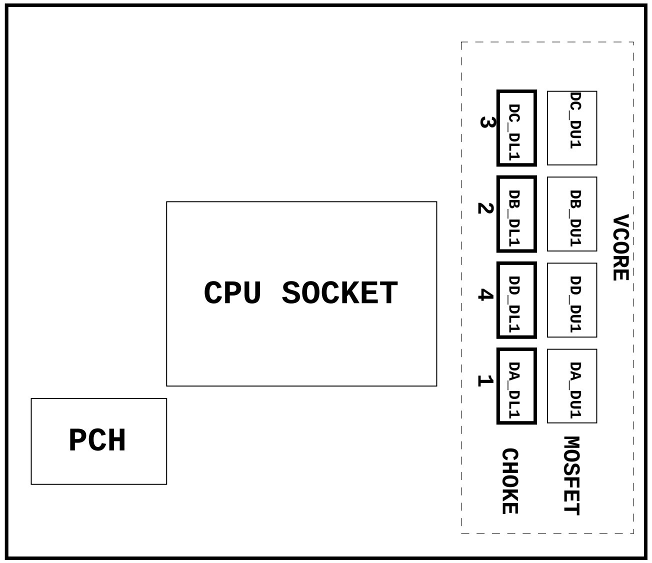
Model Name: GA-B85-HD3   *2.0*



Gigabyte Technology			
Title	Cover Sheet		
Size Custom	Document Number GA-B85-HD3		Rev 2.0
Date: Thursday, September 05, 2013	Sheet 1 of 34		

GA-B85-HD3

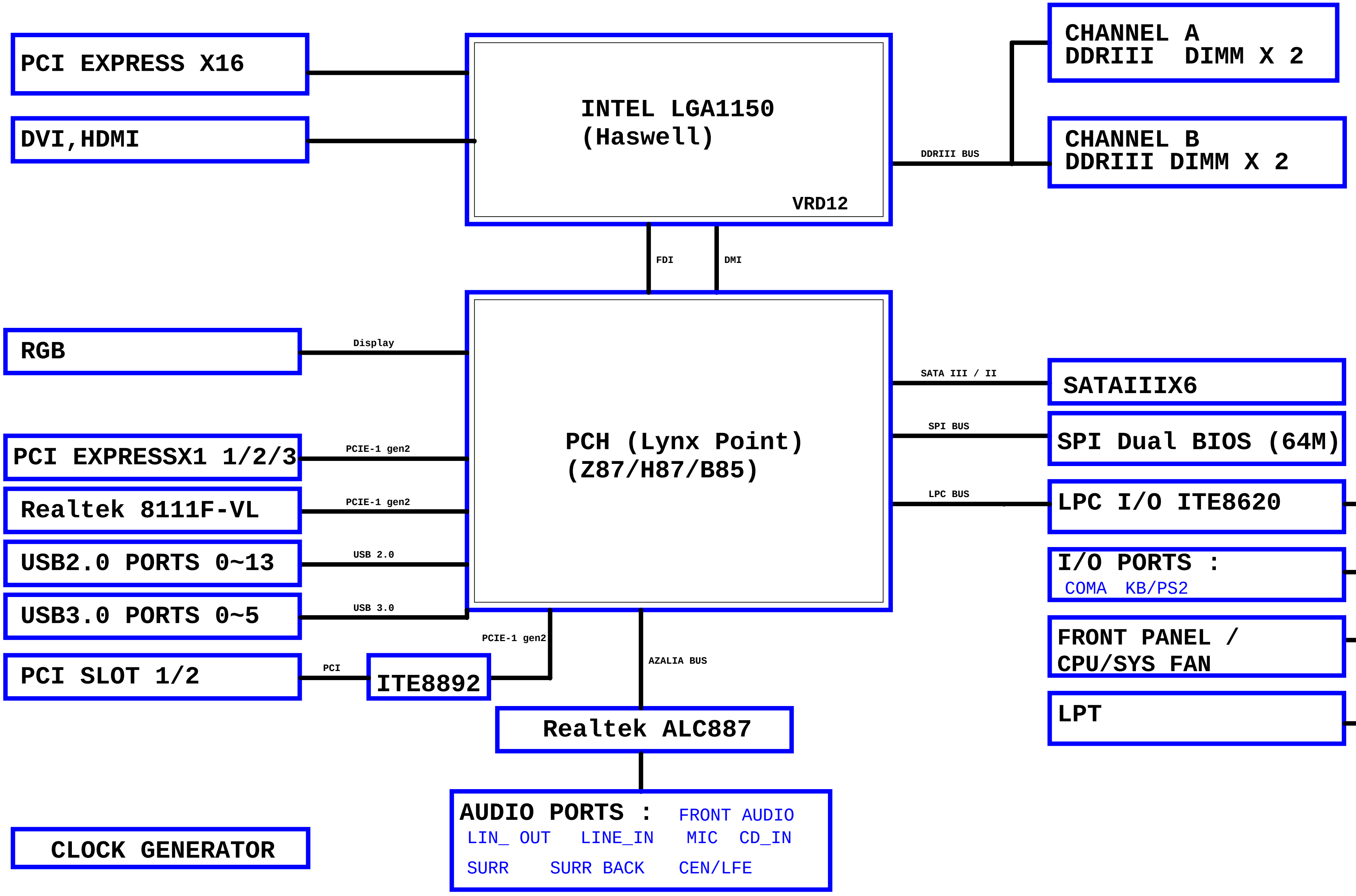
Component value change history

Data	Change Item	Reason
2013/08/13 PCB:1.5	1.由Z87-DS3H REV0.1 修改成B85-HD3-1.5	
2013/01/16 PCB:2.0	1. 0ohm SHORT PAD	
	2. Remove RS1/RS4	
20A	1. NC7,NC8 10P , NX1=25M/12p/30ppm/49US/20/D	
20B	1. NC7,NC8 10P --> 12P	
20C	1. MR17 --> P100/6V/6/S	

Circuit or PCB layout change

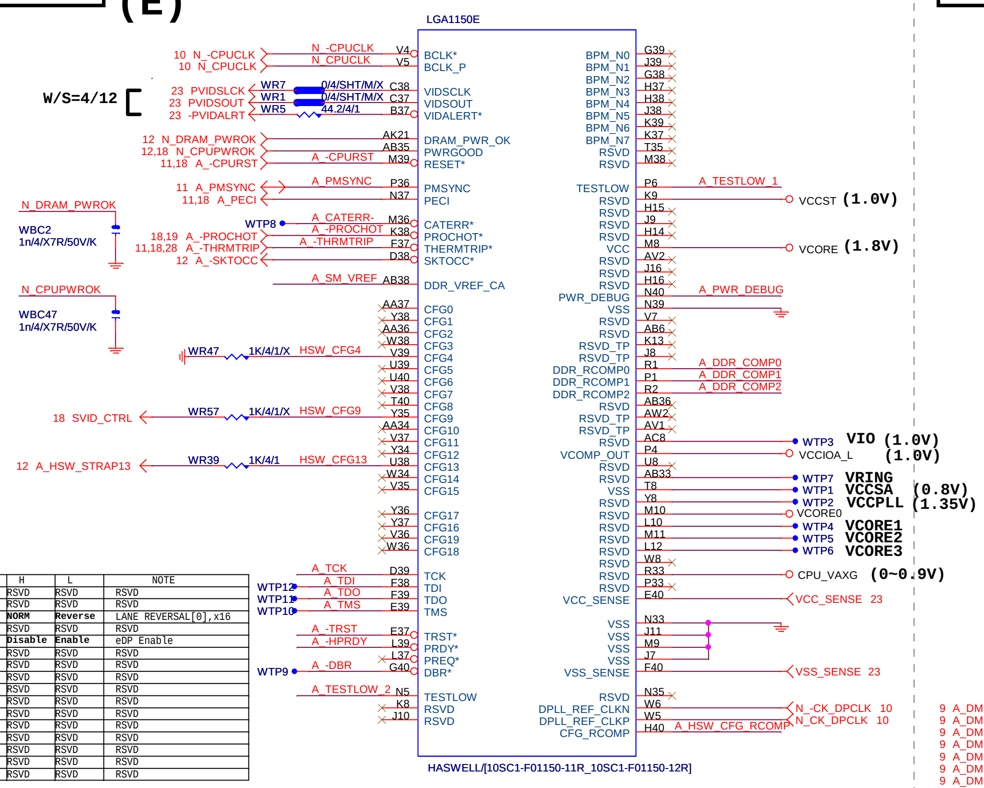
DATE	Change Item	Reason
2013/08/13 PCB:1.5	1.由Z87-DS3H REV0.1 修改成B85-HD3-1.5	
2013/01/16 PCB:2.0	1. 0ohm SHORT PAD	
	2. PE_SRCCLK_3GIO1/PE_-SRCCLK_3GIO1 change to PCH pin W6/W7	
	3. MR17 footprint update "R0603-RH"	
	4. CPU_FAN R676 update "R0603-RH"	
	5. PCH 25MHz NX1 layout修改 , Trace 4mils	
	6. 32.768KHz will REF "GND" , Trace 4mil	
	7. Update "POLYSWITCH-1206-1"	
	8. 所有的PPAK footprint改為Q_TDSON8-GDS-T (增加NXP相容)	
	9. U14~U15 update footprint "SOP8-NCT3941S"	

BLOCK DIAGRAM



Gigabyte Technology	
Title	BLOCK DIAGRAM
Size C	Document Number GA-B85-HD3 — Rev 2.0
Date: Wednesday, August 28, 2013	Sheet 3 of 34

LGA1150 (E)

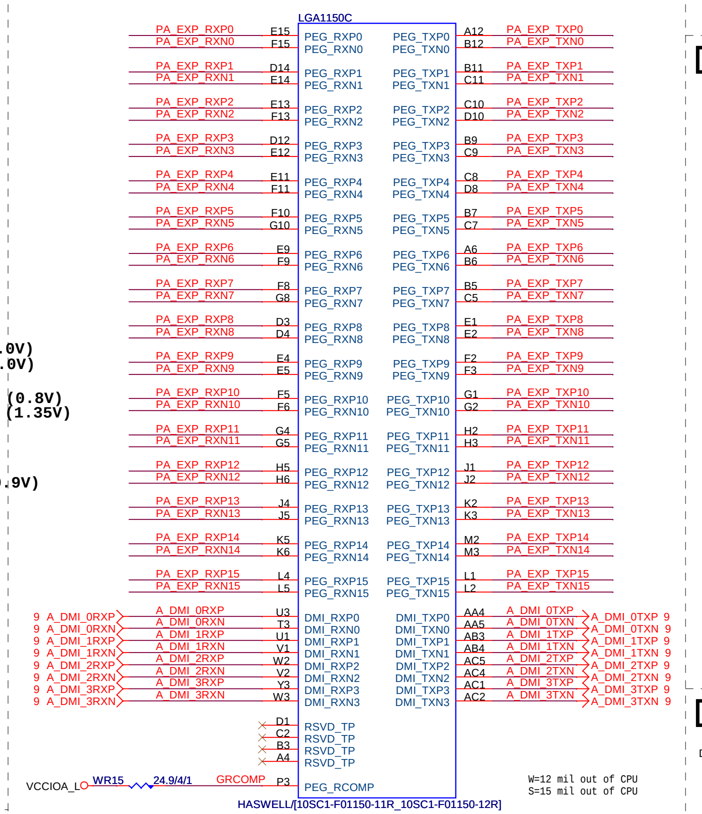


CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	**NORM**	**Reverse**	LANE REVERSAL[0],x16
3	RSVD	RSVD	RSVD
4	**Disable**	**Enable**	eDP Enable
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD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

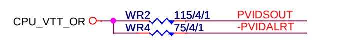
CFG6	CFG5	PCIE CONFIG
1	1	1X16 , Default
1	0	2X8
0	1	RSVD
0	0	X8,X4,X4

CFG 0-17 all internal PULL-UP

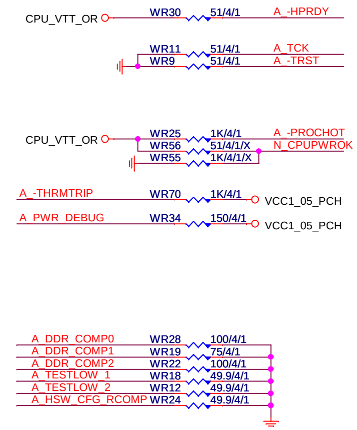
LGA1155 (C)



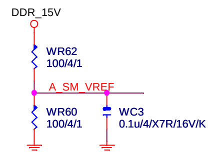
CPU SVID

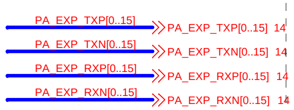


CPU PU/PD



SM REF

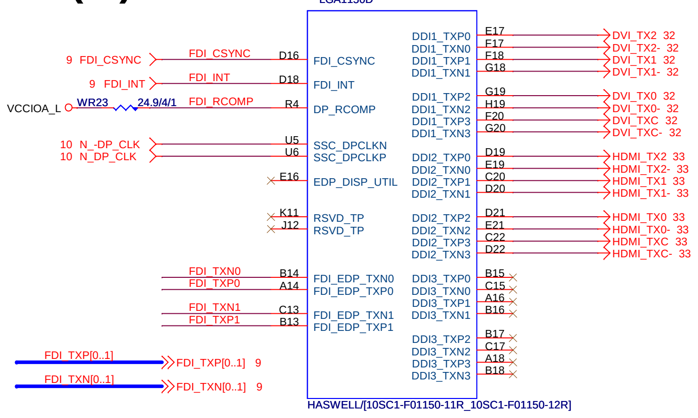




CPU PEG 5/5/5//20 Impedance=80 +- 15%

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

LGA1150 (D)

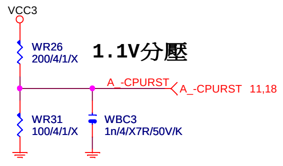


FDI:4/4/4//15(breakout min 4/4/4//8)
Impedance=85 +- 15%

DP/HDMI 4/4/4//20 FDI 4/4/4/12

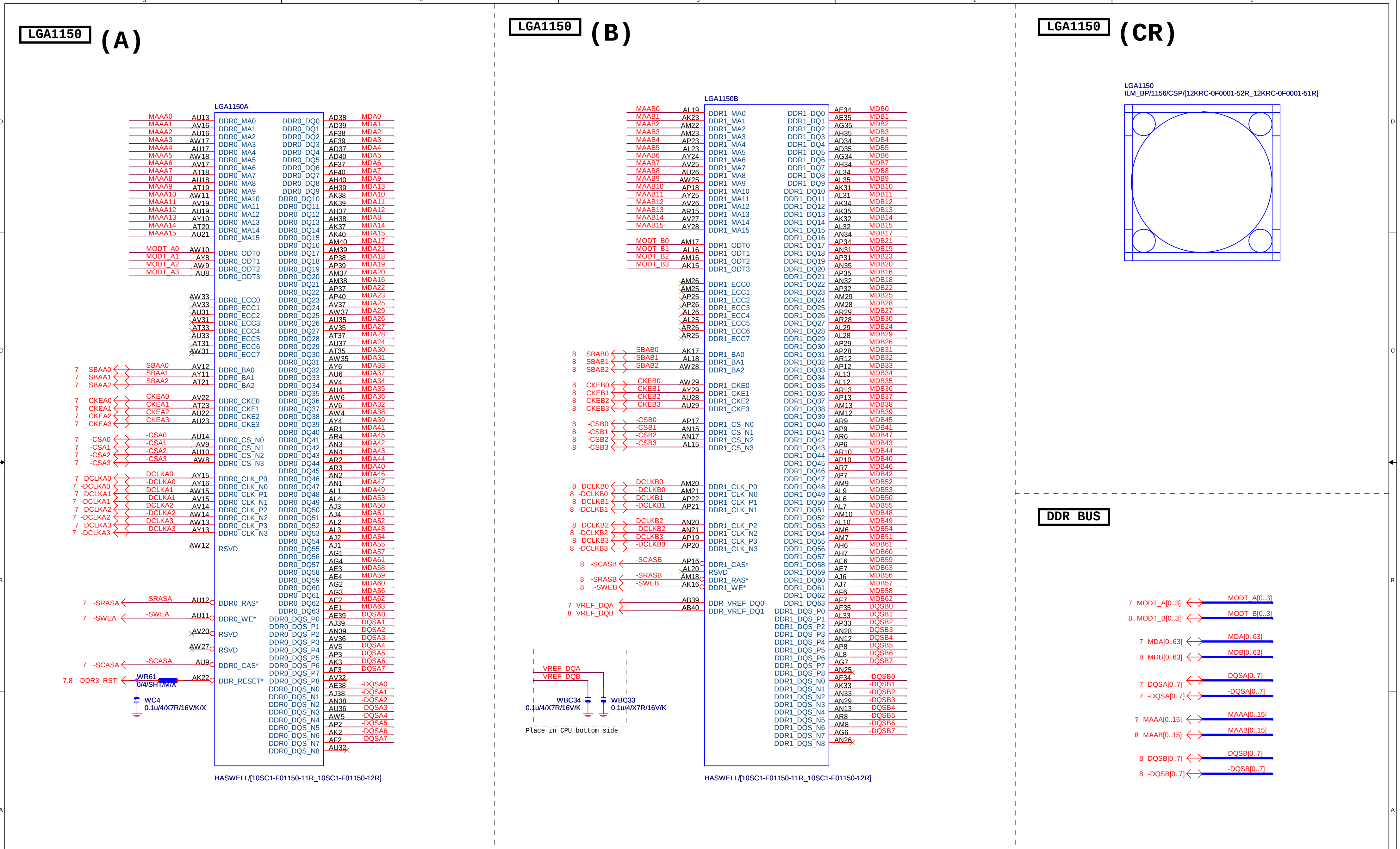
Impedance=85 +- 15%

-CPURST



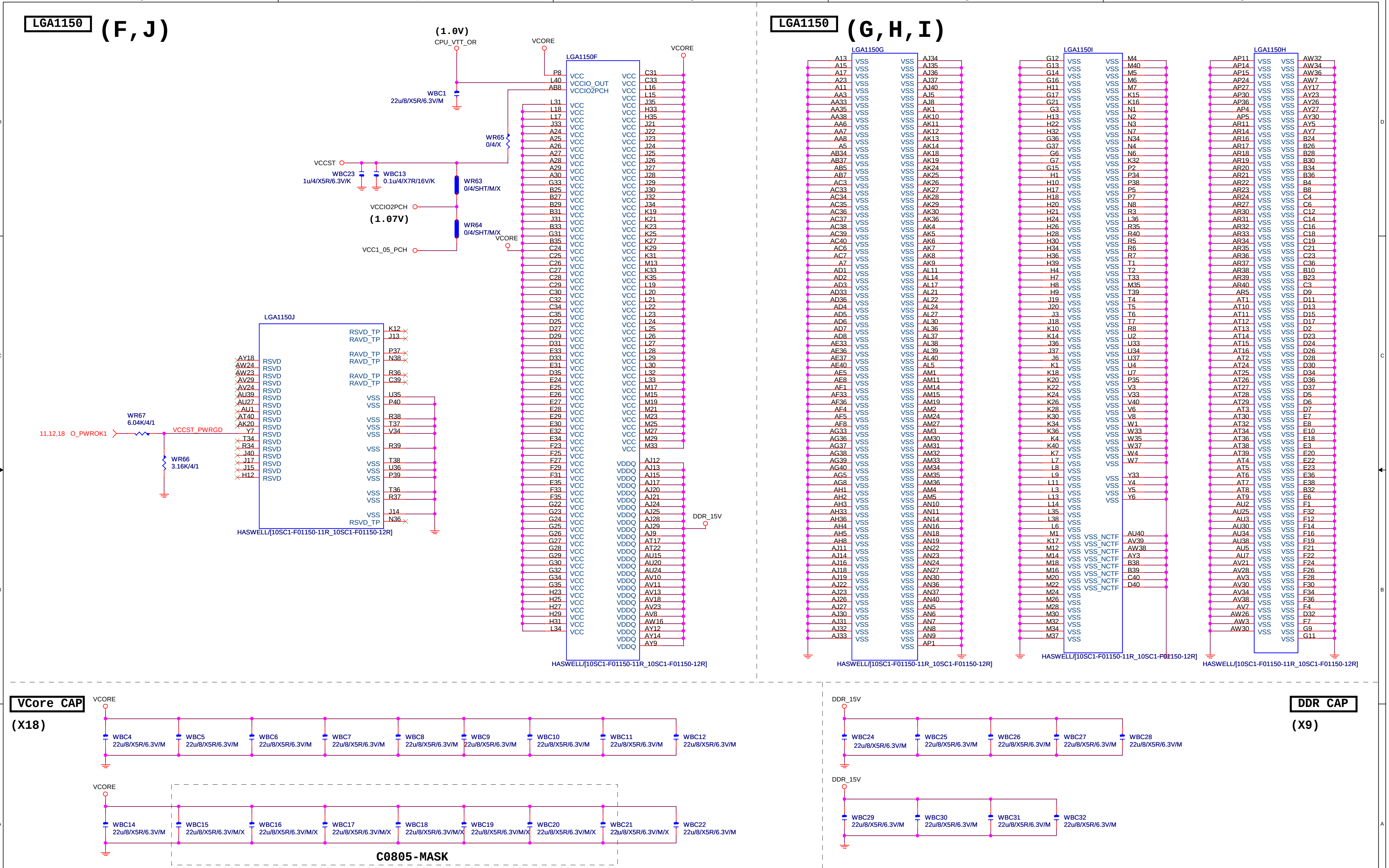
Gigabyte Technology

Title	CPU LGA1150-A
Size: Custom	Document Number: GA-B85-HD3
Rev	2.0
Date:	Wednesday, August 28, 2013
Sheet	4 of 34

