

Model Name: GA-Z87-HD3

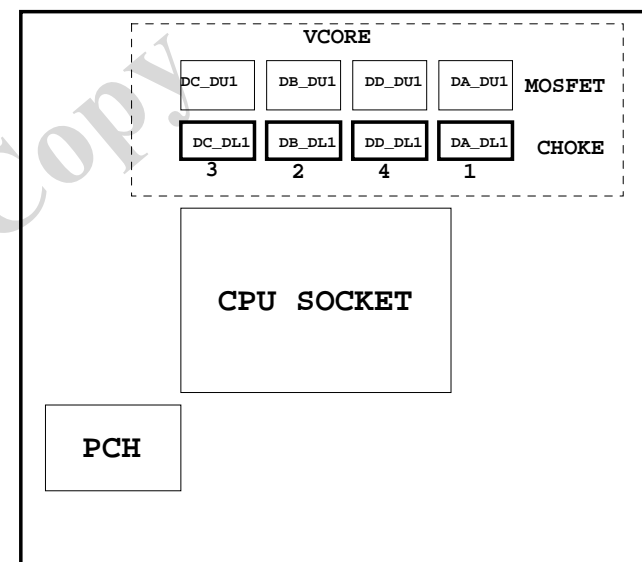
1.1

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
10	PCH_RGB,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCIEX1*2 , PCIEX4 SLOT
16	ITE8892 PCI BRIDGE
17	PCI SLOT 1&2
18	I/O ITE8728
19	COM, -PROHOT, R_USB
20	Dual BIOS / LPT
21	ALC892 CODEC
22	REAR AUDIO JACK
23	VCORE_ ISL95820_1
24	VCORE_ ISL95820_2
25	DDR15V / M3 POWER
26	NCP3933 OVER VOLTAGE
27	DISCRETE POWER

SHEET TITLE

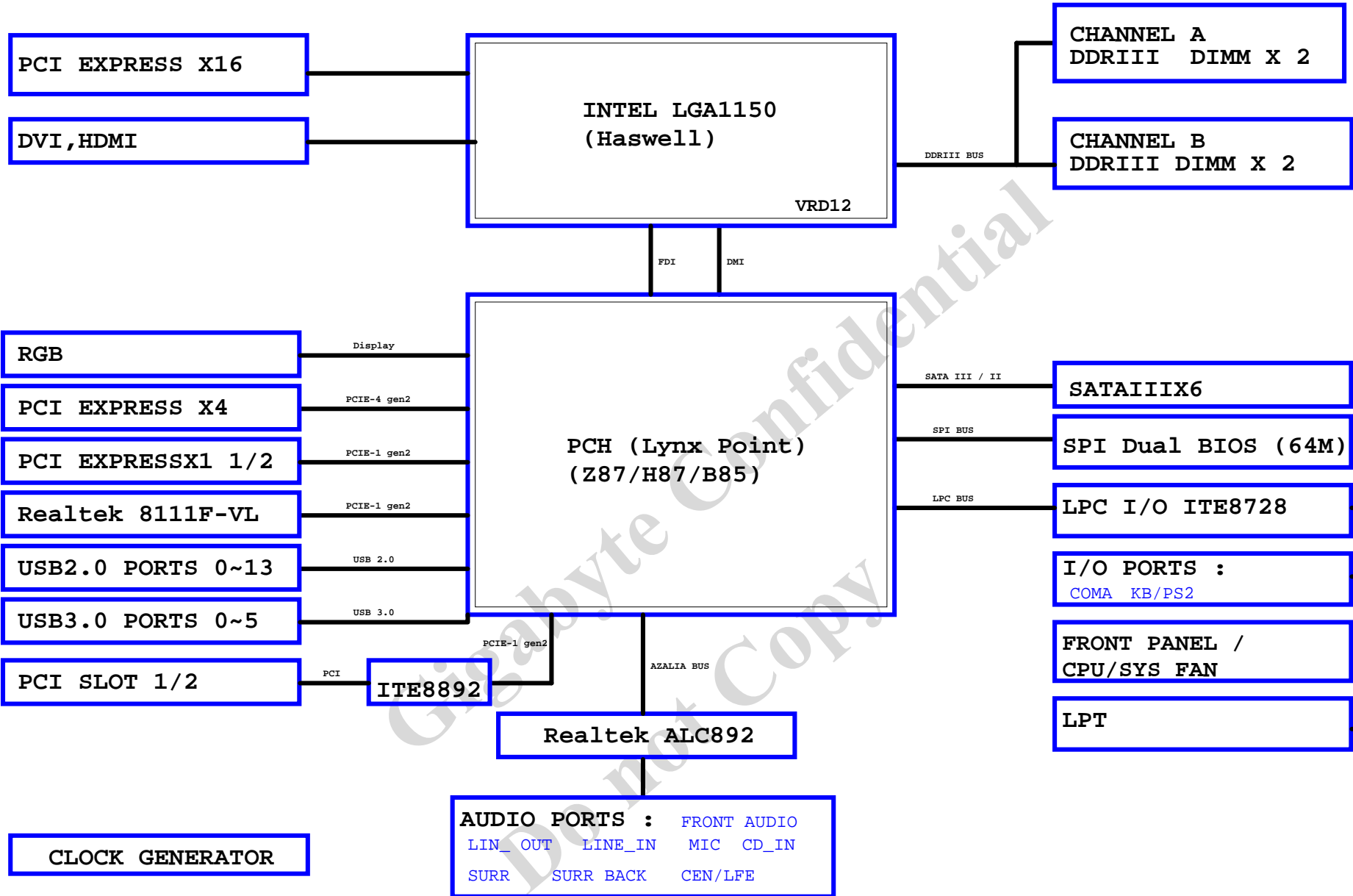
28	F_PANEL , F_USB2.0/3.0
29	ATX POWER, CLOCK GEN
30	HWM , KB/MS , FAN CTRL
31	Realtek 8111F-VL
32	DVI
33	HDMI
34	TABLE LIST
35	
36	
37	
38	
39	
40	



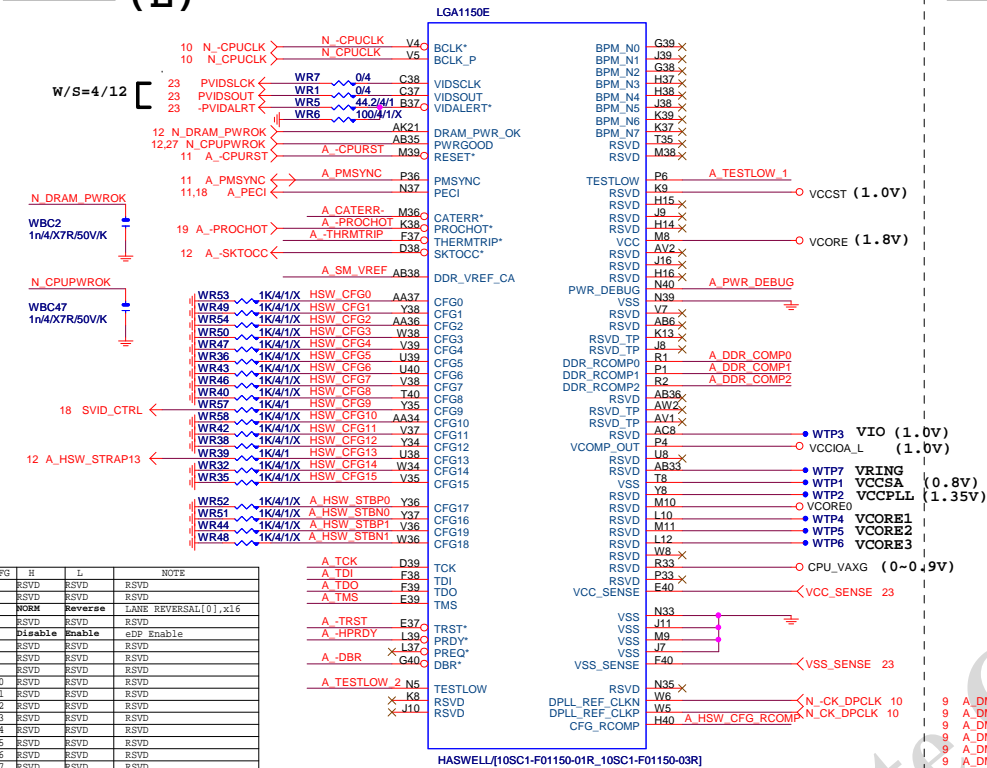
Component value change history

[illegible][illegible]

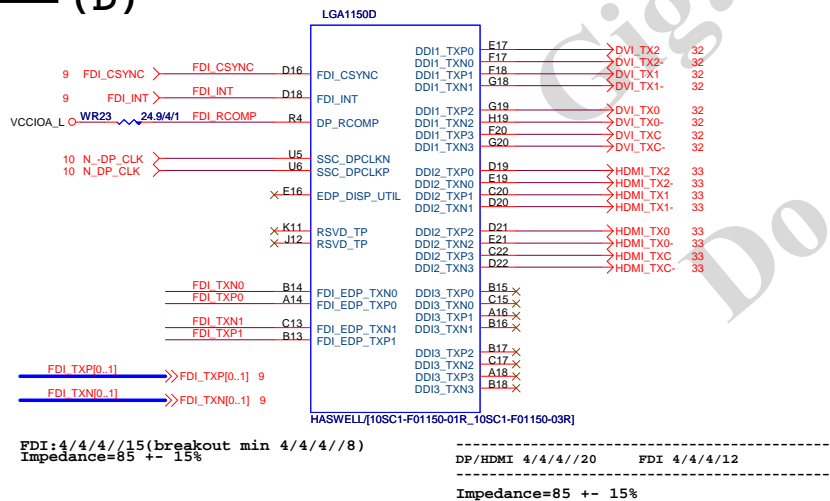
BLOCK DIAGRAM



LGA1150 (E)



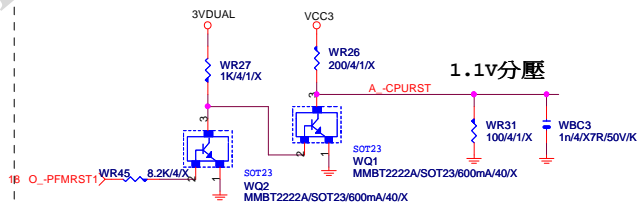
LGA1150 (D)



LGA1155 (C)



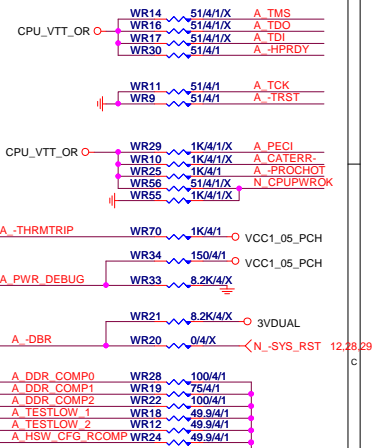
-CPURST



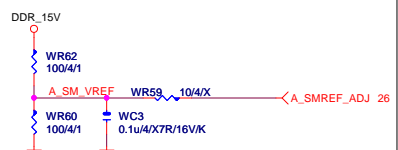
CPU SVID



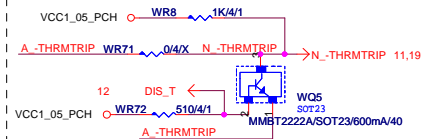
CPU PU/PD



SM REF



THRMTRIP DISABLE FOR Z87 OVERCLOCK

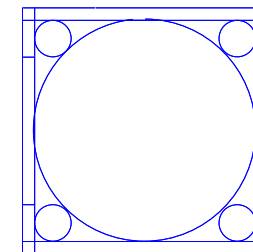


LGA1150A									
		MAAA0	AU13					AD38	MDA0
		MAAA1	AV16	DDR0_MA0			DDR0_D01	A39	MDA1
		MAAA2	AU16	DDR0_MA1			DDR0_D02	AF38	MDA2
		MAAA3	AW17	DDR0_MA2			DDR0_D03	AF39	MDA3
		MAAA4	AU17	DDR0_MA3			DDR0_D04	AD37	MDA4
		MAAA5	AW18	DDR0_MA4			DDR0_D05	AD40	MDA5
		MAAA6	AV17	DDR0_MA5			DDR0_D06	AF37	MDA6
		MAAA7	AU18	DDR0_MA6			DDR0_D07	AF40	MDA7
		MAAA8	AV18	DDR0_MA7			DDR0_D08	AH40	MDA8
		MAAA9	AU19	DDR0_MA8			DDR0_D09	AH39	MDA13
		MAAA10	AW11	DDR0_MA9			DDR0_D10	AH38	MDA11
		MAAA11	AV19	DDR0_MA10			DDR0_D11	AH39	MDA12
		MAAA12	AU19	DDR0_MA11			DDR0_D12	AH38	MDA8
		MAAA13	AY10	DDR0_MA12			DDR0_D13	AH37	MDA14
		MAAA14	AT20	DDR0_MA13			DDR0_D14	AK40	MDA15
		MAAA15	AT21	DDR0_MA14			DDR0_D15	AK41	MDA17
				DDR0_MA15			DDR0_D16	AM38	MDA21
		MODT_A0	AW10	DDR0_ODT0			DDR0_D17	AM39	MDA18
		MODT_A1	AY8	DDR0_ODT1			DDR0_D18	AP39	MDA19
		MODT_A2	AW8	DDR0_ODT2			DDR0_D19	AM37	MDA20
		MODT_A3	AU8	DDR0_ODT3			DDR0_D20	AM38	MDA16
							DDR0_D21	AP37	MDA22
			AW33	DDR0_ECC0			DDR0_D22	AU37	MDA25
			AU33	DDR0_ECC1			DDR0_D23	AW37	MDA29
			AU31	DDR0_ECC2			DDR0_D24	AU37	MDA26
			AV31	DDR0_ECC3			DDR0_D25	AW37	MDA27
			AT33	DDR0_ECC4			DDR0_D26	AU37	MDA28
			AU33	DDR0_ECC5			DDR0_D27	AU37	MDA29
			AT31	DDR0_ECC6			DDR0_D28	AU37	MDA30
			AW31	DDR0_ECC7			DDR0_D29	AW35	MDA31
							DDR0_D30	AY6	MDA33
		SBAA0	AY12	DDR0_D31			DDR0_D32	AY6	MDA37
7		SBAA1	SBAA1	DDR0_BA0			DDR0_D33	AY8	MDA37
7		SBAA2	SBAA2	DDR0_BA1			DDR0_D34	AW4	MDA35
7				DDR0_BA2			DDR0_D35	AW6	MDA36
7		CKEA0	CKEA0	DDR0_D36			DDR0_D37	AW4	MDA38
7		CKEA1	CKEA1	DDR0_D38			DDR0_D39	AW4	MDA39
7		CKEA2	CKEA2	DDR0_D40			DDR0_D41	AR1	MDA41
7		CKEA3	CKEA3	DDR0_D42			DDR0_D43	AR4	MDA42
7				DDR0_D44			DDR0_D45	AN2	MDA46
7		-CSA0	-CSA0	DDR0_CS_N0			DDR0_D46	AN1	MDA47
7		-CSA1	-CSA1	DDR0_CS_N1			DDR0_D47	AL3	MDA50
7		-CSA2	-CSA2	DDR0_CS_N2			DDR0_D48	AL4	MDA51
7		-CSA3	-CSA3	DDR0_CS_N3			DDR0_D49	AL2	MDA52
7							DDR0_D50	AL2	MDA54
7		DCLKA0	DCLKA0	DDR0_CLK_P0			DDR0_D51	AL2	MDA55
7		-DCLKA0	-DCLKA0	DDR0_CLK_N0			DDR0_D52	AG1	MDA57
7		DCLKA1	DCLKA1	DDR0_CLK_P1			DDR0_D53	AG1	MDA58
7		-DCLKA1	-DCLKA1	DDR0_CLK_N1			DDR0_D54	AE3	MDA59
7		DCLKA2	DCLKA2	DDR0_CLK_P2			DDR0_D55	AE4	MDA60
7		-DCLKA2	-DCLKA2	DDR0_CLK_N2			DDR0_D56	AE3	MDA58
7		DCLKA3	DCLKA3	DDR0_CLK_P3			DDR0_D57	AE2	MDA59
7		-DCLKA3	-DCLKA3	DDR0_CLK_N3			DDR0_D58	AE4	MDA60
7							DDR0_D59	AE3	MDA58
7							DDR0_D60	AE2	MDA59
7							DDR0_D61	AE3	MDA60
7		-SRASA	-SRASA	AU12C	DDR0_RAS*		DDR0_D62	AE1	MDA63
7		-SWEA	-SWEA	AU11C	DDR0_WE*		DDR0_D63	AE1	MDA63
7				AW20C	RSVD	DDR0_DOS_P0	AJ39	DOSA0	
7				AW27C	RSVD	DDR0_DOS_P1	AN39	DOSA2	
7		-SCASA	-SCASA	AU9C	DDR0_CAS*	DDR0_DOS_P2	AV36	DOSA3	
7						DDR0_DOS_P3	AE4	DOSA4	
7						DDR0_DOS_P4	AP3	DOSA5	
7						DDR0_DOS_P5	AP3	DOSA6	
7						DDR0_DOS_P6	AE2	DOSA7	
7						DDR0_DOS_P7	AE2	DOSA7	
7.8	-DDR3_RST	WR61	AK22C	DDR0_RESET*		DDR0_DOS_P8	AV32	DOSA0	
		D4/SHT/MX				DDR0_DOS_P9	AJ38	DOSA1	
		WC4				DDR0_DOS_N1	AN38	DOSA2	
		0.1uA/XCTR/16V/KX				DDR0_DOS_N2	AN36	DOSA3	
						DDR0_DOS_N3	AW5	DOSA4	
						DDR0_DOS_N4	AE2	DOSA5	
						DDR0_DOS_N5	AE2	DOSA6	
						DDR0_DOS_N6	AE2	DOSA7	
						DDR0_DOS_N7	AU32	DOSA7	
						DDR0_DOS_N8			

HASWELL/10SC1-F01150-01R 10SC1-F01150-03R]

