AMD AM4

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04 AM4 PCIE/SATAE	42 SATA
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27 M.2_2	62 NCT7718W temp sensor /EMI CAP
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37 Front USB2.0	69 Power Delivery
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MS-7B79 BOM List

	Schematic Cfg	ERP NO.	Remark	BOM
*	CFG-7B79-0A-X470-GAMING_PRO	601-7B79-01S		A
	CFG-7B79-0A-X470-GAMING_PLUS	601-7B79-02S		

MSI BOM:

MSI Link to the Future MICRO-START INT'L CO.,LTD.

Title: COVER SHEET

Size: C | Document Number: MS-7B79 | Rev: 1.1/2.1

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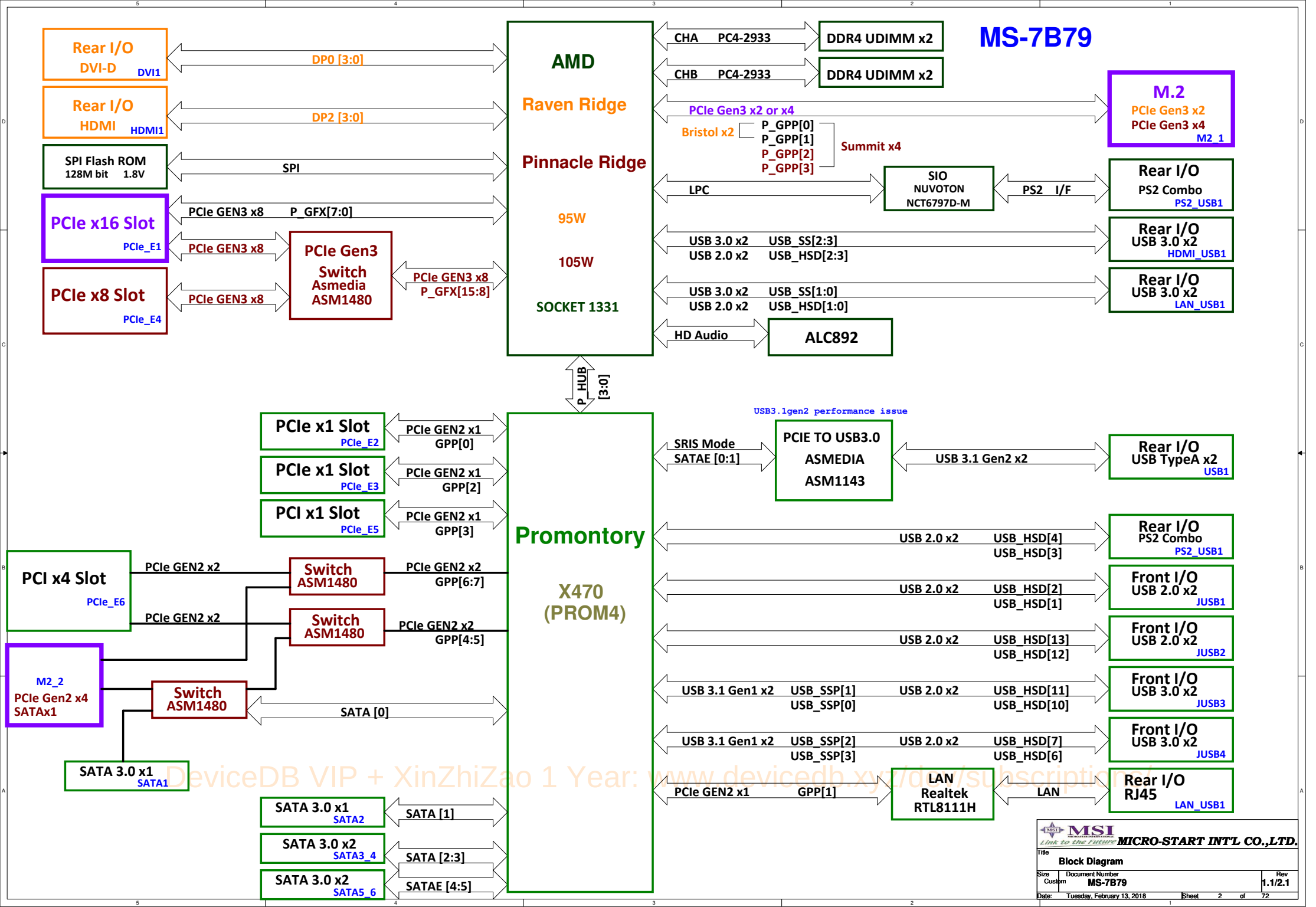

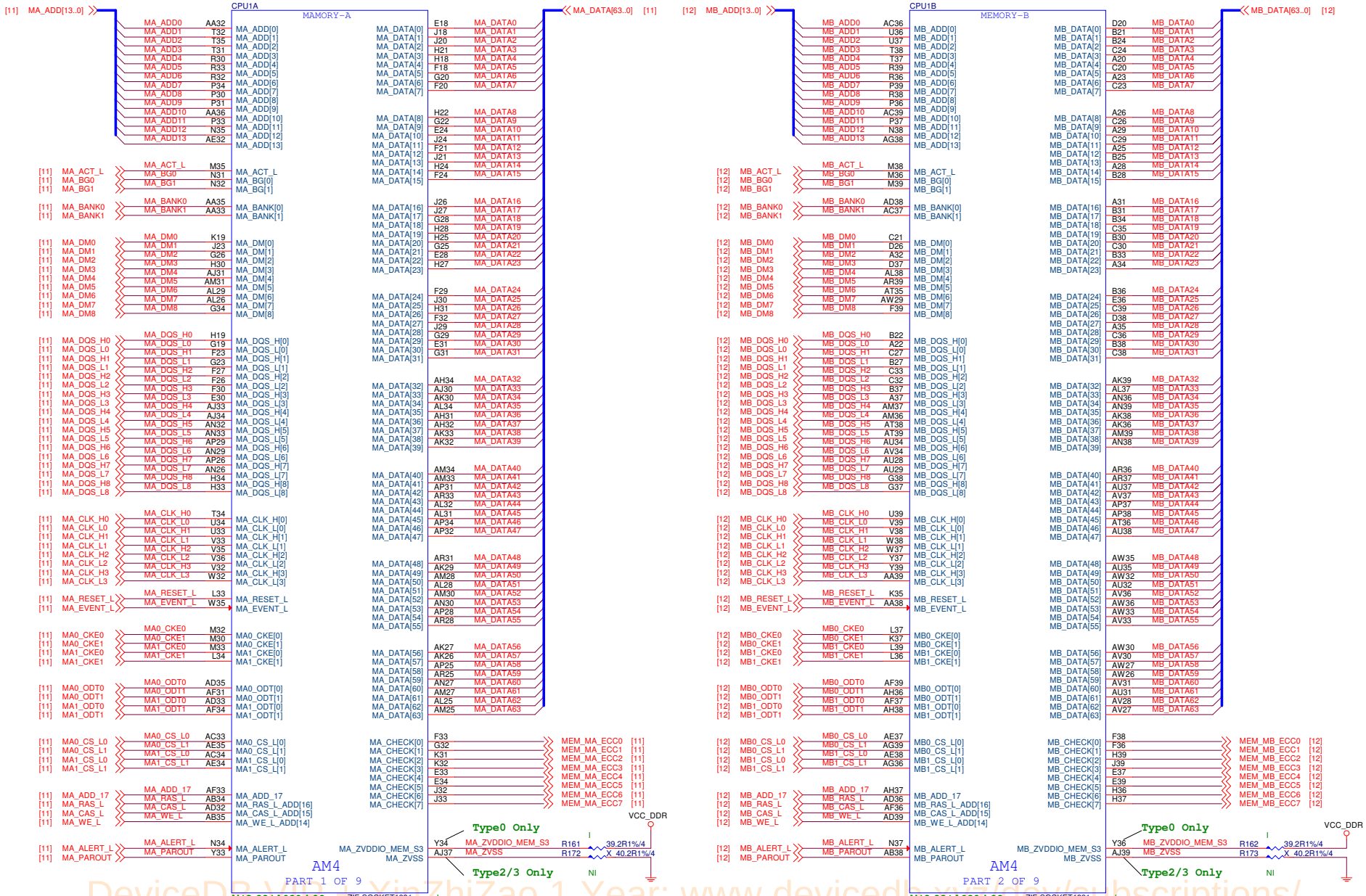

Schematic Cfg	Project	
CFG-7B79-0A-X470-GAMING PRO	V	A
CFG-7B79-0A-X470-GAMING PLUS		

MICRO-START INT'L CO.,LTD.

Title: AM4 DDR4 I/F

Size: Custom | Document Number: MS-7B79 | Rev: 1.1/2.1

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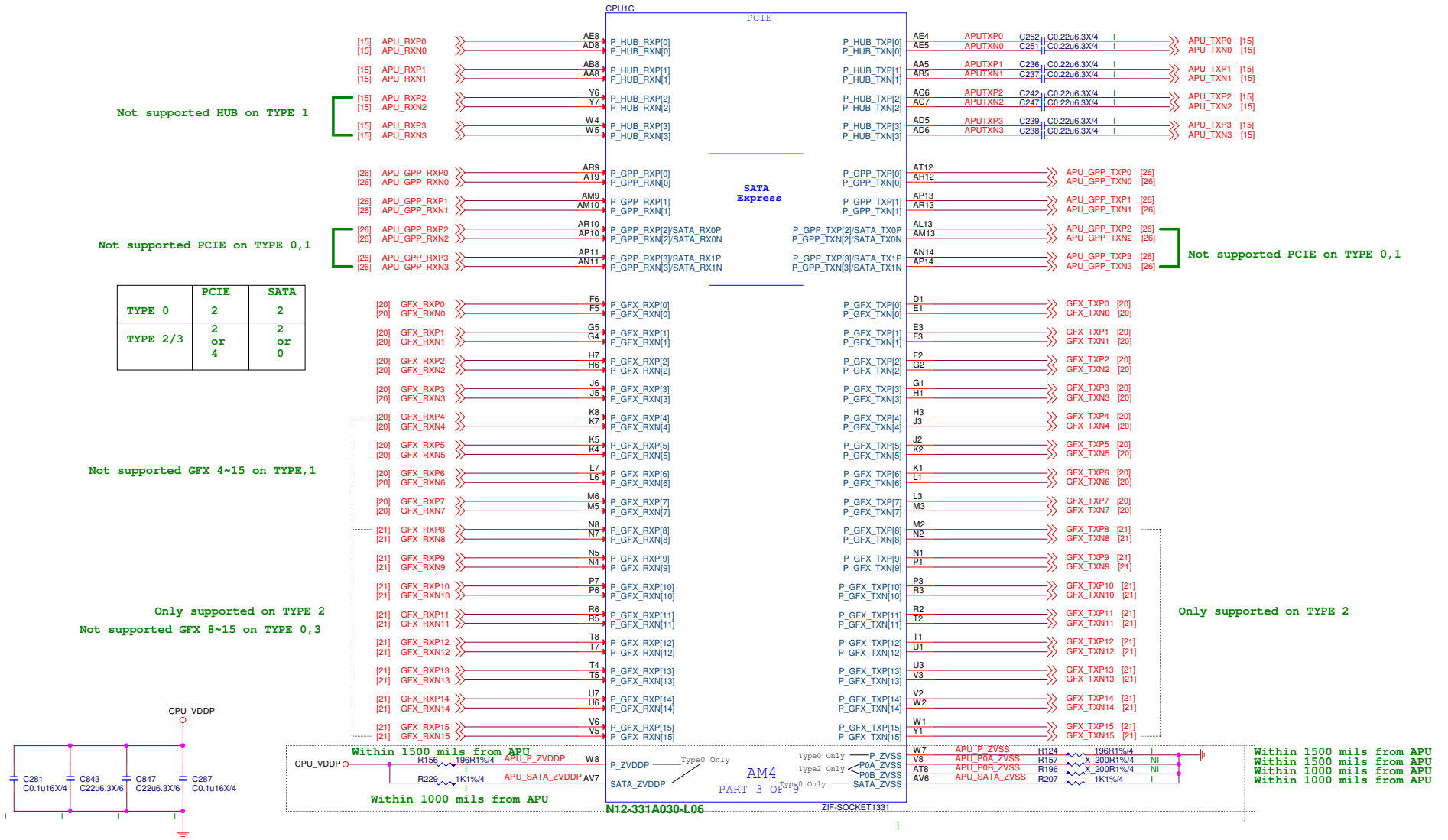

	PCIE	SATA
TYPE 0	2	2
TYPE 2/3	2 or 4	2 or 0

Schematic Cfg	Project	
CFG-7B79-0A-X470-GAMING PRO	V	A
CFG-7B79-0A-X470-GAMING PLUS		

MSI MICRO-STAR INT'L CO.,LTD.

Title: AM4 PCIE/SATAE

Size: Custom | Document Number: MS-7B79 | Rev: 1.1/2.1

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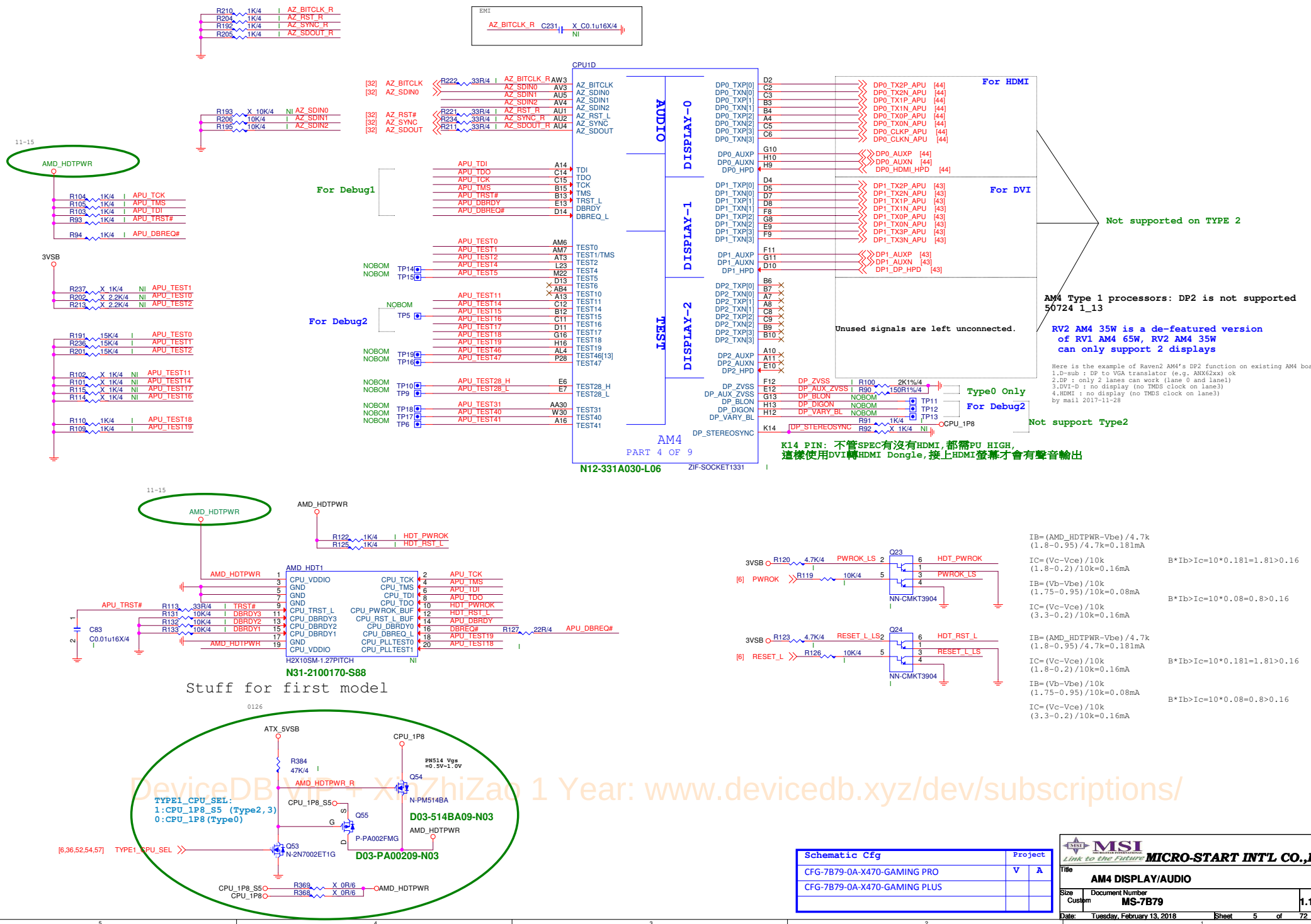
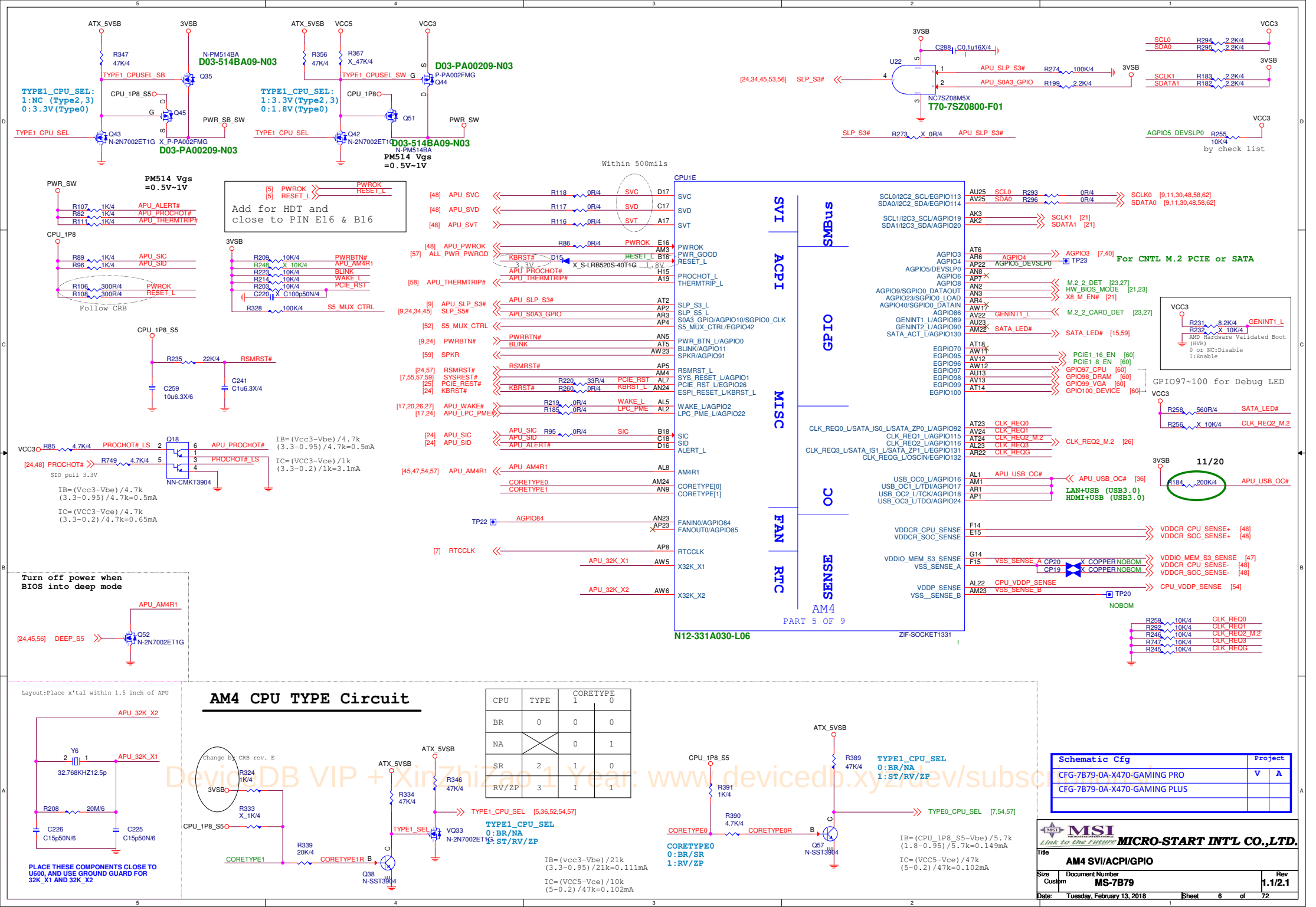
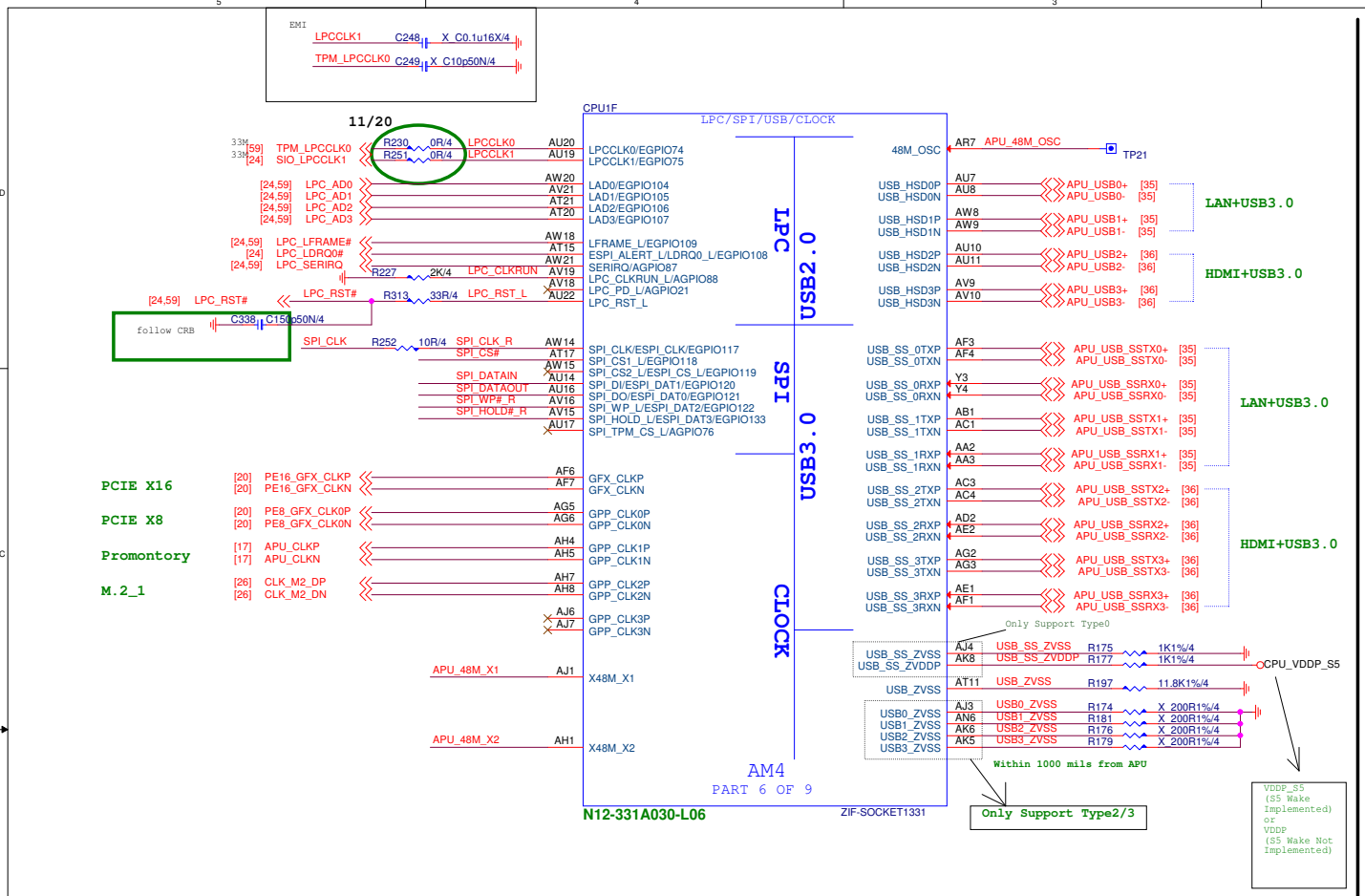
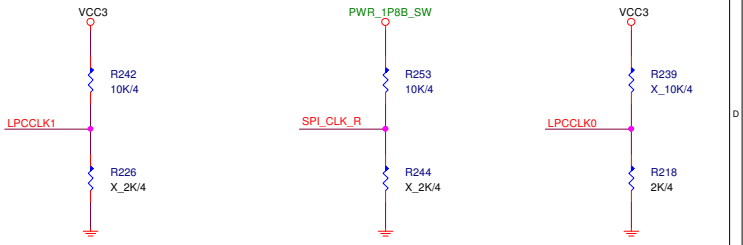

R210 1K/4 AZ_BITCLK_R
R204 1K/4 AZ_RST_R
R192 1K/4 AZ_SYNC_R
R205 1K/4 AZ_SDOUT_R
EMI
AZ_BITCLK_R C231 X_C0.1u16X/4 NI
CPU1D
[32] AZ_BITCLK
[32] AZ_SDIN0
R222 33R/4
AZ_BITCLK_R AW3
AZ_SDIN0 AV3
AZ_SDIN1 AU5
AZ_SDIN2 AV4
R193 X_10K/4 NI AZ_SDIN0
R206 10K/4 AZ_SDIN1
R195 10K/4 AZ_SDIN2
[32] AZ_RST#
[32] AZ_SYNC
[32] AZ_SDOUT
R221 33R/4 AZ_RST_R AU1
R234 33R/4 AZ_SYNC_R AU2
R211 33R/4 AZ_SDOUT_R AU4
AUDIO
DISPLAY-0
DISPLAY-1
DISPLAY-2
TEST
AM4
PART 4 OF 9
N12-331A030-L06
ZIF-SOCKET1331
11-15
AMD_HDTPWR
R104 1K/4 APU_TCK
R105 1K/4 APU_TMS
R103 1K/4 APU_TDI
R93 1K/4 APU_TRST#
R94 1K/4 APU_DBREQ#
3VSB
R237 X_1K/4 NI APU_TEST1
R202 X_2.2K/4 NI APU_TEST0
R213 X_2.2K/4 NI APU_TEST2
R191 15K/4 APU_TEST0
R236 15K/4 APU_TEST1
R201 15K/4 APU_TEST2
R102 X_1K/4 NI APU_TEST11
R101 X_1K/4 NI APU_TEST14
R115 X_1K/4 NI APU_TEST17
R114 X_1K/4 NI APU_TEST16
R110 1K/4 APU_TEST18
R109 1K/4 APU_TEST19
For Debug1
APU_TDI A14
APU_TDO C14
APU_TCK C15
APU_TMS B15
APU_TRST# B13
APU_DBRDY E13
APU_DBREQ# D14
NOBOM TP14
NOBOM TP15
APU_TEST0 AM6
APU_TEST1 AM7
APU_TEST2 AT3
APU_TEST4 L23
APU_TEST5 M22
D13
AB4
For Debug2
NOBOM TP5
APU_TEST11 A13
APU_TEST14 C12
APU_TEST15 B12
APU_TEST16 C11
APU_TEST17 D11
APU_TEST18 G16
APU_TEST19 H16
NOBOM TP19
NOBOM TP16
APU_TEST46 AL4
APU_TEST47 P28
NOBOM TP10
NOBOM TP9
APU_TEST28_H E6
APU_TEST28_L E7
NOBOM TP18
NOBOM TP17
NOBOM TP6
APU_TEST31 AA30
APU_TEST40 W30
APU_TEST41 A16
TDI TDO TCK TMS TRST_L DBRDY DBREQ_L
TEST0 TEST1/TMS TEST2 TEST4 TEST5 TEST6 TEST10 TEST11 TEST14 TEST15 TEST16 TEST17 TEST18 TEST19 TEST46[13] TEST47
TEST28_H TEST28_L
TEST31 TEST40 TEST41
DP0_TXP[0] D2
DP0_TXN[0] C2
DP0_TXP[1] C3
DP0_TXN[1] B3
DP0_TXP[2] B4
DP0_TXN[2] A4
DP0_TXP[3] C5
DP0_TXN[3] C6
DP0_AUXP G10
DP0_AUXN H10
DP0_HPD H9
DP1_TXP[0] D4
DP1_TXN[0] D5
DP1_TXP[1] D7
DP1_TXN[1] D8
DP1_TXP[2] F8
DP1_TXN[2] G8
DP1_TXP[3] E9
DP1_TXN[3] F9
DP1_AUXP F11
DP1_AUXN G11
DP1_HPD D10
DP2_TXP[0] B6
DP2_TXN[0] B7
DP2_TXP[1] A7
DP2_TXN[1] A8
DP2_TXP[2] C8
DP2_TXN[2] C9
DP2_TXP[3] B9
DP2_TXN[3] B10
DP2_AUXP A10
DP2_AUXN A11
DP2_HPD E10
DP_ZVSS F12
DP_AUX_ZVSS E12
DP_BLON G13
DP_DIGON H13
DP_VARY_BL H12
DP_STEREOSYNC K14
For HDMI
DP0_TX2P_APU [44]
DP0_TX2N_APU [44]
DP0_TX1P_APU [44]
DP0_TX1N_APU [44]
DP0_TX0P_APU [44]
DP0_TX0N_APU [44]
DP0_CLKP_APU [44]
DP0_CLKN_APU [44]
DP0_AUXP [44]
DP0_AUXN [44]
DP0_HDMI_HPD [44]
For DVI
DP1_TX2P_APU [43]
DP1_TX2N_APU [43]
DP1_TX1P_APU [43]
DP1_TX1N_APU [43]
DP1_TX0P_APU [43]
DP1_TX0N_APU [43]
DP1_TX3P_APU [43]
DP1_TX3N_APU [43]
DP1_AUXP [43]
DP1_AUXN [43]
DP1_DP_HPD [43]
Unused signals are left unconnected.
Not supported on TYPE 2
AM4 Type 1 processors: DP2 is not supported
50724 1_13
RV2 AM4 35W is a de-featured version
of RV1 AM4 65W, RV2 AM4 35W
can only support 2 displays
Here is the example of Raven2 AM4's DP2 function on existing AM4 board :
1.D-sub : DP to VGA translator (e.g. ANX62xx) ok
2.DP : only 2 lanes can work (lane 0 and lane1)
3.DVI-D : no display (no TMDS clock on lane3)
4.HDMI : no display (no TMDS clock on lane3)
by mail 2017-11-28
DP_ZVSS R100 2K1%/4
DP_AUX_ZVSS R90 150R1%/4
DP_BLON NOBOM TP11
DP_DIGON NOBOM TP12
DP_VARY_BL NOBOM TP13
R91 1K/4
DP_STEREOSYNC R92 X_1K/4 NI
CPU_1P8
Type0 Only
For Debug2
Not support Type2
K14 PIN: 不管SPEC有沒有HDMI,都需PU HIGH,
這樣使用DVI轉HDMI Dongle,接上HDMI螢幕才會有聲音輸出
11-15
AMD_HDTPWR
AMD_HDTPWR
R122 1K/4 HDT_PWROK
R125 1K/4 HDT_RST_L
AMD_HDT1
CPU_VDDIO GND GND GND CPU_TRST_L CPU_DBRDY3 CPU_DBRDY2 CPU_DBRDY1 GND CPU_VDDIO
CPU_TCK CPU_TMS CPU_TDI CPU_TDO CPU_PWROK_BUF CPU_RST_L_BUF CPU_DBRDY0 CPU_DBREQ_L CPU_PLLTEST0 CPU_PLLTEST1
APU_TCK APU_TMS APU_TDI APU_TDO HDT_PWROK HDT_RST_L APU_DBRDY DBREQ# APU_TEST19 APU_TEST18
H2X10SM-1.27PITCH NI
N31-2100170-S88
APU_TRST# R113 33R/4 TRST#
R131 10K/4 DBRDY3
R132 10K/4 DBRDY2
R133 10K/4 DBRDY1
C83 C0.01u16X/4
R127 22R/4 APU_DBREQ#
Stuff for first model
3VSB R120 4.7K/4 PWROK_LS Q23 HDT_PWROK
[6] PWROK R119 10K/4 PWROK_LS
NN-CMKT3904
3VSB R123 4.7K/4 RESET_L_LS Q24 HDT_RST_L
[6] RESET_L R126 10K/4 RESET_L_LS
NN-CMKT3904
IB=(AMD_HDTPWR-Vbe)/4.7k
(1.8-0.95)/4.7k=0.181mA
IC=(Vc-Vce)/10k
(1.8-0.2)/10k=0.16mA
B*Ib>Ic=10*0.181=1.81>0.16
IB=(Vb-Vbe)/10k
(1.75-0.95)/10k=0.08mA
IC=(Vc-Vce)/10k
(3.3-0.2)/10k=0.16mA
B*Ib>Ic=10*0.08=0.8>0.16
0126
ATX_5VSB
CPU_1P8
R384 47K/4
PN514 Vgs =0.5V~1.0V
AMD_HDTPWR_R
Q54 N-PM514BA
D03-514BA09-N03
TYPE1_CPU_SEL:
1:CPU_1P8_S5 (Type2,3)
0:CPU_1P8(Type0)
CPU_1P8_S5
Q55 P-PA002FMG
AMD_HDTPWR
[6,36,52,54,57] TYPE1_CPU_SEL
Q53 N-2N7002ET1G
D03-PA00209-N03
R369 X_0R/6
R368 X_0R/6
CPU_1P8_S5
CPU_1P8
AMD_HDTPWR
DeviceDB VIP + XinZhiZao 1 Year: www.devicedb.xyz/dev/subscriptions/
Schematic Cfg
Project
V
A
CFG-7B79-0A-X470-GAMING PRO
CFG-7B79-0A-X470-GAMING PLUS
MSI
MICRO-START INT'L CO.,LTD.
Title
AM4 DISPLAY/AUDIO
Size
Custom
Document Number
MS-7B79
Rev
1.1/2.1
Date: Tuesday, February 13, 2018
Sheet 5 of 72

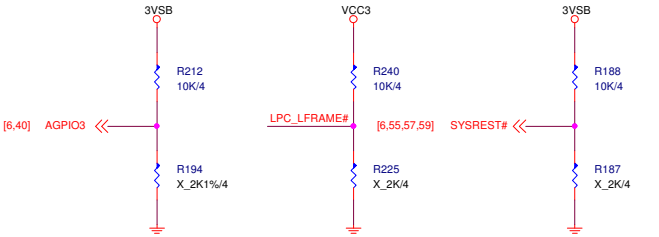




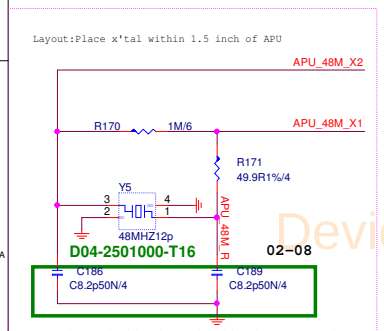
Strapping Options



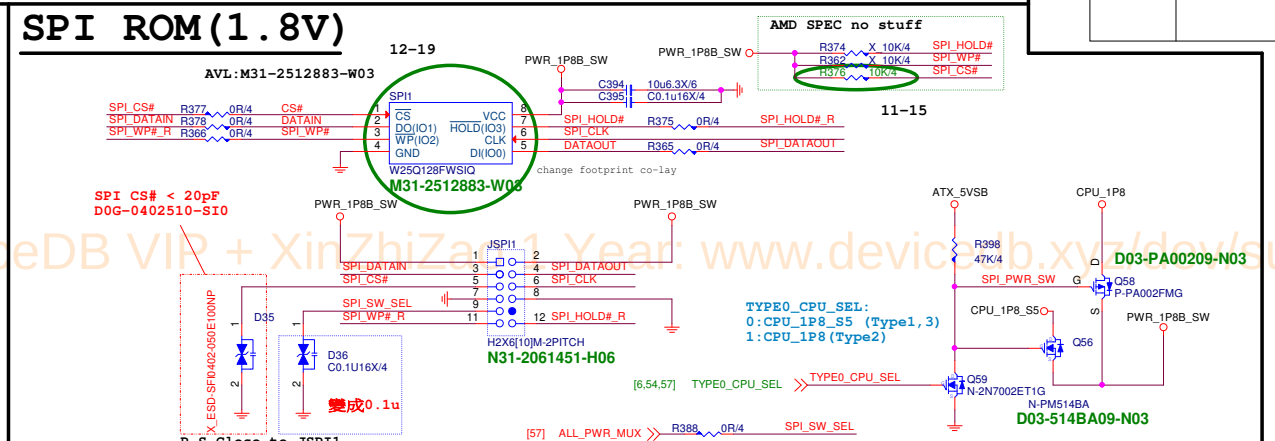
	LPCCLK1	SPI_CLK	LPCCLK0
PULL HIGH	Configured for Internal clock generator (Default)	Use 48Mhz crystal clock and generate both internal and external clocks (Default)	LPC device Boot Fail Timer Enabled
PULL LOW	Configured for External clock generator ?????	Use 100Mhz PCIE clock as reference clock and generate internal clocks only	LPC device Boot Fail Timer Disabled (Default)

