

Model Name: GA-H81M-S2PV

Revision 1.02

SHEET

TITLE

01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B
06	CPU_LGA1150-C
07	DDR III CHANNEL A
08	DDR III CHANNEL B
09	PCH_FDI,DMI,USB,PCIE,NVRAM
10	PCH_DP,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCI EXPRESS X1 SLOT
16	PCI SLOT 1,2
17	ITE 8620 LPC IO
18	COM,LPT,KB_MS
19	HWM,FAN CTRL,OV,-PROCHOT
20	DUAL BIOS
21	R_USB30,FP,FUSB,SPK,SATALED
22	Realtek ALC887-VD2
23	REAR AUDIO JACK
24	REALTEK RTL8111F
25	DISCRETE POWER
26	ATX
27	VCORE ISL95812_1

SHEET

TITLE

28	VCORE ISL95812_2
29	RT8120_DDR POWER
31	DVI
32	IT8892E

Gigabyte Technology

Cover Sheet

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Revision 1.02

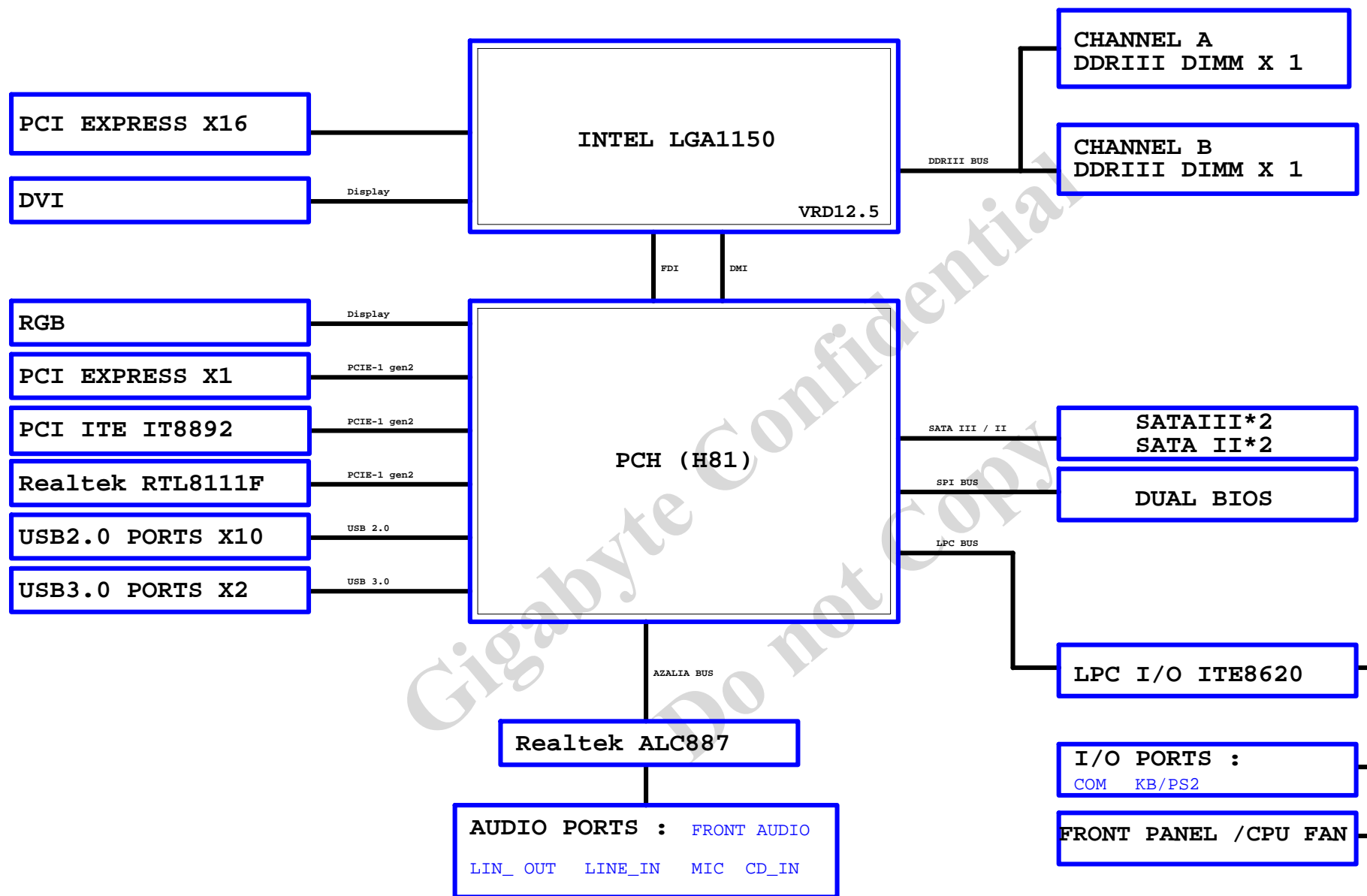
Circuit or PCB layout change

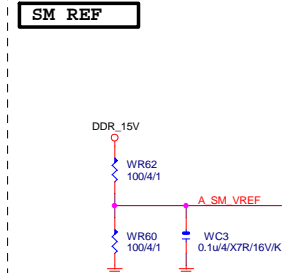
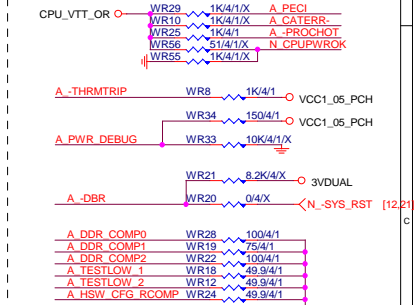
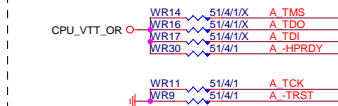
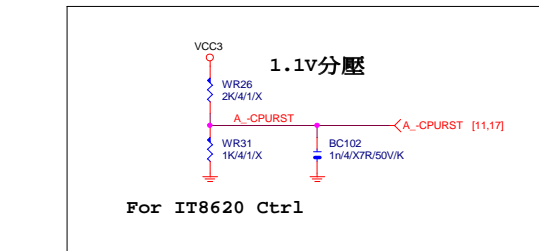
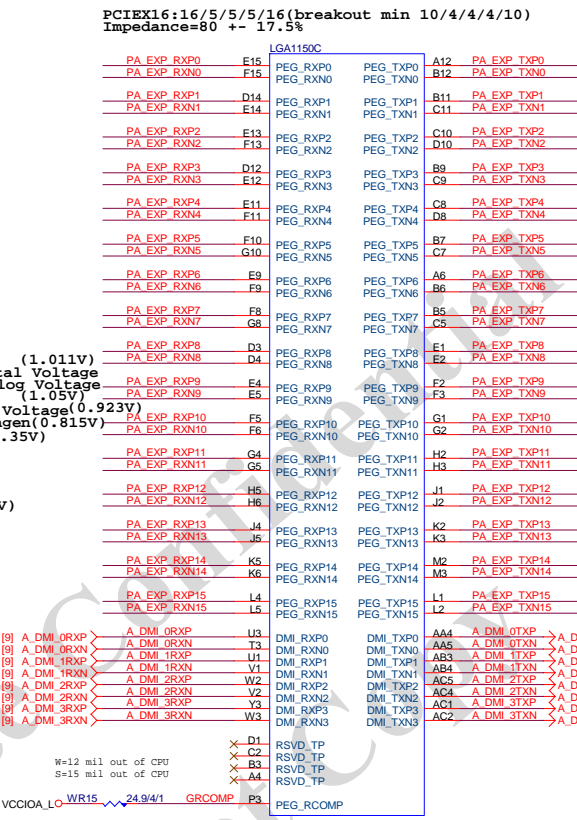
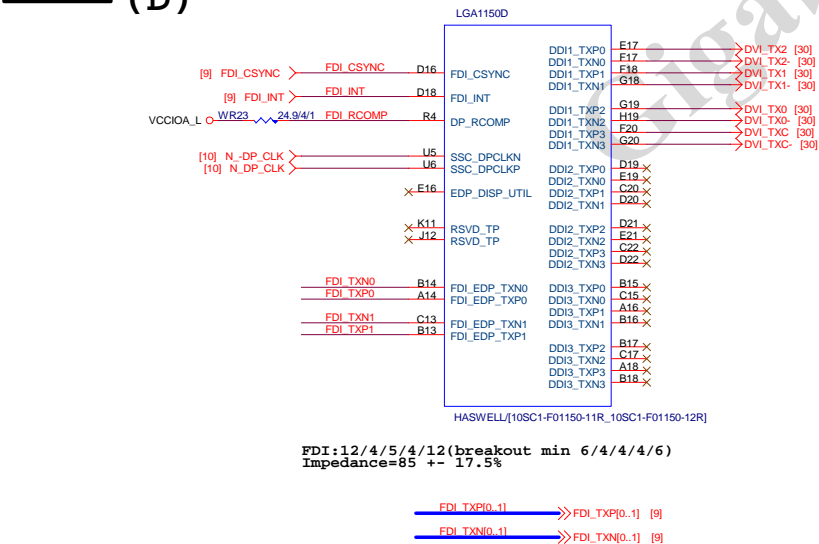
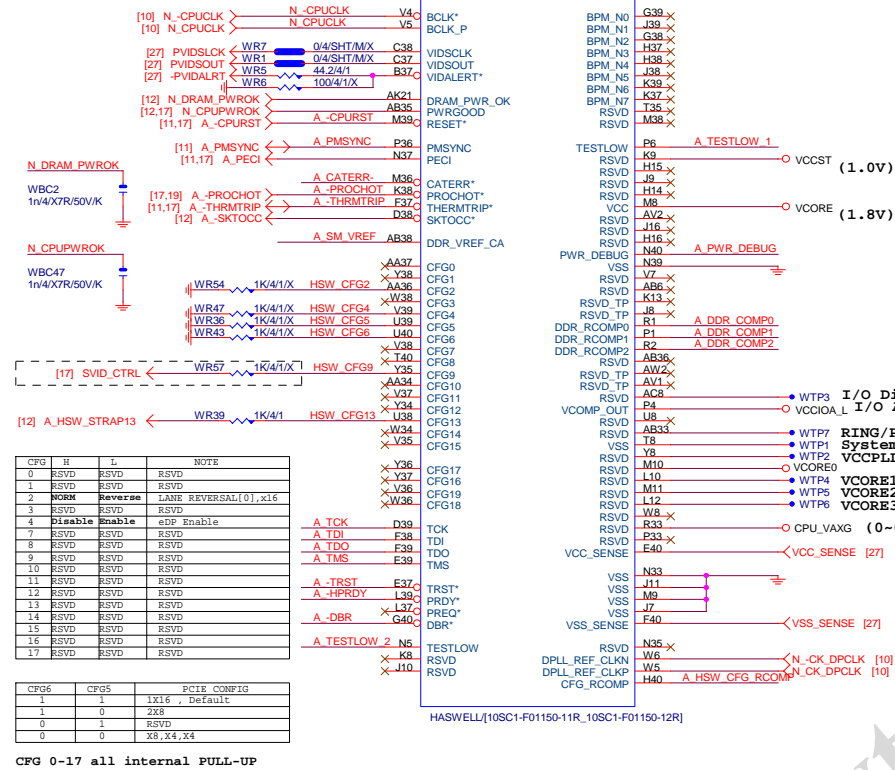
Component value change history

2013/11/04

[illegible][illegible]

BLOCK DIAGRAM





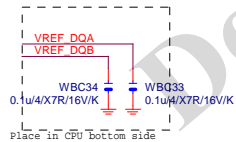
LGA1150 (A)

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MAAA0	AU13	DDR0_MA1	DDR0_D01	AD39	MDA1
MAAA1	AV16	DDR0_MA2	DDR0_D02	AF38	MDA2
MAAA2	AU16	DDR0_MA3	DDR0_D03	AF39	MDA3
MAAA3	AW17	DDR0_MA4	DDR0_D04	AD37	MDA4
MAAA4	AW18	DDR0_MA5	DDR0_D05	AD40	MDA5
MAAA5	AW17	DDR0_MA6	DDR0_D06	AE37	MDA6
MAAA6	AT18	DDR0_MA7	DDR0_D07	AF40	MDA7
MAAA7	AU18	DDR0_MA8	DDR0_D08	AH40	MDA9
MAAA8	AT19	DDR0_MA9	DDR0_D09	AH39	MDA10
MAAA9	AW11	DDR0_MA10	DDR0_D10	AK38	MDA10
MAAA10	AW19	DDR0_MA11	DDR0_D11	AK39	MDA11
MAAA11	AU19	DDR0_MA12	DDR0_D12	AH37	MDA12
MAAA12	AY10	DDR0_MA13	DDR0_D13	AH38	MDA12
MAAA13	AT20	DDR0_MA14	DDR0_D14	AK37	MDA14
MAAA14	AU21	DDR0_MA15	DDR0_D15	AK40	MDA15
MAAA15			DDR0_D16	AM40	MDA17
MODT_A0	AW10	DDR0_ODT0	DDR0_D17	AM39	MDA21
MODT_A1	AY8	DDR0_ODT1	DDR0_D18	AP38	MDA18
	AW9	DDR0_ODT2	DDR0_D19	AP39	MDA19
	AW8	DDR0_ODT3	DDR0_D20	AM37	MDA20
			DDR0_D21	AM38	MDA16
			DDR0_D22	AP37	MDA22
			DDR0_D23	AP40	MDA23
			DDR0_D24	AW37	MDA28
			DDR0_D25	AU35	MDA26
			DDR0_D26	AU35	MDA27
			DDR0_D27	AT37	MDA28
			DDR0_D28	AU37	MDA24
			DDR0_D29	AT35	MDA30
			DDR0_D30	AW35	MDA31
			DDR0_D31	AY6	MDA33
			DDR0_D32	AU6	MDA37
			DDR0_D33	AW6	MDA36
			DDR0_D34	AW4	MDA38
			DDR0_D35	AW4	MDA39
			DDR0_D36	AR1	MDA41
			DDR0_D37	AR4	MDA45
			DDR0_D38	AN3	MDA42
			DDR0_D39	AN4	MDA43
			DDR0_D40	AR2	MDA44
			DDR0_D41	AR3	MDA40
			DDR0_D42	AN2	MDA46
			DDR0_D43	AN1	MDA47
			DDR0_D44	AL1	MDA49
			DDR0_D45	AL4	MDA53
			DDR0_D46	AL4	MDA50
			DDR0_D47	AJ4	MDA51
			DDR0_D48	AL2	MDA52
			DDR0_D49	AJ2	MDA48
			DDR0_D50	AJ2	MDA54
			DDR0_D51	AJ1	MDA55
			DDR0_D52	AG1	MDA57
			DDR0_D53	AG4	MDA61
			DDR0_D54	AE3	MDA58
			DDR0_D55	E4	MDA59
			DDR0_D56	AG2	MDA60
			DDR0_D57	AG3	MDA56
			DDR0_D58	AE2	MDA62
			DDR0_D59	AE1	MDA63
			DDR0_D60	AE39	DQSA0
			DDR0_D61	AJ39	DQSA1
			DDR0_D62	AN39	DQSA2
			DDR0_D63	AV36	DQSA3
			DDR0_D64	AV5	DQSA4
			DDR0_D65	AP3	DQSA5
			DDR0_D66	AK3	DQSA6
			DDR0_D67	AF3	DQSA7
			DDR0_D68	AV32	DQSA7
			DDR0_D69	AE38	DQSA0
			DDR0_D70	AJ38	DQSA1
			DDR0_D71	AN38	DQSA2
			DDR0_D72	AJ36	DQSA3
			DDR0_D73	AW5	DQSA4
			DDR0_D74	AP2	DQSA5
			DDR0_D75	AK2	DQSA6
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HASWELL[10SC1-F01150-11R_10SC1-F01150-12R]

