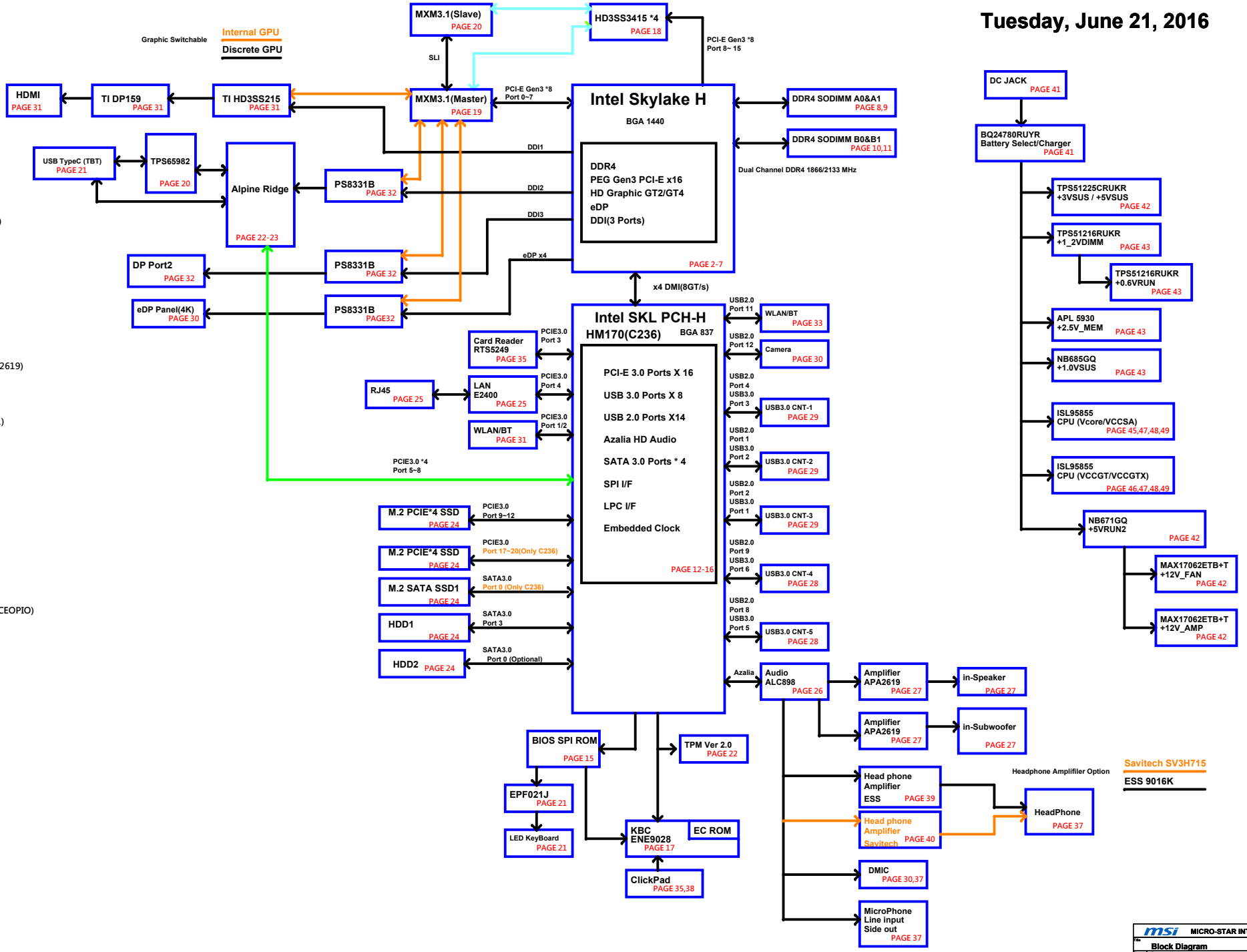
MS-17A1 Ver: 1.0 Intel Skylake platform

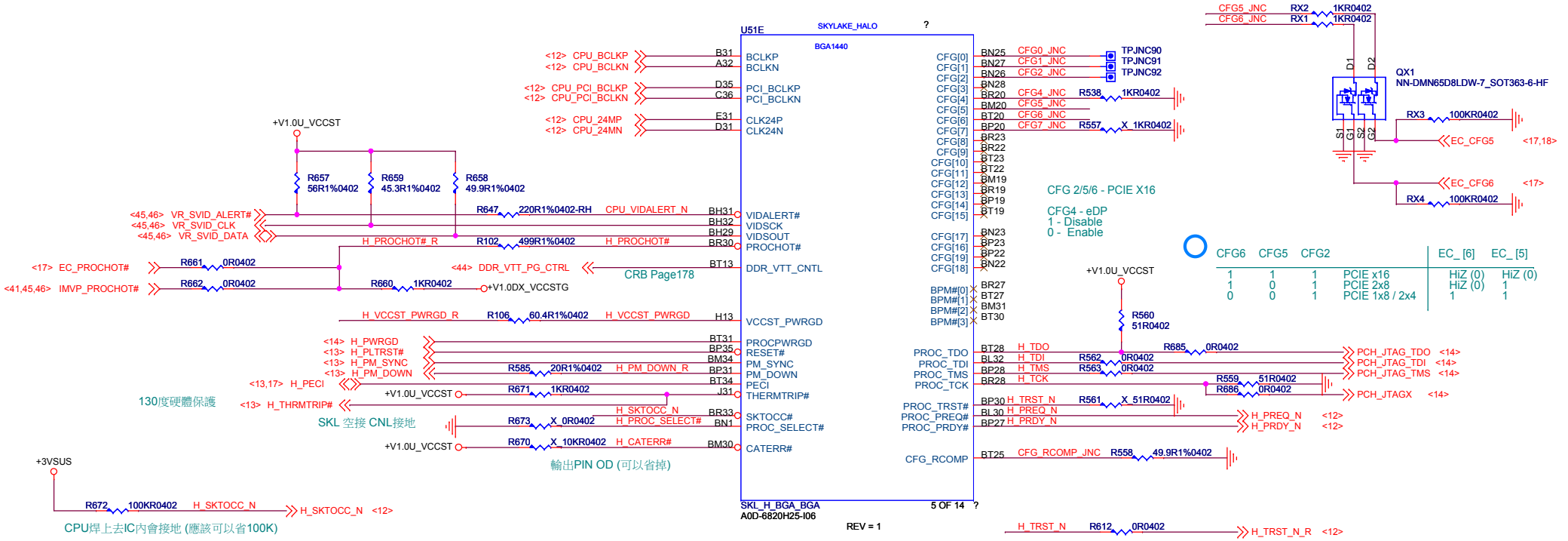
Tuesday, June 21, 2016



MICRO-STAR INT'L CO.,LTD.

Block Diagram

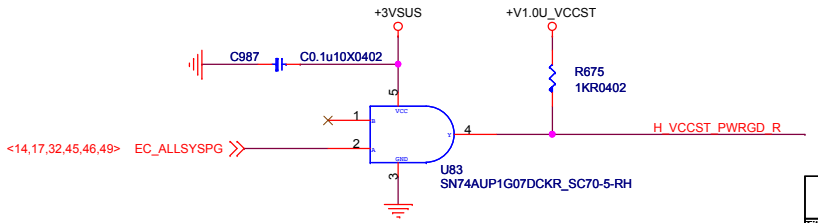
MS-17A1



MSR Privacy Bit Feature	
CFG3	1 = Debug capability is determined by IA32_Debug_Interface_MSR (0xC80) bit[0] setting 0 = IA32_Debug_Interface_MSR (0xC80) bit[0] default setting overridden

eDP Enable	
CFG4	1 = Disabled 0 = Enabled

PEG DEFER TRAINING	
CFG7	1: (Default) PEG Train immediately following xxRESETB de assertion 0: PEG Wait for BIOS for training



U54 i7-6700HQ A0D-6700H15-I06
U55 i7-6920HQ A0D-6920H15-I06
U56 i7-6820HK A0D-6820H25-I06

MICRO-STAR INT'L CO.,LTD.

Title: Skylake(HOST)

Size	Document Number	Rev
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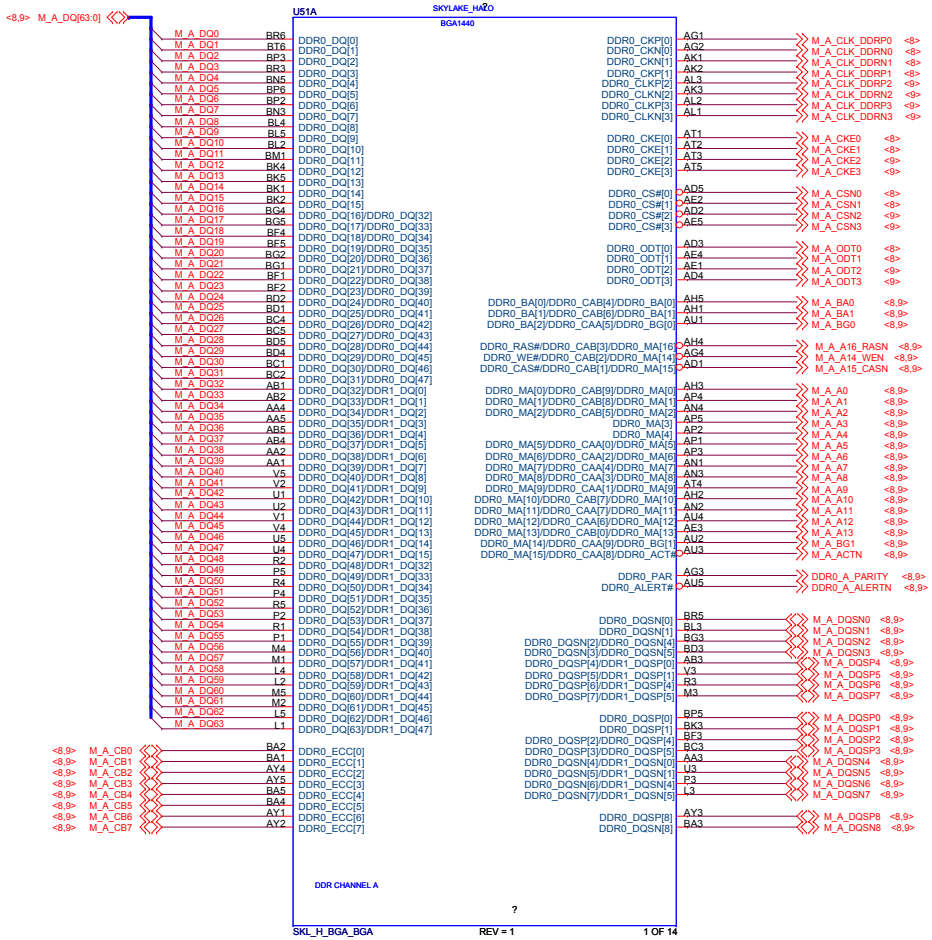
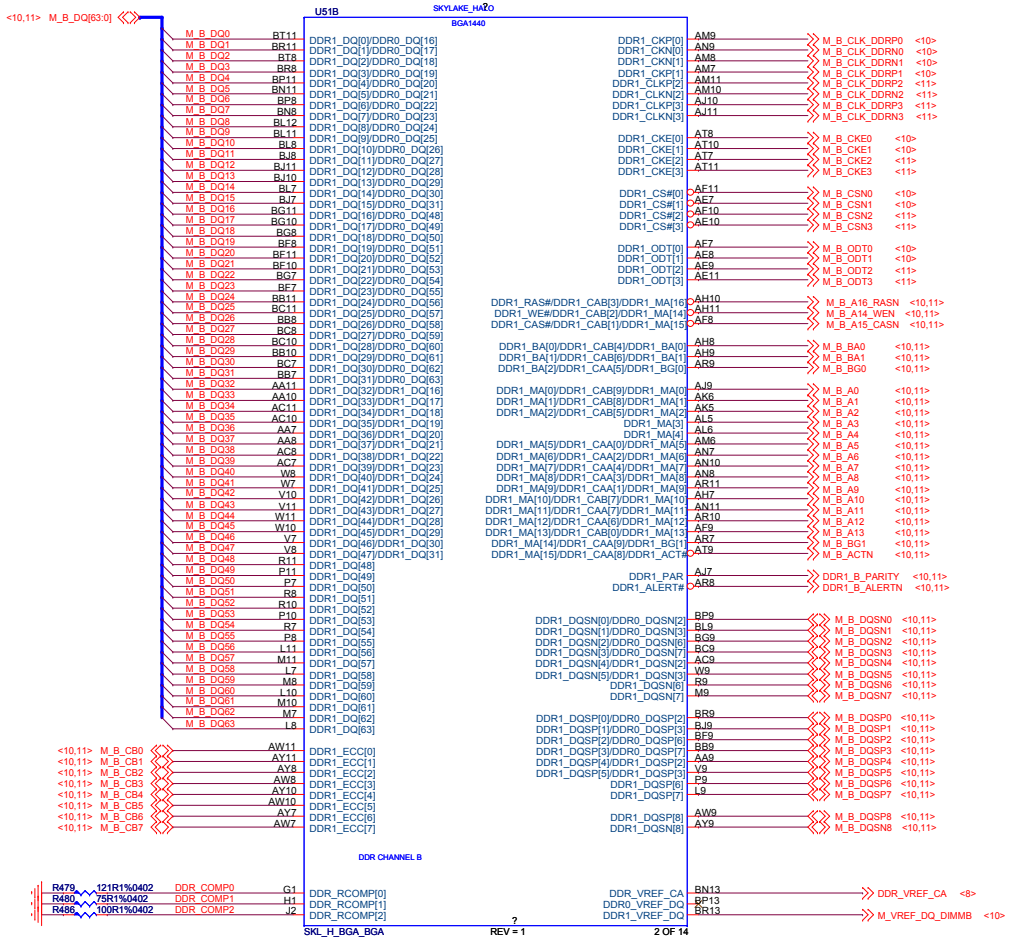
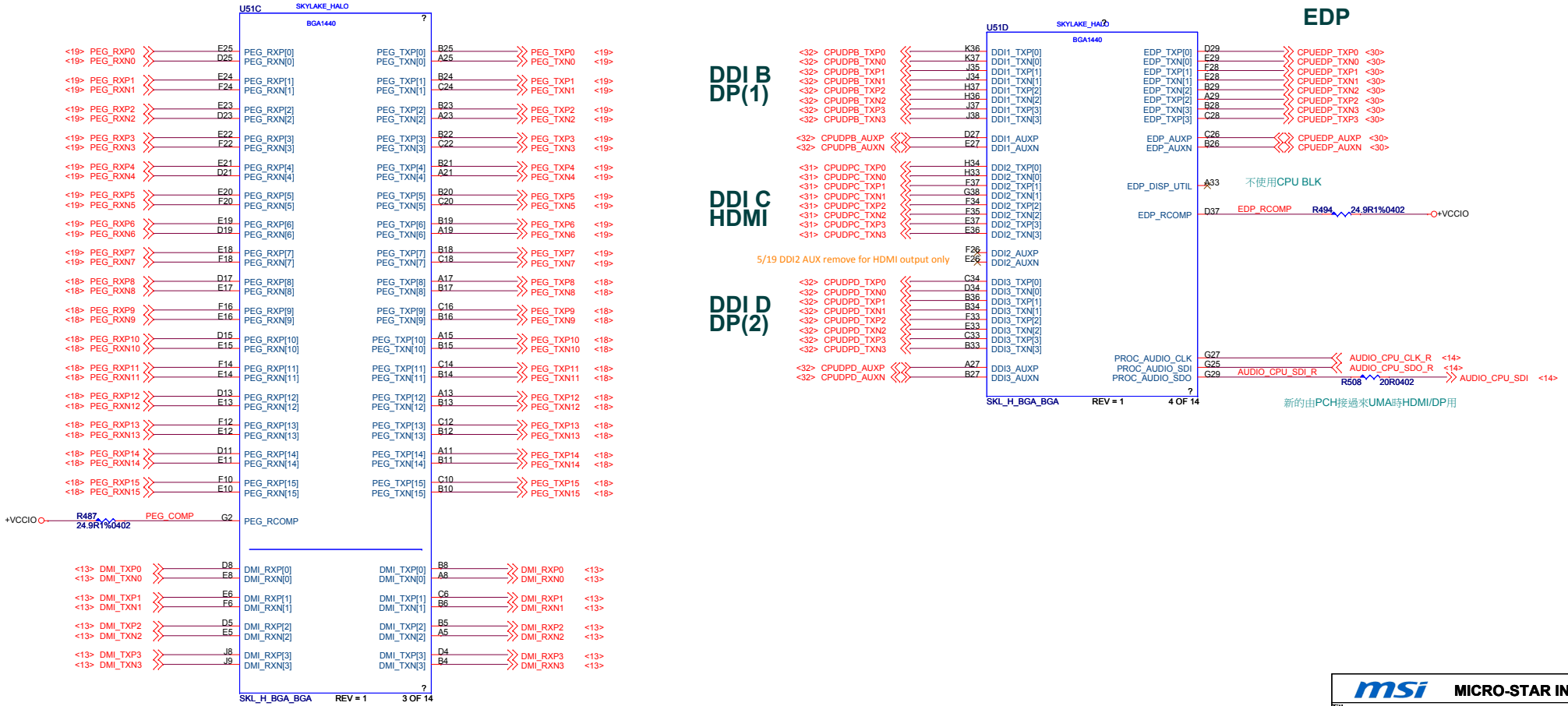
DDR Channel A



DDR Channel B



MSI	MICRO-STAR INT'L CO.,LTD.	
Title	Skylake(DDR4)	
Size: Custom	Document Number: MS-17A1	Rev: 1.0
Date: Friday, June 17, 2016	Sheet 3 of 55	

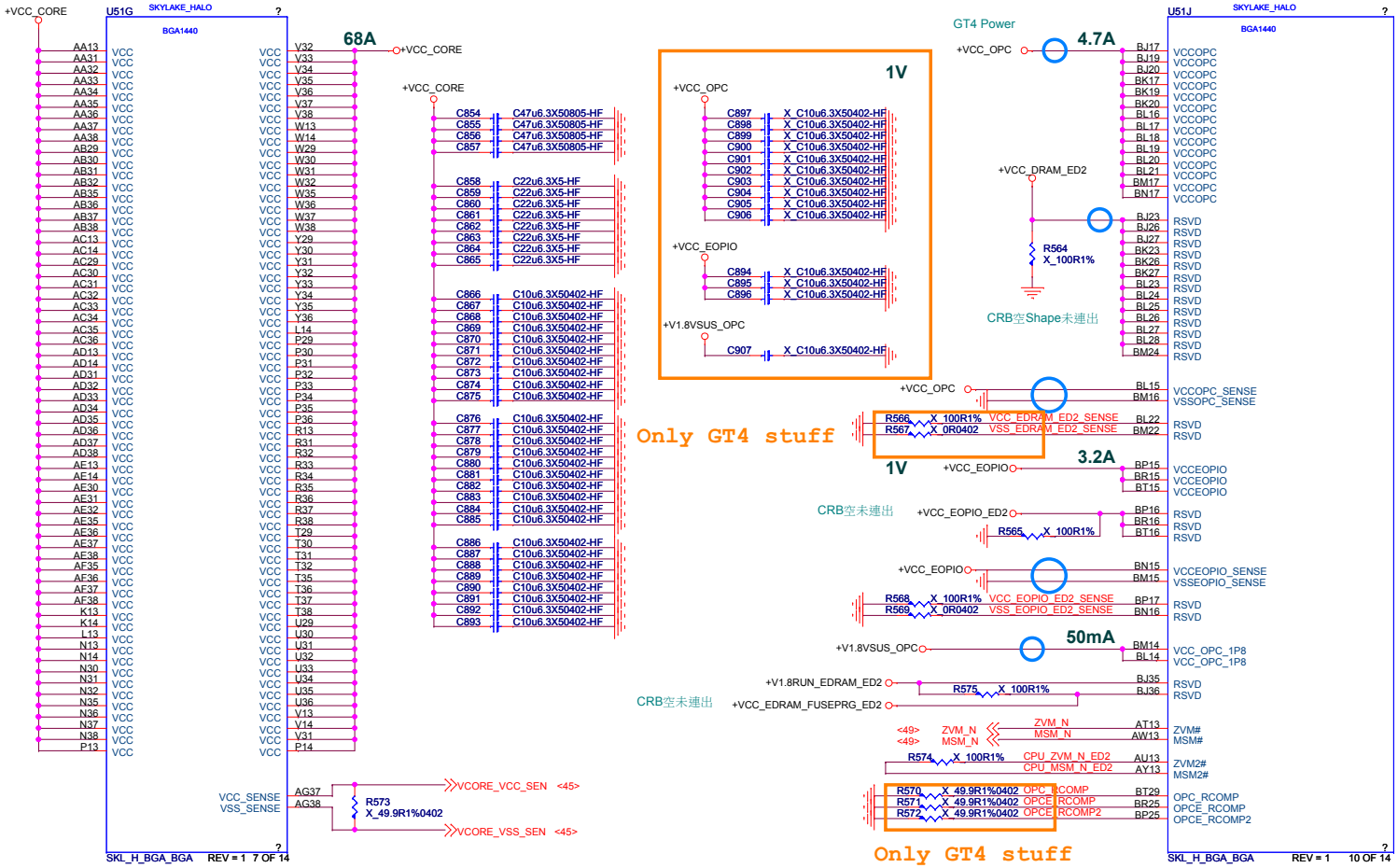


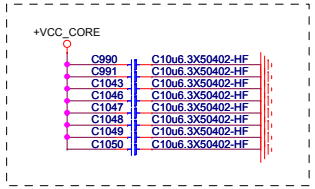
MICRO-STAR INT'L CO.,LTD.

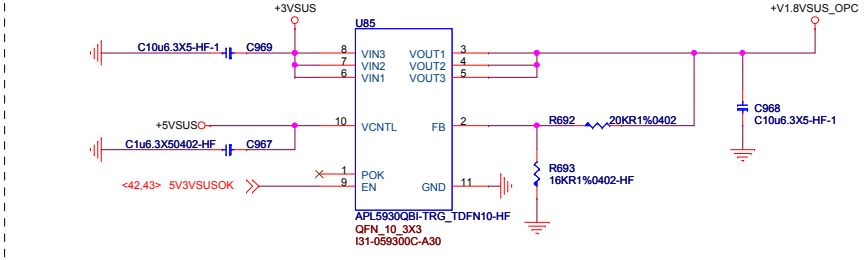
Title: Skylake(DMI/Display)

Size: Custom | Document Number: MS-17A1 | Rev: 1.0

Date: Friday, June 17, 2016 | Sheet 4 of 55





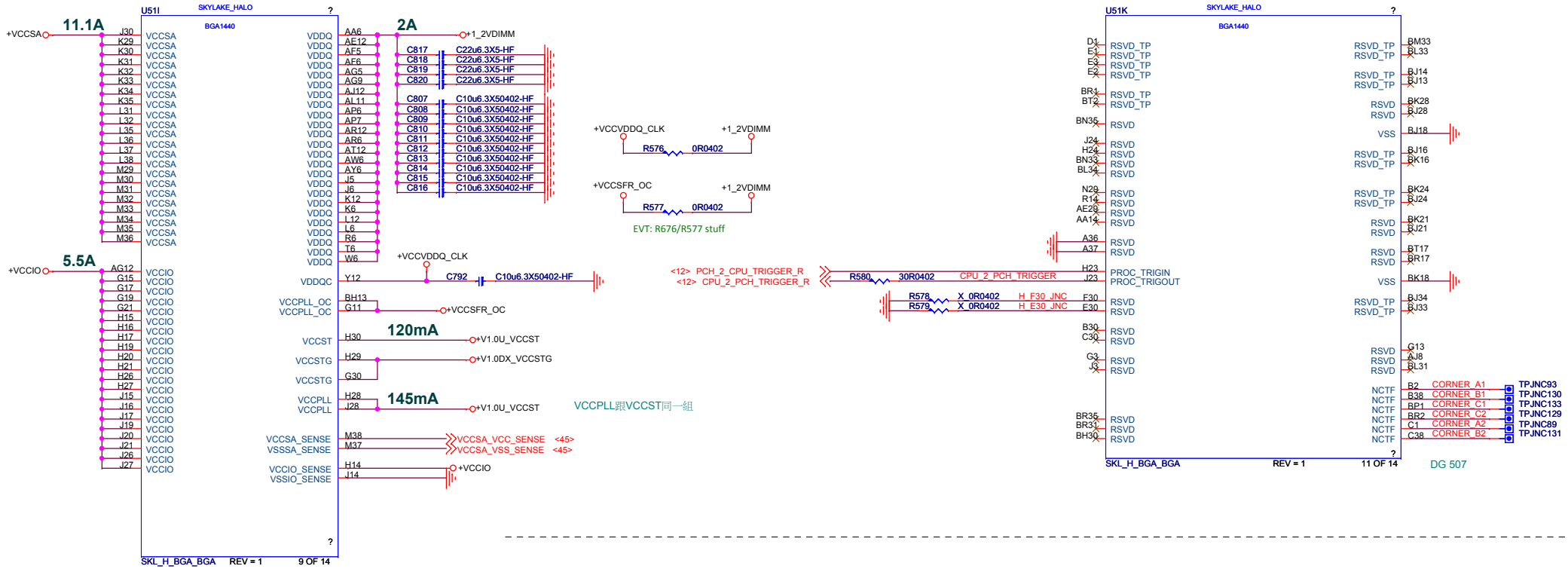


MICRO-STAR INT'L CO.,LTD.

Title: Skylake(Power1)

Size: Custom | Document Number: MS-17A1 | Rev: 1.0

Date: Monday, June 20, 2016 | Sheet 5 of 55

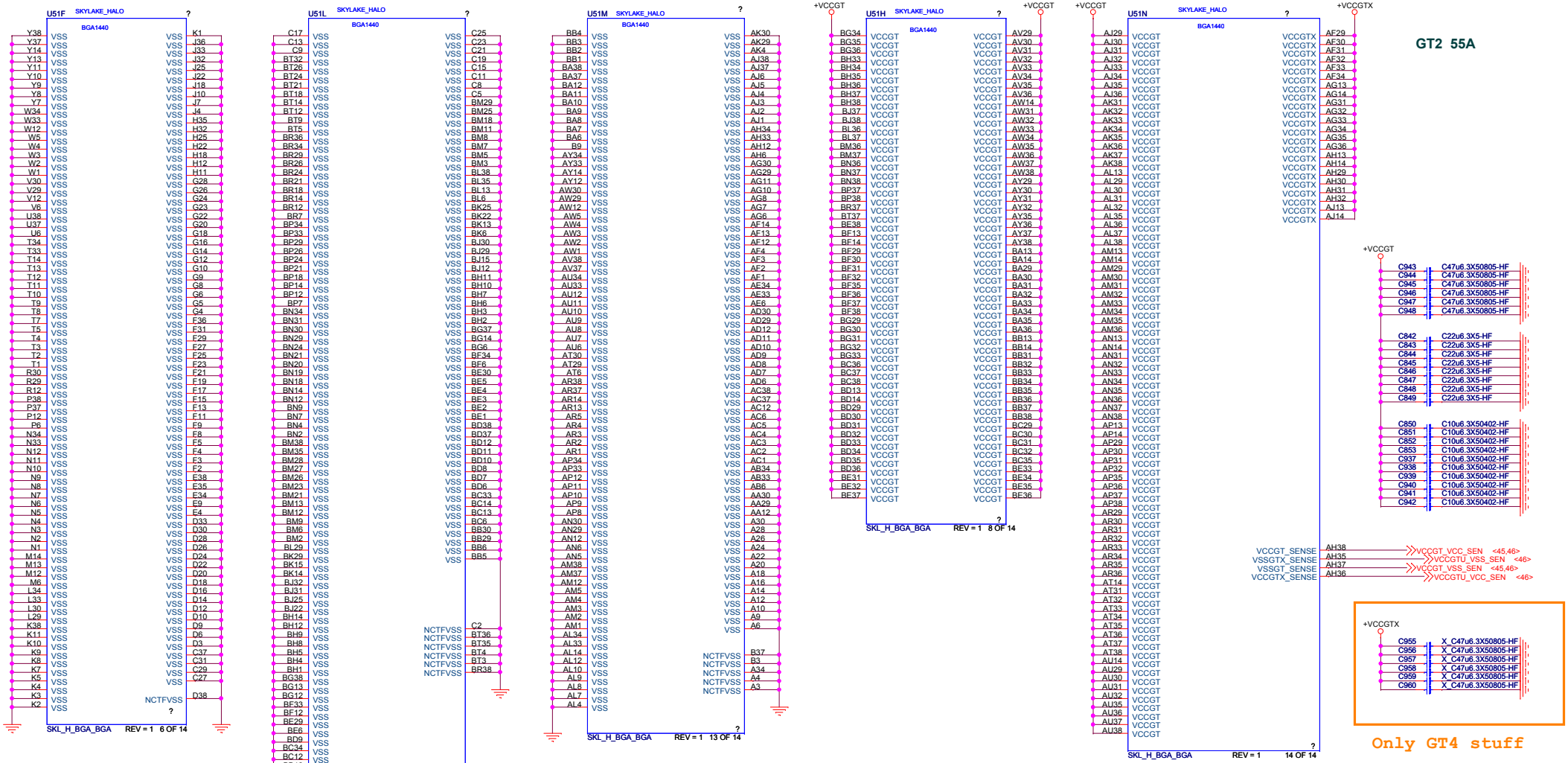


MICRO-STAR INT'L CO.,LTD.

Title: Skylake(Power2)

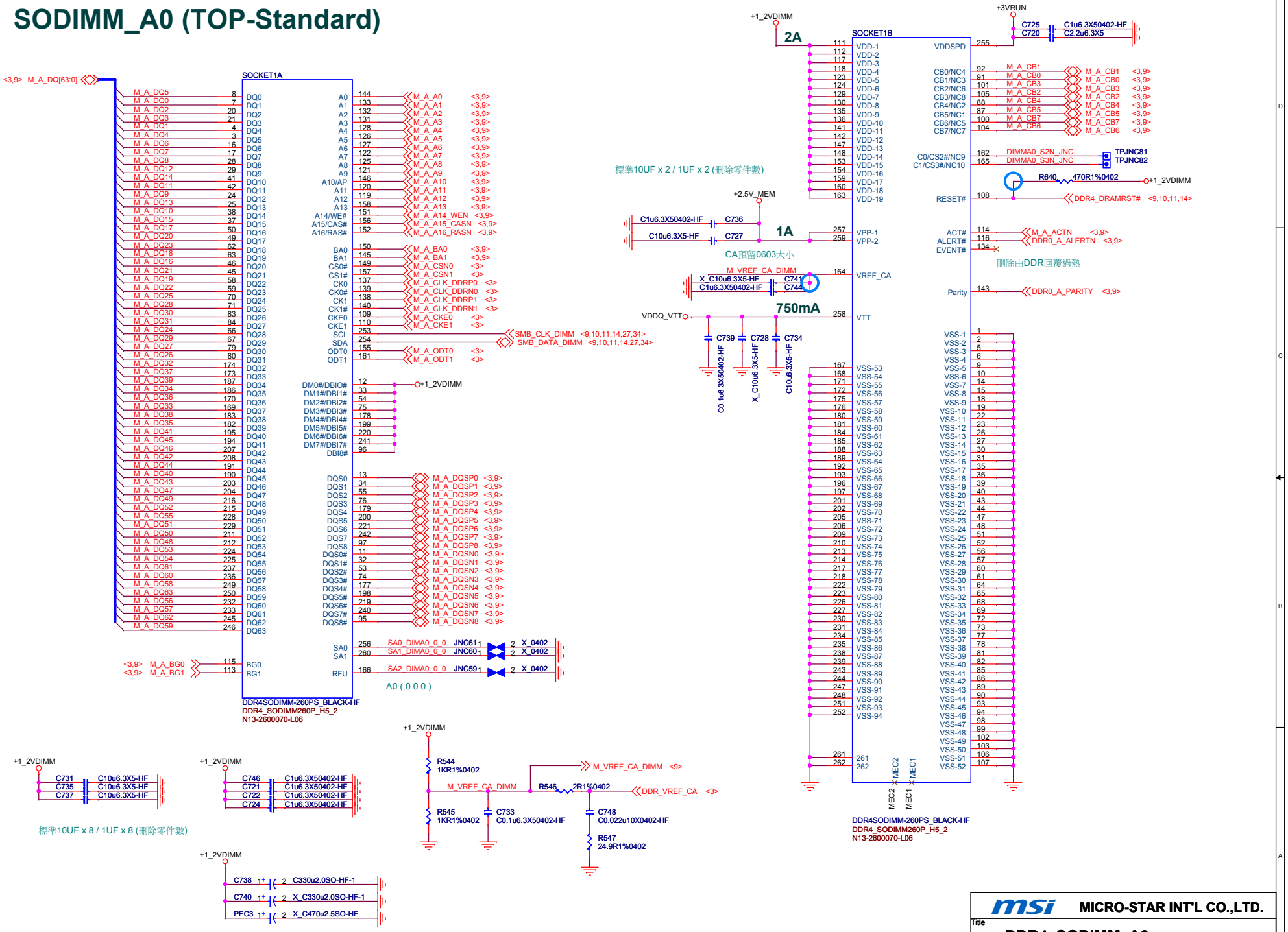
Size: Custom | Document Number: MS-17A1 | Rev: 1.0

Date: Friday, June 17, 2016 | Sheet 6 of 55



MICRO-STAR INT'L CO.,LTD.			
Title: Skylake(Power3)			
Size: Custom	Document Number: MS-17A1		Rev: 1.0
Date: Friday, June 17, 2016	Sheet 7 of 55		

SODIMM_A0 (TOP-Standard)



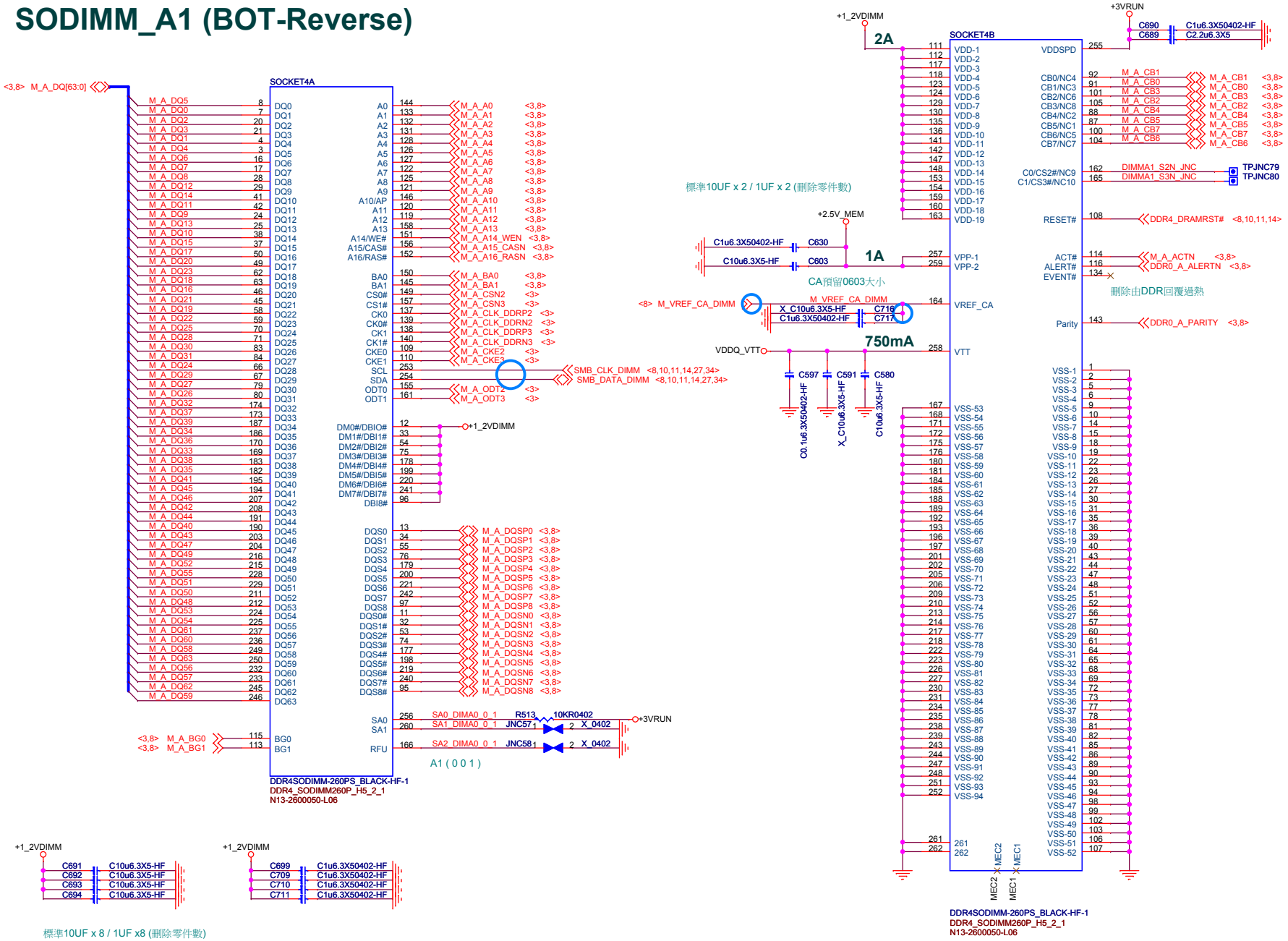
MICRO-STAR INT'L CO.,LTD.

