MS-7851 ITX

Ver: 2.2

Intel Sharkbay plamform H81

CPU:

INTEL-Haswell LGA1150

System Chipset:

INTEL-LYNX

Memory:

DDRIII (1333/1666MHz) * 2 (Dual Channel)

PWM:

VRD12 - ISL95812

OnBoard Chipset:

HD Audio Codec:RTL887

LAN-realtek8111G

SIO:NUVOTON 5533D

SPI ROM: 64 MB

Other:

DVI*1/HDMI*1
VGA*1
SATA2*2
SATA3*2

FRONT USB2.0 *4
REAL USB2.0 *2
REAL USB3.0 *2
FRONT USB3.0 *2

Expansion Slots:

PCI Express (X16) Slot * 1

MICRO-STAR INT'L CO.,LTD

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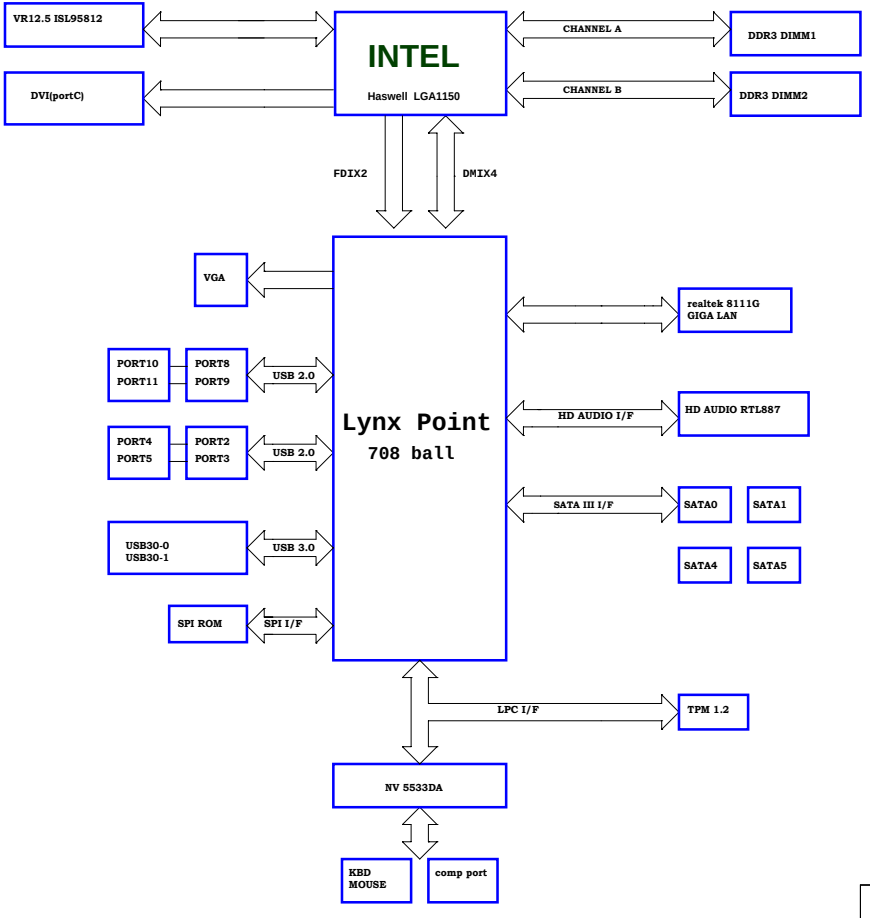
MS-7851-2.2 Block Diagram



MSI	MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: Block Diagram	Rev: 22
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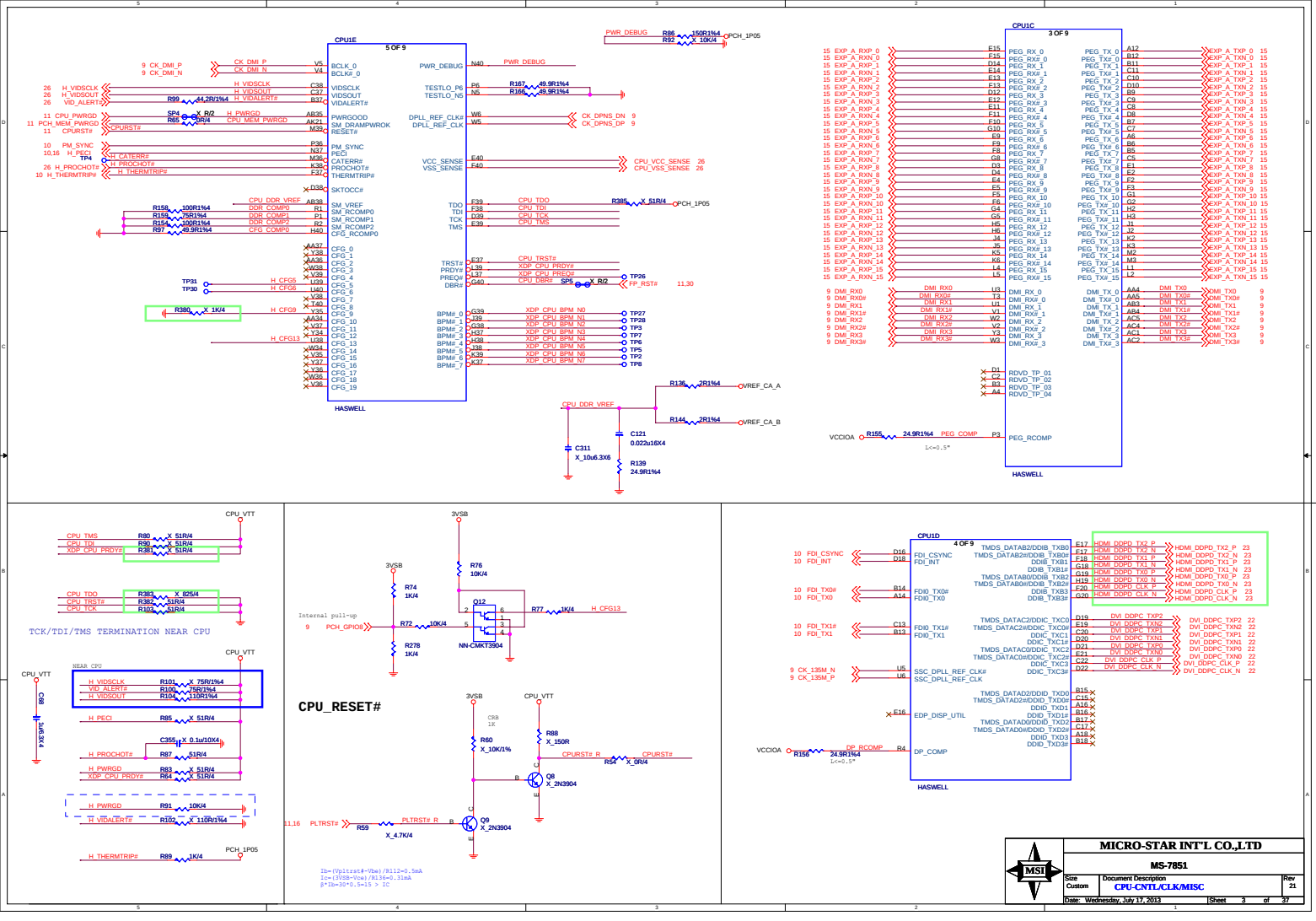
CPU1E
5 OF 9
HASWELL
CPU1C
3 OF 9
CPU1D
4 OF 9
TCK/TDI/TMS TERMINATION NEAR CPU
CPU_RESET#
MICRO-STAR INT'L CO.,LTD
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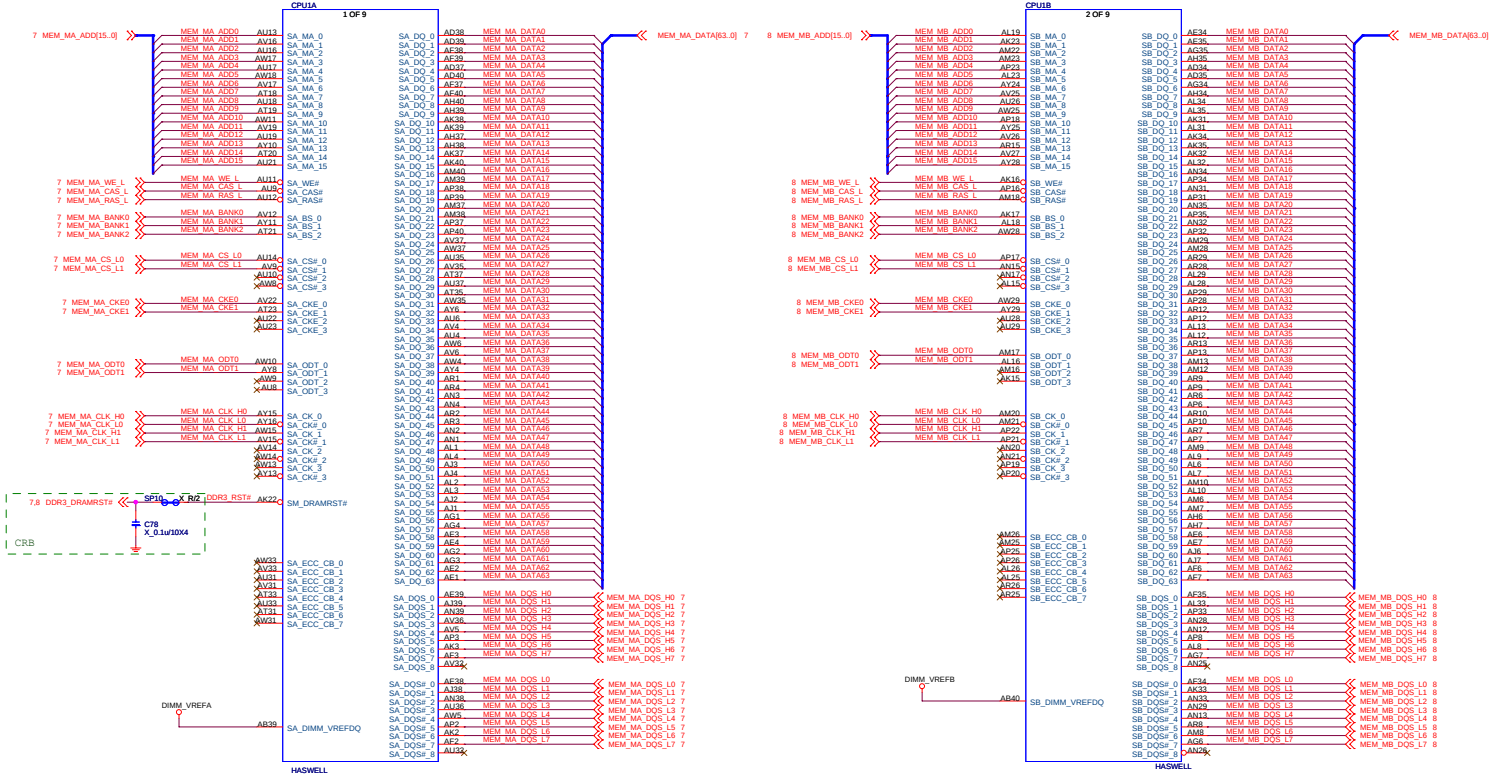

MICRO-STAR INT'L CO.,LTD		
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Size: Custom	Document Description: CPU-Memory	Rev: 21
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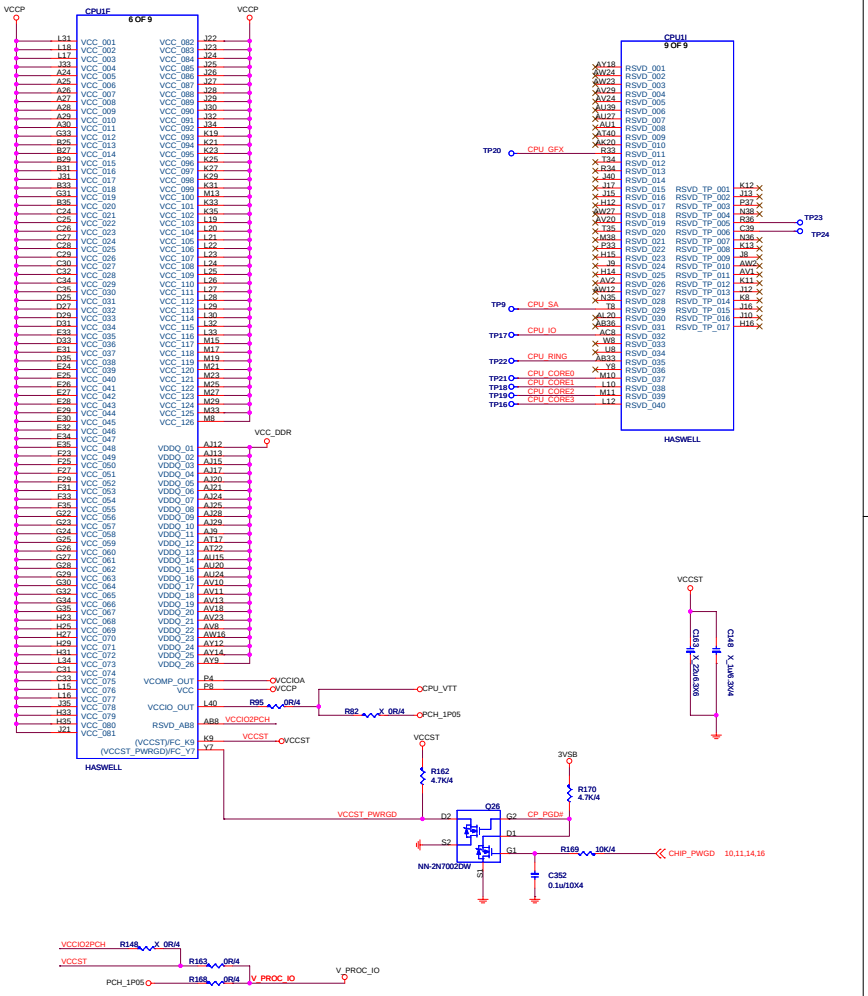
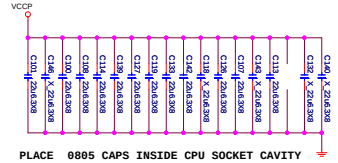
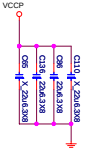