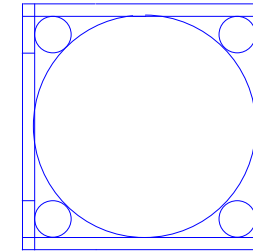
LGA1150 (B)

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MAAB1	AK23	DDR1_MA2	AG35	MD82
MAAB2	AM22	DDR1_MA3	AH35	MD83
MAAB3	AM23	DDR1_MA4	AD34	MD84
MAAB4	AP23	DDR1_MA5	AD35	MD85
MAAB5	AL23	DDR1_MA6	AG34	MD86
MAAB6	AY24	DDR1_MA7	AH34	MD87
MAAB7	AV25	DDR1_MA8	AL34	MD88
MAAB8	AU26	DDR1_MA9	AL35	MD89
MAAB9	AW25	DDR1_MA10	AL31	MD810
MAABA0	AP18	DDR1_MA11	AK31	MD811
MAABA1	AY25	DDR1_MA12	AK34	MD812
MAABA2	AV26	DDR1_MA13	AK35	MD813
MAABA3	AR15	DDR1_MA14	AK32	MD814
MAABA4	AV27	DDR1_MA15	AL32	MD815
MAABA5	AY28			
MODT_B0	AM17	DDR1_ODT0	AP34	MD817
MODT_B1	AL16	DDR1_ODT1	AN31	MD819
	AM16	DDR1_ODT2	AP31	MD823
	AK15	DDR1_ODT3	AP35	MD820
			AP35	MD816
			AN32	MD818
			AP32	MD822
			AM29	MD825
			AP28	MD828
			AR29	MD827
			AR28	MD830
			AL23	MD834
			AR28	MD829
			AP29	MD826
			AP28	MD831
			AR12	MD832
			AP12	MD833
			AL13	MD834
			AL12	MD835
			AR13	MD836
			AP13	MD837
			AM13	MD838
			AM12	MD839
			AR9	MD845
			AP9	MD841
			AR6	MD847
			AP6	MD843
			AR10	MD844
			AP10	MD840
			AR7	MD846
			AP7	MD842
			AM9	MD852
			AL9	MD853
			AL6	MD850
			AL7	MD855
			AM10	MD848
			AL10	MD849
			AM6	MD854
			AM7	MD851
			AH6	MD861
			AH7	MD860
			AE6	MD859
			AE7	MD863
			AJ6	MD856
			AJ7	MD857
			AG6	MD858
			AF7	MD862
			AF35	DQSB0
			AL33	DQSB1
			AN28	DQSB2
			AN28	DQSB3
			AN12	DQSB4
			AP8	DQSB5
			AL8	DQSB6
			AG7	DQSB7
			AN25	
			AE34	DQSB0
			AK33	DQSB1
			AN33	DQSB2
			AN29	DQSB3
			AN13	DQSB4
			AR8	DQSB5
			AM8	DQSB6
			AG6	DQSB7
			AN26	



HASWELL[10SC1-F01150-11R_10SC1-F01150-12R]

LGA1150 (CR)

CR
CPU RETENTION/X

LGA1150_P



ILM_BP/1156/CSP/ILM_BP/1156/CSP/[12KRC-0F0001-52R_12KRC-0F0001-51R]

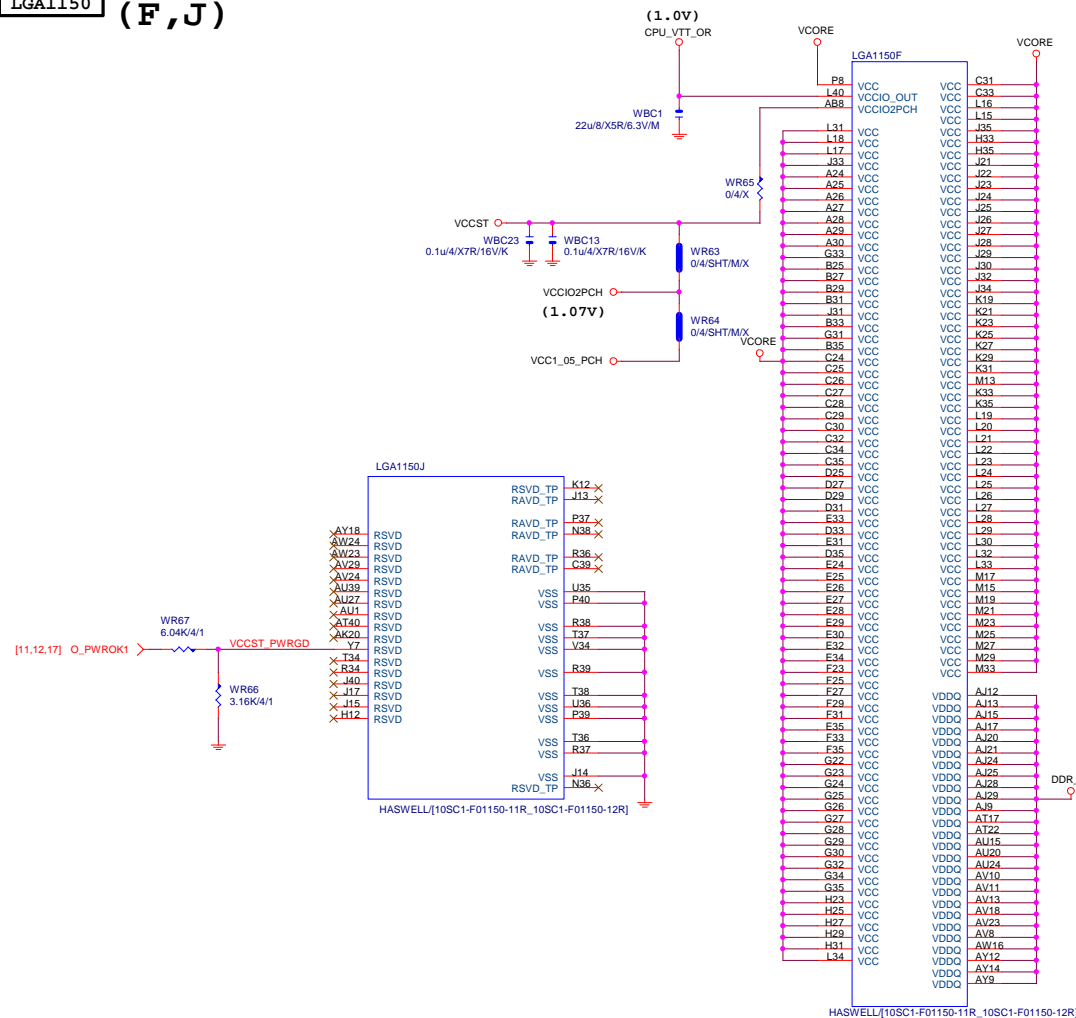
DDR BUS

[7] MODT_A[0..1]	MODT_A0..1
[8] MODT_B[0..1]	MODT_B0..1
[7] MDA[0..63]	MDA0..63
[8] MDB[0..63]	MDB0..63
[7] DQSA[0..7]	DQSA0..7
[7] DQSA[0..7]	DQSA0..7
[7] MAA[0..15]	MAA0..15
[8] MAB[0..15]	MAB0..15
[8] DQSB[0..7]	DQSB0..7
[8] DQSB[0..7]	DQSB0..7

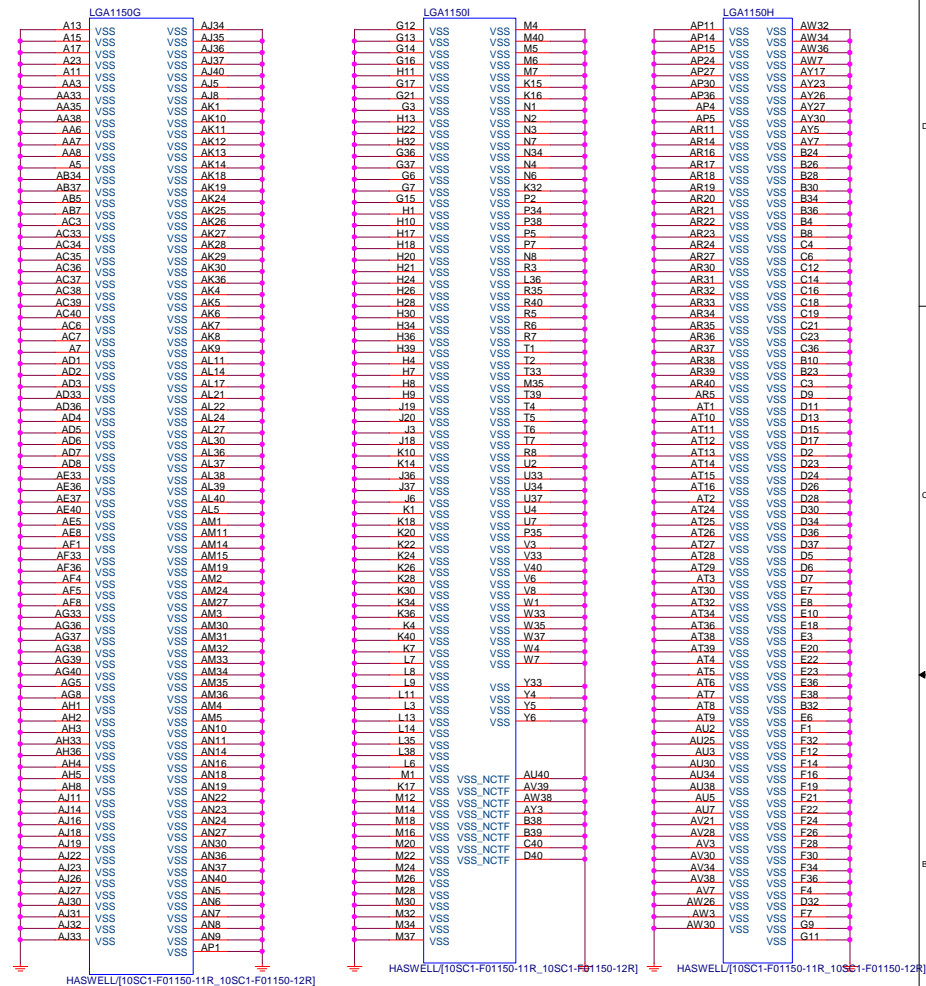
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Title			CPU LGA1150-B
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LGA1150 (F, J)

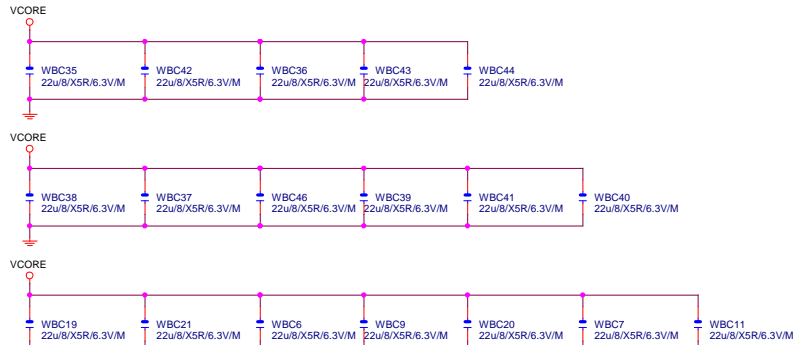


LGA1155 (G,H,I)



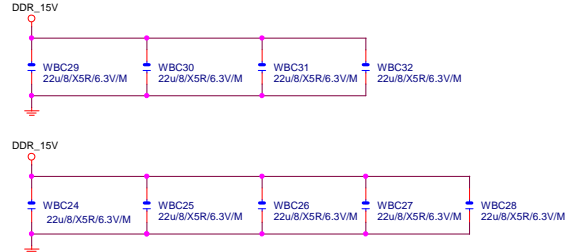
VCore CAP

(X18)



DDR CAP

(x9)