Title: DDR4_SODIMM_A0

Size: Custom | Document Number: MS-17A1 | Rev: 1.0

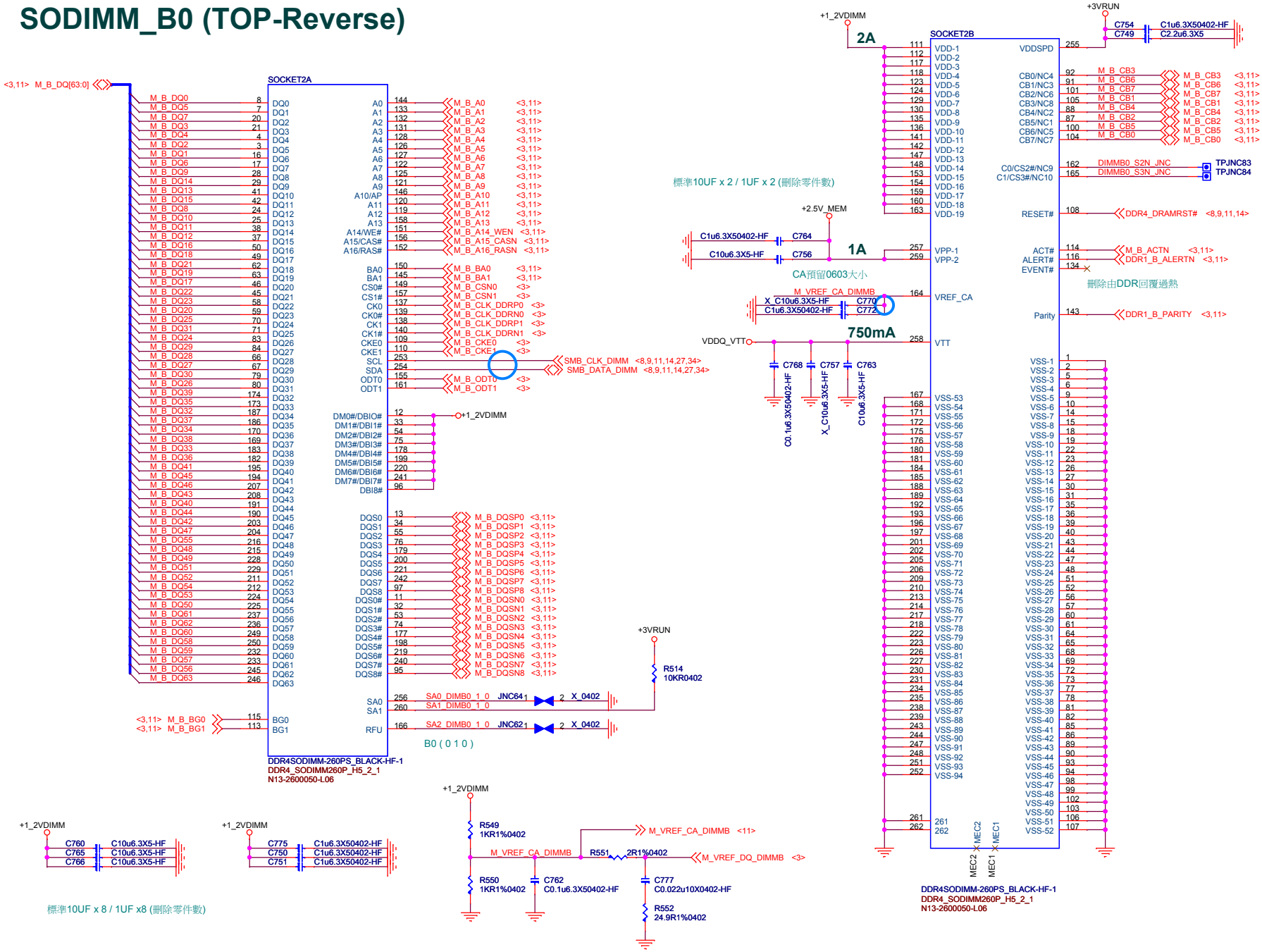
Date: Friday, June 17, 2016 | Sheet 8 of 55

SODIMM_A1 (BOT-Reverse)



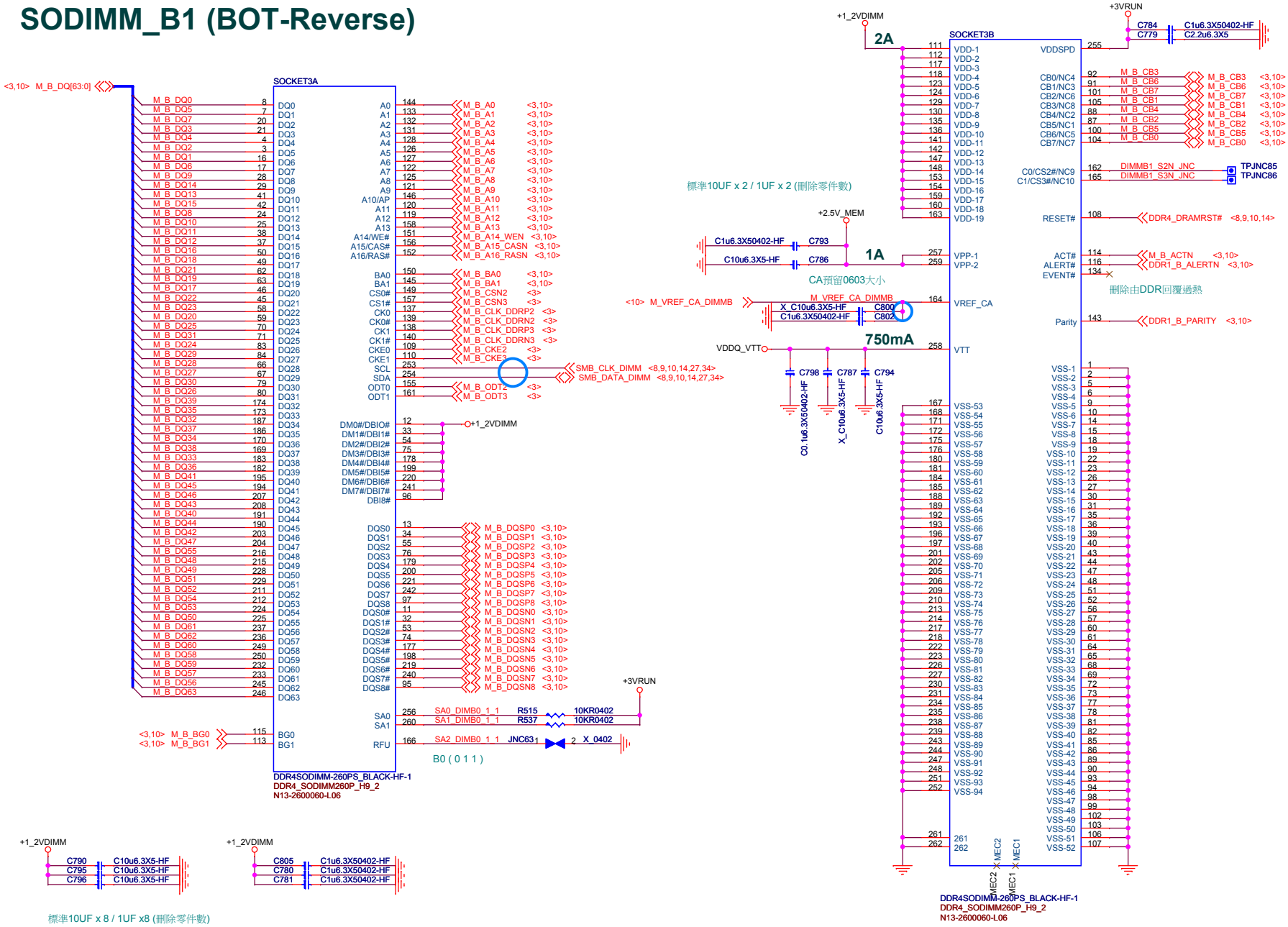
MICRO-STAR INT'L CO.,LTD.			
Title: DDR4_SODIMM_A1			
Size: Custom	Document Number: MS-17A1		Rev: 1.0
Date: Friday, June 17, 2016	Sheet 9 of 55		

SODIMM_B0 (TOP-Reverse)

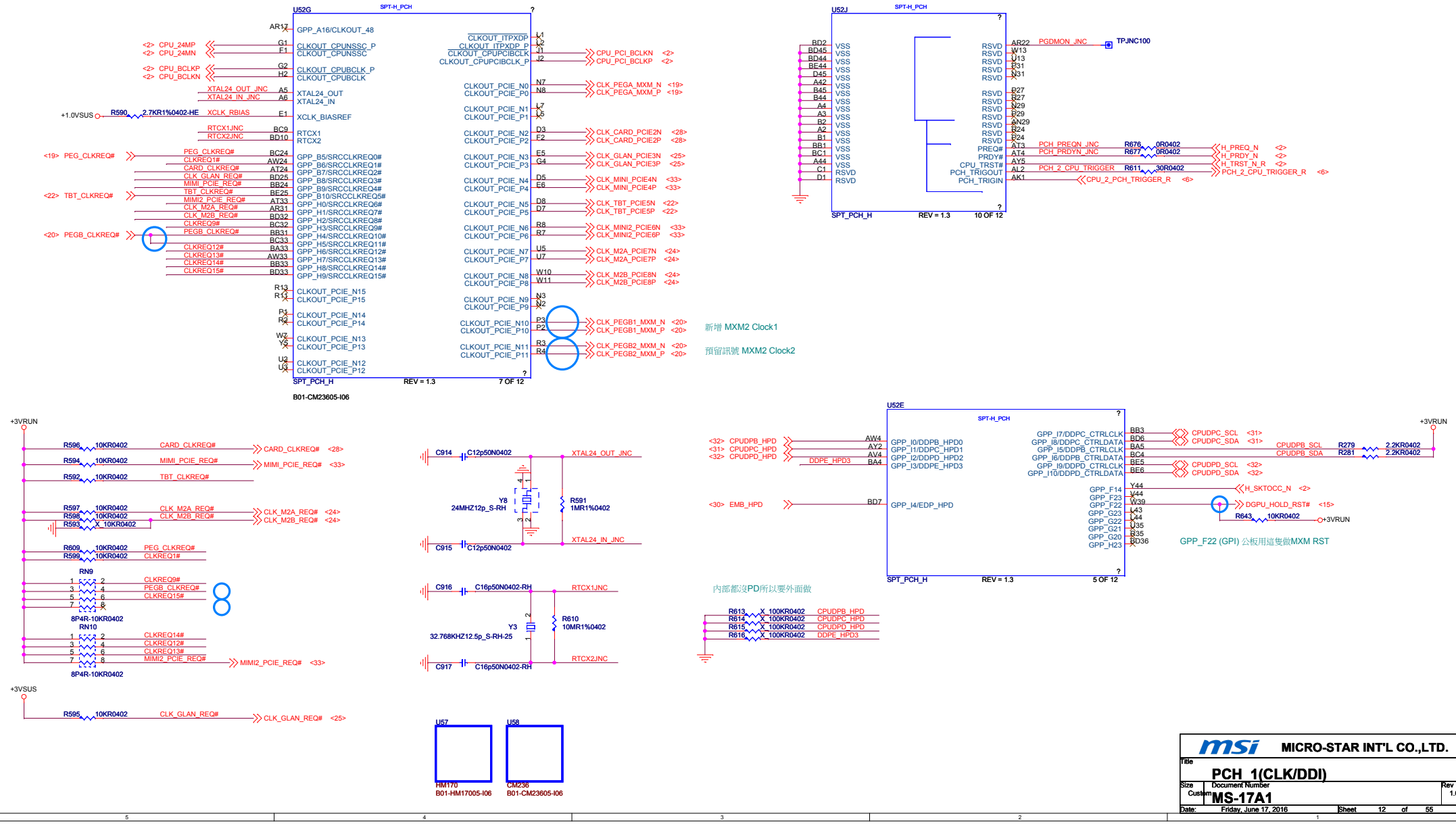


MSI	MICRO-STAR INT'L CO.,LTD.	
Title	DDR4_SODIMM_B0	
Size: Custom	Document Number: MS-17A1	Rev: 1.0
Date: Friday, June 17, 2016	Sheet 10 of 55	

SODIMM_B1 (BOT-Reverse)



MICRO-STAR INT'L CO.,LTD.			
Title: DDR4_SODIMM_B1			
Size: Custom	Document Number: MS-17A1		Rev: 1.0
Date: Friday, June 17, 2016		Sheet 11 of 55	



MICRO-STAR INT'L CO.,LTD.	
Title	PCH 1(CLK/DDI)
Size	Custom
Document Number	MS-17A1
Rev	1.0
Date:	Friday, June 17, 2016
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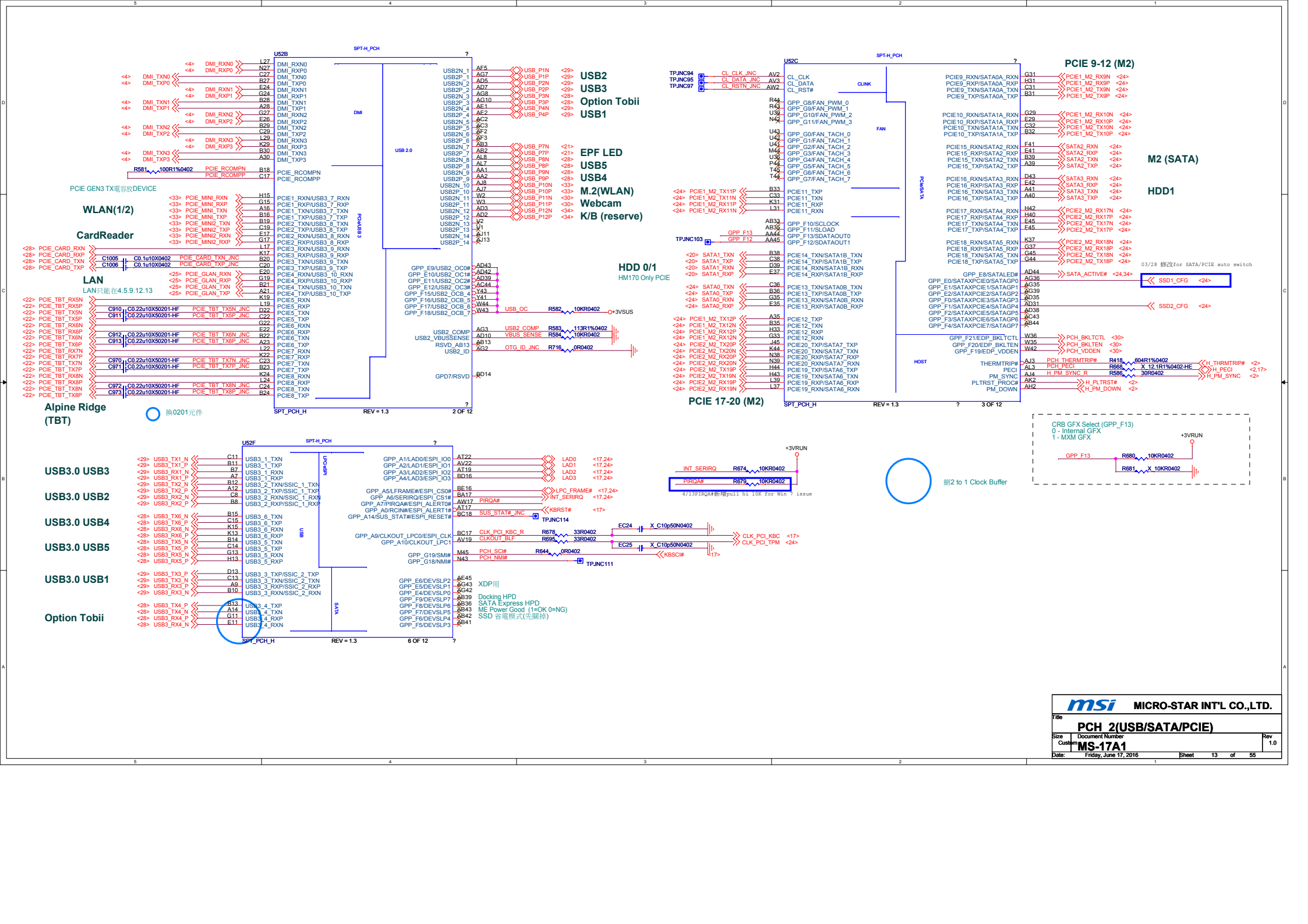
SPT-H_PCH
U52B
DMI
USB 2.0
PCIe*USB 3
USB2
USB3
Option Tobii
USB1
EPF LED
USB5
USB4
M.2(WLAN)
Webcam
K/B (reserve)
PCIE GEN3 TX電容放DEVICE
WLAN(1/2)
CardReader
LAN
LAN只能在4.5.9.12.13
Alpine Ridge (TBT)
換0201元件
HDD 0/1
HM170 Only PCIE
SPT_PCH_H
REV = 1.3
2 OF 12
U52C
CLINK
FAN
PCIe*SATA
HOST
PCIE 17-20 (M2)
PCIE 9-12 (M2)
M2 (SATA)
HDD1
03/28 修改for SATA/PCIE auto switch
3 OF 12
U52F
USB3.0 USB3
USB3.0 USB2
USB3.0 USB4
USB3.0 USB5
USB3.0 USB1
Option Tobii
USB3
SATA
6 OF 12
XDP用
Docking HPD
SATA Express HPD
ME Power Good (1=OK 0=NG)
SSD 省電模式(先關掉)
+3VRUN
4/13PIRQA#新增pull hi 10K for Win 7 issue
刪2 to 1 Clock Buffer
CRB GFX Select (GPP_F13)
0 - Internal GFX
1 - MXM GFX
MICRO-STAR INT'L CO.,LTD.
PCH_2(USB/SATA/PCIE)
MS-17A1
Rev 1.0
Friday, June 17, 2016
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SMBALERT#
0 - Disable (Default Internal 20K PD)
1- Enable (AMT/SBA)

SML0ALERT#
0 - LPC (Default Internal 20K PD)
1- eSPI

PCH EDS Page 52

U52D — SPT-H_PCH — AUDIO — SMBUS — JTAG — SPT_PCH_H — REV = 1.3 — 4 OF 12

HDA_BITCLK, HDA_RST#, HDA_SDI0, HDA_SDI1, HDA_SDO, HDA_SYNC, RSVD_BD1, RSVD_BE2, DISPA_SDO, DISPA_SDI, DISPA_BCLK

<26> CODEC_HDA_SDIN0
<17> FLASH_SECURITY
R617 1KR0402
<4> AUDIO_CPU_SDO_R
<4> AUDIO_CPU_SDI
<4> AUDIO_CPU_CLK_R
R624 30R0402
R633 30R0402
AUDIO_CPU_SDO
AUDIO_CPU_CLK

GPP_D8/I2S0_SCLK, GPP_D7/I2S0_RXD, GPP_D6/I2S0_TXD, GPP_D5/I2S0_SFRM, GPP_D20/DMIC_DATA0, GPP_D19/DMIC_CLK0, GPP_D18/DMIC_DATA1, GPP_D17/DMIC_CLK1

RTCRST#, SRTCRST#, PCH_PWROK, RSMRST#, DSW_PWROK, GPP_C2/SMBALERT#, GPP_C0/SMBCLK, GPP_C1/SMBDATA, GPP_C5/SML0ALERT#, GPP_C3/SML0CLK, GPP_C4/SML0DATA, GPP_B23/SML1ALERT#/PCHHOT#, GPP_C6/SML1CLK, GPP_C7/SML1DATA

<17,19> RSMRST#
X_0402
JNC65
RSMRST#_JNC
SMBALERT#, SUS_SMBCLK, SUS_SMBDATA, SML0_CLK, SML0ALERT#, SML0_DATA, SML1ALERT#, SML1_CLK, SML1_DATA

GPP_A12/BMBUSY#/ISH_GP6/SX_EXIT_HOLDOFF#
GPP_A8/CLKRUN#
GPD11/LANPHYPC
GPD9/SLP_WLAN#
DRAM_RESET#
GPP_B2/VRALERT#
GPP_B1
GPP_B0
GPP_G17/ADR_COMPLETE
GPP_B11
SYS_PWROK
WAKE#
GPD6/SLP_A#
SLP_LAN#
GPP_B12/SLP_S0#
GPD4/SLP_S3#
GPD5/SLP_S4#
GPD10/SLP_S5#
GPD8/SUSCLK
GPD0/BATLOW#
GPP_A15/SUSACK#
GPP_A13/SUSWARN#/SUSPWRDNACK
GPD2/LAN_WAKE#
GPD1/ACPRESENT
SLP_SUS#
GPD3/PWRBTN#
SYS_RESET#
GPP_B14/SPKR
PROCPWRGD
ITP_PMODE
JTAGX
JTAG_TMS
JTAG_TDO
JTAG_TDI
JTAG_TCK

PM_CLKRUN# — TPJNC107 — R637 0R0402 — EC_CLKRUN# <17>
4/11 R637改上件
DDR4_DRAMRST# <8,9,10,11>
DRAM_SW1 <44>
DRAM_SW2 <44>
05/30 Add DRAM_SW1/DRAM_SW2
GPU1_EVENT# <19>
GPP_B11 (GPO)
PCIE_WAKE# <19,25,33>
PM_SLP_S3# <17,22,44,49>
PM_SLP_S4# <17,44>
PM_SLP_S5#JNC
SUSCLK_WLAN <33>
SUSCLK
BATLOW#
SUSACK#_JNC
SUSPWRACK
LAN_WAKE#
SLP_SUS#_JNC
AC_PRESENT <17>
PM_SYSRST#
PM_PWRBTN# <17>
H_PWRGD <2>
GPU2_EVENT# <20>
05/30 Shift GPU2_EVENT# to pin BD26
PCH_JTAGX <2>
PCH_JTAG_TMS <2>
PCH_JTAG_TDO <2>
PCH_JTAG_TDI <2>
PCH_JTAG_TCK
R687 X_51R0402

TPJNC105, TPJNC113, TPJNC106, TPJNC117, TPJNC110
0 - Enable TCO

+3VRUN
PM_SYSRST# R635 10KR0402
SMB_CLK_DIMM R629 1KR0402
SMB_DATA_DIMM R630 1KR0402
PM_CLKRUN# R664 10KR0402
4/12 EC request 新增 CLKRUN pull Hi 10K
PM_CLKRUN# R461 X_100KR0402
4/12 EC R461改接PM_CLKRUN# 不上件

+3VSUS
R620 X_2.2KR0402 SMBALERT#
R689 X_20KR0402-2
R625 X_2.2KR0402 SML0ALERT#
R626 X_150KR0402 SML1ALERT#
R627 1KR0402 SUS_SMBCLK
R628 1KR0402 SUS_SMBDATA
RN12 8P4R-1KR0402: SML0_CLK, SML0_DATA, SML1_DATA, SML1_CLK
RN13 8P4R-10KR0402: LAN_WAKE#, BATLOW#, AC_PRESENT

Q40 NN-DMN65D8LDW-7_SOT363-6-HF
SUS_SMBCLK, SUS_SMBDATA
SMB_CLK_DIMM <8,9,10,11,27,34>
SMB_DATA_DIMM <8,9,10,11,27,34>
R715 100KR0402
+3VSUS
+5VRUN
R622 100KR0402
R623 2.2KR0402
PWOK_SMB
C330 C0.1u6.3X50402-HF
Q39 NN-DMN65D8LDW-7_SOT363-6-HF
PCH_PWROK

+3VALW
R709 1.5KR0402
部門統一線路不上件
選Dual 體積比較小
QX12 NN-DMN65D8LDW-7_SOT363-6-HF
EC_RTC_RST <17>
RX45 100KR0402
R710 X_45.3KR1%0402
R713 X_0R0402
D12 1SS355_SOD323
D9 S-BAT54C_SOT23
RTCVCC
R618 20KR0402-2 RTCRST#
R619 20KR0402-2 SRTCRST#
C920 C1u10
C918 C1u10
C919 C1u10
G9
RTC_P2
R621 1KR0402
RTC_P3
MEC1 MEC2
BAT1 BAT2PS_BLACK-RH-1 BATHOLD_S2_2 N91-02F0060-L06
06/01 採購建議Coin battery 主料 改D06-0100101-K26

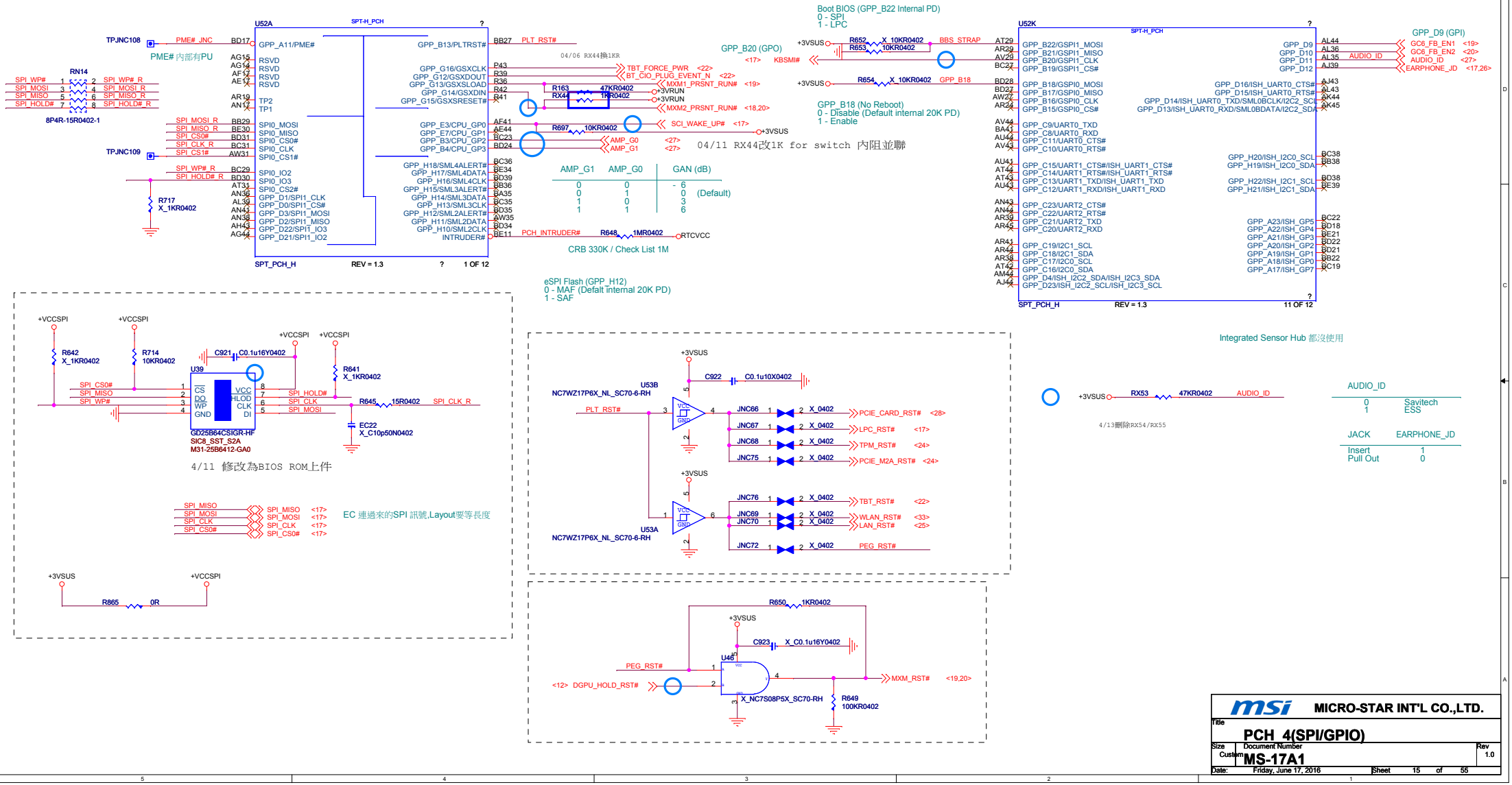
<26> CODEC_HDA_BITCLK
<26> CODEC_HDA_SDOUT
<26> CODEC_HDA_RST#
<26> CODEC_HDA_SYNC
RN11 8P4R-33R0402: HDA_BITCLK, HDA_SDO, HDA_RST#, HDA_SYNC
EC18 X_C10p50N0402
EC19 X_C10p50N0402
EC20 X_C10p50N0402
EC21 X_C10p50N0402

EVT: Add C985 for RC delay
C985 C0.1u6.3X50402-HF
R116 0R0402
<46> GT_PWROK
<45> CPU_PWROK
<2,17,32,45,46,49> EC_ALLSYSPG
除CPU power 外RUN電最後一根
C278 C0.1u6.3X50402-HF
PCH_PWROK
U27 NC7S08P5X_SC70-RH

60
BAT2 BAT-BCR2032P-RH D06-0100101-K26

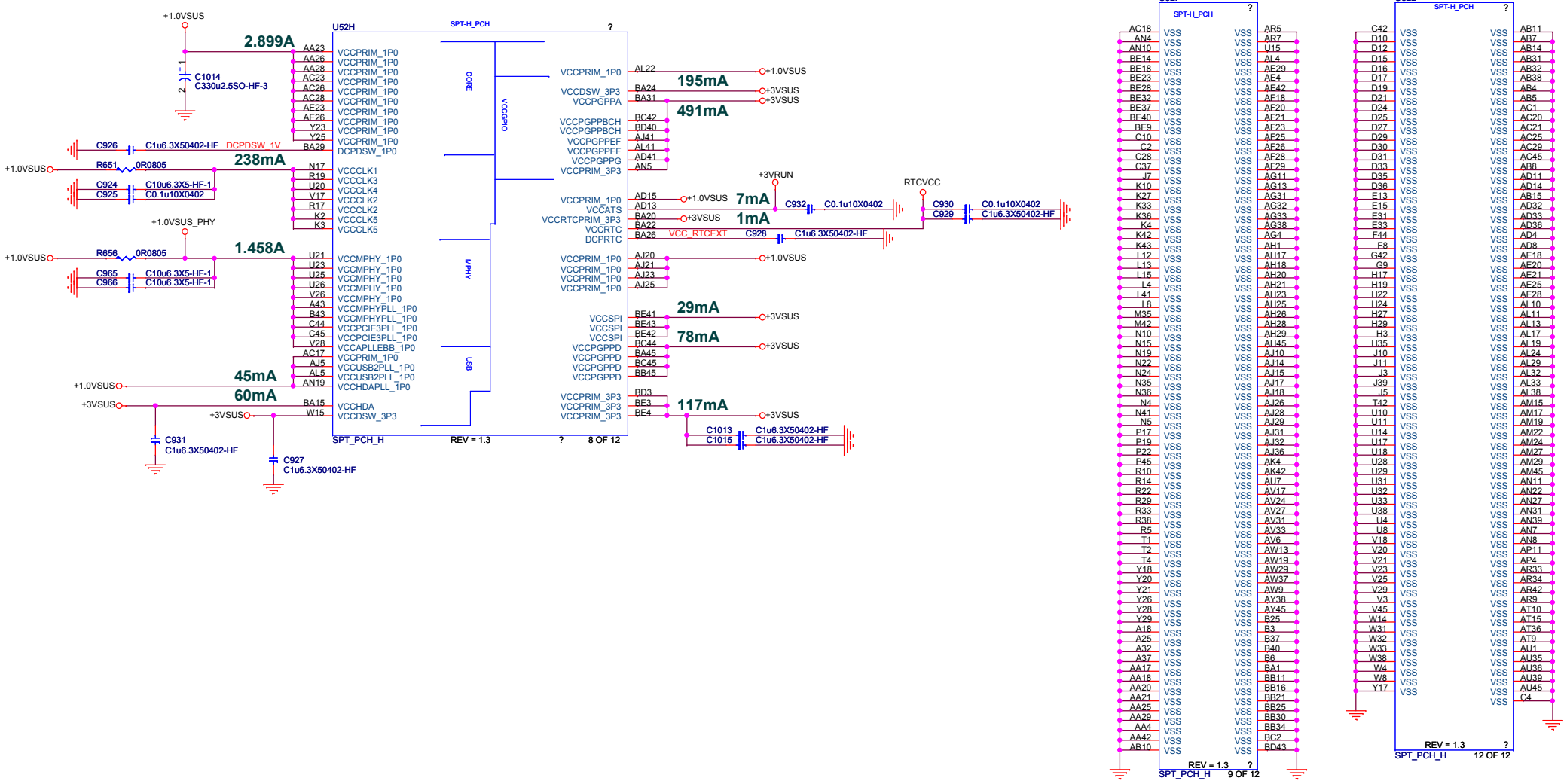
C276 C0.1u6.3X50402-HF
PCH_PWROK
<17> EC_PCH_PWROK
EC delay 100ms
SYS_PWROK
U17 NC7S08P5X_SC70-RH

MICRO-STAR INT'L CO.,LTD.
Title: PCH_3(HDA/RTC/SMBUS)
Size: Custom | Document Number: MS-17A1 | Rev: 1.0
Date: Friday, June 17, 2016 | Sheet 14 of 55



Title	PCH_4(SPI/GPIO)
Size	Custom
Document Number	MS-17A1
Rev	1.0
Date:	Friday, June 17, 2016
Sheet	15 of 55

MICRO-STAR INT'L CO.,LTD.



