MS-7971

ATX

Ver: 21

Intel -Skylake plamform Z170 / H170 / B150

CPU:

Skylake-S

System Chipset:

Z170 Colay H170 and B150

Onboard Chip:

HD Audio Codec:ALC892
LAN:RTL8111H
SIO:Nuvoton 6793D
Flash ROM: SPI 128MB / 64MB(For H170/B150)

Main Memory:

*DDRIV (800/1066/1333/1600/2133MHz) * 4 (Dual Channel)*

ACPI:

NIKO/UPI

PWM:

RT3606BC

Expansion Slots:

*PCI Express (X16) Slot *1*
*PCI Express (X4) Slot * 1*
*PCI Express (X1) Slot * 3*
*PCI Slot * 2*

*M2 * 1*

SATAe 1*

Other:

SATA3.0 x6 (PCH)

*FRONT USB2.0 *4*
*FRONTUSB3.0 *2*
*REAR USB3.0 *4*
*REAR USB3.1 *2*

MICRO-STAR INT'L CO.,LTD

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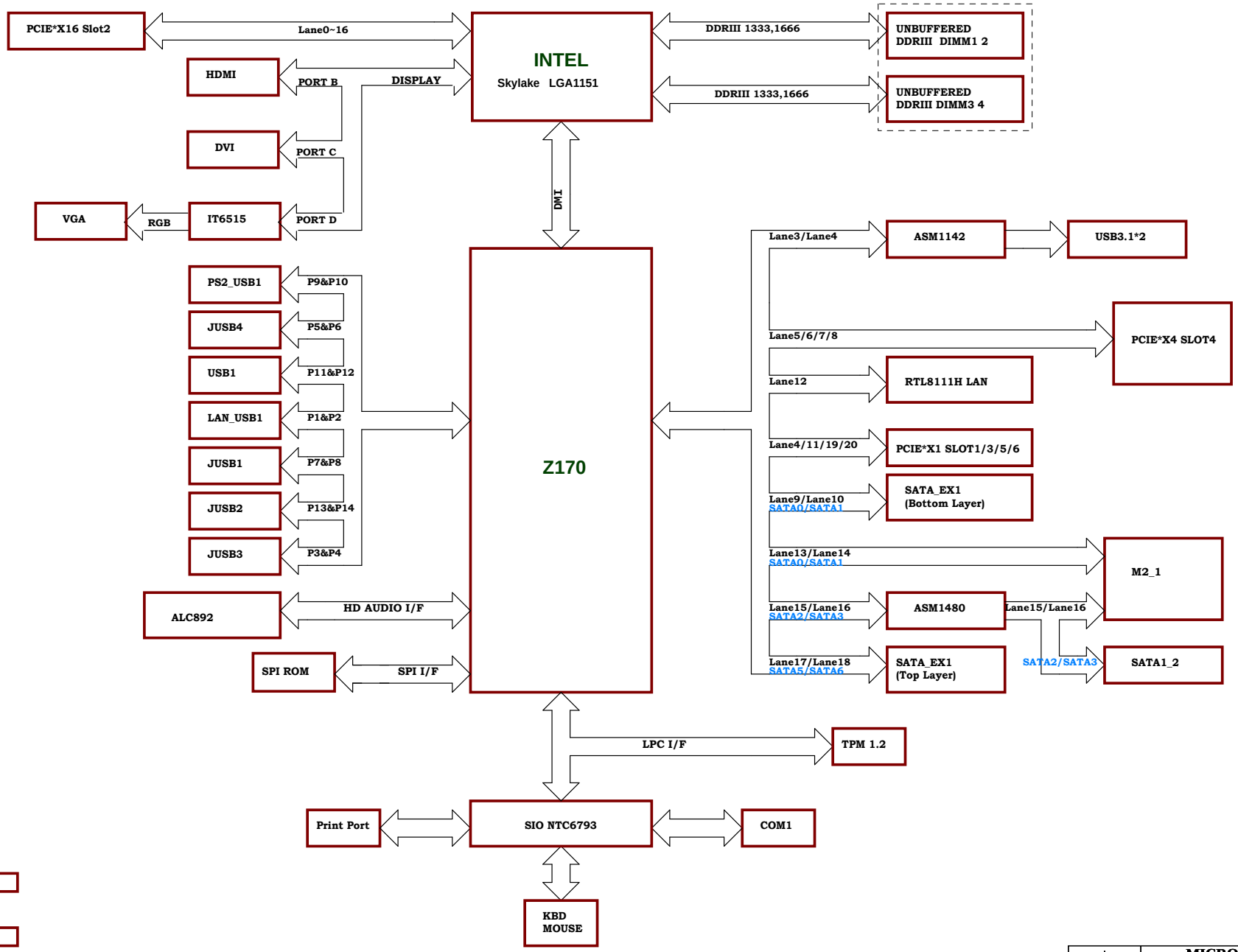
MS-7971 Block Diagram



Slot Sequence:

- PCIE X1
- PCIE X16
- PCIE X1
- PCIE X4
- PCIE X1
- PCIE X1

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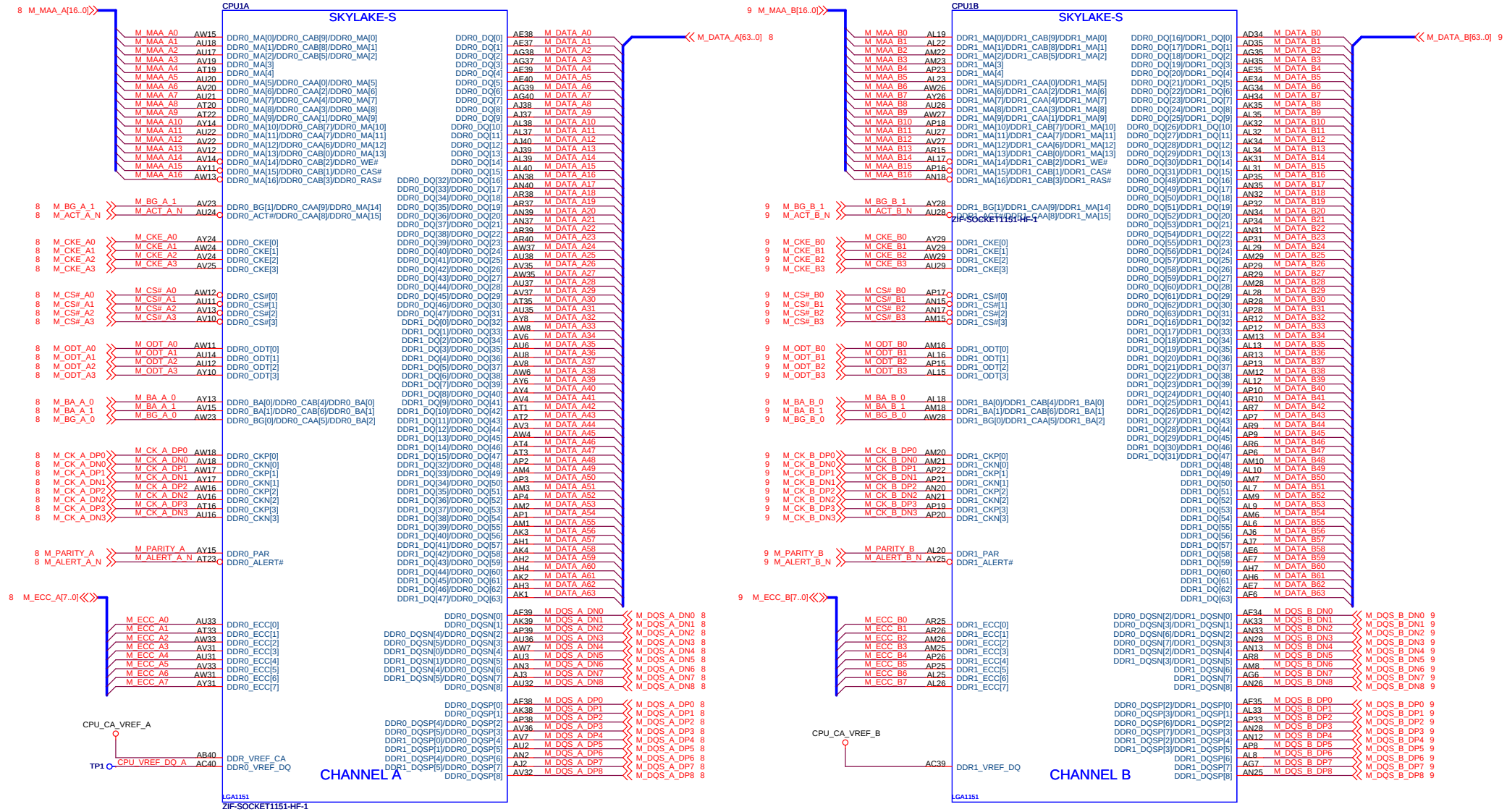
SOCKET PN N12-151A010-L06



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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			RSVD
10			RSVD
11			RSVD
12			RSVD
13			RSVD
14	RSVD		
15	RSVD		

CPU1E

SKYLAKE-S

ZIF-SOCKET1151-HF-1

CRB 1.0 update R11 change 100R

2014.09.29 remove

Close CPU <1100 mil

1000 mil < CPU_XDP_MBP0~1 < 6000 mil

2014.09.24

CRB 1.0 update R29 change 20R

CRB 1.0 update RSVD

Detail refer CRB 1.0

2014.09.24

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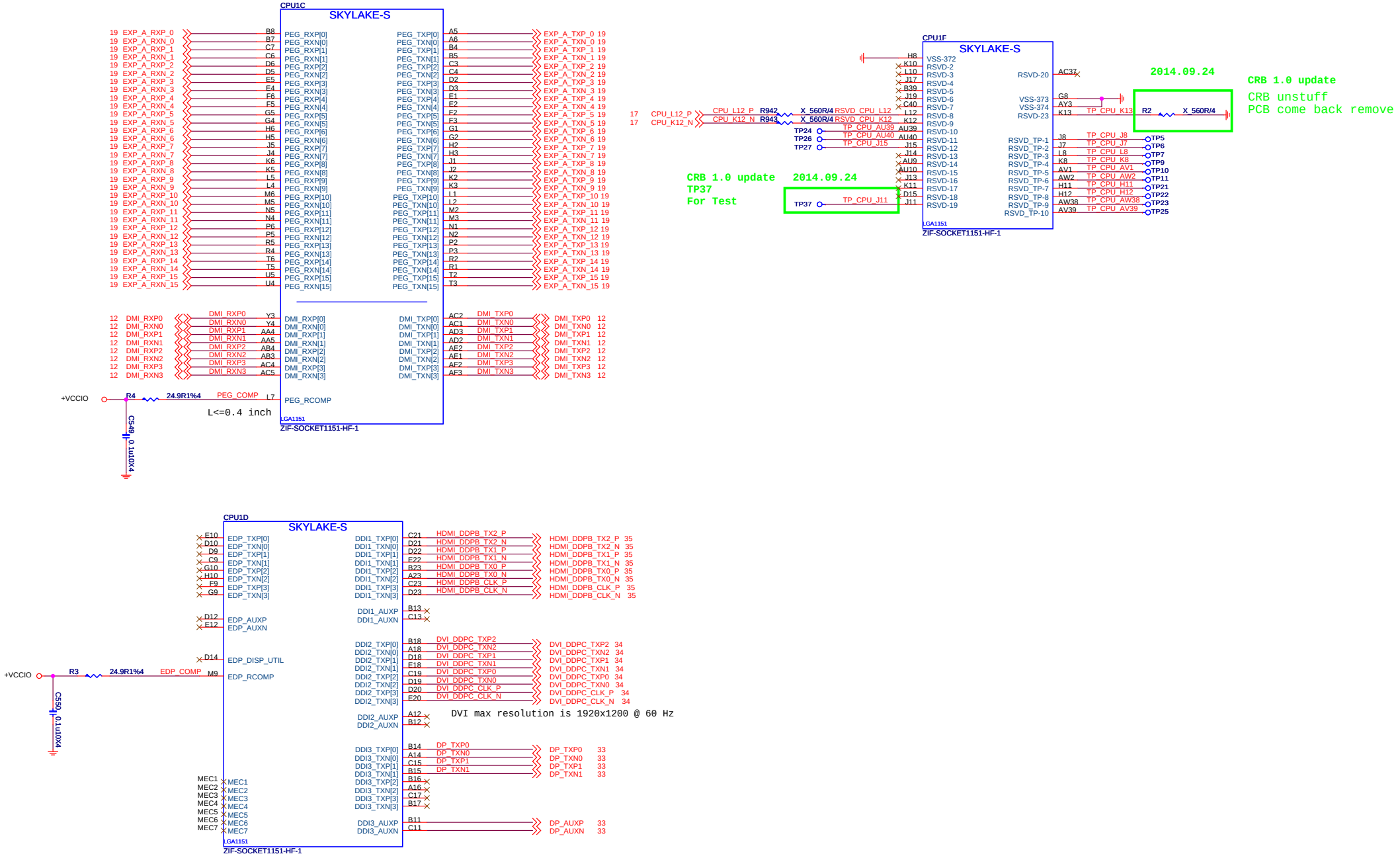

MICRO-STAR INT'L CO.,LTD	
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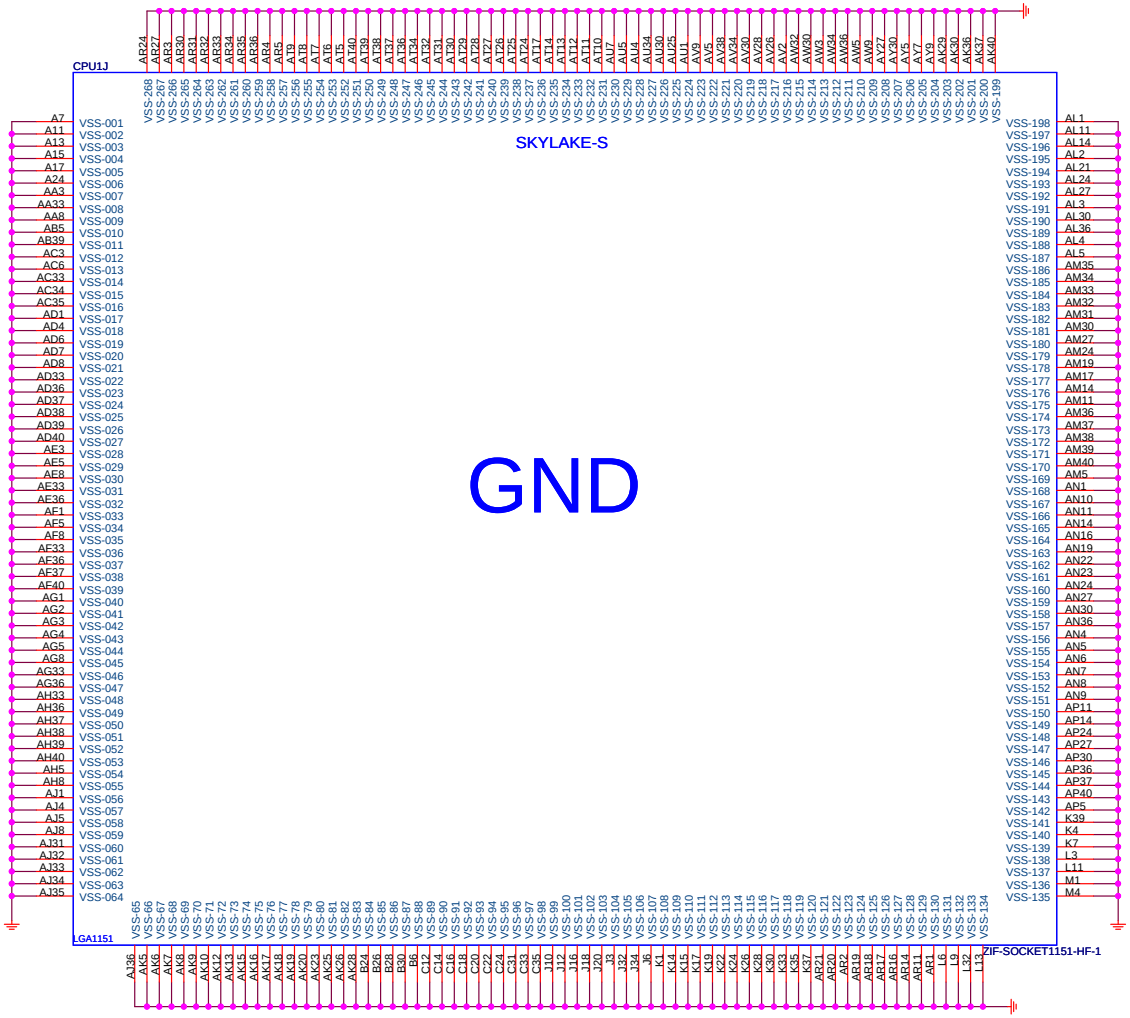

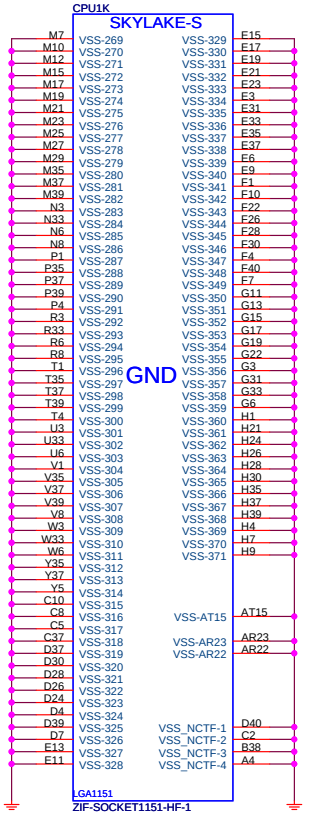

MICRO-STAR INT'L CO.,LTD		
MS-7971		
Size: Custom	Document Description: CPU-GND	Rev: 21
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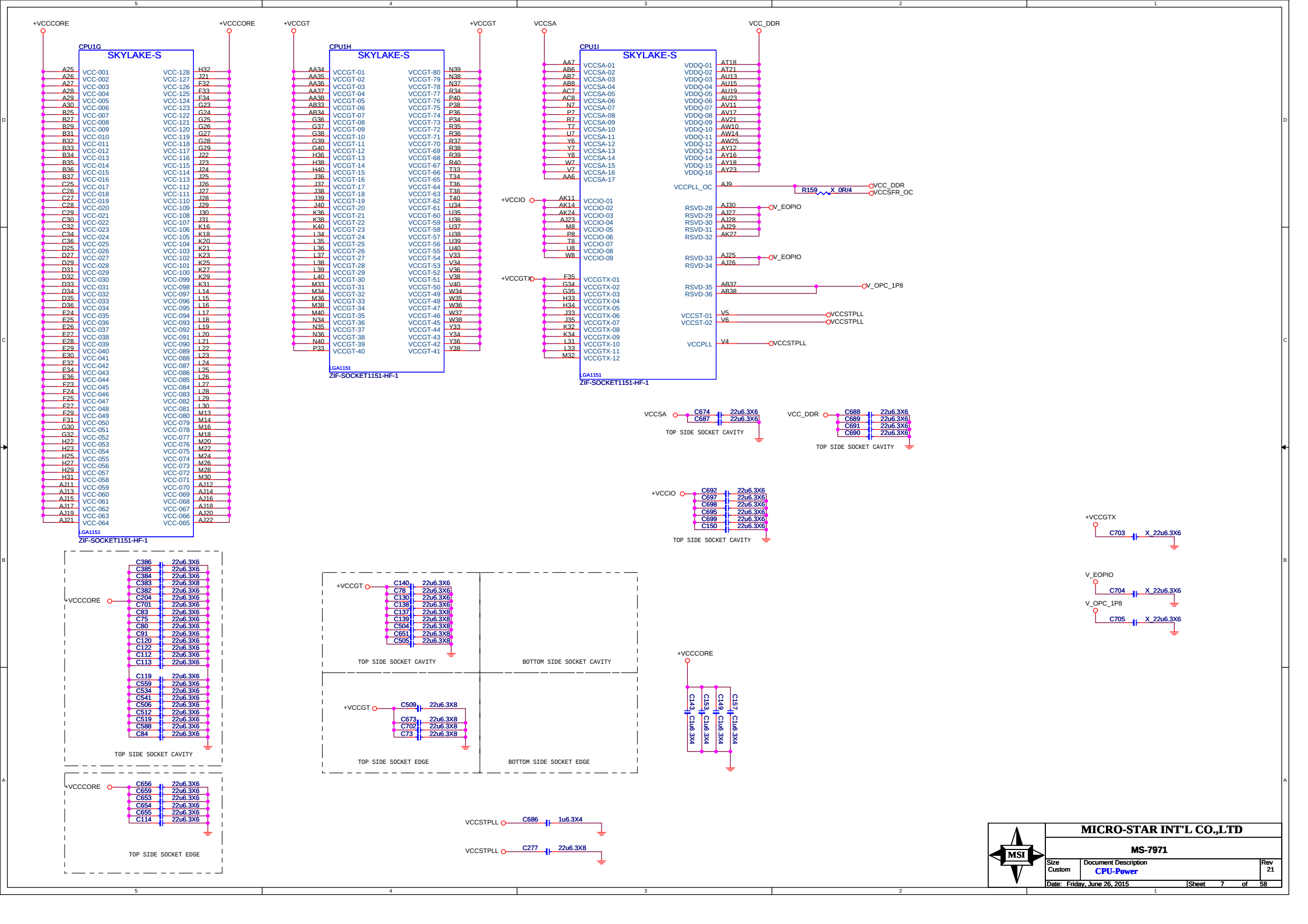
+VCCCORE
CPU1G
SKYLAKE-S
VCC-001 VCC-002 VCC-003 VCC-004 VCC-005 VCC-006 VCC-007 VCC-008 VCC-009 VCC-010 VCC-011 VCC-012 VCC-013 VCC-014 VCC-015 VCC-016 VCC-017 VCC-018 VCC-019 VCC-020 VCC-021 VCC-022 VCC-023 VCC-024 VCC-025 VCC-026 VCC-027 VCC-028 VCC-029 VCC-030 VCC-031 VCC-032 VCC-033 VCC-034 VCC-035 VCC-036 VCC-037 VCC-038 VCC-039 VCC-040 VCC-041 VCC-042 VCC-043 VCC-044 VCC-045 VCC-046 VCC-047 VCC-048 VCC-049 VCC-050 VCC-051 VCC-052 VCC-053 VCC-054 VCC-055 VCC-056 VCC-057 VCC-058 VCC-059 VCC-060 VCC-061 VCC-062 VCC-063 VCC-064
VCC-065 VCC-066 VCC-067 VCC-068 VCC-069 VCC-070 VCC-071 VCC-072 VCC-073 VCC-074 VCC-075 VCC-076 VCC-077 VCC-078 VCC-079 VCC-080 VCC-081 VCC-082 VCC-083 VCC-084 VCC-085 VCC-086 VCC-087 VCC-088 VCC-089 VCC-090 VCC-091 VCC-092 VCC-093 VCC-094 VCC-095 VCC-096 VCC-097 VCC-098 VCC-099 VCC-100 VCC-101 VCC-102 VCC-103 VCC-104 VCC-105 VCC-106 VCC-107 VCC-108 VCC-109 VCC-110 VCC-111 VCC-112 VCC-113 VCC-114 VCC-115 VCC-116 VCC-117 VCC-118 VCC-119 VCC-120 VCC-121 VCC-122 VCC-123 VCC-124 VCC-125 VCC-126 VCC-127 VCC-128
LGA1151
ZIF-SOCKET1151-HF-1
+VCCCORE
+VCCGT
CPU1H
SKYLAKE-S
VCCGT-01 VCCGT-02 VCCGT-03 VCCGT-04 VCCGT-05 VCCGT-06 VCCGT-07 VCCGT-08 VCCGT-09 VCCGT-10 VCCGT-11 VCCGT-12 VCCGT-13 VCCGT-14 VCCGT-15 VCCGT-16 VCCGT-17 VCCGT-18 VCCGT-19 VCCGT-20 VCCGT-21 VCCGT-22 VCCGT-23 VCCGT-24 VCCGT-25 VCCGT-26 VCCGT-27 VCCGT-28 VCCGT-29 VCCGT-30 VCCGT-31 VCCGT-32 VCCGT-33 VCCGT-34 VCCGT-35 VCCGT-36 VCCGT-37 VCCGT-38 VCCGT-39 VCCGT-40
VCCGT-41 VCCGT-42 VCCGT-43 VCCGT-44 VCCGT-45 VCCGT-46 VCCGT-47 VCCGT-48 VCCGT-49 VCCGT-50 VCCGT-51 VCCGT-52 VCCGT-53 VCCGT-54 VCCGT-55 VCCGT-56 VCCGT-57 VCCGT-58 VCCGT-59 VCCGT-60 VCCGT-61 VCCGT-62 VCCGT-63 VCCGT-64 VCCGT-65 VCCGT-66 VCCGT-67 VCCGT-68 VCCGT-69 VCCGT-70 VCCGT-71 VCCGT-72 VCCGT-73 VCCGT-74 VCCGT-75 VCCGT-76 VCCGT-77 VCCGT-78 VCCGT-79 VCCGT-80
LGA1151
ZIF-SOCKET1151-HF-1
VCCSA
VCC_DDR
CPU1I
SKYLAKE-S
VCCSA-01 VCCSA-02 VCCSA-03 VCCSA-04 VCCSA-05 VCCSA-06 VCCSA-07 VCCSA-08 VCCSA-09 VCCSA-10 VCCSA-11 VCCSA-12 VCCSA-13 VCCSA-14 VCCSA-15 VCCSA-16 VCCSA-17
VDDQ-01 VDDQ-02 VDDQ-03 VDDQ-04 VDDQ-05 VDDQ-06 VDDQ-07 VDDQ-08 VDDQ-09 VDDQ-10 VDDQ-11 VDDQ-12 VDDQ-13 VDDQ-14 VDDQ-15 VDDQ-16
VCCPLL_OC
+VCCIO
VCCIO-01 VCCIO-02 VCCIO-03 VCCIO-04 VCCIO-05 VCCIO-06 VCCIO-07 VCCIO-08 VCCIO-09
RSVD-28 RSVD-29 RSVD-30 RSVD-31 RSVD-32 RSVD-33 RSVD-34 RSVD-35 RSVD-36
+VCCGTX
VCCGTX-01 VCCGTX-02 VCCGTX-03 VCCGTX-04 VCCGTX-05 VCCGTX-06 VCCGTX-07 VCCGTX-08 VCCGTX-09 VCCGTX-10 VCCGTX-11 VCCGTX-12
VCCST-01 VCCST-02
VCCPLL
R159 X_0R/4
VCC_DDR
VCCSFR_OC
V_EOPIO
V_OPC_1P8
VCCSTPLL
LGA1151
ZIF-SOCKET1151-HF-1
VCCSA
C674 C687 22u6.3X6
TOP SIDE SOCKET CAVITY
VCC_DDR
C688 C689 C691 C690 22u6.3X6
TOP SIDE SOCKET CAVITY
+VCCIO
C692 C697 C698 C695 C699 C150 22u6.3X6
TOP SIDE SOCKET CAVITY
+VCCGTX
C703 X_22u6.3X6
V_EOPIO
C704 X_22u6.3X6
V_OPC_1P8
C705 X_22u6.3X6
+VCCCORE
C386 C385 C384 C383 C382 C204 C701 C83 C75 C80 C91 C120 C122 C112 C113 22u6.3X6
C119 C559 C534 C541 C506 C512 C519 C588 C84 22u6.3X6
TOP SIDE SOCKET CAVITY
+VCCGT
C140 C78 C130 C138 C137 C139 C504 C651 C505 22u6.3X6
TOP SIDE SOCKET CAVITY
BOTTOM SIDE SOCKET CAVITY
+VCCGT
C509 22u6.3X8
C673 C702 C73 22u6.3X8
TOP SIDE SOCKET EDGE
BOTTOM SIDE SOCKET EDGE
+VCCCORE
C143 C153 C149 C157 C1u6.3X4
+VCCCORE
C656 C659 C653 C654 C655 C114 22u6.3X6
TOP SIDE SOCKET EDGE
VCCSTPLL
C686 1u6.3X4
VCCSTPLL
C277 22u6.3X8
MICRO-STAR INT'L CO.,LTD
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Size Custom
Document Description
CPU-Power
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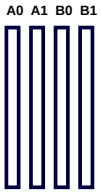

DIMM1A

DIMM1(CHANNEL-A)
ADDRESS = 0:0 [SA1:SA0]

DIMM2A

DIMM2(CHANNEL-A)
ADDRESS = 0:1 [SA1:SA0]