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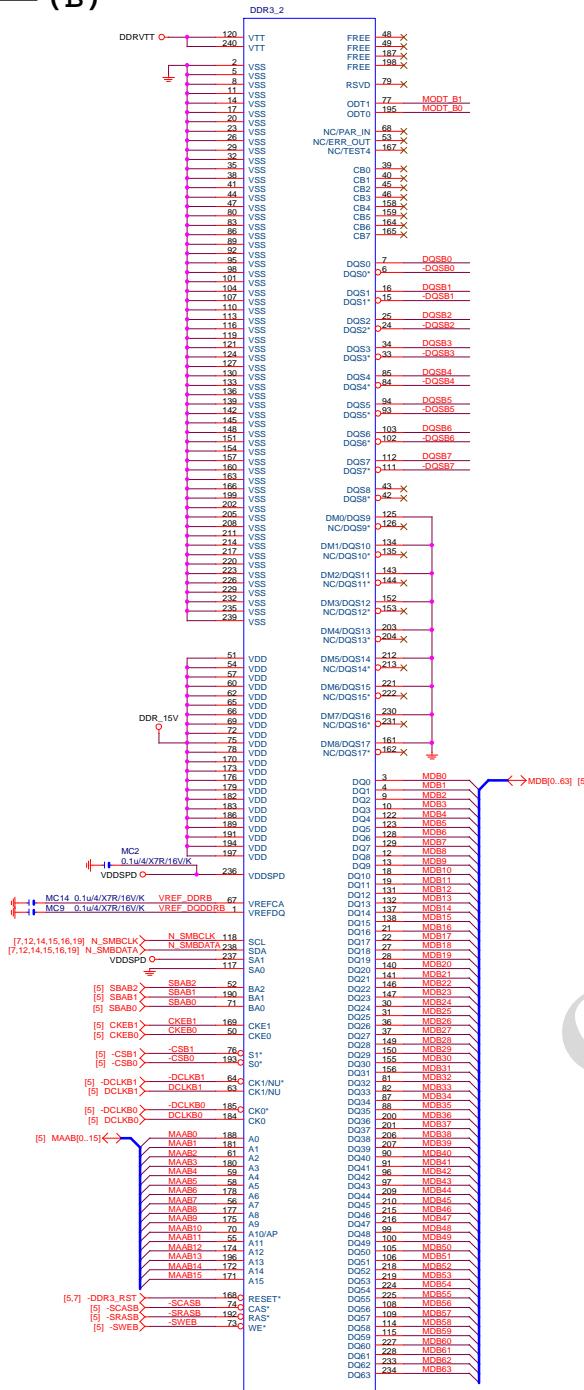
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Size	Document Number	GA-H81M-S2PV	Rev
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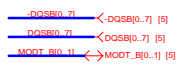
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DDR3

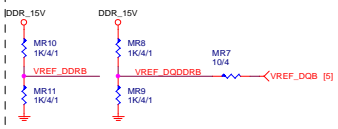
(B)



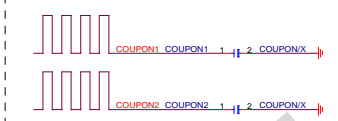
DDR3_240/BK/VA/D
BLACK CONNECTOR



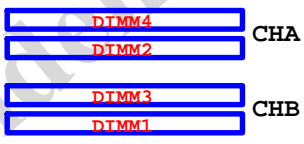
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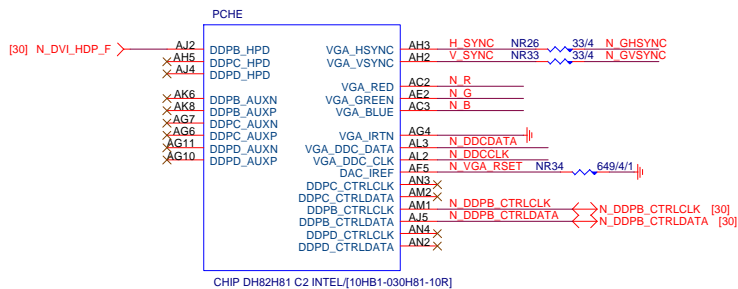
COUPON



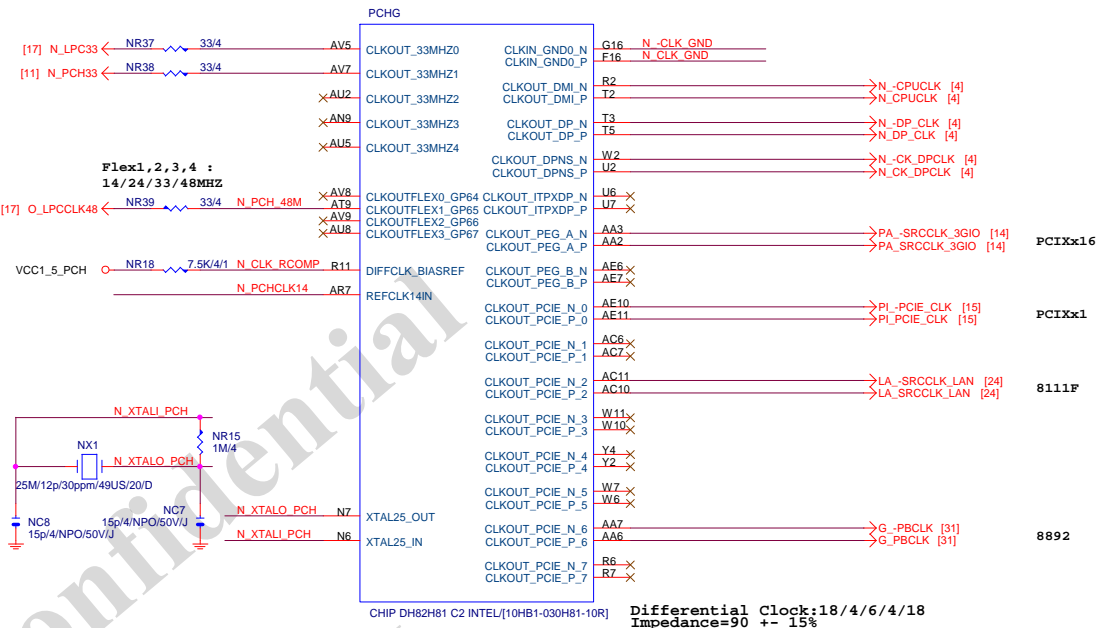
CPU



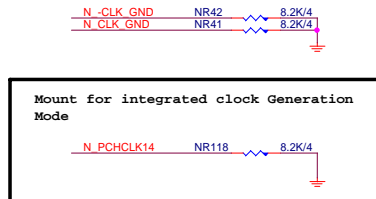
PCH (E)



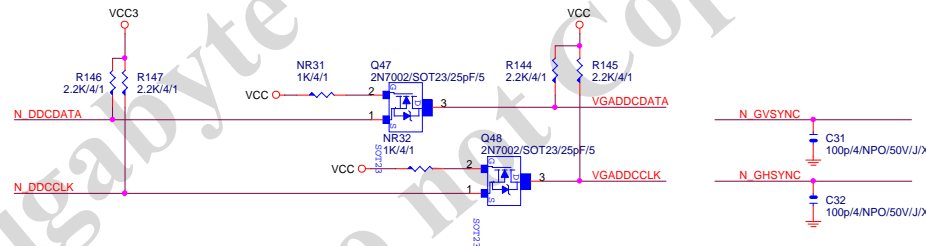
PCH (G)



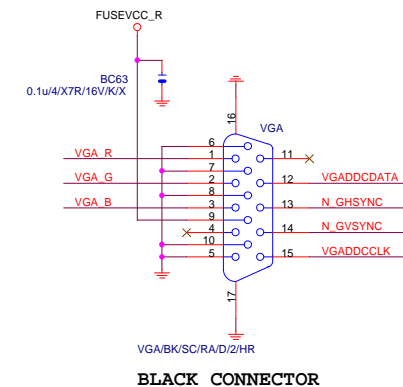
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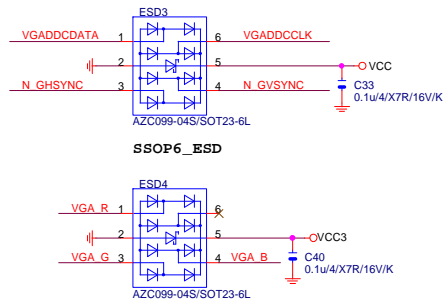
VGA DDC



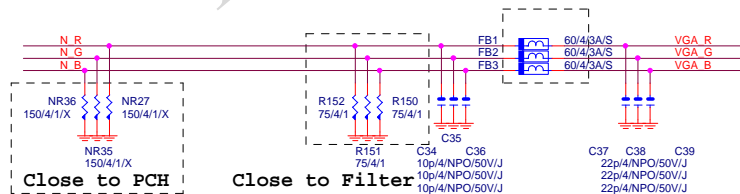
VGA CONNECTOR



VGA ESD



VGA DDC



Gigabyte Technology		
Title		
PCH DISPLAY, CLK BUFFER		
Size		
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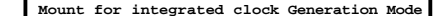
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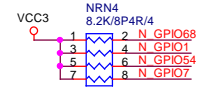
SATA CONNECTOR



(A)



PCH	PU/PD
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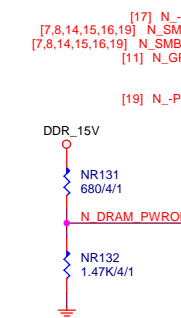
GPIO38 Ctrl



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Title			
PCH HOST , SATA, PCI			
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(D)



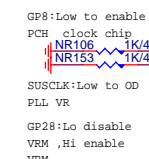
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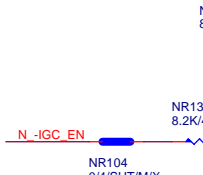
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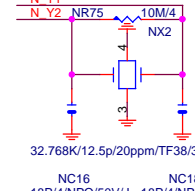
PCH	PU/PD
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HSW_STRAP13



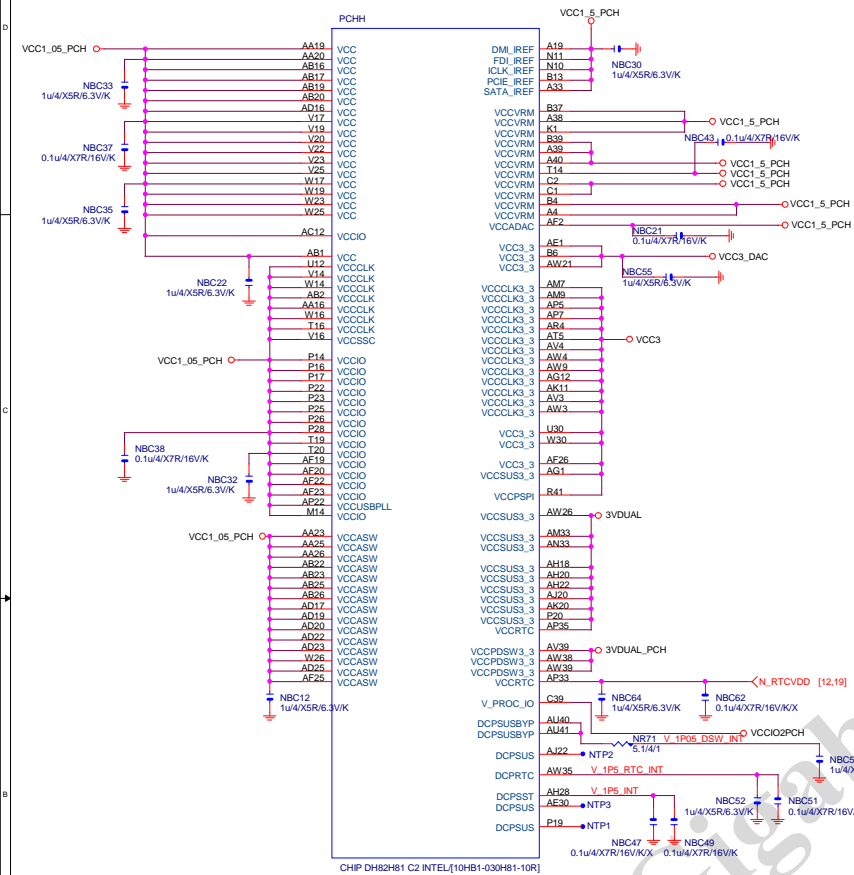
32.768KHZ



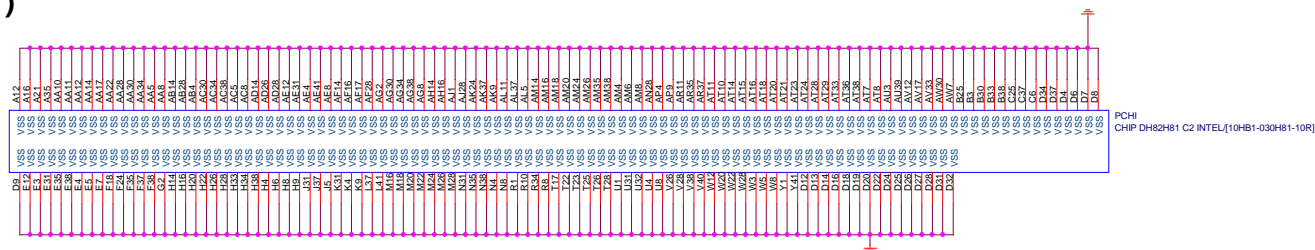
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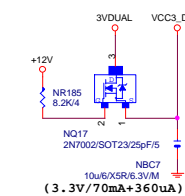
PCH (H)



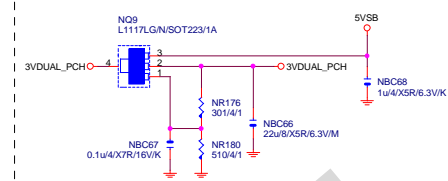
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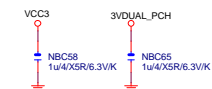
VCC3_DAC