MICRO-STAR INT'L CO.,LTD.

Title: PCH 5(Power1)

Size: Custom | Document Number: MS-17A1 | Rev: 1.0

Date: Friday, June 17, 2016 | Sheet 16 of 55

RSMRST# follow DG modify to 10K

KBC/EC/uP (ENE9028)

EC Reset

+3VRUN
R509 X_10KR0402 KBSMI#
R491 X_10KR0402 KBSCI#
R453 X_10KR0402 KBRST#
R445 47KR0402 RSMRST#
R460 100KR0402 KBRST#

<34> ECRST_SW# R528 33R0402 EC_RST#

LID pull hi 10K

+3VALW R345 10KR0402 LID#

+3VSUS
R202 47KR0402 MXM1_PRSNT#
RX46 47KR0402 MXM2_PRSNT#
RX47 47KR0402 MXM2_CFG

+3VALW
R495 4.7KR0402 BATCLK_M
R489 4.7KR0402 BATDATA_M

Option Power Key

+3VALW
R299 10KR0402
PWR_SW#
C360 C1000p25X0402
SW1 SW-TACTB1S-HF SWTA_S6_5_2X6_3 N71-0101630-D02

Debug Port CON11

U37

SERIRQ	LPC I/F	VCC_LPC, VCC, VCC-1, VCC-2, VCC-3, VCC0, VCC_IO2
LFRAME#		POWER/GROUND
PCICLK		AVCC, AGND
CLKRUN#/GPIO1D		GND, GND-1, GND-2, GND-3, GND-4
LAD0		
LAD1		
LAD2		
LAD3		
ECRST#		
KBRST#/GPIO01		
SCI#/GPIO0E		
GA20/GPIO00		
PCIRST#/GPIO05		
PWM0/GPIO0F	FAN&PWM	
PWM1/GPIO10		
PWM2/GPIO11		
PWM3/GPIO19		
FANPWM0/GPIO12		
FANPWM1/GPIO13		
FANFB0/GPIO14		
FANFB1/GPIO15		
KSO0/GPIO20	IKB	SMBUS: SDA0/GPIO45, SCL0/GPIO44, IEDI_SDA/SDA1/GPIO47, IEDI_SCL/SCL1/GPIO46
KSO1/GPIO21		AD/DA: DA0/GPO3C, DA1/GPO3D, DA2/GPO3E, DA3/GPO3F, AD0/GPI38, AD1/GPI39, AD2/GPI3A, AD3/GPI3B, AD4/GPI42, AD5/GPI43
KSO2/GPIO22		
KSO3/GPIO23		
KSO4/GPIO24		
KSO5/GPIO25/UART_SOUT		SDI: GPXIOA00/GPIO60/SHICS#, GPXIOA01/GPIO61/SHICLK, GPXIOA02/GPIO62/SHIDO
KSO6/GPIO26		
KSO7/GPIO27/SERIRQ(LPC_Bypass)UART_RTS		
KSO8/GPIO28		
KSO9/GPIO29		
KSO10/GPIO2A		
KSO11/GPIO2B/LAD3(LPC_Bypass)		
KSO12/GPIO2C/LAD2(LPC_Bypass)UART_DTR		
KSO13/GPIO2D/LAD1(LPC_Bypass)		
KSO14/GPIO2E/LAD0(LPC_Bypass)		
KSO15/GPIO2F		
KSO16/GPIO48/UART_SOUT2		
KSO17/GPIO49		
KSI0/GPIO30/E51TXD		
KSI1/GPIO31		
KSI2/GPIO32		
KSI3/GPIO33		
KSI4/GPIO34		
KSI5/GPIO35		
KSI6/GPIO36		
KSI7/GPIO37/EDI_DO		
GPIO0B/ESB_CLK	ESB	
GPIO0C/ESB_DAT_O		
GPIO40/AD6	CIR	
GPIO41/CIR_RLC_TX/AD7		
GPIO0A/WWM		
GPIO0D/RLC_TX2		
MISO/GPIO5B	SPI FLASH	
MOSI/GPIO5C		
SPICLK/GPIO58		
SPICS#/GPIO5A		
PSCLK3/GPIO4E	PS2 I/F	
PSDAT3/GPIO4F		
PSCLK2/GPIO4C/SCL3		
PSDAT2/GPIO4D/SDA3		
PSCLK1/GPIO4A/SCL2/SMBD_CLK		
PSDAT1/GPIO4B/SDA2/SMBD_DAT		
E51TXD/GPIO16	UART	LED: GPIO1A/NUMLED#, GPIO53/CAPSLED#, GPIO55/SCROLED#
E51CLK/GPIO17		
GPIO5D		
GPIO5E		

KB9028Q-C-RH

<13,24> INT_SERIRQ 3
<13,24> LPC_FRAME# 4
<13> CLK_PCI_KBC 12
<14> EC_CLKRUN# 38
<13,24> LAD0 10
<13,24> LAD1 8
<13,24> LAD2 7
<13,24> LAD3 5

MXM2_CFG 0 PCIE 1x8 / 2x4
1 PCIE 2x8

TPJNC123 EC_RST# 37
<13> KBRST# 2
<13> KBSCI# 20
<20> MXM2_CFG 1
<15> LPC_RST# 13

New
<31> HDMI_HPD_DET 21
<33> MXMFAN2_PWM 23
<41> AC_CTL 25
<14> FLASH_SECURITY 26
<33> CPUFAN_PWM 27
<33> MXMFAN_PWM 28
<33> CPUFAN_FB 29
<33> MXMFAN_FB

AUDIO_ID
0 Savitech
1 ESS

KBOUT0 39
KBOUT1 40
KBOUT2 41
KBOUT3 42
KBOUT4 43
KBOUT5 44
KBOUT6 45
KBOUT7 46
KBOUT16 47
KBOUT17 48

<19> MXM1_PRSNT# 49
<20> MXM2_PRSNT# 50
<41> BATT_EN 51
<41> BAT_IN# 52
<30,34> LID# 53
<43> SUSPWROK 54

TPJNC121 EC_SDA 81
TPJNC122 EC_SCL 82

KBOUT8 55
KBOUT9 56
KBOUT10 57
KBOUT11 58
KBOUT12 59
KBOUT13 60
KBOUT14 61
KBOUT15 62

<34> ESB_CLK R488 22R0402 ESB_CLK_JNC 17
<34> ESB_DATA 18

KBIN6 73
KBIN7 74

<43> DIMM_ON_2V5 16
<19,20> MXM_PWRSR_EN 19

<15> SPI_MISO 119
<15> SPI_MOSI 120
<15> SPI_CLK 126
<15> SPI_CS# 128

<34> TP_CLK 87
<34> TP_DATA 88

Clear CMOS
<33> WLAN_PWR_ON 85
<14> EC_RTC_RST 86
Battery / EPF / MXM2
<20,21,41> BATCLK_M 83
<20,21,41> BATDATA_M 84

<21> EPF021_RST JNC73 1 2 X_0402 E51TXD_JNC 30
<21> EPF021_OPMODE JNC74 1 2 X_0402 E51CLK_JNC 31

<2,18> EC_CFG5 122
<2> EC_CFG6 123

CFG6	CFG5	CFG2		EC_ [6]	EC_ [5]
1	1	1	PCIE x16	HIZ (0)	HIZ (0)
1	0	1	PCIE 2x8	HIZ (0)	1
0	0	1	PCIE 1x8 / 2x4	1	1

+3VALW
VCC_LPC 9
VCC 22
VCC-1 33
VCC-2 96
VCC-3 125
VCC0 111
VCC_IO2 124
AVCC 67
AGND 69
GND 11
GND-1 24
GND-2 35
GND-3 94
GND-4 113

C632 C0.1u10X0402
C572 C0.1u10X0402
C596 C0.1u10X0402
C550 C0.1u10X0402
C609 C0.1u10X0402

+3VRUN
SMB_CPU_CLK R631 1KR0402
SMB_CPU_DATA R632 1KR0402
MXM1 / Meter1 / Meter2

78 SMB_CPU_DATA <19,28,29>
77 SMB_CPU_CLK <19,28,29>
80 EC_SDA <31>
79 EC_SCL <31>
控制腳換位置

68 EC_MXMEN <19>
70 CAMERA_ON <30>
71
72 EC_MUTE# <26>
MUTE# <27>
4/11 pin68改MXM EN PIN

63 KBIN0
64 KBIN1
65 KBIN2
66 KBIN3
75 KBIN4
76 KBIN5

MXM2_CFG 0 PCIE 1x8 / 2x4
1 PCIE 2x8

97 EC_SPI_CS <34>
98 EC_SPI_CLK <34>
99 EC_SPI_DO <34>

100 SUS_ON <30,42>
101 MXMFAN2_FB <33>
102 ADP_ICC <41>
103 EC_PROCHOT# <2>
104 DIMM_ON_1V2 <6,21,44>
105
106 LED_WLAN# <34>
107 LED_CHARGE# <34>
108 LED_BATLOW# <34>
109 AC_PRESENT <14>
110 EC_SPI_DI <34>
AC_OK改High AC Adapter
111 AC_OK <41>
112 MXM_ACOK_EC
114 PWR_SW# <34>
115 EC_ALLSYSPG
116 RUN_ON <6,42,43>
117
118 H_PECI_R R443 33R0402 PM_PWRBTN# <14>
H_PECI <2,13>
6 KBSMI# <15>
14 MXM_RUN_EN# <19,20,30,31,32>
15 SCI_WAKE_UP# <15>
32 EC_PCH_PWROK <14>
89 MB_ID
90 USB_ENABLE <28,29>
92 LED_PWR# <34>
95 RSMRST# <14,19>
121 PM_SLP_S3# <14,22,44,49>
127 PM_SLP_S4# <14,44>

36 LED_NUM# <34>
91 LED_CAP# <21>
93 R605 X_0R0402 EARPHONE_JD <15,26>
R606 0R0402 GC6_FB_EN1_EC <19>
4/13移除R605改上件R606

JACK EARPHONE_JD
Insert 1
Pull Out 0

+3VALW R520 10KR0402 MB_ID
R519 X_10KR0402

AC_OK#	MXM_ACOK_EC	Mode
0	0	AC
0	1	AC
1	0	AC
1	1	DC

+3VALW R682 100KR0402
AC_OK G Q17 N-2N7002CK_SOT23-3-RH

+3VRUN_MXM
R683 X_100KR0402
MXM_ACOK <19,20>
MXM internal PU 100K
MXM_ACOK_EC
AC_OK#
Q42 NN-DMN65D8LDW-7_SOT363-6-HF
R684 X_0R0402

+3VRUN
R444 10KR0402
<43> +1_1VRUN_PWRGD R118 0R0402
<49> VCCIO_PWRGD R116 0R0402
<19> MXM_PWROK R72 X_0R0402
EC_ALLSYSPG <2,14,32,45,46,49>
C636 X_C10p50N0402

CON9 FPC26P-B-1PITCH_BLACK-RH FPC_S26_7 N5A-26F0340-H06
KBOUT17 26
KBOUT16 25
KBIN0 24
KBIN1 23
KBIN2 22
KBIN3 21
KBIN4 20
KBIN5 19
KBIN6 18
KBIN7 17
KBOUT15 16
KBOUT14 15
KBOUT13 14
KBOUT12 13
KBOUT11 12
KBOUT10 11
KBOUT9 10
KBOUT8 9
KBOUT7 8
KBOUT6 7
KBOUT5 6
KBOUT4 5
KBOUT3 4
KBOUT2 3
KBOUT1 2
KBOUT0 1

For EMI

KBOUT17 EC8 C100p16N0402
KBOUT16 EC9 C100p16N0402
EC15 KBOUT7 KBOUT6 KBOUT5 KBOUT4 8p4C-100p50N0402-RH
EC14 KBOUT3 KBOUT2 KBOUT1 KBOUT0 8p4C-100p50N0402-RH
EC16 KBOUT11 KBOUT10 KBOUT9 KBOUT8 8p4C-100p50N0402-RH
EC17 KBOUT15 KBOUT14 KBOUT13 KBOUT12 8p4C-100p50N0402-RH

+3VALW
RN16 KBIN3 KBIN2 KBIN1 KBIN0 8P4R-10KR0402
RN17 KBIN5 KBIN4 KBIN7 KBIN6 8P4R-10KR0402

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Title	KBC/EC/up (ENE3930)
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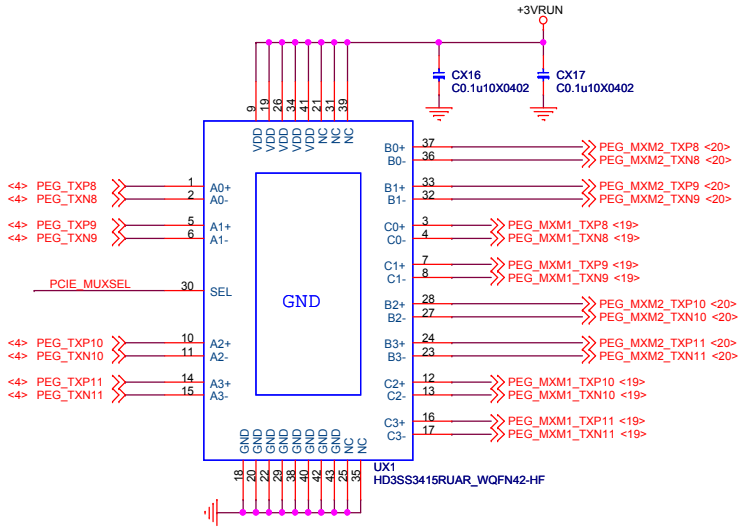

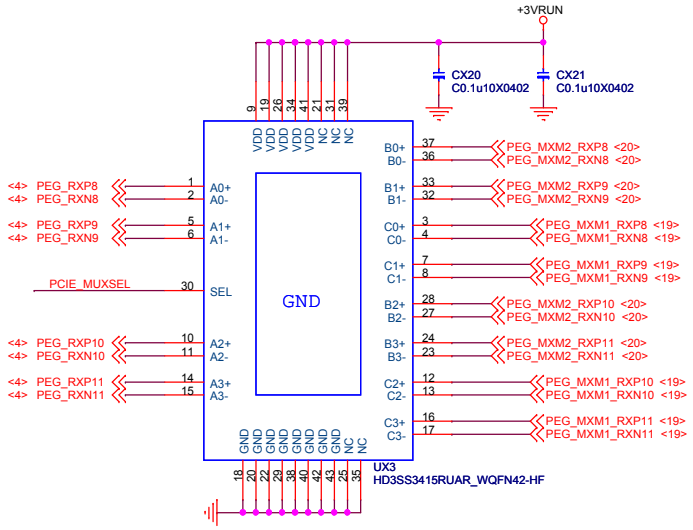

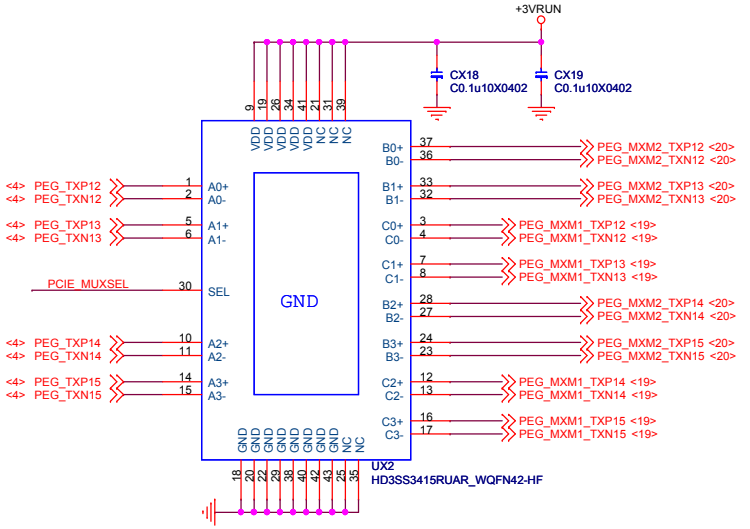

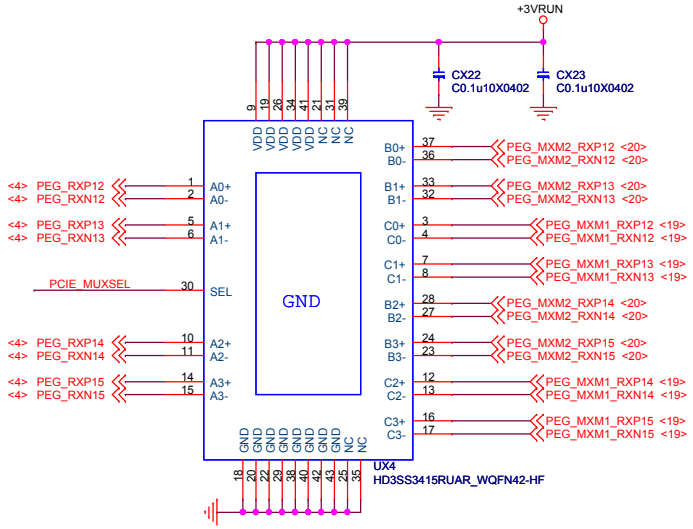

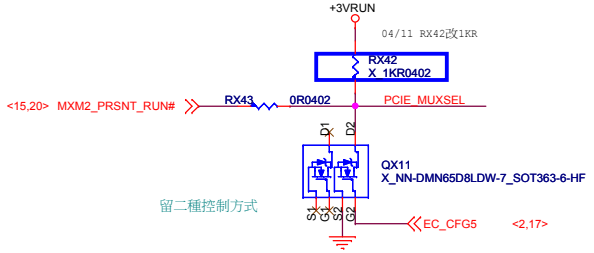

CFG6	CFG5	CFG2		EC_ [6]	EC_ [5]
1	1	1	PCIE x16	HiZ	Hiz (0)
1	0	1	PCIE 2x8	HiZ	1
0	0	1	PCIE 1x8 / 2x4	1	1

PCIE MUX SEL			EC_ [5] >> [SEL]	
1	A - C (MXM 1)	PCIE x16	Hiz (0)	1
0	A - B (MXM 2)	PCIE 2x8 (1x8 / 2x4)	1	0

MICRO-STAR INT'L CO.,LTD.

Title: PCIE Switch

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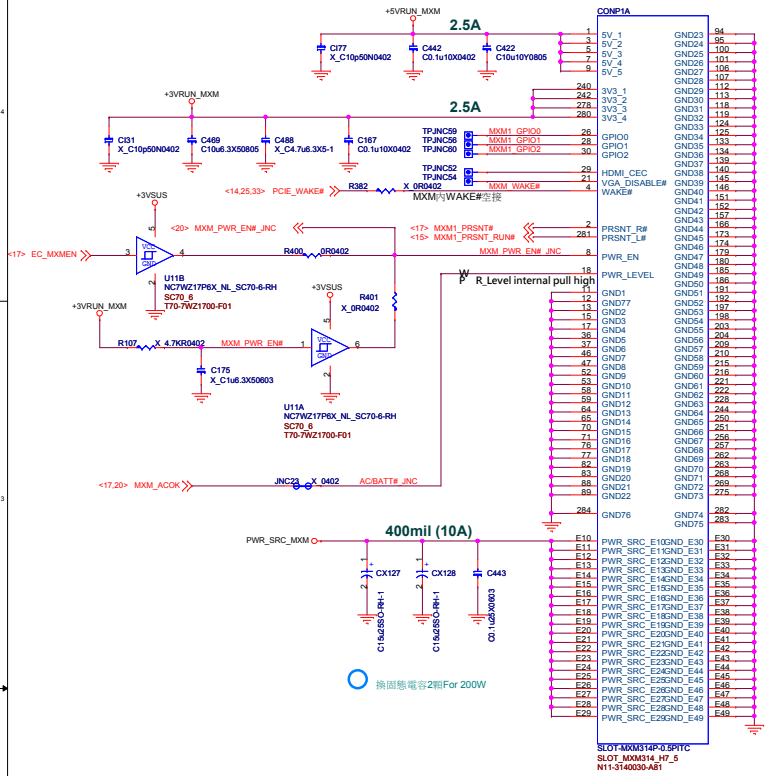
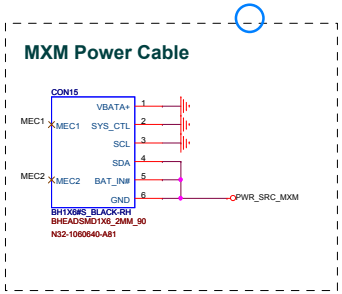
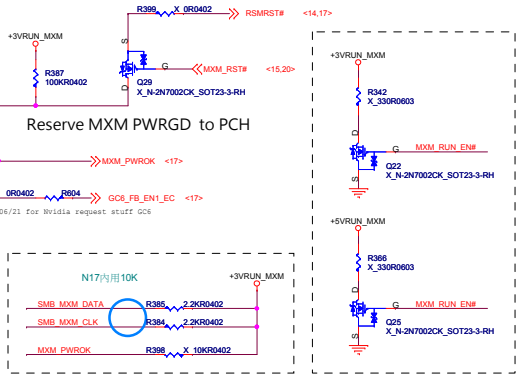
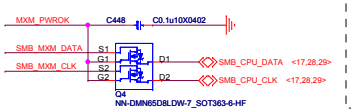
MXM 3.1 Slot 1 (Master)

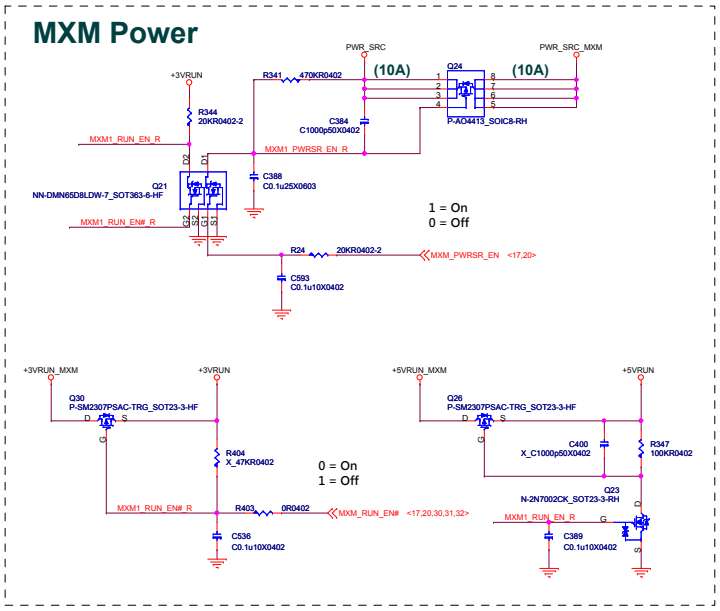
GB3-256 Split Mode EF	
Link AB	Not Connected
Link C	DisplayPort, HDMI
Link D	DisplayPort/eDP
Link E	DisplayPort, HDMI, DVI (Single Link)
Link F	DisplayPort/eDP, DVI (Single Link)

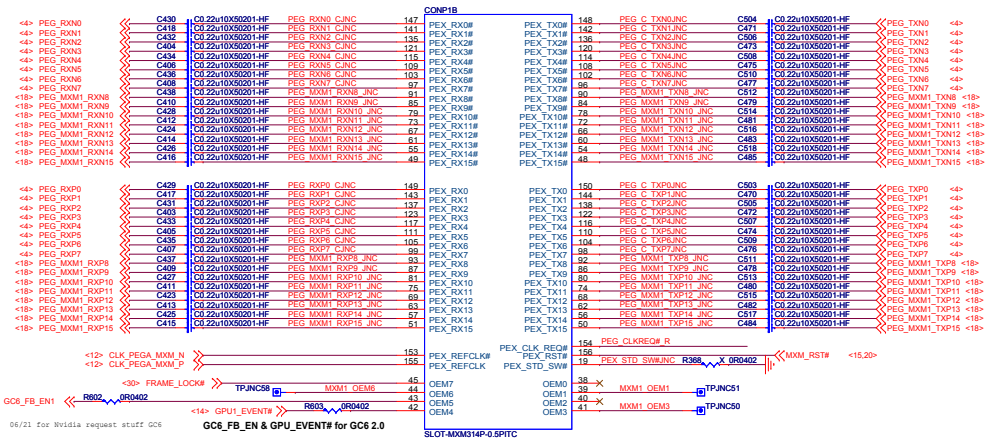


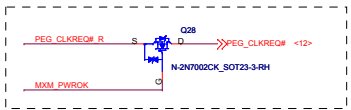












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Title: MXM Slot 1 (Master)

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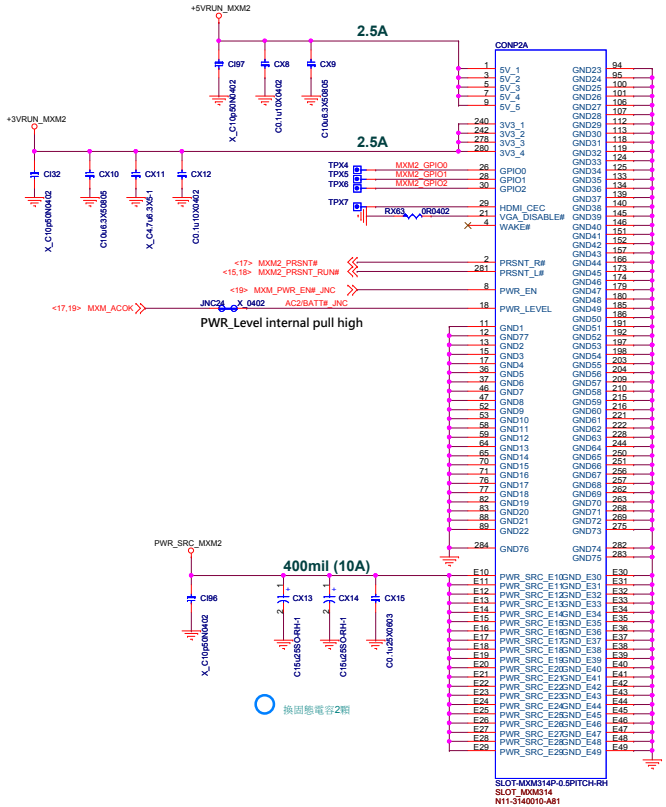
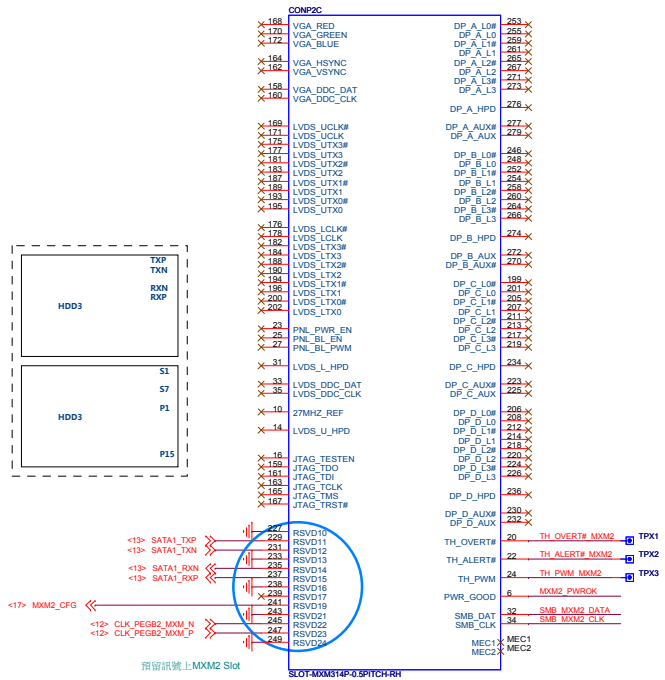
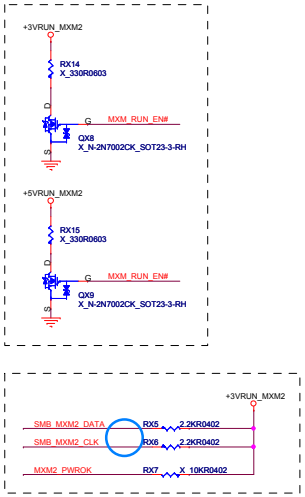
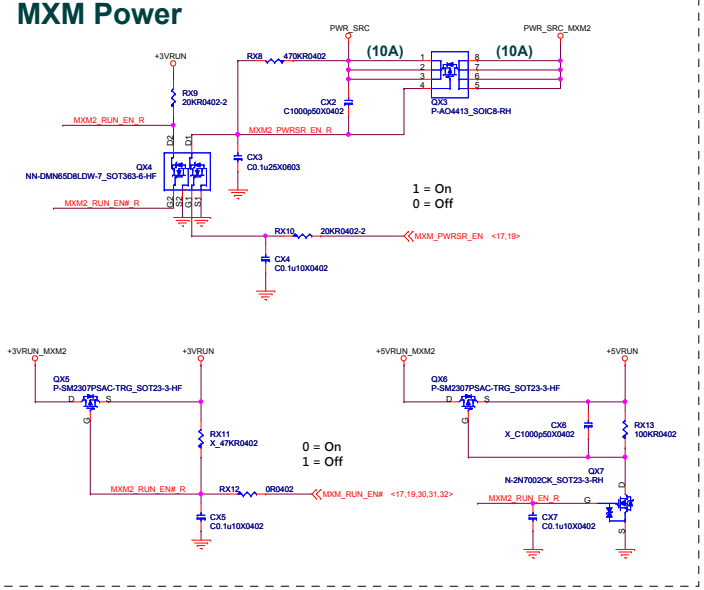
MXM 3.1 Slot 2 (Slave)

