TITLE	Page
Cover Sheet	1
Block Diagram	2
CPU-CLK/Control/MISC/PEG/Memory	3,4 5,6 7
CPU-Power,CPU-GND	8,9
DDRIV X8	10,11,12,13,14,15
PCH-LPC/HDA/RTC/MISC/SPI	16
PCH-DMI/PCIE/USB/SATA	17
PCH-CLK/GPIO	18
PCH-POWER/GND	19,20
PCH Strap	21
Dual BIOS	22
PCIESLOT	23,24,25
SIO-NTC6779D/PS2	26
FAN CONTROLLOR-1	27,28
CLK GEN4105	29
ALC892/887	30
LAN RTL8111G/8106E	31
USB3.0-VL805	32,33
SATA Connector	34
Rear/Front USB2.0/USB3 Connector	35,36
ACPI Controller UPI	37
CPU Power-ISL6388	38
CPU Power -ISL6611	39
CPU Power -MOS	40,41
DDR Power	42,43,44
PCH Power	45,46
ATX F_Panel/EMI/TPM	47
XDP / Manual Parts	48

MS-7883

ATX

Ver: 11

Haswell-E Platform

CPU:

Haswell-E

System Chipset:

Wellsburg

Onboard Chip:

HD Audio Codec: ALC1150

LAN-Killer LAN
LAN-Killer LAN

SIO:NTC6792D

Dual Flash ROM: SPI 64 MB X2

Main Memory:

*DDRIV (1666MHz) * 8 (Dual Channel)*

ACPI:

ISL6388

PWM:

VRD12.5 -ISL6388

Expansion Slots:

PCI Express (X16) Slot1
PCI Express (X8) Slot2
PCI Express (X16) Slot3
PCI Express (X16) Slot4
PCI Express (X8) Slot5

Other:

*SATA3.0 *8*
*USB2.0 *8*
*USB3.1 *1*
*REAL USB3.0 *6*
*FRONT USB2.0 *4*
*FRONT USB3.0 *4*

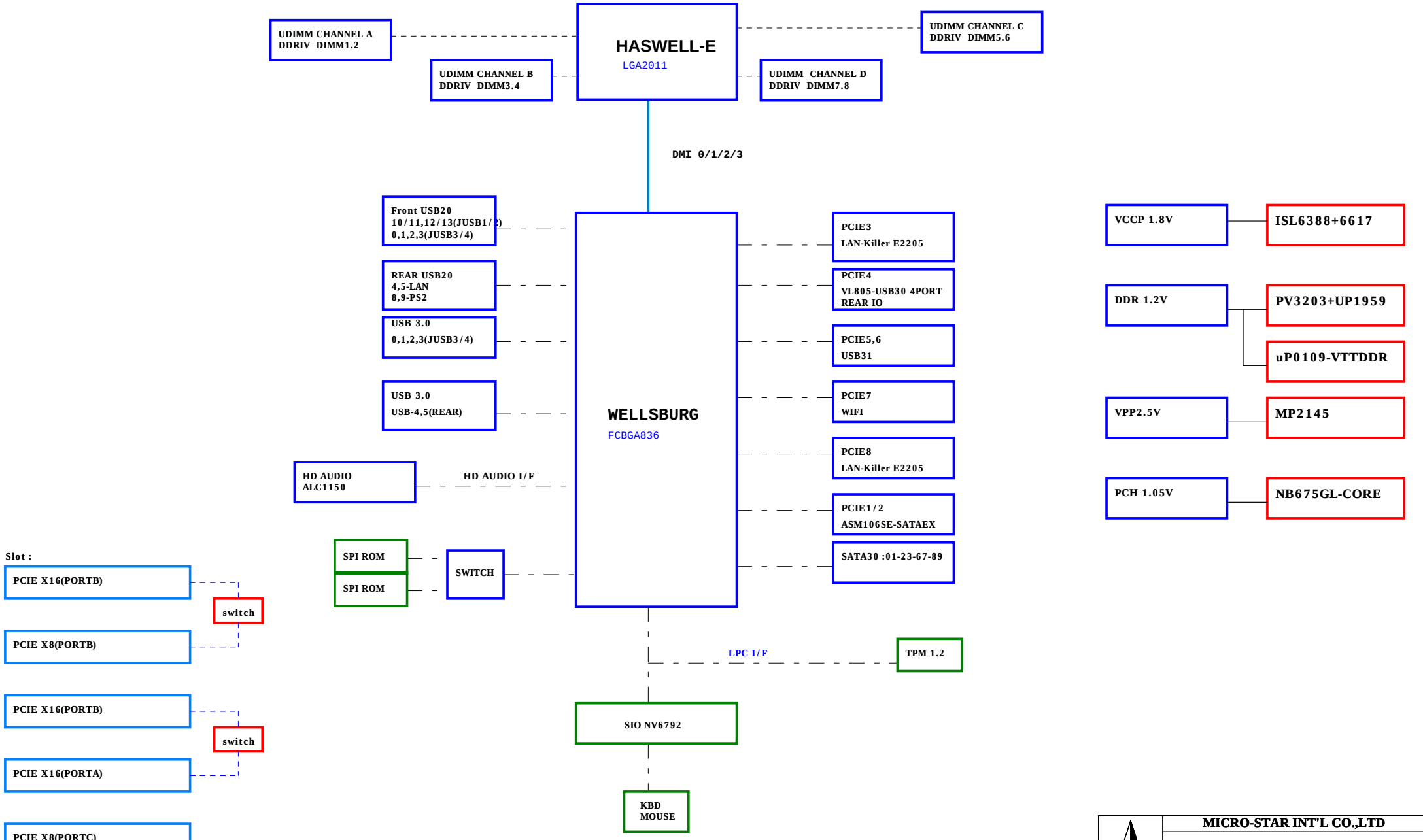
MICRO-STAR INT'L CO.,LTD

MS-7883

Size	Document Description	Rev
Custom	Cover Sheet	1.1

Date: Thursday, June 04, 2015 Sheet 1 of 74

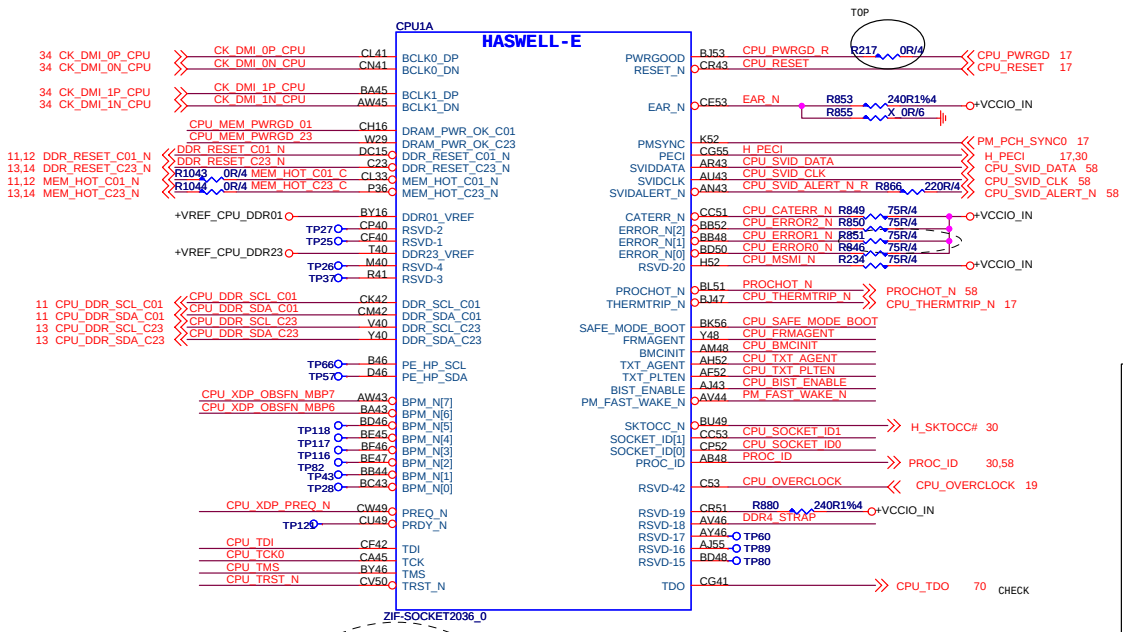
MS-7882 Block Diagram

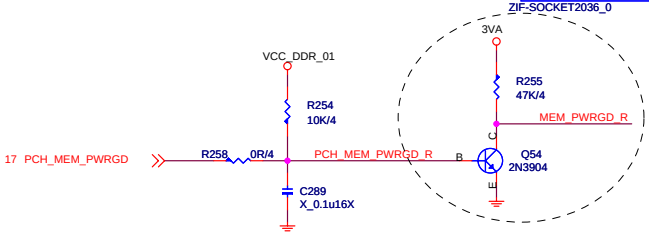


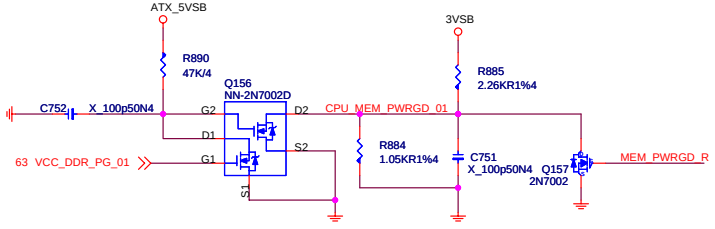
MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: Block Diagram	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 2 of 74	

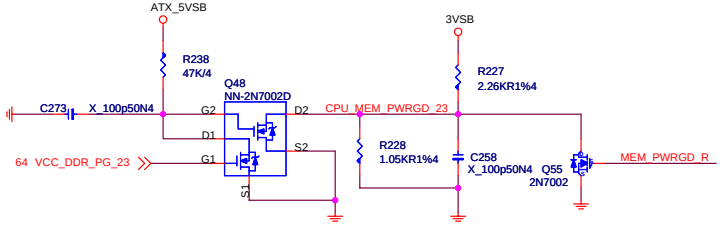
CPU-CLK/Control/MISC

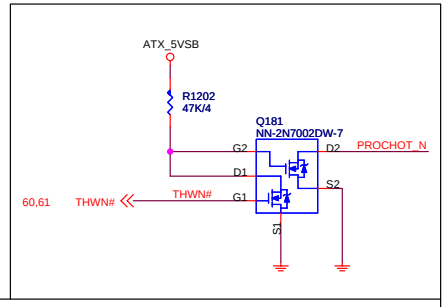
OR:R278 REMOVED



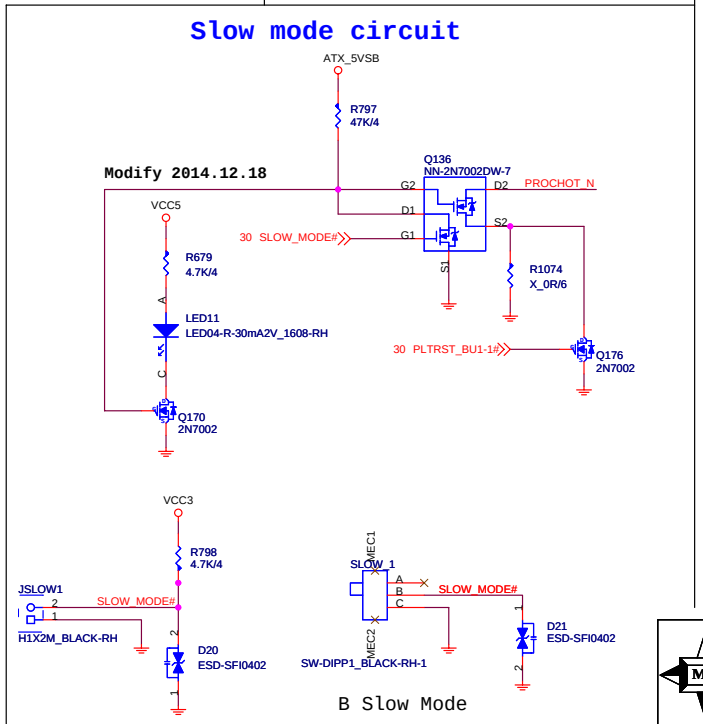


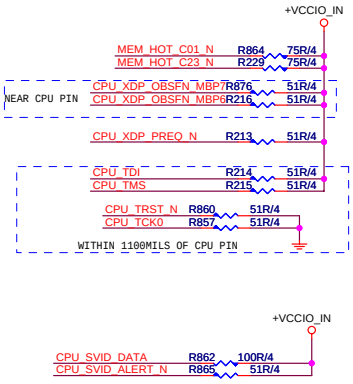


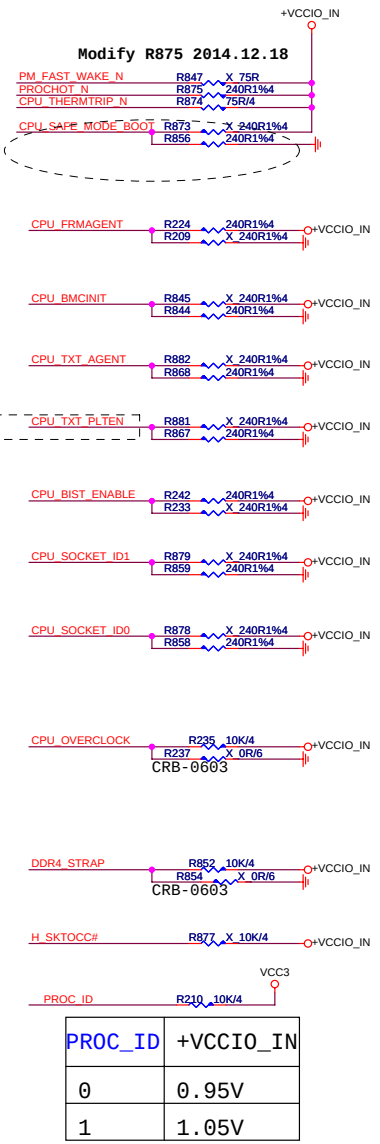




Slow mode circuit







PROC_ID	+VCCIO_IN
0	0.95V
1	1.05V

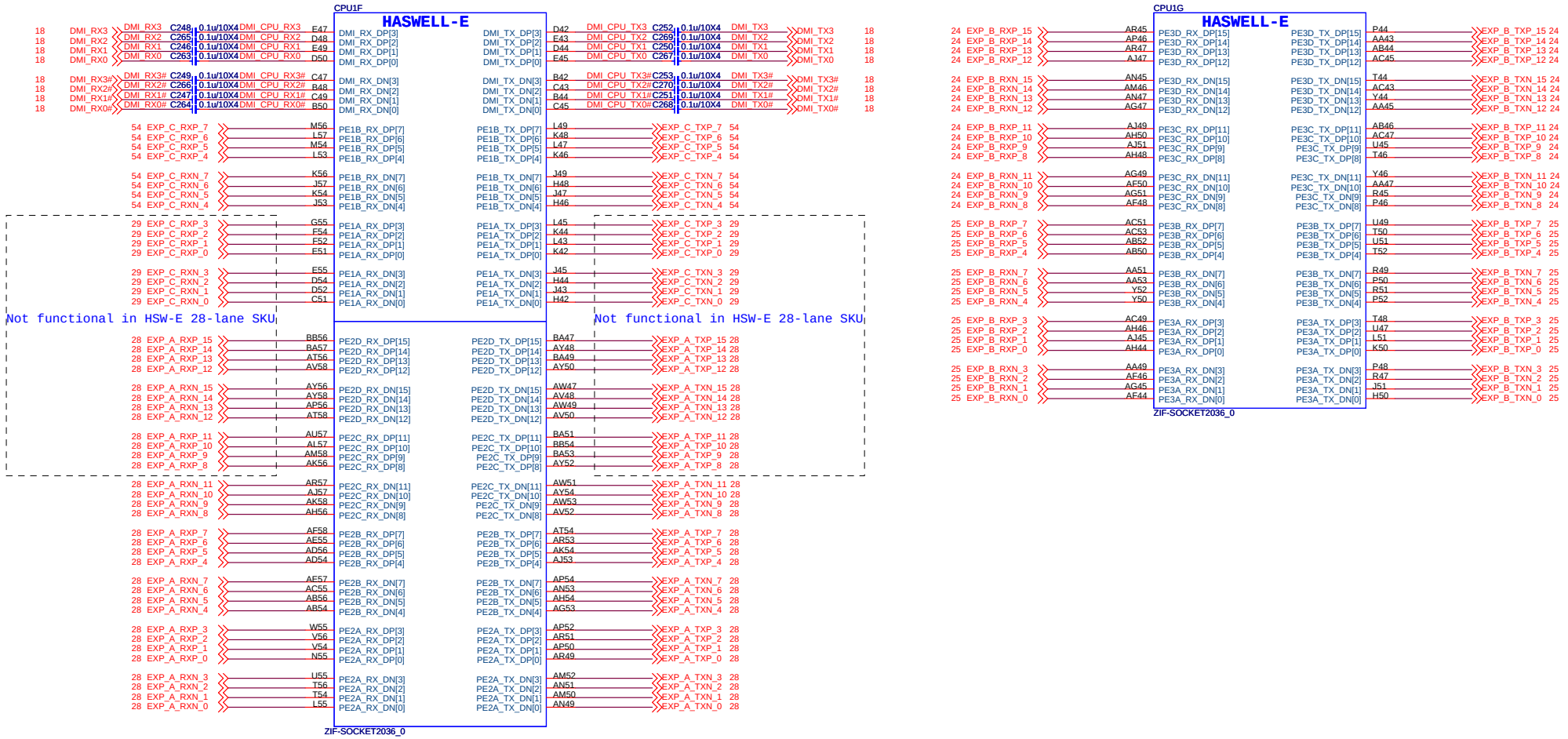
MICRO-STAR INT'L CO.,LTD

MS-7883

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

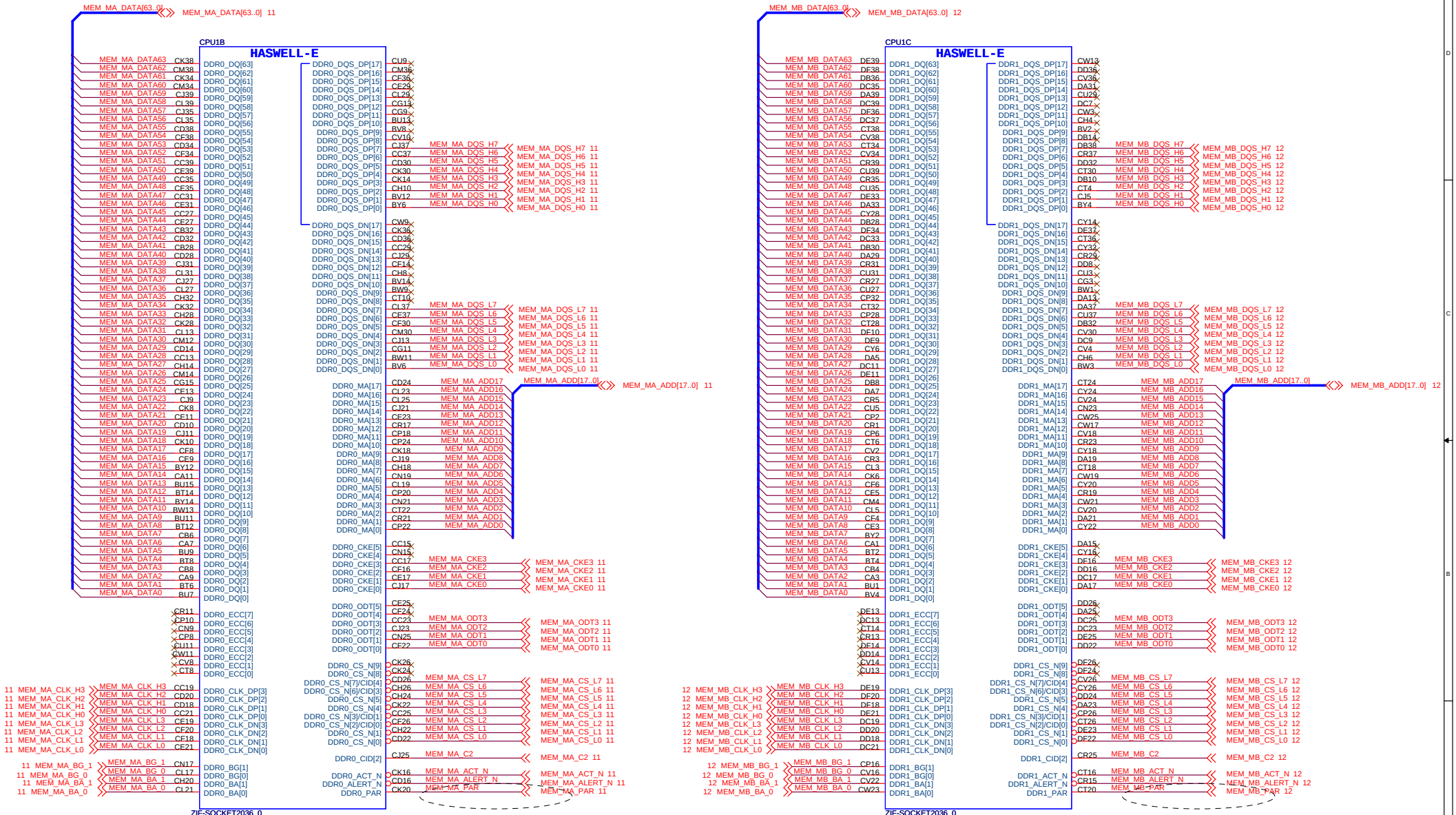
Date: Thursday, June 04, 2015 | Sheet 3 of 74

CPU-DMI/PEG



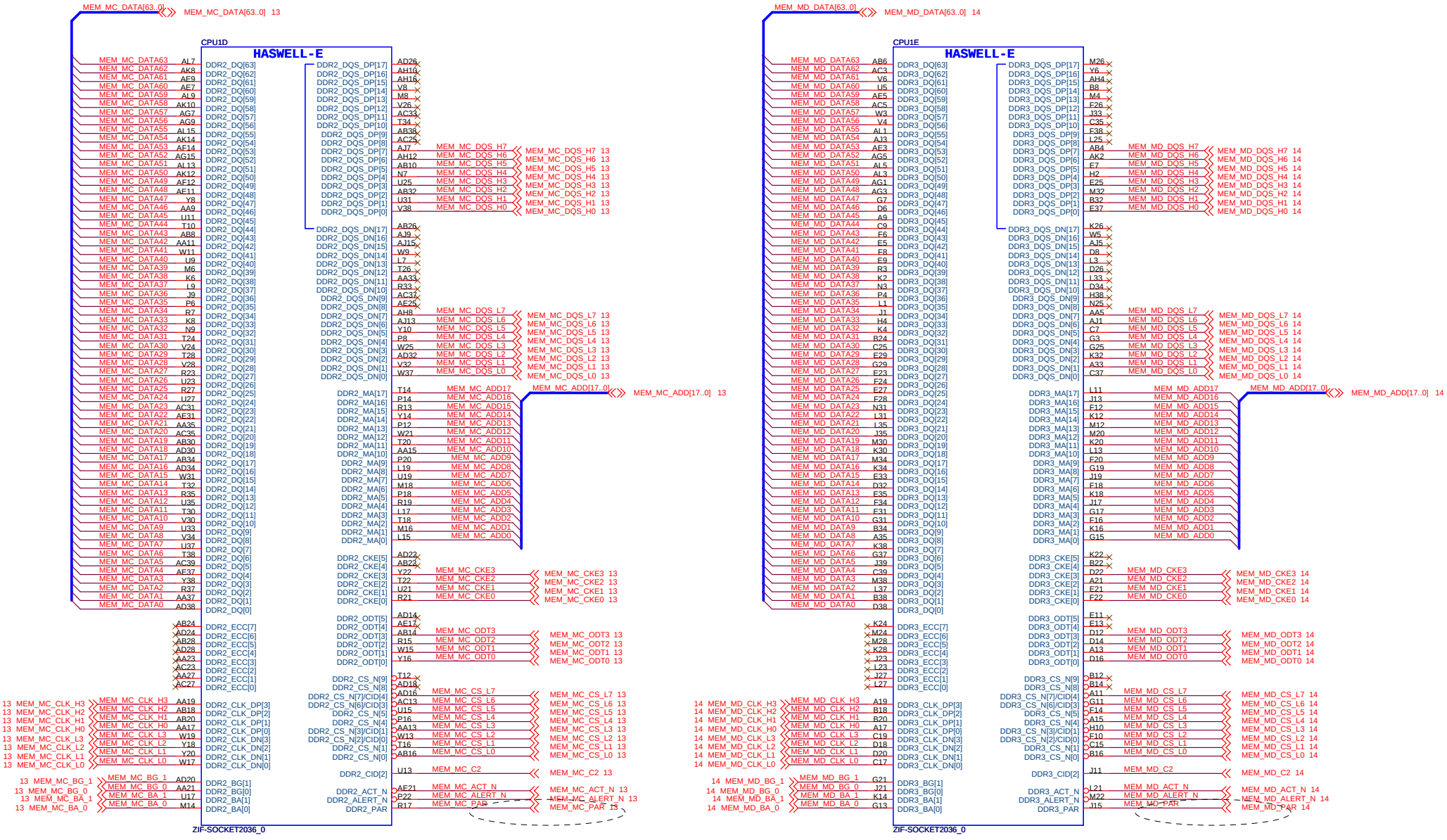
MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: CPU-DMI/PEG	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 4 of 74	

CPU-Memory0/1



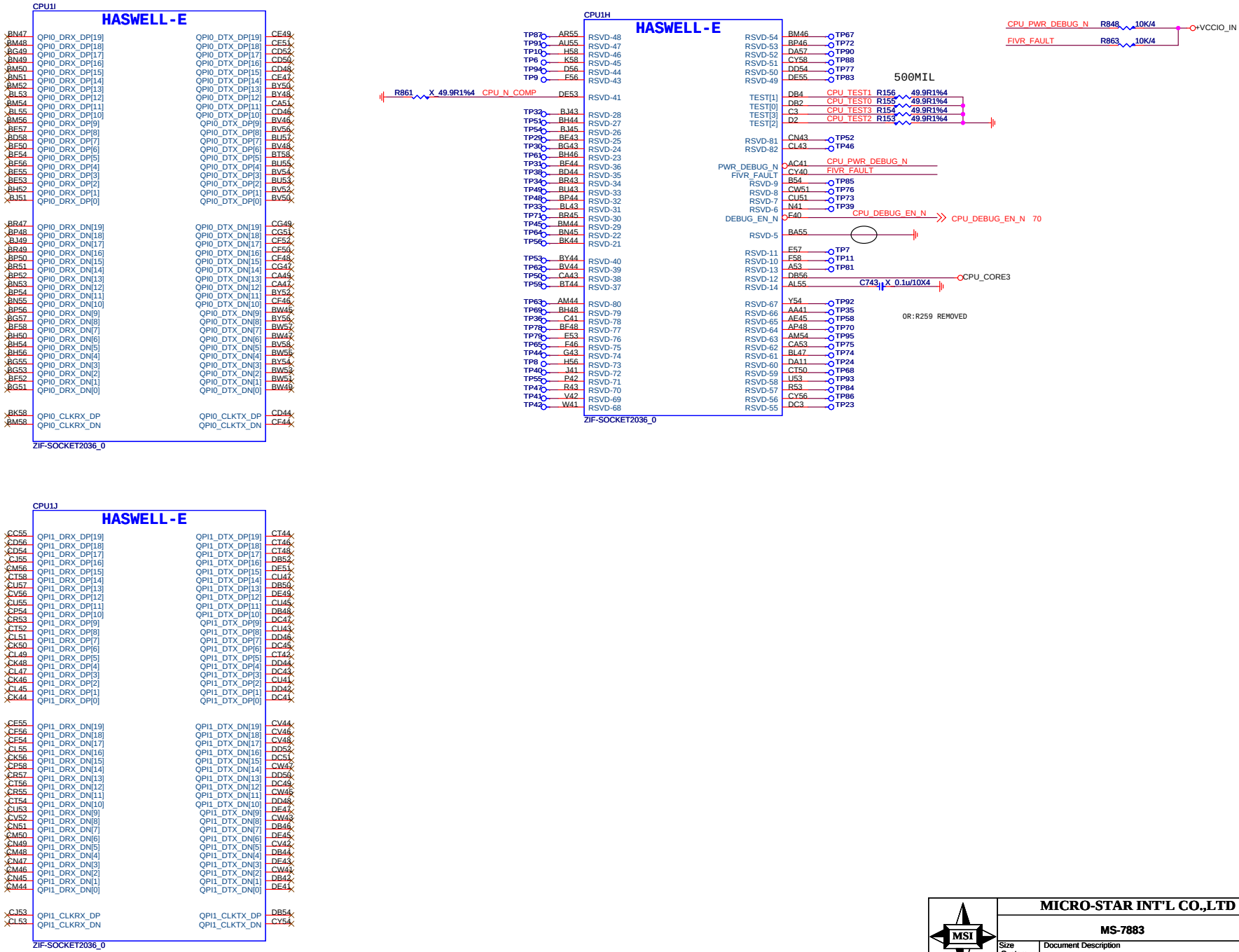
MICRO-STAR INT'L CO.,LTD	
MS-7883	
Size: Custom	Document Description: CPU-Memory0/1
Rev: 1.1	
Date: Thursday, June 04, 2015	Sheet 5 of 74

CPU-Memory2/3



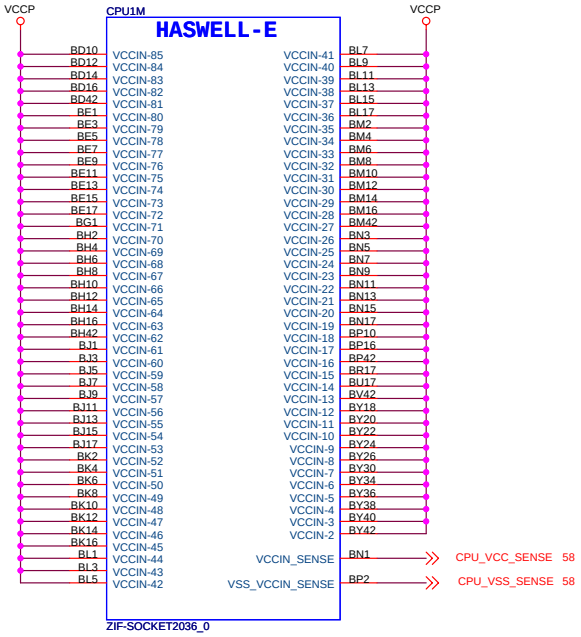
MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: CPU-Memory2/3	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 6 of 74	

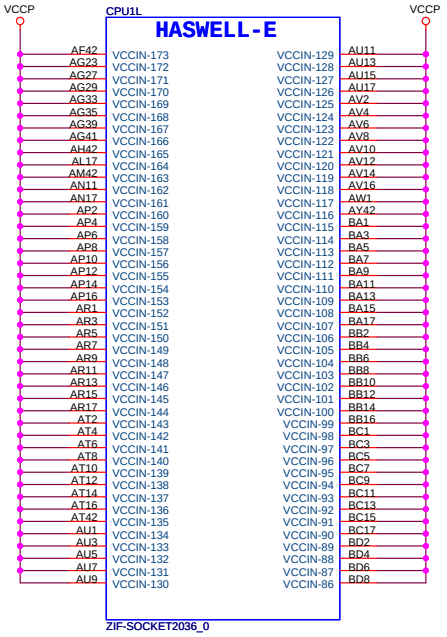
CPU-QPI/RESERVE

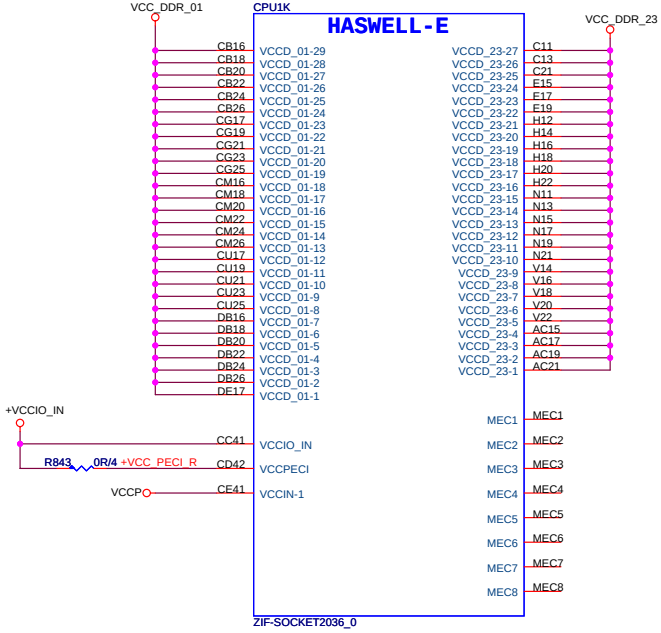


MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: CPU-QPI/RESERVE	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 7 of 74	

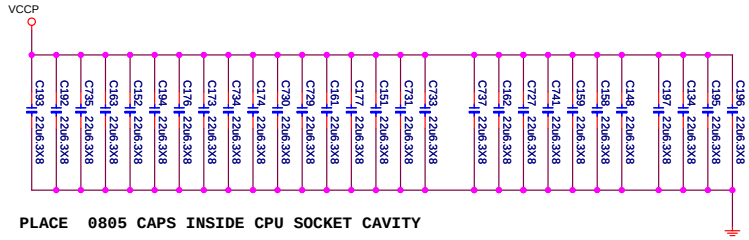
CPU-Power



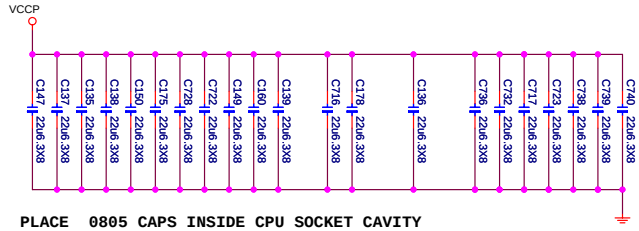




+CPU_VCCP-Decoupling



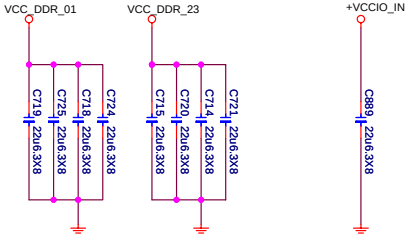
PLACE 0805 CAPS INSIDE CPU SOCKET CAVITY



PLACE 0805 CAPS INSIDE CPU SOCKET CAVITY

Skt cavity caps, place: 28 on top side & 26 on back side.