DDRIV-288P_BLACK-RH-21

MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: DDR4 SLOT-DIMM1/DIMM2
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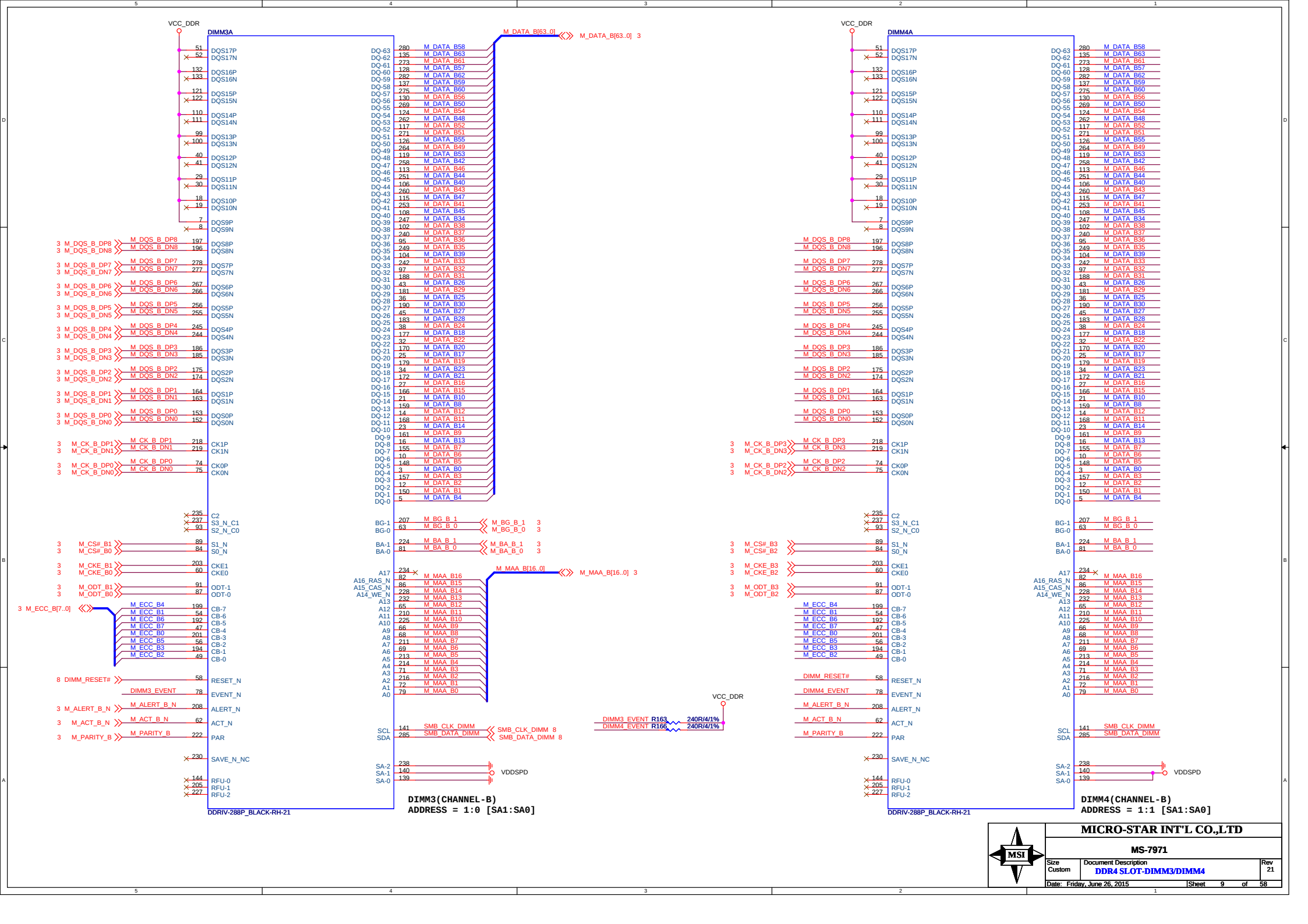
VCC_DDR
DIMM3A
M_DATA_B[63..0]
M_DATA_B[63..0] 3
DQS17P
DQS17N
DQS16P
DQS16N
DQS15P
DQS15N
DQS14P
DQS14N
DQS13P
DQS13N
DQS12P
DQS12N
DQS11P
DQS11N
DQS10P
DQS10N
DQS9P
DQS9N
DQS8P
DQS8N
DQS7P
DQS7N
DQS6P
DQS6N
DQS5P
DQS5N
DQS4P
DQS4N
DQS3P
DQS3N
DQS2P
DQS2N
DQS1P
DQS1N
DQS0P
DQS0N
CK1P
CK1N
CK0P
CK0N
C2
S3_N_C1
S2_N_C0
S1_N
S0_N
CKE1
CKE0
ODT-1
ODT-0
CB-7
CB-6
CB-5
CB-4
CB-3
CB-2
CB-1
CB-0
RESET_N
EVENT_N
ALERT_N
ACT_N
PAR
SAVE_N_NC
RFU-0
RFU-1
RFU-2
DDRIV-288P_BLACK-RH-21
M_MAA_B[16..0]
M_MAA_B[16..0] 3
A17
A16_RAS_N
A15_CAS_N
A14_WE_N
A13
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
BG-1
BG-0
BA-1
BA-0
SCL
SDA
SMB_CLK_DIMM
SMB_DATA_DIMM
SMB_CLK_DIMM 8
SMB_DATA_DIMM 8
SA-2
SA-1
SA-0
VDDSPD
DIMM3_EVENT R163 240R/4/1%
DIMM4_EVENT R166 240R/4/1%
DIMM3(CHANNEL-B)
ADDRESS = 1:0 [SA1:SA0]
DIMM4A
DIMM4(CHANNEL-B)
ADDRESS = 1:1 [SA1:SA0]
MICRO-STAR INT'L CO.,LTD
MS-7971
Size
Custom
Document Description
DDR4 SLOT-DIMM3/DIMM4
Rev
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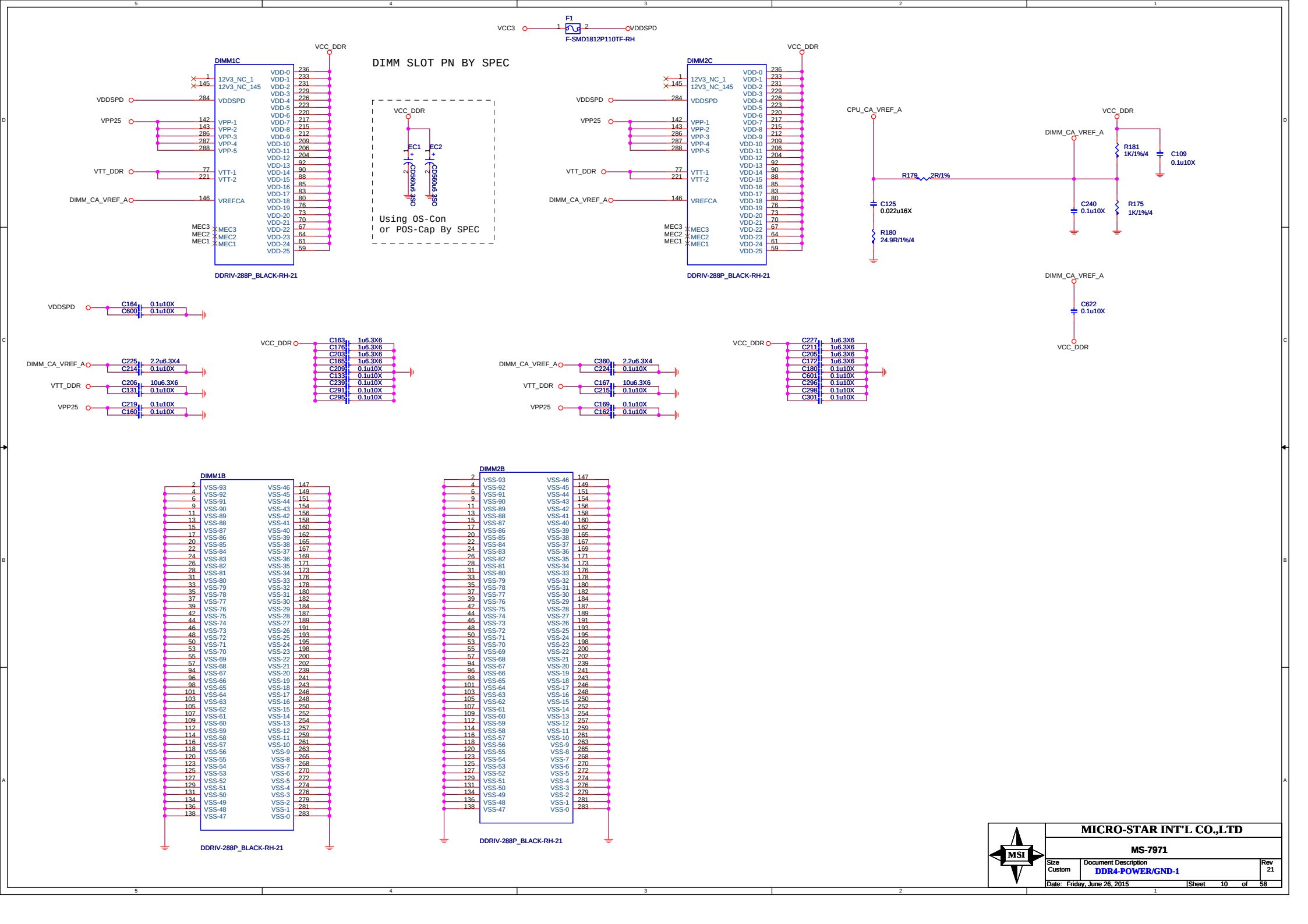
F1
VCC3
VDDSPD
F-SMD1812P110TF-RH
DIMM SLOT PN BY SPEC
DIMM1C
DIMM2C
DDRIV-288P_BLACK-RH-21
VCC_DDR
VDDSPD
VPP25
VTT_DDR
DIMM_CA_VREF_A
MEC3
MEC2
MEC1
EC1
EC2
CD560u6.3SO
Using OS-Con
or POS-Cap By SPEC
CPU_CA_VREF_A
R179 2R/1%
C125 0.022u16X
R180 24.9R/1%/4
R181 1K/1%/4
C109 0.1u10X
C240 0.1u10X
R175 1K/1%/4
C622 0.1u10X
C164 0.1u10X
C600 0.1u10X
C225 2.2u6.3X4
C214 0.1u10X
C206 10u6.3X6
C131 0.1u10X
C219 0.1u10X
C160 0.1u10X
C163 1u6.3X6
C176 1u6.3X6
C203 1u6.3X6
C165 1u6.3X6
C209 0.1u10X
C133 0.1u10X
C239 0.1u10X
C291 0.1u10X
C295 0.1u10X
C360 2.2u6.3X4
C224 0.1u10X
C167 10u6.3X6
C215 0.1u10X
C169 0.1u10X
C162 0.1u10X
C227 1u6.3X6
C211 1u6.3X6
C205 1u6.3X6
C172 1u6.3X6
C180 0.1u10X
C601 0.1u10X
C296 0.1u10X
C298 0.1u10X
C301 0.1u10X
DIMM1B
DIMM2B
MICRO-STAR INT'L CO.,LTD
MS-7971
Size Custom
Document Description
DDR4-POWER/GND-1
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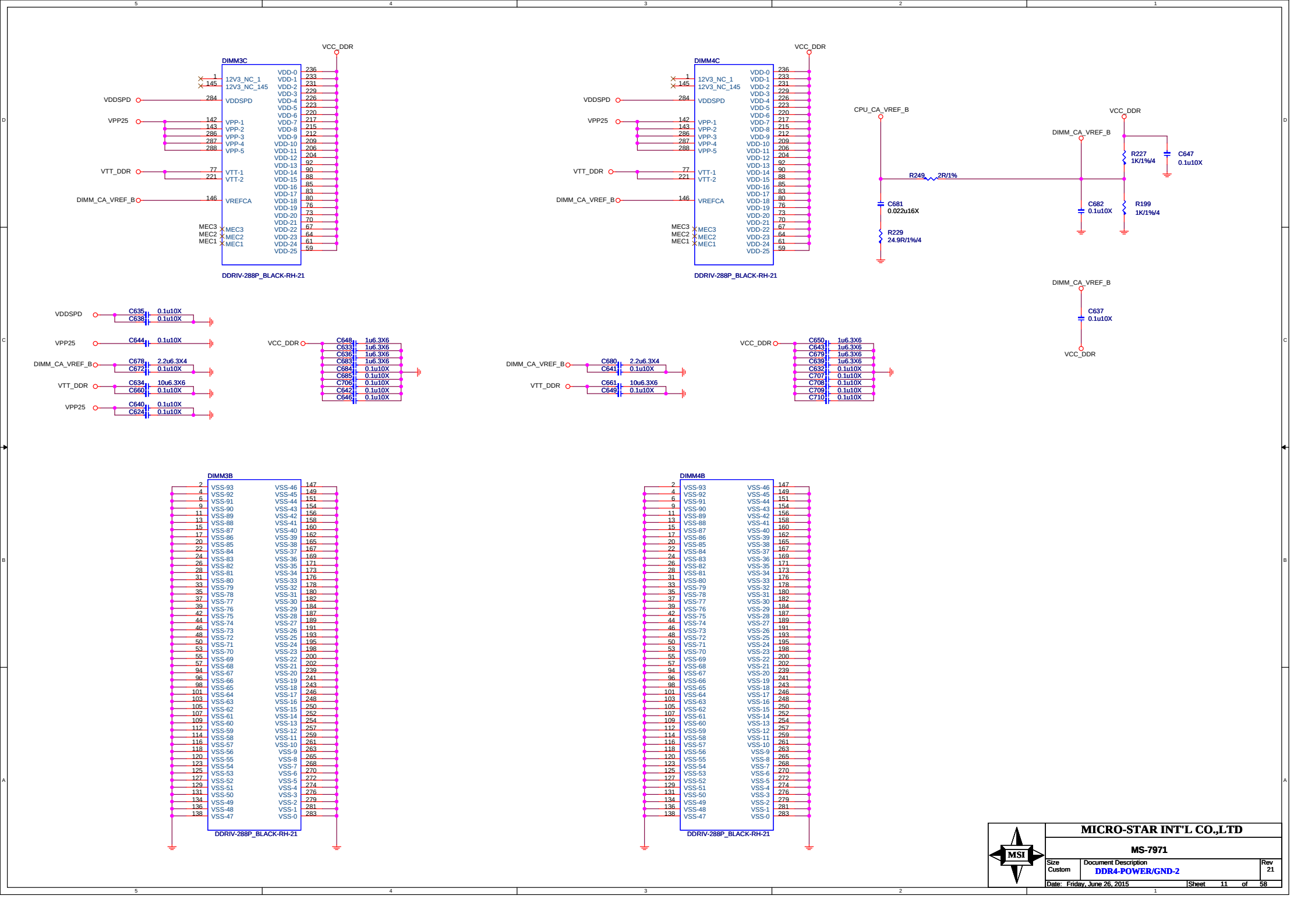
VCC_DDR
DIMM3C
1
145
12V3_NC_1
12V3_NC_145
VDDSPD
284
VDDSPD
VPP25
142
143
286
287
288
VPP-1
VPP-2
VPP-3
VPP-4
VPP-5
VTT_DDR
77
221
VTT-1
VTT-2
DIMM_CA_VREF_B
146
VREFCA
MEC3
MEC2
MEC1
VDD-0
VDD-1
VDD-2
VDD-3
VDD-4
VDD-5
VDD-6
VDD-7
VDD-8
VDD-9
VDD-10
VDD-11
VDD-12
VDD-13
VDD-14
VDD-15
VDD-16
VDD-17
VDD-18
VDD-19
VDD-20
VDD-21
VDD-22
VDD-23
VDD-24
VDD-25
DDRIV-288P_BLACK-RH-21
DIMM4C
CPU_CA_VREF_B
R249
2R/1%
C681
0.022u16X
R229
24.9R/1%/4
DIMM_CA_VREF_B
R227
1K/1%/4
C647
0.1u10X
C682
0.1u10X
R199
1K/1%/4
C637
0.1u10X
C635
C638
0.1u10X
C644
C678
C672
2.2u6.3X4
C634
C660
10u6.3X6
C640
C624
C648
C633
C636
C683
C684
C685
C706
C642
C646
1u6.3X6
C680
C641
C661
C649
C650
C643
C679
C639
C632
C707
C708
C709
C710
DIMM3B
DIMM4B
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Document Description
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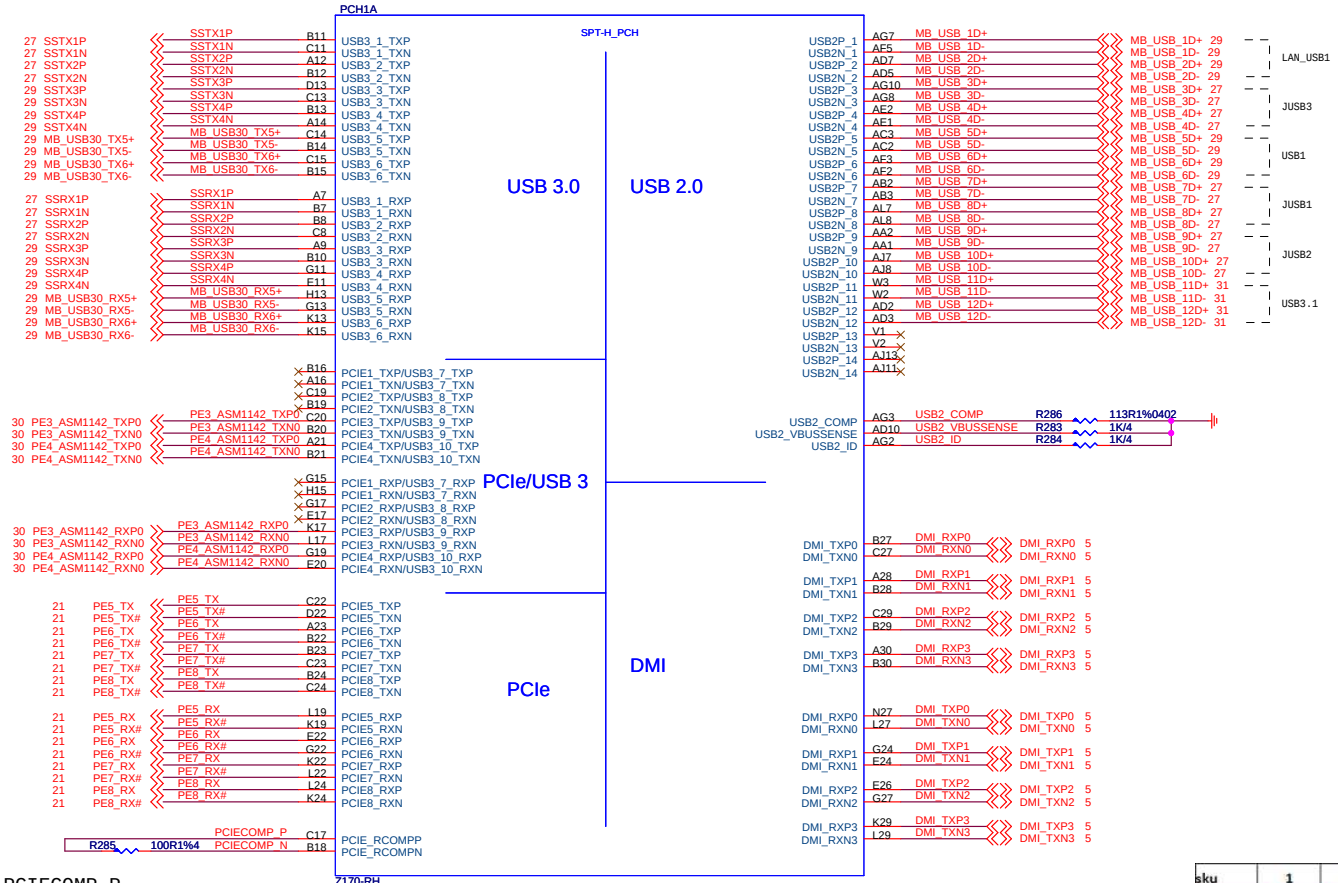
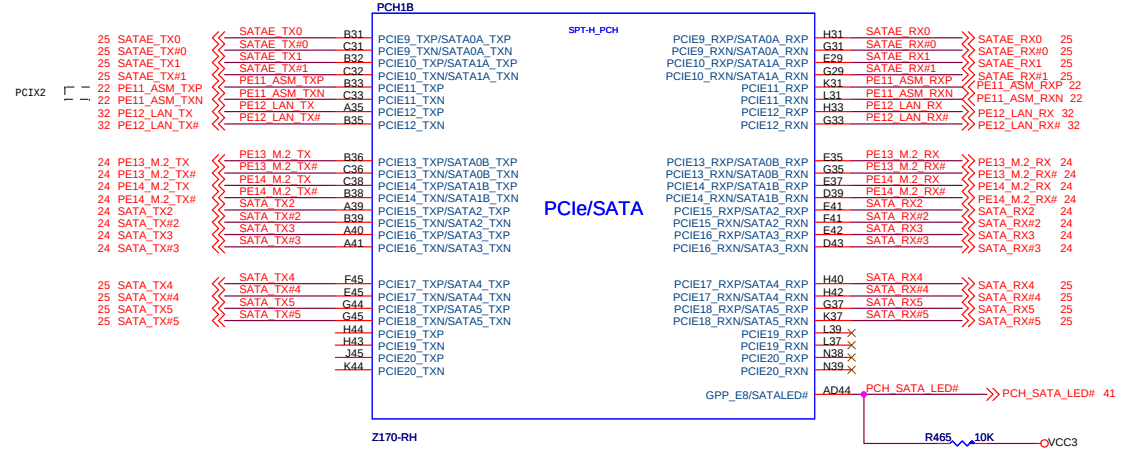


PCIECOMP_P
PCIECOMP_N Length Match < 5mil



sku	1	2	3	4	5	6	7	8	9	10	11	12	13	14
H110	USB3/ OTG	USB3/ SSIC	USB3/ SSIC	USB3	N/A	N/A	N/A	N/A	N/A	LAN Only	PCIe/ LAN	PCIe	PCIe	PCIe
B150	USB3/ OTG	USB3/ SSIC	USB3/ SSIC	USB3	USB3	USB3	N/A	N/A	N/A	LAN Only	PCIe/ LAN	PCIe	PCIe	PCIe
H170	USB3/ OTG	USB3/ SSIC	USB3/ SSIC	USB3	USB3	USB3	USB3	USB3	PCIe	PCIe/ LAN	PCIe/ LAN	PCIe	PCIe	PCIe
Z170	USB3/ OTG	USB3/ SSIC	USB3/ SSIC	USB3	USB3	USB3	USB3/ PCIe	USB3/ PCIe	USB3/ PCIe	USB3/ PCIe/ LAN	PCIe/ LAN	PCIe	PCIe	PCIe

Sku	15	16	17	18	19	20	21	22	23	24	25	26	RST for PCIe Ports
H110	PCIe/ LAN	PCIe	N/A	LAN Only	SATA*/ LAN	SATA*	SATA	SATA	N/A	N/A	N/A	N/A	0
B150	PCIe/LAN SATA*	PCIe/ SATA*	PCIe	PCIe/ LAN	SATA* /LAN	SATA*	SATA	SATA	SATA	SATA	N/A	N/A	0
H170	PCIe/LAN SATA	PCIe/ SATA	PCIe	PCIe/ LAN	PCIe/LAN SATA	PCIe/ SATA	PCIe/ SATA	PCIe/ SATA	SATA	SATA	PCIe	PCIe	2
Z170	PCIe/LAN SATA	PCIe/ SATA	PCIe	PCIe/ LAN	PCIe/LAN SATA	PCIe/ SATA	PCIe/ SATA	PCIe/ SATA	PCIe/ SATA	PCIe/ SATA	PCIe	PCIe	3

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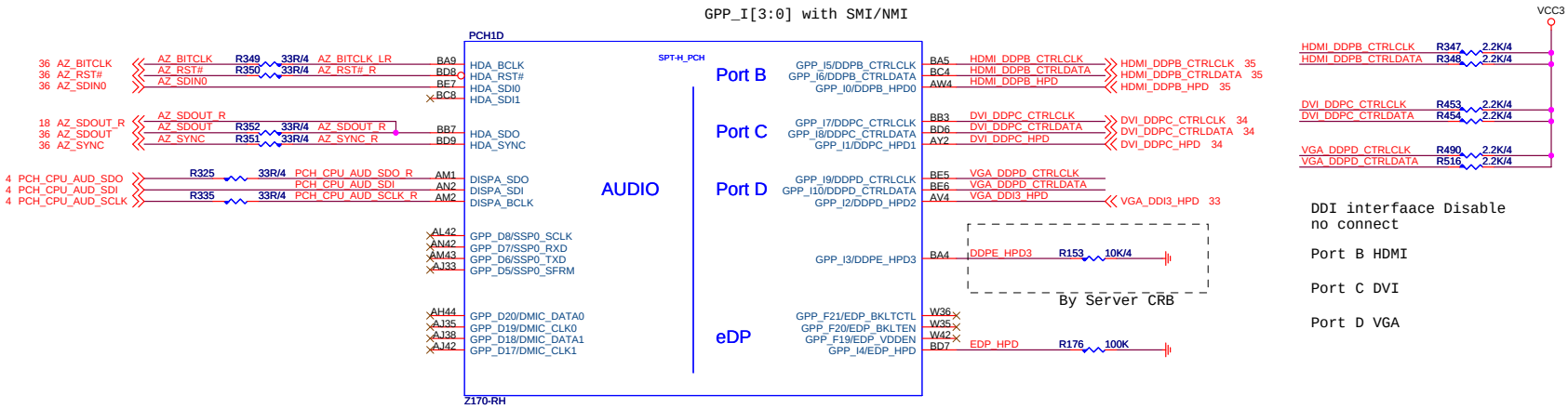
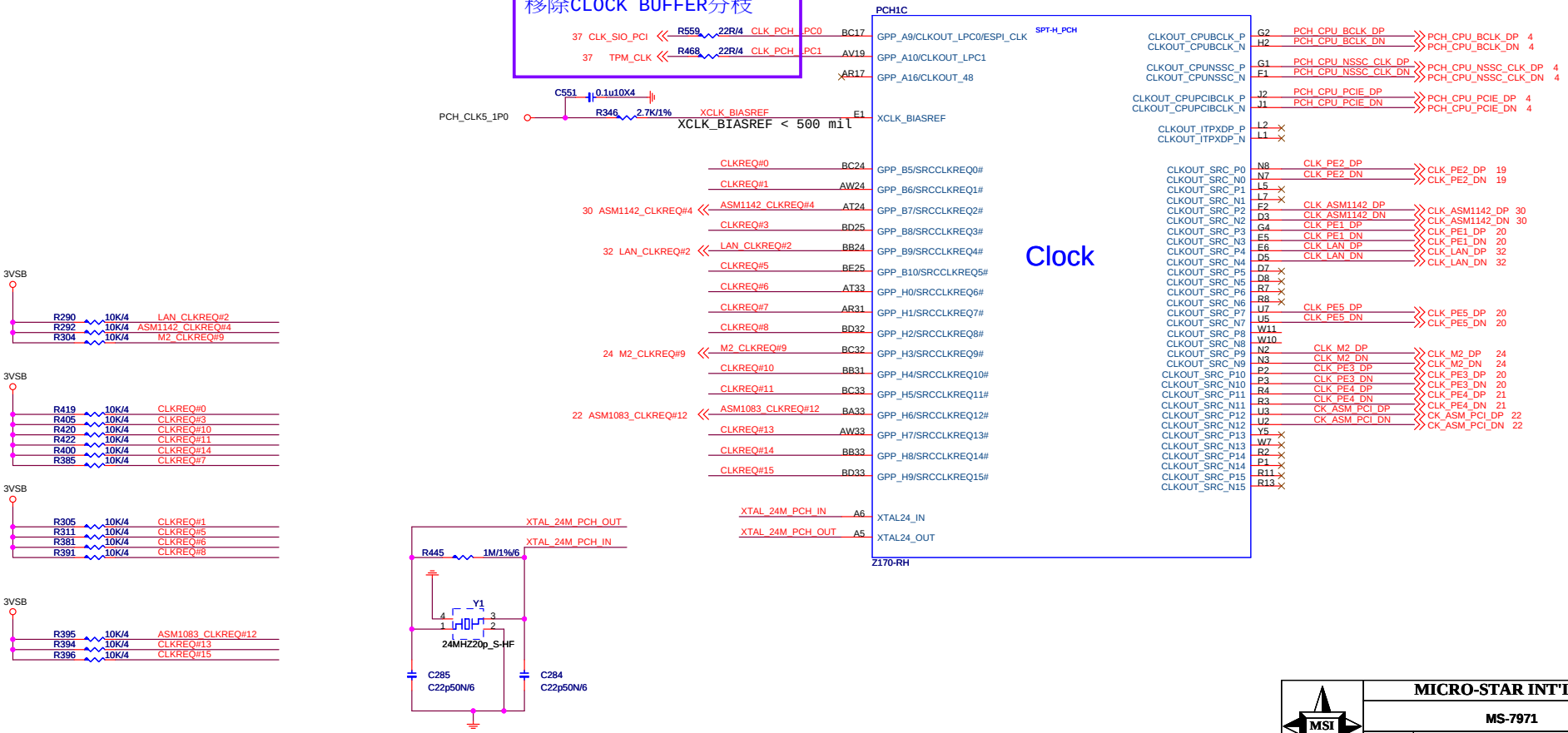
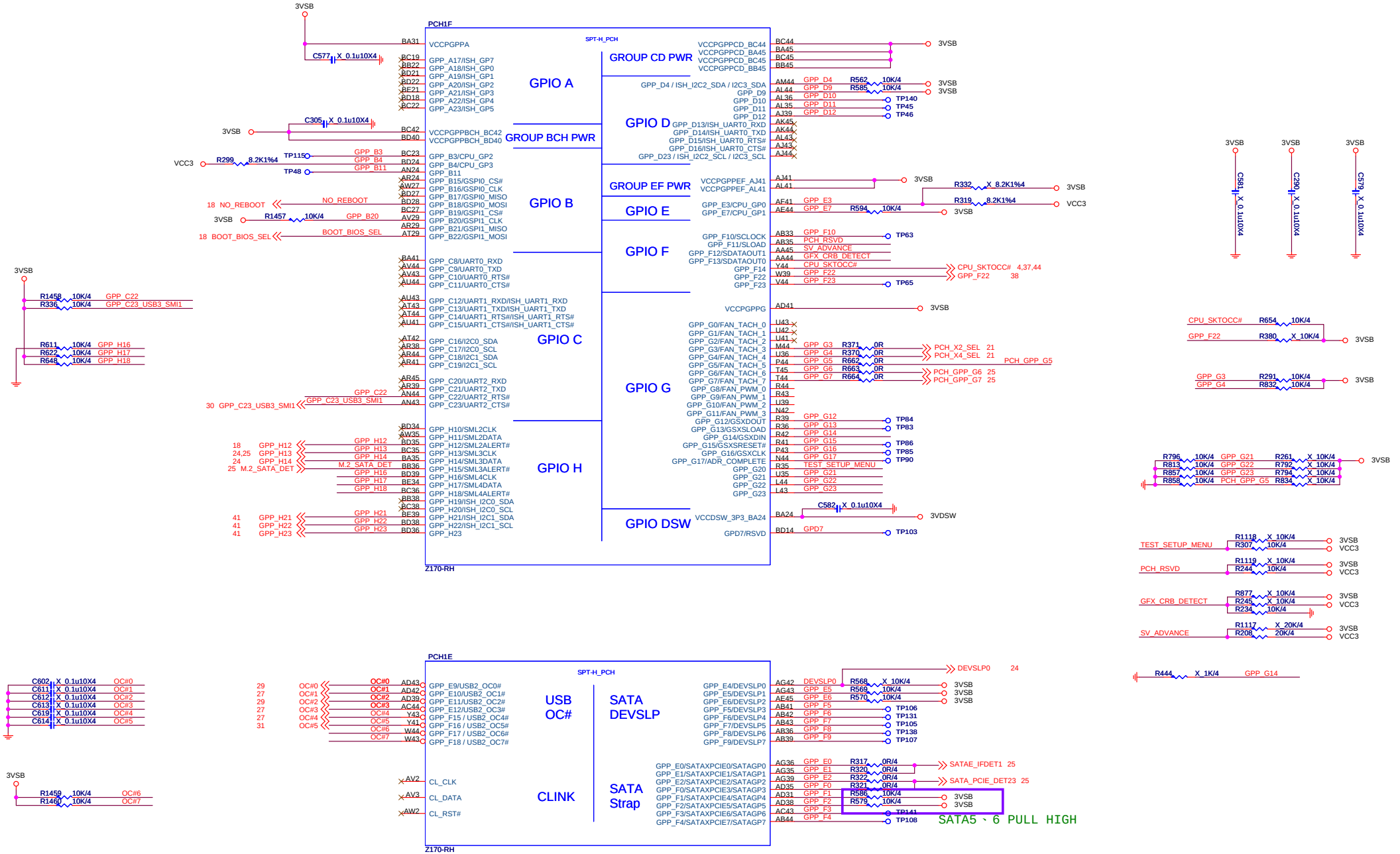
GPP_I[3:0] with SMI/NMI