LGA1150B			
MAA80	AL19	DDR1_MA0	DDR1_DQ0
MAA81	AK23	DDR1_MA1	DDR1_DQ1
MAA82	AM22	DDR1_MA2	DDR1_DQ2
MAA83	AM23	DDR1_MA3	DDR1_DQ3
MAA84	AF23	DDR1_MA4	DDR1_DQ4
MAA85	AF23	DDR1_MA5	DDR1_DQ5
MAA86	AY24	DDR1_MA6	DDR1_DQ6
MAA87	AV25	DDR1_MA7	DDR1_DQ7
MAA88	AL26	DDR1_MA8	DDR1_DQ8
MAA89	AW25	DDR1_MA9	DDR1_DQ9
MAA90	AP18	DDR1_MA10	DDR1_DQ10
MAA91	AY25	DDR1_MA11	DDR1_DQ11
MAA92	AM21	DDR1_MA12	DDR1_DQ12
MAA93	AL15	DDR1_MA13	DDR1_DQ13
MAA94	AY27	DDR1_MA14	DDR1_DQ14
MAA95	AV28	DDR1_MA15	DDR1_DQ15
MODT_B0	AM17	DDR1_ODT0	DDR1_DQ16
MODT_B1	AL16	DDR1_ODT1	DDR1_DQ17
MODT_B2	AM16	DDR1_ODT2	DDR1_DQ18
MODT_B3	AK15	DDR1_ODT3	DDR1_DQ19
			DDR1_DQ20
			DDR1_DQ21
	AM26	DDR1_EC00	DDR1_DQ22
	AM25	DDR1_EC01	DDR1_DQ23
	AF26	DDR1_EC02	DDR1_DQ24
	AF26	DDR1_EC03	DDR1_DQ25
	AL26	DDR1_EC04	DDR1_DQ26
	AL25	DDR1_EC05	DDR1_DQ27
	AR25	DDR1_EC06	DDR1_DQ28
	AR25	DDR1_EC07	DDR1_DQ29
		DDR1_EC30	DDR1_DQ30
SBAB0	AK17	DDR1_BA0	DDR1_DQ31
SBAB1	AL18	DDR1_BA1	DDR1_DQ32
SBAB2	AW28	DDR1_BA2	DDR1_DQ33
		DDR1_EC34	DDR1_DQ34
CKEB0	AW29	DDR1_CKE0	DDR1_DQ35
CKEB1	AY29	DDR1_CKE1	DDR1_DQ36
CKEB2	AL29	DDR1_CKE2	DDR1_DQ37
CKEB3	AL29	DDR1_CKE3	DDR1_DQ38
		DDR1_CS_0	DDR1_DQ39
CSB0	AP17	DDR1_CS_N0	DDR1_DQ40
CSB1	AN15	DDR1_CS_N1	DDR1_DQ41
CSB2	AN17	DDR1_CS_N2	DDR1_DQ42
CSB3		DDR1_CS_N3	DDR1_DQ43
			DDR1_DQ44
			DDR1_DQ45
			DDR1_DQ46
			DDR1_DQ47
DCLKB0	AM20	DDR1_CLK_P0	DDR1_DQ48
DCLKB1	AM21	DDR1_CLK_N0	DDR1_DQ49
DCLKB1	AP21	DDR1_CLK_P1	DDR1_DQ50
DCLKB1	AN20	DDR1_CLK_N1	DDR1_DQ51
DCLKB2	AN21	DDR1_CLK_P2	DDR1_DQ52
DCLKB2	AN21	DDR1_CLK_N2	DDR1_DQ53
DCLKB3	AP19	DDR1_CLK_P3	DDR1_DQ54
DCLKB3	AP20	DDR1_CLK_N3	DDR1_DQ55
SCASB	AP16C	DDR1_CAS*	DDR1_DQ56
	AL20	DDR1_CS_0	DDR1_DQ57
SRASB	AM18C	DDR1_RAS*	DDR1_DQ58
SWEB	AK16C	DDR1_WE*	DDR1_DQ59
			DDR1_DQ60
AB39	DDR_VREF_DQ0	DDR1_DQ61	DDR1_DQ62
AB40	DDR_VREF_DQ1	DDR1_DQ63	DDR1_DQ64
		DDR1_DQ65	DDR1_DQ66
		DDR1_DQ67	DDR1_DQ68
		DDR1_DQ69	DDR1_DQ70
		DDR1_DQ71	DDR1_DQ72
		DDR1_DQ73	DDR1_DQ74
		DDR1_DQ75	DDR1_DQ76
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		DDR1_DQ79	DDR1_DQ80
		DDR1_DQ81	DDR1_DQ82
		DDR1_DQ83	DDR1_DQ84
		DDR1_DQ85	DDR1_DQ86
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		DDR1_DQ107	DDR1_DQ108
		DDR1_DQ109	DDR1_DQ110
		DDR1_DQ111	DDR1_DQ112
		DDR1_DQ113	DDR1_DQ114
		DDR1_DQ115	DDR1_DQ116
		DDR1_DQ117	DDR1_DQ118
		DDR1_DQ119	DDR1_DQ120
		DDR1_DQ121	DDR1_DQ122
		DDR1_DQ123	DDR1_DQ124
		DDR1_DQ125	DDR1_DQ126
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		DDR1_DQ129	DDR1_DQ130
		DDR1_DQ131	DDR1_DQ132
		DDR1_DQ133	DDR1_DQ134
		DDR1_DQ135	DDR1_DQ136
		DDR1_DQ137	DDR1_DQ138
		DDR1_DQ139	DDR1_DQ140
		DDR1_DQ141	DDR1_DQ142
		DDR1_DQ143	DDR1_DQ144
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		DDR1_DQ149	DDR1_DQ150</

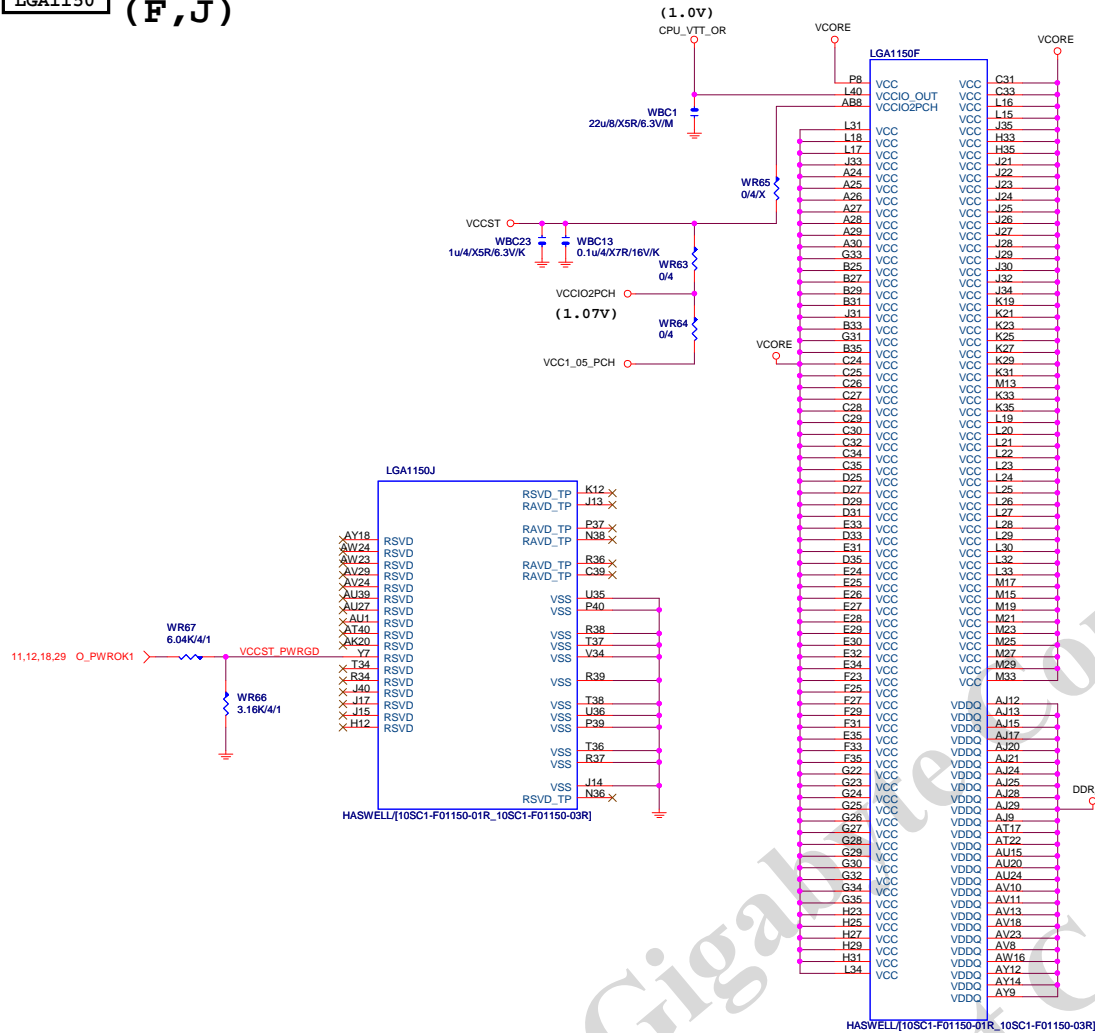
HASWELL/10SC1-F01150-01R 10SC1-F01150-03R

LGA1150
ILM_BP/1156/CSP

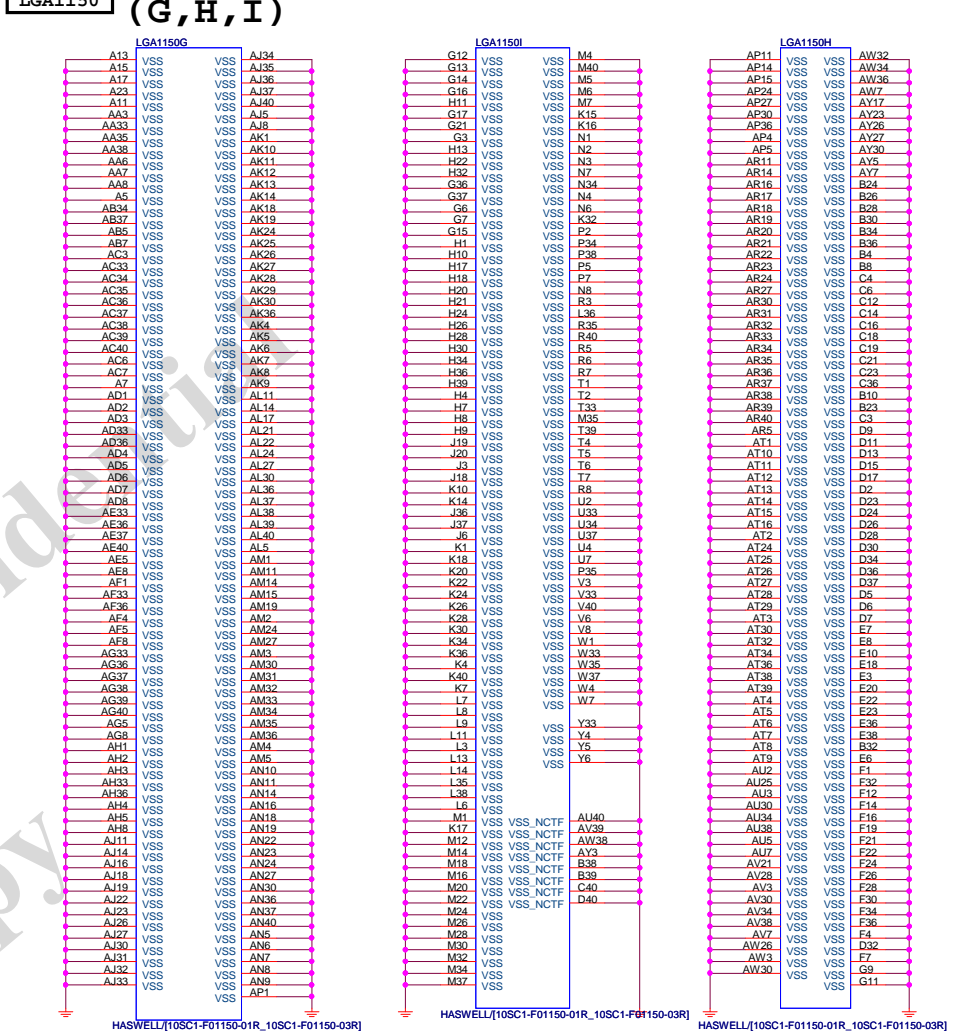
DDR BUS

7	MODT_A[0..3]	↔	MODT_A[0..3]
8	MODT_B[0..3]	↔	MODT_B[0..3]
7	MDA[0..63]	↔	MDA[0..63]
8	MDB[0..63]	↔	MDB[0..63]
7	DQSA[0..7]	↔	DQSA[0..7]
7	-DQSA[0..7]	↔	-DQSA[0..7]
7	MAAA[0..15]	↔	MAAA[0..15]
8	MAAB[0..15]	↔	MAAB[0..15]
8	DQSB[0..7]	↔	DQSB[0..7]
8	-DQSB[0..7]	↔	-DQSB[0..7]

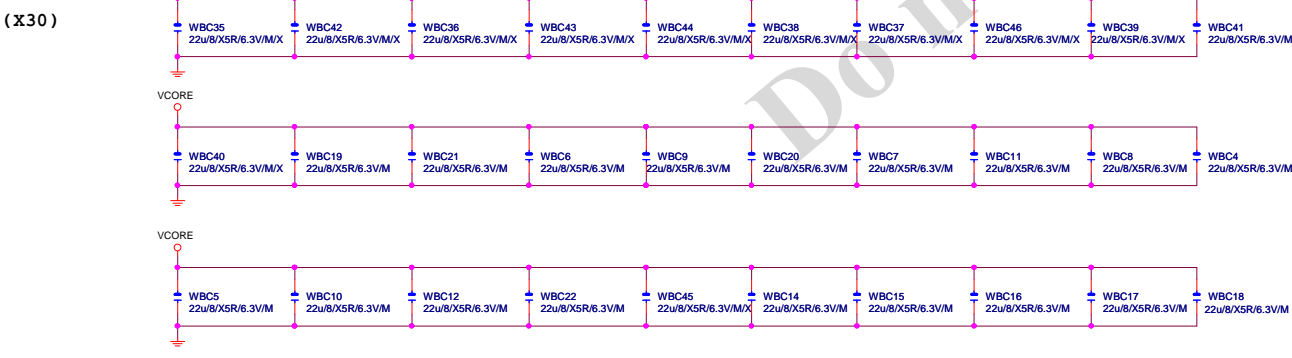
LGA1150 (F, J)



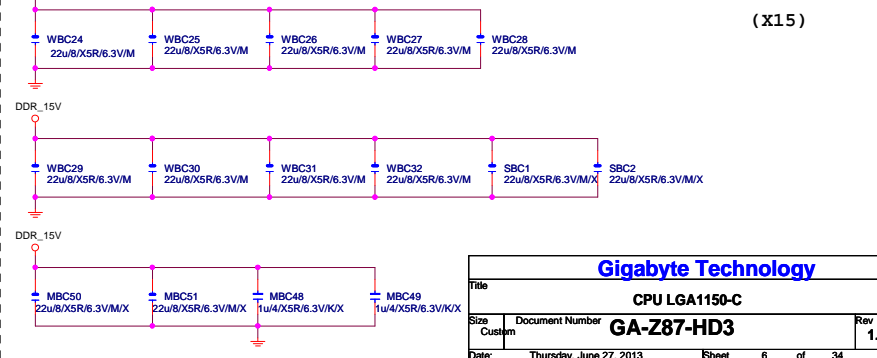
LGA1150 (G, H, I)

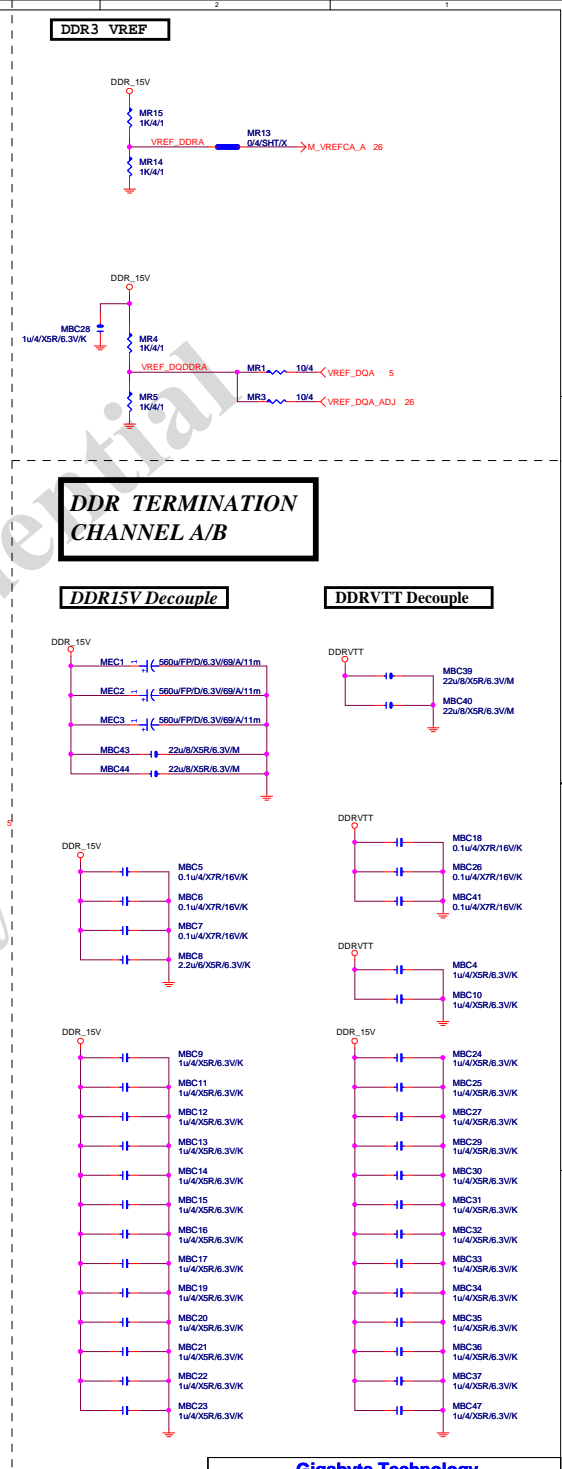


VCore CAP (X30)