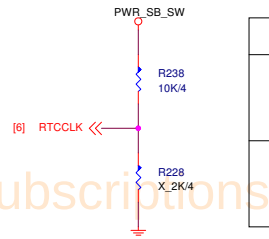


	AGPIO3	SIO_LFRAME	SYSREST#
PULL HIGH	Enhanced Reset logic (Default)	SPI ROM (Default)	Normal reset mode (Default)
PULL LOW	Traditional Reset logic	LPC ROM	short reset mode



SPI ROM(1.8V)

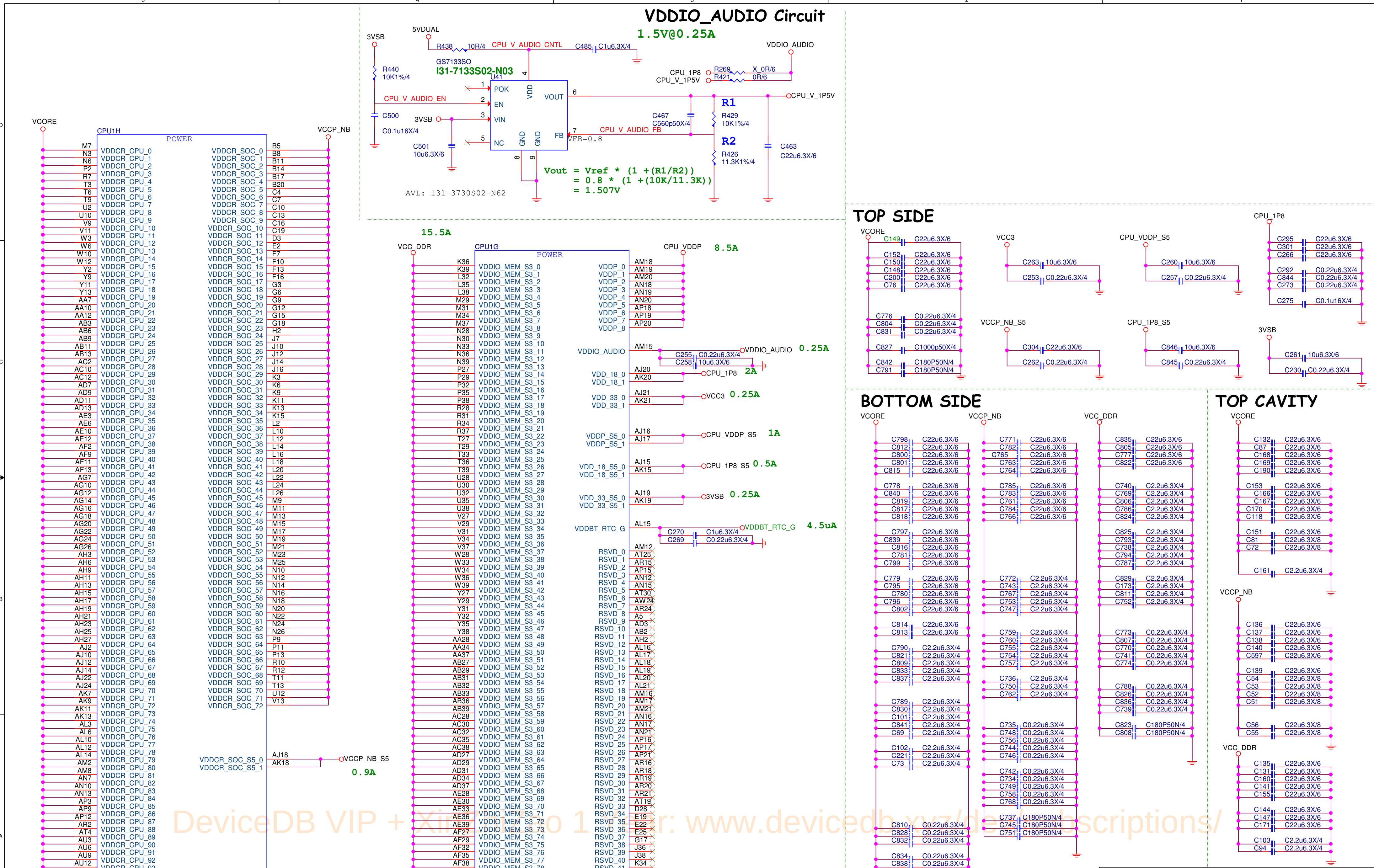




	RTCCLK
PULL HIGH	RTC Coin Battery is on board (Default)
PULL LOW	RTC Coin Battery is not on board

MSI MICRO-STAR INT'L CO.,LTD.
Link to the Future

Title	AM4 LPC/SPI/USB/CLK/STRAP	
Size: Custom	Document Number: MS-7B79	Rev: 1.1/2.1
Date: Tuesday, February 13, 2018	Sheet 7 of 72	



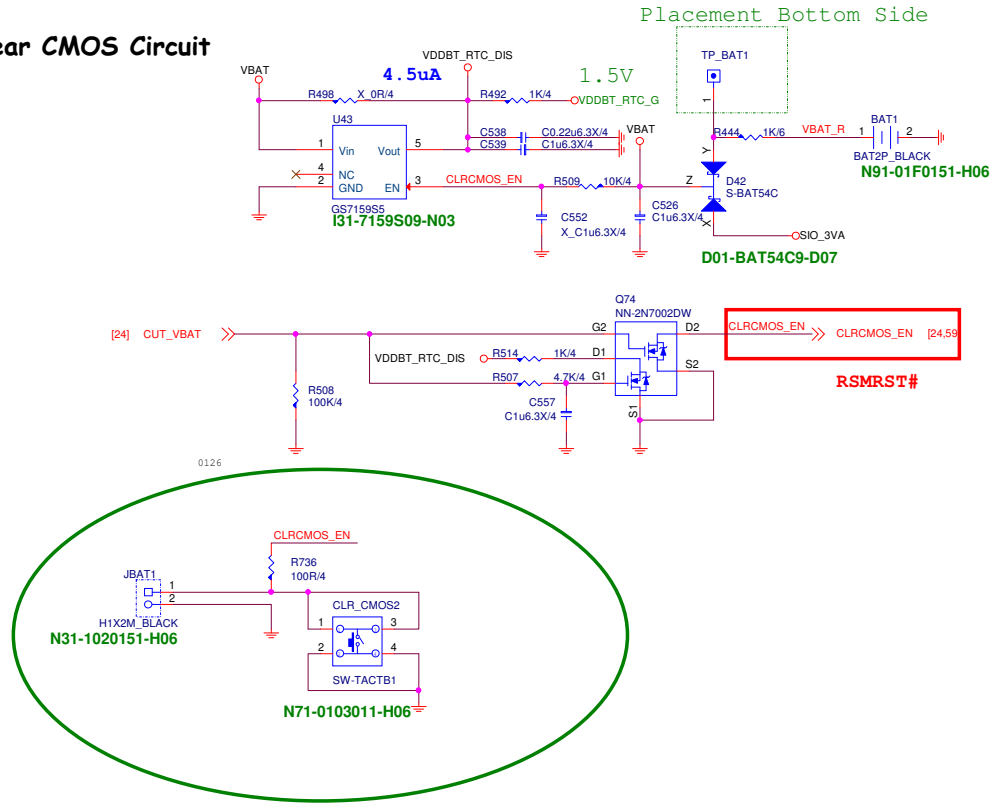
MICRO-START INT'L CO.,LTD.

Title: 08 AM4 Power/VDDIO_AUDIO Power

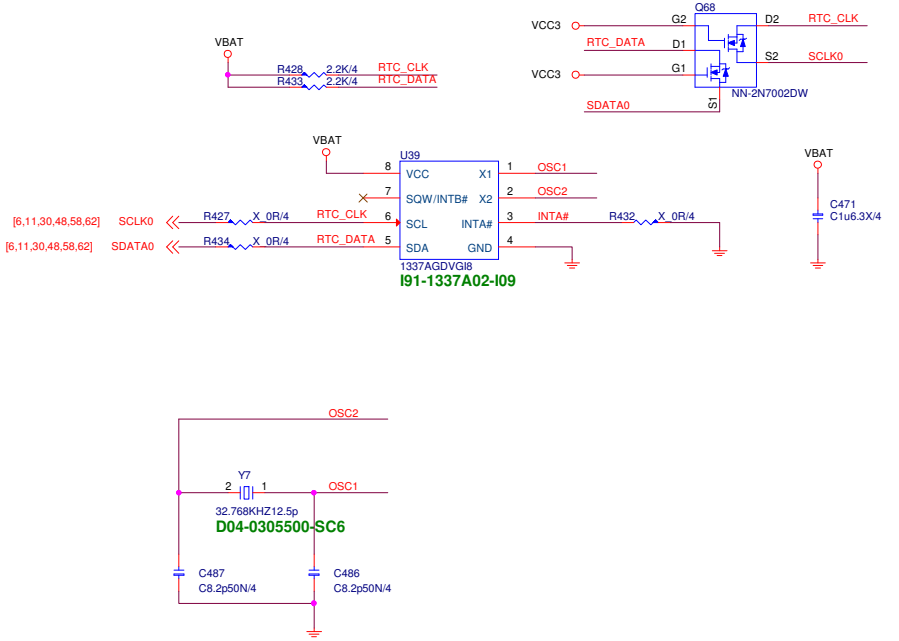
Size	Document Number	Rev
Custom	MS-7B79	1.1/2.1

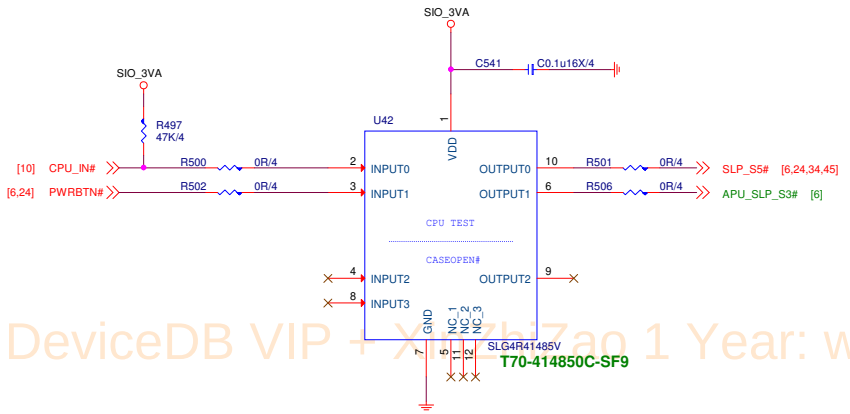
Date: Tuesday, February 13, 2018 | Sheet 8 of 72

RTC & Clear CMOS Circuit



RTC Backup

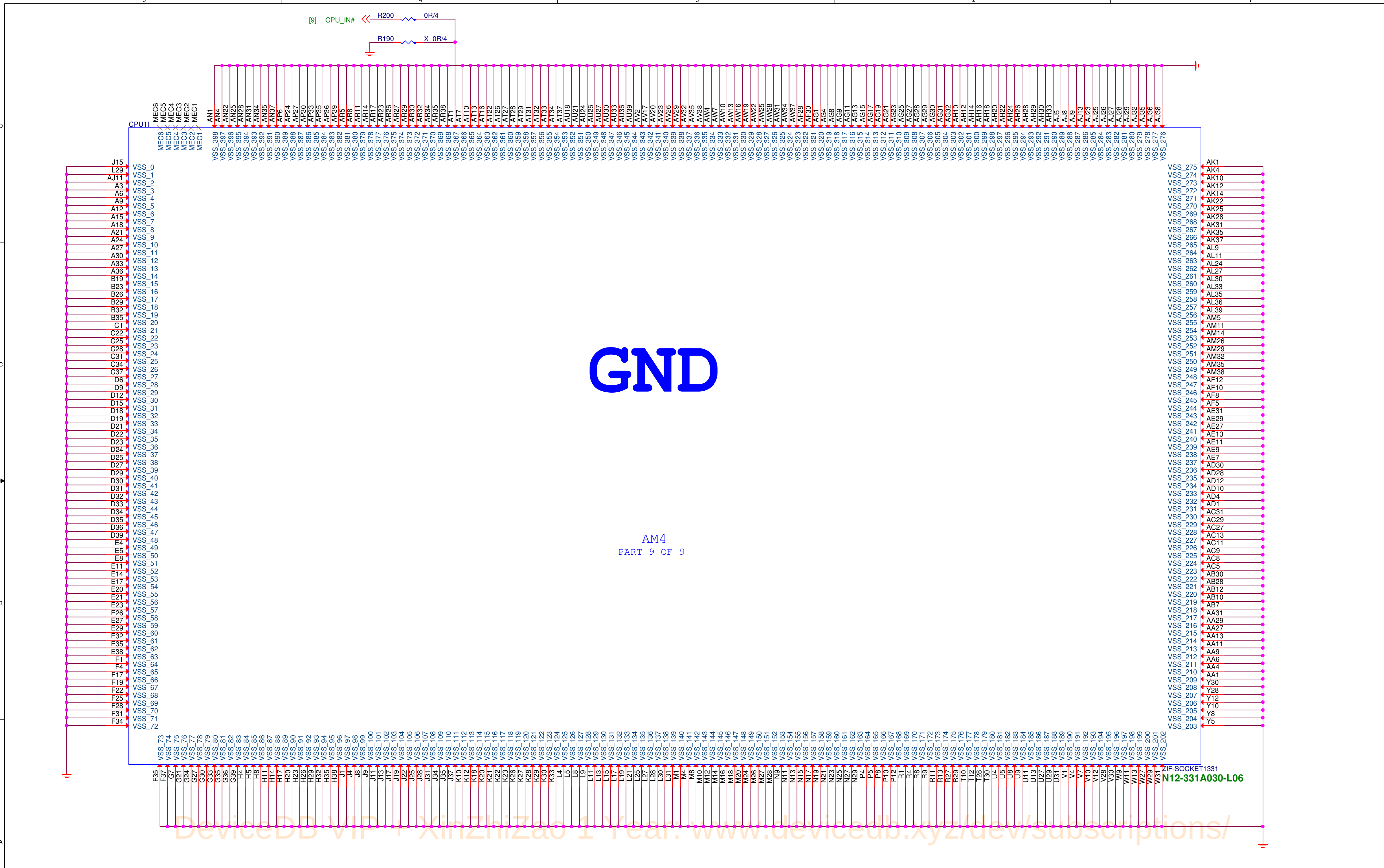




Function 2					
IN		OUT			
INPUT3 & lowswitch EN	INPUT4	OUTPUT2	OUTPUT3	VOUT	
0	0	0	~~1~~	1	Default
1	0	1	~~1~~	0 (discharge)	
~~0~~	~~1~~	~~1~~	~~0~~	~~0~~ (discharge)	
~~1~~	~~1~~	~~1~~	~~0~~	~~0~~ (discharge)	

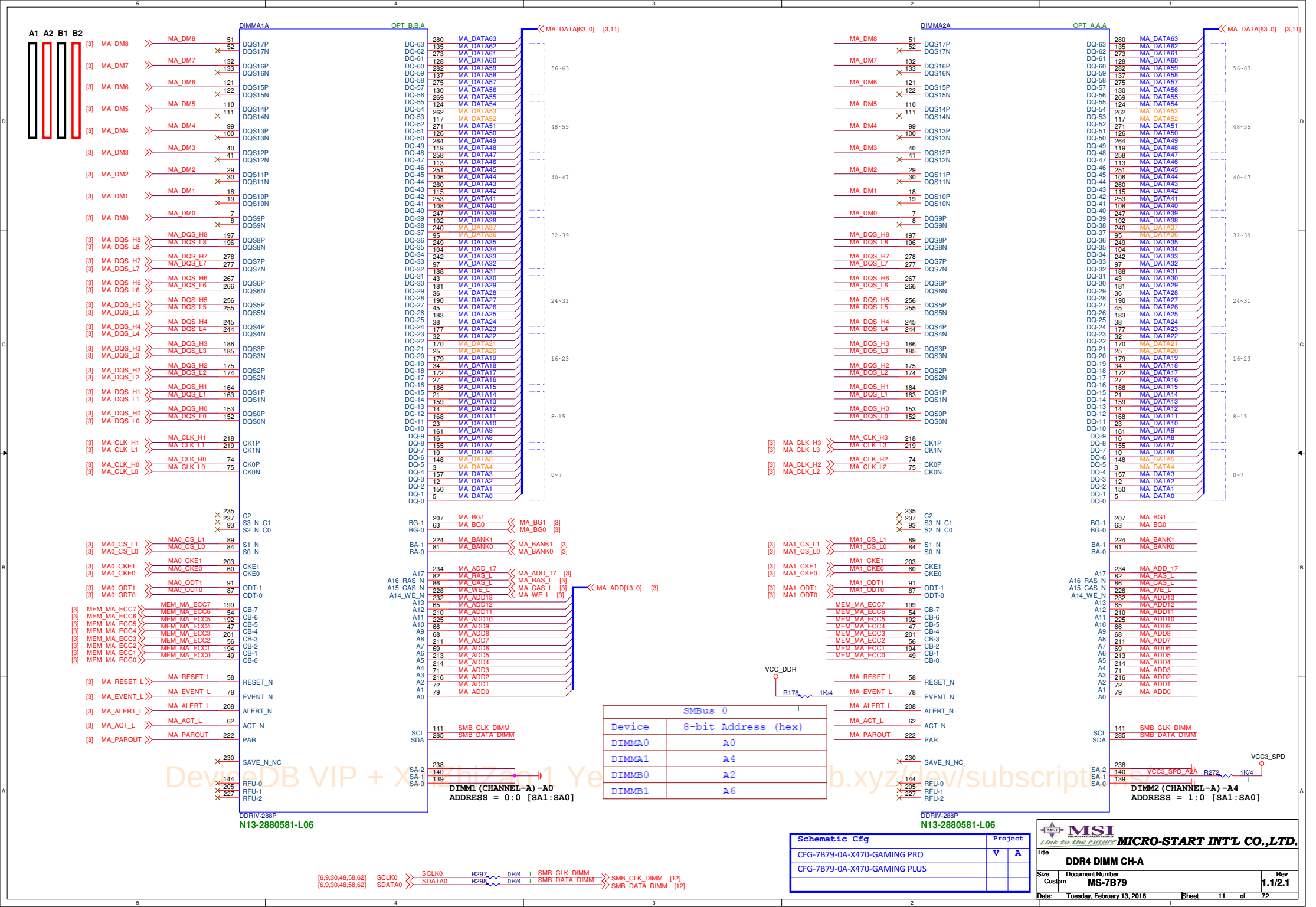
MSI MICRO-STAR INT'L CO.,LTD.
Link to the Future

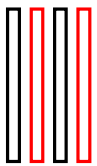
Title	RTC/Clear CMOS/RTC Power	
Size: Custom	Document Number: MS-7B79	Rev: 1.1/2.1
Date: Tuesday, February 13, 2018	Sheet 9 of 72	



MSI Link to the Future MICRO-START INT'L CO.,LTD.

Title	AM4 GND	
Size Custom	Document Number MS-7B79	Rev 1.1/2.1
Date: Tuesday, February 13, 2018	Sheet 10 of 72	





DIMMB1A

OPT_B,B,A

DIMMB2A

OPT_A,A,A

DDRIV-288P

N13-2880581-L06

DIMM3(CHANNEL-B)-A2
ADDRESS = 0:1 [SA1:SA0]

DIMM4(CHANNEL-B)-A6
ADDRESS = 1:1 [SA1:SA0]

Schematic Cfg	Project	
	V	A
CFG-7B79-0A-X470-GAMING PRO		
CFG-7B79-0A-X470-GAMING PLUS		

MICRO-START INT'L CO.,LTD.

Title: DDR4 DIMM CH-B

Size: Custom | Document Number: MS-7B79 | Rev: 1.1/2.1

Date: Tuesday, February 13, 2018 | Sheet 12 of 72

avl:D08-0301100-B07

F10
VCC3 1 2 VCC3_SPD
F-SPR-P260T
D08-0301000-P16

DIMM SLOT PN BY SPEC

DIMMA1C
DDRIV-288P
N13-2880581-L06

DIMMA2C
DDRIV-288P
N13-2880581-L06

DDR VREF

(place resistors close to DIMMs)

DIMM_CA_VREF_A
C12 C0.1u16X/4
VCC_DDR

DIMM_CA_VREF_A VCC_DDR
R24 1K1%/4
C10 C0.1u16X/4
C16 C1000p50X/4
C23 C0.1u16X/4
R29 1K1%/4

VCC3_SPD C299 C0.1u16X/4
DIMM_CA_VREF_A C34 C2.2u6.3X/4 C42 C0.1u16X/4
VTT_DDR C179 C0.1u16X/4
VPP25 C314 C0.1u16X/4 C310 C0.1u16X/4

VCC_DDR C96 C175 C143 C207 C126 C192 C199 C104 C1u6.3X/6 C0.1u16X/4

VCC3_SPD C296 C0.1u16X/4
DIMM_CA_VREF_A C41 C33 C2.2u6.3X/4 C0.1u16X/4
VTT_DDR C157 C0.1u16X/4
VPP25 C323 C325 C0.1u16X/4

VCC_DDR C164 C109 C110 C154 C1u6.3X/6 C134 C121 C129 C124 C0.1u16X/4

[60] DIMM1_HWDETECT
D6 ESD-AOZ8831DT
11-22
D0G-35B240C-A68

DIMMA1B
DDRIV-288P
N13-2880581-L06

[60] DIMM2_HWDETECT
D8 ESD-AOZ8831DT
11-22
D0G-35B240C-A68

DIMMA2B
DDRIV-288P
N13-2880581-L06

MSI MICRO-STAR INT'L CO.,LTD.
Link to the Future

Title	DDR4-POWER/GND-1	
Size: Custom	Document Number: MS-7B79	Rev: 1.1/2.1
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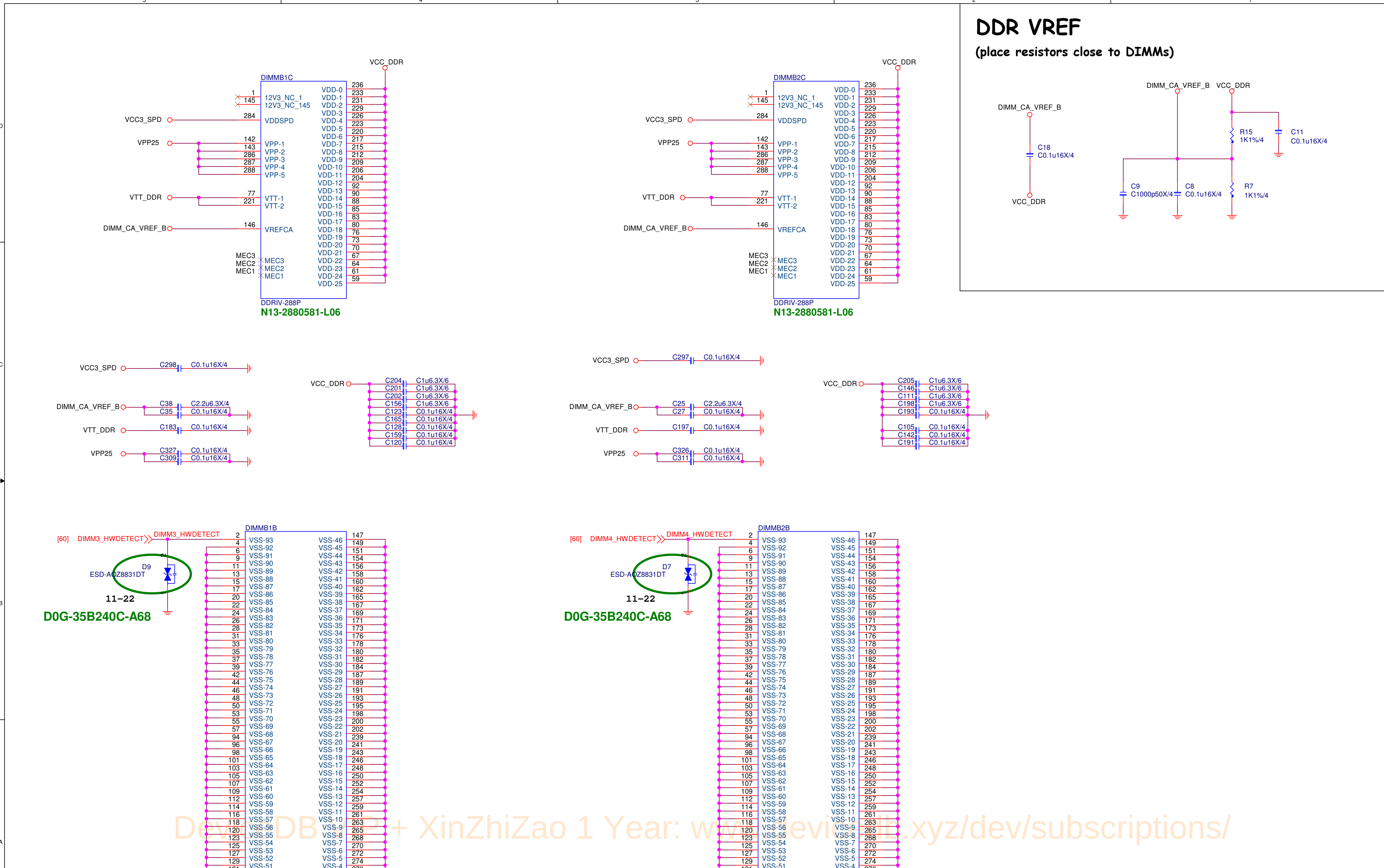
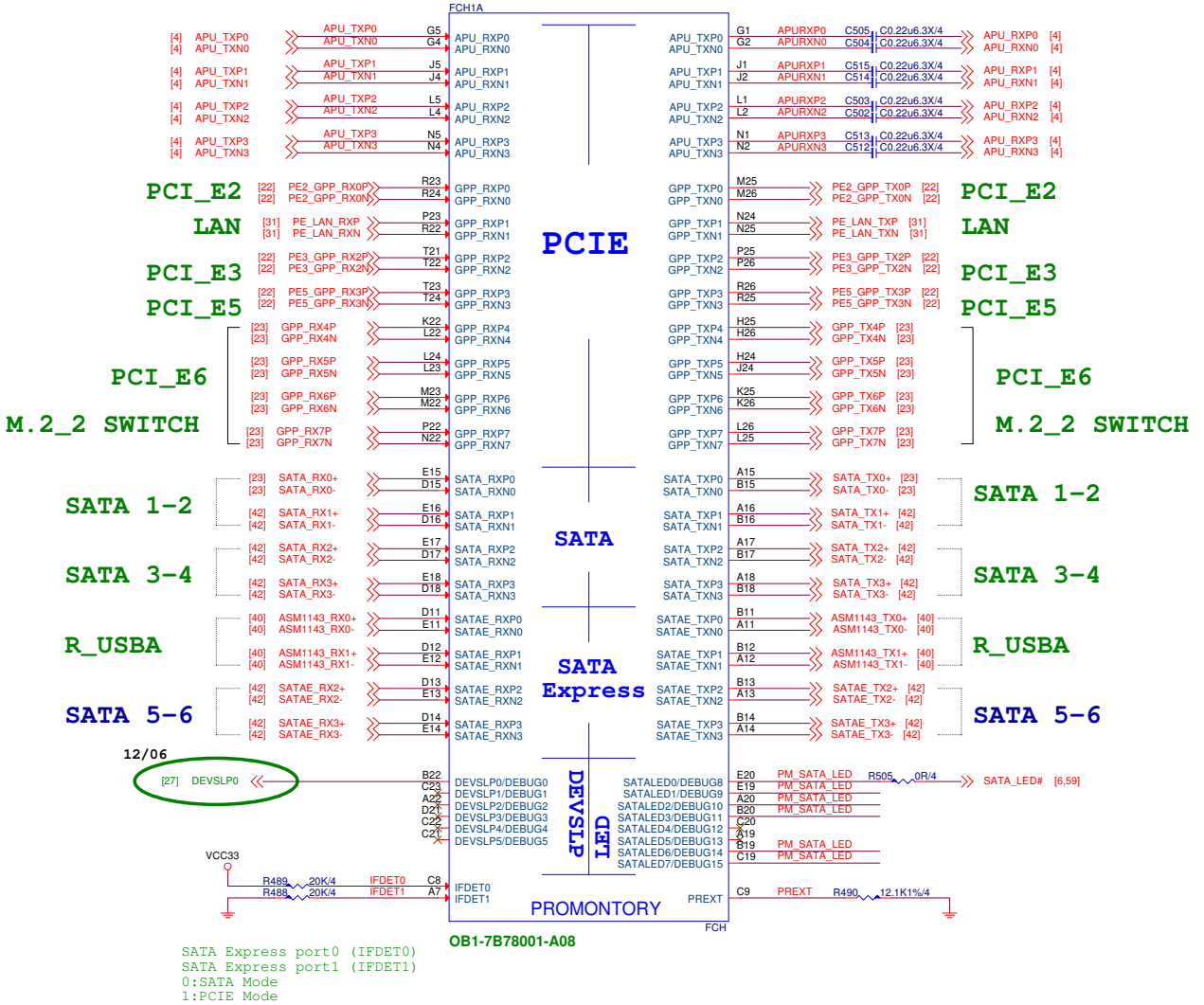


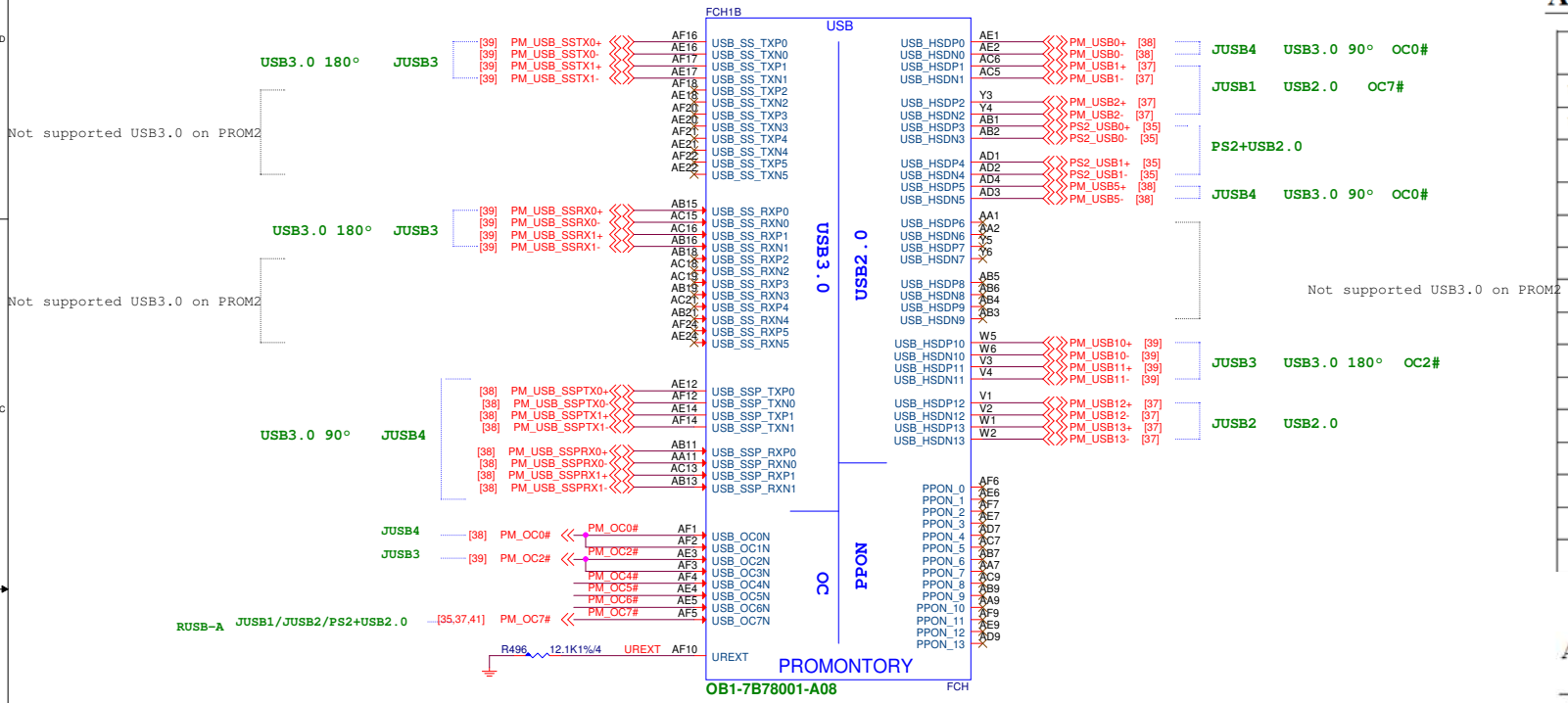
MSI Link to the Future MICRO-START INT'L CO.,LTD.

