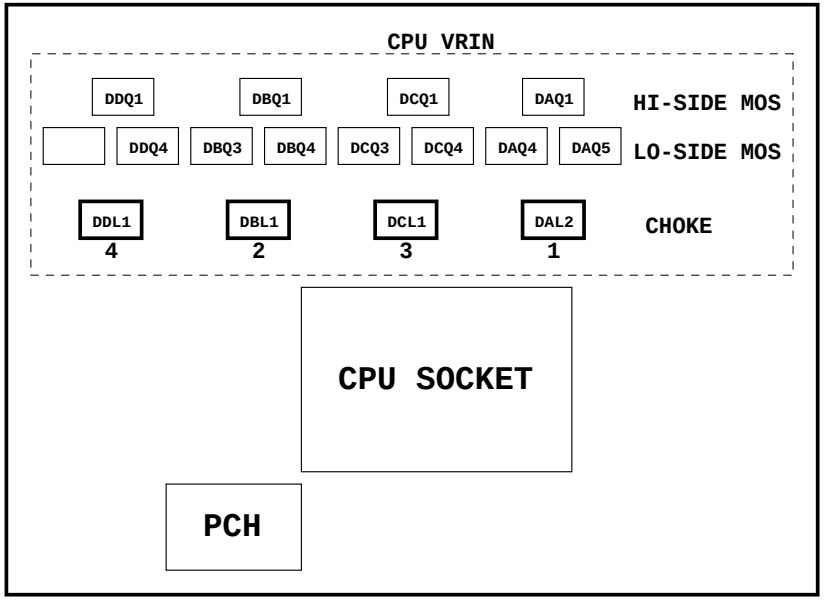
Model Name: GA-B85-HD3 1.1

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	
40	



Gigabyte Technology

Title: Cover Sheet

Size: Custom | Document Number: GA-B85-HD3 | Rev: 1.1

Date: Monday, July 01, 2013 | Sheet 1 of 34

GA-B85-HD3

Component value change history

Data	Change Item	Reason
0.1	E-BOM	
	1. SYS_FAN1 & AUDIO ON-OFF PLAY 實驗測試	
	2. PCH --> 改成B85	
	3. Update Heatsink 料號 : PCH_HS & MOS_HS	
	4. Update load-line	
0.2	1. CPU SOCKET + RM 要用哪種料號?	
	2. PCH_HS & MOS_HS change new 料號	
	3. PCIEX16 patch reset circuit 怎麼上?	
	4. Remove DAQ1,DBQ1,DCQ1,DDQ1	
	5. Clk buffer IDT4105要上?	
	6. GPIO8 "NR136"不上	
	7. AUDIO ON/OFF Remove?	
	8. Prochot是否只上一組	
	9. Add +12V排阻 RN2~RN6	
	10. Remove PWR_LED Control	
	11. Clock Buffer的power要上,Pull-down電阻移除	
1.0A	1. 若超壓IC(U9,U10)不上,LOAD-LINE阻值要還原	
	2. PCH_HS & MOS_HS change new 料號	
	3. Q87 --> B85	
	4. 確認level shifter "NXP"用料	
	5. 若IDT4105要上,記的CKR5也要上	
10B	1. 5VDUAL OVP --> 5VSB OVP	
	2. Remove CLK Buffer	
10C	1. OR46 8.2K/4 --> 1K/4/1	
11A	1. For PCH Rev.C2	
11B	1. Disable Anti-surge Function	
11C	1. 5VSB --> 5VDUAL OVP & Remove CD1:AZ2225	

Circuit or PCB layout change

DATE	Change Item	Reason
0.1	1. Z87-HD3 Rev0.1修改 2. Z87 --> B85 , SATA3_4,SATA3_5 --> SATA2_4,SATA2_5 3. Remove R_USB30_2 4. Remove PCIEX1/PCIEX4 select	
0.2	1. AUDIO SPDIF-IN CR77 "R0402-2" FOR short protection 2. Change PCIEX1/PCIX4 CLK 3. SATA2_0/SATA2_4 --> SATA2_1/SATA2_5 4. Remove DAQ1,DBQ1,DCQ1,DDQ1 5. Update F_PANEL footprint 6. BC49要過電容 7. 注意Slot和後窗正面有做十字Thermal處理 8. SYS_FAN2移至SYS_FAN1右邊	
1.0	1. 0 ohm --> short pad 2. 簡化CPU Config setting 3. 背板電容移除或mask (包含pch) 4. Remove BIOS "CS" pin 5. UBF9/UBF10 1206 --> 0805 6. N_GPIO37 pull-up to VCC3 7. +12V RN2~RN6要不要上? add VCC/VCC3 dummy load 8. DDR_15V H/W monitor detect 改從 DDR slot 拉回 9. 5VSB/5VDUAL OVP protection 10. 預留N_PCH_DPWROK 控制線路 11. USB2.0 port2/3 , 4/5 swap	
1.1	1. For PCH Rev.C2 2. UPDATE "HDMI-3"	
1.11	1. Remove UAR2 2. 文字面UEFI DUALBIOS 3. ALL FAN ADD 0.1u/4 DDU1 PIN6/7 short	

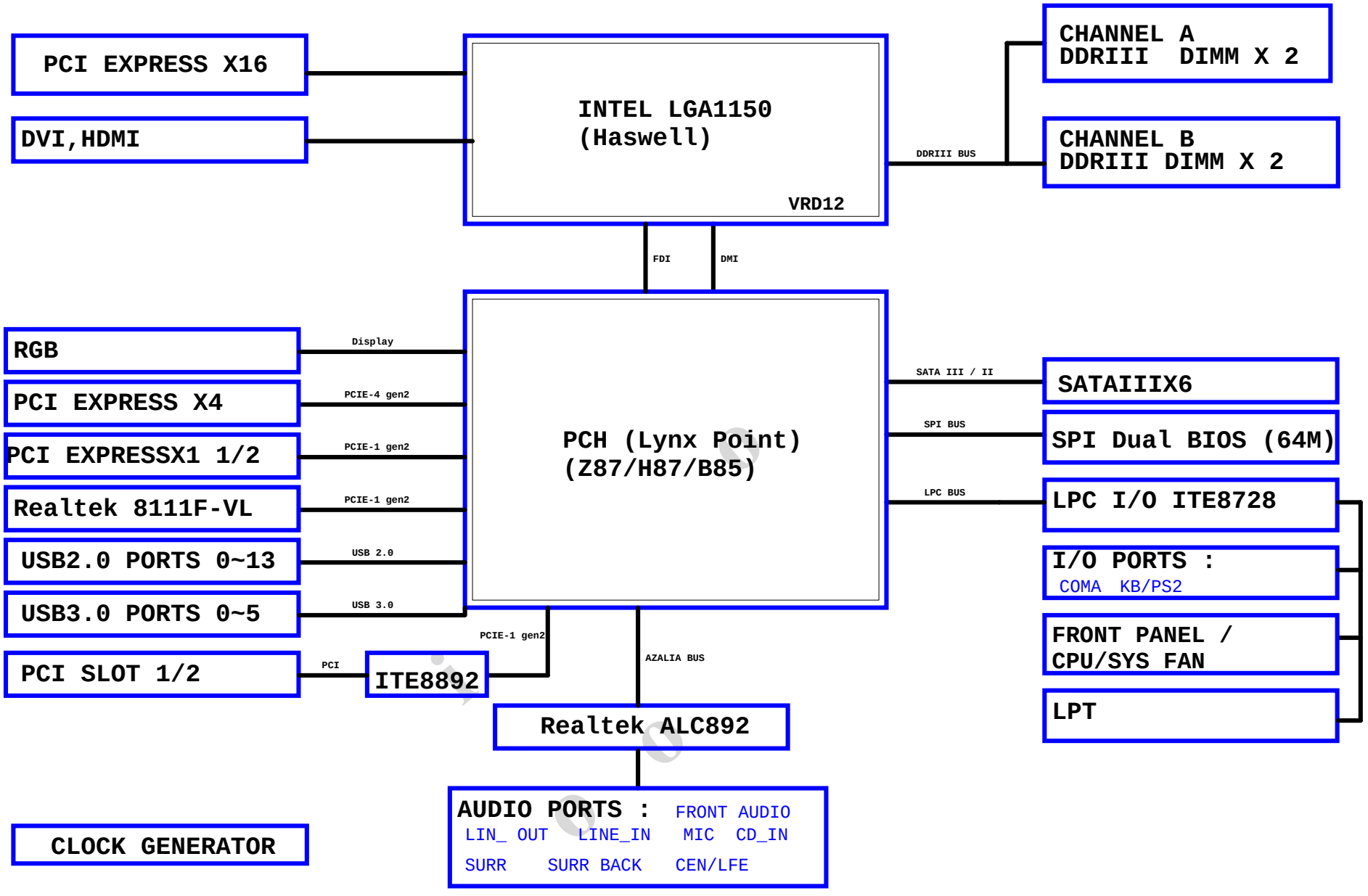
Gigabyte Technology

Title: BOM & PCB MODIFY HISTORY

Size: Custom | Document Number: GA-B85-HD3 | Rev: 1.1

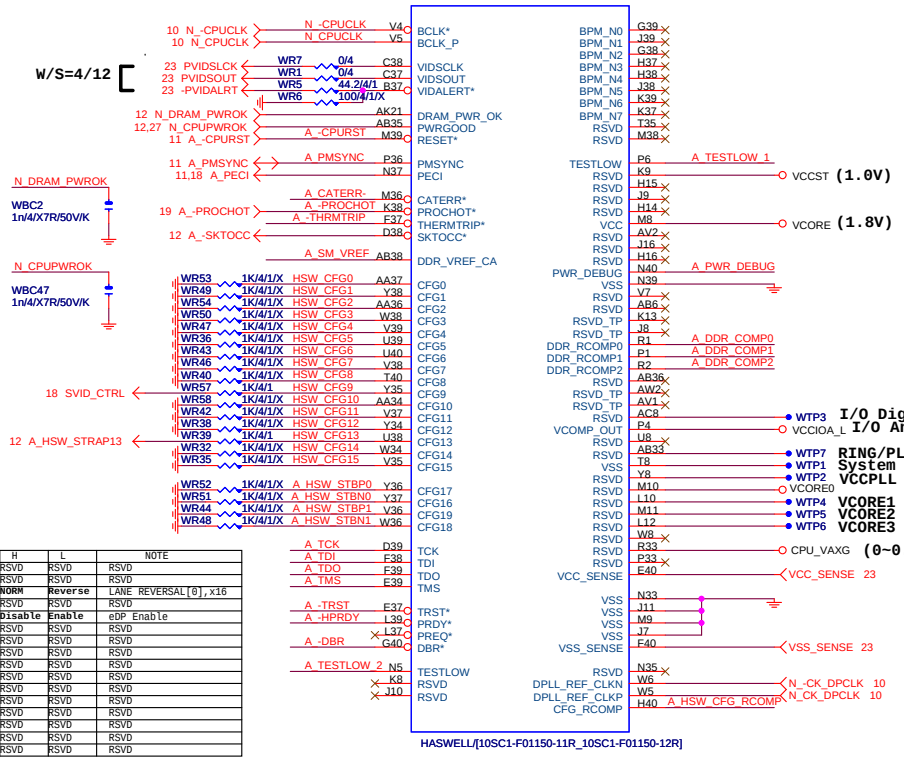
Date: Tuesday, July 09, 2013 | Sheet 2 of 34

BLOCK DIAGRAM



Gigabyte Technology			
Title: BLOCK DIAGRAM			
Size: C	Document Number: GA-B85-HD3		Rev: 1.1
Date: Thursday, June 27, 2013	Sheet 3 of 34		

LGA1150 (E)

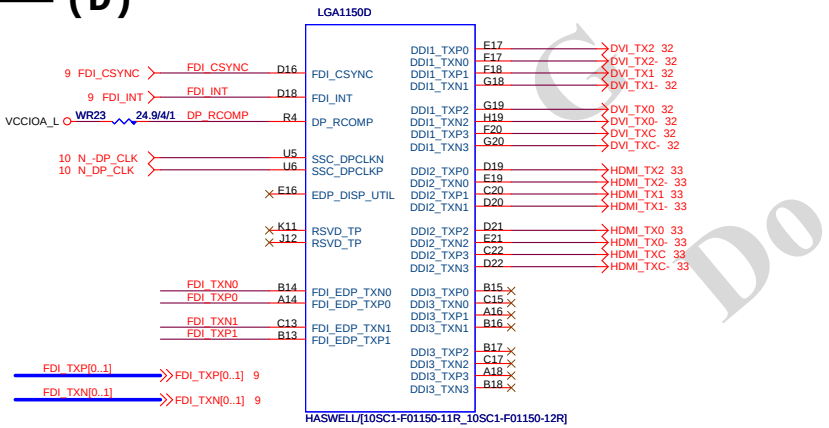


CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	**NORM**	**Reverse**	LANE_REVERSAL[0],x16
3	RSVD	RSVD	RSVD
4	**Disable**	**Enable**	eDP Enable
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD
16	RSVD	RSVD	RSVD
17	RSVD	RSVD	RSVD

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

CFG 0-17 all internal PULL-UP

LGA1150 (D)

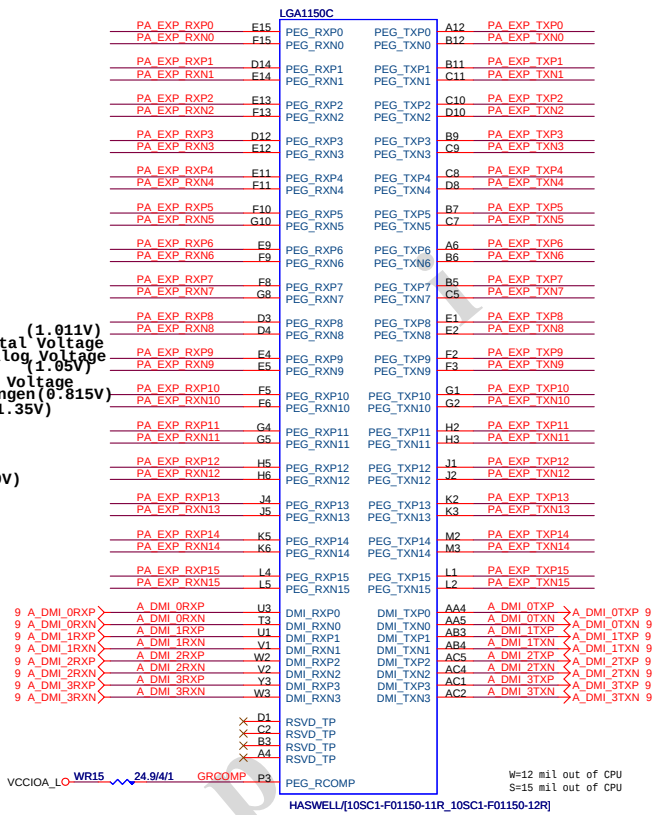


FDI:15/4/4/4/15(breakout min 4/4/4//8)
Impedance=85 +- 15%

DP/HDMI 15/4/4/4//15 FDI 12/4/4/4/12

Impedance=85 +- 15%

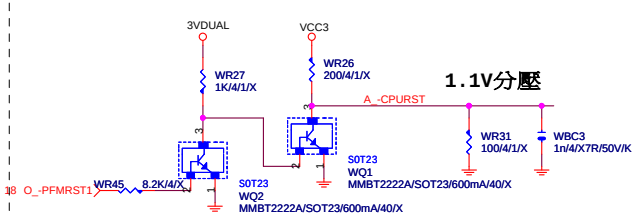
LGA1155 (C)



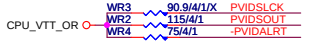
CPU PEG 20/5/4/5/20 Impedance=80 +- 15%

DMI 12/4/4/4//12 Impedance=85 +- 15%

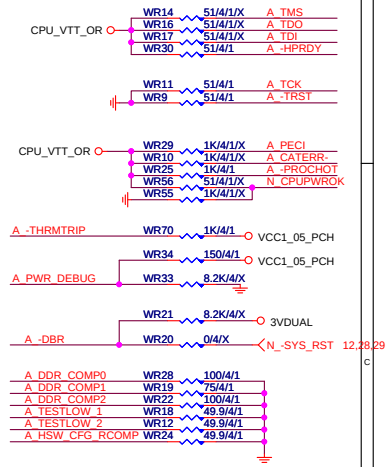
-CPURST



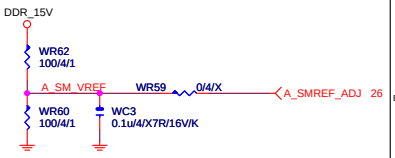
CPU SVID



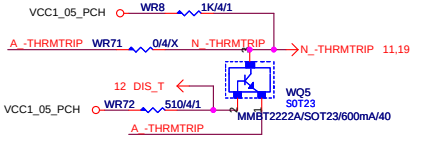
CPU PU/PD



SM REF

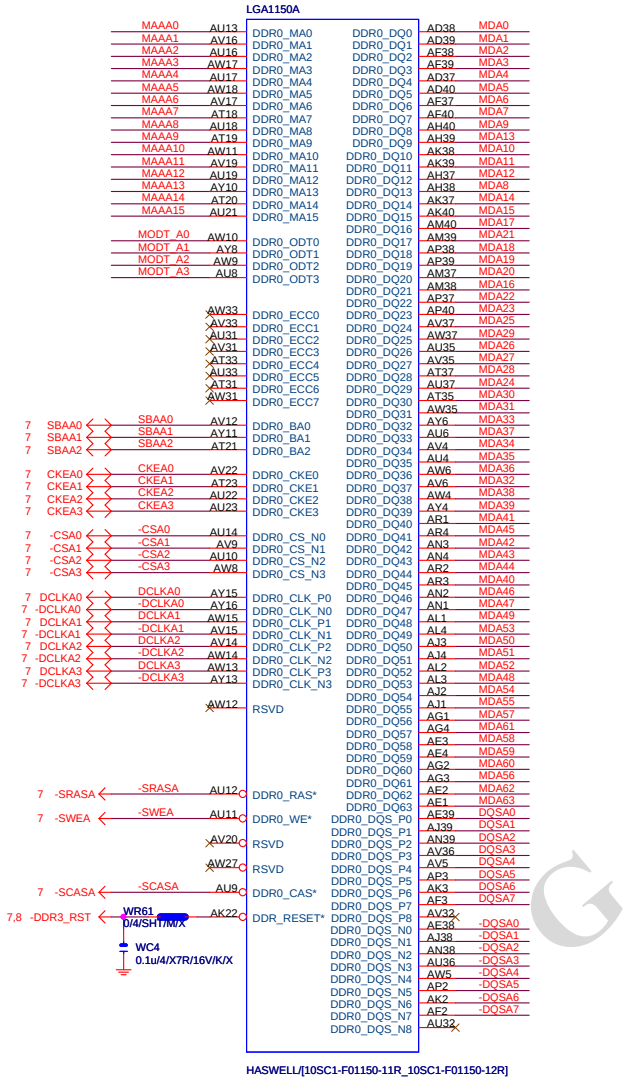


THRMTRIP DISABLE FOR Z87 OVERCLOCK

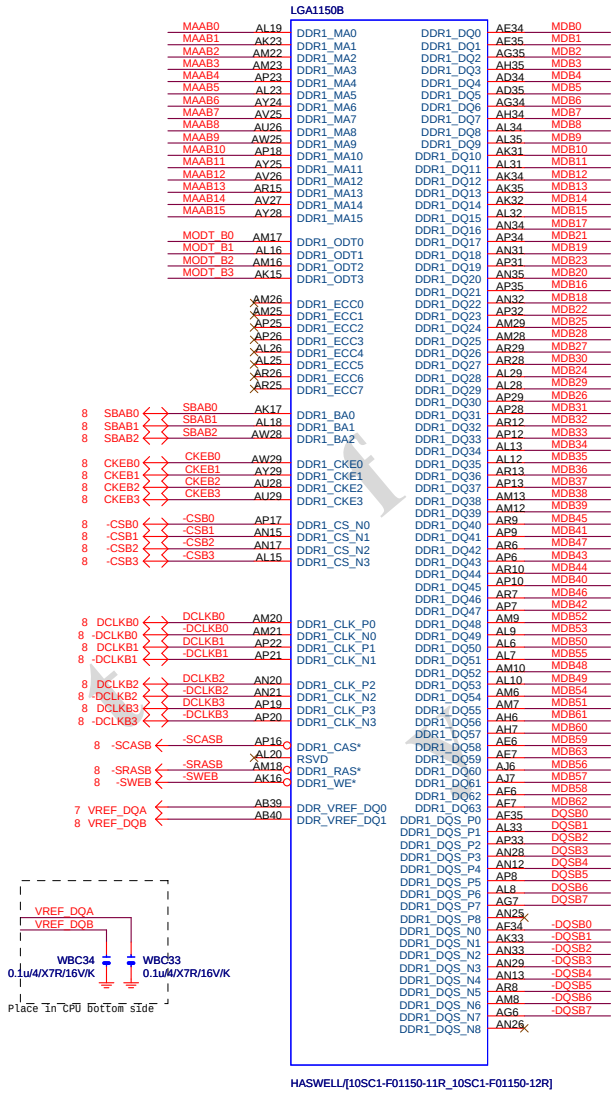


Gigabyte Technology			
Title: CPU LGA1150-A			
Size: Custom	Document Number: GA-B85-HD3		Rev: 1.1
Date: Thursday, June 27, 2013	Sheet 4 of 34		

LGA1150 (A)

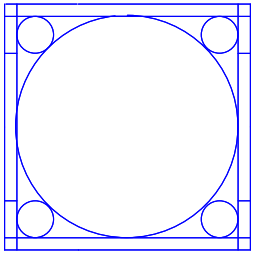


LGA1150 (B)

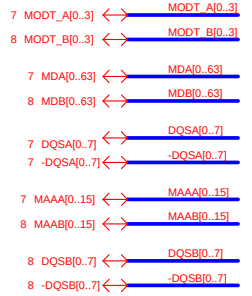


LGA1150 (CR)

