

Model Name:MRNM7AP

Revision 1.0

SHEET

TITLE

01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	PWRGD&RESET MAP
05	POWER DELIVERY CHART
06	CPU_1-PCIE_DMI_FDI_eDP
07	CPU_2-MEM Controller
08	DDRIII CHANNEL A,B
09	CPU_3-PWR
10	CPU_4-GND
11	HDMI,mDP
12	NM70_FDI, DMI,USB,PCI
13	NM70_DISPLAY,GPIO
14	NM70_HOST,SATA,HDA,SPI
15	NM70_CLK BUFFER,PCIE
16	NM70_PWR
17	NM70_GND
18	SIO ITE8773 , FAN,FP
19	AUDIO CODEC ALC887
20	AUDIO JACK
21	RTL8111E-CG/RTL8105E-H
22	LINNER POWER-1
23	DISCRETE POWER
24	AD19V & VCC5 & VCC3
25	VCORE & VCPU_VAXG NCP6131
26	
27	

SHEET

TITLE

28	
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31	
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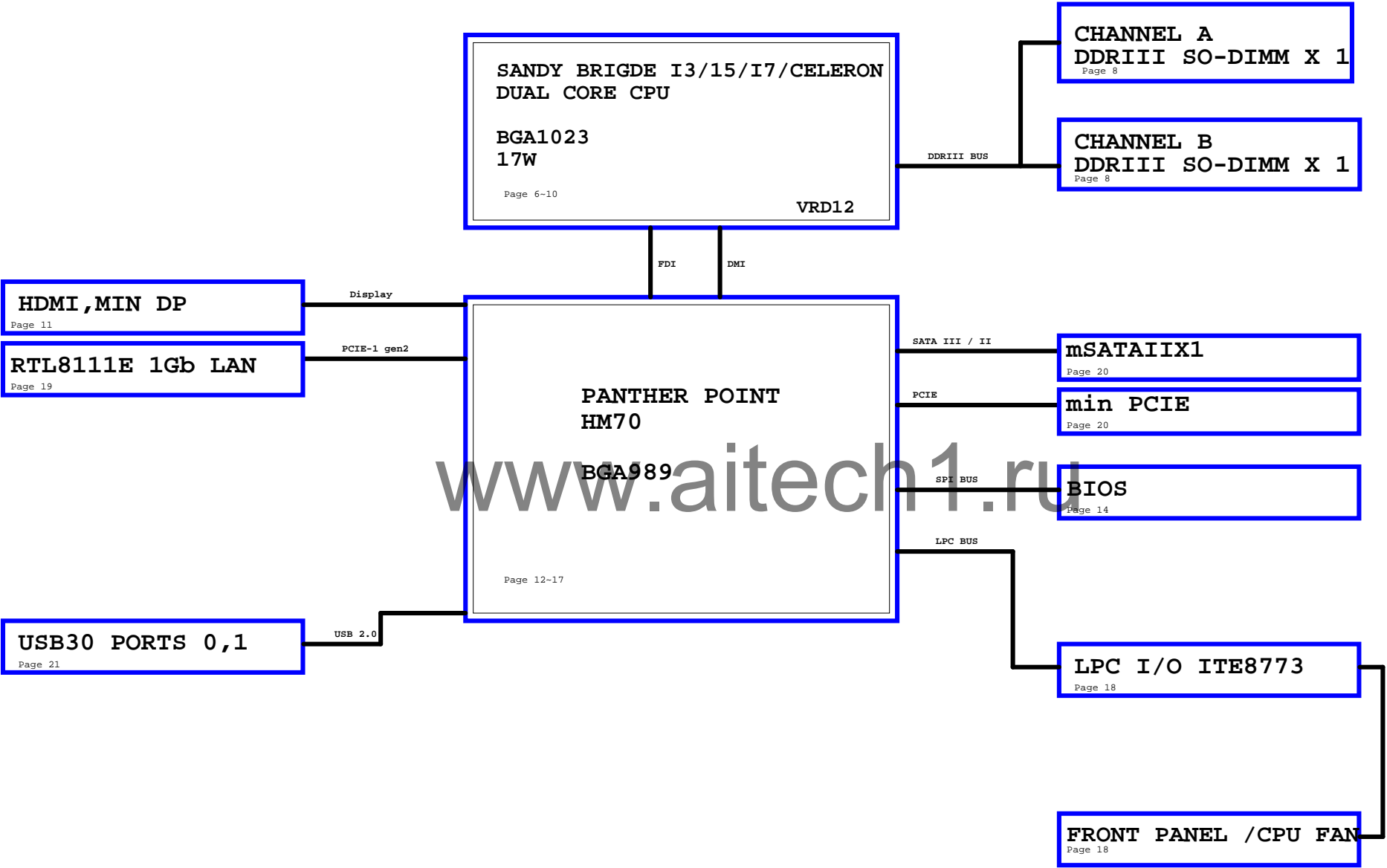
GIGABYTE TECHNOLOGIES, INC.

Title			
Cover Sheet			
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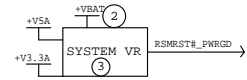
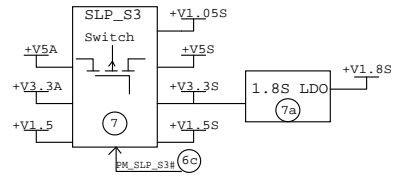
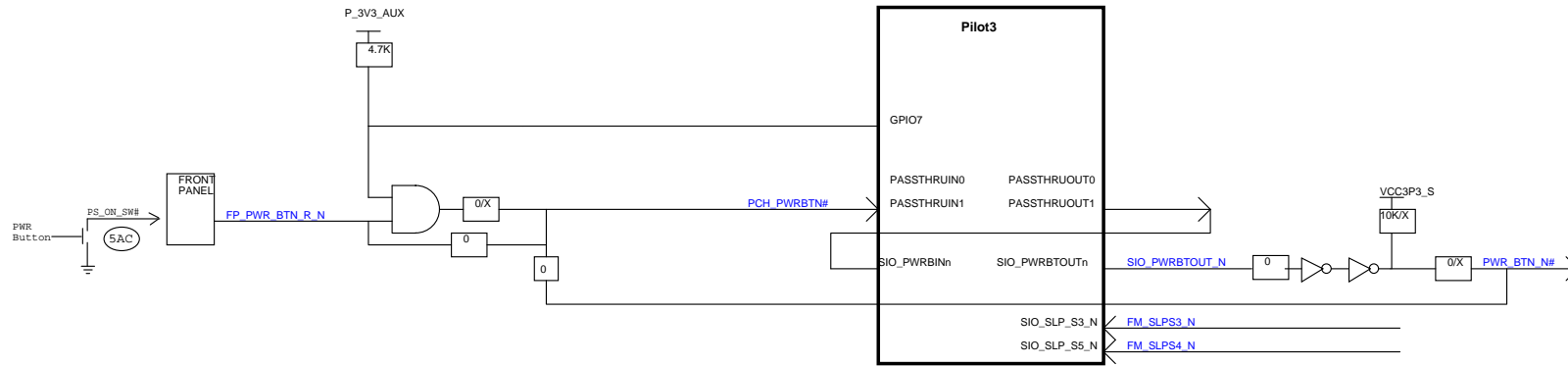
D

CD

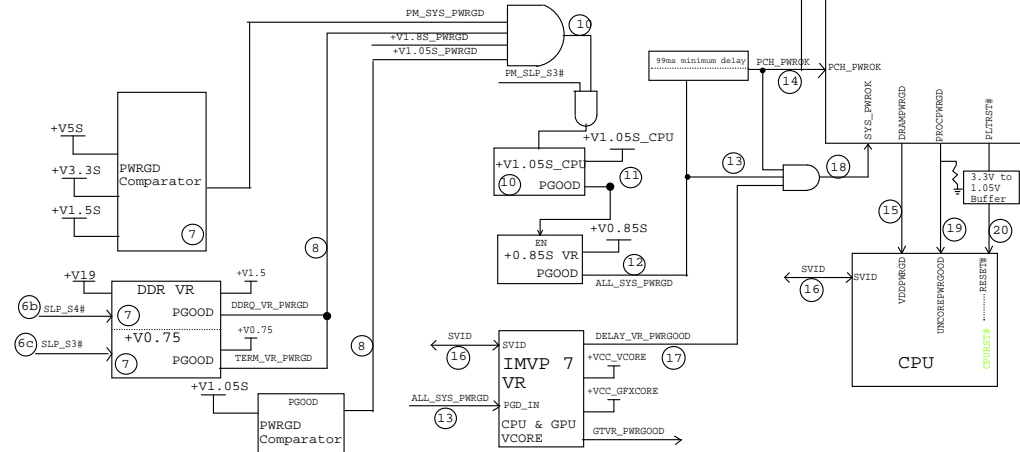
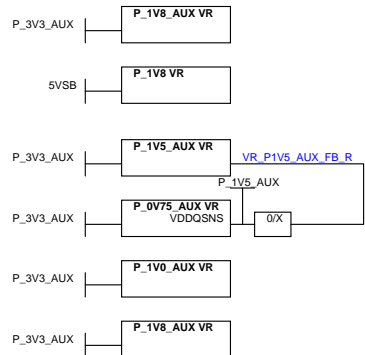
BLOCK DIAGRAM



Huron River Power Up Sequence Diagram



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PWRGD&RESET MAP			
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Adapter in