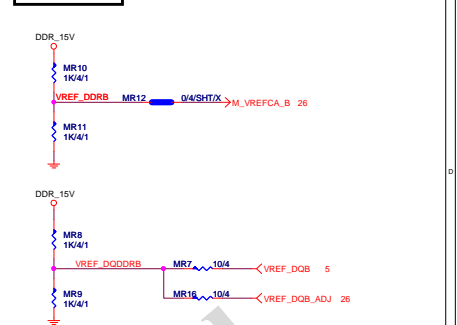
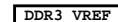
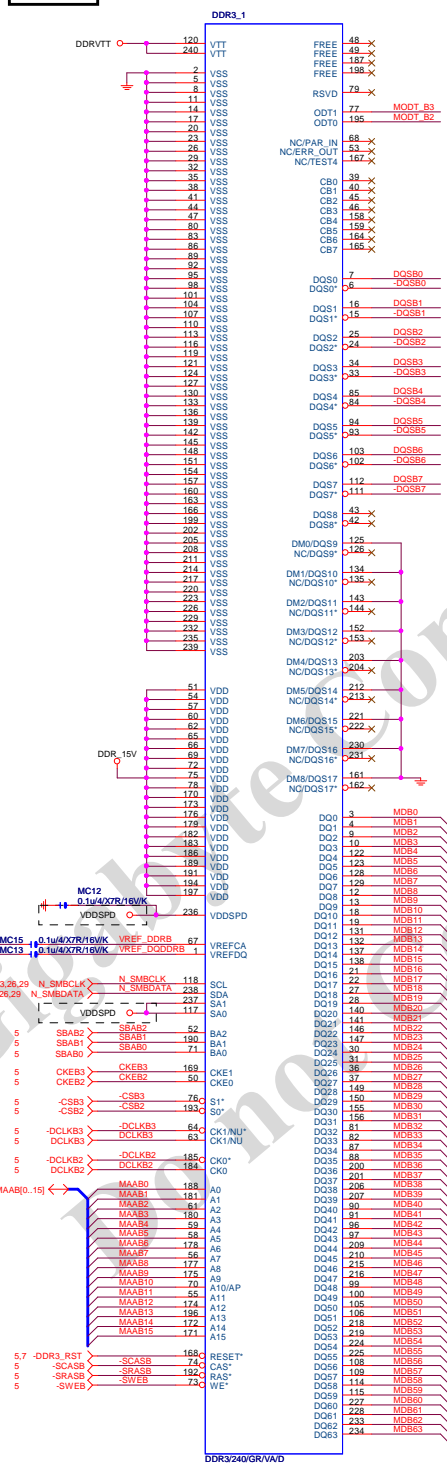
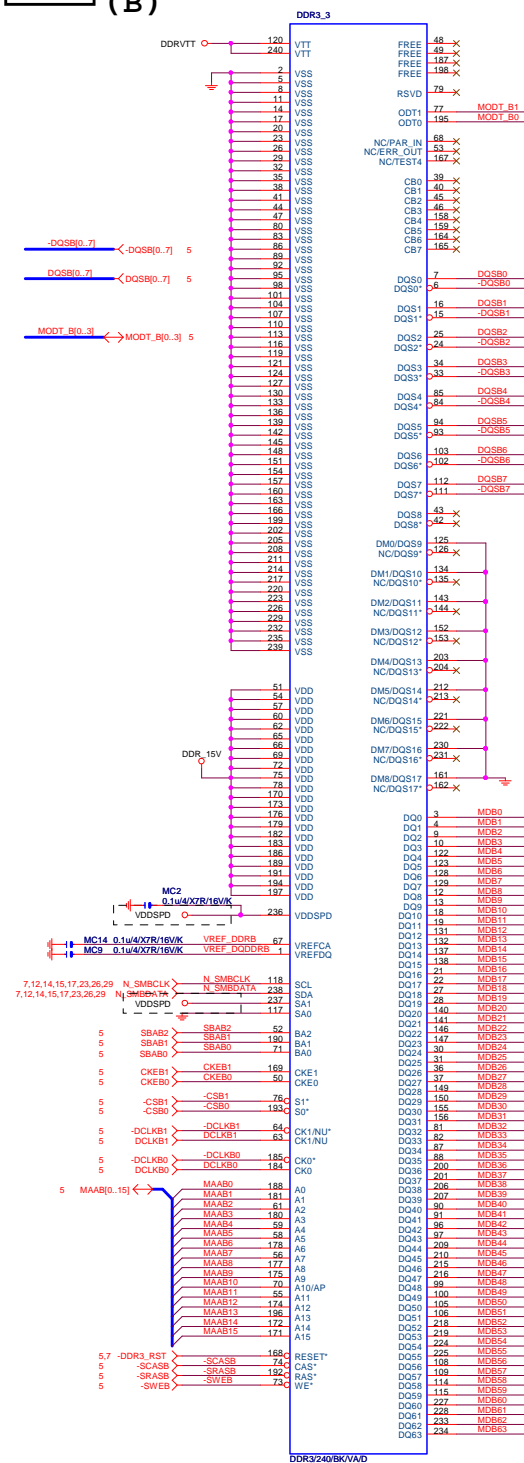
DDR CAP (X15)







(B)



DDR3 1066,1333,1600MHZ BANDWIDTH

```
| DDR3 1066MHZ
```

```
DDR3 clock=533MHZ
```

DDR3 single channel bandwidth=533x2x8Byte=8.5GB/s

DDR3 dual channel bandwidth=533x2x2x8Byte=17GB/s

DDR3 1333MHZ

```
DDR3 clock=667MHZ
```

DDR3 single channel bandwidth=10.6GB/s

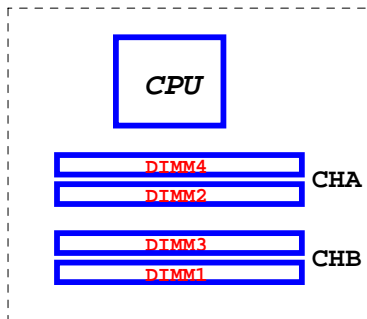
DDR3 dual channel bandwidth=21GB/s

DDR3 1600MHZ

```
| DDR3 clock=800MHZ
```

```
DDR3 single channel bandwidth=12.8GB/s
```

DDR3 dual channel bandwidth=25.6GB/s



CHA

Critique

QED

CHB

CHA

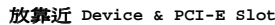
QED

Gigabyte Technology

Title					DDRIII CHANNEL B					
Size	Document Number				GA-Z87-HD3					Rev
Custom										1.
Date:					Sheet	8	of	34		

DMI:12/4/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%

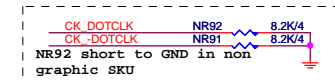
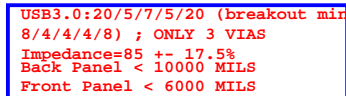
PCHB Impedance=85 +- 15%



DH82Z87/S/[10HB1-030Z87-20R]

PCH PCIE ,DMI 4/4/4//15 Impedance=85 +- 15%

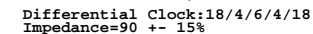
usb2.0 5/7/5//12
usb3.0 5/7/5//20 Impedance=85 +- 15%



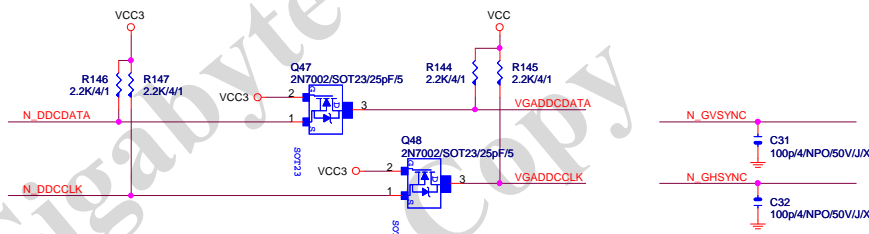
1
1

USB OC#	Configure
OC0#	USB0,1
OC1#	USB2,3
OC2#	USB4,5
OC3#	USB6,7
OC4#	USB8,9
OC5#	USB10,11
OC6#	USB12,13
OC7#	Not Use

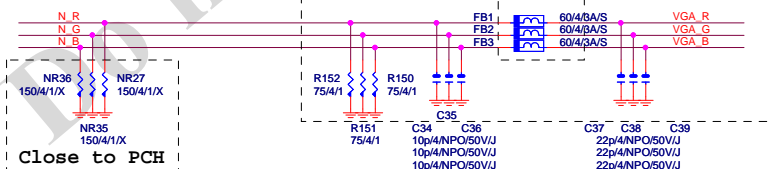
PCH (G)



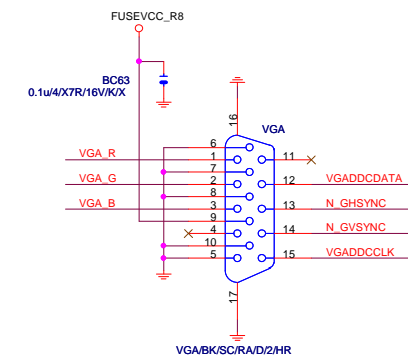
VGA DDC



VGA DDC



FUSEVCC_R8



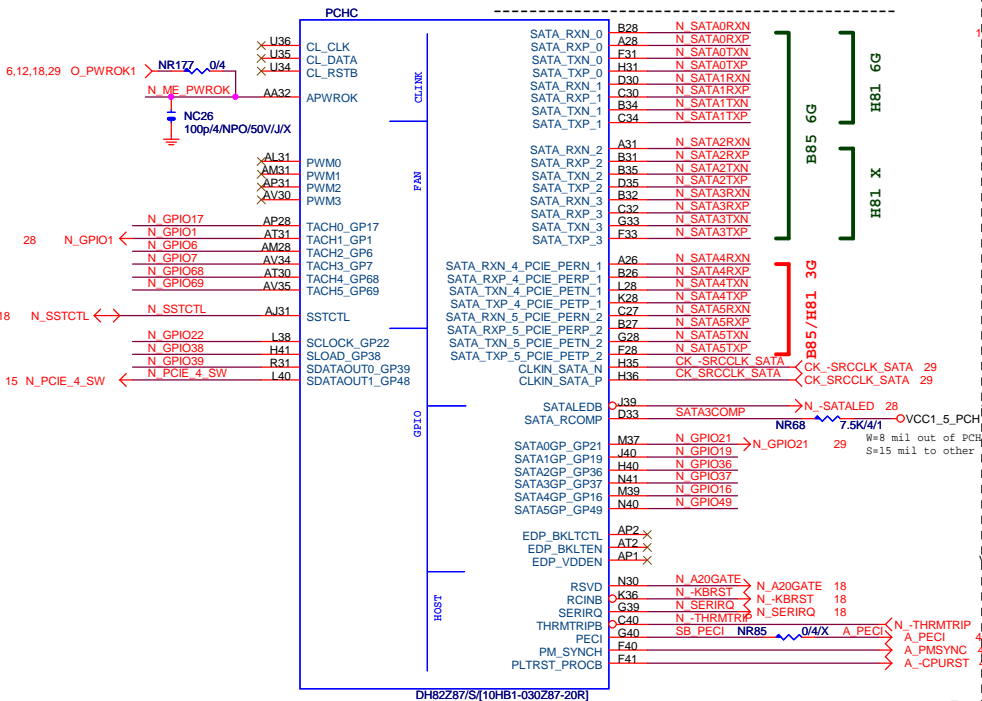
PCH (C)

SATA3 : 20/4/4/4/20 (breakout min 8/4/4/4/8)

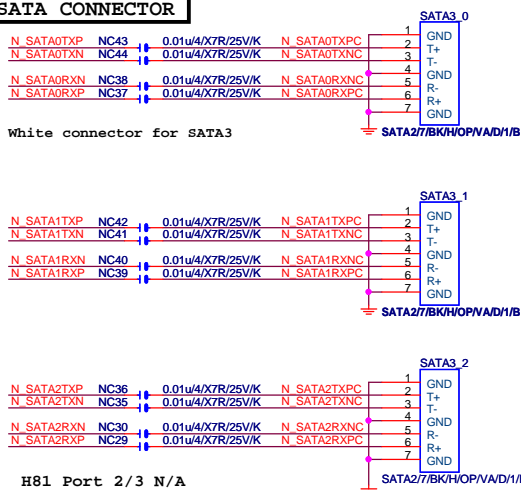
Impedance=85 +- 17.5%

SATA2 4/4/4//15

SATA3 4/4/4//20

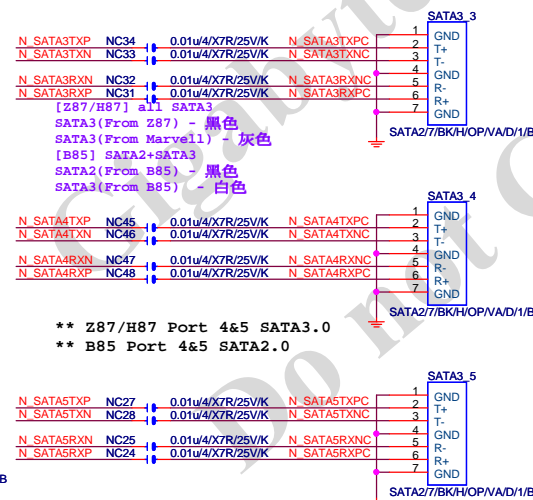


SATA CONNECTOR

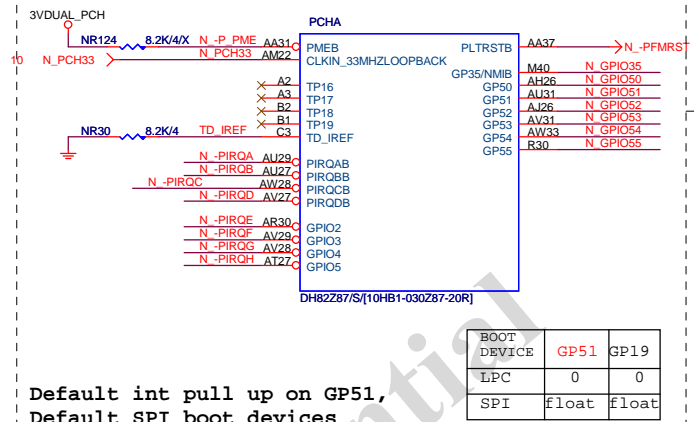


** Z87/H87 Port 4&5 SATA3.0

** B85 Port 4&5 SATA2.0

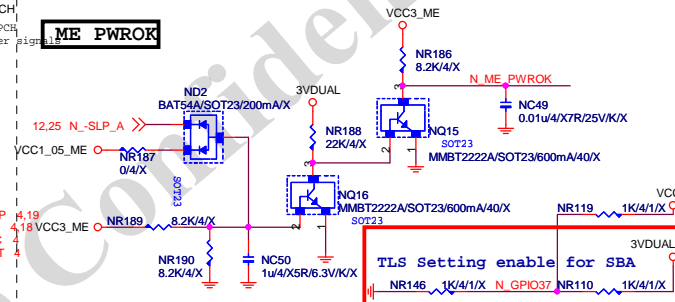


PCH (A)



```
Default int pull up on GP51,
Default SPI boot devices
```

ME PWROK

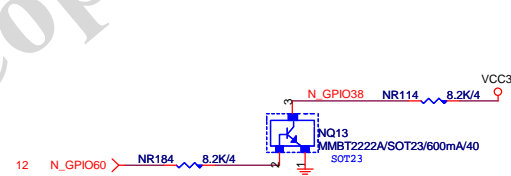


GPIO38 Ctrl

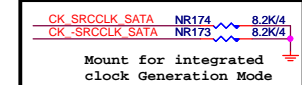
MFG Mode

```
N_GPIO38 : Lo --> Enable
```

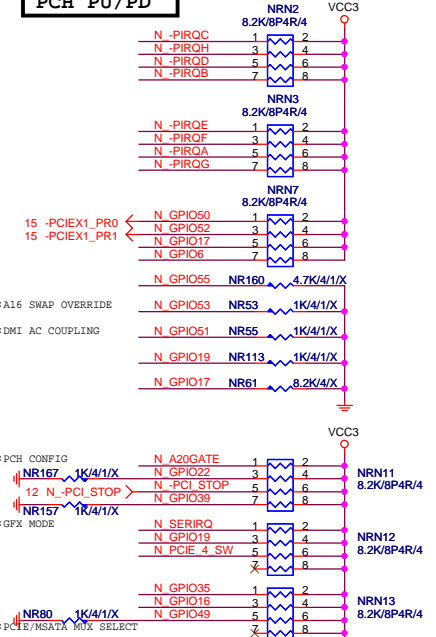
Hi --> Disable



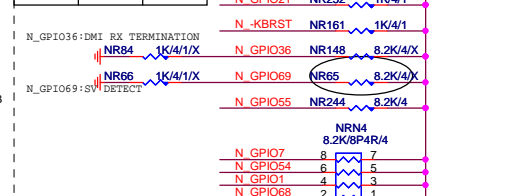
PCH CLK PD



PCH PU/PD



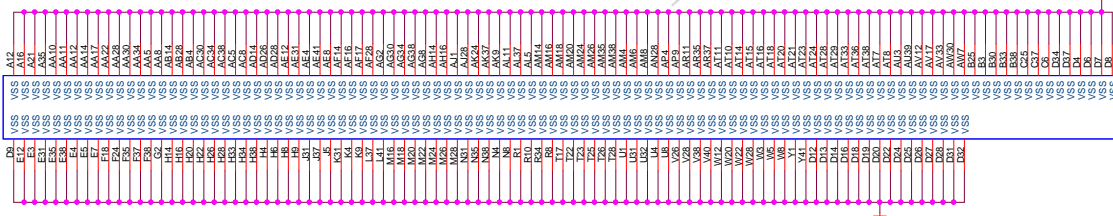
soft strap	GP16	GP49
0	pcie1	pcie2
1	sata4	sata5



Gigabyte Technology

Title			
PCH HOST , SATA, PCI			
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PCH (I)



SHT PWR

VCC3_ME 3VDUAL_PCH

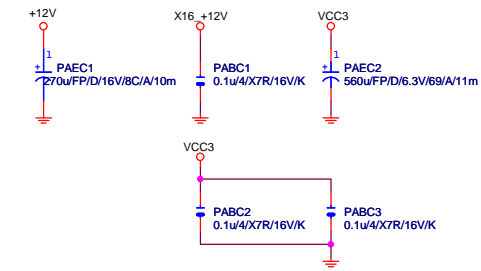
NBC58 NBC65

1u4/X5R/6.3V/K 1u4/X5R/6.3V/K

(1.05V) (x5)