+CPU_VCCP-Decoupling

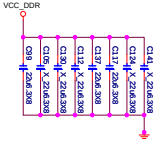


PLACE 0805 CAPS INSIDE CPU SOCKET CAVITY

PLACE 0805 CAPS Near CPU SOCKET edge



+1.5V_DDR3-Decoupling



CPU SOCKET CAVITY CAPS

MICRO-STAR INT'L CO.,LTD		
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Size: Custom	Document Description: CPU-Power	Rev: 21
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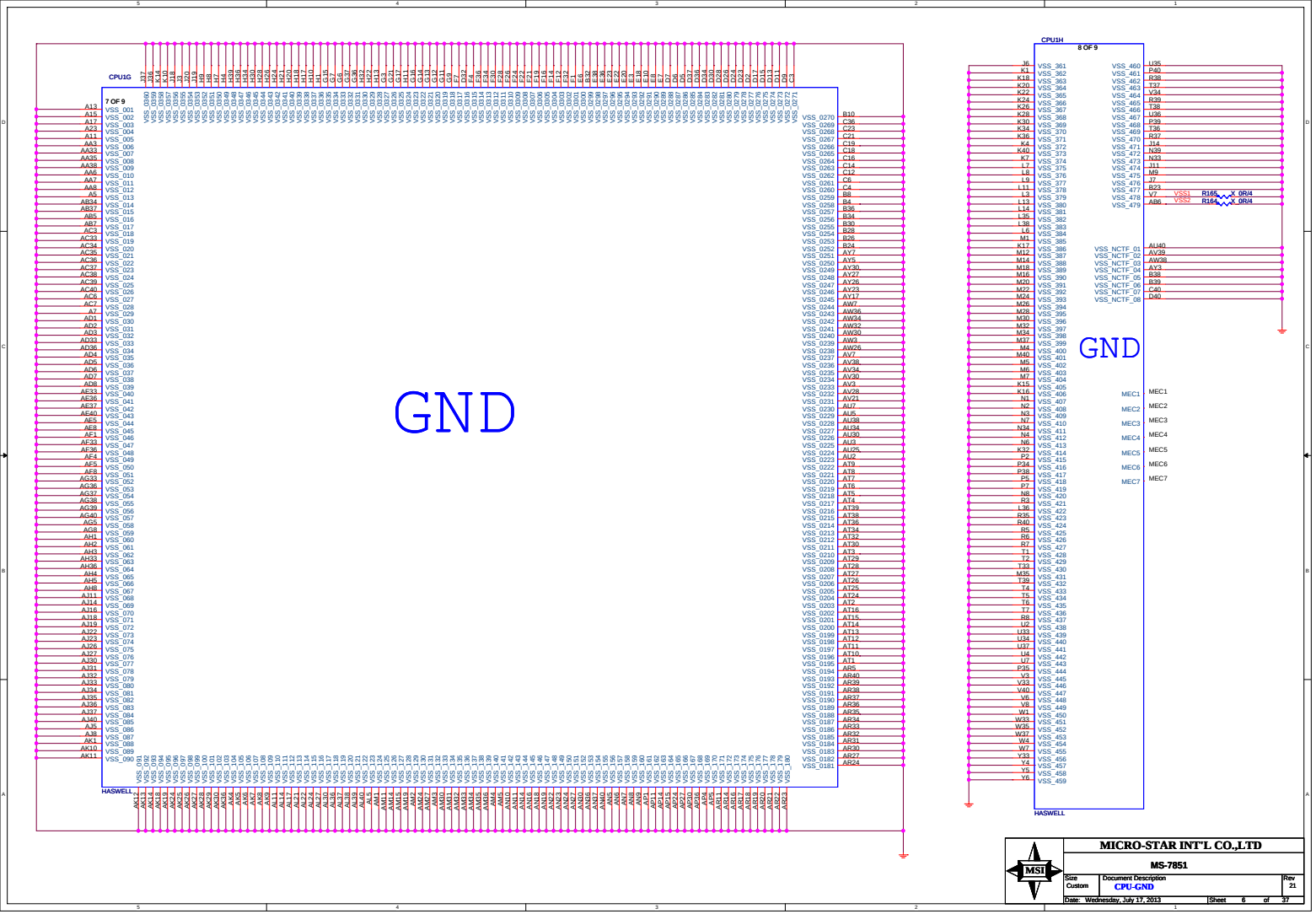

MICRO-STAR INT'L CO.,LTD		
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Size: Custom	Document Description: CPU-GND	Rev: 21
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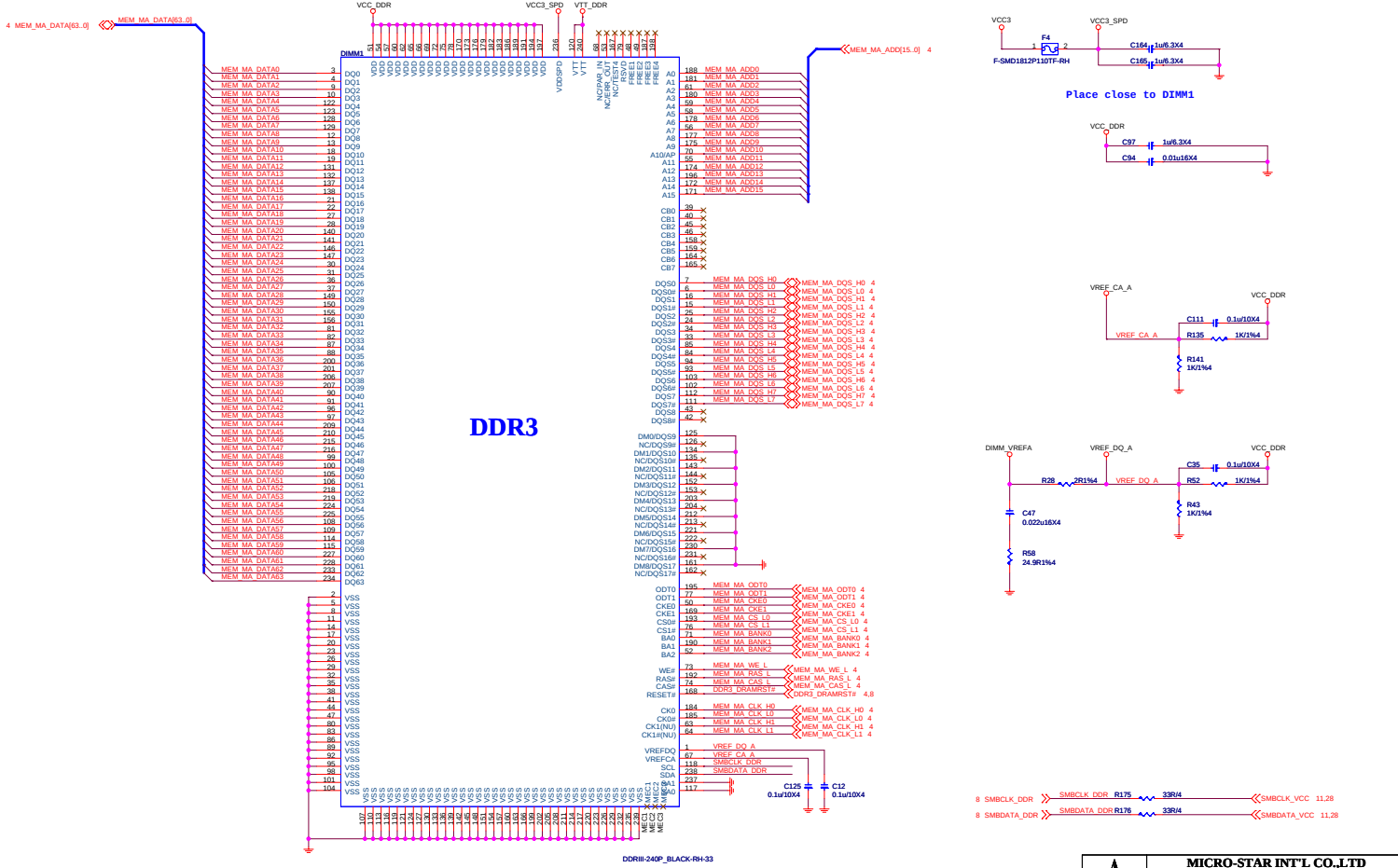

MICRO-STAR INT'L CO.,LTD	
MS-7851	
Size: Custom	Document Description: DDR3 Chanel-A DIMM1/2
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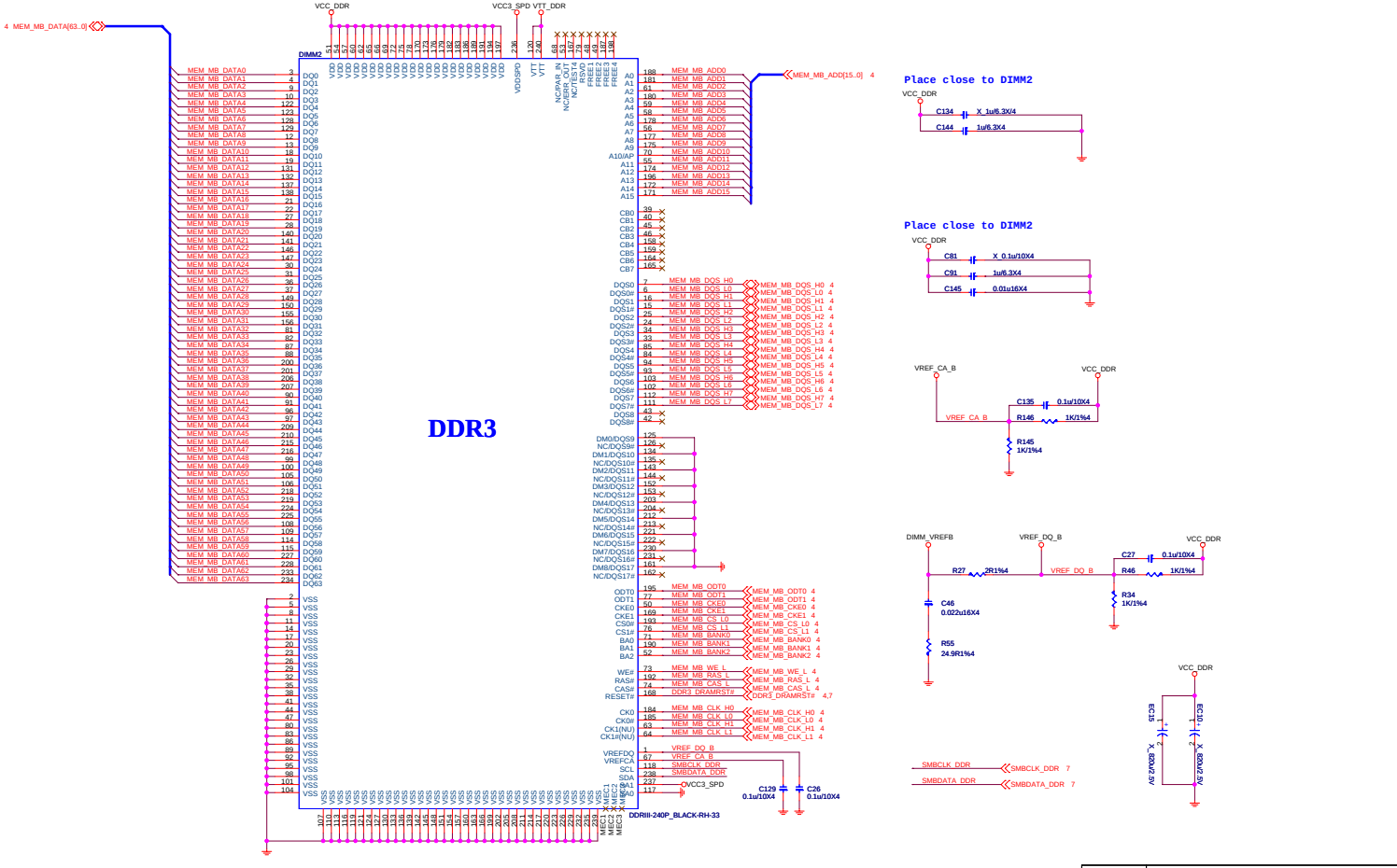
DDRIII DIMM_B0