VBATA
6.04A

+19V_VCC_CORE
0.58A

NCP6131

7.29A

CPU_VAXG

+19V_PVCC_CPU
1.73A

NCP6131

21.88A

VCORE

+19V_+12VFUSE
1.12A

APW7313

OCP: 3A

VCC12_S
1.51A

0.05A

APL78L05

0.05A

AVDD

VCC12_S

+19V_+12VFUSE
?A

NCP1579

VCC12_S
4A

+VCC12_S_HDD

+19V_VCC3P3_A
0.68A

APW7313

OCP: 3A

VCC3P3_A
1.17A

1.17A

P3202CMG

1.17A

0.4A

VCC3P3_S

0.78A

NCT3720S

0.78A

VCC1P8_S

1A

APL3518

1A

USB_POWER1

1A

APL3518

1A

USB_POWER2

1A

APL3518

1A

USB_POWER_F

+19V_VCC5_A
1.61A

NCP1579

VCC5_A
5.19A

0.9A

MOS

0.9A

VCC5_S

0.06A

APW7153

0.13A

P_1V8_AUX

0.24A

APW7153

0.96A

P_1V0_AUX

0.21A

APW7153

0.56A

P_1V5_AUX

0.11A

RT9199

0.11A

P_0V75_AUX_DDR3_BMC

+19V_VCC1P5
0.42A

NCP1579

VCC1P5
4.5A

4.5A

VCC1P5_S

+19V_VCCPFUSE
0.5A

NCP5212A

VCCP1P05_S
7.31A

0.2A

RT9199

0.2A

APL5916

6.28A

VCC1P05_S

VCC0P75_S

VCCP1P05_S

4.31A

APL5916

4.5A (CRB)

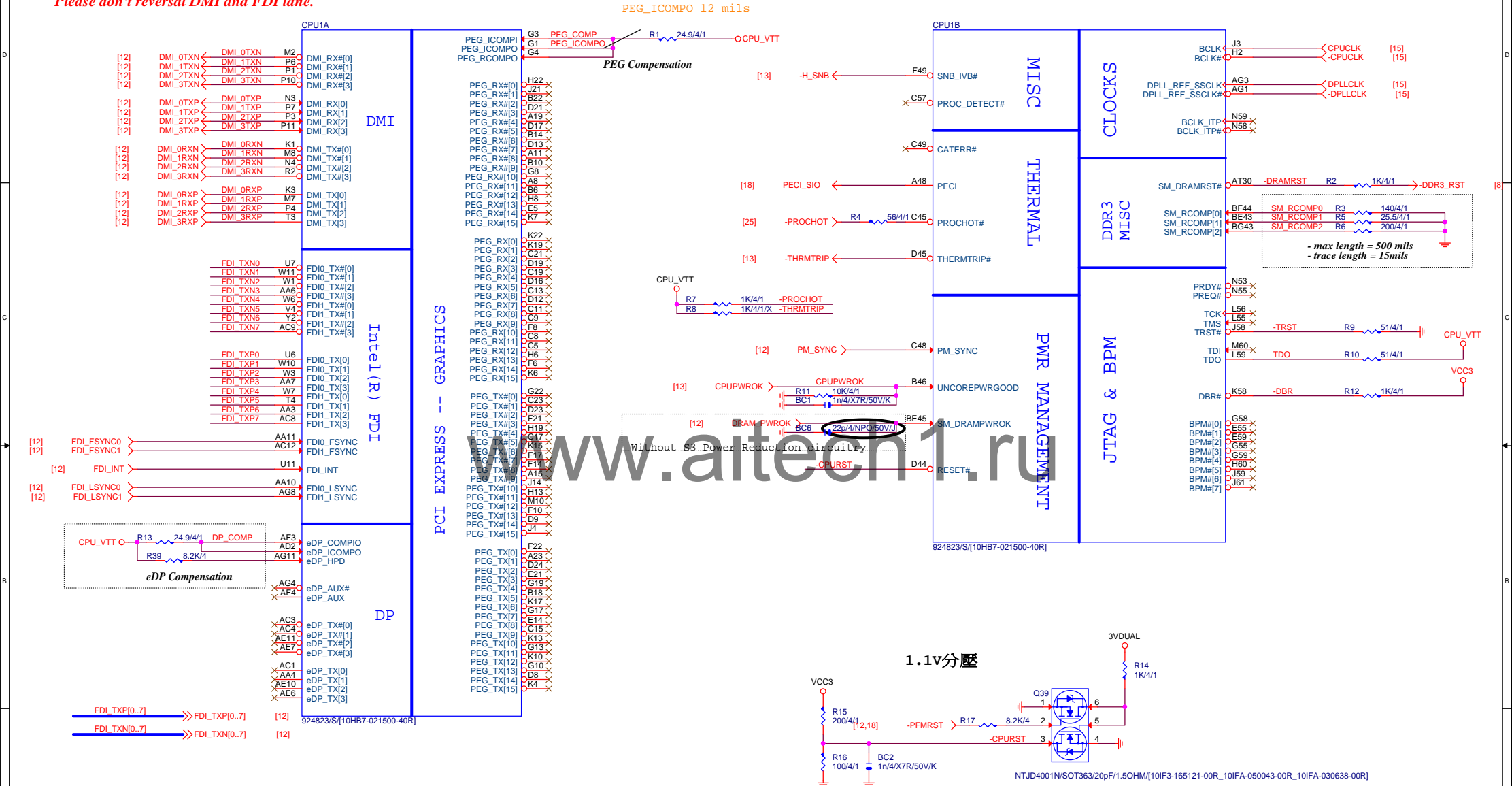
VCC0P85_S

Title				POWER DELIVERY CHART			
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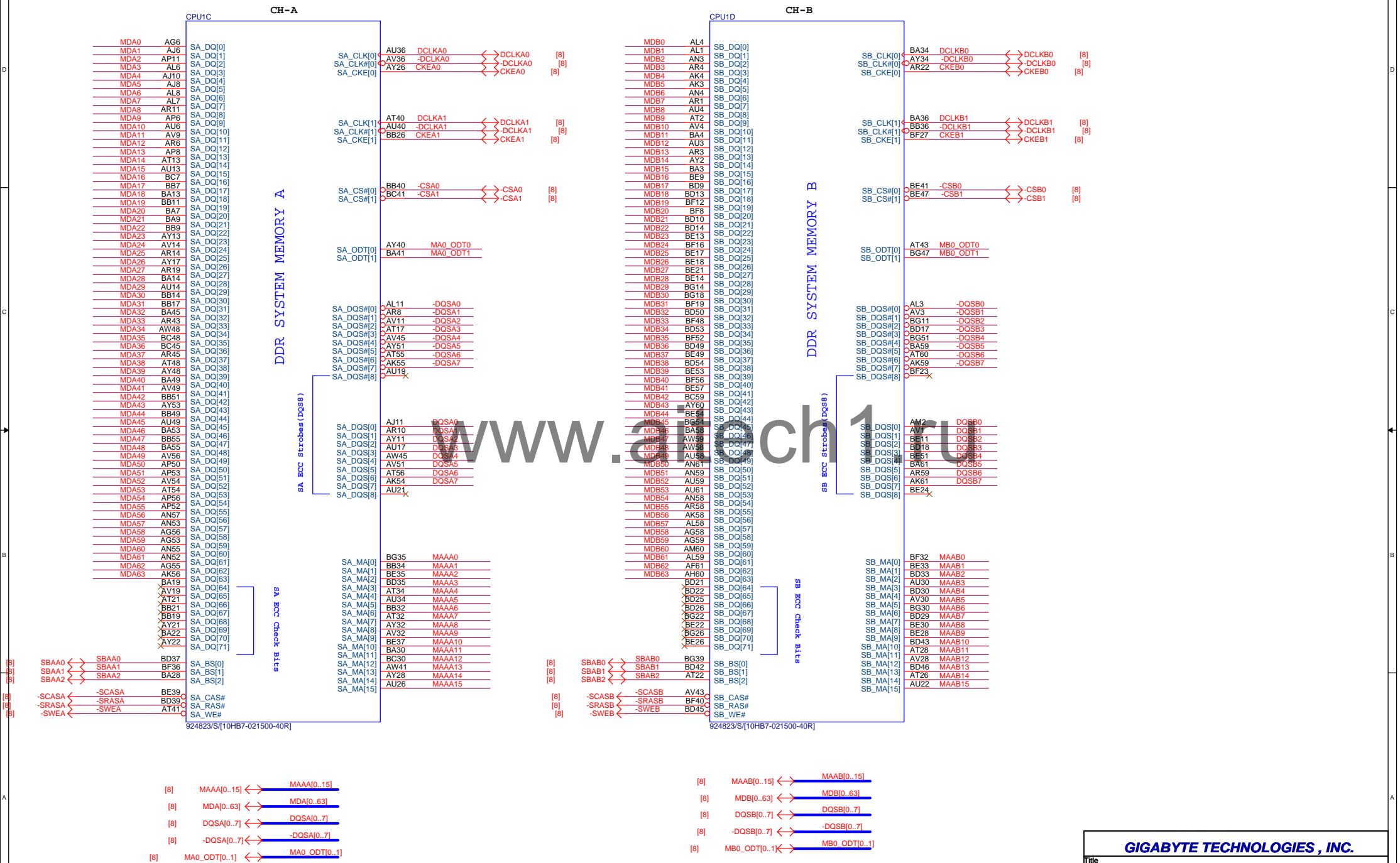
Sandy Bridge 2C BGA Processor (DMI,DP,PEG,FDI)

Sandy Bridge 2C BGA Processor (CLK,MISC,JTAG)