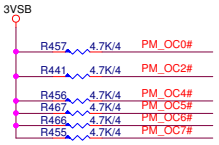
Title	DDR4-POWER/GND-2	
Size: Custom	Document Number: MS-7B79	Rev: 1.1/2.1
Date: Tuesday, February 13, 2018	Sheet 14 of 72	



MSI MICRO-STAR INT'L CO.,LTD.
Link to the Future

Title: Promontory-PCIE/SATA/SATAE		
Size: Custom	Document Number: MS-7B79	Rev: 1.1/2.1
Date: Tuesday, February 13, 2018	Sheet 15 of 72	





Appendix D USB Port to OC Pin Mapping

USB3.1	USB2.0	USB_OC
USB_SSP_TX/RXP/N[0]	USB_HSDP/N[5]	USB_OC0N
USB_SSP_TX/RXP/N[1]	USB_HSDP/N[0]	USB_OC1N
USB3.0	**USB2.0**	**USB_OC**
USB_SS_TX/RXP/N[0]	USB_HSDP/N[10]	USB_OC2N
USB_SS_TX/RXP/N[1]	USB_HSDP/N[11]	USB_OC3N
USB_SS_TX/RXP/N[2]	USB_HSDP/N[6]	USB_OC4N
USB_SS_TX/RXP/N[3]	USB_HSDP/N[7]	USB_OC5N
USB_SS_TX/RXP/N[4]	USB_HSDP/N[8]	USB_OC6N
USB_SS_TX/RXP/N[5]	USB_HSDP/N[9]	USB_OC7N
	USB_HSDP/N[1]	USB_OC7N
	USB_HSDP/N[2]	USB_OC7N
	USB_HSDP/N[3]	USB_OC7N
	USB_HSDP/N[4]	USB_OC7N
	USB_HSDP/N[12]	USB_OC7N
	USB_HSDP/N[13]	USB_OC7N

Appendix C Port Mapping for Different Bus Models

BUS Model	USB			
	3.1 Gen2 10 Gbps	3.1 Gen1 5 Gbps	2.0	Debug Port
PROM4	USB_SSP Port0~1	USB_SS Port 0~5	USB_HSD Port0~13	USB_SSP Port0
PROM2	USB_SSP Port0~1	USB_SS Port 0~1	USB_HSD Port0~5 USB_HSD Port10~13	USB_SSP Port0
PROM1	USB_SSP Port0	USB_SS Port0 USB_SSP Port1	USB_HSD Port0~5 USB_HSD Port10, 12~13	USB_SSP Port0

BUS Model	SATA 3.0	SATA Express	PCI Express® Gen2 GPP	PCI Express® CLK
PROM4	SATA port0~3	SATAE port0~3	GPP lane0~7	CLK0~7
PROM2	SATA port0~1	SATAE port0~1	GPP lane0~1 GPP lane4~7	CLK0~1 CLK4~7
PROM1	SATA port0~1	SATAE port0~1	GPP lane4~7	CLK4~7

CLK2.3不能用
CLK1-3不能用

MSI MICRO-STAR INT'L CO.,LTD.
Link to the Future

Title	Promontory-USB/OC	
Size: Custom	Document Number: MS-7B79	Rev: 1.1/2.1
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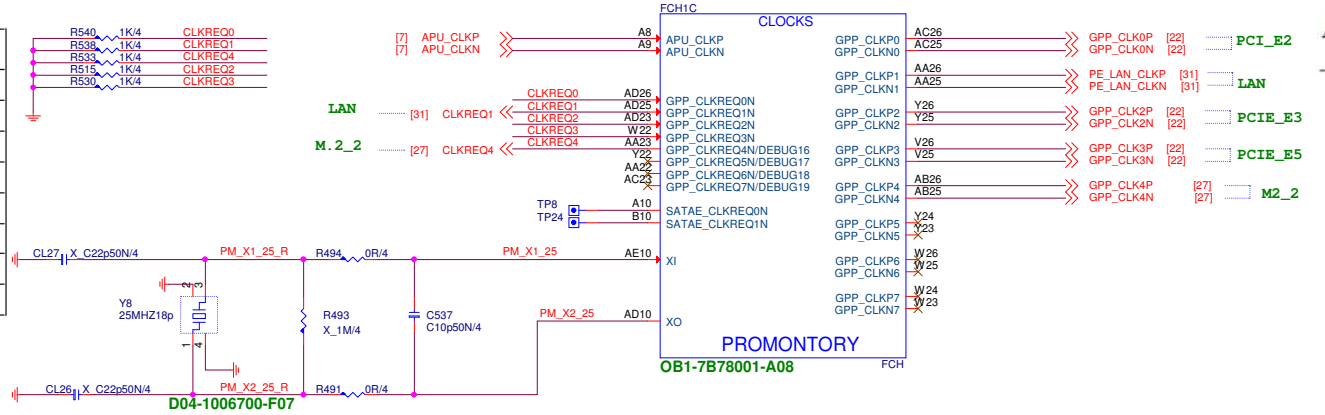
GPP Clock	CLKREQ#
GPP_CLKP/N[0]	GPP_CLKREQ0N
GPP_CLKP/N[1]	GPP_CLKREQ1N
GPP_CLKP/N[2]	GPP_CLKREQ2N
GPP_CLKP/N[3]	GPP_CLKREQ3N
GPP_CLKP/N[4]	GPP_CLKREQ4N
GPP_CLKP/N[5]	GPP_CLKREQ5N
GPP_CLKP/N[6]	GPP_CLKREQ6N
GPP_CLKP/N[7]	GPP_CLKREQ7N

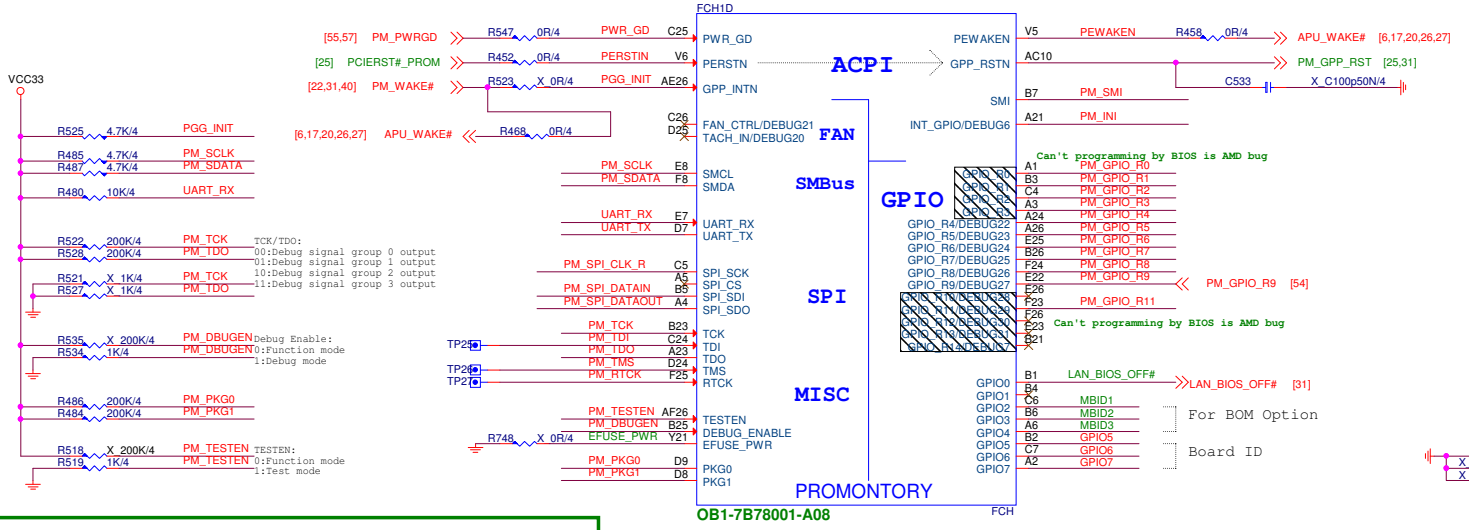


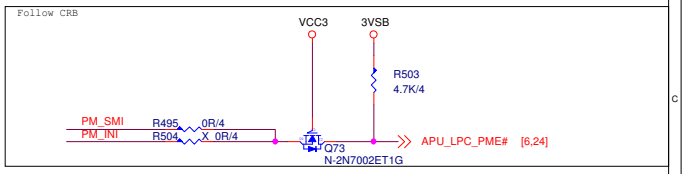
Appendix C Port Mapping for Different Bus Models

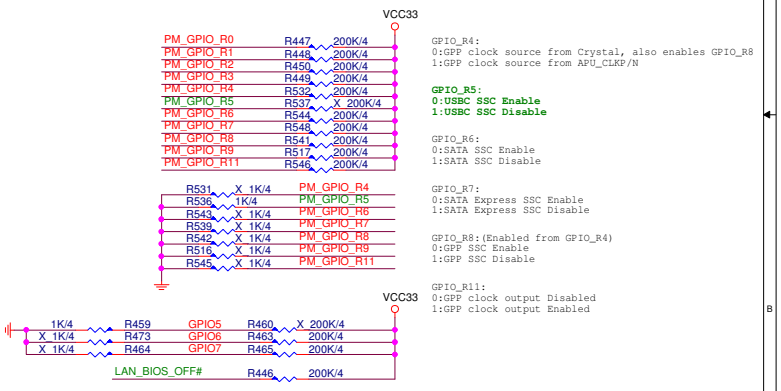
BUS Model	USB			
	3.1 Gen2 10 Gbps	3.1 Gen1 5 Gbps	2.0	Debug Port
PROM4	USB_SSP Port0~1	USB_SS Port 0~3	USB_HSD Port0~13	USB_SSP Port0
PROM2	USB_SSP Port0~1	USB_SS Port 0~1	USB_HSD Port0~5 USB_HSD Port10~13	USB_SSP Port0
PROM1	USB_SSP Port0	USB_SS Port0 USB_SSP Port1	USB_HSD Port0~5 USB_HSD Port10, 12~13	USB_SSP Port0

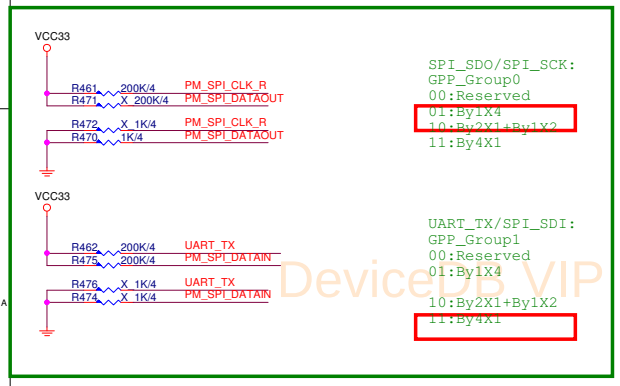
BUS Model	SATA 3.0	SATA Express	PCI Express® Gen2 GPP	PCI Express® CLK
PROM4	SATA port0~3	SATAE port0~3	GPP lane0~7	CLK0~7
PROM2	SATA port0~1	SATAE port0~1	GPP lane0~1 GPP lane4~7	CLK0~1 CLK4~7
PROM1	SATA port0~1	SATAE port0~1	GPP lane4~7	CLK4~7

CLK2.3不能用
CLK1-3不能用

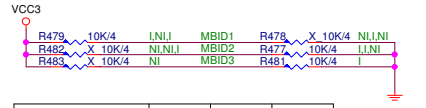








BOM OPTION



	MBID1	MBID2	MBID3
X470-GAMING Pro 601-7B79-A01	1	0	0
X470-GAMING PLUS 601-7B79	0	0	0
	1	1	0

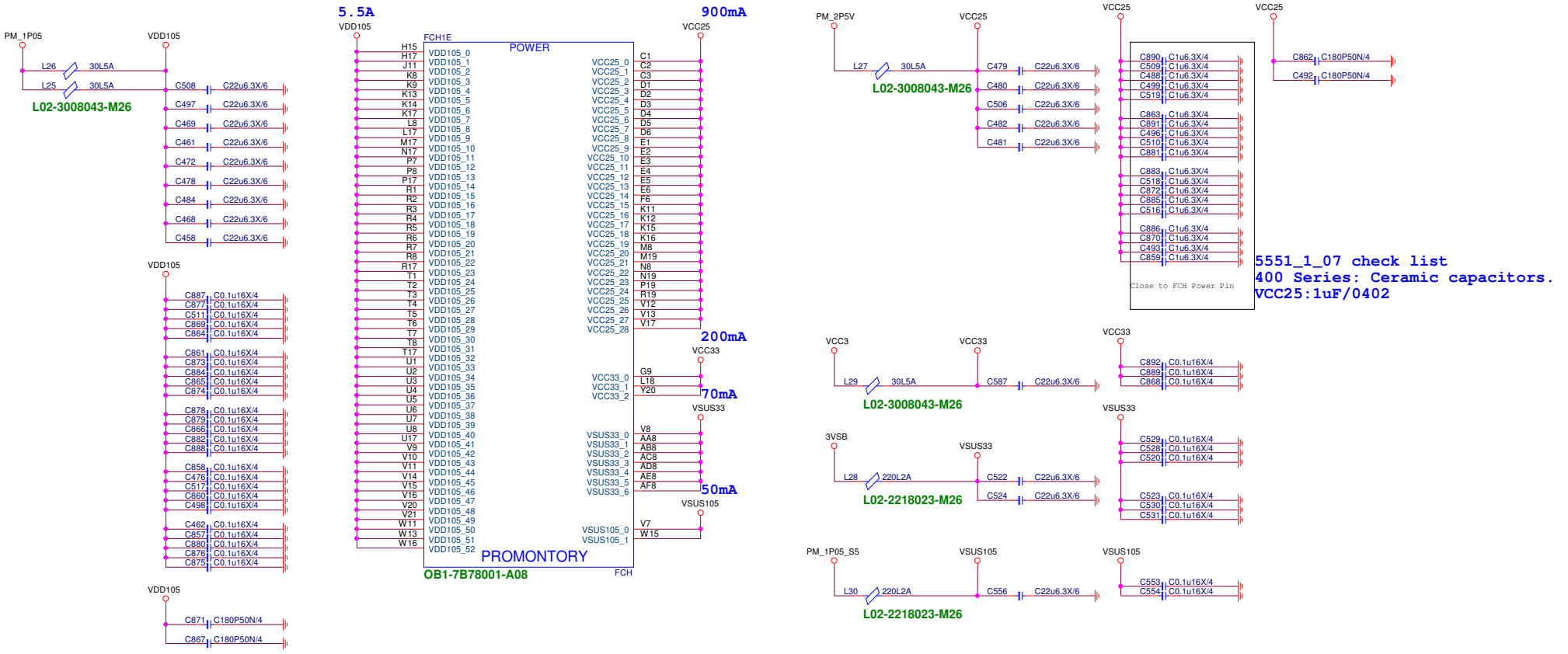
Schematic Cfg	Project	
CFG-7B79-0A-X470-GAMING PRO	V	A
CFG-7B79-0A-X470-GAMING PLUS		

MSI MICRO-STAR INTERNATIONAL Link to the Future MICRO-START INT'L CO.,LTD.

Title: Promontory-CLK/ACPI/GPIO

Size: Custom | Document Number: MS-7B79 | Rev: 1.1/2.1

Date: Tuesday, February 13, 2018 | Sheet 17 of 72



MICRO-START INT'L CO.,LTD.

Title: Promontory-Power

Size	Document Number	Rev
Custom	MS-7B79	1.1/2.1

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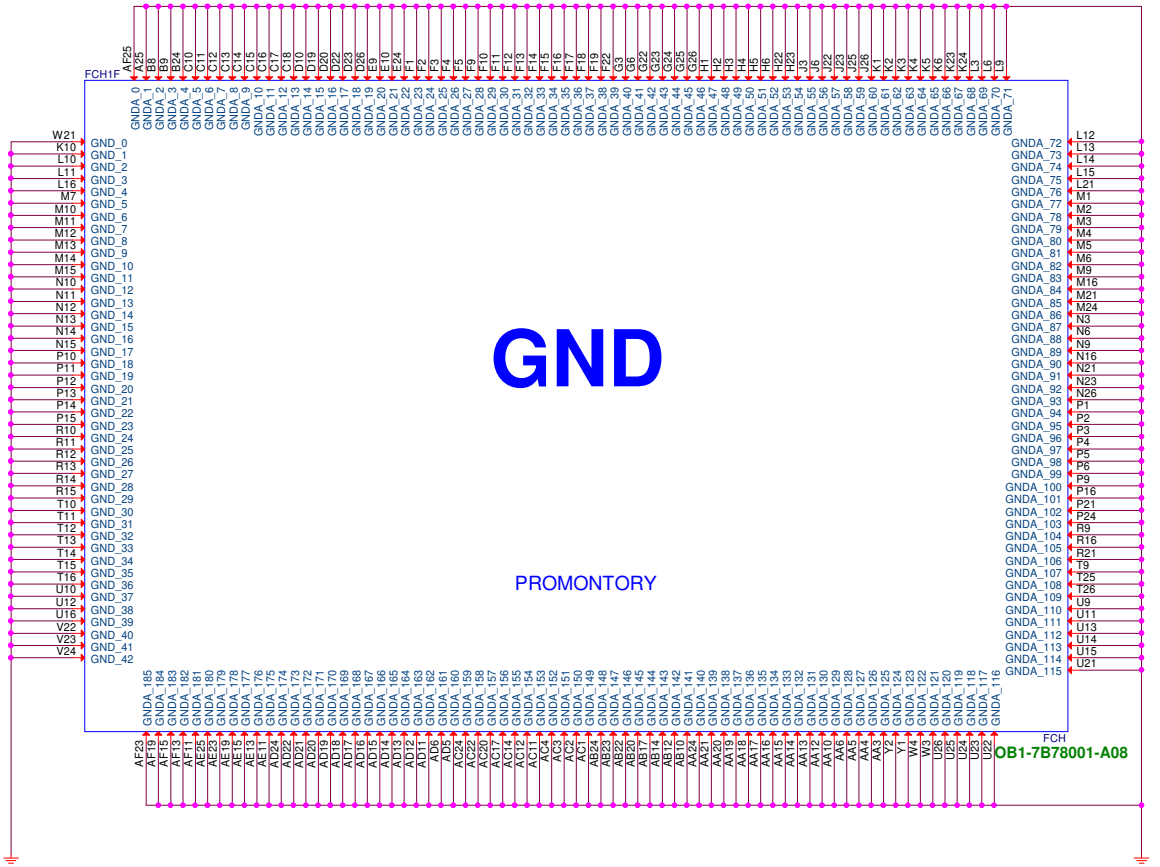

MSI MICRO-STAR INT'L CO.,LTD.
Link to the Future

Title: Promontory-GND		
Size: Custom	Document Number: MS-7B79	Rev: 1.1/2.1
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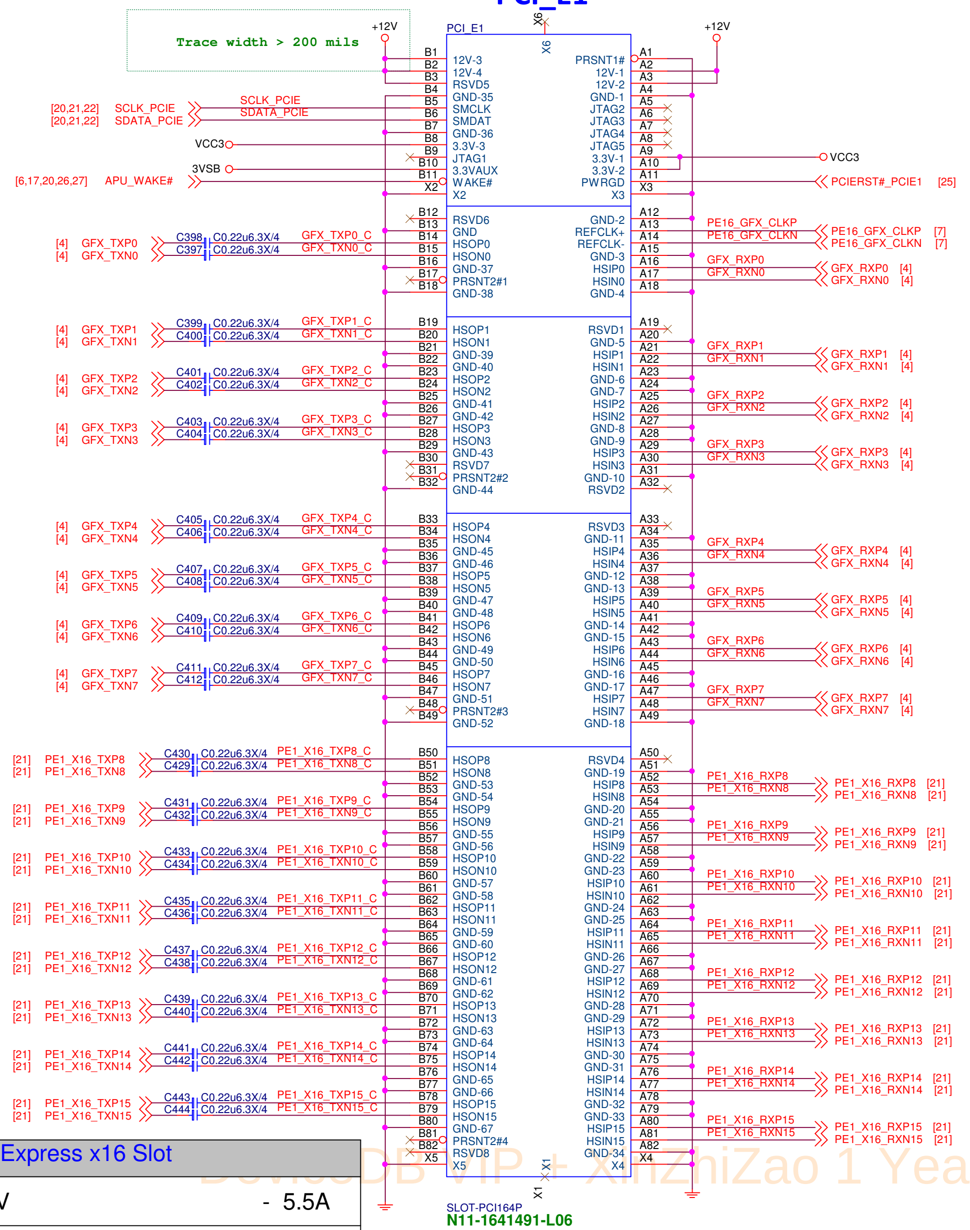
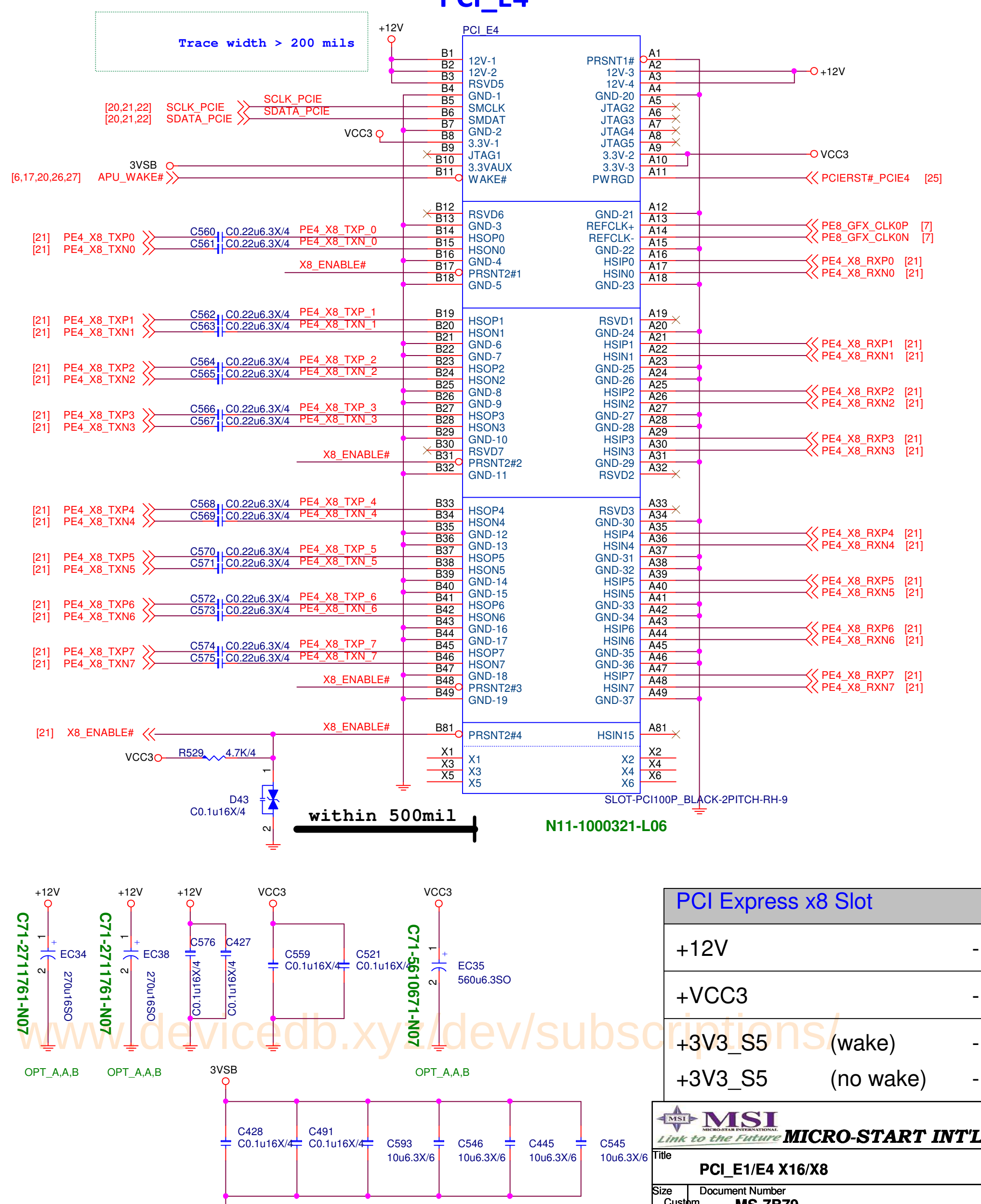
PCI EXPRESS x16 Slot



PCI EXPRESS x8 Slot



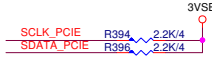
PCI Express x16 Slot		
+12V		- 5.5A
+VCC3		- 3A
+3V3_S5	(wake)	- 375mA
+3V3_S5	(no wake)	- 20mA

PCI Express x8 Slot		
+12V		- 5.5A
+VCC3		- 3A
+3V3_S5	(wake)	- 375mA
+3V3_S5	(no wake)	- 20mA

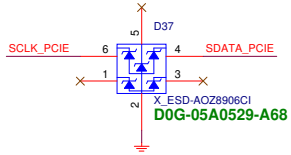
PCI EXPRESS Switch

For PCIE_2 & PCIE_4 (X16/ X8)

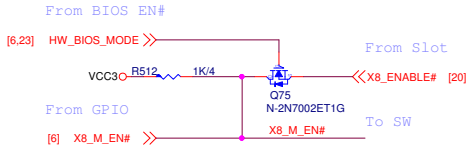
SMBus separate circuit



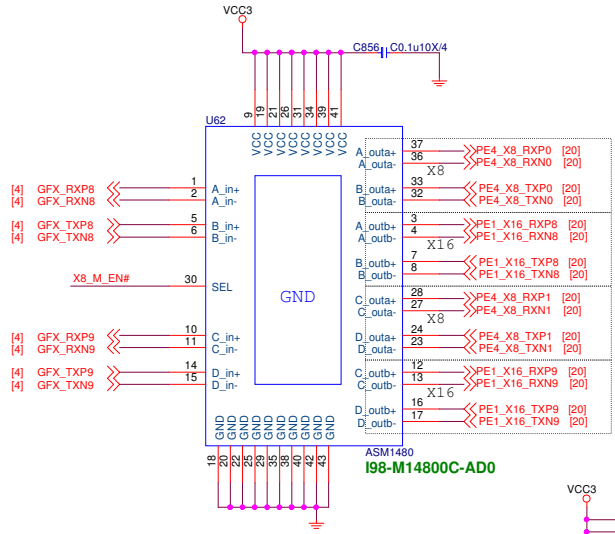
SMB_SEL
GPIO Default High

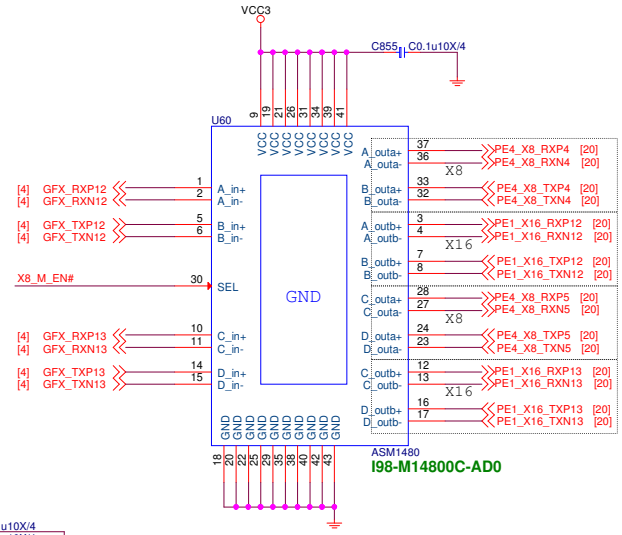


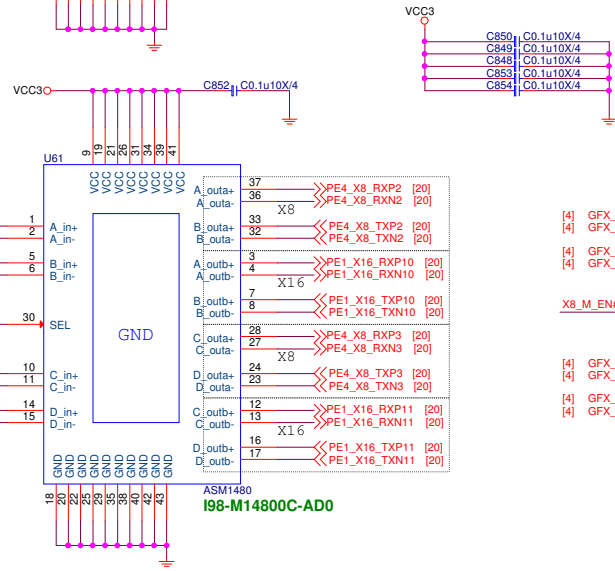
PCIE Lanes control circuit

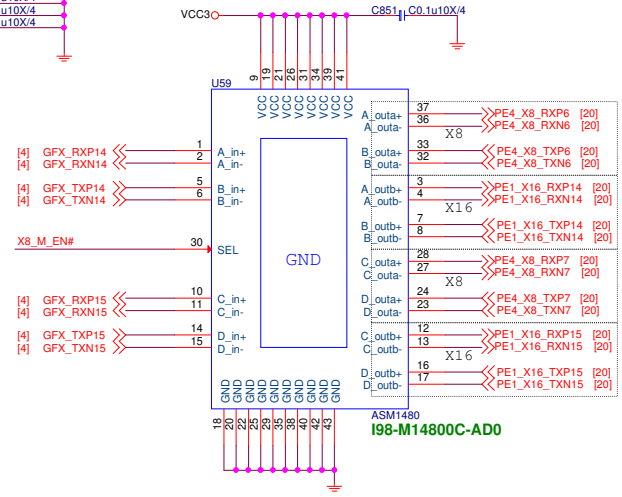


	HW_BIOS_MODE	X8_M_EN#
Auto	1	1
Manual x16	0	1
Manual x8, x8	0	0









SEL	Function
L	N_in +/1 to N_outa+/-
H	N_in +/1 to N_outb+/-

MICRO-STAR INT'L CO.,LTD	
PCIE Switch X16 / X8	
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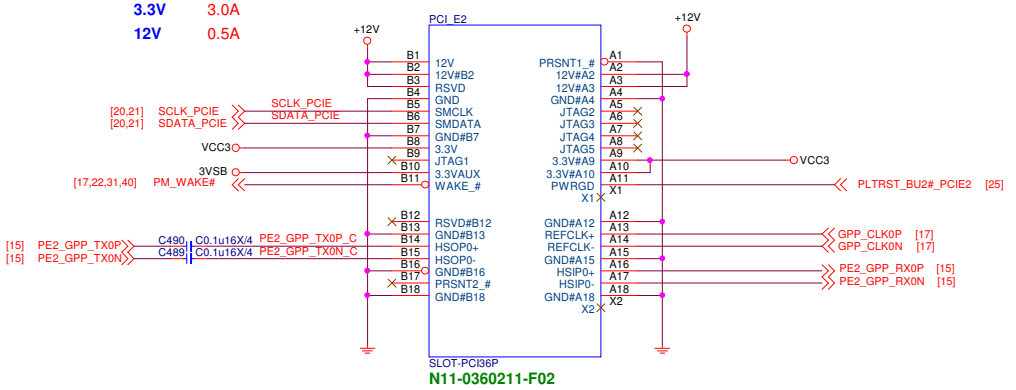
PCIEX1 12V 0.5A
3.3V weak 375mA

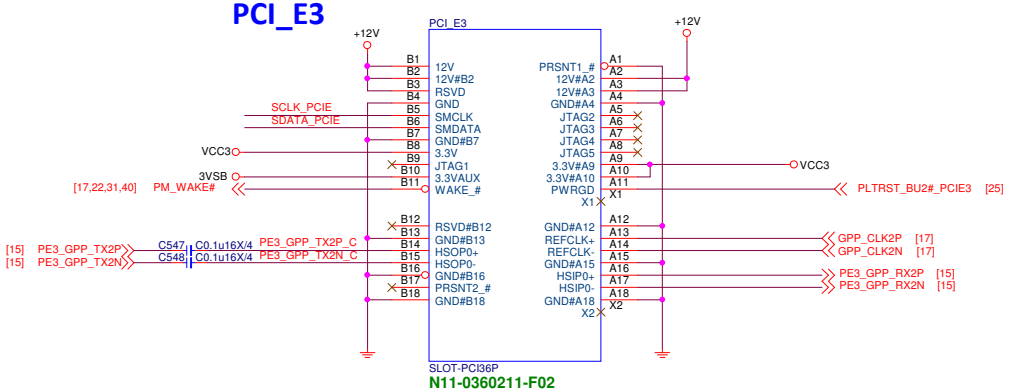
PCI_E2

3.3V 3.0A
12V 0.5A



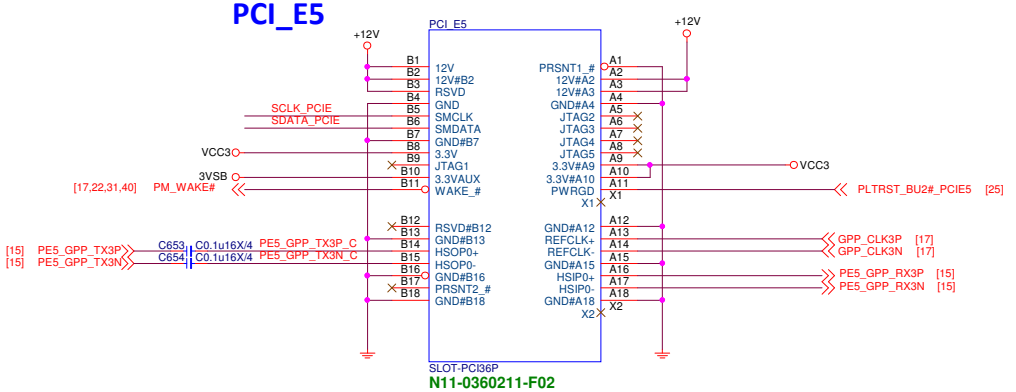
N11-0360211-F02

PCI_E3



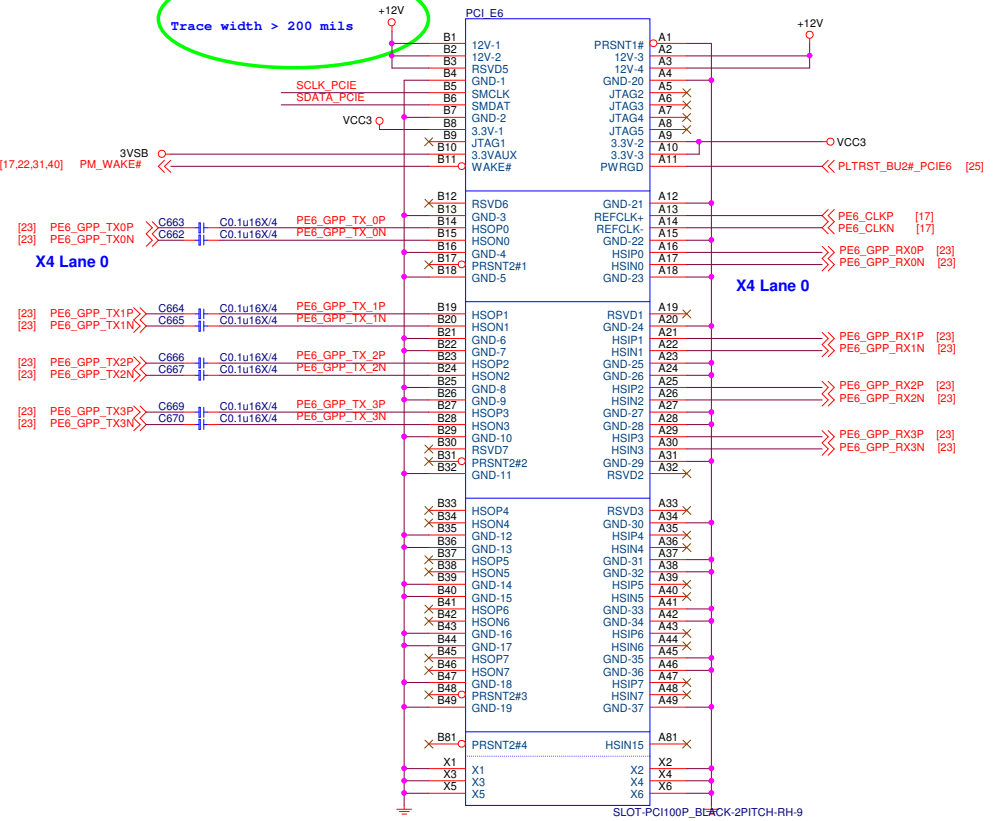
N11-0360211-F02

PCI_E5

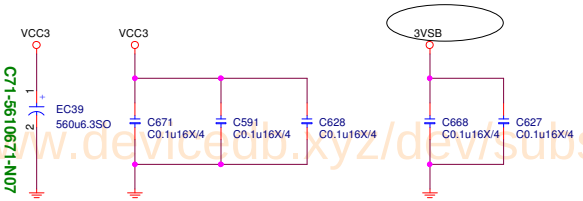


N11-0360211-F02

Trace width > 200 mils



N11-1000321-L06



OPT_A,A,B

PCI Express x4 Slot *1		
+12V		- 2.1A
+VCC3		- 3A
+3V3_S5	(wake)	- 375mA
+3V3_S5	(no wake)	- 20mA
PCI Express x1 Slot *3		
+12V		- 1.5 A
+VCC3		- 9A
+3V3_S5	(wake)	- 1125mA
+3V3_S5	(no wake)	- 60mA

Schematic Cfg	Project	
	V	A
CFG-7B79-0A-X470-GAMING PRO		
CFG-7B79-0A-X470-GAMING PLUS		

MSI MICRO-STAR INT'L CO.,LTD.