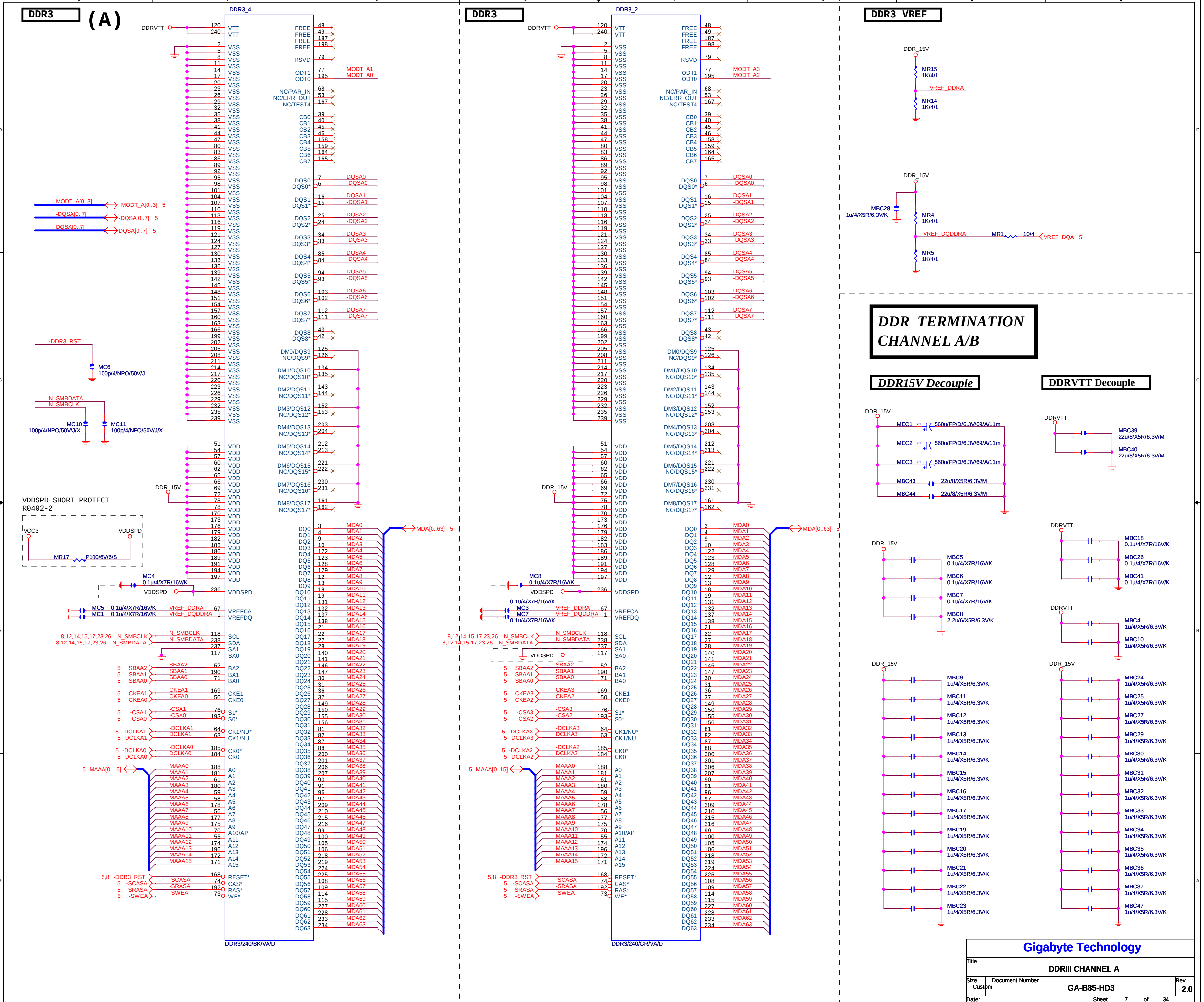


Gigabyte Technology

Title	CPU LGA1150-B
Size: Custom	Document Number: GA-B85-HD3
Rev	2.0
Date:	Wednesday, August 28, 2013
Sheet	5 of 34

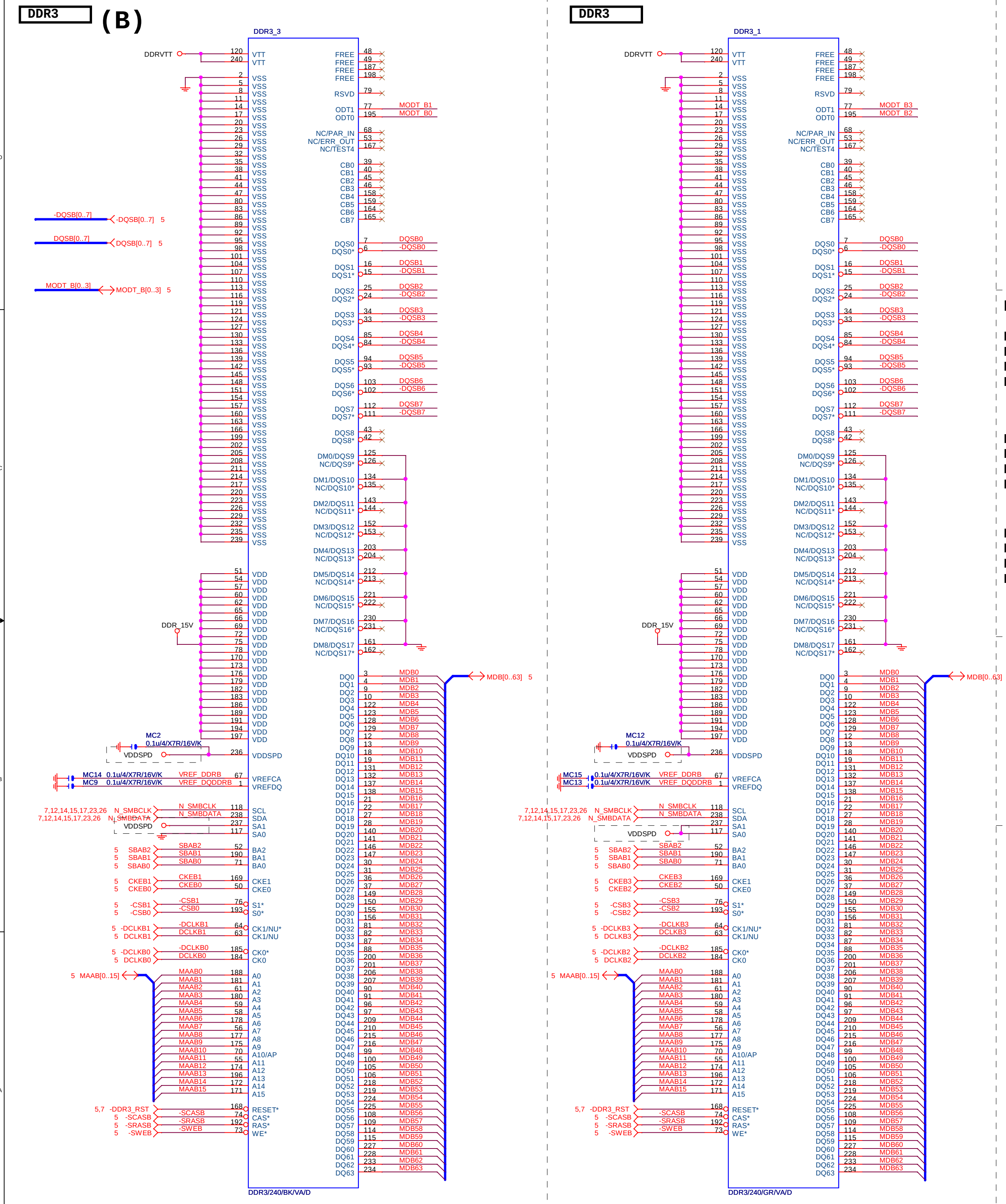


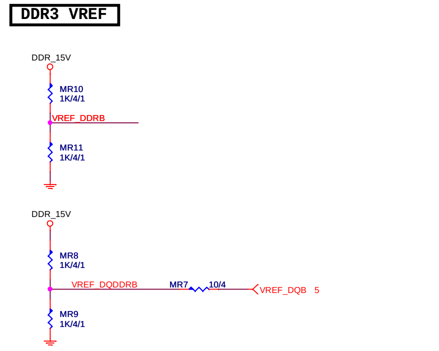
Gigabyte Technology	
Title	CPU LGA1150-C
Size: Custom	Document Number: GA-B85-HD3 — Rev 2.0
Date: Wednesday, August 28, 2013	Sheet 6 of 34



Gigabyte Technology

Title	DDRIII CHANNEL A
Size: Custom	Document Number: GA-B85-HD3
Rev	2.0
Date:	Sheet 7 of 34



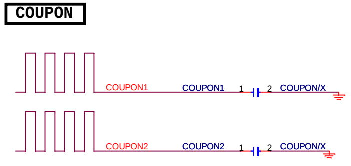


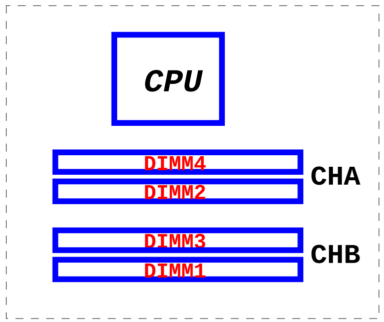
DDR3 1066,1333,1600MHZ BANDWIDTH

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

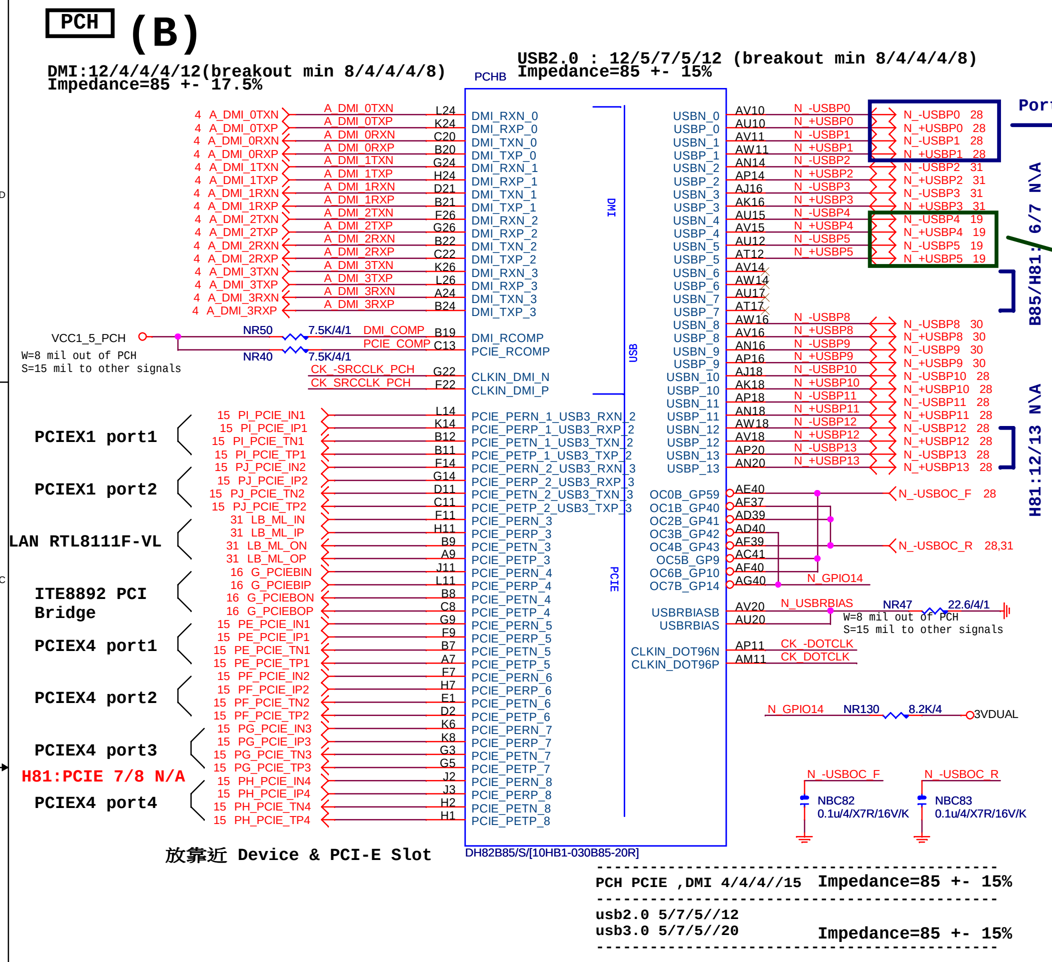
DDR3 1600MHZ
DDR3 clock=800MHZ
DDR3 single channel bandwidth=12.8GB/s
DDR3 dual channel bandwidth=25.6GB/s

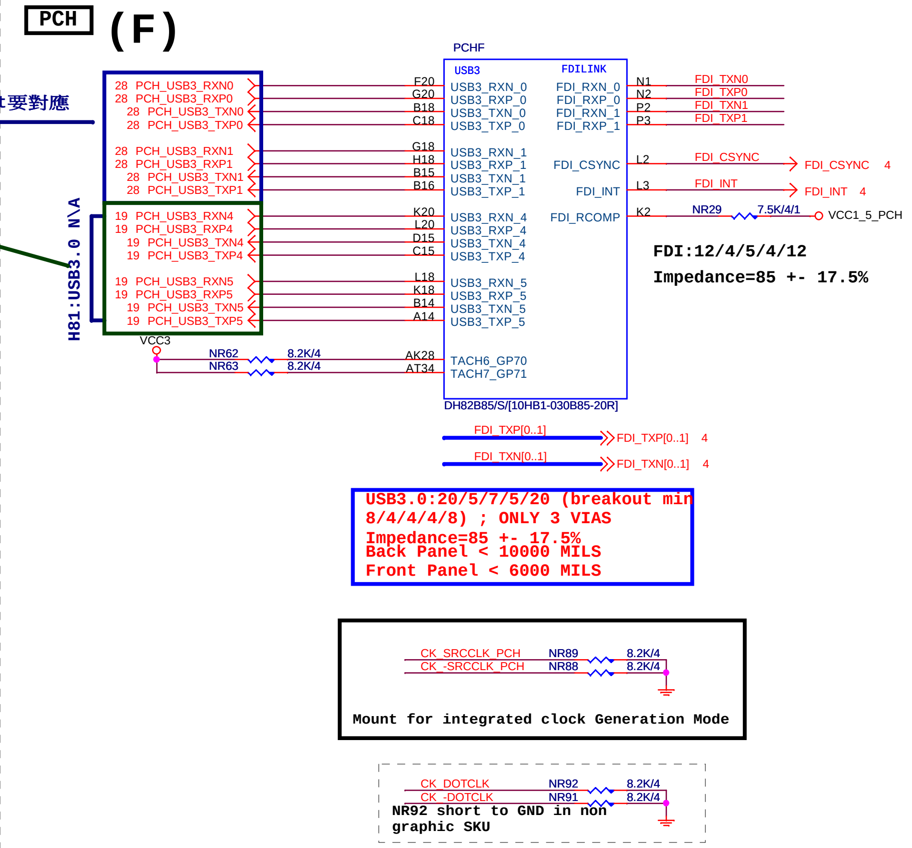


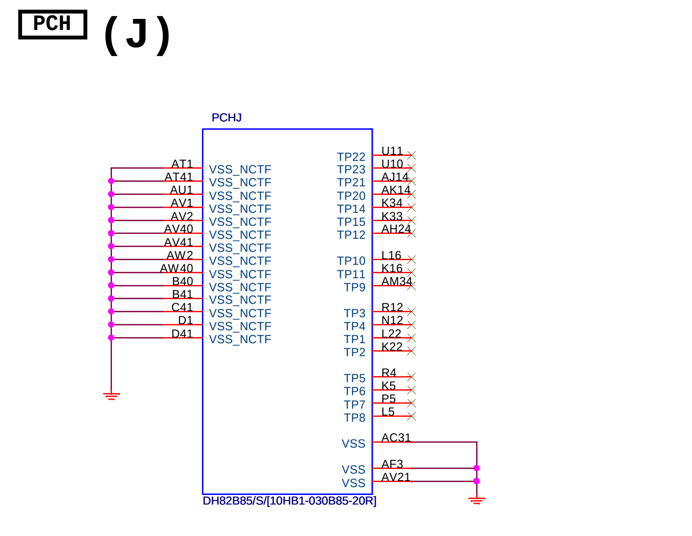


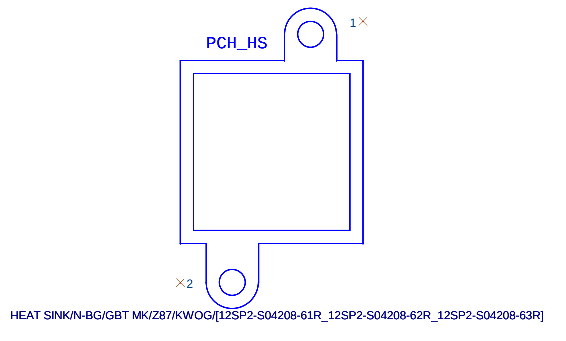
Gigabyte Technology

Title	DDRIII CHANNEL B		
Size: Custom	Document Number: GA-B85-HD3		Rev: 2.0
Date:	Sheet 8 of 34		







