MS-7A95

ATX

Ver: 1.0

Basinfall Platform

CPU:

Skylake X/Kabylake X

System Chipset:

Kaby Lake PCH-X

Onboard Chip:

HD Audio Codec:ALC1220

LAN-Intel I219+I211

SIO:NTC6795D

Dual Flash ROM: SPI 64 MB X2

Main Memory:

*DDRIV (UP to 2677MHz) * 8DIMM (4 Channel)*

ACPI:

MPS

PWM:

VR13 -IR35201

Expansion Slots:

*PCI Express (X16) Slot * 2*
*PCI Express (X8) Slot * 1*
*PCI Express (X4) Slot * 1*
*PCI Express (X1) Slot * 2*

Other:

*SATA3.0 *8*
*USB2.0 *6 Ports (2R/4F)*
*REAR USB30*5 + USB3.1*1 & TYPEC*1*
*FRONT USB3.0 *4+TYPEC*1*

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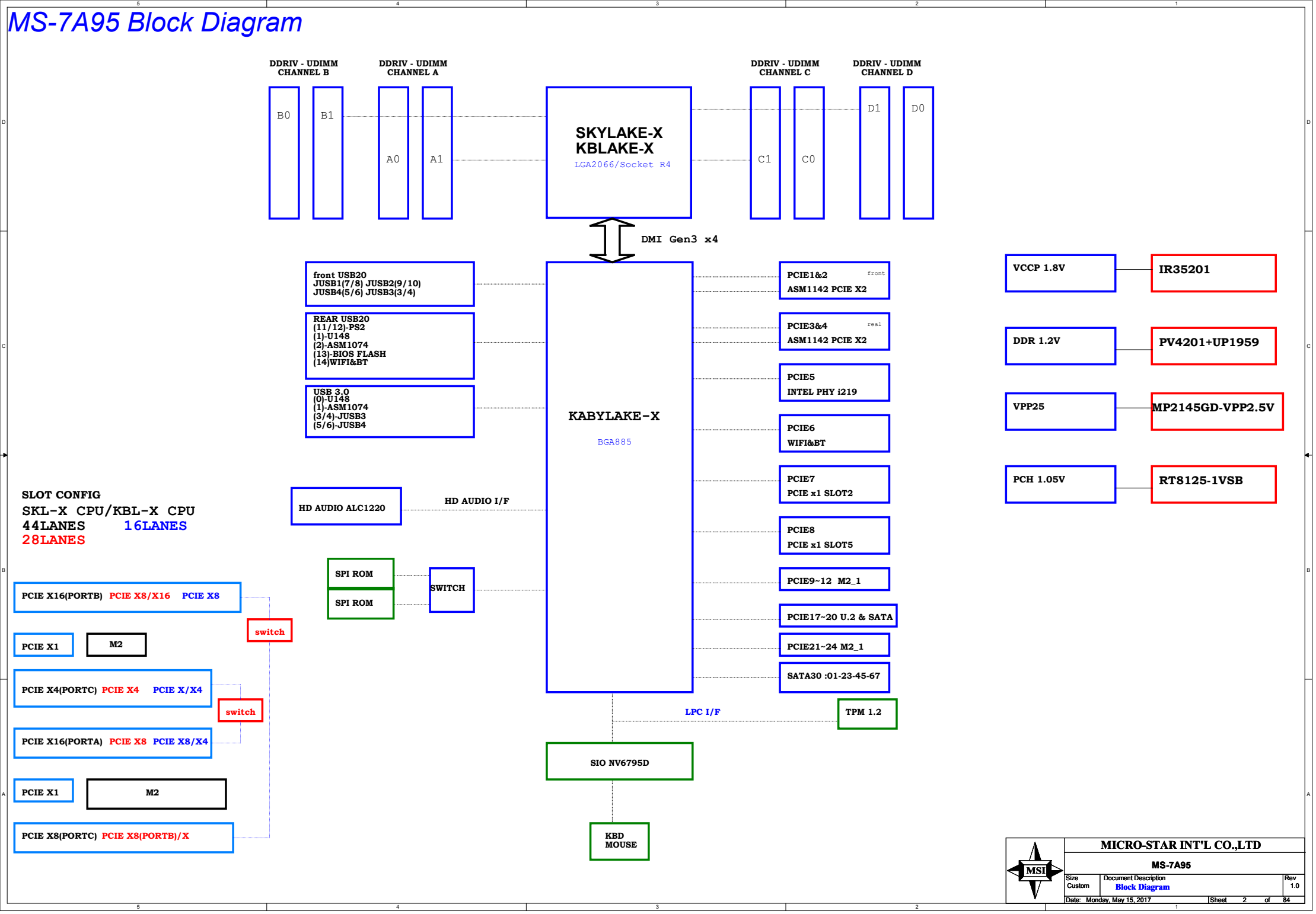
MS-7A95

Size: Custom | Document Description: Cover Sheet | Rev: 1.0

Date: Monday, May 15, 2017 | Sheet 1 of 84

MS-7A95 Block Diagram



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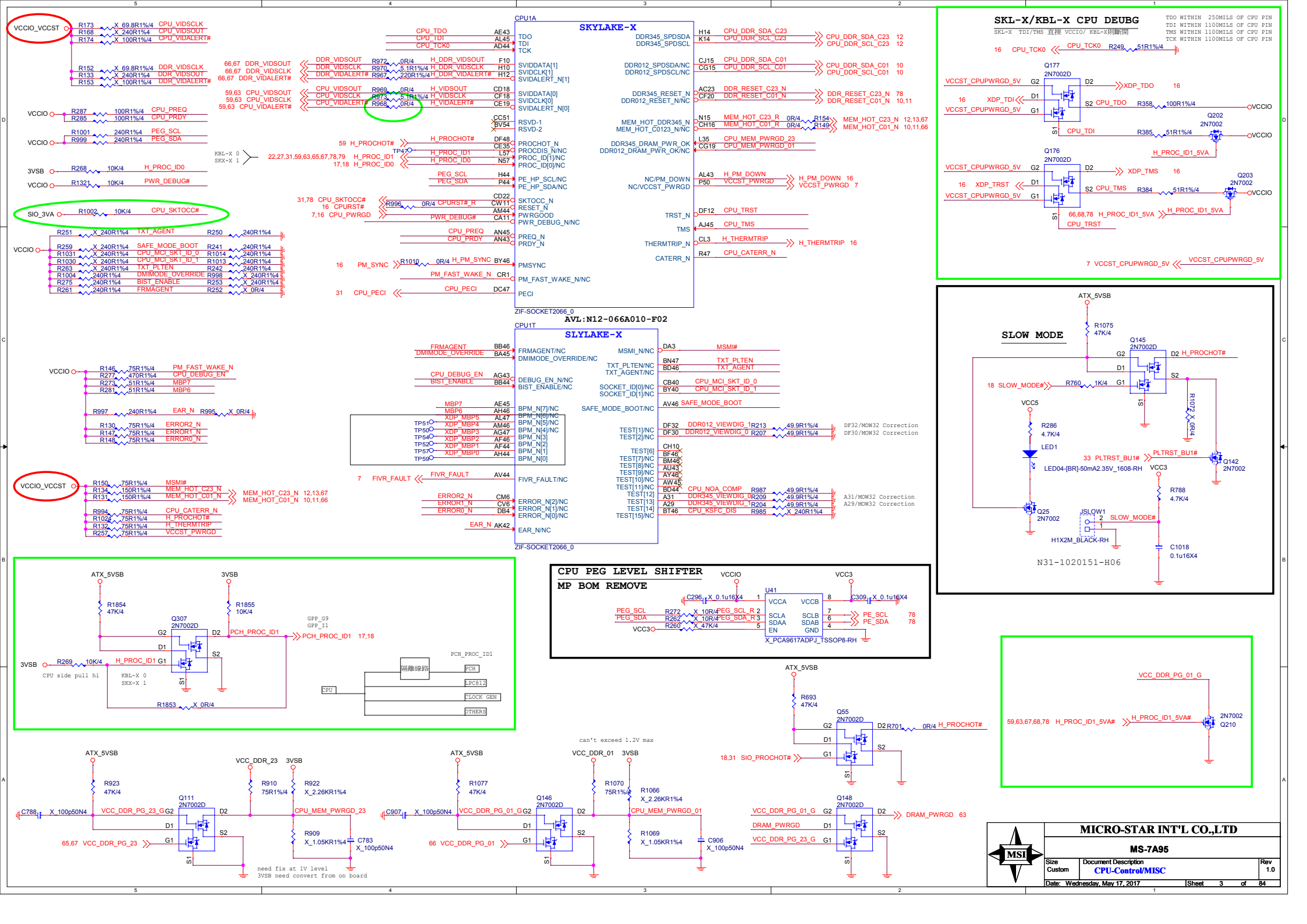
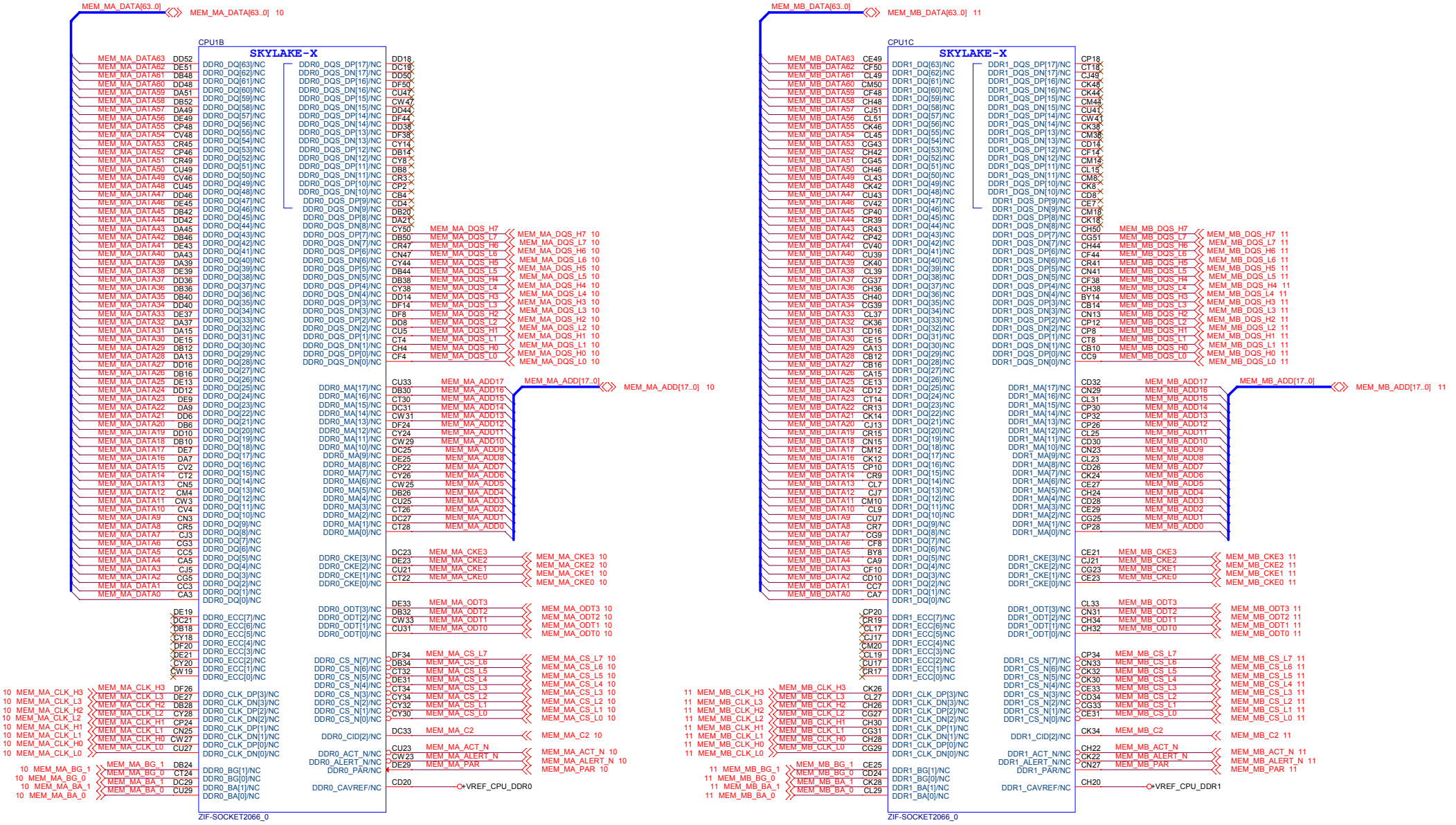
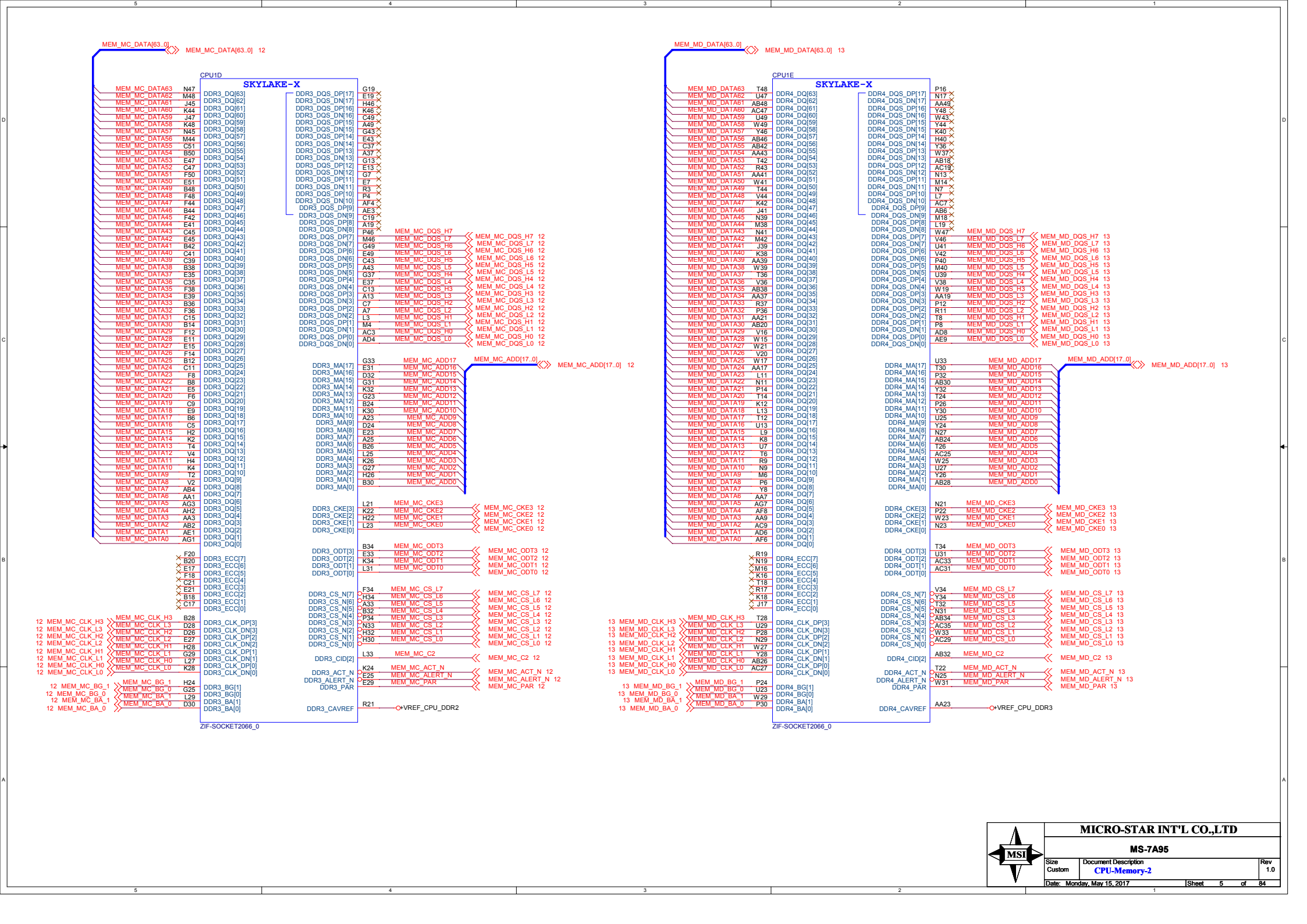
Size: Custom	Document Description: Block Diagram
Rev: 1.0	
Date: Monday, May 15, 2017	Sheet 2 of 84


SKYLAKE-X
SLYLAKE-X
AVL:N12-066A010-F02
SKL-X/KBL-X CPU DEUBG
SLOW MODE
CPU PEG LEVEL SHIFTER
MP BOM REMOVE
MICRO-STAR INT'L CO.,LTD
MS-7A95
CPU-Control/MISC
Wednesday, May 17, 2017
N31-1020151-H06



MICRO-STAR INT'L CO.,LTD	
MS-7A95	
Size: Custom	Document Description: CPU-Memory-1
Rev: 1.0	
Date: Monday, May 15, 2017	Sheet 4 of 84

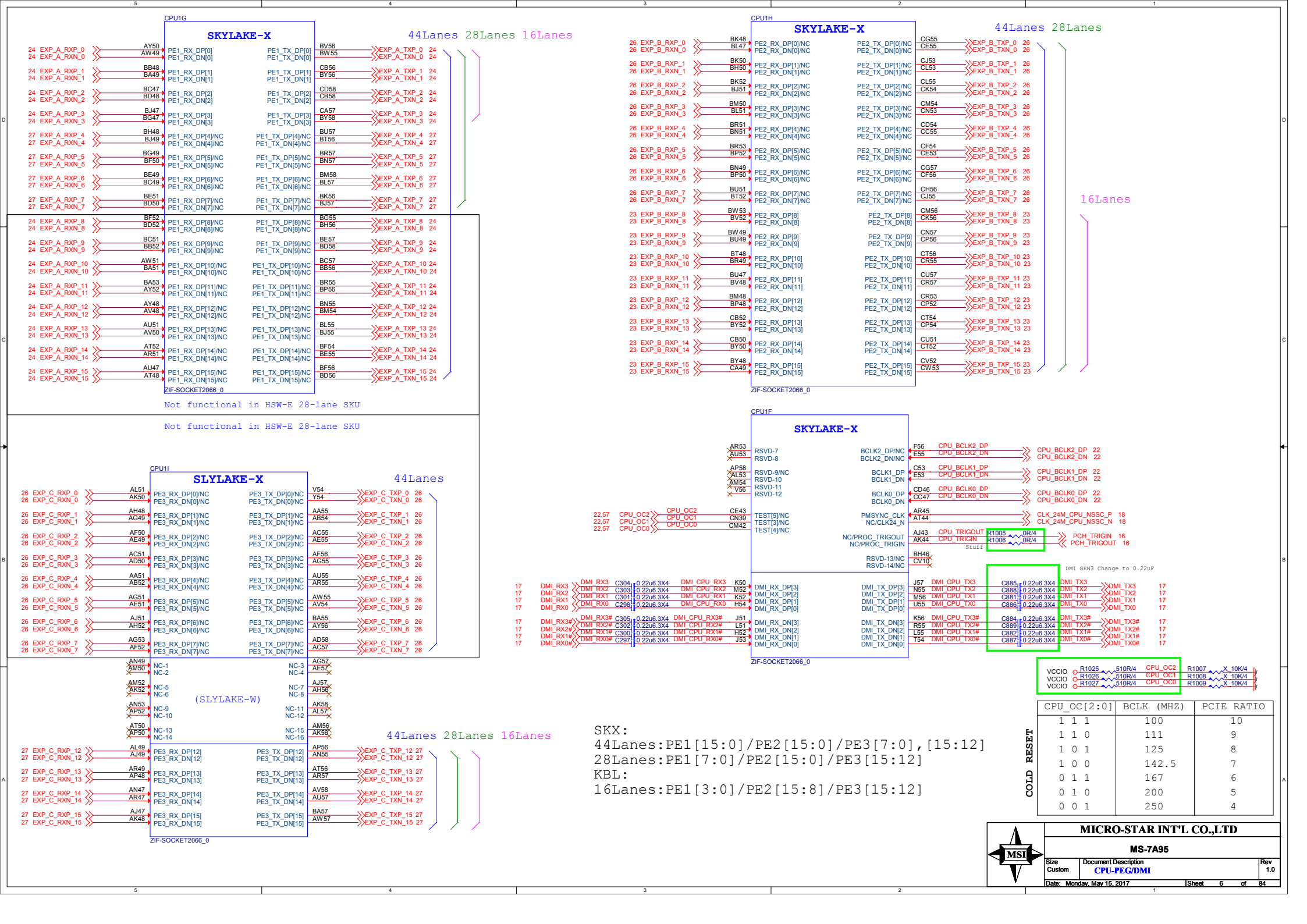


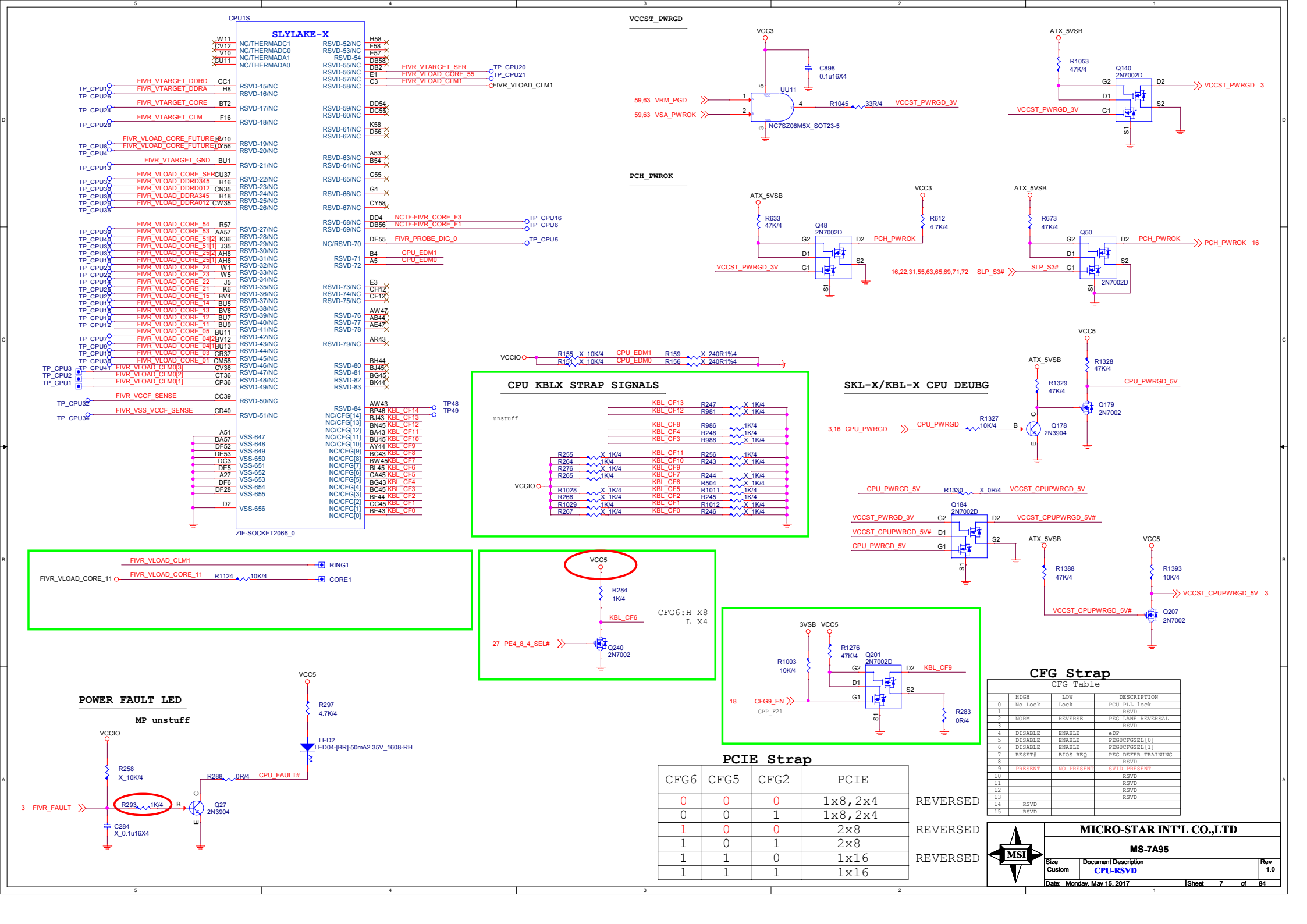
MICRO-STAR INT'L CO.,LTD

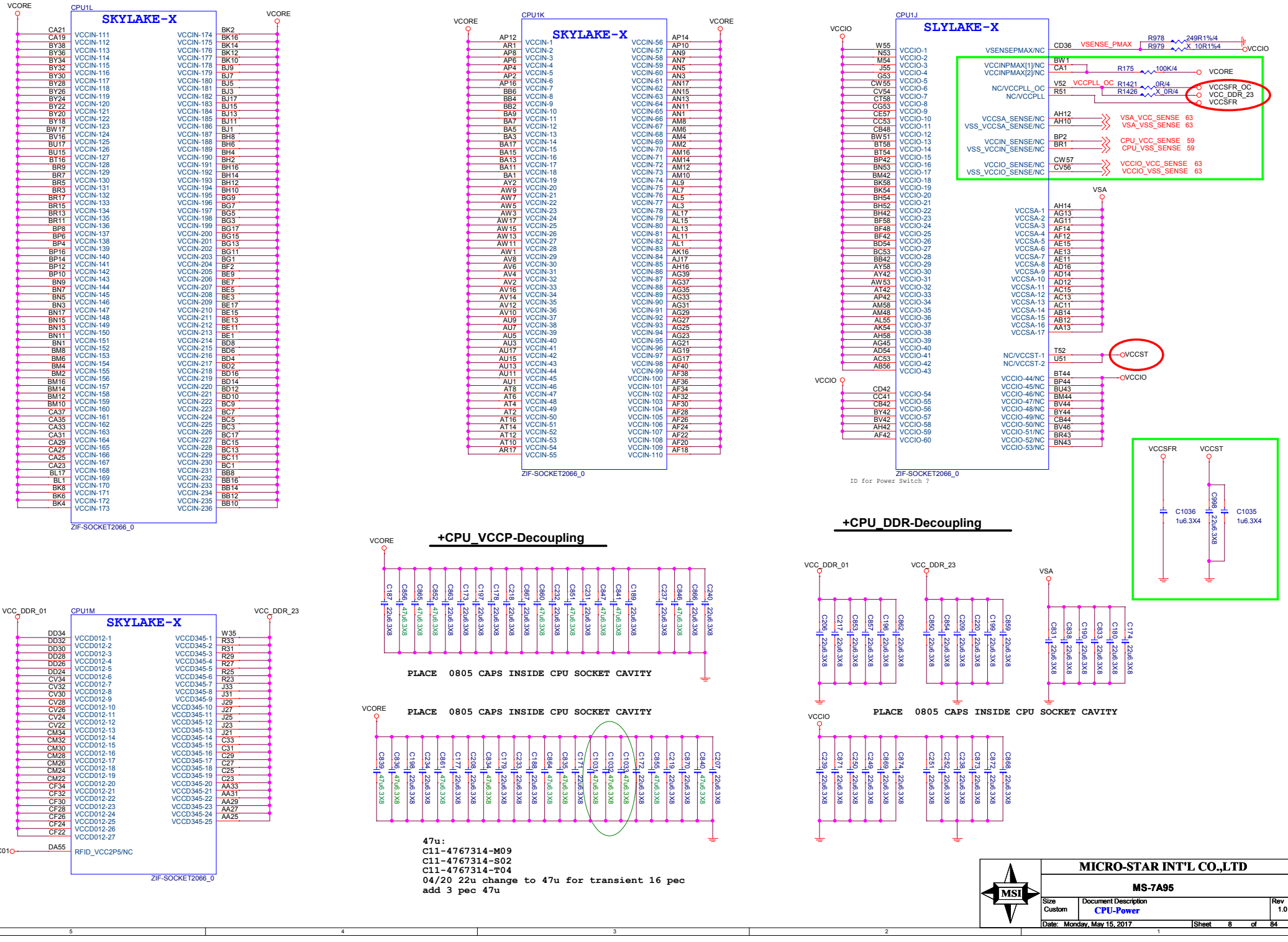
MS-7A95

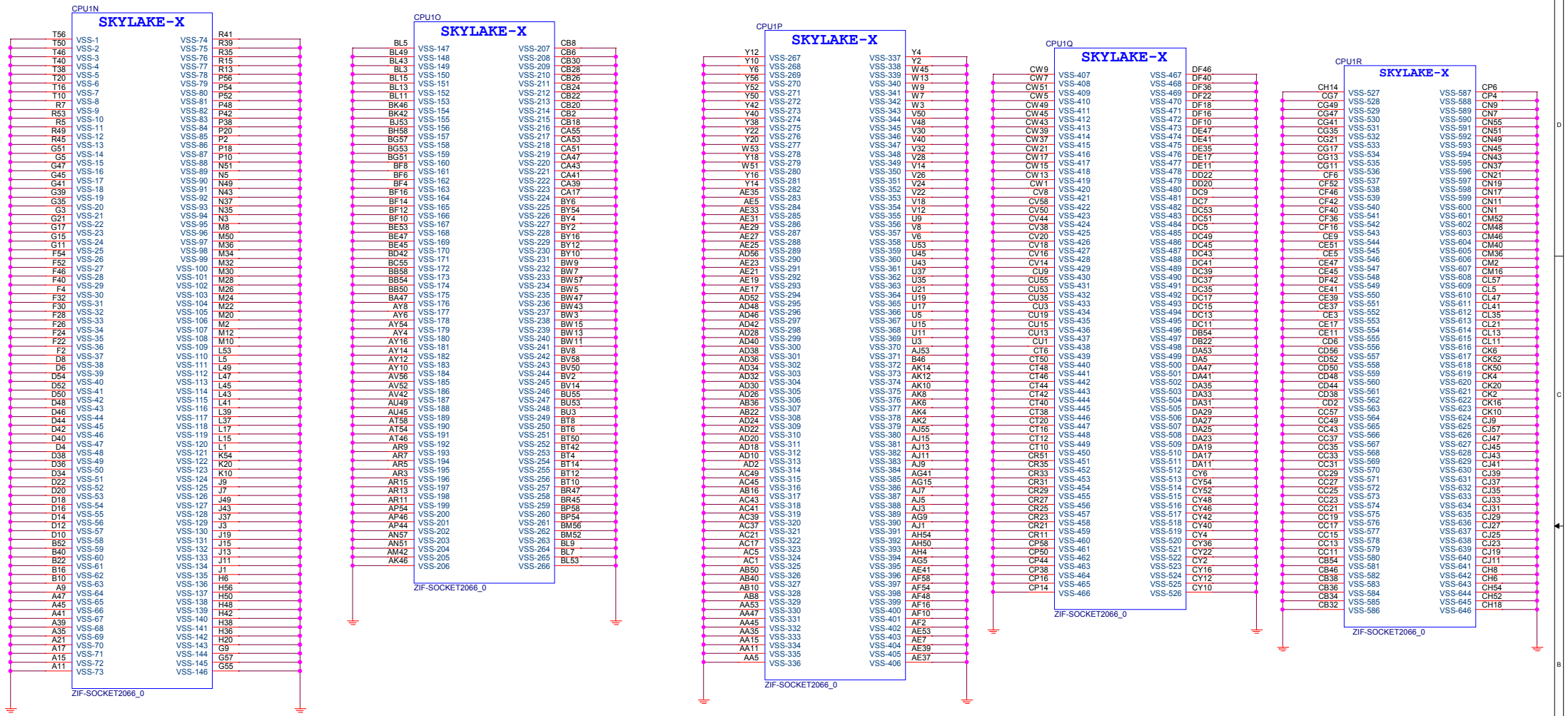
Size	Document Description	Rev
Custom	CPU-Memory-2	1.0

Date: Monday, May 15, 2017 Sheet 5 of 84


CPU1G
SKYLAKE-X
44Lanes 28Lanes 16Lanes
ZIF-SOCKET2066_0
Not functional in HSW-E 28-lane SKU
Not functional in HSW-E 28-lane SKU
CPU1I
SLYLAKE-X
44Lanes
(SLYLAKE-W)
ZIF-SOCKET2066_0
44Lanes 28Lanes 16Lanes
CPU1H
SKYLAKE-X
44Lanes 28Lanes
16Lanes
ZIF-SOCKET2066_0
CPU1F
SKYLAKE-X
ZIF-SOCKET2066_0
DMI GEN3 Change to 0.22uF
SKX:
44Lanes:PE1[15:0]/PE2[15:0]/PE3[7:0],[15:12]
28Lanes:PE1[7:0]/PE2[15:0]/PE3[15:12]
KBL:
16Lanes:PE1[3:0]/PE2[15:8]/PE3[15:12]
COLD RESET
CPU_OC[2:0] | BCLK (MHZ) | PCIE RATIO
1 1 1 | 100 | 10
1 1 0 | 111 | 9
1 0 1 | 125 | 8
1 0 0 | 142.5 | 7
0 1 1 | 167 | 6
0 1 0 | 200 | 5
0 0 1 | 250 | 4
MICRO-STAR INT'L CO.,LTD
MS-7A95
Size Custom
Document Description CPU-PEG/DMI
Rev 1.0
Date: Monday, May 15, 2017
Sheet 6 of 84


CPU1S
SLYLAKE-X
ZIF-SOCKET2066_0
VCCST_PWRGD
PCH_PWROK
CPU KBLX STRAP SIGNALS
unstuff
SKL-X/KBL-X CPU DEUBG
POWER FAULT LED
MP unstuff
PCIE Strap
CFG Strap
CFG Table
MICRO-STAR INT'L CO.,LTD
MS-7A95
CPU-RSVD
Monday, May 15, 2017


CPU1L
SKYLAKE-X
VCORE
ZIF-SOCKET2066_0
CPU1K
SKYLAKE-X
VCORE
ZIF-SOCKET2066_0
CPU1J
SLYLAKE-X
VCCIO
VSA
VCORE
VCCIO
ZIF-SOCKET2066_0
ID for Power Switch ?
VSENSEPMAX/NC
VSENSE_PMAX
R978 249R1%/4
R979 X_10R1%4
CD36
VCCSFR_OC
VCC_DDR_23
VCCSFR
VSA_VCC_SENSE 63
VSA_VSS_SENSE 63
CPU_VCC_SENSE 59
CPU_VSS_SENSE 59
VCCIO_VCC_SENSE 63
VCCIO_VSS_SENSE 63
VCCST
VCCIO
VCCSFR
VCCST
C1036 1u6.3X4
C998 22u6.3X8
C1035 1u6.3X4
CPU1M
SKYLAKE-X
VCC_DDR_01
VCC_DDR_23
ZIF-SOCKET2066_0
+VPP25_C01
RFID_VCC2P5/NC
+CPU_VCCP-Decoupling
VCORE
PLACE 0805 CAPS INSIDE CPU SOCKET CAVITY
PLACE 0805 CAPS INSIDE CPU SOCKET CAVITY
47u:
C11-4767314-M09
C11-4767314-S02
C11-4767314-T04
04/20 22u change to 47u for transient 16 pec
add 3 pec 47u
+CPU_DDR-Decoupling
VCC_DDR_01
VCC_DDR_23
VSA
VCCIO
PLACE 0805 CAPS INSIDE CPU SOCKET CAVITY
MICRO-STAR INT'L CO.,LTD
MS-7A95
Size Custom
Document Description
CPU-Power
Rev 1.0
Date: Monday, May 15, 2017
Sheet 8 of 84



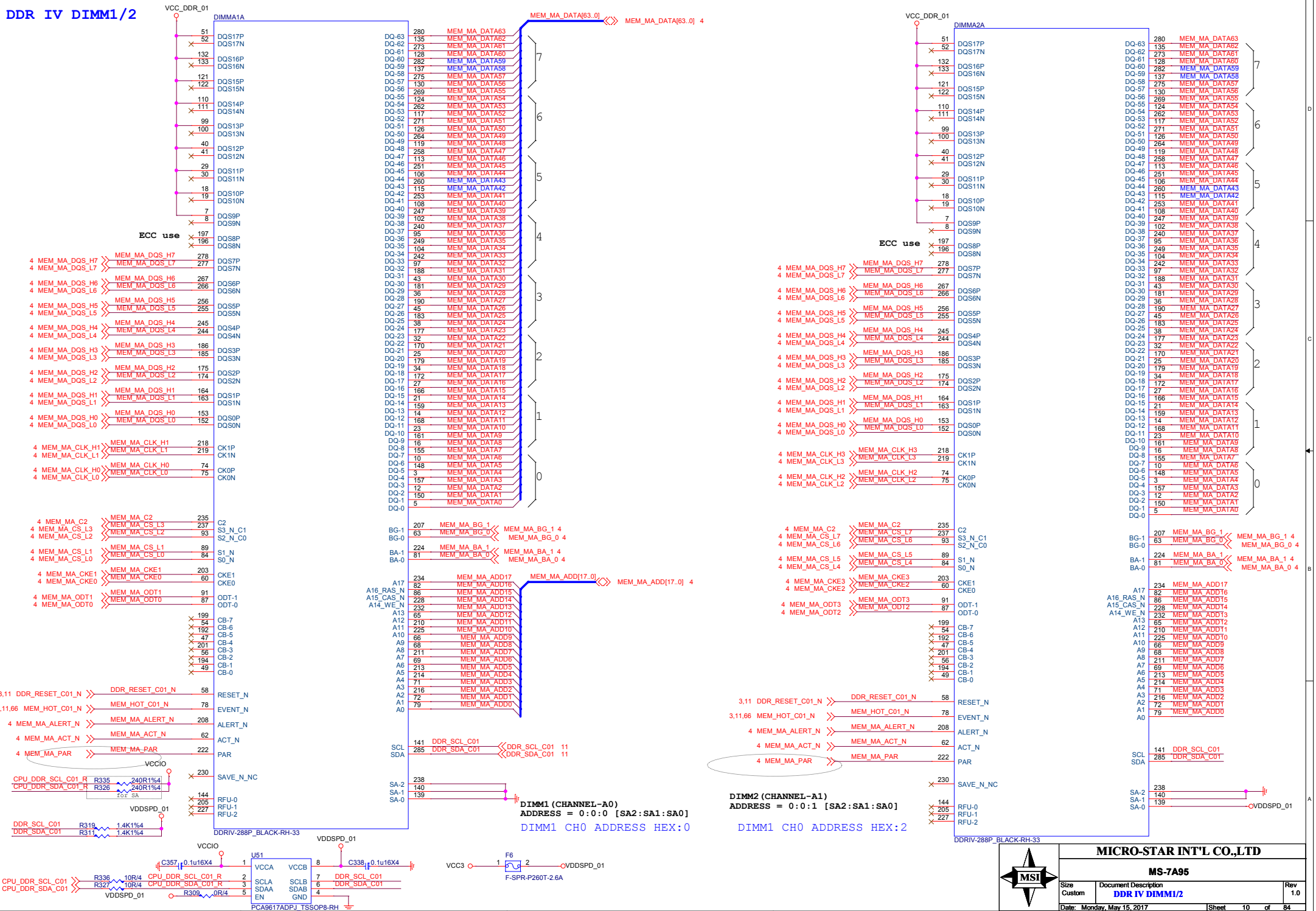
MICRO-STAR INT'L CO.,LTD

MS-7A95

Size	Document Description	Rev
Custom	CPU-GND	1.0

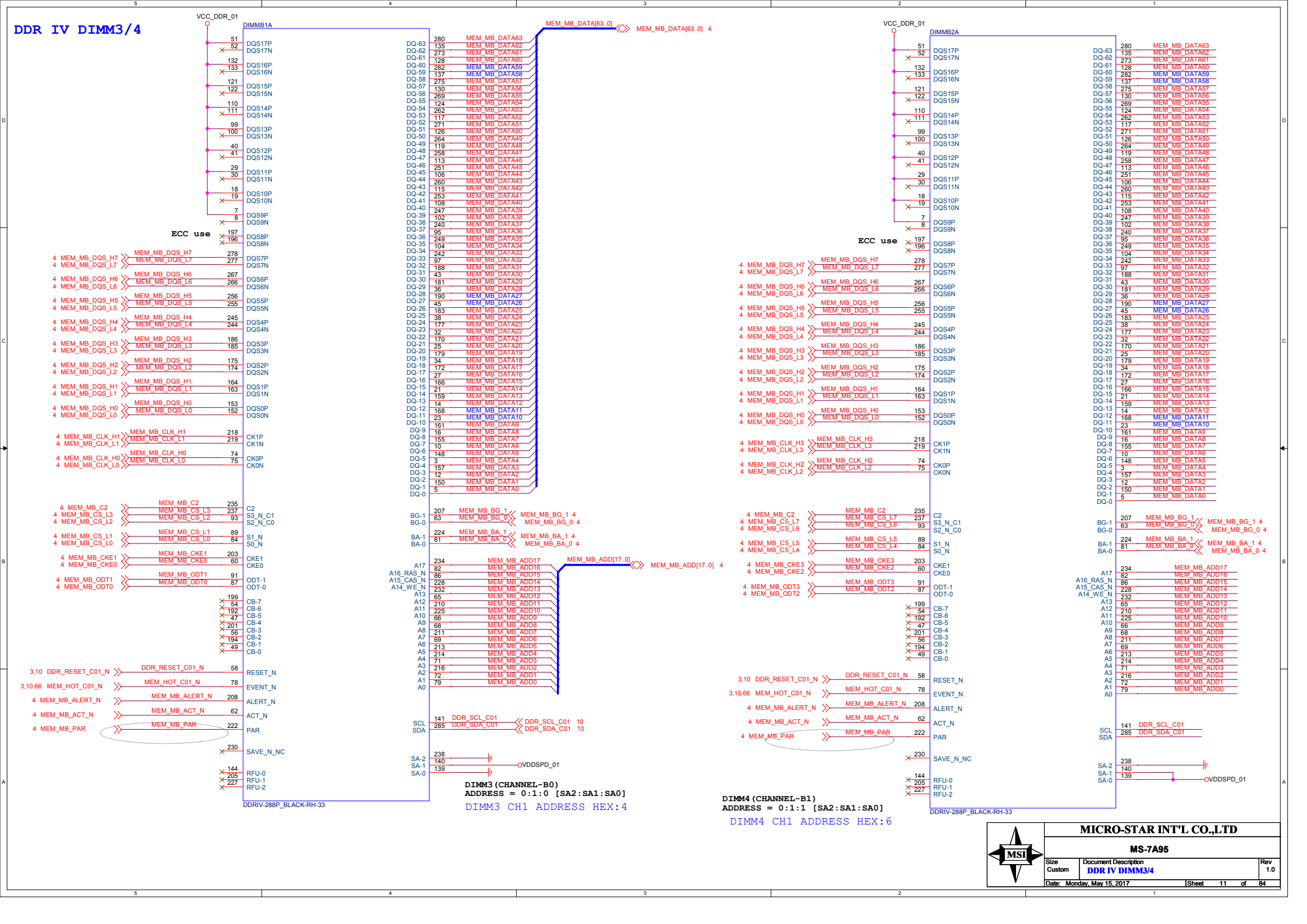
Date: Monday, May 15, 2017 Sheet 9 of 84

DDR IV DIMM1/2



MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: DDR IV DIMM1/2	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 10 of 84	

DDR IV DIMM3/4



MICRO-STAR INT'L CO.,LTD	
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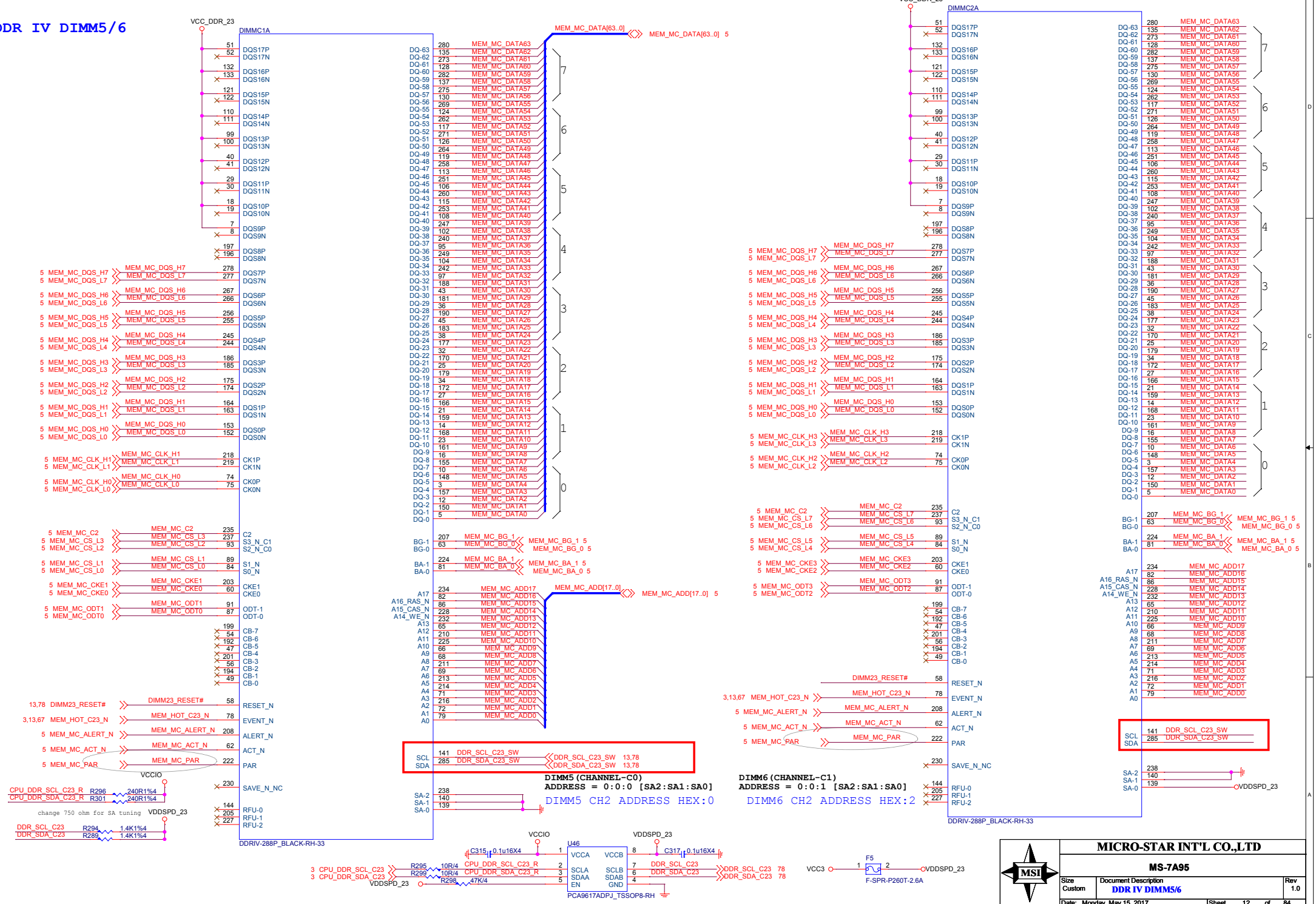
Size: Custom	Document Description: DDR IV DIMM3/4
Rev: 1.0	
Date: Monday, May 15, 2017	Sheet 11 of 84