+CPU_DDR-Decoupling



PLACE 0805 CAPS INSIDE CPU SOCKET CAVITY

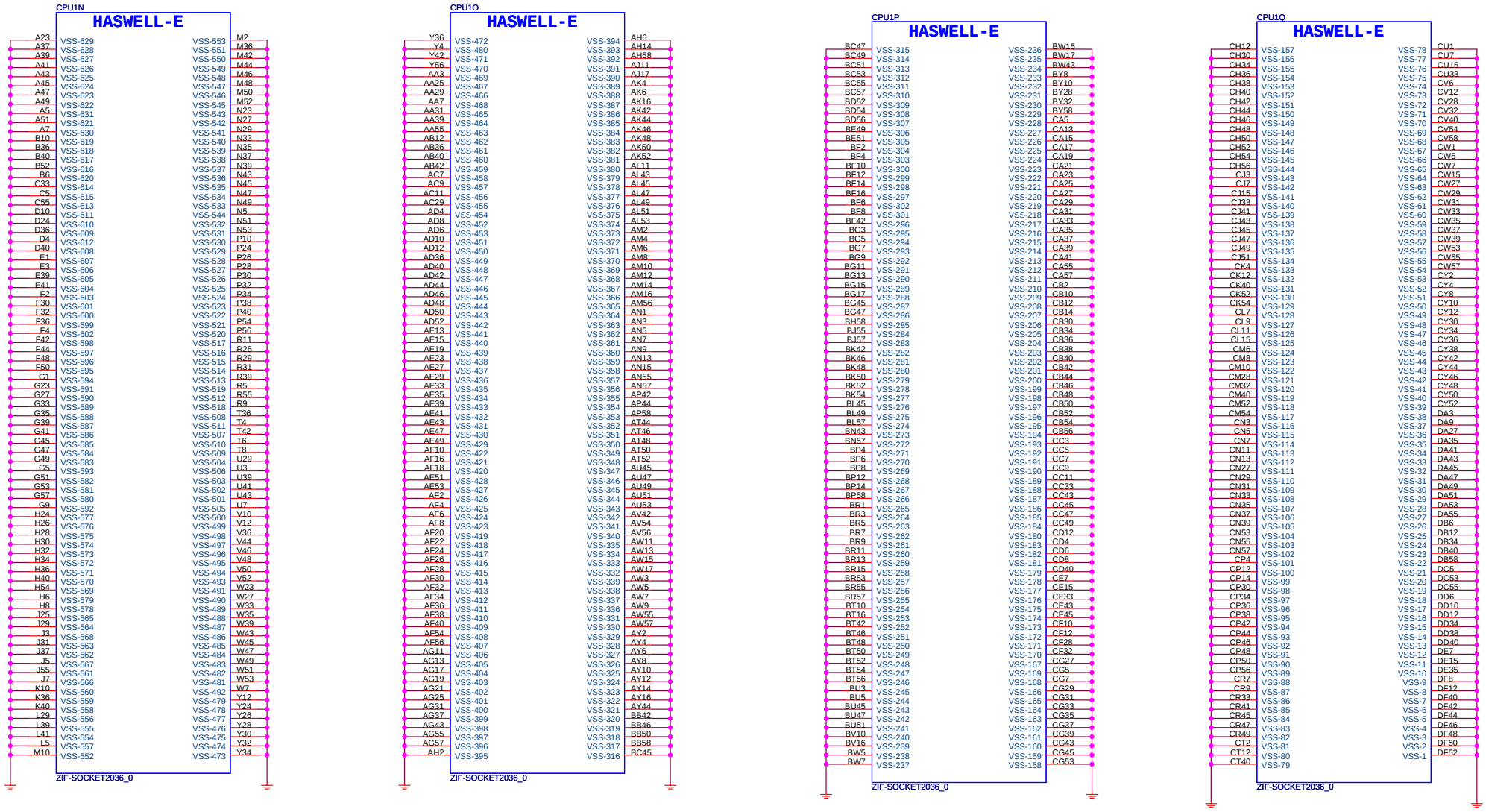
MICRO-STAR INT'L CO.,LTD

MS-7883

Size	Document Description	Rev
Custom	CPU-Power	1.1

Date: Thursday, June 04, 2015 Sheet 8 of 74

CPU-GND

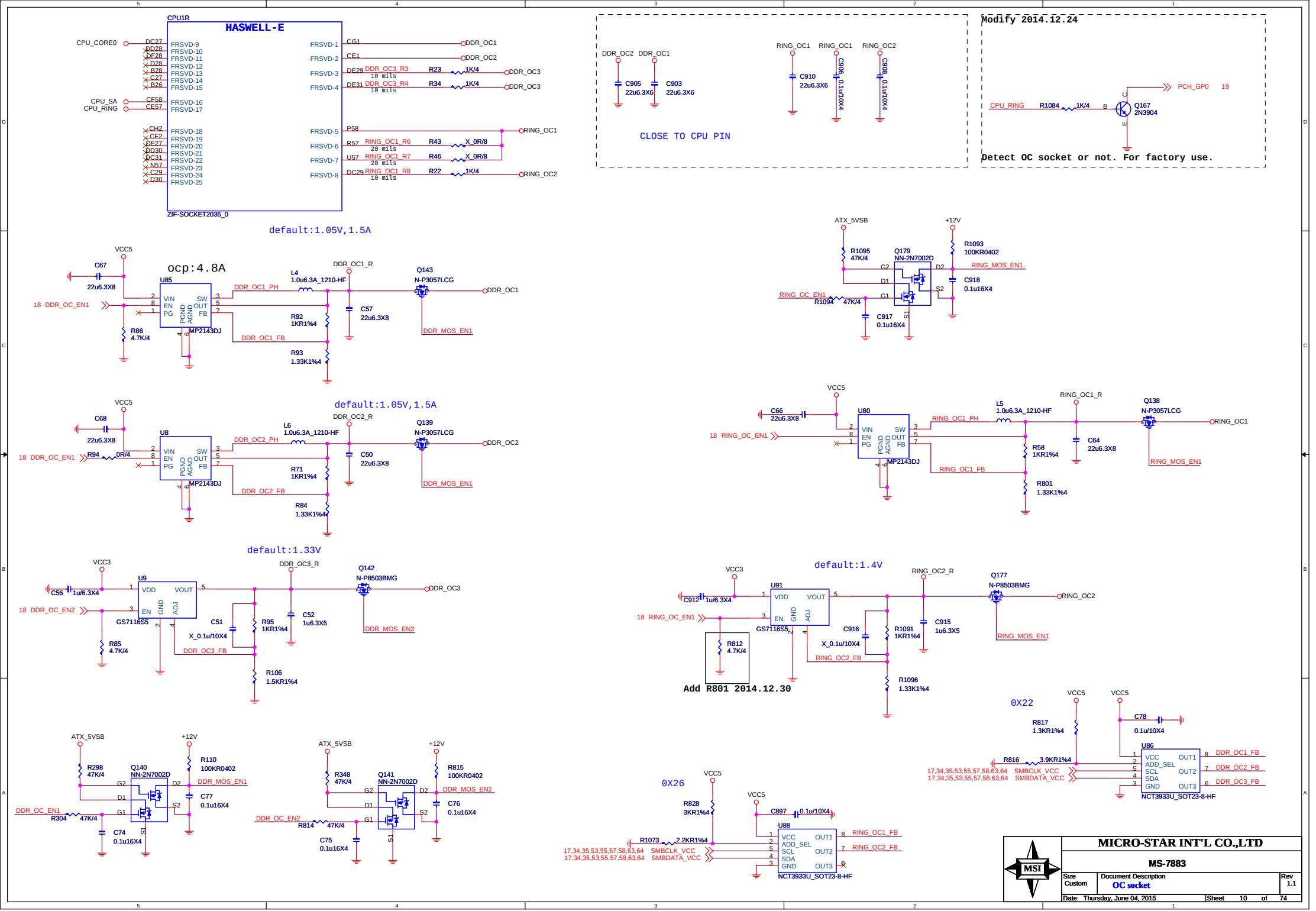


MICRO-STAR INT'L CO.,LTD

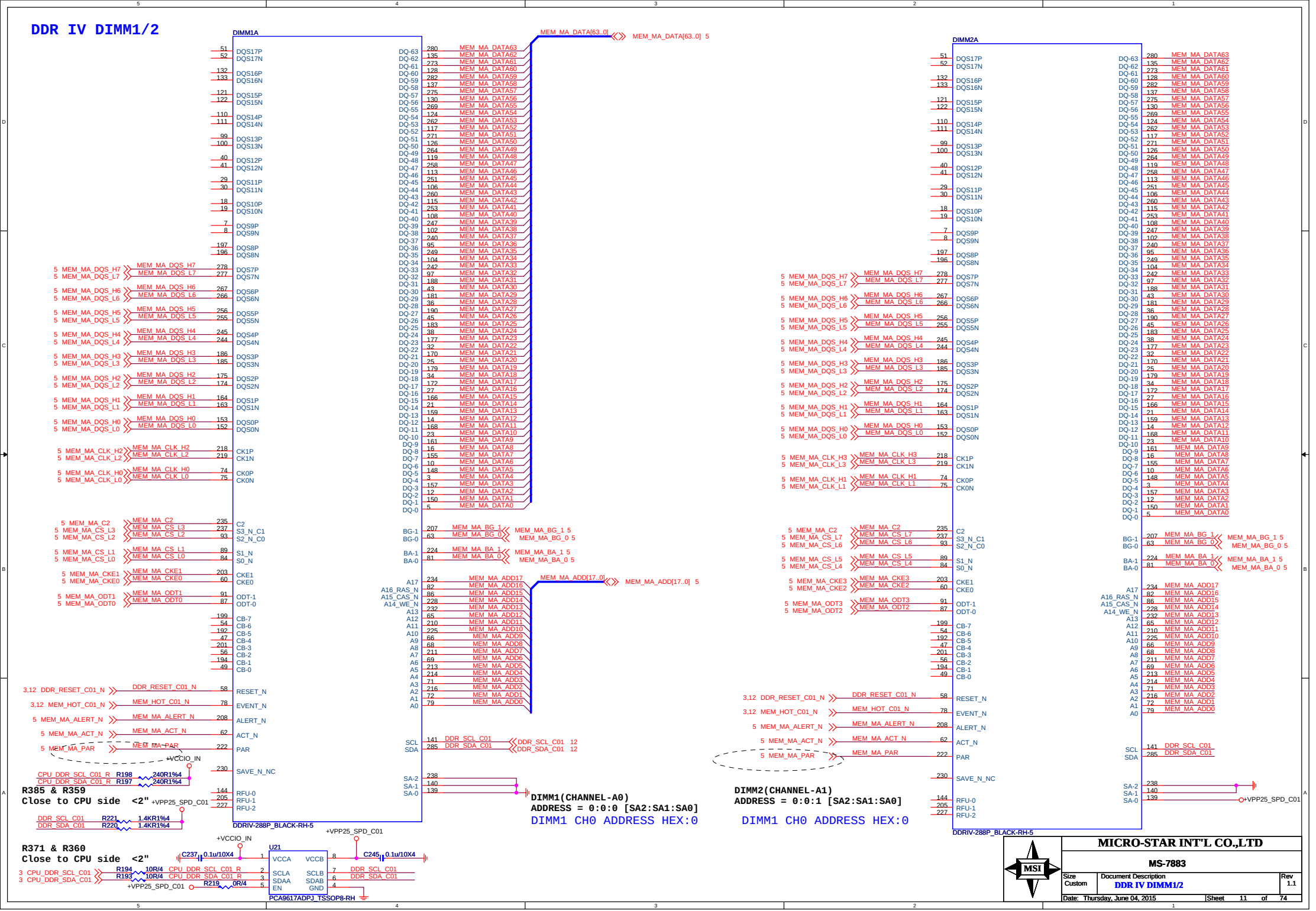
MS-7883

Size	Document Description	Rev
Custom	CPU-GND	1.1

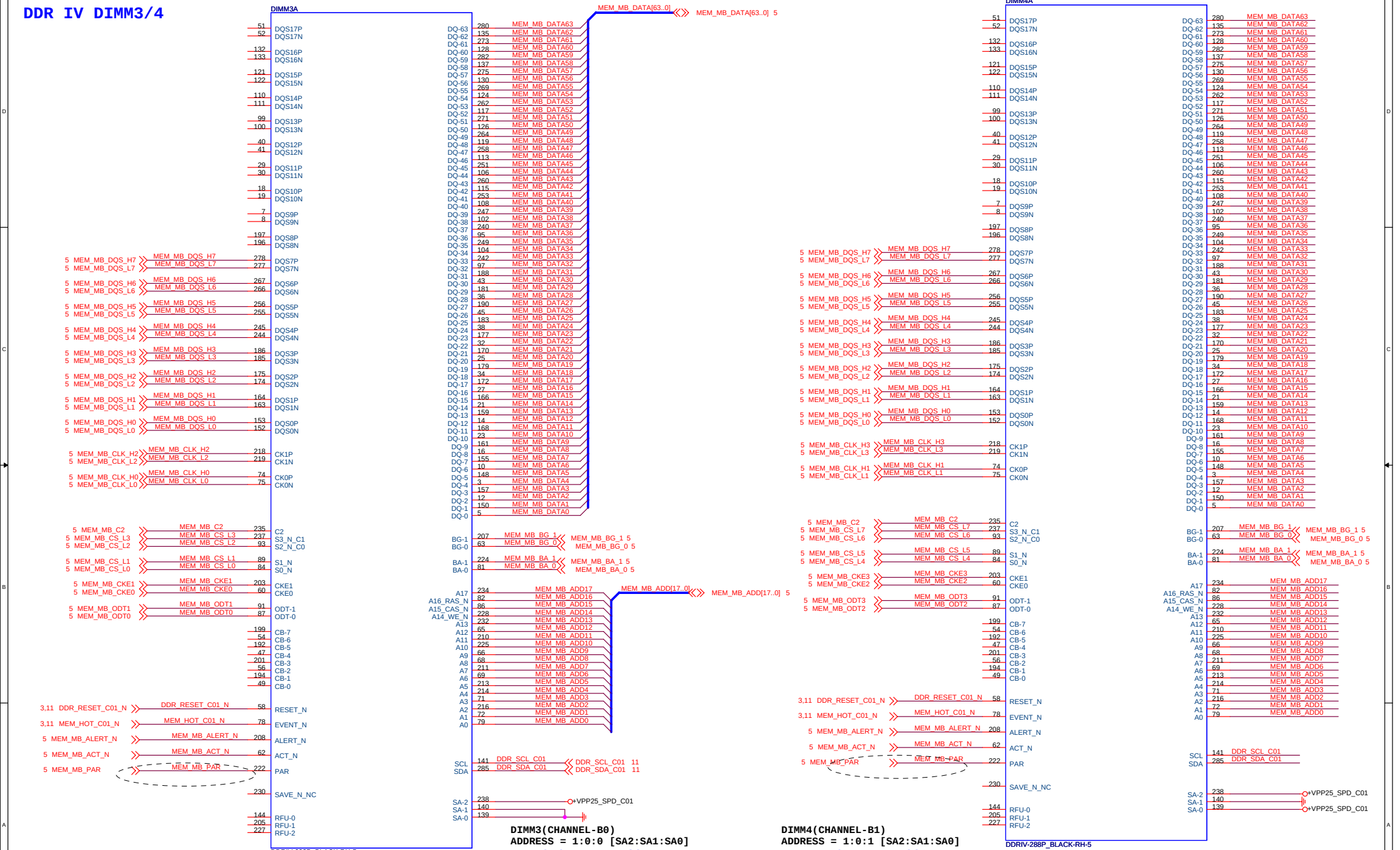
Date: Thursday, June 04, 2015 Sheet 9 of 74


CPU1R
HASWELL-E
CPU_CORE0
FRSVD-9
FRSVD-10
FRSVD-11
FRSVD-12
FRSVD-13
FRSVD-14
FRSVD-15
CPU_SA
CPU_RING
FRSVD-16
FRSVD-17
FRSVD-18
FRSVD-19
FRSVD-20
FRSVD-21
FRSVD-22
FRSVD-23
FRSVD-24
FRSVD-25
FRSVD-1
FRSVD-2
FRSVD-3
FRSVD-4
FRSVD-5
FRSVD-6
FRSVD-7
FRSVD-8
DDR_OC1
DDR_OC2
DDR_OC3
DDR_OC3_R3
DDR_OC3_R4
R23 1K/4
R34 1K/4
RING_OC1
RING_OC2
RING_OC1_R6
RING_OC1_R7
RING_OC1_R8
R43 X_0R/8
R46 X_0R/8
R22 1K/4
10 mils
20 mils
ZIF-SOCKET2036_0
DDR_OC2 DDR_OC1
C905 22u6.3X6
C903 22u6.3X6
RING_OC1 RING_OC1 RING_OC2
C910 22u6.3X6
C906 0.1u/10X4
C908 0.1u/10X4
CLOSE TO CPU PIN
Modify 2014.12.24
CPU_RING R1084 1K/4
Q167 2N3904
PCH_GP0 19
Detect OC socket or not. For factory use.
default:1.05V,1.5A
ocp:4.8A
VCC5
C67 22u6.3X8
U85
VIN EN PG SW OUT FB PGND AGND
MP2143DJ
18 DDR_OC_EN1
R86 4.7K/4
L4 1.0u6.3A_1210-HF
DDR_OC1_PH
DDR_OC1_R
R92 1KR1%4
R93 1.33K1%4
DDR_OC1_FB
C57 22u6.3X8
Q143 N-P3057LCG
DDR_MOS_EN1
DDR_OC1
default:1.05V,1.5A
VCC5
C68 22u6.3X8
U8
18 DDR_OC_EN1
R94 0R/4
MP2143DJ
L6 1.0u6.3A_1210-HF
DDR_OC2_PH
DDR_OC2_R
R71 1KR1%4
R84 1.33K1%4
DDR_OC2_FB
C50 22u6.3X8
Q139 N-P3057LCG
DDR_MOS_EN1
DDR_OC2
default:1.33V
VCC3
C56 1u/6.3X4
U9
VDD VOUT EN GND ADJ
GS7116S5
18 DDR_OC_EN2
R85 4.7K/4
C51 X_0.1u/10X4
R95 1KR1%4
R106 1.5KR1%4
DDR_OC3_FB
DDR_OC3_R
C52 1u6.3X5
Q142 N-P8503BMG
DDR_MOS_EN2
DDR_OC3
ATX_5VSB
+12V
R298 47K/4
Q140 NN-2N7002D
R110 100KR0402
DDR_MOS_EN1
C77 0.1u16X4
DDR_OC_EN1
R304 47K/4
C74 0.1u16X4
R348 47K/4
Q141 NN-2N7002D
R815 100KR0402
DDR_MOS_EN2
C76 0.1u16X4
DDR_OC_EN2
R814 47K/4
C75 0.1u16X4
ATX_5VSB
+12V
R1095 47K/4
Q179 NN-2N7002D
R1093 100KR0402
RING_MOS_EN1
C918 0.1u16X4
RING_OC_EN1
R1094 47K/4
C917 0.1u16X4
VCC5
C66 22u6.3X8
U80
18 RING_OC_EN1
MP2143DJ
L5 1.0u6.3A_1210-HF
RING_OC1_PH
RING_OC1_R
R58 1KR1%4
R801 1.33K1%4
RING_OC1_FB
C64 22u6.3X8
Q138 N-P3057LCG
RING_MOS_EN1
RING_OC1
default:1.4V
VCC3
C912 1u/6.3X4
U91
VDD VOUT EN GND ADJ
GS7116S5
18 RING_OC_EN1
R812 4.7K/4
Add R801 2014.12.30
C916 X_0.1u/10X4
R1091 1KR1%4
R1096 1.33K1%4
RING_OC2_FB
RING_OC2_R
C915 1u6.3X5
Q177 N-P8503BMG
RING_MOS_EN1
RING_OC2
0X26
VCC5
R828 3K1%4
C897 0.1u/10X4
U88
VCC ADD_SEL SCL SDA GND OUT1 OUT2 OUT3
NCT3933U_SOT23-8-HF
R1073 2.2KR1%4
17,34,35,53,55,57,58,63,64 SMBCLK_VCC
17,34,35,53,55,57,58,63,64 SMBDATA_VCC
RING_OC1_FB
RING_OC2_FB
0X22
R817 1.3KR1%4
R816 3.9KR1%4
C78 0.1u/10X4
U86
DDR_OC1_FB
DDR_OC2_FB
DDR_OC3_FB
MICRO-STAR INT'L CO.,LTD
MS-7883
Size Custom
Document Description
OC socket
Rev 1.1
Date: Thursday, June 04, 2015
Sheet 10 of 74

DDR IV DIMM1/2

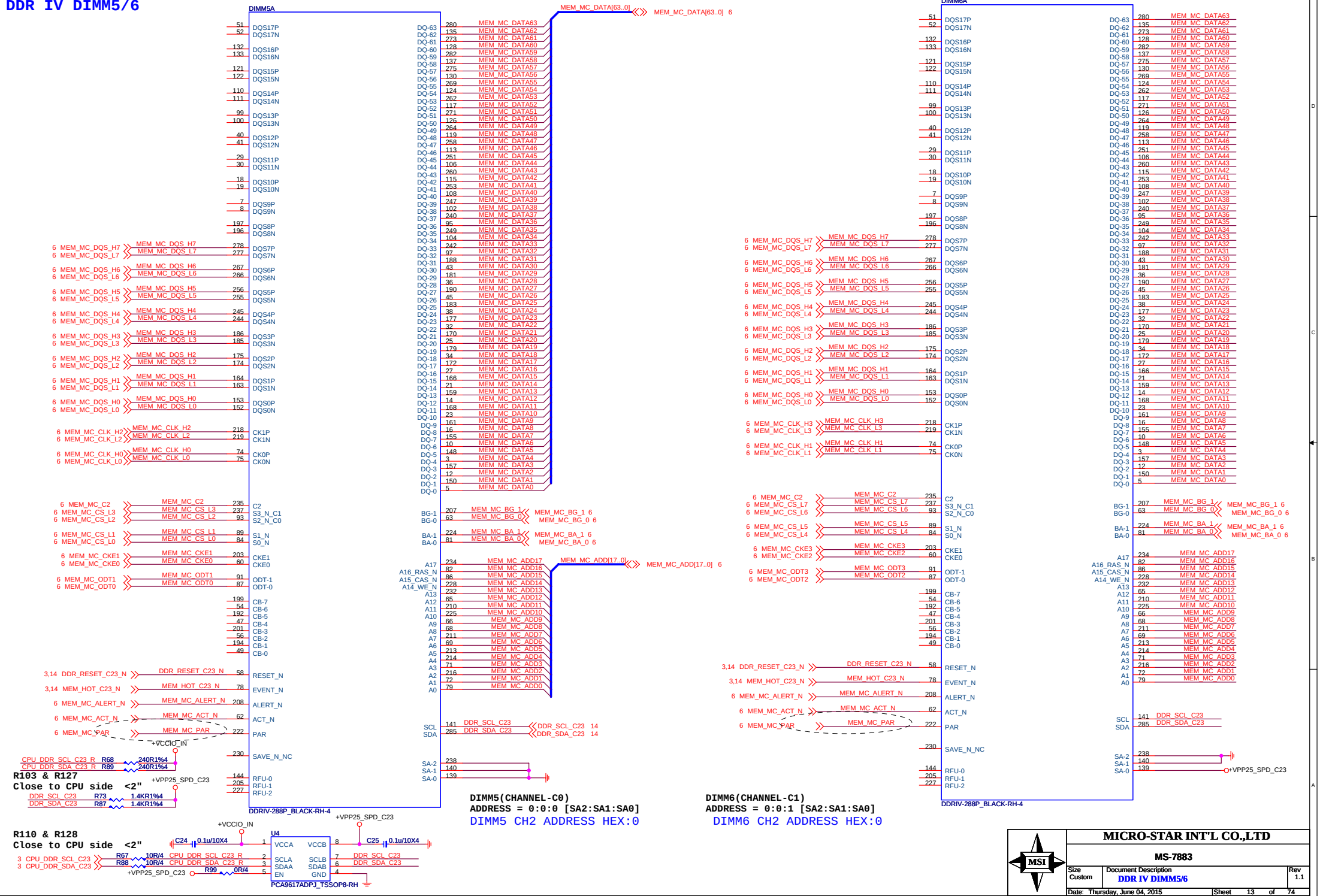


DDR IV DIMM3/4

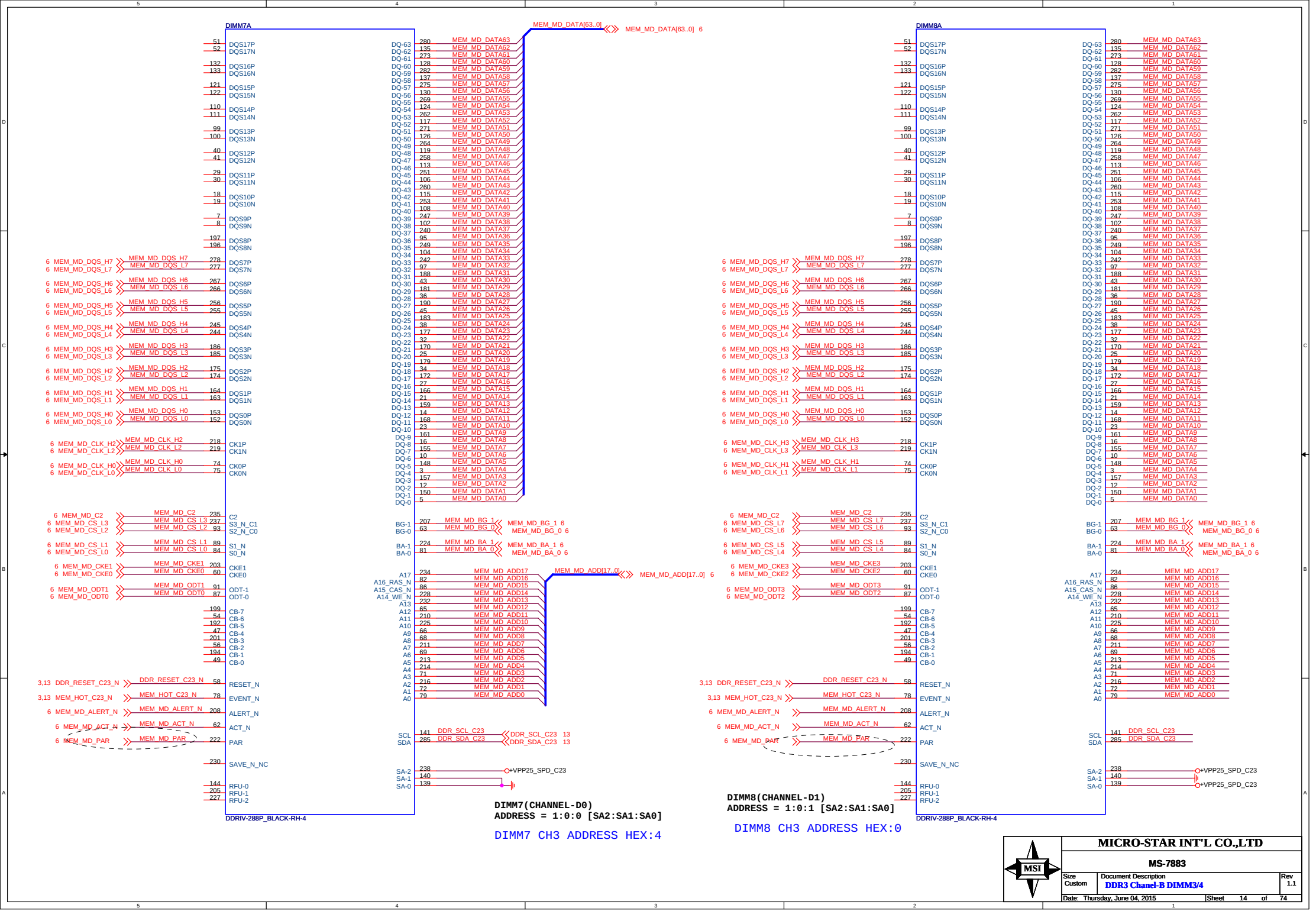


MICRO-STAR INT'L CO.,LTD	
MS-7883	
Size: Custom	Document Description: DDR IV DIMM3/4
Rev: 1.1	
Date: Thursday, June 04, 2015	Sheet 12 of 74

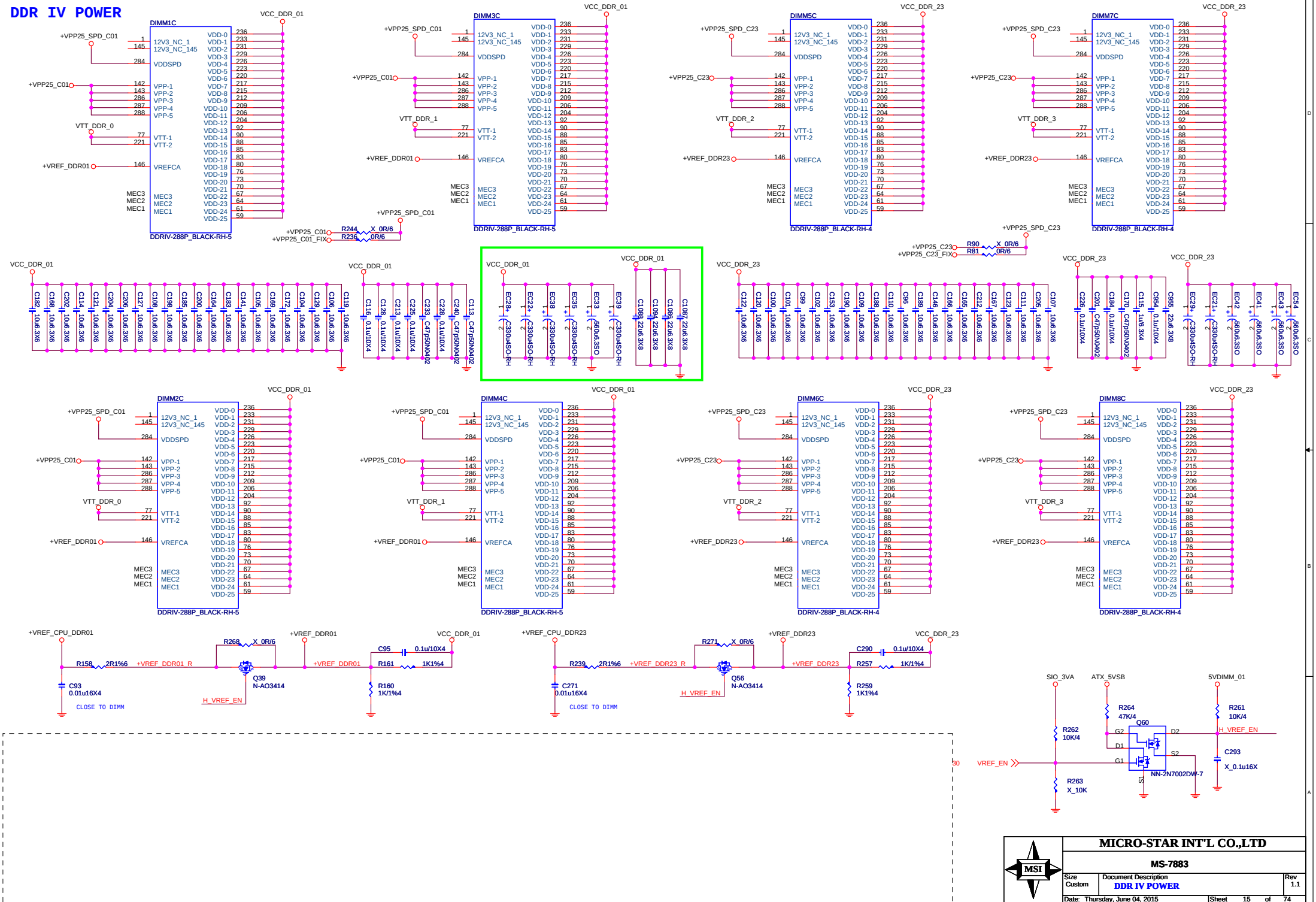
DDR IV DIMM5/6



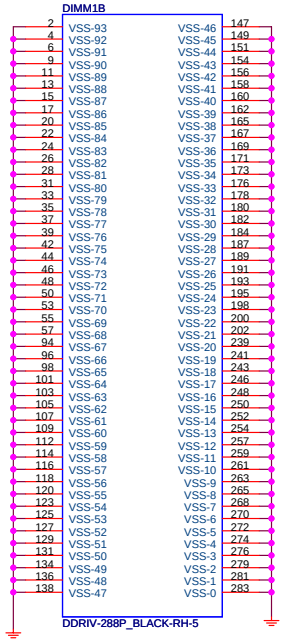
MICRO-STAR INT'L CO.,LTD	
MS-7883	
Size: Custom	Document Description: DDR IV DIMM5/6
Rev: 1.1	
Date: Thursday, June 04, 2015	Sheet 13 of 74

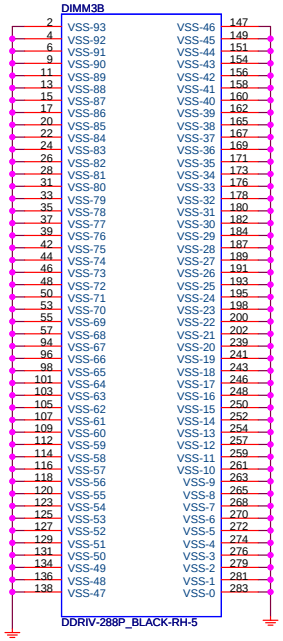

DIMM7A
DIMM8A
MEM_MD_DATA[63..0]
MEM_MD_DATA[63..0] 6
MEM_MD_ADD[17..0]
MEM_MD_ADD[17..0] 6
DDRIV-288P_BLACK-RH-4
DDRIV-288P_BLACK-RH-4
DIMM7(CHANNEL-D0)
ADDRESS = 1:0:0 [SA2:SA1:SA0]
DIMM7 CH3 ADDRESS HEX:4
DIMM8(CHANNEL-D1)
ADDRESS = 1:0:1 [SA2:SA1:SA0]
DIMM8 CH3 ADDRESS HEX:0
MICRO-STAR INT'L CO.,LTD
MS-7883
Size Custom
Document Description
DDR3 Chanel-B DIMM3/4
Rev 1.1
Date: Thursday, June 04, 2015
Sheet 14 of 74

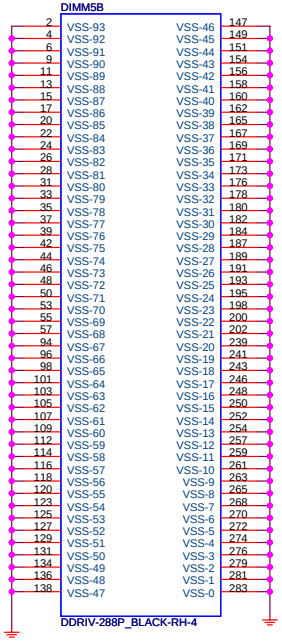
DDR IV POWER

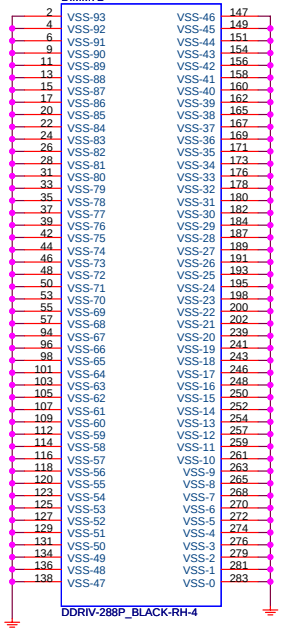

DIMM1C
DIMM3C
DIMM5C
DIMM7C
DIMM2C
DIMM4C
DIMM6C
DIMM8C
DDRIV-288P_BLACK-RH-5
DDRIV-288P_BLACK-RH-4
VCC_DDR_01
VCC_DDR_23
+VPP25_SPD_C01
+VPP25_SPD_C23
+VPP25_C01
+VPP25_C23
VTT_DDR_0
VTT_DDR_1
VTT_DDR_2
VTT_DDR_3
+VREF_DDR01
+VREF_DDR23
+VPP25_C01_FIX
+VPP25_C23_FIX
+VREF_CPU_DDR01
+VREF_CPU_DDR23
+VREF_DDR01_R
+VREF_DDR23_R
H_VREF_EN
CLOSE TO DIMM
Q39
N-AO3414
Q56
N-AO3414
Q60
NN-2N7002DW-7
SIO_3VA
ATX_5VSB
5VDIMM_01
VREF_EN
MICRO-STAR INT'L CO.,LTD
MS-7883
DDR IV POWER
Size Custom
Rev 1.1
Date: Thursday, June 04, 2015
Sheet 15 of 74

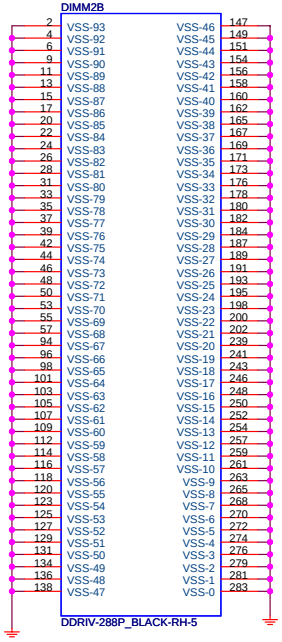
DDR IV GND

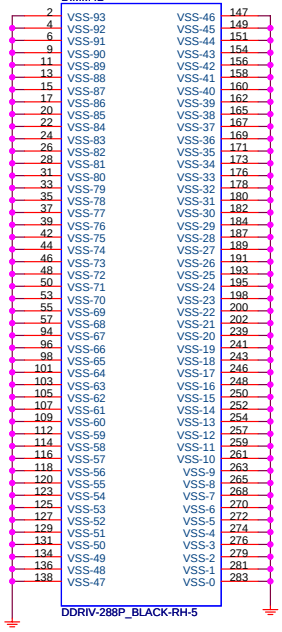


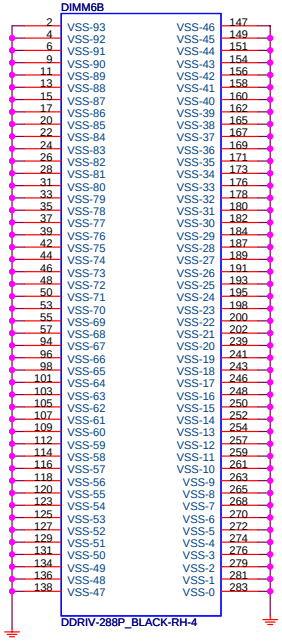


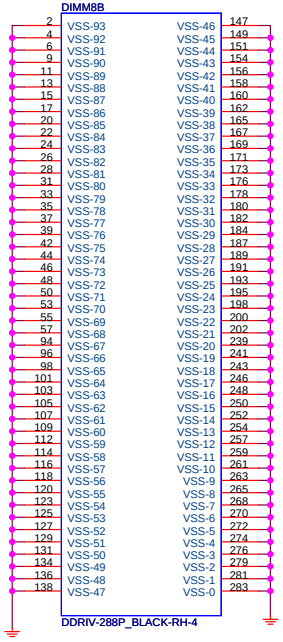












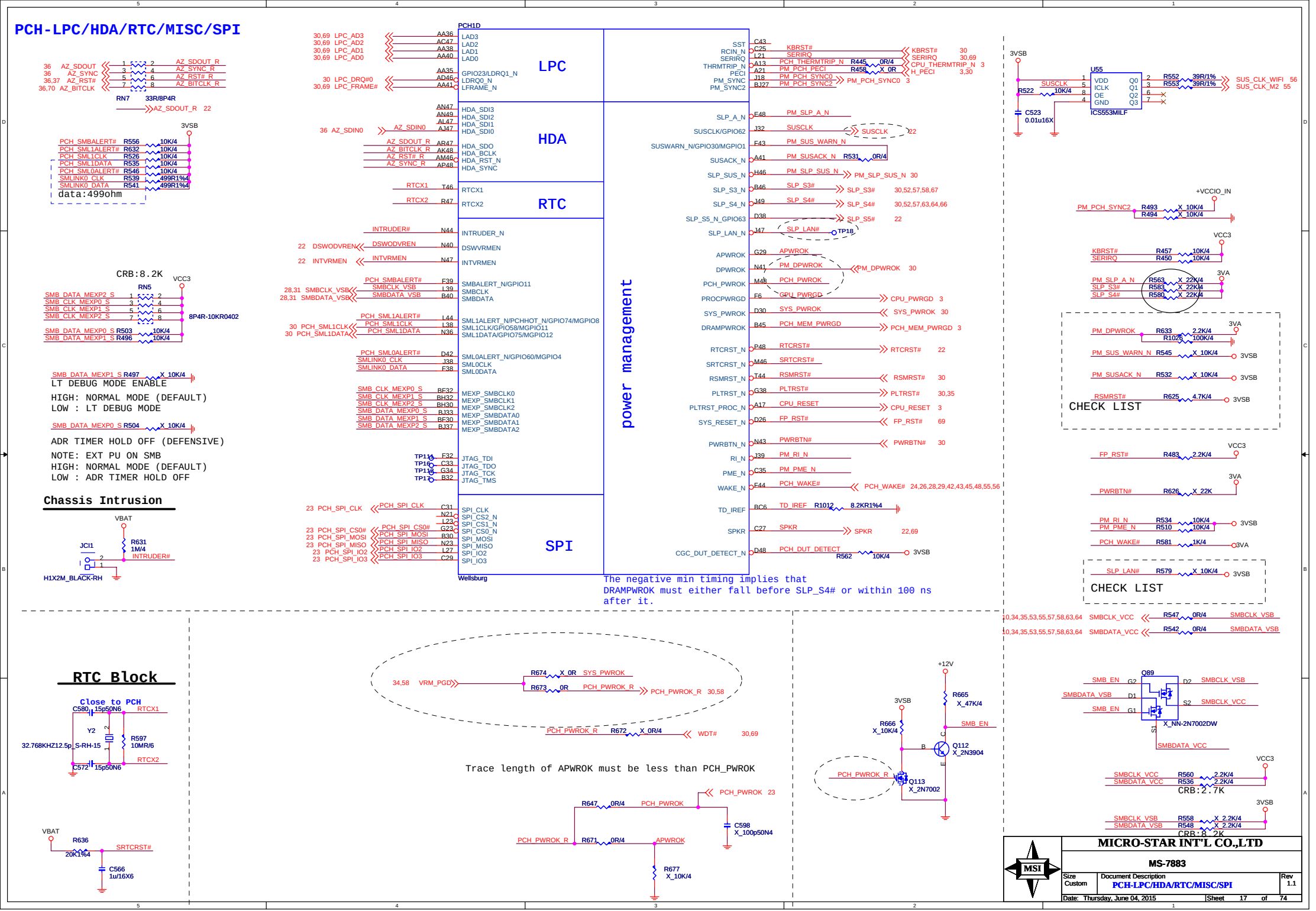
MICRO-STAR INT'L CO.,LTD

MS-7883

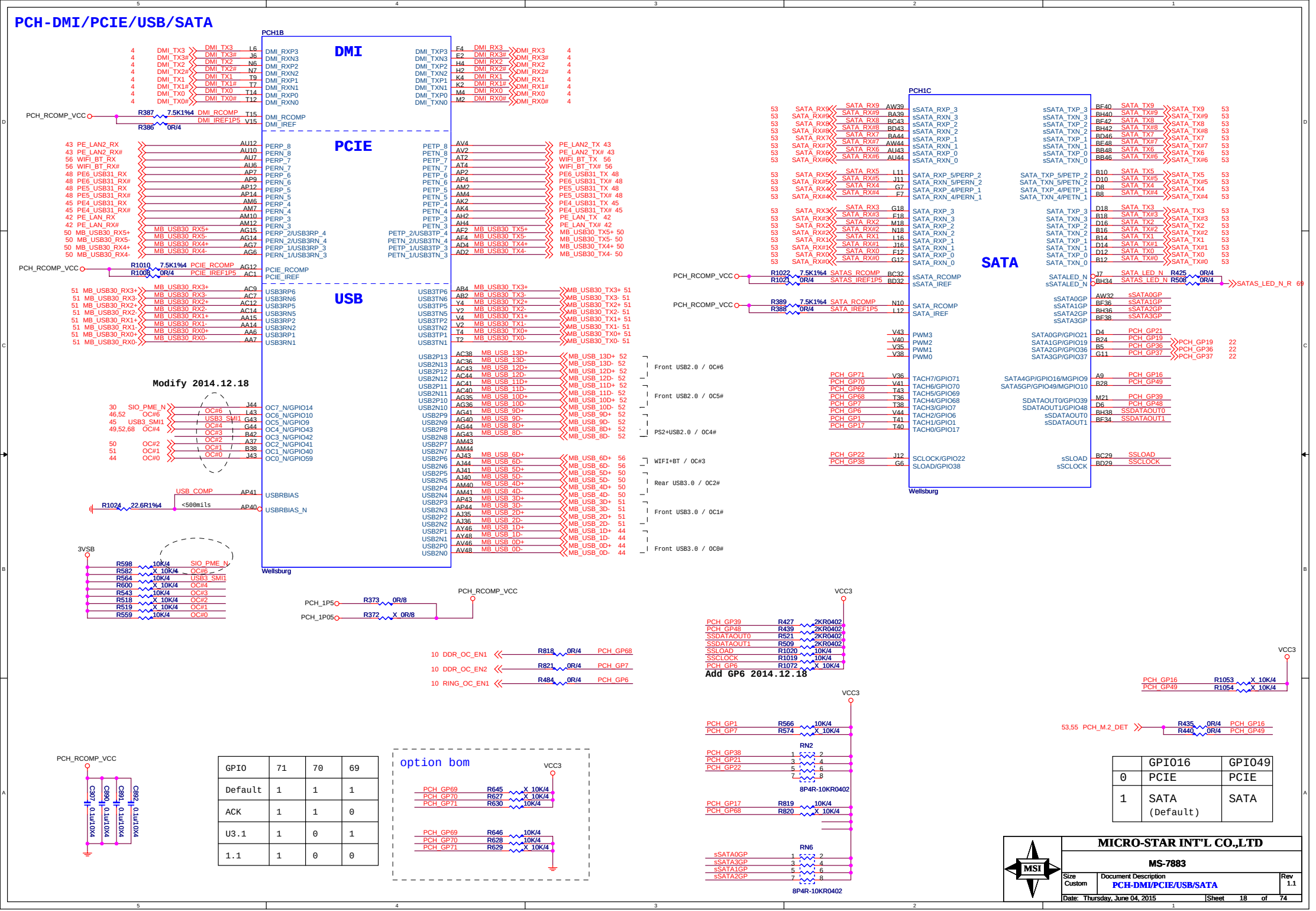
Size	Document Description	Rev
Custom	DDR IV GND	1.1

