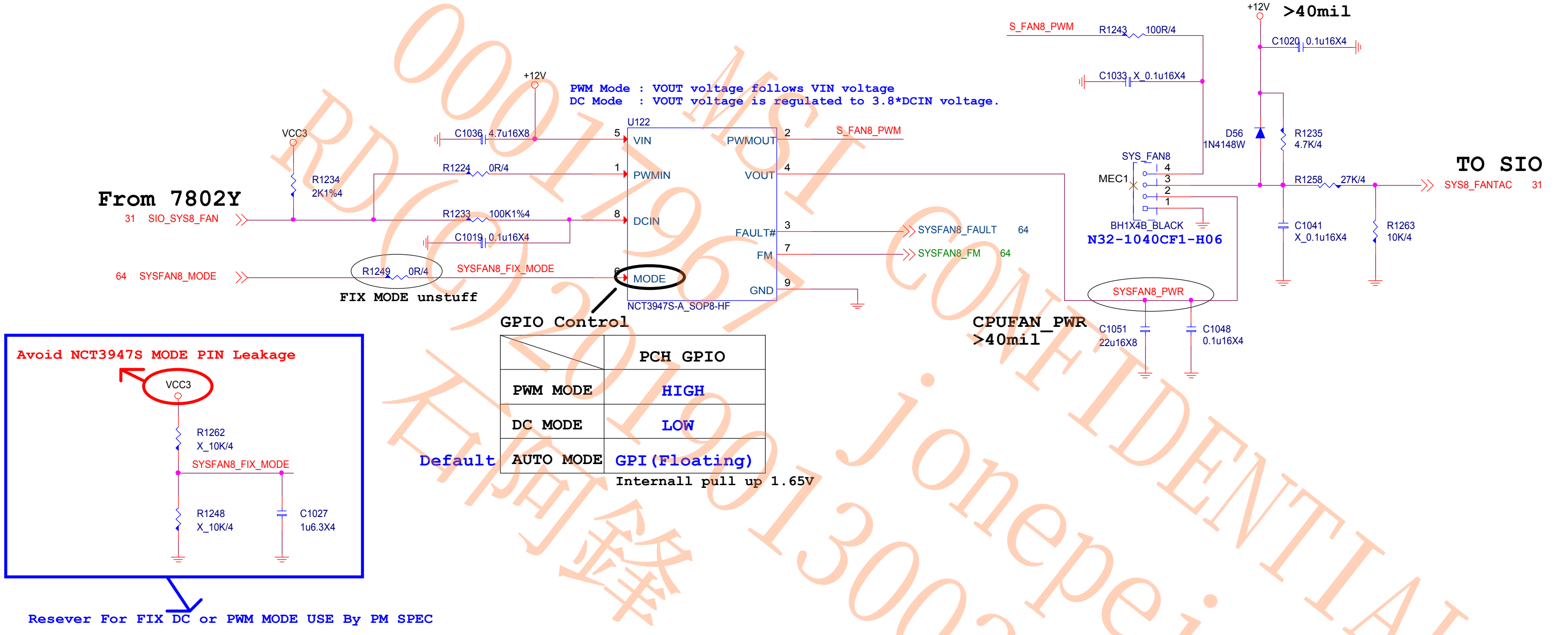
TYPE J : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO



GPIO Control

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

Default: AUTO MODE

Internall pull up 1.65V

MICRO-STAR INT'L CO.,LTD

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Size	Document Description	Rev
Custom	SYSTEM FAN8	20

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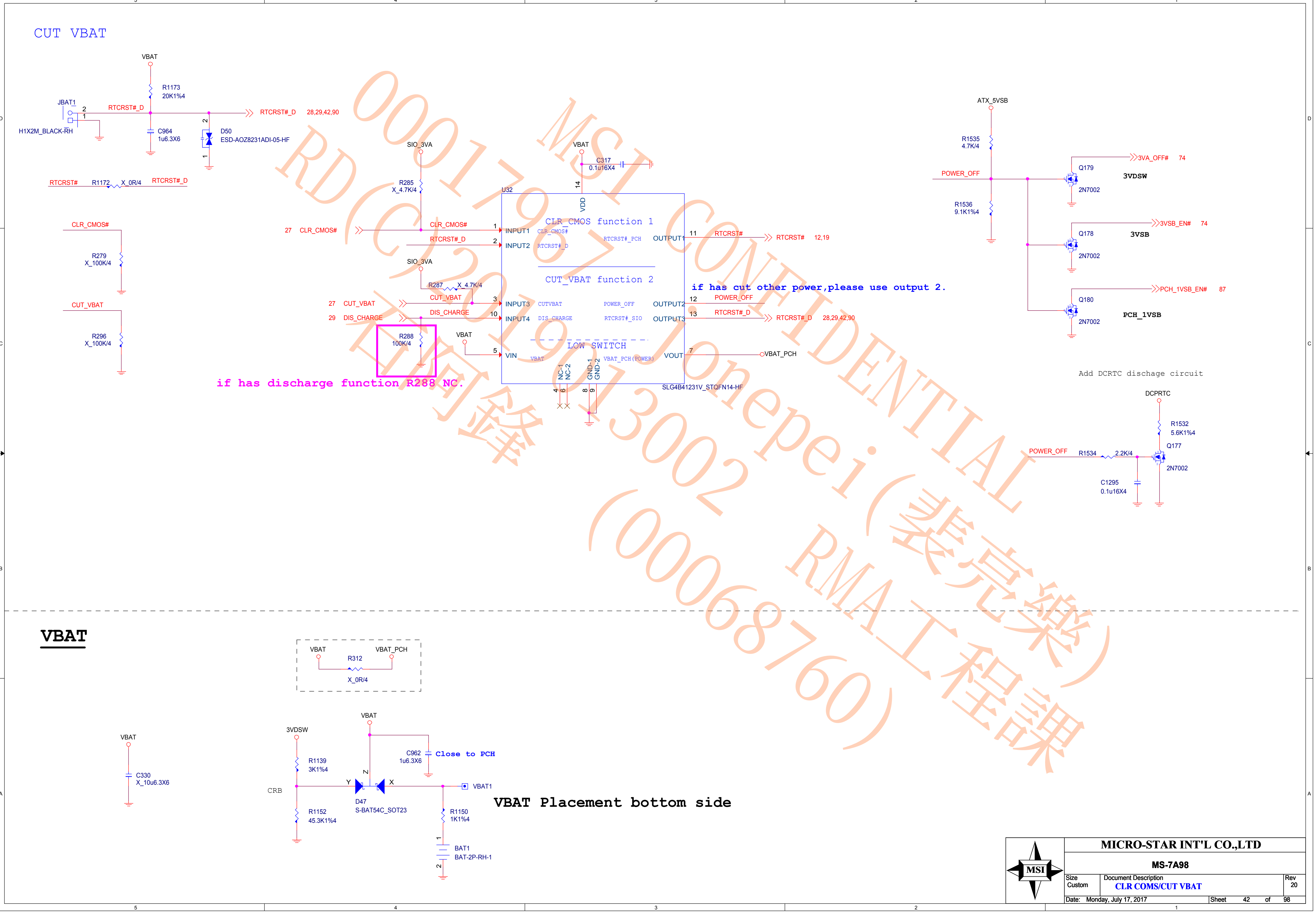
CUT VBAT
VBAT
R1173
20K1%4
JBAT1
RTCRST#_D
H1X2M_BLACK-RH
C964
1u6.3X6
D50
ESD-AOZ8231ADI-05-HF
RTCRST#_D 28,29,42,90
RTCRST# R1172 X_0R/4 RTCRST#_D
CLR_CMOS#
R279
X_100K/4
CUT_VBAT
R296
X_100K/4
SIO_3VA
R285
X_4.7K/4
27 CLR_CMOS#
RTCRST#_D
R287 X_4.7K/4
27 CUT_VBAT
29 DIS_CHARGE
R288
100K/4
if has discharge function R288 NC.
VBAT
C317
0.1u16X4
U32
VDD
CLR_CMOS function 1
INPUT1 CLR_CMOS#
INPUT2 RTCRST#_D
RTCRST#_PCH OUTPUT1
CUT_VBAT function 2
INPUT3 CUTVBAT
INPUT4 DIS_CHARGE
POWER_OFF OUTPUT2
RTCRST#_SIO OUTPUT3
LOW SWITCH
VIN VBAT
VBAT_PCH(POWER) VOUT
NC-1 NC-2 GND-1 GND-2
SLG4B41231V_STQFN14-HF
RTCRST# 12,19
if has cut other power,please use output 2.
POWER_OFF
RTCRST#_D 28,29,42,90
VBAT_PCH
ATX_5VSB
R1535
4.7K/4
POWER_OFF
R1536
9.1K1%4
Q179 2N7002
3VA_OFF# 74
3VDSW
Q178 2N7002
3VSB_EN# 74
3VSB
Q180 2N7002
PCH_1VSB_EN# 87
PCH_1VSB
Add DCRTC dischage circuit
DCPRTC
R1532
5.6K1%4
Q177
2N7002
POWER_OFF R1534 2.2K/4
C1295
0.1u16X4
VBAT
VBAT VBAT_PCH
R312
X_0R/4
VBAT
C330
X_10u6.3X6
3VDSW
R1139
3K1%4
CRB
R1152
45.3K1%4
VBAT
C962
1u6.3X6
Close to PCH
D47
S-BAT54C_SOT23
VBAT1
R1150
1K1%4
BAT1
BAT-2P-RH-1
VBAT Placement bottom side
MICRO-STAR INT'L CO.,LTD
MS-7A98
Size Custom
Document Description
CLR COMS/CUT VBAT
Rev 20
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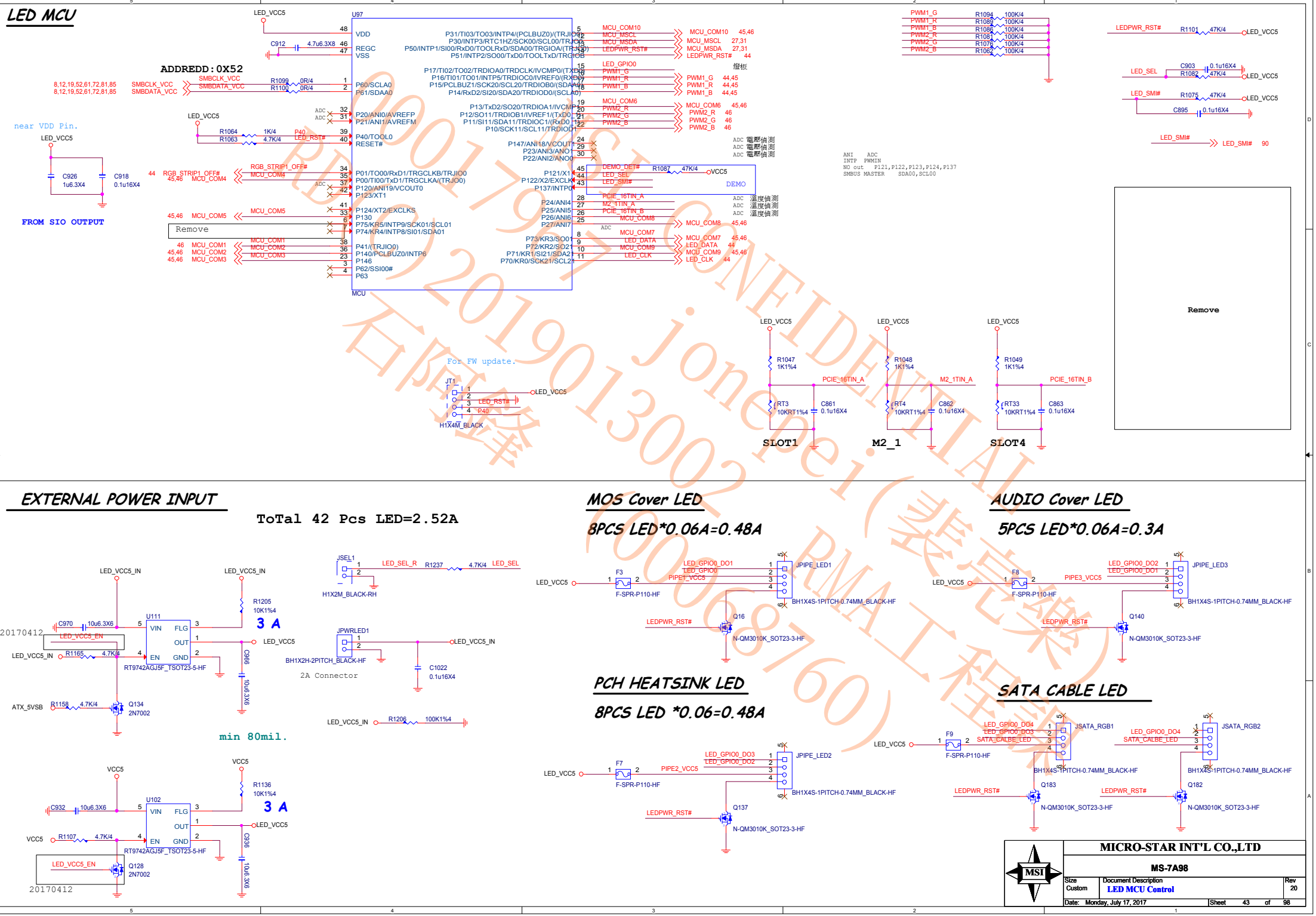
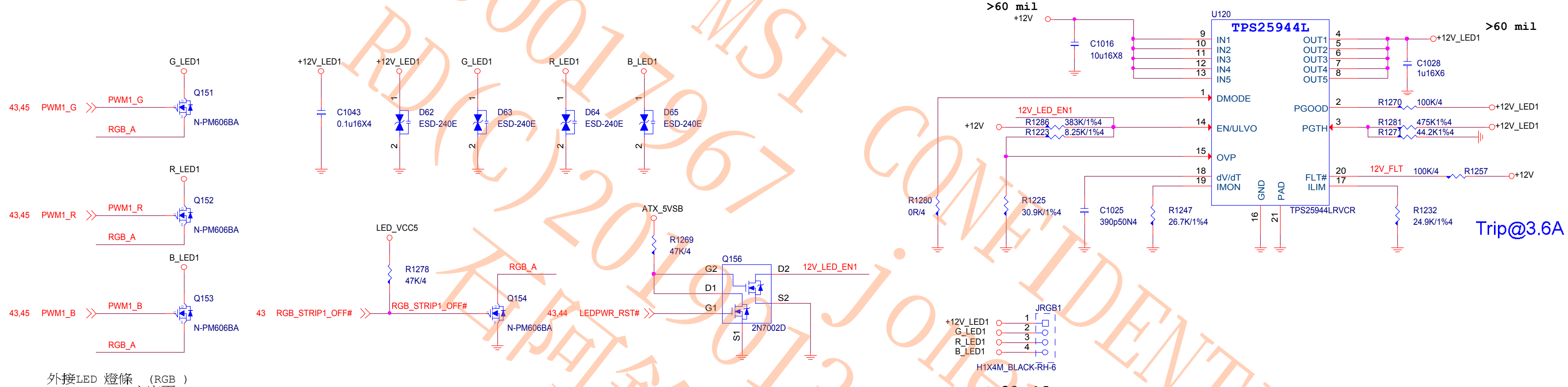
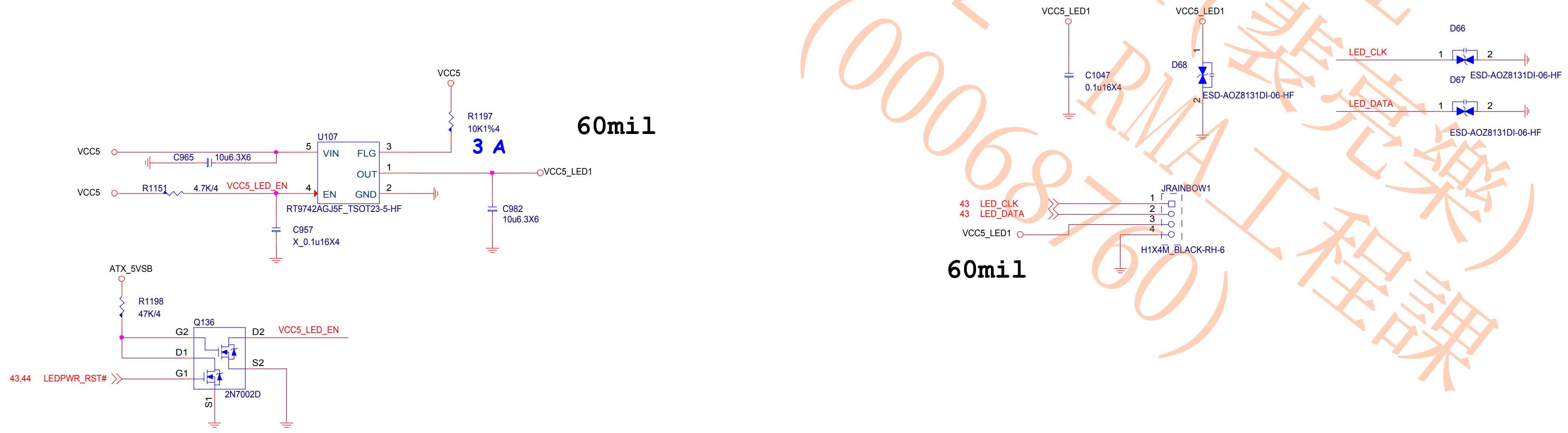

LED MCU
ADDREDD:0X52
near VDD Pin.
FROM SIO OUTPUT
Remove
For FW update.
U97
MCU
DEMO
SLOT1
M2_1
SLOT4
EXTERNAL POWER INPUT
ToTal 42 Pcs LED=2.52A
3 A
min 80mil.
2A Connector
MOS Cover LED
8PCS LED*0.06A=0.48A
AUDIO Cover LED
5PCS LED*0.06A=0.3A
PCH HEATSINK LED
8PCS LED *0.06=0.48A
SATA CABLE LED
MICRO-STAR INT'L CO.,LTD
MS-7A98
LED MCU Control
Monday, July 17, 2017

LED STRIPLINE



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

LED STRIPLINE



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Size	Document Description	Rev
Custom	LED STRIPLINE	20

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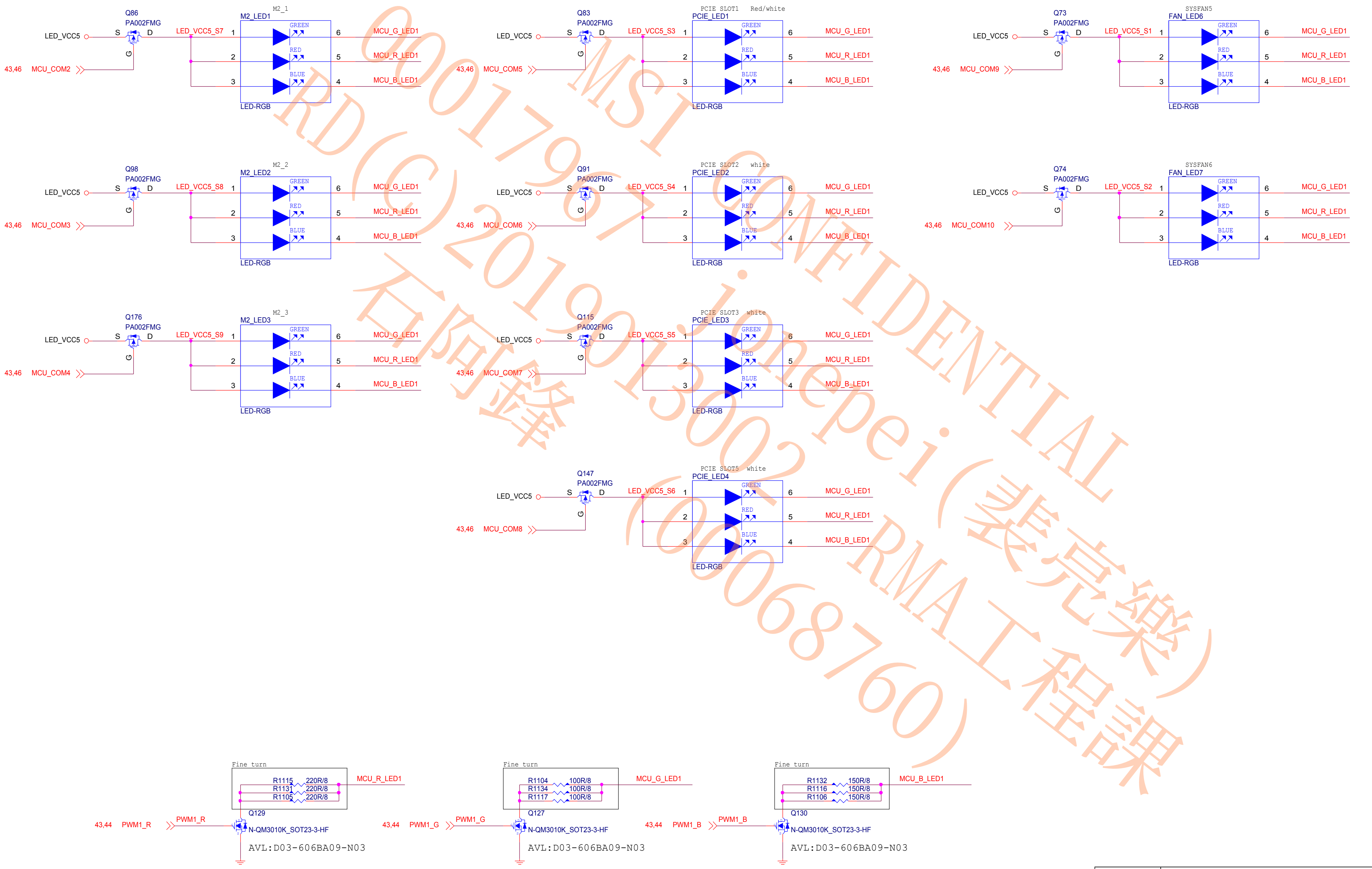
9PCS LED*0.06=0.54A



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Size: Custom | Document Description: MCU LED Control 1 | Rev: 20

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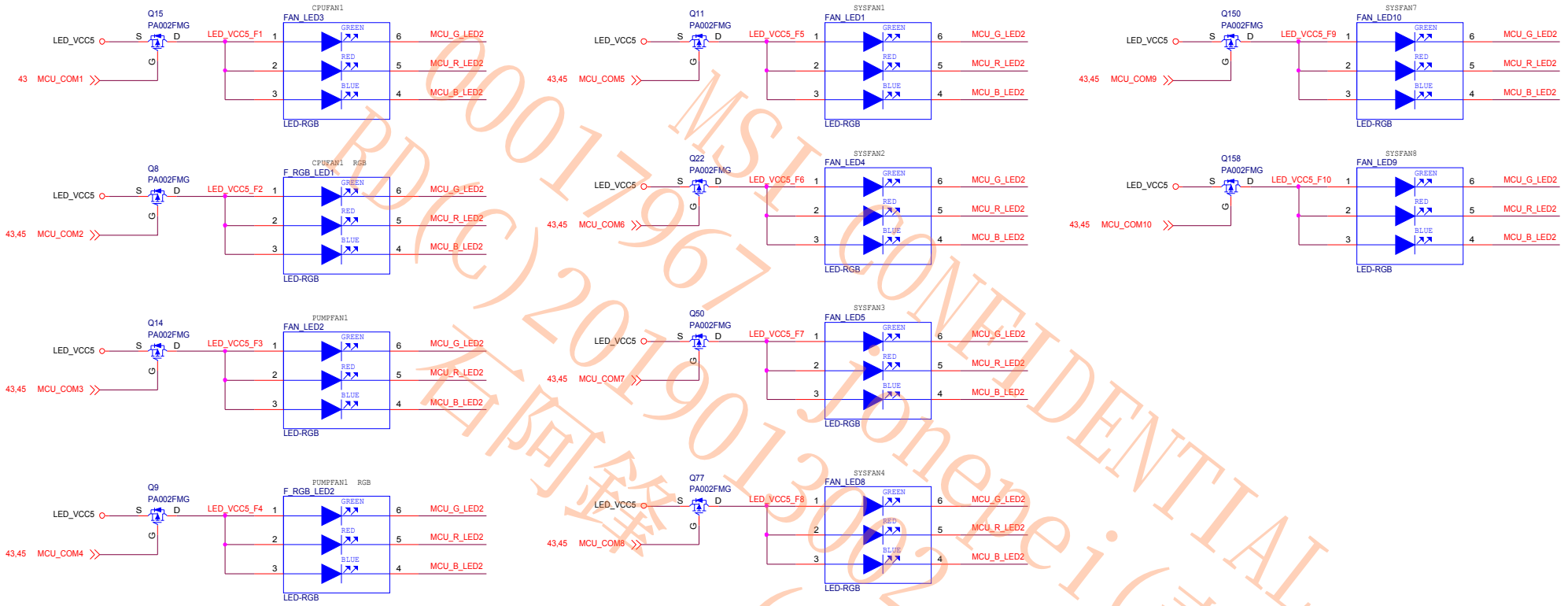
10PCS LED*0.06=0.6A

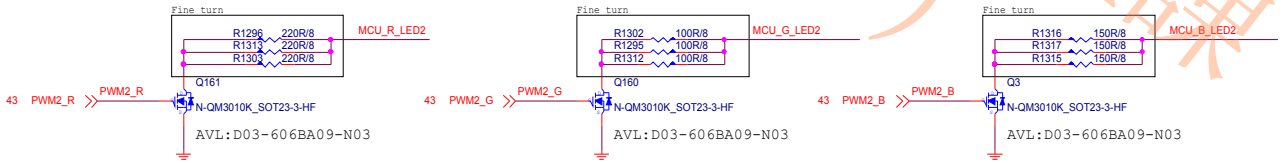


F_RGB_LED1 active reference
F_RGB_LED4 active reference

Default

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

GPIO			State
IN2	IN1	IN0	
0	0	0	65% 紅 85% 綠
0	0	1	65% 藍 85% 綠
0	1	0	65% 紅 85% 藍
0	1	1	65% 綠 85% 藍
1	0	0	65% 綠 85% 紅
1	0	1	65% 藍 85% 紅
1	1	0	NA
1	1	1	NA



MICRO-STAR INT'L CO.,LTD

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Size: Custom | Document Description: MCU LED Control 2 | Rev: 20

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Layout Guide:

2.) VIA hole <2

Power Consumption

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

UU14A ASM2142

USB SS (80Ohm-Diff)
USB HS (90Ohm-Diff)

13 CLK_ASM2142_R_DP
13 CLK_ASM2142_R_DN
PECLKP
PECLKN
U2DP_A
U2DM_A
SS31_R_DP1 69
SS31_R_DN1 69

14 PCIE5_ASM2142_R_RXP
14 PCIE5_ASM2142_R_RXN
CU109 0.22u10X4
CU111 0.22u10X4
PCIE5_ASM2142_R_RXP_C
PCIE5_ASM2142_R_RXN_C
PTX0P
PTX0N
U3TXP_A
U3TXN_A
U3RXP_A
U3RXN_A
SS31_R_TXP1 69
SS31_R_TXN1 69
SS31_R_RXP1 69
SS31_R_RXN1 69

14 PCIE5_ASM2142_R_TXP
14 PCIE5_ASM2142_R_TXN
CU114 0.22u10X4
CU112 0.22u10X4
PCIE5_ASM2142_R_TXP_C
PCIE5_ASM2142_R_TXN_C
PRX0P
PRX0N

14 PCIE6_ASM2142_R_RXP
14 PCIE6_ASM2142_R_RXN
CU111 0.22u10X4
CU110 0.22u10X4
PCIE6_ASM2142_R_RXP_C
PCIE6_ASM2142_R_RXN_C
PTX1P
PTX1N
U2DP_B
U2DM_B
SS31_R_DP2 69
SS31_R_DN2 69

14 PCIE6_ASM2142_R_TXP
14 PCIE6_ASM2142_R_TXN
CU108 0.22u10X4
CU113 0.22u10X4
PCIE6_ASM2142_R_TXP_C
PCIE6_ASM2142_R_TXN_C
PRX1P
PRX1N
U3TXP_B
U3TXN_B
U3RXP_B
U3RXN_B
SS31_R_TXP2 69
SS31_R_TXN2 69
SS31_R_RXP2 69
SS31_R_RXN2 69

ASM_RST#_2
ASM2142_WAKE#_2
PE_RST#
PE_WAKE#
PE_CLKREQ#

ASM2142_SMI1#_2
SMI#
PRON_A
PRON_B
PPONA_2
PPONB_2
TPU15
TPU16
PPON_X Internal Pull-up to VCC3

OCI_A#
OCI_B#
OCIA_2
OCIB_2
TPU18
TPU20
OCI_X Internal Pull-up to SUS

VCC3 RU42 80.6K1%4 PONRST#_2
CU106 1u6.3X4
USB_SPISCK_2
USB_SPICSB_2
USB_SPISI_2
USB_SPISO_2
SPI_CLK
SPI_CS#
SPI_DI
SPI_DO
XI_2
XO_2

UART_RX
UART_TX
TPU13
TPU12
RX/TX Internal Pull-up

RU58 4.7K/4 TEST_EN
REXT
ASM2142_REXT_2
RU40 12.1K1%4

ASM3142-RH

12,21,22,23,24,25,26,48,54,55,56,73 PCH_WAKE#
DU3 0.1u16X4
QU4 2N7002D
ASM2142_WAKE#_2
ASM2142_SMI1#_2
3VSB RU43 4.7K/4
15 USB3_SMI2
RU44 4.7K/4 VCC3

ASM_SMI has internal Pull-up to VCC
ASM_WAKE has internal Pull-up to VCCSUS

USB_SPISCK_2 RU15 4.7K/4 VCC3
RU55 X_4.7K/4

UU14B ASM2142

TPU21	VREGIN	VCCH-1, VCCH-2	VCC3 4mA
TPU22	LXI	VCCLP-1, VCCLP-2	USB3_2P5_2 220mA
TPU17, TPU19	VCCHSUS_IN		
	VDDSUS_O	VCCLU-2, VCCLU-3	
USB3_2P5_2 3VSB	VCCLU-1, VCCHSUS	VDD-1, VDD-2, VDD-3	USB3_1P1_2 470mA
USB3_1P1_VSB_2 10mA	VDDSUS-1, VDDSUS-2	VDDP-1, VDDP-2	
RU60 X_0R/4	GND	VDDU-1, VDDU-2, VDDU-3	
	PGND		

ASM3142-RH

USB3_1P1_2 Close to UU14.58 CU17 10u6.3X6
USB3_1P1_VSB_2 Close to UU14.21/34 CU6 CU87 0.1u16X4
USB3_1P1_2 Close to UU14.41 CU89 10u6.3X6
USB3_1P1_2 Close to UU14.1/12/33 CU14 CU88 CU11 0.1u16X4
VCC3 Close to UU14.4/32 CU10 CU13 0.1u16X4
USB3_1P1_2 Close to UU14.35/47/52 CU105 CU19 CU104 2.2u6.3X4
3VSB Close to UU14.24 CU8 0.1u16X4
USB3_2P5_2 Close to UU14.38/44/55/62/20 CU16 CU18 CU91 CU90 2.2u6.3X4 CU7 0.1u16X4

ASM3142 remove

3VSB CU64 X_0.1u16X4
UU13
15,48 GPP_D23
27,48,52,72,73,89 PLTRST_BU1#
ASM2142_RST#_R2 RU53 33R/4 ASM_RST#_2
X_NC7SZ08M5X_SOT23-5
RU54 0R/4

ASM2142 UU13 stuff RU53 unstuff
ASM1142 UU13 unstuff RU53 stuff
ASM3142 UU13 & CU64 unstuff
Reset control for ASM2142 only.