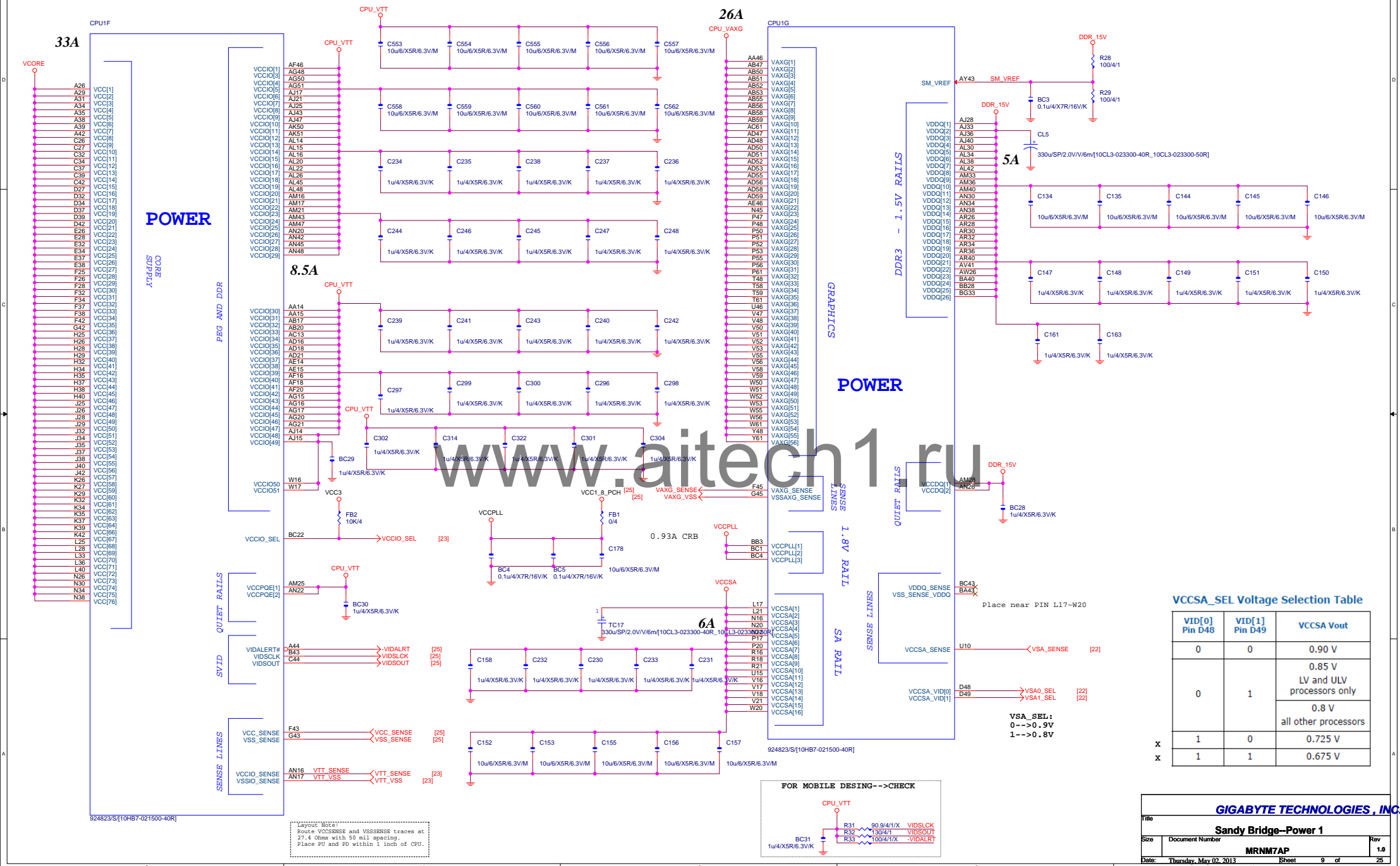
Please don't reversal DMI and FDI lane.



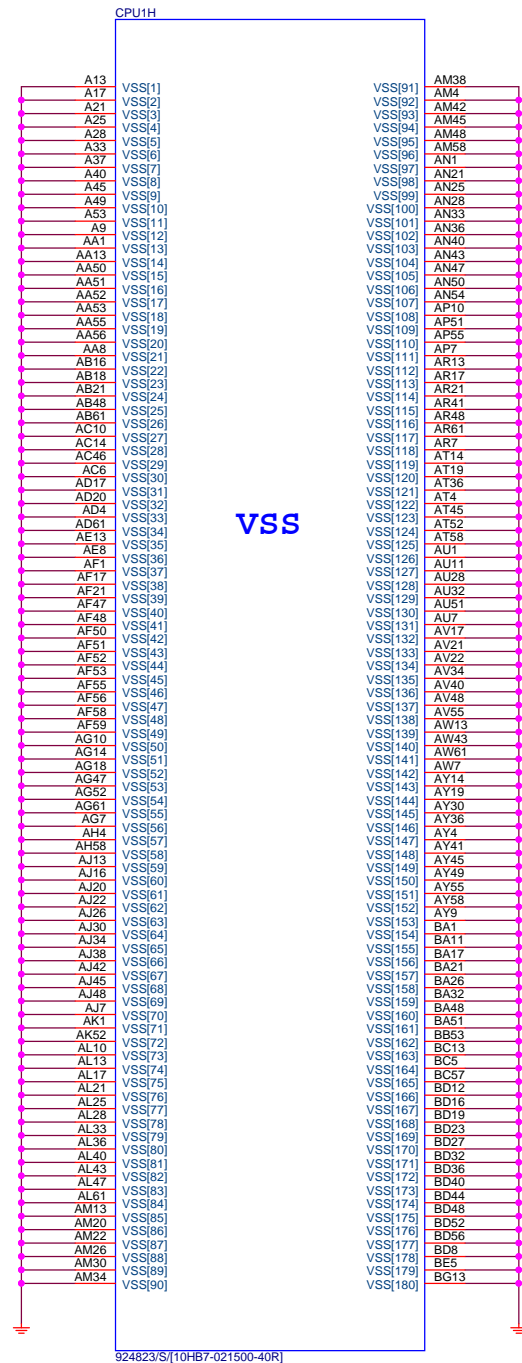
Sandy Bridge 2C BGA Processor (DDR3)



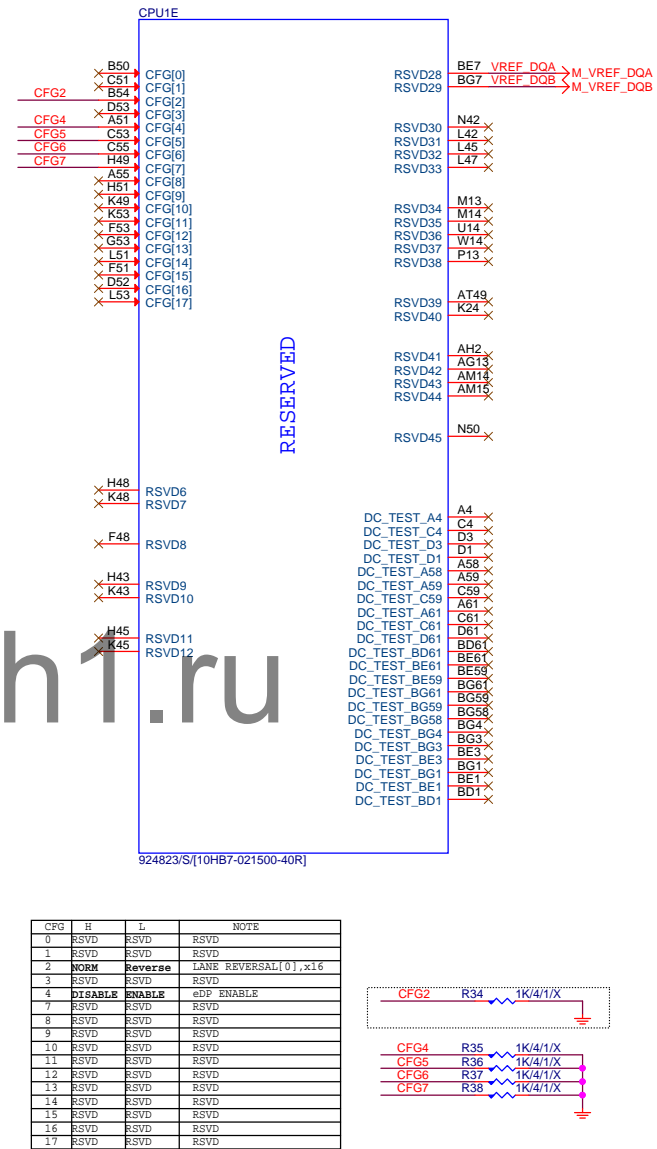
Sandy Bridge 2C BGA Processor (Power)



Sandy Bridge 2C BGA Processor (GND)



Sandy Bridge 2C BGA Processor (Reserved)

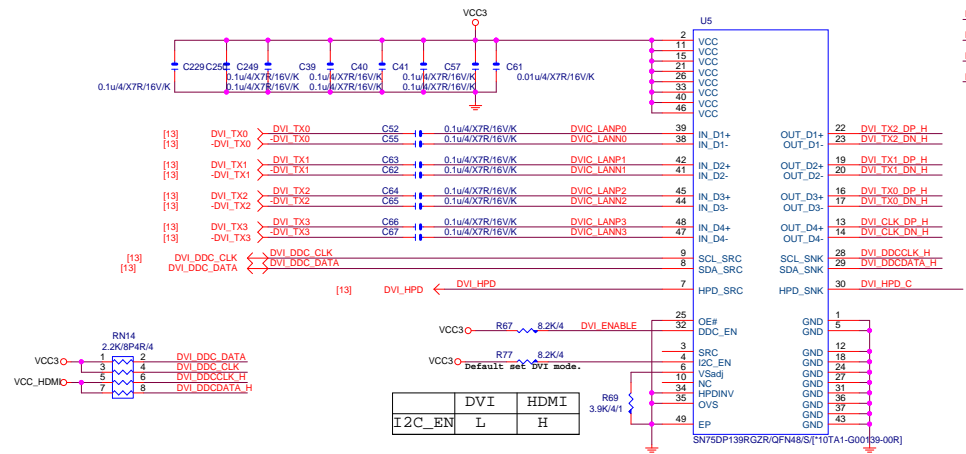


CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	NORM	Reverse	LANE REVERSAL[0..x16]
3	RSVD	RSVD	RSVD
4	DISABLE	ENABLE	eDP ENABLE
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD
16	RSVD	RSVD	RSVD
17	RSVD	RSVD	RSVD