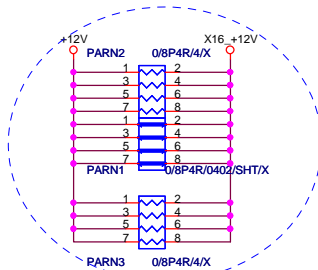
$$(1.05V)(x_2) - (3.3V)(x_2)$$

PCIEX16 CAP



PCIEX16 PROTECT SHT

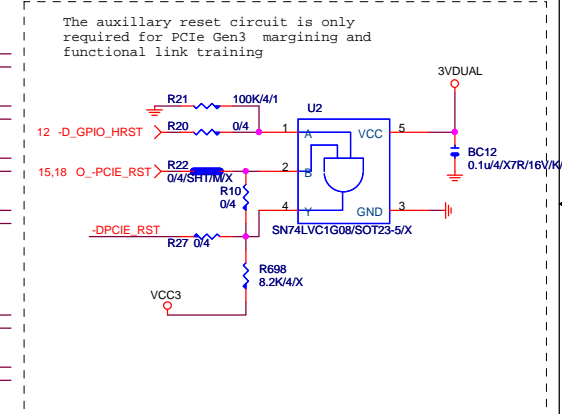
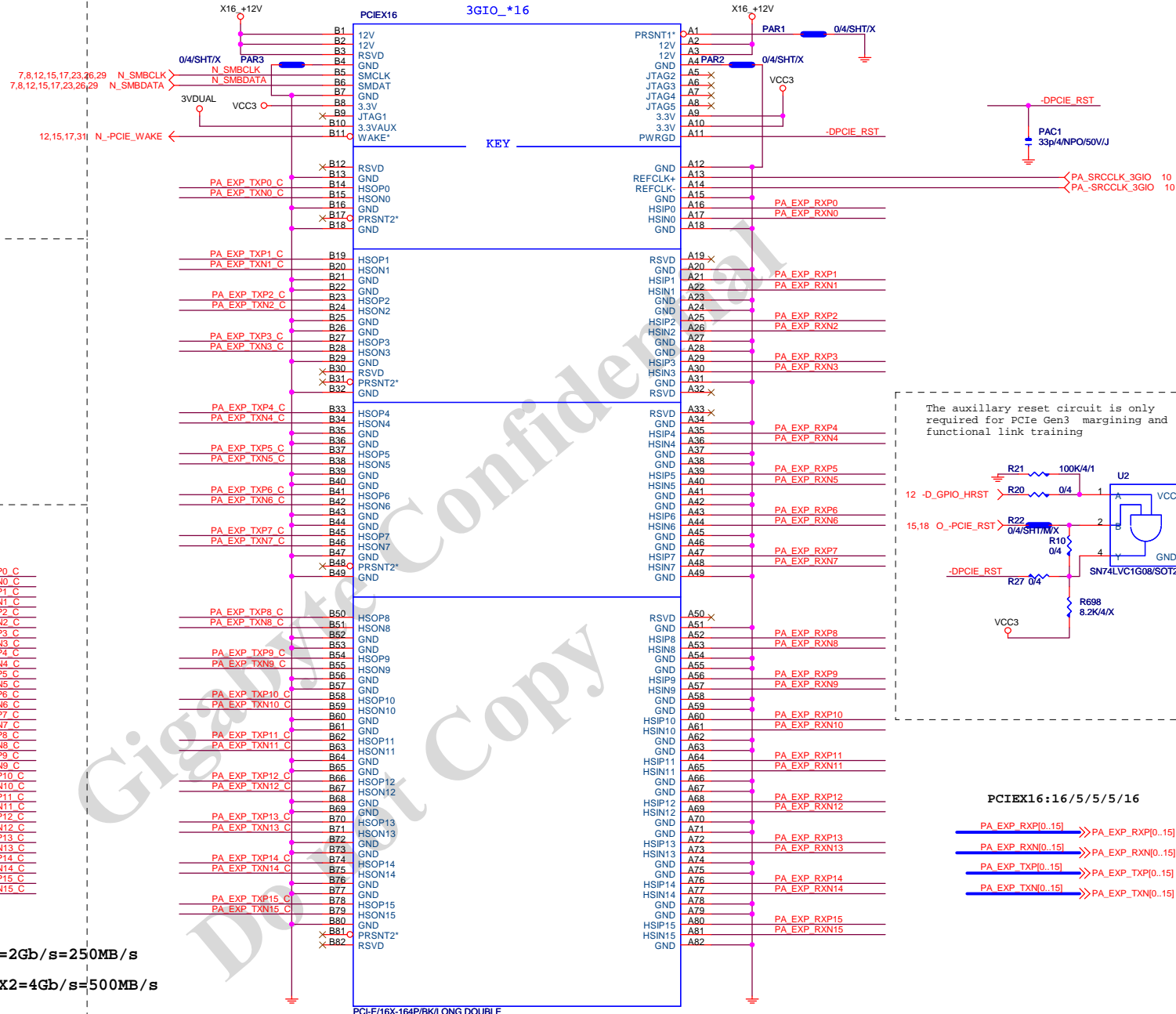
+12 protect short-wire test



PCIEX16 AC CAP

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

PCIEX16 SLOT



PCIEX16:16/5/5/5/16

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

PCI-E REV:1.1--> 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

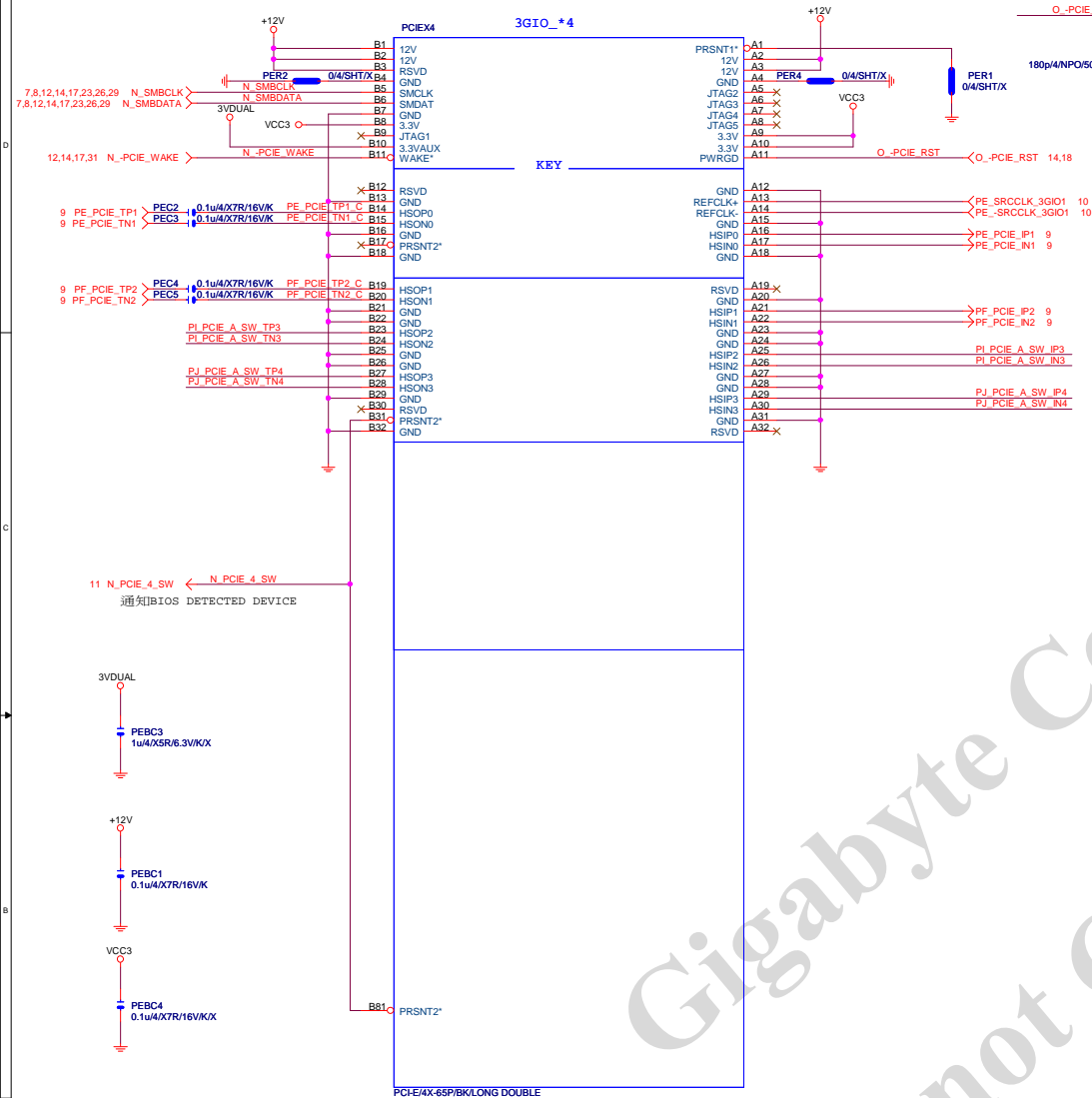
PCE-E X16(單向) BANDWITH=2.5GHz*(8b/10b)X16=32Gb/s=4GB/s

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

PCI-E REV:2.0--> 5GHZ

Gigabyte Technology			
PCI EXPRESS * 16			
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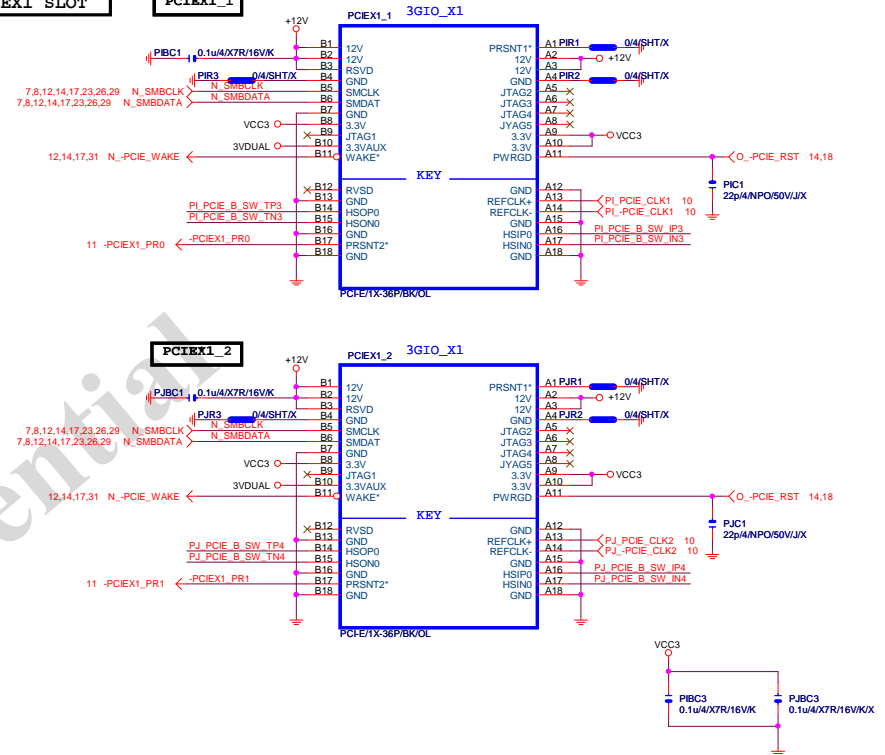
PCIEX4 SLOT



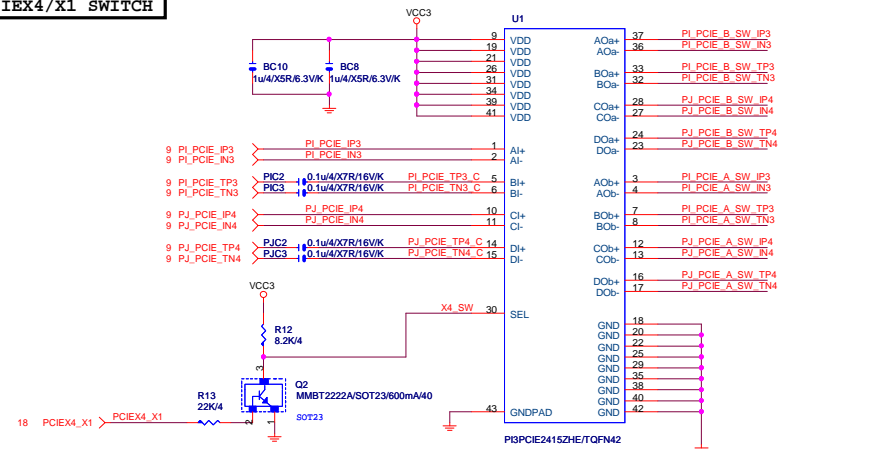
	N_PCIE_4_SW (PCH GPIO48)	PCIEX4_X1 (SIO_GPIO26)
PCIEX4 No devices	H	H
PCIEX4 -> X1	H	H
PCIEX4 Have devices	L	L
PCIEX4 -> X4	L	L
PCIEX1_1/2 -> N/A		

PCIEX1 SLOT

PCIEX1_1

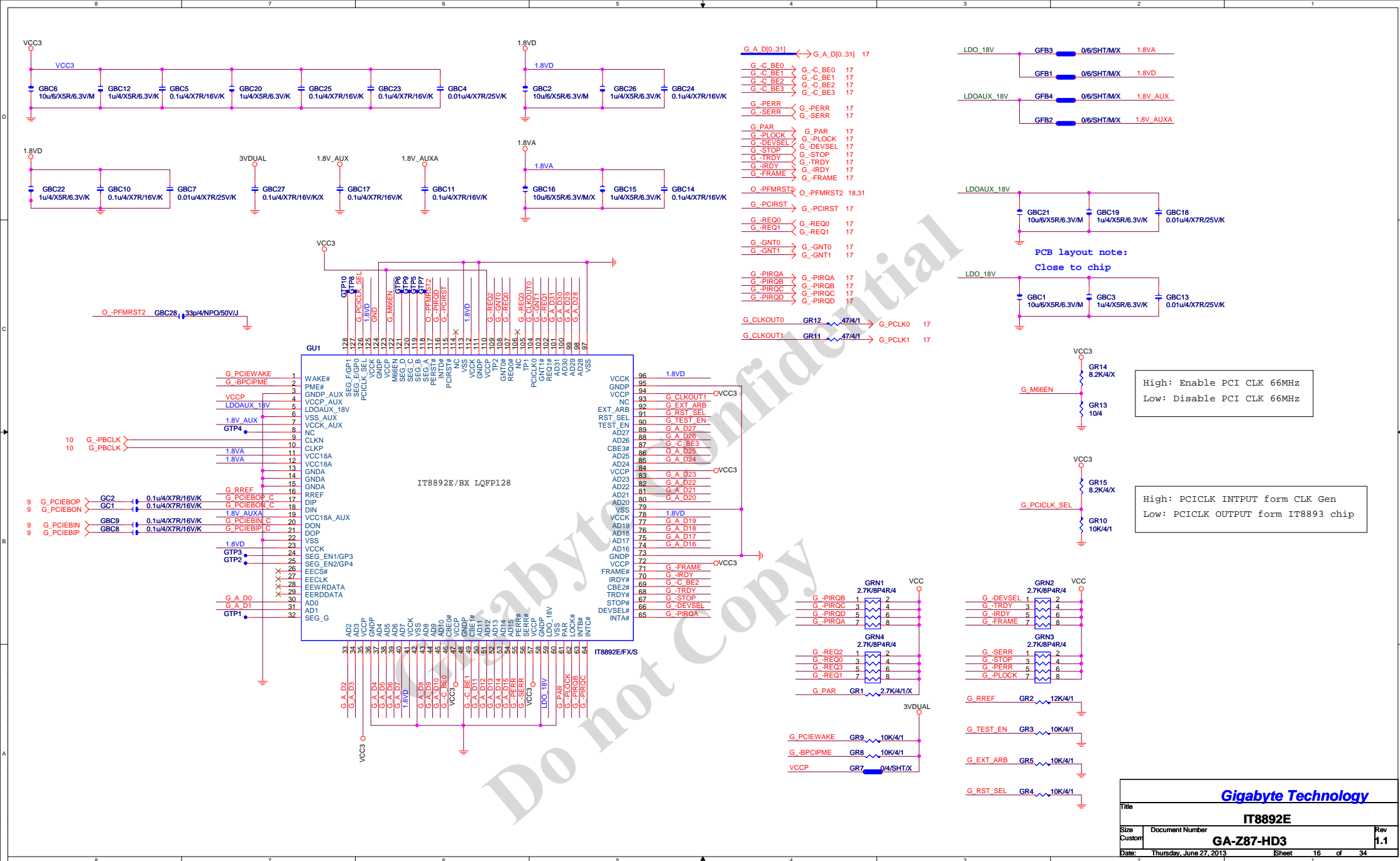


PCIEX4/X1 SWITCH



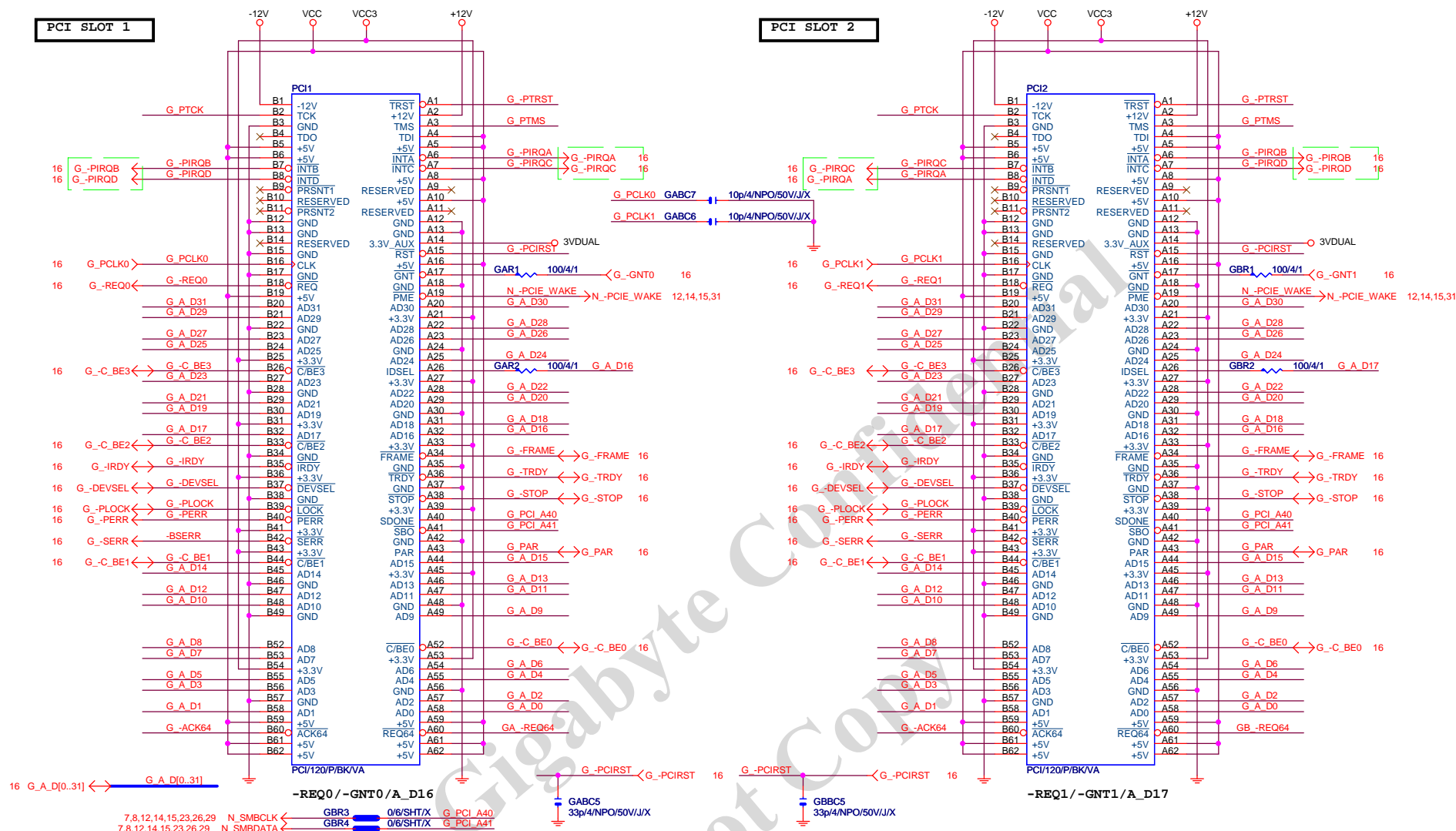
Function	SEL
xI--> x0a	L;PCIEX4 SLOT-->X1
xI--> x0b	H;PCIEX4 SLOT-->X4