Date: Thursday, June 04, 2015 | Sheet 16 of 74

PCH-LPC/HDA/RTC/MISC/SPI



PCH-DMI/PCIE/USB/SATA



GPIO	71	70	69
Default	1	1	1
ACK	1	1	0
U3.1	1	0	1
1.1	1	0	0

	GPIO16	GPIO49
0	PCIE	PCIE
1	SATA (Default)	SATA

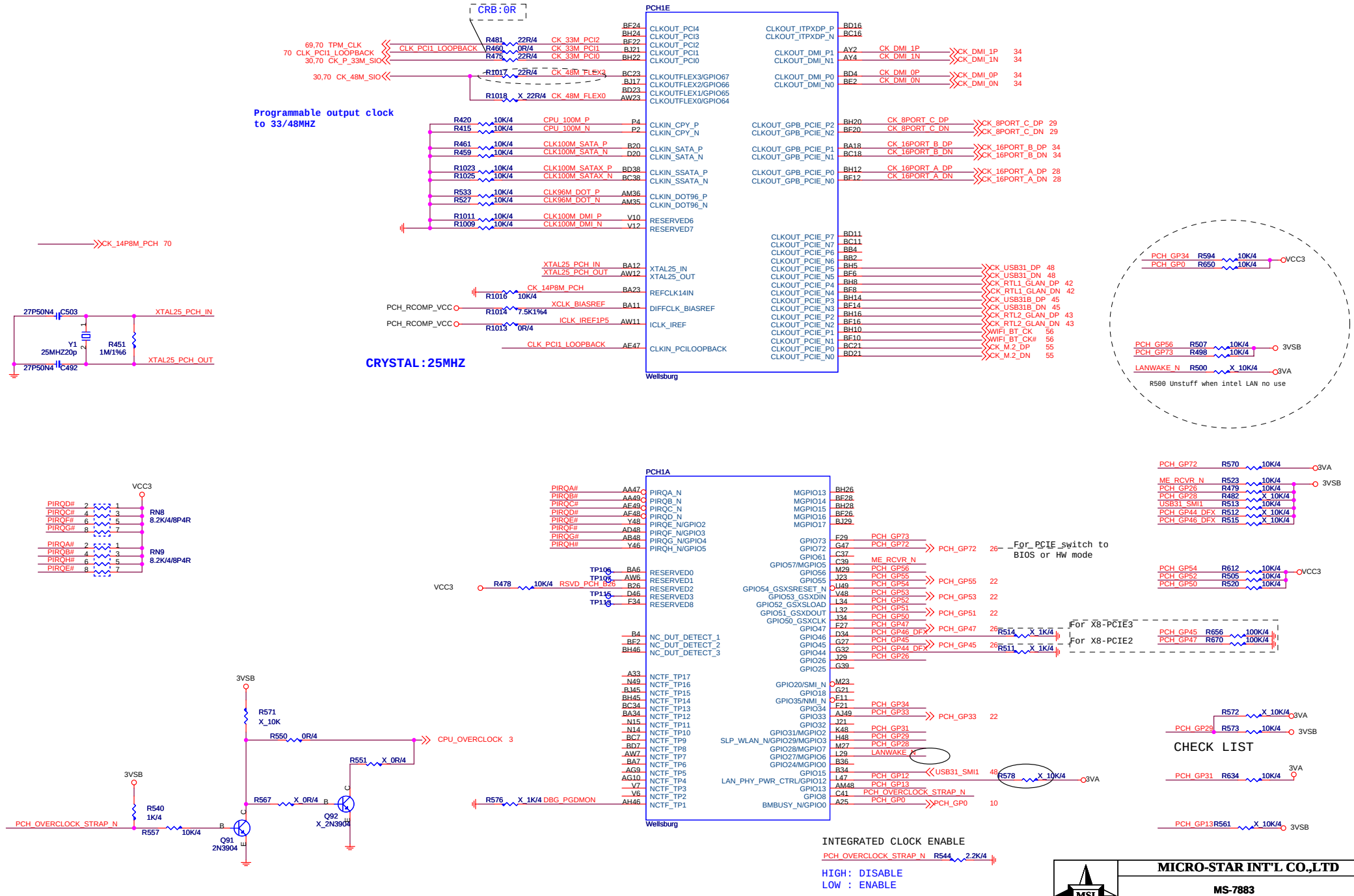
MICRO-STAR INT'L CO.,LTD

MS-7883

Size: Custom | Document Description: PCH-DMI/PCIE/USB/SATA | Rev: 1.1

Date: Thursday, June 04, 2015 | Sheet 18 of 74

PCH-CLK/GPIO



MICRO-STAR INT'L CO.,LTD	
MS-7883	
Size: Custom	Document Description: PCH-CLK/GPIO
Rev: 1.1	
Date: Thursday, June 04, 2015	Sheet 19 of 74

PCH-POWER

PCH_1P05:5.83A

+1P05V_ME:0.67A

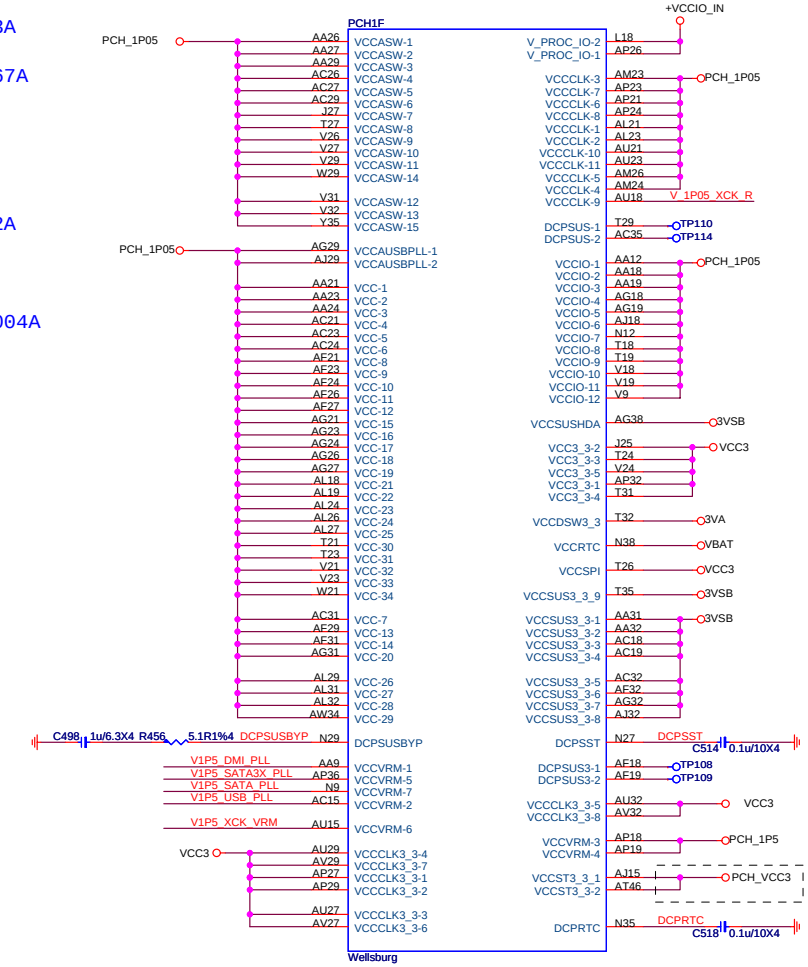
VCC3:0.2A

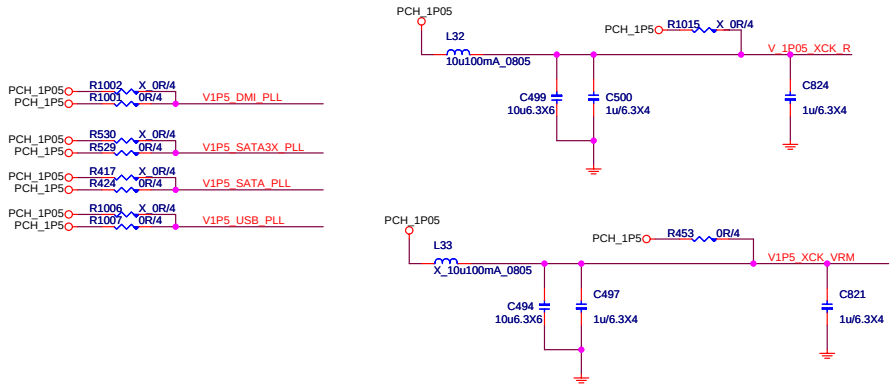
3VSB:0.27A

SPI_VCC3:0.02A

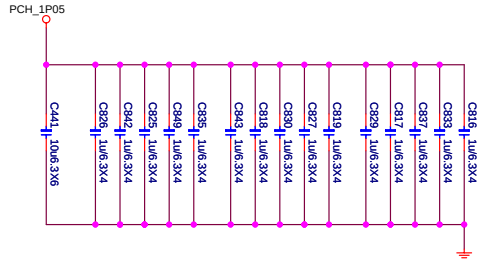
3VA:0.02A

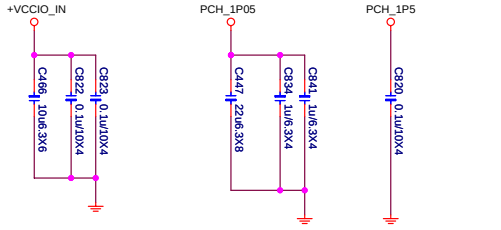
+VCCIO_IN:0.004A

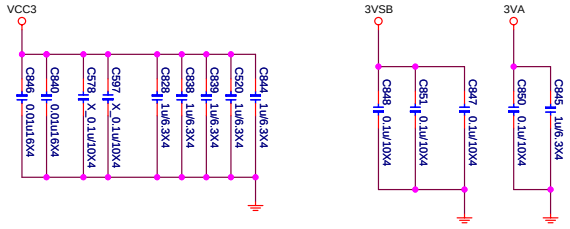


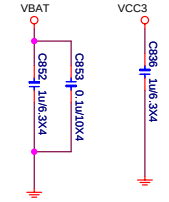


PCH decoupling cap



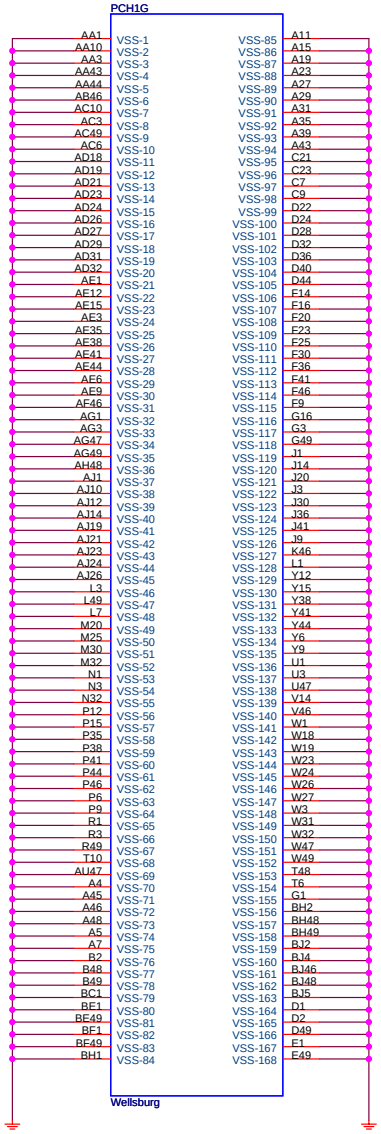


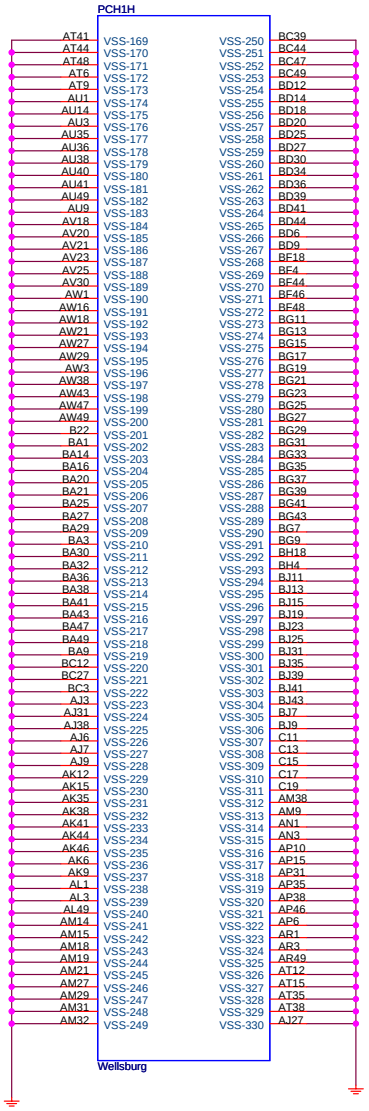




MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: PCH-POWER	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 20 of 74	

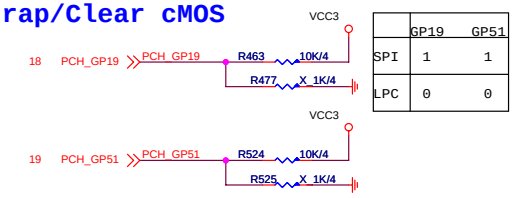
PCH-GND





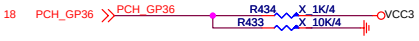
MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: PCH-GND	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 21 of 74	

PCH Strap/Clear cMOS



	GP19	GP51
SPI	1	1
LPC	0	0

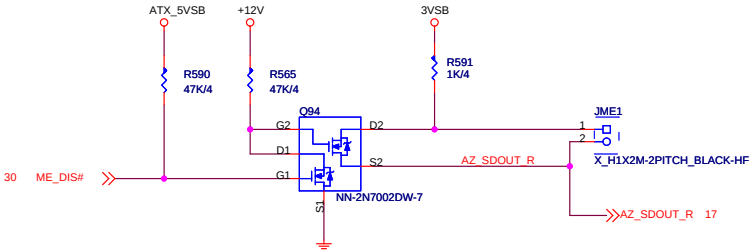
DMI RX Termination



This signal has a weak internal pull-down.
This signal only take effect if DMI is configured in AC-coupled mode.
0 = DMI RX is terminated to VSS.
1 = option not supported.

TLS CONFIDENTIALITY ENABLE STRAP

HIGH :TLS CONFIDENTIALITY ENABLE (DEFAULT)
LOW : RING OSCILLATOR BYPASS
LOW :TLS CONFIDENTIALITY DISABLE



HIGH (1-2):SECURITY MEASURES OVERRIDEN
LOW (0-1) : SECURITY PER FLASH DESCRIPTOR (DEFAULT)

DEEP SLEEP WELL ON-DIE VRM ENABLE

HIGH: ENABLE (INTERNAL SUPPLY) (DEFAULT)
LOW: DISABLE (EXTERNAL SUPPLY)

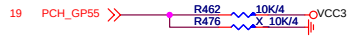
INTEGRATED SUS 1.05V VRM ENABLE

HIGH: ENABLE (INTERNAL SUPPLY) (DEFAULT)
LOW: DISABLE (EXTERNAL SUPPLY)

PLL ON-DIE VR ENABLE

HIGH :PLL ON-DIE VR ENABLE. INT PU. (DEFAULT)
LOW :PLL ON-DIE VR DISABLE

Top-Block Swap
Override



DMI TX TERMINATION (DEFENSIVE)

This signal has a weak internal pull-down.
This signal only takes effect if DMI is configured in DC-coupled mode.
0 = DMI TX is terminated to VSS.
1 = DMI TX is terminated to VCC/2.

NO REBOOT OPTION STRAP

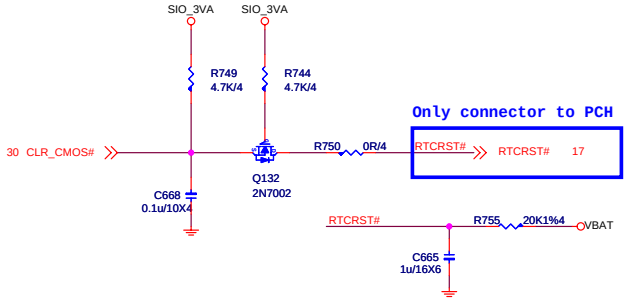
LOW : REBOOT
HIGH: NO-REBOOT

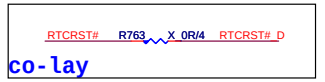
DMI AC Coupling

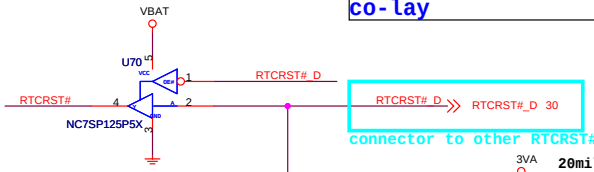
CHECK LIST

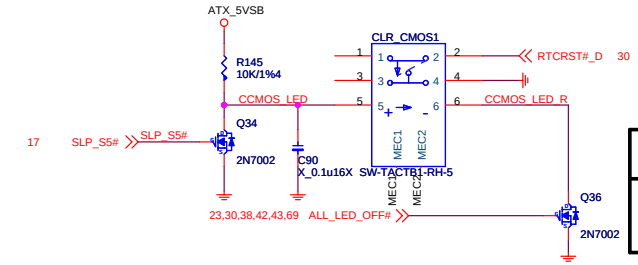
This Signal has a weak internal pull-up.
0= Configures DMI for AC coupling mode.
1 = Configures DMI for DC coupling mode.

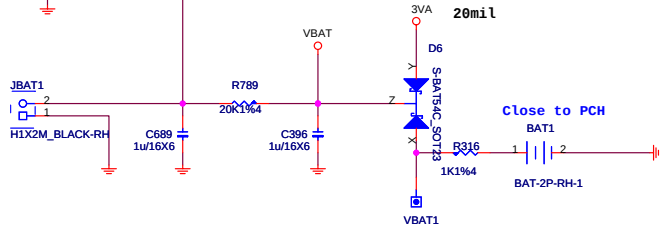
RTC and CLR_CMOS











LED LIGHTING RULE
S0/S3/S4 : LED OFF
S5 : LED ON

tri-state

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

MICRO-STAR INT'L CO.,LTD

MS-7883

Size: Custom | Document Description: PCH Strap/Clear cMOS | Rev: 1.1

Date: Thursday, June 04, 2015 | Sheet 22 of 74

17 PCH_SPI_CS0# PCH_SPI_CS0#

17 PCH_SPI_MOSI PCH_SPI_MOSI

17 PCH_SPI_MISO PCH_SPI_MISO

17 PCH_SPI_CLK PCH_SPI_CLK

17 PCH_SPI_IO2 PCH_SPI_IO2

17 PCH_SPI_IO3 PCH_SPI_IO3

PCH_SPI_CS# SPI_SW_SEL

D15 ESD-SFI0402

D16 ESD-SFI0402

SPI2_SW

SPI1_SW_D R826 1K/4 Q151 2N7002

SPI2_SW_D R827 1K/4 Q152 2N7002

20150316

OPTION BIOS

HW MODE

A BIOS

B BIOS

SW-DIPP1_BLACK-RH-1

BIOS1 MEC1 MEC2

SPI1_SW_D R729 1K/4 SPI1_SW

SPI2_SW_D R723 1K/4 SPI2_SW

R728 100K/4 SPI_CS1# Q116 N-BSS138LT1G

R722 100K/4 SPI_CS2# Q115 N-BSS138LT1G

SPI_SW_SEL_R R1066 X_0R/4 SPI_SW_SEL

R800 4.7K/4 ATX_5VSB

R724 X_10K1%4 +12V

20150309

PCH_SPI_CS#

For TL-624-1.1: Don't stuff R1066
Old Stuff R1066

SPI DEBUG PROT

Close to SPI ROM

VCC3 C711 0.1u/10X4

JSPI1

PCH_SPI_MISO R731 33R/4 PCH_SPI_MISO_TL

PCH_SPI_CS0# R708 0R/4 PCH_SPI_CS#

SPI_SW_SEL

PCH_SPI_IO2 R733 33R/4 PCH_SPI_IO2_TL

PCH_SPI_MOSI_TL R730 33R/4 PCH_SPI_MOSI

PCH_SPI_CLK_TL R732 33R/4 PCH_SPI_CLK

PCH_SPI_IO3_TL R734 33R/4 PCH_SPI_IO3

H2X6[10]M-2PITCH_BLACK-RH-1

Part Number:N31-2061341-H06

17 PCH_PWROK PCH_PWROK R1065 0R/4 SPI_SW_SEL

2014.06.05 Add for support TL624-1.1

For auto testing in factory. **Modify 2014.12.18**

ATX_5VSB SIO_3VA R683 47K/4 R695 4.7K/4

DUAL_BIOS# Q168 NN-2N7002D

30 DUAL_BIOS

C931 X_0.1u/10X4

20150309

SPI_SW_SEL_R

DUAL_BIOS# R684 1K/1% C893 X_0.1u/10X4 R102 100K/1%

SPI_CS2# Q125 N-BSS138LT1G PCH_SPI_CS#

VCC3 R686 2.2K/4

A BIOS

SPI1 W25Q16DVSSIG-HF

SPI_CS1# PCH_SPI_MISO R709 33R/4 SPI1_MISO PCH_SPI_IO2 R700 33R/4 SPI1_IO2

R714 1K/4

C637 0.1u/10X4 C636 10u6.3X6

SPI1_IO3 R710 33R/4 PCH_SPI_IO3

SPI1_CLK R711 33R/4 PCH_SPI_CLK

SPI1_MOSI R712 33R/4 PCH_SPI_MOSI

R735 1K/4 VCC3

* if you not support Standby power in S5 Status, component "MULTI_BIOS_SWITCH1.B(PIN B)
" Pull-high to +12V & Q12/Q13 MOS select 2N7002

* if you support Standby power in S5 Status(Ex; PCH is B75 Chipset) ,
component "MULTI_BIOS_SWITCH1.B(PIN B)" pull-igh to ATX_5VSB , component Q12/Q13 must
select "Vth" under 1V (Component Suggestion as below)

D03-0341409-A68 / D03-0230019-A30

16M ROM

VCC3 R685 2.2K/4

B BIOS

SPI2 W25Q16DVSSIG-HF

SPI_CS2# PCH_SPI_MISO R704 33R/4 SPI2_MISO PCH_SPI_IO2 R703 33R/4 SPI2_IO2

C635 0.1u/10X4 C634 10u6.3X6

SPI2_IO3 R705 33R/4 PCH_SPI_IO3

SPI2_CLK R706 33R/4 PCH_SPI_CLK

SPI2_MOSI R707 33R/4 PCH_SPI_MOSI

VCC5 R770 4.7K/4 A_BIOS1 LED,20mA

VCC5 R769 1K/4 B_BIOS1 LED04-G-30mA

Q185 NN-2N7002D

SPI2_SW SPI1_SW

Q117 2N7002 DUAL_BIOS#

22,30,38,42,43,69 ALL_LED_OFF# Q109 2N7002

SPI FLASH ROM

Place close to SB.

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

Placement 1

MULTI_BIOS_SWITCH

SPI1 A BIOS SPI2 B BIOS

A_BIOS_LED B_BIOS_LED

Placement 2

SPI1 A BIOS SPI2 B BIOS

A_BIOS_LED B_BIOS_LED

MULTI_BIOS_SWITCH

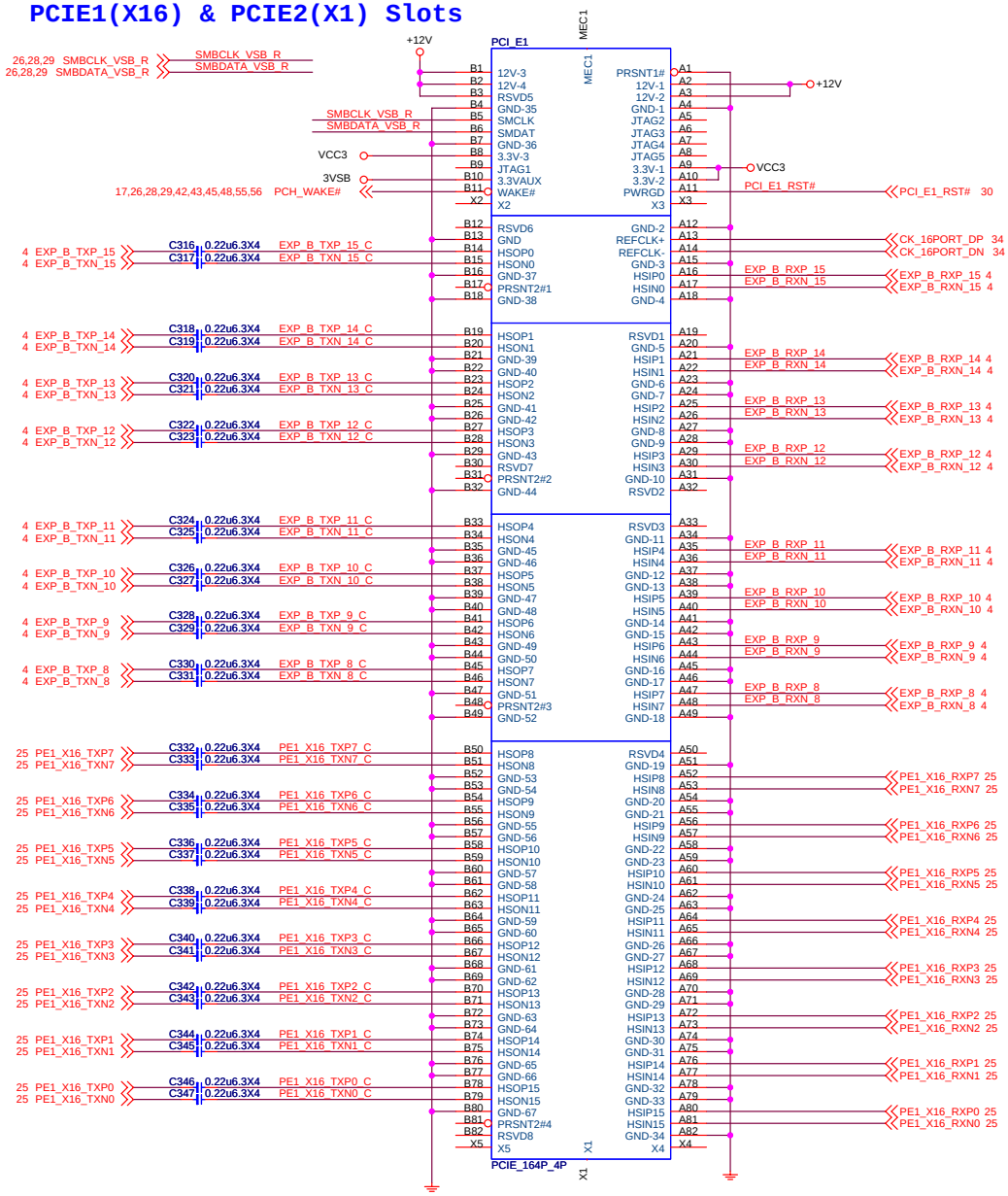
MICRO-STAR INT'L CO.,LTD

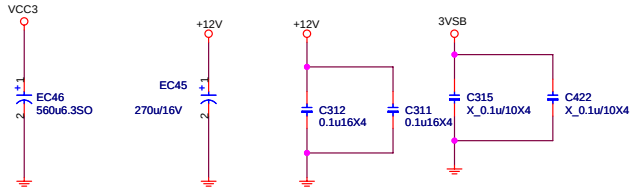
MS-7883

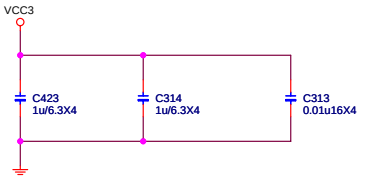
Size	Document Description	Rev
Custom	Dual BIOS	1.1

Date: Thursday, June 04, 2015 Sheet 23 of 74

PCIE1(X16) & PCIE2(X1) Slots







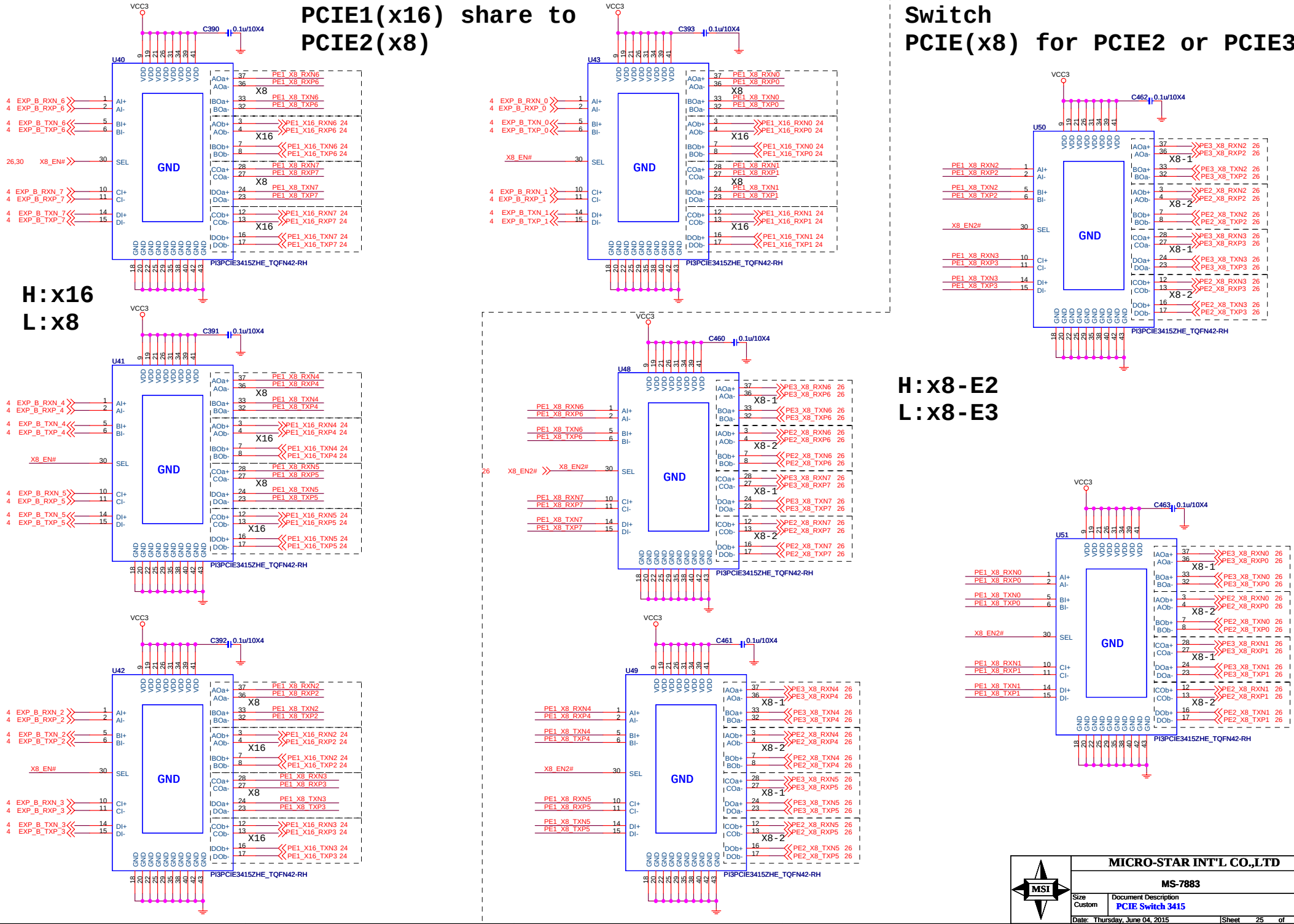
MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: PCIE1(X16) Slots	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 24 of 74	

PCIE1(x16) share to PCIE2(x8)

Switch PCIE(x8) for PCIE2 or PCIE3

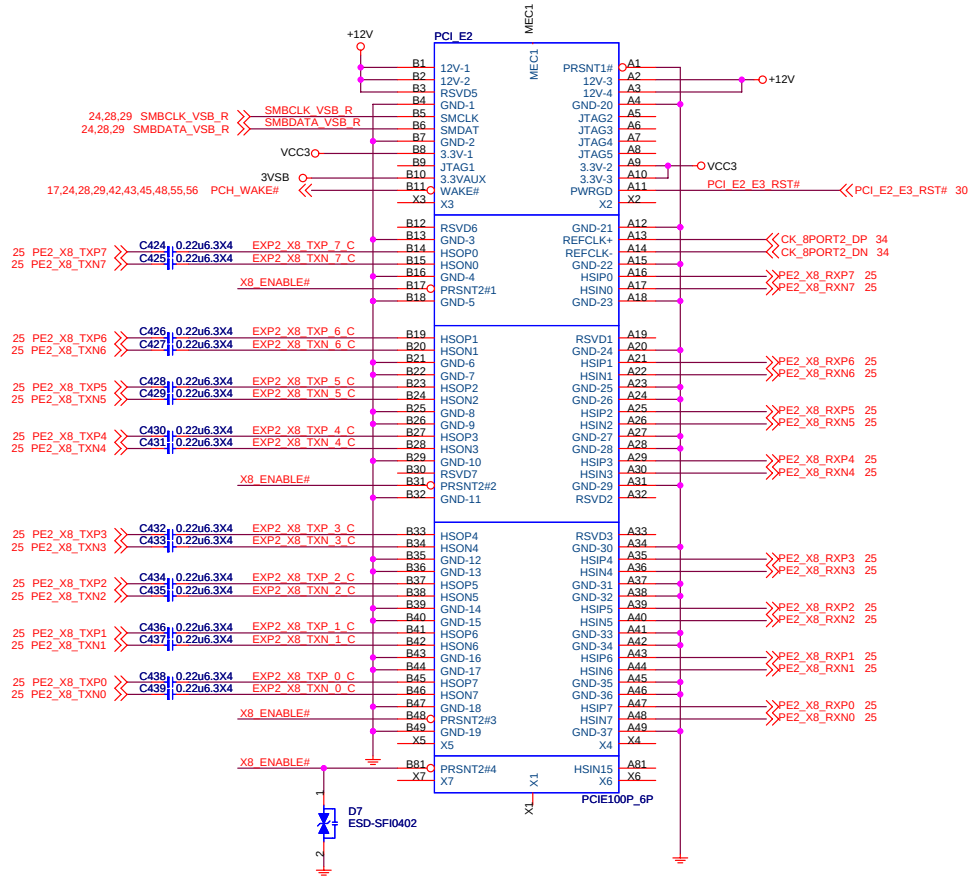
H:x16
L:x8

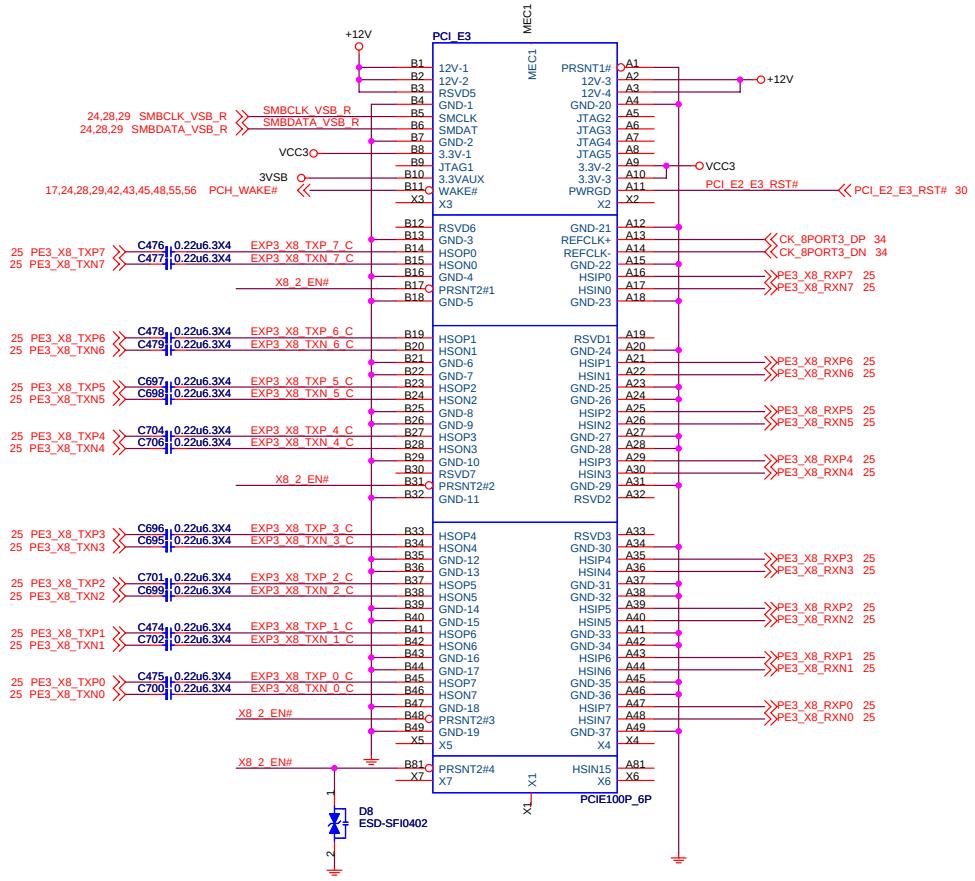
H:x8-E2
L:x8-E3



MICRO-STAR INT'L CO.,LTD			
MS-7883			
Size: Custom	Document Description: PCIE Switch 3415		Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 25 of 74		

PCIE5(X8) /PCIE3415





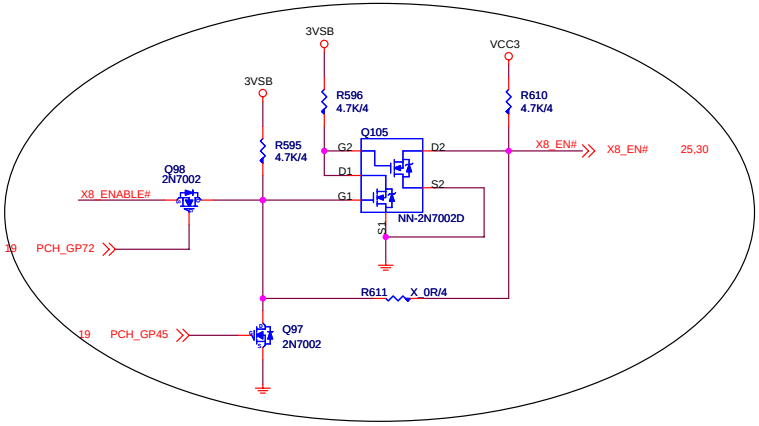
GPIO72

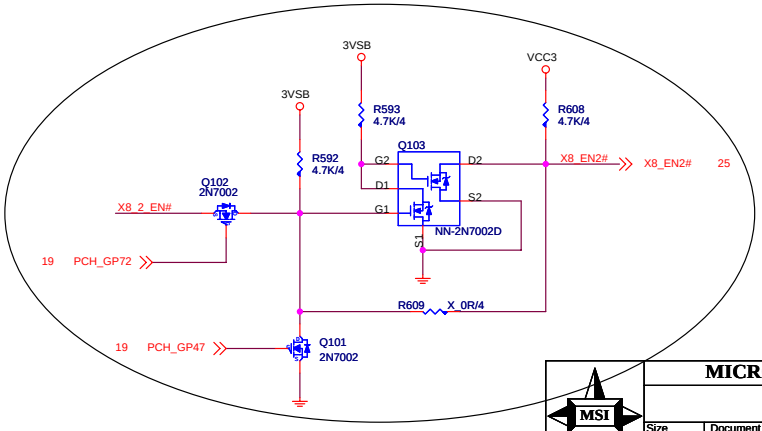
0: BIOS MODE
1: HW MODE

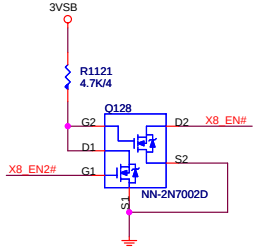
If USE HW MODE
PCH_GPIO45/47 programming to GPI
PCH_GPIO72 programming GPO

If USE BIOS MODE
PCH_GPIO45/47 programming to GPO

PCH Status	GPIO72	GPIO45	GPIO47
AUTO	1	GPI(def:0)	
16,0,0	0	X	X
8,8,0	0	1	0
8,0,8	0	0	1





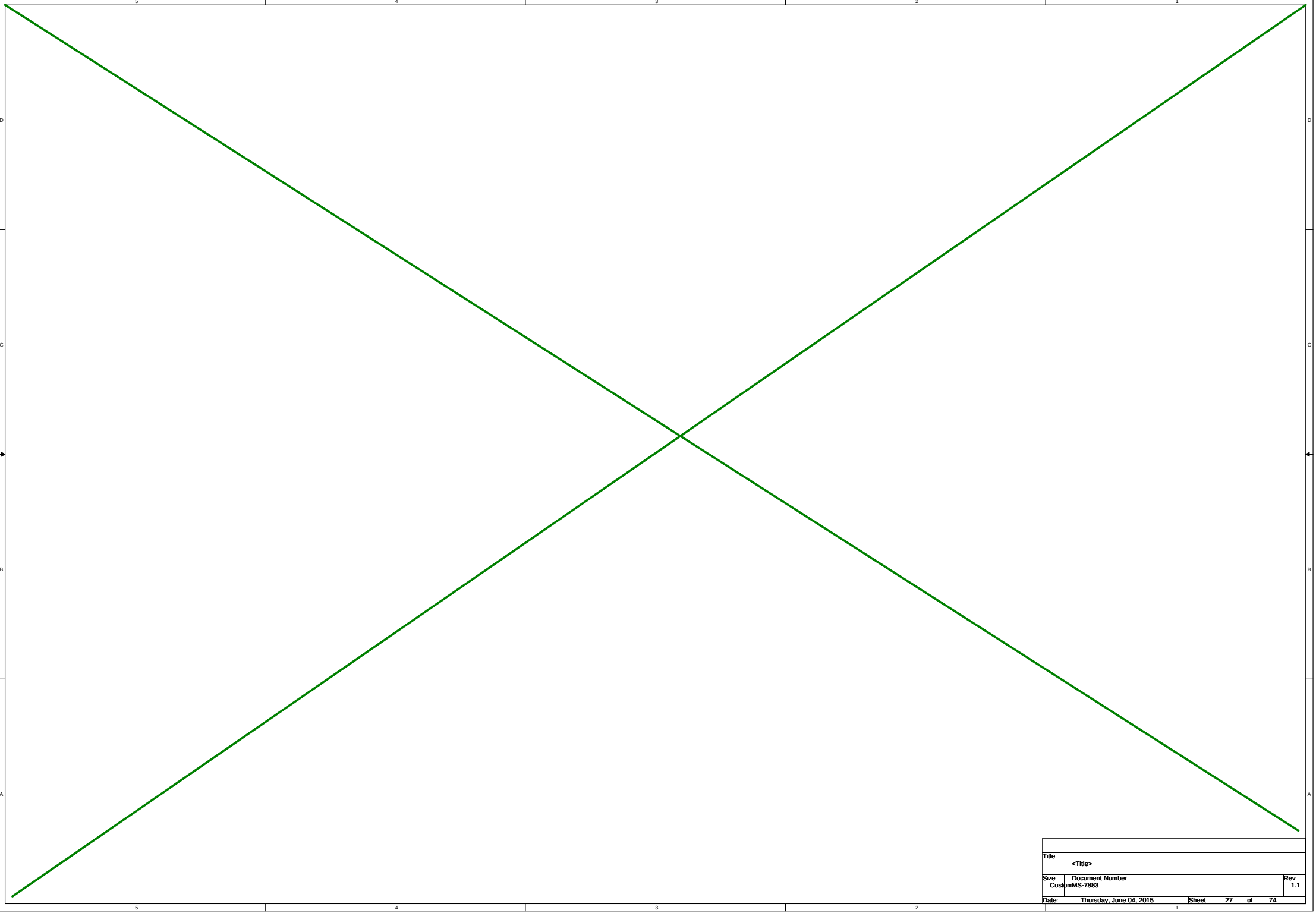


MICRO-STAR INT'L CO.,LTD

MS-7883

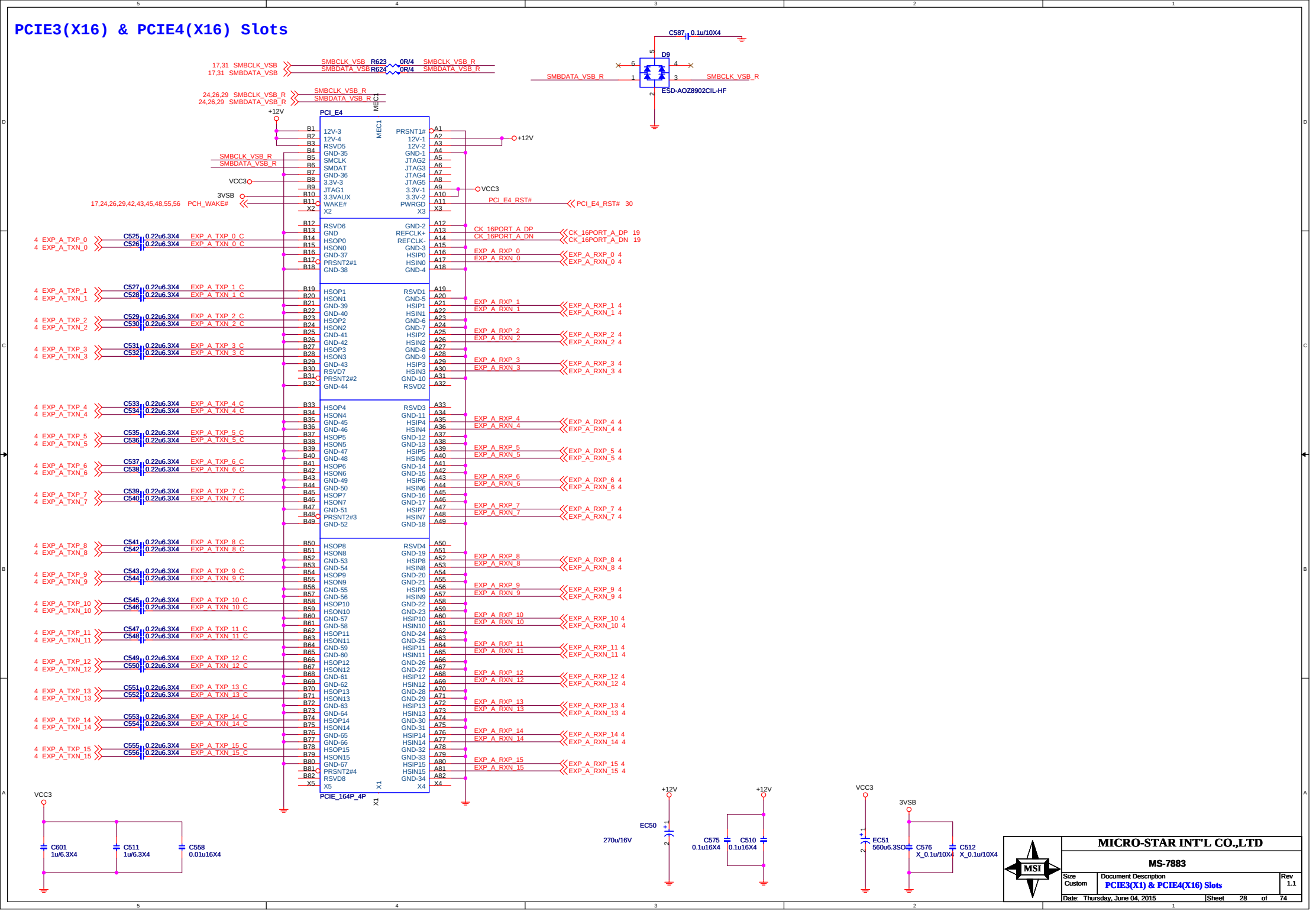
Size	Document Description	Rev
Custom	PCIE2&3(X8) /PCIE3415	1.1