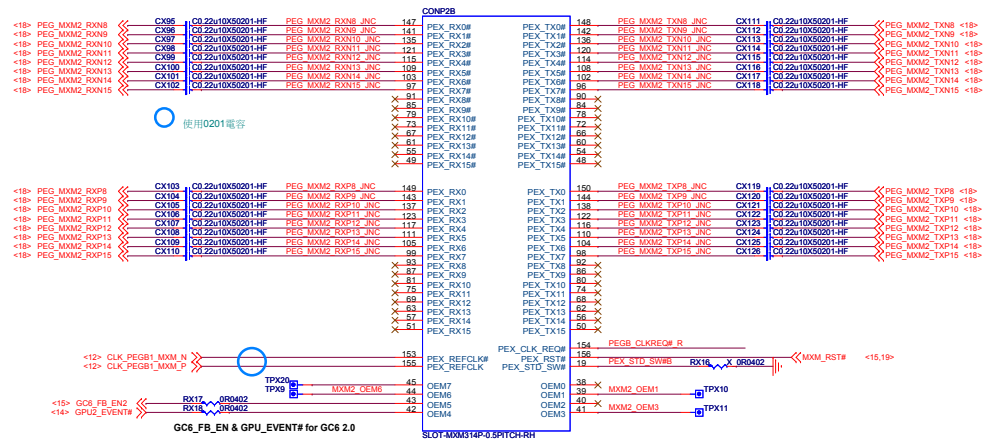


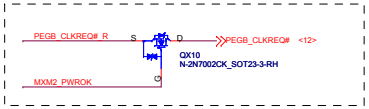




MXM Power







msi	MICRO-STAR INT'L CO.,LTD.		
Title	MXM Slot 2 (Slave)		
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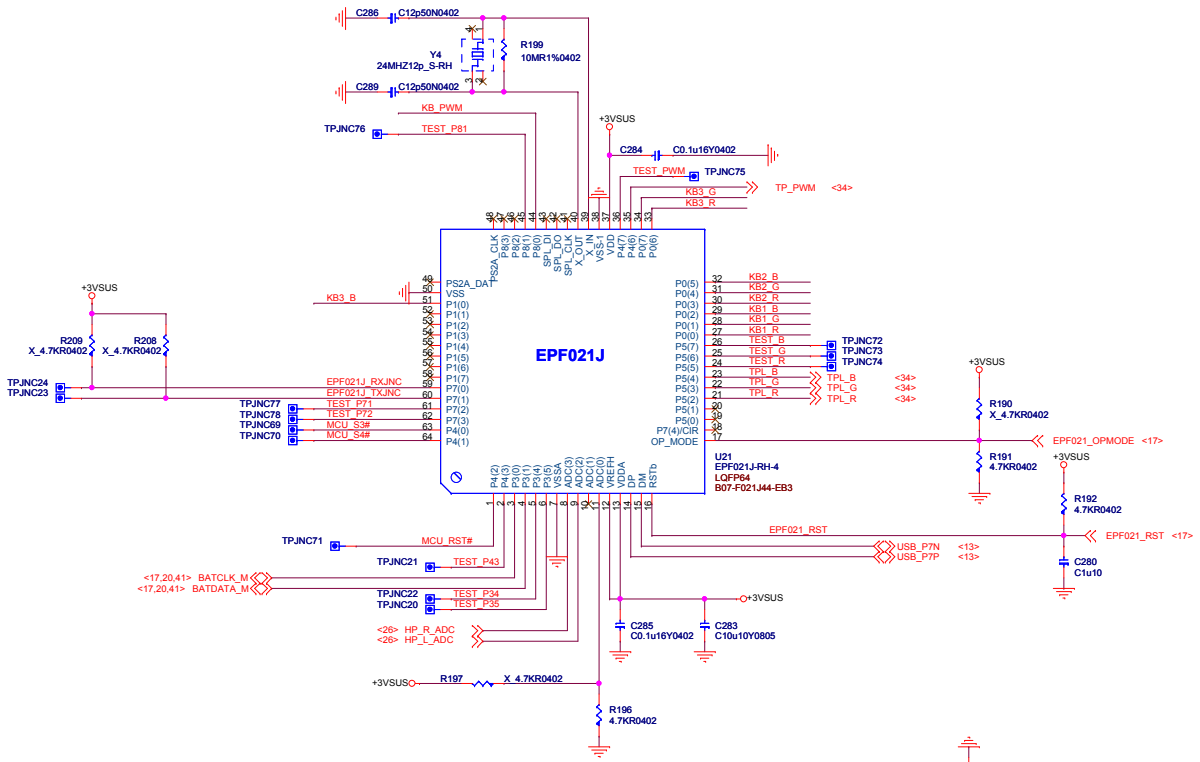
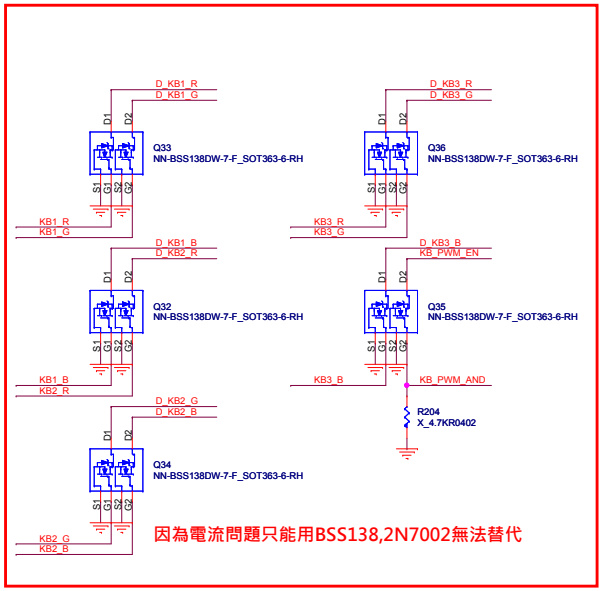
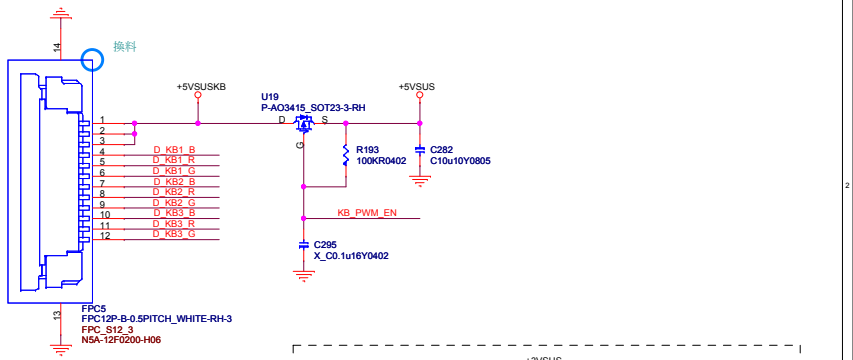
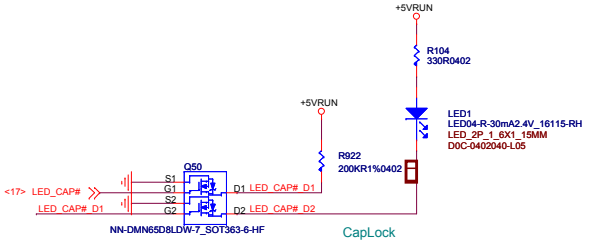


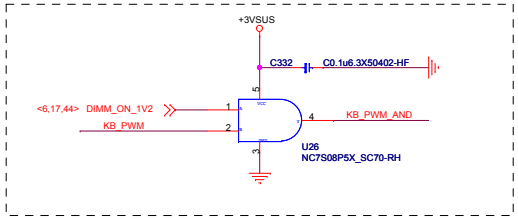
LED Keyboard Pin Define	
Pin 1	VCC_G
Pin 2	VCC_R
Pin 3	VCC_B
Pin 4	LED1_B
Pin 5	LED1_R
Pin 6	LED1_G
Pin 7	LED2_B
Pin 8	LED2_R
Pin 9	LED2_G
Pin 10	LED3_B
Pin 11	LED3_R
Pin 12	LED3_G

PIN1 要接 CON 的 PIN1









05/18 add for Caps lock微亮問題

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Title	LED Driver IC/ LED 8051		
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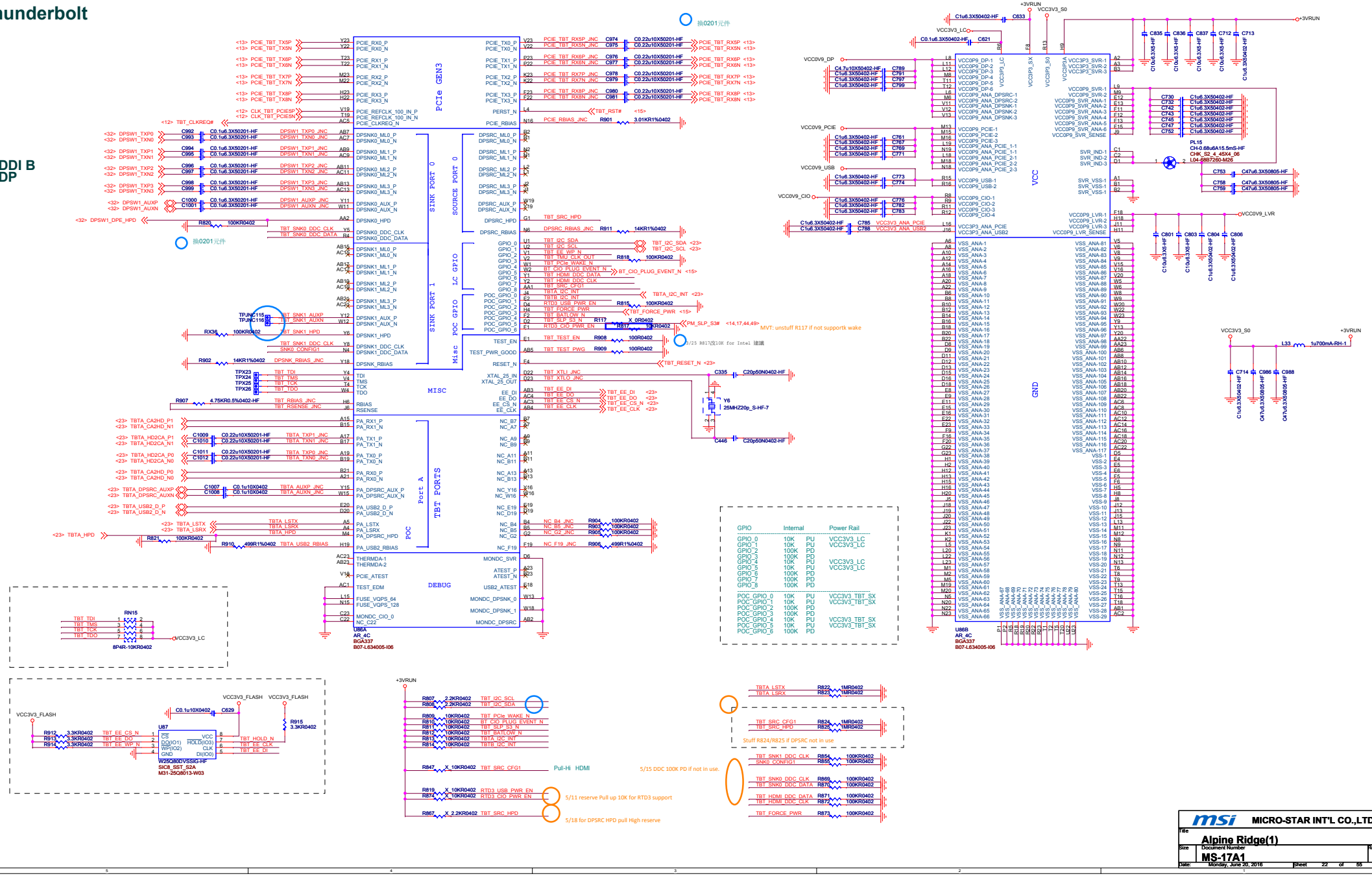
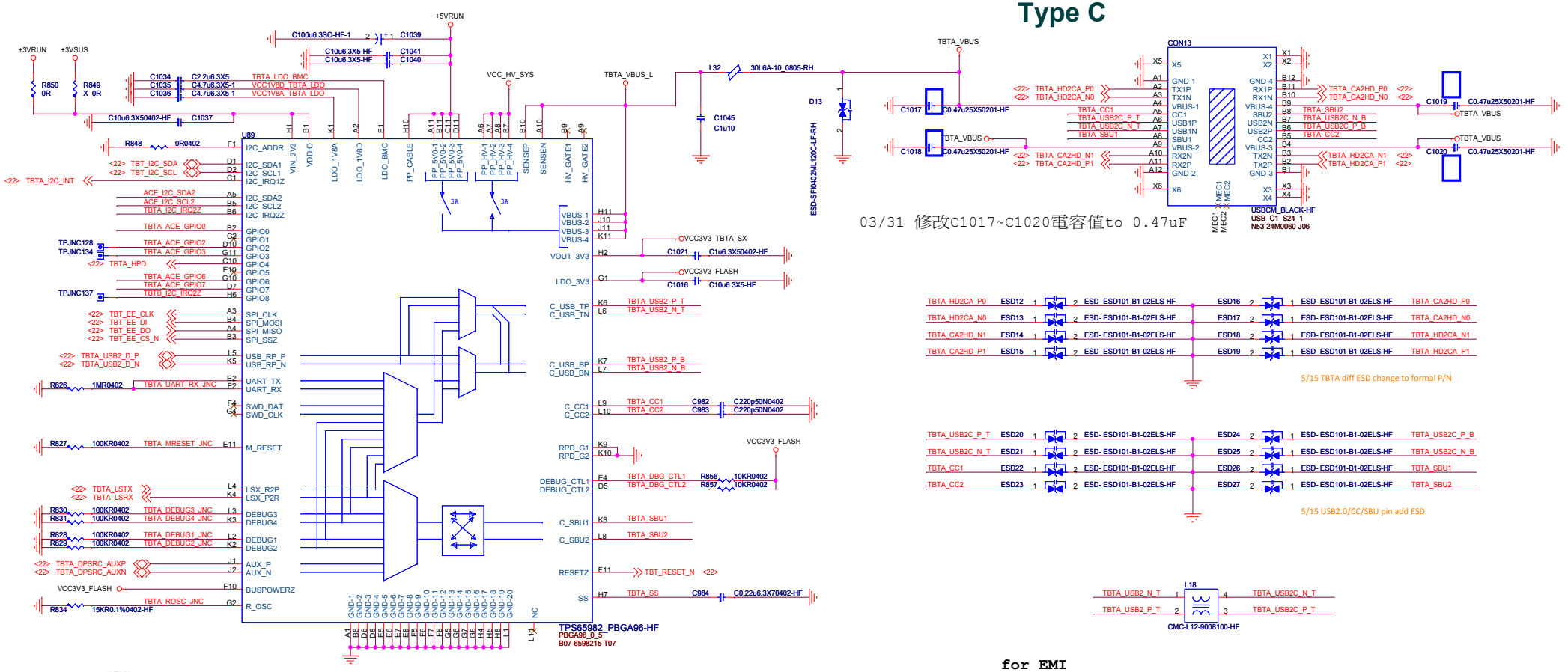
Thunderbolt

DDI B
DP



Type C



Title	Apline Ridge (2)
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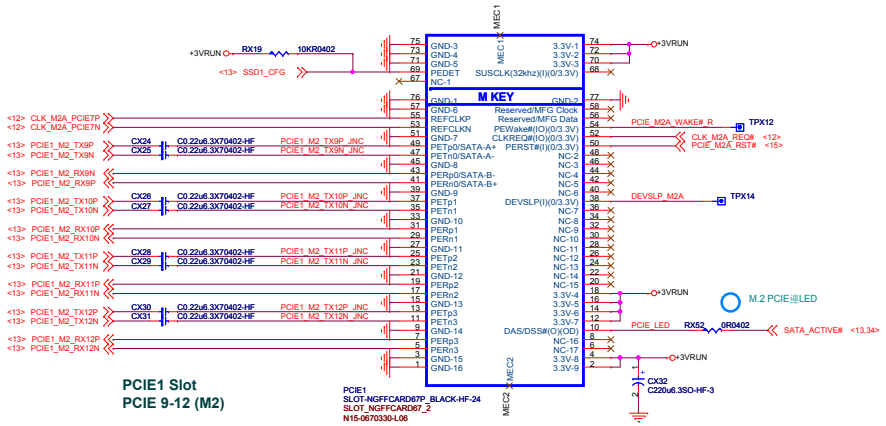
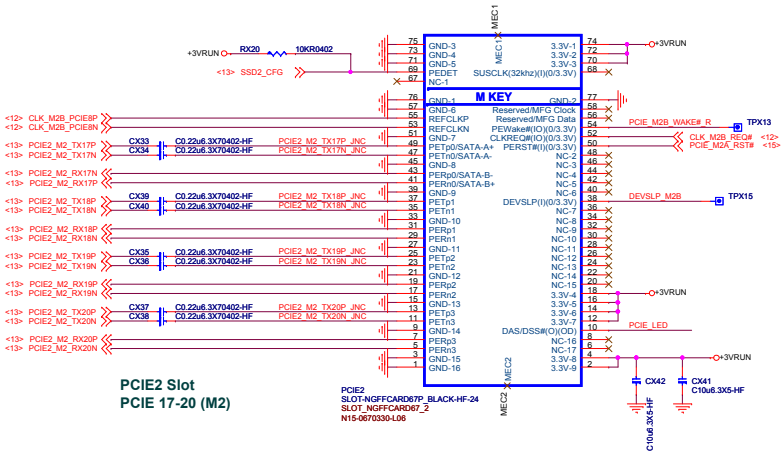
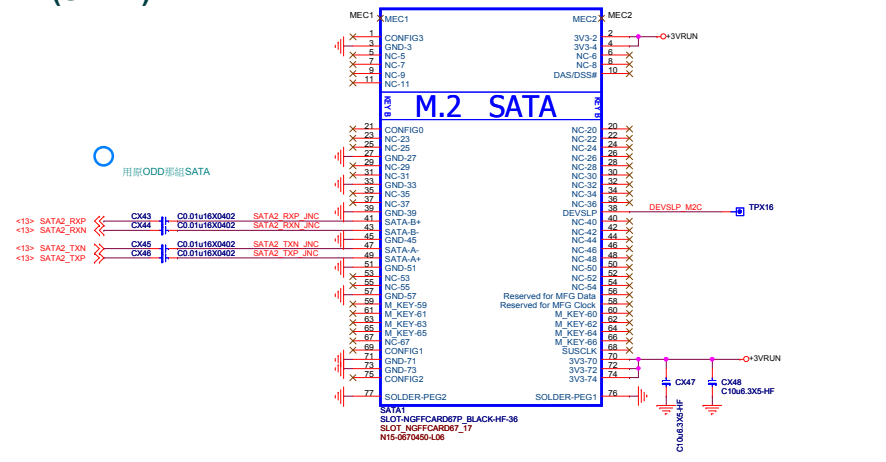
PCIE1



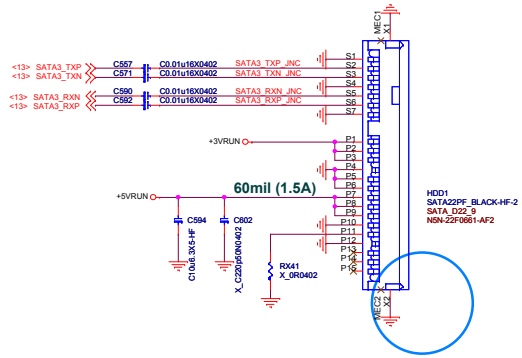
PCIE2



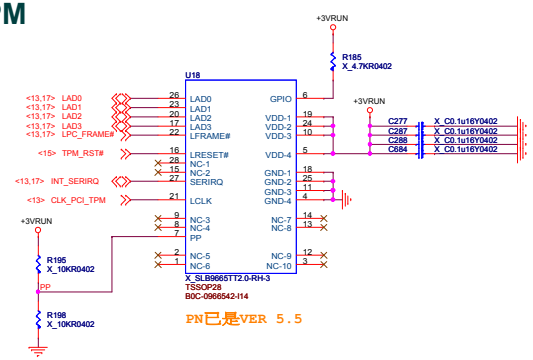
M2 (SATA)



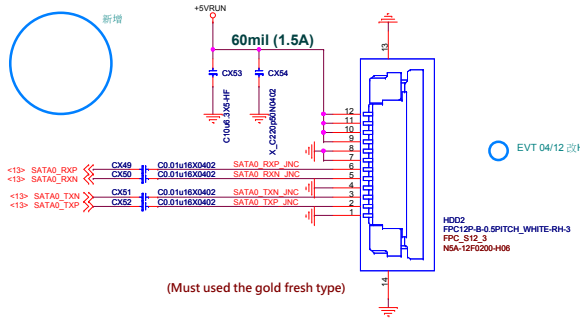
HDD1 (Master)



TPM



HDD2 (Slave)



MICRO-STAR INT'L CO.,LTD.	
Title	TPM/HDD2/HDD Conn.
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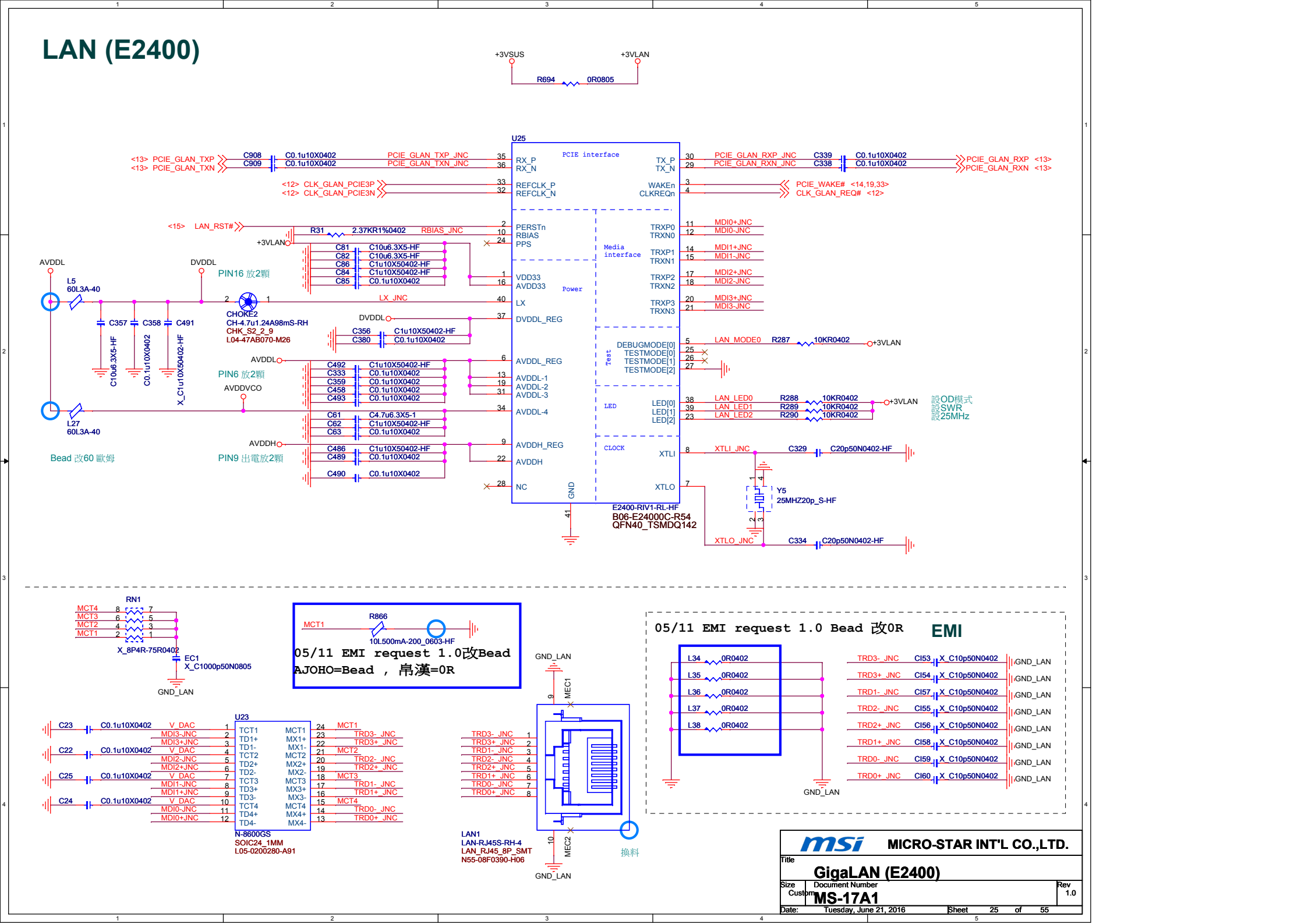
LAN (E2400)



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Title: GigaLAN (E2400)			
Size: Custom	Document Number: MS-17A1		Rev: 1.0
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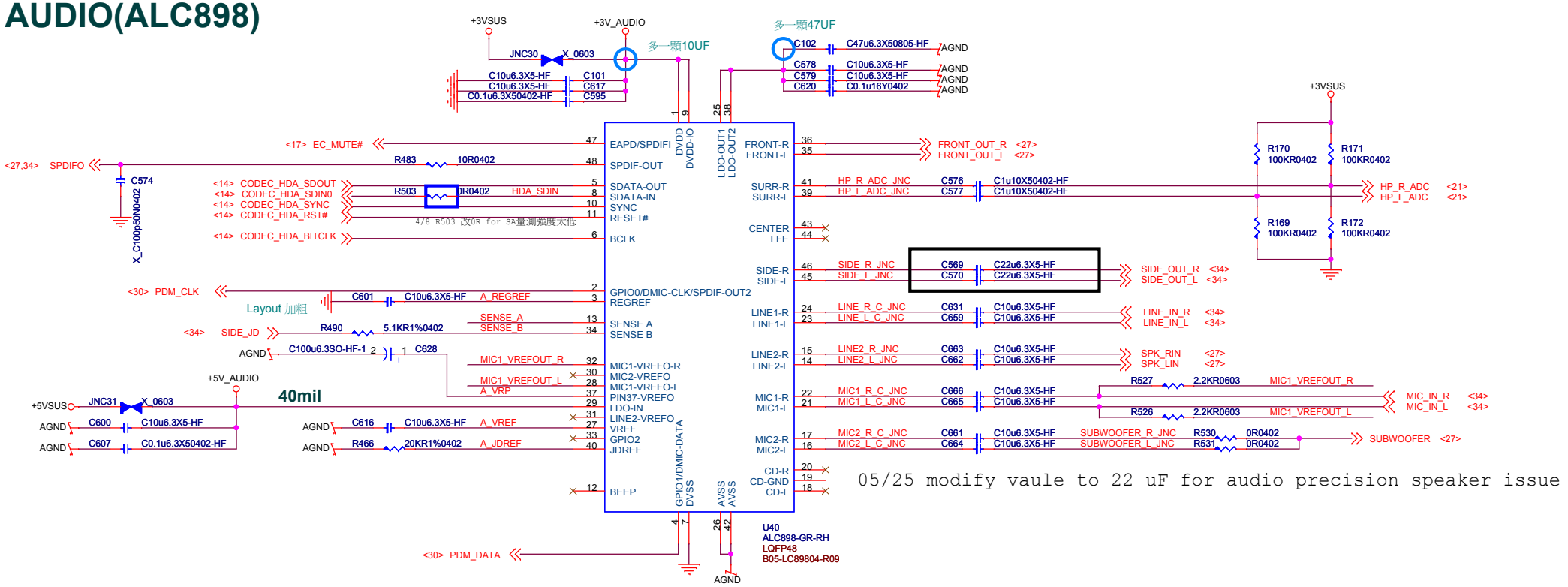
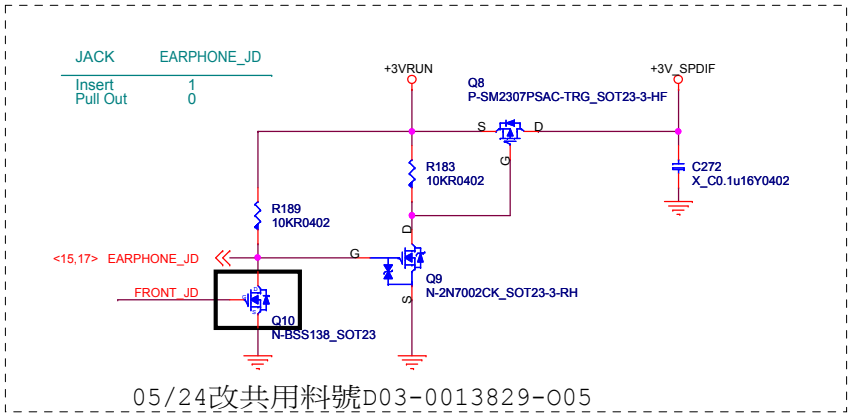
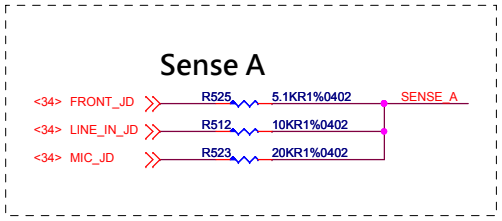
AUDIO(ALC898)

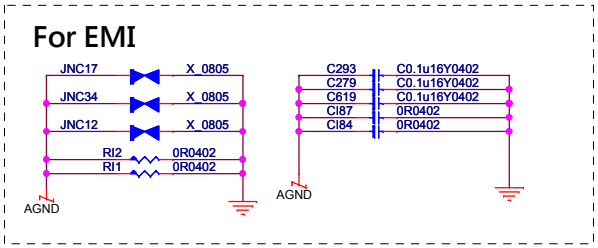


05/25 modify vaule to 22 uF for audio precision speaker issue



05/24改共用料號D03-0013829-005





MICRO-STAR INT'L CO.,LTD.			
Title: Audio(ALC898)			
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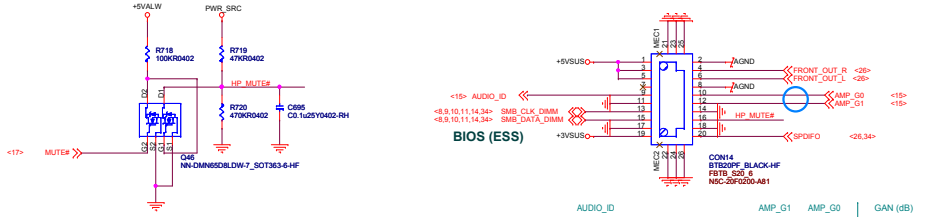
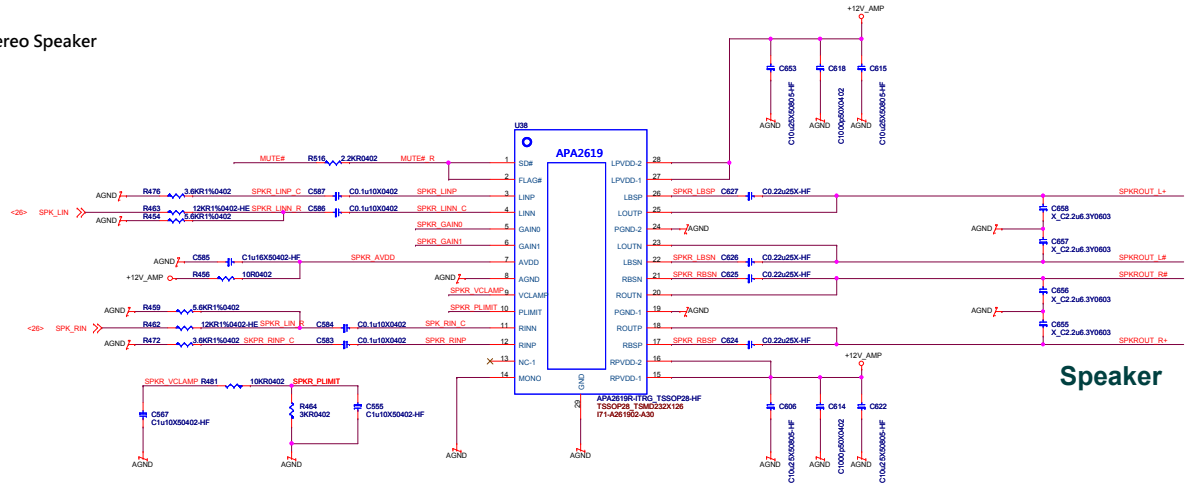
Earphone BTB



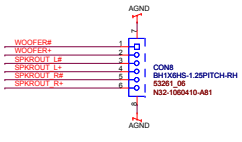
AUDIO_ID	
0	Savitech
1	ESS

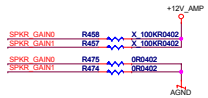
AMP_G1	AMP_G0	GAN (dB)
0	0	- 6
0	1	0 (Default)
1	0	3
1	1	6

