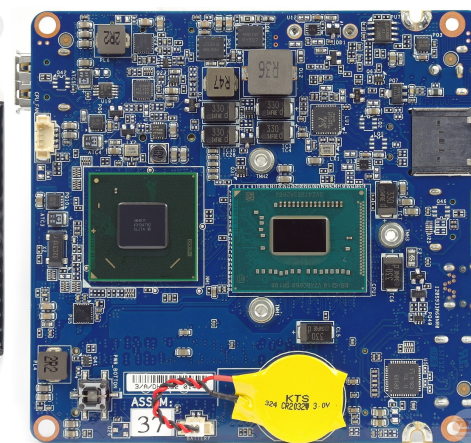
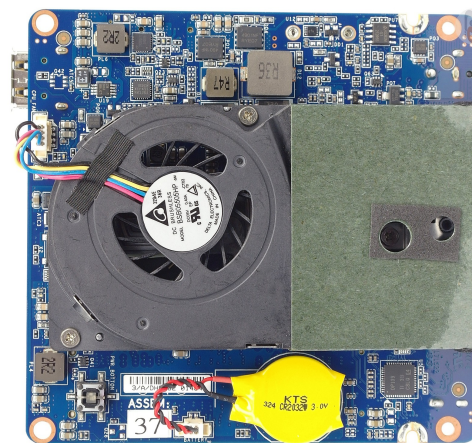
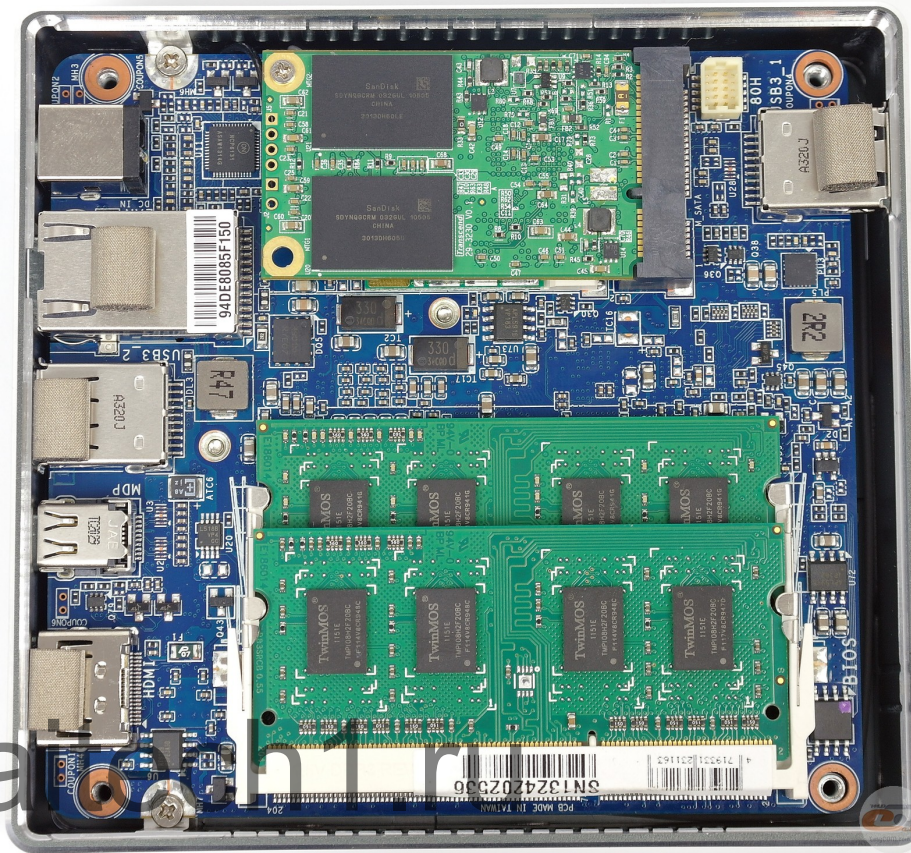


Model Name:MRNM7AP Revision 1.0  
SHEET TITLE

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	



<b>GIGABYTE TECHNOLOGIES, INC.</b>			
Title			
Cover Sheet			
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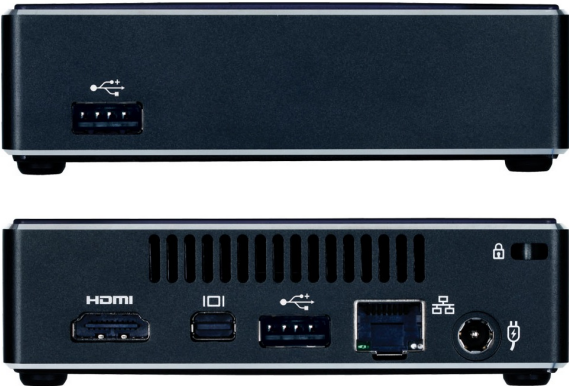
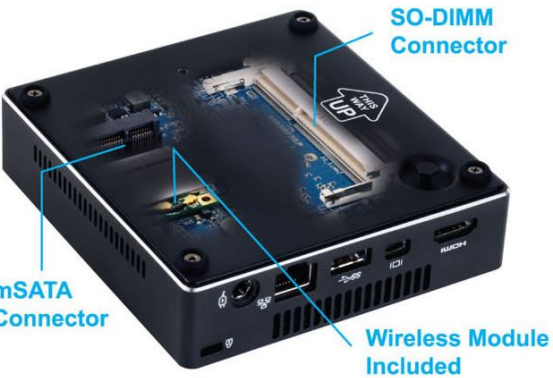
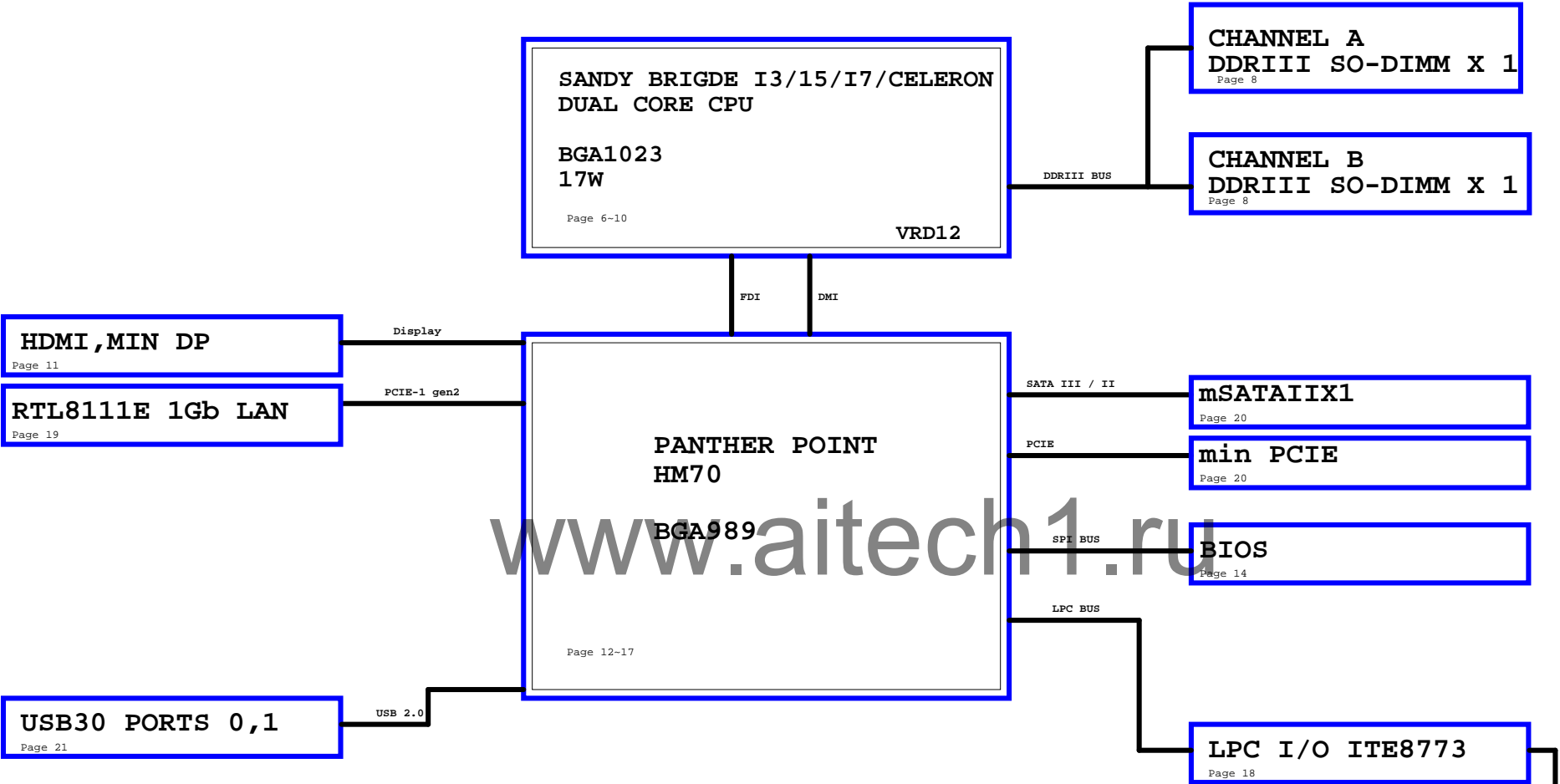
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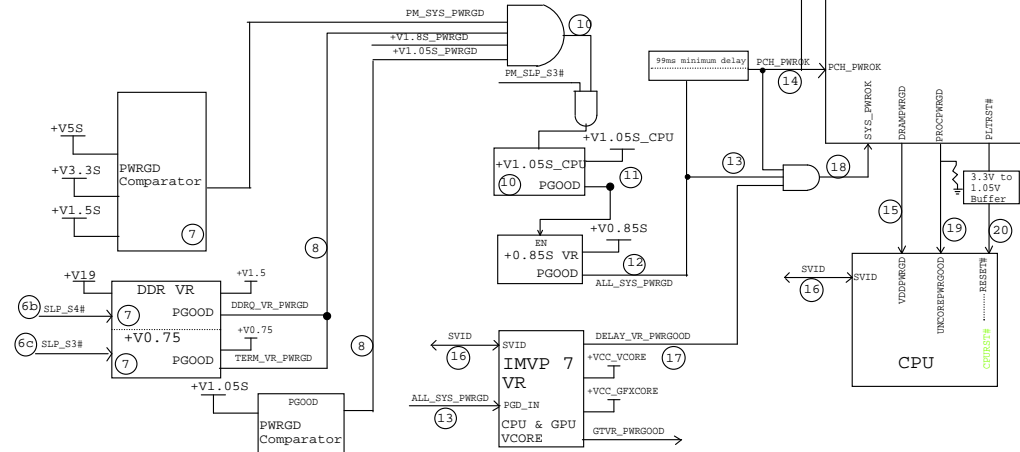
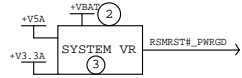
C

↑

D

BLOCK DIAGRAM





Title				<b>PWRGD&amp;RESET MAP</b>			
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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

