

## Model Name: GA-Z270X-Ultra Gaming

SHEET

TITLE

01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1151-A
05	CPU_LGA1151-B_DDR4
06	CPU_LGA1151-C
07	CPU_LGA1151-D
08	DDR4 CHANNEL A 1,2
09	DDR4 CHANNEL B 1,2
10	PCH_RGB,CLK BUFFER
11	PCH DMI,USB,PCIE
12	PCH MISC
13	PCH SATA,PCIE,SATA_EXPRESS
14	PCH_PWR,GND
15	PCH_GND
16	ITE 8686 LPC IO
17	HMW
18	FAN CTRL--SIO
19	PCI EXPRESS X16 SLOT
20	PCI EXPRESS X8 SLOT
21	PCI EXPRESS X16 SWITCH
22	PCI EXPRESS X4 SLOT(CPU)
23	NA
24	PCI EXPRESS X1 SLOTS (PCIEX4 SWITCH)
25	SATA EXPRESS
26	ISL95856 PWM
27	ISL95856 MOS_VCORE
28	ISL95856 MOS_VCCGT
29	VCCSA_VCCIO_VCCPLL
30	RT8120_DDR
31	RT8120_VPP
32	RT8120_PCH
33	DISCRETE POWER1
34	NCT3933
35	ATX POWER , A_-PROCHOT

Rev 1.01

SHEET

TITLE

36	KB_MS_USB
37	OC , ECO , POWER BUTTON
38	F_USB30
39	F_USB20
40	R_USB30
41-42	ALC1220
45	NA
46	LAN~I219
47	USB30_LAN-I219
48	IDT6V41630_CLK BUFFER
49	COM , TPM , 80 port , THB_C
50	F_PANEL
51~53	ASM2142
55	NA
56	HDMI
57	DVI
58	NA
59	NA
60	M2A_32G (M.2 22110)
61	NA
62	N/A
63	EMI/ESD
64	NTC MAP
65	POWER MAP
66	POWER零件使用表
67	TABLE LIST
68	DUAL BIOS
69	U2_32G
70	NA
71	NA
72~74	MCU LED
75	USB_DAC POWER
76	VCCPLL , VCCPLL_OC , VCCST_VCCPLL

Gigabyte Technology

Title		Cover Sheet		Rev	
Size		Document Number		GA-Z270X-Ultra Gaming	
Date		Tuesday, November 01, 2016		Sheet 1 of 76	

Model Name: GA-Z270X-Ultra Gaming

Component value change history

Data	Change Item	Reason
2016/07/05	1. First Release	9MZ27ULGA-00-01
2016/08/15	1. NC2 27P/4 to 22P/4 2. Remove NR17,NR186 8.2K/4 3. OR56 10K/4 to 8.2K/4 4. Remove CD1 AZ2225-01 5. PWM to ISL95866 6. TTR2 5.49K/4/1 to 4.7K/4/1 7. TTR8 4.02K/4/1 to 4.3K/4/1 8. CR20,CR1 0/4 to 75/4/1 9. Remove BSR1,BSR5 1K/4/1	9MZ27ULGA-00-02
2016/09/13	1. Update LED Control Circuit 2. Update Type C to Ti 3220	9MZ27XD3U-00-01
2016/10/06	1. Remove 0 ohm 2. Update H.S. 料號 3. Add Audio beat mode 4. PCB Rev 1.0	9MZ27ULGA-00-10A
2016/10/21	1. PCB Rev 1.01 2. 移除DC_SBC7/8, MR25/26,MC20 3. 增加DCC1/2/3, MABC6 4. Add DCC51,DCC52,DCC53,DCC55 5. Remove 12pcs LED	9MZ27ULGA-00-10D
2016/10/25	1. R_USB30 connect change to 11NR6-H03037-01R	9MZ27ULGA-00-10E
2016/10/27	1. MOSFET change to ON	9MZ27ULGA-00-10F

2016/10/19 Rev 1.01  
1. 由Z270X-Gaming K5 Rev 1.0修改  
2. 移除DC\_SBC7/8, MR25/26,MC20  
3. 增加DCC1/2/3, MABC6  
4. Add DCC51,DCC52,DCC53,DCC55  
5. 修改DDR O.C. Layout

Circuit or PCB layout change

DATE	Change Item	Reason
2016/07/05 Rev 0.1	1. First Release	
2016/08/12 Rev 0.2	1.Remove IT8792 2.Add NR85,NR86 3.Remove OC button 4. OR56改接3VDUAL_PCH 5. PCIE X4 slot 改跟PCIE X1 切换 (原本跟M2P_32G) 6. Add PWM ID NR400,NR401 close to PCH 7. F_USB30_1 DAC power, 改為FBU2EC1,FBU3F1,FBU3C5 fuse power 8. Audio connect power 改接FUSEVCC_R 9. USB30_LAN 改為USB_LAN 10. M2P_32G改為M2A_32G 11. M2M remove 12. U2_32G pin D6改接GND 13. LED control update (跟Gaming 3一樣) 14. DEBUG_LED 文字加粗 15. AUDIO切割靠近AUDIO connect處加LED 或由其他地方移LED過來 16. NX1 背板SHAPE REMOVE 17. 統一PCIE x4跟PCIE x1的切换方式 18. XMP/TURBO/Model Name LED 改測發光, 擺放位置請參考Z270X-Gaming 7 Rev 0.2 19. MH1,MH2 改 AGND 20. CR22 改0/6 , MOATR1,MOATR2,MOATR4 改0/4/X , MOATR3改0/4 21. Add CPVDD POWER 22. Add SMOATR1,放在CUI下方背板 23. Model LED改側發光LED 24. C_3LED32, C_3LED33, C_3LED16, C_3LED17移到靠近AUDIO connect 切割線 25. Audio add CD3,CD4,CD5,CD6 26. Delete C_3LED32 27. Add M_3LED4 for "G1 GAMING" model name 28. KABY LAKE模組化線路LED CONTROL Rev0.6 29. Add MCUCD10-13 30. Remove flex IO 31. COUPON1.2 net改為VCC3 32. Remove Audio 部分正面LED, C_3LED31, C_3LED30, C_3LED29, C_3LED27, C_3LED18, C_3LED26	
2016/09/12 Rev 0.1	1. 由Z270X-Ultra Gaming Rev 0.2來修改 2. MABC8 0603改為0402 3. LED circuit update a. MCU1 power 改成 MCU_PW33 b. Remove MCU_PHL, test pin c. MCUR13改short-pad d. LEDR3改2.2M/4, VRN3改330/8P4R/6 e. 側發光改宏齊LED料號:10DL6-220RGB-51R f. 移除背板PCB LED和G1.Gaming 鑲空, 改成正面雷雕導光燈條設計 g. 刪除Audio 正面LED 4. ASM2142 circuit update a. SSAC40,SSAC41,SSAC42,SSAC43,SSAC44,SSAC45, SSAC46,SSAC24,SSAC49 0603改為0402 Capture Value: 2.2u/4/X5R/6.3V/M 5. MH1改GND, MOATR1&MOATC1移到F_AUDIO下方 6. MH2改dummy 7. SYS_TEMP2移到FFR13下方 8. MOATR1&MOATC1移到F_AUDIO下方 9. MOATR3 &MOATC3到目前 Rev 0.2版MOATR1&MOATC1的位置 10. Debug_LED 文字面加框放在下面一點 11. USB31_2改為USB31 12. C_3LED38, C_3LED25, C_3LED20, C_3LED19, C_3LED17, C_3LED16, C_3LED15, C_3LED11, C_3LED10刪除. 13. Remove OC_BT & OC_LED connect 14. SYS3_PUMP rename to SYS_FAN3_PUMP 15. TTRT1跟VRM_TEMP對調位置 (VCORE最熱的MOS是DC_DQ1) 16. TTRT2放在DO_DQ2下方 (VAXG最熱的MOS是DO_DQ2) 17. PCIE X4 slot改為非金屬slot	
2016/10/06 Rev 1.0	1. 由Z270X-Ultra Gaming Rev 0.1來修改 2. 0 ohm改為short pad 3. MOS_HS改為TMOS: MOSHSINK-SNIPERB8-T & RMOS: MOSHSINK-SNIPERB8-R 4. Audio修改 a. Remove ALC1220 pin41 CPVDD LDO POWER , 改成從3VDUAL過來 b. MOATR1, MOATR3 改 SHORT PAD 5. LED修改 a. Add "N_GFP_D10" software beat mode control b. Remove PCIE_LED control ON/OFF circuit 6. H_3LED1,H_3LED2,H_3LED3,H_3LED4 MASK 7. PCH_HS改為BGASHINK-Z270-GAMING-K3 8. Rear footpint Z270 UD BASE_COVER 9. MASK clock buffer & 適通零件 10. 移除USB_LAN_HS	

GIGABYTE™

File

BOM & PCB MODIFY HISTORY

Date

Tuesday, November 01, 2016

Sheet

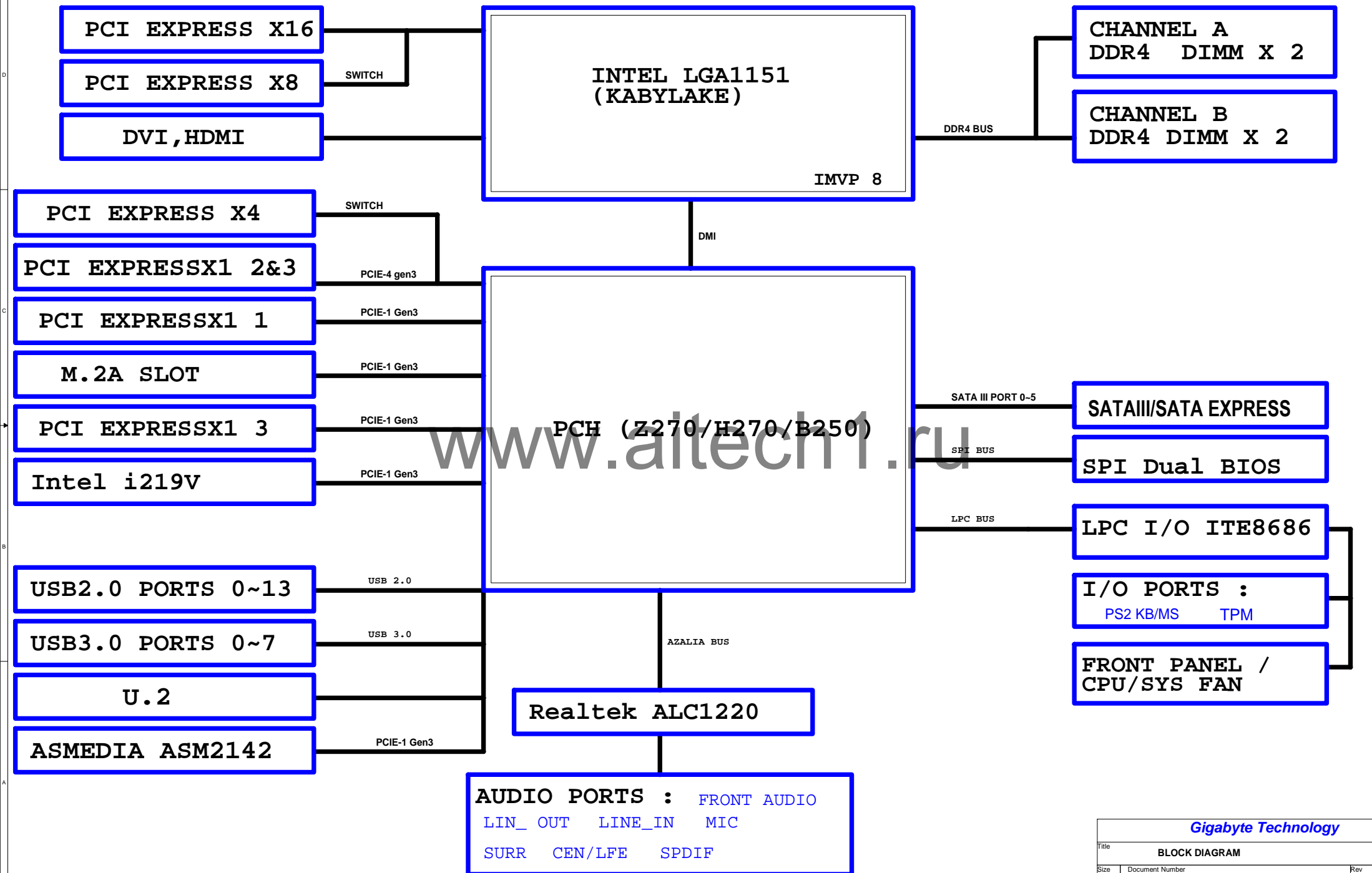
2 of 76

Document Name

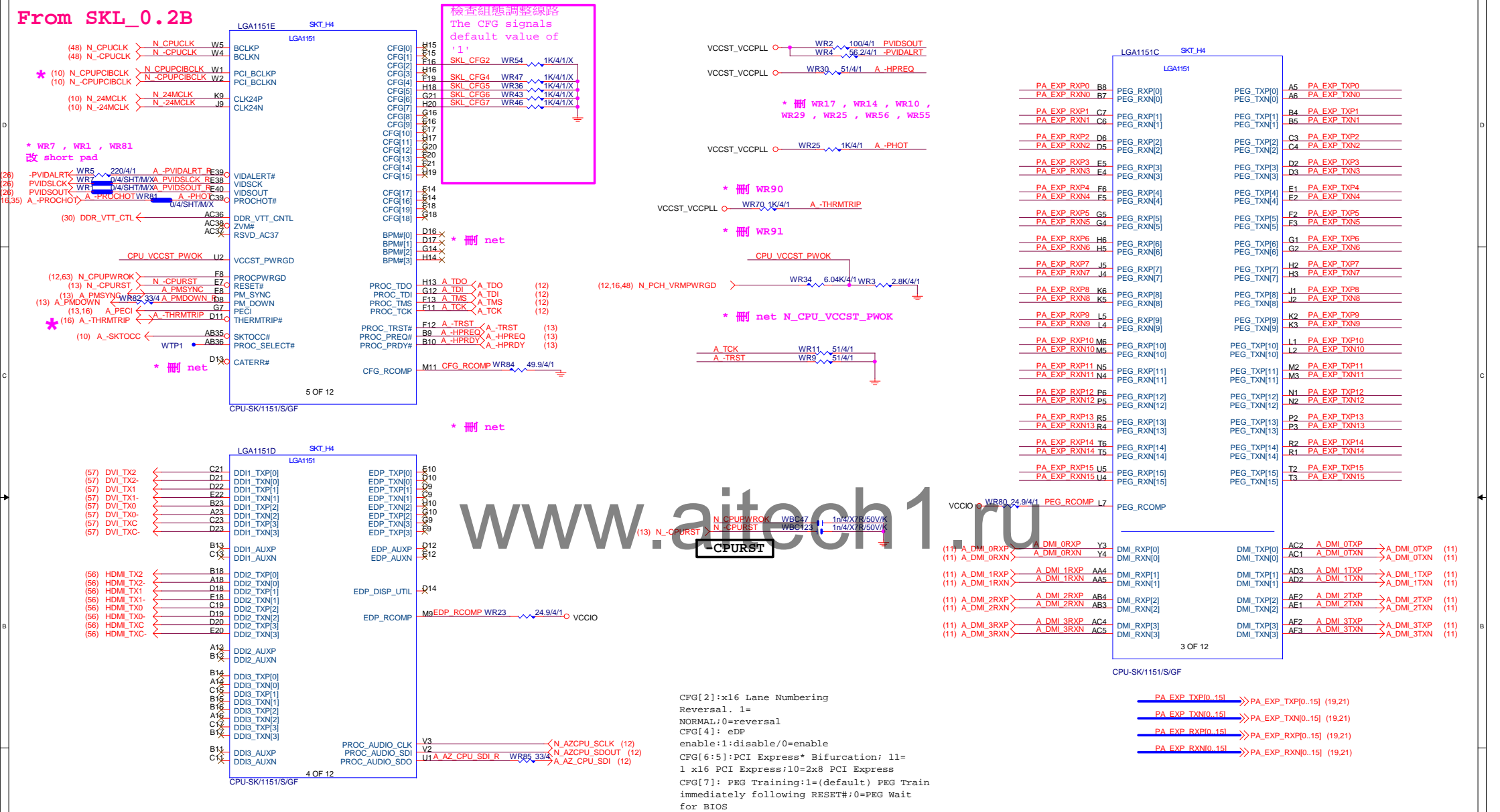
GA-Z270X-Ultra Gaming

1.01


# BLOCK DIAGRAM



## From SKL\_0.2B



Bifurcation Config.	Signals Lanes		
	CFG[6]	CFG[5]	CFG[2]
1x16	1	1	1
1x16 Reversed	1	1	0
2x8	1	0	1
2x8 Reversed	1	0	0
1x8+2x4	0	0	1
1x8+2x4 Reversed	0	0	0

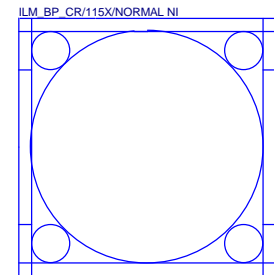
			
Title			
CPU LGA1151-A			
Size Custom	Document Number		Rev
	GA-Z270X-Ultra Gaming		1.0
Date	Tuesday	November 01, 2016	Sheet 4 of 76



# \* 改DDR4 net



LGA1151



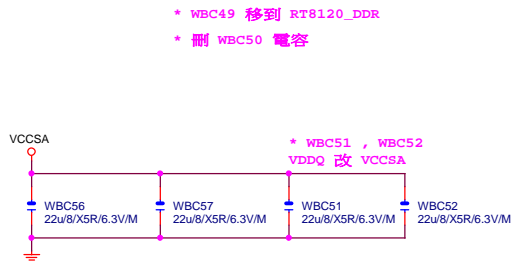
Need check the new CPU MB

CPU-SK/1151/S/GF  
CPU-SK/1151/S/GF



(8) MODT\_A[0..3] <=> MODT\_A0..31  
(9) MODT\_B[0..3] <=> MODT\_B0..31  
(8) MDA[0..63] <=> MDA0..63  
(9) MDB[0..63] <=> MDB0..63  
(8) M\_DQSA[0..7] <=> M\_DQSA0..71  
(8) M\_-DQSA[0..7] <=> M\_-DQSA0..71  
(8) MAAA[0..16] <=> MAAA0..161  
(9) MAAB[0..16] <=> MAAB0..161  
(9) M\_DQSB[0..7] <=> M\_DQSB0..71  
(9) M\_-DQSB[0..7] <=> M\_-DQSB0..71

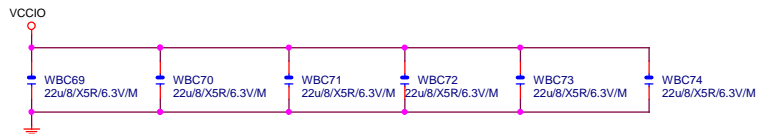
Gigabyte Technology		
Title CPU LGA1151-B		
Size Custom	Document Number GA-Z270X-Ultra Gaming	Rev 1.01
Date: Tuesday, November 01, 2016	Sheet 5	of 76



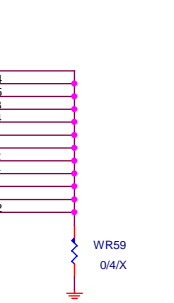
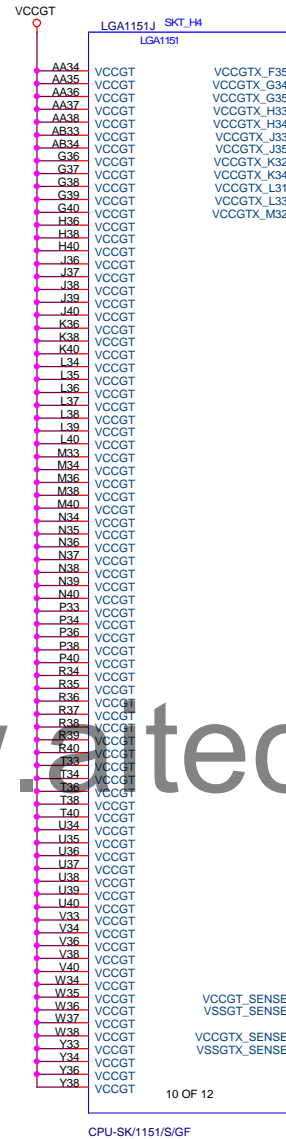
\* 刪 WBC124, WBC125, WBC126, WBC127 電容

CPU POWER

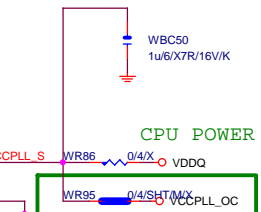
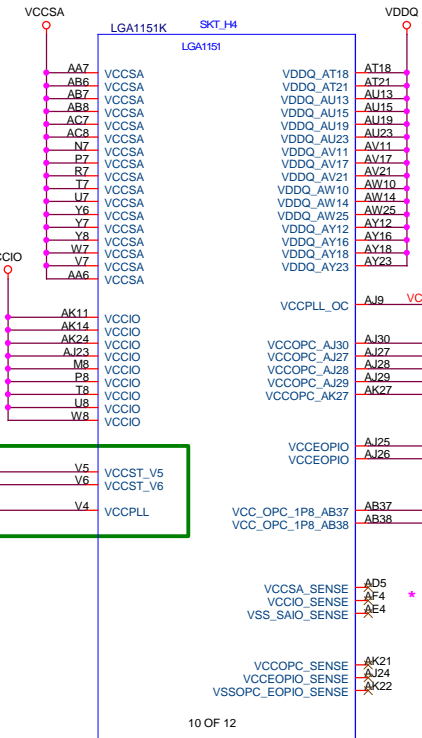
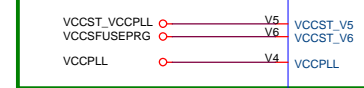
\* WR94, WR59, WR86, WR60,  
WR61, WR62, WR63 改 short  
pad



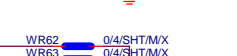
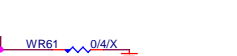
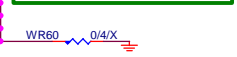
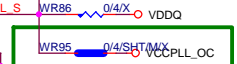
\* 刪 VCCGT 電容



CPU POWER



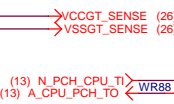
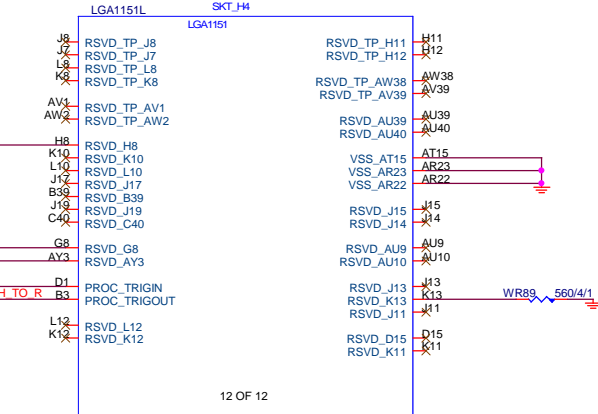
CPU POWER