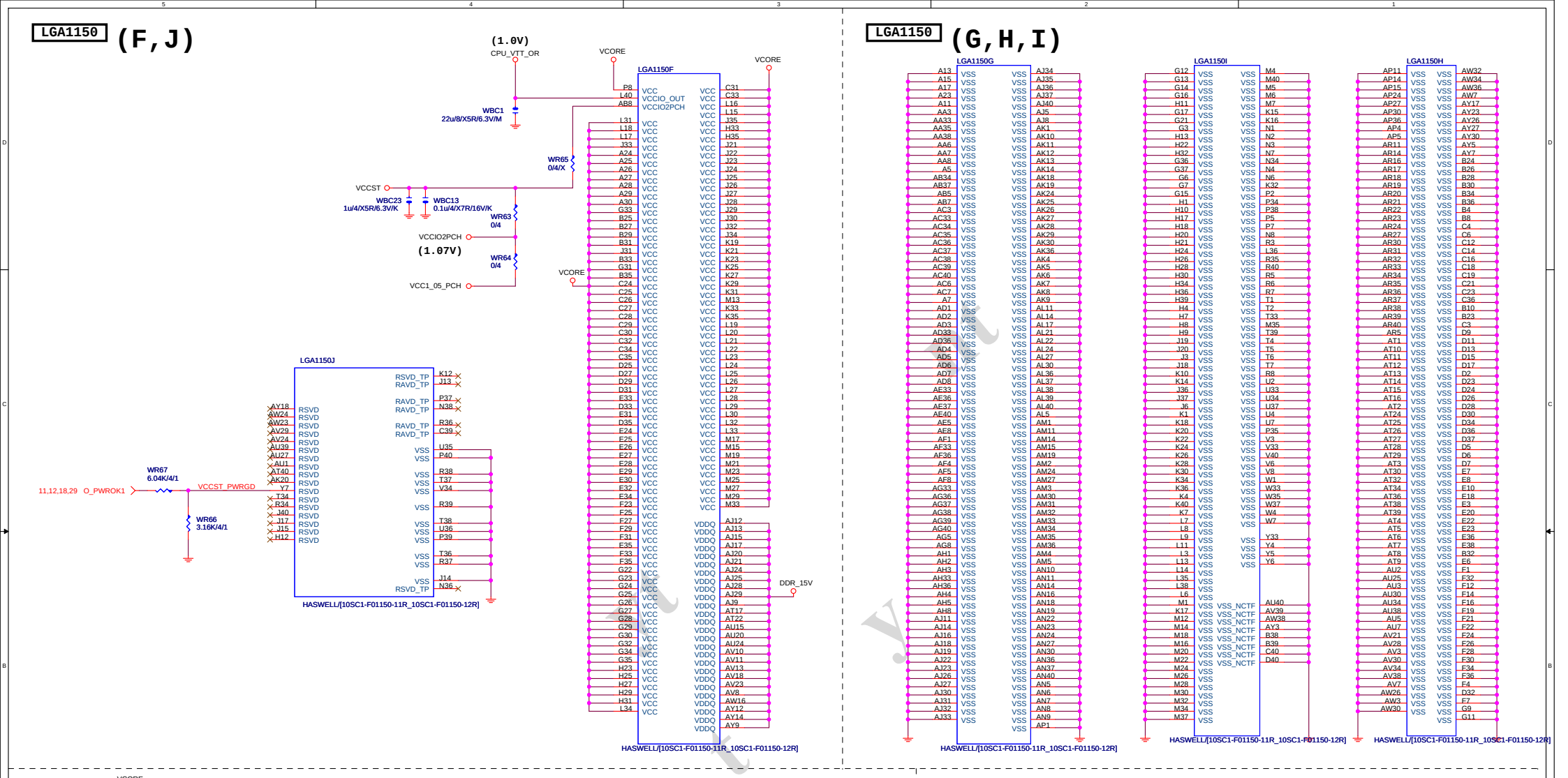
LGA1150
ILM_BP/1156/CSP/[12KRC-0F0001-52R_12KRC-0F0001-51R]

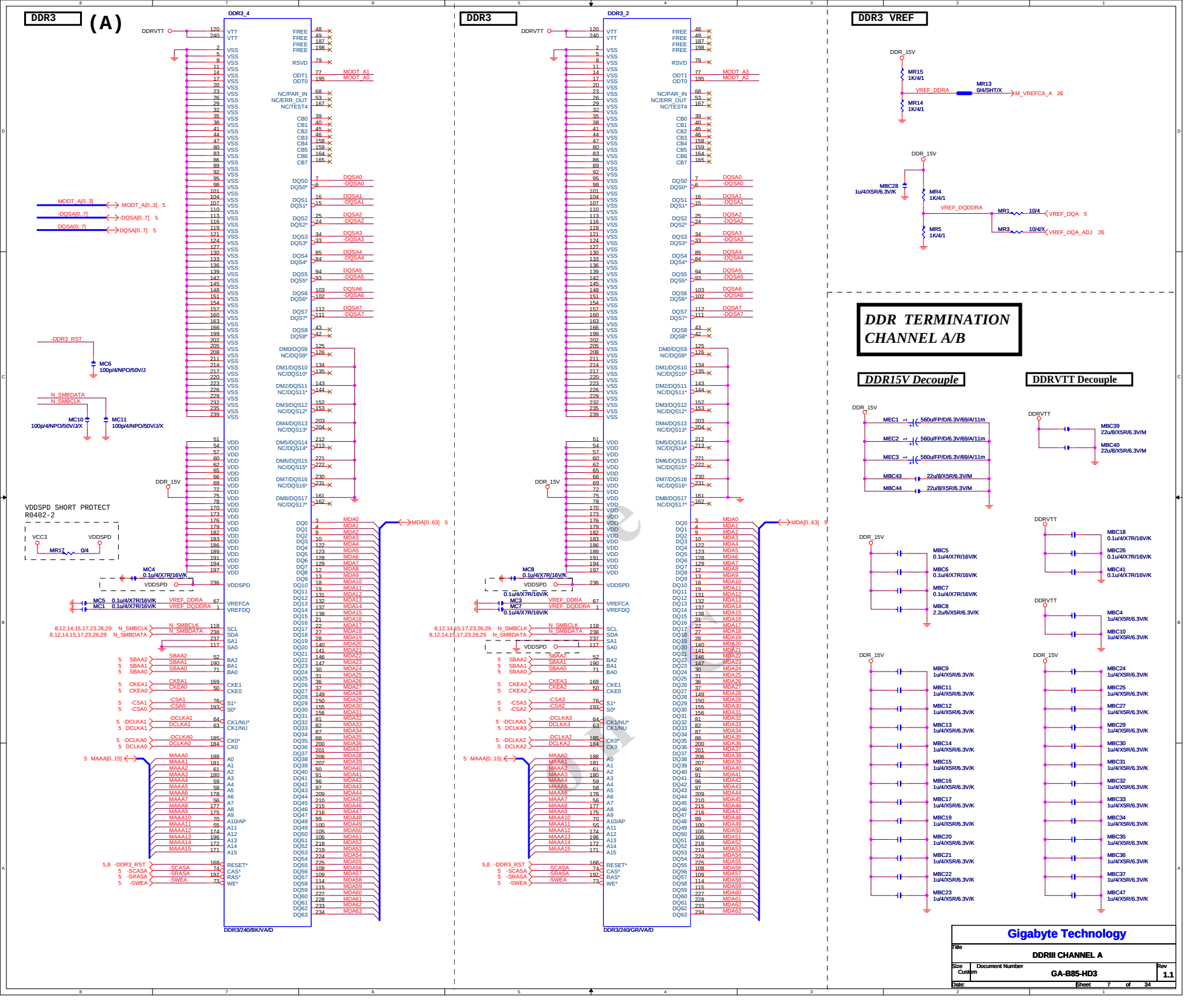


DDR BUS

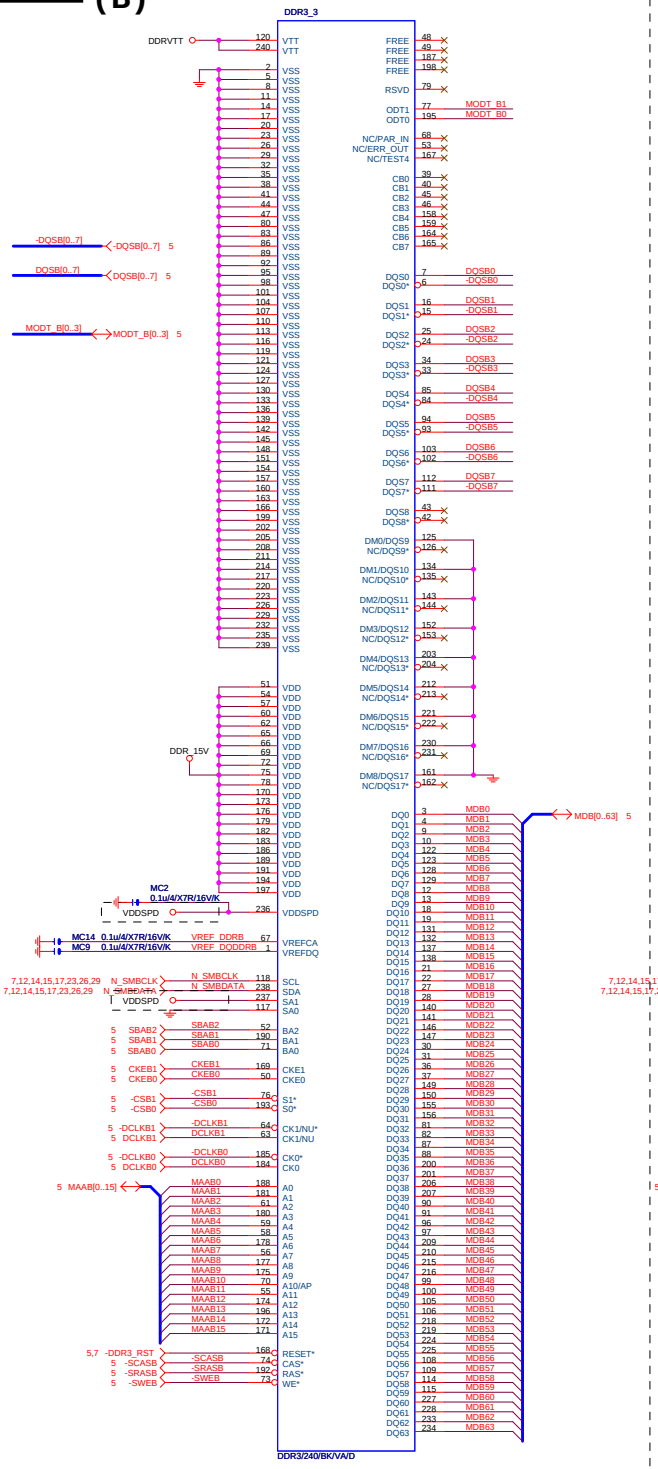


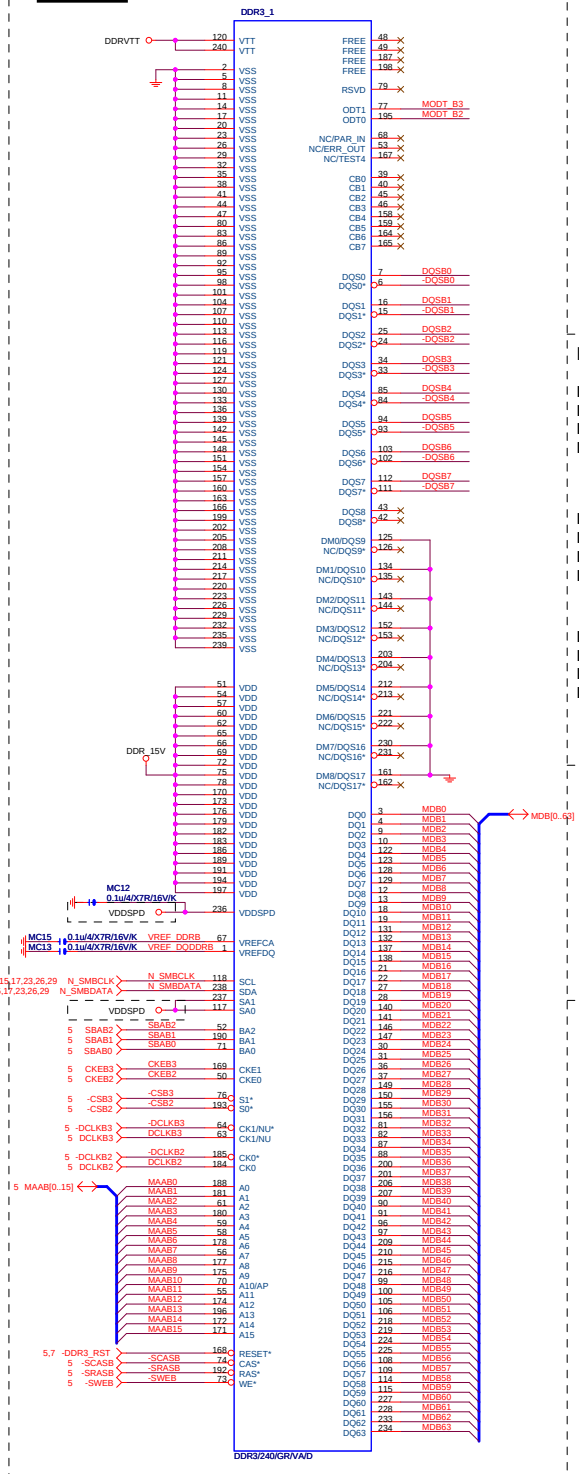
Gigabyte Technology	
Title	CPU LGA1150-B
Size: Custom	Document Number: GA-B85-HD3
Rev	1.1
Date: Thursday, June 27, 2013	Sheet 5 of 34


LGA1150 (F,J)
(1.0V)
CPU_VTT_OR
VCORE
LGA1150F
WBC1
22u/8/X5R/6.3V/M
WR65
0/4/X
VCCST
WBC23
1u/4/X5R/6.3V/K
WBC13
0.1u/4/X7R/16V/K
WR63
0/4
VCCIO2PCH
(1.07V)
WR64
0/4
VCC1_05_PCH
LGA1150J
WR67
6.04K/4/1
11,12,18,29 O_PWROK1
VCCST_PWRGD
WR66
3.16K/4/1
HASWELL/[10SC1-F01150-11R_10SC1-F01150-12R]
DDR_15V
LGA1150 (G,H,I)
LGA1150G
LGA1150I
LGA1150H
VCore CAP
(X30)
WBC35 22u/8/X5R/6.3V/M/X
WBC42 22u/8/X5R/6.3V/M/X
WBC36 22u/8/X5R/6.3V/M/X
WBC43 22u/8/X5R/6.3V/M/X
WBC44 22u/8/X5R/6.3V/M/X
WBC38 22u/8/X5R/6.3V/M/X
WBC37 22u/8/X5R/6.3V/M/X
WBC46 22u/8/X5R/6.3V/M/X
WBC39 22u/8/X5R/6.3V/M/X
WBC41 22u/8/X5R/6.3V/M/X
WBC40 22u/8/X5R/6.3V/M/X
WBC19 22u/8/X5R/6.3V/M
WBC21 22u/8/X5R/6.3V/M
WBC6 22u/8/X5R/6.3V/M
WBC9 22u/8/X5R/6.3V/M
WBC20 22u/8/X5R/6.3V/M
WBC7 22u/8/X5R/6.3V/M
WBC11 22u/8/X5R/6.3V/M
WBC8 22u/8/X5R/6.3V/M
WBC4 22u/8/X5R/6.3V/M
WBC5 22u/8/X5R/6.3V/M
WBC10 22u/8/X5R/6.3V/M
WBC12 22u/8/X5R/6.3V/M
WBC22 22u/8/X5R/6.3V/M
WBC45 22u/8/X5R/6.3V/M/X
WBC14 22u/8/X5R/6.3V/M
WBC15 22u/8/X5R/6.3V/M
WBC16 22u/8/X5R/6.3V/M
WBC17 22u/8/X5R/6.3V/M
WBC18 22u/8/X5R/6.3V/M
DDR CAP
(X15)
WBC24 22u/8/X5R/6.3V/M
WBC25 22u/8/X5R/6.3V/M
WBC26 22u/8/X5R/6.3V/M
WBC27 22u/8/X5R/6.3V/M
WBC28 22u/8/X5R/6.3V/M
WBC29 22u/8/X5R/6.3V/M
WBC30 22u/8/X5R/6.3V/M
WBC31 22u/8/X5R/6.3V/M
WBC32 22u/8/X5R/6.3V/M
SBC1 22u/8/X5R/6.3V/M/X
SBC2 22u/8/X5R/6.3V/M/X
MBC50 22u/8/X5R/6.3V/M/X
MBC51 22u/8/X5R/6.3V/M/X
MBC48 1u/4/X5R/6.3V/K/X
MBC49 1u/4/X5R/6.3V/K/X
Gigabyte Technology
Title
CPU LGA1150-C
Size Custom
Document Number GA-B85-HD3
Rev 1.1
Date: Thursday, June 27, 2013
Sheet 6 of 33

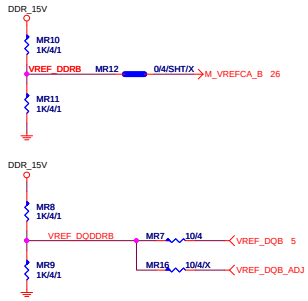

DDR3
(A)
DDR3_4
DDRVTT
VTT
VSS
FREE
RSVD
ODT1
ODT0
MODT_A1
MODT_A0
NC/PAR_IN
NC/ERR_OUT
NC/TEST4
CB0
CB1
CB2
CB3
CB4
CB5
CB6
CB7
DQS0
DQS0*
DQS1
DQS1*
DQS2
DQS2*
DQS3
DQS3*
DQS4
DQS4*
DQS5
DQS5*
DQS6
DQS6*
DQS7
DQS7*
DQS8
DQS8*
DM0/DQS9
DM1/DQS10
DM2/DQS11
DM3/DQS12
DM4/DQS13
DM5/DQS14
DM6/DQS15
DM7/DQS16
DM8/DQS17
VDD
DQ0
DQ1
DQ2
DQ3
DQ4
DQ5
DQ6
DQ7
DQ8
DQ9
DQ10
DQ11
DQ12
DQ13
DQ14
DQ15
DQ16
DQ17
DQ18
DQ19
DQ20
DQ21
DQ22
DQ23
DQ24
DQ25
DQ26
DQ27
DQ28
DQ29
DQ30
DQ31
DQ32
DQ33
DQ34
DQ35
DQ36
DQ37
DQ38
DQ39
DQ40
DQ41
DQ42
DQ43
DQ44
DQ45
DQ46
DQ47
DQ48
DQ49
DQ50
DQ51
DQ52
DQ53
DQ54
DQ55
DQ56
DQ57
DQ58
DQ59
DQ60
DQ61
DQ62
DQ63
MODT_A[0..3]
-DQSA[0..7]
DQSA[0..7]
-DDR3_RST
MC6
100p/4NPO/50V/J
N_SMBDATA
N_SMBCLK
MC10
100p/4NPO/50V/J/X
MC11
100p/4NPO/50V/J/X
DDR_15V
VDDSPD SHORT PROTECT
R0402-2
VCC3
VDDSPD
MR17
0/4
MC4
0.1u/4/X7R/16V/K
MC5
MC1
VREF_DDRA
VREF_DQDDRA
VREFCA
VREFDQ
MDA[0..63]
SCL
SDA
SA1
SA0
SBAA2
SBAA1
SBAA0
BA2
BA1
BA0
CKE1
CKE0
-CSA1
-CSA0
S1*
S0*
-DCLKA1
DCLKA1
CK1/NU*
CK1/NU
-DCLKA0
DCLKA0
CK0*
CK0
MAA[0..15]
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10/AP
A11
A12
A13
A14
A15
-DDR3_RST
-SCASA
-SRASA
-SWEA
RESET*
CAS*
RAS*
WE*
DDR3/240/BK/VA/D
DDR3
DDR3_2
DDR3/240/GR/VA/D
DDR3 VREF
DDR_15V
MR15
1K/4/1
MR13
0/4/SHT/X
MR14
1K/4/1
VREF_DDRA
M_VREFCA_A
26
MBC28
1u/4/X5R/6.3V/K
MR4
1K/4/1
MR5
1K/4/1
VREF_DQDDRA
MR1
10/4
MR3
10/4/X
VREF_DQA
VREF_DQA_ADJ
5
DDR TERMINATION
CHANNEL A/B
DDR15V Decouple
DDRVTT Decouple
MEC1
MEC2
MEC3
560u/FP/D/6.3V/69/A/11m
MBC43
MBC44
22u/8/X5R/6.3V/M
MBC39
MBC40
MBC5
MBC6
MBC7
0.1u/4/X7R/16V/K
MBC8
2.2u/6/X5R/6.3V/K
MBC18
MBC26
MBC41
MBC4
MBC10
1u/4/X5R/6.3V/K
MBC9
MBC11
MBC12
MBC13
MBC14
MBC15
MBC16
MBC17
MBC19
MBC20
MBC21
MBC22
MBC23
MBC24
MBC25
MBC27
MBC29
MBC30
MBC31
MBC32
MBC33
MBC34
MBC35
MBC36
MBC37
MBC47
Gigabyte Technology
Title
DDRIII CHANNEL A
Size
Custom
Document Number
GA-B85-HD3
Rev
1.1
Date:
Sheet
7
of
34

DDR3 (B)





DDR3 VREF



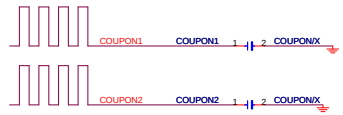
DDR3 1066,1333,1600MHZ BANDWIDTH

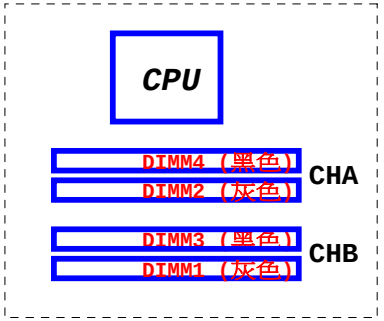
DDR3 1066MHZ
DDR3 clock=533MHZ
DDR3 single channel bandwidth=533x2x8Byte=8.5GB/s
DDR3 dual channel bandwidth=533x2x2x8Byte=17GB/s

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

COUPON





Gigabyte Technology			
Title: DDRIII CHANNEL B			
Size: Custom	Document Number: GA-B85-HD3		Rev: 1.1
Date:	Sheet 8 of 34		

PCH (B)

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

USB2.0 : 12/5/7/5/12 (breakout min 8/4/4/4/8)
Impedance=85 +- 15%

B85: Port 6/7 N/A
H81: Port 6/7/12/13 N/A

PCHB

DMI_RXN_0 DMI_RXP_0 DMI_TXN_0 DMI_TXP_0 DMI_RXN_1 DMI_RXP_1 DMI_TXN_1 DMI_TXP_1 DMI_RXN_2 DMI_RXP_2 DMI_TXN_2 DMI_TXP_2 DMI_RXN_3 DMI_RXP_3 DMI_TXN_3 DMI_TXP_3

DMI_RCOMP
PCIE_RCOMP
CLKIN_DMI_N
CLKIN_DMI_P

USBN_0 USBP_0 USBN_1 USBP_1 USBN_2 USBP_2 USBN_3 USBP_3 USBN_4 USBP_4 USBN_5 USBP_5 USBN_6 USBP_6 USBN_7 USBP_7 USBN_8 USBP_8 USBN_9 USBP_9 USBN_10 USBP_10 USBN_11 USBP_11 USBN_12 USBP_12 USBN_13 USBP_13

B85/H81: 6/7 N\A
H81:12/13 N\A

N_-USBP0 N_+USBP0 N_-USBP1 N_+USBP1 N_-USBP2 N_+USBP2 N_-USBP3 N_+USBP3 N_-USBP4 N_+USBP4 N_-USBP5 N_+USBP5

N_-USBP8 N_+USBP8 N_-USBP9 N_+USBP9 N_-USBP10 N_+USBP10 N_-USBP11 N_+USBP11 N_-USBP12 N_+USBP12 N_-USBP13 N_+USBP13

VCC1_5_PCH — NR50 7.5K/4/1 — DMI_COMP / PCIE_COMP
W=8 mil out of PCH
S=15 mil to other signals
NR40 7.5K/4/1

29 CK_-SRCCLK_PCH — CK_-SRCCLK_PCH
29 CK_SRCCLK_PCH — CK_SRCCLK_PCH

OC0B_GP59 OC1B_GP40 OC2B_GP41 OC3B_GP42 OC4B_GP43 OC5B_GP9 OC6B_GP10 OC7B_GP14

N_-USBOC_F 28
N_-USBOC_R 28,31

USBRBIASB USBRBIAS
N_USBRBIAS — NR47 22.6/4/1
W=8 mil out of PCH
S=15 mil to other signals