0.2A

RT9199

0.2A

APL5916

6.28A

VCC1P05\_S

VCC0P75\_S

+19V\_VCCPFUSE  
0.5A

NCP5212A

VCCP1P05\_S  
7.31A

4.31A

VCCP1P05\_S

3A

APL5916

4.5A (CRB)

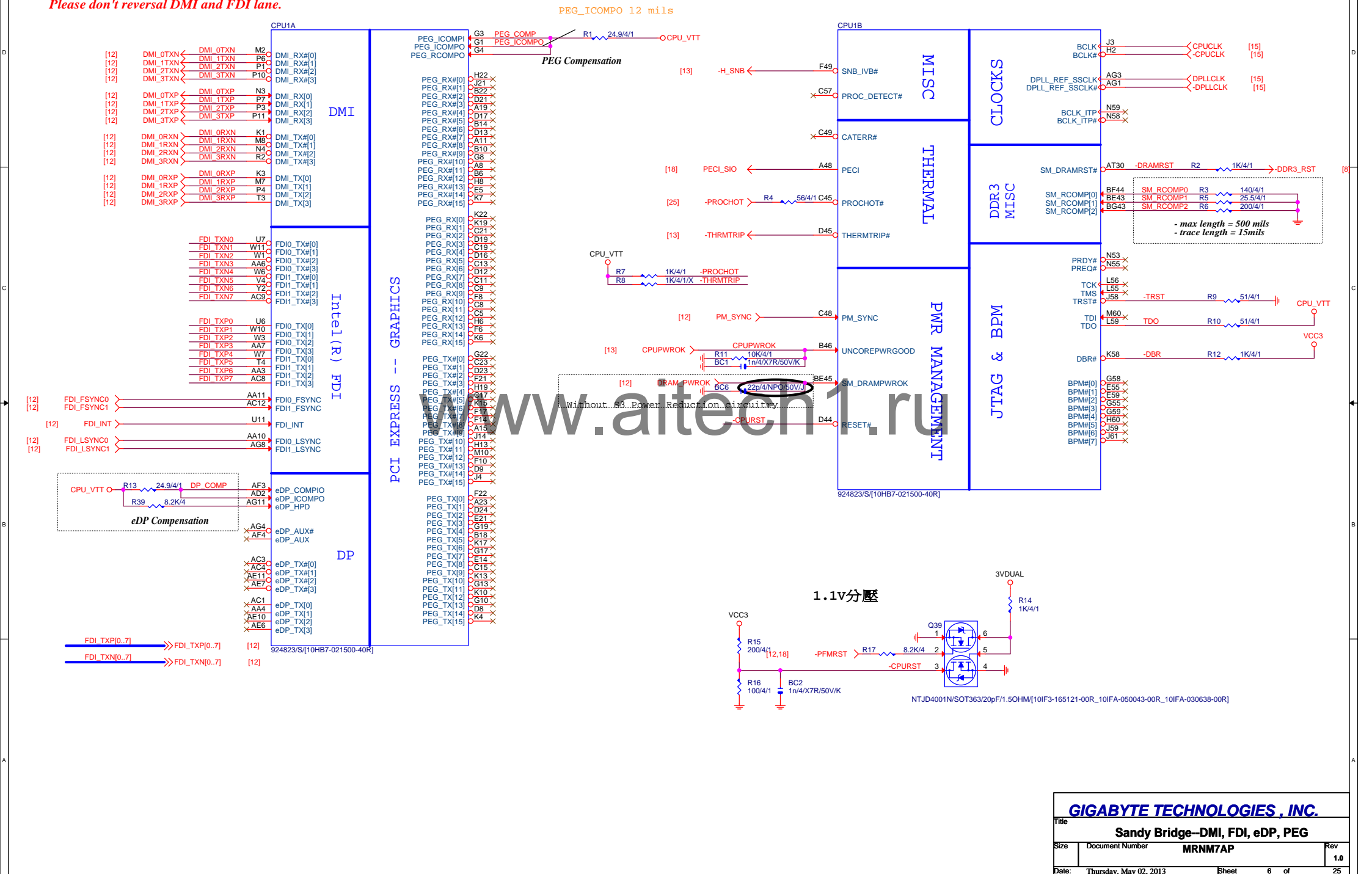
VCC0P85\_S

Title				POWER DELIVERY CHART			
Size B	Document Number			MRNM7AP			Rev 1.0
	Date:	Thursday, May 02, 2013		Sheet	5	of	25

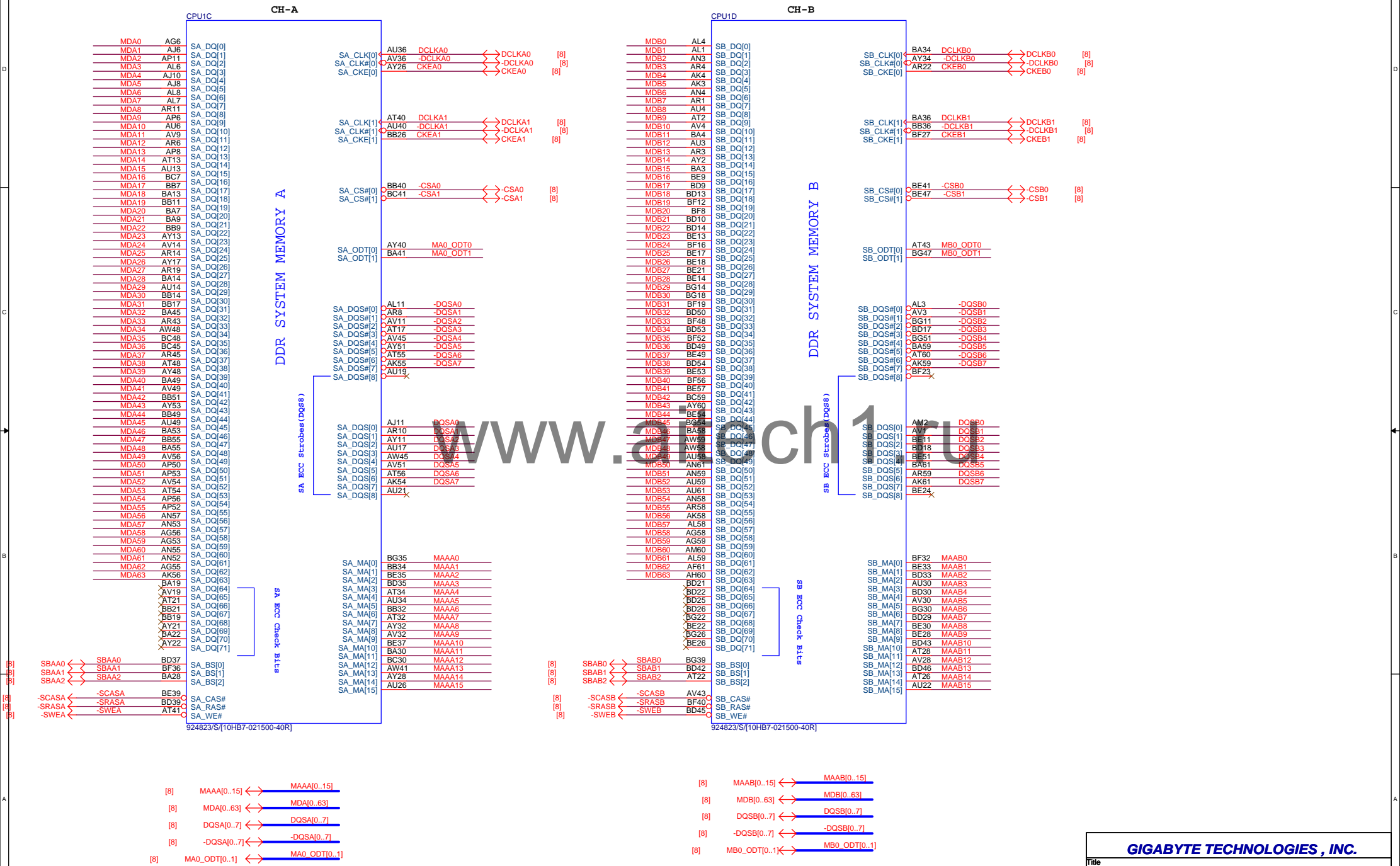
Sandy Bridge 2C BGA Processor (DMI,DP,PEG,FDI)

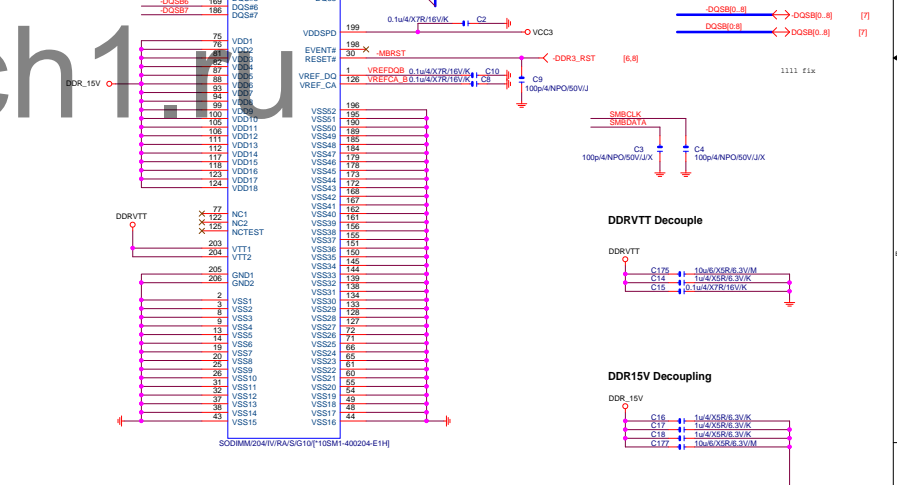
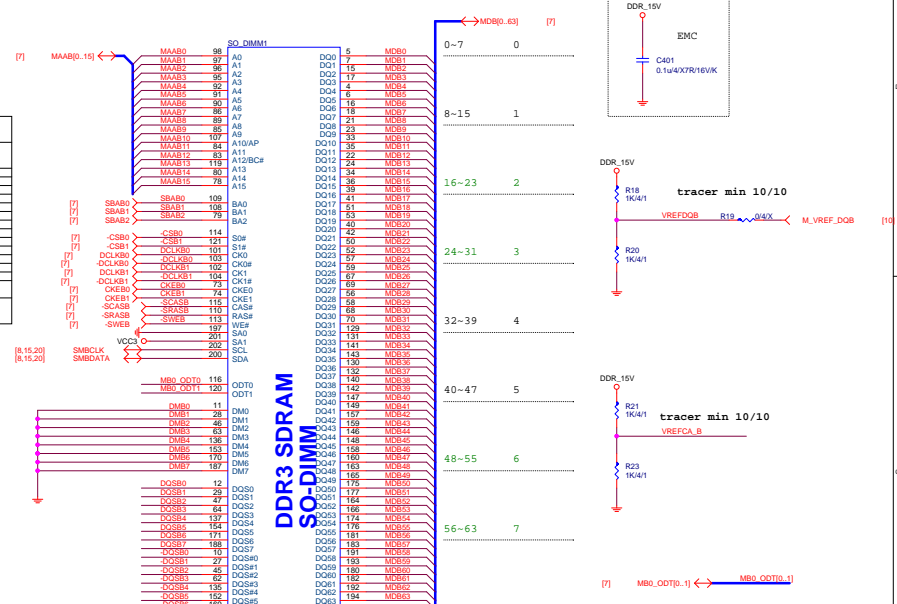
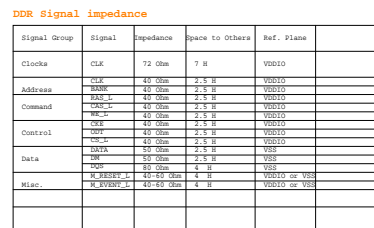
Sandy Bridge 2C BGA Processor (CLK,MISC,JTAG)

Please don't reversal DMI and FDI lane.



