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MS-7823

mATX

Ver: 10(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

PWM:

ISL95812 3 Phase

Expansion Slots:

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

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

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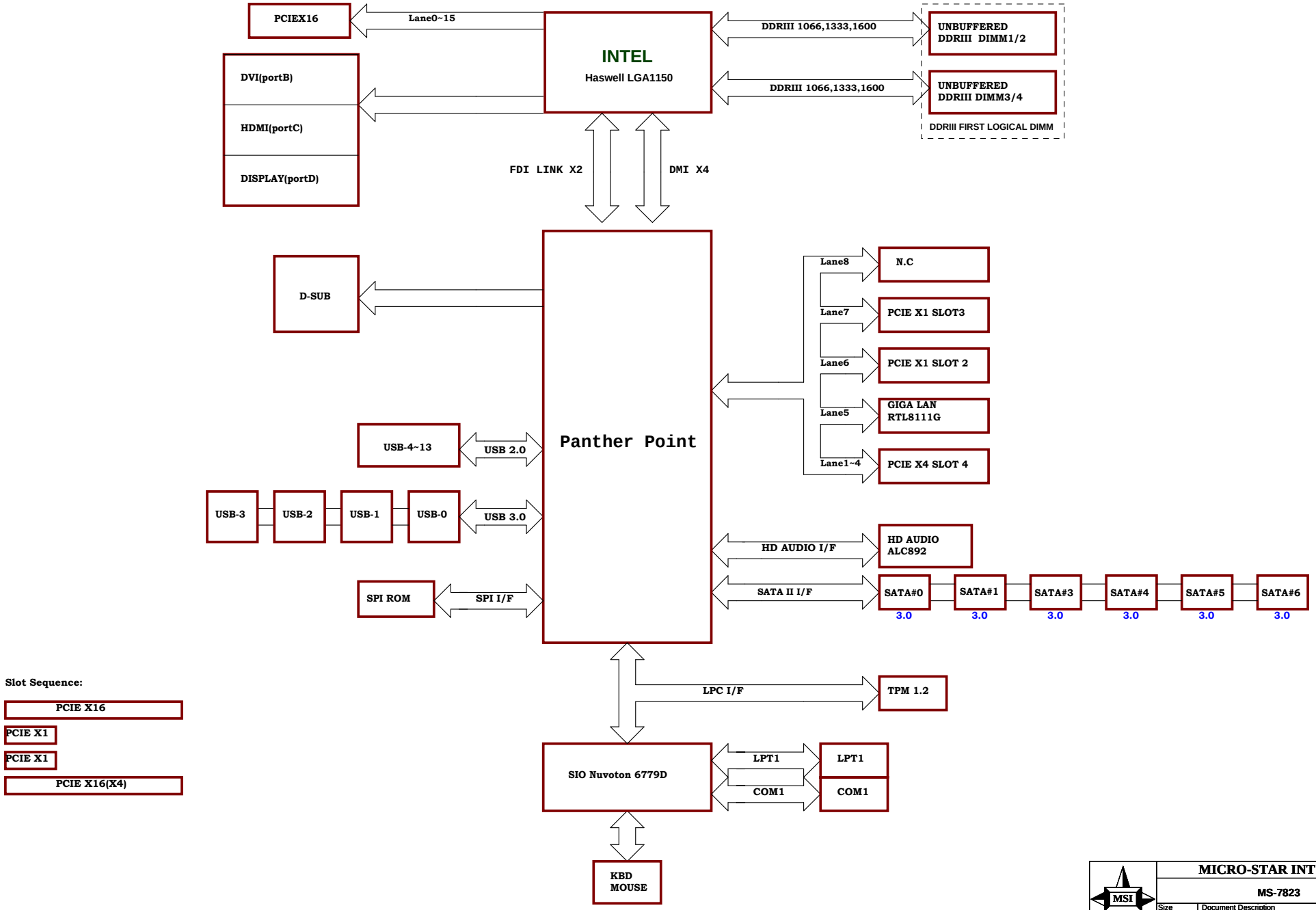
MS-7823 Block Diagram



MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: Block Diagram	Rev: 10
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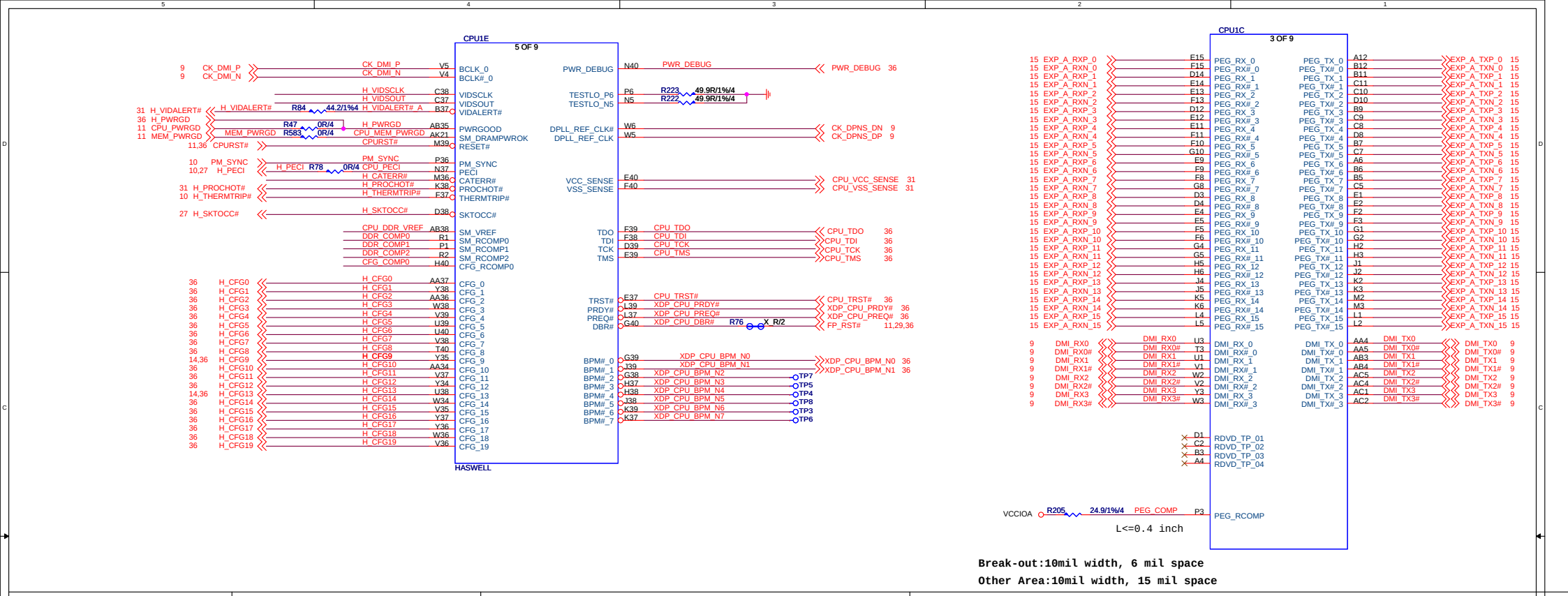
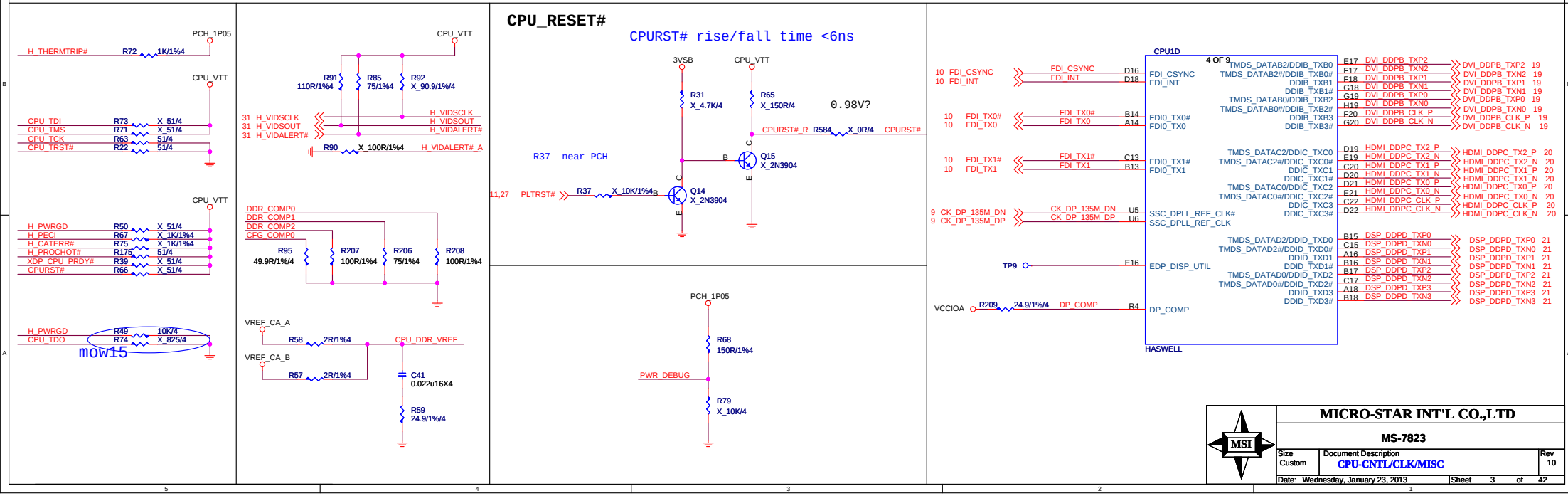
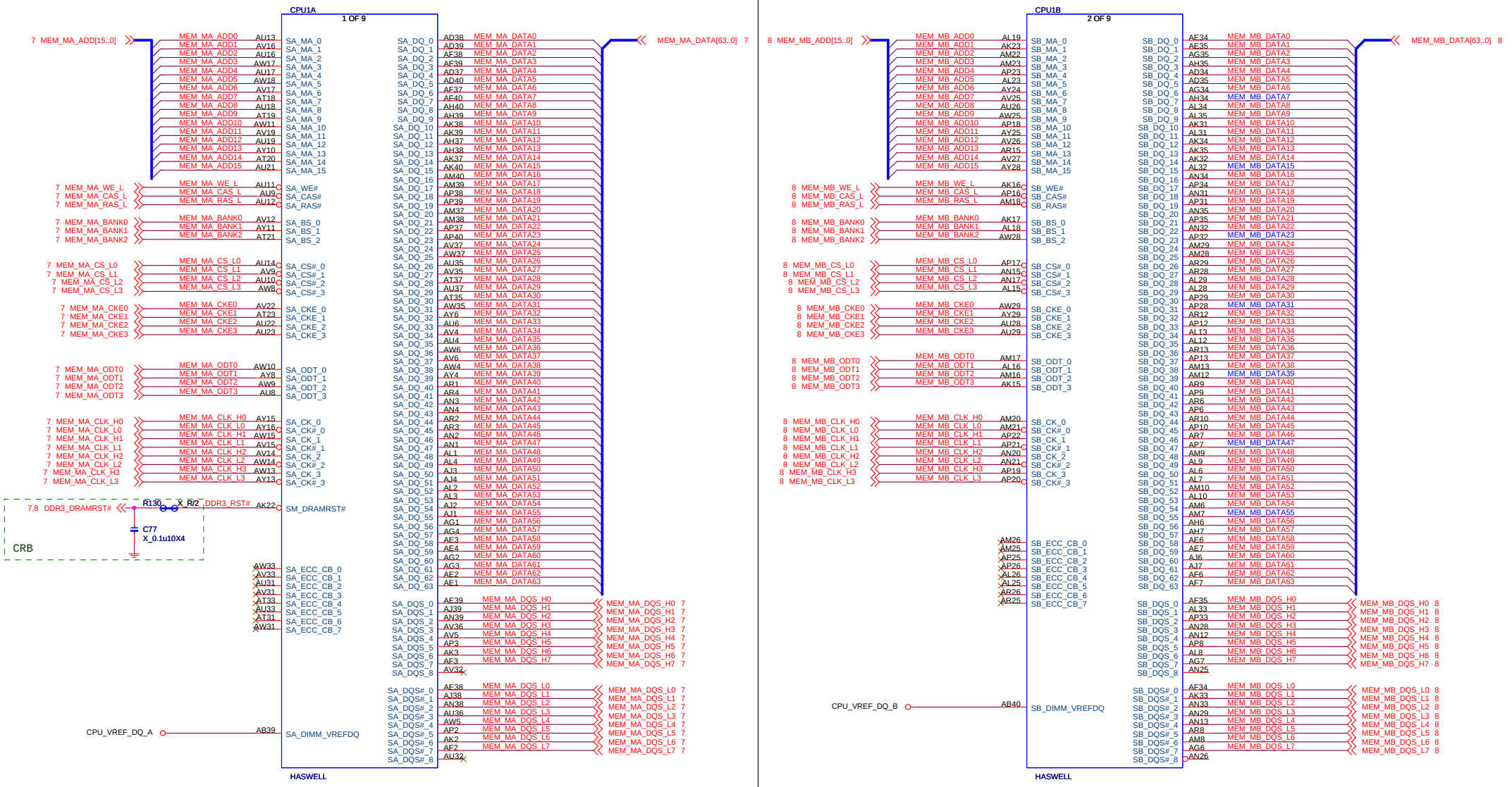




MICRO-STAR INT'L CO.,LTD	
MS-7823	
Size: Custom	Document Description: CPU-CNTL/CLK/MISC
Rev: 10	
Date: Wednesday, January 23, 2013	Sheet 3 of 42



MICRO-STAR INT'L CO.,LTD	
MS-7823	
Size: Custom	Document Description: CPU-Memory
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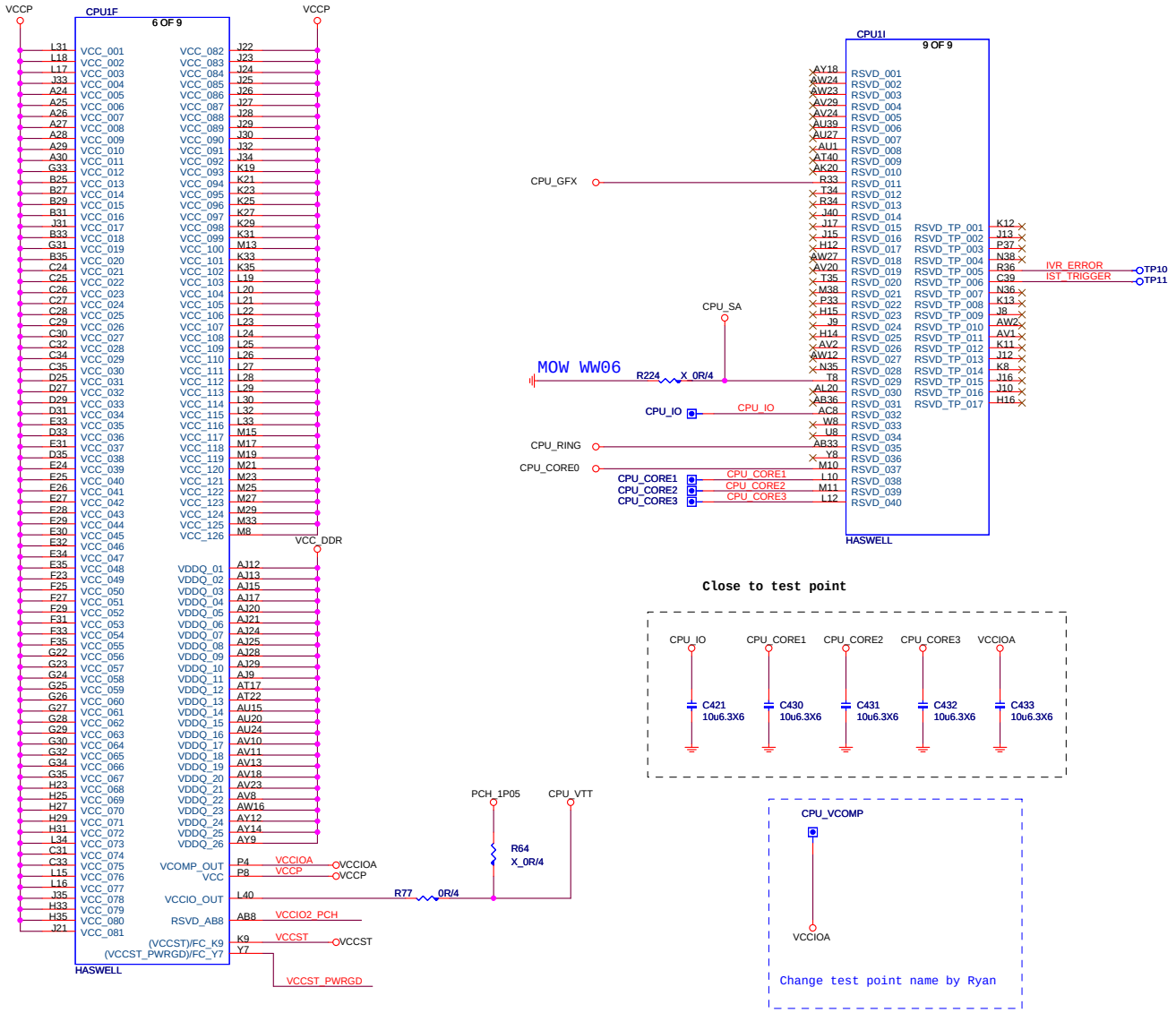
CPU1F
6 OF 9
HASWELL
VCCP
VCC_DDR
VCC_001
VCC_002
VCC_003
VCC_004
VCC_005
VCC_006
VCC_007
VCC_008
VCC_009
VCC_010
VCC_011
VCC_012
VCC_013
VCC_014
VCC_015
VCC_016
VCC_017
VCC_018
VCC_019
VCC_020
VCC_021
VCC_022
VCC_023
VCC_024
VCC_025
VCC_026
VCC_027
VCC_028
VCC_029
VCC_030
VCC_031
VCC_032
VCC_033
VCC_034
VCC_035
VCC_036
VCC_037
VCC_038
VCC_039
VCC_040
VCC_041
VCC_042
VCC_043
VCC_044
VCC_045
VCC_046
VCC_047
VCC_048
VCC_049
VCC_050
VCC_051
VCC_052
VCC_053
VCC_054
VCC_055
VCC_056
VCC_057
VCC_058
VCC_059
VCC_060
VCC_061
VCC_062
VCC_063
VCC_064
VCC_065
VCC_066
VCC_067
VCC_068
VCC_069
VCC_070
VCC_071
VCC_072
VCC_073
VCC_074
VCC_075
VCC_076
VCC_077
VCC_078
VCC_079
VCC_080
VCC_081
VCC_082
VCC_083
VCC_084
VCC_085
VCC_086
VCC_087
VCC_088
VCC_089
VCC_090
VCC_091
VCC_092
VCC_093
VCC_094
VCC_095
VCC_096
VCC_097
VCC_098
VCC_099
VCC_100
VCC_101
VCC_102
VCC_103
VCC_104
VCC_105
VCC_106
VCC_107
VCC_108
VCC_109
VCC_110
VCC_111
VCC_112
VCC_113
VCC_114
VCC_115
VCC_116
VCC_117
VCC_118
VCC_119
VCC_120
VCC_121
VCC_122
VCC_123
VCC_124
VCC_125
VCC_126
VDDQ_01
VDDQ_02
VDDQ_03
VDDQ_04
VDDQ_05
VDDQ_06
VDDQ_07
VDDQ_08
VDDQ_09
VDDQ_10
VDDQ_11
VDDQ_12
VDDQ_13
VDDQ_14
VDDQ_15
VDDQ_16
VDDQ_17
VDDQ_18
VDDQ_19
VDDQ_20
VDDQ_21
VDDQ_22
VDDQ_23
VDDQ_24
VDDQ_25
VDDQ_26
VCOMP_OUT
VCC
VCCIO_OUT
RSVD_AB8
(VCCST)/FC_K9
(VCCST_PWRGD)/FC_Y7
VCCIOA
VCCP
VCCST_PWRGD
VCCIO2_PCH
VCCST
PCH_1P05
CPU_VTT
R64
X_0R/4
R77
0R/4
CPU1I
9 OF 9
HASWELL
RSVD_001
RSVD_002
RSVD_003
RSVD_004
RSVD_005
RSVD_006
RSVD_007
RSVD_008
RSVD_009
RSVD_010
RSVD_011
RSVD_012
RSVD_013
RSVD_014
RSVD_015
RSVD_016
RSVD_017
RSVD_018
RSVD_019
RSVD_020
RSVD_021
RSVD_022
RSVD_023
RSVD_024
RSVD_025
RSVD_026
RSVD_027
RSVD_028
RSVD_029
RSVD_030
RSVD_031
RSVD_032
RSVD_033
RSVD_034
RSVD_035
RSVD_036
RSVD_037
RSVD_038
RSVD_039
RSVD_040
RSVD_TP_001
RSVD_TP_002
RSVD_TP_003
RSVD_TP_004
RSVD_TP_005
RSVD_TP_006
RSVD_TP_007
RSVD_TP_008
RSVD_TP_009
RSVD_TP_010
RSVD_TP_011
RSVD_TP_012
RSVD_TP_013
RSVD_TP_014
RSVD_TP_015
RSVD_TP_016
RSVD_TP_017
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
CPU_VCOMP
Change test point name by Ryan
+1.5V_DDR3-Decoupling
VCC_DDR
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#
10,11,27,31 CHIP_PWGD
R235
10K/4
C460
0.1u10X4
VCCST_PWRGD
V_PROC_IO
R227
X_0R/4
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
10
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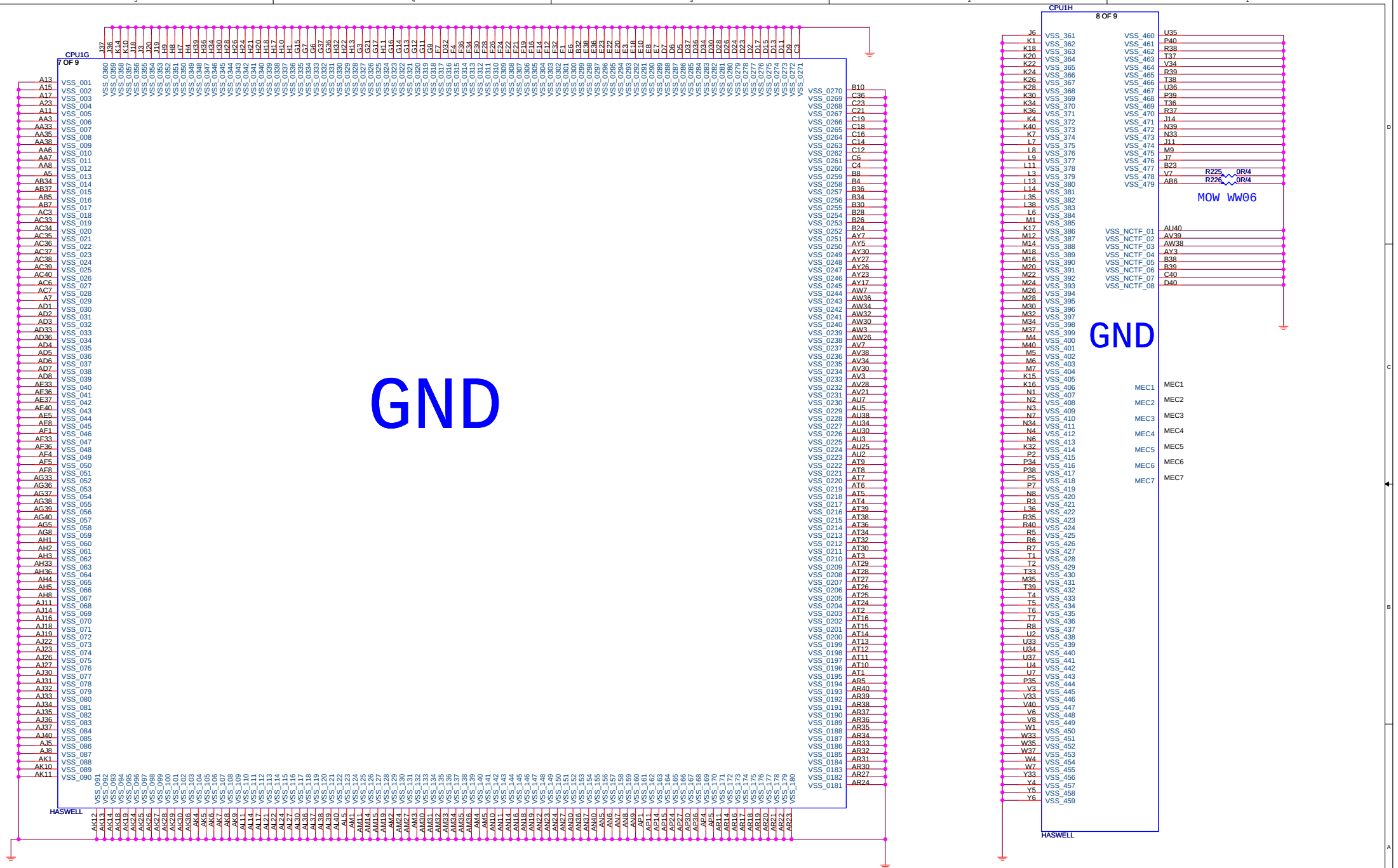