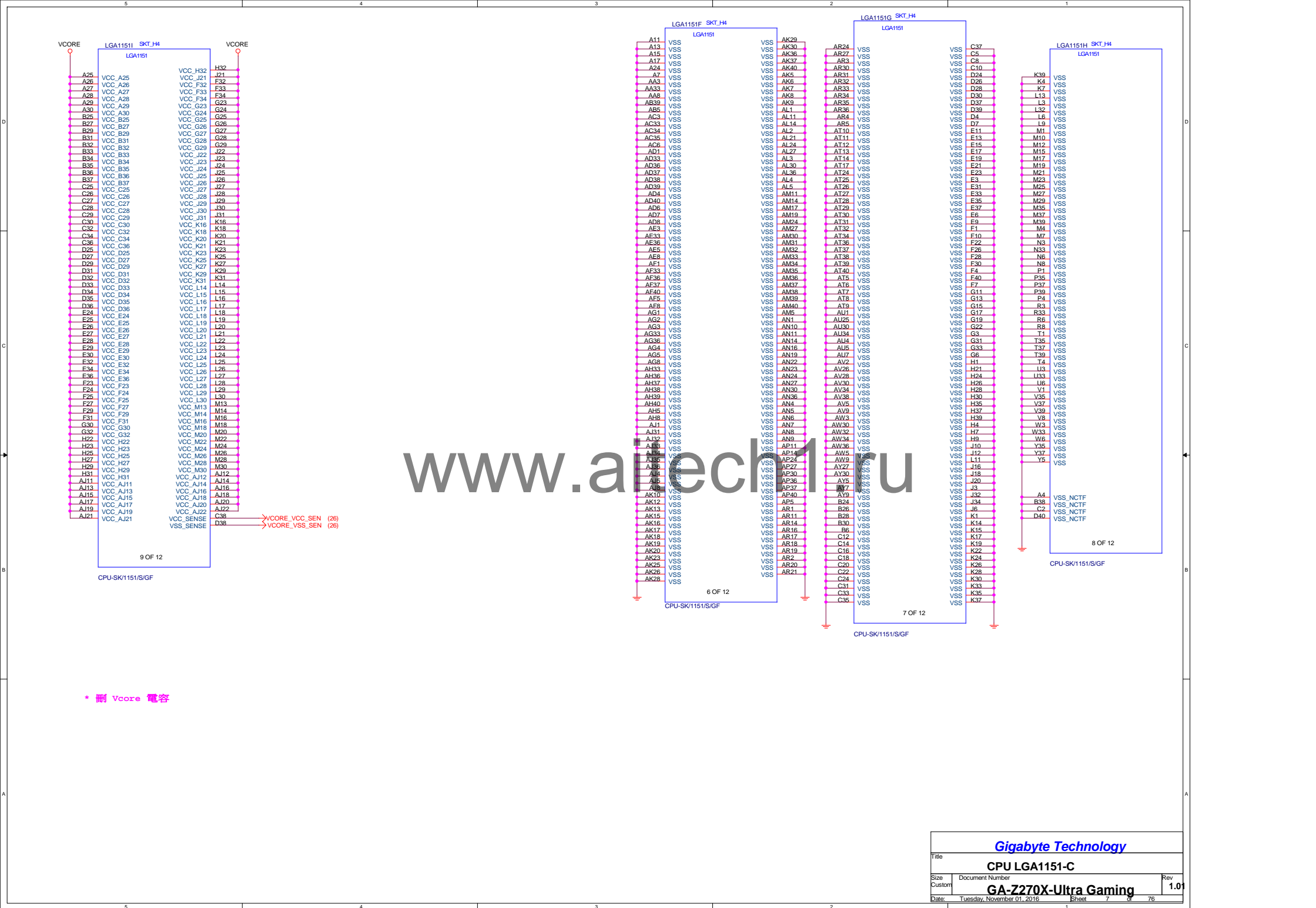
\* 刪 net



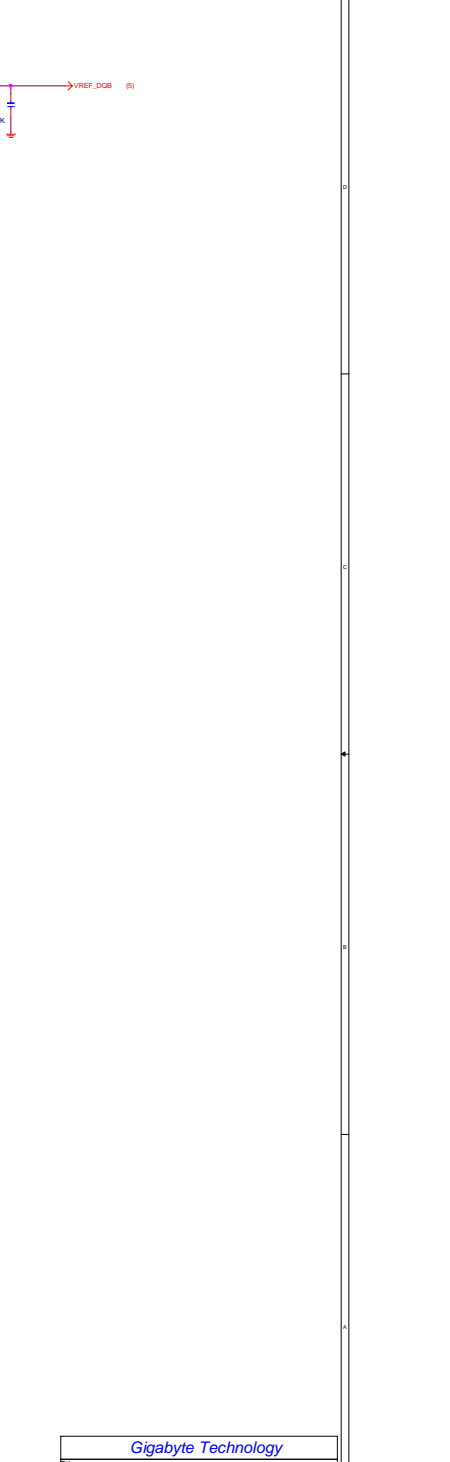
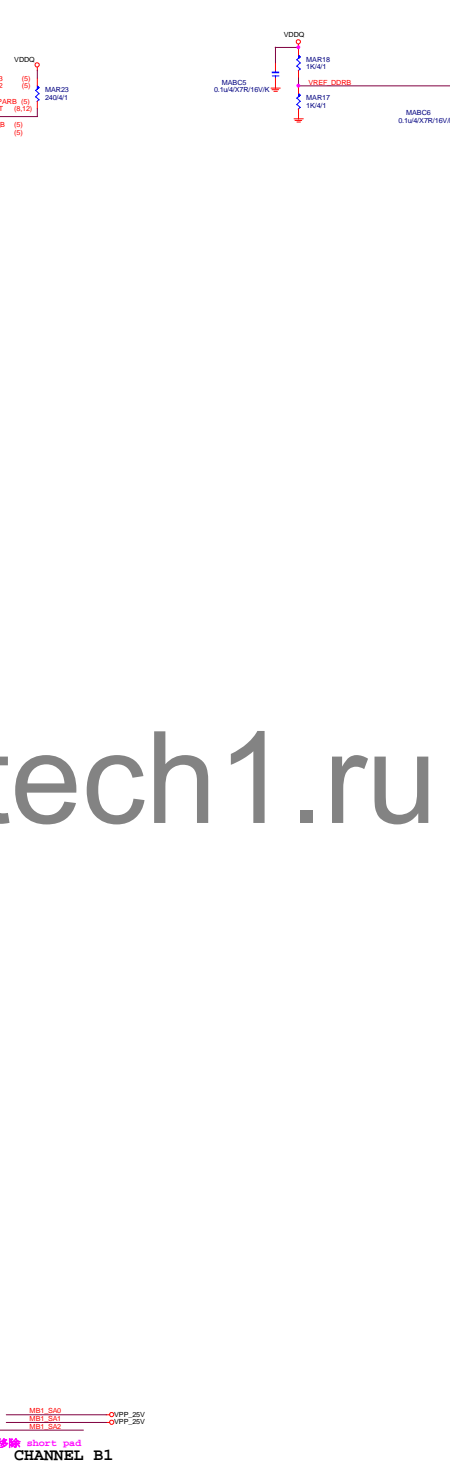
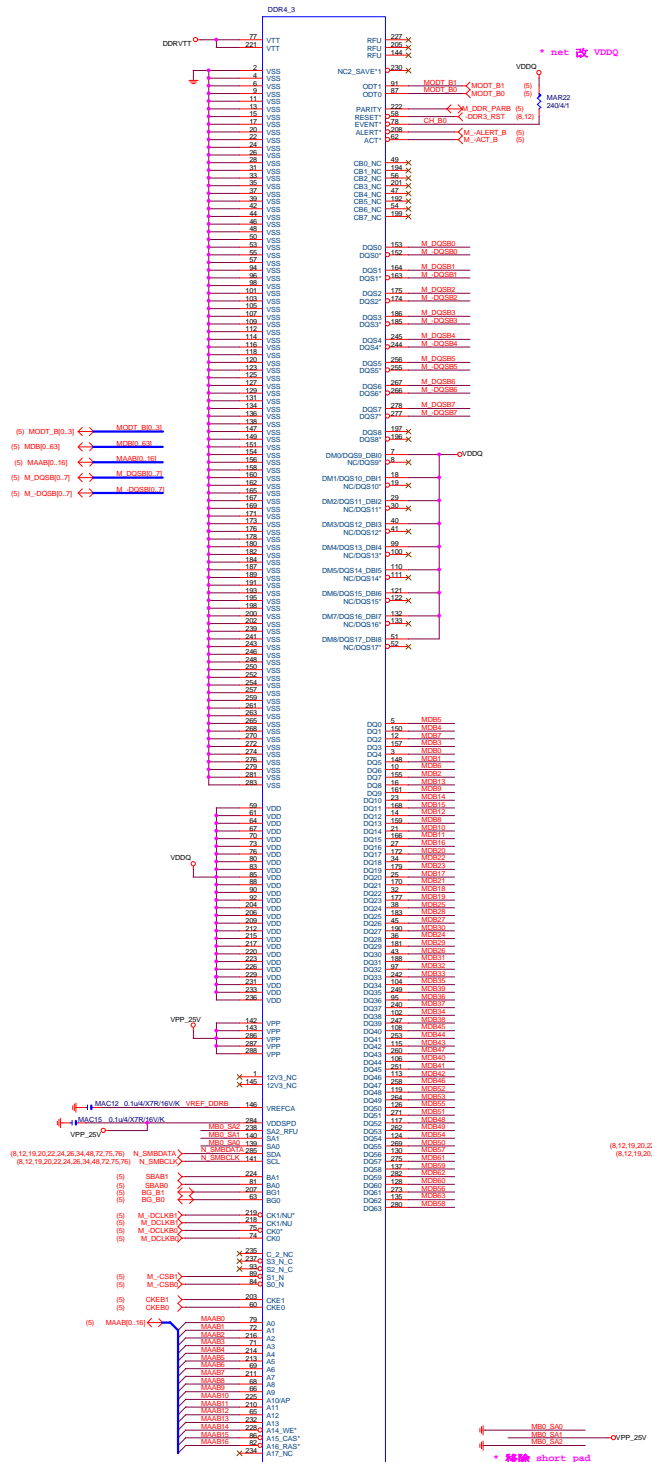
CPU-SK/1151/S/GF



(13) N\_PCH\_CPU\_T1  
(13) A\_CPU\_PCH\_TO





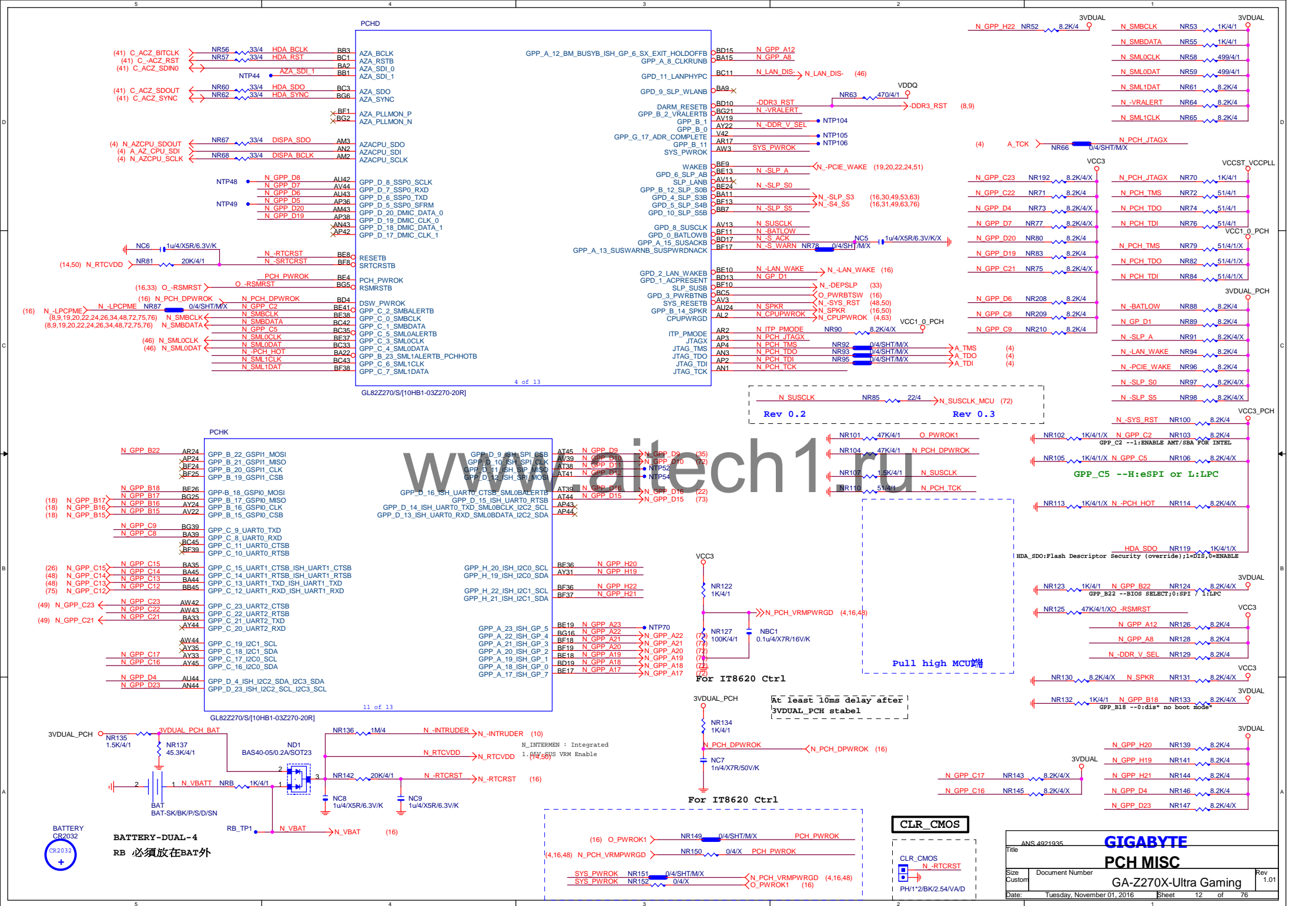


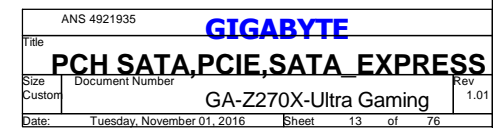


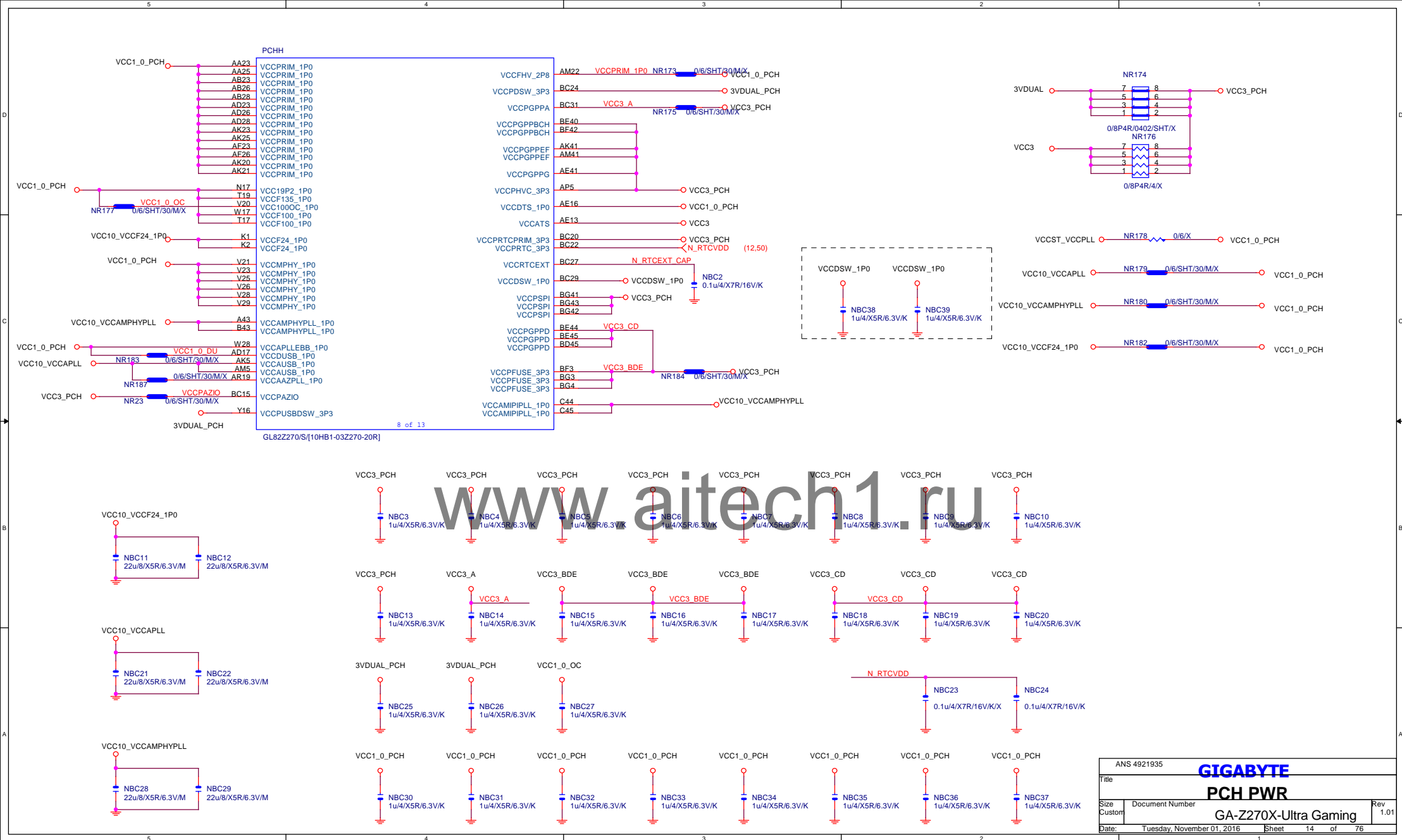












A25	VSS	A42	VSS
A30	VSS	D45	VSS
P22	VSS	BG44	VSS
AV38	VSS	BE44	VSS
AV45	VSS	BF45	VSS
AV8	VSS	BF2	VSS
AY11	VSS	W29	VSS
AY19	VSS	A35	VSS
AY37	VSS	AG23	VSS
AY4	VSS	A40	VSS
AY42	VSS	AA1	VSS
AY8	VSS	AA17	VSS
B25	VSS	AA20	VSS
B3	VSS	C1	VSS
B30	VSS	AA26	VSS
B35	VSS	AA28	VSS
B4	VSS	AA29	VSS
BA1	VSS	AB17	VSS
BA13	VSS	AC32	VSS
BA17	VSS	AE4	VSS
BA37	VSS	AE8	VSS
BA4	VSS	AF18	VSS
BA42	VSS	AF20	VSS
BA44	VSS	AF21	VSS
BA44	VSS	AF25	VSS
BD40	VSS	AF28	VSS
BC38	VSS	AF29	VSS
BC40	VSS	AF4	VSS
BC9	VSS	AF42	VSS
BD11	VSS	AG18	VSS
BD16	VSS	AG20	VSS
BD2	VSS	AG21	VSS
BD21	VSS	AG23	VSS
BD25	VSS	AG25	VSS
F2	VSS	AG26	VSS
F31	VSS	AG28	VSS
E6	VSS	AG28	VSS
E8	VSS	AH11	VSS
F39	VSS	AH13	VSS
F43	VSS	AH30	VSS
G4	VSS	AH32	VSS
G40	VSS	AH33	VSS
G42	VSS	AH38	VSS
F6	VSS	AJ1	VSS
G9	VSS	AJ17	VSS
H11	VSS	AJ20	VSS
H13	VSS	AJ20	VSS
H17	VSS	AJ21	VSS
H19	VSS	AJ23	VSS
H22	VSS	AJ26	VSS
H24	VSS	AJ26	VSS
H27	VSS	AJ28	VSS
H29	VSS	AJ29	VSS
H33	VSS	AJ45	VSS
H35	VSS	AK10	VSS
H38	VSS	AK14	VSS
H4	VSS	AK16	VSS
H42	VSS	AK17	VSS
H9	VSS	AK18	VSS
J4	VSS	AK26	VSS
M36	VSS	AK28	VSS
M38	VSS	AM14	VSS
M4	VSS	AM14	VSS
M8	VSS	AP19	VSS
M9	VSS	AR22	VSS
N13	VSS	AR27	VSS
N15	VSS	AU29	VSS
N19	VSS	AU33	VSS
N22	VSS	AV1	VSS
N24	VSS	AV10	VSS
N31	VSS	AV15	VSS
N42	VSS	AV24	VSS
P10	VSS	AV27	VSS
P12	VSS	AV33	VSS
AV35	VSS		

9 of 13

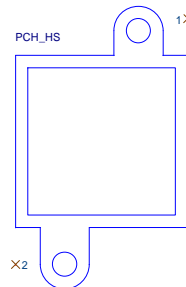
GL82Z270/S/[10HB1-03Z270-20R]

BD34	VSS[70]	AB18	VSS[1]
BD39	VSS[71]	AB20	VSS[2]
BD7	VSS[72]	AB21	VSS[3]
BE2	VSS[73]	AB25	VSS[4]
BF43	VSS[74]	AB29	VSS[5]
BF2	VSS[75]	AB4	VSS[6]
BG18	VSS[76]	AB42	VSS[7]
BG23	VSS[77]	AC10	VSS[8]
BG28	VSS[78]	AC14	VSS[9]
BG32	VSS[79]	AC16	VSS[10]
BG37	VSS[80]	AC18	VSS[11]
BG40	VSS[81]	AC38	VSS[12]
BG9	VSS[83]	AC4	VSS[13]
C1	VSS[84]	AC5	VSS[14]
A12	VSS[85]	AC7	VSS[15]
C2	VSS[86]	AC8	VSS[16]
C37	VSS[87]	AD1	VSS[17]
A6	VSS[88]	AD18	VSS[18]
C9	VSS[89]	AD20	VSS[19]
D1	VSS[90]	AD21	VSS[20]
D10	VSS[91]	AD25	VSS[21]
D12	VSS[92]	AD29	VSS[22]
D15	VSS[93]	AD45	VSS[23]
D16	VSS[94]	AE11	VSS[24]
B12	VSS[95]	AE14	VSS[25]
D19	VSS[96]	AE32	VSS[26]
D21	VSS[97]	AE33	VSS[27]
D24	VSS[98]	AK29	VSS[28]
D25	VSS[99]	AK30	VSS[29]
D29	VSS[100]	AK32	VSS[30]
AG20	VSS[101]	AK35	VSS[31]
D33	VSS[102]	AK39	VSS[32]
D35	VSS[103]	AL4	VSS[33]
D36	VSS[104]	AL42	VSS[34]
D39	VSS[105]	AM10	VSS[35]
D44	VSS[106]	AM11	VSS[36]
D7	VSS[107]	AM13	VSS[37]
P13	VSS[108]	AM17	VSS[38]
P15	VSS[109]	AM19	VSS[39]
P17	VSS[110]	AM24	VSS[40]
P19	VSS[111]	AM27	VSS[41]
P31	VSS[112]	AM29	VSS[42]
P33	VSS[113]	AM32	VSS[43]
P35	VSS[114]	AM33	VSS[44]
AJ17	VSS[115]	AM4	VSS[45]
P4	VSS[116]	AN45	VSS[46]
P42	VSS[117]	AP10	VSS[47]
P8	VSS[118]	AP11	VSS[48]
R1	VSS[119]	AP13	VSS[49]
R32	VSS[120]	AP15	VSS[50]
T10	VSS[121]	AP22	VSS[51]
T14	VSS[122]	AP27	VSS[52]
T22	VSS[123]	AP31	VSS[53]
T29	VSS[124]	AP33	VSS[54]
T32	VSS[125]	AP34	VSS[55]
T36	VSS[126]	AP39	VSS[56]
T38	VSS[127]	W18	VSS[57]
Y38	VSS[128]	W20	VSS[58]
Y4	VSS[129]	W21	VSS[59]
Y8	VSS[130]	W23	VSS[60]
T42	VSS[131]	W25	VSS[61]
T5	VSS[132]		
U4	VSS[133]		
U42	VSS[134]		
V10	VSS[135]		
V14	VSS[136]		
W3	VSS[137]		
AR13	VSS[138]		
AR31	VSS[139]		
AR33	VSS[140]		
AR4	VSS[141]		
AT10	VSS[142]		
AT13	VSS[143]		
AT35	VSS[144]		
AT37	VSS[145]		
AT42	VSS[146]		
AU11	VSS[147]		
AU17	VSS[148]		
BD30	VSS[149]		
W45	VSS[150]		
Y13	VSS[151]		
Y14	VSS[152]		
Y30	VSS[153]		
Y32	VSS[154]		
Y33	VSS[155]		
VSS_2	VSS[156]		
BG14	VSS[157]		
VSS_BG14	VSS[158]		

12 of 13

GL82Z270/S/[10HB1-03Z270-20R]

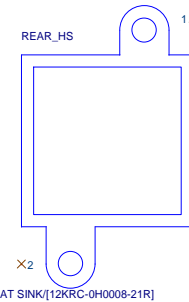
## 装甲HEATSINK 分成五大部份



Footprint :  
BGAHSINK-Z270-GAMING-K3

Rev 1.0

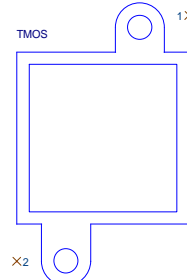
HEAT SINK[12SP2-S05511-61R\_12SP2-S05511-62R\_12SP2-S05511-63R]



Footprint :  
Z270\_UD\_BASE\_COVER

Rev 1.0

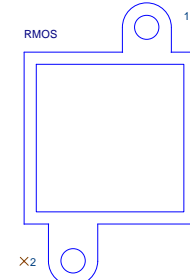
HEAT SINK[12KRC-0H0008-21R]



Footprint :  
MOSHHSINK-SNIPERB8-T

Rev 1.0

HEAT SINK[12SP2-S09425-21R\_12SP2-S09425-22R\_12SP2-S09425-23R]



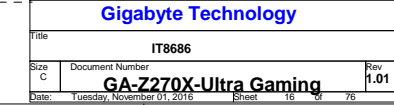
Footprint :  
MOSHHSINK-SNIPERB8-R

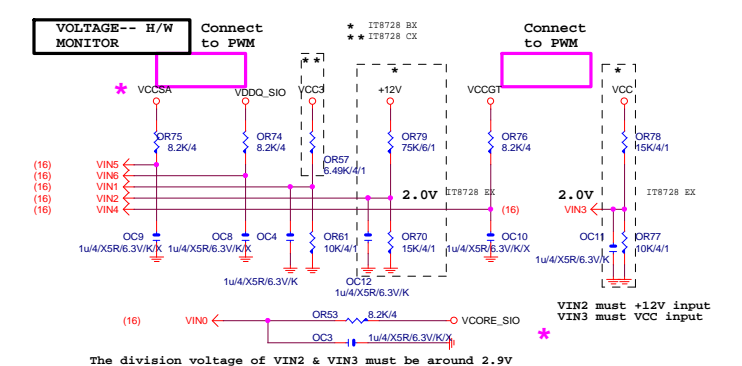
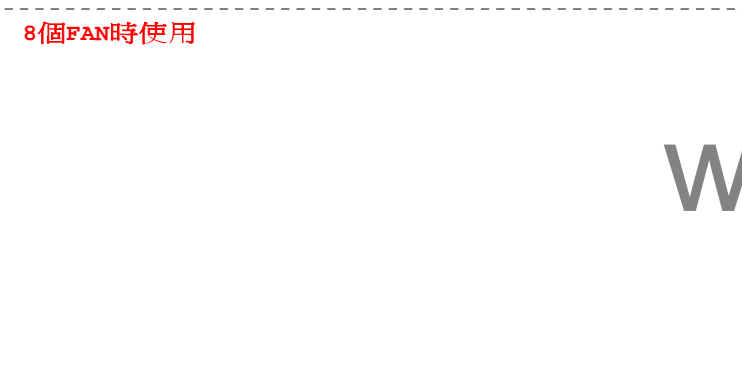
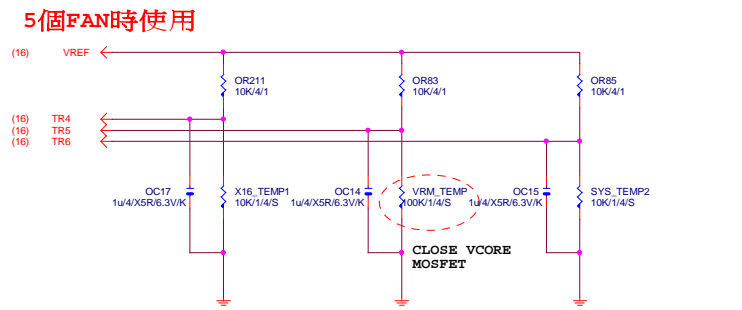
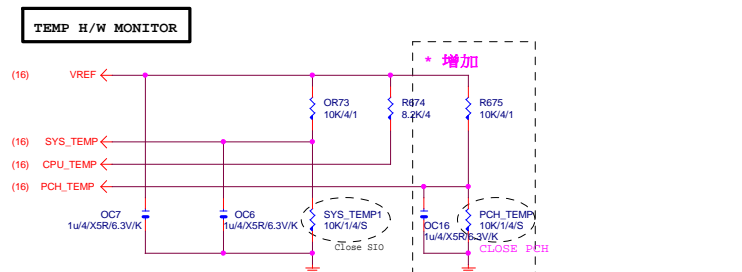
Rev 1.0

HEAT SINK[12SP2-S08025-81R\_12SP2-S08025-82R\_12SP2-S08025-83R]

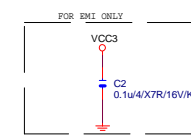
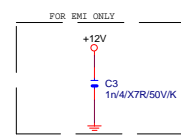
GIGABYTE

ANS 4921935			
Title			
PCH GND			
Size	Document Number	Rev	
Custom	GA-Z270X-Ultra Gaming	1.01	
Date:	Tuesday, November 01, 2016	Sheet	15 of 76



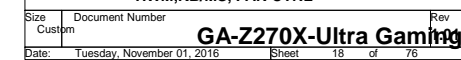


www.aitech1.ru



★Update 2015-04.24

Gigabyte Technology			
Title		HWM,KB/MS, FAN CTRL	
Size	Document Number	Rev	
Custom	GA-Z270X-Ultra Gaming	1.01	
Date:	Tuesday, November 01, 2016	Sheet	17 of 76





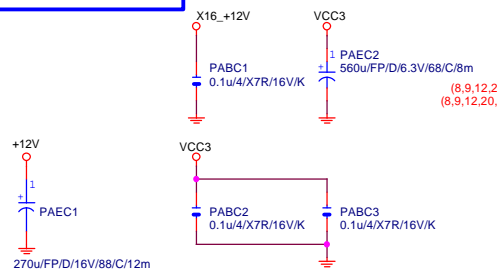
Rev 0.3

PCIEX16 CAP

PCIEX16 SLOT

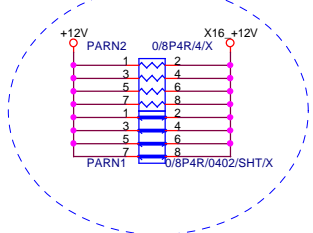
PCIESLOT-164STH

PCIEX16 3GIO\_\*16



PCIEX16 PROTECT SHT

+12 protect short-wire test



PCIEX16 AC CAP

PA EXP TXP0	PAC5	0.22u/4/X5R/6.3V/K	PA EXP TXP0 C
PA EXP TXN0	PAC4	0.22u/4/X5R/6.3V/K	PA EXP TXN0 C
PA EXP TXP1	PAC6	0.22u/4/X5R/6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC7	0.22u/4/X5R/6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC8	0.22u/4/X5R/6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC9	0.22u/4/X5R/6.3V/K	PA EXP TXN2 C
PA EXP TXP3	PAC10	0.22u/4/X5R/6.3V/K	PA EXP TXP3 C
PA EXP TXN3	PAC11	0.22u/4/X5R/6.3V/K	PA EXP TXN3 C
PA EXP TXP4	PAC12	0.22u/4/X5R/6.3V/K	PA EXP TXP4 C
PA EXP TXN4	PAC13	0.22u/4/X5R/6.3V/K	PA EXP TXN4 C
PA EXP TXP5	PAC14	0.22u/4/X5R/6.3V/K	PA EXP TXP5 C
PA EXP TXN5	PAC15	0.22u/4/X5R/6.3V/K	PA EXP TXN5 C
PA EXP TXP6	PAC16	0.22u/4/X5R/6.3V/K	PA EXP TXP6 C
PA EXP TXN6	PAC17	0.22u/4/X5R/6.3V/K	PA EXP TXN6 C
PA EXP TXP7	PAC18	0.22u/4/X5R/6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC19	0.22u/4/X5R/6.3V/K	PA EXP TXN7 C
PA EXP SW TXP8	PAC20	0.22u/4/X5R/6.3V/K	PA EXP SW TXP8 C
PA EXP SW TXN8	PAC21	0.22u/4/X5R/6.3V/K	PA EXP SW TXN8 C
PA EXP SW TXP9	PAC22	0.22u/4/X5R/6.3V/K	PA EXP SW TXP9 C
PA EXP SW TXN9	PAC23	0.22u/4/X5R/6.3V/K	PA EXP SW TXN9 C
PA EXP SW TXP10	PAC24	0.22u/4/X5R/6.3V/K	PA EXP SW TXP10 C
PA EXP SW TXN10	PAC25	0.22u/4/X5R/6.3V/K	PA EXP SW TXN10 C
PA EXP SW TXP11	PAC26	0.22u/4/X5R/6.3V/K	PA EXP SW TXP11 C
PA EXP SW TXN11	PAC27	0.22u/4/X5R/6.3V/K	PA EXP SW TXN11 C
PA EXP SW TXP12	PAC28	0.22u/4/X5R/6.3V/K	PA EXP SW TXP12 C
PA EXP SW TXN12	PAC29	0.22u/4/X5R/6.3V/K	PA EXP SW TXN12 C
PA EXP SW TXP13	PAC30	0.22u/4/X5R/6.3V/K	PA EXP SW TXP13 C
PA EXP SW TXN13	PAC31	0.22u/4/X5R/6.3V/K	PA EXP SW TXN13 C
PA EXP SW TXP14	PAC32	0.22u/4/X5R/6.3V/K	PA EXP SW TXP14 C
PA EXP SW TXN14	PAC33	0.22u/4/X5R/6.3V/K	PA EXP SW TXN14 C
PA EXP SW TXP15	PAC34	0.22u/4/X5R/6.3V/K	PA EXP SW TXP15 C
PA EXP SW TXN15	PAC35	0.22u/4/X5R/6.3V/K	PA EXP SW TXN15 C