DDR IV DIMM5/6



MICRO-STAR INT'L CO.,LTD		
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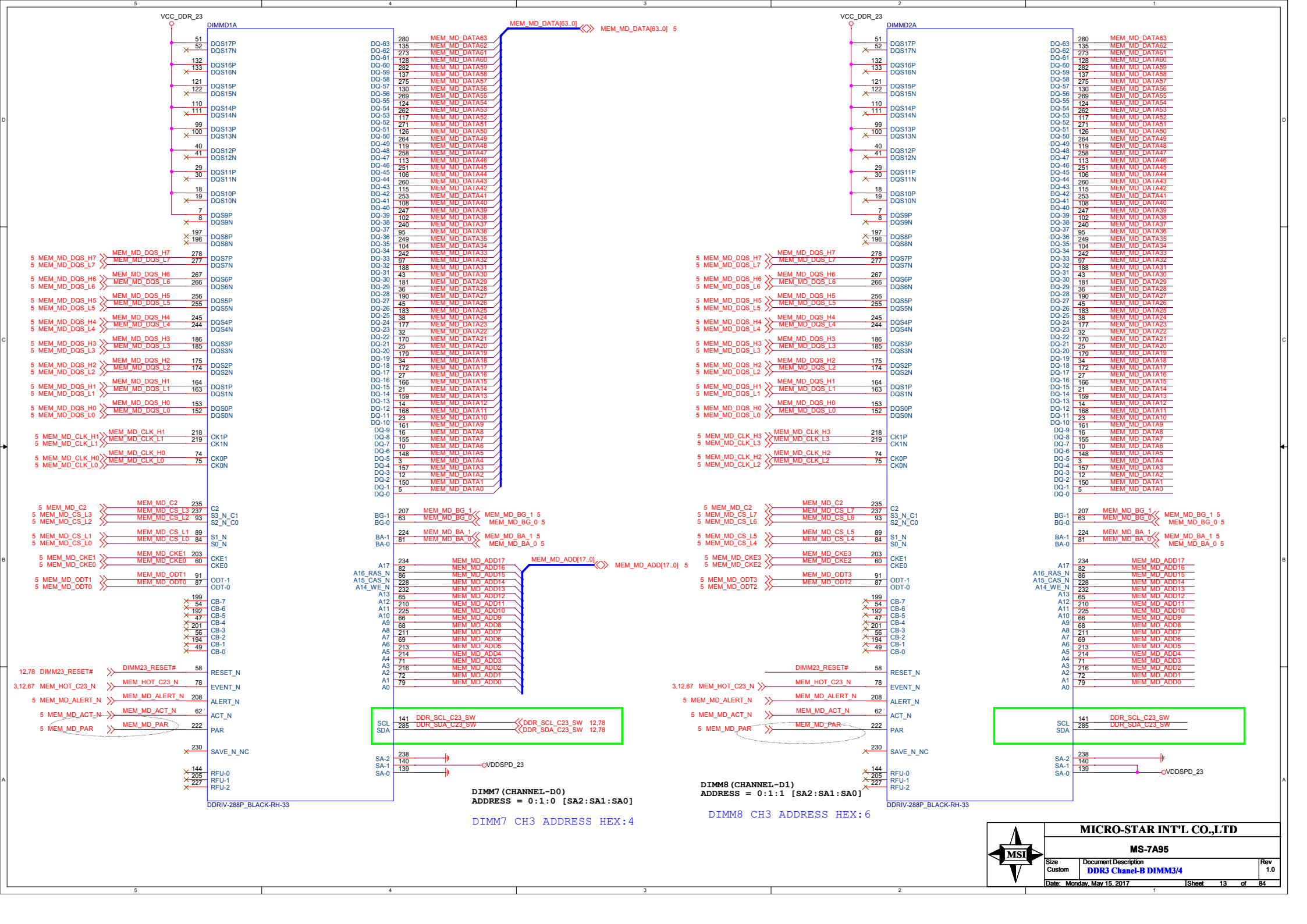
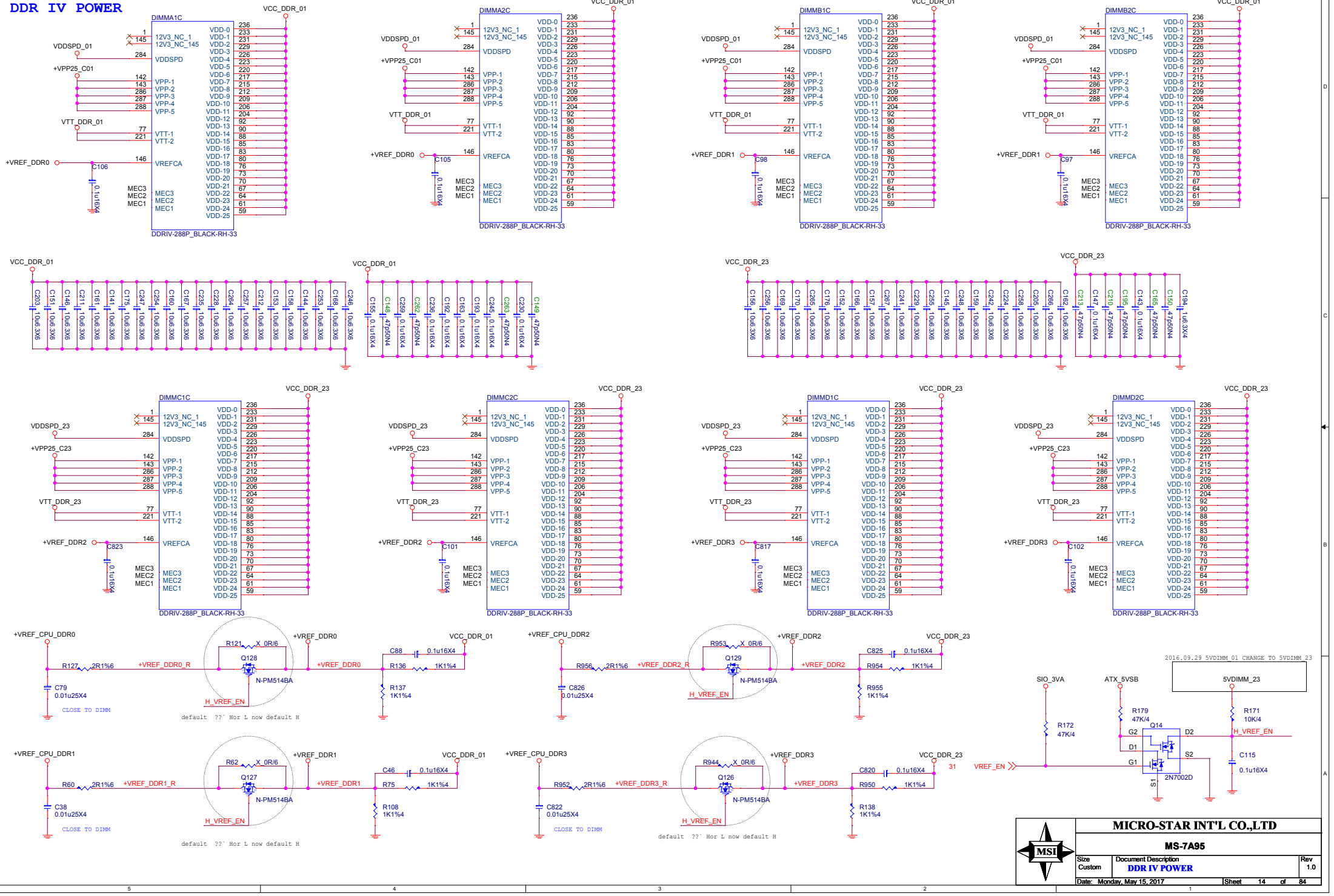
Size: Custom	Document Description: DDR IV DIMM5/6	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 12 of 84	

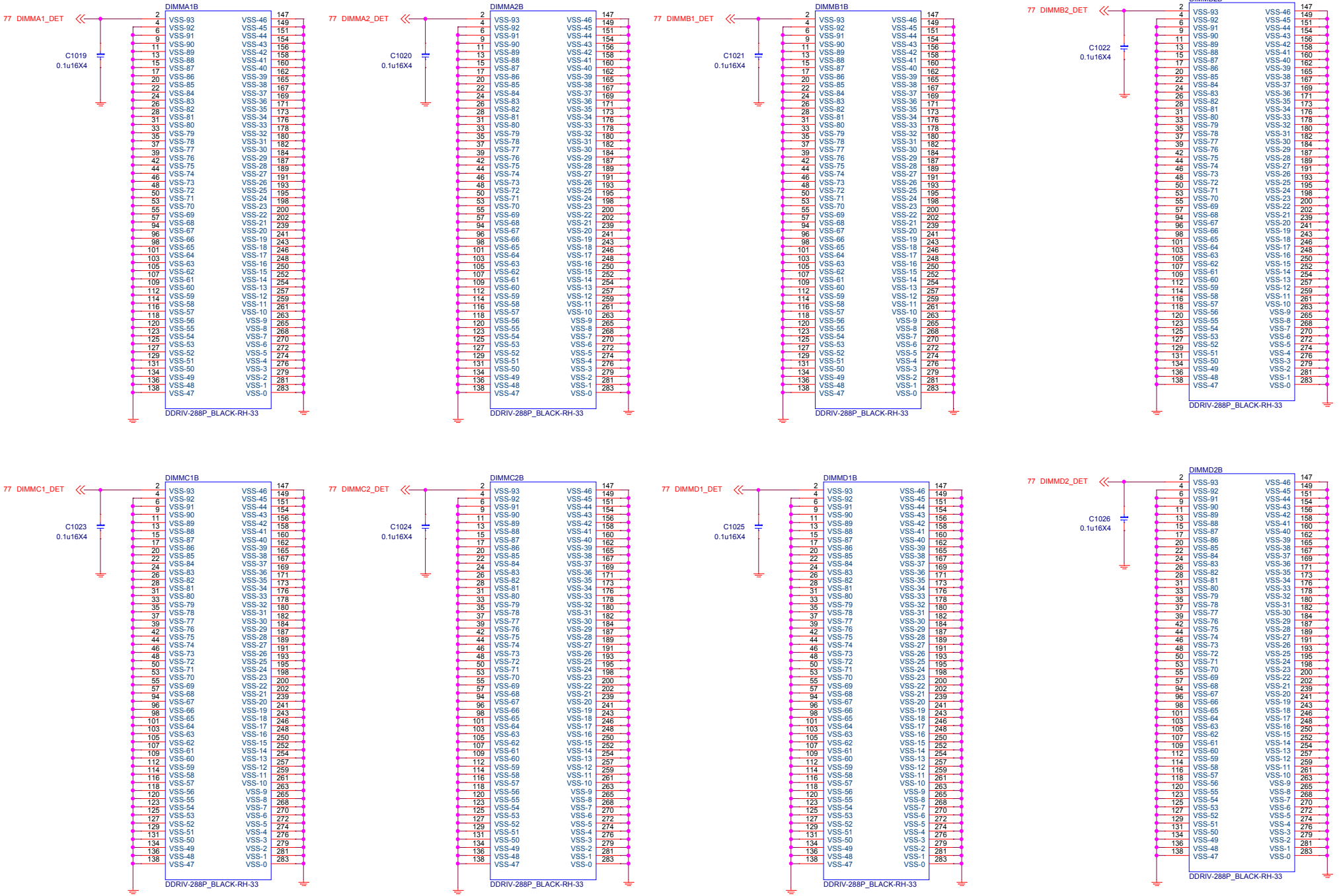

VCC_DDR_23
DIMMD1A
MEM_MD_DATA[63..0]
MEM_MD_DATA[63..0] 5
DDRIV-288P_BLACK-RH-33
DIMM7(CHANNEL-D0)
ADDRESS = 0:1:0 [SA2:SA1:SA0]
DIMM7 CH3 ADDRESS HEX:4
VCC_DDR_23
DIMMD2A
DDRIV-288P_BLACK-RH-33
DIMM8(CHANNEL-D1)
ADDRESS = 0:1:1 [SA2:SA1:SA0]
DIMM8 CH3 ADDRESS HEX:6
MEM_MD_ADD[17..0]
MEM_MD_ADD[17..0] 5
DDR_SCL_C23_SW
DDR_SDA_C23_SW
VDDSPD_23
MICRO-STAR INT'L CO.,LTD
MS-7A95
Size
Custom
Document Description
DDR3 Chanel-B DIMM3/4
Rev
1.0
Date: Monday, May 15, 2017
Sheet 13 of 84

DDR IV POWER



MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: DDR IV POWER	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 14 of 84	

DDR IV GND



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MS-7A95			
Size: Custom	Document Description: DDR IV GND		Rev: 1.0
Date: Monday, May 15, 2017		Sheet 15 of 84	

PCH1D

LPC
SMB
SPI
power management

31,73 LPC_AD0 — AR15 — GPP_A1 / LAD0 / ESPI_IO0
31,73 LPC_AD1 — AY15 — GPP_A2 / LAD1 / ESPI_IO1
31,73 LPC_AD2 — AV17 — GPP_A3 / LAD2 / ESPI_IO2
31,73 LPC_AD3 — BE14 — GPP_A4 / LAD3 / ESPI_IO3
31,73 LPC_FRAME# — BF14 — GPP_A5 / LFRAME# / ESPI_CS0#
31,73 SERIRQ — BC13 — GPP_A6 / SERIRQ / ESPI_CS1#
PIRQA# — AY13 — GPP_A7 / PIRQA# / ESPI_ALERT0#
KBRST#_R — AU15 — GPP_A0 / RCIN# / ESPI_ALERT1#
31 LPC_DRQ#0 — R617 X_0R/4 ESPI_RESET# — BF16 — GPP_A14 / SUS_STAT# / ESPI_RESET#

SMBCLK_VSB — BE38 — GPP_C0 / SMBCLK
SMBDATA_VSB — BC42 — GPP_C1 / SMBDATA
BE41 — GPP_C2 / SMBALERT#
21 ME_TLS_ON
46 SMLINK0_CLK — SMLINK0_CLK — BE37 — GPP_C3 / SML0CLK
46 SMLINK0_DATA — SMLINK0_DATA — BC33 — GPP_C4 / SML0DATA
21 LPC_ESPI_SEL — LPC_ESPI_SEL — BC35 — GPP_C5 / SML0ALERT#
31 SMLINK1_CLK — SMLINK1_CLK — BC43 — GPP_C6 / SML1CLK
31 SMLINK1_DATA — SMLINK1_DATA — BF38 — GPP_C7 / SML1DATA
21 PCH_SML1ALERT# — PCH_SML1ALERT# — BA22 — GPP_B23 / SML1ALERT# / PCHHOT#

3VSB
R1174 1K/4 SMBCLK_VSB
R1168 1K/4 SMBDATA_VSB
R1164 499R1%4 SMLINK0_CLK
R1161 499R1%4 SMLINK0_DATA
R1162 1K/4 SMLINK1_CLK
R665 1K/4 SMLINK1_DATA

BE32 — GPP_H10 / SML2CLK
AU31 — GPP_H11 / SML2DATA
21 GPP_H12 — GPP_H12 — BF33 — GPP_H12 / SML2ALERT#
BE33 — GPP_H13 / SML3CLK
AV31 — GPP_H14 / SML3DATA
28 BIOS_DIS_SW1 — BD33 — GPP_H15 / SML3ALERT#
GPP_H16 — BD36 — GPP_H16 / SML4CLK
GPP_H17 — BF32 — GPP_H17 / SML4DATA
GPP_H18 — BF34 — GPP_H18 / SML4ALERT#

AU2 — CL_CLK
AU4 — CL_DATA
AW2 — CL_RST#

34,55 PCH_SPI_CLK — PCH_SPI_CLK — BE29 — SPI0_CLK
21,34 PCH_SPI_IO2 — PCH_SPI_IO2 — BF26 — SPI0_IO2
21,34 PCH_SPI_IO3 — PCH_SPI_IO3 — BD27 — SPI0_IO3
21,34,55 PCH_SPI_MISO — PCH_SPI_MISO — BE27 — SPI0_MISO
21,34,55 PCH_SPI_MOSI — PCH_SPI_MOSI — BF27 — SPI0_MOSI
34,55 PCH_SPI_CS0# — PCH_SPI_CS0# — BF28 — SPI0_CS0#
TP77 — BA27 — SPI0_CS1#
TP75 — AY27 — SPI0_CS2#

KBP_X

SLP_SUS# — BF10 SLP_SUS# — SLP_SUS# 31
GPD6 / SLP_A# — BE13 SLP_A# — TP36
GPD4 / SLP_S3# — BA11 SLP_S3#_R R1163 0R/4 SLP_S3# — SLP_S3# 7,22,31,55,63,65,69,71,72
GPD5 / SLP_S4# — BF13 SLP_S4#_R R621 0R/4 SLP_S4# — SLP_S4# 31,55,63,65,66,67,71,72
GPD10 / SLP_S5# — BB7 SLP_S5# — TP78
GPP_B12 / SLP_S0# — BE24 SLP_S0# — TP34

SLP_LAN# — AV11 SLP_LAN# — SLP_LAN# 46
GPD11 / LANPHYPC — BC11 LAN_DISABLE# — LAN_DISABLE# 46
GPD9 / SLP_WLAN# — BA9
GPP_A13 / SUSWARN# / SUSPWRDNACK — BF17 SUSWARN# R610 0R/4 — PCH_SUSCLK 47
GPP_A15 / SUSACK# — BD17 SUSACK#
GPD8 / SUSCLK — AV13 PCH_SUSCLK

DSW_PWROK — BD4 PCH_DPWROK — PCH_DPWROK 31,34
PCH_PWROK — BE4 PCH_PWROK — PCH_PWROK 7
SYS_PWROK — AW3 SYS_PWROK — SYS_PWROK 33
PROCPWRGD — AL2 CPU_PWRGD_R R586 0R/4 — CPU_PWRGD 3,7

RTCRST# — BE8 RTCRST#
SRTCRST# — BF8 SRTCRST#
RSMRST# — BG5 RSMRST# — RSMRST# 31,34
DRAM_RESET# — BD10 DRAM_RESET# — DRAM_RESET# 78
SYS_RESET# — AV3 FP_RST# — FP_RST# 22,73
PLTRST_PROC# — AK3 CPURST# — CPURST# 3
GPP_B13 / PLTRST# — BD24 PLTRST#_R R1170 0R/4 — PLTRST# 31
GPD3 / PWRBTN# — BC5 PWRBTN# — PWRBTN# 31

WAKE# — BE9 PCH_WAKE# — PCH_WAKE# 23,24,25,28,29,47,49,51
GPD2 / LAN_WAKE# — BE10 LANPHY_WAKE# — LANPHY_WAKE# 46
GPP_A11 / PME# — BF15 IO_PME_N — IO_PME_N 31
GPD1 / ACPRESENT — BD13 ACPRESENT
GPD0 / BATLOW# — BF11 BATLOW#
GPP_A12 / BMBUSY# / ISH_GP6 / SX_EXIT_HOLDOFF# — BD15 GPP_A12 R1183 10K/4 — 3VSB

GPP_A8 / CLKRUN# — BA15 CLKRUN#
PECI — AK4 PCH_PECI
THRMTRIP# — AH4 PCH_THERMTRIP_R R1117 619R1%4 — H_THERMTRIP 3
PM_DOWN — AH2 PCH_PM_DOWN R575 20R/4 — H_PM_DOWN 3
PM_SYNC — AH3 SYNC_R R580 30R/4 — PM_SYNC 3
INTRUDER# — BF9 INTRUDER#

GPP_B14 / SPKR — AU24 — SPKR 21,73

JTAG_TCK — AN1 PCH_JTAG_TCK
JTAG_TMS — AP4 PCH_JTAG_TMS R1323 0R/4 — XDP_TMS 3
JTAG_TDI — AP2 PCH_JTAG_TDI R1322 0R/4 — XDP_TDI 3
JTAG_TDO — AN3 PCH_JTAG_TDO R1325 0R/4 — XDP_TDO 3
JTAGX — AP3 PCH_JTAGX R1324 0R/4 — CPU_TCK0 3
ITP_PMODE — AR2 ITP_PMODE — TP26
PCH_TRIGIN — AJ2
PCH_TRIGOUT — AL1 PCH_TRIGOUT — PCH_TRIGIN 6
PREQ# — AU3 PCH_PREQ — PCH_TRIGOUT 6
PRDY# — AR1 PCH_PRDY — TP30
CPU_TRST# — AV2 PCH_TRST_R R1326 0R/4 — TP25 — XDP_TRST 3

PCH_LANPHY_PWR
Pull Down PCH PHY into low power state.
For No Use intel Lan
LAN_DISABLE# R1201 X_10K/4

3VDSW
PCH_WAKE# R656 1K/4
LANPHY_WAKE# R634 4.7K/4
PWRBTN# R1156 3K1%4
BATLOW# R635 10K/4
ACPRESENT R1165 10K/4

3VSB
SUSACK# R619 X_10K/4
RSMRST# R614 4.7K/4
R613 100K/4

VCC3
FP_RST# R1169 3K1%4

PCH_THERMTRIP_R R1116 X_200R/4 PCH_1VSB
H_PM_DOWN R574 X_1K/4

If used ESPI this pin can be NC
CLKRUN# R1204 10K/4 VCC3
R1208 X_10K/4
IO_PME_N R607 10K/4 PWR_GPP_A
R622 X_10K/4 VCC3 CRB

PCH_SUSCLK R1147 X_1.5K1%4
PCH_PM_DOWN R577 X_1K/4
PCH_PECI R1125 X_1K/4

PCH_1VSB
PCH_JTAGX R1137 X_1K/4
PCH_JTAG_TMS R596 51R/4
PCH_JTAG_TDO R569 100R/4
PCH_JTAG_TDI R595 51R/4
PCH_JTAG_TCK R592 X_51R/4
PLACE TDI, TMS, TDK WITHIN 1100MILS OF PCH PIN
PLACE TDO WITHIN 250MILS OF PCH PIN

PCH GPIO FOR BIOS ID 110

3VSB
R683 10K/4 GPP_H18 R662 X_10K/4
R681 10K/4 GPP_H17 R660 X_10K/4
R1178 X_10K/4 GPP_H16 R1190 10K/4

Used ESPI ALL NC

VCC3
R1172 10K/4 KBRST#_R
R1205 10K/4 SERIRQ
3VSB
R1160 10K/4 PIRQA#
31 KBRST# — R1185 0R/4 KBRST#_R

RTC

VBAT_PCH
R655 20K1%4 SRTCRST#
C558 1u6.3X6
VBAT_PCH
R674 20K1%4 RTCRST# 32,36
C562 1u6.3X6

Chassis Intrusion

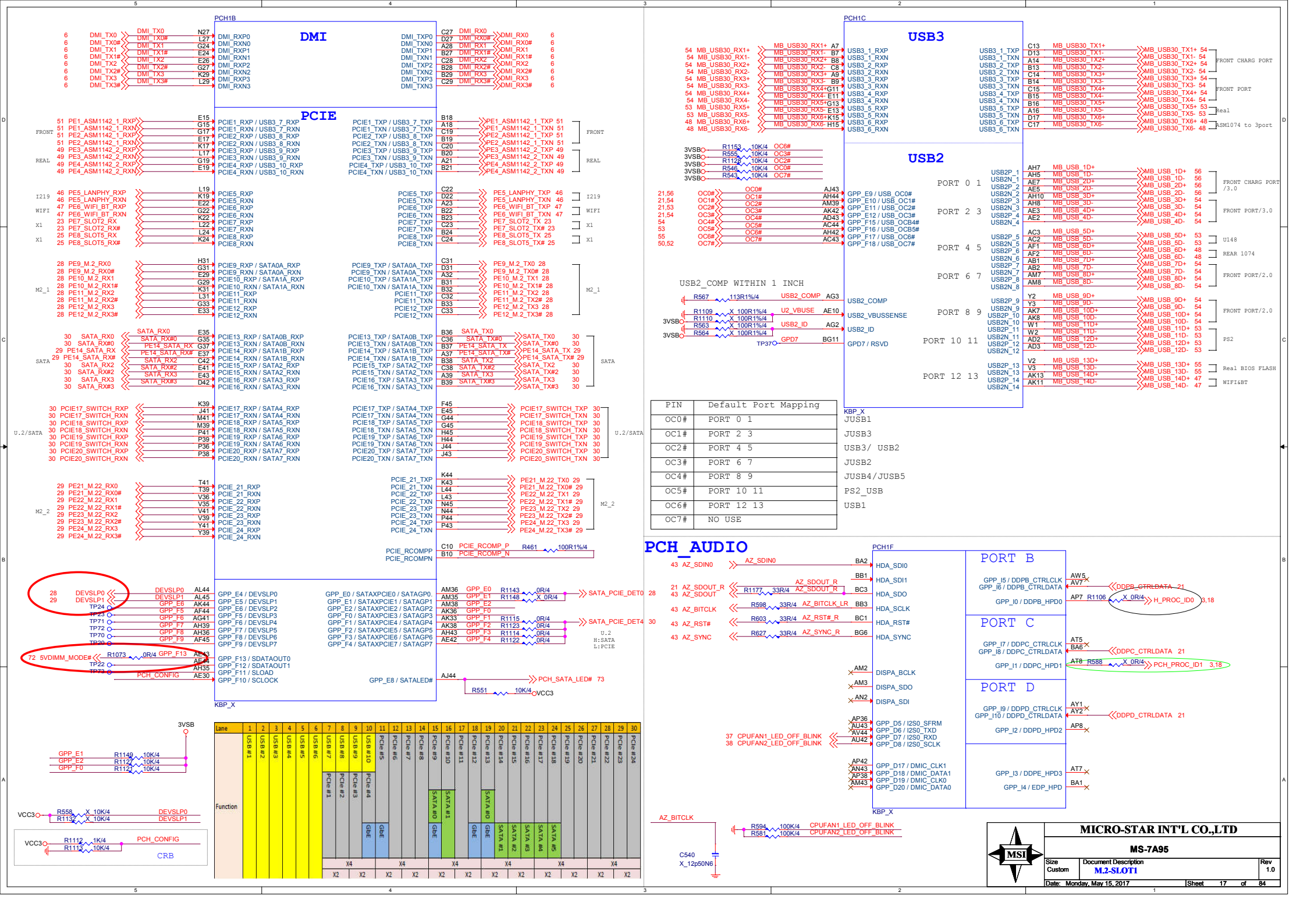
VBAT_PCH
R652 1MR/4
JCI1
2
1
INTRUDER#
H1X2M_BLACK-RH
N31-1020151-H06

擺在一起(注意到所有的SMBUS的分枝)

3VSB
R692 10K/4
Q52 2N7002D
G2
D1
G1
D2
S2
S1
SYS_PWROK
R597 100K/4
+12V
R709 10K/4
Q61 2N7002
Q60 2N7002
VCC3
R711 1K/4 SMBCLK_VCC
R710 1K/4 SMBDATA_VCC
SMBCLK_VSB 22,23,55,57,59,63,78
R700 X_0R/4
SMBCLK_VCC 30,33,66,67,75,78
SMBDATA_VSB 22,23,55,57,59,63,78
R699 X_0R/4
SMBDATA_VCC 30,33,66,67,75,78

22,31,34 CHIP_PWGD — CHIP_PWGD
R490 0R/4 SYS_PWROK 33
R493 X_0R/4 PCH_PWROK 7
R601 100K/4

MICRO-STAR INT'L CO.,LTD
MS-7A95
Size: Custom
Document Description: M.2-SLOT1
Rev: 1.0
Date: Monday, May 15, 2017
Sheet 16 of 84


PCH1B
DMI
PCIE
KBP_X
PCH1C
USB3
USB2
KBP_X
USB2_COMP WITHIN 1 INCH
PIN | Default Port Mapping
OC0# | PORT 0 1 | JUSB1
OC1# | PORT 2 3 | JUSB3
OC2# | PORT 4 5 | USB3/ USB2
OC3# | PORT 6 7 | JUSB2
OC4# | PORT 8 9 | JUSB4/JUSB5
OC5# | PORT 10 11 | PS2_USB
OC6# | PORT 12 13 | USB1
OC7# | NO USE
PCH_AUDIO
PCH1F
PORT B
PORT C
PORT D
KBP_X
Lane
Function
CRB
MICRO-STAR INT'L CO.,LTD
MS-7A95
Size Custom
Document Description M.2-SLOT1
Rev 1.0
Date: Monday, May 15, 2017
Sheet 17 of 84

PCH_CLK

Used ESPI(GPPA) GPIO Group A will be come 1.8V leve)

PCH1E

PCH1A

GPIO

LPC

RTC

24MHz

KBP_X

XCLK_BIASREF < 500 mil

remove led x16、x8 LED gpio, use mcu control

W/ SMI/NMI Funtion
GPP_B[23,20,14]
GPP_C[23:22]
GPP_D[4:0]
GPP_E[8:0]

Close to PCH

<1 inch

VROC pin header

BH1X4H-2PITCH_BLACK-RH-1

BOM ID 0 0 0 AC
0 0 1 non AC

CLK GEN	R220 unstuff	R227 unstuff
HOTKEY	Stuff	Stuff

0716

GPI GPP_D21
HIGH : A0,A1 Version FOR ASM2142
LOW : Furture Version FOR ASM2142

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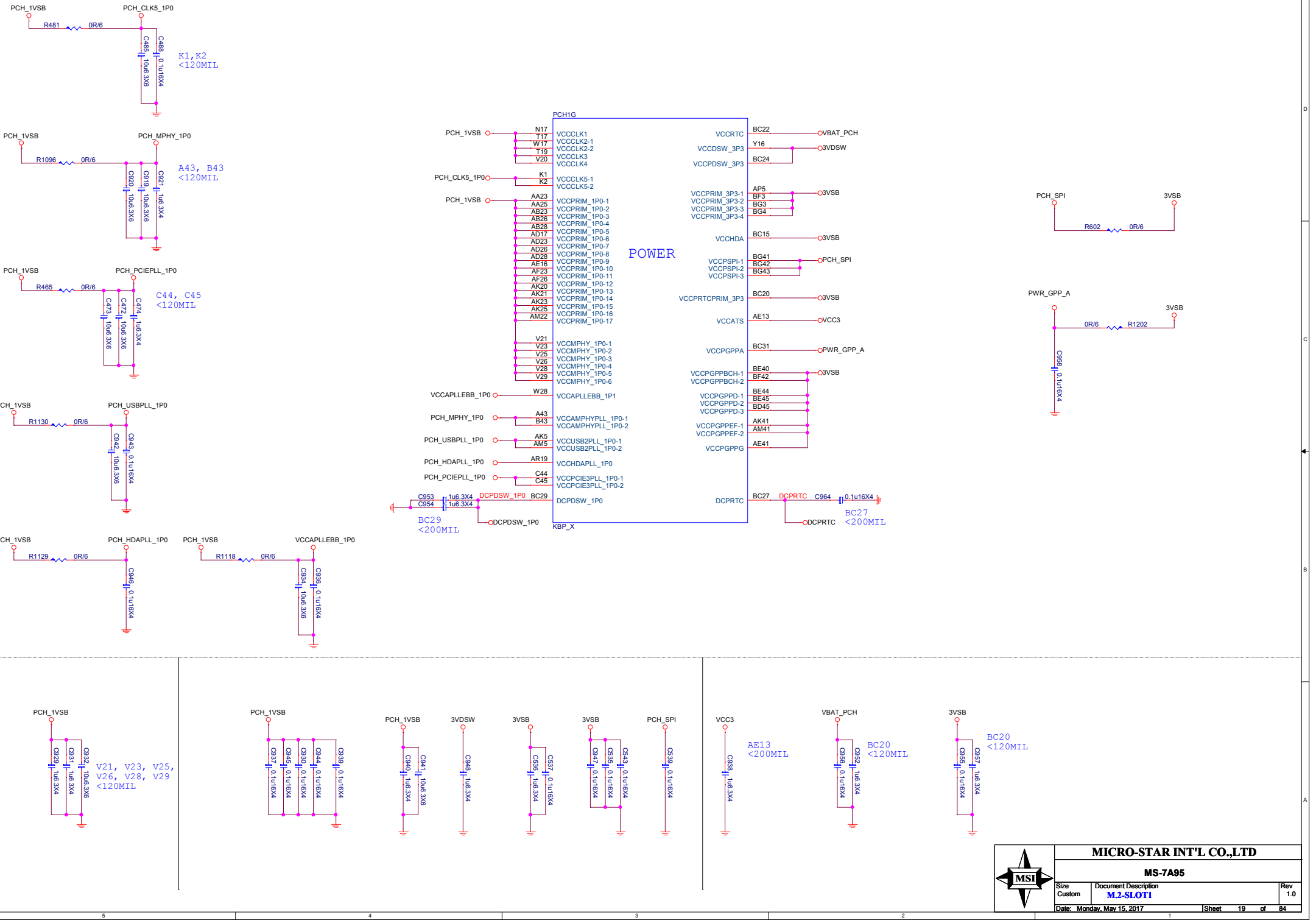
MS-7A95

Size	Document Description	Rev
Custom	M.2-SLOT1	1.0

Date: Thursday, May 18, 2017 Sheet 18 of 84

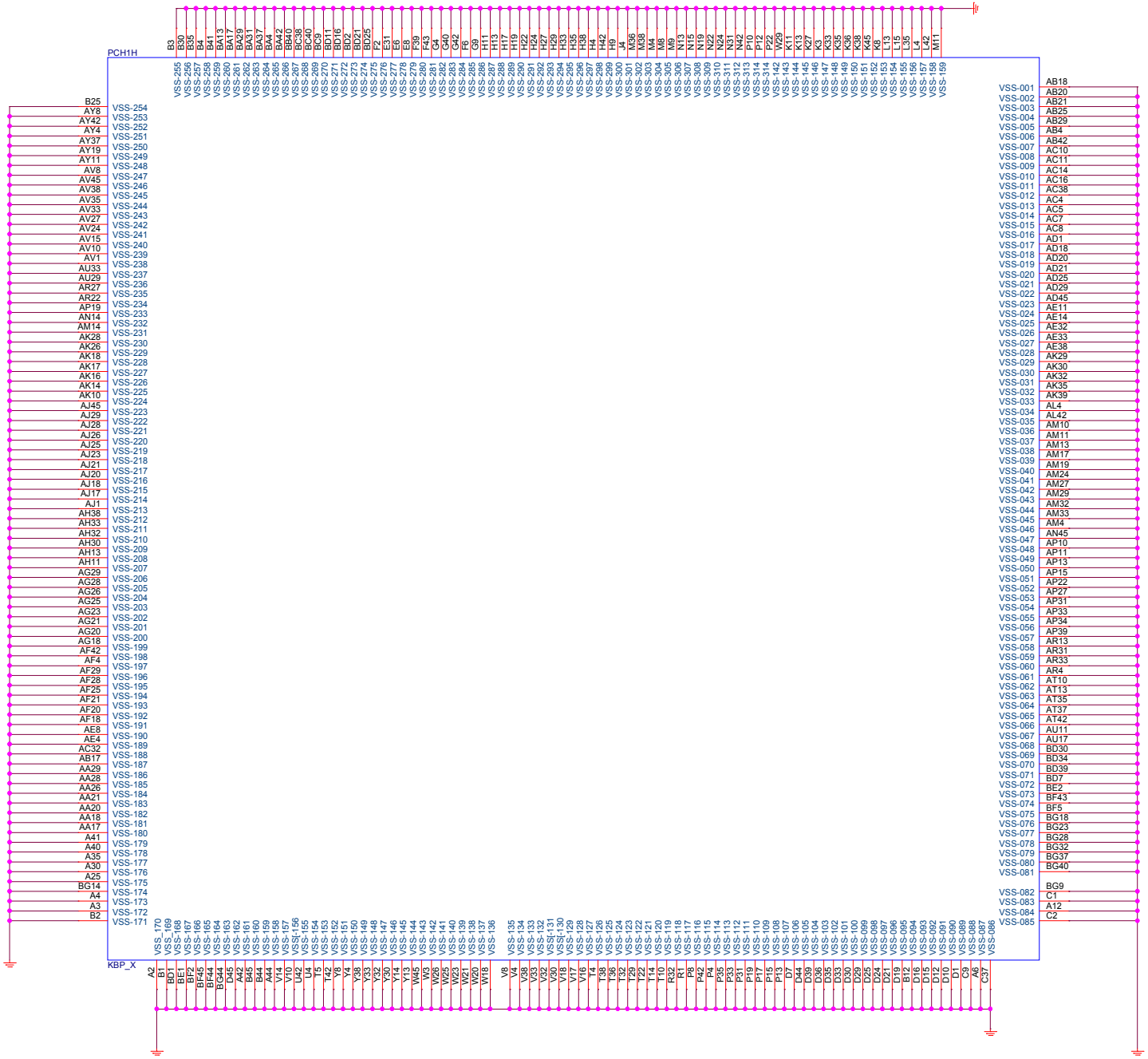


MICRO-STAR INT'L CO.,LTD

MS-7A95

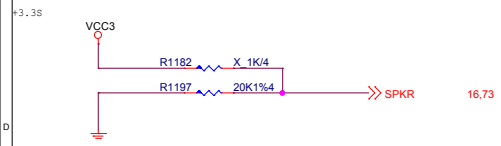
Size	Document Description	Rev
Custom	M.2-SLOT1	1.0

Date: Monday, May 15, 2017 Sheet 19 of 84



MICRO-STAR INT'L CO.,LTD	
MS-7A95	
Size: Custom	Document Description: M.2-SLOT1
Rev: 1.0	
Date: Monday, May 15, 2017	Sheet 20 of 84

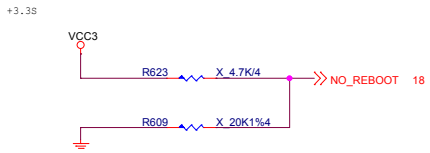
TOP SWAP OVERRIDE STRAP



HIGH: TOP_SWAP ENABLED
LOW : TOP_SWAP DISABLED

PCH HAS INTERNAL WEAK PD

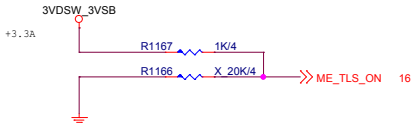
No Reboot OPTION



0 : NO-REBOOT (Default)
1 : REBOOT

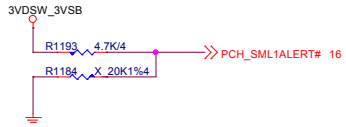
PCH HAS INTERNAL WEAK PD

AMT and SBA with confidentiality



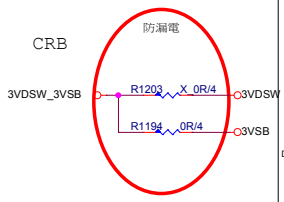
0 : DISABLE
1 : ENABLE (Default)

DCI ENABLE

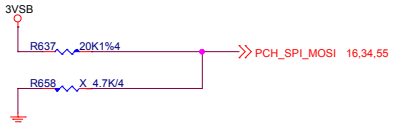


0 : DCI DISABLE
1 : DCI ENABLE (Default)

PCH HAS INTERNAL WEAK PD

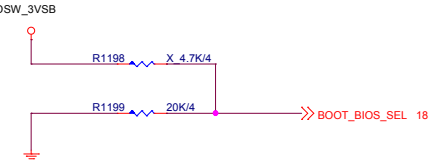


Booot-HALT SEL STRAP



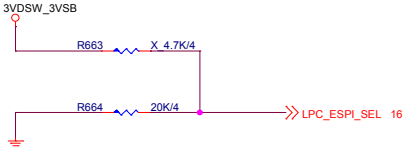
PCH HAS INTERNAL WEAK PU

Boot BIOS



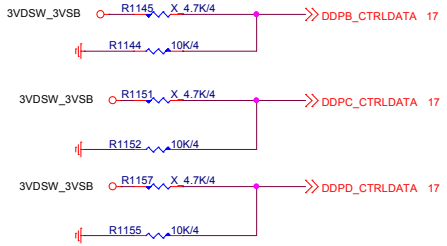
0 : SPI
1 : LPC

LPC eSPI Mode



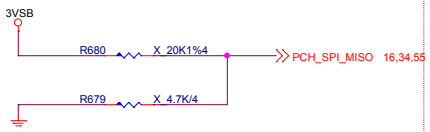
0 : LPC
1 : eSPI

DISPLAY PORT



0 : DISPLAY NOT DETECTED (Default)
1 : DISPLAY DETECTED

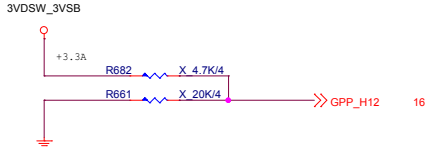
JTAG ODT SEL



HIGH: JTAG ODT ENABLED
LOW : JTAG ODT DISABLED

PCH HAS INTERNAL WEAK PU

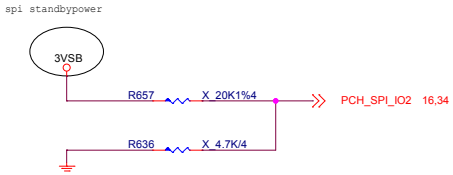
ESPI FLASH SHARING MODE



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

PCH HAS INTERNAL WEAK PD

CONSENT



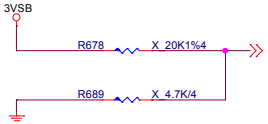
0 : CONSENT STRAP ENABLE
1 : CONSENT STRAP ENABLE

PCH HAS INTERNAL WEAK PU

DFX TEST MODE

UNSRTUFF: NORMAL
STUFF: TEST MODE

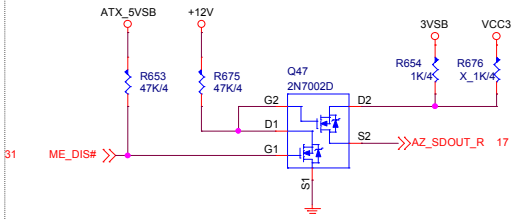
PERSONALITY



HIGH: PERSONALITY ENABLED
LOW : PERSONALITY DISABLED

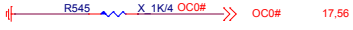
PCH HAS INTERNAL WEAK PU

HDA_SDO



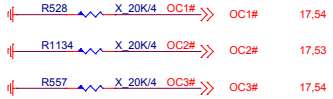
0 : SECURITY MEASURES OVERRIDEN
1 : SECURITY PER FLASH DESCRIPTOR

RING OSCILLATOR BYPASS (DFX)



0 : Ring Oscillator bypass
1 : Normal Mode

XTAL INPUT FREQUENCY [HVM MODE]