MICRO-STAR INT'L CO.,LTD	
MS-7823	
Size: Custom	Document Description: CPU-GND
Rev: 10	
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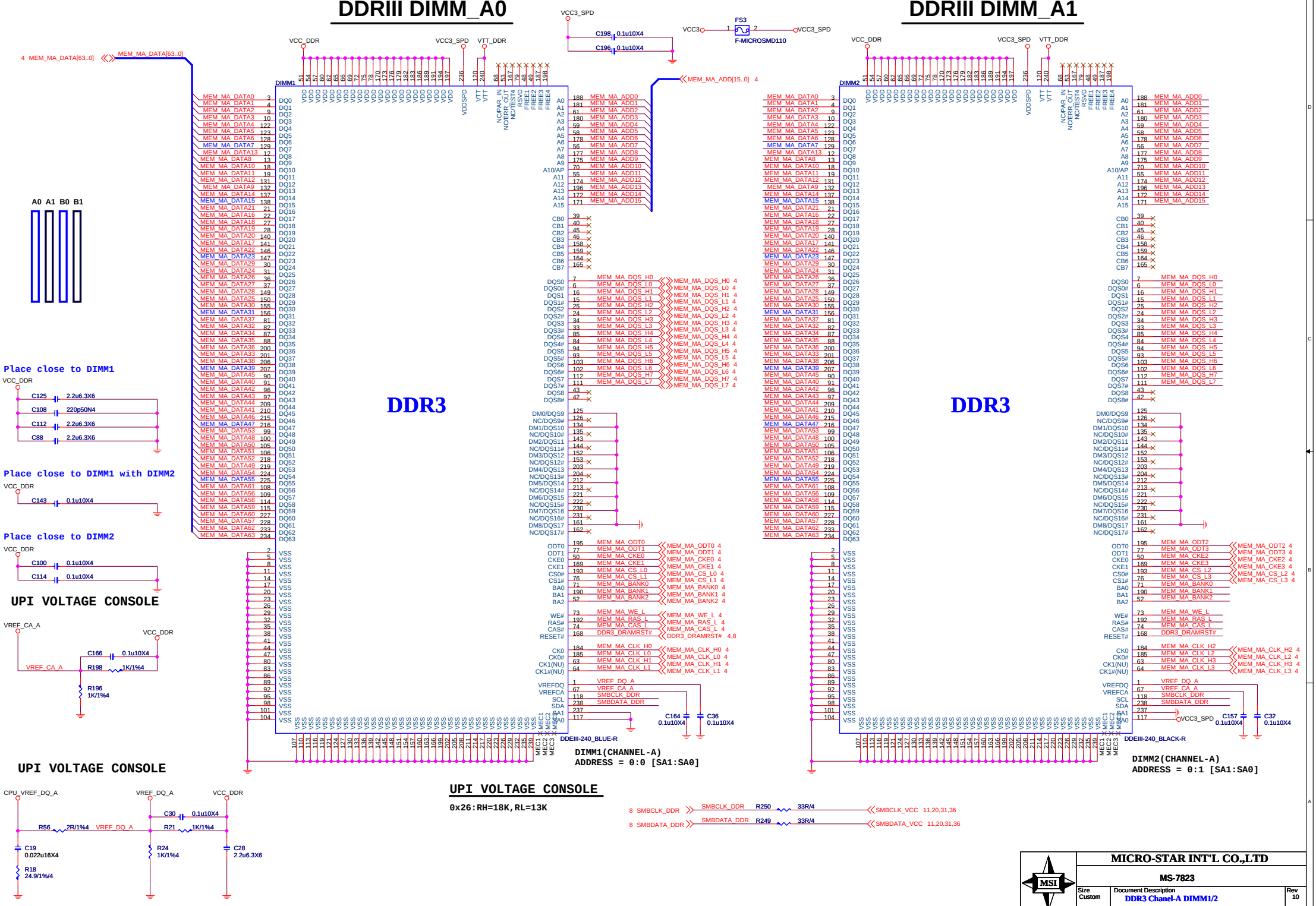
DDRIII DIMM_A0

DDRIII DIMM_A1



MICRO-STAR INT'L CO.,LTD	
MS-7823	
Size: Custom	Document Description: DDR3 Chanel-A DIMM1/2
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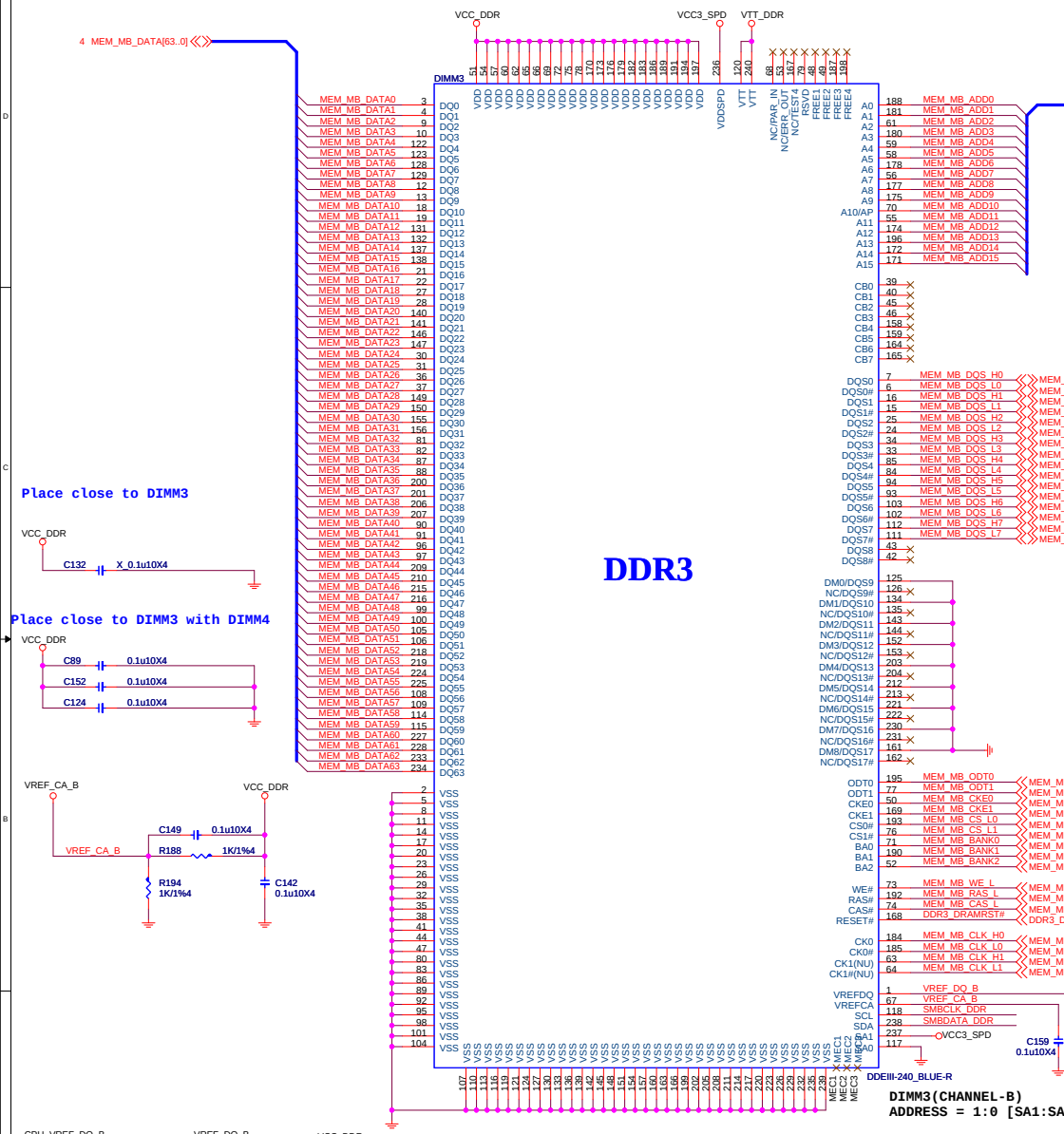
DDRIII DIMM_B0