PCI-E REV:1.1--&gt; 2.5GHZ

PCE-E X1(單向) BANDWITH=2.5GHz\*(8b/10b)=2Gb/s=250MB/s

PCE-E X1(雙向) BANDWITH=2.5GHz\*(8b/10b)X2=4Gb/s=500MB/s

PCE-E X16(單向) BANDWITH=2.5GHz\*(8b/10b)X16=32Gb/s=4GB/s

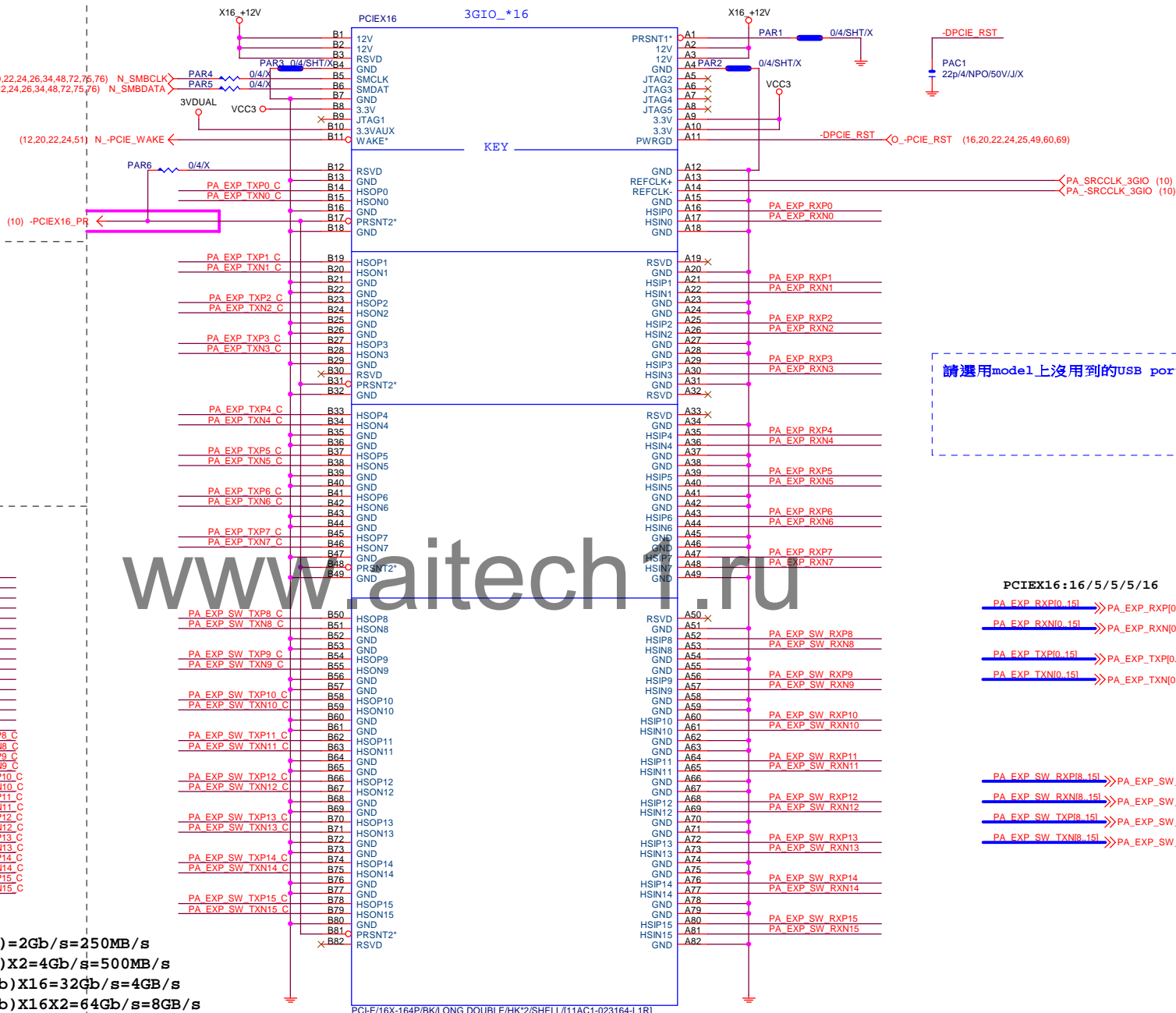
PCE-E X16(雙向) BANDWITH=2.5GHz\*(8b/10b)X16X2=64Gb/s=8GB/s

PCI-E REV:2.0--&gt; 5GHZ

PCE-E X1(單向) BANDWITH=5GHz\*(8b/10b)=4Gb/s=500MB/s

PCI-E REV:3.0--&gt; 8GHZ

PCE-E X1(單向) BANDWITH=8GHz\*(128b/130b)=8Gb/s=1GB/s



黑色金屬加強

Gigabyte Technology			
Title PCI EXPRESS * 16			
Size	Document Number	GA-Z270X-Ultra Gaming	
Custom			Rev
Date:	Tuesday, November 01, 2016	Sheet	19 of 76

Rev 0.3

PCIEX8 PROTECT SHT

12V protect short-wire test

PCI-E 8X-99P/BK/Long Double/HK\*2/Shell (11AC1-023099-F1R)

黑色金屬加強

Gigabyte Technology

PCI EXPRESS X8

Size Custom

Document Number

Rev 9.0

GA-Z270X-Ultra Gaming

Date: Tuesday, November 01, 2016

Sheet 20 of 76

Rev 0.3

PCIEX8 PROTECT SHT

www.aitech.ru

Component	Value	Component	Value
PE EXP SW TXP8	PEC7	0.22u4/X5R/6.3V/K	PE EXP SW TXP8 C
PE EXP SW TXN8	PEC8	0.22u4/X5R/6.3V/K	PE EXP SW TXN8 C
PE EXP SW TXP9	PEC9	0.22u4/X5R/6.3V/K	PE EXP SW TXP9 C
PE EXP SW TXN9	PEC10	0.22u4/X5R/6.3V/K	PE EXP SW TXN9 C
PE EXP SW TXP10	PEC11	0.22u4/X5R/6.3V/K	PE EXP SW TXP10 C
PE EXP SW TXN10	PEC12	0.22u4/X5R/6.3V/K	PE EXP SW TXN10 C
PE EXP SW TXP11	PEC13	0.22u4/X5R/6.3V/K	PE EXP SW TXP11 C
PE EXP SW TXN11	PEC14	0.22u4/X5R/6.3V/K	PE EXP SW TXN11 C
PE EXP SW TXP12	PEC15	0.22u4/X5R/6.3V/K	PE EXP SW TXP12 C
PE EXP SW TXN12	PEC16	0.22u4/X5R/6.3V/K	PE EXP SW TXN12 C
PE EXP SW TXP13	PEC17	0.22u4/X5R/6.3V/K	PE EXP SW TXP13 C
PE EXP SW TXN13	PEC18	0.22u4/X5R/6.3V/K	PE EXP SW TXN13 C
PE EXP SW TXP14	PEC19	0.22u4/X5R/6.3V/K	PE EXP SW TXP14 C
PE EXP SW TXN14	PEC20	0.22u4/X5R/6.3V/K	PE EXP SW TXN14 C
PE EXP SW TXP15	PEC21	0.22u4/X5R/6.3V/K	PE EXP SW TXP15 C
PE EXP SW TXN15	PEC22	0.22u4/X5R/6.3V/K	PE EXP SW TXN15 C

Gigabyte Technology

PCI EXPRESS X8

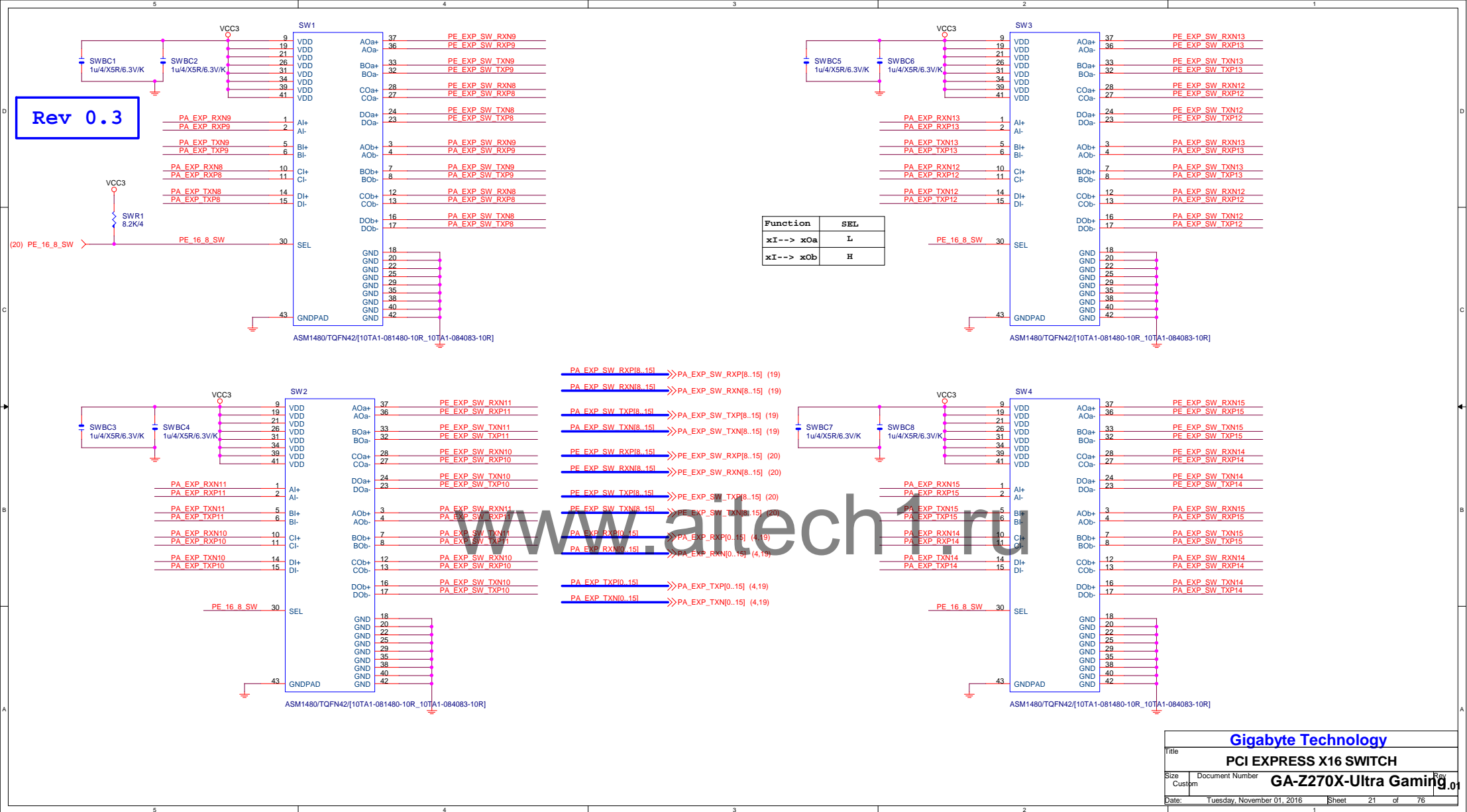
Size Custom

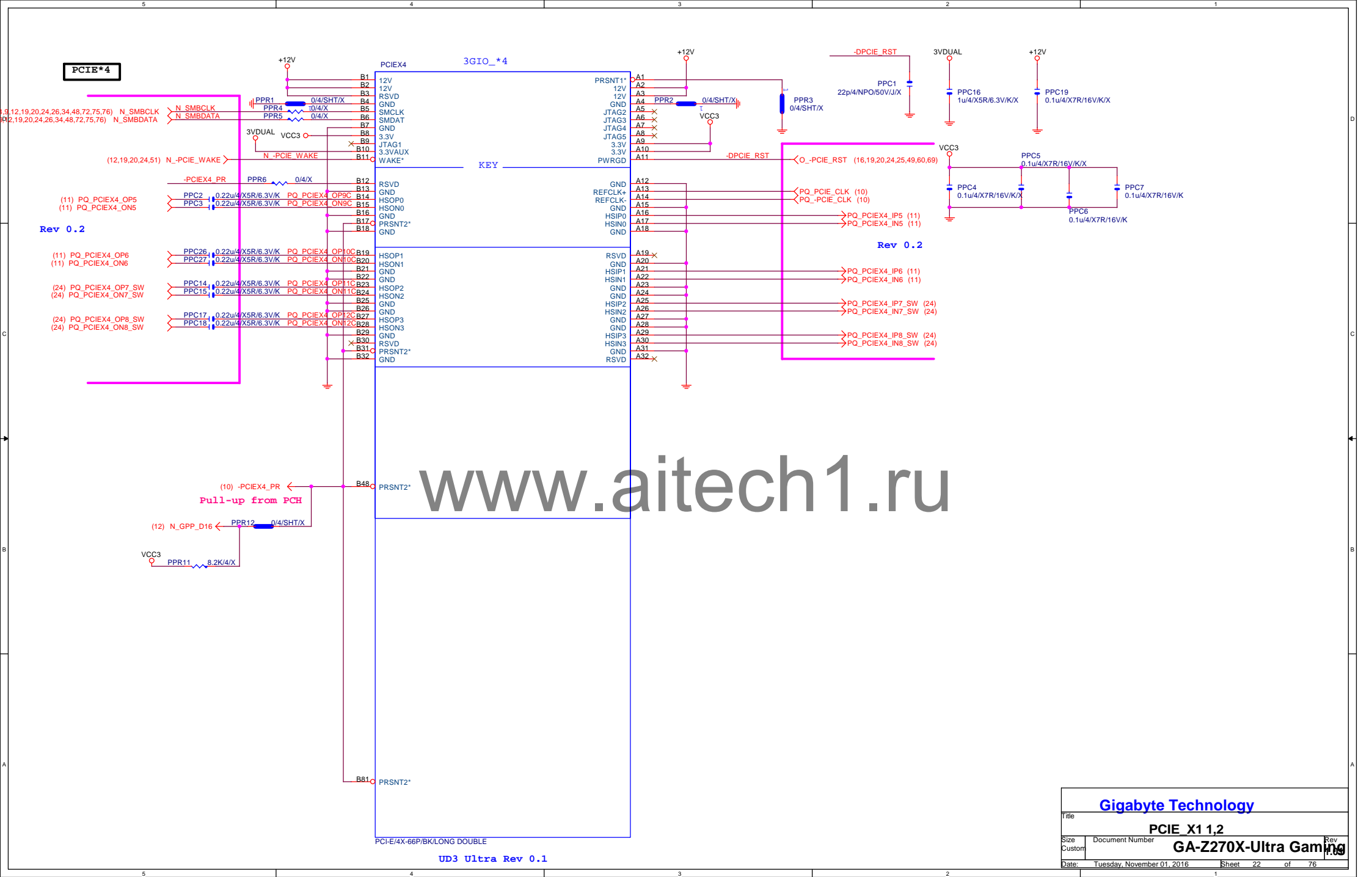
Document Number

BA-Z270X-Ultra Gaming

Date: Tuesday, November 01, 2016

Sheet 20 of 76





Gigabyte Technology			
Title			
PCIE_X1 1.2			
Size	Document Number	GA-Z270X-Ultra Gaming	
Custom		Rev 1.0	
Date:	Tuesday, November 01, 2016	Sheet	22 of 76

www.aitech1.ru

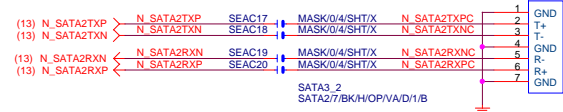
Gigabyte Technology			
SWITCH			
Size	Document Number		Rev
Custom	GA-Z270X-Ultra Gaming		.01
Date:	Tuesday, November 01, 2016	Sheet	23 of 76



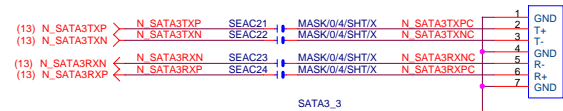
Rev 0.5



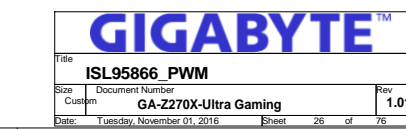
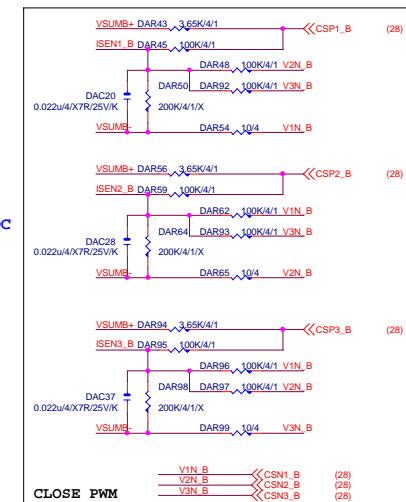
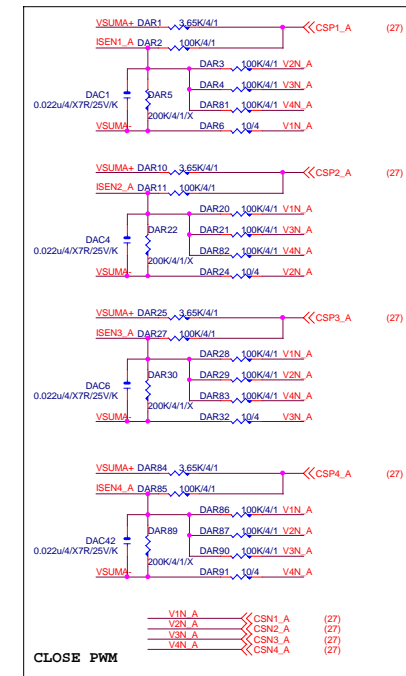
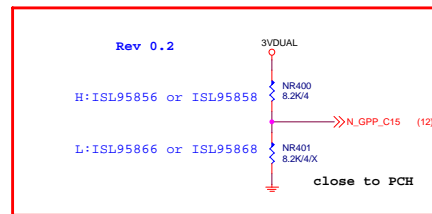
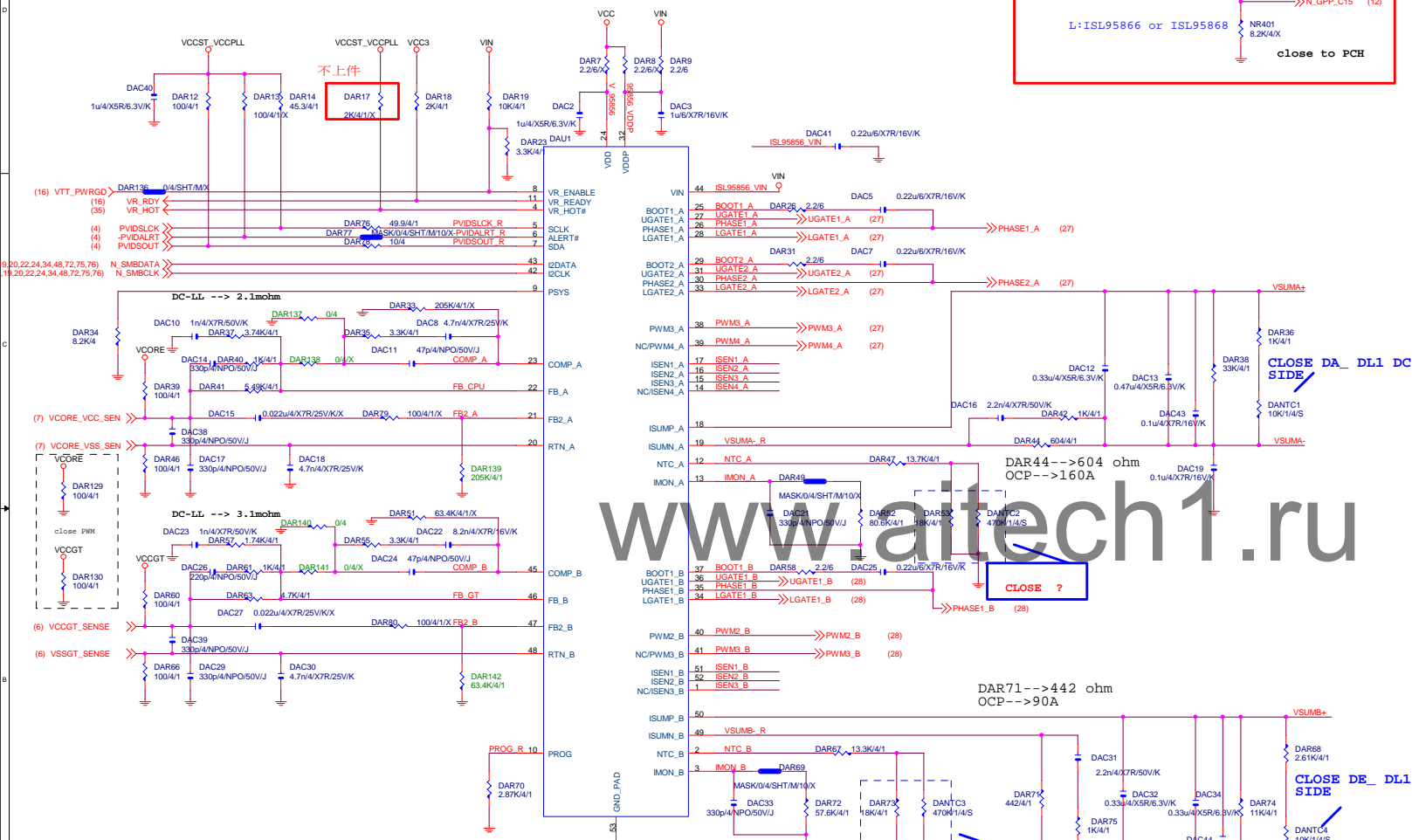
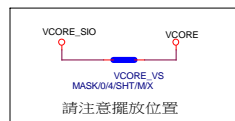
www.aitech1.ru



BLACK CONNECTOR



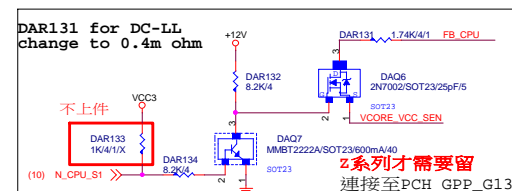
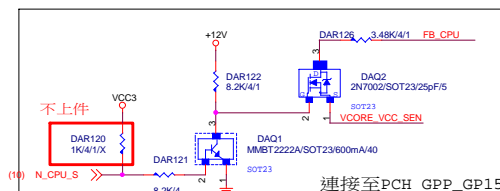
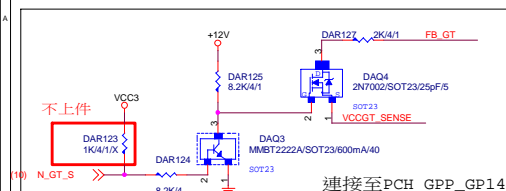




Vcore	ISL95856	ISL95866	VCCGT	ISL95856	ISL95866
DAR137	X	V	DAR140	X	V
DAR138	V	X	DAR141	V	X
DAR139	X	V	DAR142	X	V
DAC15	V	X	DAC27	V	X
DAR79	V	X	DAR80	V	X
DAR33	V	X	DAR51	V	X

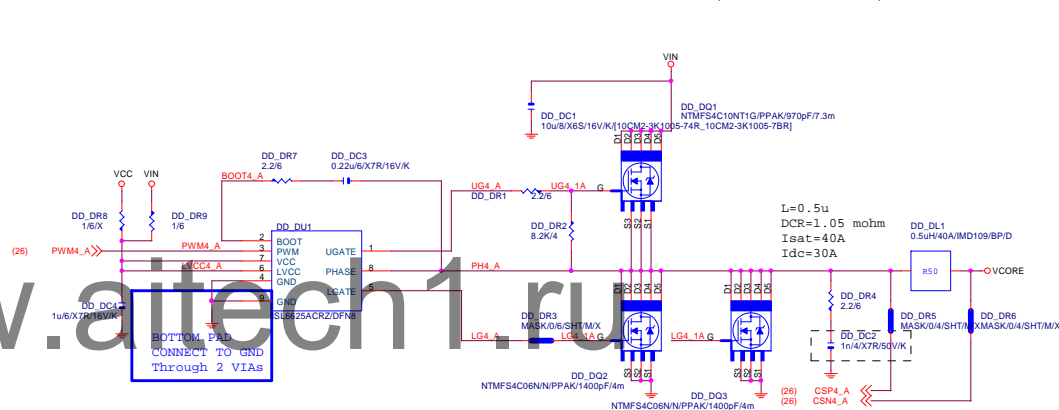
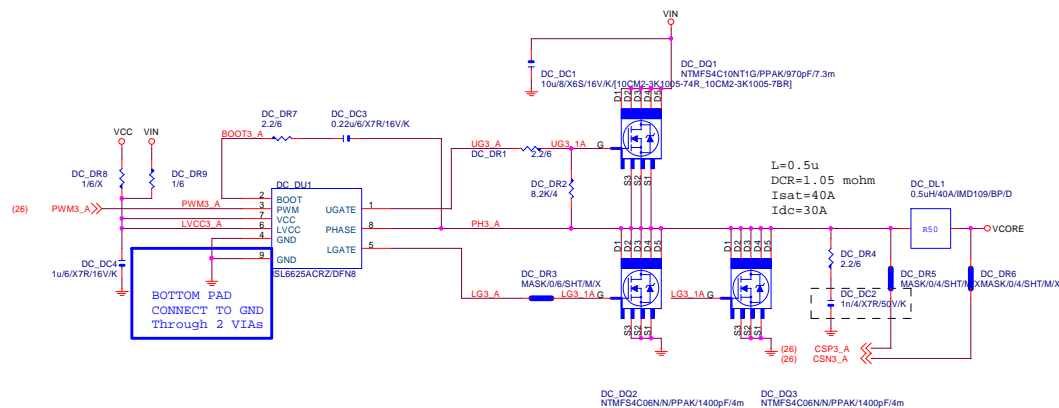
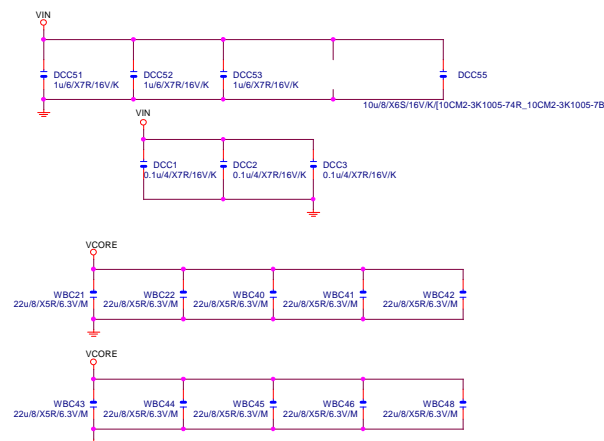
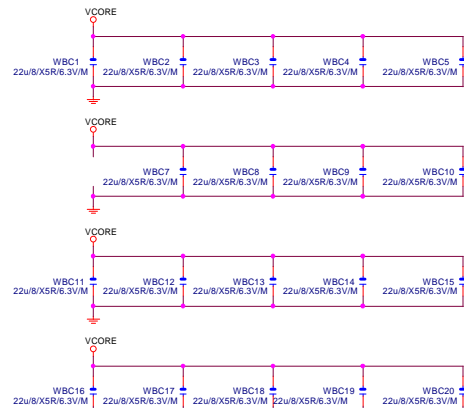
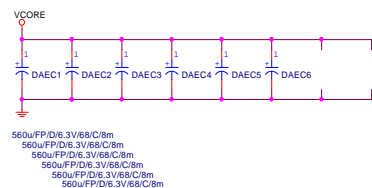
Rev 0.2

Connect to EC H/W Monitor

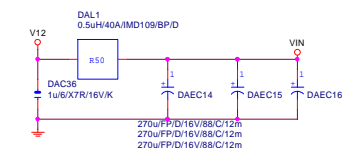


GIGABYTE™

Title	ISL95866_PWM	Rev	1.01
Size	Document Number	Custom	GA-Z270X-Ultra Gaming
Date	Tuesday, November 01, 2016	Sheet	26 of 76

