Model Name: GA-B85M-HD3

Revision 1.0

SHEET	TITLE
01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B
06	CPU_LGA1150-C
07	DDR III CHANNEL A
08	DDR III CHANNEL B
09	PCH_FDI,DMI,USB,PCIE,NVRAM
10	PCH_DP,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCI EXPRESS X1 *2 SLOT
16	PCI SLOT
17	ITE 8728 LPC IO
18	COM,KB_MS_USB,USB30_20
19	HWM,FAN CTRL,OV,-PROCHOT
20	DUAL BIOS
21	FP,FUSB,SPK,SATALED
22	Realtek ALC887-VD2
23	REAR AUDIO JACK
24	REALTEK RTL8111F
25	DISCRETE POWER
26	ATX , CLOCK GEN
27	VCORE ISL95820_1

SHEET	TITLE
28	VCORE ISL95820_2
29	RT8120_DDR POWER
30	LPT, M3 POWER
31	DVI, HDMI
32	IT8892E

Gigabyte Technology

Title	Cover Sheet	
Size: Custom	Document Number: GA-B85M-HD3	Rev: 1.0
Date: Monday, April 08, 2013	Sheet 1 of 32	

Model Name: GA-B85M-HD3

Revision 1.0

Component value change history

2013/04/08

Data	Change Item	Reason
2013/01/30	Modify to R0.2	
	PCIEX1_2 CLK Change Port	
	ADD Disable SVID [SVID_CTRL]	
	ADD Disable ME [DS_ME]	
	ADD -PCIE_RST Patch	
2013/02/05	O_PWROK1 reserve 0.01u Cap (For EMI)	
2013/03/11	Update to R1.0	
	Modify F_PANEL MPD+ (Super I/O GP65)	
	ADD SYS_FAN 防燒	
	ADD N_-THRMTRIP / A_-PROCHOT Protection Option	
	ADD 5VSB OVP Protection	
	ADD +12V Dummy Control	
	Reserve N_PCH_DPWROK Control	
2013/03/19	ADD EMI 0ohm (R707)	
2013/04/02		PBOM: 9MB85MHD3-00-10A
2013/04/08	Update PROCHOT	PBOM: 9MB85MHD3-00-10B
	R148: 35.7K -> 75K	
	R136: 1.4K -> 1.5K	
	DR149: 3.83K -> 13K	

Circuit or PCB layout change

DATE	Change Item	Reason

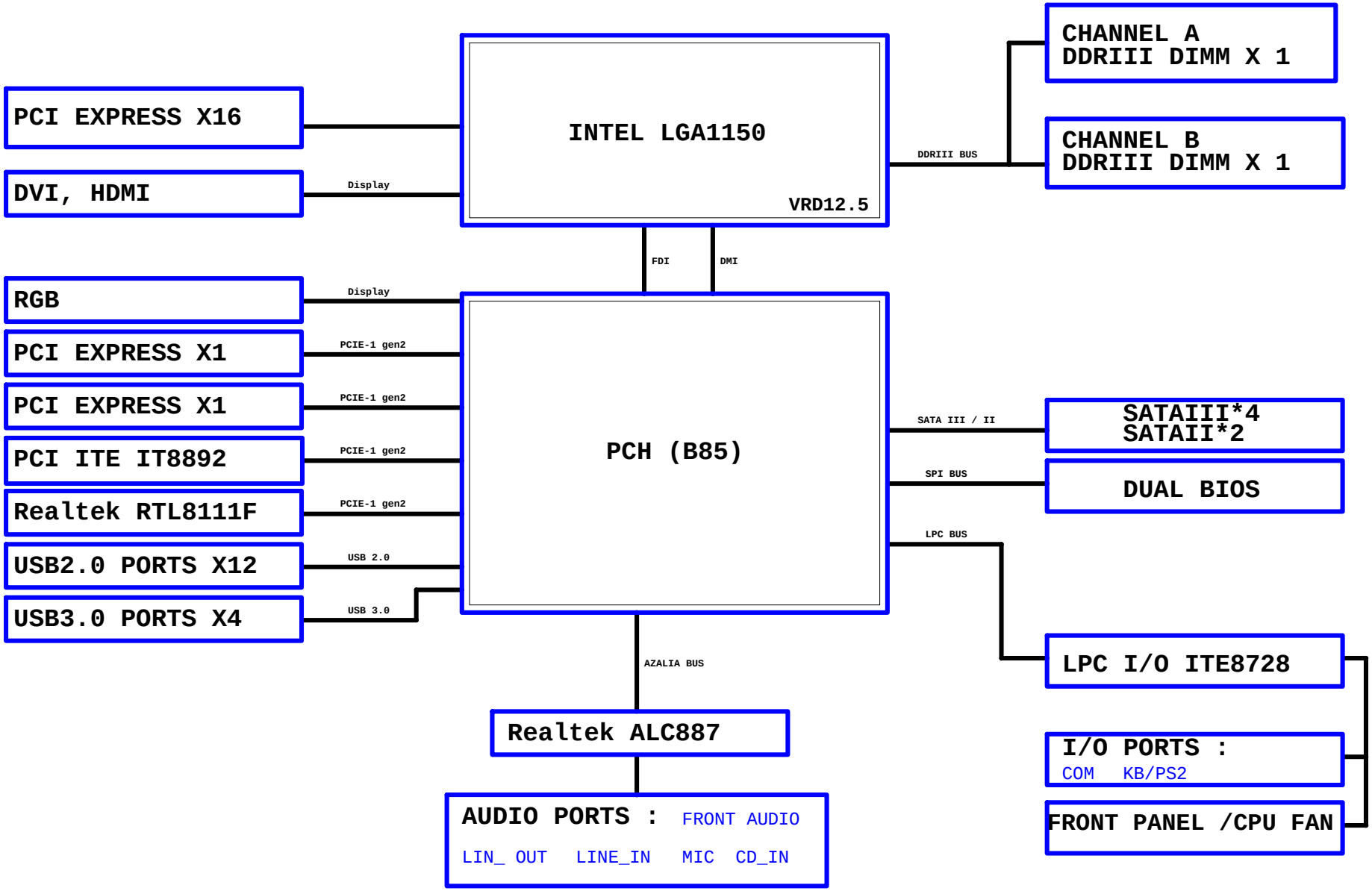
Gigabyte Technology

Title: BOM & PCB MODIFY HISTORY

Size: Custom | Document Number: GA-B85M-HD3 | Rev: 1.0

Date: Monday, April 08, 2013 | Sheet 2 of 32

BLOCK DIAGRAM



Gigabyte Technology		
Title: BLOCK DIAGRAM		
Size: C	Document Number: GA-B85M-HD3	Rev: 1.0
Date: Monday, April 08, 2013	Sheet 3 of 32	

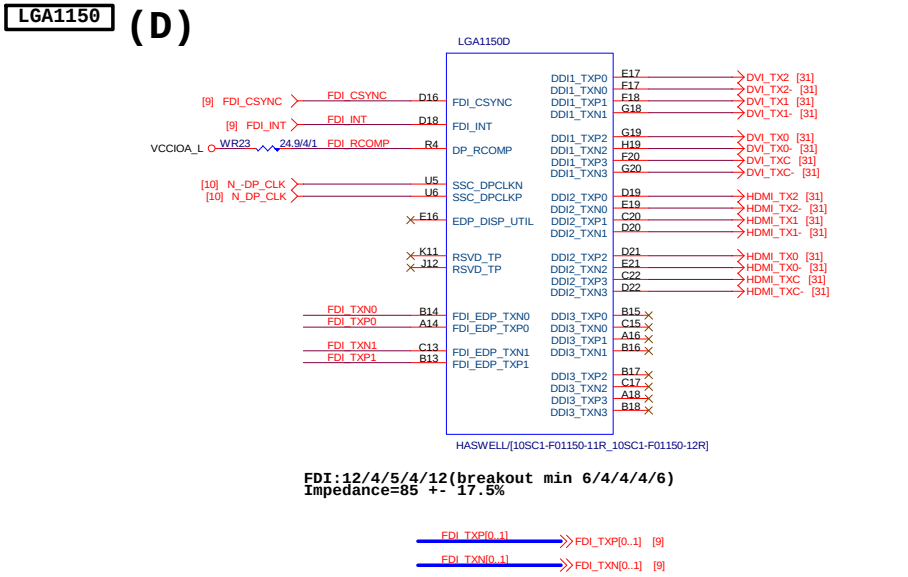
LGA1150 (E)

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

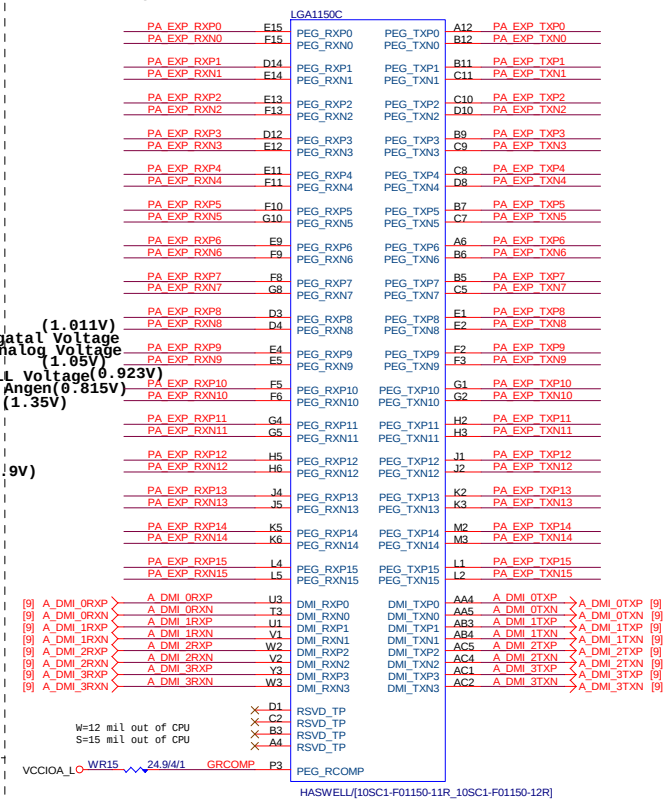
LGA1150 (D)



FDI:12/4/5/4/12(breakout min 6/4/4/4/6)
Impedance=85 +- 17.5%

LGA1155 (C)

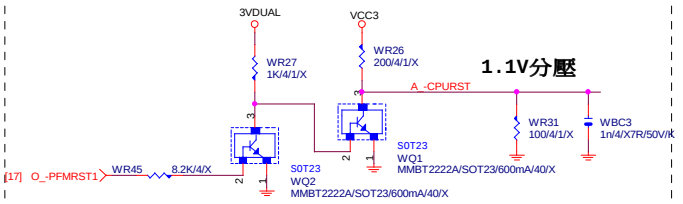
PCIEX16:16/5/5/5/16(breakout min 10/4/4/4/10)
Impedance=80 +- 17.5%



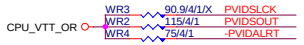
DMI:12/4/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%

PA_EXP_TXP[0..15] [14]
PA_EXP_TXN[0..15] [14]
PA_EXP_RXP[0..15] [14]
PA_EXP_RXN[0..15] [14]

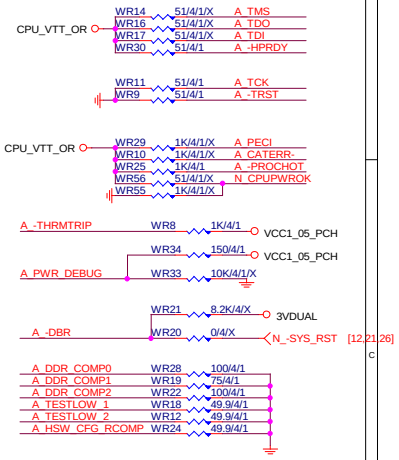
-CPURST



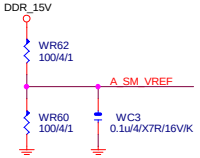
CPU SVID



CPU PU/PD



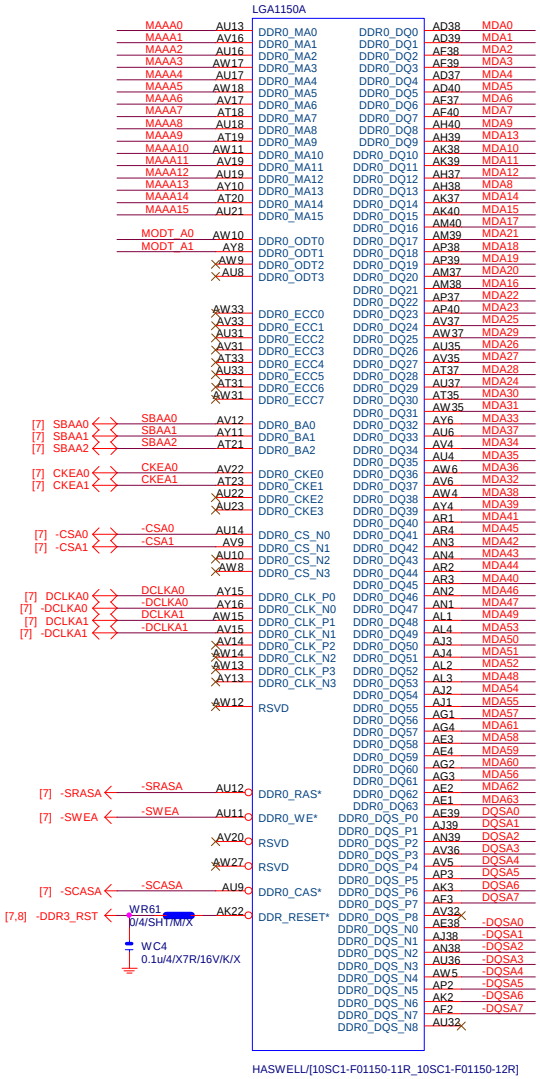
SM REF



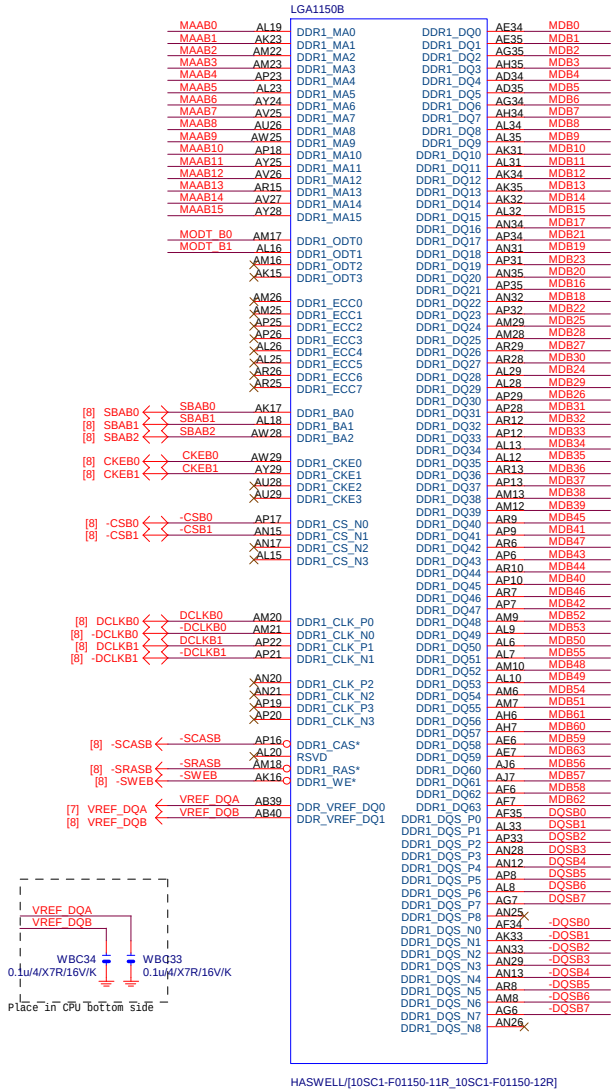
Title	CPU LGA1150-A
Size	Custom
Document Number	GA-B85M-HD3
Rev	1.0
Date:	Monday, April 08, 2013
Sheet	4 of 32

Gigabyte Technology

LGA1150 (A)

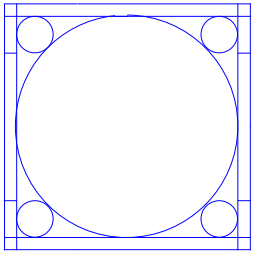


LGA1150 (B)



LGA1150 (CR)

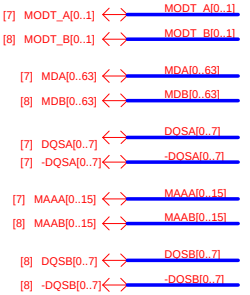
CR
CPU RETAINTION/X



LGA1150_P

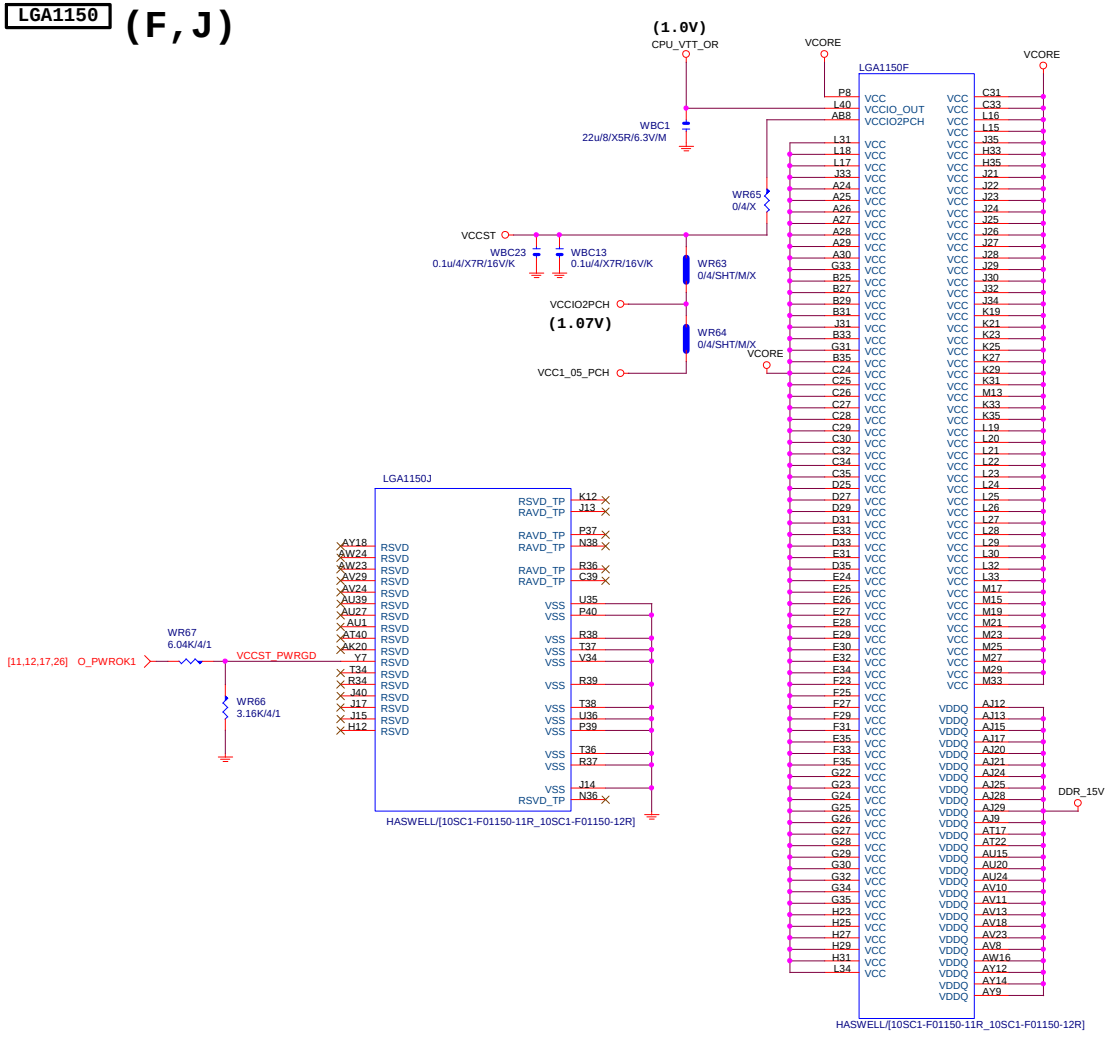
ILM_BP/1156/CSP/ILM_BP/1156/CSP/[12KRC-0F0001-52R_12KRC-0F0001-51R]