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: 10
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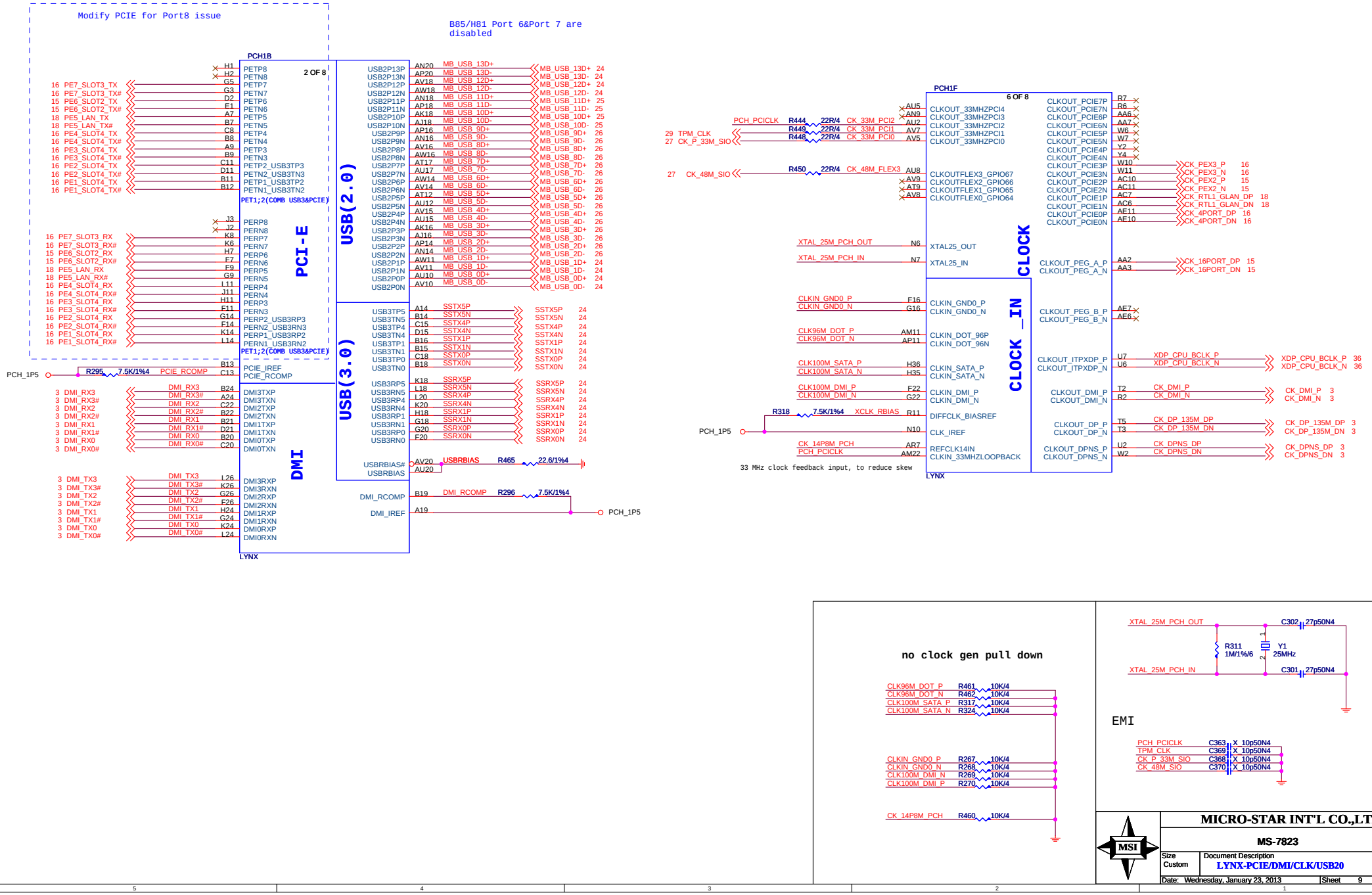
Modify PCIE for Port8 issue
B85/H81 Port 6&Port 7 are disabled
PCH1B
2 OF 8
PCI-E
USB(2.0)
USB(3.0)
DMI
LYNX
PET1;2(COMB USB3&PCIE)
PCH1F
6 OF 8
CLOCK
CLOCK _IN
33 MHz clock feedback input, to reduce skew
no clock gen pull down
EMI
MICRO-STAR INT'L CO.,LTD
MS-7823
LYNX-PCIE/DMI/CLK/USB20
Size Custom
Rev 10
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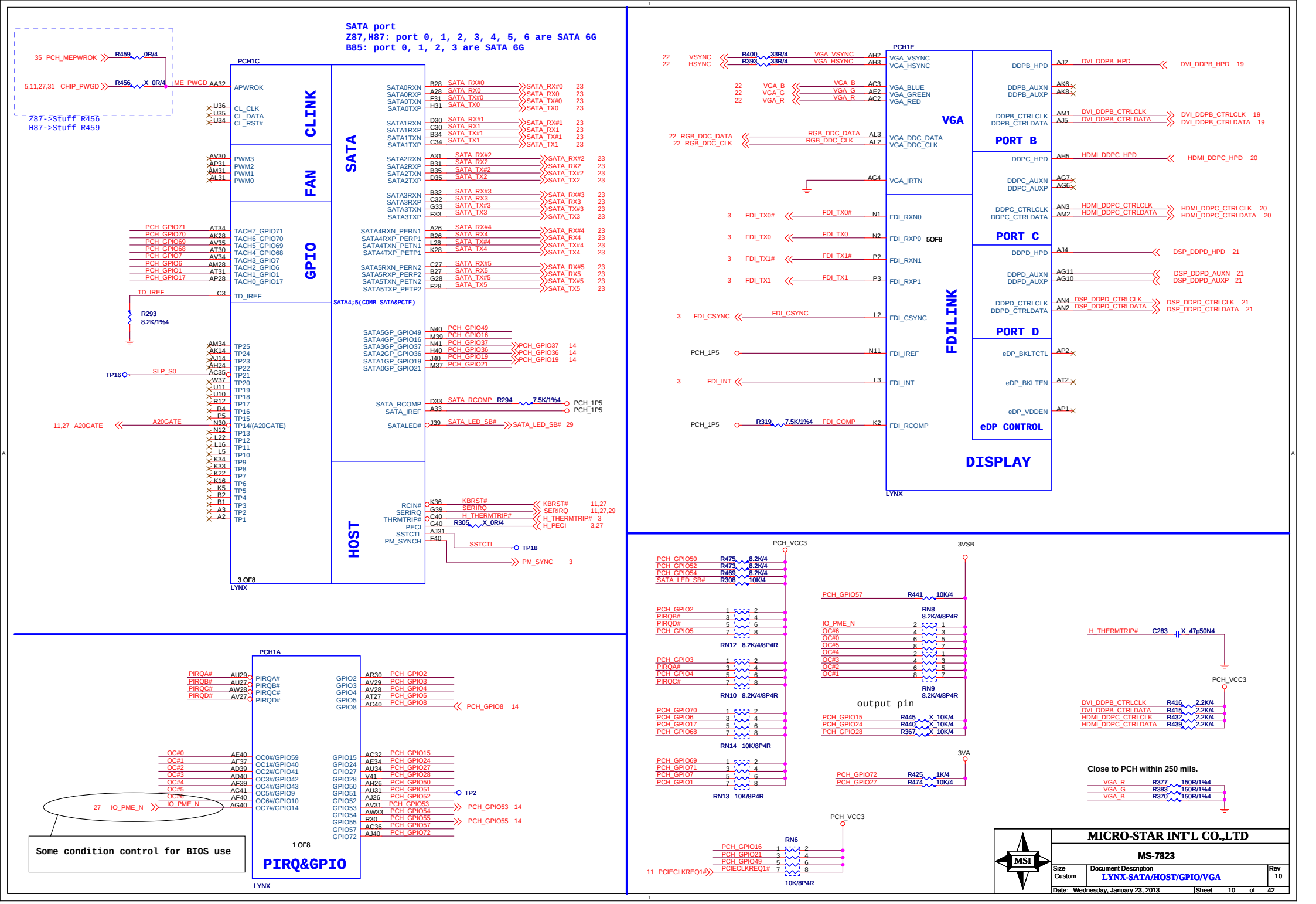
SATA port
Z87,H87: port 0, 1, 2, 3, 4, 5, 6 are SATA 6G
B85: port 0, 1, 2, 3 are SATA 6G
Z87->Stuff R456
H87->Stuff R459
PCH1C
CLINK
FAN
GPIO
SATA
HOST
SATA4;5(COMB SATA&PCIE)
3 OF8
LYNX
PCH1E
VGA
PORT B
PORT C
PORT D
eDP CONTROL
FDILINK
DISPLAY
PCH1A
PIRQ&GPIO
1 OF8
Some condition control for BIOS use
output pin
Close to PCH within 250 mils.
MICRO-STAR INT'L CO.,LTD
MS-7823
LYNX-SATA/HOST/GPIO/VGA
Rev 10
Wednesday, January 23, 2013
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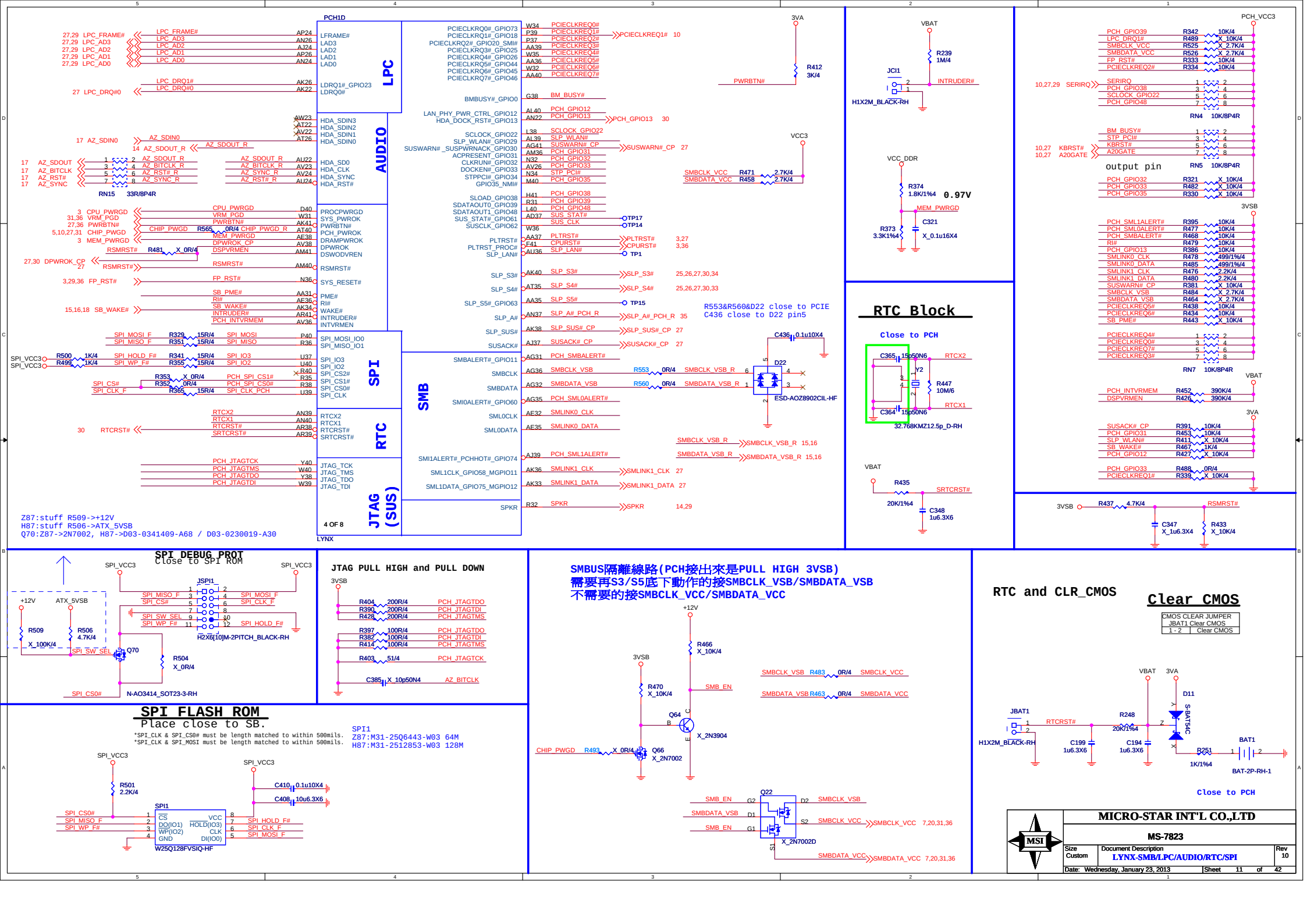
PCH1D
LPC
AUDIO
SPI
SMB
RTC
JTAG (SUS)
4 OF 8
LYNX
LFRAME#
LAD3
LAD2
LAD1
LAD0
LDRQ1#_GIO23
LDRQ0#
HDA_SDIN3
HDA_SDIN2
HDA_SDIN1
HDA_SDIN0
HDA_SD0
HDA_CLK
HDA_SYNC
HDA_RST#
PROCPWRGD
SYS_PWROK
PWRBTN#
PCH_PWROK
DRAMPWROK
DPWROK
DSWODVREN
RSMRST#
SYS_RESET#
PME#
RI#
WAKE#
INTRUDER#
INTVRMEN
SPI_MOSI_IO0
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
SMBALERT#_GPIO11
SMBCLK
SMBDATA
SMI0ALERT#_GPIO60
SML0CLK
SML0DATA
SMI1ALERT#_PCHHOT#_GPIO74
SML1CLK_GPIO58_MGPIO11
SML1DATA_GPIO75_MGPIO12
SPKR
LPC_FRAME#
LPC_AD3
LPC_AD2
LPC_AD1
LPC_AD0
LPC_DRQ1#
LPC_DRQ0#
AZ_SDIN0
AZ_SDOUT_R
AZ_SDOUT
AZ_BITCLK
AZ_RST#
AZ_SYNC
AZ_BITCLK_R
AZ_RST#_R
AZ_SYNC_R
RN15 33R/8P4R
CPU_PWRGD
VRM_PGD
PWRBTN#
CHIP_PWGD
MEM_PWRGD
DPWROK_CP
DSPVRMEN
FP_RST#
SB_PME#
SB_WAKE#
INTRUDER#
PCH_INTVRMEM
SPI_MOSI_F
SPI_MISO_F
SPI_HOLD_F#
SPI_WP_F#
SPI_CS#
SPI_CLK_F
SPI_MOSI
SPI_MISO
SPI_IO3
SPI_IO2
PCH_SPI_CS1#
PCH_SPI_CS0#
SPI_CLK_PCH
RTCX2
RTCX1
RTCRST#
SRTCRST#
PCH_JTAGTCK
PCH_JTAGTMS
PCH_JTAGTDO
PCH_JTAGTDI
PCIECLKRQ0#_GPIO73
PCIECLKRQ1#_GPIO18
PCIECLKRQ2#_GPIO20_SMI#
PCIECLKRQ3#_GPIO25
PCIECLKRQ4#_GPIO26
PCIECLKRQ5#_GPIO44
PCIECLKRQ6#_GPIO45
PCIECLKRQ7#_GPIO46
PCIECLKREQ0#
PCIECLKREQ1#
PCIECLKREQ2#
PCIECLKREQ3#
PCIECLKREQ4#
PCIECLKREQ5#
PCIECLKREQ6#
PCIECLKREQ7#
PCIECLKREQ1# 10
PWRBTN#
R412 3K/4
3VA
BMBUSY#_GPIO0
BM_BUSY#
LAN_PHY_PWR_CTRL_GPIO12
HDA_DOCK_RST#_GPIO13
PCH_GPIO12
PCH_GPIO13
PCH_GPIO13 30
SCLOCK_GPIO22
SLP_WLAN#_GPIO29
SUSWARN#_SUSPWRNACK_GPIO30
ACPRESENT_GPIO31
CLKRUN#_GPIO32
DOCKEN#_GPIO33
STPPCI#_GPIO34
GPIO35_NMI#
SCLOCK_GPIO22
SLP_WLAN#
SUSWARN#_CP
PCH_GPIO31
PCH_GPIO32
PCH_GPIO33
STP_PCI#
PCH_GPIO35
SUSWARN#_CP 27
SMBCLK_VCC R471 2.7K/4
SMBDATA_VCC R458 2.7K/4
VCC3
SLOAD_GPIO38
SDATAOUT0_GPIO39
SDATAOUT1_GPIO48
SUS_STAT#_GPIO61
SUSCLK_GPIO62
PCH_GPIO38
PCH_GPIO39
PCH_GPIO48
SUS_STAT#
SUS_CLK
TP17
TP14
PLTRST#
PLTRST_PROC#
SLP_LAN#
CPURST#
PLTRST# 3,27
CPURST# 3,36
TP1
SLP_S3#
SLP_S4#
SLP_S5#_GPIO63
SLP_A#
SLP_SUS#
SUSACK#
SLP_A#_PCH_R
SLP_SUS#_CP
SUSACK#_CP
SLP_S3# 25,26,27,30,34
SLP_S4# 25,26,27,30,33
TP15
SLP_A#_PCH_R 35
SLP_SUS#_CP 27
SUSACK#_CP 27
PCH_SMBALERT#
SMBCLK_VSB
SMBDATA_VSB
PCH_SML0ALERT#
SMLINK0_CLK
SMLINK0_DATA
PCH_SML1ALERT#
SMLINK1_CLK
SMLINK1_DATA
SMLINK1_CLK 27
SMLINK1_DATA 27
SMBCLK_VSB_R
SMBDATA_VSB_R
SMBCLK_VSB_R 15,16
SMBDATA_VSB_R 15,16
R553 0R/4
R560 0R/4
SPKR
SPKR 14,29
R553&R560&D22 close to PCIE
C436 close to D22 pin5
C436 0.1u10X4
D22
ESD-AOZ8902CIL-HF
VBAT
R239 1M/4
JCI1
INTRUDER#
H1X2M_BLACK-RH
VCC_DDR
R374 1.8K/1%4
0.97V
MEM_PWRGD
C321
X_0.1u16X4
R373 3.3K1%4
RTC Block
Close to PCH
C365 15p50N6
C364 15p50N6
RTCX2
RTCX1
Y2
R447 10M/6
32.768KMZ12.5p_D-RH
VBAT
R435
20K/1%4
SRTCRST#
C348 1u6.3X6
PCH_VCC3
PCH_GPIO39 R342 10K/4
LPC_DRQ1# R489 X_10K/4
SMBCLK_VCC R525 X_2.7K/4
SMBDATA_VCC R526 X_2.7K/4
FP_RST# R333 10K/4
PCIECLKREQ2# R334 10K/4
10,27,29 SERIRQ
SERIRQ
PCH_GPIO38
SCLOCK_GPIO22
PCH_GPIO48
RN4 10K/8P4R
BM_BUSY# R342 10K/4
STP_PCI# R489 X_10K/4
10,27 KBRST#
10,27 A20GATE
KBRST# R525 X_2.7K/4
A20GATE R526 X_2.7K/4
output pin
RN5 10K/8P4R
PCH_GPIO32 R321 X_10K/4
PCH_GPIO33 R482 X_10K/4
PCH_GPIO35 R330 X_10K/4
3VSB
PCH_SML1ALERT# R395 10K/4
PCH_SML0ALERT# R477 10K/4
PCH_SMBALERT# R468 10K/4
RI# R479 10K/4
PCH_GPIO13 R386 10K/4
SMLINK0_CLK R478 499/1%4
SMLINK0_DATA R485 499/1%4
SMLINK1_CLK R476 2.2K/4
SMLINK1_DATA R480 2.2K/4
SUSWARN#_CP R381 X_10K/4
SMBCLK_VSB R484 X_2.7K/4
SMBDATA_VSB R464 X_2.7K/4
PCIECLKREQ5# R438 10K/4
PCIECLKREQ6# R434 10K/4
SB_PME# R443 X_10K/4
PCIECLKREQ4#
PCIECLKREQ0#
PCIECLKREQ7#
PCIECLKREQ3#
RN7 10K/8P4R
VBAT
PCH_INTVRMEM R452 390K/4
DSPVRMEN R426 390K/4
3VA
SUSACK# CP R391 10K/4
PCH_GPIO31 R453 10K/4
SLP_WLAN# R411 X_10K/4
SB_WAKE# R467 1K/4
PCH_GPIO12 R427 X_10K/4
PCH_GPIO33 R488 0R/4
PCIECLKREQ1# R339 X_10K/4
3VSB
R437 4.7K/4
RSMRST#
C347 X_1u6.3X4
R433 X_10K/4
Z87:stuff R509->+12V
H87:stuff R506->ATX_5VSB
Q70:Z87->2N7002, H87->D03-0341409-A68 / D03-0230019-A30
SPI DEBUG PROT
Close to SPI ROM
SPI_VCC3
JSPI1
H2X6[10]M-2PITCH_BLACK-RH
+12V
ATX_5VSB
R509
R506 4.7K/4
X_100K/4
Q70
R504 X_0R/4
N-AO3414_SOT23-3-RH
JTAG PULL HIGH and PULL DOWN
3VSB
R404 200R/4
R390 200R/4
R428 200R/4
R397 100R/4
R382 100R/4
R414 100R/4
R403 51/4
C385 X_10p50N4
PCH_JTAGTDO
PCH_JTAGTDI
PCH_JTAGTMS
PCH_JTAGTCK
AZ_BITCLK
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
+12V
R466 X_10K/4
3VSB
R470 X_10K/4
SMB_EN
Q64
X_2N3904
CHIP_PWGD R493 X_0R/4
Q66 X_2N7002
SMBCLK_VSB R483 0R/4 SMBCLK_VCC
SMBDATA_VSB R463 0R/4 SMBDATA_VCC
Q22
X_2N7002D
SMBCLK_VCC 7,20,31,36
SMBDATA_VCC 7,20,31,36
RTC and CLR_CMOS
Clear CMOS
CMOS CLEAR JUMPER
JBAT1 Clear CMOS
1 - 2 Clear CMOS
VBAT
3VA
JBAT1
H1X2M_BLACK-RH
RTCRST#
R248 20K/1%4
C199 1u6.3X6
C194 1u6.3X6
D11
S-BAT54C
R251 1K/1%4
BAT1
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
R501 2.2K/4
C410 0.1u10X4
C408 10u6.3X6
W25Q128FVSIQ-HF
MICRO-STAR INT'L CO.,LTD
MS-7823
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Document Description
LYNX-SMB/LPC/AUDIO/RTC/SPI
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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

Backside for V14,U12,T16,V16
unstuff

PCH decoupling cap

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Size: Custom	Document Description: LYNX-POWER
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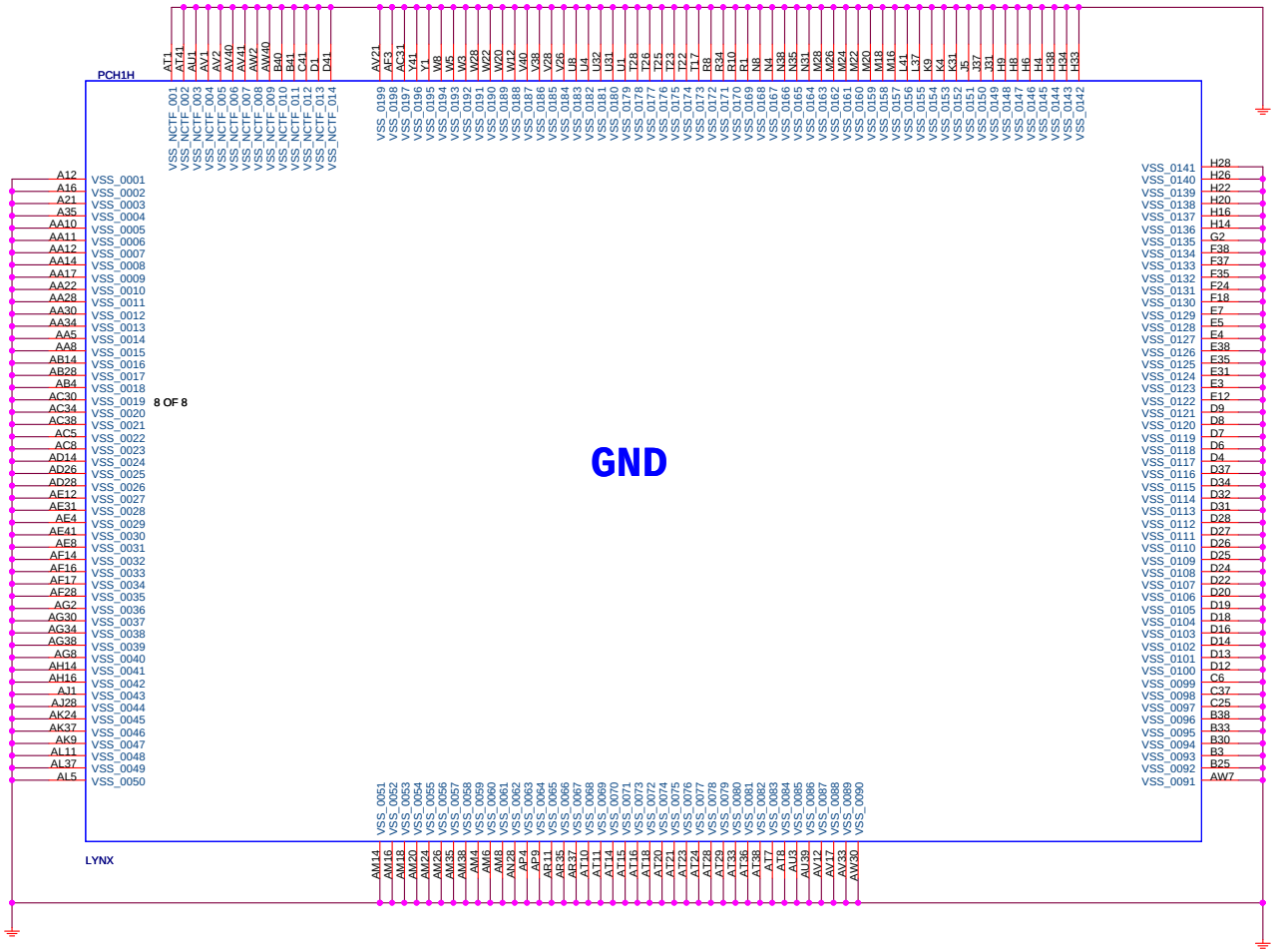

MICRO-STAR INT'L CO.,LTD		
MS-7823		
Size: Custom	Document Description: LYNX-GND/NVRAM/USB30	Rev: 10
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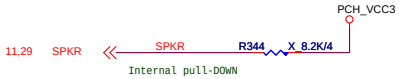
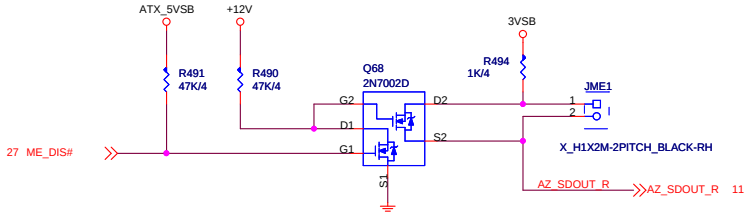
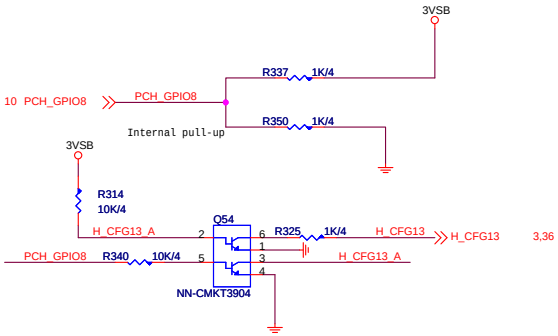


SPKR
Default Mode:
Internal weak Pull-down.

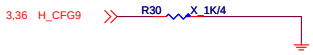
No Reboot Mode with TCO Disabled:
Connect to Vcc3_3 with 8.2k-10k Ohm weak pullup resistor.



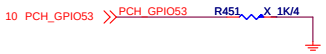


GPIO55
Default Mode:
Internal pull-up.

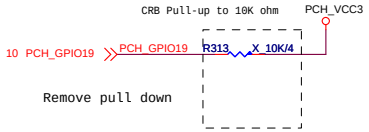
Top Block Swap Mode:
Connect to ground with 4.7k Ohm weak pulldown resistor.



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.



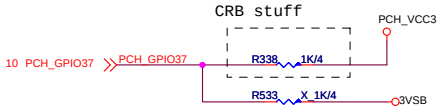
Default (SPI):
Left both SATA1GP/GPIO19 and GPIO51 floating.
No pull up required.

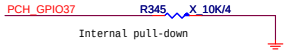
Boot from PCI:
Connect SATA1GP/GPIO19 to ground with 1k Ohm pull-down resistor.
Leave GPIO51 Floating.

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

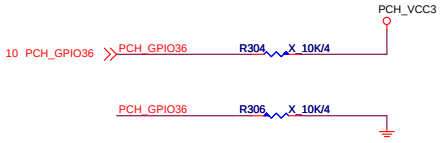
Default





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

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



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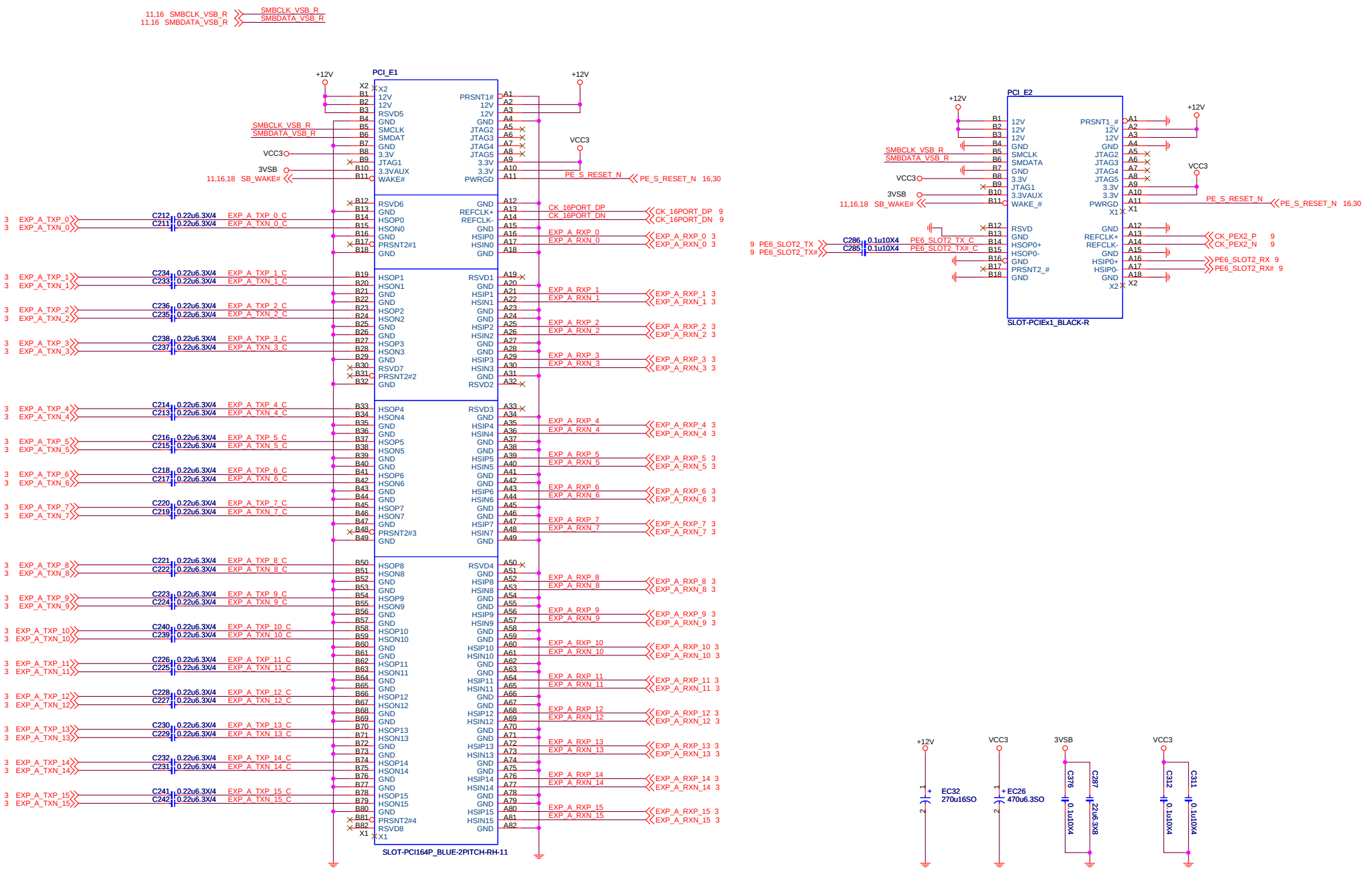