VCORE CAP 560u\*8PCS  
22u\*29PCS

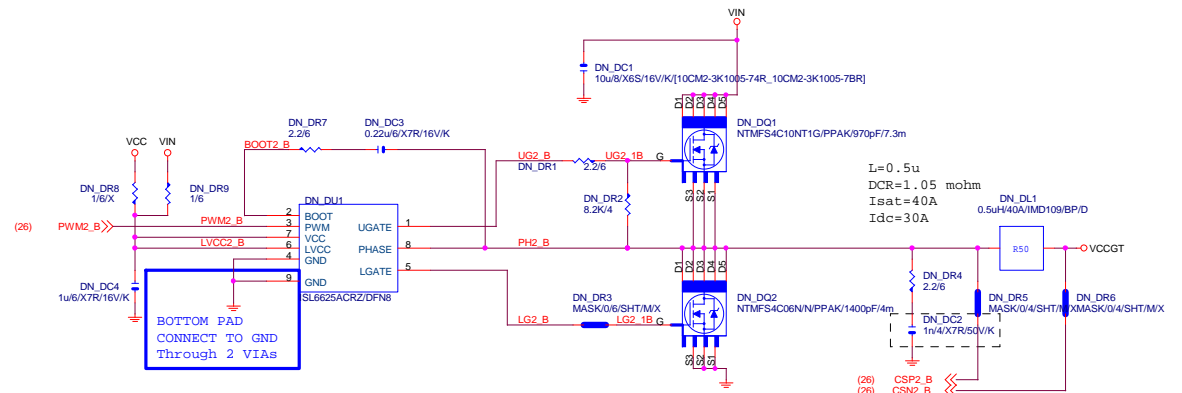
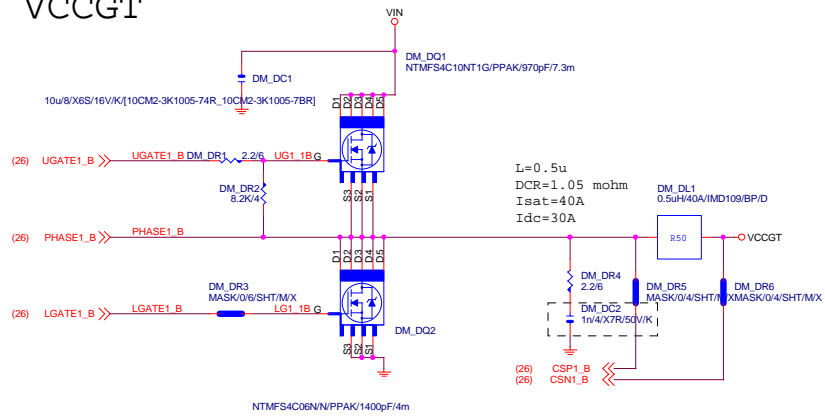
## VIN CAP 270u\*3PCS



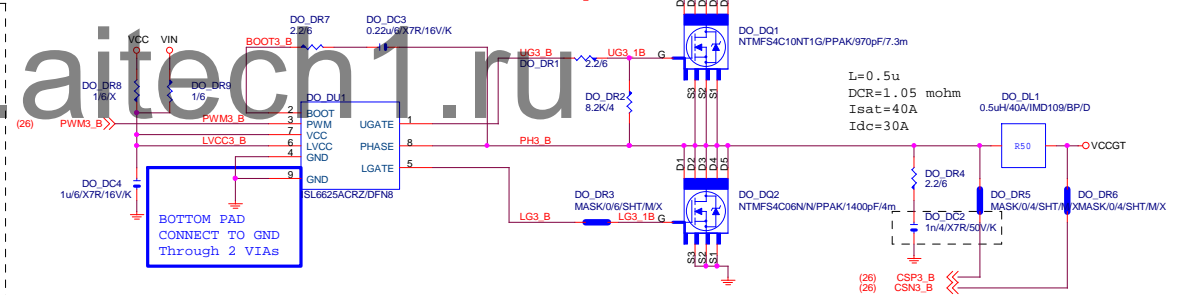
# GIGABYTE

Title			
ISL95856_MOS			
Size	Document Number	Rev	
Custom	GA-Z270X-Ultra Gaming	1.01	
Date:	Tuesday, November 01, 2016	Sheet	27 of 76

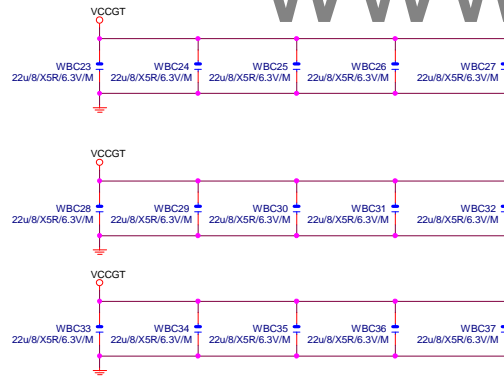
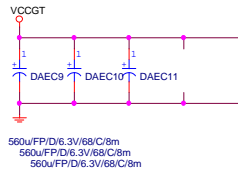
## VCCGT



www.aitech1.ru

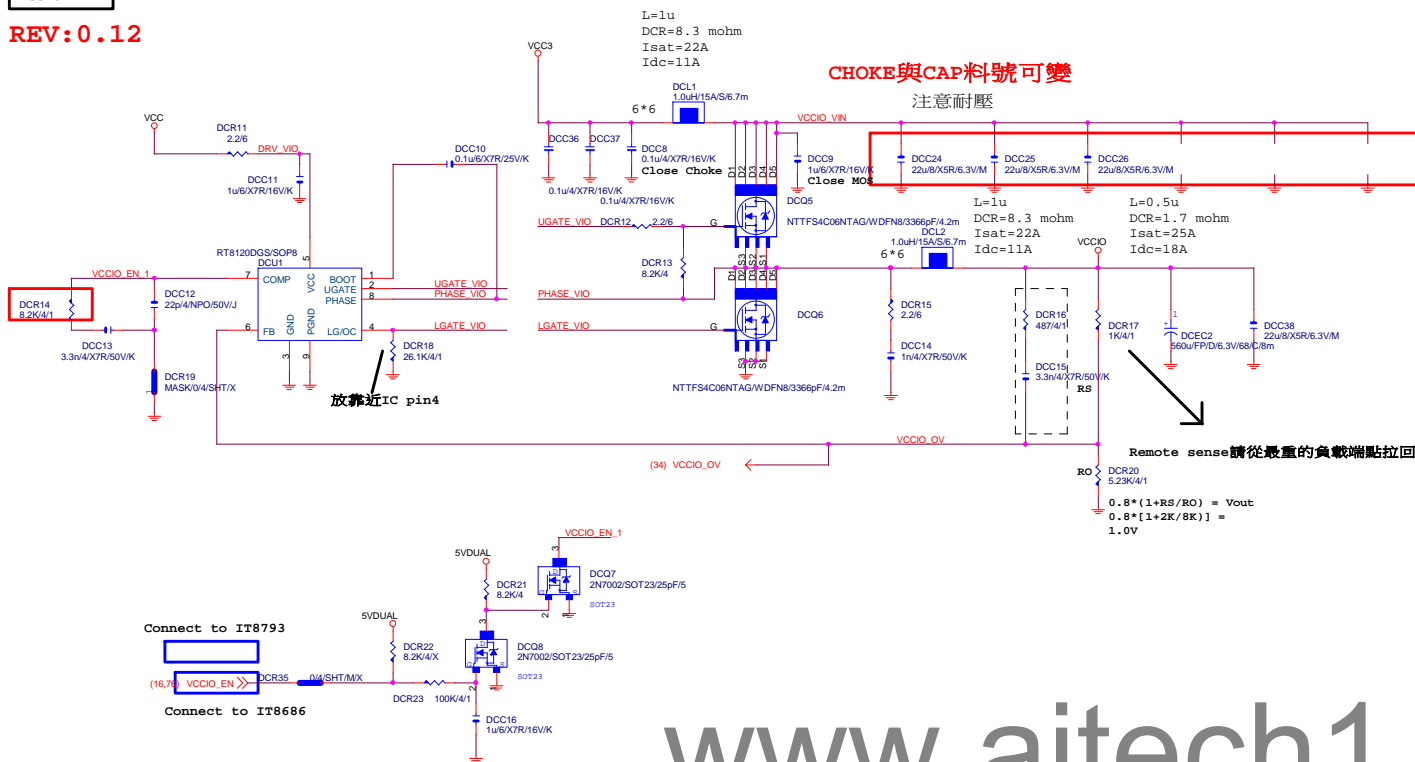


VCCGT CAP 560u\*5PCS 22u\*15PCS

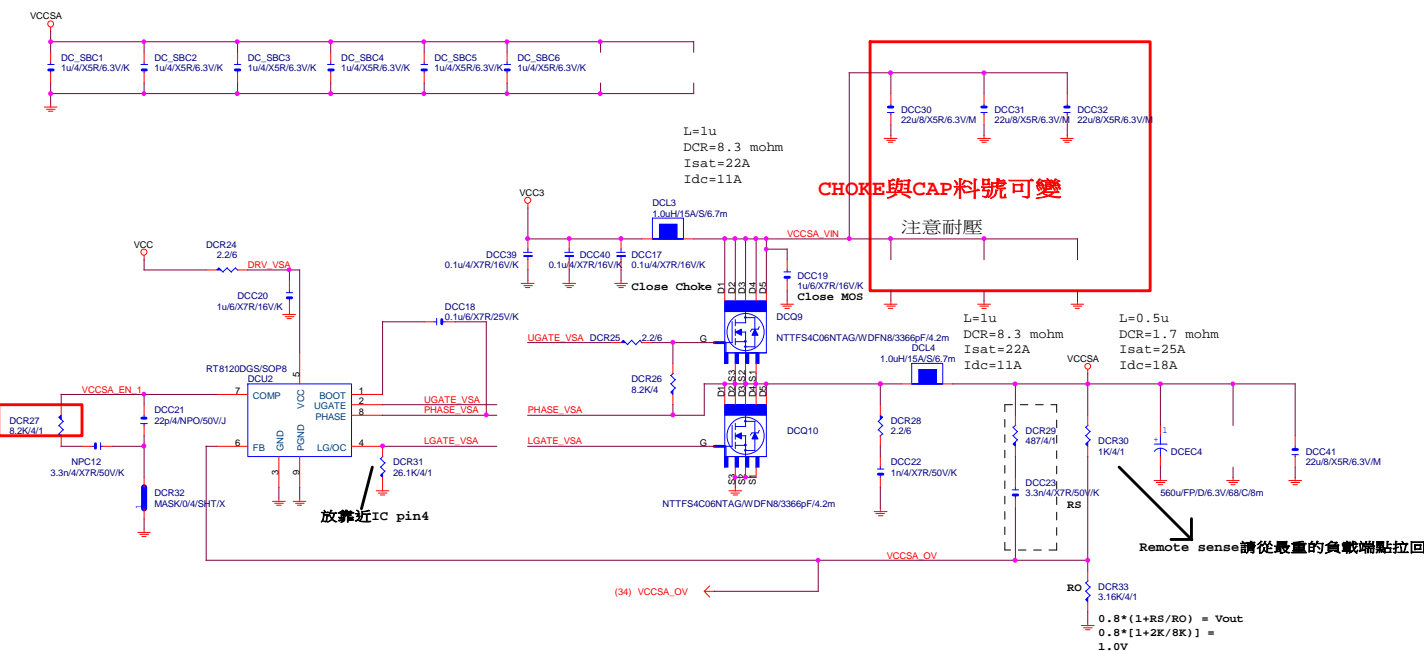
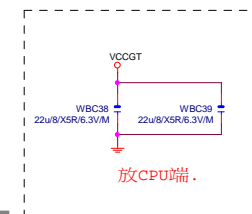


GIGABYTE™			
Title			
ISL95856 MOS			
Size	Document Number	Rev	
Custom	GA-Z270X-Ultra Gaming	1.01	
Date:	Tuesday, November 01, 2016	Sheet	28 of 76

REV:0.12

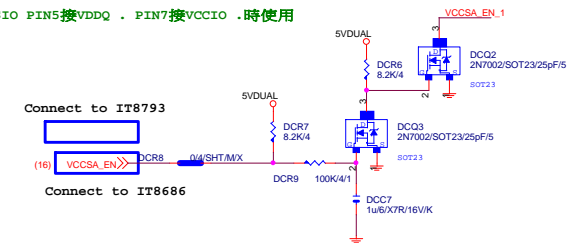


[www.aitech1.ru](http://www.aitech1.ru)

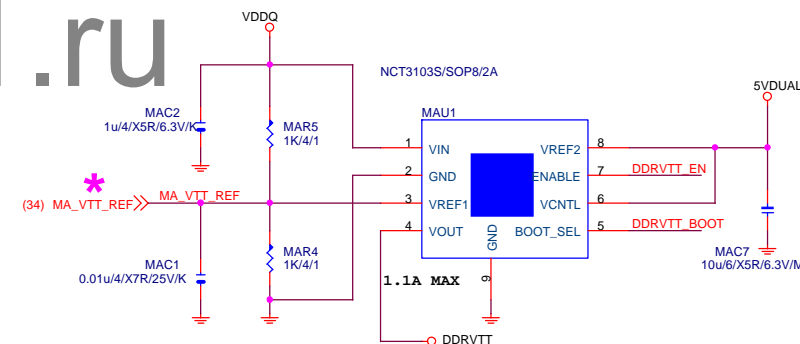
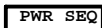


SIO PIN5 . PIN7 用在其他function時使用

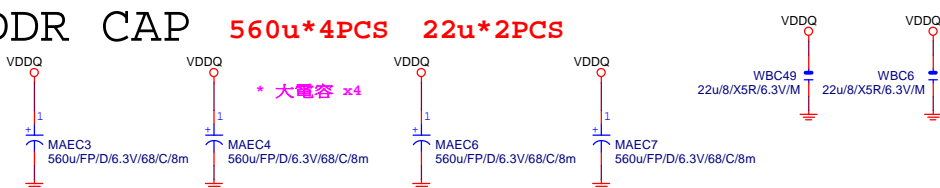
SIO PIN5接VDDQ . PIN7接VCCIO .時使用



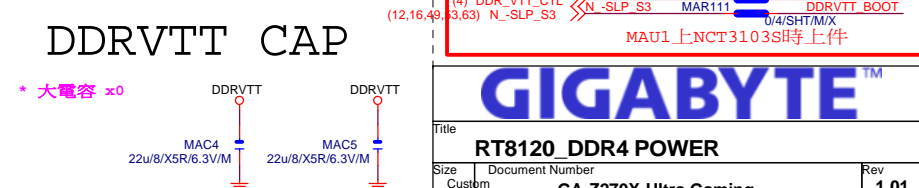
## DDR4



DDR	CAP	560u*4PCS	22u*2PCS
-----	-----	-----------	----------



DDRVTT CAP



# GIGABYTE™

## RT8120 DDR4 POWER

Document Number	GA-Z270X-Ultra Gaming
-----------------	-----------------------

Rev	1.01
-----	------

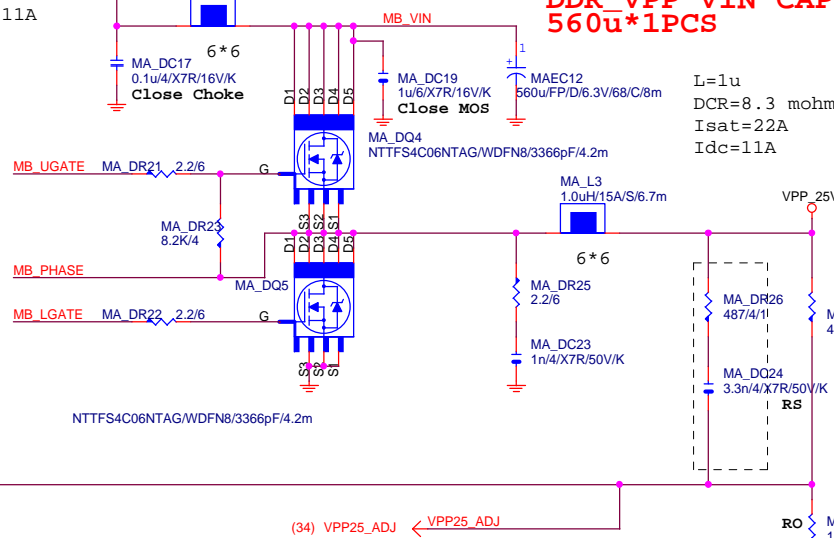
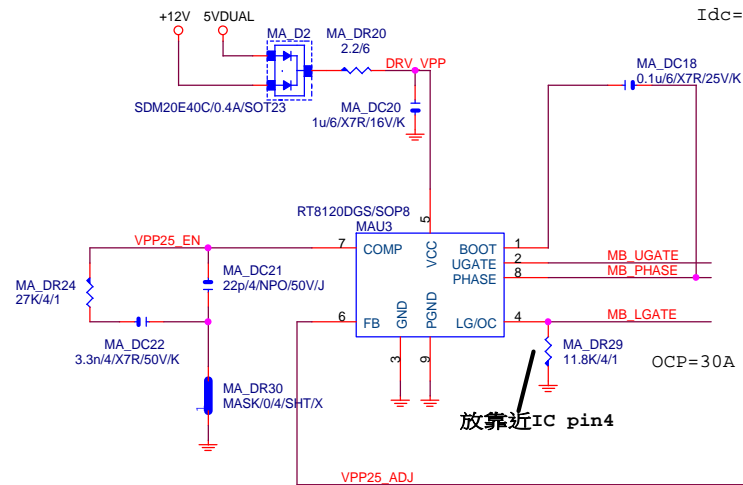
Date:	Tuesday, November 01, 2016	Sheet	30	of	76
-------	----------------------------	-------	----	----	----

REV:0.1

VPP\_25V

CHOKE與CAP料號可變

L=1u  
DCR=8.3 mohm 5VDUAL  
Isat=22A  
Idc=11A



V <sub>(BR)DSS</sub>	R <sub>DS(on)</sub> MAX	I <sub>D</sub> MAX
30 V	4.2 mΩ @ 10 V	67 A
	6.1 mΩ @ 4.5 V	

L=1u  
DCR=8.3 mohm  
Isat=22A  
Idc=11A

SUPPORT DDR4 2.5V

25A MAX

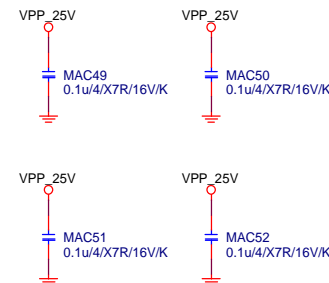
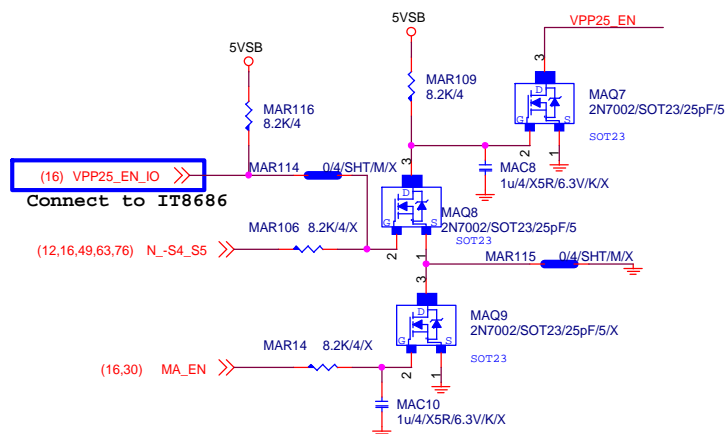
請放置CHOKE一出來位置.先預留.  
請自行確認ripple後再決定是否上件

Remote sense請從最重的負載端點拉回

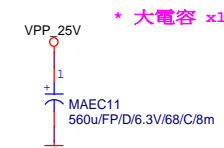
www.aitech1.ru

PWR\_SEQ

\* 刪 MA\_DR32

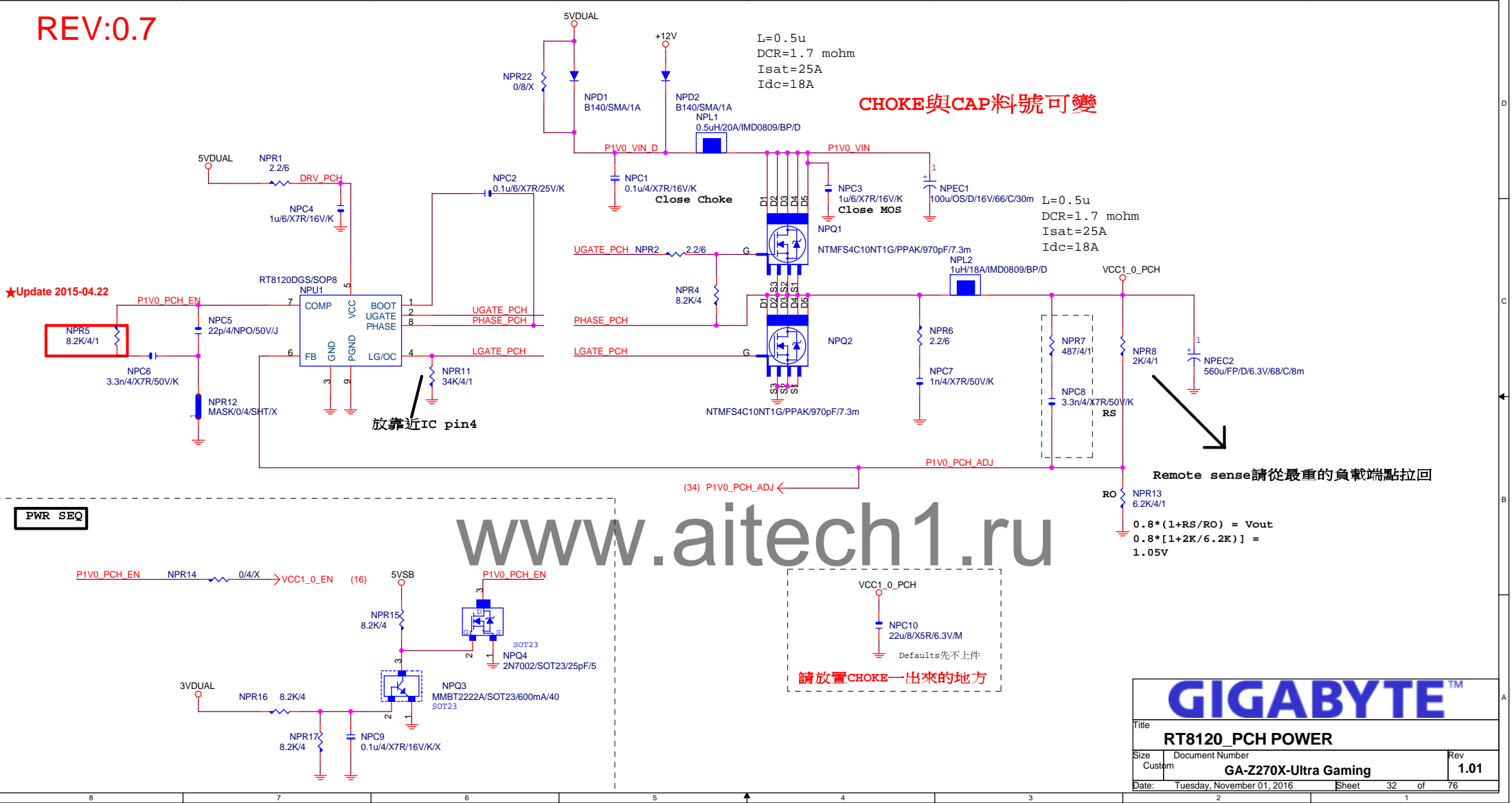


VPP CAP 560u\*1PCS



GIGABYTE™			
Title	RT8120_VPP25 POWER		
Size	Document Number	Rev	
Custom	GA-Z270X-Ultra Gaming	1.01	
Date:	Tuesday, November 01, 2016	Sheet	31 of 76

REV:0.7

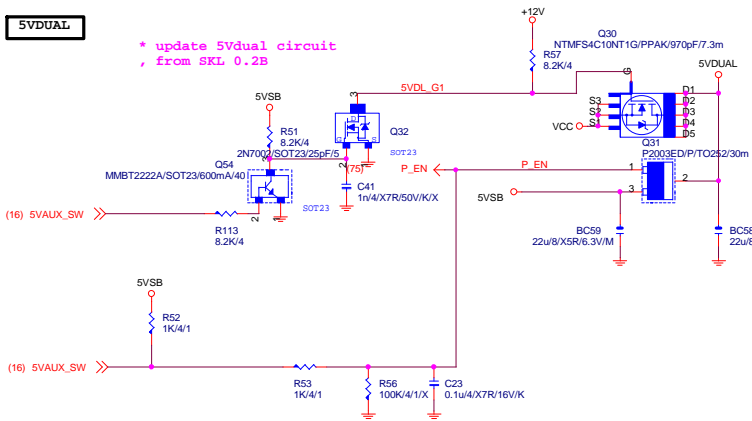


GIGABYTE™			
Title			
RT8120_PCH POWER			
Size	Document Number	Rev	
Custom	GA-Z270X-Ultra Gaming	1.01	
Date:	Tuesday, November 01, 2016	Sheet	32 of 76

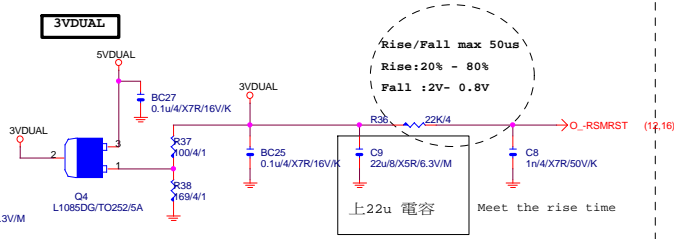


# 5VDUAL

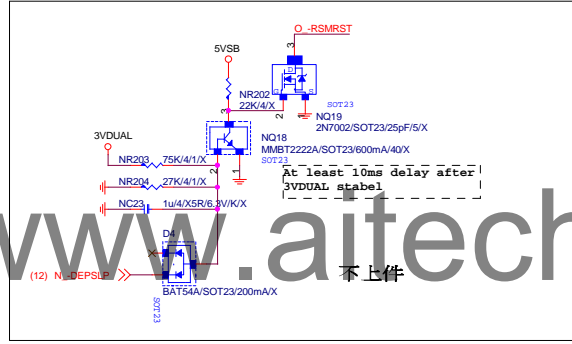
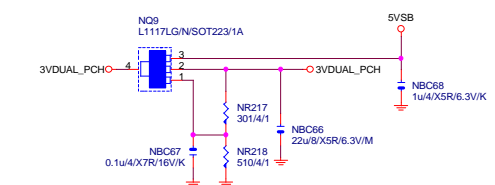
\* update 5Vdual circuit  
from SKL 0.2B



# 3VDUAL

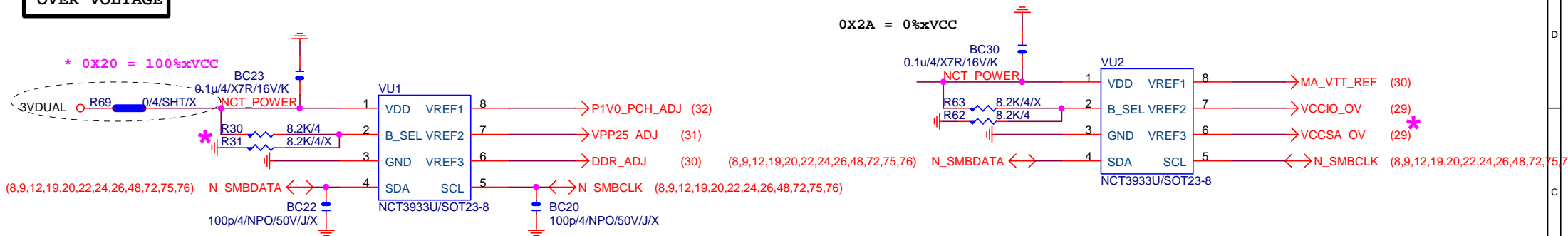


# 3VDUAL\_PCH



www.aitech1.ru

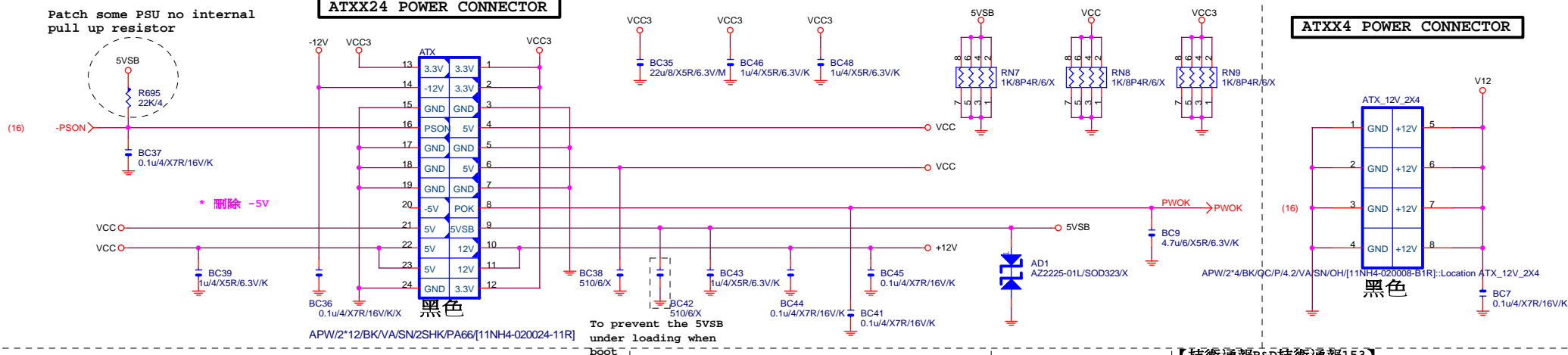
# OVER VOLTAGE



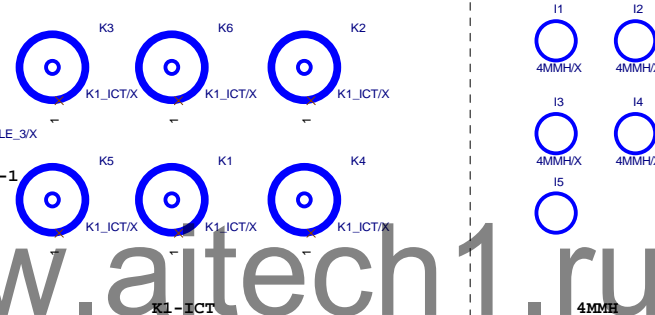
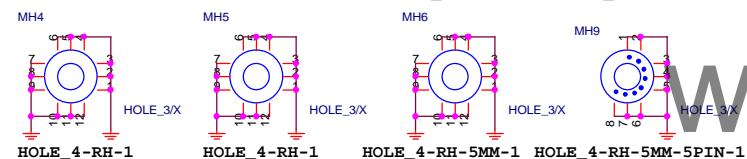
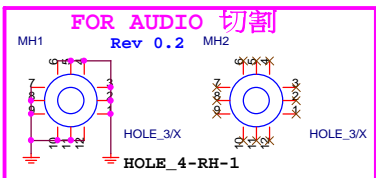
NCT3933	0X2A	0X20	0X22
VREF1	DDRVTT	VREF_DDRA_DQ	PCH Core
VREF2	VREF_DDRA_CA	N/A	VCC1_5_PCH
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	SMREF