DDR BUS

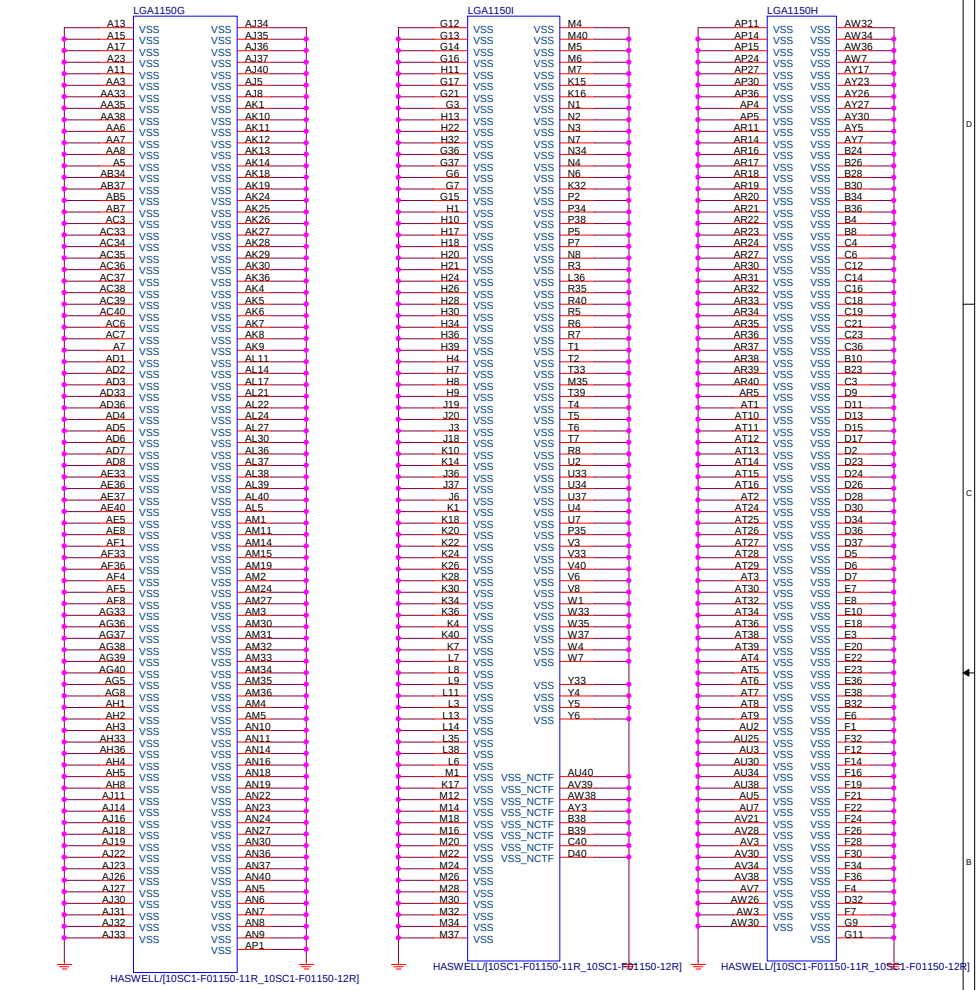


Gigabyte Technology			
Title: CPU LGA1150-B			
Size: Custom	Document Number: GA-B85M-HD3		Rev: 1.0
Date: Monday, April 08, 2013	Sheet 5 of 32		

LGA1150 (F,J)

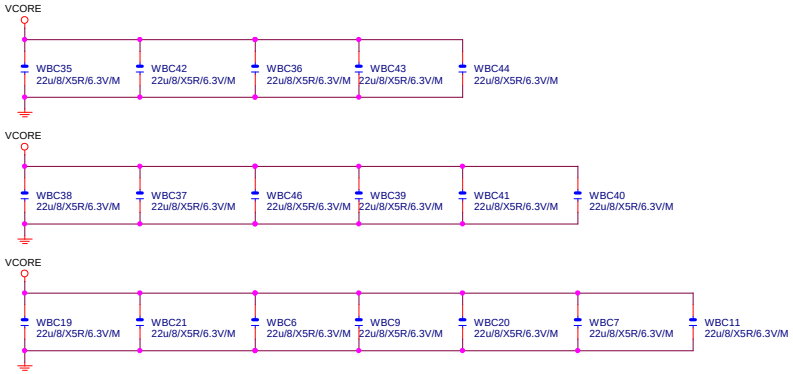


LGA1155 (G,H,I)



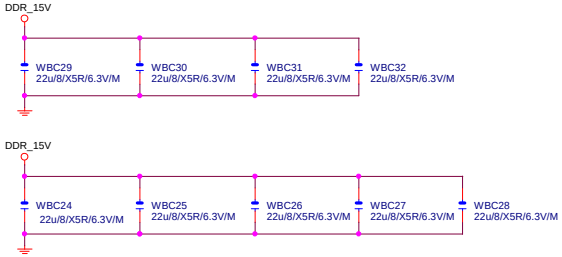
VCore CAP

(X18)

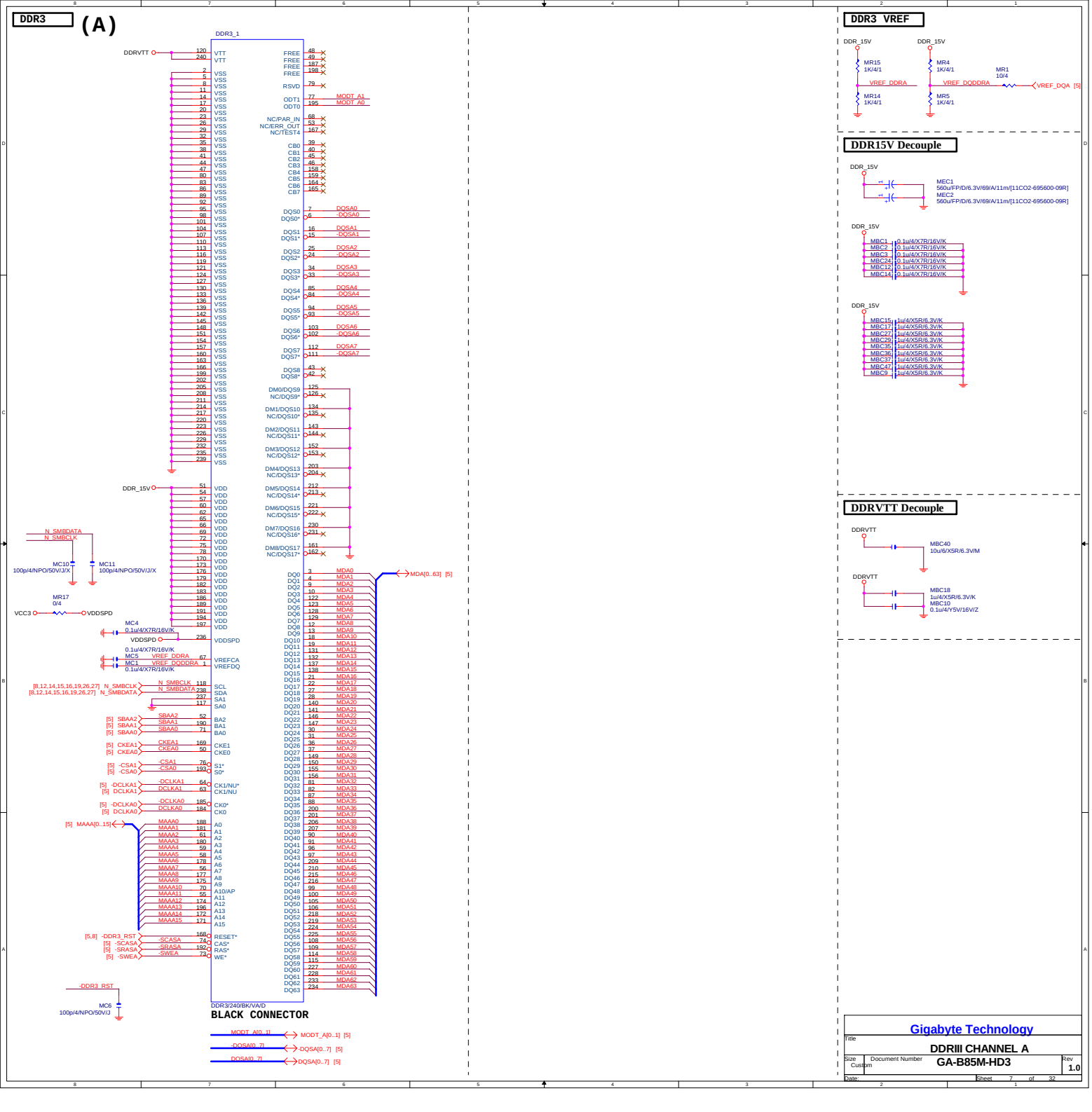


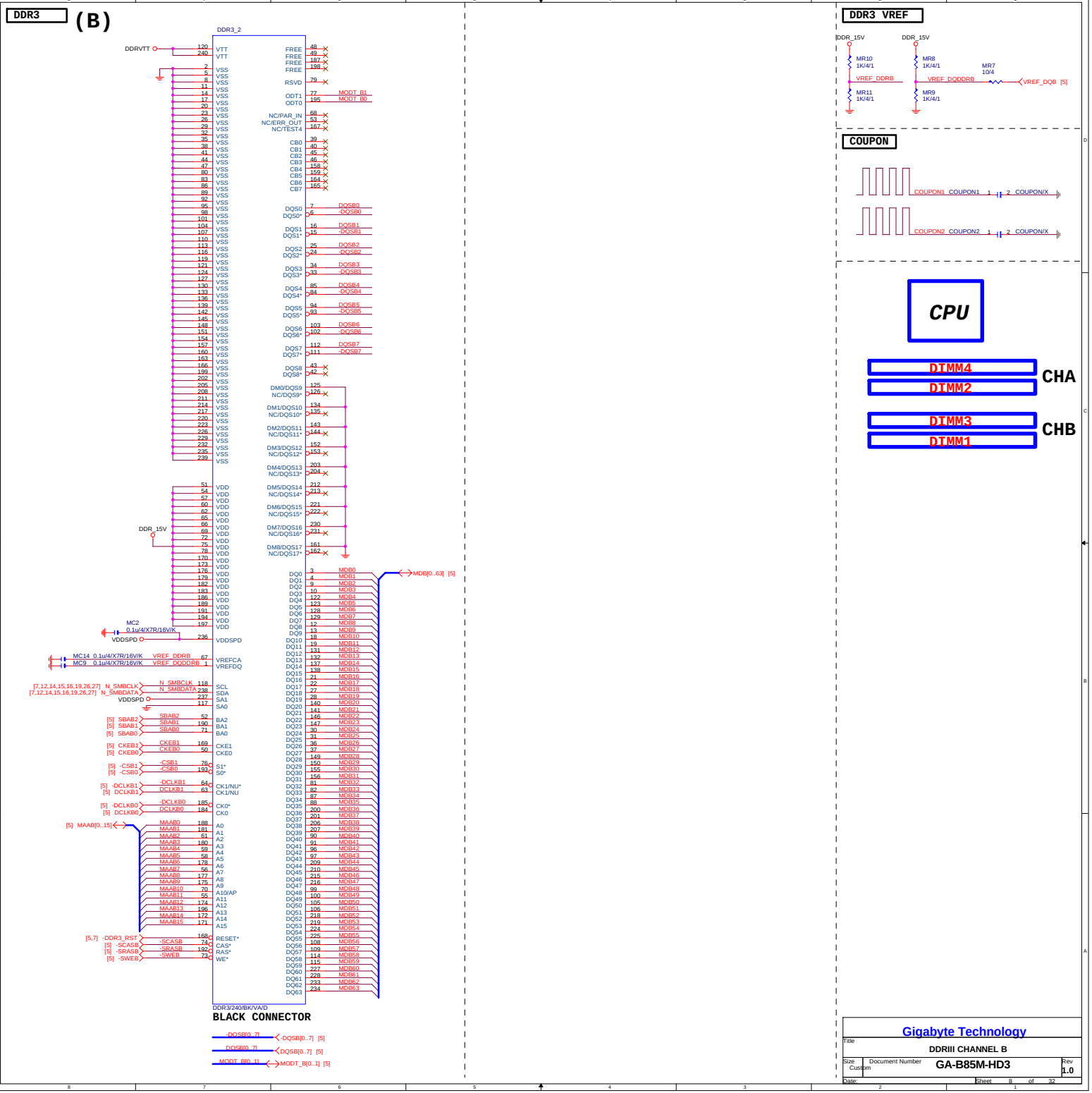
DDR CAP

(X9)



Gigabyte Technology			
Title: CPU LGA1150-C			
Size: Custom	Document Number: GA-B85M-HD3		Rev: 1.0
Date: Monday, April 08, 2013	Sheet 6 of 32		


DDR3
(A)
DDR3_1
DDRVTT
DDR_15V
VDDSPD
VCC3
N_SMBDATA
N_SMBCLK
MC10
100p/4/NPO/50V/J/X
MC11
100p/4/NPO/50V/J/X
MR17
0/4
MC4
0.1u/4/X7R/16V/K
MC5
VREF_DDRA
MC1
VREF_DDDRA
0.1u/4/X7R/16V/K
VREFCA
VREFDQ
SCL
SDA
SA1
SA0
BA2
BA1
BA0
CKE1
CKE0
S1*
S0*
CK1/NU*
CK1/NU
CK0*
CK0
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10/AP
A11
A12
A13
A14
A15
RESET*
CAS*
RAS*
WE*
MDA0
MDA1
MDA2
MDA3
MDA4
MDA5
MDA6
MDA7
MDA8
MDA9
MDA10
MDA11
MDA12
MDA13
MDA14
MDA15
MDA16
MDA17
MDA18
MDA19
MDA20
MDA21
MDA22
MDA23
MDA24
MDA25
MDA26
MDA27
MDA28
MDA29
MDA30
MDA31
MDA32
MDA33
MDA34
MDA35
MDA36
MDA37
MDA38
MDA39
MDA40
MDA41
MDA42
MDA43
MDA44
MDA45
MDA46
MDA47
MDA48
MDA49
MDA50
MDA51
MDA52
MDA53
MDA54
MDA55
MDA56
MDA57
MDA58
MDA59
MDA60
MDA61
MDA62
MDA63
MDA[0..63] [5]
MAAA[0..15]
-DDR3_RST
MC6
100p/4/NPO/50V/J
DDR3/240/BK/VA/D
BLACK CONNECTOR
MODT_A[0..1] [5]
-DQSA[0..7] [5]
DQSA[0..7] [5]
DDR3 VREF
MR15
1K/4/1
MR14
1K/4/1
MR4
1K/4/1
MR5
1K/4/1
MR1
10/4
VREF_DDRA
VREF_DDDRA
VREF_DQA [5]
DDR15V Decouple
MEC1
560u/FP/D/6.3V/69/A/11m/[11CO2-695600-09R]
MEC2
560u/FP/D/6.3V/69/A/11m/[11CO2-695600-09R]
MBC1
MBC2
MBC3
MBC24
MBC12
MBC14
0.1u/4/X7R/16V/K
MBC15
MBC17
MBC27
MBC29
MBC35
MBC36
MBC37
MBC47
MBC9
1u/4/X5R/6.3V/K
DDRVTT Decouple
MBC40
10u/6/X5R/6.3V/M
MBC18
1u/4/X5R/6.3V/K
MBC10
0.1u/4/Y5V/16V/Z
Gigabyte Technology
Title
DDRIII CHANNEL A
Size
Custom
Document Number
GA-B85M-HD3
Rev
1.0
Date:
Sheet 7 of 32