移除CLOCK BUFFER分枝





MICRO-STAR INT'L CO.,LTD		
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Size: Custom	Document Description: PCH-GPIO/USBOC#/SATASTRAP	Rev: 21
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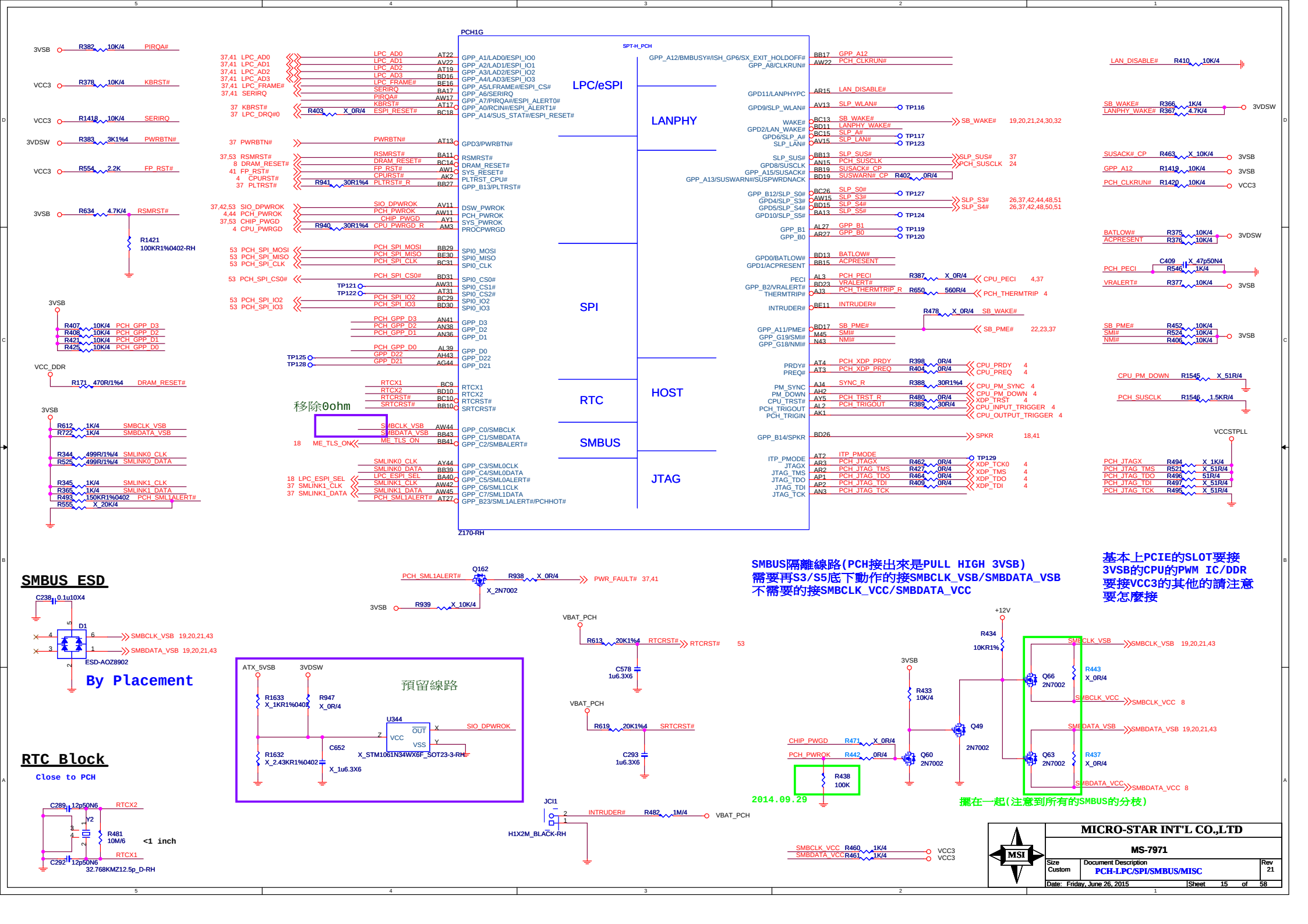
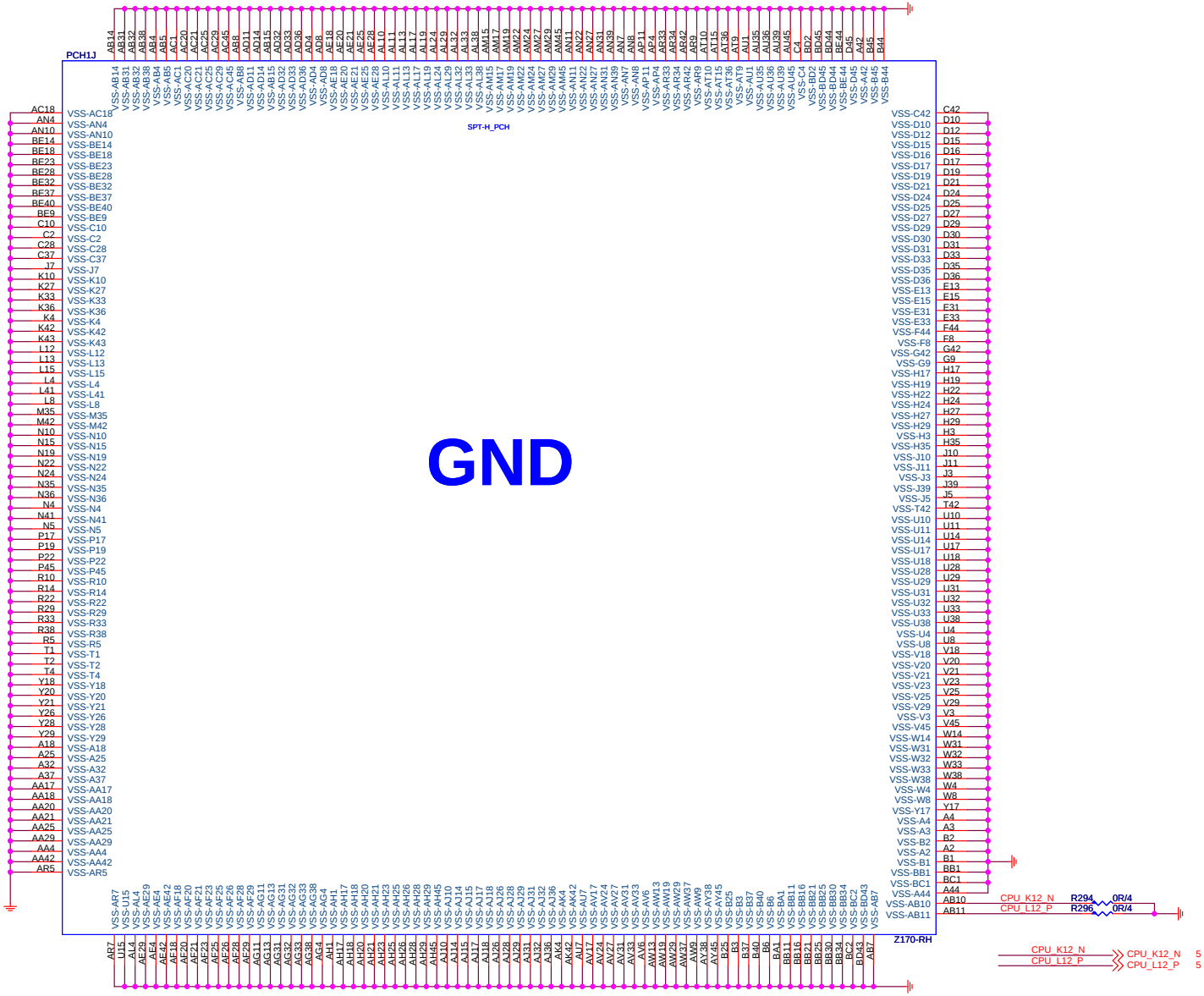

PCH1G
SPT-H_PCH
LPC/eSPI
LANPHY
SPI
HOST
RTC
SMBUS
JTAG
Z170-RH
移除0ohm
預留線路
SMBUS_ESD
By Placement
RTC_Block
Close to PCH
SMBUS隔離線路(PCH接出來是PULL HIGH 3VSB)
需要再S3/S5底下動作的接SMBCLK_VSB/SMBDATA_VSB
不需要的接SMBCLK_VCC/SMBDATA_VCC
基本上PCIE的SLOT要接
3VSB的CPU的PWM IC/DDR
要接VCC3的其他的請注意
要怎麼接
2014.09.29
擺在一起(注意到所有的SMBUS的分枝)
MICRO-STAR INT'L CO.,LTD
MS-7971
PCH-LPC/SPI/SMBUS/MISC



MICRO-STAR INT'L CO.,LTD		
MS-7971		
Size: Custom	Document Description: PCH-GND	Rev: 21
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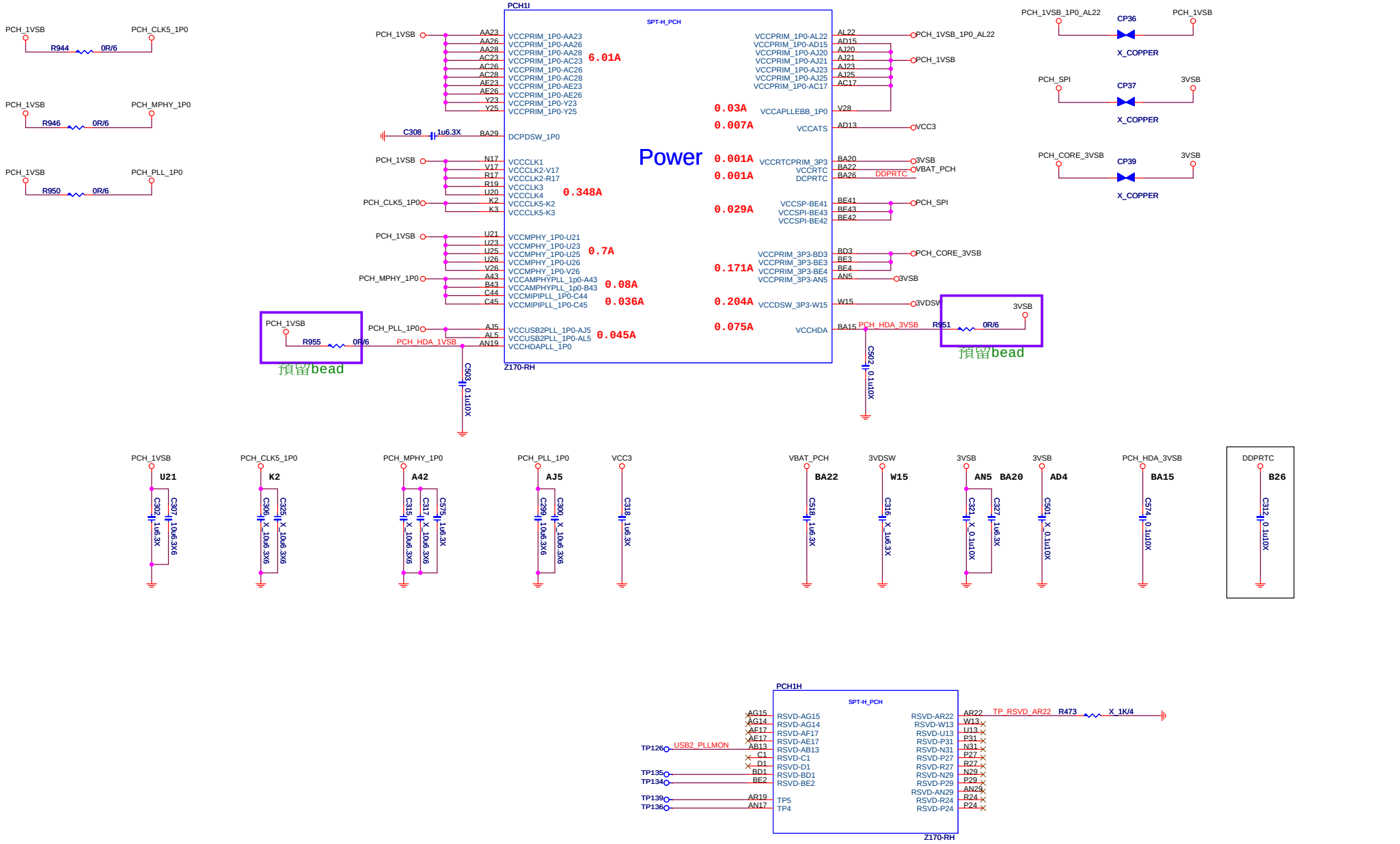

MICRO-STAR INT'L CO.,LTD	
MS-7971	
Size: Custom	Document Description: PCH-Power
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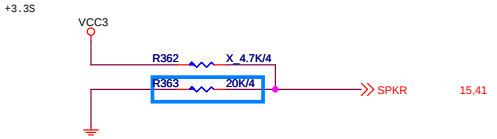
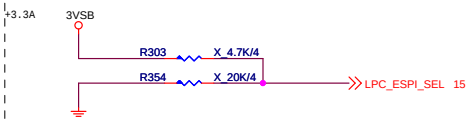
TOP Swap



Internal pull-down is disabled after PLTRST#

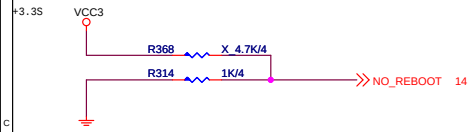
LPC eSPI Mode



0 : LPC
1 : eSPI

Internal pull-down is disabled after RSMRST

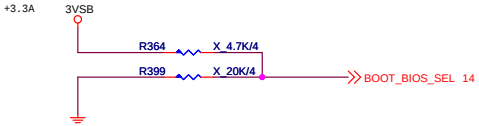
No Reboot



0 : DISABLE (Default)
1 : ENABLE

Internal pull-down is disabled after PLTRST#

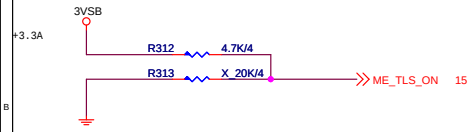
Boot BIOS



0 : SPI
1 : LPC

Internal pull-down is disabled after PLTRST

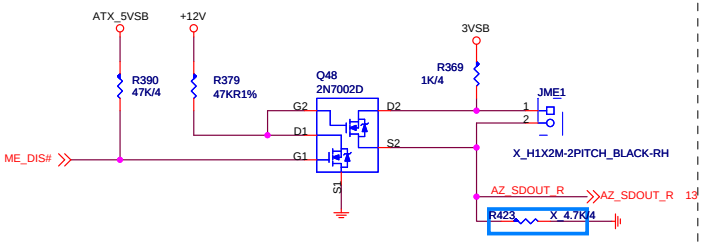
AMT and SBA with confidentiality



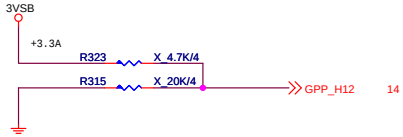
0 : DISABLE
1 : ENABLE (Default)

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

MICRO-STAR INT'L CO.,LTD	
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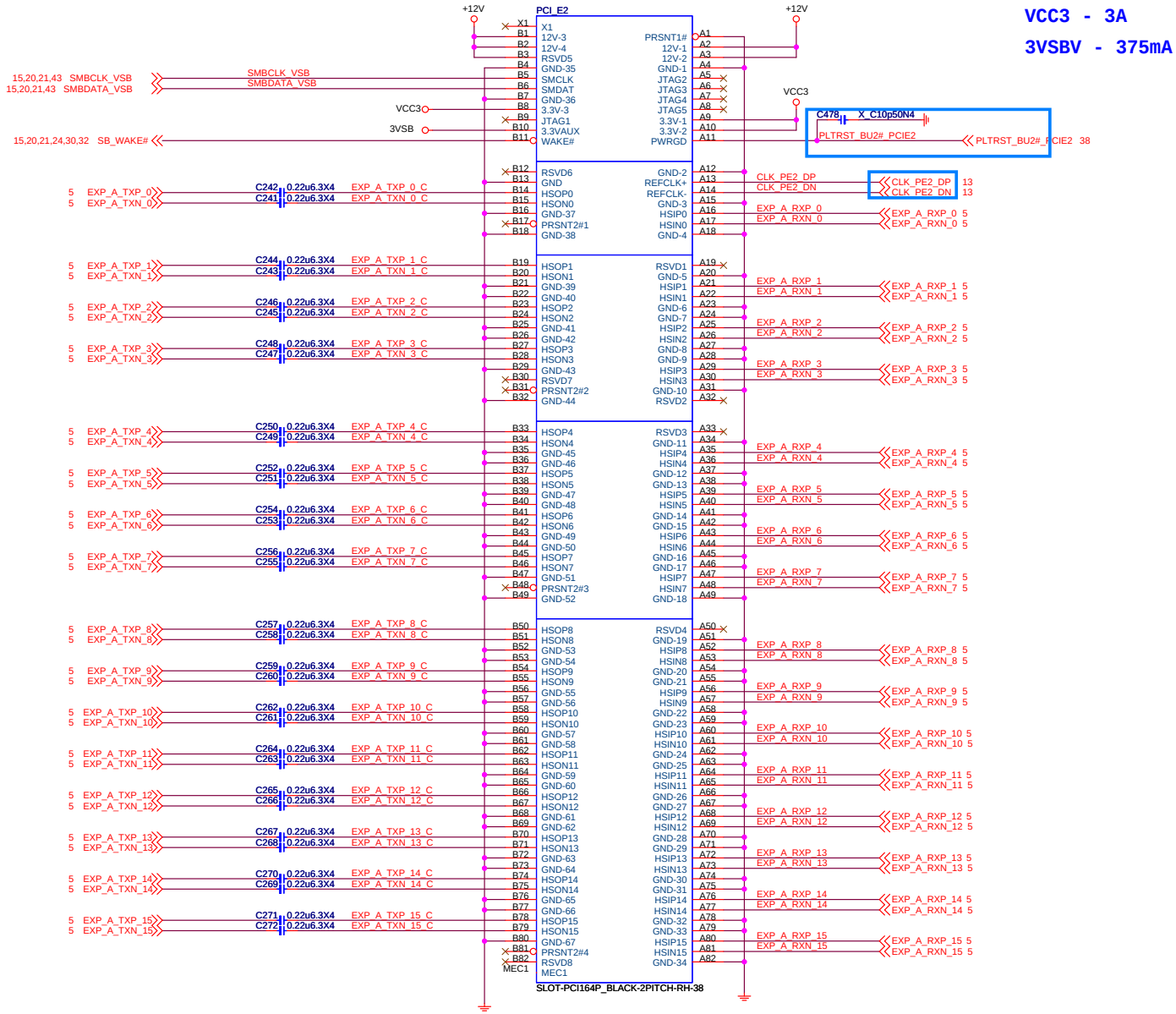

MICRO-STAR INT'L CO.,LTD	
MS-7971	
Size: Custom	Document Description: PCIE SLOT (X16)
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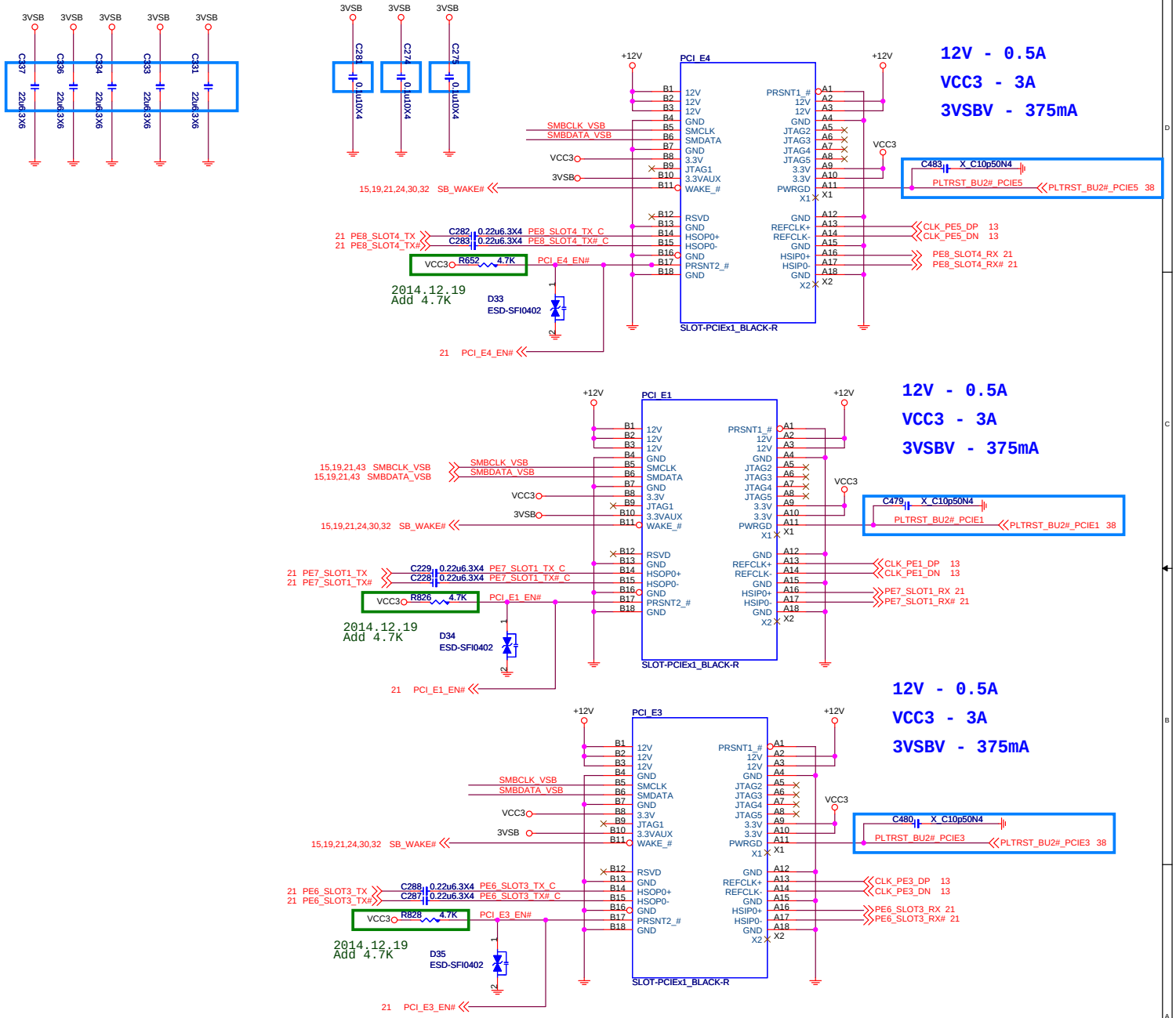

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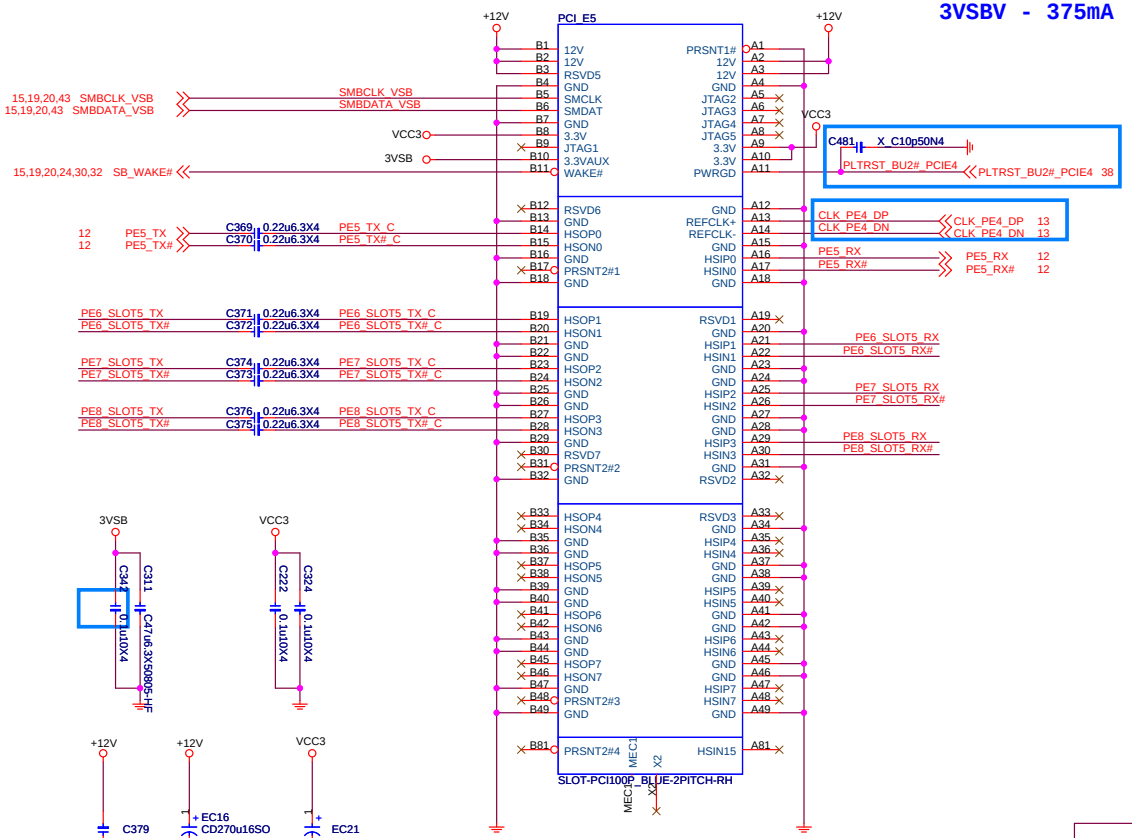
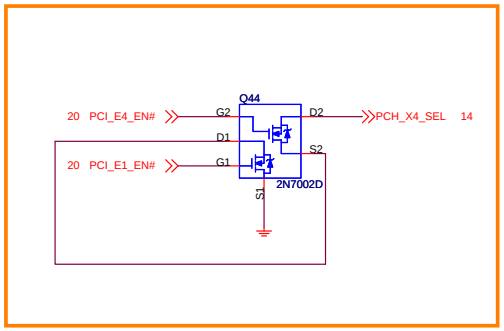
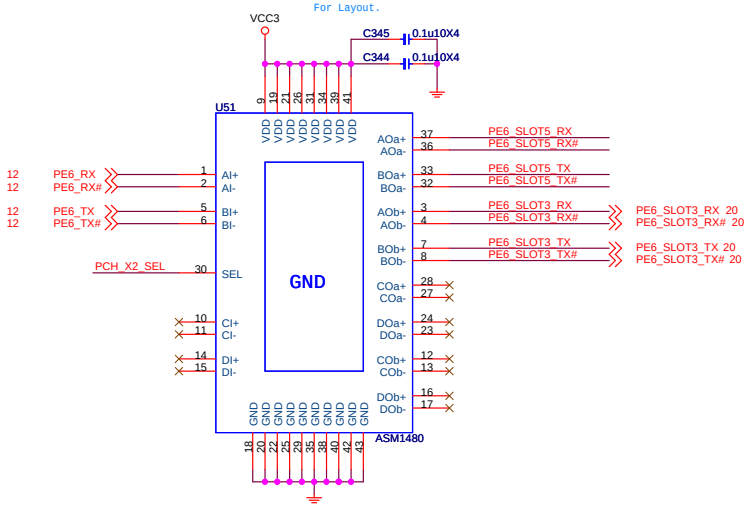
PCI_Express X4 Slot