CLKIN_DOT96N CLKIN_DOT96P
CK_-DOTCLK — CK_-DOTCLK 29
CK_DOTCLK — CK_DOTCLK 29

N_GPIO14 — NR130 8.2K/4 — 3VDUAL

N_-USBOC_F — NBC82 0.1u/4/X7R/16V/K
N_-USBOC_R — NBC83 0.1u/4/X7R/16V/K

PCIE

PCIEX1 port1
15 PI_PCIE_IN1 / IP1 / TN1 / TP1
PCIE_PERN_1_USB3_RXN_2 PCIE_PERP_1_USB3_RXP_2 PCIE_PETN_1_USB3_TXN_2 PCIE_PETP_1_USB3_TXP_2

PCIEX1 port2
15 PJ_PCIE_IN2 / IP2 / TN2 / TP2
PCIE_PERN_2_USB3_RXN_3 PCIE_PERP_2_USB3_RXP_3 PCIE_PETN_2_USB3_TXN_3 PCIE_PETP_2_USB3_TXP_3

LAN RTL8111F-VL
31 LB_ML_IN / IP / ON / OP
PCIE_PERN_3 PCIE_PERP_3 PCIE_PETN_3 PCIE_PETP_3

ITE8892 PCI Bridge
16 G_PCIEBIN / IP / ON / OP
PCIE_PERN_4 PCIE_PERP_4 PCIE_PETN_4 PCIE_PETP_4

PCIEX4 port1
15 PE_PCIE_IN1 / IP1 / TN1 / TP1
PCIE_PERN_5 PCIE_PERP_5 PCIE_PETN_5 PCIE_PETP_5

PCIEX4 port2
15 PF_PCIE_IN2 / IP2 / TN2 / TP2
PCIE_PERN_6 PCIE_PERP_6 PCIE_PETN_6 PCIE_PETP_6

PCIEX4 port3
15 PG_PCIE_IN3 / IP3 / TN3 / TP3
PCIE_PERN_7 PCIE_PERP_7 PCIE_PETN_7 PCIE_PETP_7

H81:PCIE 7/8 N/A

PCIEX4 port4
15 PH_PCIE_IN4 / IP4 / TN4 / TP4
PCIE_PERN_8 PCIE_PERP_8 PCIE_PETN_8 PCIE_PETP_8

放靠近 Device & PCI-E Slot

DH82B85/S/[10HB1-030B85-20R]

PCH PCIE ,DMI 15/4/4/4//15 Impedance=85 +- 15%
usb2.0 12/5/7/5/12
usb3.0 20/5/7/5/20 Impedance=85 +- 15%

PCH (F)

PCHF

USB3: USB3_RXN_0 USB3_RXP_0 USB3_TXN_0 USB3_TXP_0 USB3_RXN_1 USB3_RXP_1 USB3_TXN_1 USB3_TXP_1 USB3_RXN_4 USB3_RXP_4 USB3_TXN_4 USB3_TXP_4 USB3_RXN_5 USB3_RXP_5 USB3_TXN_5 USB3_TXP_5

FDILINK: FDI_RXN_0 FDI_RXP_0 FDI_TXN_0 FDI_TXP_0 FDI_RXN_1 FDI_RXP_1 FDI_TXN_1 FDI_TXP_1 FDI_CSYNC FDI_INT FDI_RCOMP

28 PCH_USB3_RXN0 / RXP0 / TXN0 / TXP0
28 PCH_USB3_RXN1 / RXP1 / TXN1 / TXP1
19 PCH_USB3_RXN4 / RXP4 / TXN4 / TXP4
19 PCH_USB3_RXN5 / RXP5 / TXN5 / TXP5

H81:USB3.0 N\A

VCC3 — NR62 8.2K/4 — NR63 8.2K/4

TACH6_GP70 TACH7_GP71

DH82B85/S/[10HB1-030B85-20R]

FDI_TXP[0..1] — FDI_TXP[0..1] 4
FDI_TXN[0..1] — FDI_TXN[0..1] 4

FDI_CSYNC — FDI_CSYNC 4
FDI_INT — FDI_INT 4
FDI_RCOMP — NR29 7.5K/4/1 — VCC1_5_PCH

FDI:12/4/4/4/12
Impedance=85 +- 17.5%

USB3.0:20/5/7/5/20 (breakout min 8/4/4/4/8) ; ONLY 3 VIAS
Impedance=85 +- 17.5%
Back Panel < 10000 MILS
Front Panel < 6000 MILS

CK_SRCCLK_PCH — NR89 8.2K/4
CK_-SRCCLK_PCH — NR88 8.2K/4
Mount for integrated clock Generation Mode

CK_DOTCLK — NR92 8.2K/4
CK_-DOTCLK — NR91 8.2K/4
NR92 short to GND in non graphic SKU

PCH (J)

PCHJ

VSS_NCTF: AT1 AT41 AU1 AV1 AV2 AV40 AV41 AW2 AW40 B40 B41 C41 D1 D41

TP22 TP23 TP21 TP20 TP14 TP15 TP12 TP10 TP11 TP9 TP3 TP4 TP1 TP2 TP5 TP6 TP7 TP8

U11 U10 AJ14 AK14 K34 K33 AH24 L16 K16 AM34 R12 N12 L22 K22 R4 K5 P5 L5

VSS: AC31 AF3 AV21

DH82B85/S/[10HB1-030B85-20R]

PCH H/S

PCH_HS

PCH_HS/[12SP2-S06012-01R_12SP2-S06012-02R_12SP2-S06012-03R]

USB TABLE

OC[3:0]# for Device 29 (ports 0-7)
OC[7:4]# for Device 26 (ports 8-13)

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

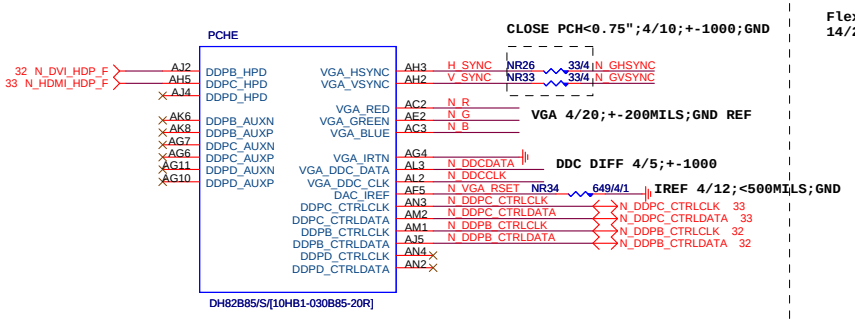
Gigabyte Technology

Title: PCH FDI,DMI,USB ,PCIE

Size: Custom | Document Number: GA-B85-HD3 | Rev: 1.1

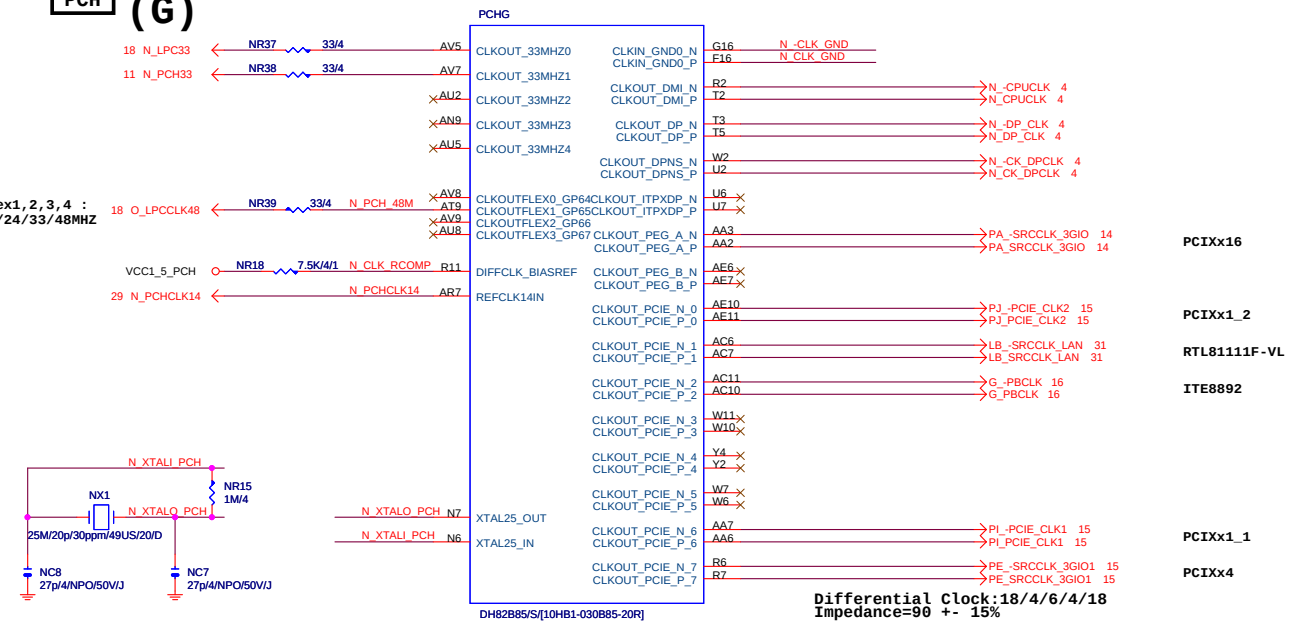
Date: Thursday, June 27, 2013 | Sheet 9 of 34

PCH (E)

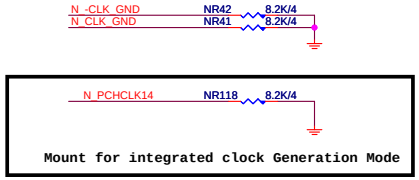


VGA DISABLE
R,G,B NC OR GND
IRTN / IREF GND
VGA_HSYNC, VGA_VSYNC,DDC_CLK, DDC_DATA NC
POWER VCCADAC(AF2), VCCADACBG(AE1) GND

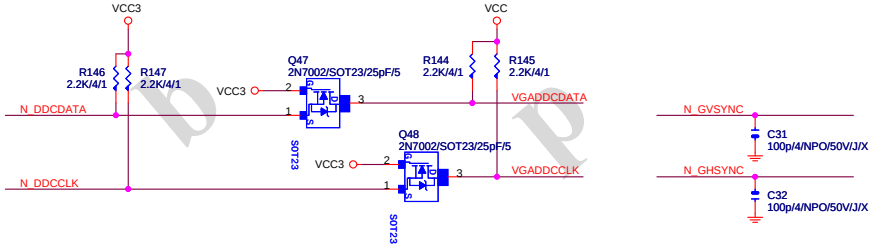
PCH (G)



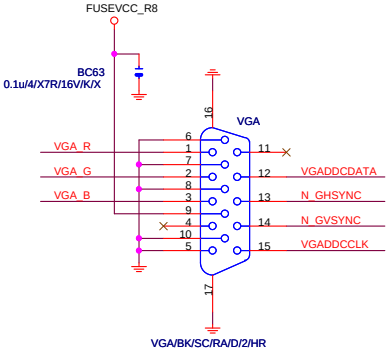
PCH CLK PD



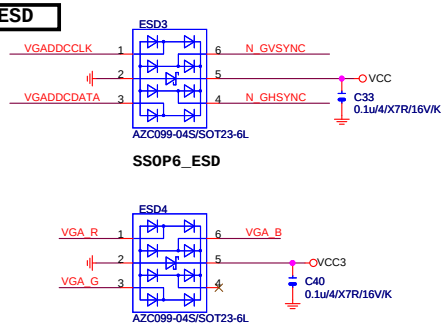
VGA DDC



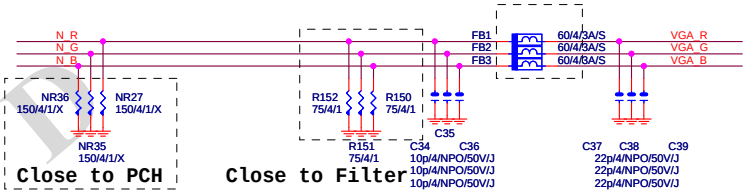
VGA CONNECTOR



VGA ESD



VGA DDC



Gigabyte Technology		
Title: PCH DISPLAY ,CLK BUFFER		
Size: Custom	Document Number: GA-B85-HD3	Rev: 1.1
Date: Thursday, June 27, 2013	Sheet 10 of 34	

PCH (C)

SATA3 : 20/4/4/4/20 (breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%
SATA2 15/4/4/4/15
SATA3 20/4/4/4/20

PCHC

DH82B85/S/[10HB1-030B85-20R]

PCH (A)

PCHA

DH82B85/S/[10HB1-030B85-20R]

BOOT DEVICE	GP51	GP19
LPC	0	0
SPI	float	float

Default int pull up on GP51,
Default SPI boot devices

PCH CLK PD

Mount for integrated clock Generation Mode

PCH PU/PD

ME PWROK

GPIO37 PU ENABLE SBA
For H87&B85

SATA CONNECTOR

White connector for SATA3

[Z87/H87] all SATA3
SATA3(From Z87) - 黑色
SATA3(From Marvell) - 灰色
[B85] SATA2+SATA3
SATA2(From B85) - 黑色
SATA3(From B85) - 白色

** Z87/H87 Port 4&5 SATA3.0
** B85 Port 4&5 SATA2.0

H81 Port 2/3 N/A

GPIO38 Ctrl

MFG Mode

N_GPIO38 : Lo --> Enable
Hi --> Disable

soft strap	GP16	GP49
0	pcie1	pcie2
1	sata4	sata5

Gigabyte Technology

Title: PCH HOST , SATA, PCI

Size: Custom | Document Number: GA-B85-HD3 | Rev: 1.1

Date: Thursday, June 27, 2013 | Sheet 11 of 34

PCH (D)

PCHD

DH82B85/S/[10HB1-030B85-20R]

ACZ_SDOUT

C_ACZ_SDOUT : HI --> ME Enable
Lo --> ME Disable
HI:disable ME and override SPI Flash Access Permissions

PCH_DPWROK

At least 10ms delay after 3VDUAL_PCH stabel

At least 40ns lead fall to 0V before 3VDUAL_PCH fall to 2V

PCH PU/PD

GP44:DFX test Mode

N_-IGC_EN:Low to over clock validation strap

SUSCLK: OD PLL VR Disable

HSW_STRAP13

32.768KHZ

NX2-SHT SHW/D0.64*5.08*6.74

32.768K/12.5p/20ppm/TF38/35K/D

CLR_CMOS

BATTERY CR2032

BAT-SK/BK/P/S/D/SN

BATTERY-DUAL-4

RB 必須放在BAT外

N_INTERMEN : Integrated 1.05V SUS VRM Enable

Gigabyte Technology	
Title	PCH GPIO , CTRL , AUDIO
Size: Custom	Document Number: GA-B85-HD3
Rev	1.1
Date: Thursday, June 27, 2013	Sheet 12 of 34

PCH (H)

PCHH

DH82B85/S/[10HB1-030B85-20R]

VCC3_DAC

CLOSE北橋(注意震盪水波紋)

(3.3V/70mA+360uA)

3VDUAL_PCH

SHT_PWR

CAP

(3.3V)(X6)

(1.05V)(X5)

(1.05V)(X6)

(1.05V)(X2)

(3.3V)(X2)

(1.5V) (X10)

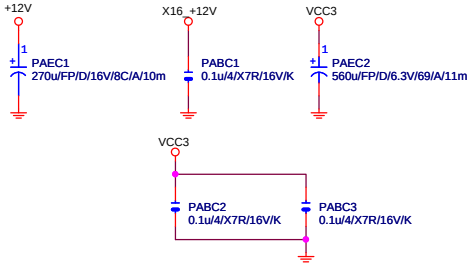
PCH (I)

PCHI

DH82B85/S/[10HB1-030B85-20R]

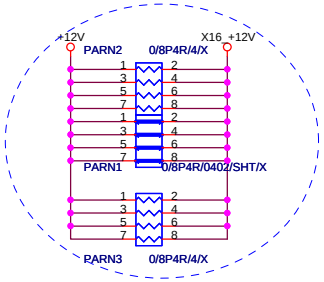
Gigabyte Technology			
Title: PCH PWR ,GND			
Size: Custom	Document Number: GA-B85-HD3		Rev: 1.1
Date: Thursday, June 27, 2013	Sheet 13 of 34		

PCIEX16 CAP



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	PAC19	0.22u/4/X5R/6.3V/K	PA_EXP_TXP7_C
PA_EXP_TXN7	PAC18	0.22u/4/X5R/6.3V/K	PA_EXP_TXN7_C
PA_EXP_TXP8	PAC20	0.22u/4/X5R/6.3V/K	PA_EXP_TXP8_C
PA_EXP_TXN8	PAC21	0.22u/4/X5R/6.3V/K	PA_EXP_TXN8_C
PA_EXP_TXP9	PAC22	0.22u/4/X5R/6.3V/K	PA_EXP_TXP9_C
PA_EXP_TXN9	PAC23	0.22u/4/X5R/6.3V/K	PA_EXP_TXN9_C
PA_EXP_TXP10	PAC24	0.22u/4/X5R/6.3V/K	PA_EXP_TXP10_C
PA_EXP_TXN10	PAC25	0.22u/4/X5R/6.3V/K	PA_EXP_TXN10_C
PA_EXP_TXP11	PAC26	0.22u/4/X5R/6.3V/K	PA_EXP_TXP11_C
PA_EXP_TXN11	PAC27	0.22u/4/X5R/6.3V/K	PA_EXP_TXN11_C
PA_EXP_TXP12	PAC28	0.22u/4/X5R/6.3V/K	PA_EXP_TXP12_C
PA_EXP_TXN12	PAC29	0.22u/4/X5R/6.3V/K	PA_EXP_TXN12_C
PA_EXP_TXP13	PAC30	0.22u/4/X5R/6.3V/K	PA_EXP_TXP13_C
PA_EXP_TXN13	PAC31	0.22u/4/X5R/6.3V/K	PA_EXP_TXN13_C
PA_EXP_TXP14	PAC32	0.22u/4/X5R/6.3V/K	PA_EXP_TXP14_C
PA_EXP_TXN14	PAC33	0.22u/4/X5R/6.3V/K	PA_EXP_TXN14_C
PA_EXP_TXP15	PAC34	0.22u/4/X5R/6.3V/K	PA_EXP_TXP15_C
PA_EXP_TXN15	PAC35	0.22u/4/X5R/6.3V/K	PA_EXP_TXN15_C

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

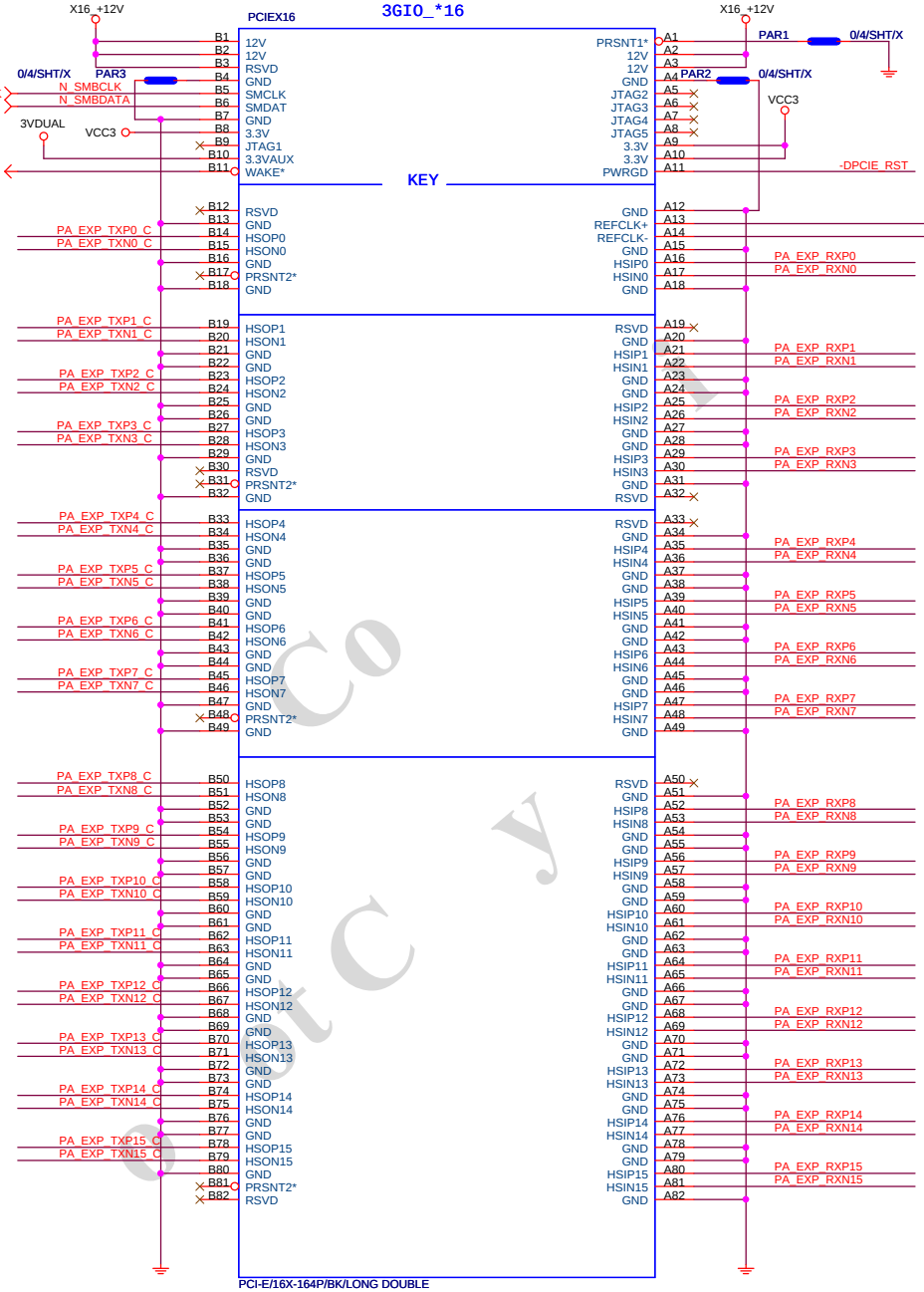
PCE-E X16(單向) BANDWITH=2.5GHz*(8b/10b)X16=32Gb/s=4GB/s

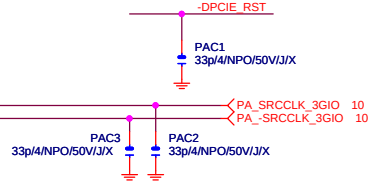
PCE-E X16(雙向) BANDWITH=2.5GHz*(8b/10b)X16X2=64Gb/s=8GB/s

PCI-E REV:2.0--> 5GHZ

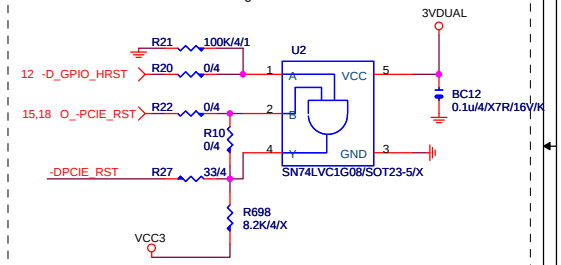
PCIEX16 SLOT

PCIESLOT-164DN-Q





The auxillary reset circuit is only required for PCIe Gen3 margining and functional link training



