MS-7798

m-ATX

Ver: 1.0(243 * 225)

Intel -MahoBay plamform B75

CPU:

IVY bridge LGA1155

System Chipset:

Panther Point B75

Onboard Chip:

HD Audio Codec:ALC887 colay VTI1708S
LAN-RTL8111E colay8105E
SIO:Fintek F71868AD
Flash ROM: SPI 128 MB

Main Memory:

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

ACPI:

UPI

PWM:

VRD12 -UT501 3+1 Phase

Expansion Slots:

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

Other:

SATA3.0 x1+SATA2.0 x5 (PCH)
*USB2.0 *8*
*REAL USB3.0 *2*
*FRONT USB3.0 *2*

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Size	Document Description	Rev
Custom	Cover Sheet	1.0

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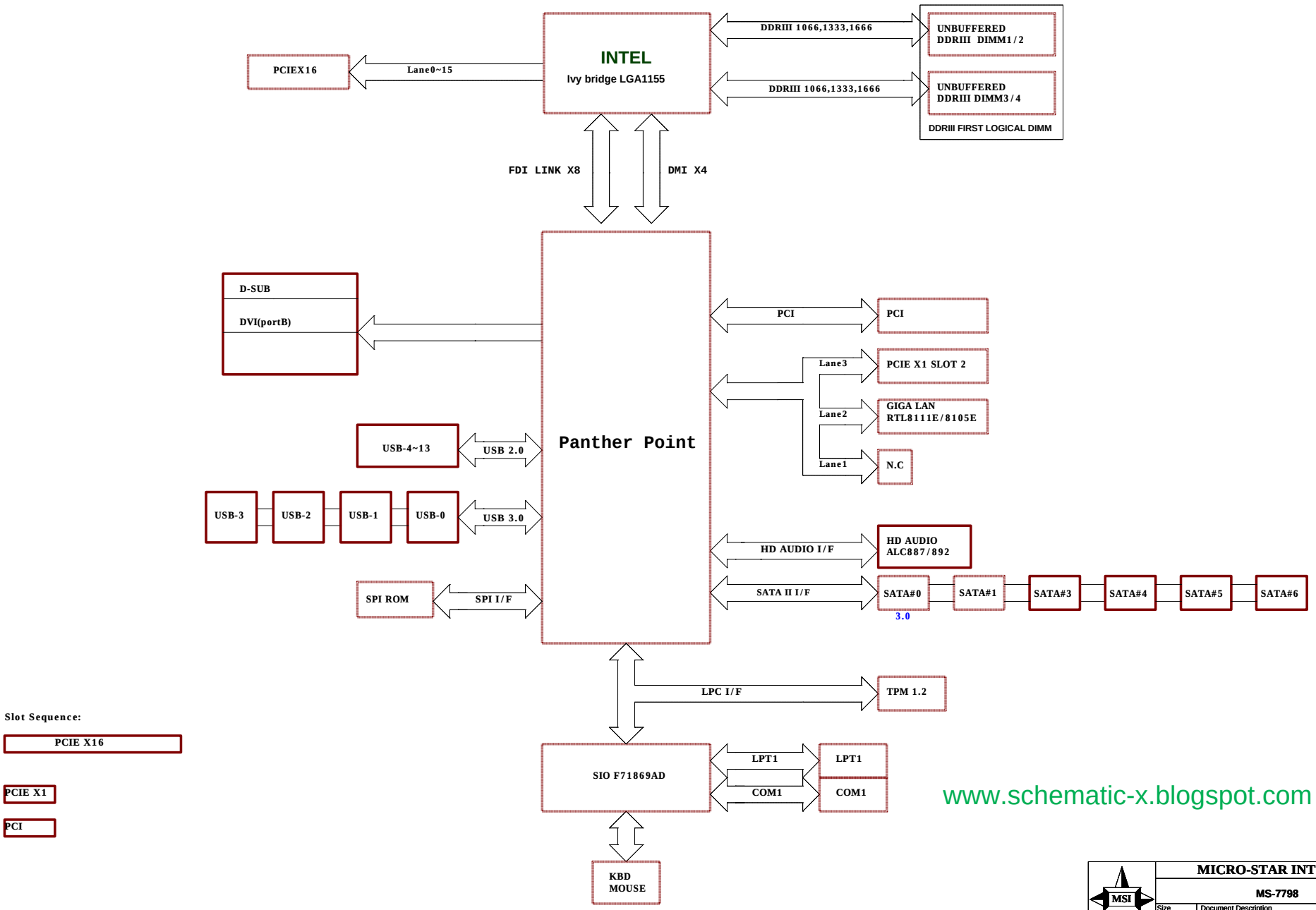
MS-7798 Block Diagram



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Size	Document Description	Rev
Custom	Block Diagram	1.0

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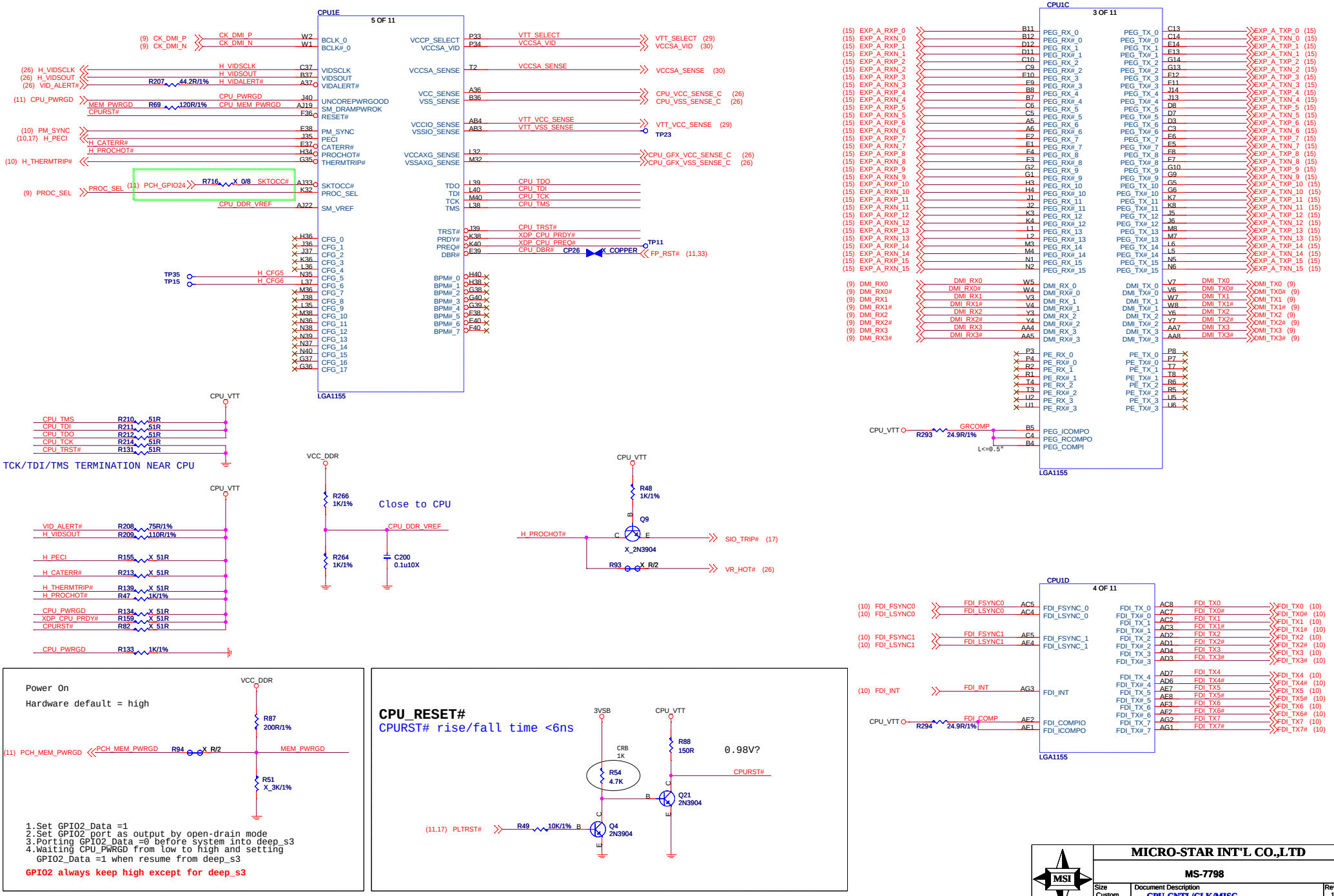
CPU1E
5 OF 11
LGA1155
CPU1C
3 OF 11
LGA1155
CPU1D
4 OF 11
LGA1155
TCK/TDI/TMS TERMINATION NEAR CPU
Close to CPU
Power On
Hardware default = high
1.Set GPIO2_Data =1
2.Set GPIO2 port as output by open-drain mode
3.Porting GPIO2_Data =0 before system into deep_s3
4.Waiting CPU_PWRGD from low to high and setting
GPIO2_Data =1 when resume from deep_s3
GPIO2 always keep high except for deep_s3
CPU_RESET#
CPURST# rise/fall time <6ns
0.98V?
MICRO-STAR INT'L CO.,LTD
MS-7798
CPU-CNTL/CLK/MISC
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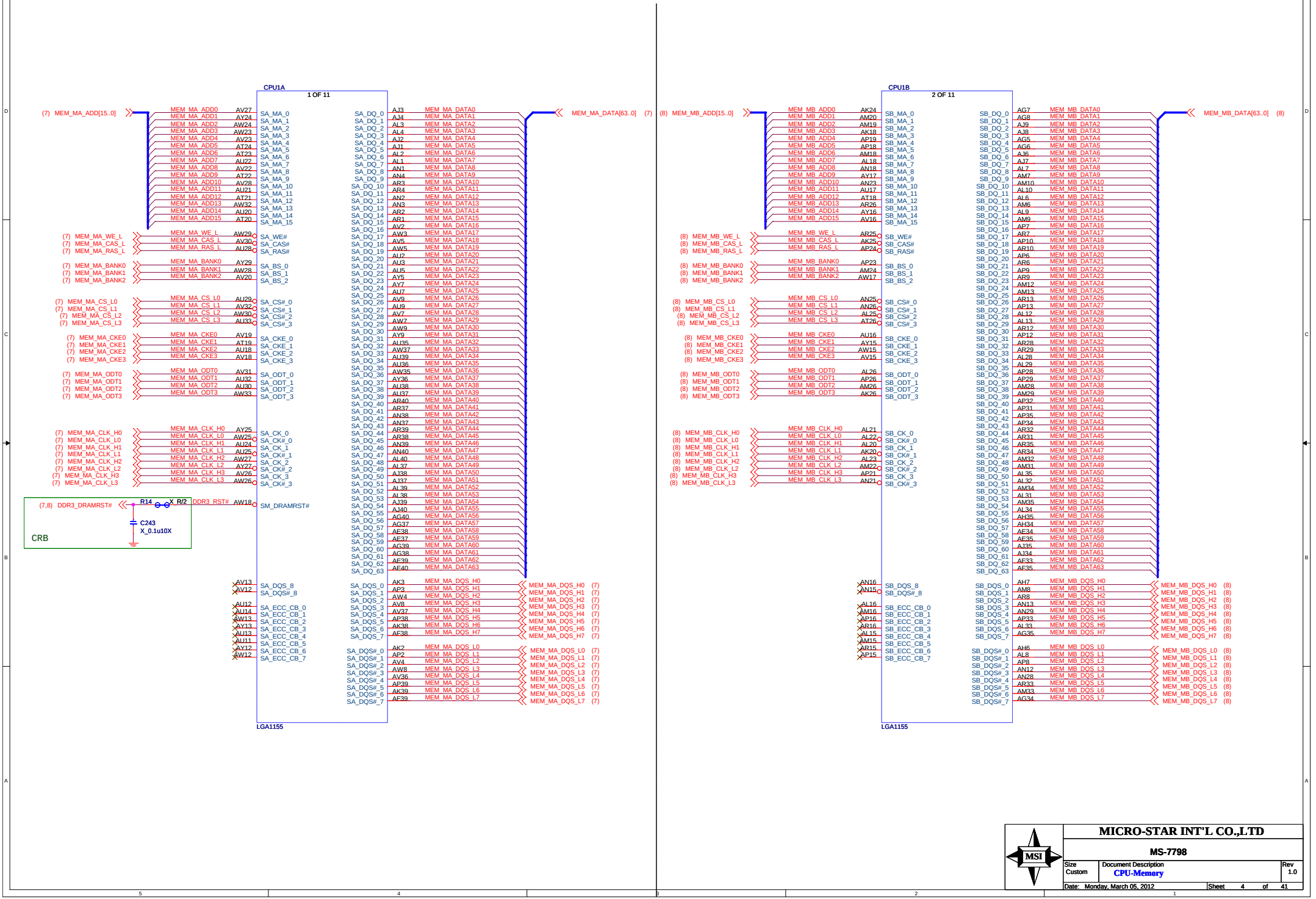
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MEM_MA_ADD1 AY24
MEM_MA_ADD2 AW24
MEM_MA_ADD3 AW23
MEM_MA_ADD4 AV23
MEM_MA_ADD5 AT24
MEM_MA_ADD6 AT23
MEM_MA_ADD7 AU22
MEM_MA_ADD8 AV22
MEM_MA_ADD9 AT22
MEM_MA_ADD10 AV28
MEM_MA_ADD11 AU21
MEM_MA_ADD12 AT21
MEM_MA_ADD13 AW32
MEM_MA_ADD14 AU20
MEM_MA_ADD15 AT20
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SA_MA_1
SA_MA_2
SA_MA_3
SA_MA_4
SA_MA_5
SA_MA_6
SA_MA_7
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SA_MA_14
SA_MA_15
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(7) MEM_MA_CAS_L
(7) MEM_MA_RAS_L
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MEM_MA_CAS_L AV30
MEM_MA_RAS_L AU28
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SA_CAS#
SA_RAS#
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(7) MEM_MA_BANK2
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MEM_MA_BANK1 AW28
MEM_MA_BANK2 AV20
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SA_BS_2
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(7) MEM_MA_CS_L1
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(7) MEM_MA_CS_L3
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MEM_MA_CS_L1 AV32
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SA_CS#_2
SA_CS#_3
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(7) MEM_MA_CKE1
(7) MEM_MA_CKE2
(7) MEM_MA_CKE3
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MEM_MA_CKE1 AT19
MEM_MA_CKE2 AU18
MEM_MA_CKE3 AV18
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SA_CKE_1
SA_CKE_2
SA_CKE_3
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(7) MEM_MA_ODT1
(7) MEM_MA_ODT2
(7) MEM_MA_ODT3
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MEM_MA_ODT1 AU32
MEM_MA_ODT2 AU30
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SA_ODT_2
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MEM_MA_CLK_L1 AU25
MEM_MA_CLK_H2 AW27
MEM_MA_CLK_L2 AY27
MEM_MA_CLK_H3 AV26
MEM_MA_CLK_L3 AW26
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SA_CK_1
SA_CK#_1
SA_CK_2
SA_CK#_2
SA_CK_3
SA_CK#_3
(7,8) DDR3_DRAMRST#
R14 X_R/2
DDR3_RST# AW18
SM_DRAMRST#
C243
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AV13 SA_DQS_8
AV12 SA_DQS#_8
AU12 SA_ECC_CB_0
AU14 SA_ECC_CB_1
AW13 SA_ECC_CB_2
AY13 SA_ECC_CB_3
AU13 SA_ECC_CB_4
AU11 SA_ECC_CB_5
AY12 SA_ECC_CB_6
BW12 SA_ECC_CB_7
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SA_DQ_1 AJ4
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SA_DQ_5 AJ1
SA_DQ_6 AL2
SA_DQ_7 AL1
SA_DQ_8 AN1
SA_DQ_9 AN4
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SA_DQ_12 AN2
SA_DQ_13 AN3
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SA_DQS_1 AP3
SA_DQS_2 AW4
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MEM_MA_DQS_L1
MEM_MA_DQS_L2
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MEM_MA_DQS_L5
MEM_MA_DQS_L6
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LGA1155
CPU1B
2 OF 11
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LGA1155
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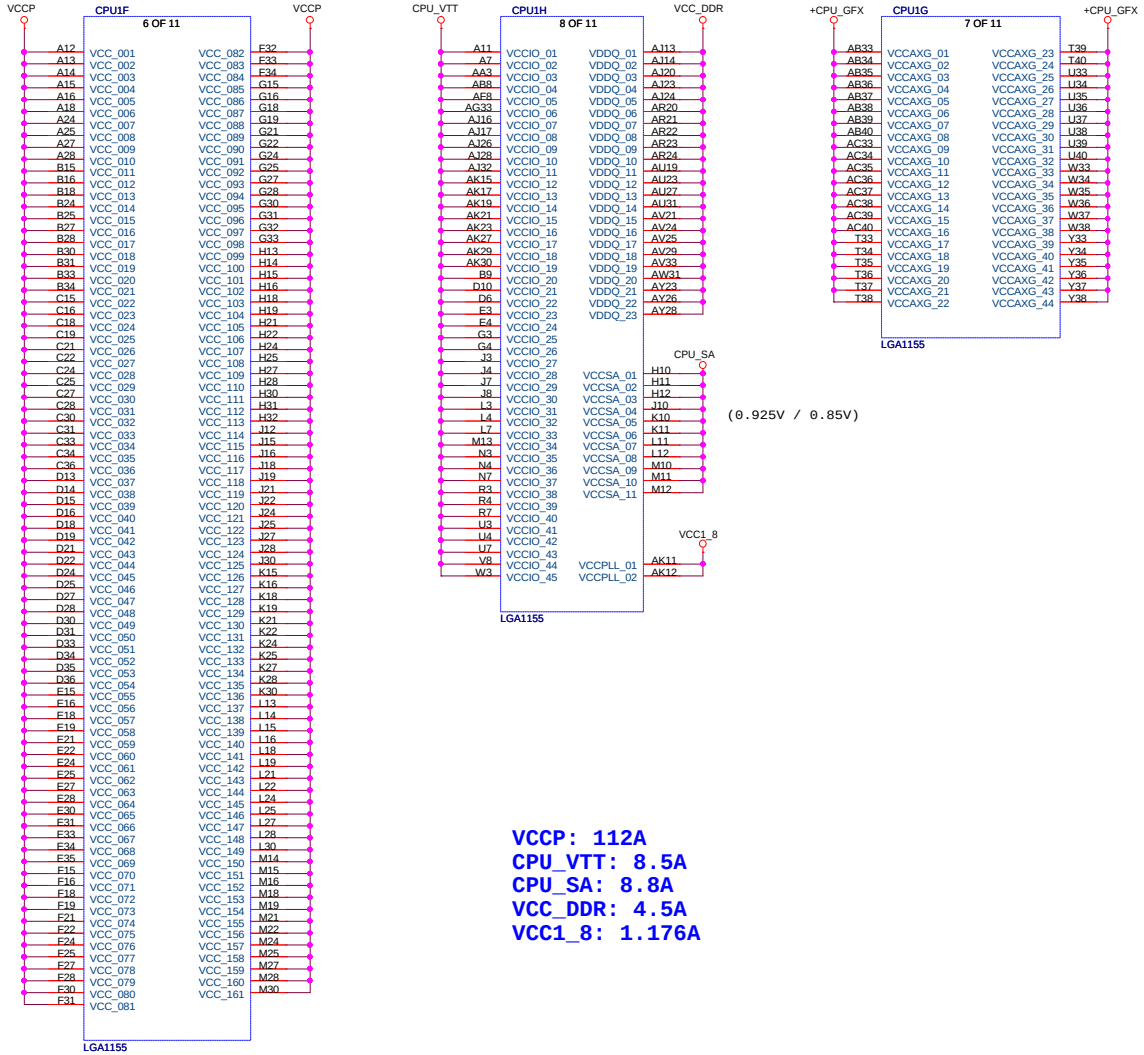
(1.05V / 1.00V)

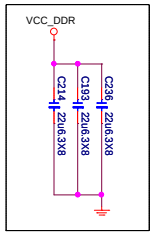


(0.925V / 0.85V)

