TITLE	Page
Cover Sheet	1
Block Diagram	2
CPU-Memory, CPU-PEG/Display	3,4
CPU-Control/MISC/CFG/Audio	5
CPU-Power,CPU-GND	6,7
DDR4 DIMM1&DDR4 DIMM2	8,9,10,11
PCH-USB/PCIE/DMI/SATA	12
PCH-Audio/Display/Clock	13
PCH-GPIO/USBOC#/SATASTRAP	14
PCH-LPC/SPI/SMBUS/MISC	15
PCH-Power,PCH-GND,PCH-Strap	16,17,18
PCIE SLOT-CPU(X16)	19
PCIE SLOT-PCH(X1)	20
SIO-NCT5567D / FAN CONTROLLOR	21,22
AUDIO - ALC887,AUDIO - depop circuit	23,24
LAN - RTL8111H	25
DVI/HDMI/VGA	26,27,28
USB2.0/USB3.0/LAN_USB/SATA connector	29~32
CLR_CMOS circuit/BIOS ROM	33,34
ACPI CONTROLLER	35
PWM-RT3607BC/VCORE 4PHASE/VGT 2PHASE	36,37,38
DDR-RT8231/DDR-PM2143-VPP25	39,40
CPU PWR_ST/PLL/PCH Core power	41,42
VCCSA - POWER/VCCIO - POWER	43,44
ATX F_Panel/TPM/MSI_LED	45
DEBUG LED/EMI CAP/Manial Part	46,47,48
Power Map/Power Sequence/GPIO MAP	49,50,51
Revision History	52

MS-7B23

ATX:243.8mm*243.8mm

Ver: 1.1

Intel -CoffeeLake-S plamform

CPU:

LGA1151

*CPU POWER PAK *4Phase*

*GT POWER PAK *2 Phase*

Onboard Chip:

SIO: NCT5567D colay NCT5565D
HD Audio Codec: ALC887
LAN: RTL8111H
Flash ROM: SPI 64 MB

DP to VGA: RTD2167

CUT VBAT:SLG4B41231

Main Memory:

*DDR4 * 4 (Dual Channel)*

ACPI:

5VDAUL:uP7501

5VDIMM:uP7501

3VSB:GS7133+N MOS

1P8_VSB:GS7133

3VDSW:GS7116

VCCSTPLL:GS7133

System Chipset:

Cannon Lake B360

PWM:

VCORE - RT3606

DDR - RT8125E

DDR VPP25- MP2147

PCH(1.05V) - RT8125E

VCCSA - RT8125E

VCCIO - SY8288

Expansion Slots:

*PCI Express (X16) Slot * 1*

*PCI Express (X1) Slot * 2*

*M.2 Slot * 2*

MICRO-STAR INT'L CO.,LTD

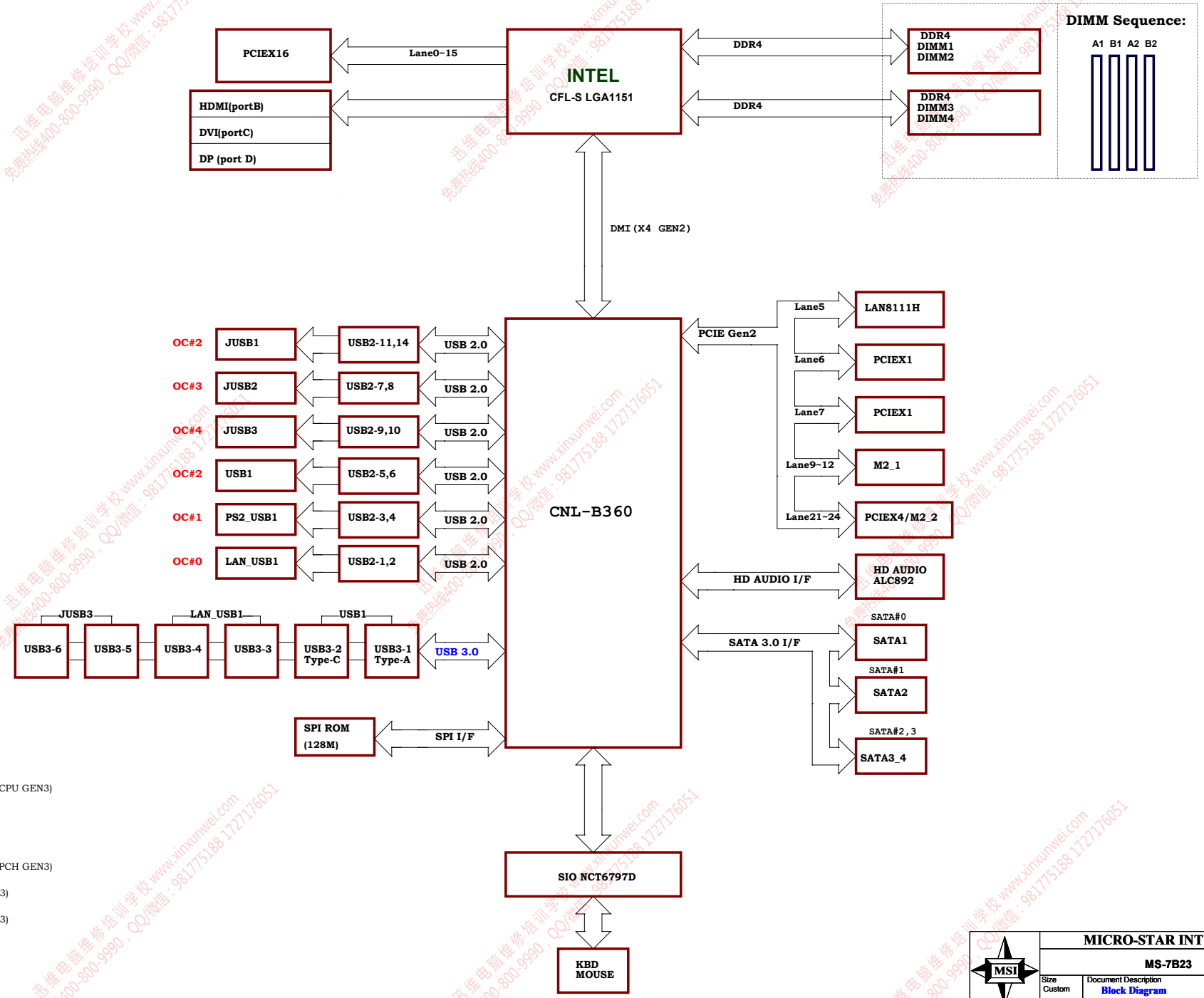
MS-7B23

Size: Custom | Document Description: Cover Sheet | Rev: 1.1

Date: Monday, February 12, 2018 | Sheet 1 of 63

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

MS-7B23 Block Diagram



Slot Sequence:

PCIE X16	(By CPU GEN3)
PCIE X1	(By PCH GEN3)
PCIE X1	(By PCH GEN3)
PCIE X4	(By PCH GEN3)
M2_1	(By PCH GEN3)
M2_2	(By PCH GEN3)

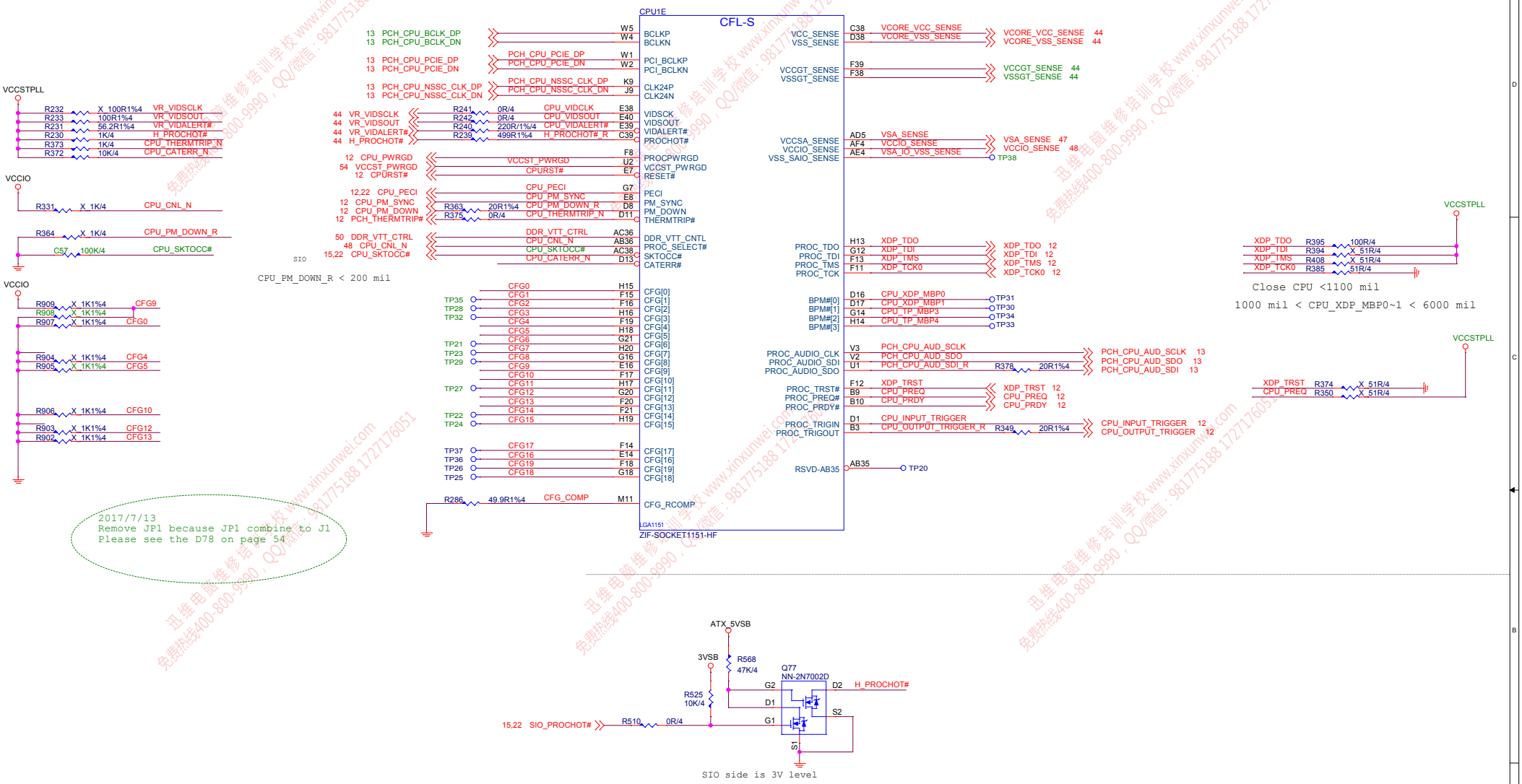
MICRO-STAR INT'L CO.,LTD

MS-7B23

Size: Custom | Document Description: Block Diagram | Rev: 1.1

Date: Monday, February 12, 2018 | Sheet 2 of 63

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051



CFG Strap

CFG Table

	HIGH	LOW	DESCRIPTION
0	No Lock	Lock	PCU PLL lock
1			RSVD
2	NORM	REVERSE	PEG LANE REVERSAL
3			RSVD
4	DISABLE	ENABLE	eDP
5	DISABLE	ENABLE	PEG0CFGSEL[0]
6	DISABLE	ENABLE	PEG0CFGSEL[1]
7	RESET#	BIOS REQ	PEG DEFER TRAINING
8			RSVD
9	PRESENT	NO PRESENT	SVID PRESENT
10			RSVD
11			RSVD
12			RSVD
13			RSVD
14			RSVD
15			RSVD
16			RSVD
17			RSVD
18			RSVD
19			RSVD

MICRO-STAR INT'L CO.,LTD

MS-7B23

Size	Document Description	Rev
Custom	CPU-Control/MISC/CFG	1.1

Date: Monday, February 12, 2018 Sheet 3 of 63

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

SOCKET PN N12-151A010-L06

follow 7B16-0A DDR 走線

CPU1A

CFL-S

CHANNEL A

ZIF-SOCKET1151-HF

CPU1B

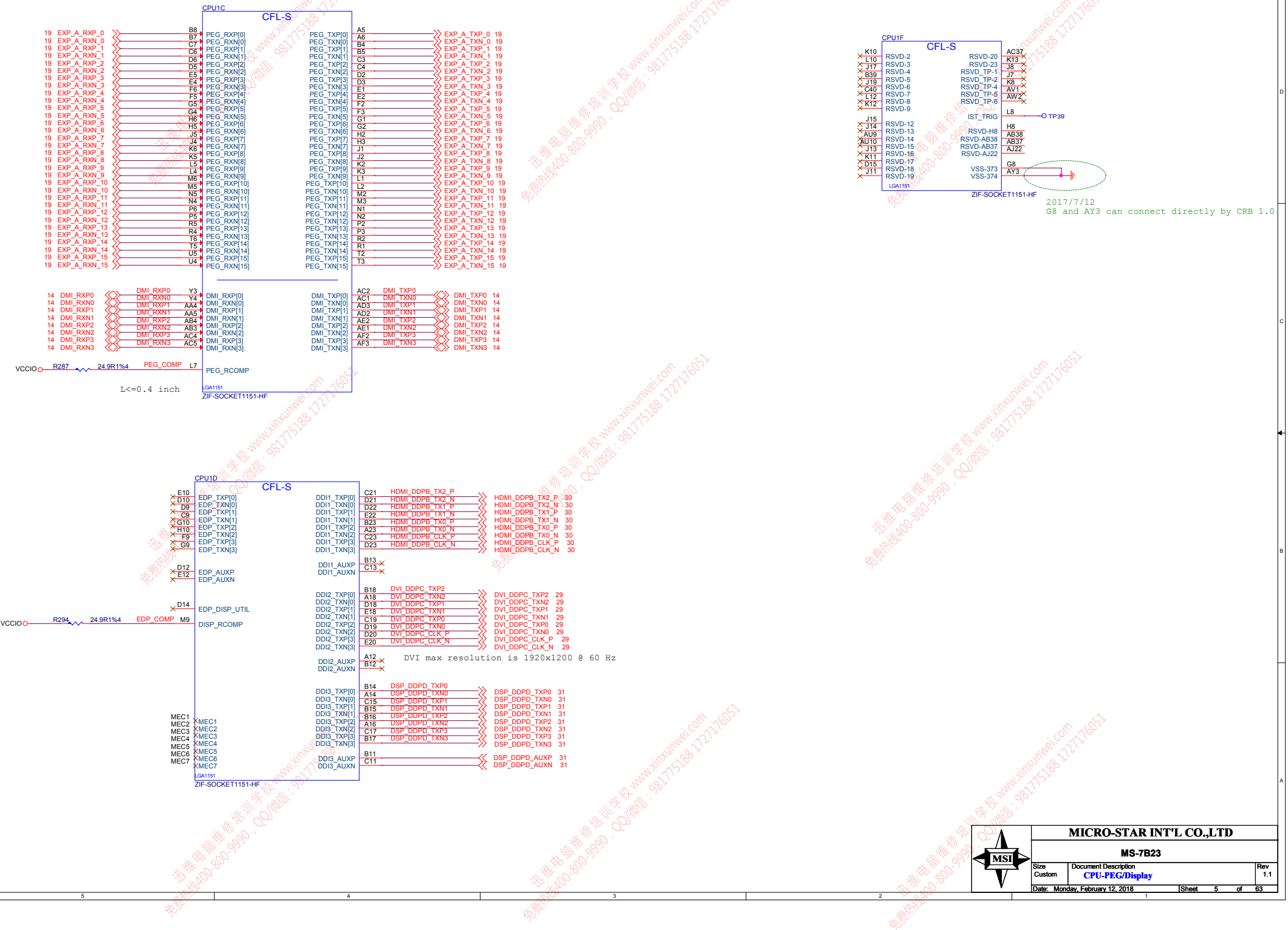
CFL-S

CHANNEL B

ZIF-SOCKET1151-HF

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: CPU-Memory	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 4 of 63	

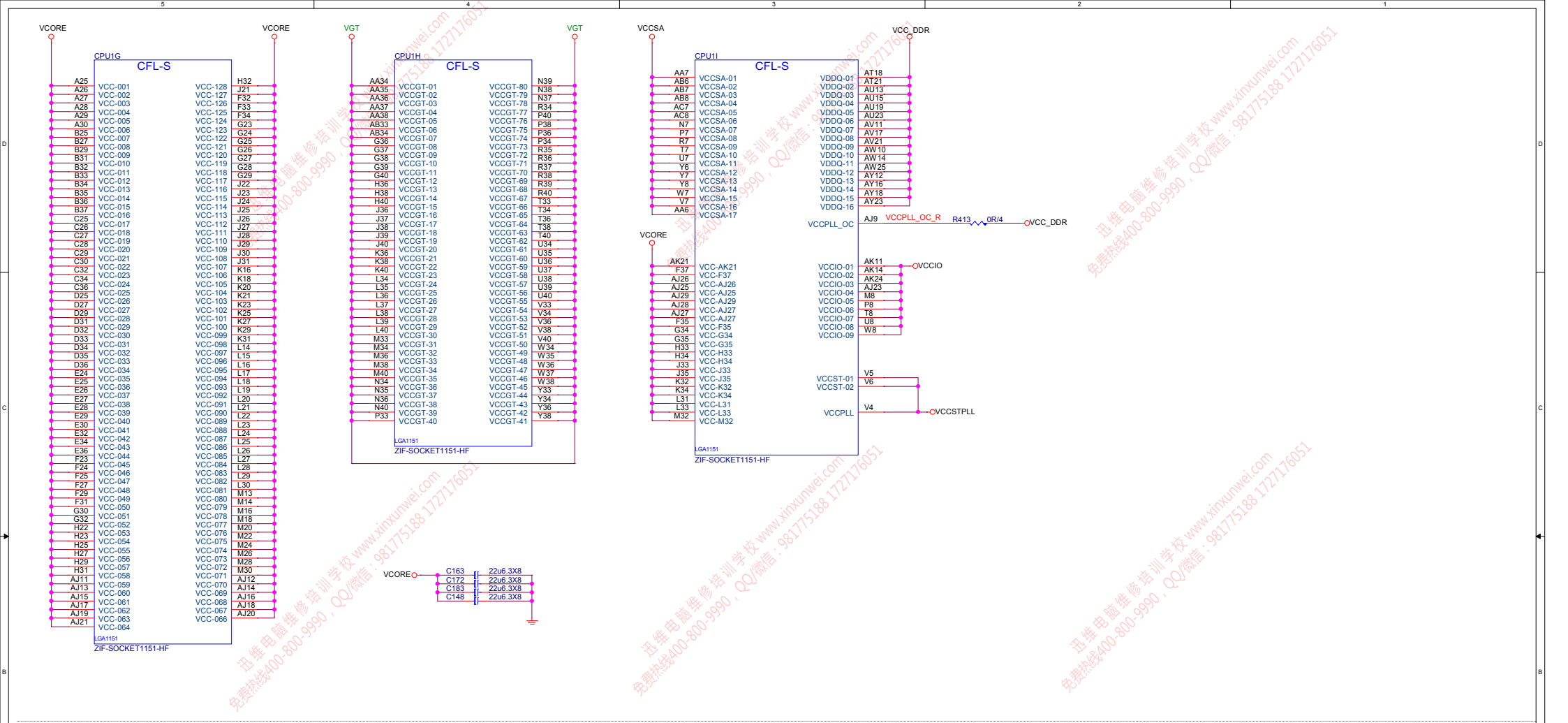


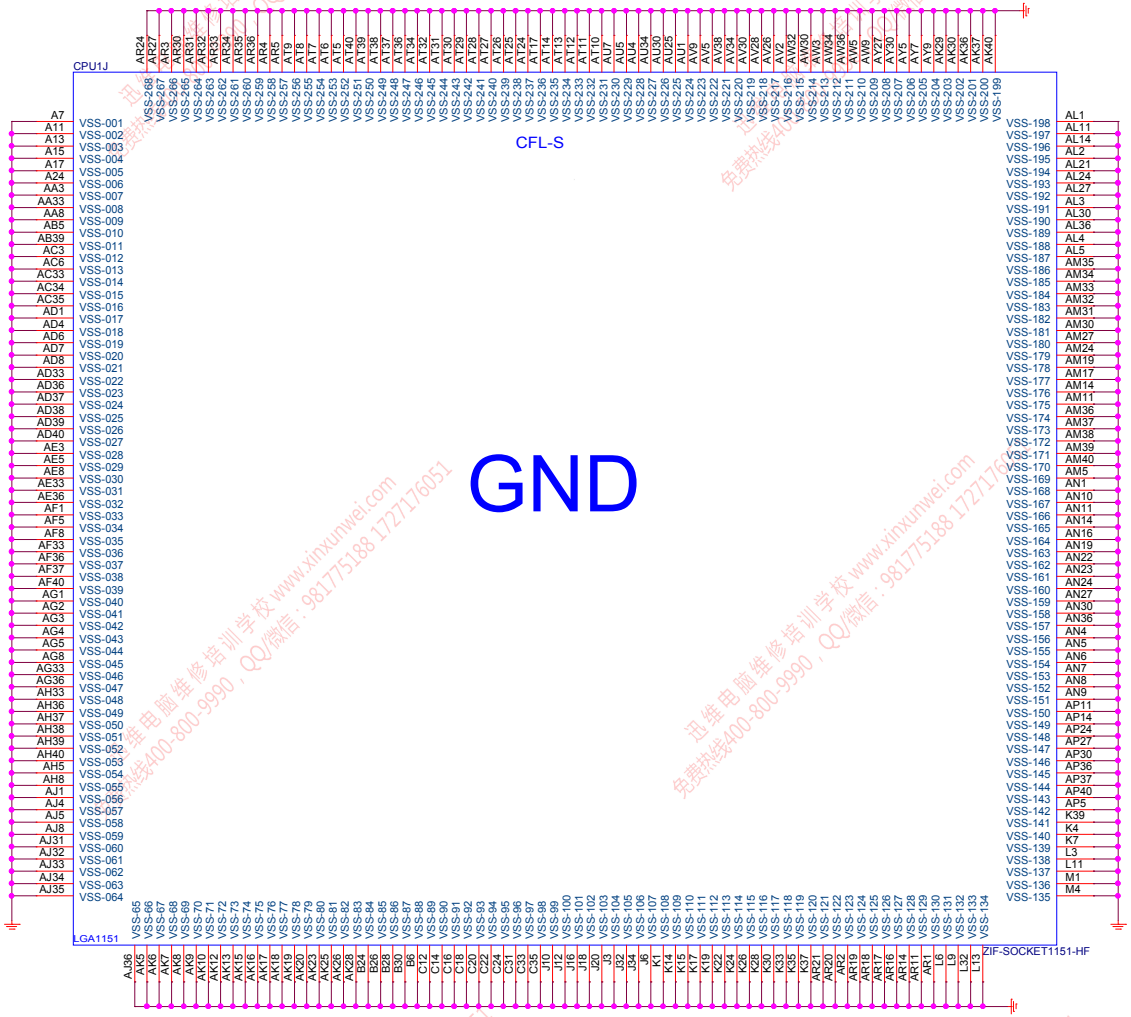
MICRO-STAR INT'L CO.,LTD

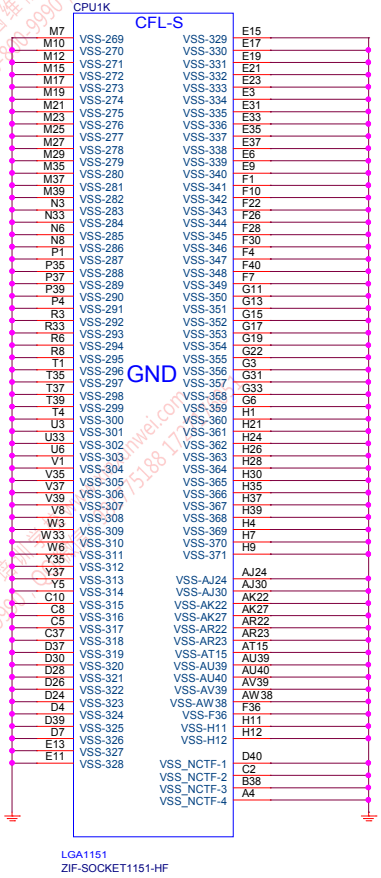
MS-7B23

Size	Document Description	Rev
Custom	CPU-PEG/Display	1.1

Date: Monday, February 12, 2018 Sheet 5 of 63

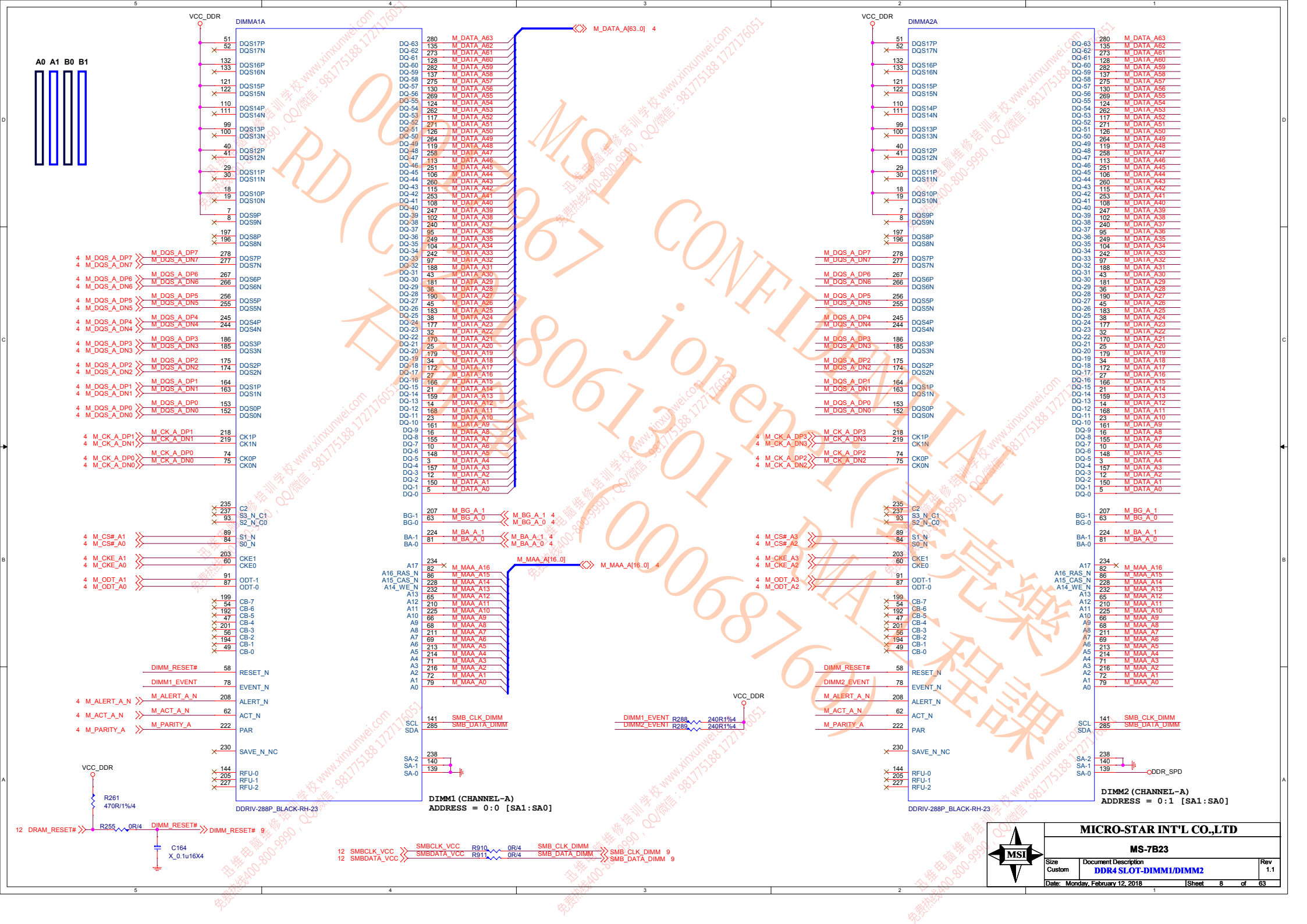

VCORE
CPU1G
CFL-S
VCC-001 VCC-002 VCC-003 VCC-004 VCC-005 VCC-006 VCC-007 VCC-008 VCC-009 VCC-010 VCC-011 VCC-012 VCC-013 VCC-014 VCC-015 VCC-016 VCC-017 VCC-018 VCC-019 VCC-020 VCC-021 VCC-022 VCC-023 VCC-024 VCC-025 VCC-026 VCC-027 VCC-028 VCC-029 VCC-030 VCC-031 VCC-032 VCC-033 VCC-034 VCC-035 VCC-036 VCC-037 VCC-038 VCC-039 VCC-040 VCC-041 VCC-042 VCC-043 VCC-044 VCC-045 VCC-046 VCC-047 VCC-048 VCC-049 VCC-050 VCC-051 VCC-052 VCC-053 VCC-054 VCC-055 VCC-056 VCC-057 VCC-058 VCC-059 VCC-060 VCC-061 VCC-062 VCC-063 VCC-064
VCC-128 VCC-127 VCC-126 VCC-125 VCC-124 VCC-123 VCC-122 VCC-121 VCC-120 VCC-119 VCC-118 VCC-117 VCC-116 VCC-115 VCC-114 VCC-113 VCC-112 VCC-111 VCC-110 VCC-109 VCC-108 VCC-107 VCC-106 VCC-105 VCC-104 VCC-103 VCC-102 VCC-101 VCC-100 VCC-099 VCC-098 VCC-097 VCC-096 VCC-095 VCC-094 VCC-093 VCC-092 VCC-091 VCC-090 VCC-089 VCC-088 VCC-087 VCC-086 VCC-085 VCC-084 VCC-083 VCC-082 VCC-081 VCC-080 VCC-079 VCC-078 VCC-077 VCC-076 VCC-075 VCC-074 VCC-073 VCC-072 VCC-071 VCC-070 VCC-069 VCC-068 VCC-067 VCC-066
LGA1151
ZIF-SOCKET1151-HF
VGT
CPU1H
CFL-S
VCCGT-01 VCCGT-02 VCCGT-03 VCCGT-04 VCCGT-05 VCCGT-06 VCCGT-07 VCCGT-08 VCCGT-09 VCCGT-10 VCCGT-11 VCCGT-12 VCCGT-13 VCCGT-14 VCCGT-15 VCCGT-16 VCCGT-17 VCCGT-18 VCCGT-19 VCCGT-20 VCCGT-21 VCCGT-22 VCCGT-23 VCCGT-24 VCCGT-25 VCCGT-26 VCCGT-27 VCCGT-28 VCCGT-29 VCCGT-30 VCCGT-31 VCCGT-32 VCCGT-33 VCCGT-34 VCCGT-35 VCCGT-36 VCCGT-37 VCCGT-38 VCCGT-39 VCCGT-40
VCCGT-80 VCCGT-79 VCCGT-78 VCCGT-77 VCCGT-76 VCCGT-75 VCCGT-74 VCCGT-73 VCCGT-72 VCCGT-71 VCCGT-70 VCCGT-69 VCCGT-68 VCCGT-67 VCCGT-66 VCCGT-65 VCCGT-64 VCCGT-63 VCCGT-62 VCCGT-61 VCCGT-60 VCCGT-59 VCCGT-58 VCCGT-57 VCCGT-56 VCCGT-55 VCCGT-54 VCCGT-53 VCCGT-52 VCCGT-51 VCCGT-50 VCCGT-49 VCCGT-48 VCCGT-47 VCCGT-46 VCCGT-45 VCCGT-44 VCCGT-43 VCCGT-42 VCCGT-41
LGA1151
ZIF-SOCKET1151-HF
C163 C172 C183 C148 22u6.3X8
VCCSA
CPU1I
CFL-S
VCCSA-01 VCCSA-02 VCCSA-03 VCCSA-04 VCCSA-05 VCCSA-06 VCCSA-07 VCCSA-08 VCCSA-09 VCCSA-10 VCCSA-11 VCCSA-12 VCCSA-13 VCCSA-14 VCCSA-15 VCCSA-16 VCCSA-17
VDDQ-01 VDDQ-02 VDDQ-03 VDDQ-04 VDDQ-05 VDDQ-06 VDDQ-07 VDDQ-08 VDDQ-09 VDDQ-10 VDDQ-11 VDDQ-12 VDDQ-13 VDDQ-14 VDDQ-15 VDDQ-16
VCCPLL_OC
VCC_DDR
AJ9 VCCPLL_OC_R R413 0R/4 VCC_DDR
VCORE
VCC-AK21 VCC-F37 VCC-AJ26 VCC-AJ25 VCC-AJ29 VCC-AJ28 VCC-AJ27 VCC-AJ27 VCC-F35 VCC-G34 VCC-G35 VCC-H33 VCC-H34 VCC-J33 VCC-J35 VCC-K32 VCC-K34 VCC-L31 VCC-L33 VCC-M32
VCCIO-01 VCCIO-02 VCCIO-03 VCCIO-04 VCCIO-05 VCCIO-06 VCCIO-07 VCCIO-08 VCCIO-09
VCCIO
VCCST-01 VCCST-02
VCCPLL
VCCSTPLL
LGA1151
ZIF-SOCKET1151-HF
C219 C242 C236 C243 C193 C220 C192 C227 C228 C208 22u6.3X6
TOP SIDE SOCKET CAVITY
C239 C237 C210 C221 C229 C209 C222 C238 C230 C240 C245 C244 22u6.3X8
C197 C198 C194 C196 C195 22u6.3X6
VCORE CAP:30PCS
VGT CAP:11PCS
C256 C257 C258 C255 22u6.3X6
TOP SIDE SOCKET CAVITY
BOT SIDE SOCKET CAVITY
C262 22u6.3X6
C328 C329 22u6.3X6 1u6.3X4
C677 C678 C685 C686 C692 C697 C698 C703 22u6.3X6
C688 C687 X_22u6.3X6
2017.12.22 remove
C679 C680 C682 C681 C683 C684 22u6.3X6
C715 C713 C714 C252 C254 C253 22u6.3X6
C716 1u6.3X4
BOT SIDE SOCKET CAVITY
MICRO-STAR INT'L CO.,LTD
MS-7B23
Size Custom
Document Description CPU-Power
Rev 1.1
Date: Monday, February 12, 2018
Sheet 6 of 63





MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: CPU-GND	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 7 of 63	

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051



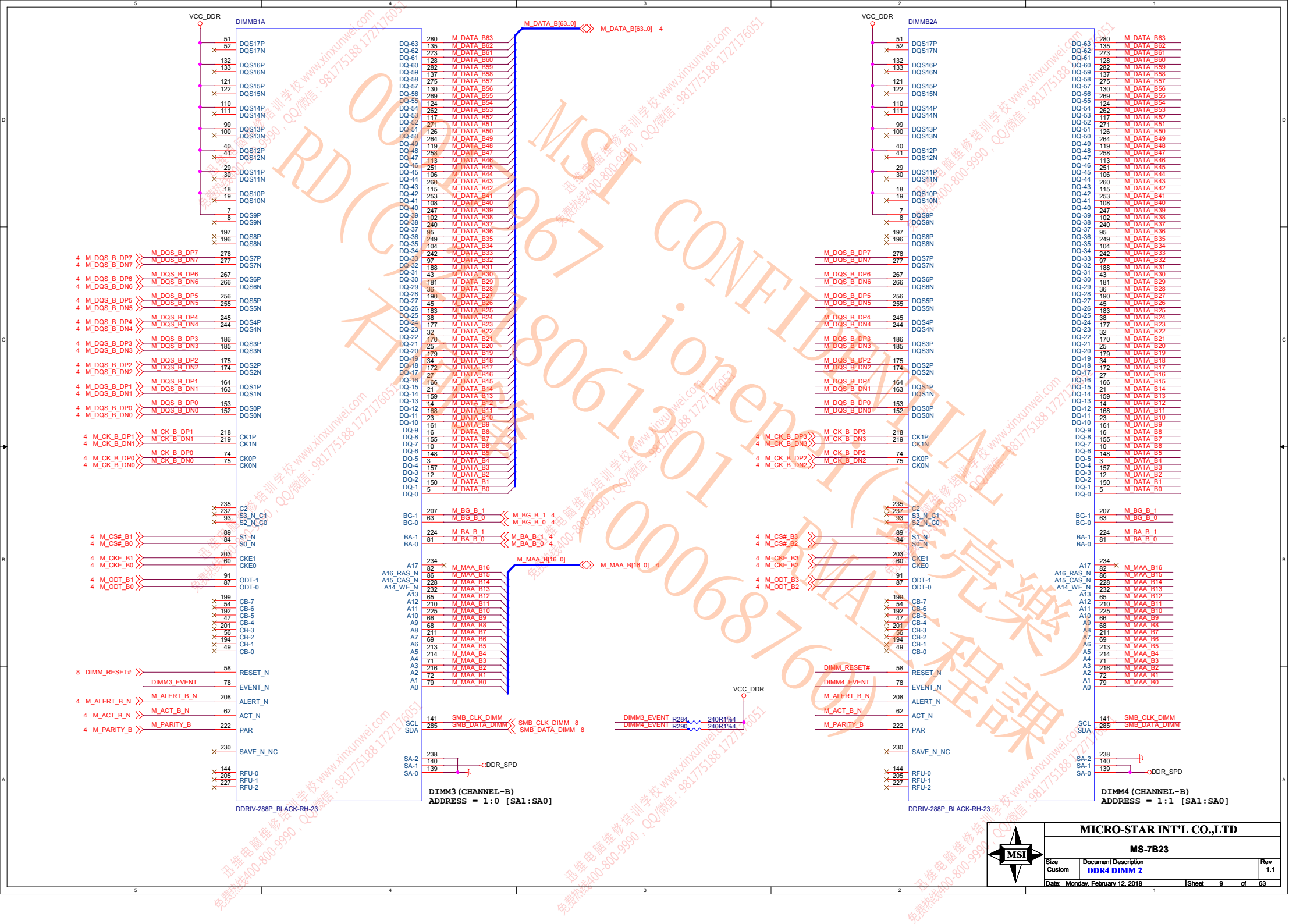
MICRO-STAR INT'L CO.,LTD

MS-7B23

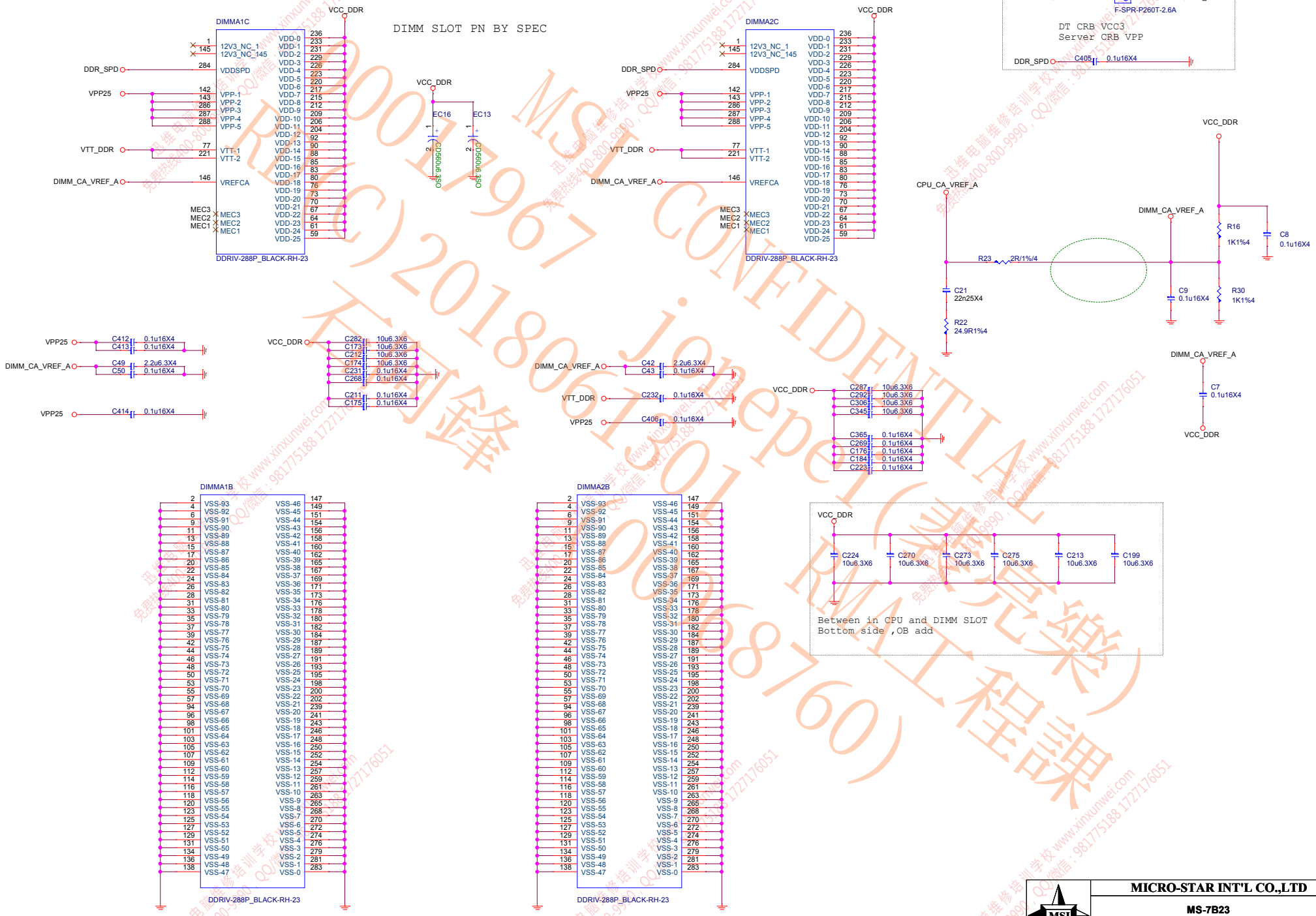
Size: Custom | Document Description: DDR4 SLOT-DIMM1/DIMM2 | Rev: 1.1

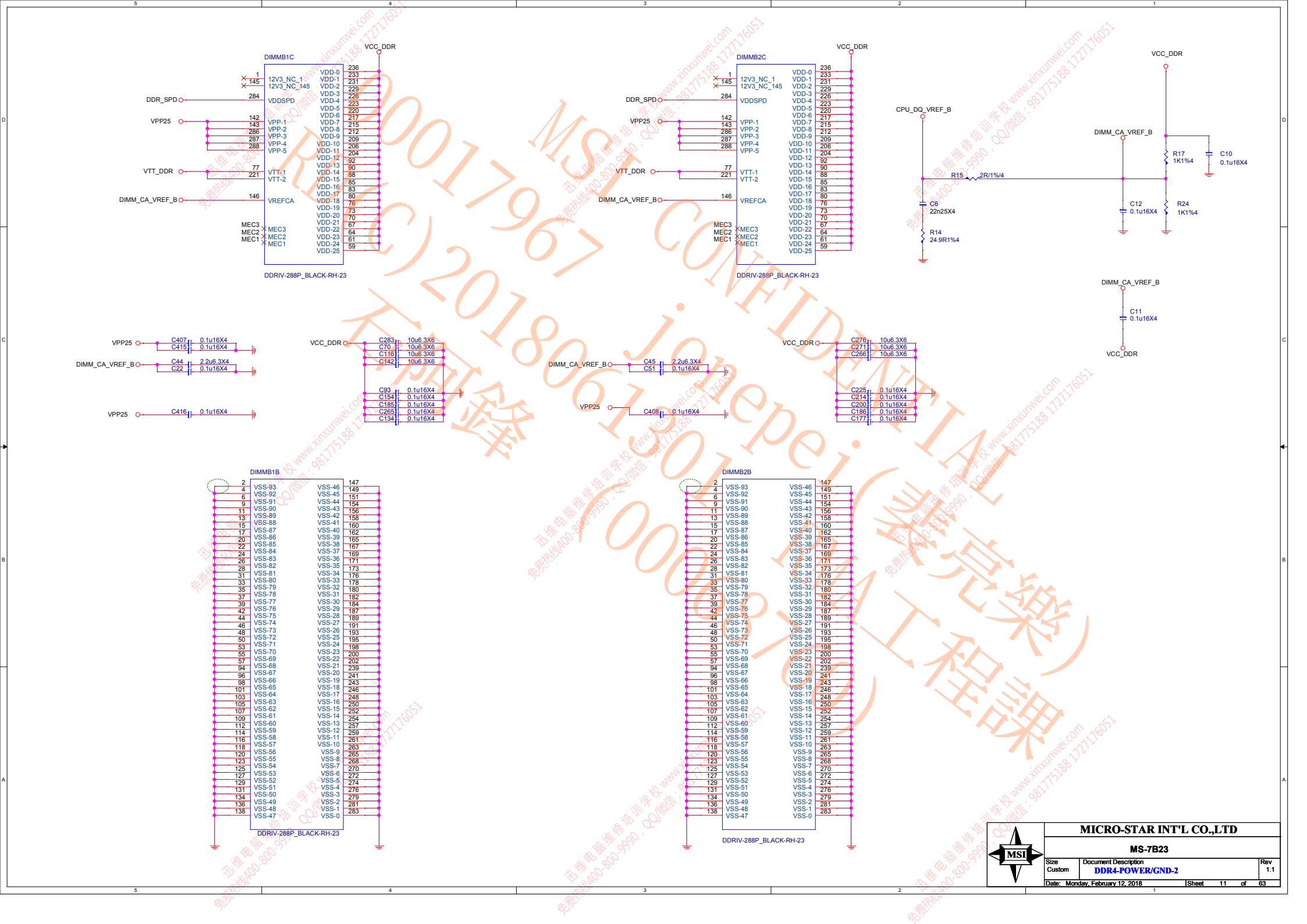
Date: Monday, February 12, 2018 | Sheet 8 of 63

MSI CONFIDENTIAL
RD(CS)2017 jonepeng 8061301 BMA_完稿
0000687609
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051



MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: DDR4 DIMM 2	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 9 of 63	


DIMM SLOT PN BY SPEC
DIMMA1C
DIMMA2C
DIMMA1B
DIMMA2B
DDRIV-288P_BLACK-RH-23
VCC_DDR
DDR_SPD
VPP25
VTT_DDR
DIMM_CA_VREF_A
CPU_CA_VREF_A
F4
F-SPR-P260T-2.6A
VCC3
DT CRB VCC3
Server CRB VPP
Between in CPU and DIMM SLOT
Bottom side ,OB add
MICRO-STAR INT'L CO.,LTD
MS-7B23
DDR4-POWER/GND-1
Rev 1.1
Monday, February 12, 2018
Sheet 10 of 63



MSI CONFIDENTIAL
Jonepei(樊完樂)
RD(C)20180613001(600017967)
不可錄
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: DDR4-POWER/GND-2	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 11 of 63	

2017.12.07 Eric mail

VCC3 3VSB R785 X_10K/4 R2113 X_10K/4 LFRAME_CS0_N
VCC3 3VSB R965 X_10K/4 R2112 10K/4 SERIRQ
VCC3 3VSB R774 X_10K/4 R2111 10K/4 KBRST#_R
3VSB R952 10K/4 PIRQA#
VCC3 3VSB R2117 X_10K/4 R2118 X_10K/4 LDRQ#_RST_N

LPC_ESPI_IO0_R C1884 X_10p50N4
LPC_ESPI_IO1_R C1885 X_10p50N4
LPC_ESPI_IO2_R C1886 X_10p50N4
LPC_ESPI_IO3_R C1887 X_10p50N4
close to PCH in 500~1000mil

22,55 LPC_ESPI_IO0_R R950 0R/4 LPC_ESPI_IO0 BB39
22,55 LPC_ESPI_IO1_R R951 0R/4 LPC_ESPI_IO1 AW37
22,55 LPC_ESPI_IO2_R R953 0R/4 LPC_ESPI_IO2 AV37
22,55 LPC_ESPI_IO3_R R957 0R/4 LPC_ESPI_IO3 BA38

22,55 LFRAME_CS0_N LFRAME_CS0_N BE38
22,55 SERIRQ SERIRQ AW35
PIRQA# BA36

To SIO 22 KBRST# R786 0R/4 KBRST#_R BE39
22 LDRQ#_RST_N R736 X_0R/4 ESPI_RST# BF38

12,19,20,21 SMBCLK_VSB_R R781 X_0R/4 SMBCLK_VSB BE26
12,19,20,21 SMBDATA_VSB_R R770 X_0R/4 SMBDATA_VSB BF26
18 ME_TLS_ON ME_TLS_ON BE25

24 SMLINK0_CLK SMLINK0_CLK BF25
24 SMLINK0_DATA SMLINK0_DATA BE24
18 LPC_ESPI_SEL LPC_ESPI_SEL BF24

22 SMLINK1_CLK SMLINK1_CLK BF27
22 SMLINK1_DATA SMLINK1_DATA BE27

18 PCH_SML1ALERT# PCH_SML1ALERT# BD33

3VSB
R484 1K/4 SMBCLK_VSB_R
R485 1K/4 SMBDATA_VSB_R
R772 4.7K/4 SMBCLK_VSB
R771 4.7K/4 SMBDATA_VSB
LANPHY USE by SPEC
R730 499R1%4 SMLINK0_CLK
R731 499R1%4 SMLINK0_DATA
R783 1K/4 SMLINK1_CLK
R782 1K/4 SMLINK1_DATA

for loadline disable
3VSB R605 10K/4 GPP_H19

3VSB
R917 10K/4 GPP_H18
R606 10K/4 GPP_H17
R919 X_10K/4 GPP_H16
R920 X_10K/4 GPP_H18
R604 X_10K/4 GPP_H17
R921 10K/4 GPP_H16
ID

PCH1A

GPP_A1/LAD0/ESPI_IO0
GPP_A2/LAD1/ESPI_IO1
GPP_A3/LAD2/ESPI_IO2
GPP_A4/LAD3/ESPI_IO3
LPC eSPI

GPP_A5/LFRAME#/ESPI_CS0#
GPP_A6/SERIRQ/ESPI_CS1#
GPP_A7/PIRQA#/ESPI_ALERT0#
GPP_A0/RCIN#/ESPI_ALERT1#
GPP_A14/SUS_STAT#/ESPI_RESET#

GPP_C0/SMBCLK
GPP_C1/SMBDATA
GPP_C2/SMBALERT#
GPP_C3/SML0CLK
GPP_C4/SML0DATA
GPP_C5/SML0ALERT#
GPP_C6/SML1CLK
GPP_C7/SML1DATA
GPP_B23/SML1ALERT#/PCHHOT#
SMB

GPP_H10/SML2CLK
GPP_H11/SML2DATA
GPP_H12/SML2ALERT#
GPP_H13/SML3CLK
GPP_H14/SML3DATA
GPP_H15/SML3ALERT#
GPP_H16/SML4CLK
GPP_H17/SML4DATA
GPP_H18/SML4ALERT#

18 GPP_H12 GPP_H12
32 BIOS_SEL_PCIESATA1
32 BIOS_DIS_SW1
18 GPP_H15 GPP_H15 GPP_H16 GPP_H17 GPP_H18

FAN MODE USE
25 CPUFAN1_MODE
25 SYSFAN1_MODE
26 SYSFAN2_MODE

PWM LL disable 44 GPP_H19 GPP_H19
EZ LED 56 GPP_H20 GPP_H20
EZ LED 56 GPP_H21 GPP_H21
EZ LED 56 GPP_H22 GPP_H22
EZ LED 56 GPP_H23 GPP_H23

GPP_C16/I2C0_SDA
GPP_C17/I2C0_SCL
GPP_C18/I2C1_SDA
GPP_C19/I2C1_SCL
GPP_H19/ISH_I2C0_SDA
GPP_H20/ISH_I2C0_SCL
GPP_H21/ISH_I2C1_SDA
GPP_H22/ISH_I2C1_SCL
GPP_H23/TIME_SYNC0

CL_CLK
CL_DATA
CL_RST#

41 PCH_CLK PCH_CLK
41 PCH_MISO SPI0_MISO
18,41 PCH_MOSI SPI0_MOSI
18,41 PCH_IO2 SPI0_IO2
18,41 PCH_IO3 SPI0_IO3
41 PCH_SPI_CS0# PCH_SPI_CS0#
SPI0_CS0#
SPI0_CS1#
SPI0_CS2#
SPI

GPP_D0/SPI1_CS#/SBK0/BK0
GPP_D1/SPI1_CLK/SBK1/BK1
GPP_D2/SPI1_MISO/SBK2/BK2
GPP_D3/SPI1_MOSI/SBK3/BK3
GPP_D21/SPI1_IO2
GPP_D22/SPI1_IO3

R2390 100K/4 PCH_CLK
2018.01.23 Robert mail

PCH_H

SLP_SUS# BD39 SLP_SUS#
GPD6/SLP_A# BE40 SLP_A#
SLP_S3# R R787 0R/4 SLP_S3# BF42 SLP_S3# 15,22,38,42,50,51,54
SLP_S4# R R761 0R/4 SLP_S4# BE42 SLP_S4# 15,22,38,42,49,50,51
SLP_S5# BC42 SLP_S5# 15
GPD10/SLP_S5# BC28 SLP_S0#
GPP_B12/SLP_S0# TP52

SLP_LAN# BF40 SLP_LAN# 24
GPD11/LANPHYPC BF41 LAN_DISABLE# 24

GPD9/SLP_WLAN# BD42

GPP_A13/SUSWARN#/SUSPWRDNACK BC37 SUSWARN# R734 0R/4
GPP_A15/SUSACK# BE35 SUSACK#
GPD8/SUSCLK BE45 PCH_SUSCLK

CHIP_PWGD_SPI 41
R795 0R/4
AW41 PCH_DPWROK
DSW_PWROK AY42 PCH_PWROK_R R942 0R/4 PCH_DPWROK 22
PCH_PWROK AU3 CHIP_PWGD_PCH R796 0R/4 PCH_PWROK 54
SYS_PWROK AE3 CPU_PWRGD_R R633 0R/4 CPU_PWRGD 3
CPUPWRGD CHIP_PWGD 22

Power Management

RTCRST# BE47 RTCRST# RTCRST# 40,42,54
SRTCRST# BD46 SRTCRST#
RSMRST# BA47 RSMRST#
DRAM_RESET# BB46 DRAM_RESET# DRAM_RESET# 8
SYS_RESET# AU2 FP_RST# FP_RST# 55
PLTRST_CPU# AG5 CPURST# CPURST# 3
GPP_B13/PLTRST# AV29 PLTRST#_R R946 30R1%4 PLTRST# 22

GPD3/PWRBTN# BE46 PWRBTN# PWRBTN# 22

WAKE# BB47 SB_WAKE# SB_WAKE# 19,20,21,32,33
GPD2/LAN_WAKE# BC44 LANPHY_WAKE# LANPHY_WAKE# 24
GPP_A11/PME#/SD_VDD2_PWR_EN# BE36 IO_PME_N IO_PME_N 22
GPD1/ACPRESENT BG42 ACPRESENT
GPD0/BATLOW# BF44 BATLOW#
GPP_A12/BM_BUSY#/ISH_GP6/SX_EXIT_HOLDOFF# BF36 GPP_A12

GPP_A8/CLKRUN# AV32 PCH_CLKRUN#
PECI AF2 PCH_PECI R648 X_0R/4 CPU_PECI 3,22
THRMTRIP# AD3 PCH_THERMTRIP_R R626 619R/1%4 PCH_THERMTRIP# 3
PM_DOWN AE2 CPU_PM_DOWN 3
PM_SYNC AF3 SYNC_R R634 30R1%4 CPU_PM_SYNC 3
INTRUDER# BB44 INTRUDER#

STRAP

GPP_B14/SPKR AW29 SPKR 18,55
GPP_B18/GSPI0_MOSI BE30 NO_REBOOT NO_REBOOT 18
GPP_B22/GSPI1_MOSI BA26 BOOT_BIOS_SEL BOOT_BIOS_SEL 18
GPD7 BE41 GPD7 18

JTAG

PCH_JTAG_TCK AJ3 PCH_JTAG_TCK
PCH_JTAG_TMS AJ4 XDP_TMS 3
PCH_JTAG_TDI AH2 XDP_TDI 3
PCH_JTAG_TDO AH3 XDP_TDO 3
PCH_JTAGX AH4 XDP_TCK0 3
ITP_PMODE AL3 ITP_PMODE
TRIGGER_IN AK2 TP13
TRIGGER_OUT AK3 PCH_TRIGOUT R652 30R/4 CPU_OUTPUT_TRIGGER 3
PREQ# AL2 CPU_INPUT_TRIGGER 3
PRDY# AM5 CPU_PREQ 3
CPU_TRST# AM4 CPU_PRDY 3
XDP_TRST 3

Place R390 within 200mil of PCH.

PCH LANPHY PWR
Pull Down PCH PHY into low power state.
For No Use intel Lan
LAN_DISABLE# R759 X_10K/4

SB_WAKE# R762 1K/4
LANPHY_WAKE# R788 4.7K/4
PWRBTN# R956 3K1%4
BATLOW# R737 10K/4
ACPRESENT R760 X_10K/4
3VDSW

SLP_S3# R2392 X_10K/4
SLP_S4# R2393 X_10K/4
2018.01.23 Robert mail
SLP_S3# R2389 100K/4
SLP_S4# R2388 100K/4
SLP_LAN# R2391 100K/4
PCH_SUSCLK R941 X_1.5K/4

PCH_CLKRUN# R945 X_10K/4 3VSB
2017.12.07 Eric mail
CRB RSVD pull up to +V3P3_DUAL.

IO_PME_N R756 10K/4 3VSB
SUSACK# R755 X_10K/4 3VSB
GPP_A12 R735 X_10K/4 3VSB
PCH_PECI R650 X_1K/4
CPU_PM_DOWN R632 X_51R/4
FP_RST# R719 1K/4 VCC3

Defensive Termination. CRB unstuff.
Place within 1.1" of PCH Pin.
VCCSTPLL
XDP_TCK0 R649 X_1K/4
XDP_TMS R653 51R/4
XDP_TDO R635 100R1%4
XDP_TDI R651 51R/4
Place within 1.5" of PCH Pin.

PCH_JTAG_TCK R636 X_51R/4
Defensive Termination. CRB unstuff.
Place within 1.1" of PCH Pin.

RSMRST# USE solution

2017.08.14 Eric mail add
2017.11.30 Robert mail remove

RSMRST#
3VSB R800 4.7K/4
RSMRST# R789 X_0R/4 SIO_RSMRST# 22,41
R997 0R/4 RSMRST#_SLG 54
R801 100K/4

擺在一起(注意到所有的SMBUS的分支)

SMBCLK_VCC R798 4.7K/4
SMBDATA_VCC R779 4.7K/4
VCC3

3VSB R753 10K/4
+12V R750 10K/4
CFL CRB
PCH_PWROK R749 0R/4 PCH_PWROK_SMBUS
R748 100K/4
Q88 G2 D1 D2 S2 S1 NN-2N7002D
59G

SMBCLK_VSB
Q93 2N7002 R797 X_0R/4
SMBCLK_VCC
SMBCLK_VSB 35,36,37,49
SMBCLK_VCC 8

SMBDATA_VSB
Q92 2N7002 R780 X_0R/4
SMBDATA_VCC
SMBDATA_VSB 35,36,37,49
SMBDATA_VCC 8

SMBUS ESD

D18 X_ESD-AOZ8231 SMBCLK_VSB_R 12,19,20,21
D17 X_ESD-AOZ8231 SMBDATA_VSB_R 12,19,20,21
close to PCH

RTC

VBAT_PCH
2014.12.29
CRB R763 20K1%4
SRTCRST#
C623 1u16X6

2017.12.20 remove RTC

Chassis Intrusion

VBAT_PCH
R738 1M/4
JCI1 H1X2M_BLACK-RH
INTRUDER#
D19 X_ESD-AOZ8231

MICRO-STAR INT'L CO.,LTD
MS-7B23
Size Custom
Document Description PCH-LPC/SPI/SMBUS/MISC
Rev 1.1
Date: Monday, February 12, 2018 Sheet 12 of 63

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990 QQ/微信：981775188 1727176051

RTC Block

Close to PCH

C596 12p50N6 RTCX2
Y2
R703 10M/6 <1 inch
RTCX1
C595 12p50N6
32.768KHZ12.5p_D-RH-10

XTAL_24M_PCH_OUT
R615 200K1%4 XTAL_24M_PCH_IN
PDG
R613 0R/4
R614 0R/4
24M_OUT R612 0R/4 24M_R
Y1 24MHZ20p
24M_IN
C539 18p50N4
C551 18p50N4
for 0A sa fail

3VSB
R598 10K/4 LAN_CLKREQ#9
R918 10K/4 CLKREQ#15
VCC3
R947 10K/4 CLKREQ#4
2017.11.07 Robert mail
Optance pu to VCC3

C740 X_10p50N4
22 CLK_SIO_PCI R943 22R/4 CLK_PCH_LPC0 BB36
55 CLK_24M_TPM R954 15R1%4 CLK_PCH_24M BB34
C1888 X_10p50N4
2017.12.07 Eric mail
RTCX1 BA49
RTCX2 BA48
XCLK_BIASREF < 1000 mil
XTAL_24M_PCH_IN U10
XTAL_24M_PCH_OUT U9
R603 60.4R1%4 XCLK_BIASREF T3
R916 10K/4 R6
2017.08.23 Robert mail

PCH1E
GPP_A9/CLKOUT_LPC0/ESPI_CLK
GPP_A10/CLKOUT_LPC1
LPC
RTCX1
RTCX2
RTC
XTAL_IN
XTAL_OUT
XCLK_BIASREF
CLKIN_XTAL
24MHZ

TP18 SLOT1_CLKREQ#0 BF31
TP17 SLOT2_CLKREQ#1 BE31
TP49 SLOT3_CLKREQ#2 AR32
CLKREQ#3 BB30
33 CLKREQ#4 CLKREQ#4 BA30
GPP_B9/SRCCLKREQ4#
GPP_B10/SRCCLKREQ5#
CLK_REQ
AE47 GPP_H0/SRCCLKREQ6#
AC48 GPP_H1/SRCCLKREQ7#
AE41 GPP_H2/SRCCLKREQ8#
24 LAN_CLKREQ#9 AF48 GPP_H3/SRCCLKREQ9#
AC41 GPP_H4/SRCCLKREQ10#
AC39 GPP_H5/SRCCLKREQ11#
AE39 GPP_H6/SRCCLKREQ12#
AB48 GPP_H7/SRCCLKREQ13#
AC44 GPP_H8/SRCCLKREQ14#
32 CLKREQ#15 CLKREQ#15 AC43 GPP_H9/SRCCLKREQ15#
PCH_H

CLKOUT_CPUBCLK_P B8 PCH_CPU_BCLK_DP → PCH_CPU_BCLK_DP 3
CLKOUT_CPUBCLK_N C8 PCH_CPU_BCLK_DN → PCH_CPU_BCLK_DN 3 100M
CLKOUT_CPUNSSC_P D7 PCH_CPU_NSSC_CLK_DP → PCH_CPU_NSSC_CLK_DP 3
CLKOUT_CPUNSSC_N C6 PCH_CPU_NSSC_CLK_DN → PCH_CPU_NSSC_CLK_DN 3 24M
CLKOUT_CPUPCIBCLK_P A6 PCH_CPU_PCIE_DP → PCH_CPU_PCIE_DP 3
CLKOUT_CPUPCIBCLK_N B6 PCH_CPU_PCIE_DN → PCH_CPU_PCIE_DN 3 100M
CLKOUT_ITPXDP_P Y4
CLKOUT_ITPXDP_N Y3

CLKOUT_PCIE_P0 AJ7 CK_SLOT1_DP → CK_SLOT1_DP 19
CLKOUT_PCIE_N0 AJ6 CK_SLOT1_DN → CK_SLOT1_DN 19
CLKOUT_PCIE_P1 AH10 CK_SLOT2_DP → CK_SLOT2_DP 20
CLKOUT_PCIE_N1 AH9 CK_SLOT2_DN → CK_SLOT2_DN 20
CLKOUT_PCIE_P2 AE15 CK_SLOT3_DP → CK_SLOT3_DP 20
CLKOUT_PCIE_N2 AE14 CK_SLOT3_DN → CK_SLOT3_DN 20
CLKOUT_PCIE_P3 AE7 CK_SLOT4_DP → CK_SLOT4_DP 21
CLKOUT_PCIE_N3 AE6 CK_SLOT4_DN → CK_SLOT4_DN 21
CLKOUT_PCIE_P4 AC3 CLK_M2_2_DP → CLK_M2_2_DP 33
CLKOUT_PCIE_N4 AC2 CLK_M2_2_DN → CLK_M2_2_DN 33
CLKOUT_PCIE_P5 AB3
CLKOUT_PCIE_N5 AB2
CLKOUT_PCIE_P6 W3
CLKOUT_PCIE_N6 W4
CLKOUT_PCIE_P7 W6
CLKOUT_PCIE_N7 W7
CLKOUT_PCIE_P8 AC15
CLKOUT_PCIE_N8 AC14
CLKOUT_PCIE_P9 U3 CLK_LAN_DP → CLK_LAN_DP 24
CLKOUT_PCIE_N9 U2 CLK_LAN_DN → CLK_LAN_DN 24
CLKOUT_PCIE_P10 AC11
CLKOUT_PCIE_N10 AC9
CLKOUT_PCIE_P11 AE11
CLKOUT_PCIE_N11 AE9
CLKOUT_PCIE_P12 AC6
CLKOUT_PCIE_N12 AC7
CLKOUT_PCIE_P13 Y2
CLKOUT_PCIE_N13 AA1
CLKOUT_PCIE_P14 T1
CLKOUT_PCIE_N14 T2
CLKOUT_PCIE_P15 V3 CLK_M2_1_DP → CLK_M2_1_DP 32
CLKOUT_PCIE_N15 V2 CLK_M2_1_DN → CLK_M2_1_DN 32

EMI
AZ_BITCLK
C602 X_10p50N4

PCH1D
27 AZ_SDIN0 AZ_SDIN0 BE11 HDA_SDI0/I2S0_RXD
BF10 HDA_SDI1/I2S1_RXD
18 AZ_SDOUT_R
27 AZ_SDOUT AZ_SDOUT R724 33R/4 AZ_SDOUT_R BF12 HDA_SDO/I2S0_TXD
27 AZ_BITCLK AZ_BITCLK R723 33R/4 AZ_BITCLK_LR BD11 HDA_BCLK/I2S0_SCLK
27 AZ_RST# AZ_RST# R722 33R/4 AZ_RST#_R BE10 HDA_RST#/I2S1_SCLK
27 AZ_SYNC AZ_SYNC R725 33R/4 AZ_SYNC_R BG13 HDA_SYNC/I2S0_SFRM
AUDIO
3 PCH_CPU_AUD_SDO R677 30R/4 PCH_CPU_AUD_SDO_R AM2 HDACPU_SDO
3 PCH_CPU_AUD_SDI PCH_CPU_AUD_SDI AN3 HDACPU_SDI
3 PCH_CPU_AUD_SCLK R675 30R/4 PCH_CPU_AUD_SCLK_R AM3 HDACPU_SCLK
BE12 I2S1_TXD/SNDW2_DATA
BD12 I2S1_SFRM/SNDW2_CLK
Default Native F3/CNV_RF_R_ESET#.
TP57 BE16 GPP_D5/I2S2_SFRM/CNV_RF_RESET#
TP53 BA17 GPP_D6/I2S2_TXD/MODEM_CLKREQ
Default Native F3/MODEM_CLKREQ.
AW18 GPP_D7/I2S2_RXD
AV18 GPP_D8/I2S2_SCLK
AW15 GPP_D17/DMIC_CLK1/SNDW3_CLK
AV16 GPP_D18/DMIC_DATA1/SNDW3_DATA
BD16 GPP_D19/DMIC_CLK0/SNDW4_CLK
BF15 GPP_D20/DMIC_DATA0/SNDW4_DATA
PCH_H