PCIEX16:16/5/5/5/16

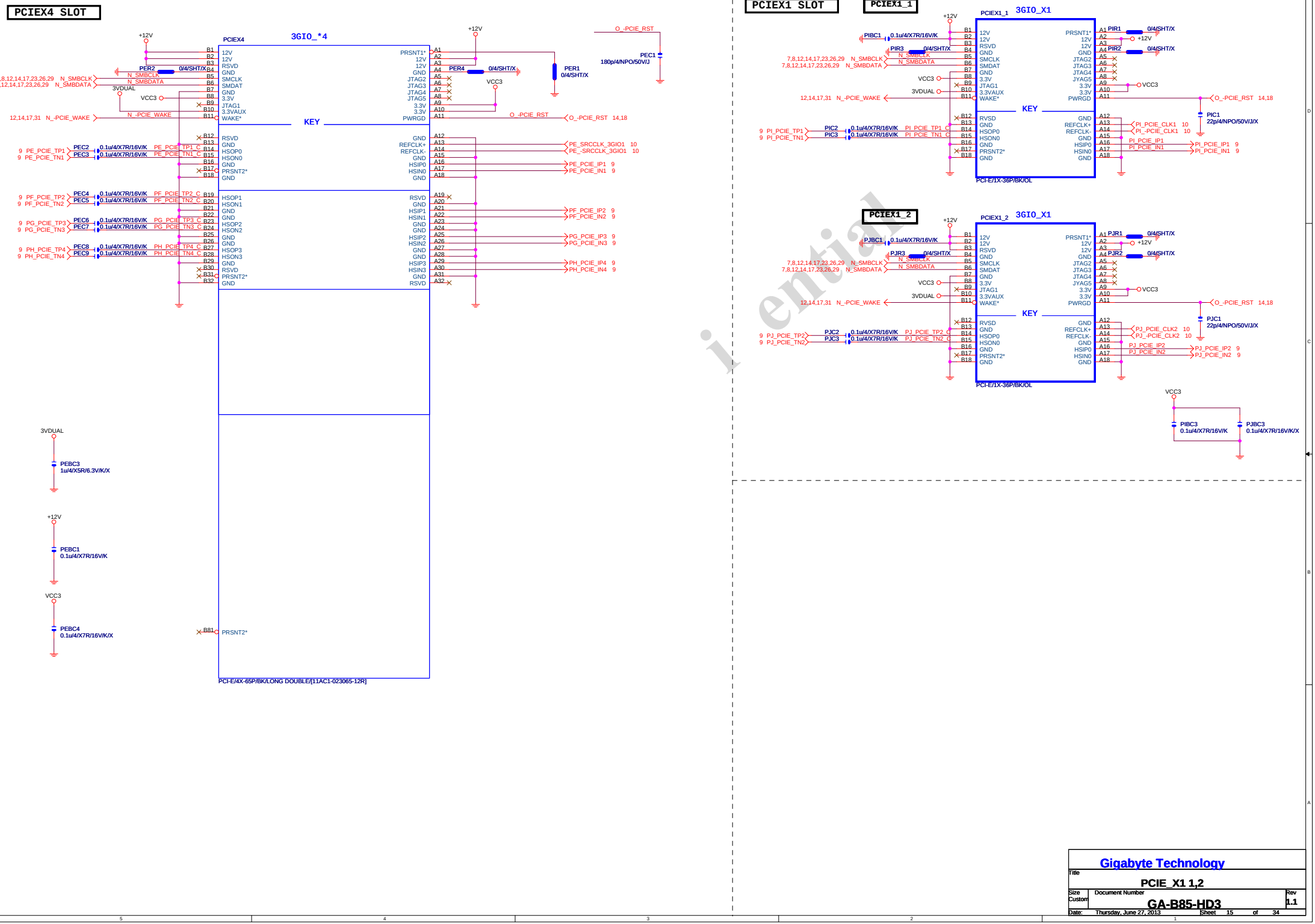
PA_EXP_RXP[0..15] >> PA_EXP_RXP[0..15] 4

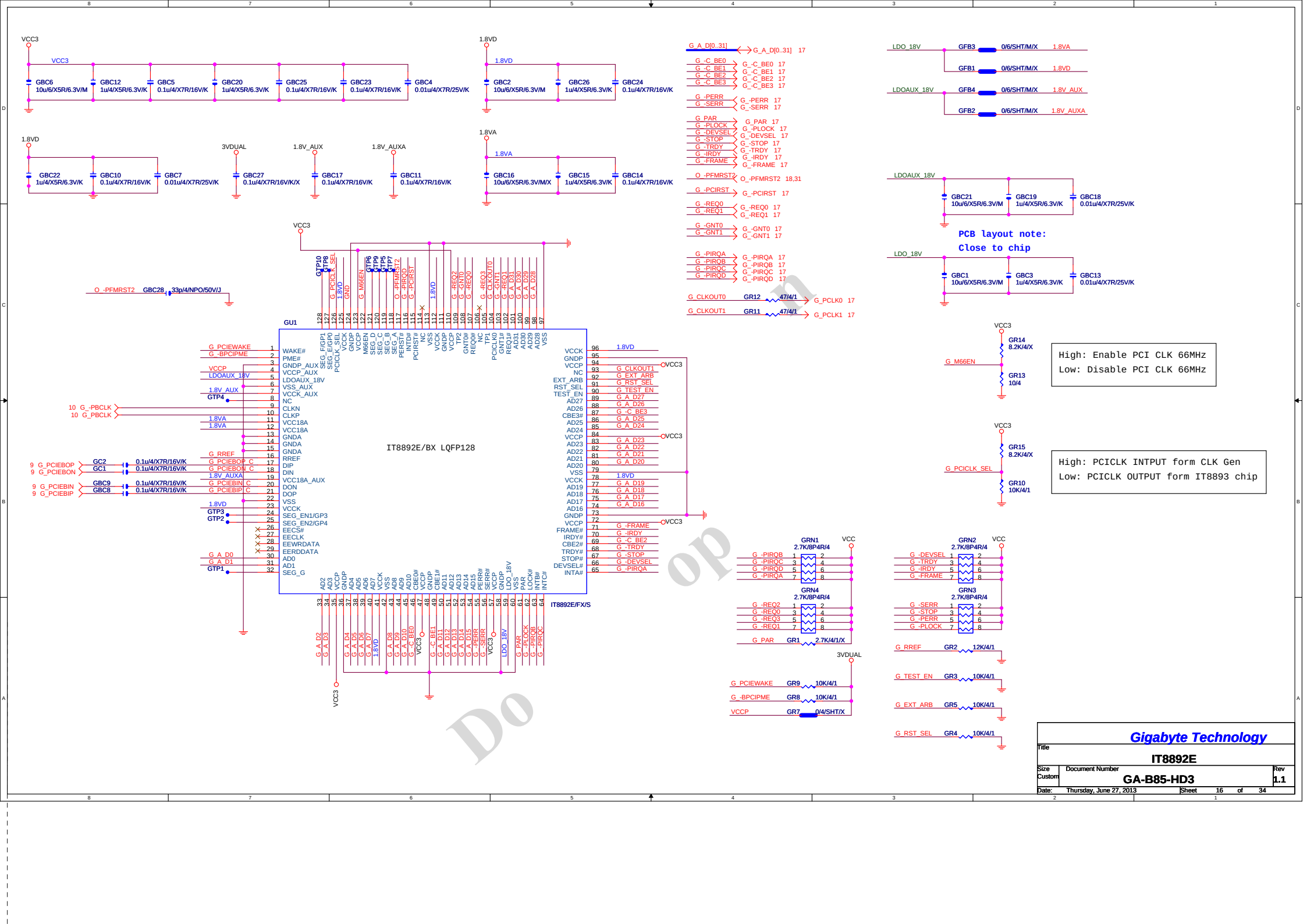
PA_EXP_RXN[0..15] >> PA_EXP_RXN[0..15] 4

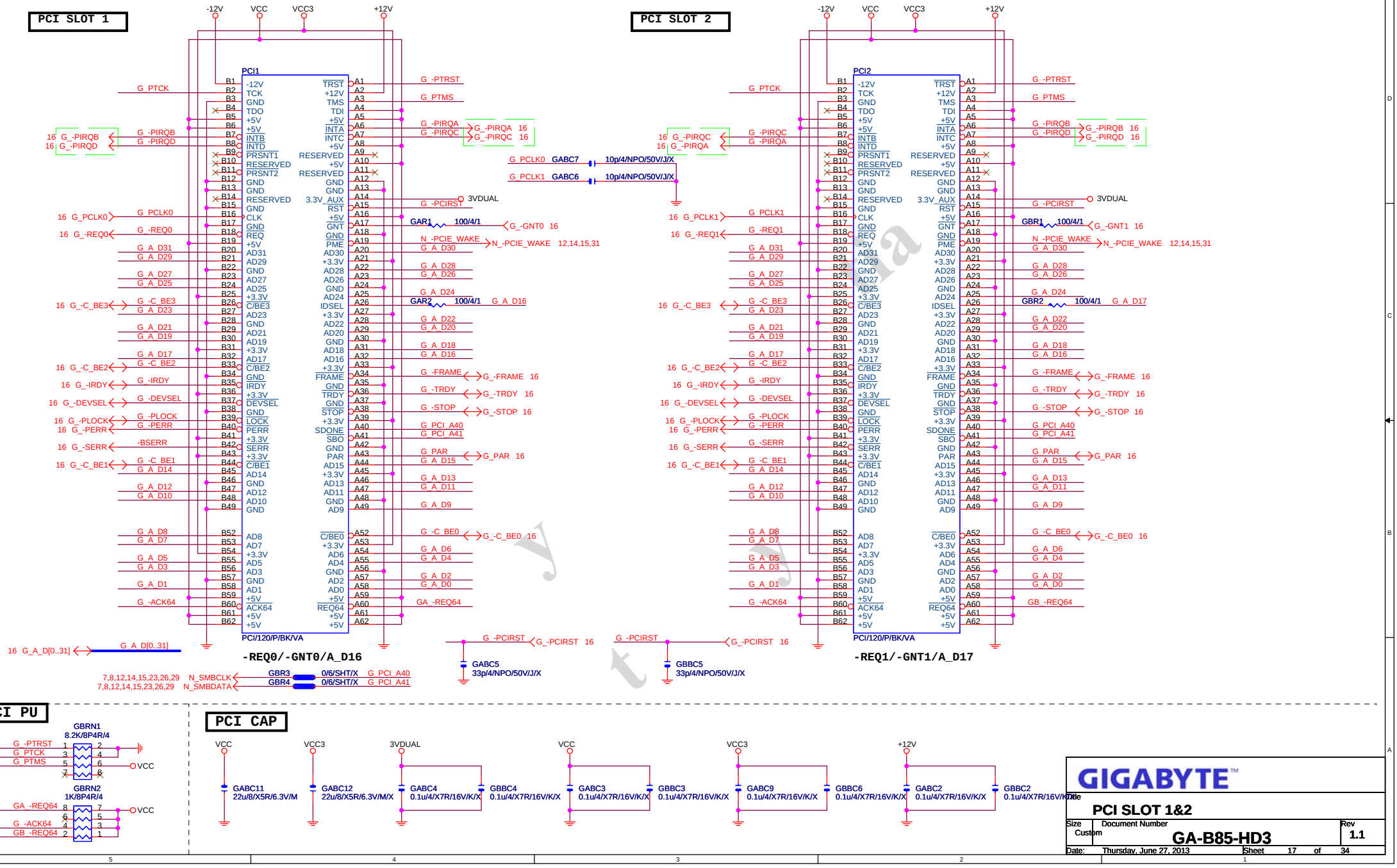
PA_EXP_TXP[0..15] >> PA_EXP_TXP[0..15] 4

PA_EXP_TXN[0..15] >> PA_EXP_TXN[0..15] 4

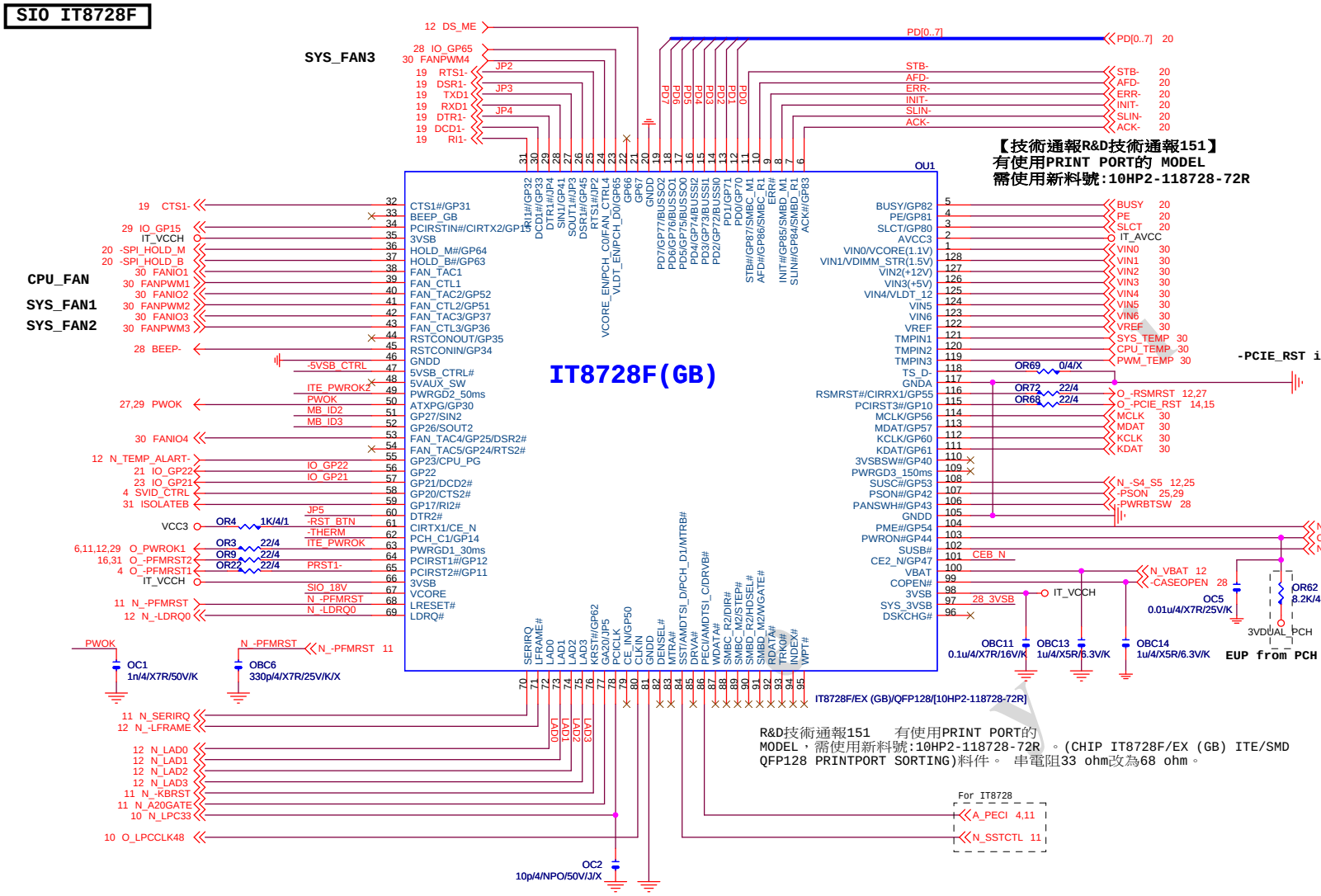
Gigabyte Technology			
Title: PCI EXPRESS * 16			
Size: Custom	Document Number: GA-B85-HD3		Rev: 1.1
Date: Thursday, June 27, 2013		Sheet 14 of 34	


PCIEX4 SLOT
PCIEX4
3GIO_*4
KEY
PCI-E/4X-65P/BK/LONG DOUBLE/[11AC1-023065-12R]
PCIEX1 SLOT
PCIEX1_1
PCIEX1_1 3GIO_X1
KEY
PCI-E/1X-36P/BK/OL
PCIEX1_2
PCIEX1_2 3GIO_X1
KEY
PCI-E/1X-36P/BK/OL
i ential
Gigabyte Technology
PCIE_X1 1,2
GA-B85-HD3
Rev 1.1
Thursday, June 27, 2013
Sheet 15 of 34

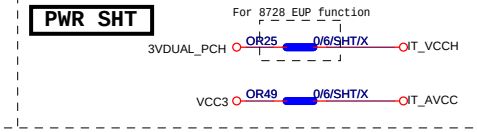

VCC3
GBC6 10u/6/X5R/6.3V/M
GBC12 1u/4/X5R/6.3V/K
GBC5 0.1u/4/X7R/16V/K
GBC20 1u/4/X5R/6.3V/K
GBC25 0.1u/4/X7R/16V/K
GBC23 0.1u/4/X7R/16V/K
GBC4 0.01u/4/X7R/25V/K
1.8VD
GBC2 10u/6/X5R/6.3V/M
GBC26 1u/4/X5R/6.3V/K
GBC24 0.1u/4/X7R/16V/K
GBC22 1u/4/X5R/6.3V/K
GBC10 0.1u/4/X7R/16V/K
GBC7 0.01u/4/X7R/25V/K
3VDUAL
GBC27 0.1u/4/X7R/16V/K/X
1.8V_AUX
GBC17 0.1u/4/X7R/16V/K
1.8V_AUXA
GBC11 0.1u/4/X7R/16V/K
1.8VA
GBC16 10u/6/X5R/6.3V/M/X
GBC15 1u/4/X5R/6.3V/K
GBC14 0.1u/4/X7R/16V/K
G_A_D[0..31]
G_-C_BE0
G_-C_BE1
G_-C_BE2
G_-C_BE3
G_-PERR
G_-SERR
G_PAR
G_-PLOCK
G_-DEVSEL
G_-STOP
G_-TRDY
G_-IRDY
G_-FRAME
O_-PFMRST2
G_-PCIRST
G_-REQ0
G_-REQ1
G_-GNT0
G_-GNT1
G_-PIRQA
G_-PIRQB
G_-PIRQC
G_-PIRQD
G_CLKOUT0
G_CLKOUT1
GR12 47/4/1
GR11 47/4/1
G_PCLK0 17
G_PCLK1 17
LDO_18V
GFB3 0/6/SHT/M/X 1.8VA
GFB1 0/6/SHT/M/X 1.8VD
LDOAUX_18V
GFB4 0/6/SHT/M/X 1.8V_AUX
GFB2 0/6/SHT/M/X 1.8V_AUXA
GBC21 10u/6/X5R/6.3V/M
GBC19 1u/4/X5R/6.3V/K
GBC18 0.01u/4/X7R/25V/K
PCB layout note:
Close to chip
GBC1 10u/6/X5R/6.3V/M
GBC3 1u/4/X5R/6.3V/K
GBC13 0.01u/4/X7R/25V/K
O_-PFMRST2
GBC28 33p/4/NPO/50V/J
GU1
IT8892E/BX LQFP128
IT8892E/FX/S
GR14 8.2K/4/X
GR13 10/4
G_M66EN
High: Enable PCI CLK 66MHz
Low: Disable PCI CLK 66MHz
GR15 8.2K/4/X
GR10 10K/4/1
G_PCICLK_SEL
High: PCICLK INTPUT form CLK Gen
Low: PCICLK OUTPUT form IT8893 chip
GRN1 2.7K/8P4R/4
GRN2 2.7K/8P4R/4
GRN4 2.7K/8P4R/4
GRN3 2.7K/8P4R/4
G_PAR GR1 2.7K/4/1/X
G_RREF GR2 12K/4/1
G_TEST_EN GR3 10K/4/1
G_EXT_ARB GR5 10K/4/1
G_RST_SEL GR4 10K/4/1
G_PCIEWAKE GR9 10K/4/1
G_-BPCIPME GR8 10K/4/1
VCCP GR7 0/4/SHT/X
Gigabyte Technology
IT8892E
GA-B85-HD3
Rev 1.1
Thursday, June 27, 2013
Sheet 16 of 34


PCI SLOT 1
PCI SLOT 2
-12V
VCC
VCC3
+12V
PCI1
PCI2
PCI/120/P/BK/VA
-REQ0/-GNT0/A_D16
-REQ1/-GNT1/A_D17
G_PTCK
G_PTRST
G_PTMS
G_PIRQA
G_PIRQB
G_PIRQC
G_PIRQD
G_PCLK0
G_PCLK1
GABC7
GABC6
10p/4NPO/50V/J/X
3VDUAL
G_PCIRST
GAR1
GBR1
100/4/1
G_GNT0
G_GNT1
G_REQ0
G_REQ1
N_PCIE_WAKE
G_A_D30
G_A_D28
G_A_D26
G_A_D24
GAR2
GBR2
G_A_D16
G_A_D17
G_A_D22
G_A_D20
G_A_D18
G_A_D16
G_C_BE3
G_C_BE2
G_C_BE1
G_C_BE0
G_FRAME
G_TRDY
G_STOP
G_IRDY
G_DEVSEL
G_PLOCK
G_PERR
G_SERR
G_PAR
G_PCI_A40
G_PCI_A41
G_A_D15
G_A_D13
G_A_D11
G_A_D9
G_A_D8
G_A_D7
G_A_D6
G_A_D5
G_A_D4
G_A_D3
G_A_D2
G_A_D1
G_A_D0
G_ACK64
GA_REQ64
GB_REQ64
G_A_D[0..31]
N_SMBCLK
N_SMBDATA
GBR3
GBR4
0/6/SHT/X
GABC5
GBBC5
33p/4NPO/50V/J/X
PCI PU
GBRN1
8.2K/8P4R/4
GBRN2
1K/8P4R/4
PCI CAP
GABC11
22u/8/X5R/6.3V/M
GABC12
22u/8/X5R/6.3V/M/X
GABC4
GBBC4
GABC3
GBBC3
GABC9
GBBC6
GABC2
GBBC2
0.1u/4/X7R/16V/K/X
GIGABYTE
Title
PCI SLOT 1&2
Size
Custom
Document Number
GA-B85-HD3
Rev
1.1
Date:
Thursday, June 27, 2013
Sheet
17
of
34

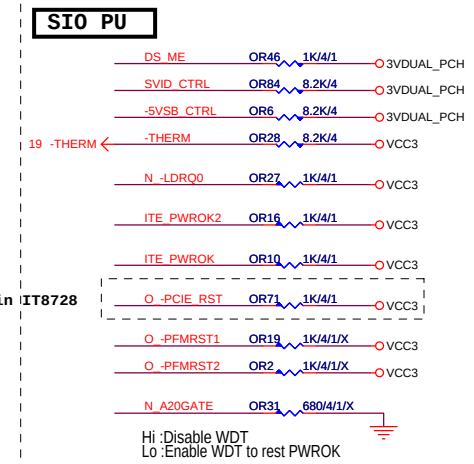
SIO IT8728F



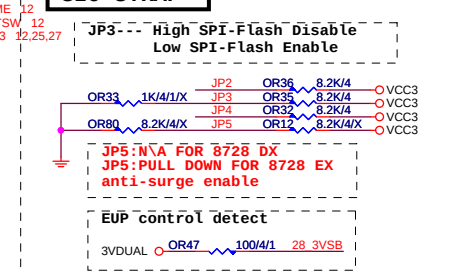
PWR SHT



SIO PU



SIO STRAP



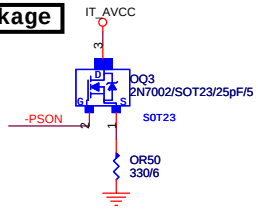
JP4	1	k8 power sequency function is Disable
	0	k8 power sequency function is Enable
JP3 JP5	1 1	The default value of EC Index 63h/6Bh/73h is 80h.
	1 0	The default value of EC Index 63h/6Bh/73h is FFh
	0 1	The default value of EC Index 63h/6Bh/73h is 00h.
	0 0	The default value of EC Index 63h/6Bh/73h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