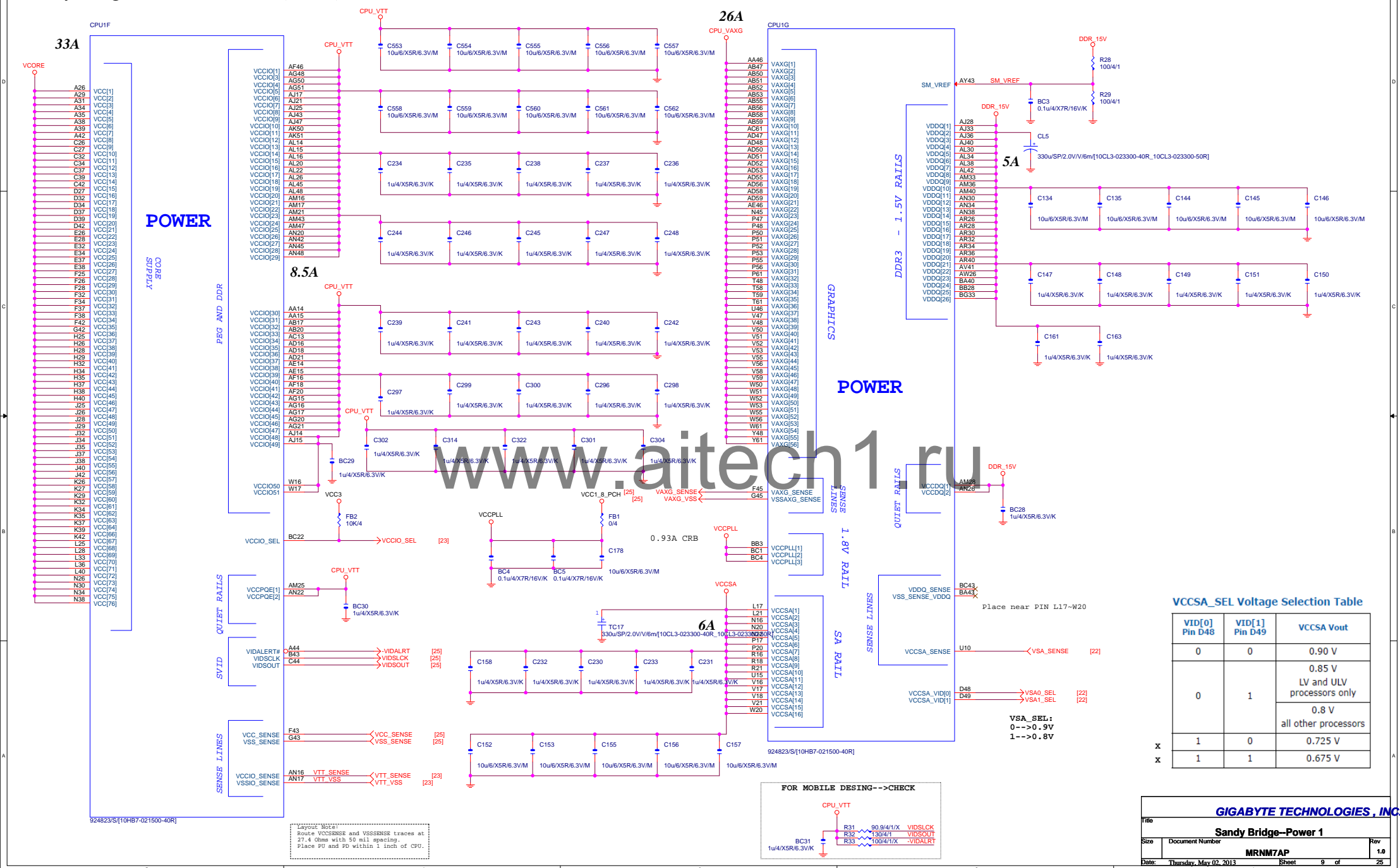
Sandy Bridge 2C BGA Processor (DDR3)





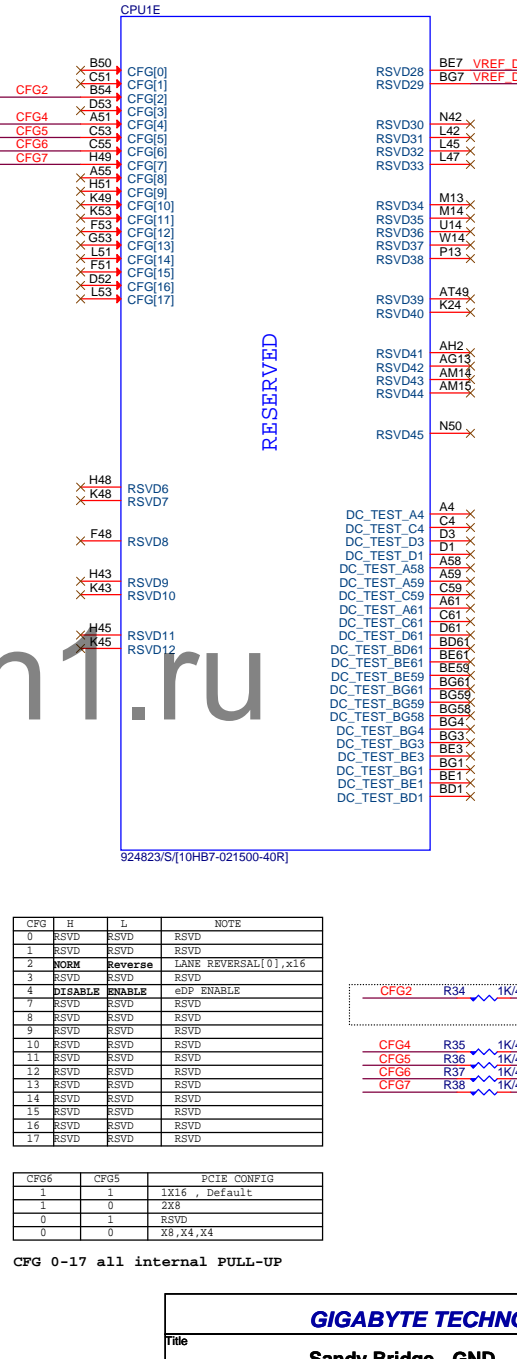
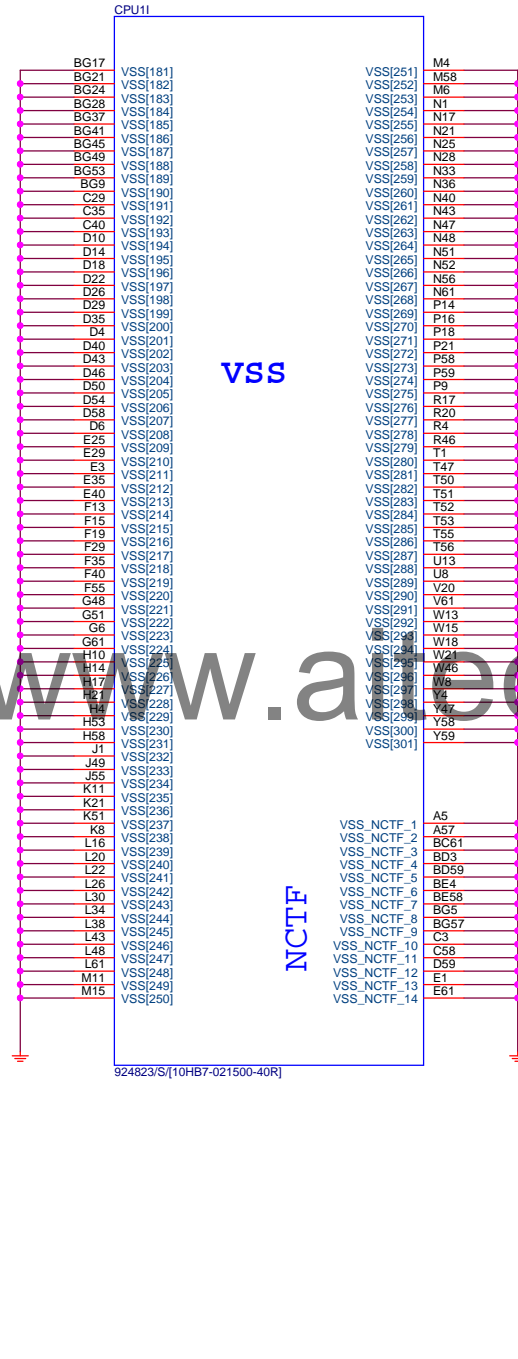
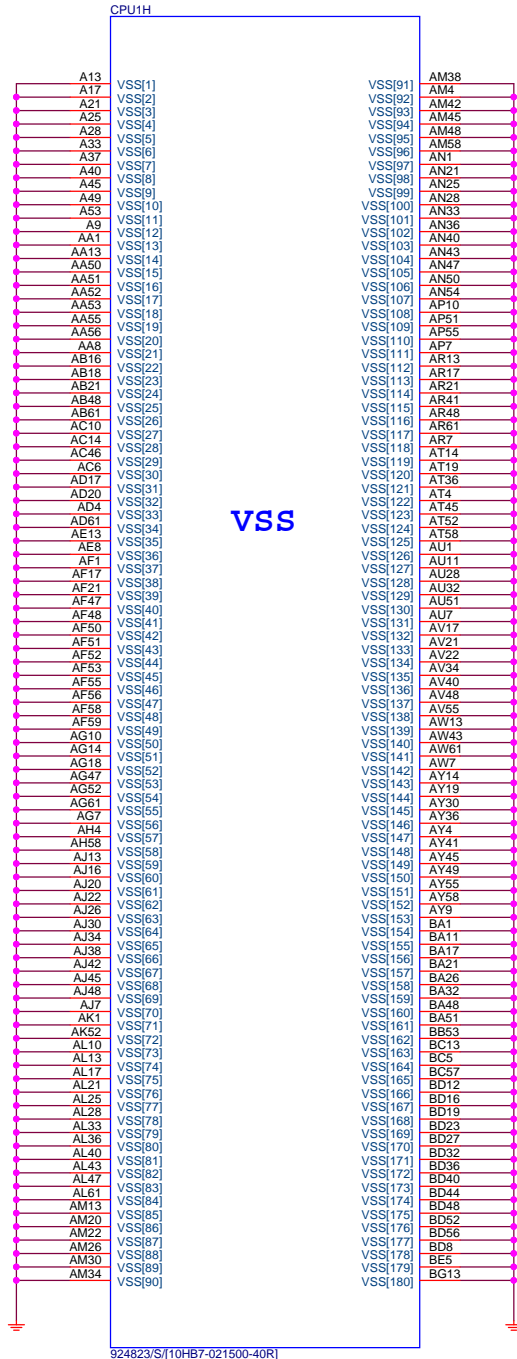