Stereo Speaker



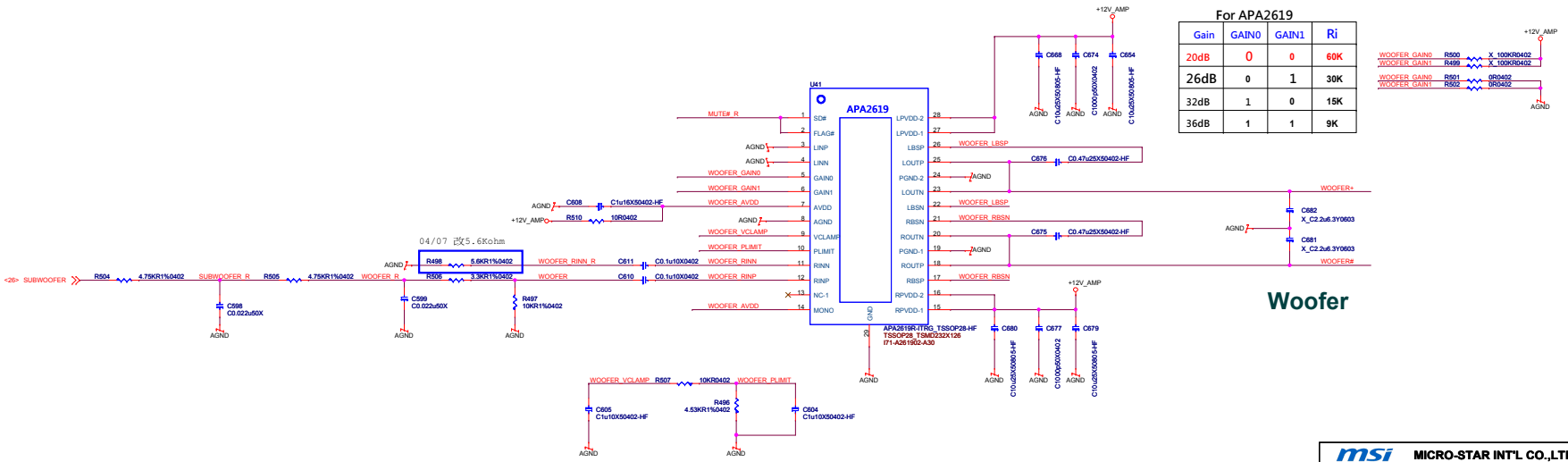
Speaker





For APA2619

Gain	GAIN0	GAIN1	Ri
20dB	0	0	60K
26dB	0	1	30K
32dB	1	0	15K
36dB	1	1	9K



04/07 改5.6Kohm

For APA2619

Gain	GAIN0	GAIN1	Ri
20dB	0	0	60K
26dB	0	1	30K
32dB	1	0	15K
36dB	1	1	9K

Woofer

msi	MICRO-STAR INT'L CO.,LTD.
Title	Speaker/Woofer Amp(APA2619)
Size: Custom	Document Number: MS-17A1
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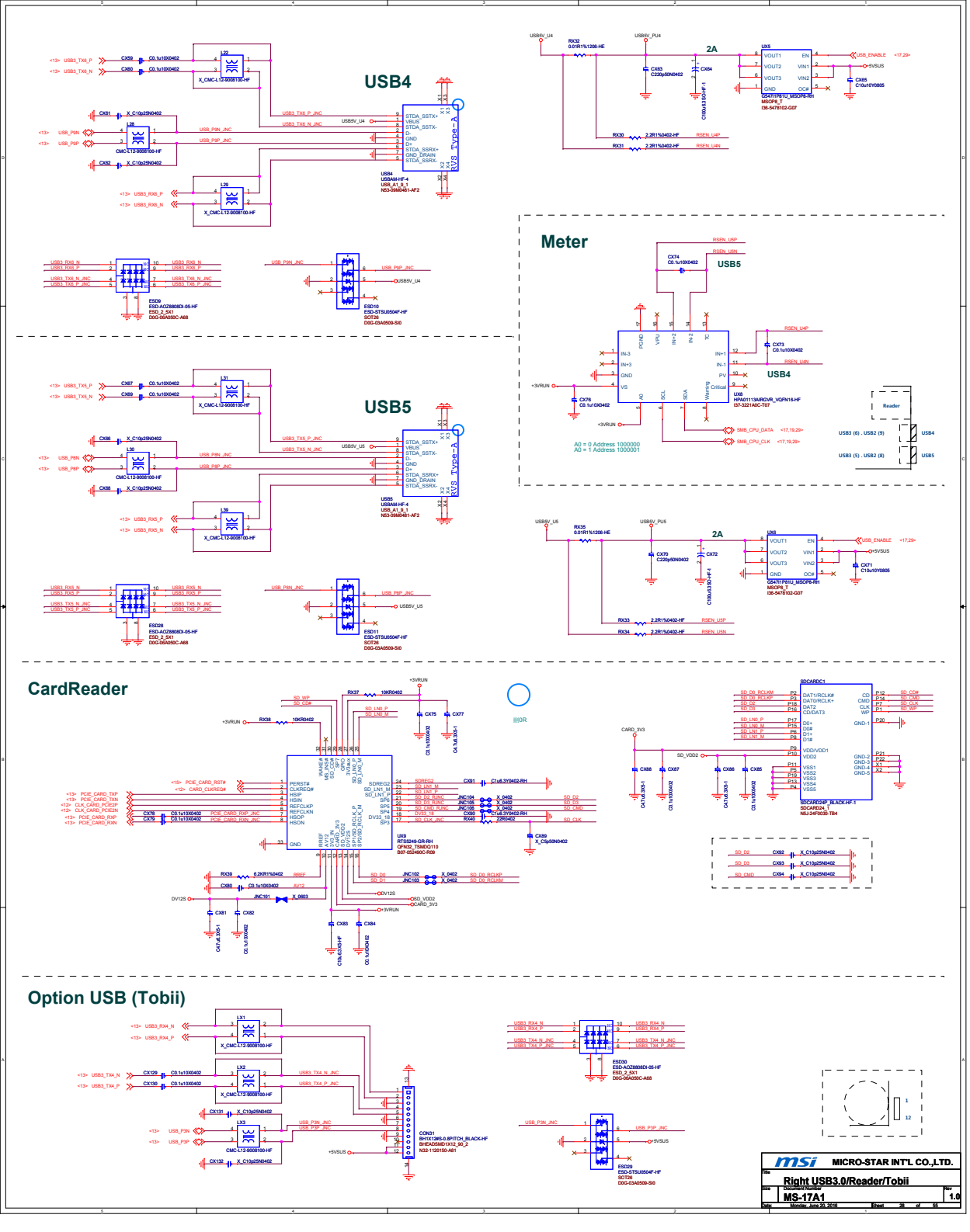
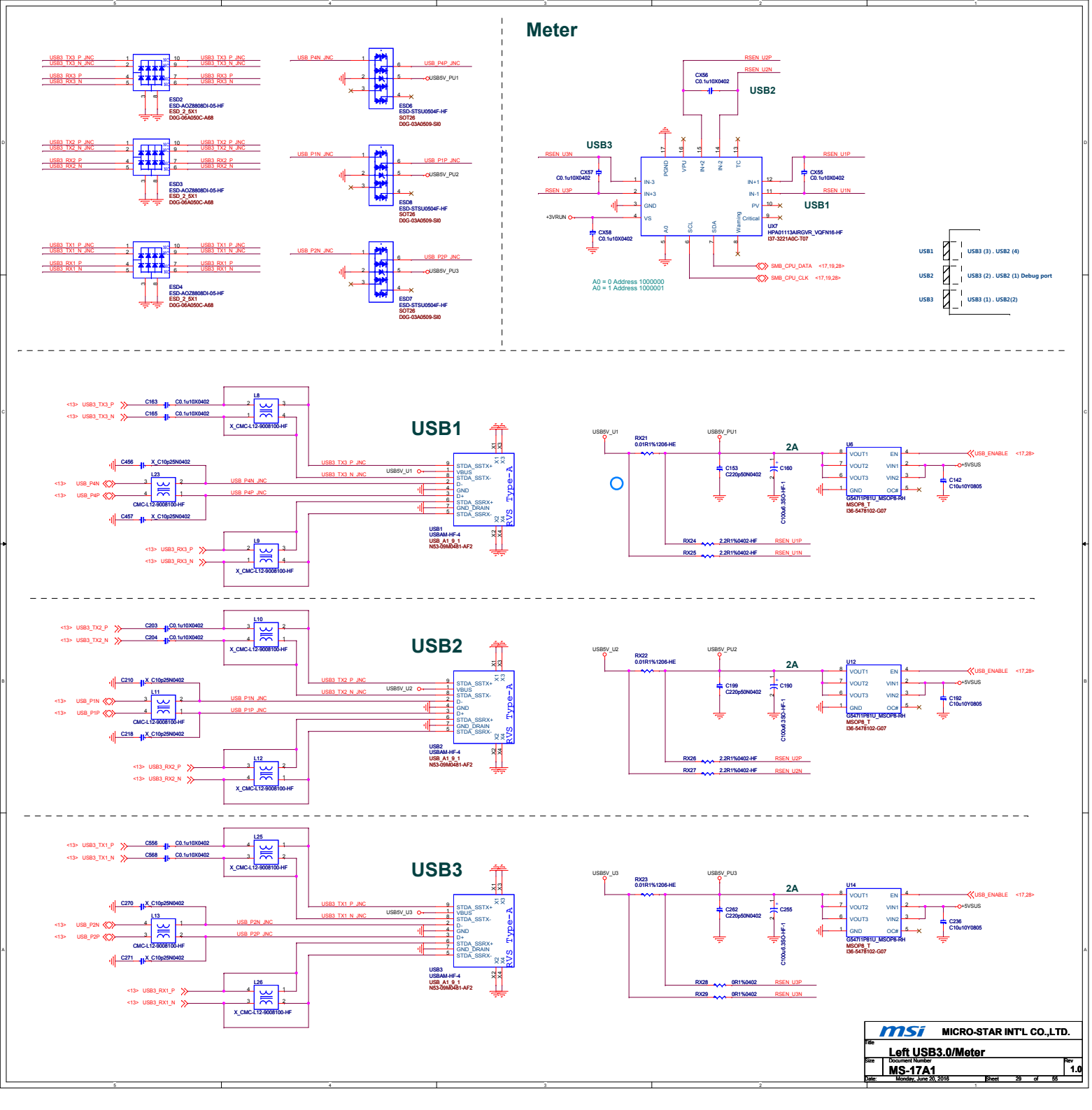
Date: Monday, June 20, 2016	Sheet 27 of 55


USB4
USB5
Meter
CardReader
Option USB (Tobii)
Reader
USB3 (6) , USB2 (9)
USB3 (5) , USB2 (8)
A0 = 0 Address 1000000
A0 = 1 Address 1000001
MICRO-STAR INT'L CO.,LTD.
Right USB3.0/Reader/Tobii
MS-17A1
1.0
Monday, June 20, 2016


Meter
USB3_TX3_P_JNC
USB3_TX3_N_JNC
USB3_RX3_P
USB3_RX3_N
ESD2
ESD-AOZ8808DI-05-HF
ESD_2_5X1
D0G-06A050C-A68
USB_P4N_JNC
USB_P4P_JNC
USB5V_PU1
ESD6
ESD-STSU0504F-HF
SOT26
D0G-03A0509-SI0
USB3_TX2_P_JNC
USB3_TX2_N_JNC
USB3_RX2_P
USB3_RX2_N
ESD3
USB_P1N_JNC
USB_P1P_JNC
USB5V_PU2
ESD8
USB3_TX1_P_JNC
USB3_TX1_N_JNC
USB3_RX1_P
USB3_RX1_N
ESD4
USB_P2N_JNC
USB_P2P_JNC
USB5V_PU3
ESD7
RSEN_U2P
RSEN_U2N
CX56
C0.1u10X0402
USB2
USB3
RSEN_U3N
CX57
RSEN_U3P
+3VRUN
CX58
IN-3
IN+3
GND
VS
PGND
VFU
IN+2
IN-2
TC
A0
SCL
SDA
Warning
Critical
IN+1
IN-1
PV
UX7
HPA01113AIRGVR_VQFN16-HF
I37-3221A0C-T07
RSEN_U1P
CX55
RSEN_U1N
USB1
SMB_CPU_DATA
SMB_CPU_CLK
A0 = 0 Address 1000000
A0 = 1 Address 1000001
USB1
USB3 (3) , USB2 (4)
USB2
USB3 (2) , USB2 (1) Debug port
USB3
USB3 (1) , USB2(2)
USB1
C163
C165
L8
X_CMC-L12-9008100-HF
C456
X_C10p25N0402
L23
CMC-L12-9008100-HF
C457
L9
USB3_TX3_P_JNC
USB3_TX3_N_JNC
USB_P4N_JNC
USB_P4P_JNC
USB5V_U1
USB1
USBAM-HF-4
USB_A1_9_1
N53-09M04B1-AF2
Type-A
RX21
0.01R1%1206-HE
USB5V_PU1
2A
C153
C220p50N0402
C160
C100u6.3SO-HF-1
U6
VOUT1
VOUT2
VOUT3
GND
EN
VIN1
VIN2
OC#
G547I1P81U_MSOP8-RH
MSOP8_T
I36-5478102-G07
USB_ENABLE
+5VSUS
C142
C10u10Y0805
RX24
2.2R1%0402-HF
RX25
RSEN_U1N
USB2
C203
C204
L10
C210
L11
C218
L12
USB_P1N_JNC
USB_P1P_JNC
USB5V_U2
RX22
USB5V_PU2
C199
C190
U12
C192
RX26
RX27
RSEN_U2N
USB3
C556
C568
L25
C270
L13
C271
L26
USB_P2N_JNC
USB_P2P_JNC
USB5V_U3
RX23
USB5V_PU3
C262
C255
U14
C236
RX28
0R1%0402
RX29
RSEN_U3N
MICRO-STAR INT'L CO.,LTD.
Left USB3.0/Meter
MS-17A1
1.0
Monday, June 20, 2016
29
55

MXM_PWRSR_EN#	Low	High
Output Select	MXM(Default)	IGPU

Port switching control configuration; Internal pull down at ~150Kohm, 3.3V I/O.
L: Input port1 is selected (default)
H: Input port2 is selected

Programmable inout equalization levels; Internal pull down at 150K ohm, 3.3V I/O.
L: default, LEQ, compensate channel loss up to 11.5 dB @ HBR2
H: HEQ, compensate channel loss up to 14.5dB @ HBR2
M: LLEQ, compensate channel loss up to 8.5dB @ HBR2

Auto test enable! Internal pull down at ~150Kohm, 3.3V I/O.
L: Auto test disable & input offset cancellation enable (default)
H: Auto test enable & input offset cancellation enable
M: Auto test disable & input offset cancellation disable

Automatic EQ disable!; Internal pull down 150Kohm, 3.3V I/O.
L: Automatic EQ enable (default)
H: Automatic EQ disable

AUX interception diable for prot y (y=1,2). Internal pull down ~150Kohm, 3.3V I/O;
L: AUX interception enable, driver configuration is set by link training (default)
H: AUX interception diable, driver output with fixed 800mv and 0dB
M: AUX interception diable, driver output with fixed 400mv and 0dB

Outout swing adjustment for port y(y=1,2). Internal pull down ~150Kohm, 3.3V I/O;
L:default
H:+20%
M:-16.7%

PS8331B

PS8331BQFN60GTR-A1-HF
QFN60_T118X276
B0B-8331B0C-P97

PD pin signal reversal

7/31 remove PQ5, R86 for LG panel LID# issue

eDP Panel Signal 2in 1out switch
Default set S1 output

Inputs		INPUT/OUTPUT	DFUNCTION
EN#	MXM_PWRSR_EN#		
L	L	S1	D PORT=S1 PORT
L	H	S2	D PORT= S2 PORT
H	X	Z	DISCONNECT

Camera_ON:
High= On
Low=Off

For 0A consumption measure

EMI

Panel Logic power

MSI	MICRO-STAR INT'L CO.,LTD.
Title	eDP switch & Conn/CAM
Size	Document Number: MS-17A1
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Date:	Monday, June 20, 2016
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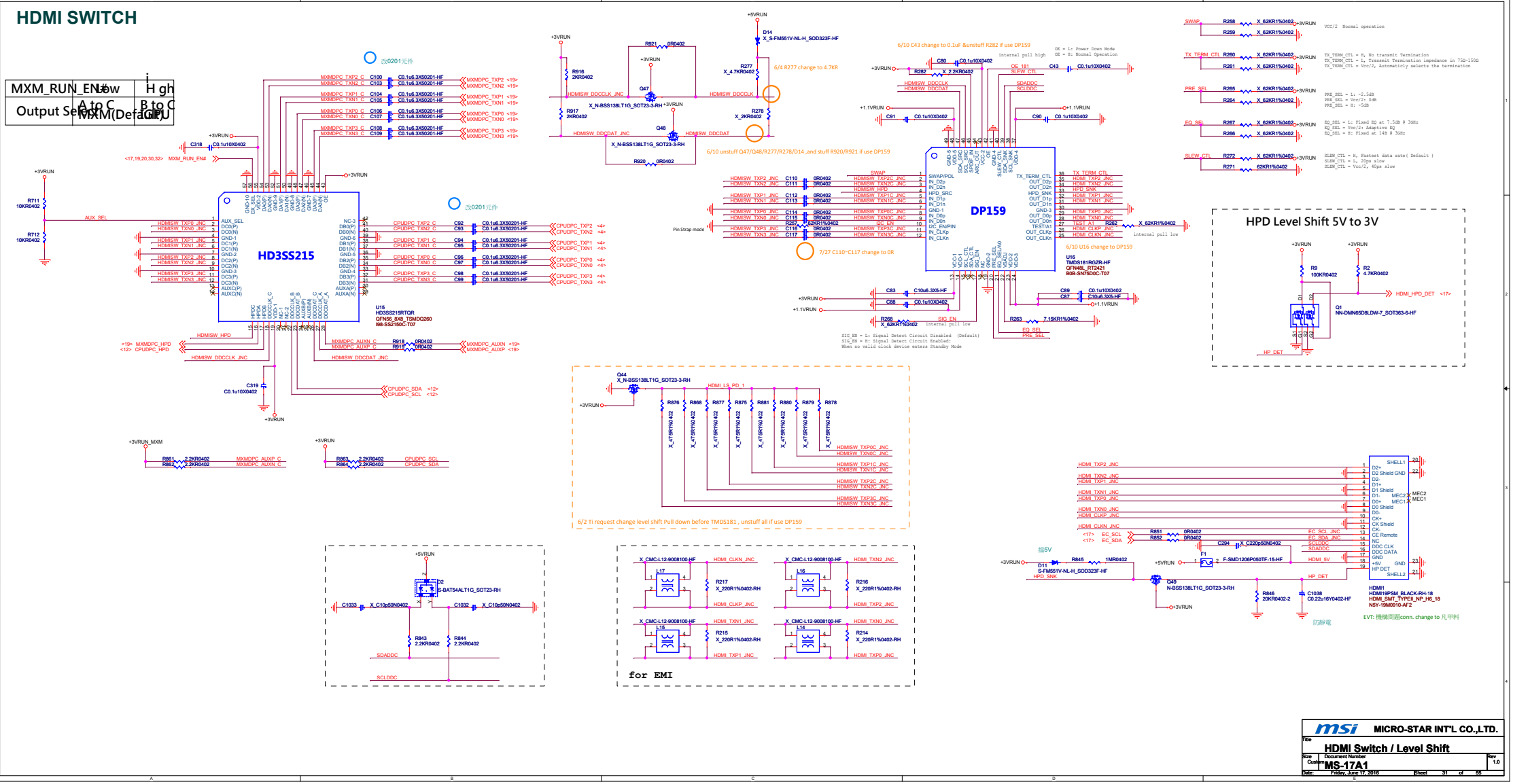
HDMI SWITCH

MXM_RUN_EN#	Low	High
Output Select	A to C	B to C
	MXM(Default)	iGPU



DP 2in 1 out Switch

MXM_PWRSR_EN#	Low	High
Output Select	MXM(Default)	IGPU

Port switching control configuration; Internal pull down at ~150Kohm, 3.3V I/O.
L: Input port1 is selected (default)
H: Input port2 is selected

Programmable inout equalization levels; Internal pull down at 150K ohm, 3.3V I/O.
L: default, LEQ, compensate channel loss up to 11.5 dB @ HBR2
H: HEQ, compensate channel loss up to 14.5dB @ HBR2
M: LLEQ, compensate channel loss up to 8.5dB @ HBR2

Auto test enable! Internal pull down at ~150Kohm, 3.3V I/O.
L: Auto test disable & input offset cancellation enable (default)
H: Auto test enable & input offset cancellation enable
M: Auto test disable & input offset cancellation disable

Automatic EQ disable!; Internal pull down 150Kohm, 3.3V I/O.
L: Automatic EQ enable (default)
H: Automatic EQ disable

AUX interception diable for prot y (y=1,2). Internal pull down ~150Kohm, 3.3V I/O;
L: AUX interception enable, driver configuration is set by link training (default)
H: AUX interception diable, driver output with fixed 800mv and 0dB
M: AUX interception diable, driver output with fixed 400mv and 0dB

Outout swing adjustment for port y(y=1,2). Internal pull down ~150Kohm, 3.3V I/O;
L:default
H:+20%
M:-16.7%

換0201元件

PS8331B

U4
PS8331BQFN60GTR-A1-HF
QFN60_T118X276
B0B-8331B0C-P97

For Dual Mode switch to DDC

Avoid DP connector Leakage to IC

TBT-SINK0

MXM_RUN_EN#	Low	High
Output Select	MXM(Default)	IGPU

Programmable inout equalization levels; Internal pull down at 150K ohm, 3.3V I/O.
L: default, LEQ, compensate channel loss up to 11.5 dB @ HBR2
H: HEQ, compensate channel loss up to 14.5dB @ HBR2
M: LLEQ, compensate channel loss up to 8.5dB @ HBR2

Auto test enable! Internal pull down at ~150Kohm, 3.3V I/O.
L: Auto test disable & input offset cancellation enable (default)
H: Auto test enable & input offset cancellation enable
M: Auto test disable & input offset cancellation disable

Automatic EQ disable!; Internal pull down 150Kohm, 3.3V I/O.
L: Automatic EQ enable (default)
H: Automatic EQ disable

AUX interception diable for prot y (y=1,2). Internal pull down ~150Kohm, 3.3V I/O;
L: AUX interception enable, driver configuration is set by link training (default)
H: AUX interception diable, driver output with fixed 800mv and 0dB
M: AUX interception diable, driver output with fixed 400mv and 0dB

Outout swing adjustment for port y(y=1,2). Internal pull down ~150Kohm, 3.3V I/O;
L:default
H:+20%
M:-16.7%

換0201元件

PS8331B

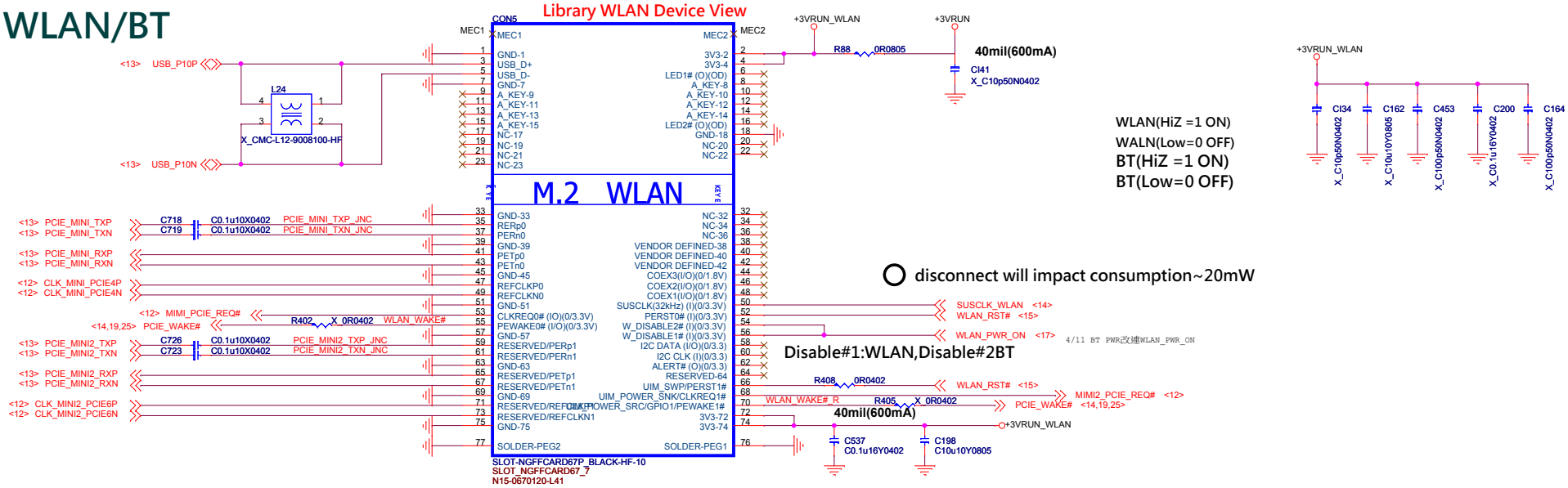
U3
PS8331BQFN60GTR-A1-HF
QFN60_T118X276
B0B-8331B0C-P97

強迫AUX輸出

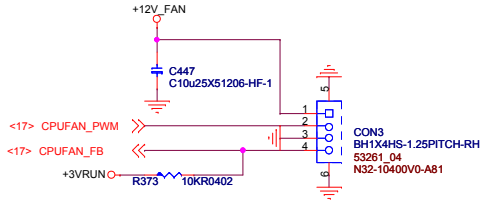
MICRO-STAR INT'L CO.,LTD.

Title: DP Switch
Size: Custom | Document Number: MS-17A1 | Rev: 1.0
Date: Monday, June 20, 2016 | Sheet 32 of 55

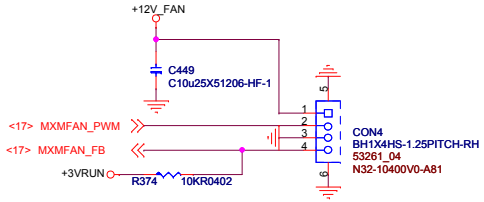
M.2 WLAN/BT



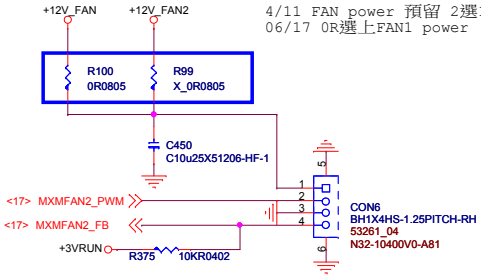
CPU FAN



MXM1 FAN



MXM2 FAN



MICRO-STAR INT'L CO.,LTD.		
Title: WLAN/BT/FAN		
Size	Document Number: MS-17A1	Rev: 1.0
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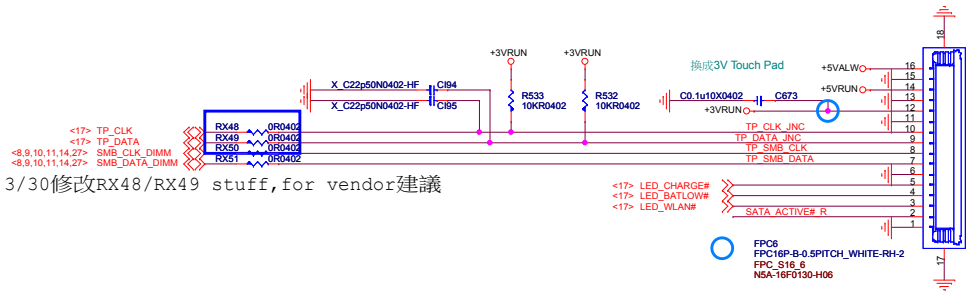
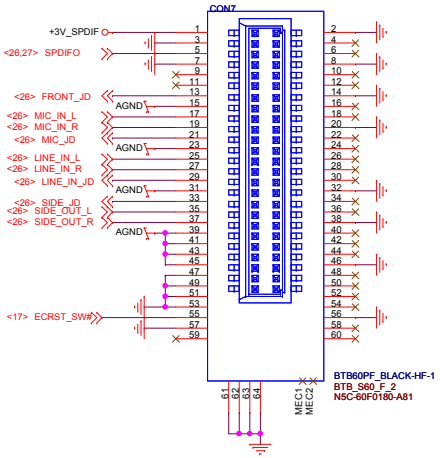
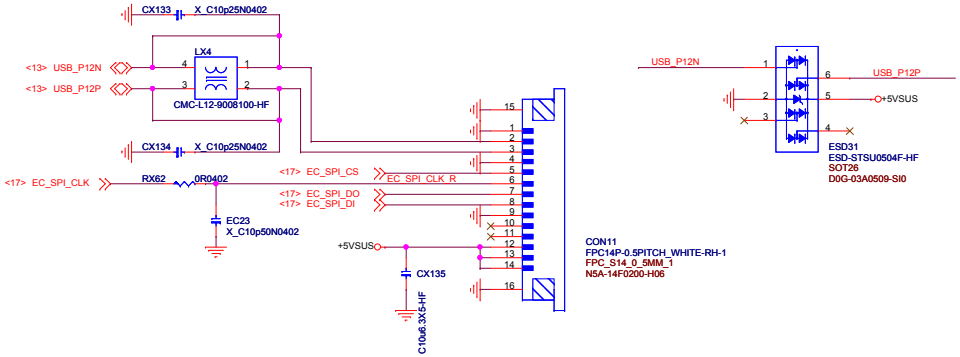
Touch Pad con

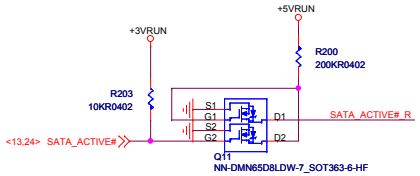


3/30修改RX48/RX49 stuff,for vendor建議

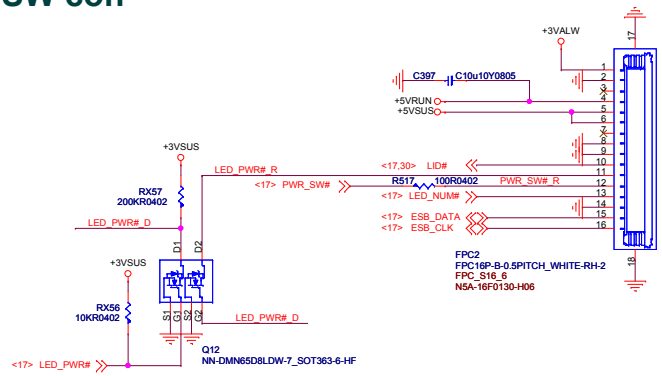
Audio BTB



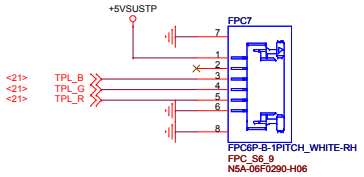


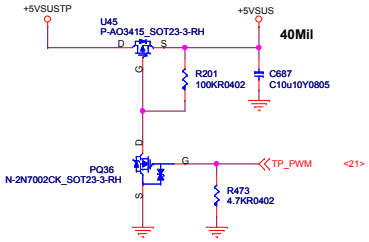


SW con



TP LED





msi	MICRO-STAR INT'L CO.,LTD.	
Title	Audio BTB/TP Conn	
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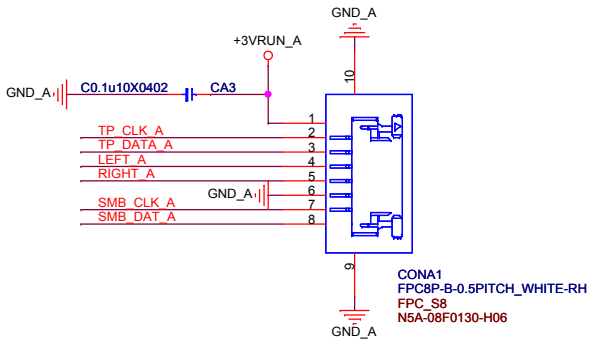
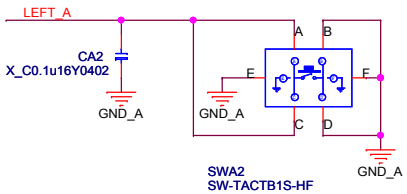
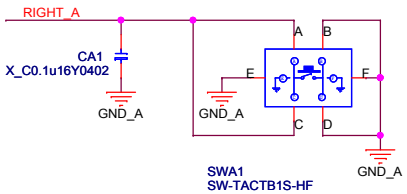
TP Pad FPC