Date: Thursday, June 04, 2015 Sheet 26 of 74



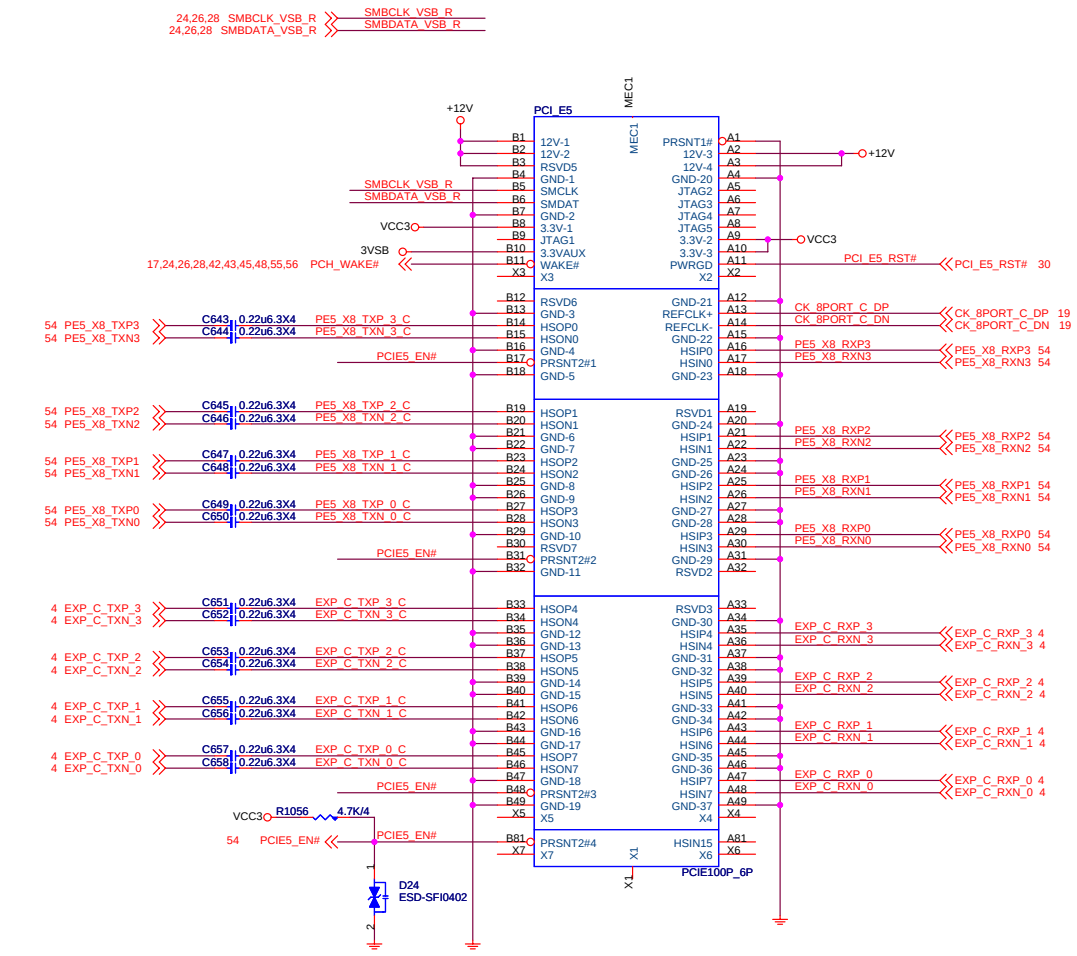
Title	<Title>	
Size: Custom	Document Number: MS-7883	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 27 of 74	

PCIE3(X16) & PCIE4(X16) Slots



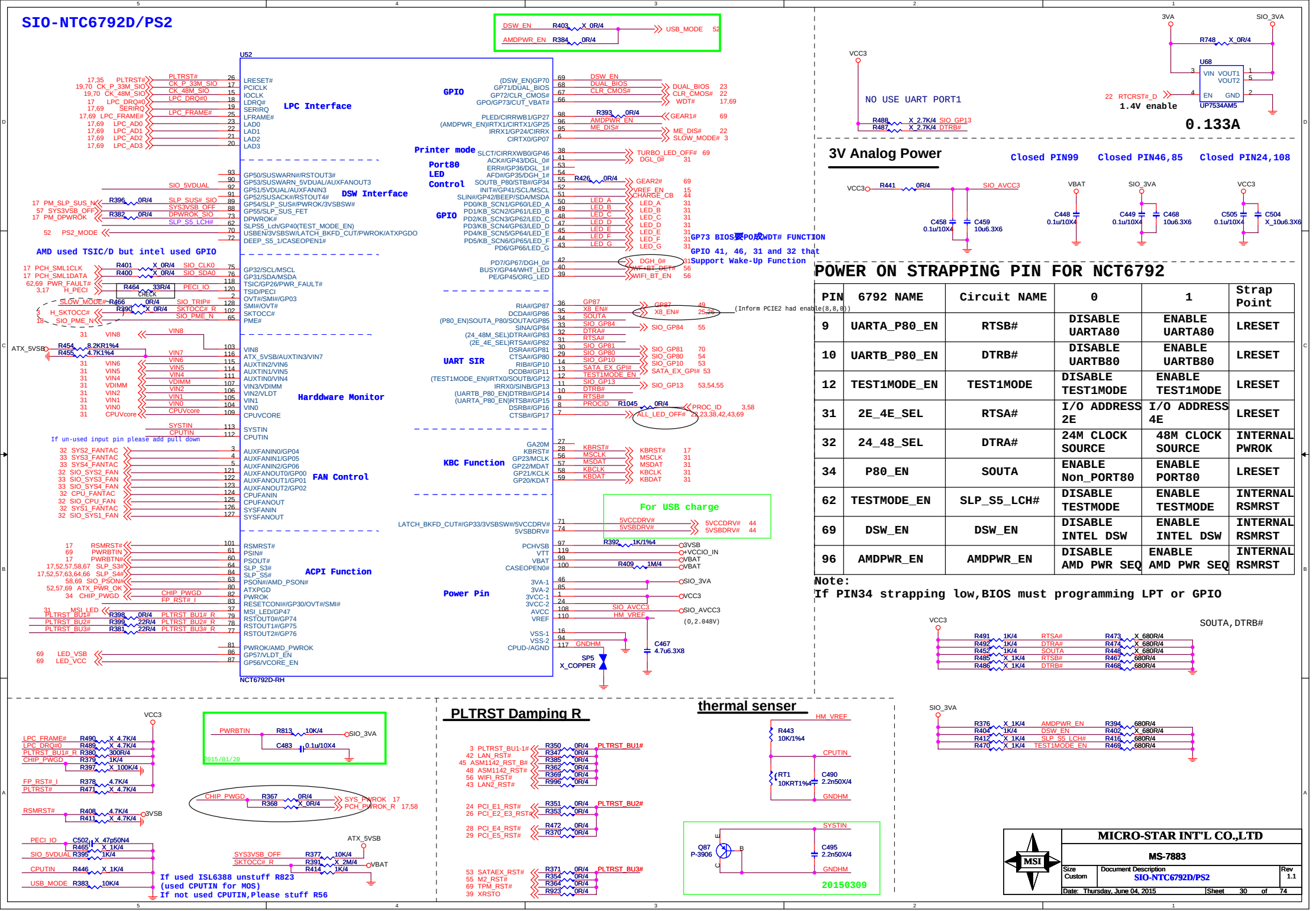
MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: PCIE3(X1) & PCIE4(X16) Slots	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 28 of 74	

PCIE5(X8) Slots



MICRO-STAR INT'L CO.,LTD	
MS-7883	
Size: Custom	Document Description: PCIE6(X8) Slots
Rev: 1.1	
Date: Thursday, June 04, 2015	Sheet 29 of 74

SIO-NTC6792D/PS2



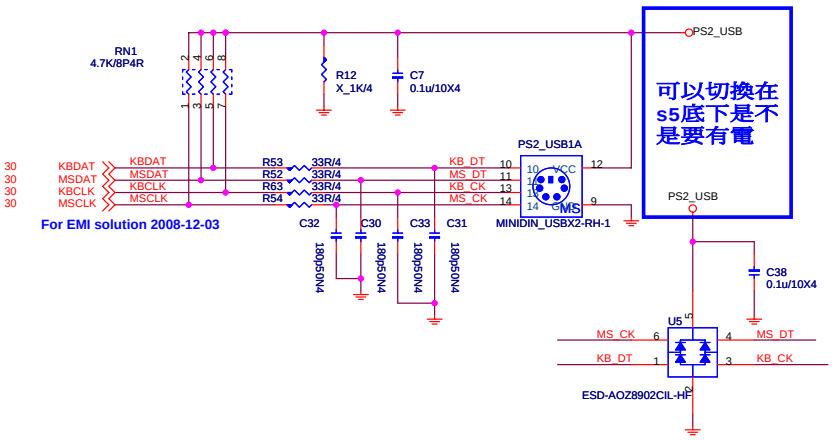
POWER ON STRAPPING PIN FOR NCT6792

PIN	6792 NAME	Circuit NAME	0	1	Strap Point
9	UARTA_P80_EN	RTSB#	DISABLE UARTA80	ENABLE UARTA80	LRESET
10	UARTB_P80_EN	DTRB#	DISABLE UARTB80	ENABLE UARTB80	LRESET
12	TEST1MODE_EN	TEST1MODE	DISABLE TEST1MODE	ENABLE TEST1MODE	LRESET
31	2E_4E_SEL	RTSA#	I/O ADDRESS 2E	I/O ADDRESS 4E	LRESET
32	24_48_SEL	DTRA#	24M CLOCK SOURCE	48M CLOCK SOURCE	INTERNAL PWROK
34	P80_EN	SOUTA	ENABLE Non_PORT80	ENABLE PORT80	LRESET
62	TESTMODE_EN	SLP_S5_LCH#	DISABLE TESTMODE	ENABLE TESTMODE	INTERNAL RSMRST
69	DSW_EN	DSW_EN	DISABLE INTEL DSW	ENABLE INTEL DSW	INTERNAL RSMRST
96	AMDPWR_EN	AMDPWR_EN	DISABLE AMD PWR SEQ	ENABLE AMD PWR SEQ	INTERNAL RSMRST

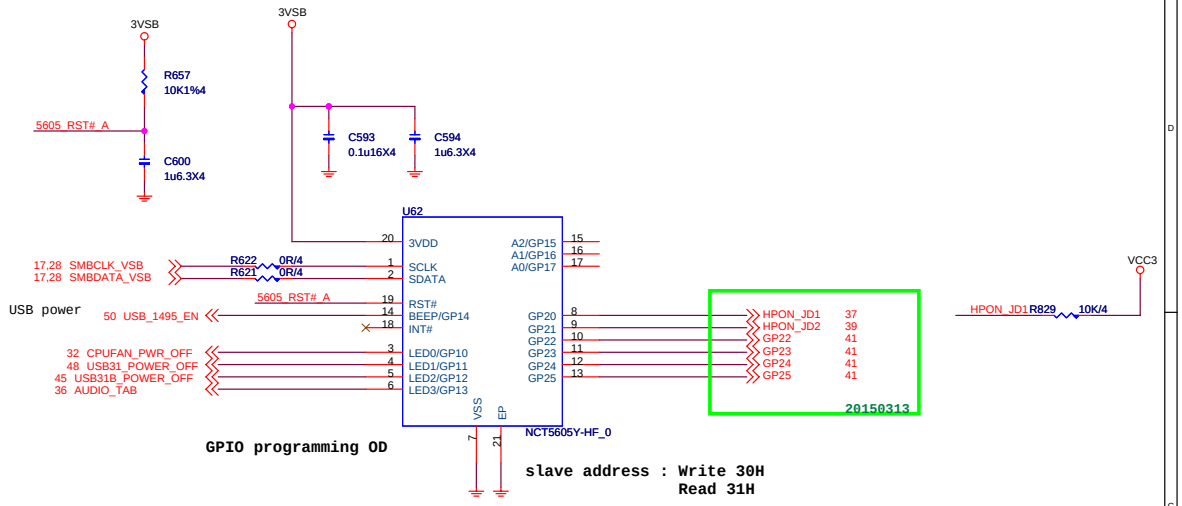
Note:
If PIN34 strapping low,BIOS must programming LPT or GPIO

MICRO-STAR INT'L CO.,LTD	
MS-7883	
Size: Custom	Document Description: SIO-NTC6792D/PS2 — Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 30 of 74

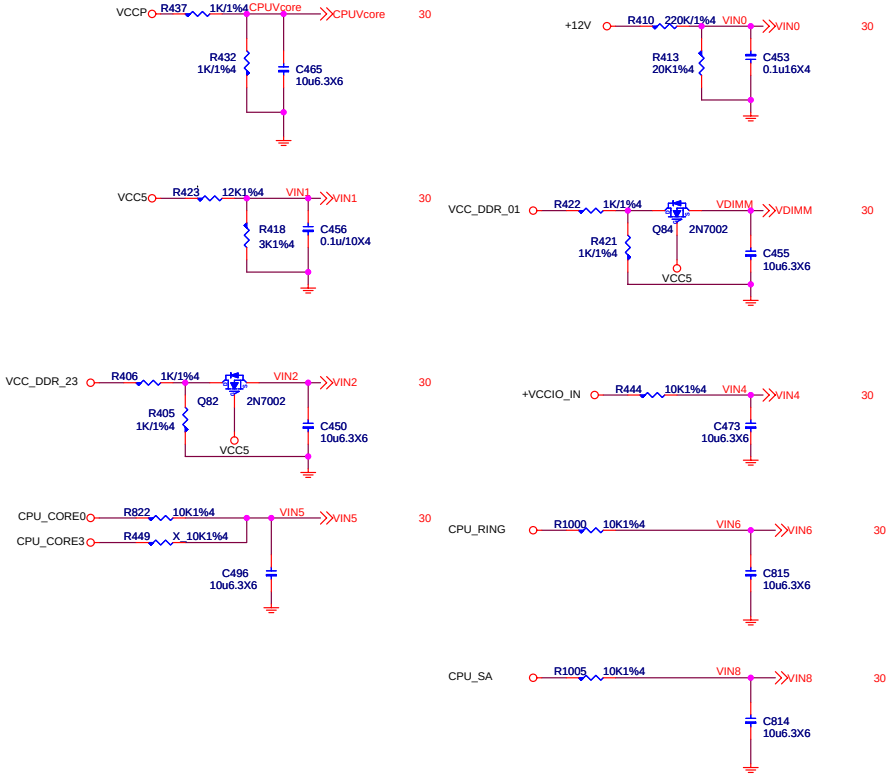
PS2 KEYBOARD & MOUSE CONNECTOR



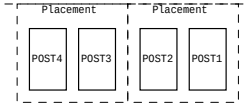
CUT POWER CHIP



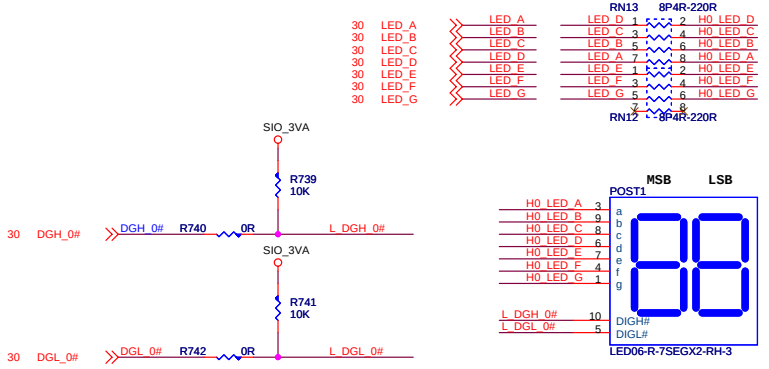
HW Monitor - Voltage



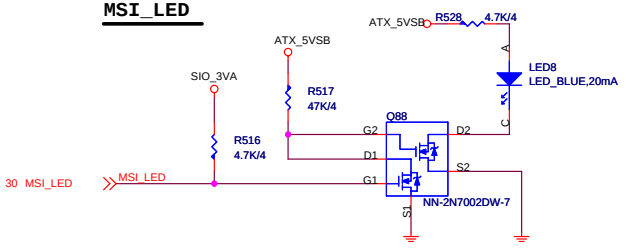
DEBUG LED



Placement一定要對
(DGH1=Post4/DGL1=Post3/DGH0=Post2/DGL0=Post1)

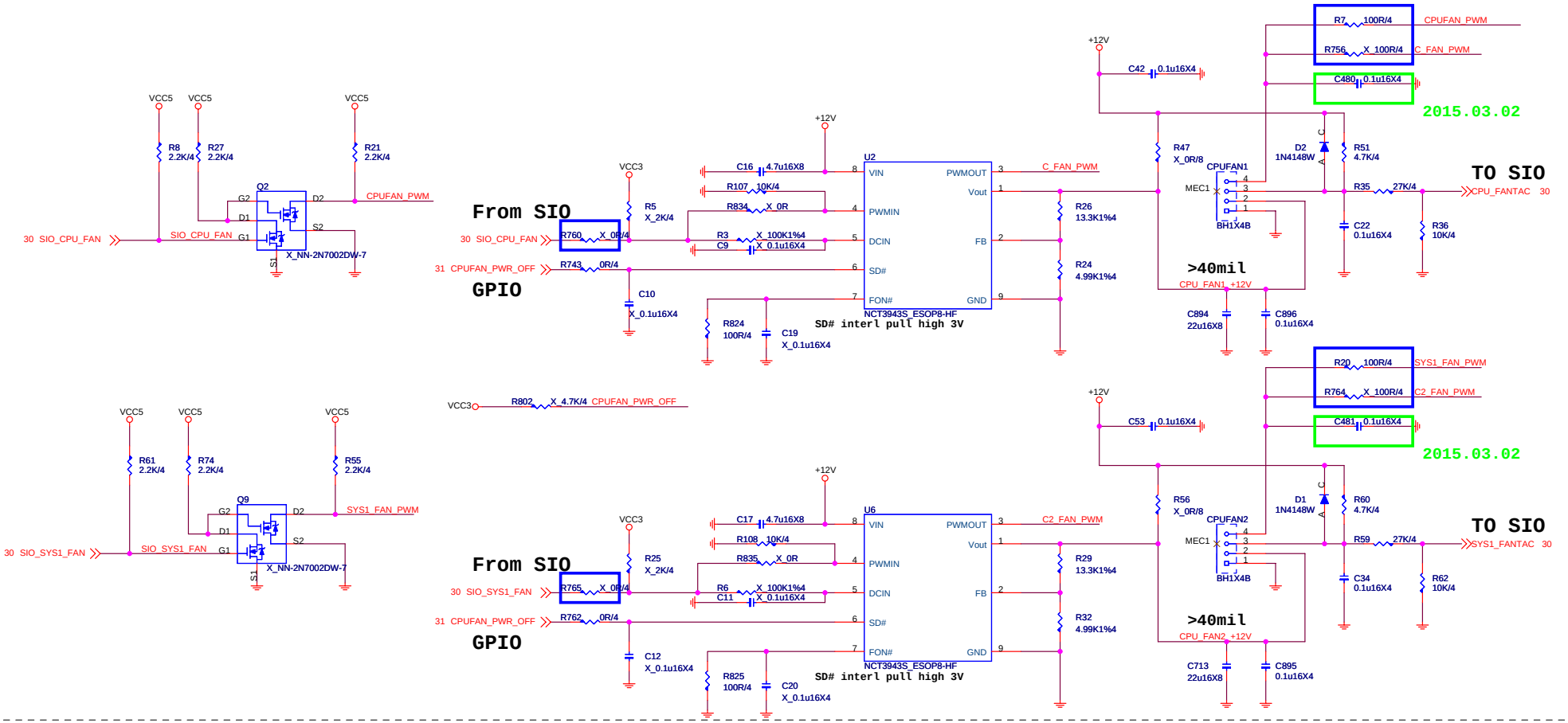


MSI_LED

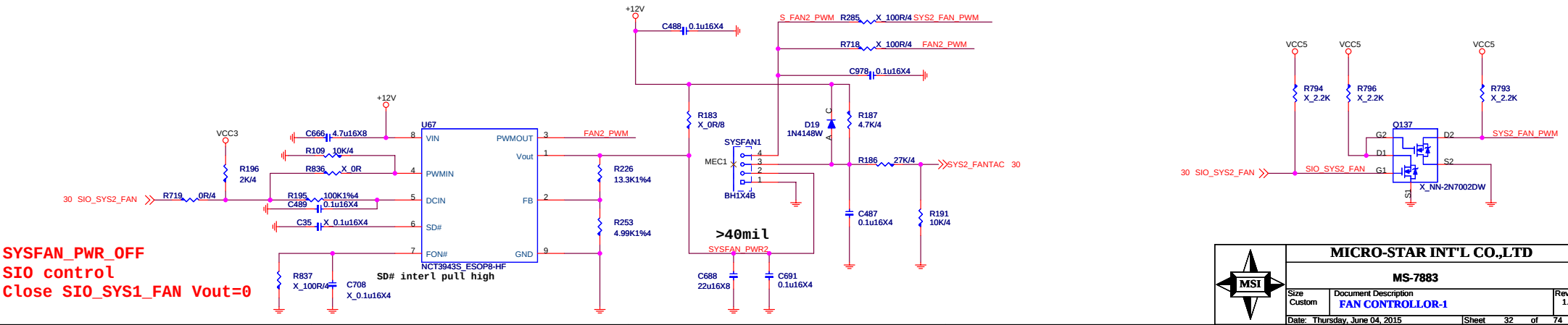


MICRO-STAR INT'L CO.,LTD	
MS-7883	
Size: Custom	Document Description: SIO-NTC6792D/PS2
Rev: 1.1	
Date: Thursday, June 04, 2015	Sheet 31 of 74

Type E : 4 PIN CPU FAN FROM SIO (Smart Fan/PWM MODE)(FOR NCT6792)

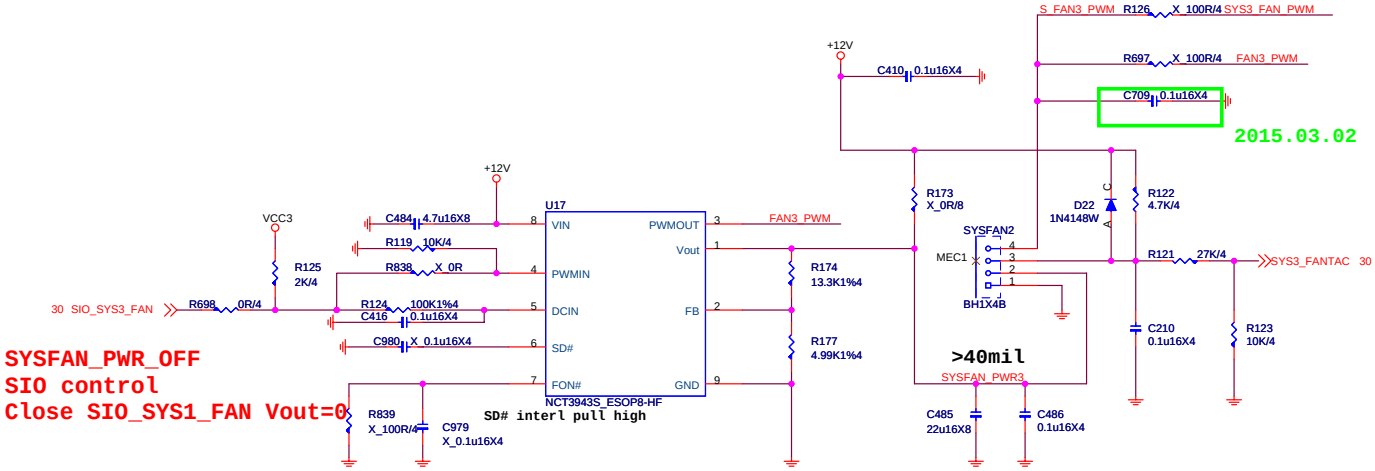


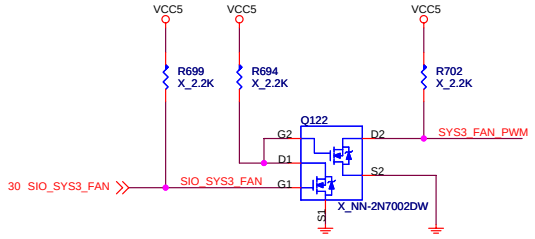
Type F : 4 PIN SYSTEM FAN FROM SIO (Smart Fan/PWM MODE)(FOR NCT6792)

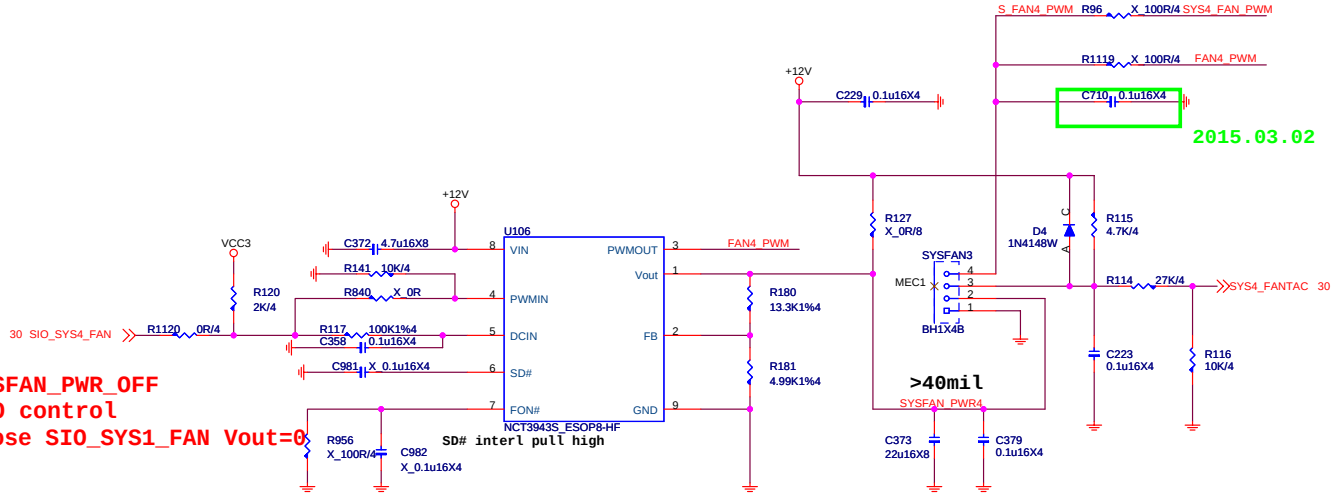


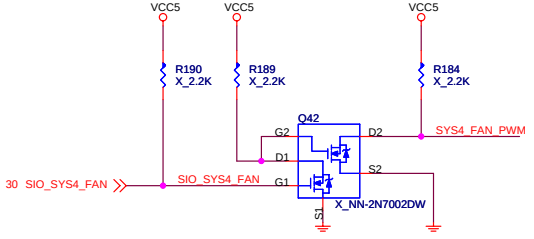
MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: FAN CONTROLLOR-1	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 32 of 74	

Type F : 4 PIN SYSTEM FAN FROM SIO (Smart Fan/PWM MODE)(FOR NCT6792)



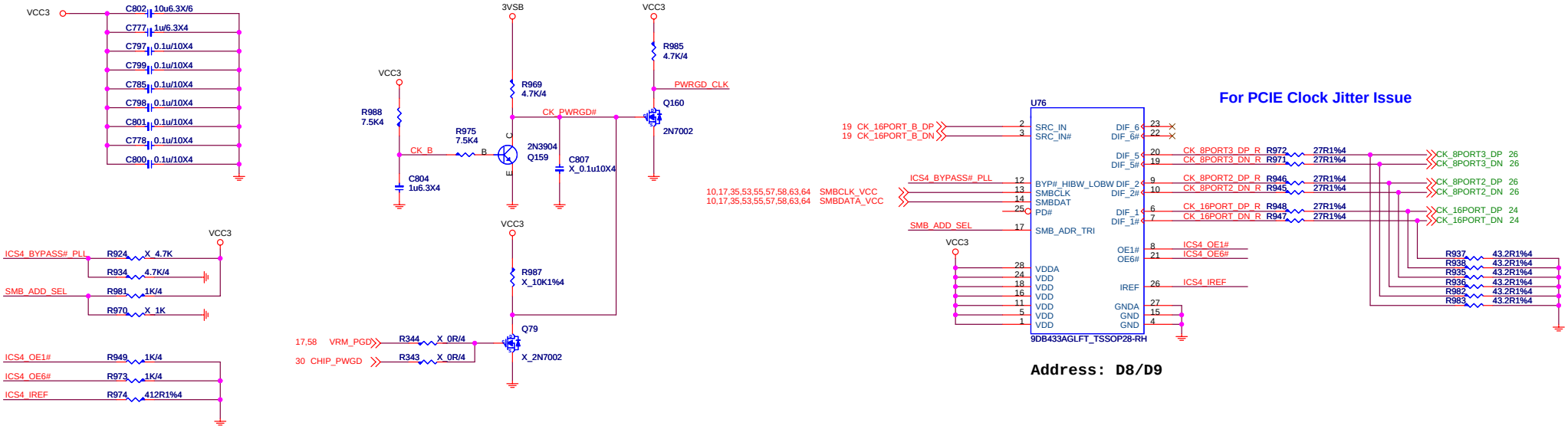






MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: FAN CONTROLLOR-2	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 33 of 74	

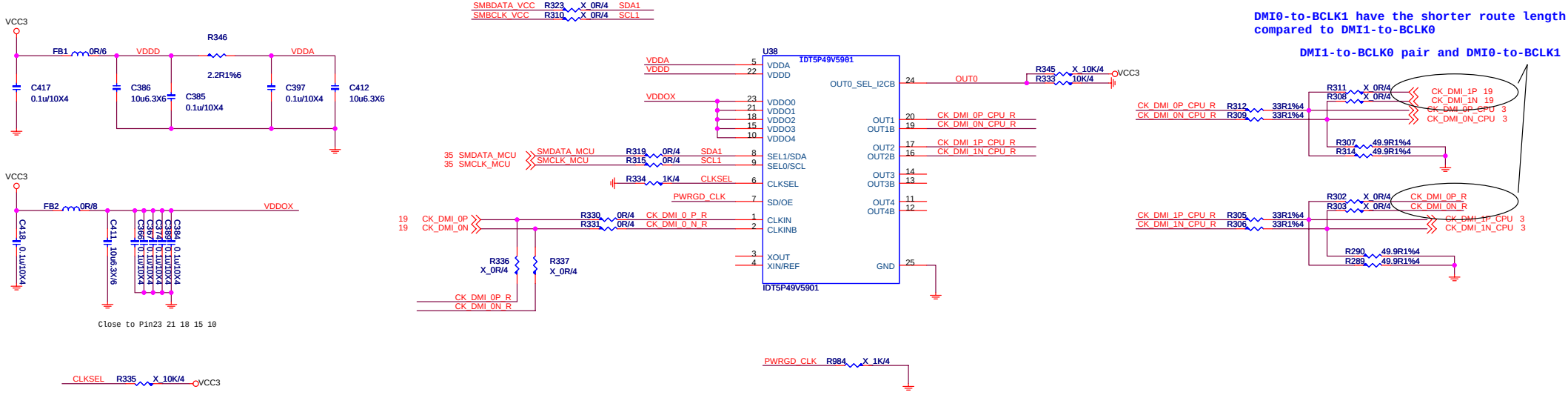
CLK Buffer_9DB433



For PCIE Clock Jitter Issue

Address: D8/D9

CLK GEN-IDT5P49V5901



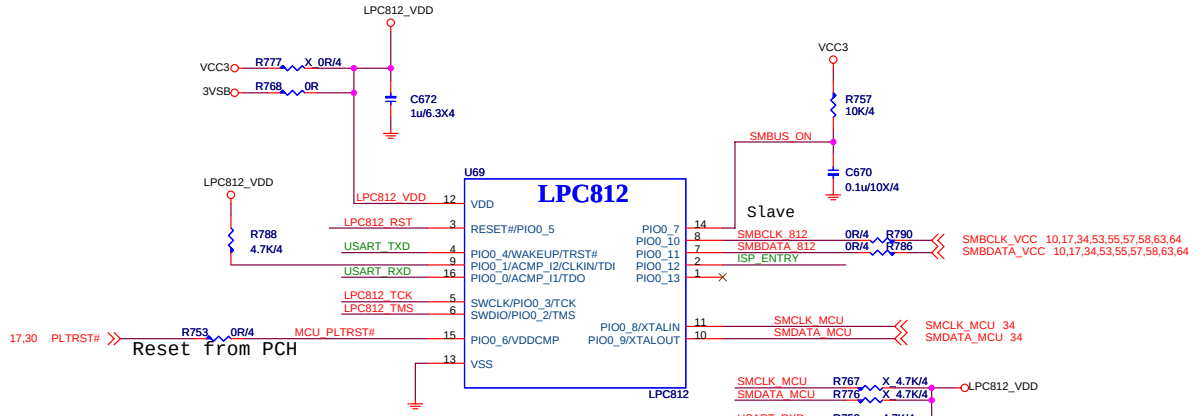
DMI0-to-BCLK1 have the shorter route length compared to DMI1-to-BCLK0

DMI1-to-BCLK0 pair and DMI0-to-BCLK1

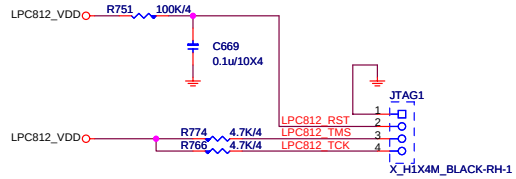
PIN:CLKSEL. Input clock select. Selects the active input reference source in manual switchover mode.
0 = XIN/REF, XOUT (default)
1 = CLKIN, CLKINB

MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: CLK Buffer_9DB433/IDT49325	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 34 of 74	

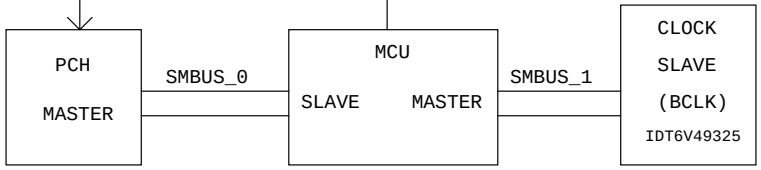
SIO 6792 , GPIO13
default low , active high



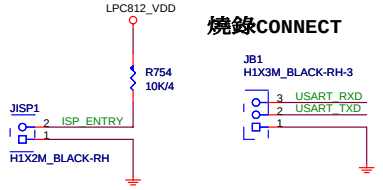
JTAG for SW DEBUG



Clear CMOS When System Boot Fail

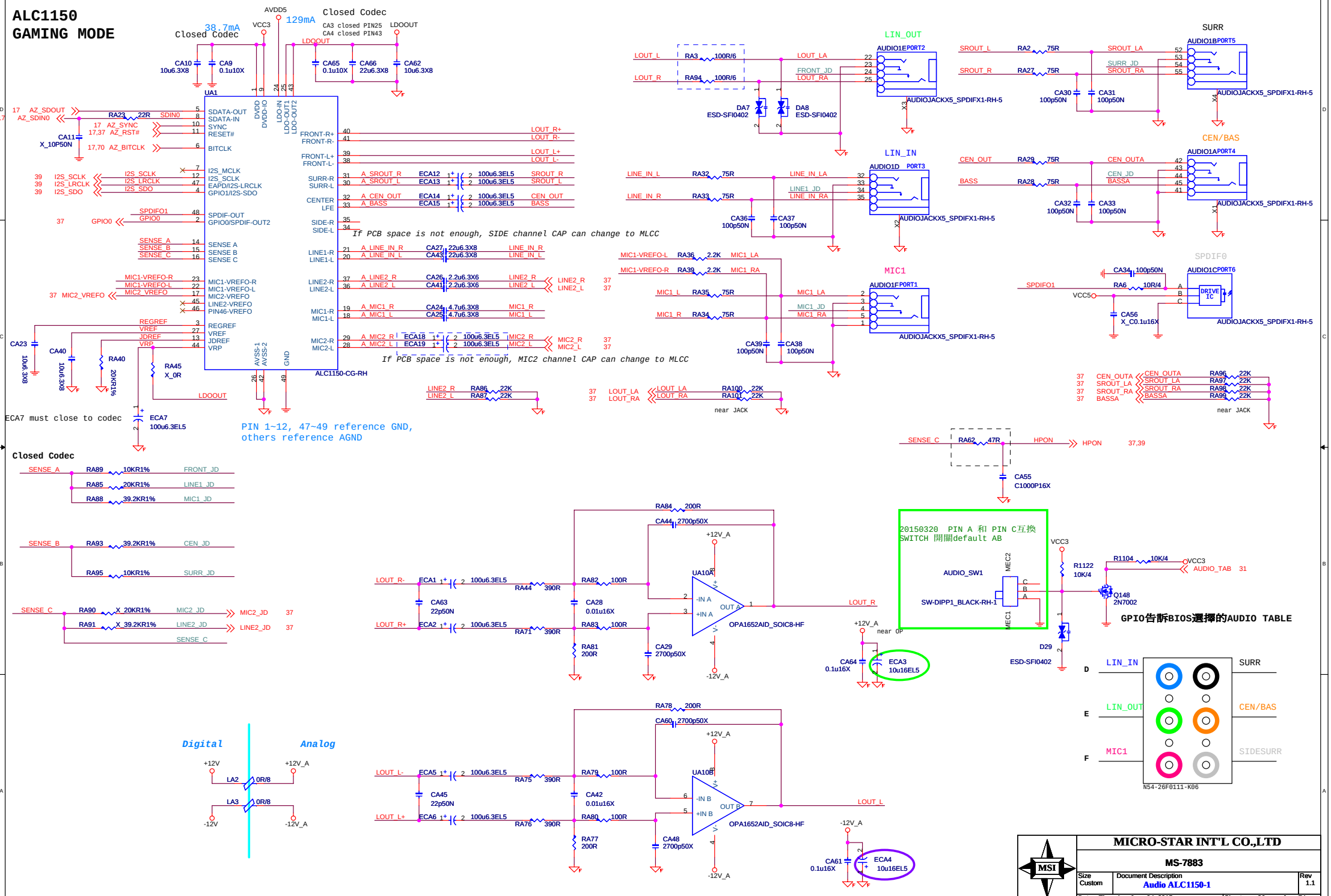


燒錄CONNECT

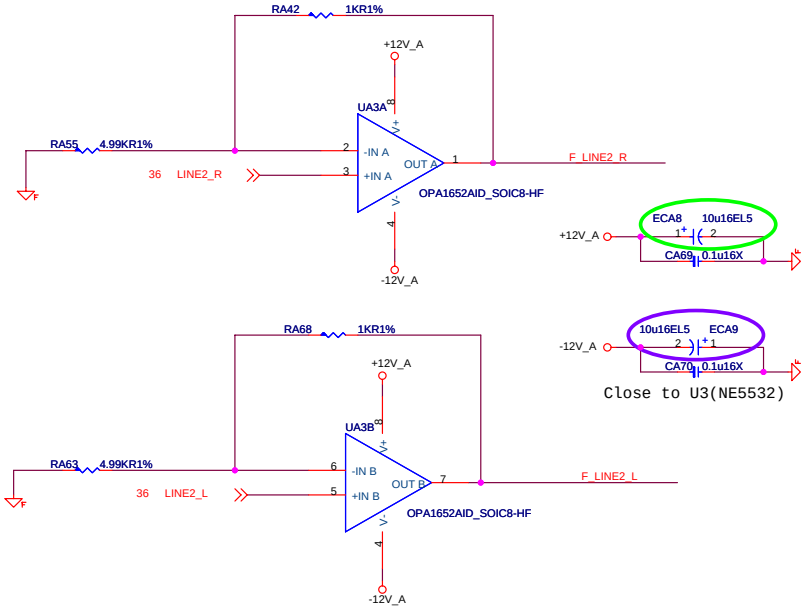


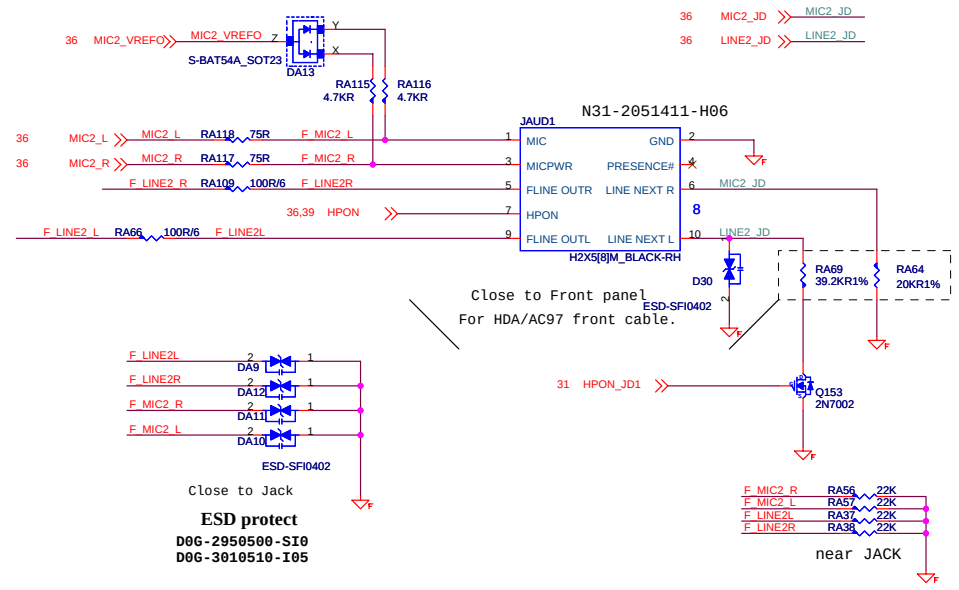
MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7883	
Size: Custom	Document Description: MCU-LPC812	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 35 of 74	