VCCP: 112A
CPU_VTT: 8.5A
CPU_SA: 8.8A
VCC_DDR: 4.5A
VCC1_8: 1.176A

+1.5V_DDR3-Decoupling

CPU SOCKET CAVITY CAPS

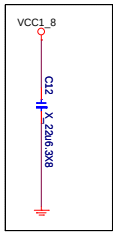


+CPU_SA Decoupling

Backside

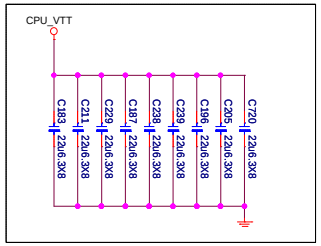
+VCC1_8 Decoupling

Backside



+CPU_VTT Decoupling

CPU SOCKET CAVITY CAPS



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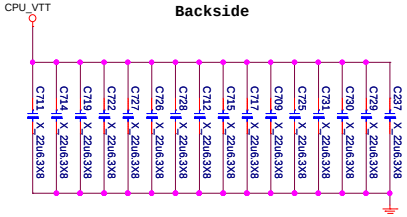
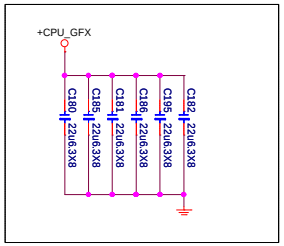


+CPU_GFX Decoupling

CPU SOCKET CAVITY CAPS



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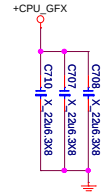
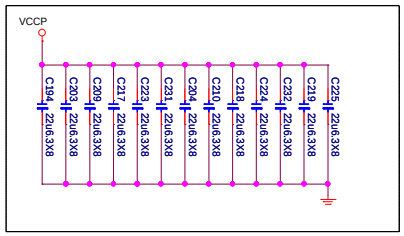


+CPU_VCCP-Decoupling

CPU SOCKET CAVITY CAPS



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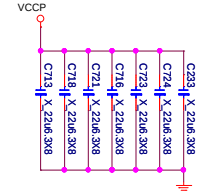

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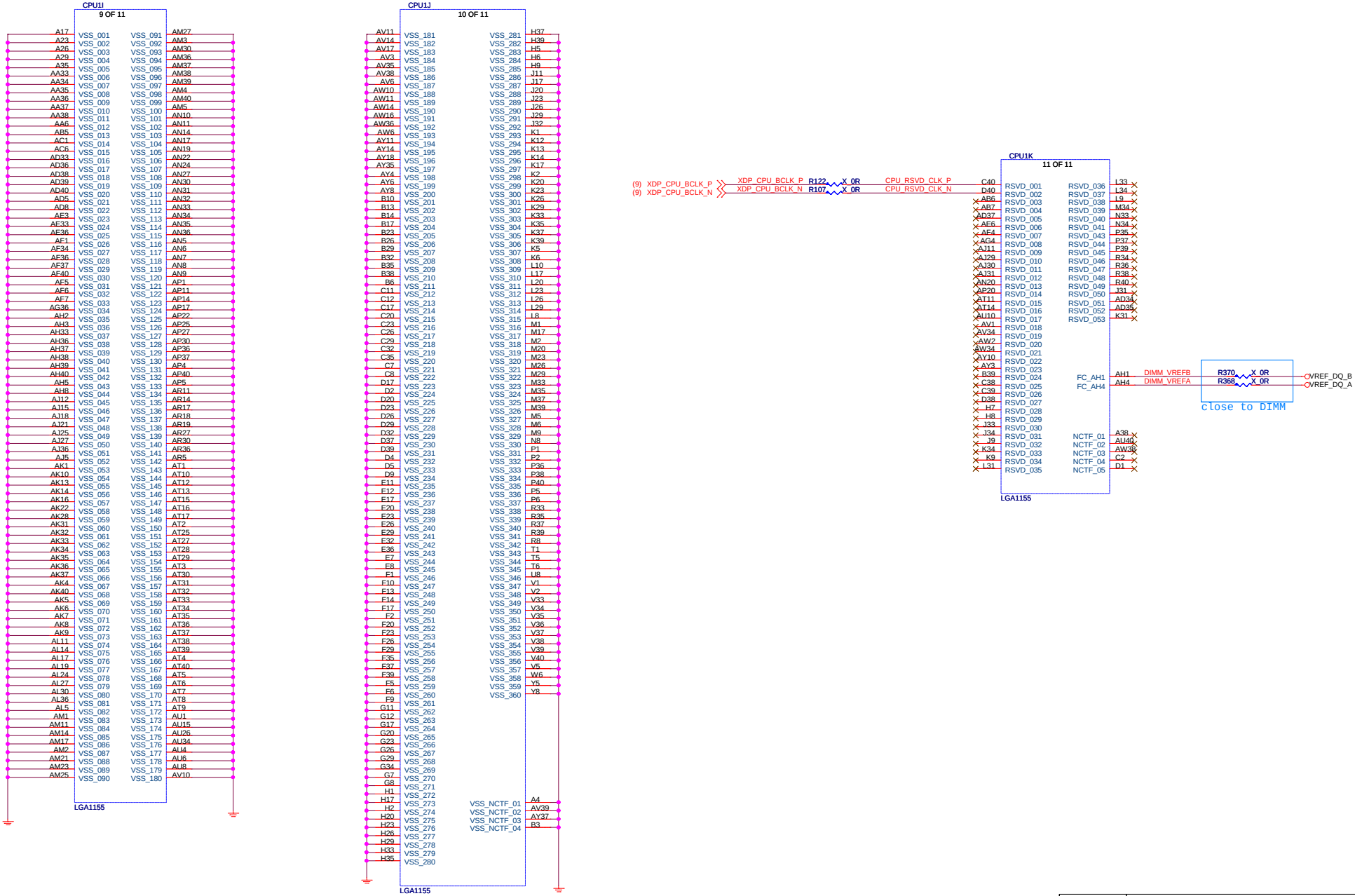

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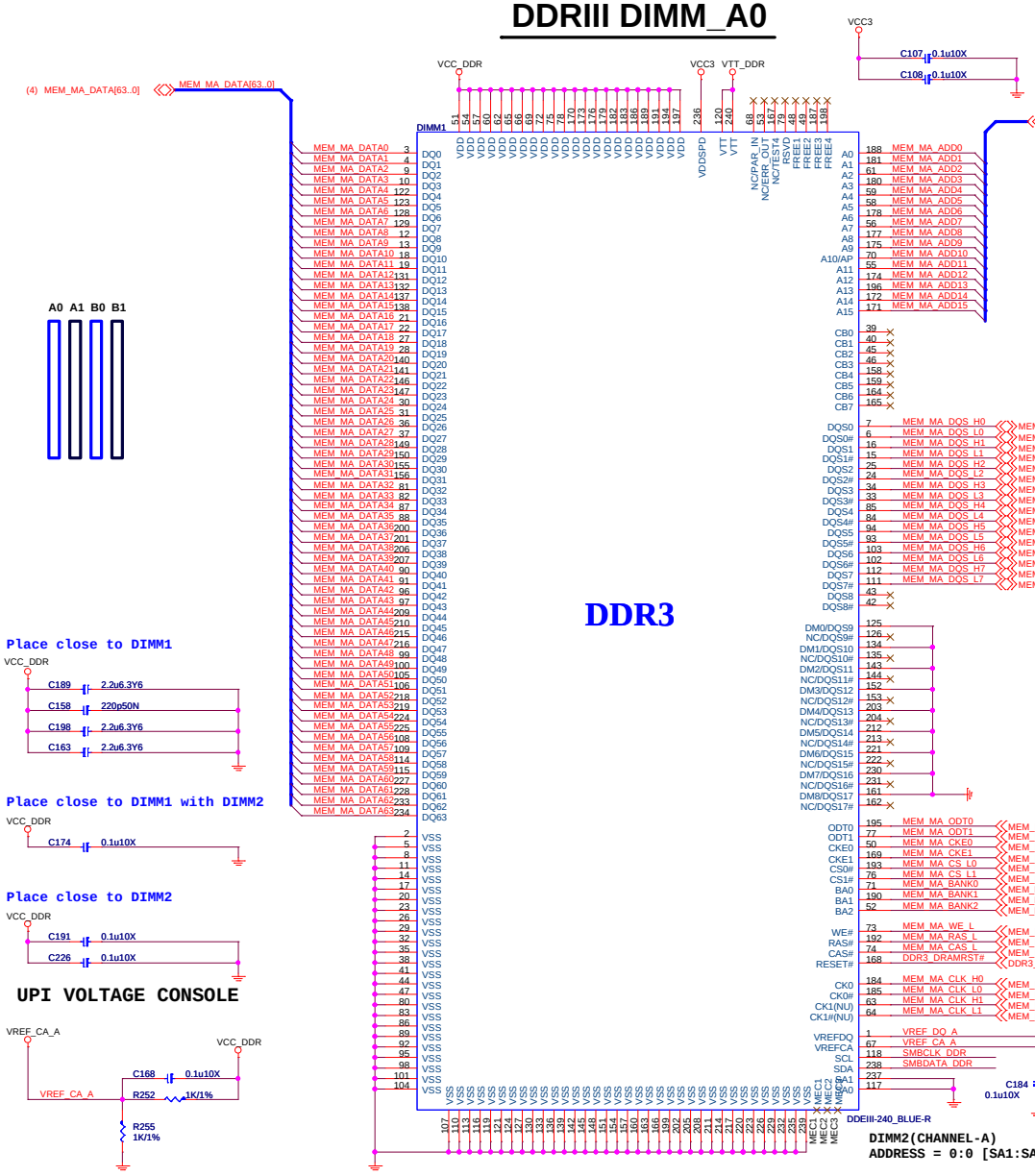
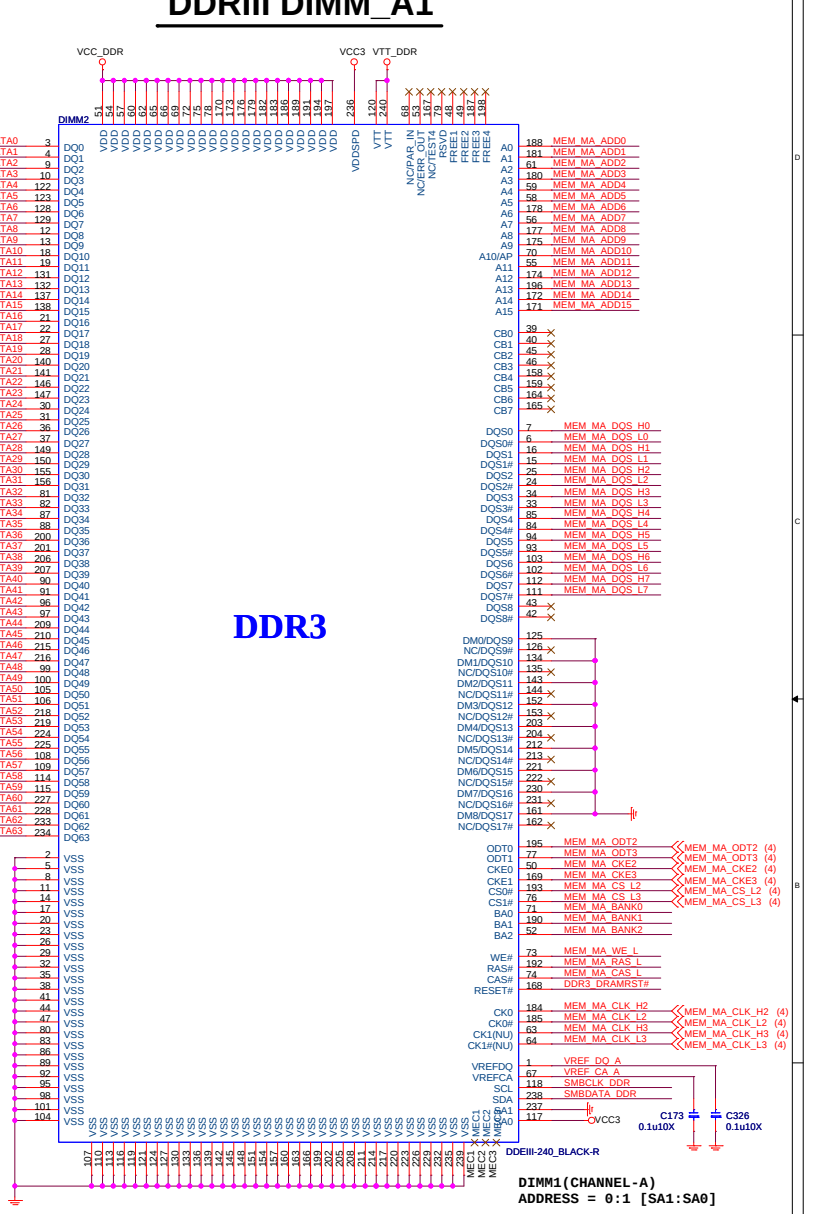
DDRIII DIMM_A0



DDRIII DIMM_A1



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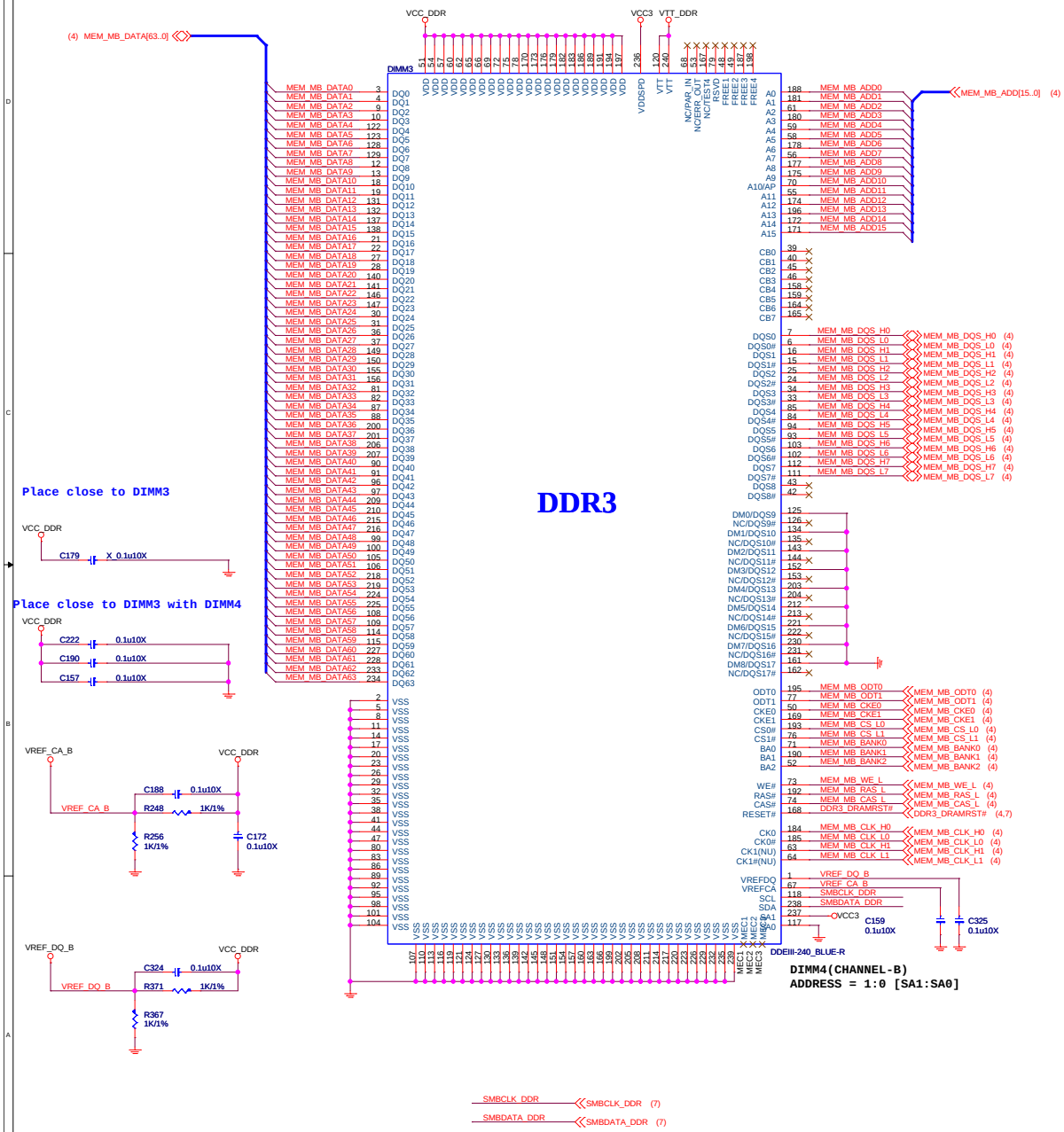
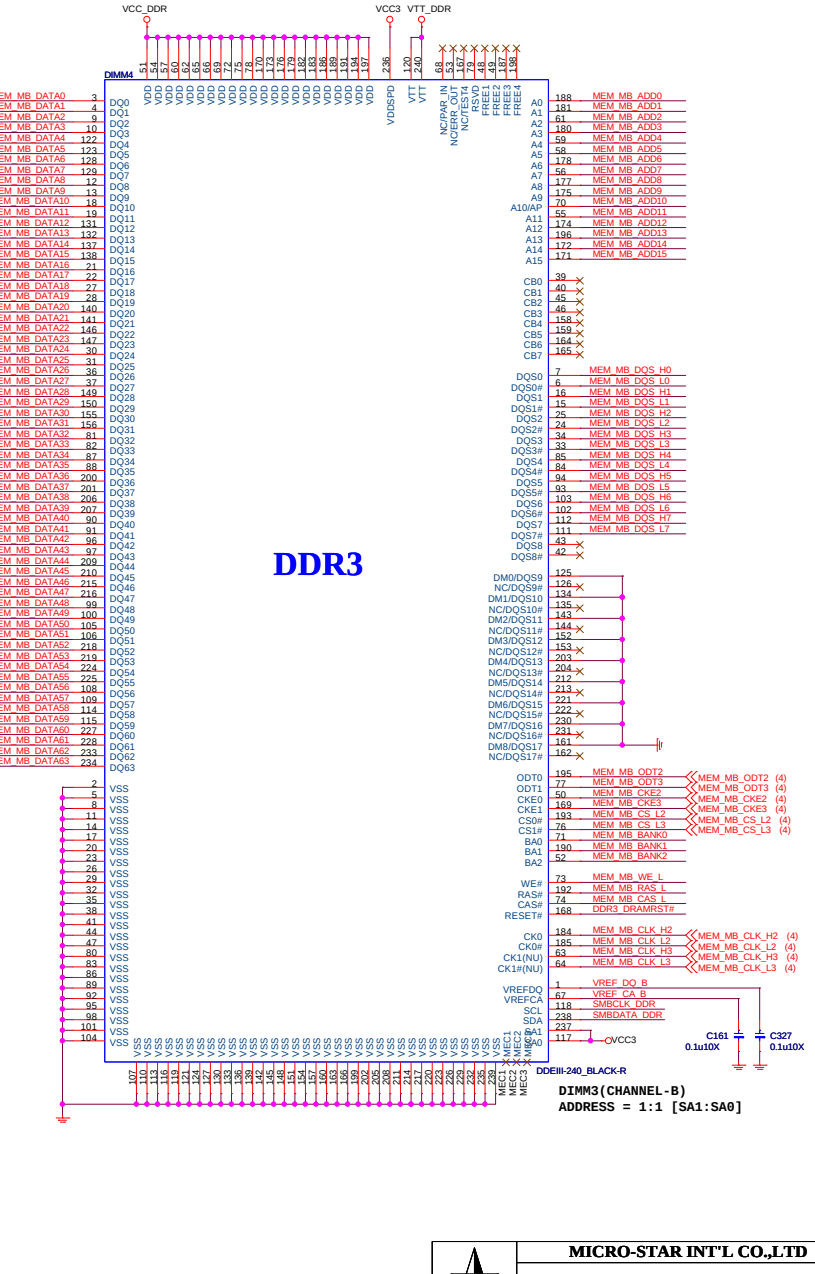
DDRIII DIMM_B0