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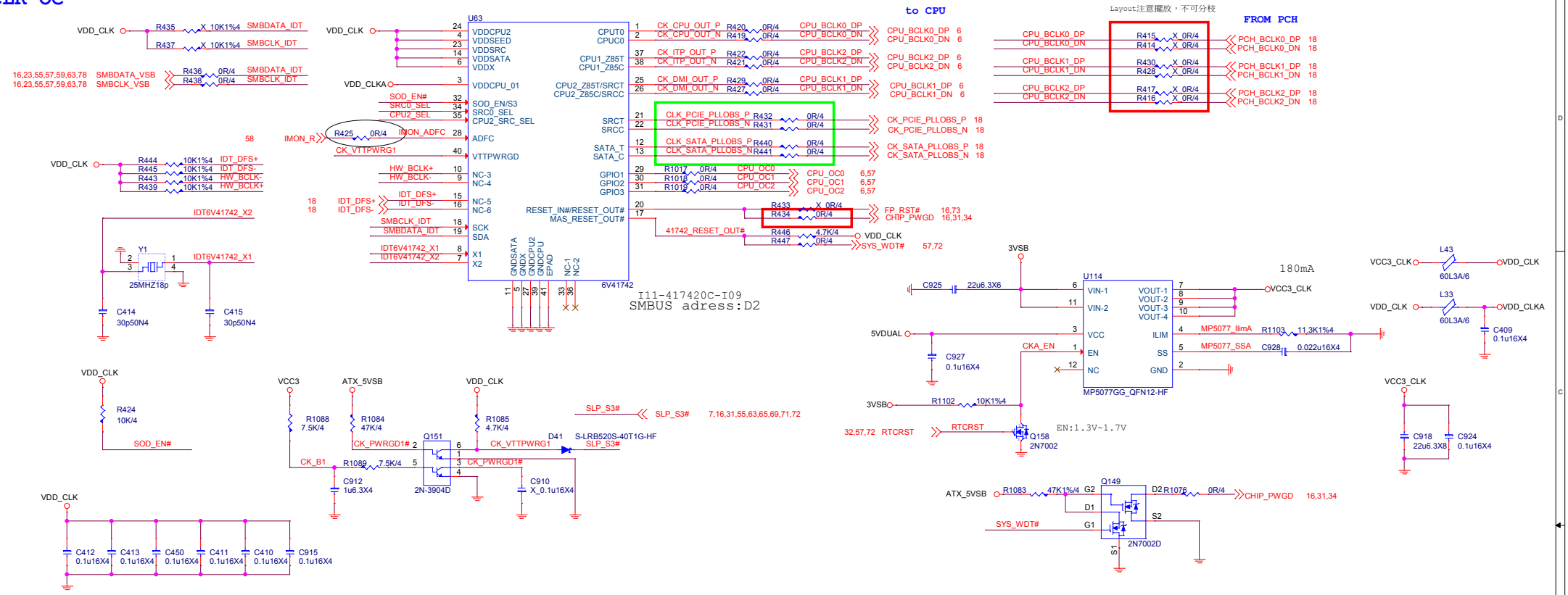
MS-7A95

Size	Document Description	Rev
Custom	PCH-Strap	1.0

Date: Monday, May 15, 2017 Sheet 21 of 84

BCLK OC



SRC0_SEL	Description	CPU	H_PROC_ID1
0	Source from CPUPLL	SKX	1
1	Source from PCIEPLL	KBX	0

CPU2_SRC_SEL	Description	CPU	H_PROC_ID1
0	Source from CPUPLL	SKX	1
1	Source from PCIEPLL	KBX	0

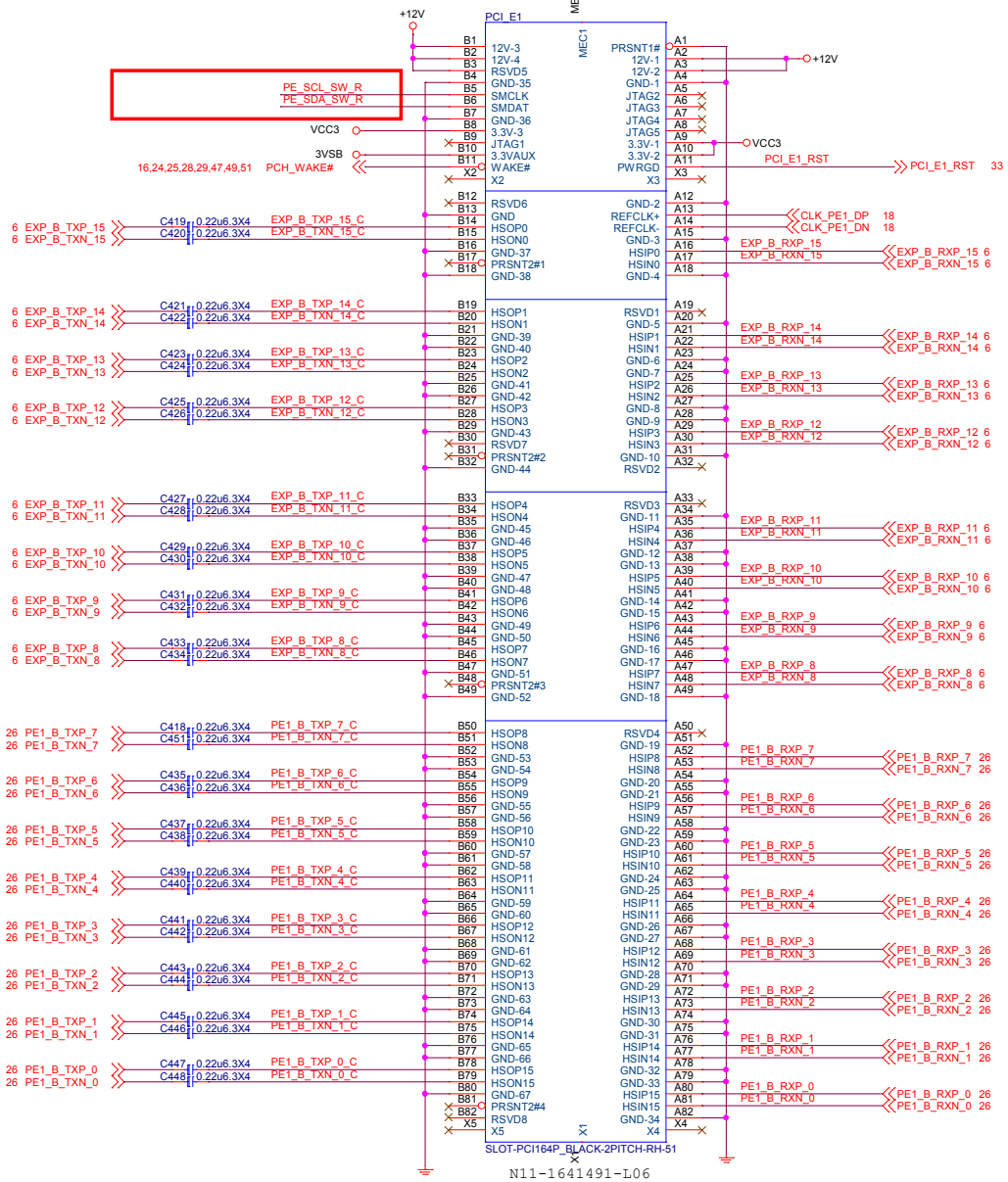
MICRO-STAR INT'L CO.,LTD

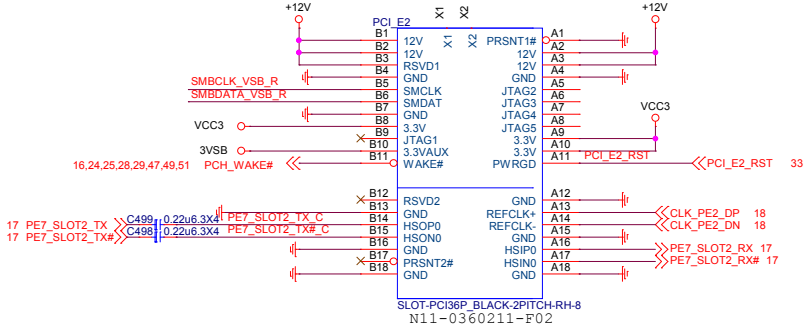
MS-7A95

Size: Custom | Document Description: Clock Gen-IDT6V41506 | Rev: 1.0

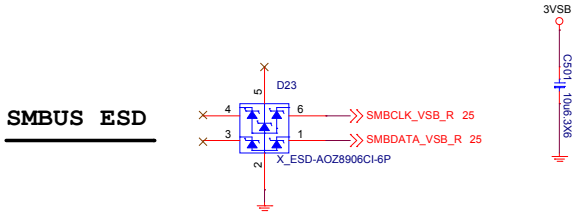
Date: Monday, May 15, 2017 | Sheet 22 of 84

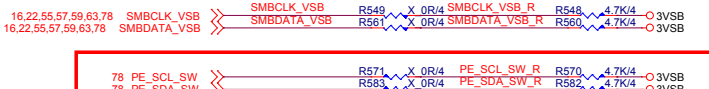
PCIE1(X16) & PCIE2(X1) Slots

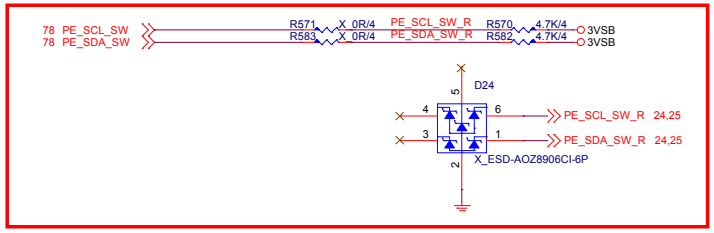


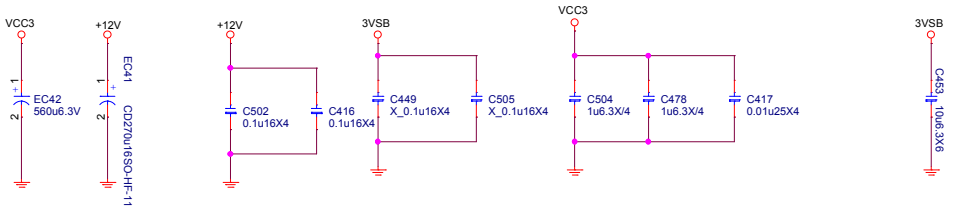


SMBUS ESD

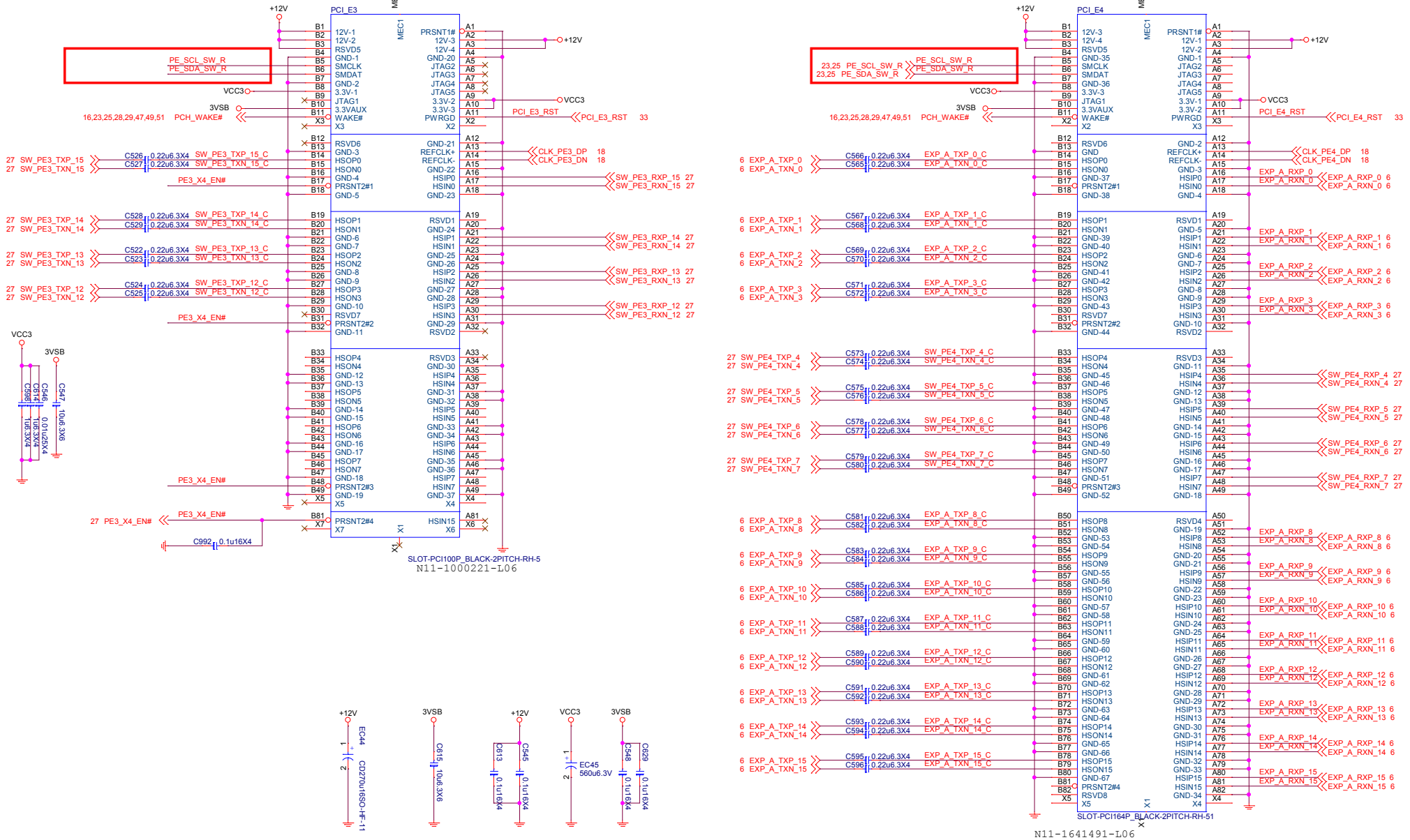




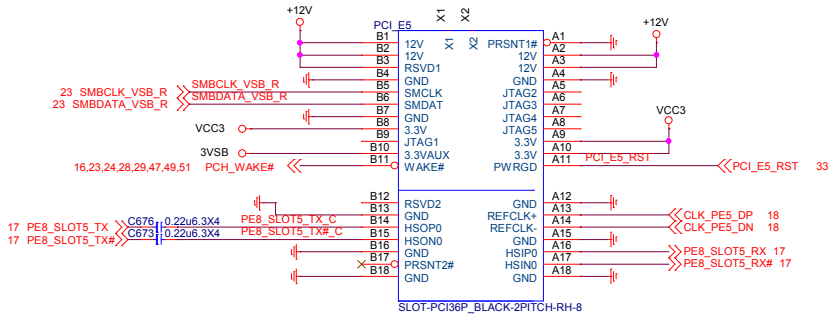




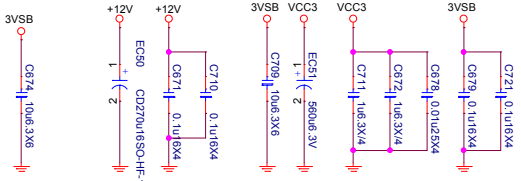
MICRO-STAR INT'L CO.,LTD	
MS-7A95	
Size: Custom	Document Description: PCIE1(X16) & PCIE2(X1) Slots
Rev: 1.0	
Date: Monday, May 15, 2017	Sheet 23 of 84

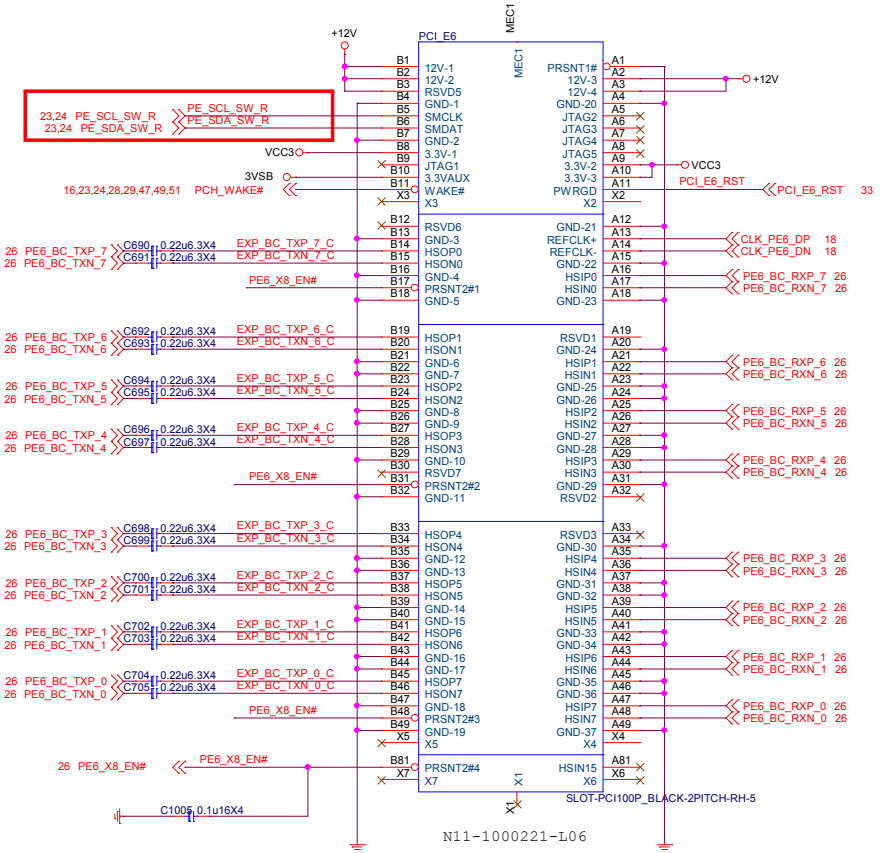


MICRO-STAR INT'L CO.,LTD	
MS-7A95	
Size: Custom	Document Description: M.2-SLOT1
Rev: 1.0	
Date: Monday, May 15, 2017	Sheet 24 of 84



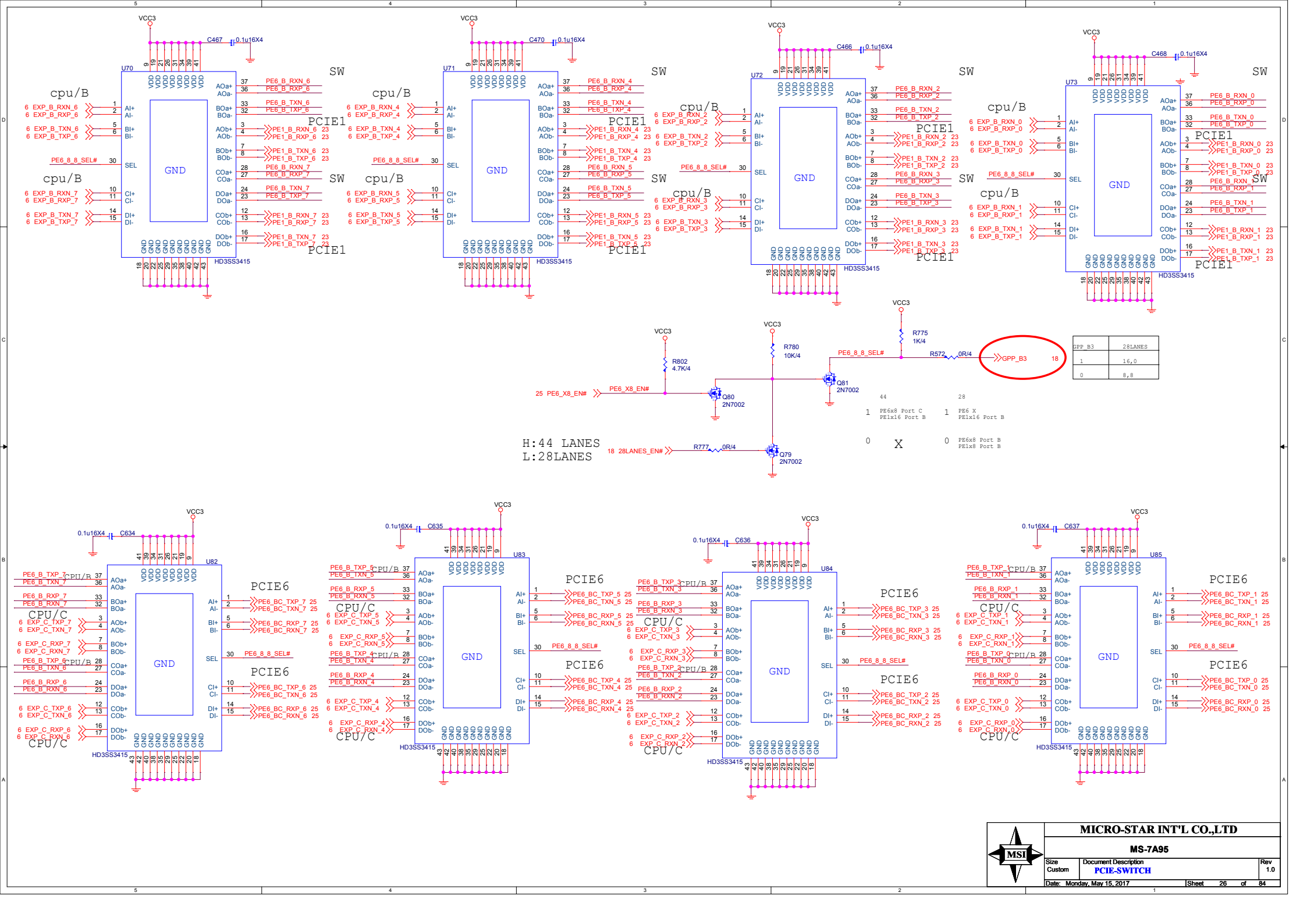
N11-0360211-F02

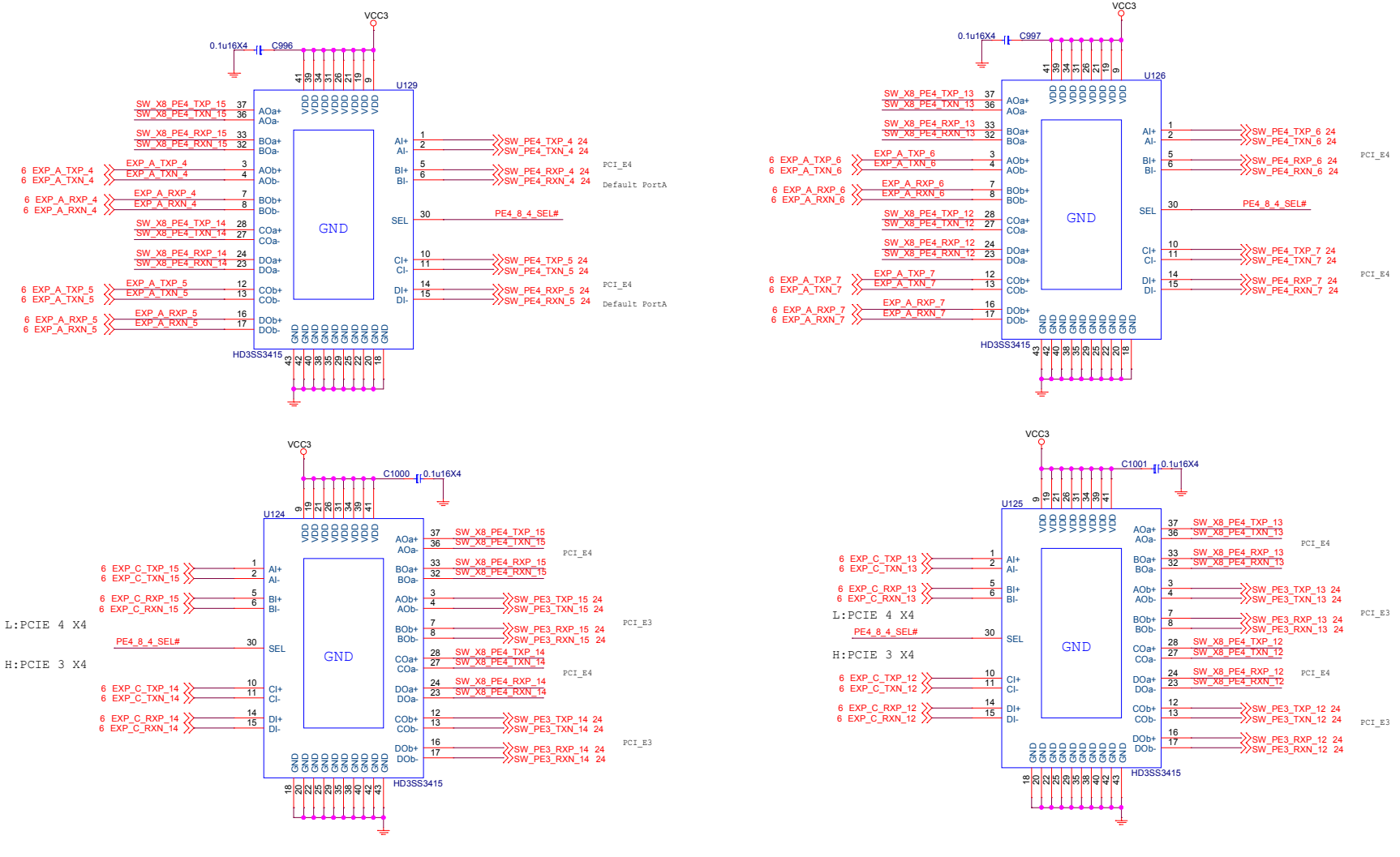




N11-1000221-L06

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7A95	
Size: Custom	Document Description: M.2-SLOT1	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 25 of 84	


U70
U71
U72
U73
U82
U83
U84
U85
HD3SS3415
GND
cpu/B
CPU/C
PCIE1
PCIE6
SW
C467 0.1u16X4
C470 0.1u16X4
C466 0.1u16X4
C468 0.1u16X4
C634 0.1u16X4
C635 0.1u16X4
C636 0.1u16X4
C637 0.1u16X4
R802 4.7K/4
R780 10K/4
R775 1K/4
R572 0R/4
R777 0R/4
Q80 2N7002
Q81 2N7002
Q79 2N7002
PE6_8_8_SEL#
PE6_X8_EN#
28LANES_EN#
GPP_B3
H:44 LANES
L:28LANES
PE6x8 Port C
PE1x16 Port B
PE6 X
PE1x16 Port B
PE6x8 Port B
PE1x8 Port B
MICRO-STAR INT'L CO.,LTD
MS-7A95
PCIE-SWITCH
Monday, May 15, 2017

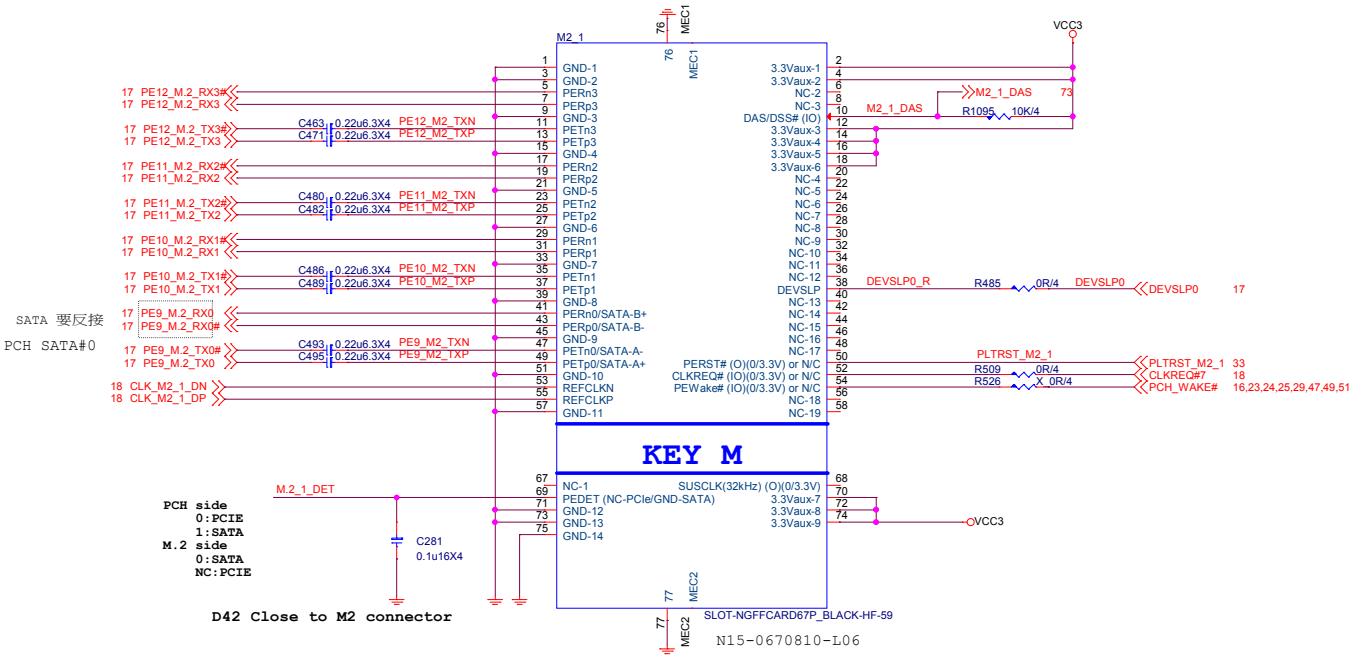


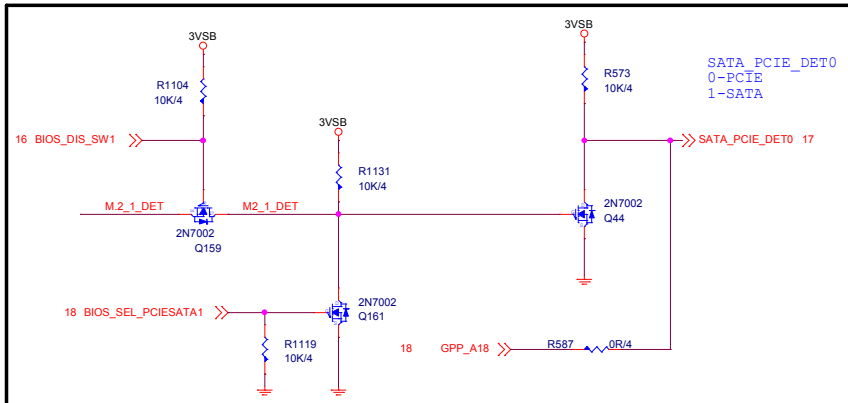
MICRO-STAR INT'L CO.,LTD

MS-7A90

Size	Document Description	Rev
Custom	PCIE-SWITCH2	1.0

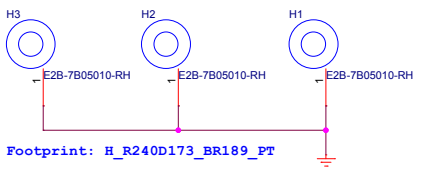
Date: Monday, May 15, 2017 Sheet 27 of 84

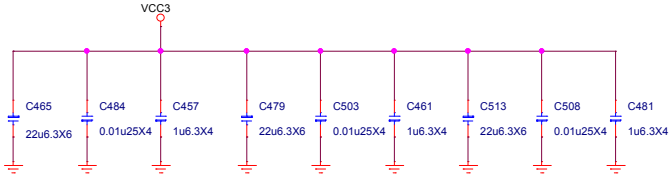




BIOS_MODE

BIOS_DIS_SW1	*BIOS_SEL_PCIESATA1*	*Mode*
0	*1*	***M2-SATA***
0	*0*	***M2-PCIE***
GPI(1)	*0*	*AUTO*



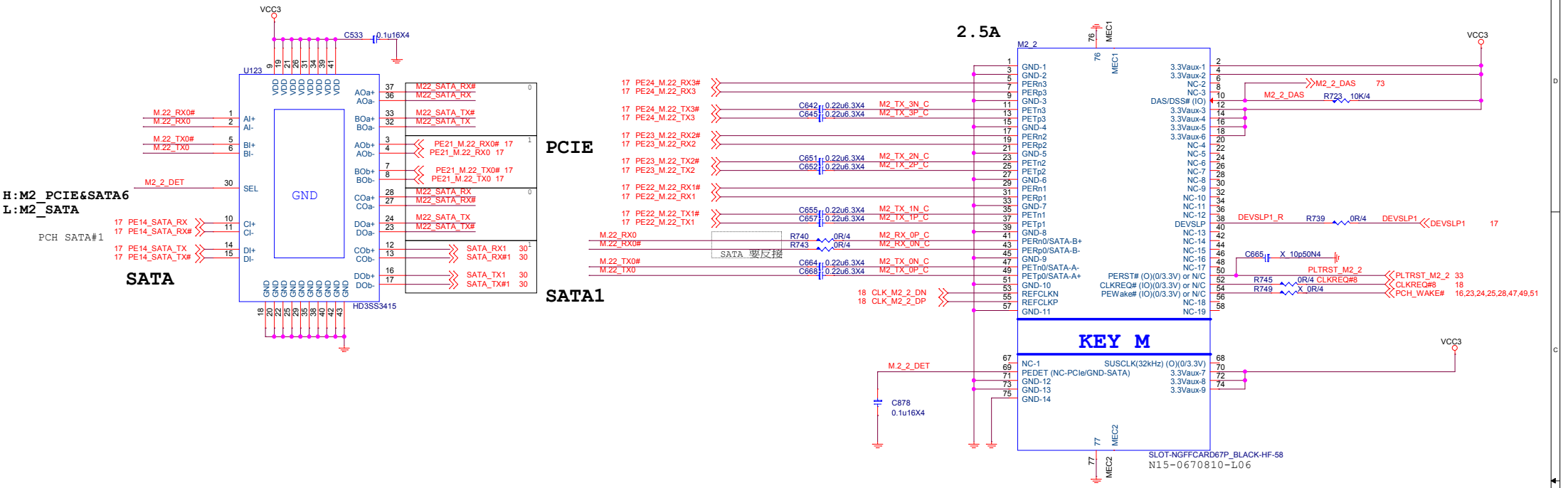


MICRO-STAR INT'L CO.,LTD

MS-7A95

Size	Document Description	Rev
Custom	M.2-SLOT1	1.0

Date: Monday, May 15, 2017 Sheet 28 of 84



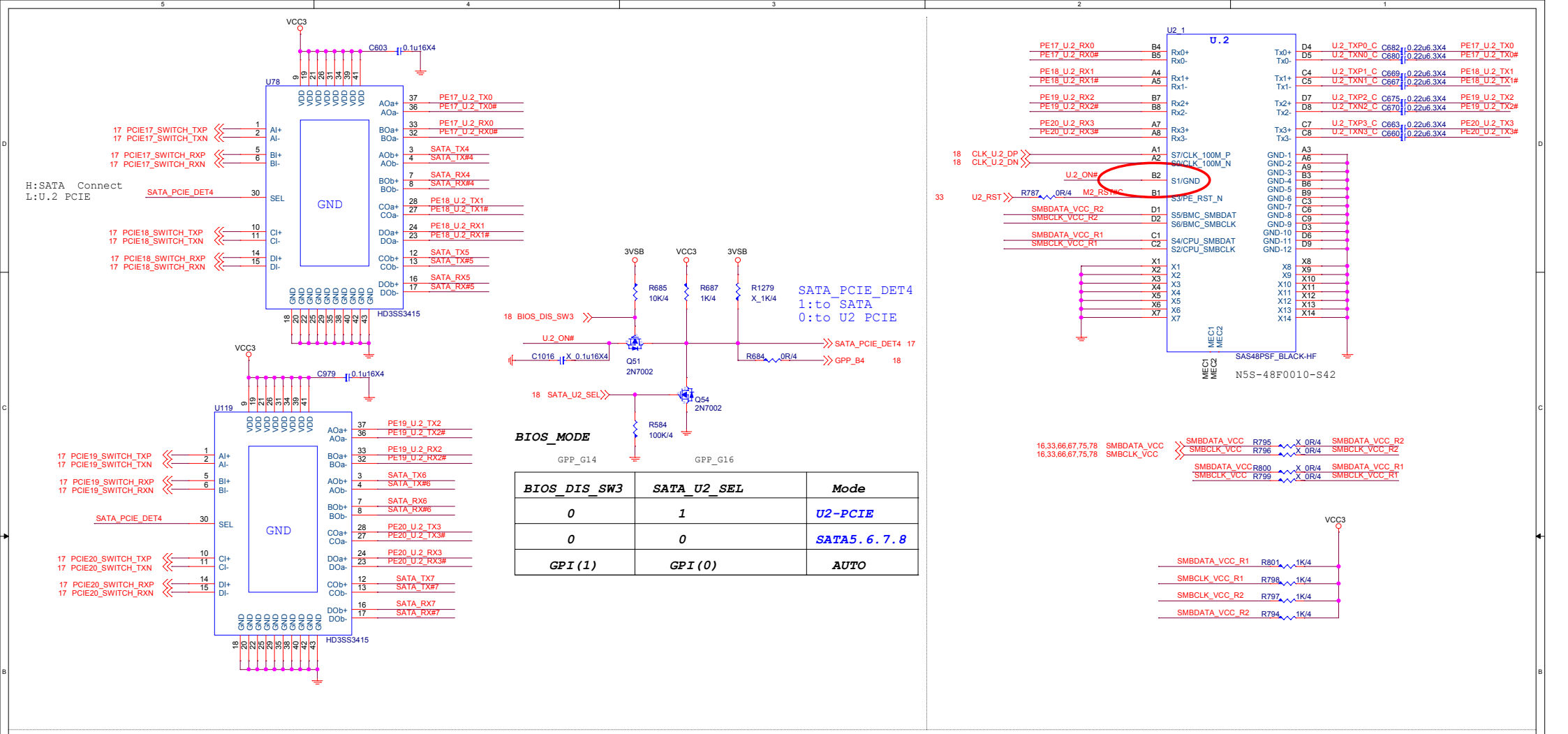
BIOS_DIS_SW2	BIOS_SEL_PCIESATA2	Mode
0	1	M2-SATA
0	0	M2-PCIE
GPI(1)	GPI(1)	AUTO

MICRO-STAR INT'L CO.,LTD

MS-7A95

Size	Document Description	Rev
Custom	M.2-SLOT2	1.0

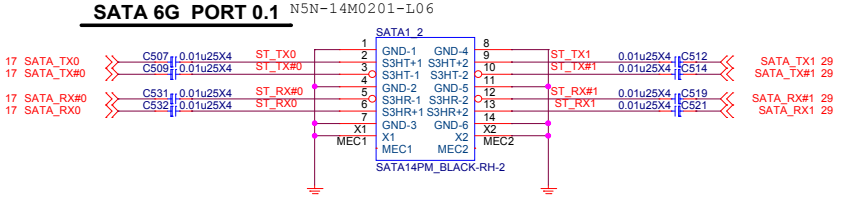
Date: Monday, May 15, 2017 Sheet 29 of 84



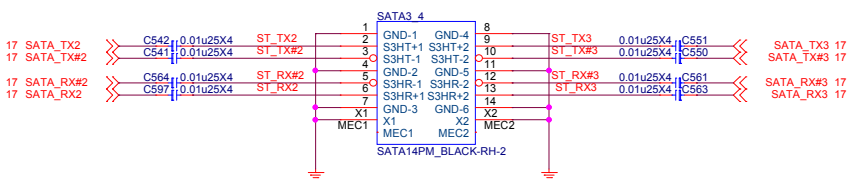
BIOS_DIS_SW3	SATA_U2_SEL	Mode
0	1	U2-PCIE
0	0	SATA5.6.7.8
GPI(1)	GPI(0)	AUTO

if M2_1&M2_2 use ,SATA1_2 connect is no function.

SATA 6G PORT 0.1 N5N-14M0201-L06

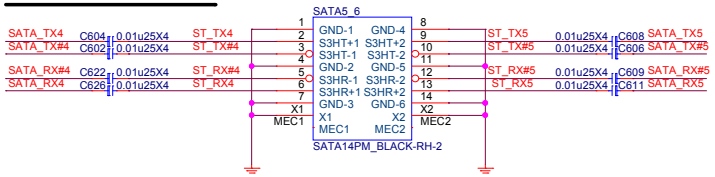


SATA 6G PORT 2.3 N5N-14M0201-L06

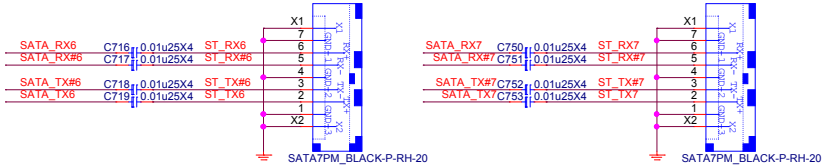


if U_2 use ,SATA5_6、SATA7、SATA8 connect is no function.