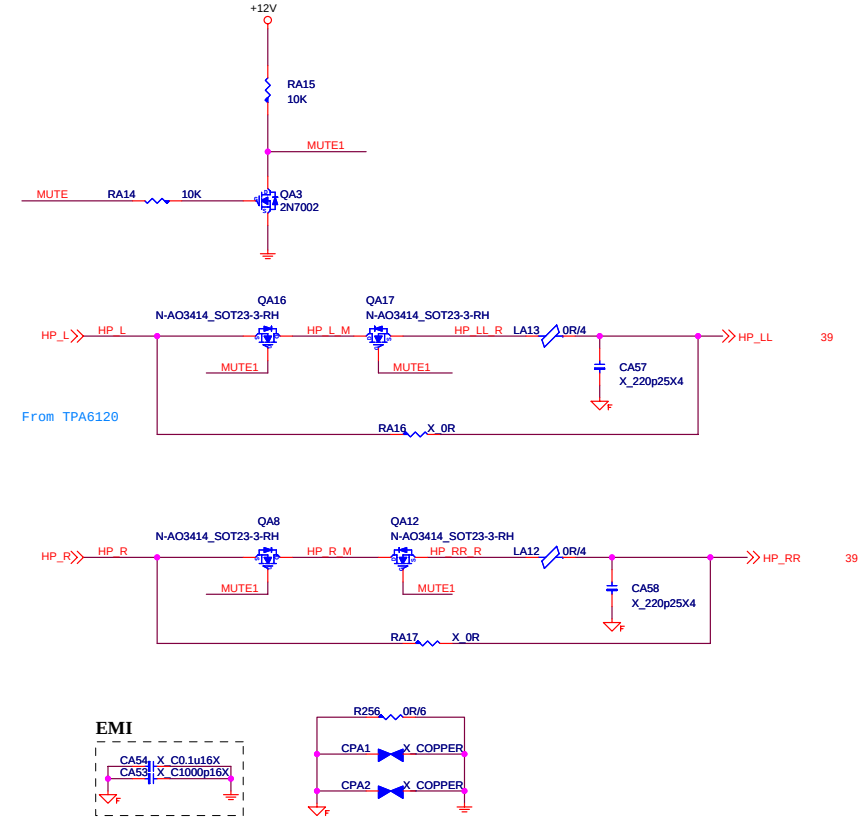
ALC1150
GAMING MODE

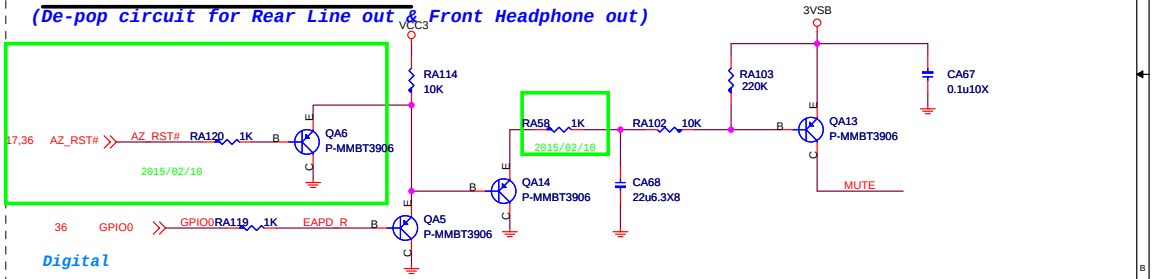


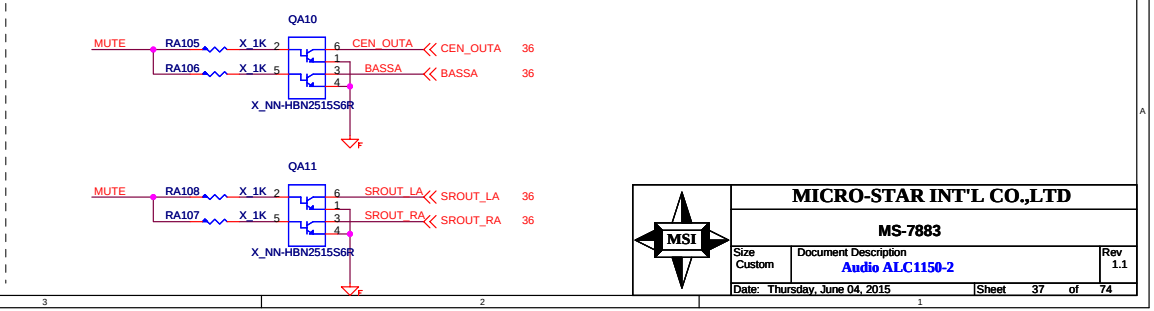
MICRO-STAR INT'L CO.,LTD	
MS-7883	
Size: Custom	Document Description: Audio ALC1150-1
Rev: 1.1	
Date: Thursday, June 04, 2015	Sheet 36 of 74











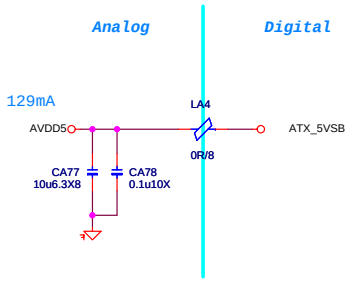
MICRO-STAR INT'L CO.,LTD

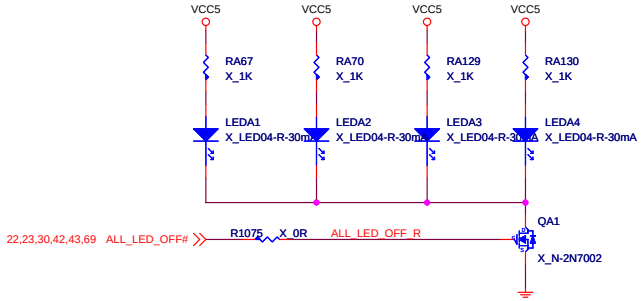
MS-7883

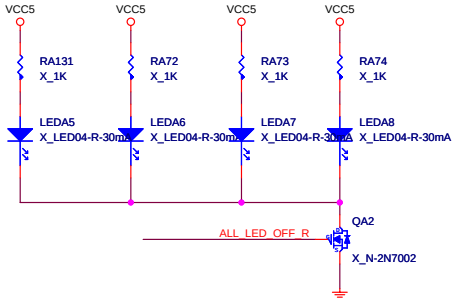
Size	Document Description	Rev
Custom	Audio ALC1150-2	1.1

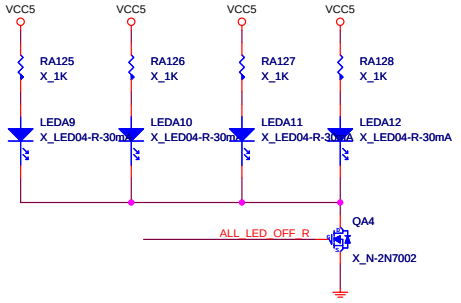
Date: Thursday, June 04, 2015 Sheet 37 of 74

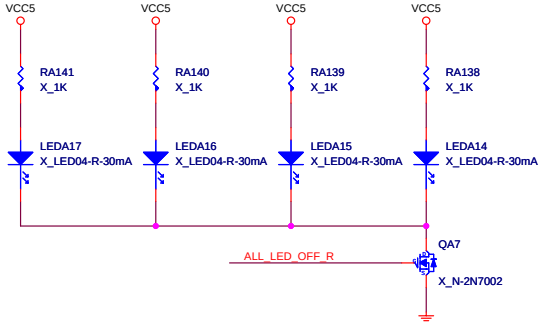
Audio moat is transparent and width 40mil











MICRO-STAR INT'L CO.,LTD

MS-7883

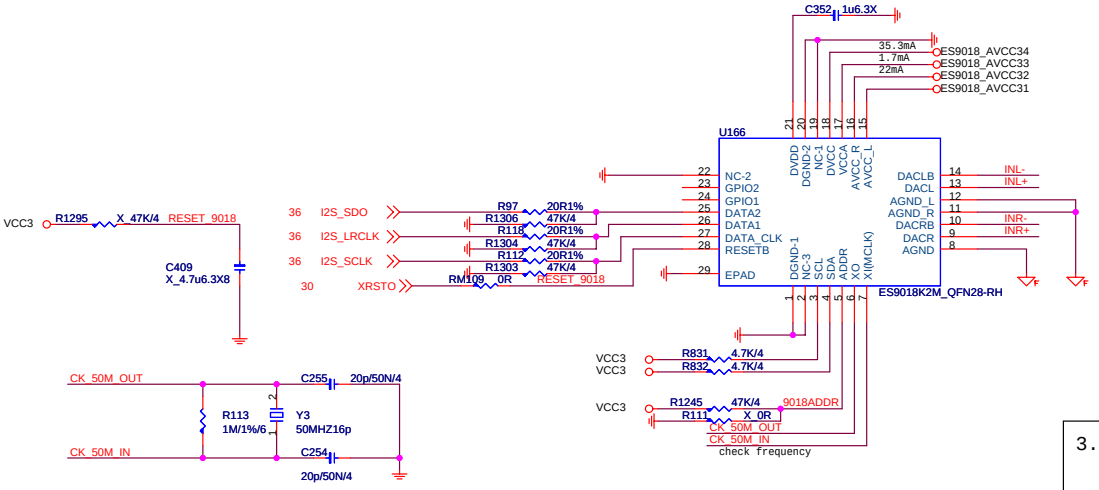
Size	Document Description	Rev
Custom	Audio power/ LED	1.1

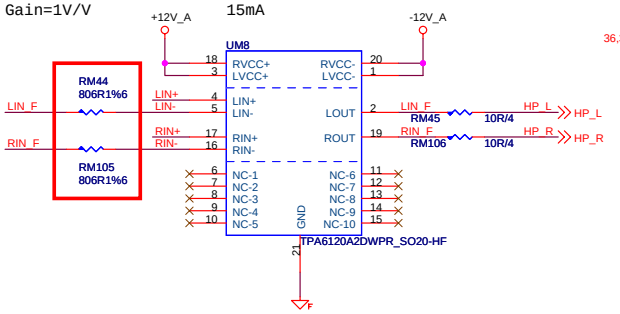
Date: Thursday, June 04, 2015 Sheet 38 of 74

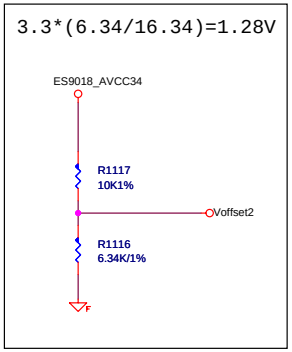
ADDR	CHIP ADDRESS
0	0x90
1	0x92

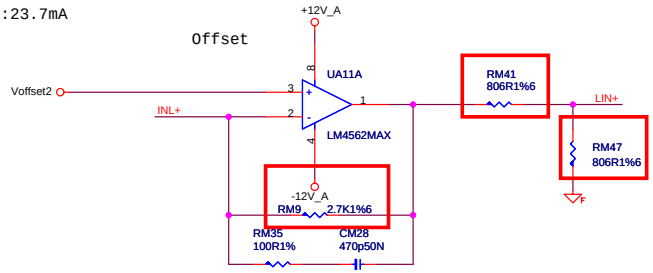
AVCCDAC3.3(MCLK=50MHz, Fs=192kHz):max W=71.5mW, I=21.667mA
DVCC3.3(MCLK=50MHz, Fs=192kHz):max W=116.48mW, I=35.3mA
VCCA3.3(MCLK=50MHz, Fs=192kHz):max W=5.5mW, I=1.667mA
DVDD1.2:max I=0A
Toatal(MCLK=50MHz, Fs=192kHz):max W=193.48mW, I=58.63mA

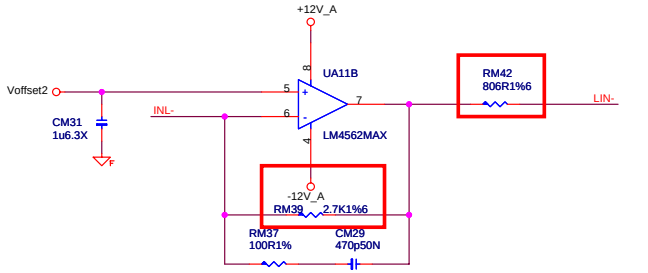
MVCC3:35.3mA
M_AVCC3:23.7mA

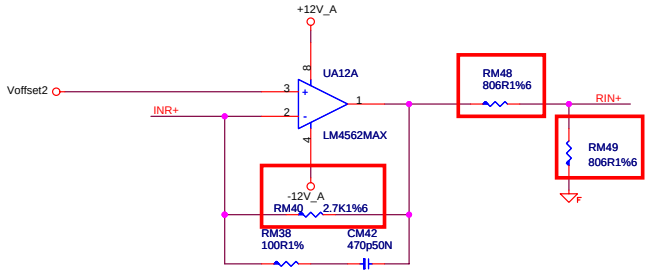


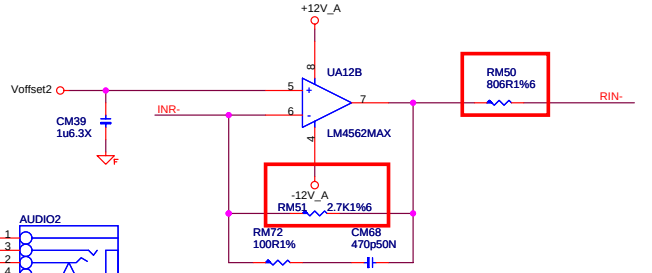








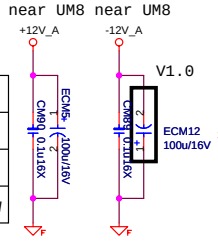


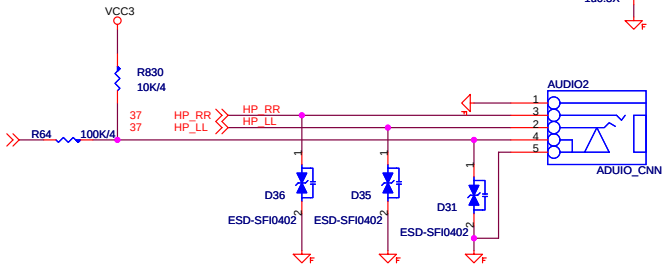


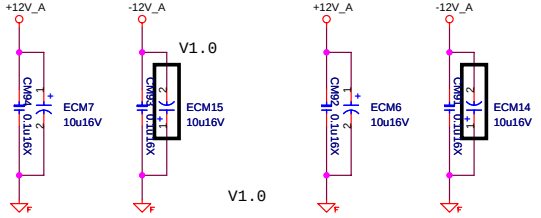
ESS9016 Vrms = 2V
When Vrms > 4V, TVS need > Vrms 4V

	Gain=1 Vrms=2	Gain=1.5 Vrms=3	Gain=2 Vrms=4
Vrms > 0.3V 32 ohm	125mW	281.25mW	500mW
Vrms > 1V 320 ohm	12.5mW	28.125mW	50mW
600 ohm	6.67mW	15mW	26.67mW

Po = (V^2)/R
12.5mW < Po < 100mW







ESS9016 Vrms = 0.8V

	Gain=1.5 Vrms=1.2
32 ohm	45mW

ESS9016 Vrms = 1V

	Gain=1.5 Vrms=1.5
32 ohm	70.32mW

ESS9016 Vrms = 1.1V

	Gain=1.5 Vrms=1.65
32 ohm	85.08mW

ESS9016 Vrms = 1.15V
Sony suggest

	Gain=1.5 Vrms=1.725
32 ohm	92.99mW

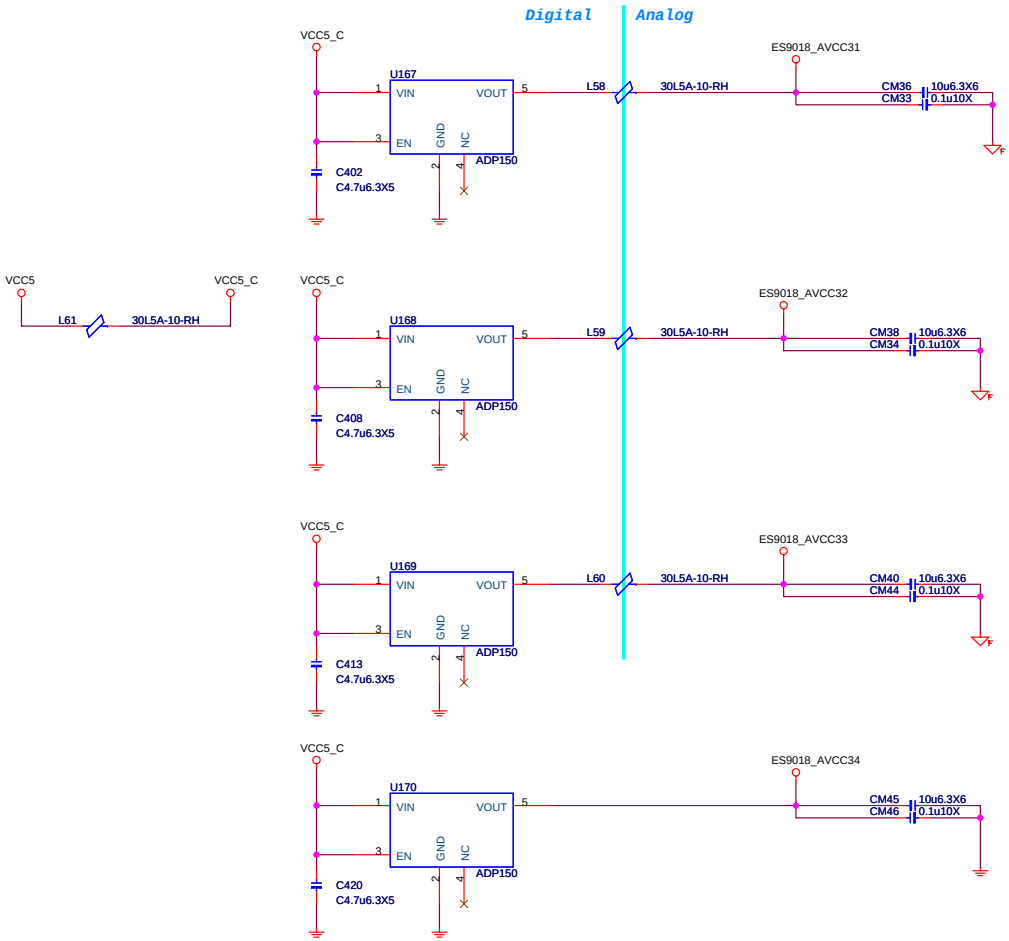
ESS9016 Vrms = 1.2V

	Gain=1.5 Vrms=1.8
32 ohm	101.25mW

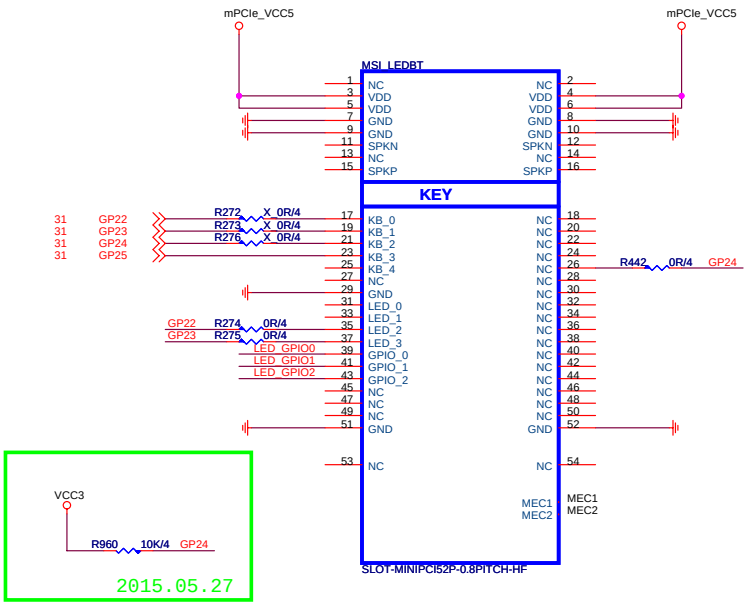
MICRO-STAR INT'L CO.,LTD

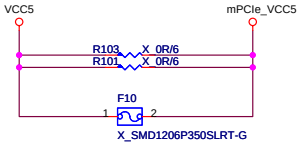
MS-7883

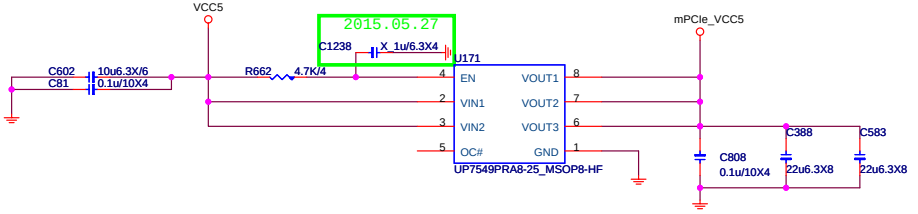
Size: Custom
Document Description: XDP / Manual Parts
Rev: 1.1
Date: Thursday, June 04, 2015
Sheet 39 of 74

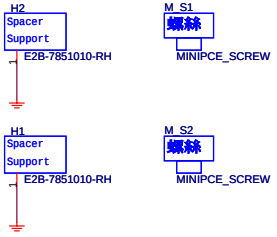


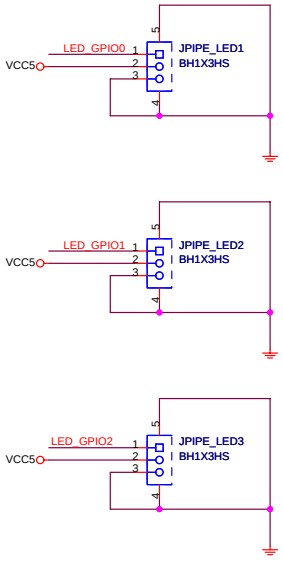
MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: XDP / Manual Parts	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 40 of 74	









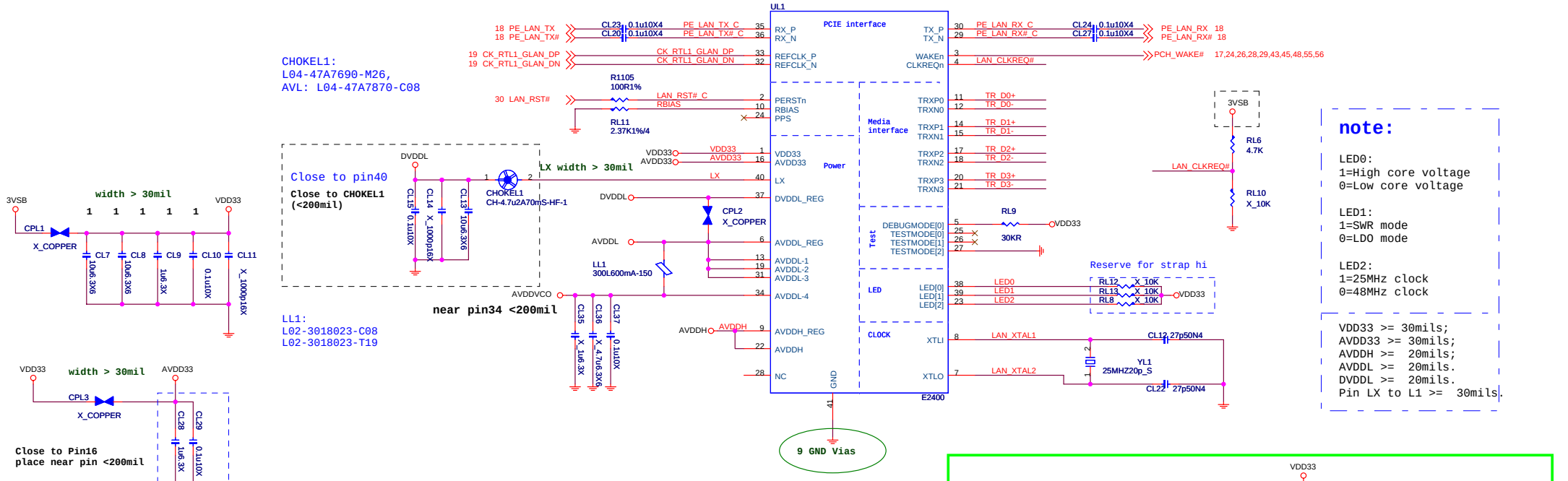


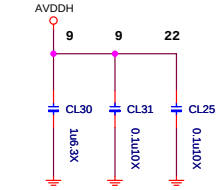
MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7883	
Size: Custom	Document Description: XDP / Manual Parts	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 41 of 74	

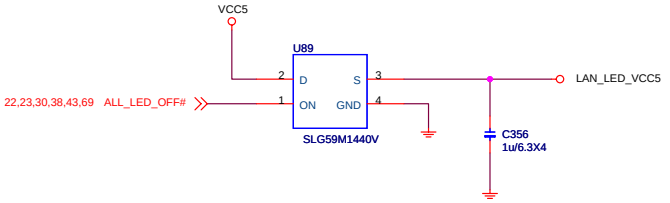
E2400 Giga LAN

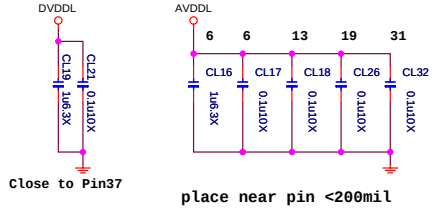
CHOKEL1:
L04-47A7690-M26,
AVL: L04-47A7870-C08

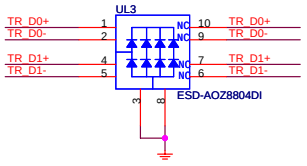
LL1:
L02-3018023-C08
L02-3018023-T19

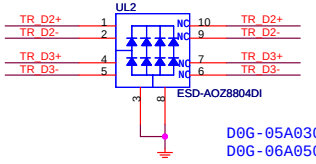




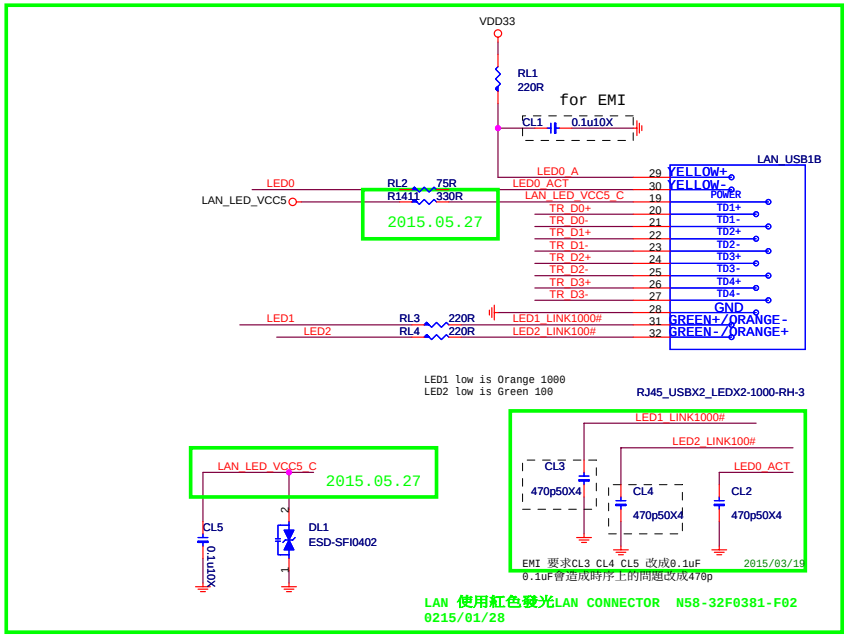








D0G-05A0300-I14
D0G-06A050C-A68



note:

LED0:
1=High core voltage
0=Low core voltage

LED1:
1=SWR mode
0=LDO mode

LED2:
1=25MHz clock
0=48MHz clock

VDD33 >= 30mils;
AVDD33 >= 30mils;
AVDDH >= 20mils;
AVDDL >= 20mils.
DVDDL >= 20mils.
Pin LX to L1 >= 30mils.

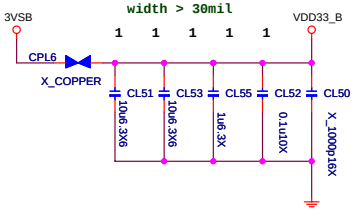
MICRO-STAR INT'L CO.,LTD

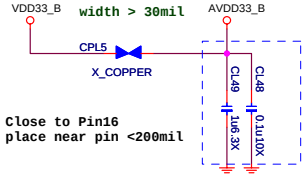
MS-7883

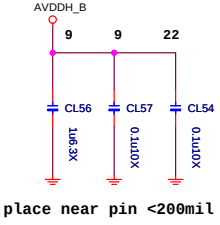
Size	Document Description	Rev
Custom	LAN RTL8111G/8106E	1.1

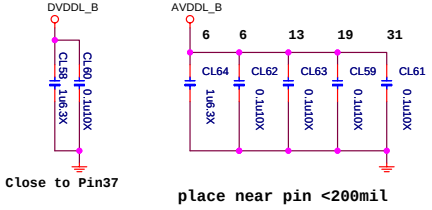
Date: Thursday, June 04, 2015 Sheet 42 of 74

E2240 Giga LAN

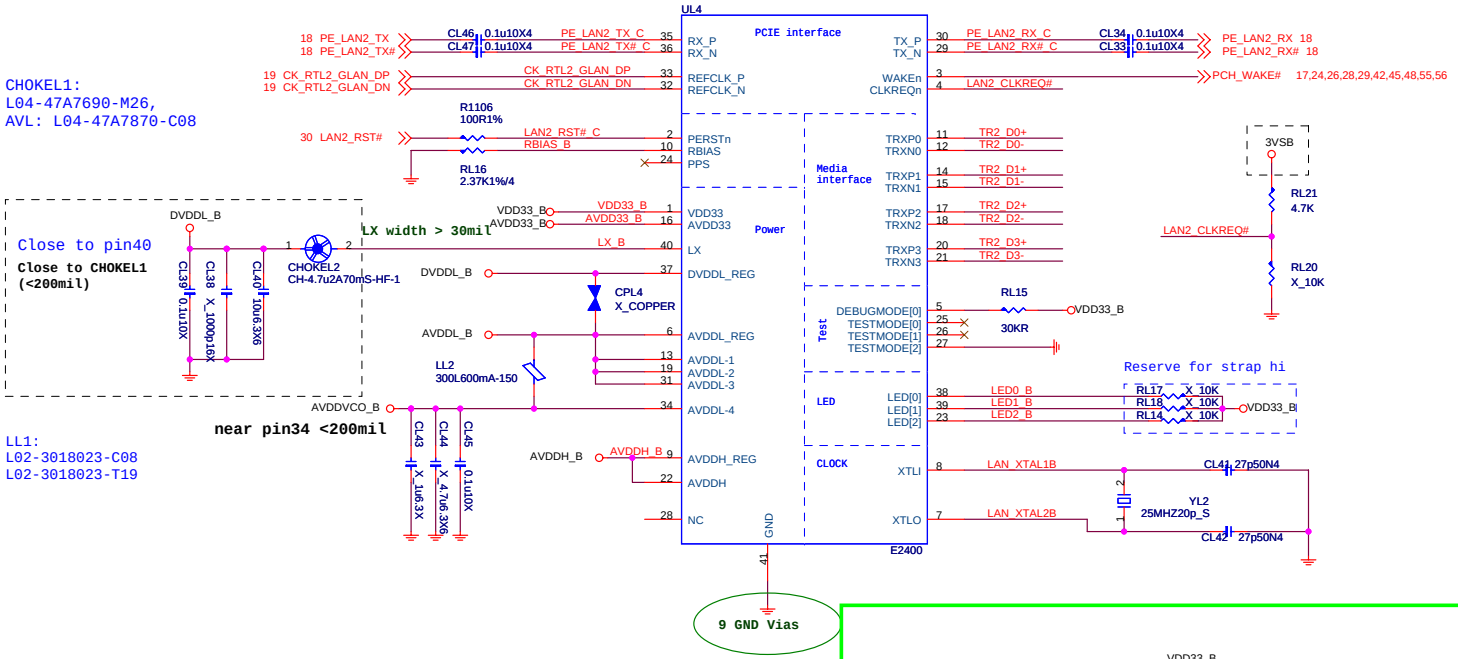




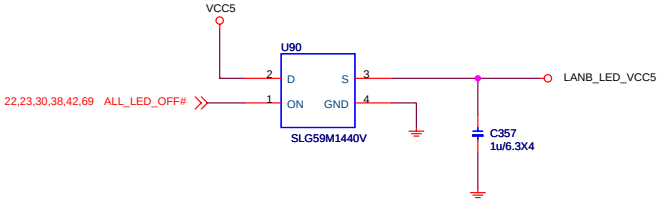


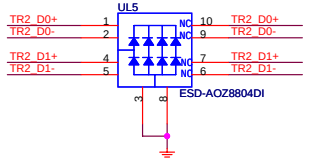


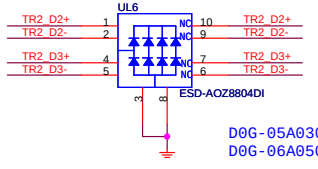
CHOKEL1:
L04-47A7690-M26,
AVL: L04-47A7870-C08



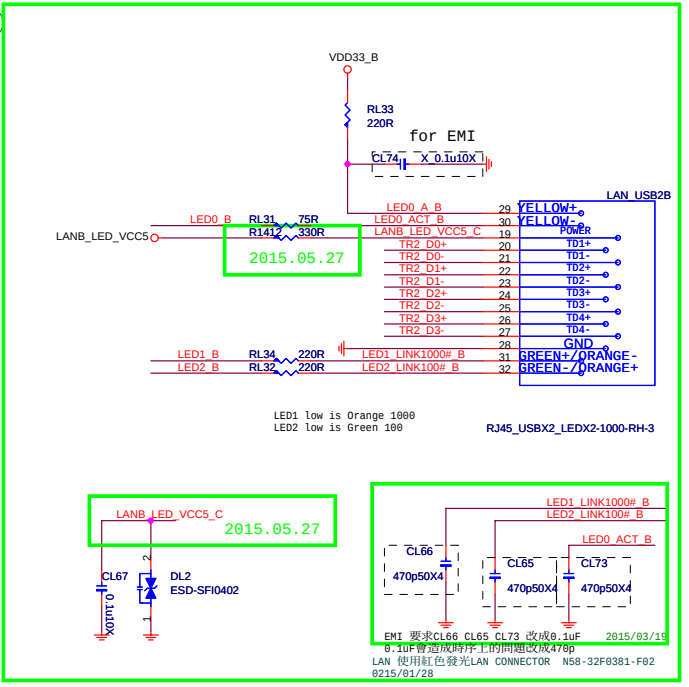
LL1:
L02-3018023-C08
L02-3018023-T19







D0G-05A0300-I14
D0G-06A050C-A68



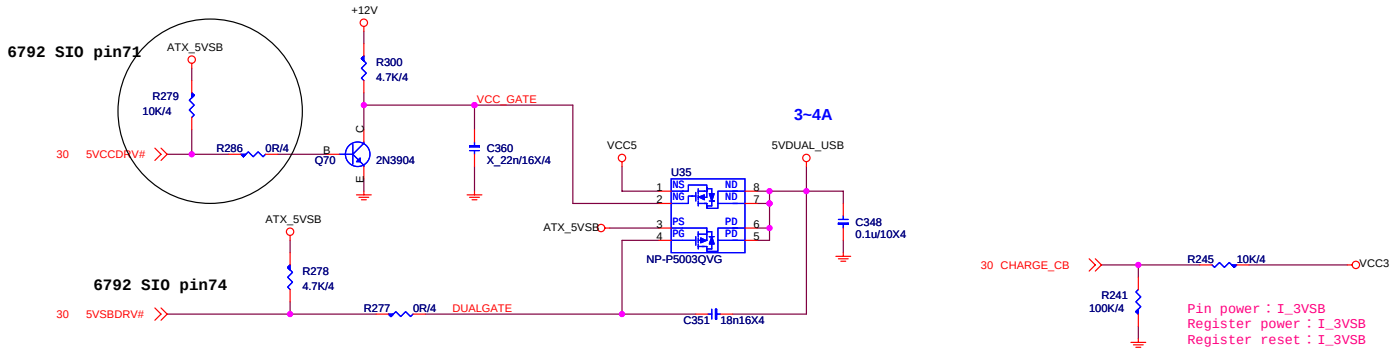
MICRO-STAR INT'L CO.,LTD

MS-7883

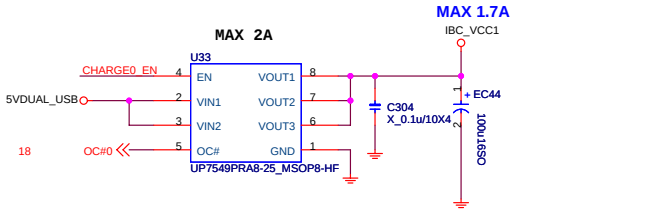
Size	Document Description	Rev
Custom	PCH Power - OP+MOS	1.1

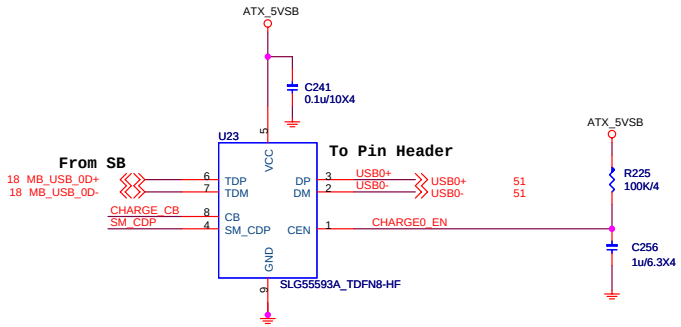
Date: Thursday, June 04, 2015 | Sheet 43 of 74

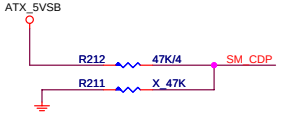
5VDUAL_USB



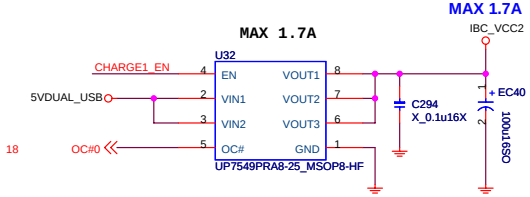
USB POWER PORT 0 For USB Charging

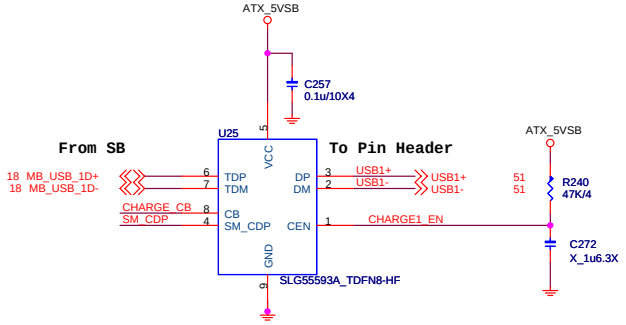






USB POWER PORT 1 For USB Charging





MICRO-STAR INT'L CO.,LTD	
MS-7883	
Size: Custom	Document Description: USB CHARGE_SLG55593A
Rev: 1.1	
Date: Thursday, June 04, 2015	Sheet 44 of 74

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

CLK Rule (Follow SB PDG)

PCIE Rule (Follow SB PDG)

USB HS (90Ohm-Diff)

USB HS (90Ohm-Diff)

USB SS (80Ohm-Diff)

USB SS (80Ohm-Diff)

OCI_X Internal Pull-up to SUS

RX/TX Internal Pull-up

USB3.0:
Stuff RU29 100K
USB3.1:
Stuff RU29 80K

SMI connect to GPI which
support smi function.
SB side need pull high 10K ohm to 3VSB.