### *Sandy Bridge 2C BGA Processor (Power)*



# Sandy Bridge 2C BGA Processor (GND)

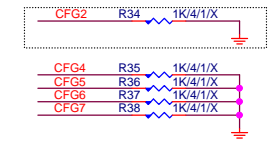
# Sandy Bridge 2C BGA Processor (Reserved)



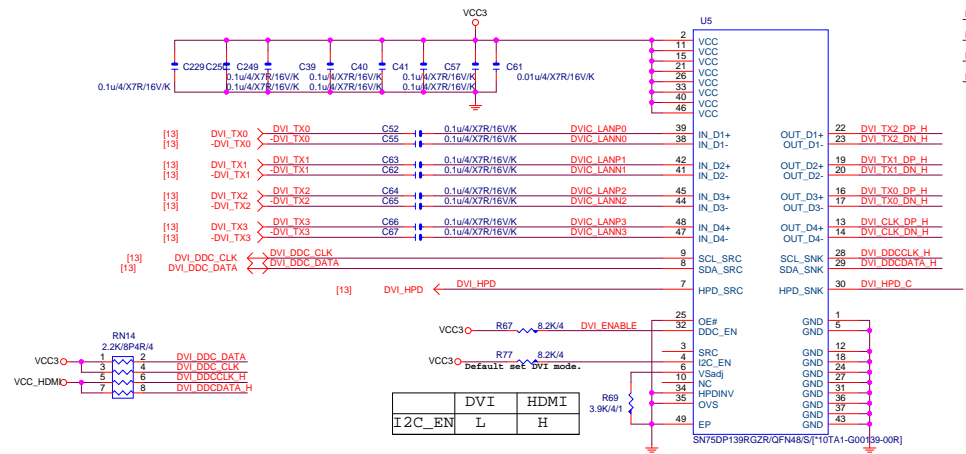
CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	NORM	Reverse	LANE REVERSAL[0..x16]
3	RSVD	RSVD	RSVD
4	DISABLE	ENABLE	eDP ENABLE
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD
16	RSVD	RSVD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

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

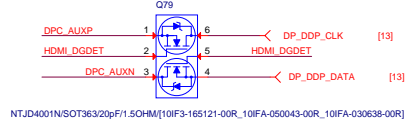
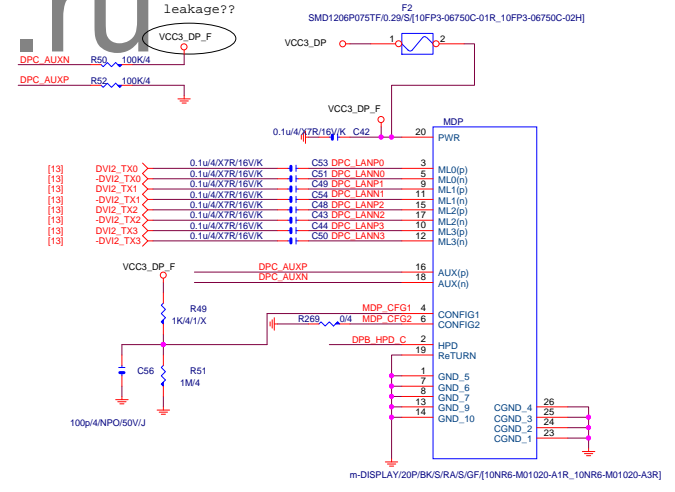
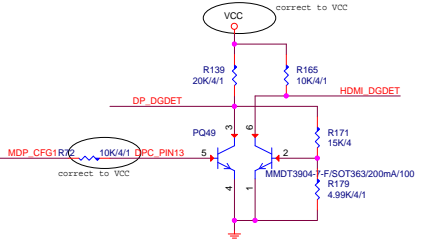
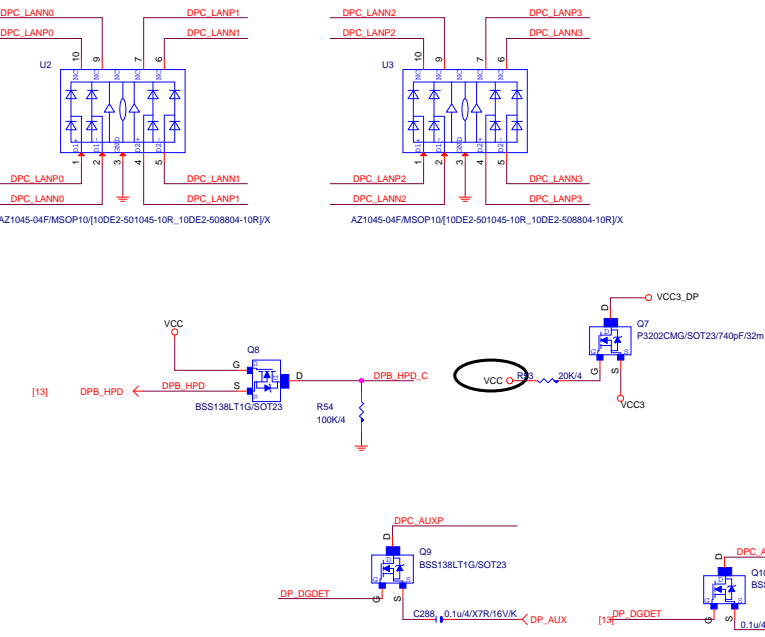
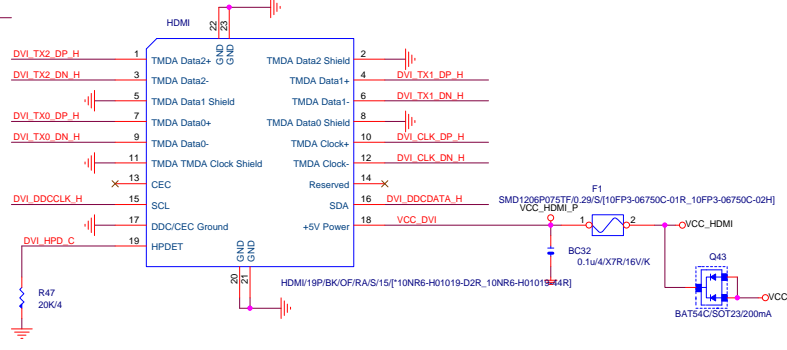
CFG 0-17 all internal PULL-UP