Title: PCI_E2_E3_E5/E4 X1/X4

Size: Custom | Document Number: MS-7B79 | Rev: 1.1/2.1

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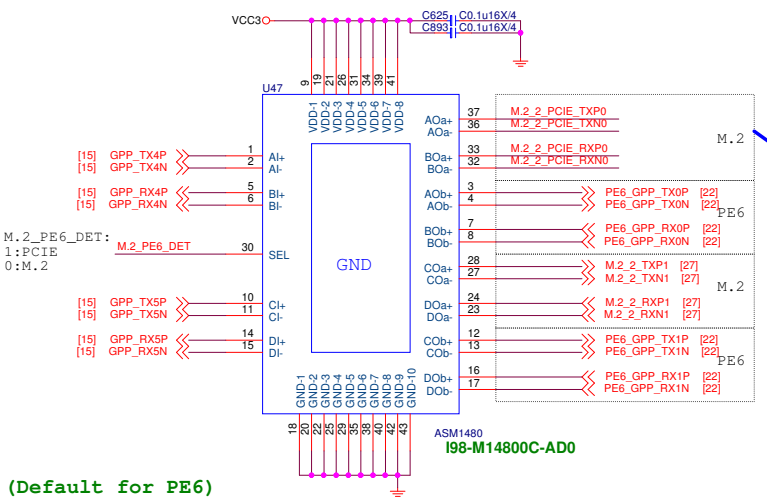
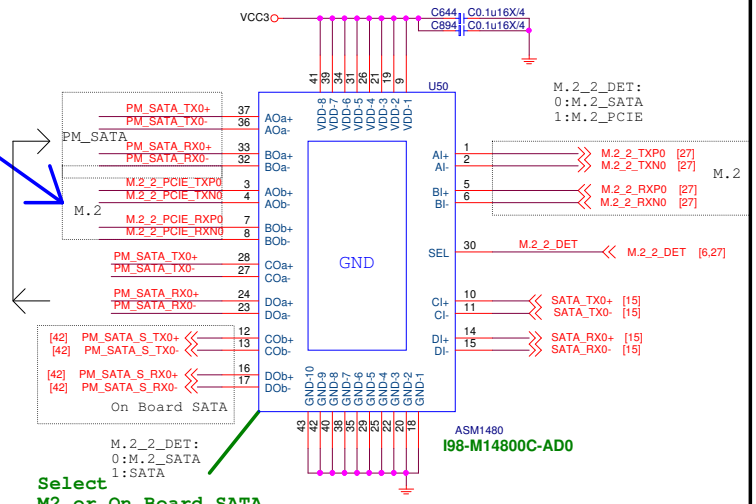
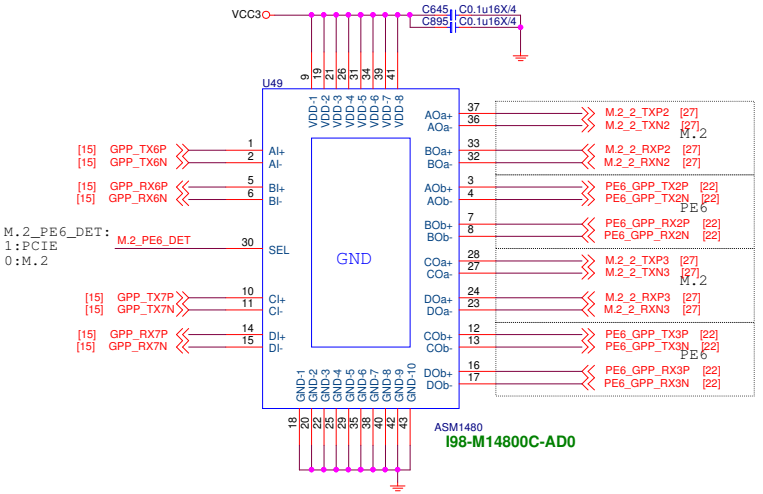
PCI_E6 and M2_2 and SATA1 Switch

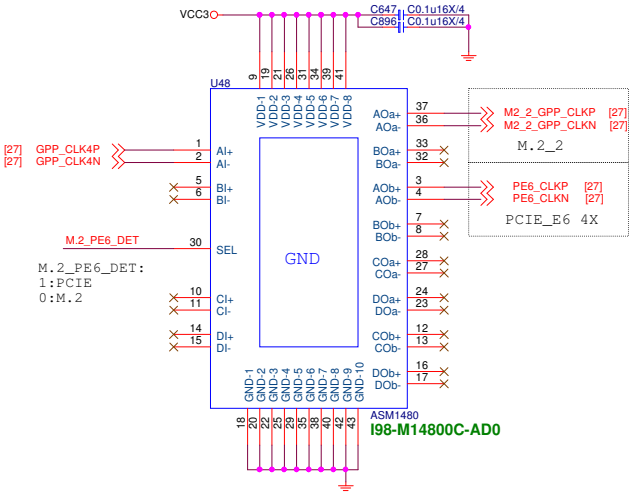


(Default for PE6)

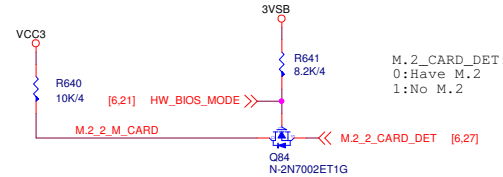


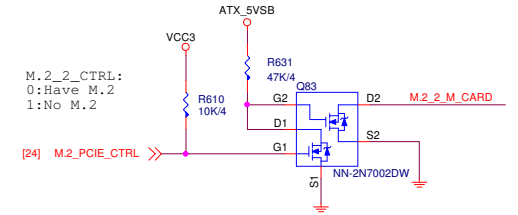
Select
M2 or On Board SATA
From on board SATA when M.2 use SATA device

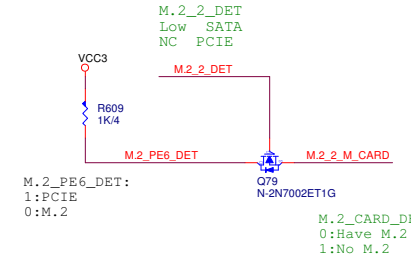




	AUTO Mode	PCIE_x4	M.2(PCIE)	M.2(SATA)	SATA CON
HW_BIOS_MODE	1	0	0	0	
M.2_PCIE_CTRL	0	1	0	0	
M.2_2_CARD_DET		1	0	0	1
M.2_DET			1	0	1







SEL	Function
L	N_in +/1 to N_outa+/-
H	N_in +/1 to N_outb+/-

MSI MICRO-STAR INT'L CO.,LTD.
Link to the Future

Title	PCIE Switch X4 / M2_2	
Size: Custom	Document Number: MS-7B79	Rev: 1.1/2.1
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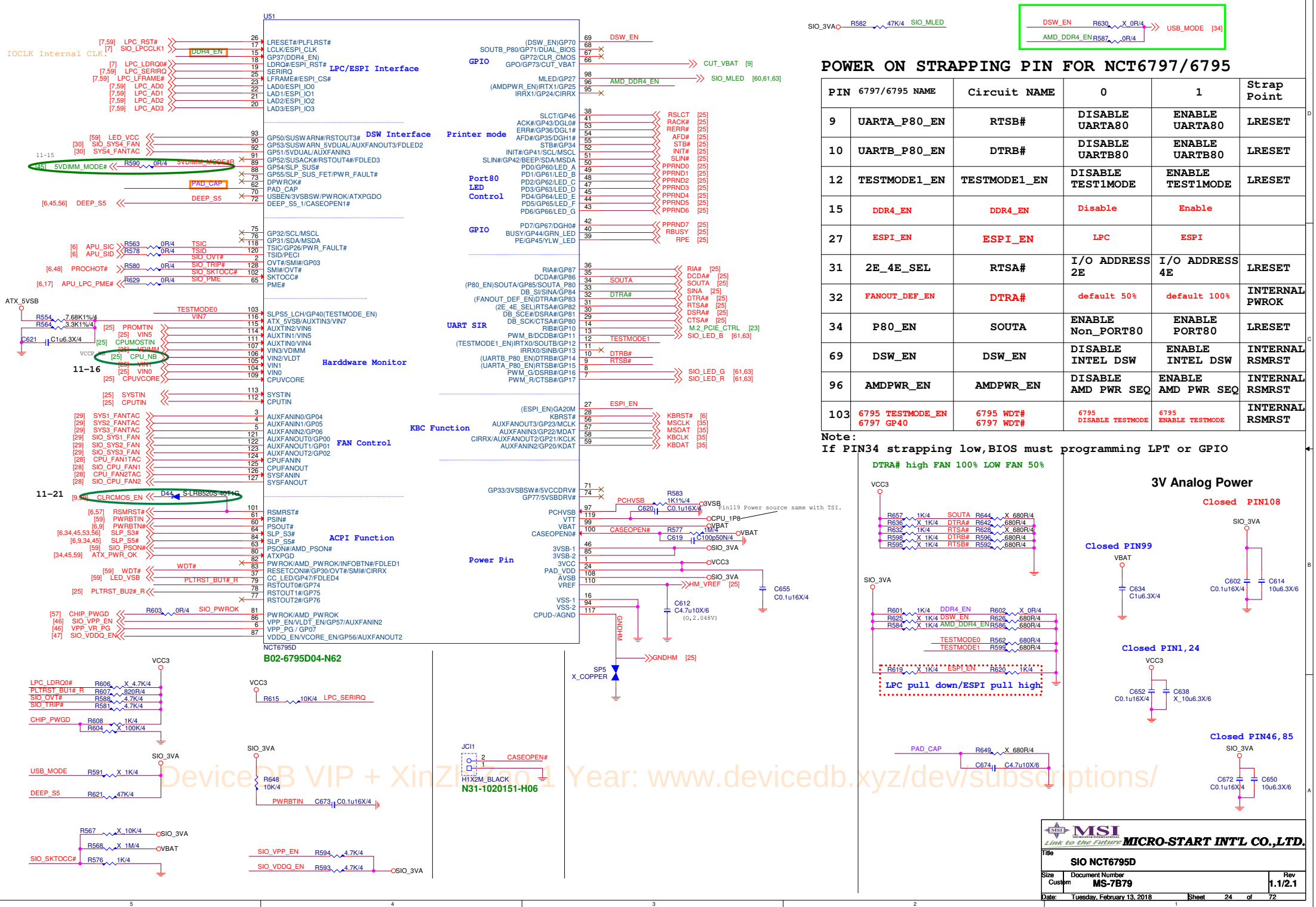

POWER ON STRAPPING PIN FOR NCT6797/6795

PIN	6797/6795 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	TESTMODE1_EN	TESTMODE1_EN	DISABLE TEST1MODE	ENABLE TEST1MODE	LRESET
15	DDR4_EN	DDR4_EN	Disable	Enable	
27	ESPI_EN	ESPI_EN	LPC	ESPI	
31	2E_4E_SEL	RTSA#	I/O ADDRESS 2E	I/O ADDRESS 4E	LRESET
32	FANOUT_DEF_EN	DTRA#	default 50%	default 100%	INTERNAL PWROK
34	P80_EN	SOUTA	ENABLE Non_PORT80	ENABLE PORT80	LRESET
69	DSW_EN	DSW_EN	DISABLE INTEL DSW	ENABLE INTEL DSW	INTERNAL RSMRST
96	AMDPWR_EN	AMDPWR_EN	DISABLE AMD PWR SEQ	ENABLE AMD PWR SEQ	INTERNAL RSMRST
103	6795 TESTMODE_EN 6797 GP40	6795 WDT# 6797 WDT#	6795 DISABLE TESTMODE	6795 ENABLE TESTMODE	INTERNAL RSMRST

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

MICRO-START INT'L CO.,LTD.

Title	SIO NCT6795D	
Size: Custom	Document Number: MS-7B79	Rev: 1.1/2.1
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HW Monitor - Voltage

SIO HM Voltage over 2.048V will not detect

VCC_DDR — 10K1%/4 R551 — VDIMM [24]
R558 10K1%/4
C615 10u6.3X/6
CPU_DRAM

VCORE — R550 10K1%/4 — CPUVCORE [24]
R557 X_10K1%/4
C613 10u6.3X/6
CPU_CORE

+12V — R575 220K1%/4 — VIN0 [24]
R561 20K1%/4
C618 C0.1u16X/4

VCC5 — R553 12K1%/4 — VIN1 [24]
R560 3K1%/4
C617 C0.1u16X/4

Power Fault detect through VIN0,VIN1,VIN2

CPU_VDDP — R566 10K1%/4 — VIN5 [24]
C611 10u6.3X/6
CPU_VDDP

Inform BIOS disable VIN2 with Power Fault

VCCP_NB — R552 10K1%/4 — CPU_NB [24]
R559 X_10K1%/4
C616 10u6.3X/6
11-16
CPU_SOC

TEMP SENSOR

For CPU

R555 10K1%/4
RT6 10KT1%/4
C599 C2200p50X/4
HM_VREF [24,25]
CPUTIN [24]
GNDHM [24,25]

Under Socket

For System

Q76 P-MMBT3906LT1G
C598 C2200p50X/4
SYSTIN [24]
GNDHM

R556 10K1%/4
RT5 10KT1%/4
C600 C2200p50X/4
HM_VREF [24,25]
CPUMOSTIN [24]
GNDHM [24,25]

Close to CPU MOS

R565 10K1%/4
RT7 10KT1%/4
C622 C2200p50X/4
HM_VREF [24,25]
PROMTIN [24]
GNDHM [24,25]

RT3 under FCH1 BOTTOM

COM PORT

VCC3
R643 X_2.7K/4 SINA
R623 X_2.7K/4 CTSA#
R646 X_2.7K/4 RIA#
R645 X_2.7K/4 DCDA#
R624 X_2.7K/4 DSRA#
NO USE UART PORT1

VCC5
C651 X_C0.1u16X/4
U52 GD75232DBR
VCC RA1 RA2 RA3 RA4 RA5 GND
VDD RY1 RY2 RY3 RY4 RY5 DY1 DY2 DY3 VSS
NRIA NCTSA# NDSRA# NSINA NDCDA#
RTSA# DTRA# SOUTA
+12V_COM RIA# CTSA# DSRA# SINA DCDA# NRTSA NDTRA NSOUTA -12V_COM
[24] RTSA# [24] DTRA# [24] SOUTA
RIA# [24] CTSA# [24] DSRA# [24] SINA [24] DCDA# [24]
C676 C0.1u16X/4
D49 1N4148W
+12V
D48 1N4148W
-12V
C675 C0.1u16X/4
I95-7523212-T07

JCOM1 H2X5[10]M
NDCDA# NSOUTA NRTSA NRIA NSINA NDTRA NDSRA# NCTSA#
N31-2051331-H06

CN5 X_8P4C-470p50X/6
NRIA NCTSA# NDSRA# NRTSA

CN6 X_8P4C-470p50X/6
NDTRA NSINA NSOUTA NDCDA#

PROM RESET

FROM SIO
[24] PLTRST_BU2#_R — R617 X_22R1%/4 — PLTRST_BU2#
R436 R469 R614 R647 R622 R618 100R1%/4
PLTRST_BU2#_PCIE2 [22]
PLTRST_BU2#_PCIE3 [22]
PLTRST_BU2#_PCIE5 [22]
PLTRST_BU2#_PCIE6 [22]
PLTRST_BU2#_M2_2 [27]
PLTRST_BU2#_ASM1143 [40]

FROM PROM
[17,31] PM_GPP_RST — R524 0R/4 — PLTRST_BU2#

Co-lay FCH Reset for meet FCH sequence. See 55553.

CPU RESET

3VSB
X_C0.1u16X/4 C558
FROM CPU
[6] PCIE_REST# — PCIE_REST#
VCC3 — R520 X_4.7K/4
U45 X_NC7SZ08M5X
PCIE_RST_BUF
R415 R528 R373 R451 100R1%/4
PCIERST#_PCIE1 [20]
PCIERST#_PCIE4 [20]
PCIERST#_M2_1 [26]
PCIERST#_PROM [17]

PCIE_REST# — R511 0R/4 — PCIE_RST_BUF

PARALLAL PORT

JLPT1 H2X13[26]M
RSTB# PRND0 PRND1 PRND2 PRND3 PRND4 PRND5 PRND6 PRND7 RACK# RBUSY RPE RSLCT
RAFD# RERR# RINIT# RSLIN#
N31-2131131-H06

D60 1N4148W
VCC5
C729 C0.1u16X/4
LPT_VC

[24] PPRND3 [24] PPRND2 [24] PPRND1 [24] PPRND0
R705 R704 R701 R700 33R/4
PRND3 PRND2 PRND1 PRND0
R720 R719 R716 R714 2.7K/4

[24] PPRND4 [24] PPRND5 [24] PPRND6 [24] PPRND7
R706 R707 R708 R709 33R/4
PRND4 PRND5 PRND6 PRND7
R721 R722 R723 R724 2.7K/4

[24] STB# [24] SLIN# [24] INIT# [24] AFD#
R698 R703 R702 R699 33R/4
RSTB# RSLIN# RINIT# RAFD#
R712 R718 R717 R713 2.7K/4

[24] RACK# [24] RBUSY [24] RPE [24] RSLCT
RACK# RBUSY RPE RSLCT
R725 R726 R727 R728 2.7K/4

[24] RERR#
RERR#
R715 2.7K/4

PRND0 C705 PRND1 C707 PRND2 C710 PRND3 C711 X_470p50X/4
PRND7 C715 PRND6 C714 PRND5 C713 PRND4 C712 X_470p50X/4
RSTB# C703 RSLIN# C709 RINIT# C708 RAFD# C704 X_470p50X/4
RACK# C716 RBUSY C717 RPE C718 RSLCT C719 X_470p50X/4
RERR# C706 X_470p50X/4

SIO_3VA

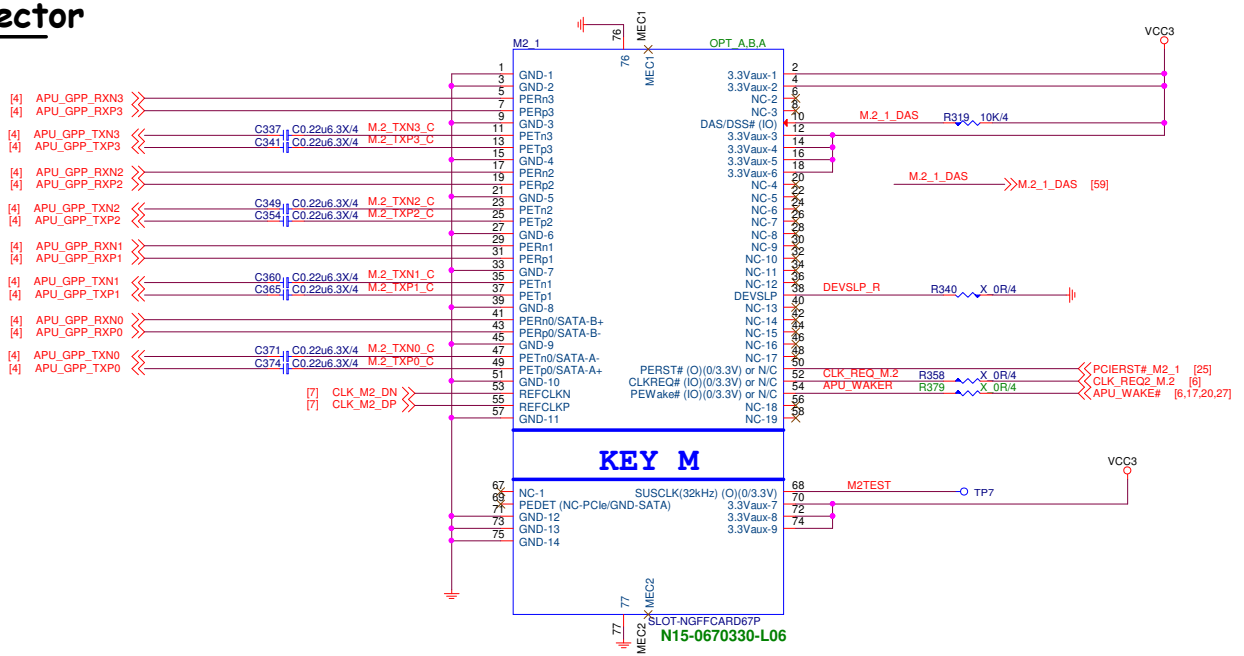
ATX_5VSB
C590 C1u6.3X/4
U54 GS7116S5
VDD VOUT EN GND ADJ
EN:VIH1.6V
C681 X_C0.1u16X/4
R1 R670 10K1%/4
R2 R676 3.16K1%/4
C680 10u6.3X/6
3VA_FB
SIO_3VA
I31-7116S09-N03

Vout = Vref * (1 +(R1/R2))
= 0.8 * (1 +(10K/3.16K))
= 3.33V

MSI MICRO-STAR INT'L CO.,LTD.
Title: SIO HWM/COM
Size: Custom | Document Number: MS-7B79 | Rev: 1.1/2.1
Date: Tuesday, February 13, 2018 | Sheet 25 of 72

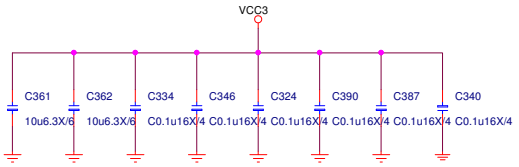
M.2_1 Connector

3.3V@2.5A

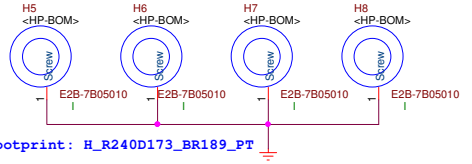


N15-0670330-L06

3.3V@2.5A



E2B-7984020-A89



E2B-7B05010-A89 E2B-7B05010-A89

E2B-7B05010-A89 E2B-7B05010-A89

Schematic Cfg	Project	
CFG-7B79-0A-X470-GAMING PRO	V	A
CFG-7B79-0A-X470-GAMING PLUS		

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Link to the Future

Title: M.2_1

Size: Custom | Document Number: MS-7B79 | Rev: 1.1/2.1

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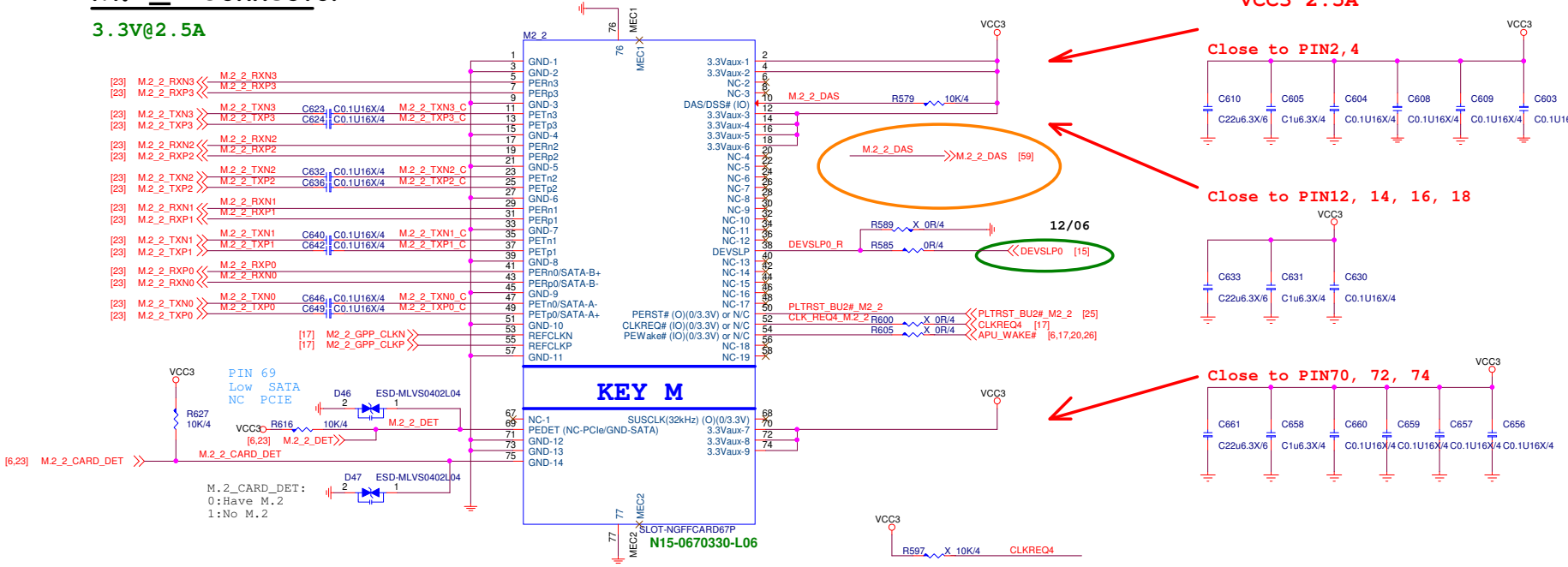
M.2_2 Connector

3.3V@2.5A

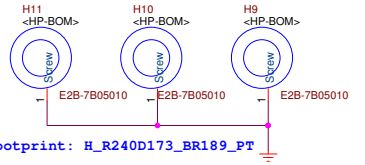


VCC3 2.5A

Close to PIN2,4

Close to PIN12, 14, 16, 18

Close to PIN70, 72, 74



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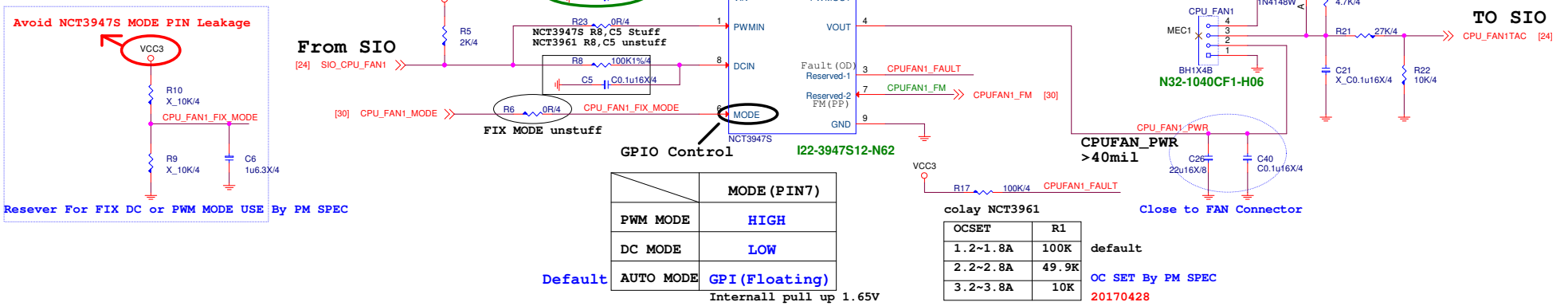
Title: M.2_2		
Size: Custom	Document Number: MS-7B79	Rev: 1.1/2.1
Date: Tuesday, February 13, 2018	Sheet 27 of 72	

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

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

CPU_FAN1



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

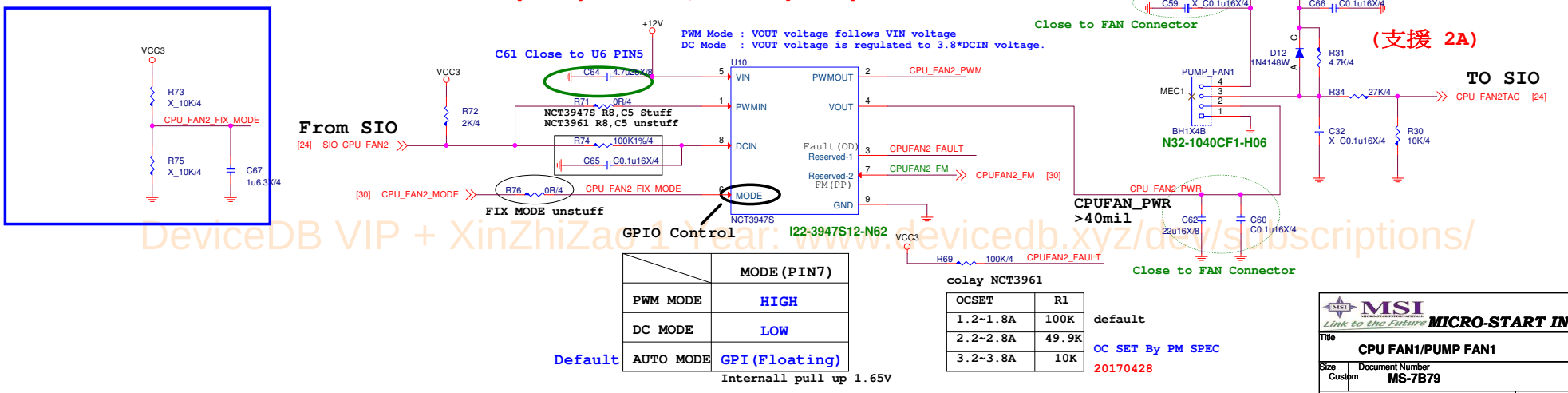
Internall pull up 1.65V

colay NCT3961

OCSET	R1	
1.2~1.8A	100K	default
2.2~2.8A	49.9K	
3.2~3.8A	10K	

OC SET By PM SPEC
20170428

PUMP_FAN1



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

Internall pull up 1.65V

colay NCT3961

OCSET	R1	
1.2~1.8A	100K	default
2.2~2.8A	49.9K	
3.2~3.8A	10K	

OC SET By PM SPEC
20170428

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Link to the Future

Title	CPU FAN1/PUMP FAN1	
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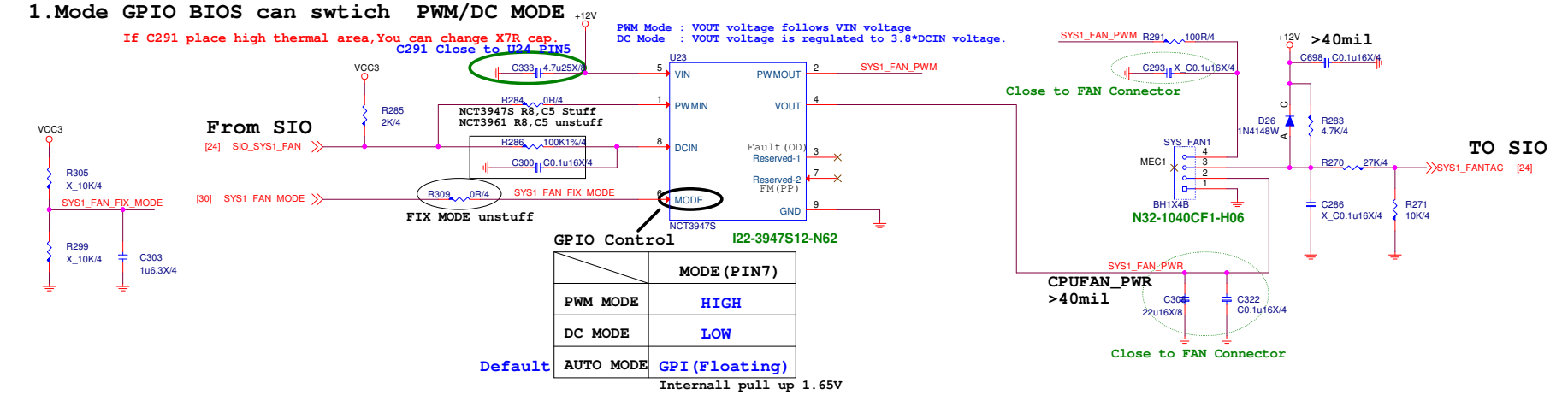
SYSFAN

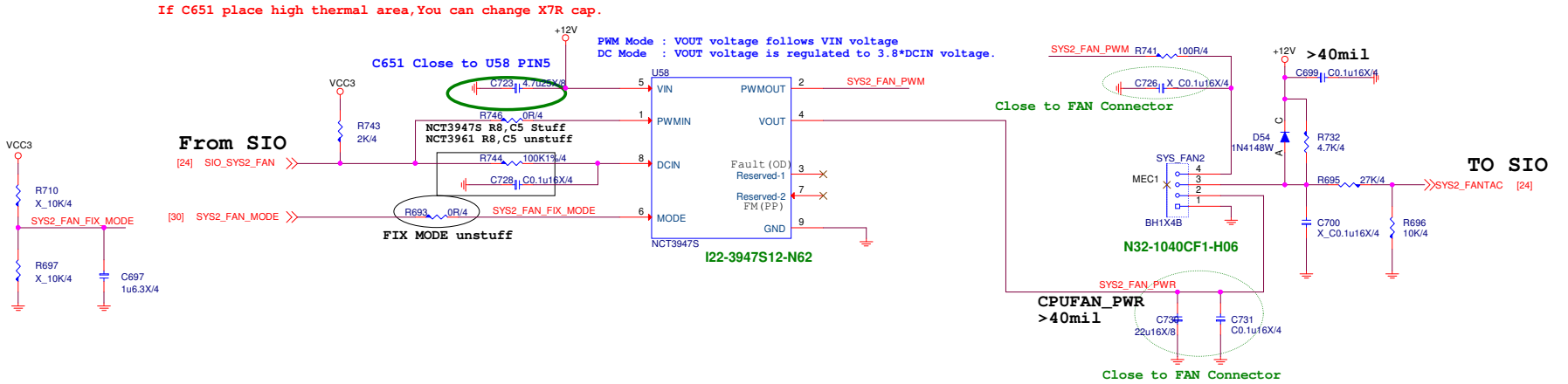
TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE

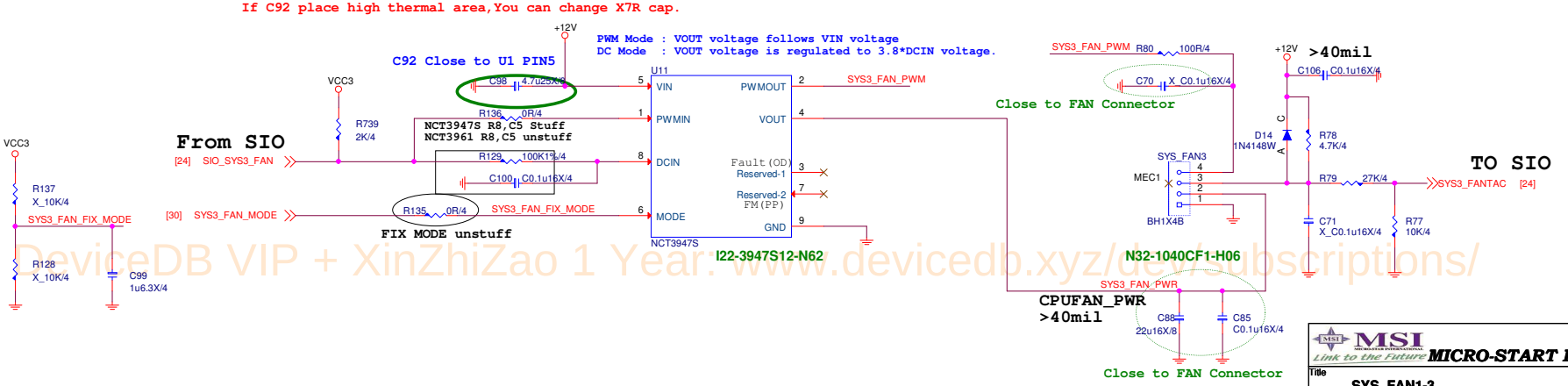
1.Mode GPIO BIOS can swtich PWM/DC MODE



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

Internall pull up 1.65V





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Title: SYS_FAN1-3

Size: Custom | Document Number: MS-7B79 | Rev: 1.1/2.1

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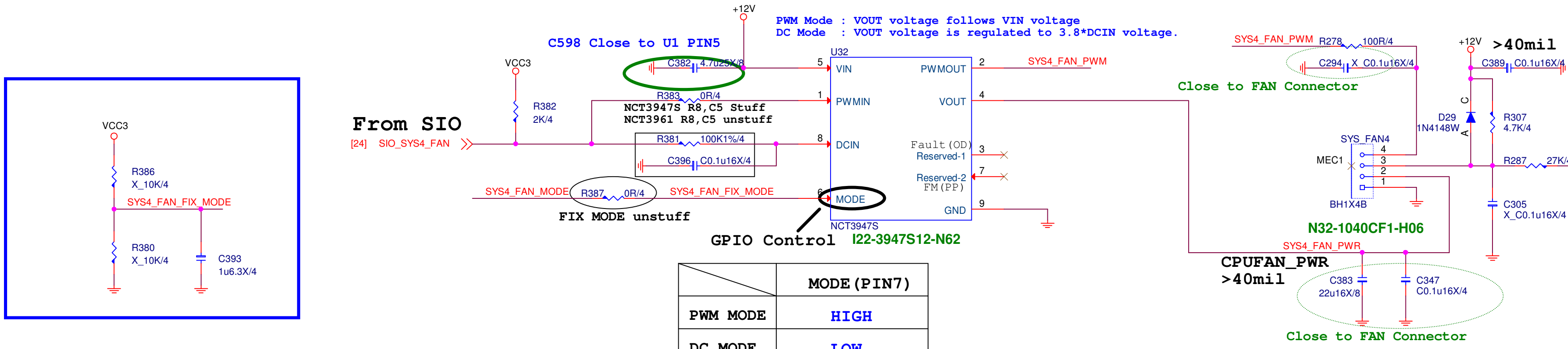
SYSFAN 4

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

If C598 place high thermal area,You can change X7R cap.