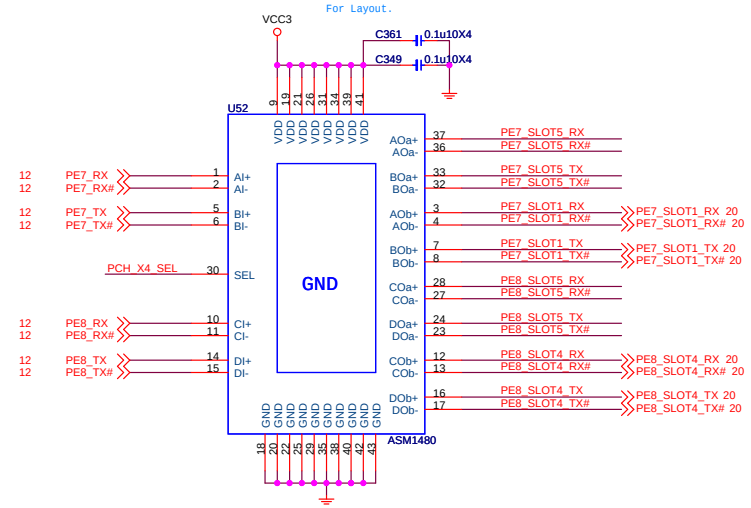
12V - 2.1A
VCC3 - 3A
3VSBV - 375mA





GPP_G3	LOW(I)	HIGH(I)	LOW(I)
GPP_G4	LOW(I)	HIGH(O)	HIGH(I)
	X4/X0/X0/X0	X1/X1/X1/X1	X2/X0/X1/X1





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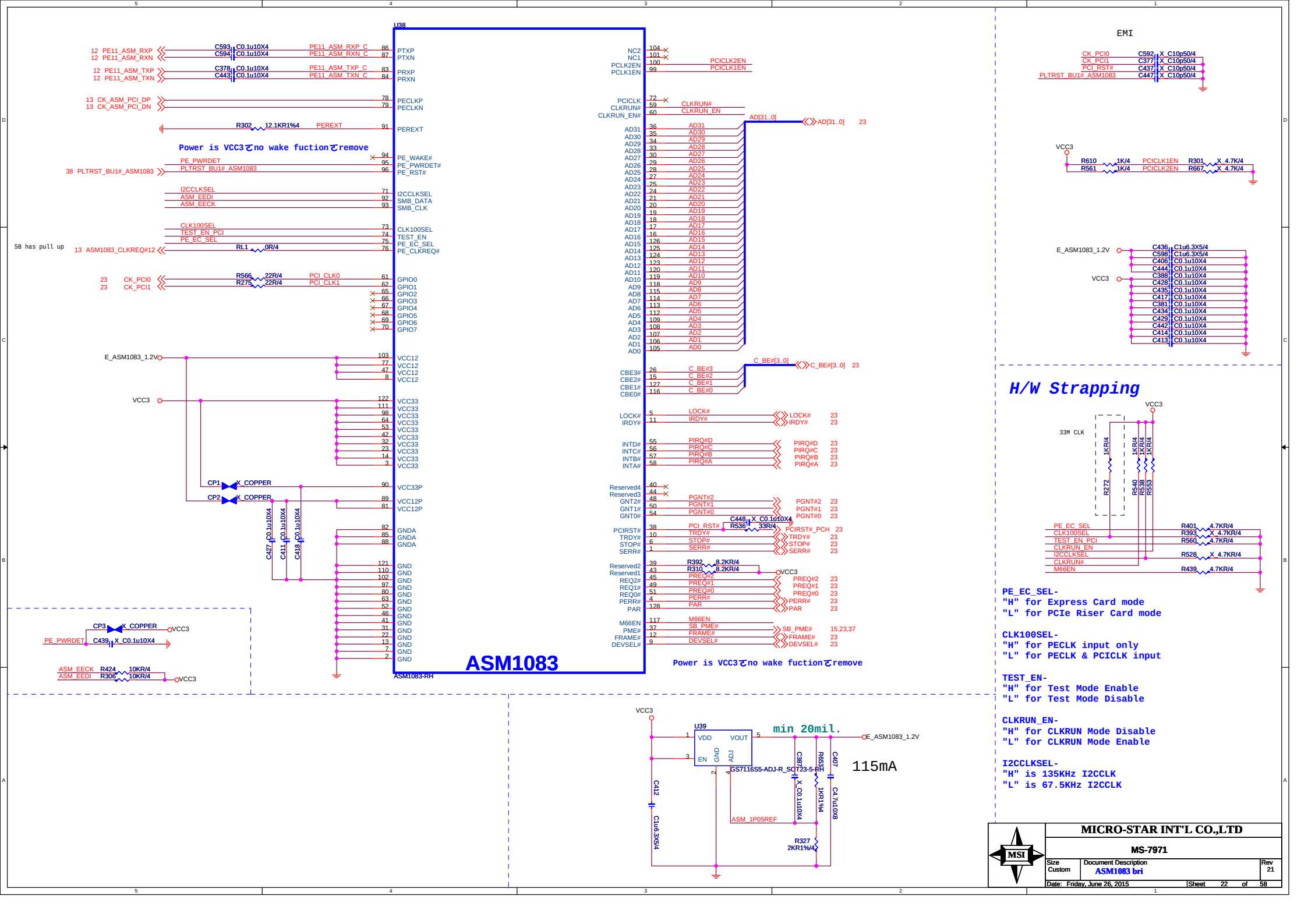
U38
ASM1083
ASM1083-RH
Power is VCC3 no wake fuction remove
Power is VCC3 no wake fuction remove
SB has pull up
EMI
H/W Strapping
33M CLK
PE_EC_SEL-
"H" for Express Card mode
"L" for PCIe Riser Card mode
CLK100SEL-
"H" for PECLK input only
"L" for PECLK & PCICLK input
TEST_EN-
"H" for Test Mode Enable
"L" for Test Mode Disable
CLKRUN_EN-
"H" for CLKRUN Mode Disable
"L" for CLKRUN Mode Enable
I2CCLKSEL-
"H" is 135KHz I2CCLK
"L" is 67.5KHz I2CCLK
U39
GS7116S5-ADJ-R_SOT23-5-RH
min 20mil.
115mA
MICRO-STAR INT'L CO.,LTD
MS-7971
ASM1083 bri
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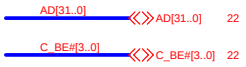
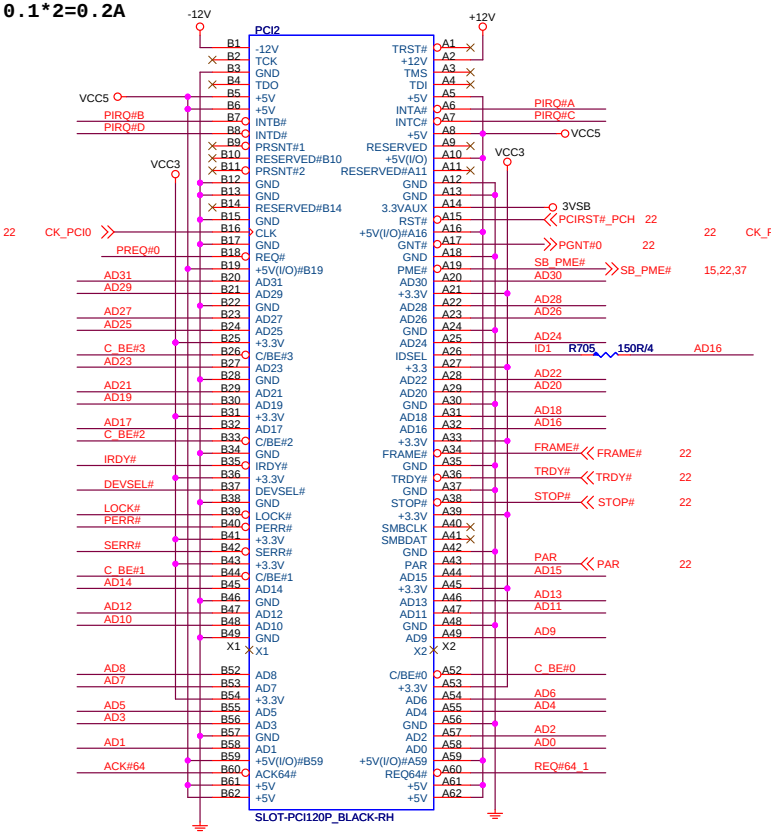
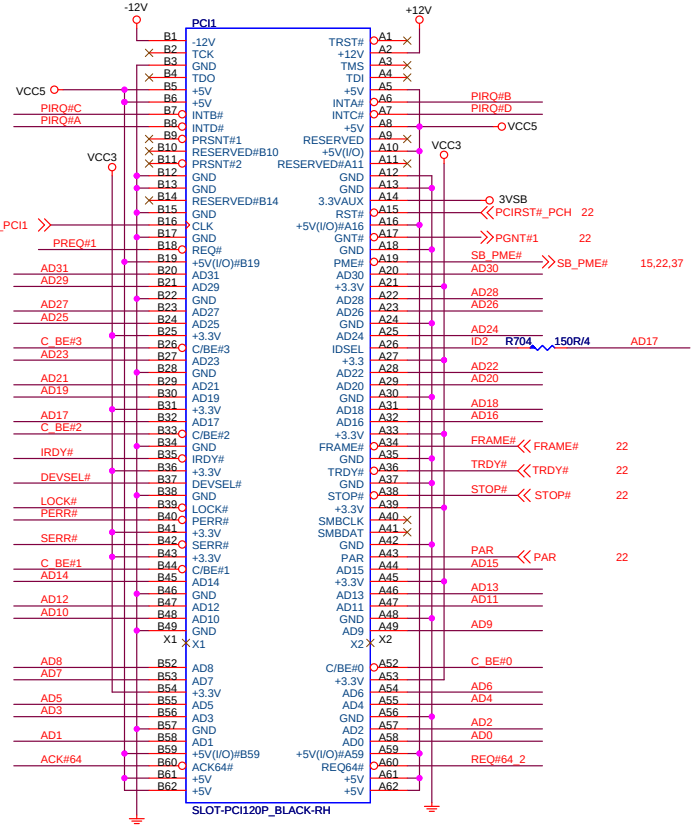
PCI X2

3.3Vaux:0.375*2=0.75A(wake)
0.02*2=0.04A(no wake)
VCC3 :7.6*2=15.2A
VCC5:5*2=10A
+12V:0.5*2=1A
-12V:0.1*2=0.2A



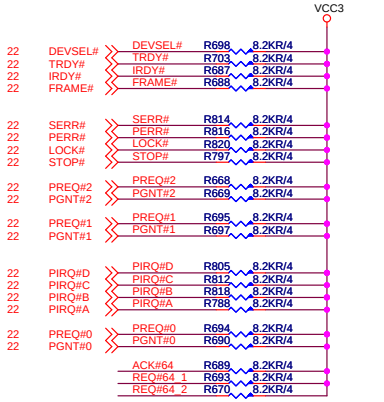


IDSEL = AD16
MASTER = PREQ#0
PIRQ#A

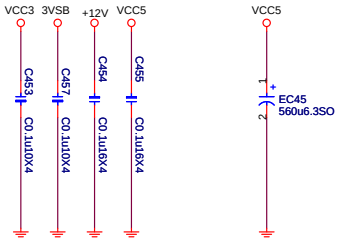


IDSEL = AD17
MASTER = PREQ#1
PIRQ#B

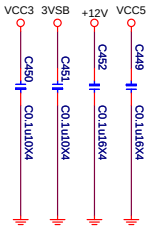
PCI PULL-UP / DOWN RESISTORS



EMI:close pin



EMI:close pin



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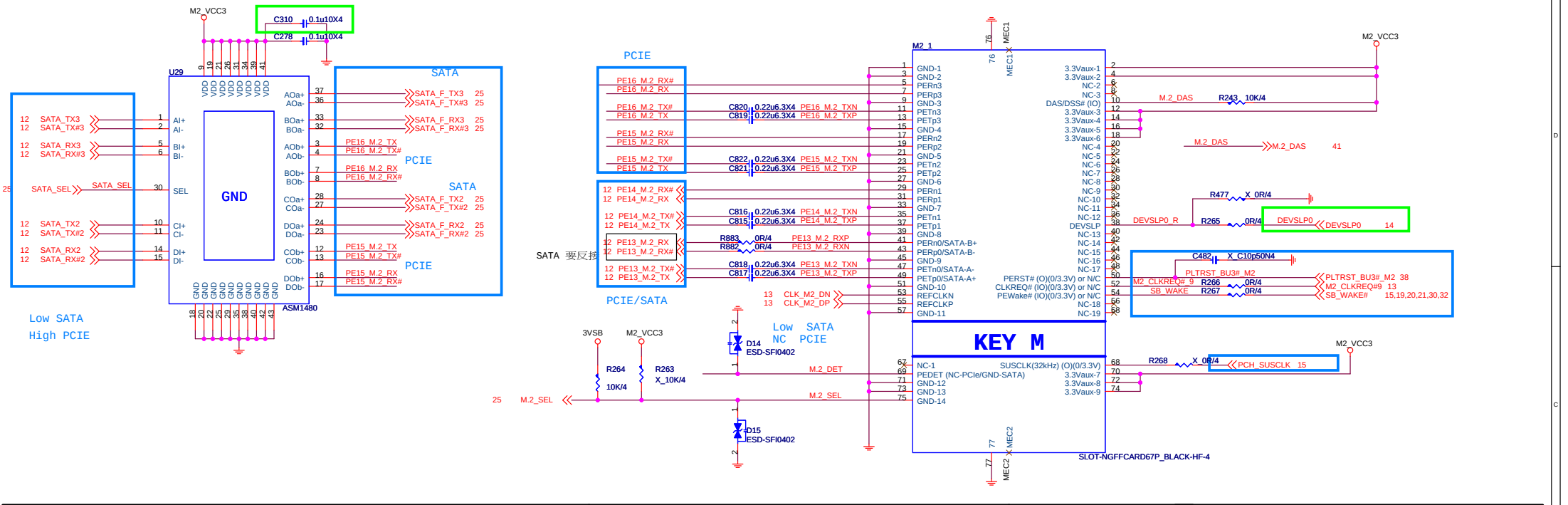
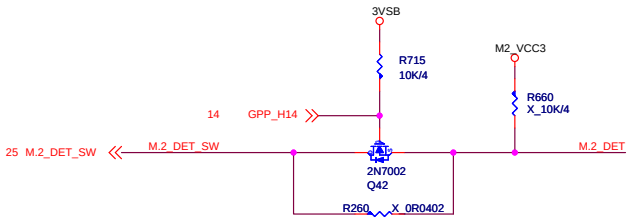
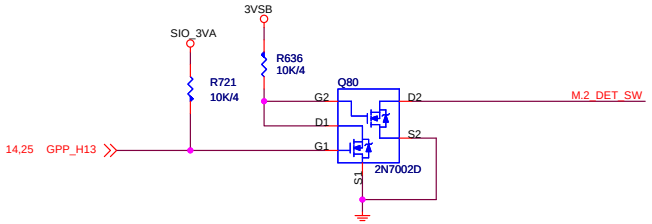
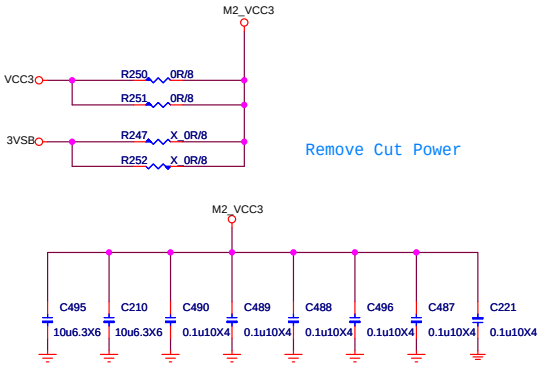


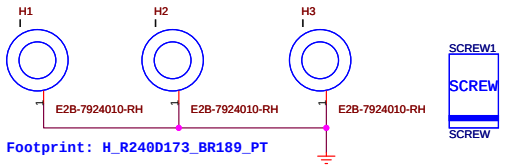




PIN1,2=SATA
PIN2,3=PCIE

2.5A





SIO_GP10	SIO_GP11	PCH_GPP_C21	SATA_Strap01	SATA_Strap23	SIO_GP16	Mode
0	0	1	1	1	1	M2-SATA
1	0	0	0	0	0	M2-PCIE
1	1	0	1	1	1	AUTO No M2 Card
1	1	1	1	1	1	AUTO M2-SATA
1	1	0	0	0	0	AUTO M2-PCIE

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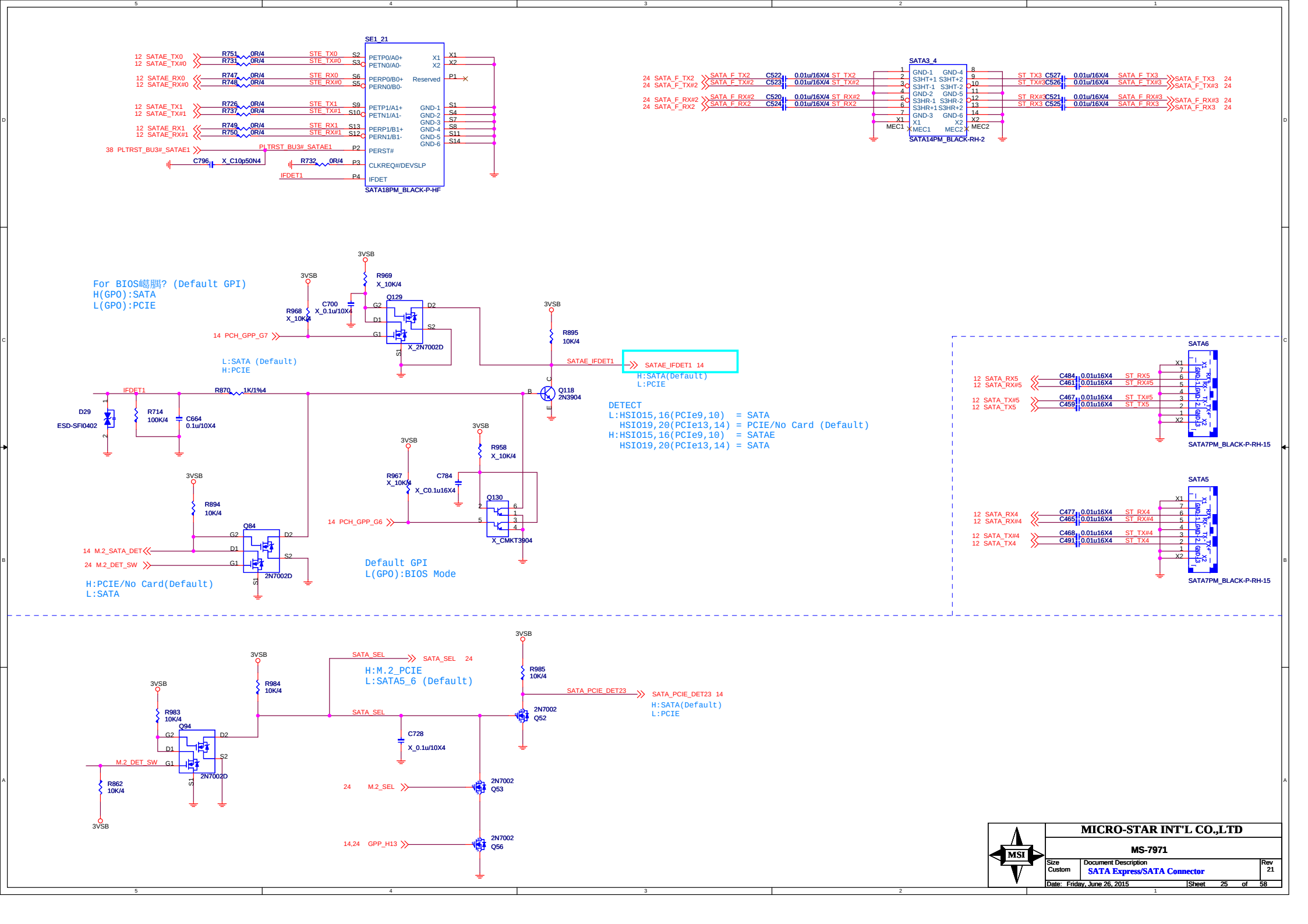
SE1_21
SATA18PM_BLACK-P-HF
SATA3_4
SATA14PM_BLACK-RH-2
For BIOS嶋膥? (Default GPI)
H(GPO):SATA
L(GPO):PCIE
L:SATA (Default)
H:PCIE
H:SATA(Default)
L:PCIE
DETECT
L:HSIO15,16(PCIe9,10) = SATA
HSIO19,20(PCIe13,14) = PCIE/No Card (Default)
H:HSIO15,16(PCIe9,10) = SATAE
HSIO19,20(PCIe13,14) = SATA
H:PCIE/No Card(Default)
L:SATA
Default GPI
L(GPO):BIOS Mode
H:M.2_PCIE
L:SATA5_6 (Default)
SATA6
SATA7PM_BLACK-P-RH-15
SATA5
SATA7PM_BLACK-P-RH-15
MICRO-STAR INT'L CO.,LTD
MS-7971
Size Custom
Document Description
SATA Express/SATA Connector
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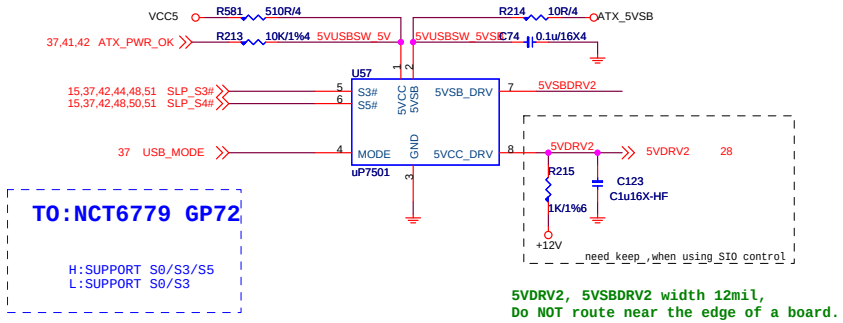
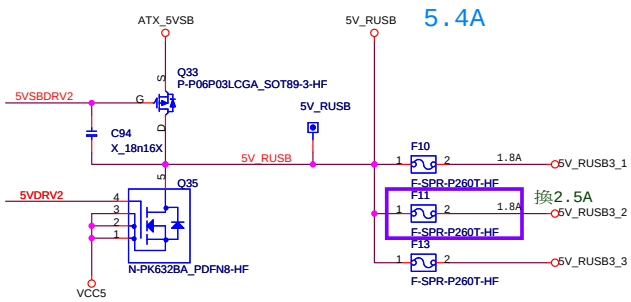
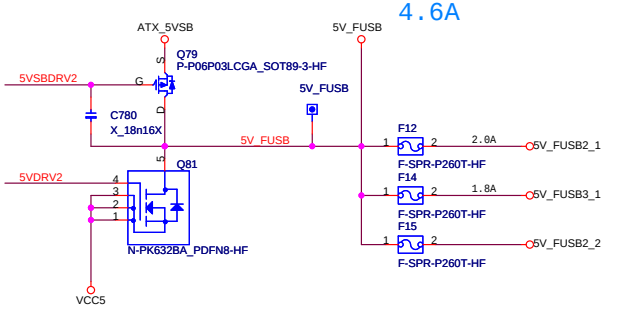
REAR USB PORT POWER



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



need confirm C780 value



P-MOS
D03-06P0319-N03

N-MOS
D03-510BA0C-N03
D03-3056M00-U47
D03-4C05N03-005
D03-3830D09-N47
D03-632BA0C-N03

D08-2000400-P16 (Itrip=3.5A; 0.003ohm)
D08-0301000-P16 (Itrip=2.6A; 0.015ohm)

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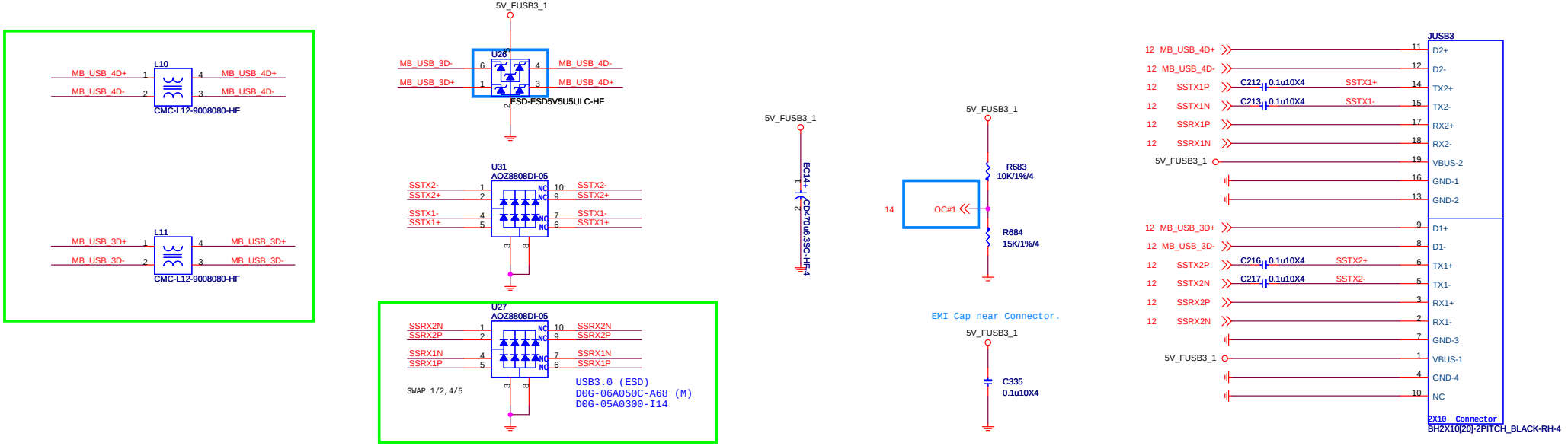
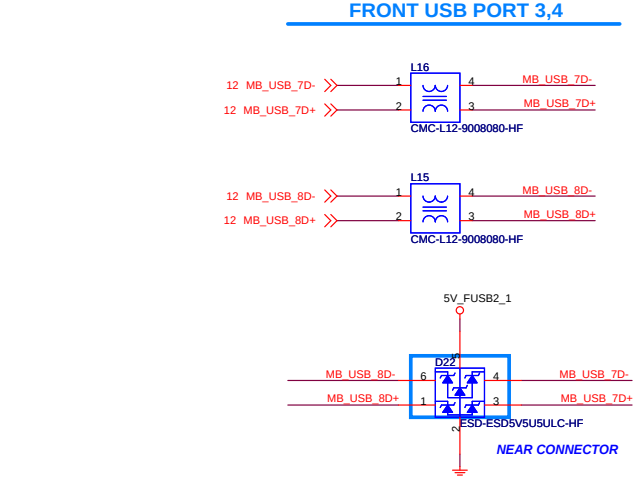
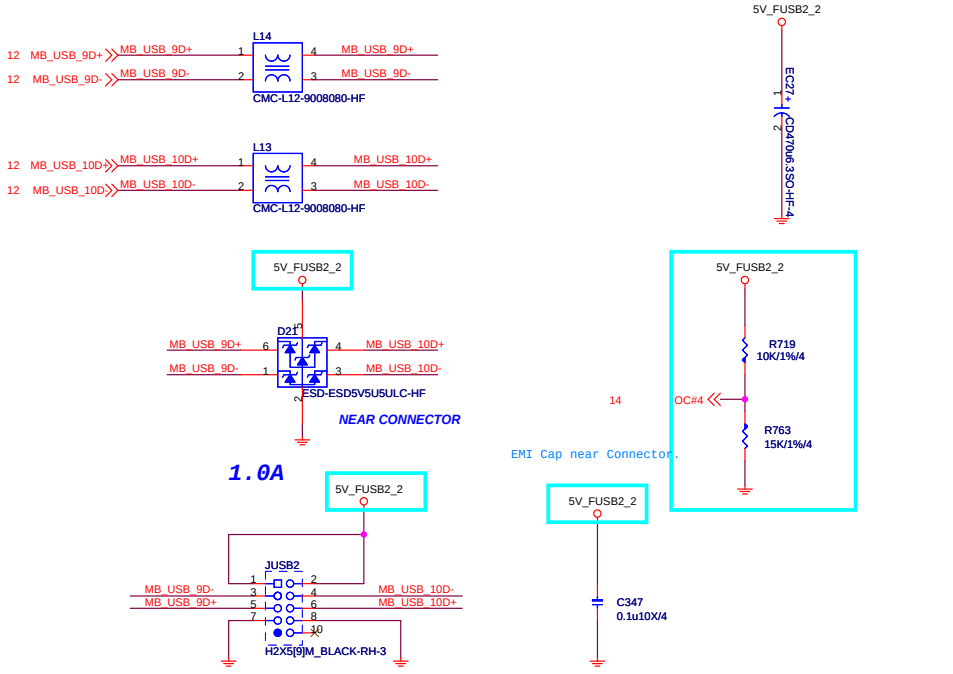