XO_2 CU15 12p50N YU2 20MHZ18p_S-HF XI_2

UREXT,PEUREXT(W/S) : 10/7
OCIA,OCIB,PPONA,PPONB(W/S) : 5/8
X0/XI (95hm-Diff,Spacing 30mil)

ASM3142 1.1v Core Power

470mA USB3_1P1_2

CU97 22u6.3X8
VCC5 VCC3 RU22 47K/4
UU9 MP2143DJ
VIN EN PG PGND AGND SW OUT FB
U155 1.0u6.3A_1210-HF
USB3_1P05_PH_2
CU96 22u6.3X8 CU28 22u6.3X8 CU94 0.1u16X4
RU45 200K1%4 CU95 X_0.1u6.3X
USB3_1P05_FB_2
RU21 240K1%4

ASM1142 RU45/RU21 200K/187K 1.24V
ASM2142 RU45/RU21 196K/261K 1.05V
ASM3142 RU45/RU21 200K/240K 1.1V

ASM3142 1.1v Suspend Power

10mA USB3_1P1_VSB_2

3VSB CU102 1u6.3X4
UU11 GS7116S5-SOT23-5
VDD VOUT EN GND ADJ
CU101 47p50N4
RU49 75K1%4 CU103 1u6.3X4
RU48 200K1%4

ASM1142 RU48 18K 1.24V
ASM2142 RU48 31.6K 1.05V
ASM3142 RU49/RU48 75K/200K 1.1V

ASM3142 2.5v Analog Power

220mA USB3_2P5_2

VCC3 CU99 1u6.3X4
UU10 GS7116S5-SOT23-5
VDD VOUT EN GND ADJ
CU98 47p50N4
RU23 430K1%4 CU100 1u6.3X4
RU25 200K1%4

ASM1142/ASM1042AE unstuff
ASM2142 stuff
ASM3142 stuff

EEPROM

VCC3 RU57 10K/4 RU56 10K/4 USB_SPICSB_2
USB_SPISO_2 RU41 X_4.7K/4 USB_SPISI_2
USB_SPISCK_2
UU7 MX25L1006E
HOLD WP CS SI SO SCK VCC GND
CU92 0.1u16X4
RU50 X_4.7K/4 USB_SPISO_2

ASM1142 UU3 M31-2551222-M24(512K bit)
ASM2142 UU3 M31-25L1022-M24(1M bit)

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Size: Custom
Document Description: USB3.1-ASM3142AE-Rear
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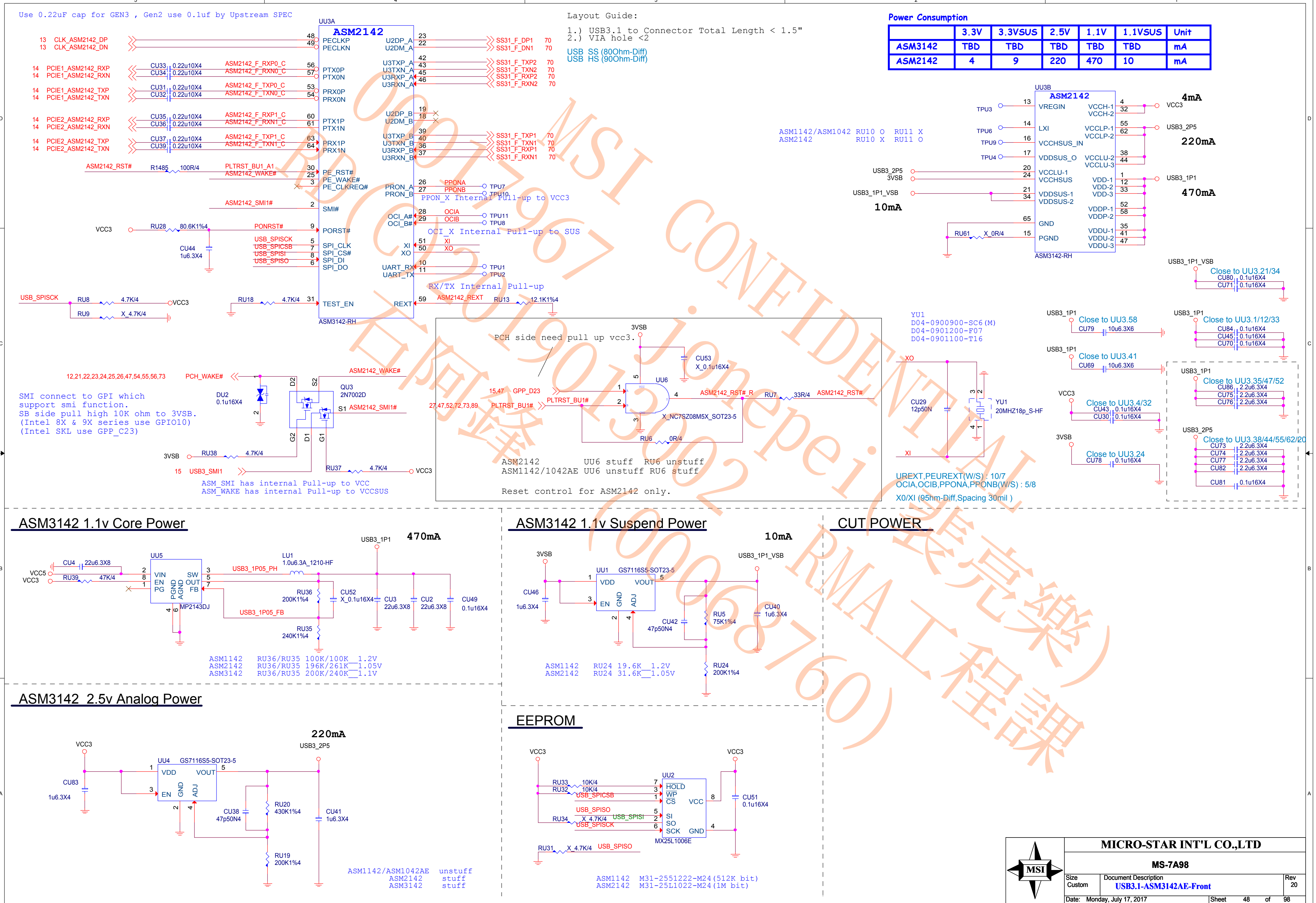
Use 0.22uF cap for GEN3 , Gen2 use 0.1uf by Upstream SPEC

Layout Guide:
1.) USB3.1 to Connector Total Length < 1.5"
2.) VIA hole <2

USB SS (80Ohm-Diff)
USB HS (90Ohm-Diff)

Power Consumption

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



UU3A
ASM2142
13 CLK_ASM2142_DP
13 CLK_ASM2142_DN
PECLKP
PECLKN
14 PCIE1_ASM2142_RXP
14 PCIE1_ASM2142_RXN
14 PCIE1_ASM2142_TXP
14 PCIE1_ASM2142_TXN
14 PCIE2_ASM2142_RXP
14 PCIE2_ASM2142_RXN
14 PCIE2_ASM2142_TXP
14 PCIE2_ASM2142_TXN
ASM2142_RST#
PLTRST_BU1_A1
ASM2142_WAKE#
ASM2142_SMI1#
PONRST#
USB_SPISCK
USB_SPISCB
USB_SPISI
USB_SPISO
PTX0P
PTX0N
PRX0P
PRX0N
PTX1P
PTX1N
PRX1P
PRX1N
PE_RST#
PE_WAKE#
PE_CLKREQ#
SMI#
PORST#
SPI_CLK
SPI_CS#
SPI_DI
SPI_DO
TEST_EN
U2DP_A
U2DM_A
U3TXP_A
U3TXN_A
U3RXP_A
U3RXN_A
U2DP_B
U2DM_B
U3TXP_B
U3TXN_B
U3RXP_B
U3RXN_B
PRON_A
PRON_B
OCI_A#
OCI_B#
XI
XO
UART_RX
UART_TX
REXT
ASM3142-RH
SS31_F_DP1
SS31_F_DN1
SS31_F_TXP2
SS31_F_TXN2
SS31_F_RXP2
SS31_F_RXN2
SS31_F_TXP1
SS31_F_TXN1
SS31_F_RXP1
SS31_F_RXN1
PPON_X Internal Pull-up to VCC3
OCI_X Internal Pull-up to SUS
RX/TX Internal Pull-up
ASM2142_REXT
RU13 12.1K1%4
UU3B
ASM2142
VREGIN
LXI
VCCHSUS_IN
VDDSUS_O
VCCLU-1
VCCHSUS
VDDSUS-1
VDDSUS-2
GND
PGND
VCCH-1
VCCH-2
VCCLP-1
VCCLP-2
VCCLU-2
VCCLU-3
VDD-1
VDD-2
VDD-3
VDDP-1
VDDP-2
VDDU-1
VDDU-2
VDDU-3
ASM3142-RH
4mA
220mA
470mA
10mA
ASM1142/ASM1042 RU10 O RU11 X
ASM2142 RU10 X RU11 O
Close to UU3.21/34
Close to UU3.58
Close to UU3.1/12/33
Close to UU3.41
Close to UU3.35/47/52
Close to UU3.4/32
Close to UU3.38/44/55/62/20
Close to UU3.24
YU1
D04-0900900-SC6(M)
D04-0901200-F07
D04-0901100-T16
20MHZ18p_S-HF
UREXT,PEUREXT(W/S) : 10/7
OCIA,OCIB,PPONA,PPONB(W/S) : 5/8
X0/XI (95hm-Diff,Spacing 30mil)
SMI connect to GPI which
support smi function.
SB side pull high 10K ohm to 3VSB.
(Intel 8X & 9X series use GPIO10)
(Intel SKL use GPP_C23)
12,21,22,23,24,25,26,47,54,55,56,73 PCH_WAKE#
QU3 2N7002D
15 USB3_SMI1
ASM_SMI has internal Pull-up to VCC
ASM_WAKE has internal Pull-up to VCCSUS
PCH side need pull up vcc3.
UU6
X_NC7SZ08M5X_SOT23-5
15,47 GPP_D23
27,47,52,72,73,89 PLTRST_BU1#
ASM2142_RST#_R
ASM2142 UU6 stuff RU6 unstuff
ASM1142/1042AE UU6 unstuff RU6 stuff
Reset control for ASM2142 only.
ASM3142 1.1v Core Power
470mA
UU5
MP2143DJ
USB3_1P05_PH
USB3_1P05_FB
LU1 1.0u6.3A_1210-HF
ASM1142 RU36/RU35 100K/100K__1.2V
ASM2142 RU36/RU35 196K/261K__1.05V
ASM3142 RU36/RU35 200K/240K__1.1V
ASM3142 1.1v Suspend Power
10mA
UU1 GS7116S5-SOT23-5
ASM1142 RU24 19.6K__1.2V
ASM2142 RU24 31.6K__1.05V
CUT POWER
ASM3142 2.5v Analog Power
220mA
UU4 GS7116S5-SOT23-5
ASM1142/ASM1042AE unstuff
ASM2142 stuff
ASM3142 stuff
EEPROM
UU2
MX25L1006E
HOLD
WP
CS
SI
SO
SCK
VCC
GND
ASM1142 M31-2551222-M24(512K bit)
ASM2142 M31-25L1022-M24(1M bit)

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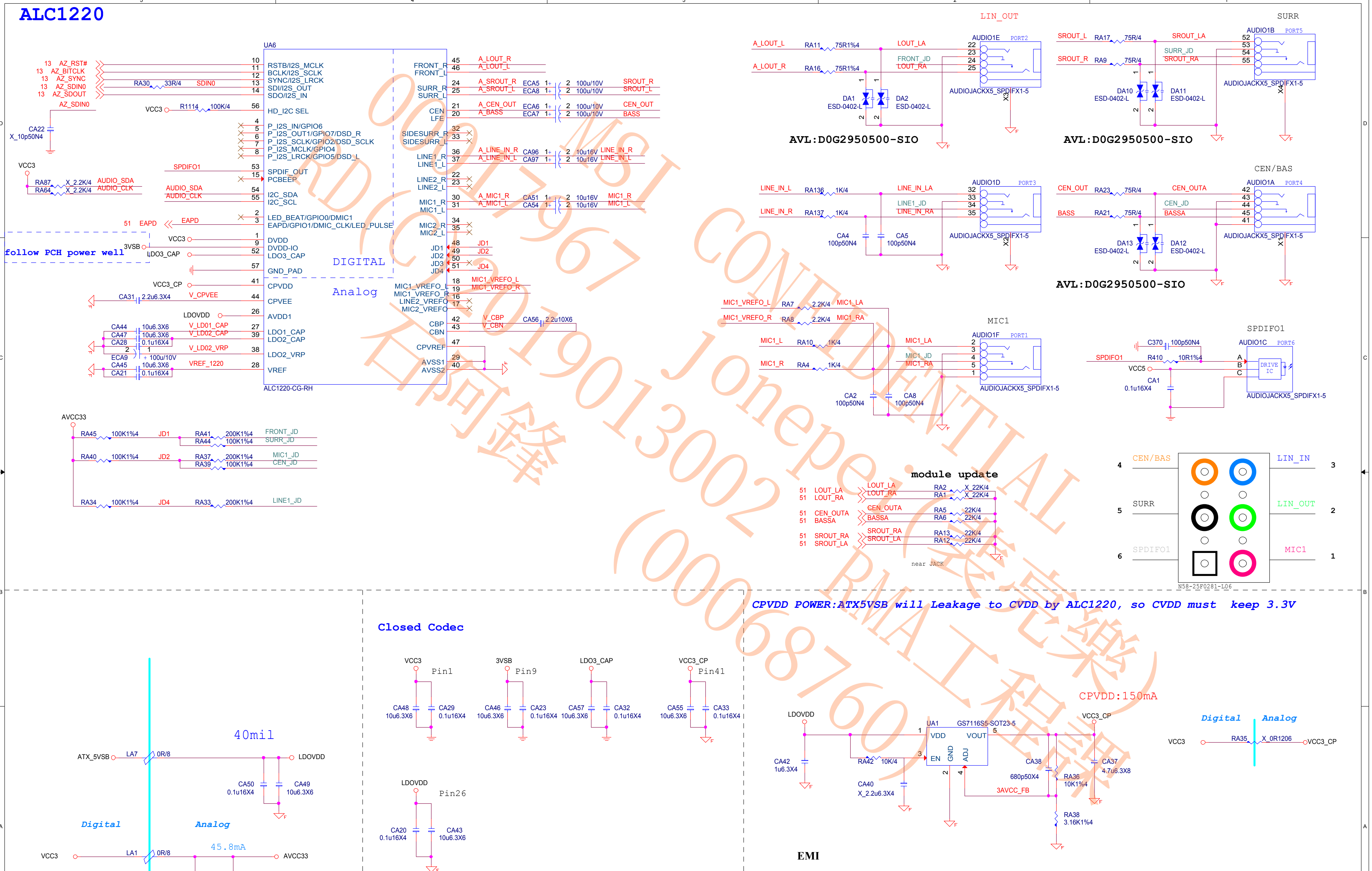
MS-7A98

Size	Document Description	Rev
Custom	USB3.1-ASM3142AE-Front	20

Date: Monday, July 17, 2017 Sheet 48 of 98



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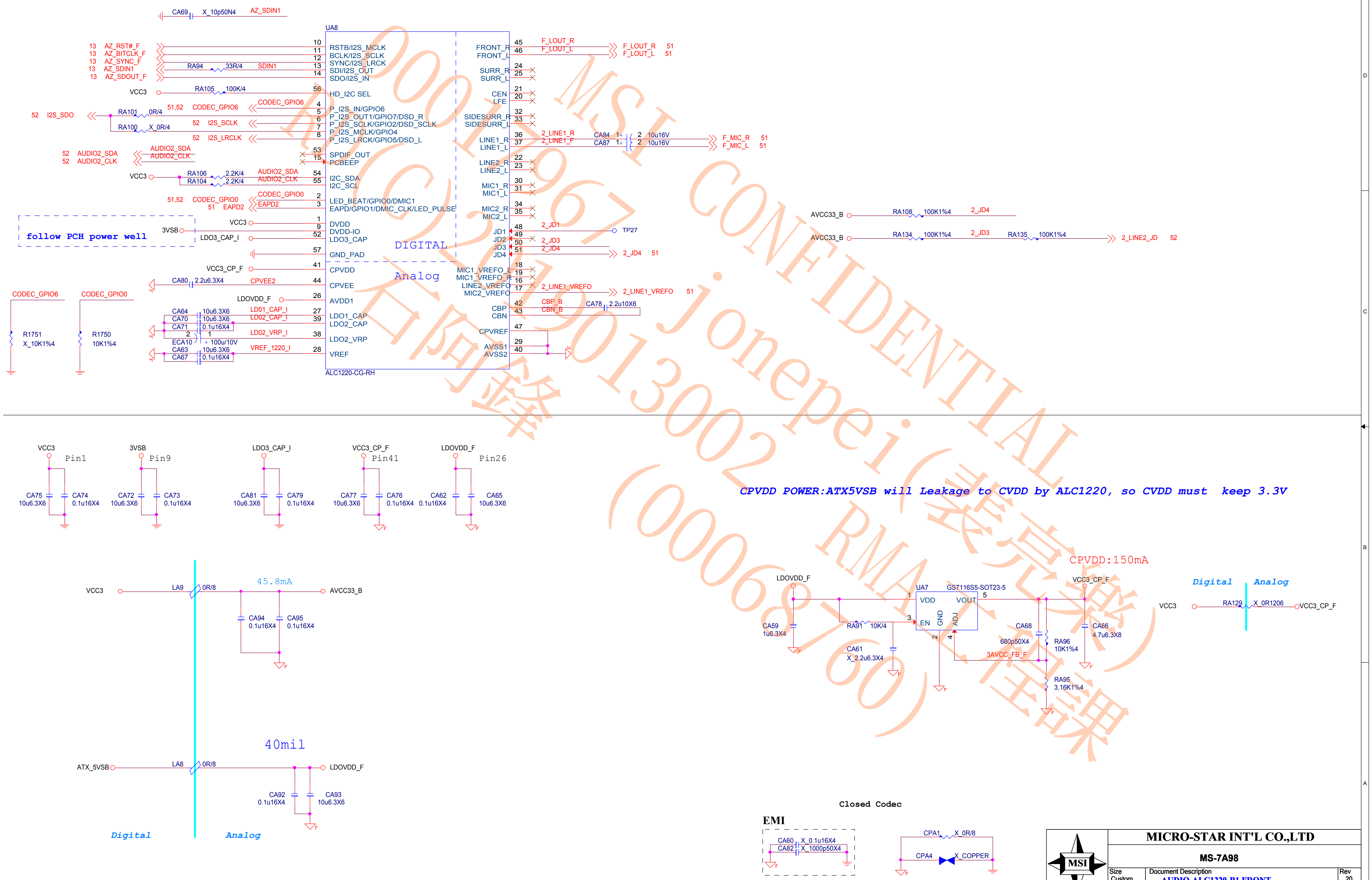
MS-7A98

Size	Document Description	Rev
Custom	AUDIO-ALC1220-A1 REAR	20

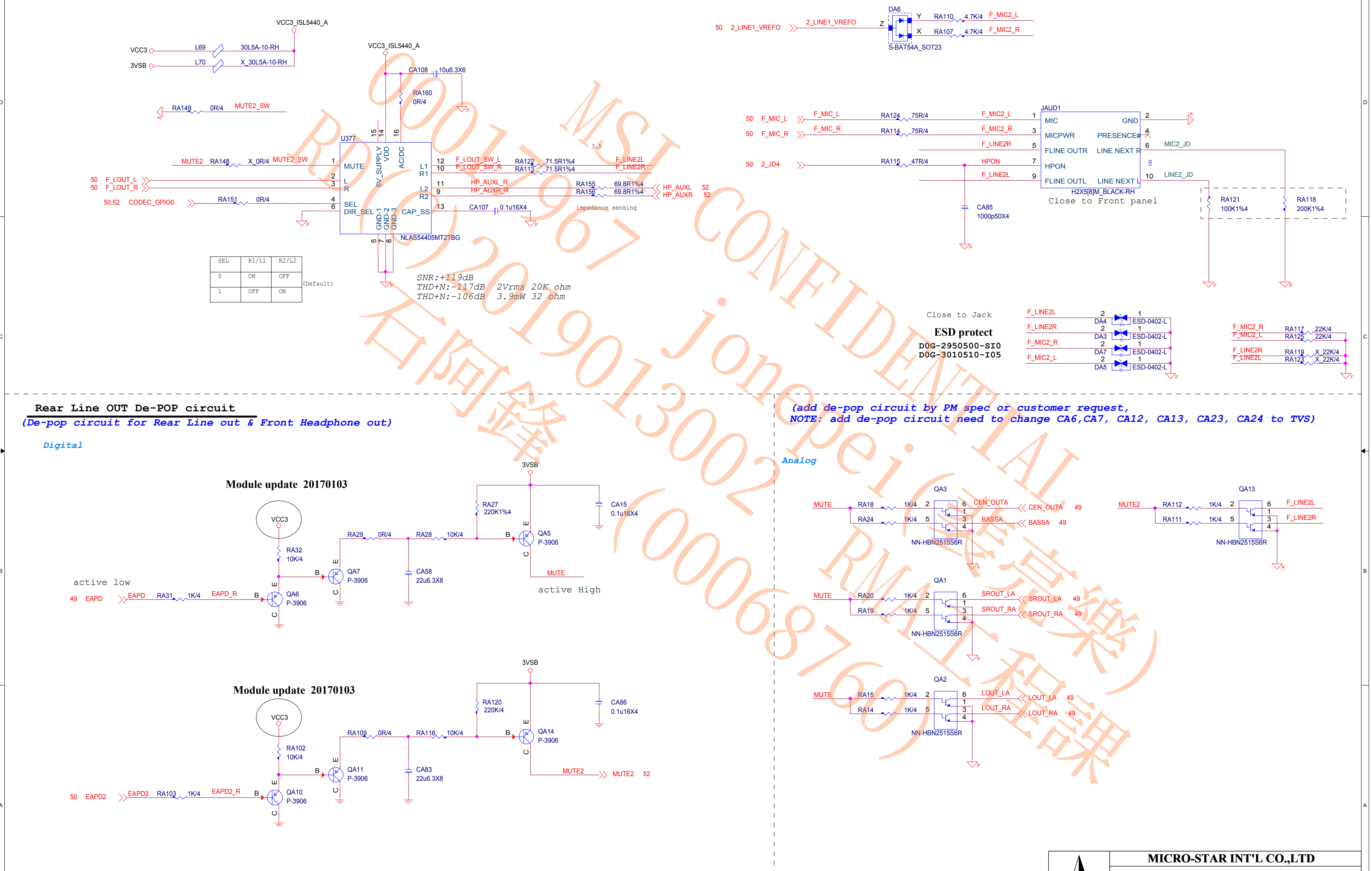
Date: Monday, July 17, 2017 Sheet 49 of 98

ALC1220



MICRO-STAR INT'L CO.,LTD		
MS-7A98		
Size: Custom	Document Description: AUDIO-ALC1220-B1 FRONT	Rev: 20
Date: Monday, July 17, 2017	Sheet 50 of 98	

Analog Switch For 6.3mm & 3.5mm Jack Impedance sensing



VCC3_ISL5440_A
VCC3
3VSB
L69
L70
30L5A-10-RH
X_30L5A-10-RH
CA108
10u6.3X6
RA160
0R/4
RA149
0R/4
MUTE2_SW
U377
MUTE2
RA148
X_0R/4
50 F_LOUT_L
50 F_LOUT_R
50,52 CODEC_GPIO0
RA151
0R/4
MUTE
5V_SUPPLY
VDD
AC/DC
SEL
DIR_SEL
GND-1
GND-2
GND-3
CAP_SS
NLAS54405MT2TBG
F_LOUT_SW_L
F_LOUT_SW_R
RA122 71.5R1%4
RA113 71.5R1%4
F_LINE2L
F_LINE2R
HP_AUXL_R
HP_AUXR_R
RA155 69.8R1%4
RA156 69.8R1%4
HP_AUXL 52
HP_AUXR 52
CA107 0.1u16X4
impedance sensing
SNR:+119dB
THD+N:-117dB 2Vrms 20K ohm
THD+N:-106dB 3.9mW 32 ohm
DA6
50 2_LINE1_VREFO
RA110 4.7K/4 F_MIC2_L
RA107 4.7K/4 F_MIC2_R
S-BAT54A_SOT23
JAUD1
50 F_MIC_L
50 F_MIC_R
50 2_JD4
RA124 75R/4
RA114 75R/4
RA115 47R/4
F_MIC2_L
F_MIC2_R
F_LINE2R
HPON
F_LINE2L
MIC
MICPWR
FLINE OUTR
HPON
FLINE OUTL
GND
PRESENCE#
LINE NEXT R
LINE NEXT L
MIC2_JD
LINE2_JD
H2X5[8]M_BLACK-RH
Close to Front panel
CA85 1000p50X4
RA121 100K1%4
RA118 200K1%4
Close to Jack
ESD protect
DOG-2950500-SI0
DOG-3010510-I05
DA4 DA3 DA7 DA5
ESD-0402-L
RA117 22K/4
RA125 22K/4
RA119 X_22K/4
RA123 X_22K/4
Rear Line OUT De-POP circuit
(De-pop circuit for Rear Line out & Front Headphone out)
Digital
Module update 20170103
active low
49 EAPD
RA31 1K/4
EAPD_R
RA32 10K/4
QA6 P-3906
QA7 P-3906
RA29 0R/4
RA28 10K/4
RA27 220K1%4
QA5 P-3906
CA58 22u6.3X8
CA15 0.1u16X4
MUTE
active High
50 EAPD2
RA103 1K/4
EAPD2_R
RA102 10K/4
QA10 P-3906
QA11 P-3906
RA109 0R/4
RA116 10K/4
RA120 220K/4
QA14 P-3906
CA83 22u6.3X8
CA86 0.1u16X4
MUTE2 52
(add de-pop circuit by PM spec or customer request,
NOTE: add de-pop circuit need to change CA6,CA7, CA12, CA13, CA23, CA24 to TVS)
Analog
QA3
RA18 1K/4
RA24 1K/4
CEN_OUTA 49
BASSA 49
NN-HBN2515S6R
QA13
RA112 1K/4
RA111 1K/4
QA1
RA20 1K/4
RA19 1K/4
SROUT_LA 49
SROUT_RA 49
QA2
RA15 1K/4
RA14 1K/4
LOUT_LA 49
LOUT_RA 49

SEL	R1/L1	R2/L2	
0	ON	OFF	(Default)
1	OFF	ON	

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Size: Custom | Document Description: AUDIO-ALC1220-2 | Rev: 20

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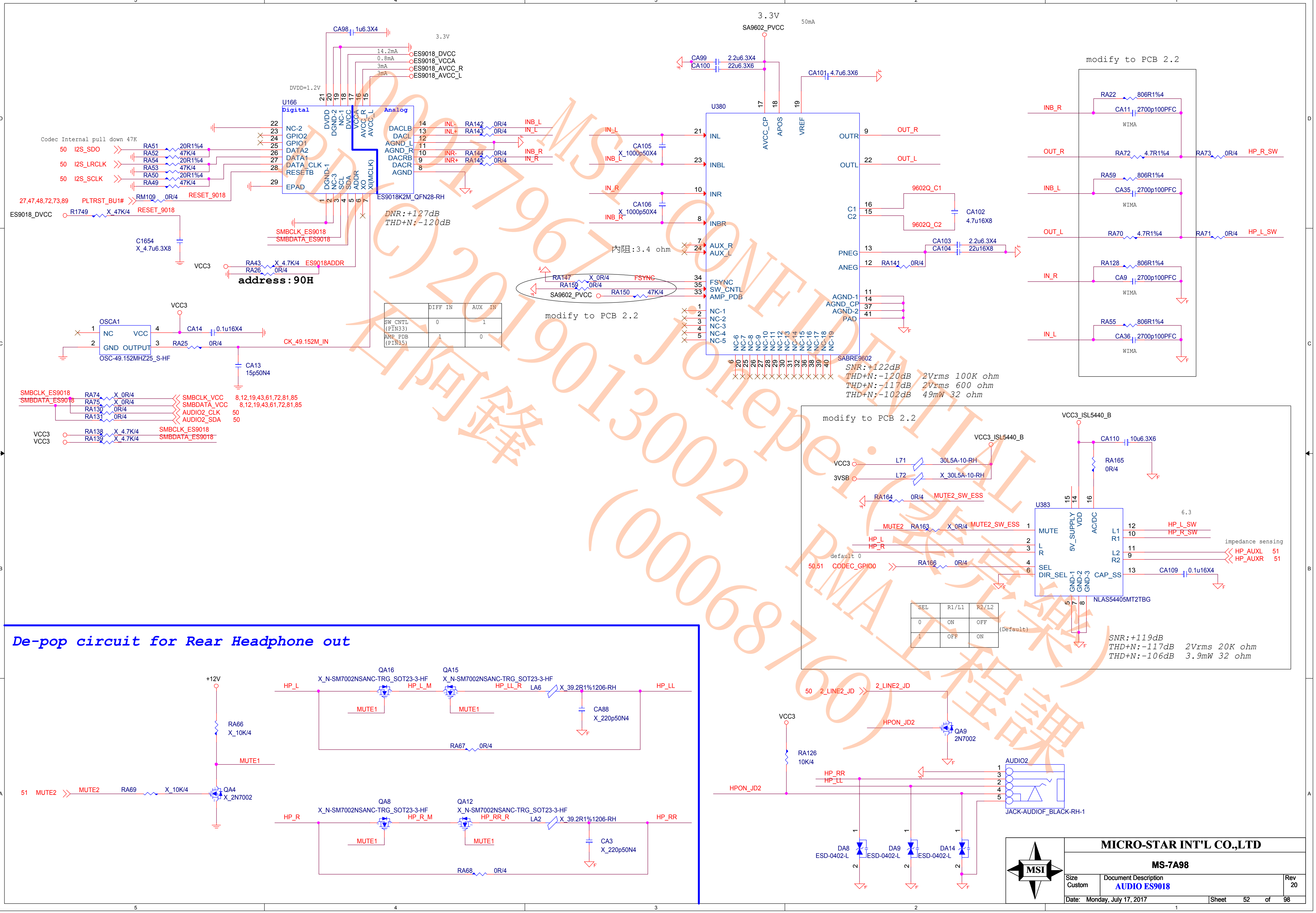

	DIFF IN	AUX IN
SW_CNTL (PIN33)	0	1
AMP_PDB (PIN35)	1	0

SEL	R1/L1	R2/L2
0	ON	OFF
1	OFF	ON

(Default)

