MS-7823

mATX

Ver: 12(243.84x243.84)

Intel -SharkBay plamform Z87

CPU:

Haswell LGA1150

System Chipset:

Lynx Point Z87 co-lay H87 & B85

Onboard Chip:

HD Audio Codec:ALC892

LAN-RTL8111G

SIO:Nuvoton 6779D

Flash ROM: SPI 64 MB/128MB

Main Memory:

*DDRIII (1066/1333/1600MHz) * 4*
(Dual Channel)

ACPI:

UPI

Expansion Slots:

*PCI Express (X16) Slot * 1*

*PCI Express (X1) Slot * 2*

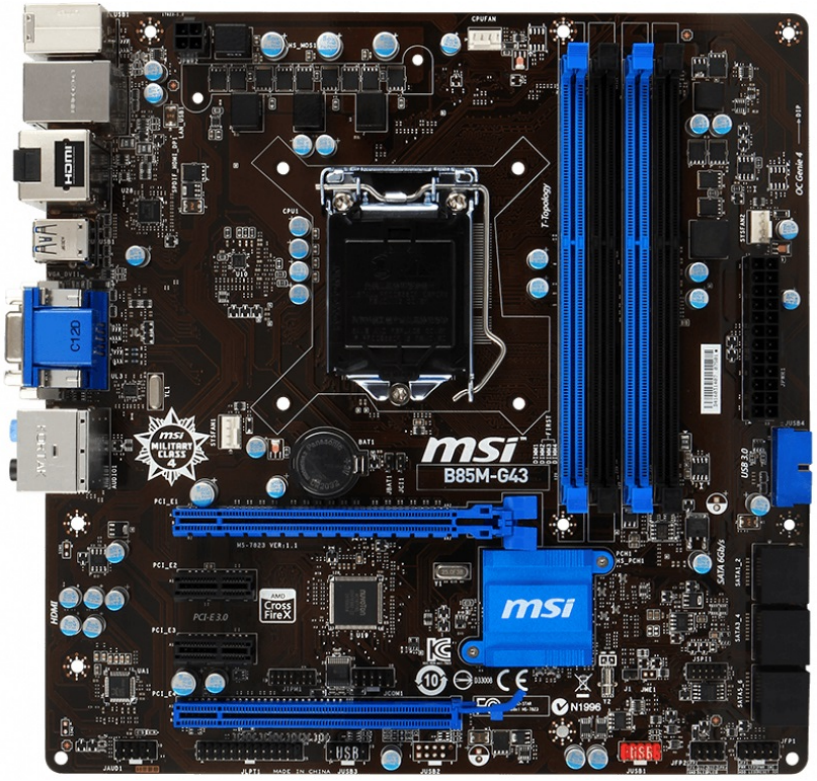
*PCI Express (X4) Slot * 1*

PWM:

ISL95812 3 Phase

Other:

SATA3.0 x6(PCH)
*REAL USB2.0 *4*
*FRONT USB2.0 *6*
*REAL USB3.0 *2*
*FRONT USB3.0 *2*



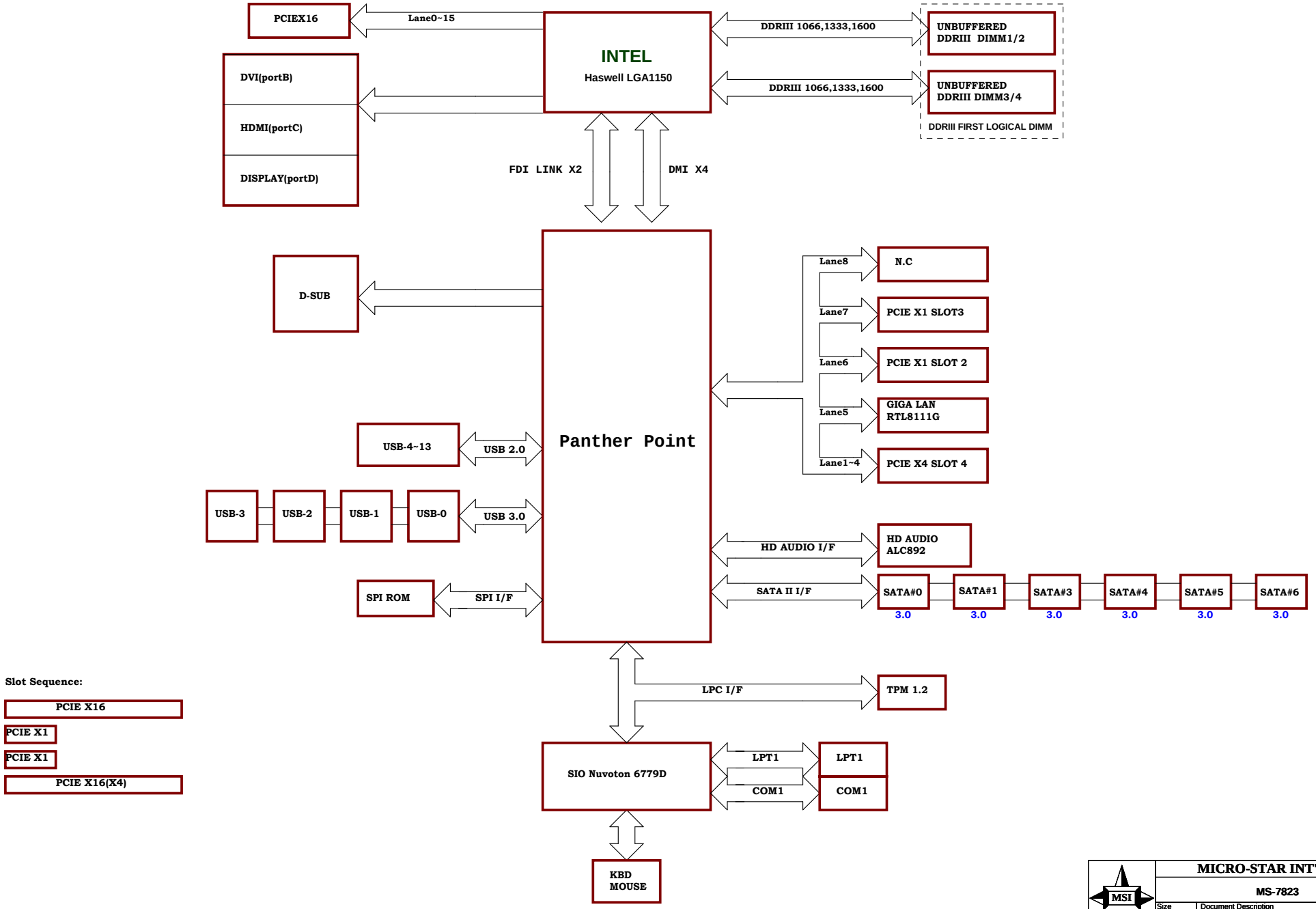
MICRO-STAR INT'L CO.,LTD

MS-7823

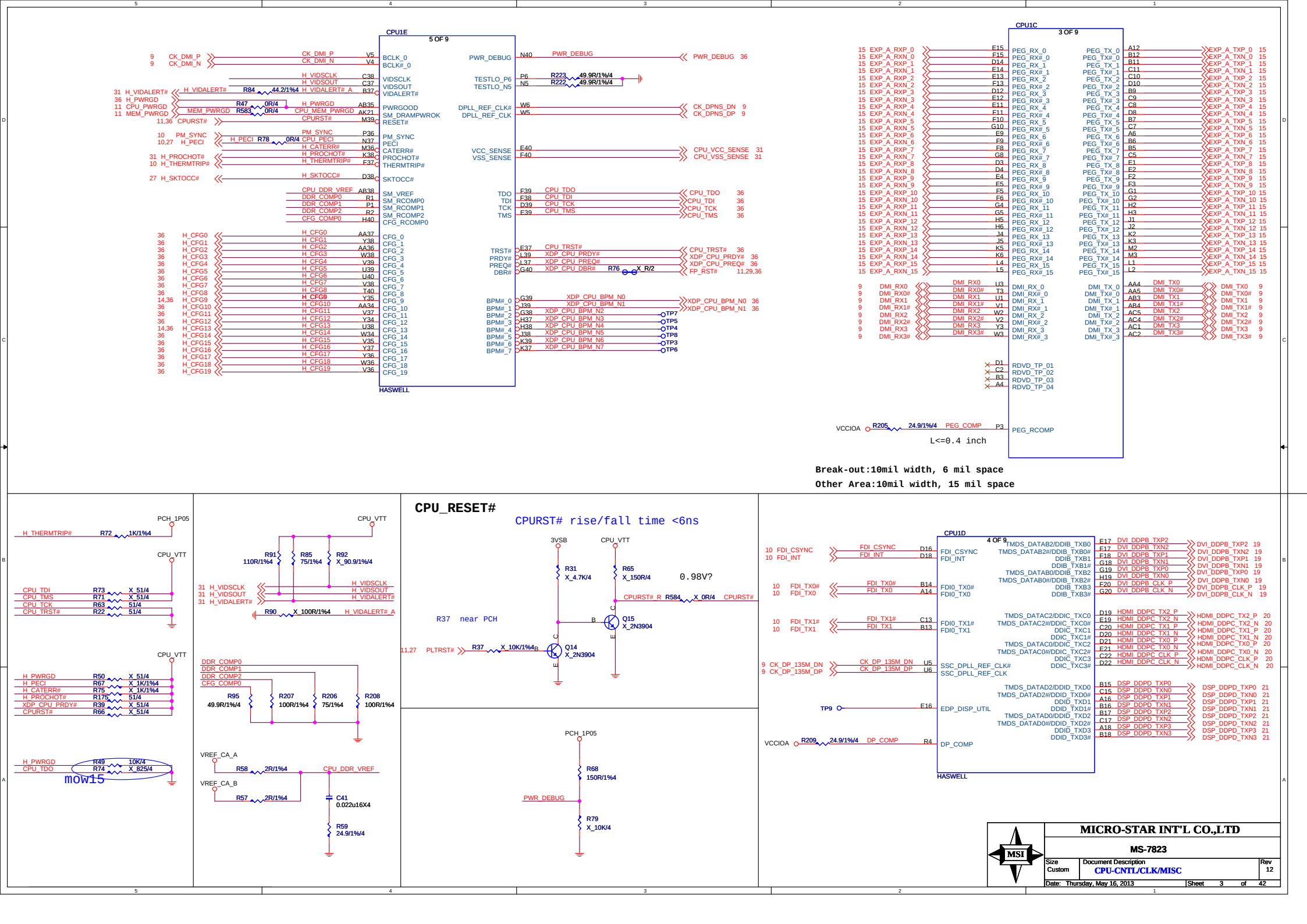
Size: Custom | Document Description: Cover Sheet | Rev: 12

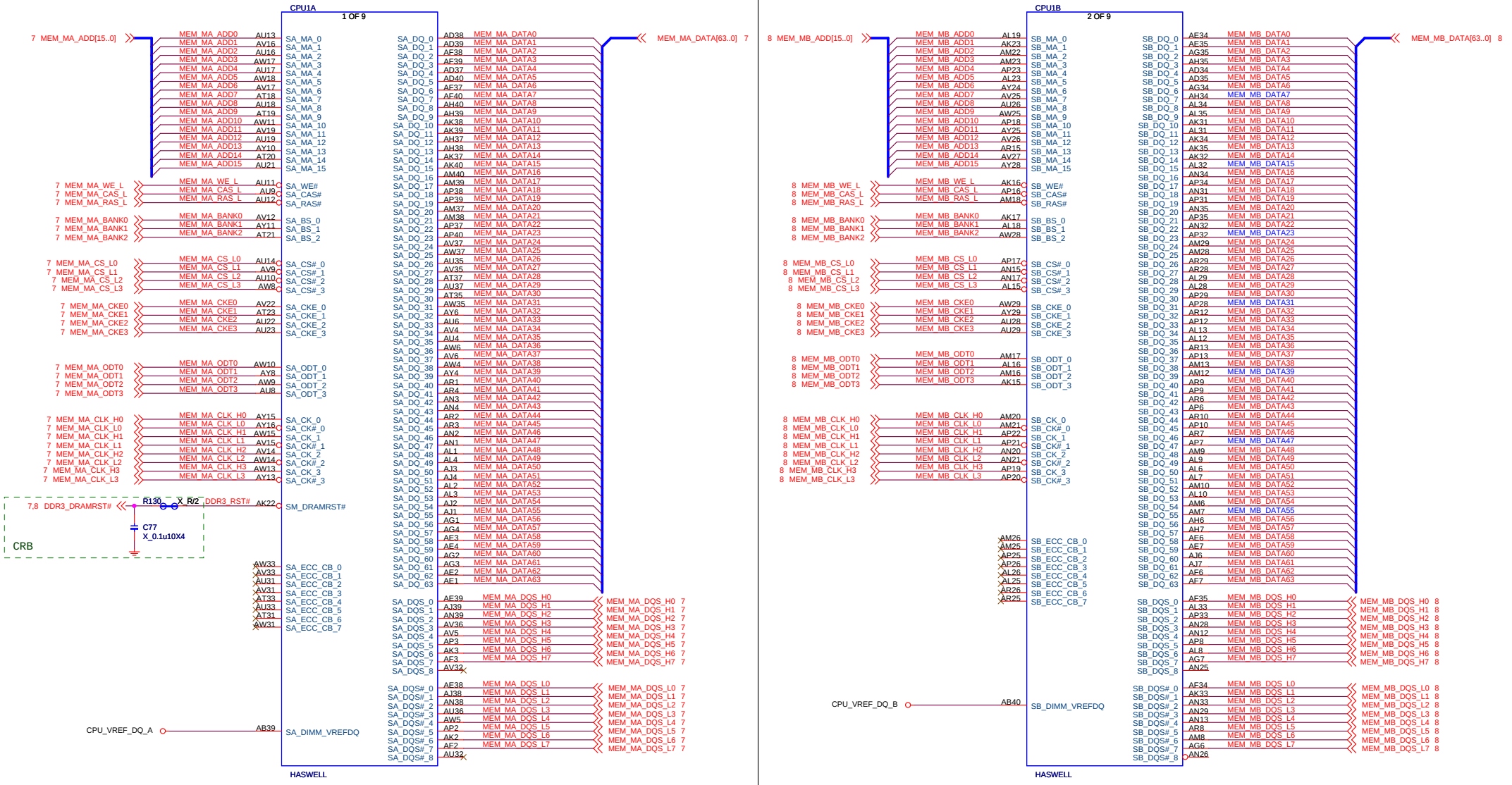
Date: Thursday, May 16, 2013 | Sheet 1 of 42

MS-7823 Block Diagram

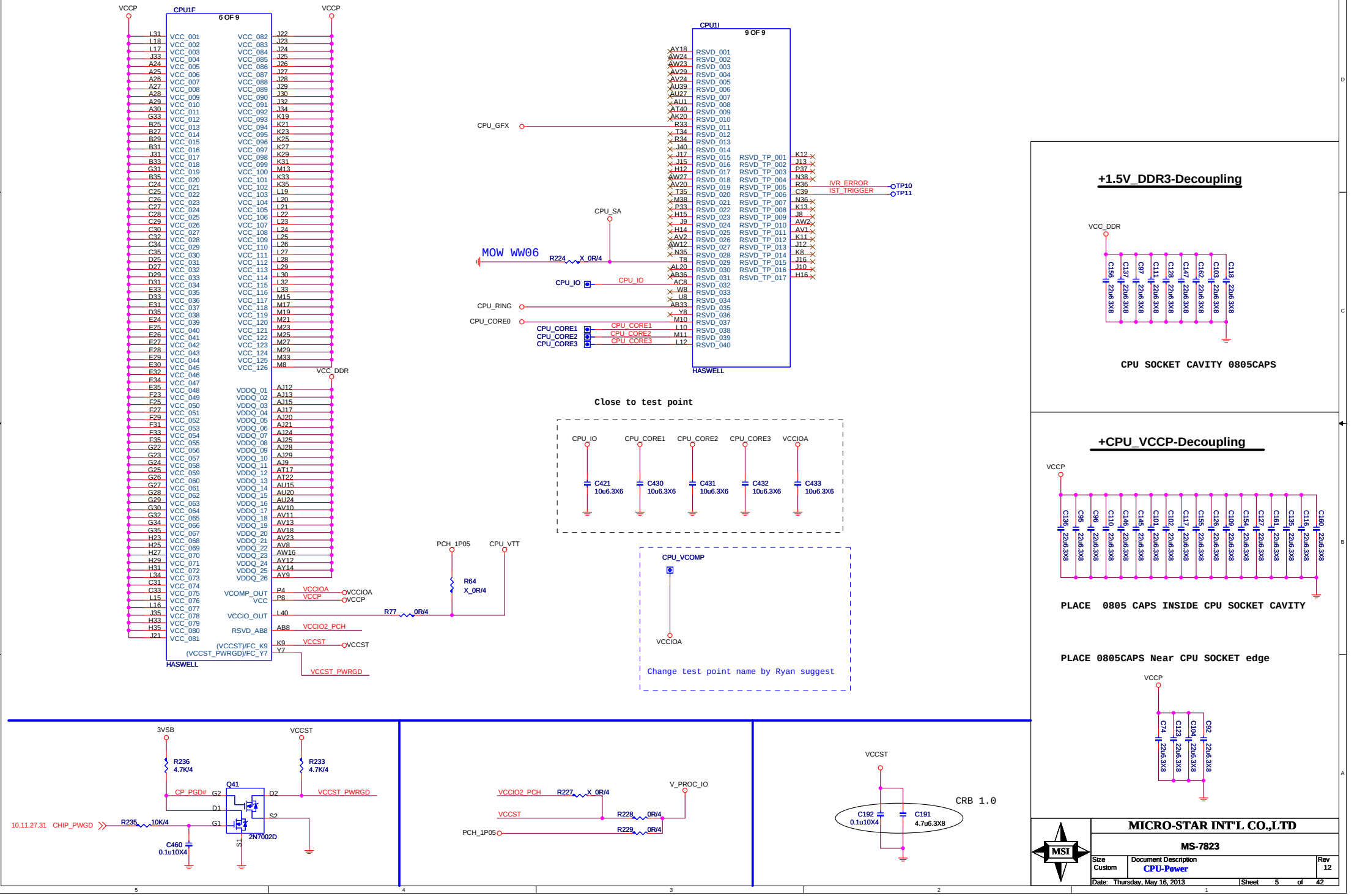


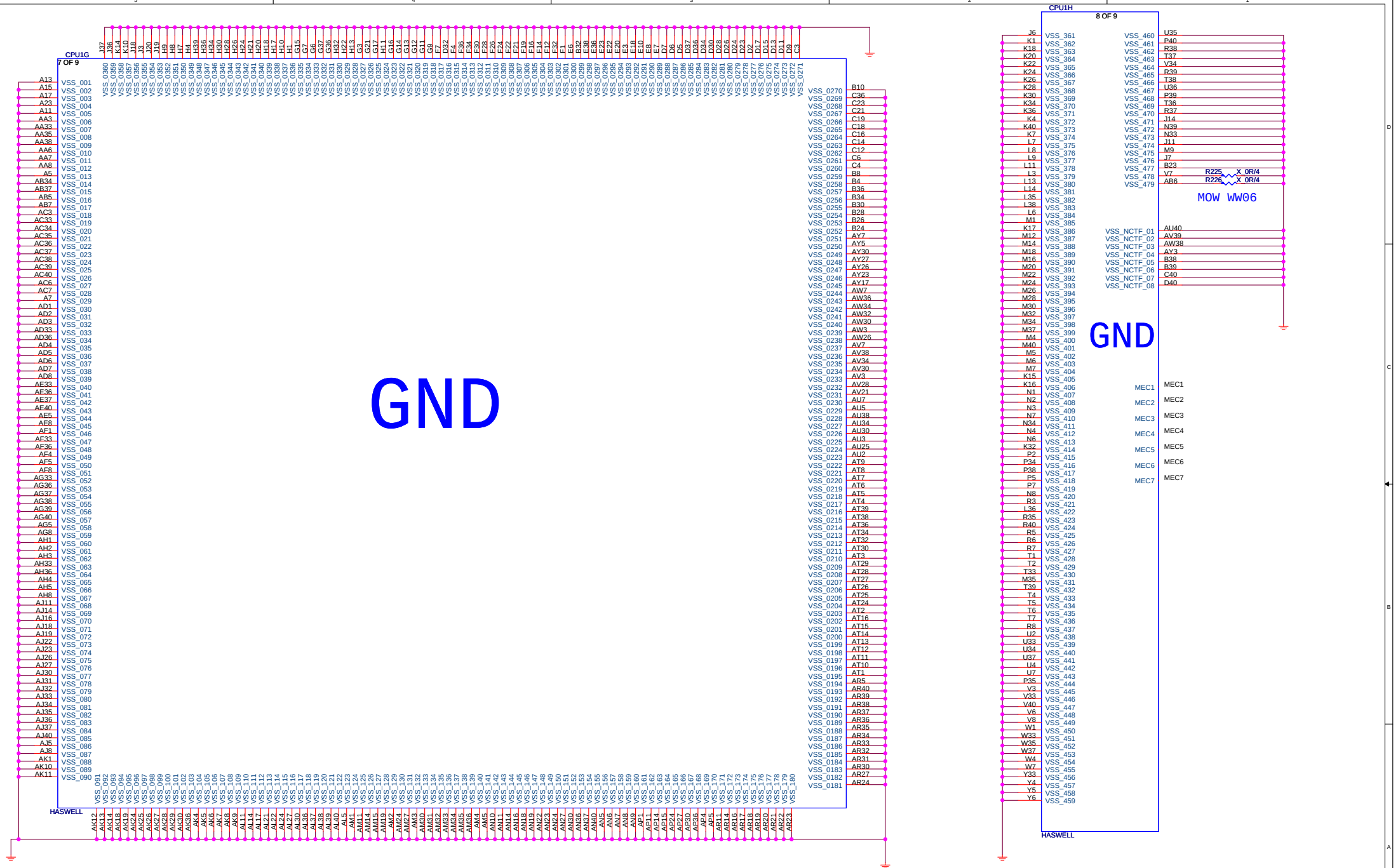
MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: Block Diagram	Rev: 12
Date: Thursday, May 16, 2013	Sheet 2 of 42	