03/09 ME改 CON to N5A-08F0130-H06

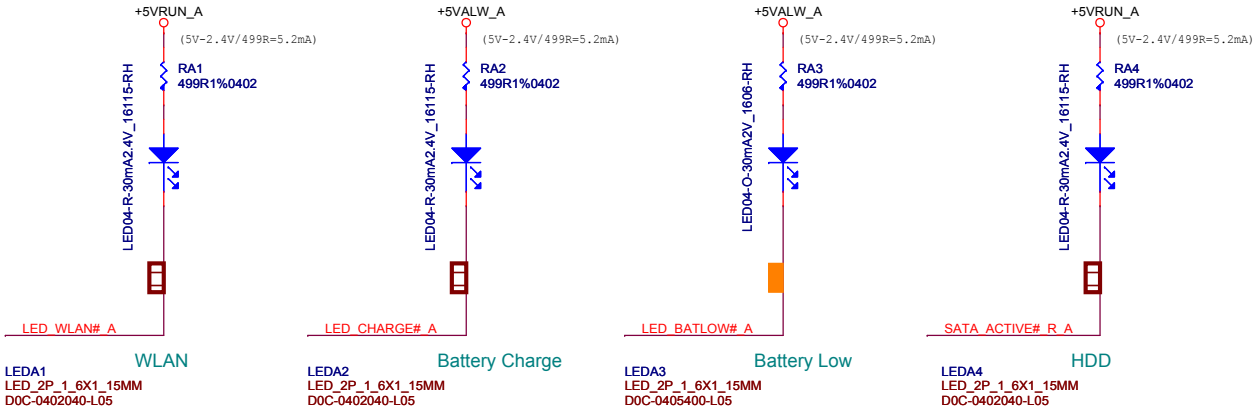


TP L/R Key

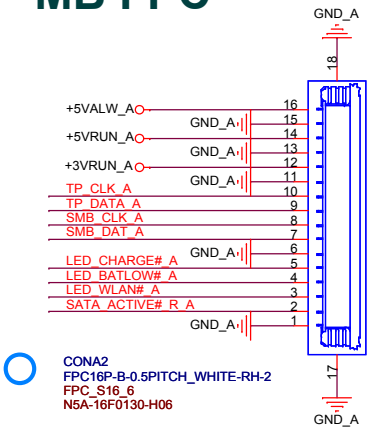




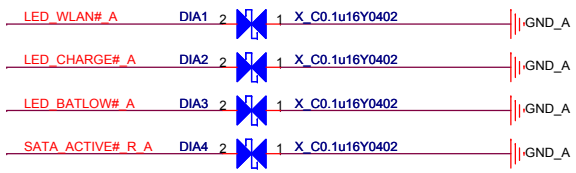
LED Board

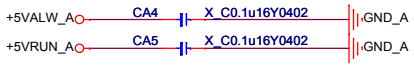


MB FPC



EMI

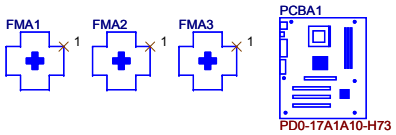


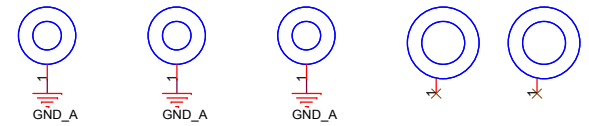


White D0C-040C300-L05 (470R = 4mA) 3.15V

Red D0C-0402040-L05 (499R = 6mA) 2V

Orang D0C-0400620-L05 (499R = 6mA) 2V





PD0-17A1A10-H73 瀚宇博德

PD0-17A1A10-T53 健鼎無錫

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

Title	[A]TP L/R Key	
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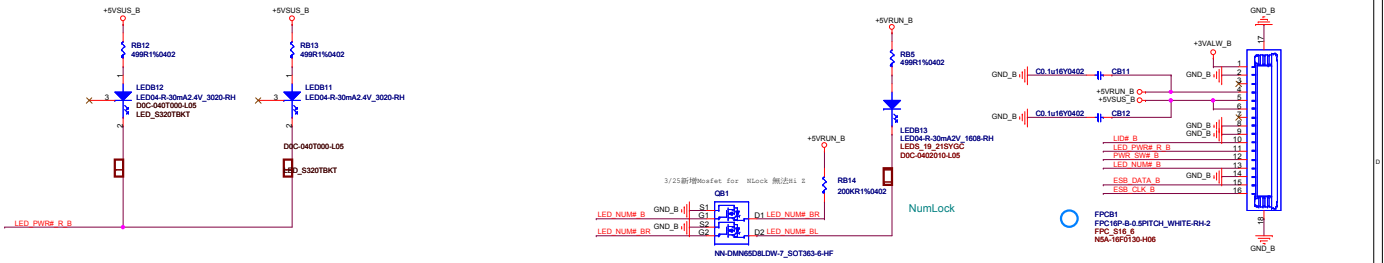
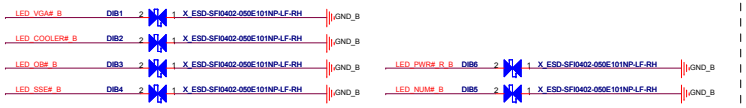
LED

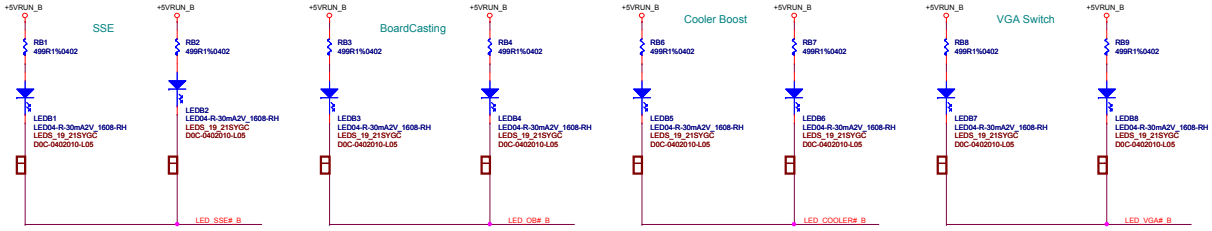


EMI

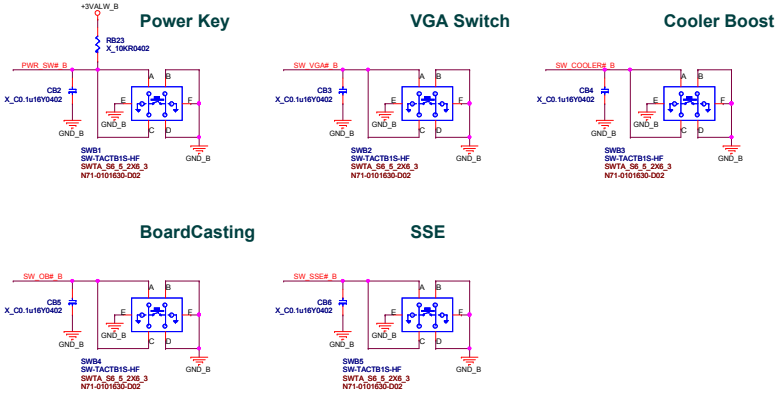


White D0C-040C300-L05 (470R = 4mA) 3.15V

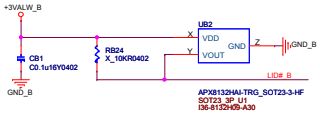
Red D0C-0402010-L05 (499R = 6mA) 2V

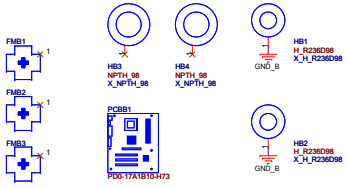


Function Key



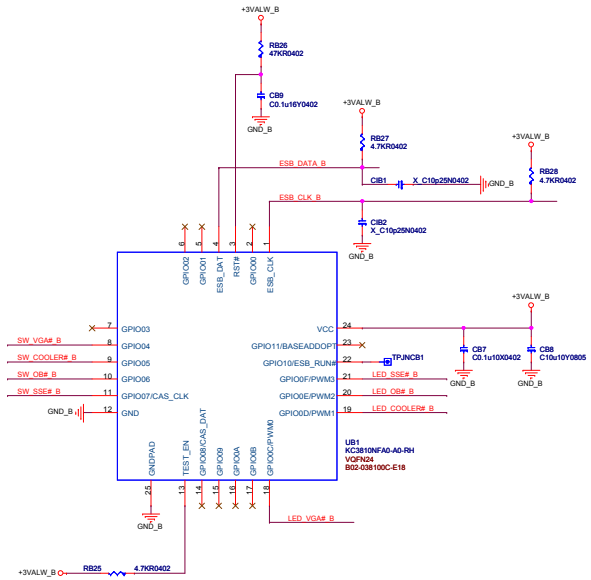
Hall Sensor





PD0-17A1B10-H73 瀚宇博德

PD0-17A1B10-T53 健鼎無錫



msi	MICRO-STAR INT'L CO.,LTD.		
Title	[B]SW Board		
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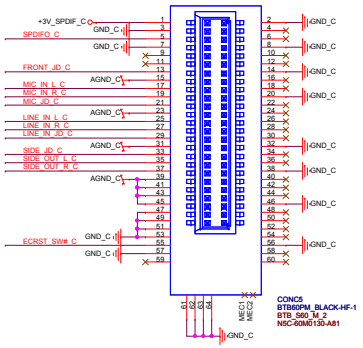
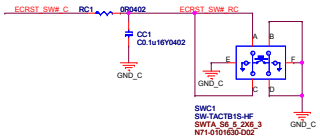
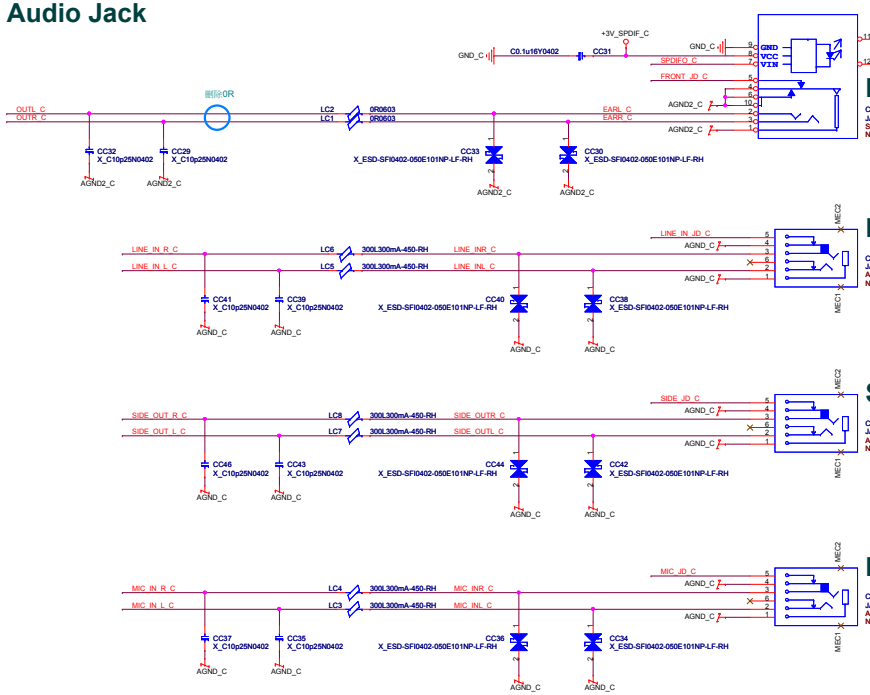
BTB



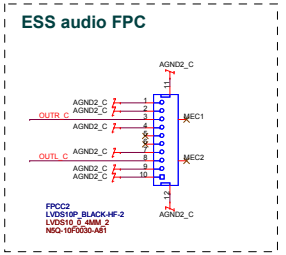
Reset Key

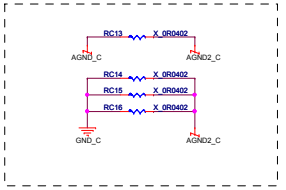


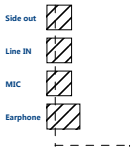
Audio Jack



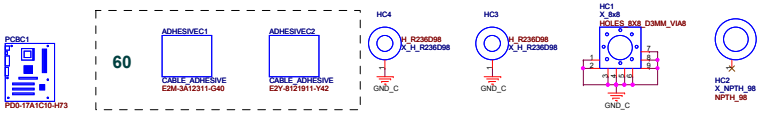
ESS audio FPC







04/19 EMI 改鋁箔　　04/22 新增Safety醋酸膠布



PD0-17A1C10-H73 瀚宇博德
PD0-17A1C10-T53 健鼎無錫

msi	MICRO-STAR INT'L CO.,LTD.	
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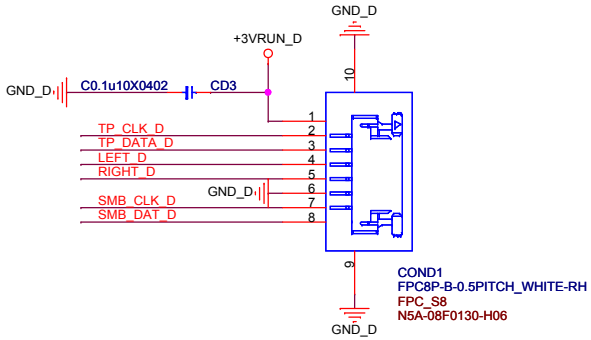
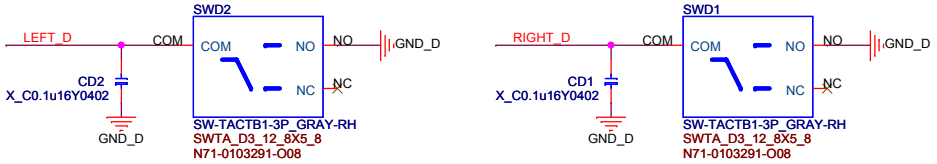
TP Pad FPC

03/04 ME改 CON to N5A-08F0130-H06

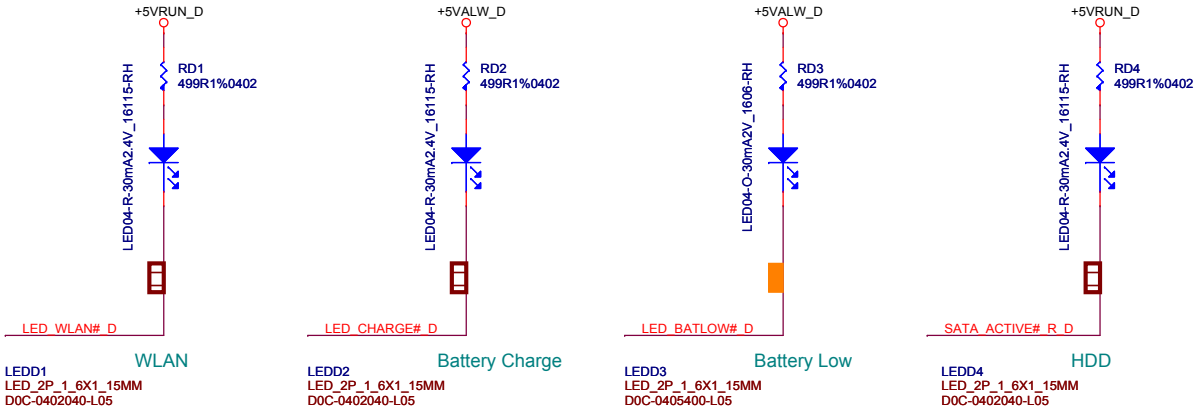


TP L/R Key

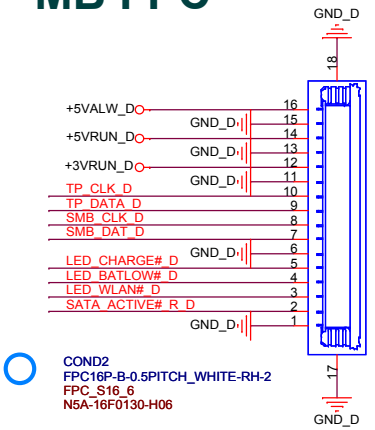
03/10 TP SW ME改歐姆龍料號N71-0103291-O08



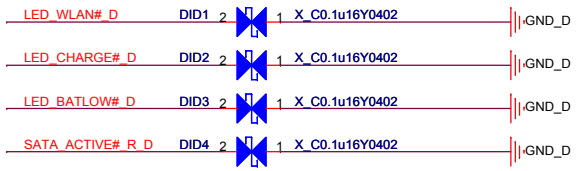
LED Board

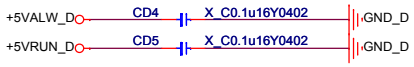


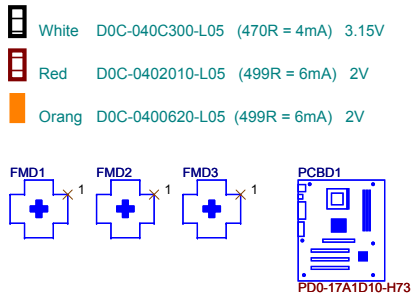
MB FPC



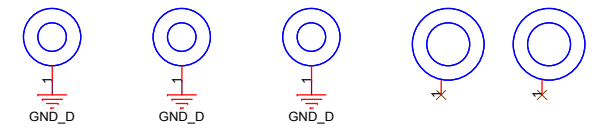
EMI







PD0-17A1D10-H73 瀚宇博德
PD0-17A1D10-T53 健鼎無錫



MICRO-STAR INT'L CO.,LTD.

Title: [D]TP L/R Key (Mechanical)

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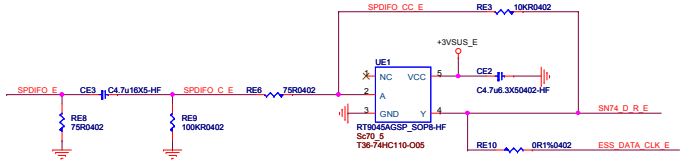
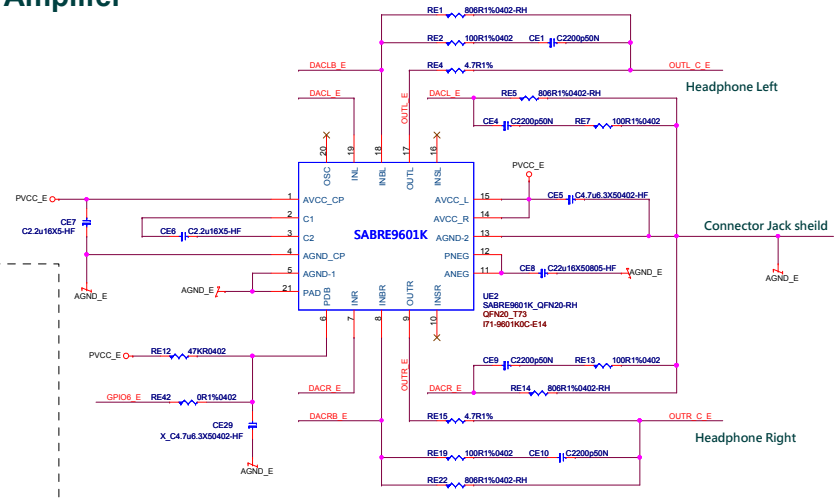
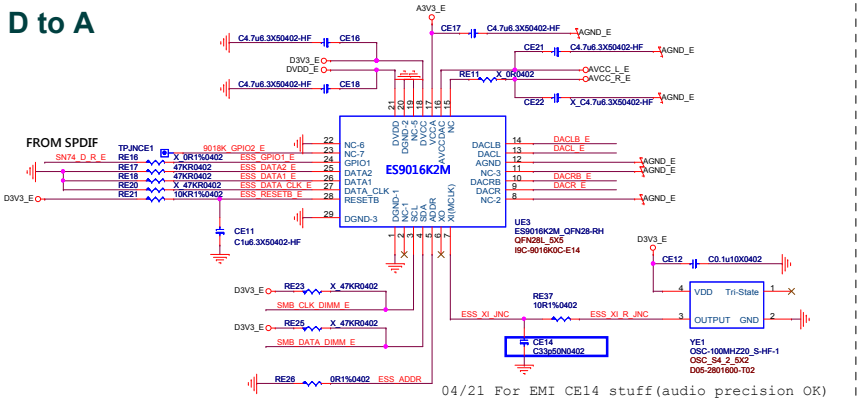
SPDIF



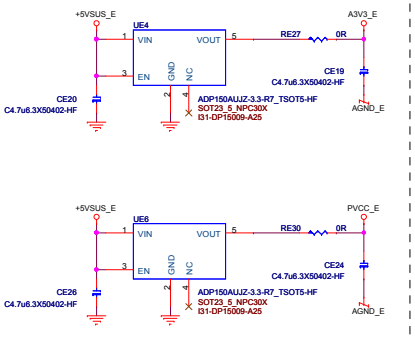
Amplifer



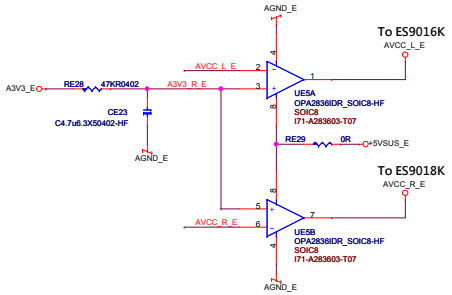
D to A



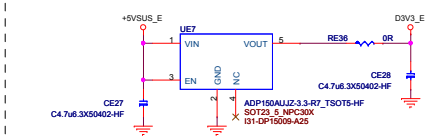
Power

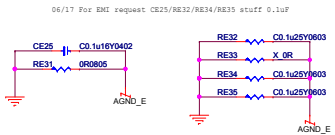


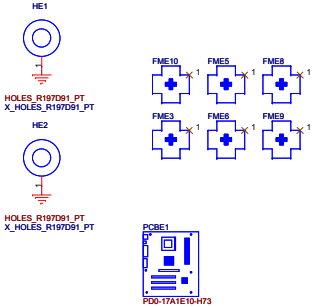
OP



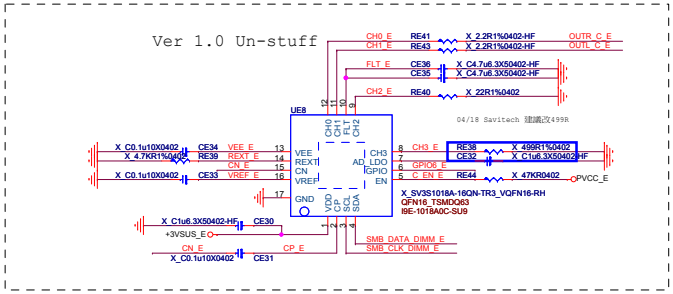
ES9016 DVCC POWER



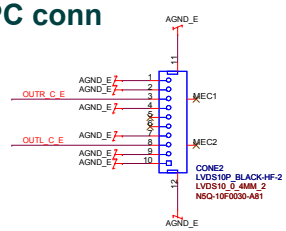




PD0-17A1E10-H73 瀚宇博德
PD0-17A1E10-T53 健鼎無錫



Audio FPC conn



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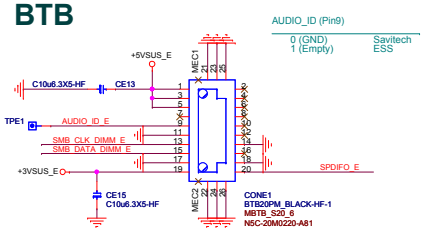

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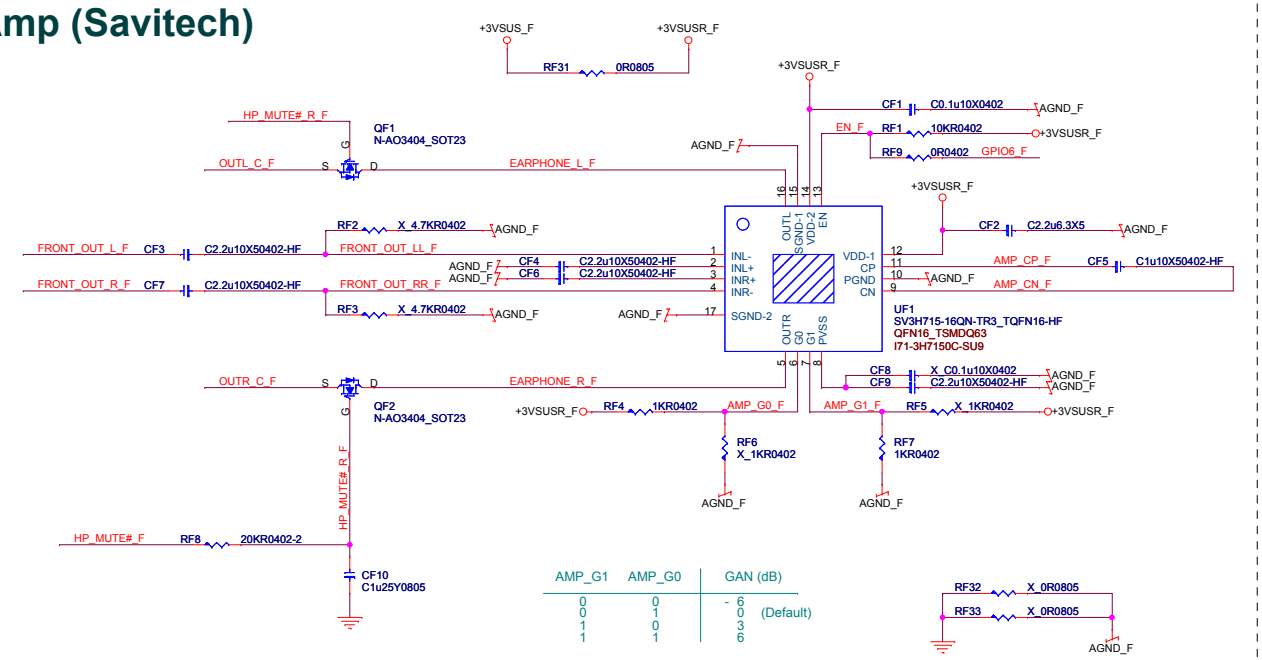
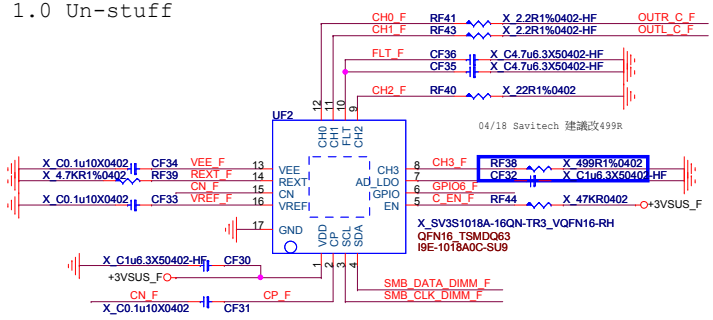
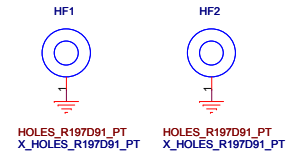
Amp (Savitech)



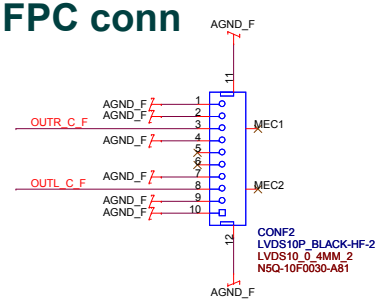
AMP_G1	AMP_G0	GAN (dB)
0	0	-6
0	1	0 (Default)
1	0	3
1	1	6

Ver 1.0 Un-stuff





Audio FPC conn



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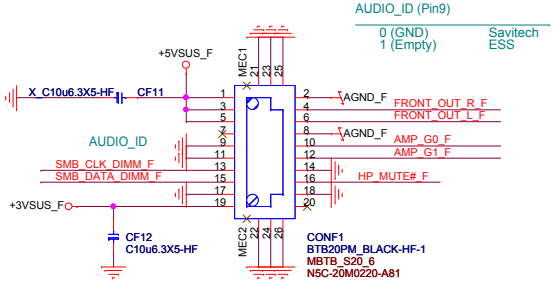

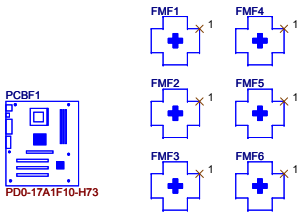

PD0-17A1F10-H73 瀚宇博德
PD0-17A1F10-T53 健鼎無錫

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Title	[F]Savitech Audio Board	
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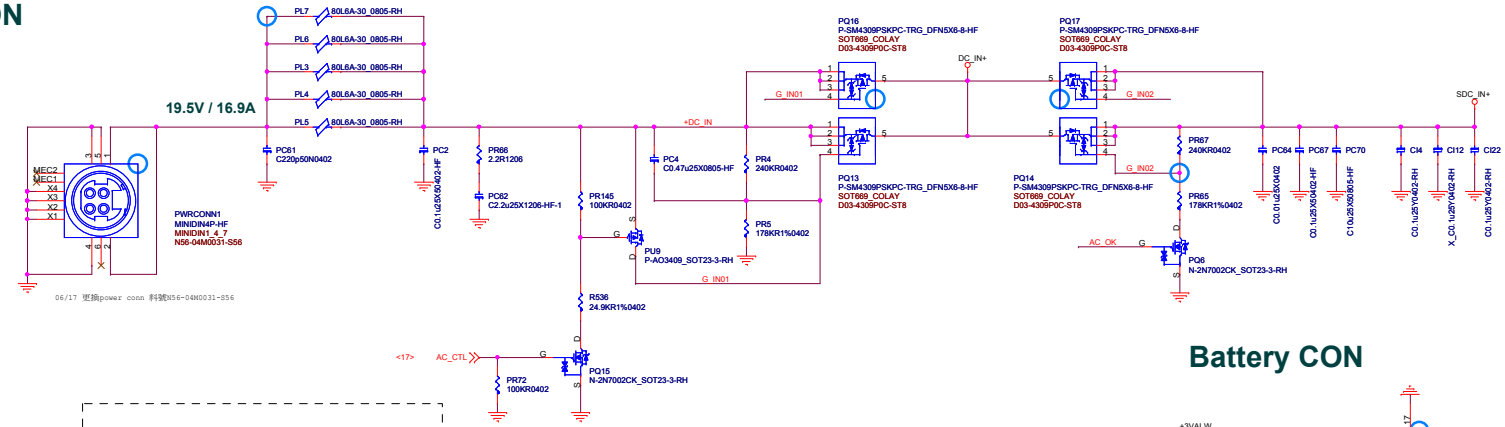
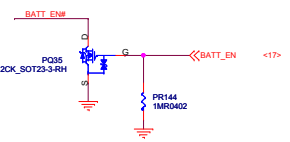
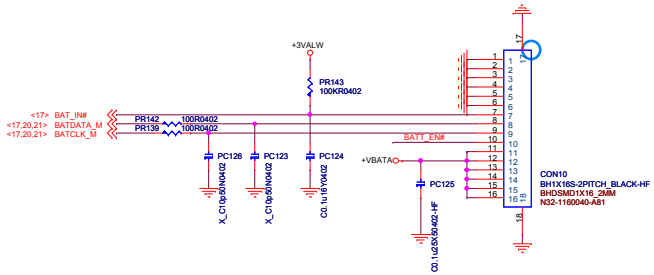
Power CON



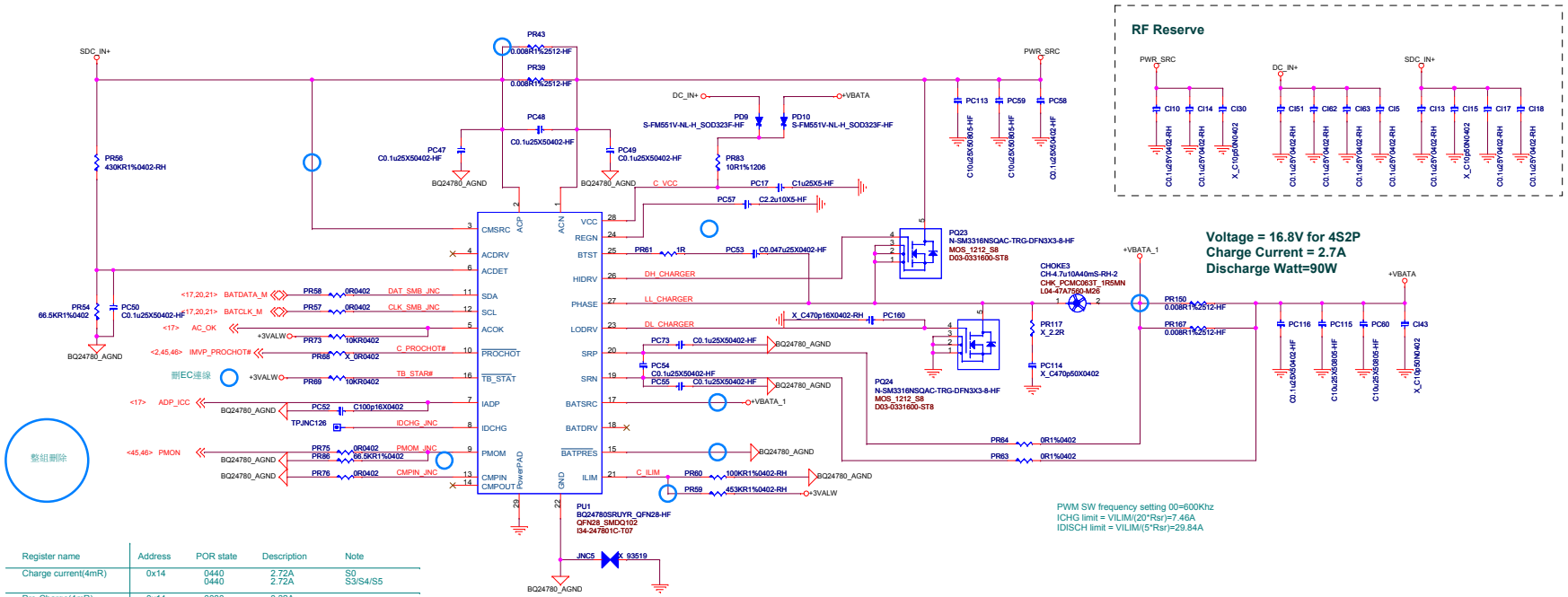
Battery EC OFF



Battery CON



Battery Charger



RF Reserve

Voltage = 16.8V for 4S2P
Charge Current = 2.7A
Discharge Watt=90W

PWM SW frequency setting 00=600Khz
ICHG limit = VILIM/(20*Rsr)=7.46A
IDISCH limit = VILIM/(5*Rsr)=29.84A

Register name	Address	POR state	Description	Note
Charge current(4mR)	0x14	0440 0440	2.72A 2.72A	S0 S3/S4/S5
Pre-Charge(4mR)	0x14	0080	0.32A	-----
Input current(4mR)	0x3F	19.5V 1A00	16.64A	325W
Charge voltage	0x15	41A0	16.8V	4S2P
Discharge current(4mR)	0x39	008x	2.048A	BOOST current

MICRO-STAR INT'L CO.,LTD.