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MS-7823		
Size: Custom	Document Description: PCIE1(X1) & PCIE2(X16) Slots	Rev: 10
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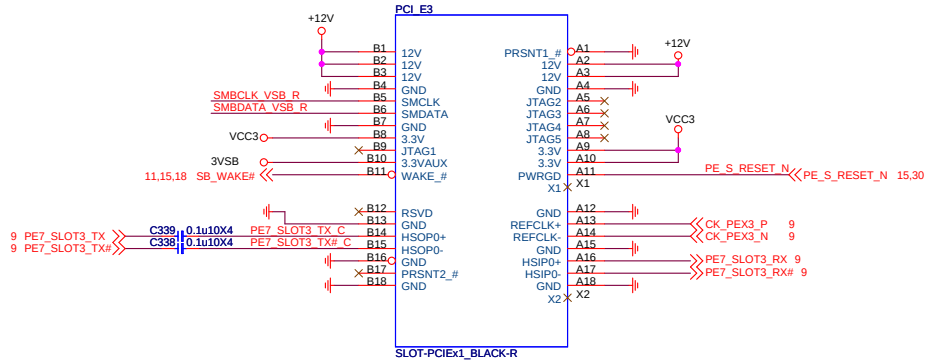
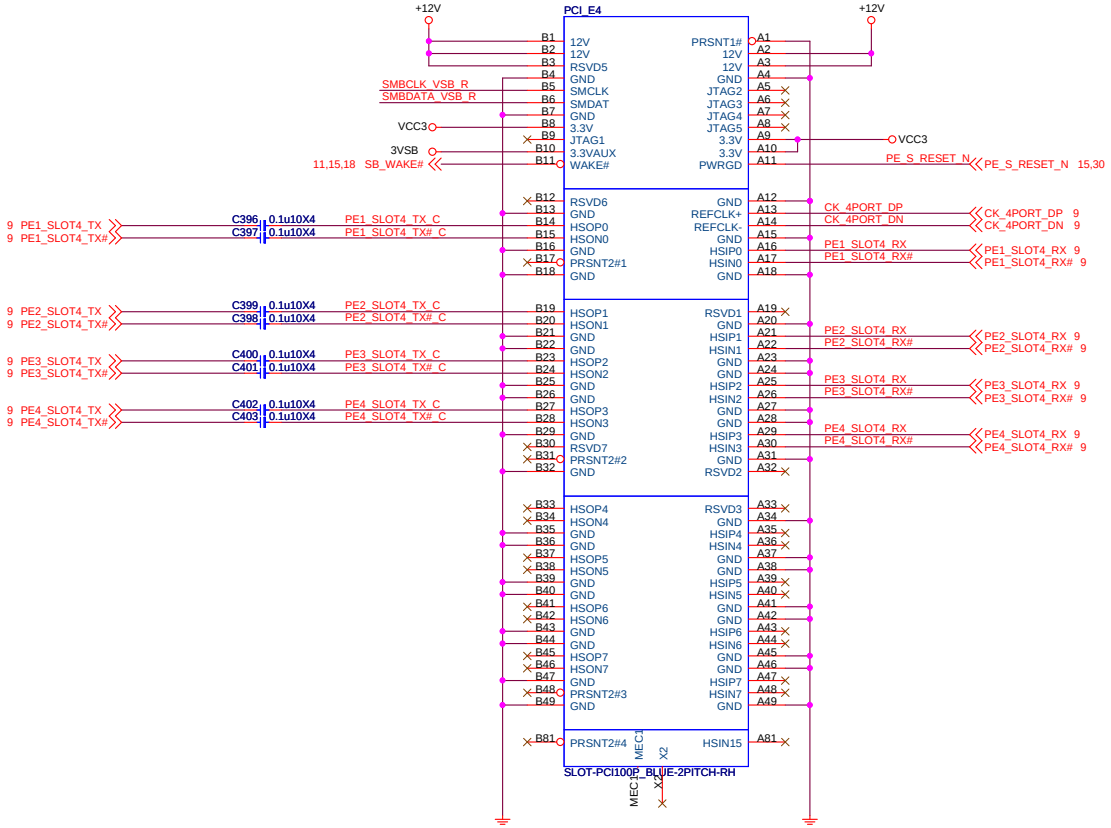
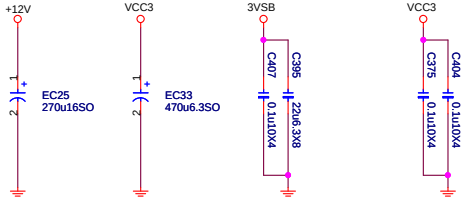
PCI_Express X4 Slot







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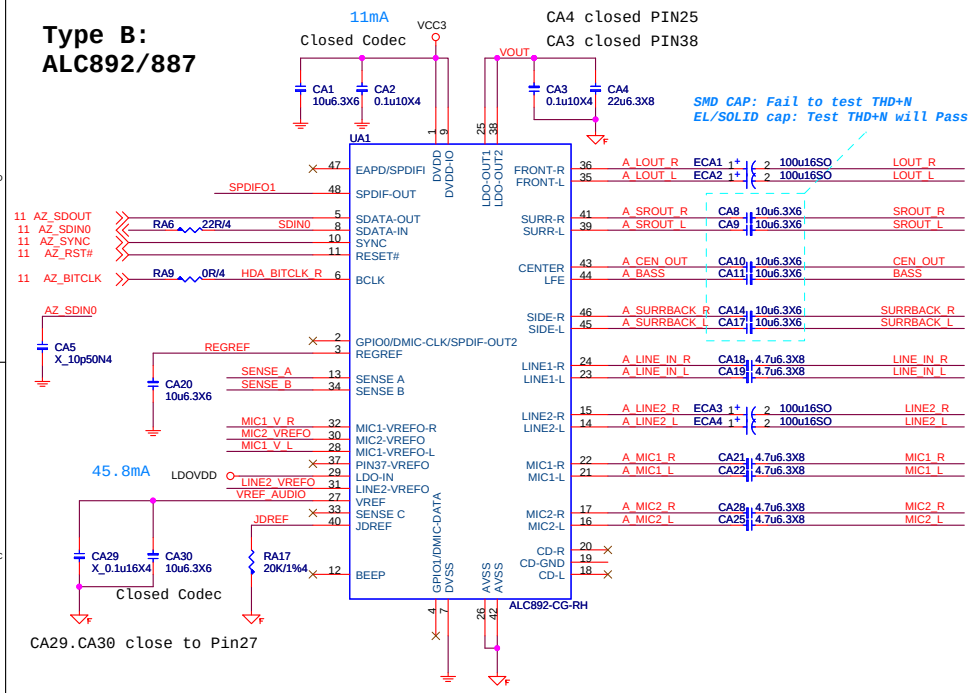
Type B: ALC892/887

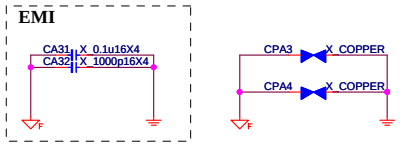
11mA
Closed Codec

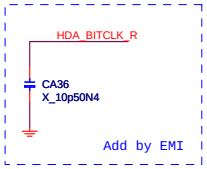
CA4 closed PIN25
CA3 closed PIN38

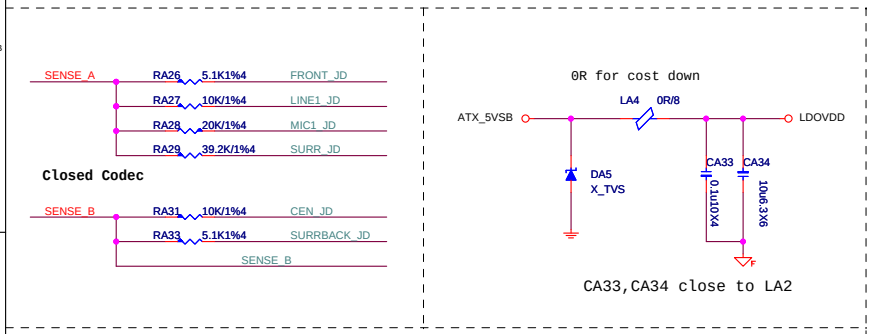
SMD CAP: Fail to test THD+N
EL/SOLID cap: Test THD+N will Pass



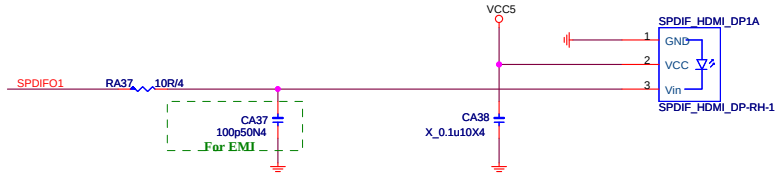
CA29.CA30 close to Pin27

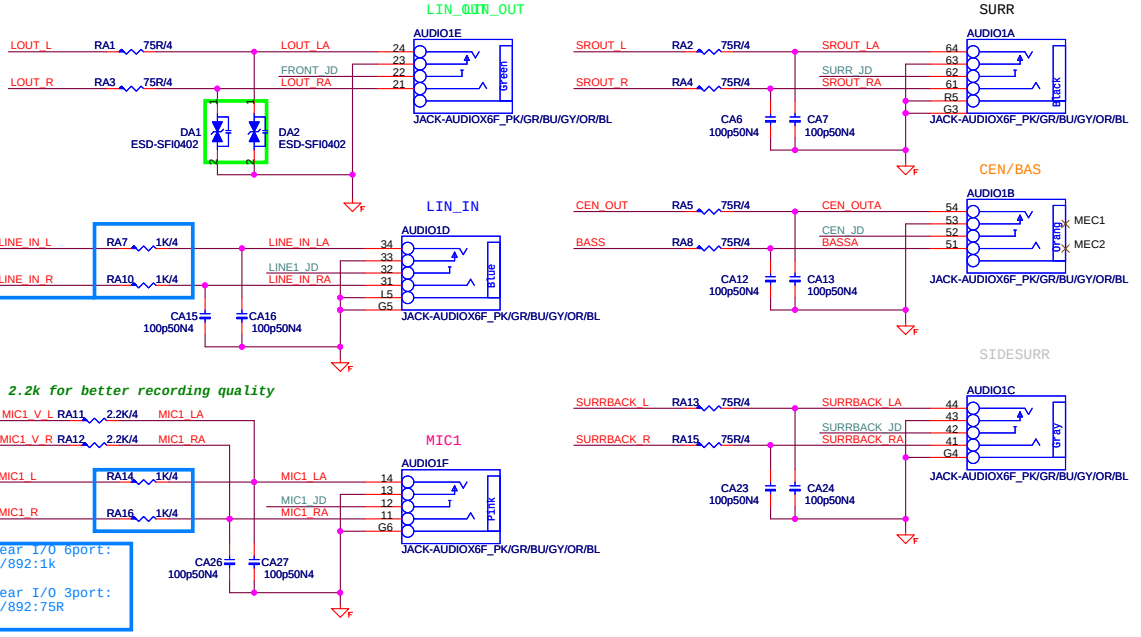


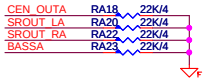


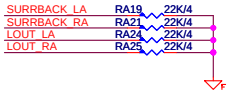


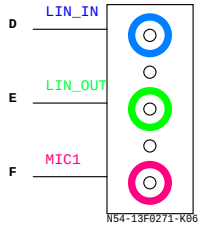
SPDIF_OUT

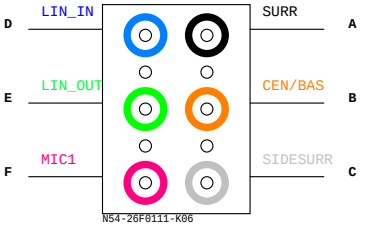


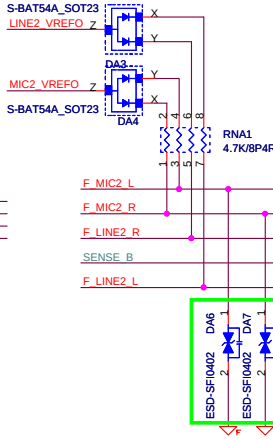












Varister --> cap for cost down

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

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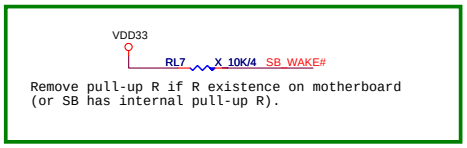
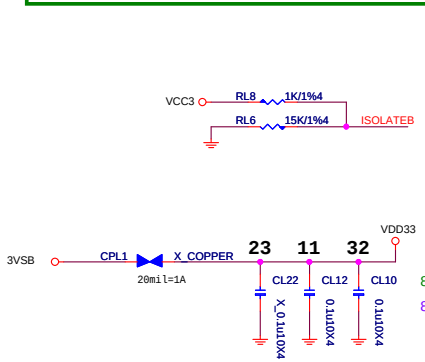
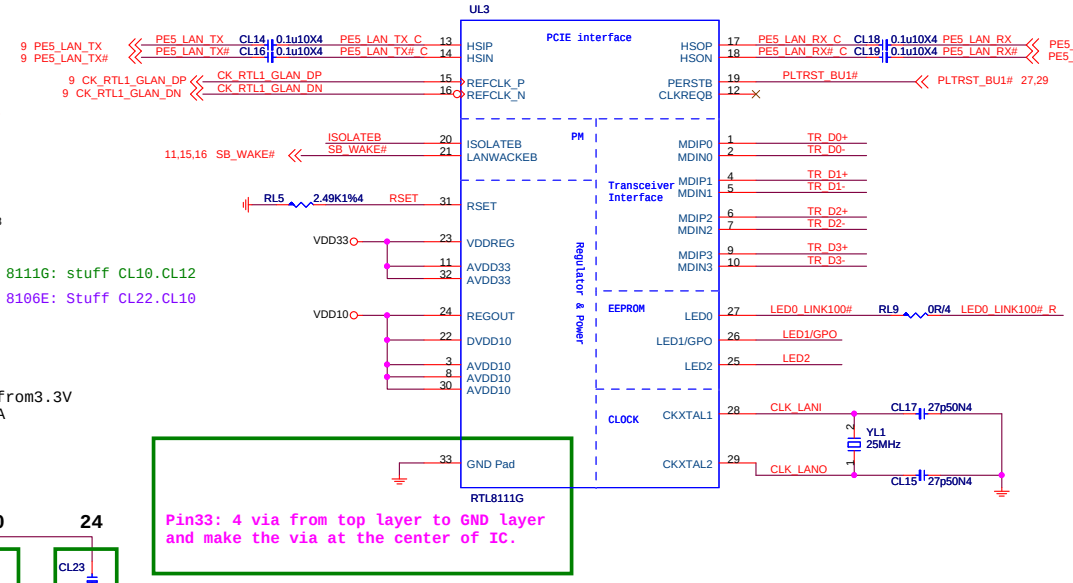
RTL8111G Giga LAN

RTL8106E 10/100M LAN

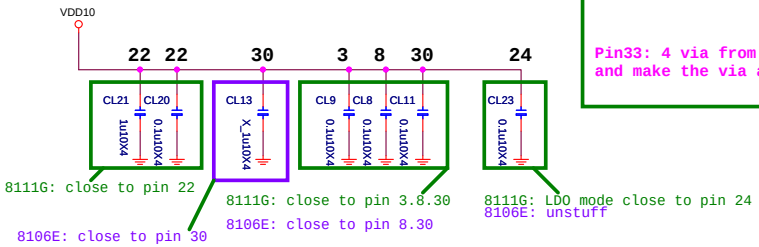






Pin33: 4 via from top layer to GND layer and make the via at the center of IC.

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

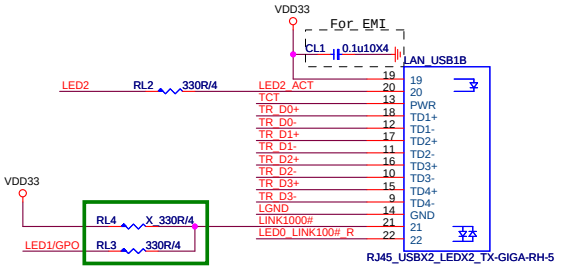


Icc10 average operating supply current from1.0V
At 1Gbps with heavy network traffic 300mA

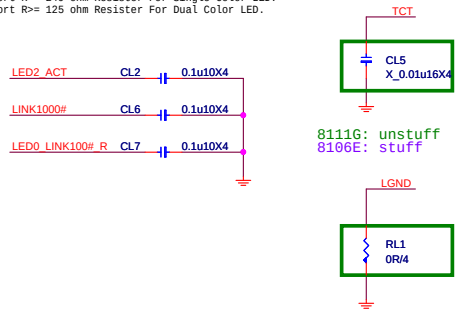
8111G:stuff CL21,CL20,CL9,CL8,CL11,CL23
un stuff CL13

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

LAN Connector

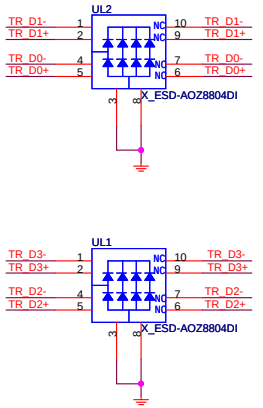


8111G: Keep RL6 and Remove RL5 for RTL8111G
8106E: Keep RL5 and Remove RL6 for RTL8106E
Support R>= 249 ohm Resister For Single Color LED.
Support R>= 125 ohm Resister For Dual Color LED.



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

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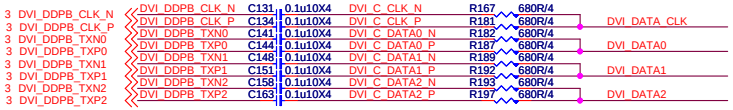
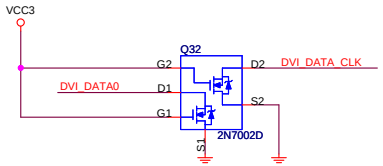
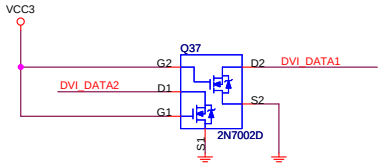
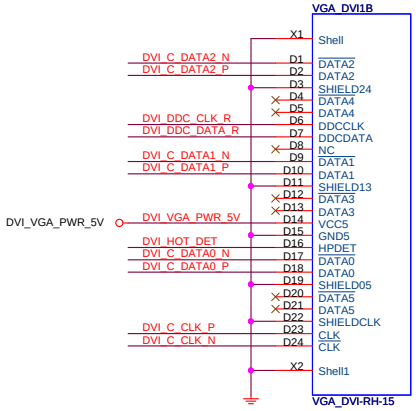
VGA: resolution of 2048x1536 pixels with 32-bit color at 75 Hz (4:3 QXGA)

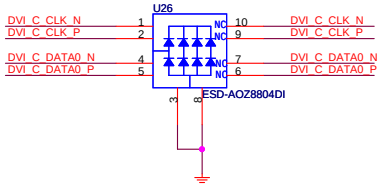








U26 AVL:D0G-05A050C-O05
D0G-06A050C-A68



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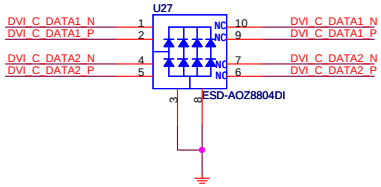
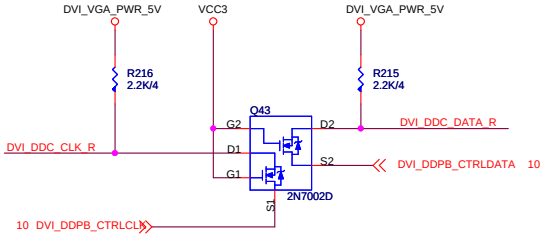
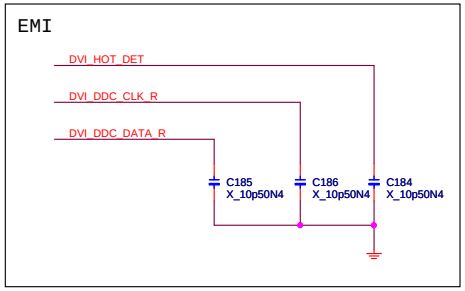
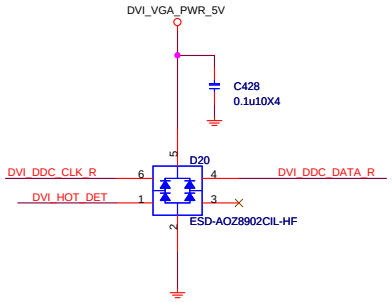
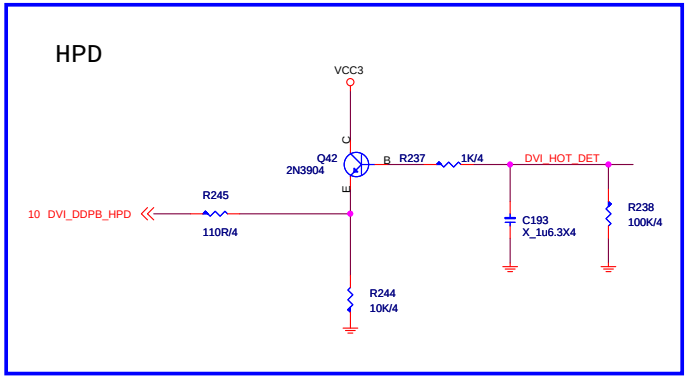
D0G-06A050C-A68