3VDUAL_PCH

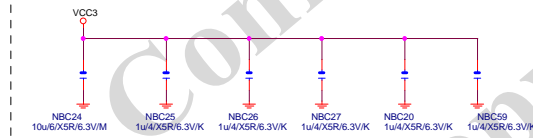


SHT PWR

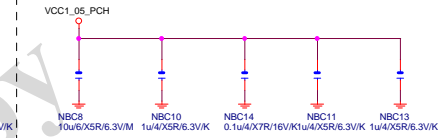


CAP

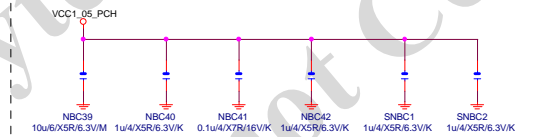
(3.3V) (X6)



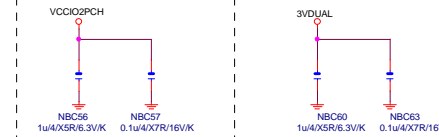
(1.05V) (x5)



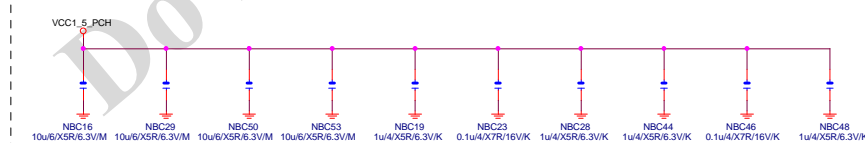
(1.05V) (x6)



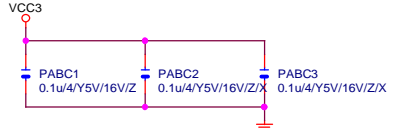
→ (1.05V)(x2) (3.3V)(x2)



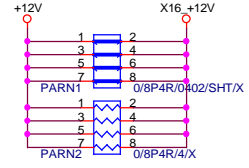
(1.05V) (x10)



PCIEX16 CAP



PCIEX16 PROTECT SHT



PCIEX16 AC CAP

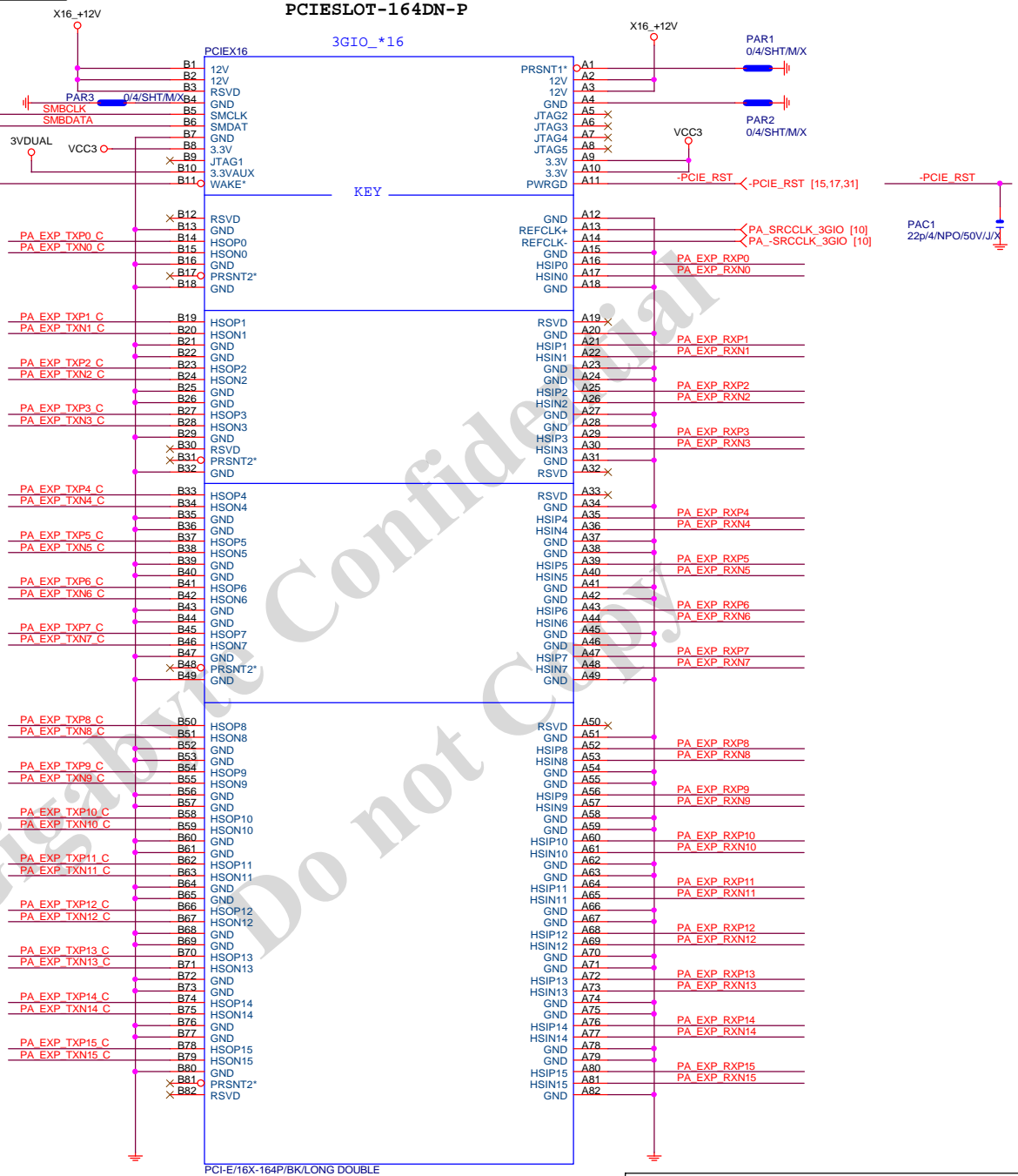
PA EXP TXP0	PAC5	0.22u4/X5R/6.3V/K	PA EXP TXP0 C
PA EXP TXN0	PAC4	0.22u4/X5R/6.3V/K	PA EXP TXN0 C
PA EXP TXP1	PAC6	0.22u4/X5R/6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC7	0.22u4/X5R/6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC8	0.22u4/X5R/6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC9	0.22u4/X5R/6.3V/K	PA EXP TXN2 C
PA EXP TXP3	PAC10	0.22u4/X5R/6.3V/K	PA EXP TXP3 C
PA EXP TXN3	PAC11	0.22u4/X5R/6.3V/K	PA EXP TXN3 C
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PA EXP TXN5	PAC15	0.22u4/X5R/6.3V/K	PA EXP TXN5 C
PA EXP TXP6	PAC16	0.22u4/X5R/6.3V/K	PA EXP TXP6 C
PA EXP TXN6	PAC17	0.22u4/X5R/6.3V/K	PA EXP TXN6 C
PA EXP TXP7	PAC19	0.22u4/X5R/6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC18	0.22u4/X5R/6.3V/K	PA EXP TXN7 C
PA EXP TXP8	PAC20	0.22u4/X5R/6.3V/K	PA EXP TXP8 C
PA EXP TXN8	PAC21	0.22u4/X5R/6.3V/K	PA EXP TXN8 C
PA EXP TXP9	PAC22	0.22u4/X5R/6.3V/K	PA EXP TXP9 C
PA EXP TXN9	PAC23	0.22u4/X5R/6.3V/K	PA EXP TXN9 C
PA EXP TXP10	PAC24	0.22u4/X5R/6.3V/K	PA EXP TXP10 C
PA EXP TXN10	PAC25	0.22u4/X5R/6.3V/K	PA EXP TXN10 C
PA EXP TXP11	PAC26	0.22u4/X5R/6.3V/K	PA EXP TXP11 C
PA EXP TXN11	PAC27	0.22u4/X5R/6.3V/K	PA EXP TXN11 C
PA EXP TXP12	PAC28	0.22u4/X5R/6.3V/K	PA EXP TXP12 C
PA EXP TXN12	PAC29	0.22u4/X5R/6.3V/K	PA EXP TXN12 C
PA EXP TXP13	PAC30	0.22u4/X5R/6.3V/K	PA EXP TXP13 C
PA EXP TXN13	PAC31	0.22u4/X5R/6.3V/K	PA EXP TXN13 C
PA EXP TXP14	PAC32	0.22u4/X5R/6.3V/K	PA EXP TXP14 C
PA EXP TXN14	PAC33	0.22u4/X5R/6.3V/K	PA EXP TXN14 C
PA EXP TXP15	PAC34	0.22u4/X5R/6.3V/K	PA EXP TXP15 C
PA EXP TXN15	PAC35	0.22u4/X5R/6.3V/K	PA EXP TXN15 C

PA EXP RXP0.[15] >>> PA_EXP_RXP[0..15] [4]
PA EXP RXN0.[15] >>> PA_EXP_RXN[0..15] [4]
PA EXP TXP0.[15] >>> PA_EXP_TXP[0..15] [4]
PA EXP TXN0.[15] >>> PA_EXP_TXN[0..15] [4]