CFG6	CFG5	PCIE CONFIG
1	1	1X16, Default
1	0	2X8
0	1	RSVD
0	0	X8, X4, X4

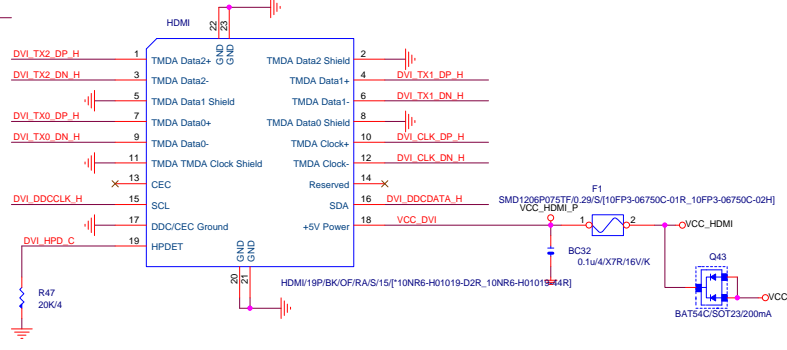
CFG 0-17 all internal PULL-UP

GIGABYTE TECHNOLOGIES, INC.		
Title		
Sandy Bridge --GND		
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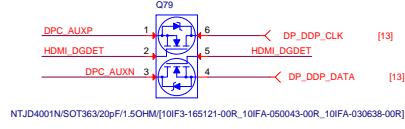
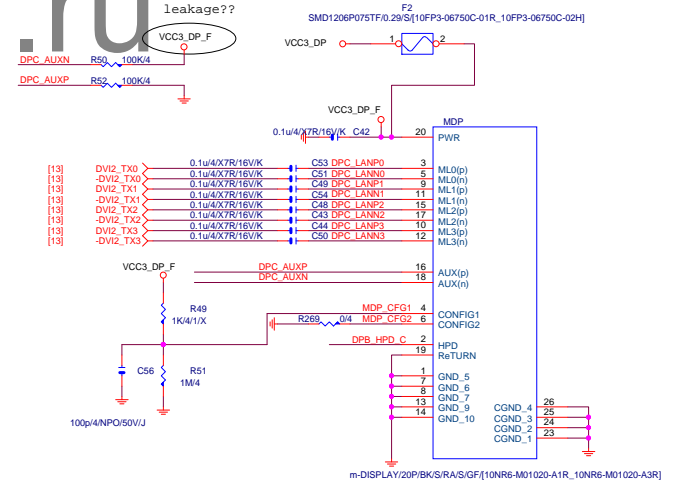
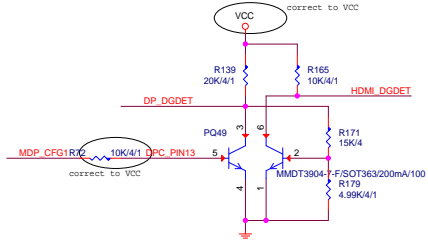
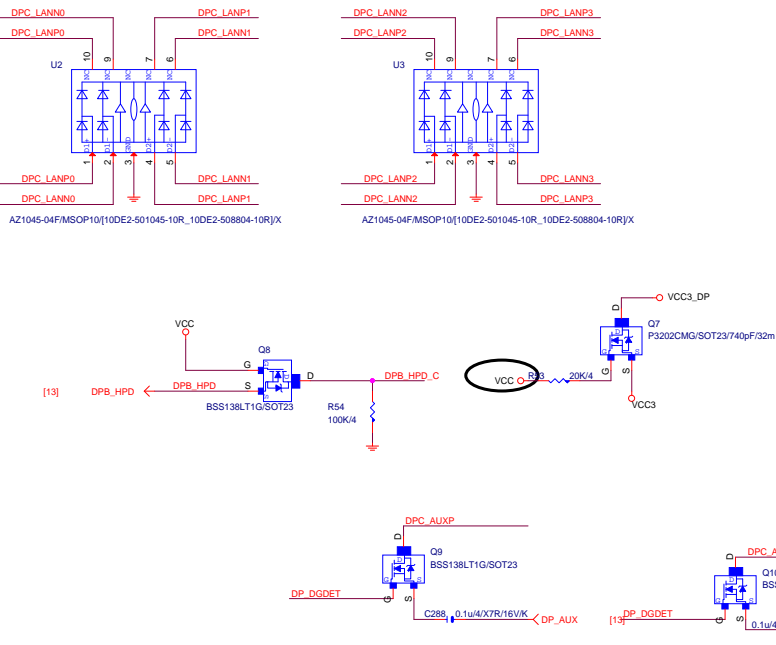


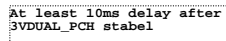
DVI_TX2_DP_H - R289 330/4/X DVI_TX2_DN_H
 DVI_TX1_DP_H - R290 330/4/X DVI_TX1_DN_H
 DVI_TX0_DP_H - R291 330/4/X DVI_TX0_DN_H
 DVI_CLK_DP_H - R292 330/4/X DVI_CLK_DN_H

for EYE result



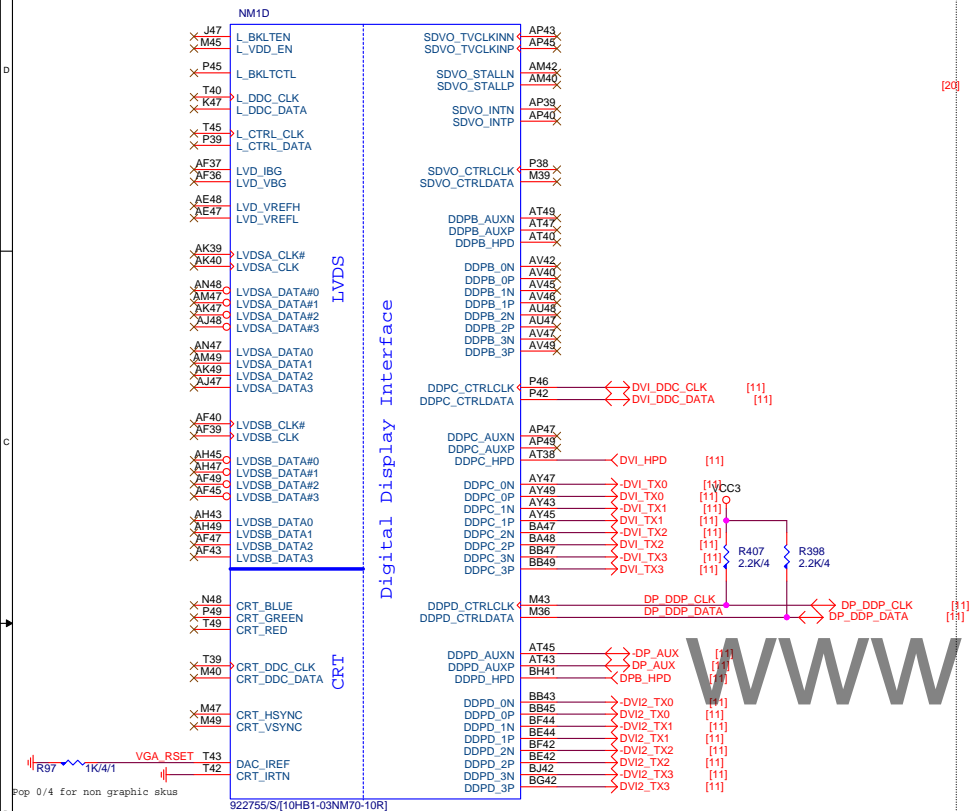
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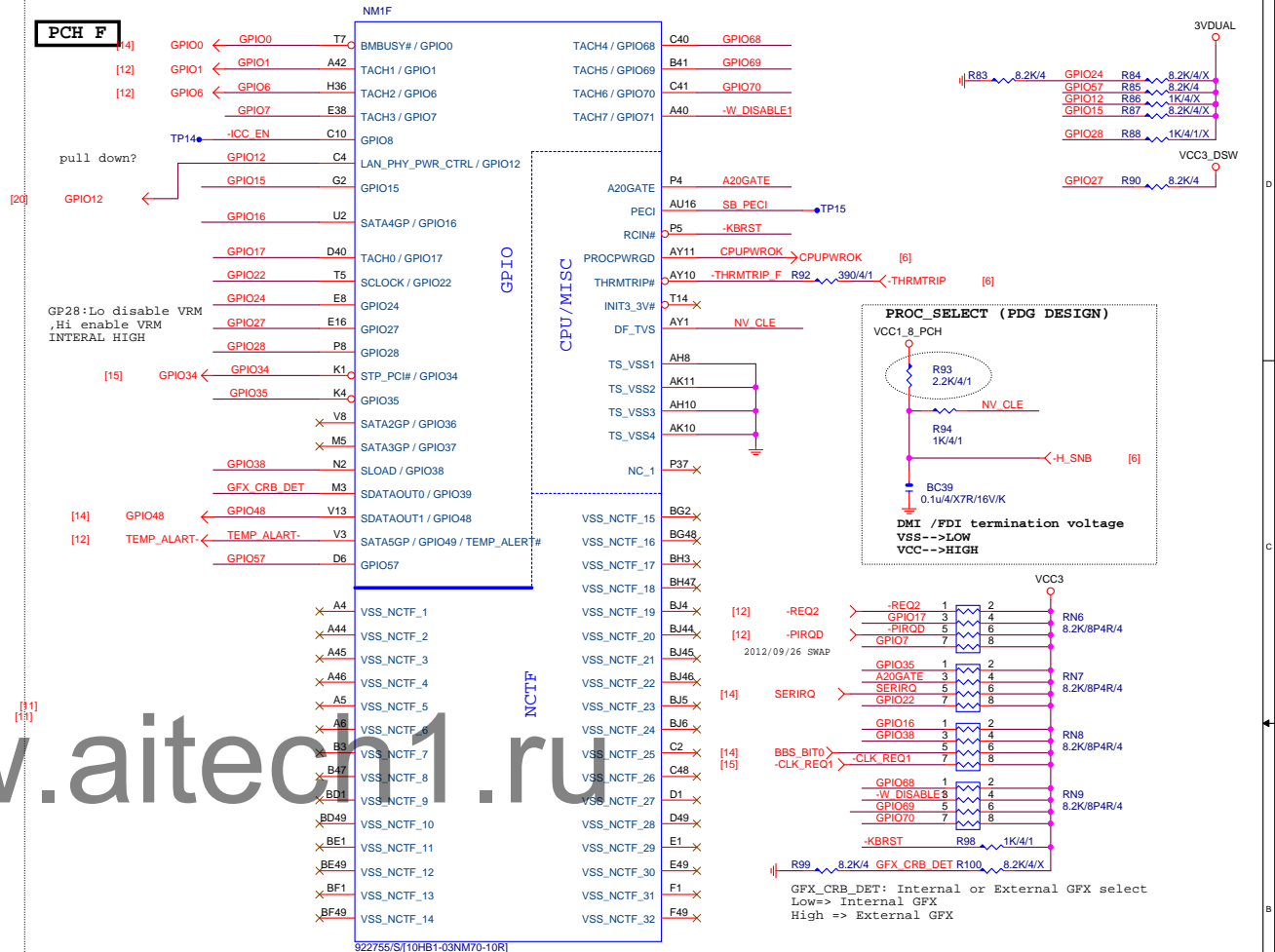