IT8728F NOTE

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

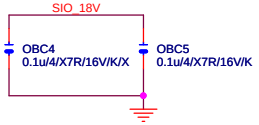
DUAL BIOS OPT STRAP

Power leakage

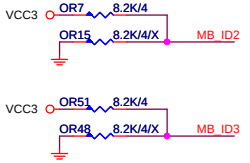


SIO_18V

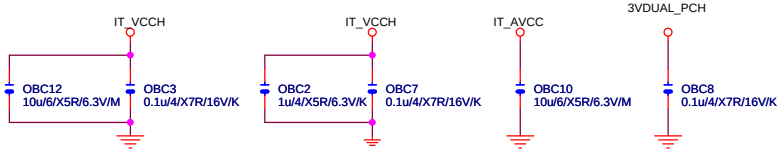
internal power pin, max 22nF cap



MB ID



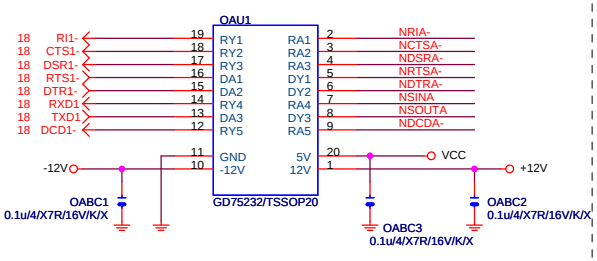
SIO CAP



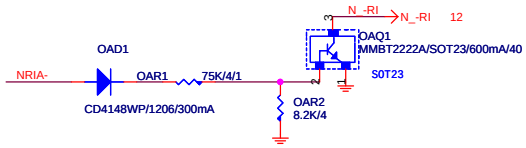
Gigabyte Technology

Title	ITE 8728 LPC IO	
Size: B	Document Number: GA-B85-HD3	Rev: 1.1
Date: Monday, July 01, 2013	Sheet 18 of 34	

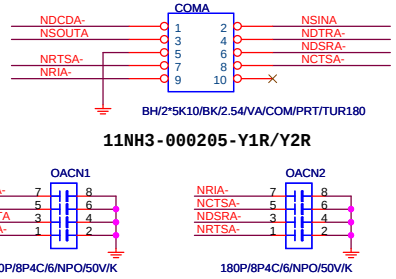
COMA



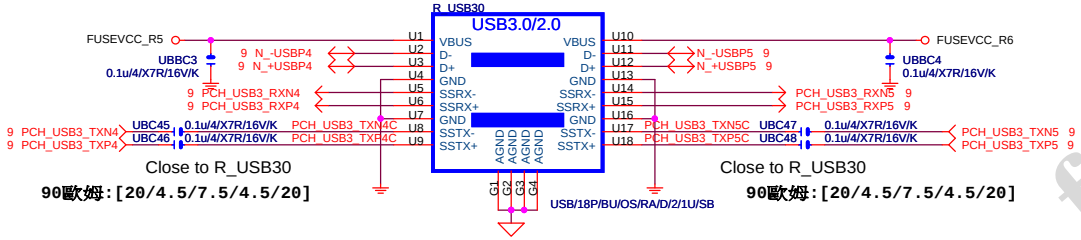
COM RI



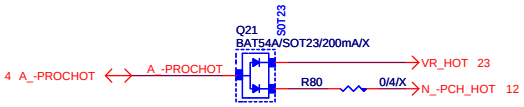
COM BUFFER



USB30_20 CONNECT

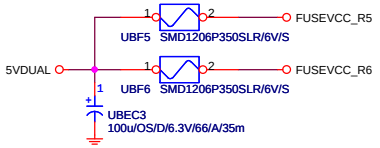


-PROHOT



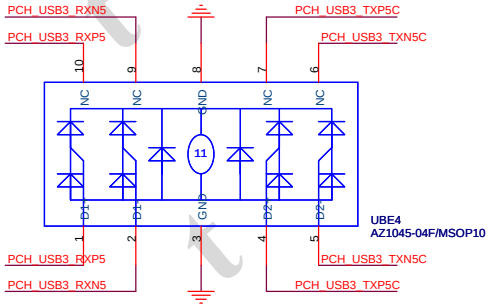
USB30 PWR

Polyswitch-1206

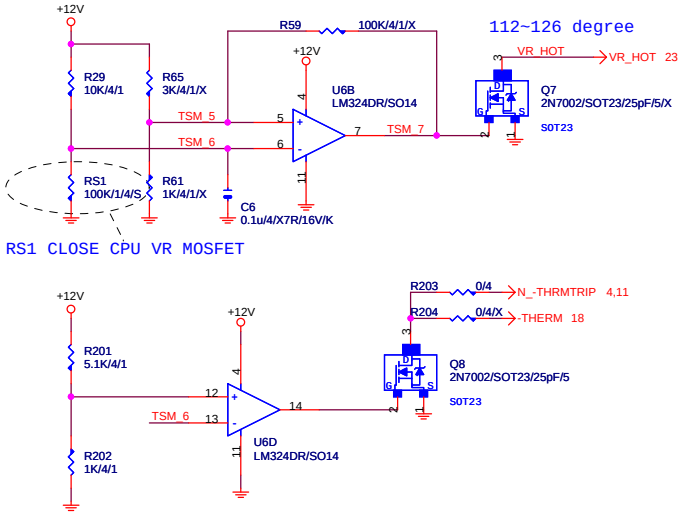


USB3.0 1Port - 1Fuse (3.5A)

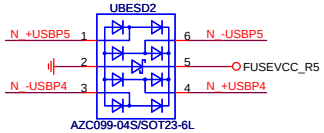
USB30 ESD PROCTECT



-PROHOT



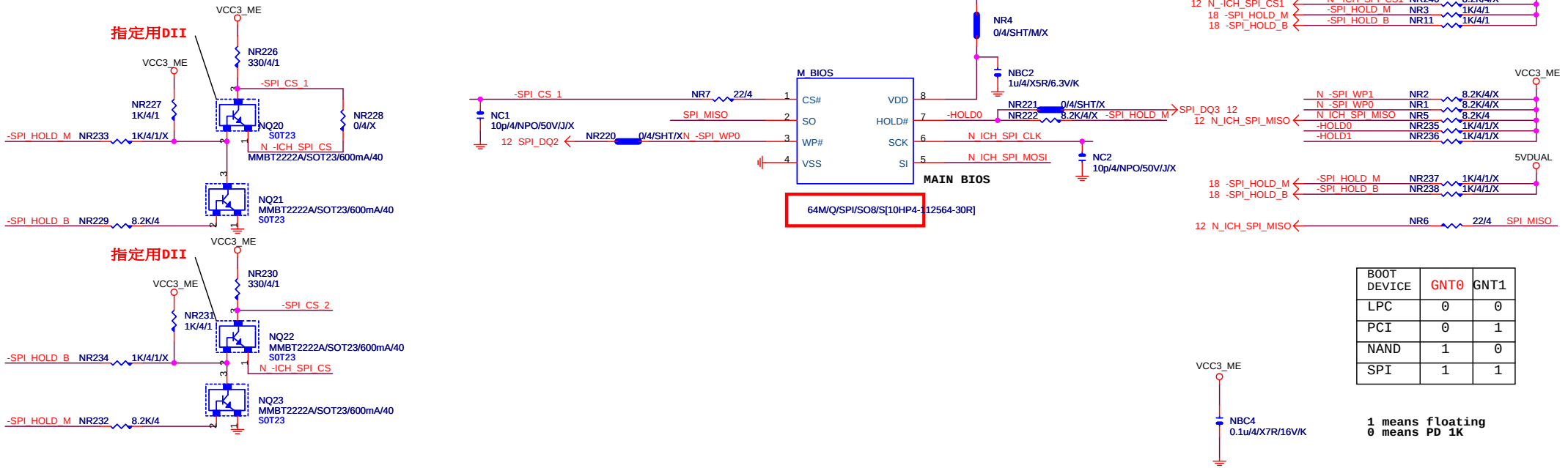
USB20 ESD PROCTECT



CLOSE R_USB30

Gigabyte Technology			
Title: COM & PROHOT/Dynamic O.C.			
Size: Custom	Document Number: GA-B85-HD3		Rev: 1.1
Date: Thursday, June 27, 2013	Sheet 19 of 34		

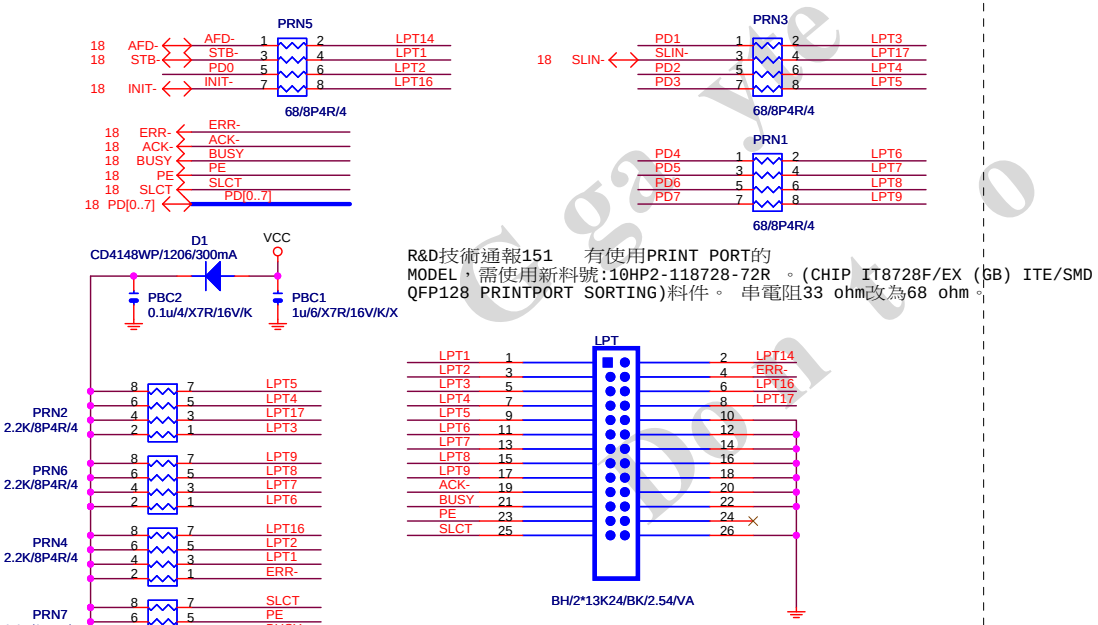
DUAL BIOS



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

1 means floating
0 means PD 1K

LPT PORT



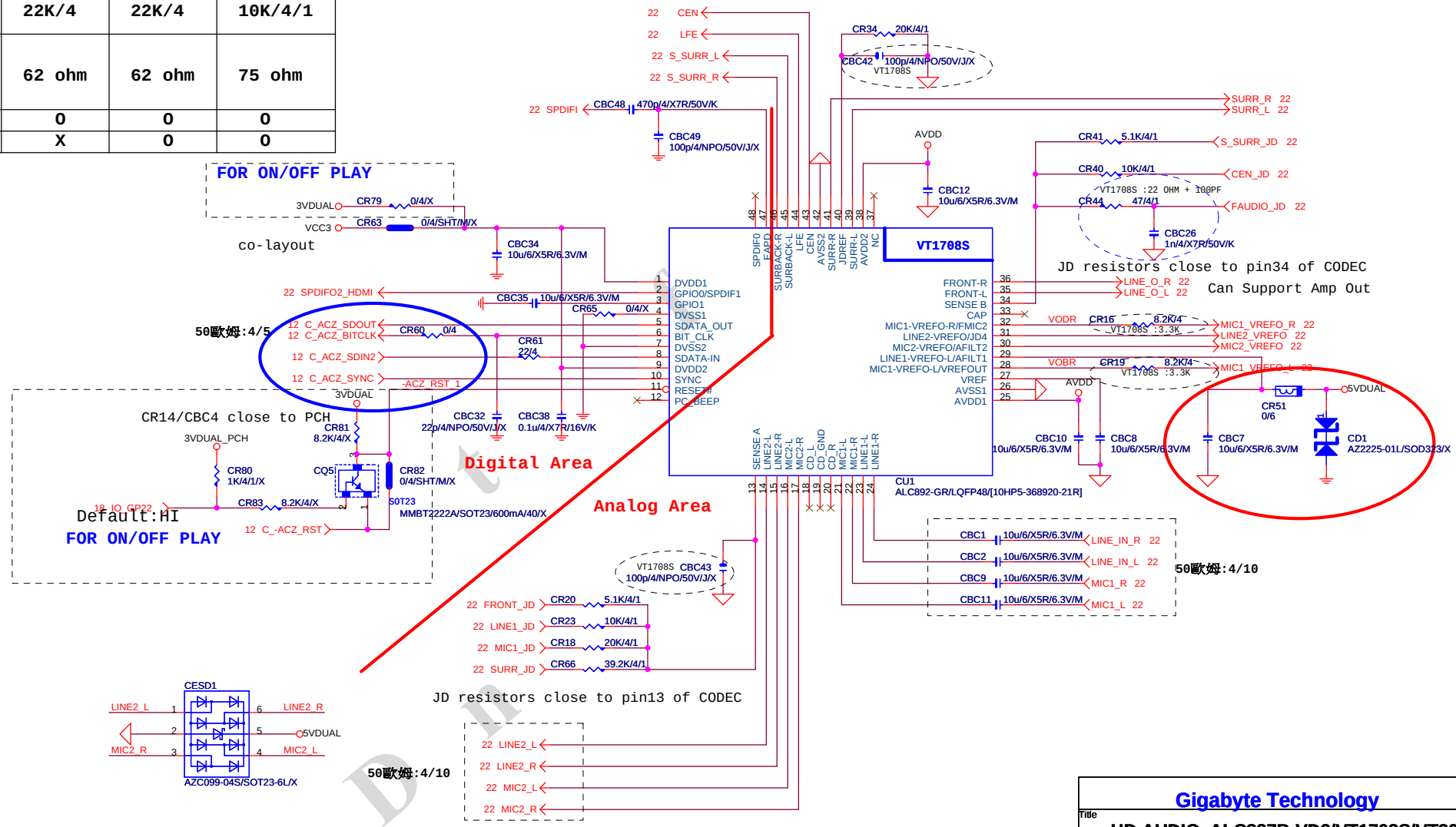
R&D技術通報151　有使用PRINT PORT的
MODEL，需使用新料號:10HP2-118728-72R 。(CHIP IT8728F/EX (GB) ITE/SMD QFP128 PRINTPORT SORTING)料件。 串電阻33 ohm改為68 ohm。

Gigabyte Technology			
Title: BIOS			
Size: Custom	Document Number: GA-B85-HD3		Rev: 1.1
Date: Monday, July 15, 2013		Sheet 20 of 34	

AZALIA CODEC

ALC892/ALC887-VD2/VT1708-CE Colay

	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	0	0	0
CESD1	X	0	0



Gigabyte Technology

Title: HD AUDIO ALC887B-VD2/VT1708S/VT2021

Size: Custom | Document Number: GA-B85-HD3 | Rev: 1.1

Date: Tuesday, July 09, 2013 | Sheet 21 of 34

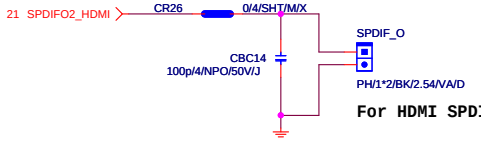
CR49 0/6/SHT/M/X → Close F_AUDIO

CR50 0/6/SHT/M/X → Close Codec

CR21 2.2/6 → Audio jack <--> USB_LAN

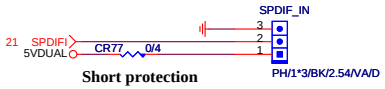
CR24 0/6/X → Under Audio jack

SPDIF_OUT



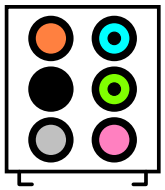
For HDMI SPDIF

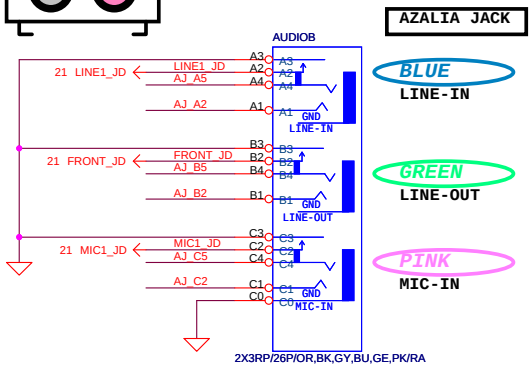
SPDIF_IN



Short protection

AZALIA JACK



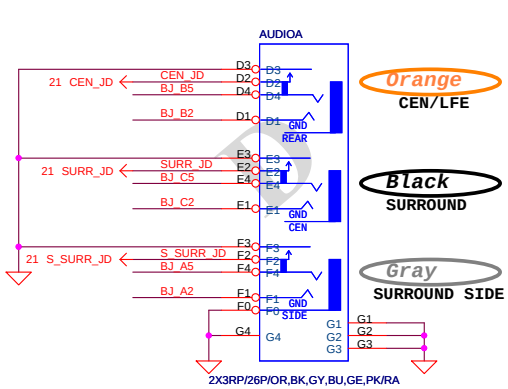


AZALIA JACK

BLUE LINE-IN

GREEN LINE-OUT

PINK MIC-IN

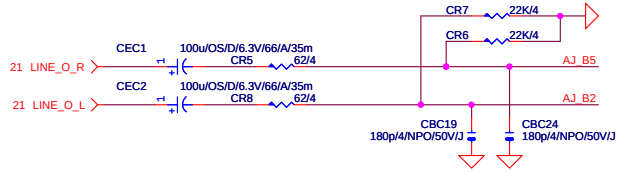


Orange CEN/LFE

Black SURROUND

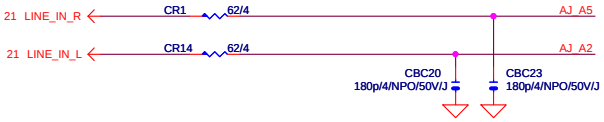
Gray SURROUND SIDE

LINE-OUT



Only reserved for ALC888

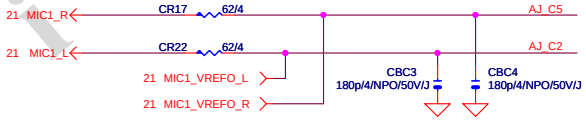
LINE-IN



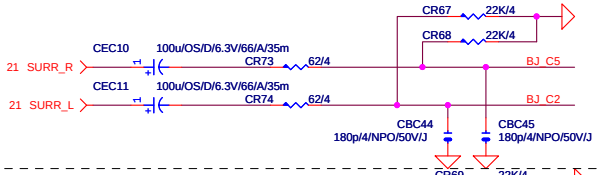
Verify MIC function in LINE-in

For 889A/888

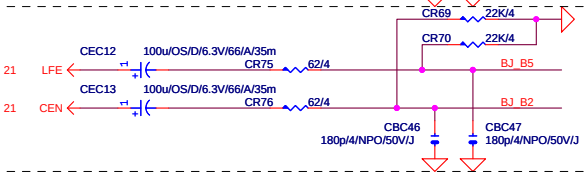
MIC-IN



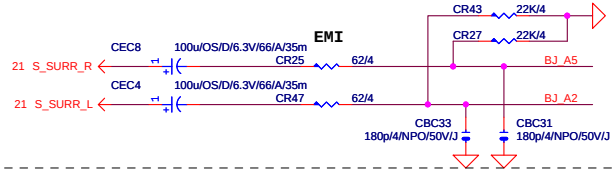
SURROUND



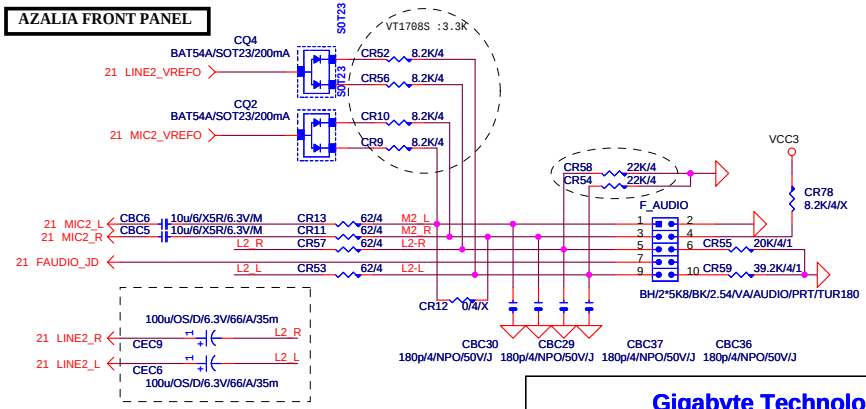
CEN/LFE



SURR BACK

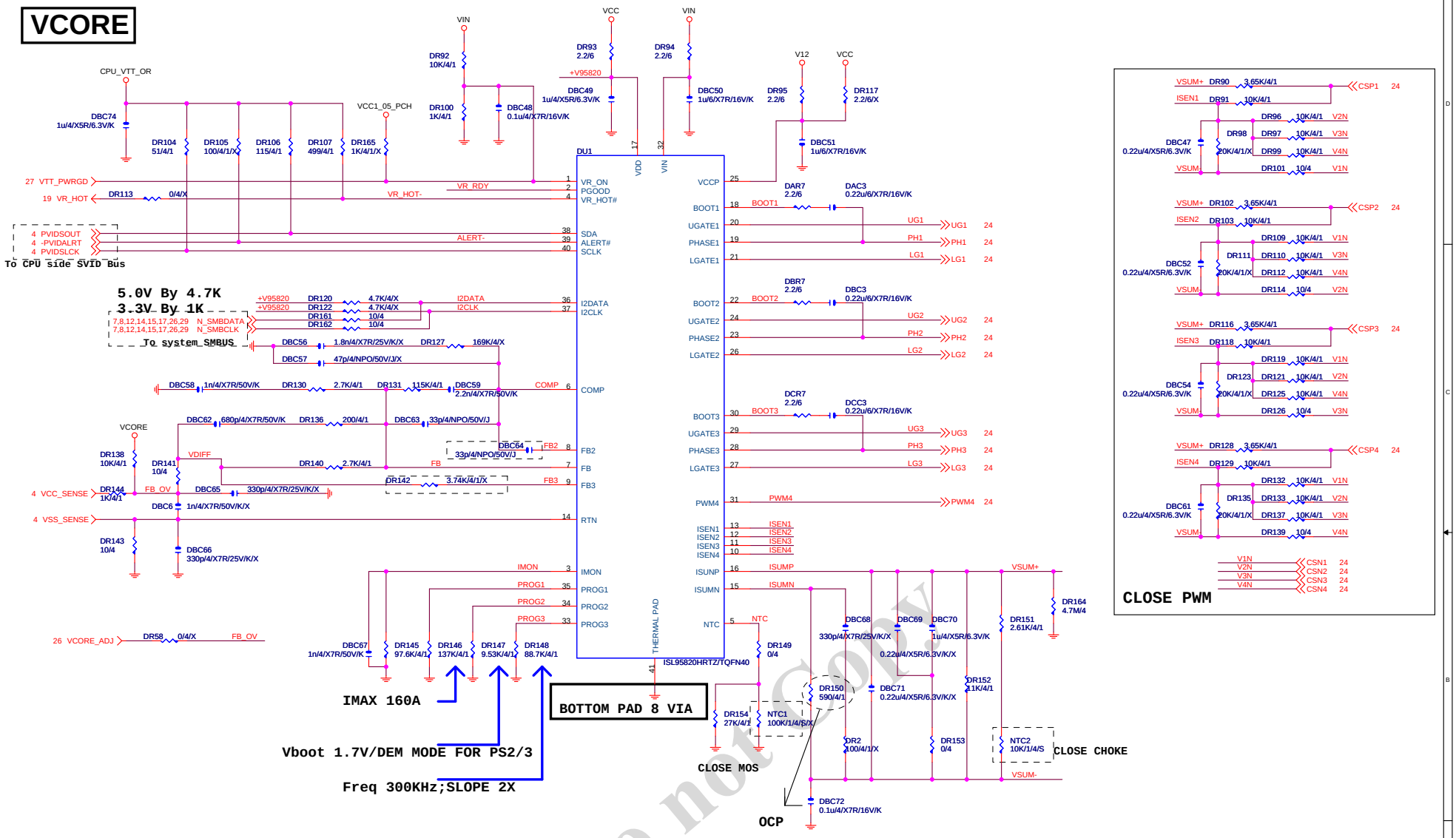


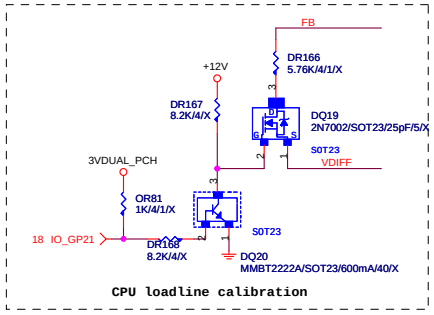
AZALIA FRONT PANEL

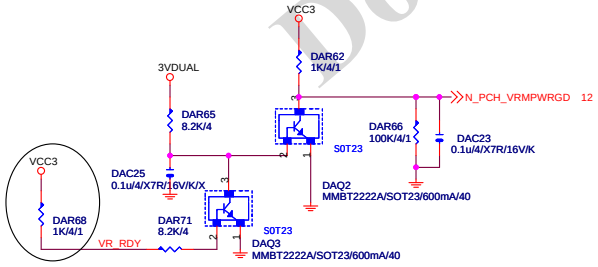


Gigabyte Technology		
Title: AUDIO JACK		
Size: Custom	Document Number: GA-B85-HD3	Rev: 1.1
Date: Thursday, June 27, 2013	Sheet 22 of 34	