Gigabyte Technology

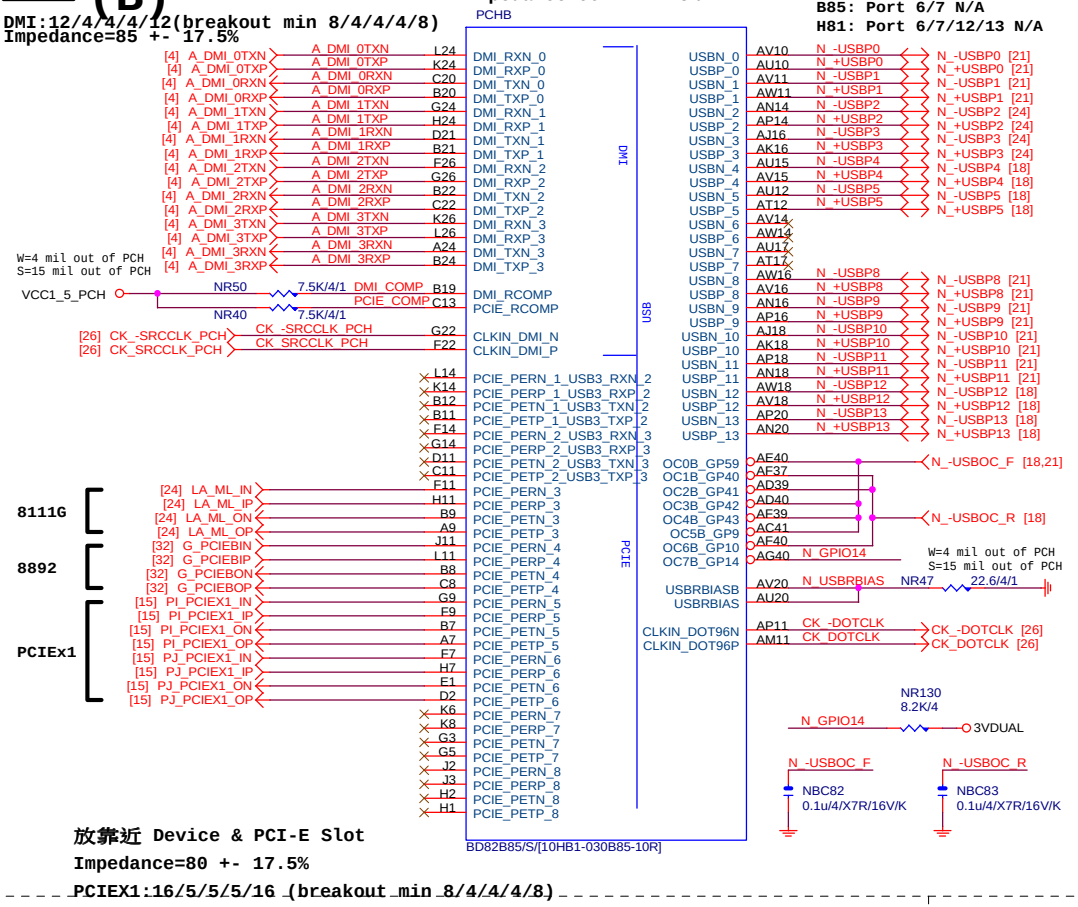
Title	DDRIII CHANNEL B		
Size: Custom	Document Number: GA-B85M-HD3		Rev: 1.0
Date:		Sheet 8 of 32	

PCH (B)

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

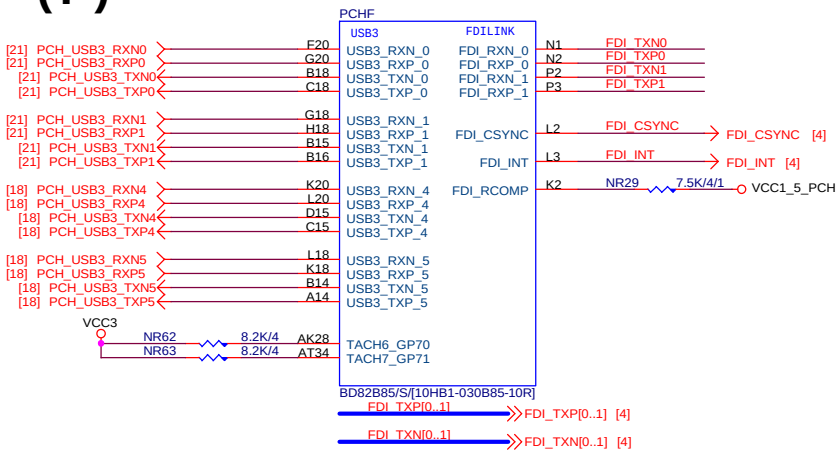
USB2.0 : 12/4.5/7.5/4.5/12 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%

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



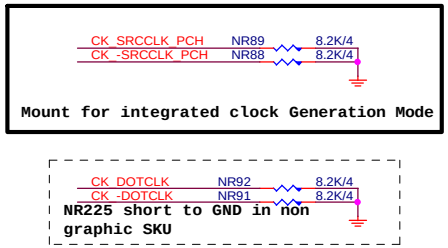
放靠近 Device & PCI-E Slot
Impedance=80 +- 17.5%
PCIEX1:16/5/5/5/16 (breakout min 8/4/4/4/8)

PCH (F)

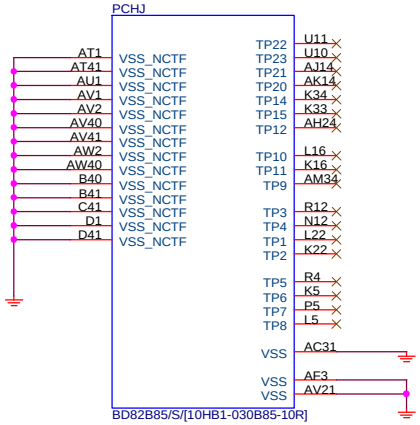


USB3.0:20/5/7/5/20 (breakout min 8/4/4/4/8) ; ONLY 3 VIAS
Impedance=85 +- 17.5%
Back Panel < 10000 MILS
Front Panel < 6000 MILS

PCH CLK PD

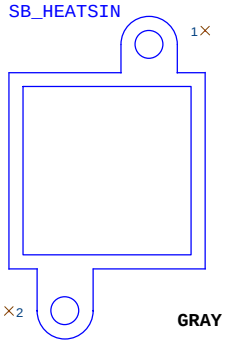


PCH (J)



PCH H/S

LOW COST ICH7 HEATSINK



USB TABLE

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

USB OC#	Configure
OC0#	F_USB30
OC1#	USB_LAN
OC2#	R_USB30
OC3#	N/A
OC4#	F_USB1
OC5#	F_USB2
OC6#	KB_MS_USB
OC7#	Not Use

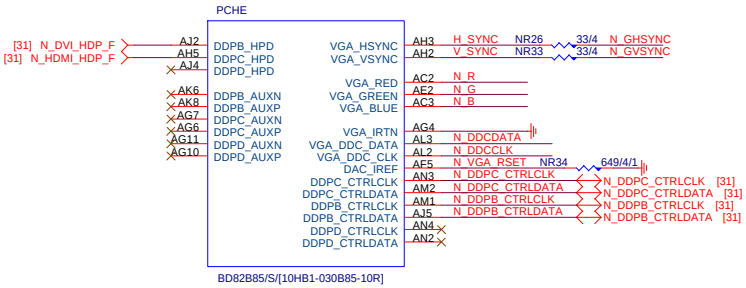
Gigabyte Technology

Title: PCH FDI,DMI,USB ,PCIE,NVRAM

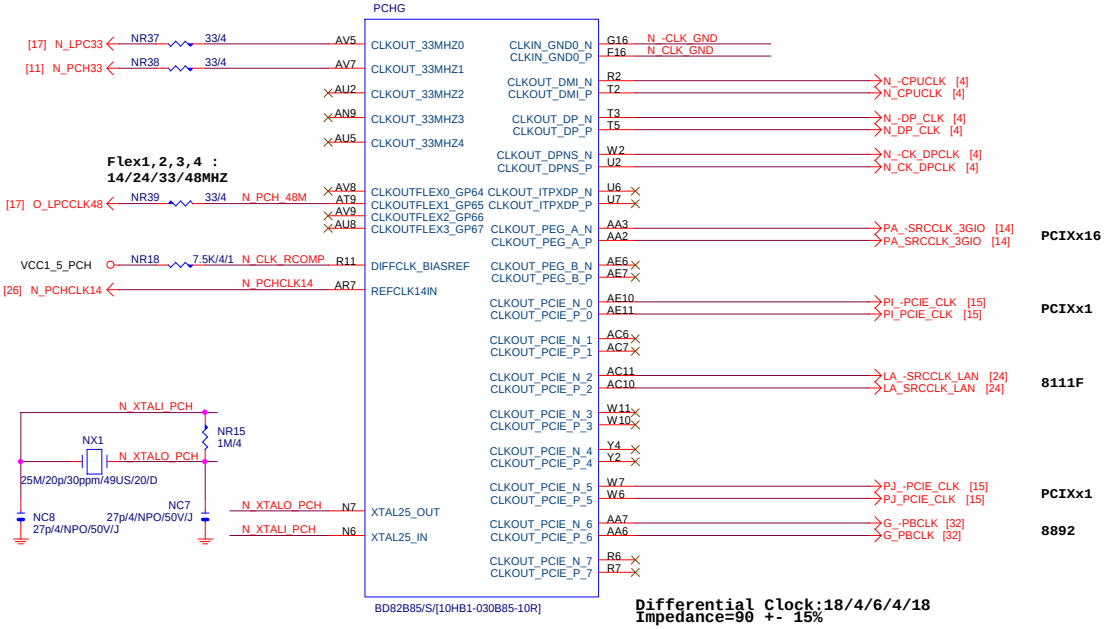
Size: Custom | Document Number: GA-B85M-HD3 | Rev: 1.0

Date: Monday, April 08, 2013 | Sheet 9 of 32

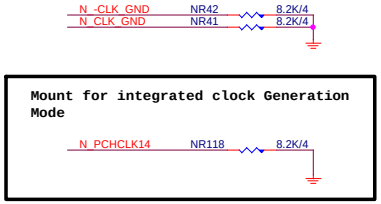
PCH (E)



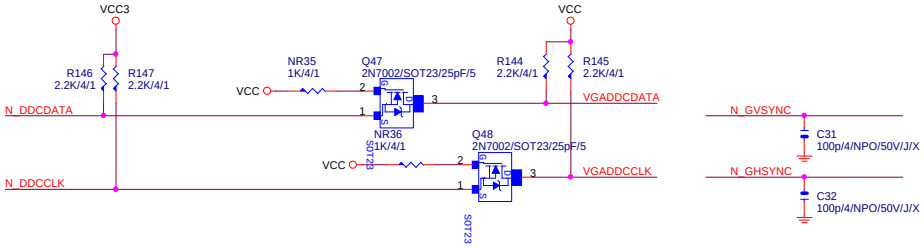
PCH (G)



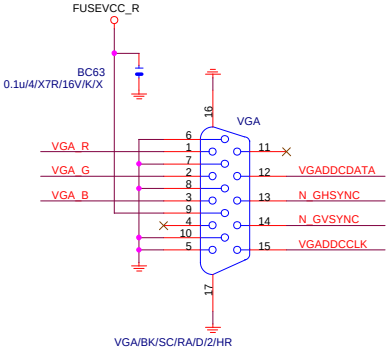
PCH CLK PD



VGA DDC

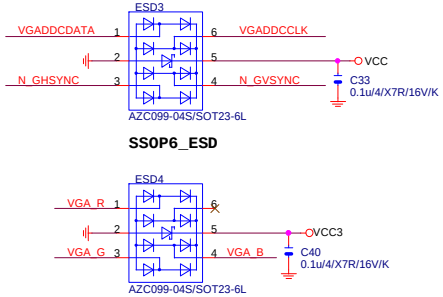


VGA CONNECTOR

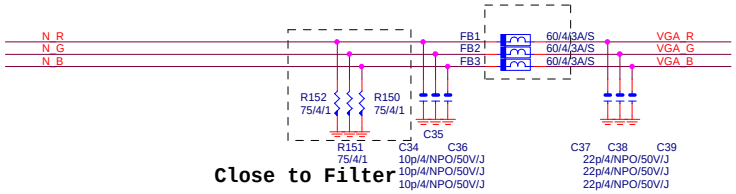


BLACK CONNECTOR

VGA ESD



VGA DDC

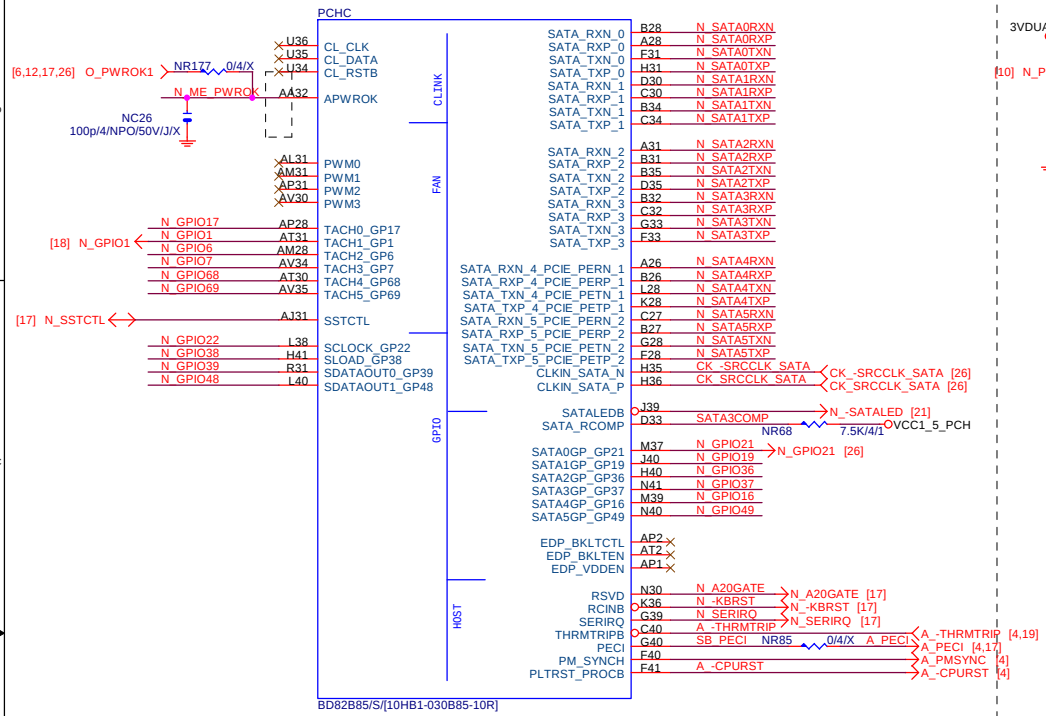


Close to Filter

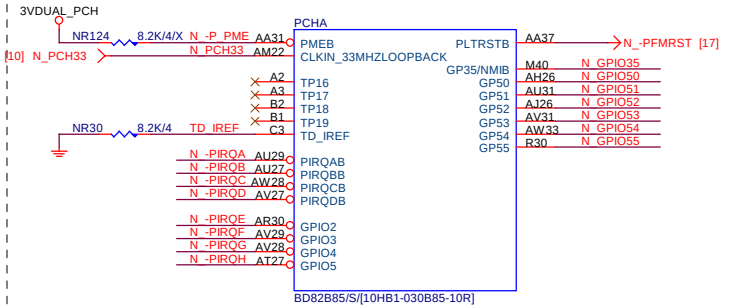
Gigabyte Technology		
Title: PCH DISPLAY ,CLK BUFFER		
Size: Custom	Document Number: GA-B85M-HD3	Rev: 1.0
Date: Monday, April 08, 2013	Sheet 10 of 32	

PCH (C)

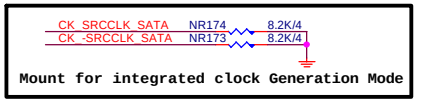
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%



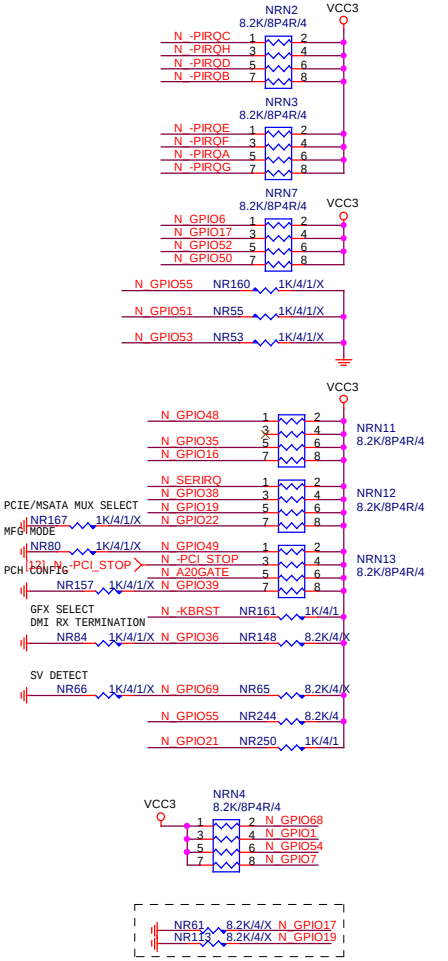
PCH (A)



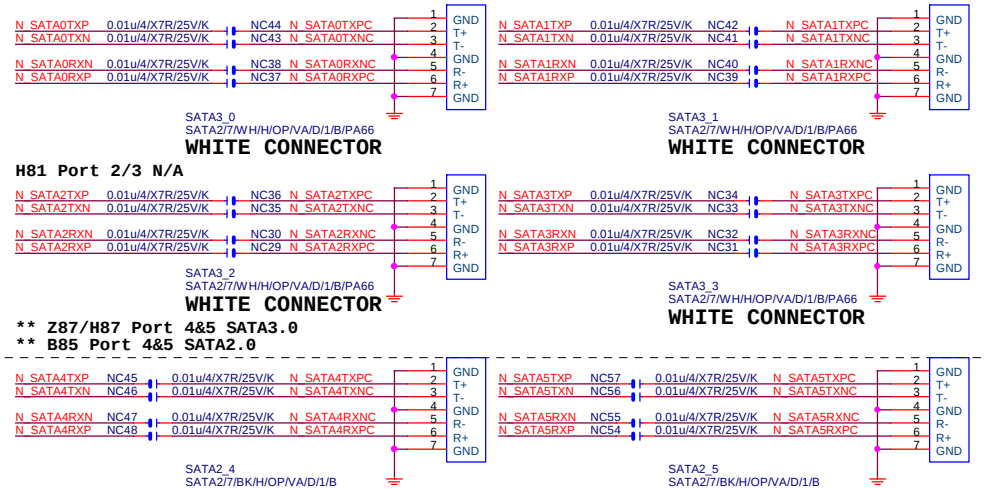
PCH CLK PD



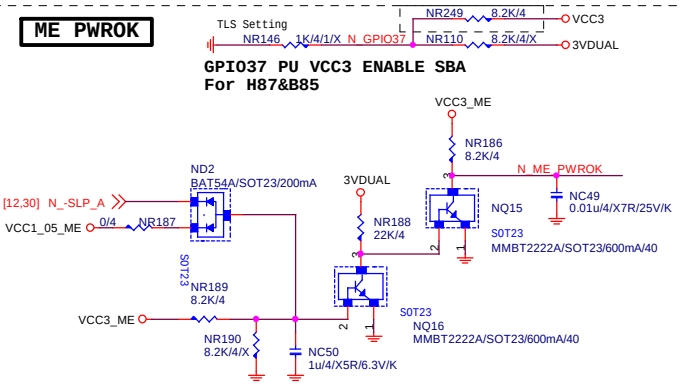
PCH PU/PD



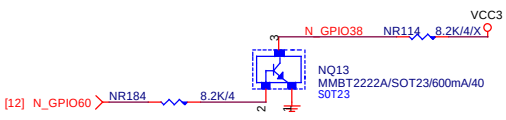
SATA CONNECTOR



ME PWROK



GPIO38 Ctrl



Gigabyte Technology

Title	PCH HOST , SATA, PCI	
Size: Custom	Document Number: GA-B85M-HD3	Rev: 1.0
Date: Monday, April 08, 2013	Sheet 11 of 32	