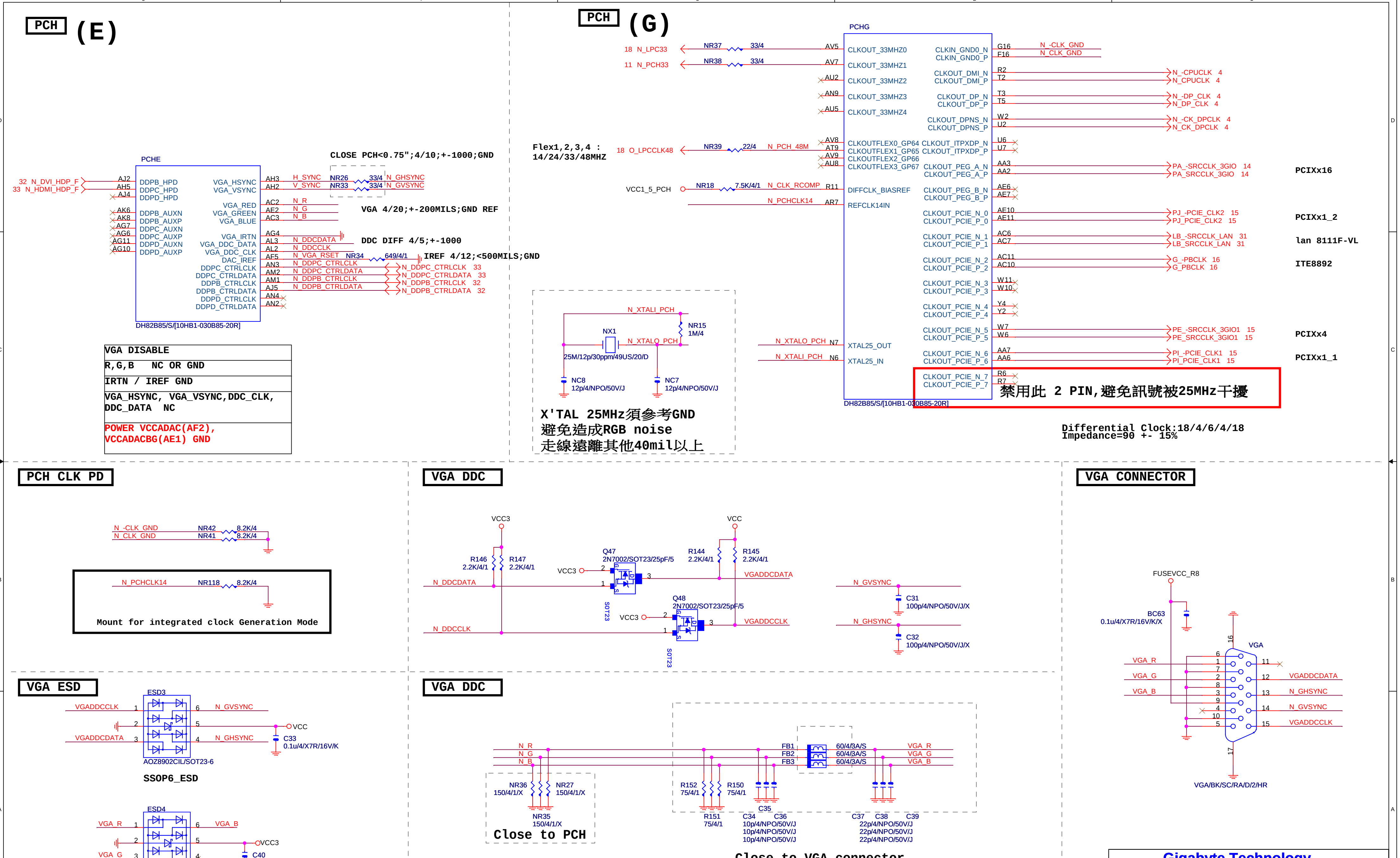


USB TABLE

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: 2.0
Date: Wednesday, August 28, 2013 Sheet 9 of 34

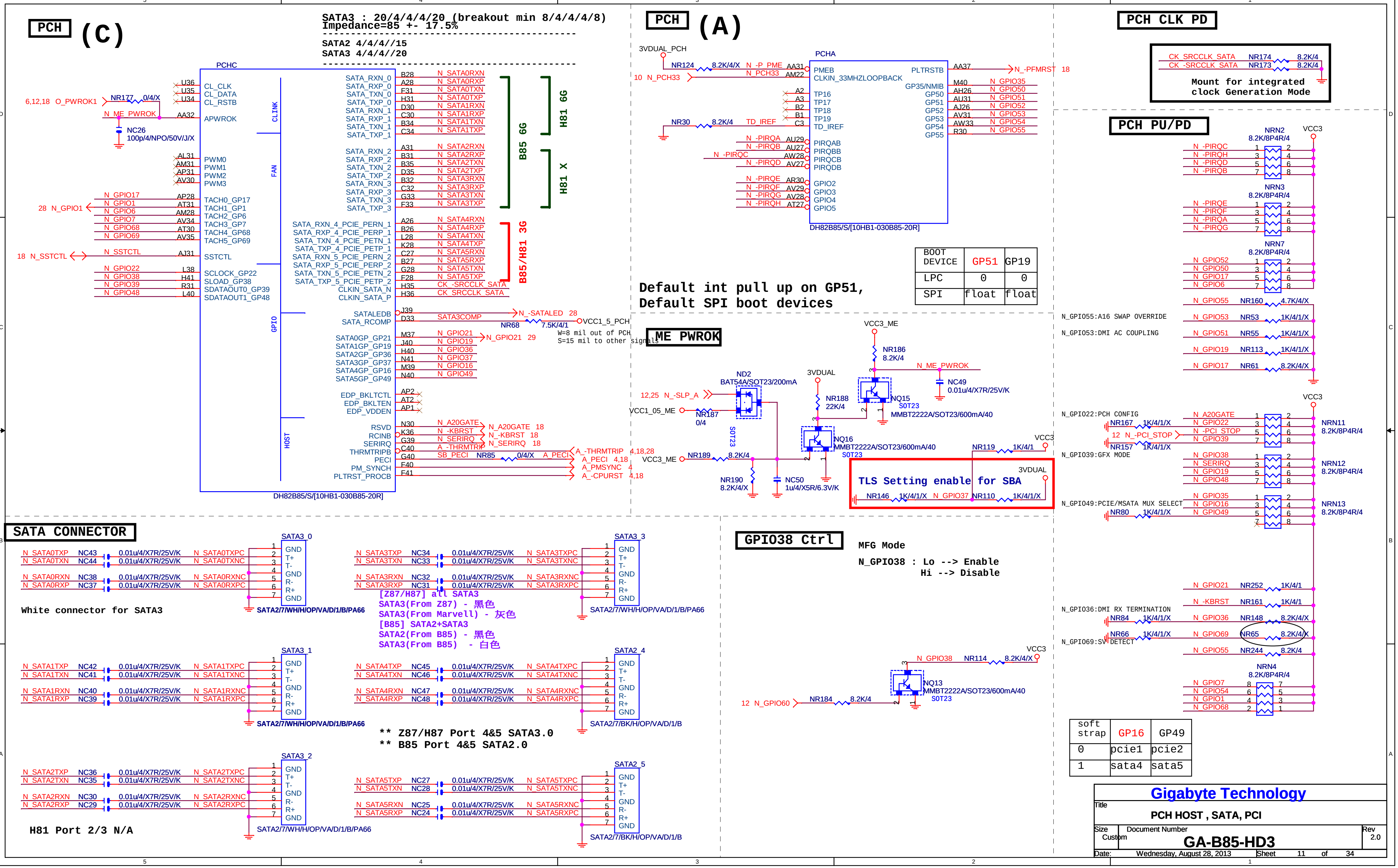


Gigabyte Technology

Title: PCH DISPLAY ,CLK BUFFER

Size	Document Number	Rev
Custom	GA-B85-HD3	2.0

Date: Monday, October 28, 2013 Sheet 10 of 34



BOOT DEVICE	GP51	GP19
LPC	0	0
SPI	float	float

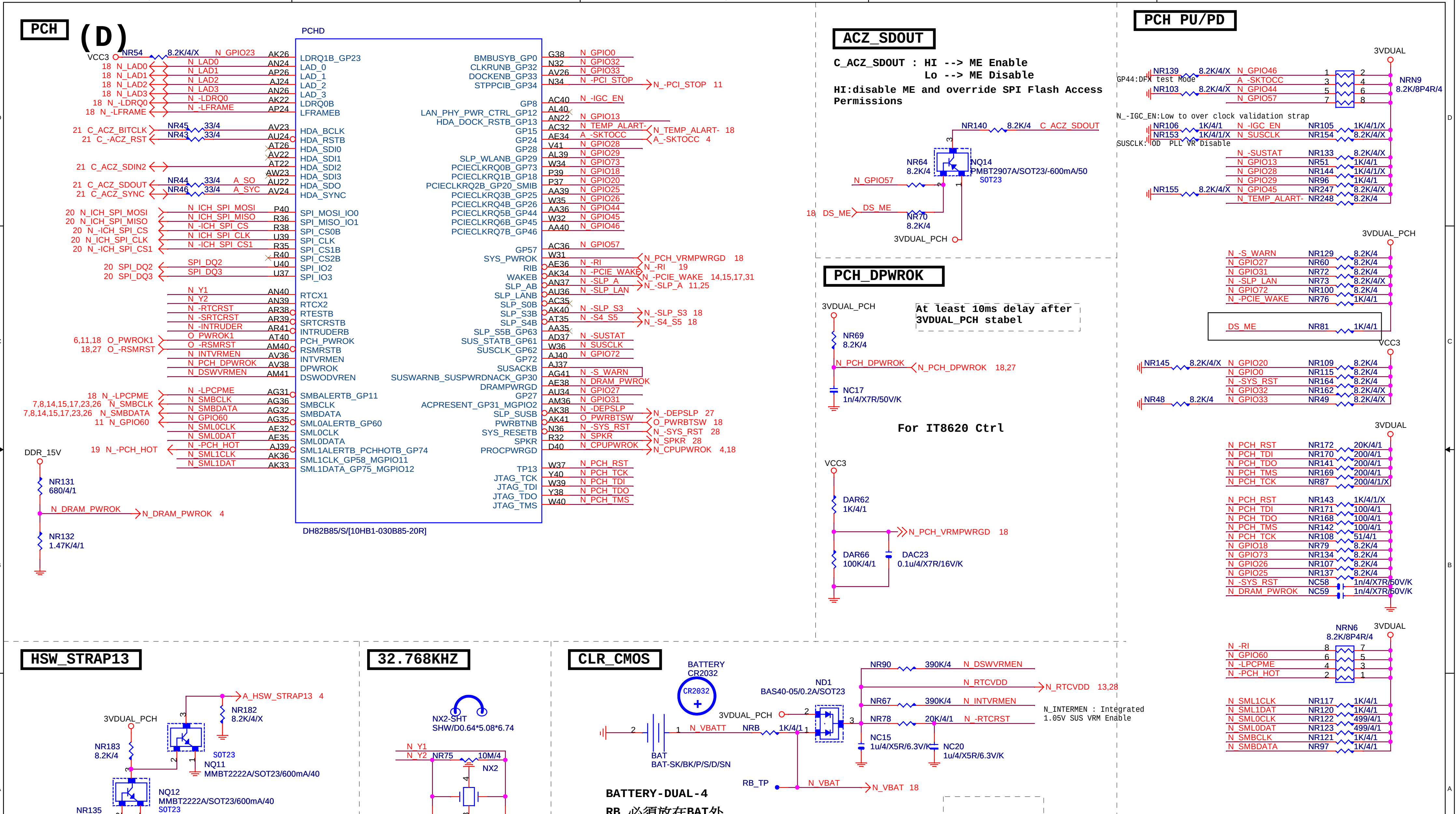
soft strap	GP16	GP49
0	pcie1	pcie2
1	sata4	sata5

Gigabyte Technology

Title: PCH HOST , SATA, PCI

Size: Custom | Document Number: GA-B85-HD3 | Rev: 2.0

Date: Wednesday, August 28, 2013 | Sheet 11 of 34

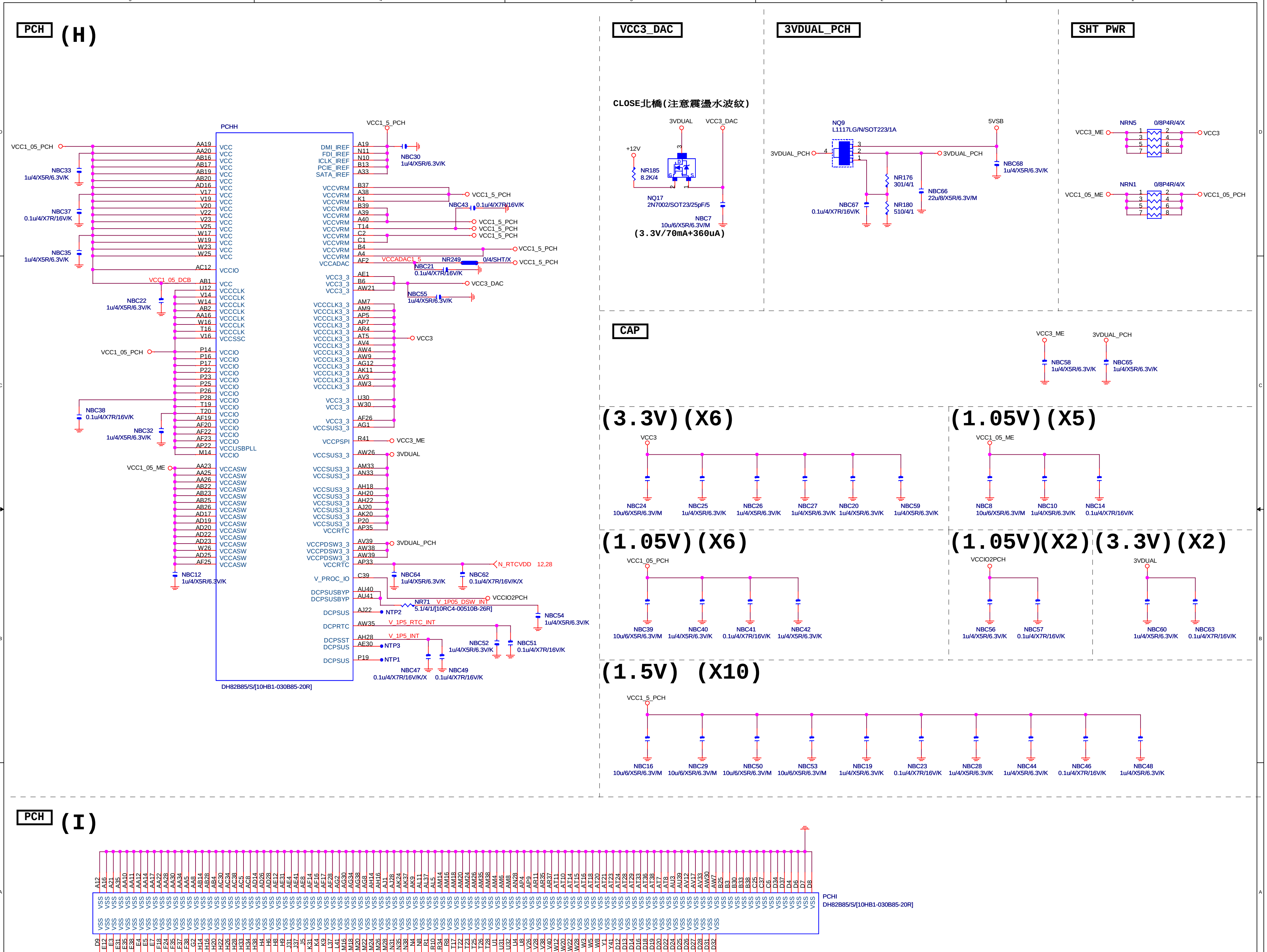


Gigabyte Technology

Title: PCH GPIO , CTRL , AUDIO

Size: Custom | Document Number: GA-B85-HD3 | Rev: 2.0

Date: Wednesday, August 28, 2013 | Sheet 12 of 34



Gigabyte Technology

Title: PCH PWR ,GND

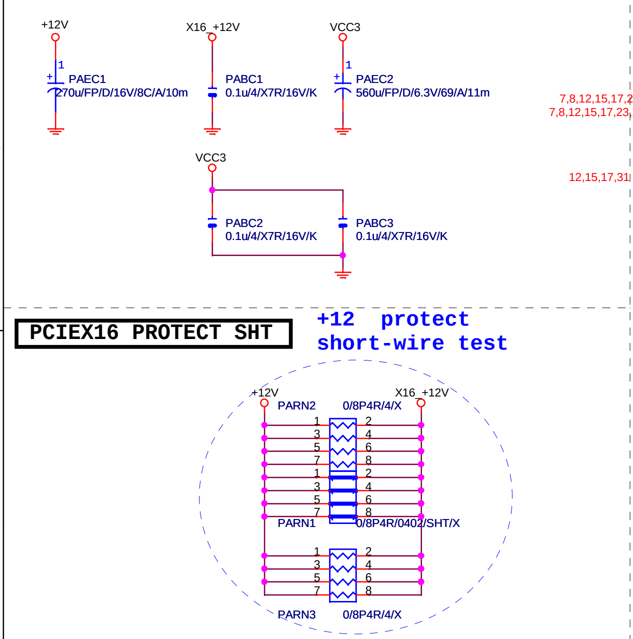
Size: Custom | Document Number: GA-B85-HD3 | Rev: 2.0