ASM1142_SMI1# has internal pull-up

Power Consumption

	3.3V	1.05V(1.2V	3.3VSUS	1.05VSUS(1.2VSUS)	Total Power
ASM1042AE	95mA	300mA	65mA	9.5mA	852.975(mW)
ASM1142	245mA	634mA	1mA	1mA	1573.8(mW)

3.3V: 95mA
3.3VSUS:65mA

1.05V: 300mA
1.05VSUS: 5.8mA

USB3.1 power switch

ASM1142 change to 2.2uF cap

ASM1142 change to 2.2uF cap

Updata 2011.10.14
Prevention crystal not work yet.

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

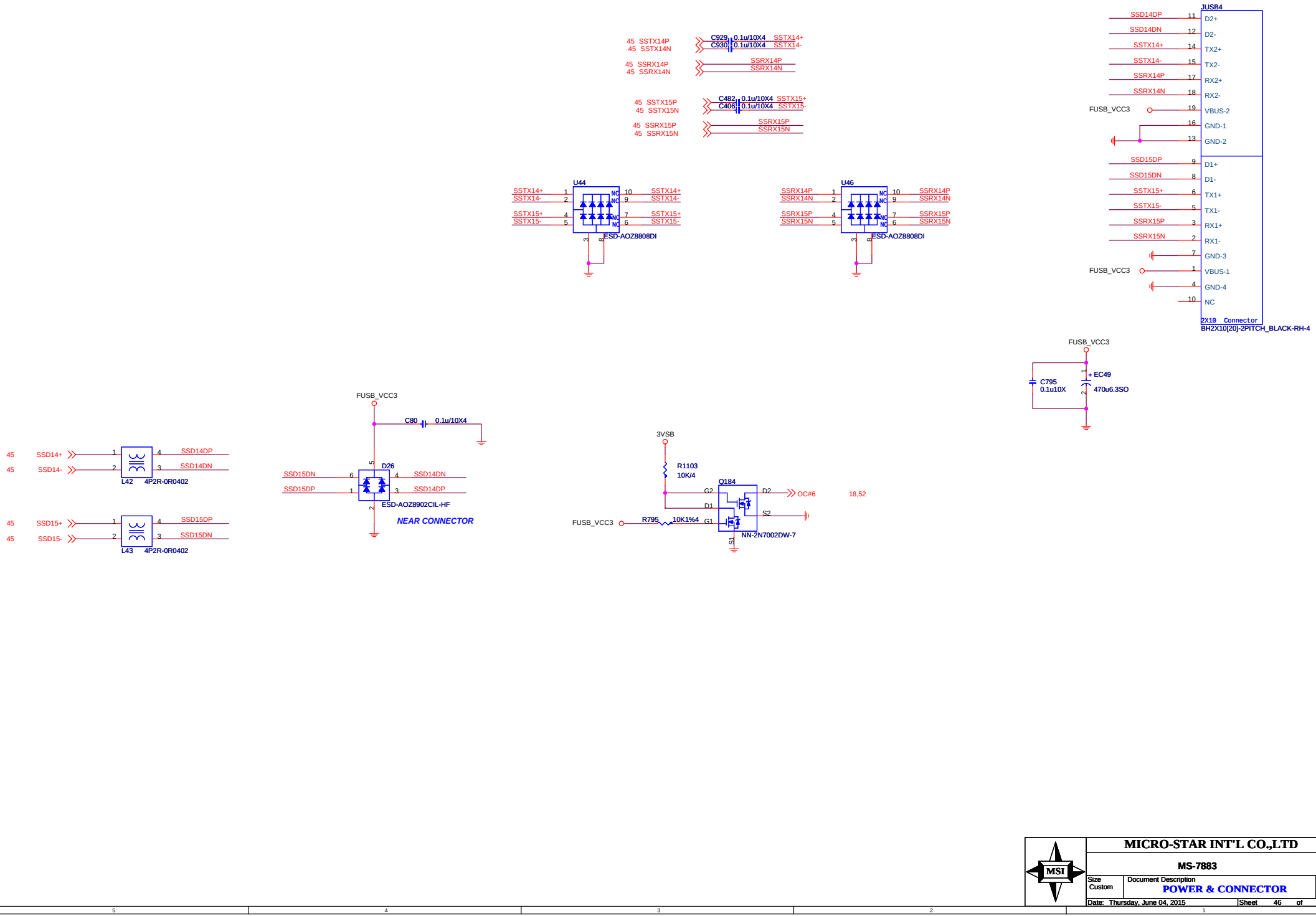
ASM1042 1.05 VSB Power

300 mA

If use ASM1142 USB3.1 IC , RU32 change to 19.6K
,let voltage output 1.2V

EEPROM

MICRO-STAR INT'L CO.,LTD	
MS-7883	
Size: Custom	Document Description: USB3.0colay3.1
Date: Thursday, June 04, 2015	Sheet 45 of 74



MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7883	
Size: Custom	Document Description: POWER & CONNECTOR	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 46 of 74	

MICRO-STAR INT'L CO.,LTD

MS-7883

Size	Document Description	Rev
Custom	Front USB3.1 switch	1.1

Date: Thursday, June 04, 2015 | Sheet 47 of 74

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

CLK Rule (Follow SB PDG)

PCIE Rule (Follow SB PDG)

USB HS (90Ohm-Diff)

USB SS (80Ohm-Diff)

USB HS (90Ohm-Diff)

USB SS (80Ohm-Diff)

20150309 換成80.6K

USB3.0:
Stuff RU29 100K
USB3.1:
Stuff RU29 80K

OCI_X Internal Pull-up to SUS

RX/TX Internal Pull-up

SMI connect to GPI which
support smi function.
SB side need pull high 10K ohm to 3VSB.

ASM1142_SMI1# has internal pull-up

Updata 2011.10.14
Prevention crystal not work yet.

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

Power Consumption

	3.3V	1.05V(1.2V	3.3VSUS	1.05VSUS(1.2VSUS	Total Power
ASM1042AE	95mA	300mA	65mA	9.5mA	852.975(mW)
ASM1142	245mA	634mA	1mA	1mA	1573.8(mW)

3.3V: 95mA 1.05V: 300mA
3.3VSUS:65mA 1.05VSUS: 5.8mA

USB3.1 power switch

USB3.0:
Stuff RU40 & RU42
Unstuff RU39 & RU41
USB3.1:
Stuff RU39 & RU41
Unstuff RU40 & RU42

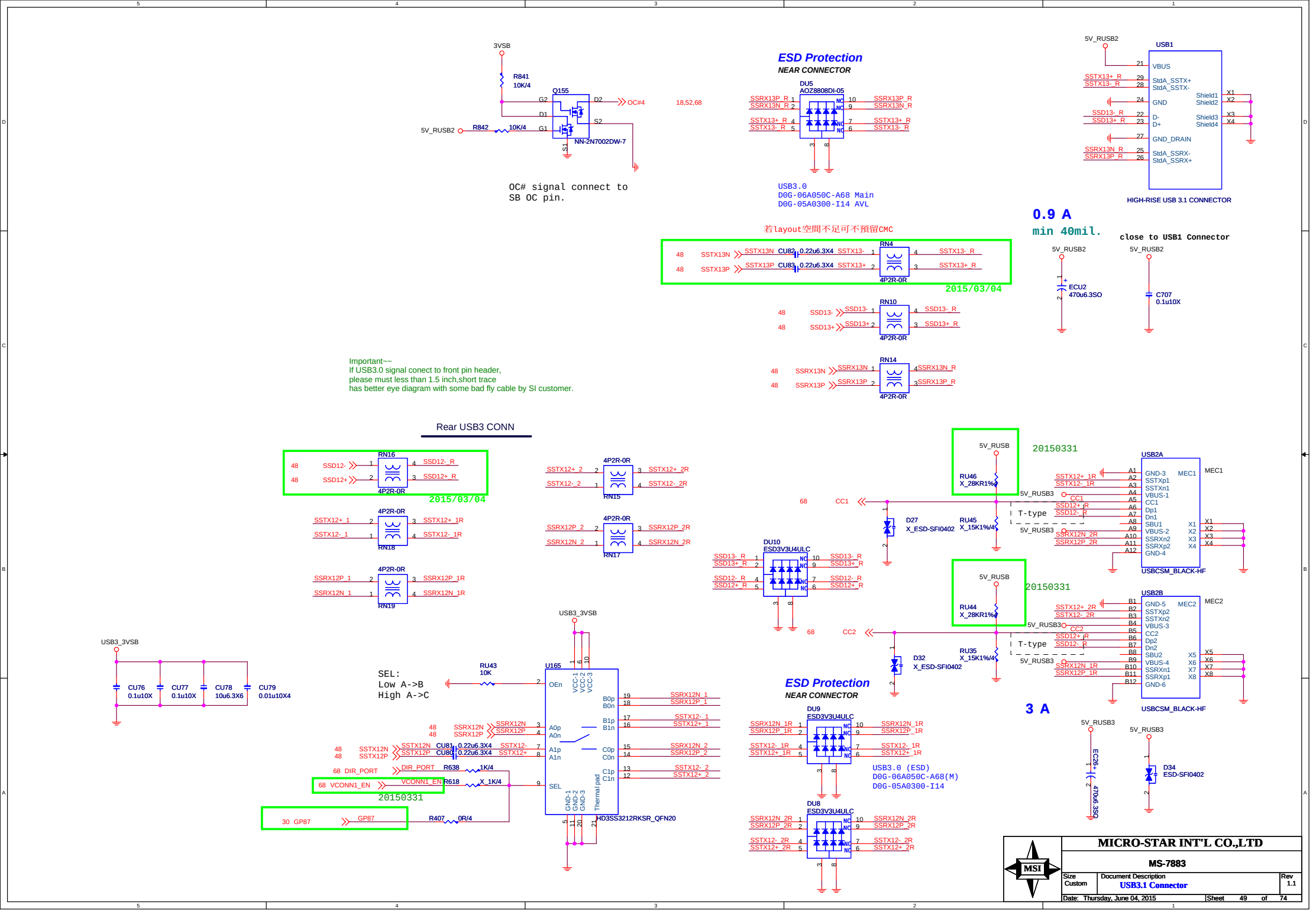
ASM1042 3VSB Circuit

ASM1042 1_2VSB Power

300 mA

EEPROM

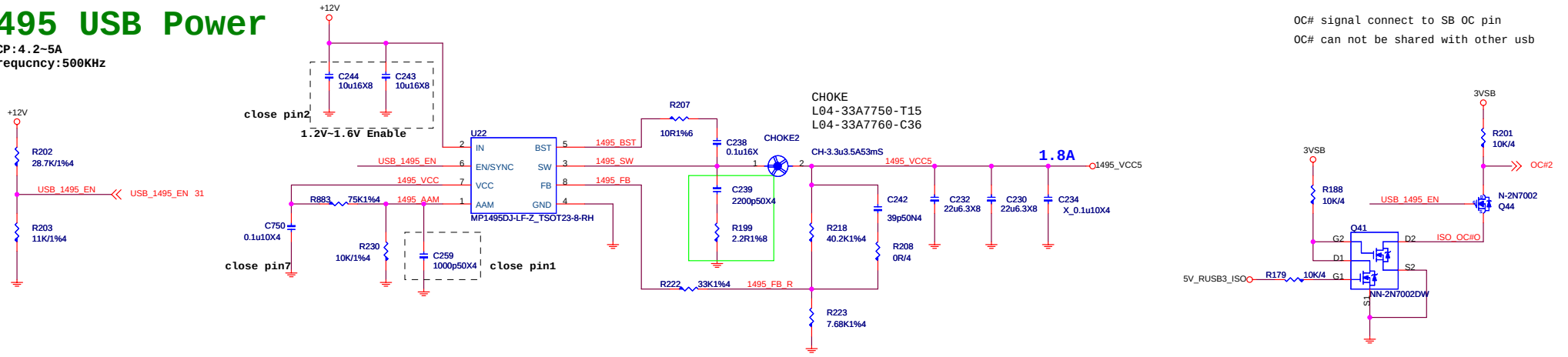
MICRO-STAR INT'L CO.,LTD	
MS-7883	
Size: Custom	Document Description: USB3.1
Rev: 1.1	
Date: Thursday, June 04, 2015	Sheet 48 of 74

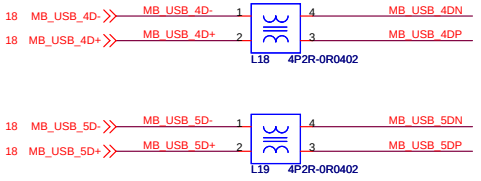

3VSB
R841
10K/4
Q155
G2
D2
OC#4
18,52,68
D1
S2
5V_RUSB2
R842
10K/4
G1
NN-2N7002DW-7
S1
OC# signal connect to
SB OC pin.
ESD Protection
NEAR CONNECTOR
DU5
AOZ8808DI-05
SSRX13P_R
SSRX13N_R
SSTX13+_R
SSTX13-_R
USB3.0
D0G-06A050C-A68 Main
D0G-05A0300-I14 AVL
USB1
VBUS
StdA_SSTX+
StdA_SSTX-
GND
D-
D+
GND_DRAIN
StdA_SSRX-
StdA_SSRX+
Shield1
Shield2
Shield3
Shield4
HIGH-RISE USB 3.1 CONNECTOR
0.9 A
min 40mil.
close to USB1 Connector
若layout空間不足可不預留CMC
SSTX13N
SSTX13P
CU82
CU83
0.22u6.3X4
RN4
4P2R-0R
2015/03/04
SSD13-
SSD13+
RN10
SSRX13N
SSRX13P
RN14
ECU2
470u6.3SO
C707
0.1u10X
Important~~
If USB3.0 signal conect to front pin header,
please must less than 1.5 inch,short trace
has better eye diagram with some bad fly cable by SI customer.
Rear USB3 CONN
RN16
SSD12-
SSD12+
RN18
SSTX12+_1
SSTX12-_1
RN19
SSRX12P_1
SSRX12N_1
RN15
SSTX12+_2
SSTX12-_2
RN17
SSRX12P_2
SSRX12N_2
USB3_3VSB
CU76
0.1u10X
CU77
0.1u10X
CU78
10u6.3X6
CU79
0.01u10X4
SEL:
Low A->B
High A->C
RU43
10K
U165
OEn
A0p
A0n
A1p
A1n
B0p
B0n
B1p
B1n
C0p
C0n
C1p
C1n
SEL
VCC-1
VCC-2
VCC-3
GND-1
GND-2
GND-3
Thermal pad
HD3SS3212RKSR_QFN20
DIR_PORT
R638
1K/4
VCONN1_EN
R618
X_1K/4
20150331
GP87
R407
0R/4
5V_RUSB
RU46
X_28KR1%/4
RU45
X_15K1%/4
RU44
RU35
T-type
D27
X_ESD-SFI0402
D32
DU10
ESD3V3U4ULC
USB2A
USB2B
MEC1
MEC2
USBCSM_BLACK-HF
3 A
DU9
DU8
USB3.0 (ESD)
D0G-06A050C-A68(M)
D0G-05A0300-I14
EC26+
470u6.3SO
D34
ESD-SFI0402
MICRO-STAR INT'L CO.,LTD
MS-7883
Size
Custom
Document Description
USB3.1 Connector
Rev
1.1
Date: Thursday, June 04, 2015
Sheet 49 of 74

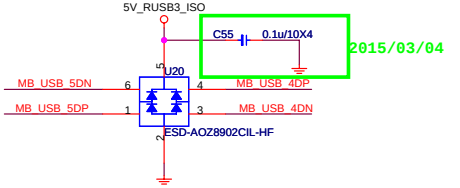
MP1495 USB Power

OCP:4.2~5A
frequcncy:500KHz

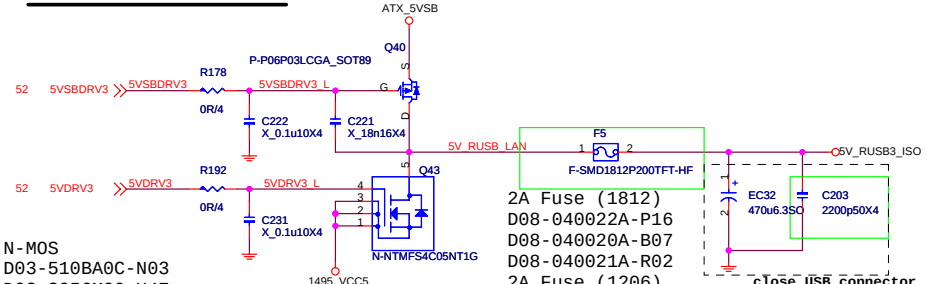
OC# signal connect to SB OC pin
OC# can not be shared with other usb







REAR USB PORT POWER



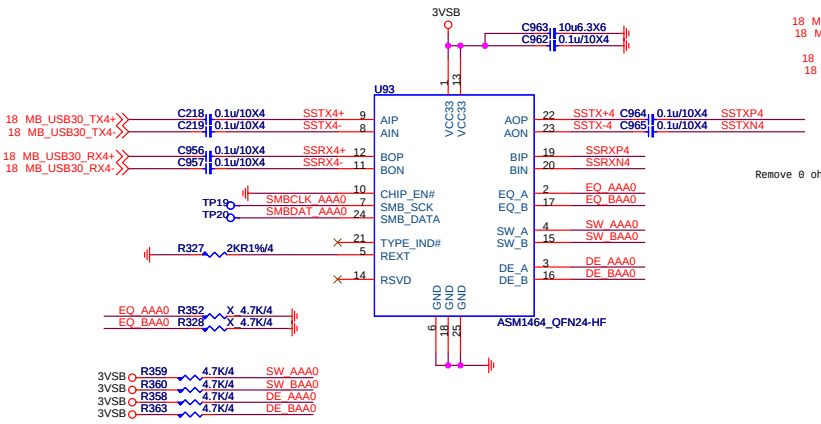
P-MOS
D03-06P0319-N03

N-MOS
D03-510BA0C-N03
D03-3056M00-U47
D03-4C05N03-O05
D03-3830D09-N47
D03-632BA0C-N03

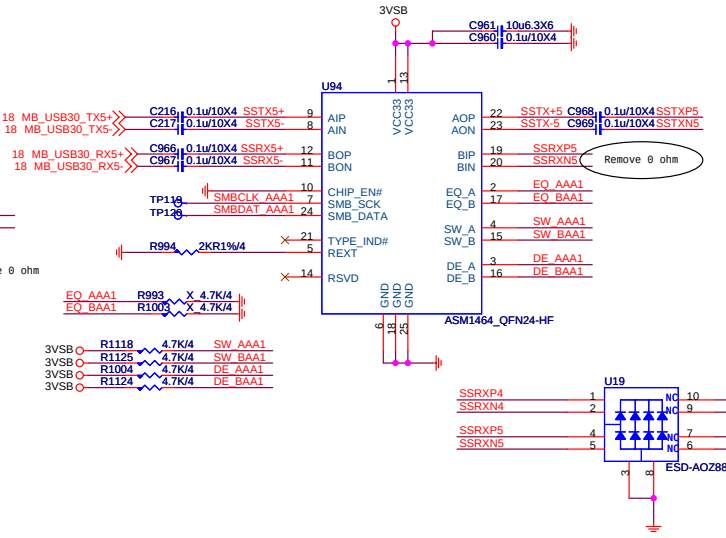
2A Fuse (1812)
D08-040022A-P16
D08-040020A-B07
D08-040021A-R02
2A Fuse (1206)
D08-0400800-B07
D08-0400900-L07

(D03-P500303-N03 N/P MOS can replace Q1/Q2)

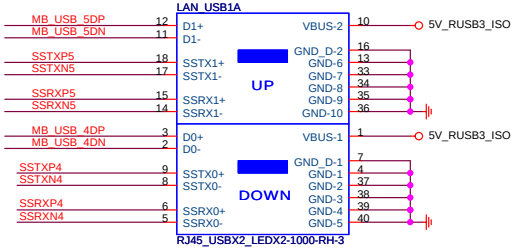
USB3.0 Connector

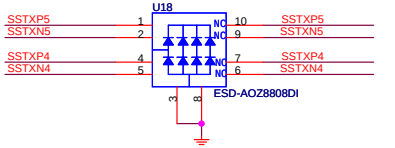


Remove 0 ohm



Remove 0 ohm





MICRO-STAR INT'L CO.,LTD

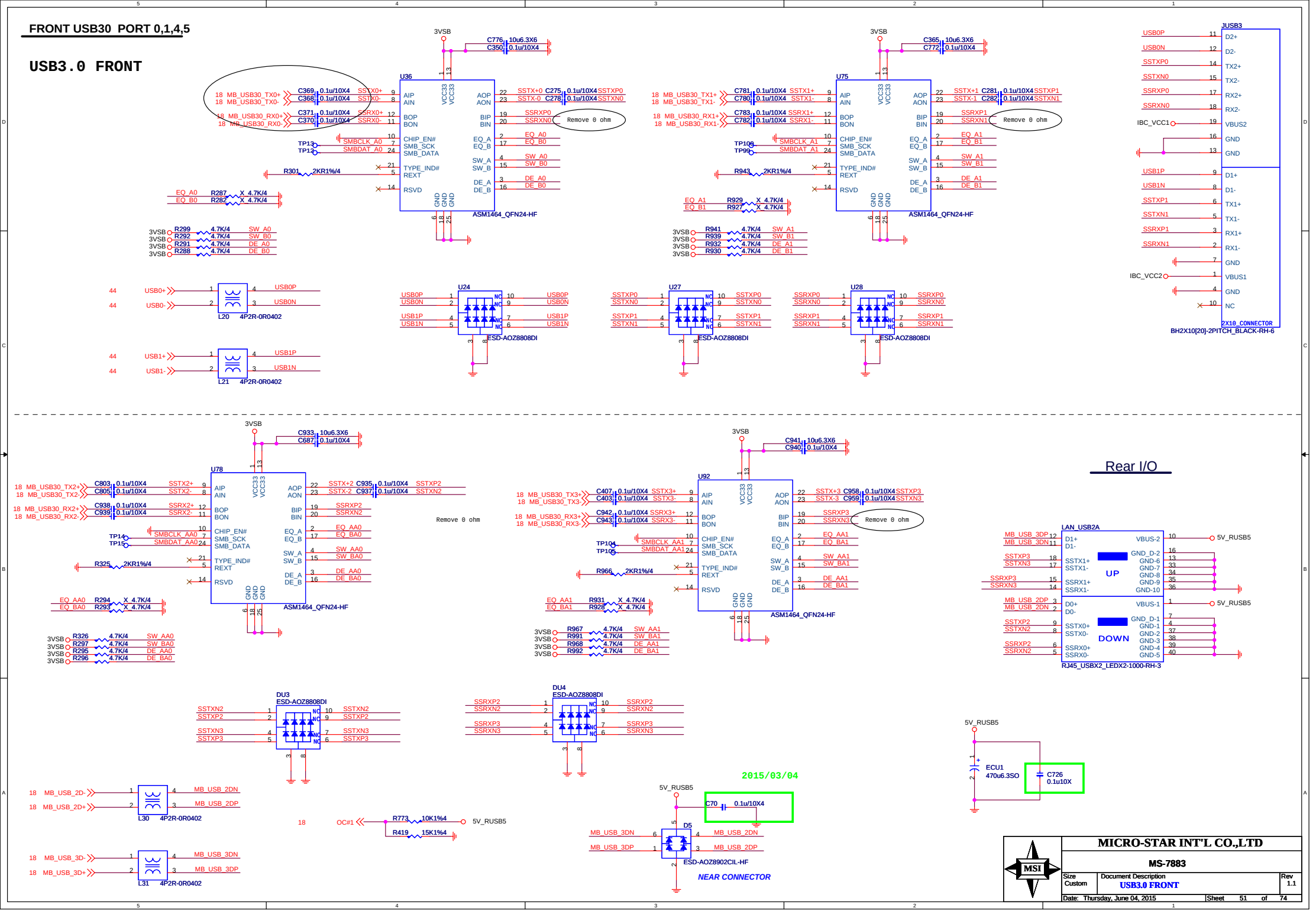
MS-7883

Size	Document Description	Rev
Custom	USB3.0 Connector/MP1495	1.1

Date: Thursday, June 04, 2015 Sheet 50 of 74

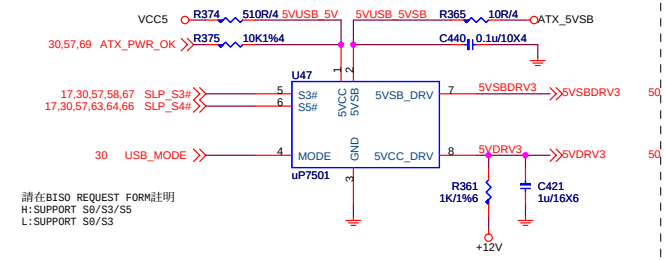
FRONT USB30 PORT 0,1,4,5

USB3.0 FRONT

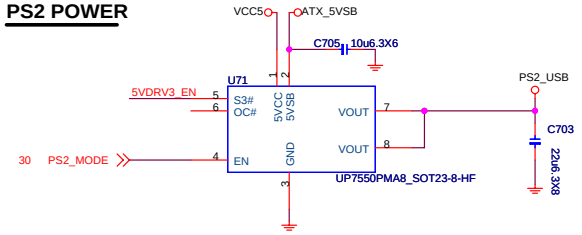


MICRO-STAR INT'L CO.,LTD			
MS-7883			
Size: Custom	Document Description: USB3.0 FRONT		Rev: 1.1
Date: Thursday, June 04, 2015		Sheet 51 of 74	

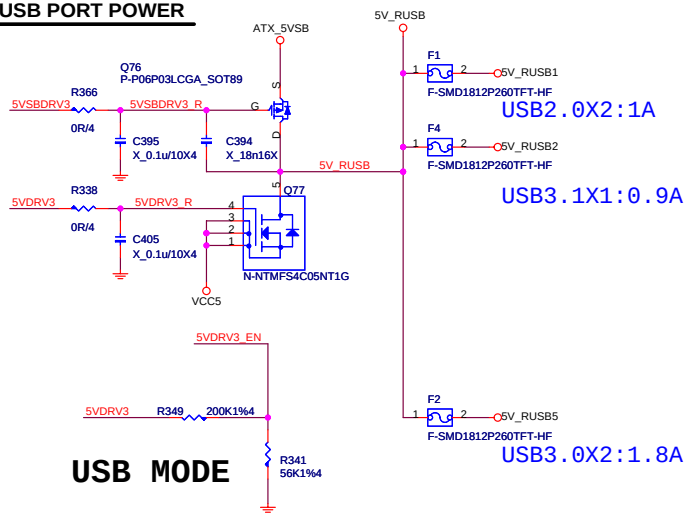
USB POWER



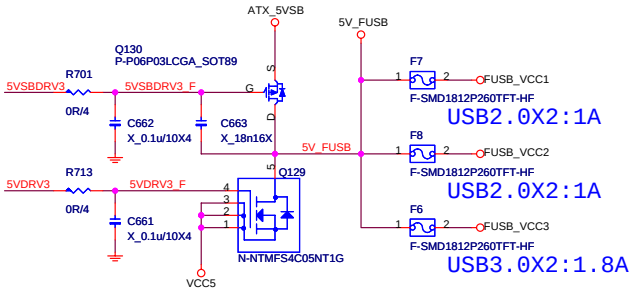
PS2 POWER



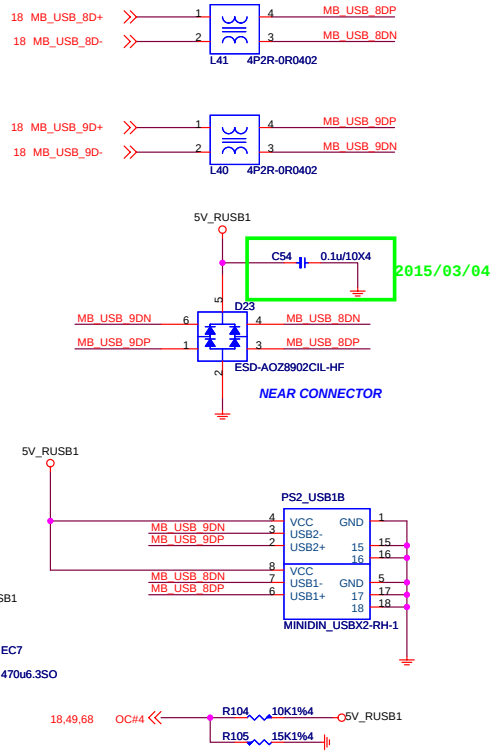
REAR USB PORT POWER



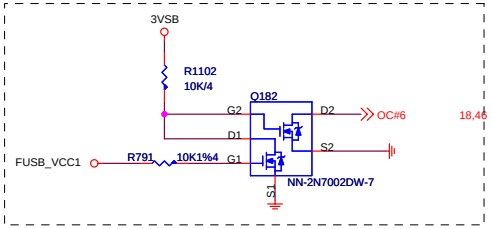
Front USB PORT POWER



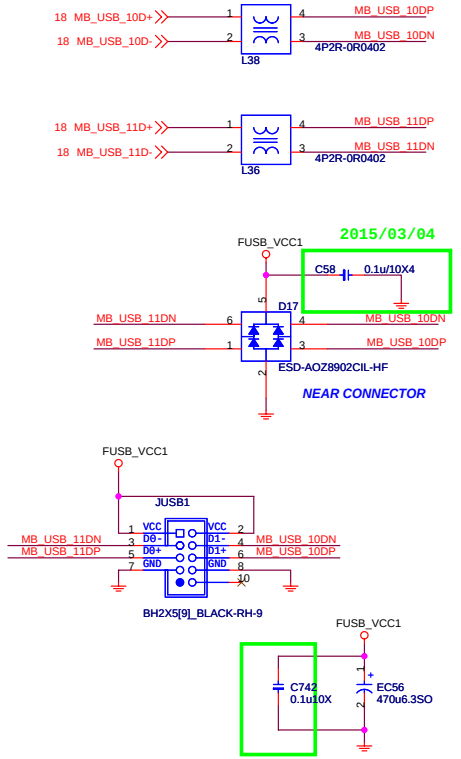
REAR USB PORT 8,9 (With PS2)



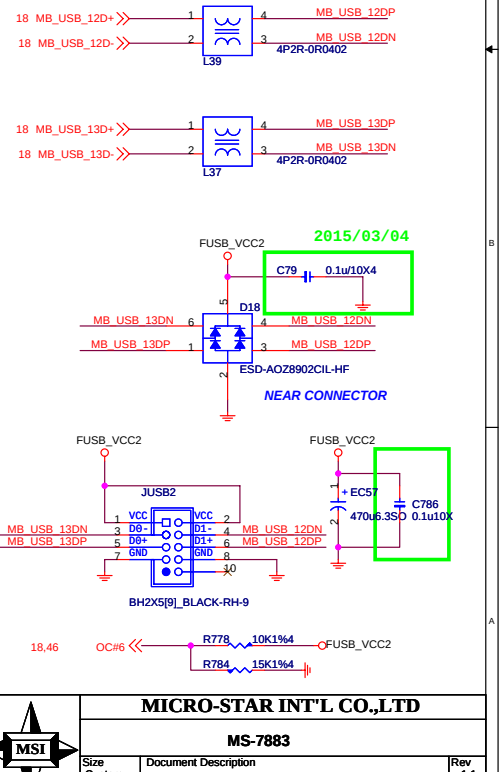
Modify 2014.12.18
From OC5 to OC6
Update 2014.12.30



FRONT USB PORT 10.11



FRONT USB PORT 12,13



MICRO-STAR INT'L CO.,LTD

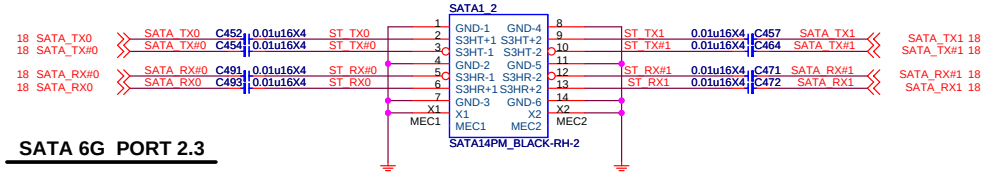
MS-7883

Size	Document Description	Rev
Custom	Rear/Front USB2.0	1.1

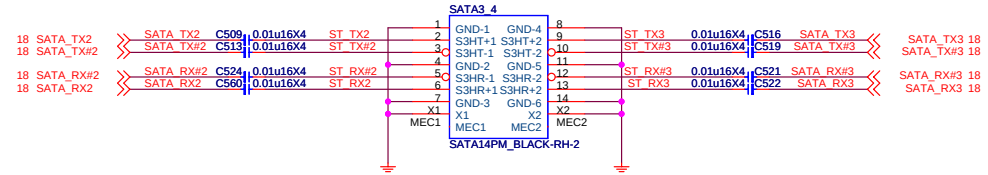
Date: Thursday, June 04, 2015 Sheet 52 of 74

SATA & PCIE Re-driver

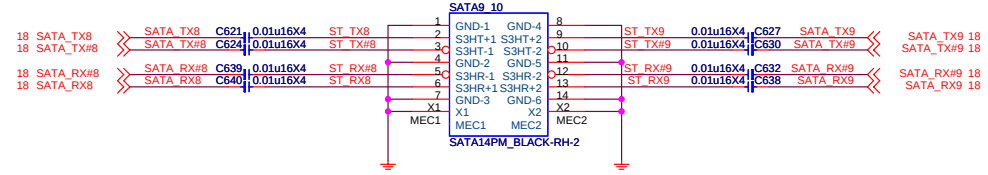
SATA 6G PORT 0.1



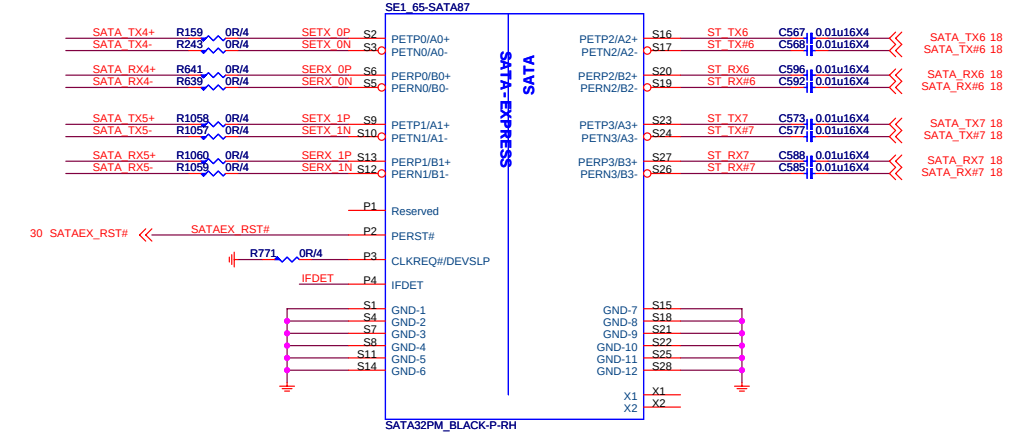
SATA 6G PORT 2.3

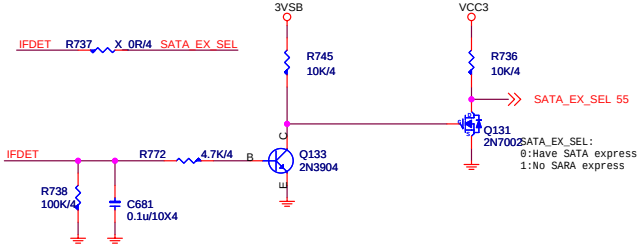


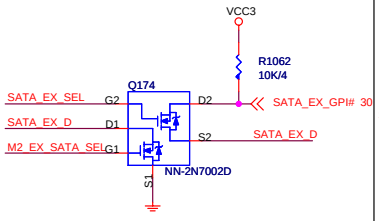
SATA 6G PORT 8.9

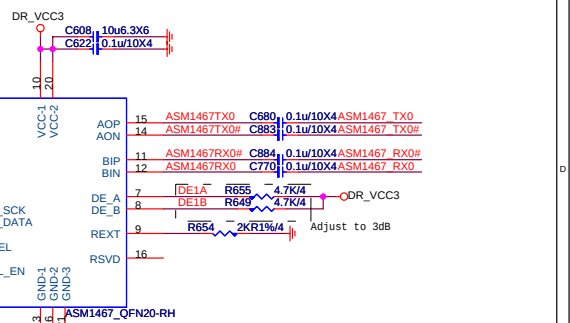


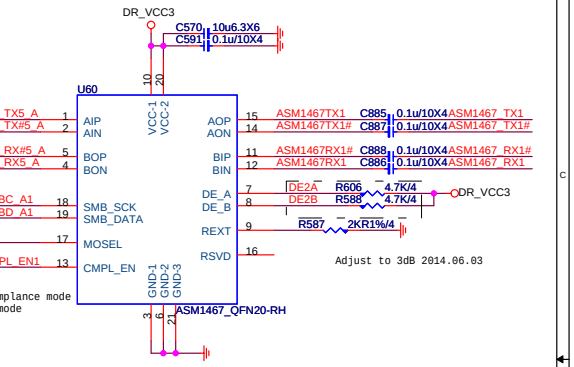
SATA 6G PORT 4.5.6.7 & SATA Express

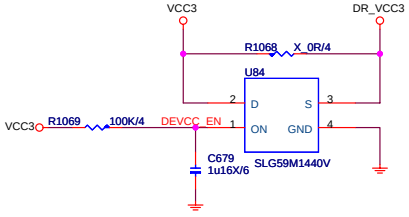


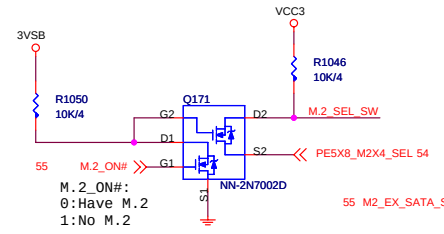


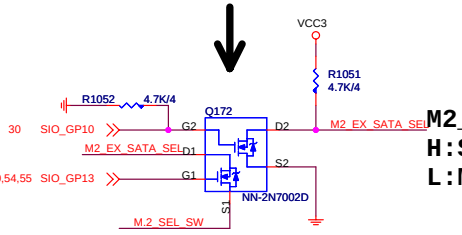


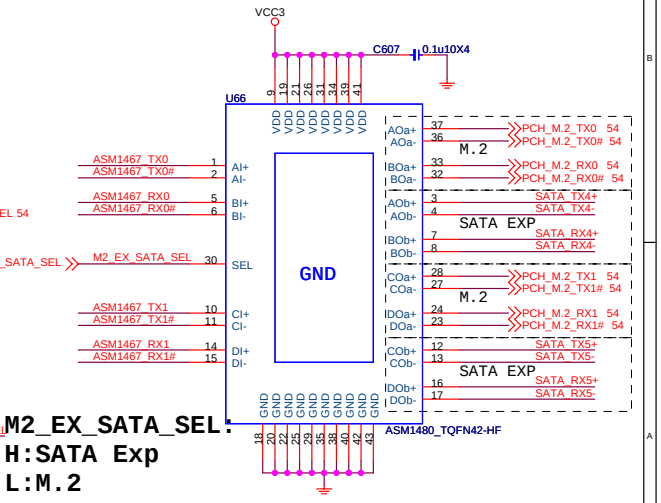






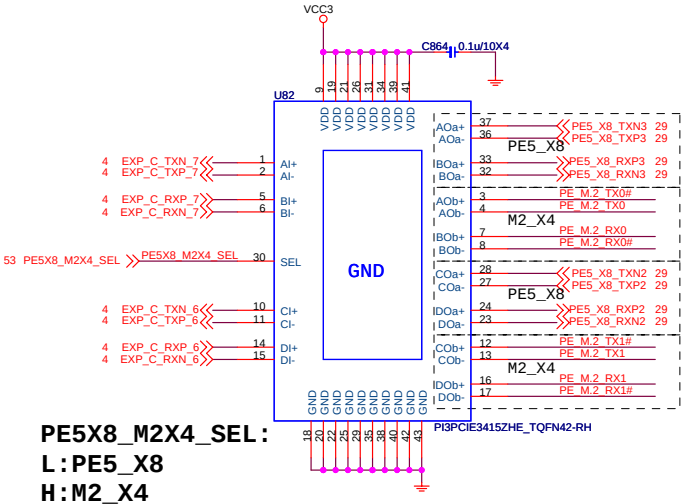




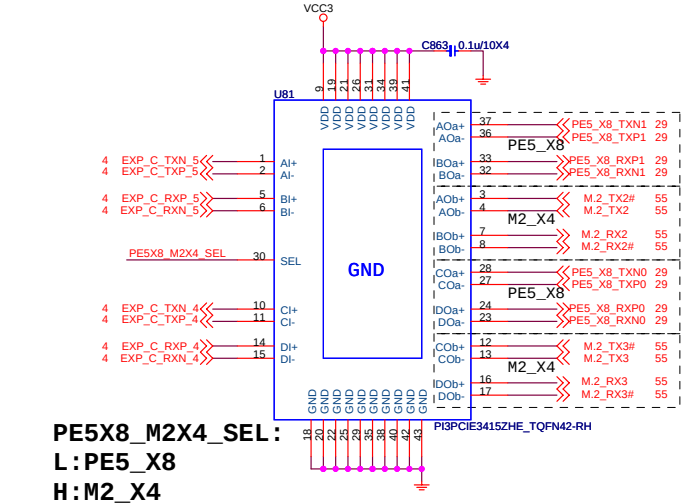


MICRO-STAR INT'L CO.,LTD	
MS-7883	
Size: Custom	Document Description: SATA Connector & Re-driver
Rev: 1.1	
Date: Thursday, June 04, 2015	Sheet 53 of 74