PCH (D)

PCHD

BD82B85/S/[10HB1-030B85-10R]

ACZ_SDOUT

SPI OVERRIDE PROTECTION

PCH_DPWROK

PCH PU/PD

HSW_STRAP13

32.768KHZ

CLR_CMOS

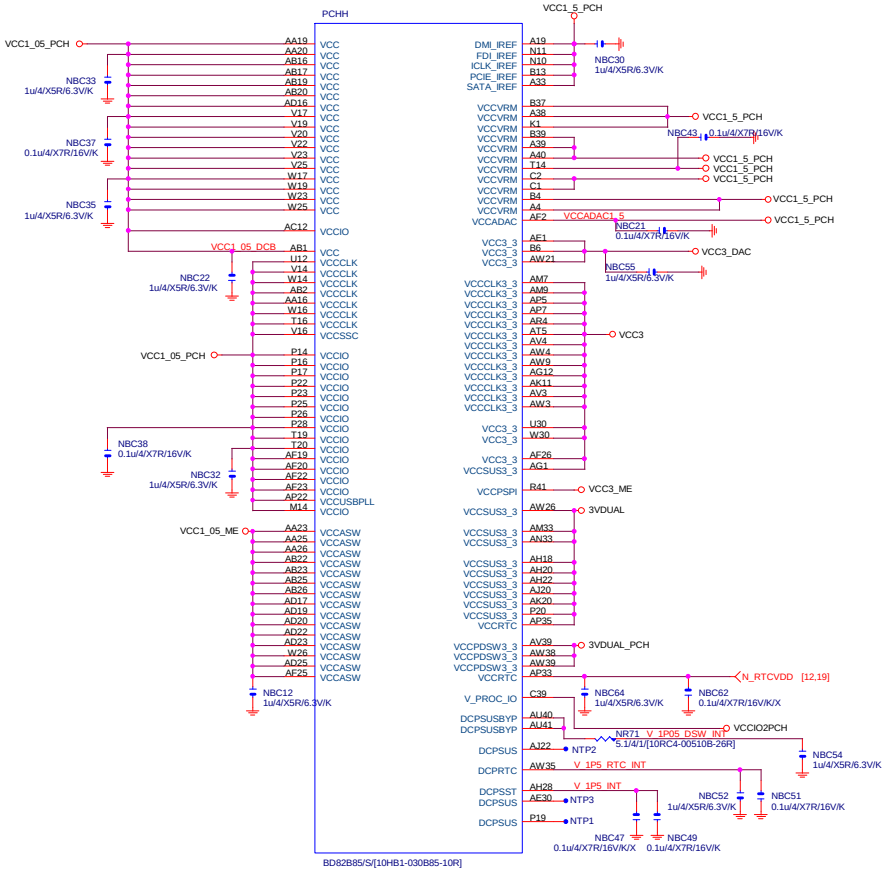
BATTERY-DUAL-4

RB 必須放在BAT外

Reserve for EMI test

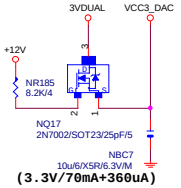
Gigabyte Technology	
Title	PCH GPIO , CTRL , AUDIO
Size: Custom	Document Number: GA-B85M-HD3
Rev	1.0
Date: Monday, April 08, 2013	Sheet 12 of 32

PCH (H)



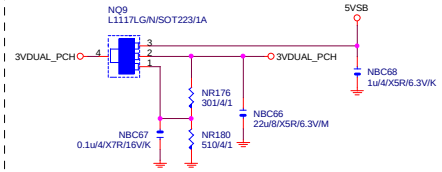
VCC3_DAC

CLOSE北橋(注意震盪水波紋)

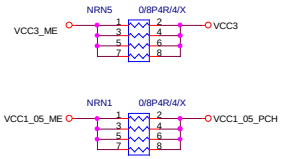


(3.3V/70mA+360uA)

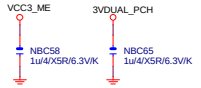
3VDUAL_PCH



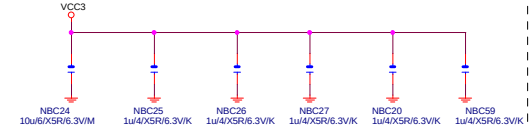
SHT PWR



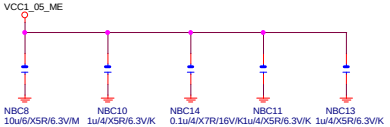
CAP



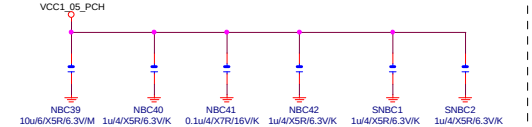
(3.3V)(X6)



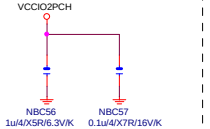
(1.05V)(X5)



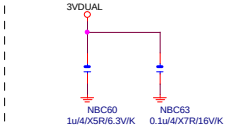
(1.05V)(X6)



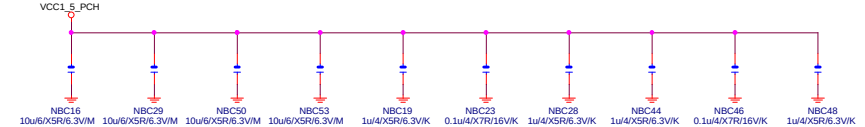
(1.05V)(X2)



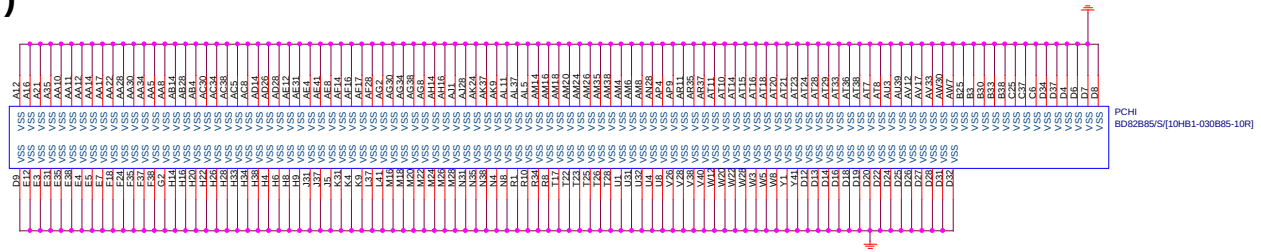
(3.3V)(X2)



(1.05V)(X10)

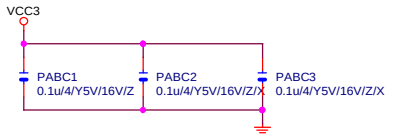


PCH (I)

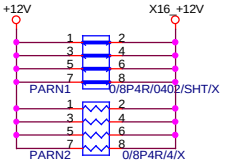


Gigabyte Technology			
Title: PCH PWR ,GND			
Size: Custom	Document Number: GA-B85M-HD3		Rev: 1.0
Date: Monday, April 08, 2013	Sheet 13 of 32		

PCIEX16 CAP



PCIEX16 PROTECT SHT



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

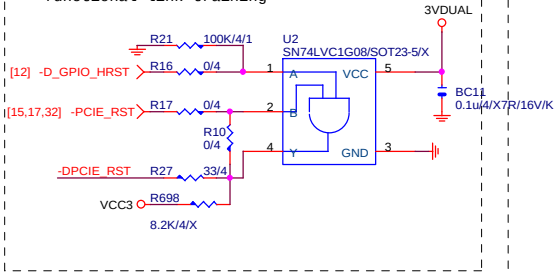
PA_EXP_RXP[0..15] >> PA_EXP_RXP[0..15] [4]

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]

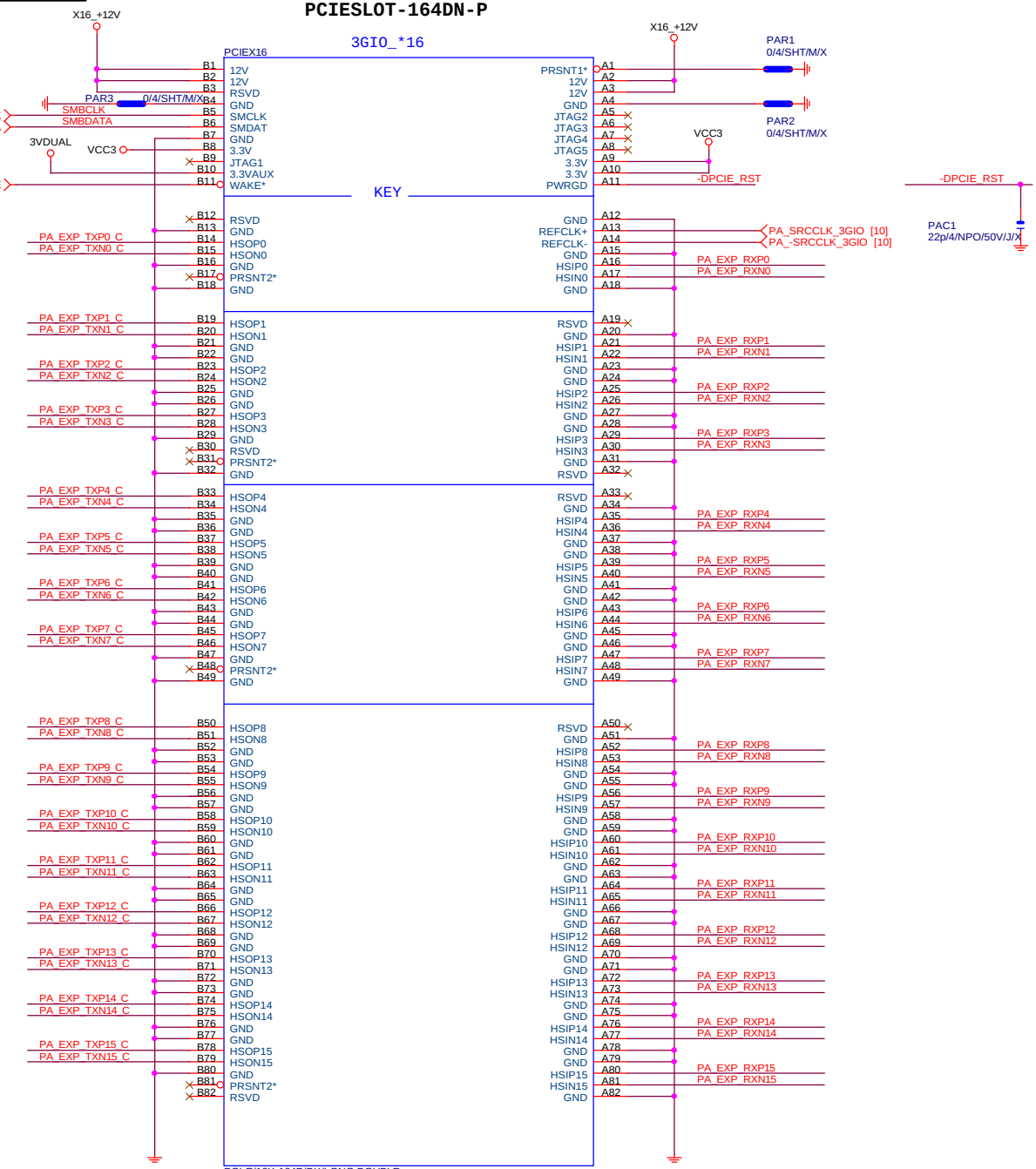
The auxillary reset circuit is only required for PCIe Gen3 margining and functional link training



PCIEX16 SLOT

PCIESLOT-164DN-P

3GIO_*16

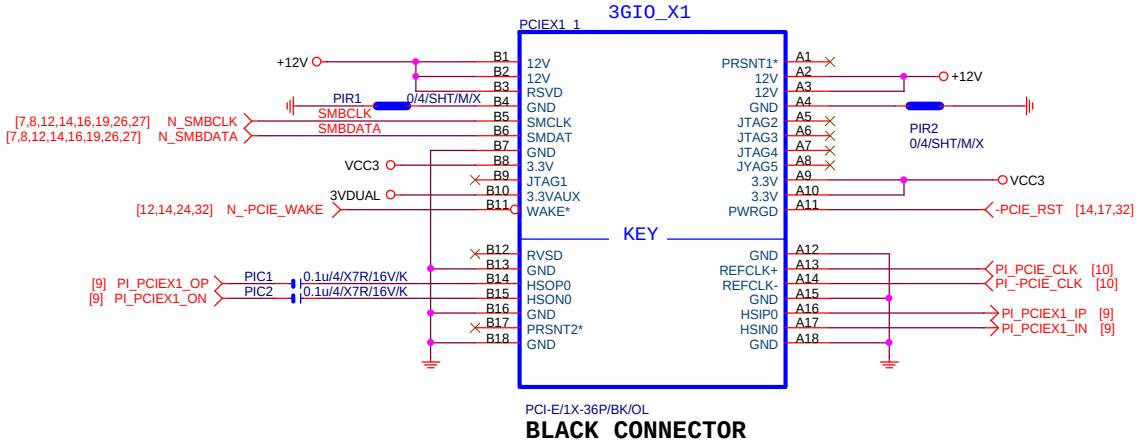


PCI-E/16X-164P/BK/LONG DOUBLE

BLACK CONNECTOR

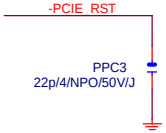
Gigabyte Technology		
Title: PCI EXPRESS * 16		
Size: Custom	Document Number: GA-B85M-HD3	Rev: 1.0
Date: Monday, April 08, 2013	Sheet 14 of 32	

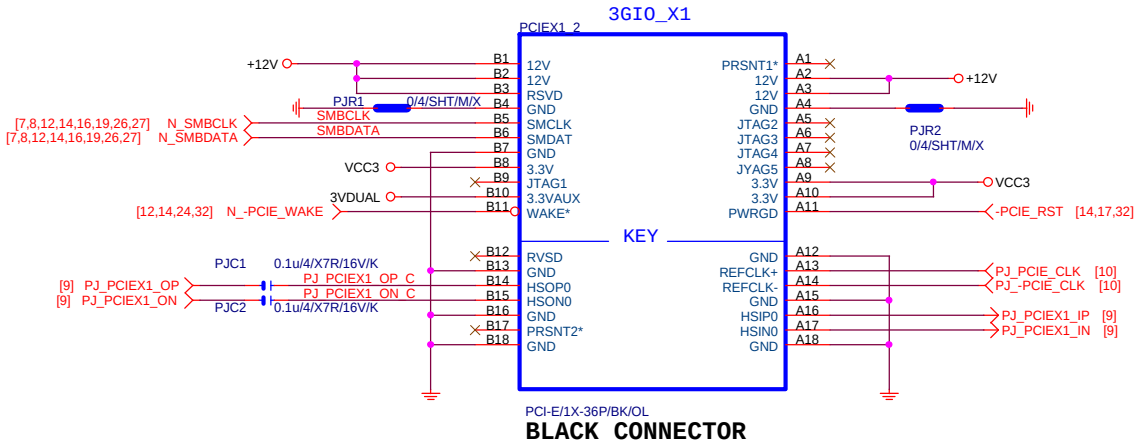
PCIEX1 SLOT



PCI-E/1X-36P/BK/OL

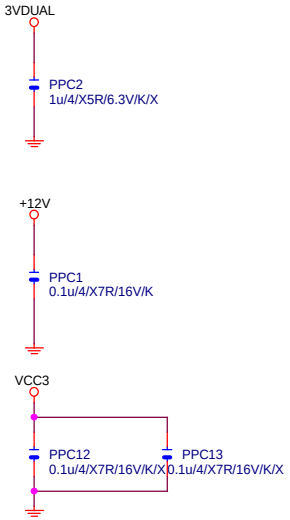
BLACK CONNECTOR





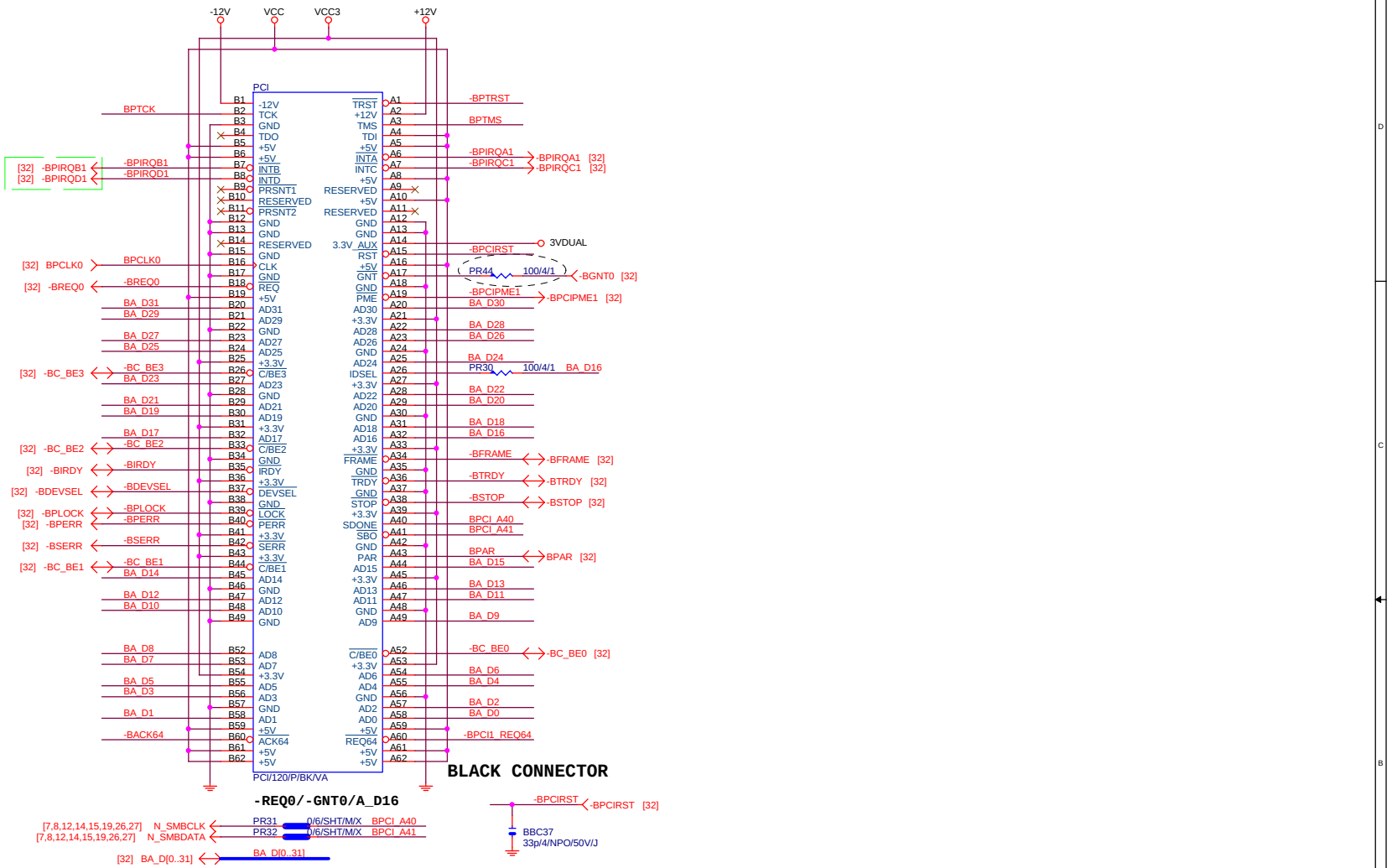
PCI-E/1X-36P/BK/OL

BLACK CONNECTOR

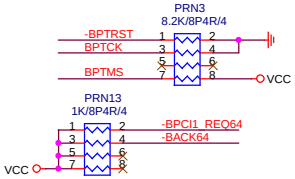


Gigabyte Technology		
Title: PCI EXPRESS X 1 PORT		
Size: Custom	Document Number: GA-B85M-HD3	Rev: 1.0
Date: Monday, April 08, 2013	Sheet 15 of 32	