MICRO-STAR INT'L CO.,LTD		
MS-7851		
Size: Custom	Document Description: DDR3 Chanel-B DIMM3/4	Rev: 21
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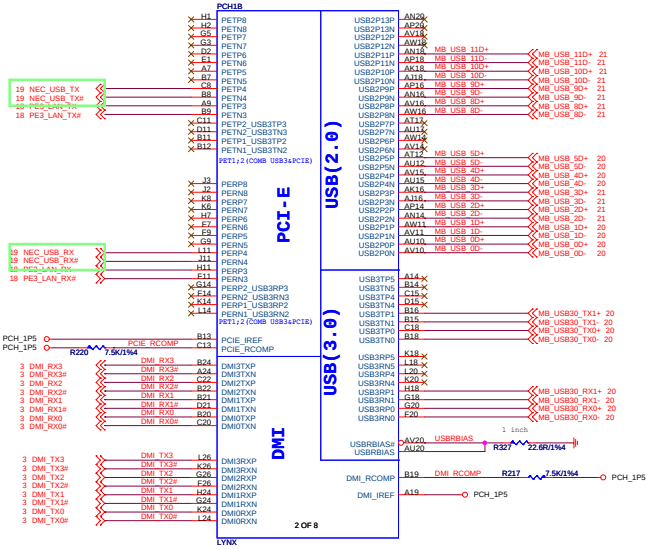
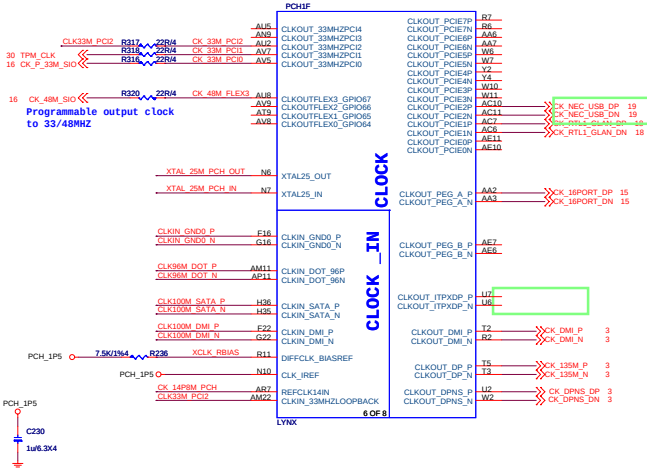
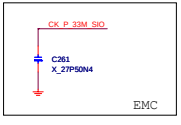
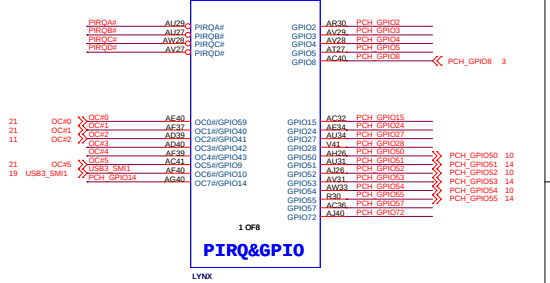
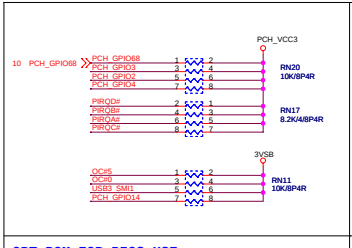
USB 2.0 ports 6,7,12 and 13 are disabled on 10 port SKUs.
Only USB 3.0 ports 1 and 2 are enabled.
pcie port7,8 NA

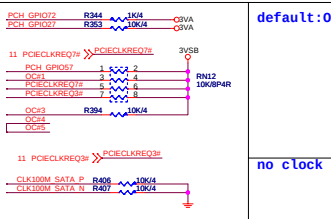


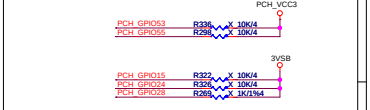


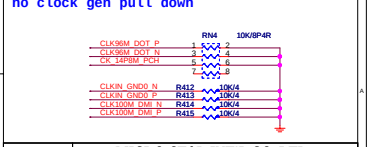


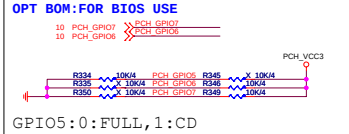


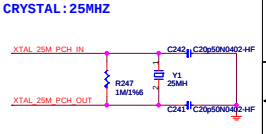












GPIO5:0:FULL,1:CD

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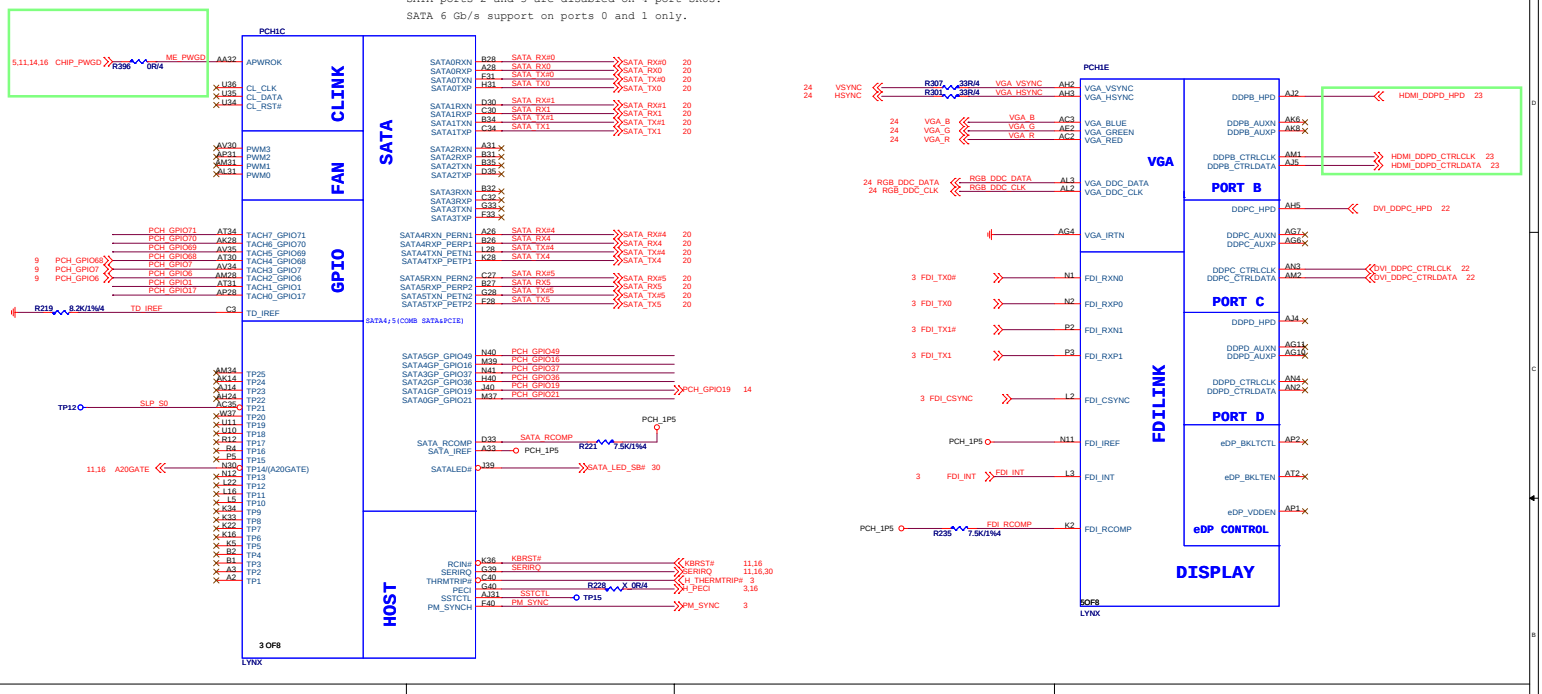
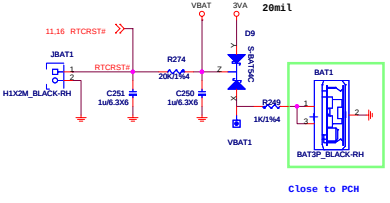
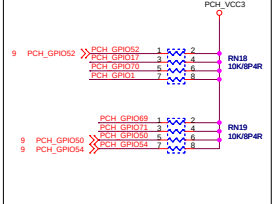
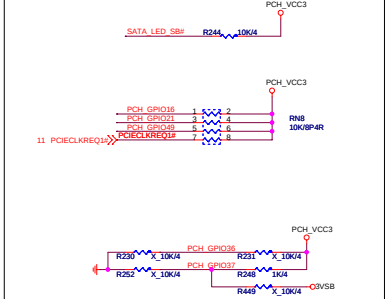
SATA ports 2 and 3 are disabled on 4 port SKUs.
SATA 6 Gb/s support on ports 0 and 1 only.



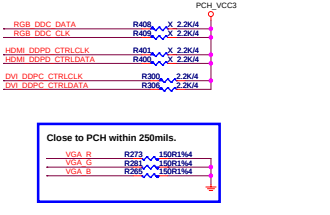
RTC and CLR_CMOS







Enable VGA(CTRLCLK/DATA Pull High)