CPU1E
5 OF 9
HASWELL
CPU1C
3 OF 9
CPU1D
4 OF 9
Break-out:10mil width, 6 mil space
Other Area:10mil width, 15 mil space
CPU_RESET#
CPURST# rise/fall time <6ns
0.98V?
R37 near PCH
mow15
L<=0.4 inch
MICRO-STAR INT'L CO.,LTD
MS-7823
CPU-CNTL/CLK/MISC
Size Custom
Rev 12
Date: Thursday, May 16, 2013
Sheet 3 of 42



MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: CPU-Memory	Rev: 12
Date: Thursday, May 16, 2013	Sheet 4 of 42	


CPU1F
6 OF 9
HASWELL
VCCP
VCC_DDR
CPU1I
9 OF 9
CPU_GFX
CPU_SA
MOW WW06
R224 X_0R/4
CPU_IO
CPU_RING
CPU_CORE0
CPU_CORE1
CPU_CORE2
CPU_CORE3
IVR_ERROR
IST_TRIGGER
TP10
TP11
Close to test point
C421 10u6.3X6
C430 10u6.3X6
C431 10u6.3X6
C432 10u6.3X6
C433 10u6.3X6
PCH_1P05
CPU_VTT
R64 X_0R/4
R77 0R/4
CPU_VCOMP
Change test point name by Ryan suggest
+1.5V_DDR3-Decoupling
CPU SOCKET CAVITY 0805CAPS
+CPU_VCCP-Decoupling
PLACE 0805 CAPS INSIDE CPU SOCKET CAVITY
PLACE 0805CAPS Near CPU SOCKET edge
3VSB
R236 4.7K/4
R233 4.7K/4
Q41
2N7002D
CP_PGD#
VCCST_PWRGD
10,11,27,31 CHIP_PWGD
R235 10K/4
C460 0.1u10X4
VCCIO2_PCH
R227 X_0R/4
V_PROC_IO
R228 0R/4
R229 0R/4
C192 0.1u10X4
C191 4.7u6.3X8
CRB 1.0
MICRO-STAR INT'L CO.,LTD
MS-7823
Size Custom
Document Description CPU-Power
Rev 12
Date: Thursday, May 16, 2013
Sheet 5 of 42



MICRO-STAR INT'L CO.,LTD	
MS-7823	
Size: Custom	Document Description: CPU-GND
Rev: 12	
Date: Thursday, May 16, 2013	Sheet 6 of 42

DDRIII DIMM_A0

DDRIII DIMM_A1

DDR3

DDR3

DIMM1

DIMM2

DDRIII-240_BLUE-R

DDRIII-240_BLACK-R

DIMM1(CHANNEL-A)
ADDRESS = 0:0 [SA1:SA0]

DIMM2(CHANNEL-A)
ADDRESS = 0:1 [SA1:SA0]

A0 A1 B0 B1

Place close to DIMM1

Place close to DIMM1 with DIMM2

Place close to DIMM2

UPI VOLTAGE CONSOLE

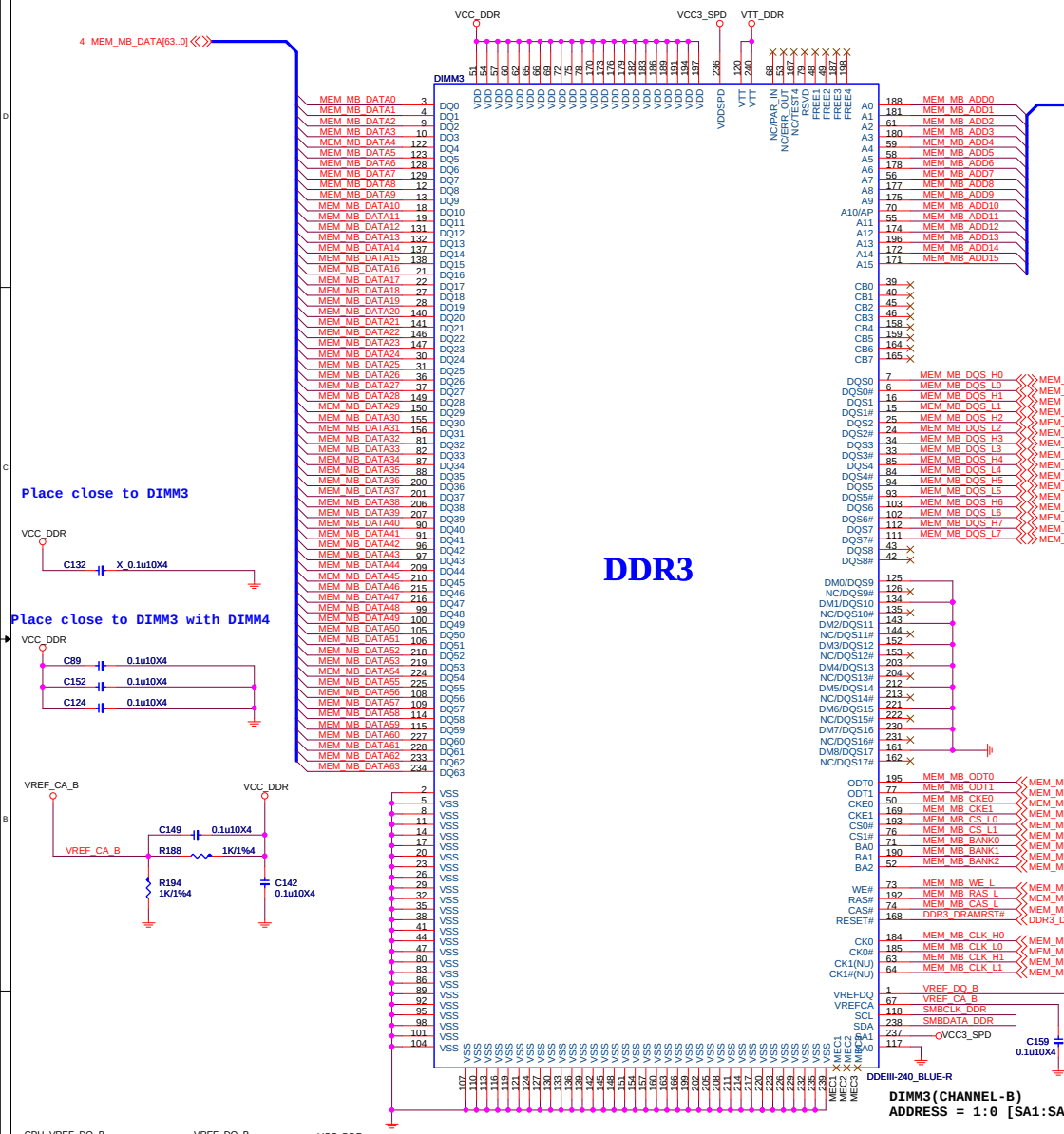
UPI VOLTAGE CONSOLE

UPI VOLTAGE CONSOLE

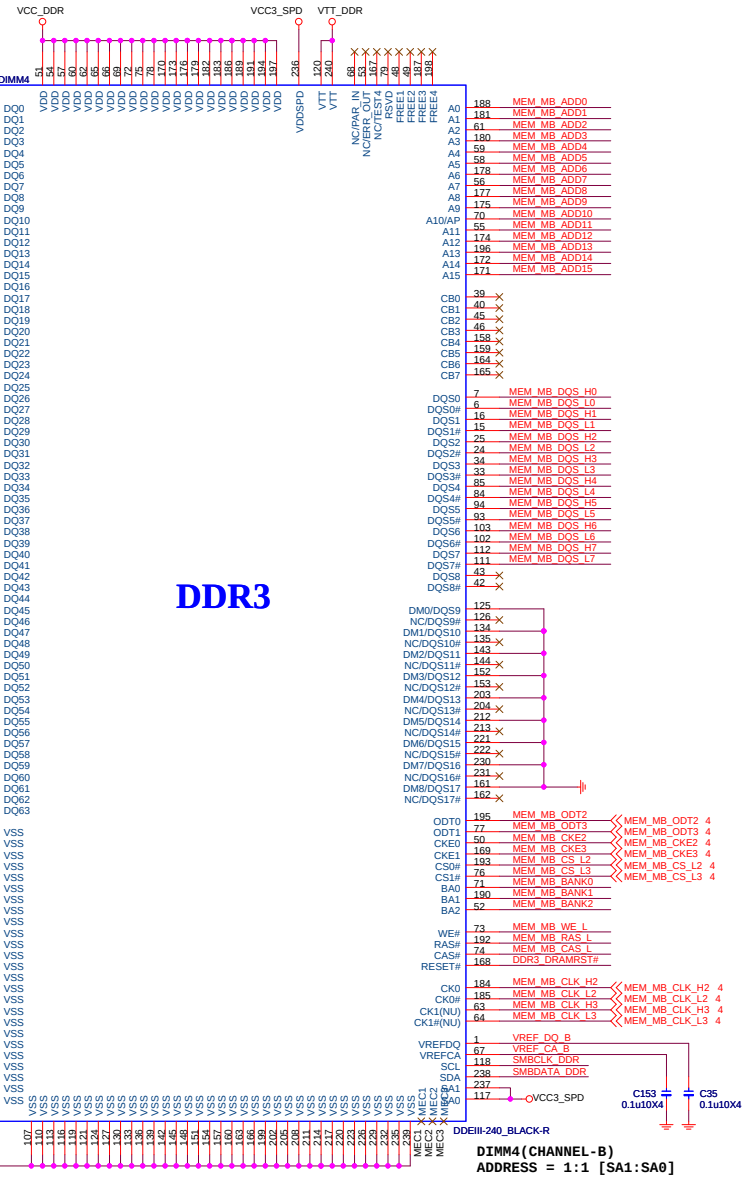
0x26:RH=18K,RL=13K

Company	MICRO-STAR INT'L CO.,LTD
Model	MS-7823
Size	Custom
Document Description	DDR3 Chanel-A DIMM1/2
Rev	12
Date	Thursday, May 16, 2013
Sheet	7 of 42

DDRIII DIMM_B0



DDRIII DIMM_B1



UPI VOLTAGE CONSOLE

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

MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: DDR3 Chanel-B DIMM3/4	Rev: 12
Date: Thursday, May 16, 2013	Sheet 8 of 42	

Modify PCIE for Port8 issue
All PCIE length need 6inch

B85/H81 Port 6&Port 7 are disabled

PCH1B

2 OF 8

PCI-E

USB(2.0)

USB(3.0)

DMI

LYNX

PCH1F

6 OF 8

CLOCK

CLOCK _IN

LYNX

33 MHz clock feedback input, to reduce skew

no clock gen pull down

EMI

MICRO-STAR INT'L CO.,LTD

MS-7823

Size	Document Description	Rev
Custom	LYNX-PCIE/DMI/CLK/USB20	12

Date: Thursday, May 16, 2013 | Sheet 9 of 42

SATA port
Z87,H87: port 0, 1, 2, 3, 4, 5, 6 are SATA 6G
B85: port 0, 1, 2, 3 are SATA 6G

Z87->Stuff R456
H87->Stuff R459

PCH1C

CLINK
FAN
GPIO
SATA
HOST

SATA4;5(COMB SATA&PCIE)

3 OF8
LYNX

PCH1E

VGA
FDILINK
PORT B
PORT C
PORT D
eDP CONTROL

DISPLAY

LYNX

PCH1A

PIRQ&GPIO

1 OF8
LYNX

Some condition control for BIOS use

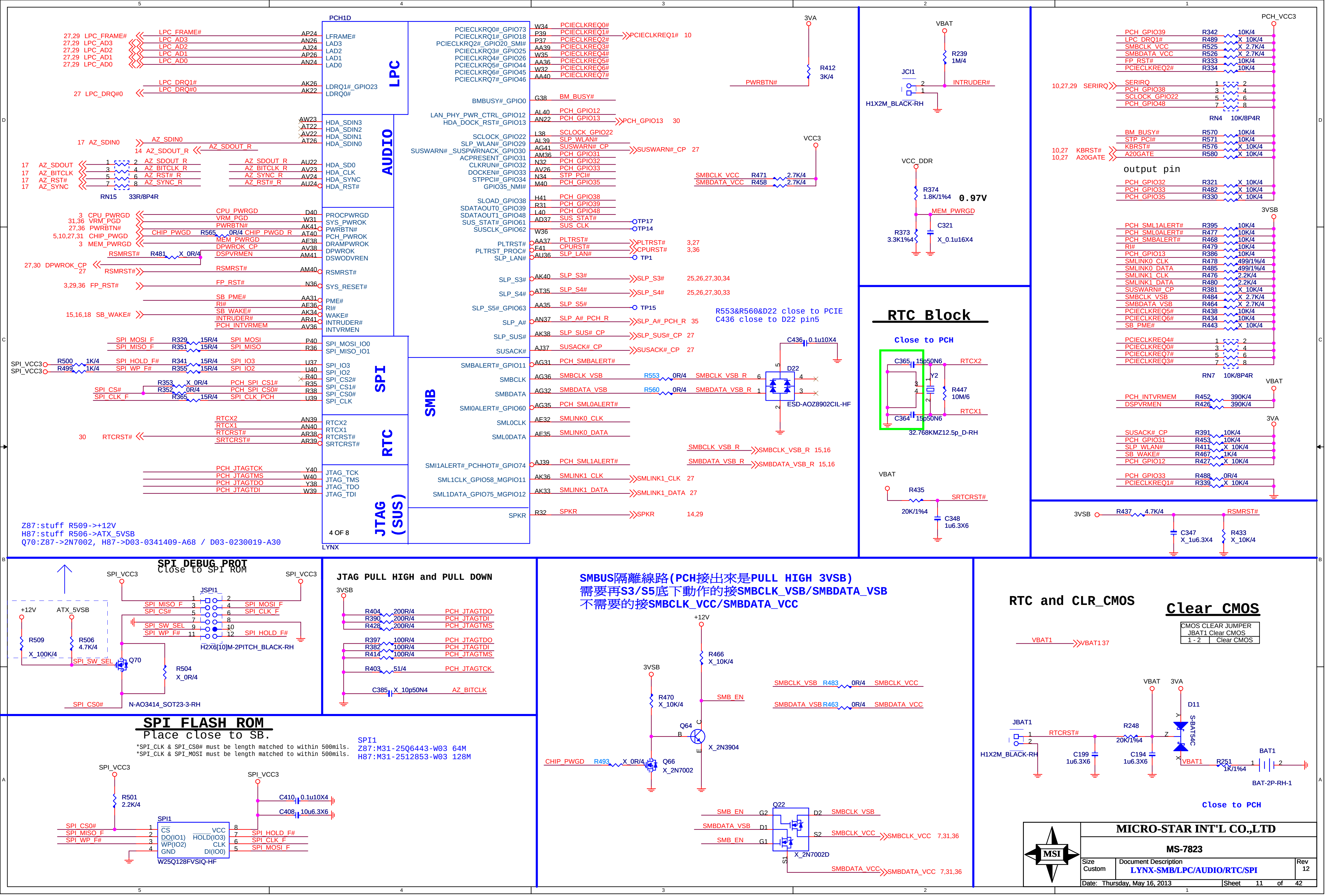
OC#5 for USB Charger Port,need pull high

output pin

Close to PCH within 250 mils.