Gigabyte Technology			
CPU CORE VR-2			
Title	Document Number	GA-Z270X-Ultra Gaming	
Size Custom		Date: Tuesday, November 01, 2016	Rev 1.01
		Sheet 34 of 76	

**ATXX4 POWER CONNECTOR**

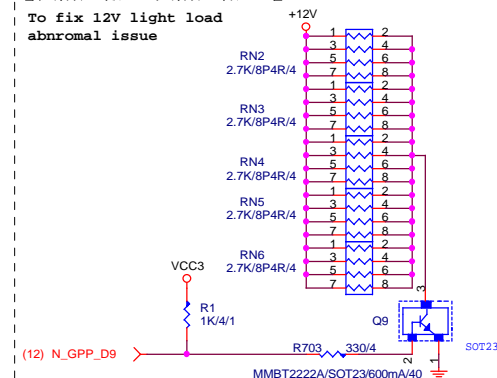


FOR AUDIO 切割  
Rev 0.2 MH2

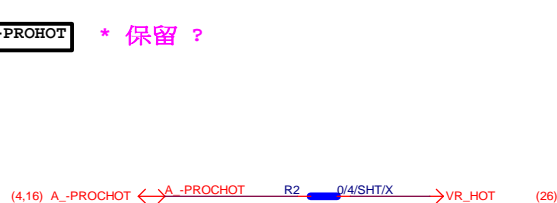


## 【技術通報R&amp;D技術通報153】

To fix 12V light load  
abnromal issue



**-PROHOT** \* 保留 ?

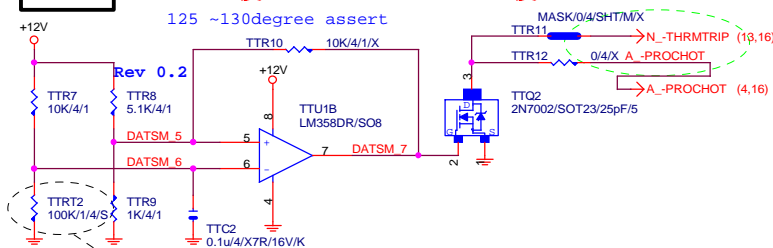


CLOSE VCORE PWM UPPER MOSFET

**-PROHOT**

QTP-120席 / DCD EXTERNA TPID-120 席

125 ~130degree assert

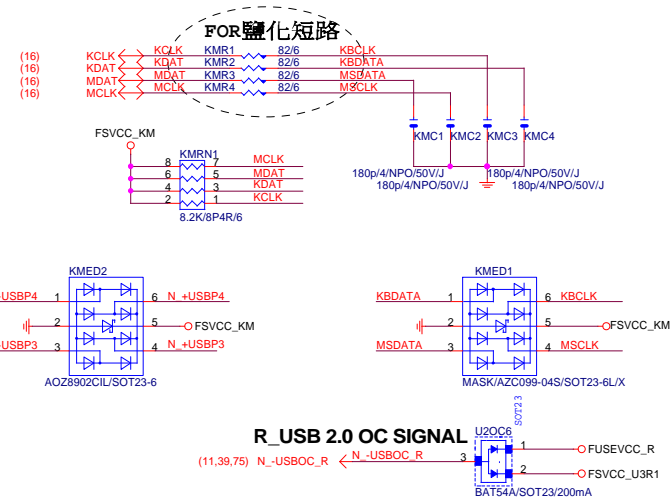


CLOSE VCCGT PWM UPPER MOSFET



## Gigabyte Technology

Title			
<b>ATX POWER CONNECTOR</b>			
Size Custom	Document Number	<b>GA-Z270X-Ultra Gaming</b>	Rev <b>001</b>
Date:	Tuesday, November 01, 2016	Sheet 35 of 76	

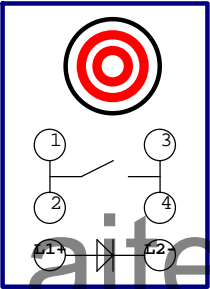


[www.aitech1.ru](http://www.aitech1.ru)

POWER

Reset

Clear CMOS



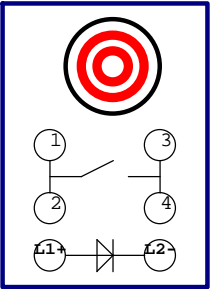
OC KEY

Rev 0.2

Rev 0.3

PCH:GPP\_D6

PCH:GPP\_D4



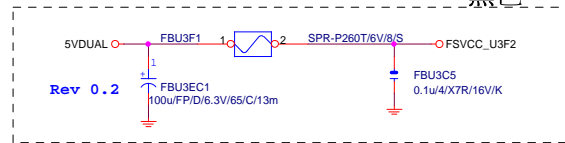
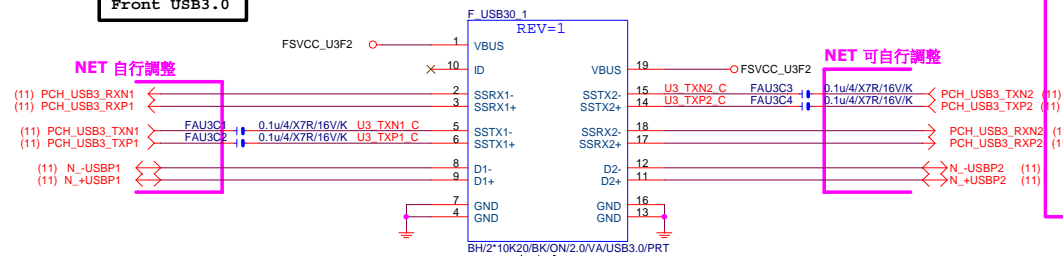
ECO KEY

PCH:GPP\_C9

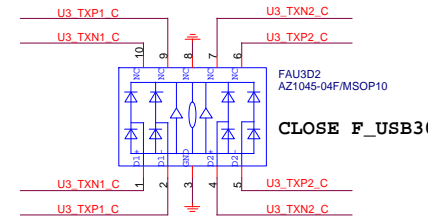
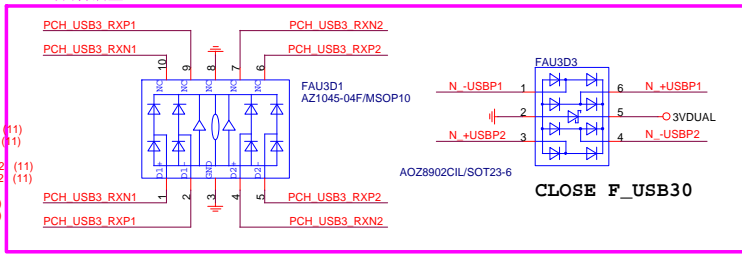
PCH:GPP\_B20

Gigabyte Technology			
Title			
OC BUTTON			
Size	Document Number		Rev
Custom	GA-Z270X-Ultra Gaming		1.0
Date:	Tuesday, November 01, 2016	Sheet	37 of 76

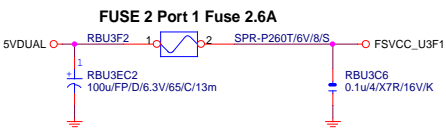
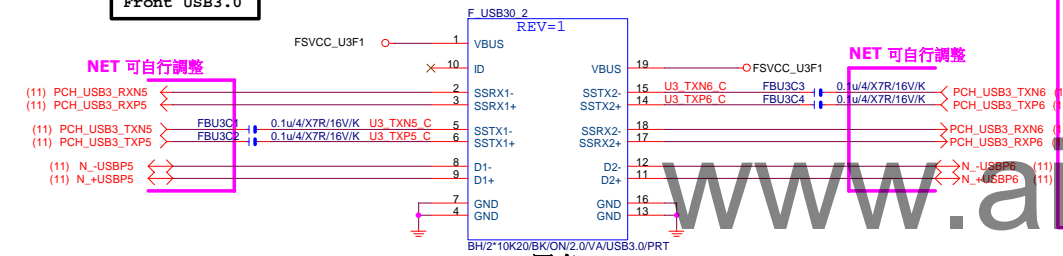
Front USB3.0



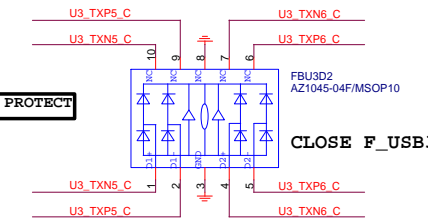
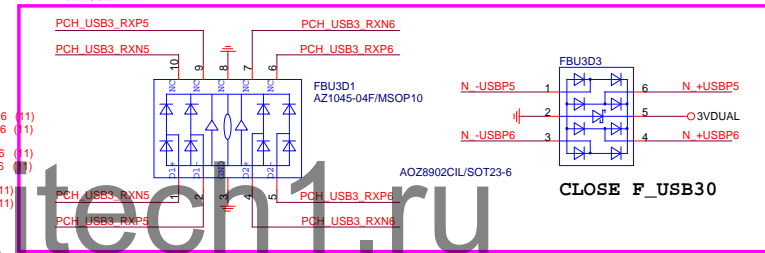
NET 可自行調整



Front USB3.0



NET 可自行調整

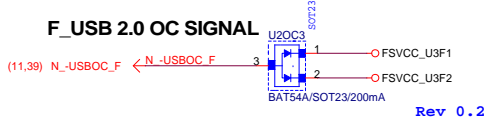


F\_USB POWER PROTECT

-USBOC\_F

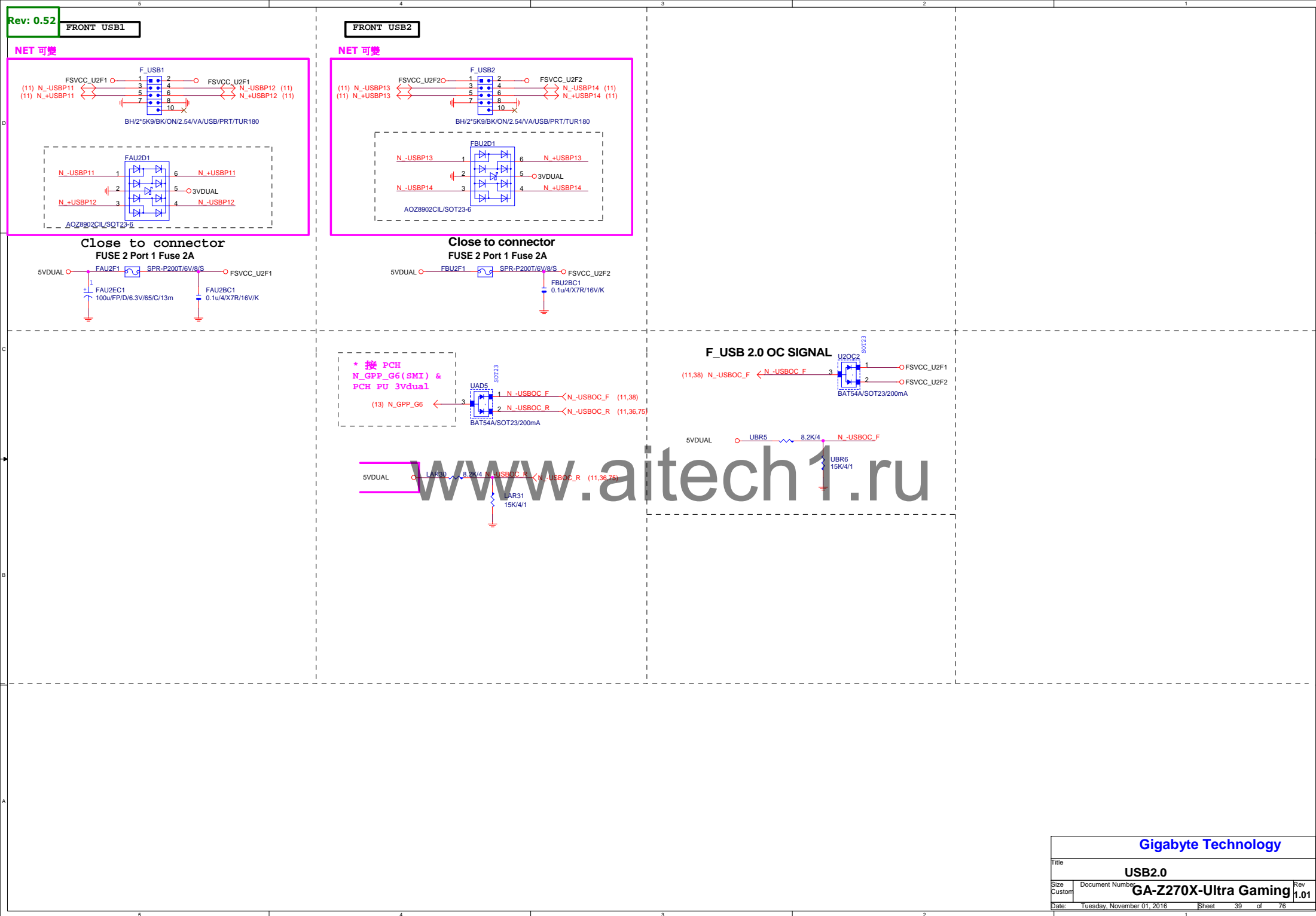
-USBOC\_R

F\_USB 2.0 OC SIGNAL



Gigabyte Technology

Title		F_USB30	
Size		Document Number	
Date		Tuesday, November 01, 2016	
Sheet		38 of 76	



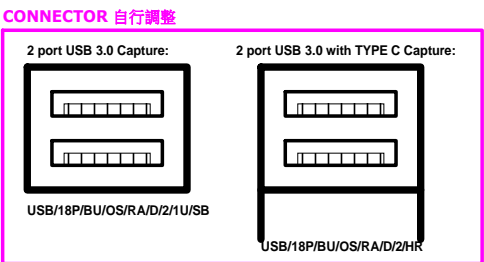
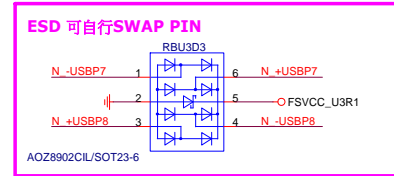
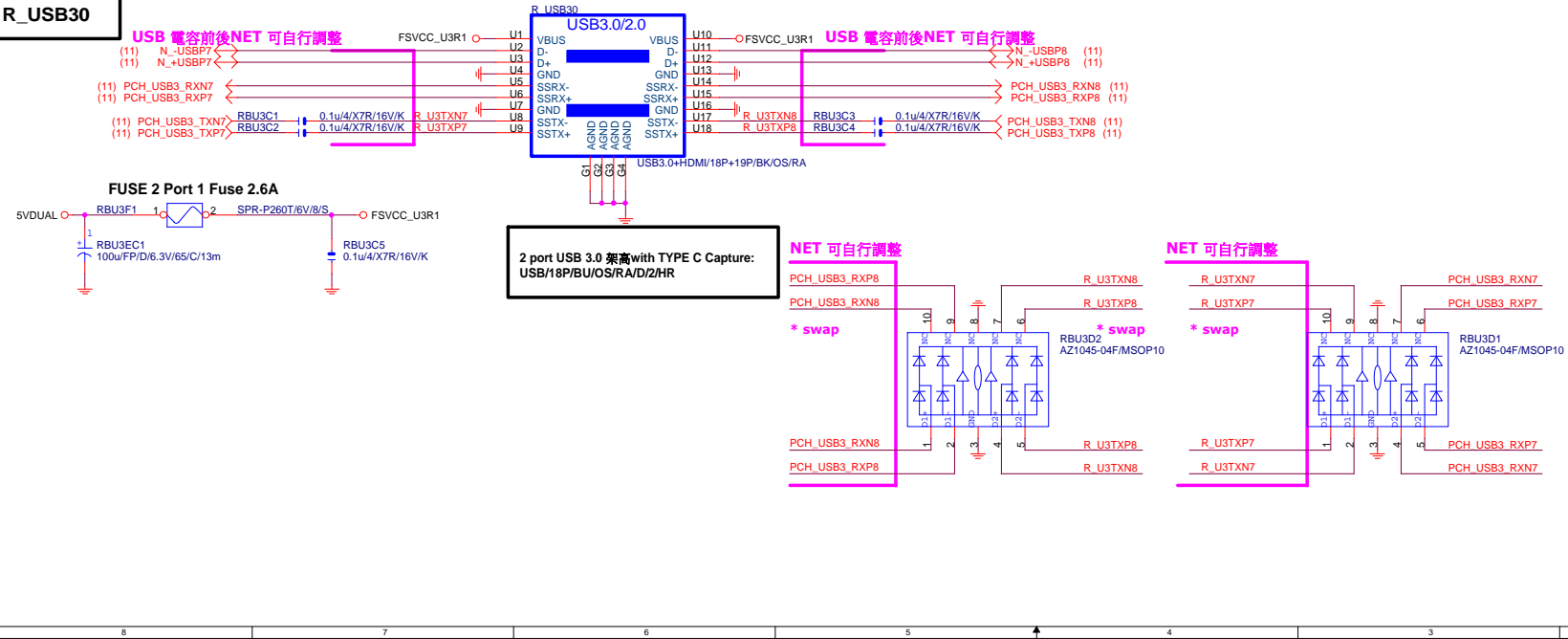
Gigabyte Technology

Title			USB2.0
Size	Document Number	GA-Z270X-Ultra Gaming	
Custom		Date	Tuesday, November 01, 2016
		Sheet	39 of 76

Rev 1.01



R\_USB30

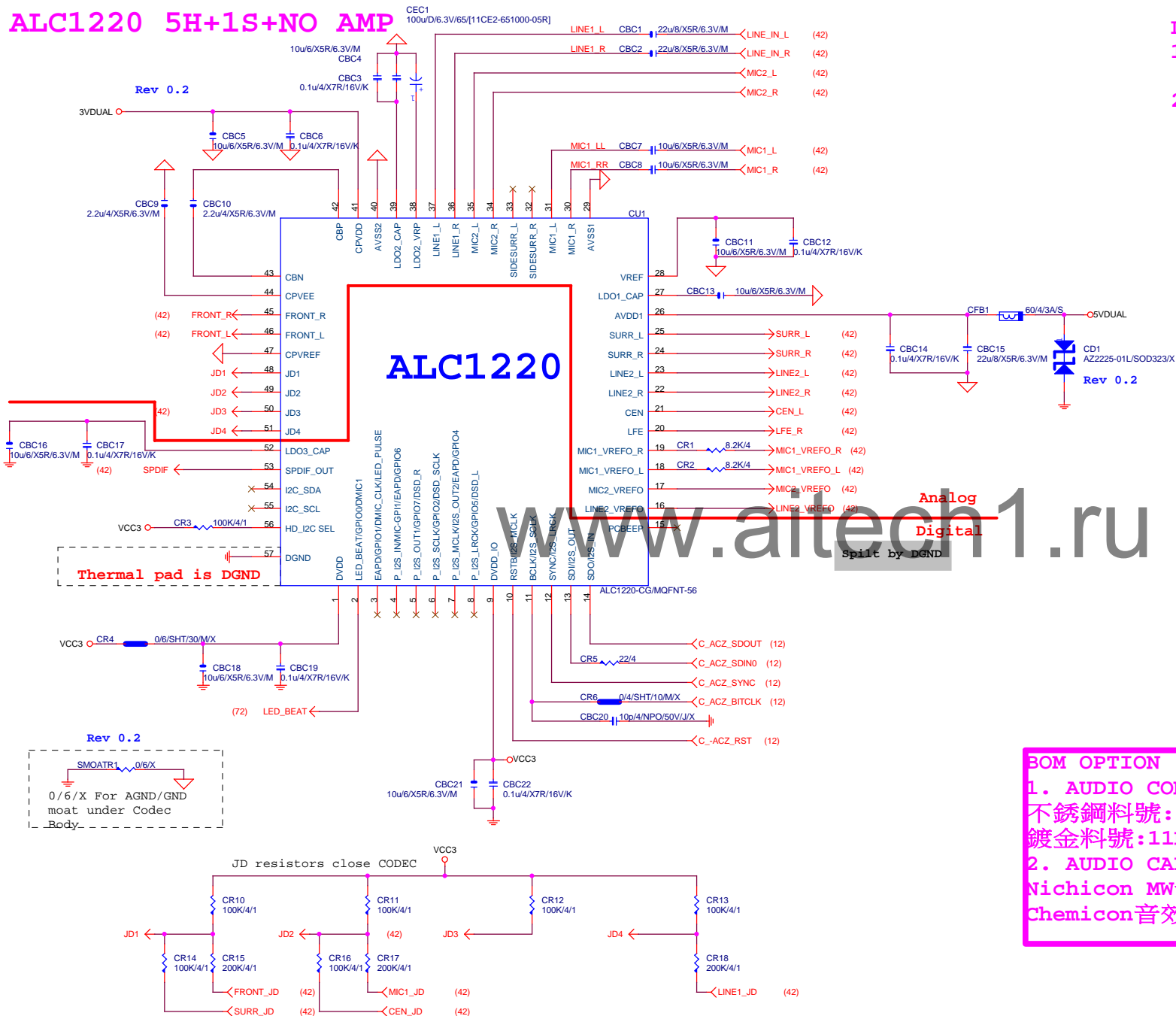


Gigabyte Technology			
Title		R_USB30	
Size	Document Number	Rev	
Custom	GA-Z270X-Ultra Gaming	1.01	
Date:	Tuesday, November 01, 2016	Sheet	40 of 76
2		1	

Rev 0.4

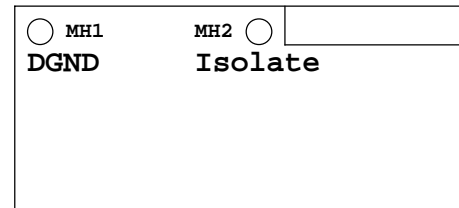
11CE2-651000-05R

## ALC1220 5H+1S+NO AMP



LAYOUT注意:螺絲孔下GND方式

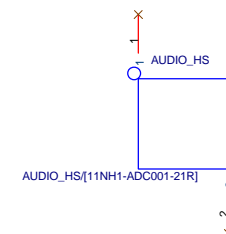
1. MH1空間夠,下DGND  
空間不夠,改為Isolate
2. MH2一律改為Isolate



LAYOUT注意:是否要加?

GND切割線

音效區域印刷



BOM OPTION :

1. AUDIO CONNECT

不銹鋼料號:11NR6-403025-A2R

鍍金料號:11NR6-403025-92R

2. AUDIO CAP

Nichicon MW音效電容 : 11CE1-651000-12R

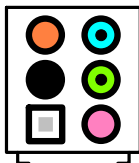
Chemicon音效電容 : 11CE2-651000-05R

Gigabyte Technology

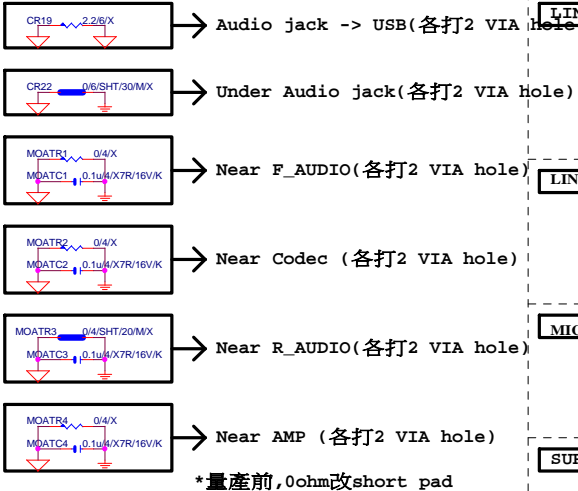
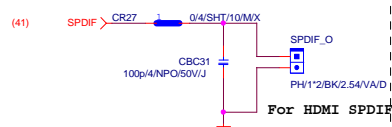
Title		
ALC1220		
Size	Document Number	Rev
Custom	GA-Z270X-Ultra Gaming	1.01
Date:	Tuesday, November 01, 2016	Sheet 41 of 76

Rev 0.4

AZALIA JACK



SPDIF OUT



LINE-OUT

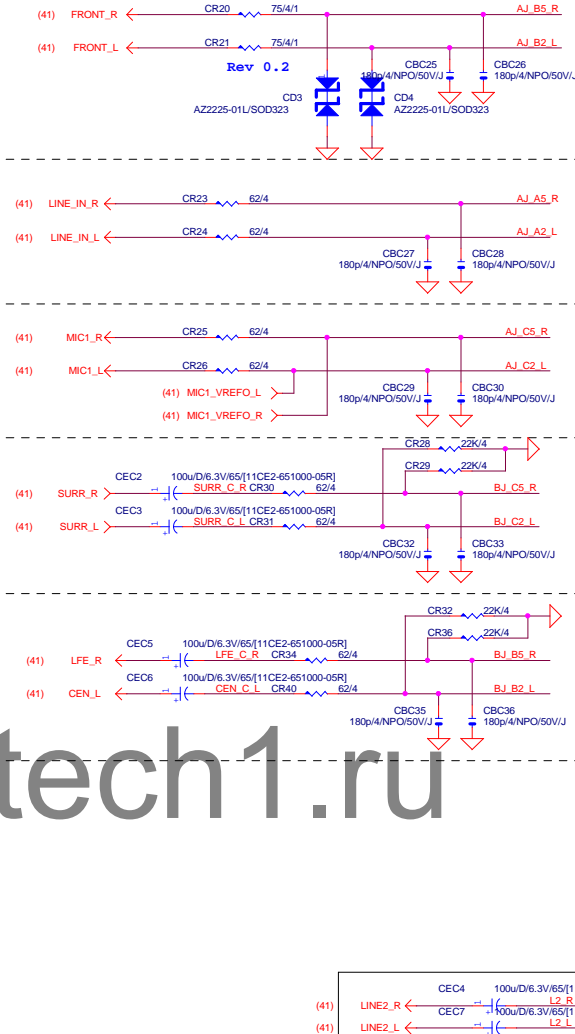
LINE-IN

MIC-IN

SURROUND

CEN/LFE

www.aitech1.ru



2X3RP/25P/OR,BK,BU,GR,RE/RA

AZALIA JACK

BLUE

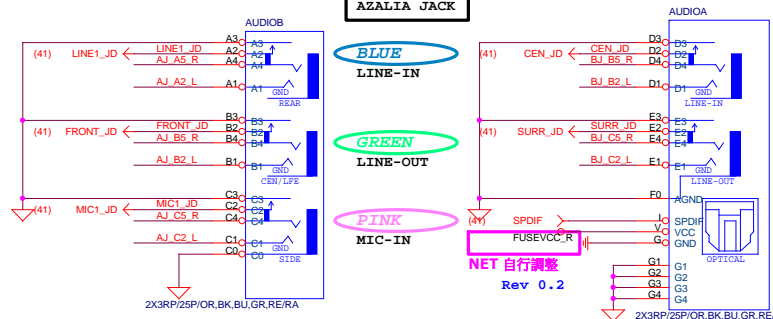
LINE-IN

GREEN

LINE-OUT

PINK

MIC-IN



Orange

CEN/LFE

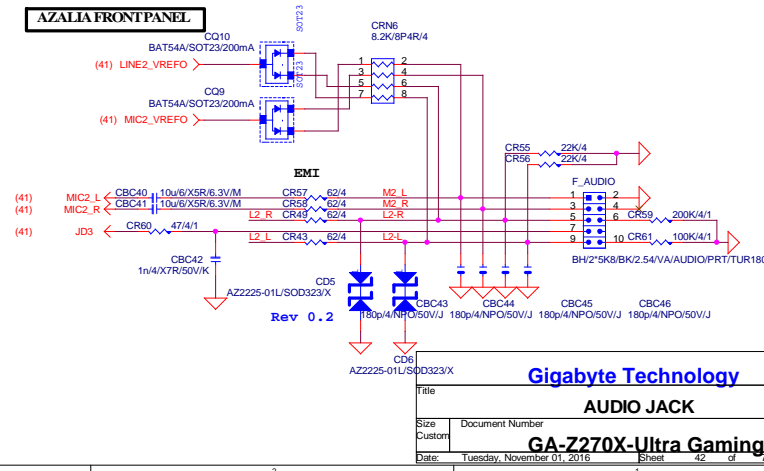
Black

SURROUND

SPDIF

不銹鋼料號:11NR6-403025-A2R  
鍍金料號:11NR6-403025-92R

AZALIA FRONT PANEL



Gigabyte Technology

AUDIO JACK

File	Document Number	Rev
Size	Custom	1.01
Date	Tuesday, November 01, 2016	Sheet 42 of 76