FRONT USB PORT 3,4



FRONT USB PORT 7,8



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Size: Custom	Document Description: Front USB3/USB2	Rev: 21
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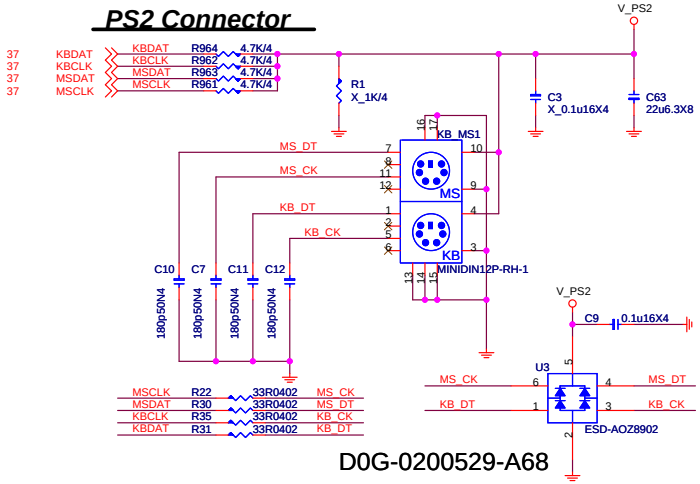
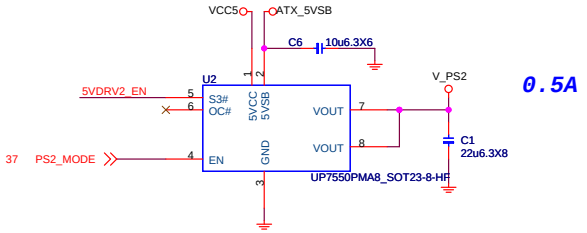
PS2 KEYBOARD & MOUSE CONNECTOR

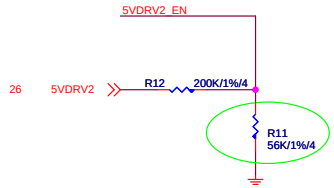
PS2 Connector



D0G-0200529-A68

PS2 Power





USB MODE

MICRO-STAR INT'L CO.,LTD			
MS-7971			
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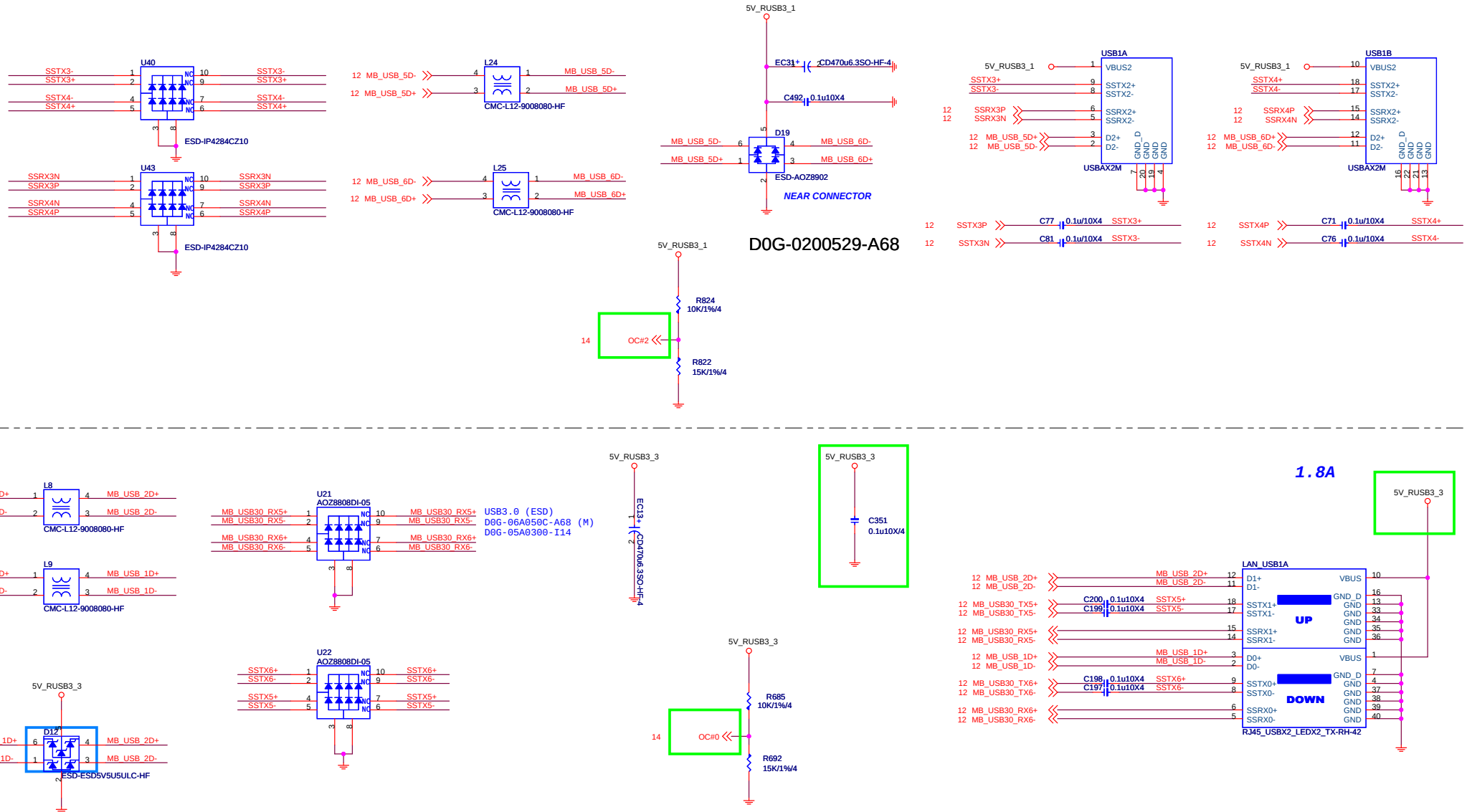

MICRO-STAR INT'L CO.,LTD		
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Minimum gap should be greater of
>15mil with other signal.

CLK Rule (Follow SB PDG)

PCIE Rule (Follow SB PDG)

USB HS (90Ohm-Diff)

Chip to Connector ~1.5 inch.

USB SS (90Ohm-Diff)

USB HS (90Ohm-Diff)

USB SS (80Ohm-Diff)

PPON_X Internal Pull-up to VCC3

OCI_X Internal Pull-up to SUS

RX/TX Internal Pull-up

ASM1042 :RU17=100K

SMI connect to GPI which
support smi function.
SB side need pull high 10K ohm to 3VSB.
(Intel 8X & 9X series use GPIO57)

ASM_SMI has internal Pull-up

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

ASM1142:
Stuff RU41 | RU43
Un-stuff RU19 | RU42.

ASM1142 change to 2.2uF.

ASM1142 1.2 VSB Power

635 mA

ASM1042 :RU32 change to 31.6K(R11-3162T12-W08)

EEPROM

MX25L512EMI-10G

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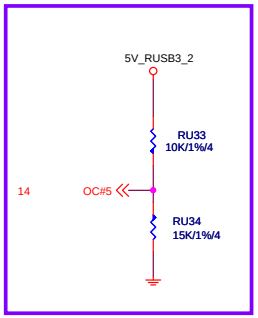
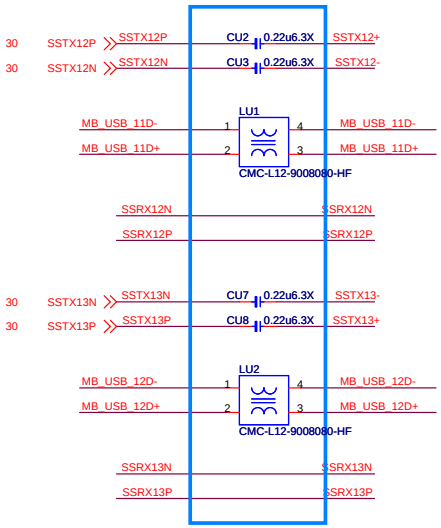
修改OC#5 pull high

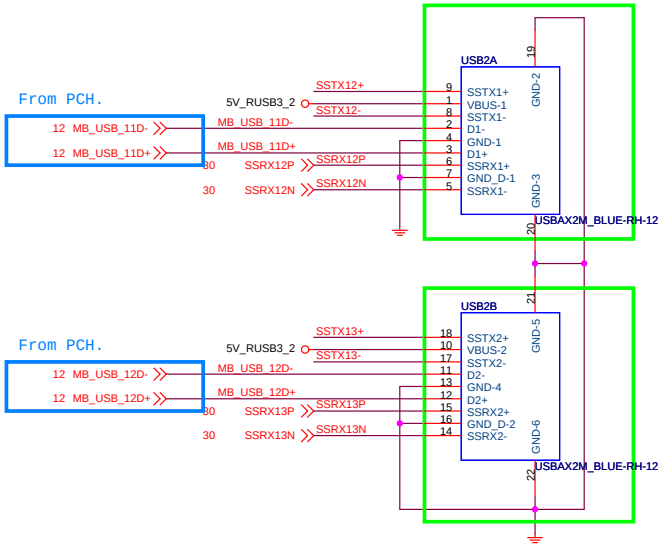


Rear USB3 CONN

Important~~
If USB3.0 signal conect to front pin header,
please must less than 1.5 inch,short trace
has better eye diagram with some bad fly cable by SI customer.



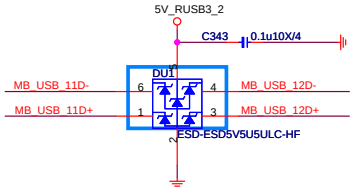
若layout空間不足可不預留此部分choke

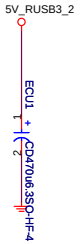


min 80mil.

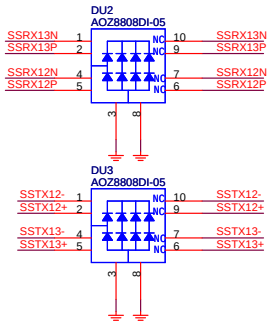
1.8 A

USB2.0
D0G-0200529-A68 Main
D0G-0100619-I05 AVL

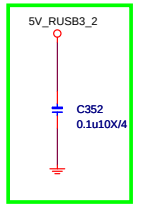




ESD Protection
NEAR CONNECTOR



EMI Cap near Connector.



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

MICRO-STAR INT'L CO.,LTD

MS-7971

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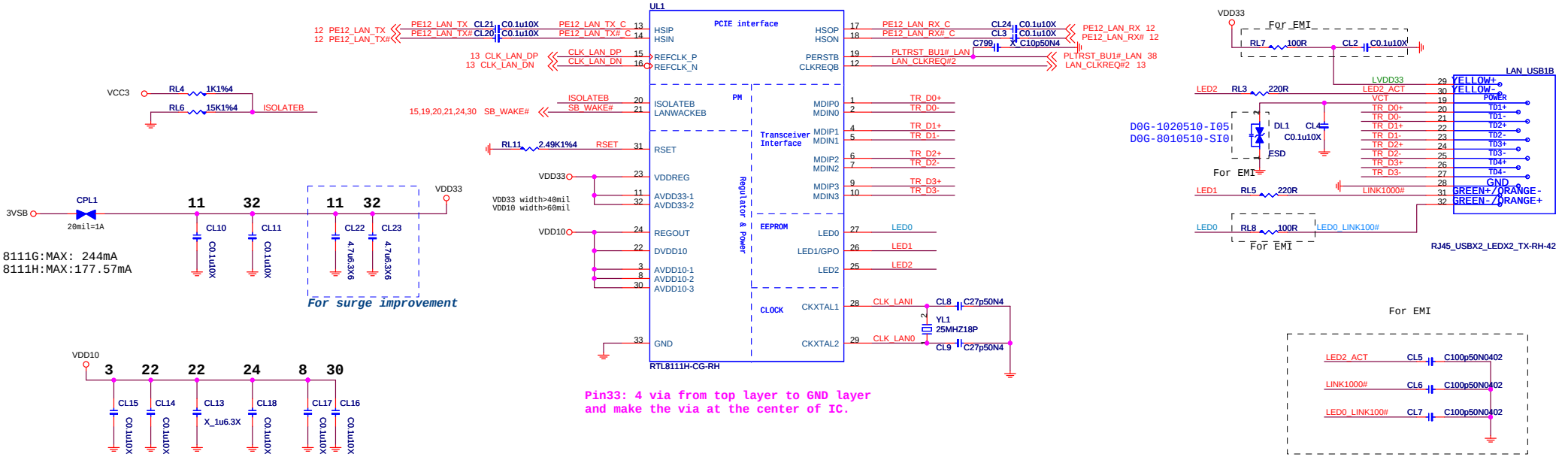
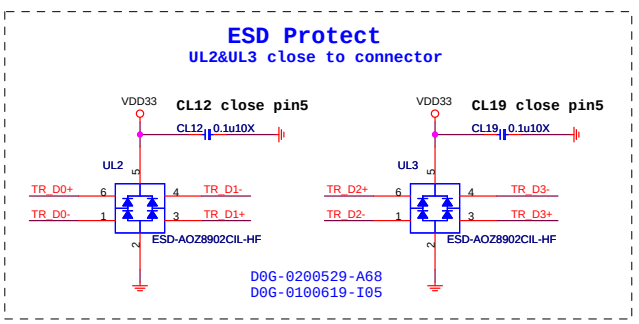
RTL8111G/RTL8111H Giga LAN

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





8111G POWER Consumption

	3.3V @ mA	mW
10 M Idle/TxRx	17.15/116.7	56.6/385.1
100 M Idle/TxRx	71.45/129.5	235.8/427.4
Giga Idle/TxRx	179.1/243.9	591/804.9
ALDPS	6.41	21.15

8111H POWER Consumption

	3.3V @ mA	mW
10 M Idle/TxRx	9.9/84.69	32.67/279.48
100 M Idle/TxRx	48.11/92.44	158.76/305.05
Giga Idle/TxRx	124.5/177.57	410.85/585.98
ALDPS	5.50	18.15

MICRO-STAR INT'L CO.,LTD

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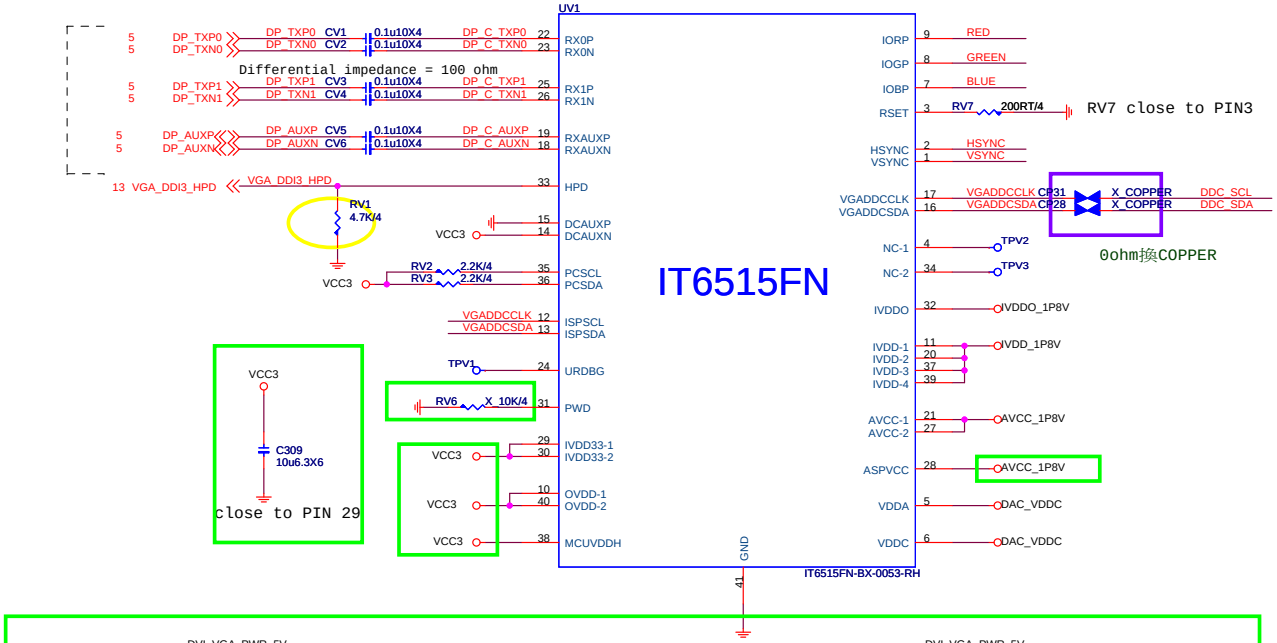
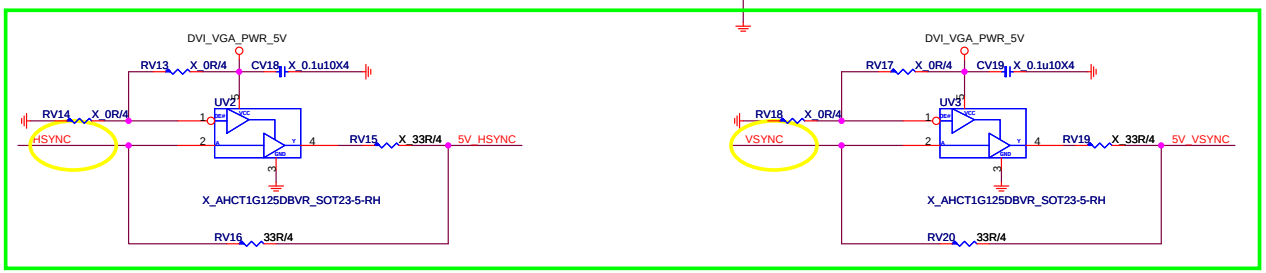
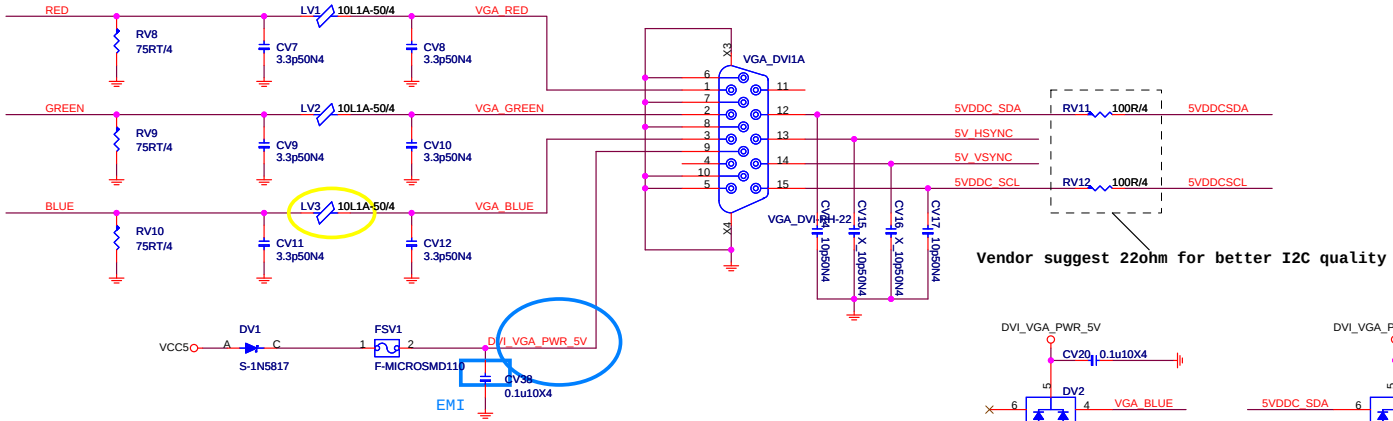
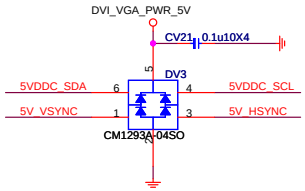
Note:

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

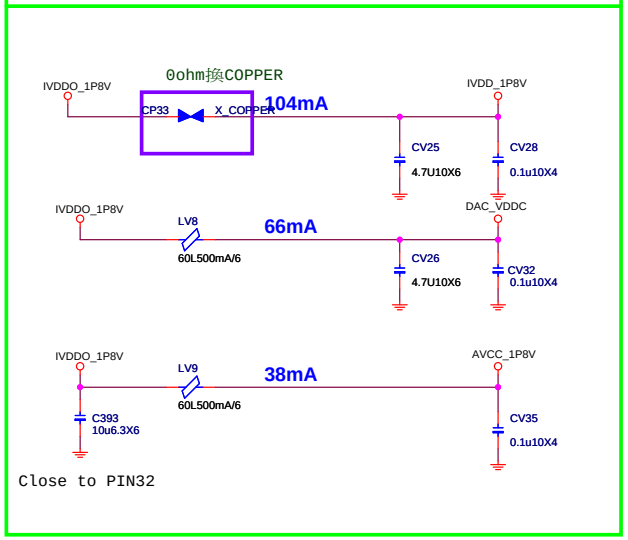


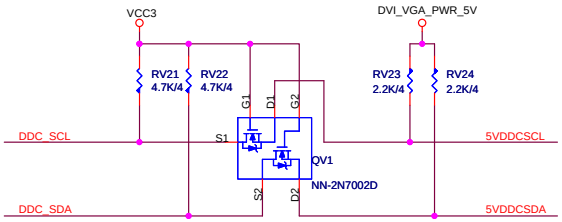






Remove





MICRO-STAR INT'L CO.,LTD		
MS-7971		
Size: Custom	Document Description: VGA Connector	Rev: 21
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VGA: resolution of 2048x1536 pixels with 32-bit color at 75 Hz (4:3 QXGA)

Check MSI PN
N58-39F0231-K06

5 DVI_DDPC_CLK_N
5 DVI_DDPC_CLK_P
5 DVI_DDPC_TXN0
5 DVI_DDPC_TXP0
5 DVI_DDPC_TXN1
5 DVI_DDPC_TXP1
5 DVI_DDPC_TXN2
5 DVI_DDPC_TXP2

DVI_DDPC_CLK_N	C53	0.1u10X4	DVI_C_CLK_N	R118	470R/4	DVI_DATA_CLK
DVI_DDPC_CLK_P	C54	0.1u10X4	DVI_C_CLK_P	R120	470R/4	
DVI_DDPC_TXN0	C45	0.1u10X4	DVI_C_DATA0_N	R84	470R/4	
DVI_DDPC_TXP0	C46	0.1u10X4	DVI_C_DATA0_P	R97	470R/4	DVI_DATA2
DVI_DDPC_TXN1	C47	0.1u10X4	DVI_C_DATA1_N	R98	470R/4	
DVI_DDPC_TXP1	C49	0.1u10X4	DVI_C_DATA1_P	R111	470R/4	DVI_DATA1
DVI_DDPC_TXN2	C50	0.1u10X4	DVI_C_DATA2_N	R112	470R/4	
DVI_DDPC_TXP2	C52	0.1u10X4	DVI_C_DATA2_P	R117	470R/4	DVI_DATA0

VGA_DVI1B

X1	Shell-1		
DVI_C_DATA2_N	D1	DATA2	
DVI_C_DATA2_P	D2	DATA2	
	D3	SHIELD-1	
	D4	DATA4	
	D5	DATA4	
DVI_DDC_CLK_R	D6	DDCCLK	
DVI_DDC_DATA_R	D7	DDCDATA	
	D8	NC	
DVI_C_DATA1_N	D9	DATA1	
DVI_C_DATA1_P	D10	DATA1	
	D11	SHIELD-2	
	D12	DATA3	
	D13	DATA3	
DVI_VGA_PWR_5V	D14	VCC5	
DVI_HOT_DET	D15	GND5	
DVI_C_DATA0_N	D16	HPDET	
DVI_C_DATA0_P	D17	DATA0	
	D18	DATA0	
	D19	SHIELD-3	
	D20	DATA5	
	D21	DATA5	
	D22	SHIELD-4	
DVI_C_CLK_P	D23	CLK	
DVI_C_CLK_N	D24	CLK	
X2	Shell-2		

VGA_DVI-RH-22

U26 AVL:D0G-05A050C-005
D0G-06A050C-A68

U8
AOZ8808DI-05

DVI_C_DATA2_N	1	10	DVI_C_DATA2_N
DVI_C_DATA2_P	2	9	DVI_C_DATA2_P
	NC	NC	
DVI_C_CLK_N	4	7	DVI_C_CLK_N
DVI_C_CLK_P	5	6	DVI_C_CLK_P
	3	8	

VCC3
DVI_DATA0 → Q45 (2N7002D) → DVI_DATA_CLK
VCC3
DVI_DATA2 → Q46 (2N7002D) → DVI_DATA1

U27 AVL:D0G-05A050C-005
D0G-06A050C-A68

U7
AOZ8808DI-05

DVI_C_DATA0_N	1	10	DVI_C_DATA0_N
DVI_C_DATA0_P	2	9	DVI_C_DATA0_P
	NC	NC	
DVI_C_DATA1_N	4	7	DVI_C_DATA1_N
DVI_C_DATA1_P	5	6	DVI_C_DATA1_P
	3	8	

DVI_VGA_PWR_5V, VCC3, DVI_VGA_PWR_5V
R128 2.2K/4, R123 2.2K/4
Q21 (2N7002D)
DVI_DDC_CLK_R → DVI_DDC_DATA_R
S2 → DVI_DDPC_CTRLDATA 13
13 DVI_DDPC_CTRLCLK

DVI_VGA_PWR_5V
C60 0.1u10X4
D9 (ESD-AOZ8902)
DVI_DDC_CLK_R ↔ DVI_DDC_DATA_R
DVI_HOT_DET

HPD

DVI_VGA_PWR_5V
VCC3
R124 10K/4
R125 10K/4
13 DVI_DDPC_HPD
Q20 (CMKT3904)
DVI_HOT_DET_R R122 10K/4 DVI_HOT_DET
C57 X_0.01u16X4
R121 100K/1%/4

DVI_VGA_PWR_5V
EMI
CV39 0.1u10X4

For EMI

DVI_C_DATA0_N	R96 X_243R/1%/4
DVI_C_DATA0_P	
DVI_C_DATA1_N	R110 X_243R/1%/4
DVI_C_DATA1_P	
DVI_C_CLK_N	R119 X_243R/1%/4
DVI_C_CLK_P	
DVI_C_DATA2_N	R116 X_243R/1%/4
DVI_C_DATA2_P	

EMI

DVI_HOT_DET
DVI_DDC_CLK_R
DVI_DDC_DATA_R
C56 X_10P50N4, C61 X_10P50N4, C55 X_10P50N4

MICRO-STAR INT'L CO.,LTD

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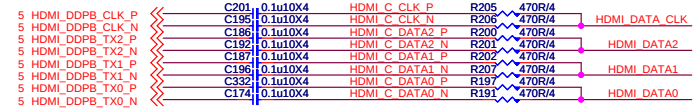
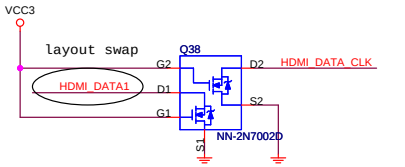
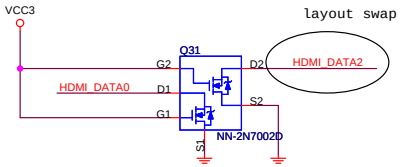
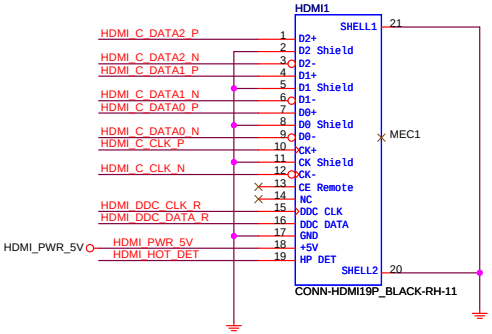
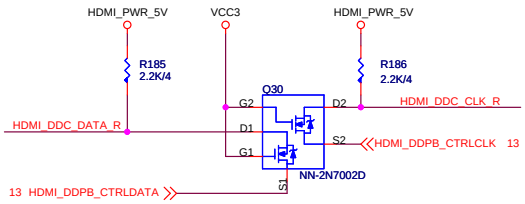
HDMI, DVI : 1920x1200 at 60 Hz (16:10 WUXGA)

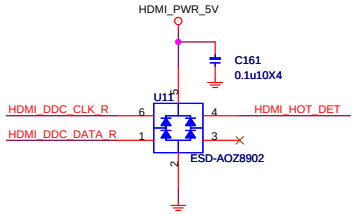


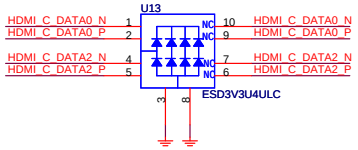


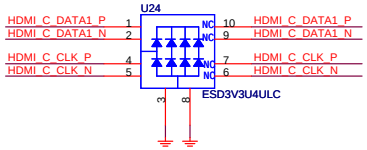


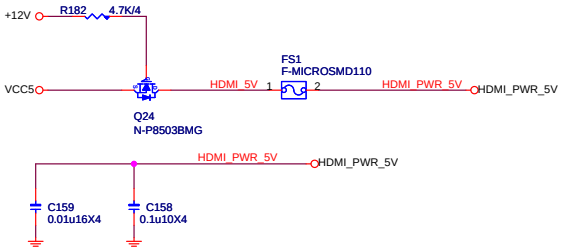


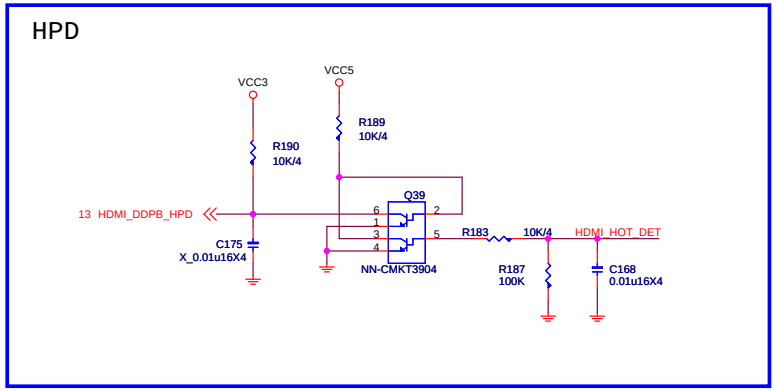


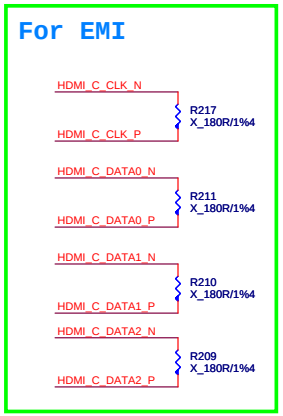












MICRO-STAR INT'L CO.,LTD

MS-7971

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Type B:
ALC892/887

CA4 closed PIN25
CA3 closed PIN38
CA38 closed PIN38

11mA Closed Codec

11mA Closed PIN9

SMD CAP: Fail to test THD+N
EL/SOLID cap: Test THD+N will Pass

150311 change Audio cap

150311 6 port change to 3 port

2.2k for better recording quality

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

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

45.8mA

Closed Codec

CA29.CA30 close to Pin27

EMI 移除電容且換package0805

Rear Line OUT De-POP circuit

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

Varister --> cap for cost down

D0G-2950500-SI0
D0G-3010510-I05
Close to Jack

Close to Front panel
For HDA/AC97 front cable.