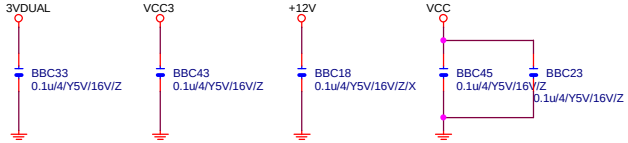
PCI SLOT 1



PCI PU

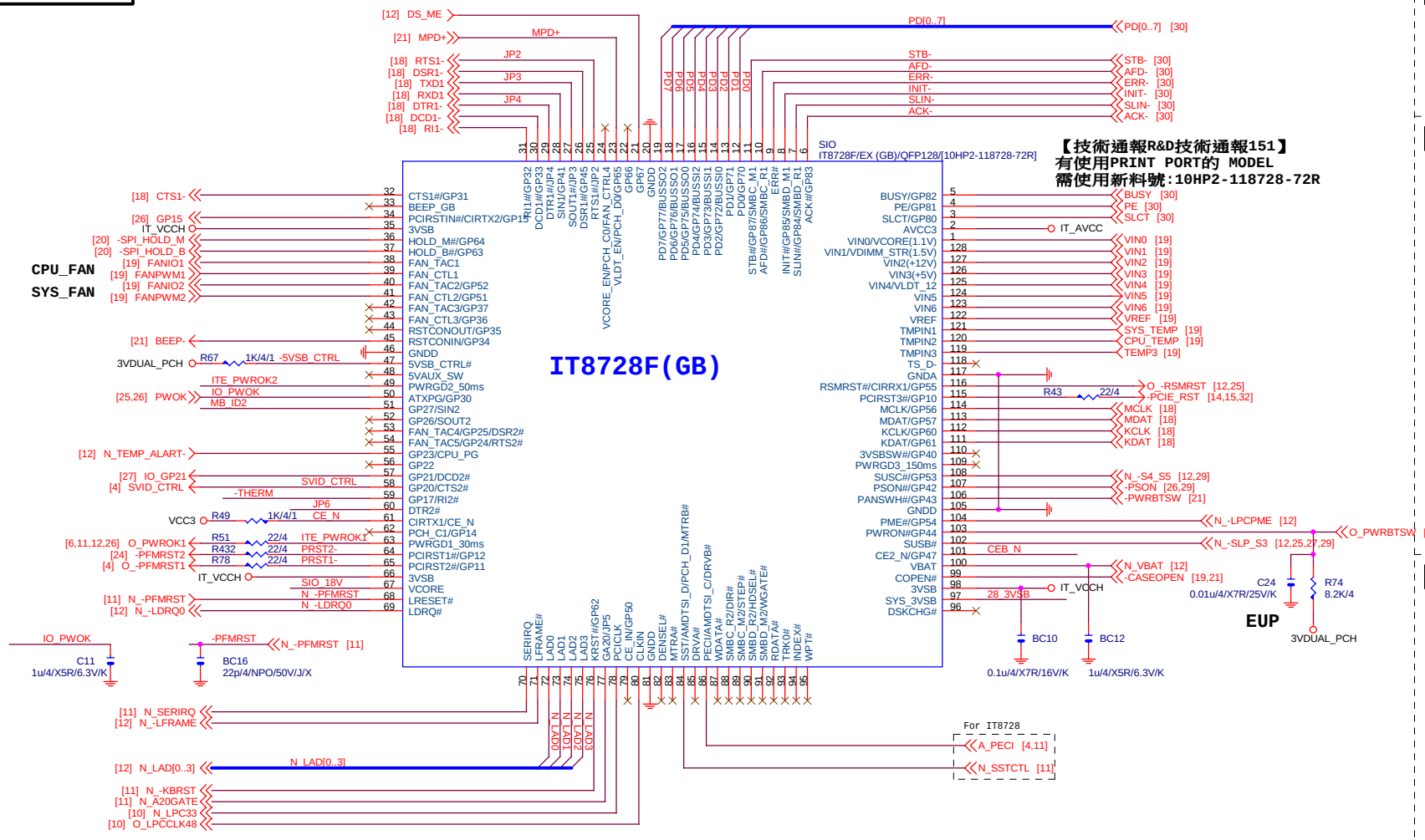


PCI CAP

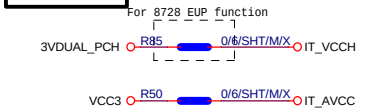


Gigabyte Technology		
Title: PCI SLOT 1&2		
Size: Custom	Document Number: GA-B85M-HD3	Rev: 1.0
Date: Monday, April 08, 2013	Sheet 16 of 32	

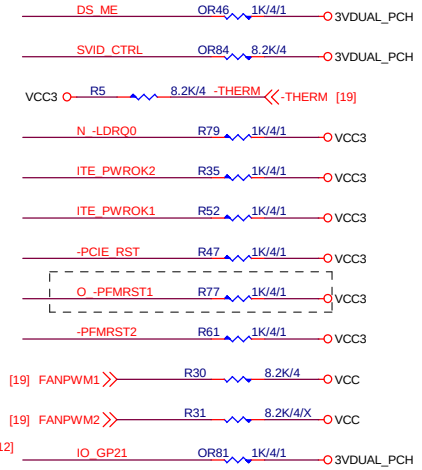
SIO IT8728F



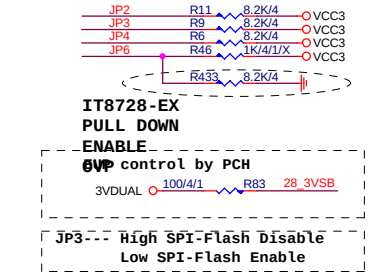
PWR SHT



SIO PU



SIO STRAP

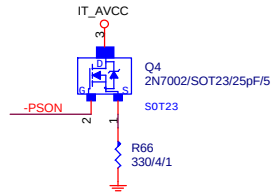


IT8728F NOTE

	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

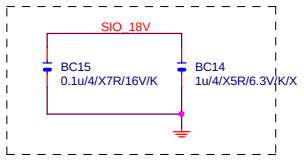
Power leakage



For IT8721 Power leakage

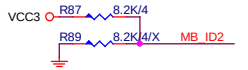
SIO_18V

internal power pin, max 22nF cap

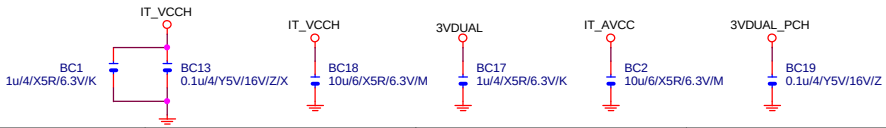


FOR LOW TEMP POWER ON INTO TEST MODE ISSUE

MB ID

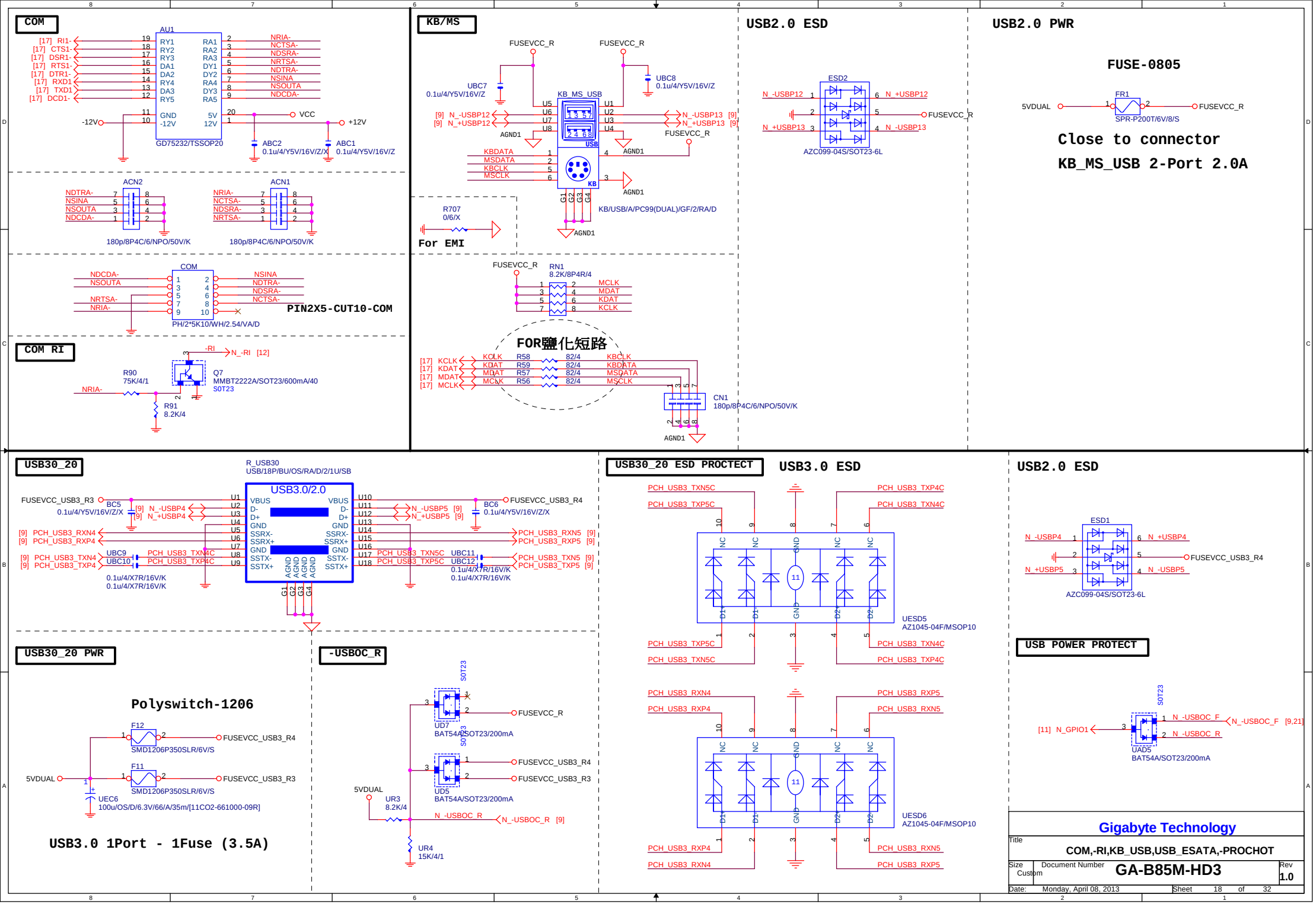


SIO CAP

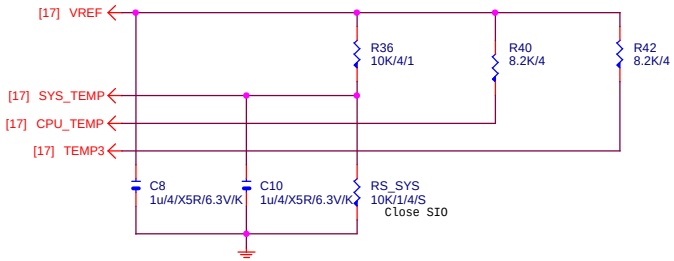


Gigabyte Technology

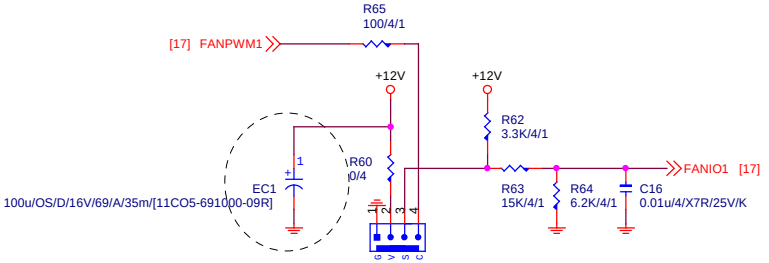
Title	ITE 8728 LPC IO	
Size: Custom	Document Number: GA-B85M-HD3	Rev: 1.0
Date: Monday, April 08, 2013	Sheet 17 of 32	


COM
AU1
GD75232/TSSOP20
ABC2
0.1u/4/Y5V/16V/Z/X
ABC1
0.1u/4/Y5V/16V/Z
ACN2
ACN1
180p/8P4C/6/NPO/50V/K
COM
PH/2*5K10/WH/2.54/VA/D
PIN2X5-CUT10-COM
COM RI
R90
75K/4/1
R91
8.2K/4
Q7
MMBT2222A/SOT23/600mA/40
SOT23
KB/MS
KB_MS_USB
KB/USB/A/PC99(DUAL)/GF/2/RA/D
R707
0/6/X
For EMI
RN1
8.2K/8P4R/4
FOR鹽化短路
CN1
180p/8P4C/6/NPO/50V/K
USB2.0 ESD
ESD2
AZC099-04S/SOT23-6L
USB2.0 PWR
FUSE-0805
SPR-P200T/6V/8/S
Close to connector
KB_MS_USB 2-Port 2.0A
USB30_20
R_USB30
USB/18P/BU/OS/RA/D/2/1U/SB
USB3.0/2.0
USB30_20 PWR
Polyswitch-1206
SMD1206P350SLR/6V/S
UEC6
100u/OS/D/6.3V/66/A/35m/[11CO2-661000-09R]
USB3.0 1Port - 1Fuse (3.5A)
-USBOC_R
UD7
BAT54A/SOT23/200mA
UD5
UR3
8.2K/4
UR4
15K/4/1
USB30_20 ESD PROCTECT
USB3.0 ESD
UESD5
AZ1045-04F/MSOP10
UESD6
USB2.0 ESD
ESD1
USB POWER PROTECT
UAD5
Gigabyte Technology
COM,-RI,KB_USB,USB_ESATA,-PROCHOT
GA-B85M-HD3
Custom
1.0
Monday, April 08, 2013
Sheet 18 of 32