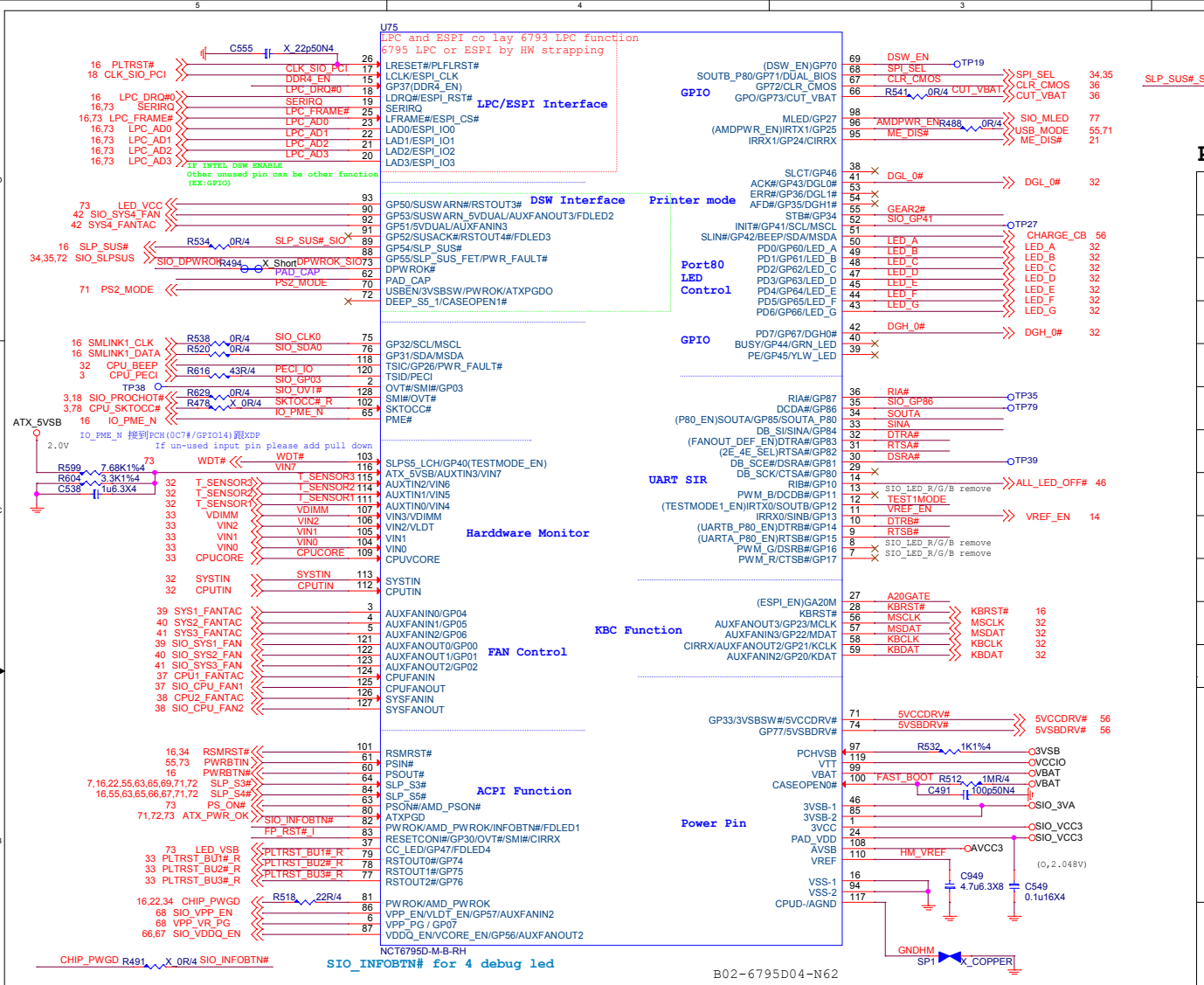
SATA 6G PORT 4.5 N5N-14M0201-L06

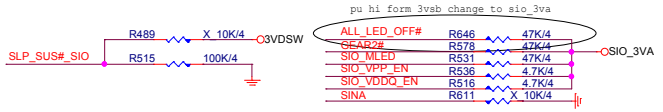


SATA 6G PORT 6.7 N5N-07M2441-H06



MICRO-STAR INT'L CO.,LTD	
MS-7A95	
Size: Custom	Document Description: U2/SATA-Conn
Rev: 1.0	
Date: Monday, May 15, 2017	Sheet 30 of 84

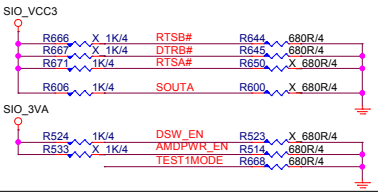


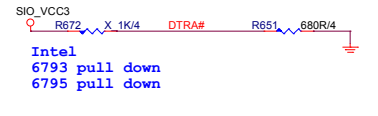


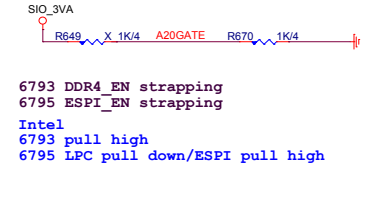
POWER ON STRAPPING PIN FOR NCT6793/6795

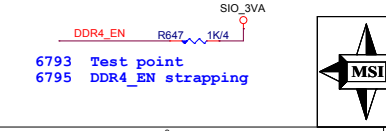
PIN	6793/6795 NAME	Circuit NAME	0	1	Strap Point
9	UARTA_P80_EN	RTSB#	DISABLE UARTA80	ENABLE UARTA80	LRESET
10	UARTB_P80_EN	DTRB#	DISABLE UARTB80	ENABLE UARTB80	LRESET
12	TEST1MODE_EN	TEST1MODE	DISABLE TEST1MODE	ENABLE TEST1MODE	LRESET
15	6793 test point 6795 DDR4_EN	6793 test point 6795 DDR4_EN	6793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

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

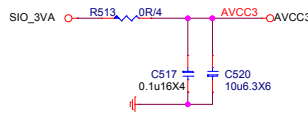


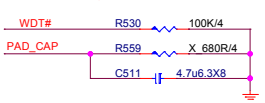


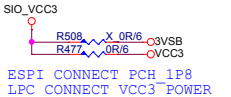


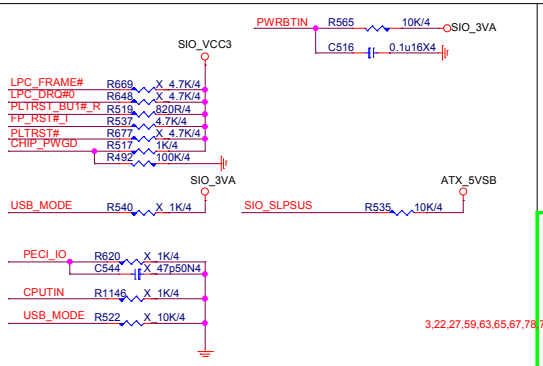


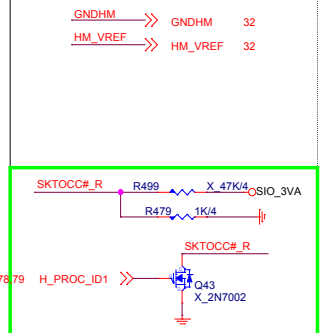
3V Analog Power

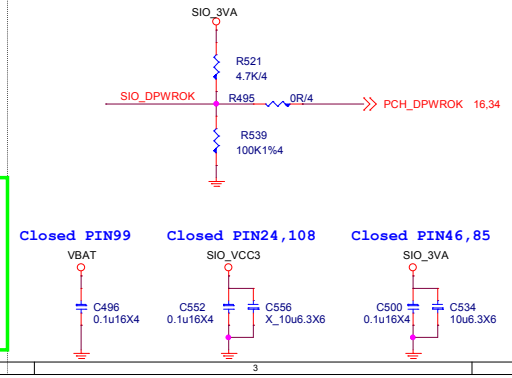






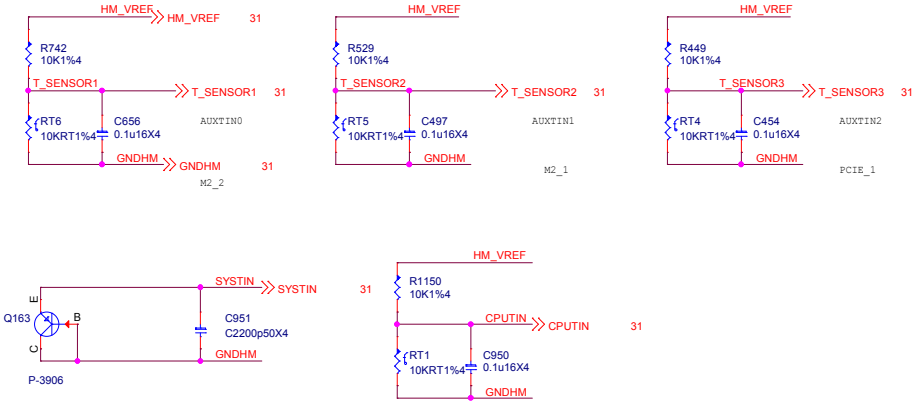






MICRO-STAR INT'L CO.,LTD	
MS-7A95	
Size: Custom	Document Description: SIO-NCT6793D-1
Rev: 1.0	
Date: Monday, May 15, 2017	Sheet 31 of 84

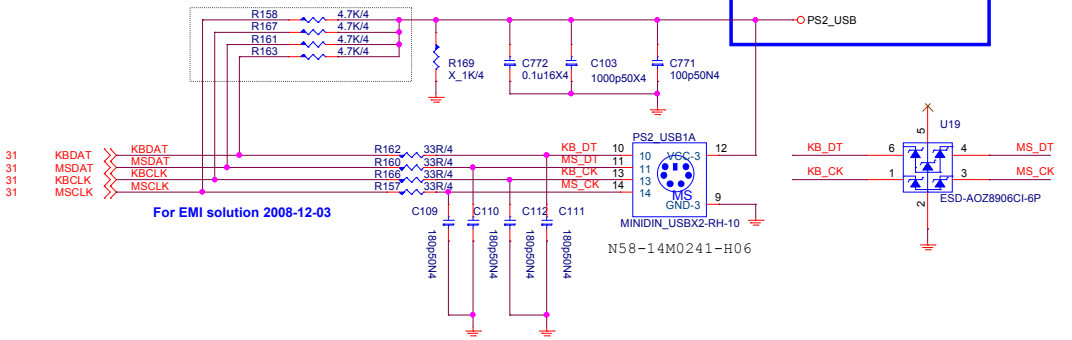
THERMAL



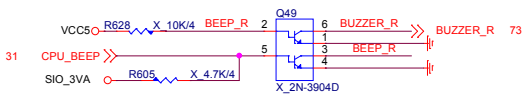
PS2 KEYBOARD & MOUSE CONNECTOR

0.5A

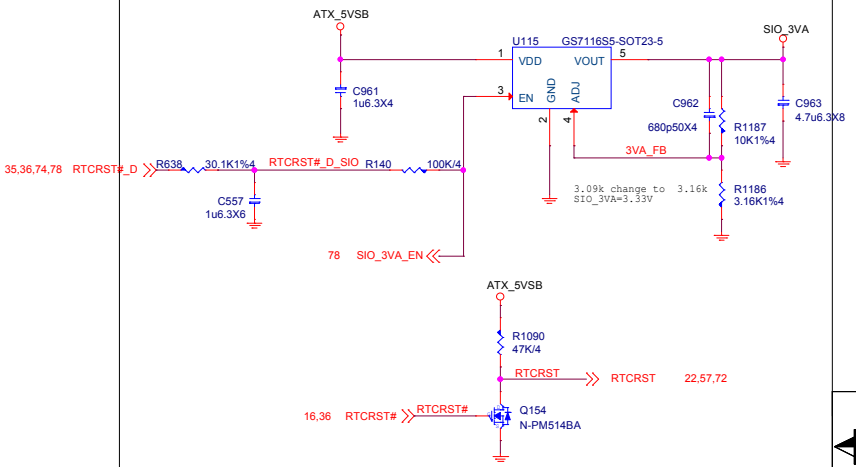
可以切換在s5
底下是不是要有電



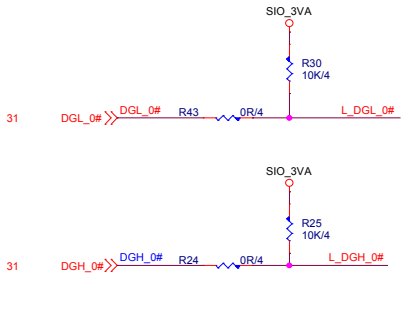
COM Port for BIOS Debug



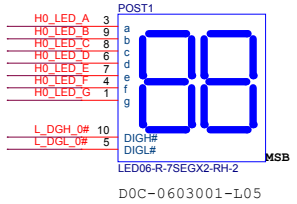
SLP_SUS Co-lay circuit

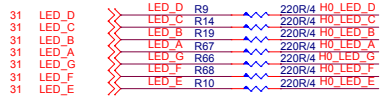


DEBUG LED



Debug LED OFF BIOS control





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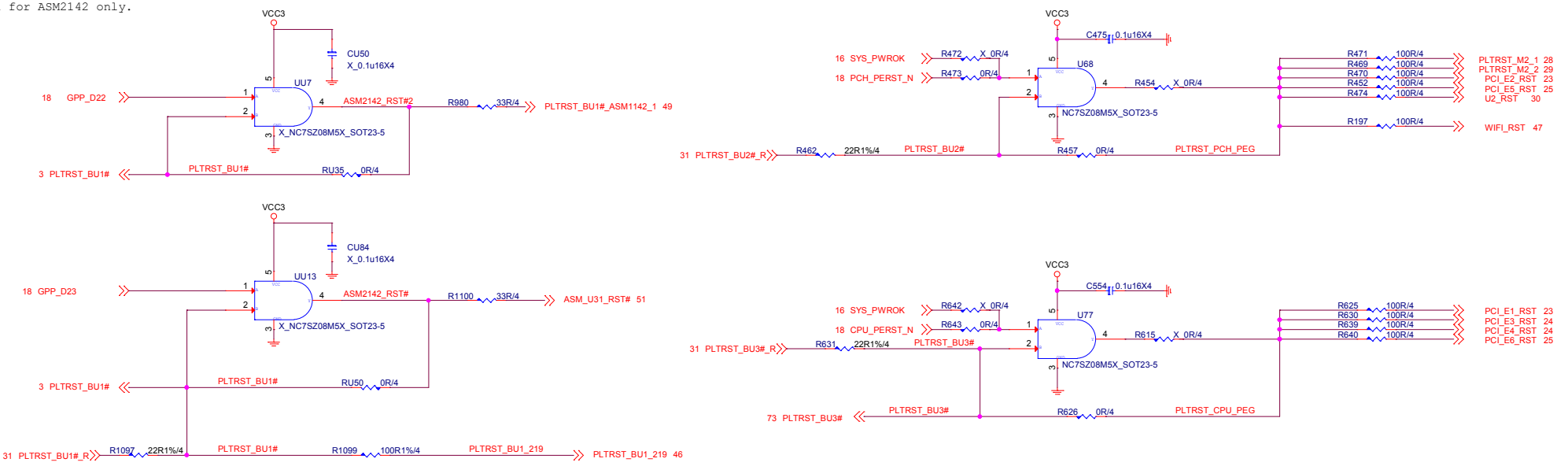
MS-7A95

Size	Document Description	Rev
Custom	SIO-NCT6793D-2	1.0

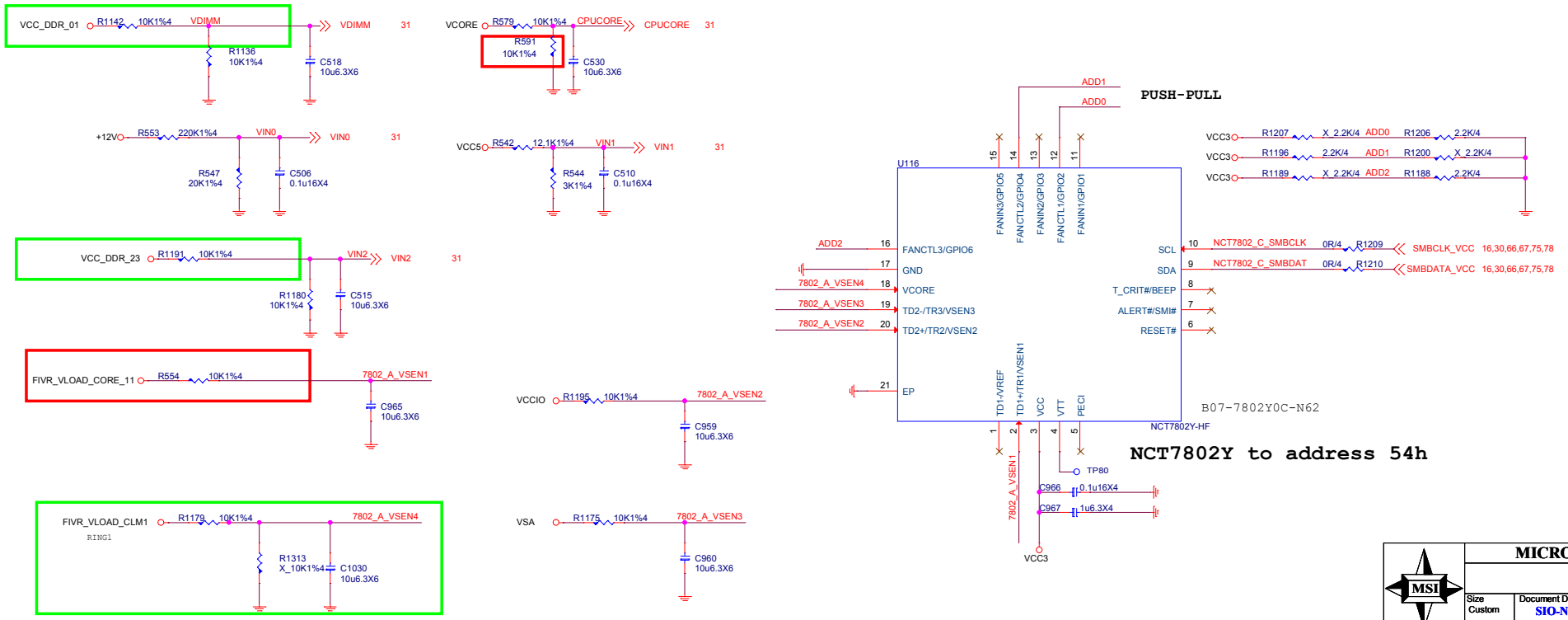
Date: Monday, May 15, 2017 Sheet 32 of 84

Reset control for ASM2142 only.



HW Monitor - Voltage

SIO HM Voltage voer 2V will not detect



MICRO-STAR INT'L CO.,LTD
MS-7A95
Size: Custom
Document Description: SIO-NCT6793D-3
Rev: 1.0
Date: Monday, May 15, 2017
Sheet 33 of 84

Part Number:N31-2061341-H06

16,55 PCH_SPI_CS0# PCH_SPI_CS0#
16,21,55 PCH_SPI_MOSI PCH_SPI_MOSI
16,21,55 PCH_SPI_MISO PCH_SPI_MISO
16,55 PCH_SPI_CLK PCH_SPI_CLK
16,21 PCH_SPI_IO2 PCH_SPI_IO2
16,21 PCH_SPI_IO3 PCH_SPI_IO3

SPI CS# < 25pF
D0G-0402510-SI0

SPI DEBUG PROT
Close to SPI ROM

SPI_VCC3 R779 0R/6 3VSB

close to JSPI1 for ESD use
SPI_VCC3 C687 0.1u16X4

JSPI1
PCH_SPI_MISO PCH_SPI_MOSI
PCH_SPI_CS# PCH_SPI_CLK
SPI_SW_SEL
PCH_SPI_IO2 PCH_SPI_IO3
H2X6[10]M-2PITCH_BLACK

PCH_SPI_CS0# R772 0R/4
D26 ESD-AOZ8131D1
C1027 0.1u16X4

ATX_5VSB R786 10K/4 SPI_SW_SEL SPI_SW_SEL 55,78
16,31 PCH_DPWROK D32 S-LRB520S-40T1G-HF
16,31 RSMRST# D31 S-LRB520S-40T1G-HF
16,22,31 CHIP_PWGD D33 X_S-LRB520S-40T1G-HF
31,35,72 SIO_SLPSUS D30 S-LRB520S-40T1G-HF

SPI_VCC3
R770 X_1K/4 PCH_SPI_MOSI
R771 X_1K/4 PCH_SPI_MISO

SPI FLASH ROM

Place close to SB.

M31-2512853-W03
AVL:M31-2512832-M24

16M ROM For X299

A BIOS
R747 2.2K/4
A_SPI1
SPI_CS1# PCH_SPI_MISO PCH_SPI_IO2
R750 33R/4 R754 33R/4
SPI1_MISO SPI1_IO2
CS SO(SIO1) WP(SIO2) GND VCC RESET(SIO3) SCLK SI(SIO0) EPAD
MX25L256-W25Q256
C661 0.1u16X4
C666 10u6.3X6
SPI1_IO3 SPI1_CLK SPI1_MOSI
R748 33R/4 R755 33R/4 R761 33R/4
PCH_SPI_IO3 PCH_SPI_CLK PCH_SPI_MOSI

B BIOS
R744 2.2K/4
B_SPI1
SPI_CS2# PCH_SPI_MISO PCH_SPI_IO2
R751 33R/4 R758 33R/4
SPI2_MISO SPI2_IO2
CS SO(SIO1) WP(SIO2) GND VCC RESET(SIO3) SCLK SI(SIO0) EPAD
MX25L256-W25Q256
C659 0.1u16X4
C662 10u6.3X6
SPI2_IO3 SPI2_CLK SPI2_MOSI
R746 33R/4 R753 33R/4 R763 33R/4
PCH_SPI_IO3 PCH_SPI_CLK PCH_SPI_MOSI

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

HW MODE

A BIOS
MEC1
BIOS_SW1
SW-DIP_BLACK-RH
N73-0100471-D02
A
B
C
SPI_SEL_R
SPI2_SW
C1028 0.1u16X4
R811 1K/4
R821 4.7K/4
SPI_SEL
SPI_VCC3
Skylake use SPI_VCC3

B BIOS
MEC2
SPI_VCC3
Skylake use SPI_VCC3
C714 0.1u16X4

SIO NCT6793 GP71
GPI default low
Active push pull high switch to SPI2
For auto testing in factory.

U92
PCH_SPI_CS#
SPI_SEL
31,35 SPI_SEL
R812 100K1%4
D S2 VCC GND IN S1
SPI_CS1#
SPI_CS2#
NC7SB3157P6X_SOT323-6
IN=0 , D connected to S2 (SPI1- A Bios)
IN=1 , D connected to S1 (SPI2- B Bios)

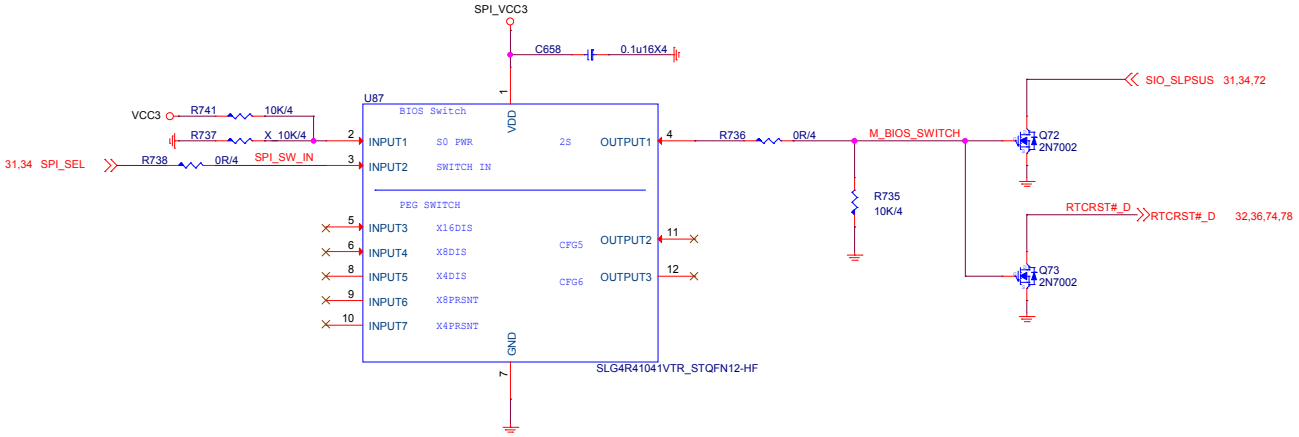
VCC5
R773 4.7K/4
A_BIOS1 LED04-R-20mA2.4V_1608-HF
R767 1K/4
B_BIOS1 LED04-W-20mA3.9V

ATX_5VSB
R805 47K/4
SPI_SEL
Q84 2N7002
Q76 2N7002D
SPI_SEL G2 D2 D1 S2
SPI1_SW G1 S1

ATX_5VSB
C688 X_1u6.3X4
R778 X_47K/4
U90 X_GS7116S5-SOT23-5
VDD VOUT EN GND ADJ
C712 X_680p50X4
R803 X_10K1%4
SPI_FB
C689 X_22u6.3X8
SPI_VCC3
SIO_SLPSUS
Q77 X_2N7002
R793 X_3.09K1%4

MICRO-STAR INT'L CO.,LTD
MS-7A95
Size Custom
Document Description Dual BIOS
Rev 1.0
Date: Monday, May 15, 2017
Sheet 34 of 84

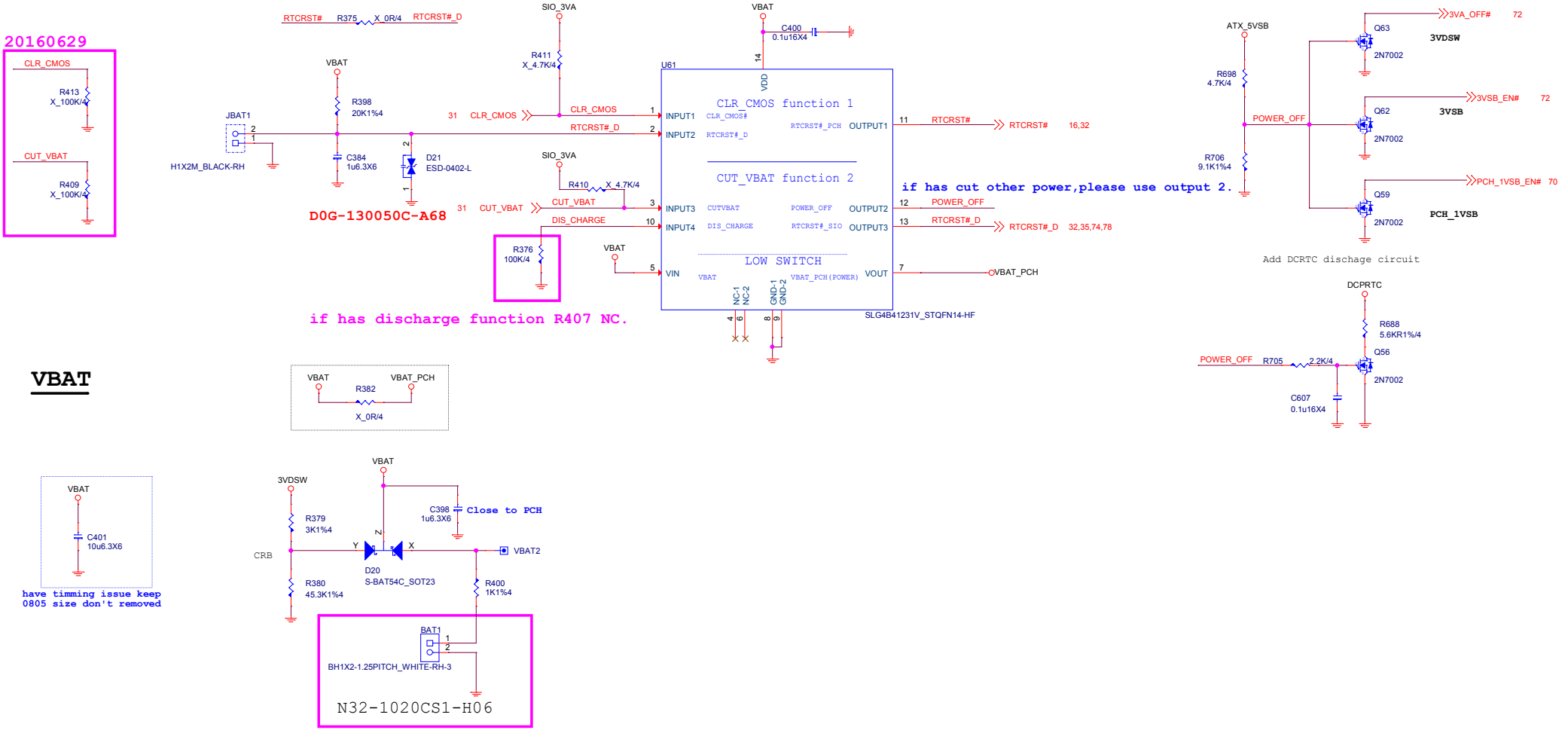
Skylake/Kabylake Path Circuit For Dual Bios



MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: Dual bios control-Silego	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 35 of 84	

CUT VBAT

20160629

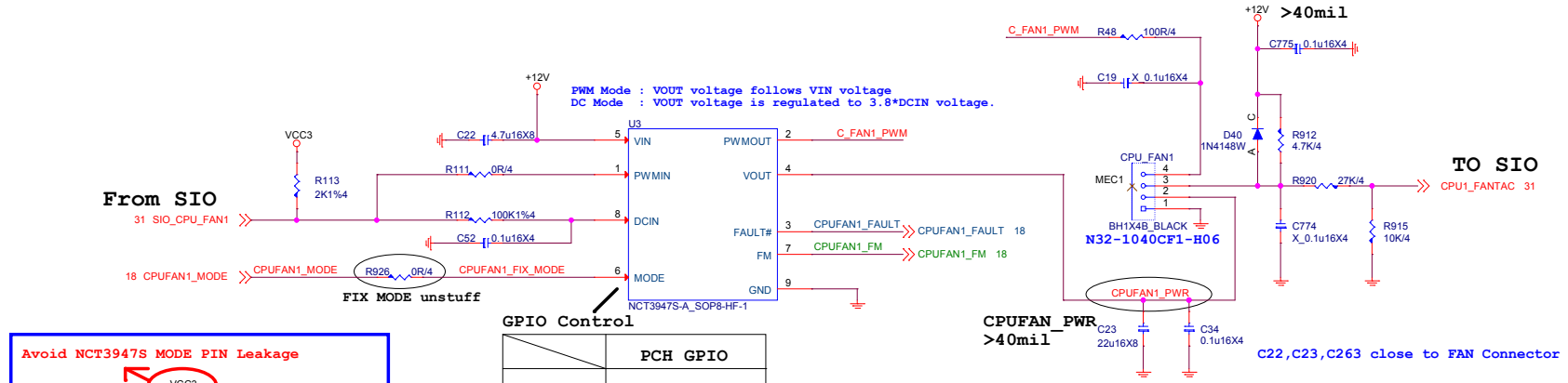


VBAT

have timming issue keep
0805 size don't removed

MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: CLR COMS/CUT VBAT	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 36 of 84	

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

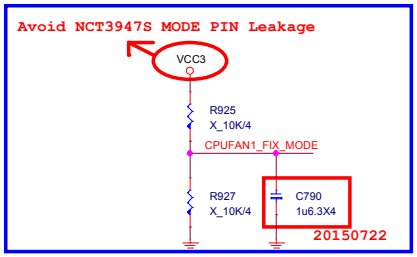


GPIO Control

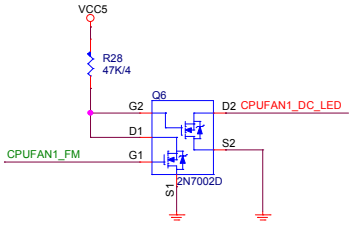
	PCH GPIO
PWM MODE	HIGH
DC MODE	LOW
AUTO MODE	GPI(Floating)

Default

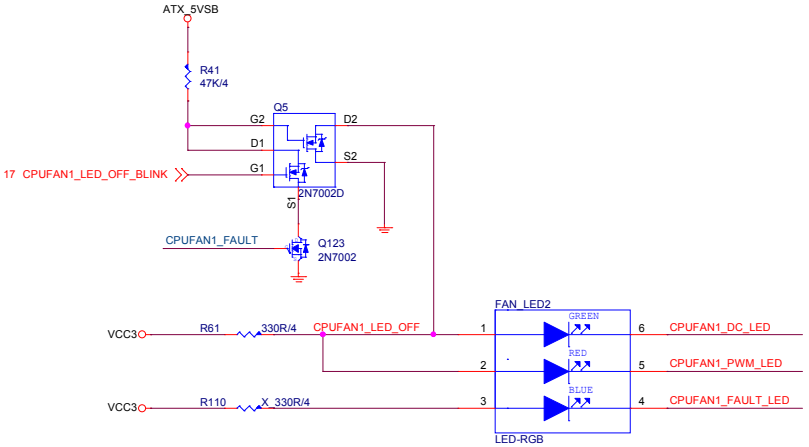
Internall pull up 1.65V



Resever For FIX DC or PWM MODE USE By PM SPEC



CHECK NCT3947S Sink Current

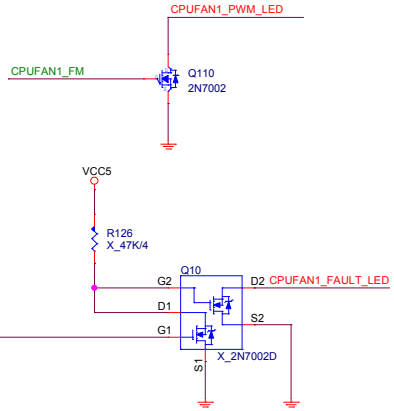


Forward Current 20mA
Pulse Forward Current 40-60mA

RGB

D0C-040S400-H91

DC_FAN_LED(綠)
PWM_FAN_LED(藍)
FAN_OCP_LED(紅)



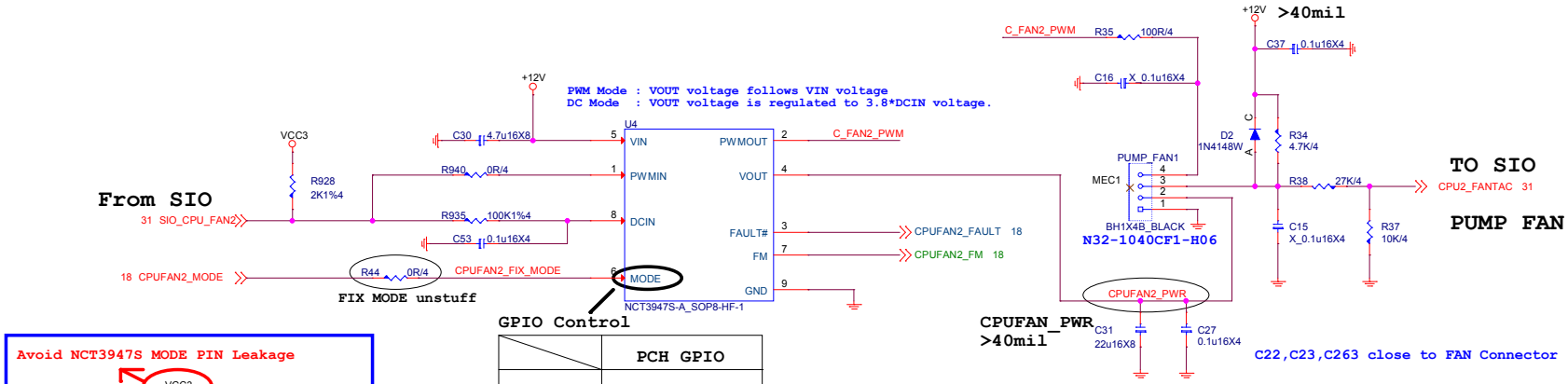
MICRO-STAR INT'L CO.,LTD

MS-7A95

Size	Document Description	Rev
Custom	CPU FAN1	1.0

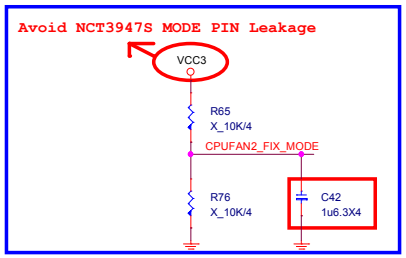
Date: Monday, May 15, 2017 Sheet 37 of 84

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

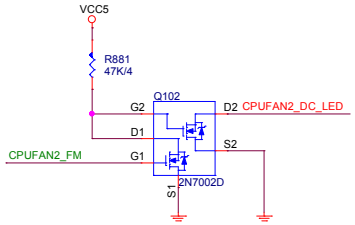


	PCH GPIO
PWM MODE	HIGH
DC MODE	LOW
Default AUTO MODE	GPI(Floating)

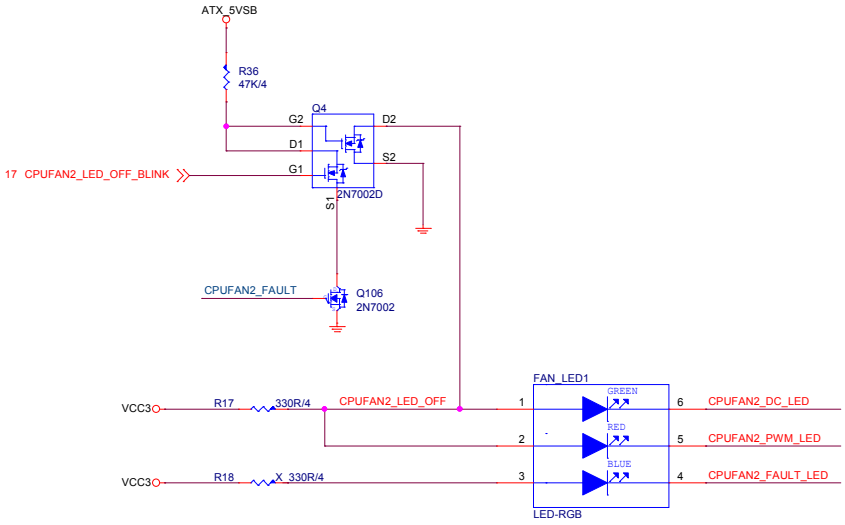
Internall pull up 1.65V



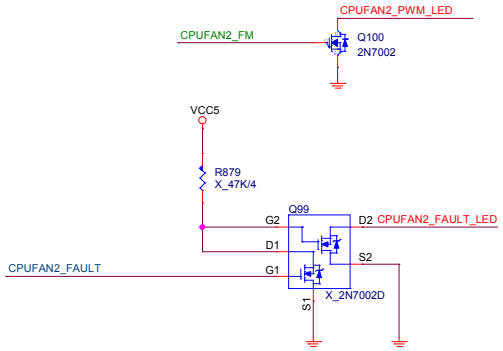
Resever For FIX DC or PWM MODE USE By PM SPEC



CHECK NCT3947S Sink Current



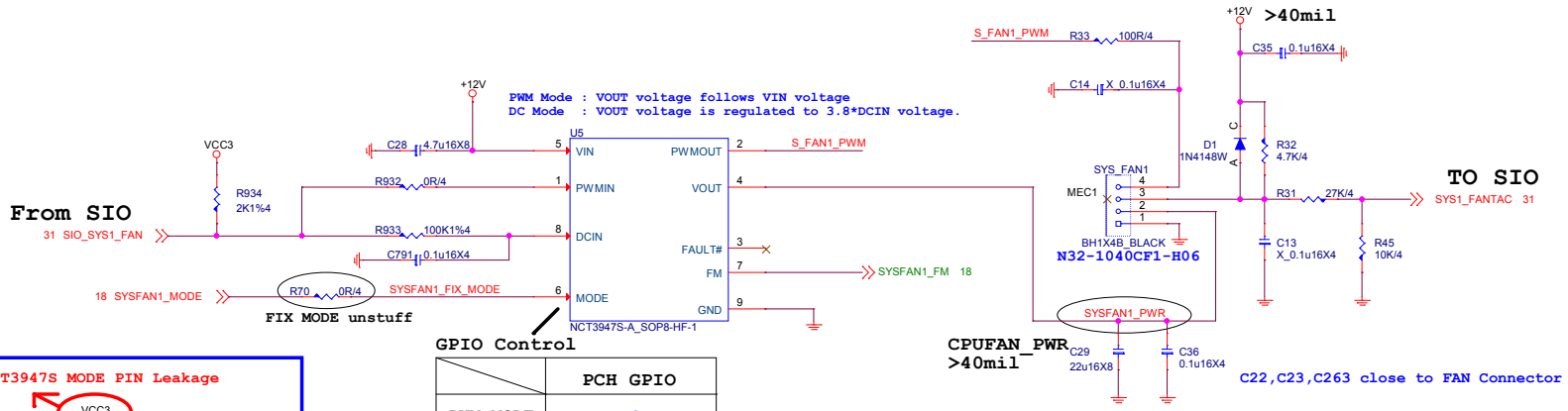
D0C-040S400-H91



CHECK NCT3947S Sink Current

MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: CPU FAN2	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 38 of 84	

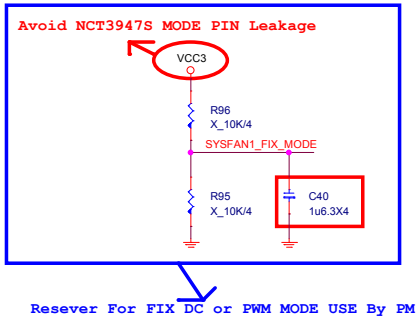
TYPE L : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO



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

Default

Internall pull up 1.65V



Resever For FIX DC or PWM MODE USE By PM SPEC

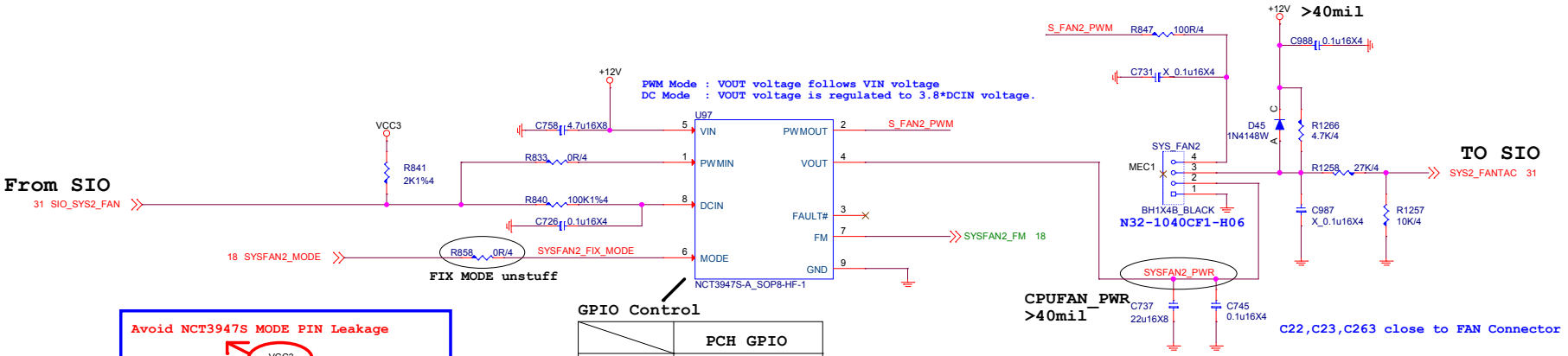
MICRO-STAR INT'L CO.,LTD

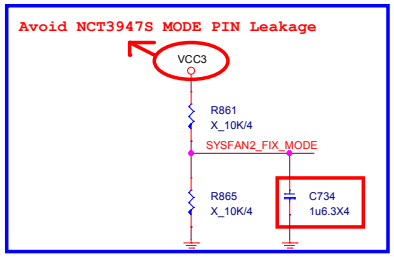
MS-7A95

Size: Custom | Document Description: SYSTEM FAN1 | Rev: 1.0

Date: Monday, May 15, 2017 | Sheet 39 of 84

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





Resever For FIX DC or PWM MODE USE By PM SPEC

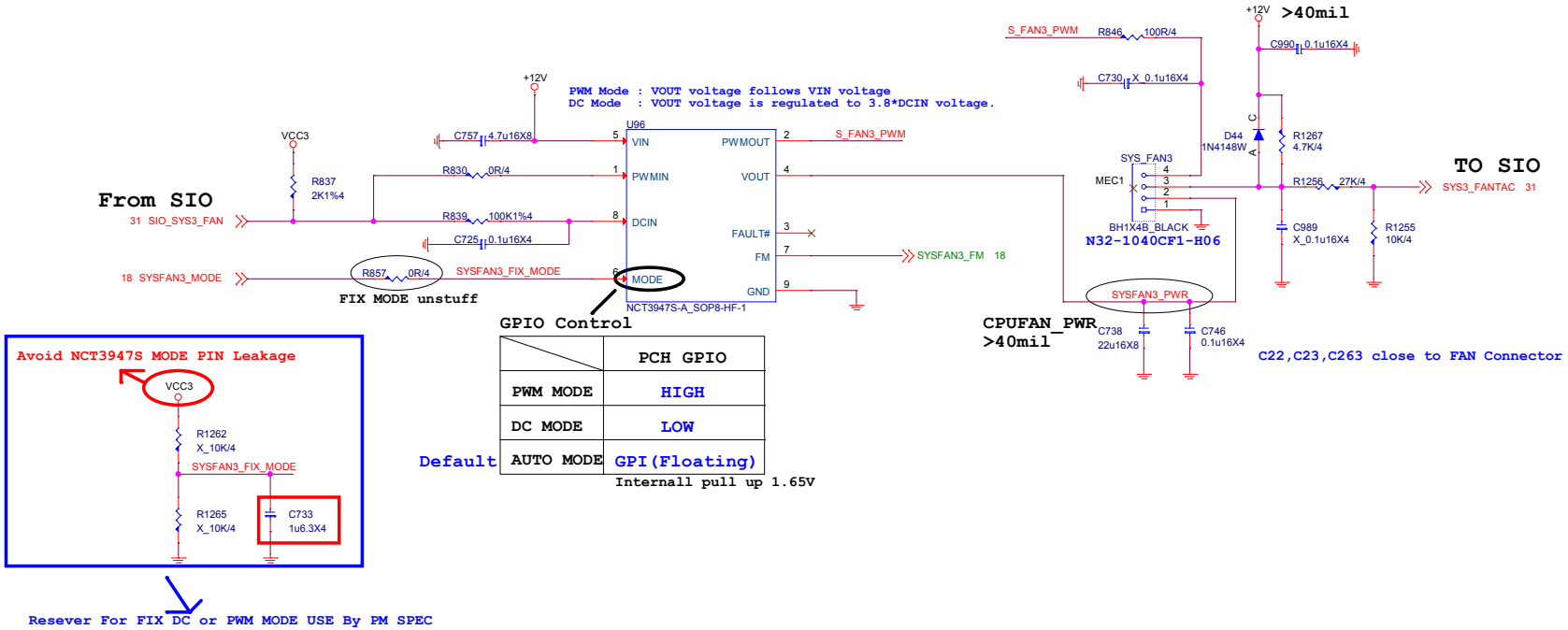
GPIO Control

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

Internall pull up 1.65V

MICRO-STAR INT'L CO.,LTD	
MS-7A95	
Size: Custom	Document Description: SYSTEM FAN2
Rev: 1.0	
Date: Monday, May 15, 2017	Sheet 40 of 84

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



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

Internall pull up 1.65V

Resever For FIX DC or PWM MODE USE By PM SPEC

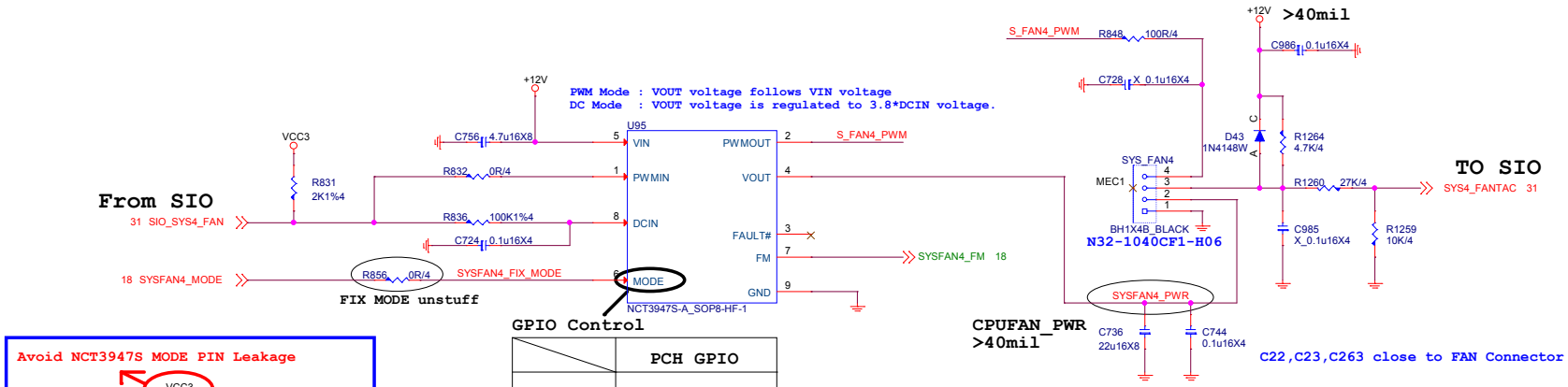
MICRO-STAR INT'L CO.,LTD

MS-7A95

Size	Document Description	Rev
Custom	SYSTEM FAN3	1.0

Date: Monday, May 15, 2017 Sheet 41 of 84

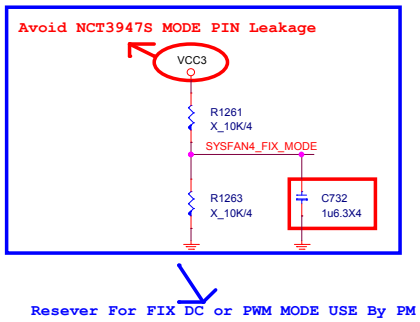
TYPE L : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO



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

Default

Internall pull up 1.65V



Resever For FIX DC or PWM MODE USE By PM SPEC

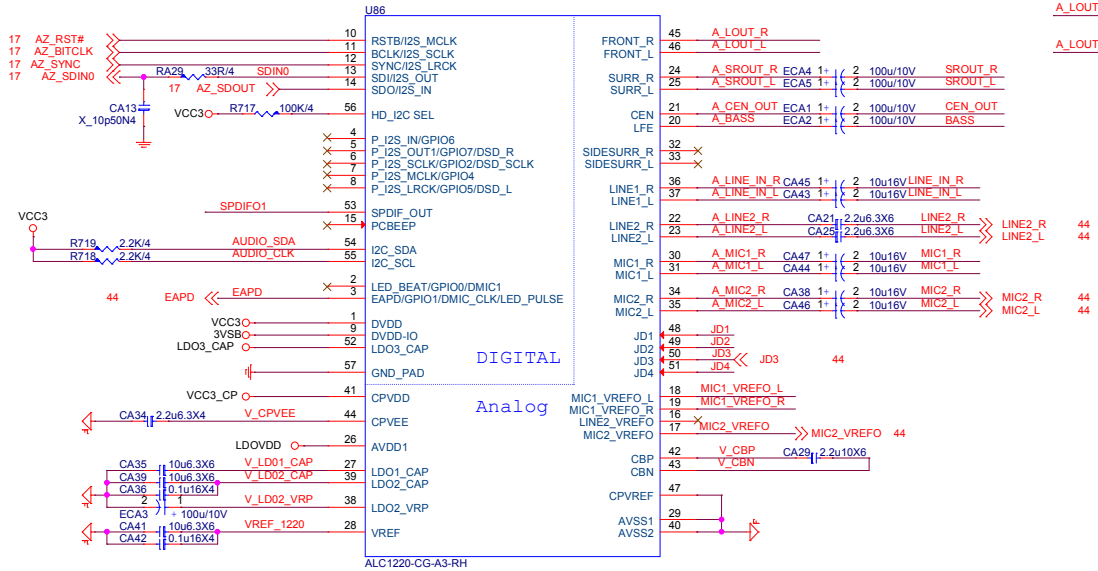
MICRO-STAR INT'L CO.,LTD

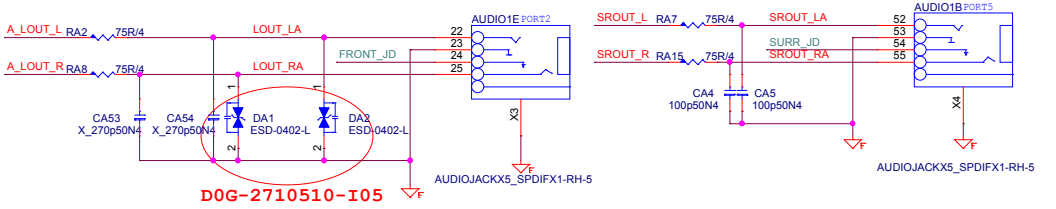
MS-7A95

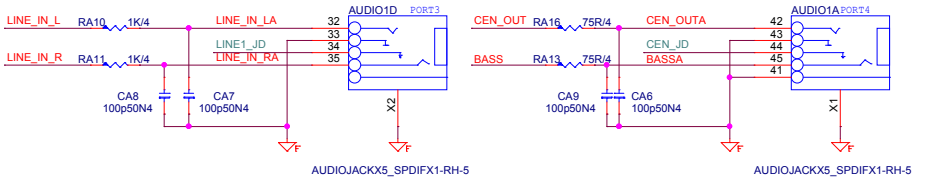
Size	Document Description	Rev
Custom	SYSTEM FAN4	1.0

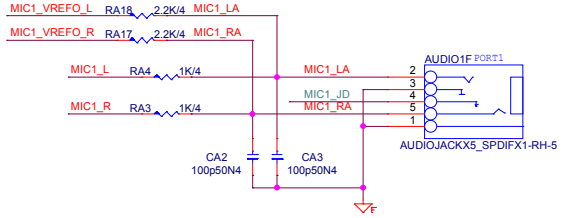
Date: Monday, May 15, 2017 Sheet 42 of 84

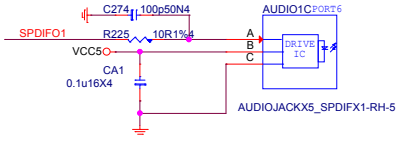
ALC1220

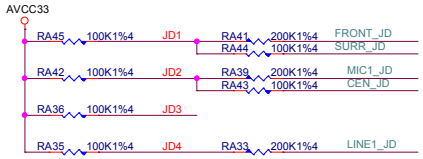


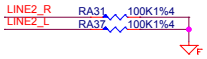


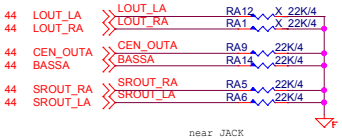


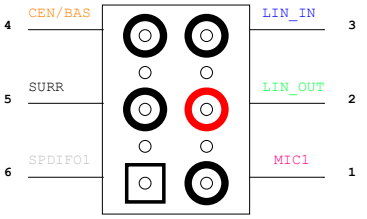


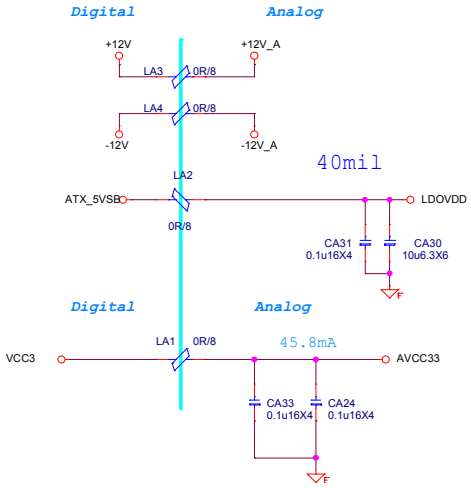




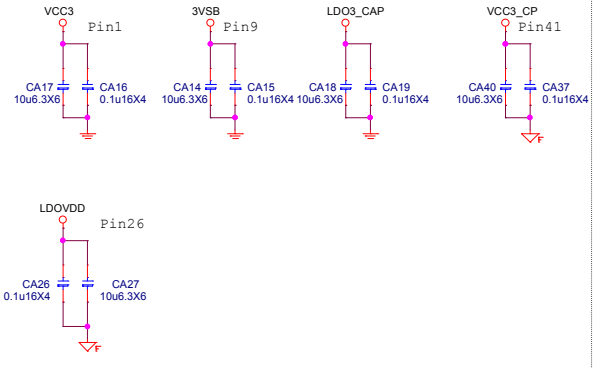




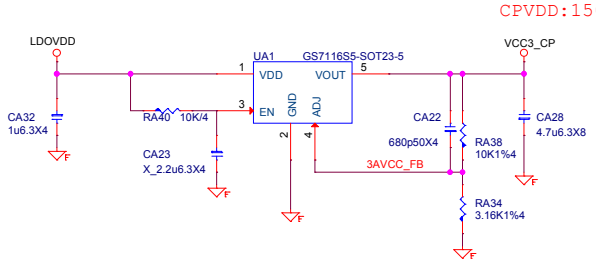




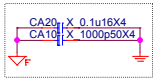
Closed Codec



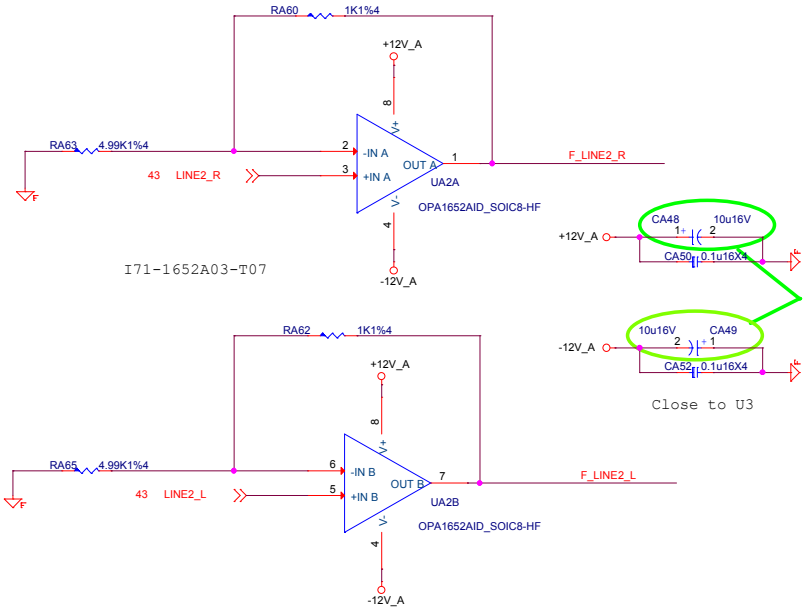
CPVDD POWER:ATX5VSB will Leakage to CVDD by ALC1220, so CVDD must keep 3.3V

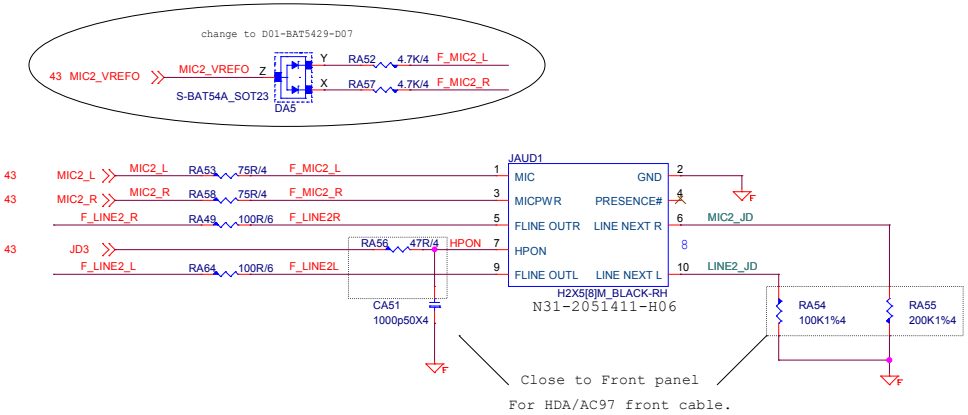


EMI



MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: AUDIO-ACL1220-1	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 43 of 84	

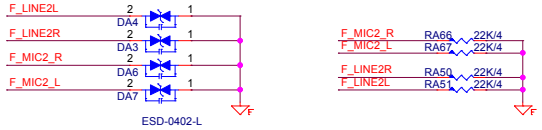




Close to Jack

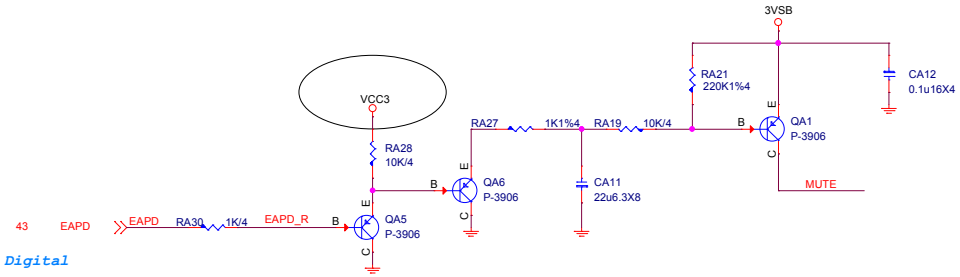
ESD protect

D0G-2950500-SI0
D0G-3010510-I05

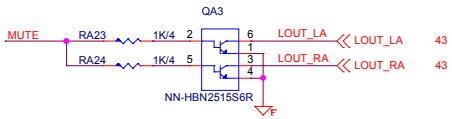


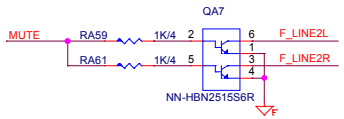
Rear Line OUT De-POP circuit

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

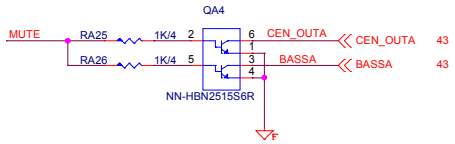


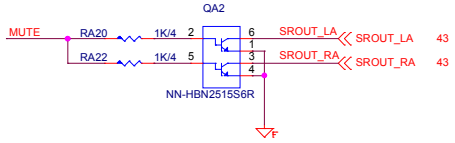
Analog





(add de-pop circuit by PM spec or customer request,
NOTE: add de-pop circuit need to change CA6,CA7, CA12, CA13, CA23, CA24 to TVS)





MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: AUDIO-ACL1220-2	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 44 of 84	

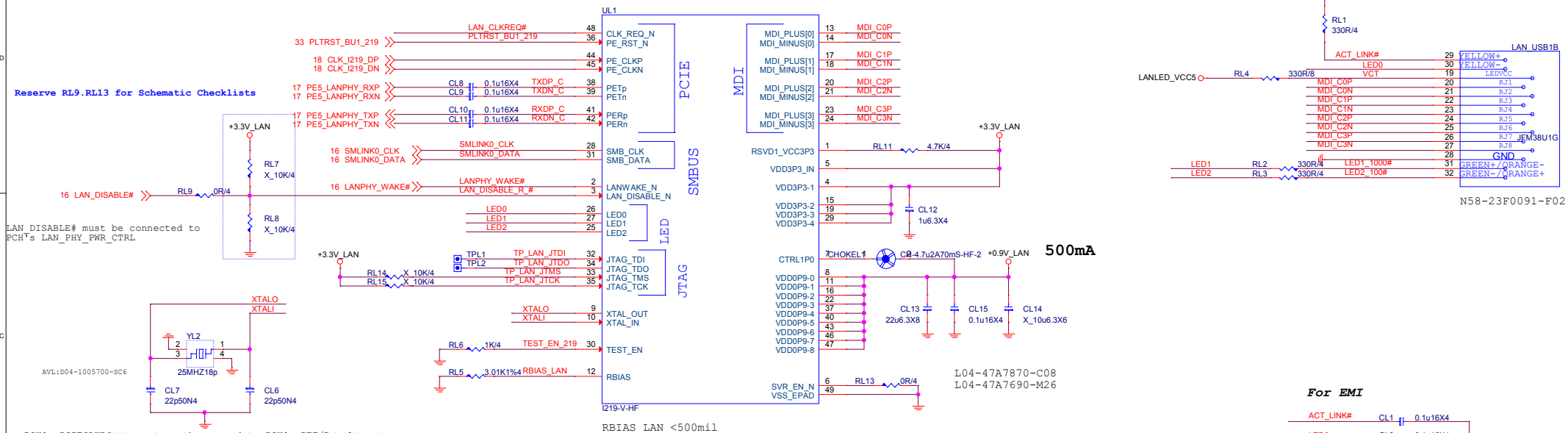
MICRO-STAR INT'L CO.,LTD

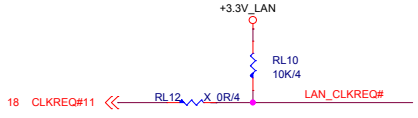
MS-7A95

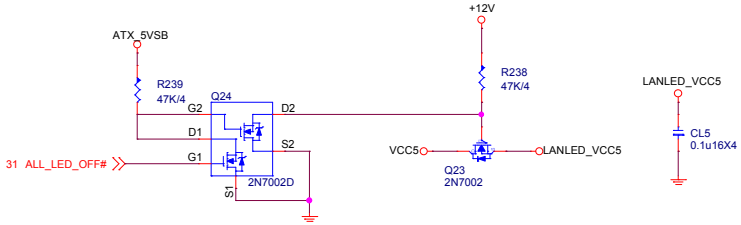
Size	Document Description	Rev
Custom	AUDIO-ACL1220-3	1.0

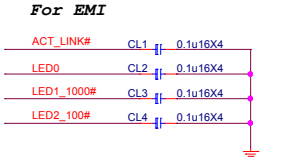
Date: Monday, May 15, 2017 Sheet 45 of 84

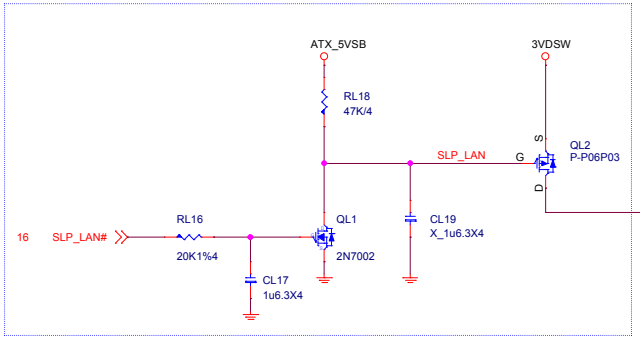
Intel I219V / I218V PHY











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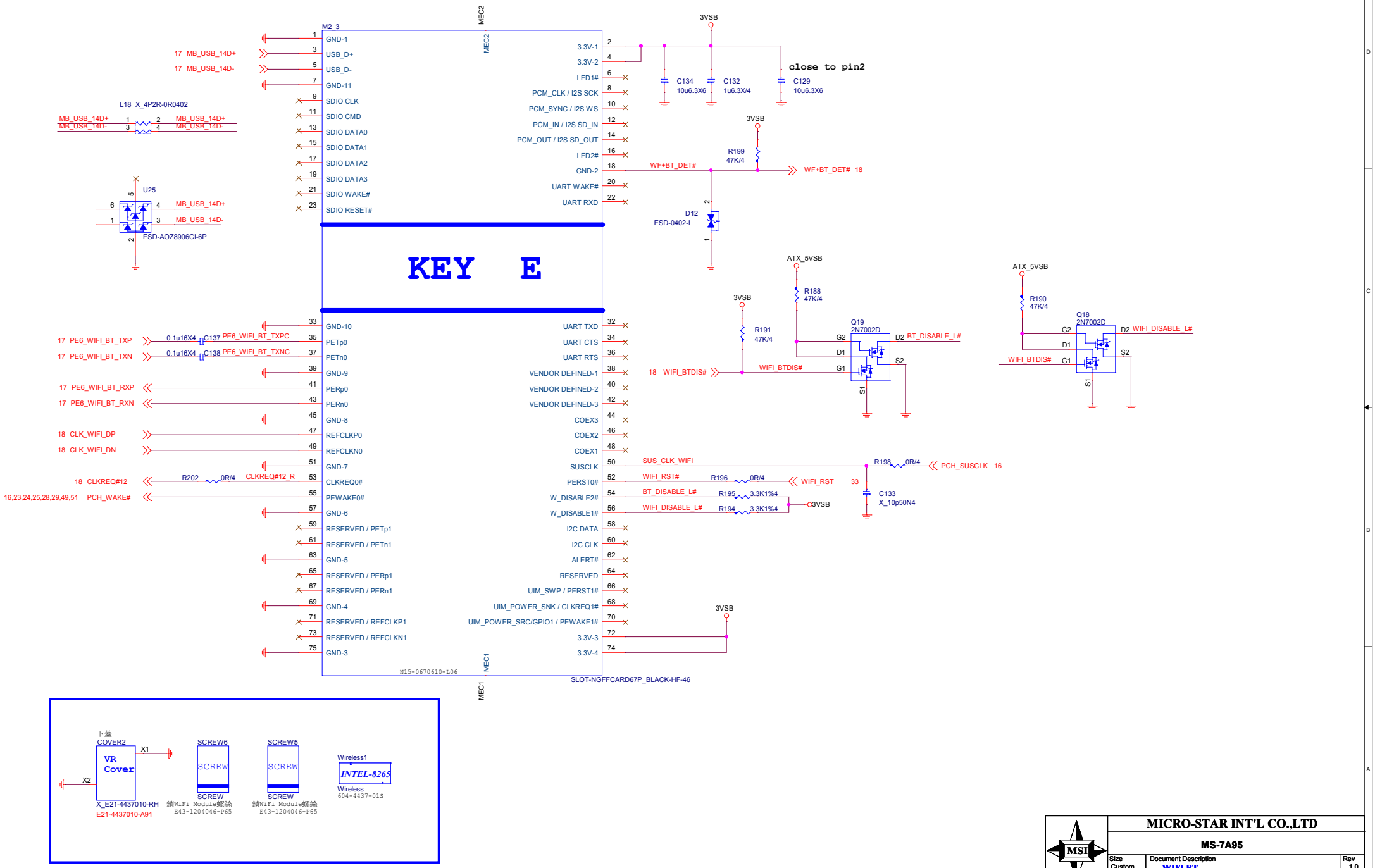
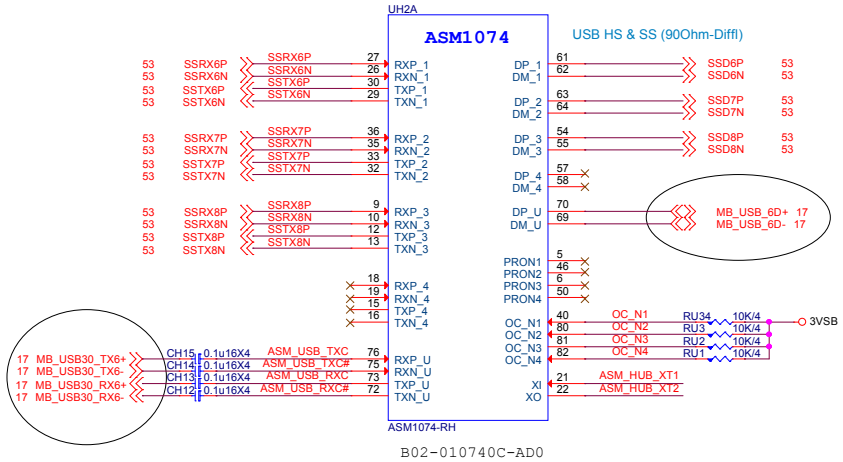
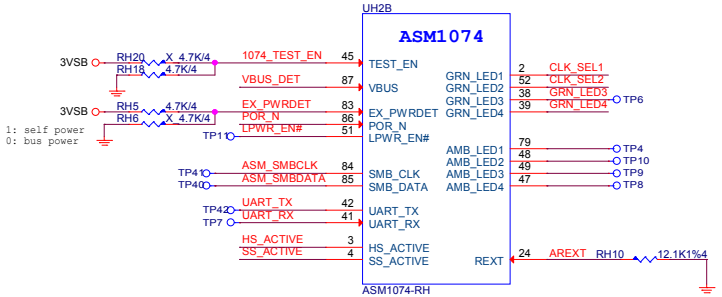
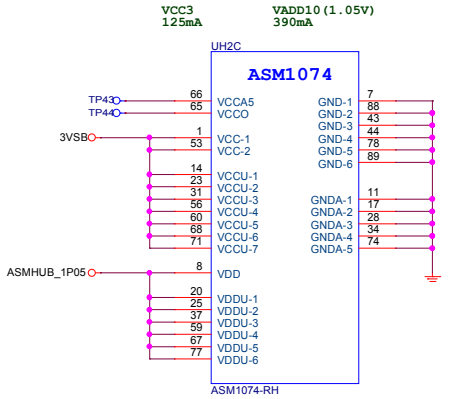
MS-7A95		
Size: Custom	Document Description: Intel Lan- i219	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 46 of 84	

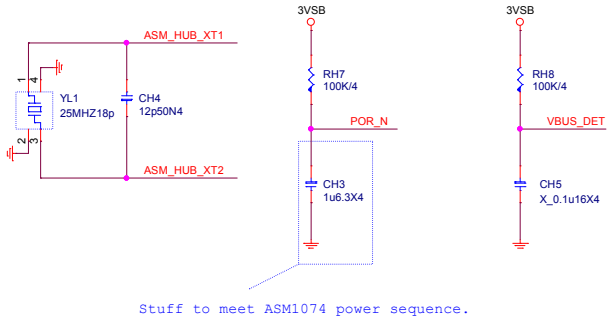


MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: WIFI BT	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 47 of 84	

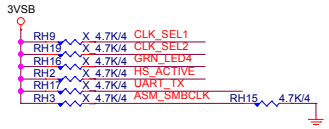








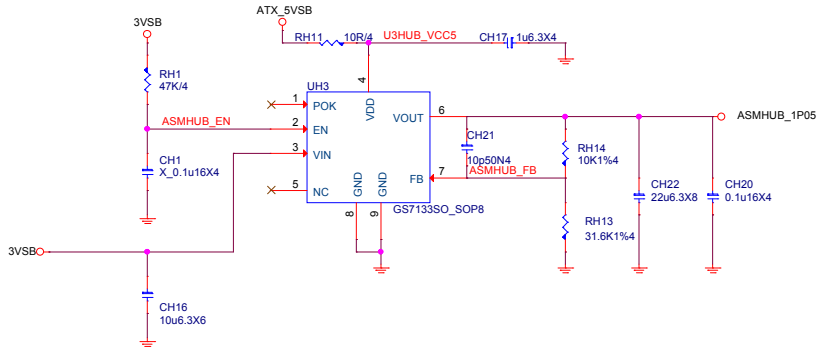
H/W Strapping

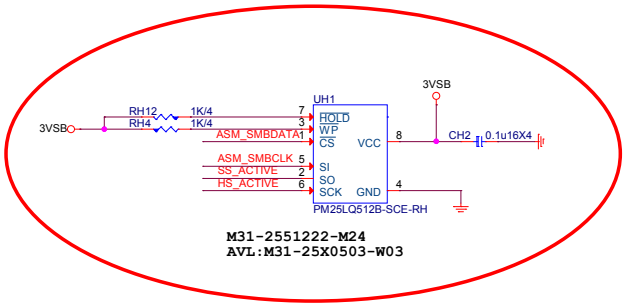


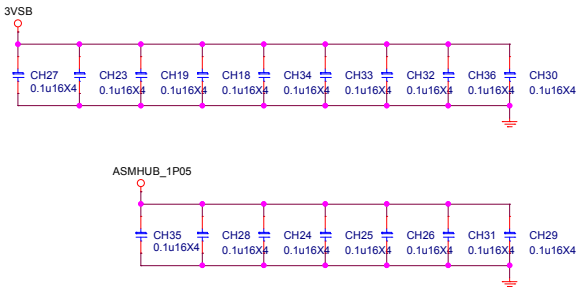
Strapping Table

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

ASM1074 USB3.0 HUB core Power



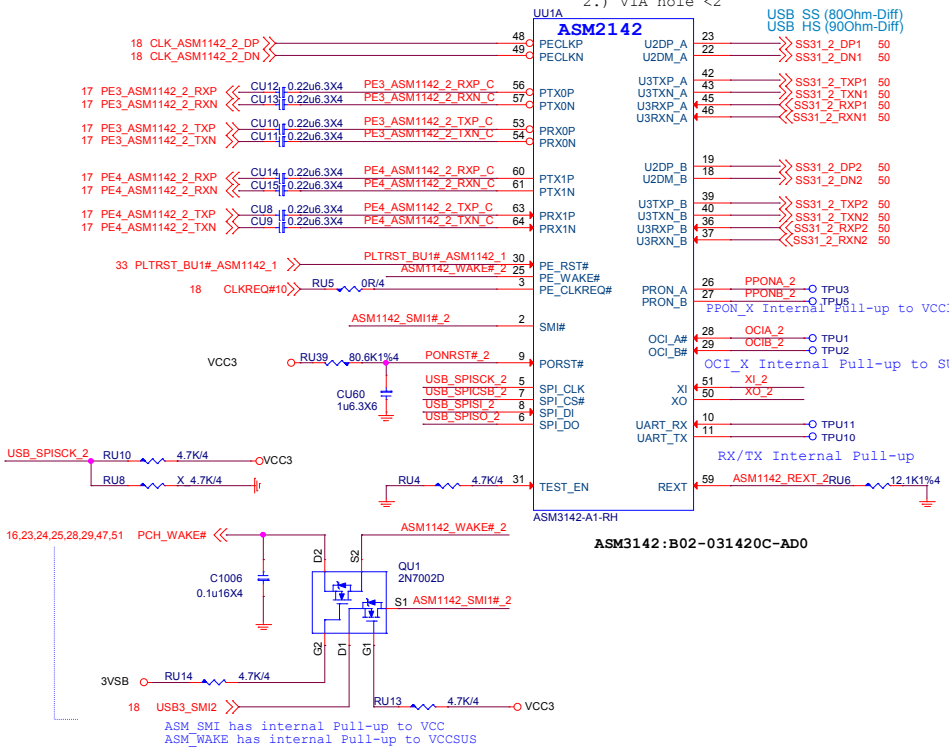




MICRO-STAR INT'L CO.,LTD	
MS-7A95	
Size: Custom	Document Description: ASM1074 USB3.0 HUB
Rev: 1.0	
Date: Monday, May 15, 2017	Sheet 48 of 84

Layout Guide:

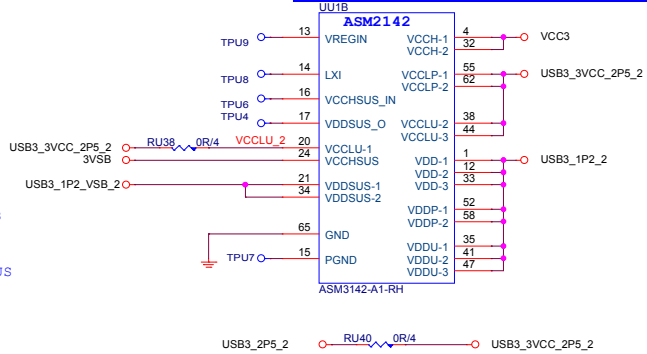
1.) USB3.1 to Connector Total Length < 1.5"
2.) VIA hole <2

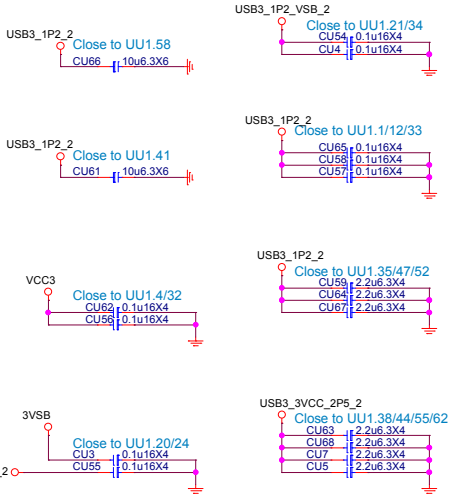


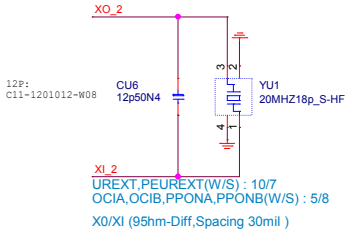
ASM3142:B02-031420C-AD0

Power Consumption

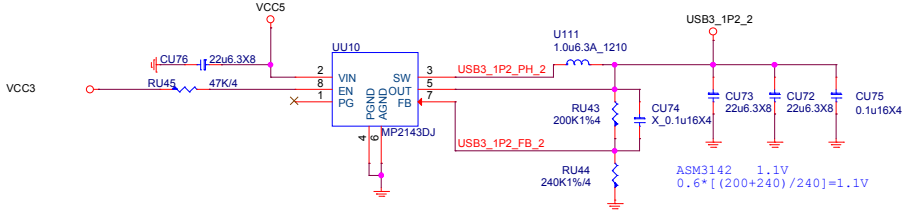
	3.3V	1.2V(1.05V)	3.3VSUS	1.05VSUS(1.2VSUS)	2.5V	Total Power
ASM1142	245mA	634mA	1mA	1mA	NA	1573.8(mW)
ASM2142	300mA	800mA	100mA	50mA	300mA	TDP
ASM3142	TBD	TBD	TBD	TBD	TBD	TBD

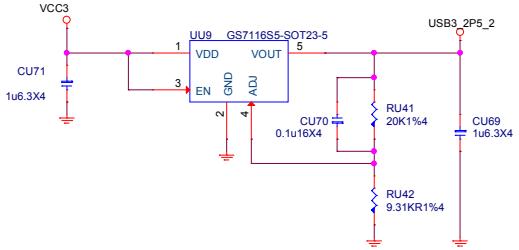




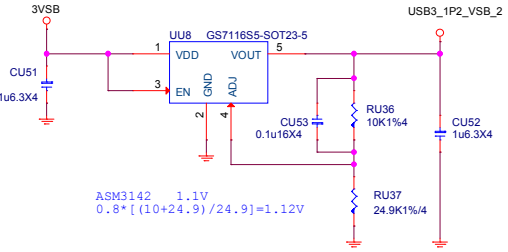


ASM3142 1.1 VCC Power

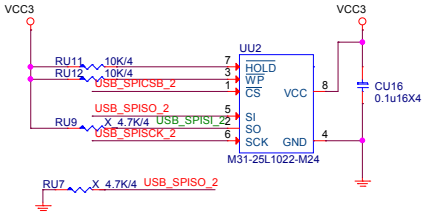




ASM3142 1.1 VSB Power



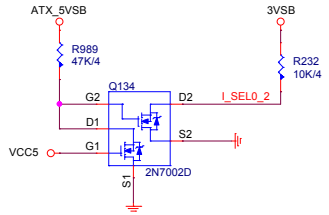
EEPROM



M31-25L1022-M24(1M)
AVL:M31-25X2023-W03(2M)

MSI	MICRO-STAR INT'L CO.,LTD		
	MS-7A95		
Size: Custom	Document Description: 49.ASM2142AE REAL-USB31-1		Rev: 1.0
Date: Tuesday, May 16, 2017	Sheet 49 of 84		

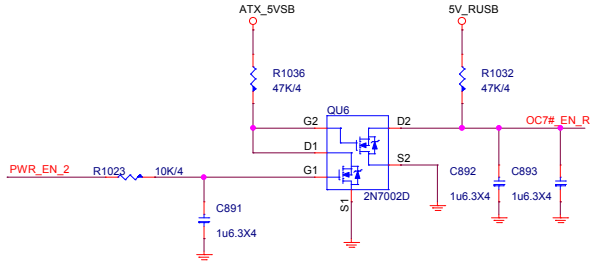
Current Mode

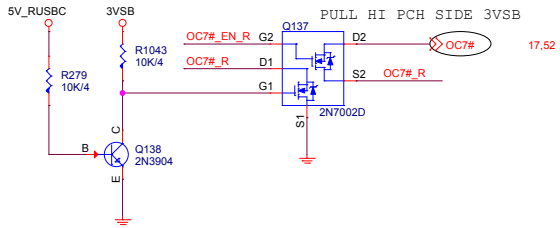


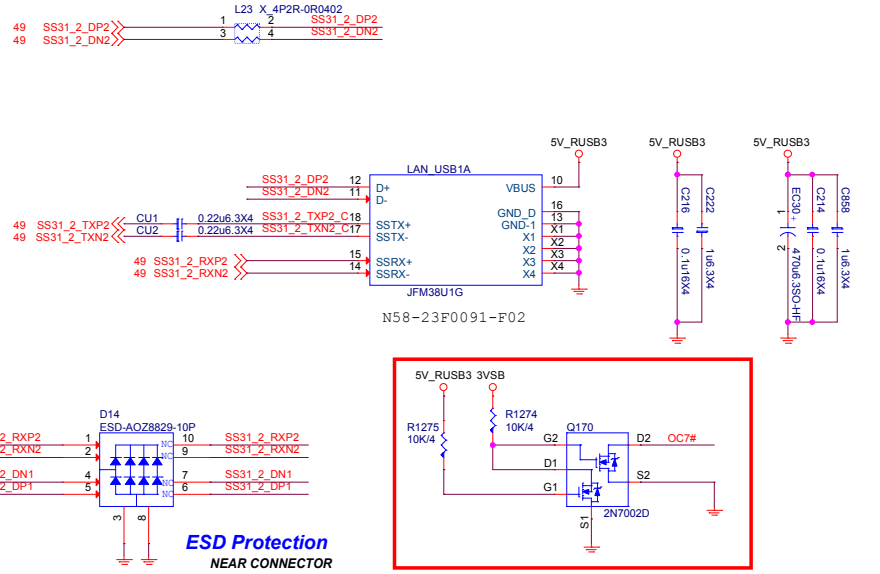
0	X	Default for 900mA
1	0	1.5A @5V
1	1	3A @5V

1.5A under S3 mode
3A under S0 mode

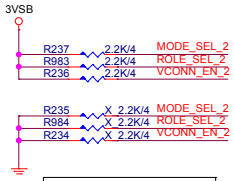
VBUS OC#







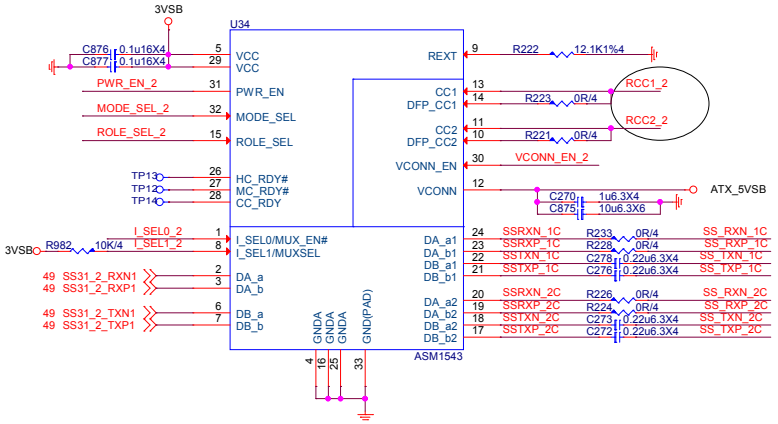
USB Type-C MUX with Configuration Channel (CC)

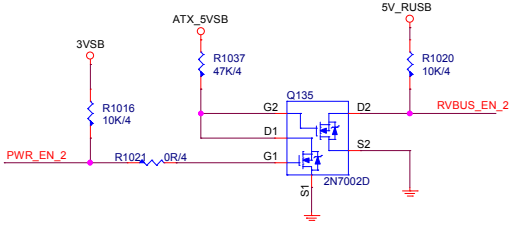


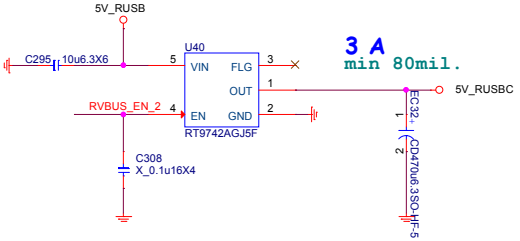
MODE_SEL	
1	CCL MODE (default)
0	Mux MODE

ROLE_SEL	
1	DFP role (default)
0	UFP role

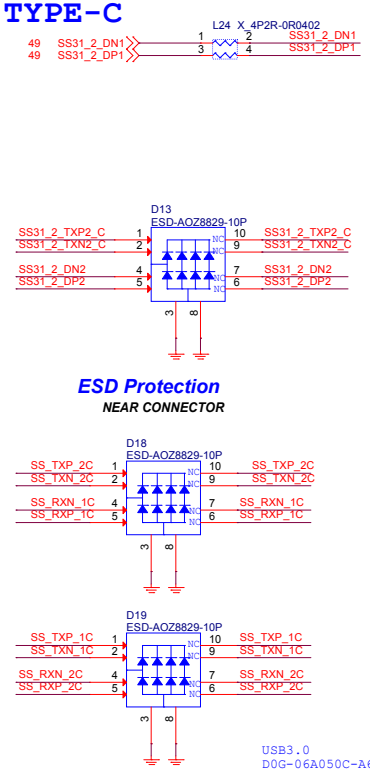
VCONN_EN	
1	enable
0	disable

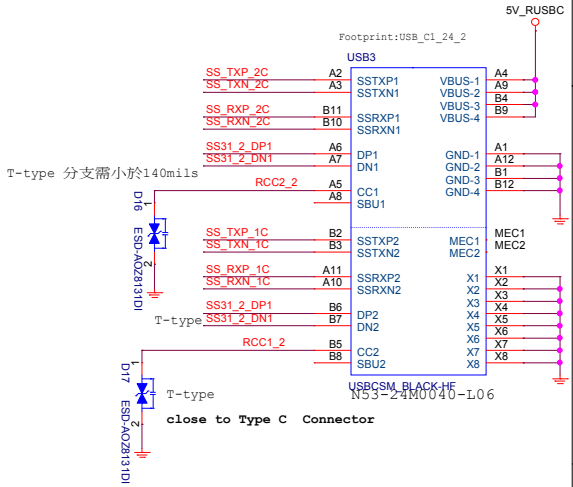


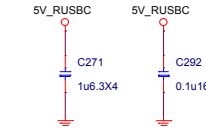




TYPE-C







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

MICRO-STAR INT'L CO.,LTD			
MS-7A95			
Size: Custom	Document Description: USB TYPEC/A-2		Rev: 1.0
Date: Monday, May 15, 2017	Sheet 50 of 84		

Layout Guide:

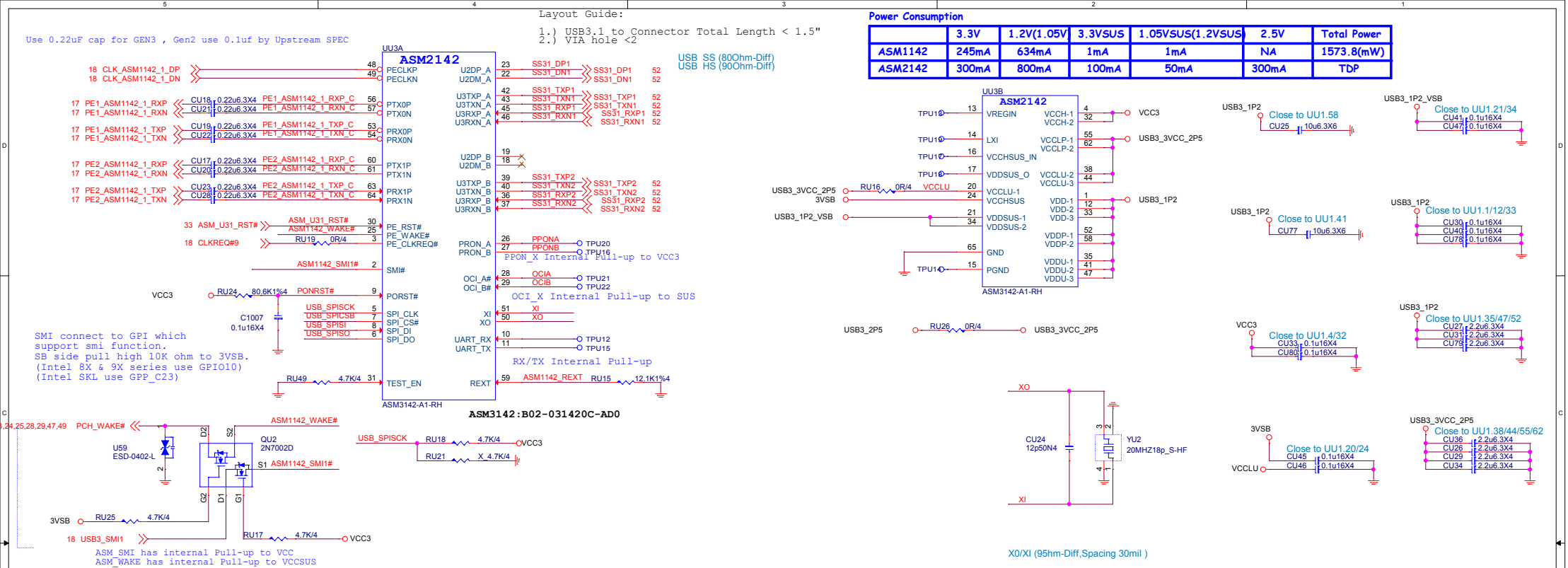
1.) USB3.1 to Connector Total Length < 1.5"
2.) VIA hole <2

Use 0.22uF cap for GEN3 , Gen2 use 0.1uf by Upstream SPEC

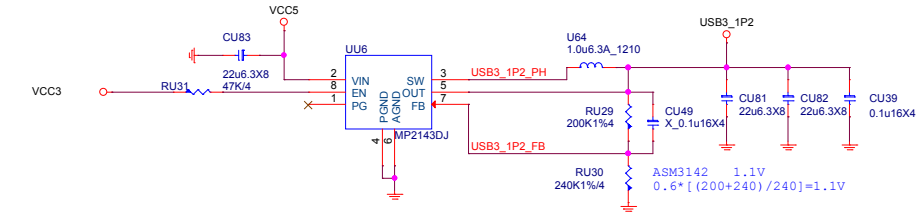
USB SS (80Ohm-Diff)
USB HS (90Ohm-Diff)

Power Consumption

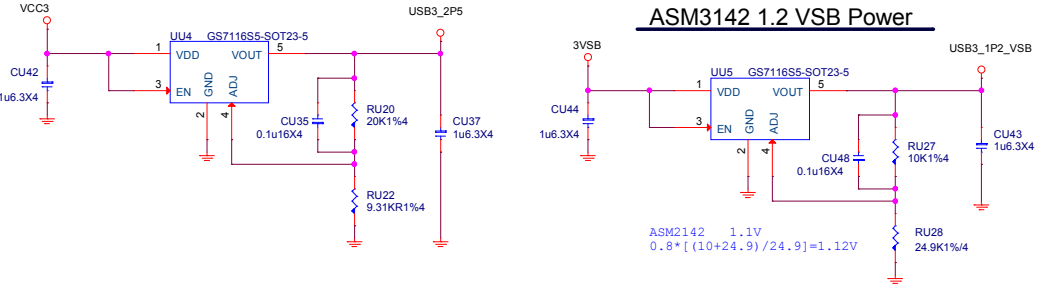
	3.3V	1.2V(1.05V	3.3VSUS	1.05VSUS(1.2VSUS	2.5V	Total Power
ASM1142	245mA	634mA	1mA	1mA	NA	1573.8(mW)
ASM2142	300mA	800mA	100mA	50mA	300mA	TDP