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Size: Custom	Document Description: PPT SATA/HOST/FAN/GPIO/VGA	Rev: 21
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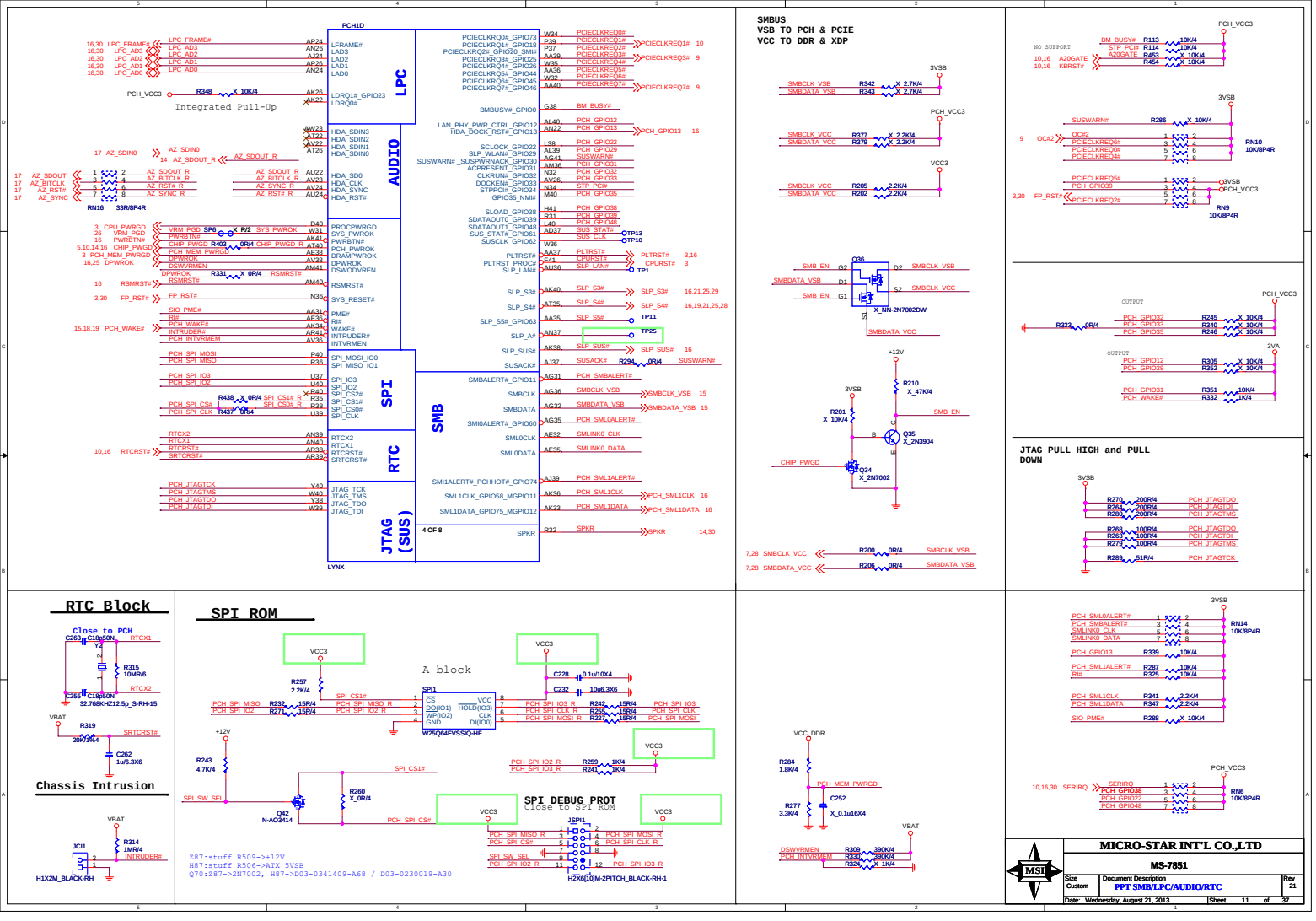
PCH1D
LPC
AUDIO
SPI
SMB
RTC
JTAG (SUS)
LYNX
LPC_FRAME#
LPC_AD3
LPC_AD2
LPC_AD1
LPC_AD0
LDRQ1#_GPIO23
LDRQ0#
Integrated Pull-Up
HDA_SDIN3
HDA_SDIN2
HDA_SDIN1
HDA_SDIN0
HDA_SD0
HDA_CLK
HDA_SYNC
HDA_RST#
PROCPWRGD
SYS_PWROK
PWRBTN#
CHIP_PWGD
PCH_MEM_PWRGD
DRAMPWROK
DPWROK
DSWVRMEN
DSWODVREN
RSMRST#
SYS_RESET#
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
RDA_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#
CPURST#
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
4 OF 8
PCIECLKREQ0#
PCIECLKREQ1#
PCIECLKREQ2#
PCIECLKREQ3#
PCIECLKREQ4#
PCIECLKREQ5#
PCIECLKREQ6#
PCIECLKREQ7#
BM_BUSY#
PCH_GPIO13
PCH_GPIO22
PCH_GPIO31
PCH_GPIO35
SUS_STAT#
SUS_CLK
SUSWARN#
PCH_GPIO32
PCH_GPIO33
SMBCLK_VSB
SMBDATA_VSB
PCH_SMBALERT#
PCH_SML0ALERT#
SMLINK0_CLK
SMLINK0_DATA
PCH_SML1ALERT#
PCH_SML1CLK
PCH_SML1DATA
SPKR
SMBUS
VSB TO PCH & PCIE
VCC TO DDR & XDP
3VSB
PCH_VCC3
VCC3
SMBCLK_VSB
SMBDATA_VSB
SMBCLK_VCC
SMBDATA_VCC
Q36
X_NN-2N7002DW
SMBCLK_VSB
SMBDATA_VSB
+12V
Q35
X_2N3904
Q34
X_2N7002
CHIP_PWGD
SMB_EN
7,28 SMBCLK_VCC
7,28 SMBDATA_VCC
SMBCLK_VSB
SMBDATA_VSB
RN16 33R/8P4R
RN10 10K/8P4R
RN9 10K/8P4R
RN14 10K/8P4R
RN6 10K/8P4R
JTAG PULL HIGH and PULL DOWN
RTC Block
Close to PCH
C263 C18@50N
Y2
32.768KHZ12.5p_S-RH-15
R315 10MR/6
C265 C18@50N
C262 1u/6.3X6
R319 20K/1%4
Chassis Intrusion
JCI1
H1X2M_BLACK-RH
R314 1M/R4
INTRUDER#
SPI ROM
A block
SPI1
W25Q64FVSSIQ-HF
R257 2.2K/4
R243 4.7K/4
R260 X_0R/4
Q42 N-AO3414
SPI_SW_SEL
SPI_CS1#
SPI_CS#
SPI DEBUG PROT
Close to SPI ROM
JSPI1
H2X6.10)M-2PITCH_BLACK-RH-1
Z87:stuff R509->+12V
H87:stuff R506->ATX_5VSB
Q70:Z87->2N7002, H87->D03-0341409-A68 / D03-0230019-A30
VCC_DDR
R284 1.8K/4
R277 3.3K/4
C252 X_0.1u16X4
DSWVRMEN
PCH_INTVRMEN
R309 390K/4
R330 390K/4
R324 X_1K/4
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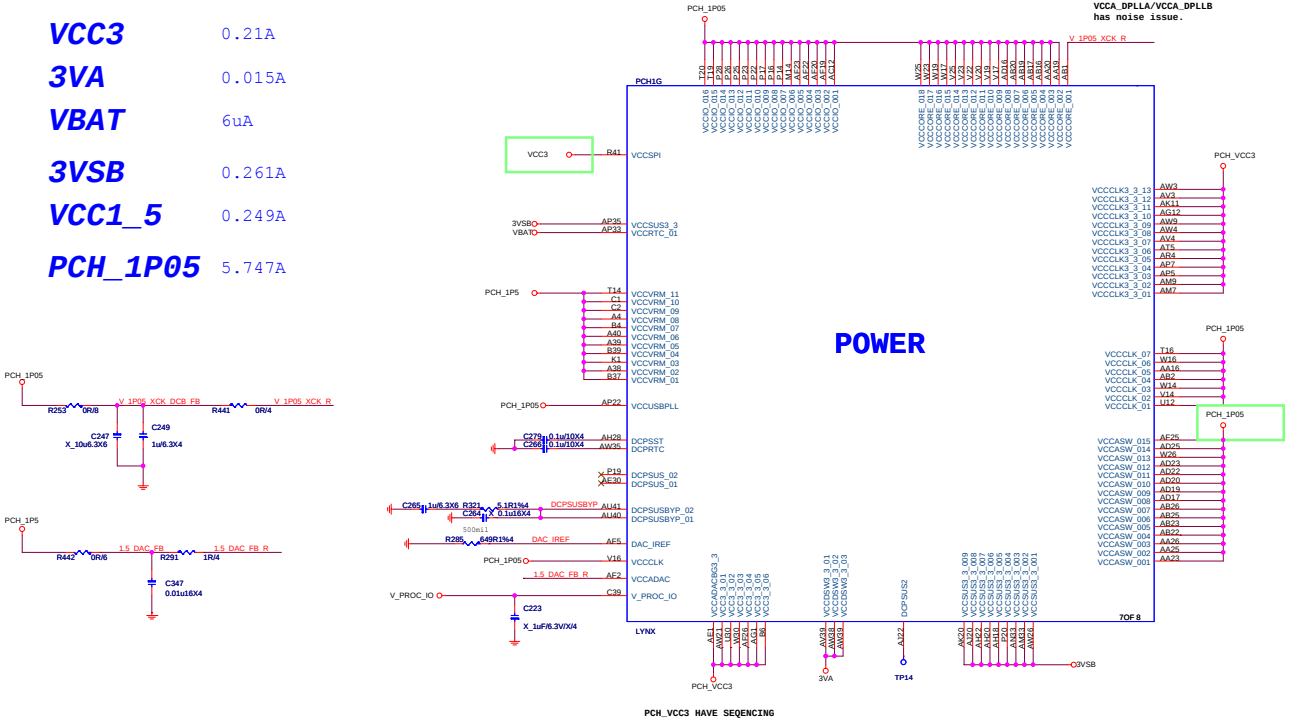
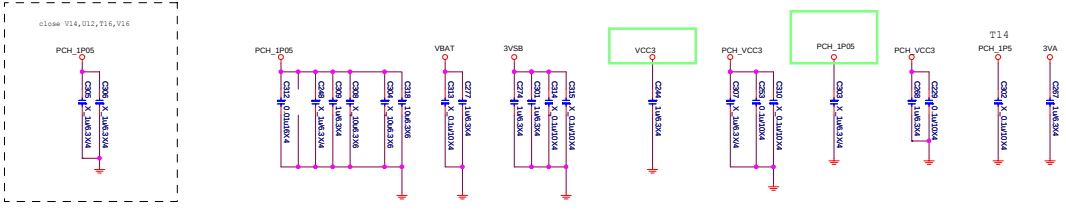
VCC3	0.21A
3VA	0.015A
VBAT	6uA
3VSB	0.261A
VCC1_5	0.249A
PCH_1P05	5.747A

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



PCH_VCC3 HAVE SEQENCING

PCH decoupling cap



MICRO-STAR INT'L CO.,LTD			
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Size: Custom	Document Description: LYNX -POWER PIN		Rev: 21
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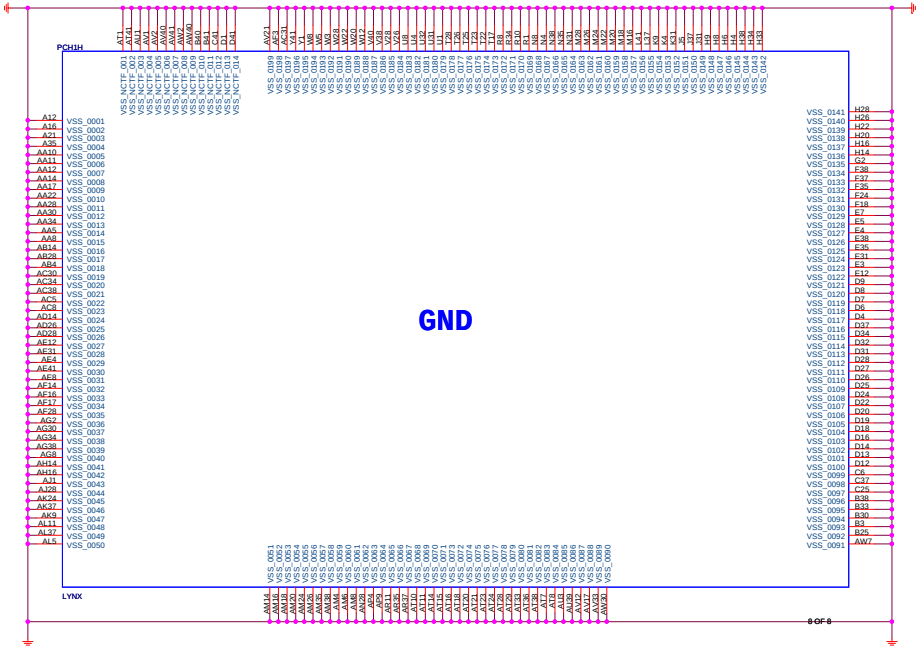

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Size: Custom	Document Description: PPT GND/NVRAM	Rev: 21
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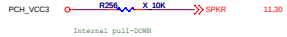
PCH Straps



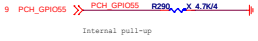
SPKR

Default Mode:

Internal weak Pull-down.

No Reboot Mode with TCO Disabled:

Connect to Vcc3_3 with 8.2k-10k Ohm weak pullup resistor.



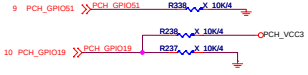
GPIO55

Default Mode:

Internal pull-up.

Top Block Swap Mode:

Connect to ground with 4.7k Ohm weak pulldown resistor.



SATA1GP/GPIO19, GPIO51

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.

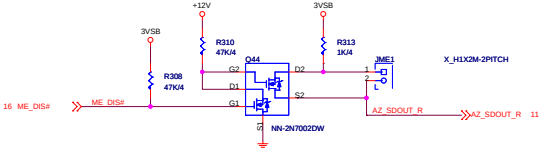
Boot from LPC:

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

GPIO53

Do not pull low.

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



HDA_SDO

Default:

Do not pull high.

Disable ME in Manufacturing Mode:

Connect to VccSusHDA with 1k Ohm pull-up resistor through a jumper.

GPIO37

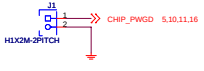
Enable TLS:

Pull up with 1k Ohm to VccSus3.3.

Default (Disable TLS):

Leave NC. Internal pull down.

For test cpu voltage



MICRO-STAR INT'L CO.,LTD		
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Size: Custom	Document Description: PPT STRAPS	Rev: 21
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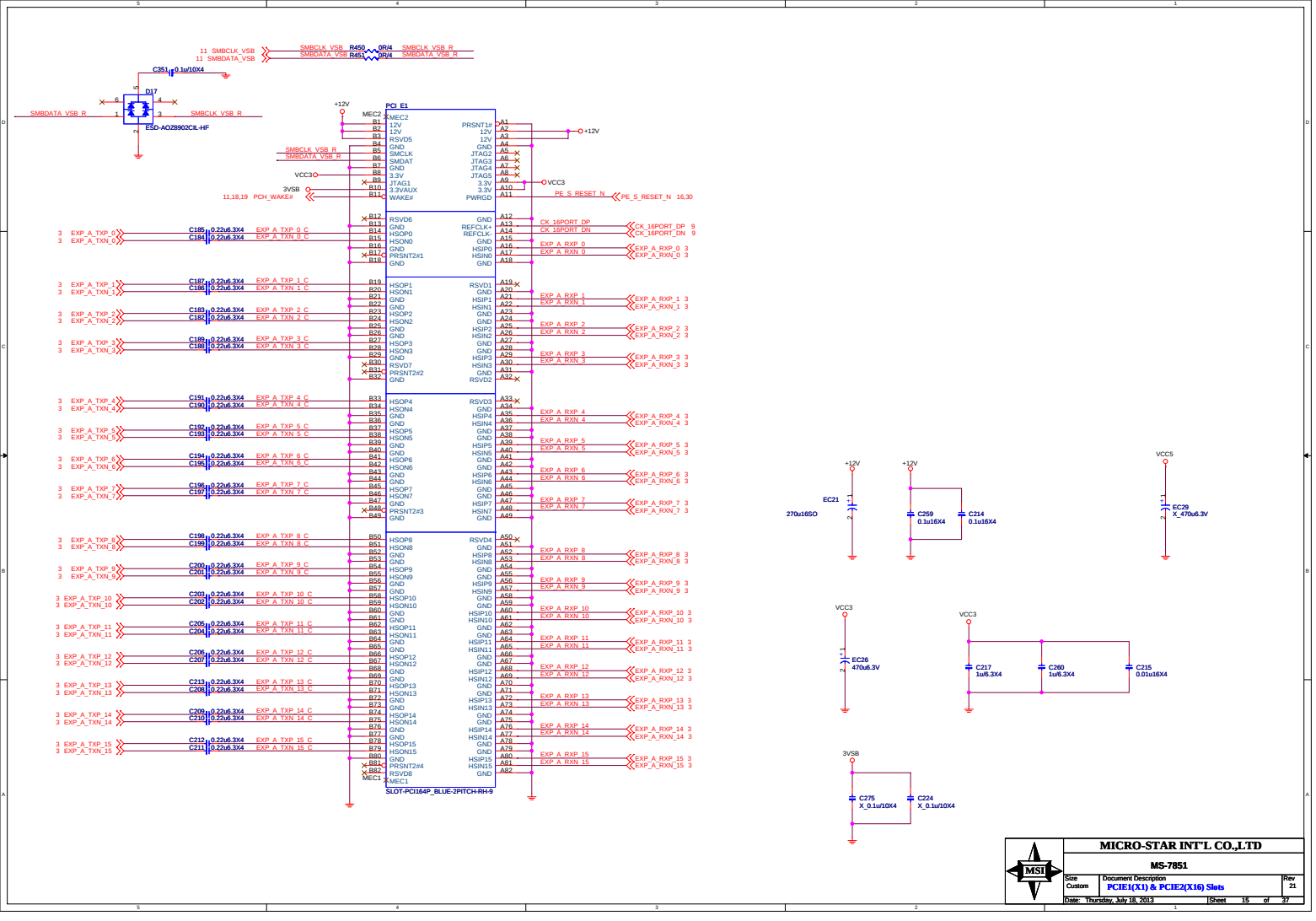