GIGABYTE TECHNOLOGIES, INC.			
Title			
PCH FDI,DMI,USB ,PCIE,NVRAM			
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PCH D DISPLAY

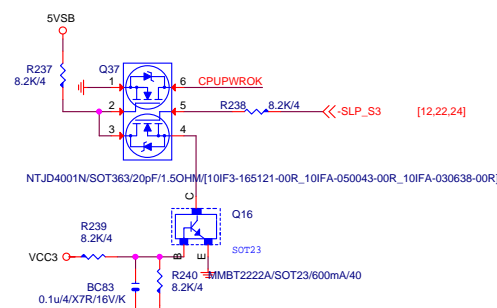


PCH F

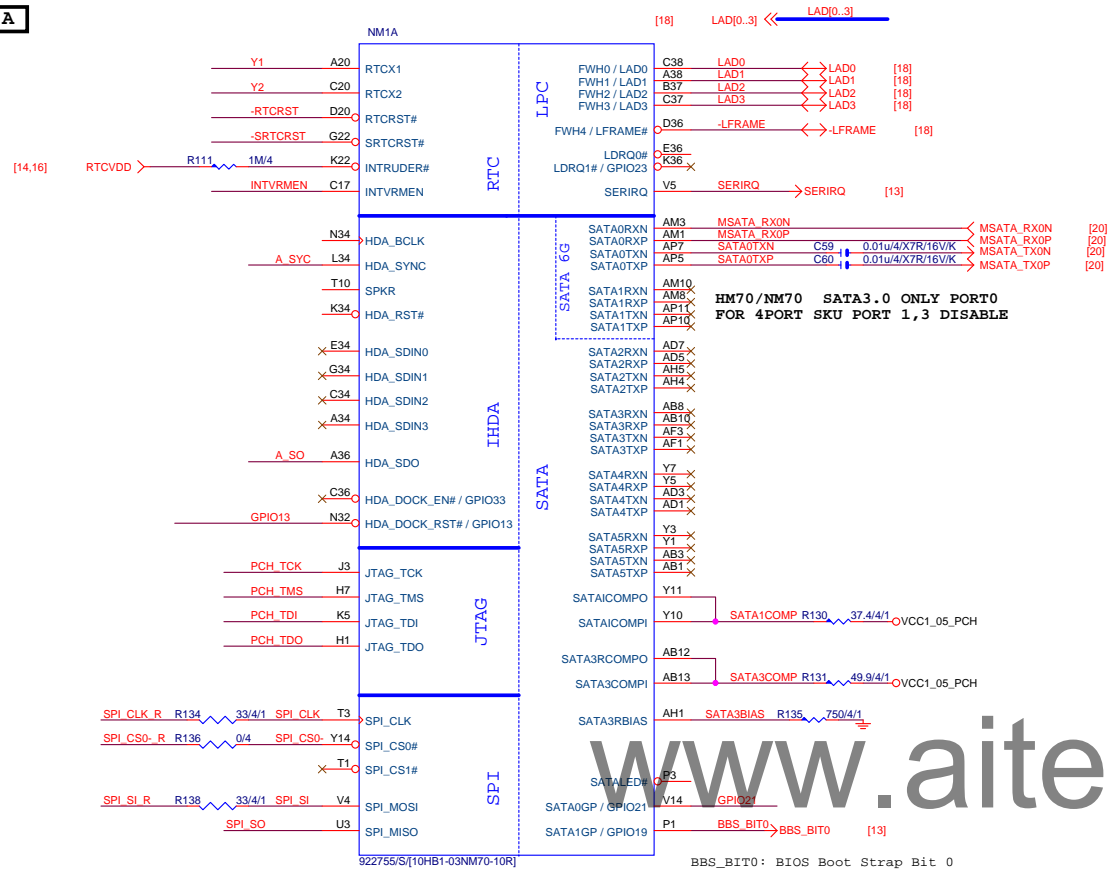


VGA ESD

VGA SIGNAL



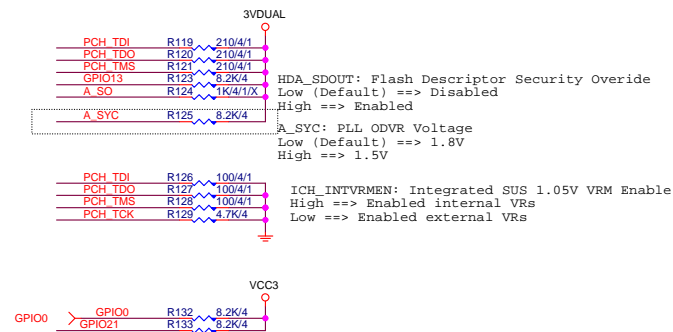
PCH A



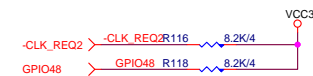
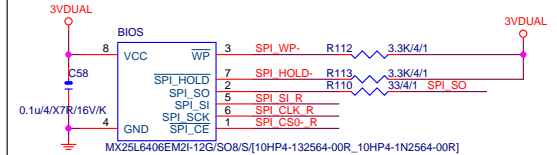
PCH HS

Boot BIOS Strap		
PCI GNT#1	BBS BIT0	Boot BIOS Location
1	1	SPI (Default)
0	1	Reserved (NAND)
0	0	LPC

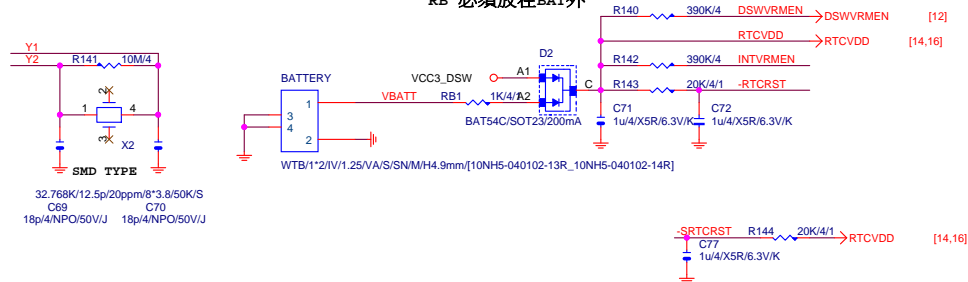
1 means floating
0 means PD 1K



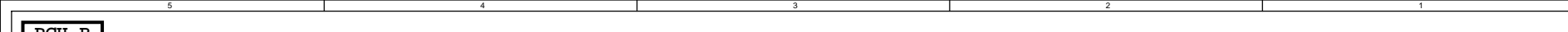
BIOS



RB 必須放在BAT外

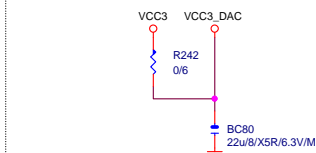
**GIGABYTE TECHNOLOGIES, INC.**

Title							PCH HOST , SATA, PCI							
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```
Flex0,2 : 33MHZ
Flex1,3 :
27/14/24/48/25MHZ
```

CLOSE北橋(注意震盪水波紋)