VCORE

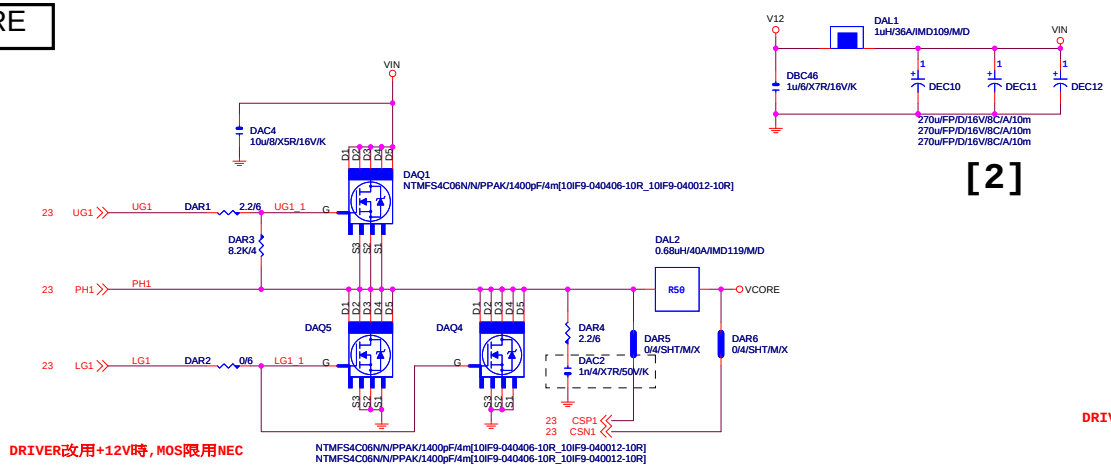


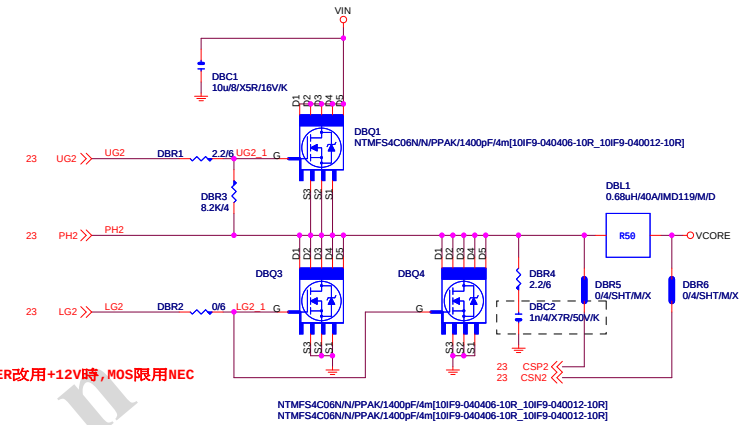


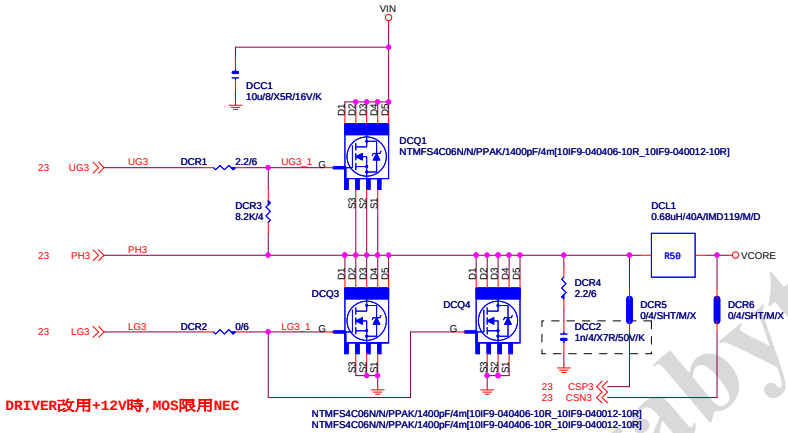


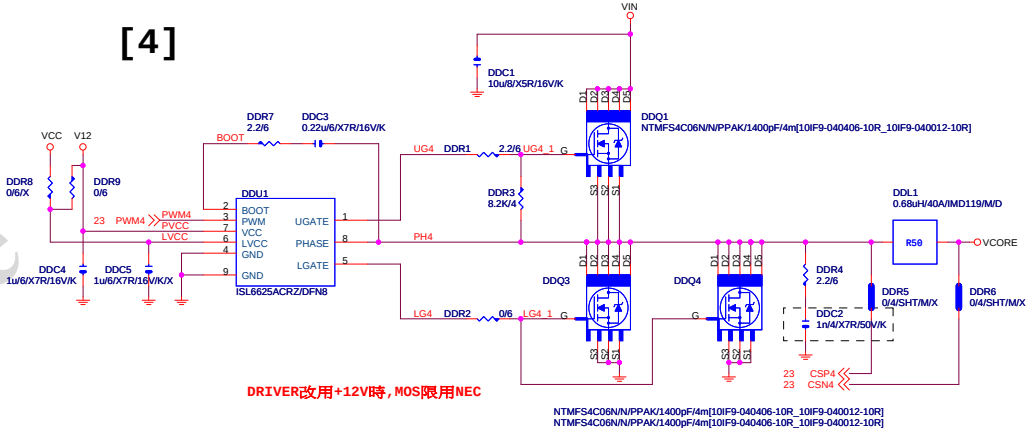
Gigabyte Technology			
Title: VCORE_ ISL95820			
Size: Custom	Document Number: GA-B85-HD3		Rev: 1.1
Date: Thursday, June 27, 2013	Sheet 23 of 33		

VCORE

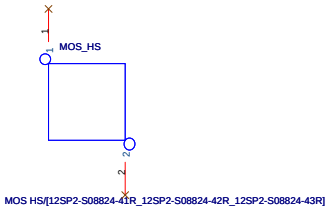


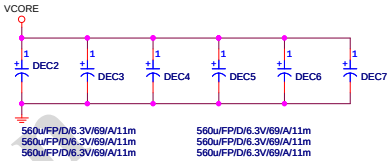






MOSFET HEATSINK

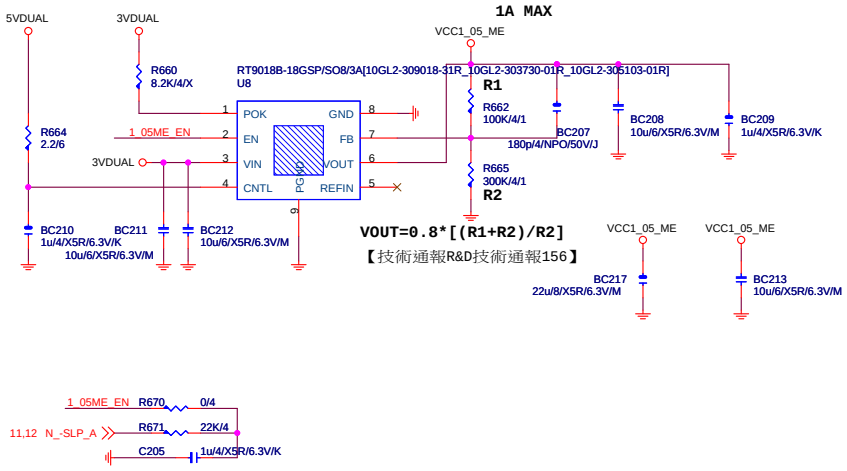




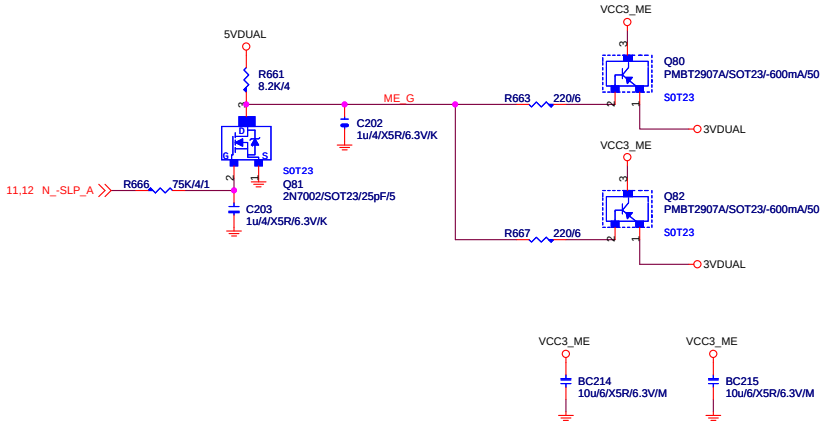
Gigabyte Technology		
Title	ISL95820_2	
Size: Custom	Document Number: GA-B85-HD3	Rev: 1.1
Date: Monday, July 01, 2013	Sheet 24 of 33	

VCC1_05_ME

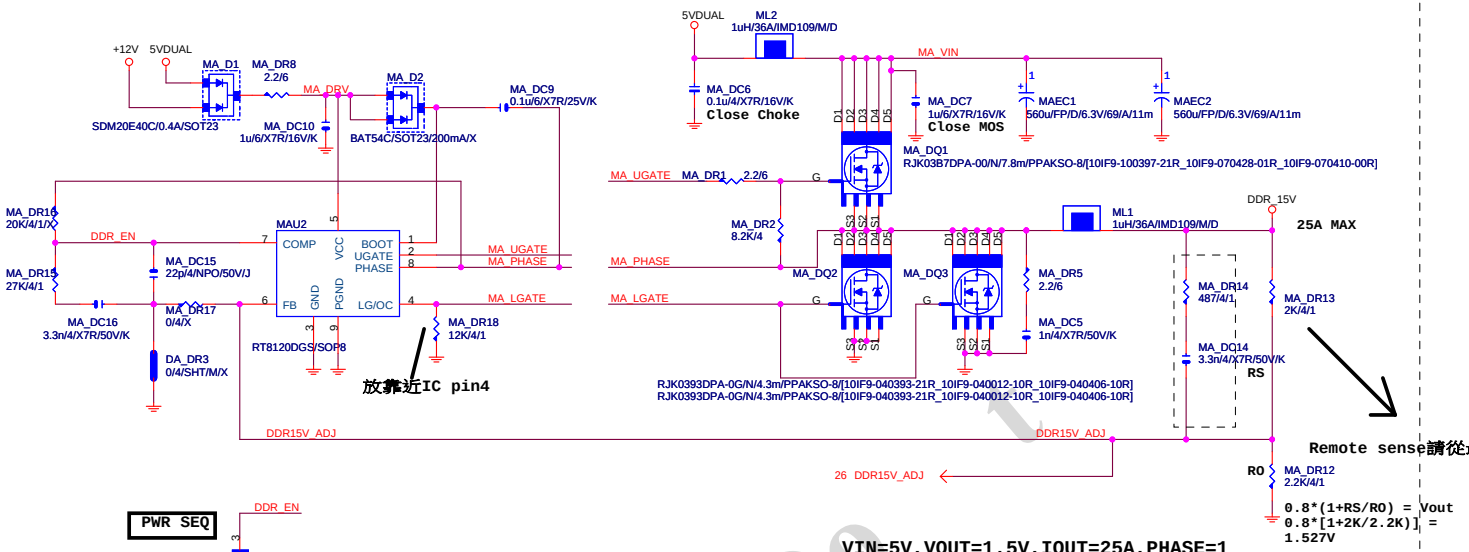
【技術通報R&D技術通報156】
(RICHTEK), (NUVOTON), (EMC)做共用
PIN7分壓阻值須做修改為100K以上電阻值



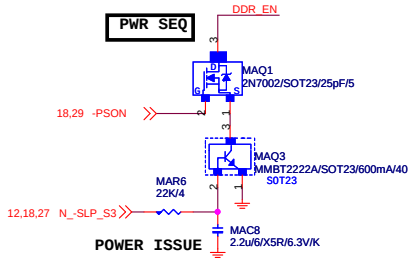
VCC3_ME

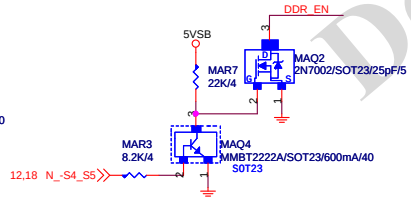


DDR_15V



PWR SEQ

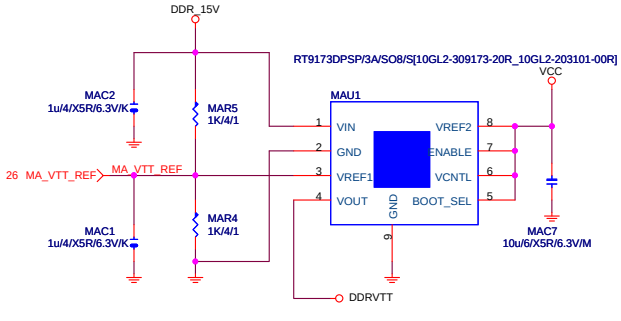




VIN=5V,VOUT=1.5V,IOUT=25A,PHASE=1
IRMS=11.45A
560u/FP/D/6.3V/68/8m RIPPLE CURRENT=4.7A
Coefficient=1.7(85℃),1(105℃)
VIN Ripple current=4.7X1.7=7.99A(85℃)
-->故固態電容須2X7.99=15.98>11.45A

OCP:35.82A for Rds=6.7m for vishay@4.5V
OCP:72.727A for Rds=3.3m for renesas@10V
OCP:48A=Roset*Iocset / Rds(on)
=12K*10uA / [5//5]

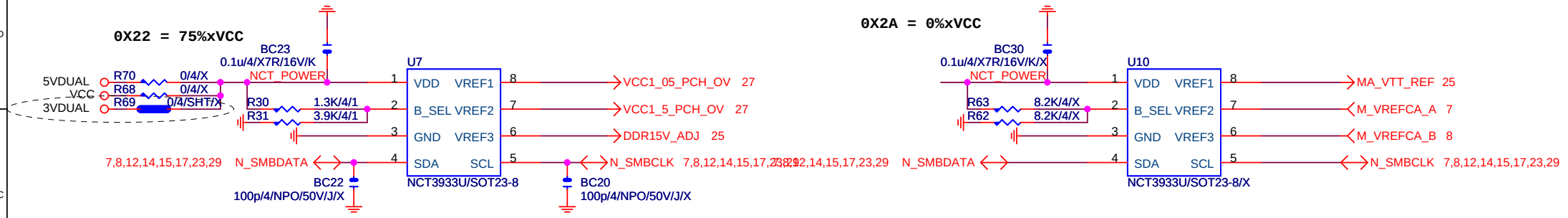
DDRVTT

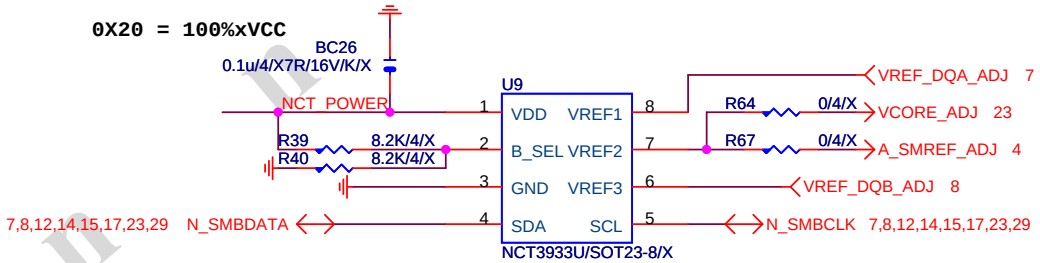


GIGABYTE™

Title	DDR15V / M3 POWER	
Size: Custom	Document Number: GA-B85-HD3	Rev: 1.1
Date: Thursday, June 27, 2013	Sheet 25 of 34	

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

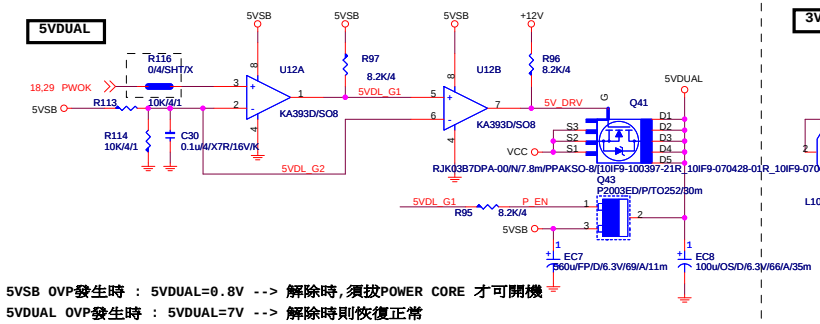
Gigabyte Technology

Title: CPU CORE VR-2

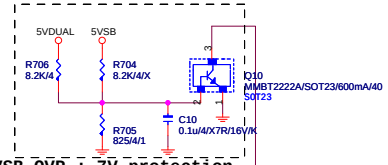
Size: Custom | Document Number: GA-B85-HD3 | Rev: 1.1

Date: Thursday, June 27, 2013 | Sheet 26 of 34

5VDUAL

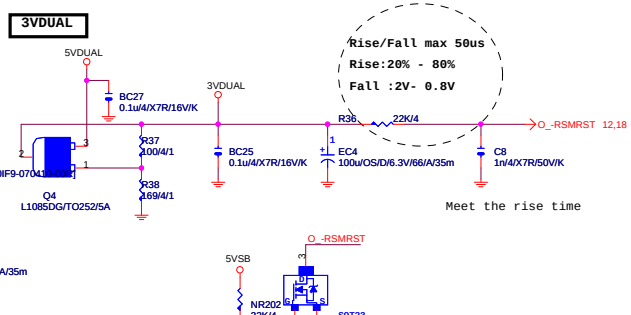


5VSB OVP發生時 : 5VDUAL=0.8V --> 解除時,須拔POWER CORE 才可開機
5VDUAL OVP發生時 : 5VDUAL=7V --> 解除時則恢復正常



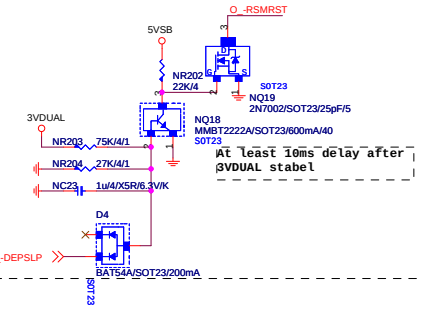
5VSB OVP : 7V protection

3VDUAL



Rise/Fall max 50us
Rise:20% - 80%
Fall :2V- 0.8V

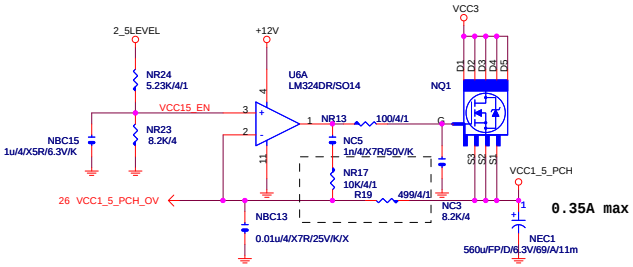
Meet the rise time



At least 10ms delay after 3VDUAL stabel

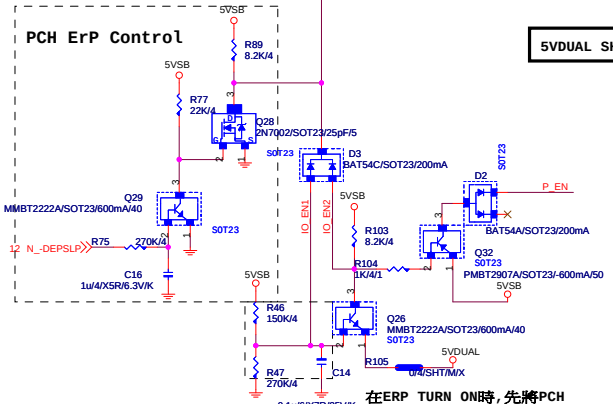
VCC1_5_PCH

RJK03B7DPA-00/N/7.8m/PPAKSO-8/[10IF9-100397-21R_10IF9-070428-01R_10IF9-070410-00R]