Gigabyte Technology			
Title	PCIE X1 1,2		
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PCI SLOT 1

PCI SLOT 2



SIO IT8728F

SYS_FAN3

CPU_OPT

CPU_FAN

SYS_FAN1

SYS_FAN2

IT8728F(GB)

【技術通報R&D技術通報151】
有使用PRINT PORTの MODEL
需使用新料號:10HP2-118728-72R

IT8728F/EX (GB)/QFP128[10HP2-118728-72R]

R&D技術通報151 有使用PRINT PORTの
MODEL 需使用新料號:10HP2-118728-72R。(CHIP IT8728F/EX (GB) ITE/SMD
QFP128 PRINTPORT SORTING)料件。串電阻33 ohm改為68 ohm。

PWR SHT

For 8728_EUP function

3VDUAL_PCH OR25 0.1u/4X7R/16V/K IT_VCCH

VCC3 OR49 0.1u/4X7R/16V/K IT_AVCC

SIO PU

SVID_CTRL OR84 8.2K/4 3VDUAL_PCH

PCIE4_X1 OR14 8.2K/4 3VDUAL_PCH

-5VSB_CTRL OR6 8.2K/4 3VDUAL_PCH

-THERM OR28 8.2K/4 VCC3

N_LDRQ0 OR27 1K/4/1 VCC3

ITE_PWROK2 OR16 1K/4/1 VCC3

ITE_PWROK OR10 1K/4/1 VCC3

O_PCIE_RST OR71 1K/4/1 VCC3

O_PFMIRST1 OR19 1K/4/1 VCC3

O_PFMIRST2 OR2 1K/4/1 VCC3

N_A20GATE OR31 680/4/1X

Hi :Disable WDT
Lo :Enable WDT to rest PWROK

SIO STRAP

JP3--- High SPI-Flash Disable
Low SPI-Flash Enable

OR33 1K/4/1X JP2 OR36 8.2K/4 VCC3
OR80 8.2K/4X JP4 OR32 8.2K/4 VCC3
JP5: N/A FOR 8728 DX
JP5: PULL DOWN FOR 8728 EX
anti-surge enable

EUP control detect

3VDUAL_PCH OR47 100/4/1 28 3VSB

JP4	1	k8 power sequency function is Disable
	0	k8 power sequency function is Enable
JP3	1 1	The default value of EC Index 63h/6Bh/73h is 80h.
	0 1	The default value of EC Index 63h/6Bh/73h is FFh.
JP5	1 0	The default value of EC Index 63h/6Bh/73h is 00h.
	0 0	The default value of EC Index 63h/6Bh/73h is 40h.

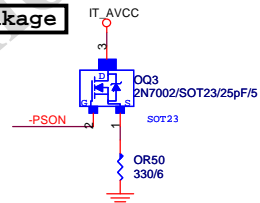
IT8728F NOTE

	IT8728
PIN121	VCORE_EN/PCH_C0
PIN120	VLD2_EN/PCH_D0
PIN19	ATXPG
PIN31	PCH_C1
PIN53	SST/AMDTSL_D/MTRB#/PCH_D1
PIN55	PECI/AMDTSL_C/DRV#
PIN66	SYS_3VSB
PIN70	GP47
PIN95	VIN2(VCC5)
PIN96	VIN1(VCC12)
PIN97	VIN1/VDIMM_STR(1.5V)
PIN98	VIN0/VCORE(1.1V)/NC

DUAL BIOS OPT STRAP

CEB_N OR58 680/4/1X
OR56 1K/4/1 VCC3

Power leakage



SIO_18V

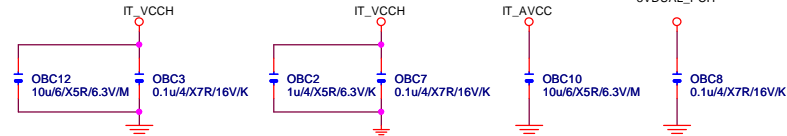
internal power pin, max 22nF cap



MB ID

VCC3 OR7 8.2K/4 MB_ID2
OR15 8.2K/4X
VCC3 OR51 8.2K/4 MB_ID3
OR48 8.2K/4X

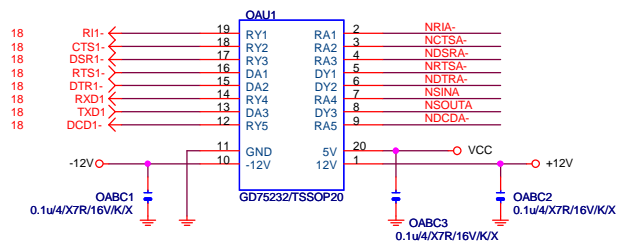
SIO CAP



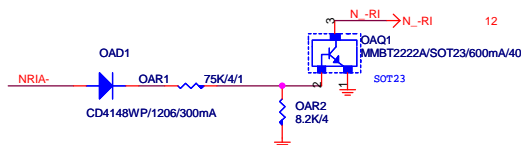
Gigabyte Technology

Title			ITE 8728 LPC IO
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			Rev 1.1

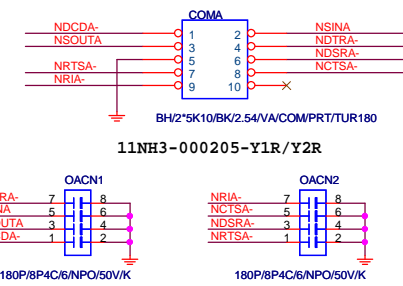
COMA



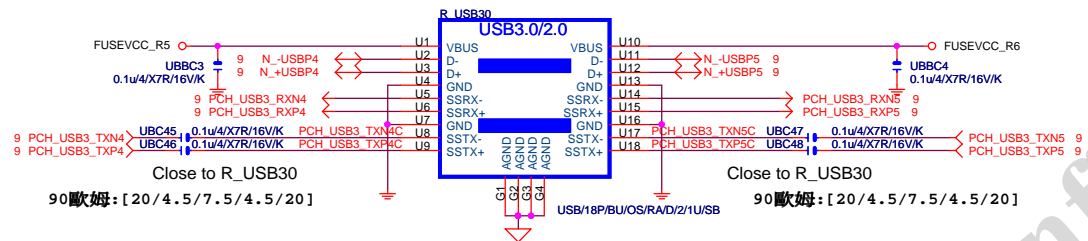
COM RI



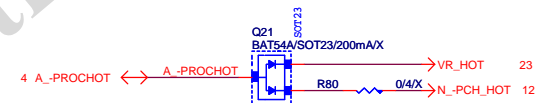
COM BUFFER



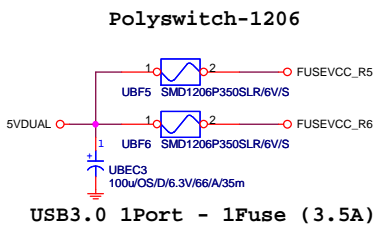
USB30_20 CONNECT



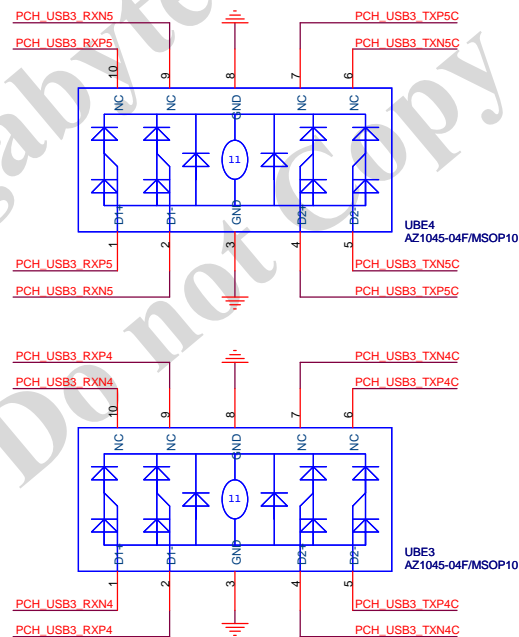
-PROHOT



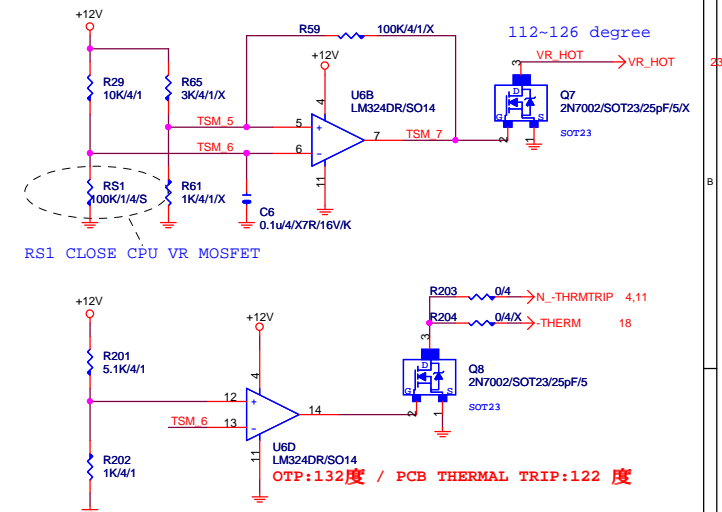
USB30 PWR



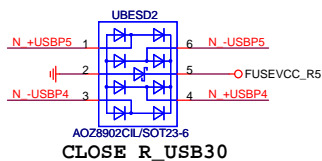
USB30 ESD PROTECT



-PROHOT



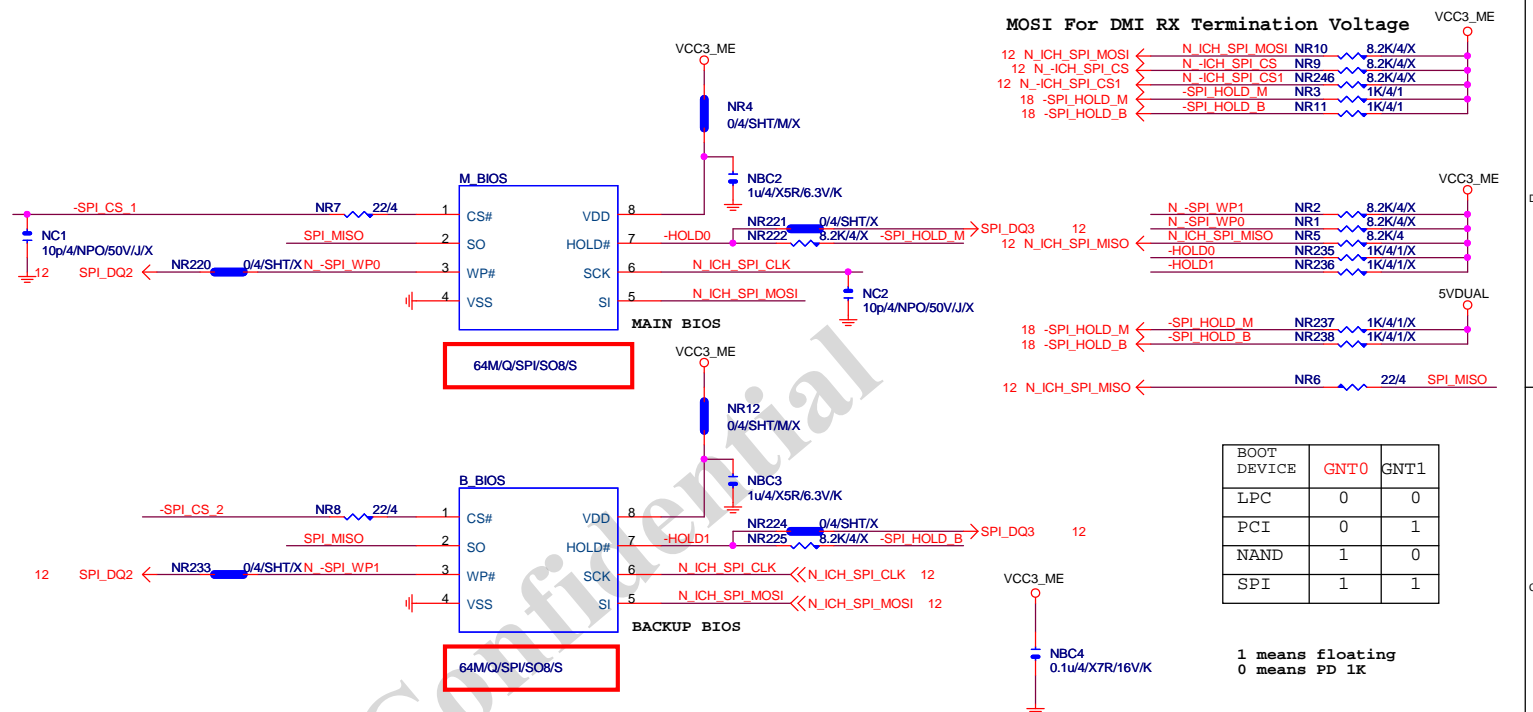
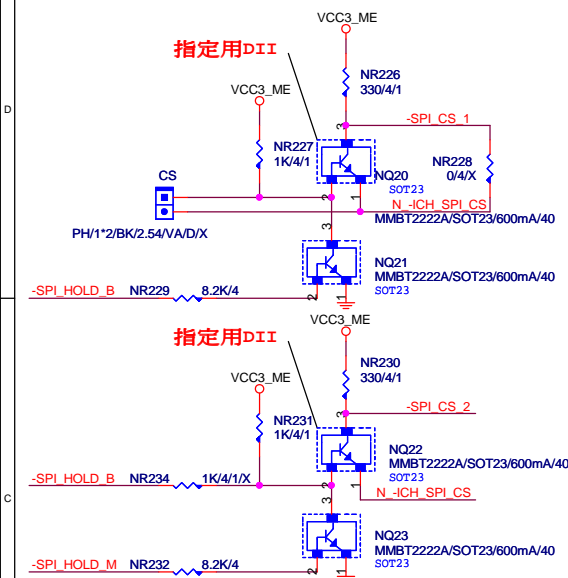
USB20 ESD PROTECT



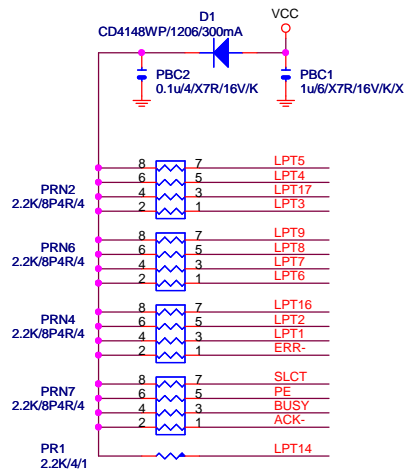
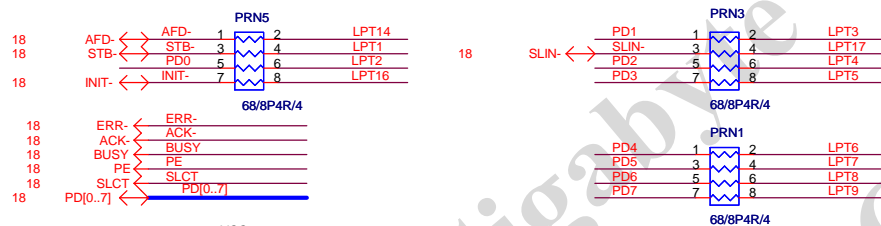
Gigabyte Technology

Title			
COM/ PROHOT/ R_USB			
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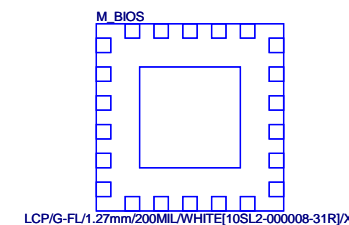
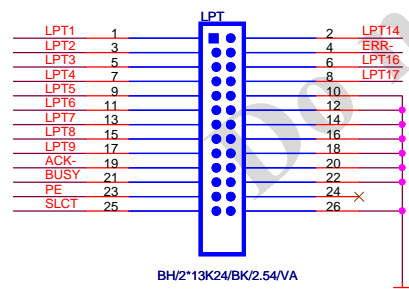
DUAL BIOS