```
CougarPoint Total PWR Consumption:
1.05V => 5.608A
5V => 0.002A
3.3V => 0.399A
1.8V => 0.25A
1.5V => 0.16A
```

Voltage Rail	Voltage (V)	\$I_0\$ Iccmax Current (Integrated Graphics)
VPROC_ID	1.05	0.001
VSRFP	5	0.001
VSRFP Sus	5	0.001
Vcc3_3	3	0.266
VccADAC3	3.3	0.001
VccDPLL4	1.05	0.08
VccADPLL3	1.05	0.08
VccCore	1.05	1.3
VccDMI	1.1	0.042
VccIO3	1.05	2.925
VccASW	1.05	1.01
VccSPI	3.3	0.020
VccDSW3_3	3.3	0.002
VccPTERM	1.8	0.19
VccRTC	1.3	N/A
VccUsb3_3	3.3	0.097
VccSUBIDA	3.3	0.01
VccVRM	1.5	0.16
VccCLKDMI	1.05	0.02
VccSC	1.05	0.055
VccDDFFCLCN	1.05	0.095
VccLVDS	3.3	0.06
VccTX_LVDS3	1.8	0.001

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PCH PWR ,GND

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NM1H

H5	VSS[0]		
AA17	VSS[1]	VSS[80]	AK38
AA2	VSS[11]	VSS[81]	AK4
AA3	VSS[3]	VSS[82]	AK42
AA33	VSS[4]	VSS[83]	AK46
AA34	VSS[5]	VSS[84]	AK8
AB11	VSS[6]	VSS[85]	AL16
AB14	VSS[7]	VSS[86]	AL17
AB39	VSS[8]	VSS[87]	AL19
AB4	VSS[9]	VSS[88]	AL2
AB43	VSS[10]	VSS[89]	AL21
AB5	VSS[11]	VSS[90]	AL23
AB7	VSS[12]	VSS[91]	AL26
AC19	VSS[13]	VSS[92]	AL27
AC2	VSS[14]	VSS[93]	AL31
AC21	VSS[15]	VSS[94]	AL33
AC24	VSS[16]	VSS[95]	AL34
AC33	VSS[17]	VSS[96]	AL48
AC34	VSS[18]	VSS[97]	AM11
AC48	VSS[19]	VSS[98]	AM14
AD10	VSS[20]	VSS[99]	AM36
AD11	VSS[21]	VSS[100]	AM39
AD12	VSS[22]	VSS[101]	AM43
AD13	VSS[23]	VSS[102]	AM45
AD19	VSS[24]	VSS[103]	AM46
AD24	VSS[25]	VSS[104]	AM7
AD26	VSS[26]	VSS[105]	AN2
AD27	VSS[27]	VSS[106]	AN29
AD33	VSS[28]	VSS[107]	AN3
AD34	VSS[29]	VSS[108]	AN31
AD36	VSS[30]	VSS[109]	AP12
AD37	VSS[31]	VSS[110]	AP19
AD38	VSS[32]	VSS[111]	AP28
AD39	VSS[33]	VSS[112]	AP30
AD40	VSS[34]	VSS[113]	AP32
AD42	VSS[35]	VSS[114]	AP38
AD43	VSS[36]	VSS[115]	AP4
AD45	VSS[37]	VSS[116]	AP42
AD46	VSS[38]	VSS[117]	AP46
AD8	VSS[39]	VSS[118]	AP8
AE2	VSS[40]	VSS[119]	AR2
AE3	VSS[41]	VSS[120]	AR48
AF10	VSS[42]	VSS[121]	AT11
AF12	VSS[43]	VSS[122]	AT13
AD14	VSS[44]	VSS[123]	AT18
AD16	VSS[45]	VSS[124]	AT22
AF16	VSS[46]	VSS[125]	AT26
AF19	VSS[47]	VSS[126]	AT28
AF24	VSS[48]	VSS[127]	AT30
AF26	VSS[49]	VSS[128]	AT32
AF27	VSS[50]	VSS[129]	AT34
AF29	VSS[51]	VSS[130]	AT39
AF31	VSS[52]	VSS[131]	AT42
AF38	VSS[53]	VSS[132]	AT46
AF4	VSS[54]	VSS[133]	AT7
AF42	VSS[55]	VSS[134]	AU24
AF46	VSS[56]	VSS[135]	AU30
AF5	VSS[57]	VSS[136]	AV16
AF7	VSS[58]	VSS[137]	AV20
AF8	VSS[59]	VSS[138]	AV34
AG19	VSS[60]	VSS[139]	AV38
AG2	VSS[61]	VSS[140]	AV4
AG31	VSS[62]	VSS[141]	AV43
AG48	VSS[63]	VSS[142]	AV8
AH11	VSS[64]	VSS[143]	AV14
AH3	VSS[65]	VSS[144]	AW18
AH36	VSS[66]	VSS[145]	AW2
AH39	VSS[67]	VSS[146]	AW22
AH40	VSS[68]	VSS[147]	AW26
AH42	VSS[69]	VSS[148]	AW28
AH46	VSS[70]	VSS[149]	AW32
AH7	VSS[71]	VSS[150]	AW34
AJ19	VSS[72]	VSS[151]	AW36
AJ21	VSS[73]	VSS[152]	AW40
AJ24	VSS[74]	VSS[153]	AW48
AJ33	VSS[75]	VSS[154]	AV11
AJ34	VSS[76]	VSS[155]	AY12
AK12	VSS[77]	VSS[156]	D34
AK3	VSS[78]	VSS[157]	D38
	VSS[79]	VSS[158]	D42

922755/S/[10HB1-03NM70-10R]

NM1I