0R for cost down

CA33,CA34 close to LA1

Digital

Analog

MICRO-STAR INT'L CO.,LTD		
MS-7971		
Size: Custom	Document Description: AUDIO ALC887	Rev: 21
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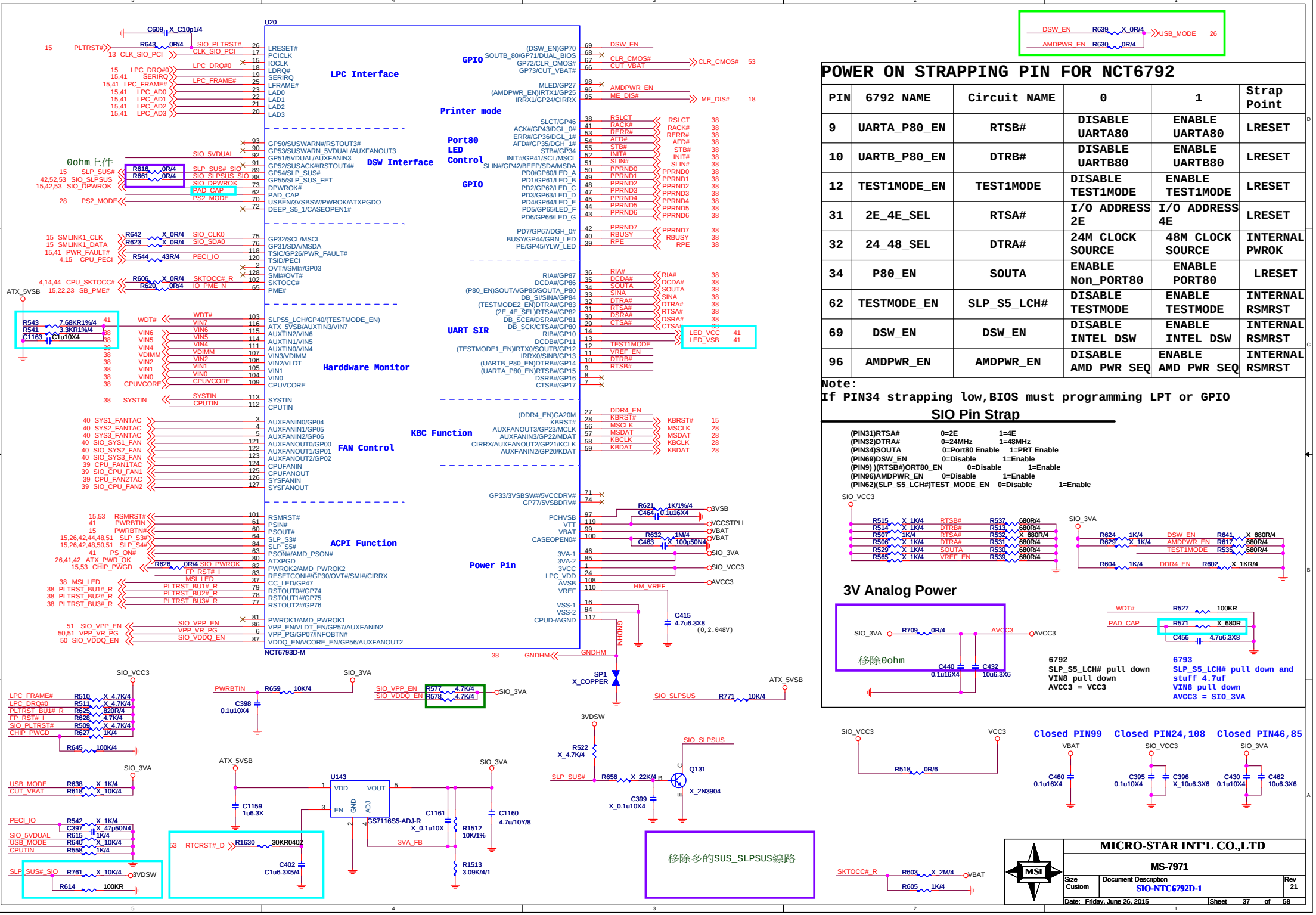

DSW_EN R639 X_0R/4 USB_MODE 26
AMDPWR_EN R630 0R/4

POWER ON STRAPPING PIN FOR NCT6792

PIN	6792 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
31	2E_4E_SEL	RTSA#	I/O ADDRESS 2E	I/O ADDRESS 4E	LRESET
32	24_48_SEL	DTRA#	24M CLOCK SOURCE	48M CLOCK SOURCE	INTERNAL PWROK
34	P80_EN	SOUTA	ENABLE Non_PORT80	ENABLE PORT80	LRESET
62	TESTMODE_EN	SLP_S5_LCH#	DISABLE TESTMODE	ENABLE TESTMODE	INTERNAL RSMRST
69	DSW_EN	DSW_EN	DISABLE INTEL DSW	ENABLE INTEL DSW	INTERNAL RSMRST
96	AMDPWR_EN	AMDPWR_EN	DISABLE AMD PWR SEQ	ENABLE AMD PWR SEQ	INTERNAL RSMRST

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

SIO Pin Strap

(PIN31)RTSA# 0=2E 1=4E
(PIN32)DTRA# 0=24MHz 1=48MHz
(PIN34)SOUTA 0=Port80 Enable 1=PRT Enable
(PIN69)DSW_EN 0=Disable 1=Enable
(PIN9))(RTSB#)ORT80_EN 0=Disable 1=Enable
(PIN96)AMDPWR_EN 0=Disable 1=Enable
(PIN62)(SLP_S5_LCH#)TEST_MODE_EN 0=Disable 1=Enable

3V Analog Power

移除0ohm

6792
SLP_S5_LCH# pull down
VIN8 pull down
AVCC3 = VCC3

6793
SLP_S5_LCH# pull down and stuff 4.7uf
VIN8 pull down
AVCC3 = SIO_3VA

Closed PIN99 Closed PIN24,108 Closed PIN46,85

Company	MICRO-STAR INT'L CO.,LTD
Model	MS-7971
Size / Document Description	Custom / SIO-NTC6792D-1
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HW Monitor - Voltage

SIO HM Voltage voer 2V will not detect

VCC_DDR R592 10K/1%/4 Q71 2N7002 VDIMM → VDIMM 37
R580 10K/1%/4 VCC5 C438 10u6.3X6

+VCCCORE R574 10K/1%/4 CPUVCORE → CPUVCORE 37
R573 X_10K/1%/4 C431 10u6.3X6

+12V R591 220K/1%/4 VIN0 → VIN0 37
R589 20K/1%/4 C446 0.1u10X4

VCC5 R590 12K/1%/4 VIN1 → VIN1 37
R588 3K/1%/4 C445 0.1u10X4

+12VIN_SIO R595 220K/1%/4 VIN2 → VIN2 37
R601 20K/1%/4 C476 0.1u10X4

+VCCIO R564 10K/1%/4 VIN4 → VIN4 37
C408 10u6.3X6

+VCCGT R551 10K/1%/4 VIN6 → VIN6 37
C400 10u6.3X6

VCCSA R552 10K/1%/4 VIN5 → VIN5 37
C401 10u6.3X6

Thermal Monitor

Q67 P-3906 SYSTIN → SYSTIN 37
C416 2.2n50X4 GNDHM → GNDHM 37 37

ATX_5VSB R676 47K/4 R681 4.7K/4 LED6 LED_BLUE,20mA
SIO_3VA R657 4.7K/4
MSI_LED → MSI_LED
Q82 2N7002D G2 D1 G1 D2 S2 S1

Close JBAT1

200mil

37 PLTRST_BU1#_R → PLTRST_BU1#_R R1504 22R1%0402 → PLTRST_BU1#
PLTRST_BU1# R1107 100R1%4 PLTRST_BU1#_ASM1142 → PLTRST_BU1#_ASM1142 30
PLTRST_BU1# R1109 100R1%4 PLTRST_BU1#_LAN → PLTRST_BU1#_LAN 32
PLTRST_BU1# R1132 100R1%4 PLTRST_BU1#_ASM1083 → PLTRST_BU1#_ASM1083 22

37 PLTRST_BU3#_R → PLTRST_BU3#_R R1501 22R1%0402 → PLTRST_BU3#
PLTRST_BU3# R1110 100R1%4 PLTRST_BU3#_M2 → PLTRST_BU3#_M2 24
PLTRST_BU3# R1111 100R1%4 PLTRST_BU3#_SATAE1 → PLTRST_BU3#_SATAE1 25
PLTRST_BU3# R1108 100R1%4 PLTRST_BU3#_TPM → PLTRST_BU3#_TPM 41

VCC3
PCH Side RSVD Pull high to 3VSB.
14 GPP_F22 → GPP_F22
C1130 X_0.1u10X4
U139 X_NC7SZ08M5X_SOT23-5
PE_RESET_N R701 0R/4 PLTRST_BU2#_PCIE2 → PLTRST_BU2#_PCIE2 19

PLTRST_BU2# R635 100R1%4
37 PLTRST_BU2#_R → PLTRST_BU2#_R R1503 22R1%0402 → PLTRST_BU2#
PLTRST_BU2# R700 100R1%4 PLTRST_BU2#_PCIE1 → PLTRST_BU2#_PCIE1 20
PLTRST_BU2# R1106 100R1%4 PLTRST_BU2#_PCIE3 → PLTRST_BU2#_PCIE3 20
PLTRST_BU2# R1113 100R1%4 PLTRST_BU2#_PCIE4 → PLTRST_BU2#_PCIE4 21
PLTRST_BU2# R1114 100R1%4 PLTRST_BU2#_PCIE5 → PLTRST_BU2#_PCIE5 20

SERIAL PORT 1

SIO_VCC3
R505 X_2.7K/4 SINA
R508 X_2.7K/4 CTSA#
R557 X_2.7K/4 RIA#
R550 X_2.7K/4 DCD#
R533 X_2.7K/4 DSR#

NO USE UART PORT1

C469 X_0.1u16X4
VCC5
U44 GD75232DBR_SSOP20-RH
NRIA NCTSA# NDSRA# NSINA NDCDA#
RTSA# DTRA# SOUTA ← 37 RTSA# 37 DTRA# 37 SOUTA
+12V_COM -12V_COM NRTSA NDTRA NSOUTA
RIA# CTSA# DSRA# SINA DCDA# → 37 37 37 37 37
C472 0.1u16X4 D23 1N4148W +12V
D26 1N4148W -12V
C473 0.1u16X4

JCOM1 H2X5[10]M_BLACK-RH
NDCDA# NSOUTA NRTSA NRIA NSINA NDTRA NCTSA# NDSRA#
C869 X_470p50X4 C868 X_470p50X4 C870 X_470p50X4 C871 X_470p50X4
C873 X_470p50X4 C872 X_470p50X4 C874 X_470p50X4 C875 X_470p50X4

PARALLAL PORT

D20 1N4148W LPT_VC
VCC5
C470 0.1u10X4

37 PPRND3 PPRND2 PPRND1 PPRND0 R563 R637 R644 R631 33R/4
PRND3 PRND2 PRND1 PRND0 R1125 R1126 R1127 R1128 2.7K/4
PRND0 C843 PRND1 C844 PRND2 C845 PRND3 C756 X_470p50X4

37 PPRND4 PPRND5 PPRND6 PPRND7 R647 R651 R734 R736 33R/4
PRND4 PRND5 PRND6 PRND7 R1129 R1146 R1147 R1148 2.7K/4
PRND7 C847 PRND6 C848 PRND5 C849 PRND4 C846 X_470p50X4

37 STB# SLIN# INIT# AFD# R741 R742 R743 R759 33R/4
RSTB# RSLIN# RINIT# RAFD# R1149 R1150 R1151 R1152 2.7K/4
RSTB# C851 RSLIN# C862 RINIT# C863 RAFD# C850 X_470p50X4

37 RACK# RBUSY RPE RSLCT
RACK# RBUSY RPE RSLCT R1153 R1154 R1155 R1156 2.7K/4
RACK# C865 RBUSY C866 RPE C867 RSLCT C864 X_470p50X4

37 RERR# → RERR# R671 2.7K/4
RERR# C474 X_470p50X4

JLPT1 H2X13[26]M_BLACK-RH
RSTB# PRND0 PRND1 PRND2 PRND3 PRND4 PRND5 PRND6 PRND7 RACK# RBUSY RPE RSLCT
RAFD# RERR# RINIT# RSLIN#

N31-2131151-H06 : 2.0mm
N31-2131131-H06 : 2.54mm

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MS-7971
Size: Custom
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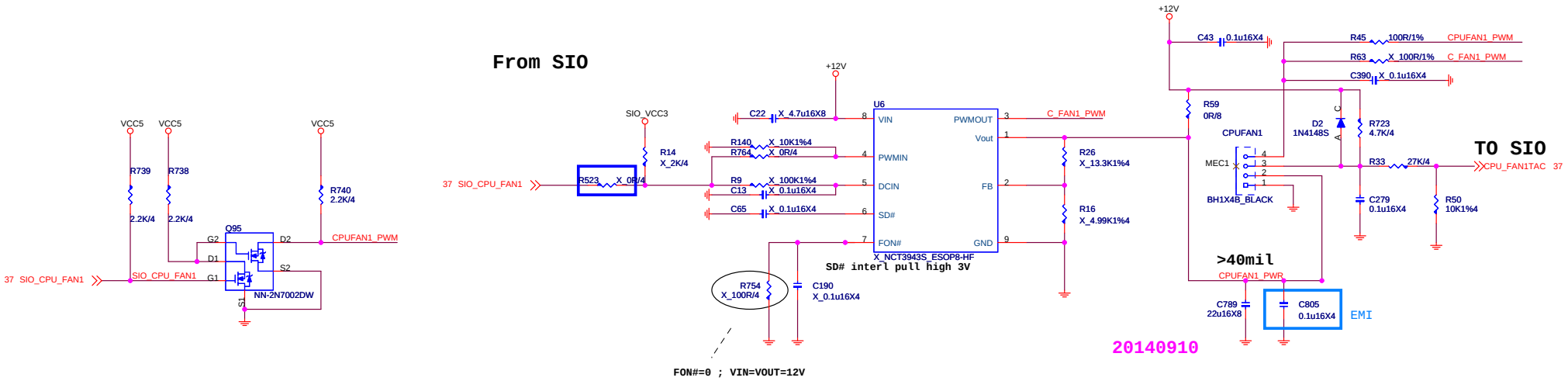
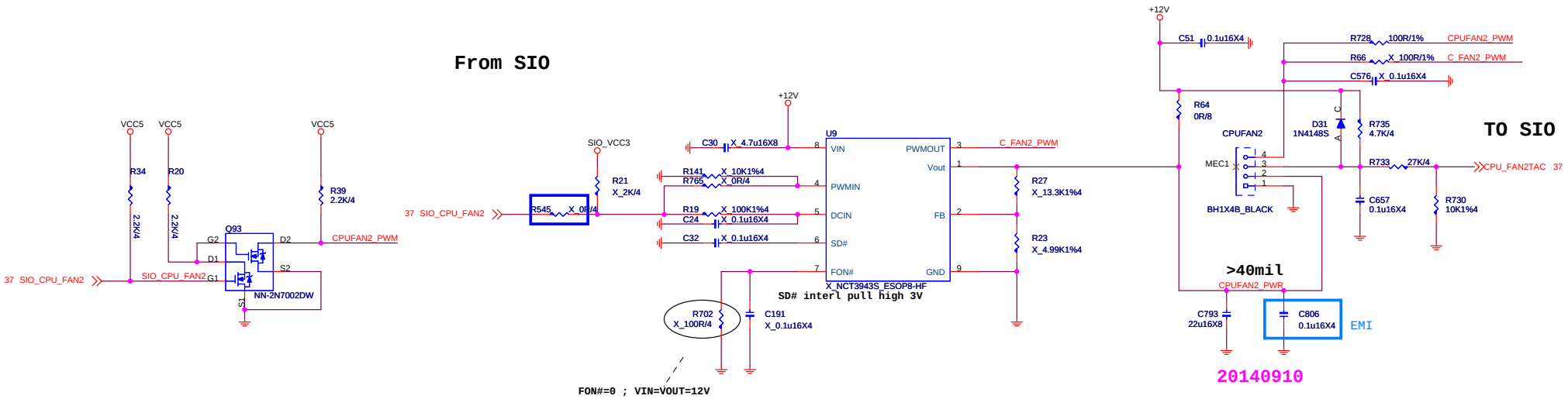
FAN TYPE G WITH CUT POWER
(Default 使用SIO的PWM MODE控制FAN的第4PIN)



BOM OPT	R63	R45	R739	R738	R740	Q95	R523
SIO PWM	X	0	0	0	0	0	X
NCT3943 PWM	0	X	X	X	X	X	0

FAN TYPE G WITH CUT POWER
(Default 使用SIO的PWM MODE控制FAN的第4PIN)



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Custom	CPU FAN	21

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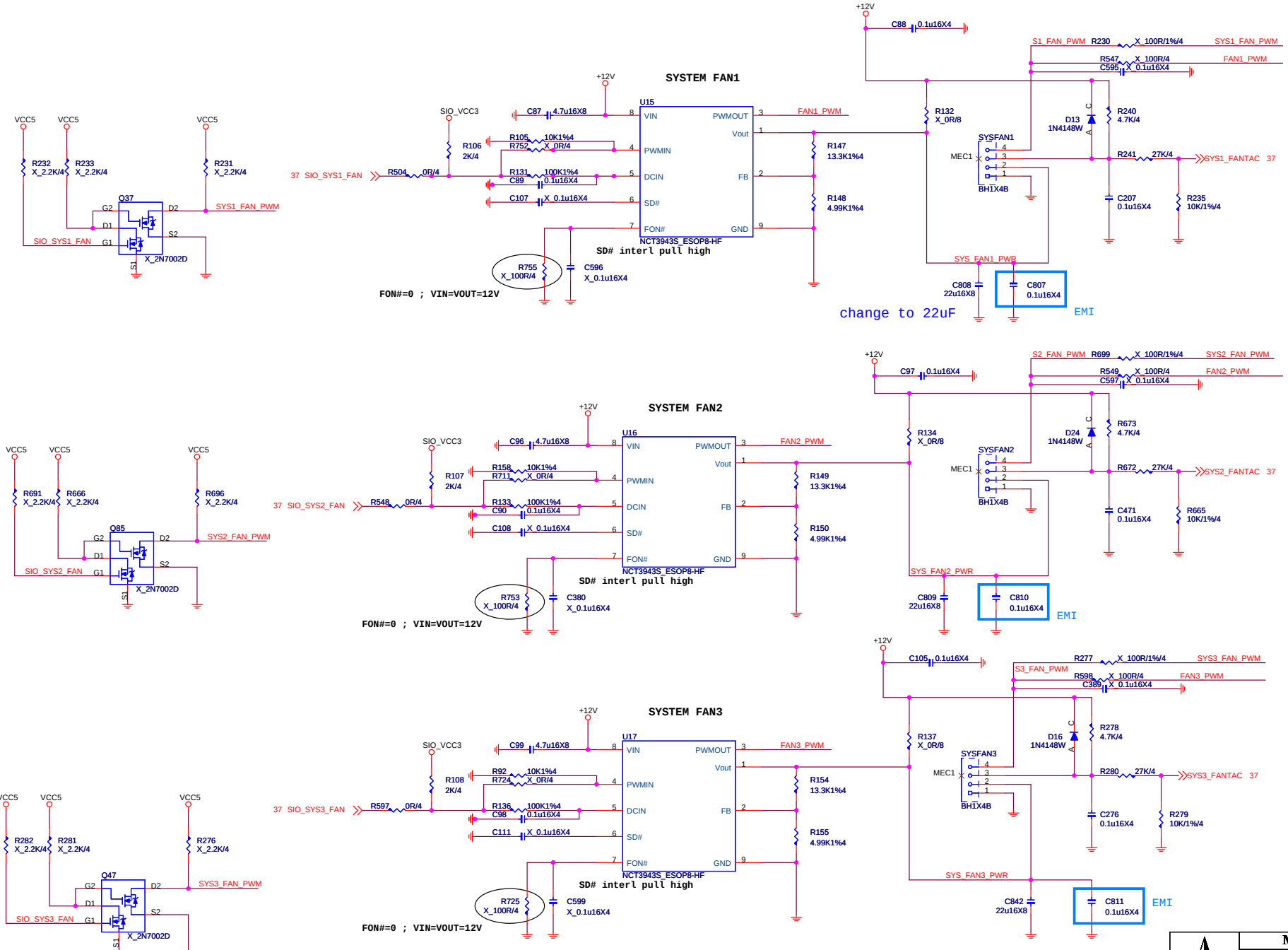
Type H : 4 PIN SYSTEM FAN FROM SIO (Smart Fan/PWM MODE)(FOR NCT6776/5533)



MICRO-STAR INT'L CO.,LTD	
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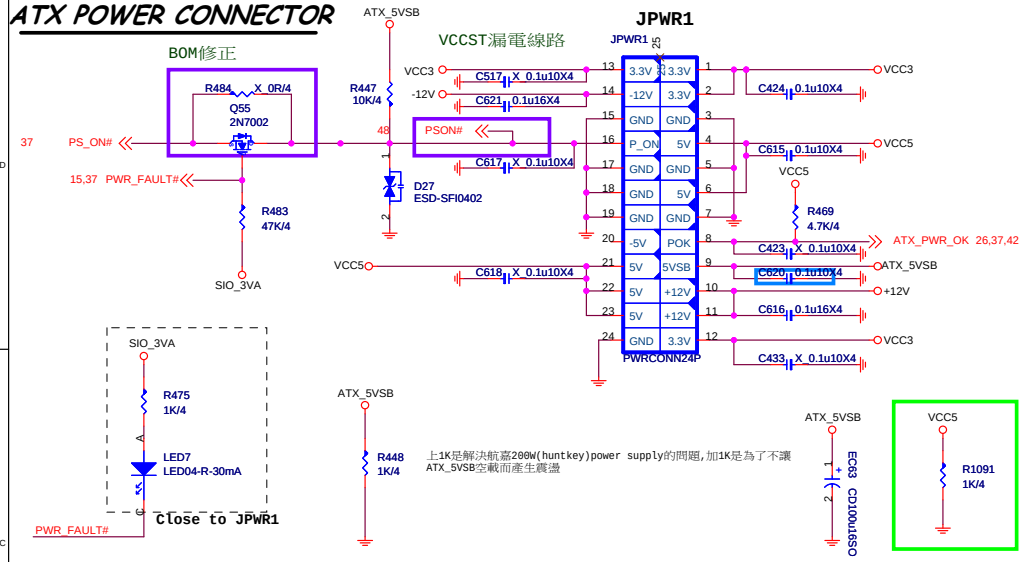
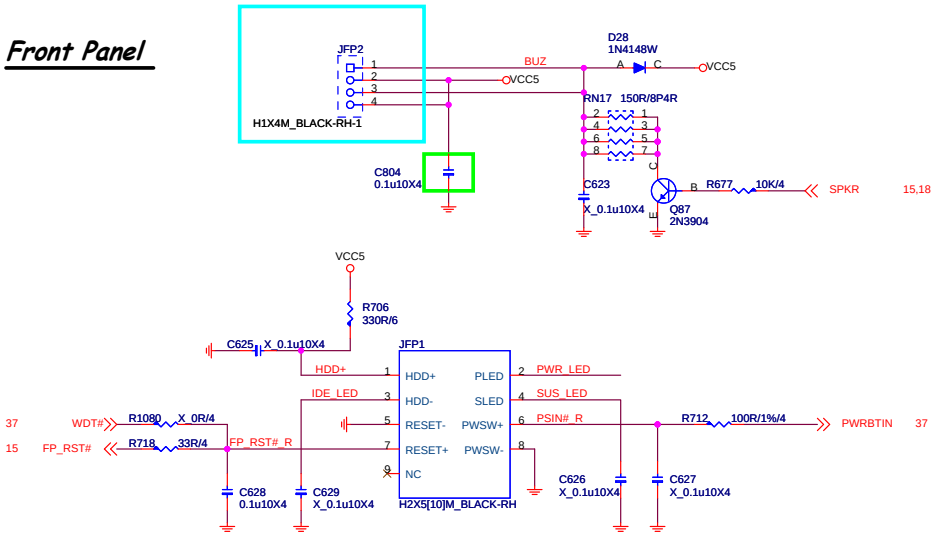
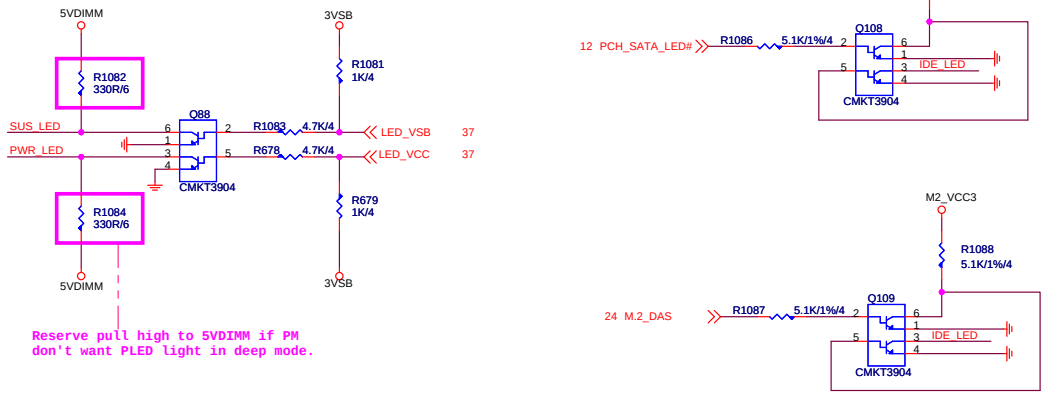
ATX POWER CONNECTOR



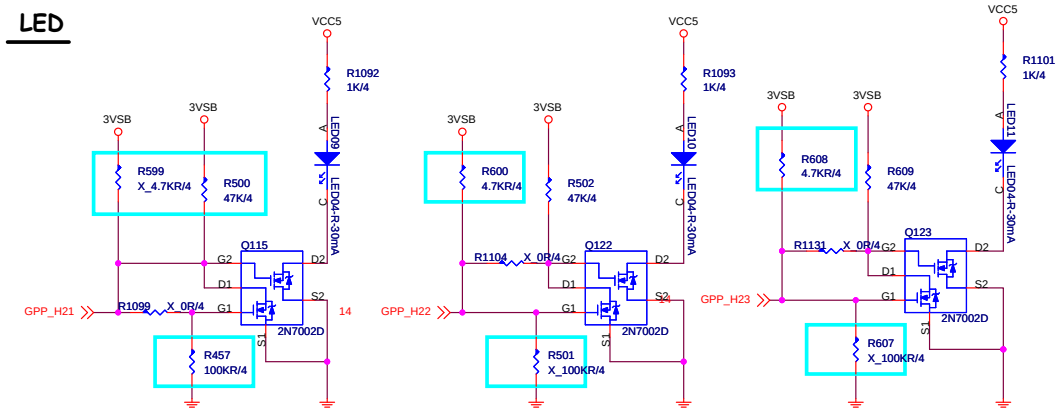
Front Panel



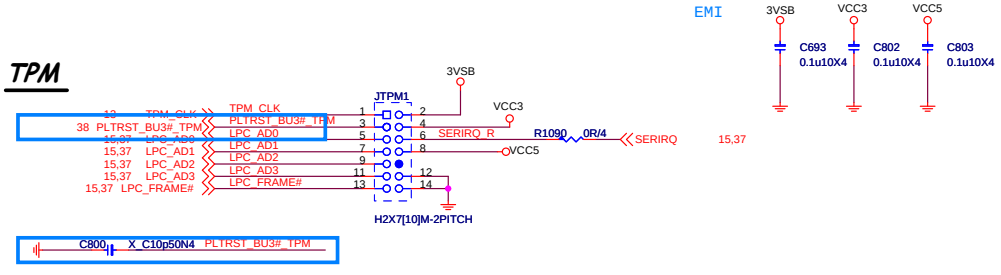
LED



LED



TPM



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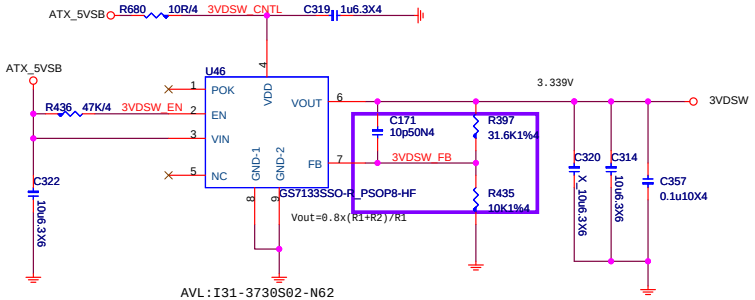
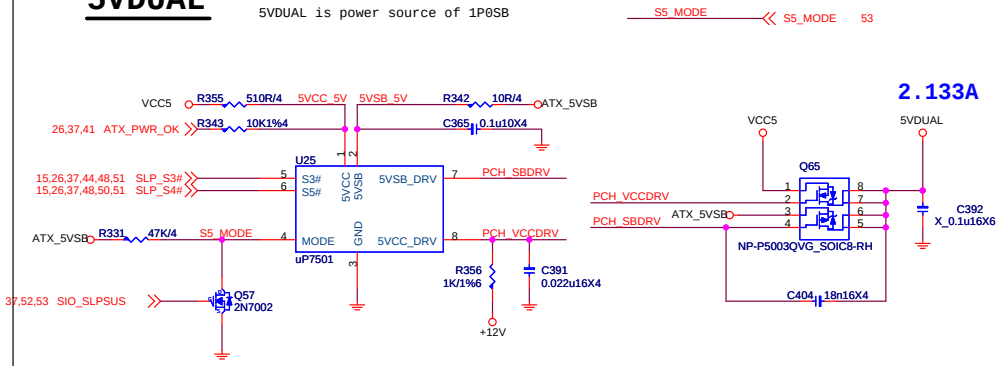
3VDSW