Date: Wednesday, August 28, 2013 | Sheet 13 of 34

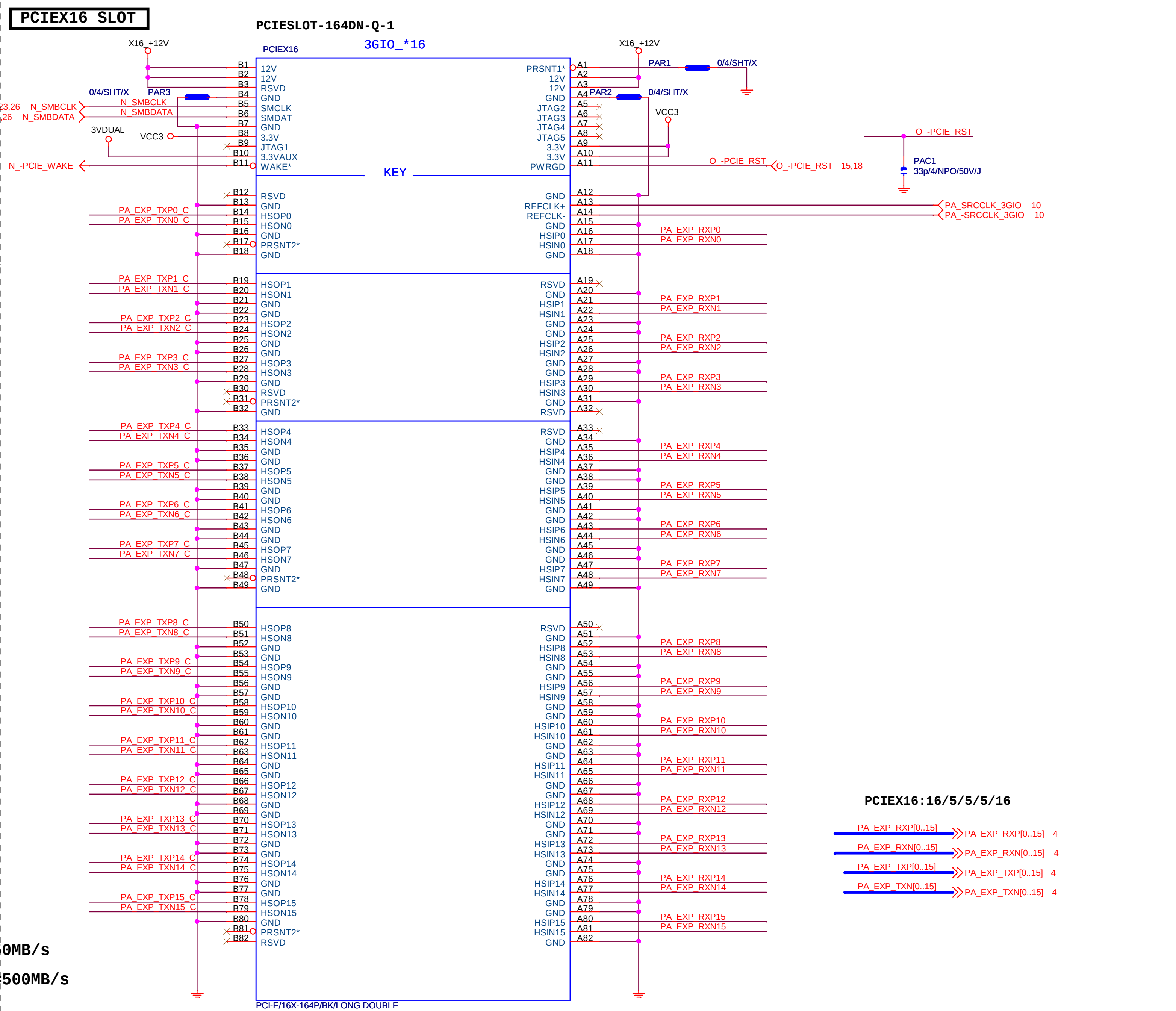
PCIEX16 CAP

PCIEX16 PROTECT SHT

+12 protect short-wire test



PCIEX16 SLOT



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

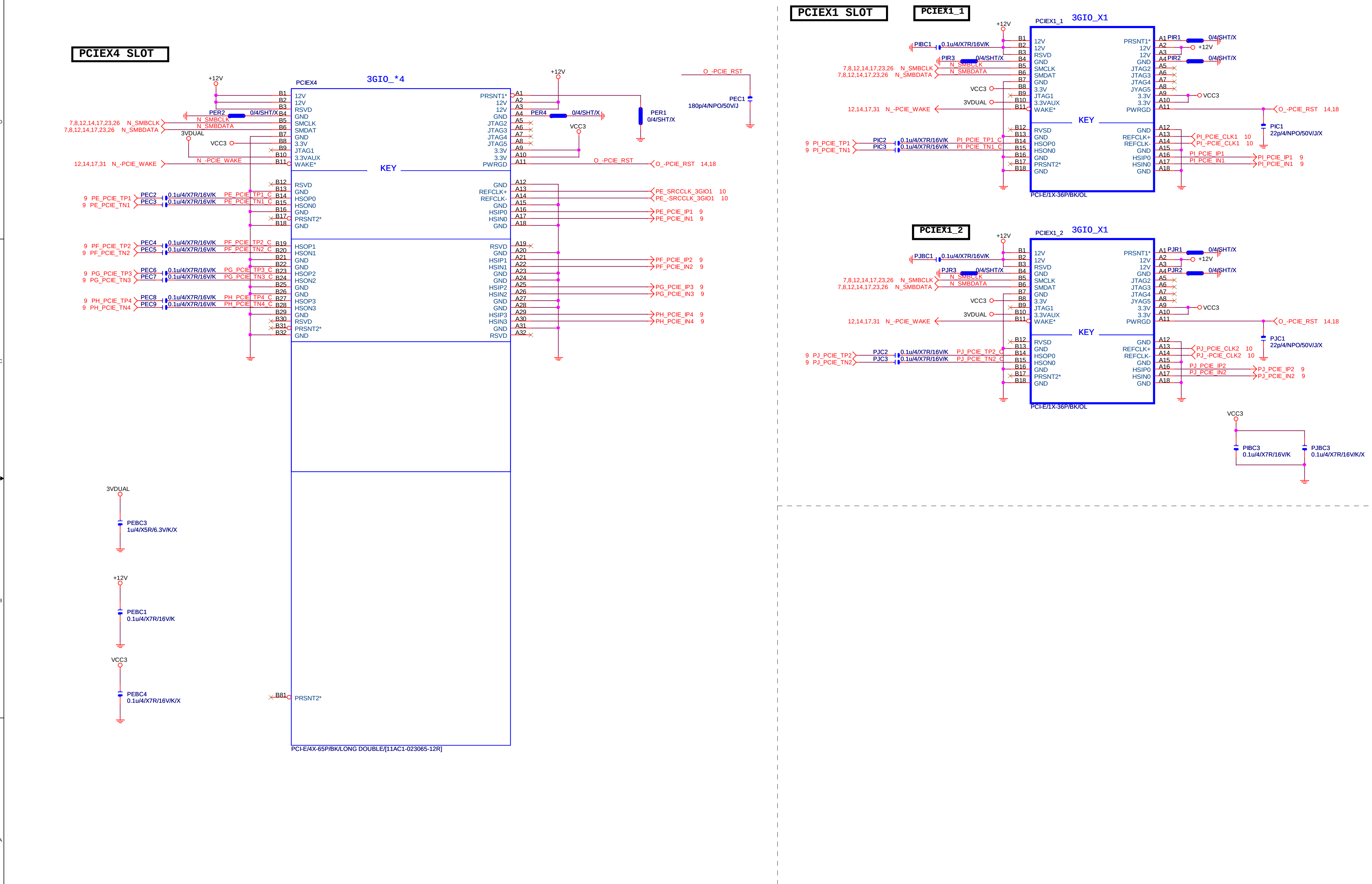
PCE-E X1(雙向) BANDWITH=2.5GHz*(8b/10b)X2=4Gb/s=500MB/s

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

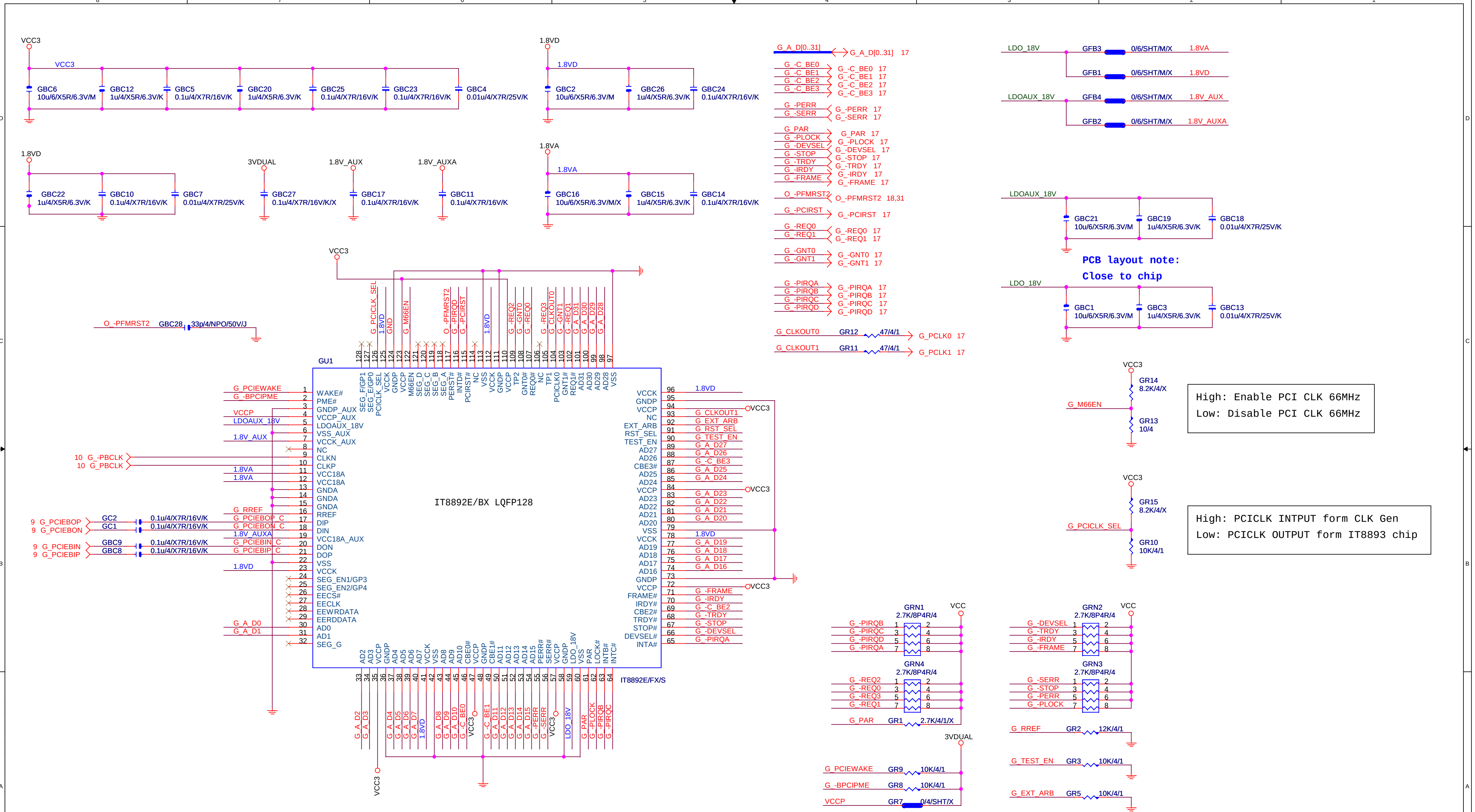
PCI-E REV:2.0--> 5GHZ

Gigabyte Technology		
Title: PCI EXPRESS * 16		
Size: Custom	Document Number: GA-B85-HD3	Rev: 2.0
Date: Wednesday, August 28, 2013	Sheet 14 of 34	



Gigabyte Technology

Title	PCIE_X1 1,2	
Size Custom	Document Number GA-B85-HD3	Rev 2.0
Date: Wednesday, August 28, 2013	Sheet 15 of 34	

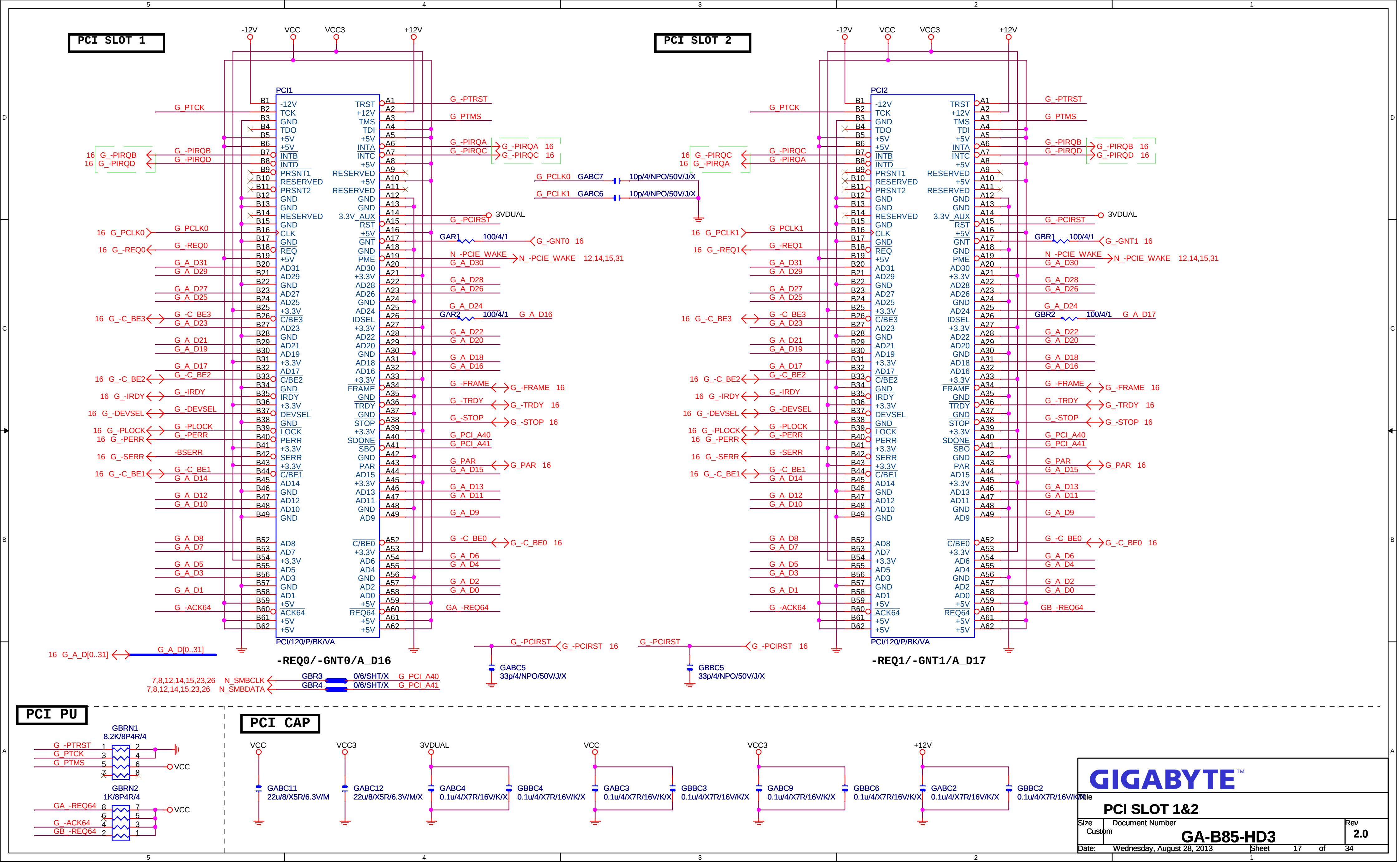


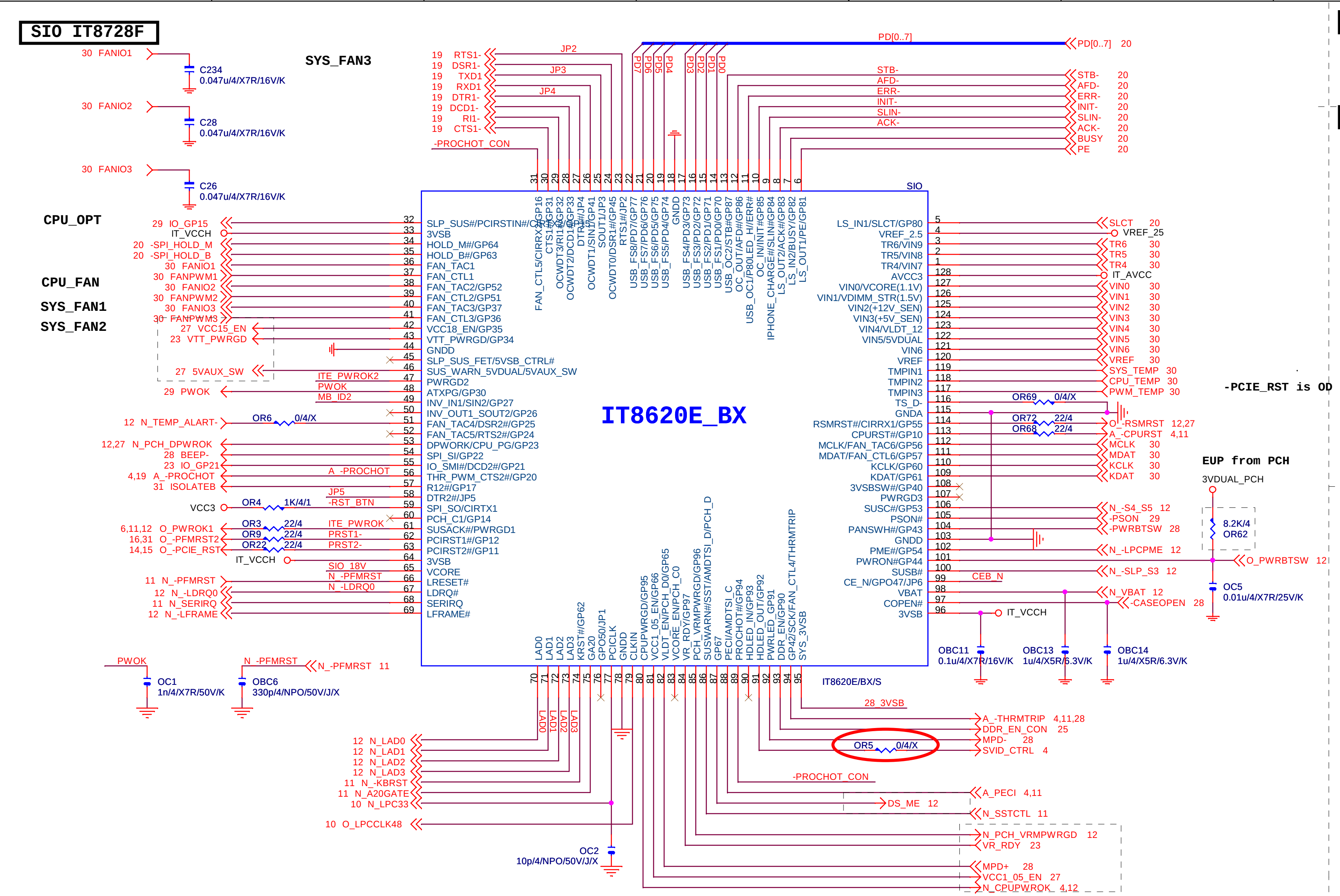
Gigabyte Technology

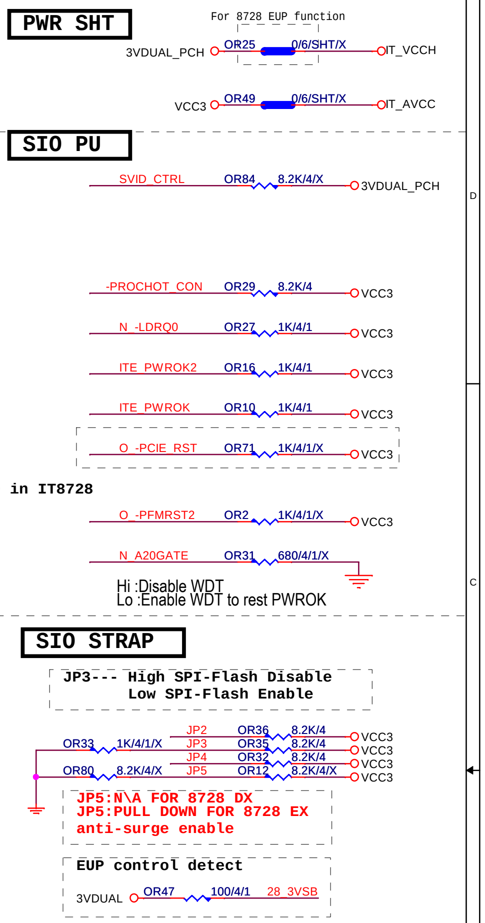
Title: IT8892E

Size: Custom | Document Number: GA-B85-HD3 | Rev: 2.0

Date: Tuesday, September 24, 2013 | Sheet 16 of 34


PCI SLOT 1
PCI SLOT 2
PCI1
PCI2
PCI/120/P/BK/VA
-REQ0/-GNT0/A_D16
-REQ1/-GNT1/A_D17
GABC7 10p/4/NPO/50V/J/X
GABC6 10p/4/NPO/50V/J/X
GABC5 33p/4/NPO/50V/J/X
GBBC5 33p/4/NPO/50V/J/X
GBR3 0/6/SHT/X
GBR4 0/6/SHT/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 0.1u/4/X7R/16V/K/X
GBBC4 0.1u/4/X7R/16V/K/X
GABC3 0.1u/4/X7R/16V/K/X
GBBC3 0.1u/4/X7R/16V/K/X
GABC9 0.1u/4/X7R/16V/K/X
GBBC6 0.1u/4/X7R/16V/K/X
GABC2 0.1u/4/X7R/16V/K/X
GBBC2 0.1u/4/X7R/16V/K/X
GIGABYTE
Title
PCI SLOT 1&2
Size Custom
Document Number
GA-B85-HD3
Rev 2.0
Date: Wednesday, August 28, 2013
Sheet 17 of 34