AY4	VSS[159]		
AY42	VSS[160]	VSS[259]	H46
AY46	VSS[161]	VSS[260]	K18
AY8	VSS[162]	VSS[261]	K26
B11	VSS[163]	VSS[262]	K39
B15	VSS[164]	VSS[263]	K46
B19	VSS[165]	VSS[264]	K7
B23	VSS[166]	VSS[265]	L18
B27	VSS[167]	VSS[266]	L2
B31	VSS[168]	VSS[267]	L20
B35	VSS[169]	VSS[268]	L26
B39	VSS[170]	VSS[269]	L28
B7	VSS[171]	VSS[270]	L36
F45	VSS[172]	VSS[271]	L48
BB12	VSS[173]	VSS[272]	M12
BB16	VSS[174]	VSS[273]	M16
BB20	VSS[175]	VSS[274]	M18
BB22	VSS[176]	VSS[275]	M22
BB24	VSS[177]	VSS[276]	M24
BB28	VSS[178]	VSS[277]	M30
BB30	VSS[179]	VSS[278]	M32
BB38	VSS[180]	VSS[279]	M34
BB4	VSS[181]	VSS[280]	M38
BB46	VSS[182]	VSS[281]	M4
BC14	VSS[183]	VSS[282]	M42
BC18	VSS[184]	VSS[283]	M46
BC2	VSS[185]	VSS[284]	M8
BC22	VSS[186]	VSS[285]	N18
BC26	VSS[187]	VSS[286]	P30
BC32	VSS[188]	VSS[287]	N47
BC34	VSS[189]	VSS[288]	P11
BC36	VSS[190]	VSS[289]	P18
BC40	VSS[191]	VSS[290]	T33
BC42	VSS[192]	VSS[291]	P40
BC48	VSS[193]	VSS[292]	P43
BD46	VSS[194]	VSS[293]	P47
B05	VSS[195]	VSS[294]	P7
BE22	VSS[196]	VSS[295]	R2
BE26	VSS[197]	VSS[296]	R48
BE40	VSS[198]	VSS[297]	T12
BF10	VSS[199]	VSS[298]	T31
BF12	VSS[200]	VSS[299]	T37
BF16	VSS[201]	VSS[300]	T4
BF20	VSS[202]	VSS[301]	T46
BF22	VSS[203]	VSS[302]	W34
BF24	VSS[204]	VSS[303]	T47
BF26	VSS[205]	VSS[304]	T8
BF28	VSS[206]	VSS[305]	V11
B03	VSS[207]	VSS[306]	V17
BF30	VSS[208]	VSS[307]	V26
BF38	VSS[209]	VSS[308]	V27
BF40	VSS[210]	VSS[309]	V29
BF8	VSS[211]	VSS[310]	V31
BC21	VSS[212]	VSS[311]	V36
BC23	VSS[213]	VSS[312]	V39
BC44	VSS[214]	VSS[313]	Y43
BC215	VSS[215]	VSS[314]	V7
BG8	VSS[216]	VSS[315]	W17
BH11	VSS[217]	VSS[316]	W19
BH15	VSS[218]	VSS[317]	W2
BH17	VSS[219]	VSS[318]	W27
BH19	VSS[220]	VSS[319]	W48
H10	VSS[221]	VSS[320]	Y12
BH27	VSS[222]	VSS[321]	Y38
BH31	VSS[223]	VSS[322]	Y4
BH33	VSS[224]	VSS[323]	Y42
BH35	VSS[225]	VSS[324]	Y46
BH39	VSS[226]	VSS[325]	Y8
BH43	VSS[227]	VSS[326]	BG29
BH7	VSS[228]	VSS[327]	N24
D3	VSS[229]	VSS[328]	AJ3
D12	VSS[230]	VSS[329]	AD47
D16	VSS[231]	VSS[330]	B43
D18	VSS[232]	VSS[331]	BE10
D22	VSS[233]	VSS[332]	BG41
D24	VSS[234]	VSS[333]	G14
D26	VSS[235]	VSS[334]	H16
D30	VSS[236]	VSS[335]	T36
D32	VSS[237]	VSS[336]	BG22
D34	VSS[238]	VSS[337]	BG24
D38	VSS[239]	VSS[338]	C22
D42	VSS[240]	VSS[339]	AP13
D8	VSS[241]	VSS[340]	M14
E18	VSS[242]	VSS[341]	AP3
E26	VSS[243]	VSS[342]	AP1
G18	VSS[244]	VSS[343]	BE16
G20	VSS[245]	VSS[344]	BC16
G26	VSS[246]	VSS[345]	BG28
G28	VSS[247]	VSS[346]	BJ28
G36	VSS[248]	VSS[347]	
G48	VSS[249]	VSS[348]	
H12	VSS[250]	VSS[349]	
H18	VSS[251]	VSS[350]	
H22	VSS[252]	VSS[351]	
H24	VSS[253]	VSS[352]	
H26	VSS[254]		
H30	VSS[255]		
H32	VSS[256]		
H34	VSS[257]		
F3	VSS[258]		

922755/S/[10HB1-03NM70-10R]

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Title			PCH ,GND
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Custom			1.0
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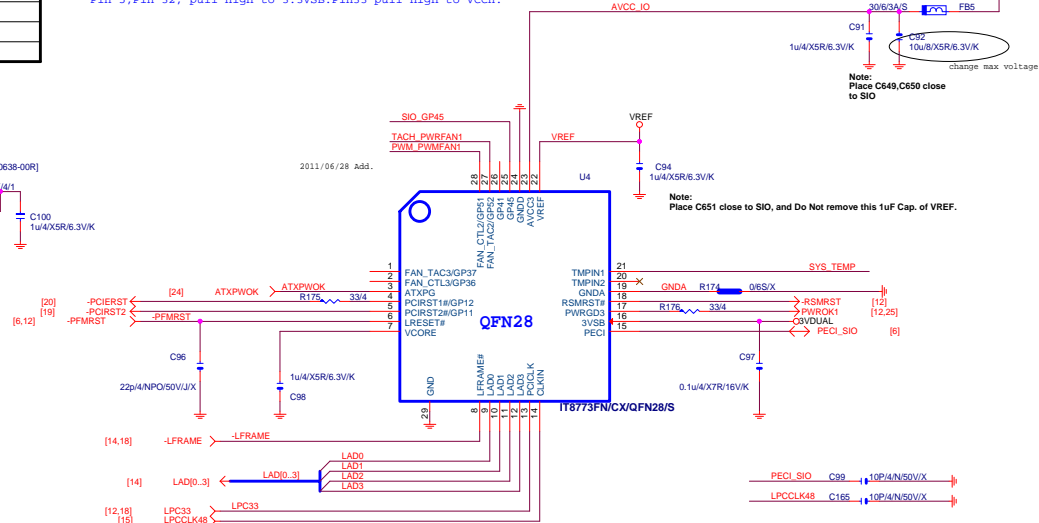
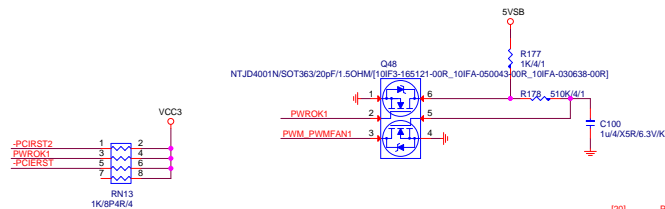