MSI	MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: PCIE1(X1) & PCIE2(X16) Slots	Rev: 21
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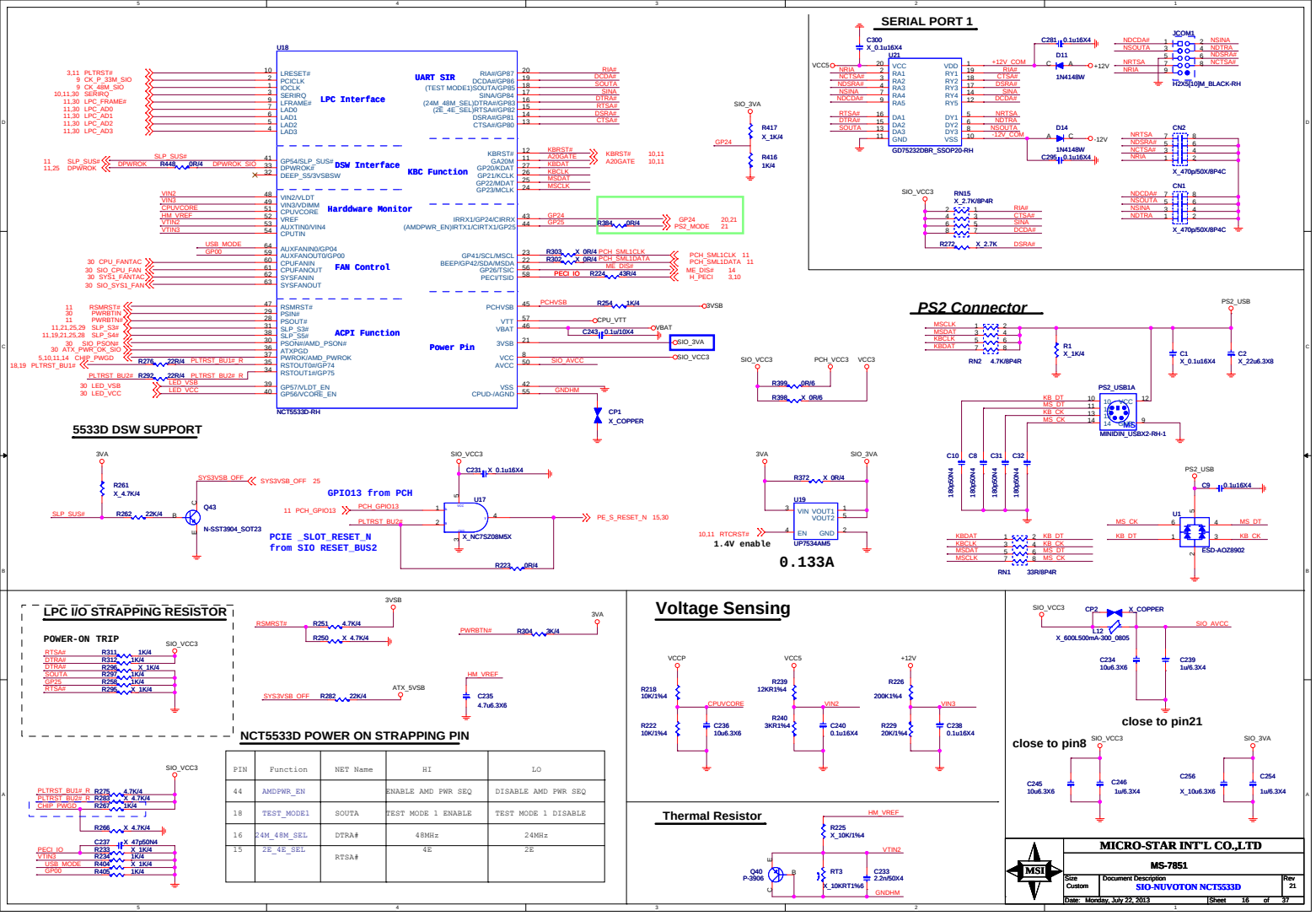
SERIAL PORT 1
U18
NCT5533D-RH
LPC Interface
DSW Interface
KBC Function
Harddware Monitor
FAN Control
ACPI Function
Power Pin
UART SIR
5533D DSW SUPPORT
GPIO13 from PCH
PCIE _SLOT_RESET_N
from SIO RESET_BUS2
PS2 Connector
MINIDIN_USBX2-RH-1
ESD-AOZ8902
1.4V enable
0.133A
LPC I/O STRAPPING RESISTOR
POWER-ON TRIP
NCT5533D POWER ON STRAPPING PIN
Voltage Sensing
Thermal Resistor
close to pin21
close to pin8
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MS-7851
SIO-NUVOTON NCT5533D
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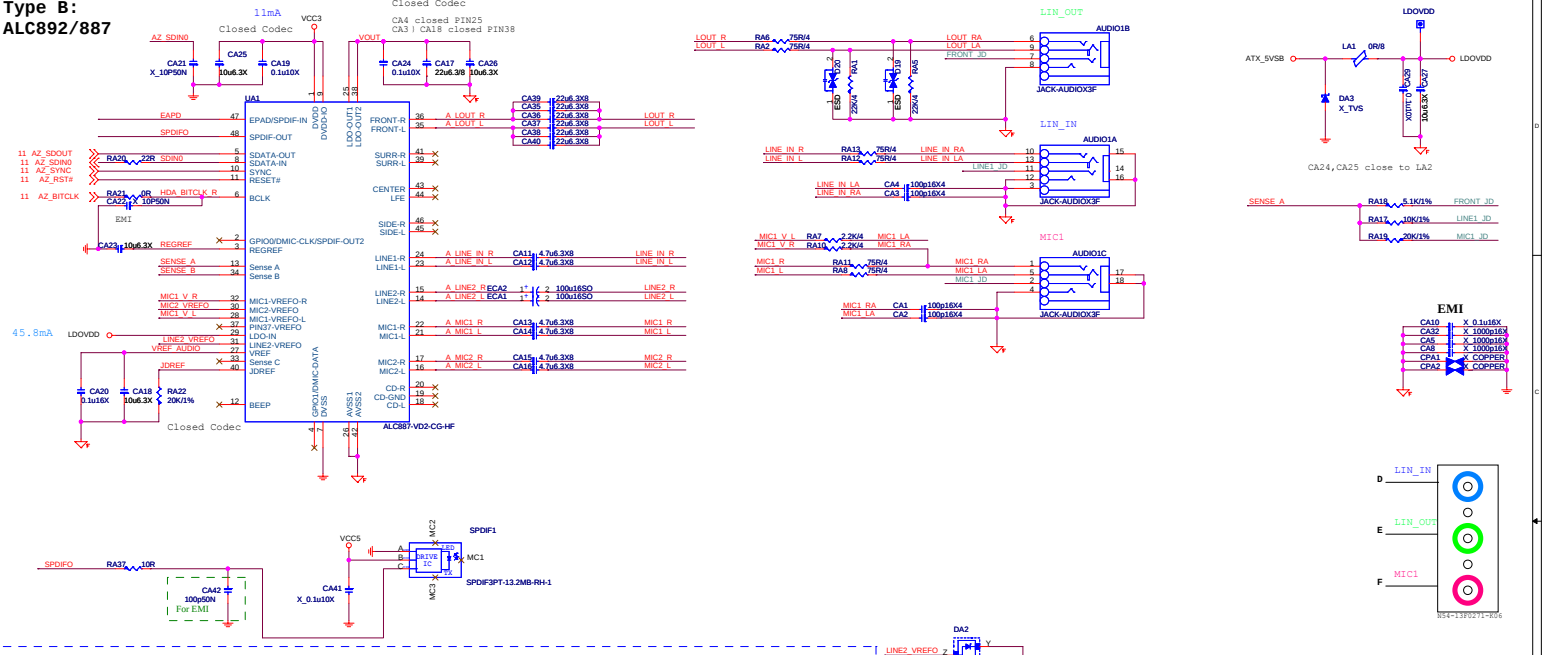
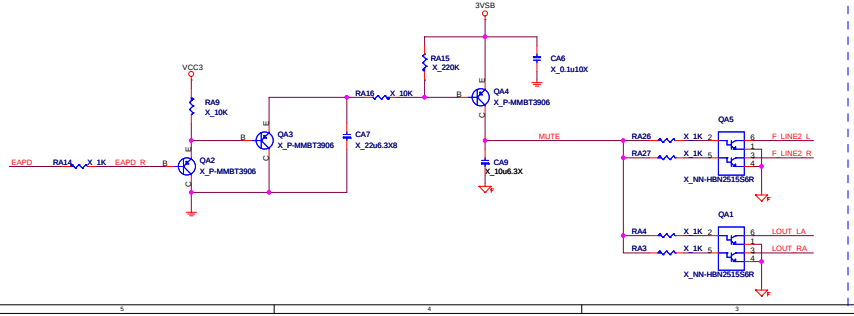
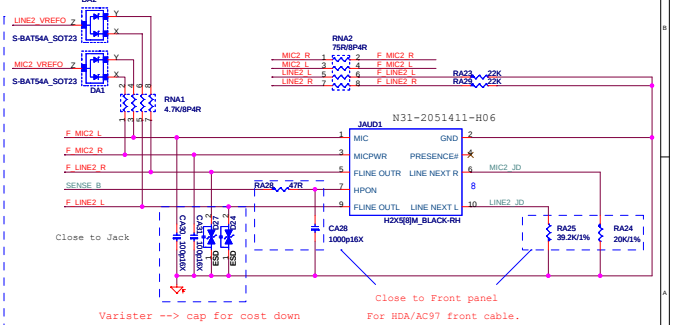
Type B:
ALC892/887



Rear Line OUT De-POP circuit

(add de-pop circuit by PM spec or customer request)





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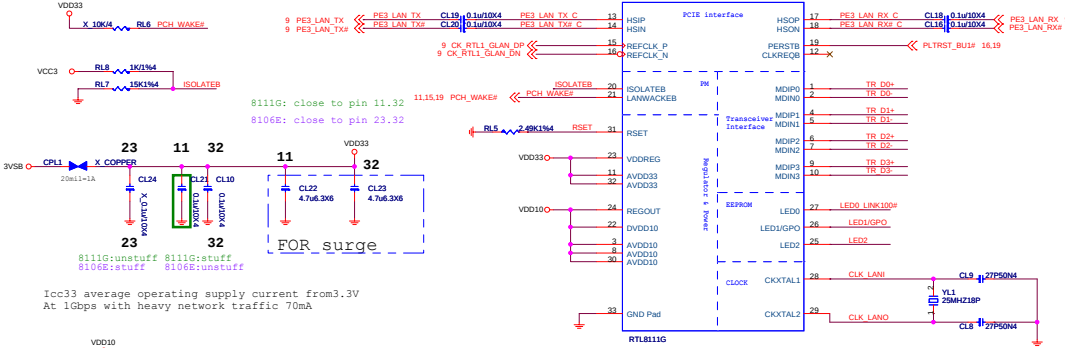
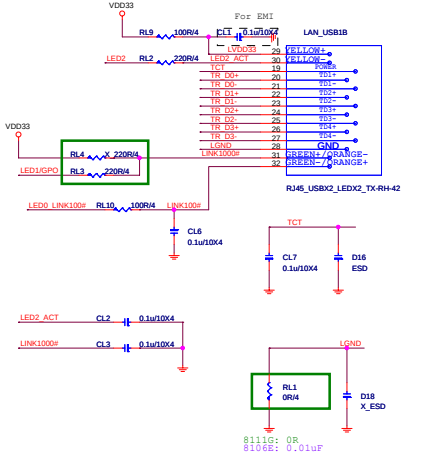
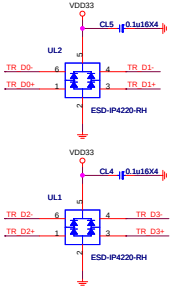
RTL8111G Giga LAN
RTL8106E 10/100M LAN