PORT B
GPP_I5/DDPB_CTRLCLK AL13 HDMI_DDPB_CTRLCLK → HDMI_DDPB_CTRLCLK 30
GPP_I6/DDPB_CTRLDATA AR8 HDMI_DDPB_CTRLDATA → HDMI_DDPB_CTRLDATA 30
GPP_I0/DDPB_HPD0/DISP_MISC0 AT6 HDMI_DDPB_HPD → HDMI_DDPB_HPD 30
SMI Pin
PORT C
GPP_I7/DDPC_CTRLCLK AN13 DVI_DDPC_CTRLCLK → DVI_DDPC_CTRLCLK 29
GPP_I8/DDPC_CTRLDATA AL10 DVI_DDPC_CTRLDATA → DVI_DDPC_CTRLDATA 29
GPP_I1/DDPC_HPD1/DISP_MISC1 AN10 DVI_DDPC_HPD → DVI_DDPC_HPD 29
SMI Pin
PORT D
GPP_I9/DDPD_CTRLCLK AL9 DSP_DDPD_CTRLCLK → DSP_DDPD_CTRLCLK 31
GPP_I10/DDPD_CTRLDATA AR3 DSP_DDPD_CTRLDATA → DSP_DDPD_CTRLDATA 31
GPP_I2/DPPD_HPD2/DISP_MISC2 AP9 DSP_DDPD_HPD → DSP_DDPD_HPD 31
SMI Pin
PORT F
GPP_F22/DDPF_CTRLCLK AT49 GPP_F22 → TP14
GPP_F23/DDPF_CTRLDATA AN40 GPP_F23 → TP43
eDP
GPP_F19/EDP_VDDEN AV44
GPP_F20/EDP_BKLTEN AV46
GPP_F21/EDP_BKLTCTL AU48
GPP_I4/EDP_HPD/DISP_MISC4 AN6 EDP_HPD R679 100K/4
GPP_I3/DPPE_HPD3/DISP_MISC3 AL15 DDPE_HPD3 R924 10K/4
SMI Pin

VCC3
HDMI_DDPB_CTRLCLK R700 2.2K/4
HDMI_DDPB_CTRLDATA R717 2.2K/4
DVI_DDPC_CTRLCLK R671 2.2K/4
DVI_DDPC_CTRLDATA R673 2.2K/4
DSP_DDPD_CTRLCLK R674 2.2K/4
DSP_DDPD_CTRLDATA R672 2.2K/4
DSP_DDPD_HPD R697 X_100K/4
改版視情況拿掉

DDI interfaace Disable
no connect

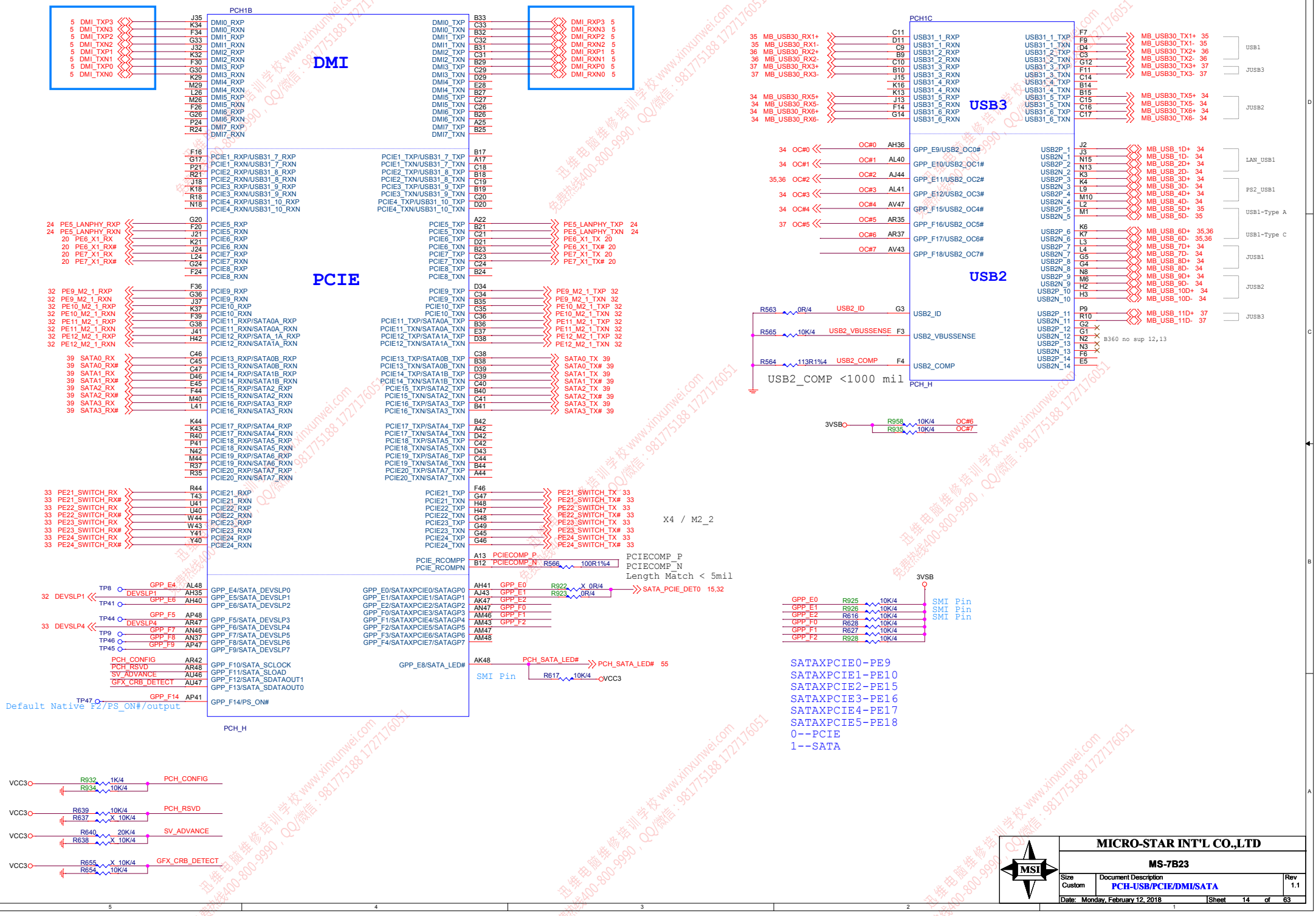
Port B HDMI

Port C DVI,HDMI2.0 OR Others

Port D DisplayPort to VGA

MICRO-STAR INT'L CO.,LTD
MS-7B23
Size Custom
Document Description PCH-Audio/Display/Clock
Rev 1.1
Date: Monday, February 12, 2018 Sheet 13 of 63

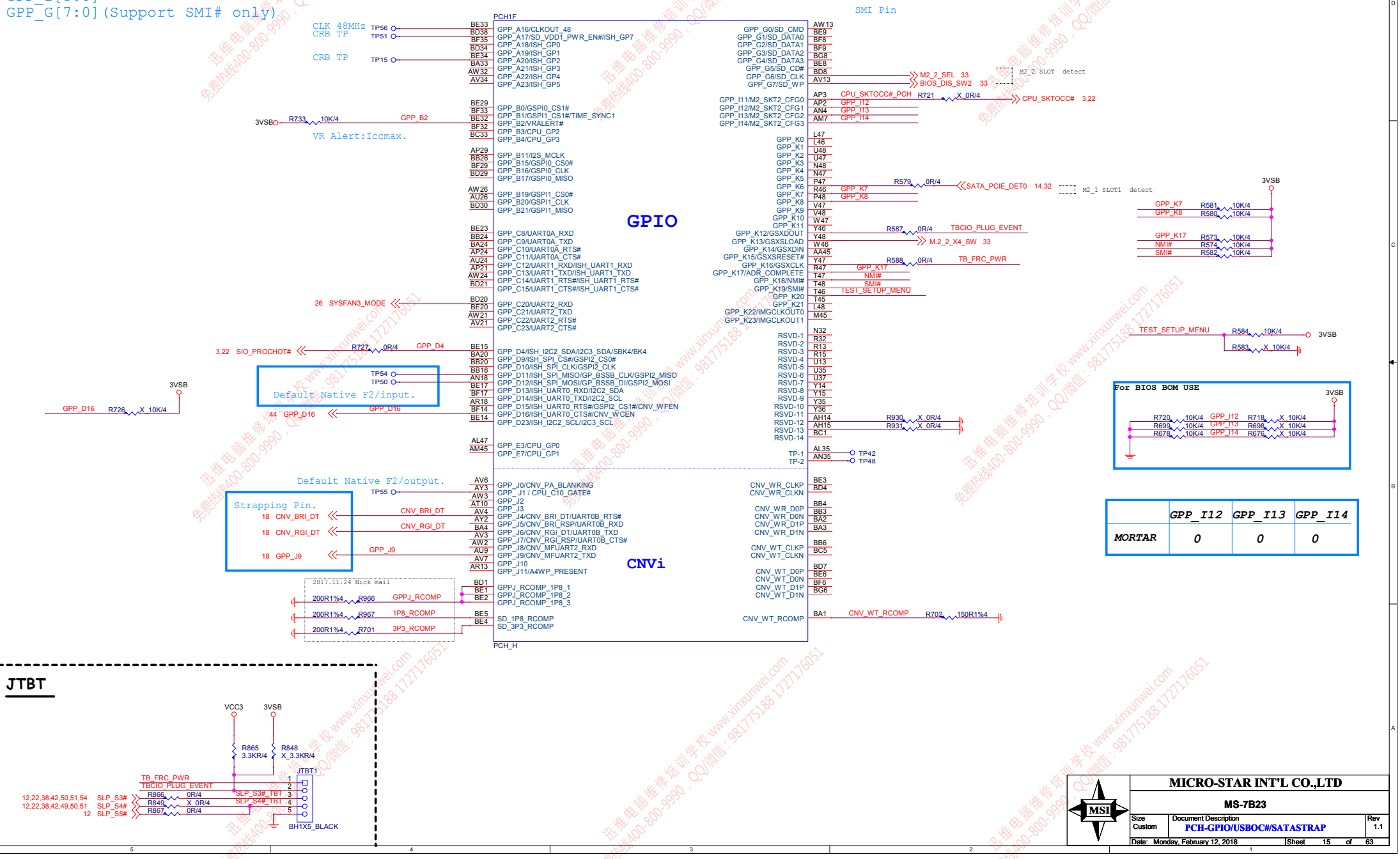
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051



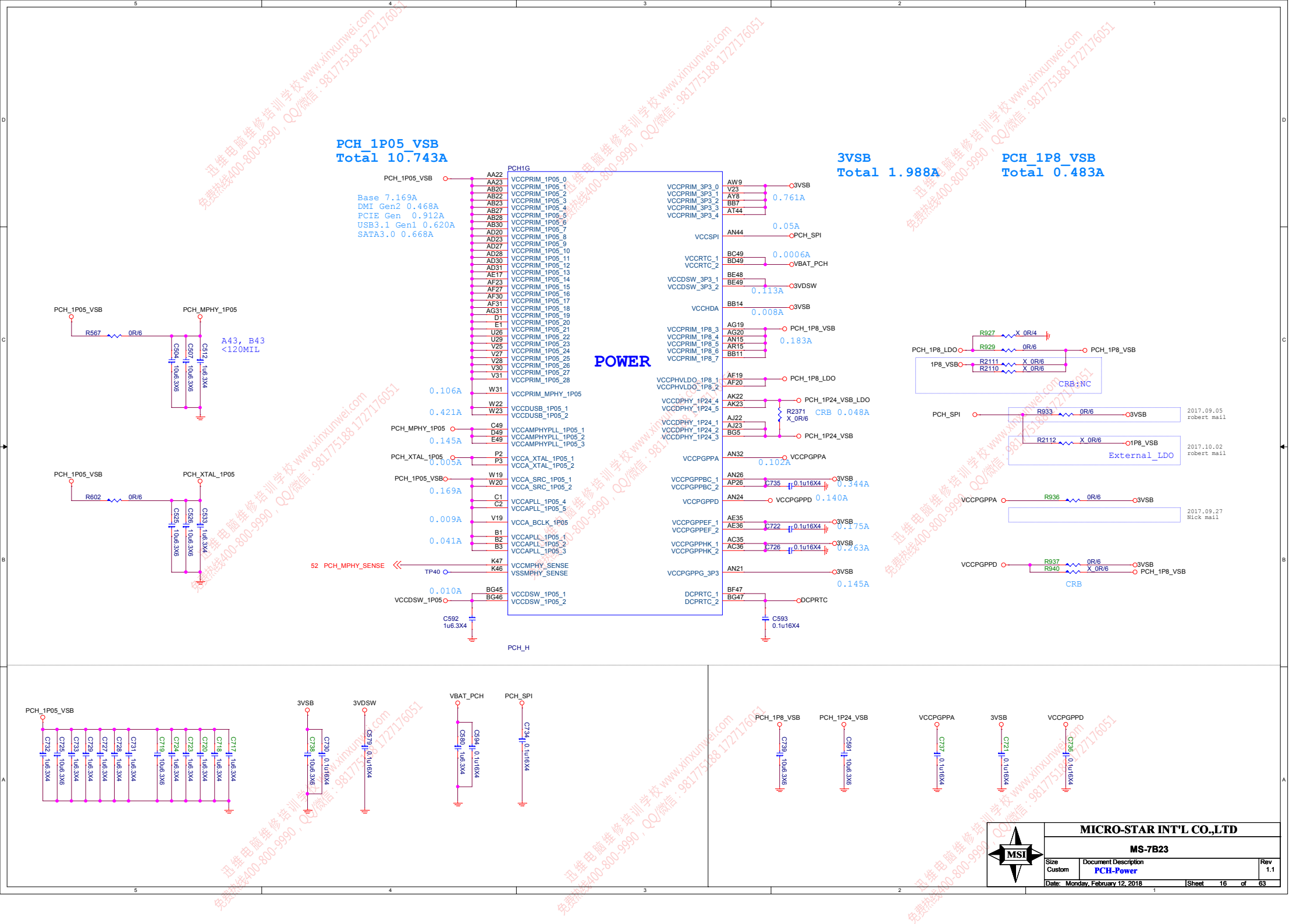
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

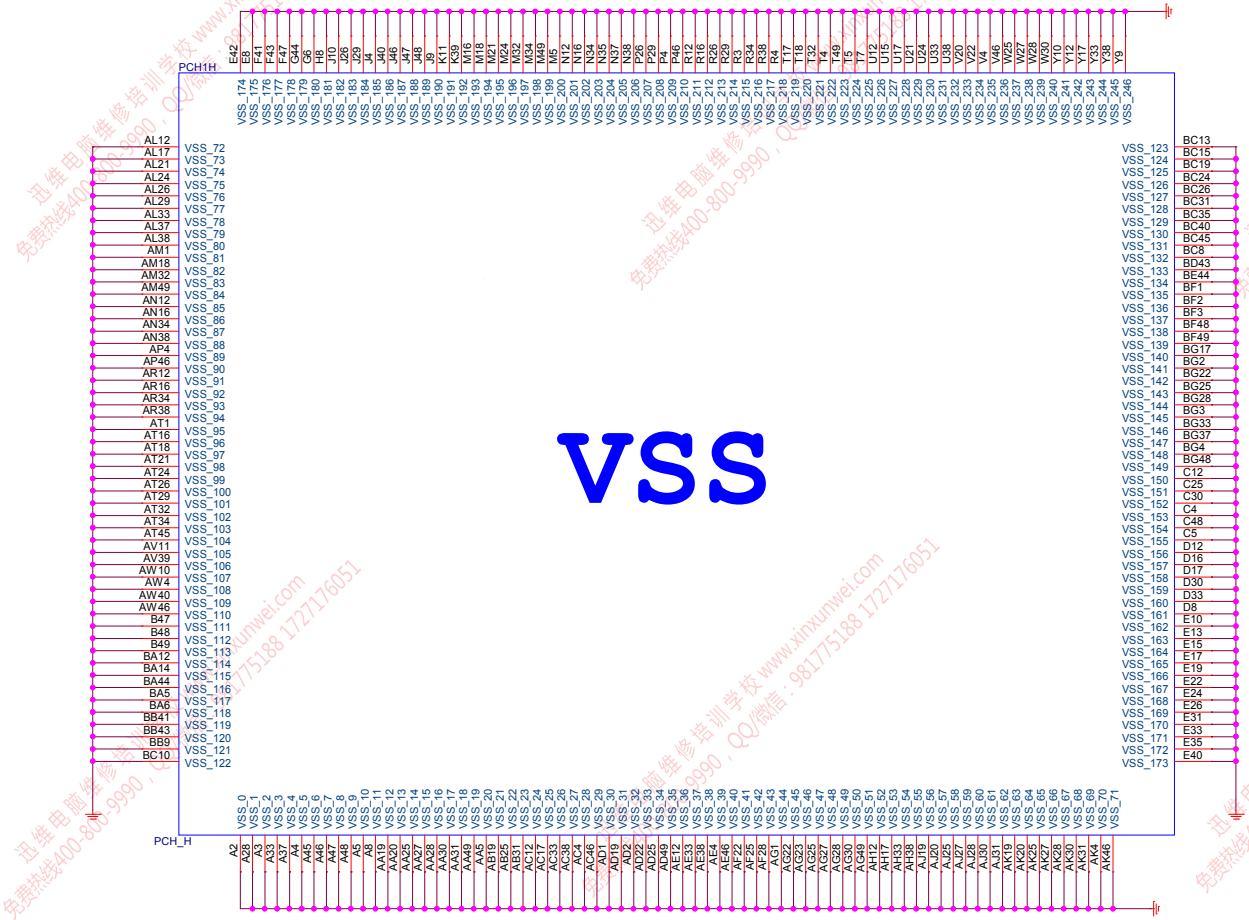
MICRO-STAR INT'L CO.,LTD	
MS-7B23	
Size: Custom	Document Description: PCH-USB/PCIE/DMI/SATA
Rev: 1.1	
Date: Monday, February 12, 2018	Sheet 14 of 63

GPIO(SMI/NMI):
GPP_B14,GPP_B20,GPP_B23
GPP_C[23:22]
GPP_D[4:0]
GPP_E[8:0]
GPP_I[3:0]
GPP_G[7:0](Support SMI# only)



	GPP_I12	GPP_I13	GPP_I14
MORTAR	0	0	0


PCH_1P05_VSB
Total 10.743A
Base 7.169A
DMI Gen2 0.468A
PCIE Gen 0.912A
USB3.1 Gen1 0.620A
SATA3.0 0.668A
PCH1G
POWER
PCH_H
3VSB
Total 1.988A
PCH_1P8_VSB
Total 0.483A
PCH_1P05_VSB
PCH_MPHY_1P05
R567 0R/6
C504 10u6.3X6
C507 10u6.3X6
C512 1u6.3X4
A43, B43
<120MIL
PCH_XTAL_1P05
R602 0R/6
C525 10u6.3X6
C526 10u6.3X6
C533 1u6.3X4
0.106A
0.421A
0.145A
0.005A
0.169A
0.009A
0.041A
0.010A
52 PCH_MPHY_SENSE
TP40
C592 1u6.3X4
C593 0.1u16X4
0.761A
0.05A
0.0006A
0.113A
0.008A
0.183A
0.102A
0.344A
0.140A
0.175A
0.263A
0.145A
R2371 X_0R/6
CRB 0.048A
R927 X_0R/4
R929 0R/6
R2111 X_0R/6
R2110 X_0R/6
CRB:NC
R933 0R/6
R2112 X_0R/6
External_LDO
2017.09.05 robert mail
2017.10.02 robert mail
2017.09.27 Nick mail
R936 0R/6
R937 0R/6
R940 X_0R/6
CRB
MICRO-STAR INT'L CO.,LTD
MS-7B23
Size Custom
Document Description PCH-Power
Rev 1.1
Date: Monday, February 12, 2018
Sheet 16 of 63

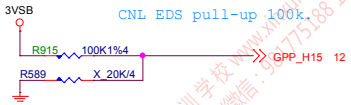


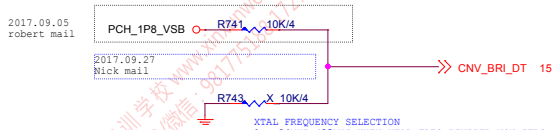
MICRO-STAR INT'L CO.,LTD	
MS-7B23	
Size: Custom	Document Description: PCH-GND
Rev: 1.1	
Date: Monday, February 12, 2018	Sheet 17 of 63

TOP Swap

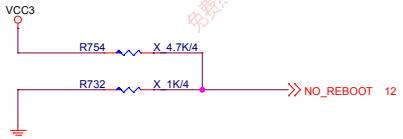
Internal pull-down 20K is disabled after PLTRST#

Reserved





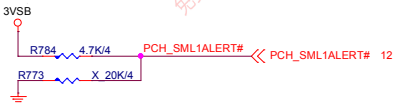
No Reboot

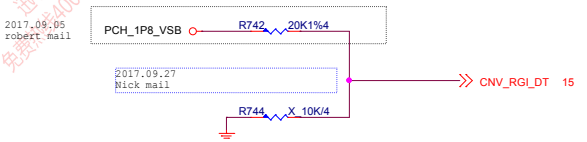


0 : DISABLE (Default)
1 : ENABLE

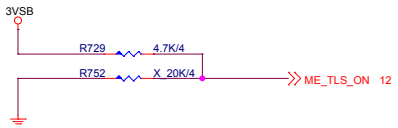
Internal pull-down 20K is disabled after PLTRST#

Reserved





AMT and SBA with confidentiality

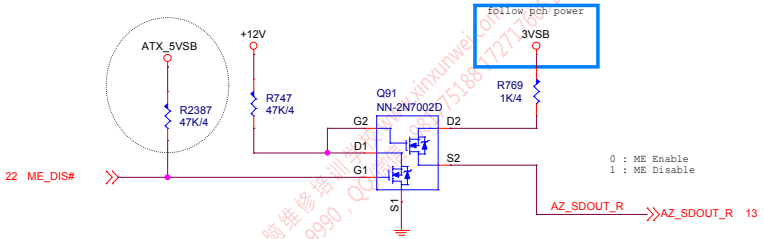


0 : DISABLE
1 : ENABLE (Default)

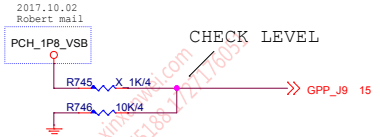
Internal pull-down 20K is disabled after RSMRST

HDA_SDO

ME flash by GPIO



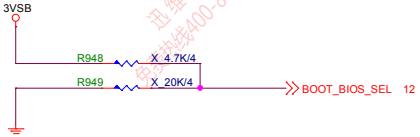
1.8V VCCPSPI



VCCSPI 3.3V,Internal pull-down.

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

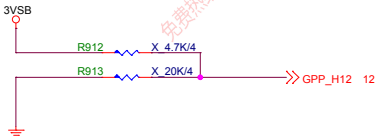
Boot BIOS



0 : SPI
1 : LPC

Internal pull-down 20K is disabled after PLTRST

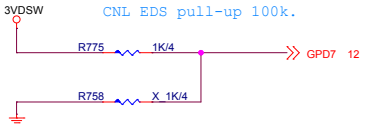
ESPI FLASH SHARING MODE



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

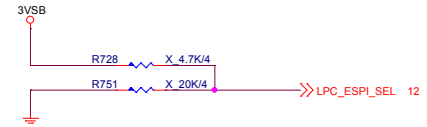
Internal pull-down 20K is disabled after RSMRST

Reserved



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

LPC eSPI Mode

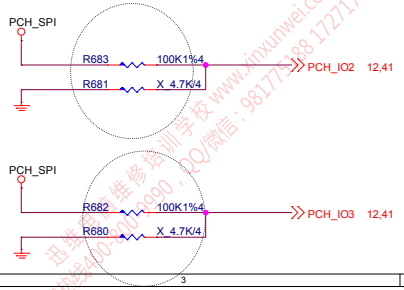


0 : LPC
1 : eSPI

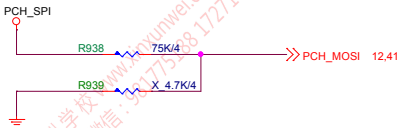
Internal pull-down 20K is disabled after RSMRST

Reserved

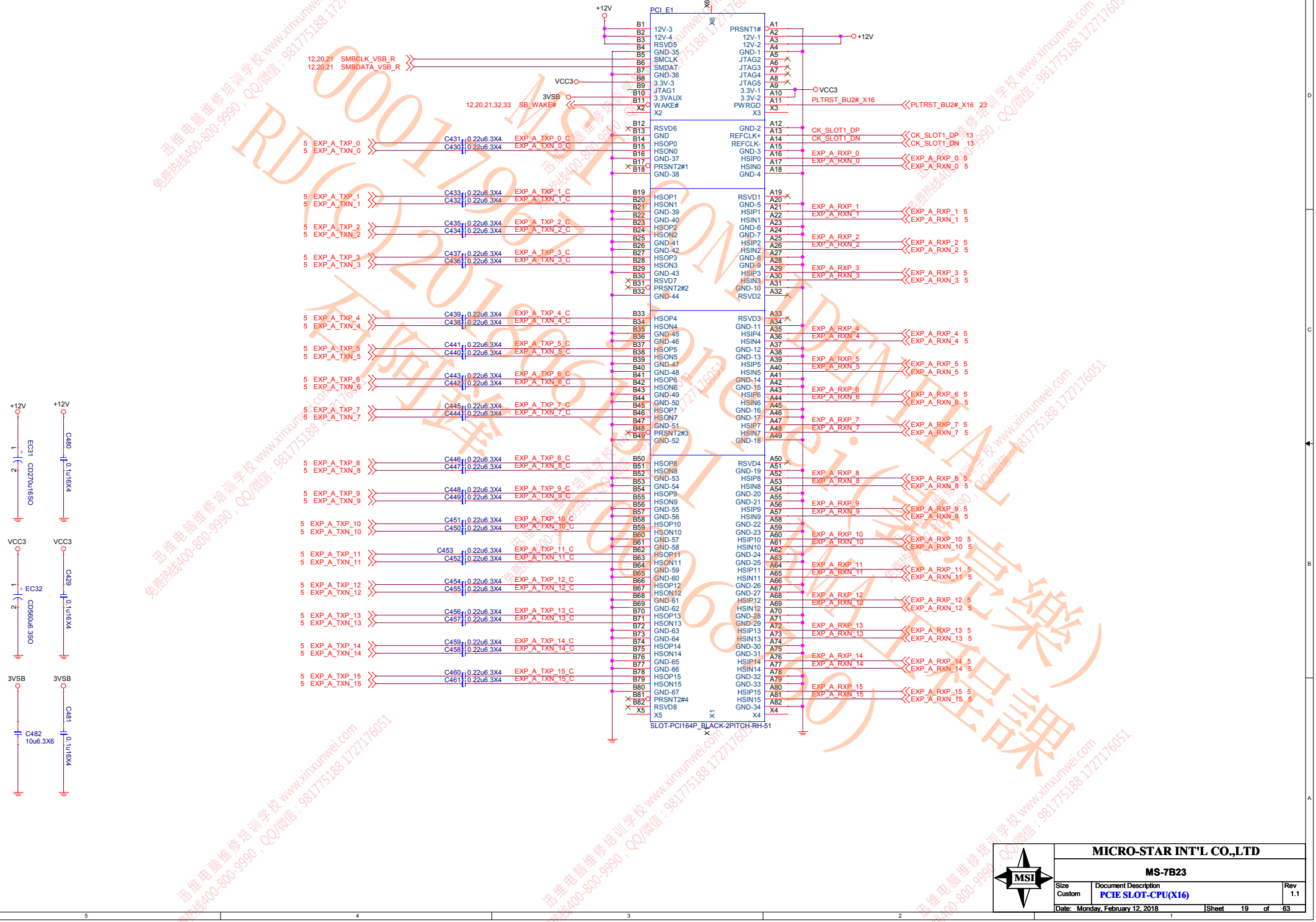
CRB 571506 Page.99



Reserved

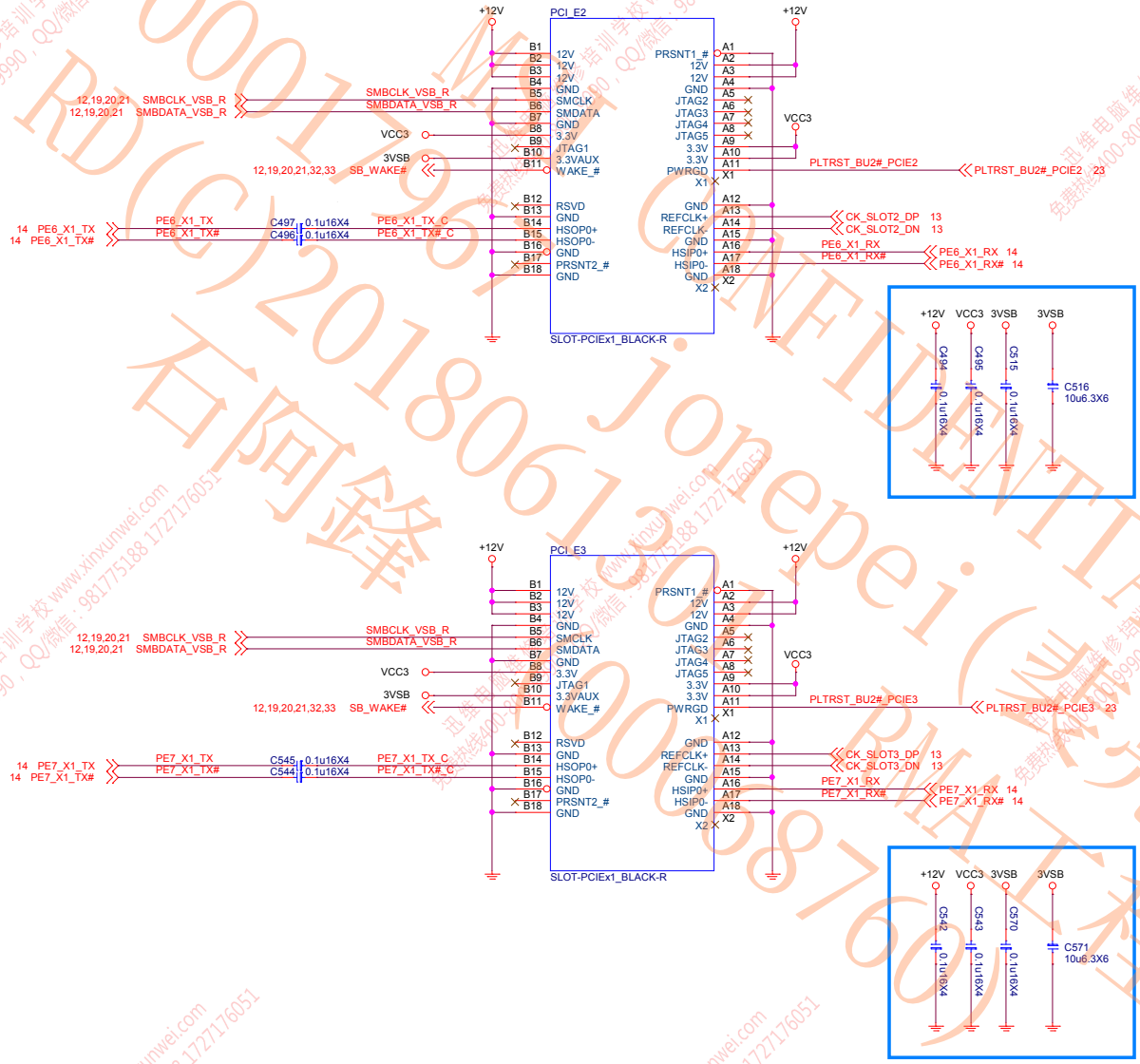


MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: PCH-Strap	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 18 of 63	



迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051
MSI CONFIDENTIAL
RD(2018-06-08)
研发样机保密

MICRO-STAR INT'L CO.,LTD	
MS-7B23	
Size: Custom	Document Description: PCIE SLOT-CPU(X16)
Rev: 1.1	
Date: Monday, February 12, 2018	Sheet 19 of 63