PCIEX16 SLOT

[7,8,12,15,16,19] N_SMBCLK
[7,8,12,15,16,19] N_SMBDATA
[12,15,24,31] N_-PCIE_WAKE

PCIESLOT-164DN-P

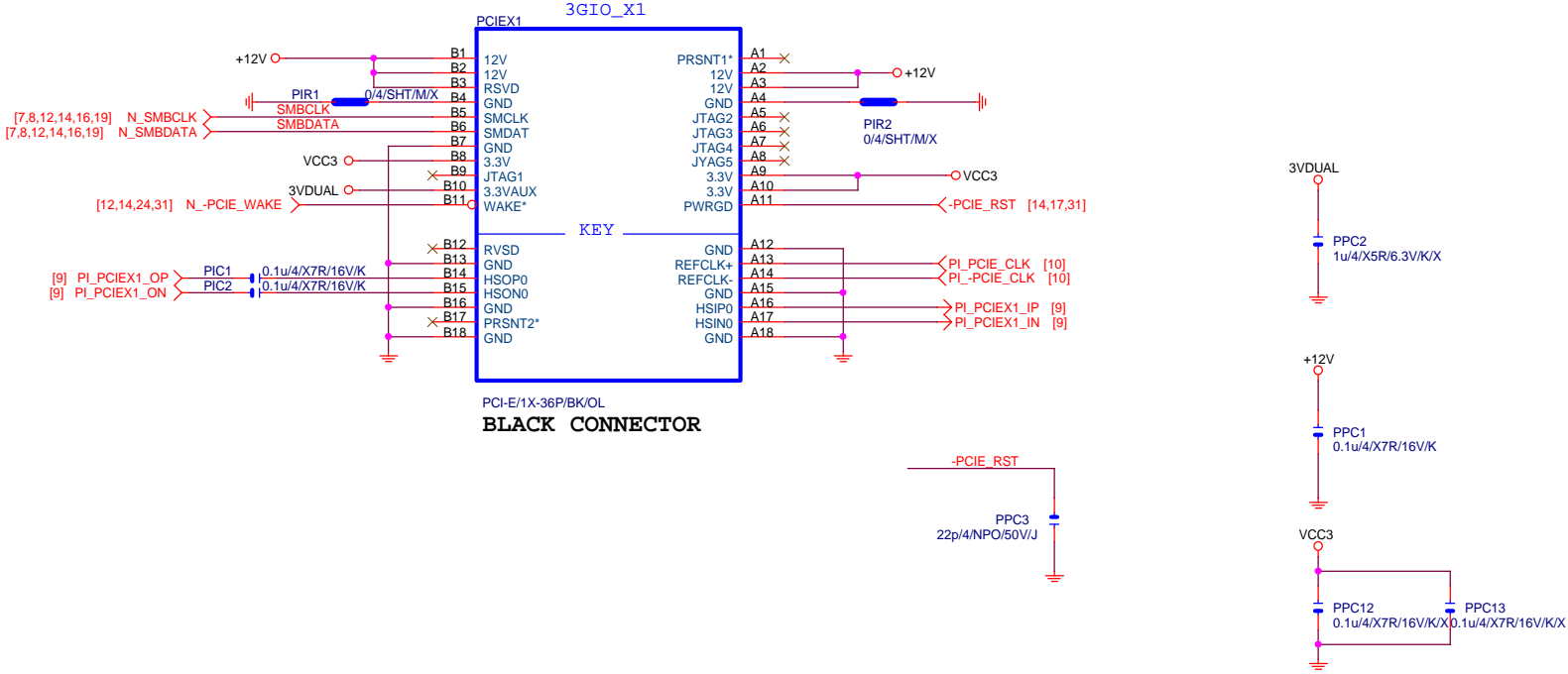


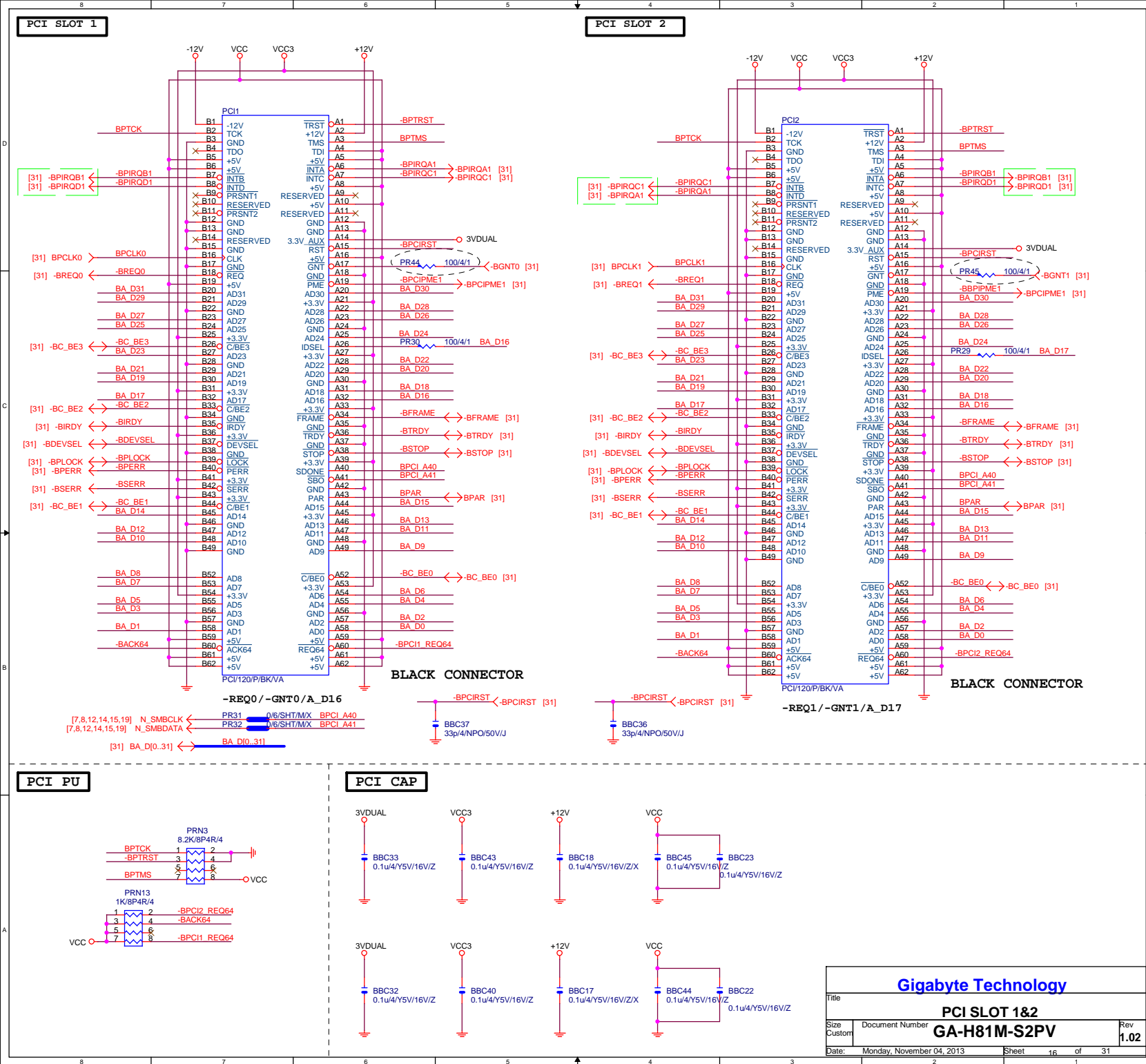
PCI-E/16X-164P/BK/LONG DOUBLE

BLACK CONNECTOR

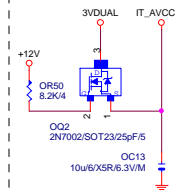
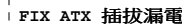
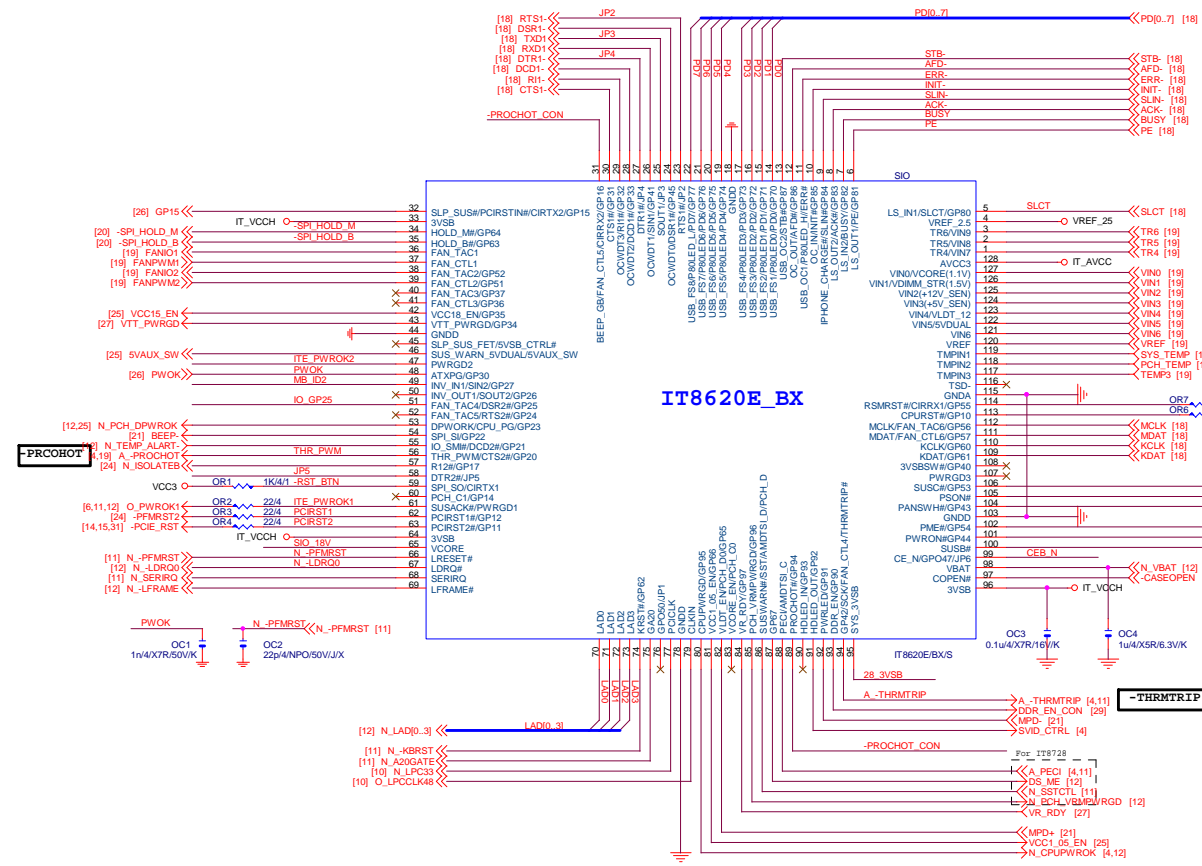
Gigabyte Technology		
Title		
PCI EXPRESS * 16		
Size	Document Number	Rev
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Date: Monday, November 04, 2013		Sheet 14 of 31