Size	Custom
Document Description	LYNX-SATA/HOST/GPIO/VGA
Rev	12
Date:	Thursday, May 16, 2013
Sheet	10 of 42

MICRO-STAR INT'L CO.,LTD
MS-7823



PCH1D
LPC
AUDIO
SPI
SMB
RTC
JTAG (SUS)
4 OF 8
LYNX
LFRAME#
LAD3
LAD2
LAD1
LAD0
LDRQ1#_GPIO23
LDRQ0#
HDA_SDIN3
HDA_SDIN2
HDA_SDIN1
HDA_SDIN0
HDA_SDO
HDA_CLK
HDA_SYNC
HDA_RST#
PROCPWRGD
SYS_PWROK
PWRBTN#
PCH_PWROK
DRAMPWROK
DPWROK
DSWODVREN
RSMRST#
SYS_RESET#
PME#
RI#
WAKE#
INTRUDER#
INTVRMEN
SPI_MOSI_IO0
SPI_MISO_IO1
SPI_IO3
SPI_IO2
SPI_CS2#
SPI_CS1#
SPI_CS0#
SPI_CLK
RTCX2
RTCX1
RTCRST#
SRTCRST#
JTAG_TCK
JTAG_TMS
JTAG_TDO
JTAG_TDI
PCIECLKRQ0#_GPIO73
PCIECLKRQ1#_GPIO18
PCIECLKRQ2#_GPIO20_SMI#
PCIECLKRQ3#_GPIO25
PCIECLKRQ4#_GPIO26
PCIECLKRQ5#_GPIO44
PCIECLKRQ6#_GPIO45
PCIECLKRQ7#_GPIO46
BMBUSY#_GPIO0
LAN_PHY_PWR_CTRL_GPIO12
HDA_DOCK_RST#_GPIO13
SCLOCK_GPIO22
SLP_WLAN#_GPIO29
SUSWARN#_SUSPWRNACK_GPIO30
ACPRESENT_GPIO31
CLKRUN#_GPIO32
DOCKEN#_GPIO33
STPPCI#_GPIO34
GPIO35_NMI#
SLOAD_GPIO38
SDATAOUT0_GPIO39
SDATAOUT1_GPIO48
SUS_STAT#_GPIO61
SUSCLK_GPIO62
PLTRST#
PLTRST_PROC#
SLP_LAN#
SLP_S3#
SLP_S4#
SLP_S5#_GPIO63
SLP_A#
SLP_SUS#
SUSACK#
SMBALERT#_GPIO11
SMBCLK
SMBDATA
SMI0ALERT#_GPIO60
SML0CLK
SML0DATA
SMI1ALERT#_PCHHOT#_GPIO74
SML1CLK_GPIO58_MGPIO11
SML1DATA_GPIO75_MGPIO12
SPKR
Z87:stuff R509->+12V
H87:stuff R506->ATX_5VSB
Q70:Z87->2N7002, H87->D03-0341409-A68 / D03-0230019-A30
R553&R560&D22 close to PCIE
C436 close to D22 pin5
ESD-AOZ8902CIL-HF
0.97V
RTC Block
Close to PCH
32.768KMZ12.5p_D-RH
output pin
RN4 10K/8P4R
RN7 10K/8P4R
RN15 33R/8P4R
H1X2M_BLACK-RH
SPI DEBUG PROT
Close to SPI ROM
JSPI1
H2X6[10]M-2PITCH_BLACK-RH
N-AO3414_SOT23-3-RH
JTAG PULL HIGH and PULL DOWN
SMBUS隔離線路(PCH接出來是PULL HIGH 3VSB)
需要再S3/S5底下動作的接SMBCLK_VSB/SMBDATA_VSB
不需要的接SMBCLK_VCC/SMBDATA_VCC
X_2N3904
X_2N7002
X_2N7002D
RTC and CLR_CMOS
Clear CMOS
CMOS CLEAR JUMPER
JBAT1 Clear CMOS
1 - 2 Clear CMOS
BAT-2P-RH-1
Close to PCH
SPI FLASH ROM
Place close to SB.
*SPI_CLK & SPI_CS0# must be length matched to within 500mils.
*SPI_CLK & SPI_MOSI must be length matched to within 500mils.
SPI1
Z87:M31-25Q6443-W03 64M
H87:M31-2512853-W03 128M
W25Q128FVSIQ-HF
MICRO-STAR INT'L CO.,LTD
MS-7823
Size Custom
Document Description
LYNX-SMB/LPC/AUDIO/RTC/SPI
Rev 12
Date: Thursday, May 16, 2013
Sheet 11 of 42

Change to 10UH if
VCCA_DPLLA/VCCA_DPLLB
has noise issue.

AF25 ;AD25 DT CRB0.7 ASW POWER

(Internal) 1.312A+(External)1.38A=2.45A

POWER

VCC3	0.21A
3VA	0.015A
VBAT	6uA
3VSB	0.261A
VCC1_5	0.249A
PCH_1P05	5.921A

PCH_VCC3 HAVE SEQENCING

AG1 DT CRB0.7 VCC3 POWER

(Internal) 0.261A+(External)0.261A=0.522A

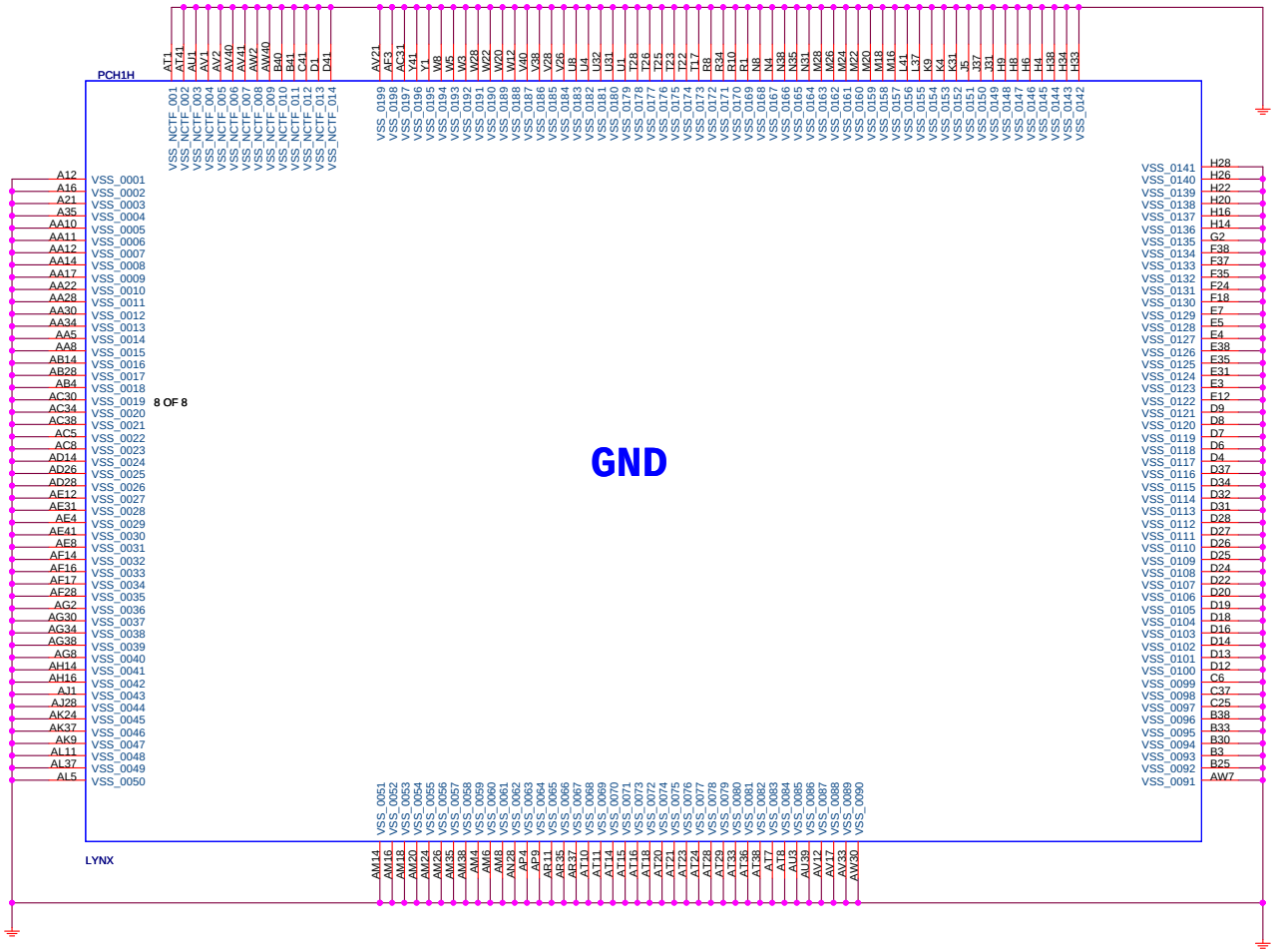
Z87->Stuff
H87&B85->un-Stuff

Backside for V14,U12,T16,V16
unstuff

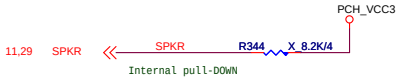
PCH decoupling cap

2013.0514.add C470

MICRO-STAR INT'L CO.,LTD	
MS-7823	
Size: Custom	Document Description: LYNX-POWER
Rev: 12	
Date: Thursday, May 16, 2013	Sheet 12 of 42

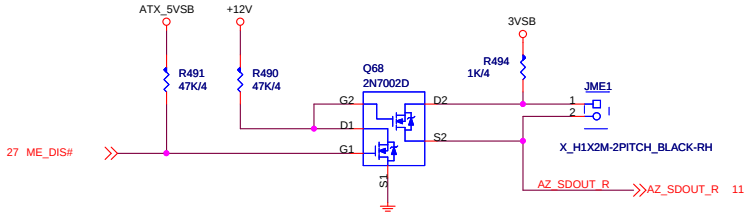


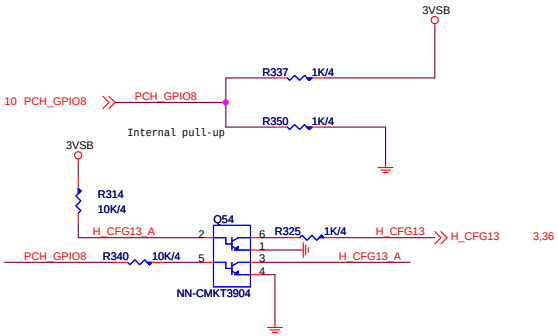
MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: LYNX-GND/NVRAM/USB30	Rev: 12
Date: Thursday, May 16, 2013	Sheet 13 of 42	



SPKR
Default Mode:
Internal weak Pull-down.

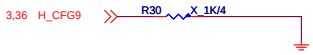
No Reboot Mode with TCO Disabled:
Connect to Vcc3_3 with 8.2k-10k Ohm weak pullup resistor.



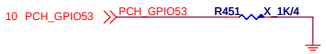


GPIO55
Default Mode:
Internal pull-up.

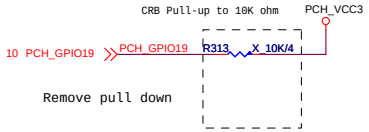
Top Block Swap Mode:
Connect to ground with 4.7k Ohm weak pulldown resistor.



For Sx power Cycling May Fail Due to SVID Logic Race Condition Within the Processor



GPIO53
Connect to ground with 1k Ohm pull-down resistor.



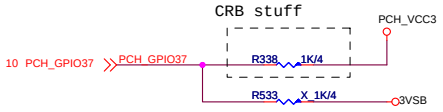
Default (SPI):
Left both SATA1GP/GPIO19 and GPIO51 floating.
No pull up required.

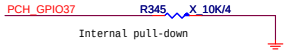
Boot from PCI:
Connect SATA1GP/GPIO19 to ground with 1k Ohm pull-down resistor.
Leave GPIO51 Floating.

Boot from LPC:
Connect both SATA1GP/GPIO19 and GPIO51 to ground with 1k Ohm pull-down resistor.

BOOT DEVICE	GPIO51	GPIO19
LPC	0	0
SPI	1	1

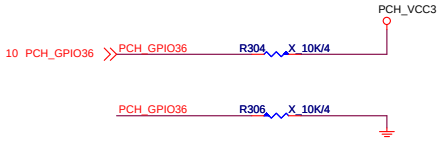
Default





Enable TLS:
Pull up with 1k Ohm to VccSus3.3.

Default (Disable TLS):
Leave NC. Internal pull down.

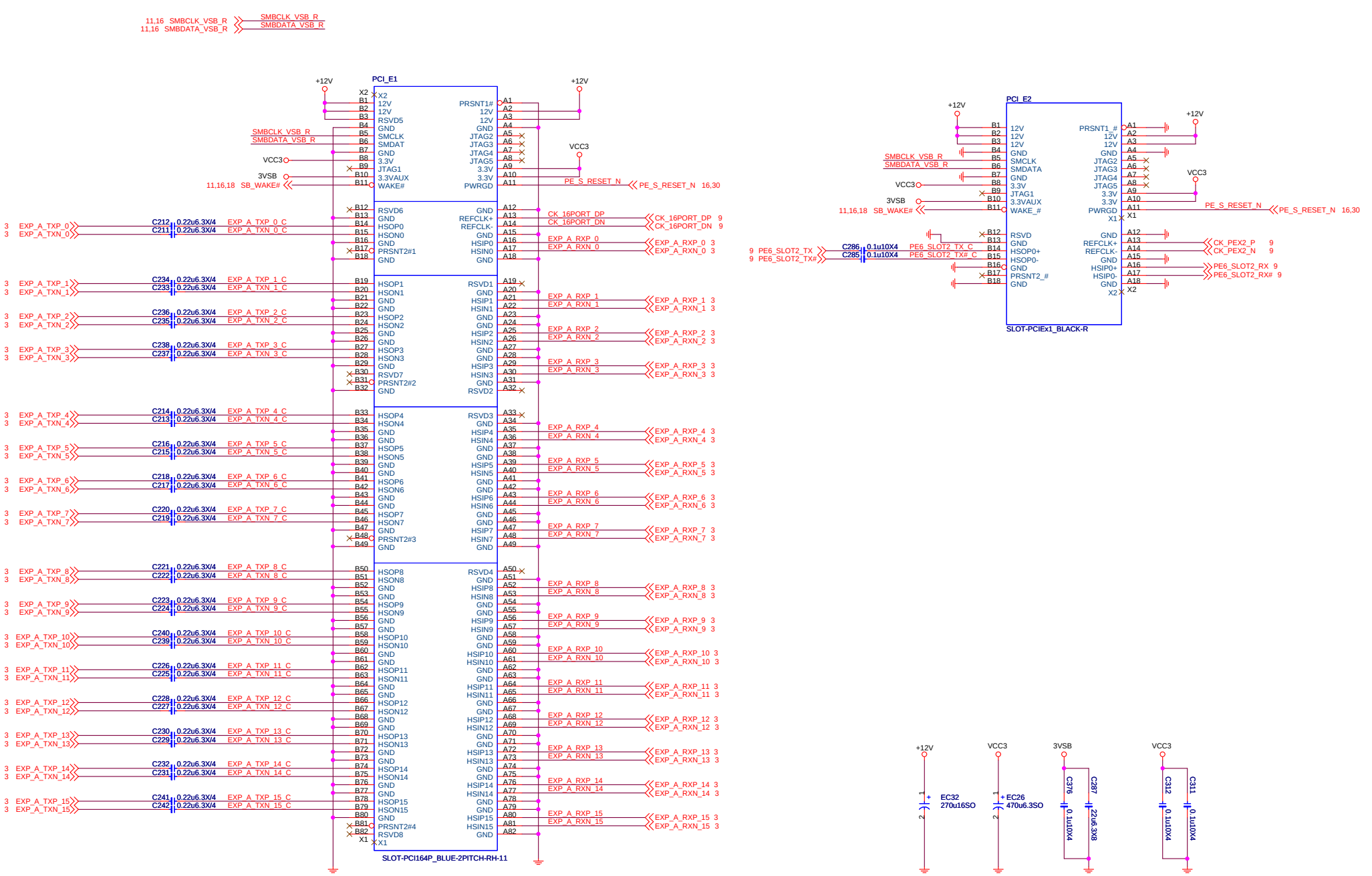


MICRO-STAR INT'L CO.,LTD

MS-7823

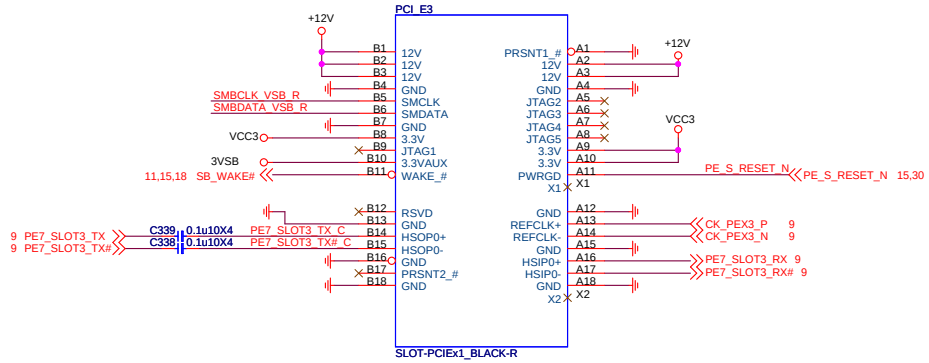
Size	Document Description	Rev
Custom	LYNX-Strap	12

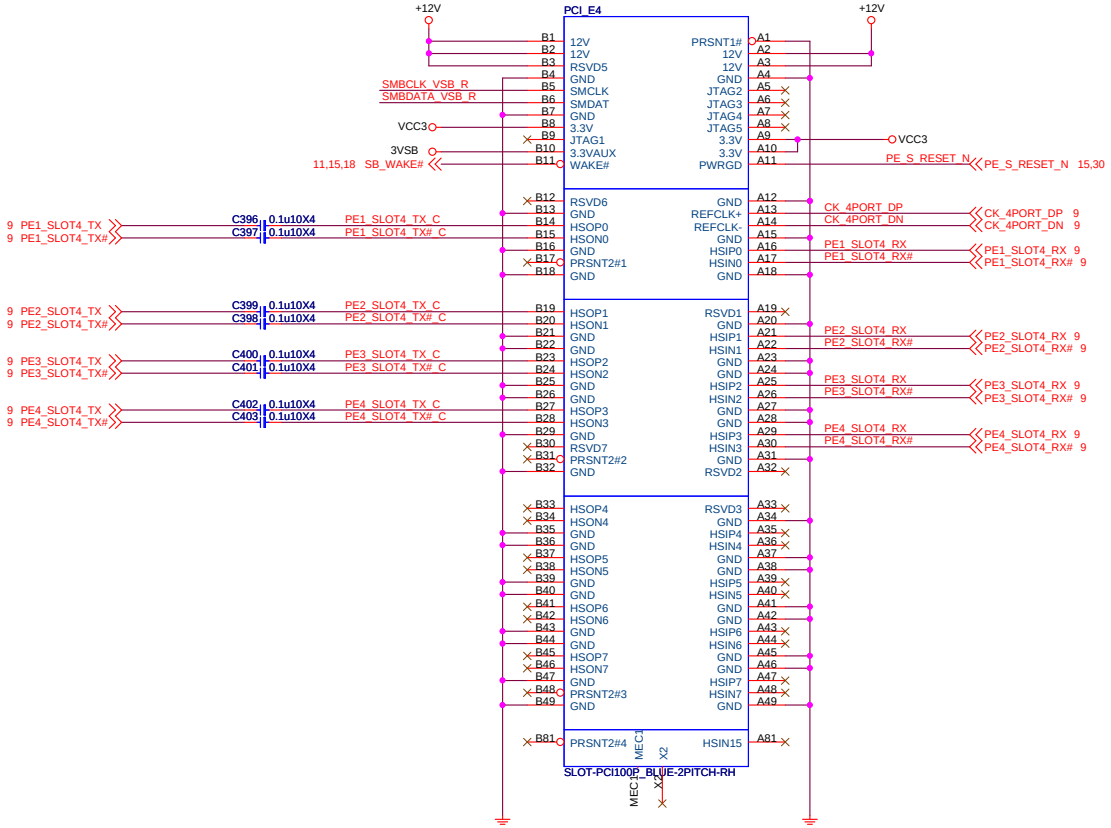
Date: Thursday, May 16, 2013 Sheet 14 of 42

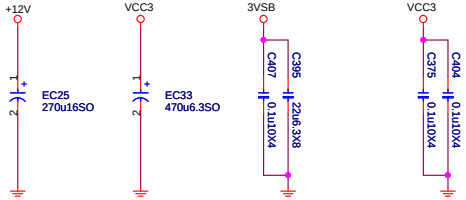


MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: PCIE1(X1) & PCIE2(X16) Slots	Rev: 12
Date: Thursday, May 16, 2013	Sheet 15 of 42	

PCI_Express X4 Slot







MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: PCIE3(X1) & PCIE4(X4.) Slots	Rev: 12
Date: Thursday, May 16, 2013	Sheet 16 of 42	

Type B:
ALC892/887

11mA
Closed Codec

CA4 closed PIN25
CA3 closed PIN38

SMD CAP: Fail to test THD+N
EL/SOLID cap: Test THD+N will Pass

UA1
ALC892-CG-RH

45.8mA

CA29.CA30 close to Pin27

2.2k for better recording quality

for rear I/O 6port:
887VD/892:1k

for rear I/O 3port:
887VD/892:75R

EMI

HDA_BITCLK_R
Add by EMI

0R for cost down

CA33,CA34 close to LA2

Closed Codec

SPDIF_OUT

Varister --> cap for cost down

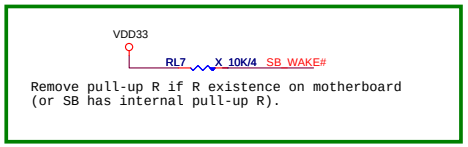
D0G-2950500-SI0
D0G-3010510-I05
Close to Jack

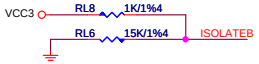
Close to Front panel
For HDA/AC97 front cable.