MICRO-STAR INT'L CO.,LTD

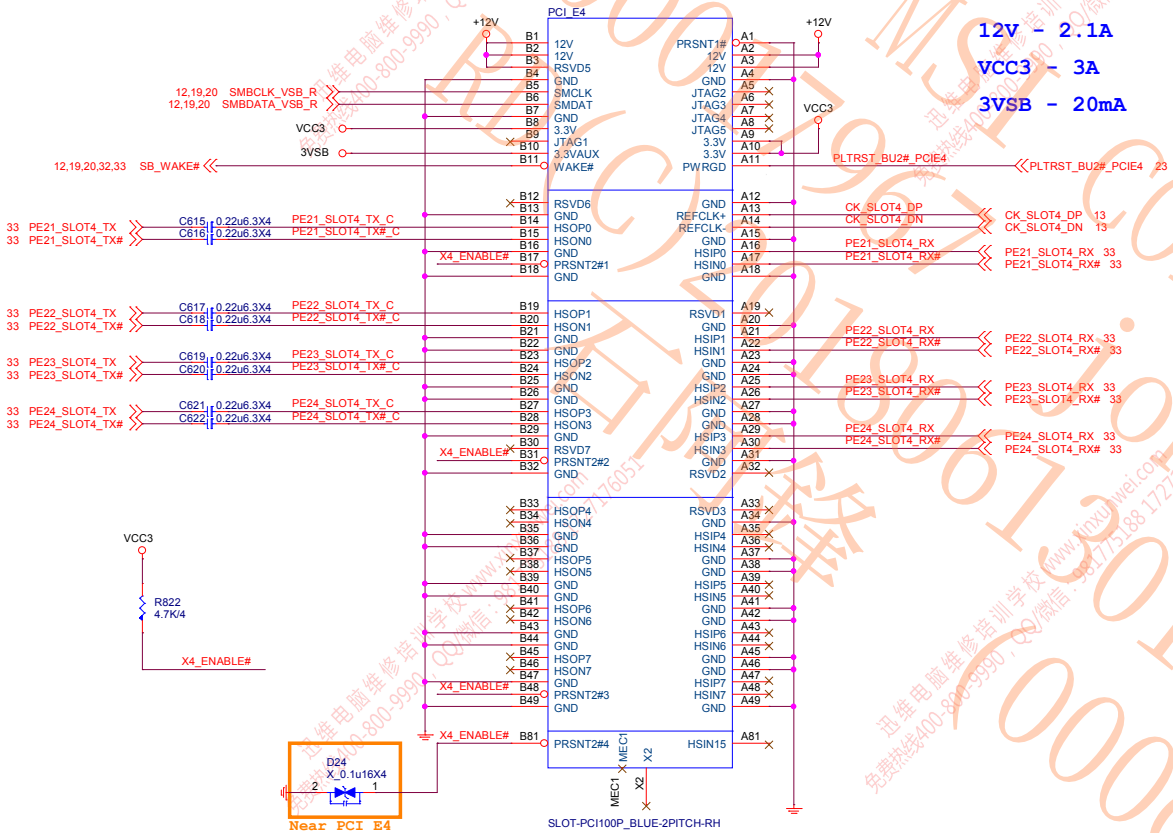
MS-7B23

Size: Custom | Document Description: PCIE SLOT-PCH(X1) | Rev: 1.1

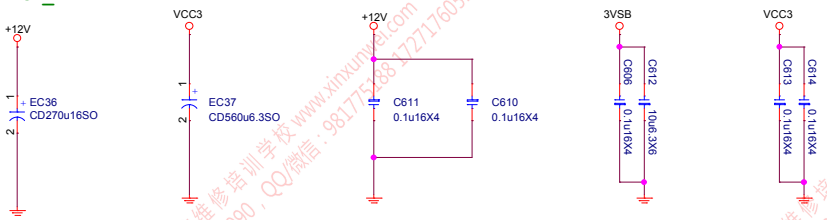
Date: Monday, February 12, 2018 | Sheet 20 of 63

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051
0001996 Jonepei(裁完缴) RD(C)20180613 00008760 石阿锋 CONFIDENTIAL BIOS工程师

PCI Express X4 Slot

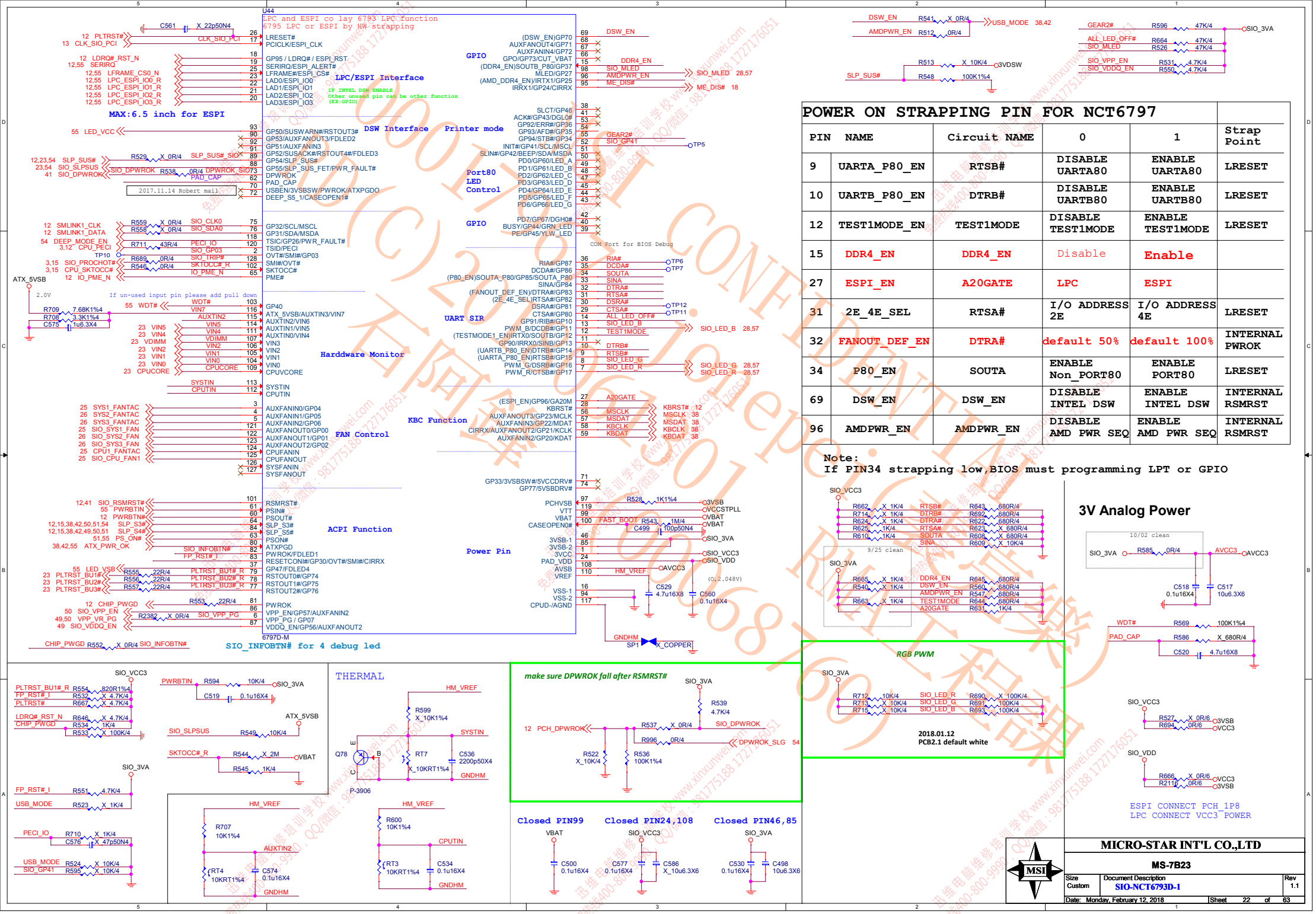


Near PCI_E4



MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: PCIE SLOT-PCH(X4)	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 21 of 63	

MSI CONFIDENTIAL
000196713 2018061301 (000068760)
RMA工程課
(完樂)
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051



POWER ON STRAPPING PIN FOR NCT6797

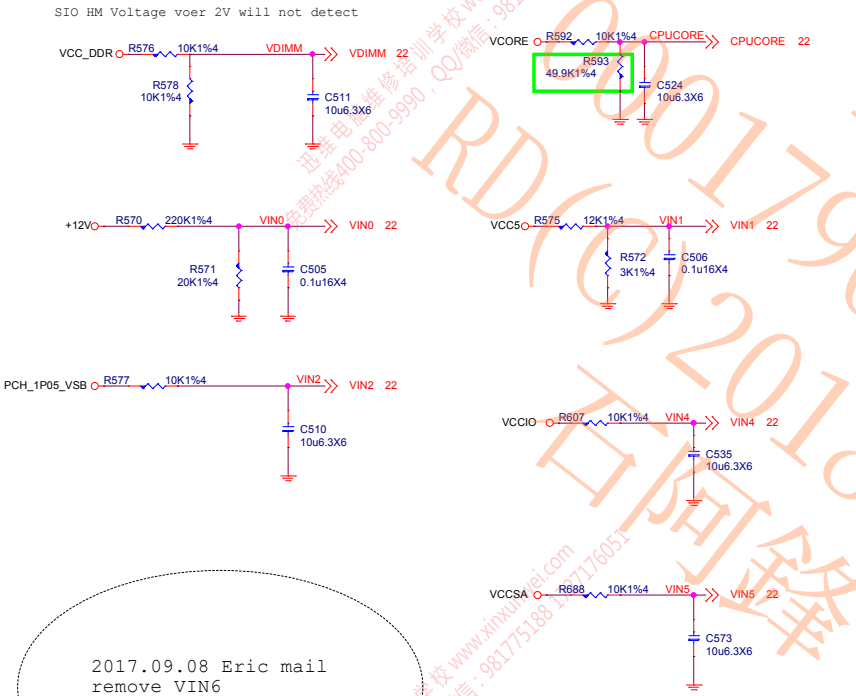
PIN	NAME	Circuit NAME	0	1	Strap Point
9	UARTA_P80_EN	RTSB#	DISABLE UARTA80	ENABLE UARTA80	LRESET
10	UARTB_P80_EN	DTRB#	DISABLE UARTB80	ENABLE UARTB80	LRESET
12	TEST1MODE_EN	TEST1MODE	DISABLE TEST1MODE	ENABLE TEST1MODE	LRESET
15	DDR4_EN	DDR4_EN	Disable	Enable	
27	ESPI_EN	A20GATE	LPC	ESPI	
31	2E_4E_SEL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

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

2018.01.12
PCB2.1 default white

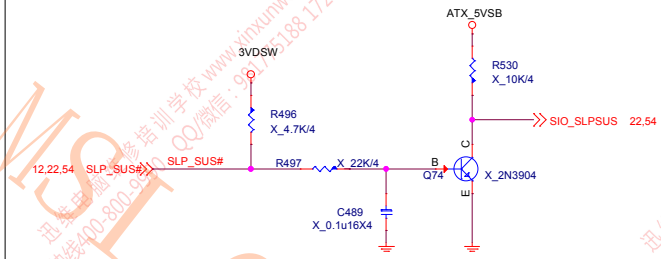
MICRO-STAR INT'L CO.,LTD			
MS-7B23			
Size: Custom	Document Description: SIO-NCT6793D-1		Rev: 1.1
Date: Monday, February 12, 2018	Sheet 22 of 63		

HW Monitor - Voltage



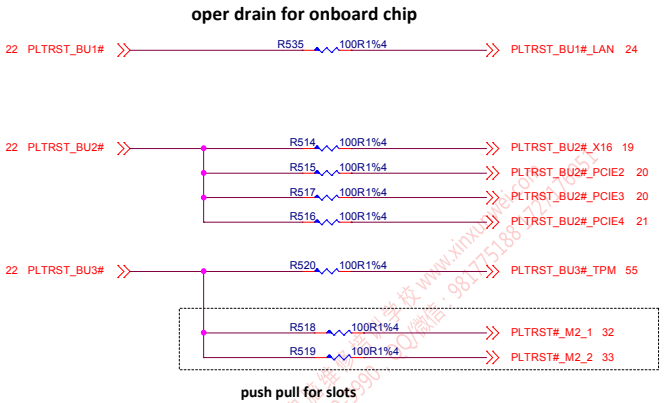
2017.09.08 Eric mail
remove VIN6
change to AUXTIN2

SLP_SUS Co-lay circuit



2017.09.25
remove for space

PLTRST#



SERIAL PORT 1

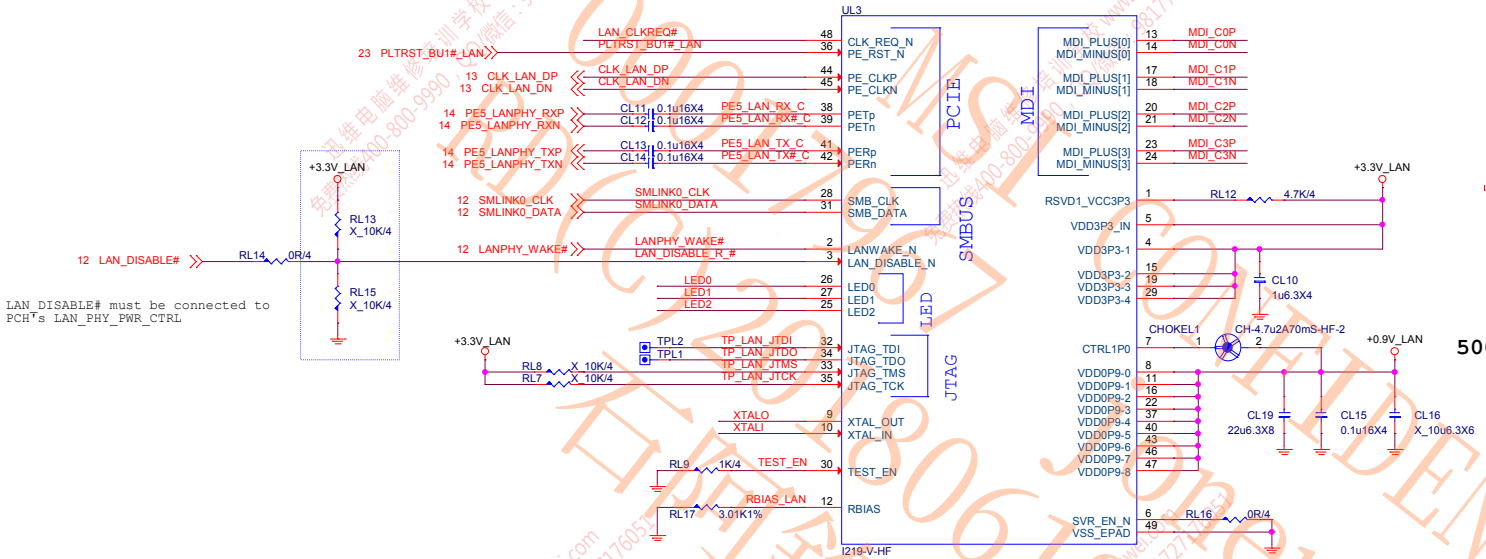
2017.09.25
remove JCOM1

MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: SIO-NCT6793D-2	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 23 of 63	

MSI CONFIDENTIAL jonepei(验完缴) RD(6)20180613-01 RMA工程课 (0006876) 0017967
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

Intel Lan- i219

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



+3.3V_LAN
RL13 X_10K/4
RL14 0R/4
RL15 X_10K/4
12 LAN_DISABLE#

LAN_DISABLE# must be connected to PCH's LAN_PHY_PWR_CTRL

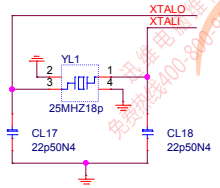
+3.3V_LAN
RL8 X_10K/4
RL7 X_10K/4
TPL2
TPL1

RL9 1K/4 TEST_EN
RL17 3.01K1% RBIAS_LAN

RL12 4.7K/4
CL10 1u6.3X4
CHOKEL1 CH-4.7u2A70mS-HF-2
+0.9V_LAN
CL19 22u6.3X8
CL15 0.1u16X4
CL16 X_10u6.3X6

500mA

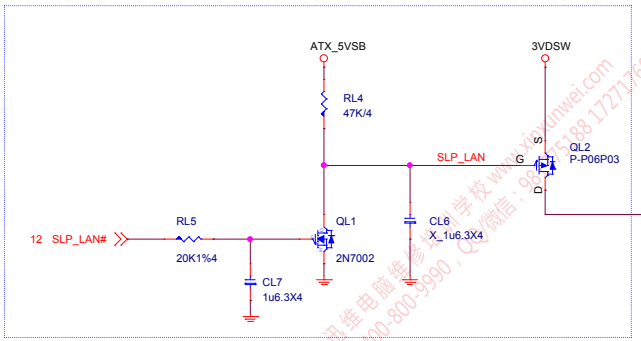
PCH's PCIECLKRQ<n> port mustbe mapped to PCH's PET/R<n+1>port.
If CLK_REQ_N is not used, pin48 is pulled up 10KR to 3.3V_LAN

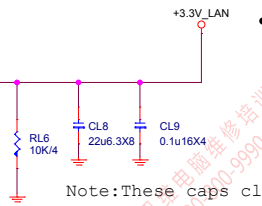


AVL:D04-1005700-SC6

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

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



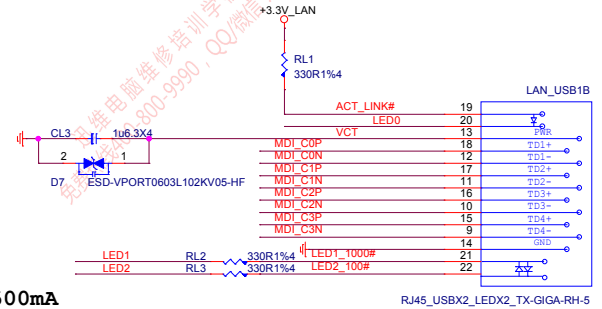


Note:These caps closed to PHY

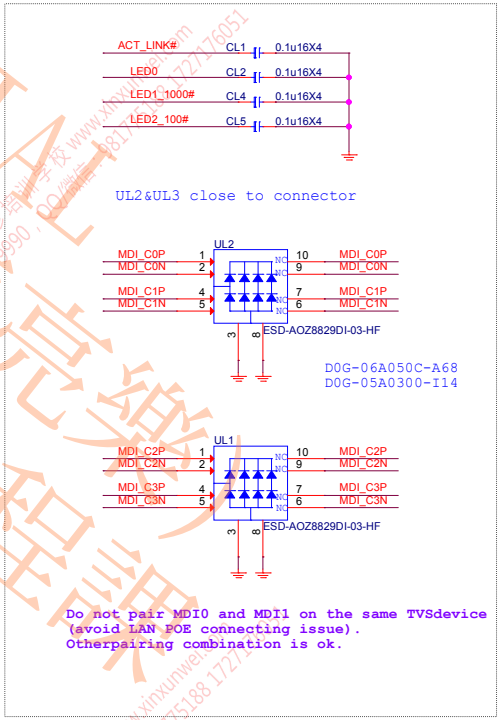
+3.3V_LAN

I218:132mA
I219:542mW

LAN Connector



For EMI

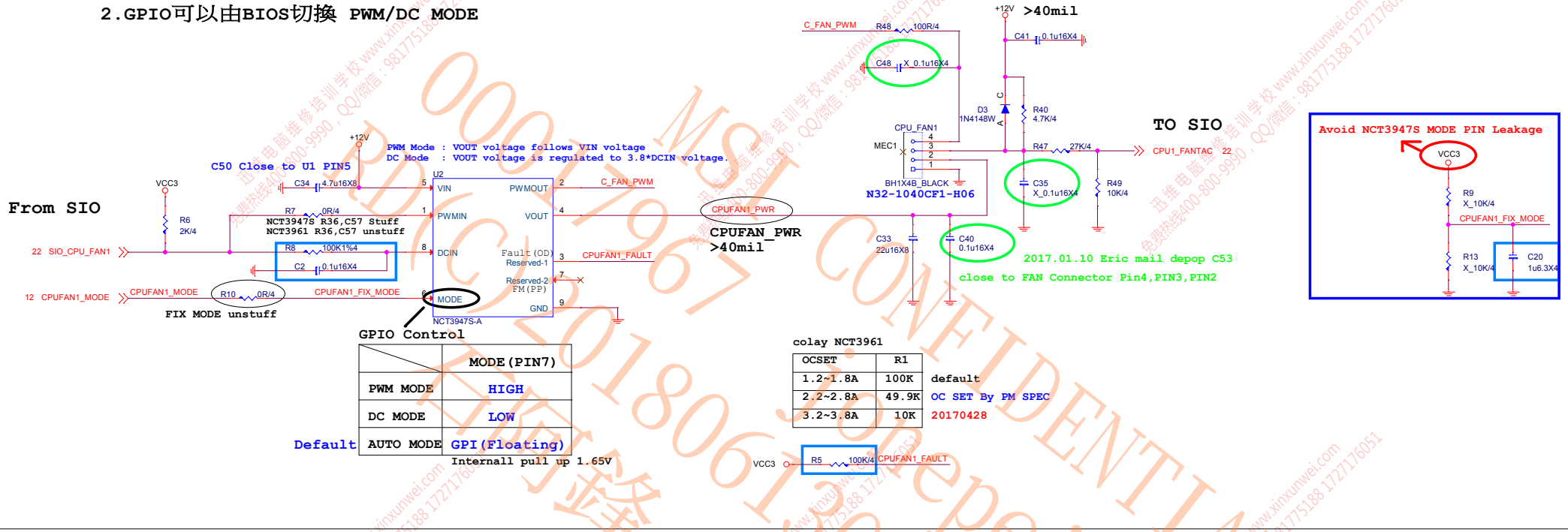


MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: LAN - Intel I219	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 24 of 63	

CONFIDENTIAL
MSI
RMA工程样

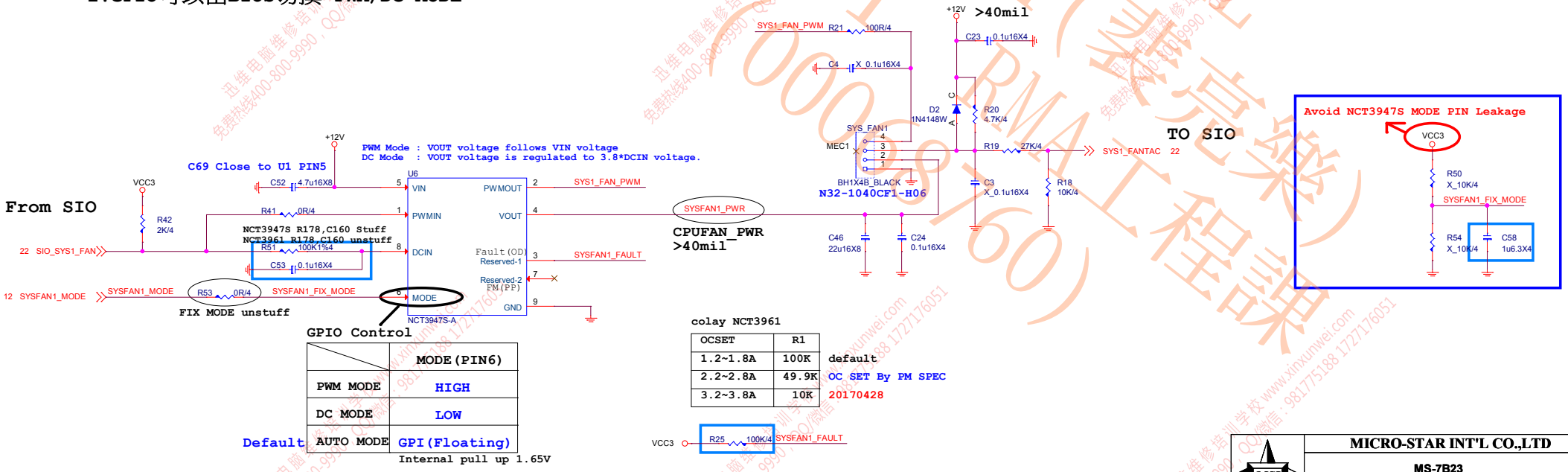
TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE

2.GPIO可以由BIOS切换 PWM/DC MODE



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

2.GPIO可以由BIOS切换 PWM/DC MODE

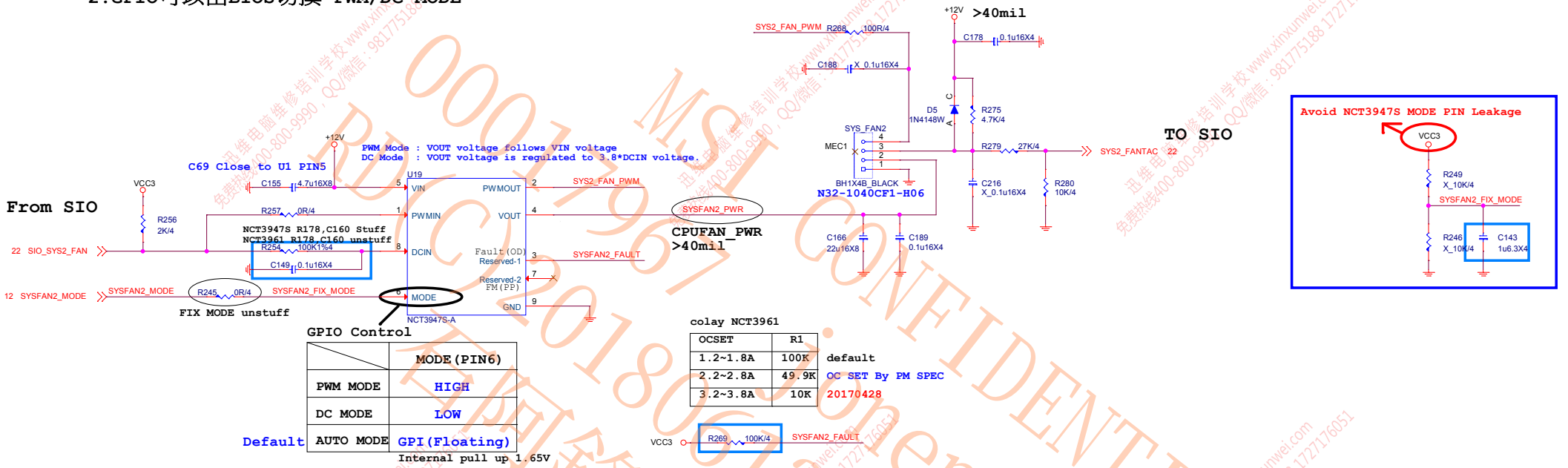


MICRO-STAR INT'L CO.,LTD	
MS-7B23	
Size: Custom	Document Description: FAN CONTROLLOR
Rev: 1.1	
Date: Monday, February 12, 2018	Sheet 25 of 63

MSI CONFIDENTIAL
RDC(2018061501 RMA工程策 (0008160) 经销商)
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

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

2.GPIO可以由BIOS切换 PWM/DC MODE

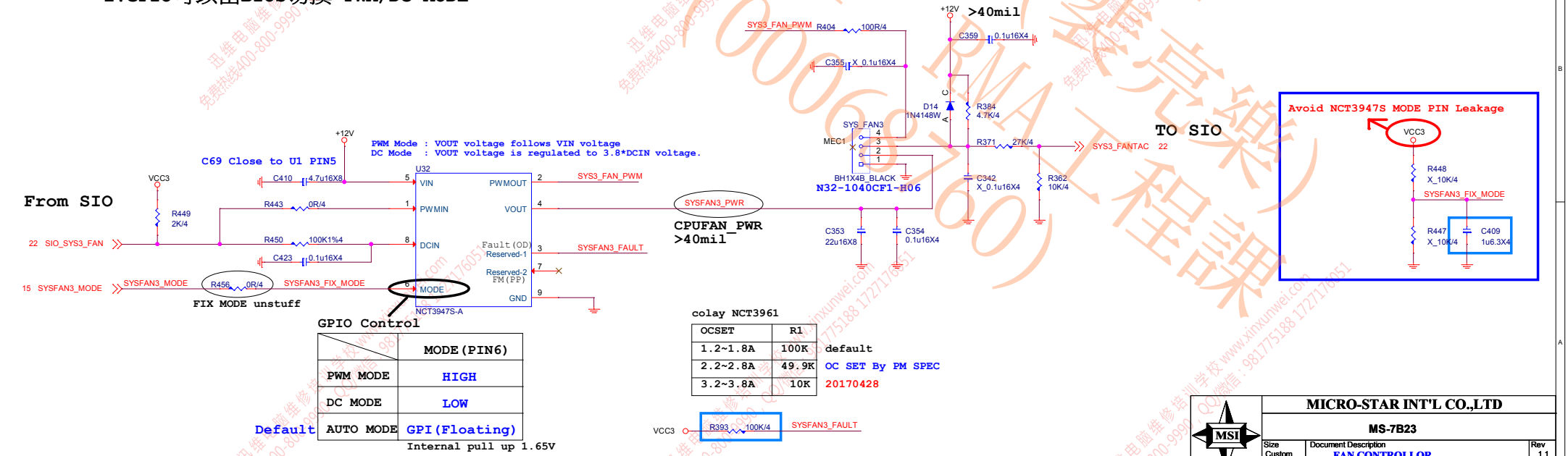


	MODE(PIN6)
PWM MODE	HIGH
DC MODE	LOW
AUTO MODE	GPI(Floating)

OCSET	R1	
1.2~1.8A	100K	default
2.2~2.8A	49.9K	OC SET By PM SPEC
3.2~3.8A	10K	20170428

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

2.GPIO可以由BIOS切换 PWM/DC MODE



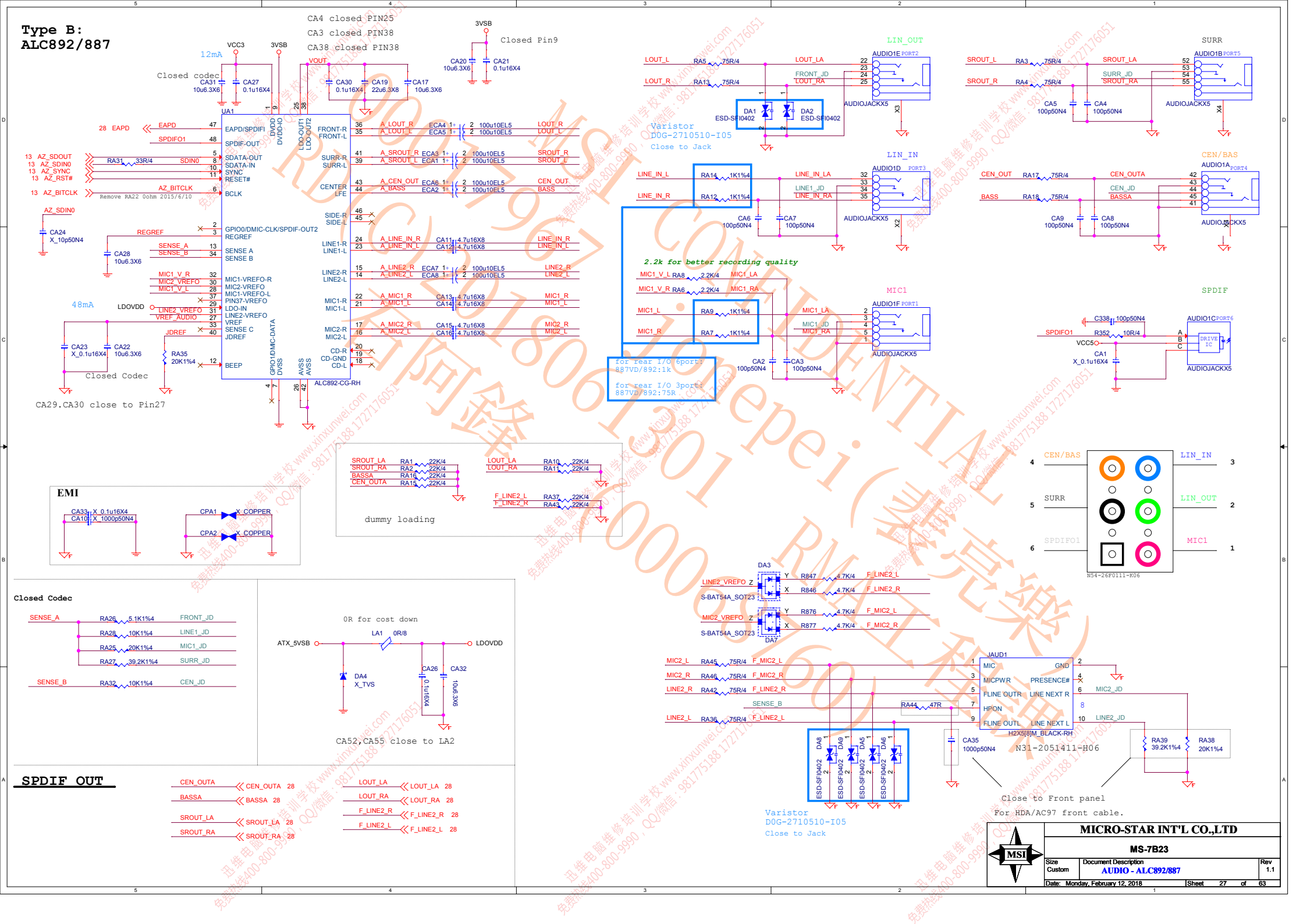
	MODE(PIN6)
PWM MODE	HIGH
DC MODE	LOW
AUTO MODE	GPI(Floating)

OCSET	R1	
1.2~1.8A	100K	default
2.2~2.8A	49.9K	OC SET By PM SPEC
3.2~3.8A	10K	20170428

MICRO-STAR INT'L CO.,LTD	
MS-7B23	
Size: Custom	Document Description: FAN CONTROLLOR
Rev: 1.1	
Date: Monday, February 12, 2018	Sheet 26 of 63

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051
MSI CONFIDENTIAL Shenpei(深圳) RMA工程课 0001796 R/C 20180613 01 (760068760)

Type B: ALC892/887



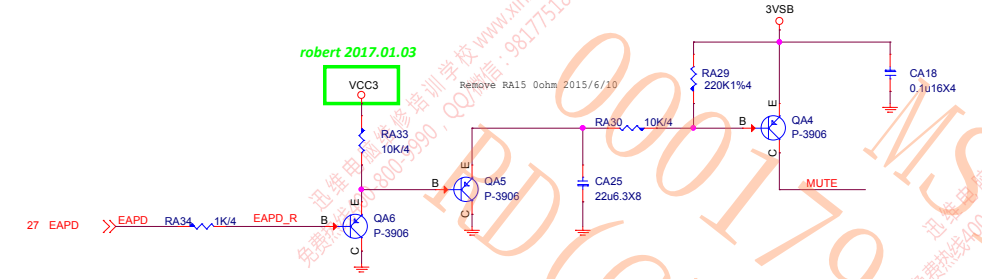
MSI CONFIDENTIAL
RUCG0180613001 RMA 维修完整