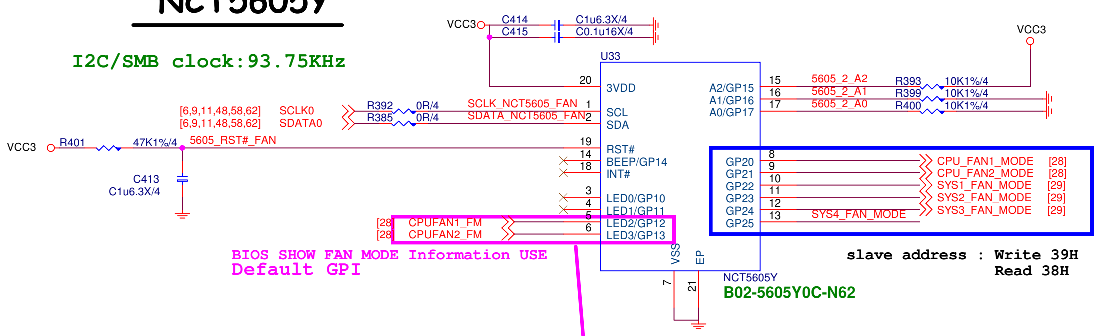


	MODE(PIN7)
PWM MODE	HIGH
DC MODE	LOW
Default AUTO MODE	GPI(Floating)

Internall pull up 1.65V

NCT5605Y

I2C/SMB clock:93.75KHz



BIOS SHOW FAN MODE Information USE
Default GPI

By PM Define FAN name

FAN MODE USE	FAN
GP20	CPUFAN1
GP21	CPUFAN2 PUMPFAN
GP22	SYSFAN1
GP23	SYSFAN2
GP24	SYSFAN3
GP25	SYSFAN4

By PM Define FAN name

SHOW FAN MODE USE	FAN
GP12	CPUFAN1
GP13	CPUFAN2 PUMPFAN

1. GENERAL DESCRIPTION

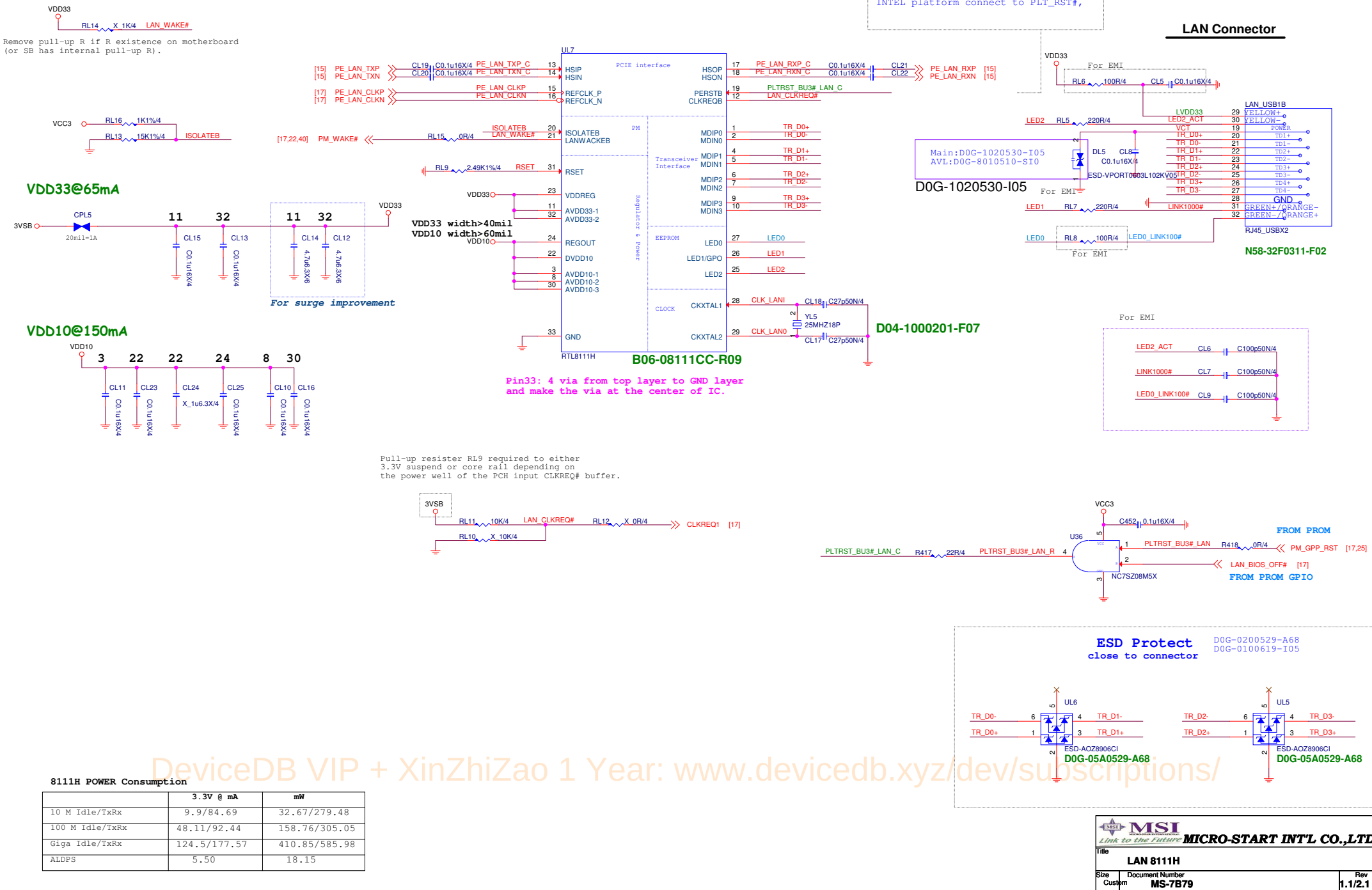
The NCT5605Y is a general purpose input/output IC with SMBus™ which provides 14 GPI/O pins. It also can provide SMBus™ address setting pins to set the address during power- on reset or from external reset.

NCT5605Y SMBus™ Address is:

0	0	1	1	A2	A1	A0	R/W

R/W: 0 / 1

RTL8111H Giga LAN



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-START INT'L CO.,LTD.

Title: LAN 8111H

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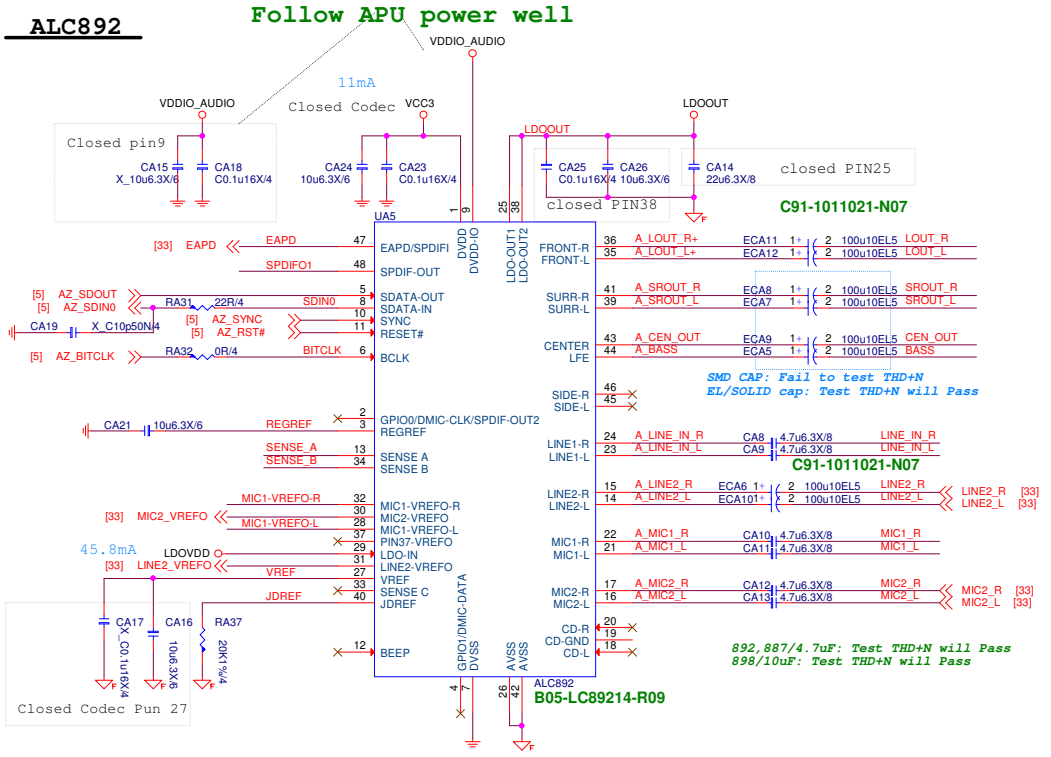
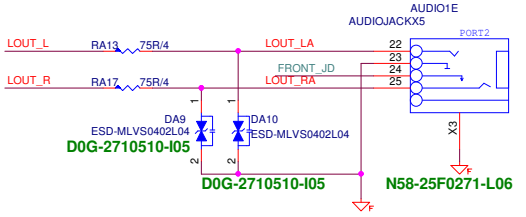
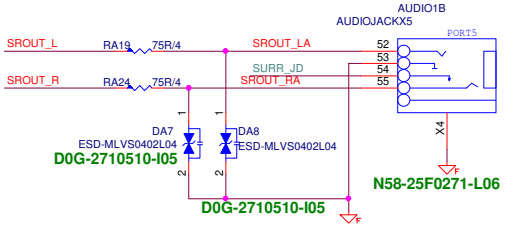
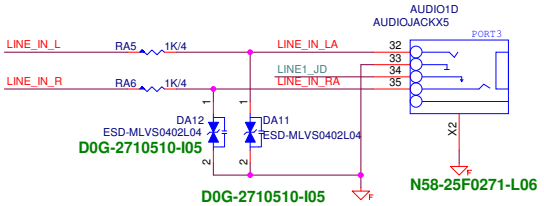
ALC892

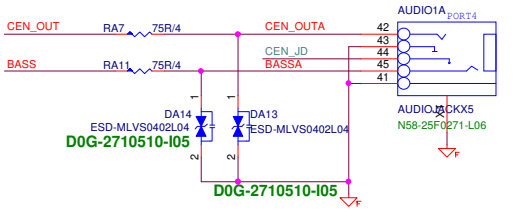
Follow APU power well

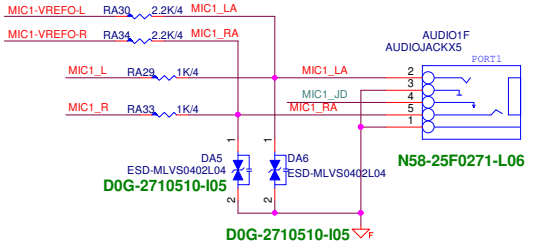


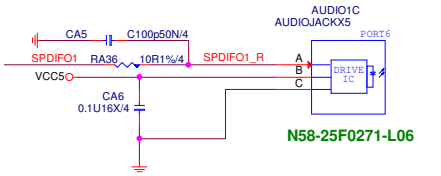


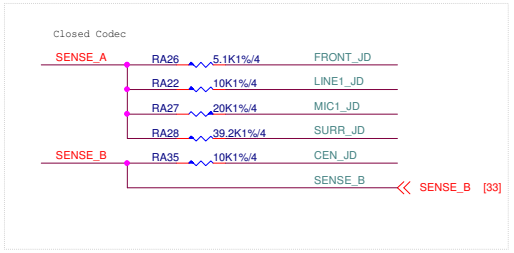


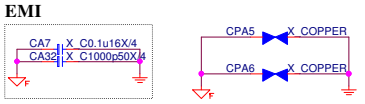


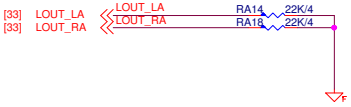


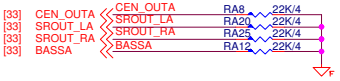


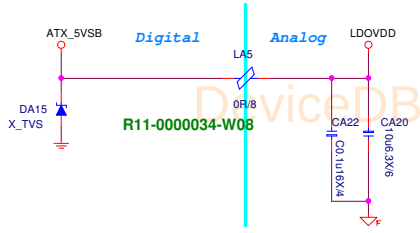


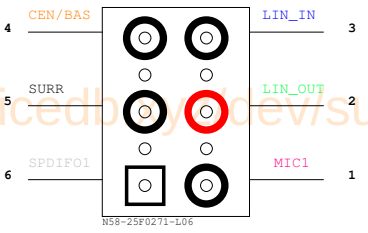












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Link to the Future

Title: Audio ALC892		
Size: Custom	Document Number: MS-7B79	Rev: 1.1/2.1
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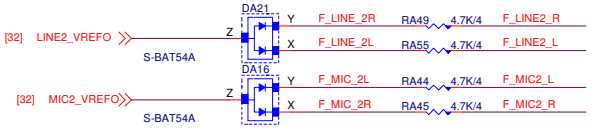
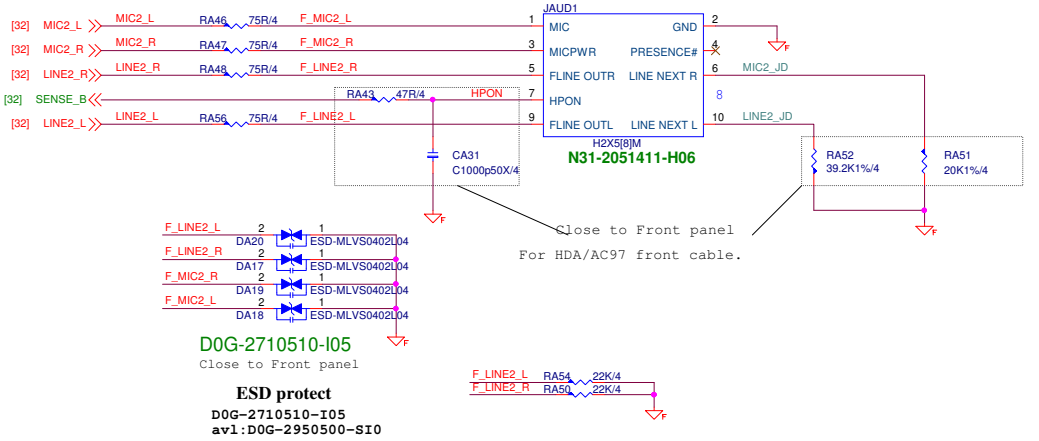
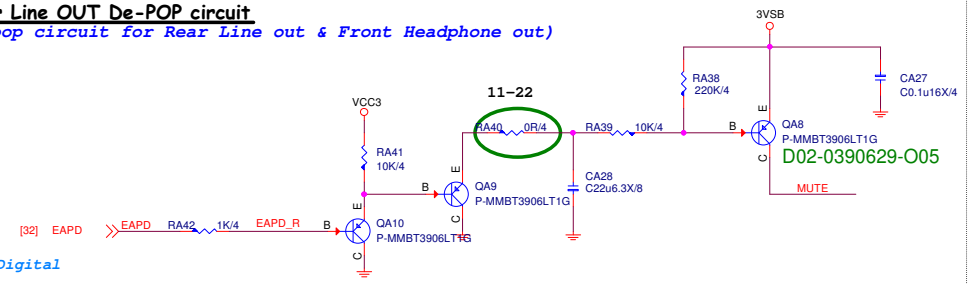


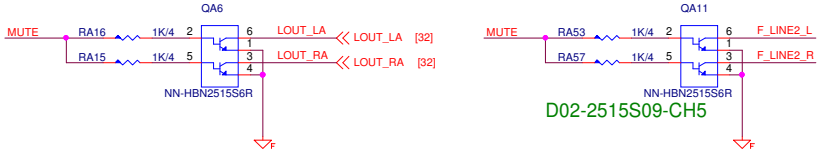


Rear Line OUT De-POP circuit

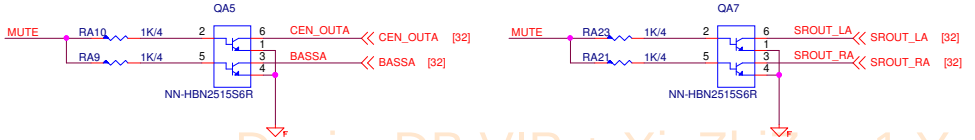
(De-pop circuit for Rear Line out & Front Headphone out)

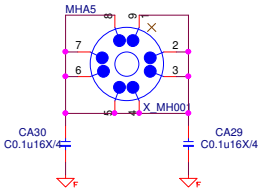


Analog



(add de-pop circuit by PM spec or customer request,
NOTE: add de-pop circuit need to change CA5,CA6, CA7, CA9,to TVS)





MSI MICRO-START INT'L CO.,LTD.
Link to the Future

Title	Audio De-POP	
Size: Custom	Document Number: MS-7B79	Rev: 1.1/2.1
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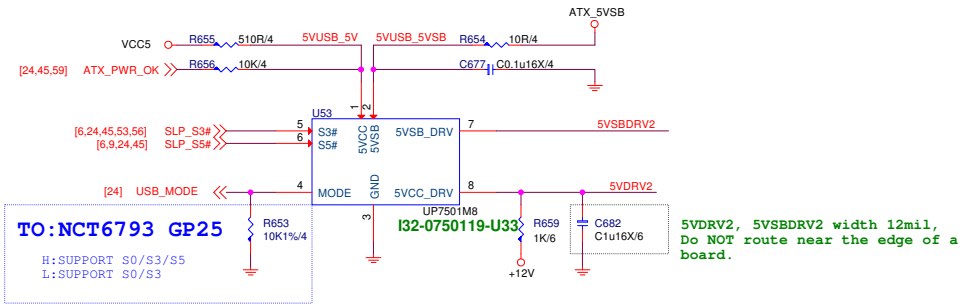
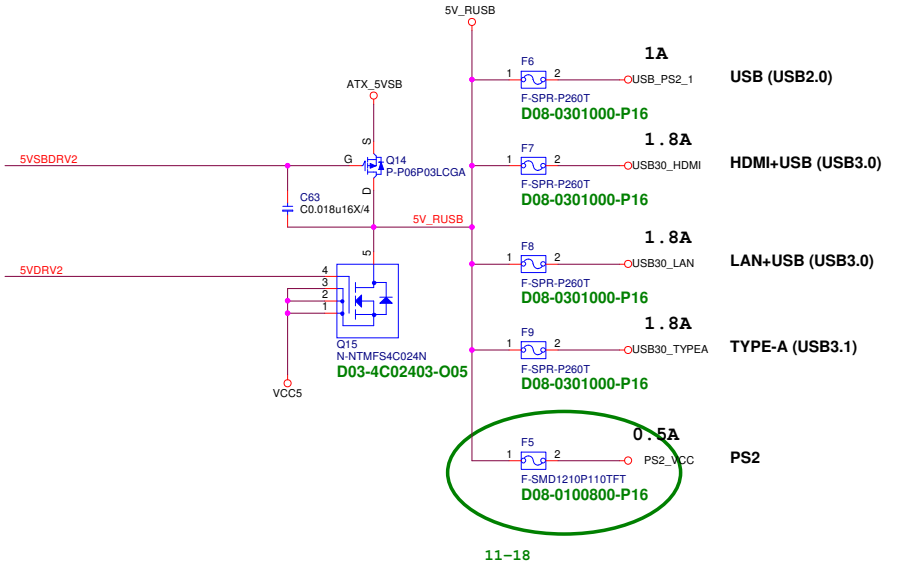
USB Power

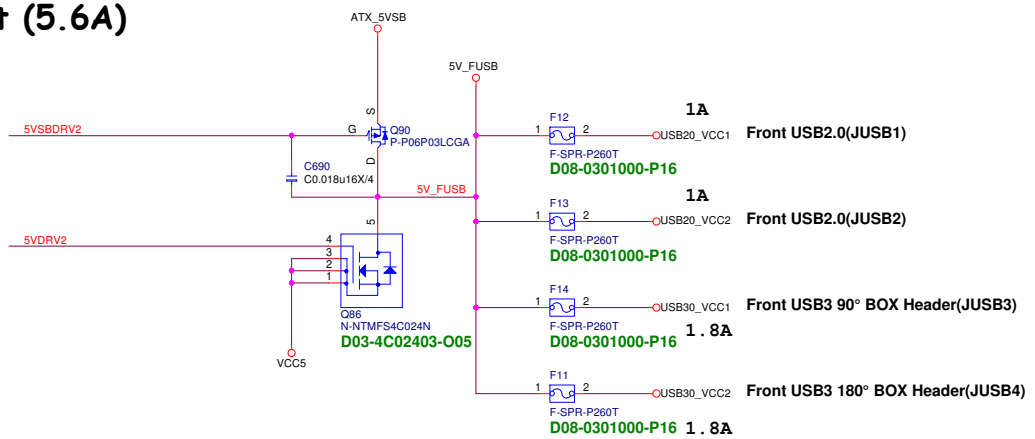


5VDRV2, 5VSBDRV2 width 12mil, Do NOT route near the edge of a board.



Rear (6.9A)

Front (5.6A)



MICRO-START INT'L CO.,LTD.

Title	USB Power	
Size: Custom	Document Number: MS-7B79	Rev: 1.1/2.1
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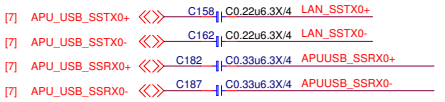
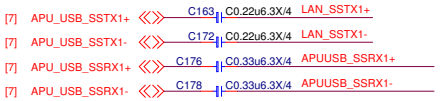
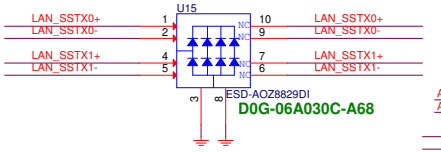
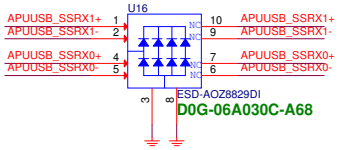
LAN+USB (USB3.0)

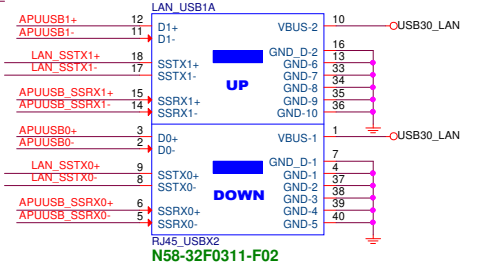
5V@1A

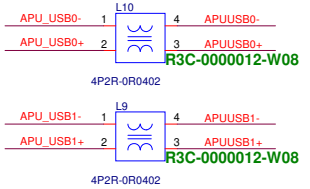


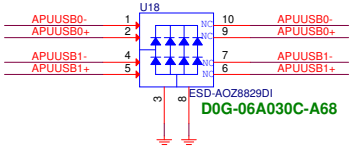


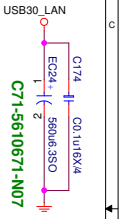






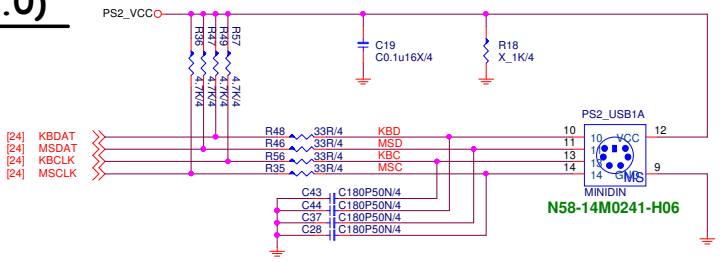


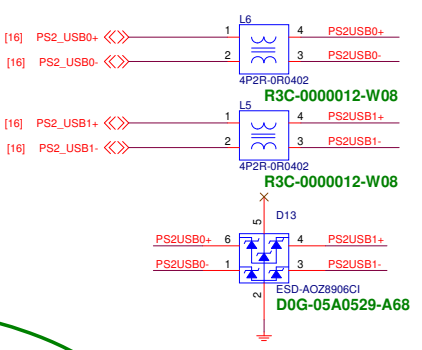


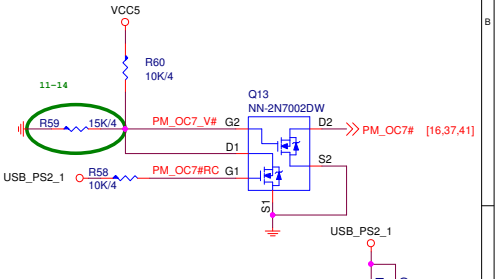


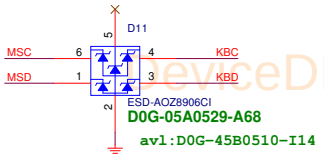
PS2+USB (USB2.0)

5V@1A

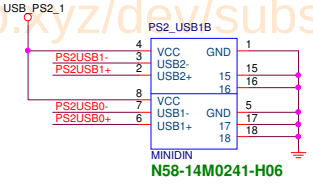








11-18 remove



layout note:
C21 must close to TVS pin5
TVS must near KB_MS1 connector and route without branch
Varistor must close to TVS and route without branch

MSI MICRO-STAR INT'L CO.,LTD.
Link to the Future

Title: Rear PS2_USB2.0/LAN_USB3.0

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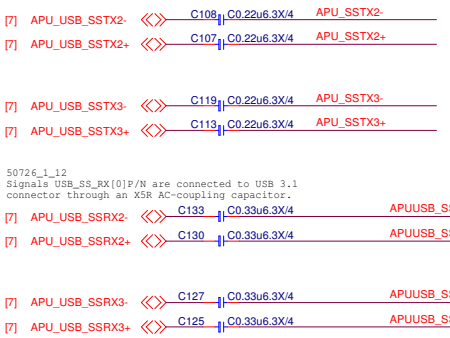
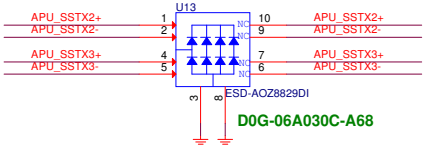
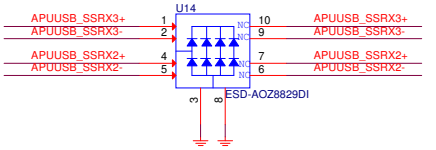
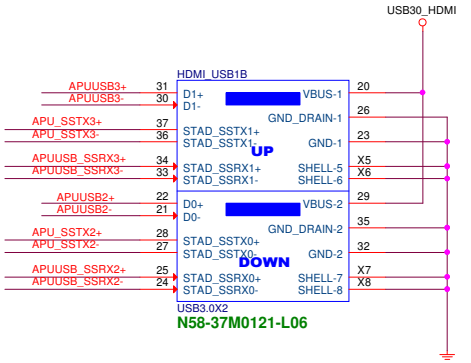
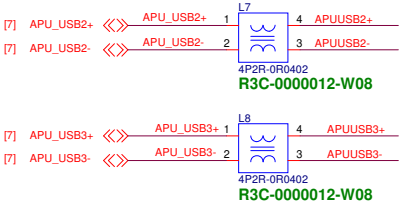
USB30_HDMI

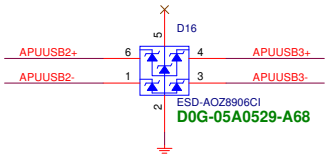


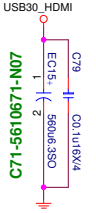




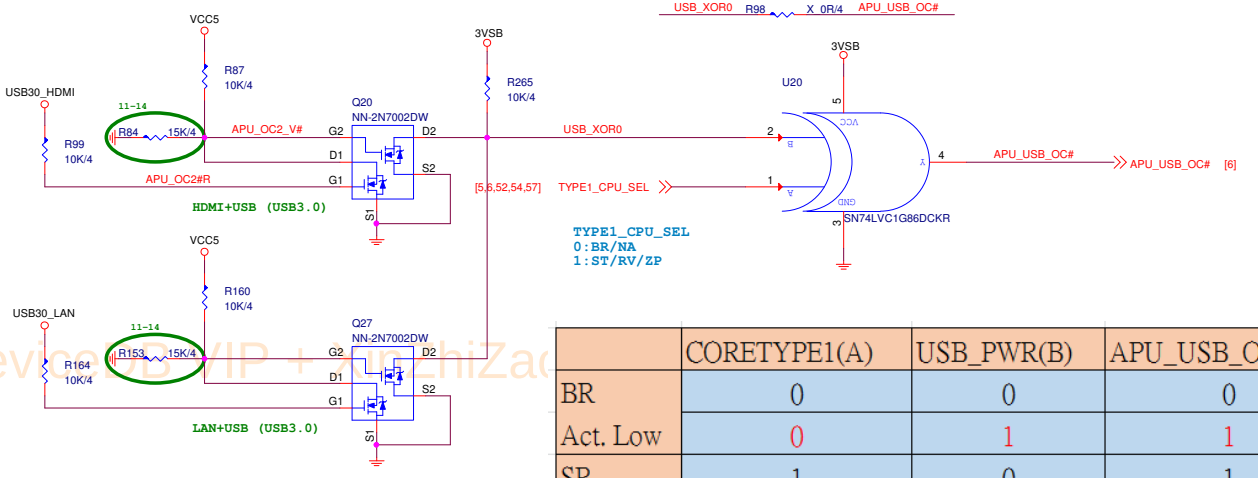








APU_USB_OC



	CORETYPE1(A)	USB_PWR(B)	APU_USB_OC(Y)
BR	0	0	0
Act. Low	0	1	1
SR	1	0	1
Act. High	1	1	0

MICRO-START INT'L CO.,LTD.

Title: Rear HDMI_USB3.0

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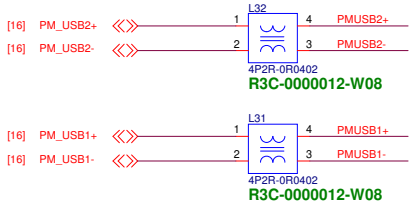
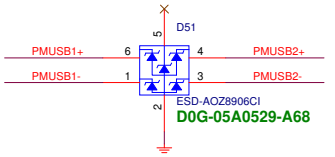
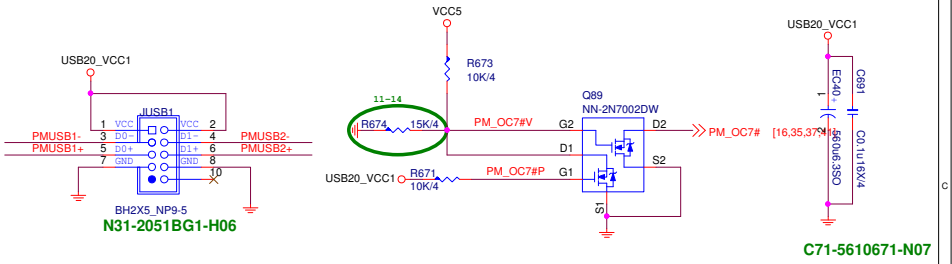
Front USB2.0(JUSB1)

5V@1A

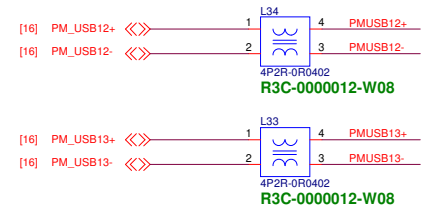


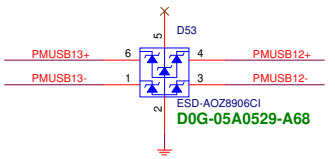


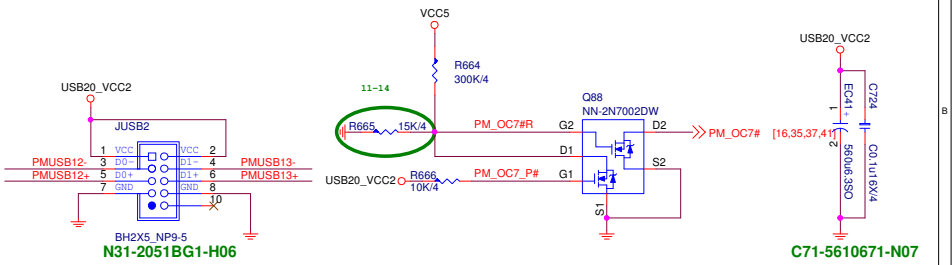


Front USB2.0(JUSB2)

5V@1A







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Title: Front USB2.0		
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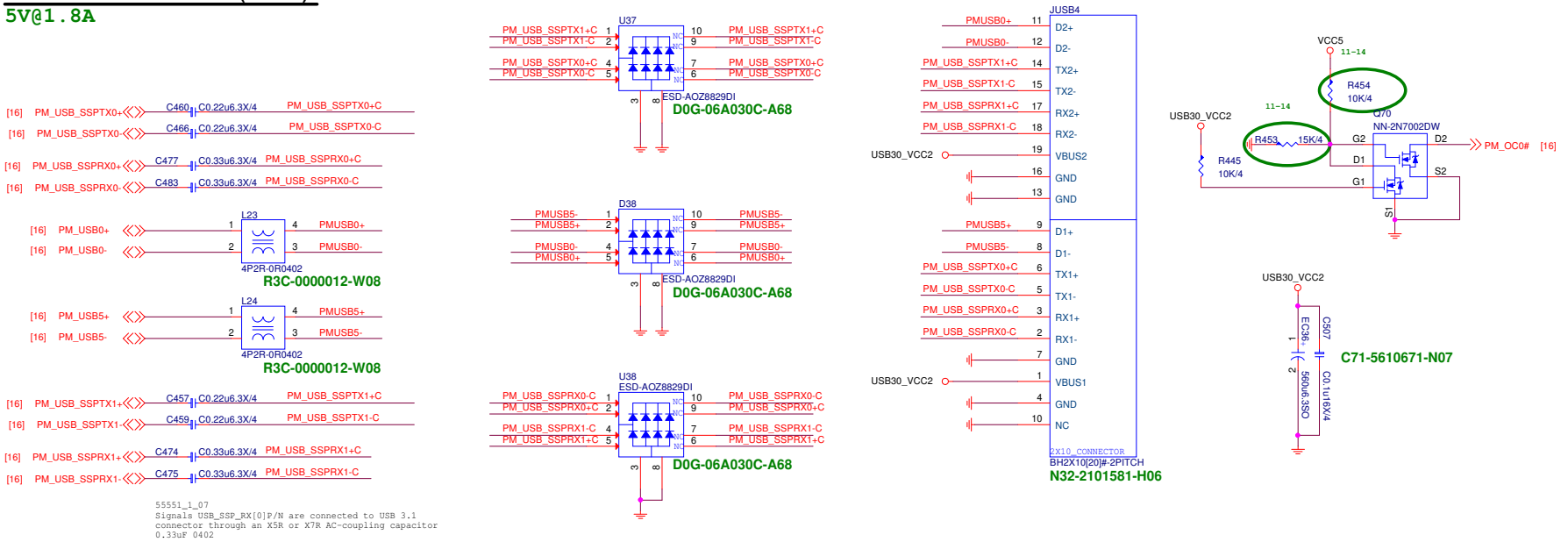
Front USB3 90° BOX Header(JUSB4)

5V@1.8A



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Link to the Future

Title: Front USB3.0 90° Header		
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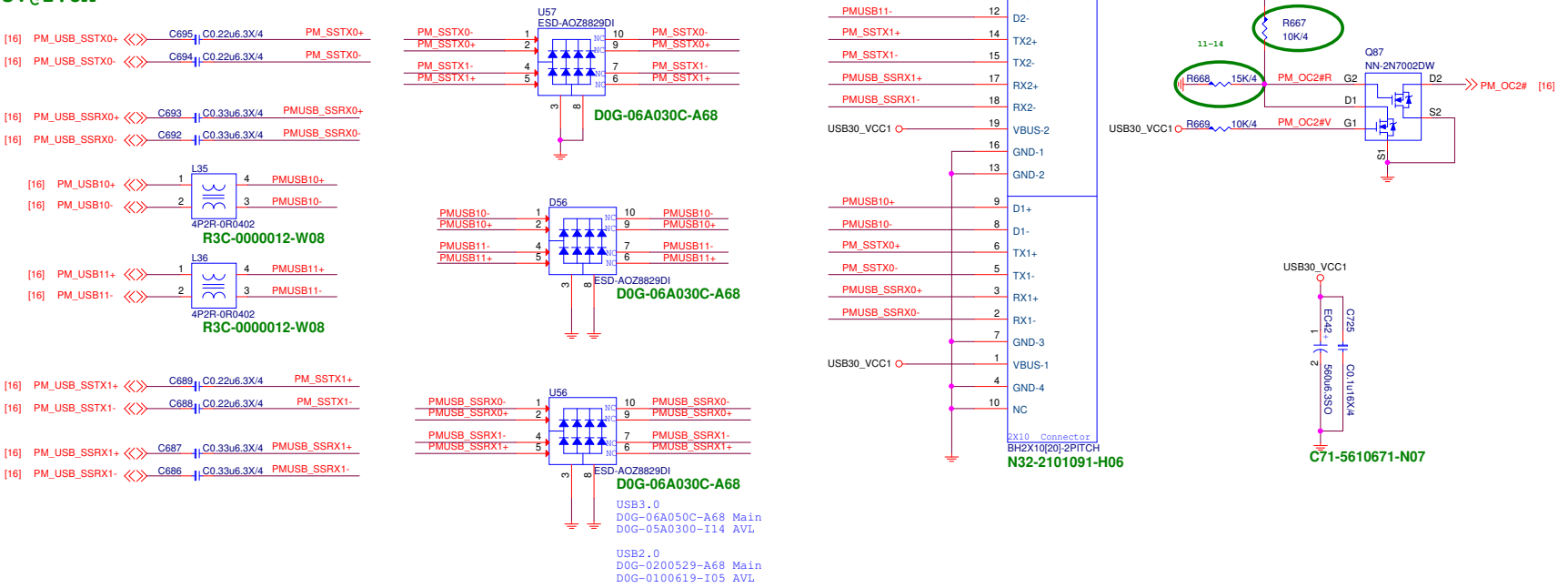
Front USB3 180° BOX Header(JUSB3)

5V@1.8A



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Link to the Future

Title	Front USB3.0 180° Header	
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Power Consumption

	3.3V	1.2V(1.05V	3.3VSUS	1.05VSUS(1.2VSUS	2.5V	Total Power
ASM1142	245mA	634mA	1mA	1mA	NA	1573.8(mW)
ASM2142	300mA	800mA	100mA	50mA	300mA	TDP

Minimun gap should be greater of >15mil with other signal.

chip PCIE singal need connecr CLKP/N

USB HS (90Ohm-Diff) Chip to Connector ~1.5 inch.

PCIE Rule (Follow SB PDG)

TYPE A

TYPE A UP

Layout Guide:

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

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

USB SS (80Ohm-Diff)

PPON_X Internal Pull-up to VCC3

OCI_X Internal Pull-up to 3VS

RX/TX Internal Pull-up

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

YU1
D04-0901200-F07
D04-0900900-SC6
D04-0901100-T16

D04-0901200-F07

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

ASM1143 1.24 VCC Power

L01-0107108-C08

MP2143DJ
I9C-2143D09-M03

Vout = Vref * (1 +(R1/R2))
= 0.6 * (1 +(10K/18K))
= 1.244V

ASM1143 1.24 VSB Power

I31-7116S09-N03

Vout = Vref * (1 +(R1/R2))
= 0.8 * (1 +(10K/18K))
= 1.244V

EEPROM

MX25L512EMI
M31-2551222-M24

MICRO-START INT'L CO.,LTD.