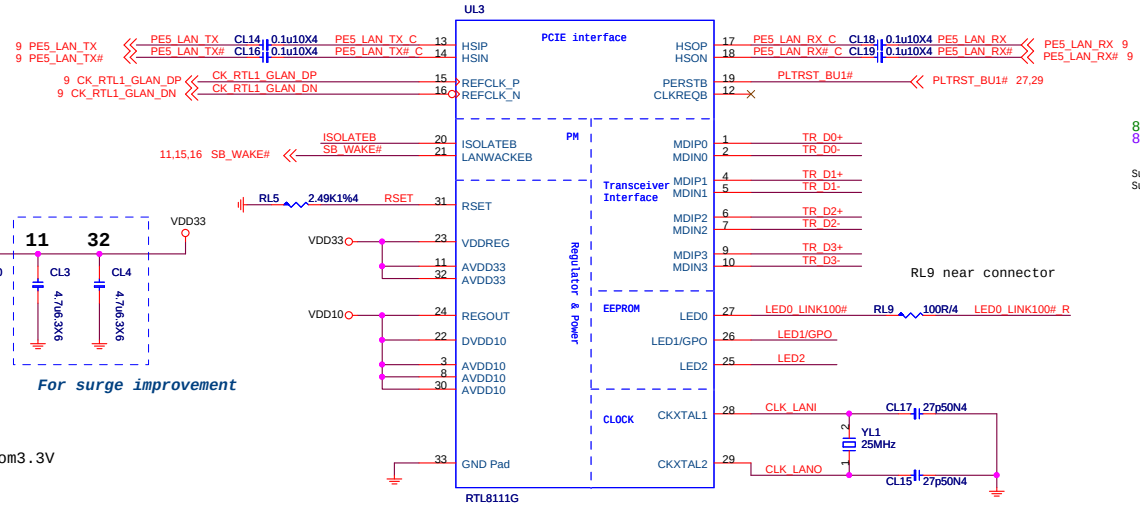
N31-2051411-H06

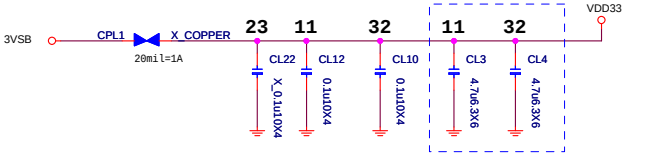
MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: Audio Codec ALC892	Rev: 12
Date: Thursday, May 16, 2013	Sheet 17 of 42	

RTL8111G Giga LAN
RTL8106E 10/100M LAN









For surge improvement

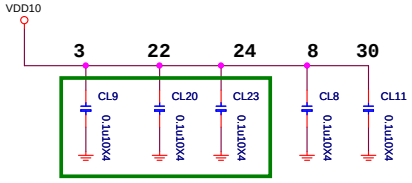
8111G: stuff CL10.CL12

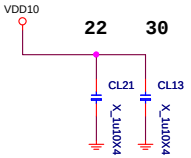
8106E: Stuff CL22.CL10

Icc33 average operating supply current from3.3V
At 1Gbps with heavy network traffic 70mA

Pin33: 4 via from top layer to GND layer
and make the via at the center of IC.

RL9 near connector





8111G: stuff

8106E: unstuff

CL21 Reserve for 8111G

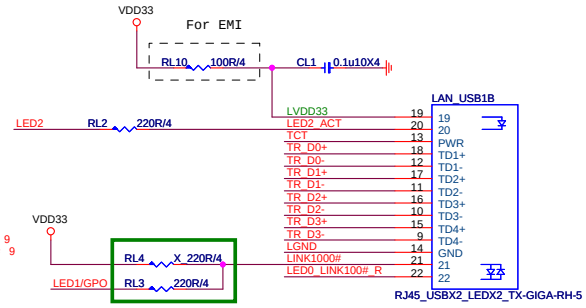
CL13 reserve for 8106E

Icc10 average operating supply current from1.0V
At 1Gbps with heavy network traffic 300mA

8111G:stuff CL20,CL9,CL8,CL11,CL23
un stuff CL13,CL21

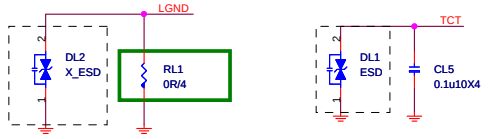
8106E: stuff CL8,CL11,CL13
un stuff CL21.CL20.CL9.CL23

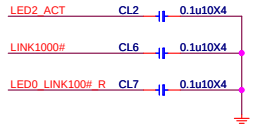
LAN Connector



8111G: Keep RL6 and Remove RL5 for RTL8111G
8106E: Keep RL5 and Remove RL6 for RTL8106E

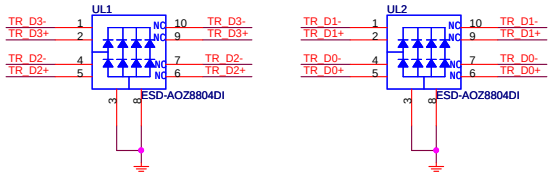
Support R>= 249 ohm Resister For Single Color LED.
Support R>= 125 ohm Resister For Dual Color LED.





Reserve ESD Protect

Change to 10 pin TVS by EMI



8106E POWER Consumption

	3.3V @ mA	mW
10 M Idle/TxRx	15/94	49.5/310.2
100 M Idle/TxRx	52/105	171.6/346.5
S0 ALDPS	4	13.2

8111G POWER Consumption

	3.3V @ mA	mW
10 M Idle/TxRx	17.15/116.7	56.6/385.1
100 M Idle/TxRx	71.45/129.5	235.8/427.4
Giga Idle/TxRx	179.1/243.9	591/804.9
ALDPS	6.41	21.15

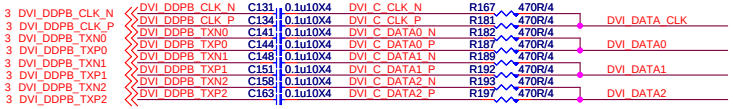
MICRO-STAR INT'L CO.,LTD

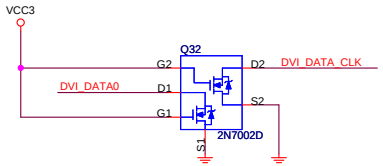
MS-7823

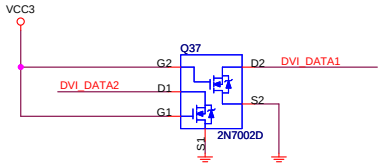
Size: Custom | Document Description: LAN-RTL8111G | Rev: 12

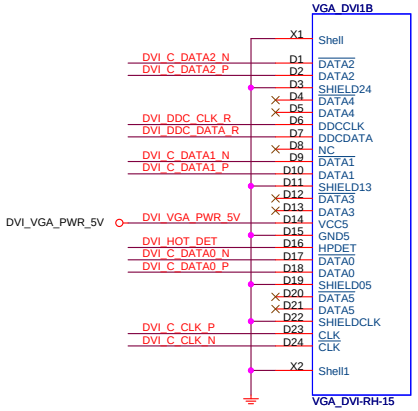
Date: Thursday, May 16, 2013 | Sheet 18 of 42

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

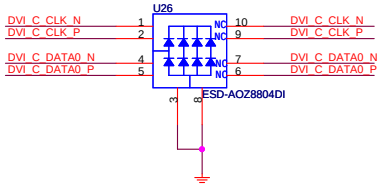




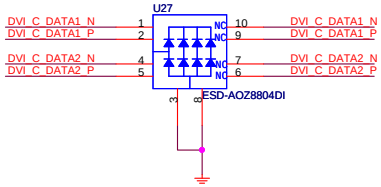


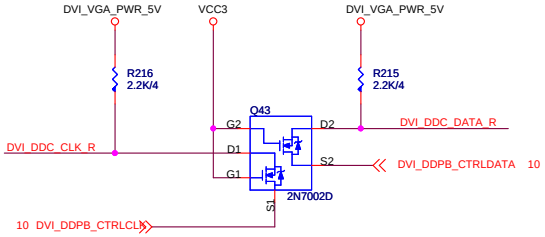


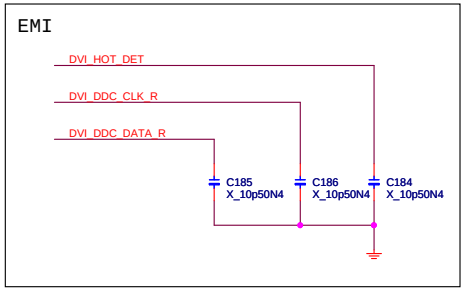
U26 AVL:D0G-05A050C-O05
D0G-06A050C-A68

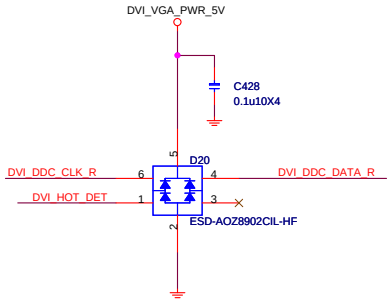


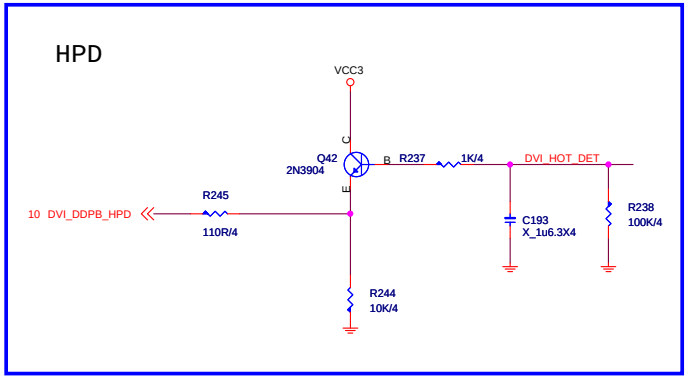
U27 AVL:D0G-05A050C-O05
D0G-06A050C-A68

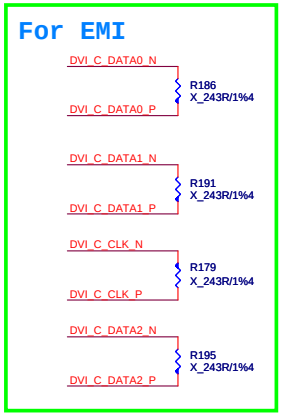






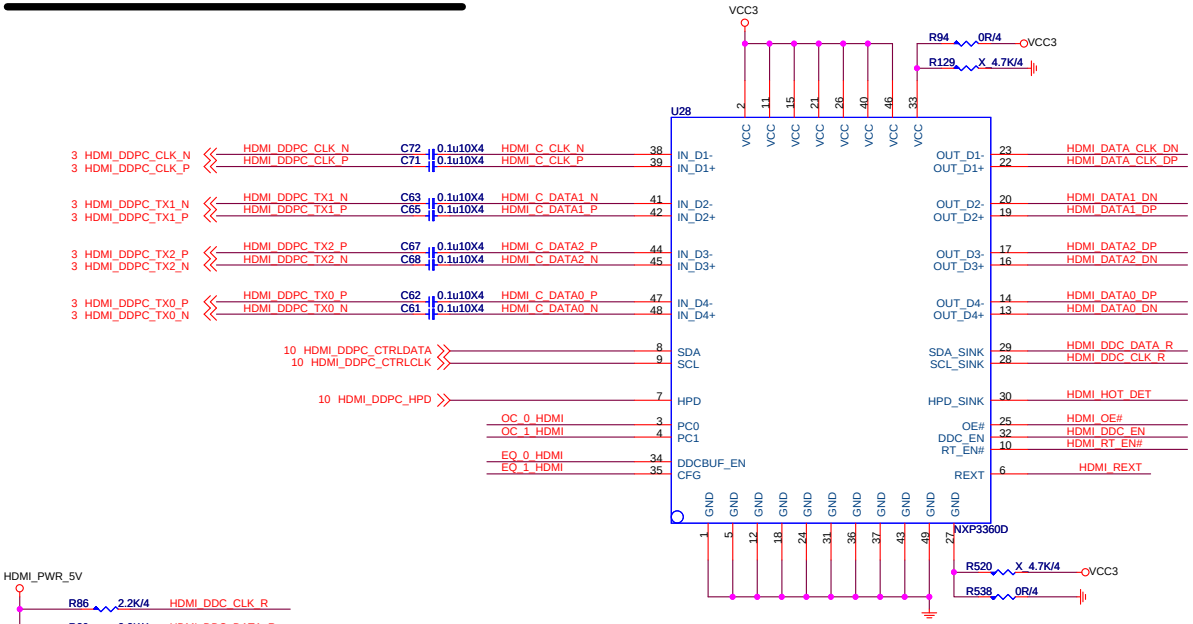


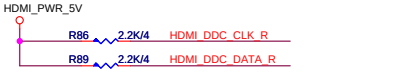


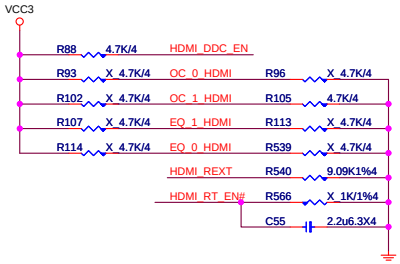


MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: DVI Connector	Rev: 12
Date: Thursday, May 16, 2013	Sheet 19 of 42	

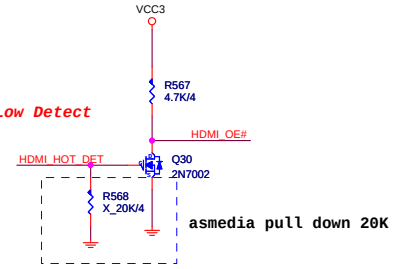
HDMI level shifter







注意High/Low Detect



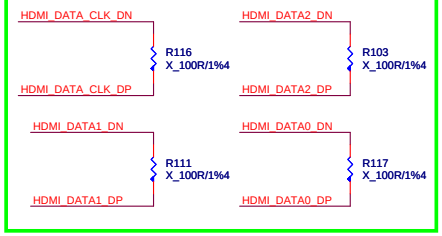
asmedia pull down 20K

	"0"	"1"	note
DDC_EN	DDC level shifter disable	DDC level shifter enable	internal pull-up at ~500K ohm.
RT_EN#	Input 50 ohm termination resistor enable	the input termination ; resistors are set to high impedances	internal pull-down at ~500K ohm.
OE#	enable	the chip is power down and input termination resistors will be at high impedance.	internal pull-down at ~500K ohm.
HPD_SINK	disable	enable	internal pull-down at ~200K ohm; 5V tolerant.
DDCBUF_EN	For DDC level shifitng configuration, please refer to Table.		internal pull-down at ~500K ohm.
REXT			analog current generation.

[DDC_EN, DDCBUF_EN, OE#]	DDC Passive Switch	DDC Active Buffer
1, 0, X	On	Off
1, 1, 0	Off	On
1, 1, 1	Off	Off

PC1, PC0		note
00	8 dB	internal pull-down at ~500K ohm.
01	4 dB	
10	12 dB	

For EMI



EMI

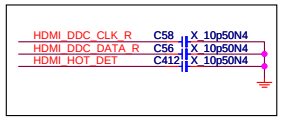
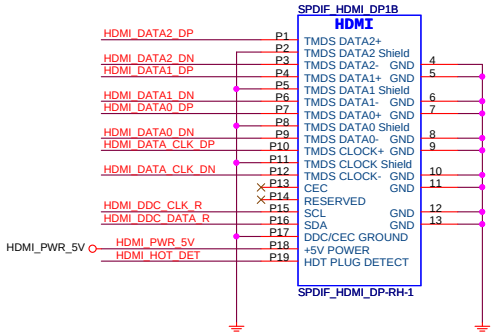
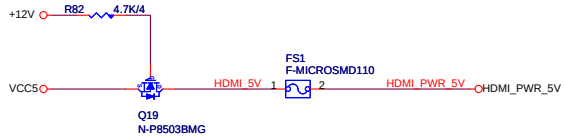
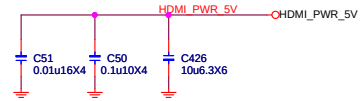


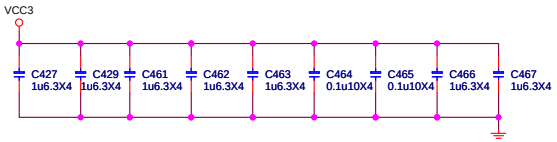
Table 8-1. PCH PCI Express Tx/RX - HDMI Signal Mappings

Port	Digital Display Interface Differential Pairs	HDMI Signals	PCH Digital Display Interface Pins
Port B	DDSP_B_TX0_DN	TMDSB_DATA2#	DDPB_0N
	DDSP_B_TX0_DP	TMDSB_DATA2	DDPB_0P
	DDSP_B_TX1_DN	TMDSB_DATA1#	DDPB_1N
	DDSP_B_TX1_DP	TMDSB_DATA1	DDPB_1P
	DDSP_B_TX2_DN	TMDSB_DATA0#	DDPB_2N
	DDSP_B_TX2_DP	TMDSB_DATA0	DDPB_2P
	DDSP_B_TX3_DN	TMDSB_CLK#	DDPB_3N
	DDSP_B_TX3_DP	TMDSB_CLK	DDPB_3P
	DDPB_HPD	DDSP_B_HPD0	Hot plug detect used by HDMI Port B.
	SDVO_CTRLCLK	HDMIB_CTRL_CLK	HDMI DDC lines for Port B
	SDVO_CTRLDATA	HDMIB_CTRL_DATA	