Title: **Battery select/Charger**

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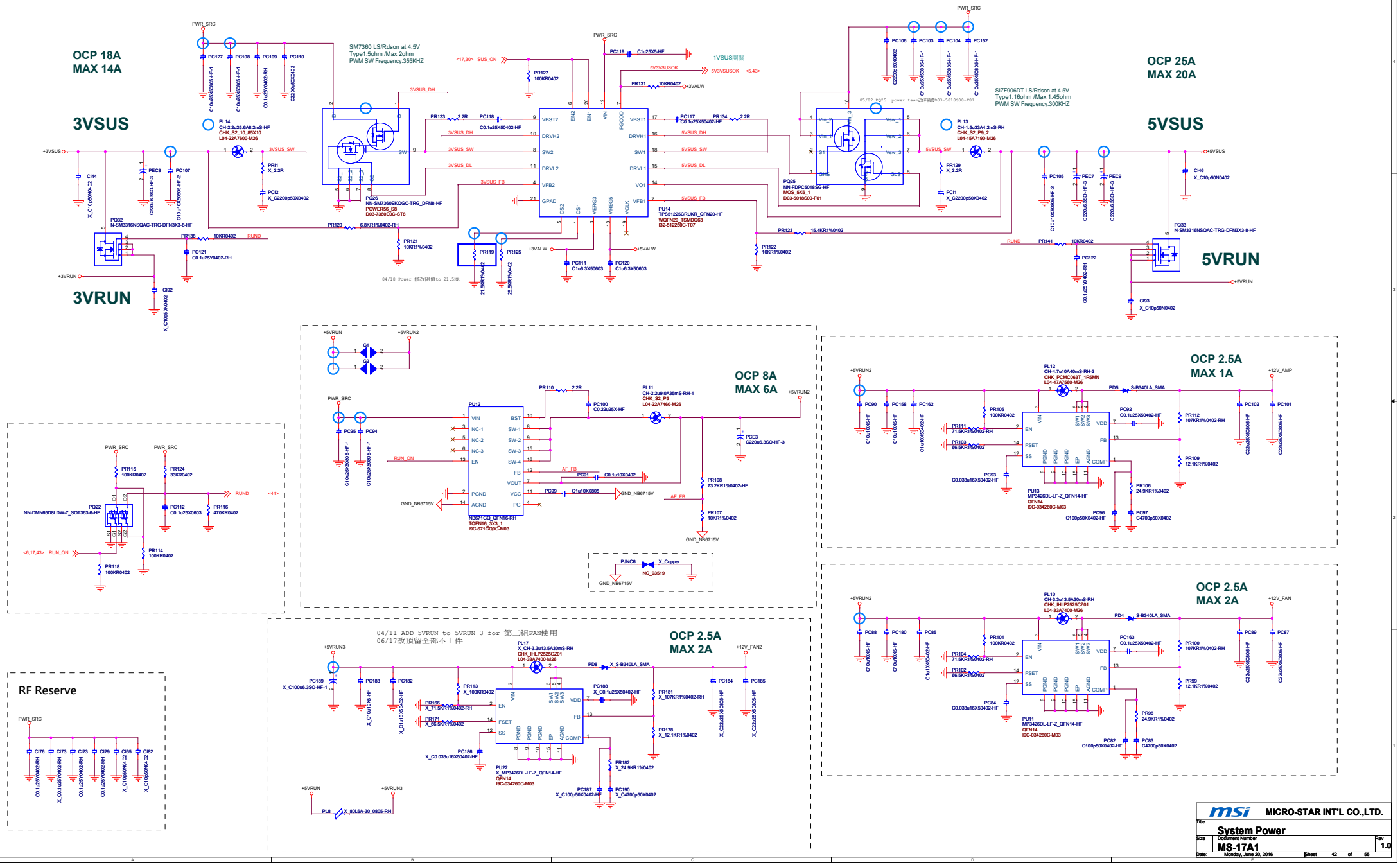
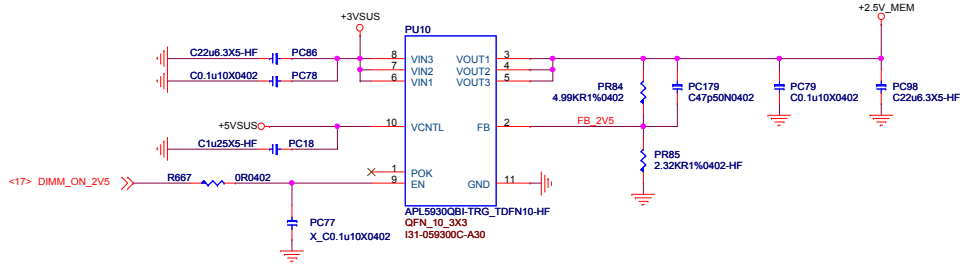
System Power



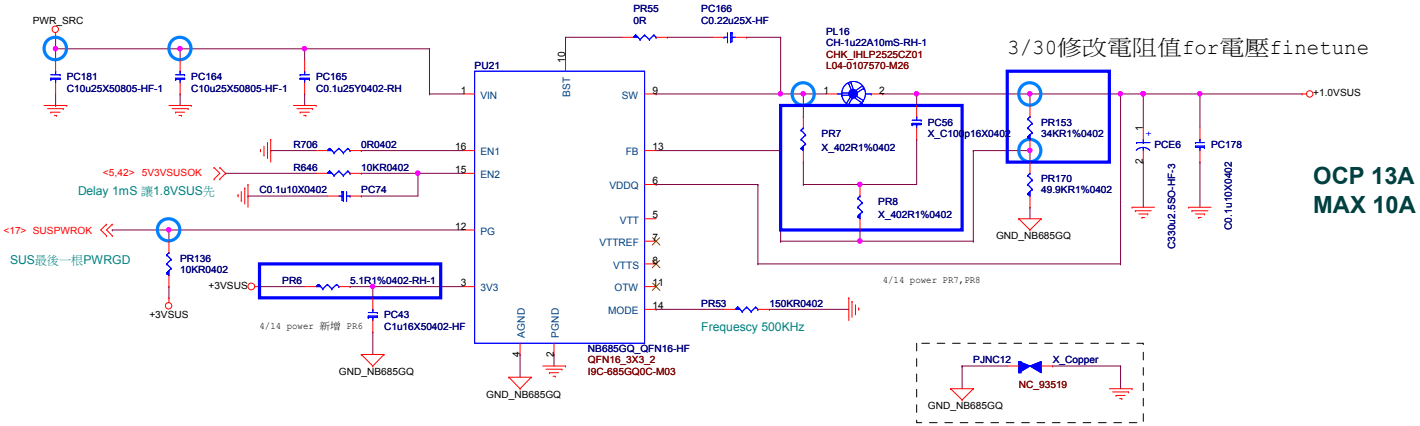
+2.5V_MEM

OCP 4.2A
MAX 1A

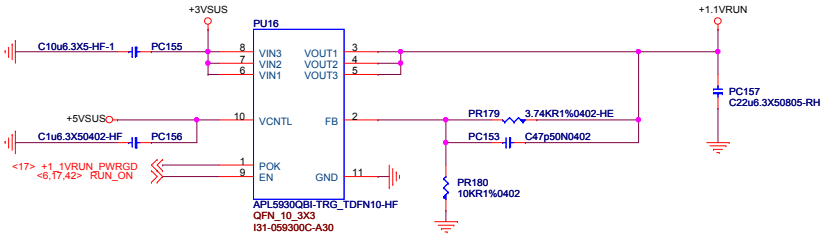


+1.0VSUS

OCP 13A
MAX 10A



+1.1VRUN



msi	MICRO-STAR INT'L CO.,LTD.	
Title	2.5VMEM/1VSUS/+1_1VRUN	
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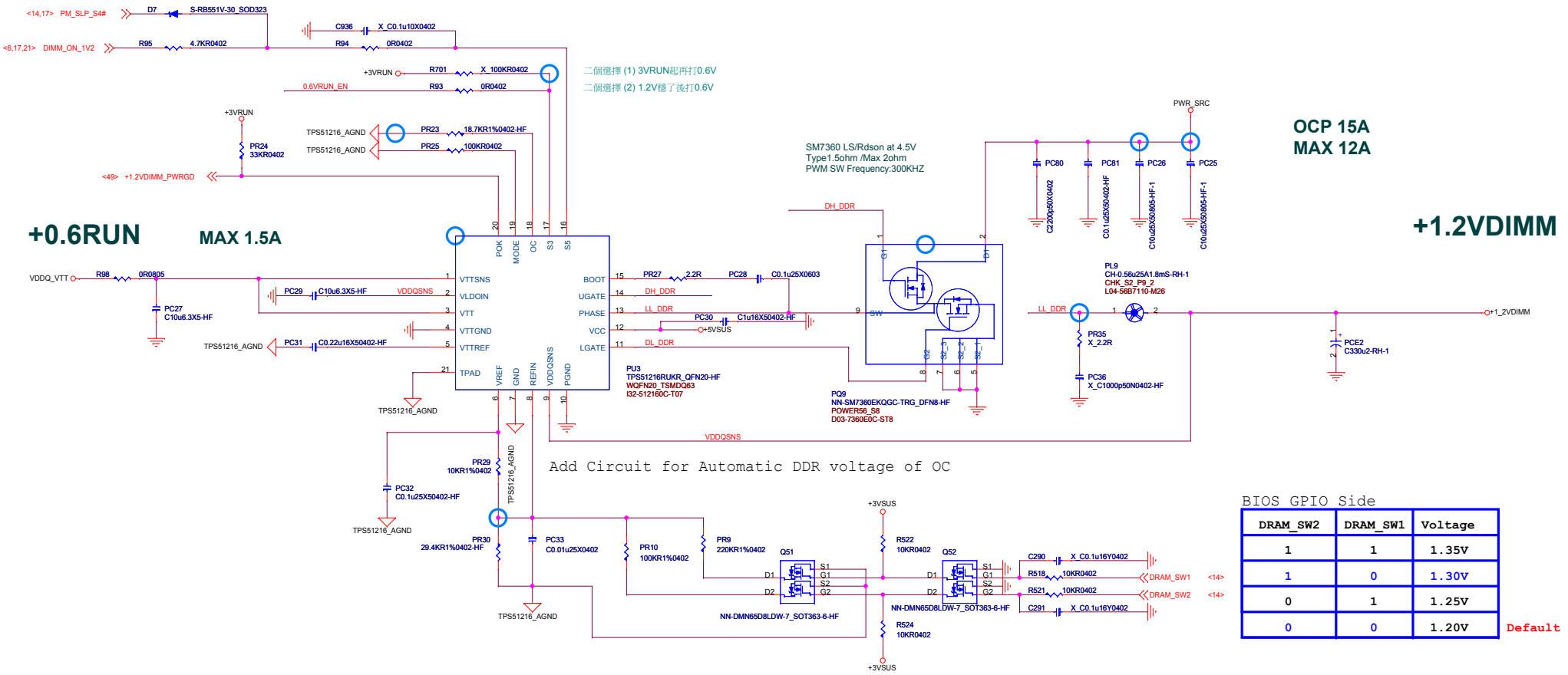

BIOS GPIO Side

DRAM_SW2	DRAM_SW1	Voltage	
1	1	1.35V	
1	0	1.30V	
0	1	1.25V	
0	0	1.20V	Default

MICRO-STAR INT'L CO.,LTD.		
Title: +1.2VDIMM/+0.6VRUN		
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Skylake H-line 44e 45W ISL95855

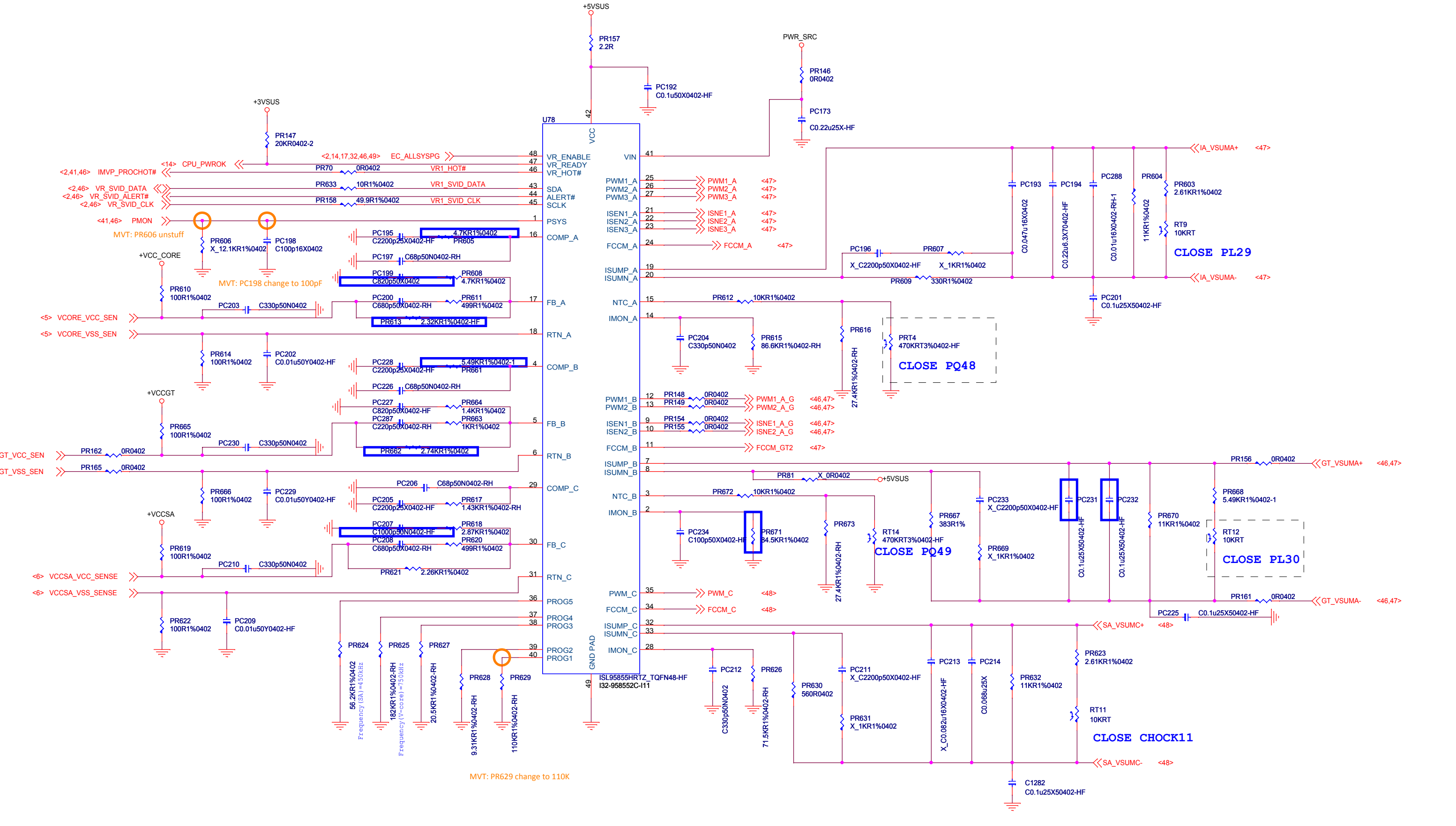


TABLE 4. PROG1 PROGRAMMING TABLE

TYPICAL PROG1 RESISTOR (±1%, kΩ)	VR A + VR B + VR C (GTUS) Vboot (V)	SLEW RATE ALL VRs (mV/µs)	ADDRESS SELECTION		
			VR A	VR B	VR C
1.87	1.05	30	GT[01h]	GTUS [03h]	SA [02h]
5.62	1.05	30	GT[01h]	IA [00h]	GTUS [03h]
9.31	1.05	30	GT[01h]	IA [00h]	SA [02h]
13.3	1.05	30	IA [00h]	GTUS [03h	SA [02h]
16.9	1.05	30	IA [00h]	GT[01h]	GTUS [03h]
20.5	1.05	30	IA [00h]	GT[01h]	SA [02h]
24.3	1.05	10	GT[01h]	GTUS [03h]	SA [02h]
28.0	1.05	10	GT[01h]	IA [00h]	GTUS [03h]
34.0	1.05	10	GT[01h]	IA [00h]	SA [02h]
41.2	1.05	10	IA [00h]	GTUS [03h	SA [02h]
48.7	1.05	10	IA [00h]	GT[01h]	GTUS [03h]
56.2	1.05	10	IA [00h]	GT[01h]	SA [02h]
63.4	0	30	GT[01h]	GTUS [03h]	SA [02h]
71.5	0	30	GT[01h]	IA [00h]	GTUS [03h]
78.7	0	30	GT[01h]	IA [00h]	SA [02h]
88.7	0	30	IA [00h]	GTUS [03h	SA [02h]
100	0	30	IA [00h]	GT[01h]	GTUS [03h]
110	0	30	IA [00h]	GT[01h]	SA [02h]
121	0	10	GT[01h]	GTUS [03h]	SA [02h]
137	0	10	GT[01h]	IA [00h]	GTUS [03h]
150	0	10	GT[01h]	IA [00h]	SA [02h]
165	0	10	IA [00h]	GTUS [03h	SA [02h]
182	0	10	IA [00h]	GT[01h]	GTUS [03h]
215	0	10	IA [00h]	GT[01h]	SA [02h]

TABLE 5. PROG2 PROGRAMMING TABLE

TYPICAL PROG2 RESISTOR (±1%, kΩ)	IMAX VR A			VR A PSI1 PHASE REDUCTION
	3-PH (A)	2-PH (A)	1-PH (A)	
1.87	67	35	7	2-Phase
5.62	70	40	10	2-Phase
9.31	75	45	15	2-Phase
13.3	80	50	18	2-Phase
16.9	85	55	20	2-Phase
20.5	91	60	25	2-Phase
24.3	95	65	27	2-Phase
28.0	100	67	30	2-Phase
34.0	105	70	33	2-Phase
41.2	110	75	35	2-Phase
48.7	115	80	40	2-Phase
56.2	120	85	45	2-Phase
63.4	67	35	7	1-Phase
71.5	70	40	10	1-Phase
78.7	75	45	15	1-Phase
88.7	80	50	18	1-Phase
100	85	55	20	1-Phase
110	91	60	25	1-Phase
121	95	65	27	1-Phase
137	100	67	30	1-Phase
150	105	70	33	1-Phase
165	110	75	35	1-Phase
182	115	80	40	1-Phase
215	120	85	45	1-Phase

TABLE 6. PROG3 PROGRAMMING TABLE

TYPICAL PROG3 RESISTOR (±1%, kΩ)	IMAX VR B		DROOP VR B
	2-PH (A)	1-PH (A)	
1.87	35	7	Active
5.62	40	10	Active
9.31	45	15	Active
13.3	50	18	Active
16.9	55	20	Active
20.5	60	25	Active
24.3	65	27	Active
28.0	67	30	Active
34.0	70	33	Active
41.2	75	35	Active
48.7	80	40	Active
56.2	85	45	Active
63.4	35	7	Disabled
71.5	40	10	Disabled
78.7	45	15	Disabled
88.7	50	18	Disabled
100	55	20	Disabled
110	60	25	Disabled
121	65	27	Disabled
137	67	30	Disabled
150	70	33	Disabled
165	75	35	Disabled
182	80	40	Disabled
215	85	45	Disabled

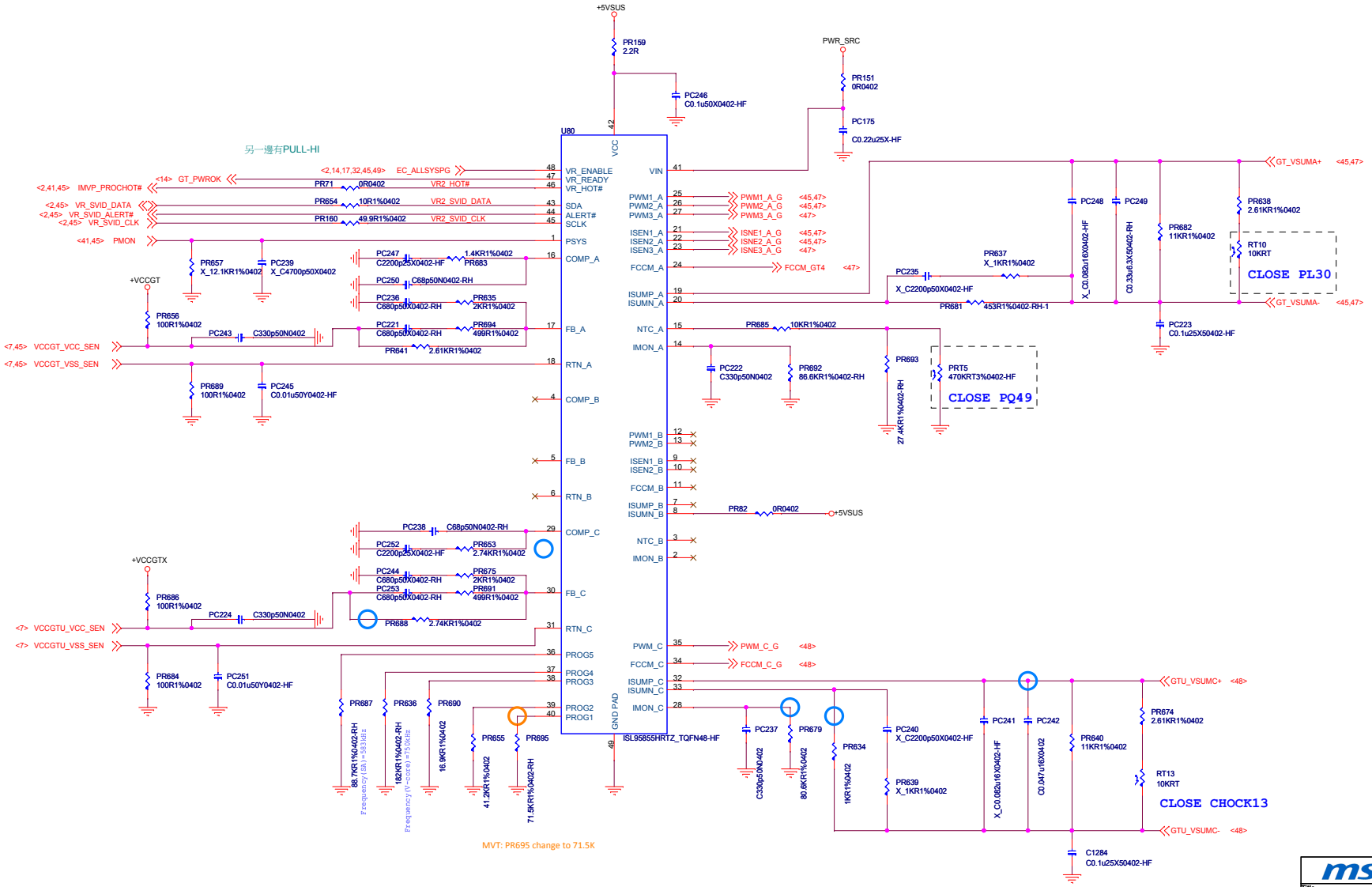
TABLE 7. PROG4 PROGRAMMING TABLE

TYPICAL PROG4 RESISTOR (±1%, kΩ)	DROOP VR A	DROOP VR C	VR A and VR B SWITCHING FREQUENCY (kHz)
1.87	Disabled	Disabled	300
5.62	Disabled	Disabled	350
9.31	Disabled	Disabled	450
13.3	Disabled	Disabled	583
16.9	Disabled	Disabled	750
20.5	Disabled	Disabled	1000
24.3	Disabled	Active	300
28.0	Disabled	Active	350
34.0	Disabled	Active	450
41.2	Disabled	Active	583
48.7	Disabled	Active	750
56.2	Disabled	Active	1000
63.4	Active	Disabled	300
71.5	Active	Disabled	350
78.7	Active	Disabled	450
88.7	Active	Disabled	583
100	Active	Disabled	750
110	Active	Disabled	1000
121	Active	Active	300
137	Active	Active	350
150	Active	Active	450
165	Active	Active	583
182	Active	Active	750
215	Active	Active	1000

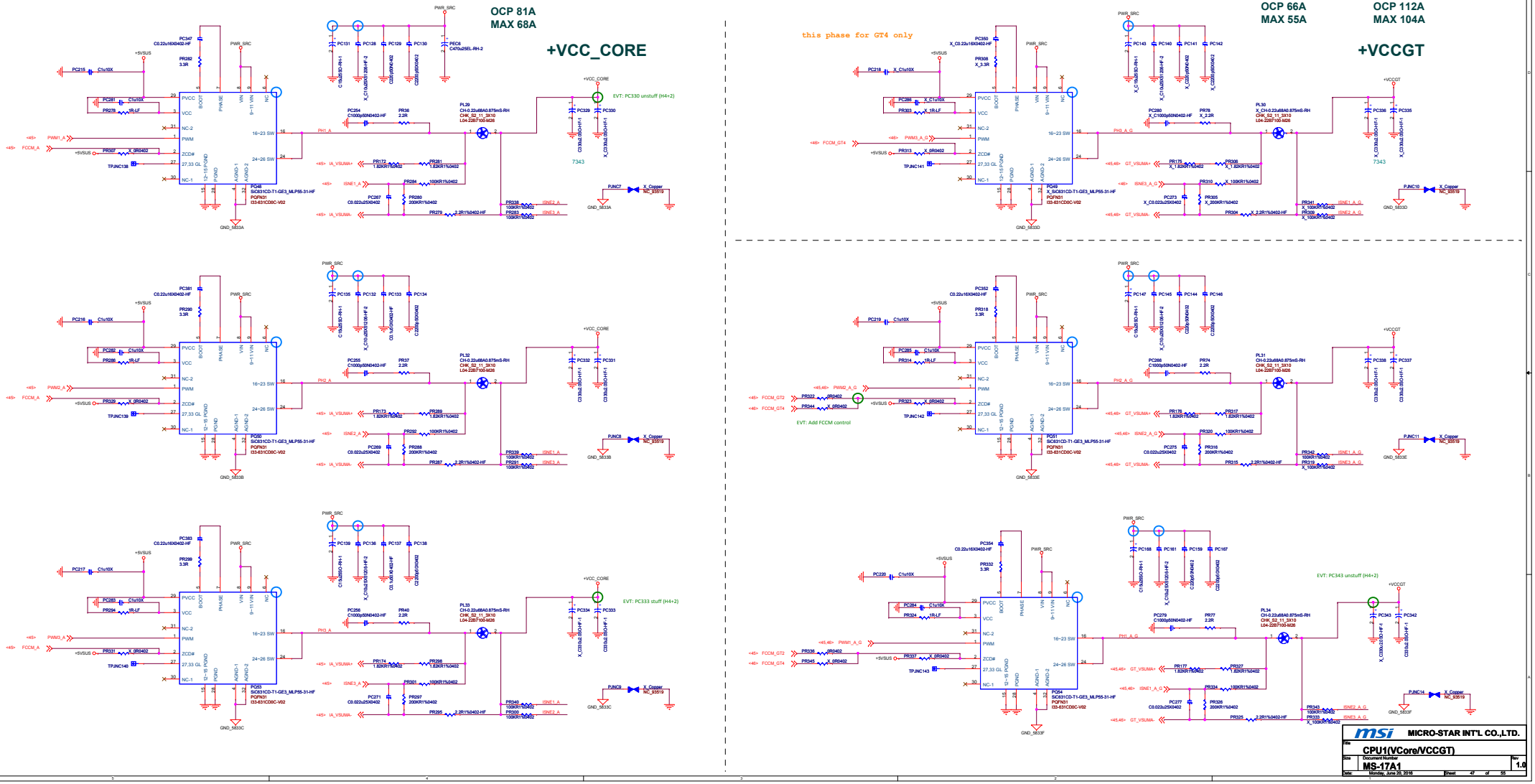
TABLE 8. PROG5 PIN

TYPICAL PROG5 RESISTOR (±1%, kΩ)	VR C IMAX (A)		VR C SWITCHING FREQUENCY (kHz)
	SA	GTUS	
1.87	7	17	300
5.62	9	20	300
9.31	12	25	300
13.3	15	27	300
16.9	7	17	350
20.5	9	20	350
24.3	12	25	350
28.0	15	27	350
34.0	7	17	450
41.2	9	20	450
48.7	12	25	450
56.2	15	27	450
63.4	7	17	583
71.5	9	20	583
78.7	12	25	583
88.7	15	27	583
100	7	17	750
110	9	20	750
121	12	25	750
137	15	27	750
150	7	17	1000
165	9	20	1000
182	12	25	1000
215	15	27	1000

Skylake H-line 44e 45W ISL95855



MICRO-STAR INT'L CO.,LTD.		
Title: CPU GT/GTX (ISL95855)		
Size	Document Number: MS-17A1	Rev: 1.0
Date: Friday, June 17, 2016	Sheet 46 of 55	


OCP 81A
MAX 68A
+VCC_CORE
EVT: PC330 unstuff (H4+2)
EVT: PC333 stuff (H4+2)
EVT: Add FCCM control
this phase for GT4 only
H-42
OCP 66A
MAX 55A
H-44e
OCP 112A
MAX 104A
+VCCGT
EVT: PC343 unstuff (H4+2)
MSI
MICRO-STAR INT'L CO.,LTD.
CPU1(VCore/VCCGT)
MS-17A1
1.0
Monday, June 20, 2016
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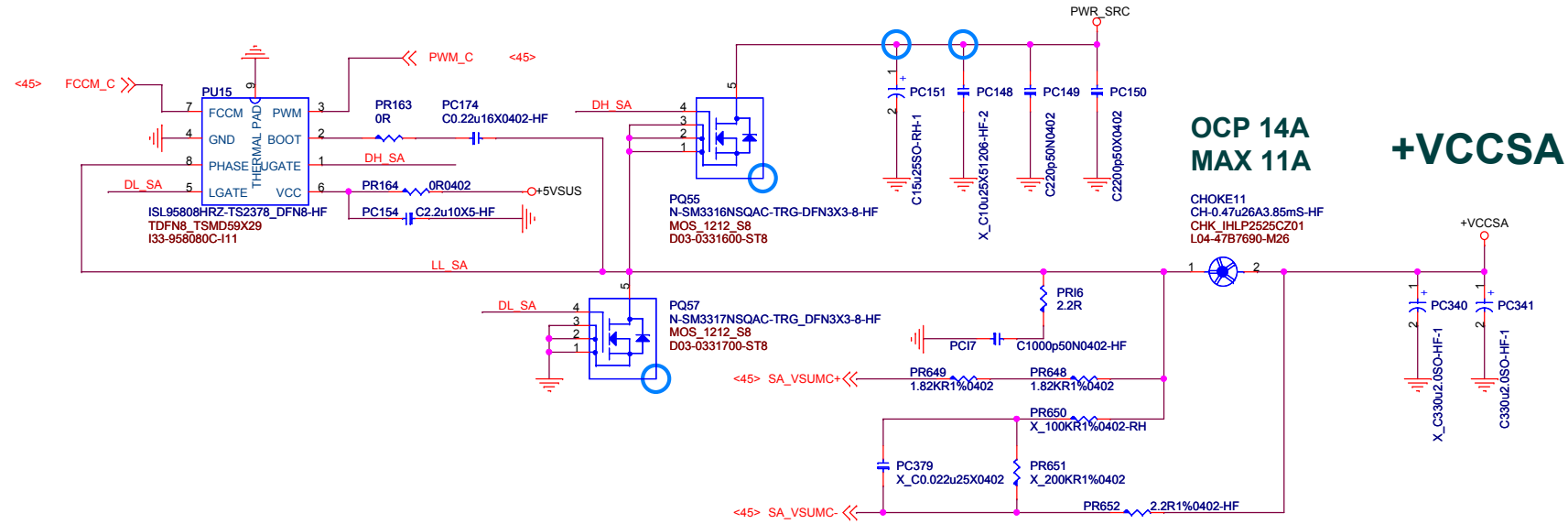
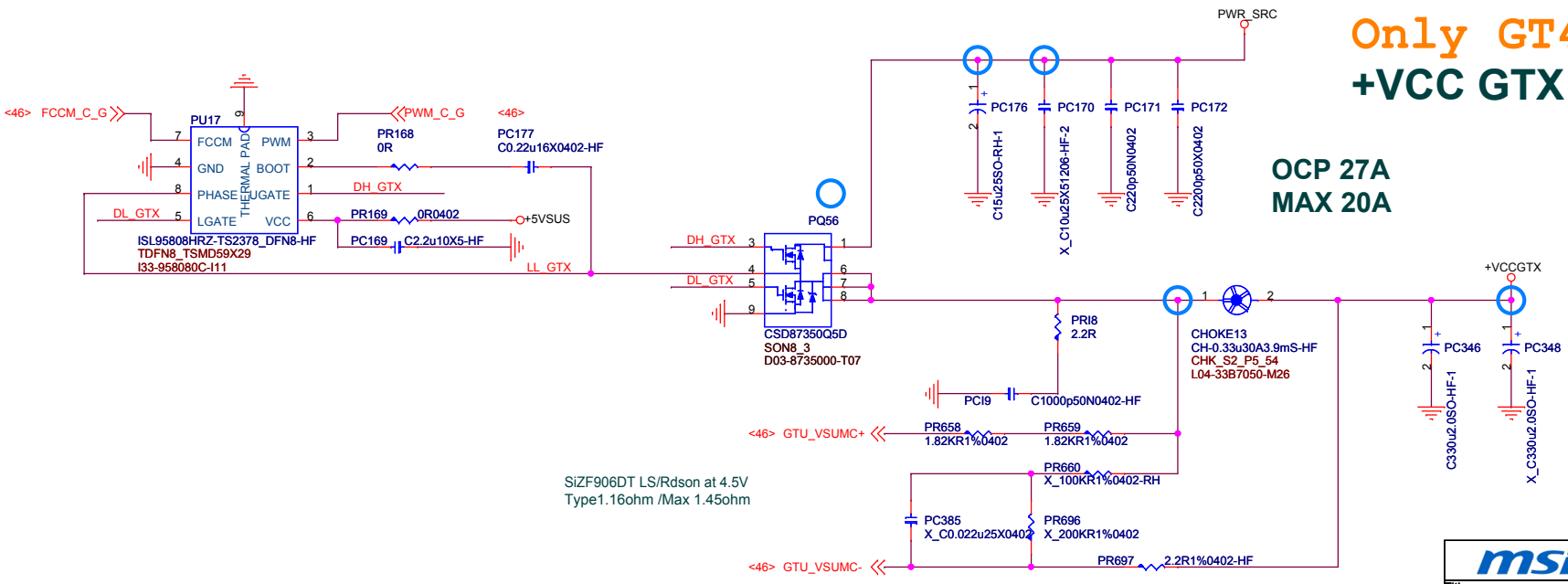
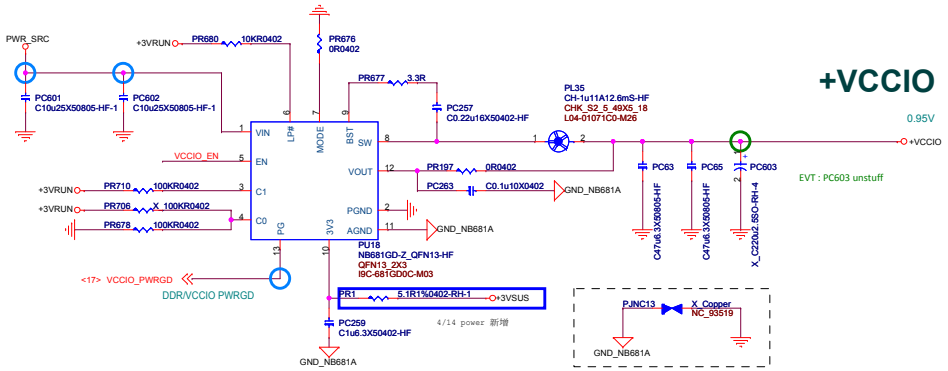
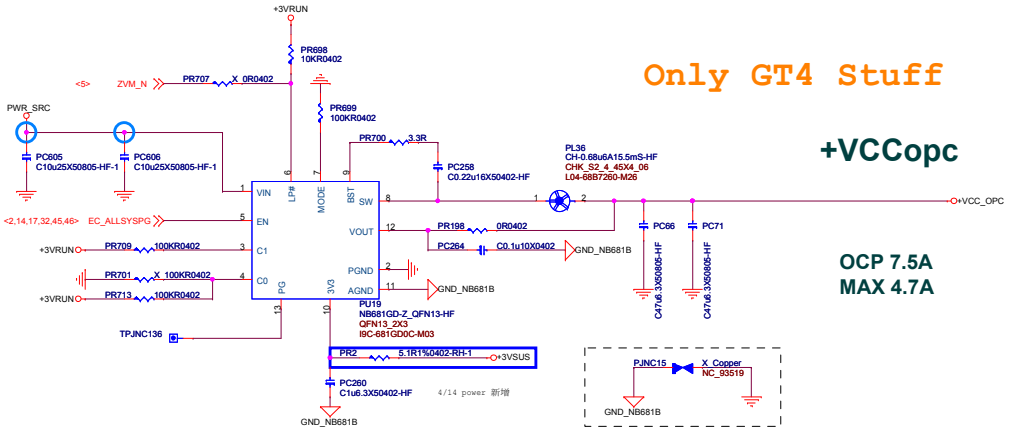
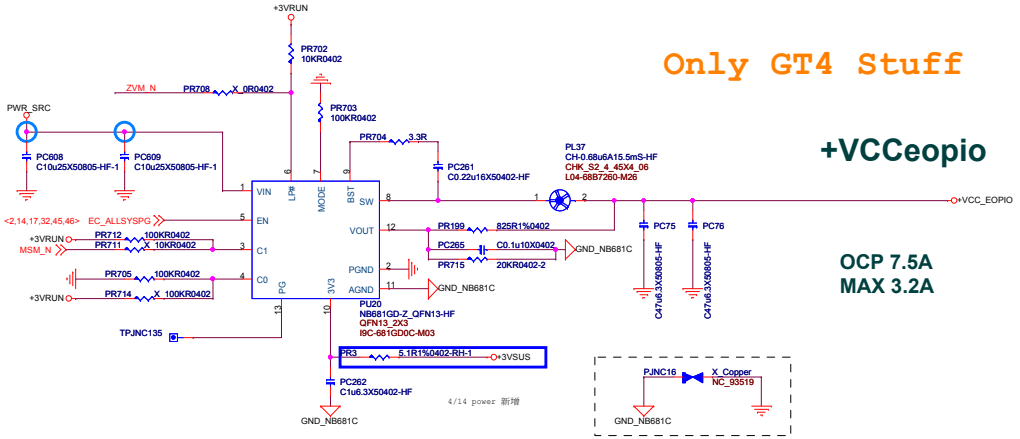