DDRIII DIMM_B1



MICRO-STAR INT'L CO.,LTD

MS-7798

Size	Document Description	Rev
Custom	DDR3 Chanel-B DIMM3/4	1.0

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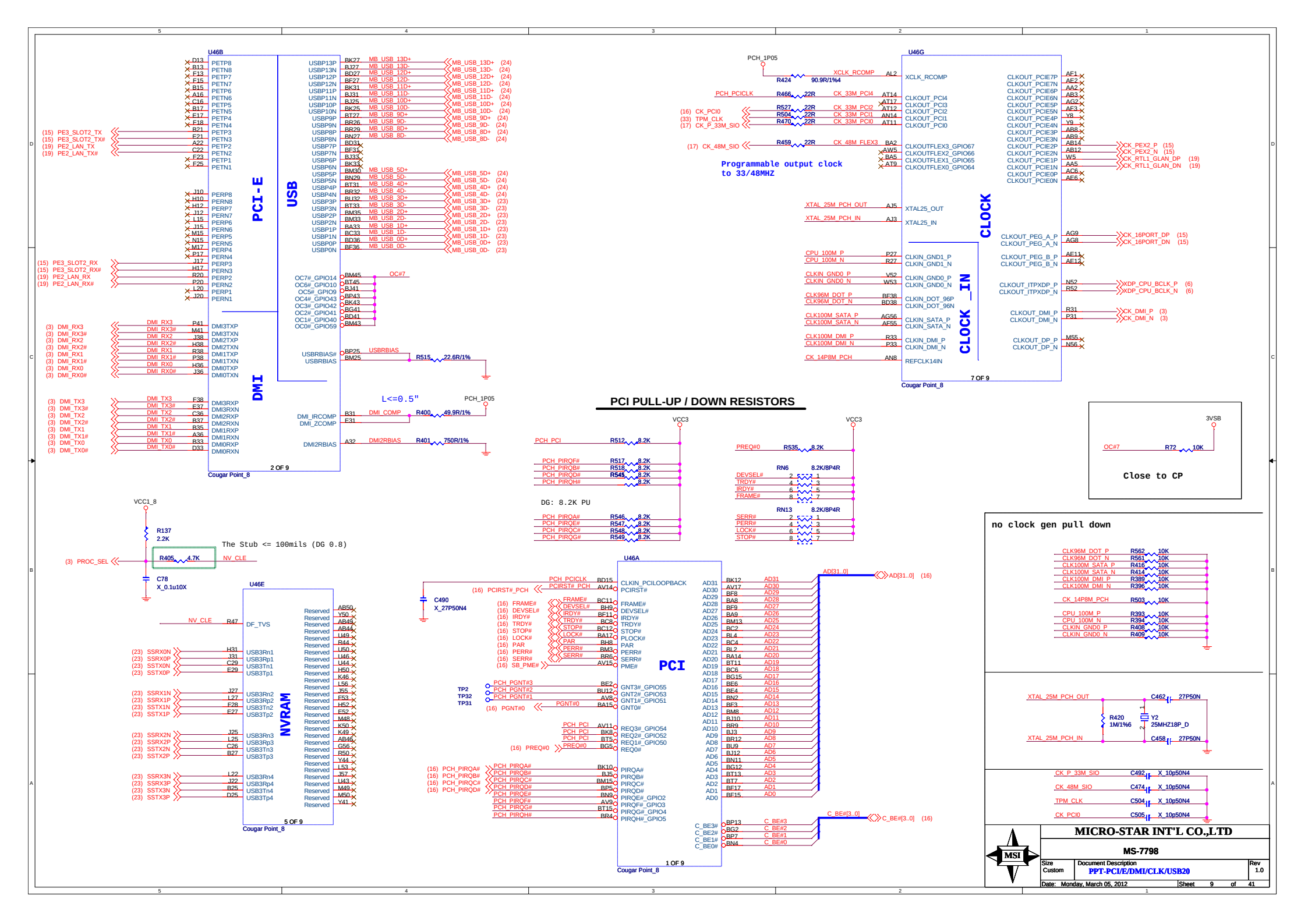
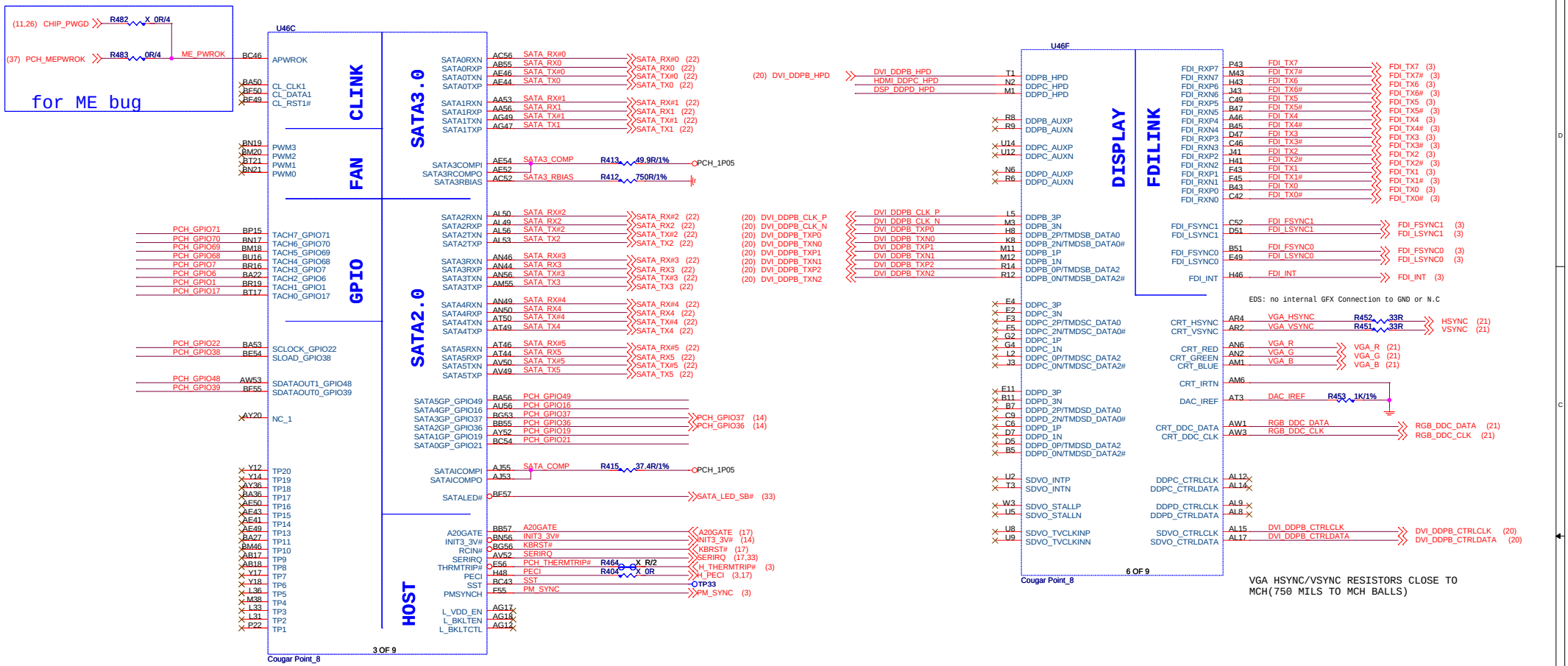
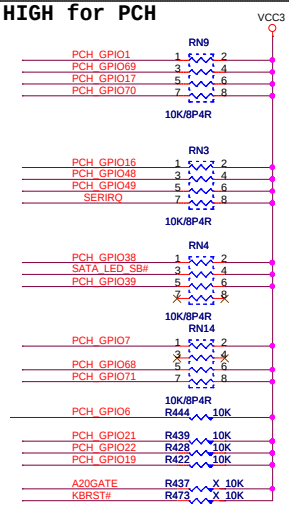
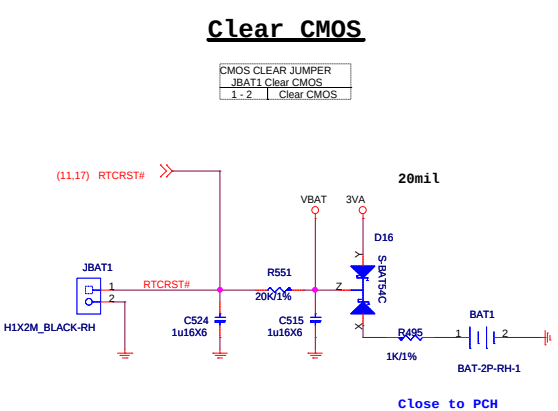

U46B
PCI-E
USB
DMI
2 OF 9
Cougar Point_8
U46G
CLOCK
CLOCK_IN
7 OF 9
Cougar Point_8
Programmable output clock
to 33/48MHZ
PCI PULL-UP / DOWN RESISTORS
DG: 8.2K PU
L<=0.5"
The Stub <= 100mils (DG 0.8)
U46E
NVRAM
5 OF 9
Cougar Point_8
U46A
PCI
1 OF 9
Cougar Point_8
3VSB
OC#7
R72
10K
Close to CP
no clock gen pull down
MICRO-STAR INT'L CO.,LTD
MS-7798
PPT-PCI/E/DMI/CLK/USB20
Size
Custom
Document Description
Rev
1.0
Date: Monday, March 05, 2012
Sheet 9 of 41



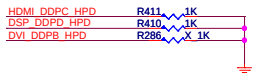
Pull HIGH for PCH



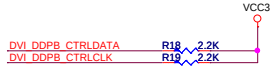
RTC and CLR_CMOS



No VGA(pull down)



Enable VGA(CTRLCLK/DATA Pull High)



Close to PCH within 250 mils.

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MS-7798		
Size: Custom	Document Description: PPT-SATA/HOST/GPIO/VGA/CCMOS	Rev: 1.0
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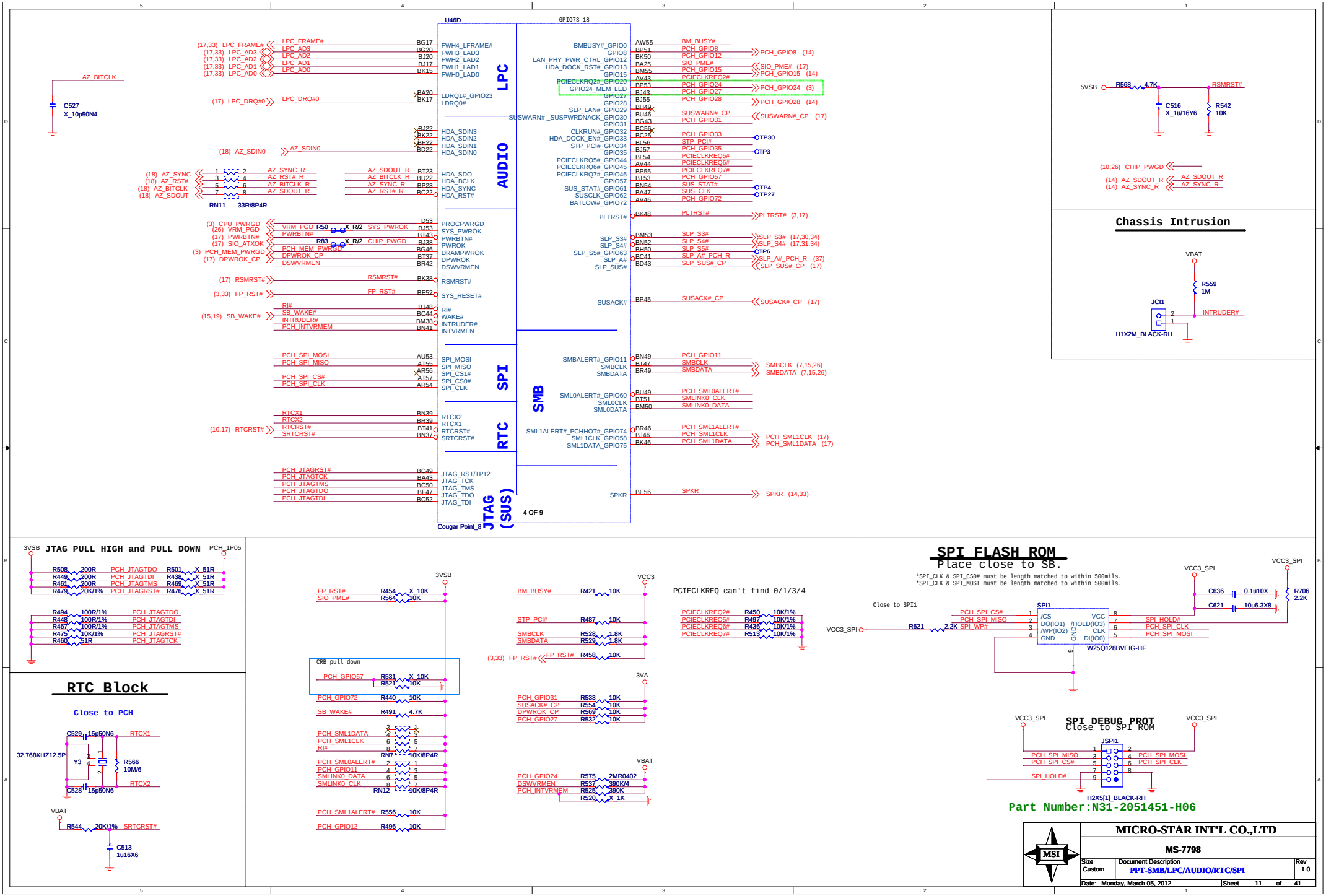
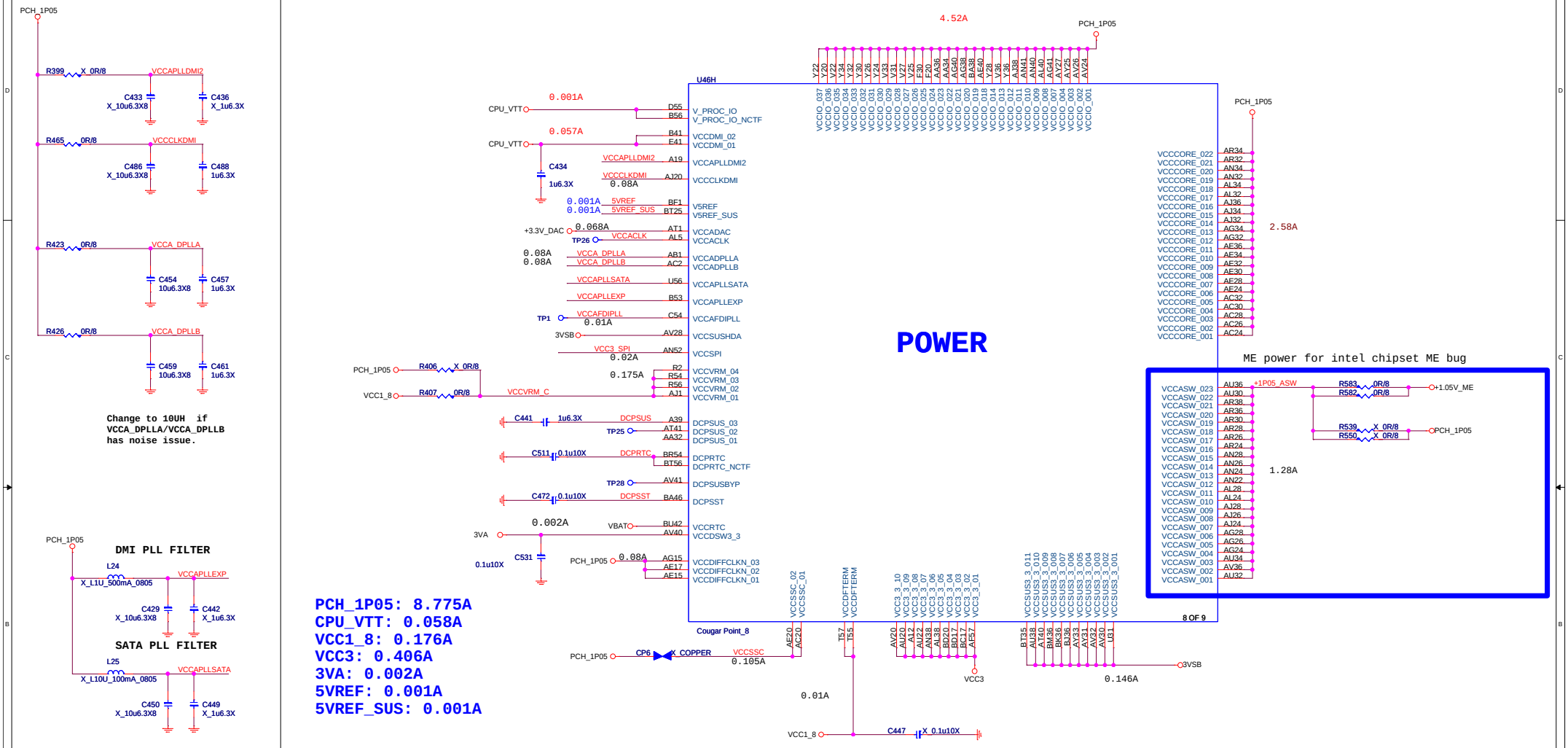
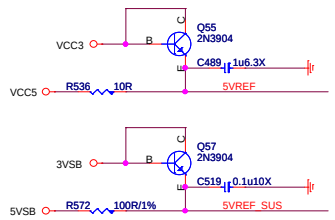
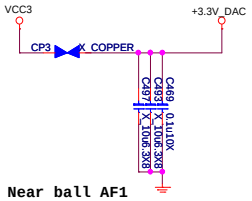

U46D
LPC
AUDIO
SPI
SMB
RTC
JTAG (SUS)
4 OF 9
Cougar Point_8
Chassis Intrusion
JTAG PULL HIGH and PULL DOWN
RTC Block
Close to PCH
SPI FLASH ROM
Place close to SB.
*SPI_CLK & SPI_CS0# must be length matched to within 500mils.
*SPI_CLK & SPI_MOSI must be length matched to within 500mils.
W25Q128BVEIG-HF
SPI DEBUG PROT
Close to SPI ROM
H2X5[1]_BLACK-RH
PCIECLKREQ can't find 0/1/3/4
Part Number:N31-2051451-H06
MICRO-STAR INT'L CO.,LTD
MS-7798
PPT-SMB/LPC/AUDIO/RTC/SPI
Monday, March 05, 2012
Sheet 11 of 41

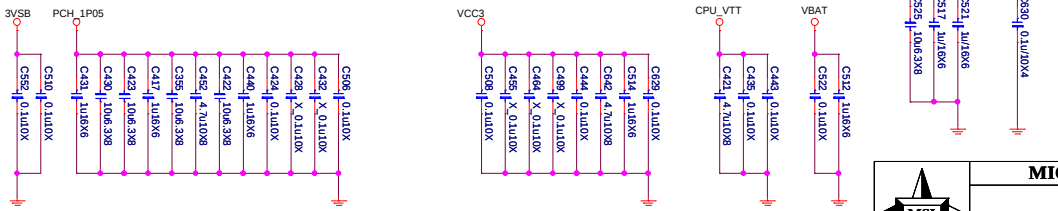


5VREF & 5VREF_SUS Sequencing Circuit





PCH decoupling cap



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Size: Custom	Document Description: PPT-POWER
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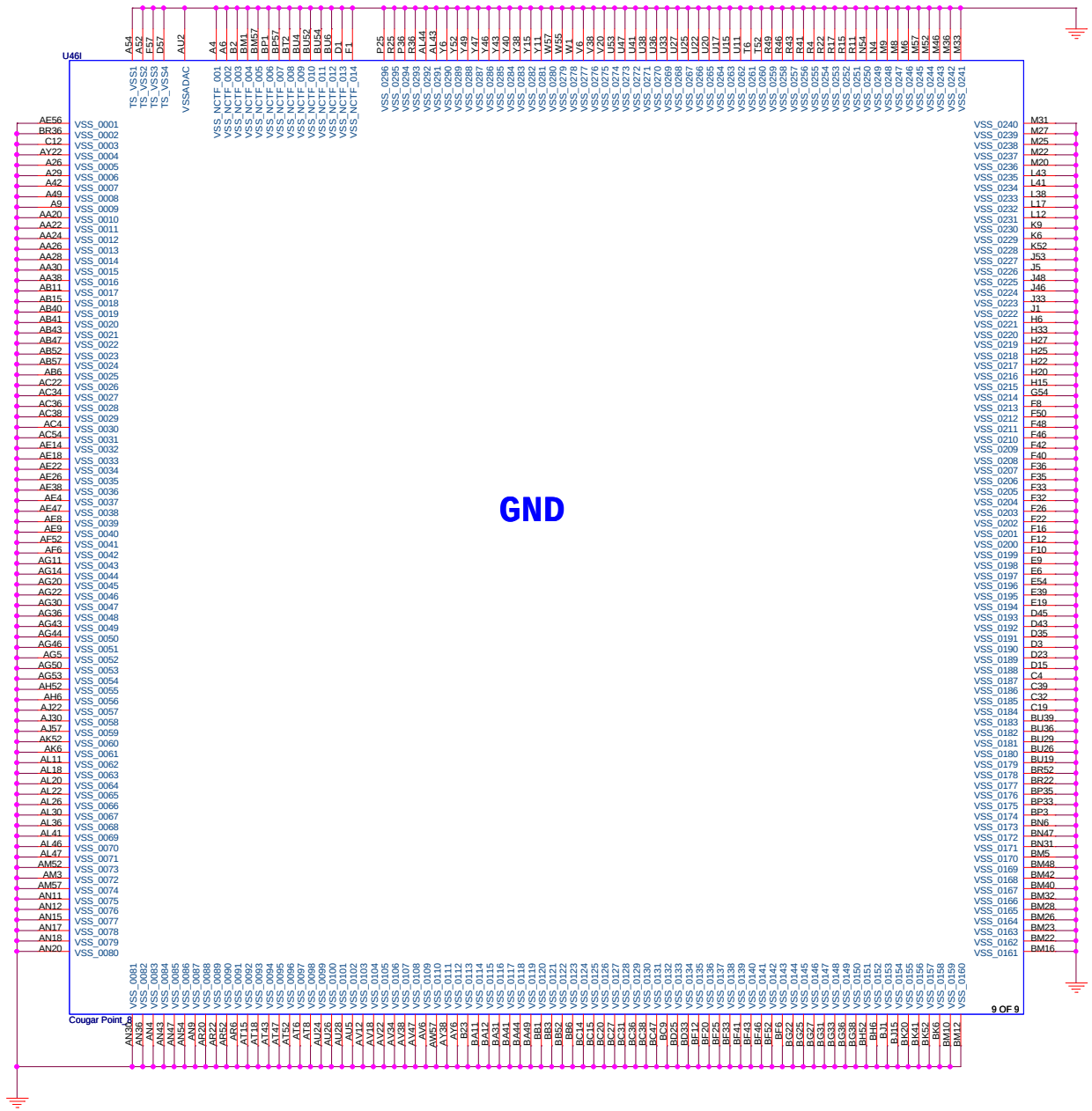

MICRO-STAR INT'L CO.,LTD	
MS-7798	
Size: Custom	Document Description: PPT-GND/NVRAM/USB30
Rev: 1.0	
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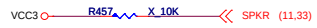
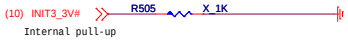
PCH Straps



SPKR
0 : Default Mode:
1 : No Reboot Mode with TCO Disabled:



Do not pull low.