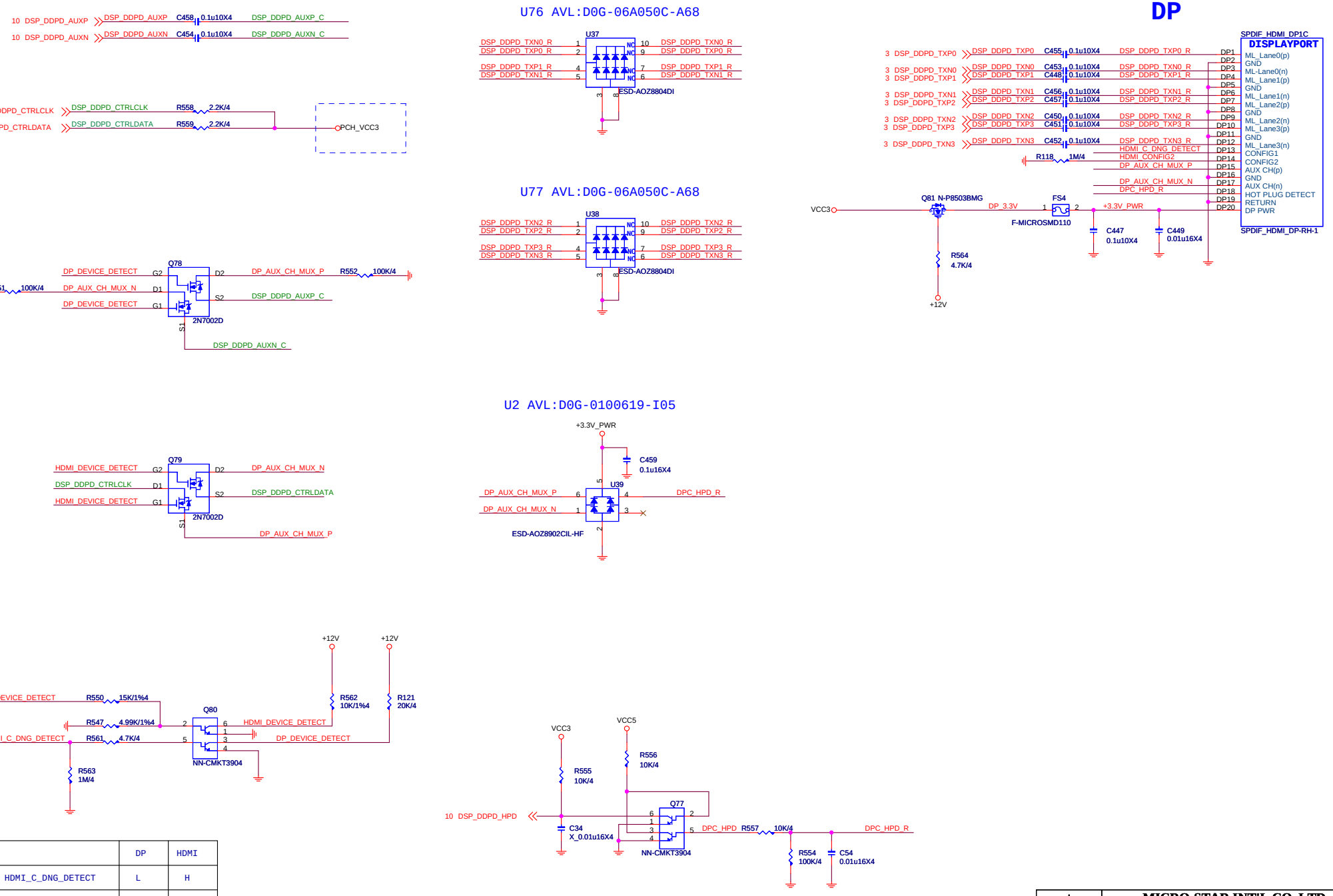


MICRO-STAR INT'L CO.,LTD

MS-7823

Size: Custom | Document Description: HDMI Connector | Rev: 12

Date: Thursday, May 16, 2013 | Sheet 20 of 42



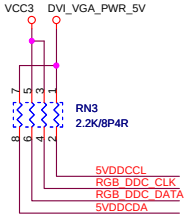
	DP	HDMI
HDMI_C_DNG_DETECT	L	H
DP_DEVICE_DETECT	H	L
HDMI_DEVICE_DETECT	L	H

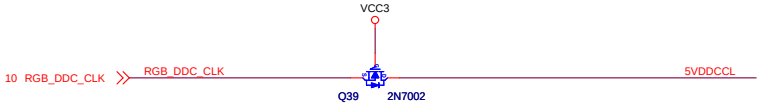
MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7823	
Size: Custom	Document Description: Display port connector	Rev: 12
Date: Thursday, May 16, 2013	Sheet 21 of 42	

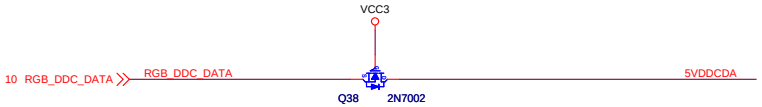
D-Sub

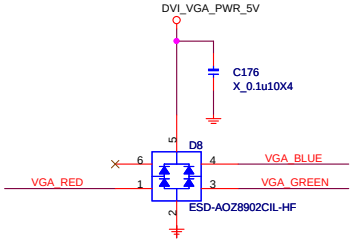
VGA: resolution of 2048x1536 pixels with 32-bit color at 75 Hz (4:3 QXGA)

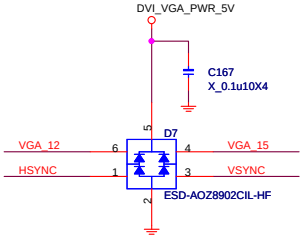
Level shift

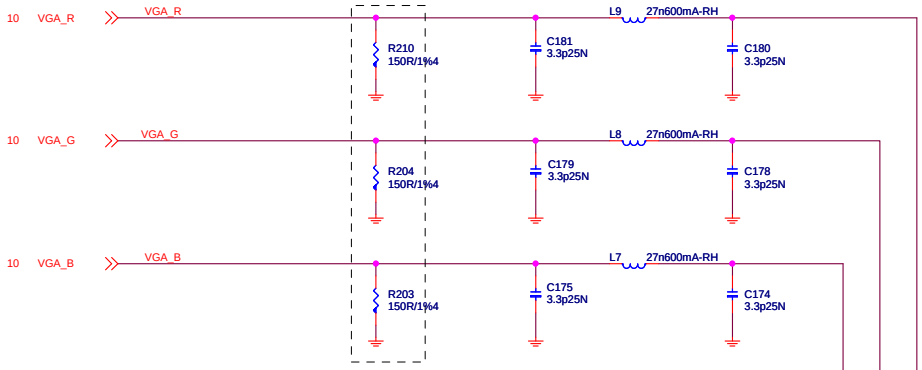




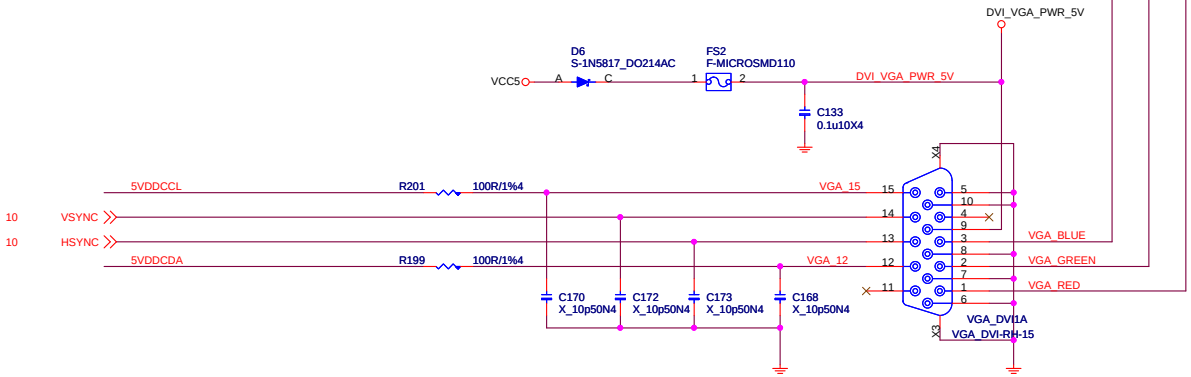








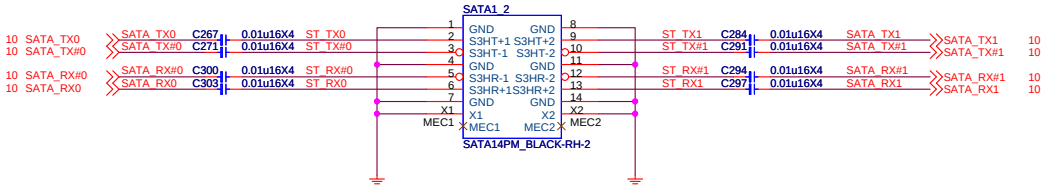
PLACE CLOSE TO VGA CONNECTOR,
WITHIN 750 MIL OF PIN



MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: VGA Connector	Rev: 12
Date: Thursday, May 16, 2013	Sheet 22 of 42	

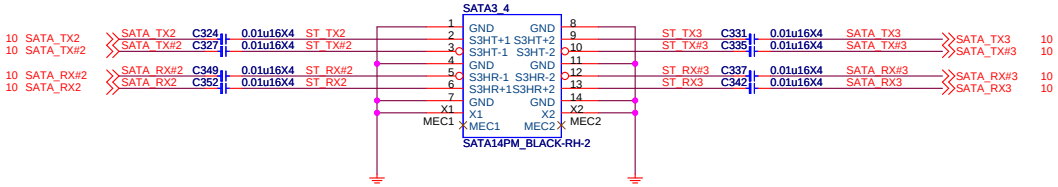
SATA 6G PORT 0,1

3.0 Black



SATA 3G PORT 2,3

3.0 Black

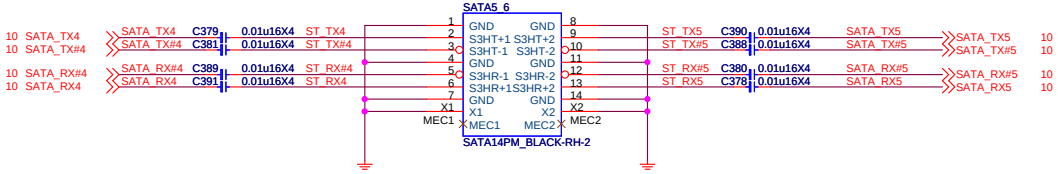


Change 90 by PM

SATA 3G PORT 4,5

3.0 Black

Z87,H87 chip support SATA3.0
B85 chip support SATA2.0

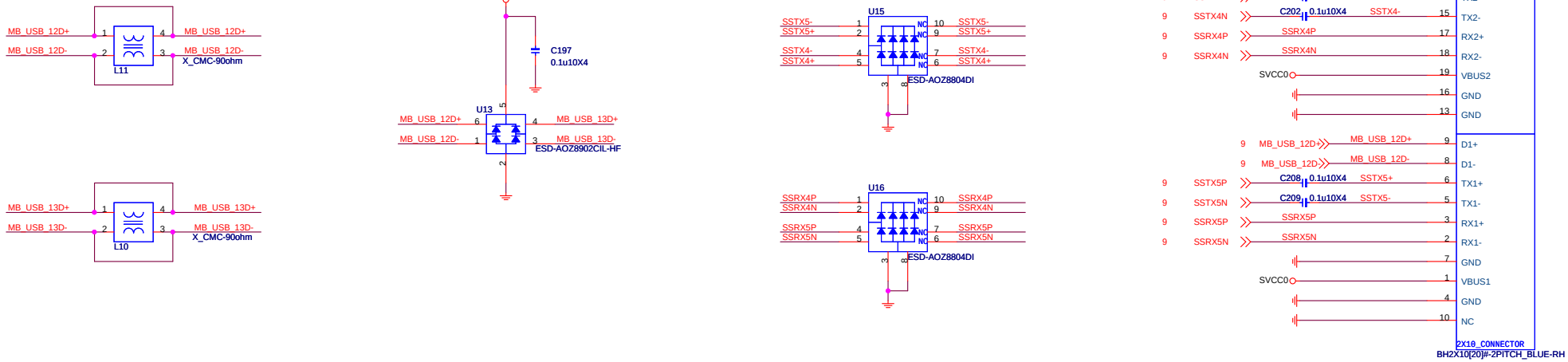


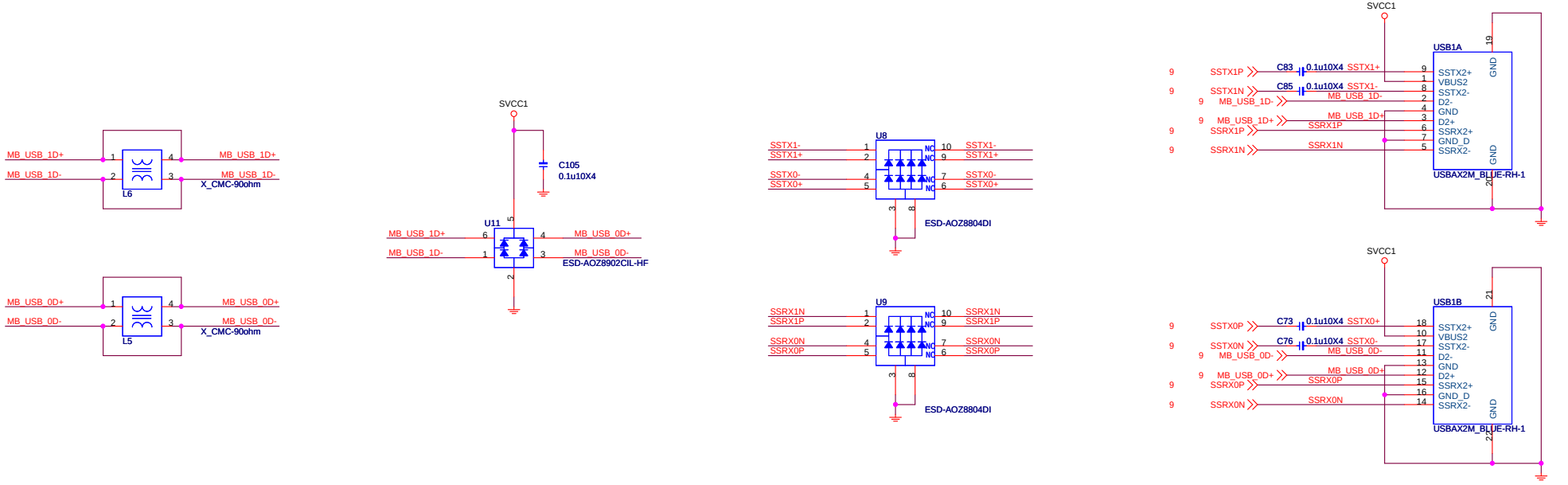
MICRO-STAR INT'L CO.,LTD

MS-7823

Size	Document Description	Rev
Custom	SATA Connector	12

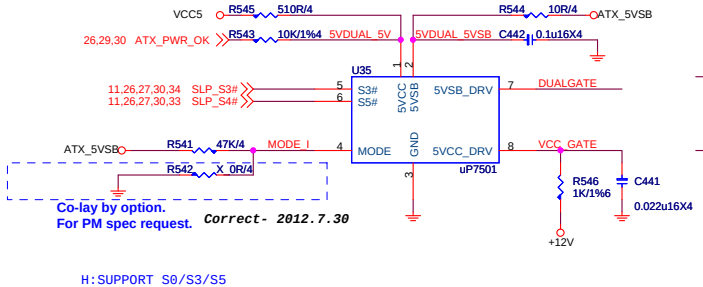
Date: Thursday, May 16, 2013 Sheet 23 of 42

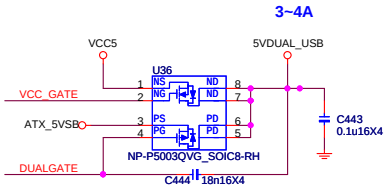


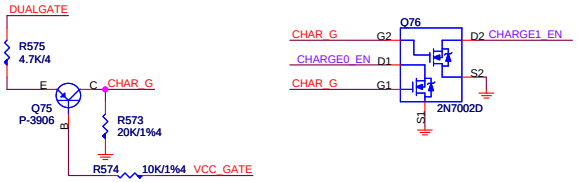


MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: USB3.0 Connector	Rev: 12
Date: Thursday, May 16, 2013	Sheet 24 of 42	

5VDUAL_USB - uP7501

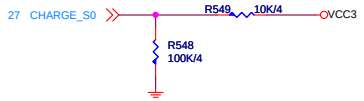




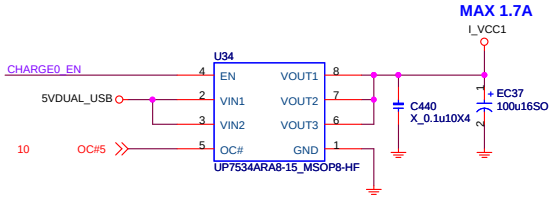


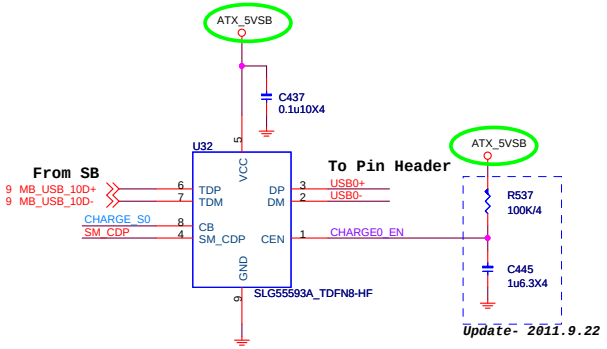
F71868 GPIO12

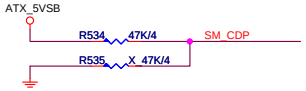
NCT6779D GPIO24
F71889 GPIO25



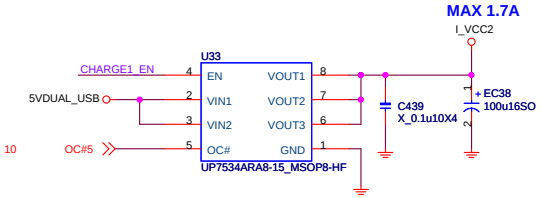
USB POWER PORT 0 For USB Charging

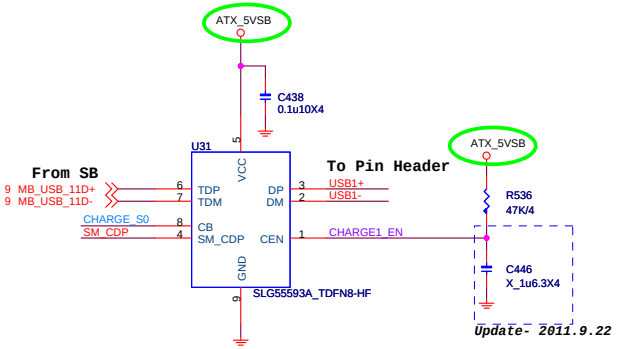




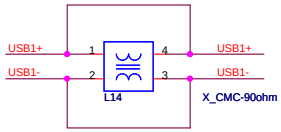


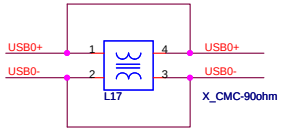
USB POWER PORT 1 For USB Charging



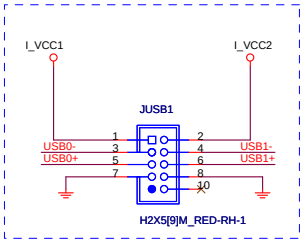


FRONT USB PORT 0,1





SLG55583A has internal ESD diode.



Please name the pin header JUSB1.