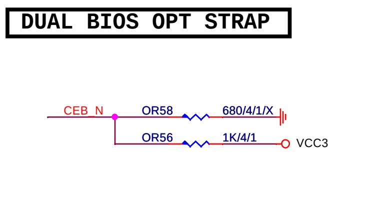


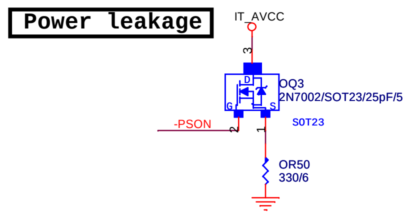


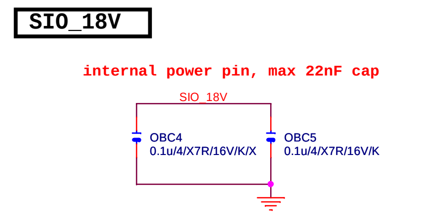
JP4	1	k8 power sequency function is Disable
	0	k8 power sequency function is Enable
JP3 JP5	1 1	The default value of EC Index 63h/6Bh/73h is 80h.
	1 0	The default value of EC Index 63h/6Bh/73h is FFh
	0 1	The default value of EC Index 63h/6Bh/73h is 00h.
	0 0	The default value of EC Index 63h/6Bh/73h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

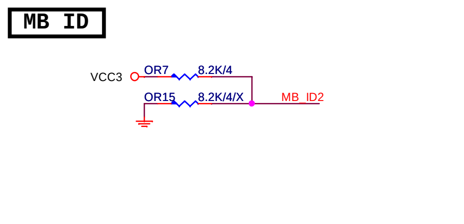
IT8620E GPIO問題匯整

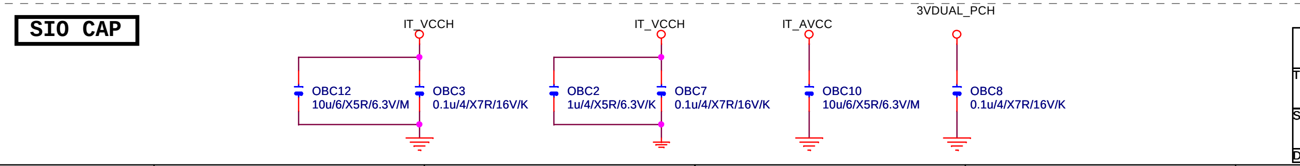
PIN 50	GP26--- 第一次接上POWER時會拉 LO
PIN 90/91	DEFAULT為HDLED FUNCTION, GP93 BYPASS TO GP92
PIN 108	GP40--- POWER ON 時會拉 LO
PIN 111/112	MOUSE 跟FAN6 FUNCTION 擇一使用,不然會互相干擾





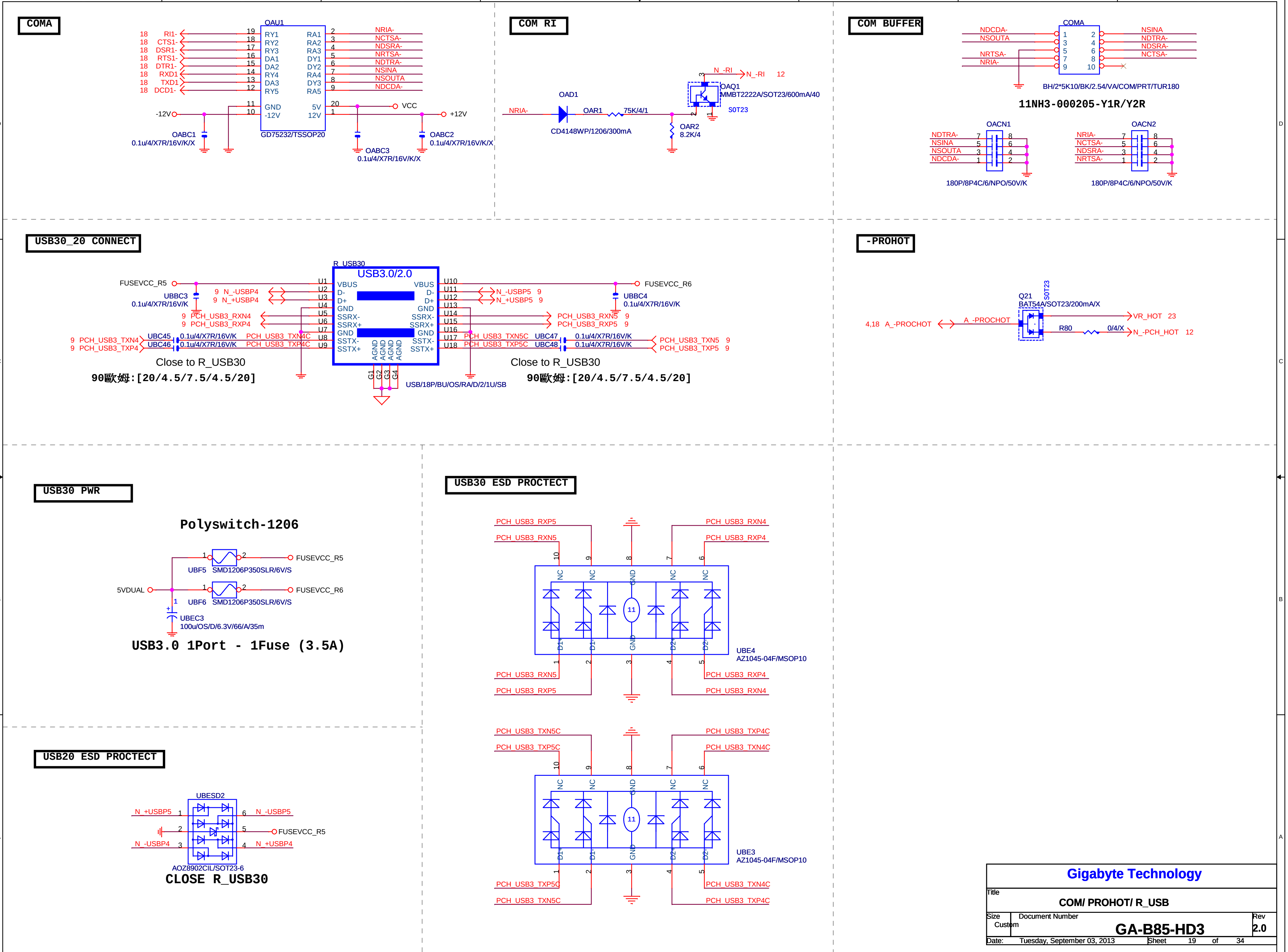




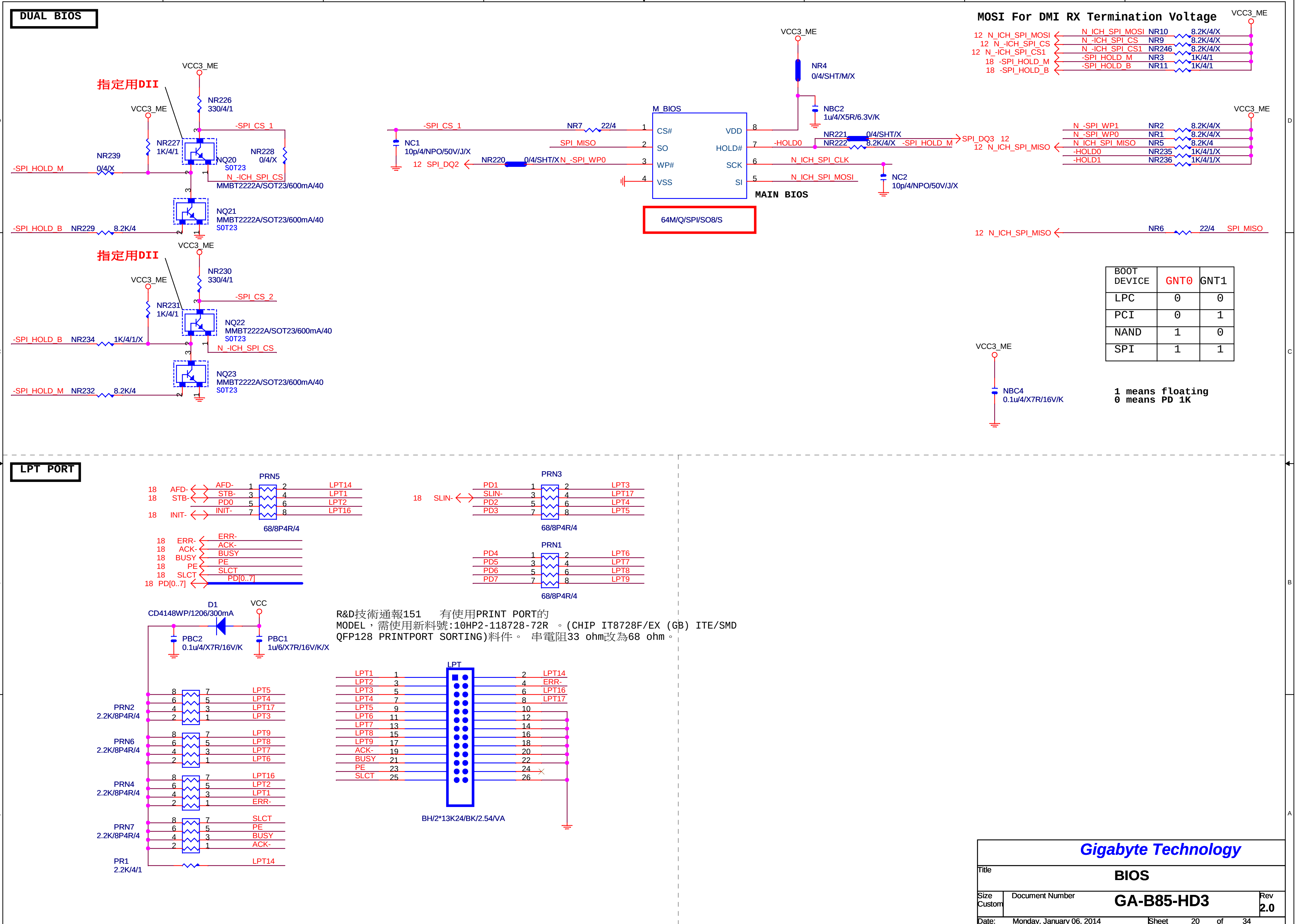


Gigabyte Technology

Title	ITE 8620 LPC IO	
Size B	Document Number GA-B85-HD3	Rev 2.0
Date: Wednesday, August 28, 2013	Sheet 18 of 34	



COMA
OAU1
GD75232/TSSOP20
RY1 RY2 RY3 DA1 DA2 RY4 DA3 RY5 GND -12V
RA1 RA2 RA3 DY1 DY2 RA4 DY3 RA5 5V 12V
18 RI1-
18 CTS1-
18 DSR1-
18 RTS1-
18 DTR1-
18 RXD1
18 TXD1
18 DCD1-
NRIA-
NCTSA-
NDSRA-
NRTSA-
NDTRA-
NSINA
NSOUTA
NDCDA-
-12V
VCC
+12V
OABC1 0.1u/4/X7R/16V/K/X
OABC2 0.1u/4/X7R/16V/K/X
OABC3 0.1u/4/X7R/16V/K/X
COM RI
OAD1
CD4148WP/1206/300mA
NRIA-
OAR1 75K/4/1
OAR2 8.2K/4
N_-RI
N_-RI 12
OAQ1
MMBT2222A/SOT23/600mA/40
SOT23
COM BUFFER
COMA
NDCDA-
NSOUTA
NRTSA-
NRIA-
NSINA
NDTRA-
NDSRA-
NCTSA-
BH/2*5K10/BK/2.54/VA/COM/PRT/TUR180
11NH3-000205-Y1R/Y2R
OACN1
NDTRA-
NSINA
NSOUTA
NDCDA-
180P/8P4C/6/NPO/50V/K
OACN2
NRIA-
NCTSA-
NDSRA-
NRTSA-
180P/8P4C/6/NPO/50V/K
USB30_20 CONNECT
R_USB30
USB3.0/2.0
VBUS D- D+ GND SSRX- SSRX+ GND SSTX- SSTX+
AGND AGND AGND AGND
G1 G2 G3 G4
USB/18P/BU/OS/RA/D/2/1U/SB
FUSEVCC_R5
UBBC3 0.1u/4/X7R/16V/K
9 N_-USBP4
9 N_+USBP4
9 PCH_USB3_RXN4
9 PCH_USB3_RXP4
9 PCH_USB3_TXN4
9 PCH_USB3_TXP4
UBC45 0.1u/4/X7R/16V/K
UBC46 0.1u/4/X7R/16V/K
PCH_USB3_TXN4C
PCH_USB3_TXP4C
Close to R_USB30
90歐姆:[20/4.5/7.5/4.5/20]
FUSEVCC_R6
UBBC4 0.1u/4/X7R/16V/K
N_-USBP5 9
N_+USBP5 9
PCH_USB3_RXN5 9
PCH_USB3_RXP5 9
PCH_USB3_TXN5C
PCH_USB3_TXP5C
UBC47 0.1u/4/X7R/16V/K
UBC48 0.1u/4/X7R/16V/K
PCH_USB3_TXN5 9
PCH_USB3_TXP5 9
Close to R_USB30
90歐姆:[20/4.5/7.5/4.5/20]
-PROHOT
Q21
BAT54A/SOT23/200mA/X
SOT23
4,18 A_-PROCHOT
A_-PROCHOT
VR_HOT 23
R80 0/4/X
N_-PCH_HOT 12
USB30 PWR
Polyswitch-1206
5VDUAL
UBF5 SMD1206P350SLR/6V/S
UBF6 SMD1206P350SLR/6V/S
FUSEVCC_R5
FUSEVCC_R6
UBEC3 100u/OS/D/6.3V/66/A/35m
USB3.0 1Port - 1Fuse (3.5A)
USB30 ESD PROCTECT
PCH_USB3_RXP5
PCH_USB3_RXN5
PCH_USB3_RXN4
PCH_USB3_RXP4
NC NC GND NC NC
D1- D1- GND D2- D2-
UBE4
AZ1045-04F/MSOP10
PCH_USB3_TXN5C
PCH_USB3_TXP5C
PCH_USB3_TXP4C
PCH_USB3_TXN4C
UBE3
AZ1045-04F/MSOP10
USB20 ESD PROCTECT
UBESD2
N_+USBP5
N_-USBP5
FUSEVCC_R5
N_-USBP4
N_+USBP4
AOZ8902CIL/SOT23-6
CLOSE R_USB30
Gigabyte Technology
Title
COM/ PROHOT/ R_USB
Size Custom
Document Number
GA-B85-HD3
Rev 2.0
Date: Tuesday, September 03, 2013
Sheet 19 of 34



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

1 means floating
0 means PD 1K

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

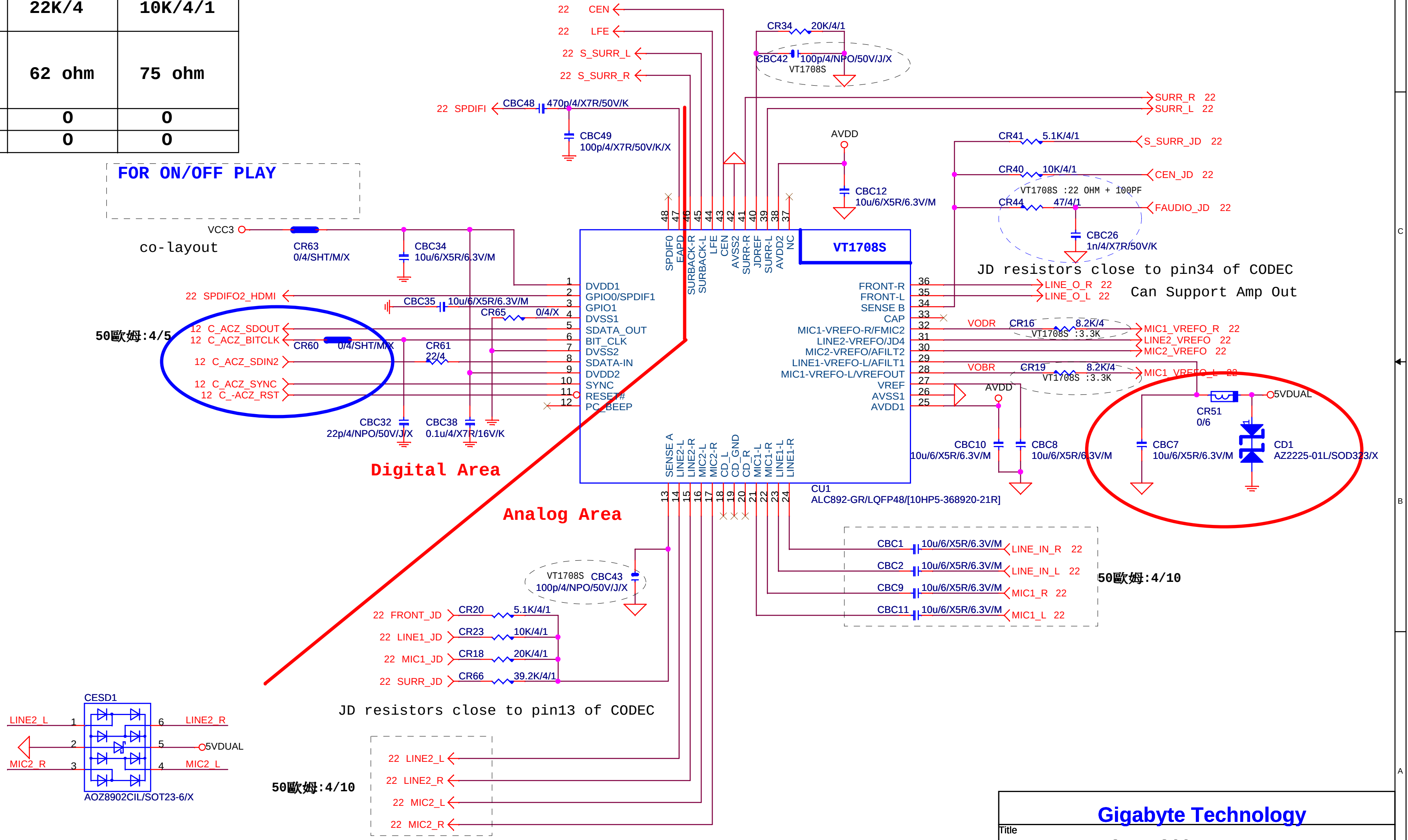
Size: Custom | Document Number: GA-B85-HD3 | Rev: 2.0