TEMP H/W MONITOR



CPU SMART FAN

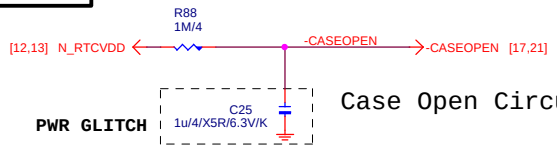


FOR HOT-PLUG ISSUE

CPU_FAN
FAN/1*4/BK/A3/PA66

BLACK CONNECTOR

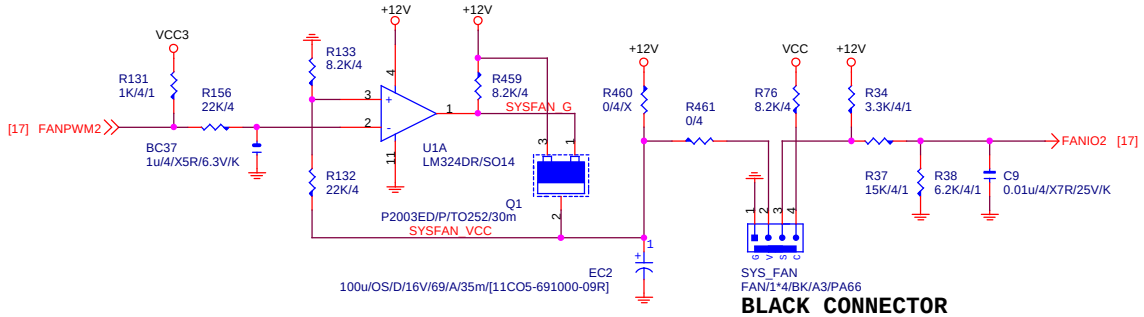
CASE OPEN



PWR GLITCH

Case Open Circuits

SYS SMART FAN

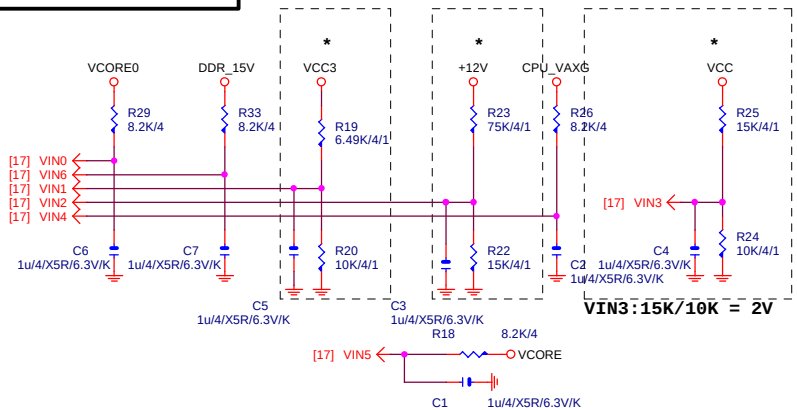


SYS_FAN
FAN/1*4/BK/A3/PA66

BLACK CONNECTOR

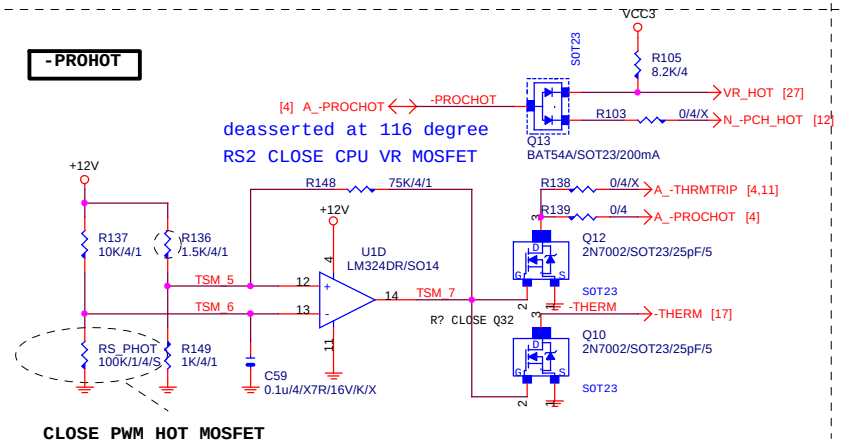
VOLTAGE-- H/W MONITOR

VIN2:75K/15K = 2V



VIN3:15K/10K = 2V

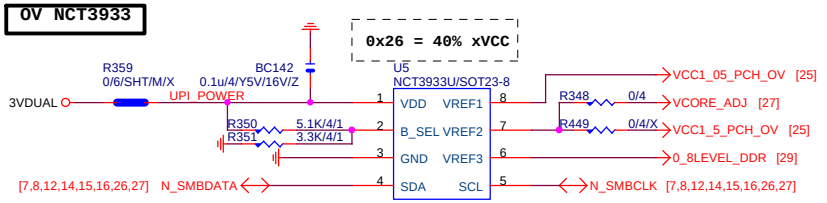
-PROHOT



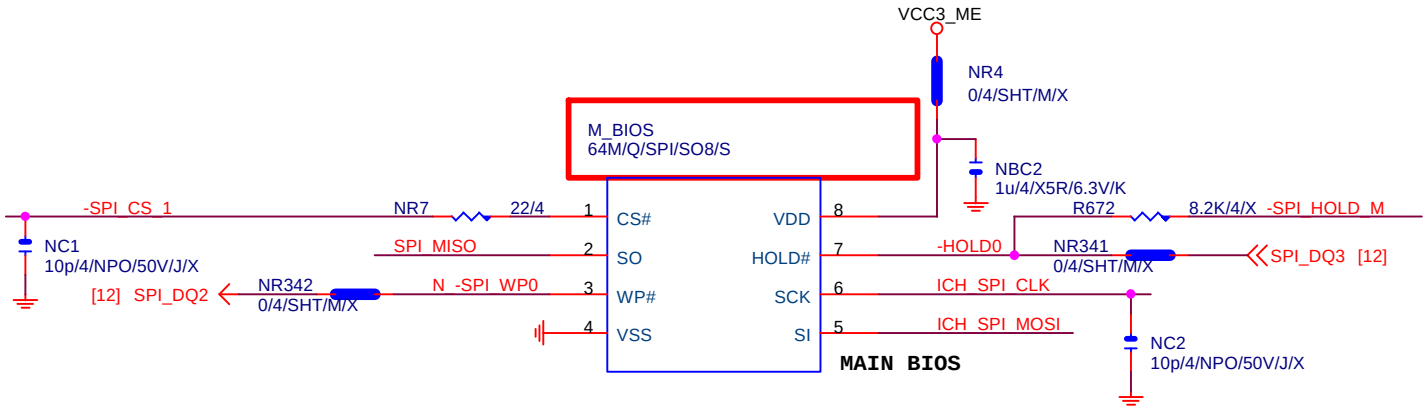
CLOSE PWM HOT MOSFET

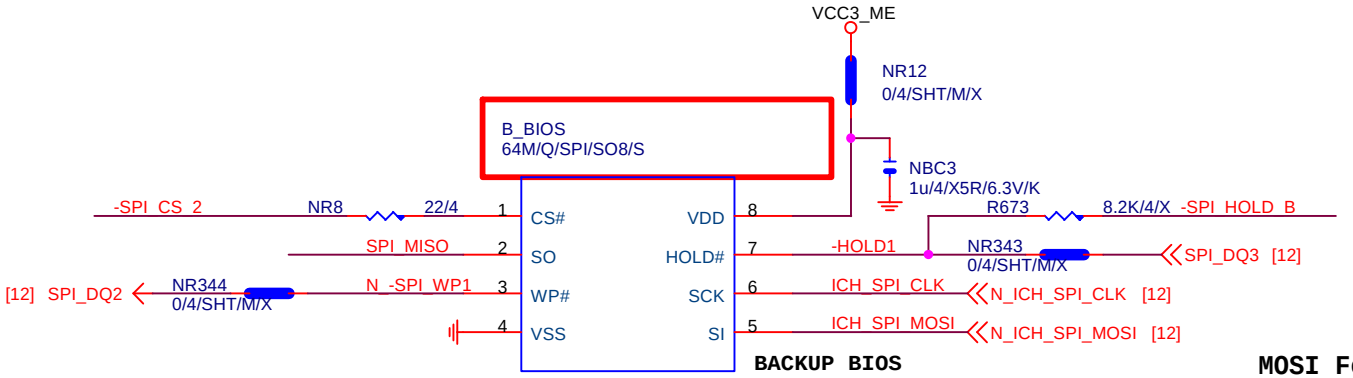
接pwm feedback pin

OV NCT3933



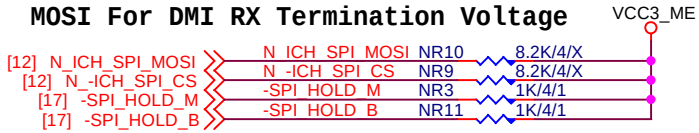
Gigabyte Technology		
Title: HWM,FAN CTRL,OV		
Size: Custom	Document Number: GA-B85M-HD3	Rev: 1.0
Date: Monday, April 08, 2013	Sheet 19 of 32	

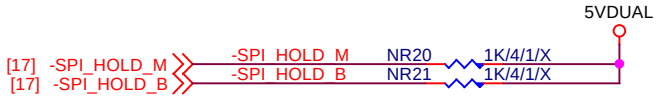


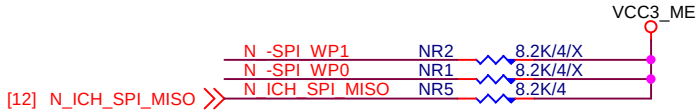


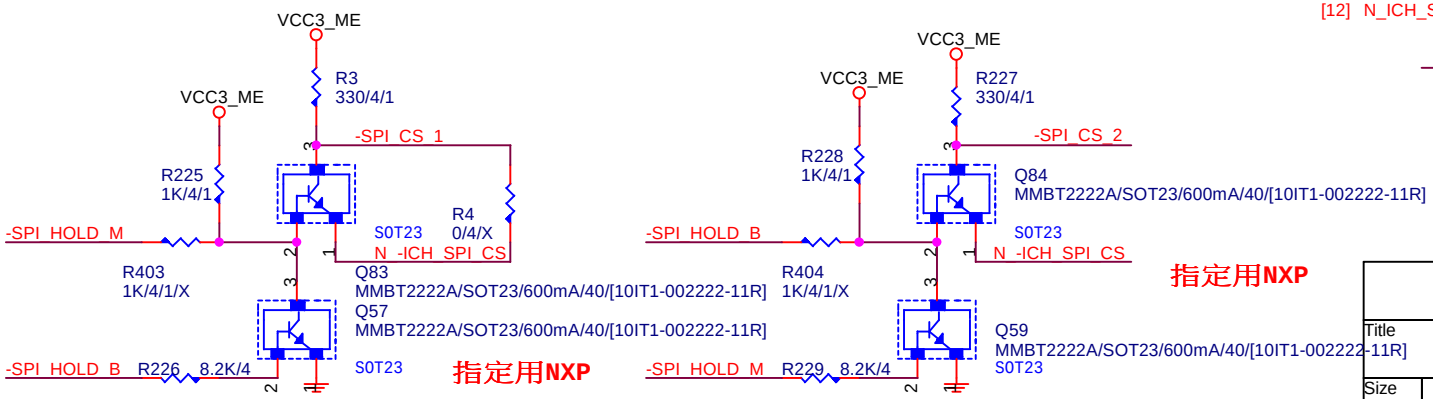
BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

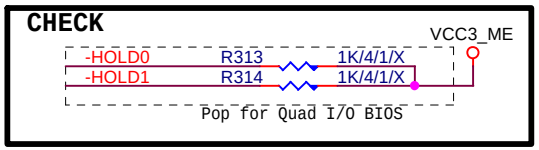
1 means floating
0 means PD 1K











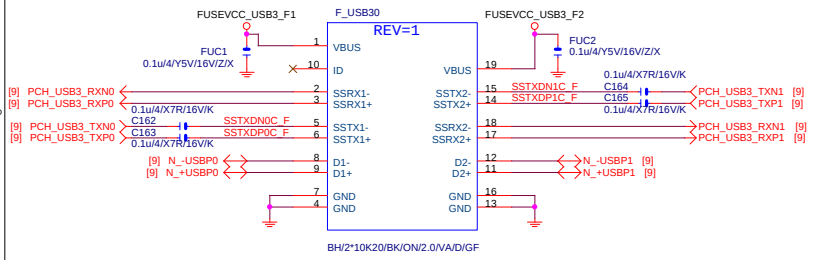
Gigabyte Technology

Title: DUAL BIOS

Size: Custom | Document Number: GA-B85M-HD3 | Rev: 1.0

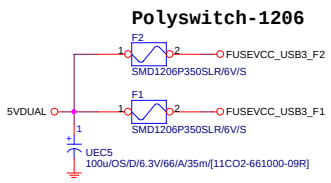
Date: Monday, April 08, 2013 | Sheet 20 of 32

F_USB30



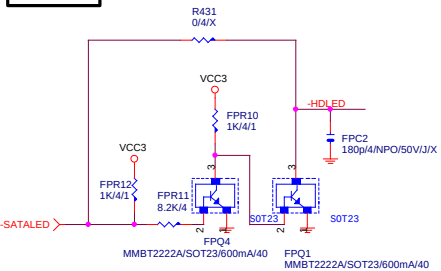
BLACK CONNECTOR

F_USB30 PWR

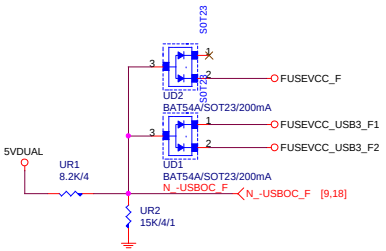


USB3.0 1Port - 1Fuse (3.5A)

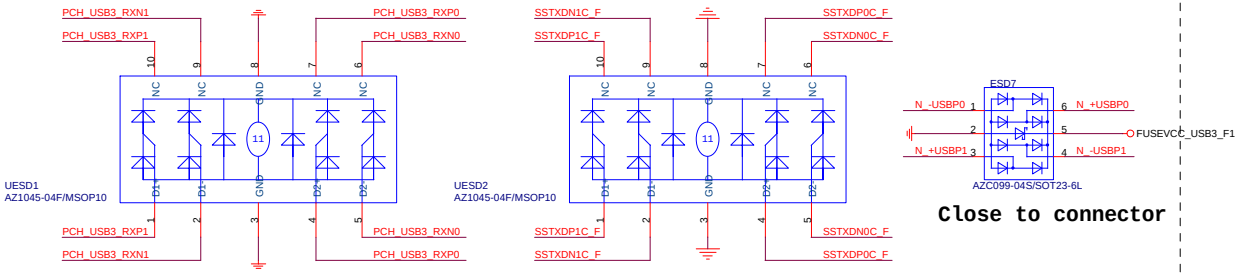
SATA LED



-USBOC_F

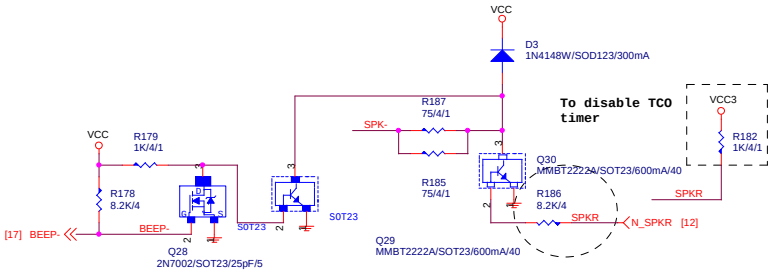


F_USB30 ESD PROTECT

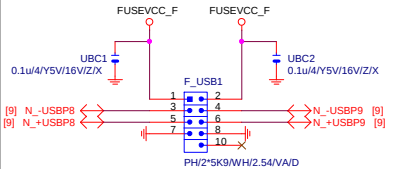


Close to connector

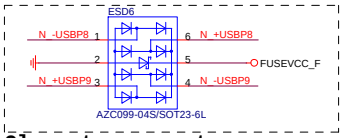
SPKR



FRONT USB1

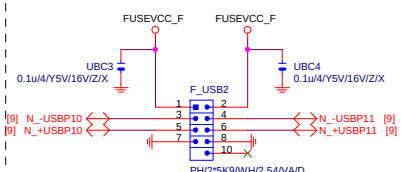


WHITE CONNECTOR

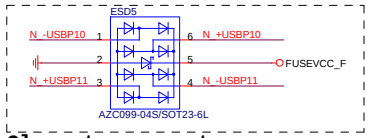


Close to connector

FRONT USB2



WHITE CONNECTOR

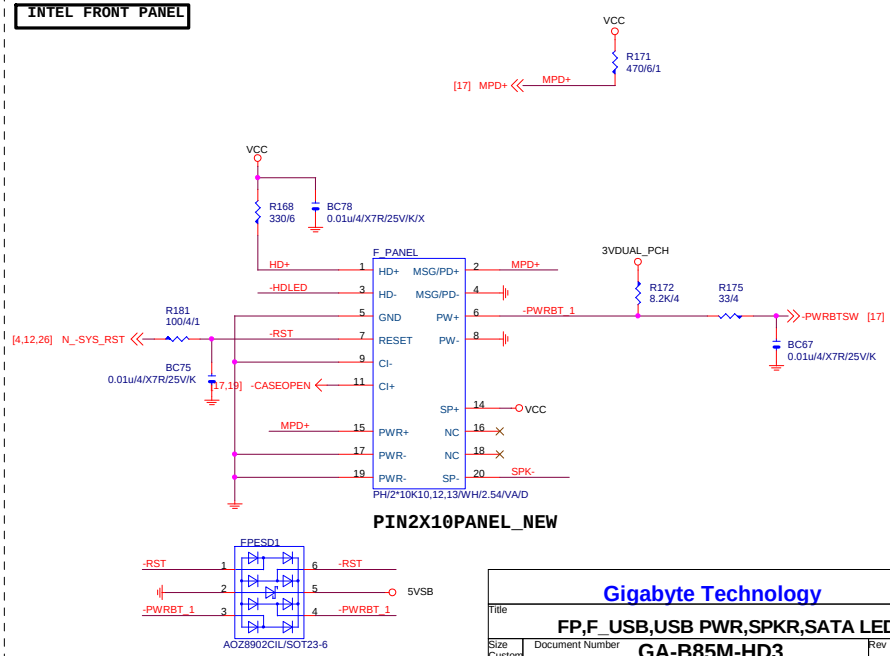


Close to connector

FUSE-0805

F_USB1, F_USB2 4-Port 2.6A

INTEL FRONT PANEL

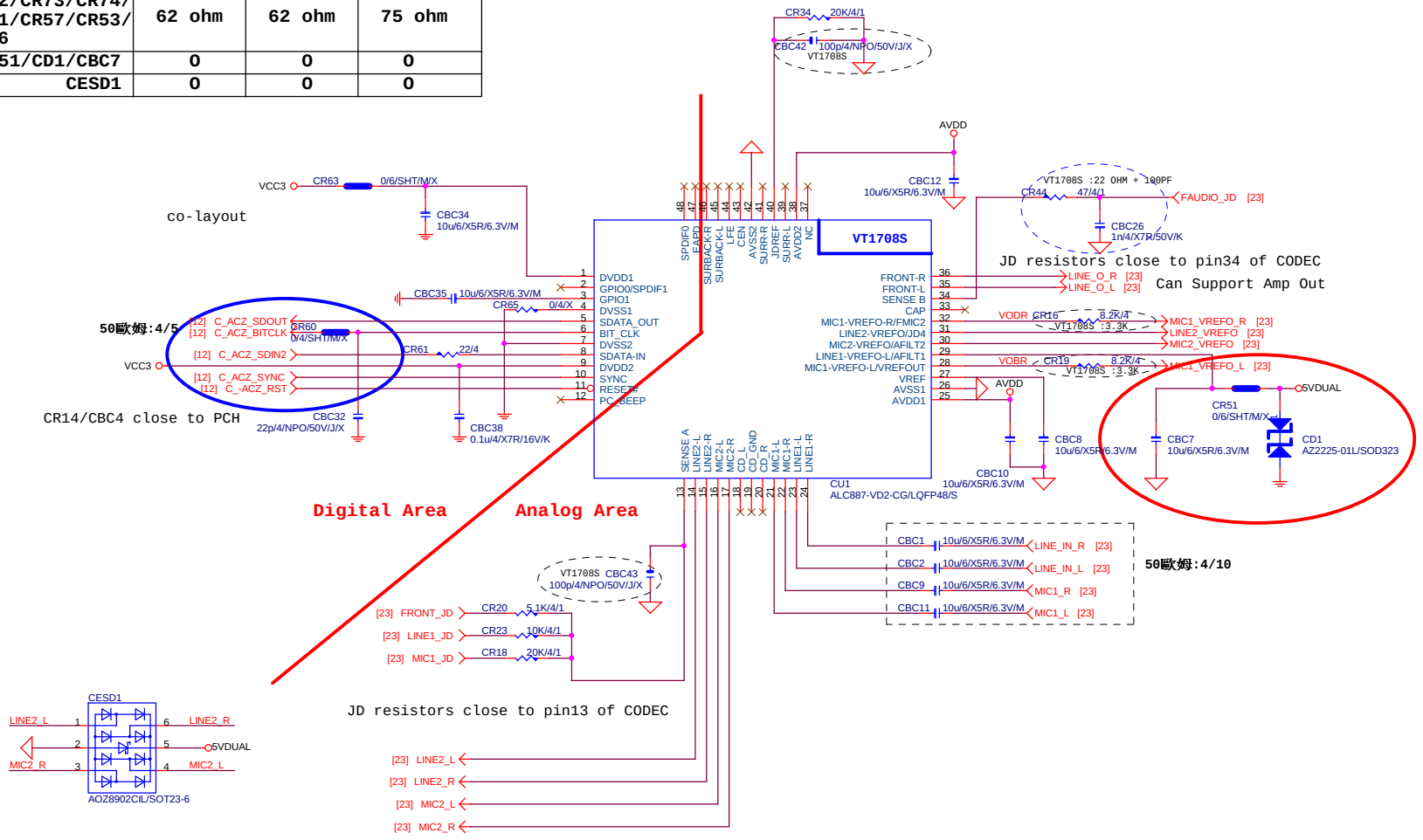


PIN2X10PANEL_NEW

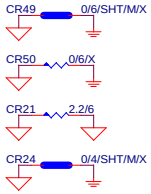
Gigabyte Technology		
Title: FP,F_USB,USB PWR,SPKR,SATA LED		
Size: Custom	Document Number: GA-B85M-HD3	Rev: 1.0
Date: Monday, April 08, 2013	Sheet 21 of 32	