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MS-7A98

Size: Custom | Document Description: AUDIO ES9018 | Rev: 20

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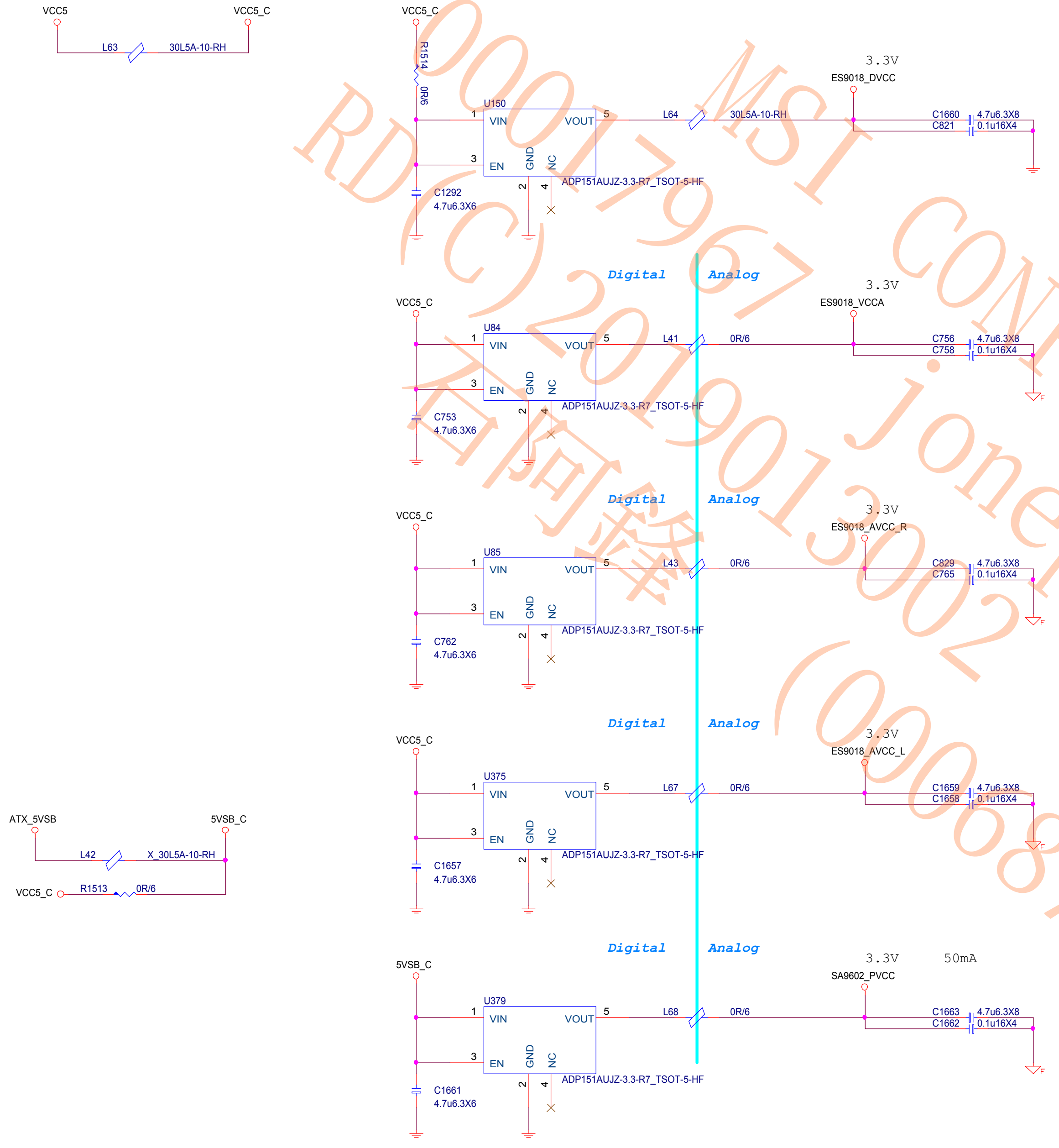

MICRO-STAR INT'L CO.,LTD

MS-7A98

Size	Document Description	Rev
Custom	AUDIO POWER	20

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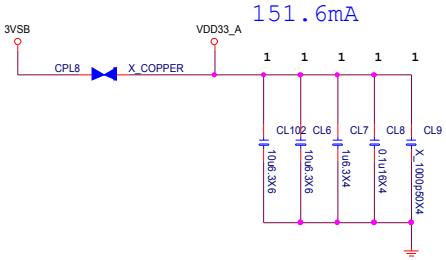
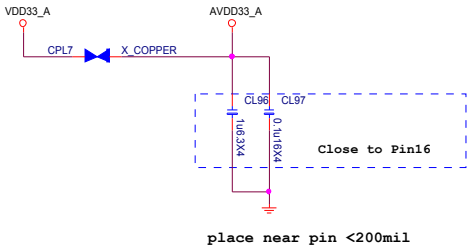
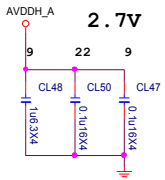
E2500 GIGA LAN

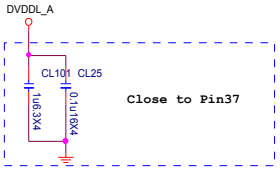




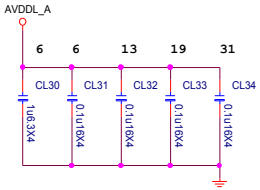
place near pin <200mil



place near pin <200mil

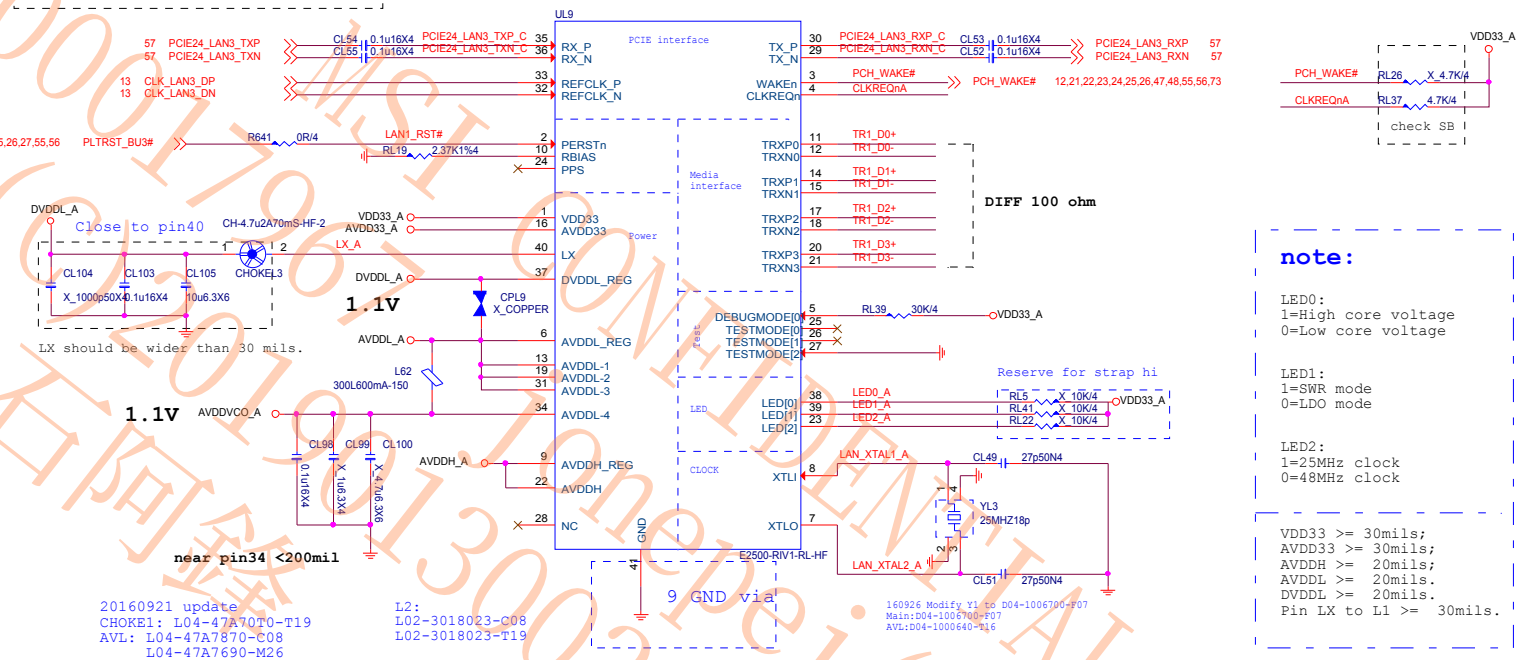


place near pin <200mil



place near pin <200mil

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



20160921 update
CHOKE1: L04-47A70T0-T19
AVL: L04-47A7870-C08
L04-47A7690-M26

L2:
L02-3018023-C08
L02-3018023-T19

note:

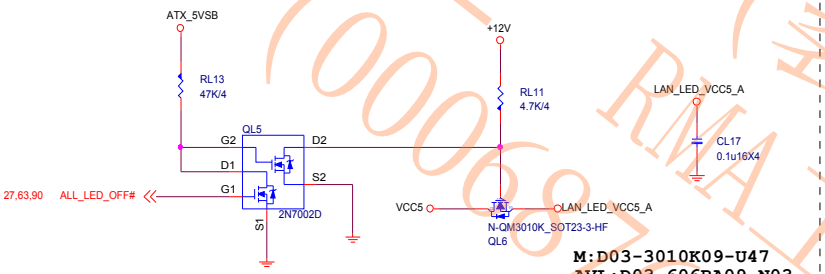
LED0:
1=High core voltage
0=Low core voltage

LED1:
1=SWR mode
0=LDO mode

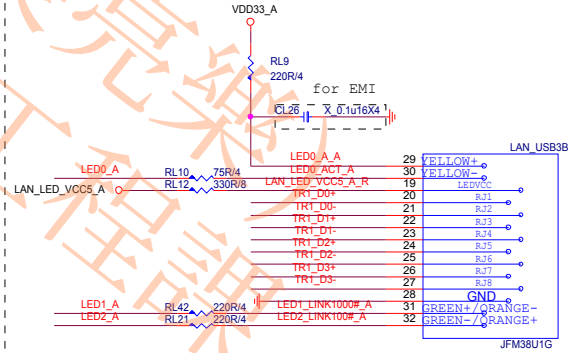
LED2:
1=25MHz clock
0=48MHz clock

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

LED ON/OFF by SIO

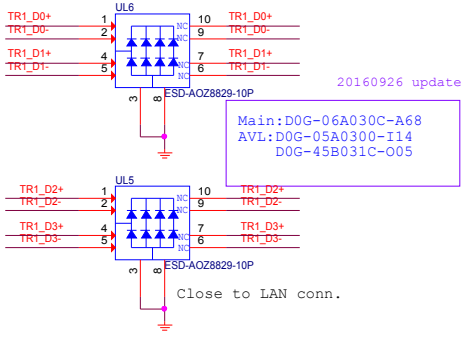


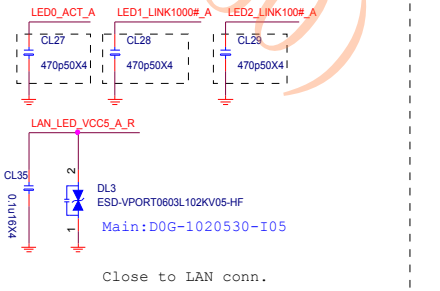
M:D03-3010K09-U47
AVL:D03-606BA09-N03

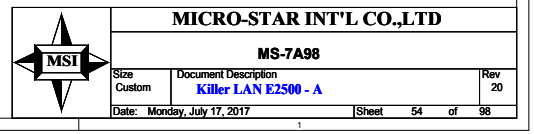


LED1 low is Orange 1000
LED2 low is Green 100

EMC







E2500 GIGA LAN

151.6mA

3VSB — CPL4 X_COPPER — VDD33_B

CL37 10u6.3X6, CL87 10u6.3X6, CL38 1u6.3X4, CL39 0.1u16X4, CL77 X_100u6.3X6

VDD33_B — CPL2 X_COPPER — AVDD33_B

CL56 1u6.3X4, CL57 0.1u16X4

Close to Pin16

place near pin <200mil

AVDDH_B 2.7V

9 9 22

CL63 1u6.3X4, CL66 0.1u16X4, CL21 0.1u16X4

place near pin <200mil

DVDDL_B

CL94 1u6.3X4, CL90 0.1u16X4

Close to Pin37

place near pin <200mil

AVDDL_B

6 6 13 19 31

CL68 1u6.3X4, CL69 0.1u16X4, CL60 0.1u16X4, CL65 0.1u16X4, CL73 0.1u16X4

place near pin <200mil

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

UL7

14 PCIE7_LAN1_TXP — CL41 0.1u16X4 — PCIE7_LAN1_TXP_C — RX_P
14 PCIE7_LAN1_TXN — CL36 0.1u16X4 — PCIE7_LAN1_TXN_C — RX_N
13 CLK_LAN1_DP — REFCLK_P
13 CLK_LAN1_DN — REFCLK_N

PCIE interface

TX_P — CL42 0.1u16X4 — PCIE7_LAN1_RXP_C — PCIE7_LAN1_RXP 14
TX_N — CL40 0.1u16X4 — PCIE7_LAN1_RXN_C — PCIE7_LAN1_RXN 14

WAKEn — PCH_WAKE# — PCH_WAKE# 12,21,22,23,24,25,26,47,48,54,56,73
CLKREQnB — CLKREQnB

VDD33_B — PCH_WAKE# RL18 X_4.7K/4 — CLKREQnB RL17 4.7K/4 — check SB

24,25,26,27,54,56 PLTRST_BU3# — R495 0R/4 — LAN2_RST# — RL14 2.37K1%4 — PERSTn

RBIAS
PPS

DVDDL_B — Close to pin40 — CH-4.7u2A70mS-HF-2 — CHOKEL1 — LX_B

CL88 X_1000p50X4, CL86 1u16X4, CL95 10u6.3X6

LX should be wider than 30 mils.

VDD33_B — AVDD33_B — VDD33 AVDD33 Power

DVDDL_B — CPL3 X_COPPER — 1.1V — DVDDL_REG

AVDDL_B — AVDDL_REG

L61 300L600mA-150 — AVDDL-1 AVDDL-2 AVDDL-3 AVDDL-4

1.1V — AVDDVCO_B — CL79 0.1u16X4, CL75 X_1u6.3X4, CL83 X_4.7u6.3X6

AVDDH_B — AVDDH_REG — AVDDH

NC — GND

near pin34 <200mil

Media interface

TRXP0 TRXN0 — TR2_D0+ TR2_D0-
TRXP1 TRXN1 — TR2_D1+ TR2_D1-
TRXP2 TRXN2 — TR2_D2+ TR2_D2-
TRXP3 TRXN3 — TR2_D3+ TR2_D3-

DIFF 100 ohm

Test

DEBUGMODE[0] — RL16 30K/4 — VDD33_B
TESTMODE[0]
TESTMODE[1]
TESTMODE[2]

Reserve for strap hi

LED

LED[0] — LED0_B — RL40 X_10K/4 — VDD33_B
LED[1] — LED1_B — RL20 X_10K/4
LED[2] — LED2_B — RL15 X_10K/4

CLOCK

XTLI — LAN_XTAL1_B — CL19 27p50N4 — YL1 25MHZ18p
XTLO — LAN_XTAL2_B — CL20 27p50N4

E2500-RIV1-RL-HF

9 GND via

160926 Modify Y1 to D04-1006700-F07
Main:D04-1006700-F07
AVL:D04-1000640-T16

20160921 update
CHOKE1: L04-47A70T0-T19
AVL: L04-47A7870-C08
L04-47A7690-M26

L2:
L02-3018023-C08
L02-3018023-T19

note:

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

LED1:
1=SWR mode
0=LDO mode

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

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

LED ON/OFF by SIO

EMC

UL2

TR2_D0+ TR2_D0- — TR2_D1+ TR2_D1-

ESD-AOZ8829-10P

Main:D0G-06A030C-A68
AVL:D0G-05A0300-I14
D0G-45B031C-005

UL1

TR2_D2+ TR2_D2- — TR2_D3+ TR2_D3-

ESD-AOZ8829-10P

Close to LAN conn.

LED0_ACT_B — CL2 470p50X4
LED1_LINK1000#_B — CL4 470p50X4
LED2_LINK100#_B — CL10 470p50X4

LAN_LED_VCC5_B_R — CL5 0.1u16X4 — DL1 ESD-VPORT0603L102KV05-HF

Main:D0G-1020530-I05
AVL :D0G-8010510-SI0

Close to LAN conn.

VDD33_B — RL24 220R/4 — for EMI — CL1 X_0.1u16X4

LAN_LED_VCC5_A — CL3 0.1u16X4

LED0_B — RL25 75R/4 — RL2 330R/8 — LAN_LED_VCC5_A

LAN_USB1B

LED0_A_B — LED0_ACT_B — LAN_LED_VCC5_B_R — TR2_D0+ TR2_D0- TR2_D1+ TR2_D1- TR2_D2+ TR2_D2- TR2_D3+ TR2_D3-

29 YELLOW+
30 YELLOW-
19 LEDVCC
20 RJ1
21 RJ2
22 RJ3
23 RJ4
24 RJ5
25 RJ6
26 RJ7
27 RJ8
28 GND

LED1_B — RL27 220R/4 — LED1_LINK1000#_B — 31 GREEN+/ORANGE-
LED2_B — RL28 220R/4 — LED2_LINK100#_B — 32 GREEN-/ORANGE+

RJ45_USBX2_LEDX2-1000-RH-10

LED1 low is Orange 1000
LED2 low is Green 100

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MS-7A98

Size	Document Description	Rev
Custom	Killer LAN E2500 - B	20

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E2500 GIGA LAN

151.6mA

3VSB — CPL6 X_COPPER — VDD33_C

CL85 10u6.3X6 | CL80 10u6.3X6 | CL74 1u6.3X4 | CL72 0.1u16X4 | CL78 X_1000p50X4

VDD33_C — CPL1 X_COPPER — AVDD33_C

CL58 1u6.3X4 | CL59 0.1u16X4

Close to Pin16

place near pin <200mil

AVDDH_C — 2.7V

9 9 22

CL62 1u6.3X4 | CL18 0.1u16X4 | CL24 0.1u16X4

place near pin <200mil

DVDDL_C

CL91 1u6.3X4 | CL92 0.1u16X4

Close to Pin37

place near pin <200mil

AVDDL_C

6 6 13 19 31

CL70 1u6.3X4 | CL64 0.1u16X4 | CL61 0.1u16X4 | CL71 0.1u16X4 | CL67 0.1u16X4

place near pin <200mil

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

UL8

14 PCIE4_LAN2_TXP — CL45 0.1u16X4 — PCIE4_LAN2_TXP_C — 35 RX_P
14 PCIE4_LAN2_TXN — CL46 0.1u16X4 — PCIE4_LAN2_TXN_C — 36 RX_N
13 CLK_LAN2_DP — 33 REFCLK_P
13 CLK_LAN2_DN — 32 REFCLK_N
PCIE interface

30 TX_P — PCIE4_LAN2_RXP_C — CL44 0.1u16X4 — PCIE4_LAN2_RXP 14
29 TX_N — PCIE4_LAN2_RXN_C — CL43 0.1u16X4 — PCIE4_LAN2_RXN 14
3 WAKEn — PCH_WAKE# — PCH_WAKE# 12,21,22,23,24,25,26,47,48,54,55,73
4 CLKREQnC — CLKREQnC

24,25,26,27,54,55 PLTRST_BU3# — R497 0R/4 — LAN3_RST# — RL31 2.37K1%4 — 2 PERSTn — 10 RBIAS — 24 PPS

Media interface

11 TRXP0 — TR3_D0+
12 TRXN0 — TR3_D0-
14 TRXP1 — TR3_D1+
15 TRXN1 — TR3_D1-
17 TRXP2 — TR3_D2+
18 TRXN2 — TR3_D2-
20 TRXP3 — TR3_D3+
21 TRXN3 — TR3_D3-

DIFF 100 ohm

DVDDL_C — Close to pin40 — CH-4.7u2A70mS-HF-2 — CHOKEL2 — LX_C — 40 LX

VDD33_C — 1 VDD33
AVDD33_C — 16 AVDD33
Power

CL93 X_1000p50X4 | CL89 1u16X4 | CL81 10u6.3X6

LX should be wider than 30 mils.

DVDDL_C — 37 DVDDL_REG

1.1V — CPL5 X_COPPER

AVDDL_C — 6 AVDDL_REG

L60 300L600mA-150

13 AVDDL-1
19 AVDDL-2
31 AVDDL-3

1.1V — AVDDVCO_C — 34 AVDDL-4

CL76 0.1u16X4 | CL82 X_1u6.3X4 | CL84 X_4.7u6.3X6

AVDDH_C — 9 AVDDH_REG — 22 AVDDH — 28 NC — GND

near pin34 <200mil

Test

5 DEBUGMODE[0] — RL32 30K/4 — VDD33_C
25 TESTMODE[0]
26 TESTMODE[1]
27 TESTMODE[2]

Reserve for strap hi

LED

38 LED[0] — LED0_C — RL33 X_10K/4 — VDD33_C
39 LED[1] — LED1_C — RL34 X_10K/4
23 LED[2] — LED2_C — RL35 X_10K/4

CLOCK

LAN_XTAL1_C — CL22 27p50N4 — 8 XTLI
YL2 25MHZ18p
7 XTLO — LAN_XTAL2_C — CL23 27p50N4

E2500-RIV1-RL-HF

9 GND via

160926 Modify Y1 to D04-1006700-F07
Main:D04-1006700-F07
AVL:D04-1000640-T16

20160921 update
CHOKE1: L04-47A70T0-T19
AVL: L04-47A7870-C08
L04-47A7690-M26

L2:
L02-3018023-C08
L02-3018023-T19

PCH_WAKE# — RL29 X_4.7K/4 — VDD33_C
CLKREQnC — RL30 4.7K/4
check SB

note:

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

LED1:
1=SWR mode
0=LDO mode

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

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

LED ON/OFF by SIO

EMC

UL4

TR3_D0+ 1 — 10 TR3_D0+
TR3_D0- 2 — 9 TR3_D0-
TR3_D1+ 4 — 7 TR3_D1+
TR3_D1- 5 — 6 TR3_D1-
3 — 8 — ESD-AOZ8829-10P

Main:D0G-06A030C-A68
AVL:D0G-05A0300-I14
D0G-45B031C-005

UL3

TR3_D2+ 1 — 10 TR3_D2+
TR3_D2- 2 — 9 TR3_D2-
TR3_D3+ 4 — 7 TR3_D3+
TR3_D3- 5 — 6 TR3_D3-
3 — 8 — ESD-AOZ8829-10P

Close to LAN conn.

LED0_ACT_C — CL12 470p50X4
LED1_LINK1000#_C — CL13 470p50X4
LED2_LINK100#_C — CL14 470p50X4

LAN_LED_VCC5_C_R
CL16 0.1u16X4 | DL2 ESD-VPORT0603L102KV05-HF

Main:D0G-1020530-I05
AVL :D0G-8010510-SI0

Close to LAN conn.

VDD33_C
LAN_LED_VCC5_A — CL15 0.1u16X4
RL38 220R/4
for EMI
CL11 X_0.1u16X4

LAN_USB2B

LED0_C — RL3 75R/4 — LED0_A_C
LAN_LED_VCC5_A — RL8 330R/8 — LAN_LED_VCC5_C_R

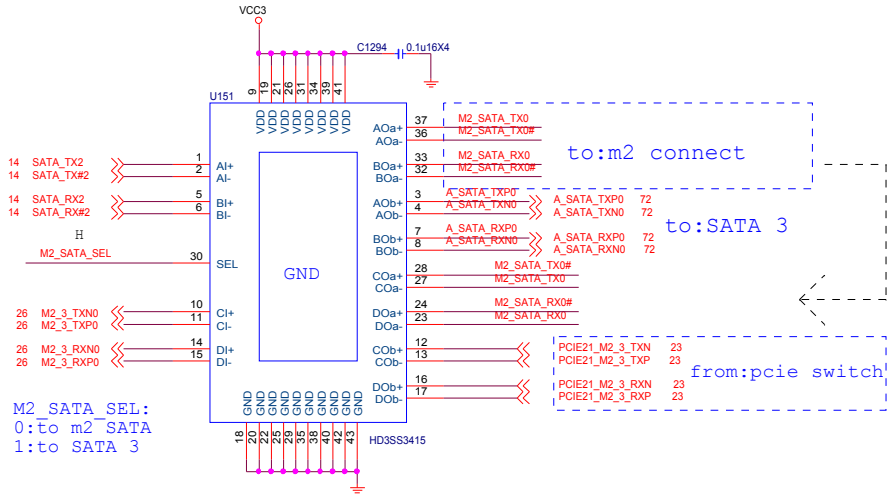
29 YELLOW+
30 YELLOW-
19 LEDVCC
20 RJ1
21 RJ2
22 RJ3
23 RJ4
24 RJ5
25 RJ6
26 RJ7
27 RJ8
28 GND

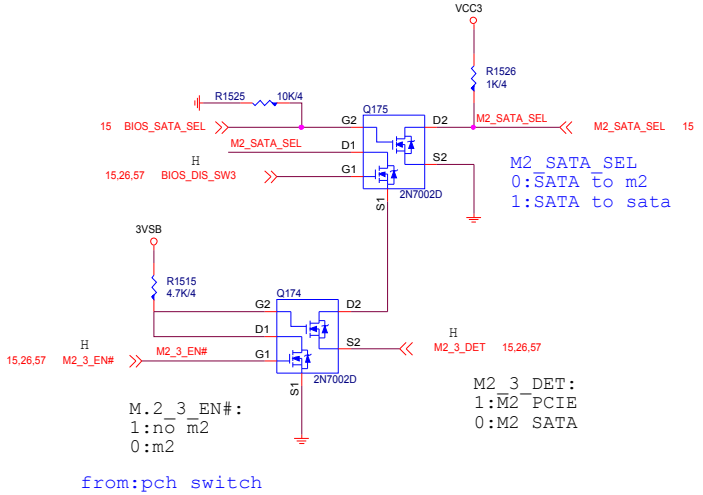
LED1_C — RL6 220R/4 — LED1_LINK1000#_C — 31 GREEN+/ORANGE-
LED2_C — RL7 220R/4 — LED2_LINK100#_C — 32 GREEN-/ORANGE+

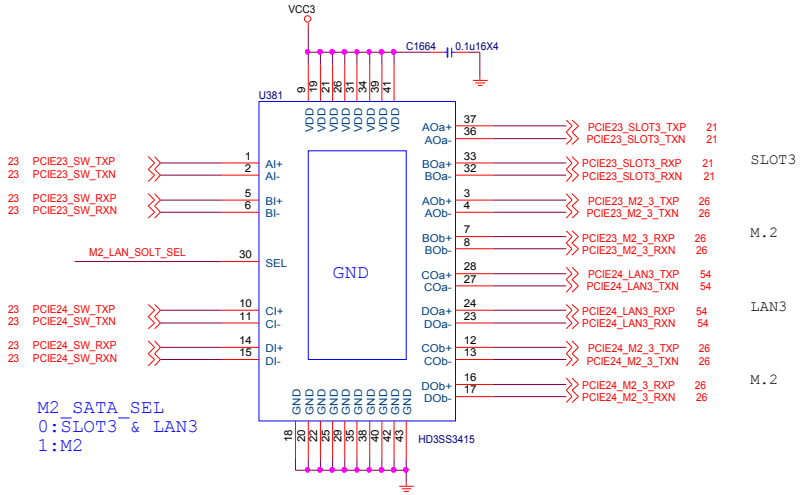
RJ45_USBX2_LEDX2-1000-RH-10

LED1 low is Orange 1000
LED2 low is Green 100

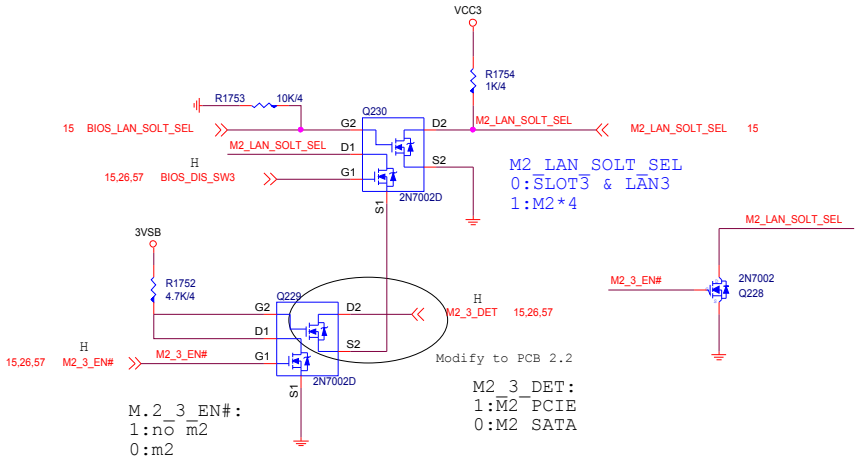
MICRO-STAR INT'L CO.,LTD		
MS-7A98		
Size: Custom	Document Description: Killer LAN E2500 - C	Rev: 20
Date: Monday, July 17, 2017	Sheet 56 of 98	





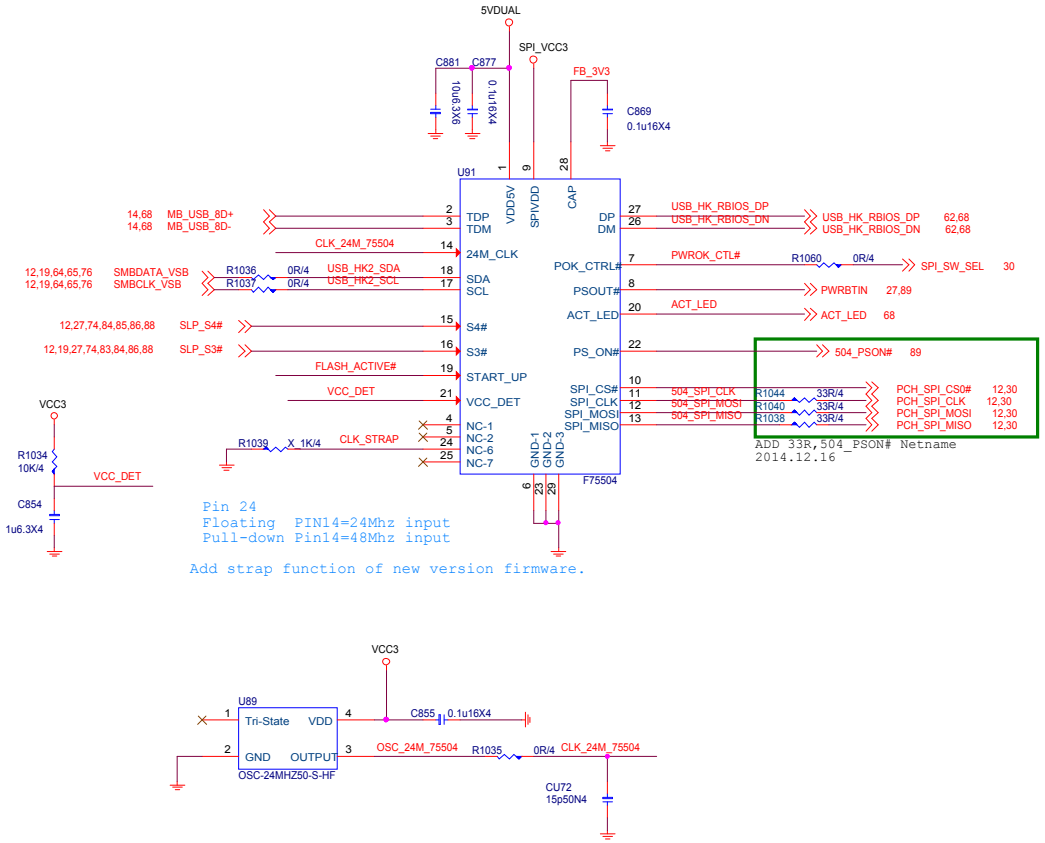


M2_LAN_SOLT_SEL
0:SLOT3 & LAN3
1:M2*4



MICRO-STAR INT'L CO.,LTD		
MS-7A98		
Size: Custom	Document Description: M2/SATA SWITCH	Rev: 20
Date: Monday, July 17, 2017	Sheet 57 of 98	

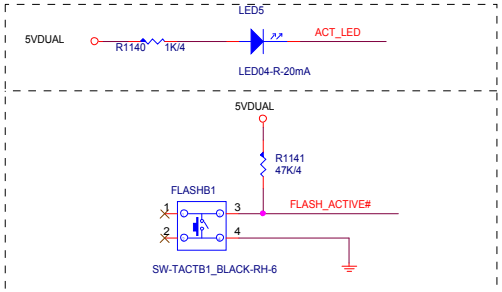
Host USB connector



ADD 33R,504_PSON# Netname
2014.12.16

Pin 24
Floating PIN14=24Mhz input
Pull-down Pin14=48Mhz input

Add strap function of new version firmware.