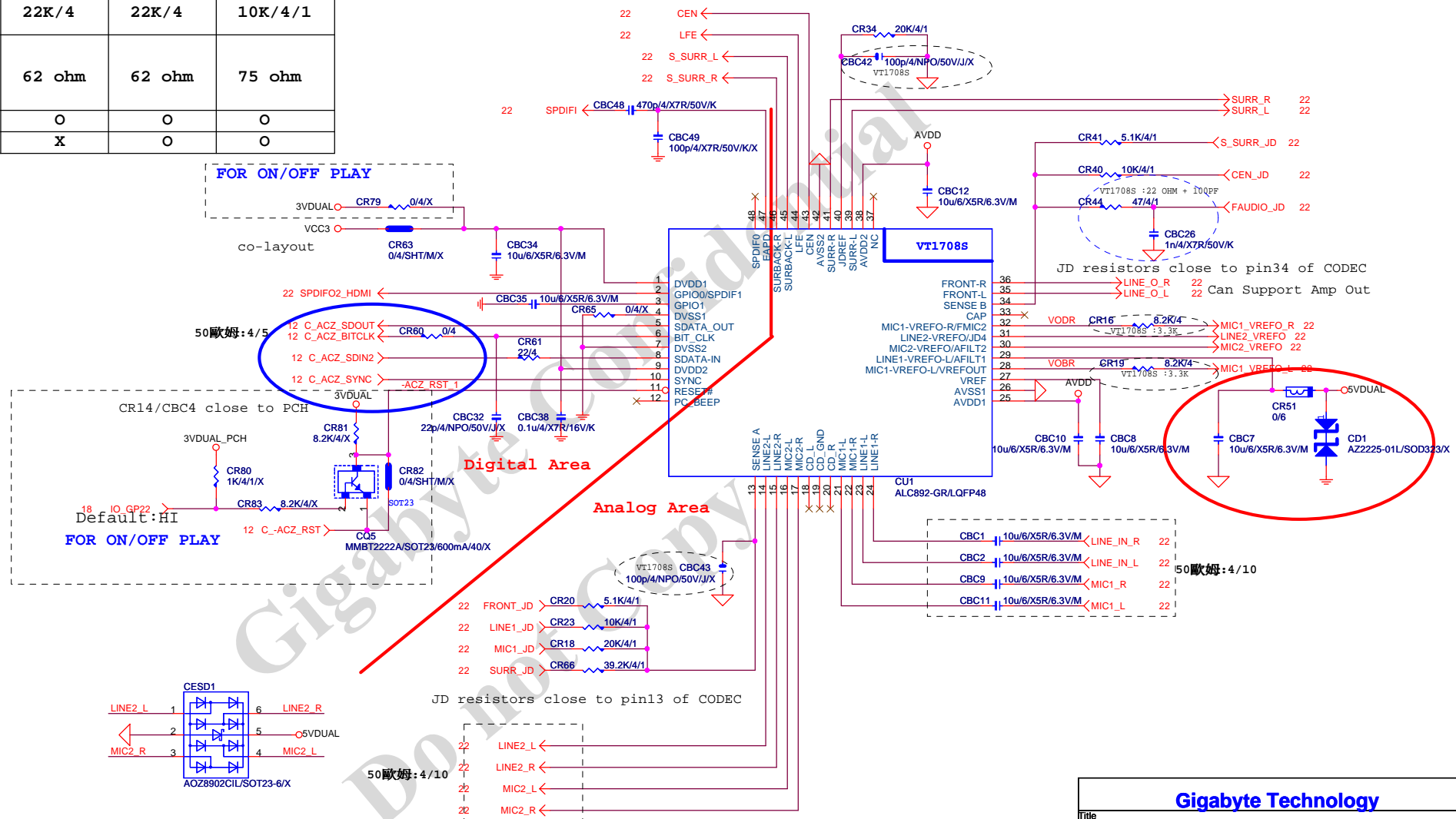
LPT PORT

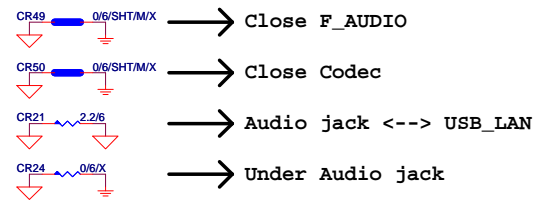


R&D技術通報151 有使用PRINT PORT的
MODEL，需使用新料號：10HP2-118728-72R。(CHIP IT8728F/EX (GB) ITE/SMD
QFP128 PRINTPORT SORTING)料件。串電阻33 ohm改為68 ohm。

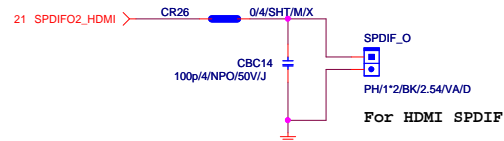


	ALC892	ALC887-VD2	VT1708S-CE
CR44/CBC26	47ohm+1nF	47ohm+1nF	22ohm+100P
CBC42/CBC43	X	X	100P/4
CR16/CR19 CR52/CR56/CR10/CR9	8.2K/4	8.2K/4	3.3K/4/1
CR6/CR7/CR58/CR54/ CR67/CR68/CR69/CR70	22K/4	22K/4	10K/4/1
CR5/CR8/CR1/CR14/ CR17/CR22/CR73/CR74/ CR13/CR11/CR57/CR53/ CR75/CR76	62 ohm	62 ohm	75 ohm
CR51/CD1/CBC7	O	O	O
CESD1	X	O	O

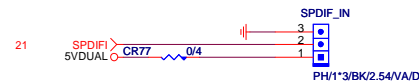




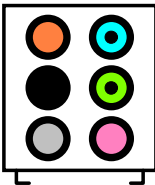
SPDIF_OUT



SPDIF_IN



AZALIA JACK

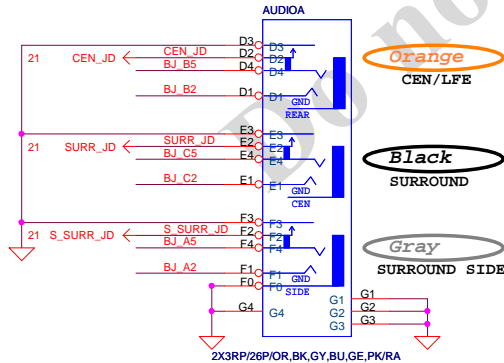
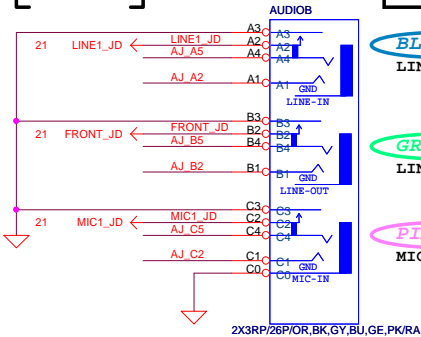


AZALIA JACK

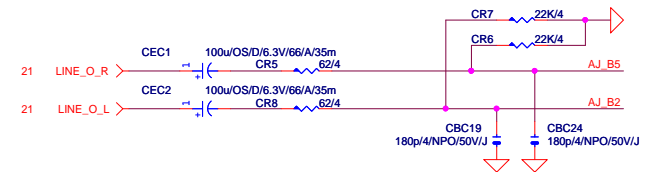
BLUE
LINE-IN

GREEN
LINE-OUT

PINK
MIC-IN



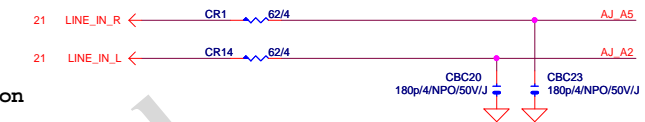
LINE-OUT



LINE-IN

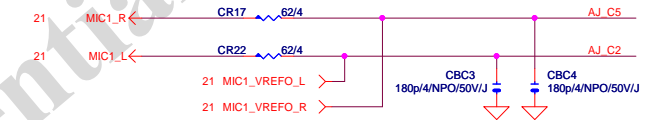
Verify MIC function
in LINE-in

Only reserved for ALC888

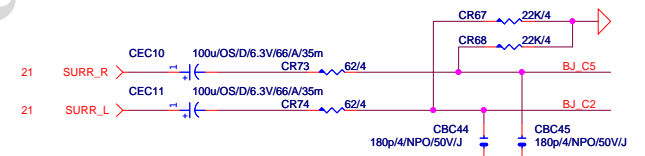


For 889A/888

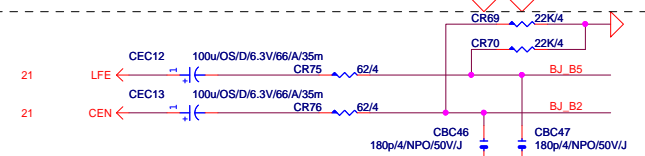
MIC-IN



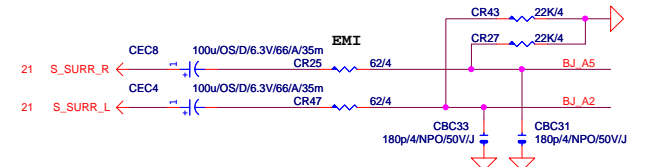
SURROUND



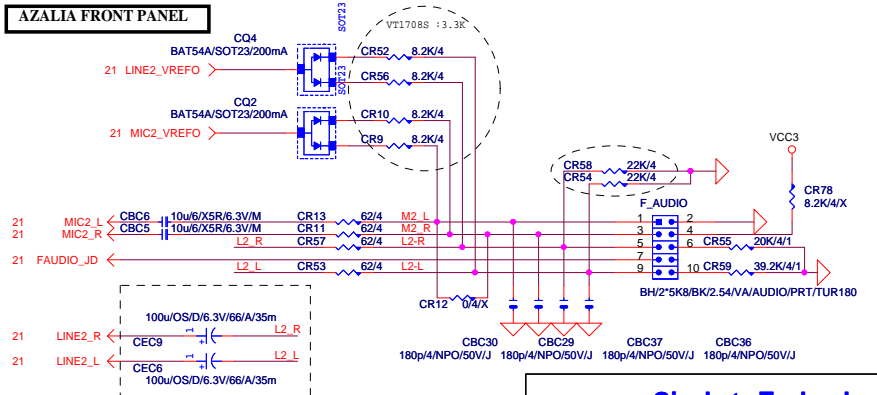
CEN/LFE



SURR BACK



AZALIA FRONT PANEL

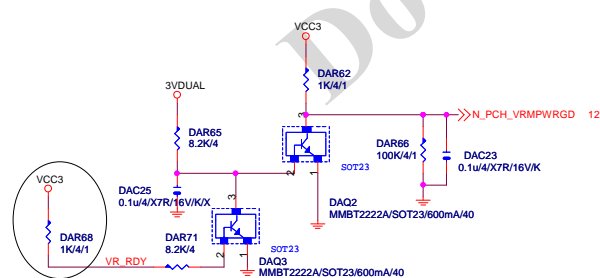
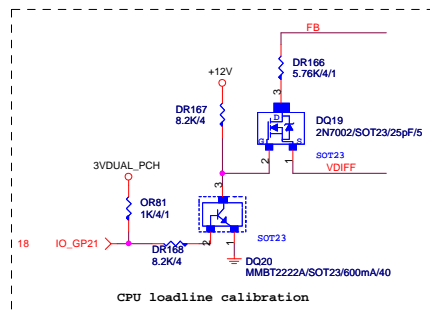
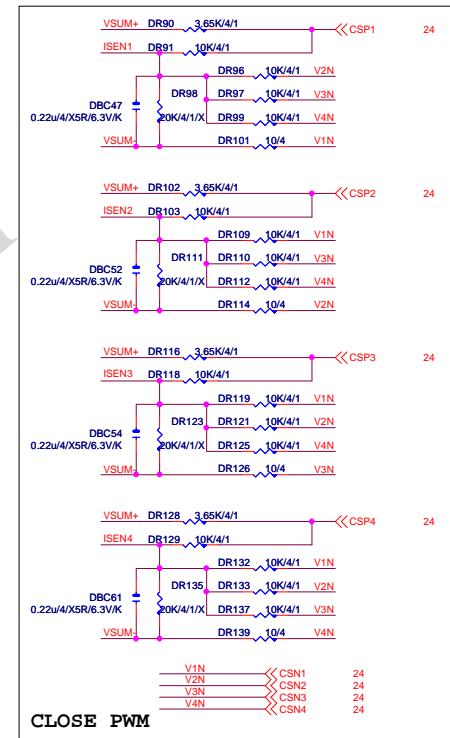
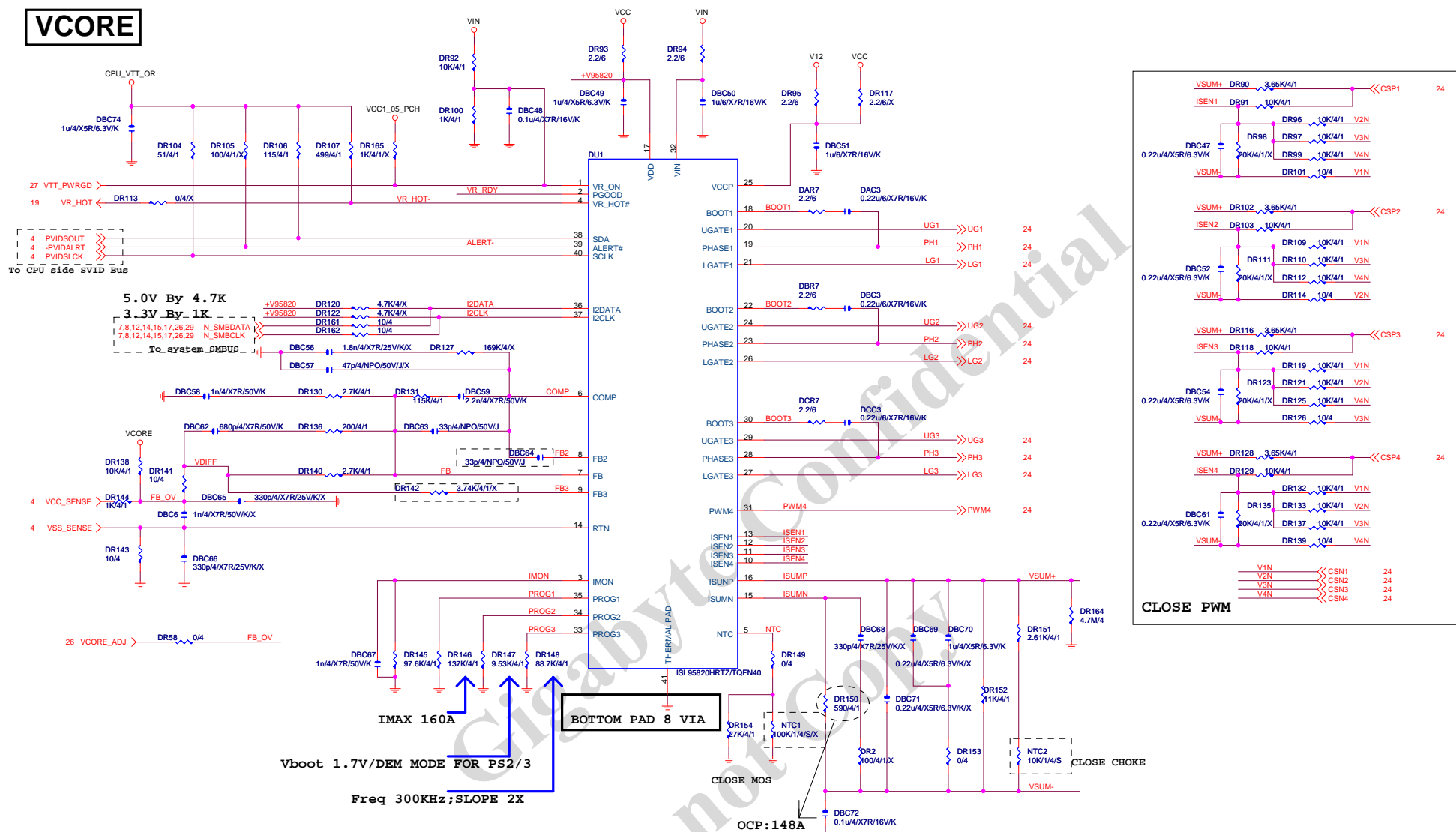


Gigabyte Technology

AUDIO JACK

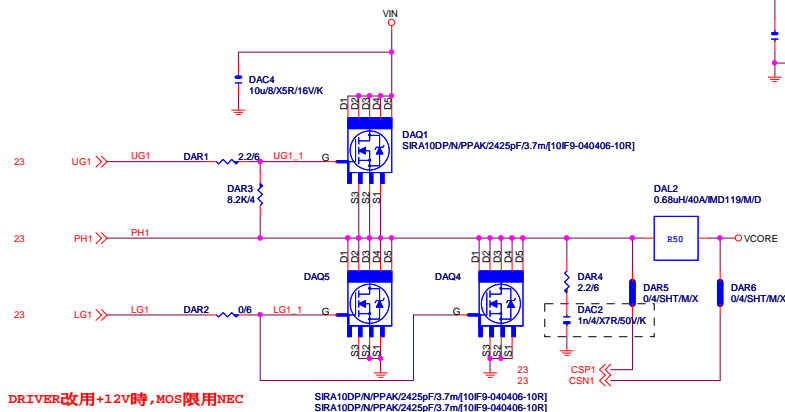
GA-Z87-HD3

Title	Document Number	Rev
Size Custom	GA-Z87-HD3	1.1
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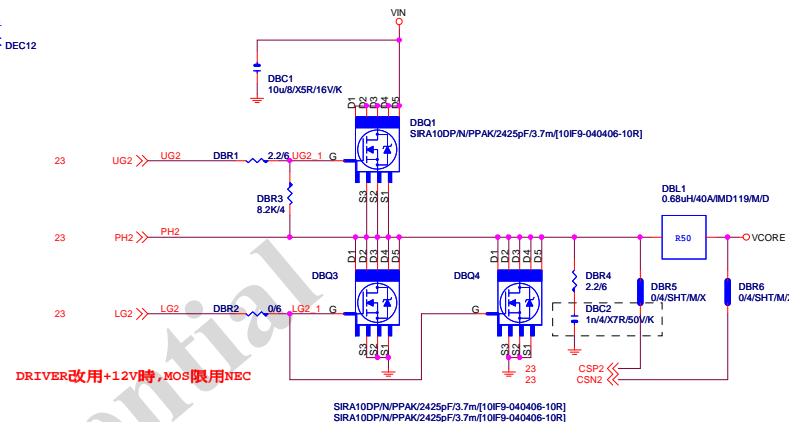
VCORE