Date: Monday, January 06, 2014 | Sheet 20 of 34

AZALIA CODEC

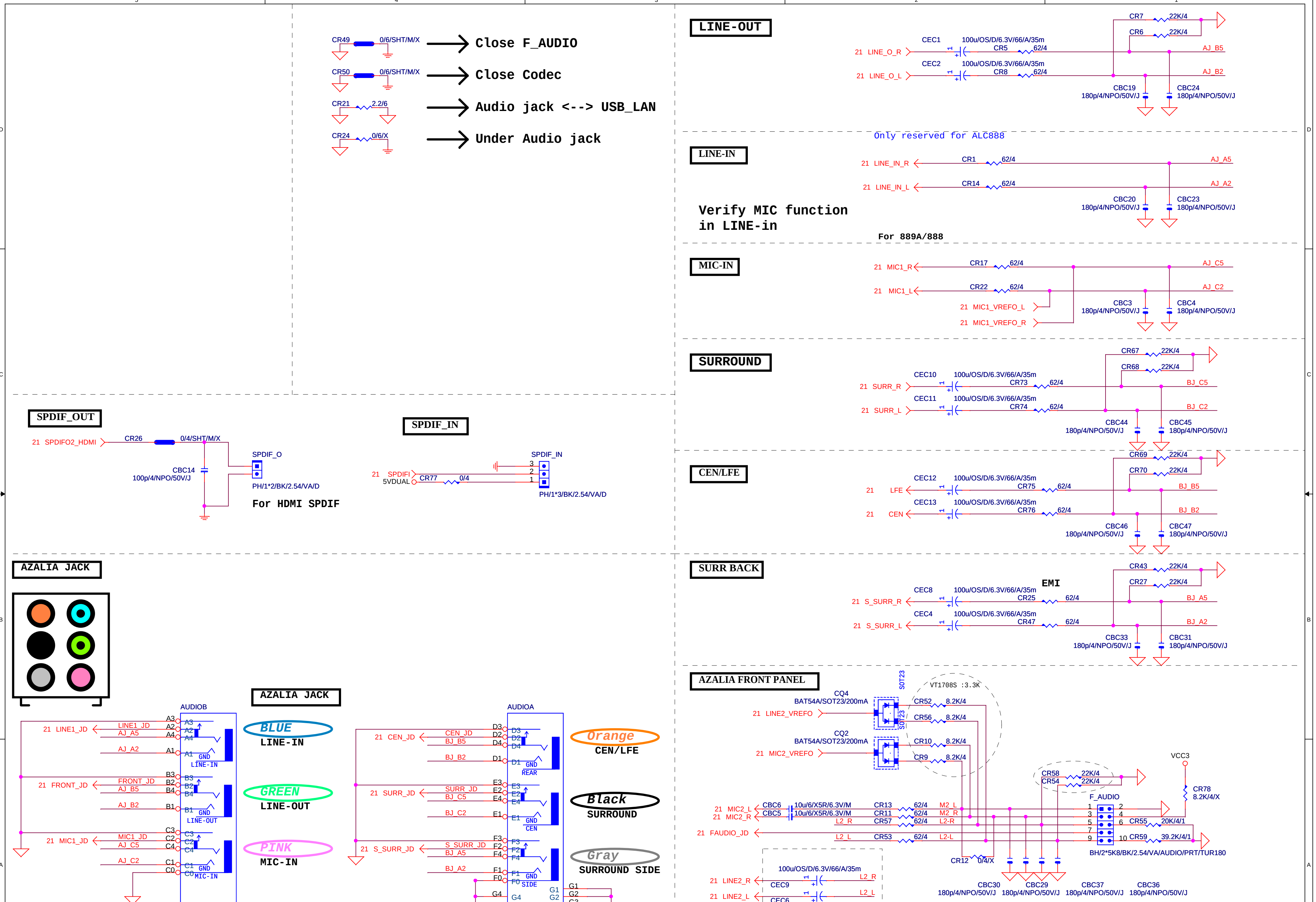
ALC892/ALC887-VD2/VT1708-CE Colay

	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	O	O	O
CESD1	X	O	O



Gigabyte Technology

Title	HD AUDIO ALC887	
Size Custom	Document Number GA-B85-HD3	Rev 2.0
Date: Wednesday, August 28, 2013	Sheet 21 of 34	

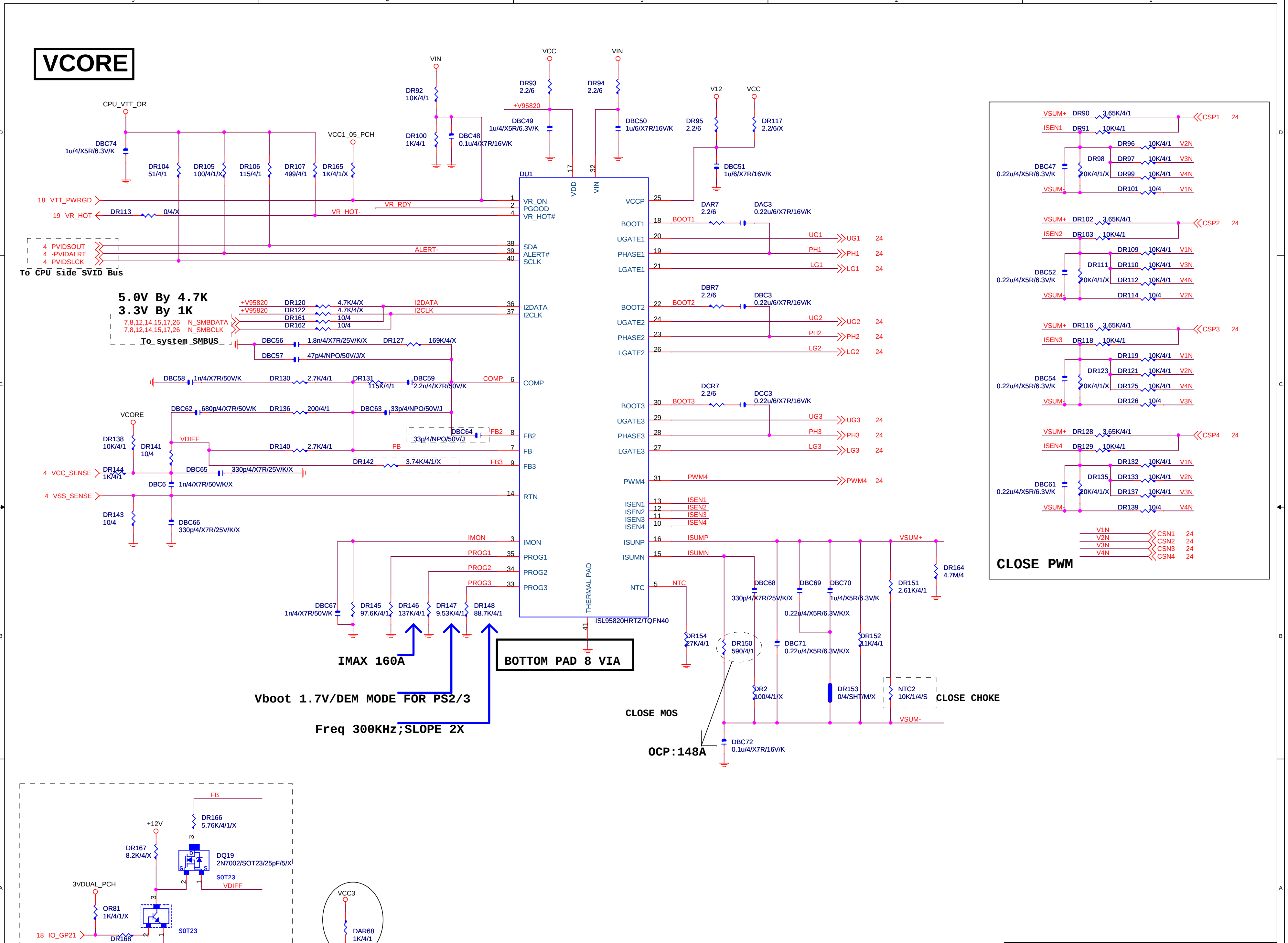


Gigabyte Technology

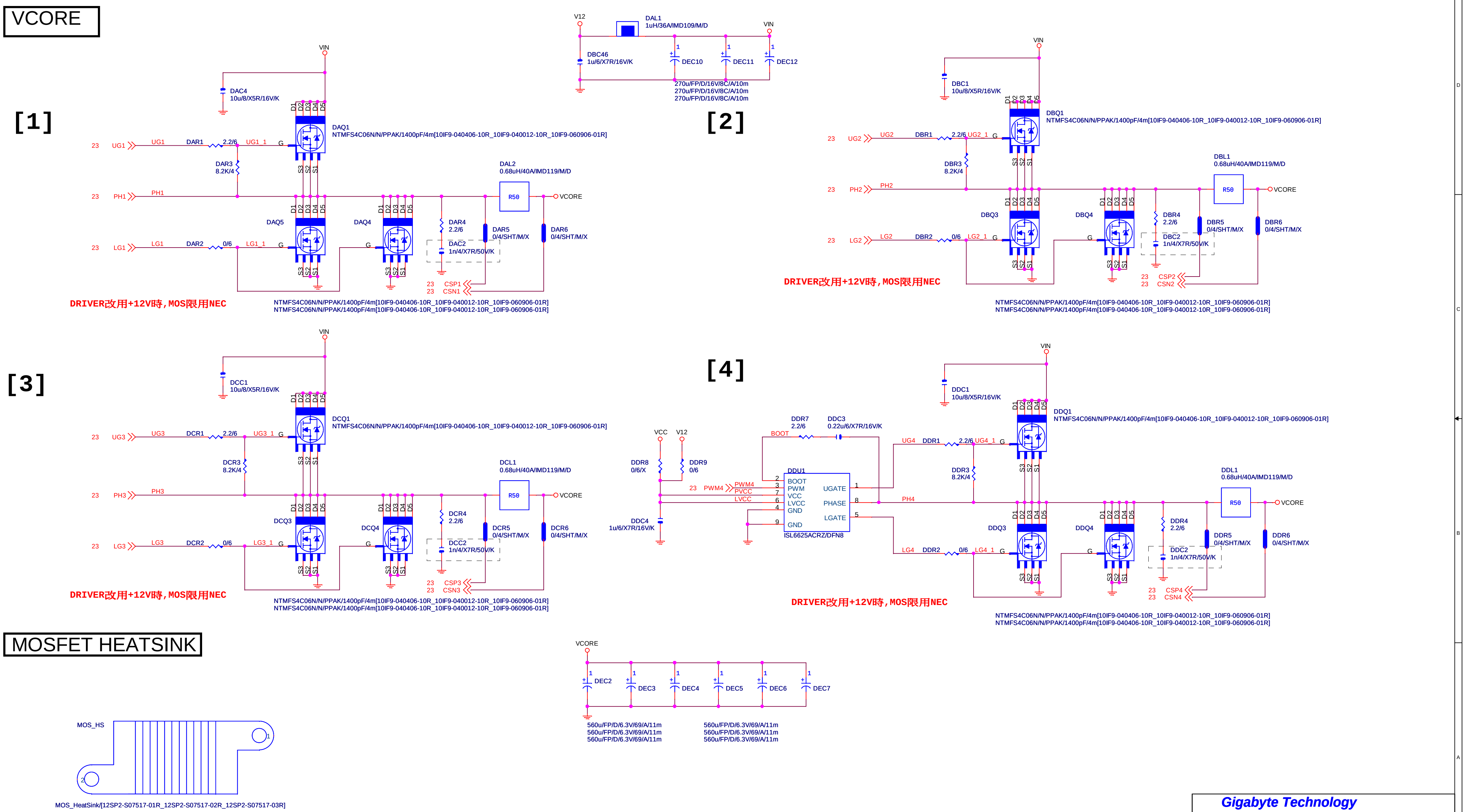
Title: AUDIO JACK

Size	Document Number	Rev
Custom	GA-B85-HD3	2.0

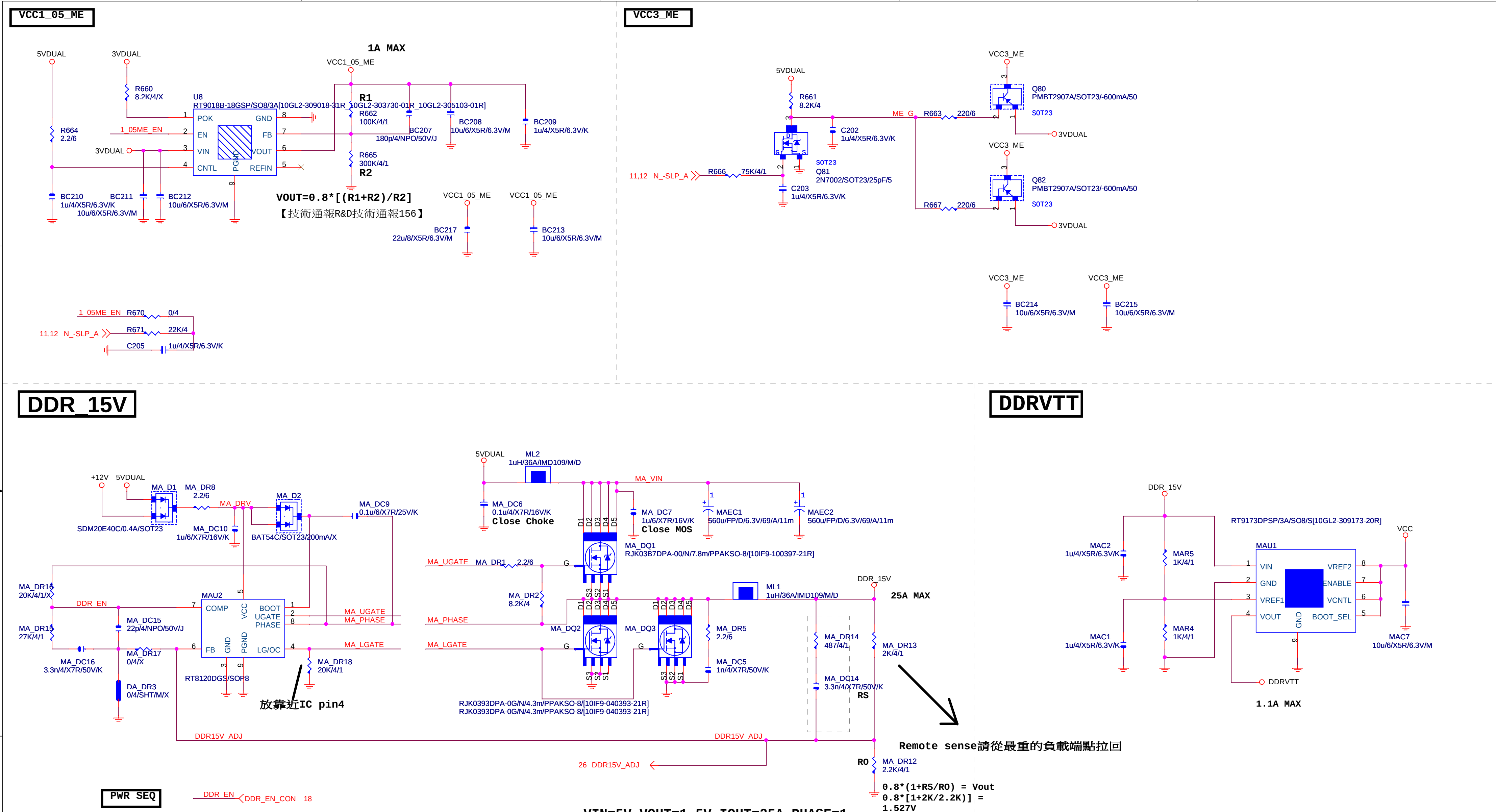
Date: Wednesday, August 28, 2013 Sheet 22 of 34



Gigabyte Technology		
Title	VCORE_ ISL95820	
Size Custom	Document Number GA-B85-HD3	Rev 2.0
Date: Wednesday, August 28, 2013	Sheet 23 of 34	



Gigabyte Technology		
Title: ISL95820_2		
Size: Custom	Document Number: **GA-B85-HD3**	Rev: 2.0
Date: Thursday, September 05, 2013	Sheet 24 of 34	



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]

GIGABYTE™

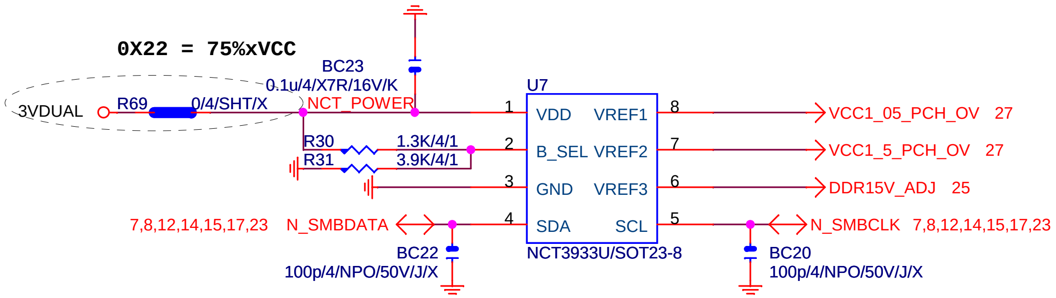
Title: DDR15V / M3 POWER

Size	Document Number	Rev
Custom	GA-B85-HD3	2.0

Date: Thursday, September 05, 2013 | Sheet 25 of 34

OVER VOLTAGE

0X22 = 75%xVCC



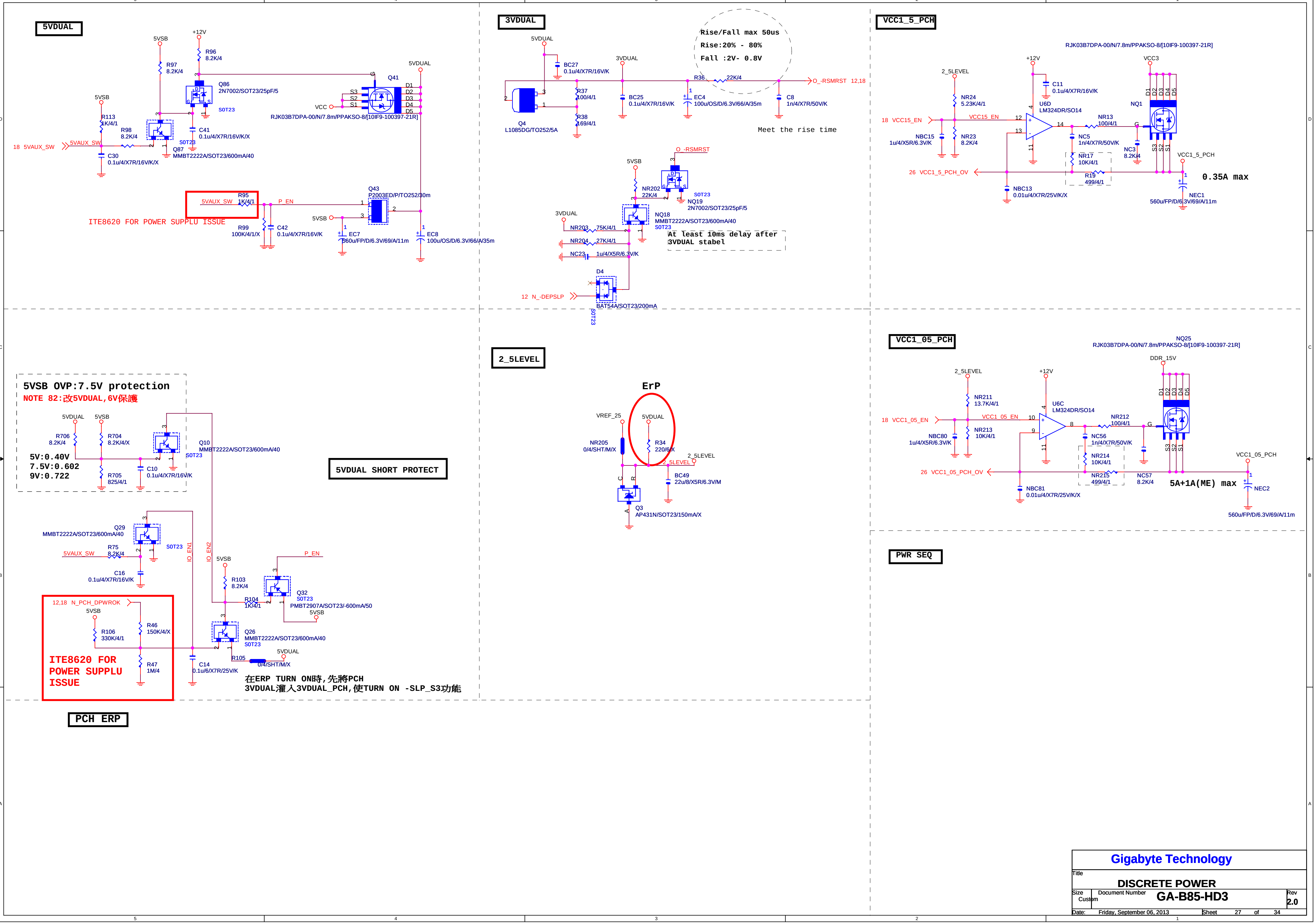
NCT3933	0X2A	0X20	0X22
VREF1	DDRVTT	VREF_DDRA_DQ	PCH Core
VREF2	VREF_DDRA_CA	N/A	VCC1_5_PCH
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	SMREF