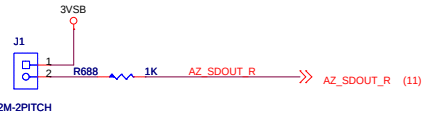
HDA_SYNC
OD PLL VR SUPPLY SEL
0: 1.8V SUPPLY *
1: 1.5V SUPPLY

Internal weak pull down. Do not pull up.

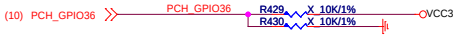
Enable TLS:GPIO15
Pull up with 1k Ohm to VccSus3.3.
Default (Disable TLS):
Leave NC. Internal pull down.

BTM
Leave floating. Do not pull low.
FCIM
Pull low with 1k Ohm to ground.
FCIM. Can be override by
softstrap through ME.

Internal weak pull up. Do not pull low.
On die PLL voltage regulator



Default
Do not pull high.
Disable ME in Manufacturing Mode
Connect to VccSusHDA with 1k Ohm pull-up
resistor through a jumper.



Since Pin has strap functionality that requires internal pull-down to be sampled at rising PWROK, following guidelines are required to be followed:
a) When Used as SATA2GP/SATA3GP for Mechanical Presence detect - Use a weak external pull-up (150K-200K ohms) to Vcc3_3 OR use 10K external pull-up that is enabled only after PLTRST# de-assertion.
b) When Used as GP Input (Pin HW default) – Ensure GPI is not driven high during strap sampling window
When Unused as GPIO or SATA[x]GP – Use 8.2K-10K pull-down to ground.

Since Pin has strap functionality that requires internal pull-down to be sampled at rising PWROK, following guidelines are required to be followed:
a) When Used as SATA2GP/SATA3GP for Mechanical Presence detect - Use a weak external pull-up (150K-200K ohms) to Vcc3_3 OR use 10K external pull-up that is enabled only after PLTRST# de-assertion.
b) When Used as GP Input (Pin HW default) – Ensure GPI is not driven high during strap sampling window
When Unused as GPIO or SATA[x]GP – Use 8.2K-10K pull-down to ground.

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7798	
Size: Custom	Document Description: PPT Strap	Rev: 1.0
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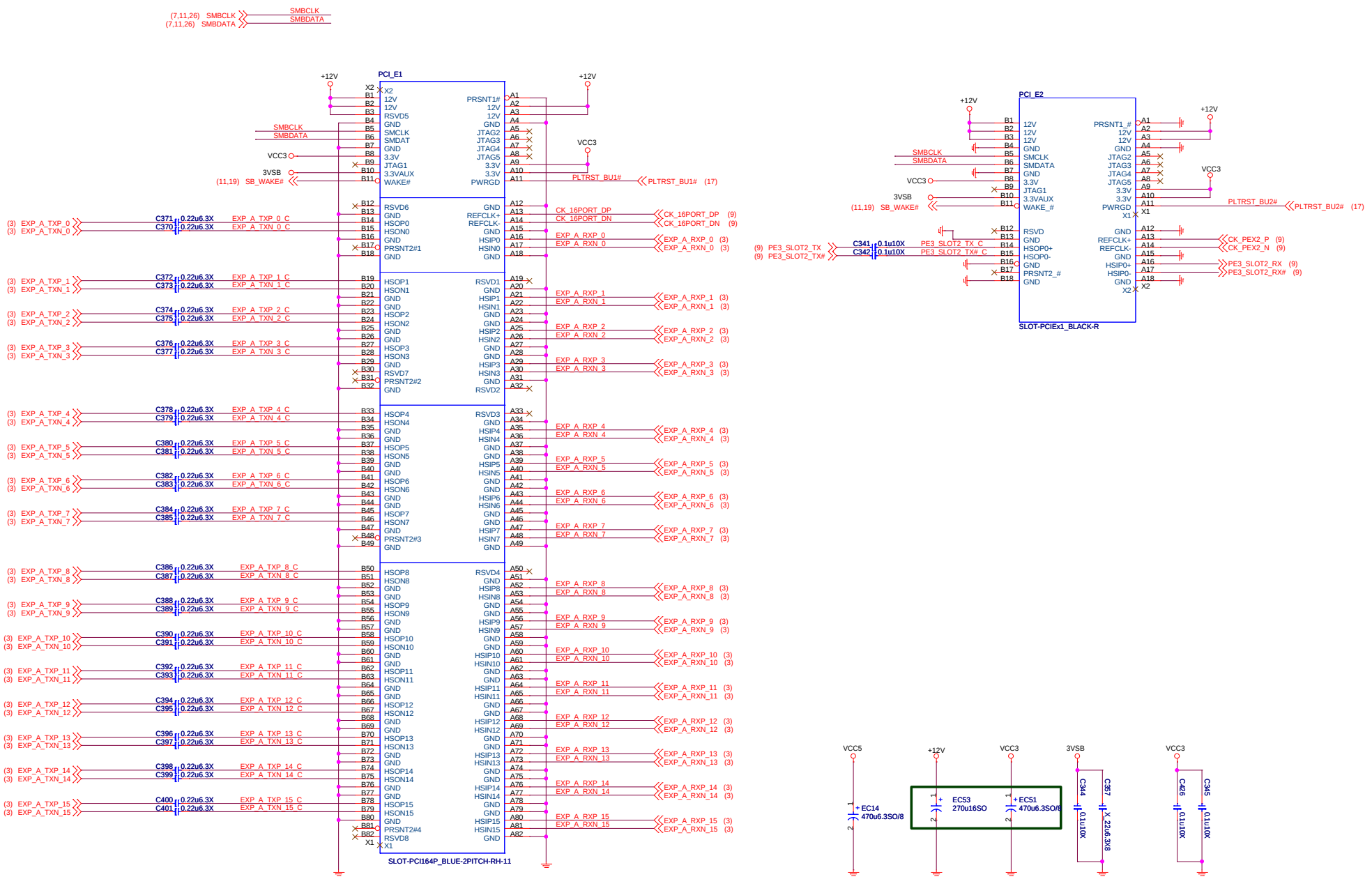

EL 470u16
C94-4711611-R07

MICRO-STAR INT'L CO.,LTD	
MS-7798	
Size: Custom	Document Description: PCIE1(X1) & PCIE2(X16) Slots
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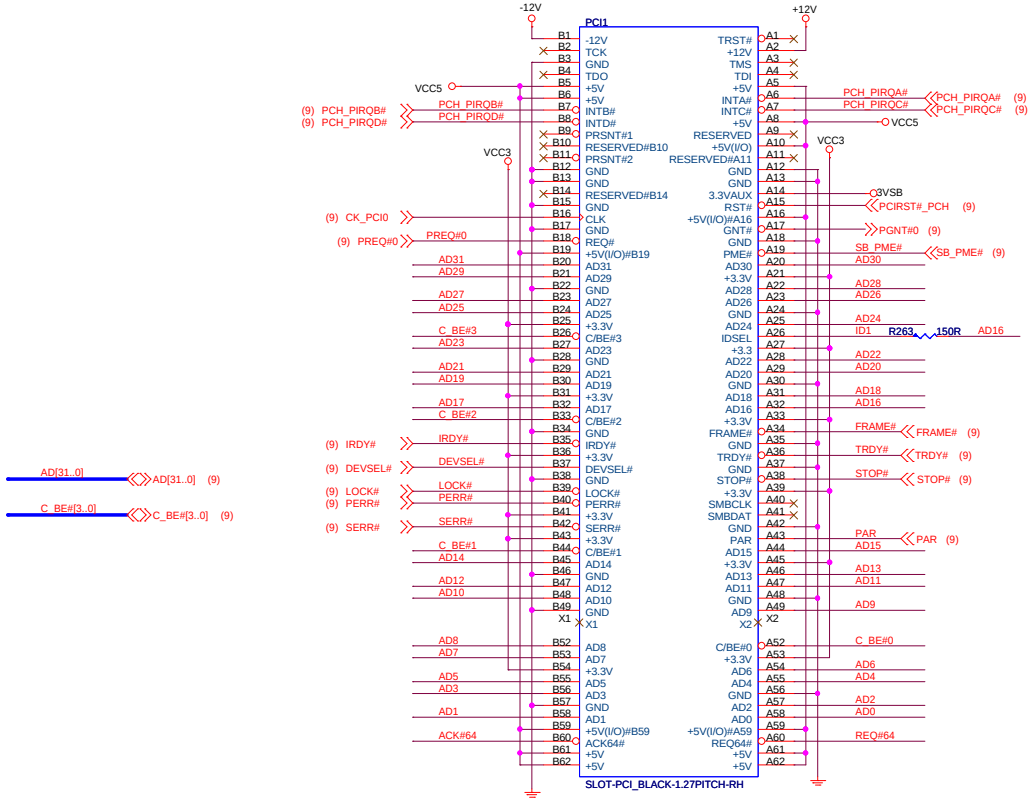

MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: PCI Slots
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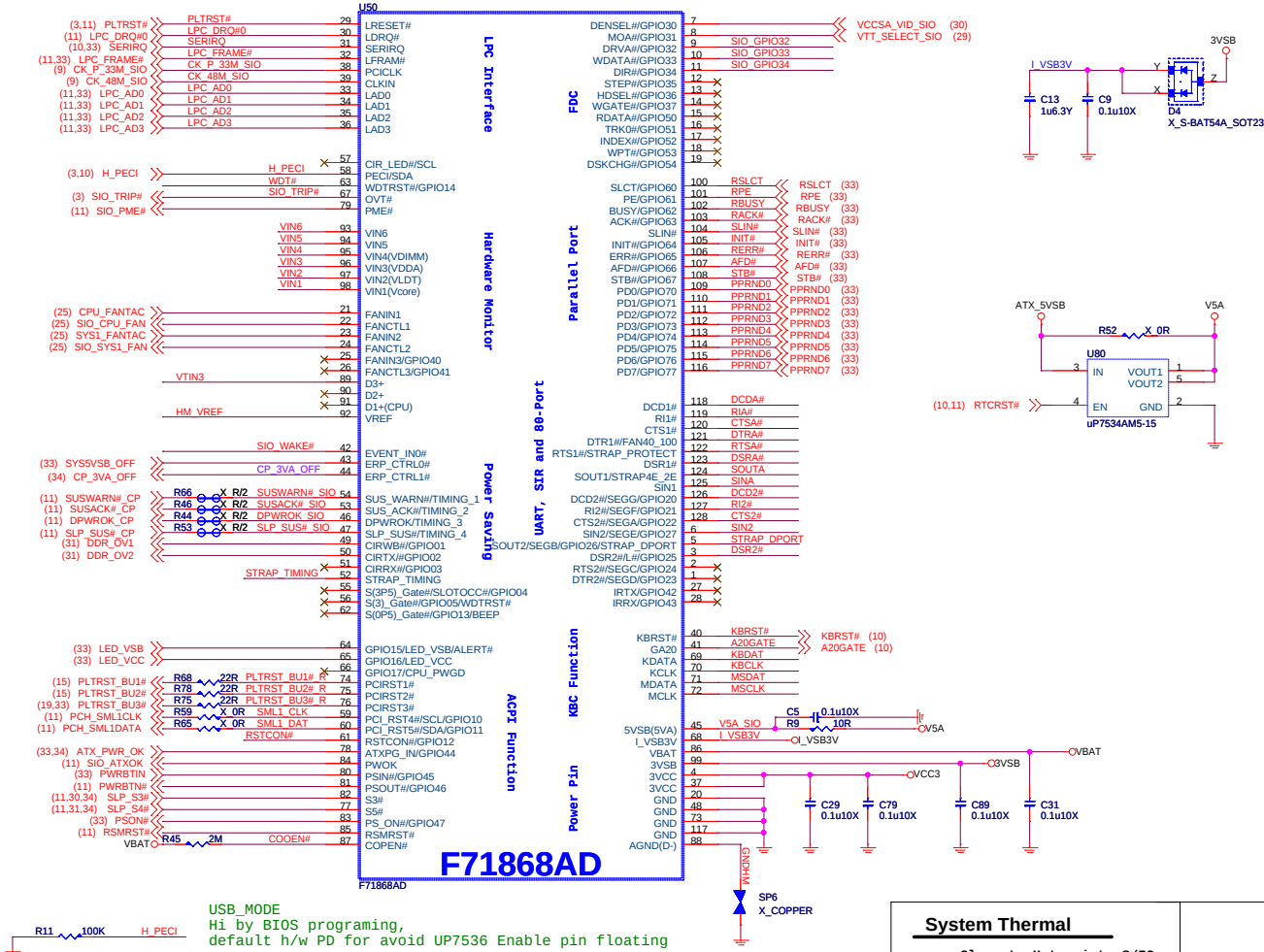
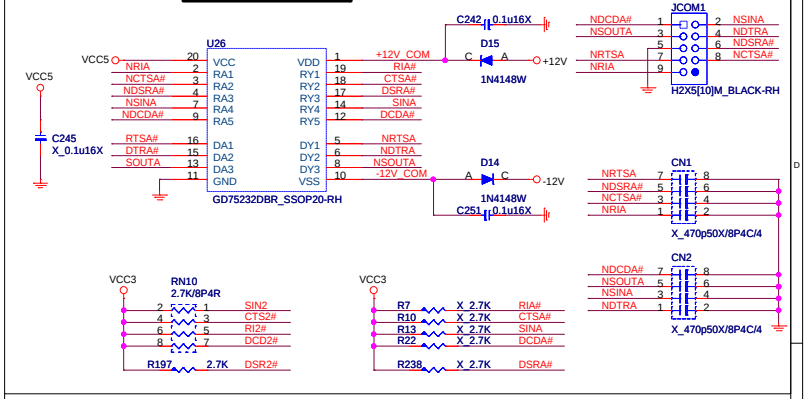
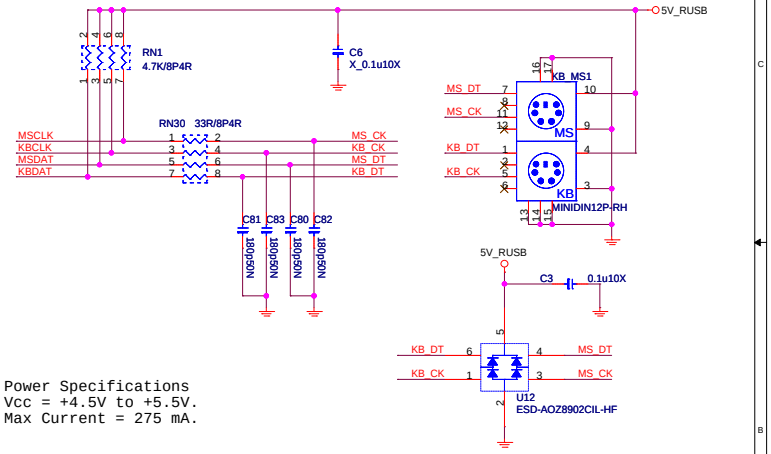


SERIAL PORT 1

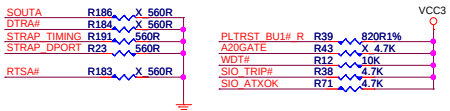


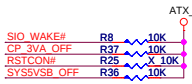
PS2 KEYBOARD & MOUSE CONNECTOR



LPC I/O STRAPPING RESISTOR & Others Pull Hi Resistor

STRAP	Don't STUFF	STUFF
SOUTA	4E	2E
DTRA#	FAN START DUTY 40%	FAN START DUTY 100%
STRAP TIMING	AMD Timing	Intel Courgar point Timing
FANCTL 1/2/3	DAC Mode	PWM Mode
STRAP DPORT(SOUT2)	Enable 80 Port	Disable 80 Port
RTSA#		

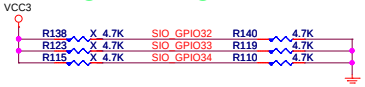




GPIO34 / GPIO33 / GPIO32

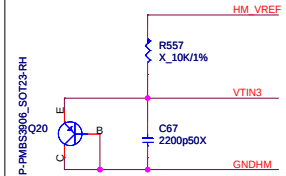
0 0 0

OPT BOM



System Thermal

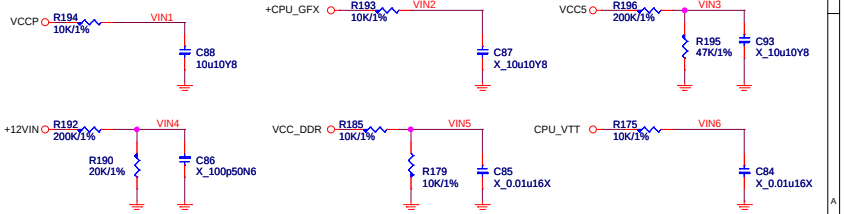
Close to Hot point S/IO



System Thermal

Close to Hot point MOS Q79

HW Monitor - Voltage



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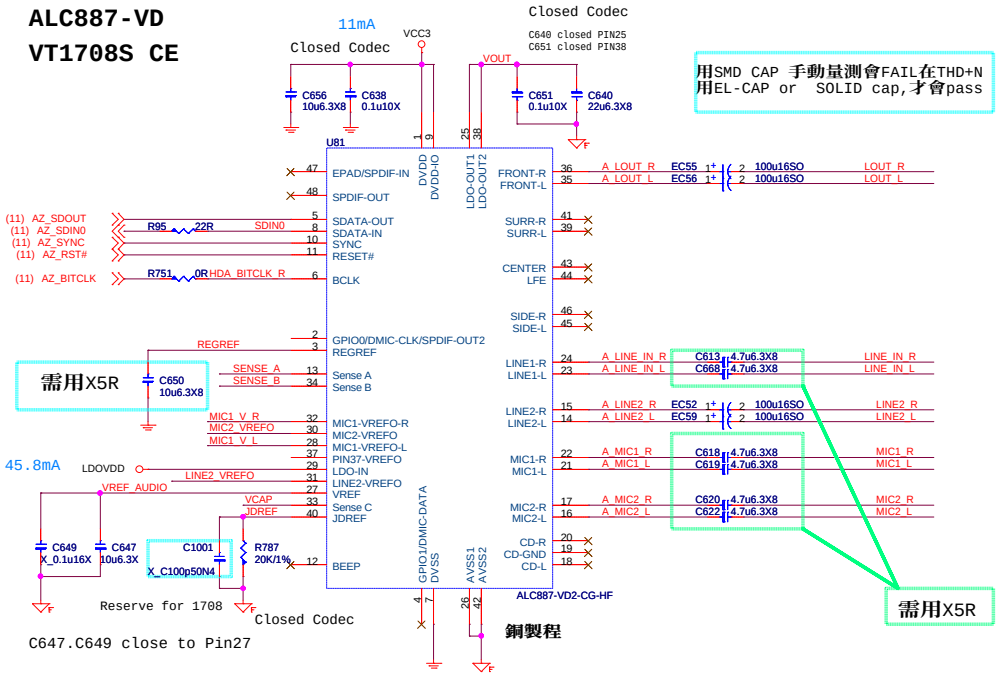
ALC887-VD
VT1708S CE