Title	ASM1143 USB3.1	
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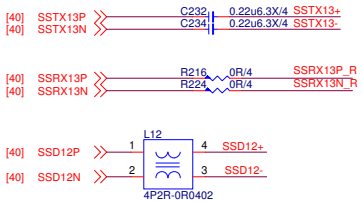
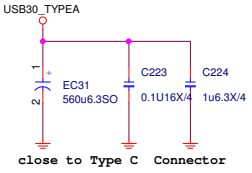
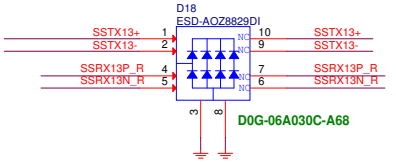
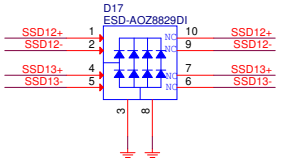
Rear USB3.1 Type A

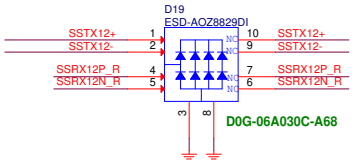


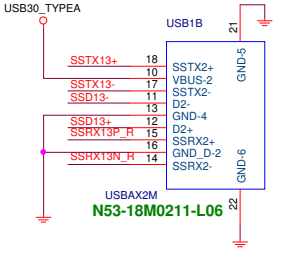


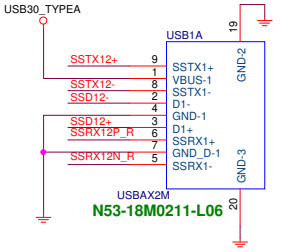
C71-5610671-N07

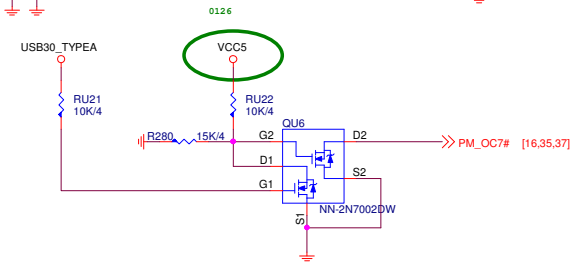












MSI MICRO-STAR INT'L CO.,LTD.
Link to the Future

Title	Rear USB3.1 Type A	
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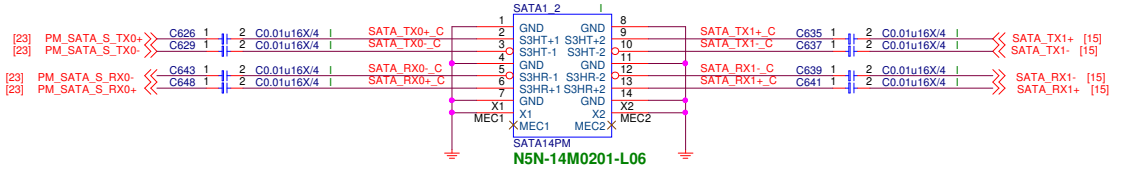
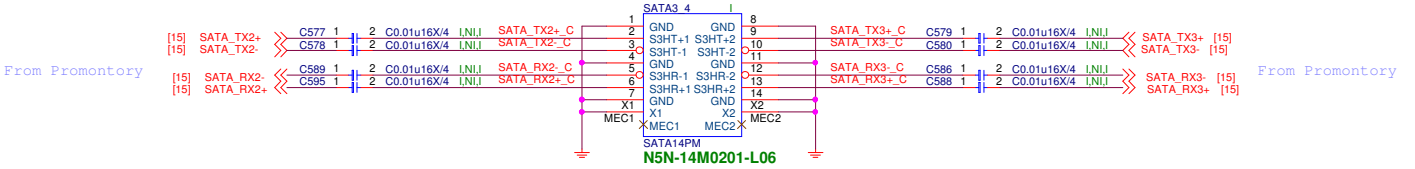
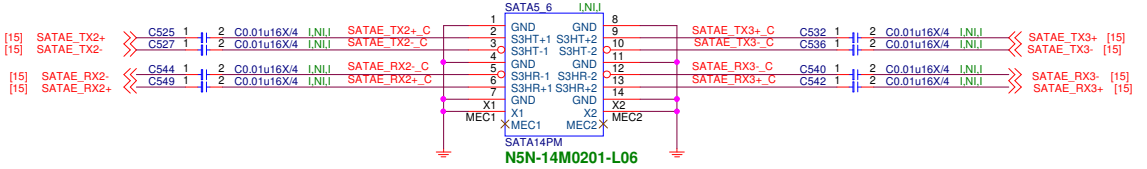
SATA Connector







Schematic Cfg	Project	
CFG-7B79-0A-X470-GAMING PRO	V	A
CFG-7B79-0A-X470-GAMING PLUS		

MSI MICRO-STAR INT'L CO.,LTD.

Title: SATA

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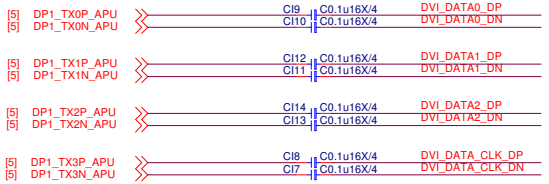
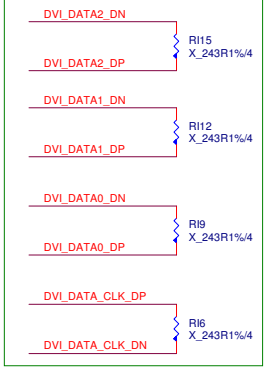
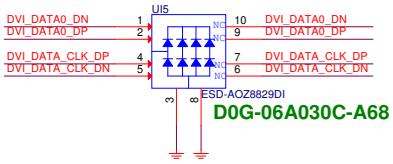
DVI CONNECTOR



For EMI





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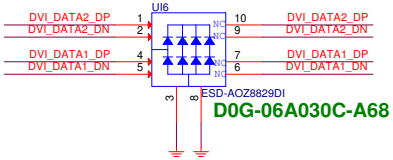

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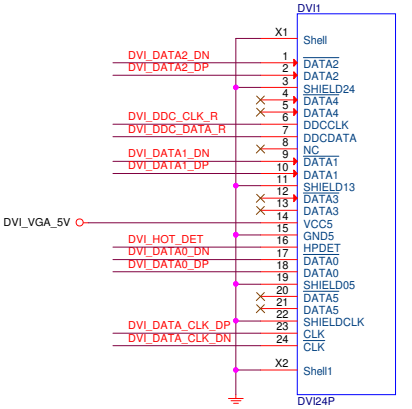
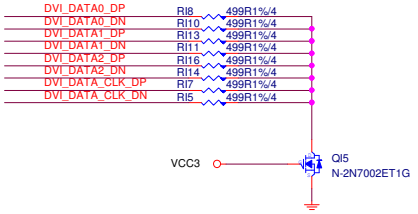
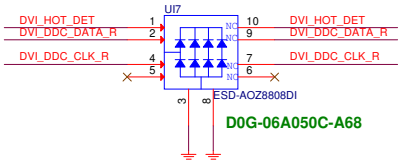


N5B-24F0771-EB6

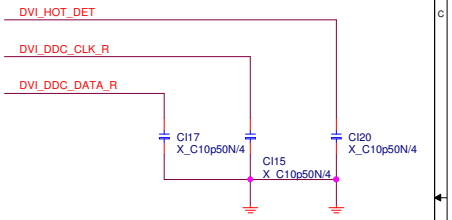


注意:耐壓5V零件

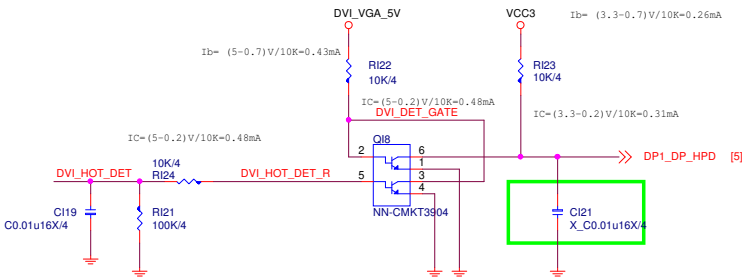


D0G-06A050C-A68

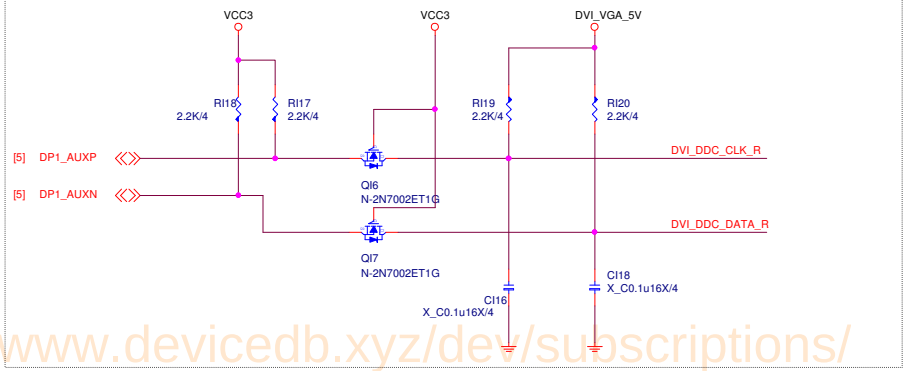
For EMI

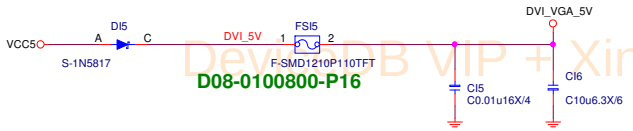


HPD



LEVEL SHIFT using I2C Repeater





D08-0100800-P16

MSI MICRO-STAR INT'L CO.,LTD.

Title: DVI

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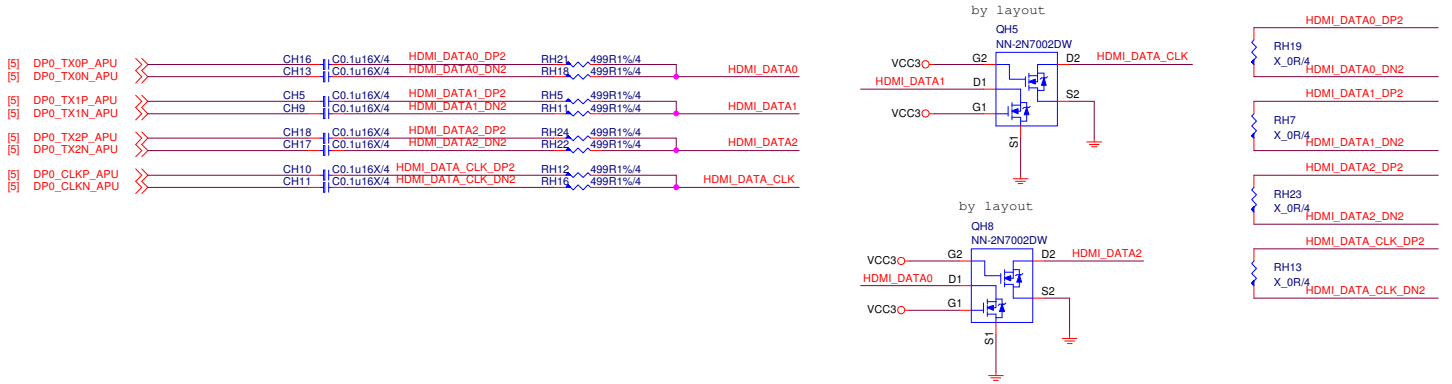
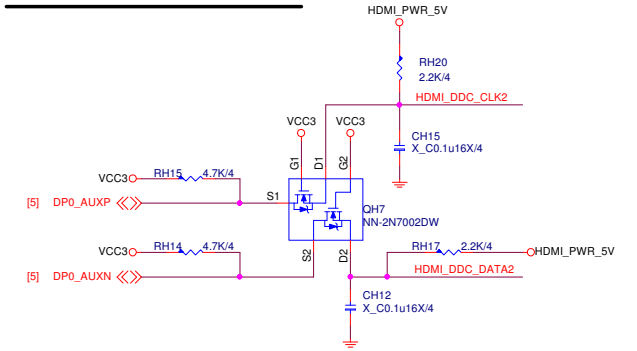
HDMI CONNECTOR

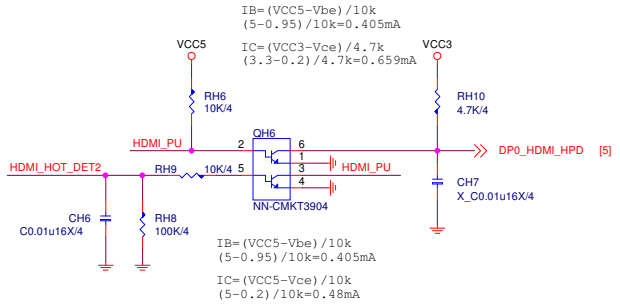
For HDMI 1.4



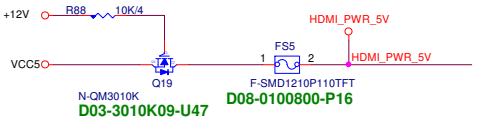
AUX Level Shifter



HPD Circuit

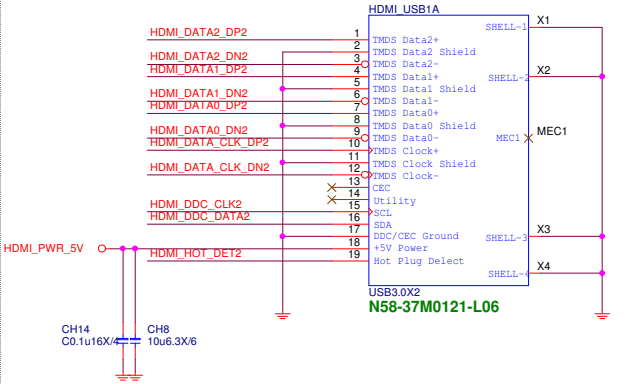


Connector Power

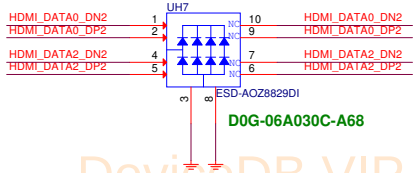


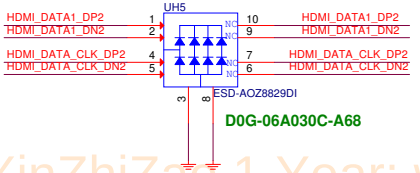
如果用DIODE SA測試電壓會不過

Connector

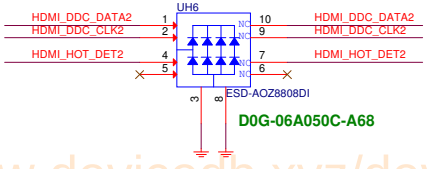


For EMI





注意:耐壓5V零件



MSI MICRO-START INT'L CO.,LTD.

Title: HDMI

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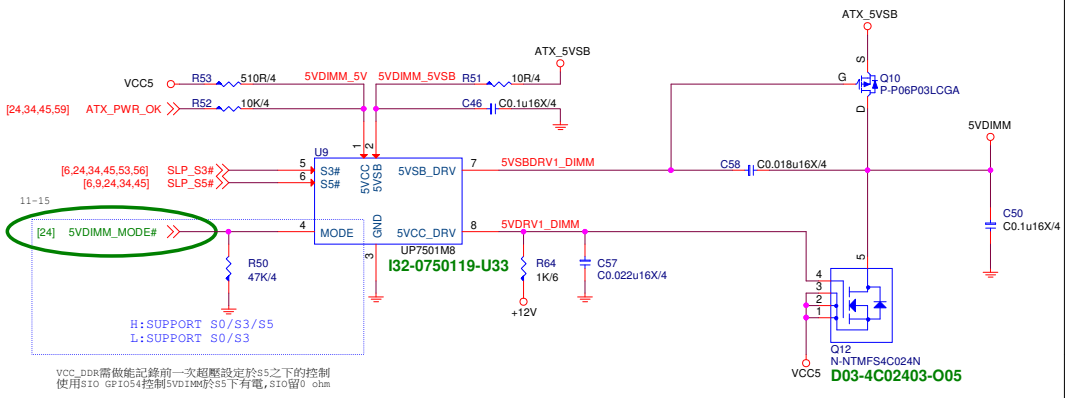
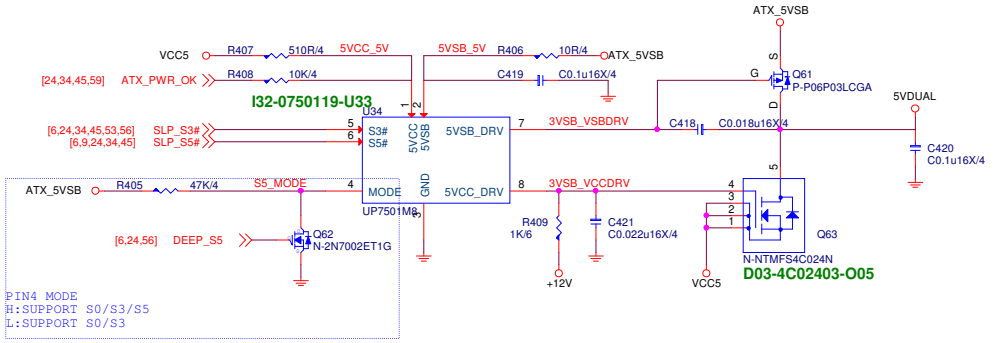
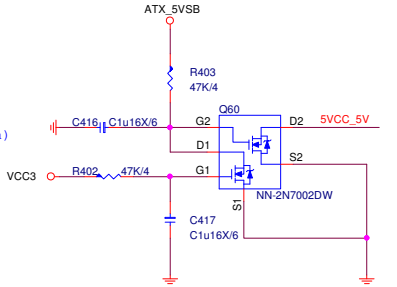
5VDIMM FOR DDR



5VDUAL For 3VSB、CPU 1.8V 、 VDDP



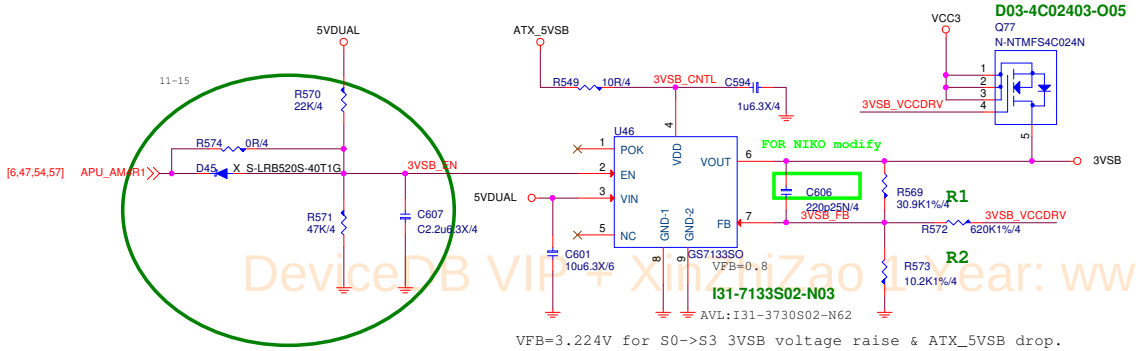


For power 700W solution (only for uP7501+uP7506 for 3VSB solution)
The power supply VCC3 delay 12ms after VCC5 assert.
The chip U7501 5VDRV1 work when the VCC5 ready
(When VCC5 up to 4.2V and the 5VDRV1 delay 6ms assert), but
VCC3 not ready and let the 3VSB sequence fail.

3VSB cost down

3.3V@2.63A

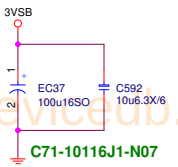
1.05V@0.05A
VDDBT_RTC_G@4.5uA
FCH@0.07A
CPU@0.25A
*PCIE*6 @2.25A*



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

Vout = Vref * (1 +(R1/R2))
= 0.8 * (1 +(30.9K/10.2K))
= 3.22V

OCP=12A
2.63A



MSI MICRO-STAR INT'L CO.,LTD.
Link to the Future

Title	ACPI 5VDIMM/3VSB	
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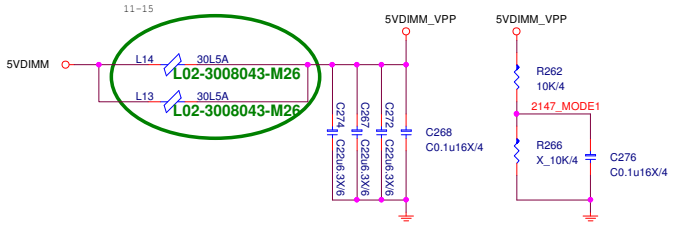
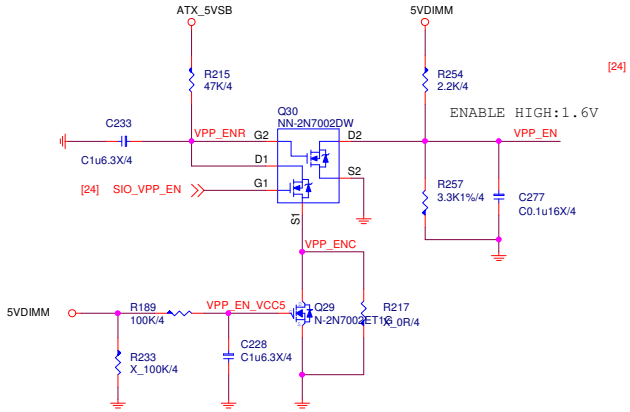
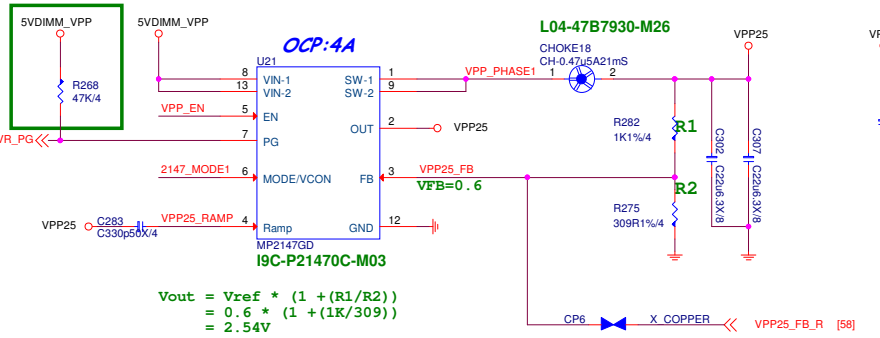
4DIMM : VPP25

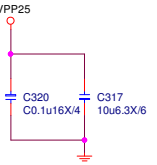
2.5V@2.24A





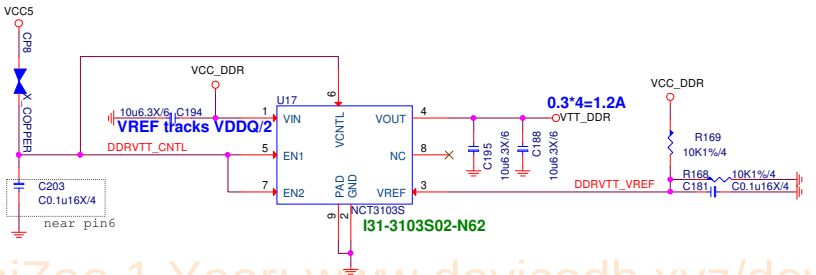
Input Current=(2.5*2.24)/5/0.8=1.4A

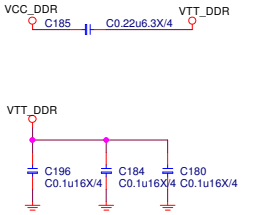




DDR VTT Power

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





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Title	DDR VPP25/VTT	
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DDR4_1.2V@26.2A

15.5A FOR CPU
9.5A FOR 4DIMM
1.2A FOR DDR VTT

Rocpset:6.8K
OCP=Rocset*10uA/Rdson(Low side)
=6.8K*10uA/2mohm
=34A

5VDIMM
R142 X_2.2K/4 EN:VIH2.4V
DDR_EN
R143 X_3.3K1%/4
C122 X_C0.1u16X/4

[6,45,54,57] APU_AM4R1 D34 S-LRB520S-40T1G DDR_EN
[24] SIO_VDDQ_EN R372 0R/4 DDR_EN 3.12V
EN:VIH2.4V
EN pin Maximum:5.5V,RECOMMENDED:3.6V

Follow CRB
5VDIMM
R134 10K/4
EN:VIH1.6V
EN pin Maximum:6.5V
[53,57] DDR_PWRGD
DDR_EN
DDR_REFOUT
C115 C1000p50X/4
R140 665R1%0402
0208
DDR_REFIN
C114 C1000p50X/4
[58] DDR_OV CP7 X_COPPER

5VDIMM
R130 10R/8
DDR_VCC C97 4.7u6.3X/6
U12
EN PGOOD REFOUT REFIN
VCC GND
BOOT PHASE UGATE LGATE/OCSET FB
DDR_BOOT1 R121 0R/4 C92 C0.1u16X/4
DDR_PH1
DDR_UG1
DDR_LG1
DDR_FB
RT8125EGQW
FB:0.8V
I32-8125E0C-R11

OCP=35A
VCC_DDR
close to DIMM side
R138 100R/4
R1
10K1%/4 R139
DDR_VSENP R144 0R/4 VDDIO_MEM_S3_SENSE [6]
C116 X_C0.1u16X/4
R2
R145 19.1K1%/4
Vout = Vref * (1 + (R1/R2))
= 0.8 * (1 + (10K/19.1K))
= 1.218V

Input Current=(26.2*1.2)/5/0.8=7.86A
L04-12A7811-T15
CHOKE8 CH-1.2u15A2m
5VDUAL_IN_DDR
5VDIMM
C68 C1u16X/6
C61 10u6.3X/6
EC10 560u6.3SO
EC11 560u6.3SO
C117 C0.1u16X/4
C71-5610671-N07
C71-5610671-N07
DDR_UG1
R81 0R/6 DDR_UG1_R
R83 X_10K/4
N-NTMFS4C029N Q16 D03-4C02903-O05
N-NTMFS4C029N Q17 D03-4C02903-O05
L04-47B7981-T15
CHOKE12 CH-0.47u42A0.81m
DDR_PH1
VCC_DDR
DDR_LG1
R97 6.8K1%/4
Rocpset
N-NTMFS4C024N Q21 D03-4C02403-O05
N-NTMFS4C024N Q22 D03-4C02403-O05
R112 2.2R/8
snubber
C82 C3300p50X/4
C112 C1u6.3X/4
C91 C22u6.3X/6
EC22 560u6.3SO
EC19 560u6.3SO
EC25 560u6.3SO
C71-5610671-N07
C71-5610671-N07
C71-5610671-N07
VCC_DDR
EC29 560u6.3SO
EC17 560u6.3SO
C71-5610671-N07
C71-5610671-N07

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Link to the Future
Title: DDR Power-RT8125E
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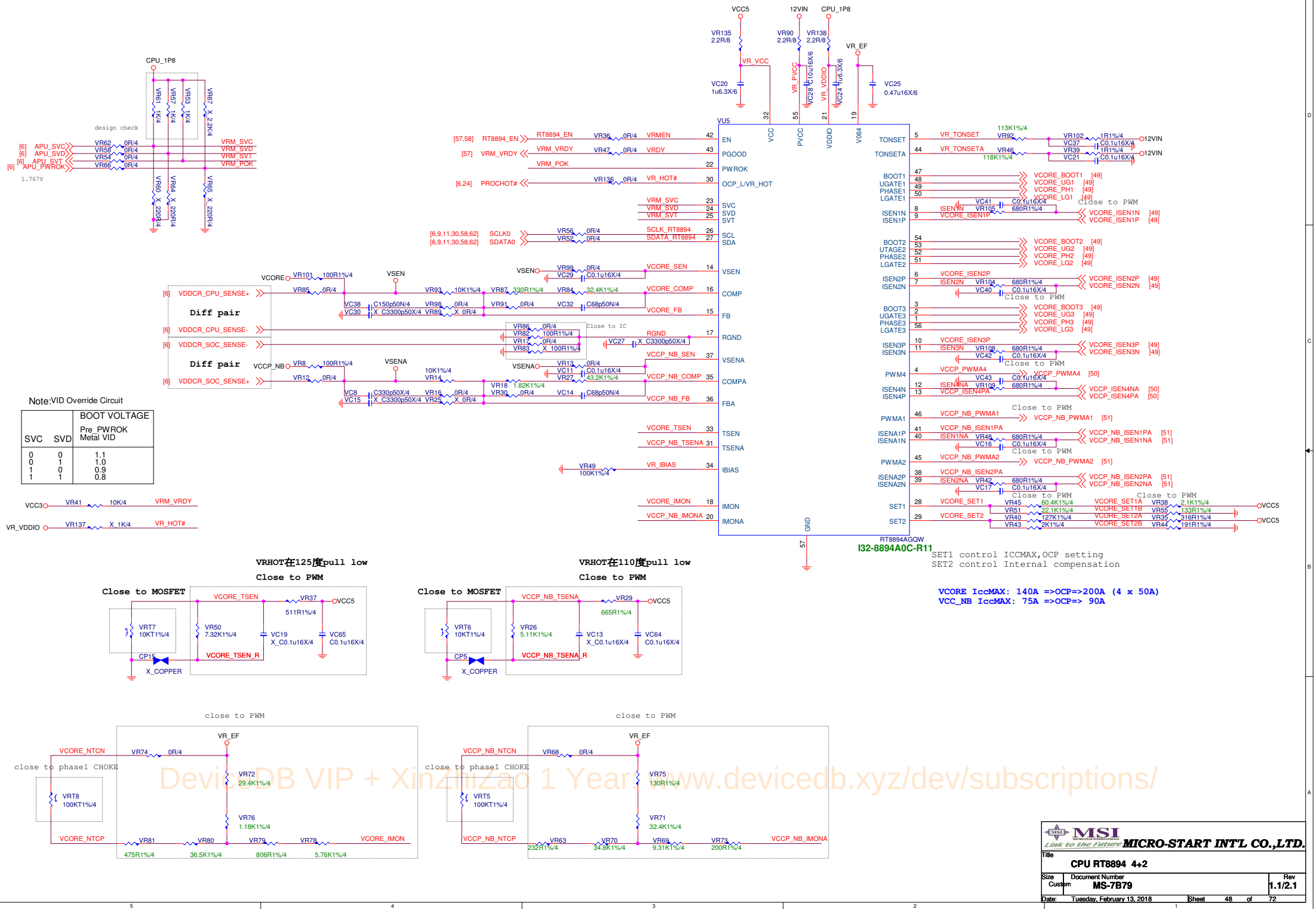

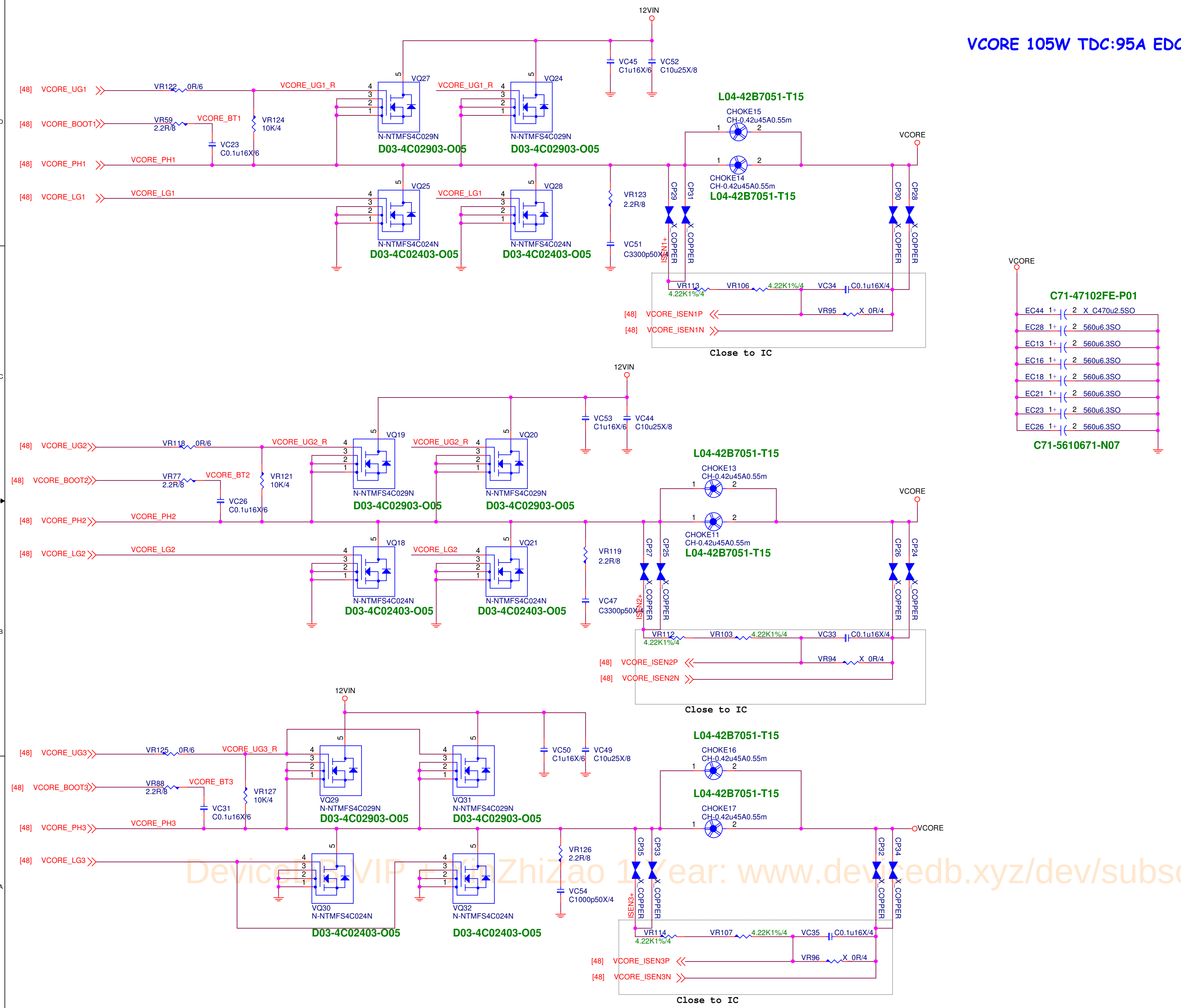

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Title	CPU Phase1-3	
Size Custom	Document Number MS-7B79	Rev 1.1/2.1
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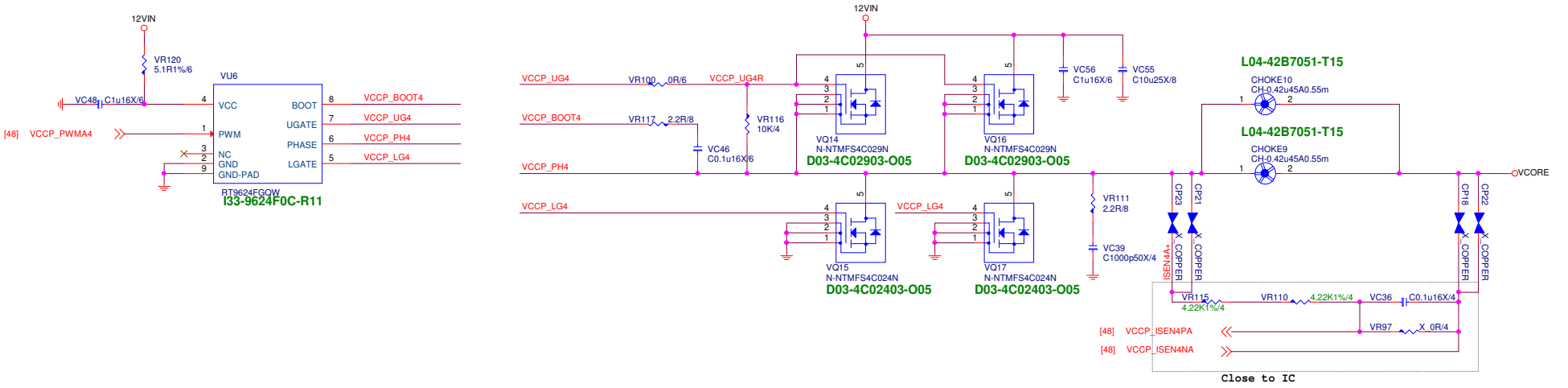