LAN Connector



Reserve ESD Protect



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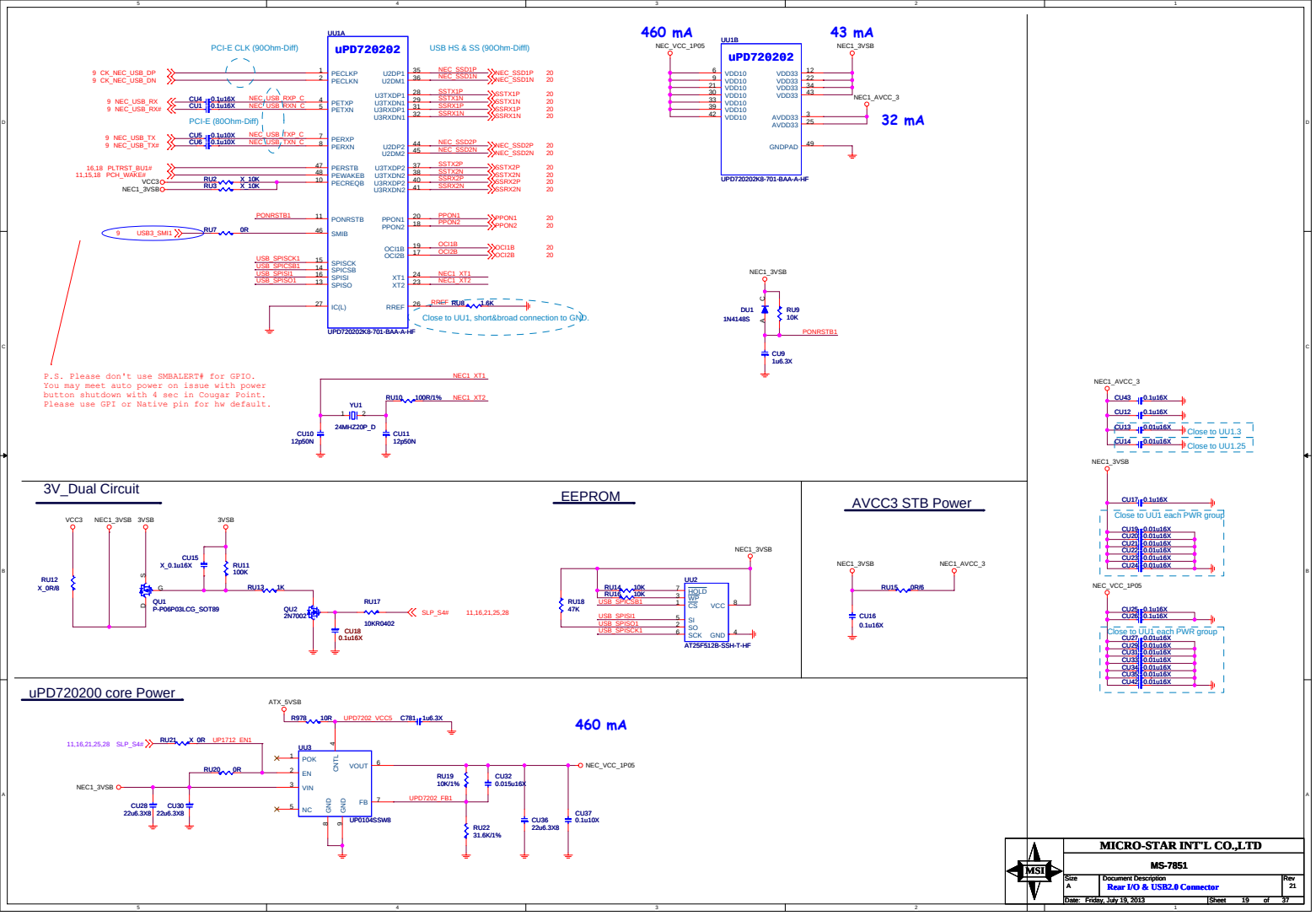

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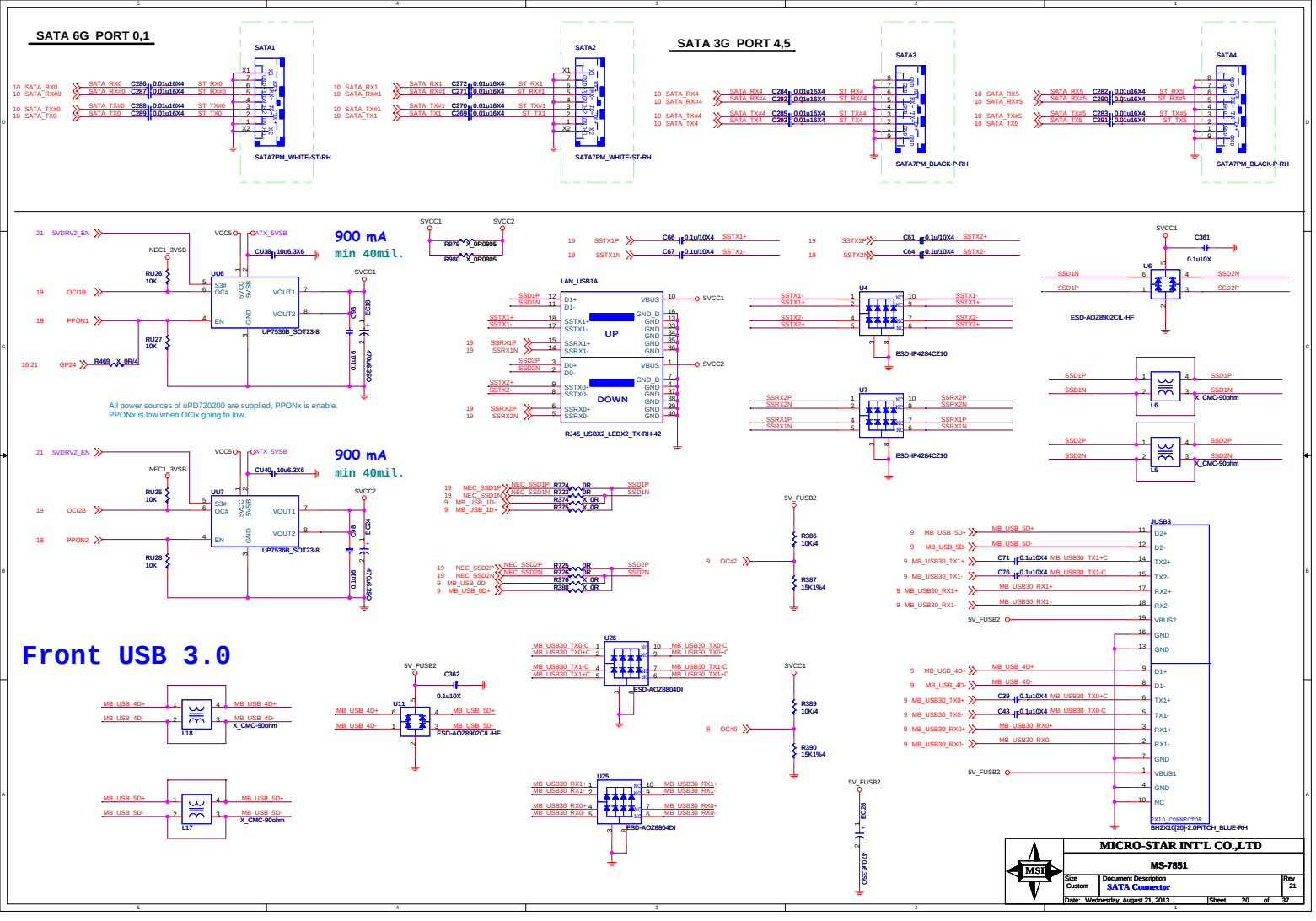
SATA 6G PORT 0,1
SATA1
SATA2
SATA7PM_WHITE-ST-RH
SATA 3G PORT 4,5
SATA3
SATA4
SATA7PM_BLACK-P-RH
900 mA
min 40mil.
All power sources of uPD720200 are supplied, PPONx is enable.
PPONx is low when OCIx going to low.
LAN_USB1A
UP
DOWN
RJ45_USBX2_LEDX2_TX-RH-42
UP7536B_SOT23-8
ESD-IP4284CZ10
ESD-AOZ8902CIL-HF
X_CMC-90ohm
ESD-AOZ8804DI
ESD-AOZ8902CIL-HF
Front USB 3.0
JUSB3
2X10_CONNECTOR
BH2X10[20]-2.0PITCH_BLUE-RH
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SATA Connector
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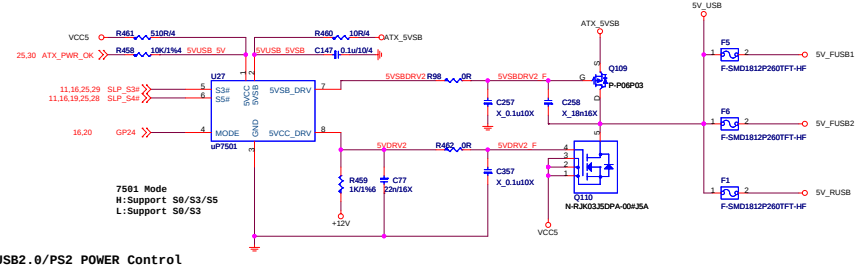
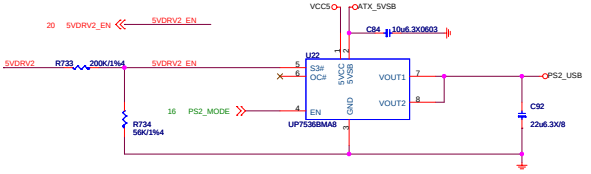
5VDIMM FOR USB

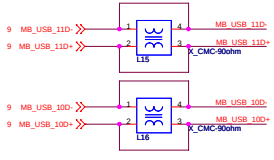


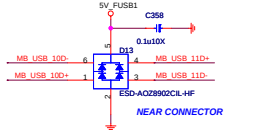
USB MODE

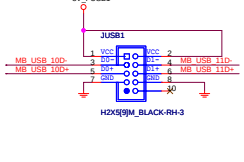


USB2.0/PS2 POWER Control

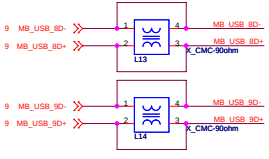
FRONT USB PORT 10,11

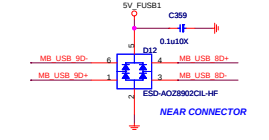


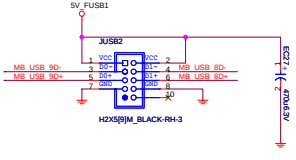




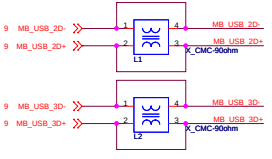
FRONT USB PORT 8.9

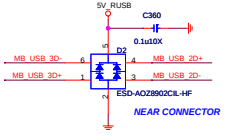


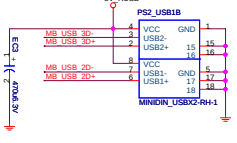


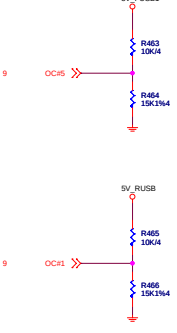


FRONT USB PORT 2.3









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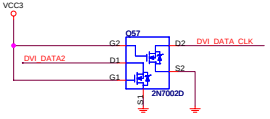
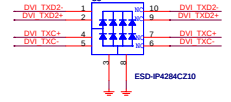
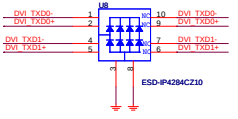
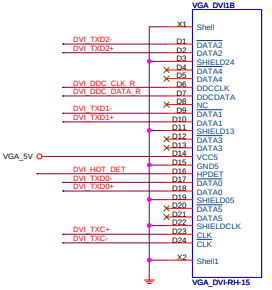
DVI level shifter

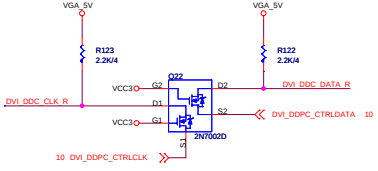
VGA: resolution of 2048x1536 pixels with 32-bit color at 75 Hz (4:3 QXGA)



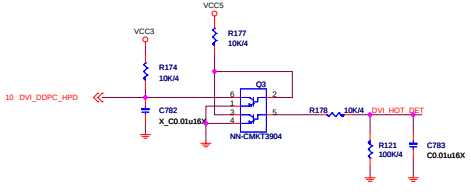




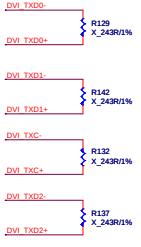


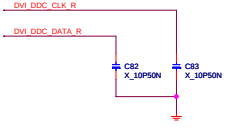


HPD



DVI For EMI





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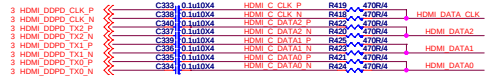
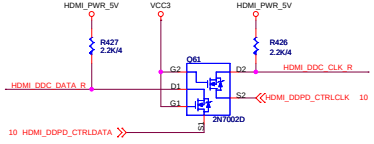
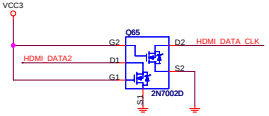
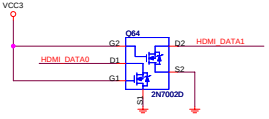
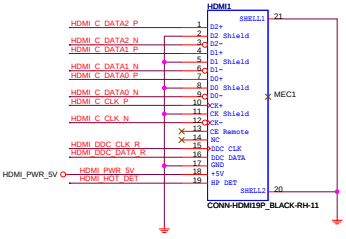
HDMI, DVI : 1920x1200 at 60 Hz (16:10 WUXGA)