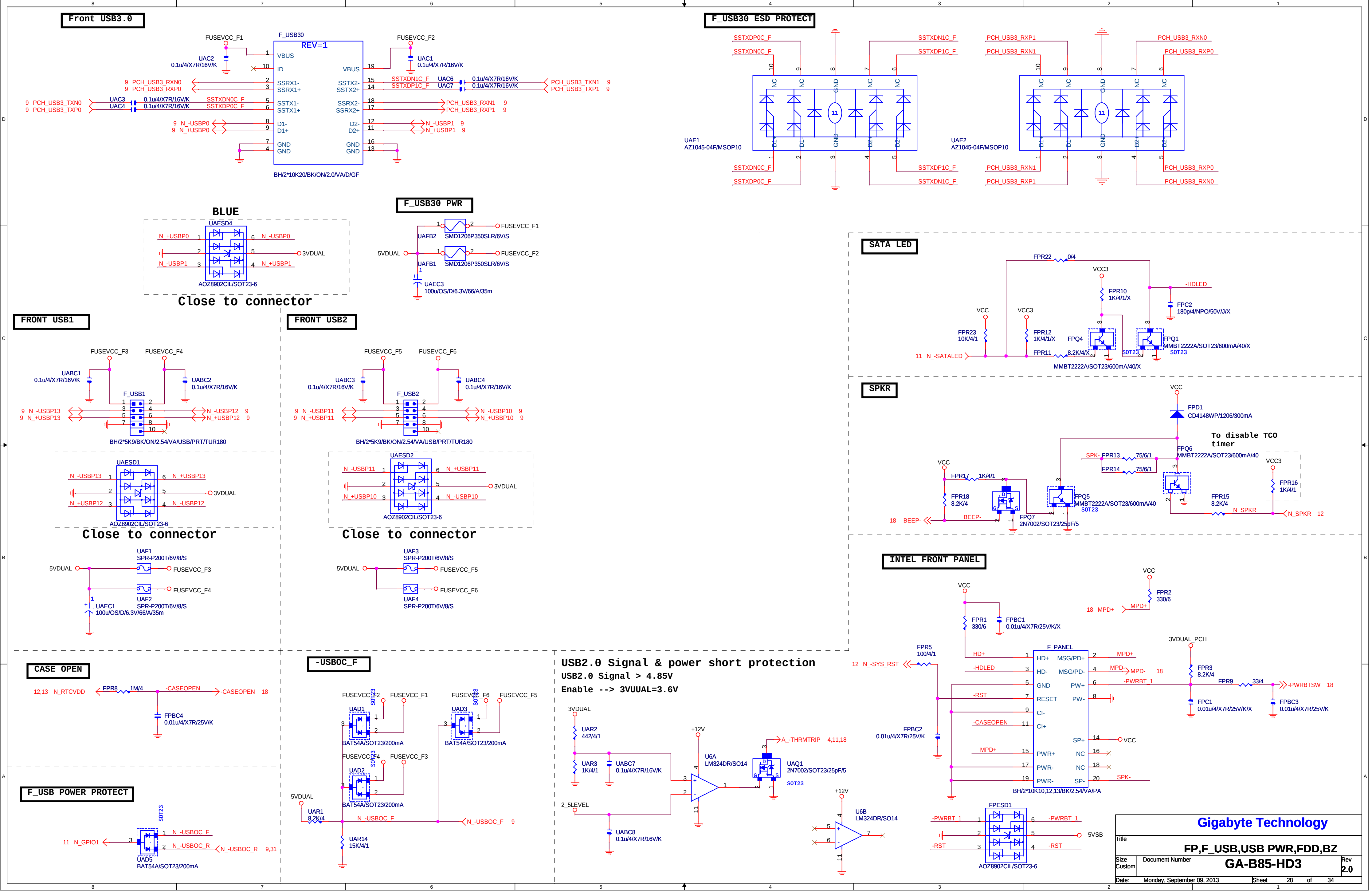
Gigabyte Technology

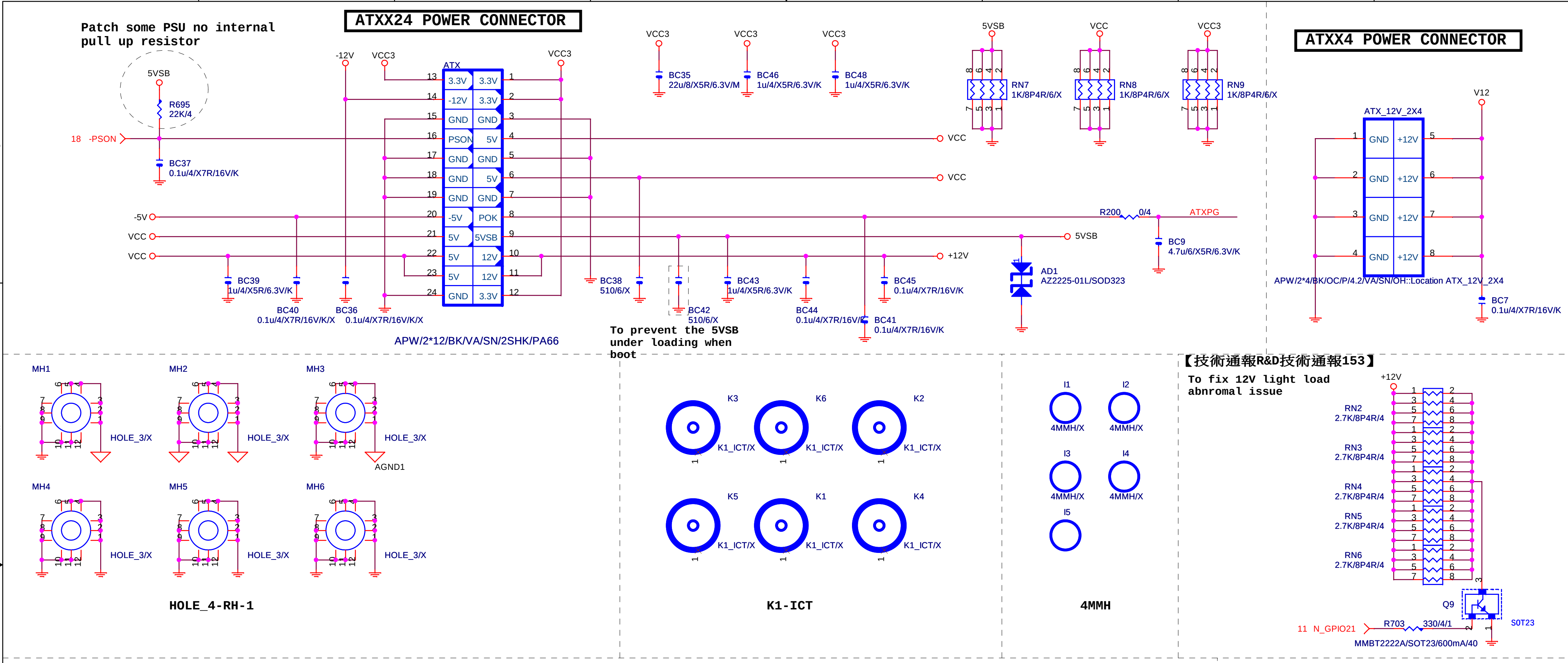
Title: CPU CORE VR-2

Size: Custom | Document Number: GA-B85-HD3 | Rev: 2.0

Date: Wednesday, August 28, 2013 | Sheet 26 of 34


5VDUAL
5VSB
+12V
R96 8.2K/4
R97 8.2K/4
Q86 2N7002/SOT23/25pF/5
Q41
RJK03B7DPA-00/N7.8m/PPAKSO-8/[10IF9-100397-21R]
5VDUAL
VCC
R113 1K/4/1
R98 8.2K/4
C41 0.1u/4/X7R/16V/K/X
Q87 MMBT2222A/SOT23/600mA/40
18 5VAUX_SW
C30 0.1u/4/X7R/16V/K/X
5VAUX_SW
R95 1K/4/1
P_EN
Q43 P2003ED/P/TO252/30m
ITE8620 FOR POWER SUPPLU ISSUE
R99 100K/4/1/X
C42 0.1u/4/X7R/16V/K
EC7 560u/FP/D/6.3V/69/A/11m
EC8 100u/OS/D/6.3V/66/A/35m
3VDUAL
BC27 0.1u/4/X7R/16V/K
Rise/Fall max 50us
Rise:20% - 80%
Fall :2V- 0.8V
R37 100/4/1
R38 169/4/1
Q4 L1085DG/TO252/5A
BC25 0.1u/4/X7R/16V/K
R36 22K/4
EC4 100u/OS/D/6.3V/66/A/35m
C8 1n/4/X7R/50V/K
O_-RSMRST 12,18
Meet the rise time
NR202 22K/4
NQ19 2N7002/SOT23/25pF/5
NQ18 MMBT2222A/SOT23/600mA/40
NR203 75K/4/1
NR204 27K/4/1
NC23 1u/4/X5R/6.3V/K
At least 10ms delay after
3VDUAL stabel
D4 BAT54A/SOT23/200mA
12 N_-DEPSLP
VCC1_5_PCH
2_5LEVEL
C11 0.1u/4/X7R/16V/K
NR24 5.23K/4/1
U6D LM324DR/SO14
NR13 100/4/1
NQ1
18 VCC15_EN
NBC15 1u/4/X5R/6.3V/K
NR23 8.2K/4
NC5 1n/4/X7R/50V/K
NR17 10K/4/1
NC3 8.2K/4
26 VCC1_5_PCH_OV
R19 499/4/1
NBC13 0.01u/4/X7R/25V/K/X
0.35A max
NEC1 560u/FP/D/6.3V/69/A/11m
VCC1_05_PCH
NQ25 RJK03B7DPA-00/N7.8m/PPAKSO-8/[10IF9-100397-21R]
DDR_15V
NR211 13.7K/4/1
U6C LM324DR/SO14
NR212 100/4/1
18 VCC1_05_EN
NBC80 1u/4/X5R/6.3V/K
NR213 10K/4/1
NC56 1n/4/X7R/50V/K
NR214 10K/4/1
NR215 499/4/1
NC57 8.2K/4
26 VCC1_05_PCH_OV
NBC81 0.01u/4/X7R/25V/K/X
5A+1A(ME) max
NEC2 560u/FP/D/6.3V/69/A/11m
2_5LEVEL
ErP
VREF_25
NR205 0/4/SHT/M/X
R34 220/6/X
BC49 22u/8/X5R/6.3V/M
Q3 AP431N/SOT23/150mA/X
5VSB OVP:7.5V protection
NOTE 82:改5VDUAL,6V保護
R706 8.2K/4
R704 8.2K/4/X
R705 825/4/1
C10 0.1u/4/X7R/16V/K
Q10 MMBT2222A/SOT23/600mA/40
5V:0.40V
7.5V:0.602
9V:0.722
5VDUAL SHORT PROTECT
Q29 MMBT2222A/SOT23/600mA/40
R75 8.2K/4
C16 0.1u/4/X7R/16V/K
IO_EN1
IO_EN2
R103 8.2K/4
R104 1K/4/1
Q32 PMBT2907A/SOT23/-600mA/50
12,18 N_PCH_DPWROK
R106 330K/4/1
R46 150K/4/X
R47 1M/4
ITE8620 FOR POWER SUPPLU ISSUE
C14 0.1u/6/X7R/25V/K
Q26 MMBT2222A/SOT23/600mA/40
R105 0/4/SHT/M/X
在ERP TURN ON時,先將PCH
3VDUAL灌入3VDUAL_PCH,使TURN ON -SLP_S3功能
PCH ERP
PWR SEQ
Gigabyte Technology
Title
DISCRETE POWER
Size Custom
Document Number
GA-B85-HD3
Rev 2.0
Date: Friday, September 06, 2013
Sheet 27 of 34


Front USB3.0
F_USB30
REV=1
FUSEVCC_F1
FUSEVCC_F2
UAC2
0.1u/4/X7R/16V/K
UAC1
0.1u/4/X7R/16V/K
VBUS
ID
SSRX1-
SSRX1+
SSTX1-
SSTX1+
D1-
D1+
GND
SSTX2-
SSTX2+
SSRX2-
SSRX2+
D2-
D2+
9 PCH_USB3_RXN0
9 PCH_USB3_RXP0
9 PCH_USB3_TXN0
9 PCH_USB3_TXP0
UAC3
UAC4
SSTXDN0C_F
SSTXDP0C_F
SSTXDN1C_F
SSTXDP1C_F
UAC6
UAC7
PCH_USB3_TXN1 9
PCH_USB3_TXP1 9
PCH_USB3_RXN1 9
PCH_USB3_RXP1 9
9 N_-USBP0
9 N_+USBP0
N_-USBP1 9
N_+USBP1 9
BH/2*10K20/BK/ON/2.0/VA/D/GF
F_USB30 ESD PROTECT
SSTXDP0C_F
SSTXDN0C_F
SSTXDN1C_F
SSTXDP1C_F
PCH_USB3_RXP1
PCH_USB3_RXN1
PCH_USB3_RXN0
PCH_USB3_RXP0
NC
GND
D1
D2
UAE1
AZ1045-04F/MSOP10
UAE2
AZ1045-04F/MSOP10
BLUE
UAESD4
N_+USBP0
N_-USBP0
N_-USBP1
N_+USBP1
3VDUAL
AOZ8902CIL/SOT23-6
Close to connector
F_USB30 PWR
5VDUAL
UAFB2
UAFB1
SMD1206P350SLR/6V/S
FUSEVCC_F1
FUSEVCC_F2
UAEC3
100u/OS/D/6.3V/66A/35m
SATA LED
FPR22 0/4
VCC3
FPR10 1K/4/1/X
-HDLED
FPC2 180p/4/NPO/50V/J/X
VCC
VCC3
FPR23 10K/4/1
FPR12 1K/4/1/X
FPQ4
FPQ1
MMBT2222A/SOT23/600mA/40/X
SOT23
11 N_-SATALED
FPR11
8.2K/4/X
MMBT2222A/SOT23/600mA/40/X
FRONT USB1
FUSEVCC_F3
FUSEVCC_F4
UABC1
0.1u/4/X7R/16V/K
UABC2
0.1u/4/X7R/16V/K
F_USB1
9 N_-USBP13
9 N_+USBP13
N_-USBP12 9
N_+USBP12 9
BH/2*5K9/BK/ON/2.54/VA/USB/PRT/TUR180
UAESD1
N_-USBP13
N_+USBP13
N_+USBP12
N_-USBP12
3VDUAL
AOZ8902CIL/SOT23-6
Close to connector
FRONT USB2
FUSEVCC_F5
FUSEVCC_F6
UABC3
0.1u/4/X7R/16V/K
UABC4
0.1u/4/X7R/16V/K
F_USB2
9 N_-USBP11
9 N_+USBP11
N_-USBP10 9
N_+USBP10 9
BH/2*5K9/BK/ON/2.54/VA/USB/PRT/TUR180
UAESD2
N_-USBP11
N_+USBP11
N_+USBP10
N_-USBP10
3VDUAL
AOZ8902CIL/SOT23-6
Close to connector
SPKR
VCC
FPD1
CD4148WP/1206/300mA
To disable TCO timer
FPQ6
MMBT2222A/SOT23/600mA/40
SPK-
FPR13 75/6/1
FPR14 75/6/1
VCC3
FPR16 1K/4/1
FPR17 1K/4/1
FPR18 8.2K/4
FPQ5
MMBT2222A/SOT23/600mA/40
SOT23
FPR15 8.2K/4
N_SPKR
18 BEEP-
FPQ7
2N7002/SOT23/25pF/5
N_SPKR 12
5VDUAL
UAF1
SPR-P200T/6V/8/S
FUSEVCC_F3
FUSEVCC_F4
UAF2
SPR-P200T/6V/8/S
UAEC1
100u/OS/D/6.3V/66A/35m
UAF3
SPR-P200T/6V/8/S
FUSEVCC_F5
FUSEVCC_F6
UAF4
SPR-P200T/6V/8/S
INTEL FRONT PANEL
VCC
FPR2 330/6
18 MPD+
FPR1 330/6
FPBC1 0.01u/4/X7R/25V/K/X
3VDUAL_PCH
FPR5 100/4/1
12 N_SYS_RST
F_PANEL
HD+
HD-
GND
RESET
CI-
CI+
PWR+
PWR-
MSG/PD+
MSG/PD-
PW+
PW-
SP+
NC
SP-
MPD+
MPD- 18
-PWRBT_1
-HDLED
-RST
-CASEOPEN
FPBC2 0.01u/4/X7R/25V/K
FPR3 8.2K/4
FPR9 33/4
-PWRBTSW 18
FPC1 0.01u/4/X7R/25V/K/X
FPBC3 0.01u/4/X7R/25V/K
BH/2*10K10,12,13/BK/2.54/VA/PA
CASE OPEN
12,13 N_RTCVDD
FPR8 1M/4
-CASEOPEN 18
FPBC4 0.01u/4/X7R/25V/K
-USBOC_F
FUSEVCC_F2
FUSEVCC_F1
UAD1
BAT54A/SOT23/200mA
FUSEVCC_F6
FUSEVCC_F5
UAD3
BAT54A/SOT23/200mA
FUSEVCC_F4
FUSEVCC_F3
UAD2
BAT54A/SOT23/200mA
SOT23
5VDUAL
UAR1 8.2K/4
N_-USBOC_F
N_-USBOC_F 9
UAR14 15K/4/1
USB2.0 Signal & power short protection
USB2.0 Signal > 4.85V
Enable --> 3VUUAL=3.6V
3VDUAL
UAR2 442/4/1
UAR3 1K/4/1
UABC7 0.1u/4/X7R/16V/K
+12V
U6A
LM324DR/SO14
UAQ1
2N7002/SOT23/25pF/5
A_-THRMTRIP 4,11,18
2_5LEVEL
UABC8 0.1u/4/X7R/16V/K
U6B
LM324DR/SO14
FPESD1
-PWRBT_1
-RST
5VSB
AOZ8902CIL/SOT23-6
F_USB POWER PROTECT
11 N_GPIO1
N_-USBOC_F
N_-USBOC_R
N_-USBOC_R 9,31
UAD5
BAT54A/SOT23/200mA
Gigabyte Technology
Title
FP,F_USB,USB PWR,FDD,BZ
Size Custom
Document Number
GA-B85-HD3
Rev 2.0
Date: Monday, September 09, 2013
Sheet 28 of 34