AZALIA CODEC ***ALC892/ALC887-VD2/VT1708-CE Colay***

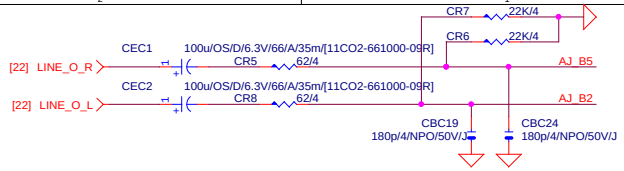
	ALC892	ALC887-VD2	VT1708S-CE
CR44/CBC26	47ohm+1nF	47ohm+1nF	22ohm+100P
CBC42/CBC43	X	X	100P/4
CR6/CR7/CR58/CR54/ CR67/CR68/CR69/CR70	22K/4	22K/4	10K/4/1
CR5/CR8/CR1/CR14/ CR17/CR22/CR73/CR74/ CR13/CR11/CR57/CR53/ CR75/CR76	62 ohm	62 ohm	75 ohm
CR51/CD1/CBC7	0	0	0
CESD1	0	0	0



Gigabyte Technology	
Title	HD AUDIO ALC887B-VD2/VT1708S/VT2021
Size: Custom	Document Number: GA-B85M-HD3
Rev: 1.0	
Date: Monday, April 08, 2013	Sheet 22 of 32

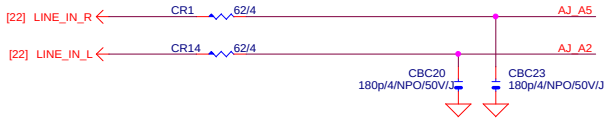


LINE-OUT



Only reserved for ALC888

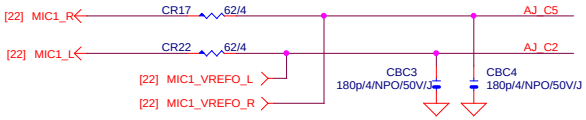
LINE-IN



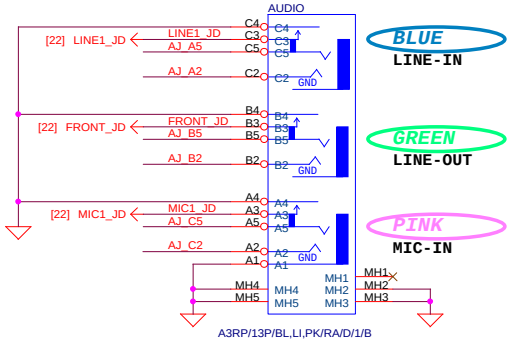
Verify MIC function in LINE-in

For 889A/888

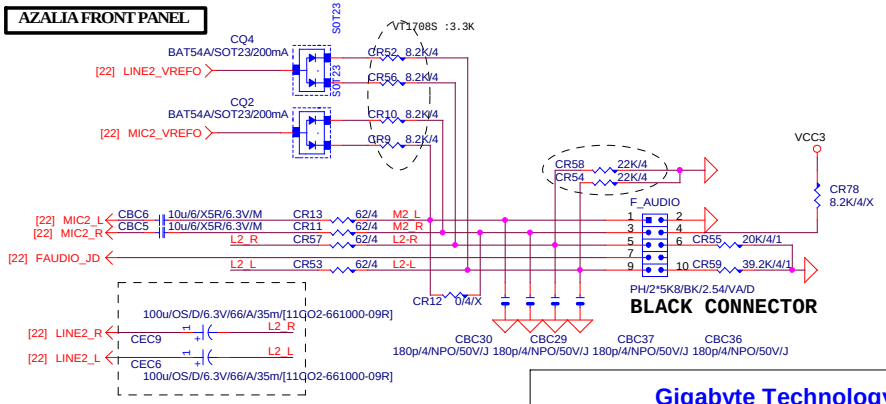
MIC-IN



SPDIF_OUT

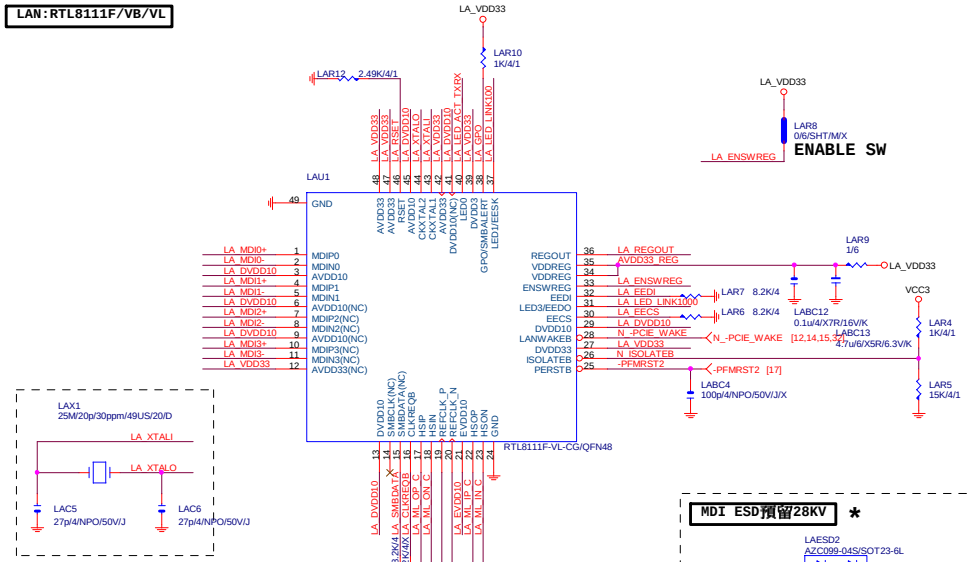


AZALIA FRONT PANEL



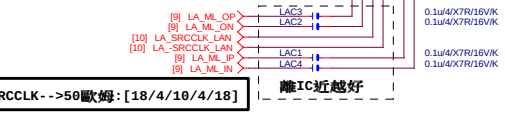
Gigabyte Technology		
Title	AUDIO JACK	
Size: Custom	Document Number: GA-B85M-HD3	Rev: 1.0
Date: Monday, April 08, 2013	Sheet 23 of 32	

LAN:RTL8111F/VB/VL



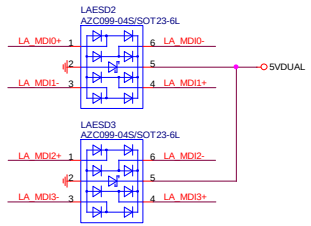
LA_ ML-->80歐姆:[15/5/5/5/15]

SRCCLK-->50歐姆:[18/4/10/4/18]

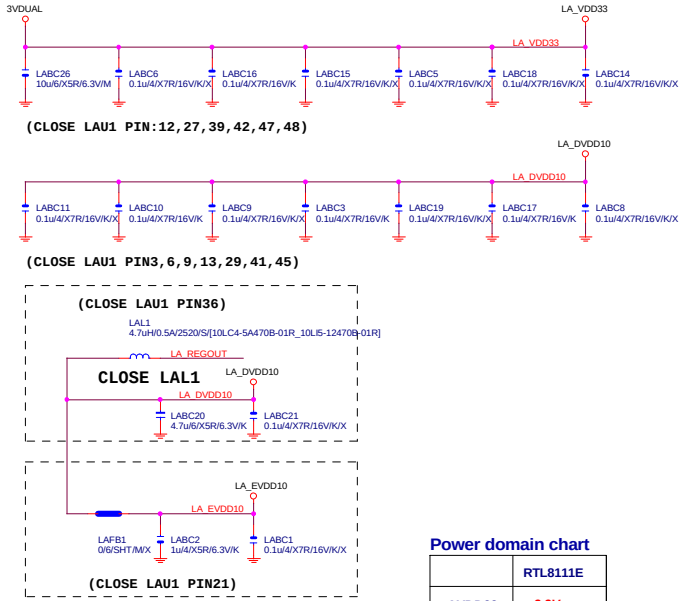


離IC近越好

MDI ESD預留28KV *



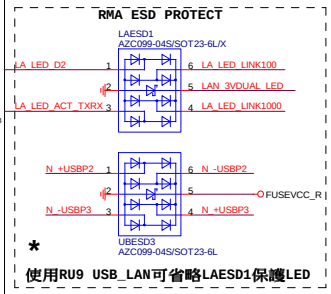
LAN POWER



Power domain chart

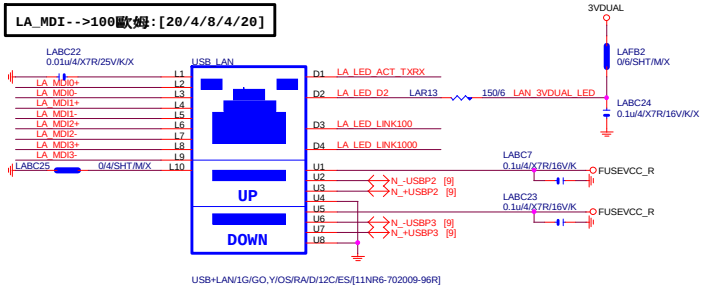
	RTL8111E
AVDD33	3.3V
DVDD33	3.3V
VDDREG	3.3V
DVDD10	1.05V

USB_LAN CONNECTOR



*使用RU9 USB_LAN可省略LAESD1保護LED

LA_MDI-->100歐姆:[20/4/8/4/20]

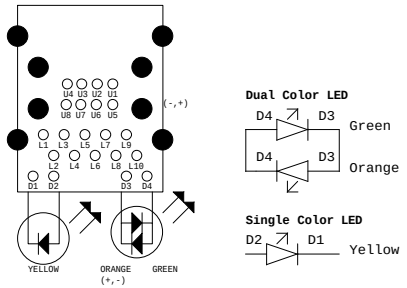


USB+LAN/1G/GO,Y/OS/RA/D/12C/ES/[11NR6-702009-96R]

USB X3 POWER

EMI SHORT PAD

PS:視EMI需求



Dual Color LED

Single Color LED

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

BOM NOTICE *

料號	規格	廠商
11NR6-702009-96R	1G LAN (12core)	UDE(RU9 ESD+)

[LED獨立走線,可省略外加AZC099料件LAESD1]

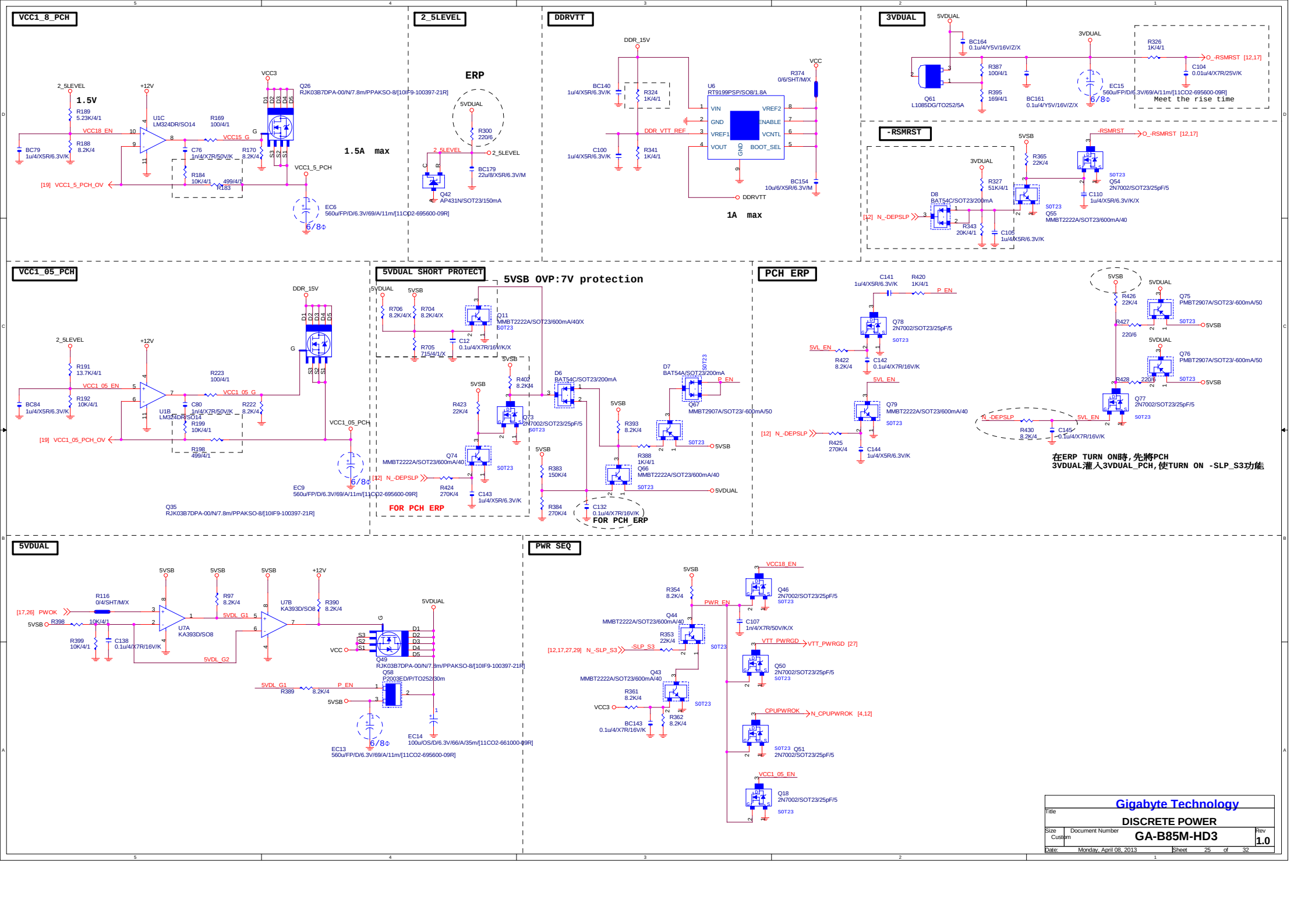
1. 9KV ESD BOM:
USB_LAN (RU9):11NR6-702009-96R
2. 28KV ESD BOM:
USB_LAN (RU9):11NR6-702009-96R
LAESD2,LAESD3:上件AZC398-04S

Gigabyte Technology

Title: Realtek RTL8111G

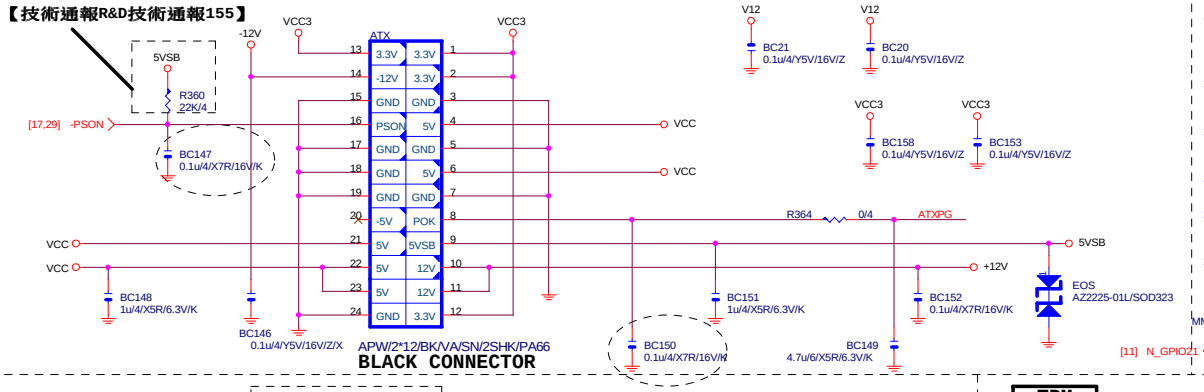
Size: Custom | Document Number: GA-B85M-HD3 | Rev: 1.0

Date: Monday, April 08, 2013 | Sheet 24 of 32


VCC1_8_PCH
2_5LEVEL
DDRVTT
3VDUAL
-RSMRST
VCC1_05_PCH
5VDUAL SHORT PROTECT
5VSB OVP:7V protection
PCH ERP
5VDUAL
PWR SEQ
ERP
1.5A max
1A max
FOR PCH ERP
FOR PCH ERP
Meet the rise time
在ERP TURN ON時,先將PCH
3VDUAL灌入3VDUAL_PCH,使TURN ON -SLP_S3功能
Gigabyte Technology
DISCRETE POWER
GA-B85M-HD3
1.0
Monday, April 08, 2013
25 of 32