MSI MICRO-STAR INT'L CO.,LTD.
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Title: CPU Phase4		
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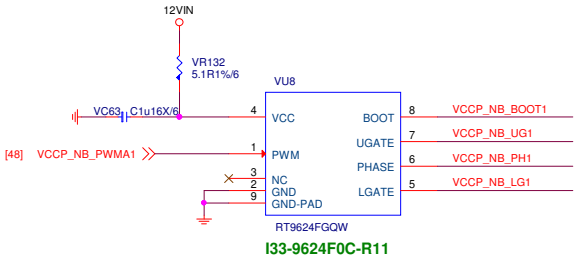
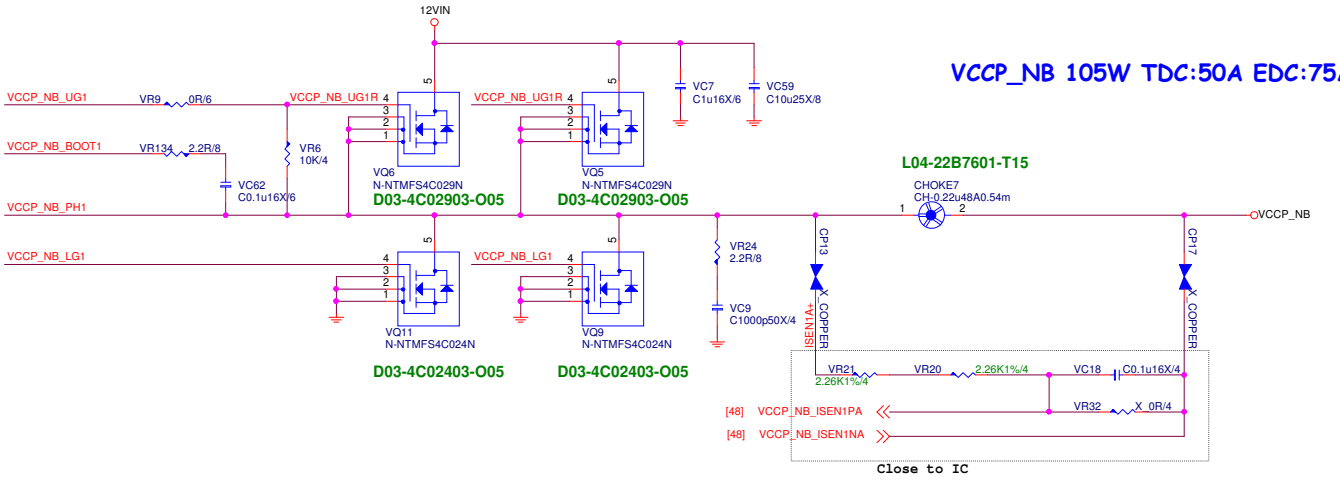
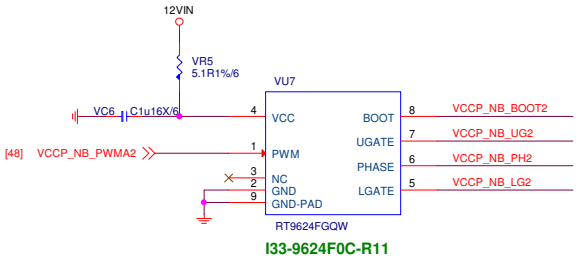
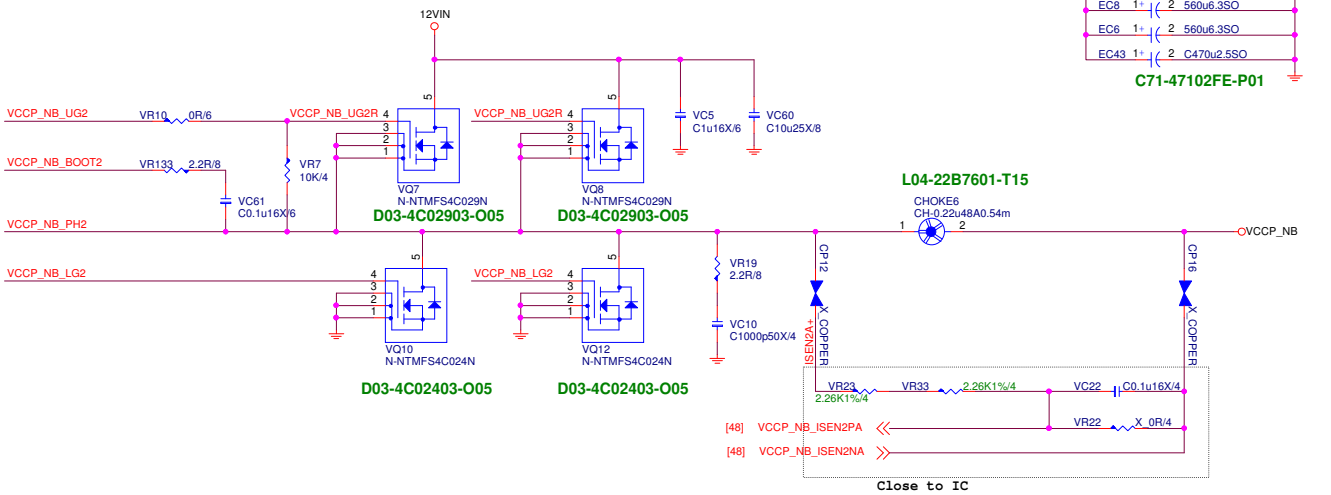
VCCP_NB 105W TDC:50A EDC:75A

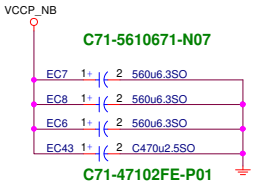




VCCP_NB 105W TDC:50A EDC:75A







MSI MICRO-STAR INT'L CO.,LTD.
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Title: CPU NB		
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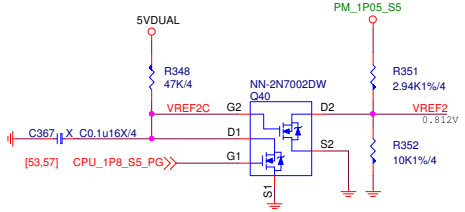
FOR
VCCP_SOC_S5
0.9A

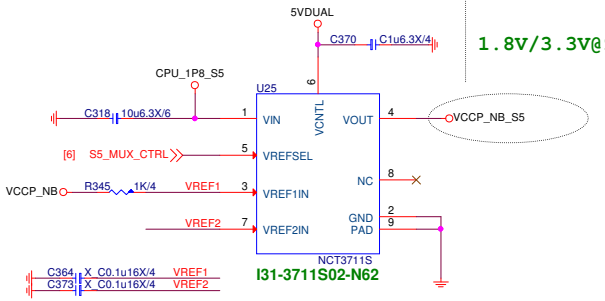
S5_MUX_CTRL
HIGH:S0
LOW: S3/S5

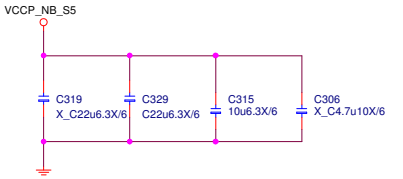
H: +VDDCR_FCH_ALW will track VDDNB
L: If VDDCR_SOC<0.775V (OR 0.85V),VDDCR_SOC_S5 =0.775V.
If VDDCR_SOC >= 0.775V (OR 0.85V) , VDDCR_SOC_S5 will track VDDCR_NB

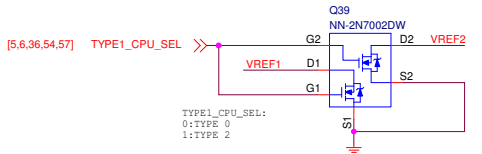
(VDDCR_SOC_S5 is only used for AMD Family 15h Models 60h-6Fh processors)

1.8V/3.3V@900mA









CPU	TYPE	TYPE1_CPU_SEL	TYPE0_CPU_SEL
BR	0	0	1
NA		0	0
SR	2	1	1
RV/ZP	3	1	0

CPU VCCP_NB_S5 ONLY SUPPORT TYPE0

MICRO-START INT'L CO.,LTD.
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Title: CPU NB_S5		
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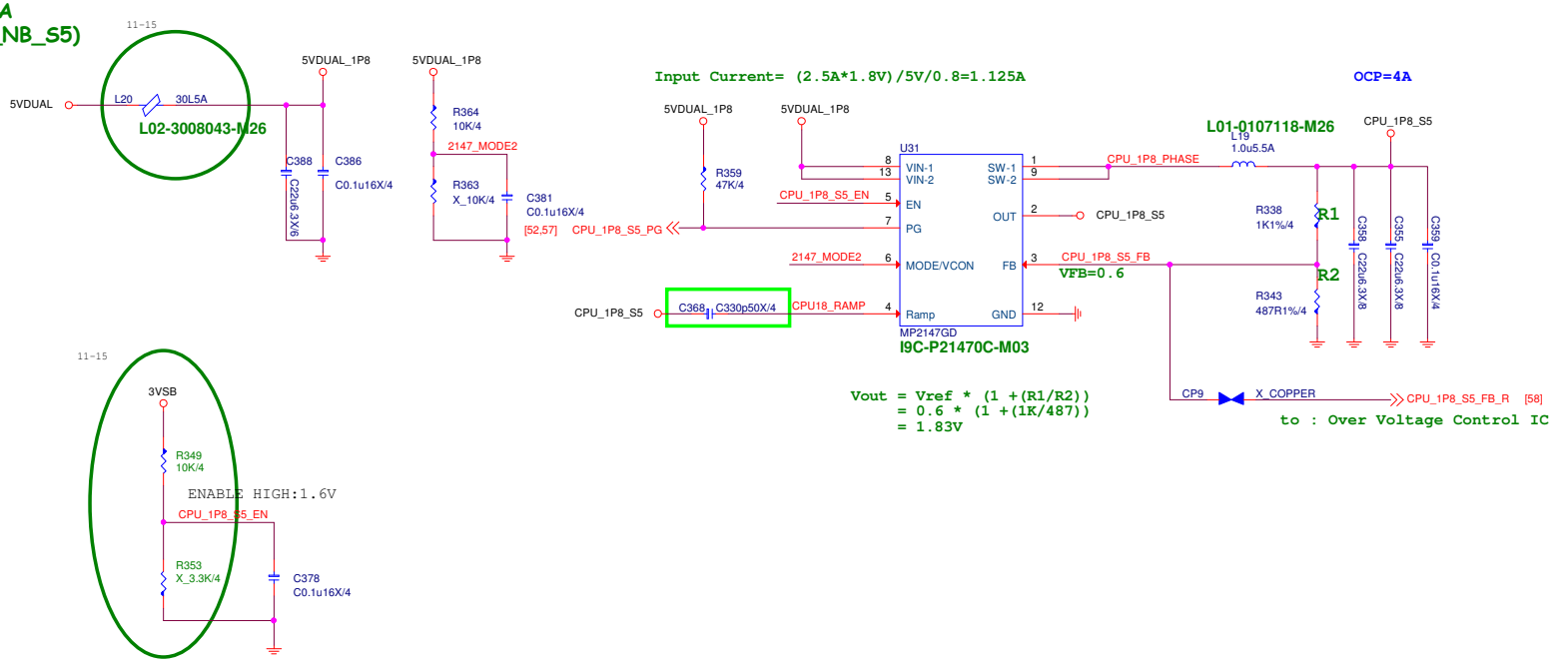
CPU 1.8V S5 @3.4A

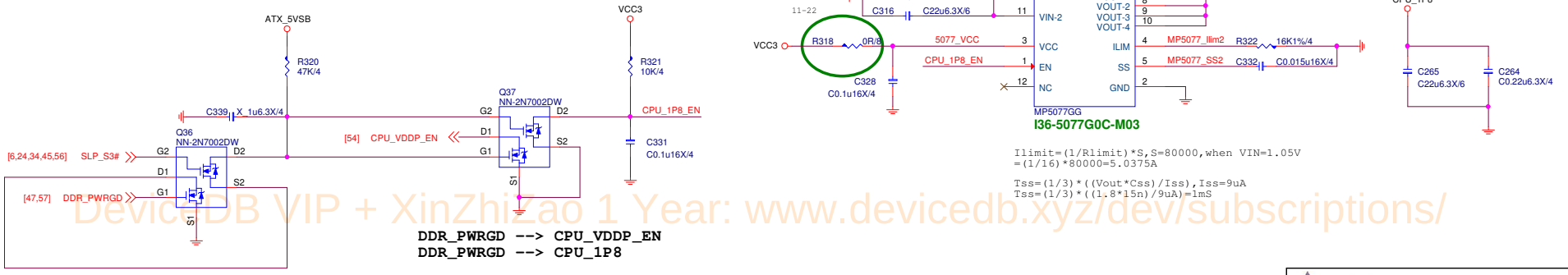
1.8V S5@0.5A
1.8V S0@2A
0.9A(VCCP_NB_S5)



CPU 1.8V S0

1.8V@2A

FOR VCCP_SOC@0.9A



MICRO-START INT'L CO.,LTD.

Title: CPU 1.8_S0/S5		
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CPU_VDDP_S0

1.05V/0.9V@S0:8.5A

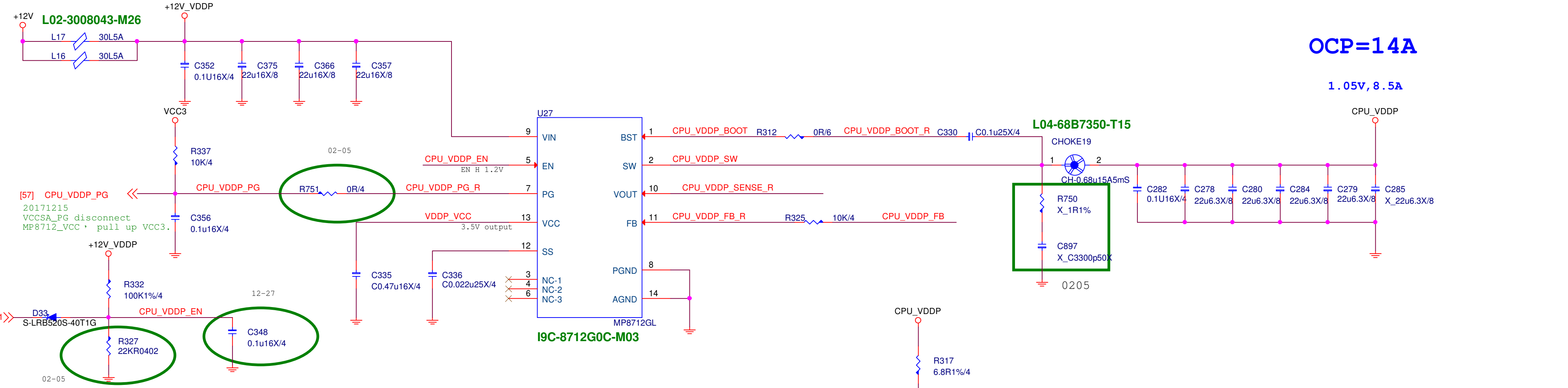
S0:8.5A
S5:1A

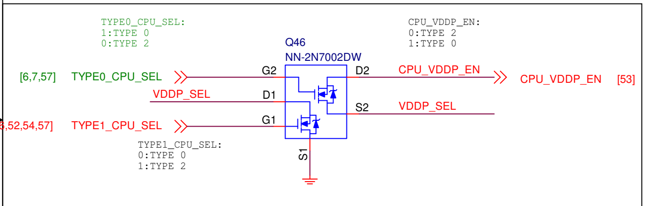
OCP=14A

Input Current= (8.5A*1.05V)/12V/0.8=0.93A

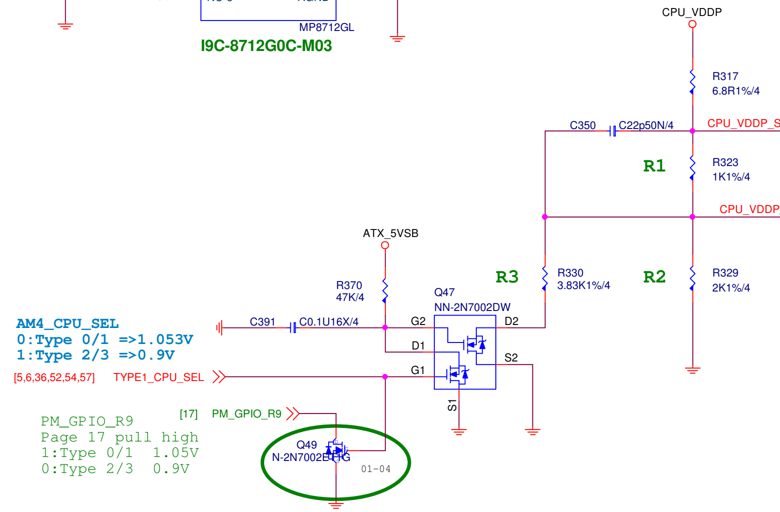
OCP=14A

1.05V,8.5A





CPU	TYPE	TYPE0_CPU_SEL	TYPE1_CPU_SEL	CPU_VDDP_EN
BR	0	1	0	1
NA		0	0	0
SR	2	1	CPU VDDP NOT SUPPORT TYPE2	0
RV/ZP	3	0	1	1



Type 0/1:
Vout = Vref * (1 +(R1/(R2//R3))
= 0.6 * (1 +(1K/(2K//3.83K))
= 1.056V

Type 2/3:
Vout = Vref * (1 +(R1/R2))
= 0.6 * (1 +(1K/2K))
= 0.9V

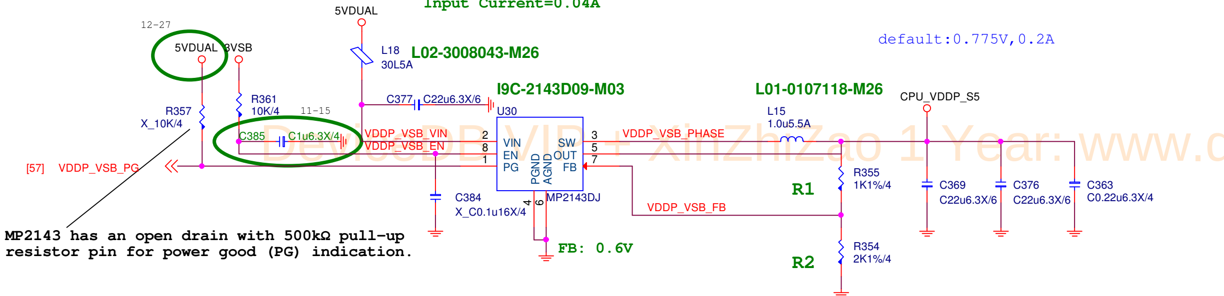
CPU_VDDP_S5

(VDDCR_SOC_S5 is only used for AMD TYPE0)

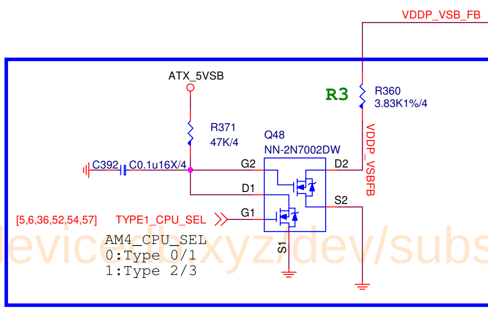
1.05V/0.9V
S5:1A

Input Current=0.04A

default:0.775V,0.2A



MP2143 has an open drain with 500kΩ pull-up resistor pin for power good (PG) indication.



Type 0/1:
Vout = Vref * (1 +(R1/(R2//R3))
= 0.6 * (1 +(1K/(2K//3.83K))
= 1.058V

Type 2/3:
Vout = Vref * (1 +(R1/R2))
= 0.6 * (1 +(1K/2K))
= 0.9V

MSI MICRO-START INT'L CO.,LTD.

Title	CPU Power VDDP		
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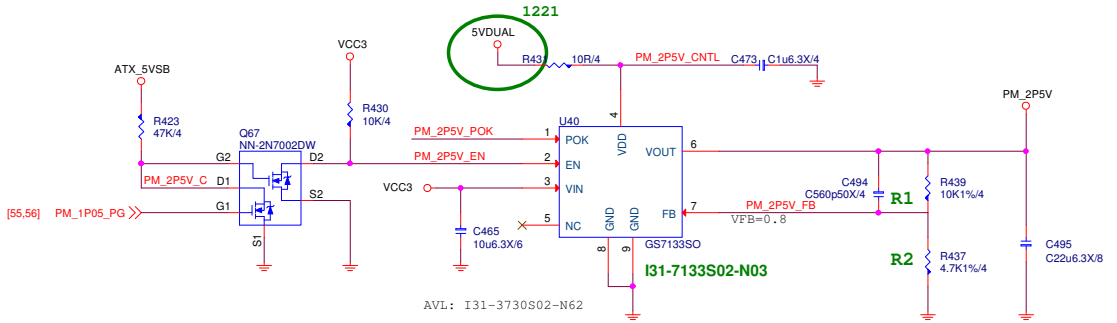
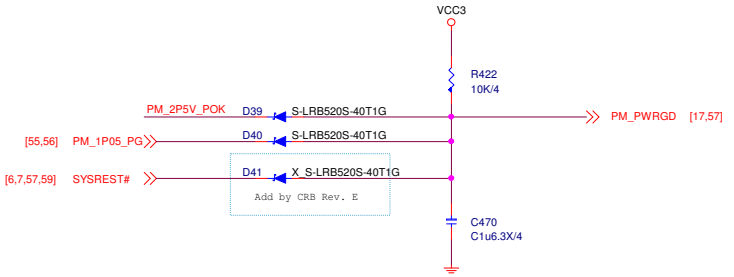
Promontory-2.5V

2.5V@900mA



Vout = Vref * (1 +(R1/R2))
= 0.8 * (1 +(10K/4.7K))
= 2.502V



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Link to the Future

Title: Prom-GS7133/2.5V		
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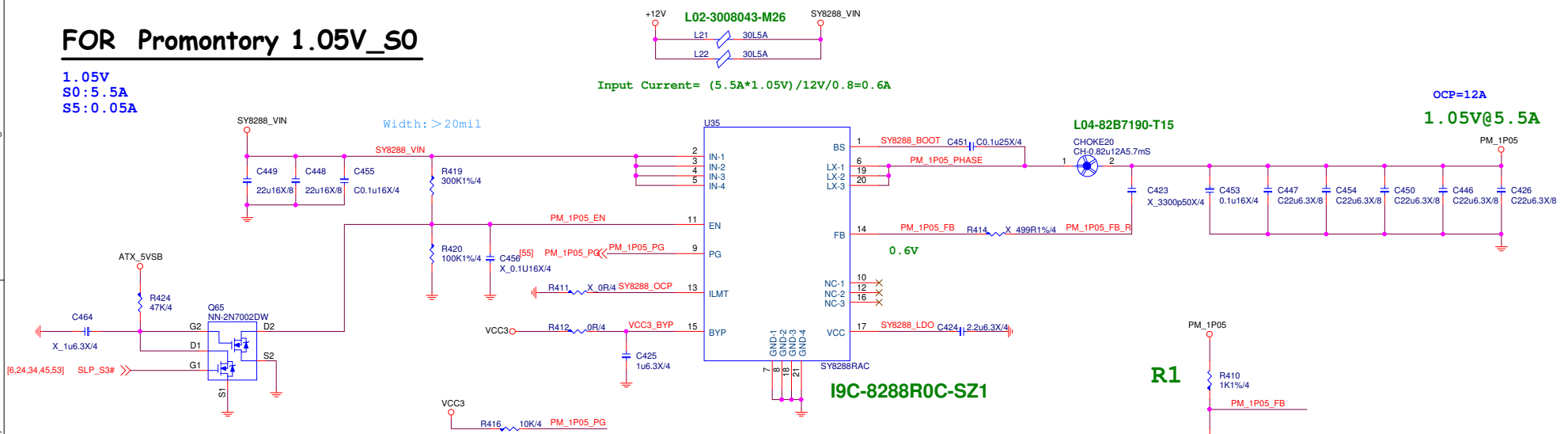
FOR Promontory 1.05V_S0

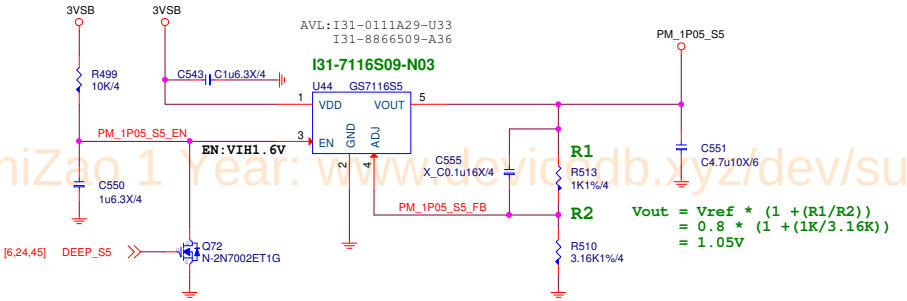
1.05V
S0:5.5A
S5:0.05A



SY8288_OCP	OCP
0	8A
floating	12A
1	16A

FOR Promontory 1.05V_S5

1.05V@0.05A



MSI MICRO-STAR INT'L CO.,LTD.
Link to the Future

Title	Prom- SY8288RAC / 1.05V	
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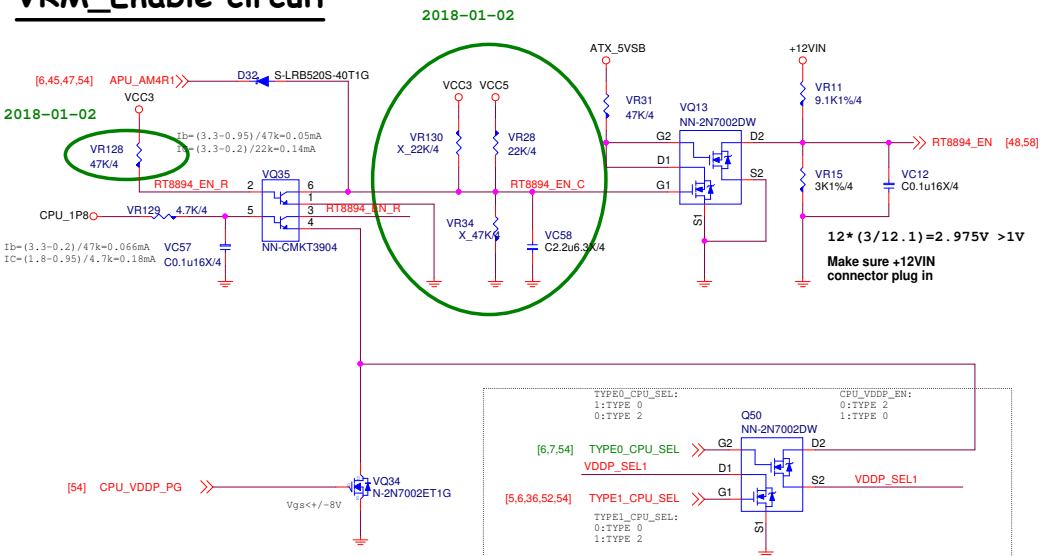
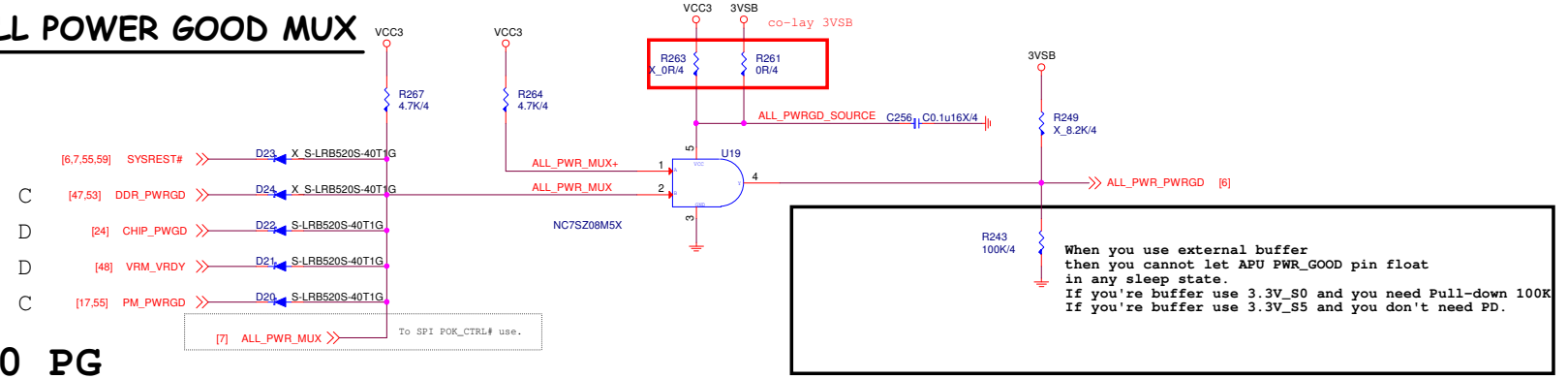
VRM_Enable circuit



CPU	TYPE	TYPE1_CPU_SEL	TYPE0_CPU_SEL
BR	0	0	1
NA	X	0	0
SR	2	1	1
RV/ZP	3	1	0

CPU VDDP NOT SUPPORT TYPE2

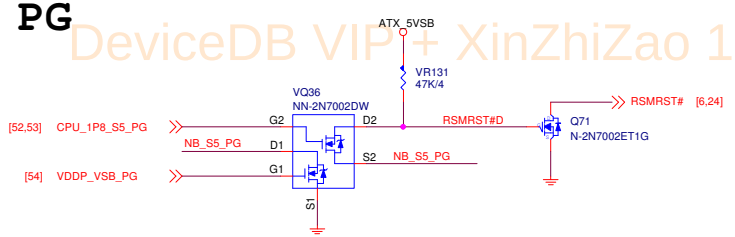
ALL POWER GOOD MUX



When you use external buffer
then you cannot let APU PWR_GOOD pin float
in any sleep state.
If you're buffer use 3.3V_S0 and you need Pull-down 100K
If you're buffer use 3.3V_S5 and you don't need PD.

S0 PG

S5 PG



MSI MICRO-STAR INT'L CO.,LTD.
Link to the Future

Title	VRM-EN/PWRGD	
Size: Custom	Document Number: MS-7B79	Rev: 1.1/2.1
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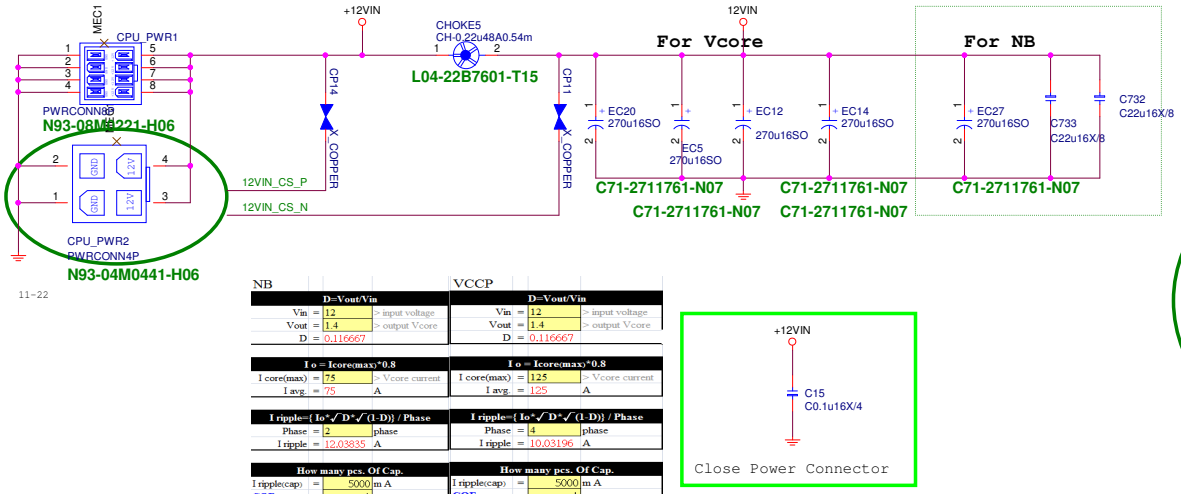
CPU POWER CONNECTOR

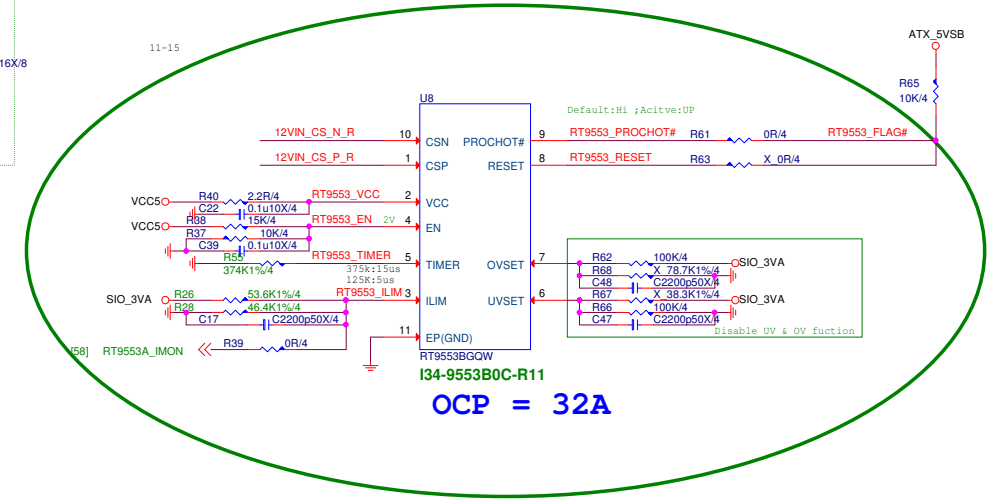


NB				VCCP			
D=Vout/Vin				D=Vout/Vin			
Vin	= 12	> input voltage		Vin	= 12	> input voltage	
Vout	= 1.4	> output Vcore		Vout	= 1.4	> output Vcore	
D	= 0.116667			D	= 0.116667		
I o = Icore(max)*0.8				I o = Icore(max)*0.8			
I core(max)	= 75	> Vcore current		I core(max)	= 125	> Vcore current	
I avg.	= 75	A		I avg.	= 125	A	
I ripple={ Io*√D*√(1-D)) / Phase				I ripple={ Io*√D*√(1-D)) / Phase			
Phase	= 2	phase		Phase	= 4	phase	
I ripple	= 12.03835	A		I ripple	= 10.03196	A	
How many pcs. Of Cap.				How many pcs. Of Cap.			
I ripple(cap)	= 5000	m A		I ripple(cap)	= 5000	m A	
COETEMP	= 1			COETEMP	= 1		
Input Cap.	= 3	pcs.		Input Cap.	= 3	pcs.	

11-15

RT9553B CURRENT SENSE

RT9553 PIN5: When start OV/UV, RESET delay time can meet SPEC 15us.