MICRO-STAR INT'L CO.,LTD	
MS-7823	
Size: Custom	Document Description: 25 USB CHARGE_SLG55593A
Rev: 12	
Date: Thursday, May 16, 2013	Sheet 25 of 42

2013.03.14 update

TO:NCT6779 GP72

H:SUPPORT S0/S3/S5
L:SUPPORT S0/S3

C413&C414 near D18&19 Pin5

C60&C43 near D3&D2 Pin5

5VDRV1, 5VSBDRV1 width 12mil
D08-0300700-P16 (Itrip=2.6A; 0.015ohm) support 2 USB ports

REAR USB PORT 2,3(OC1#)

FRONT USB PORT 8,9 (With LAN)

for B85 remove

FRONT USB PORT 6,7(OC3#)

FRONT USB PORT 4,5(OC2#)

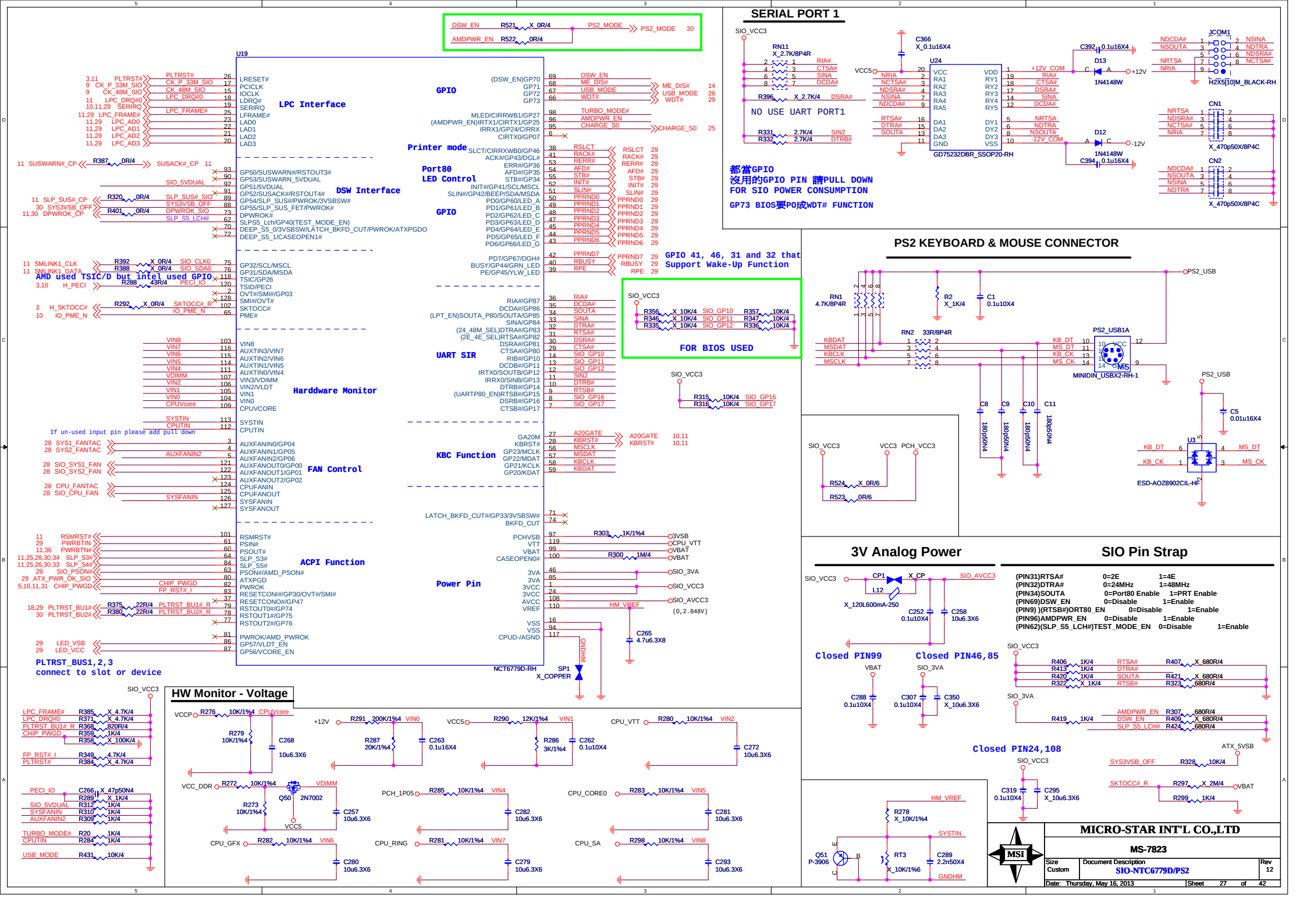
NEAR CONNECTOR

MINIDIN_USBX2-RH-1

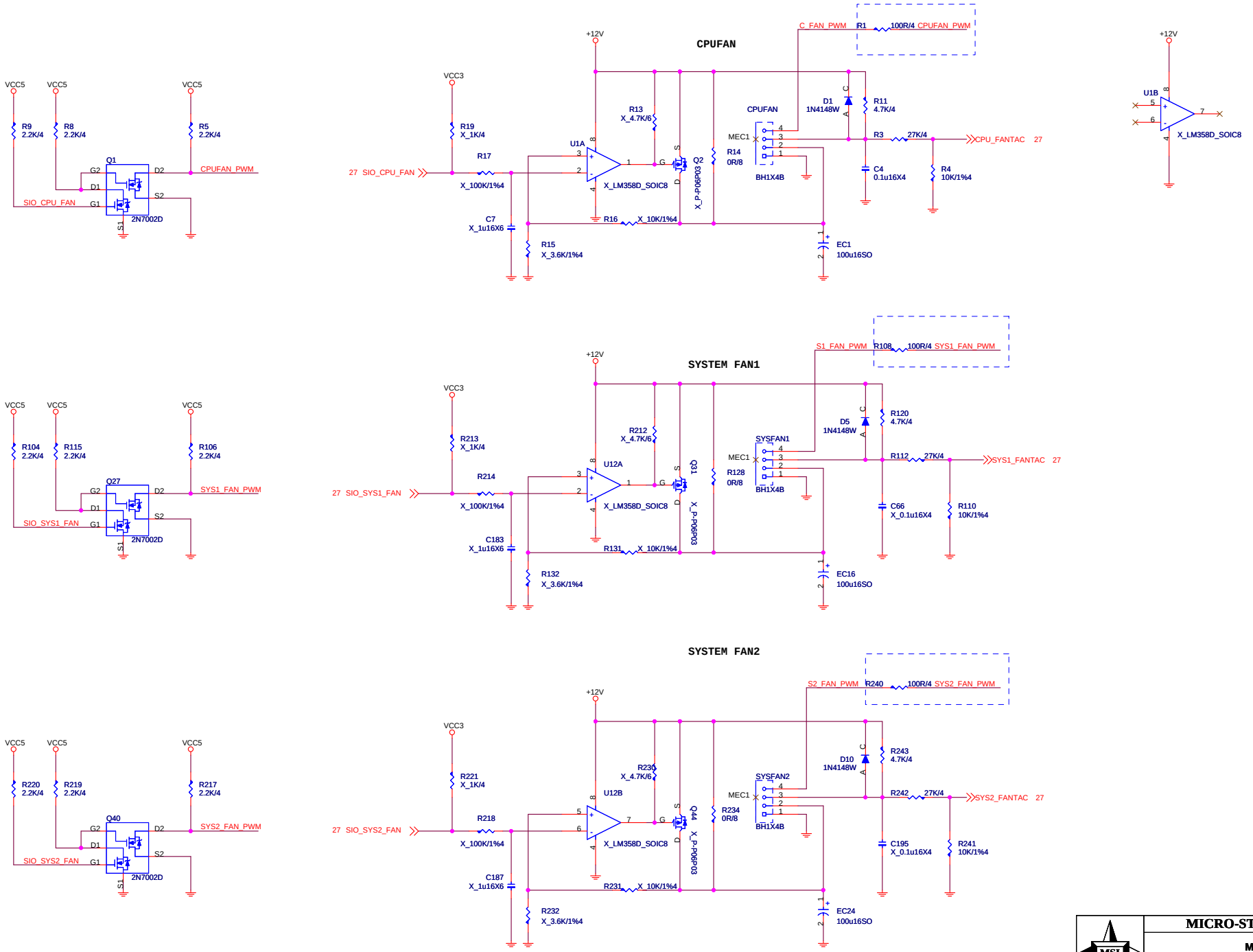
RJ45_USBX2_LEDX2_TX-GIGA-RH-5

H2X5[9]M_BLACK-RH-3

MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: Rear I/O & USB2.0 Connector	Rev: 12
Date: Thursday, May 16, 2013	Sheet 26 of 42	

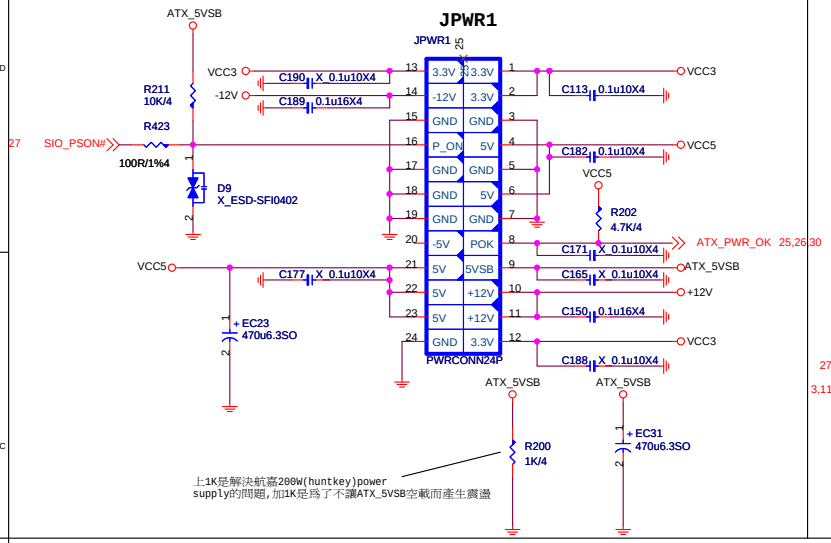

SERIAL PORT 1
NO USE UART PORT1
都當GPIO
沒用的GPIO PIN 請PULL DOWN
FOR SIO POWER CONSUMPTION
GP73 BIOS要PO成WDT# FUNCTION
PS2 KEYBOARD & MOUSE CONNECTOR
MINIDIN_USBX2-RH-1
ESD-AOZ8902CIL-HF
3V Analog Power
SIO Pin Strap
(PIN31)RTSA# 0=2E 1=4E
(PIN32)DTRA# 0=24MHz 1=48MHz
(PIN34)SOUTA 0=Port80 Enable 1=PRT Enable
(PIN69)DSW_EN 0=Disable 1=Enable
(PIN9))(RTSB#)ORT80_EN 0=Disable 1=Enable
(PIN96)AMDPWR_EN 0=Disable 1=Enable
(PIN62)(SLP_S5_LCH#)TEST_MODE_EN 0=Disable 1=Enable
Closed PIN99
Closed PIN46,85
Closed PIN24,108
HW Monitor - Voltage
AMD used TSIC/D but intel used GPIO
If un-used input pin please add pull down
PLTRST_BUS1,2,3
connect to slot or device
GPIO 41, 46, 31 and 32 that
Support Wake-Up Function
FOR BIOS USED
LPC Interface
DSW Interface
Port80
LED Control
Printer mode
UART SIR
Harddware Monitor
FAN Control
KBC Function
ACPI Function
Power Pin
NCT6779D-RH
MICRO-STAR INT'L CO.,LTD
MS-7823
SIO-NTC6779D/PS2
Thursday, May 16, 2013
Sheet 27 of 42

FAN-COUNTROL CIRCUIT

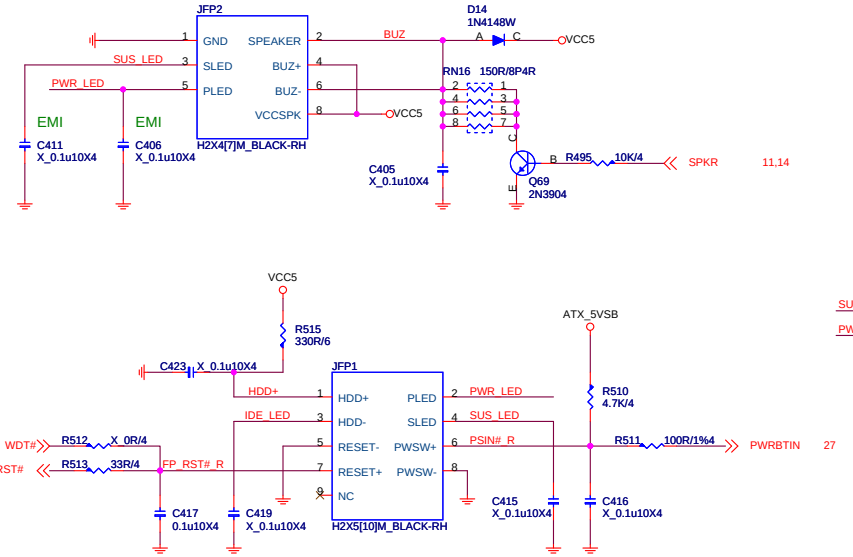


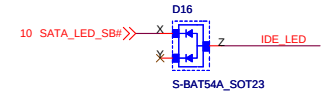
MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: FAN Control	Rev: 12
Date: Thursday, May 16, 2013	Sheet 28 of 42	

ATX POWER CONNECTOR

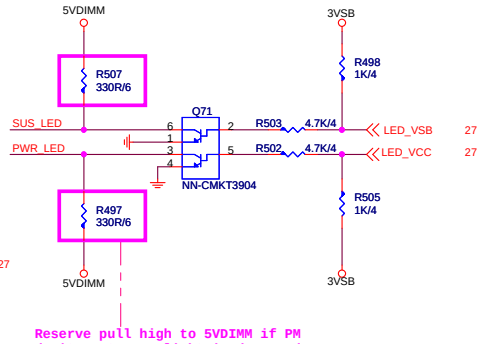


FRONT PANNEL

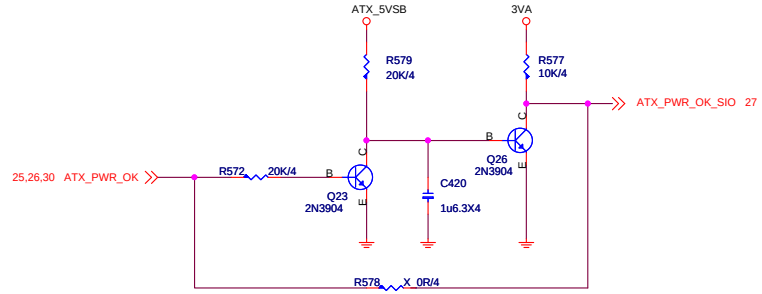




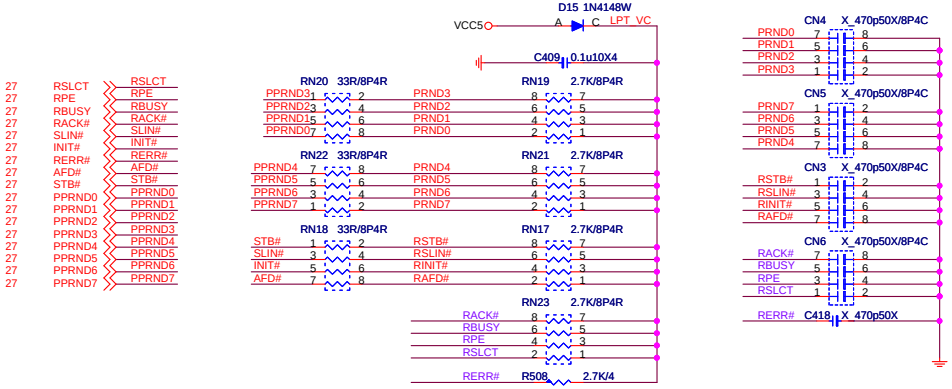
LED (for Fintek 71869)



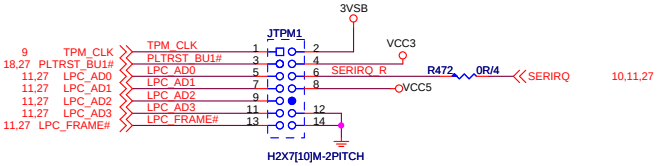
5VCC leakage from ATXPGD.(NCT6779 PIN80)

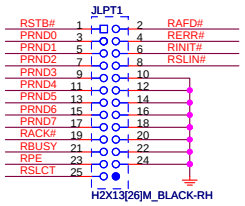


PARALLAL PORT



TPM





N31-2131151-H06 : 2.0mm

N31-2131131-H06 : 2.54mm

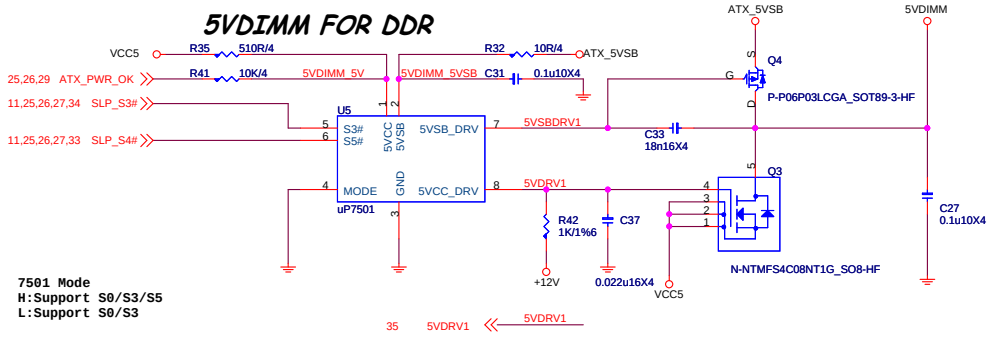
MICRO-STAR INT'L CO.,LTD

MS-7823

Size	Document Description	Rev
Custom	ATX F_Panel/EMI/TPM	12

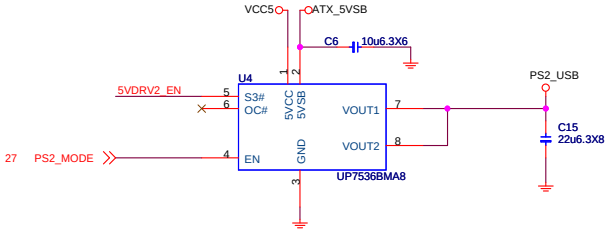
Date: Thursday, May 16, 2013 Sheet 29 of 42