PCIEX1 SLOT

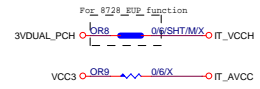




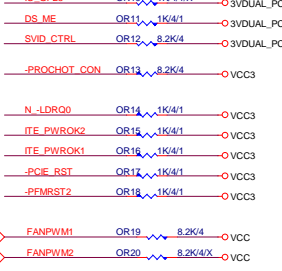
SIO IT8620



DWR CUT



SIO PU




SIO STRAP

H61M-S2 1.1 JP6 stuff
pull down



ITE recommand

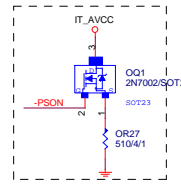
3VDUAL  OR26 100/4/1 28_3VSB

```

P3--- High SPI-Flash Disable  |
      Low SPI-Flash Enable    |
-----

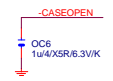
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Power leakage

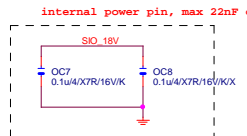


For IT8721 Power leakage

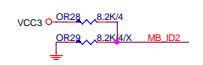
DUAL BIOS OPT STRAP



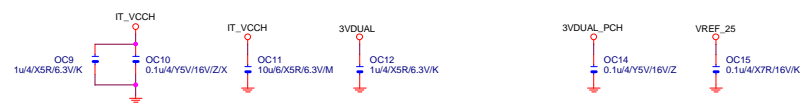
SIO_18V



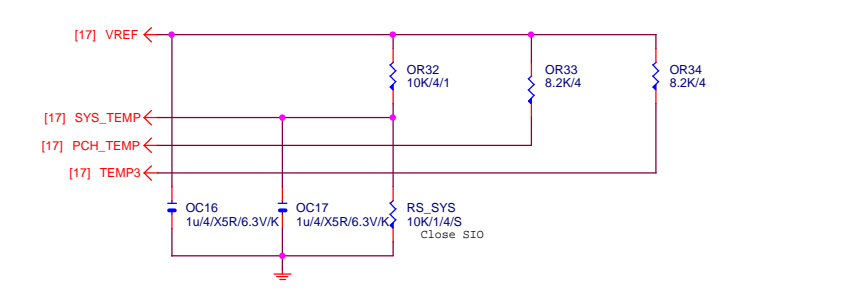
MB ID



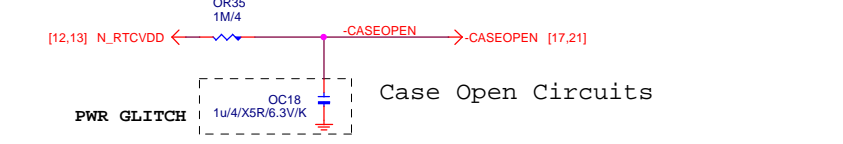
SIO CAP



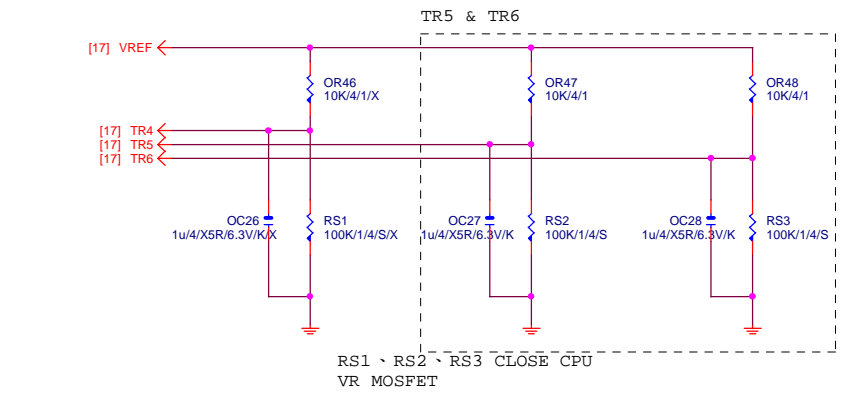
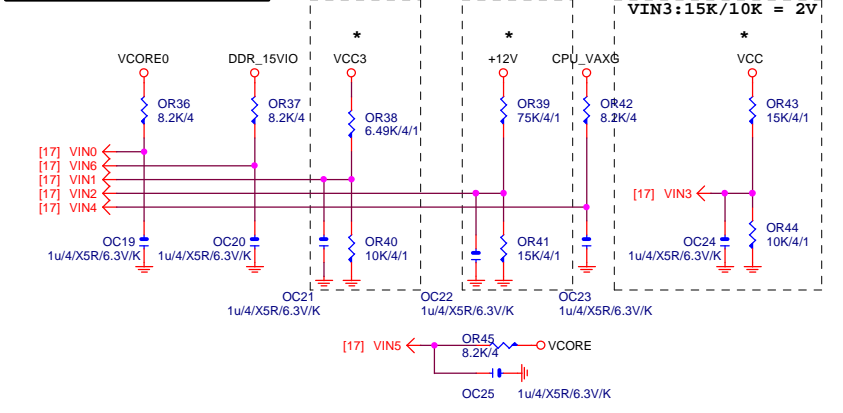
TEMP H/W MONITOR



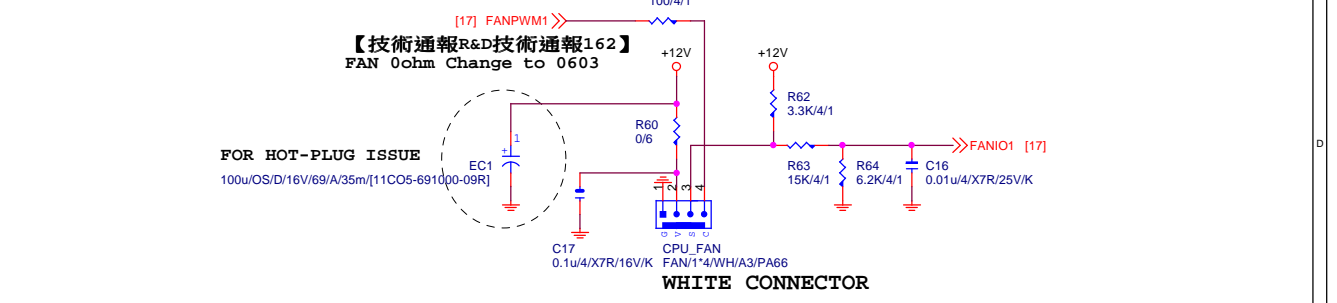
CASE OPEN



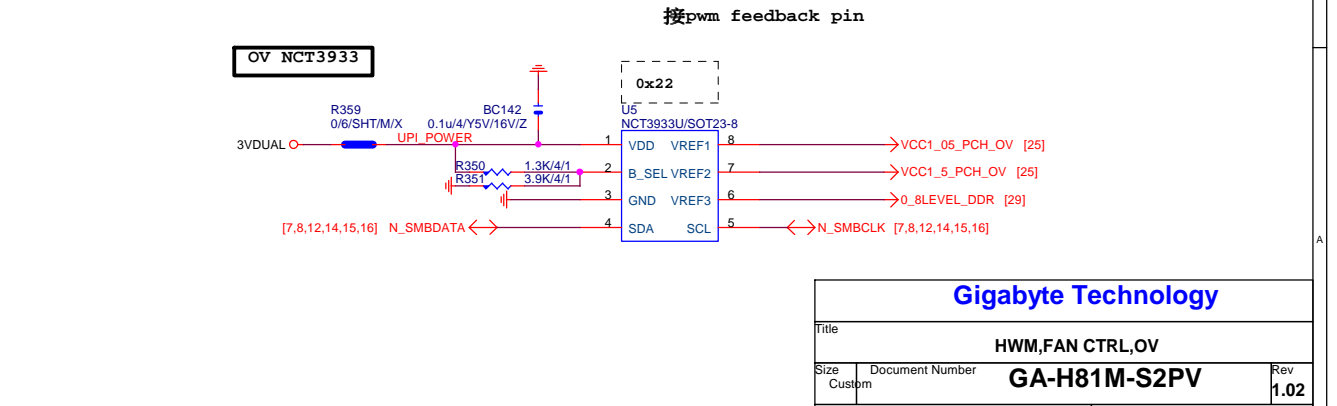
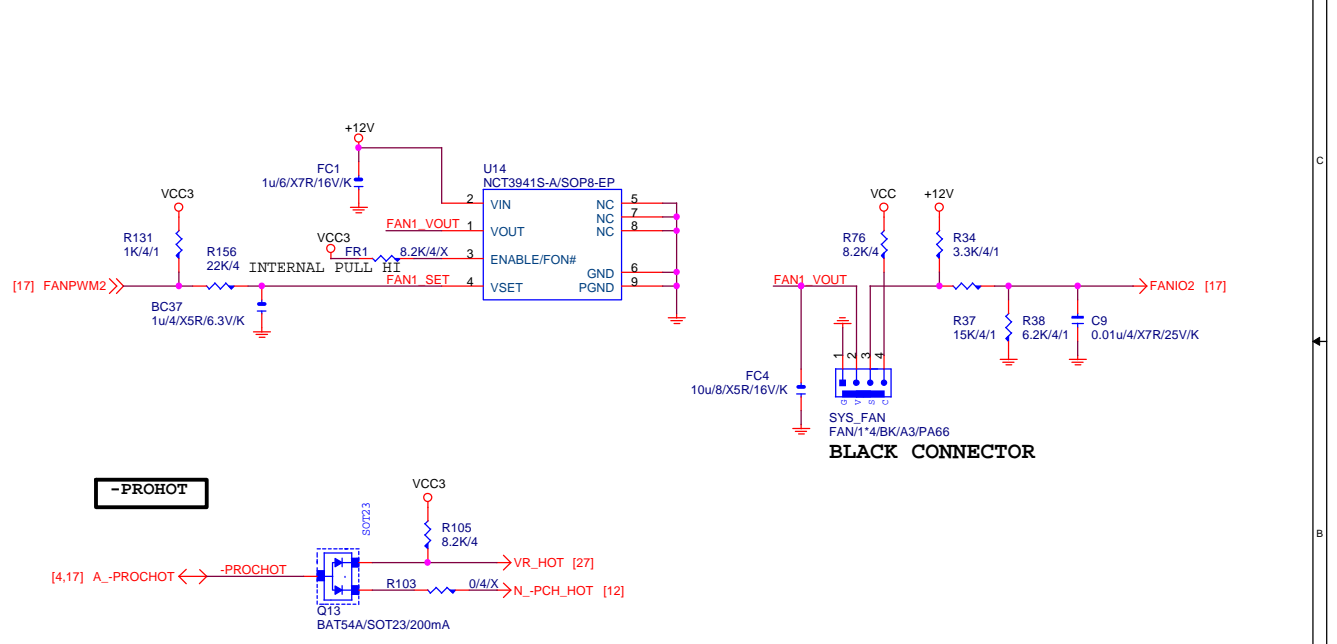
VOLTAGE-- H/W MONITOR

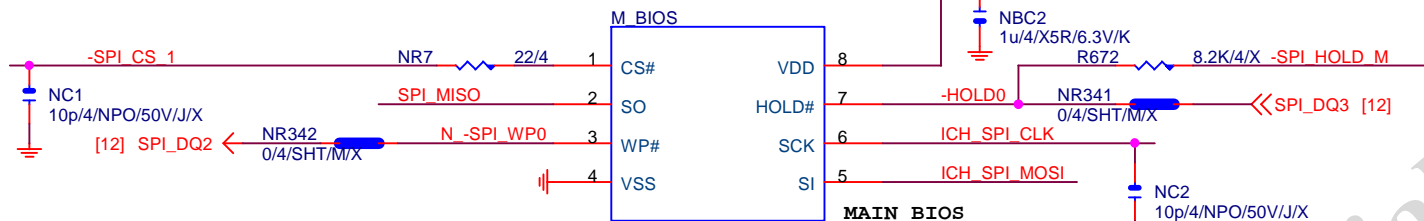


CPU SMART FAN

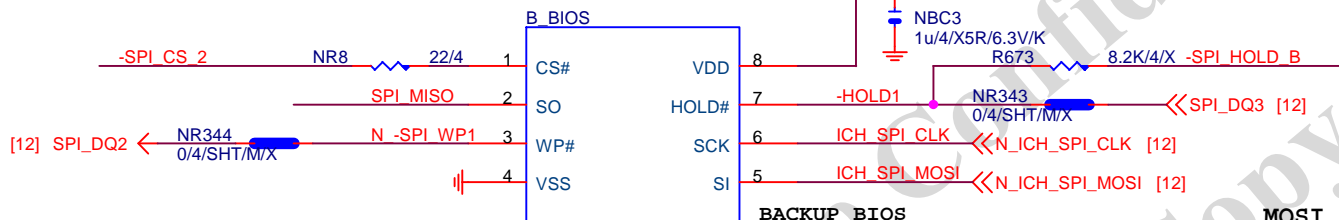


SYS SMART FAN





64M/Q/SPI/SO8/S

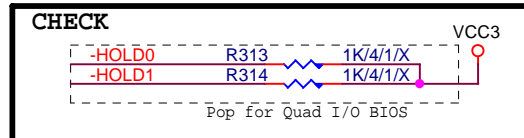
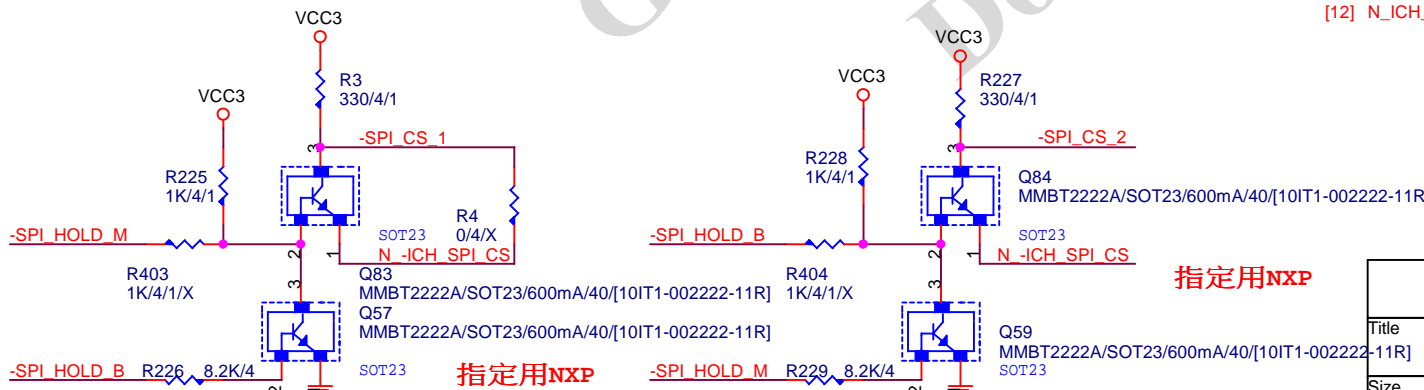
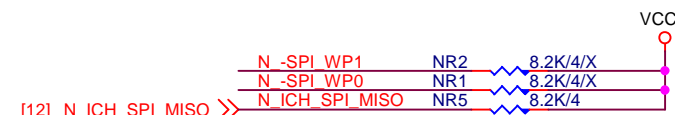
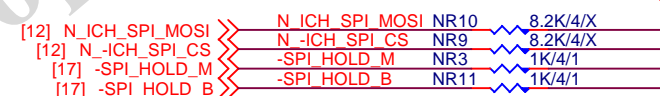


64M/Q/SPI/SO8/S

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

1 means floating
0 means PD 1K

MOSI For DMI RX Termination Voltage



指定用NXP

Gigabyte Technology

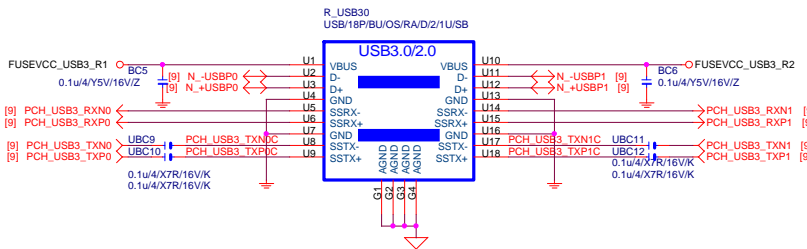
DUAL BIOS

GA-H81M-S2PV

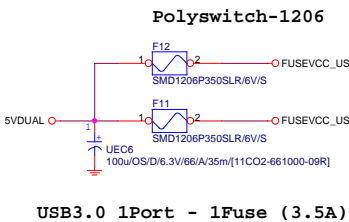
Rev 1.02

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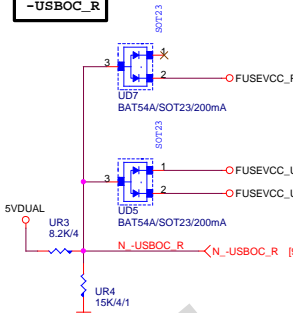
USB30_20



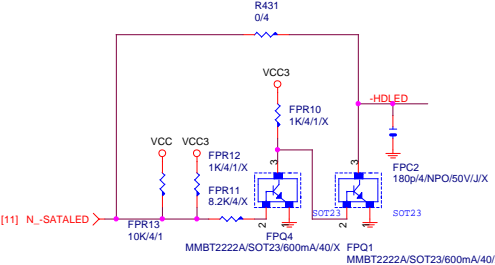
USB30_20 PWR



-USBOC_R

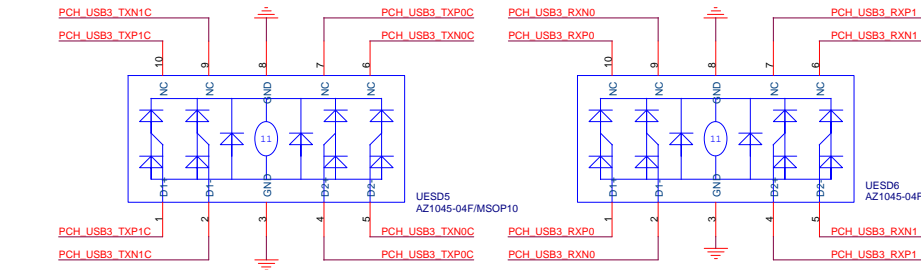


SATA LED

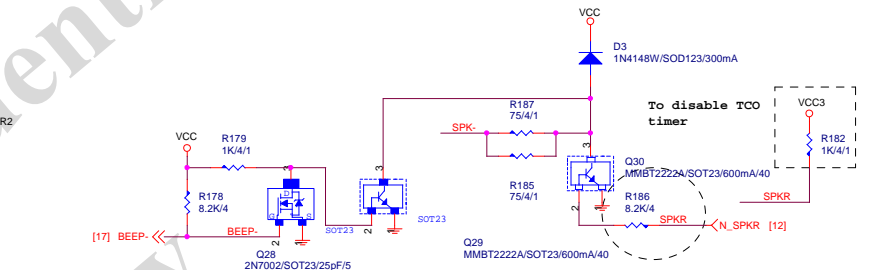


USB30_20 ESD PROTECT

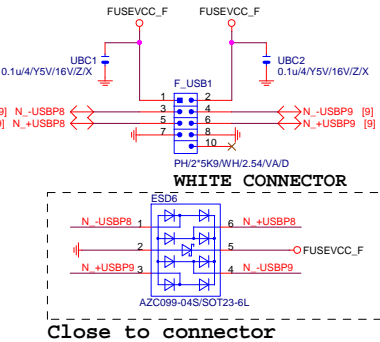