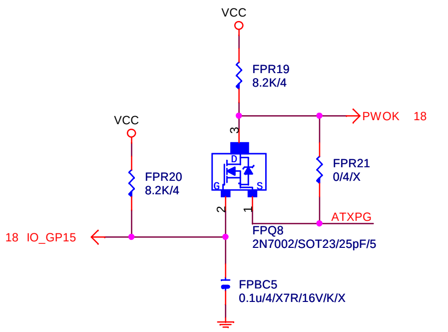
CLK GEN

CPU Frequency Selection

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

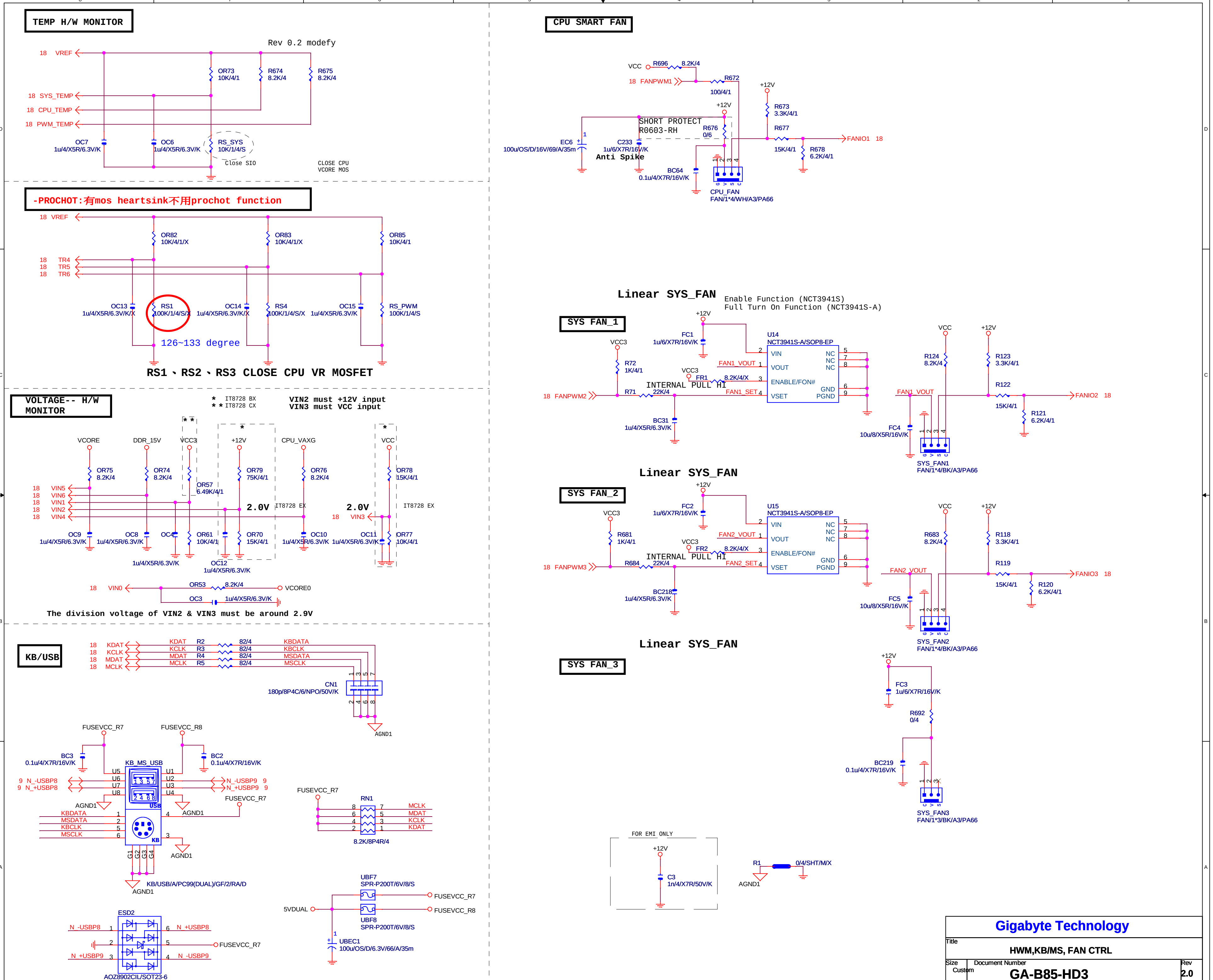
PWOK PATCH

【技術通報R&D技術通報154】

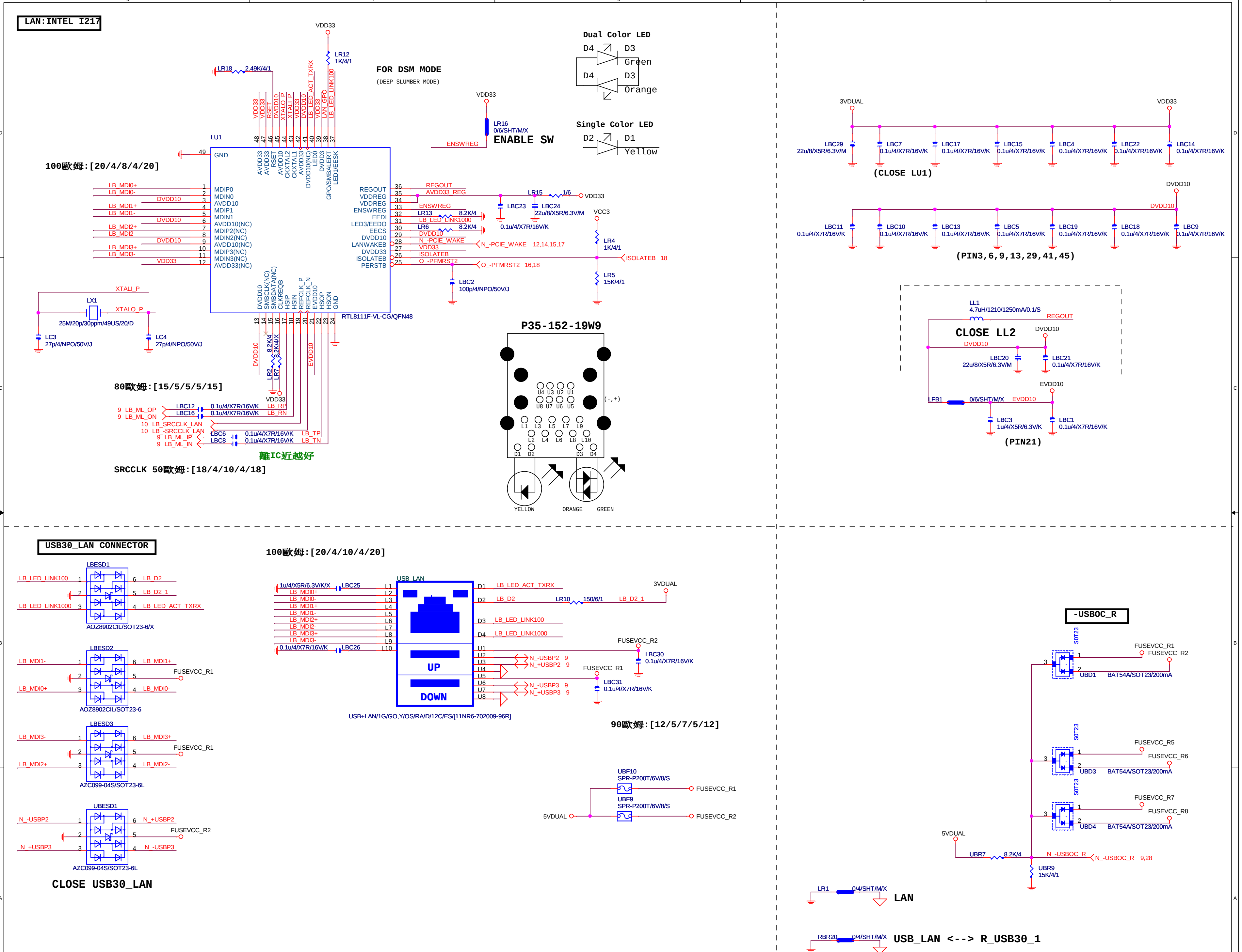


Gigabyte Technology

Title	ATX POWER CONNECTOR
Size: Custom	Document Number: GA-B85-HD3 — Rev 2.0
Date: Wednesday, August 28, 2013	Sheet 29 of 34

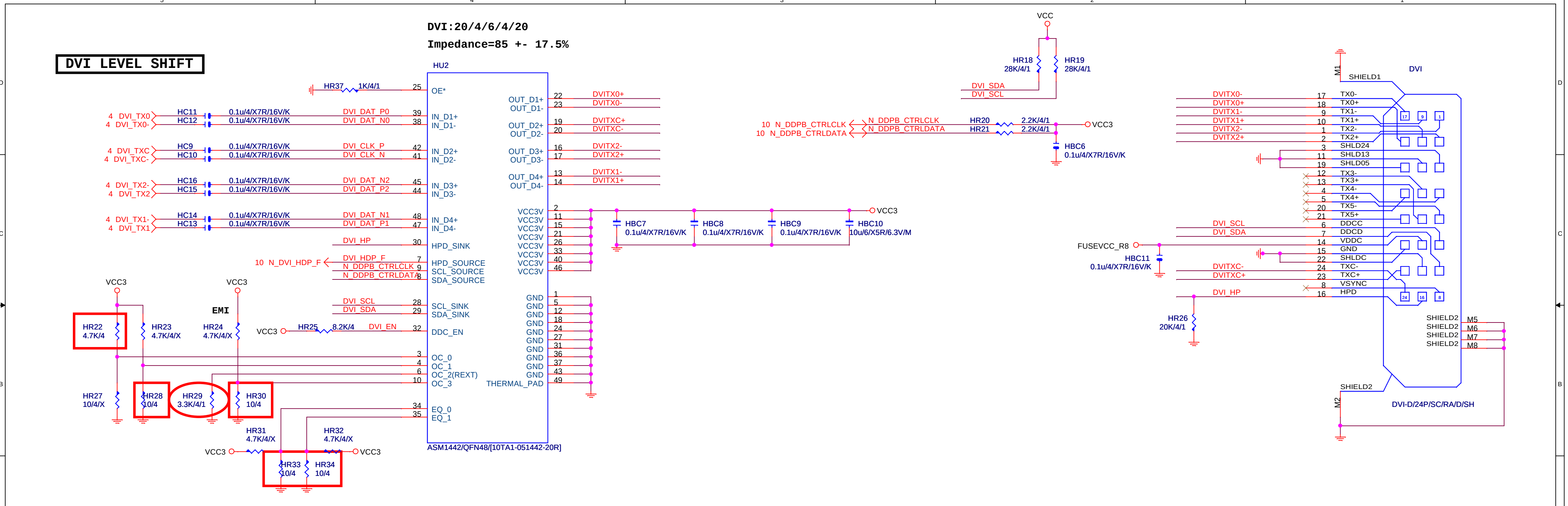


Gigabyte Technology			
Title	HWM,KB/MS, FAN CTRL		
Size: Custom	Document Number: GA-B85-HD3		Rev: 2.0
Date: Tuesday, September 24, 2013	Sheet 30 of 34		



Gigabyte Technology

Title	INTEL LAN I217	
Size Custom	Document Number GA-B85-HD3	Rev 2.0
Date: Wednesday, August 28, 2013	Sheet 31 of 34	

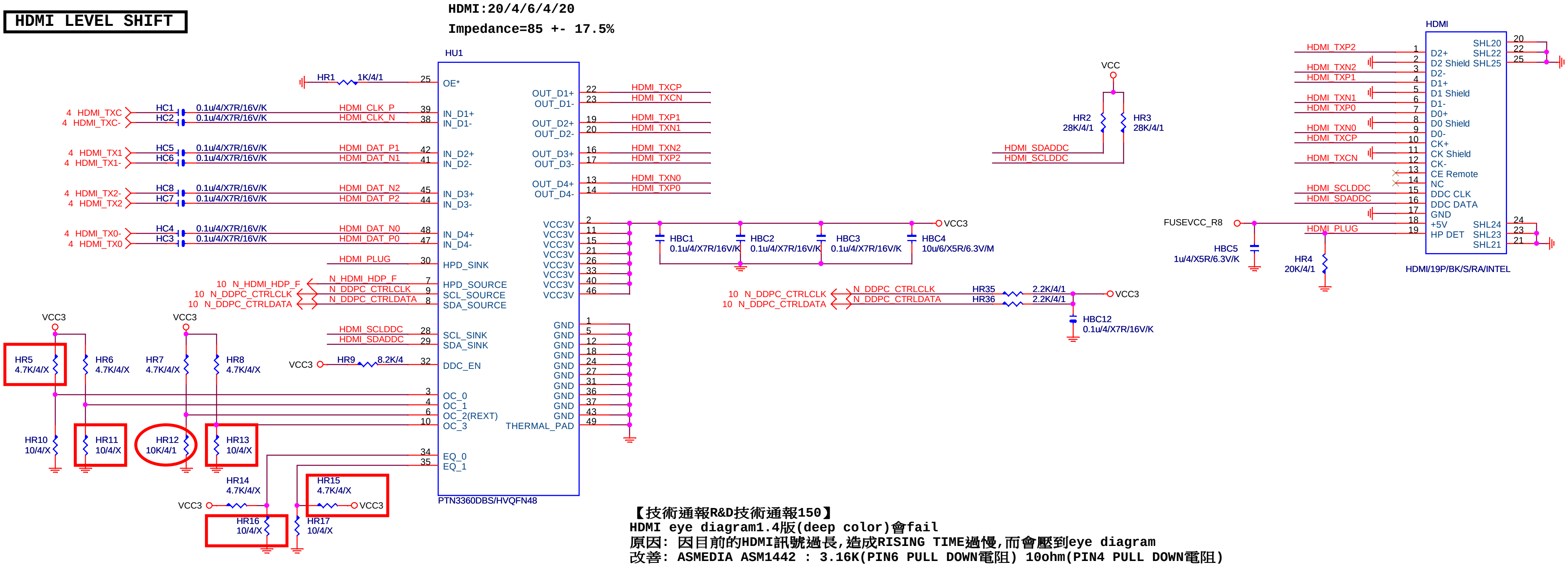


PTN3360:PIN 4/10/34/35 NC PIN,都不上值;只上HR29:10K

ASM1442:紅色框要上,HR29:3.3K

Gigabyte Technology		
Title: **DVI**		
Size: Custom	Document Number: **GA-B85-HD3**	Rev: **2.0**
Date: Wednesday, August 28, 2013	Sheet 32 of 34	

HDMI LEVEL SHIFT



【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)

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

GIGABYTE™

Title: HDMI		
Size: Custom	Document Number: GA-B85-HD3	Rev: 2.0
Date: Wednesday, August 28, 2013	Sheet 33 of 34	

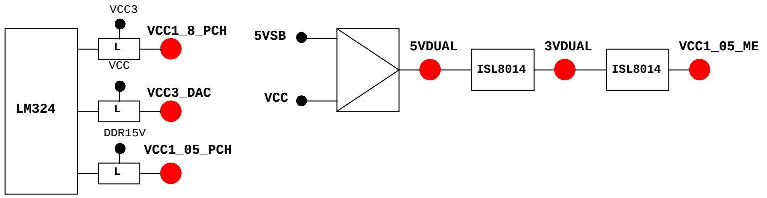
PCH GPIO LIST TABLE

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

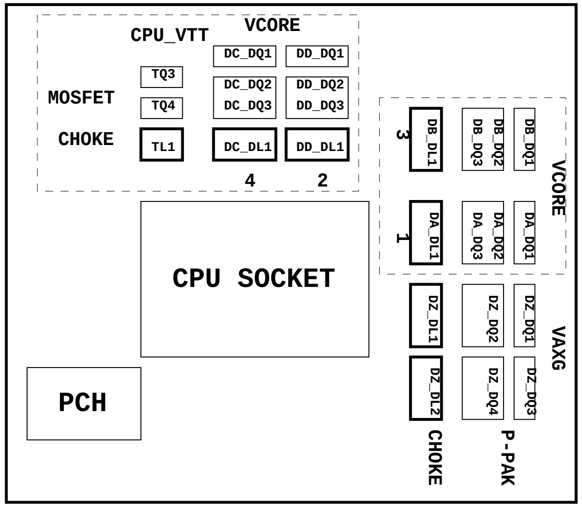
Super I/O ITE8720 GPIO Table

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	
VID03/FAN_TAC4/GP25/DSR2#	FANIO4	
FAN_CTL2/GP51	FANPWM2	
FAN_CTL3/GP36	FANPWM3	
VID4/GP34	BEEP-	
VID3/GP33	TURBO1	
VID2/GP32	TURBO0	
VCORE_GOOD/VID6/GP63	CPUT_LED1_C	
VID5/GP35	CPUT_LED2_C	
VID1/GP31	CPUT_LED3_C	
VID0/GP30	-LAN1_DSM	NBT_LED1_C
SLCT/GP80	CPU_LED1_C	
PE/GP81	CPU_LED2_C	
BUSY/GP82	CPU_LED3_C	
PD3/GP73/BUSSI1	SB_LED1_C	
PD4/GP74/BUSSI2	SB_LED2_C	
VCORE_EN/VID7/GP64	IT_GP64	SB_LED3_C
PD0/GP70	NB_LED1_C	
PD1/GP71	NB_LED2_C	
PD2/GP72/BUSSI0	NB_LED3_C	
GP22/SCK	LOW_PWR_1	
VID05/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PFMRST1	
PCIRST1#/GP12	-PFMRST2	
3VSBSW#/GP40	CSI_F0	BSEL166_1
SUSC#/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CSISBSL	
VID00/GP20/CTS2#	CPUT_LED1_C	BSEL166_4
GP65/VDDA_EN/GB_01	MB_ID2	
PD6/GP76/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	
VID01/GP21/DCD2#	DDR_LED2_C	
STB#/GP87/SMBC_M	DDR_LED3_C	
PWRON#GP44	VCORE_OV1	
PANSWH#/GP43	PWRBTSW	
KDAT/GP61	-PWRBTSW	
KCLK/GP60	KDAT	
MDAT/GP57	KCLK	
MACL/GP56	MDAT	
GP66/VLDT_EN/GB_02	NBT_LED1_C	MCLK
SVD/PCIRSTIN#/CIRTX/GP15	PWM2_CR	
KDAT/GP61	PWM2_CR	
GP67/CPU_PG/GB_03	EN_LOADLINE	IT_GP67/-EN_PWM2
SLIN#/GP84/SMBD_R	-EN_PWM2	
PSI_L/FAN_CLT5/CIRRX2/GP16	-THERM	
VID04/GP26/SOUT2	DDR18V_PH2_EN	
VID02/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VID06/GP17/RI2#	1_1V_PH_EN	
VID07/JP6/DTR2#	JP6	
PD5/GP75/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: 2.0
Date: Wednesday, August 28, 2013 | Sheet 34 of 34