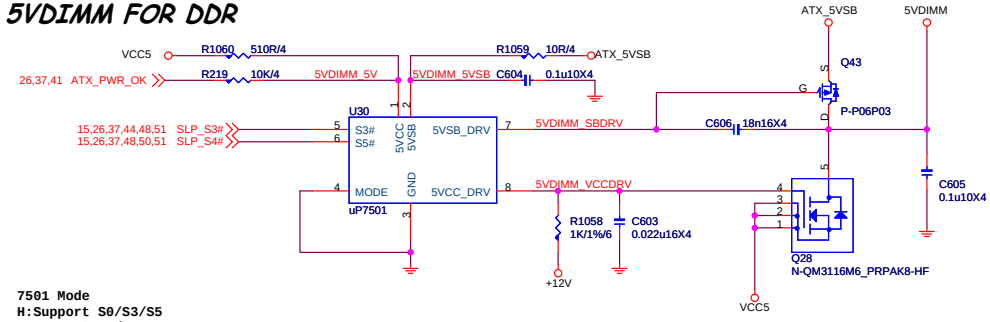
AVL:I31-3730S02-N62

5VDUAL

5VDUAL is power source of 1P0SB

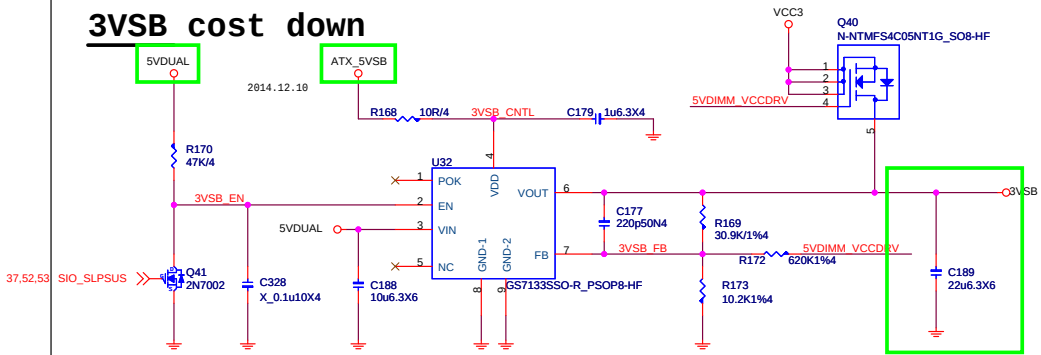


5VDIMM FOR DDR



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

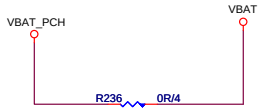
3VSB cost down



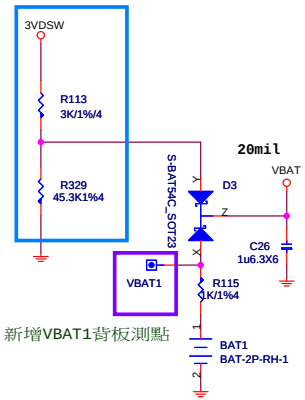
AVL:I31-3730S02-N62 2014.10.15 update

VFB=3.224V for S0->S3 3VSB voltage raise & ATX_5VSB drop.

CRB

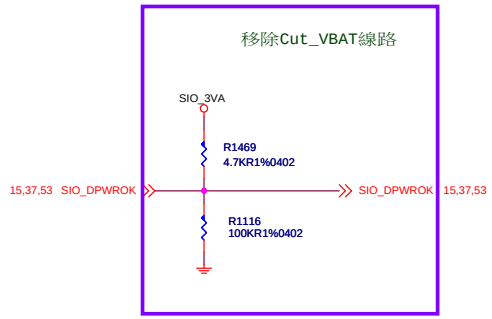


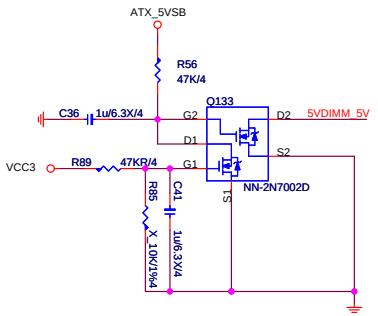
CUT_VBAT



新增VBAT1背板測點

移除Cut_VBAT線路





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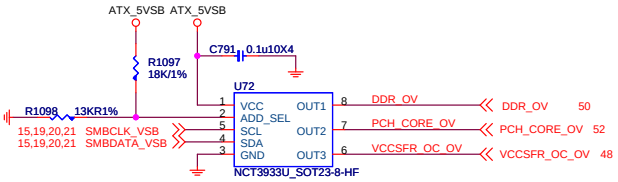
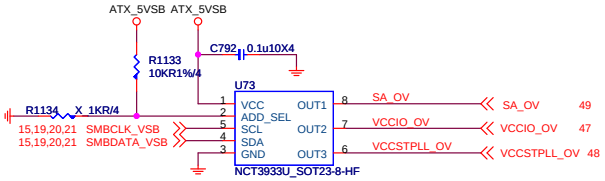
Remove Cut Power.

UPI VOLTAGE CONSOLE

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



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%

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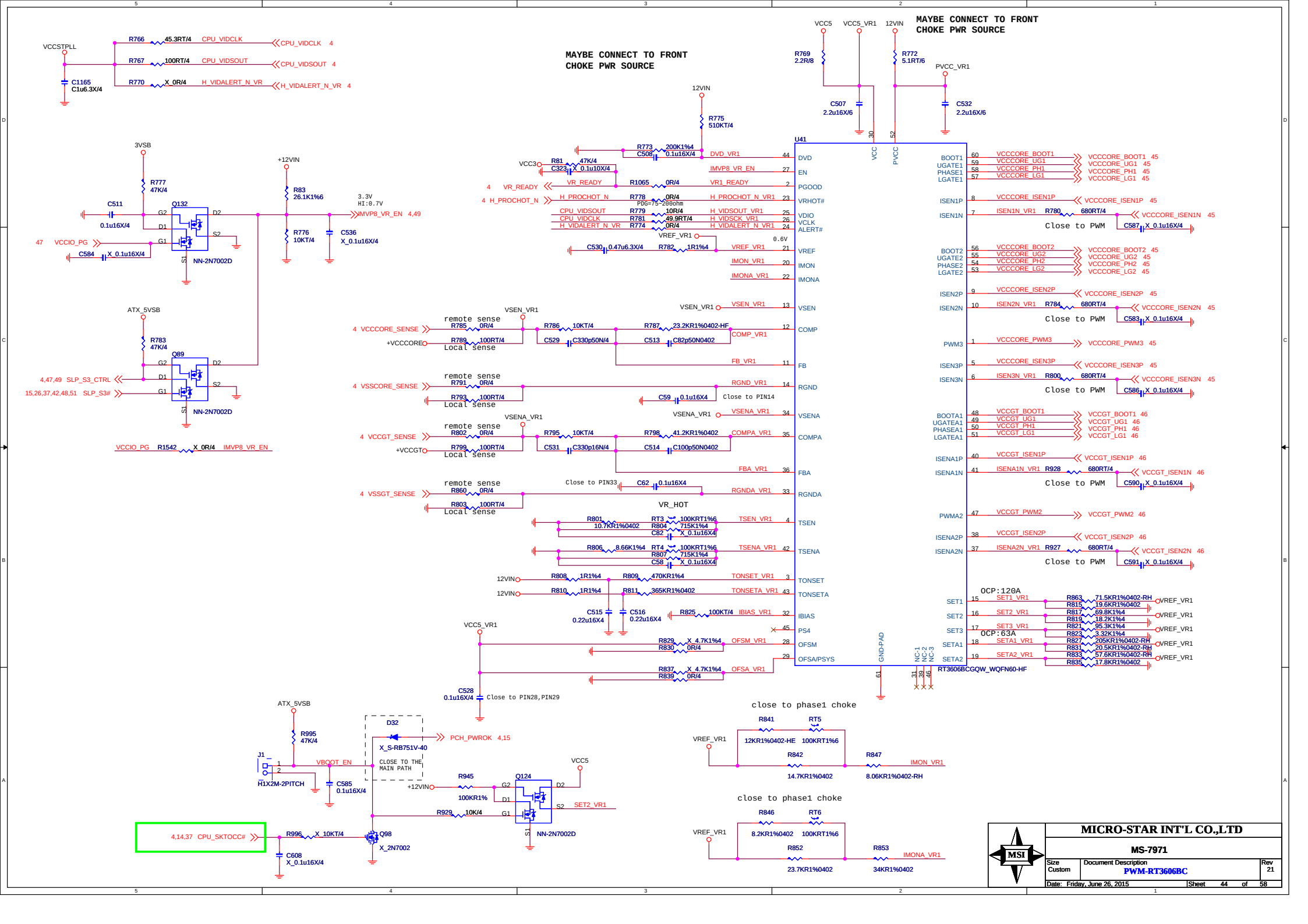
MAYBE CONNECT TO FRONT CHOKE PWR SOURCE
MAYBE CONNECT TO FRONT CHOKE PWR SOURCE
U41
RT3606BCGQW_WQFN60-HF
MICRO-STAR INT'L CO.,LTD
MS-7971
PWM-RT3606BC
Rev 21
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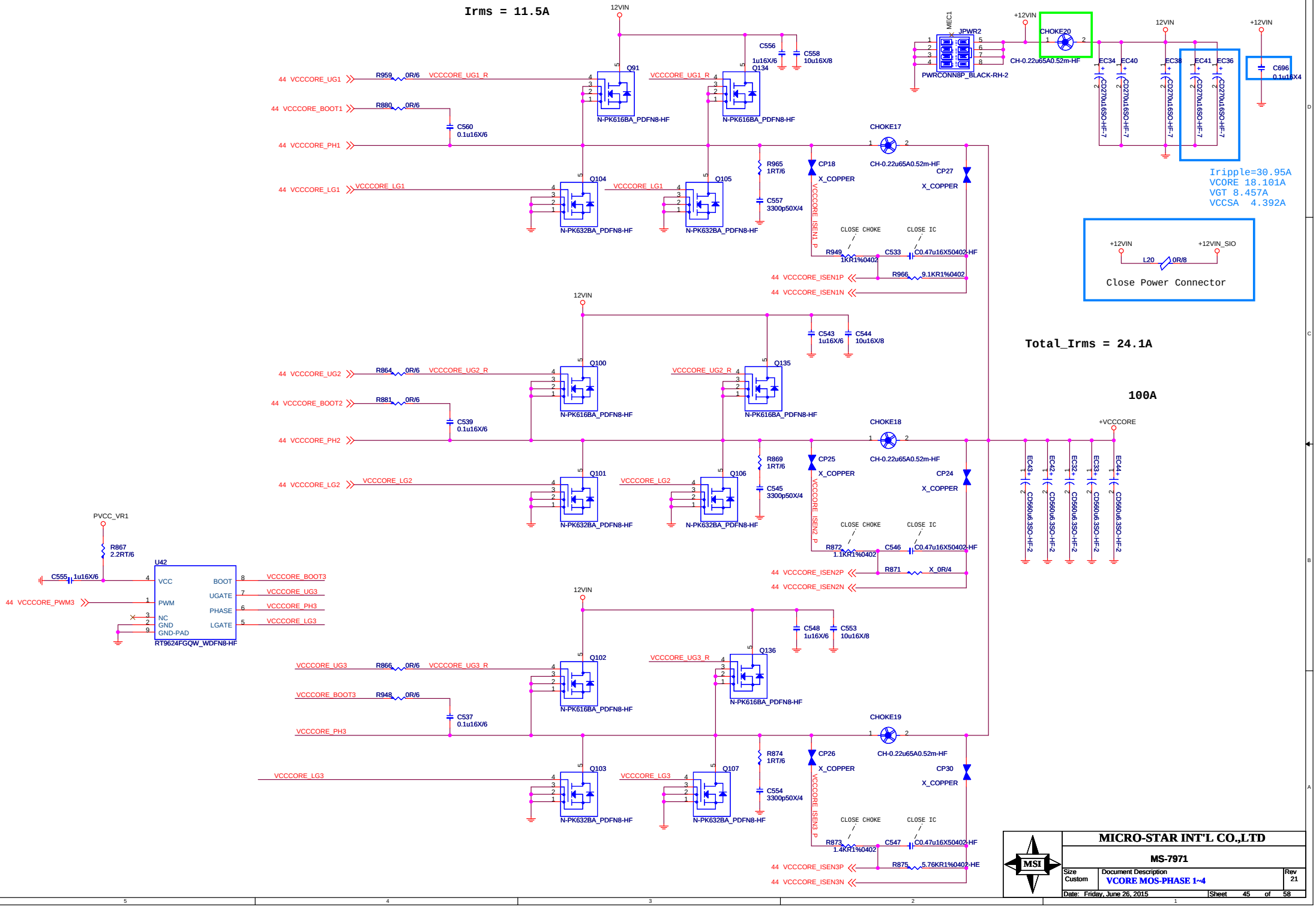
Irms = 11.5A
Total_Irms = 24.1A
100A
12VIN
+12VIN
+12VIN_SIO
+VCCCORE
PVCC_VR1
MEC1
JPWR2
PWRCONN8P_BLACK-RH-2
CHOKE20
CH-0.22u65A0.52m-HF
CHOKE17
CHOKE18
CHOKE19
Q91
Q134
Q104
Q105
Q100
Q135
Q101
Q106
Q102
Q136
Q103
Q107
N-PK616BA_PDFN8-HF
N-PK632BA_PDFN8-HF
U42
RT9624FGQW_WDFN8-HF
VCC
BOOT
UGATE
PHASE
LGATE
PWM
NC
GND
GND-PAD
R867 2.2RT/6
C555 1u16X/6
C556 1u16X/6
C558 10u16X/8
C543 1u16X/6
C544 10u16X/8
C548 1u16X/6
C553 10u16X/8
C560 0.1u16X/6
C539 0.1u16X/6
C537 0.1u16X/6
C696 0.1u16X4
R959 0R/6
R880 0R/6
R864 0R/6
R881 0R/6
R866 0R/6
R948 0R/6
R965 1RT/6
R869 1RT/6
R874 1RT/6
C557 3300p50X/4
C545 3300p50X/4
C554 3300p50X/4
CP18 X_COPPER
CP27 X_COPPER
CP25 X_COPPER
CP24 X_COPPER
CP26 X_COPPER
CP30 X_COPPER
R949 1KR1%0402
C533 C0.47u16X50402-HF
R966 9.1KR1%0402
R872 1.1KR1%0402
C546 C0.47u16X50402-HF
R871 X_0R/4
R873 1.4KR1%0402
C547 C0.47u16X50402-HF
R875 5.76KR1%0402-HE
CLOSE CHOKE
CLOSE IC
VCCCORE_ISEN1 P
VCCCORE_ISEN2 P
VCCCORE_ISEN3 P
EC34 EC40 EC38 EC41 EC36
CD270u16SO-HF-7
EC43+ EC42+ EC32+ EC33+ EC44+
CD560u6.3SO-HF-2
L20 0R/8
Close Power Connector
Iripple=30.95A
VCORE 18.101A
VGT 8.457A
VCCSA 4.392A
44 VCCCORE_UG1
44 VCCCORE_BOOT1
44 VCCCORE_PH1
44 VCCCORE_LG1
44 VCCCORE_UG2
44 VCCCORE_BOOT2
44 VCCCORE_PH2
44 VCCCORE_LG2
44 VCCCORE_PWM3
VCCCORE_BOOT3
VCCCORE_UG3
VCCCORE_PH3
VCCCORE_LG3
44 VCCCORE_ISEN1P
44 VCCCORE_ISEN1N
44 VCCCORE_ISEN2P
44 VCCCORE_ISEN2N
44 VCCCORE_ISEN3P
44 VCCCORE_ISEN3N
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Size Custom
Document Description
VCORE MOS-PHASE 1~4
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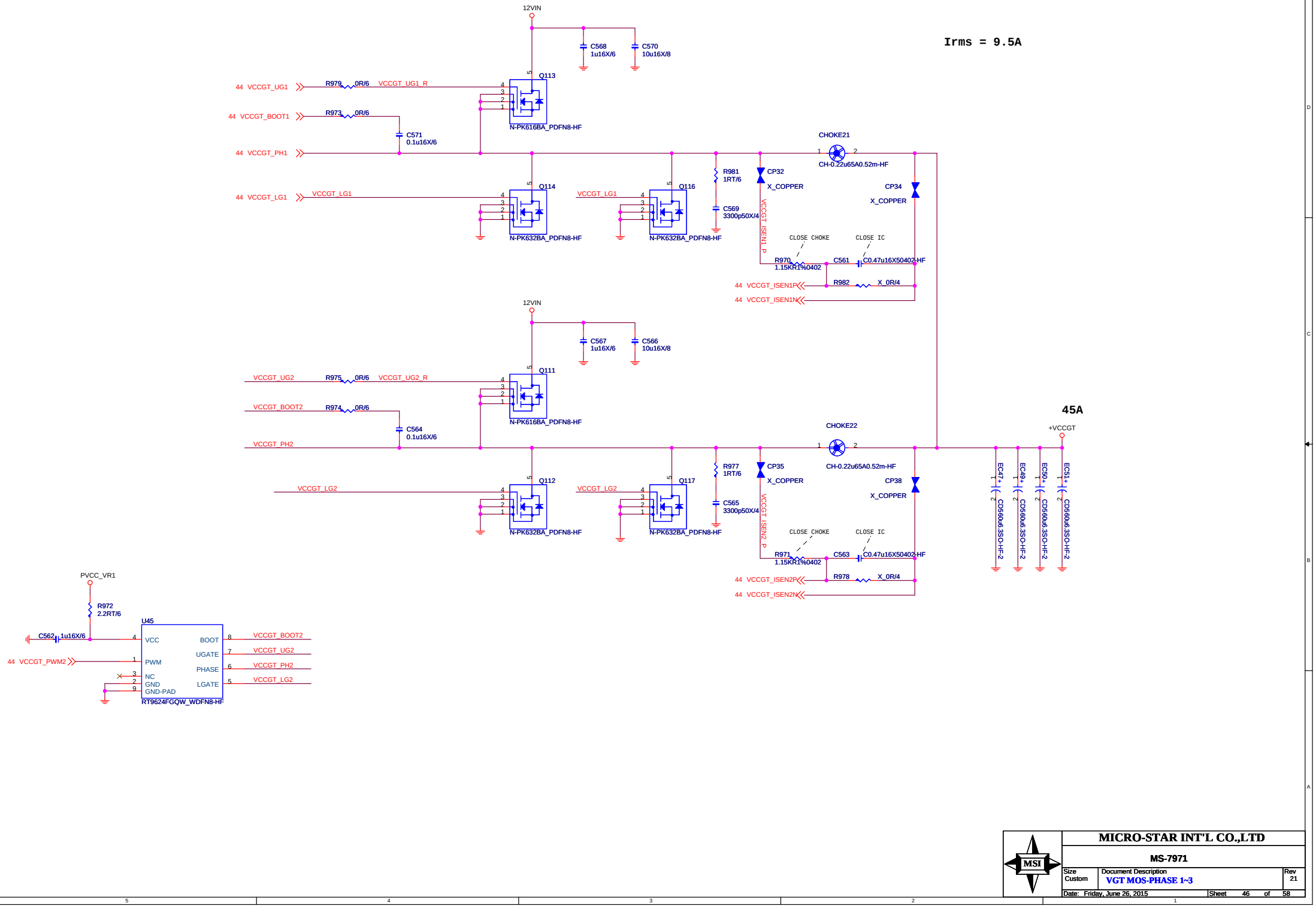

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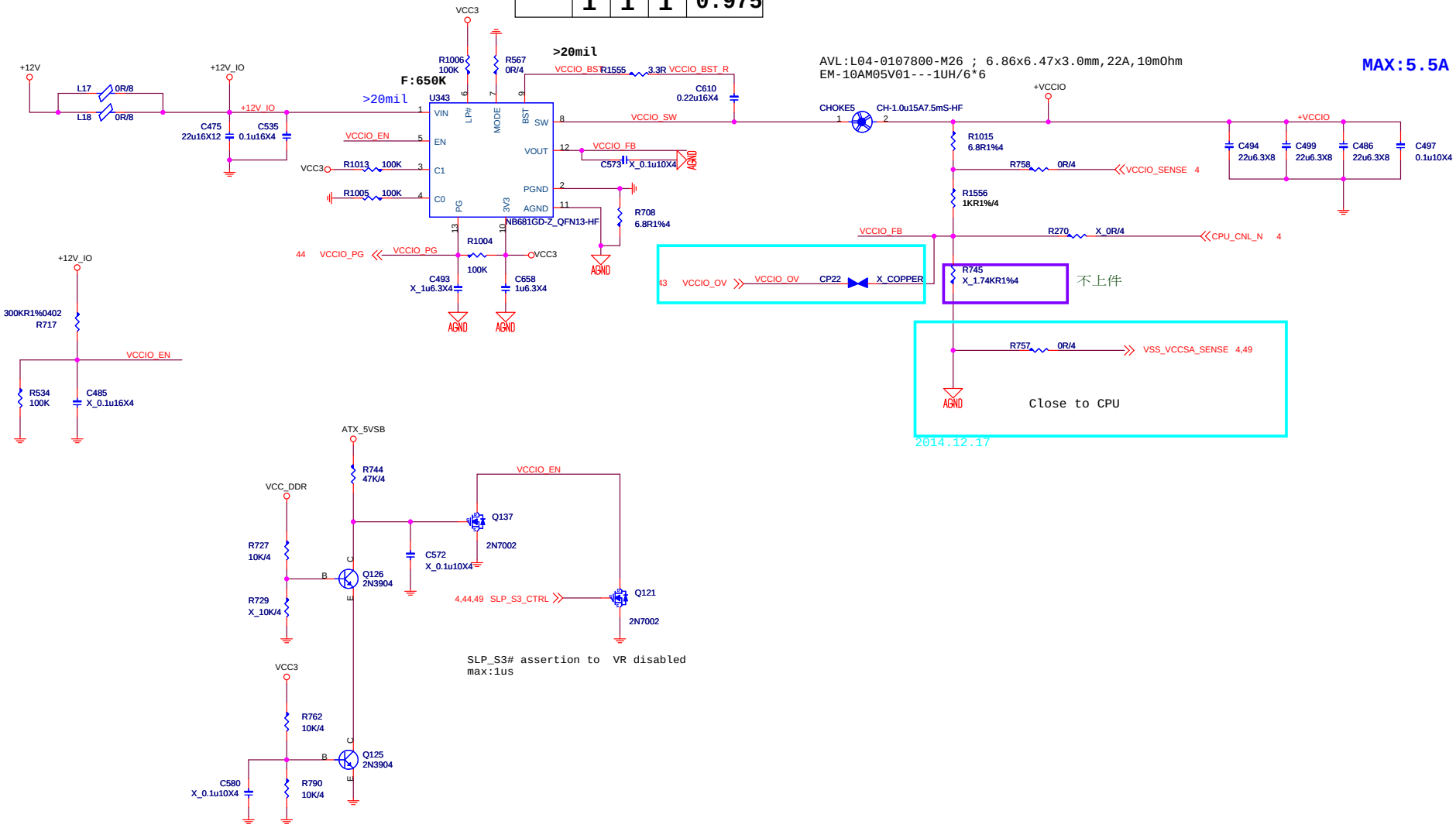
VCCIO

0.95V; 5.5A

IMAX 6A
ILIMIT=8.5~9A

	LP#	C1	C0	VOUT(V)
VCCIO	0	X	X	0
	1	0	0	0.85
	1	0	1	0.875
	1	1	0	0.95
	1	1	1	0.975



MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7971	
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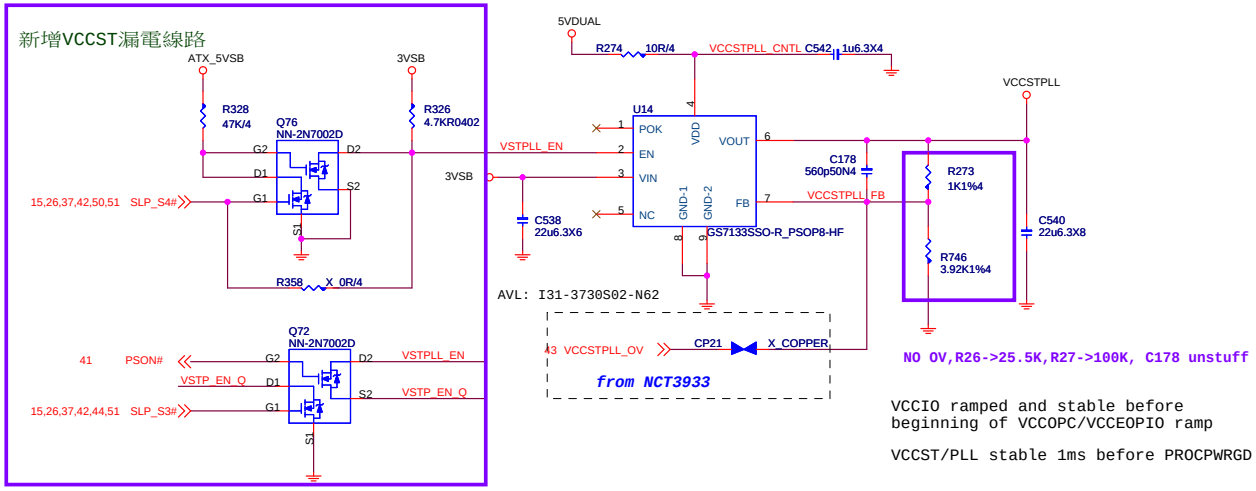
VCCSTPLL

for Gaming3/5, Classic, ECO and H110

1.0V; 250mA

For Cost down VCCST&VCCPLL merge



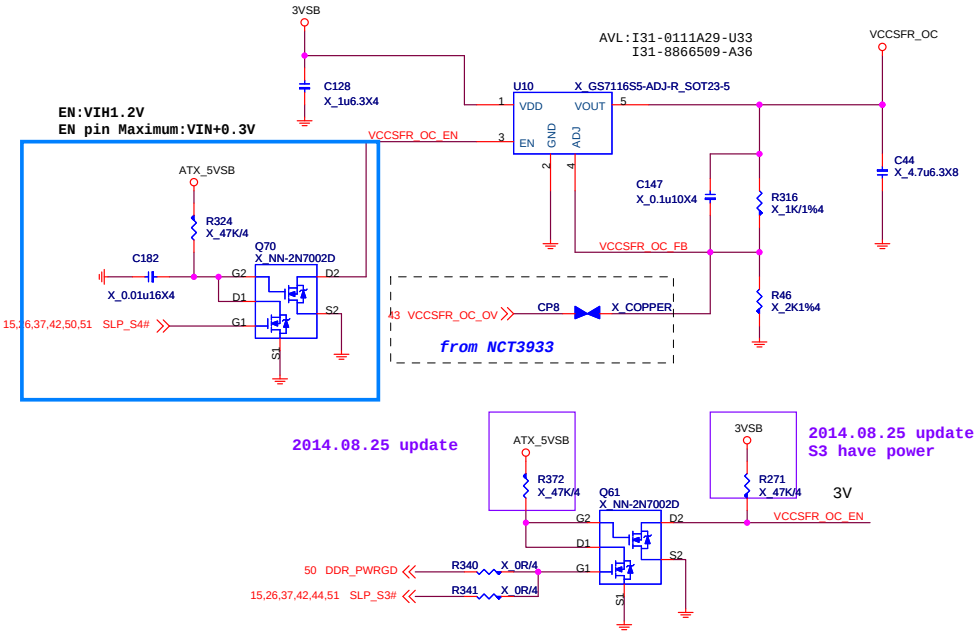
VCCIO ramped and stable before beginning of VCCOPC/VCCEOPIO ramp