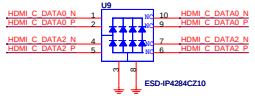


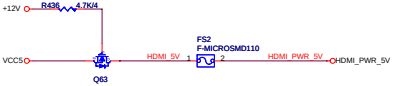


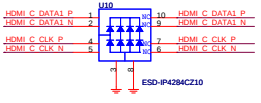




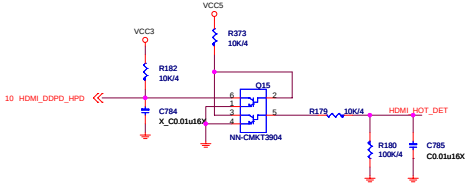


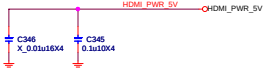






HPD





EMI

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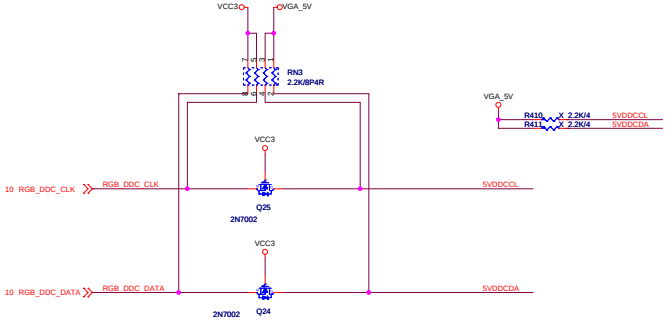
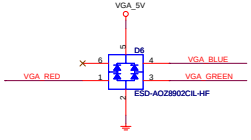
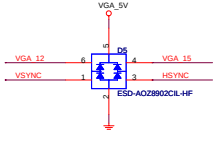
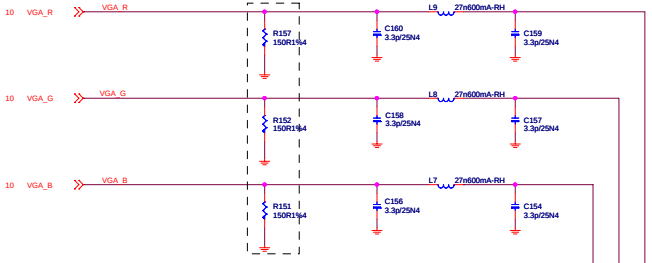
D-Sub

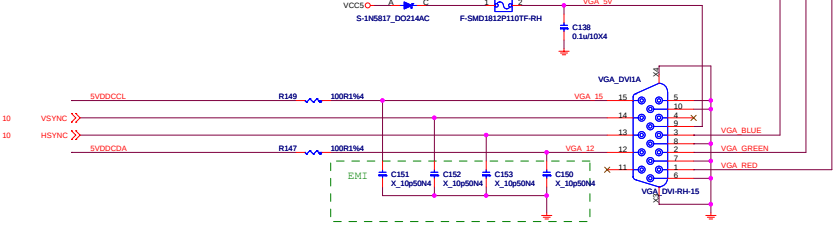
Level shift











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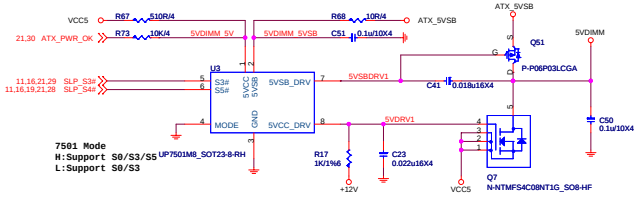
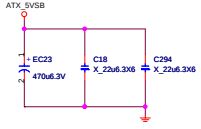
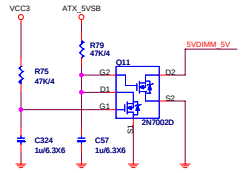
5VDIMM FOR DDR





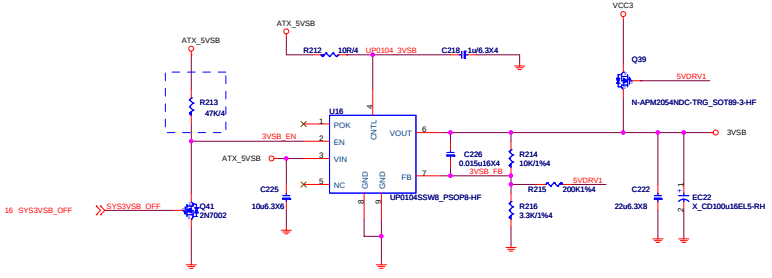
For power 700W solution (only for uP7501+uP7506 for 3VSB solution)
The power supply VCC3 delay 12ms after VCC5 assert.
The chip U7501 5VDRV1 work when the VCC5 ready
(When VCC5 up to 4.2V and the 5VDRV1 delay 6ms assert), but
VCC3 not ready and let the 3VSB sequence fail.



Patch coolermaster 700w power sequence

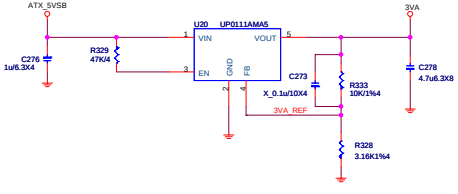
3VSB

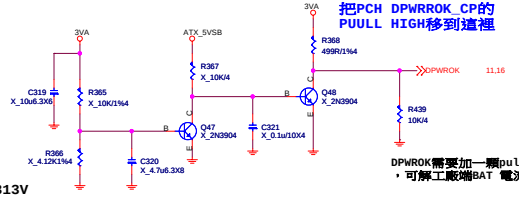
3VSB supply to PCH and other device.
Turn off when Deep S3/S5 by 5VSB off.



3VA

20mA





把PCH DPWRROK_CP的
PUULL HIGH移到這裡

DPWROK需要加一顆pull down 10k電阻
，可解工廠端BAT 電流過大問題

3.389V分壓=0.813V
2.71V分壓=0.65V

FOR DPWROK跟3VA的POWER
DOWN的時序(S5-->G3)

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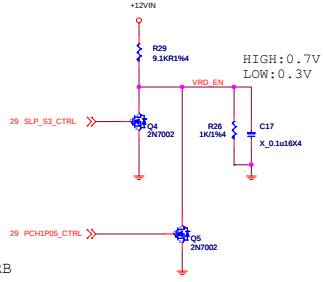
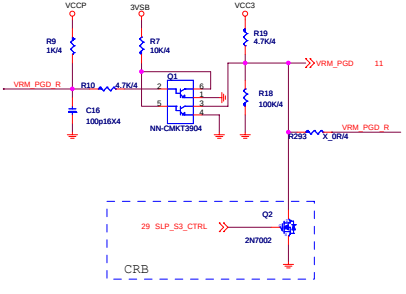
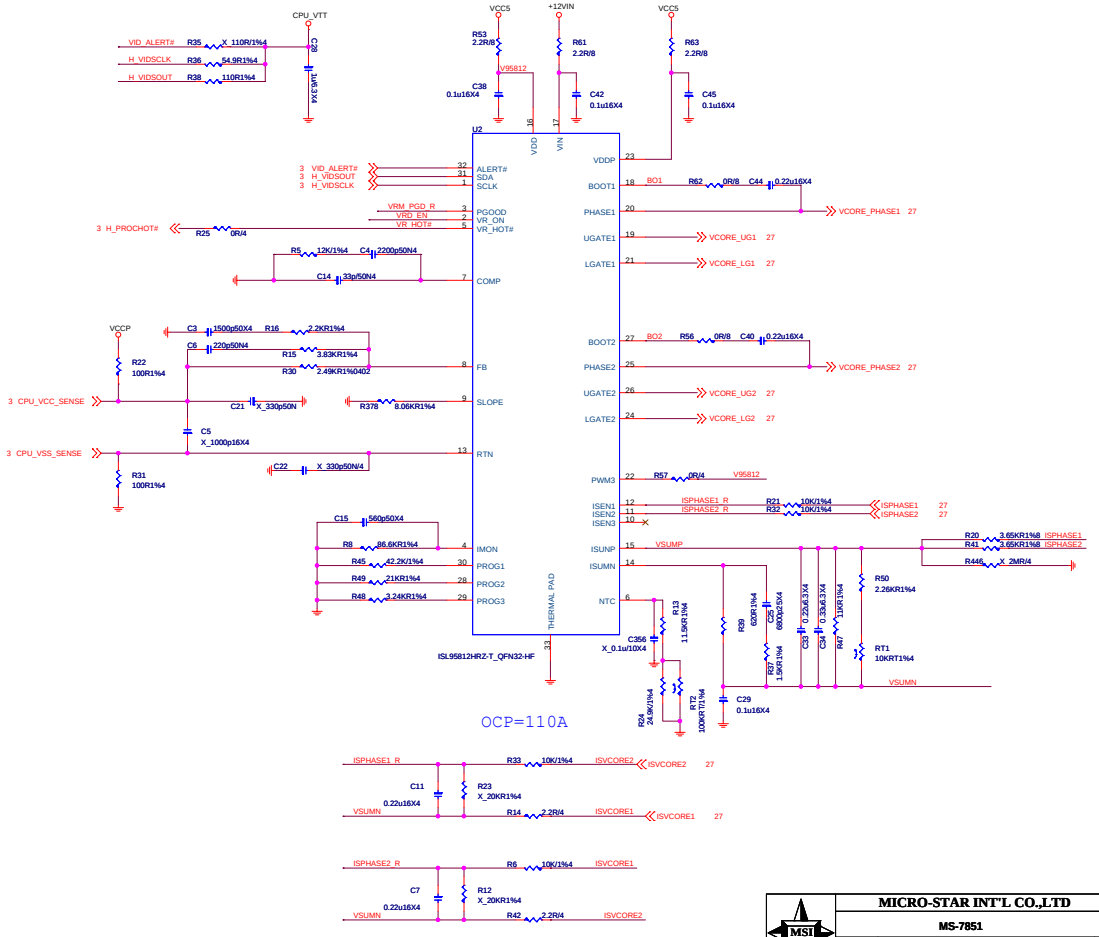
VCORE power on by s3 and 12v



VRMPWRGD LEVEL SHIFT





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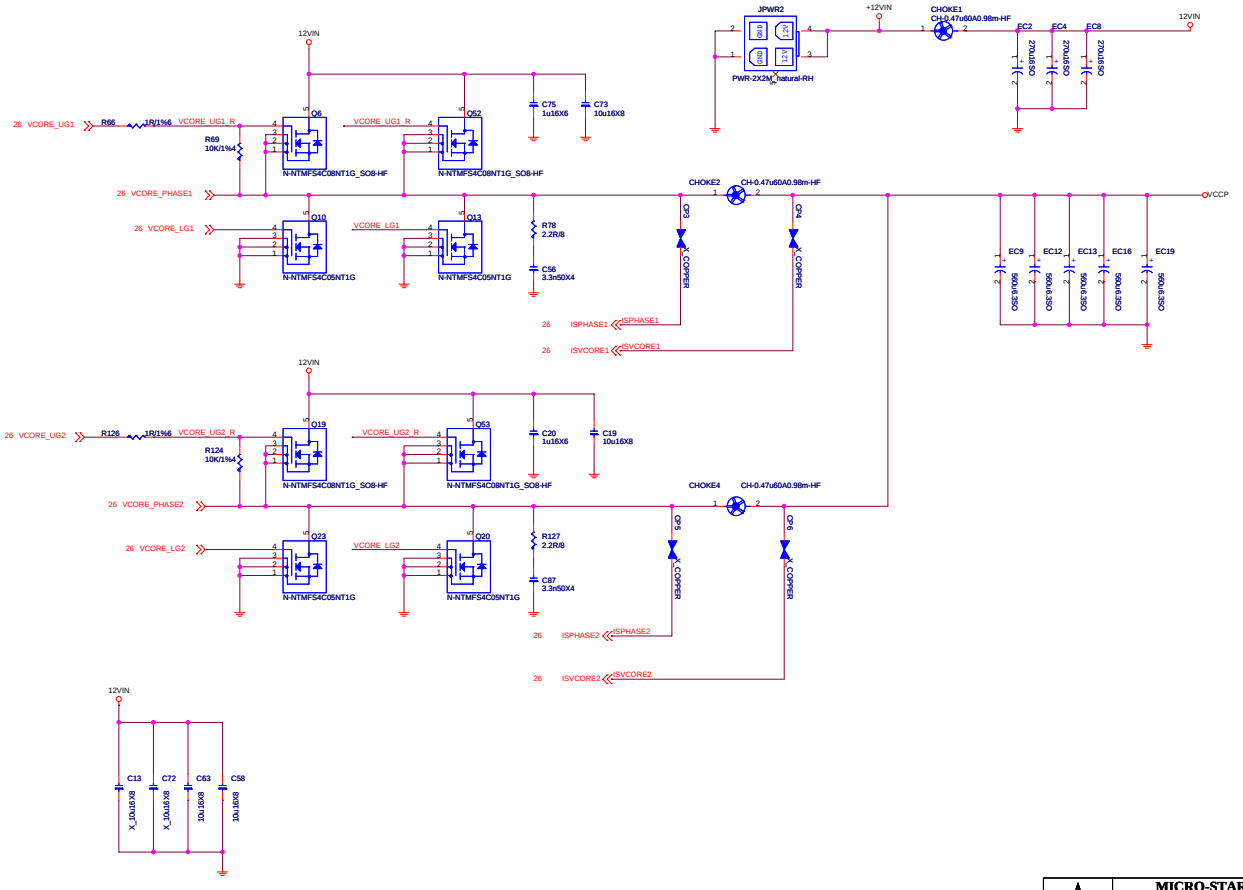
VCCP POWER