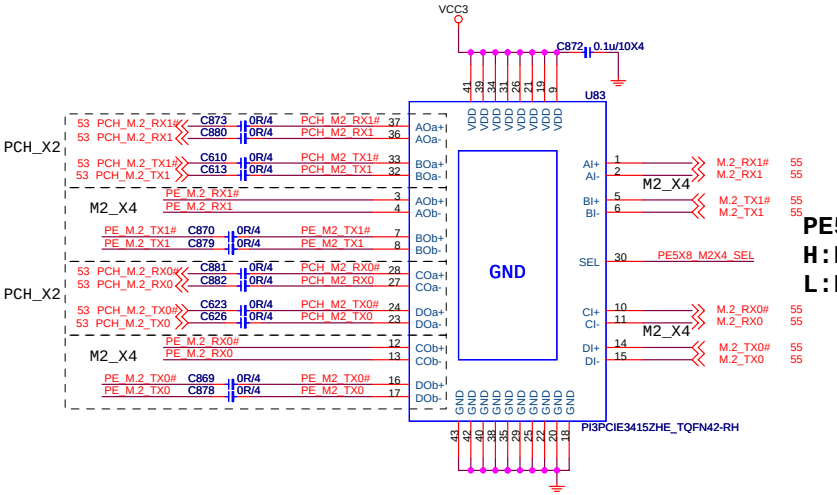
PCIE5 & M.2 Switch



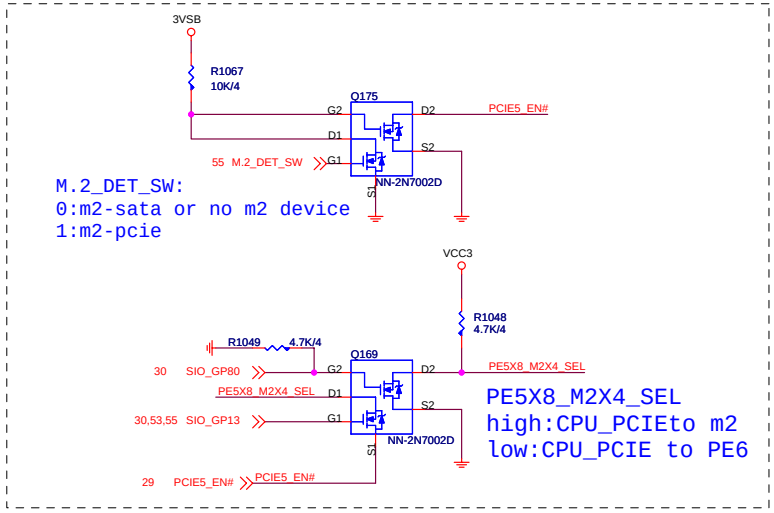
PE5X8_M2X4_SEL:
L:PE5_X8
H:M2_X4



PE5X8_M2X4_SEL:
L:PE5_X8
H:M2_X4



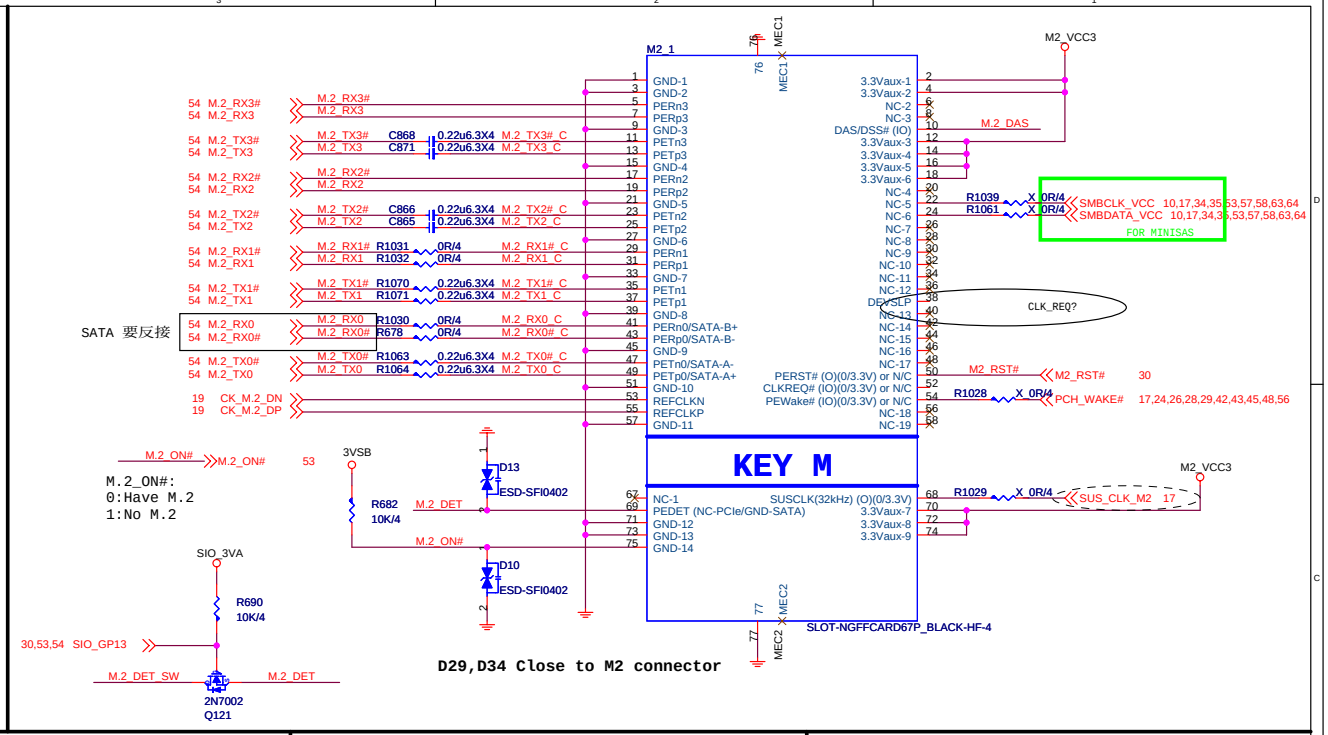
PE5X8_M2X4_SEL:
H:PCIE from CPU
L:PCIE from PCH



MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7883	
Size: Custom	Document Description: SATA & PCIE switch	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 54 of 74	

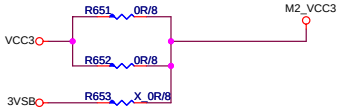
BIOS_MODE

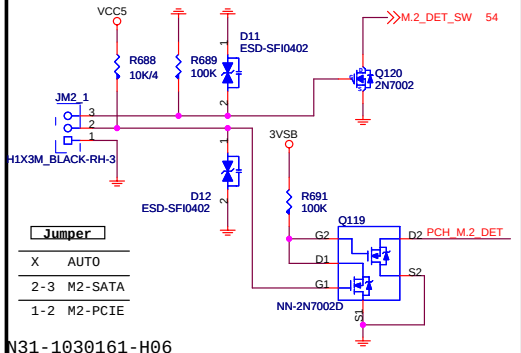
SIO_GP10	SIO_GP80	SIO_GP84	SIO_GP13	Mode
1	0	1:PCIE 0:SATA	0	M2-PCH
X	1	X	0	PCIEX8
X	0	X	0	M2-X4
0	X	1:PCIE 0:SATA	X	SATA EXpress
GPI(:0)	GPI(:0)	GPI(:0)	1	AUTO

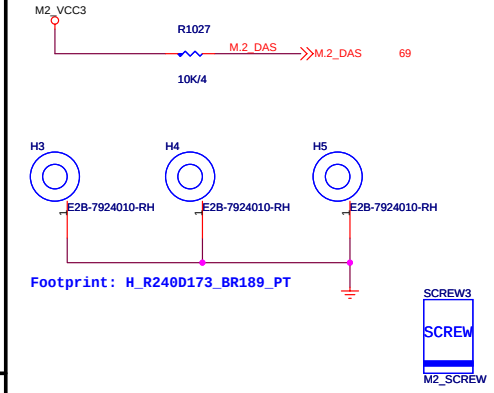


M2 cut power

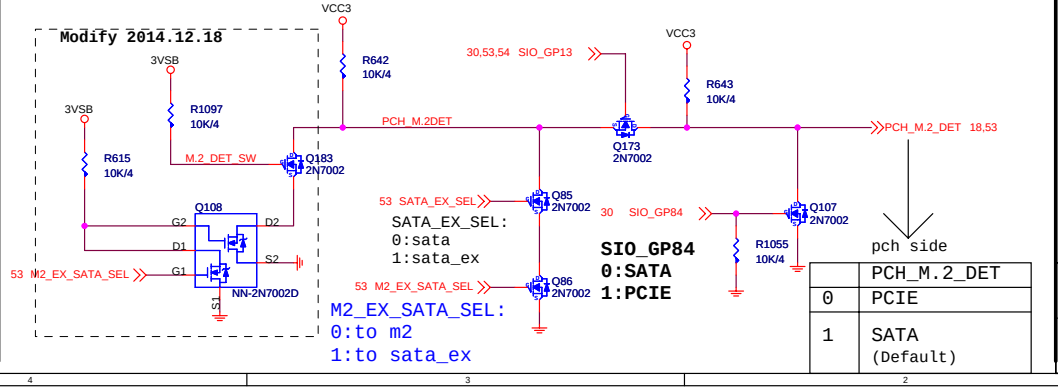
2.5A

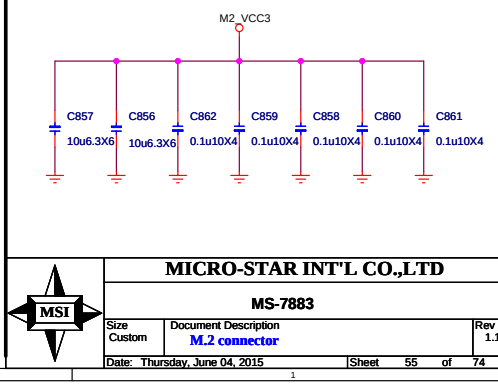






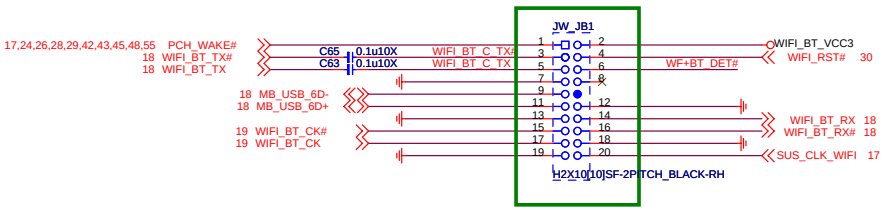
SATA & PCIE SWITCH



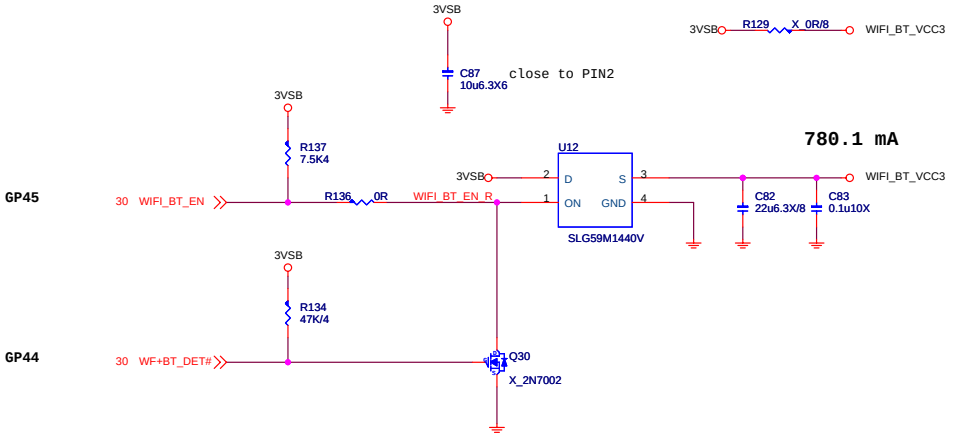


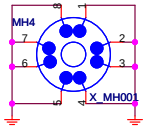
WIFI + Buletooth

2014.02.17



2014.04.02 Update footprint

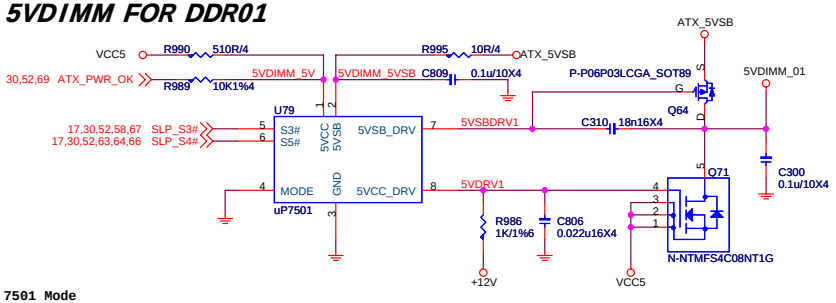




2014.04.02 Update footprint

MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: WIFI+BT Connector	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 56 of 74	

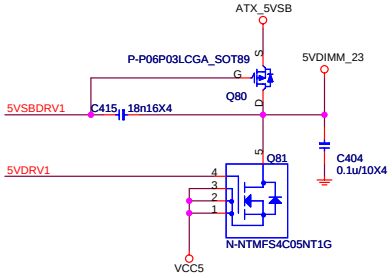
5VDIMM FOR DDR01



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

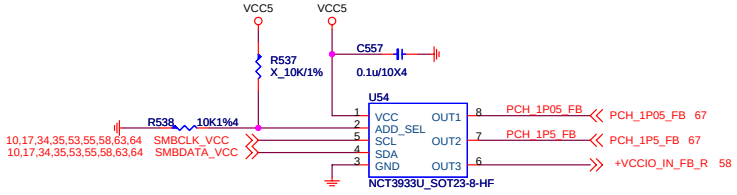
5VDRV1看VCC5起來6-10ms後起來,因為當初挑power

5VDIMM FOR DDR23

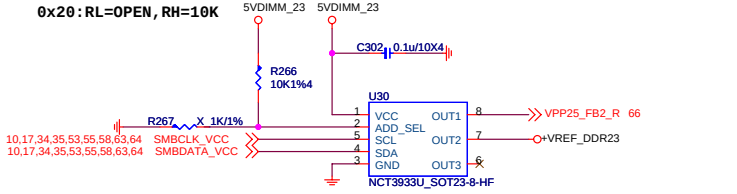


VOLTAGE CONSOLE

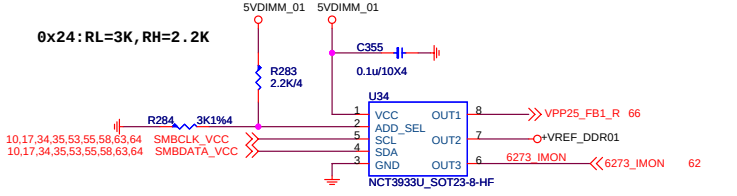
0x2A:RL=10K,RH=OPEN



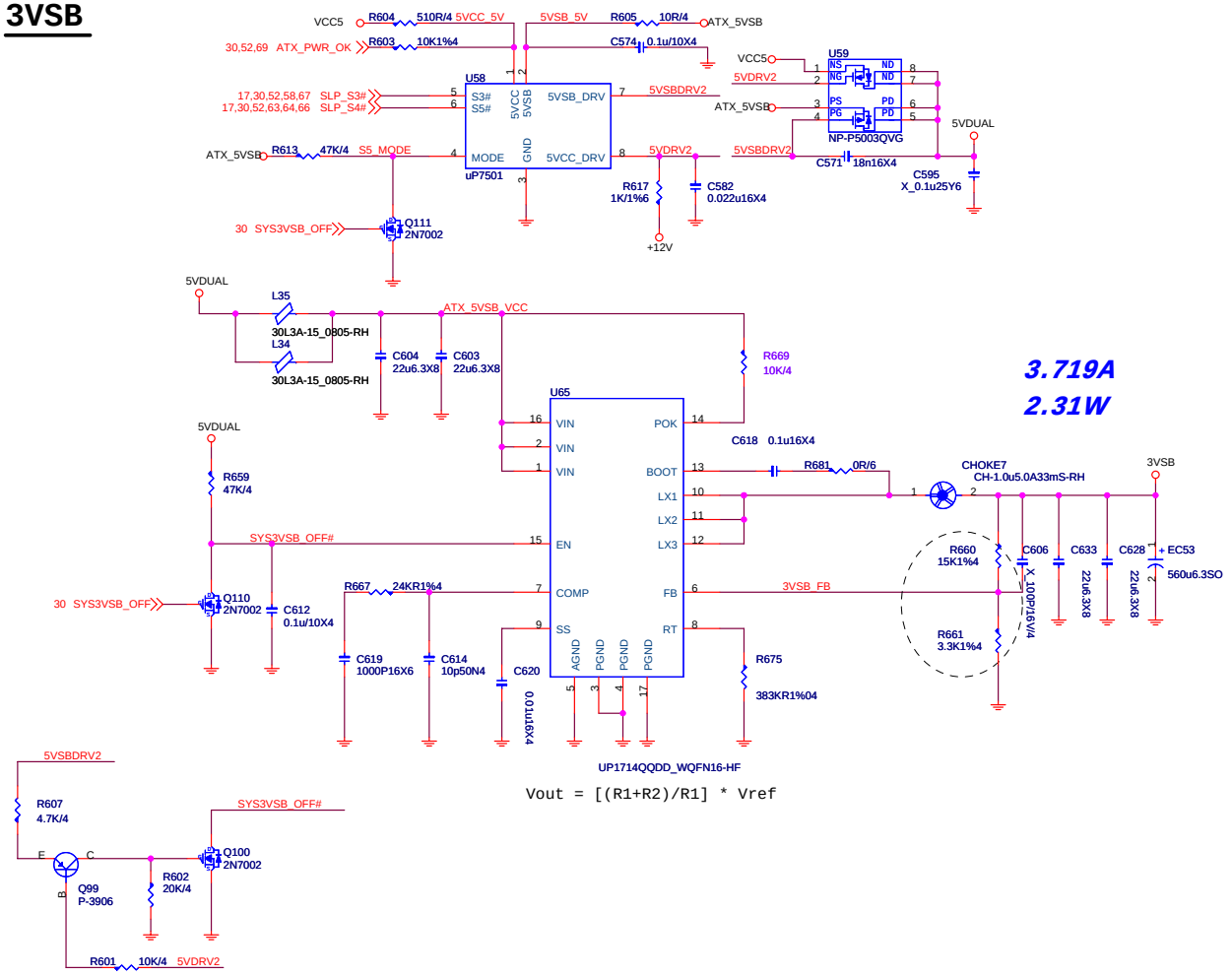
0x20:RL=OPEN,RH=10K



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

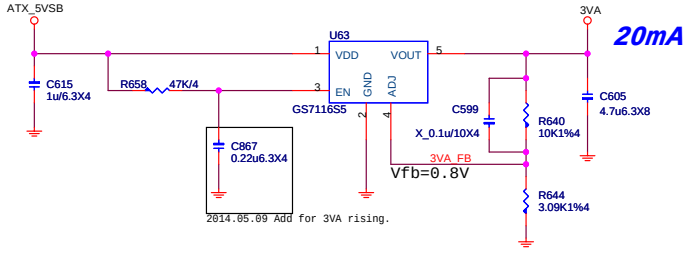


3VSB



防G3-->S5底下5VSBDRV2瞬間有電變沒電,使得下一級電壓爬升有drop

3VA



MICRO-STAR INT'L CO.,LTD

MS-7883

Size	Document Description	Rev
Custom	ACPI controller UPI	1.1

Date: Thursday, June 04, 2015 Sheet 57 of 74

CPU Power-ISL6388-12Phase

VCCP_1.8V 180A,OC margin 2.5V=240A

OCP:336A for 12Phase

VRMPWRGD LEVEL SHIFT

close to VRM

between 3 to 6 inches

R811 stuff 232K for APS =>23=>41=>61

OCP:347A

(240A / 12 Phase) * DCR / (Risen + Rset/64)
= 100uA
R753=4.64k ohm

close phase sequence 6-3-5-2-4-1
address:8AH
Golden Point only for 7882

2014.05.26 Make sure VCCIN after VCCDDR

VCCIO_IN_1.05V 431mA,OC margin 1.6V=1A

Modify 2014.12.18

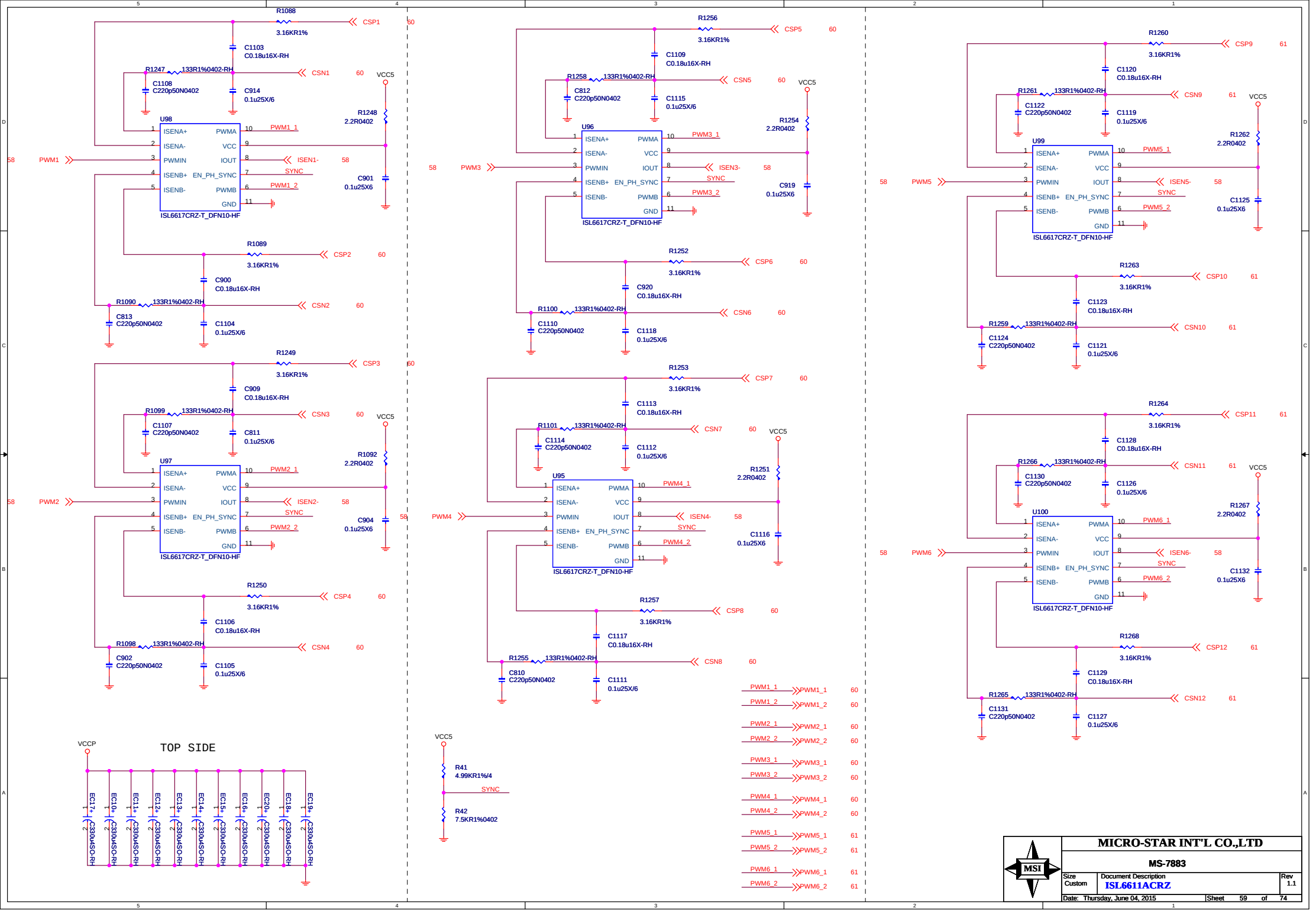
PROC_ID	+VCCIO_IN
0	0.95V
1	1.05V

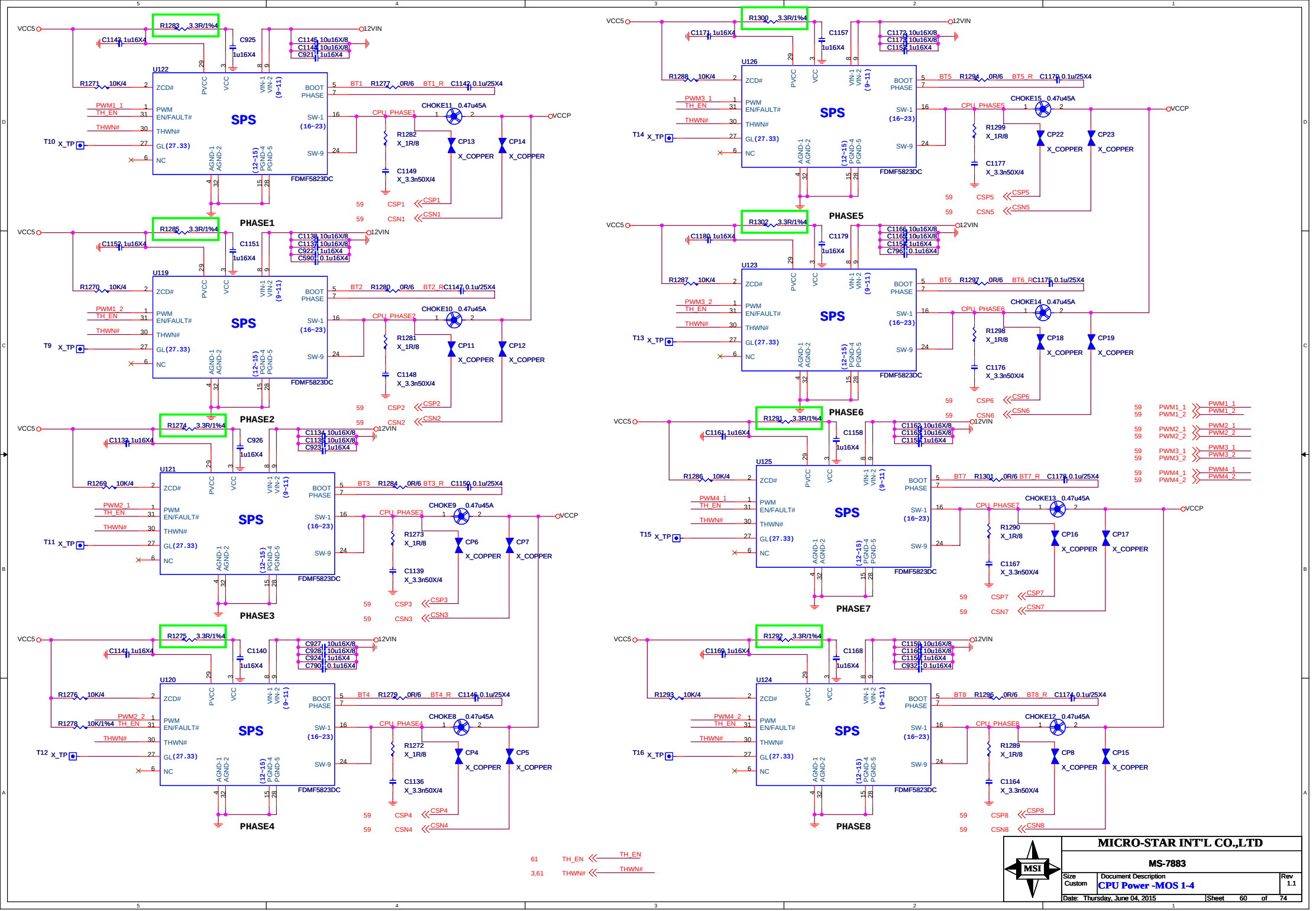
MICRO-STAR INT'L CO.,LTD

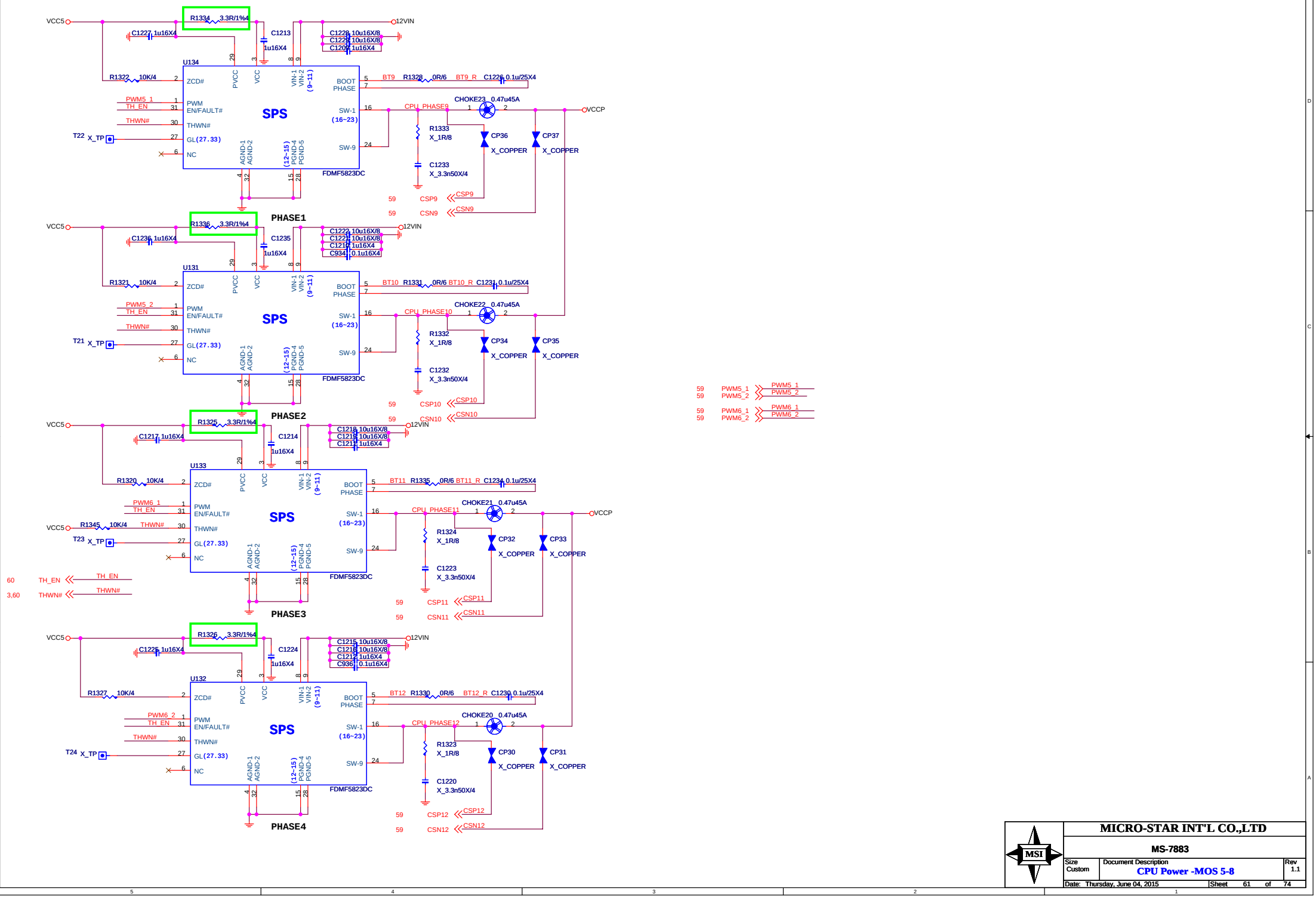
MS-7883

Size: Custom | Document Description: VRD12.5 - PWM-uP1649 | Rev: 1.1

Date: Thursday, June 04, 2015 | Sheet 58 of 74


R1088 3.16KR1% CSP1 60
C1103 C0.18u16X-RH
R1247 133R1%0402-RH CSN1 60
C1108 C220p50N0402
C914 0.1u25X/6
VCC5
R1248 2.2R0402
U98
ISENA+ PWMA
ISENA- VCC
PWMIN IOUT
ISENB+ EN_PH_SYNC
ISENB- PWMB
GND
PWM1_1
ISEN1-
SYNC
PWM1_2
PWM1 58
C901 0.1u25X6
ISL6617CRZ-T_DFN10-HF
R1089 3.16KR1% CSP2 60
C900 C0.18u16X-RH
R1090 133R1%0402-RH CSN2 60
C813 C220p50N0402
C1104 0.1u25X/6
R1249 3.16KR1% CSP3 60
C909 C0.18u16X-RH
R1099 133R1%0402-RH CSN3 60
C1107 C220p50N0402
C811 0.1u25X/6
R1092 2.2R0402
U97
PWM2_1
ISEN2-
SYNC
PWM2_2
PWM2 58
C904 0.1u25X6
R1250 3.16KR1% CSP4 60
C1106 C0.18u16X-RH
R1098 133R1%0402-RH CSN4 60
C902 C220p50N0402
C1105 0.1u25X/6
R1256 3.16KR1% CSP5 60
C1109 C0.18u16X-RH
R1258 133R1%0402-RH CSN5 60
C812 C220p50N0402
C1115 0.1u25X/6
R1254 2.2R0402
U96
PWM3_1
ISEN3-
SYNC
PWM3_2
PWM3 58
C919 0.1u25X6
R1252 3.16KR1% CSP6 60
C920 C0.18u16X-RH
R1100 133R1%0402-RH CSN6 60
C1110 C220p50N0402
C1118 0.1u25X/6
R1253 3.16KR1% CSP7 60
C1113 C0.18u16X-RH
R1101 133R1%0402-RH CSN7 60
C1114 C220p50N0402
C1112 0.1u25X/6
R1251 2.2R0402
U95
PWM4_1
ISEN4-
SYNC
PWM4_2
PWM4 58
C1116 0.1u25X6
R1257 3.16KR1% CSP8 60
C1117 C0.18u16X-RH
R1255 133R1%0402-RH CSN8 60
C810 C220p50N0402
C1111 0.1u25X/6
R1260 3.16KR1% CSP9 61
C1120 C0.18u16X-RH
R1261 133R1%0402-RH CSN9 61
C1122 C220p50N0402
C1119 0.1u25X/6
R1262 2.2R0402
U99
PWM5_1
ISEN5-
SYNC
PWM5_2
PWM5 58
C1125 0.1u25X6
R1263 3.16KR1% CSP10 61
C1123 C0.18u16X-RH
R1259 133R1%0402-RH CSN10 61
C1124 C220p50N0402
C1121 0.1u25X/6
R1264 3.16KR1% CSP11 61
C1128 C0.18u16X-RH
R1266 133R1%0402-RH CSN11 61
C1130 C220p50N0402
C1126 0.1u25X/6
R1267 2.2R0402
U100
PWM6_1
ISEN6-
SYNC
PWM6_2
PWM6 58
C1132 0.1u25X6
R1268 3.16KR1% CSP12 61
C1129 C0.18u16X-RH
R1265 133R1%0402-RH CSN12 61
C1131 C220p50N0402
C1127 0.1u25X/6
VCCP
TOP SIDE
EC17+ C330u4SO-RH
EC10+ C330u4SO-RH
EC11+ C330u4SO-RH
EC12+ C330u4SO-RH
EC13+ C330u4SO-RH
EC14+ C330u4SO-RH
EC15+ C330u4SO-RH
EC16+ C330u4SO-RH
EC20+ C330u4SO-RH
EC18+ C330u4SO-RH
EC19+ C330u4SO-RH
VCC5
R41 4.99KR1%/4
SYNC
R42 7.5KR1%0402
PWM1_1 PWM1_1 60
PWM1_2 PWM1_2 60
PWM2_1 PWM2_1 60
PWM2_2 PWM2_2 60
PWM3_1 PWM3_1 60
PWM3_2 PWM3_2 60
PWM4_1 PWM4_1 60
PWM4_2 PWM4_2 60
PWM5_1 PWM5_1 61
PWM5_2 PWM5_2 61
PWM6_1 PWM6_1 61
PWM6_2 PWM6_2 61
MICRO-STAR INT'L CO.,LTD
MS-7883
Size Custom
Document Description ISL6611ACRZ
Rev 1.1
Date: Thursday, June 04, 2015
Sheet 59 of 74


PHASE1
PHASE2
PHASE3
PHASE4
PHASE5
PHASE6
PHASE7
PHASE8
SPS
FDMF5823DC
VCC5
12VIN
VCCP
X_TP
X_COPPER
X_1R/8
X_3.3n50X/4
0R/6
10K/4
1u16X4
0.1u/25X4
0.47u45A
PWM1_1
PWM1_2
PWM2_1
PWM2_2
PWM3_1
PWM3_2
PWM4_1
PWM4_2
TH_EN
THWN#
CSP1
CSN1
CSP2
CSN2
CSP3
CSN3
CSP4
CSN4
CSP5
CSN5
CSP6
CSN6
CSP7
CSN7
CSP8
CSN8
MICRO-STAR INT'L CO.,LTD
MS-7883
CPU Power -MOS 1-4
Size Custom
Rev 1.1
Date: Thursday, June 04, 2015
Sheet 60 of 74



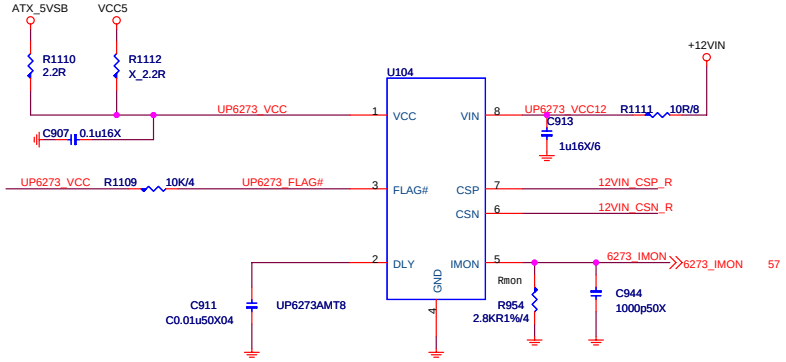
MICRO-STAR INT'L CO.,LTD

MS-7883

Size	Document Description	Rev
Custom	CPU Power -MOS 5-8	1.1

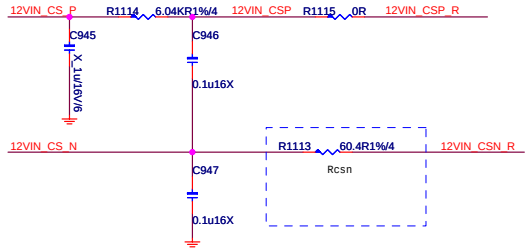
Date: Thursday, June 04, 2015 Sheet 61 of 74

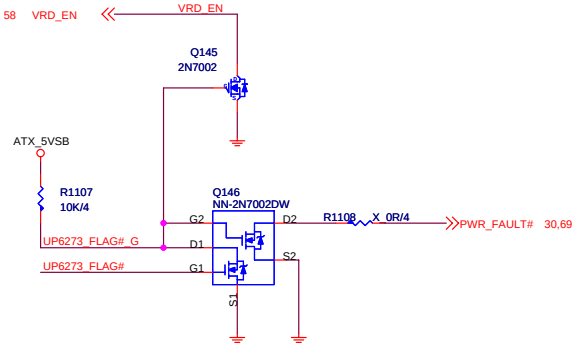
POWER METER
OCP: 120A

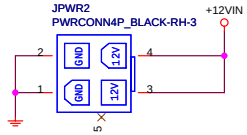


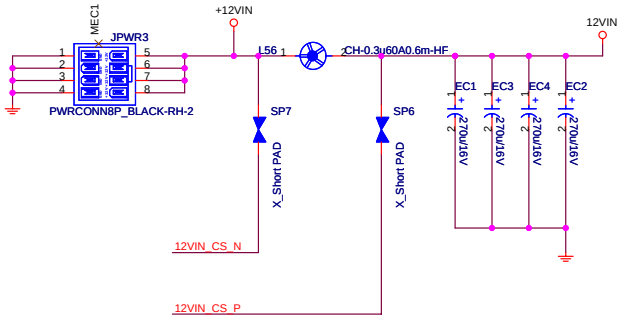
Iin=(Vmon*Rcsn)/(Rmon*Rdc)
Vmon=1.2
can change OCP trigger level by Rcsn and Rmon