USB3.0 ESD



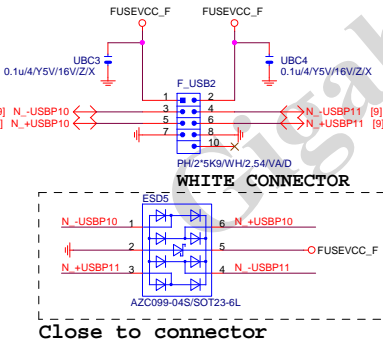
SPKR



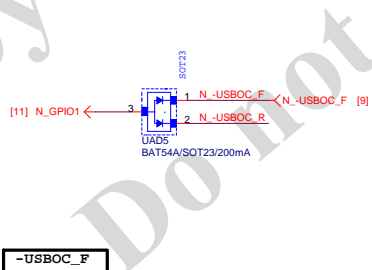
FRONT USB1



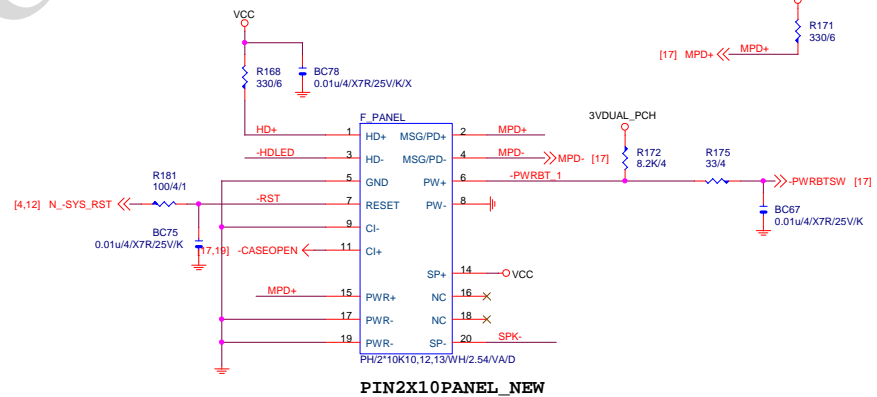
FRONT USB2



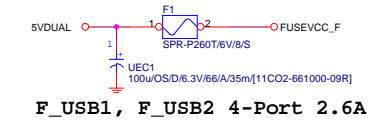
USB POWER PROTECT



INTEL FRONT PANEL

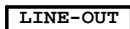


FUSE-0805



F_USB1, F_USB2 4-Port 2.6A

Gigabyte Technology			
FP,F_USB,USB PWR,SPKR,SATA LED			
Size	Document Number	Rev	
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For 889A/888

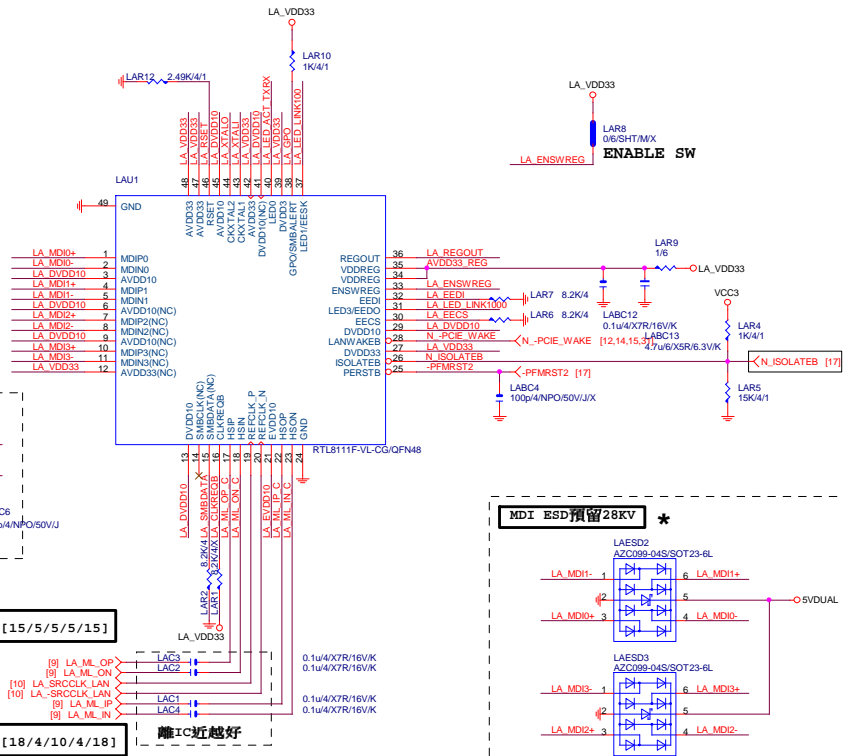


AZALIA FRONT PANEL

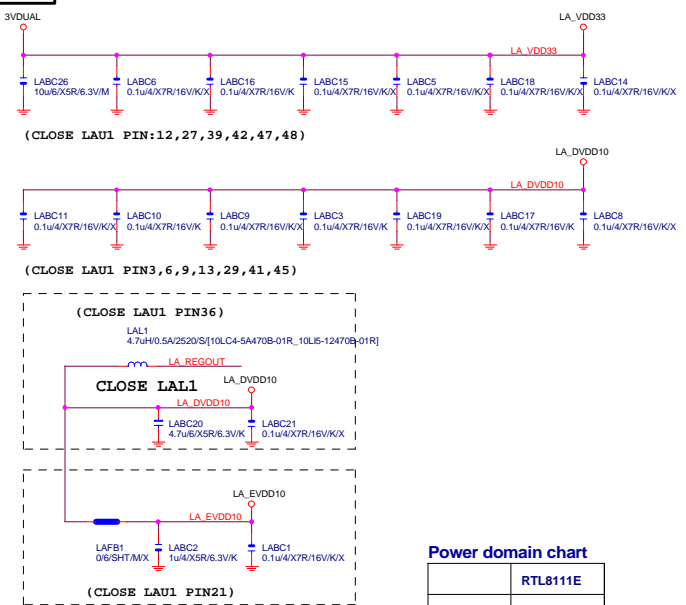


Title			
AUDIO JACK			
Size Custom	Document Number	GA-H81M-S2PV	Rev 1.02
Date:	Monday, November 04, 2013	Sheet 23 of 31	

LAN:RTL8111F/VB/VL



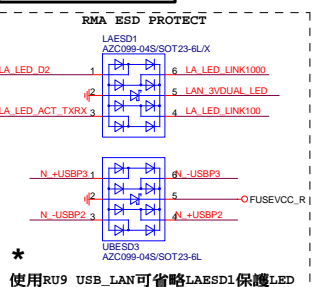
LAN POWER



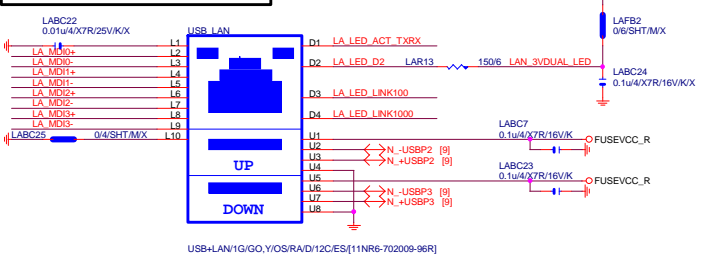
Power domain chart

	RTL8111E
AVDD33	3.3V
DVDD33	3.3V
VDDREG	3.3V
DVDD10	1.05V

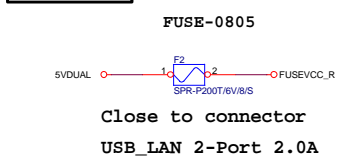
USB LAN CONNECTOR



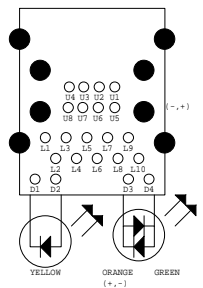
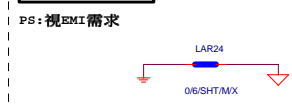
LA_MDI-->100歐姆:[20/4/8/4/20]



USB POWER



EMI SHORT PAD



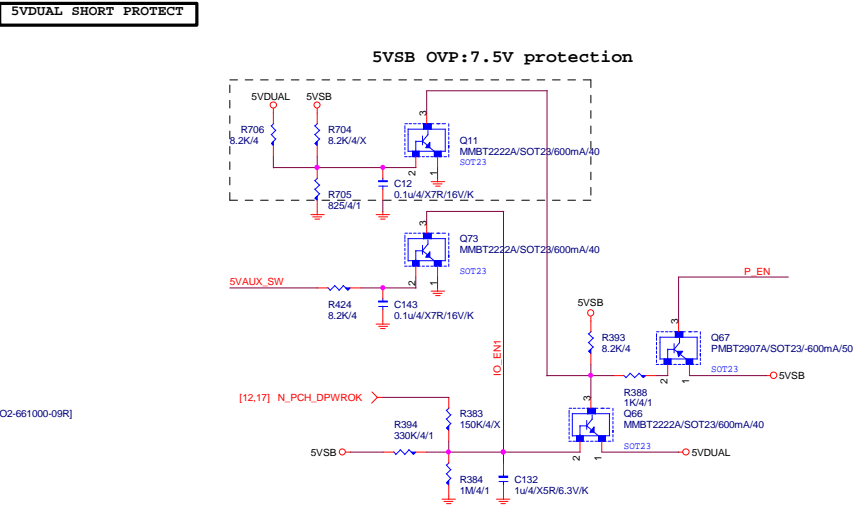
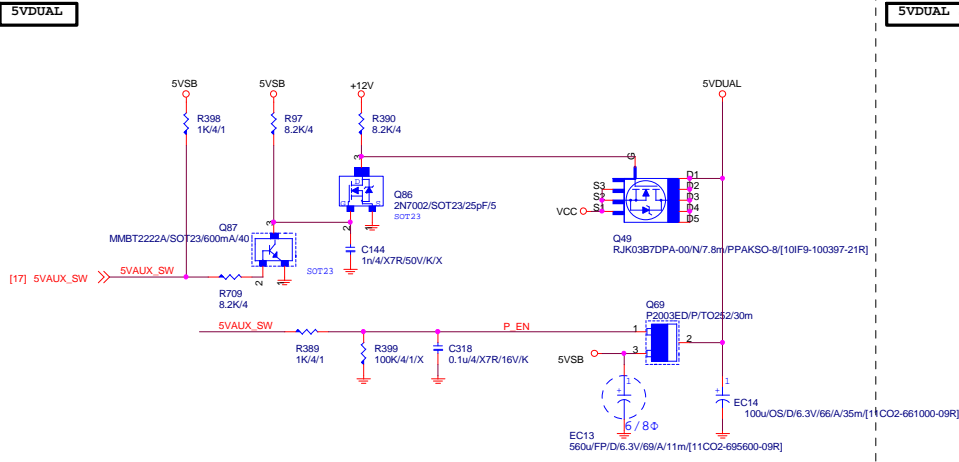
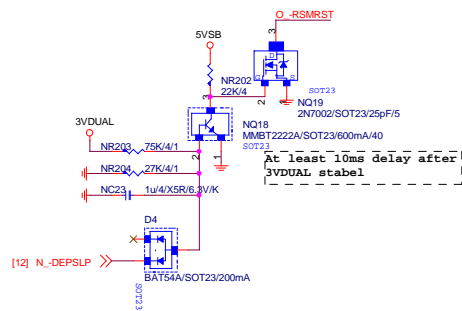
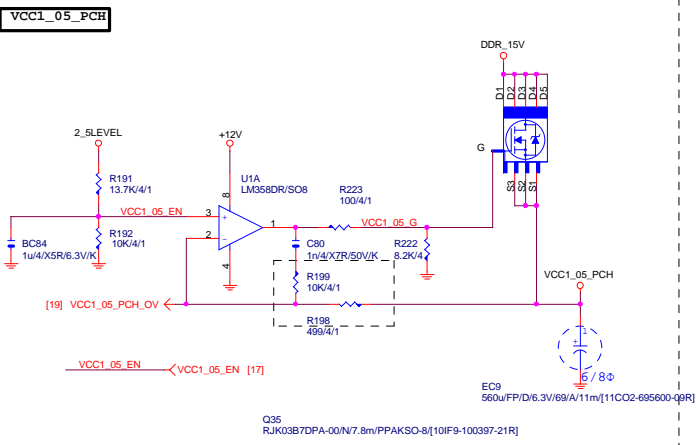
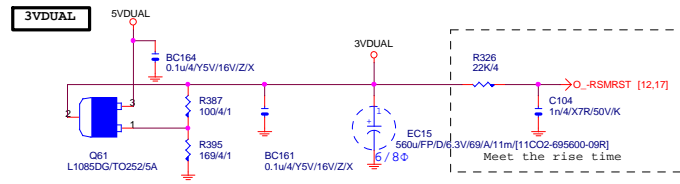
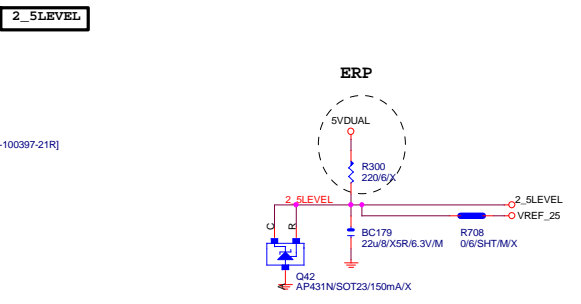
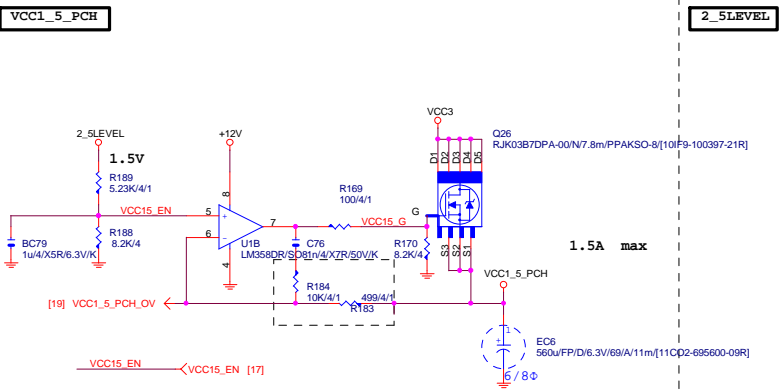
注意:USB PORT(目前:暫代6,7PORT)
USB-->90歐姆:[15/4.5/7.5/4.5/15]

BOM NOTICE *

料號	規格	廠商
11NR6-702009-96R	1G LAN (12core)	UDE(RU9 ESD+)
[LED獨立走線,可省略外加AZC099料件LAESD1]		
1. 9KV ESD BOM:		
USB_LAN (RU9):11NR6-702009-96R		
2. 28KV ESD BOM:		
USB_LAN (RU9):11NR6-702009-96R		
LAESD2,LAESD3:上件AZC398-04S		

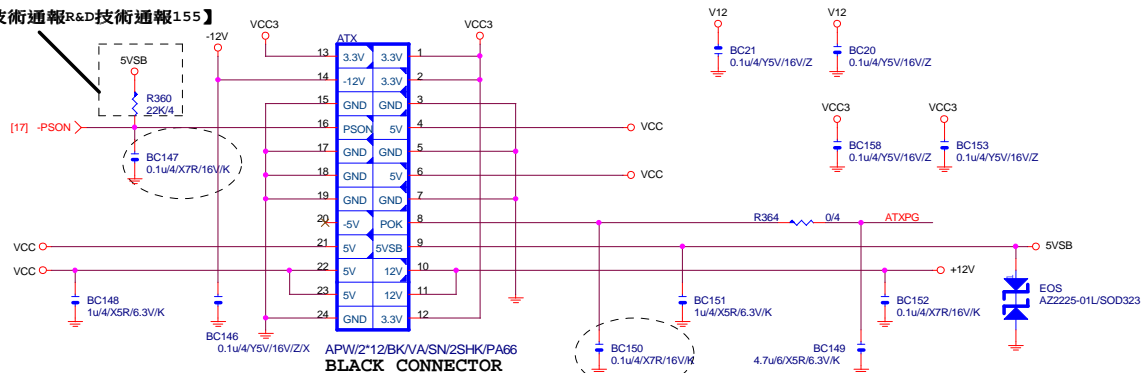
Gigabyte Technology

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Realtek RTL8111G		
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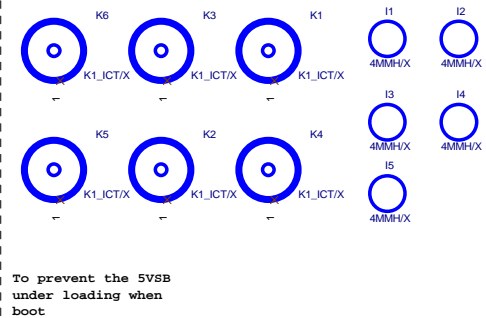