0.35A max

PCH ErP Control

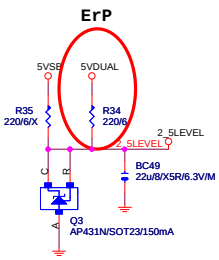


在ERP TURN ON時,先將PCH 3VDUAL灌入3VDUAL_PCH,使TURN ON -SLP_S3功能

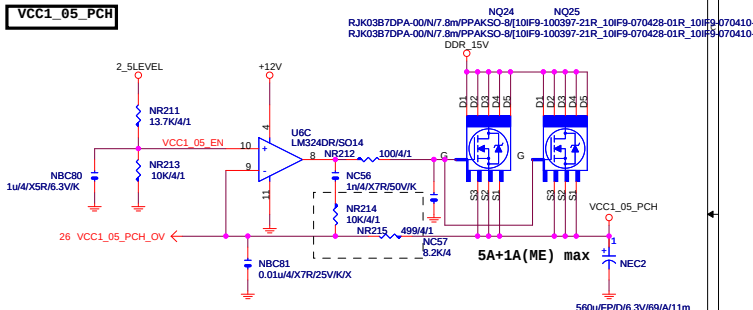
5VDUAL SHORT PROTECT

2_5LEVEL

ErP

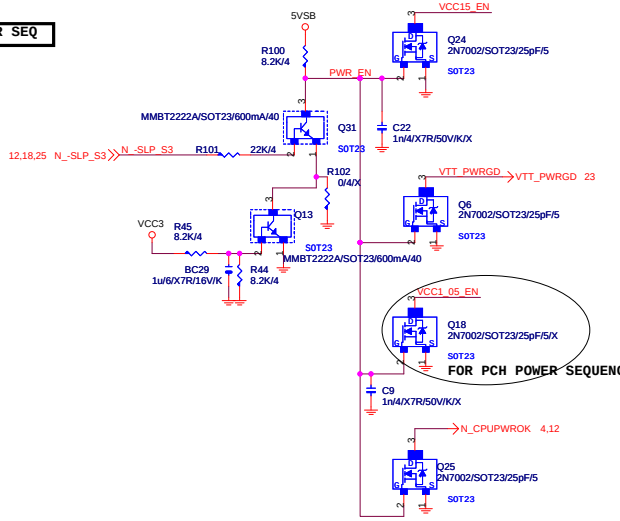


VCC1_05_PCH



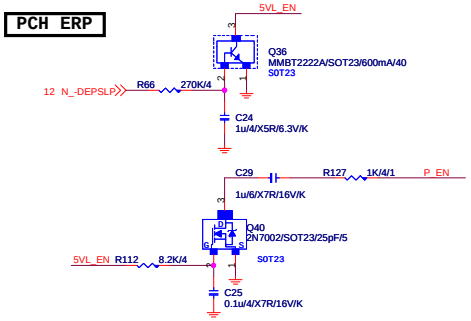
5A+1A(ME) max

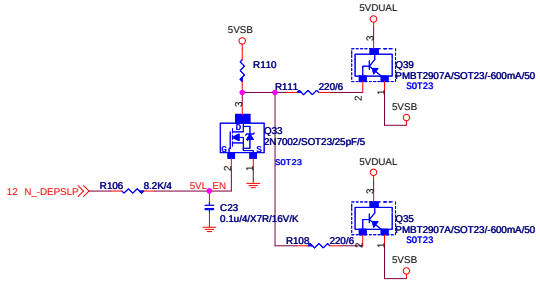
PWR SEQ



FOR PCH POWER SEQUENCE

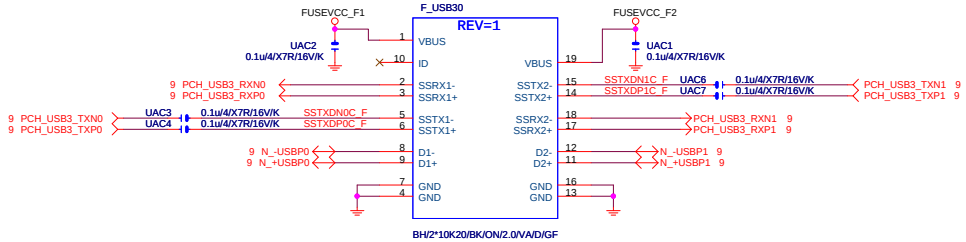
PCH ERP



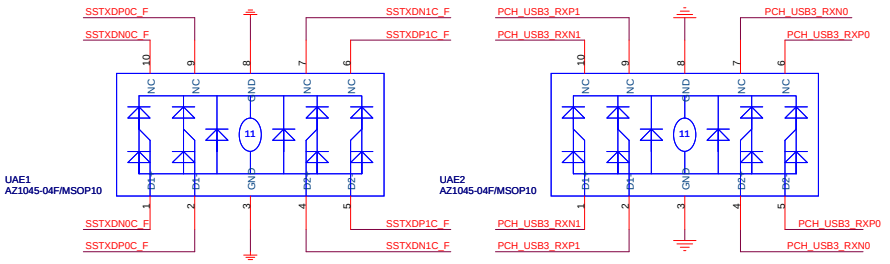


Gigabyte Technology			
Title: DISCRETE POWER			
Size: Custom	Document Number: GA-B85-HD3		Rev: 1.1
Date: Tuesday, July 09, 2013	Sheet 27 of 34		

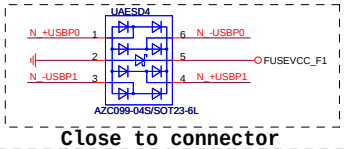
Front USB3.0



F_USB30 ESD PROTECT

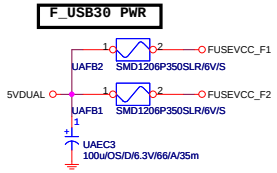


BLUE

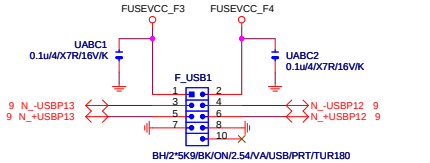


Close to connector

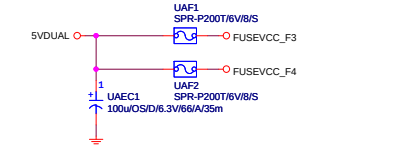
F_USB30 PWR



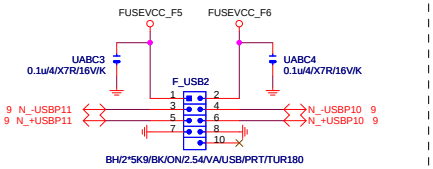
FRONT USB1



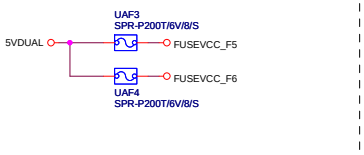
Close to connector



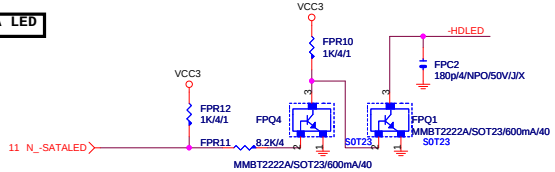
FRONT USB2



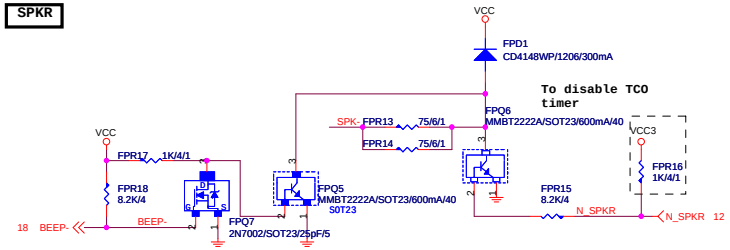
Close to connector



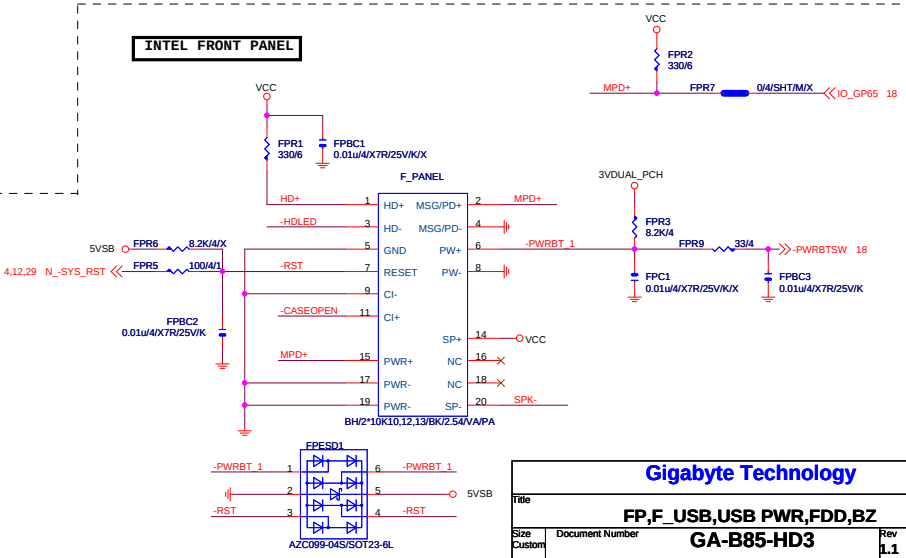
SATA LED



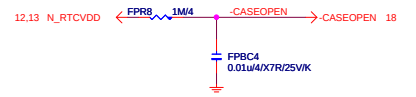
SPKR



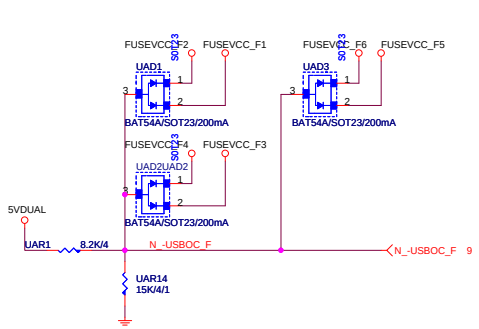
INTEL FRONT PANEL



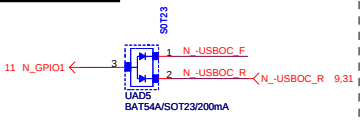
CASE OPEN



-USBOC_F



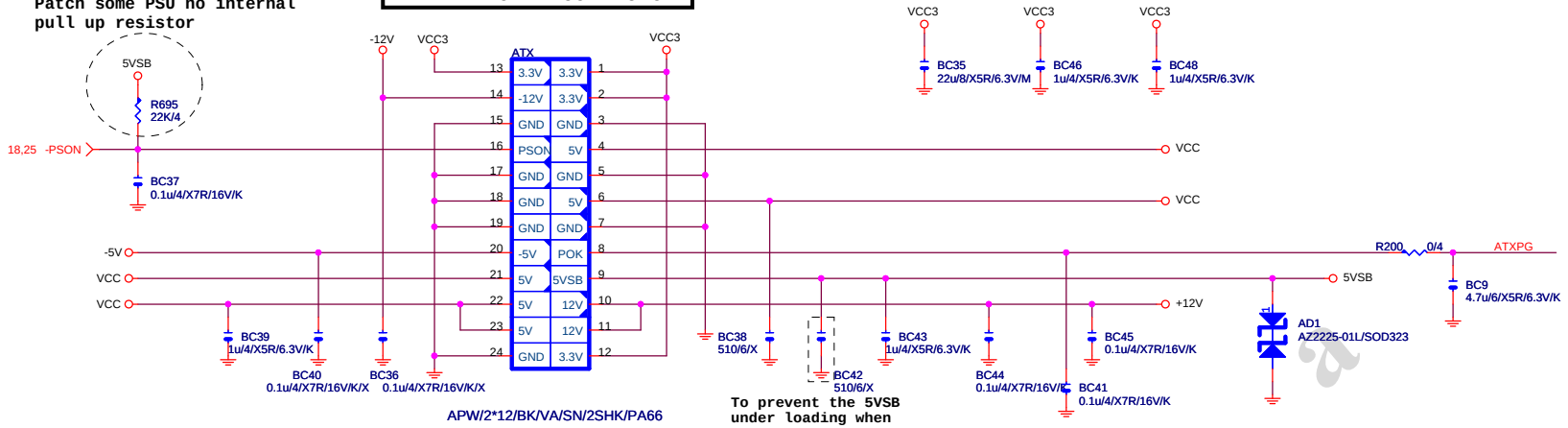
F_USB POWER PROTECT



Gigabyte Technology		
Title: FP,F_USB,USB PWR,FDD,BZ		
Size: Custom	Document Number: GA-B85-HD3	Rev: 1.1
Date: Thursday, June 27, 2013	Sheet 28 of 34	

ATXX24 POWER CONNECTOR

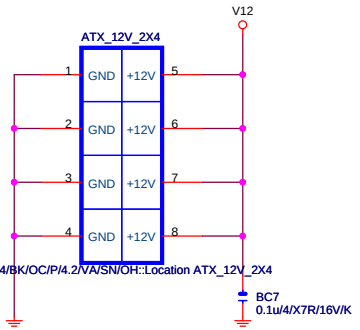
Patch some PSU no internal pull up resistor



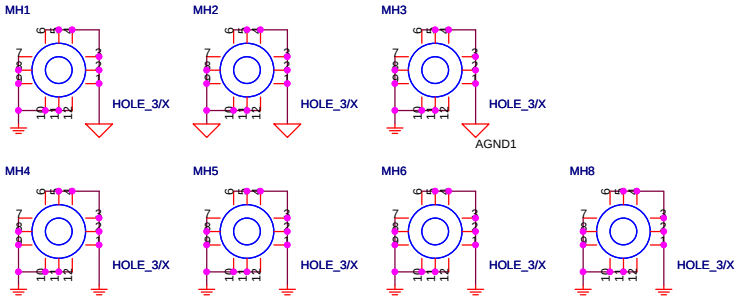
APW/2*12/BK/VA/SN/2SHK/PA66

To prevent the 5VSB under loading when boot

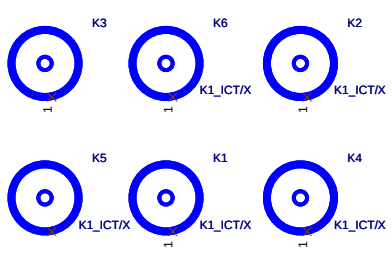
ATXX4 POWER CONNECTOR



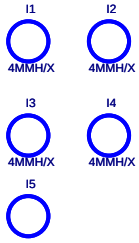
APW/2*4/BK/OC/P/4.2/VA/SN/OH::Location ATX_12V_2X4



HOLE_4-RH-1



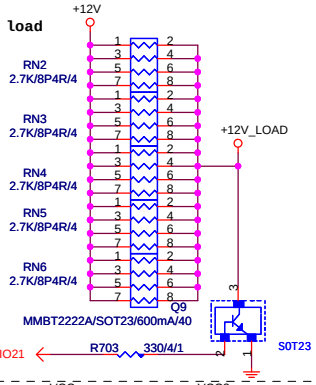
K1-ICT



4MMH

【技術通報R&D技術通報153】

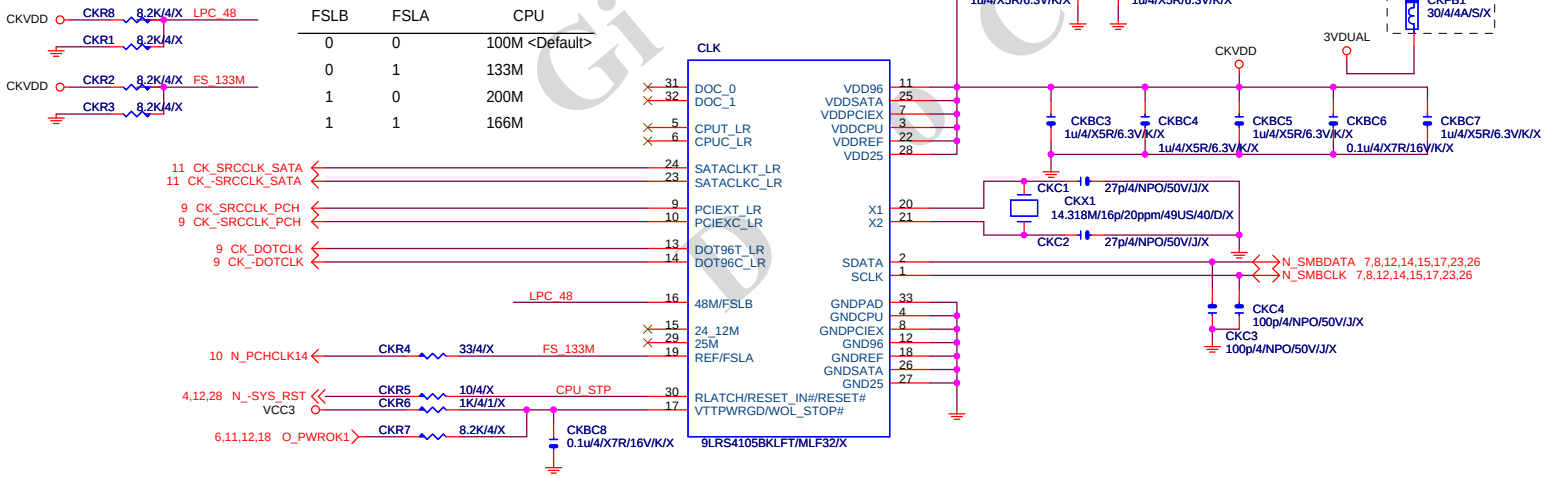
To fix 12V light load abnromal issue

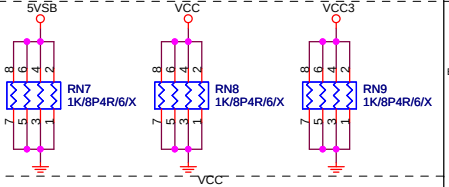


CLK GEN

CPU Frequency Selection

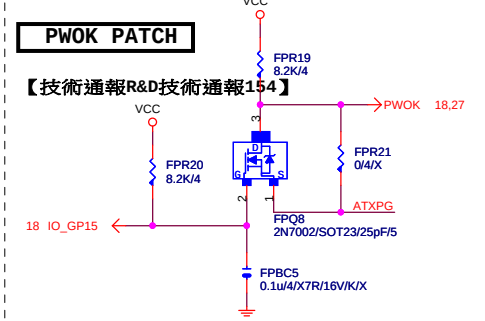
FSLB	FSLA	CPU
0	0	100M <Default>
0	1	133M
1	0	200M
1	1	166M





PWOK PATCH

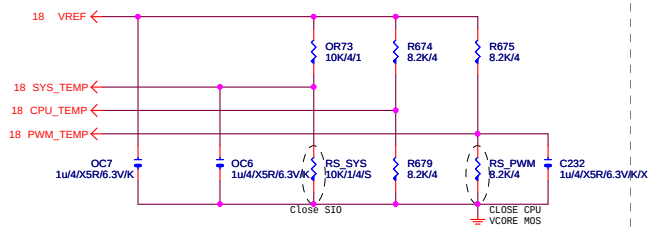
【技術通報R&D技術通報154】



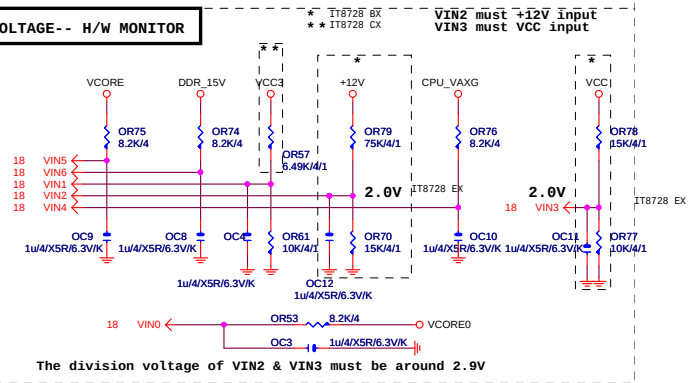
Gigabyte Technology

Title	ATX POWER CONNECTOR	
Size: Custom	Document Number: GA-B85-HD3	Rev: 1.1
Date: Thursday, June 27, 2013	Sheet 29 of 34	