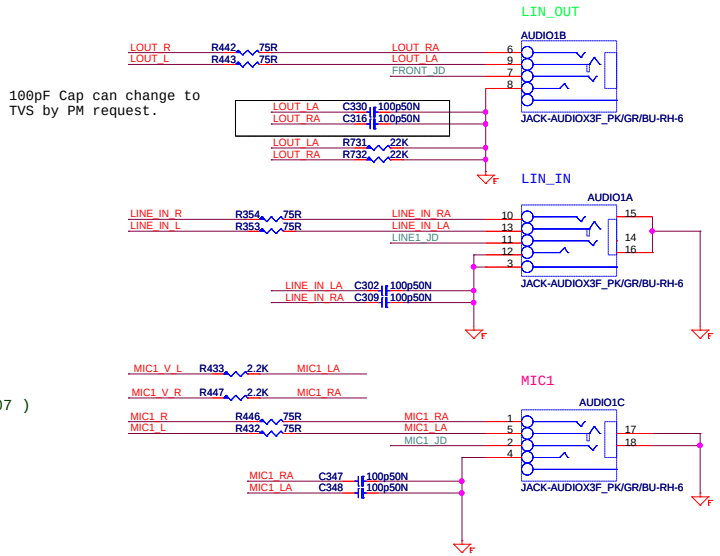


用SMD CAP 手動量測會FAIL在THD+N
用EL-CAP or SOLID cap,才會pass

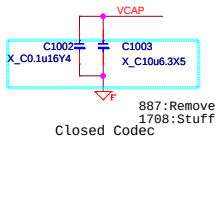
EL 100u (C94-1012511-N07)

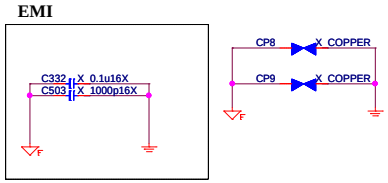
需用X5R

4.7k變為2.2k,麥克風錄音效果變好

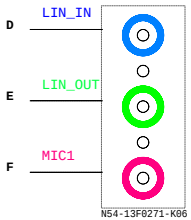


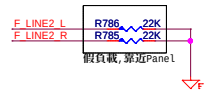
100pF Cap can change to
TVS by PM request.

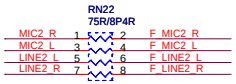


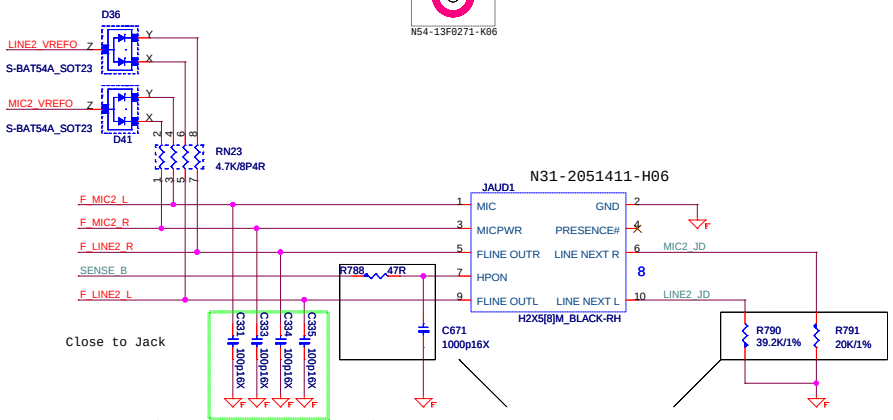


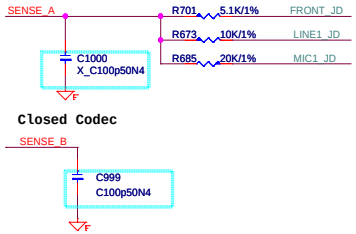
當串接電容有極性時，需上對地電阻

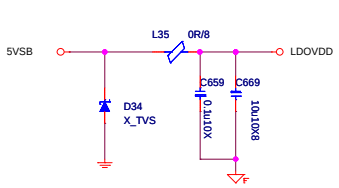












C659,C669 close to L35

SPDIF_OUT

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MS-7798			
Size: Custom	Document Description: Audio Codec ALC887/VT1708S		Rev: 1.0
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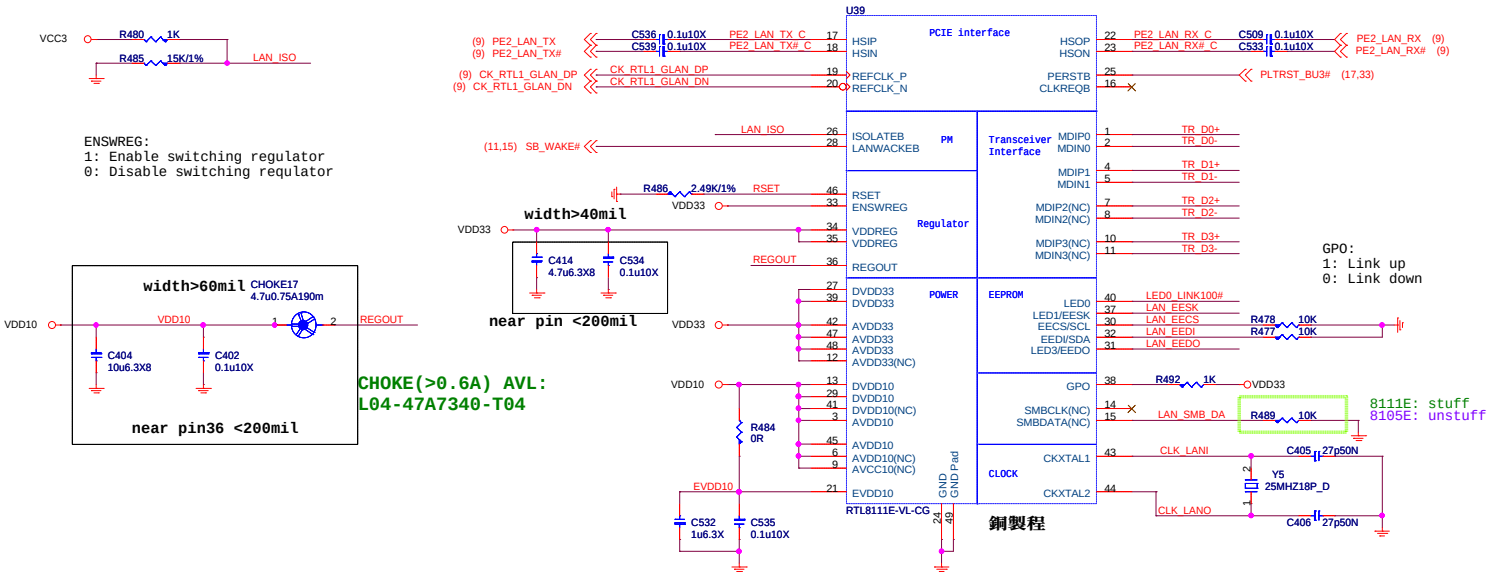
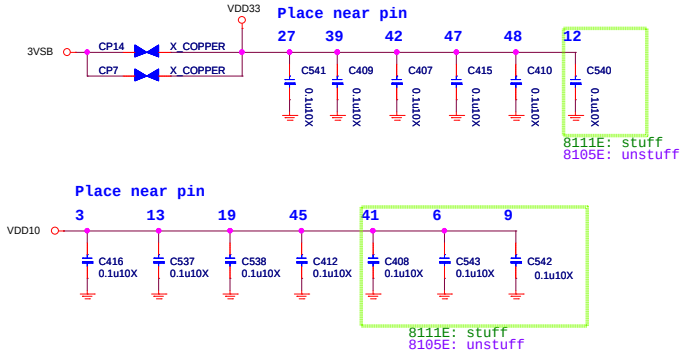
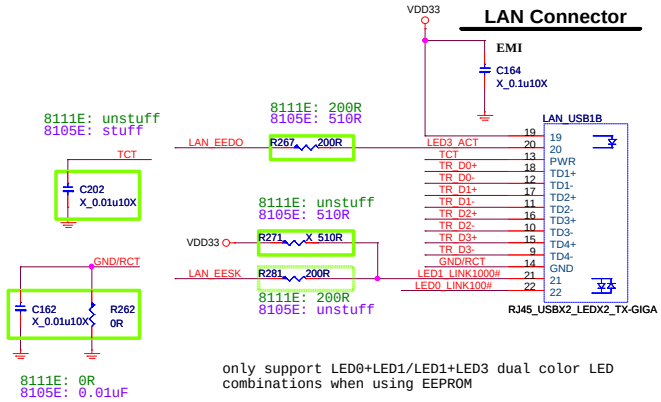
RTL8111E Giga LAN

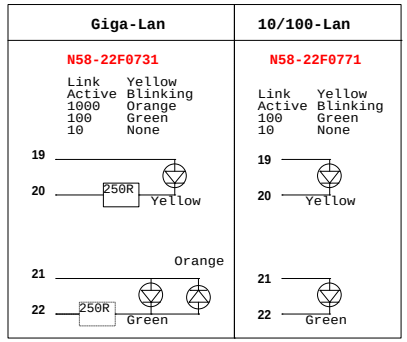
RTL8105E 10/100M LAN

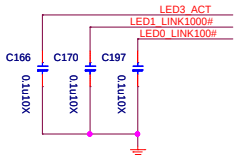


3.3v Power on rise time : 1~100ms. MAX: 163mA









8111E POWER Consumption

	3.3V	mW
10 M Idle/TxRx	12/66	40/218
100 M Idle/TxRx	31/44	102/145
Giga Idle/TxRx	135/163	452/538
ALDPS	4	13

8105E POWER Consumption

	3.3V	mW
10 M Idle/TxRx	14/75	46/248
100 M Idle/TxRx	43/66	142/218
S0 ALDPS	3.2	11

MICRO-STAR INT'L CO.,LTD

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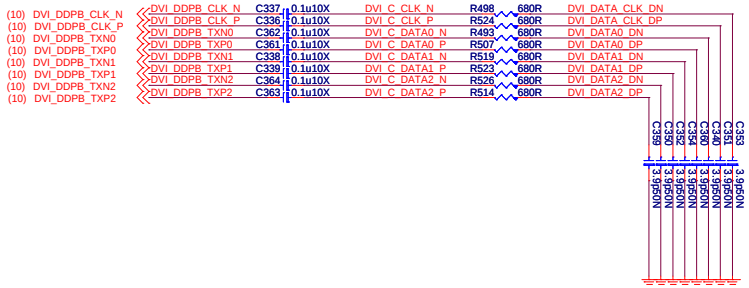
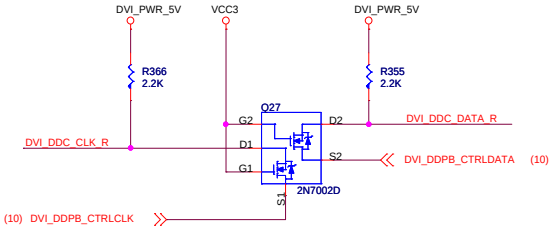
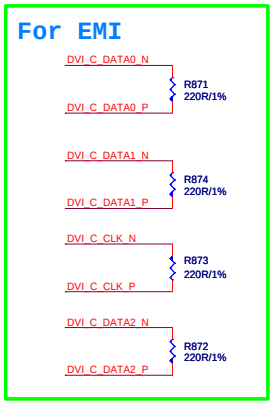
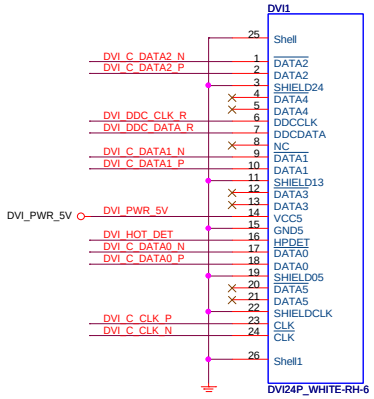
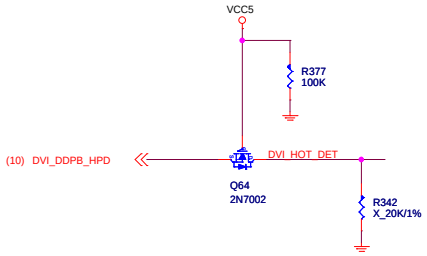
VGA: resolution of 2048x1536 pixels with 32-bit color at 75 Hz (4:3 QXGA)

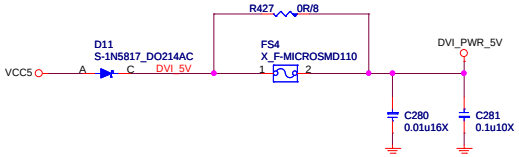


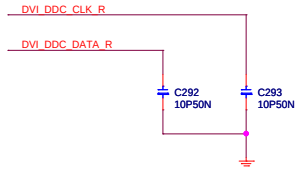












MICRO-STAR INT'L CO.,LTD

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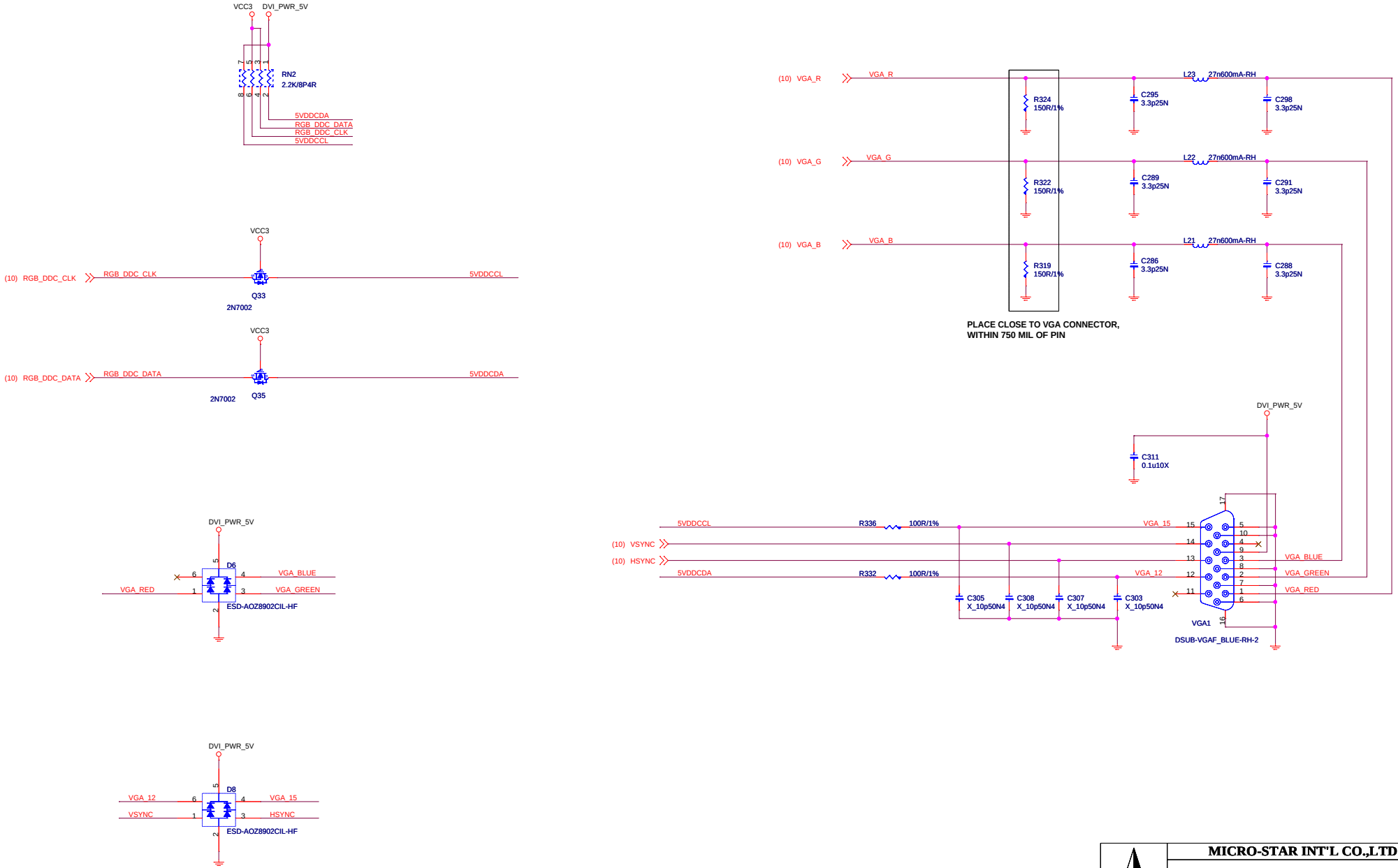
D-Sub

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

Level shift



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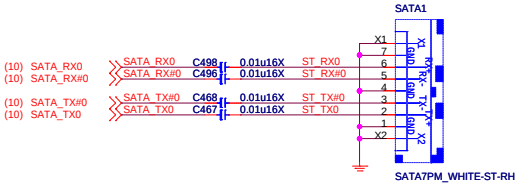
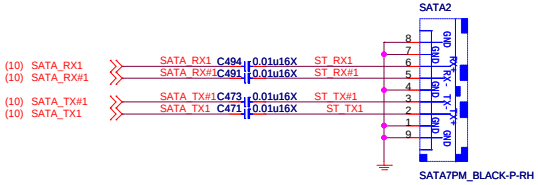
SATA1