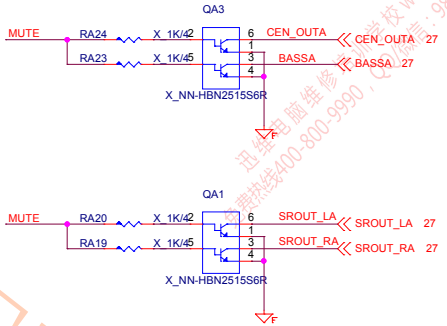
MICRO-STAR INT'L CO.,LTD	
MS-7B23	
Size: Custom	Document Description: AUDIO - ALC892/887
Rev: 1.1	
Date: Monday, February 12, 2018	Sheet 27 of 63

Rear Line OUT De-POP circuit

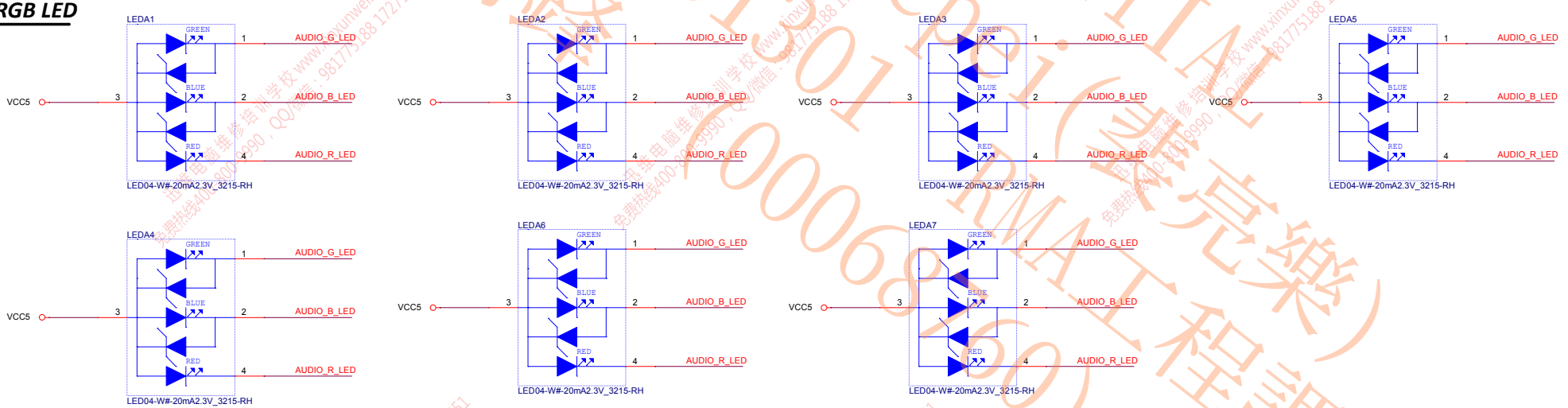
De-pop circuit for Rear Line out & Front Headphone out)

(add de-pop circuit by PM spec or customer request,
NOTE: add de-pop circuit need to change CA21,CA37, CA38, CA39, CA40, CA41 to TVS)





Audio RGB LED

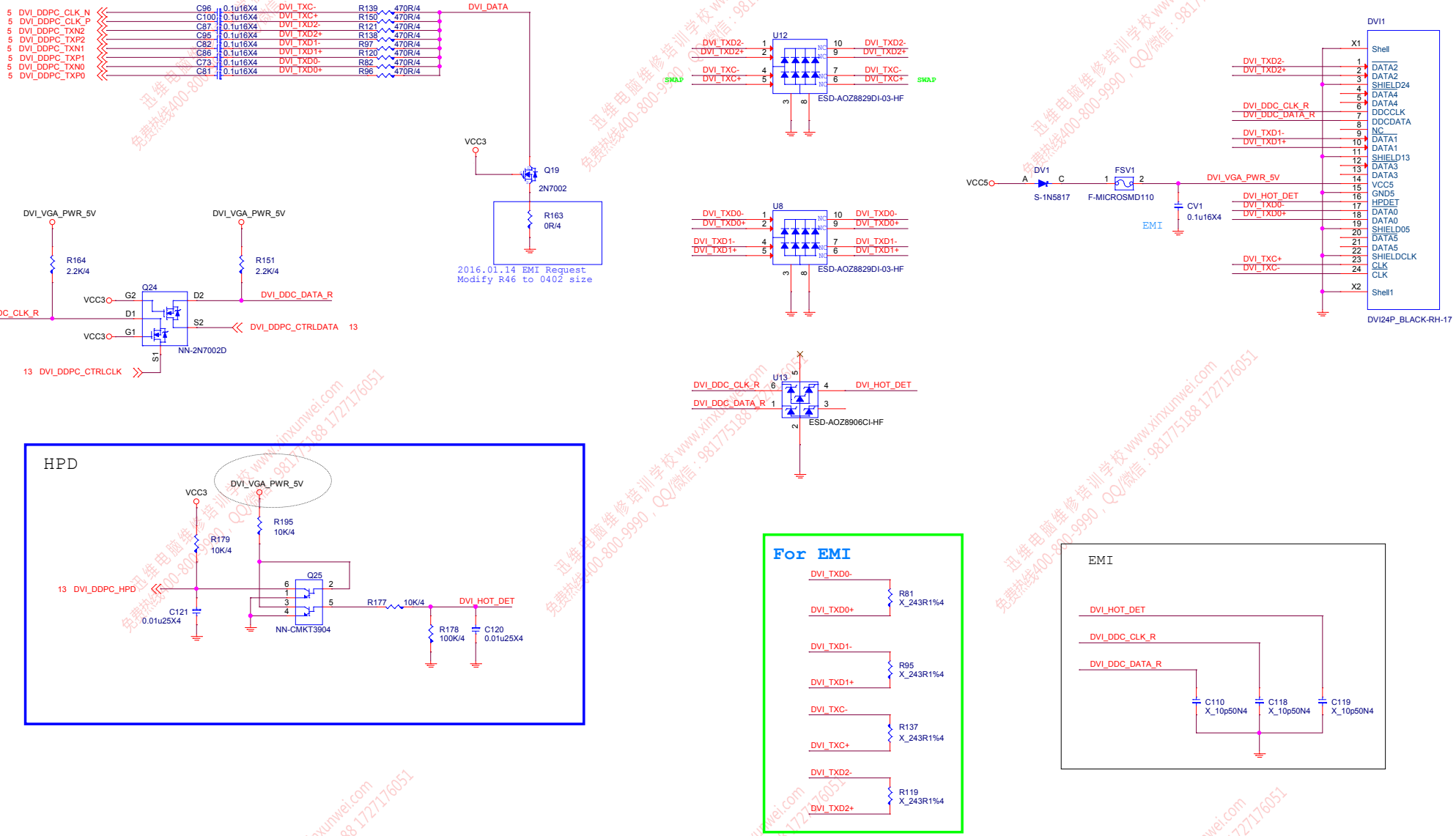


00017967 MSI CONFIDENTIAL
PD(C)20180613011 joneper(樊完燊)
2000068760 RMA工程課

MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: AUDIO - depop circuit	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 28 of 63	

DVI level shifter

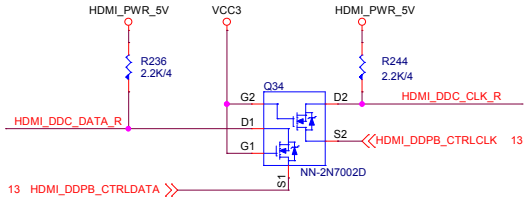
VGA: resolution of 2048x1536 pixels with 32-bit color at 75 Hz (4:3 QXGA)

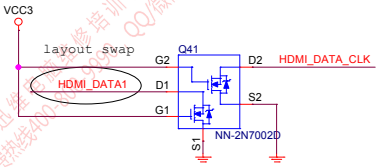


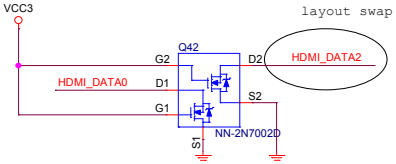
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

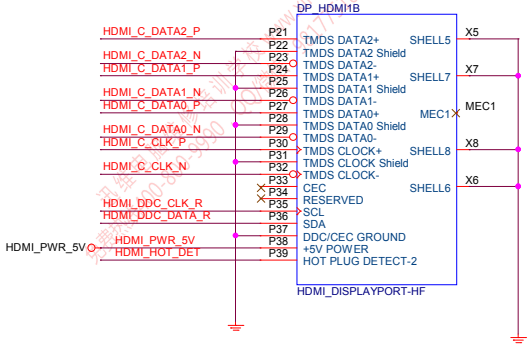
MICRO-STAR INT'L CO.,LTD	
MS-7B23	
Size: Custom	Document Description: DVI
Rev: 1.1	
Date: Monday, February 12, 2018	Sheet 29 of 63

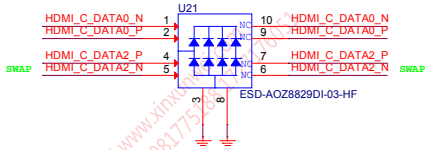
HDMI, DVI : 1920x1200 at 60 Hz (16:10 WUXGA)

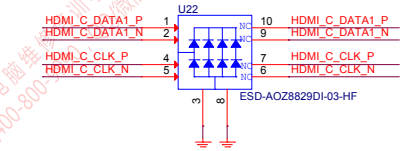


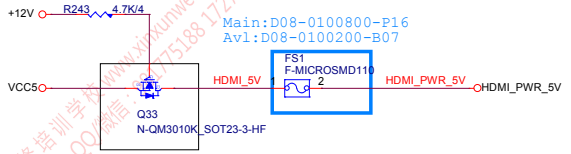




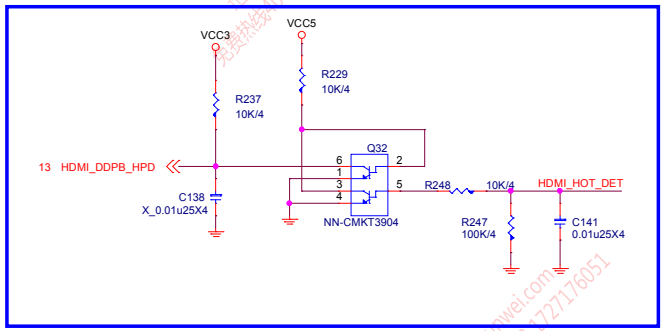


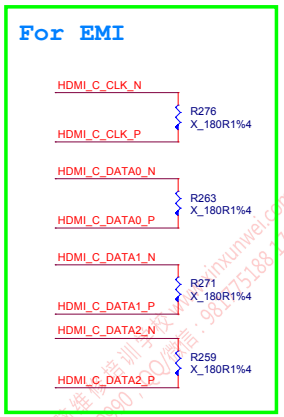


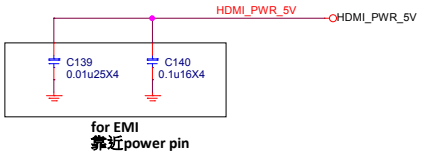


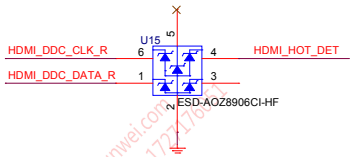


HPD





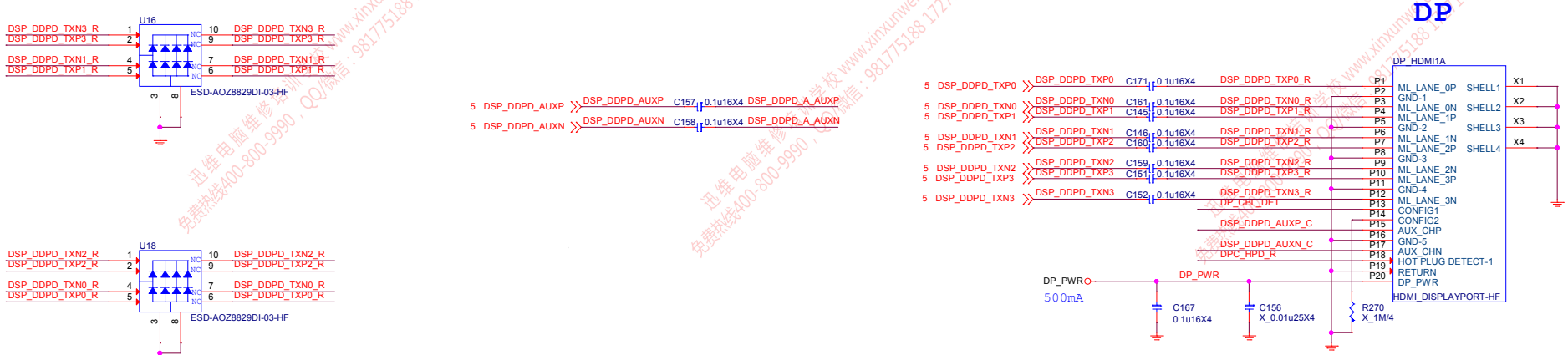


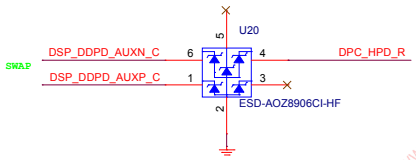


MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7B23	
Size: Custom	Document Description: HDMI Connector	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 30 of 63	

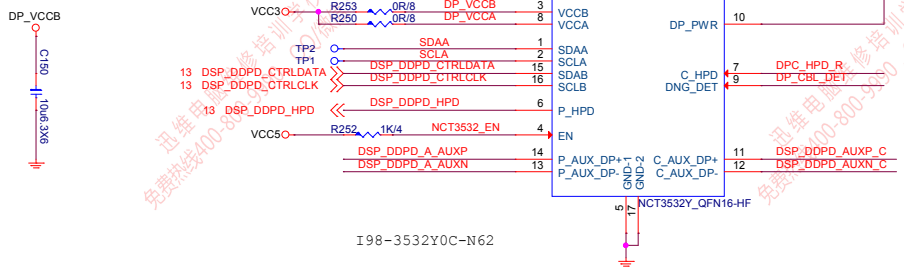
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

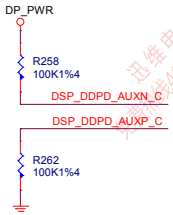
DP

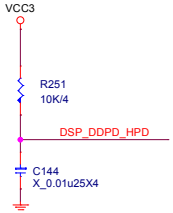


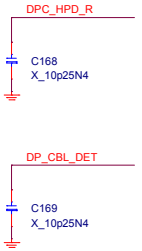


DP_VCCB trace don't less than 30 mil



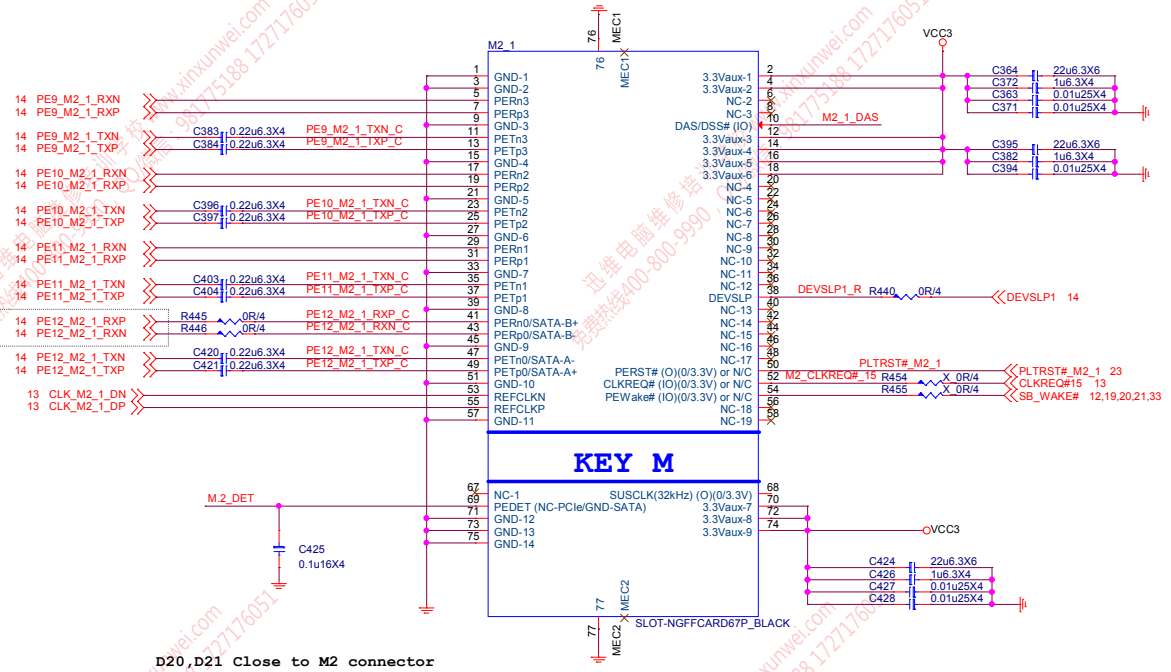




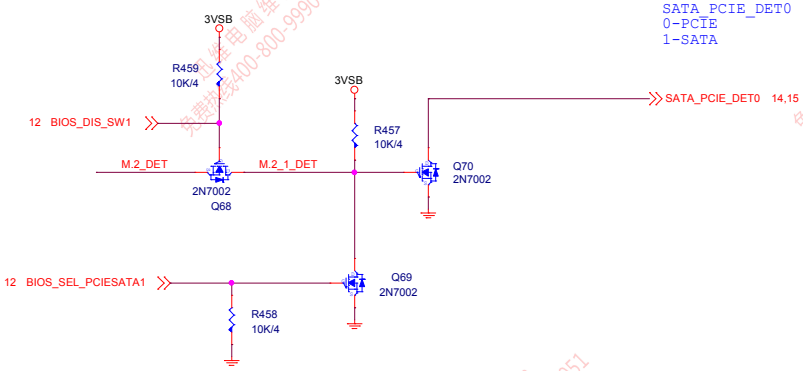


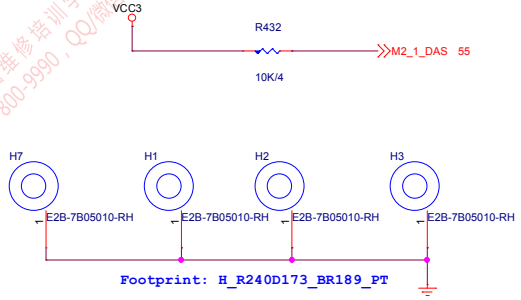
MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: DisplayPort Connector	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 31 of 63	

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051



D20,D21 Close to M2 connector





SCREW1 SCREW M2_SCREW

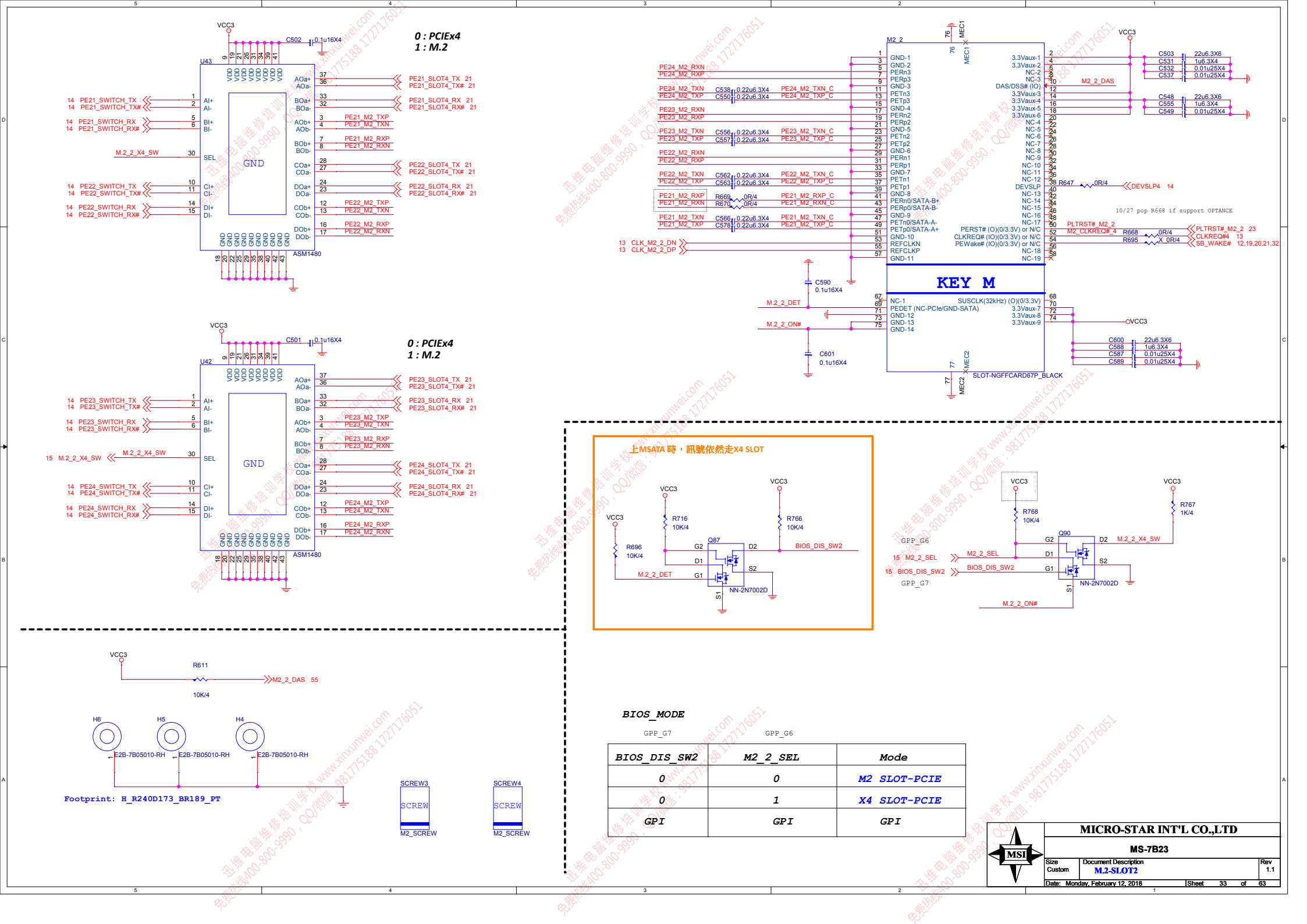
SCREW2 SCREW M2_SCREW

BIOS_MODE

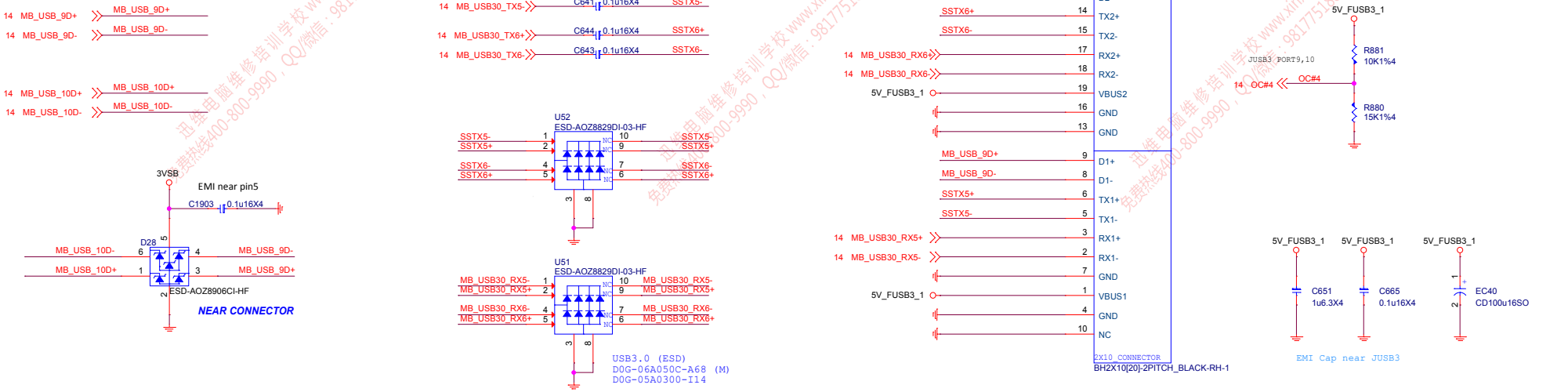
DIS_SW	*M1_SEL_PCIESATA*	*Mode*
0	*1*	*M2-SATA*
0	*0*	*M2-PCIE*
GPI	*GPI*	*AUTO*

MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: M.2-SLOT1	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 32 of 63	

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

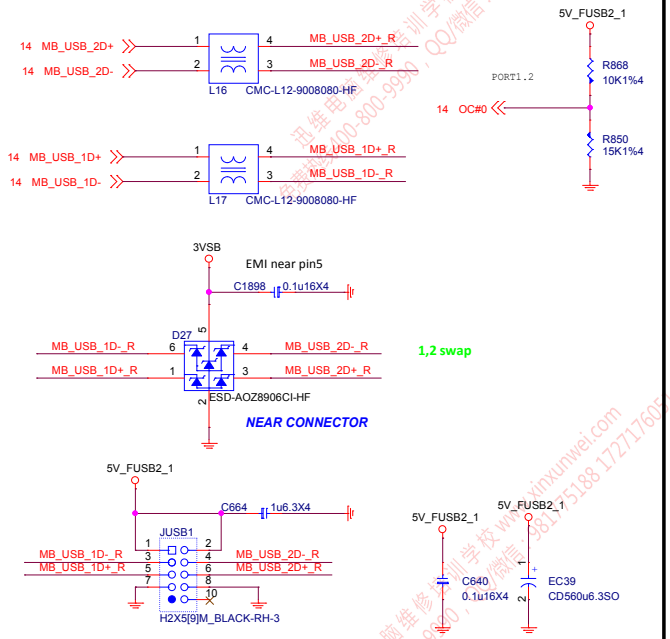

0 : PCIEx4
1 : M.2
U43
ASM1480
GND
C502 0.1u16X4
PE21_SLOT4_TX 21
PE21_SLOT4_TX# 21
PE21_SLOT4_RX 21
PE21_SLOT4_RX# 21
PE22_SLOT4_TX 21
PE22_SLOT4_TX# 21
PE22_SLOT4_RX 21
PE22_SLOT4_RX# 21
U42
C501 0.1u16X4
PE23_SLOT4_TX 21
PE23_SLOT4_TX# 21
PE23_SLOT4_RX 21
PE23_SLOT4_RX# 21
PE24_SLOT4_TX 21
PE24_SLOT4_TX# 21
PE24_SLOT4_RX 21
PE24_SLOT4_RX# 21
M2_2
SLOT-NGFFCARD67P_BLACK
KEY M
C590 0.1u16X4
C601 0.1u16X4
C503 22u6.3X6
C531 1u6.3X4
C532 0.01u25X4
C537 0.01u25X4
C548 22u6.3X6
C555 1u6.3X4
C549 0.01u25X4
C600 22u6.3X6
C588 1u6.3X4
C587 0.01u25X4
C589 0.01u25X4
R647 0R/4
DEVSLP4 14
10/27 pop R668 if support OPTANCE
R668 0R/4
R695 X 0R/4
PLTRST#_M2_2 23
CLKREQ#4 13
SB_WAKE# 12,19,20,21,32
上MSATA 時，訊號依然走X4 SLOT
R716 10K/4
R766 10K/4
R696 10K/4
Q87
NN-2N7002D
BIOS_DIS_SW2
M.2_2_DET
R768 10K/4
R767 1K/4
Q90
M.2_2_X4_SW
M.2_2_SEL
M.2_2_ON#
R611 10K/4
M2_2_DAS 55
H6
H5
H4
E2B-7B05010-RH
Footprint: H_R240D173_BR189_PT
SCREW3
SCREW4
M2_SCREW
BIOS_MODE
GPP_G7
GPP_G6
BIOS_DIS_SW2 | M2_2_SEL | Mode
0 | 0 | M2 SLOT-PCIE
0 | 1 | X4 SLOT-PCIE
GPI | GPI | GPI
MICRO-STAR INT'L CO.,LTD
MS-7B23
Size Custom
Document Description M.2-SLOT2
Rev 1.1
Date: Monday, February 12, 2018
Sheet 33 of 63

JUSB3 PORT9,10



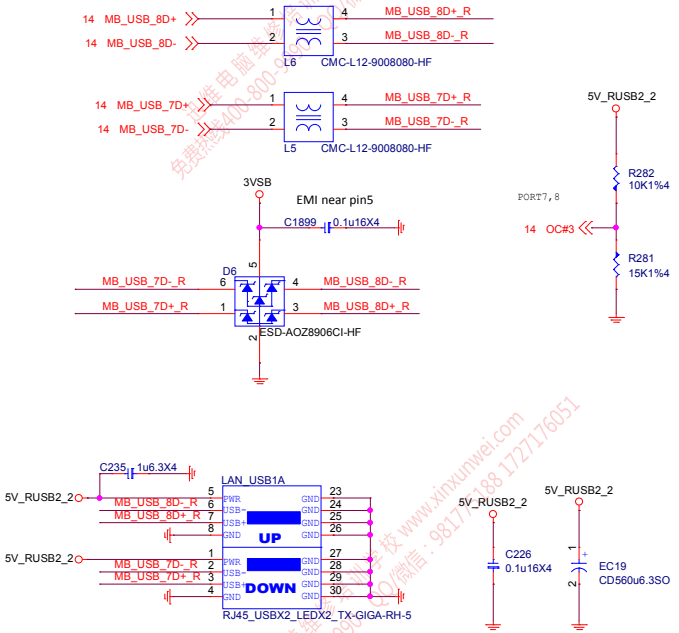
JUSB1 PORT 7,8

2017.12.12
swap 1,2 to 7,8 for layout

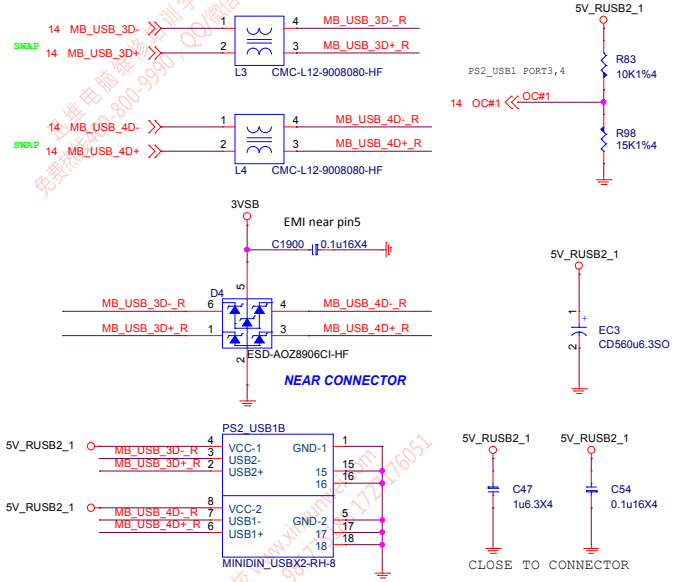


LAN_USB1 PORT 1,2

2017.12.12
swap 1,2 to 7,8 for layout

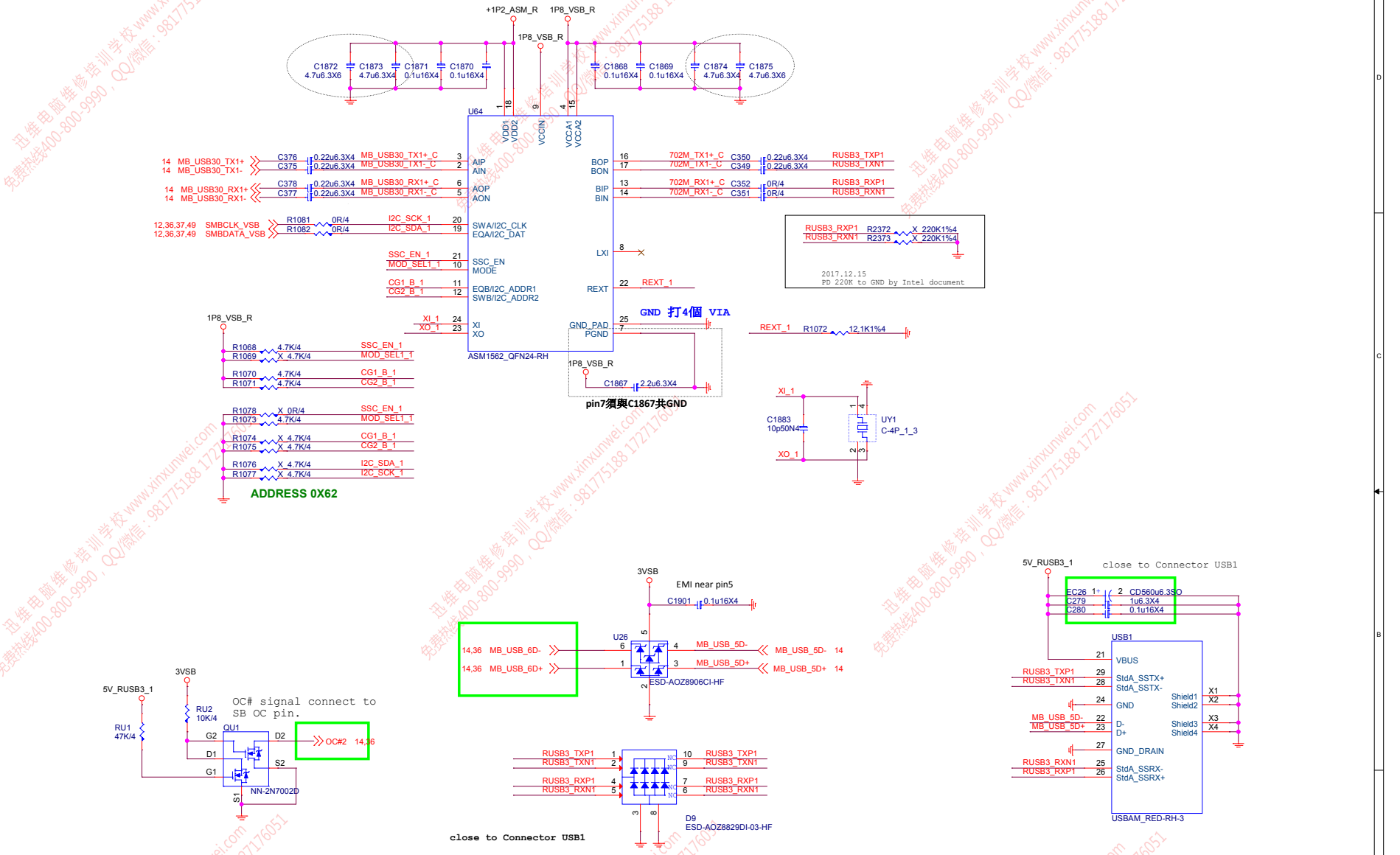


REAR PS2_USB1 PORT 3,4



MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: Front USB/ PS2_USB1	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 34 of 63	