VCORE ICC MAX70A ICCTDC:47A 65W
LL:2.5m ohm



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DDR Power:1.5V

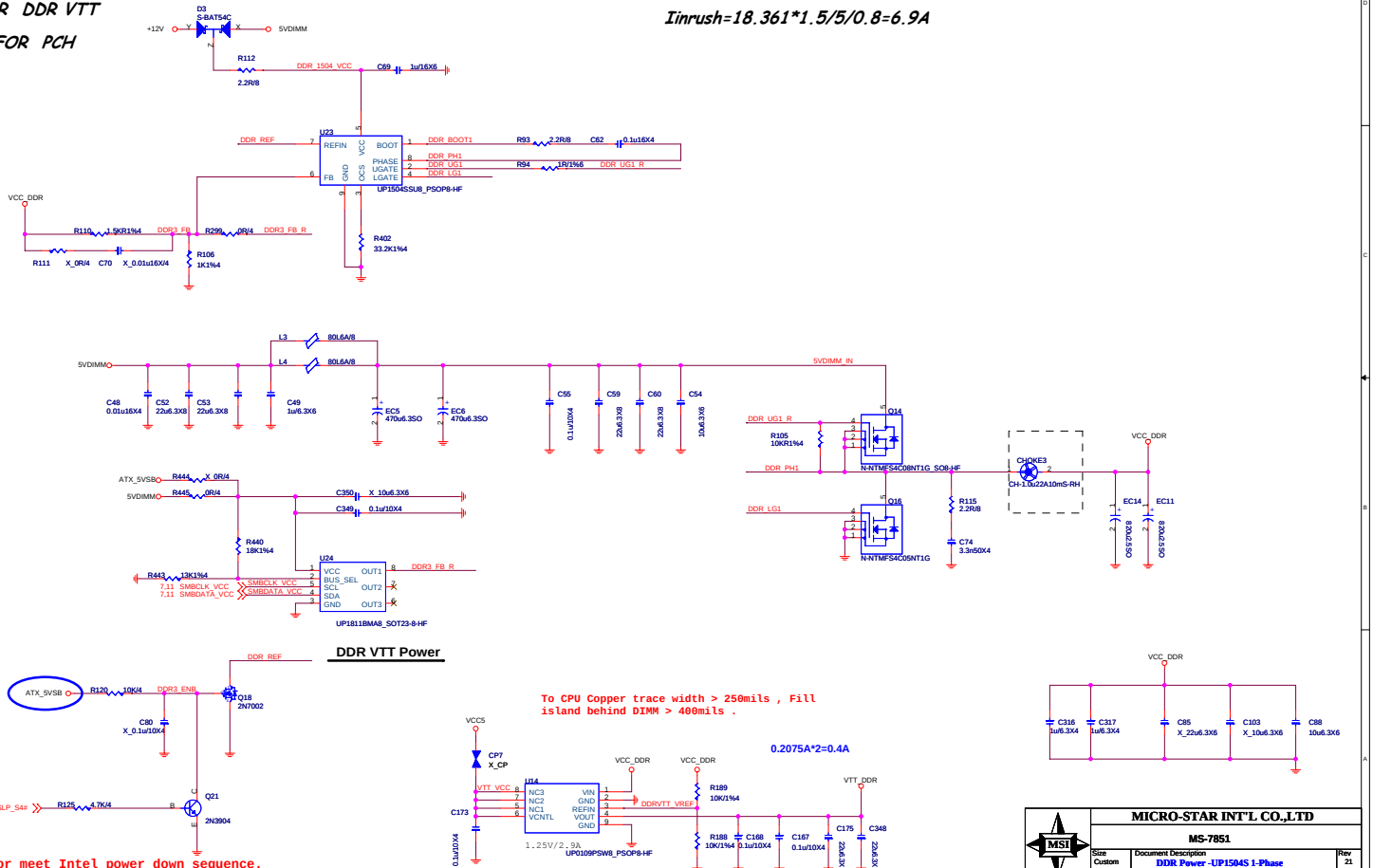
DDR3_1.5V 4.2A+6A+0.5A+7.661=18.361A

OCP：28A

4.2A FOR CPU
6A FOR 2DIMM
0.5A FOR DDR VTT
7.661A FOR PCH

OCP:16.447*1.5=24.6705A
OCPXRdson(Low side)=(40uA*Rocs(R122)-0.4V)
Rocs(R122)=13.75K

Iinrush=18.361*1.5/5/0.8=6.9A



P.S. Only for meet Intel power down sequence.

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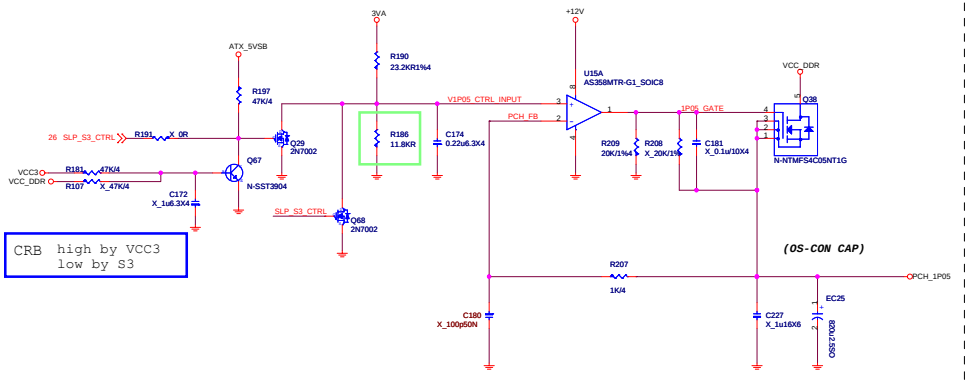
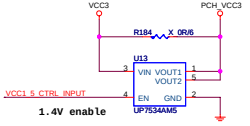
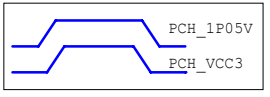
PCH Power:1.05V 5.747A

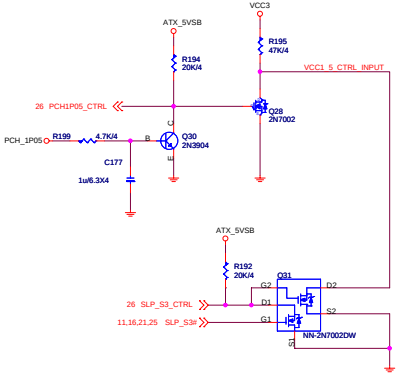


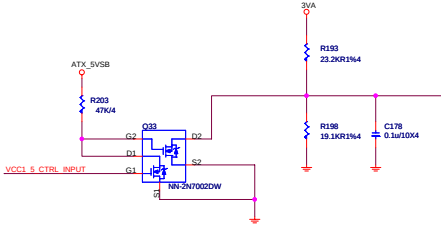
0.133A

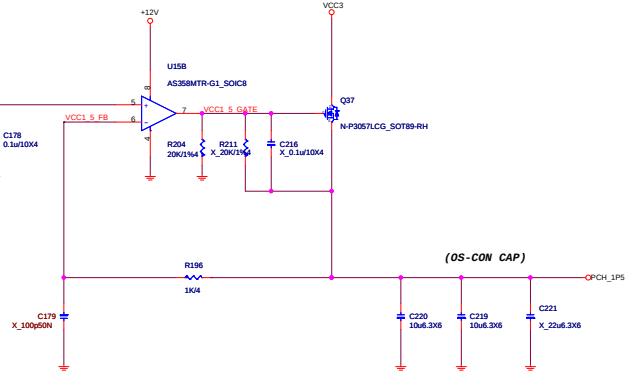




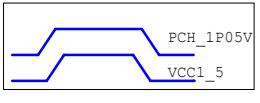
PCH Power:1.5V 0.183A







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



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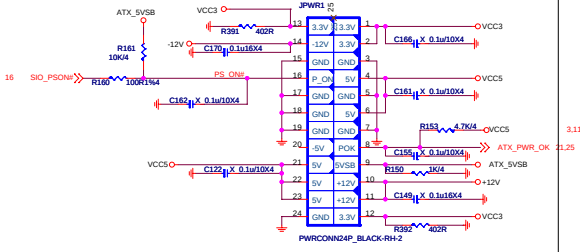
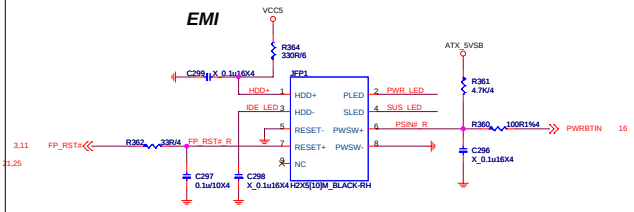
ATX POWER CONNECTOR

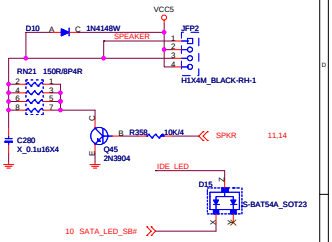


FRONT PANNEL

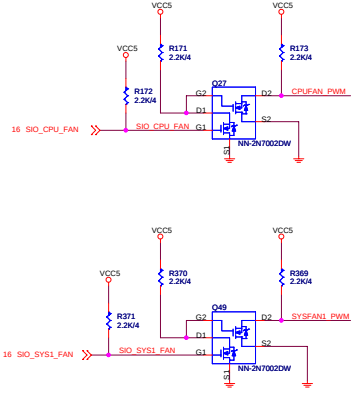
EMI

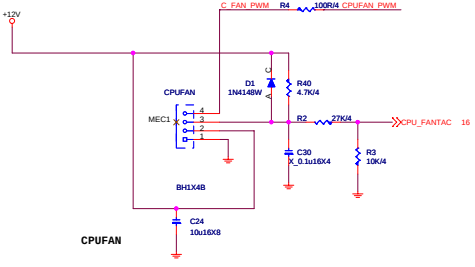


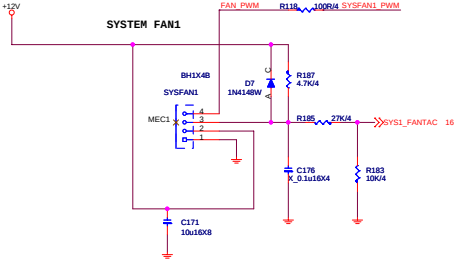
Speaker Pin Header

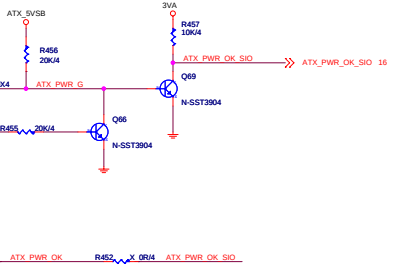


FAN-COUNTROL CIRCUIT

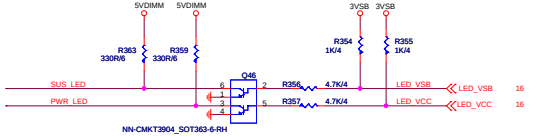




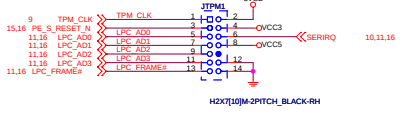




LED (for NV5533)



TPM/JLPC



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Size: Custom

Document Description: EMI Cap

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LABEL OPT.

LABEL101 — LABEL — X_LABEL — H81-Full

LABEL104 — LABEL — X_LABEL — H81-U2

LANUSB OPT.

USBII — USB2.0 — X_USBAX2M_BLACK-RH-20

Optical Fiducial Marks-120

FM4 X_FM, FM3 X_FM, FM1 X_FM, FM2 X_FM

FM6 X_FM, FM8 X_FM, FM7 X_FM, FM5 X_FM

AMI — LABEL2 — BAT-BCR2032P-RH

MARKET — LABEL1 — BAT-BCR2032P-RH

BAT1 X1 — BAT-BCR2032P-RH

HDMI Virtual — HDMI_LA1 — Label — HDMI LABEL

PCB1 — 7851_21

CPU_H1 — CPU 線座 — CPU_H1

Simulation

SIM1 — SIM1 — X_PIN1*2

SIM2 — SIM2 — X_PIN1*2

SIM4 — SIM3 — X_PIN1*2

SIM3 — SIM4 — X_PIN1*2

Mounting Holes

MH2 — X_MH001

MH3 — X_MH001

MH4 — X_MH001

MH1 — X_MH001

PCH XDP PWRGD/RESET

HS_PCH1 — MEC1, MEC2, MEC3, MEC4 — HS-0403980-RH

VCCP	VCCP
VCC_DDR	VCC_DDR
VTT_DDR	VTT_DDR
PCH_1P05	PCH_1P05
PCH_1P5	PCH_1P5
5VDIMM	5VDIMM
3VSB	3VSB
PCH_VCC3	PCH_VCC3
3VA	3VA

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