3.0

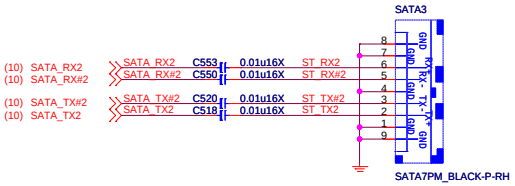
white

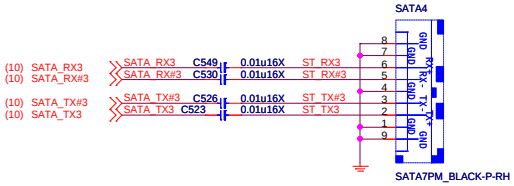


SATA2

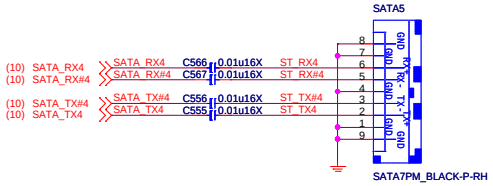


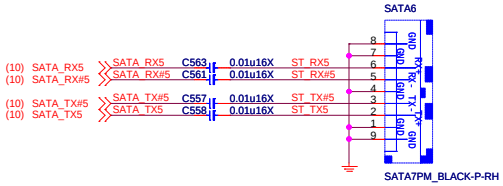
SATA3-4





SATA5-6





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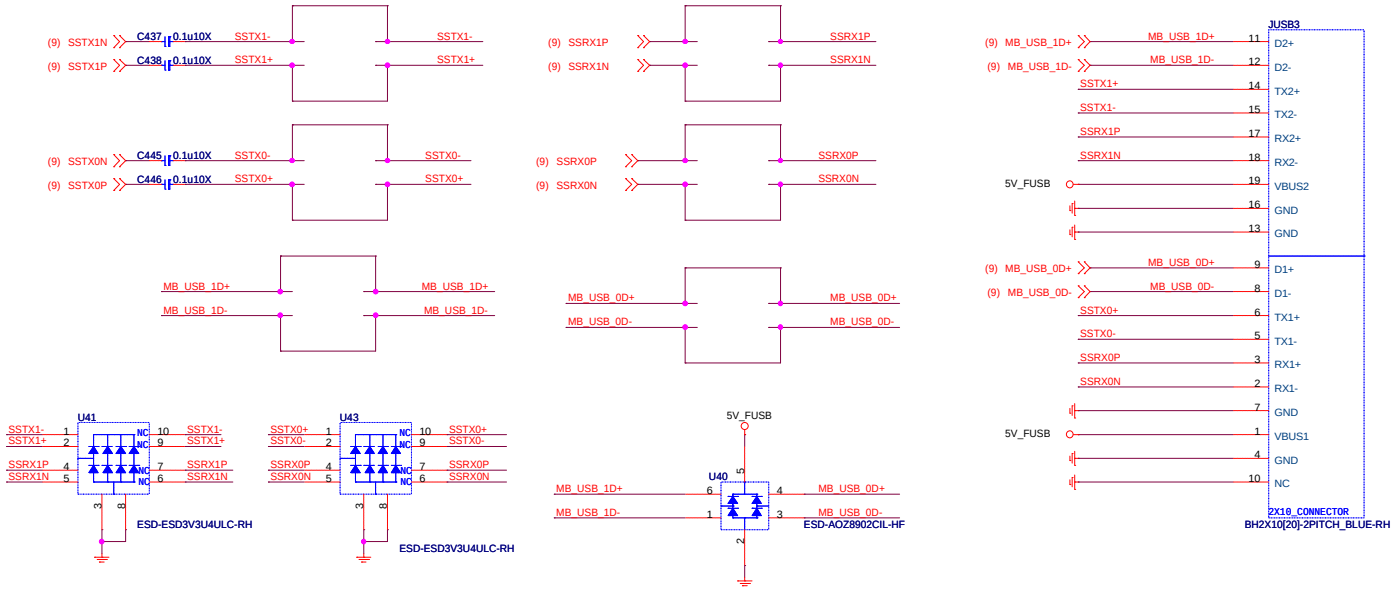
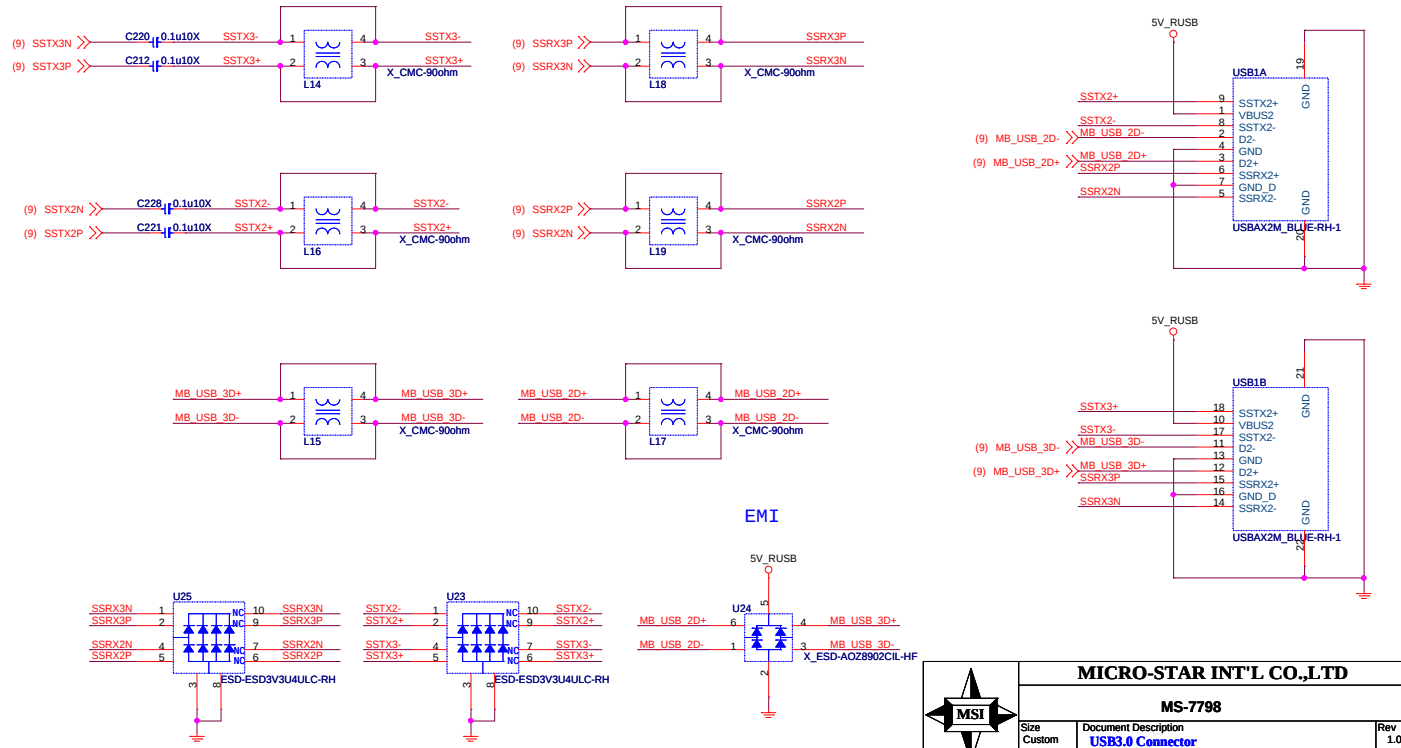
FRONT USB30 PORT 0,1



REAR USB30 PORT 2,3



MICRO-STAR INT'L CO.,LTD

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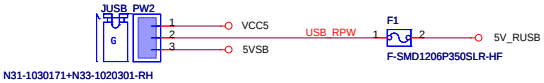
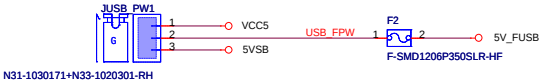
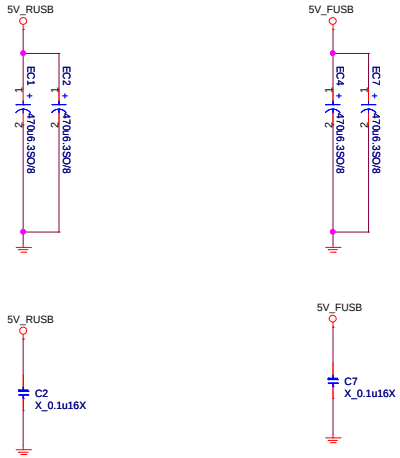
Near Rear ==>

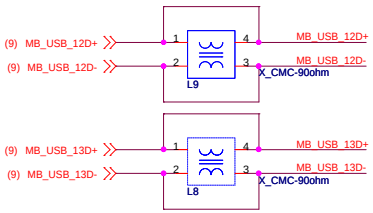


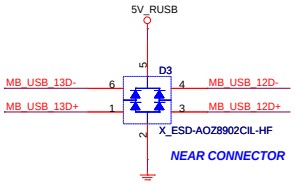
Near Front ==>

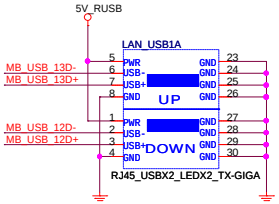




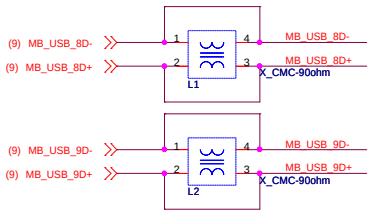
REAR USB PORT 8,9 (With PS2)

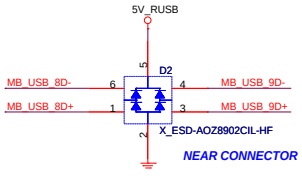


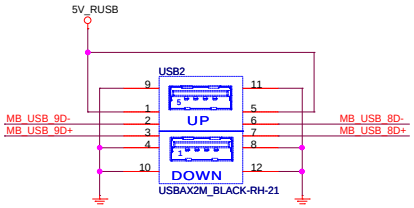




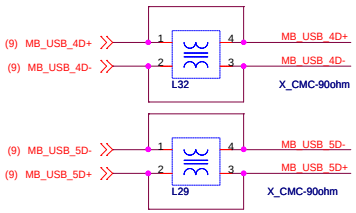
REAR USB PORT 8,9 (With PS2)

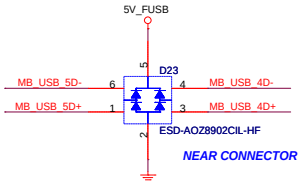


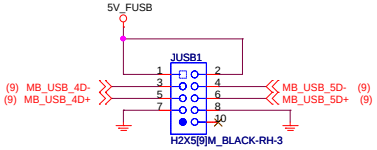




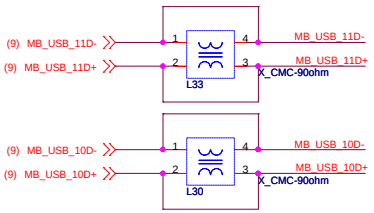
FRONT USB PORT 0,1

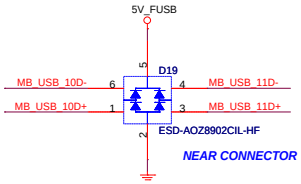


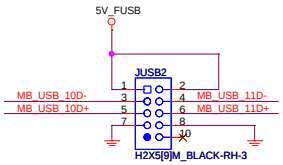




FRONT USB PORT 8,9







FRONT USB PORT 10.11

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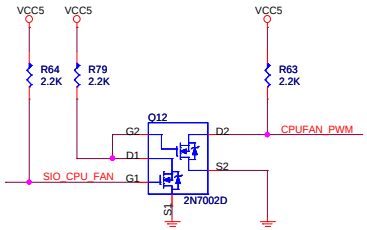
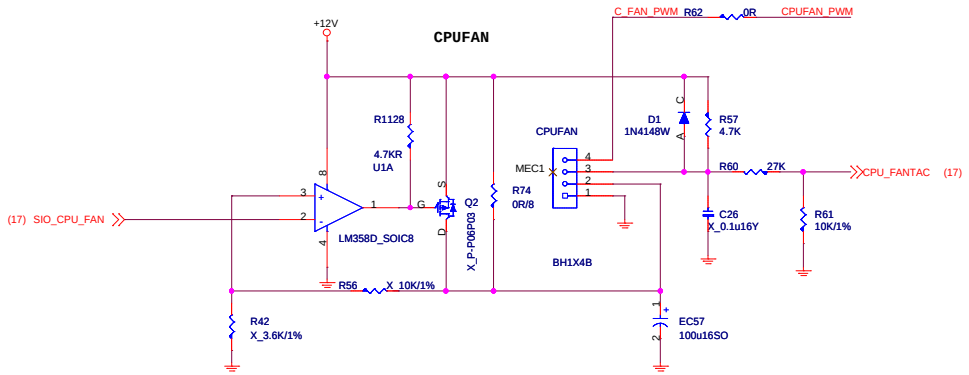
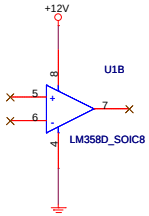
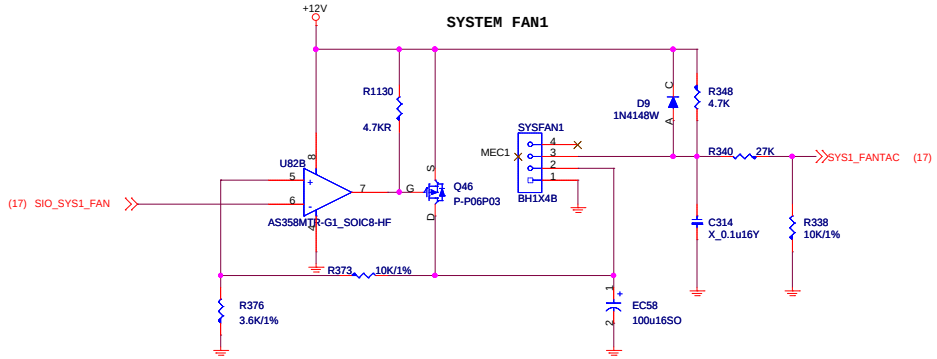
FAN-COUNTROL CIRCUIT

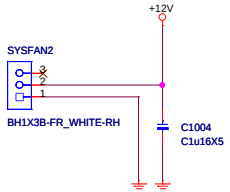








SYSTEM FAN2



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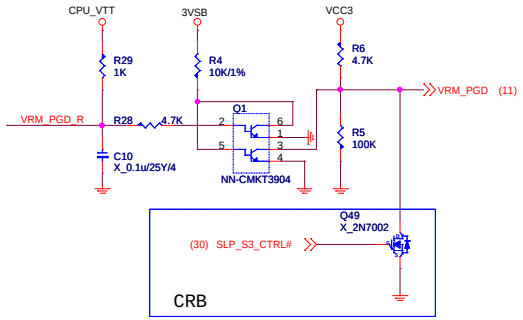
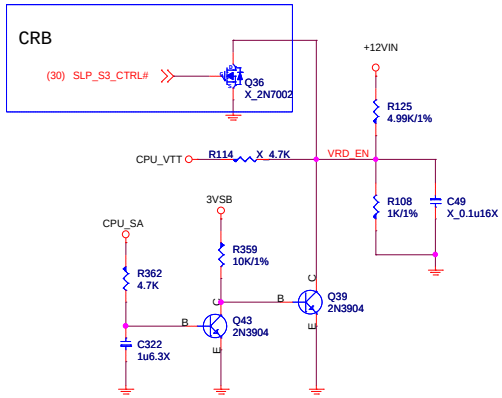
UT501 colay 1625Q+

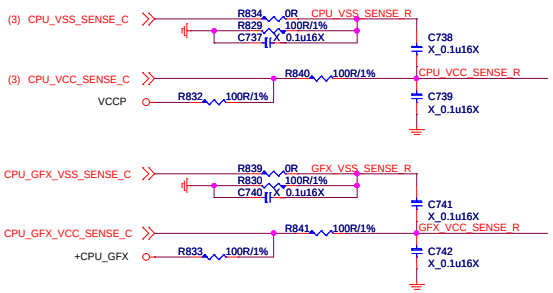
VCORE OCP: 117A

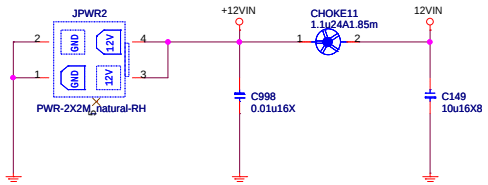
GFX OCP: 52A

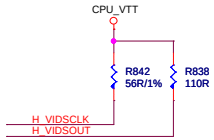
VRMPWRGD LEVEL SHIFT



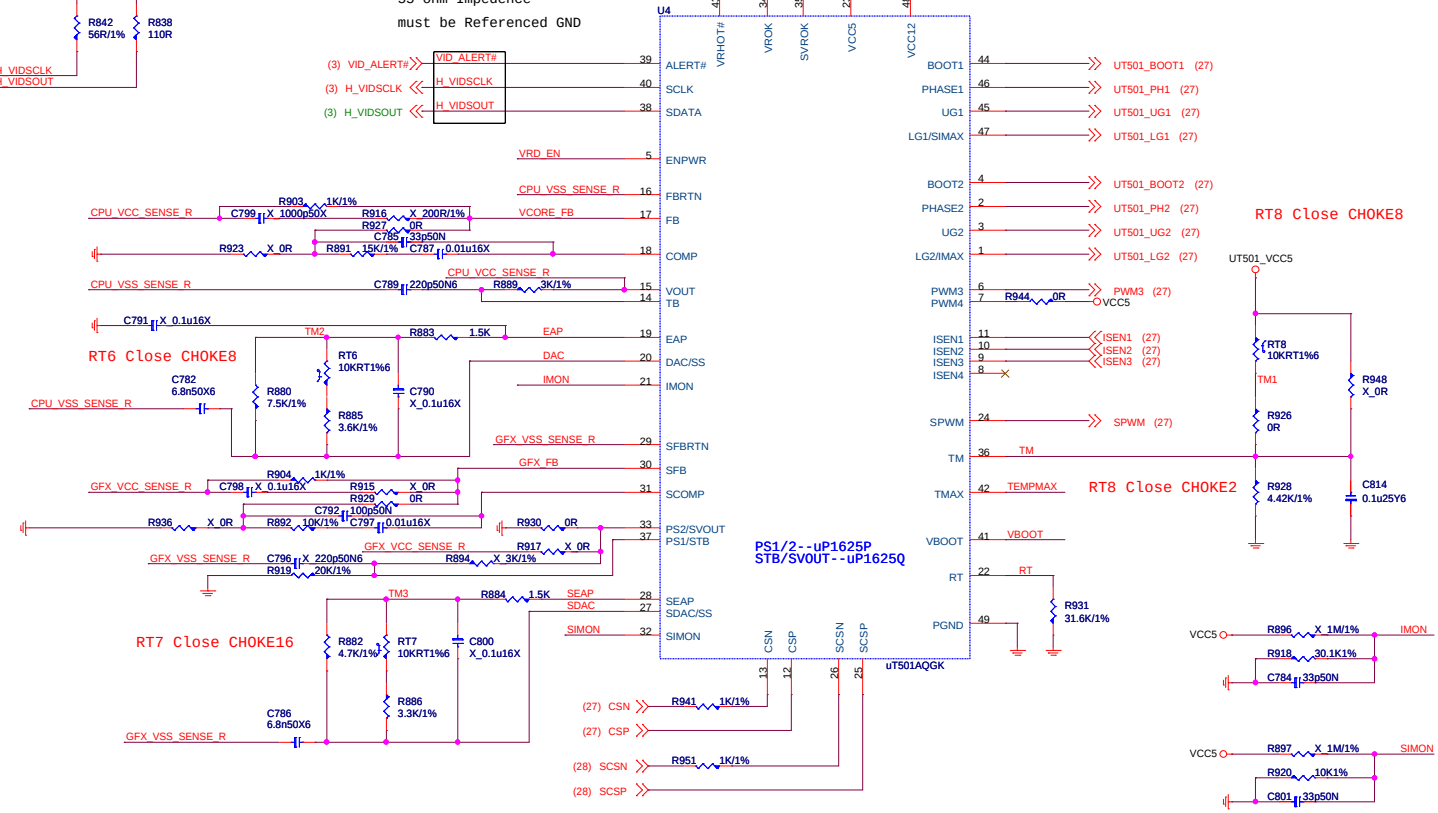








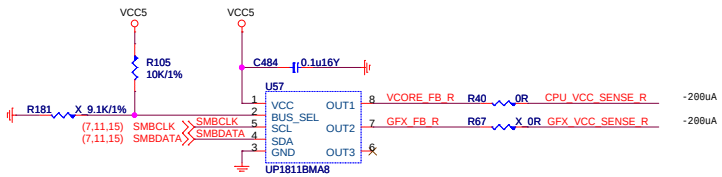
3000mil < L < 6000mil
4mil / 20mil
55 ohm Impedence
must be Referenced GND