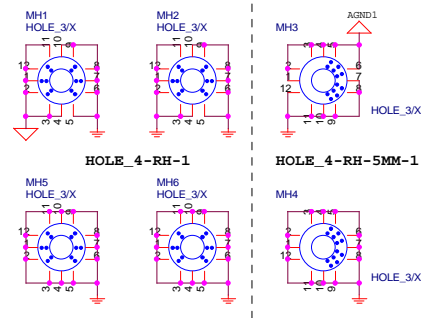
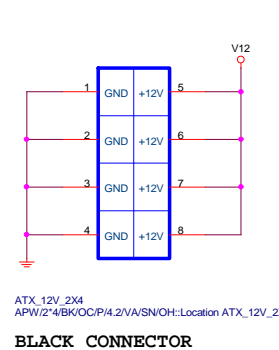


ATXX24 POWER CONNECTOR

【技術通報R&D技術通報155】

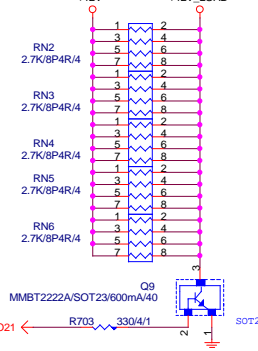


ATXX4 POWER CONNECTOR



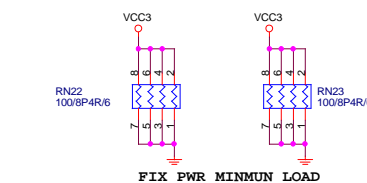
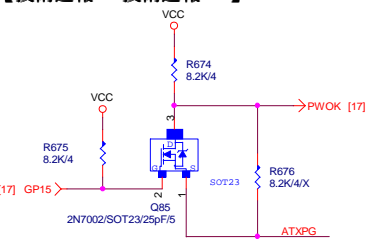
【技術通報R&D技術通報153】

To fix 12V light load abnormality issue



PWOK PATCH

【技術通報R&D技術通報154】



Gigabyte Technology

ATX CONNECTOR

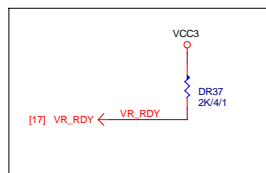
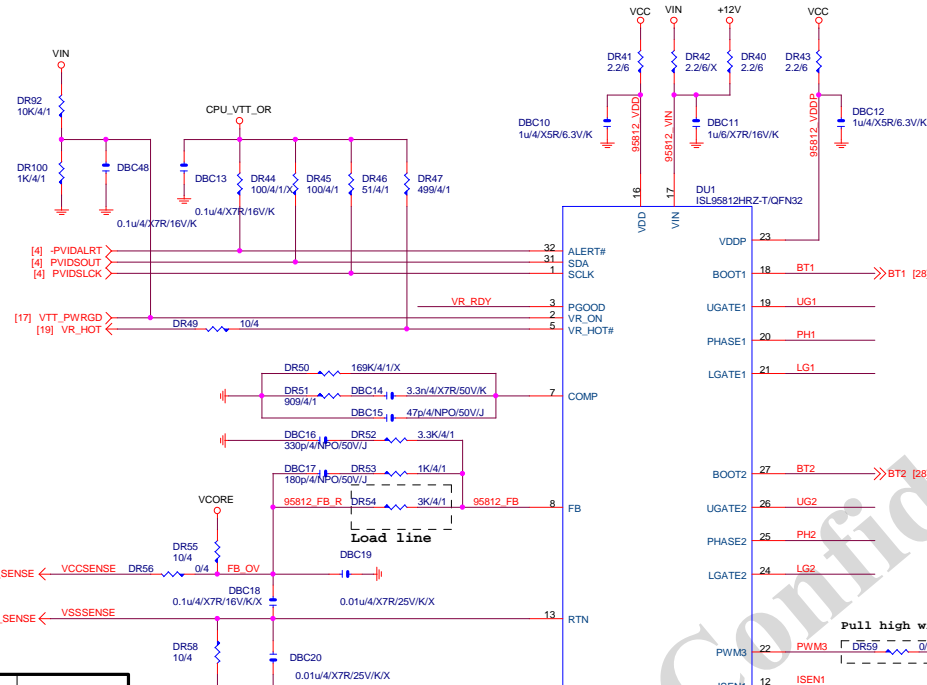
GA-H81M-S2PV

Rev 1.02

R_PROG1 (Kohm)	3-Phase Iccmax(A)
24.9	105
28.7	114
34.0	129
42.2	144

R_PROG2 (Kohm)	Fsw(KHz)	VBOOT
64.9	315	1.75
73.2	315	1.70
80.6	315	1.65
90.9	315	0

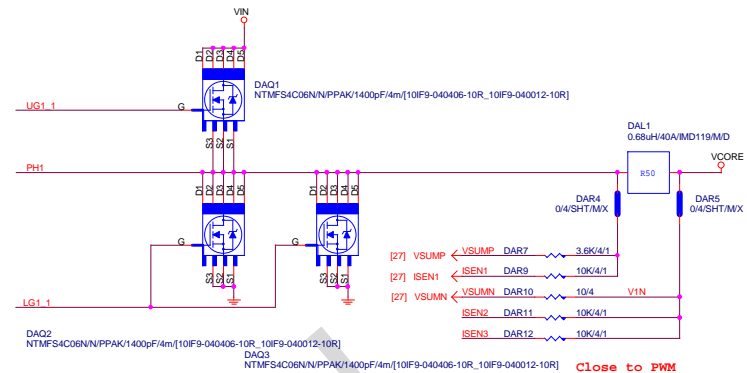
R_PROG3 (Kohm)	Fast Slew Rate (mV/us)
3.24	12
5.76	24
9.31	40
13.3	45



Pull high will disable PWM3

Disable NTC

Diagram illustrating the mapping of variables to their corresponding values in the context of the UG1 , PH1 , and LG1 variables.



PWM3 → PWM3 [27]

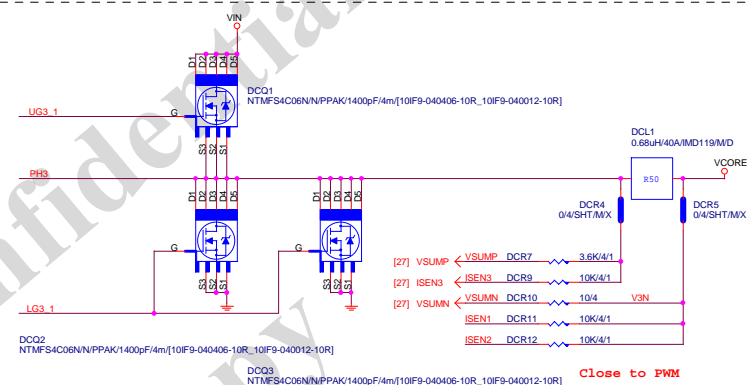
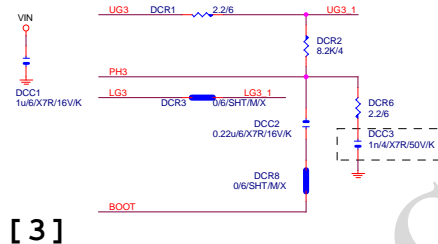
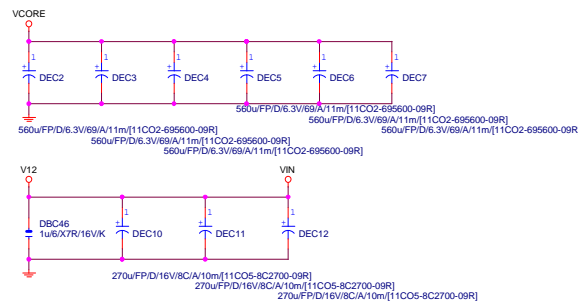
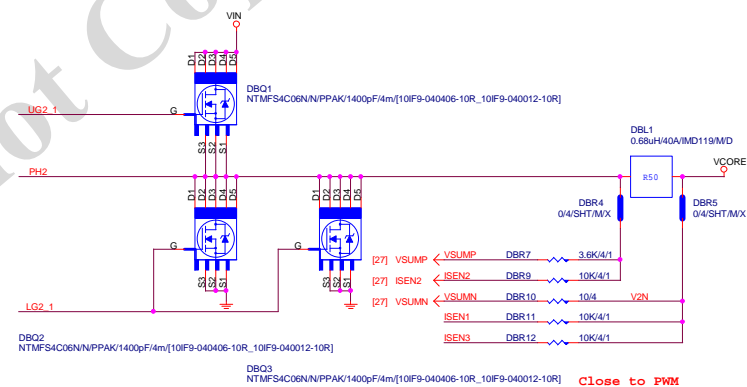
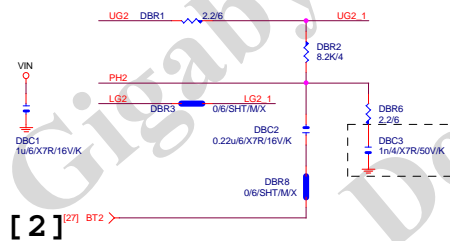
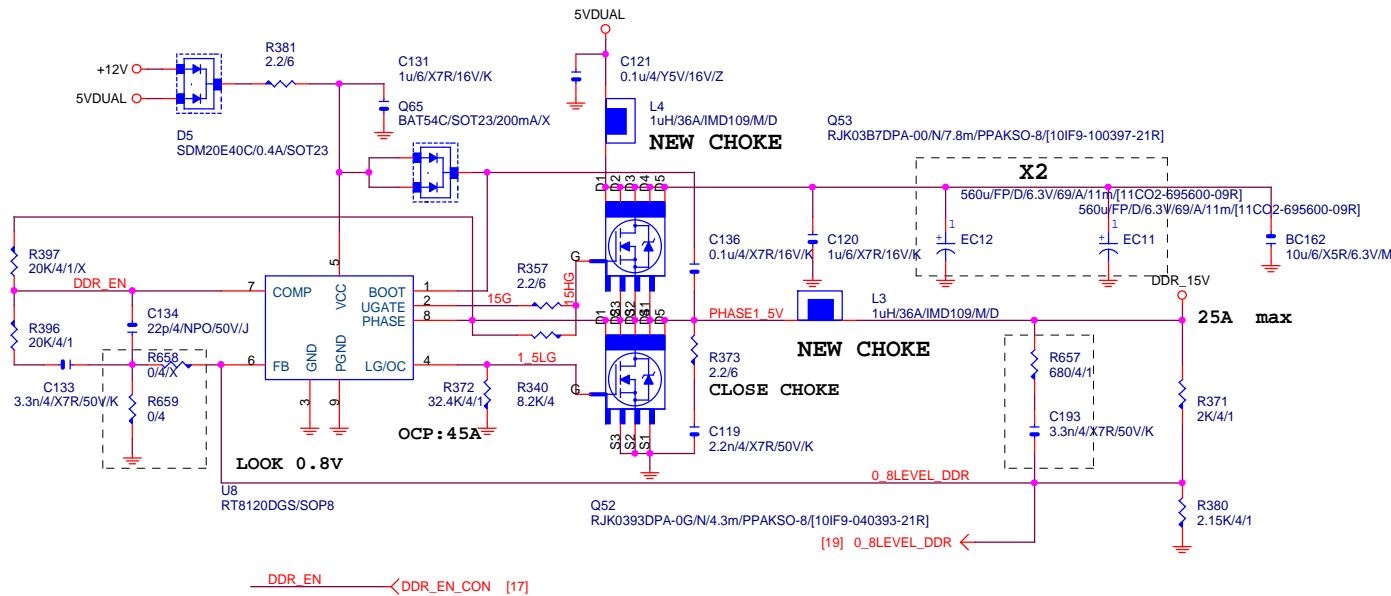


Diagram illustrating the mapping of variables to their corresponding values in the context of the PH_2 variable:

- UG2 [27]
- PH2 [27]
- LG2 [27]



DDR15V



From DDR_15V source
10 mils trace to SIO

DDR_15V DDR_15VIO
MR20 0/4/SHT/M/X

PWR_SEQ

VIN=5V, VOUT=1.5V, IOUT=25A, PHASE=1
IRMS=11.45A
560u/FP/D/6.3V/68/8m RIPPLE CURRENT=4.7A
Coefficient=1.7(85°C), 1(105°C)
VIN Ripple current=4.7X1.7=7.99A(85°C)
-->故固態電容須2X7.99=15.98>11.45A

$Rocset = (Iocp * Lgate, rdson) / Iocset$
 $Rocset = (45A * 6.7mOhm) / 10uA = 30K$
 $Iocset = 10uA$

Gigabyte Technology

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DDR POWER			
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DVI LEVEL SHIFT