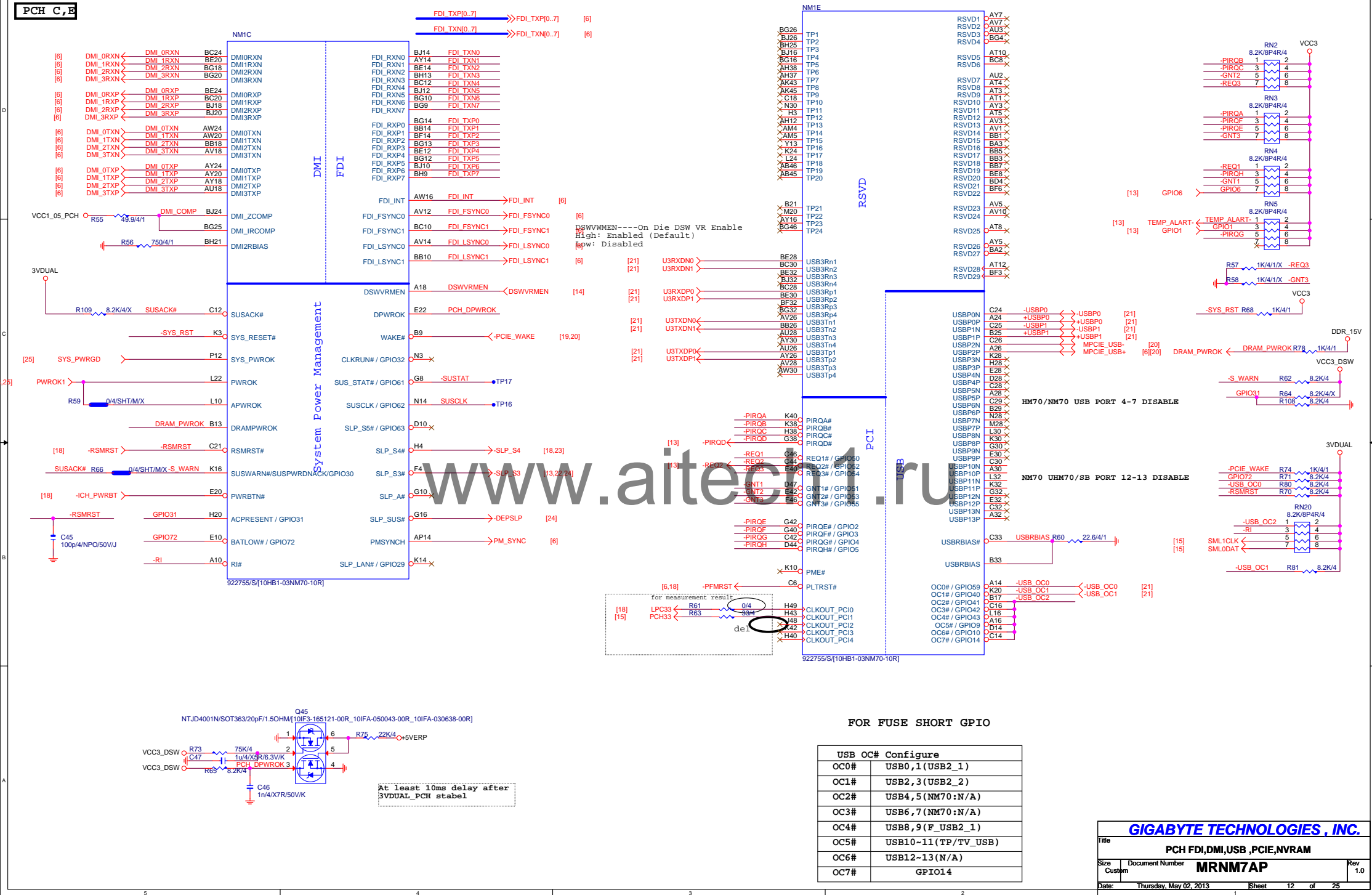


<b>GIGABYTE TECHNOLOGIES, INC.</b>			
Title			
<b>Sandy Bridge --GND</b>			
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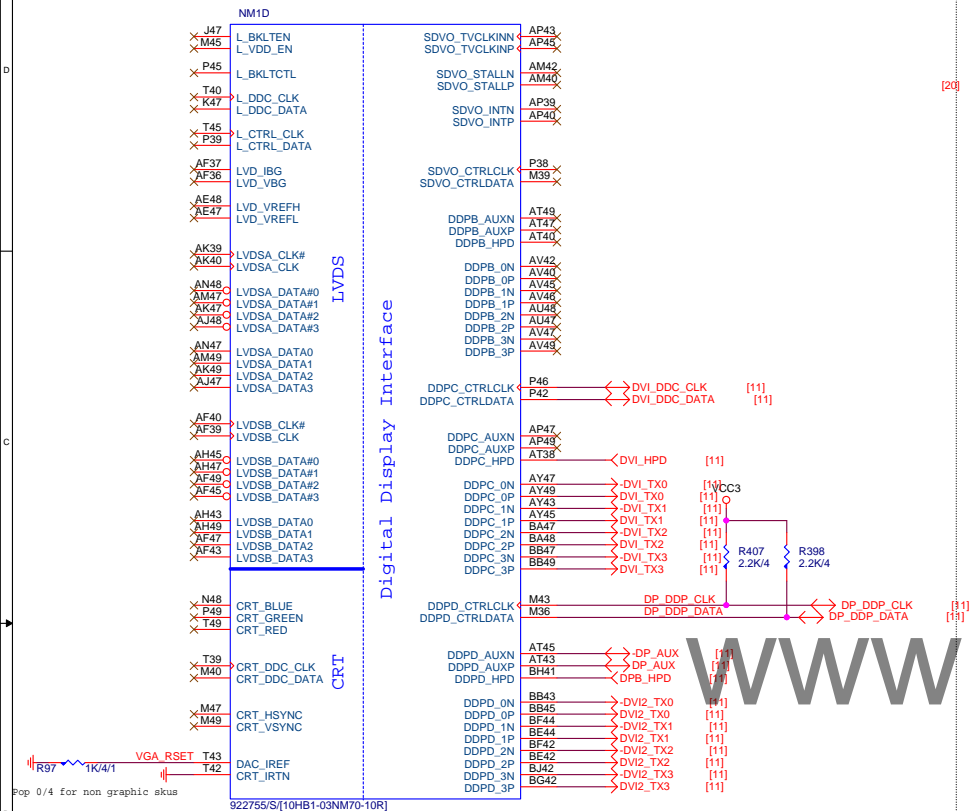
DVI TX2 DP H R289 330/4/X DVI TX2 DN H  
 DVI TX1 DP H R290 330/4/X DVI TX1 DN H  
 DVI TX0 DP H R291 330/4/X DVI TX0 DN H  
 DVI CLK DP H R292 330/4/X DVI CLK DN H  
 for EYE result



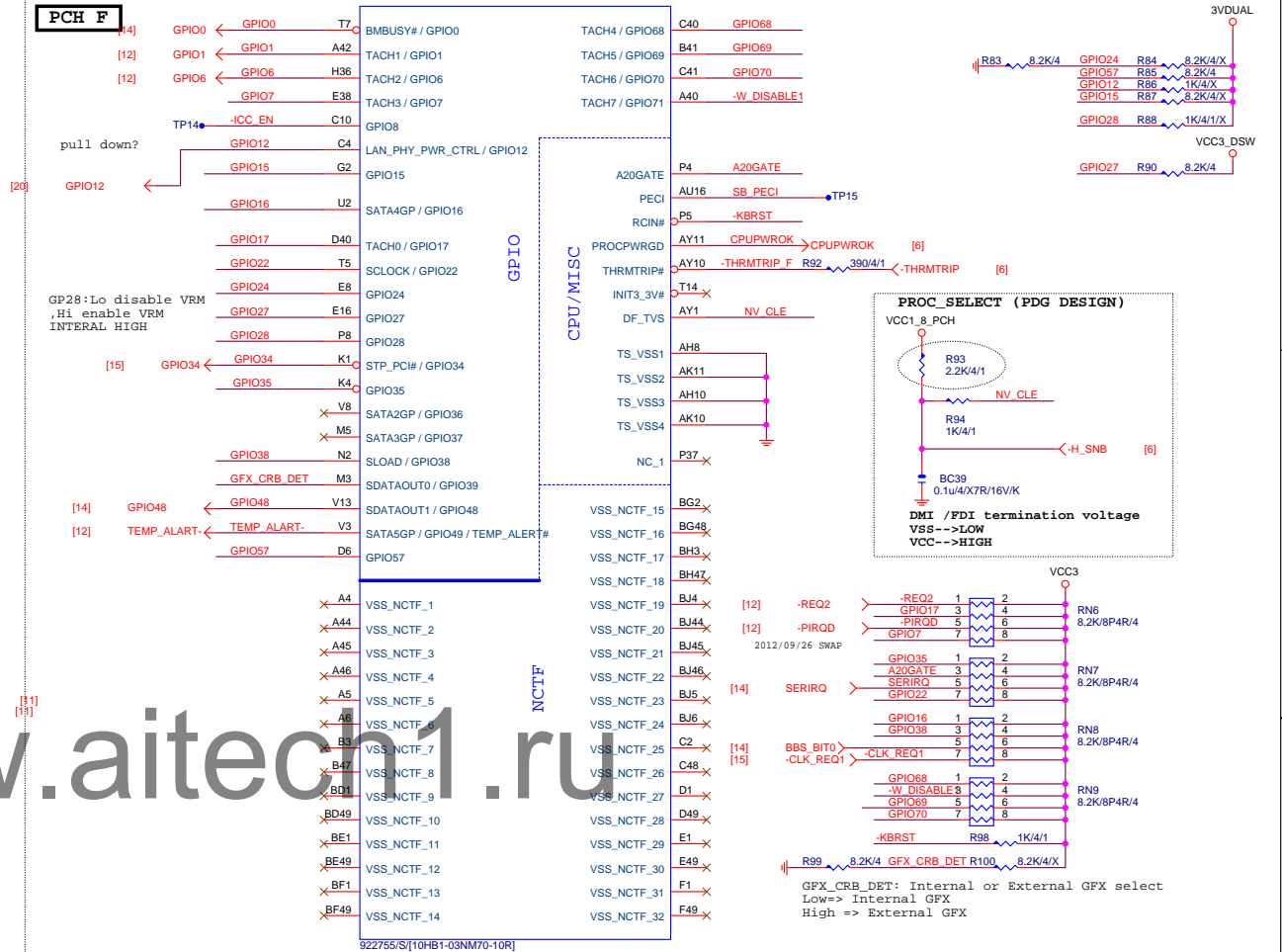




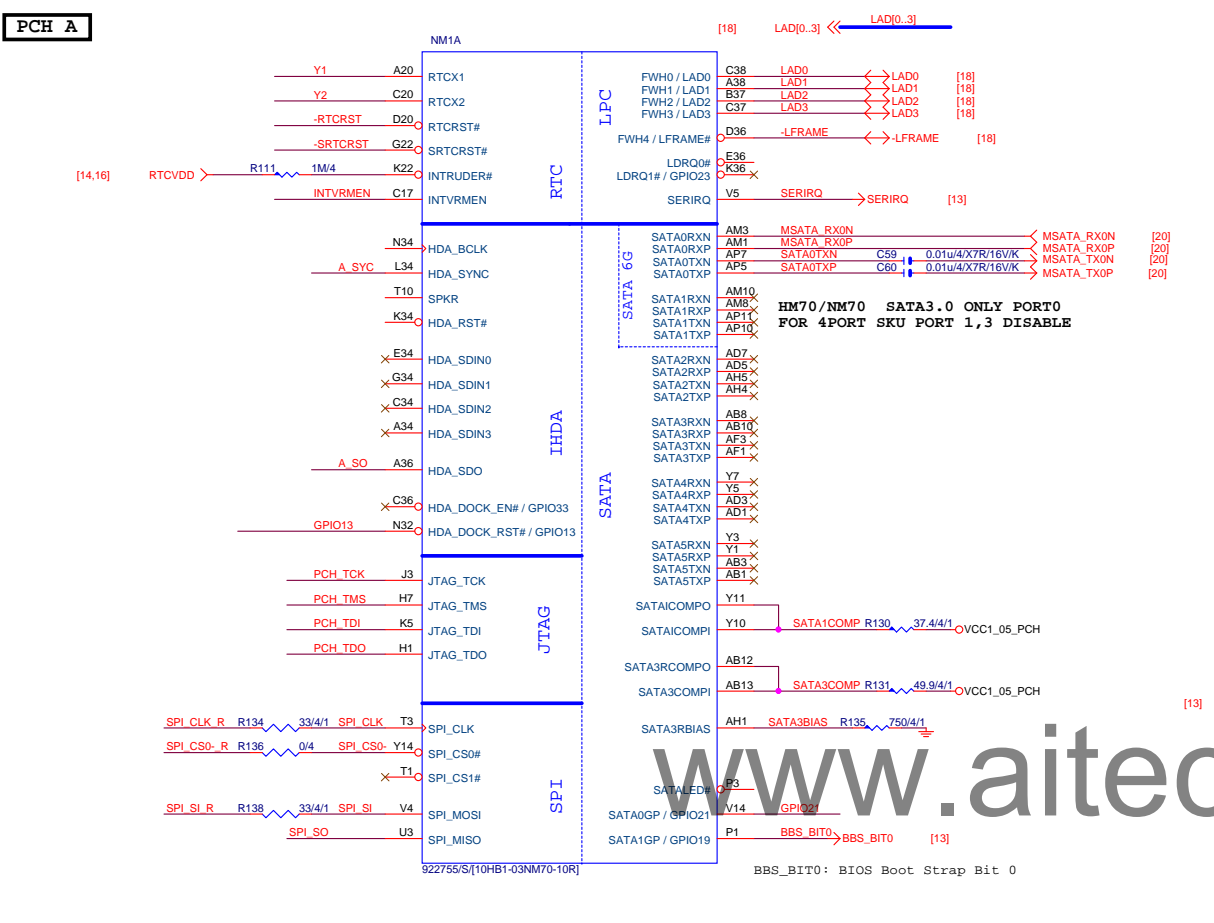
## PCH D DISPLAY



## PCH F



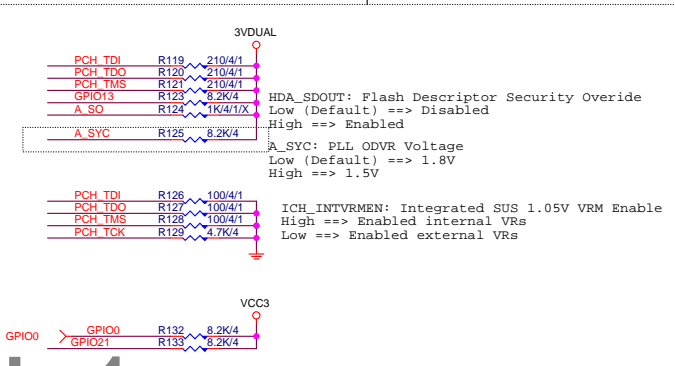
PCH A



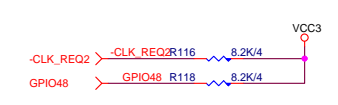
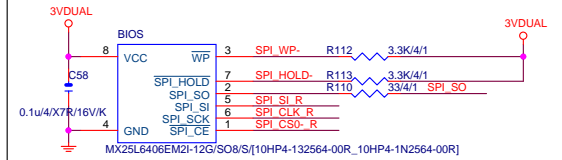
PCH HS

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

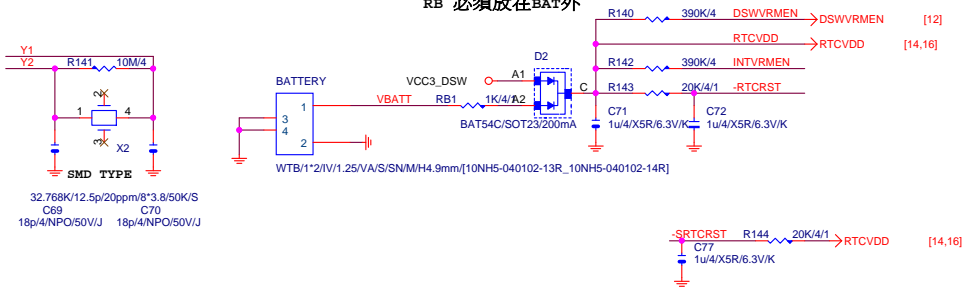
1 means floating  
0 means PD 1K



## BIOS



RB 必須放在BAT外



**GIGABYTE TECHNOLOGIES, INC.**

<b>GIGABYTE TECHNOLOGIES, INC.</b> Title <b>PCH HOST , SATA, PCI</b>				Rev
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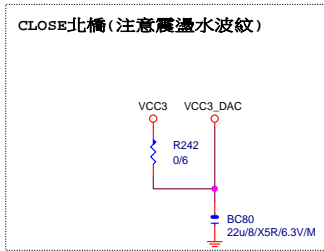
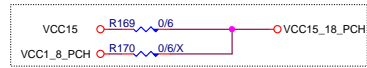
A

48Mhz

CIGABYTE TECHNOLOGIES, INC.