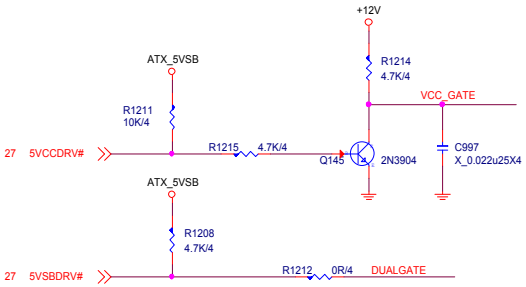


Reserved for when F75501 Hotkey device fail use

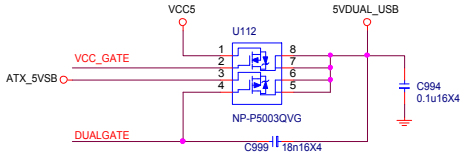
* All close to Front IO side

MICRO-STAR INT'L CO.,LTD		
MS-7A98		
Size: Custom	Document Description: USB HOTKEY F75504	Rev: 20
Date: Monday, July 17, 2017	Sheet 58 of 98	

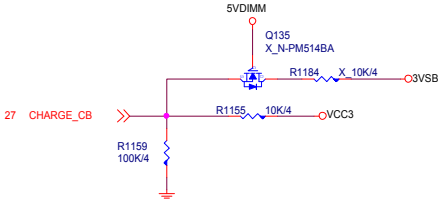
5VDUAL_USB



3~4A



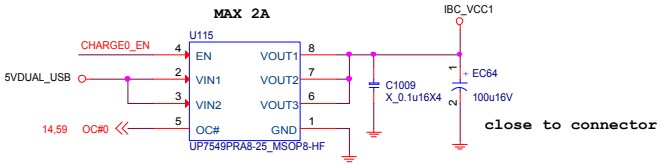
Pin power : I_3VSB
Register power : I_3VSB
Register reset : I_3VSB

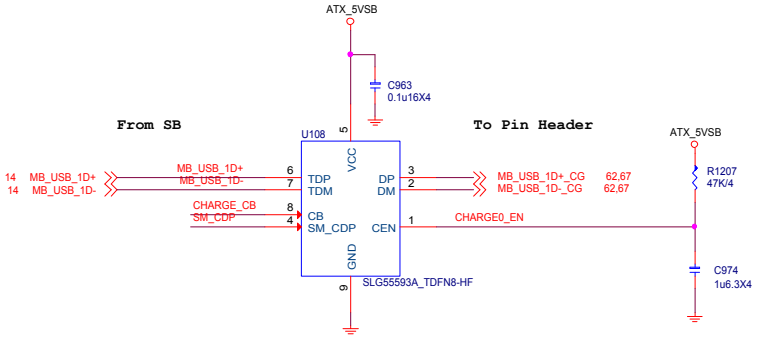


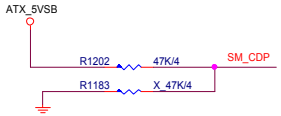
USB POWER PORT 0 For USB Charging

MAX 1.7A

MAX 2A



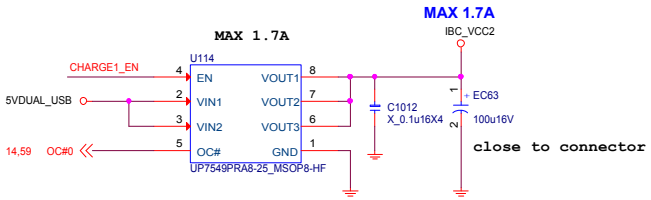


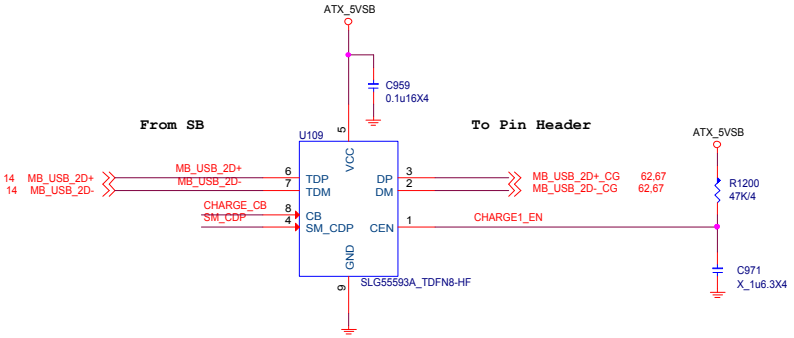


USB POWER PORT 1 For USB Charging

MAX 1.7A

MAX 1.7A



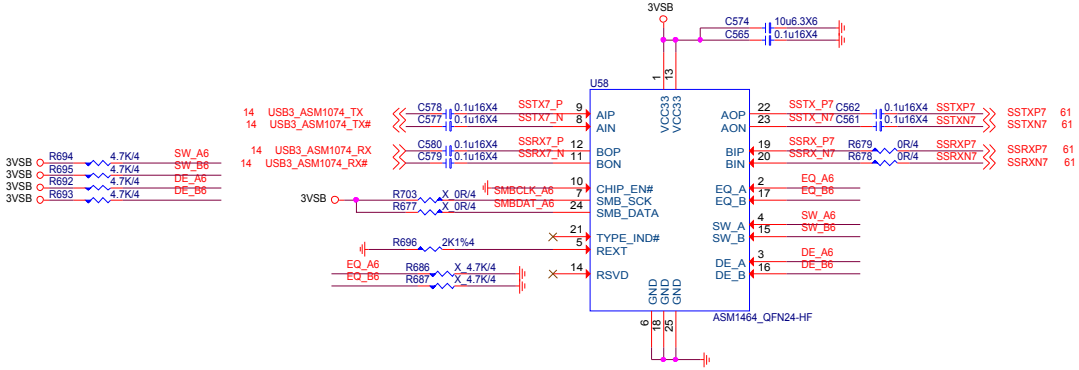


MICRO-STAR INT'L CO.,LTD

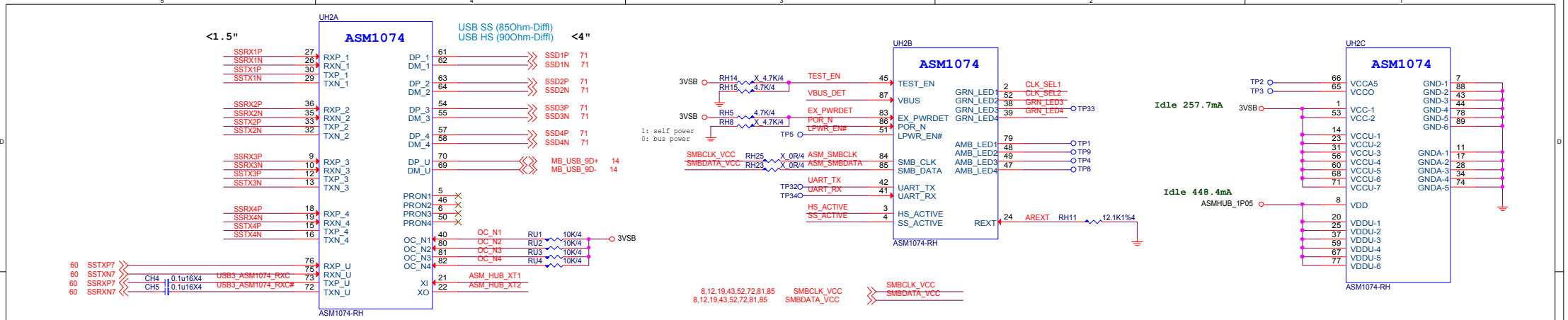
MS-7A98

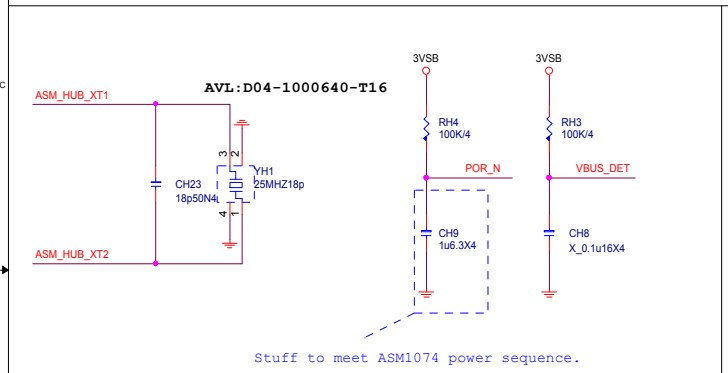
Size	Document Description	Rev
Custom	USB CHARGE_SLG55593A	20

Date: Monday, July 17, 2017 Sheet 59 of 98



MICRO-STAR INT'L CO.,LTD		
MS-7A98		
Size: Custom	Document Description: ASM1074 USB redriver	Rev: 20
Date: Monday, July 17, 2017	Sheet 60 of 98	



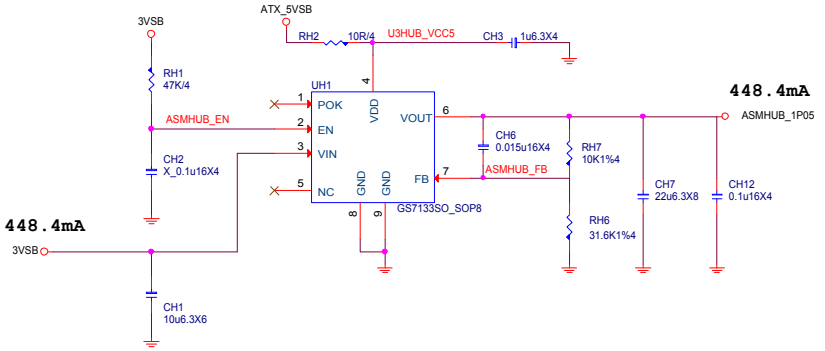


H/W Strapping

Strapping Table

GRN_LED2 (CLK_SEL1)	GRN_LED1 (CLK_SEL0)		
0	0	25MHz	Default
1	0	30MHz	
1	1	20MHz	

ASM1074 USB3.0 HUB core Power

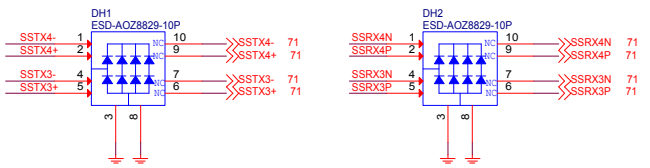


Close to Connector

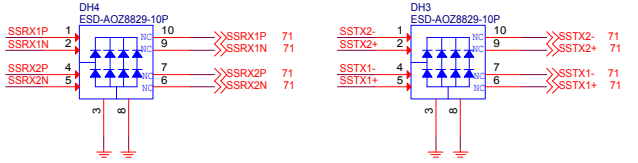
ESD Protection

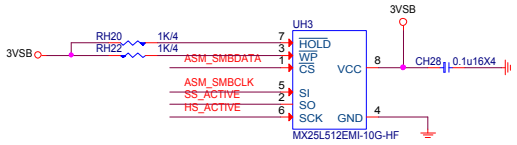
USB3.0 (ESD)
D0G-06A050C-A68 (M)
D0G-05A0300-I14

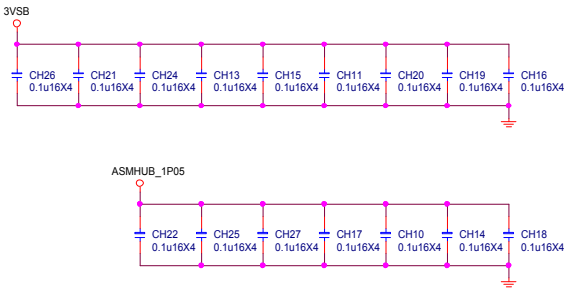
Close to Connector



Close to Connector

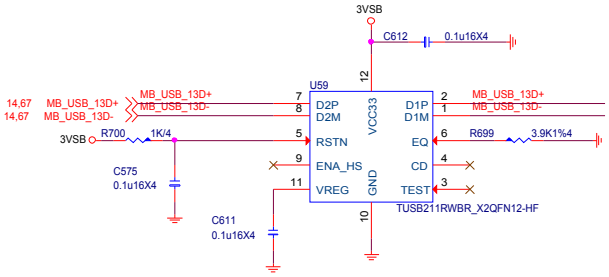


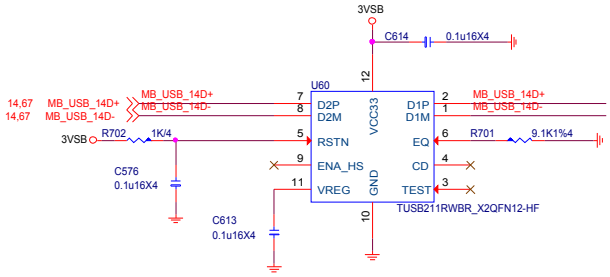




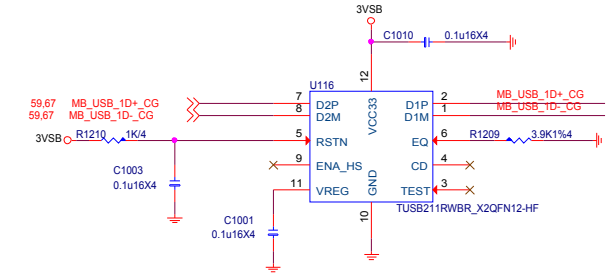
MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7A98	
Size: Custom	Document Description: ASM1074 USB HUB	Rev: 20
Date: Monday, July 17, 2017	Sheet 61 of 98	

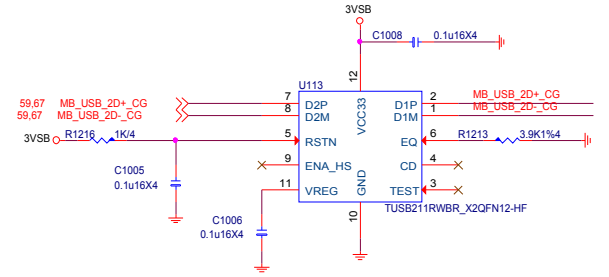
USB2.0 FRONT VR PORT JUSB1



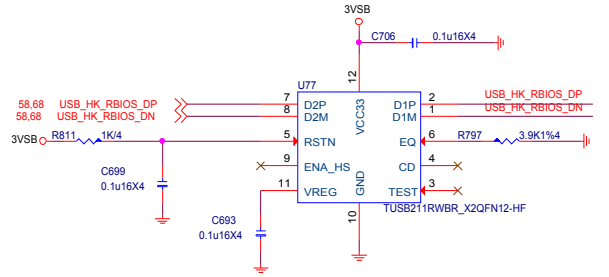


USB2.0 FRONT CHARG PORT JUSB6





USB2.0 REAR PS2 PORT



MICRO-STAR INT'L CO.,LTD

MS-7A98

Size	Document Description	Rev
Custom	USB2 Ridriver TUSB211	20

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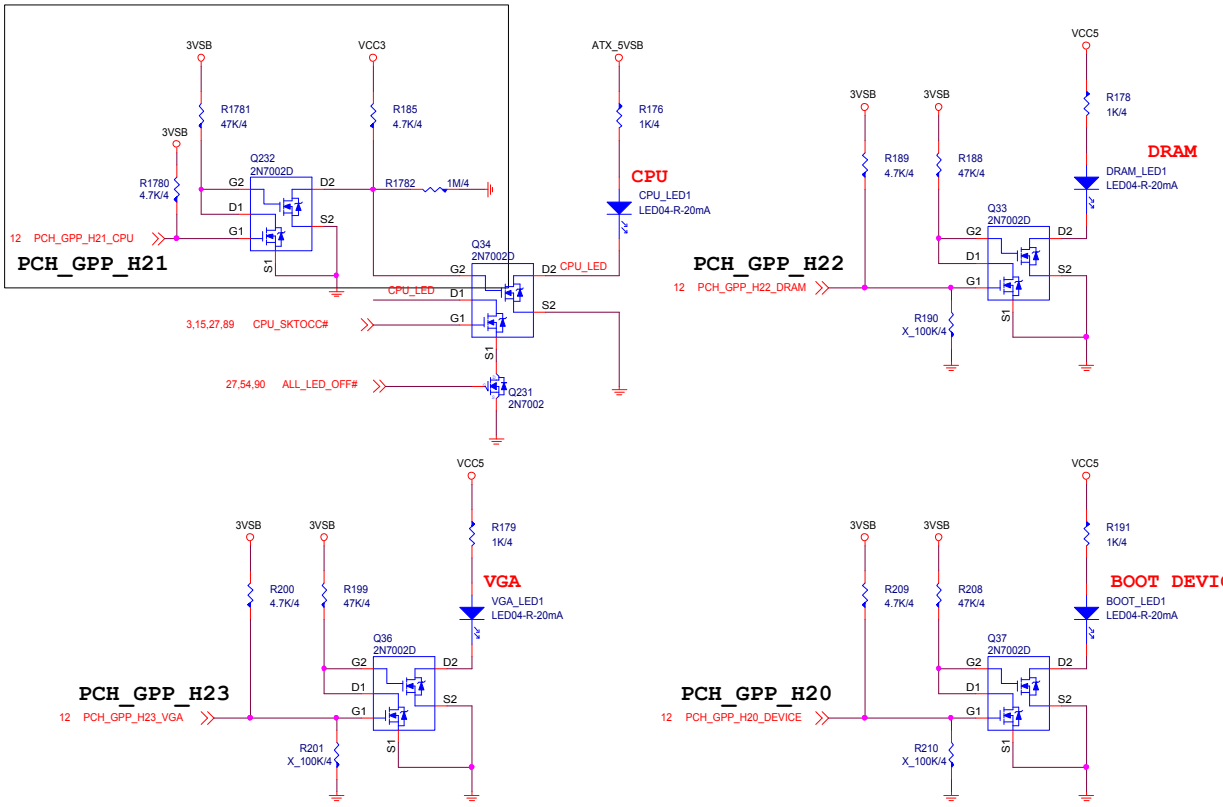
EZ DEBUG LED

modify to PCB 2.2



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

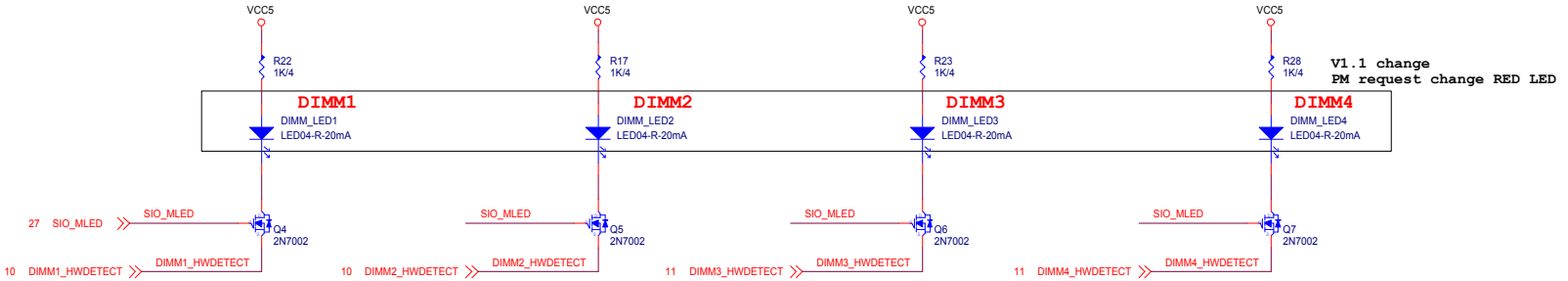
LED
白 : D0C-040T200-H91
AVL: D0C-040S200-E07

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

關機斷電狀態下，4個LED先維持default全暗，開機通電後：

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

DIMM SLOT LED



MICRO-STAR INT'L CO.,LTD

MS-7A98

Size	Document Description	Rev
Custom	EZ DEBUG / DIMM SLOT LED	20

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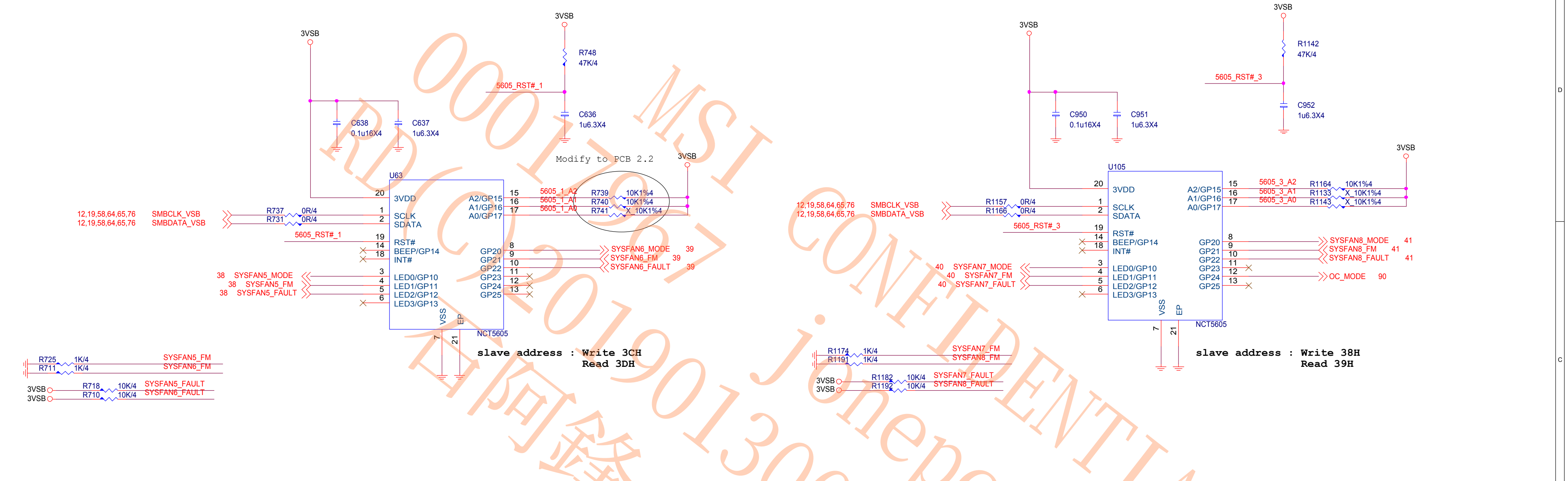
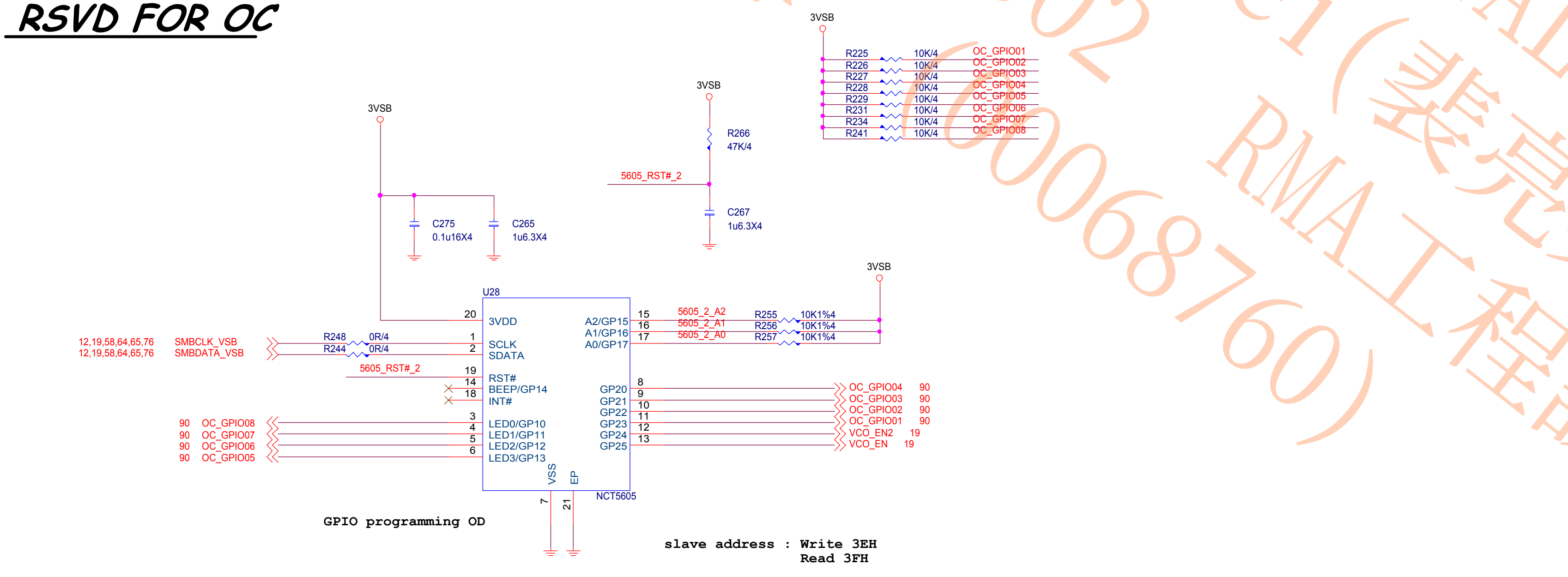
FAN GPIO



RSVD FOR OC



MICRO-STAR INT'L CO.,LTD

MS-7A98

Size	Document Description	Rev
Custom	GPIO IC-NCT5605	20

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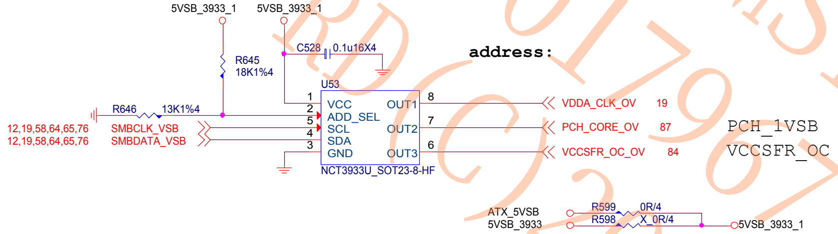
UPI VOLTAGE CONSOLE

0x20:RH=10K,RL=OPEN

ADDRESS	0x2A	0X28	0x26	0x24	0x22	0x20
RH (KOhm)	OPEN	3.9	3	2.2	1.3	10
RL (KOhm)	10	1.3	2.3	3	3.9	OPEN
BUS_SEL	0%	25%	40%	60%	75%	100%

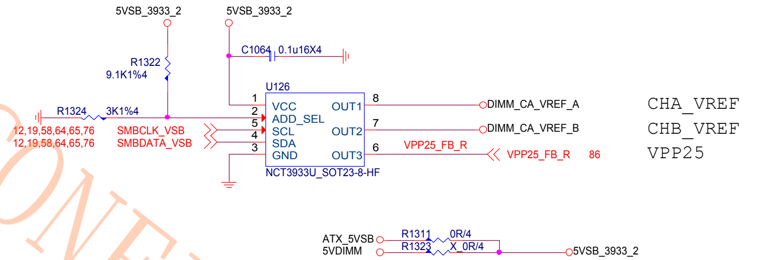
UPI VOLTAGE CONSOLE

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



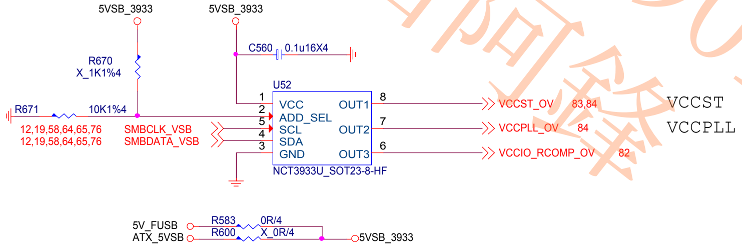
UPI VOLTAGE CONSOLE

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



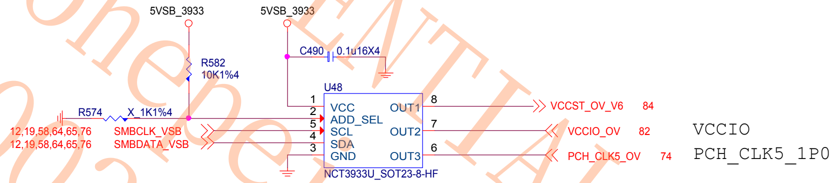
UPI VOLTAGE CONSOLE

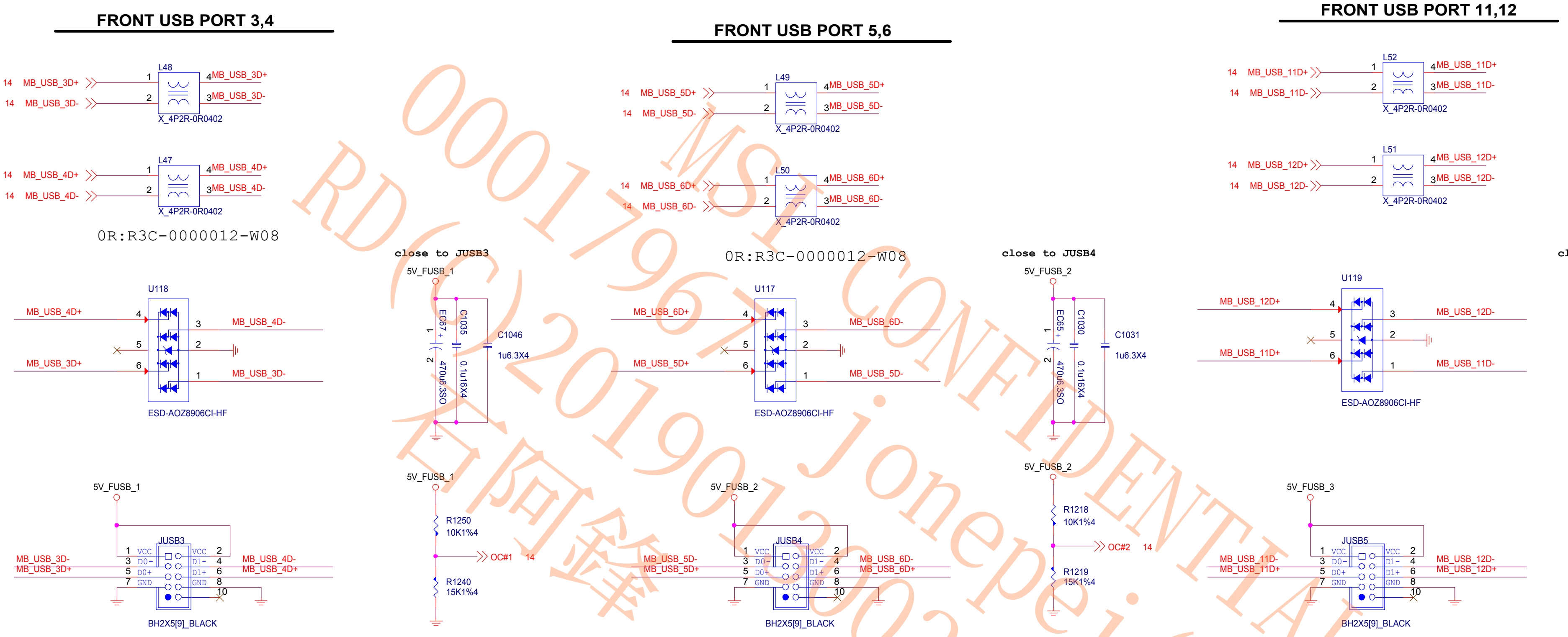
0x2A:RH=9.1K,RL=3K



UPI VOLTAGE CONSOLE

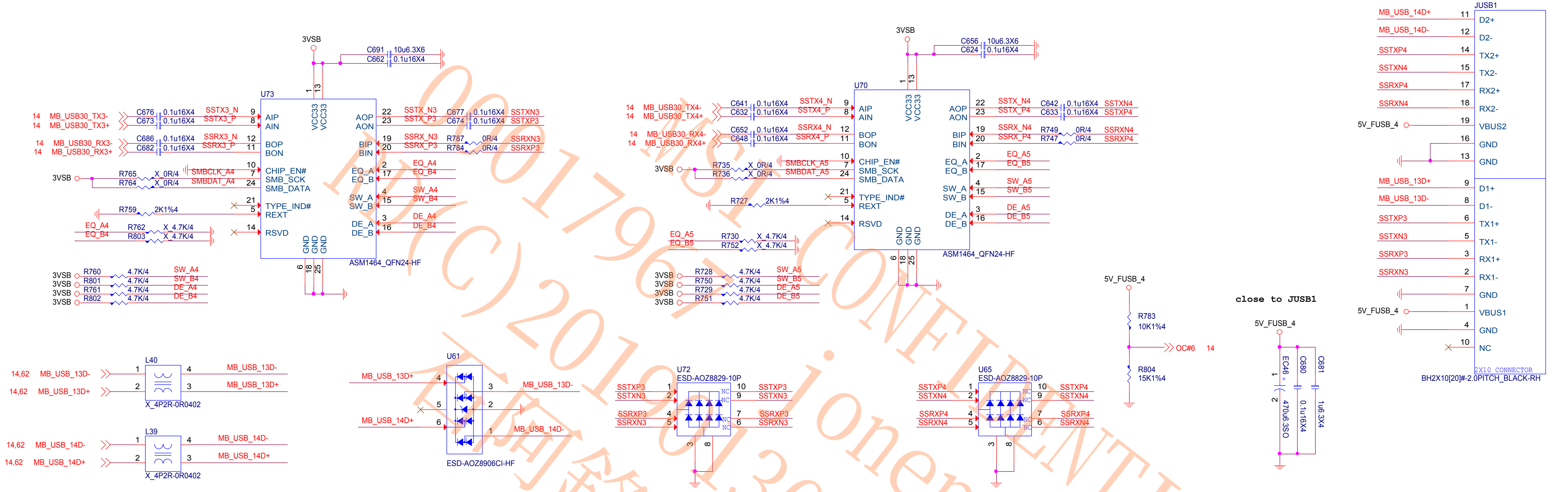
0x20:RH=18K,RL=13K




FRONT USB PORT 3,4
FRONT USB PORT 5,6
FRONT USB PORT 11,12
L48
MB_USB_3D+
MB_USB_3D-
X_4P2R-0R0402
L47
MB_USB_4D+
MB_USB_4D-
0R:R3C-0000012-W08
L49
MB_USB_5D+
MB_USB_5D-
L50
MB_USB_6D+
MB_USB_6D-
L52
MB_USB_11D+
MB_USB_11D-
L51
MB_USB_12D+
MB_USB_12D-
close to JUSB3
close to JUSB4
close to JUSB5
5V_FUSB_1
5V_FUSB_2
5V_FUSB_3
U118
U117
U119
ESD-AOZ8906CI-HF
EC67
C1035
C1046
470u6.3SO
0.1u16X4
1u6.3X4
EC65
C1030
C1031
EC66
C1032
C1026
JUSB3
JUSB4
JUSB5
BH2X5[9]_BLACK
VCC
D0-
D0+
GND
D1-
D1+
R1250
10K1%4
R1240
15K1%4
OC#1
R1218
R1219
OC#2
R1220
R1221
OC#5
14