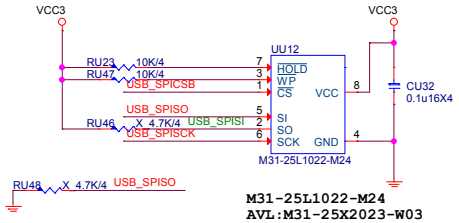
ASM3142 1.2 VCC Power



ASM3142 1.2 VSB Power



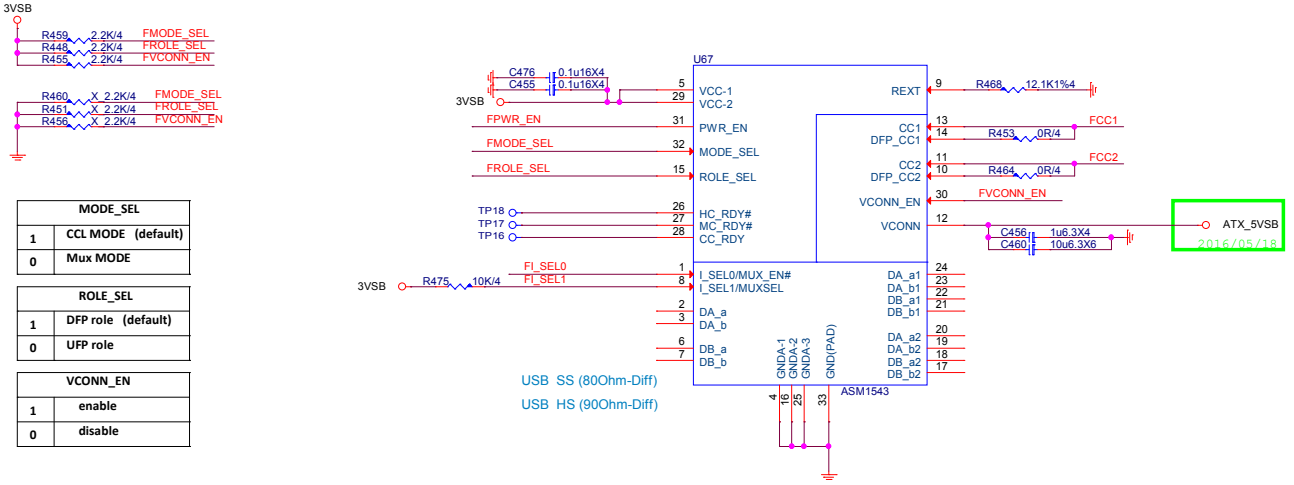
EEPROM



MICRO-STAR INT'L CO.,LTD	
MS-7A95	
Size: Custom	Document Description: 51.ASM2142AE FRONT-USB31-2
Rev: 1.0	
Date: Tuesday, May 16, 2017	Sheet 51 of 84

USB 3.1-Type-C

USB Type-C MUX with Configuration Channel (CC)

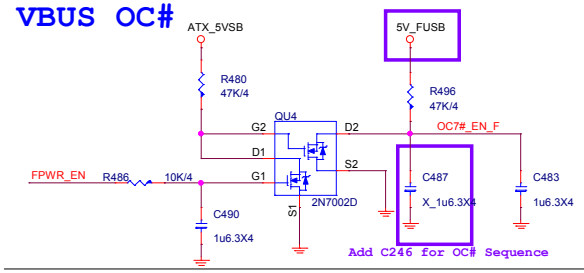


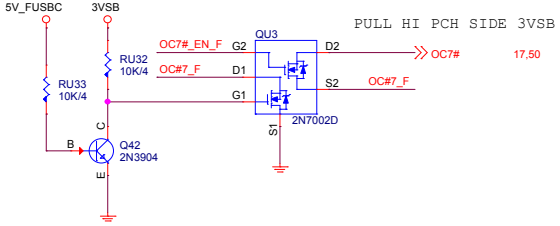
MODE_SEL	
1	CCL MODE (default)
0	Mux MODE

ROLE_SEL	
1	DFP role (default)
0	UFP role

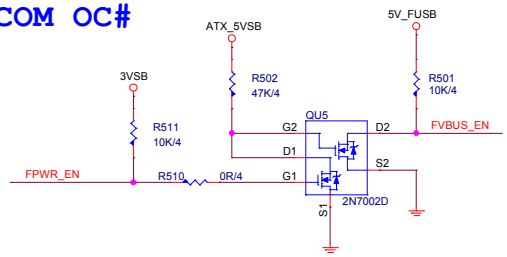
VCONN_EN	
1	enable
0	disable

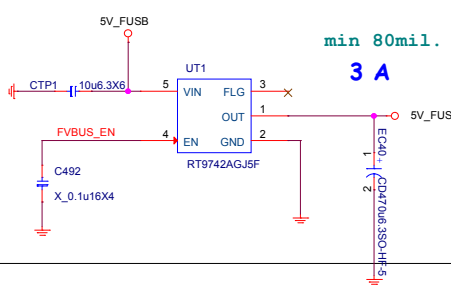
VBUS OC#



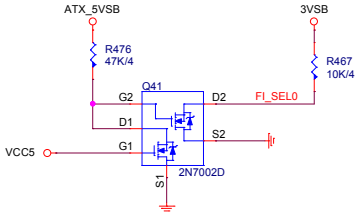


VCOM OC#





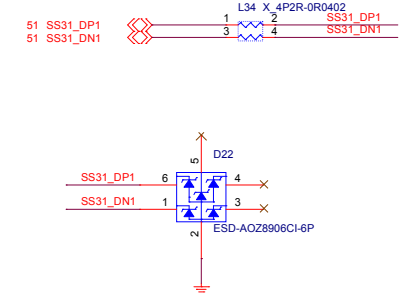
Current Mode

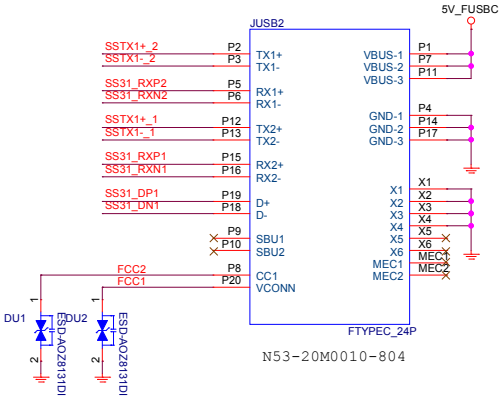


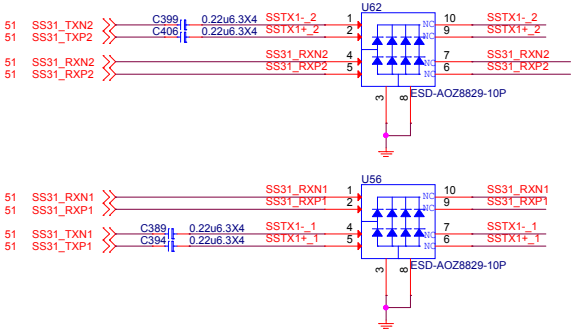
I_SEL0 : I_SEL1

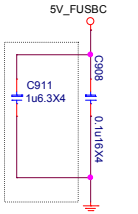
X	0	Default for 900mA
0	1	1.5A @5V
1	1	3A @5V

1.5A under S3 mode
3A under S0 mode

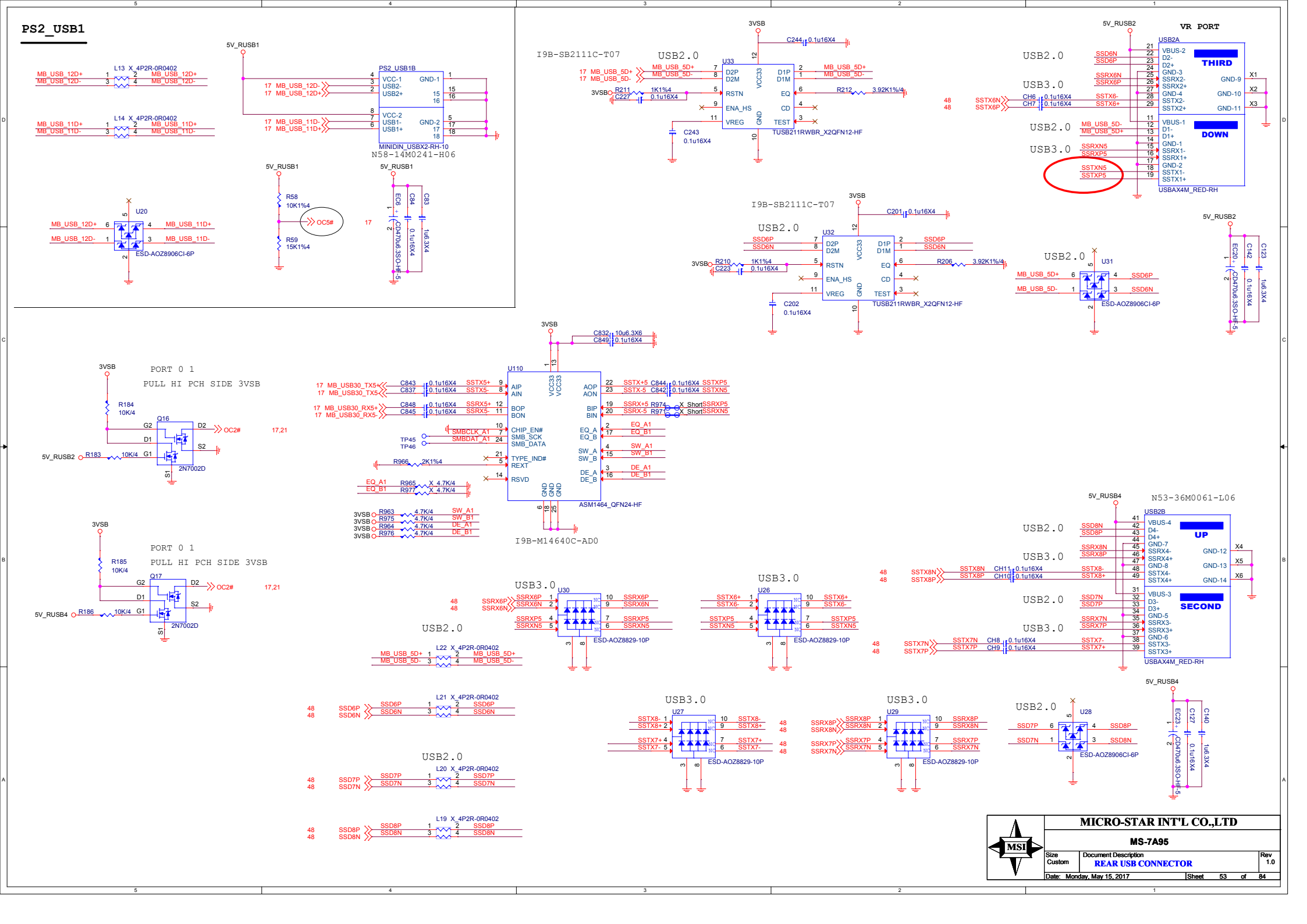








MICRO-STAR INT'L CO.,LTD			
MS-7A95			
Size: Custom	Document Description: USB FRONT TYPE-C		Rev: 1.0
Date: Monday, May 15, 2017		Sheet 52 of 84	


PS2_USB1
L13 X_4P2R-0R0402
L14 X_4P2R-0R0402
5V_RUSB1
PS2_USB1B
MINIDIN_USBX2-RH-10
N58-14M0241-H06
U20
ESD-AOZ8906CI-6P
R58 10K1%4
R59 15K1%4
OC5#
EC6 CD470u6.3SO-HF
C84 0.1u16X4
C83 1u6.3X4
I9B-SB2111C-T07
USB2.0
U33
TUSB211RWBR_X2QFN12-HF
C244 0.1u16X4
C243 0.1u16X4
R211 1K1%4
C227 0.1u16X4
R212 3.92K1%/4
VR PORT
USB2A
THIRD
DOWN
USBAX4M_RED-RH
USB3.0
U32
C201 0.1u16X4
C202 0.1u16X4
R210 1K1%4
C223 0.1u16X4
R206 3.92K1%/4
U31
ESD-AOZ8906CI-6P
EC20 CD470u6.3SO-HF
C142 0.1u16X4
C123 1u6.3X4
PORT 0 1
PULL HI PCH SIDE 3VSB
R184 10K/4
R183 10K/4
Q16
2N7002D
OC2#
U110
ASM1464_QFN24-HF
I9B-M14640C-AD0
C832 10u6.3X6
C849 0.1u16X4
C843 0.1u16X4
C837 0.1u16X4
C848 0.1u16X4
C845 0.1u16X4
C844 0.1u16X4
C842 0.1u16X4
R974 X_Short
R971 X_Short
TP45
TP46
R966 2K1%4
R965 X_4.7K/4
R977 X_4.7K/4
R963 4.7K/4
R975 4.7K/4
R964 4.7K/4
R976 4.7K/4
PORT 0 1
PULL HI PCH SIDE 3VSB
R185 10K/4
R186 10K/4
Q17
2N7002D
N53-36M0061-L06
USB2B
UP
SECOND
USBAX4M_RED-RH
U30
U26
ESD-AOZ8829-10P
L22 X_4P2R-0R0402
L21 X_4P2R-0R0402
L20 X_4P2R-0R0402
L19 X_4P2R-0R0402
U27
U29
U28
ESD-AOZ8906CI-6P
EC23 CD470u6.3SO-HF
C127 0.1u16X4
C140 1u6.3X4
MICRO-STAR INT'L CO.,LTD
MS-7A95
Size Custom
Document Description
REAR USB CONNECTOR
Rev 1.0
Date: Monday, May 15, 2017
Sheet 53 of 84

FRONT USB PORT 7,8

L42 X_4P2R-0R0402
17 MB_USB_7D-
17 MB_USB_7D+
MB_USB_7D-
MB_USB_7D+

L41 X_4P2R-0R0402
17 MB_USB_8D-
17 MB_USB_8D+
MB_USB_8D-
MB_USB_8D+

U94
MB_USB_7D-
MB_USB_7D+
MB_USB_8D-
MB_USB_8D+
ESD-AOZ8906CI-6P
NEAR CONNECTOR

5V_FUSB1
C739 0.1u16X4
JUSB4
MB_USB_7D-
MB_USB_7D+
MB_USB_8D-
MB_USB_8D+
BH2X5[9]_BLACK-RH-9
N32-2051931-H06

17,21 OC3#
R854 10K1%4
R853 15K1%4
5V_FUSB1

0D先Remove Redriver

17 MB_USB30_TX1+
17 MB_USB30_TX1-
C299 0.1u16X4
C307 0.1u16X4
SSTXP1
SSTXN1

17 MB_USB30_RX1+
17 MB_USB30_RX1-

17 MB_USB30_TX2+
17 MB_USB30_TX2-
C285 0.1u16X4
C286 0.1u16X4
SSTXP2
SSTXN2

17 MB_USB30_RX2+
17 MB_USB30_RX2-

L26 X_4P2R-0R0402
USB_1D+
USB_1D-
USB_1D+
USB_1D-

L25 X_4P2R-0R0402
USB_2D+
USB_2D-
USB_2D+
USB_2D-

U35
USB_1D+
USB_1D-
USB_2D+
USB_2D-
ESD-AOZ8906CI-6P

U42
ESD-AOZ8829-10P
SSTXP1
SSTXN1
MB_USB30_RX1+
MB_USB30_RX1-
Close to Connector

U38
ESD-AOZ8829-10P
SSTXP2
SSTXN2
MB_USB30_RX2+
MB_USB30_RX2-

IBC_VCC2
C332 0.1u16X4
IBC_VCC1
C312 0.1u16X4

JUSB1 180度
56 USB_2D+
56 USB_2D-
SSTXP2
SSTXN2
MB_USB30_RX2+
MB_USB30_RX2-
IBC_VCC2
GND-1
GND-2
56 USB_1D+
56 USB_1D-
SSTXP1
SSTXN1
MB_USB30_RX1+
MB_USB30_RX1-
IBC_VCC1
GND-3
GND-4
NC
2X10 Connector
BH2X10[20]-2PITCH_BLACK-RH-11
N32-2101571-H06

FRONT USB PORT 9.10

L40 X_4P2R-0R0402
17 MB_USB_9D-
17 MB_USB_9D+
MB_USB_9D-
MB_USB_9D+

L39 X_4P2R-0R0402
17 MB_USB_10D-
17 MB_USB_10D+
MB_USB_10D-
MB_USB_10D+

U93
MB_USB_9D-
MB_USB_9D+
MB_USB_10D-
MB_USB_10D+
ESD-AOZ8906CI-6P
NEAR CONNECTOR

5V_FUSB1
C727 0.1u16X4
JUSB5
MB_USB_9D-
MB_USB_9D+
MB_USB_10D-
MB_USB_10D+
BH2X5[9]_BLACK-RH-9
N32-2051931-H06

17 OC4#
R835 10K1%4
R844 15K1%4
5V_FUSB1

5V_FUSB1
EC54
CD470u6.3SQ-HF-5

L36 X_4P2R-0R0402
MB_USB_3D+
MB_USB_3D-
MB_USB_3D+
MB_USB_3D-

L35 X_4P2R-0R0402
MB_USB_4D+
MB_USB_4D-
MB_USB_4D+
MB_USB_4D-

U66
MB_USB_3D+
MB_USB_3D-
MB_USB_4D+
MB_USB_4D-
ESD-AOZ8906CI-6P

U74
ESD-AOZ8829-10P
17 MB_USB30_RX4+
17 MB_USB30_RX4-
17 MB_USB30_RX3-
17 MB_USB30_RX3+
MB_USB30_RX4+
MB_USB30_RX4-
MB_USB30_RX3-
MB_USB30_RX3+

U69
ESD-AOZ8829-10P
17 MB_USB30_TX4+
17 MB_USB30_TX4-
17 MB_USB30_TX3+
17 MB_USB30_TX3-
C477 0.1u16X4
C464 0.1u16X4
C462 0.1u16X4
C458 0.1u16X4
SSTXP4
SSTXN4
SSTXP3
SSTXN3

5V_FUSB2
EC43
CD470u6.3SQ-HF-5
5V_FUSB2
C494 0.1u16X4

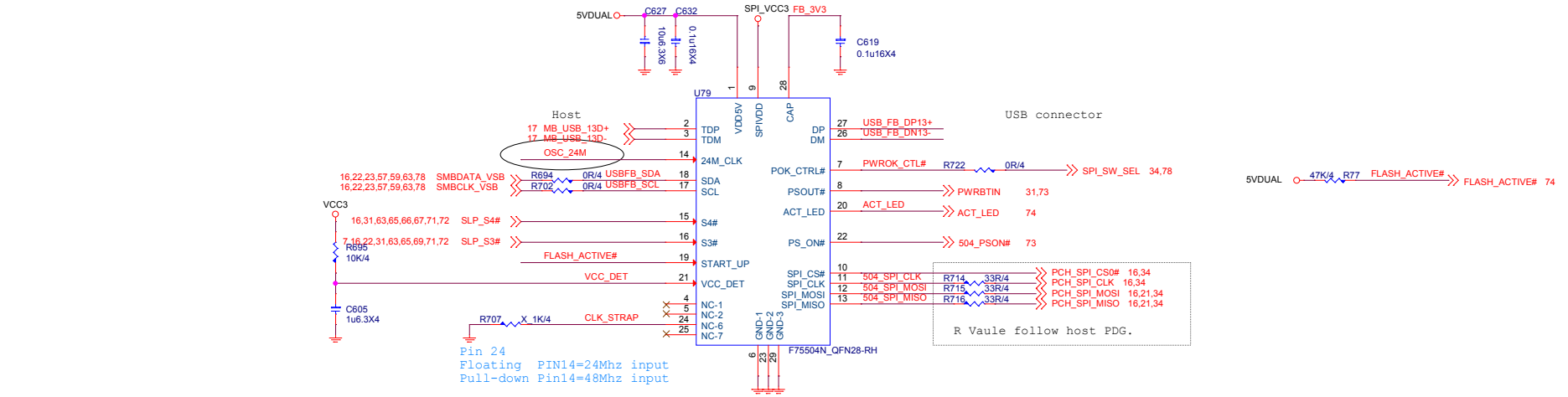
JUSB3 90度
17 MB_USB_4D+
17 MB_USB_4D-
SSTXP4
SSTXN4
MB_USB30_RX4+
MB_USB30_RX4-
5V_FUSB2
GND-1
GND-2
17 MB_USB_3D+
17 MB_USB_3D-
SSTXP3
SSTXN3
MB_USB30_RX3+
MB_USB30_RX3-
5V_FUSB2
GND-3
GND-4
NC
2X10 CONNECTOR
BH2X10[20]#-2PITCH_BLACK-RH-2
N32-2101581-H06

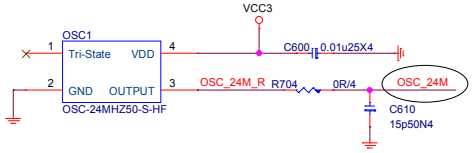
17,21 OC1#
R500 10K1%4
R484 15K1%4
5V_FUSB2

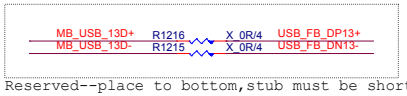
MICRO-STAR INT'L CO.,LTD
MS-7A95
Size: Custom
Document Description: Rear/Front USB2.0
Rev: 1.0
Date: Monday, May 15, 2017
Sheet 54 of 84

Host USB connector

F75504 layout placement must meet to spi/usb trace length spec with host.
As for as possible place near to host.

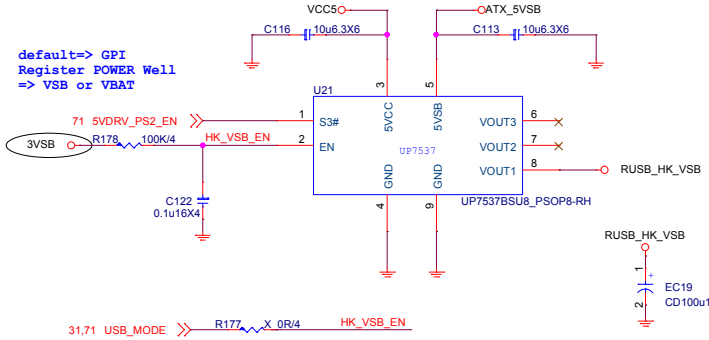


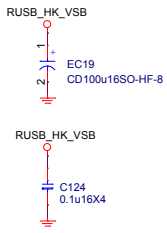


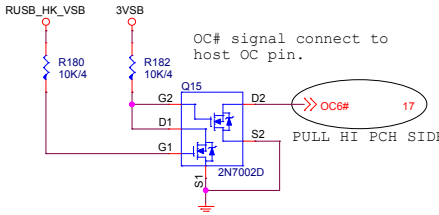


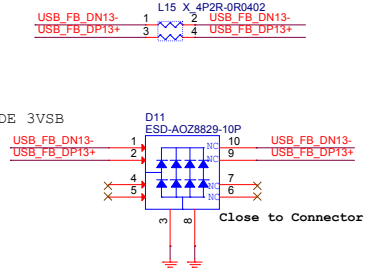
Reserved--place to bottom,stub must be shortest.

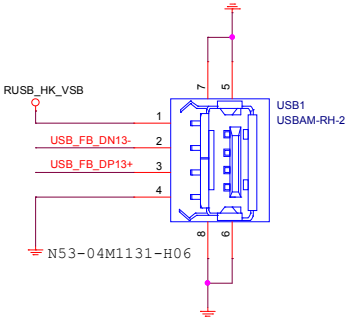
USB Connector power come from UP7537
provide(USB Hotkey Connector same)











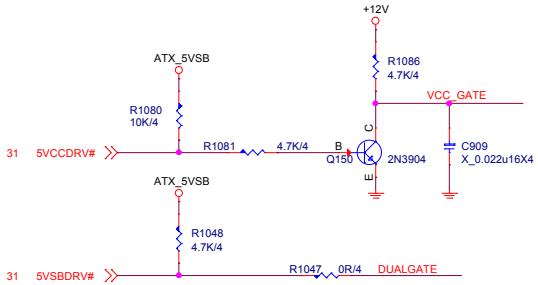
MICRO-STAR INT'L CO.,LTD

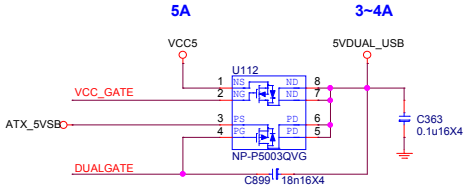
MS-7A95

Size	Document Description	Rev
Custom	BIOS FLASH F75504	1.0

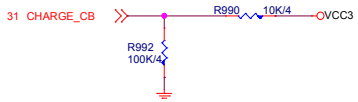
Date: Monday, May 15, 2017 Sheet 55 of 84

5VDUAL_USB

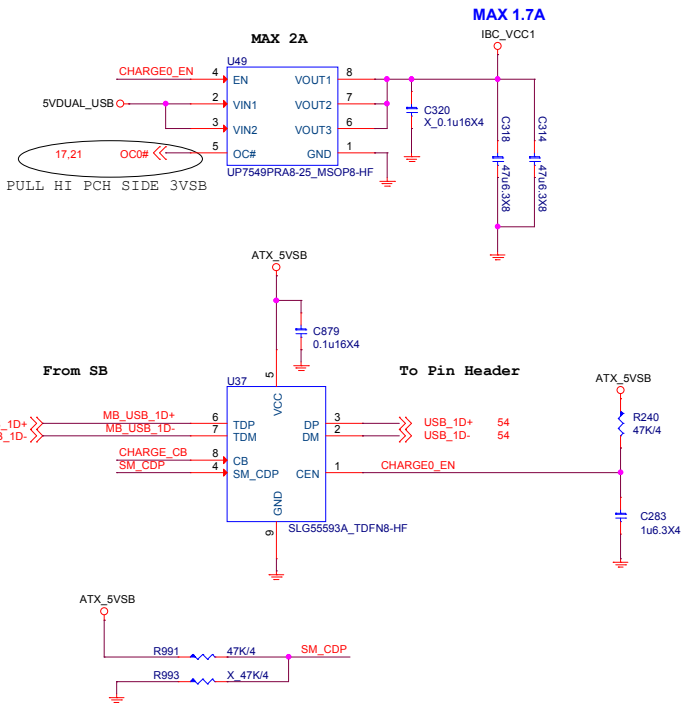




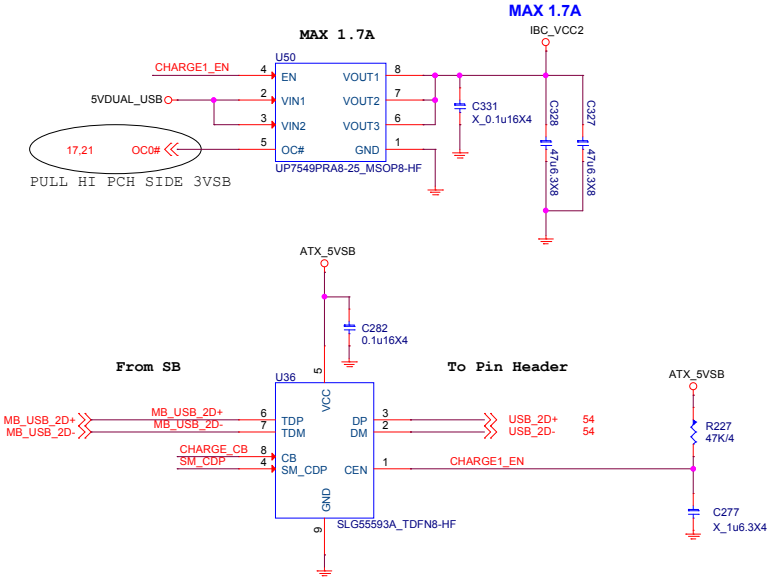
Pin power : I_3VSB
Register power : I_3VSB
Register reset : I_3VSB



USB POWER PORT 0 For USB Charging

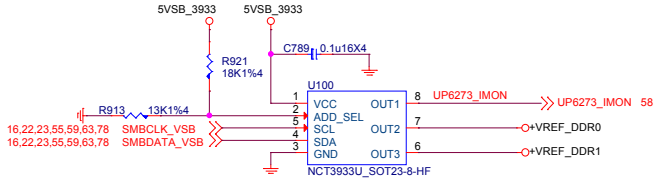


USB POWER PORT 1 For USB Charging

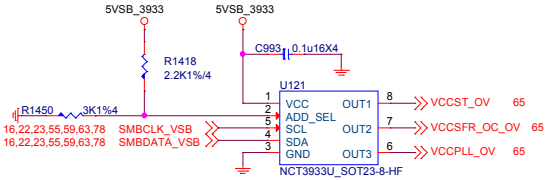


MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: USB CHARGE_SLG55593A	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 56 of 84	

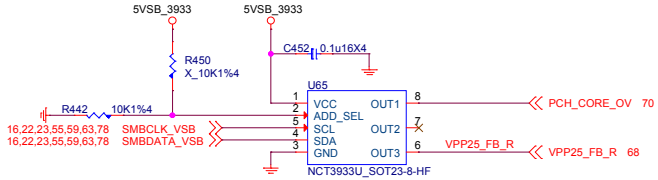
UPI VOLTAGE CONSOLE



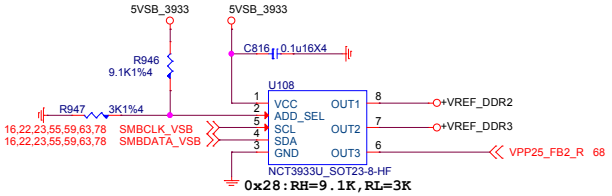
0x26:RH=18K,RL=13K



0x24:RH=2.2k,RL=3K



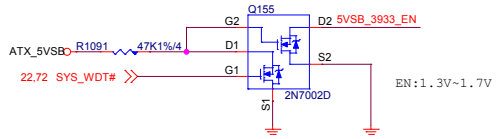
0x2A:RH=OPEN,RL=10K

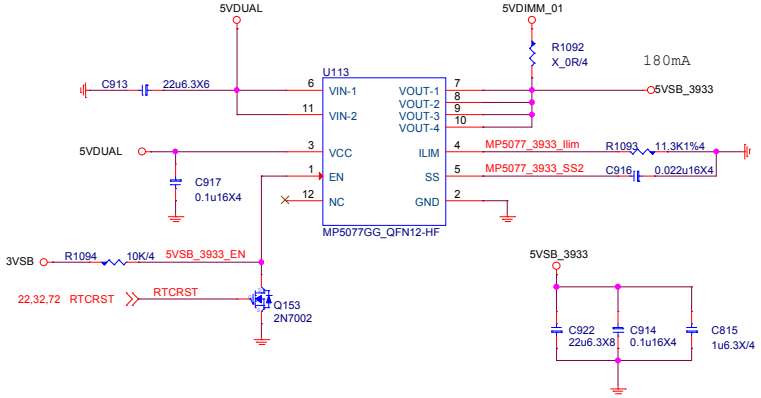


0x28:RH=9.1K,RL=3K

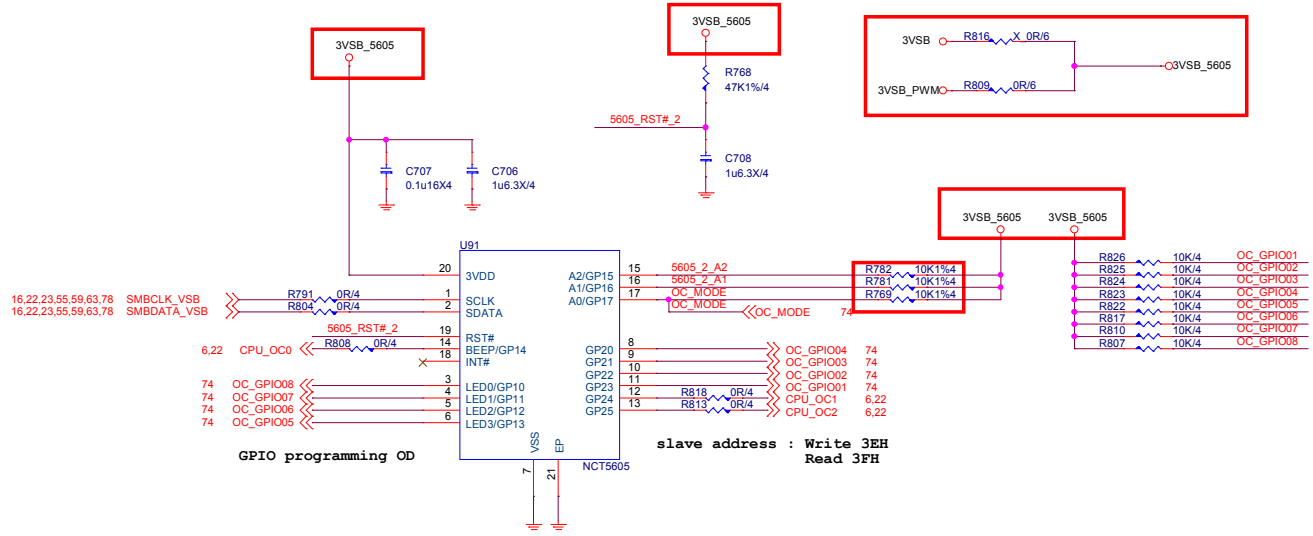
VOLTAGE CONSOLE

ADDRESS	0x2A	0X28	0x26	0x24	0x22	0x20
RH (KOhm)	OPEN	3.9	3	2.2	1.3	10
RL (KOhm)	10	1.3	2.2	3	3.9	OPEN
BUS_SEL	0%	25%	42%	58%	75%	100%





RSVD FOR OC



GPIO programming OD

slave address : Write 3EH
Read 3FH

MICRO-STAR INT'L CO.,LTD

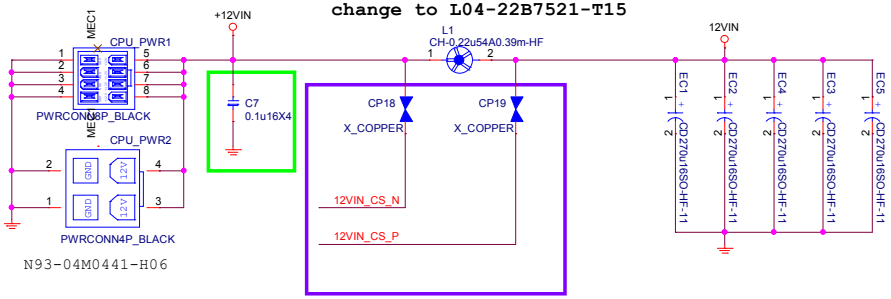
MS-7A95

Size	Document Description	Rev
Custom	USB3.0 Connector	1.0

Date: Monday, May 15, 2017 Sheet 57 of 84

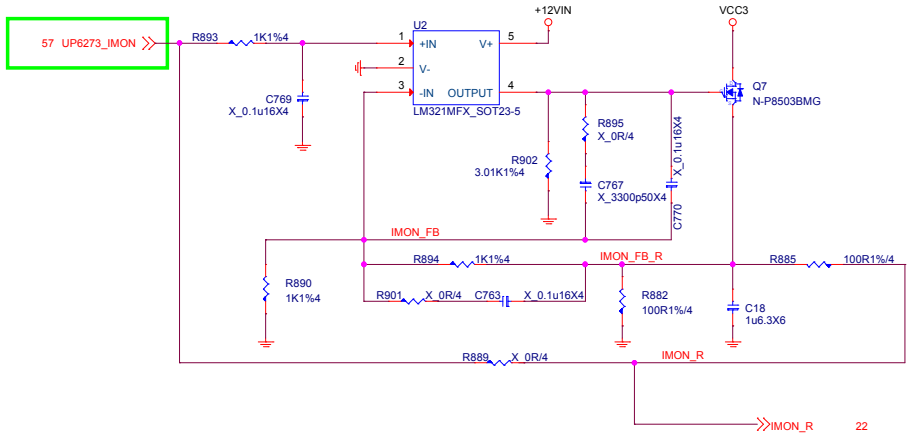
N93-08M0221-H06 Close Power Connector

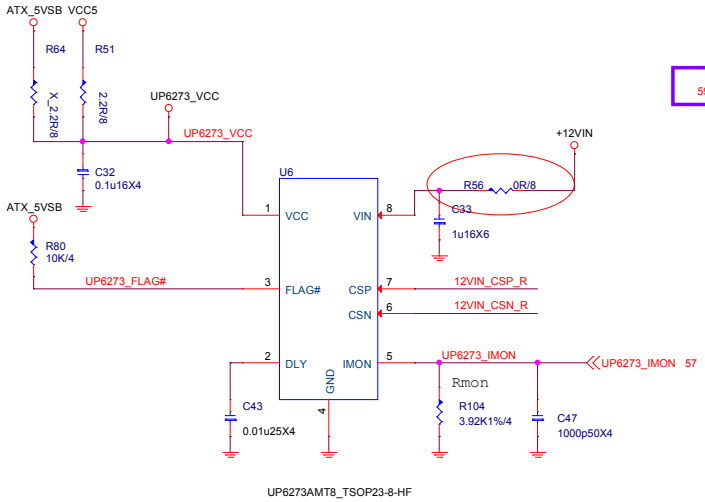
change to L04-22B7521-T15



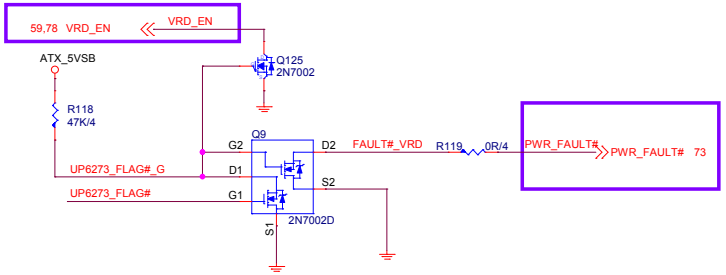
N93-04M0441-H06

Near PWM IC





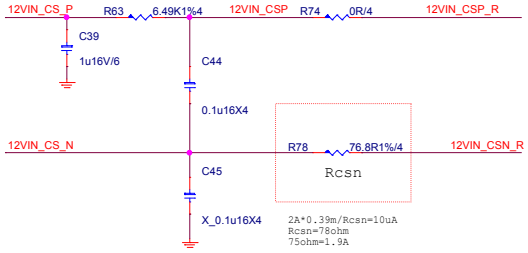
UP6273AMT8_TSOP23-8-HF



Iin=(Vmon*Rcsn)/(Rmon*Rdc)
Vmon=1.2
can change OCP trigger level by Rcsn and Rmon

Rmon=(1.2x0.0768k)/(60x0.39m)
=3.9K

一階2A
Rimon5.1Kohm
Rcsn0.0768Kohm
DCR0.39mohm
Vimon1.2V
Iocp46.33484163A
ocp=60A



MICRO-STAR INT'L CO.,LTD

MS-7A95

Size	Document Description	Rev
Custom	12VIN SENSE RT9553	1.0

Date: Monday, May 15, 2017 Sheet 58 of 84

VRMPWRGD LEVEL SHIFT

Vcore: ICC Max 100A
LL: 1.0 mohm
OCP: 400A

VSA: ICC Max 15A
OCP: 40A

PROC_ID1	Sequence	CPU TYPE
1	VCCIO->VCCIN->VCCSA	SKX-X (VR13)
0	VCCIO->VCCSA->VCCIN	KBL-X(IMVP8)

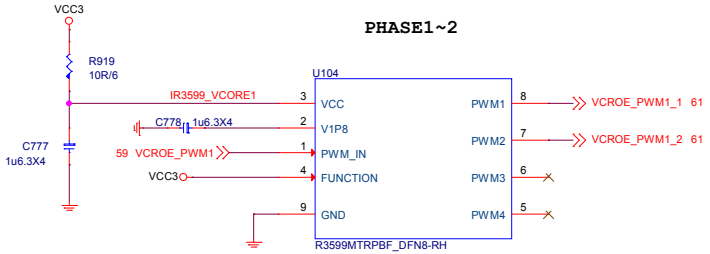
		VR53	VR54	VC20	VR58	VR57	VR59	VR60
Default	Temp	6.49k	10k	100p	X	0R	X	0R
	VAUXSEN	5.76k	1k	0.01u	0R	X	0R	X

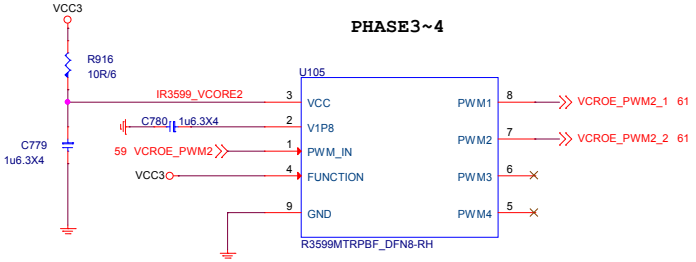
0x26:RH=18K,RL=13K

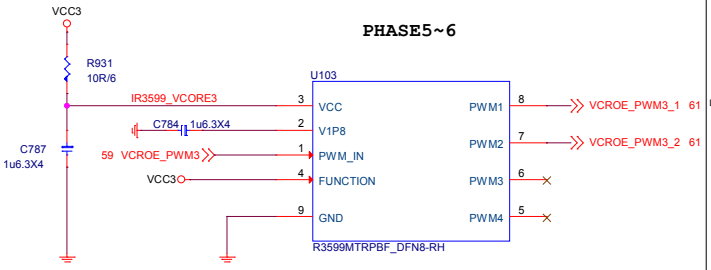
SMB Address: 0X70

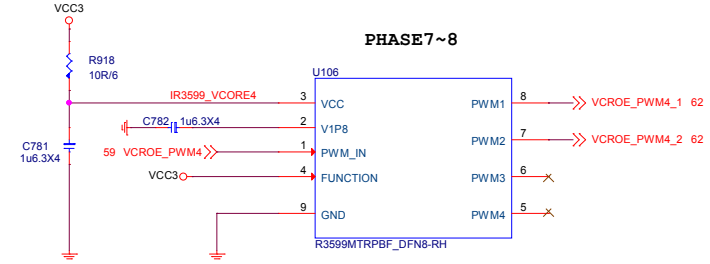
Company	MICRO-STAR INT'L CO.,LTD
Model	MS-7A95
Size	Custom
Document Description	CPU PWR-IR35201
Rev	1.0
Date	Monday, May 15, 2017
Sheet	59 of 84

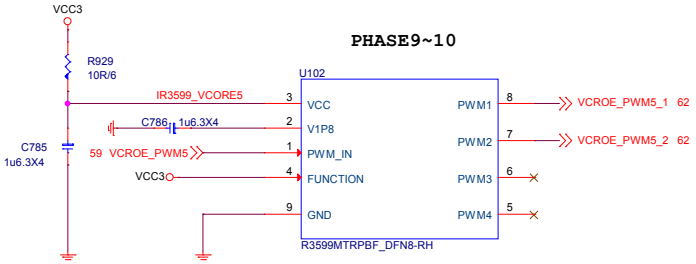
VCORE Double



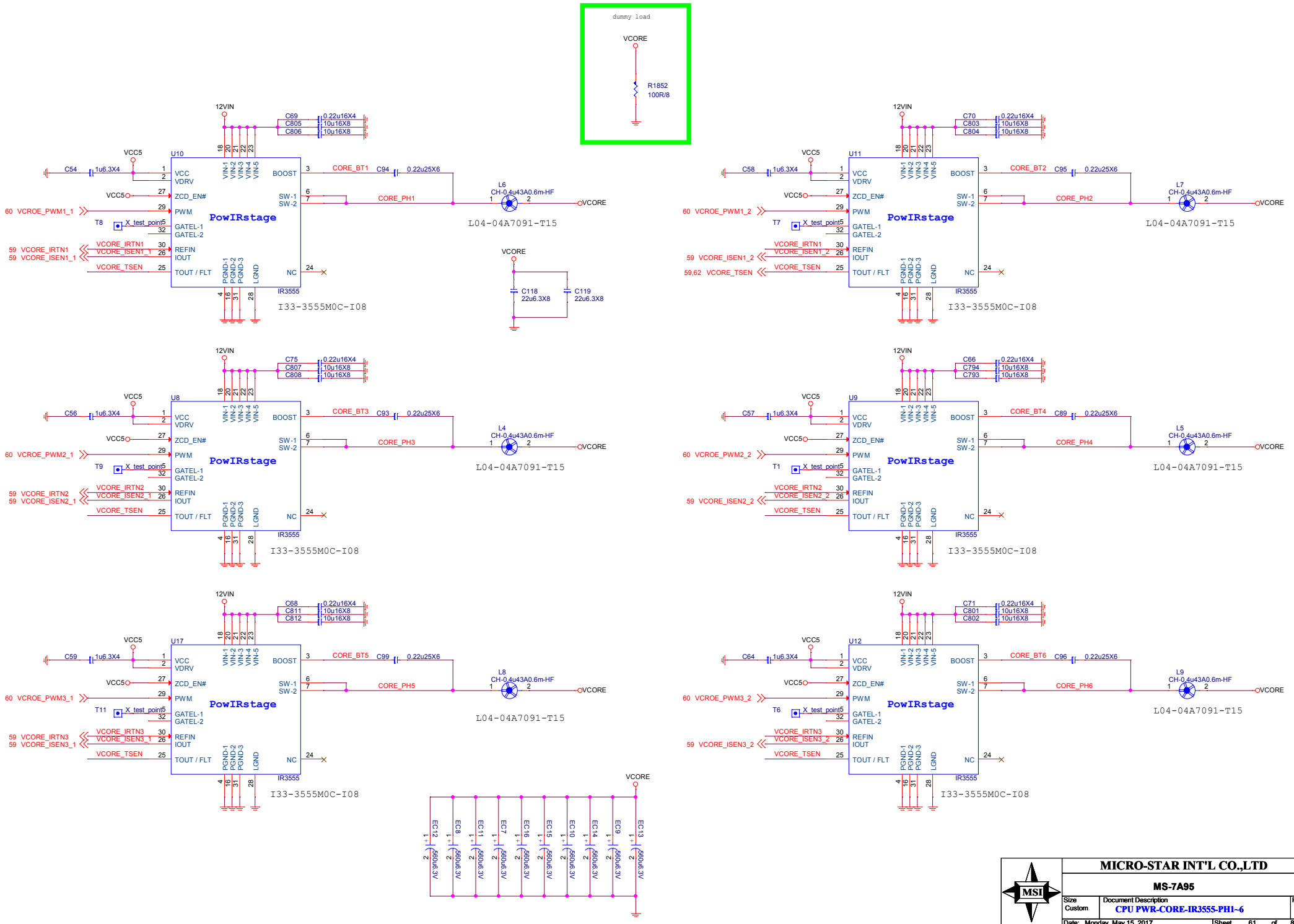




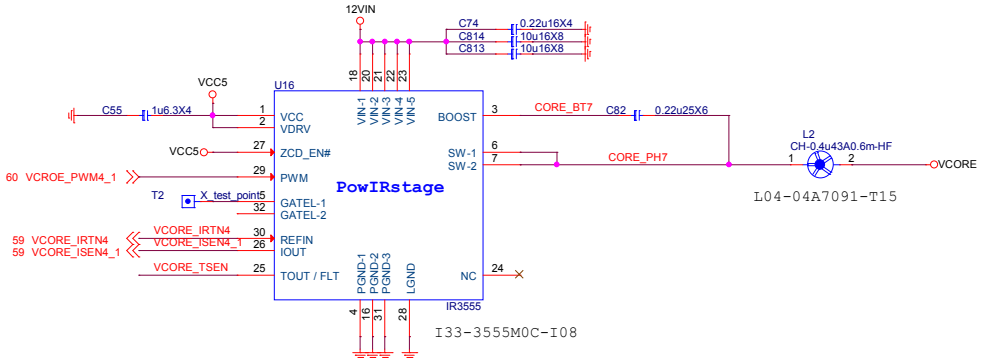


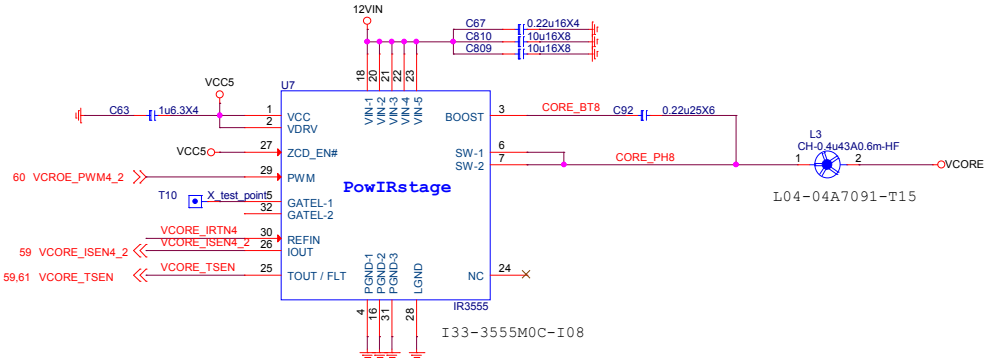


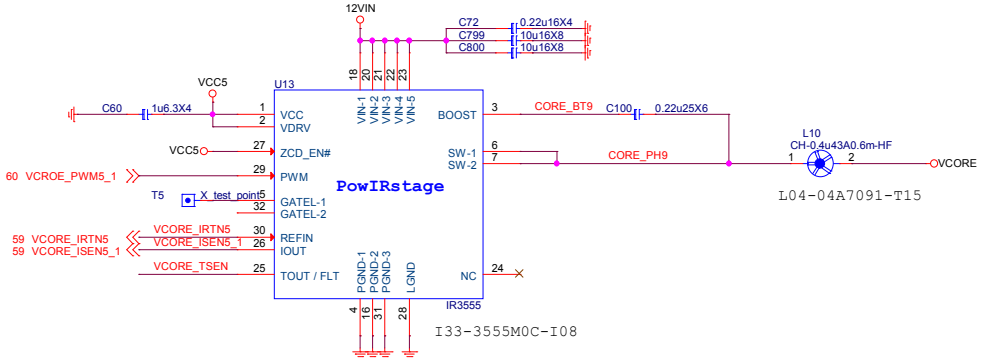
MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7A95	
Size: Custom	Document Description: CPU PWR-IR3599	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 60 of 84	