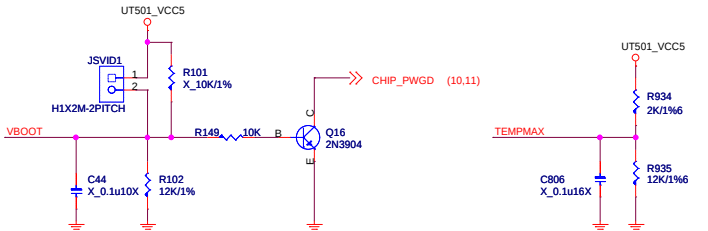


UPI VOLTAGE CONSOLE

0x20:RH=10K,RL=OPEN

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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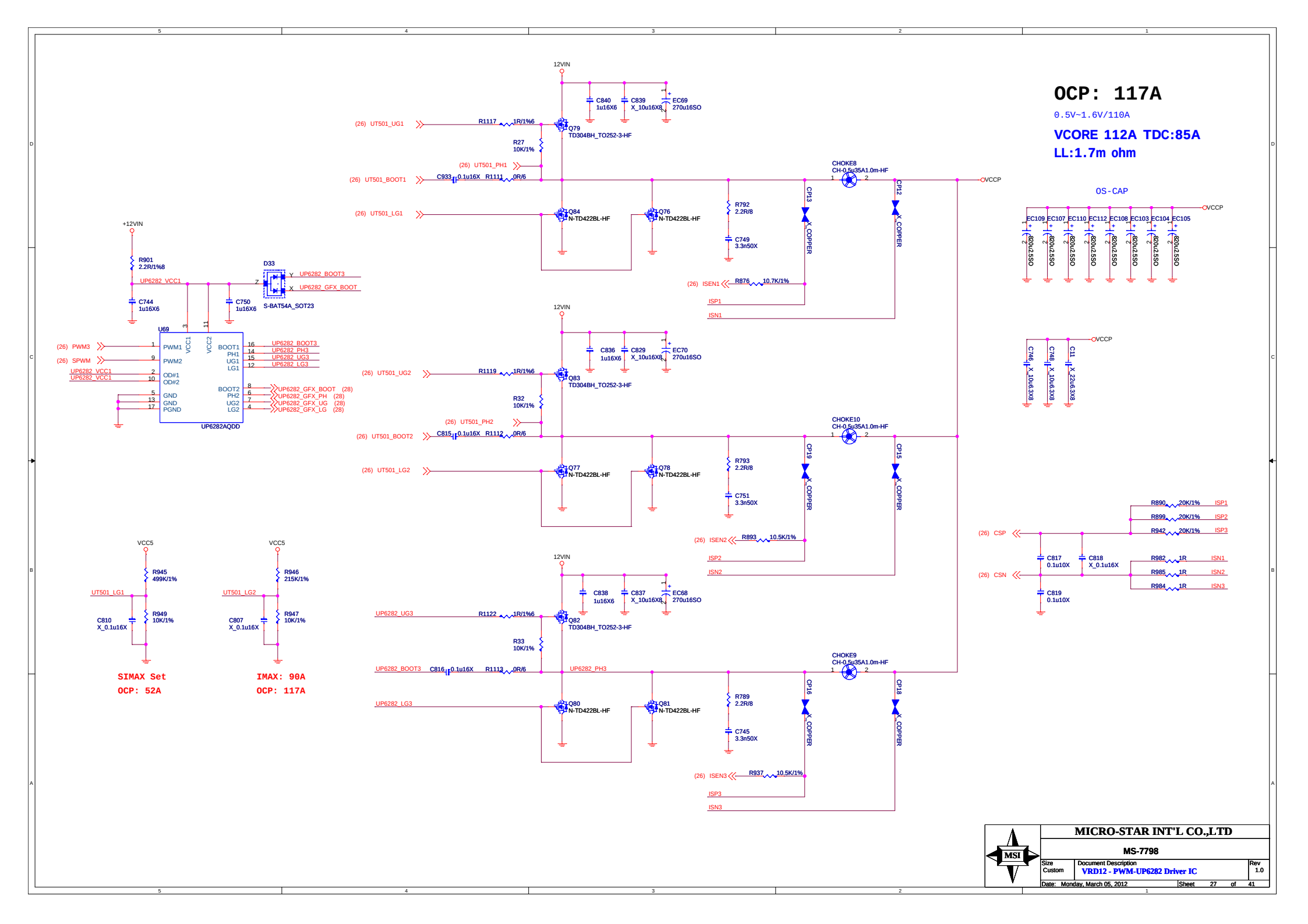
OCP: 117A
0.5V~1.6V/110A
VCORE 112A TDC:85A
LL:1.7m ohm
12VIN
+12VIN
VCCP
VCC5
OS-CAP
U69
UP6282AQDD
D33
S-BAT54A_SOT23
CHOKE8
CH-0.5u35A1.0m-HF
CHOKE10
CH-0.5u35A1.0m-HF
CHOKE9
CH-0.5u35A1.0m-HF
Q79
TD304BH_TO252-3-HF
Q84
N-TD422BL-HF
Q76
N-TD422BL-HF
Q83
TD304BH_TO252-3-HF
Q77
N-TD422BL-HF
Q78
N-TD422BL-HF
Q82
TD304BH_TO252-3-HF
Q80
N-TD422BL-HF
Q81
N-TD422BL-HF
SIMAX Set
OCP: 52A
IMAX: 90A
OCP: 117A
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MS-7798
VRD12 - PWM-UP6282 Driver IC
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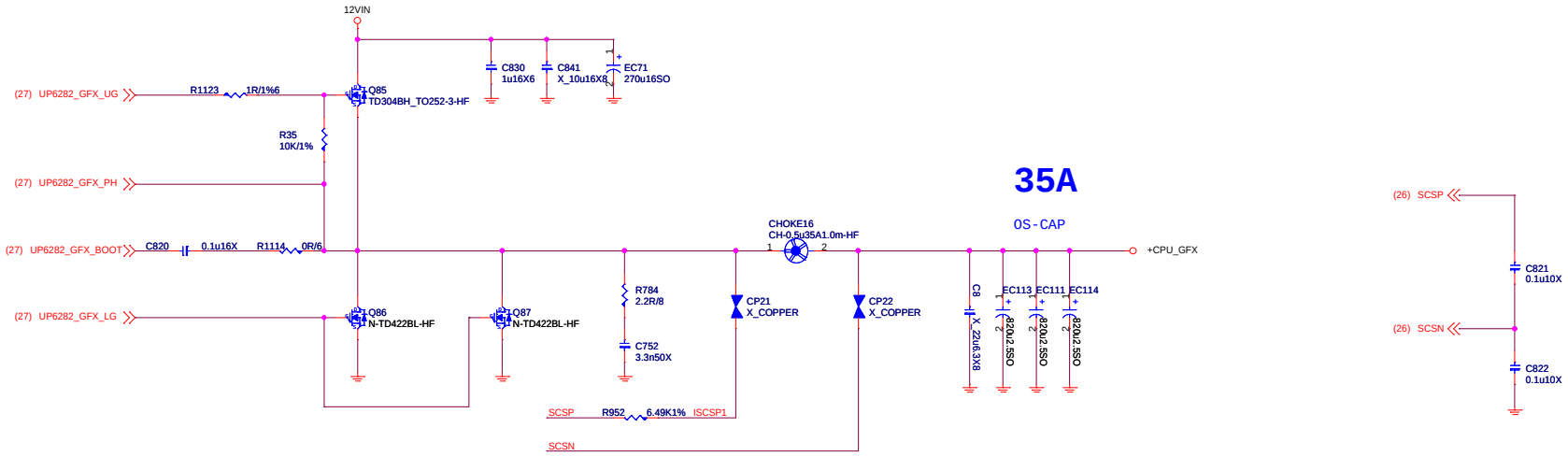
CPU_GFX:0.25-1.52

35A FOR CPU



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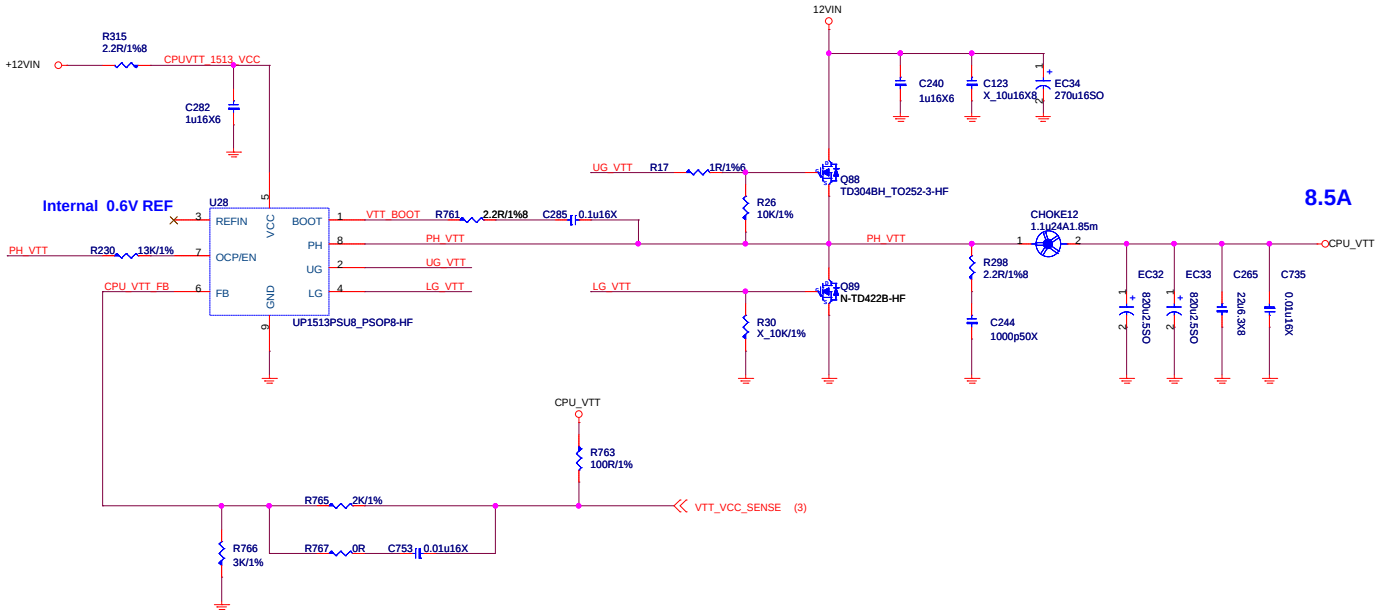
CPU_VTT:1.05/1.00 *MAX 17.3A*

CPU VTT 8.5A SA Core =8.8A

8.5A FOR CPU

Iripple=1.92(vtt)+1.88(sa)
5*1=5A>3.8A

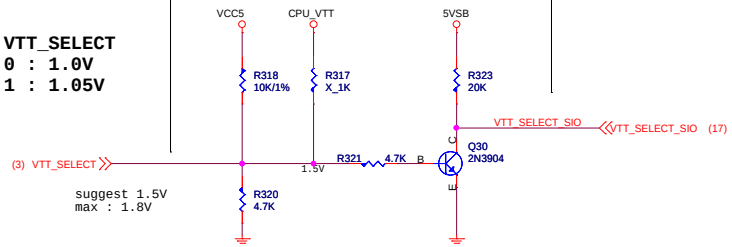


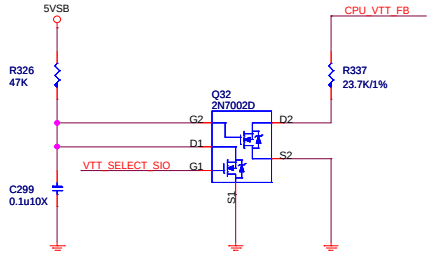
VTT_SELECT	
Ivy Bridge	1.0V
Sandy Bridge	1.05V

VTT_SELECT	
Low	1.0V
High	1.05V

VTT_SELECT Table	
Low	1.05V
High	1.0V

VTT_SELECT
0 : 1.0V
1 : 1.05V





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Size: Custom	Document Description: VTT POWER- uP1513- 1Phase MOS
Rev: 1.0	
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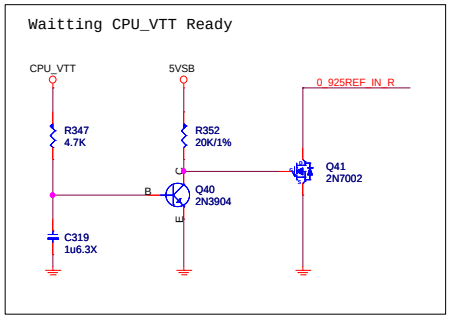
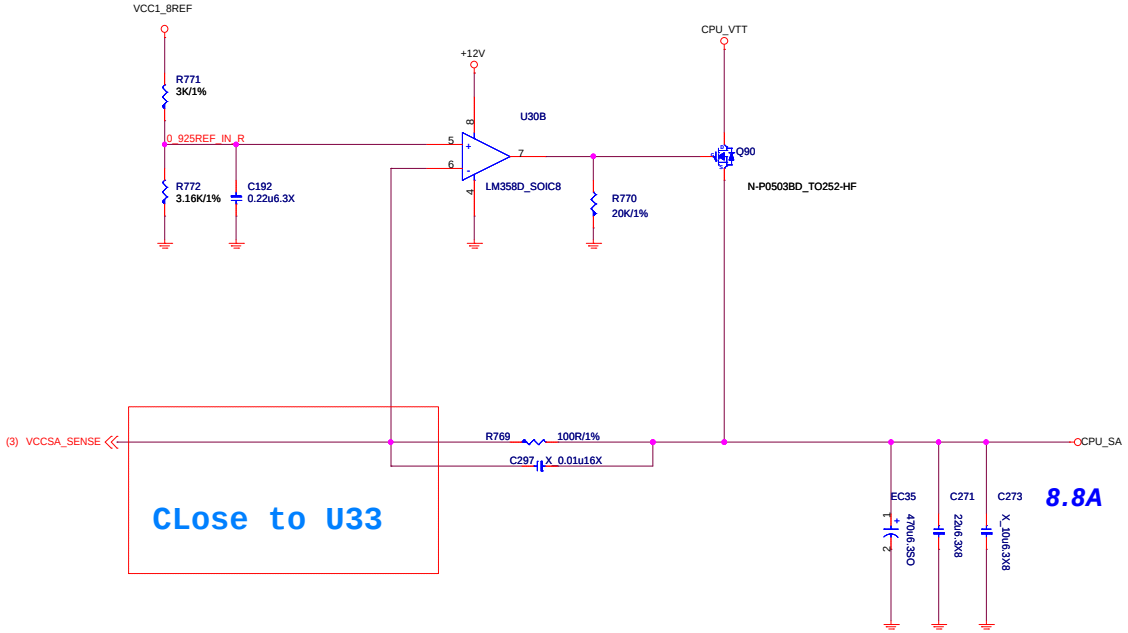
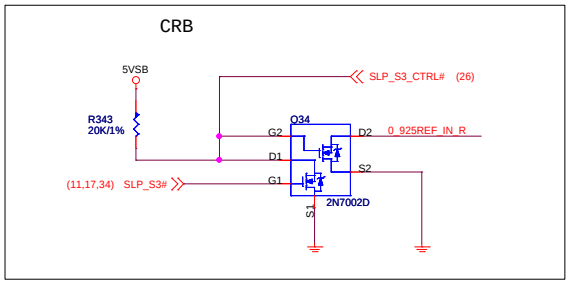
CPU_SA:0.925/0.85

SA Core =8.8A





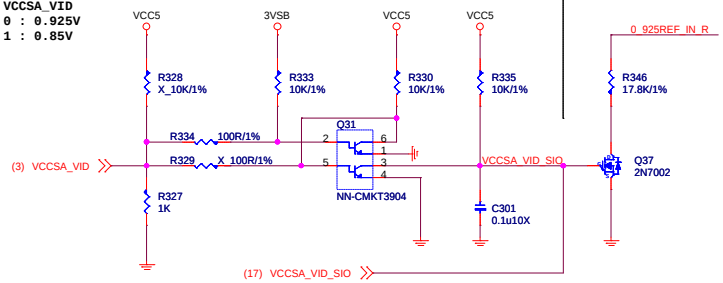


VCCSA_VID	
Low	0.925V
High	0.85V

VCCSA_VID_SIO Table	
Low	0.925V
High	0.85V

VCCSA_VID_SIO Table	
Ivy Bridge	0.85V
Sandy Bridge	0.925V

VCCSA_VID
0 : 0.925V
1 : 0.85V



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Size	Document Description	Rev
Custom	CPU_SA OP+MOS 1-Phase	1.0

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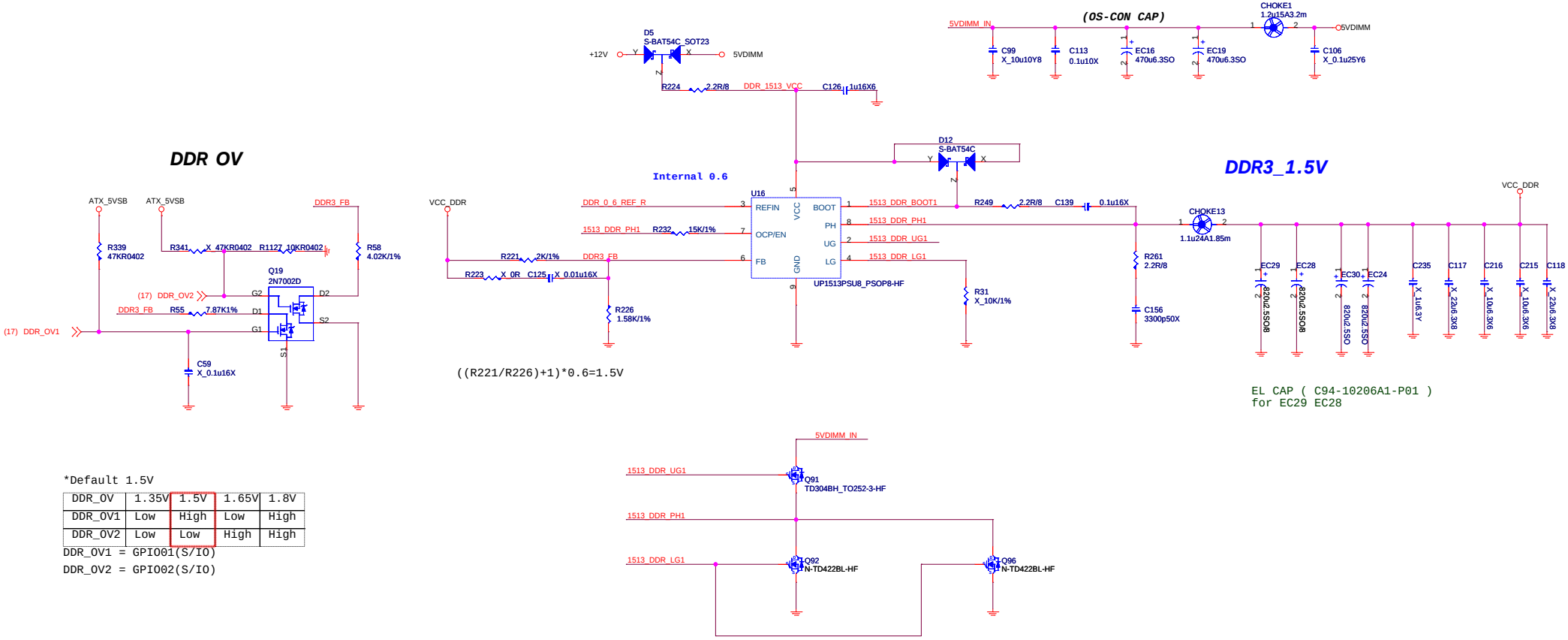
DDR Power:1.5V

DDR3_1.5V FOR CPU+FOR 4DIMM+FOR DDR_VTT=15.7A

Iripple=8A
4.7*2*1=9.4A>8A



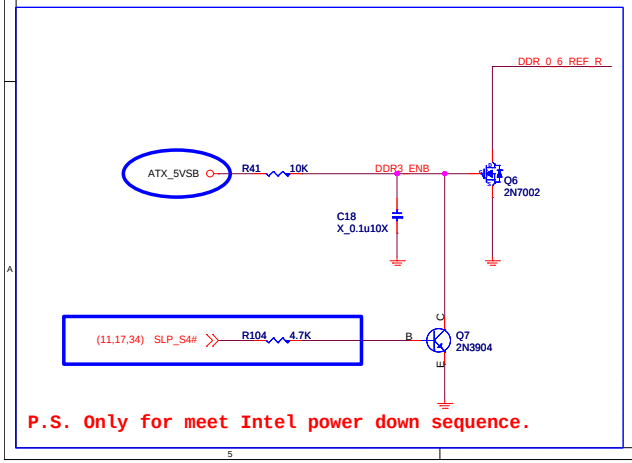
((R221/R226)+1)*0.6=1.5V

EL CAP (C94-10206A1-P01)
for EC29 EC28

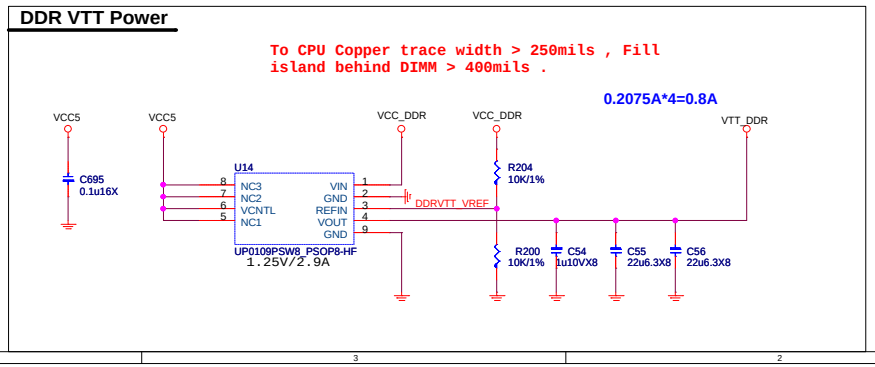
*Default 1.5V

DDR_OV	1.35V	1.5V	1.65V	1.8V
DDR_OV1	Low	High	Low	High
DDR_OV2	Low	Low	High	High

DDR_OV1 = GPIO01(S/IO)
DDR_OV2 = GPIO02(S/IO)