CREDIT TECHNOLOGIES, INC.	
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CLOSE北橋(注意震盪水波紋)



**GIGABYTE TECHNOLOGIES, INC.**

Title			
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
AD4	VSS[34]	VSS[113]	AP32
AD40	VSS[35]	VSS[114]	AP38
AD42	VSS[36]	VSS[115]	AP4
AD43	VSS[37]	VSS[116]	AP42
AD45	VSS[38]	VSS[117]	AP46
AD46	VSS[39]	VSS[118]	AP8
AD8	VSS[40]	VSS[119]	AR2
AE2	VSS[41]	VSS[120]	AR48
AE3	VSS[42]	VSS[121]	AT11
AF10	VSS[43]	VSS[122]	AT13
AF12	VSS[44]	VSS[123]	AT18
AD14	VSS[45]	VSS[124]	AT22
AD16	VSS[46]	VSS[125]	AT26
AF16	VSS[47]	VSS[126]	AT28
AF19	VSS[48]	VSS[127]	AT30
AF24	VSS[49]	VSS[128]	AT32
AF26	VSS[50]	VSS[129]	AT34
AF27	VSS[51]	VSS[130]	AT39
AF28	VSS[52]	VSS[131]	AT42
AF31	VSS[53]	VSS[132]	AT46
AF38	VSS[54]	VSS[133]	AT7
AF4	VSS[55]	VSS[134]	AU24
AF42	VSS[56]	VSS[135]	AU30
AF46	VSS[57]	VSS[136]	AV16
AF5	VSS[58]	VSS[137]	AV20
AF7	VSS[59]	VSS[138]	AV34
AF8	VSS[60]	VSS[139]	AV38
AG19	VSS[61]	VSS[140]	AV4
AG2	VSS[62]	VSS[141]	AV43
AG31	VSS[63]	VSS[142]	AV8
AG48	VSS[64]	VSS[143]	AV14
AH11	VSS[65]	VSS[144]	AW18
AH3	VSS[66]	VSS[145]	AW2
AH36	VSS[67]	VSS[146]	AW22
AH39	VSS[68]	VSS[147]	AW26
AH40	VSS[69]	VSS[148]	AW28
AH42	VSS[70]	VSS[149]	AW32
AH46	VSS[71]	VSS[150]	AW34
AH7	VSS[72]	VSS[151]	AW36
AJ19	VSS[73]	VSS[152]	AW40
AJ21	VSS[74]	VSS[153]	AW48
AJ24	VSS[75]	VSS[154]	AV11
AJ33	VSS[76]	VSS[155]	AY12
AJ34	VSS[77]	VSS[156]	D34
AK12	VSS[78]	VSS[157]	D38
AK3	VSS[79]	VSS[158]	D42

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

NM1I

AY4	VSS[159]	VSS[259]	H46
AY42	VSS[160]	VSS[260]	K18
AY46	VSS[161]	VSS[261]	K26
AY8	VSS[162]	VSS[262]	K39
B11	VSS[163]	VSS[263]	K46
B15	VSS[164]	VSS[264]	K7
B19	VSS[165]	VSS[265]	L18
B23	VSS[166]	VSS[266]	L2
B27	VSS[167]	VSS[267]	L20
B31	VSS[168]	VSS[268]	L26
B35	VSS[169]	VSS[269]	L28
B39	VSS[170]	VSS[270]	L36
B7	VSS[171]	VSS[271]	L48
F45	VSS[172]	VSS[272]	M12
BB12	VSS[173]	VSS[273]	M16
BB16	VSS[174]	VSS[274]	M18
BB20	VSS[175]	VSS[275]	M22
BB22	VSS[176]	VSS[276]	M24
BB24	VSS[177]	VSS[277]	M30
BB28	VSS[178]	VSS[278]	M32
BB30	VSS[179]	VSS[279]	M34
BB38	VSS[180]	VSS[280]	M38
BB4	VSS[181]	VSS[281]	M4
BB46	VSS[182]	VSS[282]	M42
BC14	VSS[183]	VSS[283]	M46
BC18	VSS[184]	VSS[284]	M8
BC2	VSS[185]	VSS[285]	N18
BC22	VSS[186]	VSS[286]	P30
BC26	VSS[187]	VSS[287]	N47
BC32	VSS[188]	VSS[288]	P11
BC34	VSS[189]	VSS[289]	P18
BC36	VSS[190]	VSS[290]	T33
BC40	VSS[191]	VSS[291]	P40
BC42	VSS[192]	VSS[292]	P43
BC48	VSS[193]	VSS[293]	P47
BD46	VSS[194]	VSS[294]	P7
B05	VSS[195]	VSS[295]	R2
BE22	VSS[196]	VSS[296]	R48
BE26	VSS[197]	VSS[297]	T12
BE40	VSS[198]	VSS[298]	T31
BF10	VSS[199]	VSS[299]	T37
BF12	VSS[200]	VSS[300]	T4
BF16	VSS[201]	VSS[301]	T4
BF20	VSS[202]	VSS[302]	T46
BF22	VSS[203]	VSS[303]	T47
BF24	VSS[204]	VSS[304]	T8
BF26	VSS[205]	VSS[305]	V11
BF28	VSS[206]	VSS[306]	V17
B03	VSS[207]	VSS[307]	V26
BF30	VSS[208]	VSS[308]	V27
BF38	VSS[209]	VSS[309]	V29
BF40	VSS[210]	VSS[310]	V31
BF8	VSS[211]	VSS[311]	V36
BC1	VSS[212]	VSS[312]	V39
BC21	VSS[213]	VSS[313]	V43
BC33	VSS[214]	VSS[314]	V7
BC44	VSS[215]	VSS[315]	W17
BG8	VSS[216]	VSS[316]	W19
BH11	VSS[217]	VSS[317]	W2
BH15	VSS[218]	VSS[318]	W27
BH17	VSS[219]	VSS[319]	W48
BH19	VSS[220]	VSS[320]	Y12
H10	VSS[221]	VSS[321]	Y38
BH27	VSS[222]	VSS[322]	Y4
BH31	VSS[223]	VSS[323]	Y42
BH33	VSS[224]	VSS[324]	Y46
BH35	VSS[225]	VSS[325]	Y8
BH39	VSS[226]	VSS[326]	BG29
BH43	VSS[227]	VSS[327]	N24
BH7	VSS[228]	VSS[328]	AJ3
D3	VSS[229]	VSS[329]	AD47
D12	VSS[230]	VSS[330]	B43
D16	VSS[231]	VSS[331]	BE10
D18	VSS[232]	VSS[332]	BG41
D22	VSS[233]	VSS[333]	CG14
D24	VSS[234]	VSS[334]	H16
D26	VSS[235]	VSS[335]	T36
D30	VSS[236]	VSS[336]	BG22
D32	VSS[237]	VSS[337]	BG24
D34	VSS[238]	VSS[338]	C22
D38	VSS[239]	VSS[339]	AP13
D42	VSS[240]	VSS[340]	M14
D8	VSS[241]	VSS[341]	AP3
E18	VSS[242]	VSS[342]	AP1
E26	VSS[243]	VSS[343]	BE16
G18	VSS[244]	VSS[344]	BC16
G20	VSS[245]	VSS[345]	BG28
G26	VSS[246]	VSS[346]	BJ28
G28	VSS[247]	VSS[347]	
G36	VSS[248]	VSS[348]	
G48	VSS[249]	VSS[349]	
H12	VSS[250]	VSS[350]	
H18	VSS[251]	VSS[351]	
H22	VSS[252]	VSS[352]	
H24	VSS[253]		
H26	VSS[254]		
H30	VSS[255]		
H32	VSS[256]		
H34	VSS[257]		
F3	VSS[258]		

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

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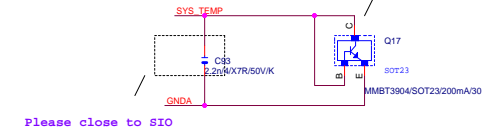
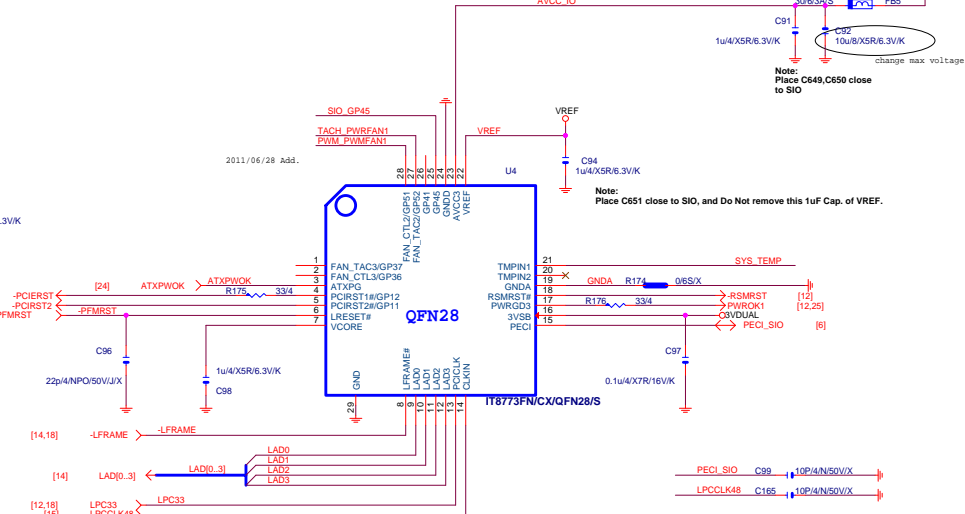
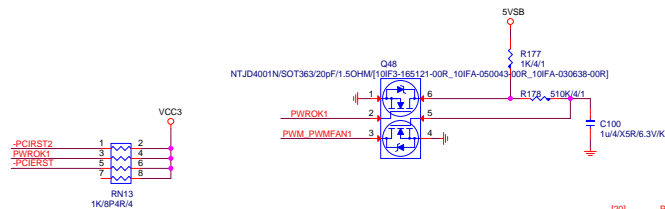
# Power On Strapping Options

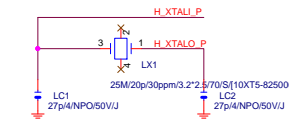
Symbol	value	Description
JP4	K8PWR_EN	1 K8 power sequence function is disabled
Pin 126		0 K8 power sequence function is enabled
	11	The default value of EC Index 15h/16h/17h is 80h
JP3 & JP5	FAN_CTL_SEL	10 The default value of EC Index 15h/16h/17h is FFh(Fan off)
Pin 124 & 46		01 The default value of 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.