MICRO-STAR INT'L CO.,LTD		
MS-7A98		
Size: Custom	Document Description: Front USB2 HEADER CONN	Rev: 20
Date: Monday, July 17, 2017	Sheet 66 of 98	

USB3.0 FRONT VR PORT

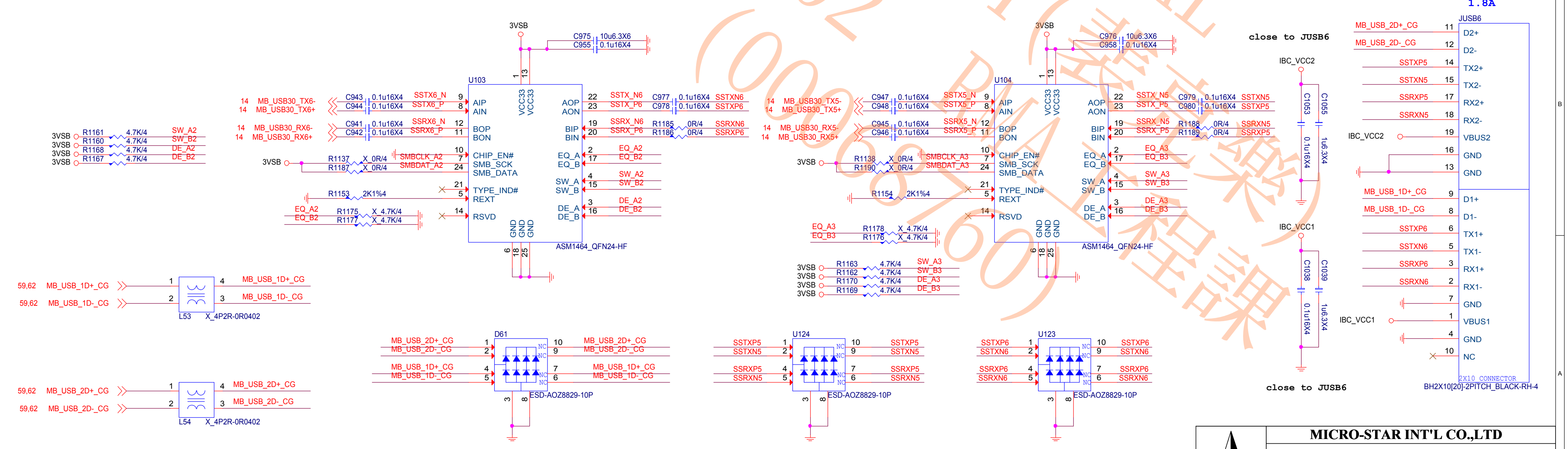


FRONT USB30 PORT 0,1,13,14

USB3.0 FRONT CHARG PORT

layout SWAP

1.8A



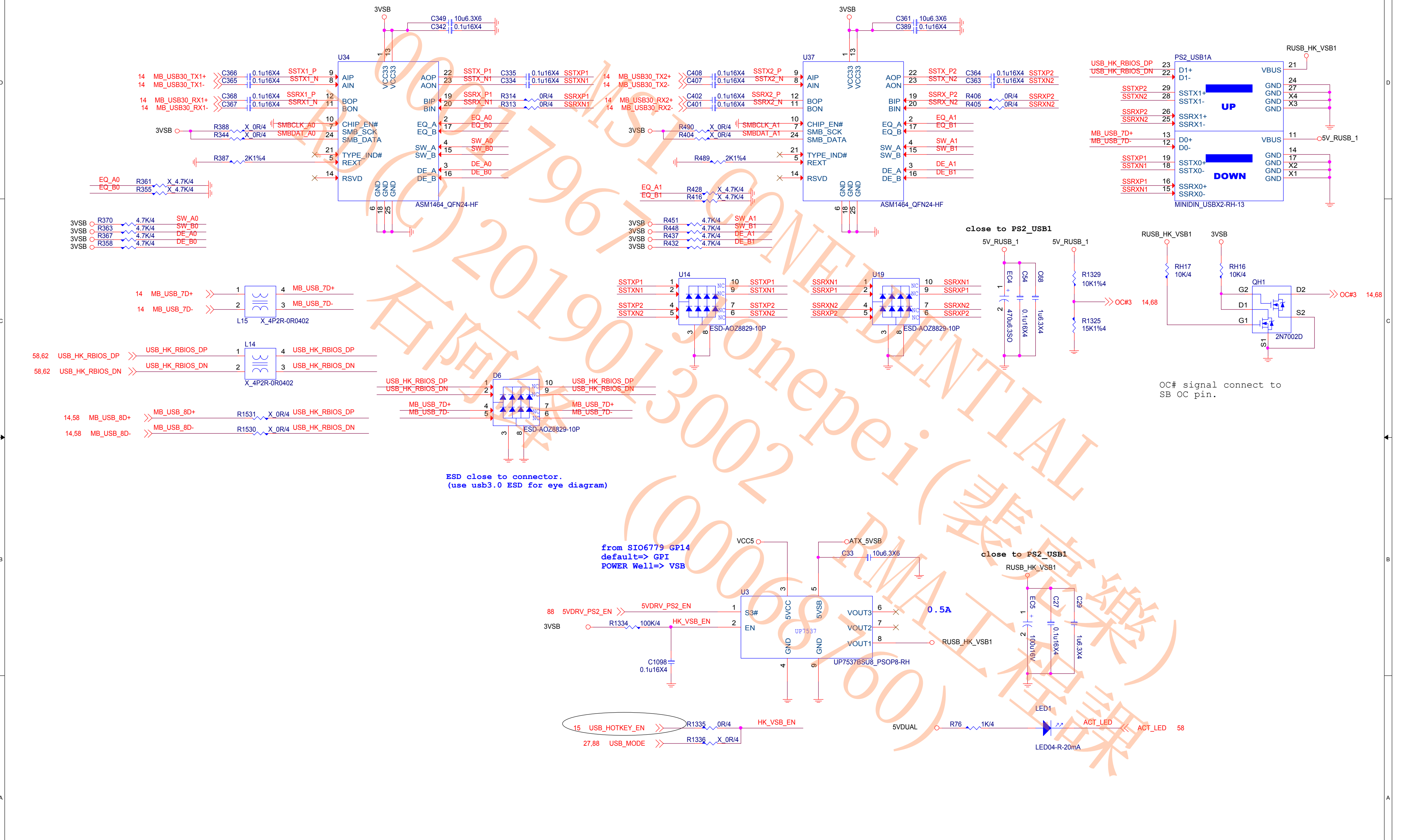
MICRO-STAR INT'L CO.,LTD

MS-7A98

Size	Document Description	Rev
Custom	Front USB3 HEADER CONN	20

Date: Monday, July 17, 2017 | Sheet 67 of 98

USB30 PORT 0,1,4,5



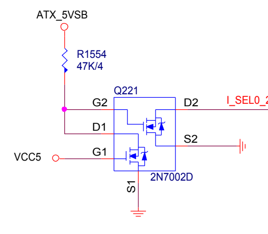
MICRO-STAR INT'L CO.,LTD

MS-7A98

Size	Document Description	Rev
Custom	Rear USB3 PS2 connector	20

Date: Monday, July 17, 2017 Sheet 68 of 98

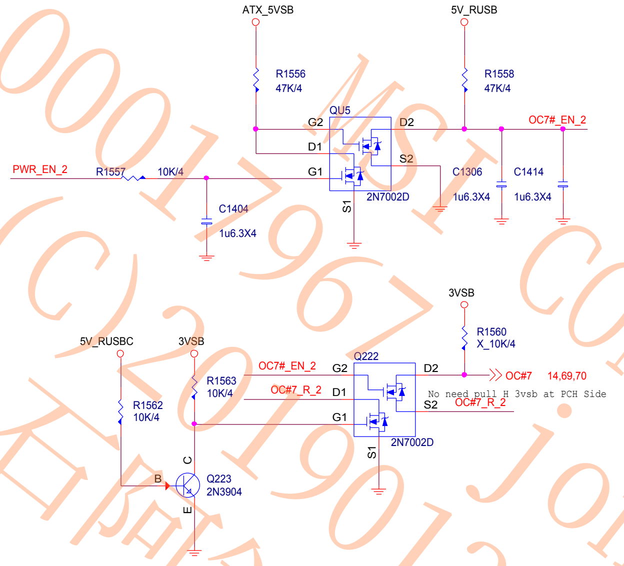
Current Mode

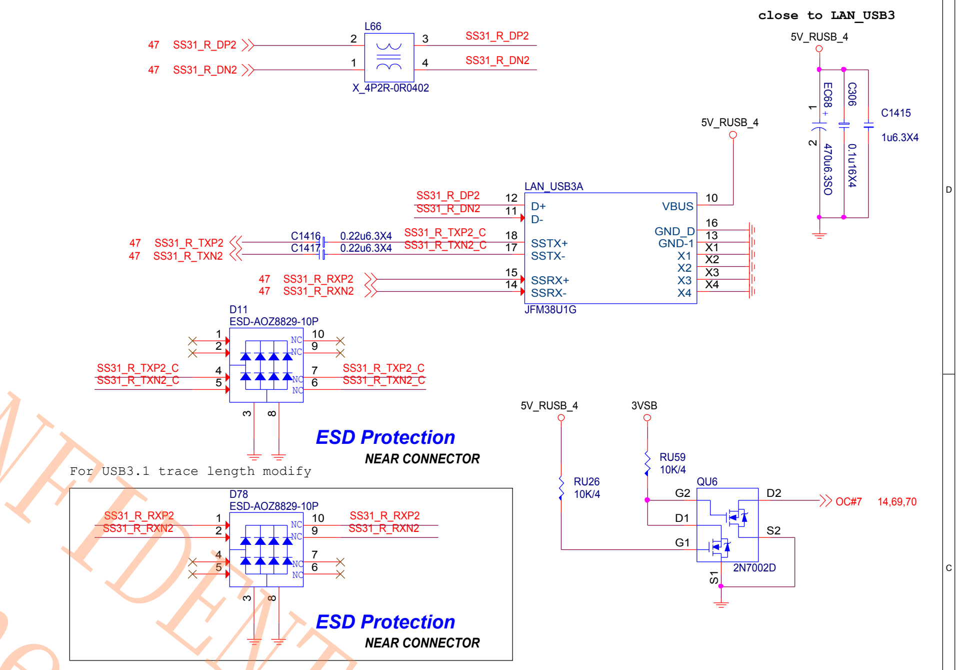


0	X	Default for 900mA
1	0	1.5A @5V
1	1	3A @5V

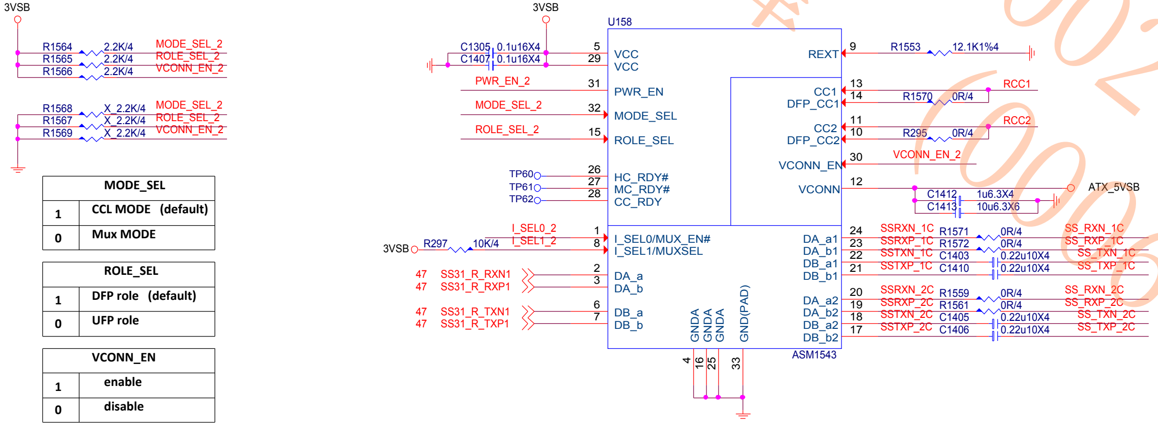
1.5A under S3 mode
3A under S0 mode

VBUS OC#





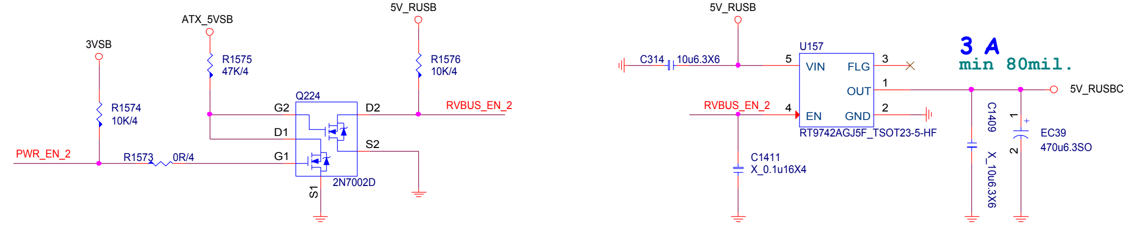
USB Type-C MUX with Configuration Channel (CC)



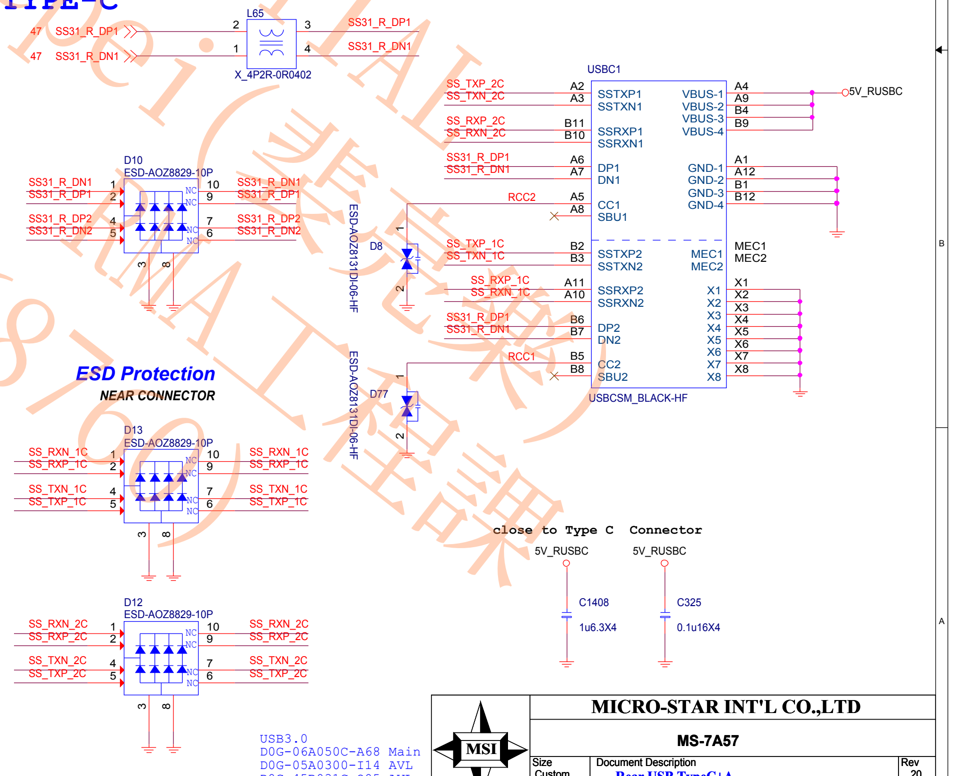
MODE_SEL	
1	CCL MODE (default)
0	Mux MODE

ROLE_SEL	
1	DFP role (default)
0	UFP role

VCONN_EN	
1	enable
0	disable

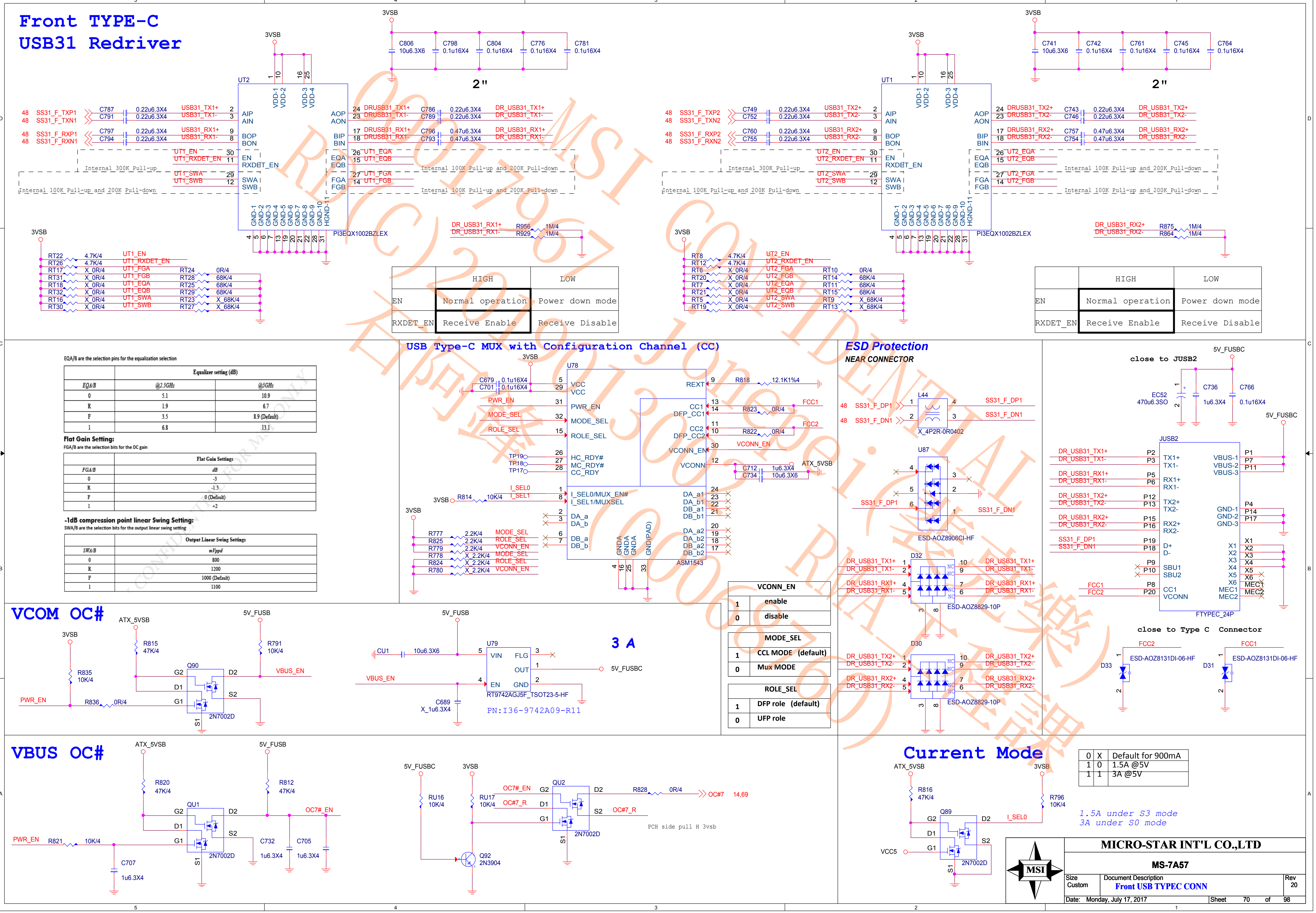


TYPE-C



USB3.0
D0G-06A050C-A68 Main
D0G-05A0300-I14 AVL
D0G-45B031C-005 AVL

MICRO-STAR INT'L CO.,LTD		
MS-7A57		
Size: Custom	Document Description: Rear USB TypeC+A	Rev: 20
Date: Monday, July 17, 2017	Sheet 69 of 98	



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

EQA/B are the selection pins for the equalization selection

	Equalizer setting (dB)	
EQA/B	@2.5GHz	@5GHz
0	5.1	10.9
R	1.9	6.7
F	3.5	8.9 (Default)
1	6.8	13.1

Flat Gain Setting:

FGA/B are the selection bits for the DC gain

	Flat Gain Settings
FGA/B	dB
0	-3
R	-1.5
F	0 (Default)
1	+2

-1dB compression point linear Swing Setting:

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

	Output Linear Swing Settings
SWA/B	mVppd
0	800
R	1200
F	1000 (Default)
1	1100

VCONN_EN	
1	enable
0	disable

MODE_SEL	
1	CCL MODE (default)
0	Mux MODE

ROLE_SEL	
1	DFP role (default)
0	UFP role

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

MICRO-STAR INT'L CO.,LTD

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Size: Custom | Document Description: Front USB TYPEC CONN | Rev: 20