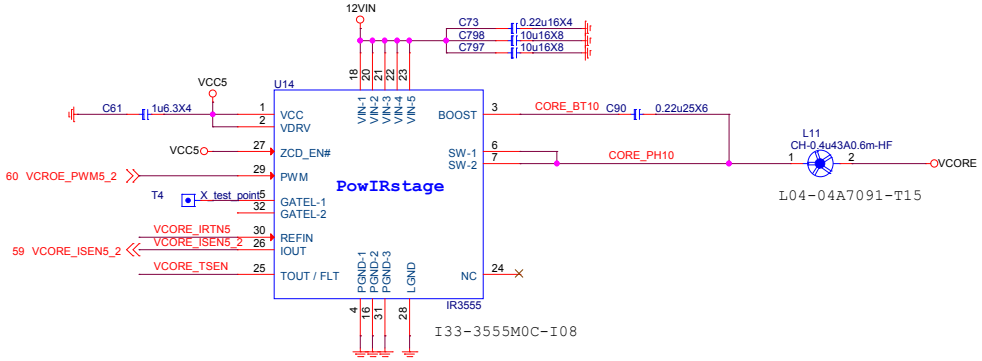


MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7A95	
Size: Custom	Document Description: CPU PWR-CORE-IR3555-PH1~6	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 61 of 84	









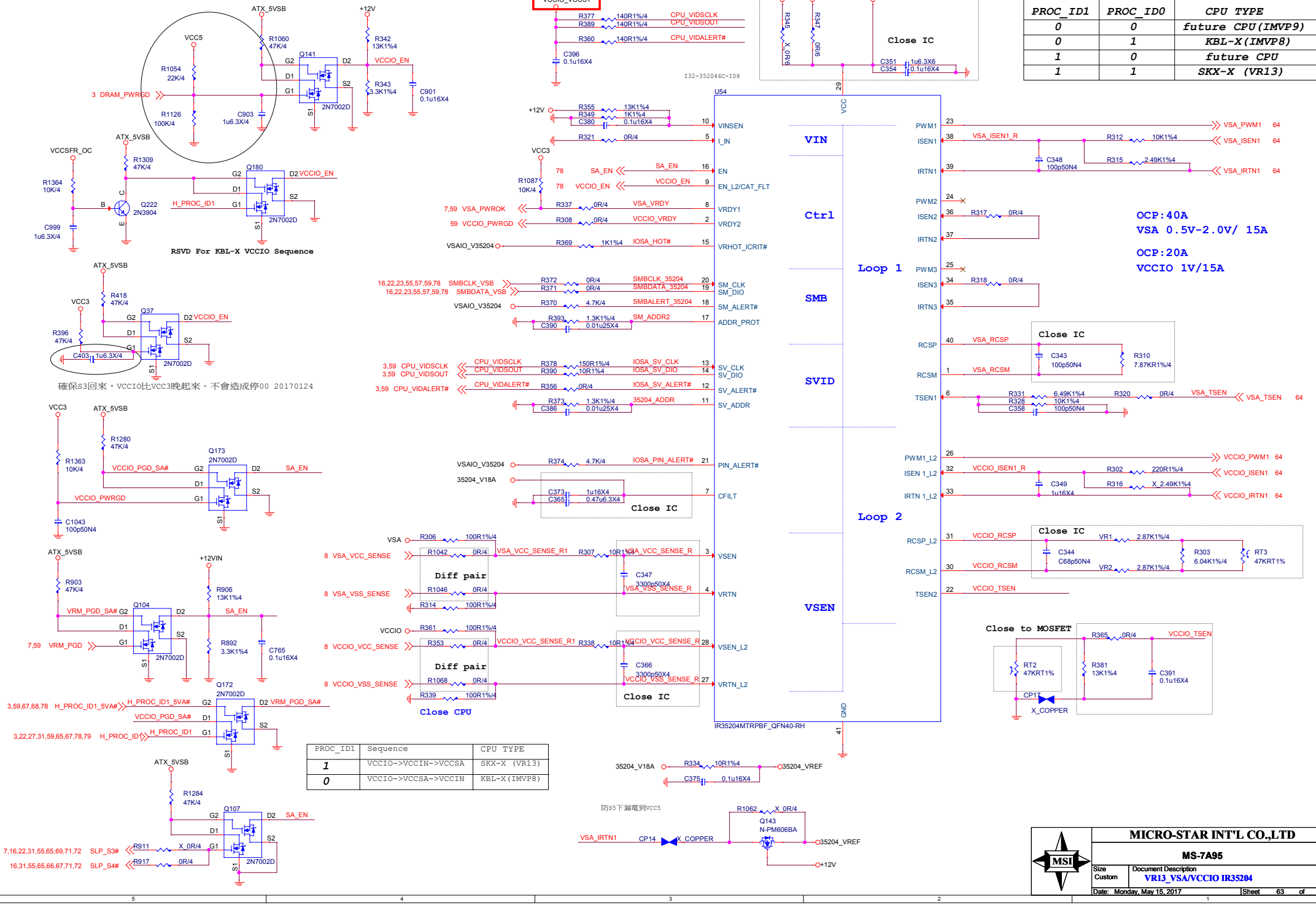
MICRO-STAR INT'L CO.,LTD

MS-7A95

Size	Document Description	Rev
Custom	CPU PWR-CORE-IR3555-PH7~10	1.0

Date: Monday, May 15, 2017 Sheet 62 of 84

VCCIOPWRGD LEVEL SHIFT

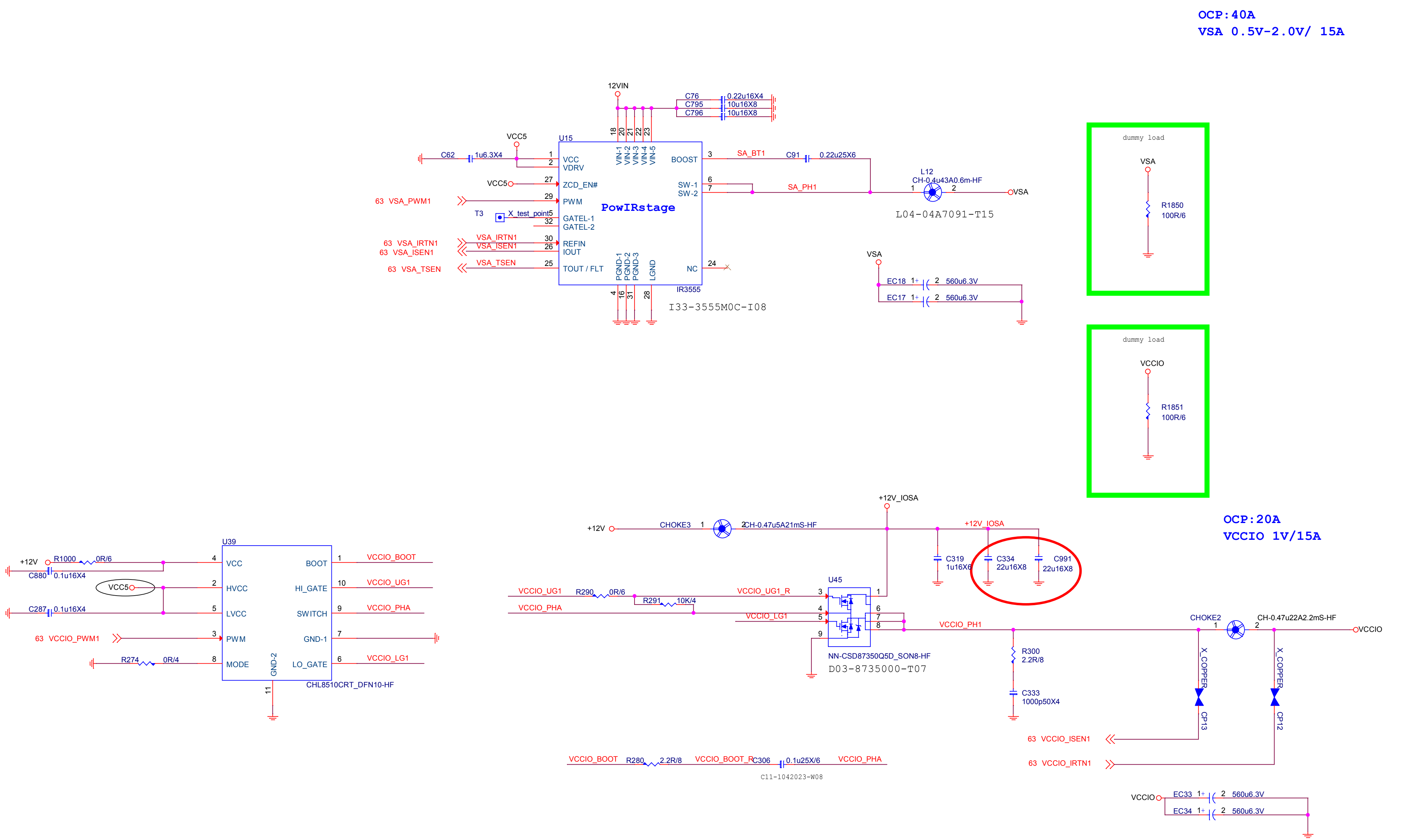


CPU ID CFG

PROC_ID1	PROC_ID0	CPU TYPE
0	0	future CPU(IMVP9)
0	1	KBL-X(IMVP8)
1	0	future CPU
1	1	SKX-X (VR13)

PROC_ID1	Sequence	CPU TYPE
1	VCCIO->VCCIN->VCCSA	SKX-X (VR13)
0	VCCIO->VCCSA->VCCIN	KBL-X(IMVP8)

MICRO-STAR INT'L CO.,LTD			
MS-7A95			
Size: Custom	Document Description: VR13_VSA/VCCIO IR35204		Rev: 1.0
Date: Monday, May 15, 2017		Sheet 63 of 84	



MICRO-STAR INT'L CO.,LTD

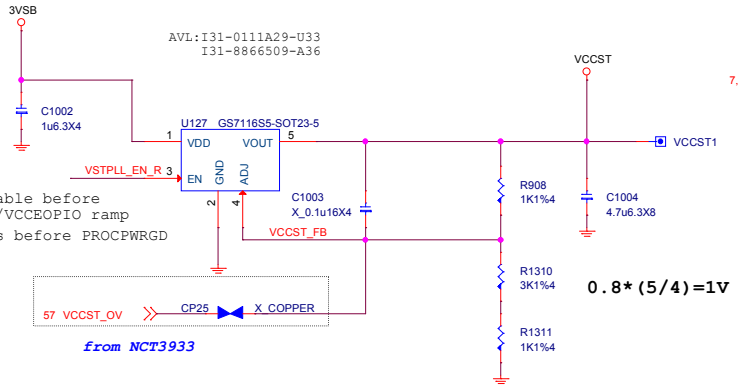
MS-7A95

Size	Document Description	Rev
Custom	VCCIO/VSA 1+1 PHASE	1.0

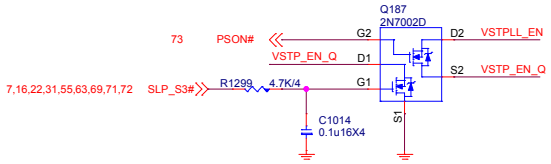
Date: Monday, May 15, 2017 | Sheet 64 of 84

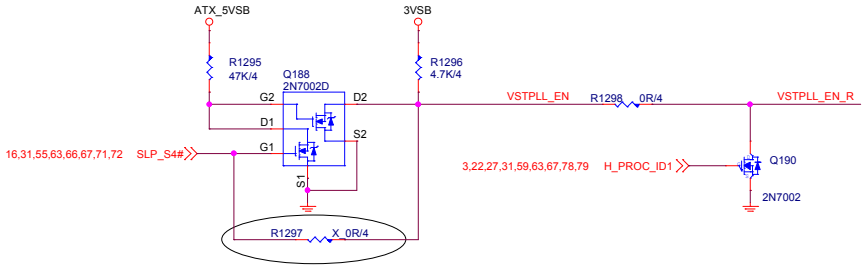
VCCST

1.0V; 60mA



VCCIO ramped and stable before
beginning of VCCOPC/VCCEOPIO ramp
VCCST/PLL stable 1ms before PROCPWRGD



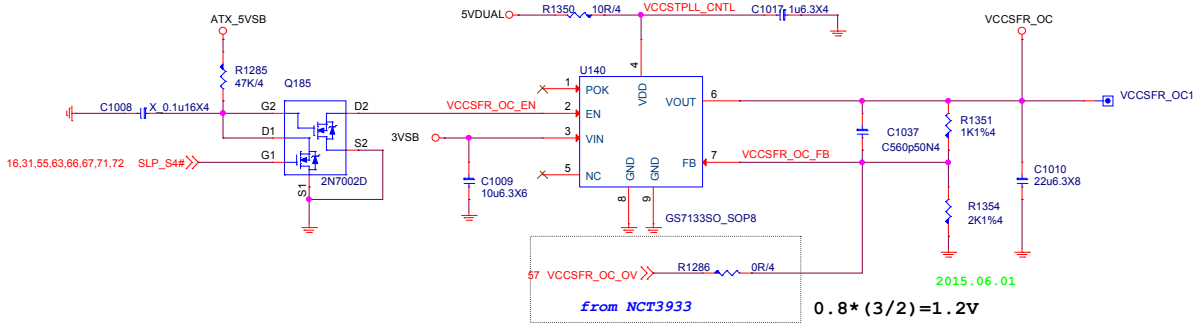


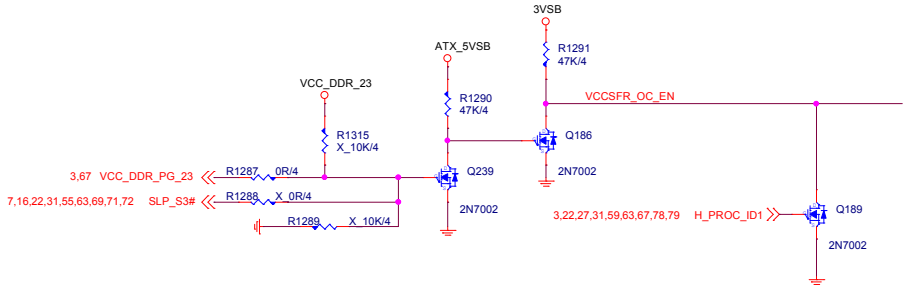
For non-OC system, configures +VCCSFR_OC as 1.2V

VCCSFR_OC

1.1V~1.5A; 500mA

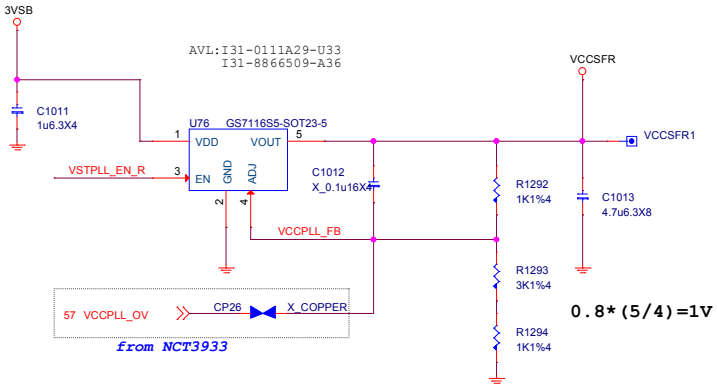
EN:VIH1.2V
EN pin Maximum:VIN+0.3V





VCCSFR

1.0V; 150mA

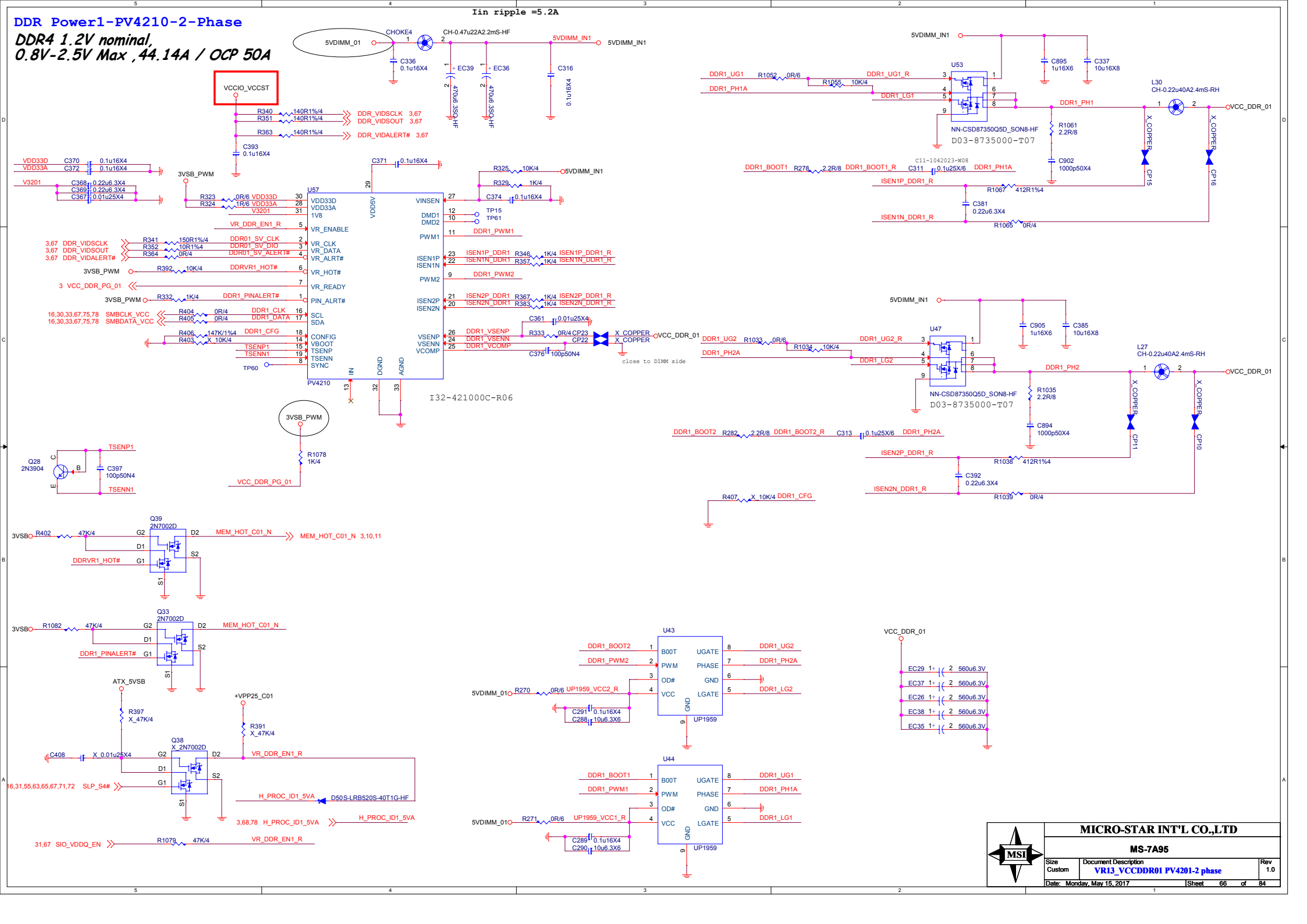


MICRO-STAR INT'L CO.,LTD		
MS-7A90		
Size: Custom	Document Description: CPU VCCST/VCCSFR/VCCSFR_OC	Rev: 10
Date: Monday, May 15, 2017	Sheet 65 of 84	

DDR Power1-PV4210-2-Phase

DDR4 1.2V nominal, 0.8V-2.5V Max ,44.14A / OCP 50A

Iin ripple =5.2A



MICRO-STAR INT'L CO.,LTD

MS-7A95

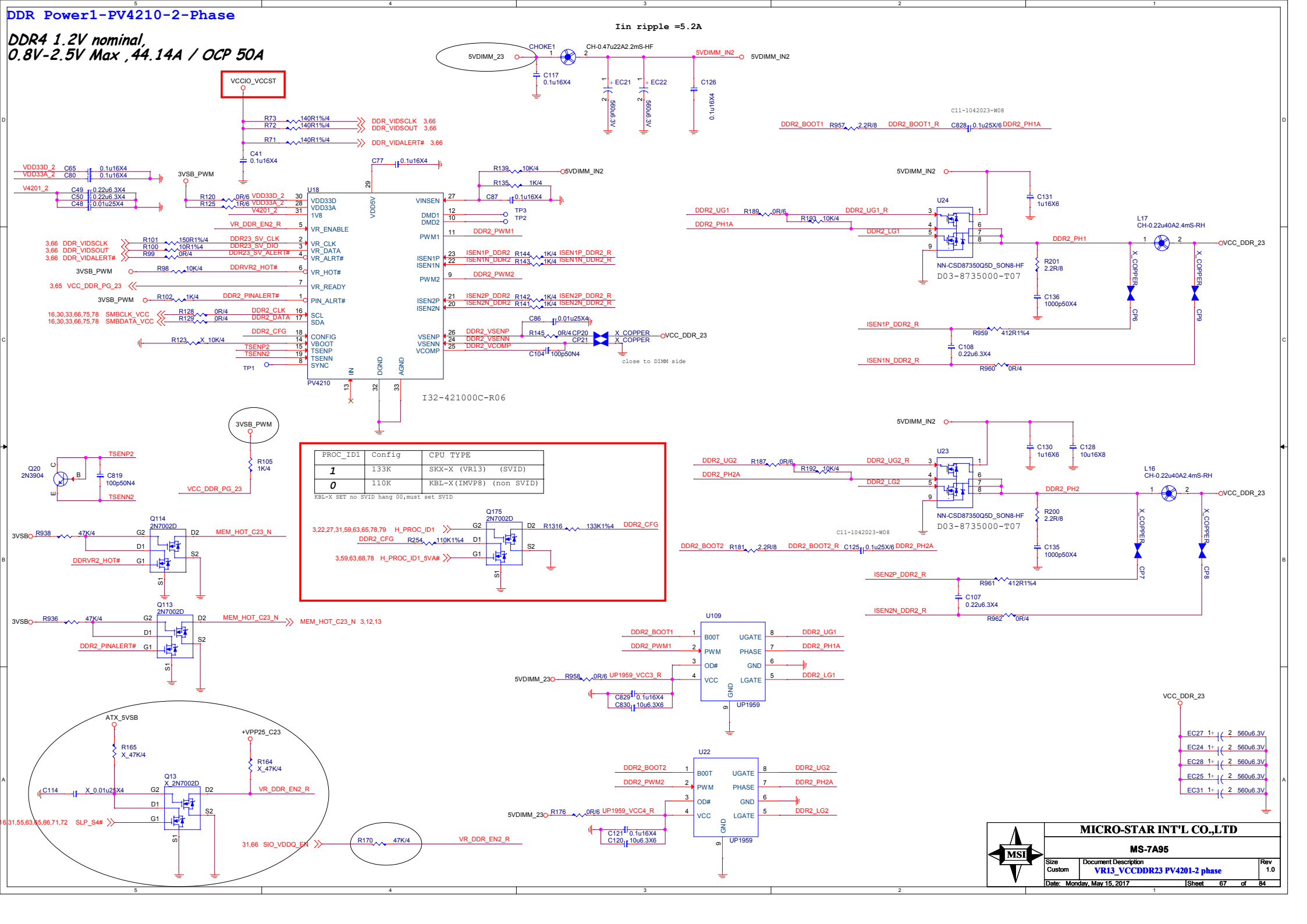
Size	Document Description	Rev
Custom	VR13_VCCDDR01 PV4201-2 phase	1.0

Date: Monday, May 15, 2017 Sheet 66 of 84

DDR Power1-PV4210-2-Phase

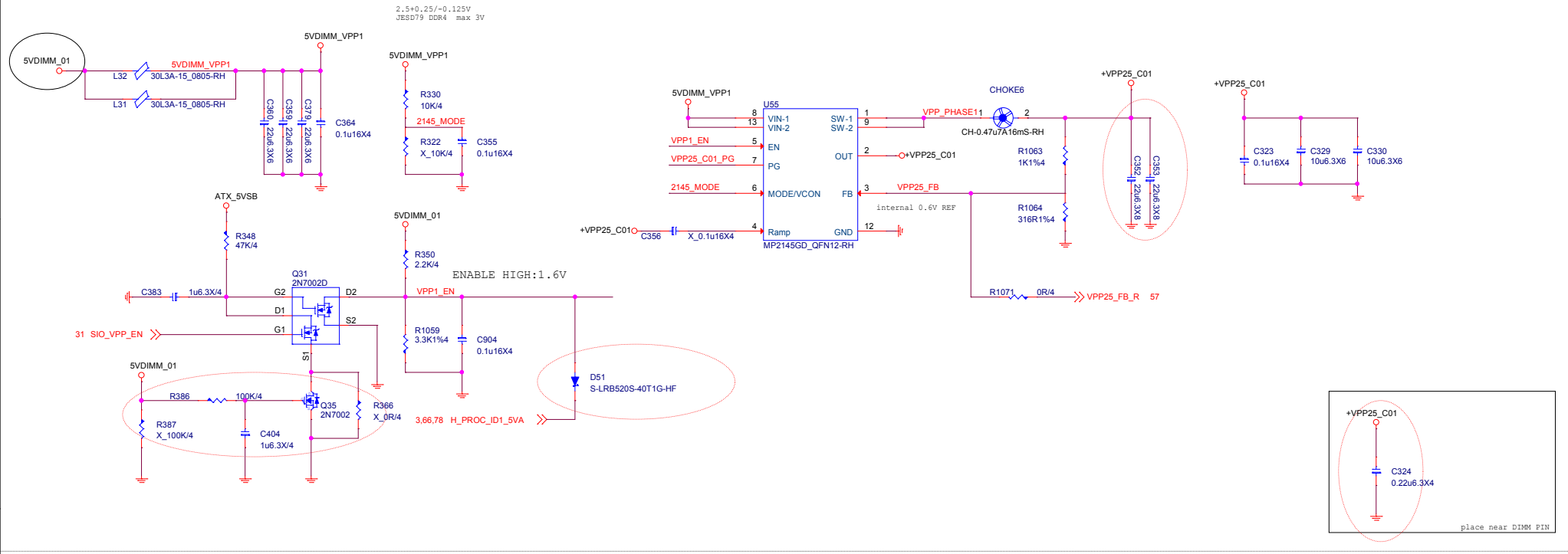
DDR4 1.2V nominal,
0.8V-2.5V Max ,44.14A / OCP 50A

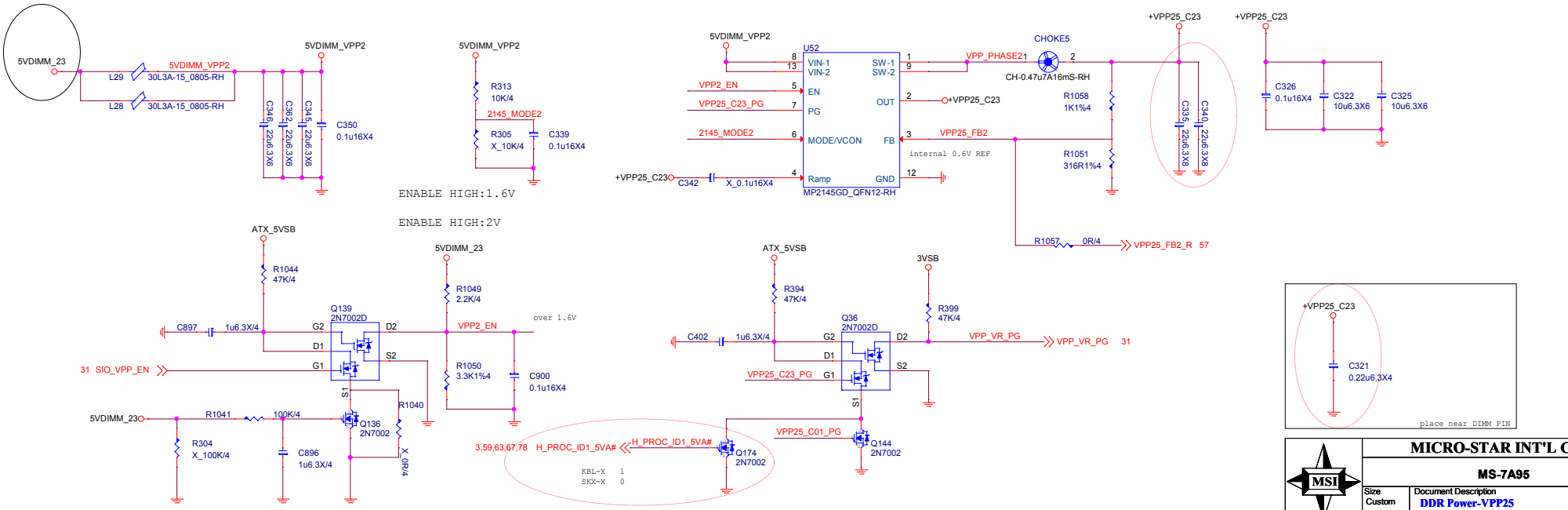
Iin ripple =5.2A



MICRO-STAR INT'L CO.,LTD	
MS-7A95	
Size: Custom	Document Description: VR13_VCCDDR23 PV4201-2 phase
Rev: 1.0	
Date: Monday, May 15, 2017	Sheet 67 of 84

4DIMM :6A FOR DDR VPP

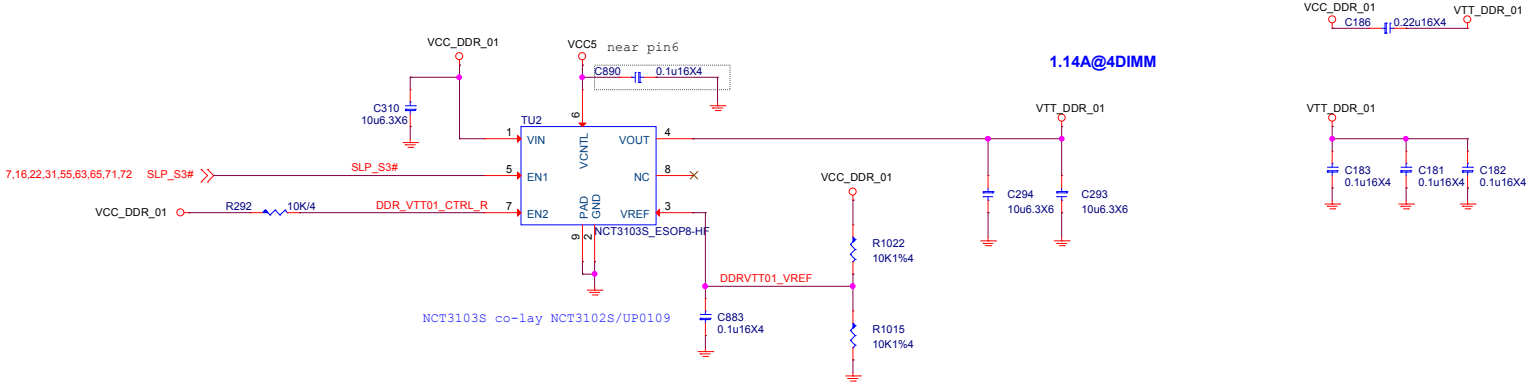




MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: DDR Power-VPP25	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 68 of 84	

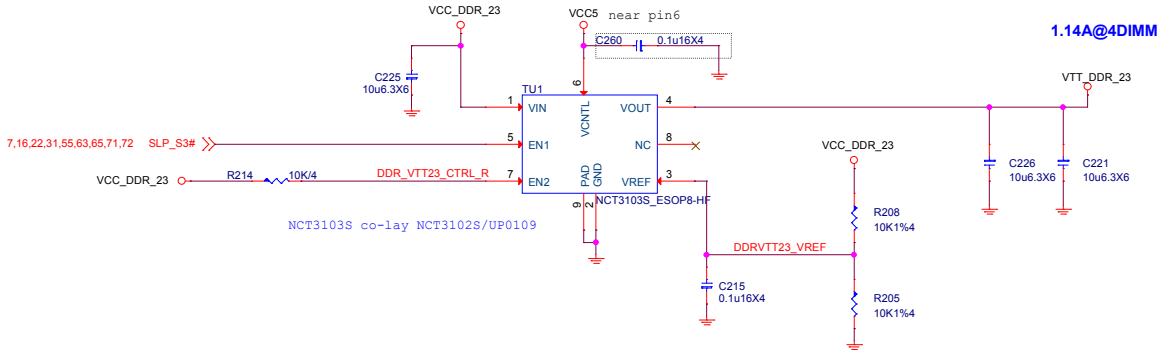
DDR VTT Power

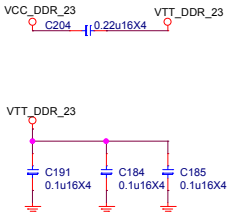
To CPU Copper trace width > 250mils , Fill island behind DIMM > 400mils .



DDR VTT Power

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





MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: VTTDDR	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 69 of 84	

PCH_1VSB Power:1.0V,10A

```
OCP = 14A  R597=5.6K
IOCP=10uA*5.6K/0.004=14A +2.67=16.67
*IOOP=10uA*6.04/0.004 =15.1A+2.67A=17.77A.DC OCP16.47
```

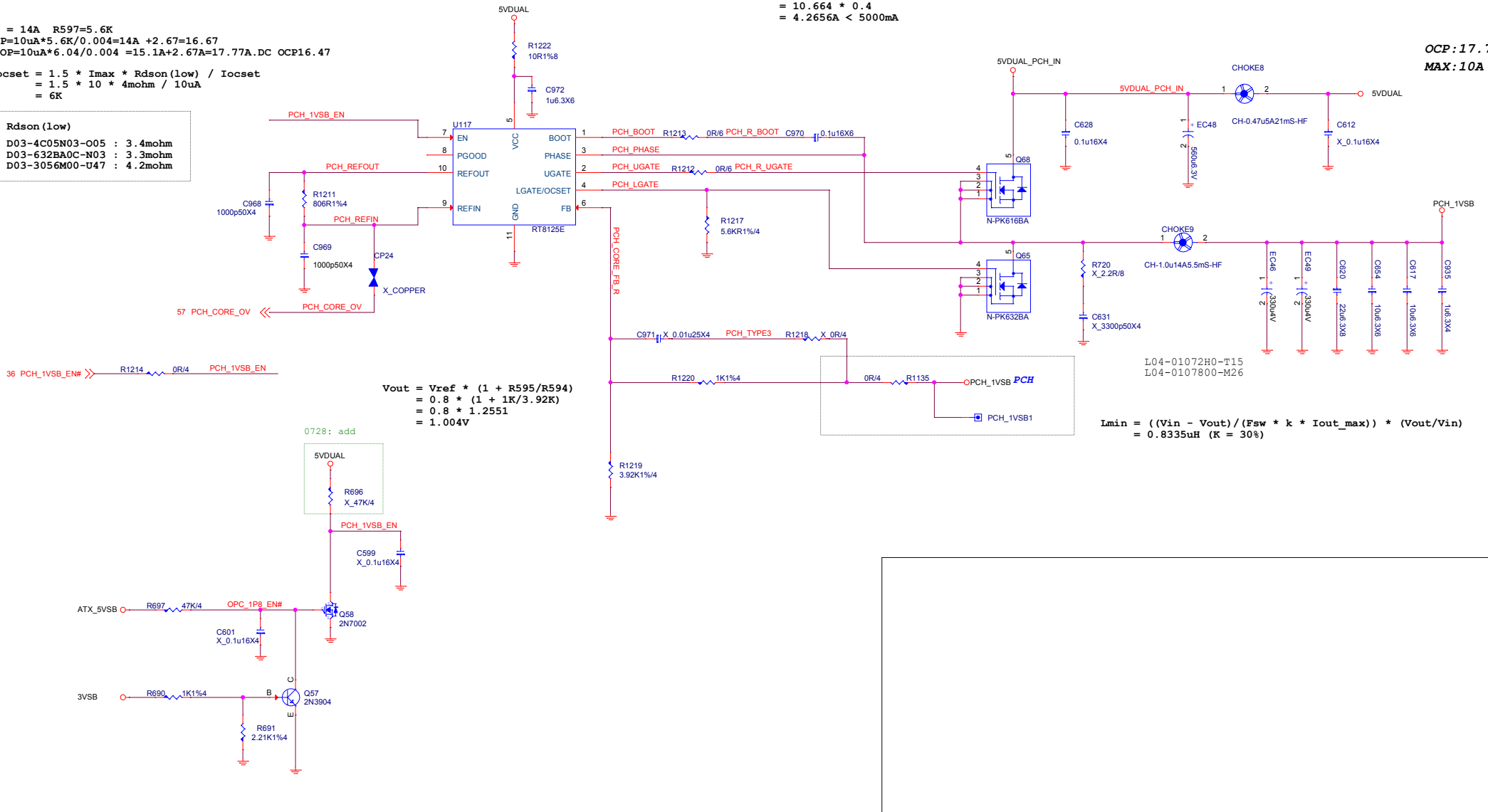
```
Rocset = 1.5 * Imax * Rdson(low) / Iocset
       = 1.5 * 10 * 4mohm / 10uA
       = 6K
```

Rdson(low)

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

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

OCP:17.77
MAX:10A



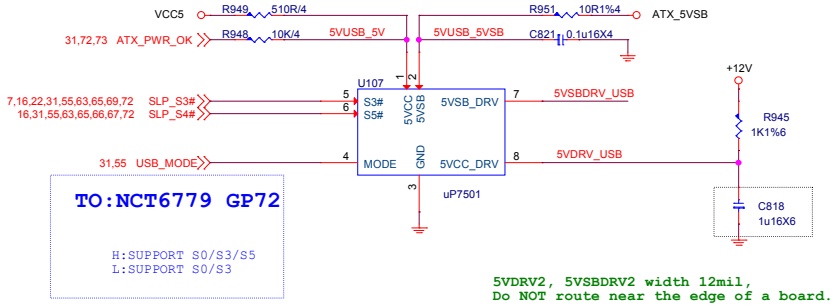

```
Vout = Vref * (1 + R595/R594)
     = 0.8 * (1 + 1K/3.92K)
     = 0.8 * 1.2551
     = 1.004V
```

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

0728: add

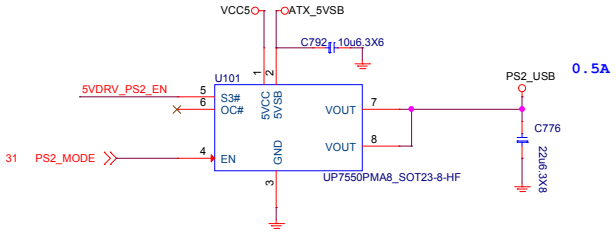
MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: PCH POWER-RT8125E	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 70 of 84	

USB POWER

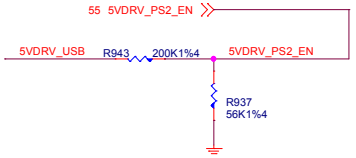


5VDRV2, 5VSBDRV2 width 12mil,
Do NOT route near the edge of a board.