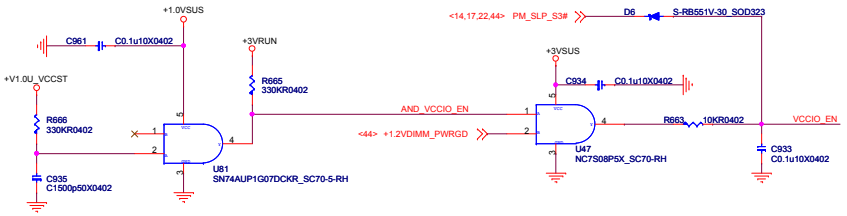


MICRO-STAR INT'L CO.,LTD.		
Title: CPU2(VCCSA/VCCGTX)		
Size	Document Number: MS-17A1	Rev: 1.0
Date: Monday, June 20, 2016	Sheet 48 of 55	









msi	MICRO-STAR INT'L CO.,LTD.		
Title	CPU3(VCCIO/VCCOPC/VCCEOPIO)		
Size	Document Number		Rev
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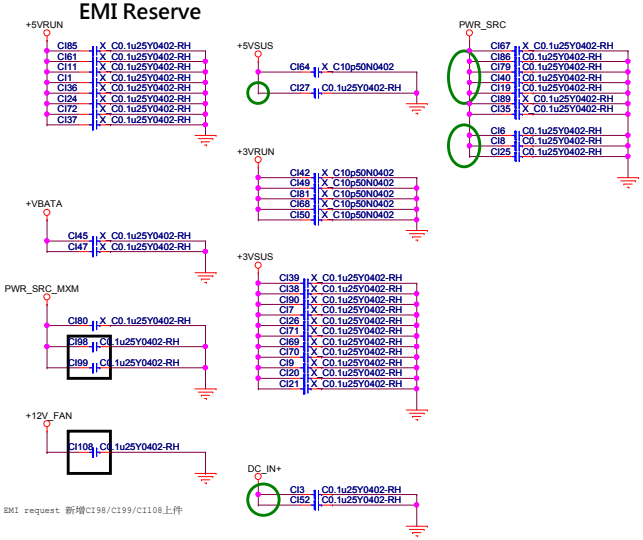
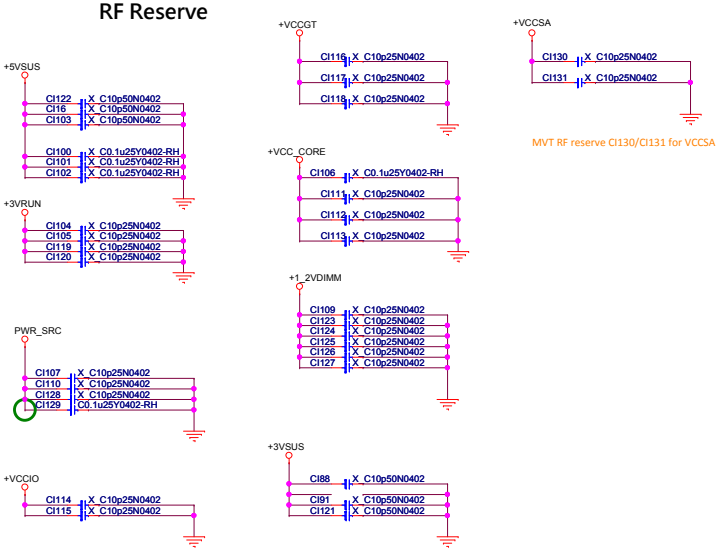
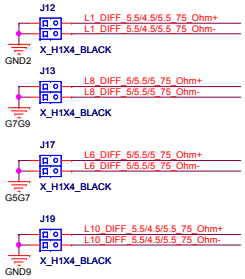
EMI Reserve



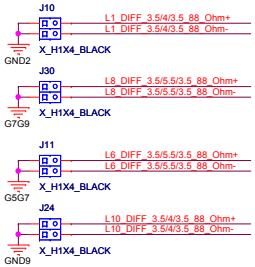
RF Reserve



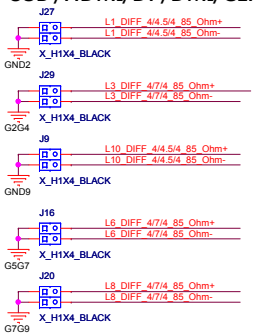
75 OHM / DDR3 DQS



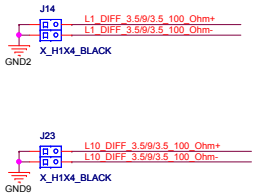
88/90 OHM / DDR3L (CLK) / AR



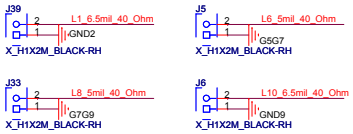
85 OHM /SATA /PCH PCIE/ EDP USB /HDMI/DP/DMI/CLK/PEG



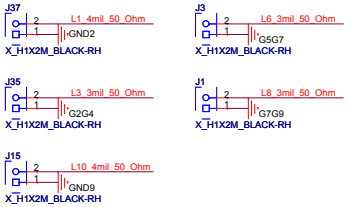
100 OHM / LAN



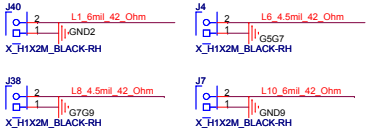
40 OHM / DDR3 CTRL



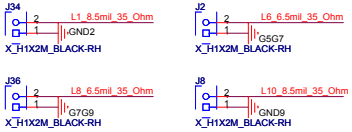
50 OHM / NORMAL



42 OHM / DDR3 DQ



35 OHM / DDR3 CMD



MICRO-STAR INT'L CO.,LTD.		
Title: EMI		
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Board Corner

H1 X_8x8 HOLES_8X8_D3MM_VIA8
H4 X_8x8 HOLES_8X8_D3MM_VIA8
H9 X_8x8 HOLES_8X8_D3MM_VIA8
H11 X_8x8 HOLES_8X8_D3MM_VIA8
H12 X_8x8 HOLES_8X8_D3MM_VIA8
H5 H_R236D98 X_H_R236D98
H7 H_R236D98 X_H_R236D98
H13 HOLES_R177D98 X_HOLES_R177D98
H3 X_8x8 HOLES_8X8_D3MM
H8 X_H_R276D118_PT_V8 H_R276D118_PT_V8
H6 X_H_R276D118_PT_V8 H_R276D118_PT_V8
H2 H_R276D118_PT X_H_R276D118_PT

PAD5 X_HS-MS1011-RH ATE_C006_106 E23-1011040-CA7
PAD7 X_HS-MS1011-RH ATE_C006_106 E23-1011040-CA7
PAD1 X_HS-MS1011-RH ATE_C006_106 E23-1011040-CA7
PAD10 X_HS-MS1011-RH ATE_C006_106 E23-1011040-CA7
PAD3 X_HS-MS1011-RH ATE_C006_106 E23-1011040-CA7
PAD2 X_HS-MS1011-RH ATE_C006_106 E23-1011040-CA7
PAD8 X_HS-MS1011-RH ATE_C006_106 E23-1011040-CA7
PAD4 X_HS-MS1011-RH ATE_C006_106 E23-1011040-CA7
PAD6 X_HS-MS1011-RH ATE_C006_106 E23-1011040-CA7
PAD9 X_HS-MS1011-RH ATE_C006_106 E23-1011040-CA7
PAD11 X_HS-MS1011-RH ATE_C006_106 E23-1011040-CA7
PAD12 X_HS-MS1011-RH ATE_C006_106 E23-1011040-CA7
PAD13 X_HS-MS1011-RH ATE_C006_106 E23-1011040-CA7

FM17 FM44 FM26 FM45 FM33
FM21 FM46 FM10 FM34 FM7
FM50 FM22 FM9 FM20 FM25
FM42 FM48 FM40 FM43 FM49
FM37 FM47 FM35 FM23 FM41
FM13 FM24 FM19 FM39 FM38
FM6 FM3 FM8 FM4 FM36
FM16 FM12 FM15 FM18 FM11
FM5 FM14 FM31 FM1 FM29
FM32 FM30 FM28 FM51 FM27
FM2 FM52 FM53 FM54

Board Inside

MH5 H_R276D118_PT X_H_R276D118_PT
MH4 H_R276D118_PT X_H_R276D118_PT
EVT 04/12 新MH7

MH6 MH1 MH8 MH9 MH10 X_NPTH_98 NPTH_98
MH11 MH12 MH13 MH14 MH15 MH20 MH21 X_NPTH_98 NPTH_98
MH26 MH27 MH28 MH29 X_NPTH_118 NPTH118
MH16 MH17 MH18 MH19 MH22 MH23 MH24 MH25 MH30 X_NPTH_98 NPTH_98

FM55 FM56 FM57 FM58 FM59 FM60 FM61 FM62
06/13 改光學點footprint form F_PAD_NB to F_PAD_NB_2

ESS Stand Off

Spacer Support
ESS_H1 E2B-1634020-RH HOLES_R177D91 E2B-1634020-L63
ESS_H2 E2B-1634020-RH HOLES_R177D91 E2B-1634020-L63

ESS Rubber

RUBBER3 60
RUBBER E2Y-6111911-Y40

Audio Stand Off

Audio_H1 Audio_H2
Spacer Support
E2B-1351010-RH HOLES_R292D142_PT E2B-1351010-L63

CPU Bracket

Bracket1 60
CPU_Bracket E2M-7820111-A89

WLAN Stand Off

Spacer Support
WLAN_H1 E2B-1781010-RH H_R201D118_PTB E2B-1781010-A89

LED Sponge

SPONGE2 60
LED_SPONGE E2Y-71H1111-G40

LABEL1 HDMI_ROYALTY_0.04 HDMI_ROYALTY Certificated Y01-RHDMI03-000 60
LABEL2 BIOS LABEL BIOS_LABEL G51-N1C0041-A09 60
05/02 MVT上件

CPU Mylar

CPU_MYLAR1 60
X_CPU_MYLAR1 E2P-6F40412-Y42

DDR Mylar

MYLAR3 60 MYLAR E2P-0112911-G40
MYLAR4 60 MYLAR E2P-0112911-G40
MYLAR5 60 MYLAR E2P-0112911-G40

60 Mylar

06/21 ME更改MYLAR PN to E2P-6920912-G40
MYLAR6 MYLAR E2P-4211211-G40
MYLAR7 MYLAR8 MYLAR9 MYLAR10 MYLAR11 MYLAR E2P-6920912-G40

Mylar

MYLAR2 60 MYLAR E2P-4312611-G40

PCIE1 Stand off

Spacer Support
H10 E2B-17A1020-RH H_R201D118_PTB E2B-17A1020-A89

06/17 改MXM stand off 料號 E2B-17A1010-L63
06/17 改H10 stand off 料號E2B-17A1020-A89

MXM1 Stand Off

MXM_H2 E2B-17A1010-RH HOLES_R276D185P_PT E2B-17A1010-L63
MXM_H1 E2B-17A1010-RH HOLES_R276D185P_PT E2B-17A1010-L63

CPU Hold

MECH1
CPU_H1 X_HOLES_R276D185P_PT H_NR172D172
CPU_H3 X_HOLES_R276D185P_PT H_NR172D172
CPU_H2 X_HOLES_R276D185P_PT H_NR172D172
CPU_H4 X_HOLES_R276D185P_PT H_NR172D172

Thermal_Songe

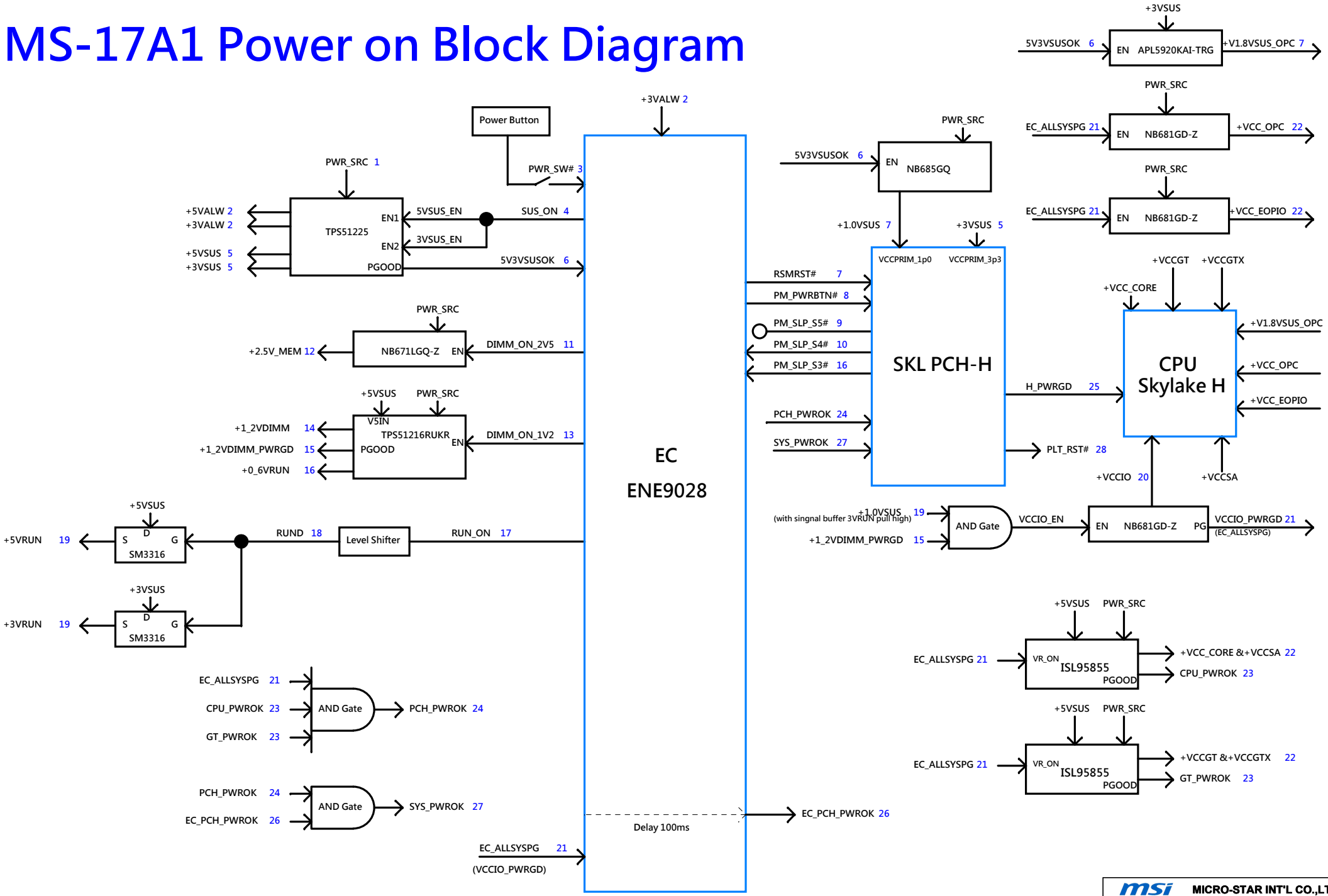
SPONGE1 60
THERMAL_SPONGE1 E2Y-6330511-G40

PCB1
PD0-17A1110-H73

PD0-17A1110-H73 瀚宇博德
PD0-17A1110-T53 健鼎無錫

MICRO-STAR INT'L CO.,LTD.
Title: Screw/ME
Size: Document Number: MS-17A1 Rev: 1.0
Date: Tuesday, June 21, 2016 Sheet 51 of 55

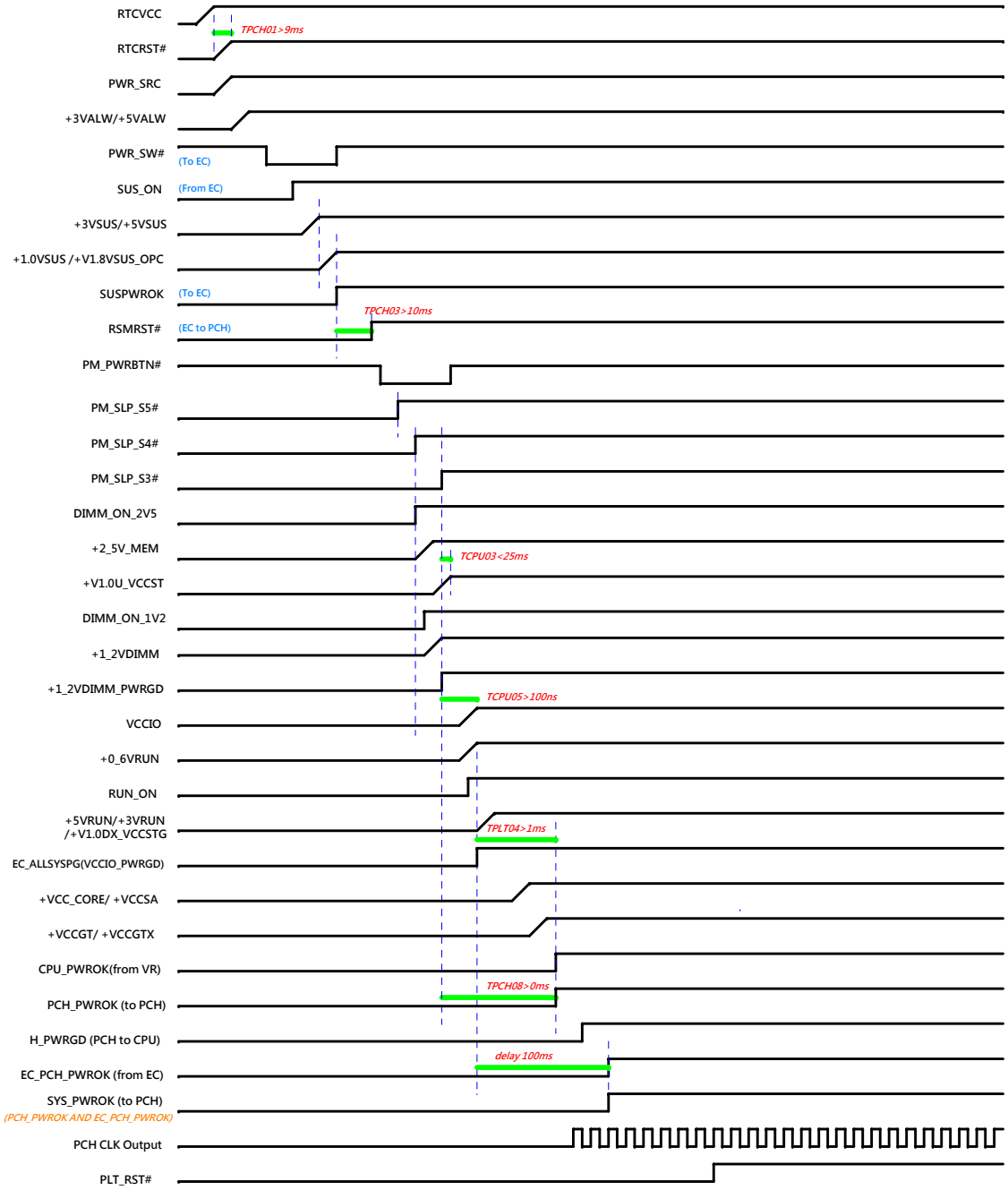
MS-17A1 Power on Block Diagram



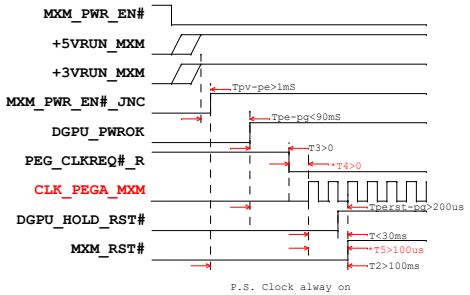
msi MICRO-STAR INT'L CO.,LTD.			
Title: Power on Block Diagram			
Size	Document Number: MS-17A1		Rev: 1.0
Date: Friday, June 17, 2016		Sheet 52 of 55	

Power on Sequence

G3 -> S0

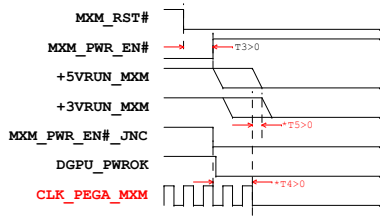


Power-Up Sequence For Optimus On MXM



P.S. Clock alway on

Power-Down Sequence For Optimus On MXM



P.S. Clock alway on

msi MICRO-STAR INT'L CO.,LTD.		
Title: Power on Sequence		
Size	Document Number: MS-17A1	Rev: 1.0
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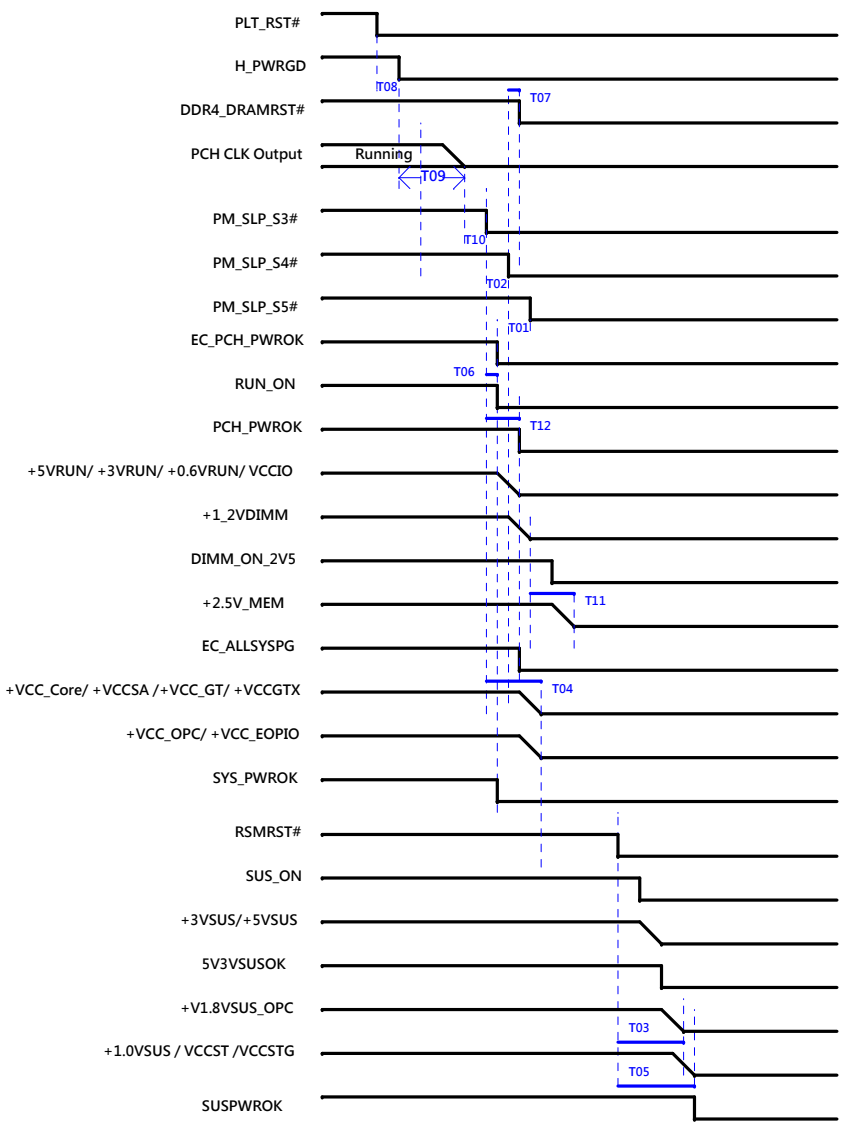
Power down Sequence

S0 -> G3



	MIN	MAX	Units	Description
T01	30		us	SLP_S5# assertion to SLP_S4#
T02	30		us	SLP_S4# assertion to SLP_S3#
T03	1		us	RSMRST# asserting to VccPRIM dropping 5% of nominal value
T04		500	ms	SLP_S3# assertion to VCC, VCCGT, VCCIO and VCCSA rails completely off.
T05	1		us	RSMRST# asserting to VccPRIM dropping 5% of nominal value
T06		1	us	SLP_S3# assertion to VCCIO VR disabled
T07	-100		ns	DDR_RESET# assertion to SLP_S4# assertion
T08	30		us	PLTRST# assertion to PROCPWRGD deassertion
T09	10		us	PROCPWRGD de-assertion to CLKOUT_BCLK turning OFF.
T10	1		us	CLKOUT_BCLK turning OFF to SLP_S3# assertion
T11	30		ms	VDDQ ramped down to VPP ramp down
T12	0		ms	SLP_S3# assertion to PCH_PWROK deassertion

0A

2016/03/04

1.Page14 R710改不上件(部門會議統一決議)
2.Page 35 CONA1主料禁用 ME改上ALV料號 N5A-08F0150-H06
3.Page 36 COND1主料禁用 ME改上ALV料號 N5A-08F0150-H06

2016/03/07

1.Page24 HDD2改不上件(MXM2 高度問題)

0B

2016/03/25

Page 36 新增Mosfet for NLock 無法Hi Z

2016/03/30

1.Page44 修改PR30 from 19.1K to 20K for 電壓降finetune
2.Page43 修改PR153 from 33.2K to 34K for 電壓降finetune
3.Page34 修改RX48/RX49 stuff,for vendor建議

2016/03/31

1.Page23 C1017~1020 修改容值form 0.22uF to0.47uF
1.Page22 R817改10KR for Intel建議

2016/04/01

1.Page45 修改PR613 from 2.43K to 2.32kohm
2.Page45 修改PC199 from 1000p to 820p
3.Page45 修改PR605 from 1.4K to 4.7K
4.Page45 修改PR622 from 2.94K to 2.74K
5.Page45 修改PR661 from 1K to 5.49K
6.Page45 PC231改上件
7.Page45 修改PC232 form 0.22uF to 0.1uF
8.Page45 修改PR671 form 86.6K to 84.5K
9.Page45 修改PC207 form 1200p to 1000p

2016/04/07

1.Page27 R498 改5.6K for Woofer fintune

2016/04/08

1.Page26 R503 改0R for Audio 量測強度

2016/04/11

1.Page15 RX44 改1KR for swirch 內部並聯
2.Page18 RX42 改1KR
3.Page42 ADD 5VRUN to 5VRUN 3 for 第三組FAN使用
4.Page15 修改Soket為BIOS ROM 上件

2016/04/12

1.Page14 新增 PM_CLKRUN# pull Hi 10K
2.Page14 R461改接PM_CLKRUN# 不上件
3.Page37 刪除B小板 LED一組
4.Page51 刪除MH7
5.Page 13預留 PIRQA# pu hi 10KR

2016/04/12

1.Page15 刪除RX54.RX55
2.Page15 EARPHONE_JD線新增連到PCH
3.Page13 新增R679 PIRQA# pull hi

2016/04/14

1.Page43 Power 新增PR6,PR7,PR8
2.Page49 Power 新增PR,PR2,PR3
3.Page13 新增R679 PIRQA# pull hi

2016/04/18

1.Page42 PR119修改阻值form 27KR to 21.5KR
2.Page45 PC231改0.1uF
2.Page51 新增8顆光學點
4.Page40 RF38 改499R
4.Page39 RE38 改499R

2016/04/19

1.Page37 EMI Jack board上醋酸膠帶改鋁箔

2016/04/21
1.Page 39 For EMI CE14改上33p (Audio precision 量測OK)
2.Page 37 新增Safety醋酸膠布

1.0

2016/05/02

Page 42 PQ25改料號 D03-5018S00-F01

2016/05/11

Page 25 EMI request R866 從0R改Bead
Page 25 EMI request L34-L38從Bead改0R

2016/05/18

Page 21 add NMOSFET for Caps LED微亮問題

2016/05/25

Page 26 修改C569/C570 capacitor value to 22uF for audio precision issue

2016/05/30

Page 39 耳機自動阻抗偵測IC與週邊元件改不上(ESS)
Page 40 耳機自動阻抗偵測IC與週邊元件改不上件(Savi-tech)
Page 43 新增DDR OC自動調電壓

2016/06/01

Page 19 GC6_FB_EN1_EC 接到MXM PWROK pin

2016/06/13

Page 51改光學點FM55~FM62 footprint form F_PAD_NB to F_PAD_NB_2
Page 50新增CI98/CI99/CI108 三顆電容上件for EMI request

2016/06/17

Page 39 for EMI request CE25/RE32/RE34/RE35 stuff 0.1uF
Page 41 修改power connetor 料號 to N56-04M0031-S56

2016/06/17

page 51 ME更改MYLAR PN to E2P-6920912-G40
page 19 R602/R603/R604 for GC6 stuff
page 20 RX17/RX18 for GC6 stuff

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