VCORE

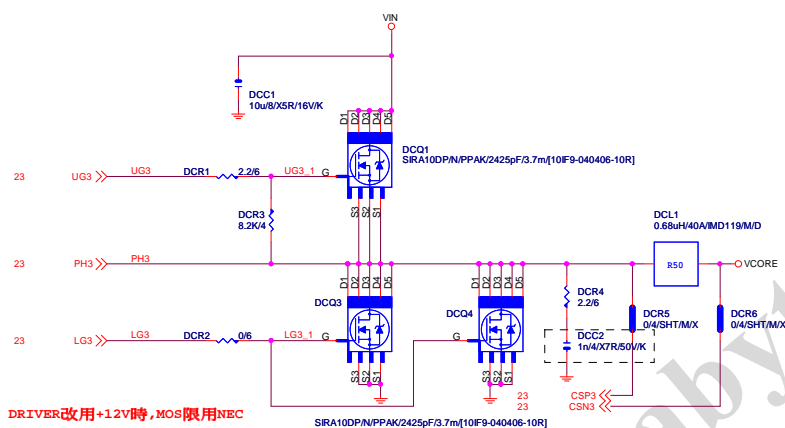
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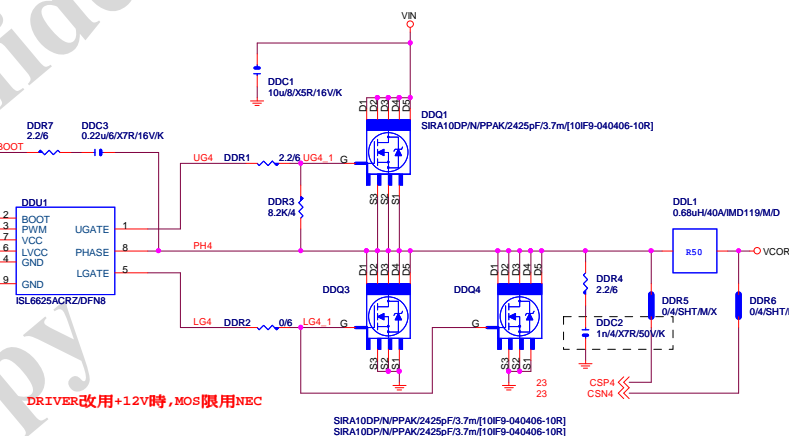
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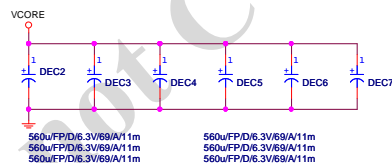
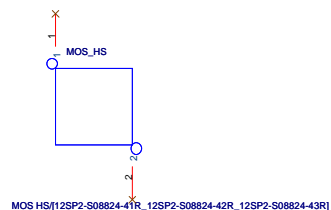
[3]



[4]

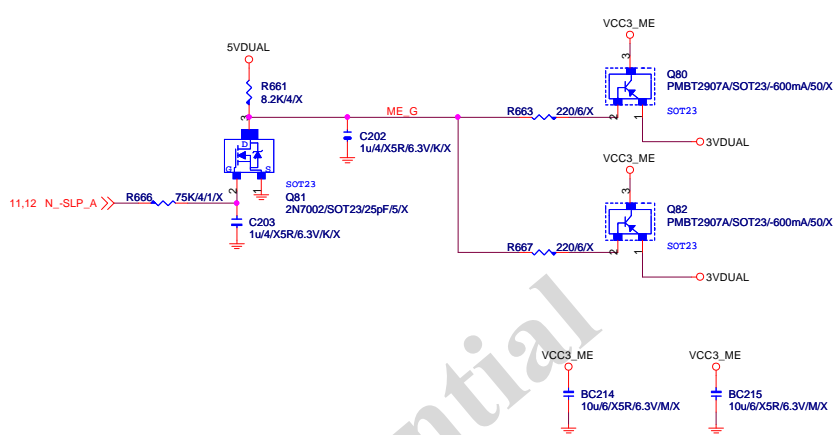


MOSFET HEATSINK

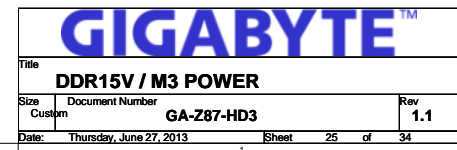


Gigabyte Technology		
Title	ISL95820_2	
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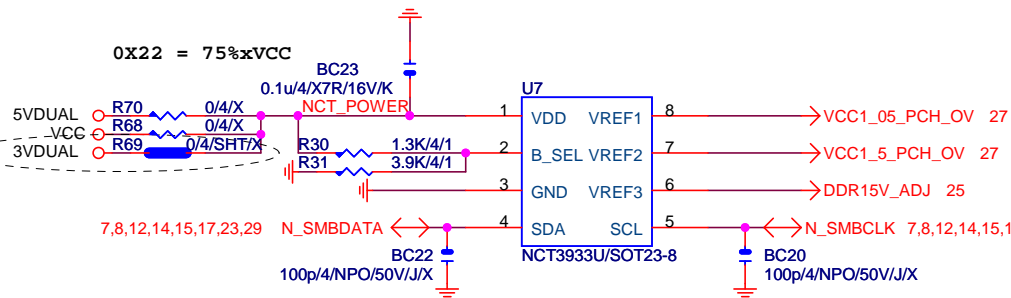
VCC3_ME



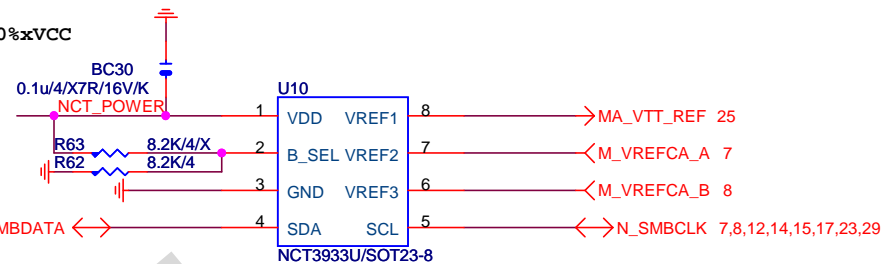
DDRVTT



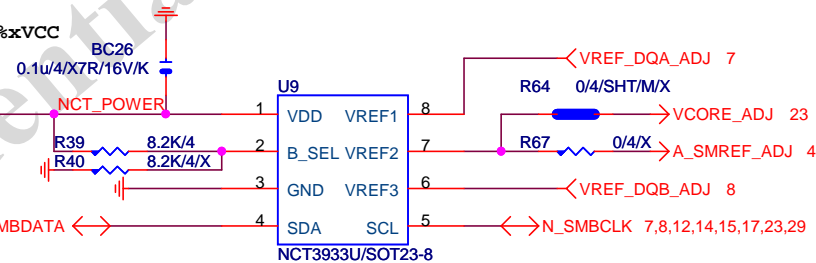
OVER VOLTAGE



0X2A = 0%xVCC



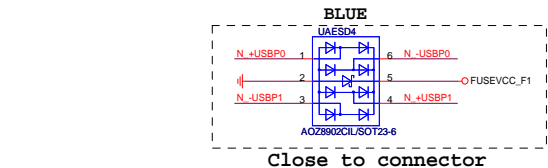
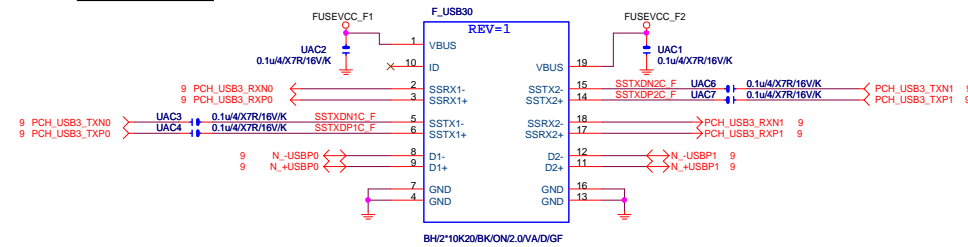
0X20 = 100%xVCC



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

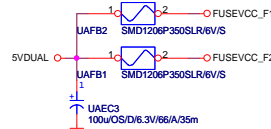
Gigabyte Technology		
CPU CORE VR-2		
Size Custom	Document Number	Rev
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Front USB3.0

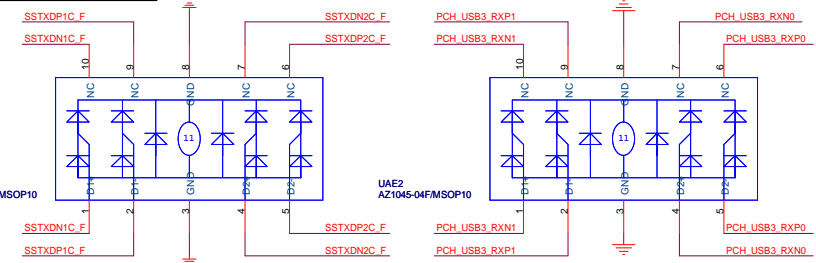


Close to connector

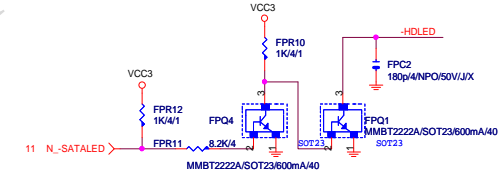
F_USB30 PWR



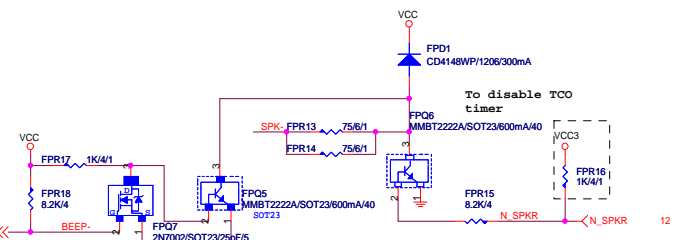
F_USB30 ESD PROTECT



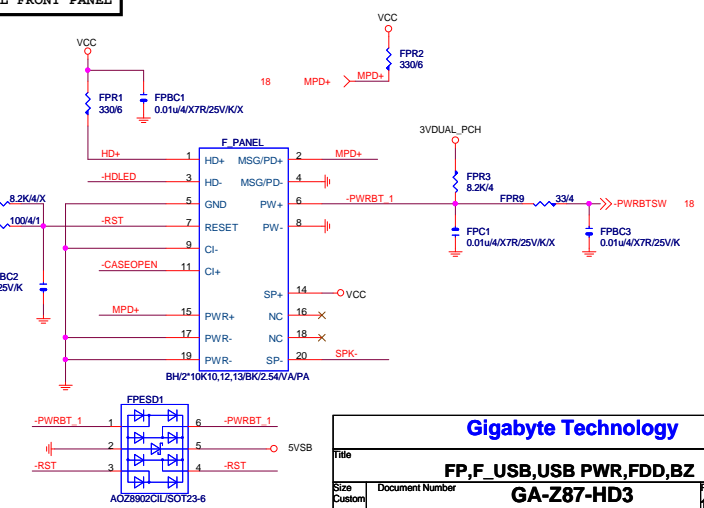
SATA LED



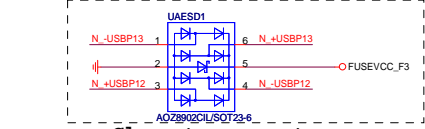
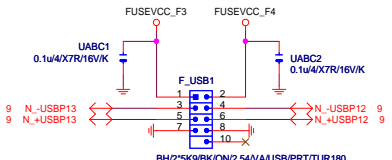
SPKR



INTEL FRONT PANEL

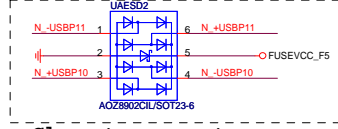
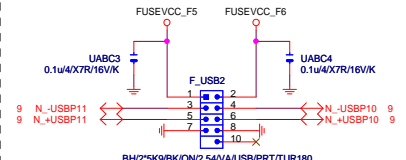


FRONT USB1



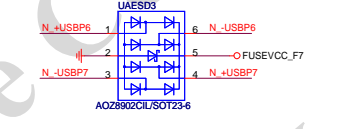
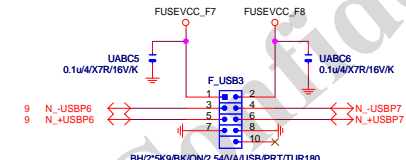
Close to connector

FRONT USB2

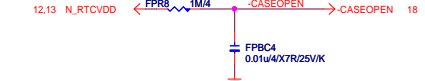


Close to connector

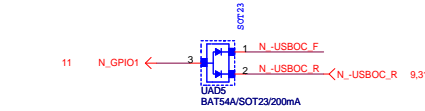
FRONT USB3



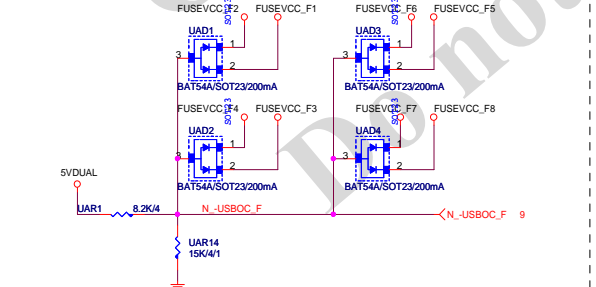
CASE OPEN



F_USB POWER PROTECT



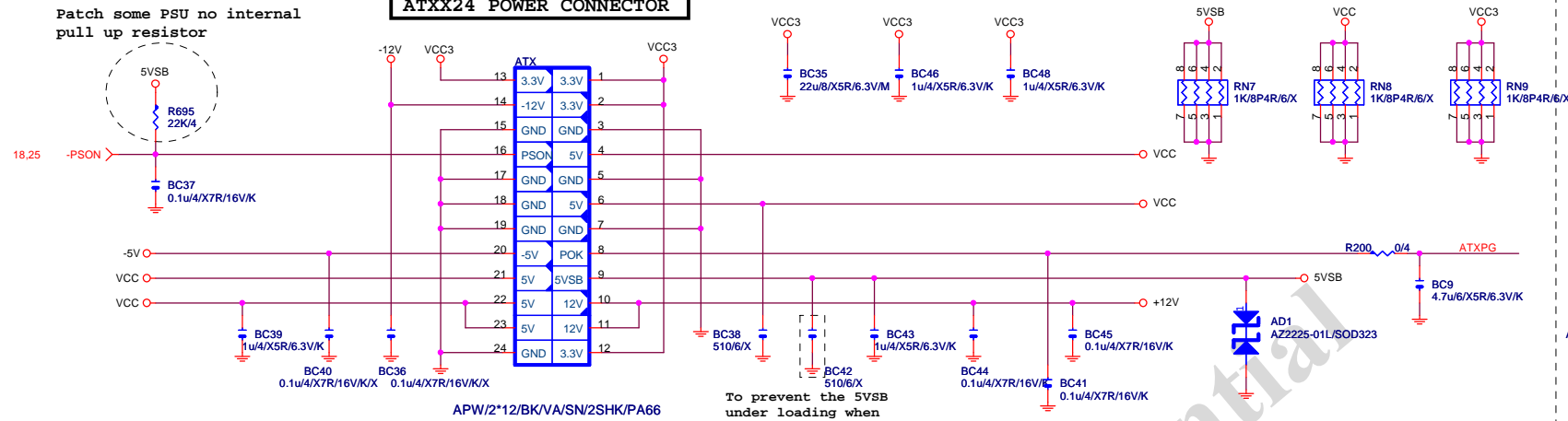
-USBOC_F



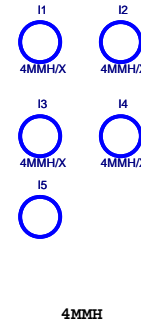
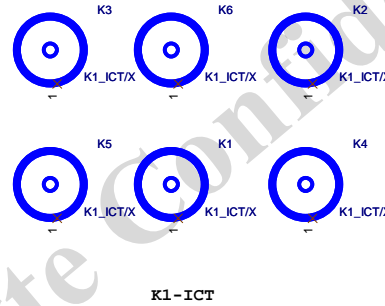
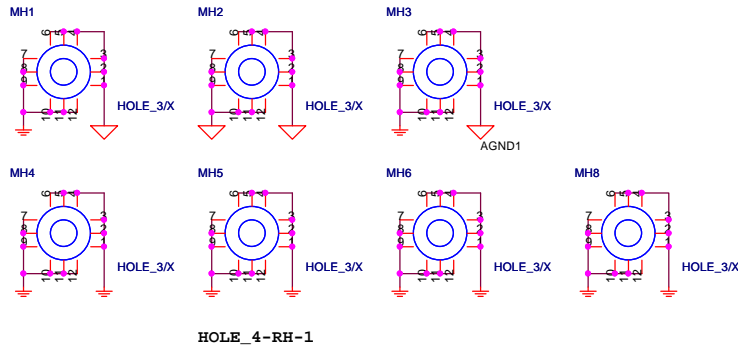
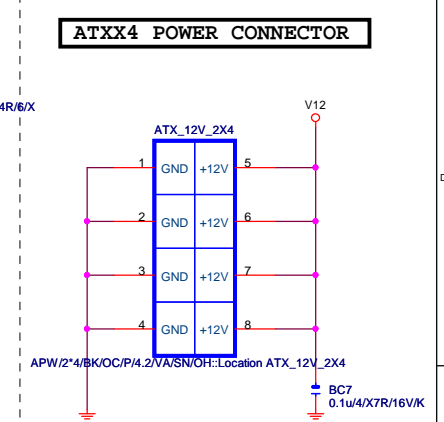
Gigabyte Technology			
Title	FP,F_USB,USB PWR,FDD,BZ		
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Patch some PSU no internal pull up resistor