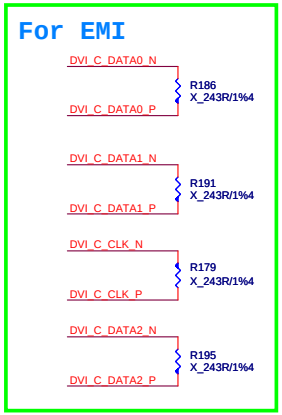












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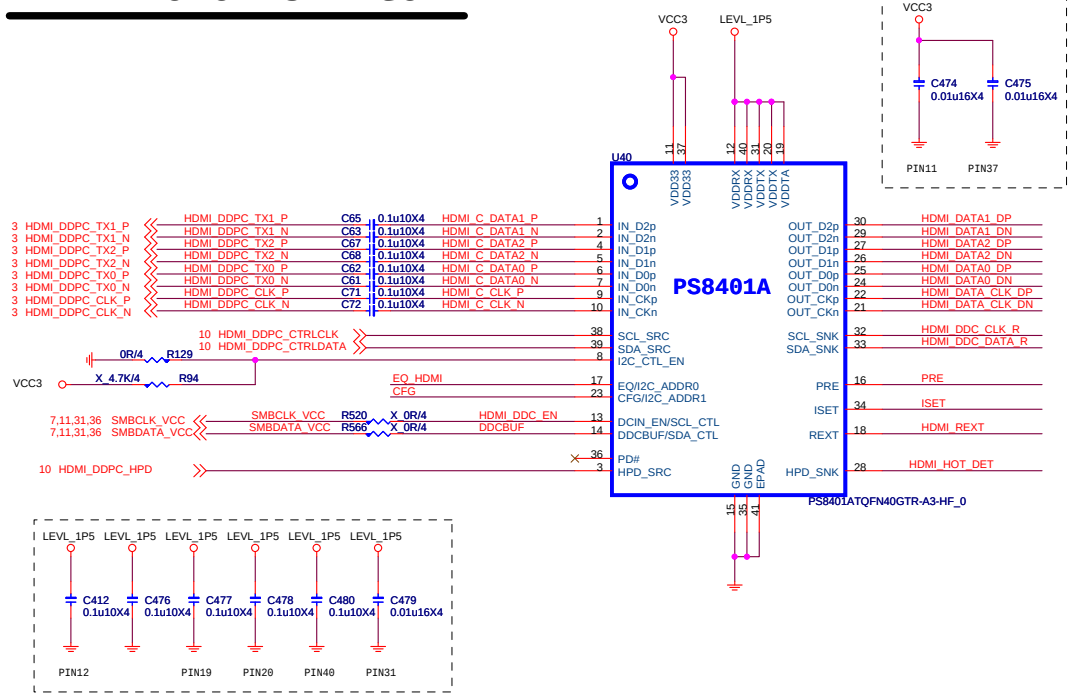
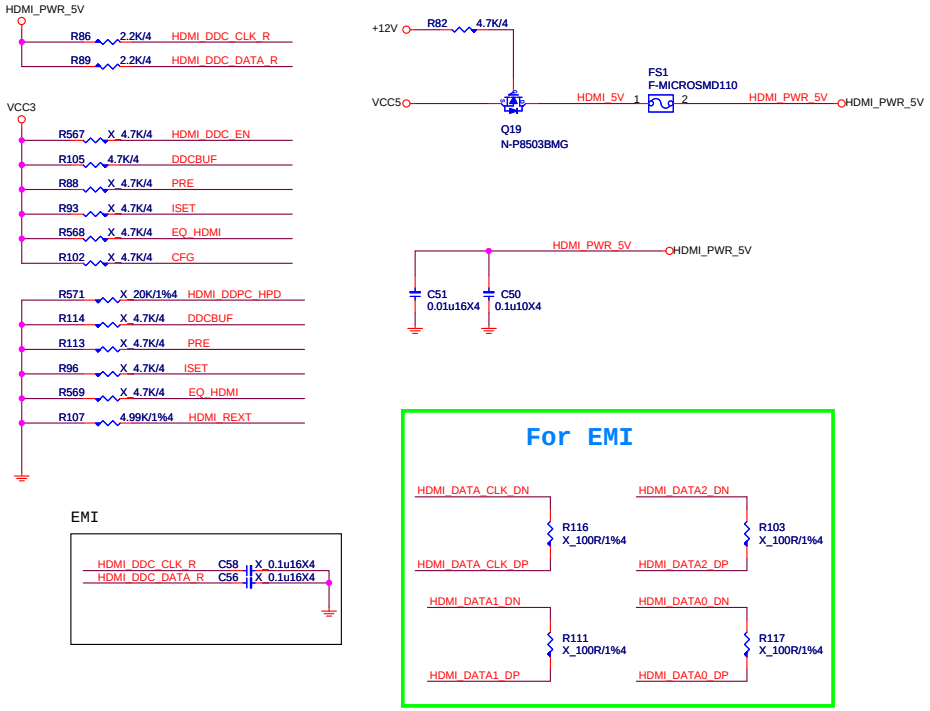
HDMI level shifter





HDMI level shifter 1.5V POWER

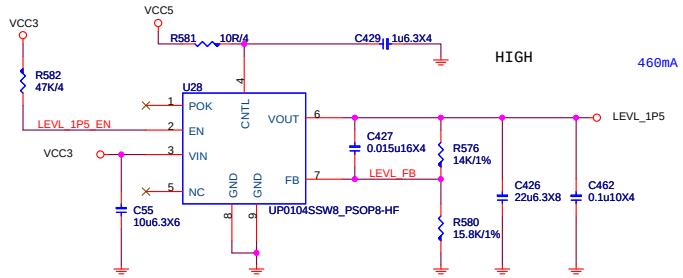


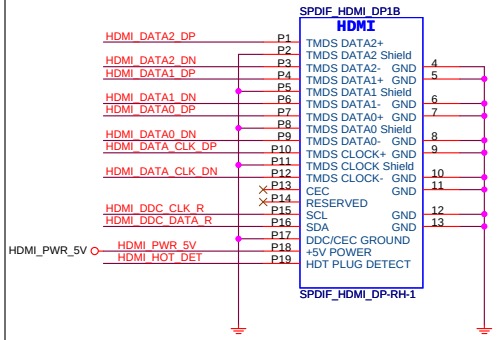
Table 8-1. PCH PCI Express Tx/RX – HDMI Signal Mappings

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	

	"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
0, X, X	Off	Off

PC1, PC0		note
00	8 dB	internal pull-down at ~500K ohm.
01	4 dB	
10	12 dB	
11	0 dB	



MICRO-STAR INT'L CO.,LTD

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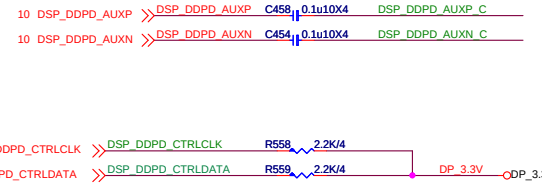
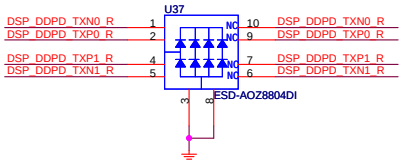
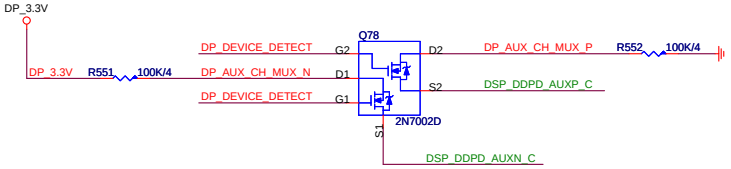
DP



U76 AVL:D0G-06A050C-A68





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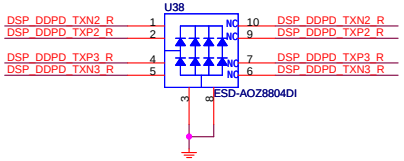
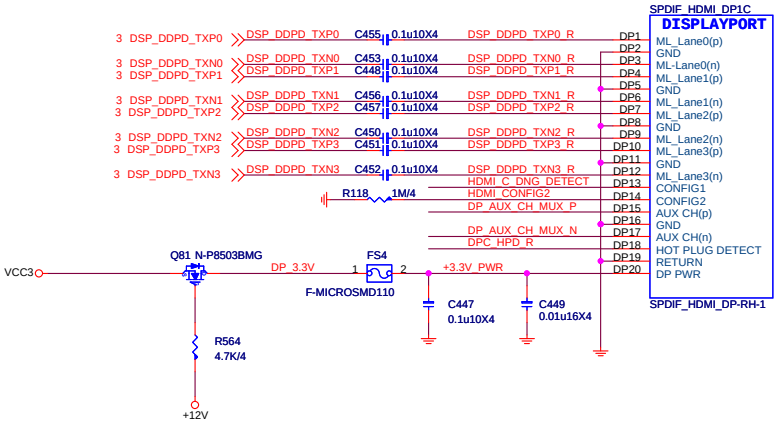
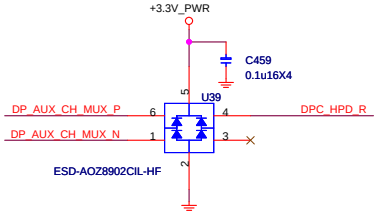
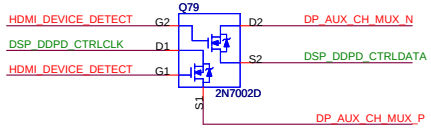
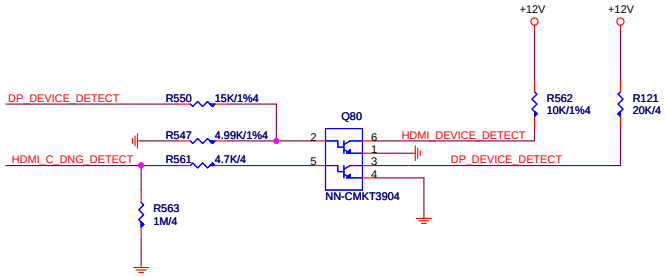


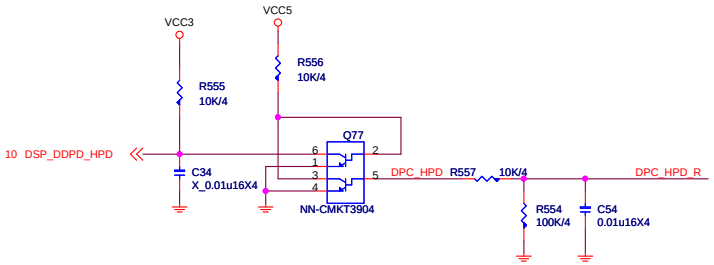


U2 AVL:D0G-0100619-I05









	DP	HDMI
HDMI_C_DNG_DETECT	L	H
DP_DEVICE_DETECT	H	L
HDMI_DEVICE_DETECT	L	H

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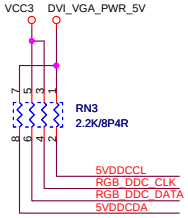
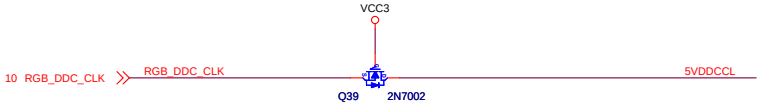
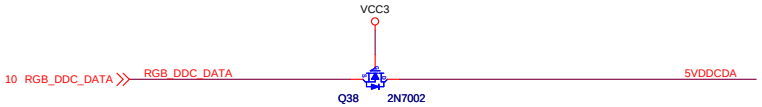
D-Sub

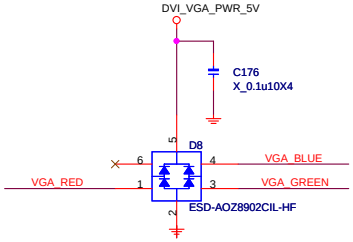
VGA: resolution of 2048x1536 pixels with 32-bit color at 75 Hz (4:3 QXGA)

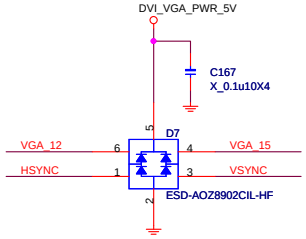
Level shift

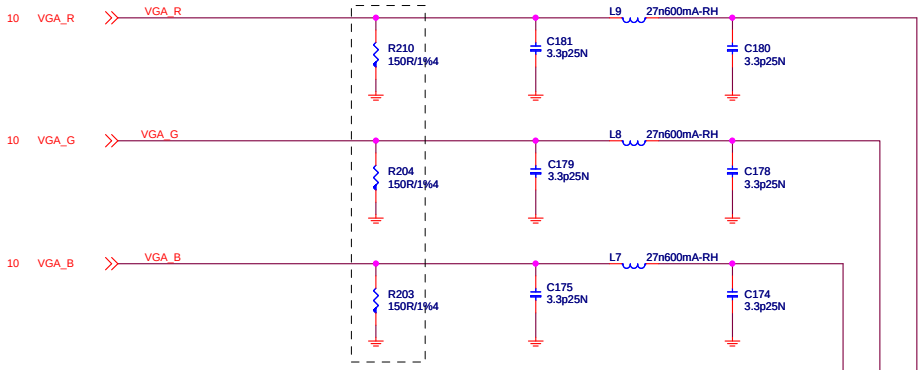




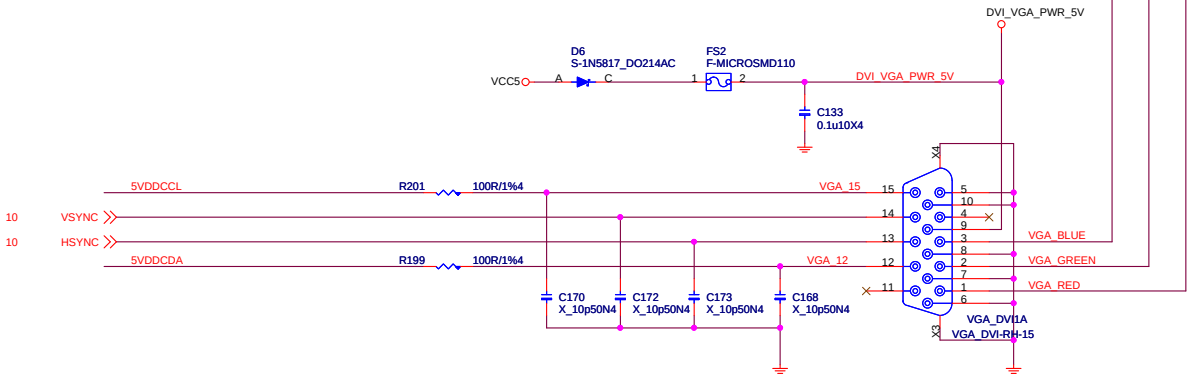








PLACE CLOSE TO VGA CONNECTOR,
WITHIN 750 MIL OF PIN



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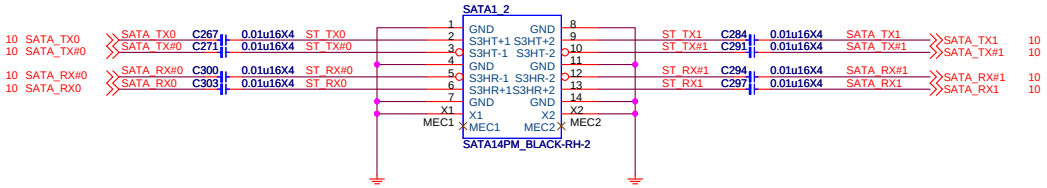
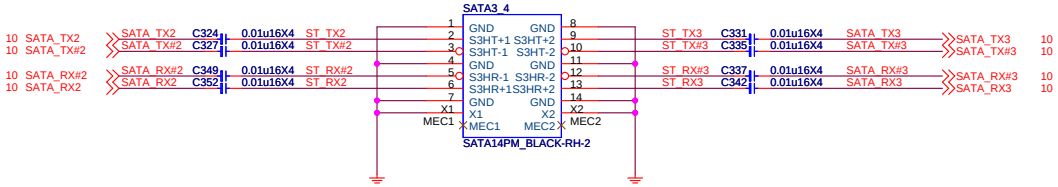
SATA 6G PORT 0,1

3.0 Black



SATA 3G PORT 2,3

3.0 Black

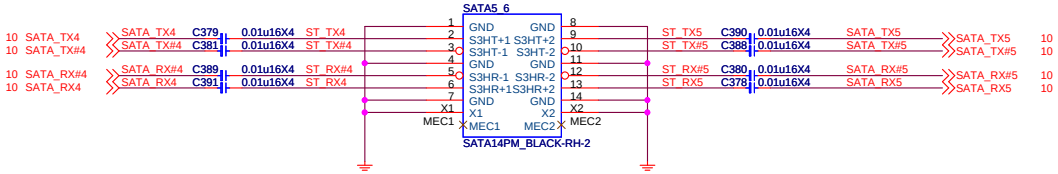


Change 90 by PM

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

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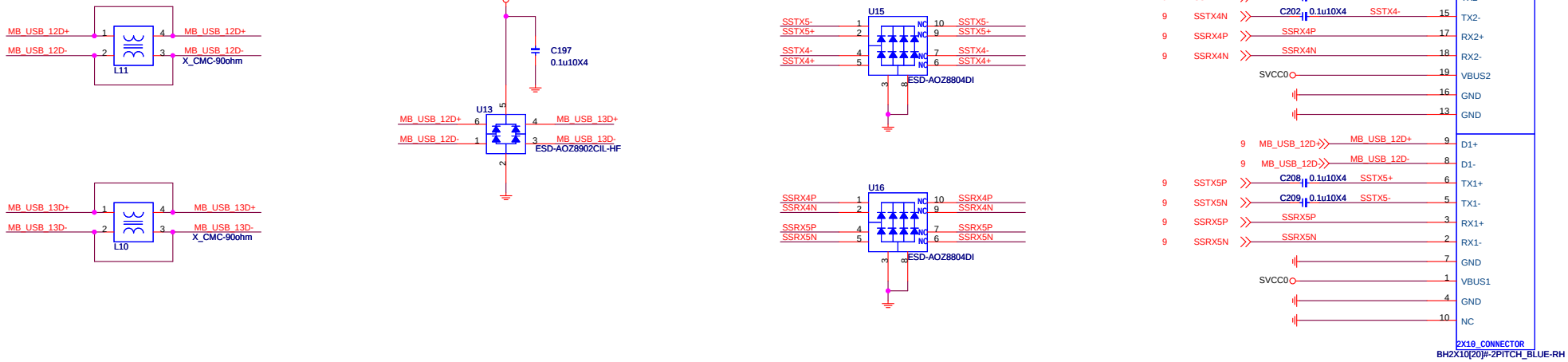

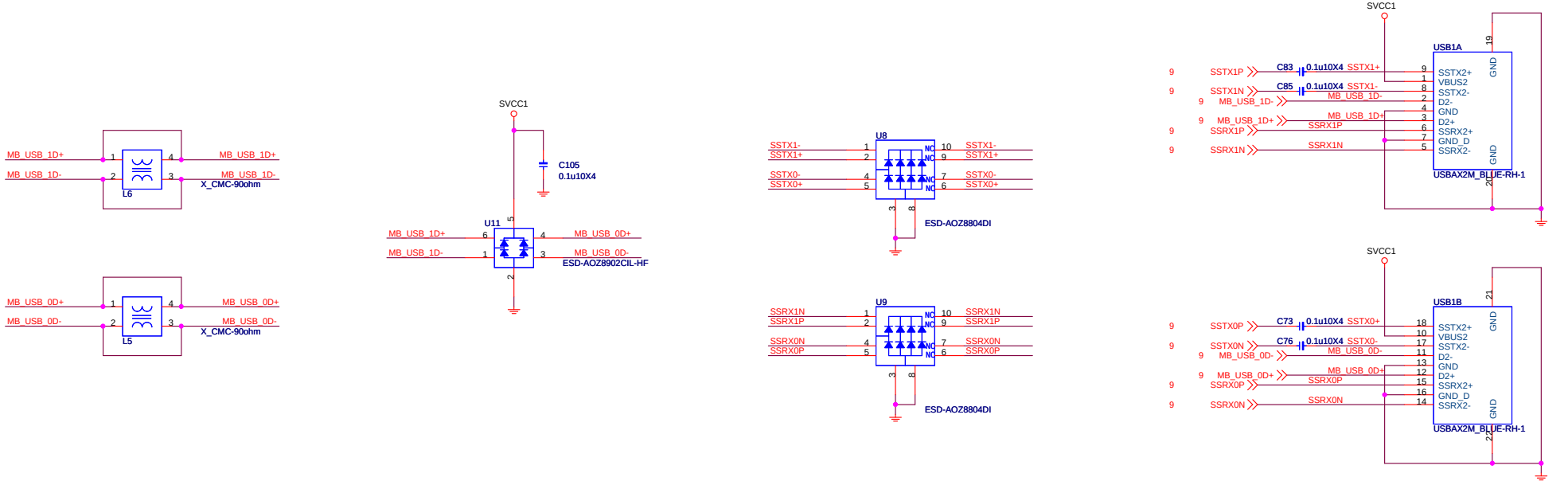

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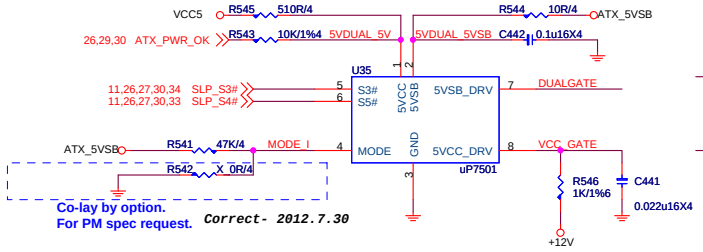
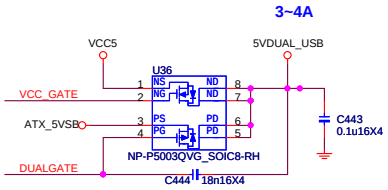
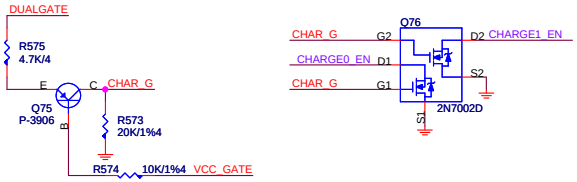
5VDUAL_USB - uP7501

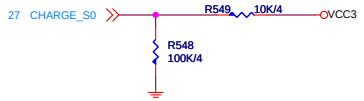




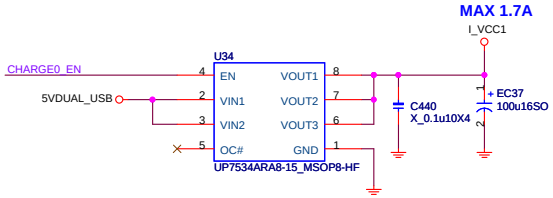


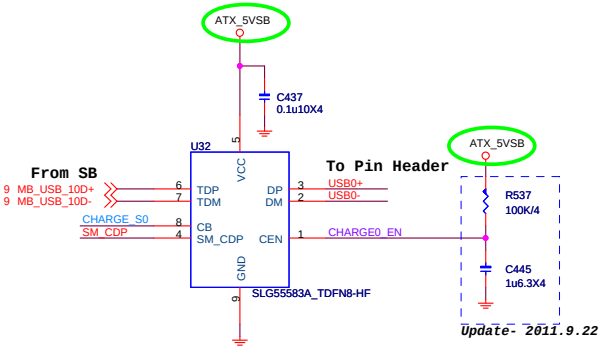
F71868 GPIO12

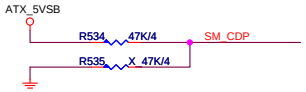
NCT6779D GPIO24
F71889 GPIO25



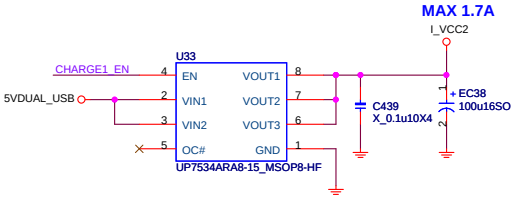
USB POWER PORT 0 For USB Charging

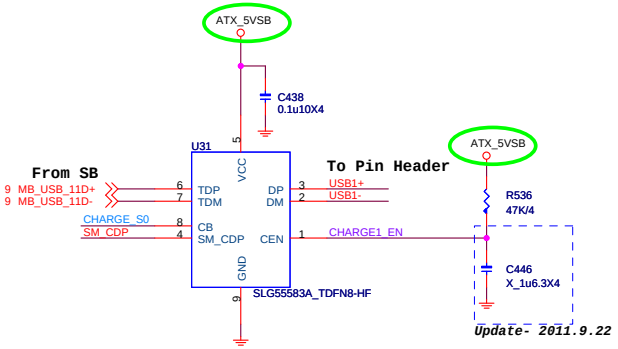




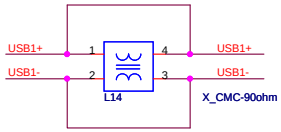


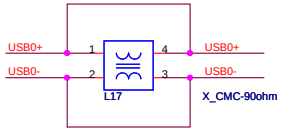
USB POWER PORT 1 For USB Charging



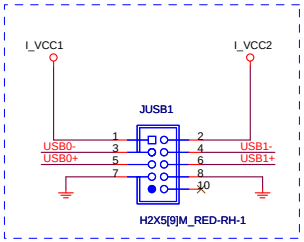


FRONT USB PORT 0,1





SLG55583A has internal ESD diode.