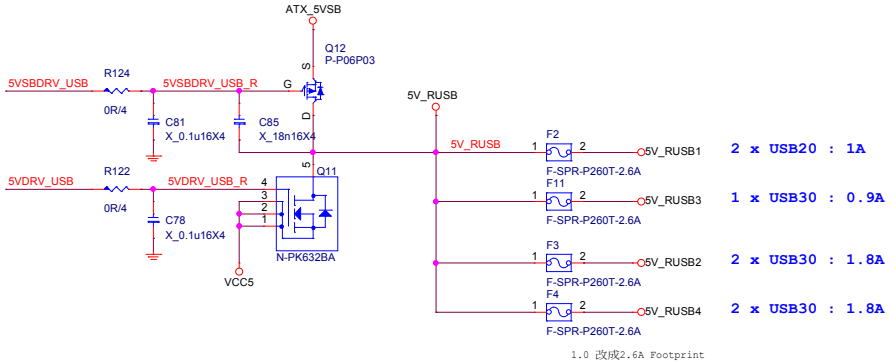
PS2 POWER



USB MODE



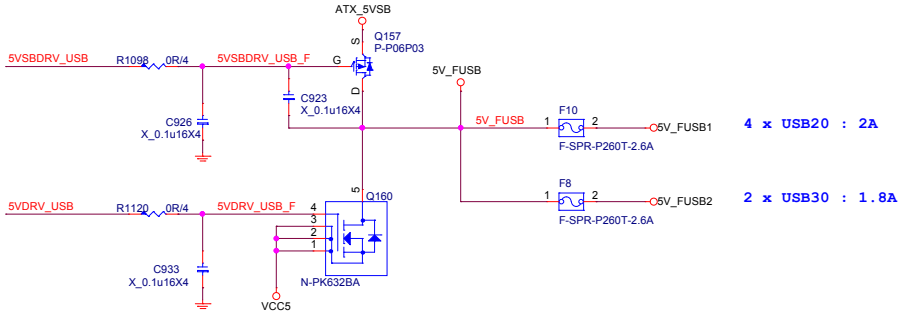
REAR USB PORT POWER



2 x USB20 : 1A
1 x USB30 : 0.9A
2 x USB30 : 1.8A
2 x USB30 : 1.8A

1.0 改成2.6A Footprint

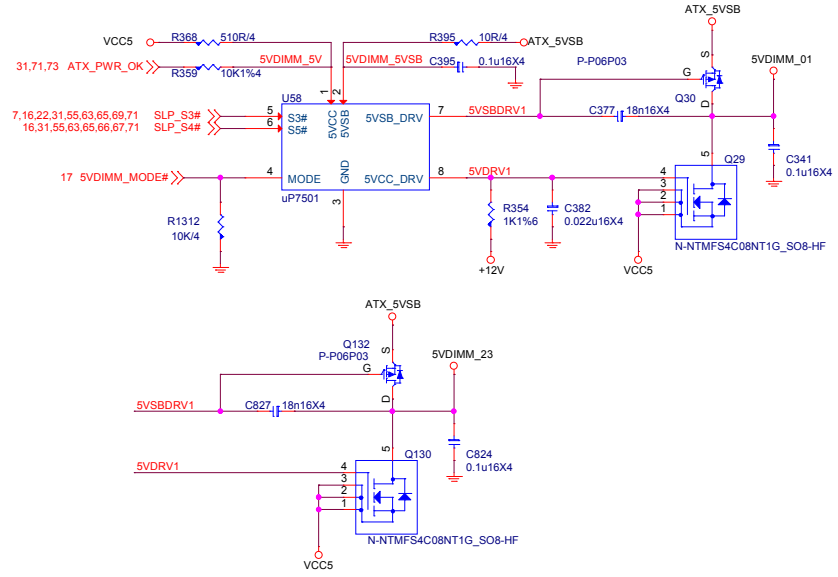
FRONT USB PORT POWER

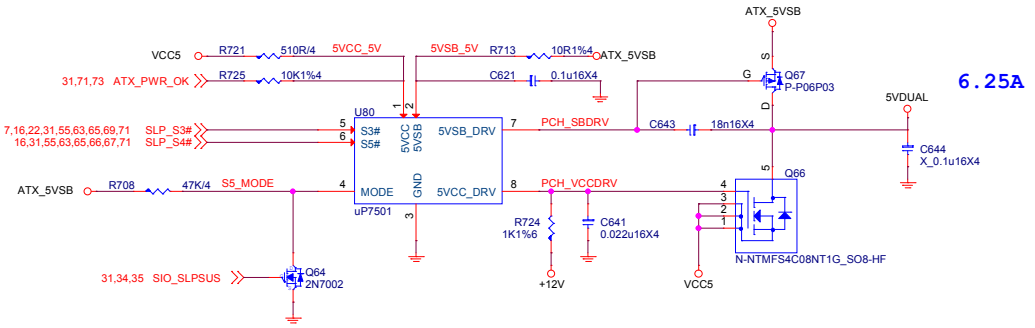


4 x USB20 : 2A
2 x USB30 : 1.8A

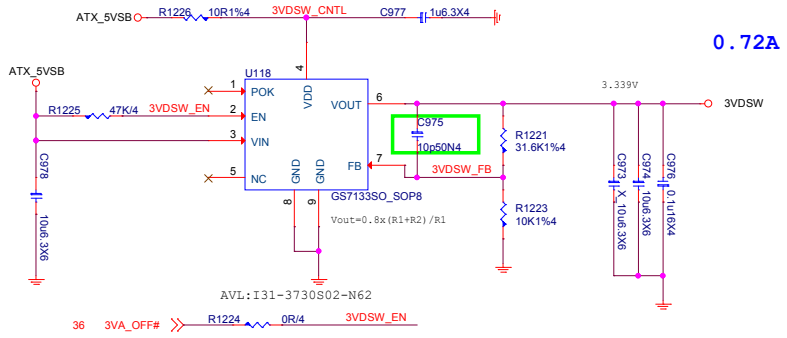
MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: USB Power	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 71 of 84	

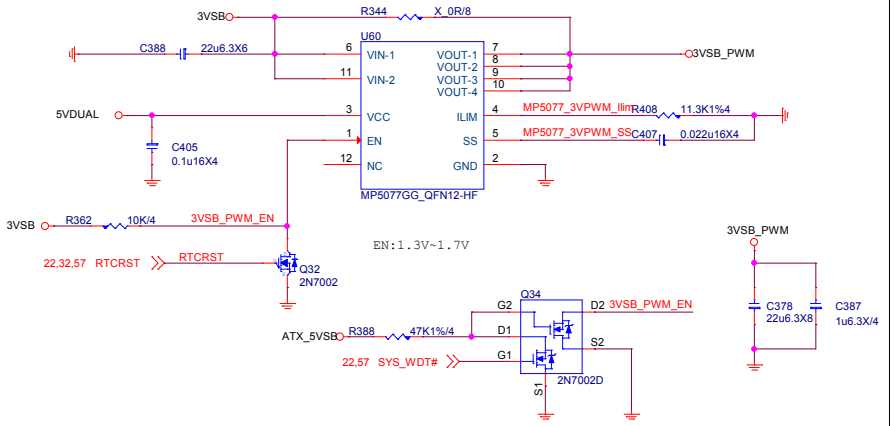
5VDIMM FOR DDR



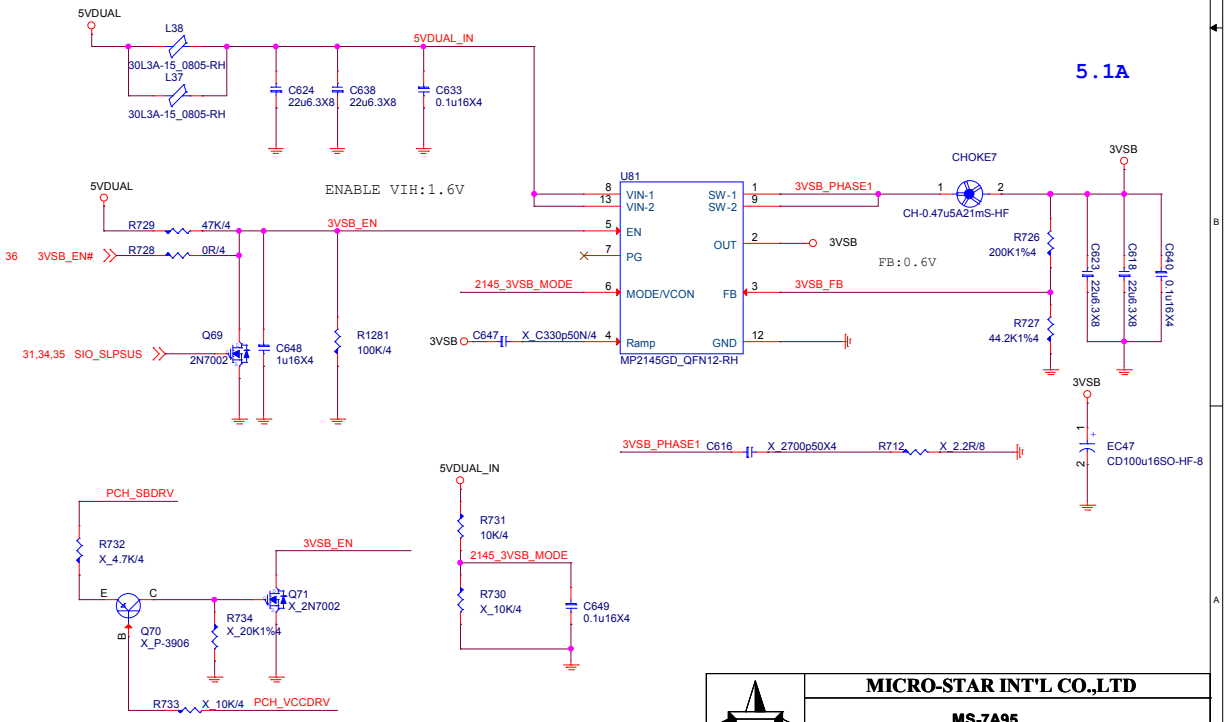


3VDSW



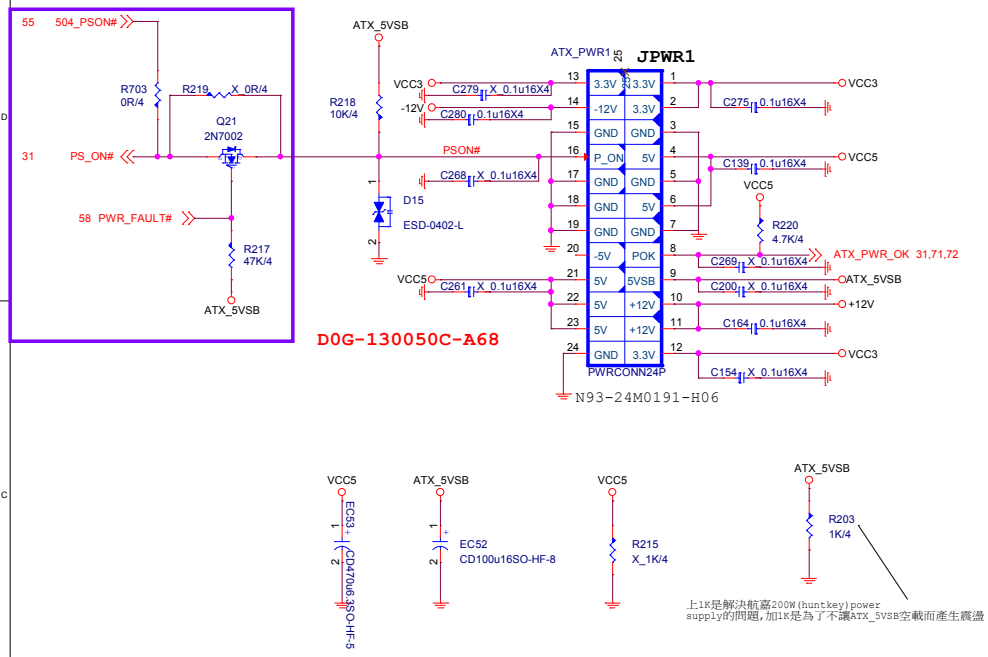


3VSB for OC & Gaming



MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7A95	
Size: Custom	Document Description: ACPI-MPS	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 72 of 84	

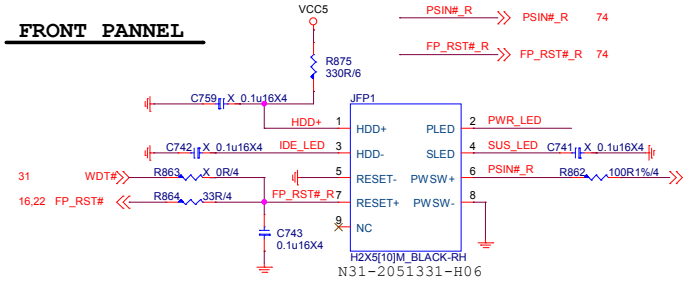
ATX POWER CONNECTOR

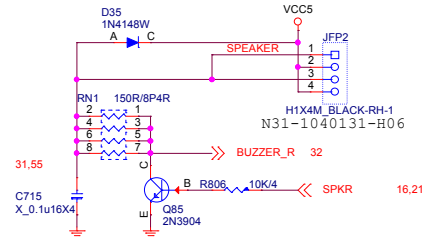


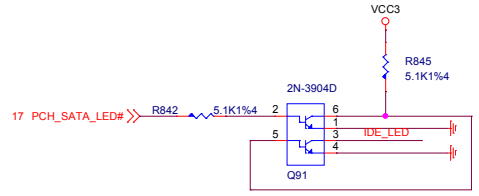
VCC5 EC53+ CD470u6.3SO-HF-5
ATX_5VSB EC52 CD100u16SO-HF-8
VCC5 R215 X_1K/4
ATX_5VSB R203 1K/4

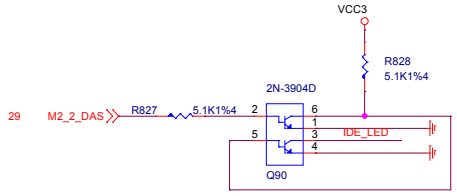
上1K是解決航嘉200W(huntkey)power supply的問題,加1K是為了不讓ATX_5VSB空載而產生震盪

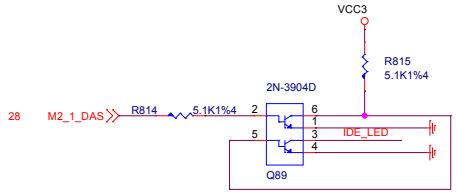
FRONT PANNEL



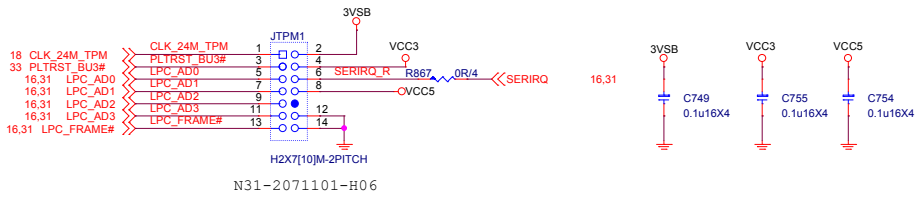






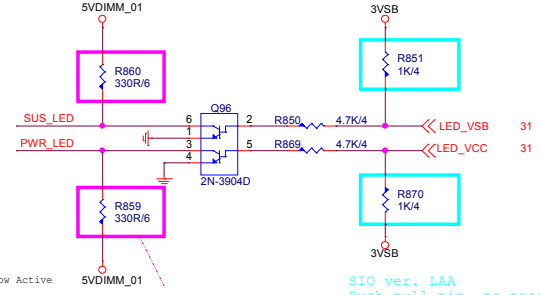


TPM Pin Header



3VSB C749 0.1u16X4
VCC3 C755 0.1u16X4
VCC5 C754 0.1u16X4

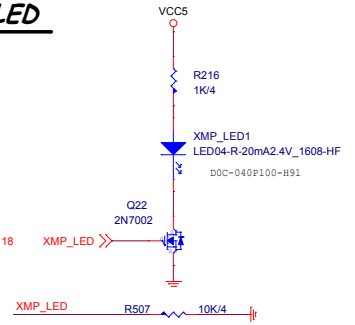
Front Panel LED



Reserve pull high to 5VDIMM if PM don't want PLED light in deep mode.

SIO ver. LAA
Push pull pin, no need to stuff resisters.

XMP LED



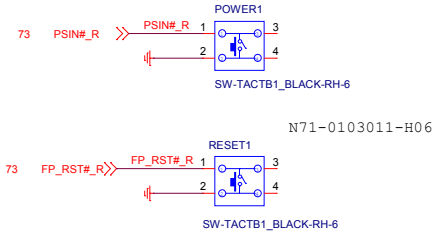
MICRO-STAR INT'L CO.,LTD

MS-7A95

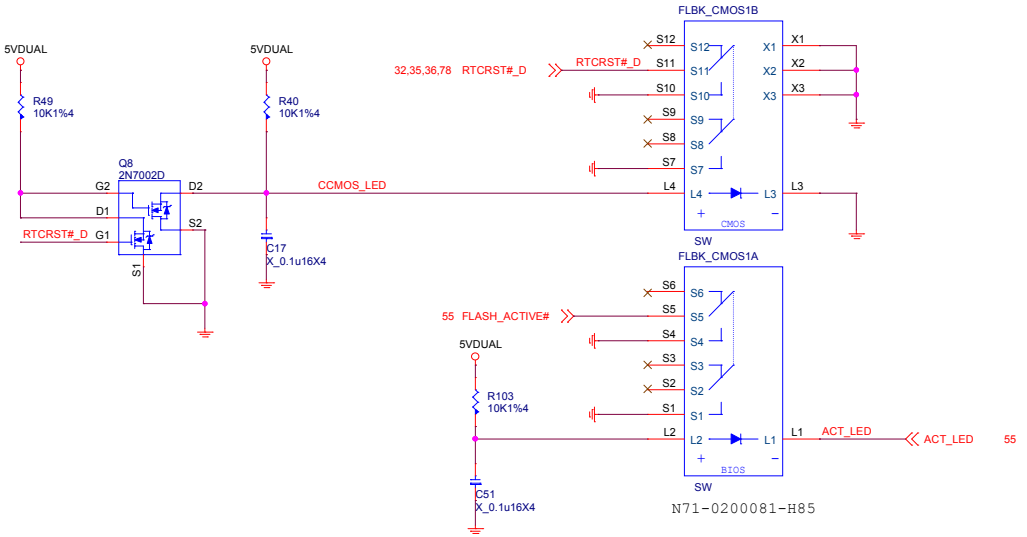
Size	Document Description	Rev
Custom	ATX Connector/F_Panel	1.0

Date: Monday, May 15, 2017 Sheet 73 of 84

PWR/RST Botton

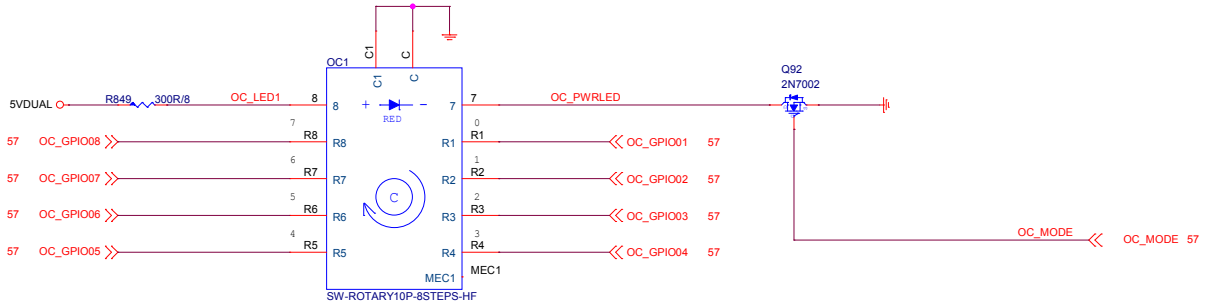


N71-0103011-H06



N71-0200081-H85

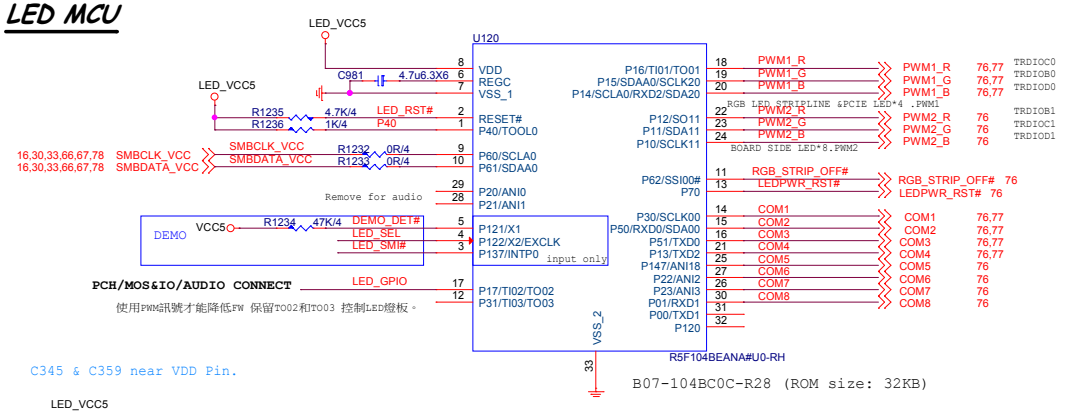
OC Genie



N7F-0100121-H06

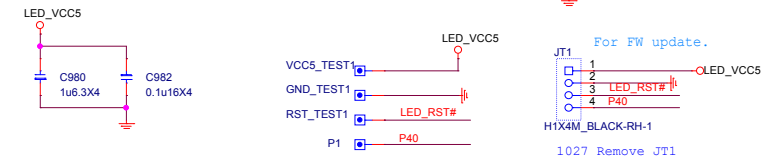
MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: Botton and OC GENIE	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 74 of 84	

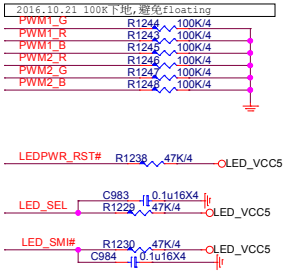
LED MCU



B07-104BC0C-R28 (ROM size: 32KB)

C345 & C359 near VDD Pin.





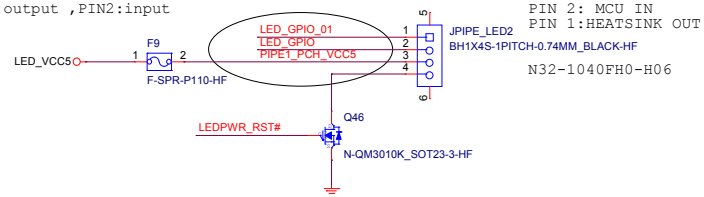
Control	Net Name	PWM USE	Connector
AUDIO Cover	LED_GPIO	No Use	JPIPE_LED1
PCH	LED_GPIO_01	No Use	JPIPE_LED2
MOS/IO cover	LED_GPIO_02	No Use	JPIPE_LED3
LED STRIPLINE	RGB_STRIP_OFF#	PWM1	JLED1
Board Side LED	COM1~8	PWM2	RGB LED
PCIE Side LED	COM1~4	PWM1	RGB LED

1 PCH HEATSINK LED

PCS LED*0.16W=W

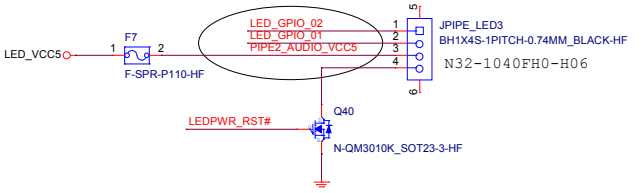
JPIPE:PIN1:output ,PIN2:input

PIN 2: MCU IN
PIN 1:HEATSINK OUT



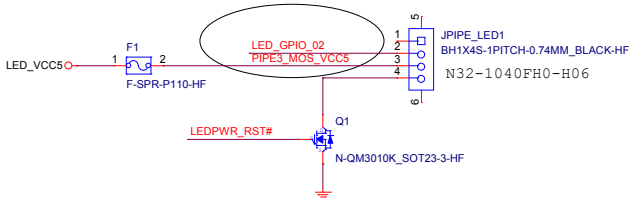
2 AUDIO/IO Cover LED

PCS LED*0.16W=W

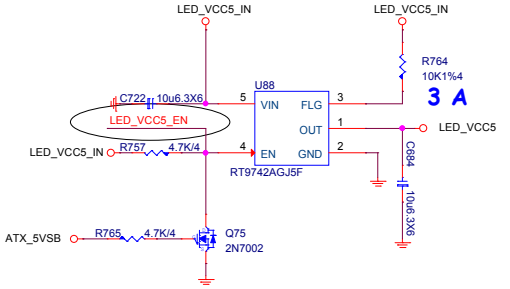


3 MOS HEATSINK LED

PCS LED*0.16W=W

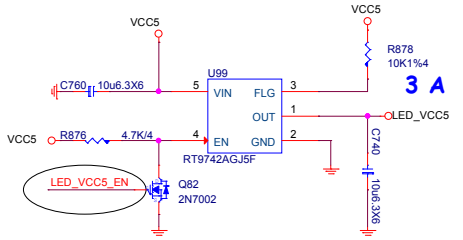


EXTERNAL POWER INPUT

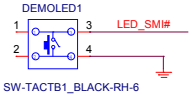


min 80mil.

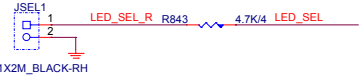
I36-9742A09-R11

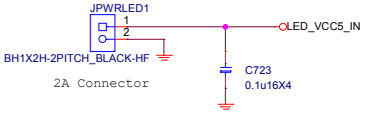


LED Demo Button



N71-0103011-H06





N32-1020CB1-H06

MICRO-STAR INT'L CO.,LTD

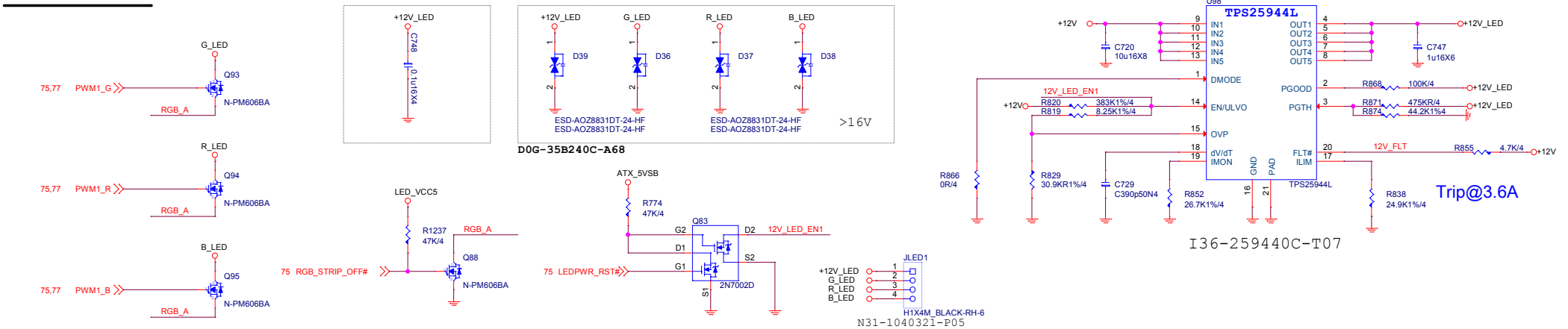
MS-7A95

Size: Custom | Document Description: LED MCU Control | Rev: 1.0

Date: Monday, May 15, 2017 | Sheet 75 of 84

LED STRIPLINE

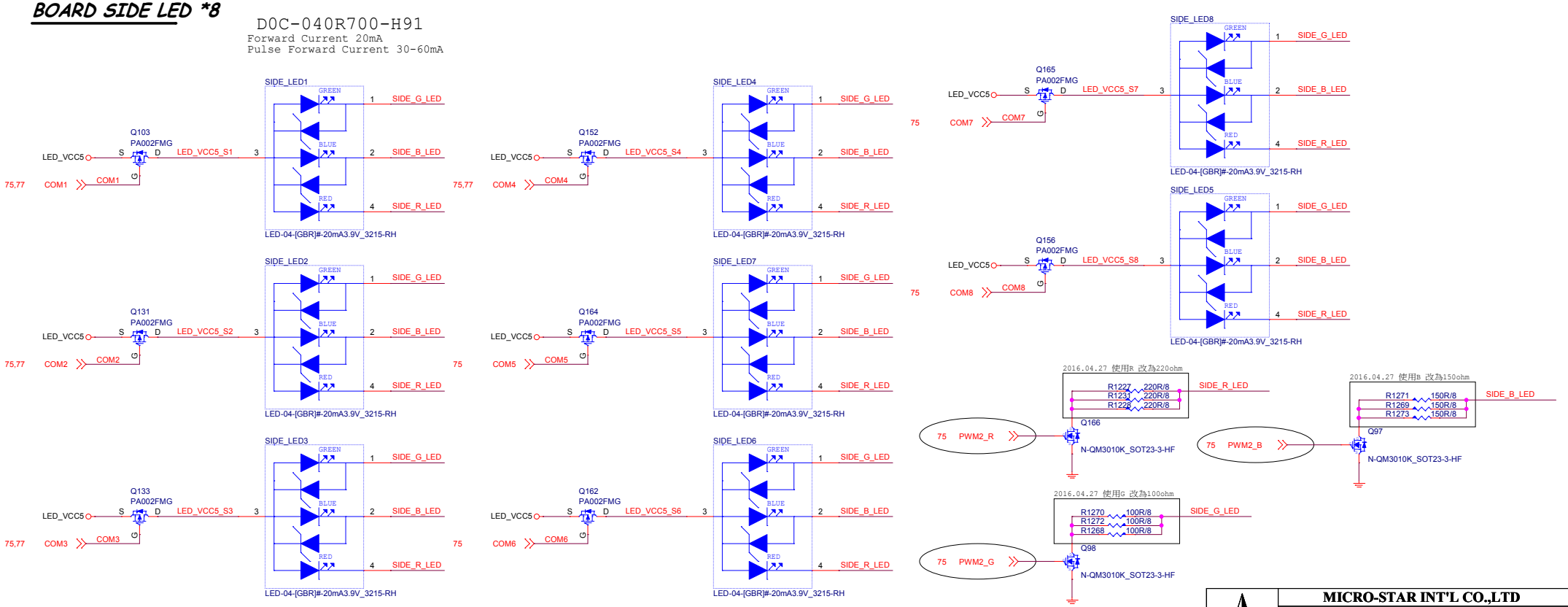
2016.07.06 only reserve now
2016.08.02 Add +12V_LED 0.1uF2016.08.02 stuff ESD



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

BOARD SIDE LED *8

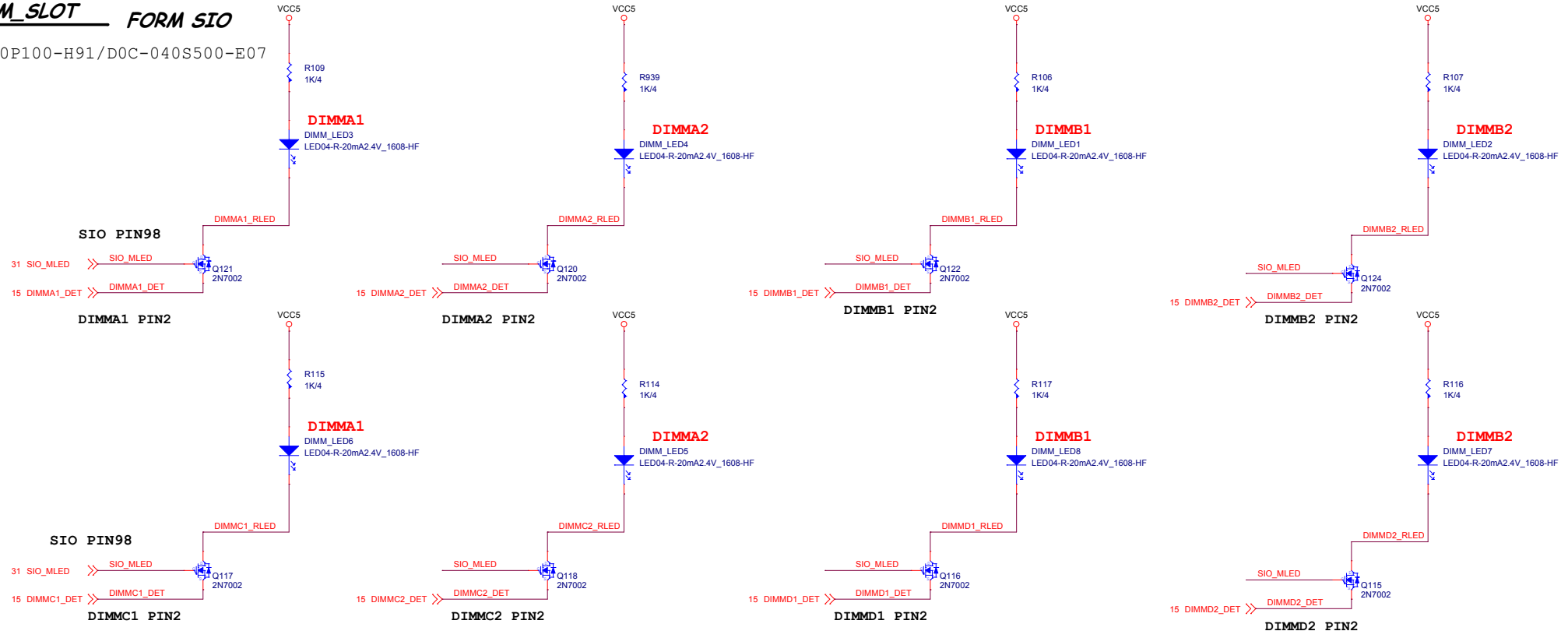
D0C-040R700-H91
Forward Current 20mA
Pulse Forward Current 30-60mA



MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: LED STRIP/BOARD SIDE LED	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 76 of 84	

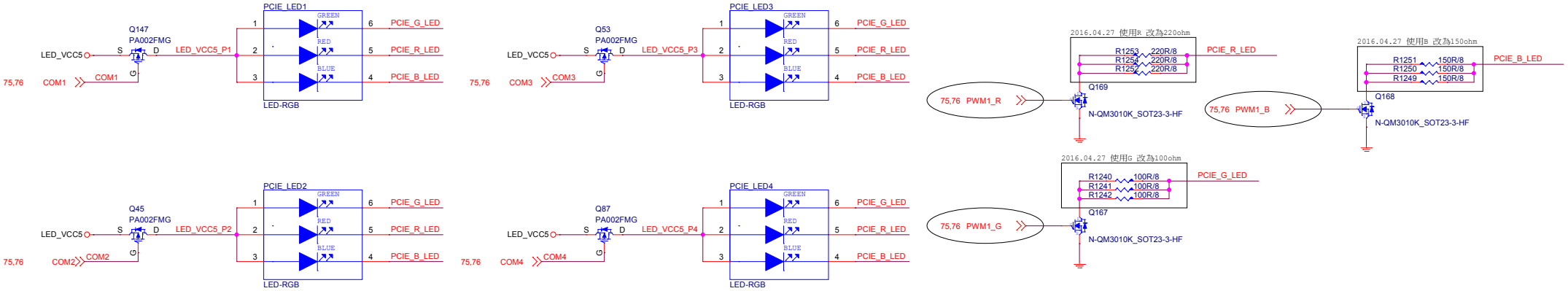
DIMM_SLOT FORM SIO

D0C-040P100-H91/D0C-040S500-E07

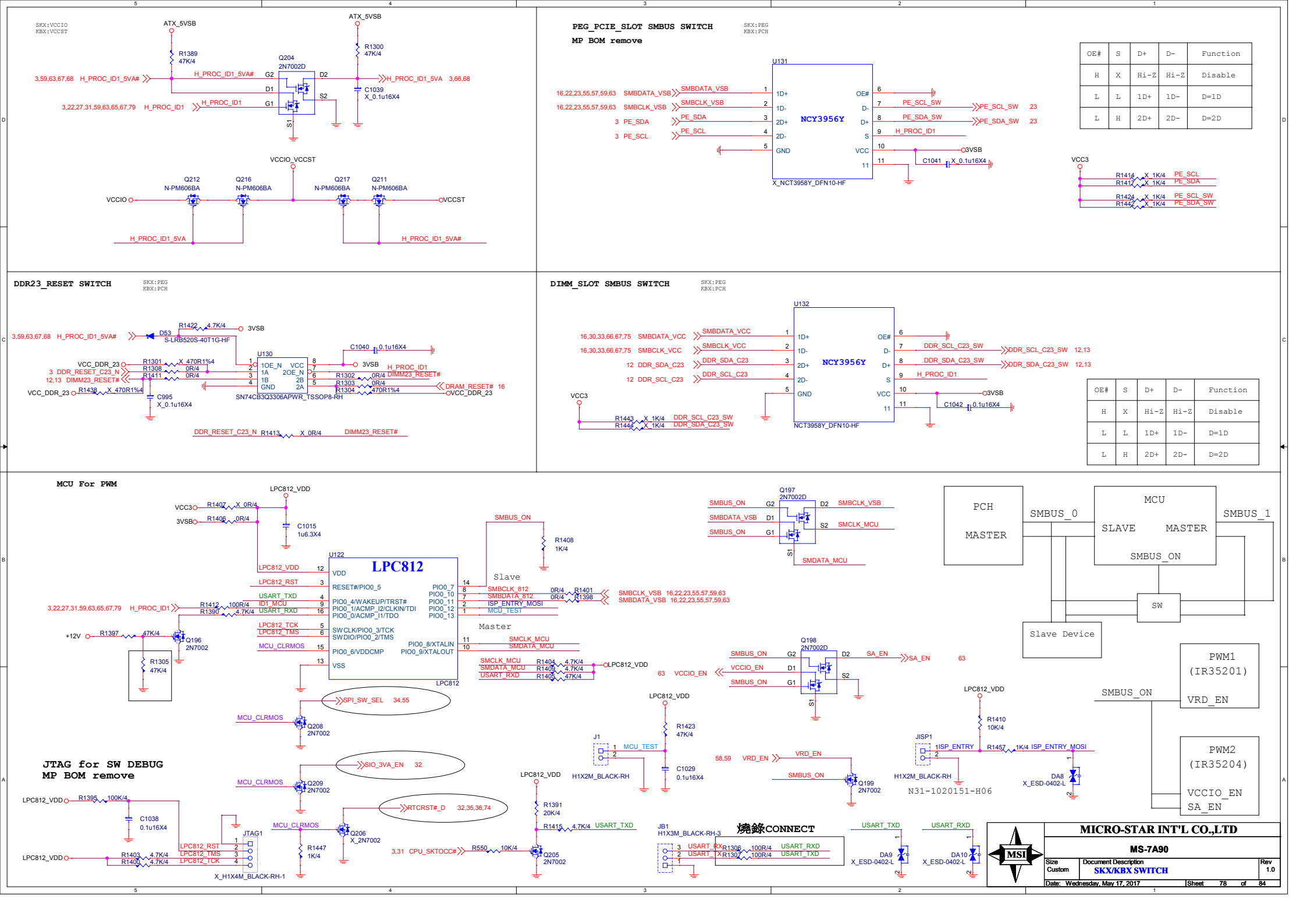


PCIE_SLOT LED*4 FORM MCU

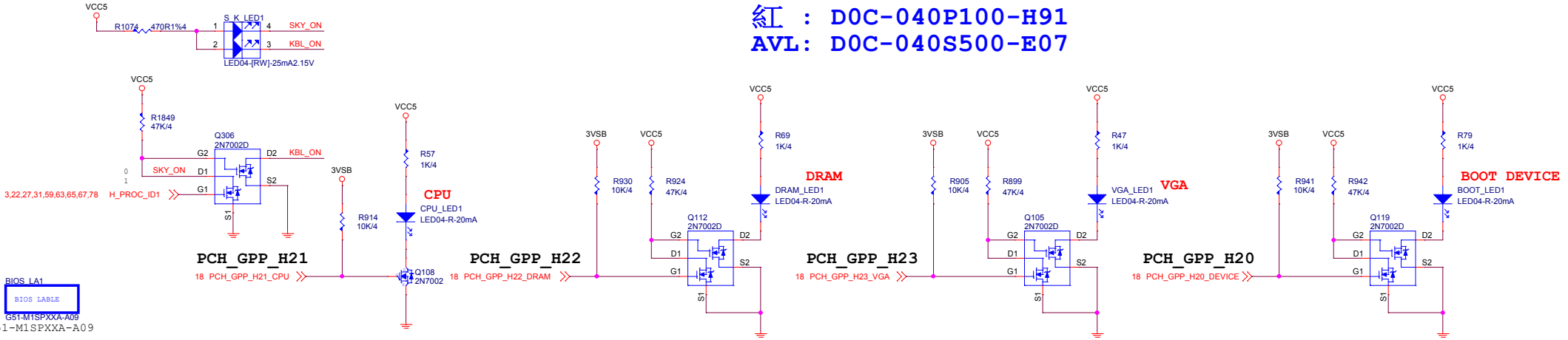
D0C-040S400-H91



MICRO-STAR INT'L CO.,LTD		
MS-7A95		
Size: Custom	Document Description: DIMM LED	Rev: 1.0
Date: Monday, May 15, 2017	Sheet 77 of 84	


SKX:VCCIO
KBX:VCCST
ATX_5VSB
R1389 47K/4
Q204 2N7002D
H_PROC_ID1_5VA#
H_PROC_ID1_5VA
R1300 47K/4
C1039 X_0.1u16X4
H_PROC_ID1
S1
S2
VCCIO_VCCST
Q212 N-PM606BA
Q216 N-PM606BA
Q217 N-PM606BA
Q211 N-PM606BA
VCCIO
VCCST
PEG_PCIE_SLOT SMBUS SWITCH
MP BOM remove
SKX:PEG
KBX:PCH
U131
NCY3956Y
SMBDATA_VSB
SMBCLK_VSB
PE_SDA
PE_SCL
PE_SCL_SW
PE_SDA_SW
H_PROC_ID1
3VSB
C1041 X_0.1u16X4
X_NCT3958Y_DFN10-HF
OE# S D+ D- Function
H X Hi-Z Hi-Z Disable
L L 1D+ 1D- D=1D
L H 2D+ 2D- D=2D
VCC3
R1414 X_1K/4 PE_SCL
R1415 X_1K/4 PE_SDA
R1424 X_1K/4 PE_SCL_SW
R1442 X_1K/4 PE_SDA_SW
DDR23_RESET SWITCH
SKX:PEG
KBX:PCH
D53 S-LRB520S-40T1G-HF
R1422 4.7K/4
U130
SN74CB3Q3306APWR_TSSOP8-RH
C1040 0.1u16X4
C995 X_0.1u16X4
DDR_RESET_C23_N
DIMM23_RESET#
DRAM_RESET# 16
VCC_DDR_23
R1413 X_0R/4
DIMM_SLOT SMBUS SWITCH
SKX:PEG
KBX:PCH
U132
NCY3956Y
SMBDATA_VCC
SMBCLK_VCC
DDR_SDA_C23
DDR_SCL_C23
DDR_SCL_C23_SW
DDR_SDA_C23_SW
H_PROC_ID1
3VSB
C1042 0.1u16X4
NCT3958Y_DFN10-HF
OE# S D+ D- Function
H X Hi-Z Hi-Z Disable
L L 1D+ 1D- D=1D
L H 2D+ 2D- D=2D
MCU For PWM
LPC812
LPC812_VDD
C1015 1u6.3X4
R1408 1K/4
Slave
Master
SMBCLK_812
SMBDATA_812
ISP_ENTRY_MOSI
MCU_TEST
SMBCLK_MCU
SMBDATA_MCU
USART_TXD
USART_RXD
ID1_MCU
LPC812_TCK
LPC812_TMS
MCU_CLRMOS
SPI_SW_SEL 34,55
SIO_3VA_EN 32
RTCRST#_D 32,35,36,74
CPU_SKTOCC# 3,31
R550 10K/4
Q196 2N7002
Q208 2N7002
Q209 2N7002
Q206 X_2N7002
Q205 2N7002
Q197 2N7002D
Q198 2N7002D
Q199 2N7002
SMBUS_ON
VCCIO_EN
SA_EN
VRD_EN
R1423 47K/4
C1029 0.1u16X4
H1X2M_BLACK-RH
R1410 10K/4
R1457 1K/4
ISP_ENTRY
JISP1
N31-1020151-H06
DA8 X_ESD-0402-L
DA9 X_ESD-0402-L
DA10 X_ESD-0402-L
JTAG for SW DEBUG
MP BOM remove
JTAG1
X_H1X4M_BLACK-RH-1
R1391 20K/4
R1415 4.7K/4
JB1
H1X3M_BLACK-RH-3
燒錄CONNECT
PCH
MASTER
SMBUS_0
MCU
SLAVE
MASTER
SMBUS_1
SMBUS_ON
SW
Slave Device
PWM1 (IR35201)
VRD_EN
PWM2 (IR35204)
VCCIO_EN
SA_EN
MICRO-STAR INT'L CO.,LTD
MS-7A90
Size Custom
Document Description SKX/KBX SWITCH
Rev 1.0
Date: Wednesday, May 17, 2017
Sheet 78 of 84

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



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

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

BIOS_LA1
BIOS LABLE
G51-M1SPXXA-A09
G51-M1SPXXA-A09

SLI1
Label
SLI
VIRTUAL
Y01-RNVIDIL-000

SSE1
Label
SSE
VIRTUAL
Y02-MA00101-SSE

XSPLT1
Label
XSPLIT
VIRTUAL
Y02-MA00401-XSP

NAHIMIC1
Label
NAHIMIC
VIRTUAL
Y02-MU00100-NAH

CFOS1
Label
CFOS
VIRTUAL
Y02-MU00170-CFO

MKT1
Label
MKT
VIRTUAL
G51-M1SPL72-Q13

M2_COVER1
M2 Cover
M2_COVER1
E31-0001400-A87

M2_COVER2
M2 Cover
M2_COVER2
E31-0001390-A87

VR_COVER1
VR Cover
X1
X2
E21-7A63020-RH
E21-7A63020-A91

E31-0409050-A87
PCH_SINK1
MEC1
MEC2
MEC3
MEC4
MEC5
MEC6
MPOWER
HS-0409050-RH

CPU_SINK1
MEC1 MEC2 MEC3 MEC4 MEC5 MEC6 MEC7
HS-0504900-RH
E31-0504900-A87

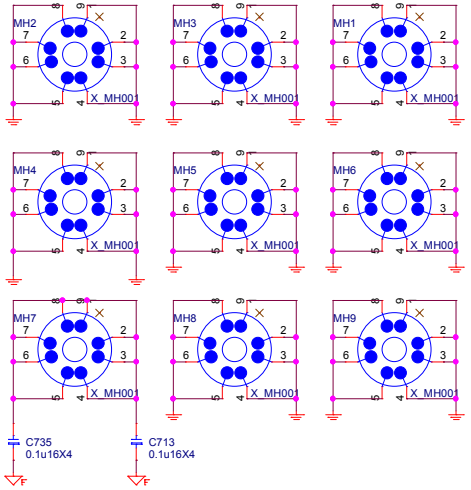
CPU_H1
CPU 鐵座
CPU_ILM1
CPU_H2
CPU 鐵座
X_CPU_BP1
E21-7A95020-L06
AVL:E21-7A95-050-F02

CHOKE_COVER1
CHOKE Cover
X1
X2
X_CHOKE_COVER

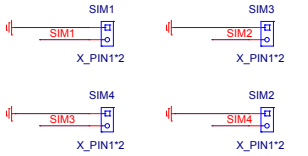
BAT1_X1
BAT-CR2032

PCB1
7A95_11
PD0-07A9511-G37

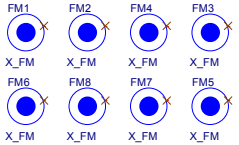
Mounting Holes

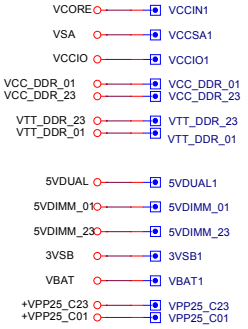


Simulation



Optical Fiducial Marks-120





MICRO-STAR INT'L CO.,LTD

MS-7A95

Size	Document Description	Rev
Custom	Manual Parts	1.0

Date: Thursday, May 18, 2017 Sheet 79 of 84