Rear TYPE-A
USB3.1 Re-Timer



迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

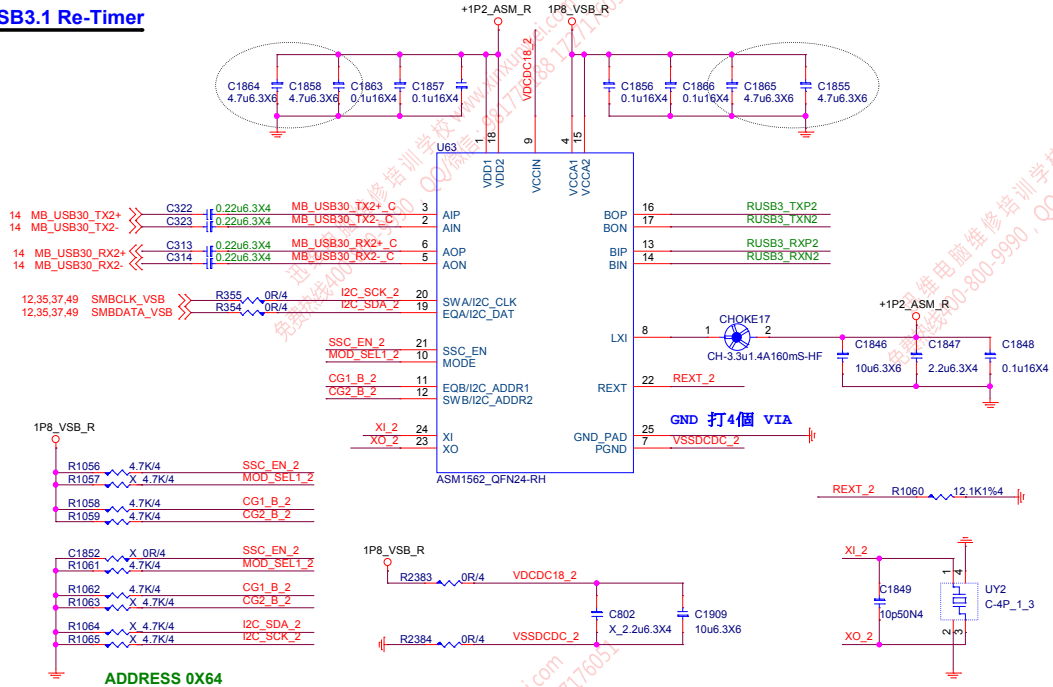
MICRO-STAR INT'L CO.,LTD

MS-7B23

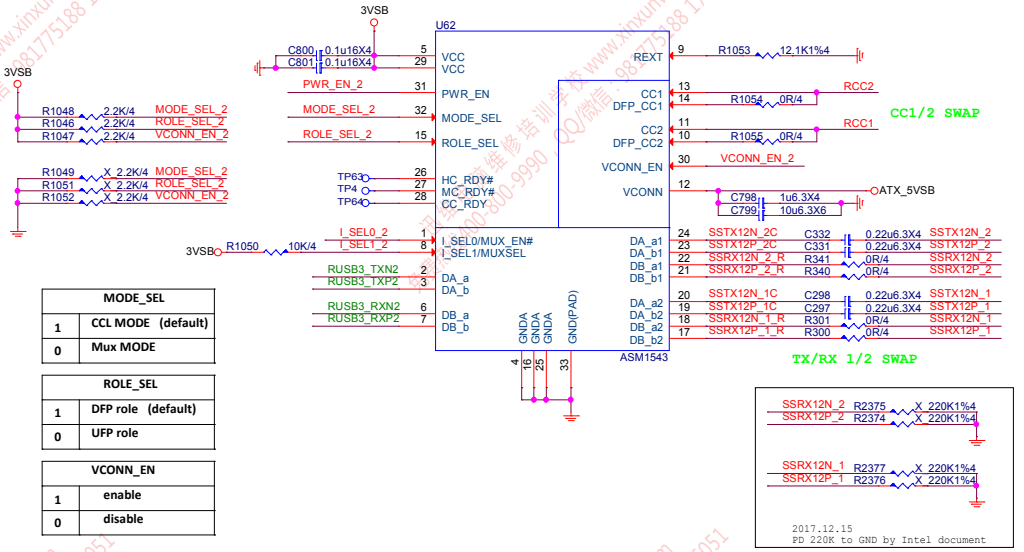
Size	Document Description	Rev
Custom	Type-A & Re_driver	1.1

Date: Monday, February 12, 2018 Sheet 35 of 63

USB3.1 Re-Timer



USB Type-C MUX with Configuration Channel (CC)

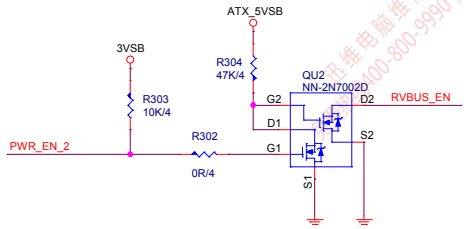


MODE_SEL	
1	CCL MODE (default)
0	Mux MODE

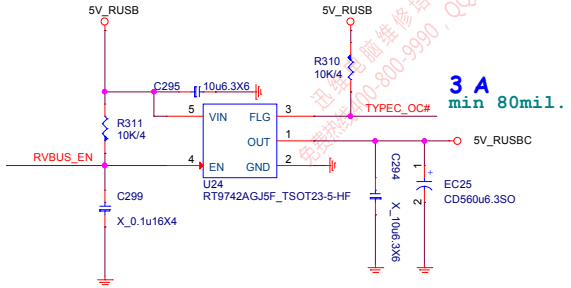
ROLE_SEL	
1	DFP role (default)
0	UFP role

VCONN_EN	
1	enable
0	disable

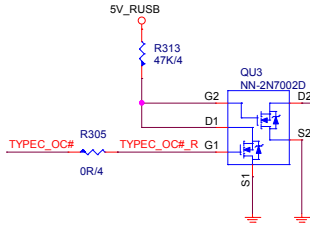
VCOM OC#



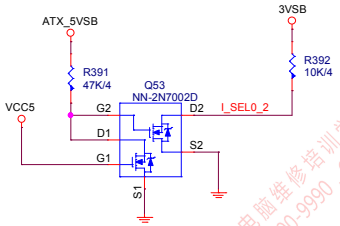
VBUS EN



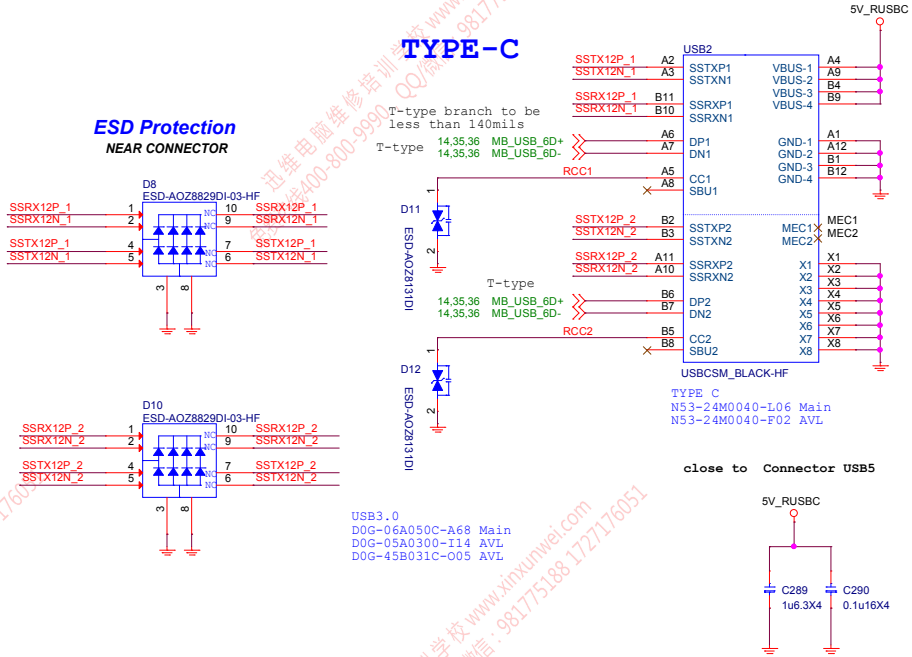
VBUS OC# LEVEL SHIFT



Current Mode



TYPE-C

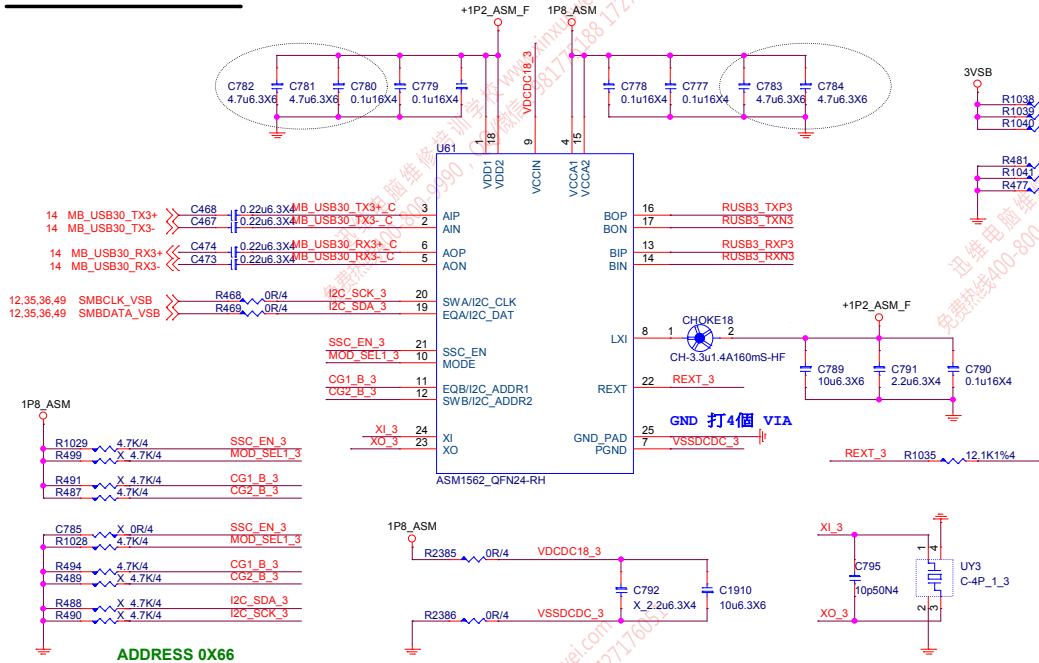


MICRO-STAR INT'L CO.,LTD	
MS-7B23	
Size: Custom	Document Description: Rear Type-C & Re-Timer
Rev: 1.1	
Date: Monday, February 12, 2018	Sheet 36 of 63

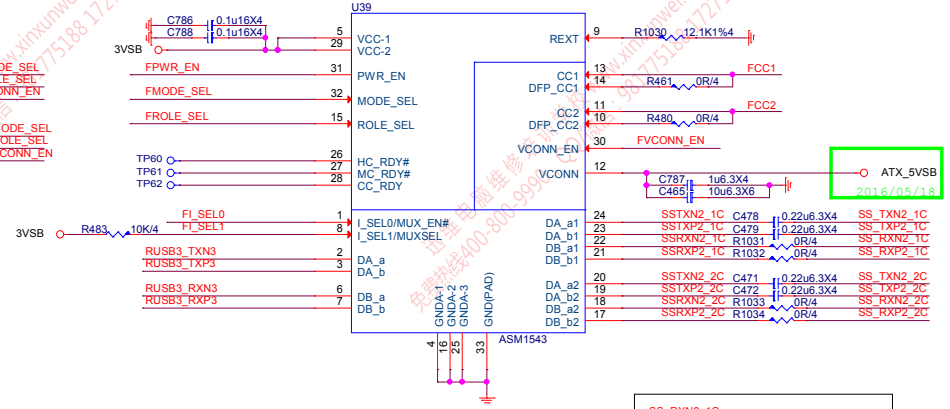
迅维电脑维修培训学校 www.xinxunwei.com QQ/微信：981775188 1727176051 免费热线400-800-9990

USB3.1 Gen2 Re-Timer

USB Type-C MUX with Configuration Channel (CC)

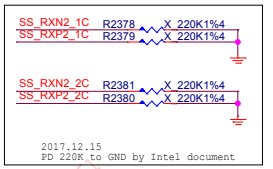


USB 3.1-Type-C

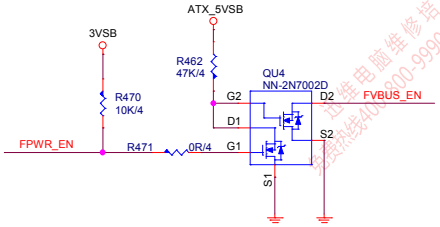


ASM1562 USB3.1 re-timer

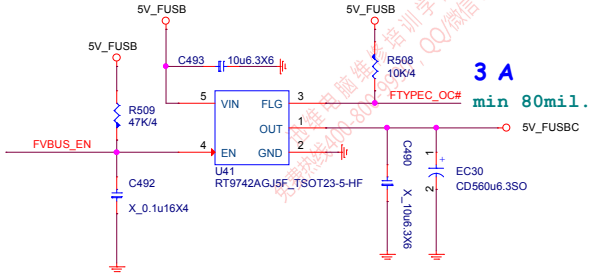
ADDRESS	0x62	0X64	0x66	0x68	0x70	0x72	0x74	0x76	0x78
PIN11 RH (KOhm)	4.7K	4.7K	N/A	4.7K	4.7K	N/A	4.7K	4.7K	N/A
PIN11 RL (KOhm)	N/A	4.7K	4.7K	N/A	4.7K	4.7K	N/A	4.7K	4.7K
PIN12 RH (KOhm)	4.7K	4.7K	4.7K	4.7K	4.7K	4.7K	N/A	N/A	N/A
PIN12 RL (KOhm)	N/A	N/A	N/A	4.7K	4.7K	4.7K	4.7K	4.7K	4.7K



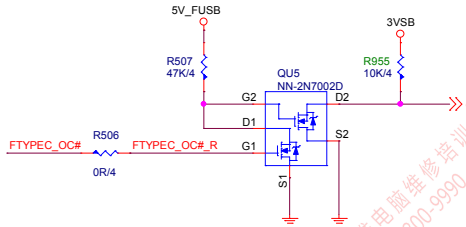
VCOM OC#



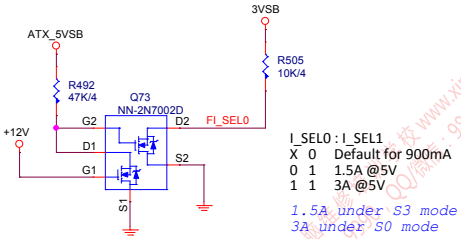
VBUS EN

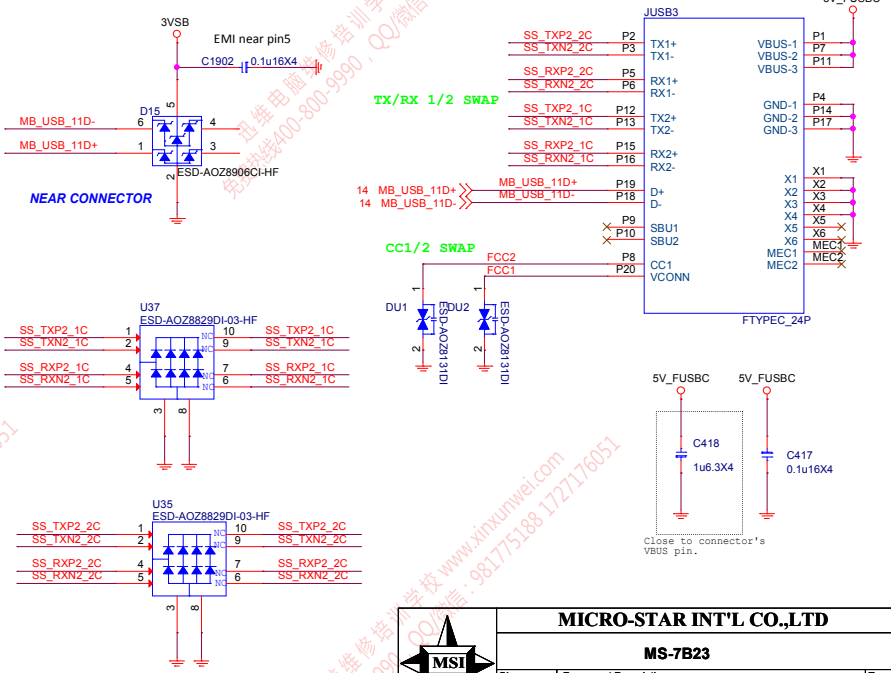


VBUS OC# LEVEL SHIFT



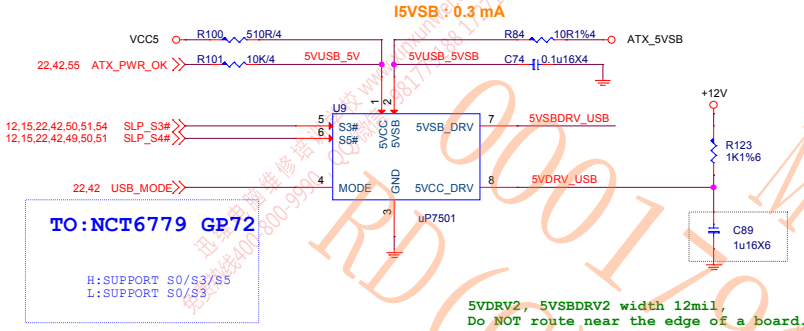
Current Mode





MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: Front Type-C & Re-driver	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 37 of 63	

USB POWER

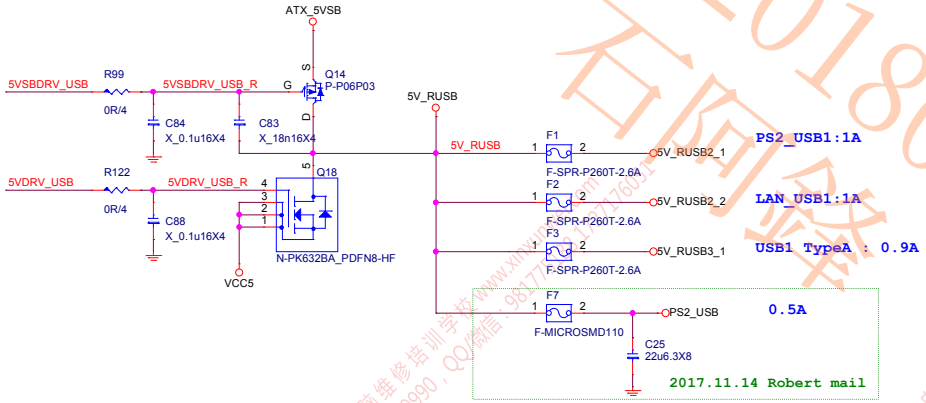


PS2 POWER

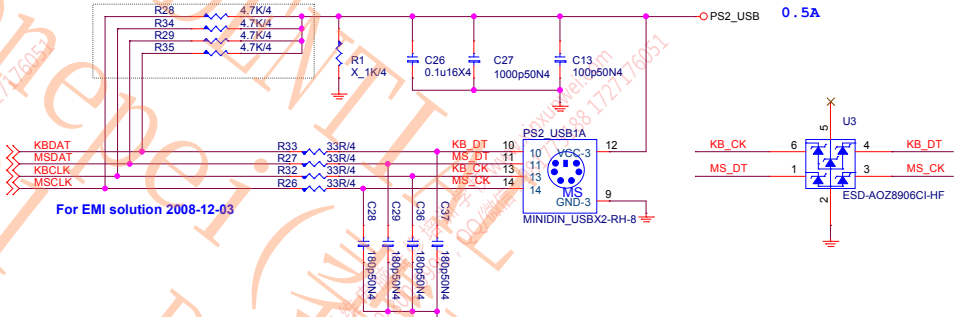
0.5A

USB MODE

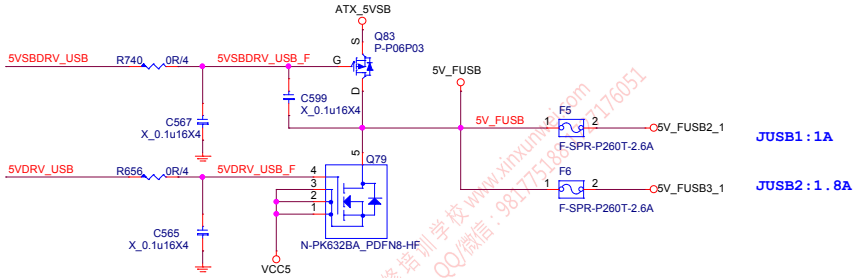
REAR USB PORT POWER



PS2 KEYBOARD & MOUSE CONNECTOR



FRONT USB PORT POWER



USB_CONN	USB_POWER	PCH_PORT	OC# SIGNAL
LAN_USB1	5V_FUSB2_1	Port5,6	OC#0
PS2_USB1	5V_RUSB2_2	Port9,10	OC#1
USB1	5V_RUSB3_1	Port1,2	OC#2
JUSB3	5V_RUSB3_1	Port3,4	OC#3
JUSB2	5V_RUSB2_1	Port7,8	OC#4

MICRO-STAR INT'L CO.,LTD

MS-7B23

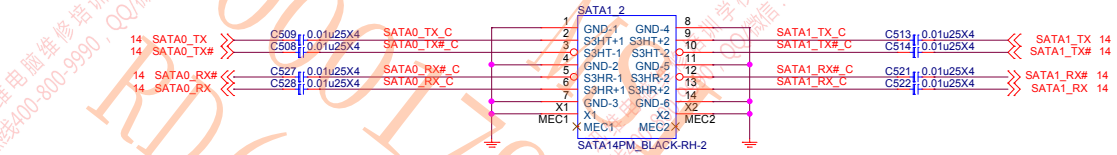
Size: Custom | Document Description: USB Power | Rev: 1.1

Date: Monday, February 12, 2018 | Sheet 38 of 63

MSI CONFIDENTIAL
RD(C)20180613
RMA工程碟
(完整)
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

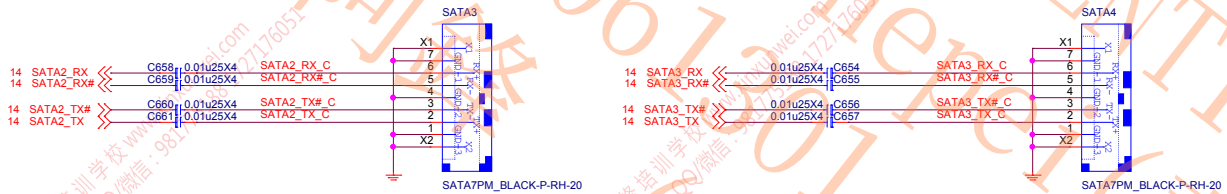
SATA PORT 0,1

Black 90 degree



SATA PORT 2,3

Black 180 degree



00917967 RD(C)20180612 01 RMA工程課 (000068760) 台灣 jonesyeh CONFIDENTIAL (製完繳)
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

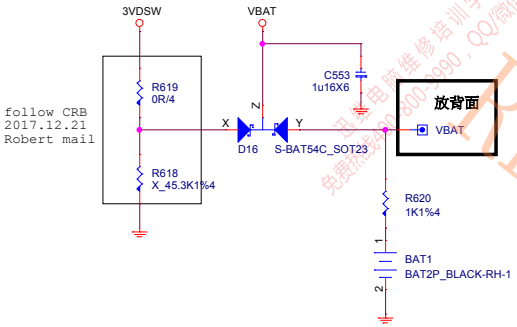
MICRO-STAR INT'L CO.,LTD

MS-7B23

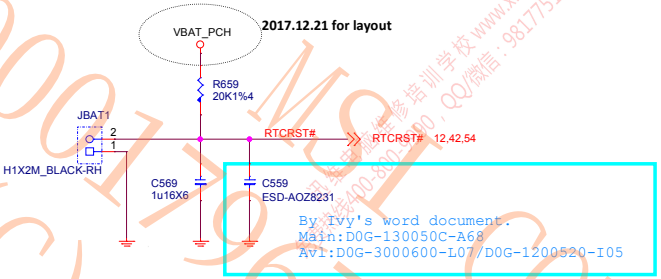
Size	Document Description	Rev
Custom	SATA connector	1.1

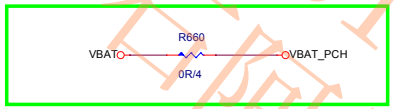
Date: Monday, February 12, 2018 Sheet 39 of 63

VBAT



Cut VBAT





Function 1		
IN		OUT
INPUT1	INPUT2	OUTPUT1
0	1	1
1	0	0
1	1	0
0	0	0

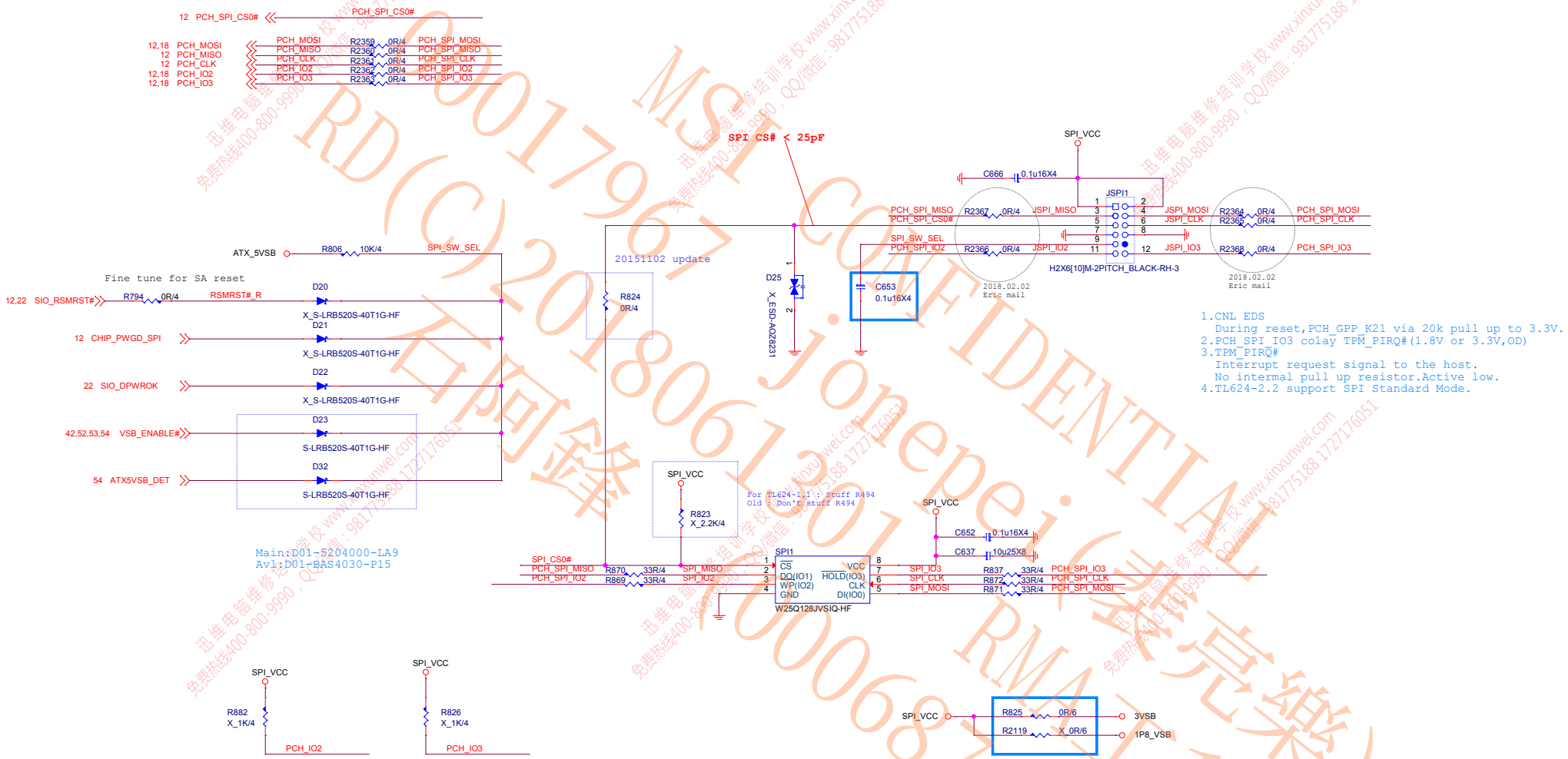
Default

Function 2				
IN		OUT		
INPUT3 & lowswitch_EN	INPUT4	OUTPUT2	OUTPUT3	VOUT
0	0	0	1	1
1	0	1	1	0 (discharge)
0	1	1	0	0 (discharge)
1	1	1	0	0 (discharge)

Default

MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: CUT VBAT circuit	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 40 of 63	

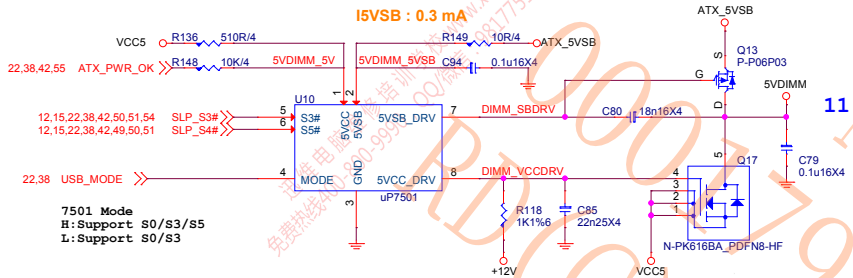
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051
MSI CONFIDENTIAL jonepei(装完维) RMA(000068760) 000176? RD(C)20180613?1 王阿锋



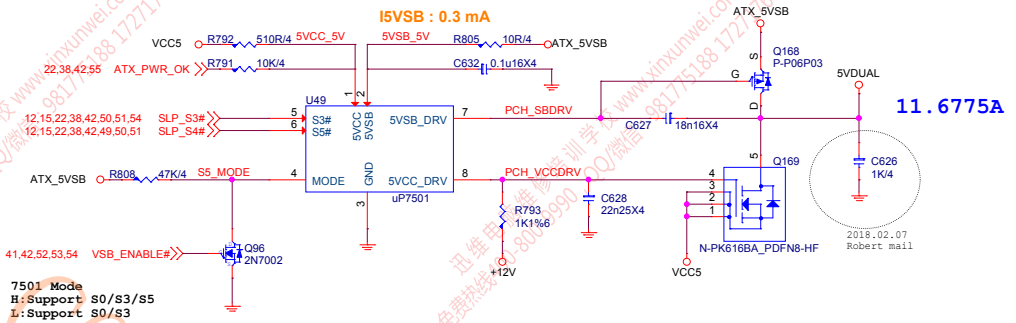
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051
MSI CONFIDENTIAL jonepei(校完樂) RD(C)20180613011 RMA工程課 (000068760) 石阿铎

MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: BIOS ROM	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 41 of 63	

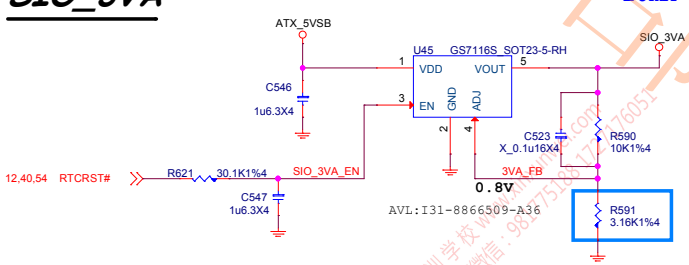
5VDIMM FOR DDR



5VDUAL

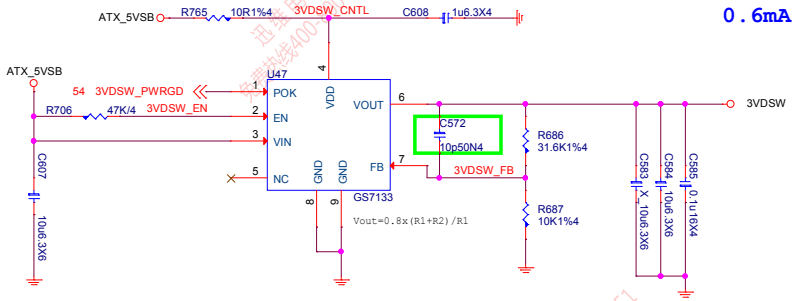


SIO_3VA

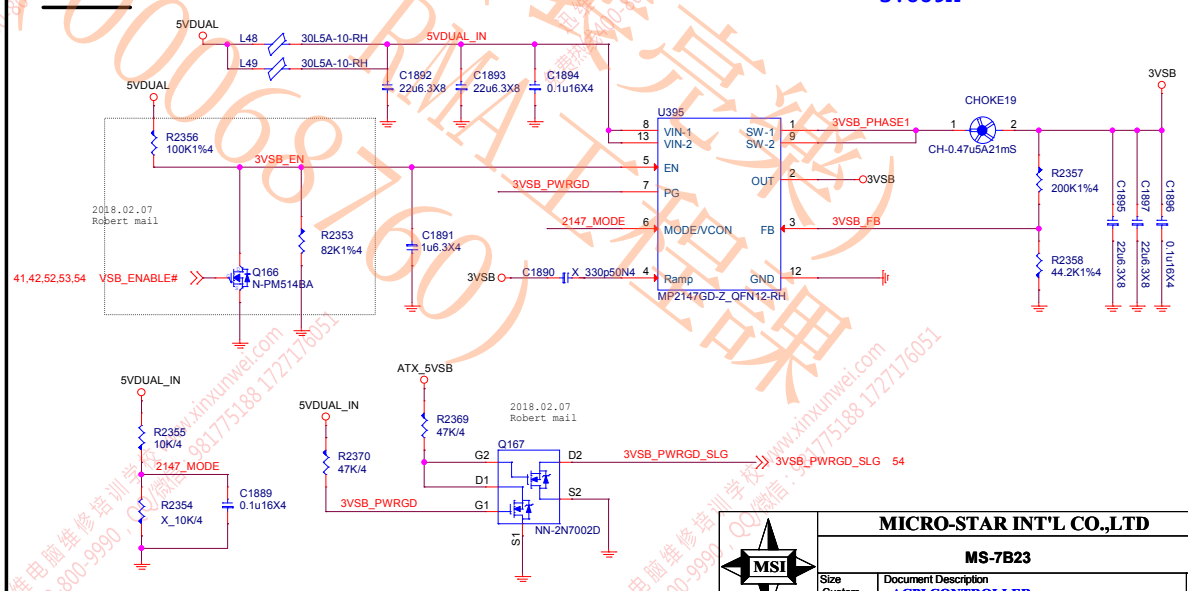


For power 700W solution. (only for uP7501+uP7506 for 3VSB solution)
The power supply VCC3 delay 12ms after VCC5 assert.
The chip U7501 5VDRV1 work when the VCC5 ready
(When VCC5 up to 4.2V and the 5VDRV1 delay 6ms assert), but
VCC3 not ready and let the 3VSB sequence fail.