www.aitech1.ru

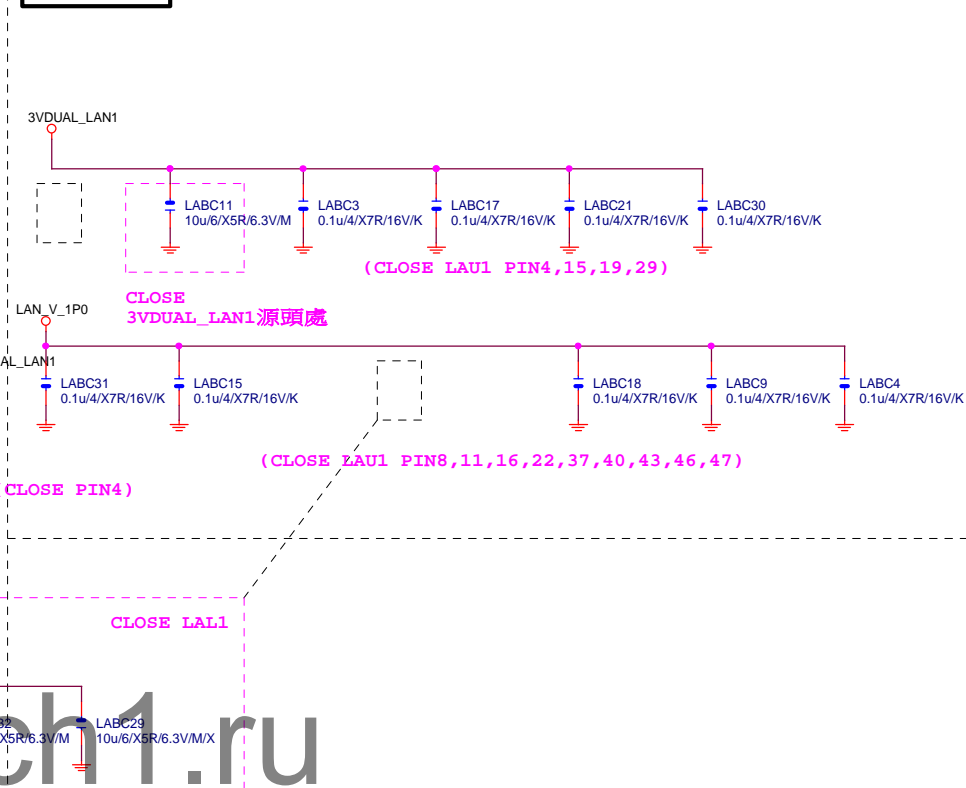
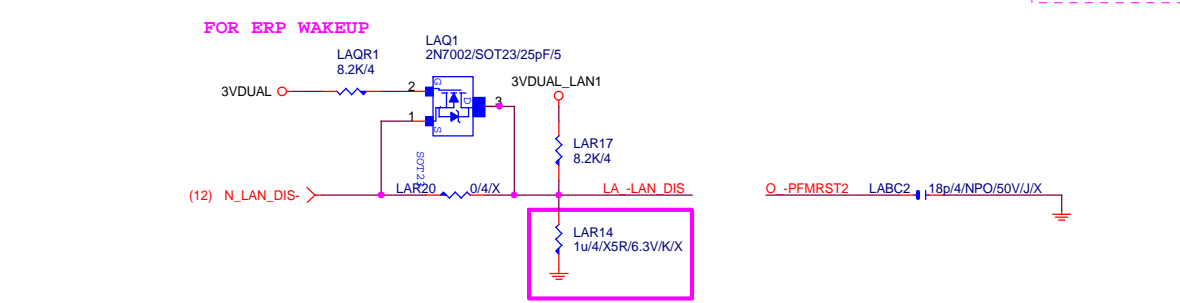
<b>GIGABYTE™</b>			
Title <b>Creative Sound3Di ZxR</b>			
Size Custom	Document Number <b>GA-Z270X-Ultra Gaming</b>		Rev <b>1.01</b>
Date Tuesday, November 01, 2016	Sheet 43 of 76		

www.aitech1.ru

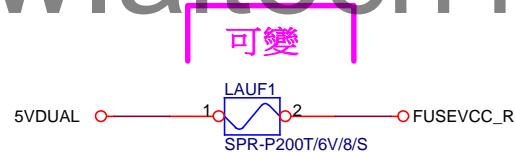
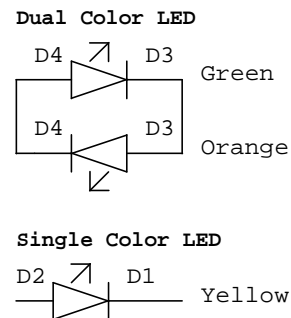
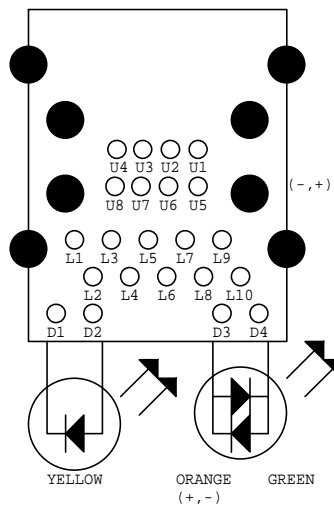
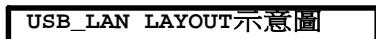
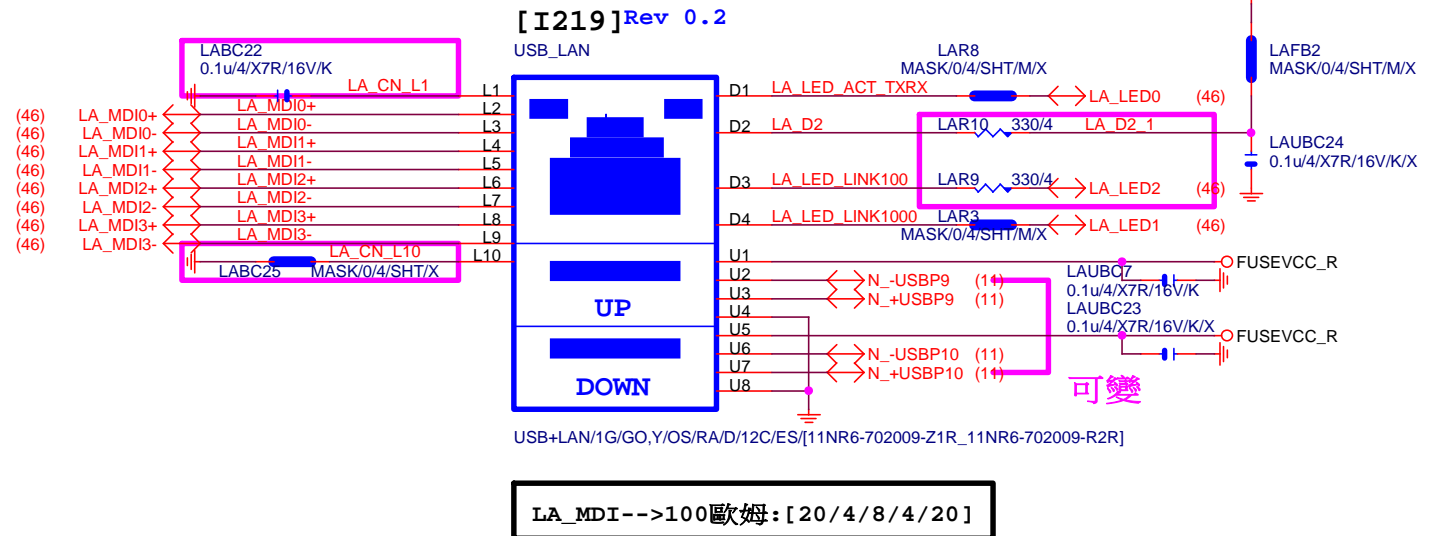
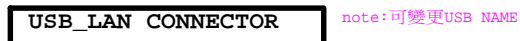
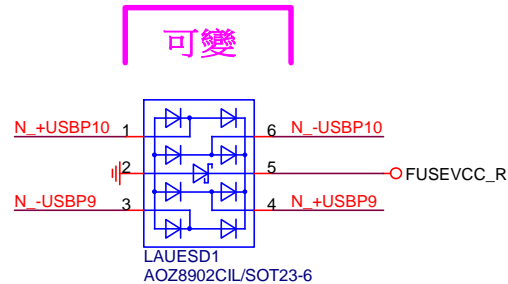
Gigabyte Technology		
Title		
Creative Sound3Di ZxR		
Size	Document Number	Rev
Custom	GA-Z270X-Ultra Gaming	1.01
Date:	Tuesday, November 01, 2016	Sheet 44 of 76

www.aitech1.ru

Gigabyte Technology			
KILLER E2500(E2400)(E2201)			
Size	Document Number		Rev
Custom	GA-Z270X-Ultra Gaming		1.01
Date:	Tuesday, November 01, 2016	Sheet	45 of 76



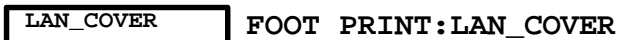




Close to connector

USB\_LAN 2-Port 2.0A

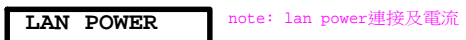
**FUSE-0805**



## 可變 [視SPEC需求]



PS:視EMI需求



## Gigabyte Technology

## LAN CONNECTOR-I219

GA-Z270X-Ultra Gaming<sup>1.01</sup>

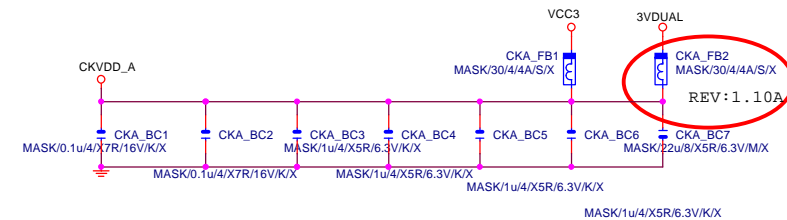
Title				Rev	
LAN CONNECTOR-I219				1.01	
Size	Document Number				
Custom					
GA-Z270X-Ultra Gaming					
Date:	Tuesday, November 01, 2016	Sheet	47	of	76

Size	Document Number	Rev
Custom	GA-7270Y Ultra Gaming	1.01

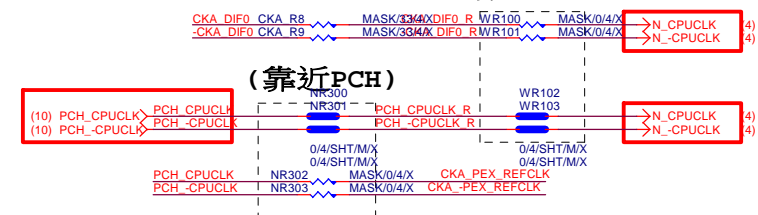
Date: Tuesday, November 01, 2016 Sheet 47 of 76

1.01

IDT6V41630

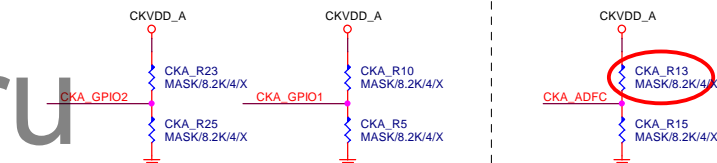


(靠近cpu)



### CPU Frequency Selection and output Divider Table

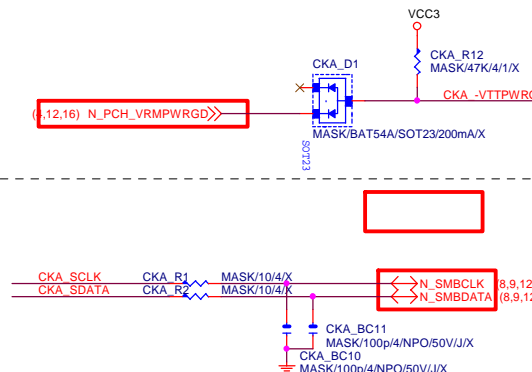
	B5b01(FS1)	B5b00(FS0)	VCO (MHz)	CPU Divider	CPU (MHz)	Typ SS%	Typ S ON/OFF
0	0	0	200.00	2.00	100.00	-	OFF
0	0	1	400.00	4.00	100.00	-	OFF
1	0	1	1000.00	10.00	100.00	-0.50%	ON
1	1	1	100.00	1.00	100.00	-	OFF



Defaults  
CKX1.CKBC8.CKBC9.CKR18.CKR19上件  
CKR30.CKR31不上件

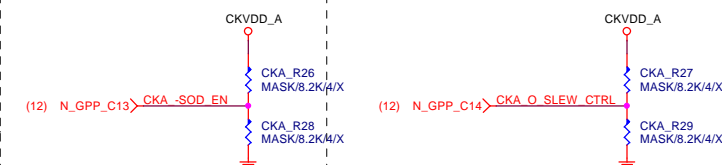


\*可變，依需求上件不上件。



Real time selection function

### Frequency change slew rate control



**GIGABYTE™**

Title	IDT6V41530 CLK BUFFER
-------	-----------------------

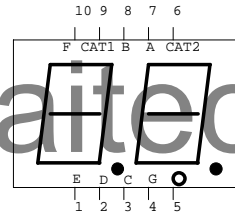
Size	Document Number	Rev
Custom	<b>GA-Z270X-Ultra Gaming</b>	<b>1.01</b>
Date:	Tuesday, November 01, 2016	Sheet 48 of 76

**COM PORT**

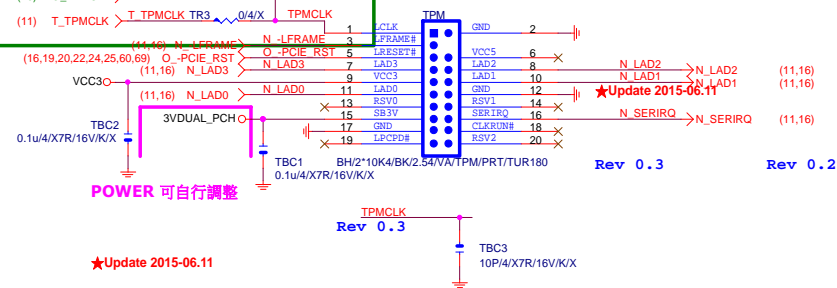
## COMA

80 PORT

Physical Package  
(TOP VIEW)

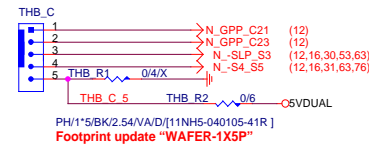


TPM CONNECT



Thunderbolt

★Update 2015-12-29

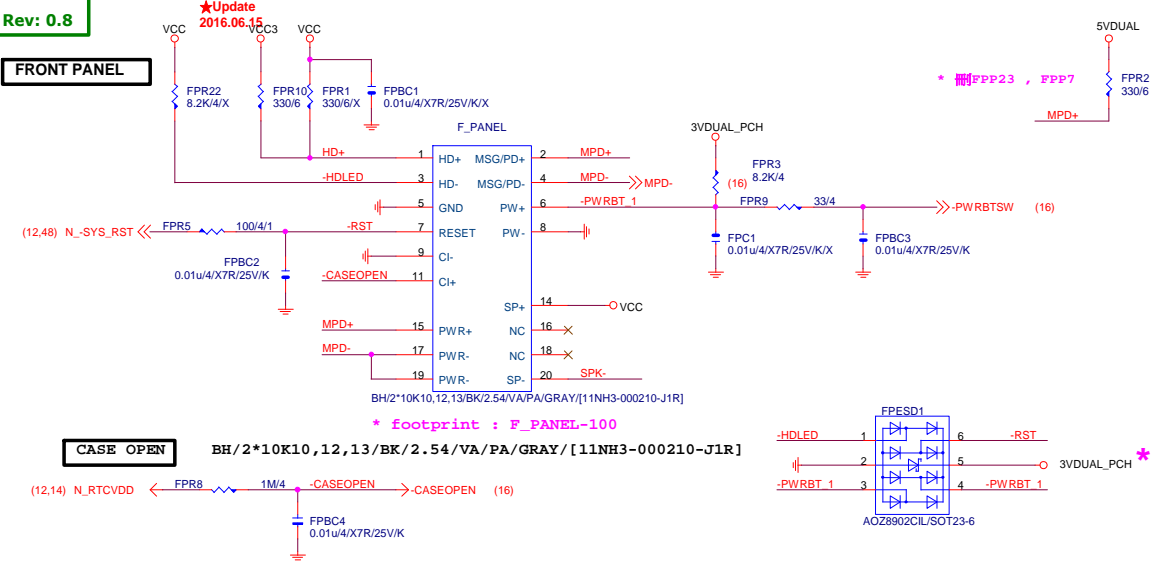


## Gigabyte Technology

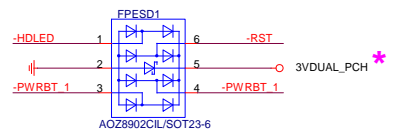
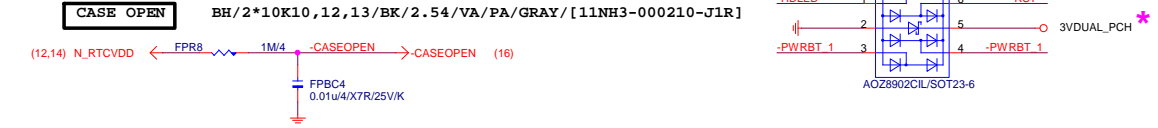
Title			
FP,F_USB,USB PWR,BZ			
Size	Document Number	Rev	
Custom	GA-Z270X-Ultra Gaming	1.01	
Date:	Tuesday, November 01, 2016	Sheet	49 of 76

Rev: 0.8

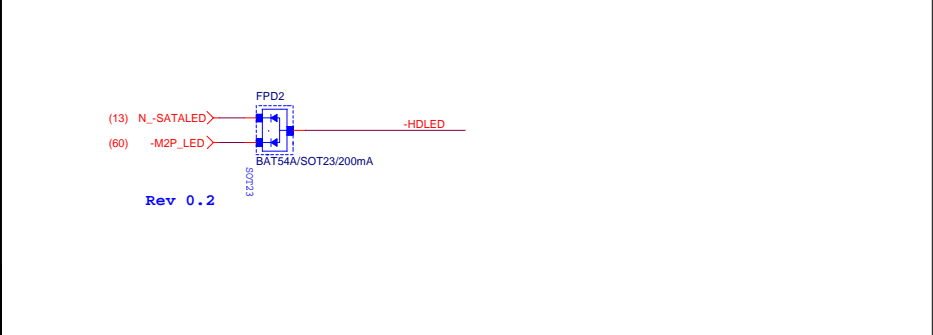
FRONT PANEL



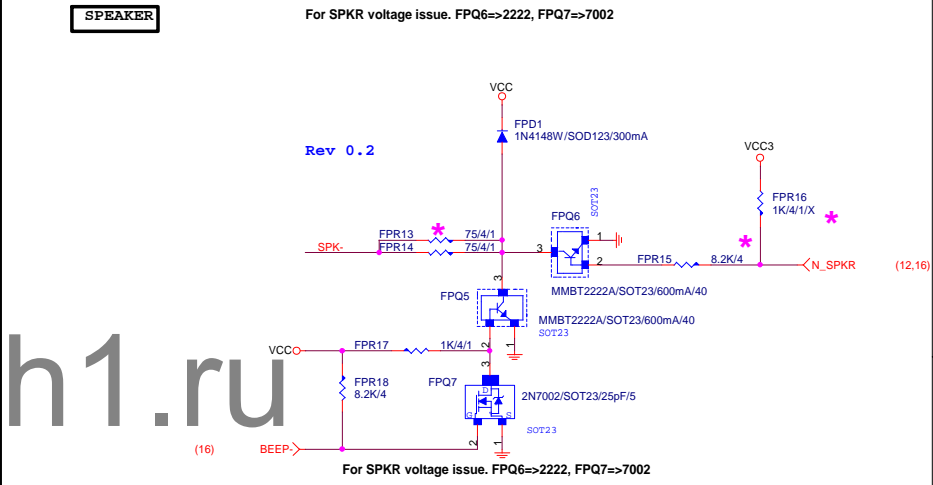
CASE OPEN



SATA LED SATALED# signal open-collector, pull-up (8.2 kΩ to 10 kΩ) to Vcc3\_3

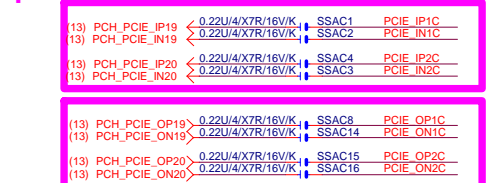


SPEAKER

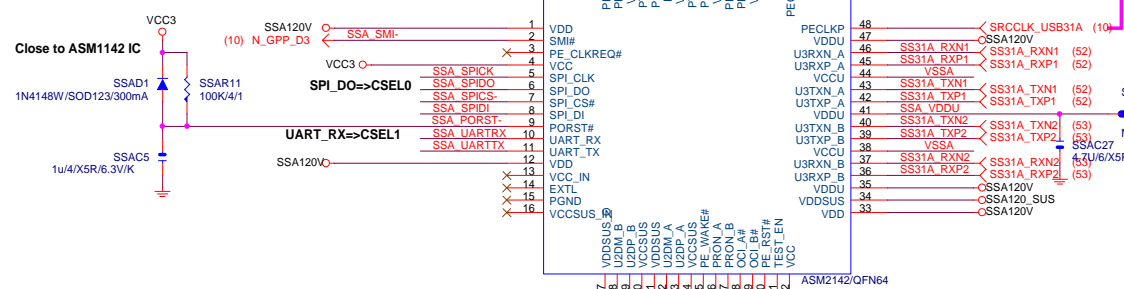


www.aitech1.ru

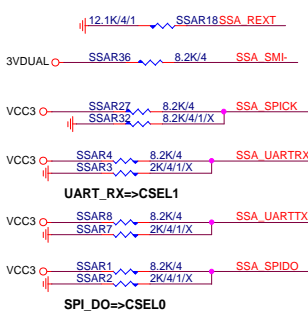
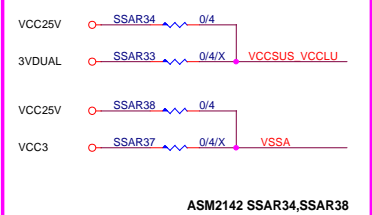
PCH PCIe\* Controller Lane Reversal / base on spec To PCIe host.



From PCIe host.

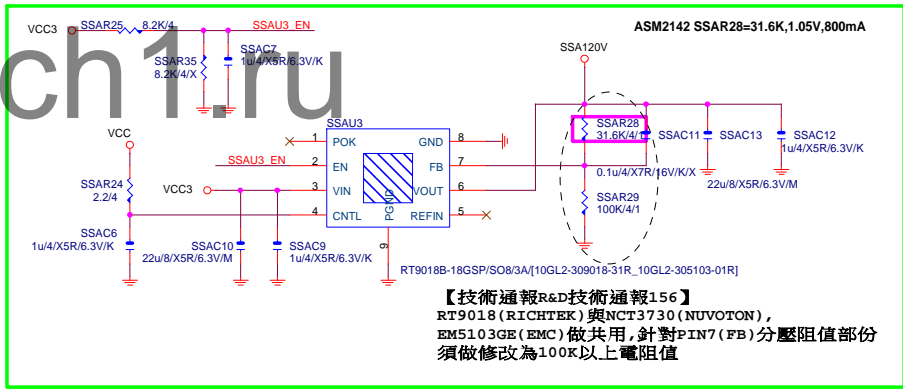
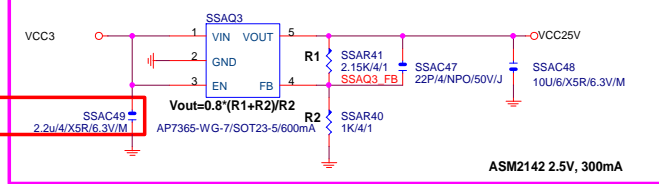


ASM 2142 Option

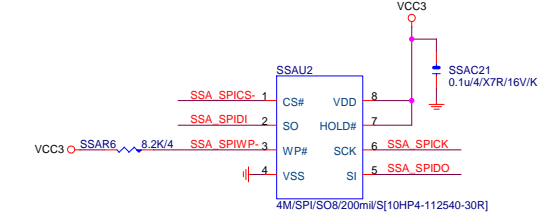


CSEL1	CSEL0	
1	1	External 20MHz Crystal (Asynchronous)
0	1	48MHz clock input (Synchronous)
X	0	Reserved for Test

ASM2142 Option



【技術通報R&D技術通報156】  
RT9018 (RICHTER) 與NCT3730 (NUVOTON),  
EM5103GE (EMC) 做共用, 針對IN7 (FB) 分壓阻值部份  
須做修改為100K以上電阻值



GIGABYTE™			
Title ASM2142			
Size Custom	Document Number GA-Z270X-Ultra Gaming	Rev 1.01	
Date: Tuesday, November 01, 2016	Sheet 51	of 76	

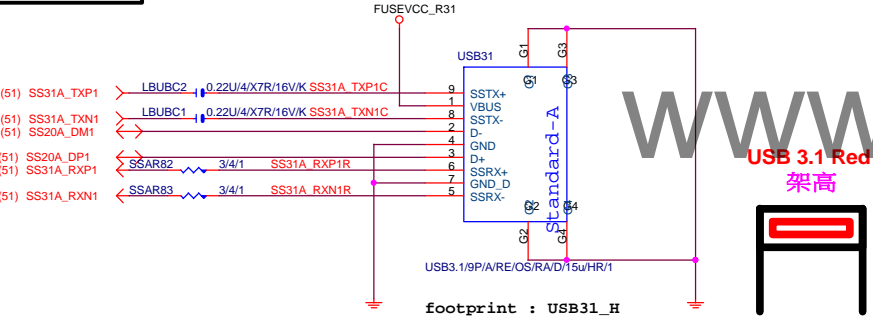
ASM2142 USB31 Host Rev0.2

平躺式type A

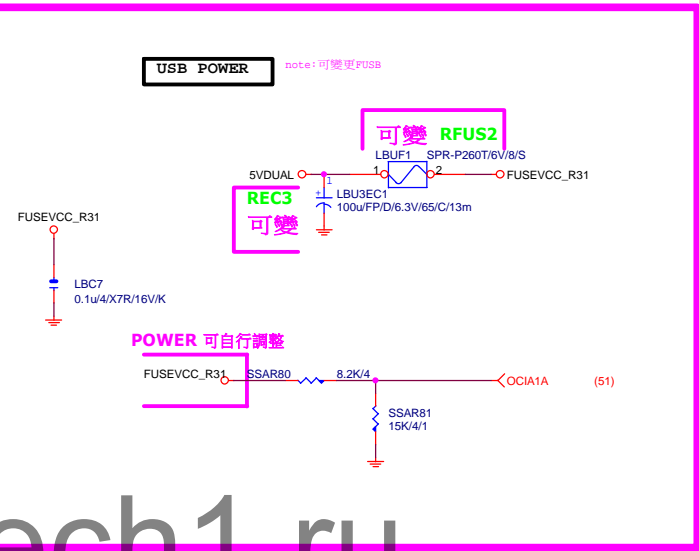


USB31 TYPE A Connector which chooses for project demand

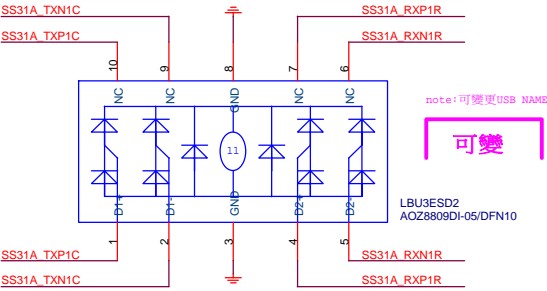
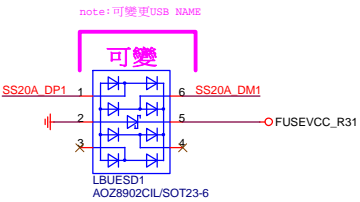
架高式type A



後窗Rule : (後窗由左至右)  
DIP電容 : REC1, REC3, REC2  
FUSE : RFUS1, RFUS2, RFUS3, RFUS4...



www.aitech1.ru

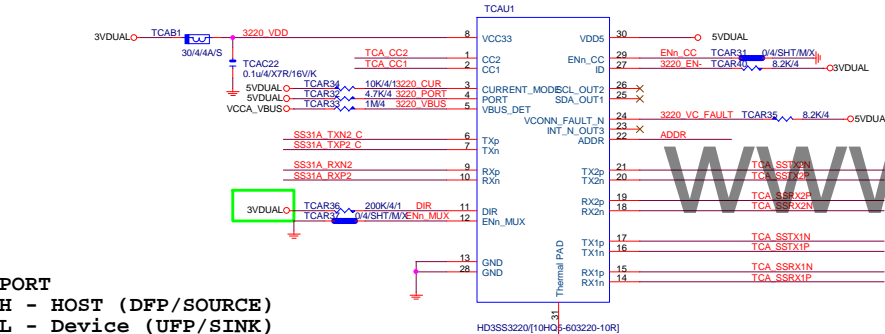
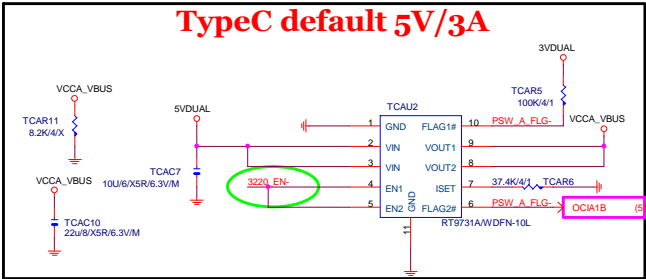