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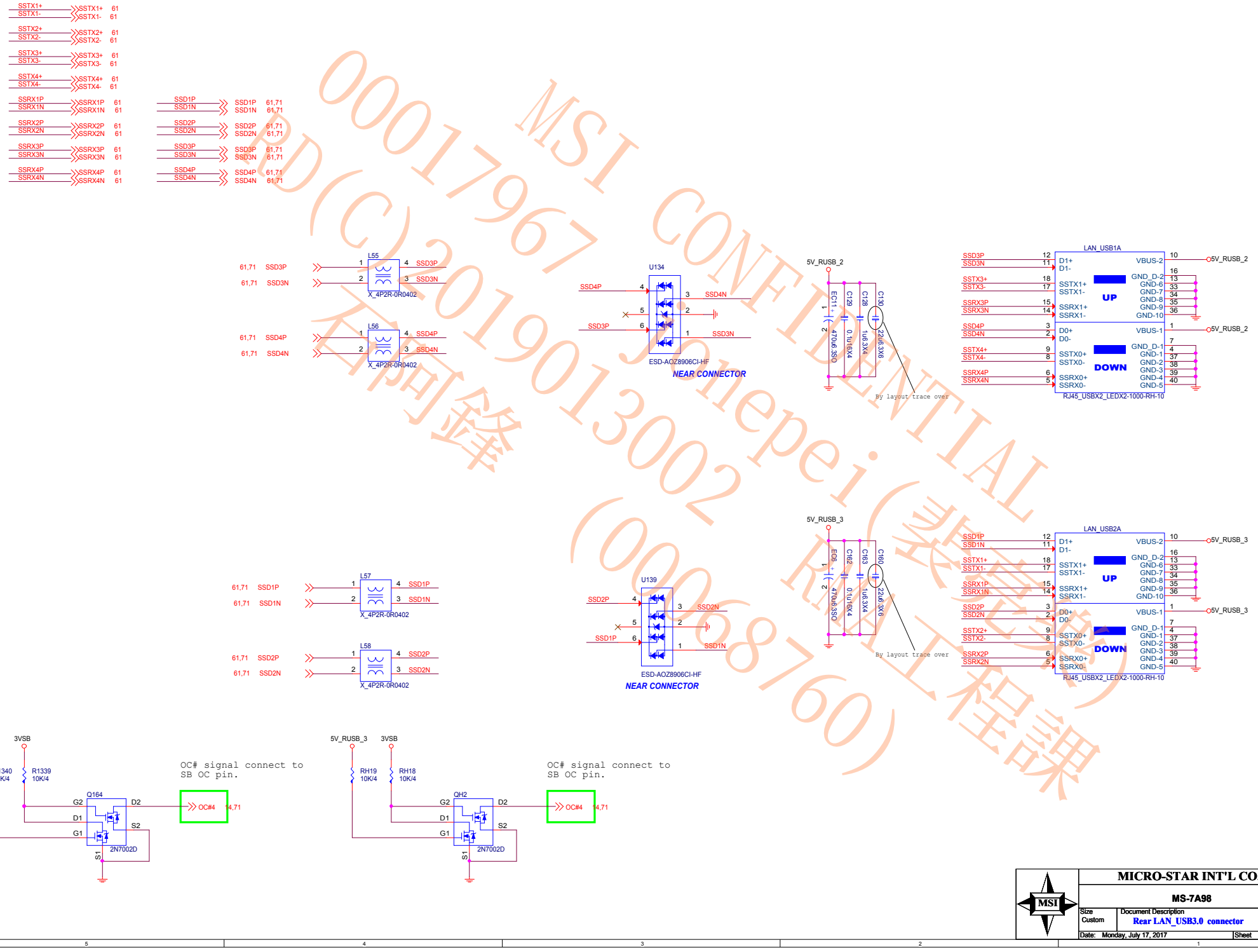
SSTX1+ SSTX1- SSTX1+ 61 SSTX1- 61
SSTX2+ SSTX2- SSTX2+ 61 SSTX2- 61
SSTX3+ SSTX3- SSTX3+ 61 SSTX3- 61
SSTX4+ SSTX4- SSTX4+ 61 SSTX4- 61
SSRX1P SSRX1N SSRX1P 61 SSRX1N 61
SSRX2P SSRX2N SSRX2P 61 SSRX2N 61
SSRX3P SSRX3N SSRX3P 61 SSRX3N 61
SSRX4P SSRX4N SSRX4P 61 SSRX4N 61
SSD1P SSD1N SSD1P 61,71 SSD1N 61,71
SSD2P SSD2N SSD2P 61,71 SSD2N 61,71
SSD3P SSD3N SSD3P 61,71 SSD3N 61,71
SSD4P SSD4N SSD4P 61,71 SSD4N 61,71
61,71 SSD3P
61,71 SSD3N
L55
X_4P2R-0R0402
61,71 SSD4P
61,71 SSD4N
L56
X_4P2R-0R0402
U134
SSD4P
SSD3P
SSD4N
SSD3N
ESD-AOZ8906CI-HF
NEAR CONNECTOR
5V_RUSB_2
EC11
470u6.3SO
C129
0.1u16X4
C128
1u6.3X4
C130
22u6.3X6
By layout trace over
LAN_USB1A
SSD3P
SSD3N
SSTX3+
SSTX3-
SSRX3P
SSRX3N
SSD4P
SSD4N
SSTX4+
SSTX4-
SSRX4P
SSRX4N
D1+
D1-
SSTX1+
SSTX1-
SSRX1+
SSRX1-
D0+
D0-
SSTX0+
SSTX0-
SSRX0+
SSRX0-
VBUS-2
VBUS-1
GND_D-2
GND_D-1
GND-6
GND-7
GND-8
GND-9
GND-10
GND-1
GND-2
GND-3
GND-4
GND-5
UP
DOWN
5V_RUSB_2
RJ45_USBX2_LEDX2-1000-RH-10
61,71 SSD1P
61,71 SSD1N
L57
X_4P2R-0R0402
61,71 SSD2P
61,71 SSD2N
L58
X_4P2R-0R0402
U139
SSD2P
SSD1P
SSD2N
SSD1N
ESD-AOZ8906CI-HF
NEAR CONNECTOR
5V_RUSB_3
EC6
470u6.3SO
C162
0.1u16X4
C163
1u6.3X4
C160
22u6.3X6
By layout trace over
LAN_USB2A
SSD1P
SSD1N
SSTX1+
SSTX1-
SSRX1P
SSRX1N
SSD2P
SSD2N
SSTX2+
SSTX2-
SSRX2P
SSRX2N
5V_RUSB_3
RJ45_USBX2_LEDX2-1000-RH-10
5V_RUSB_2
3VSB
R1340 10K/4
R1339 10K/4
Q164
G2
D1
G1
D2
S2
S1
2N7002D
OC#4
14,71
OC# signal connect to SB OC pin.
5V_RUSB_3
3VSB
RH19 10K/4
RH18 10K/4
QH2
G2
D1
G1
D2
S2
S1
2N7002D
OC#4
14,71
OC# signal connect to SB OC pin.
MICRO-STAR INT'L CO.,LTD
MS-7A98
Size
Custom
Document Description
Rear LAN_USB3.0 connector
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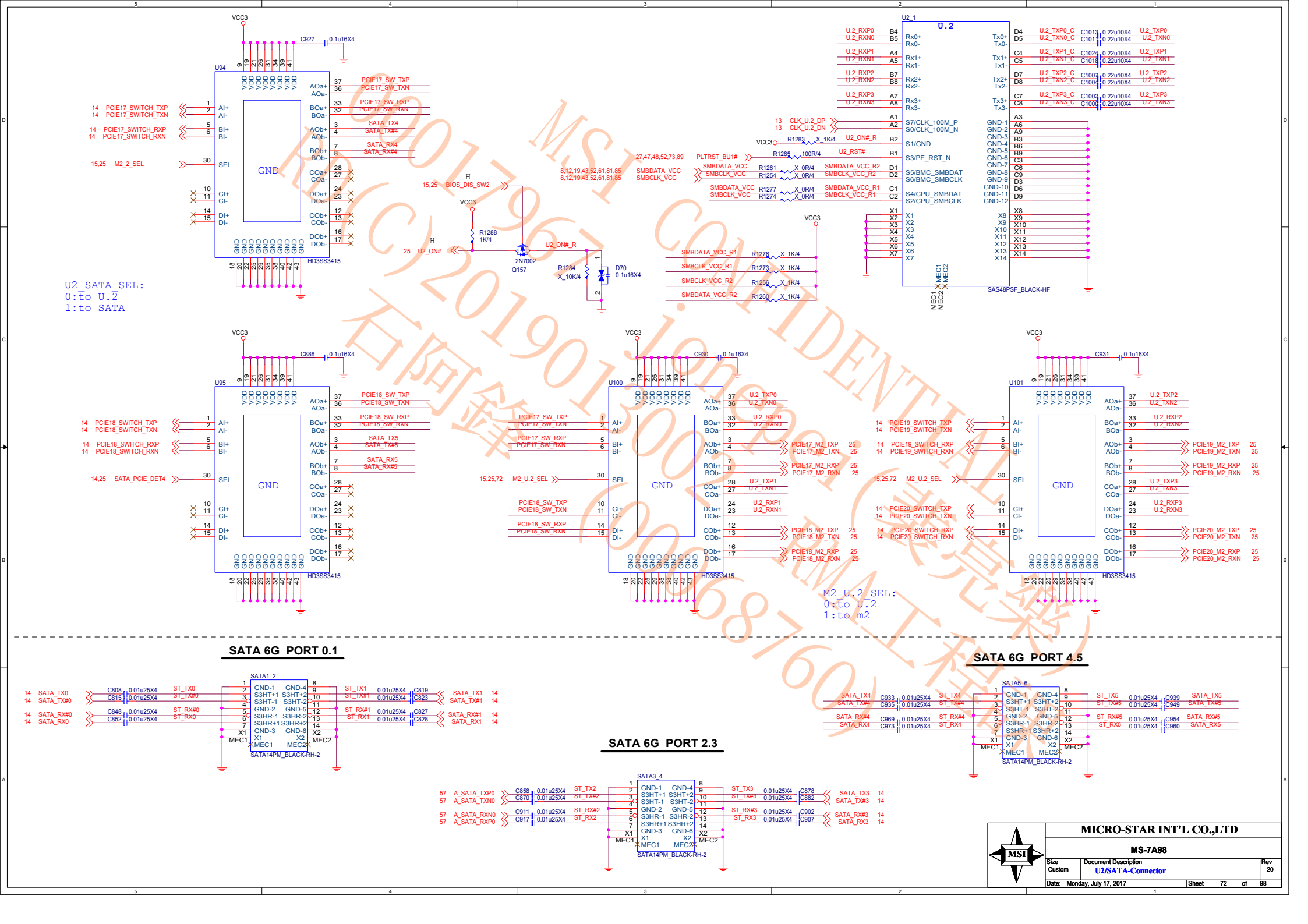
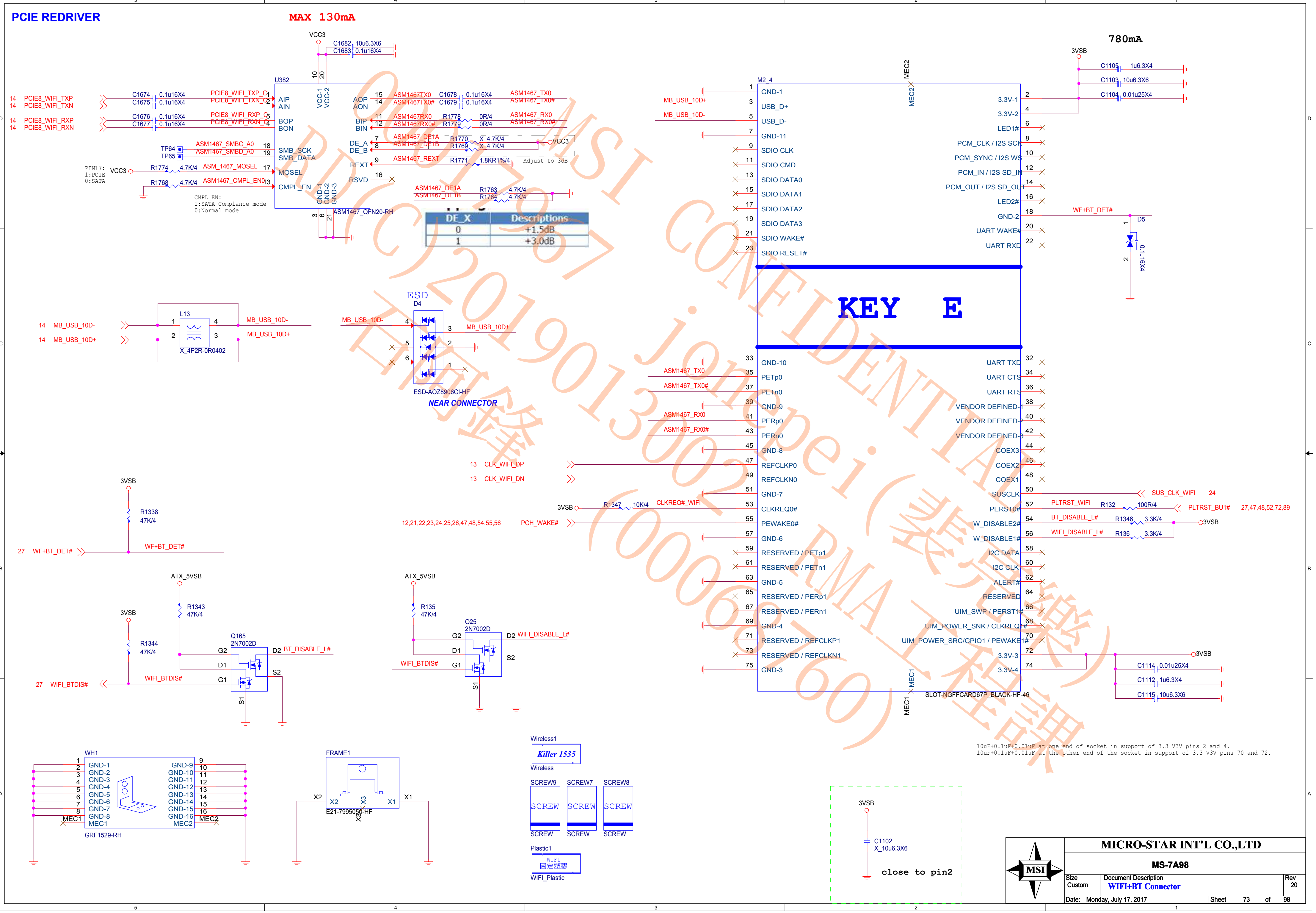

U2_SATA_SEL:
0:to U.2
1:to SATA
M2_U.2_SEL:
0:to U.2
1:to m2
SATA 6G PORT 0.1
SATA 6G PORT 2.3
SATA 6G PORT 4.5
U.2
GND
SAS48PSF_BLACK-HF
HD3SS3415
SATA14PM_BLACK-RH-2
MICRO-STAR INT'L CO.,LTD
MS-7A98
U2/SATA-Connector
Monday, July 17, 2017



DE_X	Descriptions
0	+1.5dB
1	+3.0dB

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Size: Custom
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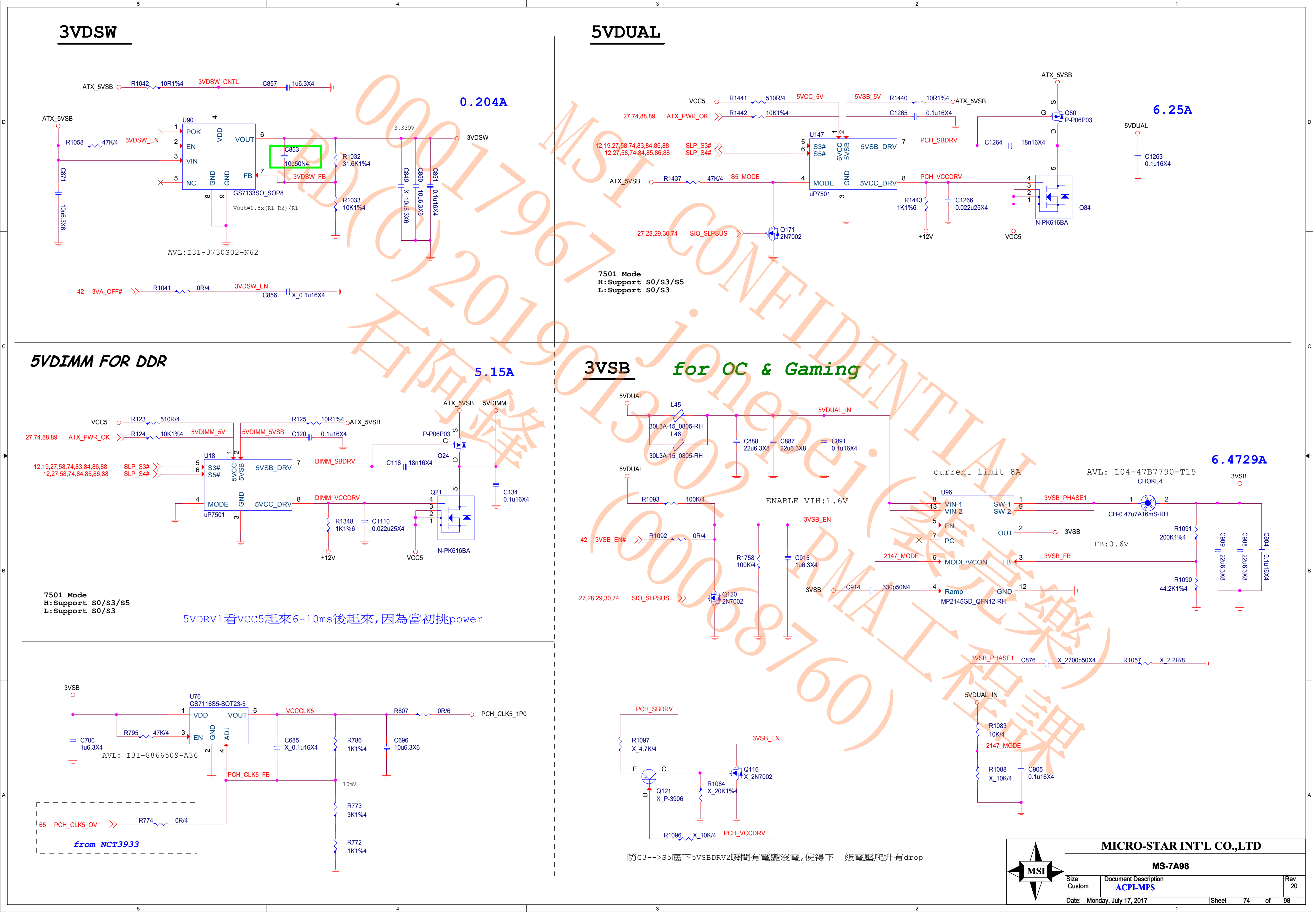

3VDSW
0.204A
ATX_5VSB R1042 10R1%4 3VDSW_CNTL C857 1u6.3X4
U90 POK EN VIN NC VDD VOUT FB GND GND
R1058 47K/4 3VDSW_EN
C871 10u6.3X6
C853 10p50N4
R1032 31.6K1%4
3VDSW_FB
R1033 10K1%4
3.339V
3VDSW
C849 X_10u6.3X6 C850 10u6.3X6 C851 0.1u16X4
GS7133SO_SOP8
Vout=0.8x(R1+R2)/R1
AVL:I31-3730S02-N62
42 3VA_OFF# R1041 0R/4 3VDSW_EN C856 X_0.1u16X4
5VDUAL
6.25A
ATX_5VSB
VCC5 R1441 510R/4 5VCC_5V 5VSB_5V R1440 10R1%4 ATX_5VSB
27,74,88,89 ATX_PWR_OK R1442 10K1%4 C1265 0.1u16X4
G Q80 P-P06P03
5VDUAL
U147
12,19,27,58,74,83,84,86,88 SLP_S3#
12,27,58,74,84,85,86,88 SLP_S4#
S3# S5# 5VCC 5VSB 5VSB_DRV PCH_SBDRV C1264 18n16X4
C1263 0.1u16X4
ATX_5VSB R1437 47K/4 S5_MODE MODE GND 5VCC_DRV PCH_VCCDRV
uP7501
R1443 1K1%6 C1266 0.022u25X4
+12V VCC5 Q84 N-PK616BA
27,28,29,30,74 SIO_SLPSUS Q171 2N7002
7501 Mode
H:Support S0/S3/S5
L:Support S0/S3
5VDIMM FOR DDR
5.15A
ATX_5VSB 5VDIMM
VCC5 R123 510R/4 R125 10R1%4 ATX_5VSB
27,74,88,89 ATX_PWR_OK R124 10K1%4 5VDIMM_5V 5VDIMM_5VSB C120 0.1u16X4
P-P06P03 Q24
U18
12,19,27,58,74,83,84,86,88 SLP_S3#
12,27,58,74,84,85,86,88 SLP_S4#
S3# S5# 5VCC 5VSB 5VSB_DRV DIMM_SBDRV C118 18n16X4
C134 0.1u16X4
MODE GND 5VCC_DRV DIMM_VCCDRV
uP7501
R1348 1K1%6 C1110 0.022u25X4
Q21
+12V VCC5 N-PK616BA
7501 Mode
H:Support S0/S3/S5
L:Support S0/S3
5VDRV1看VCC5起來6-10ms後起來,因為當初挑power
3VSB
for OC & Gaming
5VDUAL L45 30L3A-15_0805-RH L46 30L3A-15_0805-RH 5VDUAL_IN
C888 22u6.3X8 C887 22u6.3X8 C891 0.1u16X4
6.4729A
current limit 8A
AVL: L04-47B7790-T15
CHOKE4
3VSB
5VDUAL R1093 100K/4
ENABLE VIH:1.6V
U96 VIN-1 VIN-2 SW-1 SW-2 3VSB_PHASE1
CH-0.47u7A16mS-RH
3VSB_EN EN OUT 3VSB
42 3VSB_EN# R1092 0R/4 PG
R1091 200K1%4
FB:0.6V
C909 22u6.3X8 C908 22u6.3X8 C904 0.1u16X4
R1758 100K/4 C915 1u6.3X4 2147_MODE MODE/VCON FB 3VSB_FB
R1090 44.2K1%4
3VSB C914 330p50N4 Ramp GND
27,28,29,30,74 SIO_SLPSUS Q120 2N7002
MP2145GD_QFN12-RH
3VSB_PHASE1 C876 X_2700p50X4 R1057 X_2.2R/8
5VDUAL_IN R1083 10K/4 2147_MODE R1088 X_10K/4 C905 0.1u16X4
PCH_SBDRV R1097 X_4.7K/4
3VSB_EN
Q121 X_P-3906 R1084 X_20K1%4 Q116 X_2N7002
R1096 X_10K/4 PCH_VCCDRV
防G3-->S5底下5VSBDRV2瞬間有電變沒電,使得下一級電壓爬升有drop
3VSB
U76 GS7116S5-SOT23-5
VDD VOUT EN GND ADJ VCCCLK5 R807 0R/6 PCH_CLK5_1P0
C700 1u6.3X4 R795 47K/4
AVL: I31-8866509-A36
C685 X_0.1u16X4 R786 1K1%4 C696 10u6.3X6
PCH_CLK5_FB
10mV
R773 3K1%4
R772 1K1%4
65 PCH_CLK5_OV R774 0R/4
from NCT3933
MICRO-STAR INT'L CO.,LTD
MS-7A98
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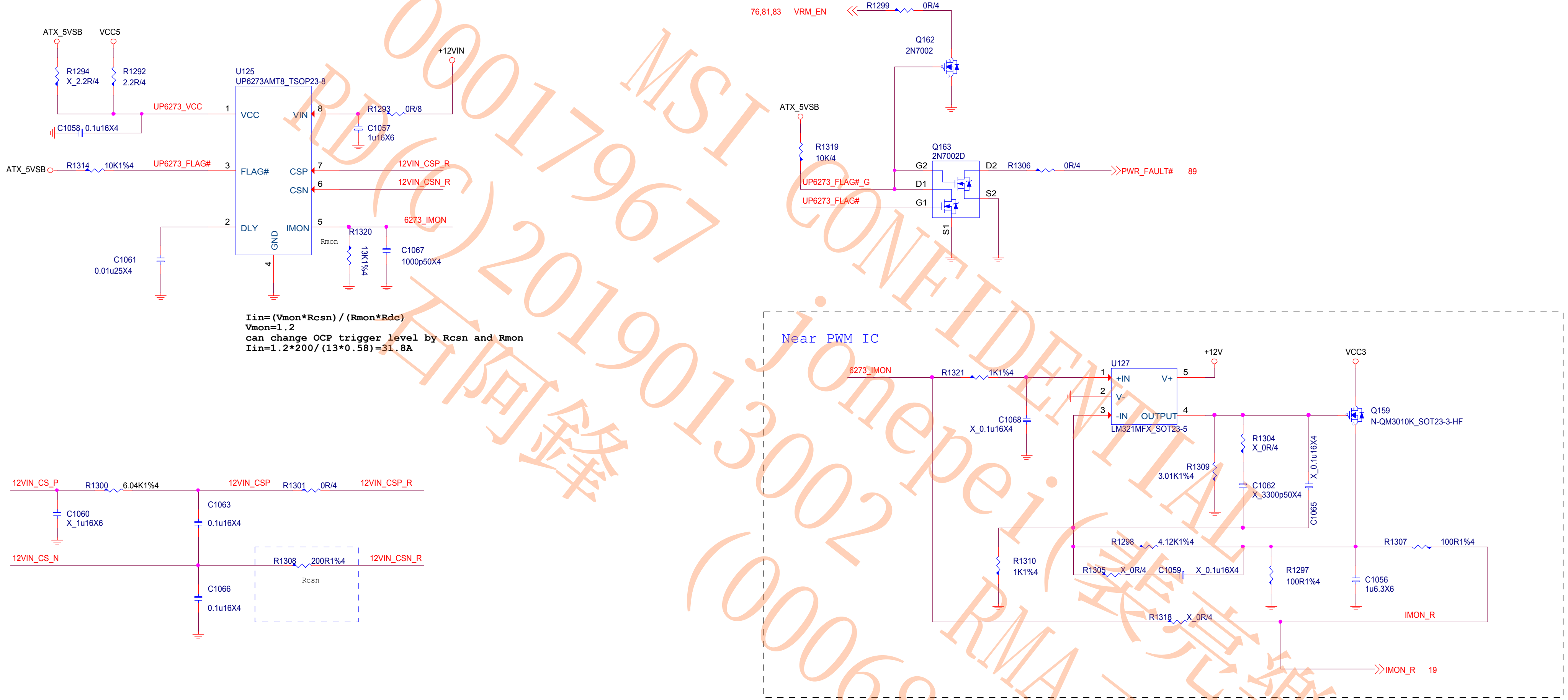
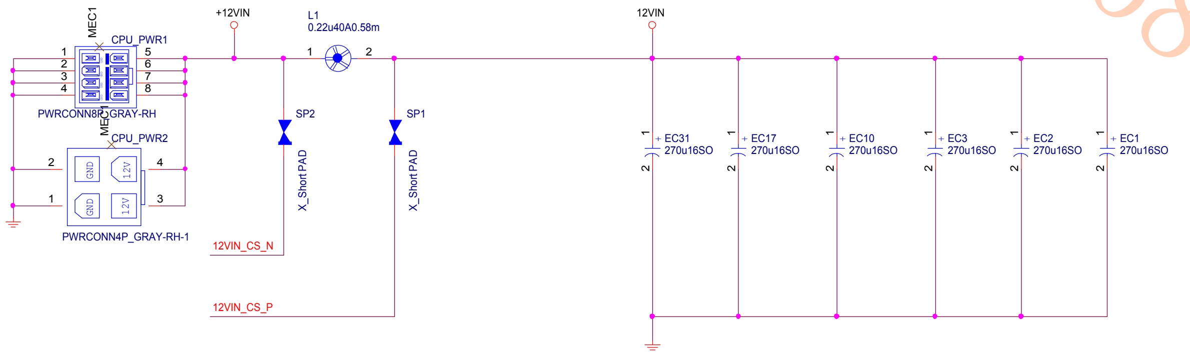
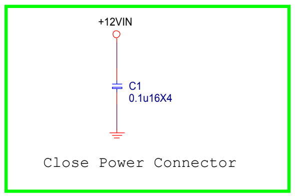
POWER METER



UPI VOLTAGE CONSOLE												
0xD4:RL=10K												
ADDRESS	0xD4			0xD6			0xD8			0xDA		
	Min	Typ.	Max	Min	Typ.	Max	Min	Typ.	Max	Min	Typ.	Max
BUS_SEL Vlotage	70	90	110	170	210	250	310	380	450	510	600	690





MICRO-STAR INT'L CO.,LTD		
MS-7A98		
Size: Custom	Document Description: CURRENT SENSE-UP6273	Rev: 20
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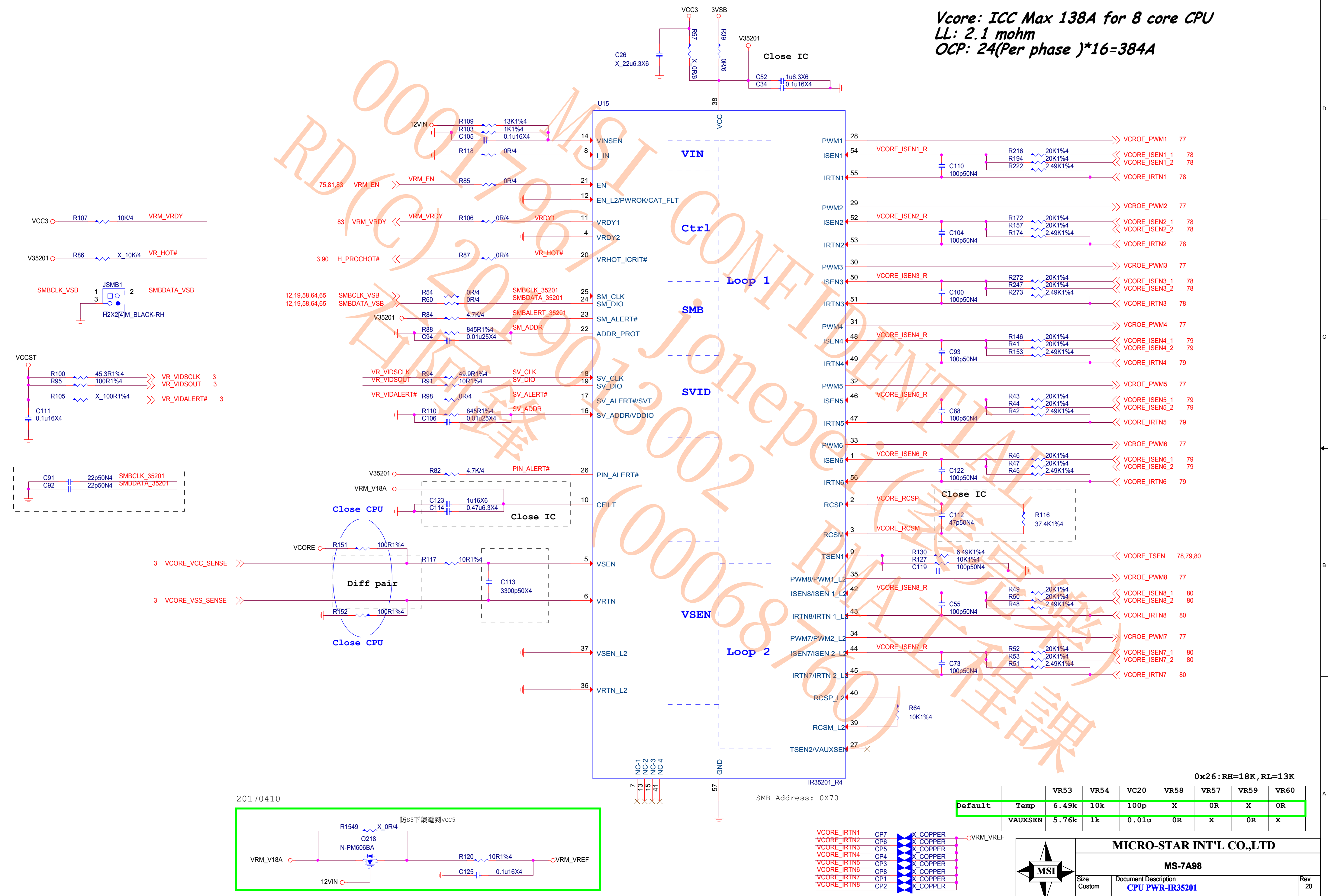
Vcore: ICC Max 138A for 8 core CPU
LL: 2.1 mohm
OCP: 24(Per phase)*16=384A



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

		VR53	VR54	VC20	VR58	VR57	VR59	VR60
Default	Temp	6.49k	10k	100p	X	0R	X	0R
	VAUXSEN	5.76k	1k	0.01u	0R	X	0R	X