5VDIMM FOR DDR

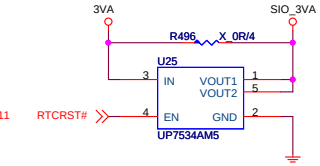


7501 Mode
H:Support S0/S3/S5
L:Support S0/S3

PS2 Power



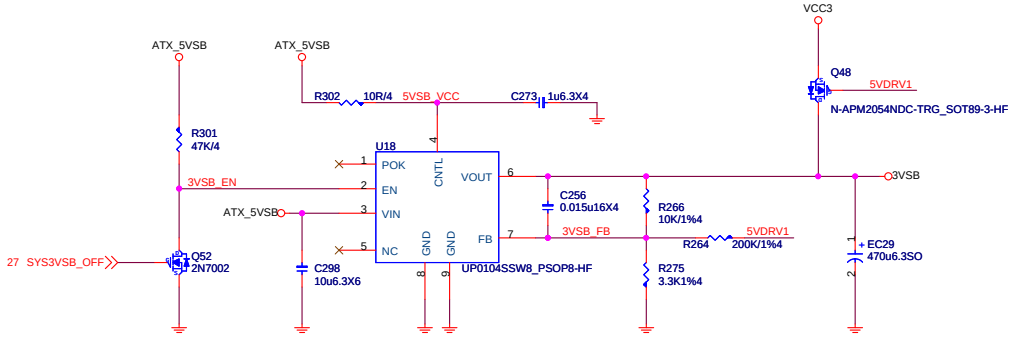
隔離PCH&SIO的3VA



3VSB

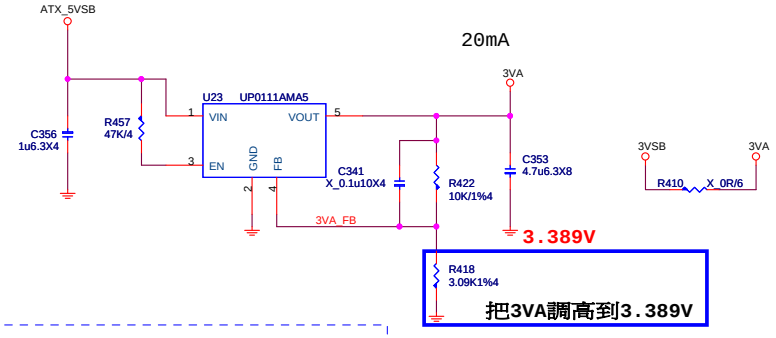
0.216+0.2+1.5+0.67=2.586A
PCH:216mA
LAN:200mA
PCIE Slot:375mA x4
up0104 ME Power:0.67A

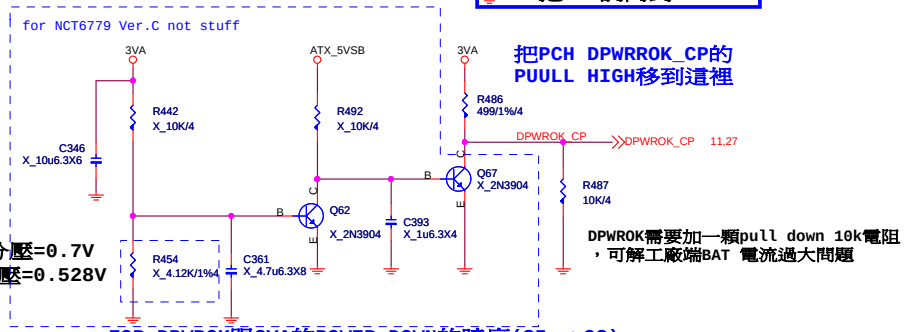
Q48 AVL:D03-3057L19-N03



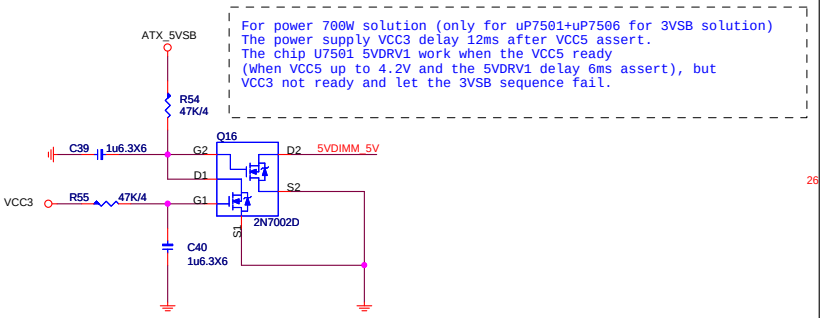
3VA

20mA

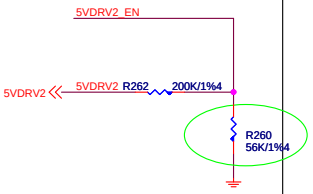


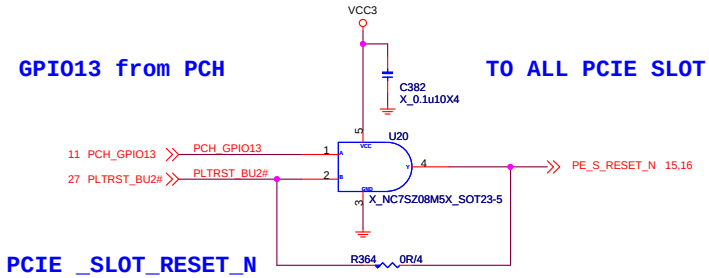


FOR DPWROK跟3VA的POWER DOWN的時序(S5-->G3)



USB MODE





MICRO-STAR INT'L CO.,LTD

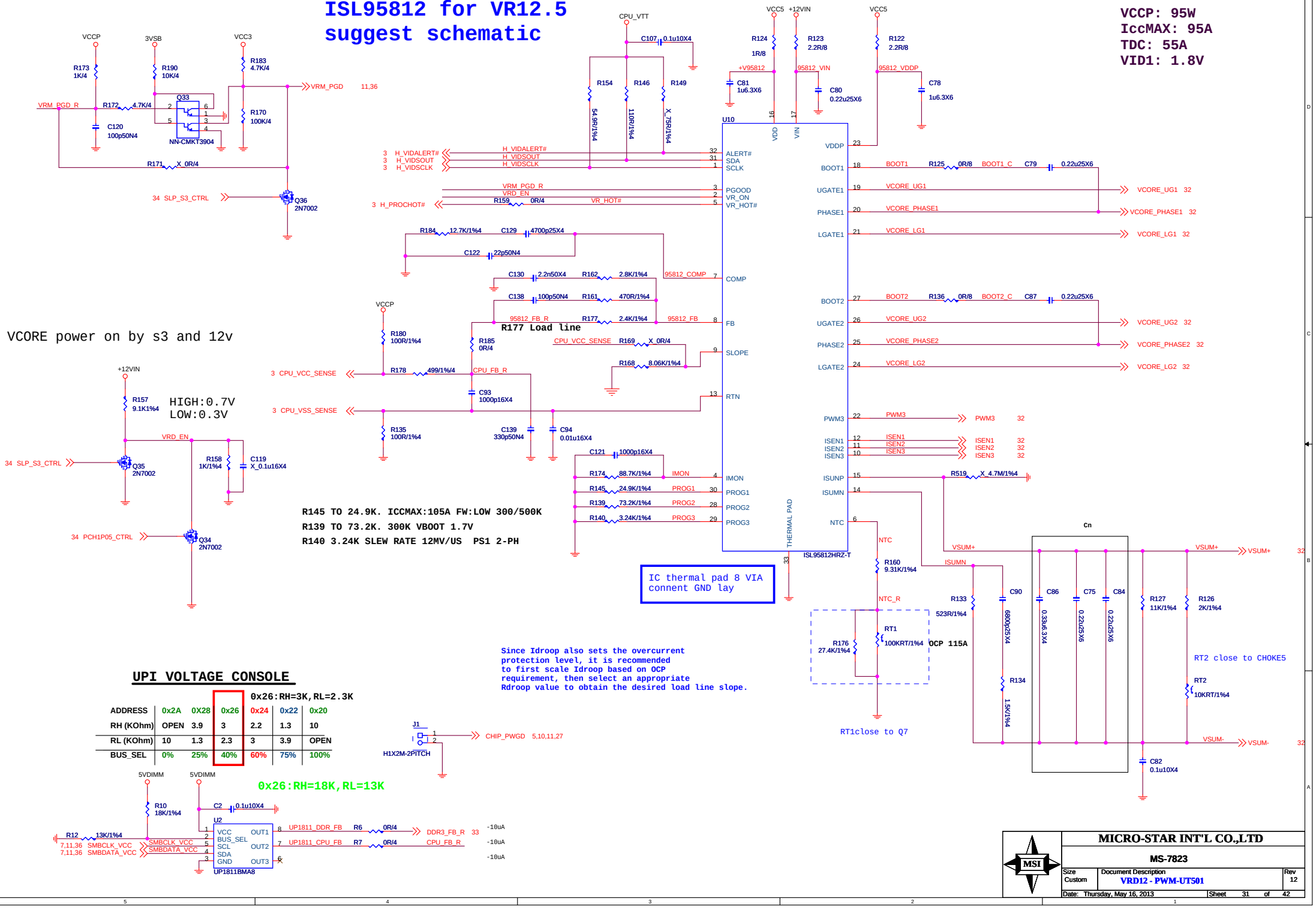
MS-7823

Size	Document Description	Rev
Custom	ACPI controller UPI	12

Date: Thursday, May 16, 2013 | Sheet 30 of 42

ISL95812 for VR12.5 suggest schematic

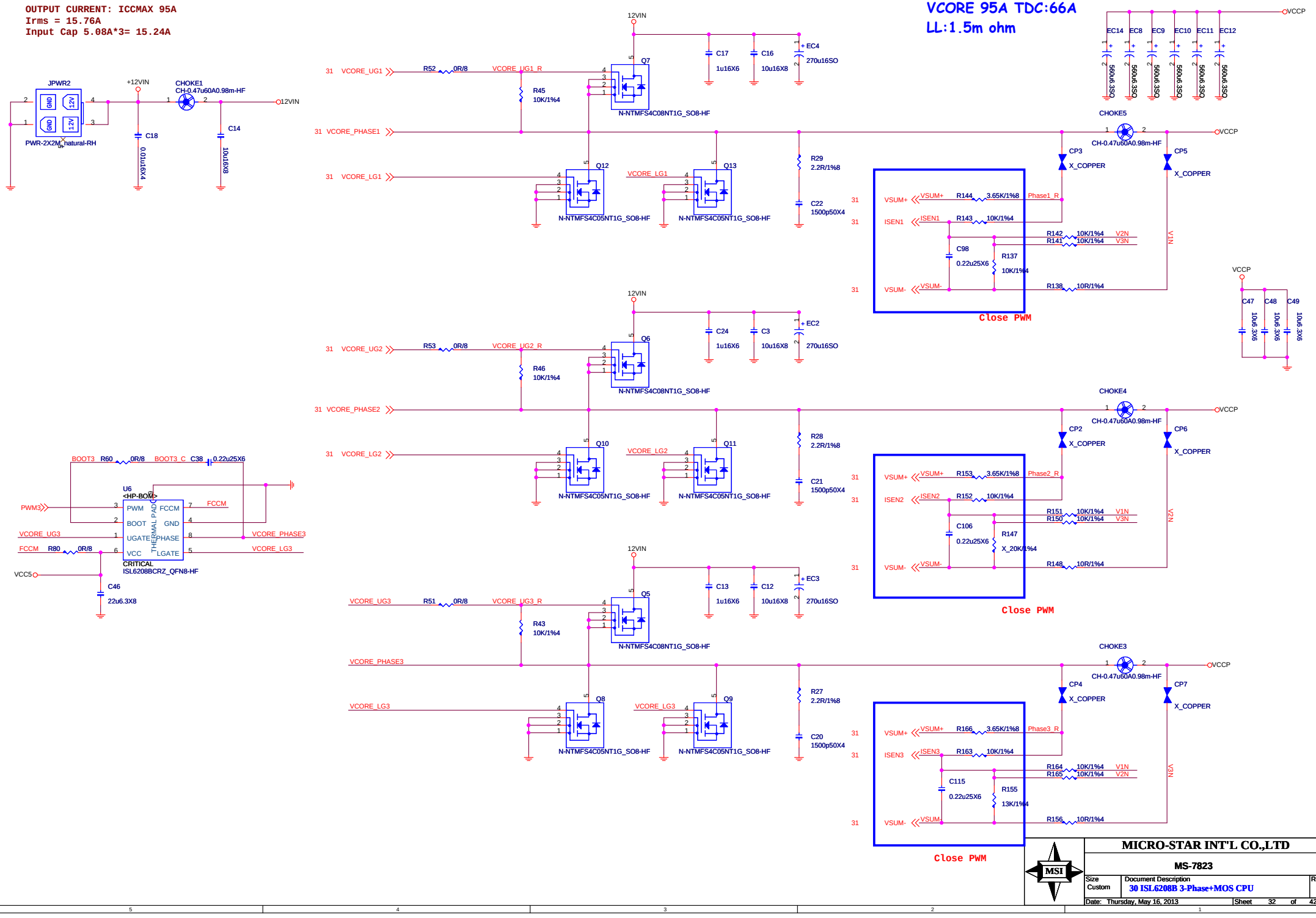
VCCP: 95W
IccMAX: 95A
TDC: 55A
VID1: 1.8V



Company	MICRO-STAR INT'L CO.,LTD	
	MS-7823	
Size: Custom	Document Description: VRD12 - PWM-UT501	Rev: 12
Date: Thursday, May 16, 2013	Sheet 31 of 42	

OUTPUT CURRENT: ICCMAX 95A
Irms = 15.76A
Input Cap 5.08A*3= 15.24A

VCORE 95A TDC:66A
LL:1.5m ohm



MICRO-STAR INT'L CO.,LTD

MS-7823

Size	Document Description	Rev
Custom	30 ISL6208B 3-Phase+MOS CPU	12

Date: Thursday, May 16, 2013 | Sheet 32 of 42

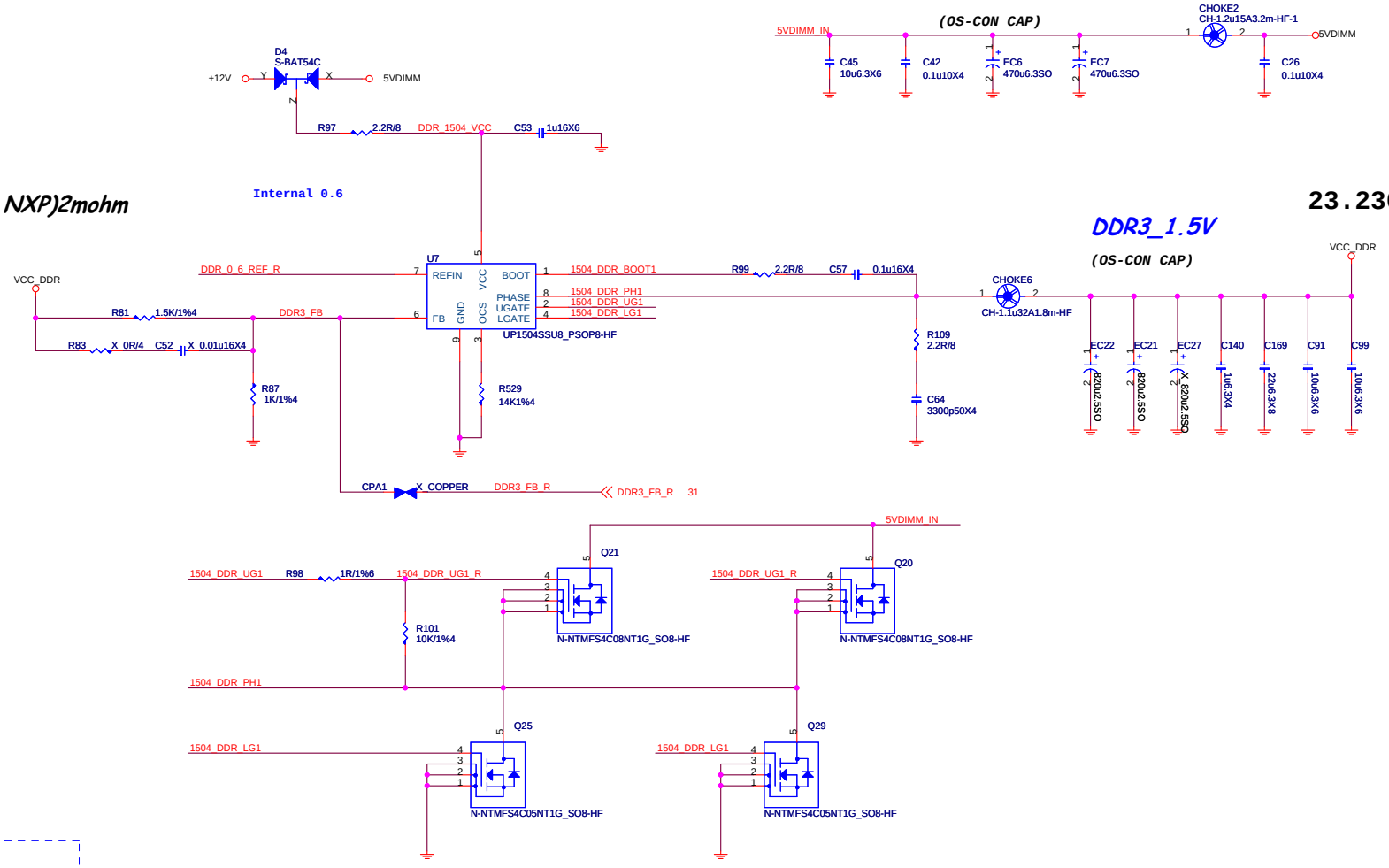
DDR Power:1.5V

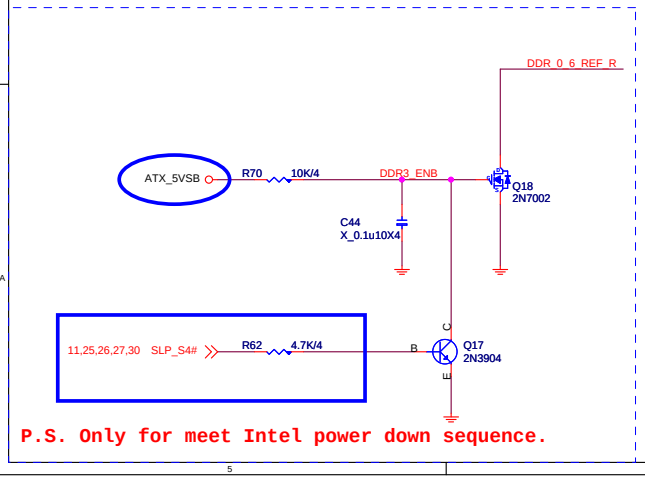
DDR3_1.5V 4.2A+12A+1.115A+5.921A=23.236A

4.2A FOR CPU
12A FOR 4DIMM
1.115A FOR VTT_DDR
5.921A FOR PCH

*OCP 23.236A*1.5=34.845A*
*OCP=[20uA*Rocs(R320)]/4*Rdson(Low side NXP)2mohm*
R529=14K ohm

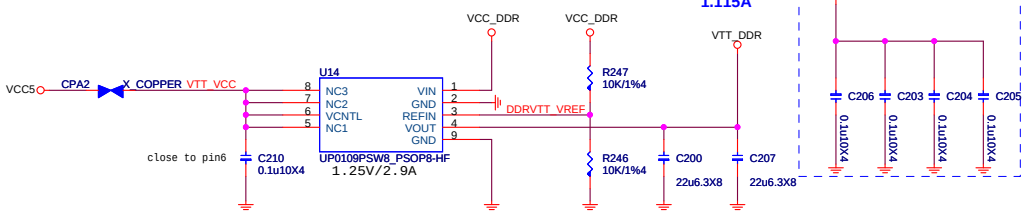
Iripple=10.64807288A
4.7*2*1=9.4A





DDR VTT Power

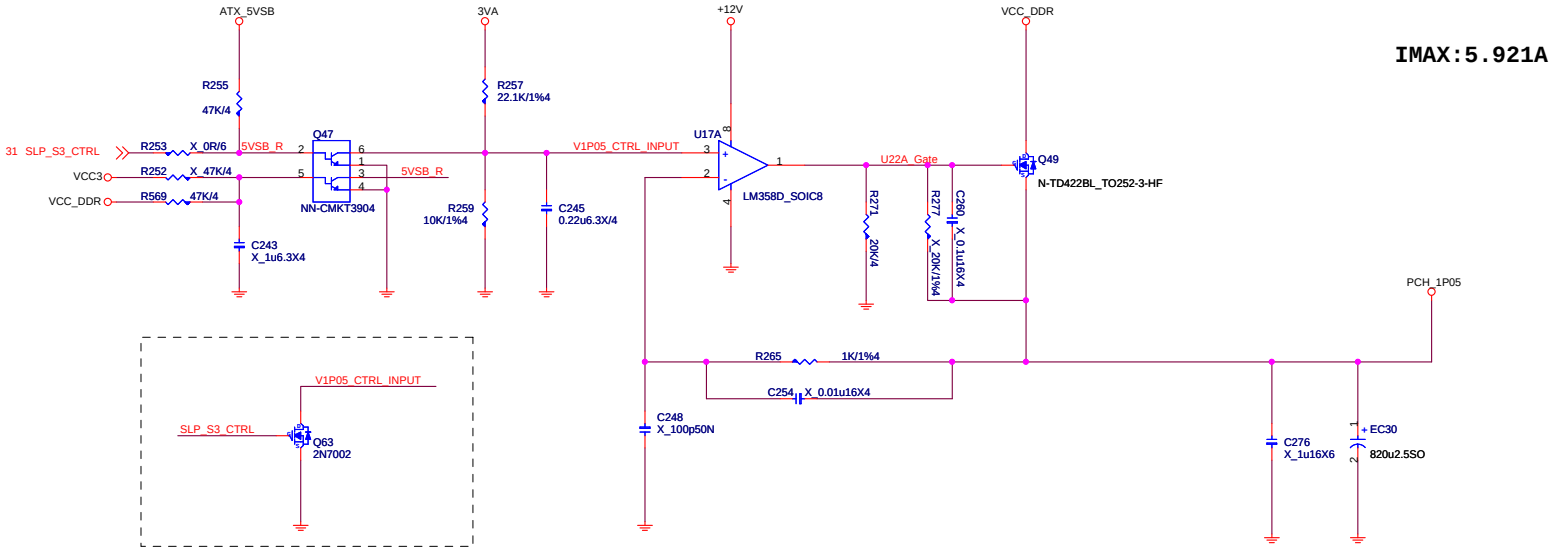
To CPU Copper trace width > 250mils , Fill island behind DIMM > 400mils .