(1.2 * 0.2) / (10K* 0.3m) = 80A









Title	<Title>		
Size: Custom	Document Number: MS-7883		Rev: 1.1
Date: Thursday, June 04, 2015		Sheet 62 of 74	

DDR Power1-PV3203-2-Phase

DDR4_1.2V 11A,OC margin=44A

OCP:66A for 2Phase

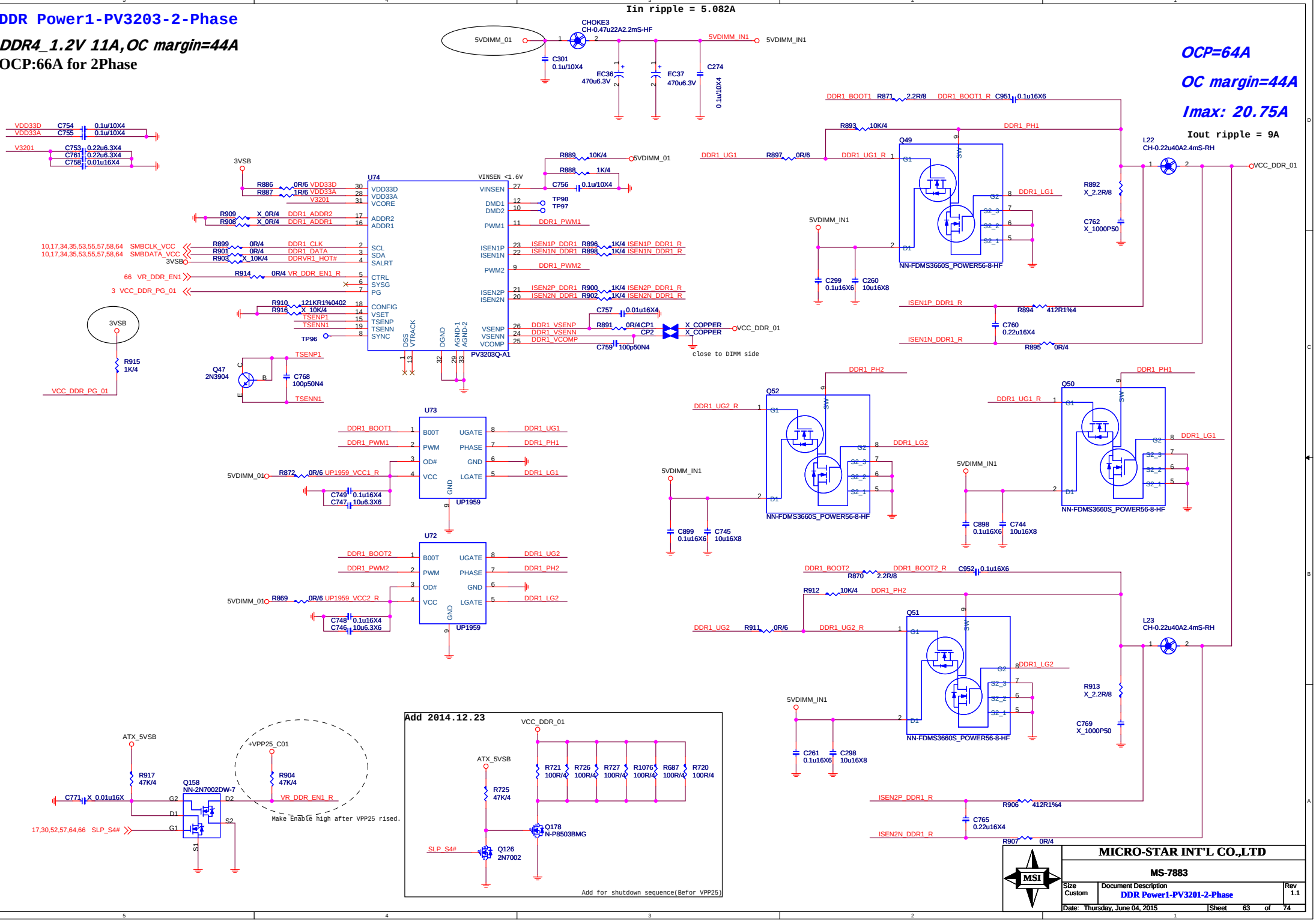
Iin ripple = 5.082A

OCP=64A

OC margin=44A

Imax: 20.75A

Iout ripple = 9A



MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: DDR Power1-PV3201-2-Phase	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 63 of 74	

DDR Power1-PV3203-2-Phase

DDR4_1.2V 11A,OC margin=44A

OCP:66A for 2Phase

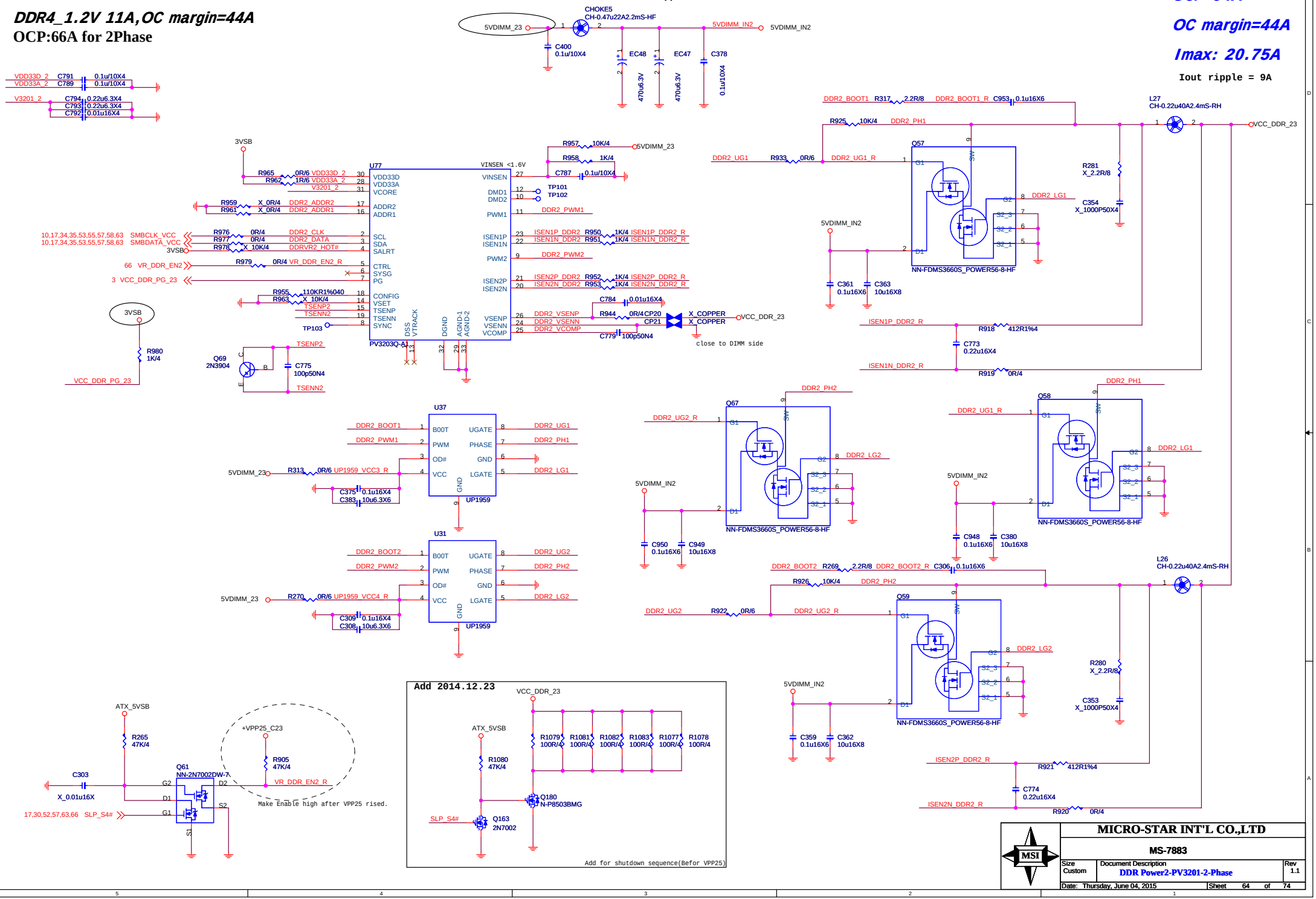
Iin ripple = 5.082A

OCP=64A

OC margin=44A

Imax: 20.75A

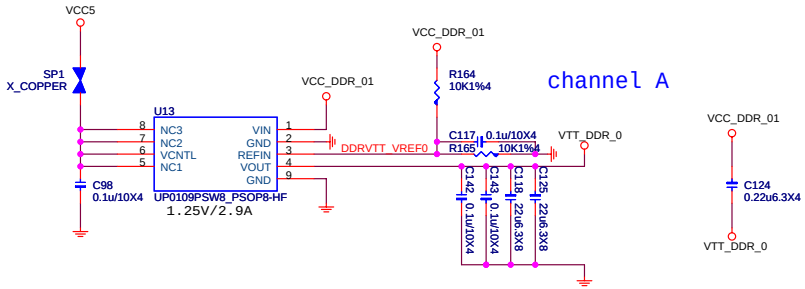
Iout ripple = 9A

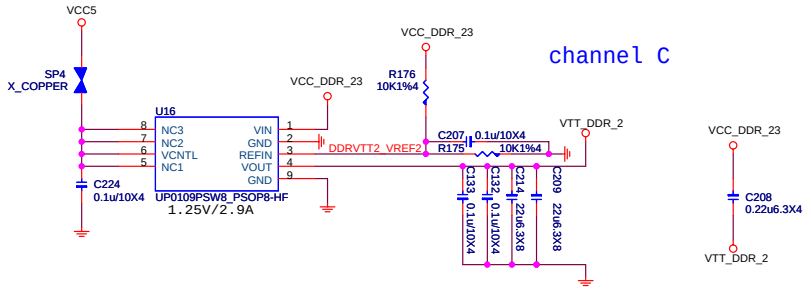


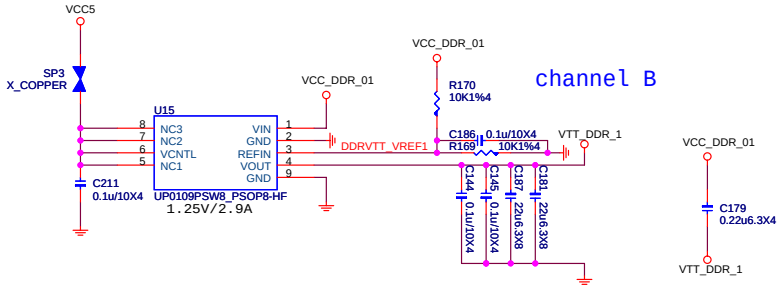
MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: DDR Power2-PV3201-2-Phase	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 64 of 74	

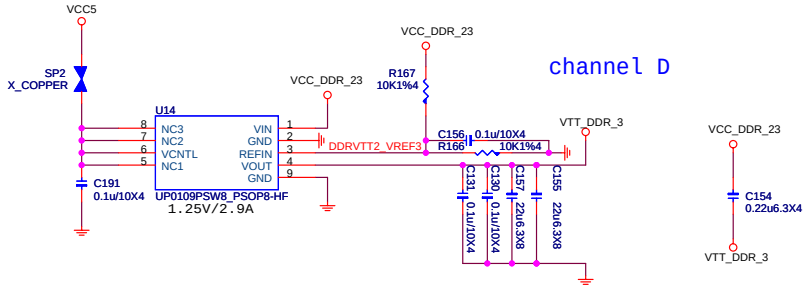
4DIMM :1.2A FOR DDR VTT

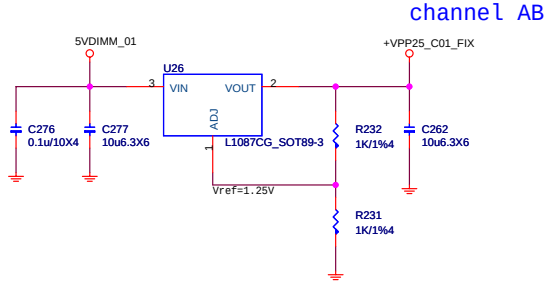
4DIMM :3A FOR OC margin

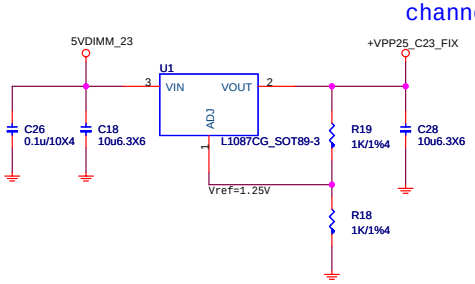






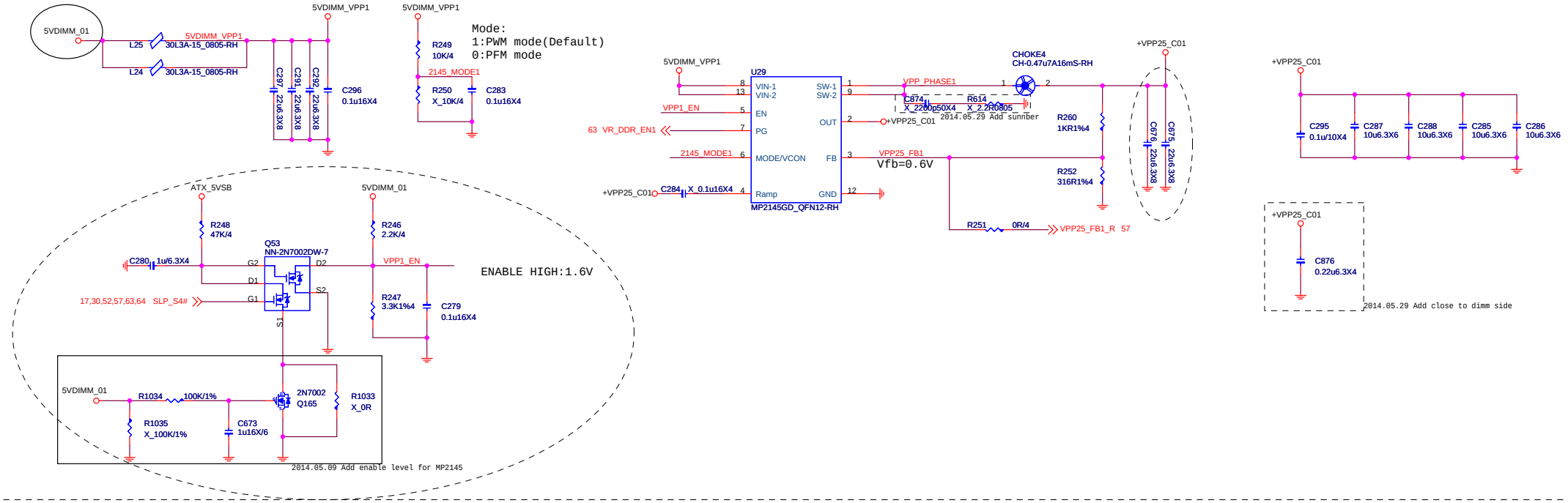


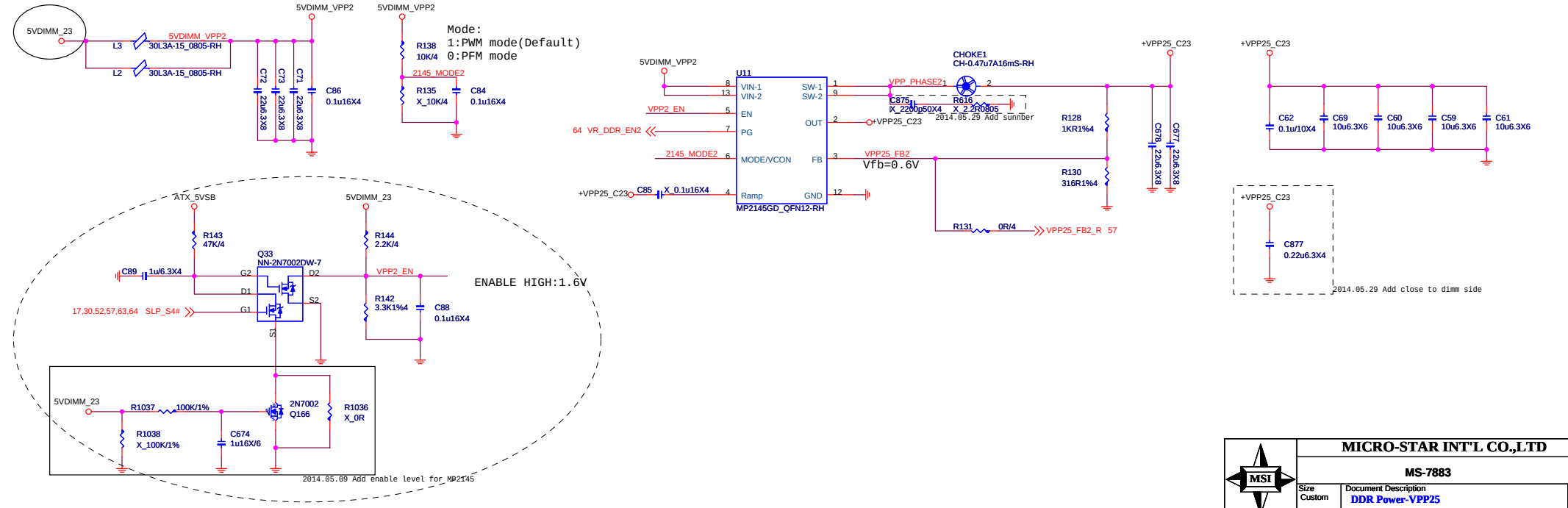




MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7883	
Size: Custom	Document Description: DDR Power-VPP25	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 65 of 74	

4DIMM :6A FOR DDR VPP

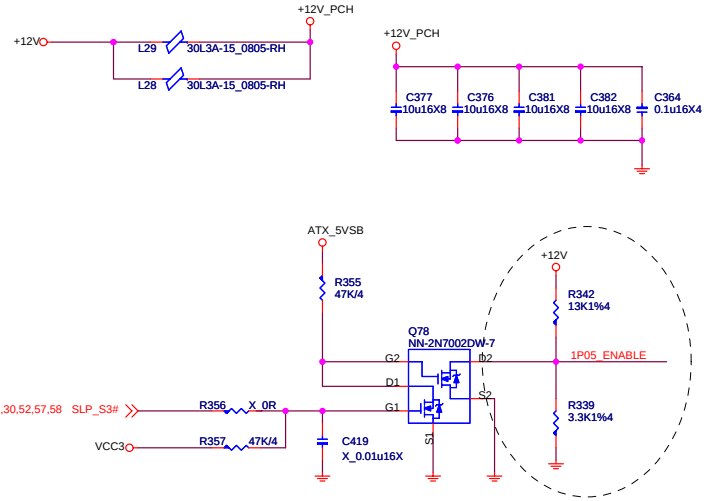




MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: DDR Power-VPP25	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 66 of 74	

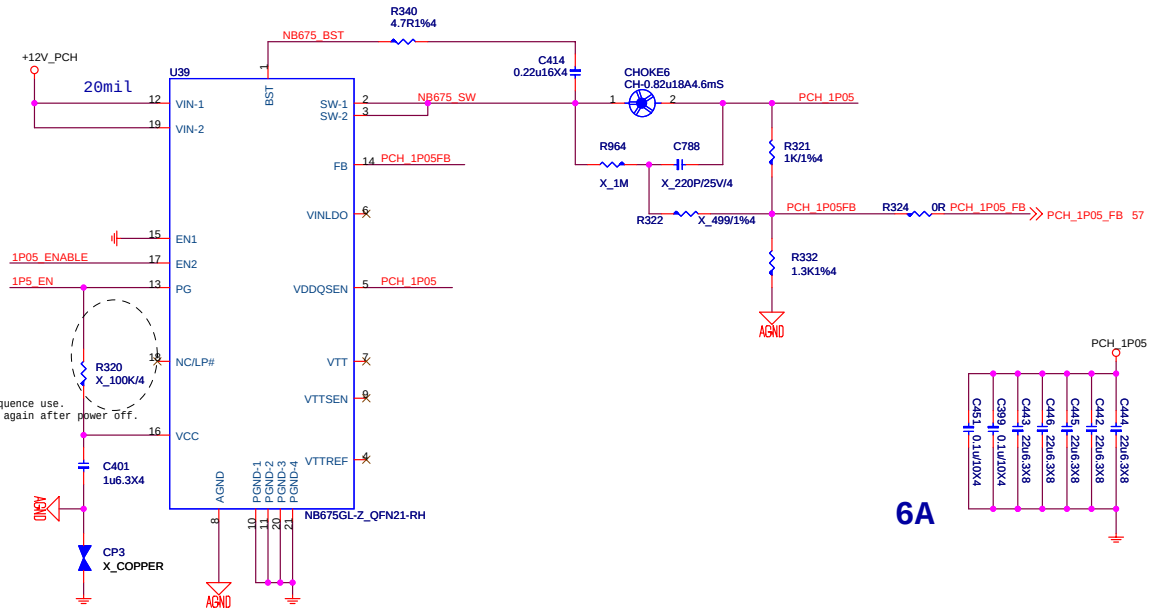
PCH Power:1.05V

PCH Core 6.504A



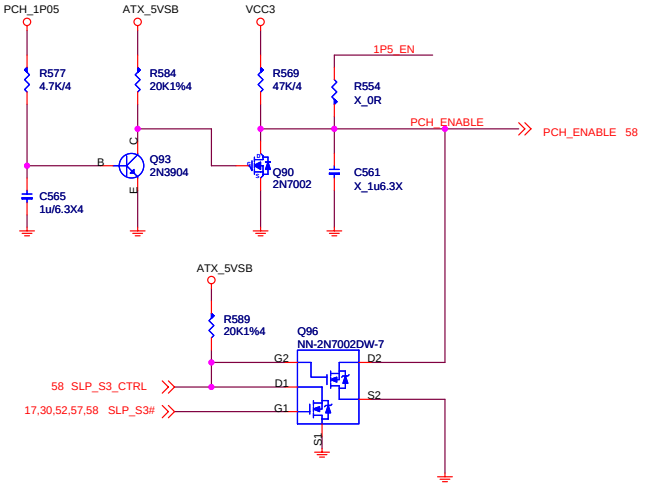
MAX 10A

ILIMIT=10A~12A 峰谷

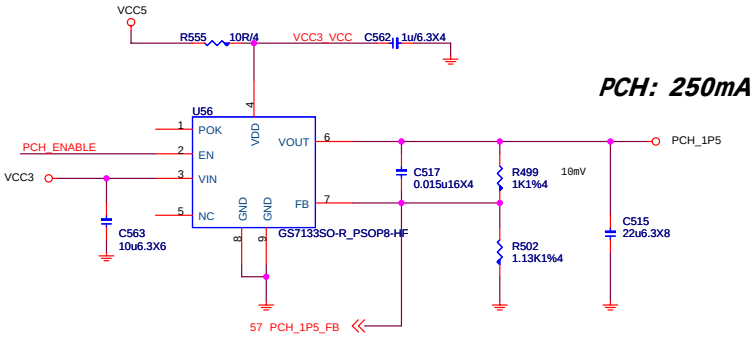


6A

Waitting PCH_1P05 Ready

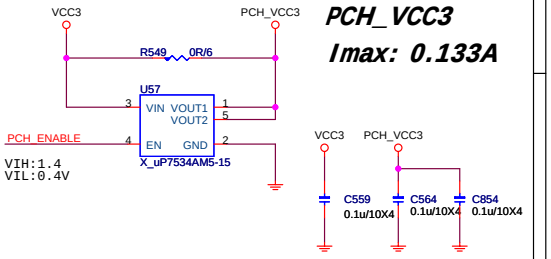


PCH: 250mA



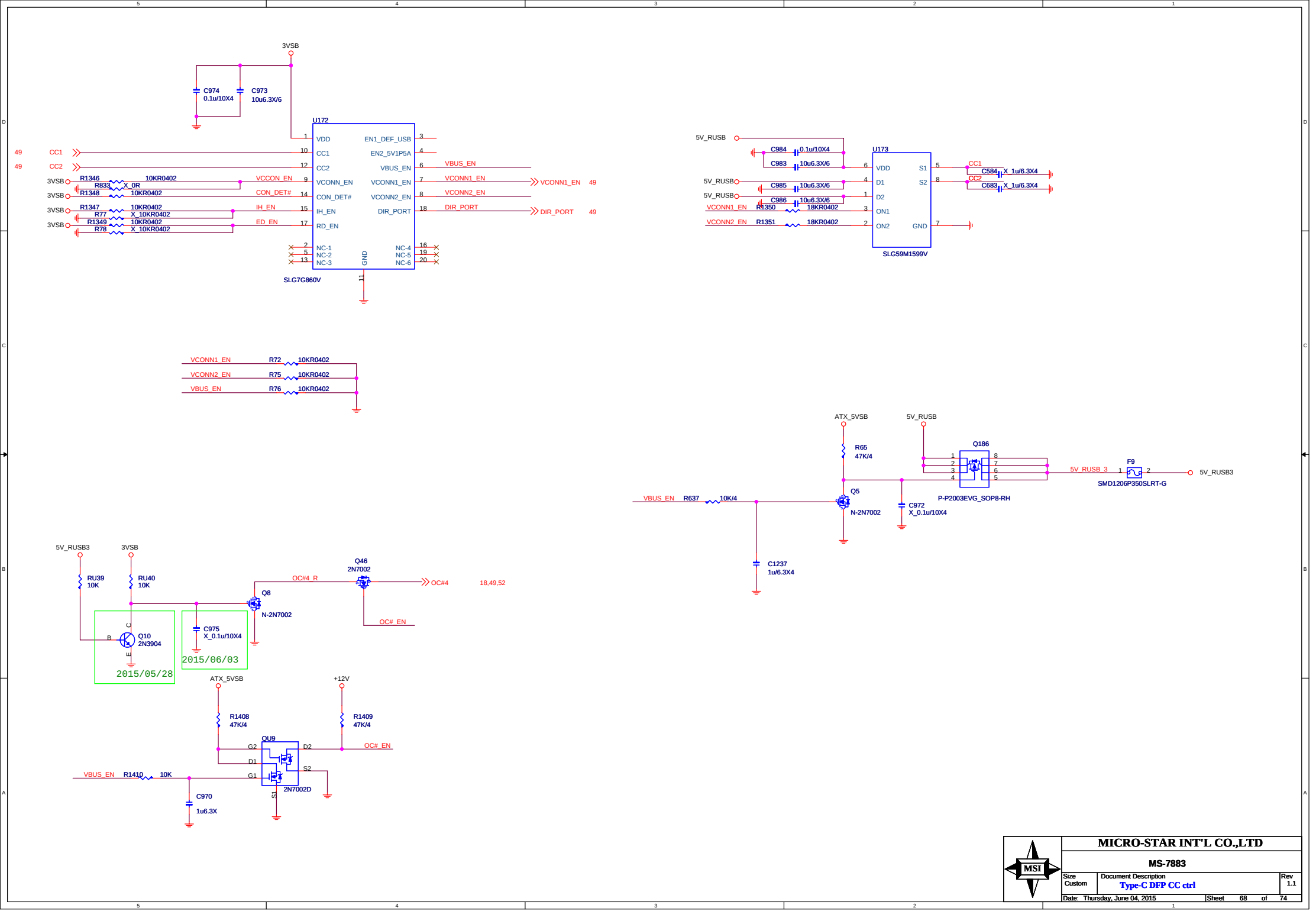
PCH_VCC3

Imax: 0.133A

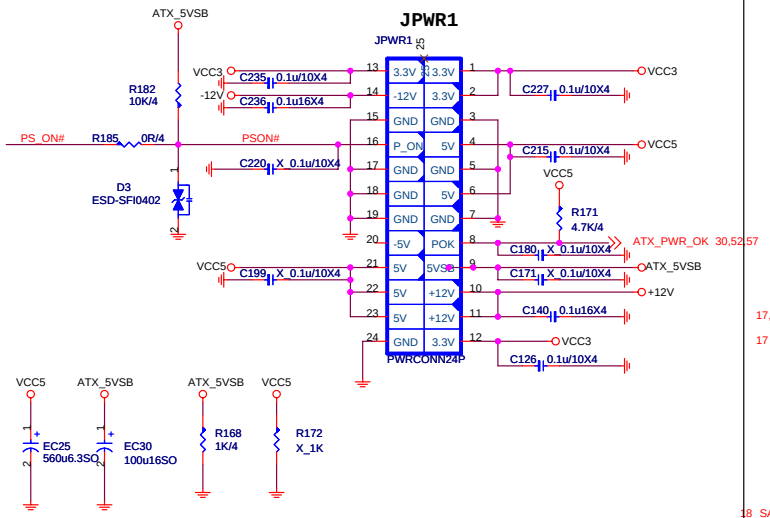


C854 close to PCH

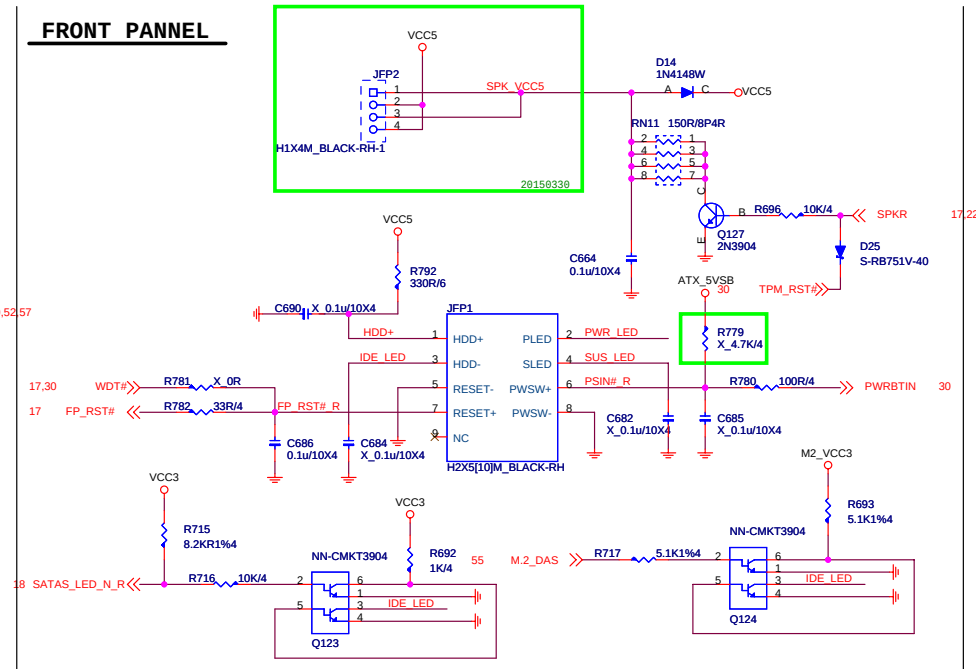
MICRO-STAR INT'L CO.,LTD	
MS-7883	
Size: Custom	Document Description: PCH Power-NB675GL
Rev: 1.1	
Date: Thursday, June 04, 2015	Sheet 67 of 74


3VSB
C974 0.1u/10X4
C973 10u6.3X/6
U172
VDD
CC1
CC2
VCONN_EN
CON_DET#
IH_EN
RD_EN
EN1_DEF_USB
EN2_5V1P5A
VBUS_EN
VCONN1_EN
VCONN2_EN
DIR_PORT
NC-1
NC-2
NC-3
GND
NC-4
NC-5
NC-6
SLG7G860V
49 CC1
49 CC2
R1346 10KR0402
R833 X_0R
R1348 10KR0402
R1347 10KR0402
R77 X_10KR0402
R1349 10KR0402
R78 X_10KR0402
VCONN_EN
CON_DET#
IH_EN
ED_EN
VBUS_EN
VCONN1_EN
VCONN2_EN
DIR_PORT
VCONN1_EN 49
DIR_PORT 49
5V_RUSB
C984 0.1u/10X4
C983 10u6.3X/6
C985 10u6.3X/6
C986 10u6.3X/6
U173
VDD
D1
D2
VCONN1_EN R1350 18KR0402
VCONN2_EN R1351 18KR0402
ON1
ON2
S1
S2
GND
CC1
CC2
C584 X_1u/6.3X4
C683 X_1u/6.3X4
SLG59M1599V
VCONN1_EN R72 10KR0402
VCONN2_EN R75 10KR0402
VBUS_EN R76 10KR0402
ATX_5VSB
5V_RUSB
R65 47K/4
Q186
P-P2003EVG_SOP8-RH
5V_RUSB_3
F9
SMD1206P350SLRT-G
5V_RUSB3
VBUS_EN R637 10K/4
Q5
N-2N7002
C972 X_0.1u/10X4
C1237 1u/6.3X4
5V_RUSB3
3VSB
RU39 10K
RU40 10K
Q46 2N7002
OC#4_R
OC#4
18,49,52
Q8
N-2N7002
OC#_EN
Q10 2N3904
C975 X_0.1u/10X4
2015/06/03
2015/05/28
ATX_5VSB
+12V
R1408 47K/4
R1409 47K/4
QU9
G2
D1
G1
D2
S2
S1
2N7002D
OC#_EN
VBUS_EN R1410 10K
C970 1u6.3X
MICRO-STAR INT'L CO.,LTD
MS-7883
Size Custom
Document Description
Type-C DFP CC ctrl
Rev 1.1
Date: Thursday, June 04, 2015
Sheet 68 of 74

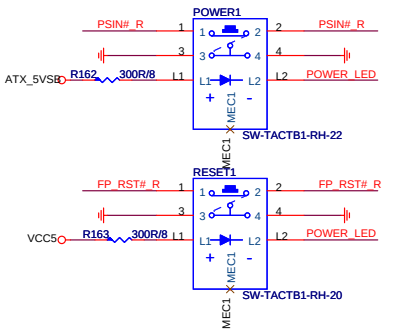
ATX POWER CONNECTOR

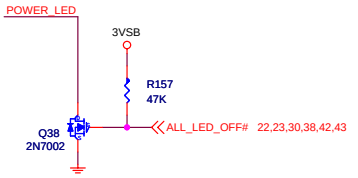


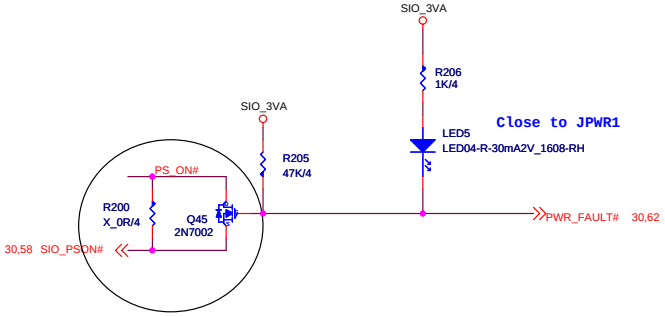
FRONT PANNEL



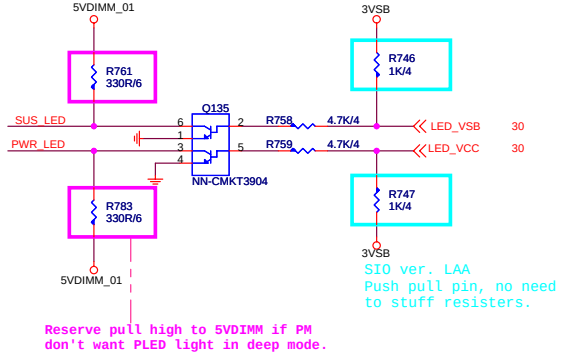
PWR/RST Botton



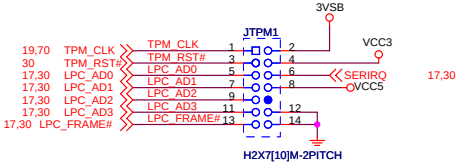


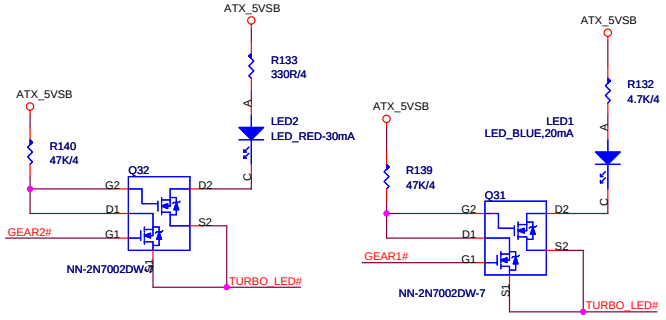


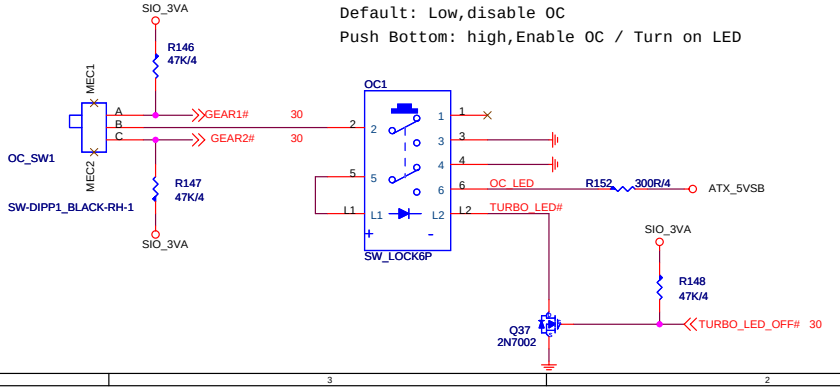
Front Panel LED



TPM

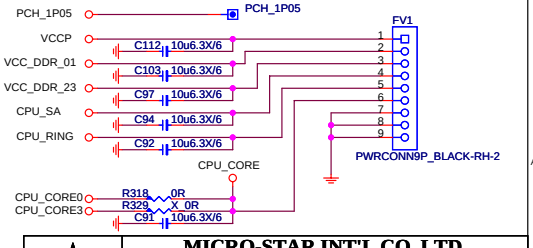






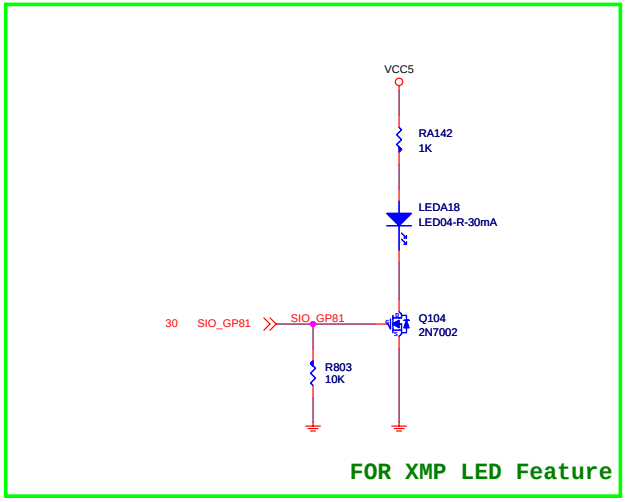
TURBO_MODE#
Default: Low,disable OC
Push Bottom: high,Enable OC / Turn on LED

Voltage test point



MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: ATX F_Panel/EMI/TPM	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 69 of 74	

Reserve debug port 5020



17,36 AZ_BITCLK
19,69 TPM_CLK
19 CLK_PCI1_LOOPBACK
19,30 CK_P_33M_SIO
C569 X_10p50N4
C508 X_10p50N4
C855 X_10p50N4
C506 X_10p50N4

19 CK_14P8M_PCH
C831 X_10p50N4

19,30 CK_48M_SIO
C832 X_10p50N4

VCC_DDR_01
C766 0.1u/10X4
C764 0.1u/10X4
C763 0.1u/10X4
C767 0.1u/10X4

+VCCIO_IN
7 CPU_DEBUG_EN_N
CPU_DEBUG_EN_N R942 976R1%4
3 CPU_TDO
CPU_TDO R940 75R/4

WITHIN 250MILS OF XDP CONNECTOR PIN

PCB1
7883_1.0

USB3.1
ASM 1142
X_ASM1142

USB3.1-CONN
ASM 1142
X_USB3.1-CONNECTOR

RU31-RST
80.6K
X_80.6K1%0402

RU31-V
19.6K
X_19.6K/1%

HS_PCH1
MEC1 MEC2 MEC3 MEC4 MEC5 MEC6 MEC7
HS-0407330-RH

CPU_H1
CPU 鐵座
CPU_H1

BAT1
MEC4
BAT-BCR2032P-RH

CPU_H2
CPU 鐵座
CPU_H1

mini_card1
mini PCIE Card
X_mini_PCIE_card

LA1 Label THX
USB AUDIO POWER Stick

LA5 Label THX
X_MKT Name Stick

LA10 Label THX
X_MKT Name Stick

LA6 Label THX
Xsplit

LA7 Label THX
X_CREATIVE SOUND BLASTER CINEMA2

LA11 Label THX
X_MKT Name Stick

LA8 Label THX
SLI

LA9 Label THX
AMI

+VPP25_C01
+VPP25_C23
3VSB
+VCCIO_IN
3VA
VTT_DDR_0
VTT_DDR_1
VTT_DDR_2
VTT_DDR_3

HS_MOS1
MEC1 MEC2 MEC3 MEC4
HS-0503160-RH

SIM2 SIM1 X_PIN1*2
SIM1 SIM2 X_PIN1*2

Mounting Holes

MH1 MH2 MH8 MH6 MH7 MH5 MH10 MH3 MH9
X_MH001
C671 0.1u/10X4
C667 0.1u/10X4
C349 0.1u/10X4
C305 0.1u/10X4

Optical Fiducial Marks-120

FM9 FM10 FM8 FM7
FM1 FM4 FM5 FM2
X_FM

MICRO-STAR INT'L CO.,LTD		
MS-7883		
Size: Custom	Document Description: XDP / Manual Parts	Rev: 1.1
Date: Thursday, June 04, 2015	Sheet 70 of 74	