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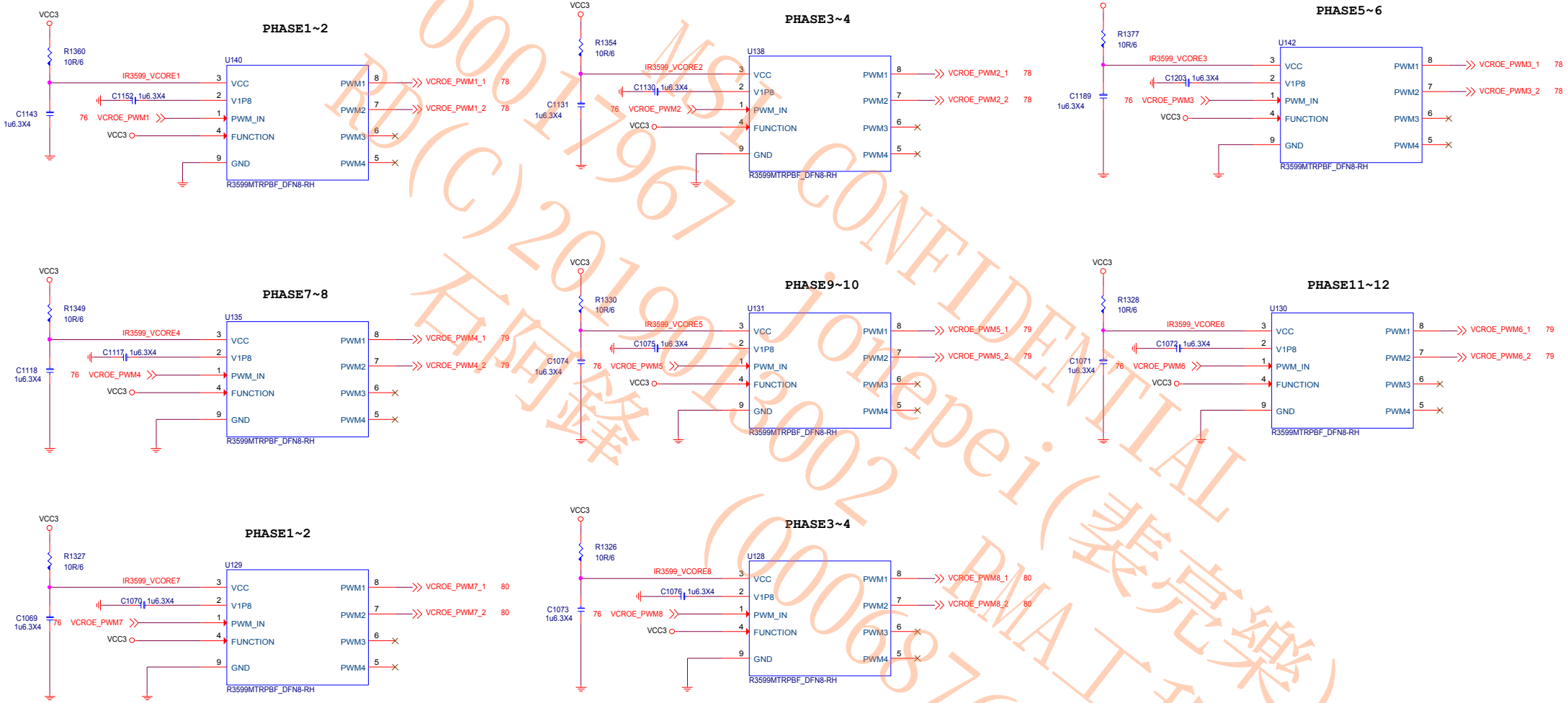
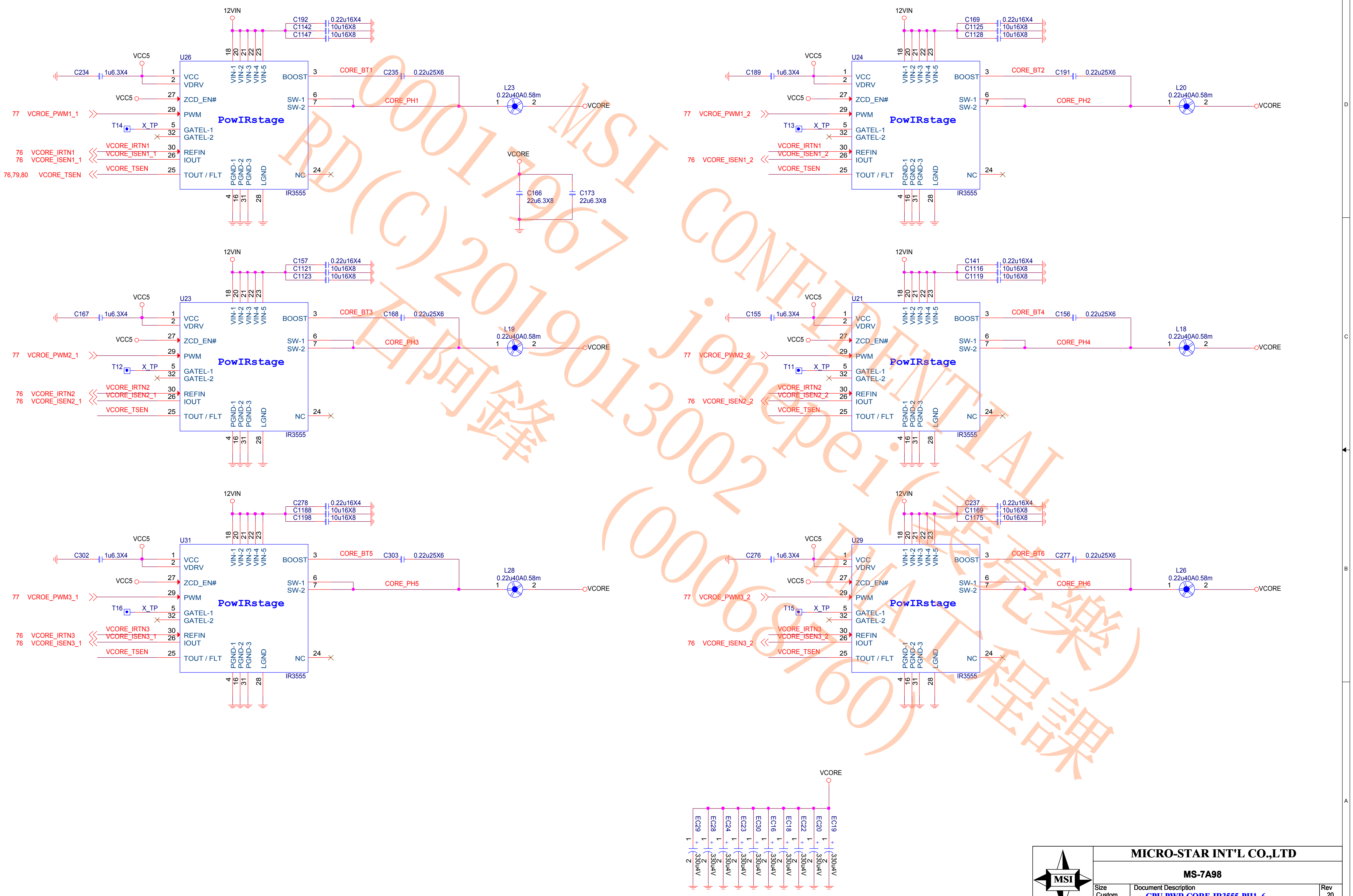
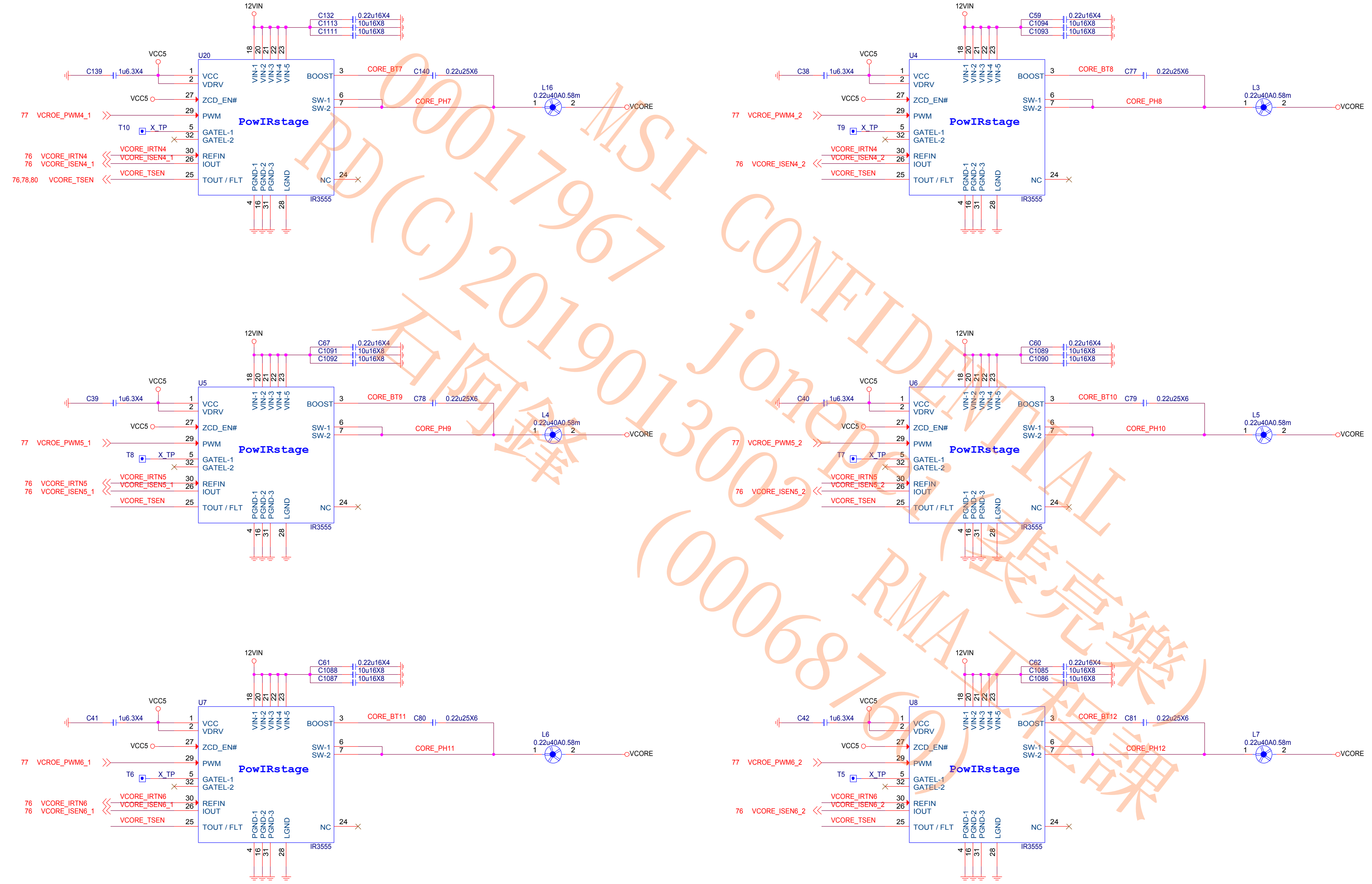
VCORE Double



MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7A98	
Size: Custom	Document Description: CPU PWR-IR3599	Rev: 20
Date: Monday, July 17, 2017	Sheet 77 of 98	



MICRO-STAR INT'L CO.,LTD	
MS-7A98	
Size: Custom	Document Description: CPU PWR CORE-IR3555-PH1~6
Rev	20
Date: Monday, July 17, 2017	Sheet 78 of 98



MICRO-STAR INT'L CO.,LTD

MS-7A98

Size	Document Description	Rev
Custom	CPU PWR CORE-IR3555-PH7~12	20

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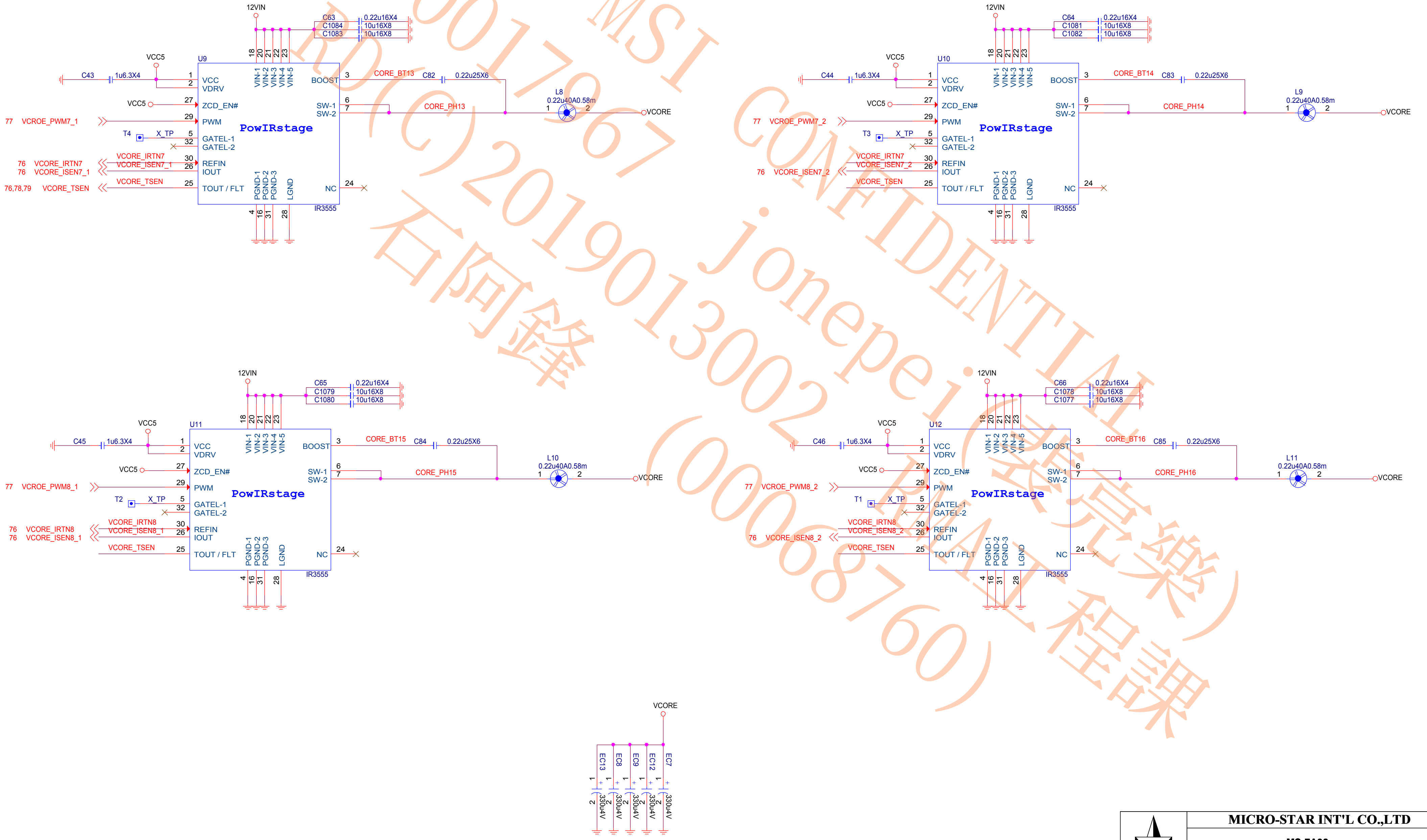

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MS-7A98

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Custom	CPU PWR CORE-IR3555-PH1316	20

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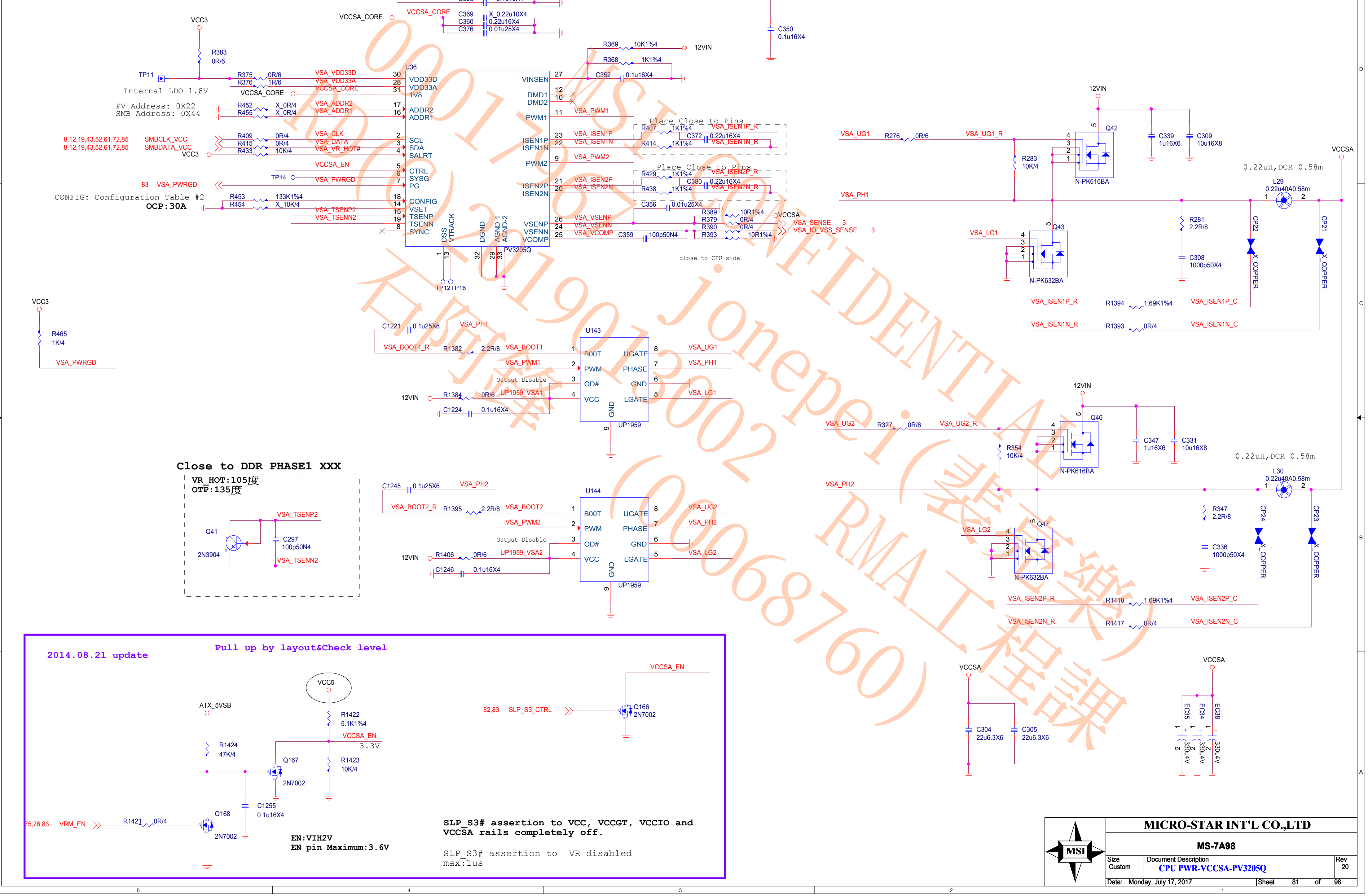
SA Power:1.05V,11.1A

OCP:30A for 2Phase



U36 PV3205Q
VDD33D VDD33A 1V8 ADDR2 ADDR1 SCL SDA SALRT CTRL SYSG PG CONFIG VSET TSENP TSENN SYNC
VINSEN DMD1 DMD2 PWM1 ISEN1P ISEN1N PWM2 ISEN2P ISEN2N VSENP VSENN VCOMP
DSS VTRACK DGND AGND-1 AGND-2
Internal LDO 1.8V
PV Address: 0X22
SMB Address: 0X44
CONFIG: Configuration Table #2
OCP:30A
Place Close to Pins
close to CPU side
VSA_SENSE 3
VSA_IO_VSS_SENSE 3
U143 UP1959
U144 UP1959
BOOT PWM OD# VCC UGATE PHASE GND LGATE
Output Disable
Q42 N-PK616BA
Q43 N-PK632BA
Q46 N-PK616BA
Q47 N-PK632BA
0.22uH,DCR 0.58m
L29 0.22u40A0.58m
L30 0.22u40A0.58m
X_COPPER
VCCSA
12VIN
Close to DDR PHASE1 XXX
VR_HOT:105度
OTP:135度
Q41 2N3904
2014.08.21 update
Pull up by layout&Check level
VCC5
ATX_5VSB
VCCSA_EN
3.3V
Q167 2N7002
Q168 2N7002
Q166 2N7002
SLP_S3_CTRL
VRM_EN
EN:VIH2V
EN pin Maximum:3.6V
SLP_S3# assertion to VCC, VCCGT, VCCIO and VCCSA rails completely off.
SLP_S3# assertion to VR disabled
max:1us
MICRO-STAR INT'L CO.,LTD
MS-7A98
Size: Custom
Document Description: CPU PWR-VCCSA-PV3205Q
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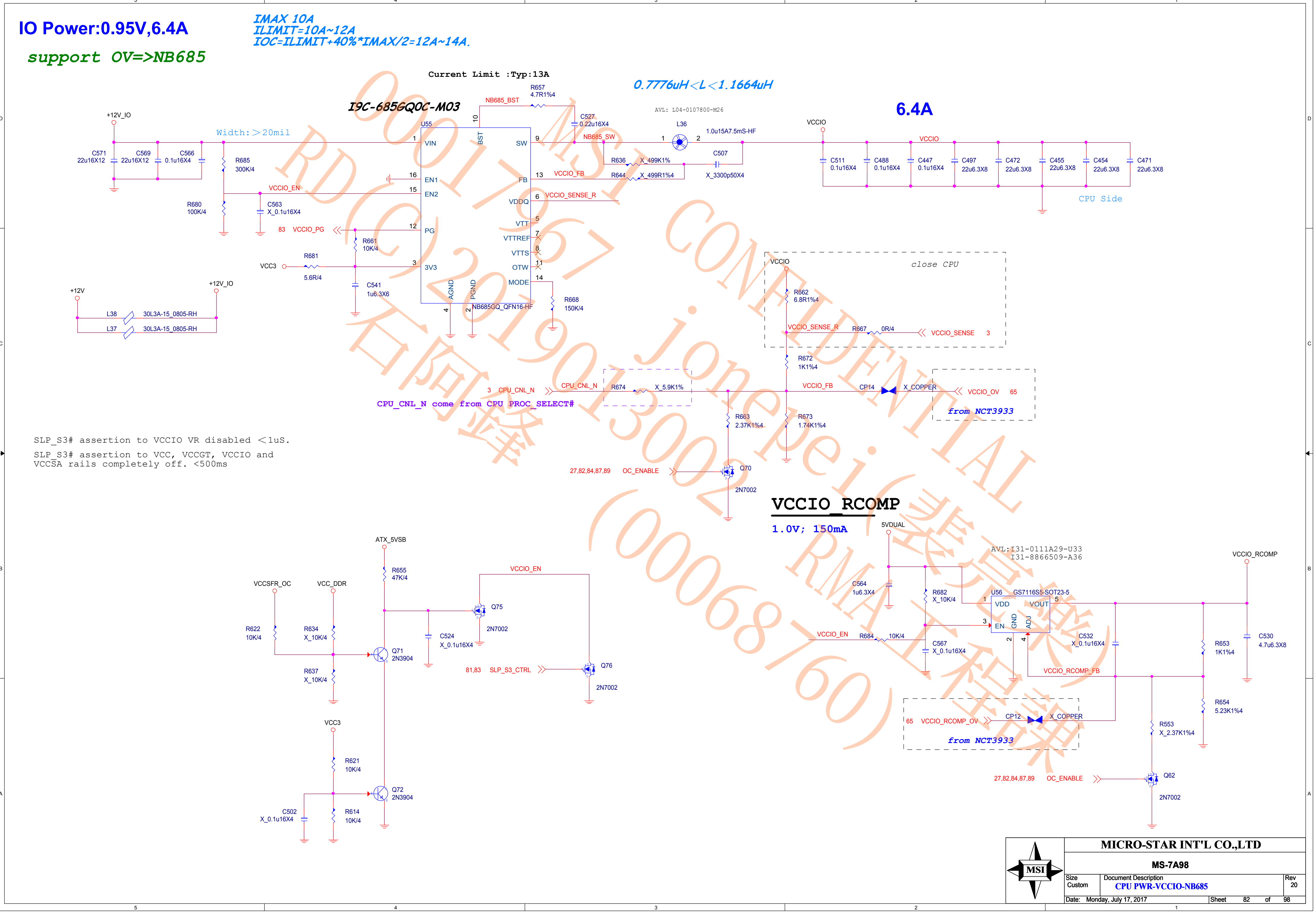
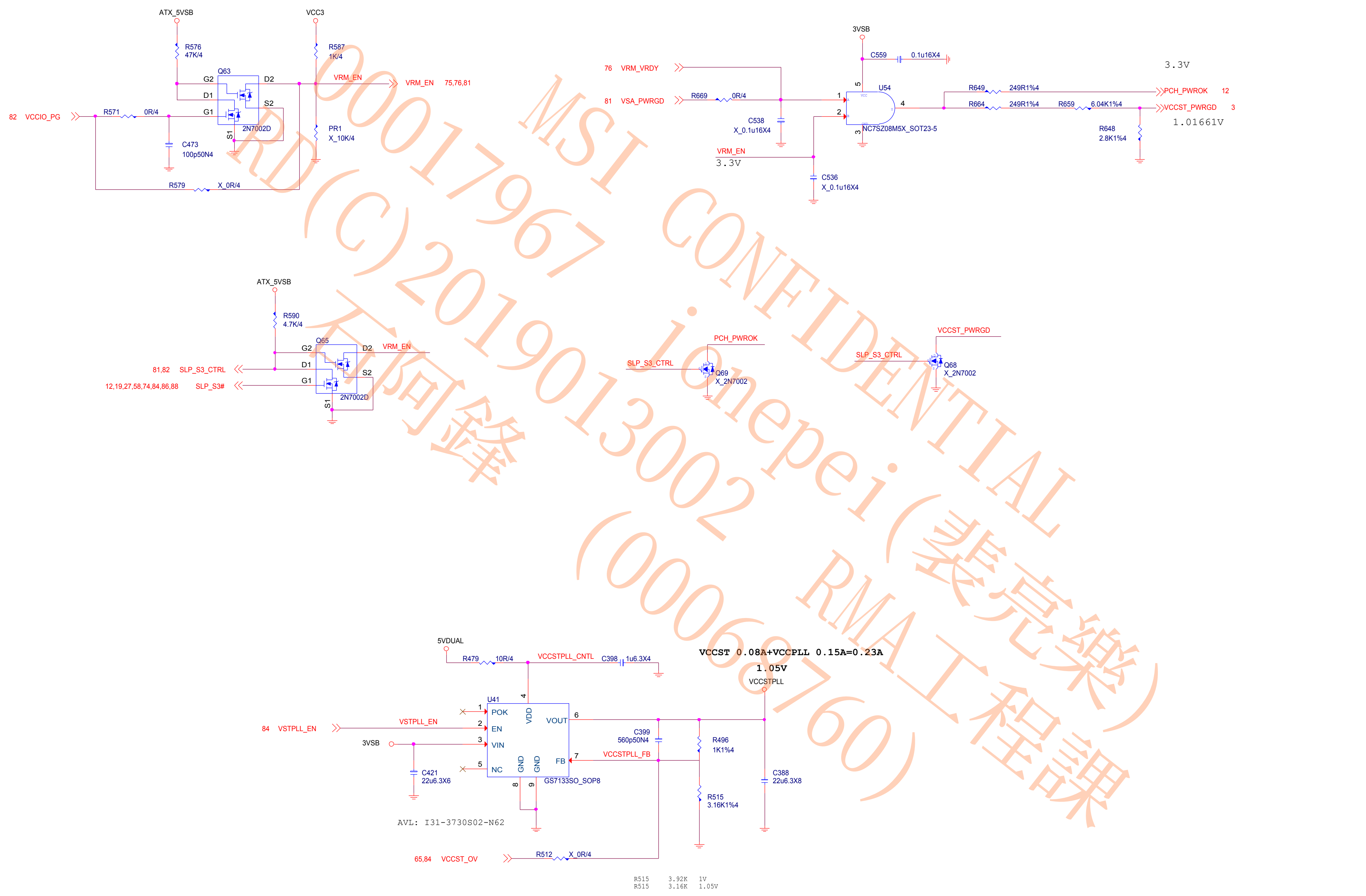


IO Power:0.95V,6.4A
support OV=>NB685
IMAX 10A
ILIMIT=10A~12A
IOC=ILIMIT+40%*IMAX/2=12A~14A.
Current Limit :Typ:13A
0.7776uH<L<1.1664uH
6.4A
I9C-685GQ0C-M03
AVL: L04-0107800-M26
Width:>20mil
U55
NB685GQ_QFN16-HF
VIN
EN1
EN2
PG
3V3
BST
SW
FB
VDDQ
VTT
VTTREF
VTTS
OTW
MODE
AGND
PGND
NB685_BST
NB685_SW
VCCIO_EN
VCCIO_FB
VCCIO_SENSE_R
VCCIO_PG
+12V_IO
+12V
VCC3
VCCIO
L36
1.0u15A7.5mS-HF
L38
L37
30L3A-15_0805-RH
R657 4.7R1%4
C527 0.22u16X4
R636 X_499K1%
R644 X_499R1%4
C507 X_3300p50X4
C571 22u16X12
C569 22u16X12
C566 0.1u16X4
R685 300K/4
R680 100K/4
C563 X_0.1u16X4
R661 10K/4
R681 5.6R/4
C541 1u6.3X6
R668 150K/4
C511 0.1u16X4
C488 0.1u16X4
C447 0.1u16X4
C497 22u6.3X8
C472 22u6.3X8
C455 22u6.3X8
C454 22u6.3X8
C471 22u6.3X8
CPU Side
close CPU
R662 6.8R1%4
R667 0R/4
VCCIO_SENSE
R672 1K1%4
CPU_CNL_N
R674 X_5.9K1%
CP14 X_COPPER
VCCIO_OV
from NCT3933
CPU_CNL_N come from CPU PROC_SELECT#
R663 2.37K1%4
R673 1.74K1%4
OC_ENABLE
Q70 2N7002
SLP_S3# assertion to VCCIO VR disabled <1uS.
SLP_S3# assertion to VCC, VCCGT, VCCIO and VCCSA rails completely off. <500ms
VCCIO_RCOMP
1.0V; 150mA
5VDUAL
AVL:I31-0111A29-U33
I31-8866509-A36
VCCIO_RCOMP
C564 1u6.3X4
R682 X_10K/4
U56 GS7116S5-SOT23-5
VDD
VOUT
EN
GND
ADJ
R684 10K/4
C567 X_0.1u16X4
C532 X_0.1u16X4
R653 1K1%4
C530 4.7u6.3X8
R654 5.23K1%4
VCCIO_RCOMP_FB
VCCIO_RCOMP_OV
CP12 X_COPPER
from NCT3933
R553 X_2.37K1%4
Q62 2N7002
ATX_5VSB
R655 47K/4
Q75 2N7002
C524 X_0.1u16X4
SLP_S3_CTRL
Q76 2N7002
VCCSFR_OC
VCC_DDR
R622 10K/4
R634 X_10K/4
Q71 2N3904
R637 X_10K/4
R621 10K/4
Q72 2N3904
C502 X_0.1u16X4
R614 10K/4



MICRO-STAR INT'L CO.,LTD

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Size	Document Description	Rev
Custom	CPU PWR-VRM-Seqence	20

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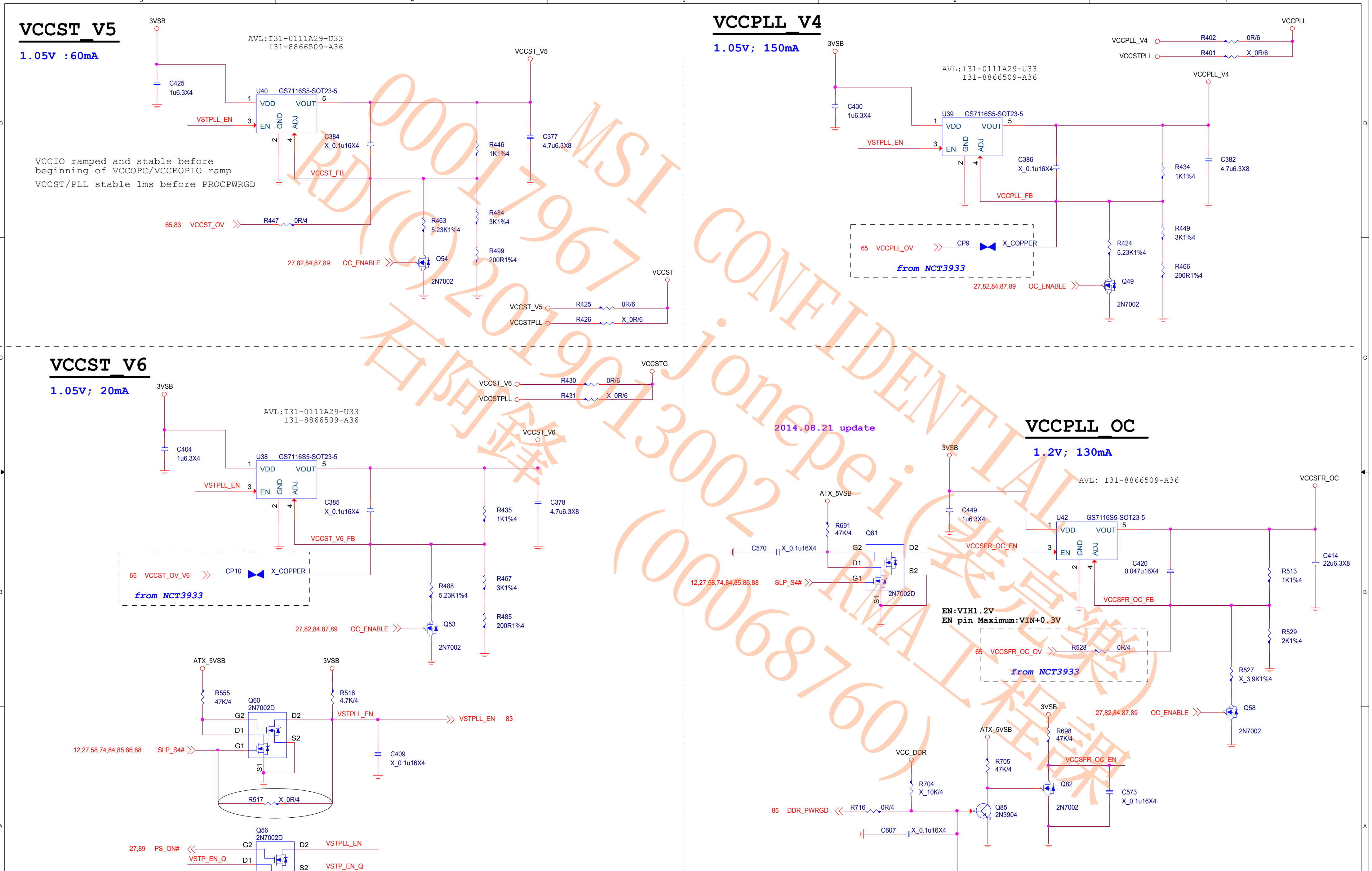
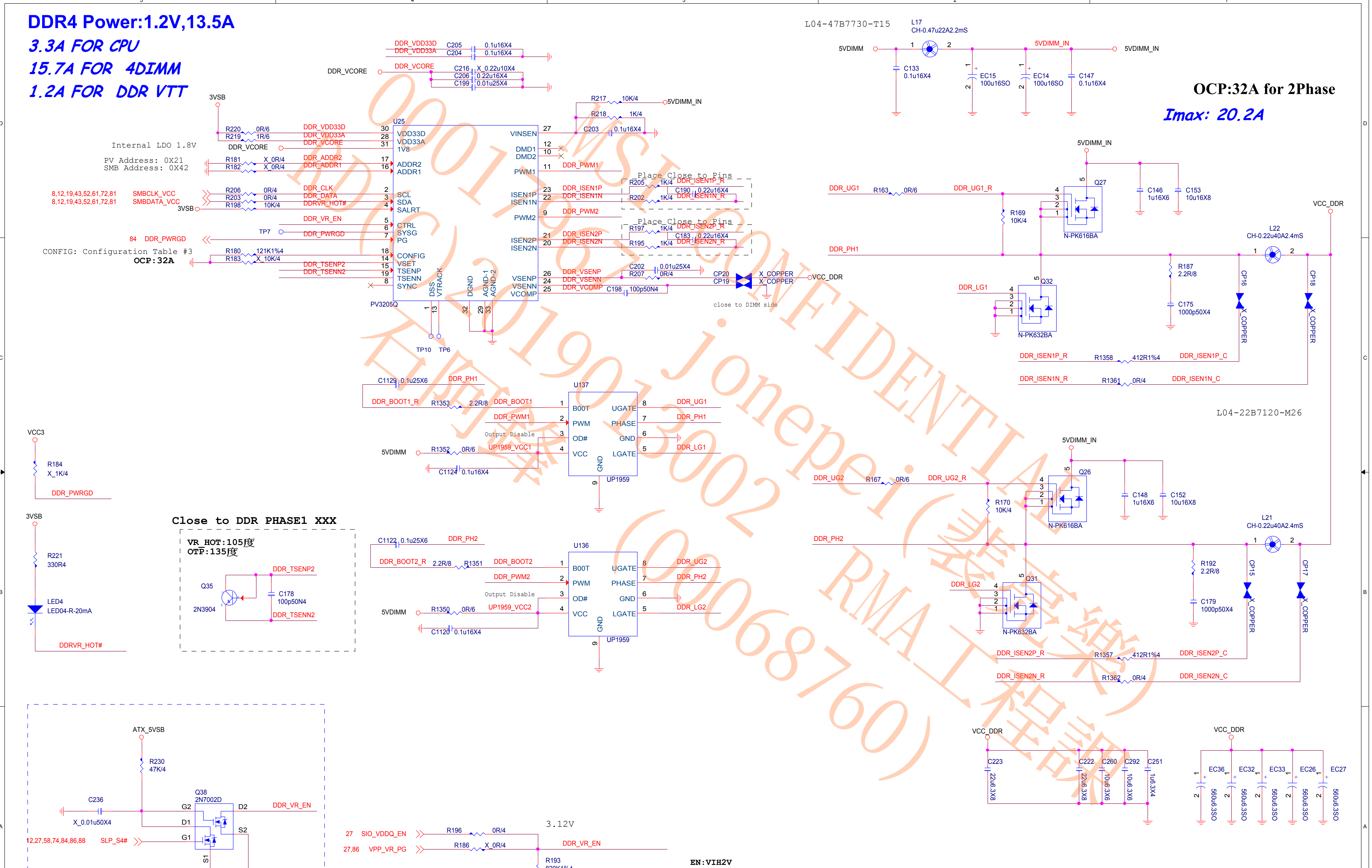