MICRO-STAR INT'L CO.,LTD	
MS-7823	
Size: Custom	Document Description: DDR Power -UP1504S 2-Phase MOS
Rev: 12	
Date: Thursday, May 16, 2013	Sheet 33 of 42

PCH Power:1.05V

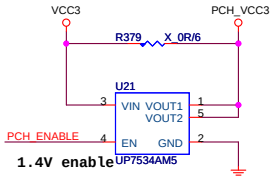
PCH Core 5.921A



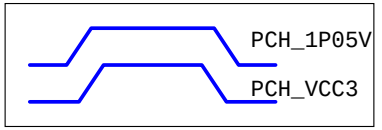
IMAX:5.921A

PCH Power:3.3V

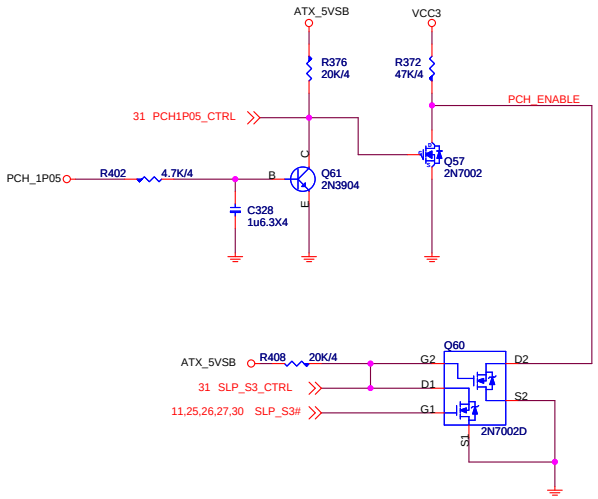
0.133A



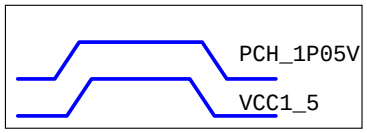
VCC1_5_CTRL_INPUT:
0:1P05V low or S3 low
1:1P05V HIGH and S3 HIGH



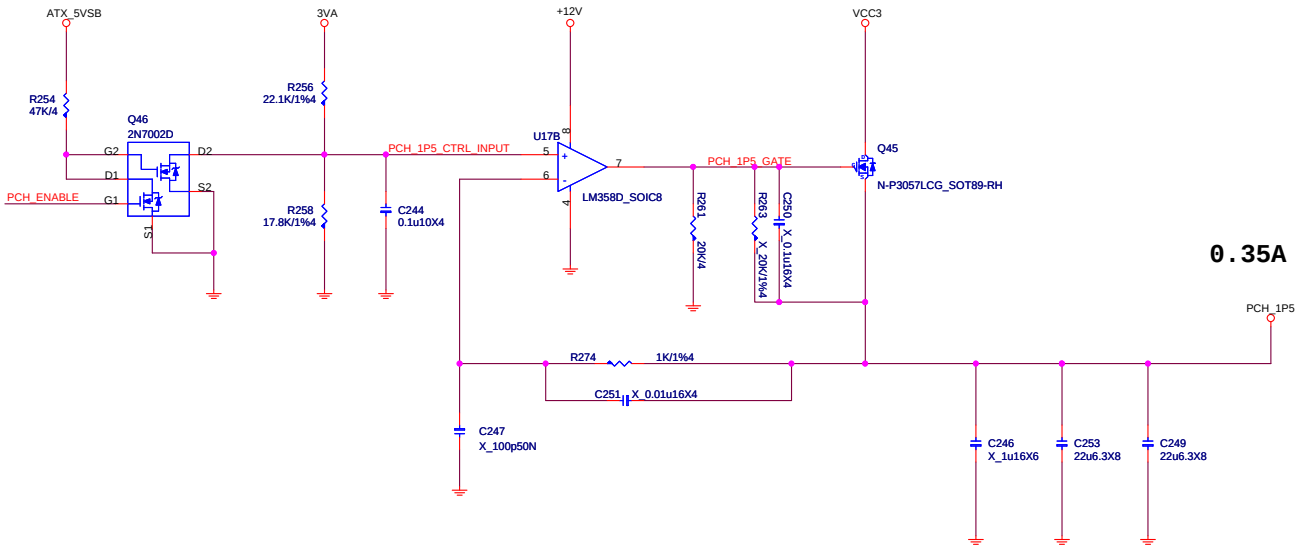
Waitting PCH_1P05 Ready



VCC1_5_CTRL_INPUT:
0:1P05V low or S3 low
1:1P05V HIGH and S3 HIGH



PCH Power:1.5V

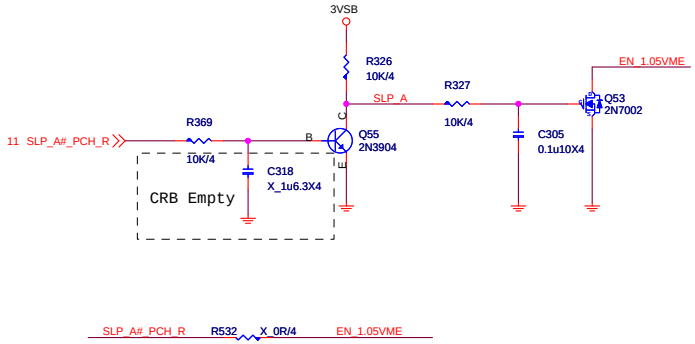


0.35A

MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: PCH Power - uP1513 1-Phase MOS	Rev: 12
Date: Thursday, May 16, 2013	Sheet 34 of 42	

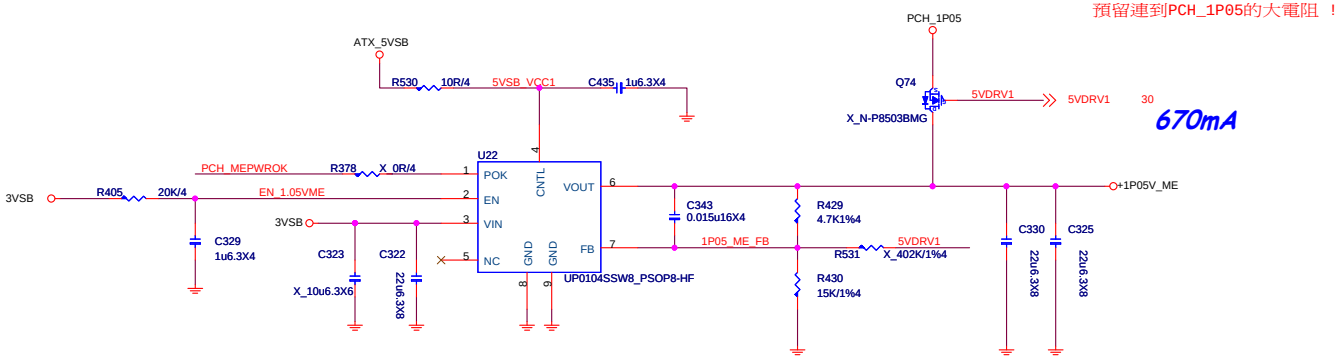
SLP_A

ME Power Control

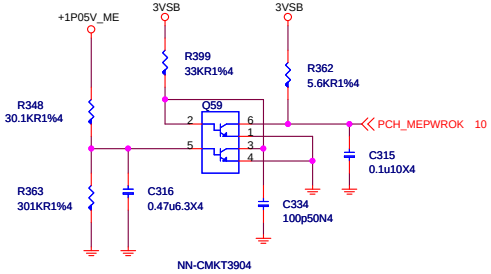


+1.05V_ME(VCCIO_ME)

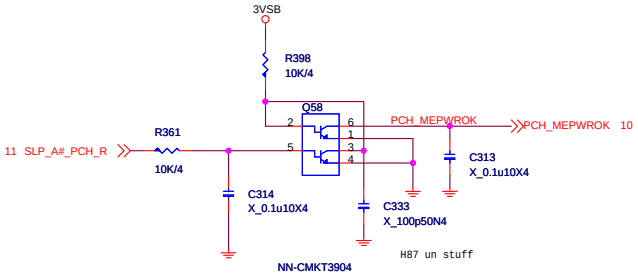
預留連到PCH_1P05的大電阻 ！



PCH_MEPWROK

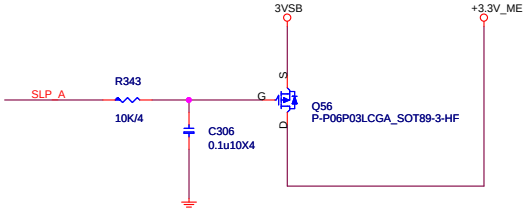


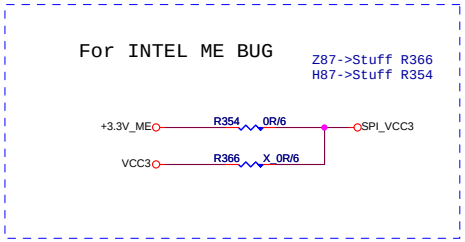
VccASW active to APWROK high 1ms



APWROK falling to VccASW falling 40ns

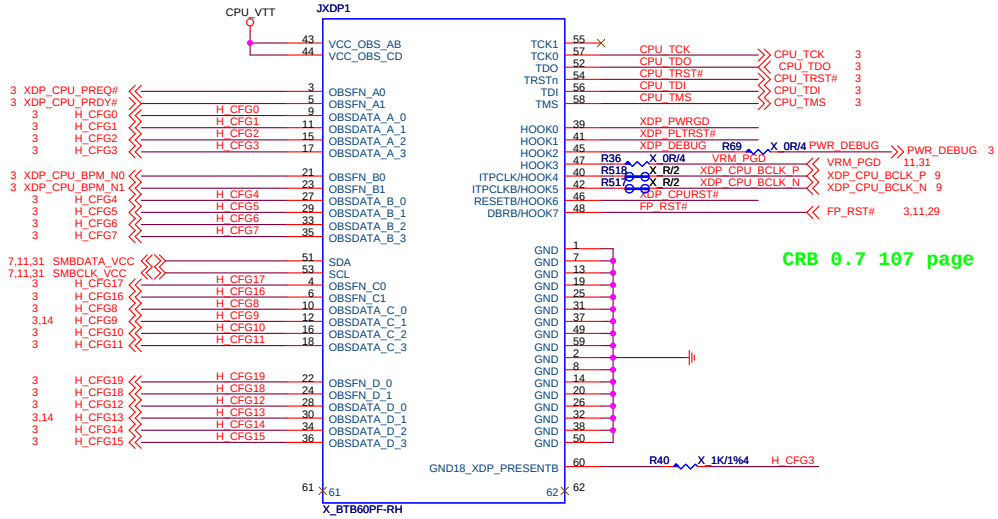
+3.3V_ME



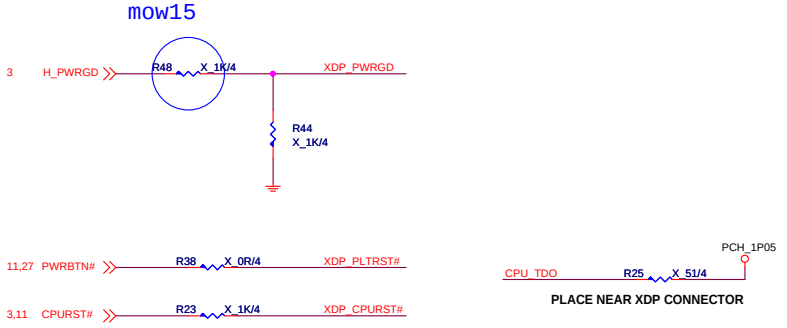


MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: ME POWER	Rev: 12
Date: Thursday, May 16, 2013	Sheet 35 of 42	

Reserve debug port 5020



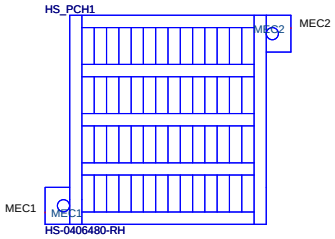
CRB 0.7 107 page

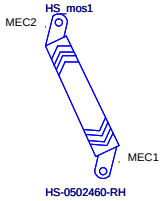


PLACE NEAR XDP CONNECTOR

MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: XDP CPU & PCH	Rev: 12
Date: Thursday, May 16, 2013	Sheet 36 of 42	

HEATSINK

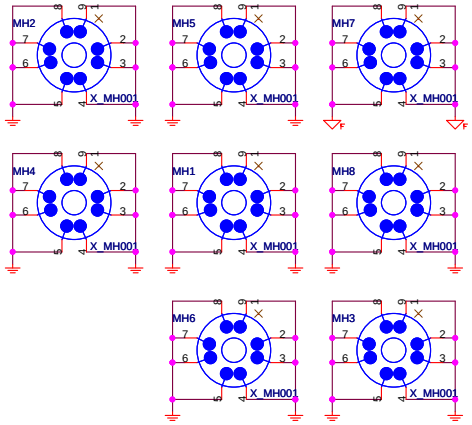




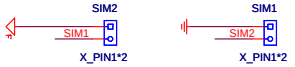
PK0-0782312-G37,精成,23,寶安恩斯邁廠(MSIS)

PK0-0782312-E48,競華,23,寶安恩斯邁廠(MSIS)

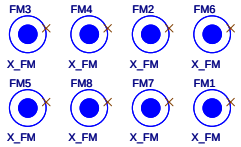
Mounting Holes



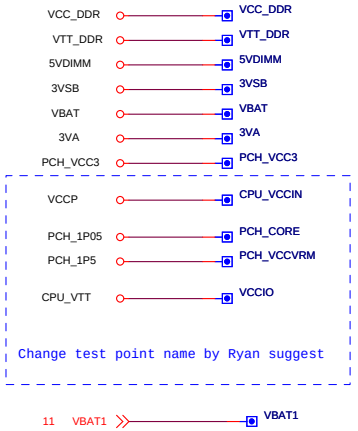
Simulation



Optical Fiducial Marks-120



Test point



SBC_LA1 — Label SBC — SBC LABEL

THX_LA2 — Label THX — X_THX LABEL

THX Virtual Part Number

LA3 — AMI_BIOS LABLE — BIOS_LABLE

HDMI_LA1 — Label HDMI — HDMI LABEL

HDMI_RLA1 — Real Label HDMI — X_HDMI_RLA

LABEL2 — MKT — X_BUY

BAT1_X1 — BAT-BCR2032P-RH

CPU_H1 — CPU 鐵座 — CPU_H1

Label OPT.

LA2 — Label 691-7823-XXX — MKT-LABEL — **H87**

LA10 — Label 691-7823-XXX — MKT-LABEL — **Z87**

LA11 — Label 691-7823-XXX — MKT-LABEL — **H87-MCJ**

LA12 — Label 691-7823-XXX — MKT-LABEL — **B85**

LA13 — Label 691-7823-XXX — MKT-LABEL — **B85-MCJ**

Chip OPT.

U100 — LPT Z87 — Lynx PointZ87 — **Z87**

U101 — LPT B85 — Lynx PointB85 — **B85**

Z87 SPI OPT.

SPI10 — SPI 8M — W25Q64FVSSIQ-HF

D1000 — MOS — 2N7002

MCJ OPT.

DP — Displayport Connector — DISPO20PM_BLACK-HF-2

FAN3 — SYSFAN 3PIN Connector — BH1X3B-FR_WHITE-RH

HS_PCH2 — PCH heatsink — HS-0406600-RH

MS-7823-1.2 主BOM爲H87

OPT	Configure	BOM	Function	GPIO Setting(GP10/GP11/GP12)
	H87M-G43		MS-7823 11 H87 H87M-G43,H87,LGA1150,4DDR3,2PCI-Ex16,2PCI-Ex1 6SATA3,4USB3,HD Audio,Gb LAN,HDMI,DP,DVI,D-Sub	0,0,0
	Z87M-G43		MS-7823 11 OPT:E Z87 Z87M-G43,Z87,LGA1150,4DDR3,2PCI-Ex16,2PCI-Ex1 6SATA3,4USB3,HD Audio,Gb LAN,HDMI,DP,DVI,D-Sub	0,0,0
	H87M-S01(MCJ)		MS-7823 12 H87 H87M-S01,H87,LGA1150,4DDR3,2PCI-Ex16,2PCI-Ex1 6SATA3,4USB3,HD Audio,Gb LAN,DP,DVI,D-Sub	1,0,0
	B85M-G43		MS-7823 11 OPT:G B85 B85M-G43,B85,LGA1150,4DDR3,2PCI-Ex16,2PCI-Ex1 4SATA3,4USB3,HD Audio,Gb LAN,HDMI,DP,DVI,D-Sub	0,0,0
	B85M-S01(MCJ)		MS-7823 11 OPT:H B85 B85M-S01,B85,LGA1150,4DDR3,2PCI-Ex16,2PCI-Ex1 4SATA3,4USB3,HD Audio,Gb LAN,DP,DVI,D-Sub	1,0,0

MICRO-STAR INT'L CO.,LTD

MS-7823

Size: Custom | Document Description: Manual parts | Rev: 12

Date: Friday, May 17, 2013 | Sheet 37 of 42

MICRO-STAR INT'L CO.,LTD

MS-7823

Size	Document Description	Rev
Custom	EMI CAP	12

Date: Thursday, May 16, 2013 | Sheet 38 of 42