Reference for strapping pin information.

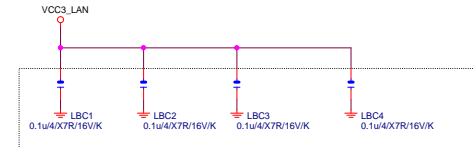
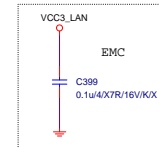
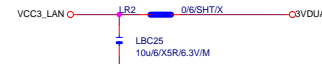
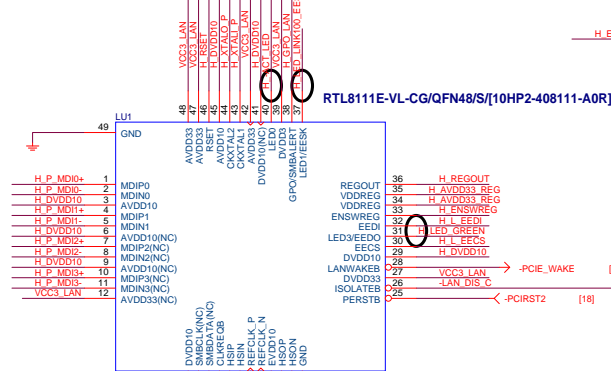
LRN1 8.2K/8P4R/4

1. When using EEPROM only without ASF function.  
Mount LR23 10K for 93C56/66  
Mount LR23 10K for 93C46  
Un-mount LR8 for not support ASF

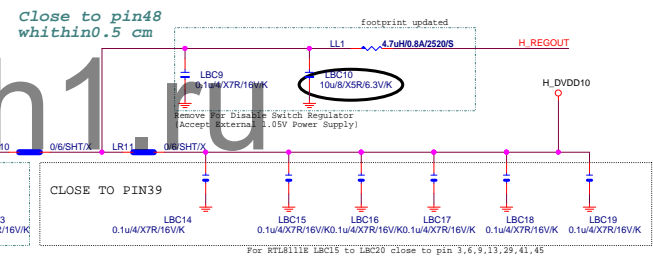
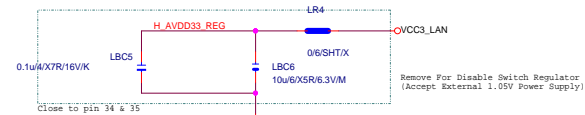
2. When using EEPROM(only 93C56/66) with ASF function.  
Mount LR22 1K for 93C56/66  
Mount LR8 for support ASF

3. When using EPfuse/BIOS Patch without ASF function.  
Mount LR23 10K for SMD\_LAN  
Un-mount LR8 for not support ASF

Note: Support ASF 93C66 is necessary and SMC\_LAN must pull-high 1K if not support please NC.

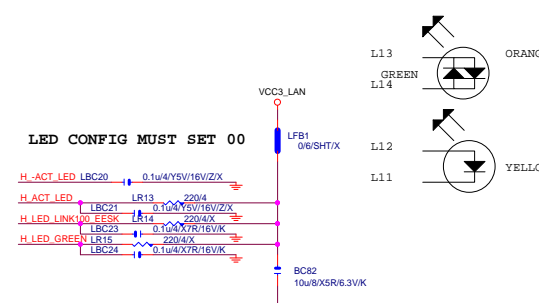
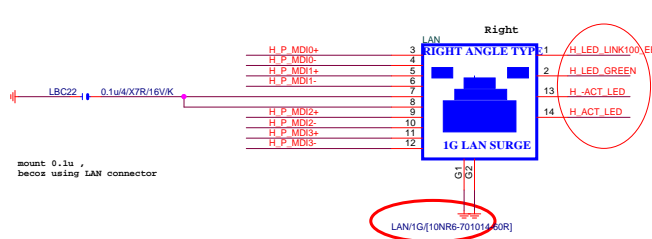
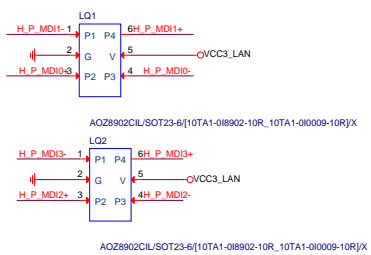


For RTL8111E LBC3 to LBC4 close to pin 12,27,39,42,47,48  
For RTL8105E LBC3 to LBC4 close to pin 27,39,42,47,48

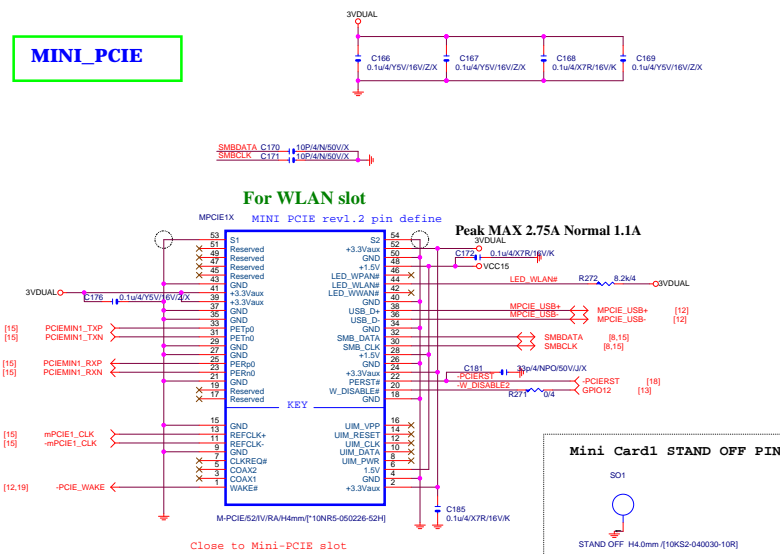


For RTL8111E LBC15 to LBC18 close to pin 3,6,9,13,29,41,45  
For RTL8105E LBC15 to LBC18 close to pin 3,13,29,45  
Put 0.1uF at each power pin of LAN

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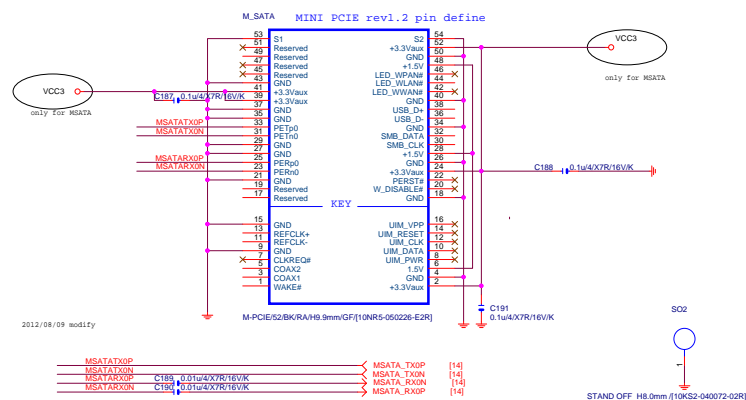
## MINI\_PCIE



## MSATA

## EXT\_CON PWR CIRCUIT

### For mSATA slot

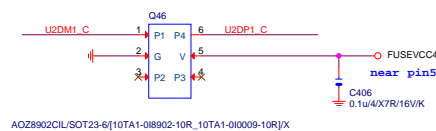
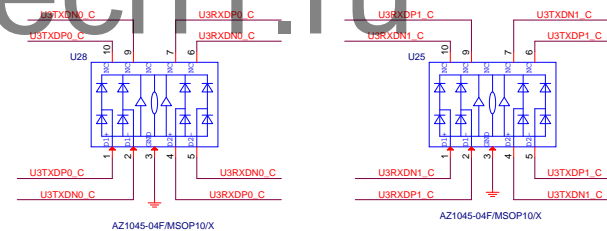
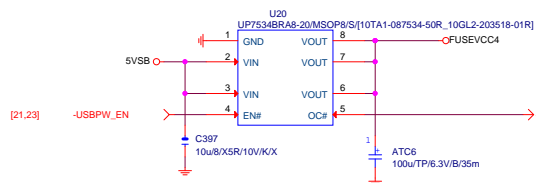


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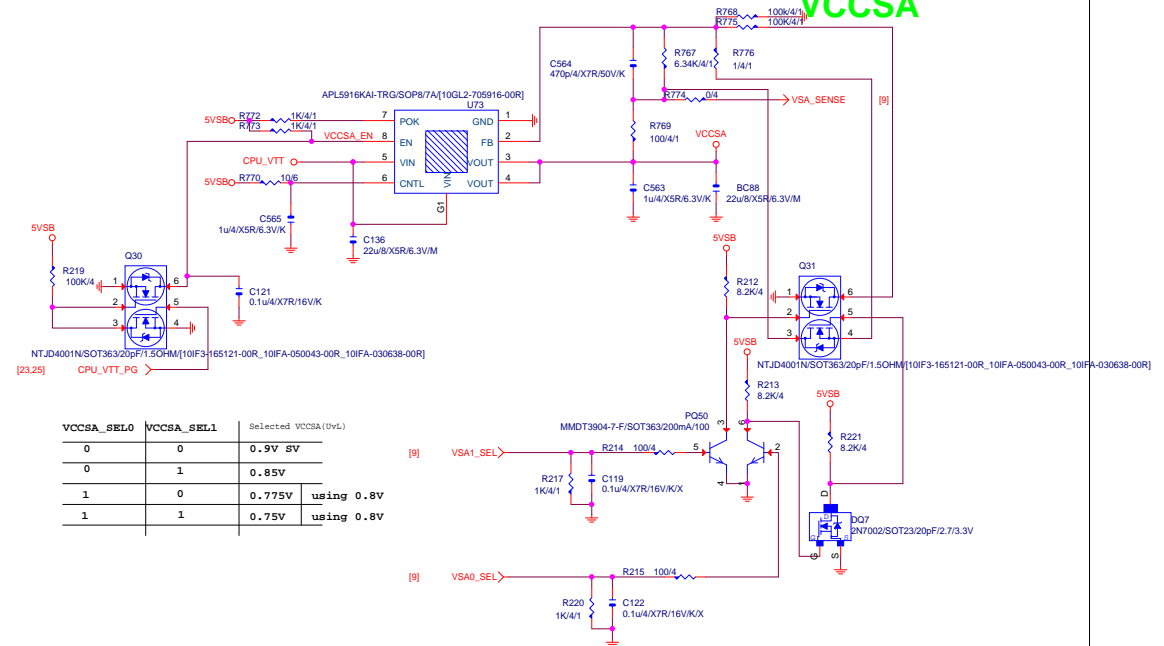
GIGABYTE TECHNOLOGIES, INC.