3VDSW

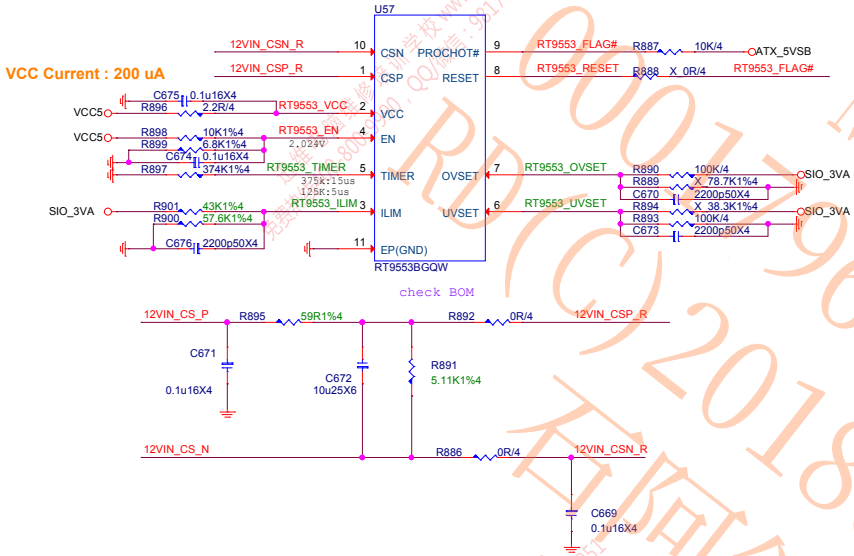


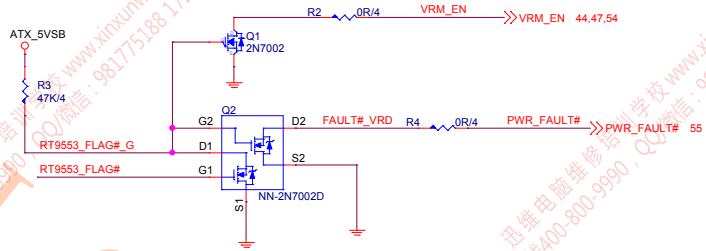
3VSB



MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: ACPI CONTROLLER	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 42 of 63	

MSI CONFIDENTIAL
Jonepei(景鸿微)
PBA工程部
00017967
PBA(C)20180613010068760
石阿锋
迅维电脑维修培训学校 www.xinxunwei.com 981775188 1727176051 QQ/微信 免费热线400-800-9990

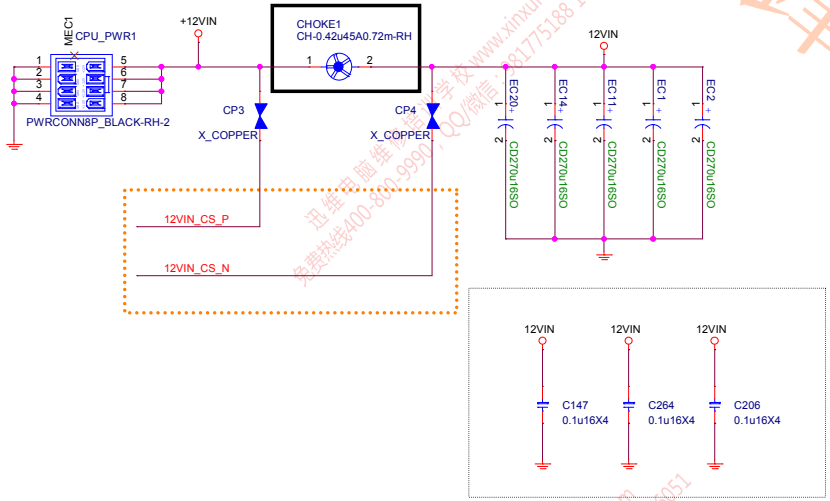




OCP:30A
Real OCP:30.05A
R17+R18>100k Vsio_3va= 3.38V Rdcr= 0.5 mohm

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

2017.12.01 Ivy mail
0.22uH->0.42uH



D=Vout/Vin			
Vin	=	12	> input voltage
Vout	=	1.52	> output Vcore
D	=	0.126667	

I o = Icore(max)*0.8			
I core(max)	=	138	> Vcore current
I avg.	=	110.4	A

I ripple={ Io*√D*√(1-D)} / Phase			
Phase	=	4	phase
I ripple	=	9.179738	A

How many pcs. Of Cap.			
I ripple(cap)	=	5000	m A
COE TEMP	=	1	
Input Cap.	=	2	pcs.

D=Vout/Vin			
Vin	=	12	> input voltage
Vout	=	1.52	> output Vcore
D	=	0.126667	

I o = Icore(max)*0.8			
I core(max)	=	45	> Vcore current
I avg.	=	36	A

I ripple={ Io*√D*√(1-D)} / Phase			
Phase	=	2	phase
I ripple	=	5.986785	A

How many pcs. Of Cap.			
I ripple(cap)	=	5000	m A
COE TEMP	=	1	
Input Cap.	=	2	pcs.

CORE:
D = Vout/Vin
= 1.52/12
= 0.126667
N = 4
Irms = Iout * [D/N - (D)^2]^(1/2)
= 138* (0.031667 - 0.016044)^(1/2)
= 17.2489A

GT:
D = Vout/Vin
= 1.52/12
= 0.126667
N = 2
Irms = Iout * [D/N - (D)^2]^(1/2)
= 45* (0.063333 - 0.016044)^(1/2)
= 9.7857A

D=Vout/Vin			
Vin	=	12	> input voltage
Vout	=	0.95	> output Vcore
D	=	0.079167	

I o = Icore(max)*0.8			
I core(max)	=	6.4	> Vcore current
I avg.	=	5.12	A

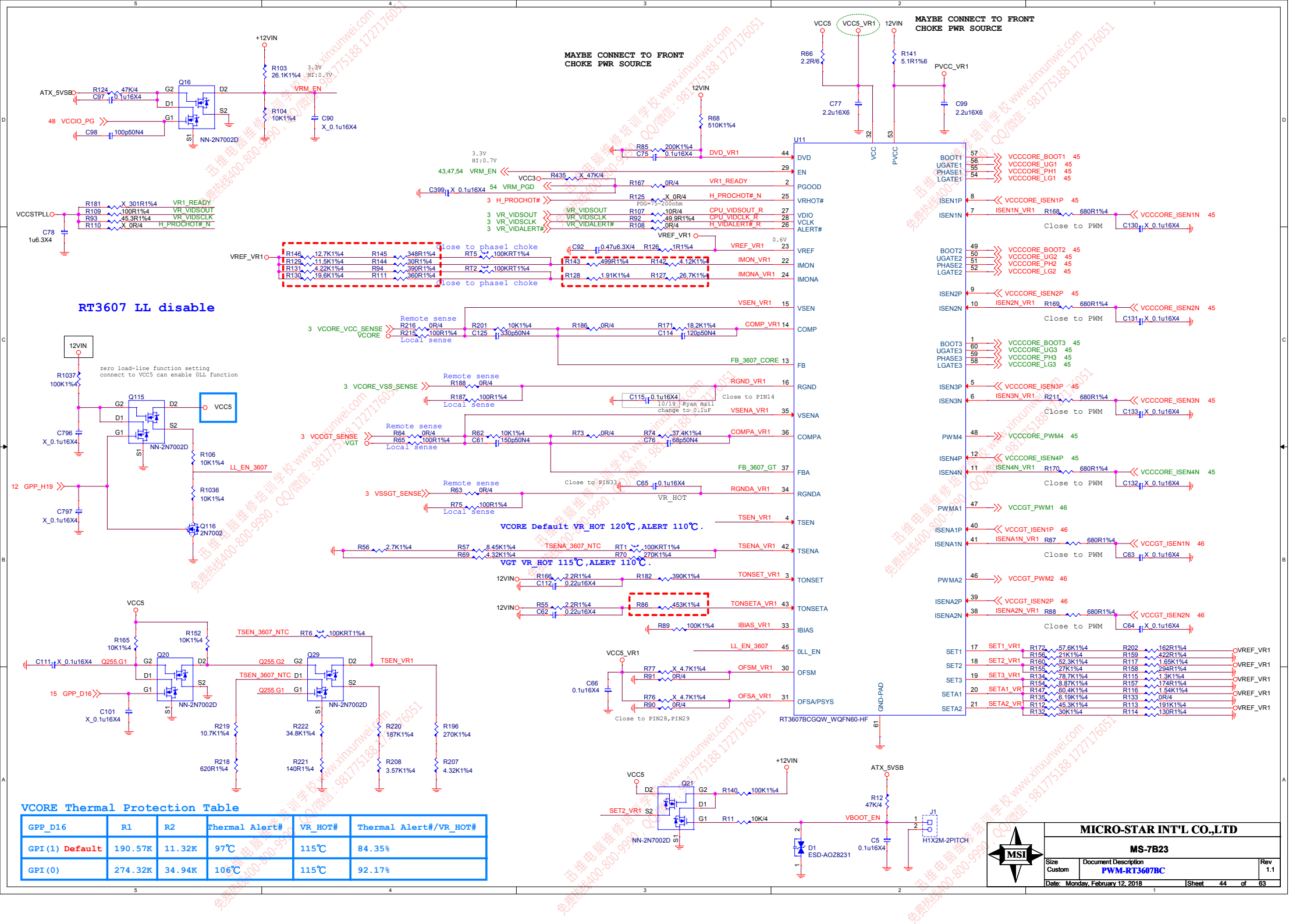
I ripple={ Io*√D*√(1-D)} / Phase			
Phase	=	1	phase
I ripple	=	1.382393	A

How many pcs. Of Cap.			
I ripple(cap)	=	5000	m A
COE TEMP	=	1	
Input Cap.	=	1	pcs.

VCCIO:
D = Vout/Vin
= 0.95/12
= 0.079167
N = 1
Irms = Iout * [D/N - (D)^2]^(1/2)
= 6.4* (0.079167 - 0.006267)^(1/2)
= 1.728A

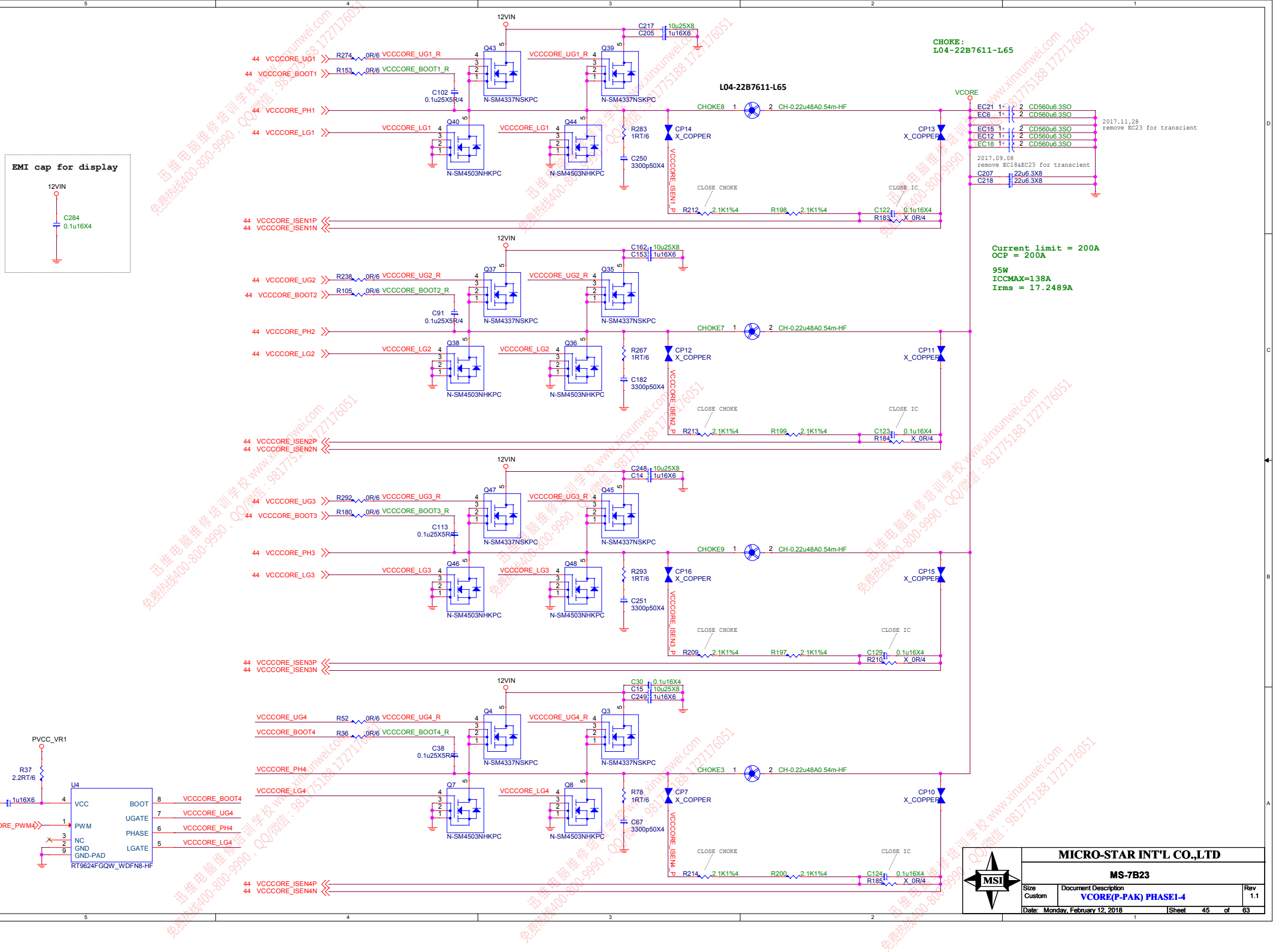
MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7B23	
Size: Custom	Document Description: 12VIN/CURRENT SENSE-RT9553	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 43 of 63	

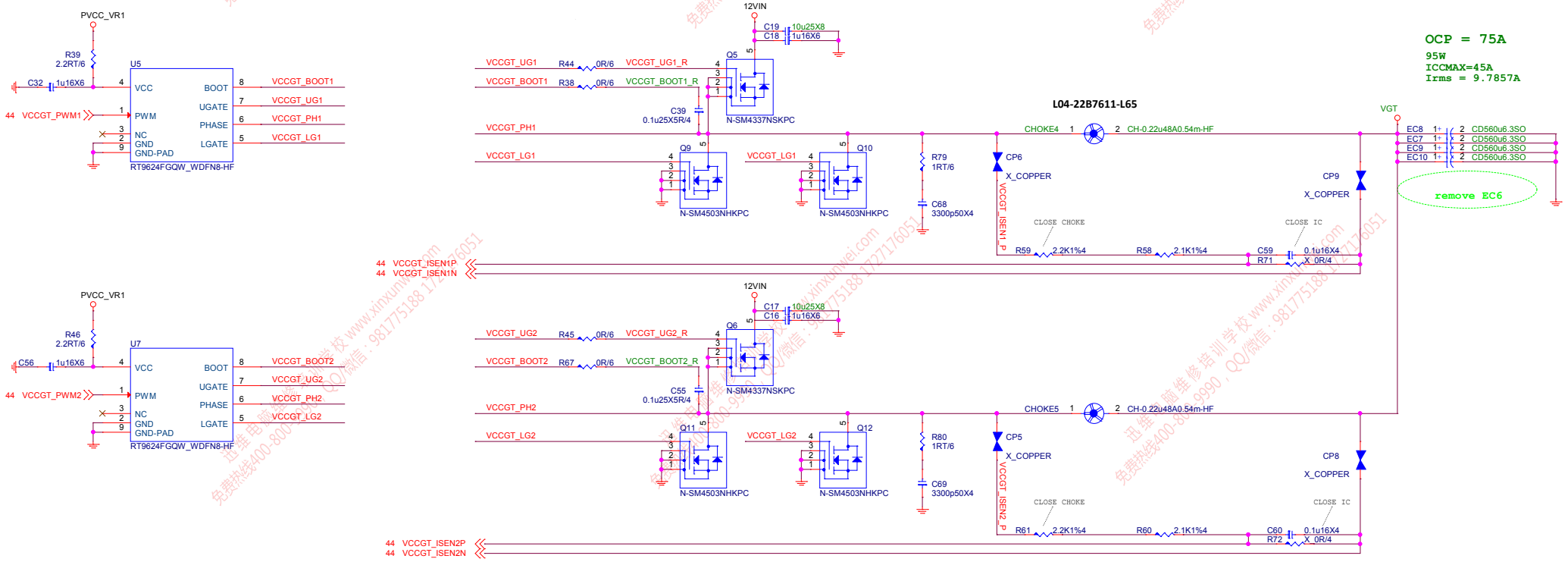
MSI CONFIDENTIAL
RD(C)20180612001
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 17271760 51



VCORE Thermal Protection Table

GPP_D16	R1	R2	Thermal Alert#	VR_HOT#	Thermal Alert#/VR_HOT#
GPI(1) Default	190.57K	11.32K	97℃	115℃	84.35%
GPI(0)	274.32K	34.94K	106℃	115℃	92.17%


EMI cap for display
12VIN
C284
0.1u16X4
CHOKE:
L04-22B7611-L65
L04-22B7611-L65
VCORE
Current limit = 200A
OCP = 200A
95W
ICCMAX=138A
Irms = 17.2489A
2017.11.28
remove EC23 for transcient
2017.09.08
remove EC18&EC25 for transcient
CLOSE CHOKE
CLOSE IC
PVCC_VR1
U4
RT9624FGQW_WDFN8-HF
MICRO-STAR INT'L CO.,LTD
MS-7B23
VCORE(P-PAK) PHASE1-4
Monday, February 12, 2018
Sheet 45 of 63



MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: VGT(P-PAK) PHASE1-2	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 46 of 63	

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

SA Power:1.05V,11.1A

OCP:16.65A

ICC : 1.25 mA

Rocset = 1.5 * Imax * Rdson(low) / Iocset
= 16.65* 3mohm / 10uA
= 14.28K

Rdson(low)10V

MOS : 5.1mohm

EN:VIH2.4V
EN pin Maximum:6.5V

FB:0.8V

Vout = Vrefout * (1 + Rpull-up/Rpull-down)
= 0.8 * (1 + 1/3.16)
= 1.053v

Irms = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
= 11.1 * (1.05/12 * (1 - 1.05/12))^(1/2)
= 3.136A

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

2014.08.21 update

Pull up by layout&Check level

EN:VIH2.4V
EN pin Maximum:6.5V

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

SLP_S3# assertion to VR disabled
max:1us

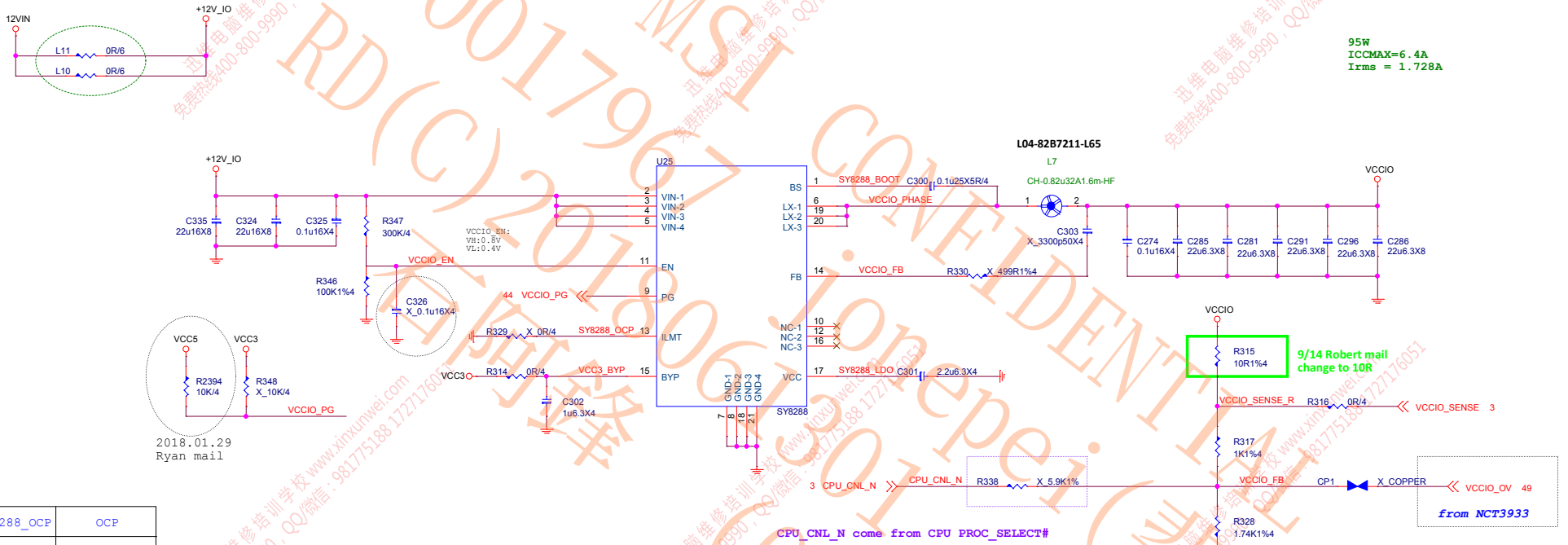
2018.01.31
change to SINOPOWER

MICRO-STAR INT'L CO.,LTD	
MS-7B23	
Size: Custom	Document Description: VCCSA - POWER RT8125E
Rev: 1.1	
Date: Monday, February 12, 2018	Sheet 47 of 63

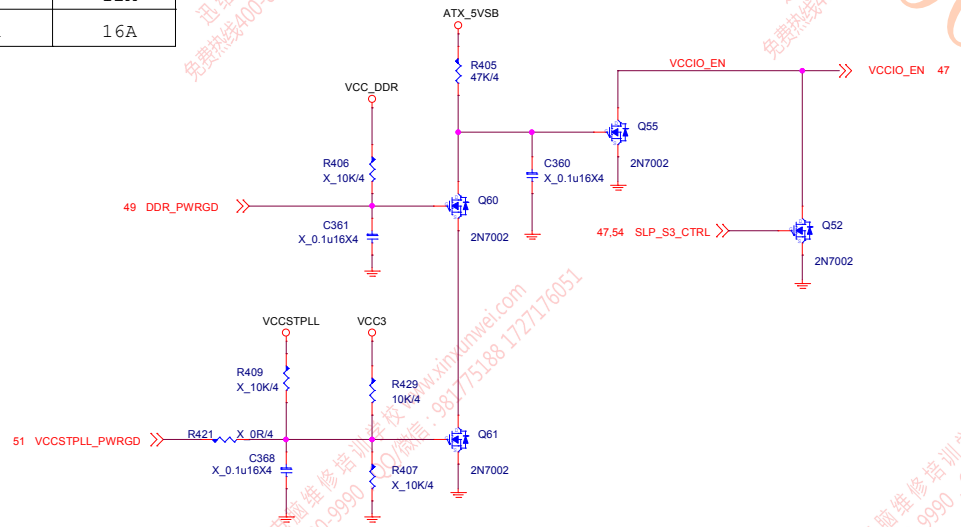
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

IO Power:0.95V,6.4A

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



SY8288_OCP	OCP
0	8A
floating	12A
1	16A



0001796 MSI CONFIDENTIAL
RD(C)20180613 Lionpei(裝完樂)
內部資料 (00068760) RMA工程課
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: VCCIO - SY8288	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 48 of 63	

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

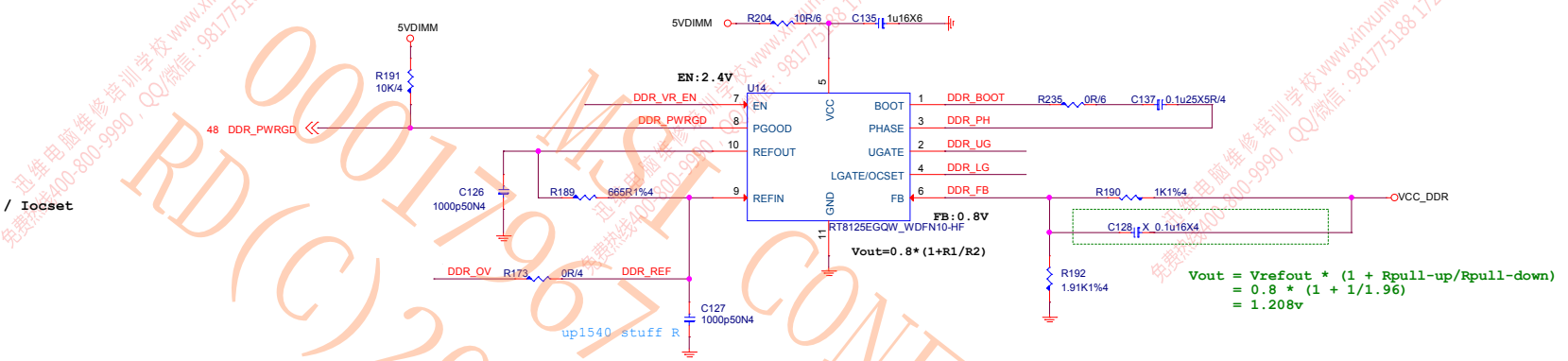
3.3A FOR CPU
15.7A FOR 4DIMM
0.7A FOR DDR VTT

OCP = 19.6A

```
Rocset = 1.5 * Imax * Rdson(low) / Iocset
       = 28* 5.1mohm / 10uA
       = 14.28K
```

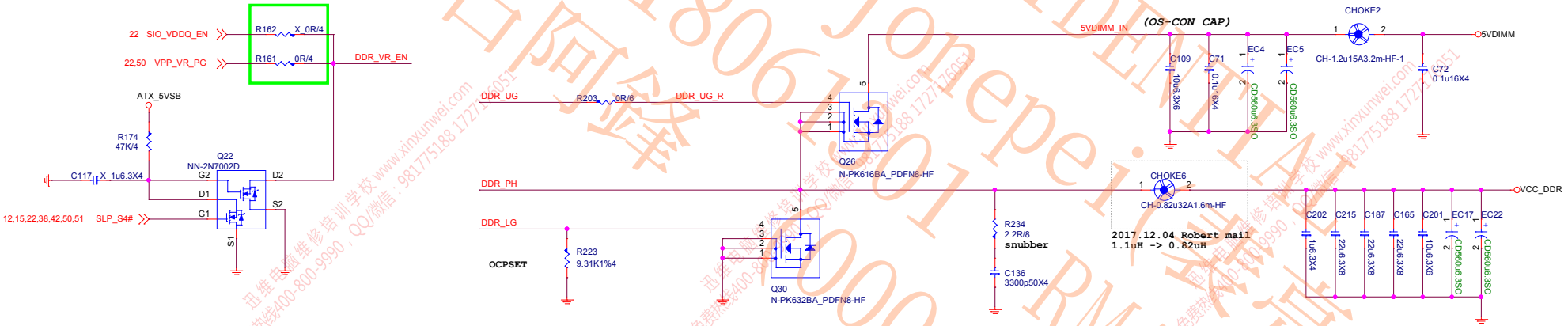
Rdson(low)

D03-4503N0C-ST8 : 5.1mohm



Vout = Vrefout * (1 + Rpull-up/Rpull-down)
= 0.8 * (1 + 1/1.96)
= 1.208v

Irms = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
= 20.2 * (1.2/5 * (1 - 1.2/12))^(1/2)
= 8.627A

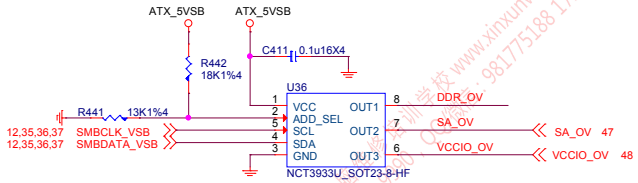


Datasheet公式計算
Lmin = ((Vin - 1.2V)/(Fsw * k * Iout_max)) * (Vout/Vin)
= 0.7677uH (K = 30%)

若帶入CAP ESR計算,0.2432uH＜L＜1.2897uH

UPI VOLTAGE CONSOLE

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



MICRO-STAR INT'L CO.,LTD

MS-7B23

Size: Custom | Document Description: DDR - RT8125E | Rev: 1.1

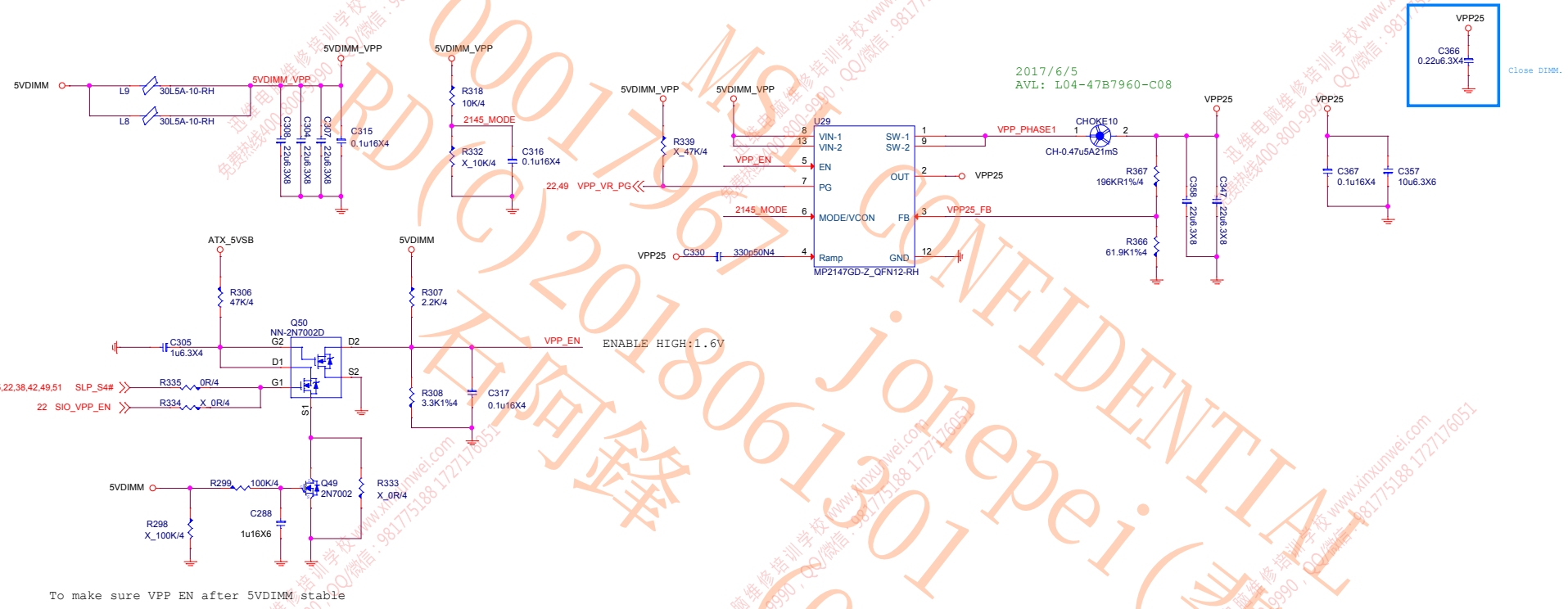
Date: Monday, February 12, 2018 | Sheet 49 of 63