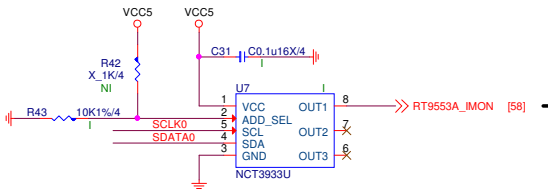


Over Voltage Control IC

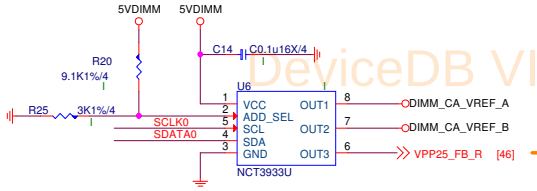
UPI VOLTAGE CONSOLE

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%

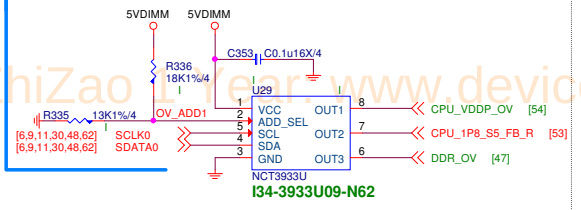
0x2A:RH=OPEN,RL=10K

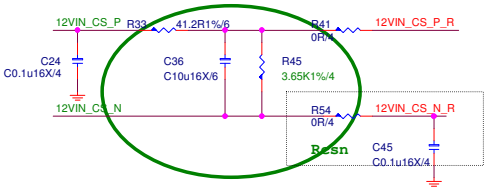


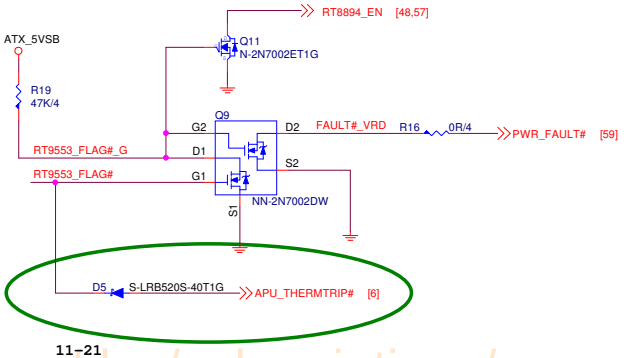
0x28:RH=9.1K,RL=3K



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







11-21

MSI MICRO-START INT'L CO.,LTD.
Link to the Future

Title	RT9553B CURRENT SENSE/OV Control	
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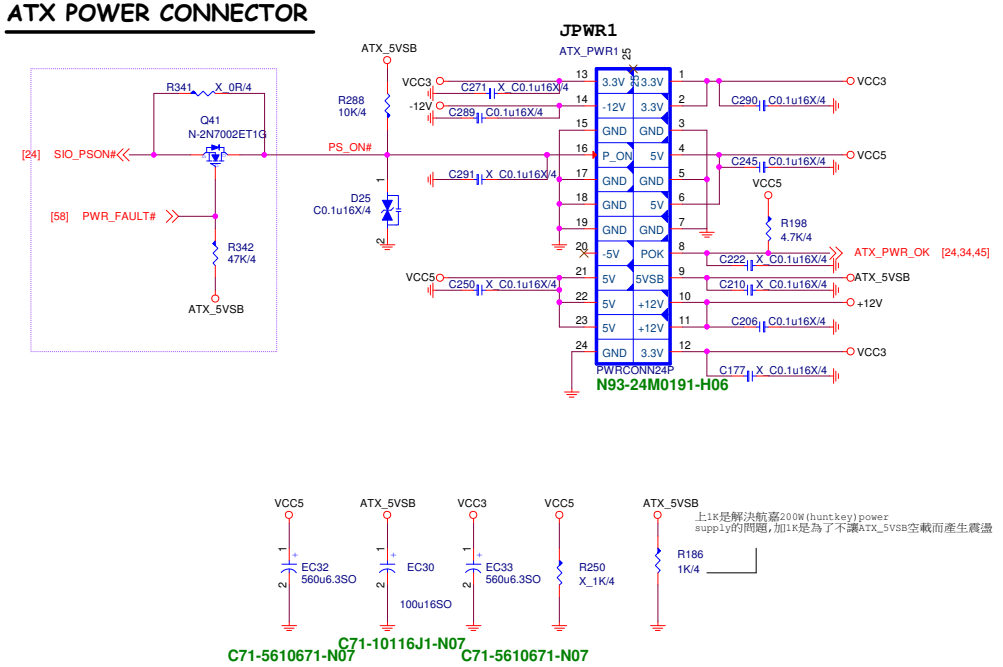
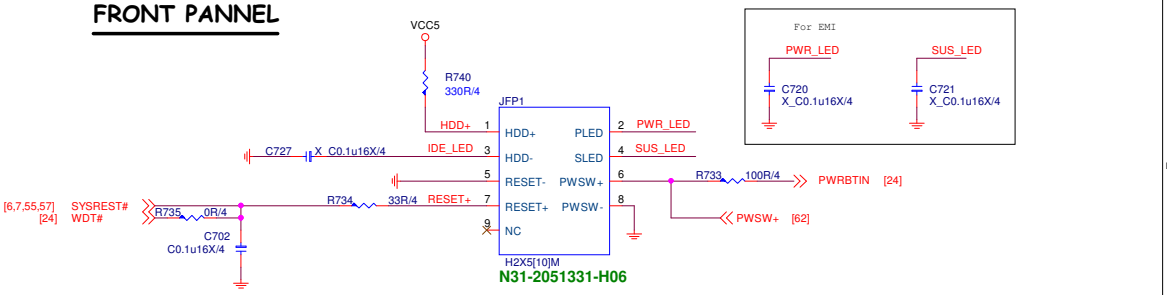
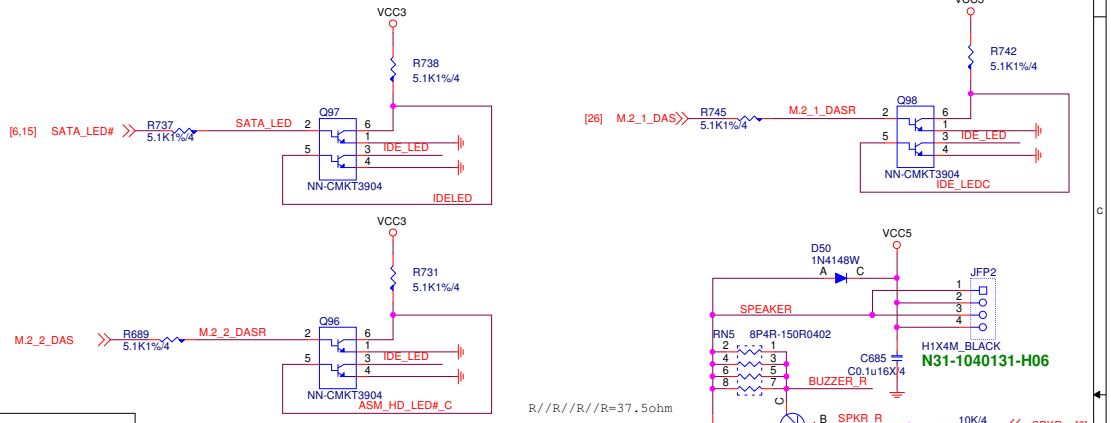
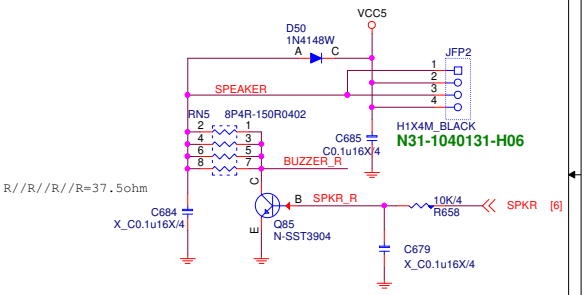
ATX POWER CONNECTOR



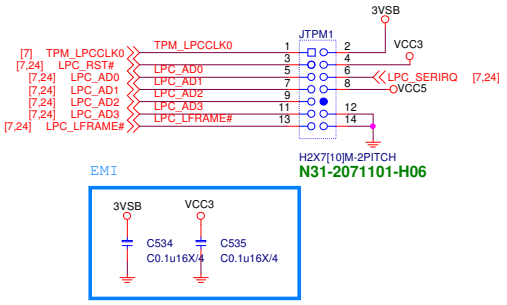
FRONT PANNEL



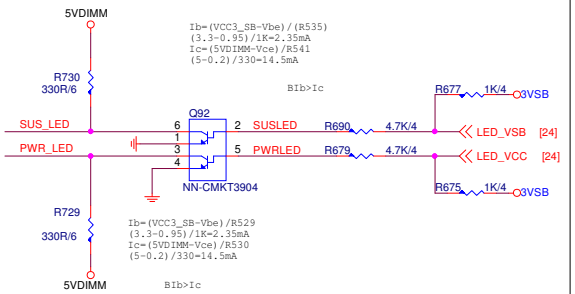




TPM

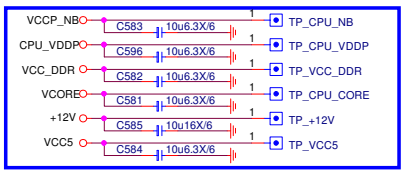


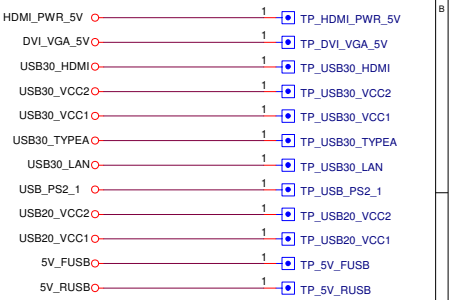
LED (for NCT6797)

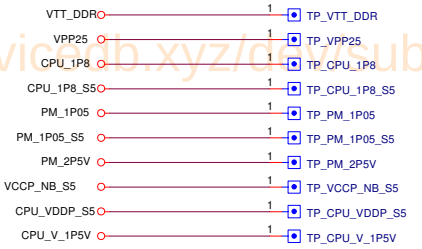


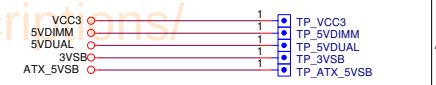
Voltage Mearsure Point

TP close to SIO
Cap close to TP









MSI MICRO-STAR INT'L CO.,LTD.
Link to the Future

Title	ATX/Front Panel	
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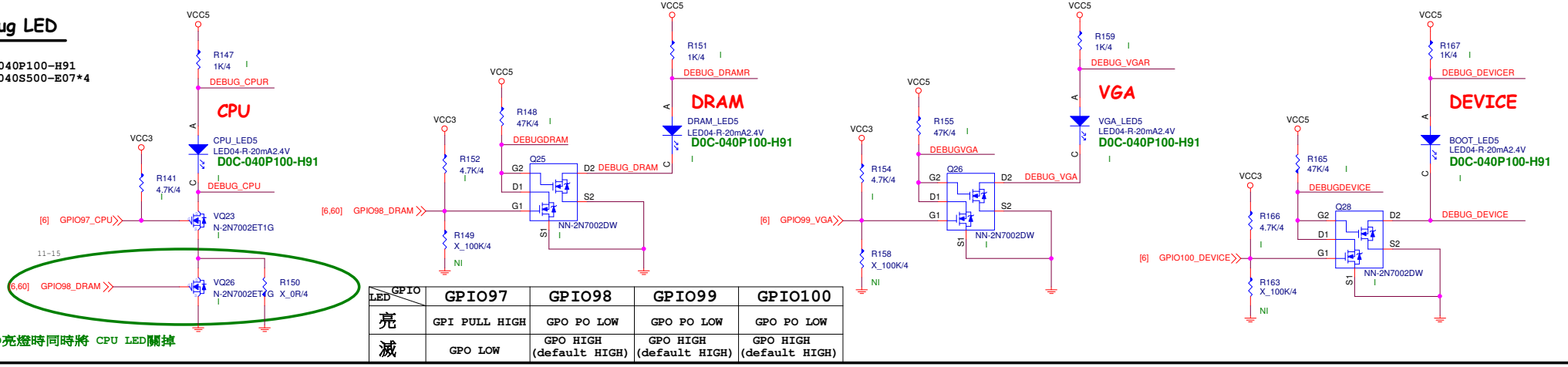
EZ Debug LED

紅:M:D0C-040P100-H91
S:D0C-040S500-E07*4

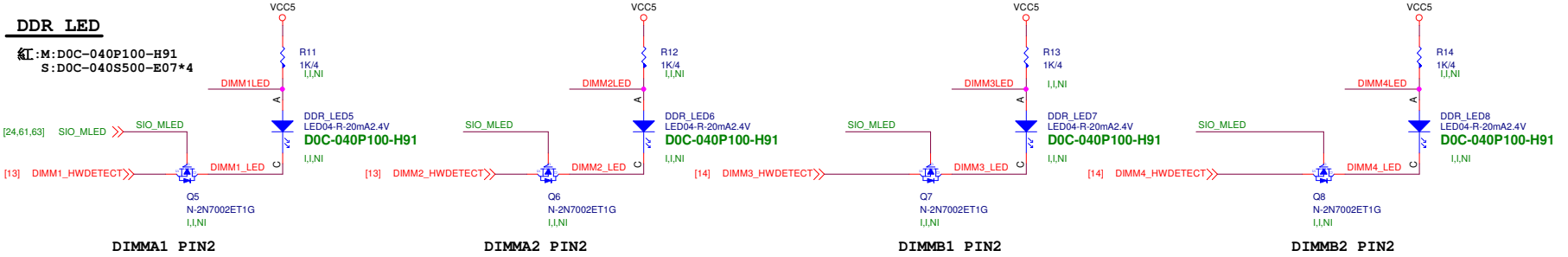


LED亮燈時同時將 CPU LED關掉

LED \ GPIO	GPIO97	GPIO98	GPIO99	GPIO100
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)

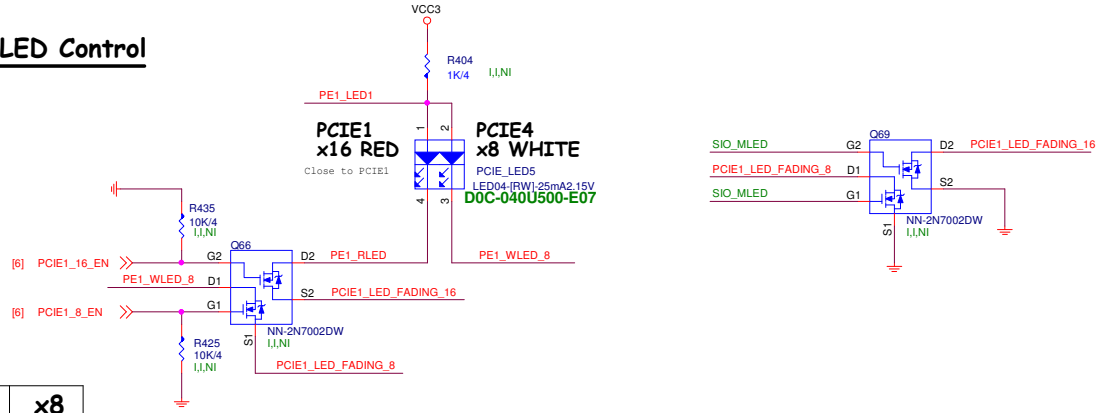
DDR LED

紅:M:D0C-040P100-H91
S:D0C-040S500-E07*4



DIMMA1 PIN2 DIMMA2 PIN2 DIMMB1 PIN2 DIMMB2 PIN2

PCI Express LED Control



	x16	x8
PCIE1	Red	X
PCIE4	X	White

MSI MICRO-START INT'L CO.,LTD.
Link to the Future

Title	ALL LED Control	
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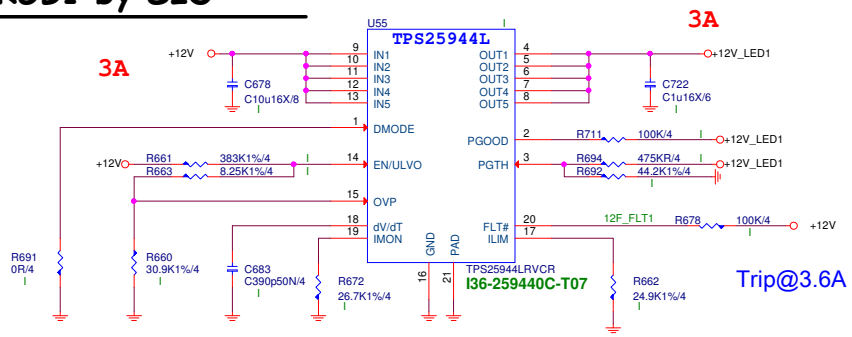
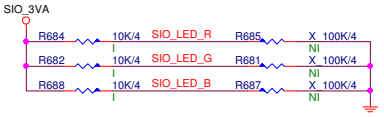
JRGB1 by SIO

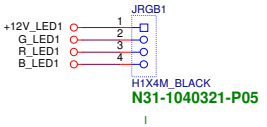
2016.07.06 Use TPS25944L



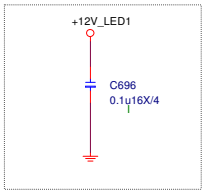
Color	SIO_LED_R	SIO_LED_G	SIO_LED_B
RED	1	0	0
GREEN	0	1	0
BLUE	0	0	1
WHITE	1	1	1

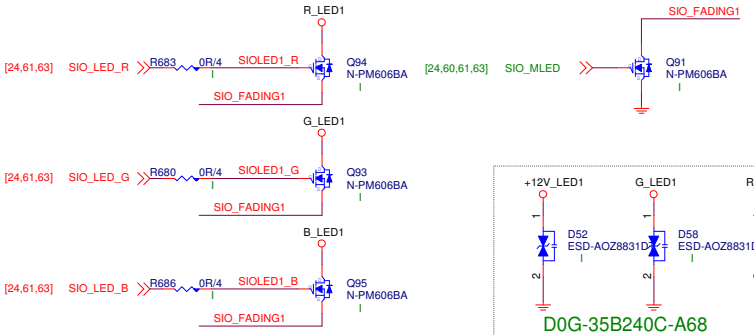


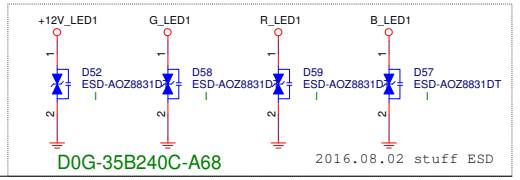
PM SPEC Default WHITE Color



2016.08.02 Add +12V_LED 0.1uF



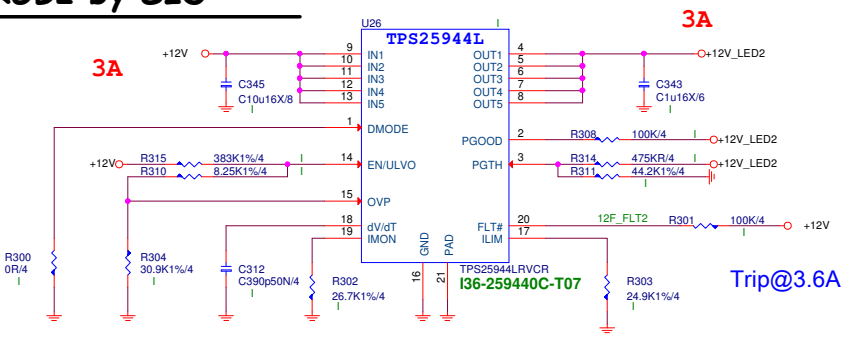


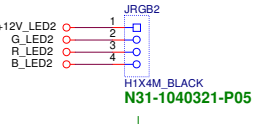


2016.08.02 stuff ESD

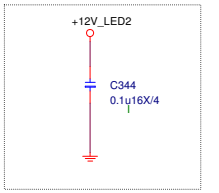
JRGB2 by SIO

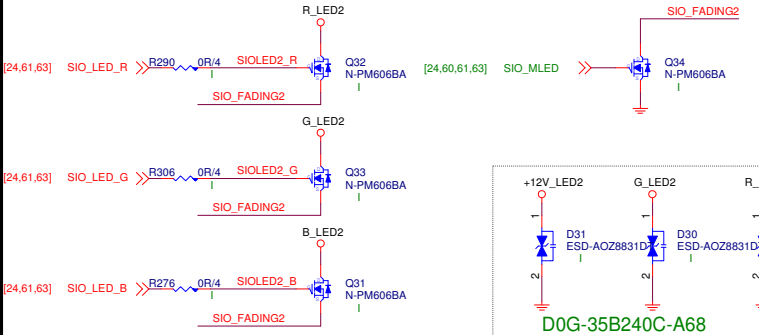
2016.07.06 Use TPS25944L

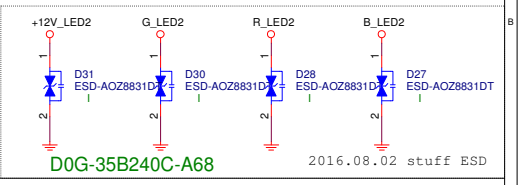




2016.08.02 Add +12V_LED 0.1uF







2016.08.02 stuff ESD

MSI MICRO-STAR INT'L CO.,LTD.
Link to the Future

Title	JRGB1/JRGB2	
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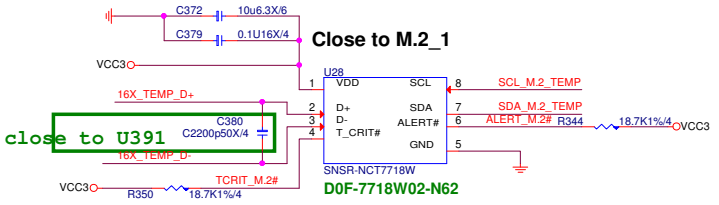
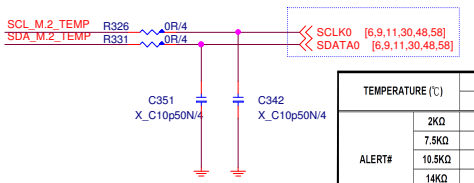
NCT7718W



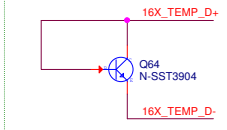
NCT7718W SM Bus address is 98h (1001100xb)

Default: ALERT# Output Comparator Mode

Please Make Sure Your SM Bus is Pull-Up to VCC3



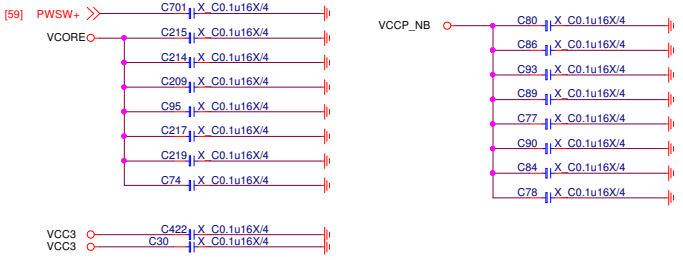
TEMPERATURE (℃)		T_CRIT#				
		2KΩ	7.5KΩ	10.5KΩ	14KΩ	18.7KΩ
ALERT#	2KΩ	77	87	97	107	117
	7.5KΩ	79	89	99	109	119
	10.5KΩ	81	91	101	111	121
	14KΩ	83	93	103	113	123
	18.7KΩ	85	95	105	115	125



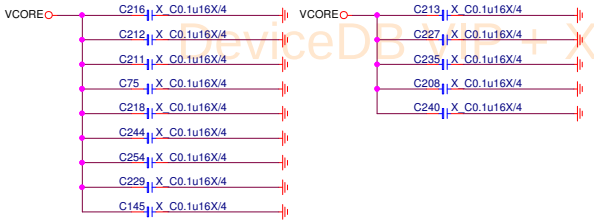
Place to PCIE16X SLOT

Layout notice:
1. Put the C1 2200pF to close the NCT7718W.
2. Add Ground Shielding For D+ and D- Traces.
3. D+/D- Route Has to be Away From the High Noise Area.
4. The Recommended Traces Width and Ground Shielding Spacing are 10mils.

Add for EMI



return path



MICRO-START INT'L CO.,LTD.

Title: NCT7718W temp sensor /EMI CAP

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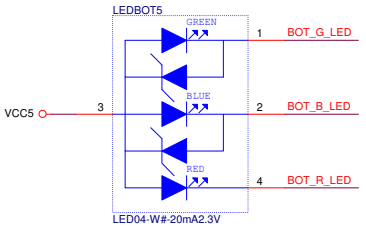
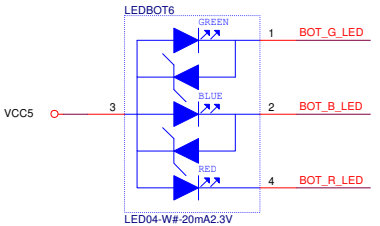
Mystic Light/Right Track LED *8

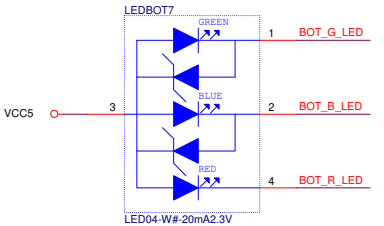
0.09A*8=0.72A



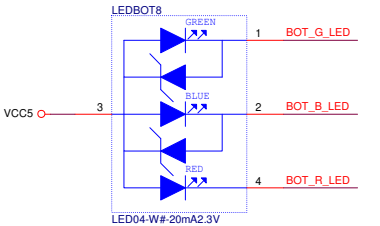
D0C-040U700-H91



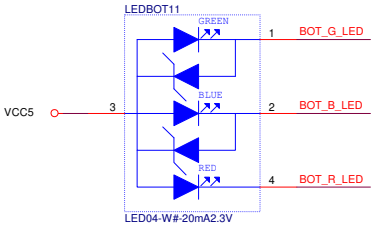
D0C-040U700-H91



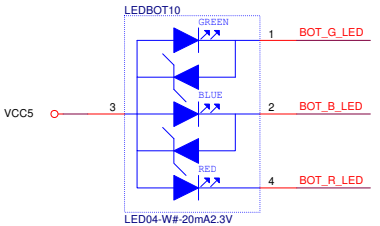
D0C-040U700-H91



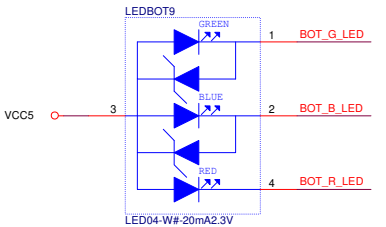
D0C-040U700-H91



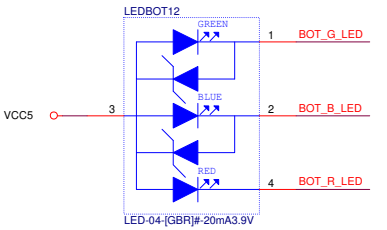
D0C-040U700-H91



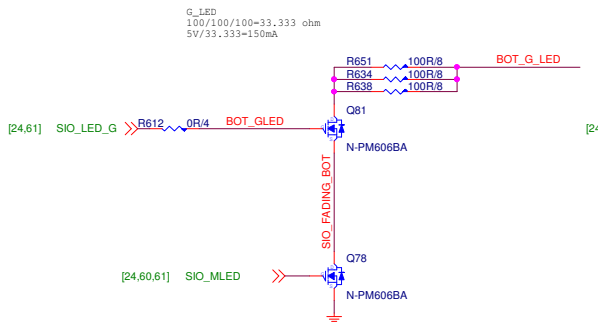
D0C-040U700-H91

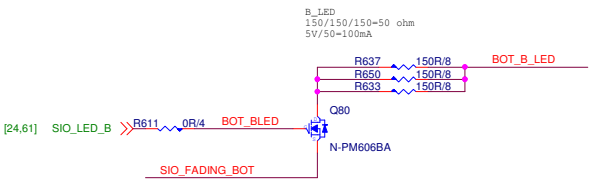


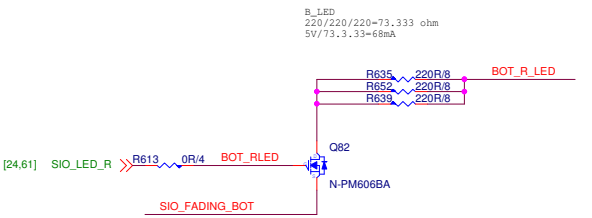
D0C-040U700-H91



D0C-040U700-H91







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Title: Mystic Light/Right Trac		
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OPTION BOM PARTS

60 Level

	A	B	C	D	E
PCIE X16 SLOT	OPT_PCIE_X16_1 PCIE x16 SLOT_PCIEXP164_13 N11-1641491-L06	OPT_PCIE_X16_2 PCIE x16 SLOT_PCIEXP164_13 N11-1641671-L06			OPT_PCIE_X16_3 PCIE x16 SLOT_PCIEXP164_13 N11-1641671-L06
PCIE X8 SLOT	OPT_PCIE_X8_1 PCIE x16 SLOT_PCIEXP100_5 N11-1000221-L06	OPT_PCIE_X8_2 PCIE x16 SLOT_PCIEXP100_3 N11-1000261-L06	OPT_PCIE_X8_3 PCIE x16 SLOT_PCIEXP100_5 N11-1000321-L06	OPT_PCIE_X8_4 PCIE x16 SLOT_PCIEXP100_3 N11-1000231-L06	OPT_PCIE_X8_5 PCIE x16 SLOT_PCIEXP100_5 N11-1000331-L06
REAL USB Type A	OPT_USBA_1 SB-Type A 鍍金 USB_A1_9_USB3_1_1 N53-09M0861-L06	OPT_USBA_2 SB-Type A USB_A1_9_USB3_1_1 N53-09M0591-L06	OPT_USBA_3 SB-Type A USB_A1_9_USB3_1_1 N53-09M0671-L06		OPT_USBA_4 SB-Type A 鍍金 USB_A1_9_USB3_1_1 N53-09M0851-L06
SOLID CAP 270u16	OPT_270u16_BLK1 SOLID CAP C_P3_5_D8_H8 C71-2711761-N07	OPT_270u16_BU1 SOLID CAP C_P3_5_D8_H9 C71-27117D1-AO5			
SOLID CAP 560u6.3	OPT_560u6.3_BLK1 SOLID CAP C_P2_5_D6_3_H9_5 C71-5610671-N07	OPT_560u6.3_BU1 SOLID CAP C_P2_5_D6_3_H9 C71-56106F1-AO5			
SOLID CAP 470u6.3	OPT_470u6.3_BLK1 SOLID CAP C_P2_5_D6_3_H9_5 C71-47106C1-N07	OPT_470u6.3_BU1 SOLID CAP C_P2_5_D6_3_H9 C71-47106K1-AO5			
SOLID CAP 100u16	OPT_100u16_BLK1 SOLID CAP C_P2_5_D6_3_H5 C71-10116J1-N07	OPT_100u16_BU1 SOLID CAP C_P2_5_D6_3_H6 C71-10116Q1-AO5			
MEM SLOT	OPT_MEM_BLK1 MEM SLOT DDRIV_D288 N13-2880581-L06	OPT_MEM_RED1 MEM SLOT DDRIV_D288 N13-2880701-L06			OPT_MEM_WHITE1 MEM SLOT DDRIV_D288 N13-2880541-L06
MKTG Label	OPT_X370_1 X370 KRAIT GAMING G51-M1SPK85-Q13	OPT_B350_1 B350 KRAIT GAMING G51-M1SPK86-Q13	OPT_X370_2 X370 SLI PLUS G51-M1SPK87-Q13	OPT_X470_1 X470 GAMING PRO G51-M1SPM51-Q13	OPT_X470_4 X470 GAMING PLUS G51-M1SPM54-Q13
PCH SINK	OPT_PCH_SINK_1 MEM SLOT X470 GAMING PRO E31-0408920-K08	OPT_PCH_SINK_2 MEM SLOT X470_GAMING_PLUS E31-0409610-K08		OPT_PCH_SINK_3 MEM SLOT KRAIT E31-0408920-K08	OPT_PCH_SINK_4 MEM SLOT KRAIT E31-0408970-A87
MOSN +IO	OPT_MOSN_IO_1 MEM SLOT KRAIT E31-0504780-K08	OPT_MOSN_IO_2 MEM SLOT PLUS E31-0505660-K08		OPT_MOSN_IO_3 MEM SLOT PRO E31-0504780-K08	OPT_MOSN_IO_4 MEM SLOT PRO E31-0504820-A87
MOSW	OPT_MOSW_1 MEM SLOT KRAIT E31-0504790-K08	OPT_MOSW_2 MEM SLOT PLUS E31-0505650-K08		OPT_MOSW_3 MEM SLOT PRO E31-0504790-K08	OPT_MOSW_4 MEM SLOT PRO E31-0504830-A87
PS2_USB	OPT_PS2_USB_1 PS2_USB IOASM_USB_DIN14 N58-14M0221-H06	OPT_PS2_USB_2 PS2_USB IOASM_USB_DIN14 N58-14M0241-H06			
HDMI_USB	OPT_HDMI_USB_1 HDMI_USB IOASM_USB3_HDMI37 N58-37M0101-L06	OPT_HDMI_USB_2 HDMI_USB IOASM_USB3_HDMI37 N58-37M0111-L06			
LAN_USB	OPT_LAN_USB_1 LAN_USB IOASM_RJ45_USB_LED32 N58-32F0291-F02	OPT_LAN_USB_2 LAN_USB IOASM_RJ45_USB_LED32 N58-32F0311-F02			

FOOTPRINT
SLOT_PCIEXP100_5 可包容
SLOT_PCIEXP100_3

FOOTPRINT
C_P3_5_D8_H12 因為機構無法使用 請注意!
C_P3_5_D8_H9 可包容
C_P3_5_D8_H8

FOOTPRINT
C_P2_5_D6_3_H9_5 可包容
C_P2_5_D6_3_H9

FOOTPRINT
C_P2_5_D6_3_H9_5 可包容
C_P2_5_D6_3_H9

FOOTPRINT
C_P2_5_D6_3_H6 可包容
C_P2_5_D6_3_H5

FOOTPRINT
DDRIV_D288_1_T 可包容
DDRIV_D288

5010 Level

	A	B	C	D	E
FCH	OPT_X470_NB AMD-218-0891008 OB1-7B78001-A08	OPT_B350_NB 218-0891005-00-RH B01-21808B5-A08			
M.2 SLOT	OPT_M2_1 M.2 Key M SLOT_NGFFCARD67_31 N15-0670820-L06	OPT_M2_2 M.2 Key M SLOT_NGFFCARD67_2 N15-0670330-L06	OPT_M2_3 M.2 Key M SLOT_NGFFCARD67_33 N15-0670810-L06		
REAL USB Type C	OPT_USBC_1 SB-Type C 鍍金 USB_C1_24_2 N53-24M0180-L06	OPT_USBC_2 SB-Type C USB_C1_24_2 N53-24M0040-L06			
PCB	OPT_PCB_1 PCB Black 7B79-10 PD0-07B7911-G37 PD0-07B7911-E48	OPT_PCB_2 PCB Black/WHITE 7B79-20 PD0-07B7921-G37 PD0-07B7921-E48	OPT_PCB_3 PCB Black/Red 7A33-31 PD0-07A3331-G37 PD0-07A3331-E48		
0 Ohm (0402)	OPT_0OHM_5010_1 Resistance 0OHM 5010_0402 R11-0000012-W08				
LED	OPT_RED_LED_5010_1 RED LED LED04-R-20mA2.4V_1608-HF D0C-040P100-H91				

FOOTPRINT
SLOT_NGFFCARD67_31 可包容
SLOT_NGFFCARD67_2

5020 Level

	A	B	C	D	E
LED	OPT_RED_LED_5020_1 RED LED LED04-[BR]-25mA2.35V_1711-RH 5020_0402 D0C-040S600-E07				

60 Level

	A	B	C	D	E
Audio cover	OPT_AUD_COV_1 Audio Cover AUDIO_COVER_20X19_5 E21-7A59010-A91			OPT_AUD_COV_2 Audio Cover AUDIO_COVER_20X19_5 E21-7A62010-A91	
Audio Jack	OPT_AUD_JACK_1 Audio Jack JACK_AUD_D26P N54-26F0351-L06			OPT_AUD_JACK_2 Audio Jack AUDIO_JACK6_26P_U2 N54-26F0361-L06	
M.2 SCREW	OPT_M2_SCR_1 RED LED SCREW E2B-7A69010-A89				
PCIE X4 SLOT	OPT_PCIE_X4_1 PCIE x16 SLOT_PCIEXP100_5 N11-1000221-L06	OPT_PCIE_X4_2 PCIE x16 SLOT_PCIEXP100_5 N11-1000261-L06	OPT_PCIE_X4_3 PCIE x16 SLOT_PCIEXP100_5 N11-1000321-L06	OPT_PCIE_X4_4 PCIE x16 SLOT_PCIEXP100_5 N11-1000331-L06	

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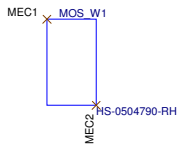
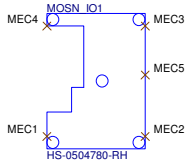
RM: E95-0000022-C22/ E95-0000022-A91

MOS SINK



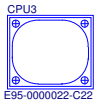
E31-0504790-K08



E31-0504780-K08

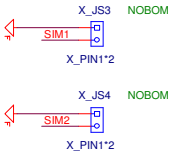
DDR Cover

CPU Socket

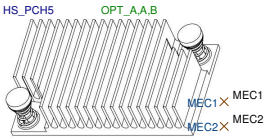


E95-0000022-C22

Simulation

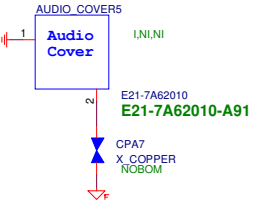


PCH SINK



E31-0408920-K08

AUDIO COVER



E21-7A62010-A91

MANUAL PART

BAT1_X1

BAT-BCR2032P

AVL:
D06-0100161-F52
D06-0100101-K26

7B79-10

PD0-07B7910-G37,精成-深圳,1,台北微星廠(MSI)
PD0-07B7910-E48,競華,1,台北微星廠(MSI)

BIOS LABEL

G51-M1SPXXA-A09

MKTG name Label

ROYALTY

HDMI_LA1

Y01-RHDMI03-000

cFosSoftware I,I,NI

Y02-MU00170-CFO

NAHIMIC I,I,NI

Y02-MU00100-NAH

NVIDIA_SLI I,NI,I

Y01-RNVIDIK-000

XSPLIT I,I,NI

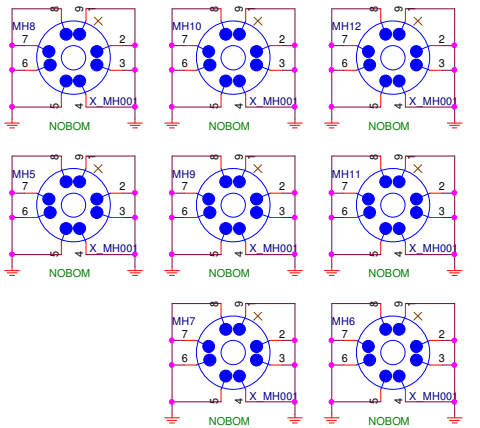
Y02-MA00401-XSP

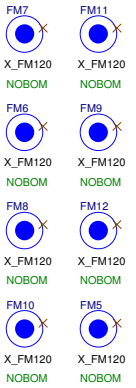
SSE I,I,NI

Y02-MA00101-SSE

GAMING Only

Optics Orientation Holes





Schematic Cfg	Project	
CFG1-7A33-0A-X370-GAMING_601-7A33-A01	V	A
CFG2-7A33-0A-B350-GAMING_601-7A33-A02	V	B
CFG3-7A33-0A-X370-SLI PLUS_601-7A33-B01	V	C

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