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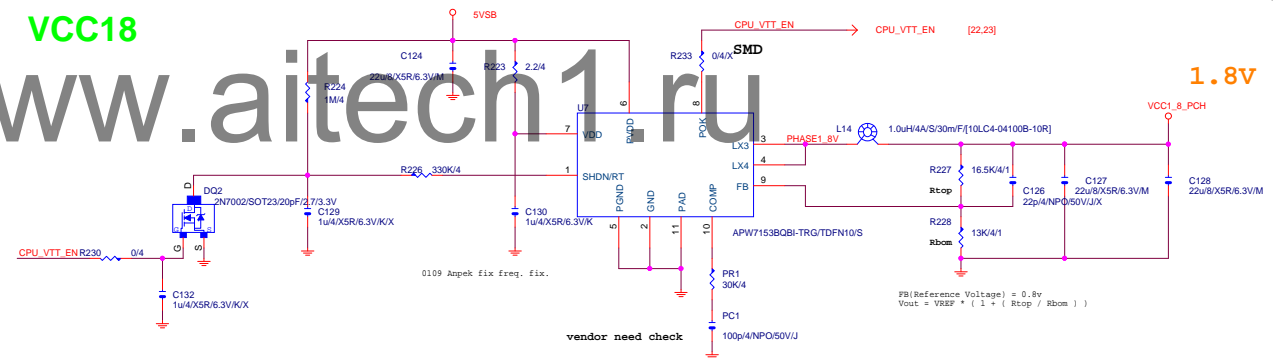




**VCCSA**

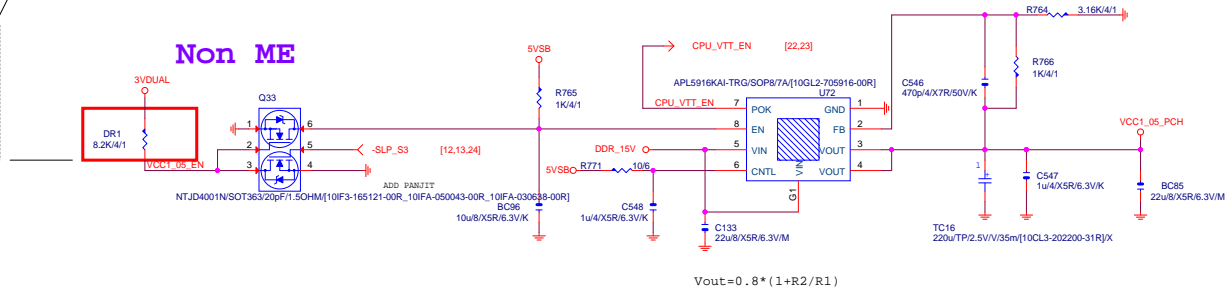


VCCSA_SEL0	VCCSA_SEL1	Selected VCCSA (VvL)	
0	0	0.9V 5V	
0	1	0.85V	
1	0	0.775V	using 0.8V
1	1	0.75V	using 0.8V

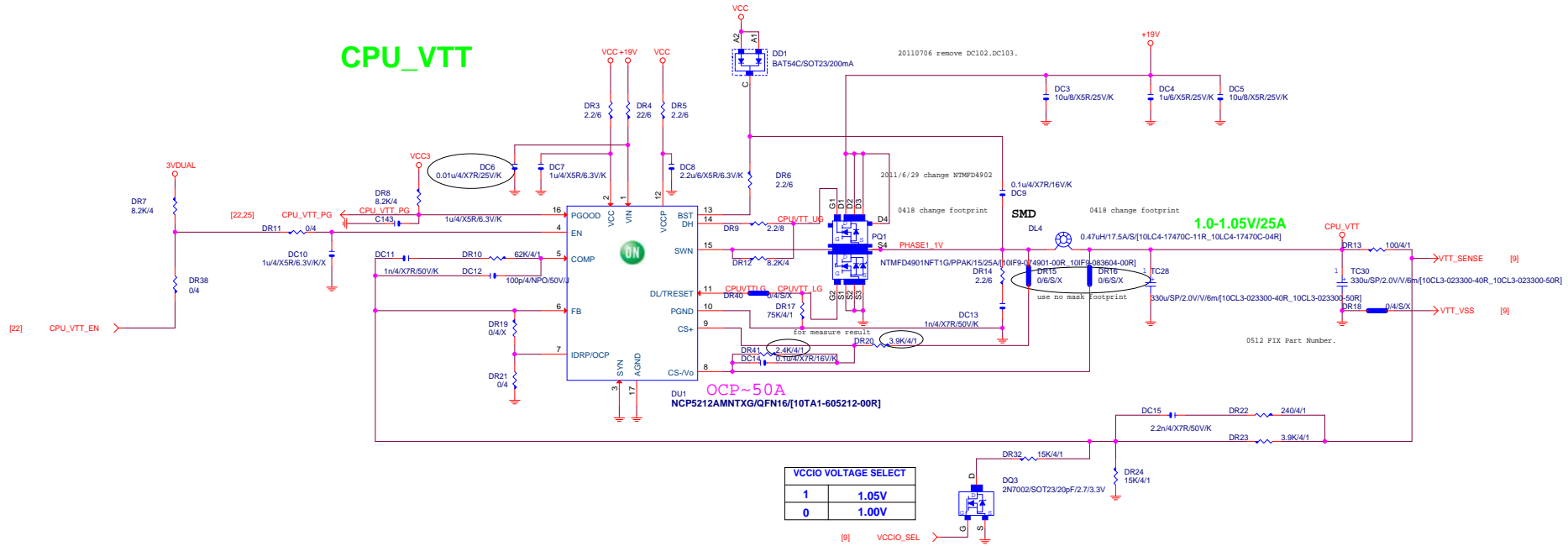


Note.

Non AMT model:  
R225 remove.  
DQ2.R230.C132.DR1 use.

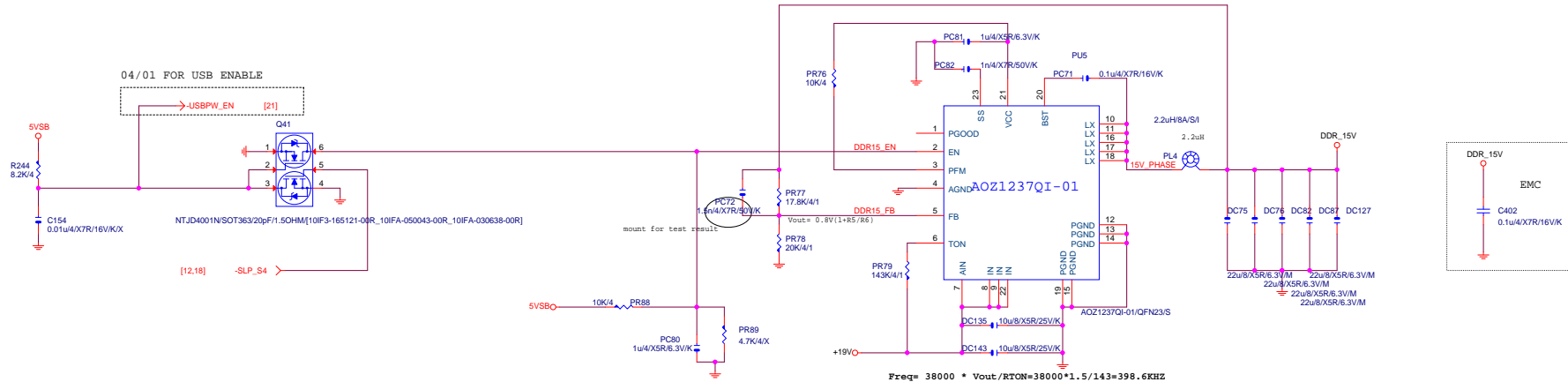


## CPU\_VTT

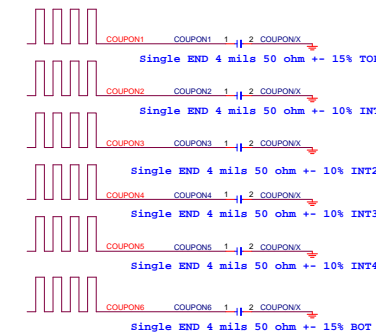


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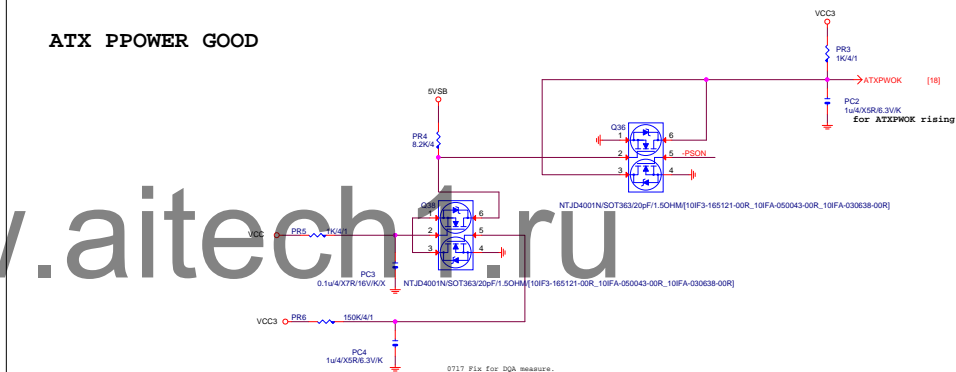
DDR15V  
11.21A



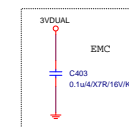
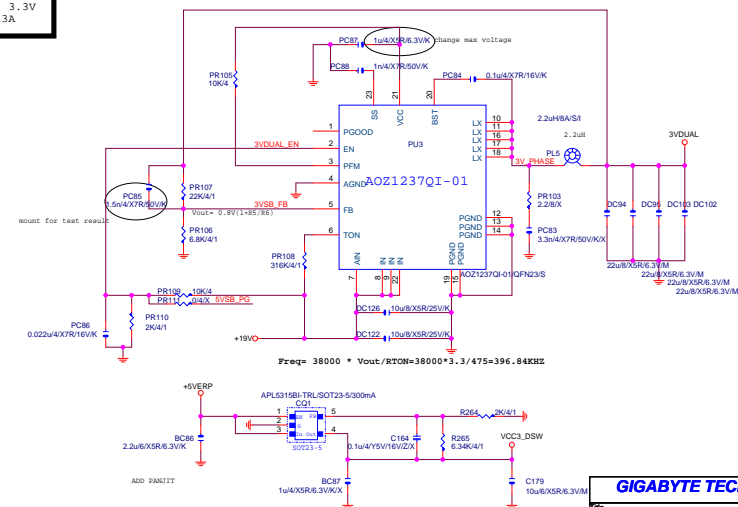
FOR INOUT AD PROTECT CIRCUIT



ATX PPOWER GOOD



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



Title			
AD19V & VCC & VCC3			
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