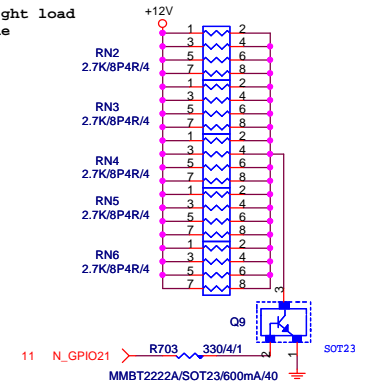
ATXX24 POWER CONNECTOR



ATXX4 POWER CONNECTOR



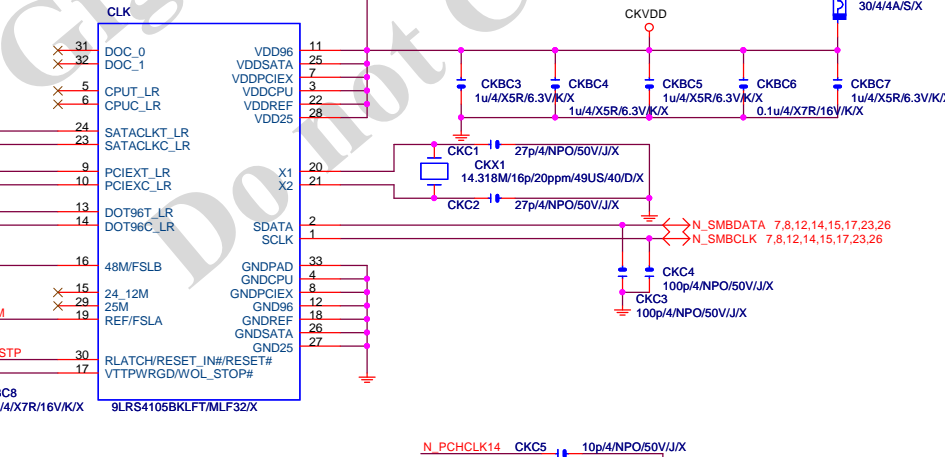
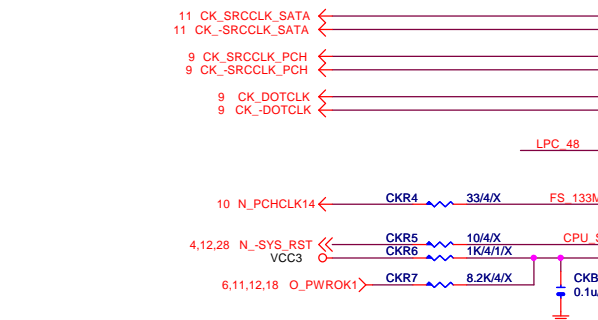
【技術通報R&D技術通報153】
To fix 12V light load abnormal issue



CLK GEN

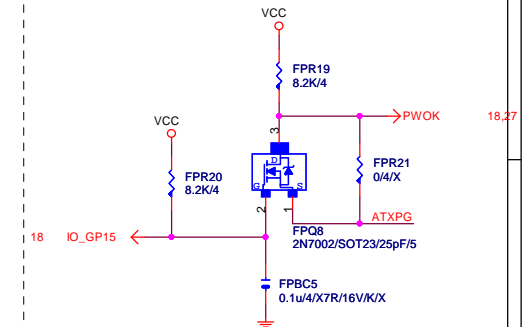
CPU Frequency Selection

CKVDD	CKR8	8.2K/4/X	LPC_48	FSLB	FSLA	CPU
	CKR1	8.2K/4/X		0	0	100M <Default>
				0	1	133M
CKVDD	CKR2	8.2K/4/X	FS_133M	1	0	200M
	CKR3	8.2K/4/X		1	1	166M



PWOK PATCH

【技術通報R&D技術通報154】



Gigabyte Technology

Title		
ATX POWER CONNECTOR		
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Rev 0.2 modify

VREF

SYS_TEMP

CPU_TEMP

PWM_TEMP

OC7 1u4/X5R/6.3V/K

OC6 1u4/X5R/6.3V/K

OR73 10K/4/1

R674 8.2K/4

R675 8.2K/4

R679 8.2K/4

RS_SYS 10K/1/4/S

RS_PWM 1u4/X5R/6.3V/K

C232 1u4/X5R/6.3V/K

Close SIO

Close CPU

The division voltage of VIN2 & VIN3 must be around 2.9V

[illegible]

Linear SYS_FAN2

SYS_FAN3

VCC3

R688 1K/4/1

FC3 1u/4/16V/K

VCC3

FR3 8.2K/4/X

INTERNAL PUL# HI

R693 22K/4

BC219 1u/4/X5R/6.3V/K

FAN3_VOUT 1

FAN3_SET 4

U16 NCT3941S-A/SOP8-EP

VIN

VOUT

NC

NC

NC

NC

ENABLE/FON#

VSET

GND

PGND

FAN3_VOUT

VCC

R692 8.2K/4

R7 15K/4/1

R6 6.2K/4/1

C2 0.047u/4/X7R/16V/K

R8 3.3K/4/1

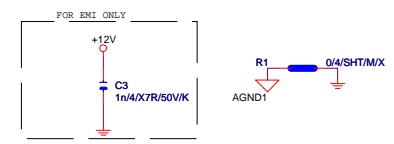
FC6 10u/8/X5R/16V/K

SYS_FAN3

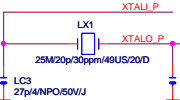
FAN114/BK/A3/PA66

FANPWM4

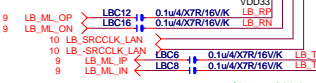
FANIO4



100歐姆:[20/4/8/4/20]

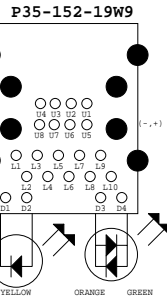
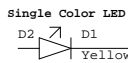
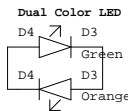


80歐姆:[15/5/5/5/15]



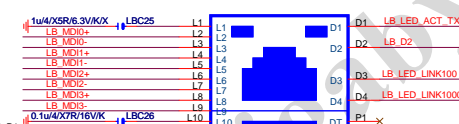
SRCCLK 50歐姆:[18/4/10/4/18]

離IC近越好

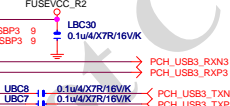
FOR DSM MODE
(DEEP SLEEP MODE)VDD33
ENSWREG
ENABLE SW

USB30_LAN CONNECTOR

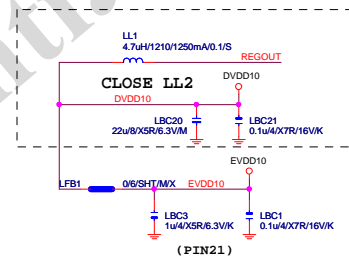
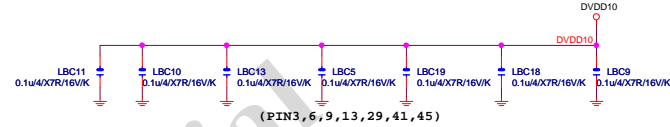
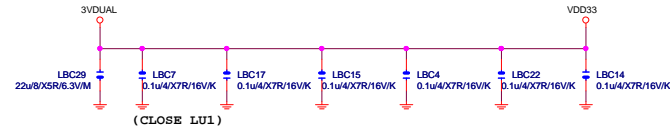
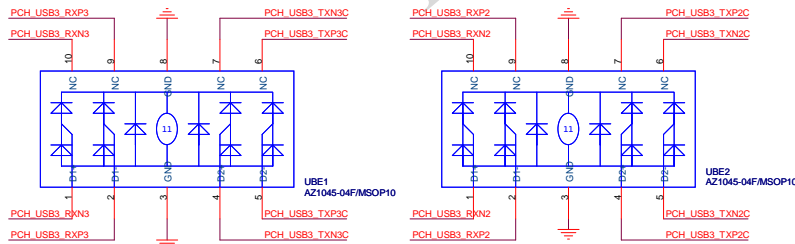
100歐姆:[20/4/8/4/20]

USB30_LAN
USB3-LAN1G/G0,Y0SRA/DG30[11NR6-702009-K1R]

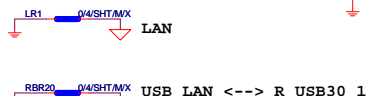
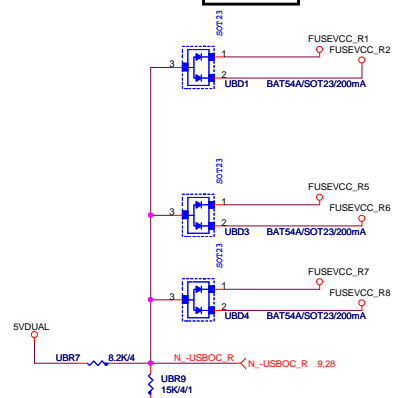
90歐姆:[15/4.5/7.5/4.5/15]



CLOSE USB30_LAN

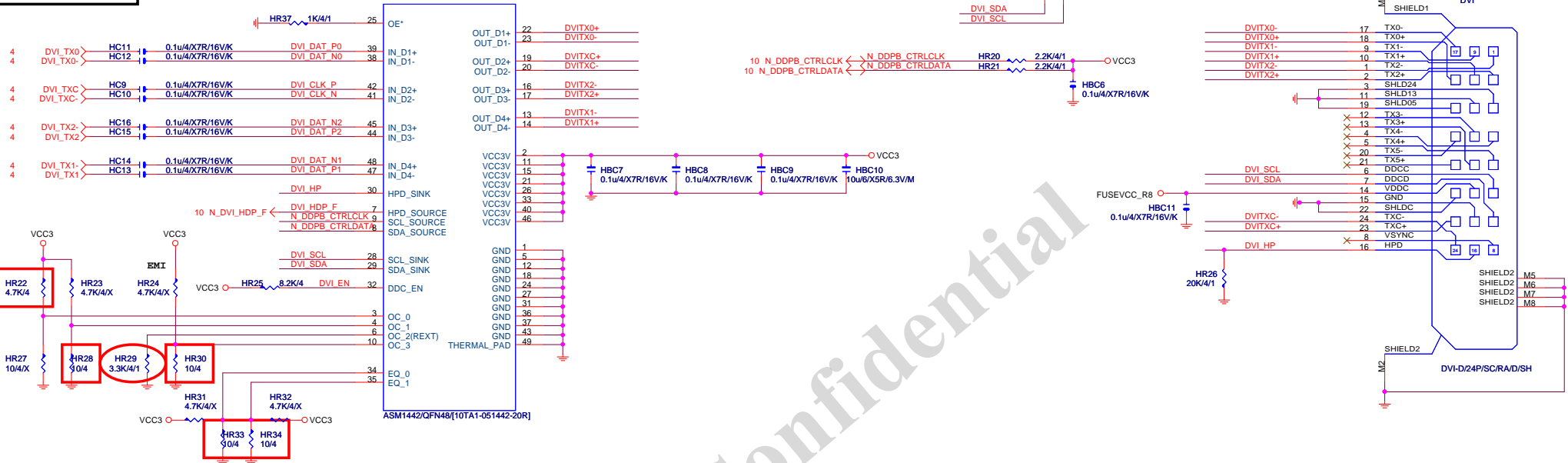


-USB0C_R



DVI LEVEL SHIFT

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

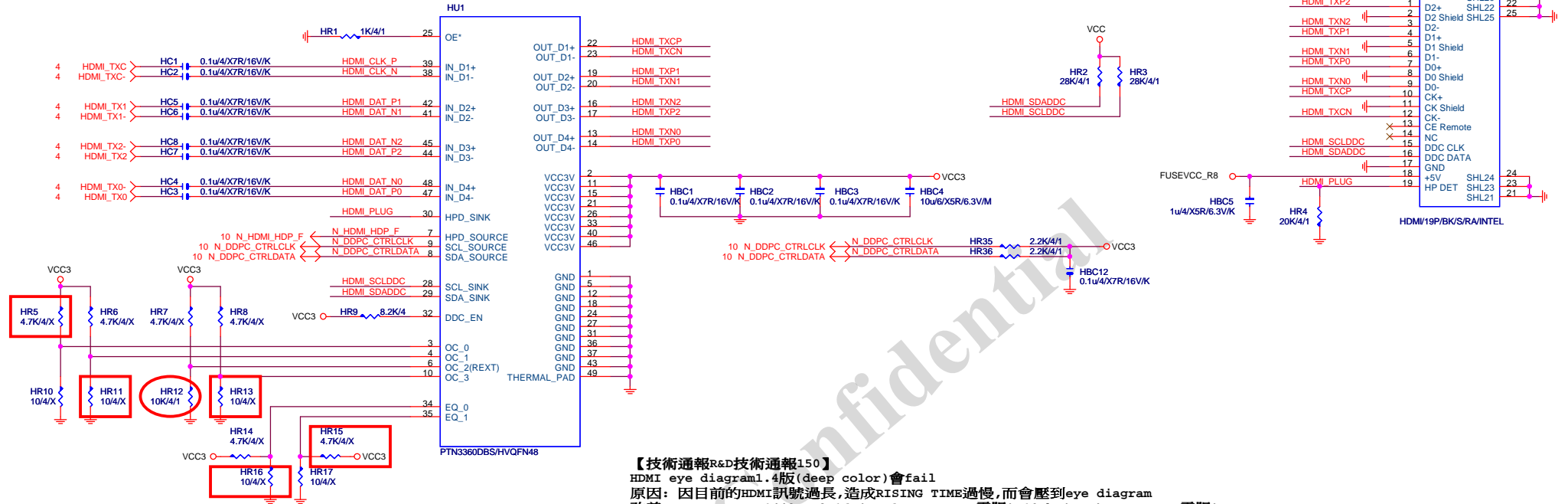


PTN3360:PIN 4/10/34/35 NC PIN,都不上值;只上HR29:10K
ASM1442:紅色框要上,HR29:3.3K

Gigabyte Technology			
Title			
DVI			
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HDMI LEVEL SHIFT

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



【技術通報R&D技術通報150】

HDMI eye diagram1.4版(deep color)會fail

原因: 因目前的HDMI訊號過長,造成RISING TIME過慢,而會壓到eye diagram

改善: ASMEDIA ASM1442 : 3.16K(PIN6 PULL DOWN電阻) 10ohm(PIN4 PULL DOWN電阻)

GIGABYTE™

Title		
HDMI		
Size	Document Number	Rev
Custom	GA-Z87-HD3	1.1
Date:	Thursday, June 27, 2013	Sheet 33 of 34

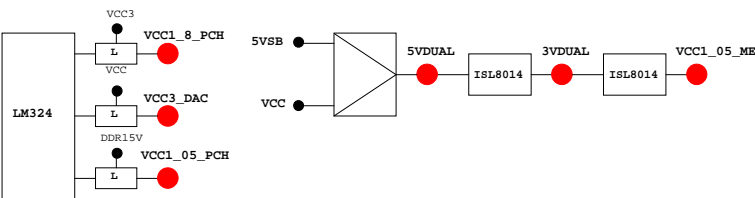
PCB GPIO LIST TABLE

PIN NAME	PWR	AFTER PLUGST	Default	USAGE	NOTE
GP0	MAIN	H-Z	GPI	GPIO0	N/A
GP1/TACH1	MAIN		GPI	GPIO1	N/A
GP2/PIRQE#	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

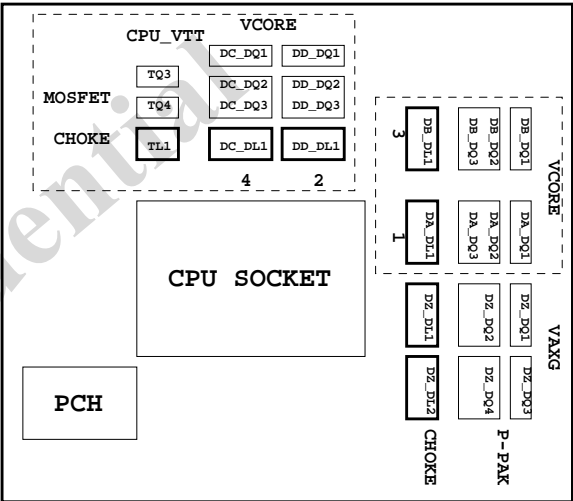
Super I/O ITE8720 GPIO Table

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	-PCIE_RST	
RSMRST#CIRRX1/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/BUSS11	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/BUSSIO	NB_LED3_C	
GP22/SCK	LOW_PWR_1	
VIDO5/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PFMRST1	
PCIRST1#/GP12	-PFMRST2	
3VSB5W#/GP40	CSI_F0	BSEL166_1
SUSCH#/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CsisBSL	
VIDO0/GP20/CTS2#	CPUT_LED1_C	BSEL166_4
GP65/VDDA_EN/GB_01	MB_ID2	
PD6/GP76/BUSSO1	MB_ID3	
PD7/GP77/BUSSO2	MB_ID4	
AFD#/GP86/SMB_C_R	⚡ PIN	FST_2X8
INIT#/GP85/SMBD_M	SEC_2x8	GTLREF_AD2
ACK#/GP83	DDR_LED1_C	
VIDO1/GP21/DCD2#	DDR_LED2_C	
STB#/GP87/SMB_C_M	DDR_LED3_C	
PWRON#/GP44	VCORE_OV1	
PANSWH#/GP43	PWRBTSW	
KDAT/GP61	-PWRBTSW	
KCLK/GP60	KCLK	
MDAT/GP57	KCLK	
MACL/GP56	MDAT	
GP66/VLDT_EN/GB_02	NBT_LED1_C	MCLK
SVD/PCIRSTIN#/CIRT2/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/CIRRX2/GP16	-THERM	
VIDO4/GP26/SOUT2	DDR18V_PH2_EN	
VIDO2/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VIDO6/GP17/RI2#	1_1V_PH_EN	
VIDO7/JP6/DTR2#	JP6	
PD5/GP75/BUSS00	SB_LED3_C	



PWM各相位の擺法如下：



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 Termination
VREF_CA_A/VREF_CA_B	DRAM Address Ref
VREF_DQ_A/VREF_DQ_B	DRAM Data Ref

	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

散熱模組料號：

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

Gigabyte Technology			
TABLE LIST			
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