VCCST/PLL stable 1ms before PROCPWRGD

VCCPLL_OC

1.2V; 110mA

2014.08.21 update



MSI	MICRO-STAR INT'L CO.,LTD	
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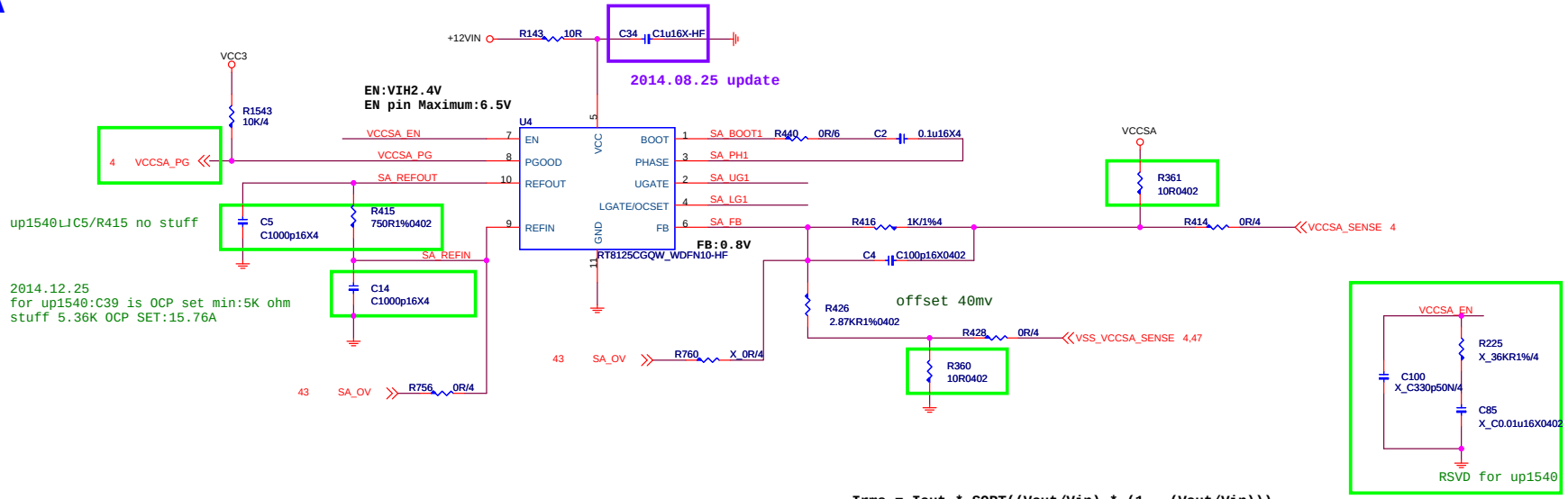
SA Power:1.05V,12.3A

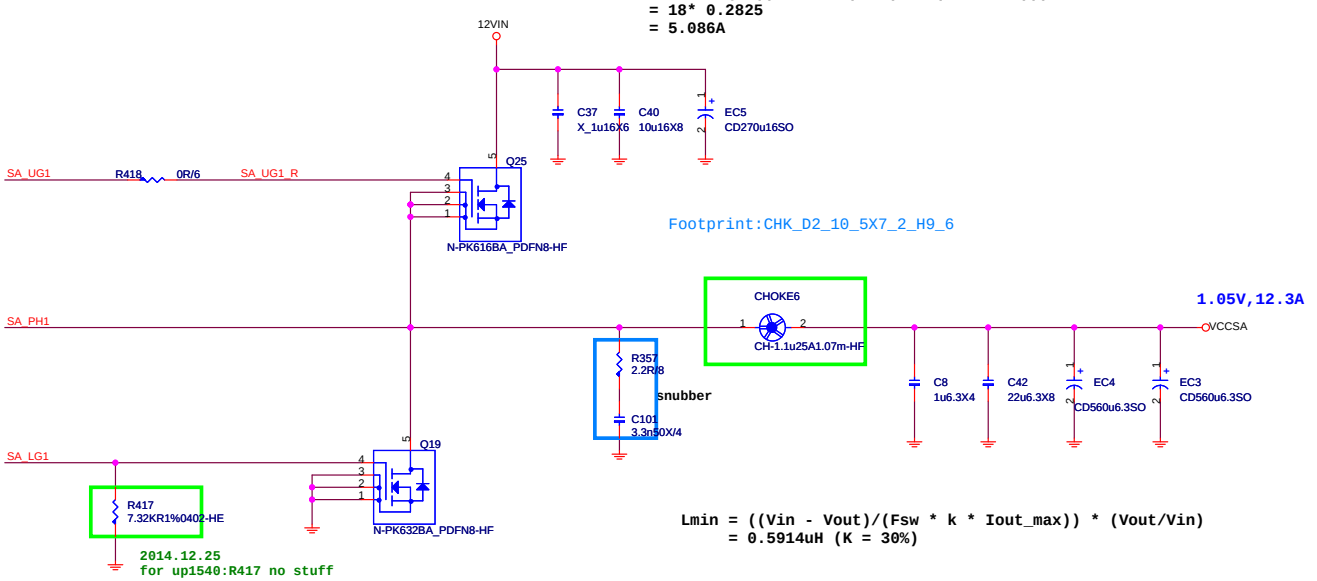
Rocpset:7.32K
*OCP=Rocset*Rdson(Low side)/10uA*
*=7.32K*3.6mohm/10uA*
=20.3A

Rocs:5.76K,OCP:
D03-4C05N03-O05 : 16.94A
D03-632BA0C-N03 : 17.45A
use UBIQ MOS need Check

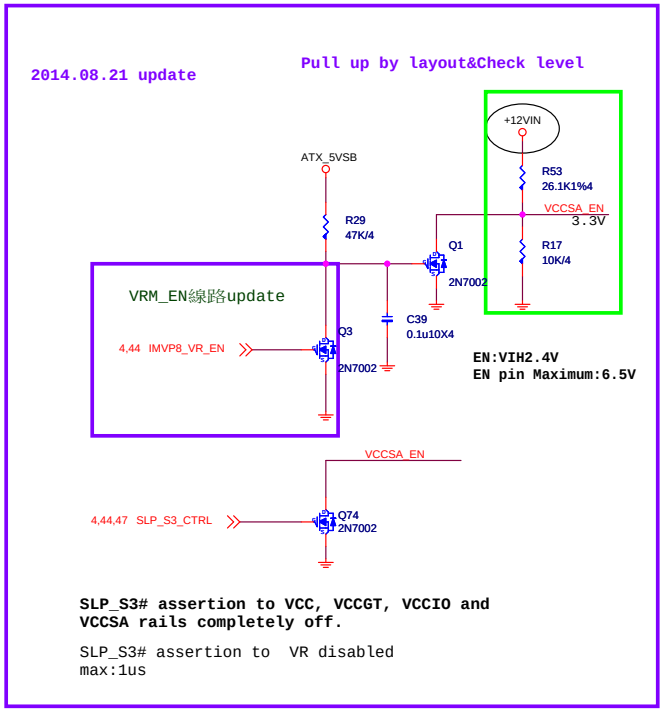
Rdson(low)10V
D03-4C05N03-O05 : 3.4mohm
D03-632BA0C-N03 : 3.3mohm
D03-3056M00-U47 : 4.2mohm



Irms = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
= 18* 0.2825
= 5.086A



Lmin = ((Vin - Vout)/(Fsw * k * Iout_max)) * (Vout/Vin)
= 0.5914uH (K = 30%)



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

SLP_S3# assertion to VR disabled
max:1us

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DDR4_1.2V 2.5A+9.5A+1.2A=13.2A

2.5A FOR CPU

9.5A FOR 4DIMM

1.2A FOR DDR VTT

OCP =13.2A*1.5=19.8A

Rocs(R3)=OCP*Rdson[(Low side)/2]/10uA

=19.8A*(4.6/2)mohm/10uA

=4.95Kohm < 5K ohm

Rocpset:7.32K

OCP=Rocset*Rdson(Low side)/10uA

=7.32K*3.6mohm/10uA

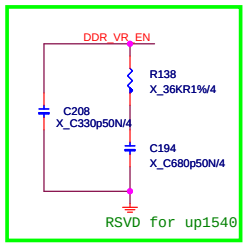
=20.3A

Rdson(low)4.5V

D03-4C05N03-O05 : 5 mohm

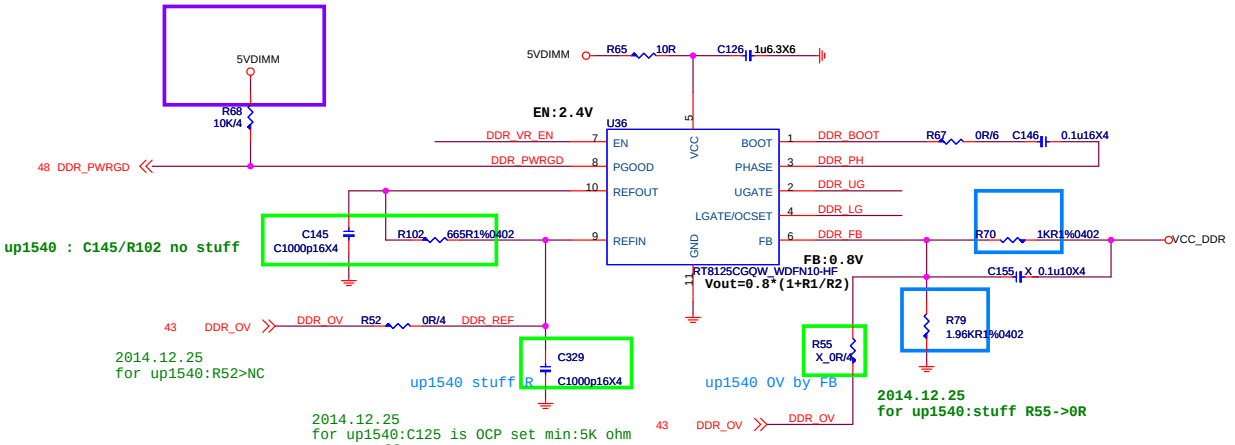
D03-632BA0C-N03 : 4.6mohm

D03-3056M00-U47 : 6.2mohm



2014.12.25
for up1540:stuff R138->36K,
C208->330pF,C194->680pF

Pull up change by layout



2014.12.25
for up1540:R52>NC

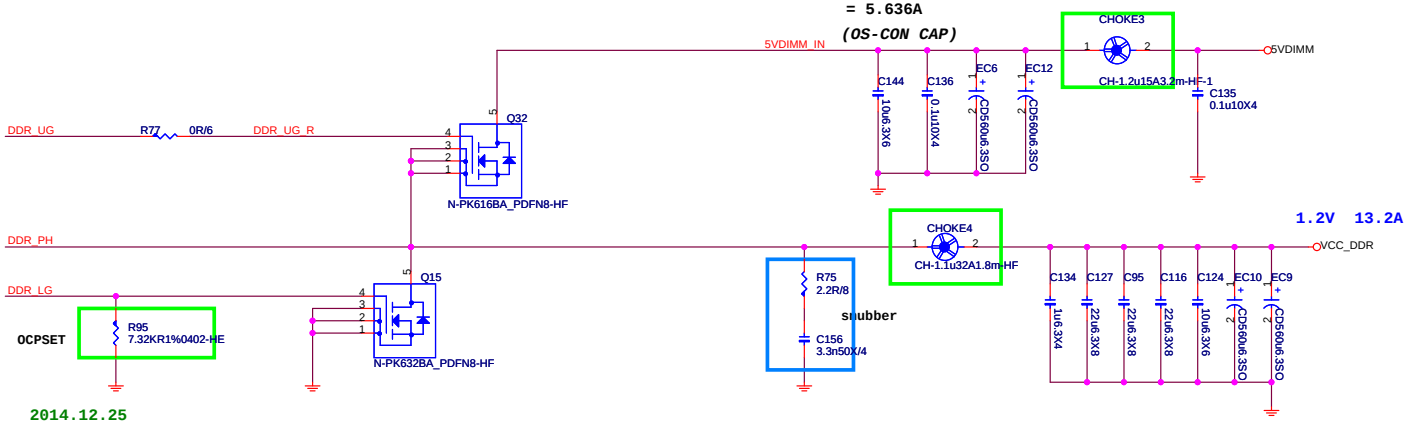
up1540 stuff R

up1540 OV by FB

2014.12.25
for up1540:stuff R55->0R

2014.12.25
for up1540:C125 is OCP set min:5K ohm
R105 stuff 5.1K OCP SET:22.173A

Irms = Iout * SQRT{(Vout/Vin) * [1 - (Vout/Vin)]}
= 13.2* 0.427
= 5.636A
(OS-CON CAP)

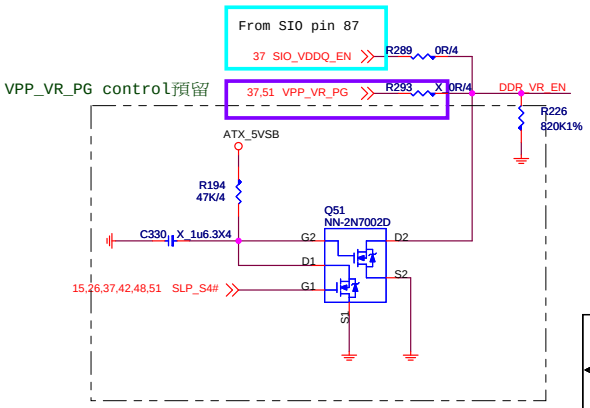


2014.12.25
for up1540:R95 ->NC

Datasheet公式計算
Lmin = ((Vin - 1.2V)/(Fsw * k * Iout_max)) * (Vout/Vin)
= 0.7677uH (K = 30%)

若帶入CAP ESR計算,0.2432uH＜L＜1.2897uH

2014.12.17 update



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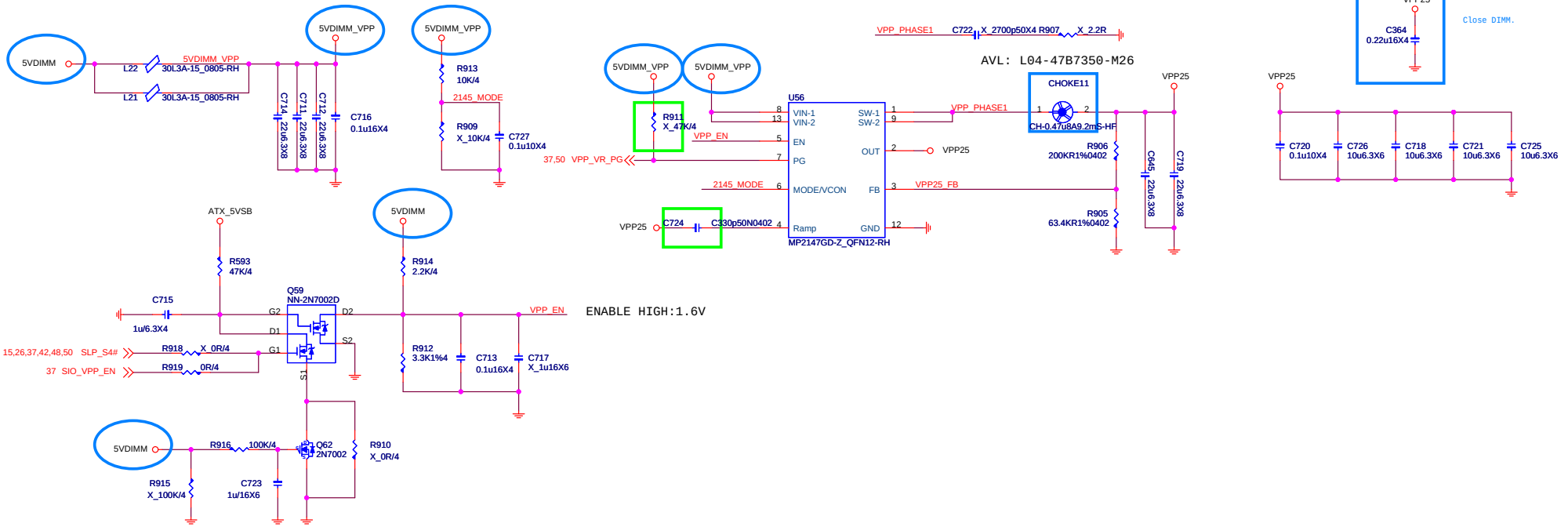
4DIMM :2.24A FOR DDR VPP2.5V

VPP25 Power

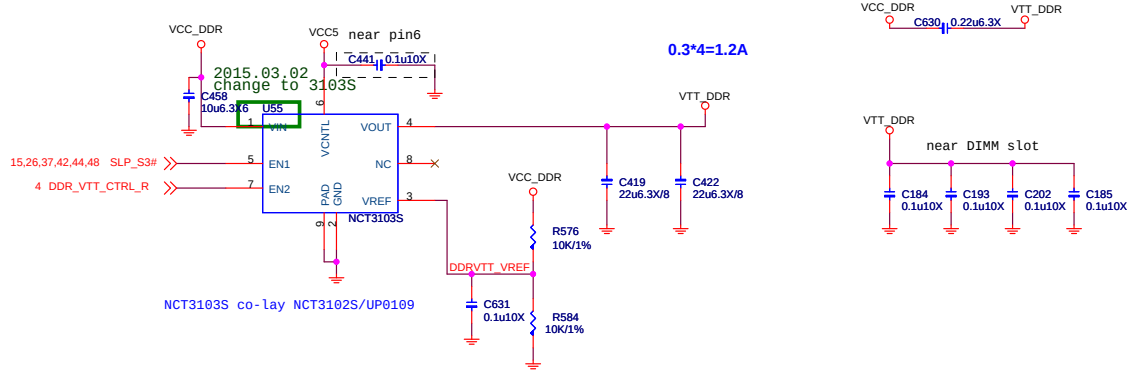
2.5V; 2.24A



ENABLE HIGH:1.6V

To make sure VPP EN after 5VDIMM stable

DDR VTT Power



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PCH_1VSB

1.0V; 11A

OCP = 16.21A

Rocset = 1.5 * Imax * Rdson(low) / Iocset
= 1.5 * 10.664 * 5mohm / 10uA
= 7.998K

Rocs:7.87K,OCP:
D03-4C05N03-005 : 15.74A
D03-632BA0C-N03 : 17.1A
use UBIQ MOS need Check

Rdson(low)4.5V
D03-3116M00-U47 : 3.6 mohm
D03-632BA0C-N03 : 4.6mohm
D03-3056M00-U47 : 6.2mohm

L04-47B7730-T15 for OC, Gaming 10, 9, 7, 5
L04-12A7321-L65 for Gaming 3, SLI, ECO
L04-12A7721-T15 for cost down

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

5VDUAL
R254 2.2R
2014.08.25:Change 1u/0603
C152 1u6.3X6
U28
PCH_1VSB_EN
2014.08.21 update
COMP/EN
POK
NC
OCS
VCC
GND
BOOT
PH
UG
LG
FB
PCH_BOOT R178 0R/6 PCH_R_BOOT C226 C0.1u50X/6
PCH_PHASE
PCH_UGATE R198 0R/6 PCH_R_UGATE
PCH_LGATE
PCH_REFOUT
PCH_REFIN
UP1540QDDA_WDFN10-HF
2014.12.25
for up1540:C236&R204 ->NC
C236 X_1000p16X4
R204 X_1K1%4
R193 5.49KR1%0402-1
R74 X_0R/4
2014.12.25
for up1540:C193 is OCP set min:5Kohm
R185 stuff 7.87K OCP SET:15.74A
R177 X_7.87K1%4
2014.12.25
for up1540:R177->NC
PCH_CORE_FB_R
43 PCH_CORE_OV
to sink/source over voltage IC.
pin10 sink/source current capability can't over 1mA
So max voltage can't over 1.8V.
from NCT3933
C233 X_0.01u16X/4
PCH_TYPE3
R255 X_0R/4
R253 1K1%4
R188 0R/4
R258 3.92K1%4
Vout = Vref * (1 + R821/R822)
= 0.8 * (1 + 1K/3.92K)
= 0.8 * 1.2551
= 1.004V
5VDUAL_PCH_IN
L19 0R/8
L23 0R/8
5VDUAL
C230 C0.1u16X/4
C235 C10u16X/8
EC19 CD560u6.3SO
too Big
C223 X_C0.1u16X/4
MAX:10.664A
Q22 N-NTMFS4C08NT1G
L04-01072H0-T15
AVL: L04-0107800-M26
Q27 N-NTMFS4C05NT1G
R257 2.2R/8
C231 3300p50X/4
CHOKE9 CH-1.0u15A7.5mS-HF
PCH_1VSB
EC29 CD560u6.3SO
EC28 CD560u6.3SO
C183 22u6.3X8
C273 10u6.3X6
C232 10u6.3X6
C234 1u6.3X4
CP29
PCH_1VSB
PLACE UNDER THE PCH
Lmin = ((Vin - Vout)/(Fsw * k * Iout_max)) * (Vout/Vin)
= 0.8335uH (K = 30%)
PCH_1VSB_EN
R192 36KR1%/4
C170 X_C330p50N/4
C142 C3300p50X0402
RSVD for up1540
2014.12.25
for up1540:stuff R192->36K,
C170->330pF,C142->680pF
43 PCH_CORE_OV
5VDUAL
R196 X_47K/4
PCH_1VSB_EN
C181 X_0.1u10X4
0728: Change net name
ATX_5VSB
R184 10K/4
OPC_1P8_EN#
Q36 2N7002
C173 X_0.1u10X4
Q34 2N3904
3VSB
R10 1K1%4
R13 2.21KR1%4
0902 : Stuff R when NO PCH_1P8 & V_OPC_1P8
PCH_1VSB_EN
37,42,53 SIO_SLPSUS
Q58 2N7002
移除CUT_VBAT線路後的修改

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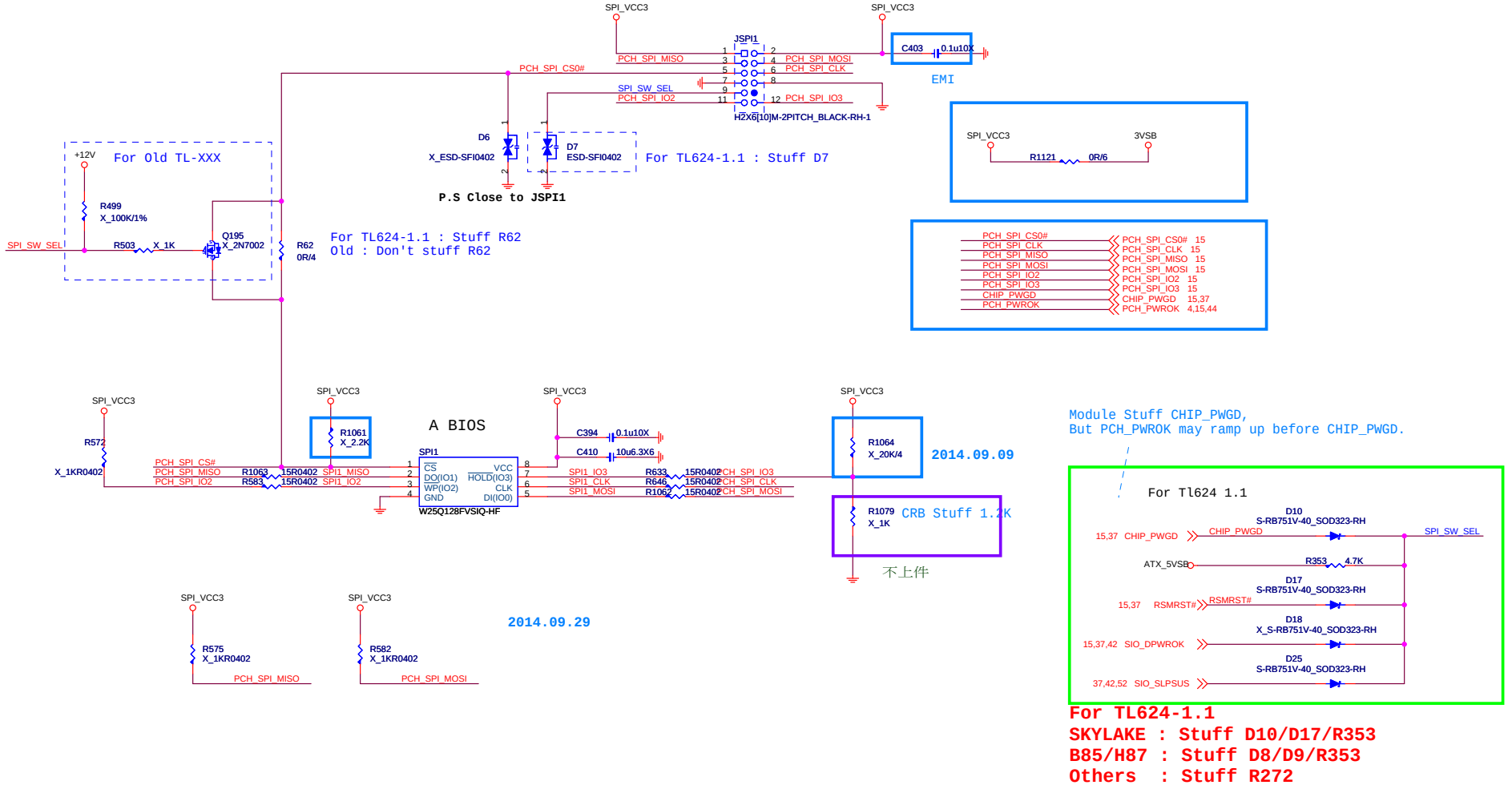
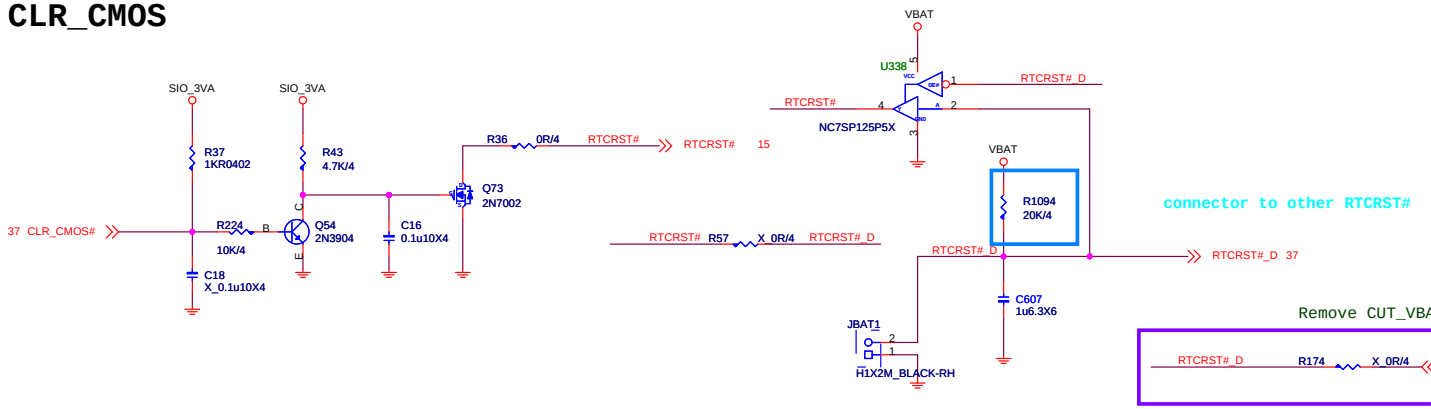


CLR_CMOS



	R184	U338	R1093	C517
USE U338 Auto CLR_CMOS	X	0	0	0
NOT USE U338 Auto CLR_CMOS	0	X	X	X

tri-state

INPUT		outout
PIN1	PIN2	pin4
L	H	H
L	L	L
H	X	Z

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PCB

PCB1

7971_21

PD0-0791810-G37,精成,23,寶安恩斯邁廠(MSIS)
PD0-0791810-G37,精成,77,寶安恩斯邁廠(MSIS)
PD0-0791810-E48,競華,23,寶安恩斯邁廠(MSIS)
PD0-0791810-E48,競華,77,寶安恩斯邁廠(MSIS)

CPU Socket

CPU_H1

CPU
鐵座

CPU_H1

HDMI_LA1

Label
HDMI

HDMI LABEL

HDMI Virtual Part Number

Battery

BAT1_X1

BAT-BCR2032P-RH

MOS1 Heatsink

HS_MOS1

MEC1 MEC2

HS-0503560-RH

BIOS Label

AMI_LA1

AMI_BIOS
LABLE

BIOS_LABLE

AMI_H170

AMI_BIOS
LABLE

BIOS_LABLE

AMI_B150

AMI_BIOS
LABLE

BIOS_LABLE

MOS2 Heatsink

HS_MOS2

MEC1 MEC2

HS-503570-RH

PCH_H170

Z170

G51-M1SPG53-Q13

Makeket name

PCH_B150

Z170

G51-M1SPG53-Q13

Makeket name

SPI_BH

Z170

G51-M1SPG53-Q13

Makeket name

R9999

Z170

G51-M1SPG53-Q13

Makeket name

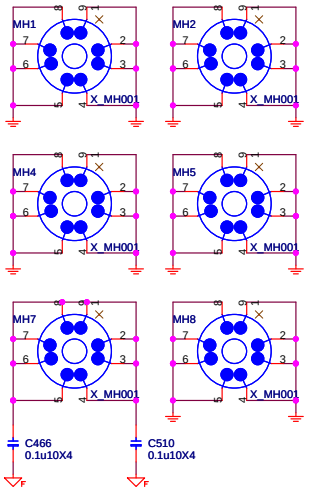
PCH_HS

MEC1 MEC1

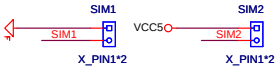
MEC2 MEC2

HS-0406990-RH

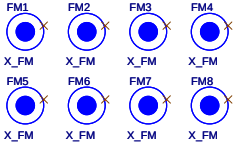
Mounting Holes



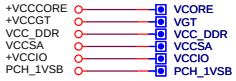
Simulation

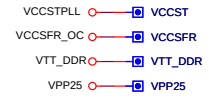


Optical Fiducial Marks-120



Test point





To POWER 2015/02/03

MSI

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