MICRO-STAR INT'L CO.,LTD		
MS-7A98		
Size: Custom	Document Description: CPU PWR-VCCST/PLL	Rev: 20
Date: Monday, July 17, 2017	Sheet 84 of 98	



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Size	Document Description	Rev
Custom	DDR PWR-PV3205Q	20

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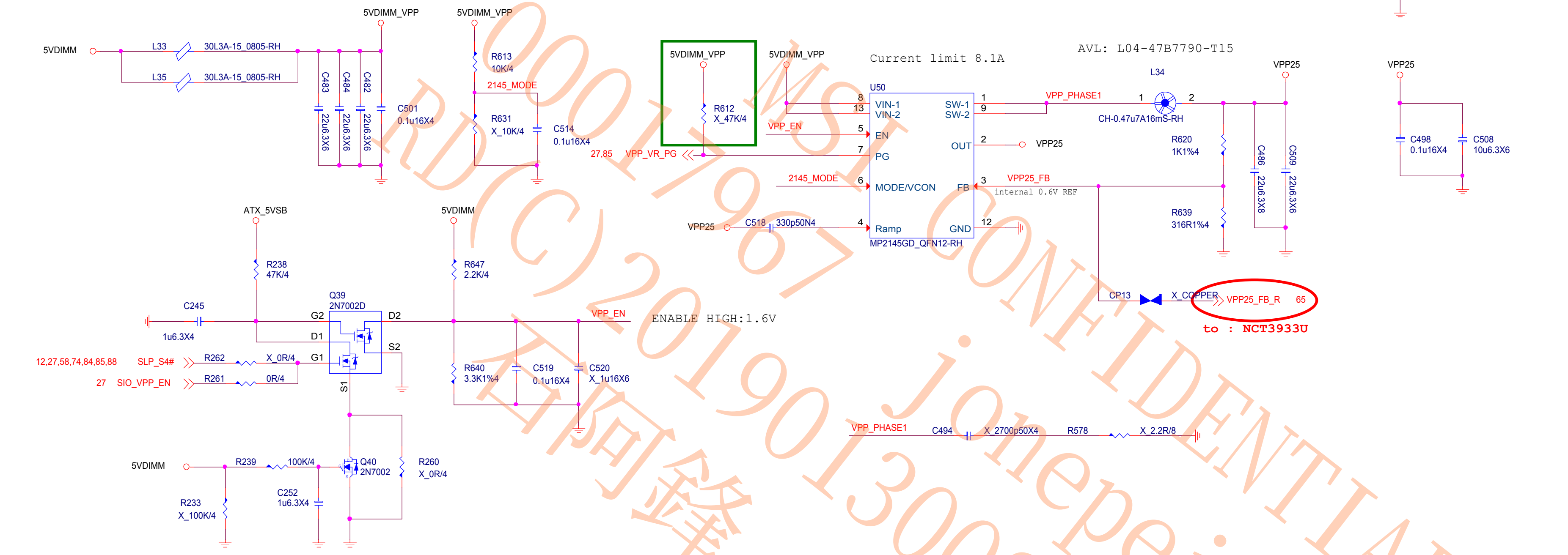
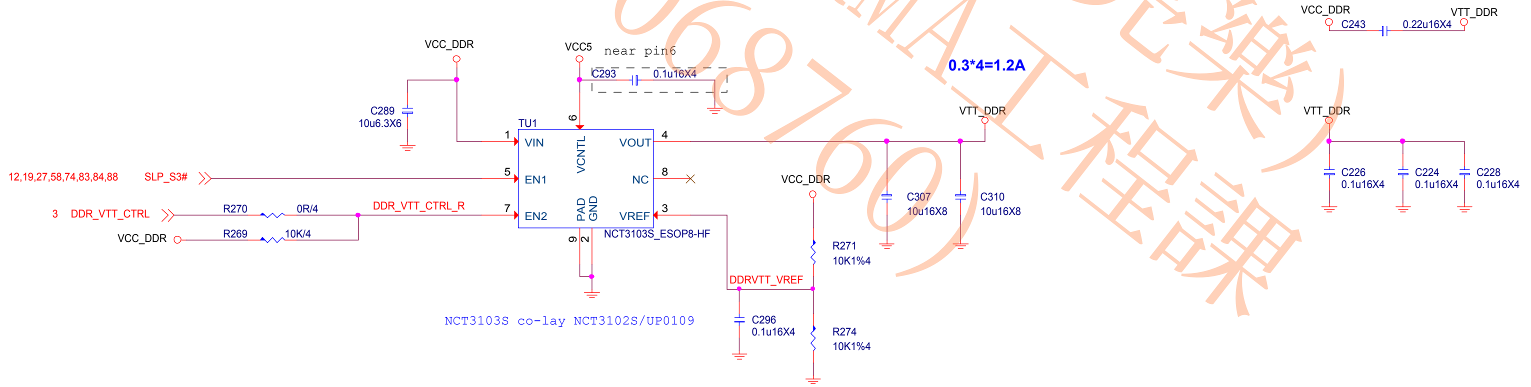
VPP2.5V Power:2.5V,2.24A



DDR VTT Power

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



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Size	Document Description	Rev
Custom	DDR PWR VPP25/VTT-MP2145	20

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PCH_1VSB Power:1V,12A

OCP = 16.21A

Rocset = 1.5 * Imax * Rdson(low) / Iocset
= 1.5 * 10.664 * 4.2mohm / 10uA
= 6.71K

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

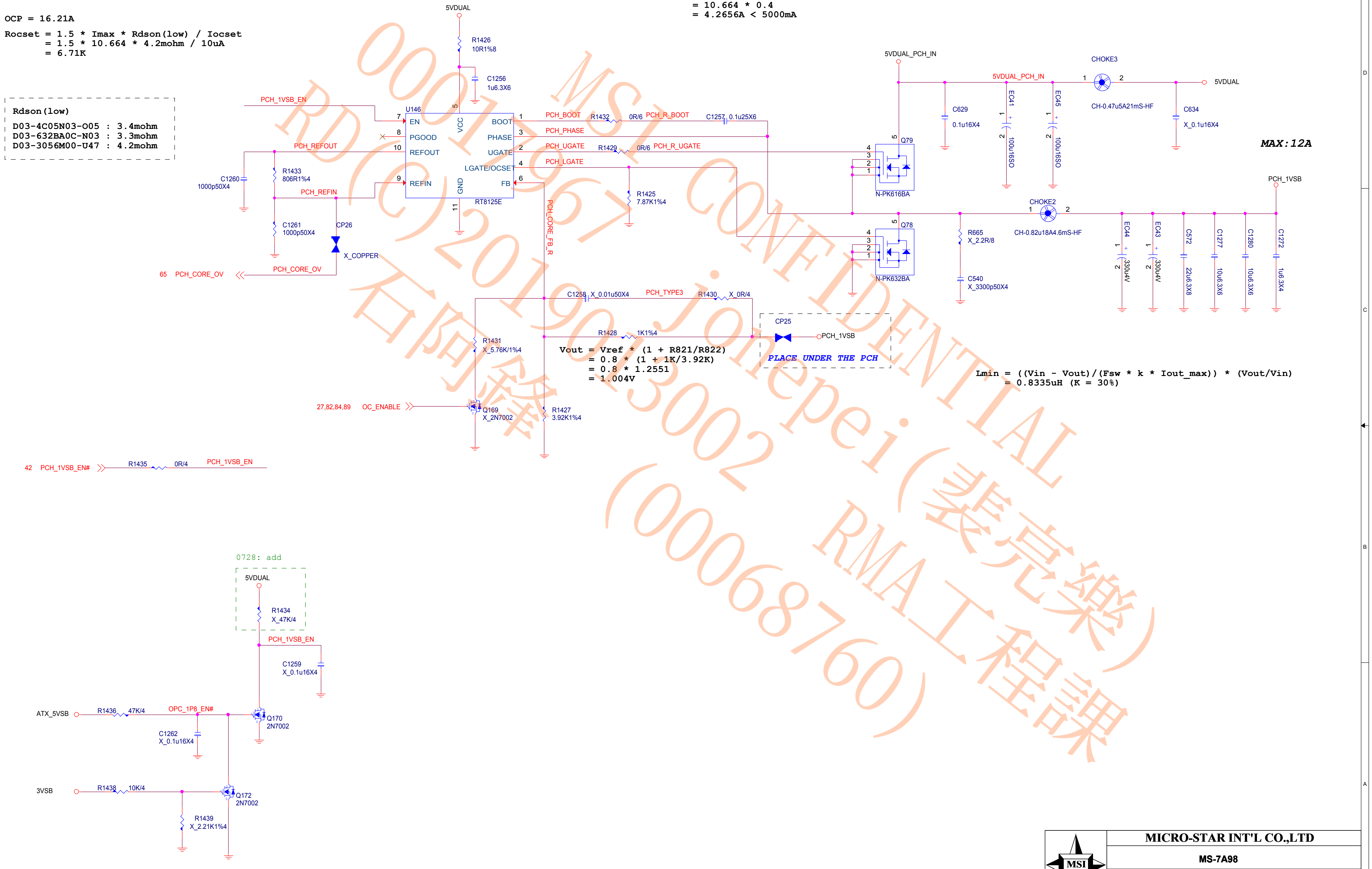
MAX:12A

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

PLACE UNDER THE PCH

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

0728: add



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Size	Document Description	Rev
Custom	PCH POWER-RT8125E	20

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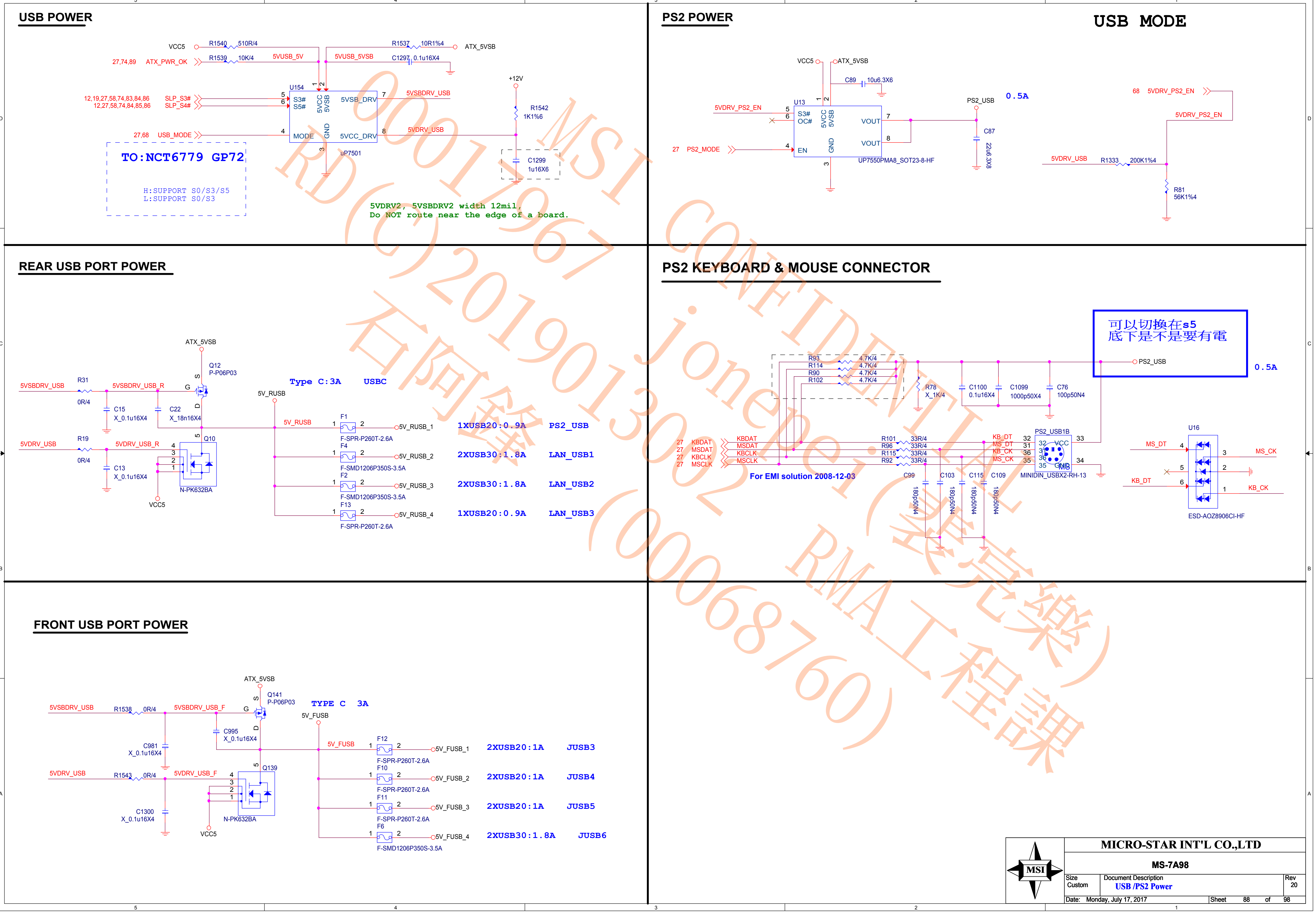
USB POWER
VCC5
R1540 510R/4
R1537 10R1%4
ATX_5VSB
27,74,89 ATX_PWR_OK
R1539 10K/4
5VUSB_5V
5VUSB_5VSB
C1297 0.1u16X4
+12V
U154
12,19,27,58,74,83,84,86 SLP_S3#
12,27,58,74,84,85,86 SLP_S4#
S3#
S5#
5VCC
5VSB
5VSB_DRV
5VSBDRV_USB
R1542
1K1%6
27,68 USB_MODE
MODE
GND
5VCC_DRV
5VDRV_USB
uP7501
C1299
1u16X6
TO:NCT6779 GP72
H:SUPPORT S0/S3/S5
L:SUPPORT S0/S3
5VDRV2, 5VSBDRV2 width 12mil,
Do NOT route near the edge of a board.
PS2 POWER
USB MODE
VCC5
ATX_5VSB
C89 10u6.3X6
U13
5VDRV_PS2_EN
S3#
OC#
5VCC
5VSB
VOUT
VOUT
PS2_USB
0.5A
C87
22u6.3X8
27 PS2_MODE
EN
GND
UP7550PMA8_SOT23-8-HF
68 5VDRV_PS2_EN
5VDRV_PS2_EN
5VDRV_USB
R1333 200K1%4
R81
56K1%4
REAR USB PORT POWER
ATX_5VSB
Q12
P-P06P03
5VSBDRV_USB
R31
5VSBDRV_USB_R
0R/4
C15
X_0.1u16X4
C22
X_18n16X4
Type C:3A
USBC
5V_RUSB
5V_RUSB
F1
5V_RUSB_1
1XUSB20:0.9A
PS2_USB
5VDRV_USB
R19
5VDRV_USB_R
Q10
F-SPR-P260T-2.6A
F4
5V_RUSB_2
2XUSB30:1.8A
LAN_USB1
0R/4
C13
X_0.1u16X4
F-SMD1206P350S-3.5A
F2
5V_RUSB_3
2XUSB30:1.8A
LAN_USB2
N-PK632BA
VCC5
F-SMD1206P350S-3.5A
F13
5V_RUSB_4
1XUSB20:0.9A
LAN_USB3
F-SPR-P260T-2.6A
PS2 KEYBOARD & MOUSE CONNECTOR
可以切換在s5
底下是不是要有電
R93 4.7K/4
R114 4.7K/4
R90 4.7K/4
R102 4.7K/4
R78
X_1K/4
C1100
0.1u16X4
C1099
1000p50X4
C76
100p50N4
PS2_USB
0.5A
27 KBDAT
27 MSDAT
27 KBCLK
27 MSCLK
KBDAT
MSDAT
KBCLK
MSCLK
R101 33R/4
R96 33R/4
R115 33R/4
R92 33R/4
KB_DT
MS_DT
KB_CK
MS_CK
PS2_USB1B
VCC
GND
MINIDIN_USBX2-RH-13
For EMI solution 2008-12-03
C99
C103
C115
C109
180p50N4
180p50N4
180p50N4
180p50N4
U16
MS_DT
MS_CK
KB_DT
KB_CK
ESD-AOZ8906CI-HF
FRONT USB PORT POWER
ATX_5VSB
Q141
P-P06P03
TYPE C 3A
5VSBDRV_USB
R1538 0R/4
5VSBDRV_USB_F
5V_FUSB
C981
X_0.1u16X4
C995
X_0.1u16X4
5V_FUSB
F12
5V_FUSB_1
2XUSB20:1A
JUSB3
F-SPR-P260T-2.6A
F10
5VDRV_USB
R1543 0R/4
5VDRV_USB_F
Q139
5V_FUSB_2
2XUSB20:1A
JUSB4
F-SPR-P260T-2.6A
F11
C1300
X_0.1u16X4
N-PK632BA
VCC5
5V_FUSB_3
2XUSB20:1A
JUSB5
F-SPR-P260T-2.6A
F6
5V_FUSB_4
2XUSB30:1.8A
JUSB6
F-SMD1206P350S-3.5A
MSI
MICRO-STAR INT'L CO.,LTD
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Document Description USB /PS2 Power
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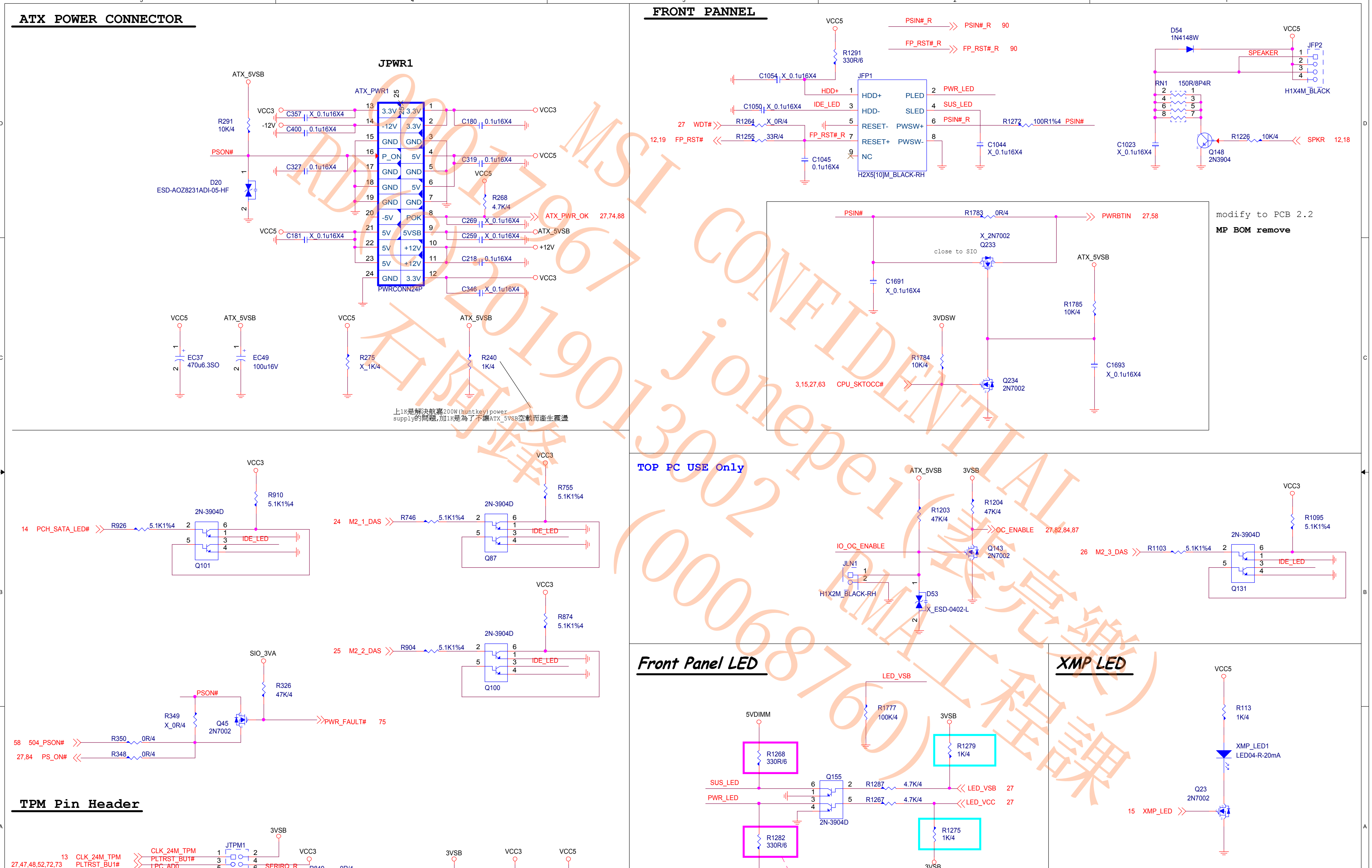

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Custom	ATX Connector/F_Panel	20

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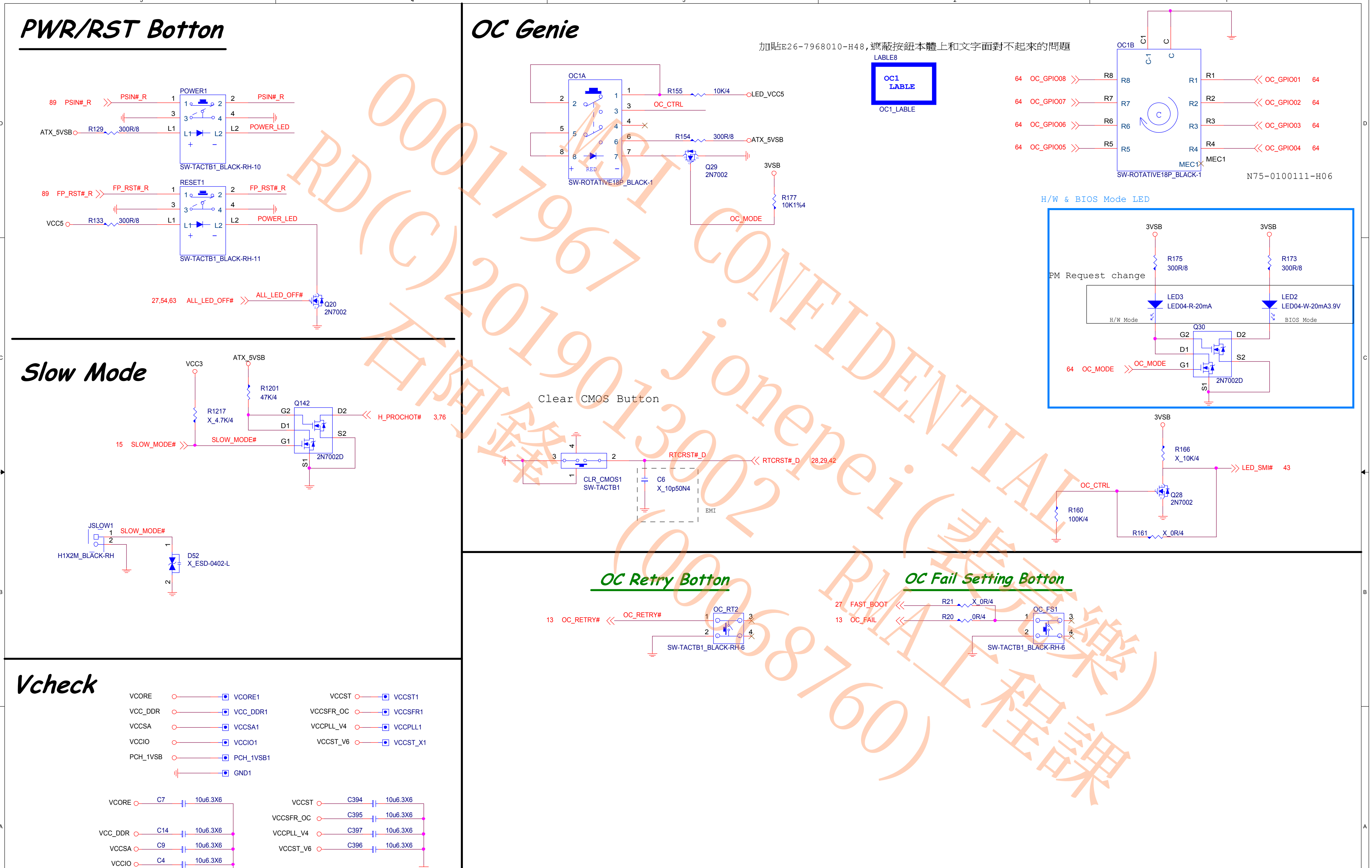

PWR/RST Botton
89 PSIN#_R
PSIN#_R
POWER1
SW-TACTB1_BLACK-RH-10
ATX_5VSB
R129 300R/8
POWER_LED
89 FP_RST#_R
FP_RST#_R
RESET1
SW-TACTB1_BLACK-RH-11
VCC5
R133 300R/8
27,54,63 ALL_LED_OFF#
Q20 2N7002
OC Genie
加貼E26-7968010-H48,遮蔽按鈕本體上和文字面對不起來的問題
OC1A
SW-ROTATIVE18P_BLACK-1
R155 10K/4 LED_VCC5
OC_CTRL
R154 300R/8 ATX_5VSB
Q29 2N7002
3VSB
R177 10K1%4
OC_MODE
LABLE8
OC1 LABLE
OC1_LABLE
OC1B
64 OC_GPIO08
64 OC_GPIO07
64 OC_GPIO06
64 OC_GPIO05
OC_GPIO01 64
OC_GPIO02 64
OC_GPIO03 64
OC_GPIO04 64
MEC1
SW-ROTATIVE18P_BLACK-1
N75-0100111-H06
H/W & BIOS Mode LED
PM Request change
R175 300R/8
R173 300R/8
LED3 LED04-R-20mA
LED2 LED04-W-20mA3.9V
H/W Mode
BIOS Mode
Q30 2N7002D
64 OC_MODE
Slow Mode
VCC3
ATX_5VSB
R1201 47K/4
R1217 X_4.7K/4
Q142 2N7002D
H_PROCHOT# 3,76
15 SLOW_MODE#
SLOW_MODE#
JSLOW1 H1X2M_BLACK-RH
D52 X_ESD-0402-L
Clear CMOS Button
CLR_CMOS1 SW-TACTB1
RTCRST#_D 28,29,42
C6 X_10p50N4
EMI
3VSB
R166 X_10K/4
LED_SMI# 43
OC_CTRL
Q28 2N7002
R160 100K/4
R161 X_0R/4
OC Retry Botton
13 OC_RETRY#
OC_RETRY#
OC_RT2 SW-TACTB1_BLACK-RH-6
OC Fail Setting Botton
27 FAST_BOOT
13 OC_FAIL
R21 X_0R/4
R20 0R/4
OC_FS1 SW-TACTB1_BLACK-RH-6
Vcheck
VCORE VCORE1
VCC_DDR VCC_DDR1
VCCSA VCCSA1
VCCIO VCCIO1
PCH_1VSB PCH_1VSB1
GND1
VCCST VCCST1
VCCSFR_OC VCCSFR1
VCCPLL_V4 VCCPLL1
VCCST_V6 VCCST_X1
VCORE C7 10u6.3X6
VCC_DDR C14 10u6.3X6
VCCSA C9 10u6.3X6
VCCIO C4 10u6.3X6
PCH_1VSB C19 10u6.3X6
VCCST C394 10u6.3X6
VCCSFR_OC C395 10u6.3X6
VCCPLL_V4 C397 10u6.3X6
VCCST_V6 C396 10u6.3X6

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2017/07/172017/07/27PD0-07A9822-G37,精成-深圳,147,寶安恩斯邁廠(MSIS)8,black
2017/07/172017/07/27PD0-07A9822-E48,競華,23,寶安恩斯邁廠(MSIS)8,black

CPU_H1
CPU
鐵座
CPU_H1

BAT1_X1
BAT-BCR2032P-RH

LABLE1 AMI_BIOS LABLE — BIOS_LABLE
LABLE2 HDMI LABLE — HDMI LABEL
LABLE3 CFOS LABLE — CFOS_LABLE
LABLE4 NAHIMIC LABLE — NAHIMIC_LABLE
LABLE5 SLI LABLE — SLI_LABLE
LABLE9 XSPLIT LABLE — XSPLIT_LABLE
LABLE7 SSE LABLE — SSE_LABLE

HEATSINK

MOS_IO_HS1
HS-0504620-RH
MEC1 MEC2 MEC3 MEC4 MEC5 MEC6 MEC7

AU_PCH_HS1
BP
PCH
MEC1 MEC2 MEC3 MEC4 MEC5 MEC6 MEC7 MEC8 MEC9 MEC10 MEC11 MEC12
HS-0001310-RH

DDR_COVER1
DDR COVER
GND-X1 GND-X2 GND-X3 GND-X4 GND-X5
X1 X2 X3 X4 X5
E21-7A63010-RH

Mounting Holes

MH1 MH2 MH3 MH4 MH5 MH6 MH7 MH8 MH9
X_MH001

C998 0.1u16X4
C1040 0.1u16X4

Simulation

SIM1 SIM2 SIM3 SIM4
X_PIN1*2

CTEMP1
MEC1
X_TEMP_HOLE

Optical Fiducial Marks-120

FM1 FM2 FM3 FM4 FM5 FM6 FM7 FM8
X_FM

5VDUAL — 5VDUAL1
5VDIMM — 5VDIMM1
3VSB — 3VSB1
VPP25 — VPP1

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