Please name the pin header JUSB1.

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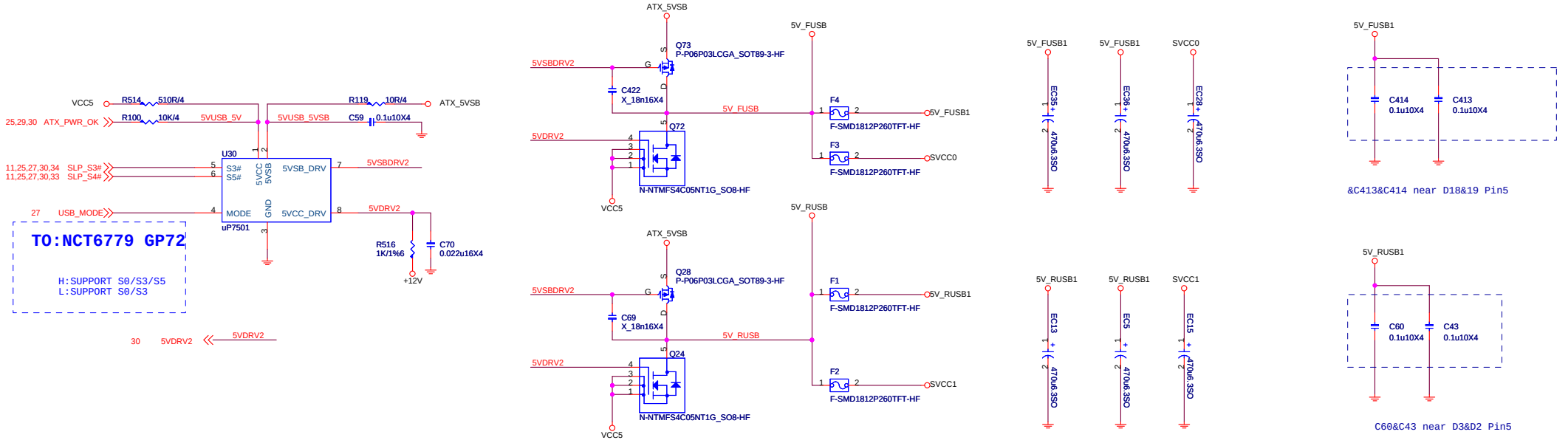
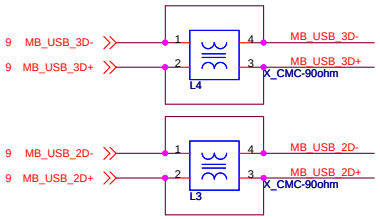
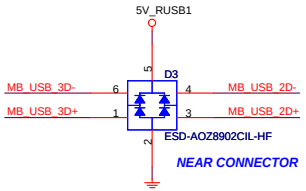


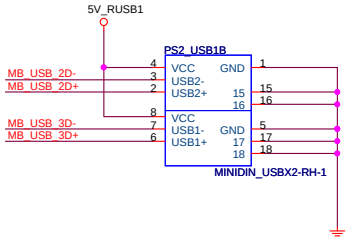
5VDRV1, 5VSBDRV1 width 12mil

D08-0300700-P16 (Itrip=2.6A; 0.015ohm) support 2 USB ports

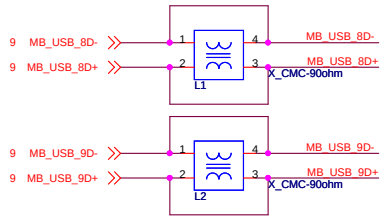
REAR USB PORT 2,3

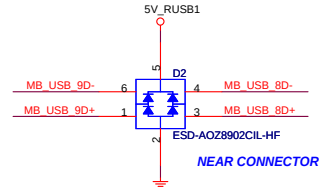


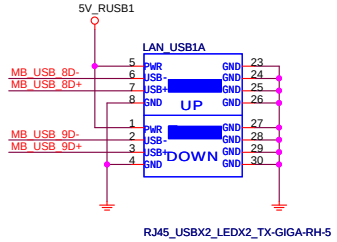




FRONT USB PORT 8,9 (With LAN)

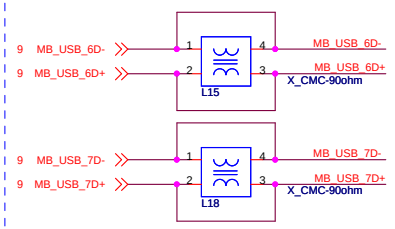


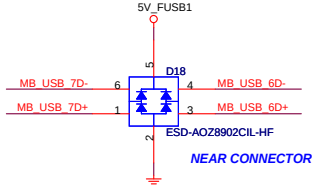


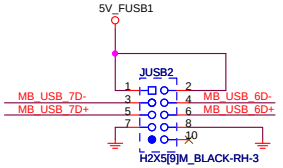


for B85 remove

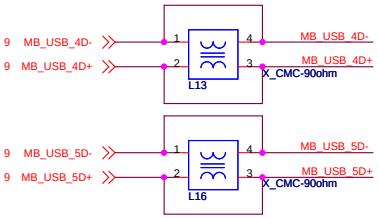
FRONT USB PORT 6,7

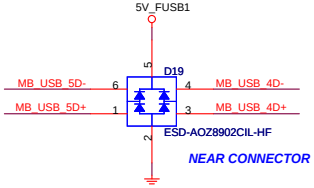


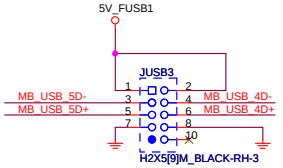




FRONT USB PORT 4,5







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SERIAL PORT 1

SIO_VCC3
RN11 X_2.7K/8P4R
RIA# CTSA# SINA DCDA#
R396 X_2.7K/4 DSRA#
NO USE UART PORT1
R331 2.7K/4 SIN2
R332 2.7K/4 DTRB#
C366 X_0.1u16X4
VCC5
U24 GD75232DBR_SSOP20-RH
+12V_COM RIA# CTSA# DSRA# SINA DCDA#
NRIA RTSA# DTRA# SOUTA
-12V_COM NRTSA NDTRA NSOUTA
C392 0.1u16X4
D13 1N4148W +12V
D12 1N4148W -12V
C394 0.1u16X4
JCOM1 H2X5[10]M_BLACK-RH
NDCDA# NSOUTA NRTSA NRIA NSINA NDTRA NDSRA# NCTSA#
CN1 X_470p50X/8P4C
CN2 X_470p50X/8P4C

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

PS2_USB
RN1 4.7K/8P4R
R2 X_1K/4
C1 0.1u10X4
RN2 33R/8P4R
KBDAT MSDAT KBCLK MSCLK
PS2_USB1A MINIDIN_USBX2-RH-1
KB_DT MS_DT KB_CK MS_CK
C8 C9 C10 C11 180p50N4
U3 ESD-AOZ8902CIL-HF
C5 0.01u16X4
SIO_VCC3 VCC3 PCH_VCC3
R524 X_0R/6
R523 0R/6

3V Analog Power

SIO_VCC3
CP1 X_CP SIO_AVCC3
L12 X_120L600mA-250
C252 0.1u10X4
C258 10u6.3X6
Closed PIN99
Closed PIN46,85
VBAT SIO_3VA
C288 0.1u10X4
C307 0.1u10X4
C350 X_10u6.3X6

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

SIO_VCC3
R406 R413 R420 R322 1K/4
RTSA# DTRA# SOUTA# RTSB#
R407 X_680R/4
R421 X_680R/4
R323 680R/4
SIO_3VA
R419 1K/4
AMDPWR_EN DSW_EN SLP_S5_LCH#
R307 R409 R424 680R/4
Closed PIN24,108
ATX_5VSB
SYS3VSB_OFF R328 10K/4
SIO_VCC3
C319 0.1u10X4
C295 X_10u6.3X6
SKTOCC#_R R297 X_2M/4
R299 1K/4
VBAT

HM_VREF
R278 X_10K/1%4
SYSTIN
Q51 P-3906
RT3 X_10K/1%6
C289 2.2n50X4
GNDHM

HW Monitor - Voltage

SIO_VCC3
LPC_FRAME# R385 X_4.7K/4
LPC_DRQ#0 R371 X_4.7K/4
PLTRST_BU1# R R368 820R/4
CHIP_PWGD R359 1K/4
R358 X_100K/4
FP_RST# I R349 4.7K/4
PLTRST# R384 X_4.7K/4
PECI_IO C266 X_47p50N4
R289 X_1K/4
SIO_5VDUAL R312 1K/4
SYSFANIN R310 1K/4
AUXFANIN2 R309 1K/4
TURBO_MODE# R20 1K/4
CPUTIN R284 1K/4
USB_MODE R431 10K/4

VCCP R276 10K/1%4 CPUVcore
R279 10K/1%4
C268 10u6.3X6
+12V R291 200K/1%4 VIN0
R287 20K/1%4
C263 0.1u16X4
VCC5 R290 12K/1%4 VIN1
R286 3K/1%4
C262 0.1u10X4
CPU_VTT R280 10K/1%4 VIN2
C272 10u6.3X6
VCC_DDR R272 10K/1%4 VDIMM
Q50 2N7002
R273 10K/1%4
C257 10u6.3X6
PCH_1P05 R285 10K/1%4 VIN4
C282 10u6.3X6
CPU_CORE0 R283 10K/1%4 VIN5
C281 10u6.3X6
CPU_GFX R282 10K/1%4 VIN6
C280 10u6.3X6
CPU_RING R281 10K/1%4 VIN7
C279 10u6.3X6
CPU_SA R298 10K/1%4 VIN8
C293 10u6.3X6

U19 NCT6779D-RH

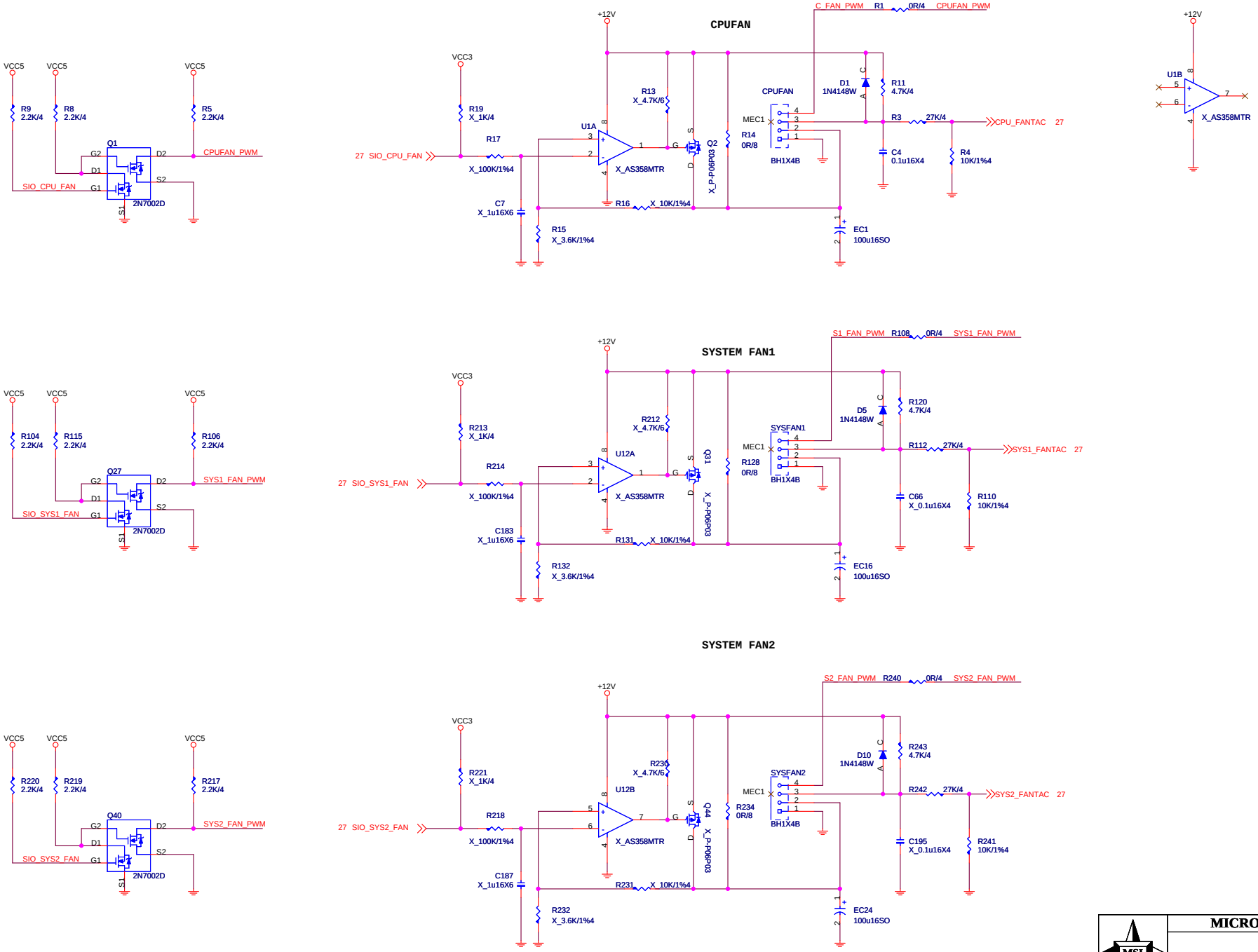
LPC Interface: LRESET# PCICLK IOCLK LDRQ# SERIRQ LFRAME# LAD0 LAD1 LAD2 LAD3
DSW Interface: GP50/SUSWARN#/RSTOUT3# GP53/SUSWARN_5VDUAL GP51/5VDUAL GP52/SUSACK#/RSTOUT4# GP54/SLP_SUS#/PWROK/3VSBSW# GP55/SLP_SUS_FET/PWROK# DPWROK# SLPS5_Lch/GP40(TEST_MODE_EN) DEEP_S5_0/3VSBSW/LATCH_BKFD_CUT/PWROK/ATXPGDO DEEP_S5_1/CASEOPEN1#
GP32/SCL/MSCL GP31/SDA/MSDA TSIC/GP26 TSID/PECI OVT#/SMI#/GP03 SMI#/OVT# SKTOCC# PME#
Harddware Monitor: VIN8 AUXTIN3/VIN7 AUXTIN2/VIN6 AUXTIN1/VIN5 AUXTIN0/VIN4 VIN3/VDIMM VIN2/VLDT VIN1 VIN0 CPUVCORE SYSTIN CPUTIN
FAN Control: AUXFANIN0/GP04 AUXFANIN1/GP05 AUXFANIN2/GP06 AUXFANOUT0/GP00 AUXFANOUT1/GP01 AUXFANOUT2/GP02 CPUFANIN CPUFANOUT SYSFANIN SYSFANOUT
ACPI Function: RSMRST# PSIN# PSOUT# SLP_S3# SLP_S5# PSON#/AMD_PSON# ATXPGD PWROK RESETCONI#/GP30/OVT#/SMI# RESETCONO#/GP47 RSTOUT0#/GP74 RSTOUT1#/GP75 RSTOUT2#/GP76 PWROK/AMD_PWROK GP57/VLDT_EN GP56/VCORE_EN
GPIO: (DSW_EN)GP70 GP71 GP72 GP73 MLED/CIRRWB1/GP27 (AMDPWR_EN)IRTX1/CIRTX1/GP25 IRRX1/GP24/CIRRX CIRTX0/GP07
Printer mode: SLCT/CIRRXWB0/GP46 ACK#/GP43/DGL# ERR#/GP36 AFD#/GP35 STB#/GP34 INIT#/GP41/SCL/MSCL SLIN#/GP42/BEEP/SDA/MSDA
Port80 LED Control: PD0/GP60/LED_A PD1/GP61/LED_B PD2/GP62/LED_C PD3/GP63/LED_D PD4/GP64/LED_E PD5/GP65/LED_F PD6/GP66/LED_G
GPIO: PD7/GP67/DGH# BUSY/GP44/GRN_LED PE/GP45/YLW_LED
UART SIR: RIA#/GP87 DCDA#/GP86 (LPT_EN)SOUTA_P80/SOUTA/GP85 SINA/GP84 (24_48M_SEL)DTRA#/GP83 (2E_4E_SEL)RTSA#/GP82 DSRA#/GP81 CTSA#/GP80 RIB#/GP10 DCDB#/GP11 IRTX0/SOUTB/GP12 IRRX0/SINB/GP13 DTRB#/GP14 (UARTP80_EN)RTSB#/GP15 DSRB#/GP16 CTSB#/GP17
KBC Function: GA20M KBRST# GP23/MCLK GP22/MDAT GP21/KCLK GP20/KDAT
LATCH_BKFD_CUT#/GP33/3VSBSW# BKFD_CUT
Power Pin: PCHVSB VTT VBAT CASEOPEN0# 3VA 3VA 3VCC 3VCC AVCC VREF VSS VSS CPUD-/AGND

DSW_EN R521 X_0R/4 PS2_MODE → PS2_MODE 30
AMDPWR_EN R522 0R/4
SUSWARN#_CP R387 0R/4 SUSACK#_CP
SLP_SUS#_CP R320 0R/4 SLP_SUS#_SIO
SYS3VSB_OFF R401 0R/4 DPWROK_SIO
SLP_S5_LCH#
SMLINK1_CLK R392 X_0R/4 SIO_CLK0
SMLINK1_DATA R388 X_0R/4 SIO_SDA0
AMD used TSIC/D but intel used GPIO
H_PECI R288 43R/4 PECI_IO
H_SKTOCC# R292 X_0R/4 SKTOCC#_R
IO_PME_N
If un-used input pin please add pull down
SYS1_FANTAC SYS2_FANTAC AUXFANIN2
SIO_SYS1_FAN SIO_SYS2_FAN
CPU_FANTAC SIO_CPU_FAN SYSFANIN
PLTRST_BU1# R375 22R/4 PLTRST_BU1#_R
PLTRST_BU2# R380 22R/4 PLTRST_BU2#_R
LED_VSB LED_VCC
PLTRST_BUS1,2,3 connect to slot or device

SIO_VCC3
R356 X_10K/4 SIO_GP10 R357 10K/4
R346 X_10K/4 SIO_GP11 R347 10K/4
R335 X_10K/4 SIO_GP12 R336 10K/4
FOR BIOS USED
R315 10K/4 SIO_GP16
R316 10K/4 SIO_GP17
R303 1K/1%4 3VSB
CPU_VTT
R300 1M/4 VBAT
SIO_3VA
SIO_VCC3
HM_VREF
C265 4.7u6.3X8
SP1 X_COPPER GNDHM
(0,2.048V)