DDR VTT Power



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Size	Document Description	Rev
Custom	DDR Power -UP1513 1-Phase MOS	1.0

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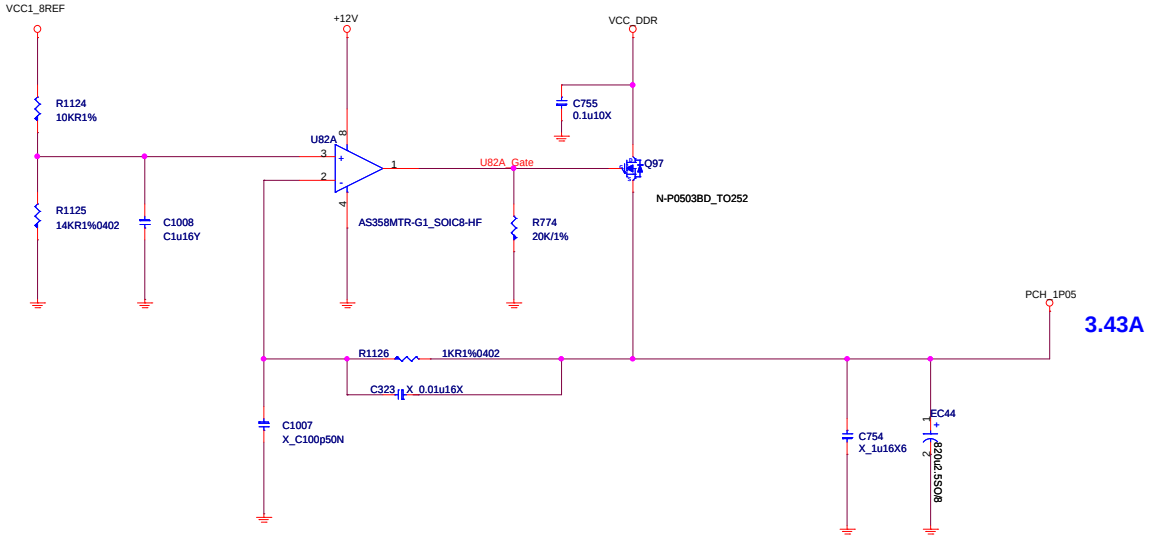
PCH Power:1.05V

PCH Core =3.43A



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	MS-7798	
Size: Custom	Document Description: PCH Power - uP1513 1-Phase MOS	Rev: 1.0
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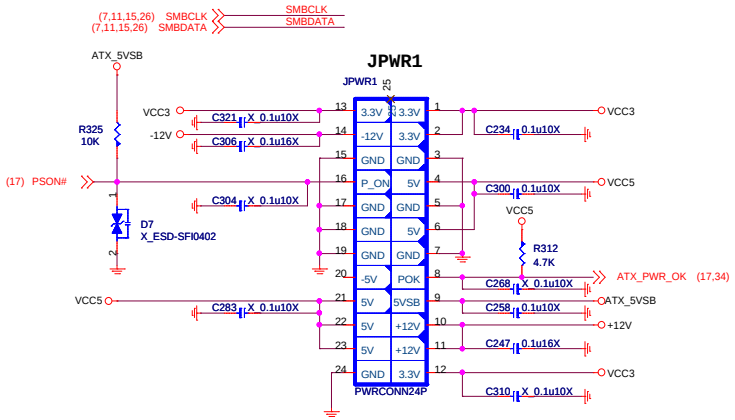
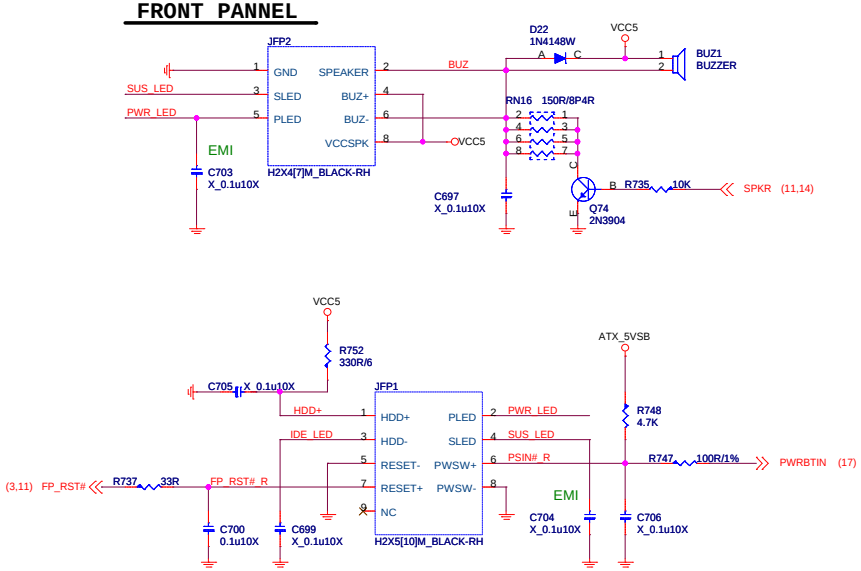
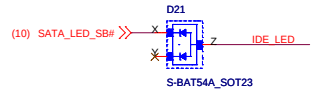
ATX POWER CONNECTOR

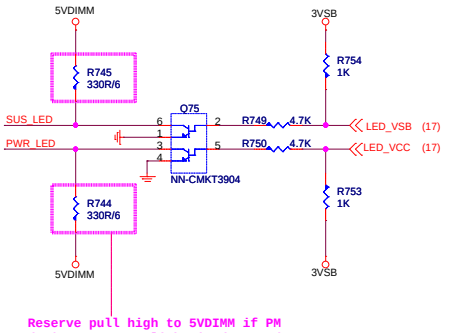


FRONT PANNEL

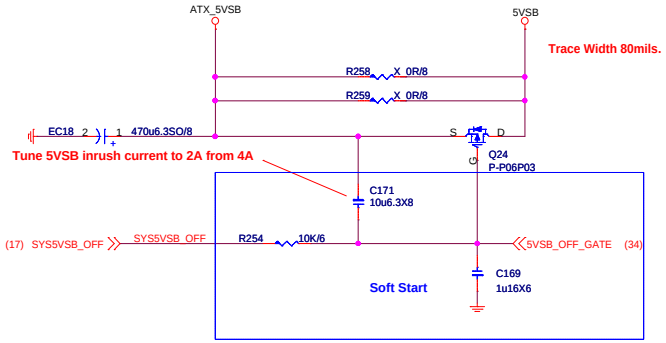




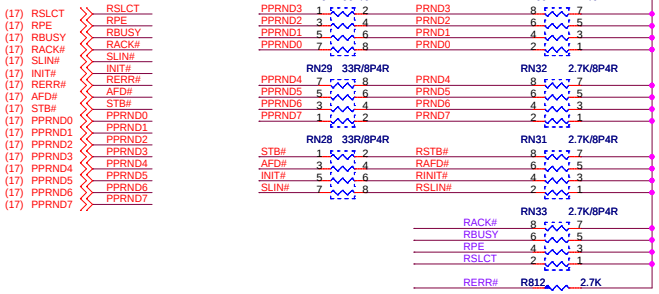
LED (for Fintek 71869)

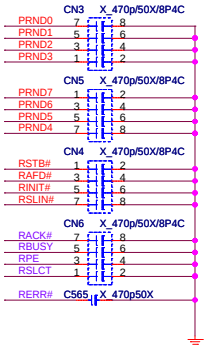


5VSB Power Switch

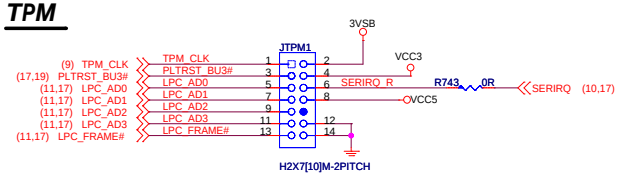


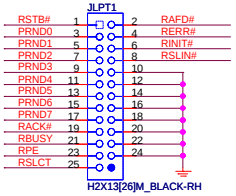
PARALLAL PORT





TPM





N31-2131151-H06 : 2.0mm

N31-2131131-H06 : 2.54mm

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	MS-7798	
Size: Custom	Document Description: ATX F_Panel/EMI/TPM	Rev: 1.0
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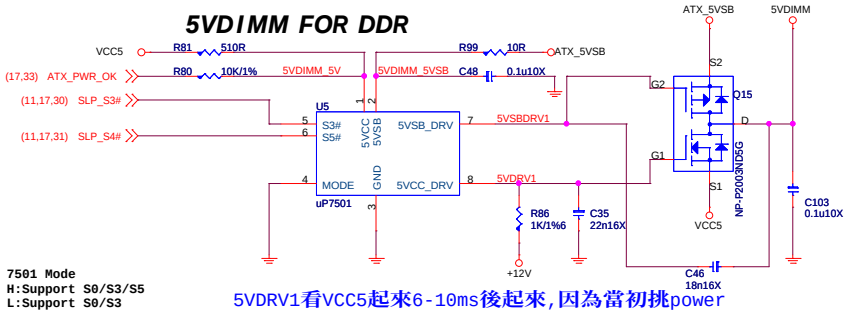
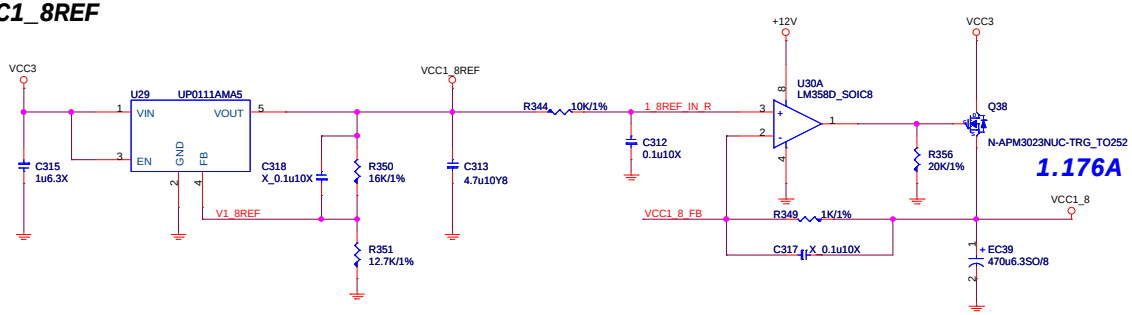
5VDIMM FOR DDR

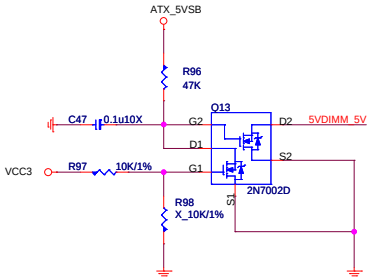


7501 Mode
H:Support S0/S3/S5
L:Support S0/S3

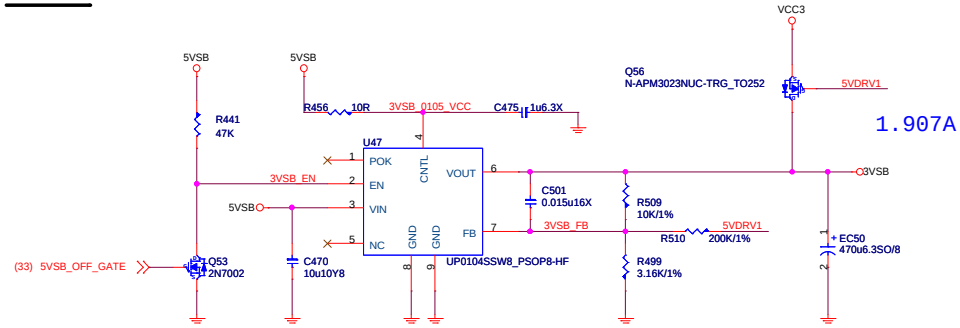
5VDRV1看VCC5起來6-10ms後起來,因為當初挑power

VCC1_8REF

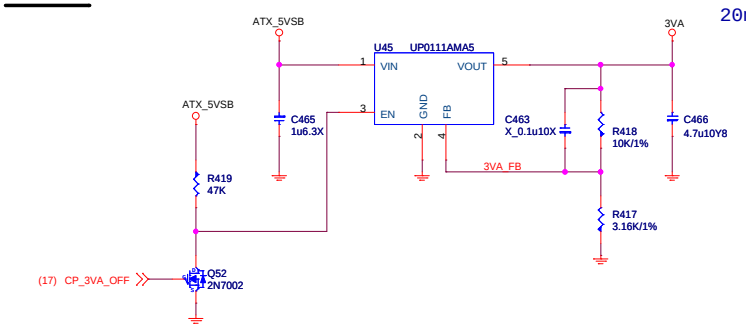




3VSB



3VA



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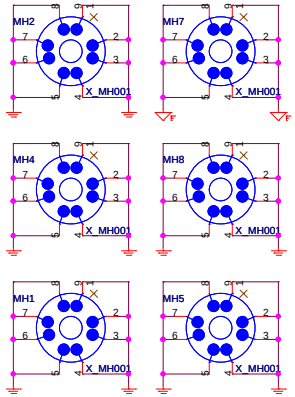
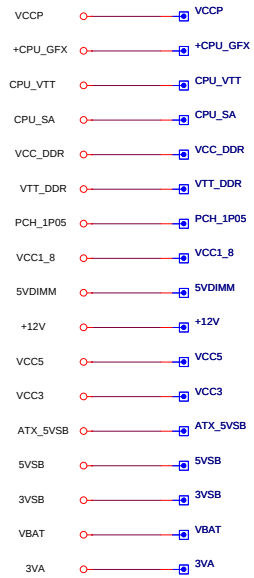
MS-7798_0A

OPT	Configure	BOM	Function

Mounting Holes



Voltage test point



LA2
Label
601-7798-XXX
MKT-LABEL

HDMI_RLA1
Real Label
HDMI
X_HDMI_RLA
HDMI Label Part Number

HDMI_LA1
Label
HDMI
X_HDMI LABEL
HDMI Virtual Part Number

LA1
AMI_BIOS LABLE
BIOS_LABLE

CPU_H1
CPU 鐵座
CPU_H1

LABEL1
X_BUY

LABEL2
X_BUY

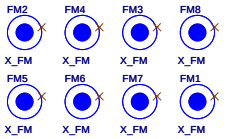
BAT1_X1
BAT-BCR2032P-RH

HS_PCH1
MEC1
MEC2
HS-0403980-RH

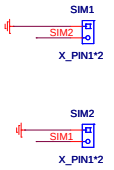
PCB1
7798_0A

PK0-077980A-G37,精成,23,寶安恩斯過廠(MSIS)
PK0-077980A-G37,精成,2,寶安恩斯過廠(MSIS)
PK0-077980A-E48,競華,23,寶安恩斯過廠(MSIS)
PK0-077980A-E48,競華,2,寶安恩斯過廠(MSIS)

Optical Fiducial Marks-120



Simulation



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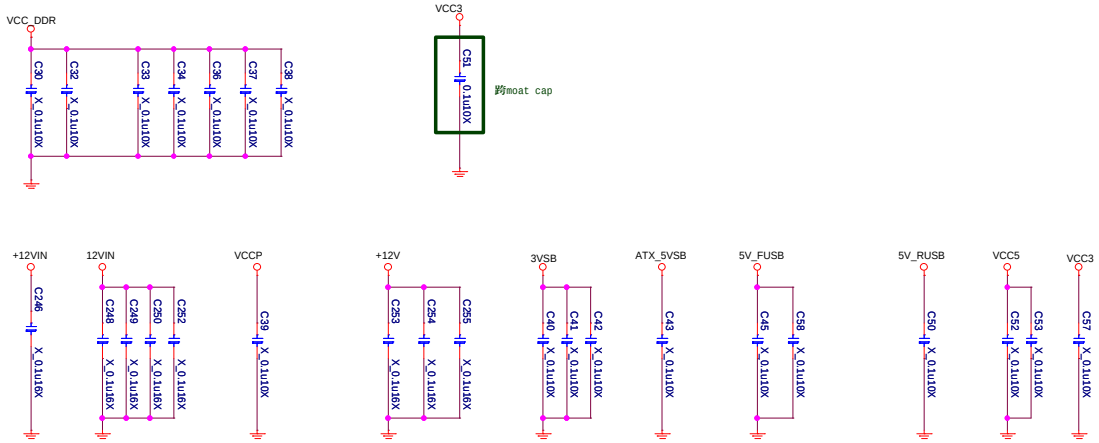

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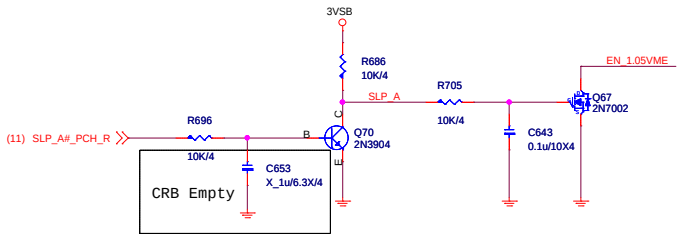
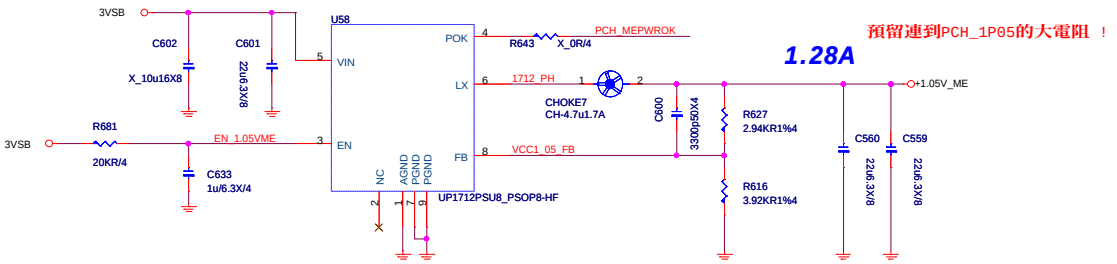
SLP_A

ME Power Control



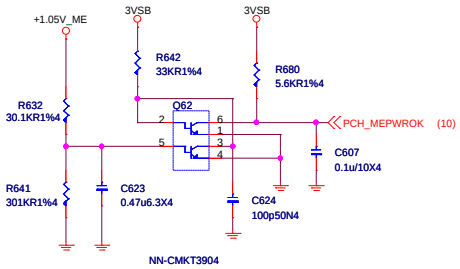
+1.05V_ME(VCCIO_ME)

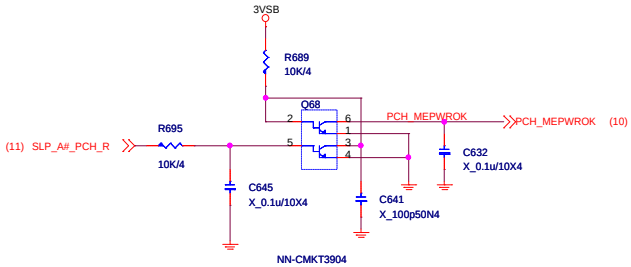


預留連到PCH_1P05的大電阻 ！

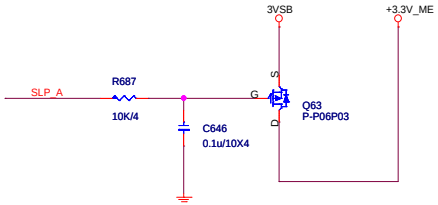
1.28A

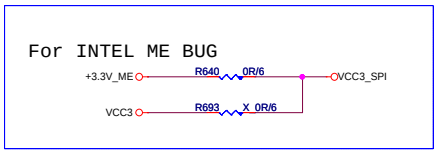
PCH_MEPWROK





+3.3V_ME





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Title: MS-7798		
Size: Custom	Document Number: ME POWER	Rev: 1.0
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