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051
MSI CONFIDENTIAL B
RD(C)20180613001 RMA工程課
0001796 jonepei(校完樂) 0006876(石阿修)

4DIMM :2.24A FOR
DDR VPP2.5V

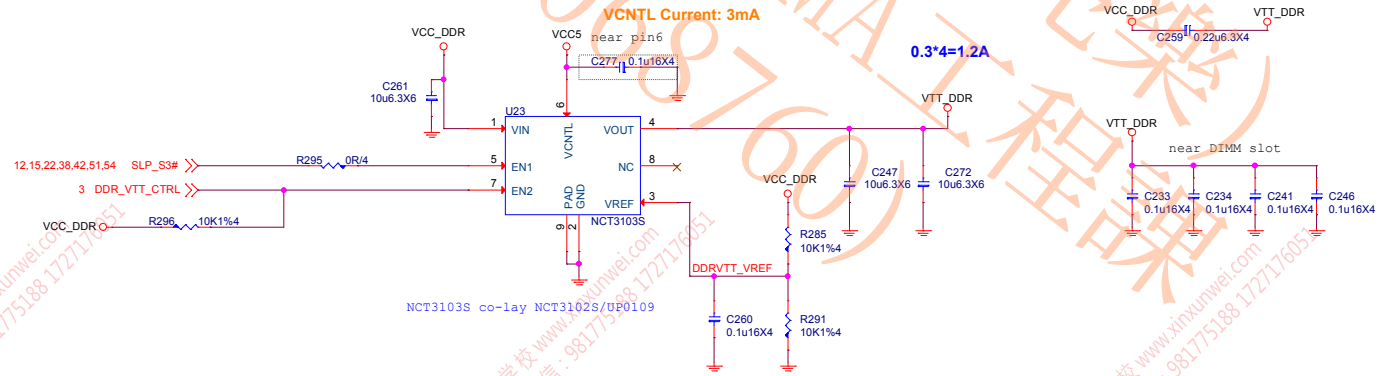
VPP25 Power

2.5V; 2.24A



DDR VTT Power

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



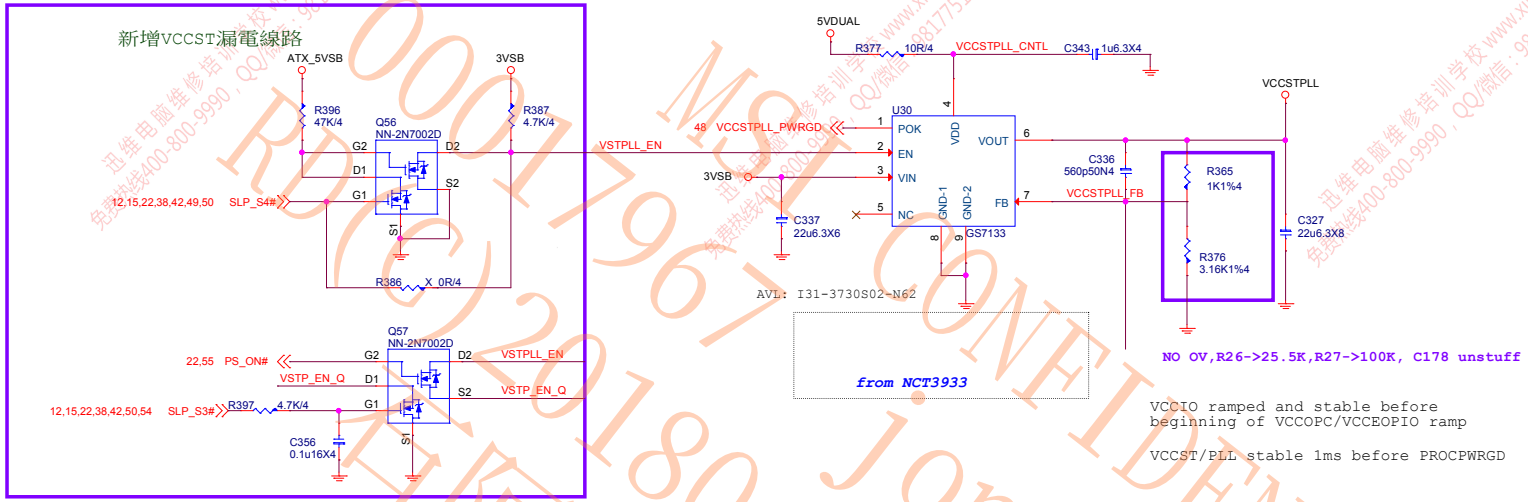
MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: VPP-2147 / VTT-3103	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 50 of 63	

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051
0001796 MSI CONFIDENTIAL jonepei(装完维) RDC(C)20180613 01 RMA(工程策) (000698769) 石阿锋

VCCSTPLL

1.05V; 230mA

For Cost down VCCST&VCCPLL merge



NO OV,R26->25.5K,R27->100K, C178 unstuff

VCCIO ramped and stable before
beginning of VCCOPC/VCCEOPIO ramp

VCCST/PLL stable 1ms before PROCPWRGD

VCCPLL_OC

1.2V; 130mA

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051
00017967 MSI CONFIDENTIAL
RD(C)20180613 01 Jonpei(裴完樂)
RMA工程課 (00068760)

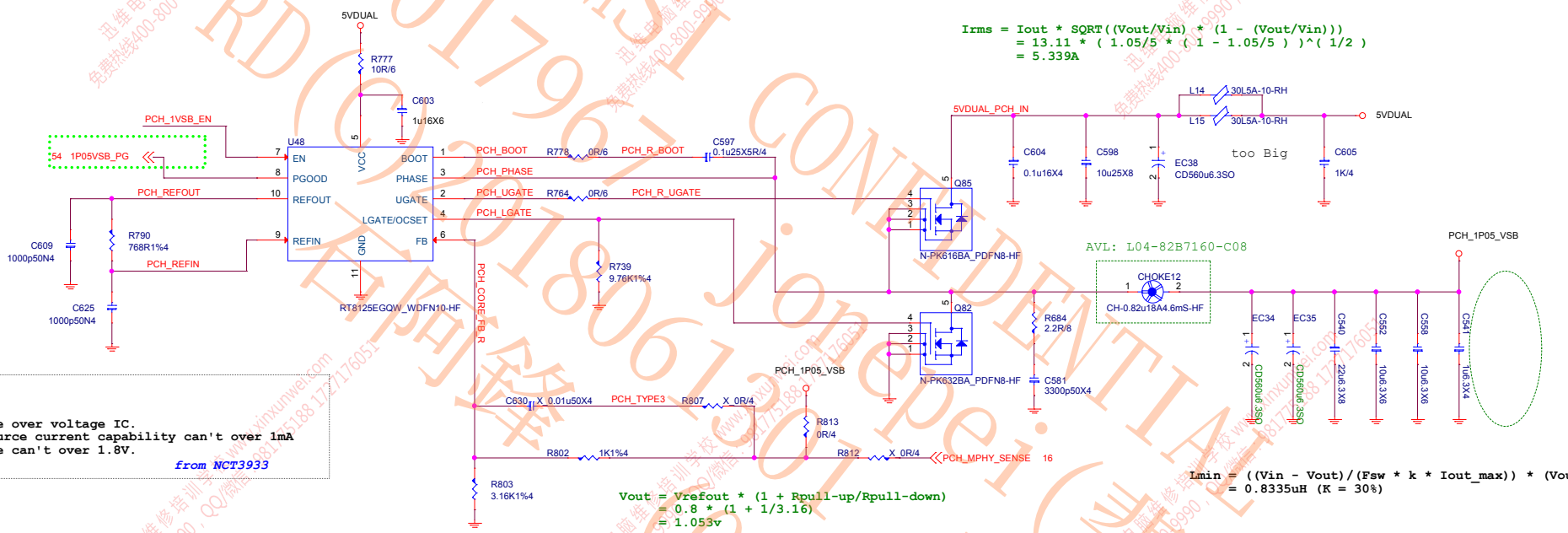
MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: CPU PWR_ST/PLL_OC	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 51 of 63	

PCH_1VSB

1.05V; 13.1A

OCP=Rocset x Iocset / Rlgds(on)
=9.76K x 10u / 3.3m
= 21.21A

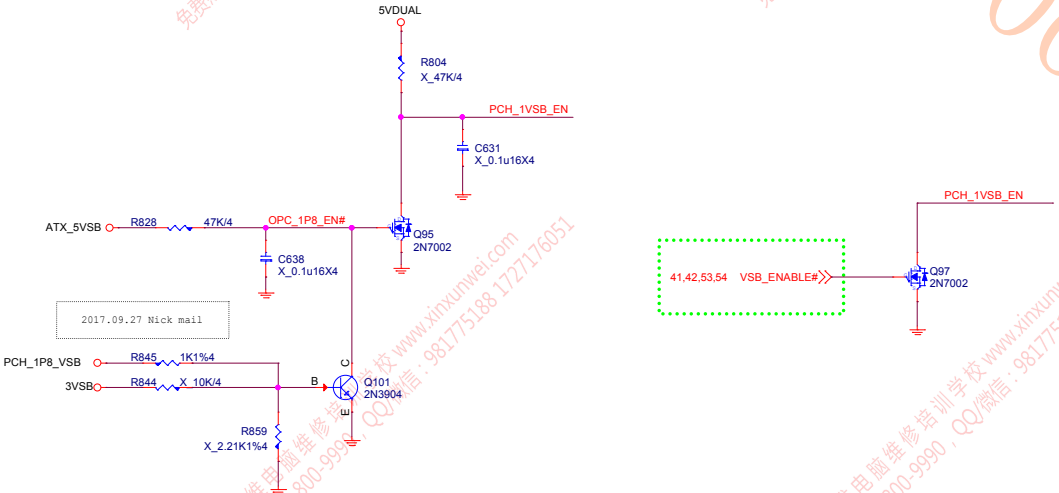
Irms = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
= 13.11 * (1.05/5 * (1 - 1.05/5))^(1/2)
= 5.339A



to sink/source over voltage IC.
pin10 sink/source current capability can't over 1mA
So max voltage can't over 1.8V.
from NCT3933

Vout = Vrefout * (1 + Rpull-up/Rpull-down)
= 0.8 * (1 + 1/3.16)
= 1.053v

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



MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: PCH Core power	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 52 of 63	

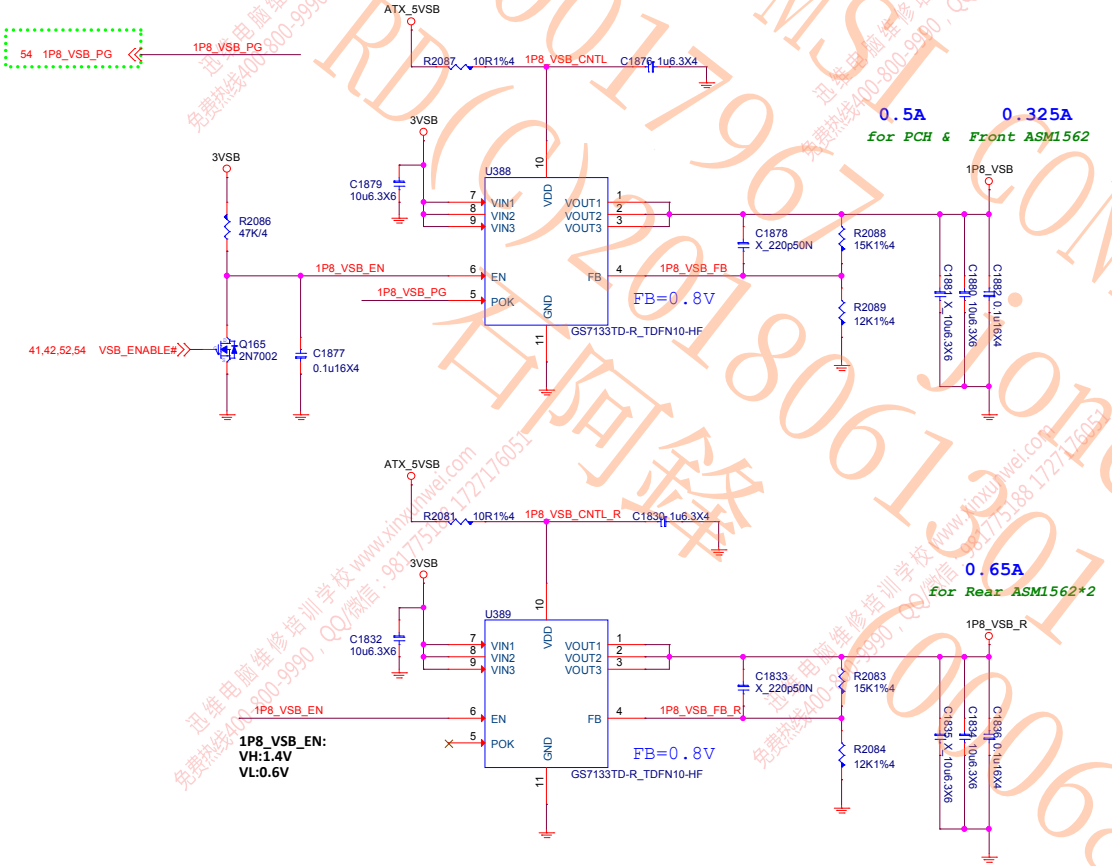
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051
0001796 MSI CONFIDENTIAL Jonepei(製完繳) RD(6)20180615(01) 000068760) RMA工程課 台階修

1P8_VSB

1.8V; 500mA

Current Limit: 3.8A

2017.12.07
GS7133 down size to I31-S71330C-N03.



The power consumption with Internal LDO

item	Power state	VCCA 1.8V (mA)	Total power (mW)
Without device plug in,	Power on	25.82	46.47
USB3.1 Gen2 device is plugged in	Burning state	324.60	584.29
USB3.1 Gen2 device is plugged in	In idle	50.58	91.05
USB3.1 Gen2 device is plugged in	S3(D3) state	50.59	91.06

The power consumption with External LDO

item	Power state	VCCA 1.8V (mA)	VDD 1.2V (mA)	Total power (mW)
Without device plug in,	Power on	10.46	17.47	39.79
USB3.1 Gen2 device is plugged in	Burning state	95.34	226.37	443.25
USB3.1 Gen2 device is plugged in	In idle	17.18	52.10	93.44
USB3.1 Gen2 device is plugged in	S3(D3) state	17.17	52.10	93.42

MICRO-STAR INT'L CO.,LTD

MS-7B23

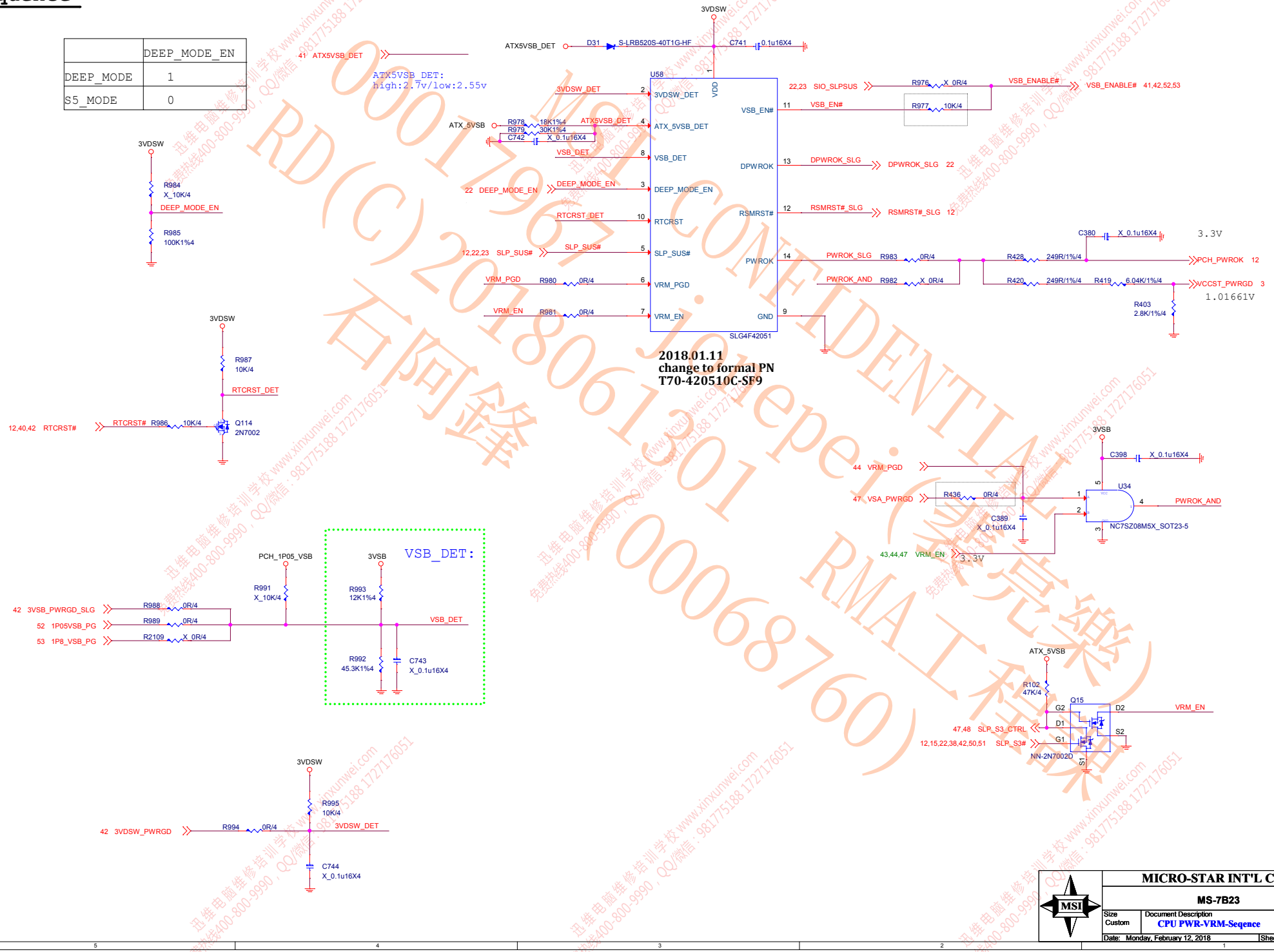
Size	Document Description	Rev
Custom	PCH 1P8V	1.1

Date: Monday, February 12, 2018 Sheet 53 of 63

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051
MSI CONFIDENTIAL 000179675 Jonepeiwei.com RD(C)2018061301 (6006876O) 石阿铭 RD工程课

Sequence

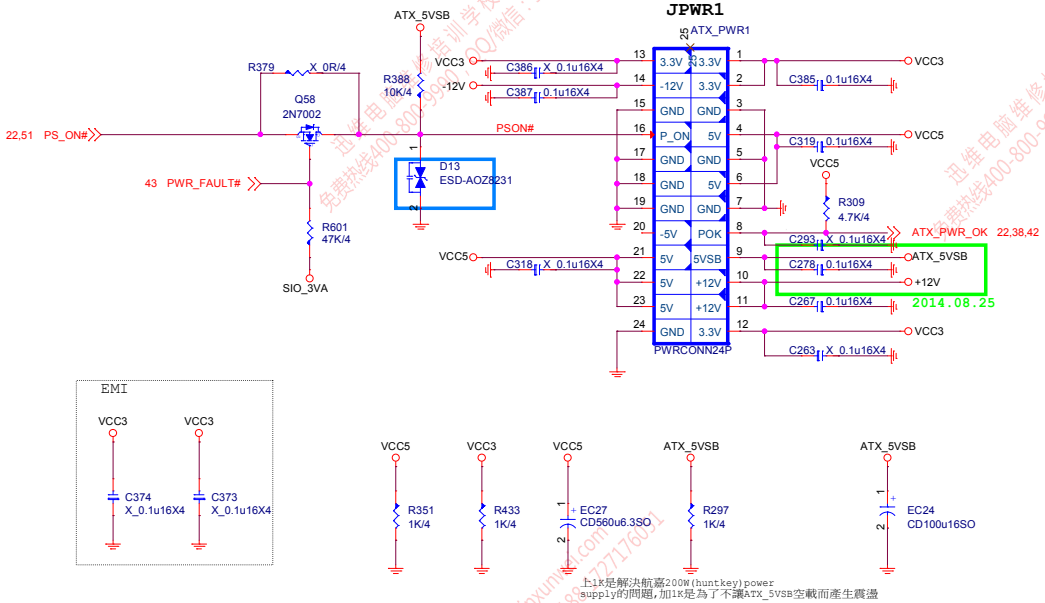
	DEEP_MODE_EN
DEEP_MODE	1
S5_MODE	0



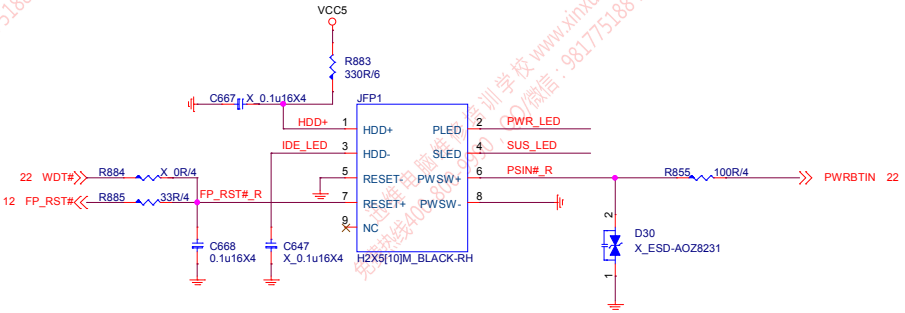
迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051
0001796 CONFIDENTIAL
RD(C)20180613 01 Jiangpei(蒋完维)
石阿锋 (0000068760) RMA工程师

ATX POWER CONNECTOR

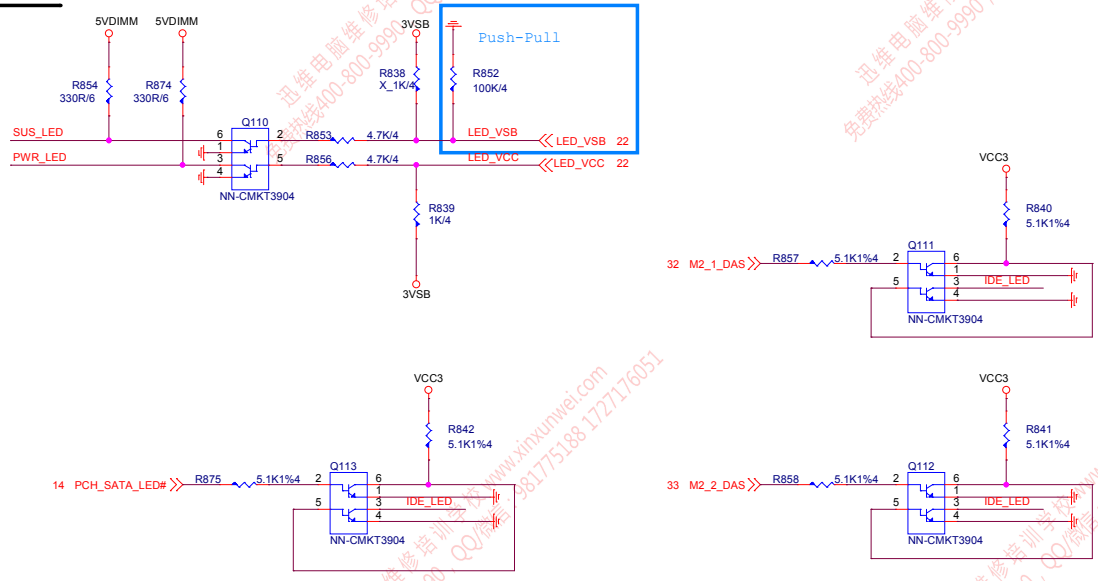
D26:By Ivy's word document.
Main:D0G-1300500-A68
Avl:D0G-3000600-L07/D0G-1200520-I05



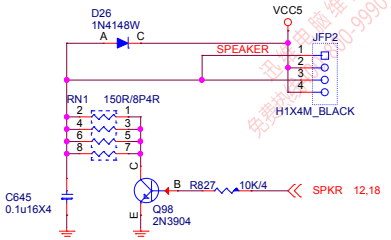
FRONT PANNEL



LED

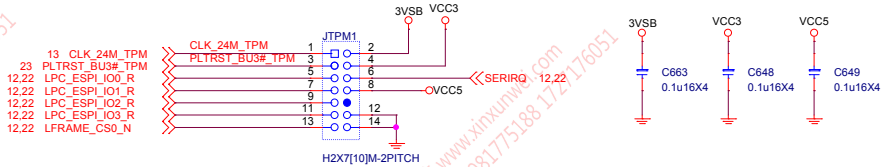


Speaker Pin Header



TPM

Don't colay espi debug.



MICRO-STAR INT'L CO.,LTD

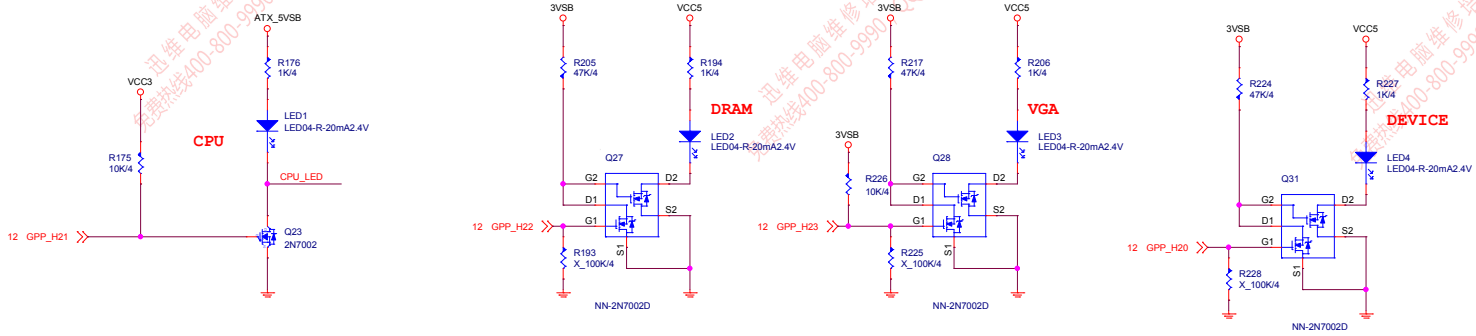
MS-7B23

Size	Document Description	Rev
Custom	ATX F_Panel/TPM/MSI_LED	1.1

Date: Monday, February 12, 2018 Sheet 55 of 63

迅维电脑维修培训学校 www.xinxunwei.com QQ/微信：981775188 1727176051 免费热线400-800-9990

DEBUG LED



RED
PN:D0C-040P100-H91
AVL:D0C-040S500-E07

2018.01.12
PCB2.1 default white LED

WHITE
PN:D0C-040T200-H91
AVL:D0C-040S200-E07

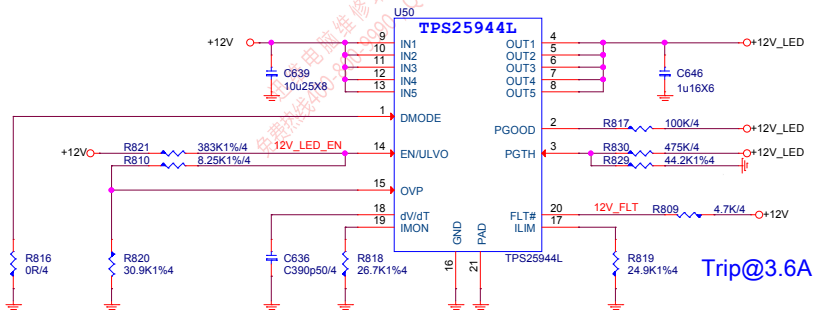
GPIO / LED	PCH_GP20	PCH_GP21	PCH_GP22	PCH_GP23
亮	NATIVE PULL HIGH	GPO PULL HIGH	GPO PULL HIGH	NATIVE PULL HIGH
滅	NATIVE LOW	GPO LOW (default LOW)	GPO LOW (default LOW)	GPO LOW (default LOW)

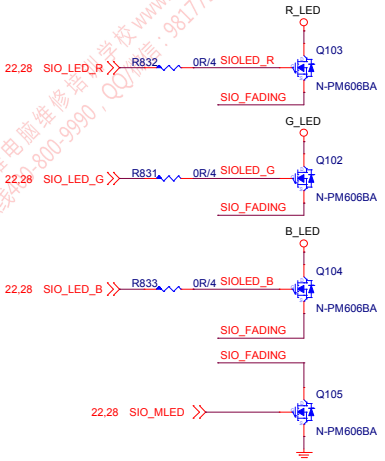
開機斷電狀態下，3個LED先維持default全暗，開機通電後：
1. 首先進行CPU checkCPU LED 亮，check PASS後則CPU LED滅掉。
2. 接著依序進行Memory /memory LED亮check PASS後則memory LED滅掉。
3. VGA的check/VGA LED亮，check PASS後則VGA LED滅掉。
4. 因此最後正常順利開機後，三個LED燈都是滅掉的。（系統重啟或其他原因造成系統重開機，則LED仍按上述行為動作）

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051

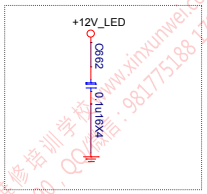
MICRO-STAR INT'L CO.,LTD
MS-7B23
Size: Custom | Document Description: ATX F_Panel/TPM/MSI_LED | Rev: 1.1
Date: Monday, February 12, 2018 | Sheet 56 of 63

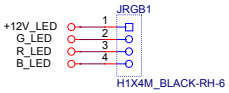
LED STRIPLINE



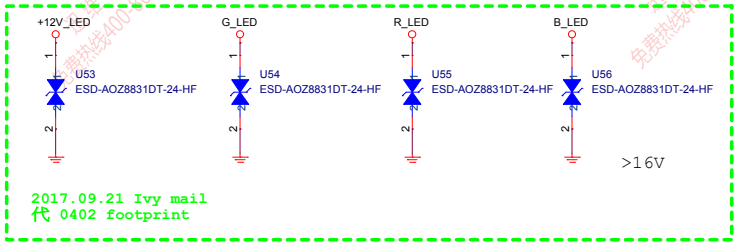


2016.08.02 Add +12V_LED 0.1uF





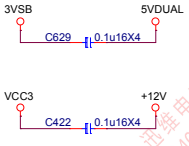
2016.07.06 only reserve now
2016.08.02 stuff ESD



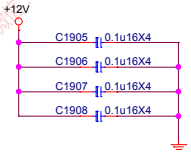
MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: LED STRIP	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 57 of 63	

EMI CAP

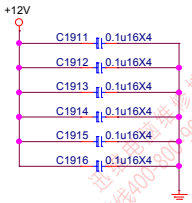
2017.10.13 moat cap



2017.12.21 SA_PH decouple cap



2018.02.02 SA_PH decouple cap



迅维电脑维修培训学校 www.xinxunwei.com
免费热线400-800-9990，QQ/微信：981775188 1727176051

MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: EMI	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 58 of 63	

Optical Fiducial Marks-120

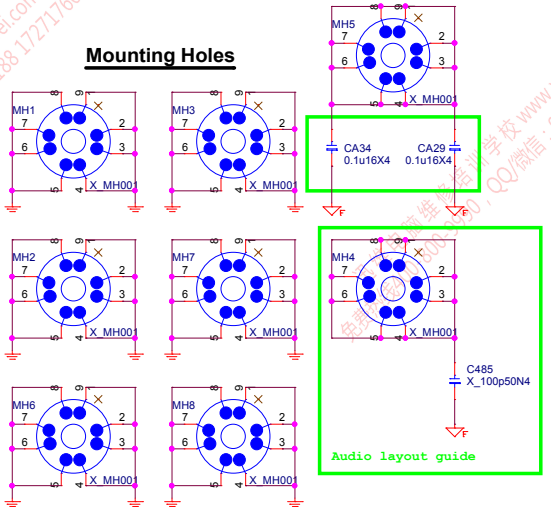
FM3 FM2 FM5 FM8
X_FM X_FM X_FM X_FM

FM1 FM4 FM6 FM7
X_FM X_FM X_FM X_FM

Simulation

SIM2 SIM1
SIM4 SIM3
X_PIN1*2 X_PIN1*2

Mounting Holes



VCC_DDR
VTT_DDR
5VDIMM
3VSB
3VDSW
PCH_1P05_VSB
PCH_1P8_VSB
VCORE
VGT
VCCSA
VCCSTPLL
VCCIO

BAT1_X1
BAT-BCR2032P-RH

CPU_H1
CPU 鐵座
CPU_H1

BIOS_LA1
AMI
AMI

HDMI_LA1
HDMI VIRTUAL
HDMI LABEL

CFOS_LA1
CFOS
CFOS

DDR_COVER1
DDR COVER
X_E21-7A63010-RH

CPU_PWR2
Silver 8 pin
X_PWRCONN8P_GRAY-RH

PCB1
7B23_11
PD0-07B2310-G37

PCB_WHITE1
PCB 2.2 (Silver)
X_7B23_22

PS0-07B2320-G37

Marketing Name

LA10
B360 MORTAR
MKT_0A

LA11
B360 MORTAR ARCTIC
X_MKT_20

HEATSINK

1.0

PCH_HS1
PCH
E31-0409500-A87

MOS_HS1
West MOS
E31-0505490-A87

MOS_HS2
North MOS
E31-0505500-A87

2.1

PCH_HS2
PCH
X_E31-0409560-A87

MOS_HS3
West MOS
X_E31-0505540-A87

MOS_HS4
North MOS
X_E31-0505560-A87

MICRO-STAR INT'L CO.,LTD		
MS-7B23		
Size: Custom	Document Description: Manual Parts	Rev: 1.1
Date: Monday, February 12, 2018	Sheet 59 of 63	

迅维电脑维修培训学校 www.xinxunwei.com 免费热线400-800-9990，QQ/微信：981775188 1727176051