Power On Strapping Options

Symbol	value	Description
JP4	K8PWR_EN	1 K8 power sequence function is disabled
Pin 126		0 K8 power sequence function is enabled
	11	The default value of EC Index 15h/16h/17h is 80h
JP3 & JP5	FAN_CTL_SEL	10 The default value of EC Index 15h/16h/17h is FFh(Fan off)
Pin 124 & 46		01 The default value of EC Index 15h/16h/17h is 00h(Fan full speed)
	00	The default value of EC Index 15h/16h/17h is 40h
JP2	WDT_EN	1 Disable WDT to rest PWROK
Pin122		0 Enable WDT to rest PWROK

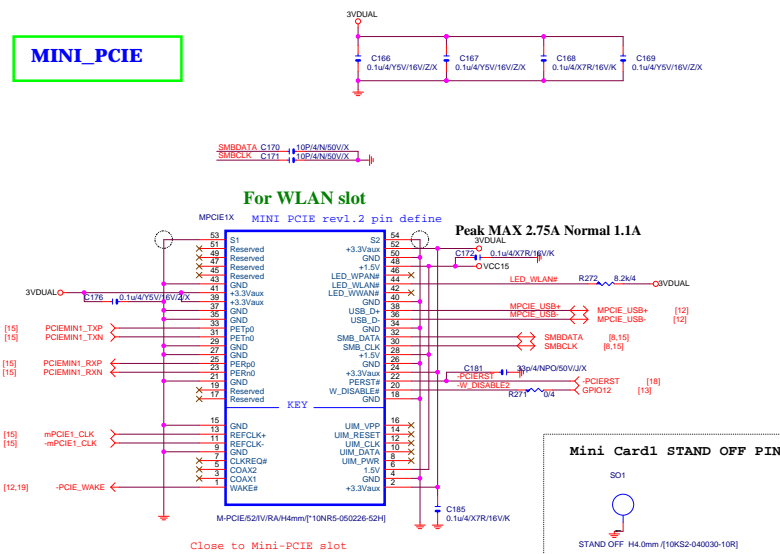
If without use these pins, Please pull-up. Don't let it floating

- 1.Pin 6:ATXPG
- 2.Pin 29:SYSB#
- 3.Pin 21/ Pin 57/ Pin 59/ Pin61
- 4.Pin37-40 KCLK/KDAT/MCLK/MDAT
- 5.Pin 63 pull high to 3VSB

Note:use EUP function:Pin29/Pin30/Pin31/Pin34/Pin42 pull high to SYS_3VSB.
Pin 5,Pin 32, pull high to 3.3VSB.Pin33 pull high to VCC3.



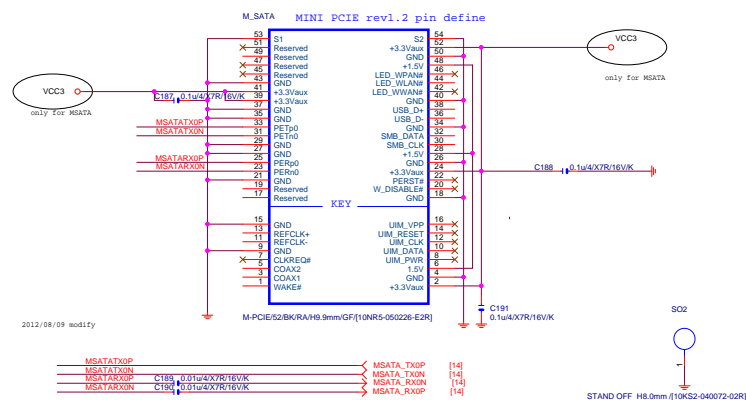
MINI_PCIE



MSATA

EXT_CON PWR CIRCUIT

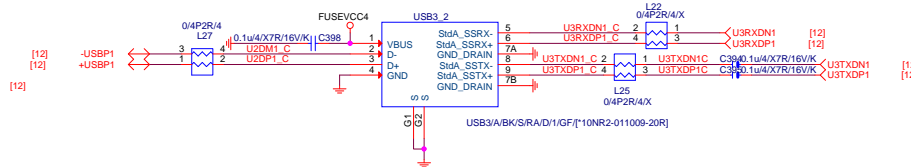
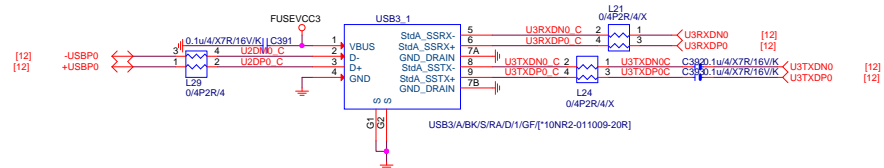
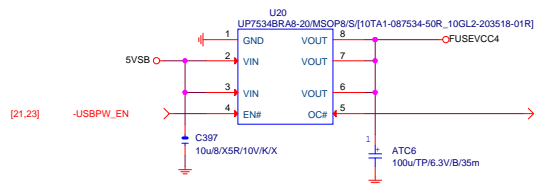
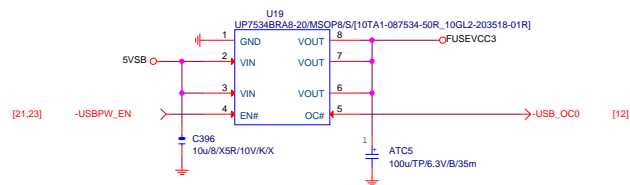
For mSATA slot



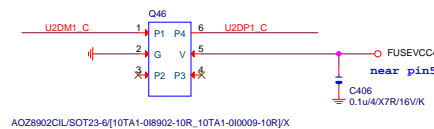
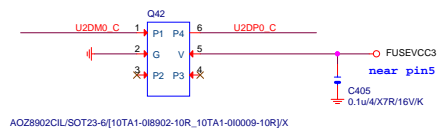
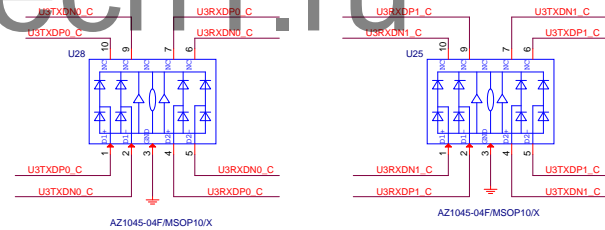
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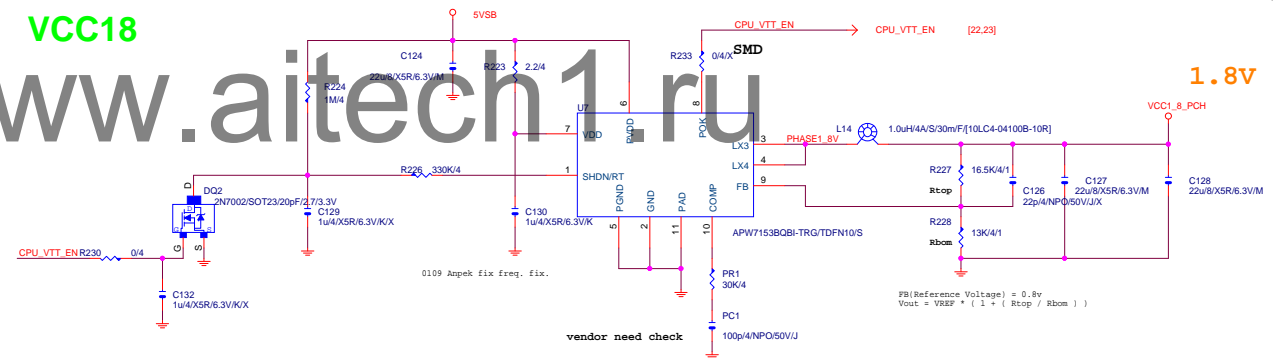
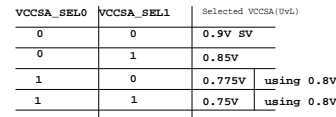
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Doc	MRNM7AP		
Version	1.0		
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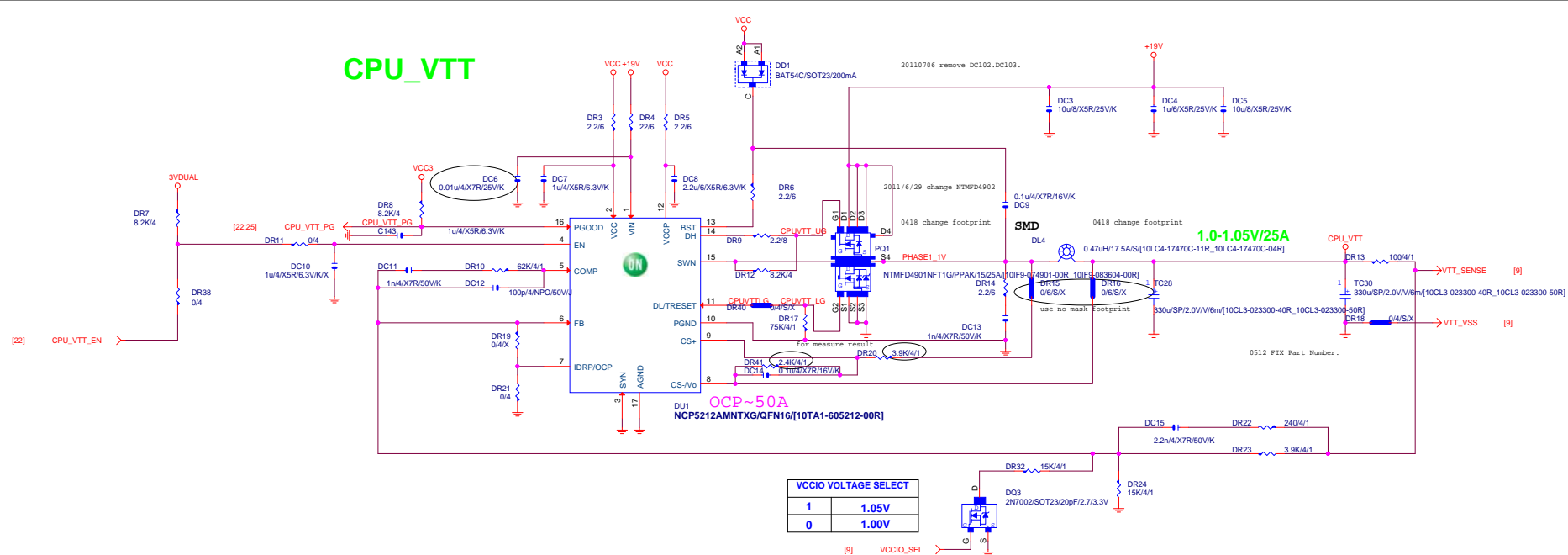
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VCCSA



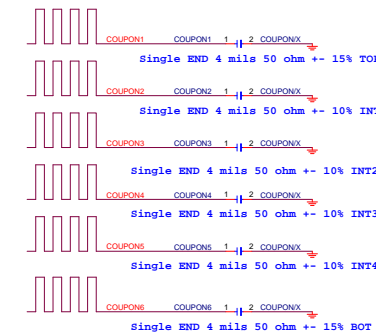
Date:	Thursday, May 02, 2013	Sheet	22	of	25
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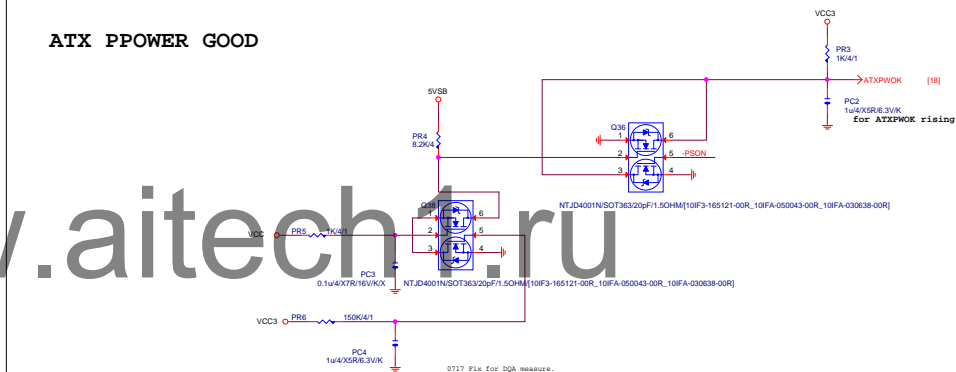
DDR15V
11.21A

Title				DISCRETE POWER			
Size	Document Number						Rev
C	MRNM7AP						1.0
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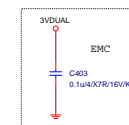
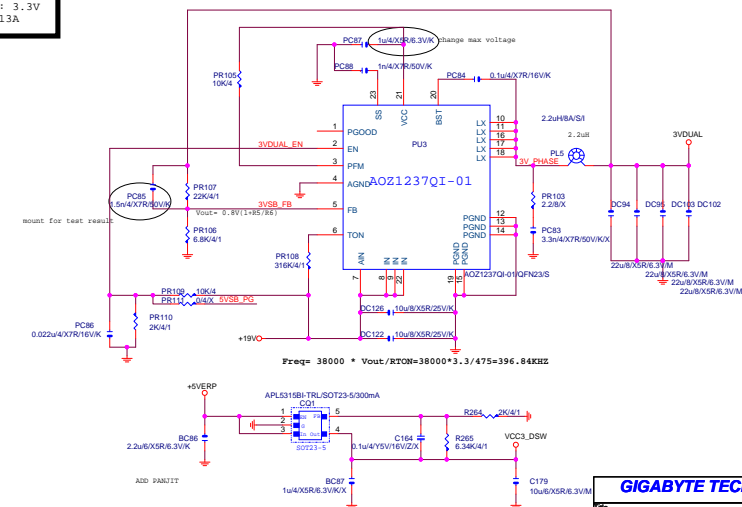
FOR INOUT AD PROTECT CIRCUIT



ATX PPOWER GOOD

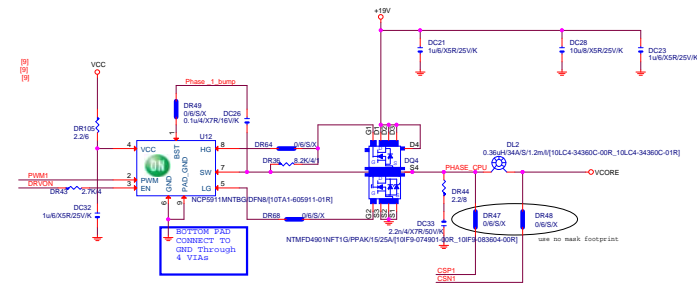
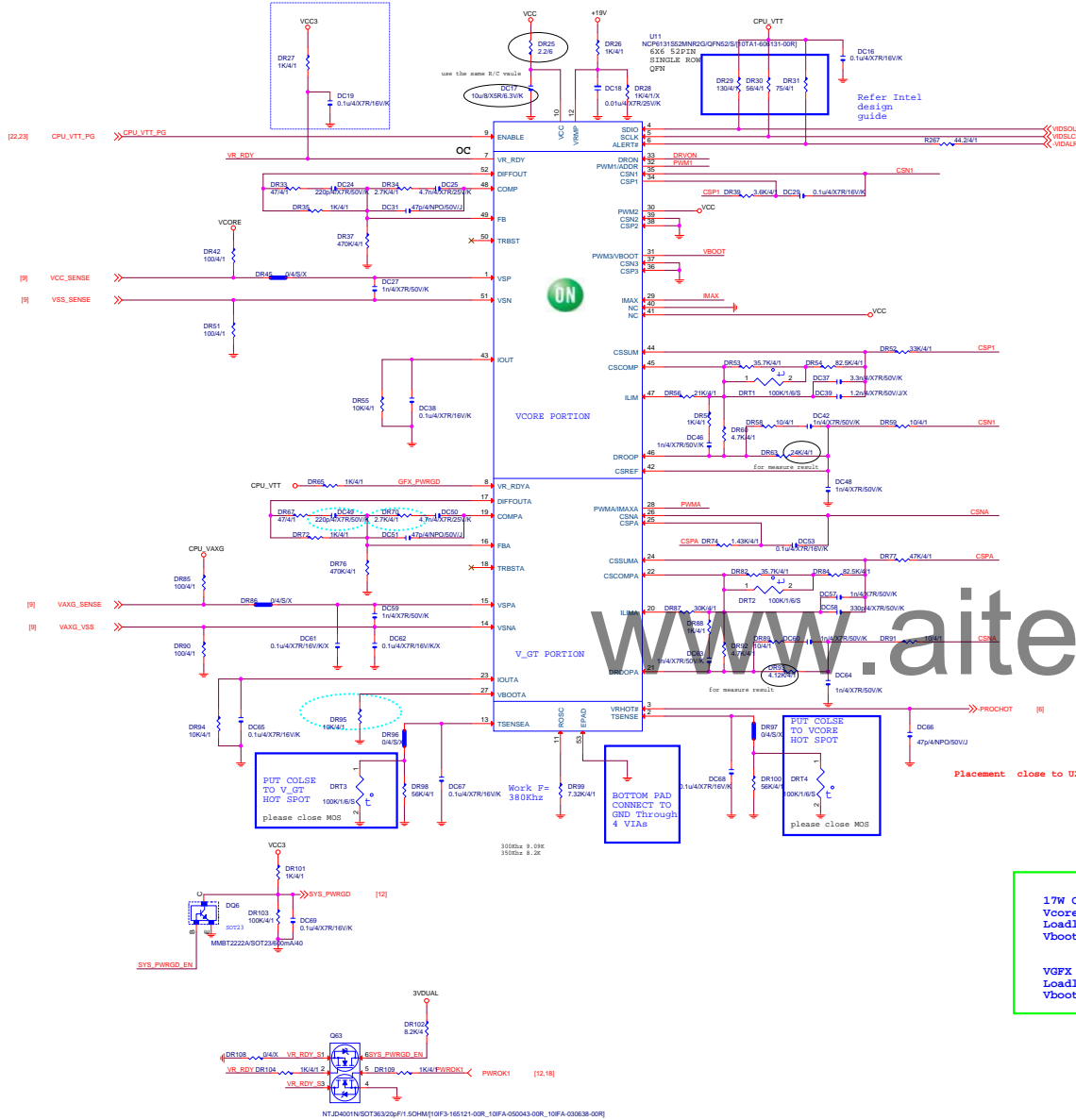


3VUDAL
Voltage level : 3.3V
Max current : 13A



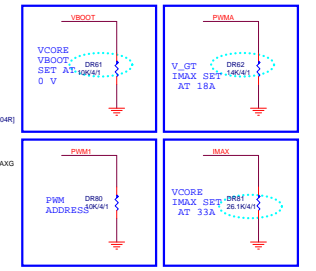
Vcore loadline=5.9 m ohm
Vaux loadline=4.1 m ohm

NCP6131 VR12 POWER CKT - 1+1 PHASE



PWM ADDRESS		
RESISTOR VALUE	SVID ADDRESS FOR VCORE RAIL	SVID ADDRESS FOR VGT RAIL
10K	0000	0001
25K	0010	0011
45K	0100	0101
70K	0110	0111
95K	1000	1001
125K	1010	1011
165K	1100	1101

BOOT VOLTAGE	
RESISTOR VALUE	BOOT VOLTAGE
10K	0V
25K	0.9V
45K	1V
70K	1.1V
95K	1.2V
125K	1.35V
165K	1.5V
VCC	SHUTDOWN



17W CPU power spec :
Vcore: Iccmax = 33A ;TDC = 21.5A
Loadline = 2.9m ohm
Vboot = 0 A OCP = 50A

VGFX : Iccmax = 18A ;TDC = 12A
Loadline = 4.6m ohm
Vboot = 0 A ; OCP = 29A

Please close to CPU