ASM2142 USB31 Host Rev0.2

USB 3.x SuperSpeed

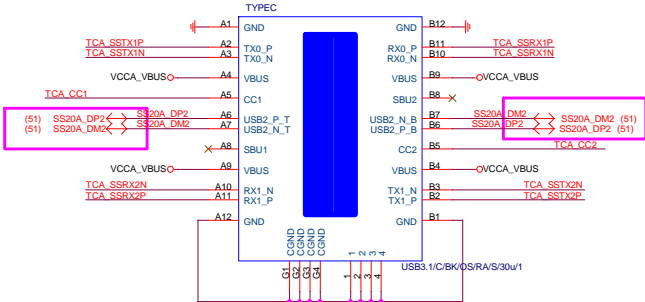


For VBUS current limit at 900mA on S3

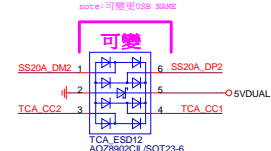
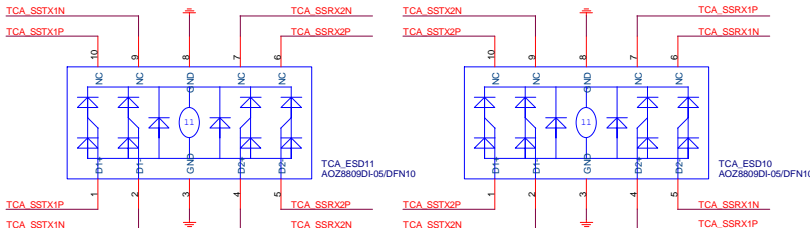


PORT  
H - HOST (DFP/SOURCE)  
L - Device (UFP/SINK)  
NC - Dual Role (DRP)

CURRENT MODE  
L - Default (900mA) / Pull down to GND or NC  
M - Medium (1.5A) / Pull up to VDD 500K  
H - High (3.0A) / Pull up to VDD 10K



USB2.0 can be used the same source



GIGABYTE™		
TI HD3SS3212		
Size C	Document Number	Rev
	GA-Z270X-Ultra Gaming	1.01
Date:	Tuesday, November 01, 2016	Sheet 53 of 76

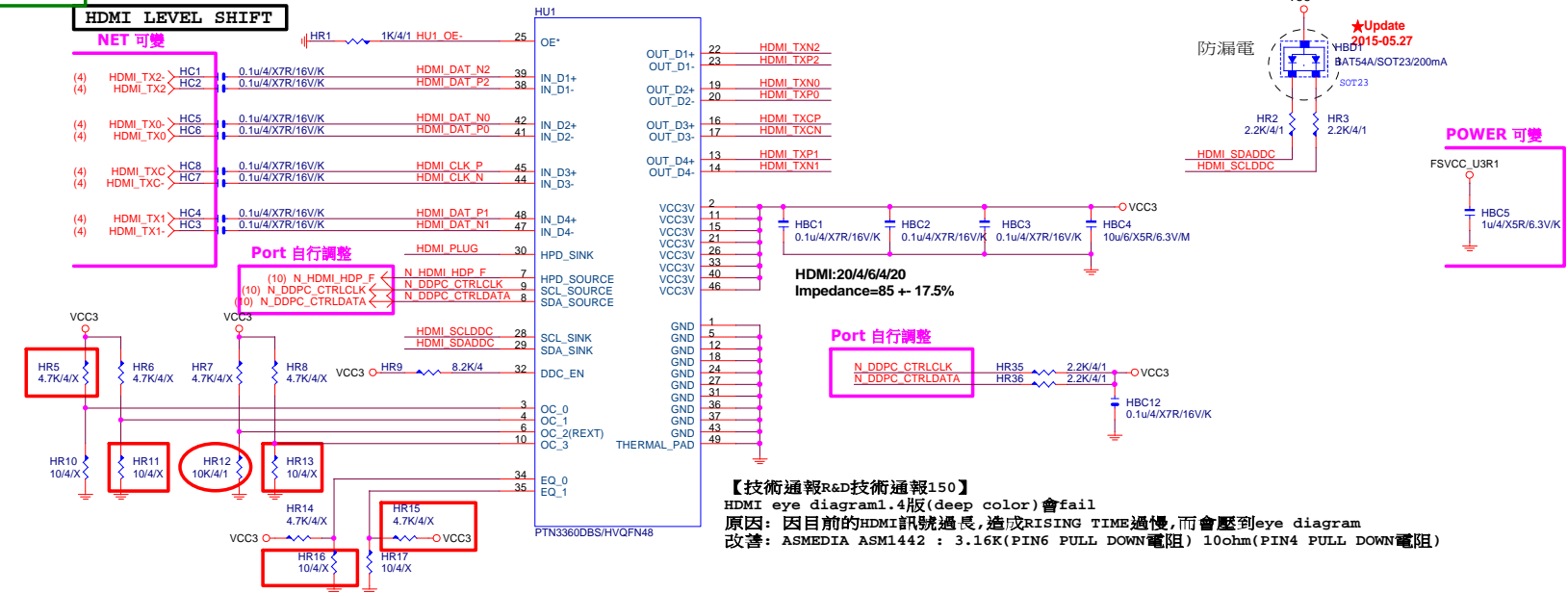


www.aitech1.ru

<b>GIGABYTE™</b>			
Title <b>PD 12V3A</b>			
Size	Document Number		Rev
Custom	<b>GA-Z270X-Ultra Gaming</b>		<b>1.01</b>
Date:	Tuesday, November 01, 2016	Sheet 54 of 76	

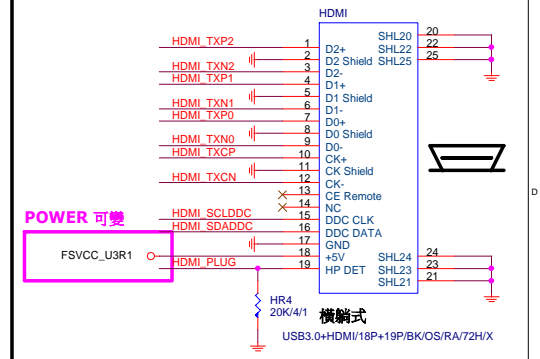
www.aitech1.ru

<b>GIGABYTE™</b>			
Title <b>DISPLAY PORT IN</b>			
Size Custom	Document Number <b>GA-Z270X-Ultra Gaming</b>		Rev <b>1.01</b>
Date: Tuesday, November 01, 2016	Sheet 55	of 76	



PTN3360: PIN 4/10/34/35 NC PIN, 都不上值; 只上HR12: 10K  
ASM1442: 紅色框要上, HR12: 3.16K

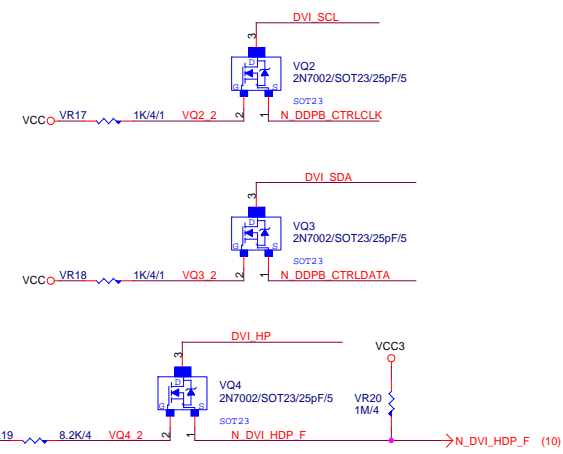
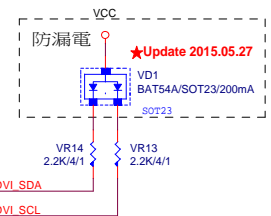
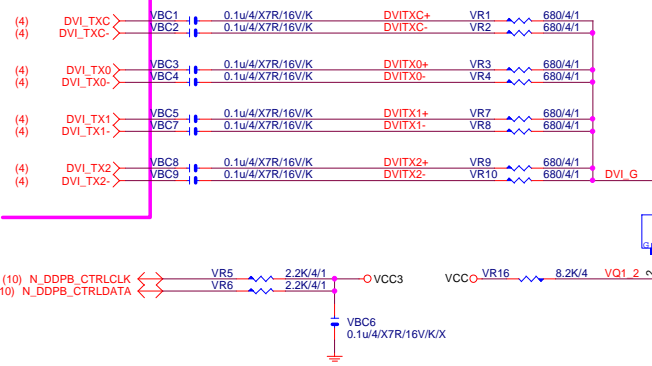
www.aitech1.ru



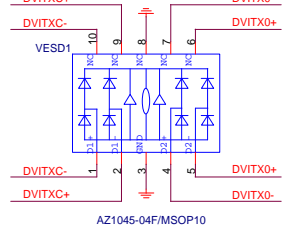
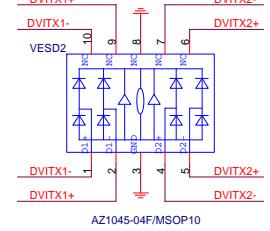
直立式  
P/N: 11NR6-H01019-K1R

DVI:20/4/6/4/20  
Impedance=85 +- 17.5%

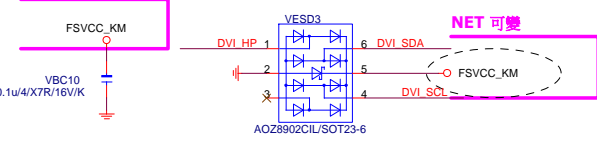
NET 可變



Close to connector



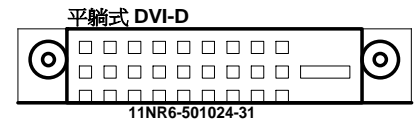
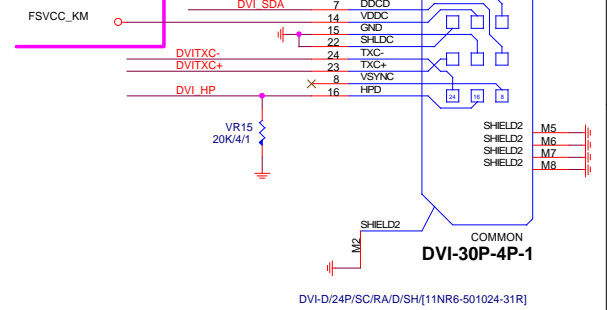
NET 可變



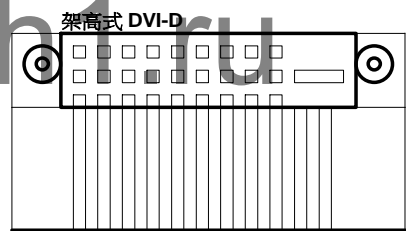
Close to connector

NET 可變

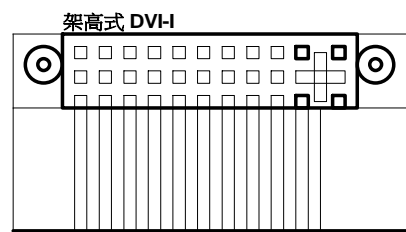
NET 可變



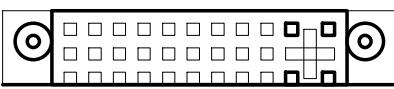
www.aitech1.ru



★Update 2015-03.24 11NR6-501024-R1R(Golden), 11NR6-501024-T1R(Normal)



★Update 2015-03.24 11NR6-501024-N1R(Golden), 11NR6-501024-L2R(Normal)



平躺式 DVI-I  
11NR6-501029-K1R

www.aitech1.ru

Gigabyte Technology			
Title			
M.2 X4			
Size	Document Number		Rev
Custom	GA-Z270X-Ultra Gaming		1.01
Date:	Tuesday, November 01, 2016	Sheet	58 of 76

www.aitech1.ru

Gigabyte Technology		
M.2X4_S4~S5 SWITCH		
Size	Document Number	Rev
Custom	GA-Z270X-Ultra Gaming	01
Date:	Tuesday, November 01, 2016	Sheet 59 of 76

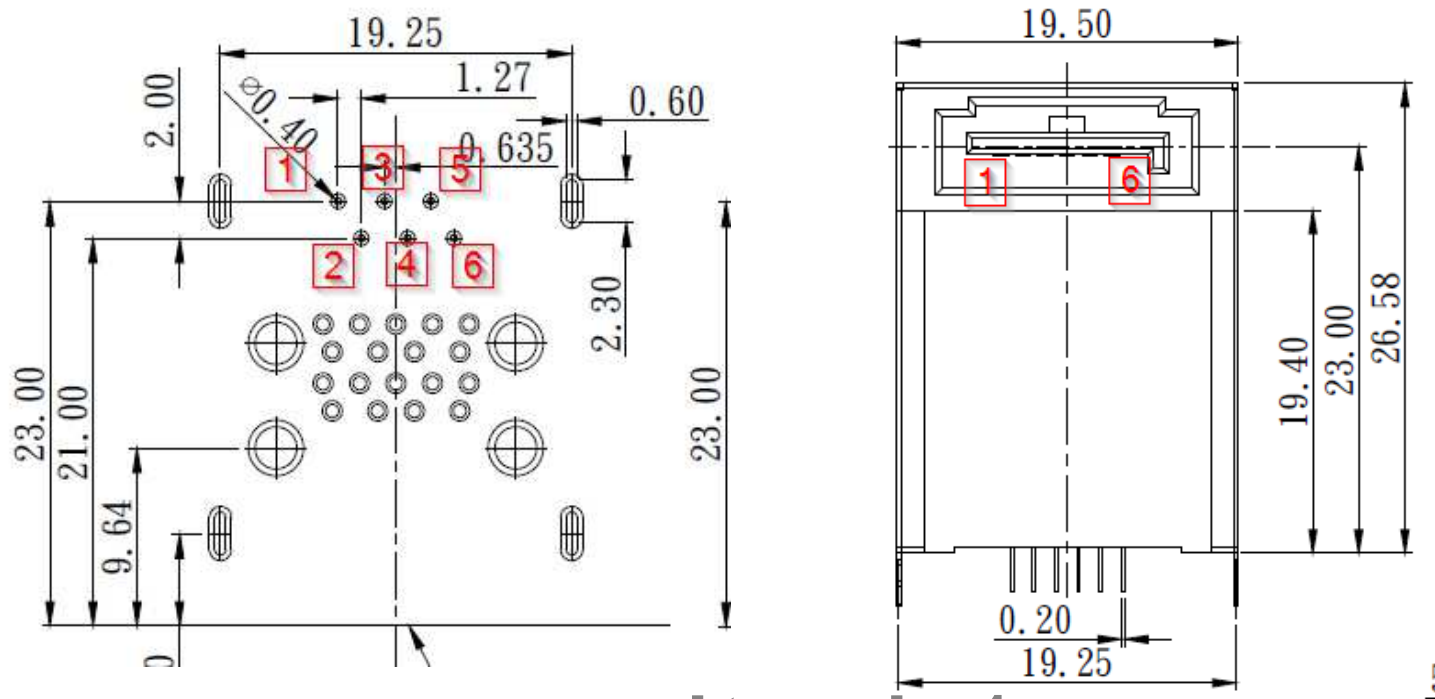




www.aitech1.ru

<b>GIGABYTE™</b>		
Title <b>Gensys GL3523_1</b>		
Size C	Document Number <b>GA-Z270X-Ultra Gaming</b>	Rev <b>1.01</b>
Date: Tuesday, November 01, 2016	Sheet 61 of 76	1

REV:0.1



www.aitech1.ru

Rev 0.2

Gigabyte Technology

Title

Flex IO

Size  
A

Document Number

GA-Z270X-Ultra Gaming

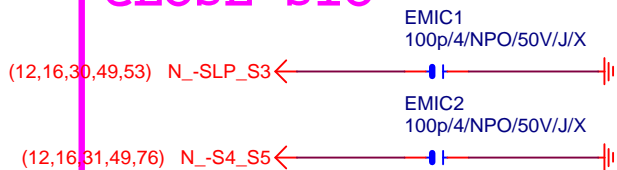
Rev

1.01

Date: Tuesday, November 01, 2016

Sheet 62 of 76

CLOSE SIO



CLOSE PCH



www.aitech1.ru

**GIGABYTE™**

Title

**EMI/ESD**

Size  
A

Document Number

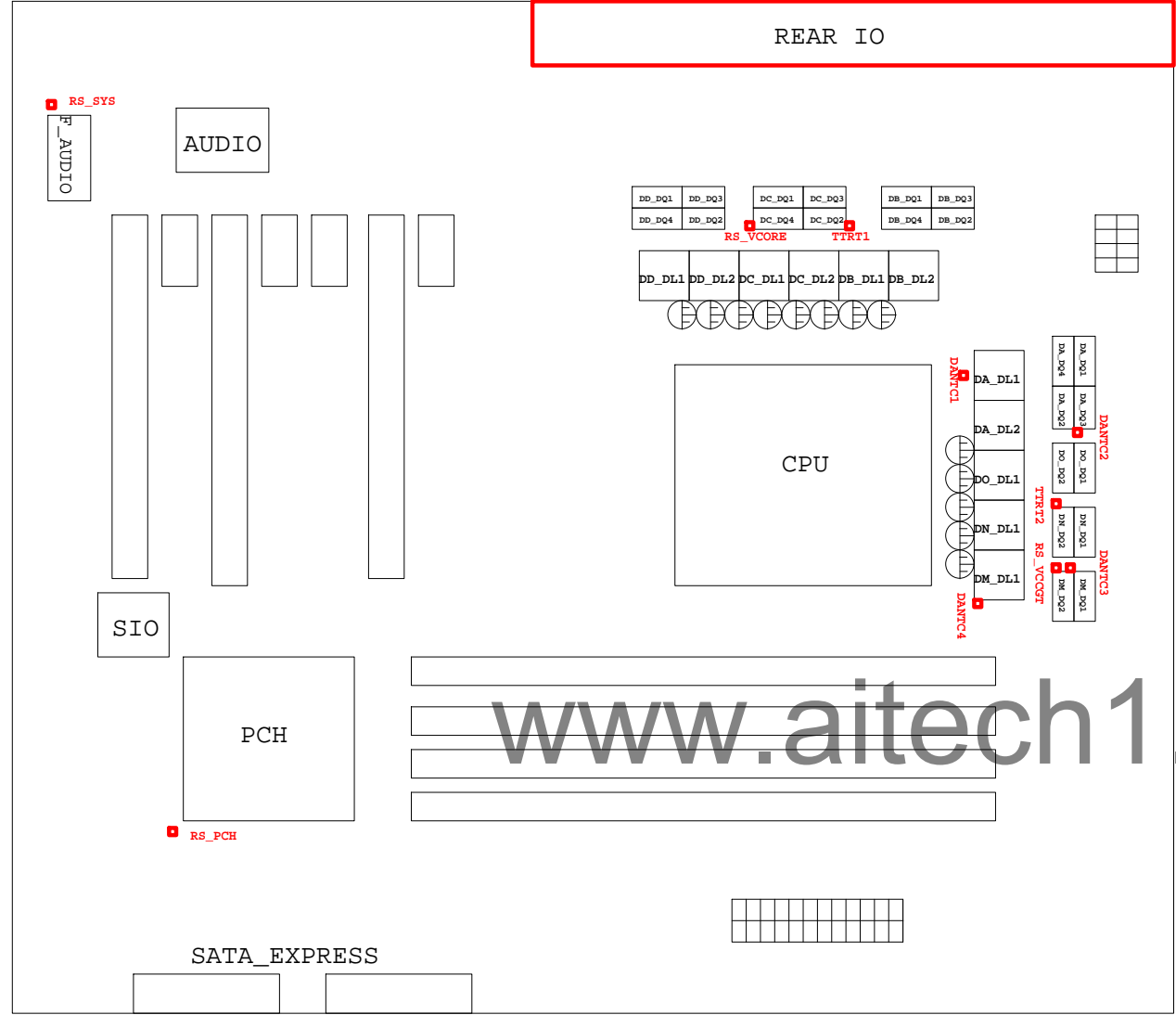
**GA-Z270X-Ultra Gaming**

Rev

**1.01**

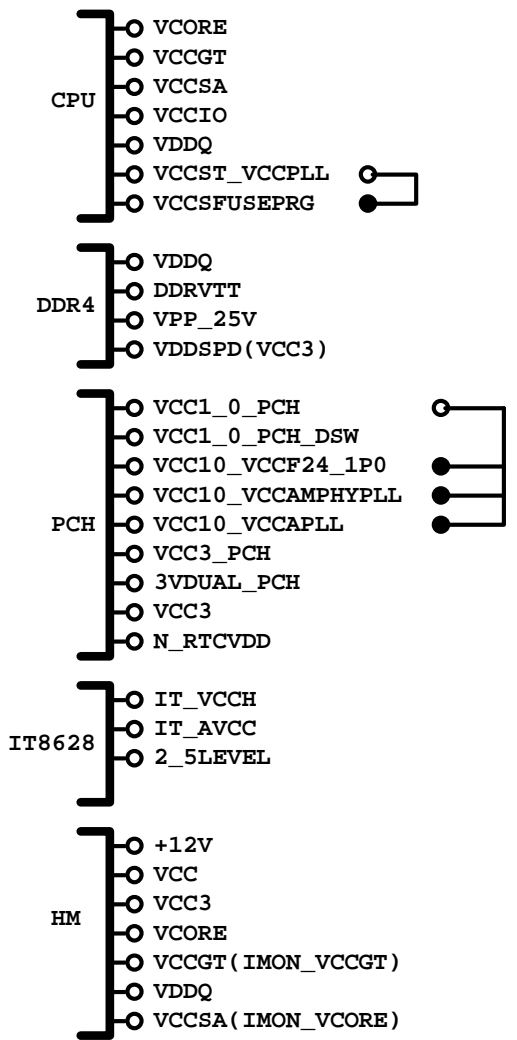
Date: Tuesday, November 01, 2016

Sheet 63 of 76

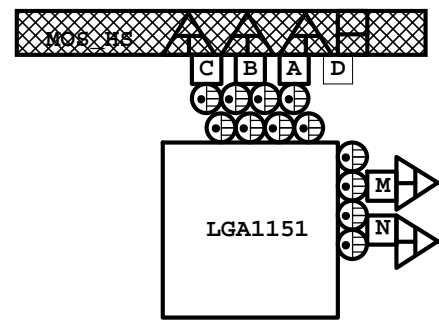
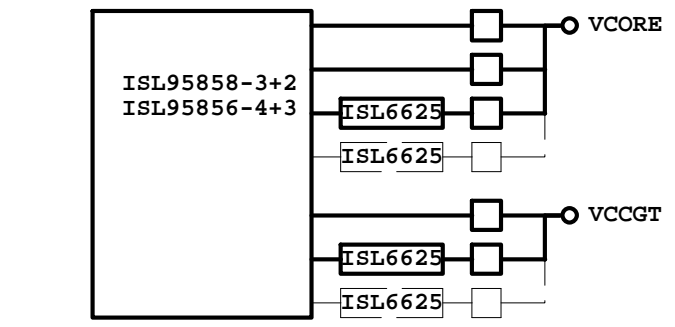


熱敏電阻	擺放靠近位置	走線方式
DANTC1	DA_DL2	Differential
DANTC2	DA_DQ3	Differential
DANTC3	DM_DQ2	Differential
DANTC4	DM_DL1	Differential
RS_VCORE	DC_DQ4	N/A
RS_VCCGT	DM_DQ2	N/A
TTRT1	DC_DQ2	N/A
TTRT2	DN_DQ2	N/A
RS_PCH	PCH	N/A
RS_SYS	F_AUDIO	N/A

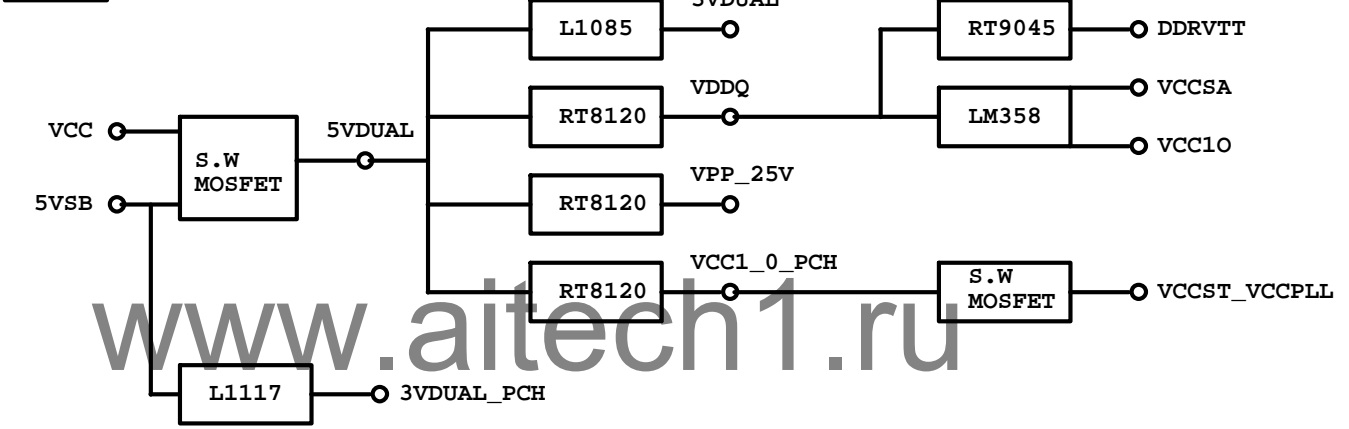
POWER BLOCK MAP



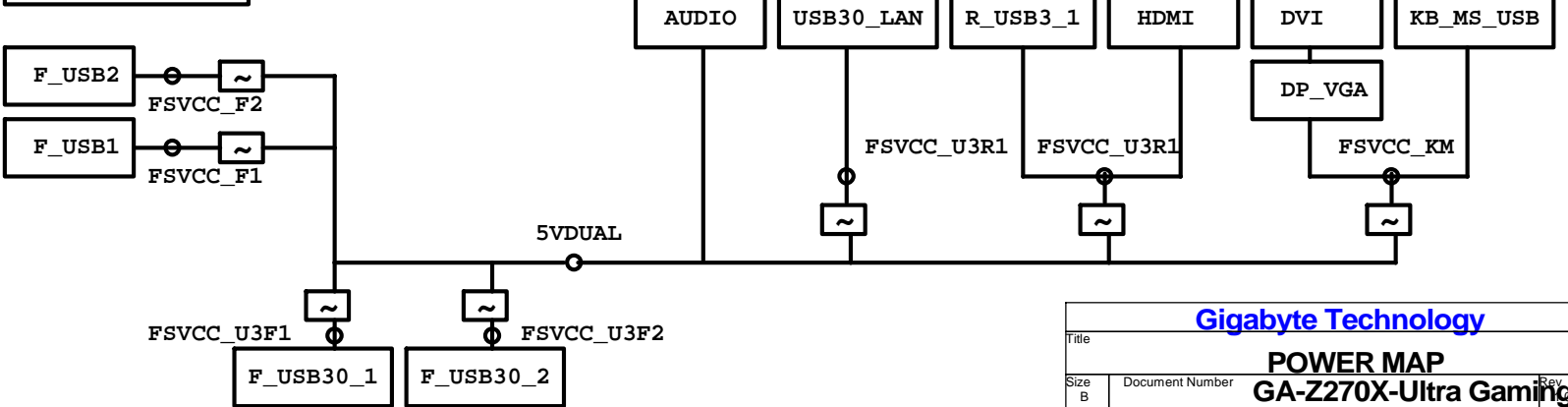
VCORE/VCCGT



POWER



FUSE POWER F/R



## 固態電容料號.請自行修改

日系黑色固態	Capture Value
11C02-C85600-01R	560u/FP/D/6.3V/68/C/8m
11C05-C82700-01R	270u/FP/D/16V/88/C/12m
11C05-C61000-01R	100u/OS/D/16V/66/C/30m
11C02-C51000-01R	100u/FP/D/6.3V/65/C/13m

日系一般固態	Capture Value
11C02-685600-01R	560u/FP/D/6.3V/68/8m
11C05-882700-01R	270u/FP/D/16V/88/12m
11C05-661000-03R	100u/OS/D/16V/66/30m
11C02-651000-02R	100u/OS/D/6.3V/66/30m

台系固態	Capture Value
11C02-661000-09R	100u/OS/D/6.3V/66/A/35m
11C05-691000-09R	100u/OS/D/16V/69/A/35m
11C05-8C2700-09R	270u/FP/D/16V/8C/A/10m
11C02-695600-09R	560u/FP/D/6.3V/69/A/11m

## IRON CHOKE

	料號	Capture Value	SIZE	Footprint	
DIP	11LC5-M4500C-01R	0.5uH/40A/IMD109/M/D	10*10	CHOKE05U-40A-1PQ-3	閃電P
DIP	11LC5-M4500C-11R	0.5uH/40A/IMD109/M/NP/D	10*10	CHOKE05U-40A-1PQ-3	無閃電P
DIP	11LC5-M2500C-01R	0.5uH/20A/IMD0809/M/D	8*8	CHOKE1U-R50M-IF	

Skylake Iron Choke閃電P導入機種如下:  
[1] Z170/H170 機種全部導入  
[2] B150/H110Gaming機種導入, 其餘不導入

## Ferrite

	料號	Capture Value	SIZE	Footprint
DIP	11LC5-F3500C-11R	0.5uH/32A/INCG109/FSI/D	10*10	CHOKE05U-40A-1PQ-3
DIP	11LC5-F2500C-11R	0.5uH/25A/INC0809/F/D	8*8	CHOKE1U-R50M-IF
SMD	10LC5-F4300C-01R	0.3uH/40A/SIUC/FR/S	10*7	CHOKE11X8MM-SMD