GPIO 41, 46, 31 and 32 that Support Wake-Up Function

FAN-COUNTROL CIRCUIT



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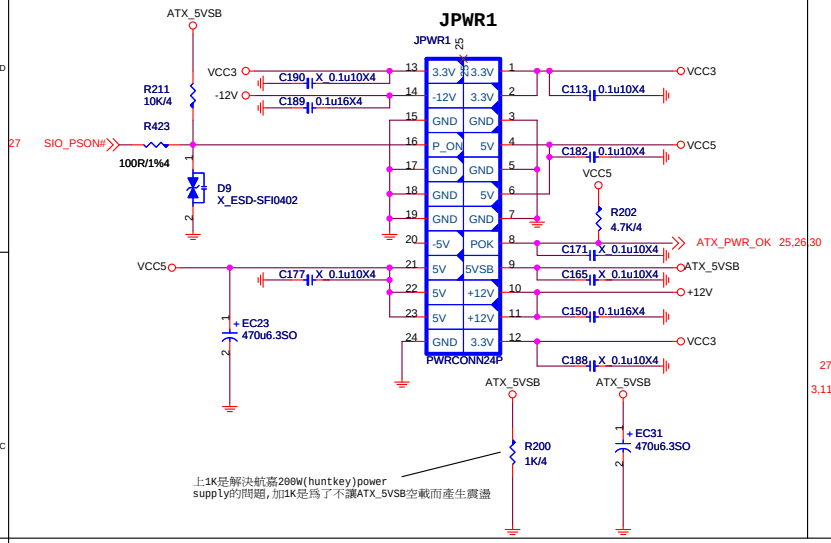
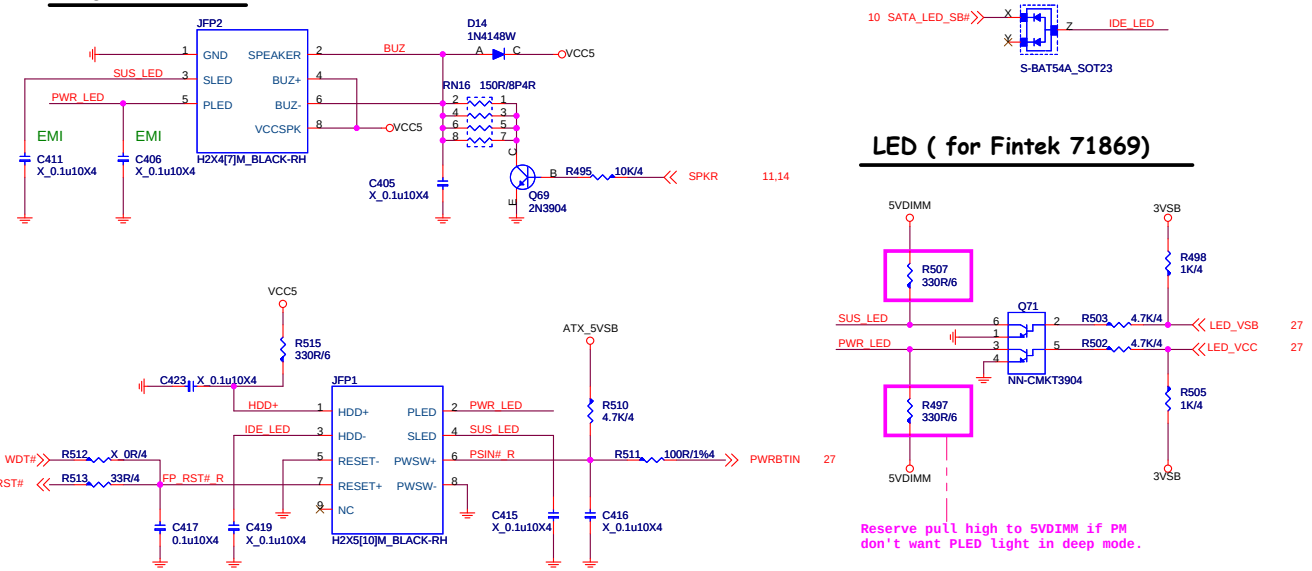
ATX POWER CONNECTOR



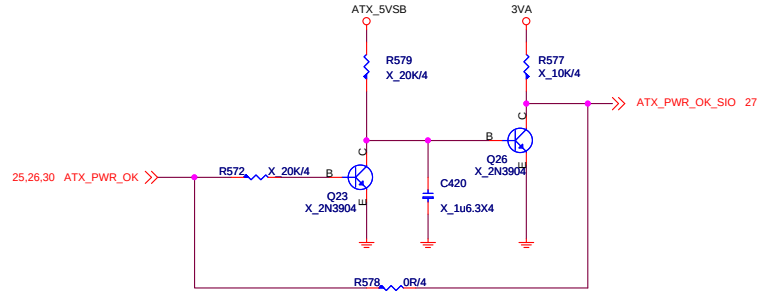
FRONT PANNEL



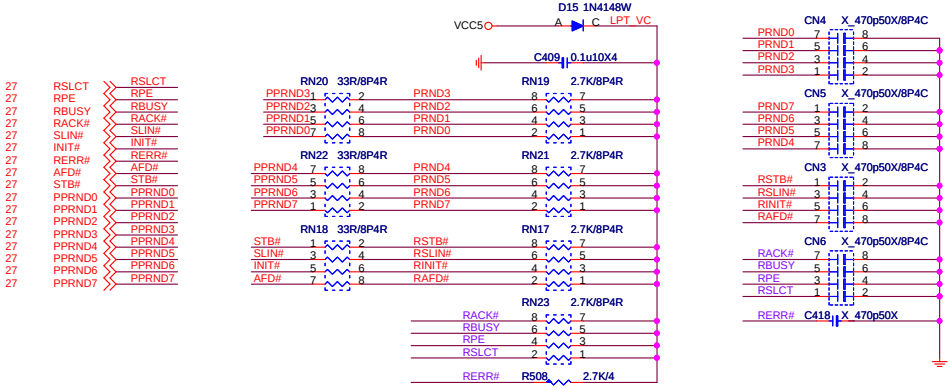
LED (for Fintek 71869)

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

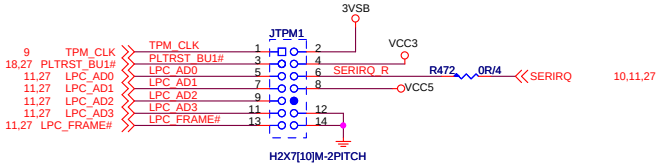
5VCC leakage from ATXPGD.(NCT6779 PIN80)

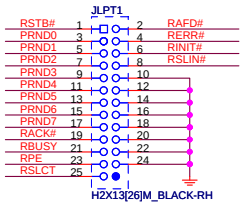


PARALLAL PORT



TPM





N31-2131151-H06 : 2.0mm

N31-2131131-H06 : 2.54mm

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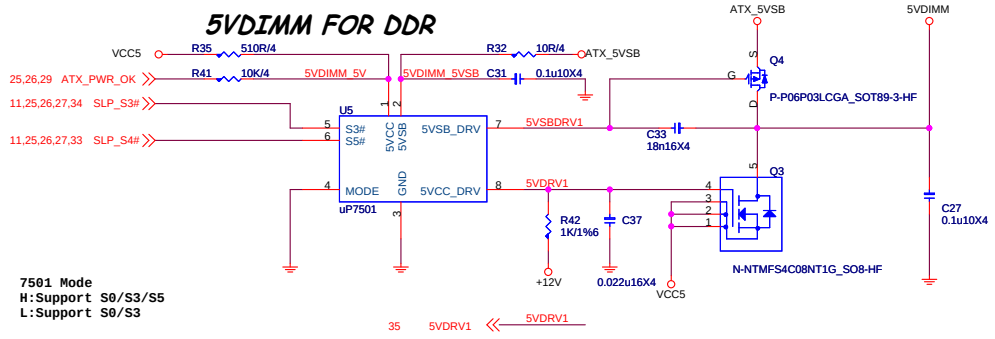
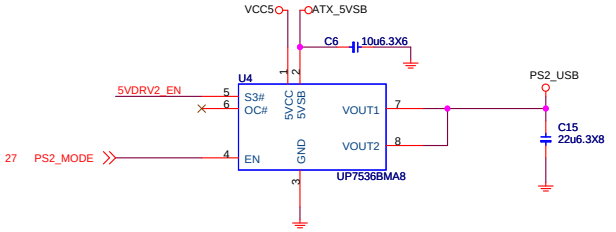
5VDIMM FOR DDR

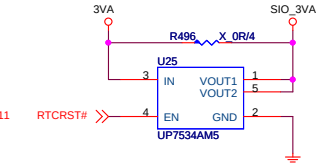


7501 Mode
H:Support S0/S3/S5
L:Support S0/S3

PS2 Power



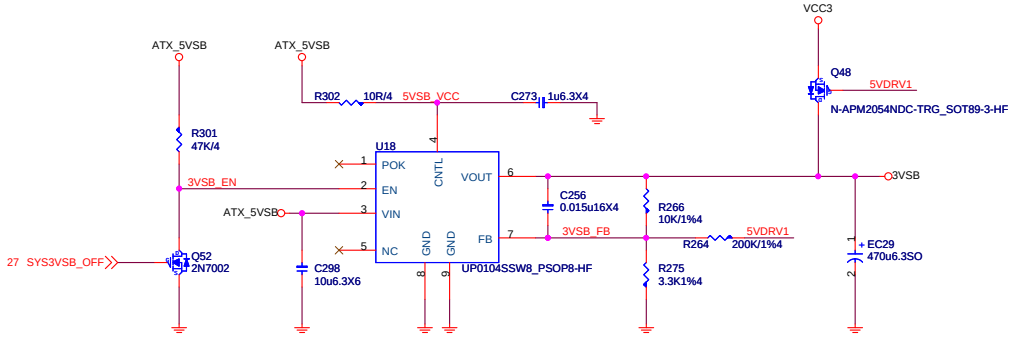
隔離PCH&SIO的3VA



3VSB

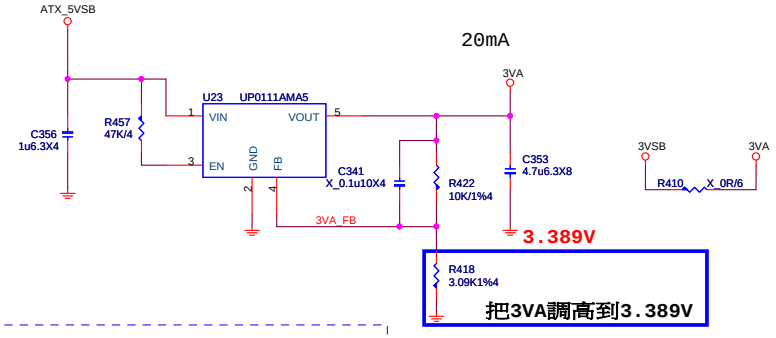
0.216+0.2+1.5+0.67=2.586A
PCH:216mA
LAN:200mA
PCIE Slot:375mA x4
up0104 ME Power:0.67A

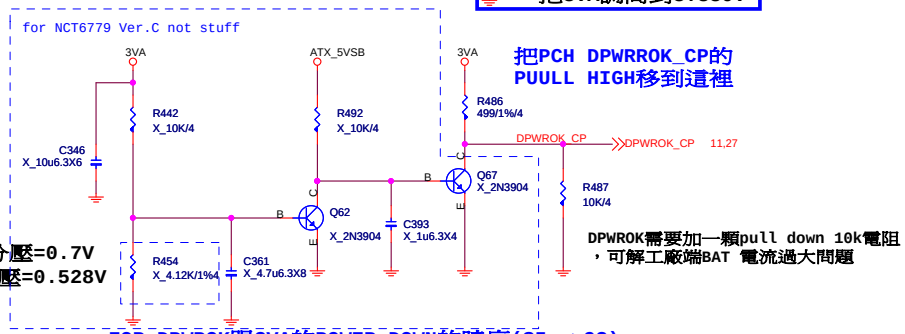
Q48 AVL:D03-3057L19-N03



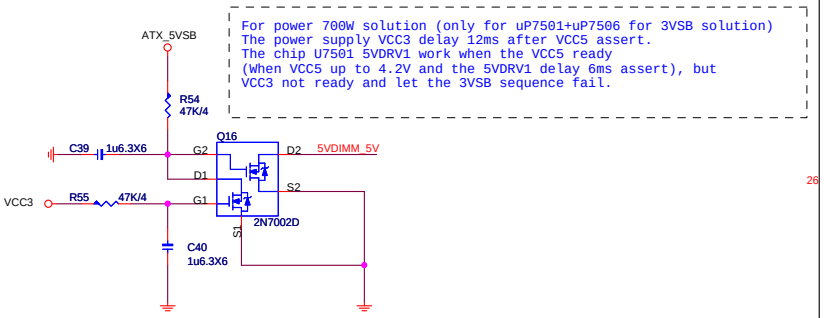
3VA

20mA

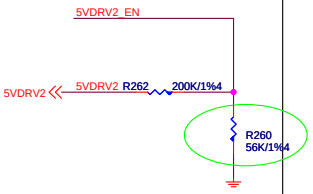


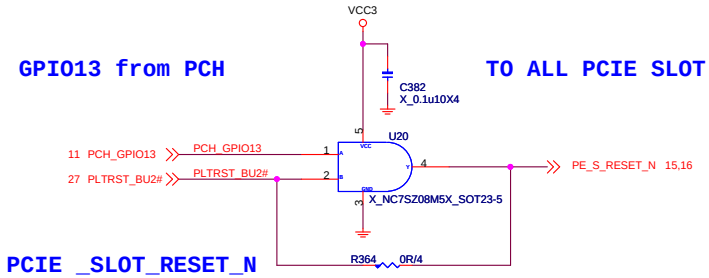


FOR DPWROK跟3VA的POWER DOWN的時序(S5-->G3)



USB MODE





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Custom	ACPI controller UPI	10

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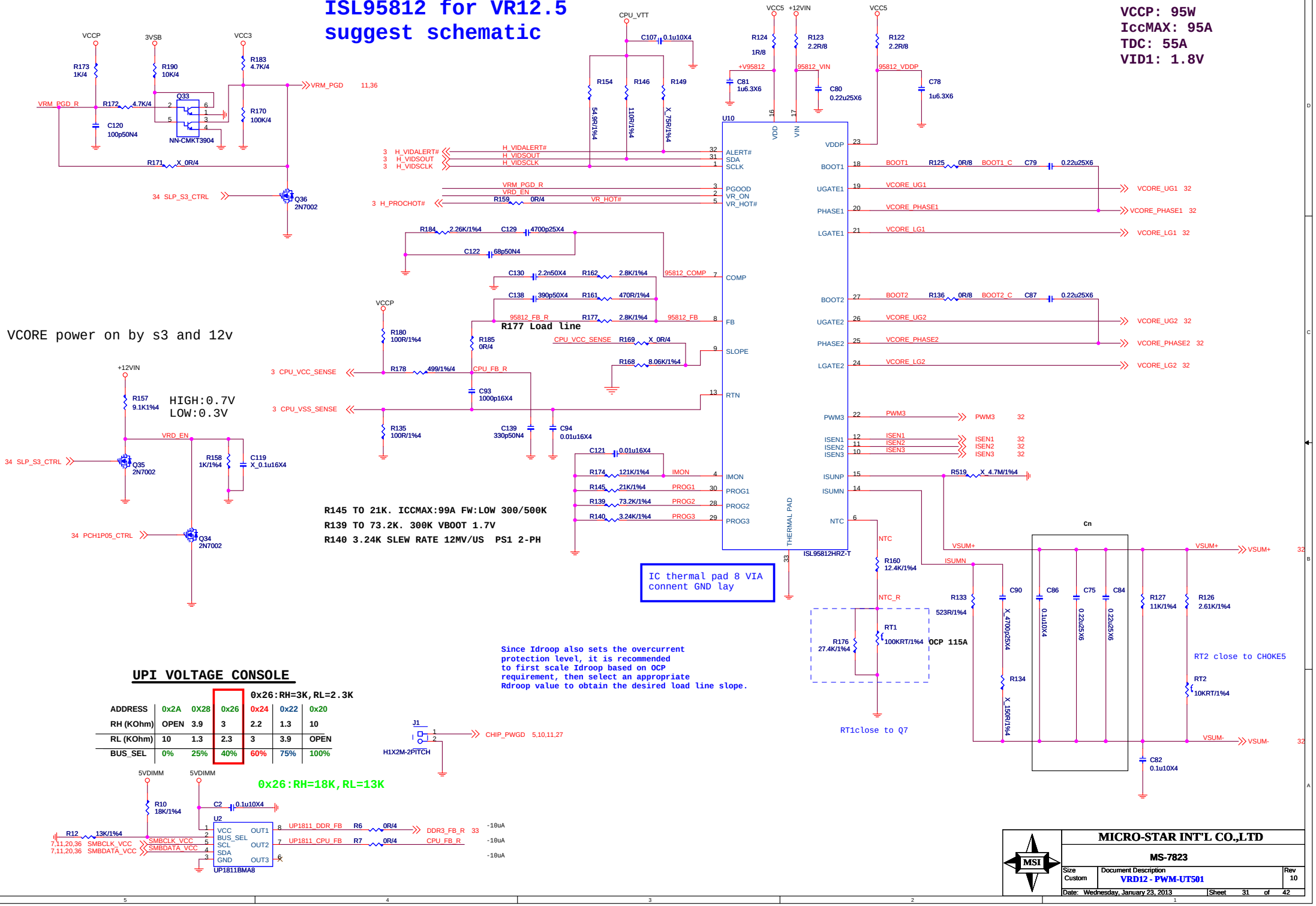
ISL95812 for VR12.5 suggest schematic

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



UPI VOLTAGE CONSOLE

ADDRESS	0x2A	0X28	0x26	0x24	0x22	0x20
RH (KOhm)	OPEN	3.9	3	2.2	1.3	10
RL (KOhm)	10	1.3	2.3	3	3.9	OPEN
BUS_SEL	0%	25%	40%	60%	75%	100%

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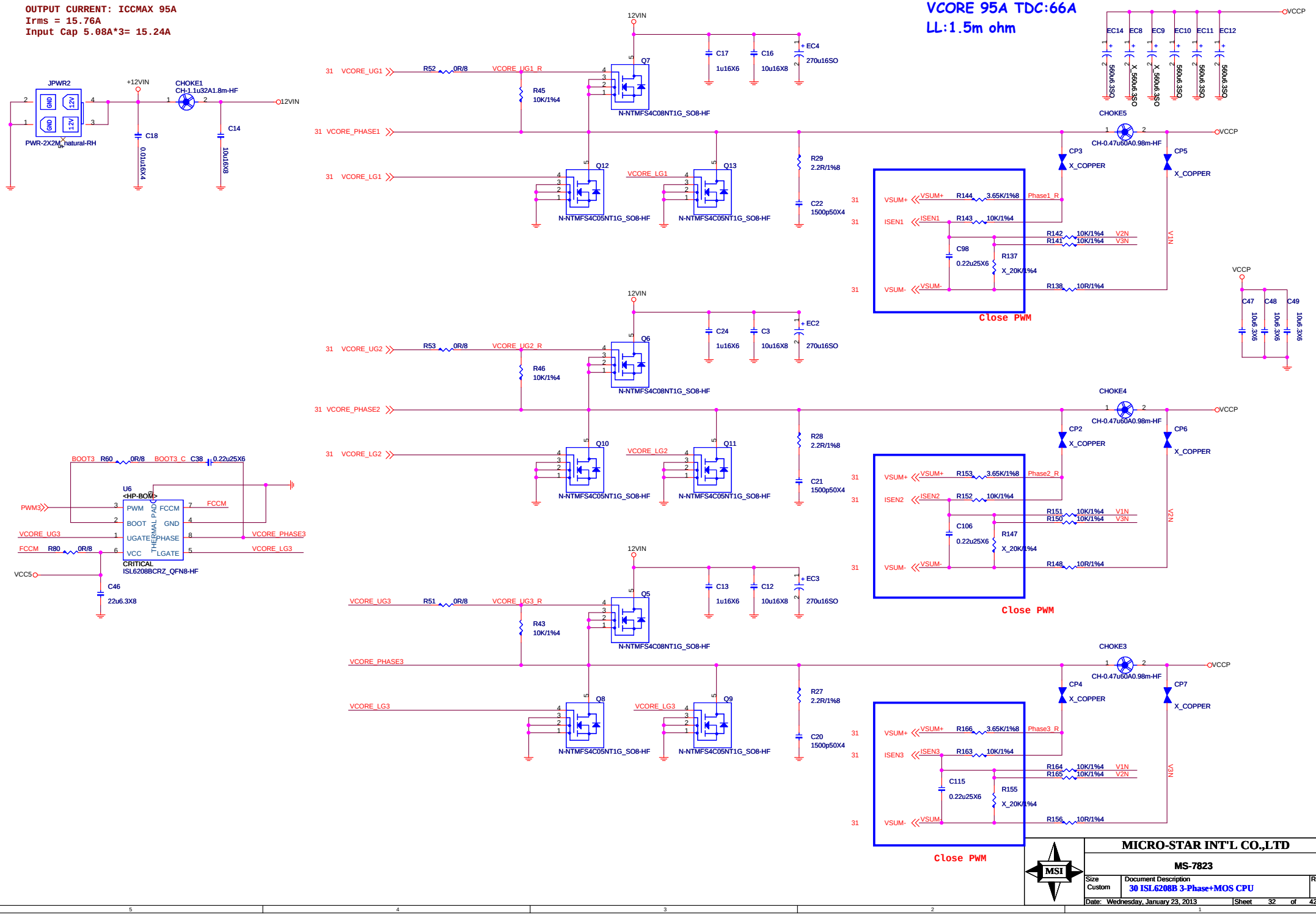
OUTPUT CURRENT: ICCMAX 95A
Irms = 15.76A
Input Cap 5.08A*3= 15.24A

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



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Custom	30 ISL6208B 3-Phase+MOS CPU	10