TEMP H/W MONITOR

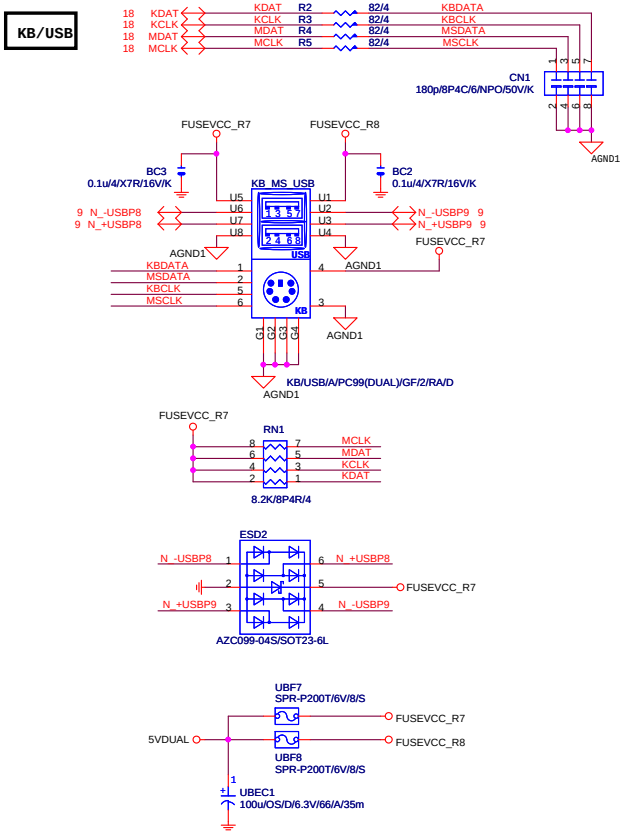


VOLTAGE-- H/W MONITOR

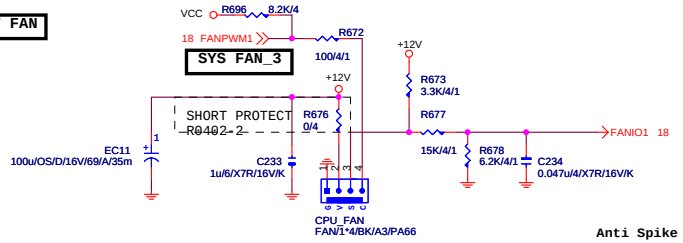


The division voltage of VIN2 & VIN3 must be around 2.9V

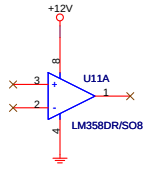
KB/USB



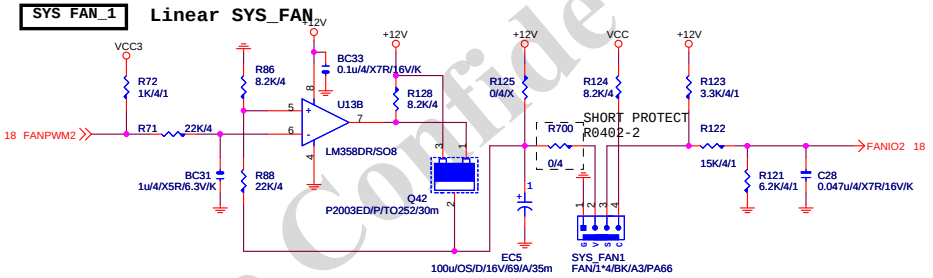
CPU SMART FAN



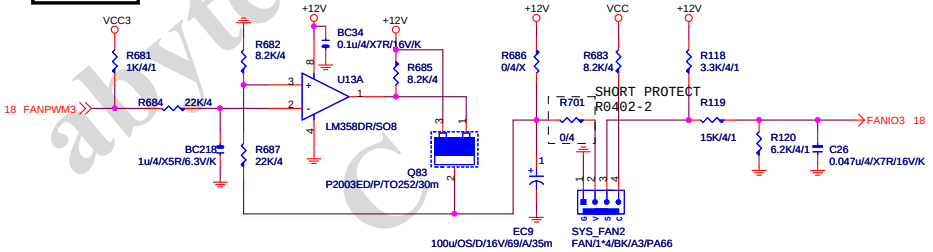
Anti Spike



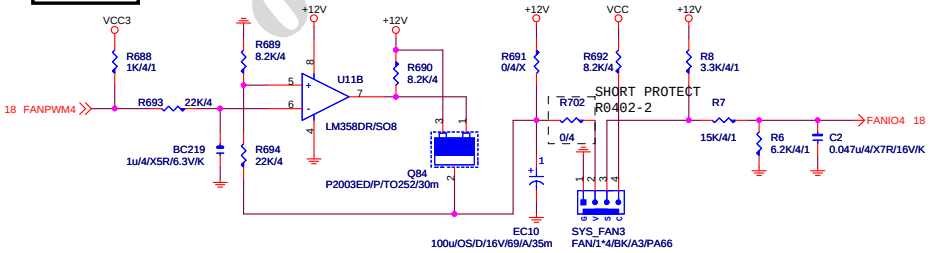
SYS FAN_1 Linear SYS_FAN



SYS FAN_2 Linear SYS_FAN

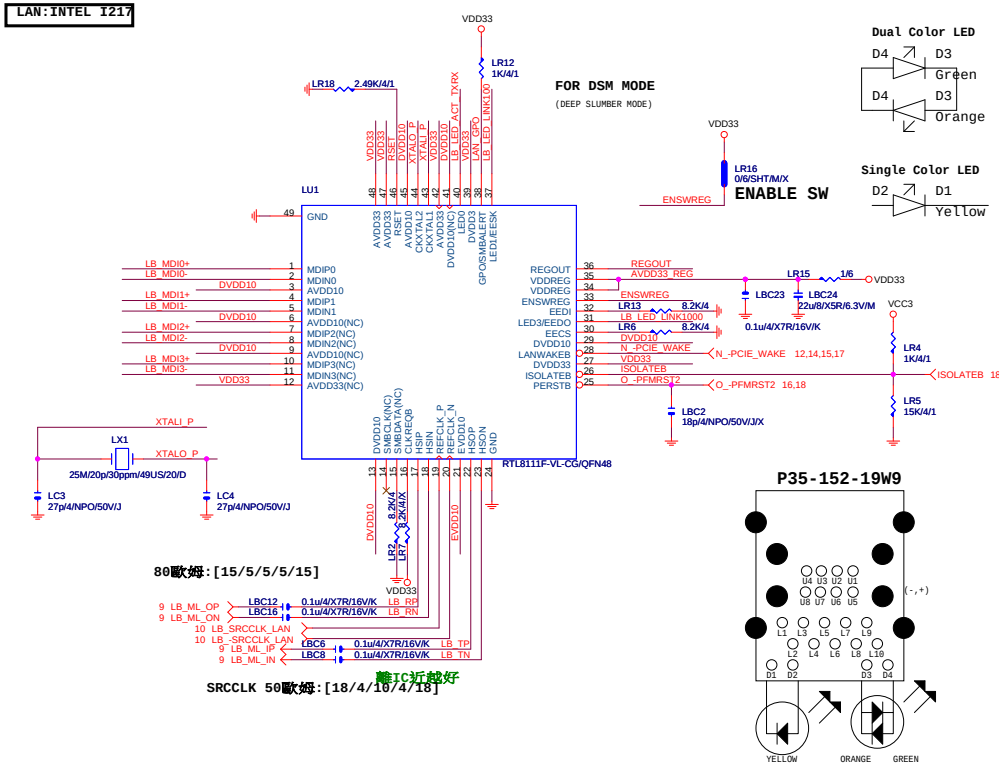


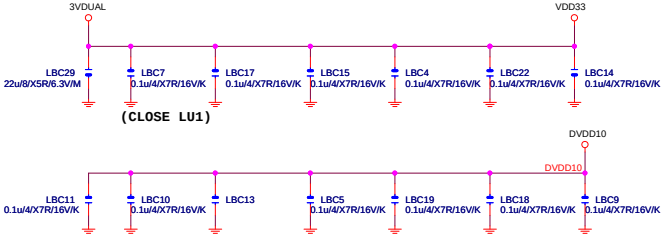
SYS FAN_3 Linear SYS_FAN

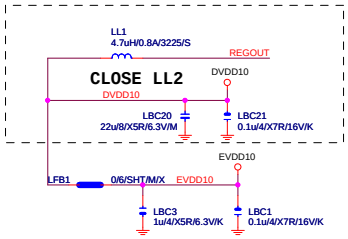


Gigabyte Technology		
Title: HWM,KB/MS, FAN CTRL		
Size: Custom	Document Number: GA-B85-HD3	Rev: 1.1
Date: Thursday, June 27, 2013	Sheet 30 of 34	

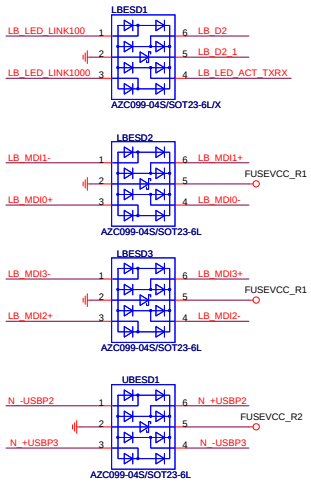
LAN:INTEL I217





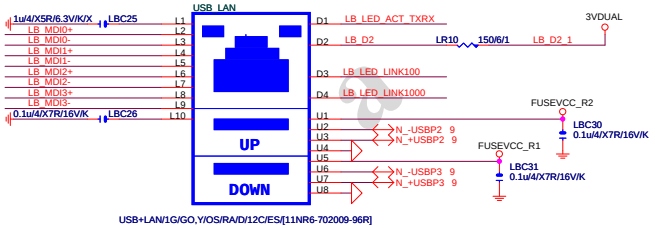


USB30_LAN CONNECTOR

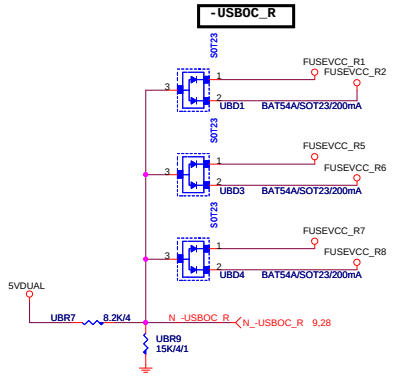


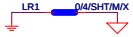
CLOSE USB30_LAN

100歐姆:[20/4/10/4/20]

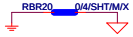


USB+LAN/1G/GO,Y/OS/RA/D/12C/ES/[11NR6-702009-96R]



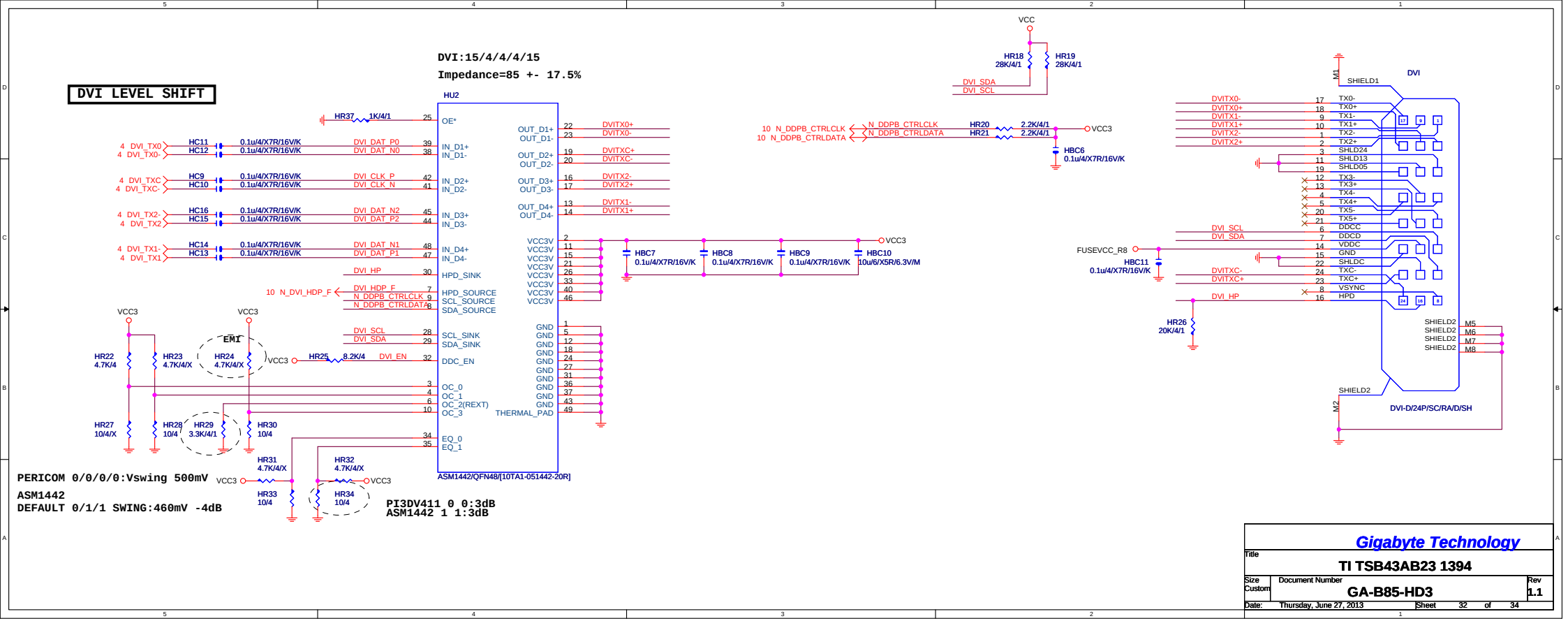


LAN



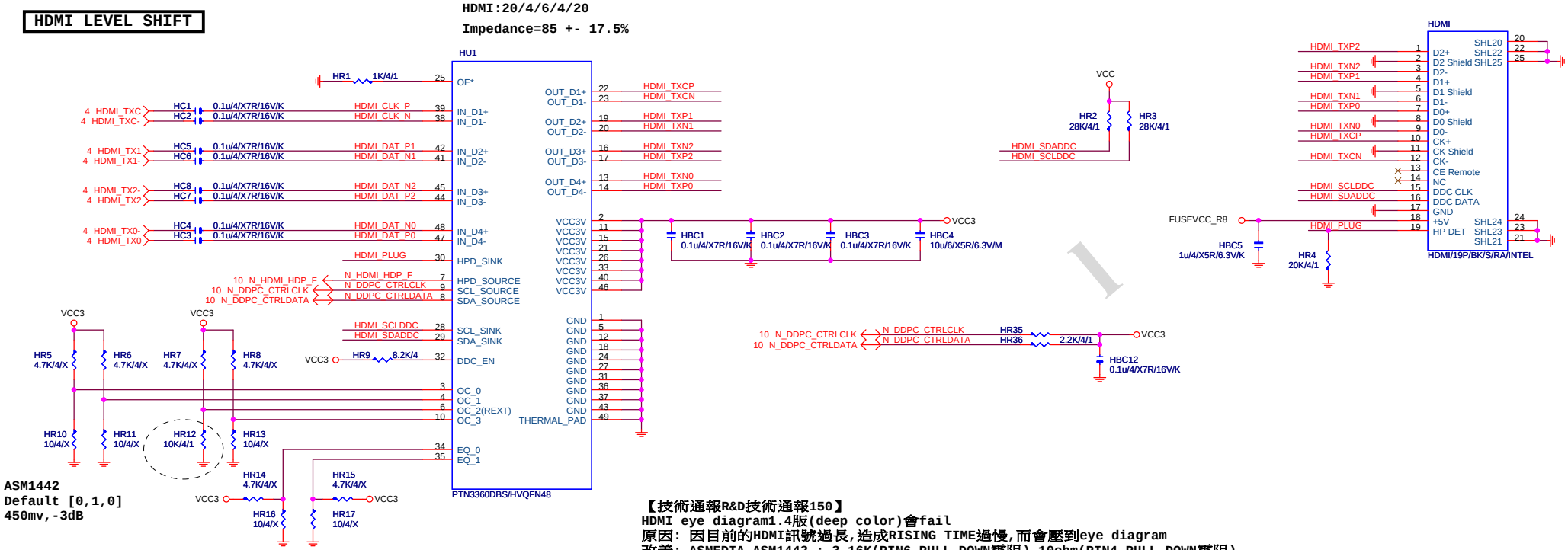
USB_LAN <--> R_USB30_1

Title	Gigabyte Technology	
	INTEL LAN I217	
Size: Custom	Document Number: GA-B85-HD3	Rev: 1.1
Date: Thursday, June 27, 2013	Sheet 31 of 34	


DVI LEVEL SHIFT
DVI:15/4/4/4/15
Impedance=85 +- 17.5%
HU2
ASM1442/QFN48/[10TA1-051442-20R]
PERICOM 0/0/0/0:Vswing 500mV
ASM1442
DEFAULT 0/1/1 SWING:460mV -4dB
PI3DV411 0 0:3dB
ASM1442 1 1:3dB
DVI
DVI-D/24P/SC/RA/D/SH
Gigabyte Technology
TI TSB43AB23 1394
GA-B85-HD3
Rev 1.1
Thursday, June 27, 2013
Sheet 32 of 34

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: Custom	Document Number: GA-B85-HD3	Rev: 1.1
Date: Thursday, June 27, 2013	Sheet 33 of 34	

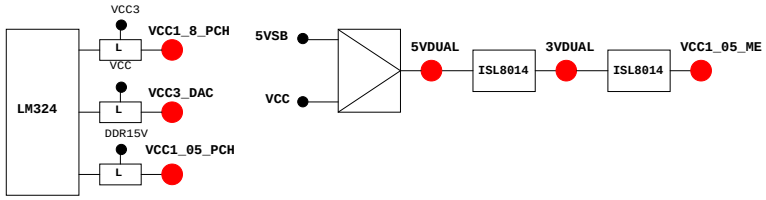
PCH GPIO LIST TABLE

PIN NAME	PWR	AFTER/PLTRST	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

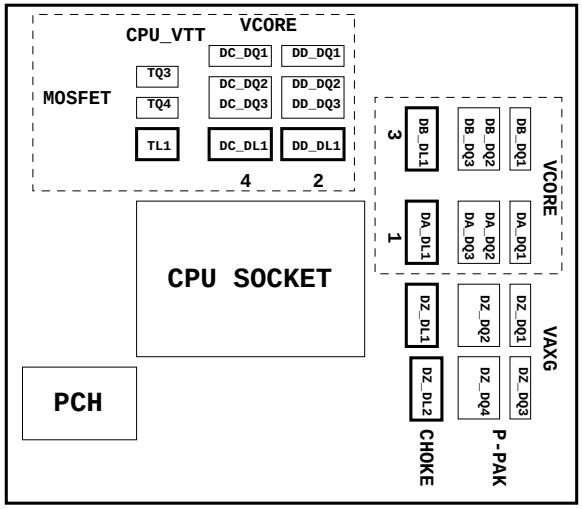
Super I/O ITE8720 GPIO Table

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/BUSSO0	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	
VIDO5/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PFMRST1	
PCIRST1#/GP12	-PFMRST2	
3VSBSW#/GP40	CSI_F0	BSEL166_1
SUSC#/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CSISBSL	
VIDO0/GP20/CTS2#	CPUT_LED1_C	
GP65/VDDA_EN/GB_01	MB_ID2	
PD6/GP76/BUSSO1	MB_ID3	
PD7/GP77/BUSSO2	MB_ID4	
AFD#/GP86/SMBC_R	空 PIN	FST_2X8
INIT#/GP85/SMBD_M	SEC_2x8	GTLREF_AD2
ACK#/GP83	DDR_LED1_C	
VIDO1/GP21/DCD2#	DDR_LED2_C	
STB#/GP87/SMBC_M	DDR_LED3_C	
PWRON#GP44		
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/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/BUSSO0	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

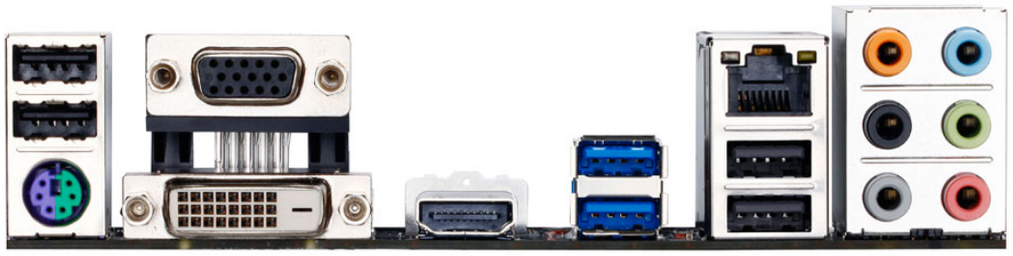
Gigabyte Technology

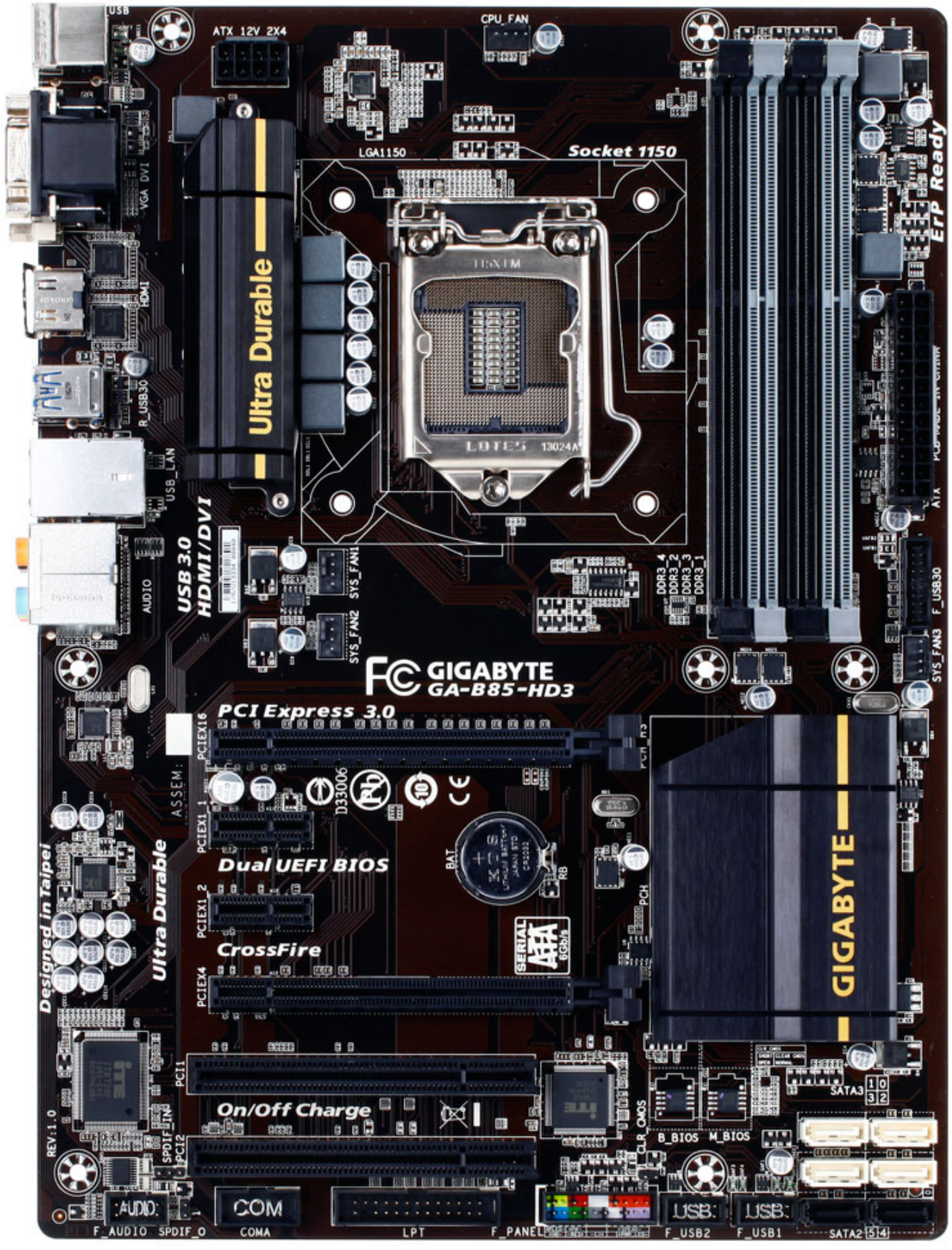
Title: TABLE LIST

Size: C | Document Number: GA-B85-HD3 | Rev: 1.1

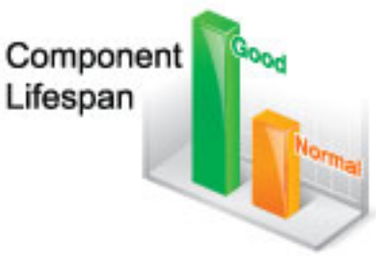
Date: Thursday, June 27, 2013 | Sheet 34 of 34


GIGABYTE
Ultra Durable
Ultra Durable Motherboard
LGA 1150
B85-HD3
ULTRA DURABLE 4 Plus
3 HDMI DVI D-SUB
Display Outputs
ULTRA COOL
ULTRA PERFORMANCE
ULTRA SAFE
UEFI DualBIOS




ATX_12V_2X4
CPU_FAN
LGA1150
Socket 1150
Ultra Durable
ErP Ready
USB 3.0
HDMI/DVI
GIGABYTE
GA-B85-HD3
PCI Express 3.0
Dual UEFI BIOS
CrossFire
On/Off Charge
Designed in Taipei
Ultra Durable
GIGABYTE
SATA3
B_BIOS
M_BIOS
F_AUDIO
SPDIF_O
COMA
LPT
F_PANEL
F_USB2
F_USB1
SATA2

Long Lifespan All Solid Caps

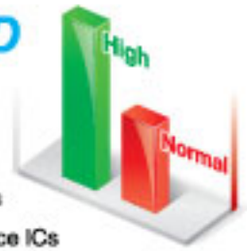


All Solid Cap Design

Traditional Cap Design

High ESD Ethernet Port Protection

High ESD USB Port Protection

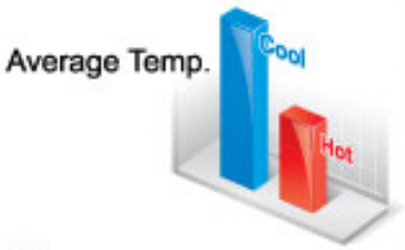


High ESD Resistance ICs

Traditional ESD Resistance ICs

High Temperature Protection

Lower RDS(on) MOSFET Design

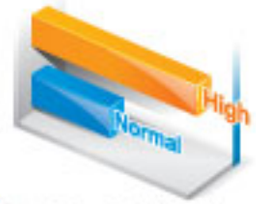


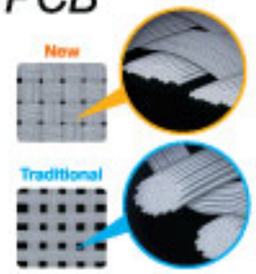
Lower RDS(on) MOSFET Design

Traditional MOSFET Design

Humidity Protection

Glass Fabric PCB





New Glass Fabric PCB

Traditional Glass Fabric PCB

Power Failure Protection Anti-Surge IC

Surge Protection Level

Anti-Surge IC

Without Anti-Surge IC

CrossFire™ Support

Exclusive UEFI DualBIOS™ Design

4 SATA3 Ports

New Heat Sink Design for Better Cooling

Front USB 3.0