## BEAD

	料號	Capture Value	SIZE	Footprint
DIP	10LFB-15470A-01R	47/4030/15A/S	4*3	BEADC8B-BPH_SMD

## PWM料號

		料號	Capture Value	Footprint
PWM	ISL95856	10TA1-695856-01R		IC52QFN-6x6-G
PWM	ISL95858	10TA1-695858-01R		IC52QFN-6x6-G
PWM	IR35201	10TA1-635201-00R		IC56QFN-9VRS4339
PWM	IR3570	10TA1-603570-00R		IC40MLFP-ISL95835
PWM	RT8237C/D	10TA1-608237-01R		IC10DFN-NIS5132

## REGULATOR

		料號	Capture Value	Footprint
	NCT3103S	10GL2-203103-01R	NCT3103S/SOP8/2A	IC8-EP50IC

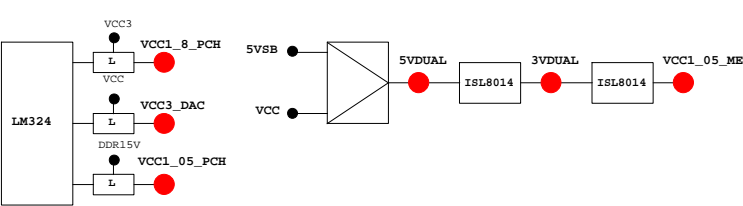
<b>GIGABYTE™</b>			
Title <b>RT8120_DDR4 POWER</b>			
Size Custom	Document Number <b>GA-Z270X-Ultra Gaming</b>		Rev <b>1.01</b>
Date:	Tuesday, November 01, 2016	Sheet 66 of 76	

PCH GPIO LIST TABLE					
PIN NAME	PWR	Default	USAGE	NOTE	
GP0	MAIN	H-Z	GPI	GPIO0	N/A
GP1/TACH1	MAIN		GPI	GPIO1	N/A
GP2/PIRQ#	MAIN		GPI	-PIRQE	P/U 8.2K VCC3
GP3/PIRQF#	MAIN		GPI	-PIRQF	P/U 8.2K VCC3
GP4/PIRQG#	MAIN		GPI	-PIRQG	P/U 8.2K VCC3
GP5/PIRQH#	MAIN		GPI	-PIRQH	P/U 8.2K VCC3
GP6/TACH2	MAIN		GPI	PCIEX1 Detect	P/U 8.2K VCC3
GP7/TACH3	MAIN		GPI	GPIO7	P/U 8.2K VCC3
GP8	STBY	H	GPI	GPIO8	N/A
GP9/OC5#	STBY		NATIVE	USB OC5#	N/A
GP10/OC6#	STBY		NATIVE	USB OC6#	N/A
GP11/SMBALERT#	STBY		NATIVE	USB PWR protect	P/U 8.2K 3VDUAL
GP12	STBY	L	GPI	GPIO12	N/A
GP13	STBY	L	GPI	LPCPME#	P/U 8.2K 3VDUAL
GP14/OC7#	STBY		NATIVE	USB OC7#	N/A
GP15	STBY	L	GPI	GPIO15(TLS Enable)	P/U 8.2K 3VDUAL
GP16	MAIN		GPI	GPIO16	P/U 8.2K VCC3
GP17/TACH0	MAIN		GPI	GPIO17	P/U 8.2K VCC3
GP18	MAIN		GPI	Mobile Only	N/A
GP19	MAIN		GPI	GPIO19	P/U 8.2K VCC3
GP20	MAIN		GPI	GPIO20	P/U 8.2K VCC3
GP21	MAIN		GPI	GPIO21	P/U 8.2K VCC3
GP22	MAIN	H-Z	GPI	GPIO22	P/U 8.2K VCC3
GP23	MAIN		GPI	GPIO23	N/A
GP24	STBY	L	GPI	SKTOCC#	N/A
GP25	STBY			Mobile Only	N/A
GP26	STBY			Mobile Only	N/A
GP27	STBY	H	GPO	GPIO27	P/U 8.2K 3VDUAL
GP28	STBY	H	GPO	PWR LED	P/U 8.2K 3VDUAL
GP29	STBY	L	GPI	GPIO29	N/A
GP30	STBY	H-Z	GPI	Mobile Only	N/A
GP31	STBY	H-Z	GPI	Mobile Only	N/A
GP32	MAIN	H	GPO	N/A	N/A
GP33	MAIN	H	GPO	N/A	N/A
GP34	MAIN	H-Z	GPI	-PCI_STOP	P/U 8.2K VCC3
GP35	MAIN	L	GPO	-ACZ_DET	P/U 8.2K VCC3
GP36	MAIN		GPI	N/A	N/A
GP37	MAIN		GPI	N/A	N/A
GP38	MAIN	H-Z	GPI	PCIEX4 Detect	P/U 8.2K VCC3
GP39	MAIN	H-Z	GPI	GPIO39	P/U 8.2K VCC3
GP40	STBY		NATIVE	USB OC1#	N/A
GP41	STBY		NATIVE	USB OC2#	N/A
GP42	STBY		NATIVE	USB OC3#	N/A
GP43	STBY		NATIVE	USB OC4#	N/A
GP44	STBY	L	NATIVE	GPIO44	P/U 8.2K 3VDUAL
GP45	STBY		NATIVE	GPIO45	P/U 8.2K 3VDUAL
GP46	STBY	L	NATIVE	GPIO46	P/U 8.2K 3VDUAL
GP47	STBY			Mobile Only	N/A
GP48	MAIN	H-Z	IN	GPIO48	P/U 8.2K 3VDUAL
GP49	MAIN	H-Z	IN	GPIO49	P/U 8.2K 3VDUAL
GP50	MAIN		NATIVE	-REQ1	P/U 2.2K VCC
GP51	MAIN	H	NATIVE	-GNT1	N/A
GP52	MAIN		NATIVE	-REQ2	P/U 2.2K VCC
GP53	MAIN	H	NATIVE	-GNT2	N/A
GP54	MAIN		NATIVE	-REQ3	P/U 2.2K VCC
GP55	MAIN	H	NATIVE	-GNT3	N/A
GP56	STBY		NATIVE	Mobile Only	N/A
GP57	STBY	H-Z	IN	VCORE_OV1	P/U 8.2K 3VDUAL
GP58	STBY	H-Z	NATIVE	F_USB_OC	P/U 8.2K 3VDUAL
GP59	STBY		NATIVE	USB_OC0#	N/A
GP60	STBY	H-Z	NATIVE	N/A(Reverse)	P/U 8.2K 3VDUAL
GP61	STBY	L	NATIVE	-SUSTAT	N/A
GP62	STBY	L	NATIVE	SUSCLK	N/A
GP63	STBY	L	NATIVE	GPIO63	N/A
GP64	MAIN	L	NATIVE	CLKOUTFLEX0	N/A
GP65	MAIN	L	NATIVE	CLKOUTFLEX1	N/A
GP66	MAIN	L	NATIVE	CLKOUTFLEX2	N/A
GP67	MAIN	L	NATIVE	CLKOUTFLEX3	N/A
GP72	STBY	H-Z	NATIVE	VCORE_OV4	P/U 8.2K 3VDUAL
GP73	STBY			Mobile Only	N/A
GP74	STBY	H-Z	NATIVE	1_05V_OV2	P/U 8.2K 3VDUAL
GP75	STBY	H-Z	NATIVE	N/A(Reverse)	P/U 8.2K 3VDUAL

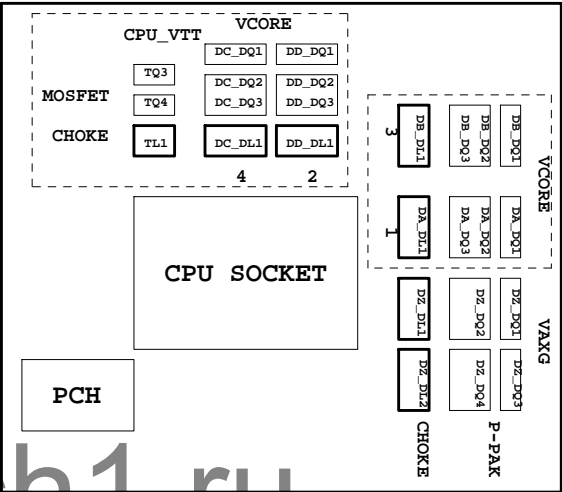
Super I/O ITE8720 GPIO Table

PIN NAME	USAGE	NOTE
SVC/PECI_RQT/GP14	-PECI_REQ	
PWROK1/GP13	PWROK1/ITE_PWROK	
KRST#/GP62	-KBRST	
SO/GP50	-ICH_SPI_CS	
IRTX/GP47/CE2_N/JP7	CEB_N	
GP46/IRRX	-LAN2_DSM	
PSION#/GP42	-PSON	
PWROK2#/GP41	PECI_CTL	
PCIRST3#/GP10/VDIMM_STR_EN	-PCI_E_RST	
RSMRST#CIRRXL/GP55	-RSMRST	
PME#/GP54	-LPCPME	
PD5/GP75/BUSS00	N/A	

PIN NAME	USAGE	NOTE
FAN_TAC2/GP52	FANIO2	
FAN_TAC3/GP37	FANIO3	
VIDO3/FAN_TAC4/GP25/DSR2#	FANIO4	
FAN_CTL2/GP51	FANPWM2	
FAN_CTL3/GP36	FANPWM3	
VID4/GP34	BEEP-	
VID3/GP33	TURBO1	
VID2/GP32	TURBO0	
VCORE_GOOD/VID6/GP63	CPUT_LED1_C	
VID5/GP35	CPUT_LED2_C	
VID1/GP31	CPUT_LED3_C	
VID0/GP30	-LAN1_DSM	NBT_LED1_C
SLCT/GP80	CPU_LED1_C	
PE/GP81	CPU_LED2_C	
BUSY/GP82	CPU_LED3_C	
PD3/GP73/BUSSI1	SB_LED1_C	
PD4/GP74/BUSSI2	SB_LED2_C	
VCORE_EN/VID7/GP64	IT_GP64	SB_LED3_C
PD0/GP70	NB_LED1_C	
PD1/GP71	NB_LED2_C	
PD2/GP72/BUSSI0	NB_LED3_C	
GP22/SCK	LOW_PWR_1	
VID05/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PWRST1	
PCIRST1#/GP12	-PWRST2	
3VBSBW#/GP40	CSI_F0	BSEL166_1
SUSC#/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CSISBSL	
VID00/GP20/CTS2#	CPUT_LED1_C	BSEL166_4
GP65/VDDA_EN/GB_01	MB_ID2	
PD6/GP76/BUSS01	MB_ID3	
PD7/GP77/BUSS02	MB_ID4	
AFD#/GP86/SMBC_R	SEC_PIN	FST_2X8
INIT#/GP85/SMBD_M	SEC_2x8	GTLREF_AD2
ACK#/GP83	DDR_LED1_C	
VID01/GP21/DCD2#	DDR_LED2_C	
STB#/GP87/SMBC_M	DDR_LED3_C	
PWRON#/GP44	VCORE_OV1	
PANSWH#/GP43	PWRBTSW	
KDAT/GP61	-PWRBTSW	
KCLK/GP60	KDAT	
MDAT/GP57	KCLK	
MACL/GP56	MDAT	
GP66/VLDT_EN/GB_02	NBT_LED1_C	MCLK
SVD/PCIRSTIN#/CIRTX/GP15	PWM2_CR	
KDAT/GP61	PWM2_CR	
GP67/CPU_PG/GB_03	EN_LOADLINE	IT_GP67/-EN_PWM2
SLIN#/GP84/SMBD_R	-EN_PWM2	
PSI_L/FAN_CLT5/CIRRXL/GP16	-THERM	
VID04/GP26/SOUT2	DDR18V_PH2_EN	
VID02/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VID06/GP17/RI2#	1_1V_PH_EN	
VID07/JP6/DTR2#	JP6	
PD5/GP75/BUSS00	SB_LED3_C	



PWM各相位的擺法如下：



BIOS超電壓對應表：

線路圖名稱	BIOS選項
Vcore	CPU Vcore
CPU_VTT	CPU Termination
CPU_VAXG	CPU Graphic Core
VCC1_8_PCH	CPU PLL
VCC1_05_PCH	PCH core
3VDUAL	3VDUAL
DDR15V	DRAM voltage
DDRVTT	DRAM Terminatio
VREF_CA_A/VREF_CA_B	DRAM Address Ref
VREF_DQ_A/VREF_DQ_B	DRAM Data Ref

散熱模組料號：

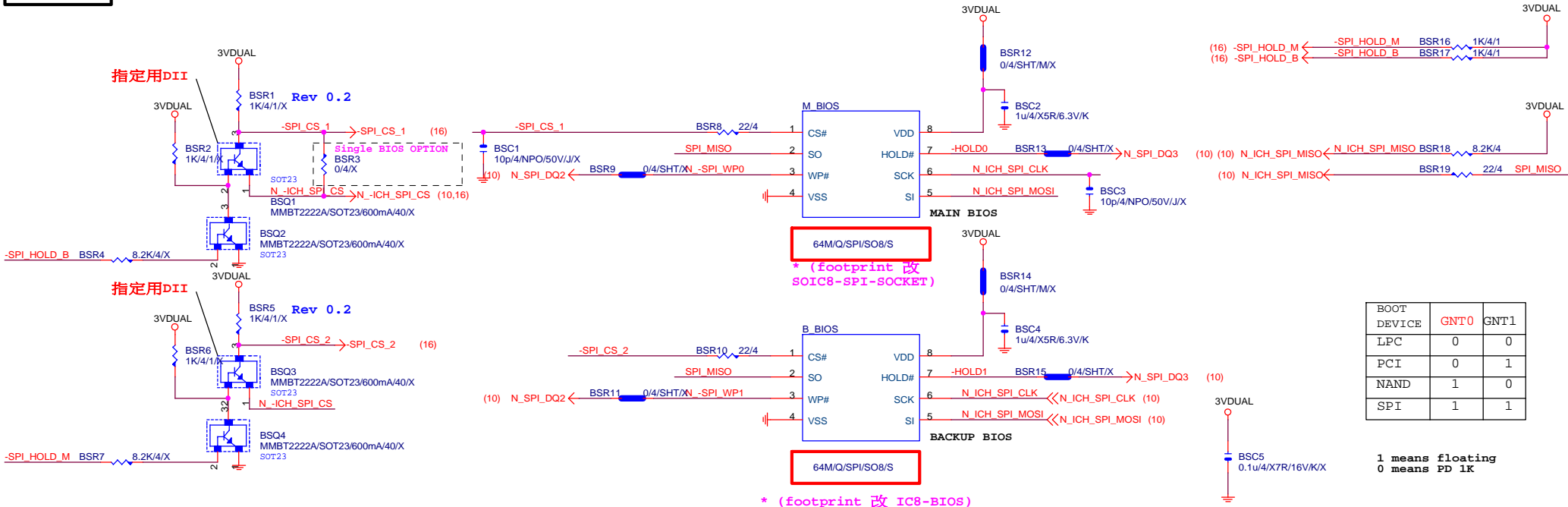
Z77-D3H :  
PCH :  
12SP2-S05511-01R/02R/03R  
MOSFET :  
12SP2-S08924-01R/02R/03R

	3 pin FAN control	4 pin FAN control	FAN speed	Controller
CPU FAN	FANPWM1	FANPWM3	FANIO1	IT8720
	ICH_FAN_PWM2	ICH_FAN_PWM0	ICH_FAN_TACH0	PCH
SYS FAN	FANPWM2	N/A	FANIO2	IT8720
	ICH_FAN_PWM1	N/A	ICH_FAN_TACH1	PCH
PWR FAN	N/A	N/A	FANIO3	IT8720
			ICH_FAN_TACH2	PCH

# DUAL BIOS

# MOSI For DMI RX Termination Voltage

指定用DII



BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

1 means floating  
0 means PD 1K

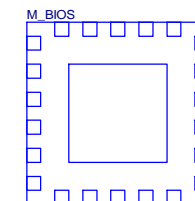
www.aitech1.ru

BIOS\_SW

BIOS_SW	
1	MAIN_BIOS
2	BACKUP_BIOS

SB:Single BIOS

Disable
Enable



LCP/G-FL/1.27mm/200MIL/WHITE(10SL2-000008-31R)X

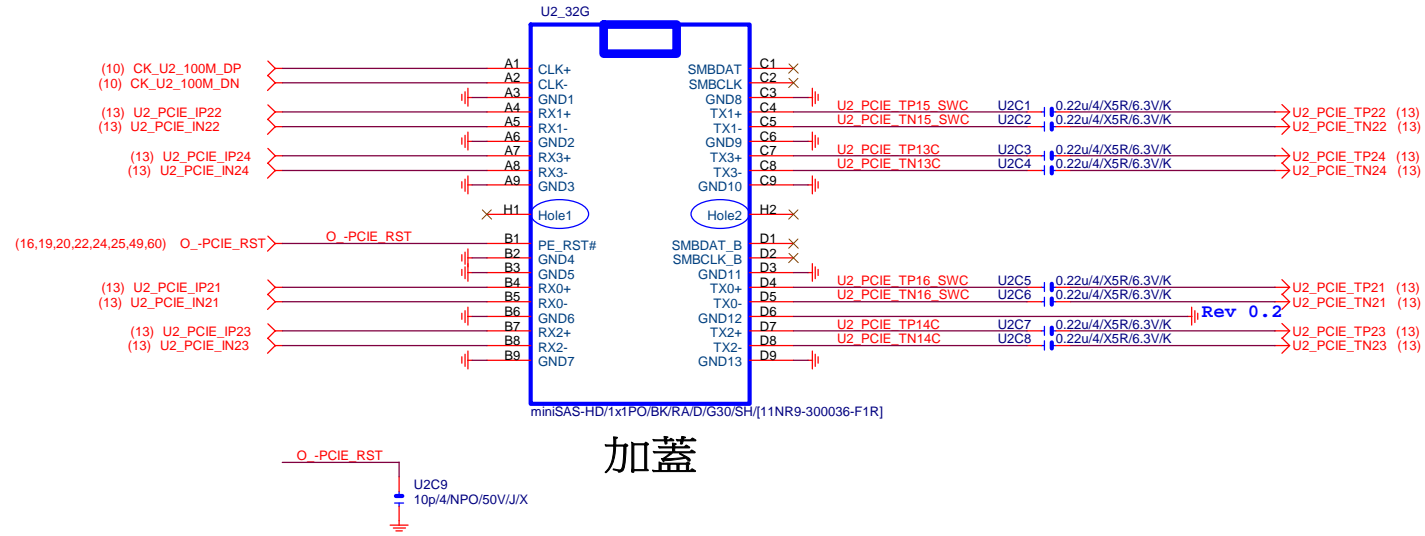
\* 試産先上, PVT 移除

Gigabyte Technology

Title	BIOS
Size	Custom
Document Number	GA-Z270X-Ultra Gaming
Date:	Tuesday, November 01, 2016
Sheet	68 of 76



Rev 0.3



www.aitech1.ru

**GIGABYTE™**

Title		
M.2 to MINISAS		
Size	Document Number	Rev
B	GA-Z270X-Ultra Gaming	1.01
Date:	Tuesday, November 01, 2016	Sheet 69 of 76

www.aitech1.ru

GIGABYTE			
Title			
PCH PWR-VCC18_PCH			
Size	Document Number		Rev
A	GA-Z270X-Ultra Gaming		1.01
Date:	Tuesday, November 01, 2016	Sheet	70 of 76

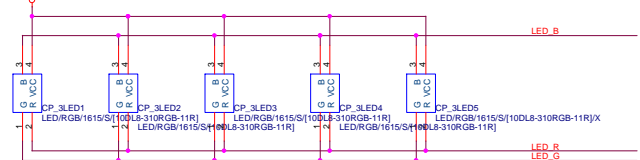
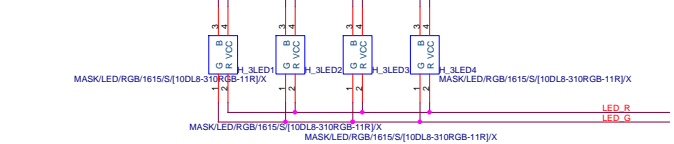
www.aitech1.ru

Title			
5FAN			
Size	Document Number		Rev
Custom	GA-Z270X-Ultra Gaming		1.01
Date:	Tuesday, November 01, 2016	Sheet 71 of 76	

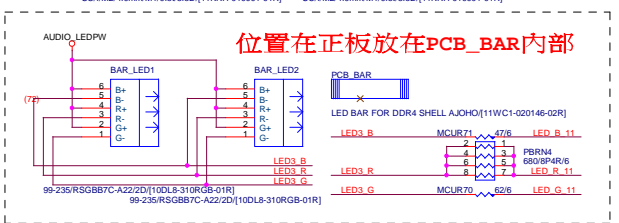
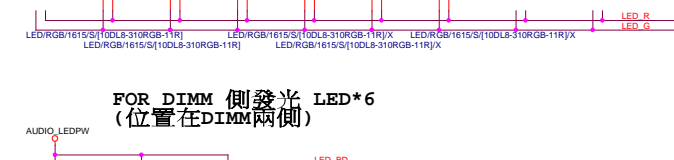
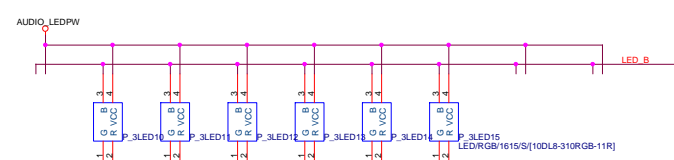
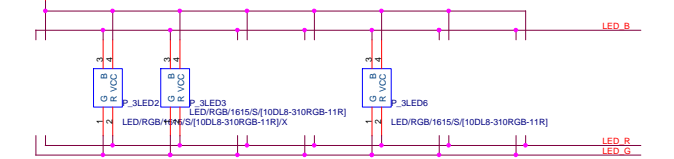


FOR PCH 正發光 LED\*4 (位置在正板,依據PCH\_HS設計擺放)

FOR CPU 正發光 LED\*5 (在CPU CHOK之間,MOS\_HS下方,不外露)

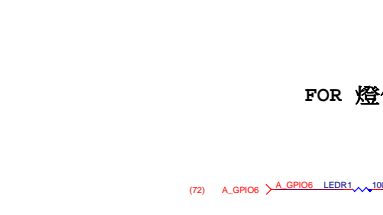
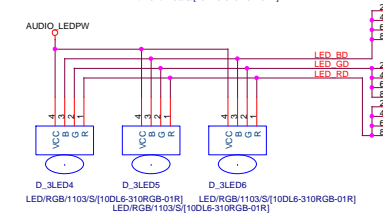
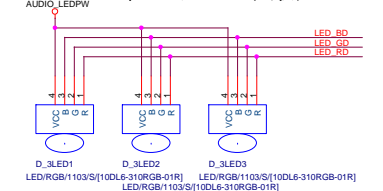


FOR PCB 正發光 LED\*16 (位置在PCB下方背板邊條)

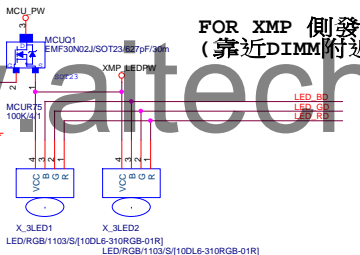


位置在正板放在PCB\_BAR內部

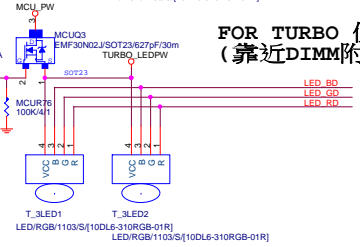
FOR DIMM 側發光 LED\*6 (位置在DIMM兩側)



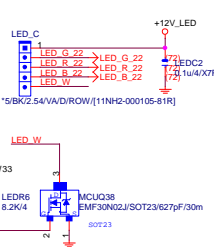
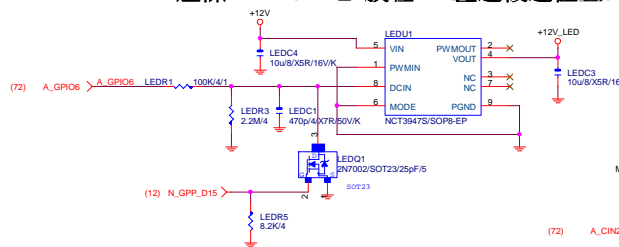
FOR XMP 側發光 LED\*2 (靠近DIMM附近放背板鏤空)



FOR TURBO 側發光 LED\*2 (靠近DIMM附近背板鏤空)



FOR 燈條 LED (LED\_C放在PCB左邊板邊位置)

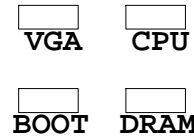


DDR燈條\*3

## RGB LED LAYOUT 注意事項：

1. Debug LED 文字面表示如右所示 (LED請擺在一起)
2. 背板 RGB LED 方向整板請統一如下  
(整板正極可統一朝下或朝上)
3. 正板 RGB LED 統一方向即可
4. LED RGB 10PCS 以上走20mils  
LED RGB 10PCS 以下空間問題可以走10mils  
LED電源一律走20mils
5. MCU LED 出pin的走線4mils,如:LED\_R\_1,LED\_G\_1,LED\_B\_1 .....  
過晶體的走線20mils,包含過排組到LED的走線如:LED\_R\_11,LED\_G\_11,LED\_B\_11..
6. XMP/TURBO/G1.GAMING 側發光 LED 位置如下

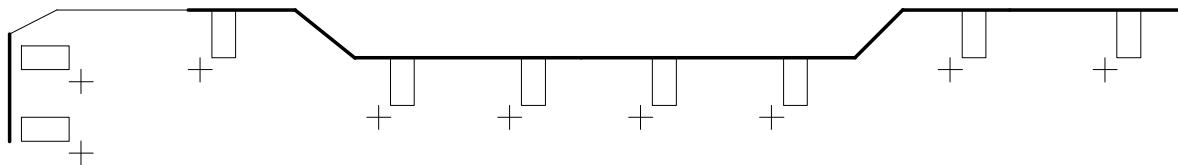
Debug LED 文字面 (單色LED)



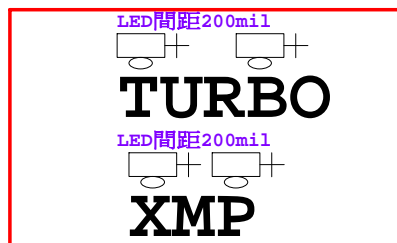
PCB板邊透光model name鏤空+背面 RGB LED



Audio Ground切割線+背面 RGB LED



"Turbo", "XMP"字樣(分開控制) 鏤空+背面 RGB側發光 LED

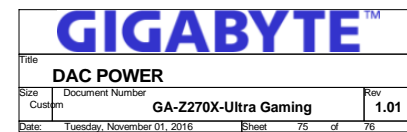


GIGABYTE™		
MODEL/PCB LED		
Size	Document Number	Rev
Custom	GA-Z270X-Ultra Gaming	1.01
Date:	Tuesday, November 01, 2016	Sheet 74 of 76

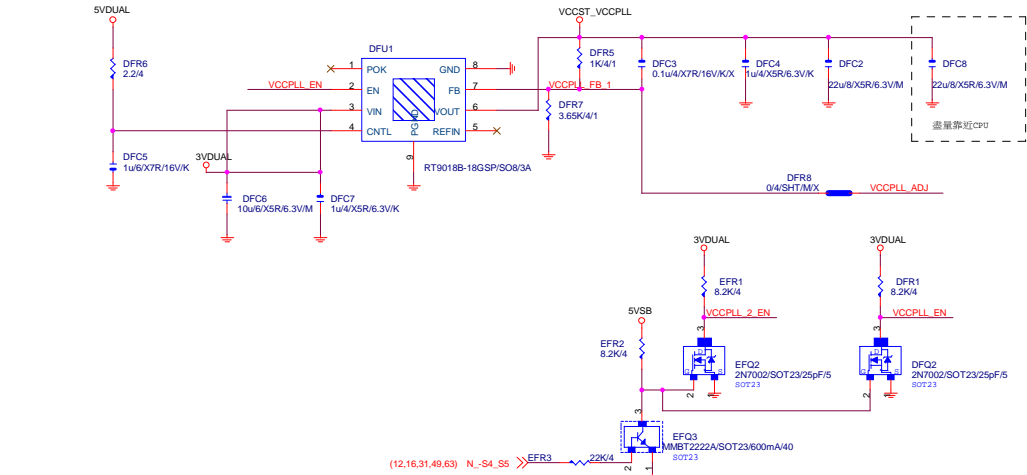
F\_USB30\_1

F\_USB30\_2

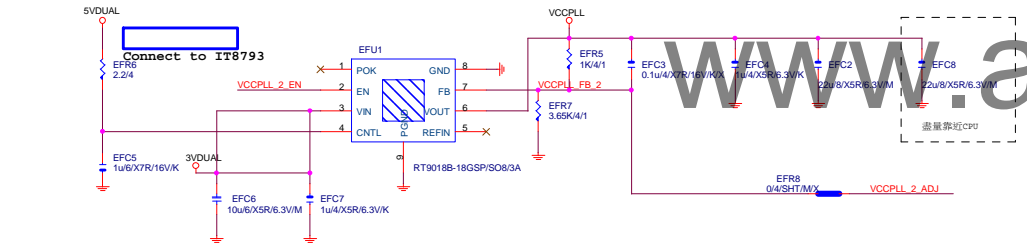
KB\_MS\_USB0



VCCST\_VCCPLL 替換原先MOS開關線路



VCCPLL



VCCPLL\_OC