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DDR Power:1.5V

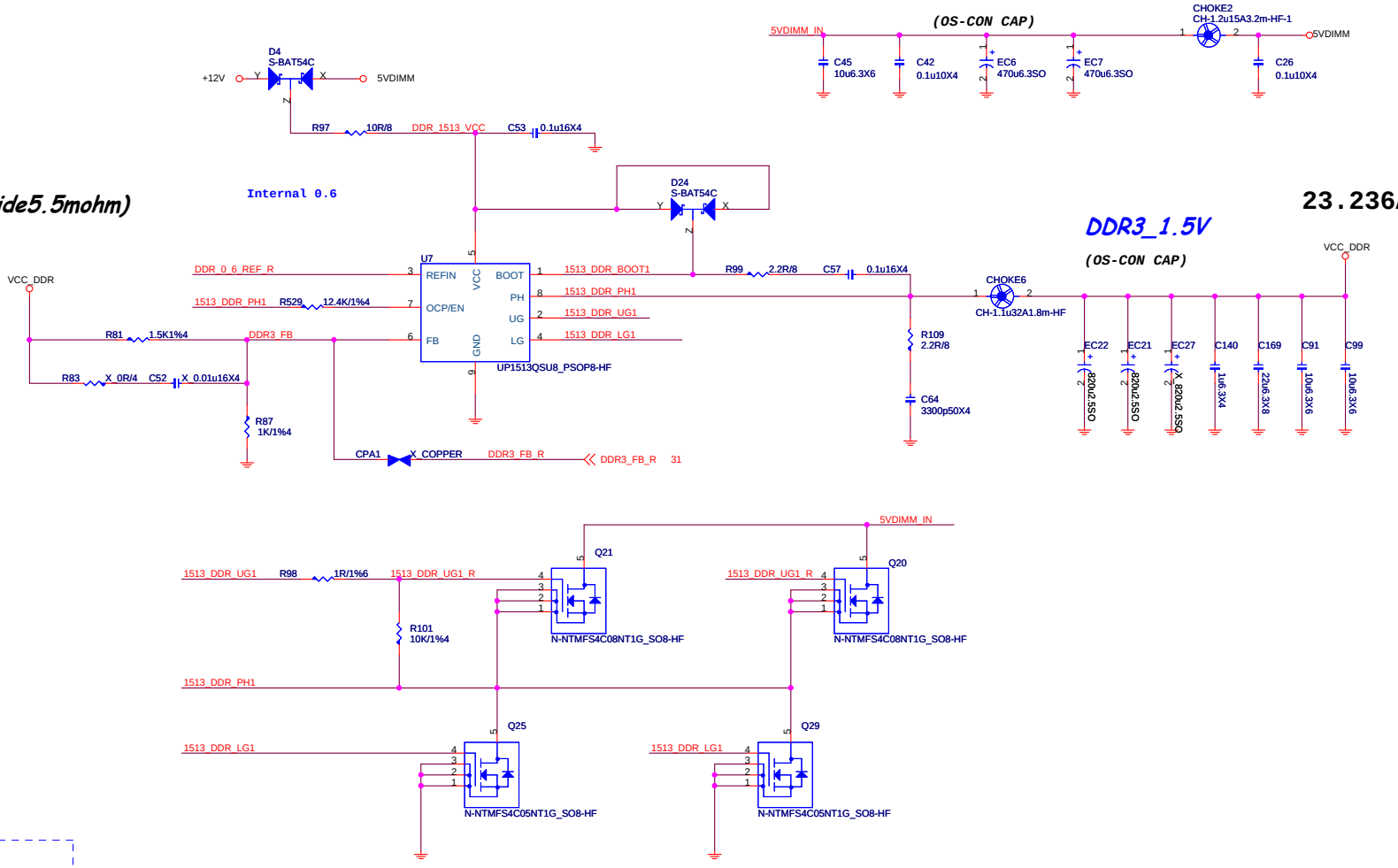
DDR3_1.5V 4.2A+12A+1.115A+5.921A=23.236A

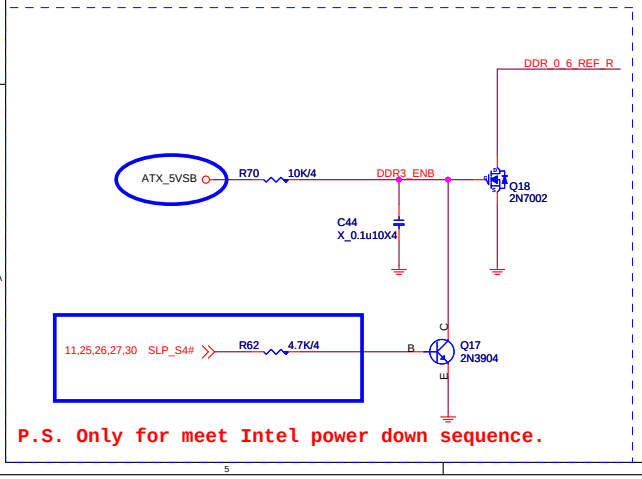
4.2A FOR CPU
12A FOR 4DIMM
1.115A FOR VTT_DDR
5.921A FOR PCH

*OCP 23.236*1.5=35A*
*35A=(40uA*Rocs(R529)-0.4V)/Rdson(Low side5.5mohm)*
R529=12.4K ohm

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

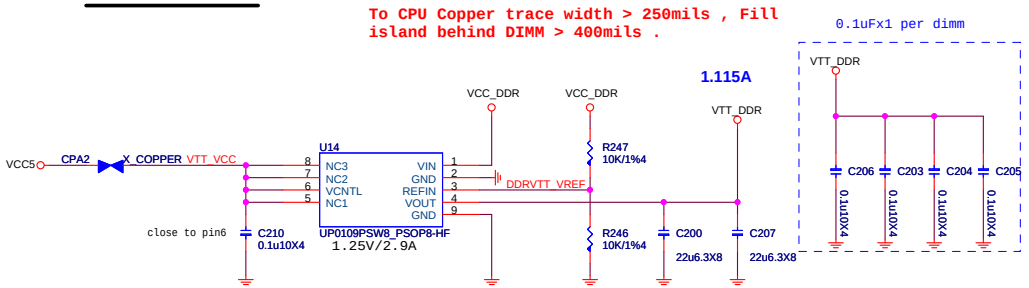
23.236A





DDR VTT Power

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



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Size: Custom	Document Description: DDR Power -UP1513 1-Phase MOS
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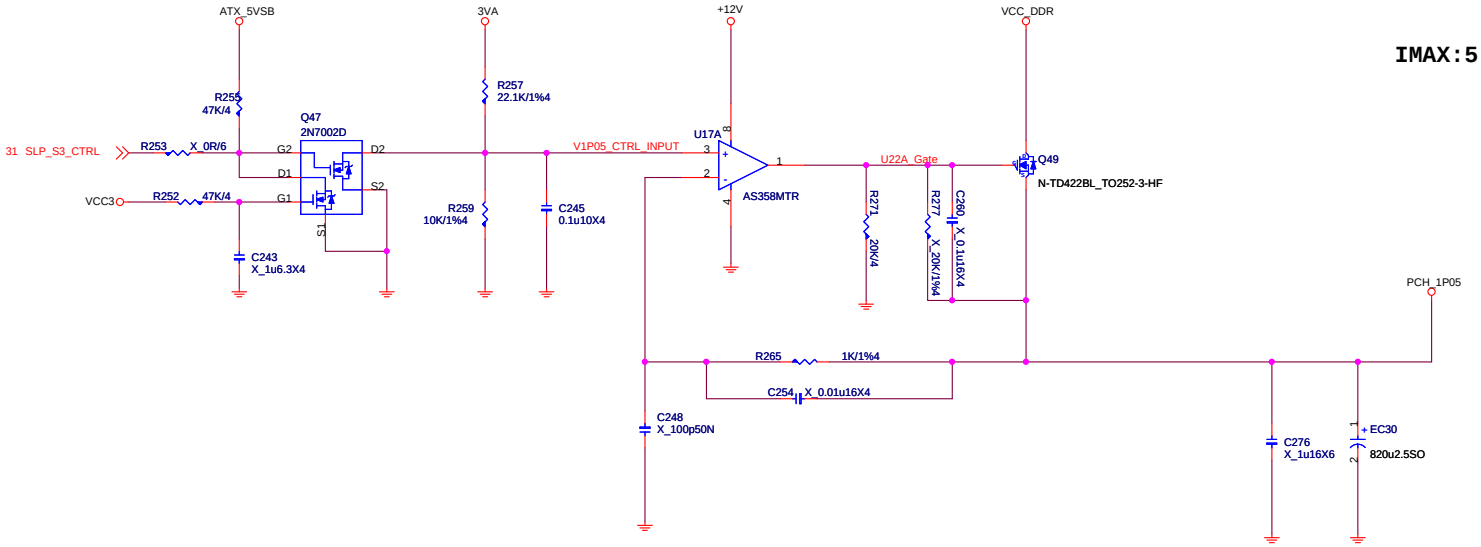
PCH Power:1.05V

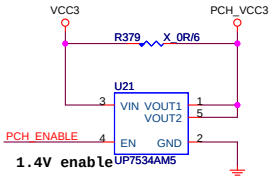
PCH Core 5.921A



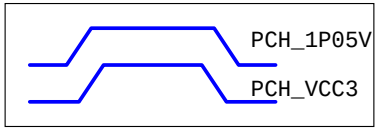
IMAX:5.921A

PCH Power:3.3V

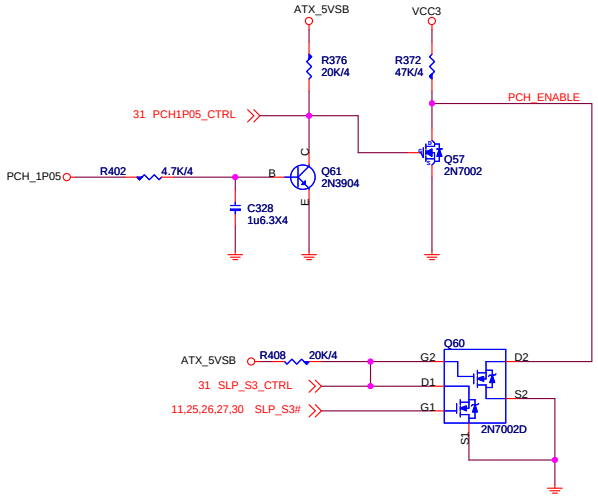
0.133A



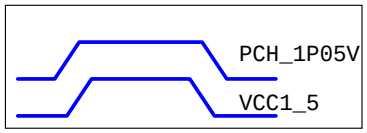
VCC1_5_CTRL_INPUT:
0:1P05V low or S3 low
1:1P05V HIGH and S3 HIGH



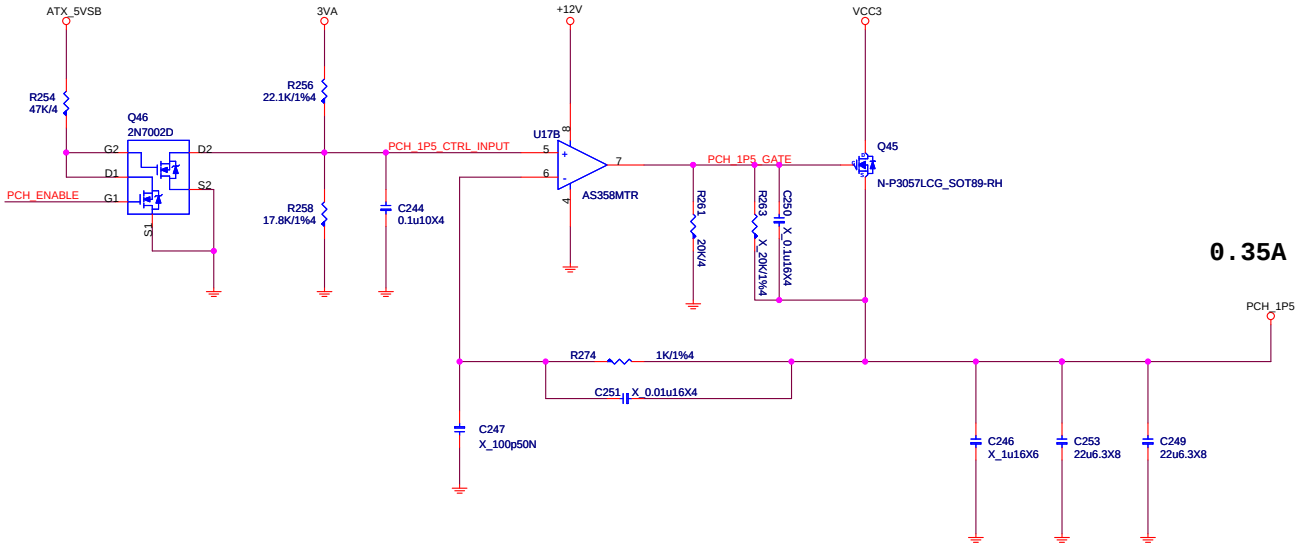
Waitting PCH_1P05 Ready



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



PCH Power:1.5V



0.35A

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Size: Custom	Document Description: PCH Power - uP1513 1-Phase MOS	Rev: 10
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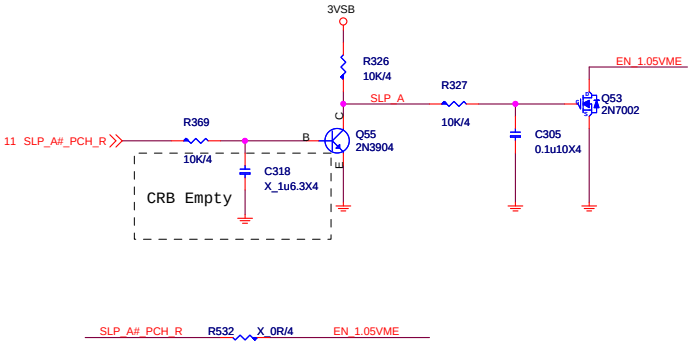
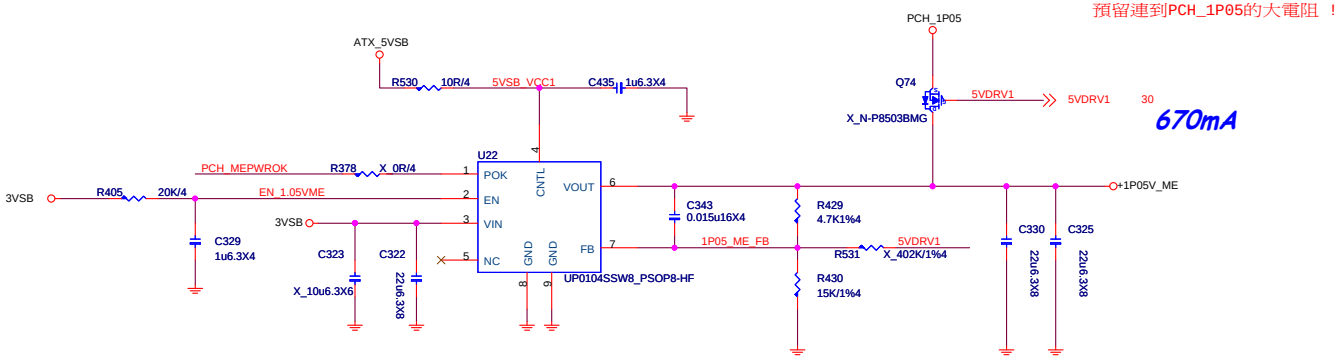
SLP_A

ME Power Control

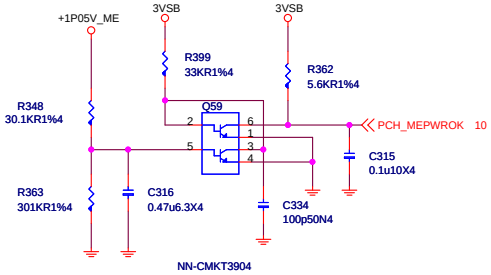


+1.05V_ME(VCCIO_ME)

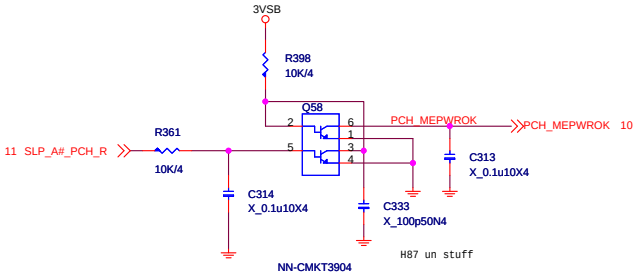
預留連到PCH_1P05的大電阻 ！



PCH_MEPWROK

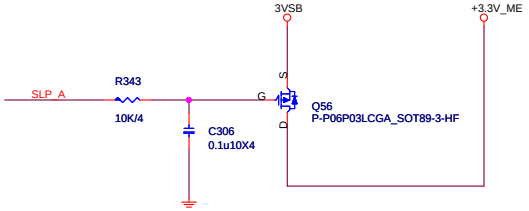


VccASW active to APWROK high 1ms



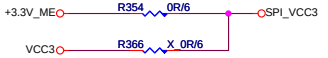
APWROK falling to VccASW falling 40ns

+3.3V_ME



For INTEL ME BUG

Z87->Stuff R366
H87->Stuff R354



MICRO-STAR INT'L CO.,LTD

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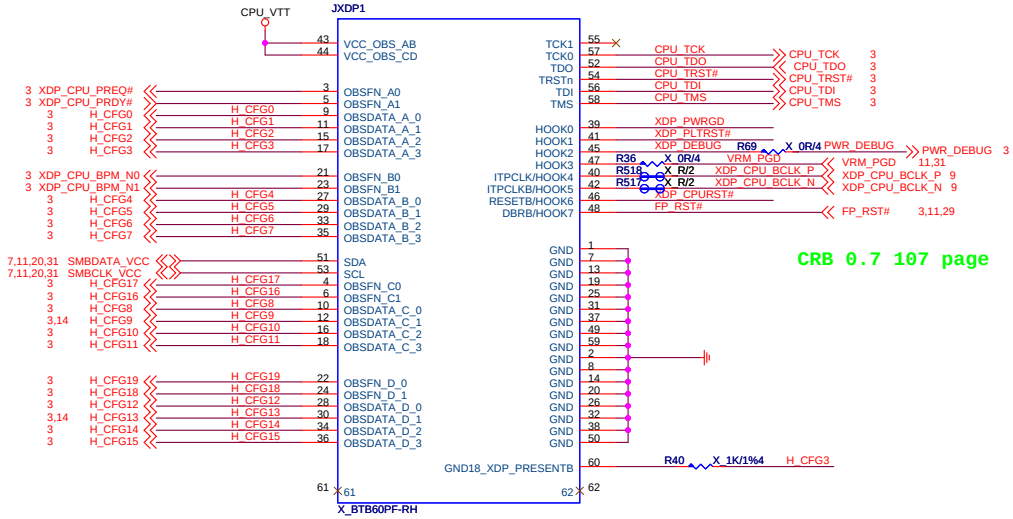
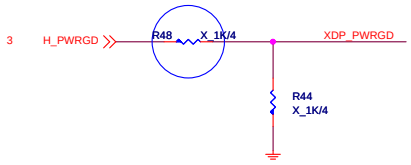
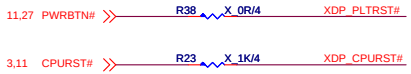
Reserve debug port 5020



CRB 0.7 107 page

mow15





PLACE NEAR XDP CONNECTOR

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MS-7823		
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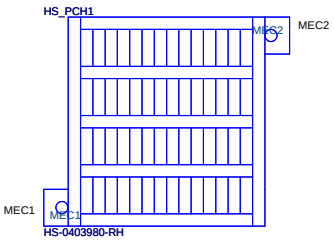
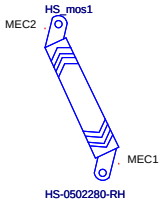
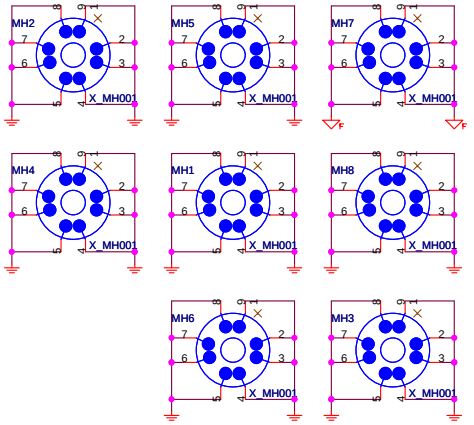
HEATSINK





Mounting Holes



PCB1

7823_10

THX_LA2 — Label THX — THX LABEL

THX Virtual Part Number

HDMI_RLA1 — Real Label — HDMI — X_HDMI_RLA

LABEL2 — MKT — X_BUY

BAT1_X1 — BAT-BCR2032P-RH

CPU_H1 — CPU 鐵座 — CPU_H1

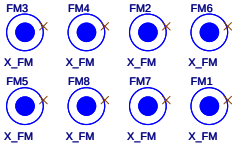
LA3 — AMI_BIOS LABLE — BIOS_LABLE

HDMI_LA1 — Label HDMI — HDMI LABEL

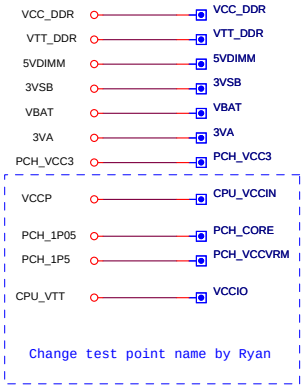
PK0-0782310-G37,精成,23,寶安恩斯邁廠(MSIS)
PK0-0782310-G37,精成,27,寶安恩斯邁廠(MSIS)
PK0-0782310-E48,競華,23,寶安恩斯邁廠(MSIS)
PK0-0782310-E48,競華,27,寶安恩斯邁廠(MSIS)

Simulation

Optical Fiducial Marks-120



Test point



Label OPT.

LA2 — Label 681-7823-XXX — MKT-LABEL — **H87**

LA10 — Label 681-7823-XXX — MKT-LABEL — **Z87**

LA11 — Label 681-7823-XXX — MKT-LABEL — **H87-MCJ**

LA12 — Label 681-7823-XXX — MKT-LABEL — **B85**

Chip OPT.

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

U101 — LPT Z87 — Lynx PointB85 — **B85**

MCJ OPT.

DP — Displayport Connector — DISPO20PM_BLACK-HF-2

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

Z87 SPI OPT.

SPI10 — SPI 8M — W25Q64FVSSIQ-HF

D1000 — MOS — 2N7002

MS-7823-1.0 主BOM爲H87

OPT	Configure	BOM	Function	GPIO Setting(GP10/GP11/GP12)
	H87M-G43		MS-7823 10 H87MA-G43 4*DDR3+2*PCI-Ex16,2*PCI-Ex1 +DVI+D-Sub+HDMI+6*SATAIII+10*USB2+4*USB3+ H/D8Ch Audio+Gb LAN,All Solid CAP,EuP,RoHS	0,0,0
A	Z87M-G43			0,0,0
B	H87M-S01(MCJ)			1,0,0
C	B85M-G43			0,0,0

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