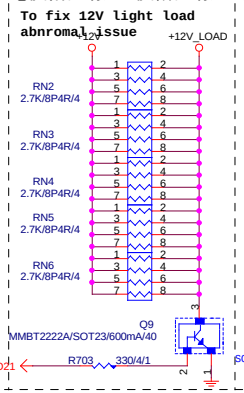
ATXX24 POWER CONNECTOR

【技術通報R&D技術通報155】

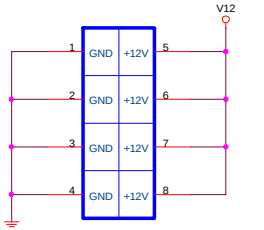


【技術通報R&D技術通報158】

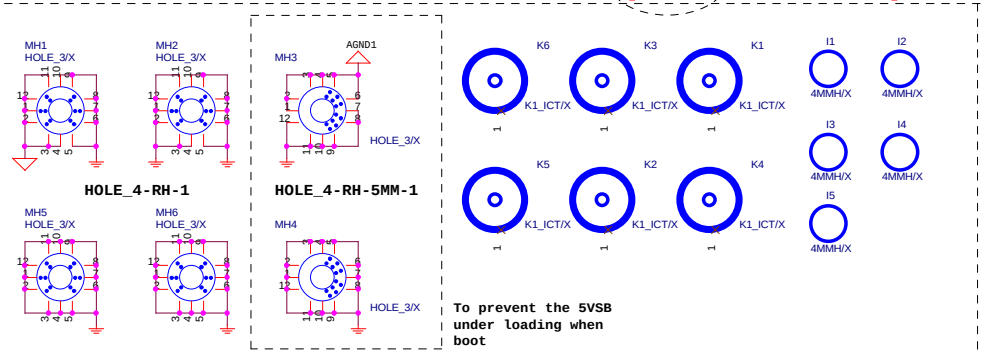
To fix 12V light load abnroma l issue



ATXX4 POWER CONNECTOR



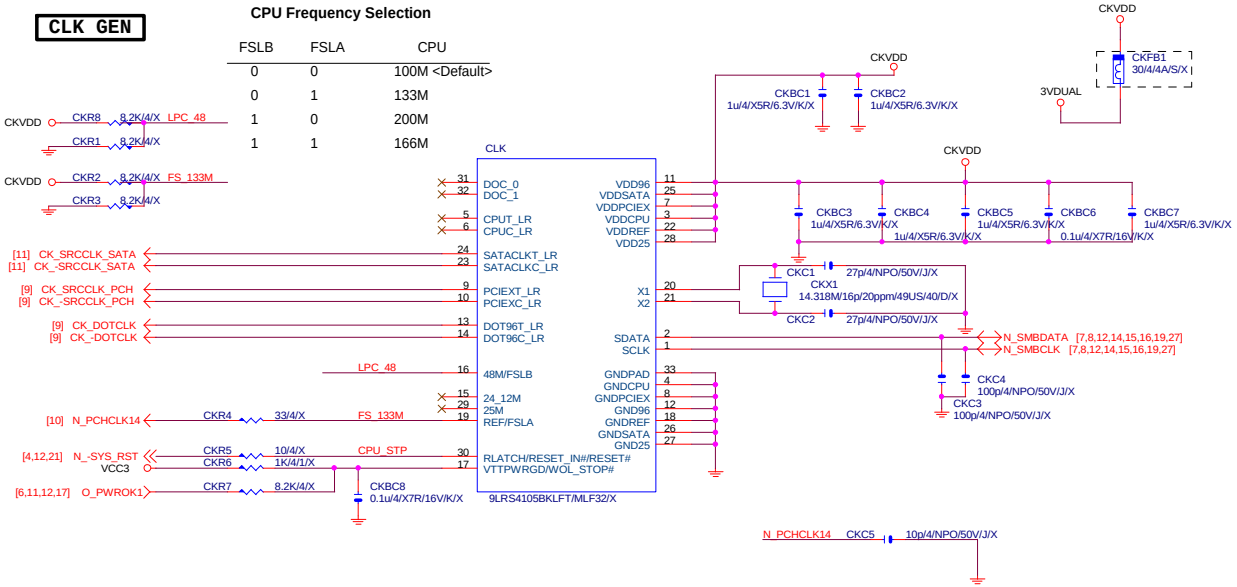
TPM



CLK GEN

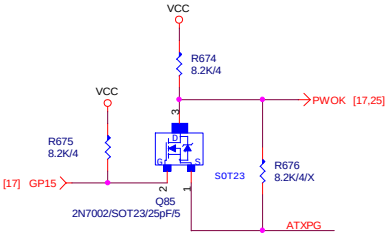
CPU Frequency Selection

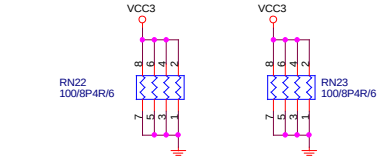
FSLB	FSLA	CPU
0	0	100M <Default>
0	1	133M
1	0	200M
1	1	166M



PWOK PATCH

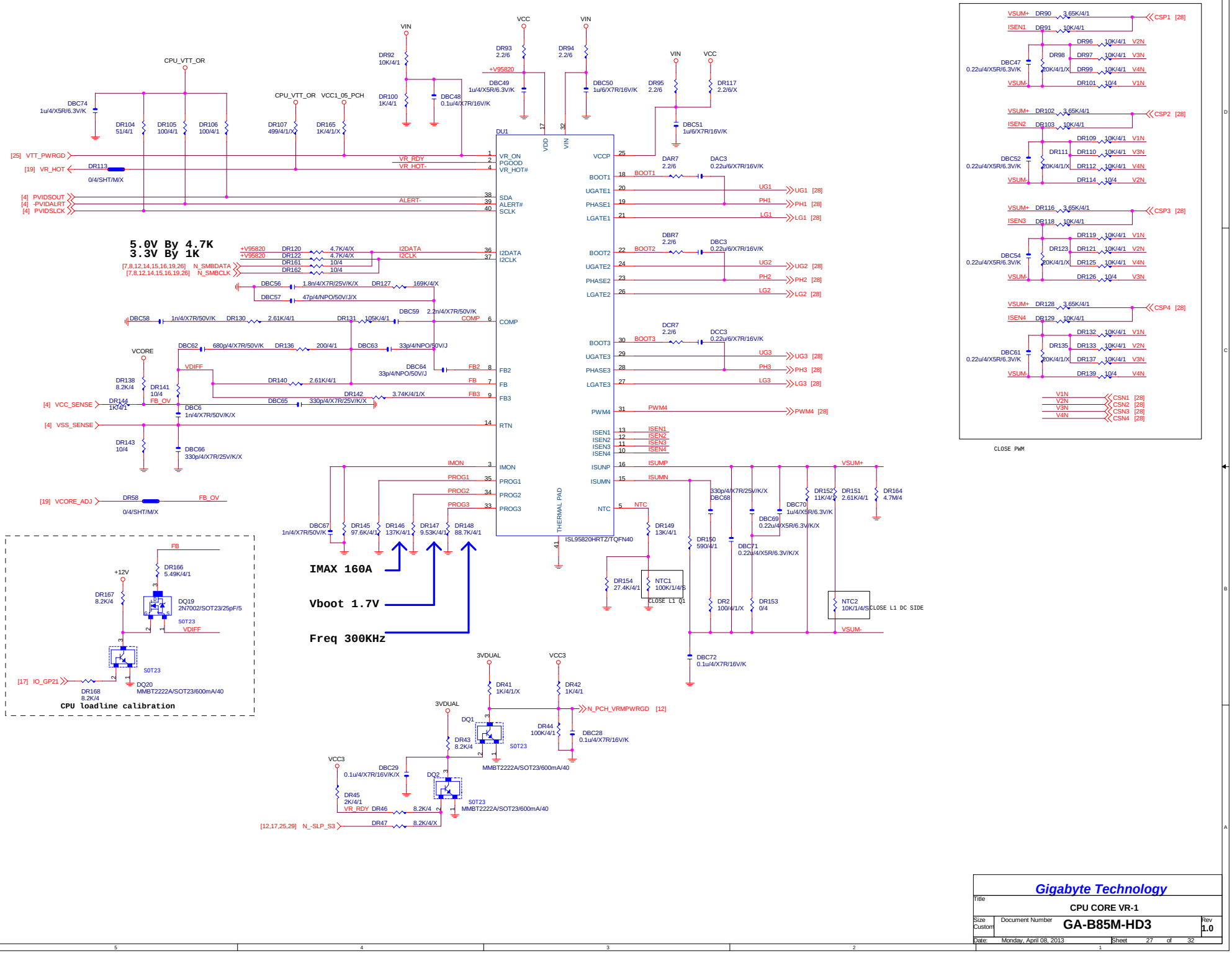
【技術通報R&D技術通報154】

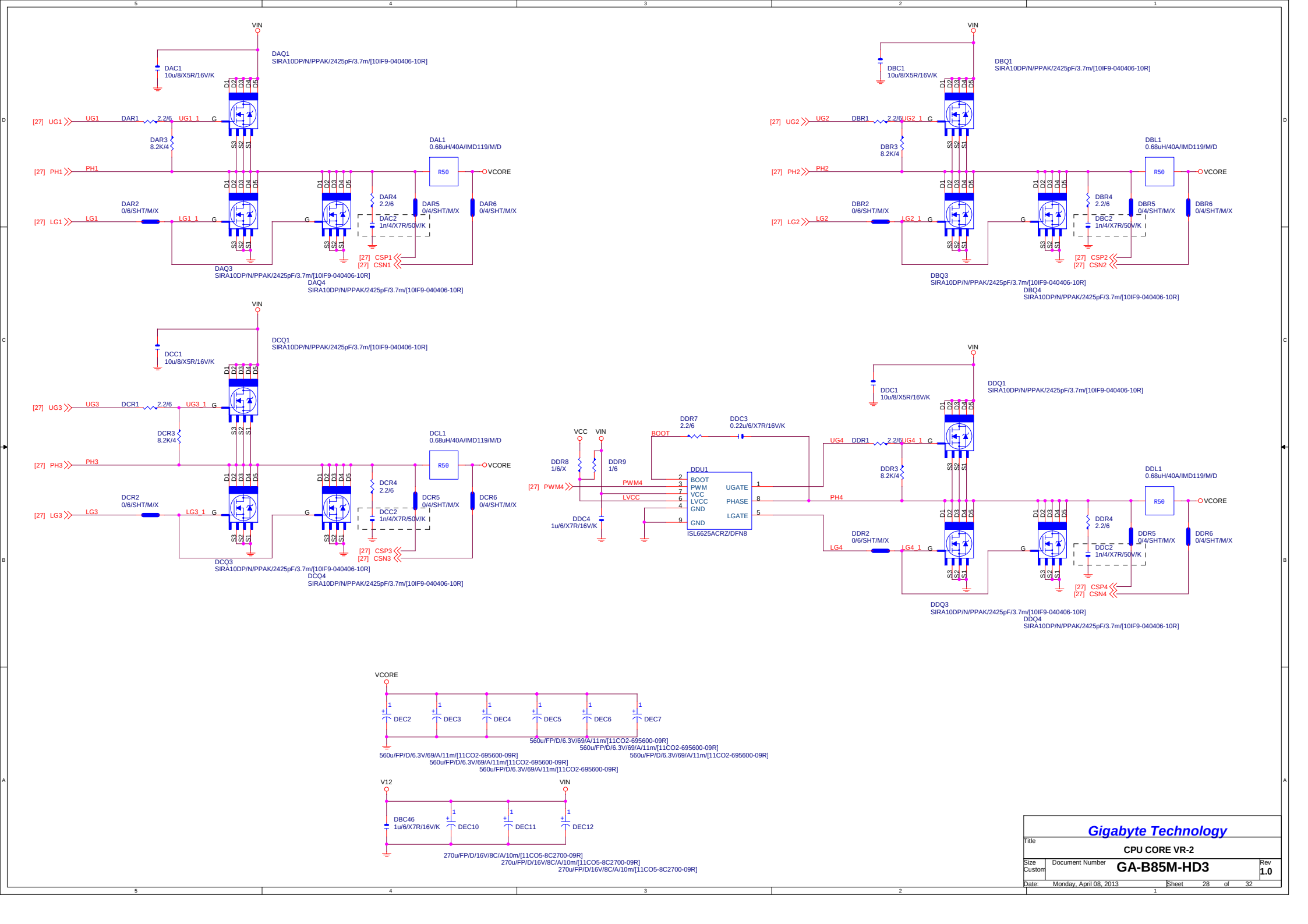


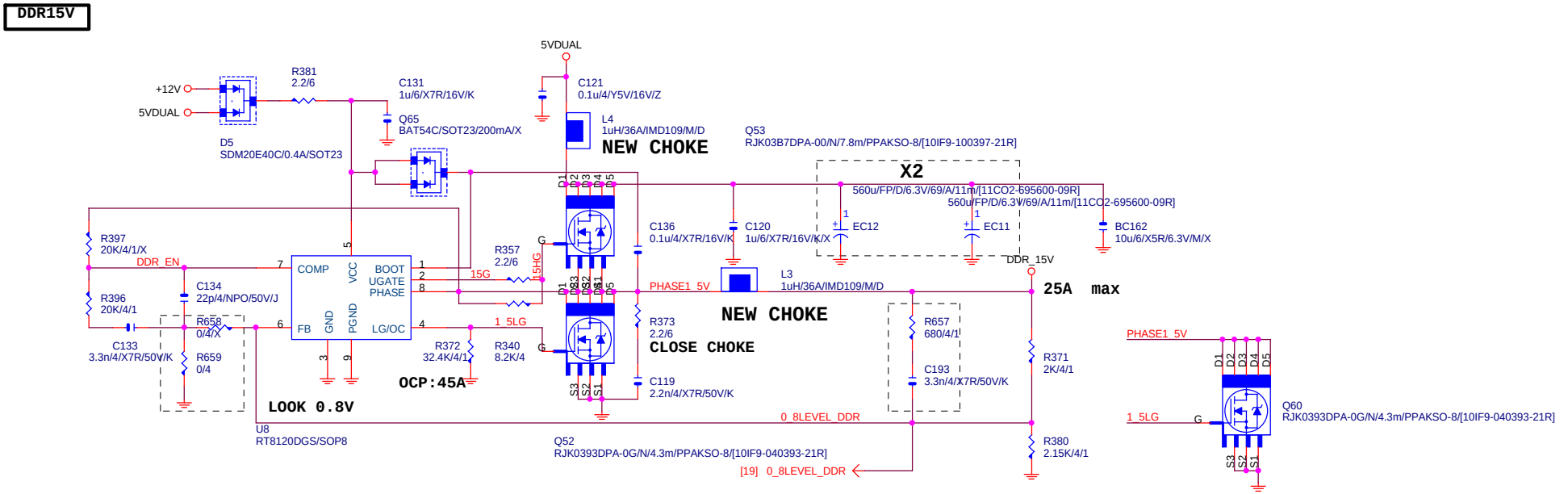


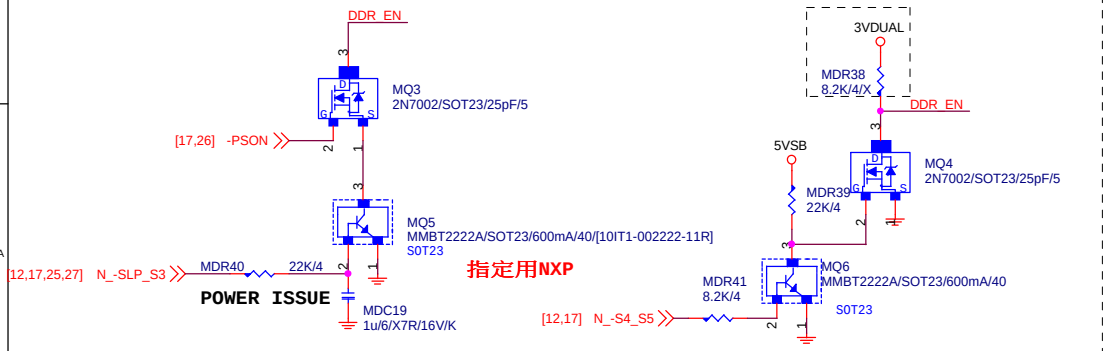
Gigabyte Technology

Title	ATX CONNECTOR	
Size: Custom	Document Number: GA-B85M-HD3	Rev: 1.0
Date: Monday, April 08, 2013	Sheet 26 of 32	


CPU_VTT_OR
VIN
VCC
DR92 10K/4/1
DR93 2.2/6
DR94 2.2/6
+V95820
DBC49 1u/4/X5R/6.3V/K
DBC50 1u/6/X7R/16V/K
DR95 2.2/6
DR117 2.2/6/X
DBC51 1u/6/X7R/16V/K
DBC74 1u/4/X5R/6.3V/K
DR104 51/4/1
DR105 100/4/1
DR106 100/4/1
CPU_VTT_OR
VCC1_05_PCH
DR107 499/4/1/X
DR165 1K/4/1/X
DR100 1K/4/1
DBC48 0.1u/4/X7R/16V/K
DU1
VDD
VIN
[25] VTT_PWRGD
[19] VR_HOT
DR113
0/4/SHT/M/X
VR_RDY
VR_HOT-
ALERT-
1 VR_ON
2 PGOOD
4 VR_HOT#
38 SDA
39 ALERT#
40 SCLK
[4] PVIDSOUT
[4] -PVIDALRT
[4] PVIDSLCK
VCCP 25
BOOT1 18
UGATE1 20
PHASE1 19
LGATE1 21
DAR7 2.2/6
DAC3 0.22u/6/X7R/16V/K
BOOT1
UG1
PH1
LG1
[28]
5.0V By 4.7K
3.3V By 1K
+V95820 DR120 4.7K/4/X
+V95820 DR122 4.7K/4/X
DR161 10/4
DR162 10/4
I2DATA 36
I2CLK 37
[7,8,12,14,15,16,19,26] N_SMBDATA
[7,8,12,14,15,16,19,26] N_SMBCLK
I2DATA
I2CLK
DBC56 1.8n/4/X7R/25V/K/X
DR127 169K/4/X
DBC57 47p/4/NPO/50V/J/X
DBC59 2.2n/4/X7R/50V/K
DBC58 1n/4/X7R/50V/K
DR130 2.61K/4/1
DR131 105K/4/1
COMP 6
COMP
DR7 2.2/6
DBC3 0.22u/6/X7R/16V/K
BOOT2 22
UGATE2 24
PHASE2 23
LGATE2 26
BOOT2
UG2
PH2
LG2
VCORE
DBC62 680p/4/X7R/50V/K
DR136 200/4/1
DBC63 33p/4/NPO/50V/J
DBC64 33p/4/NPO/50V/J
VDIFF
DR138 8.2K/4
DR141 10/4
FB_OV
DR140 2.61K/4/1
FB2 8
FB 7
FB3 9
FB2
FB
FB3
[4] VCC_SENSE
DR144 1K/4/1
DBC65 330p/4/X7R/25V/K/X
DR142 3.74K/4/1/X
DBC6 1n/4/X7R/50V/K/X
[4] VSS_SENSE
14 RTN
DR143 10/4
DBC66 330p/4/X7R/25V/K/X
DCR7 2.2/6
DCC3 0.22u/6/X7R/16V/K
BOOT3 30
UGATE3 29
PHASE3 28
LGATE3 27
BOOT3
UG3
PH3
LG3
PWM4 31
PWM4
ISEN1 13
ISEN2 12
ISEN3 11
ISEN4 10
ISEN1
ISEN2
ISEN3
ISEN4
IMON 3
PROG1 35
PROG2 34
PROG3 33
IMON
PROG1
PROG2
PROG3
THERMAL PAD
41
ISL95820HRTZ/TQFN40
ISUNP 16
ISUMN 15
ISUMP
ISUMN
VSUM+
NTC 5
NTC
DBC67 1n/4/X7R/50V/K
DR145 97.6K/4/1
DR146 137K/4/1
DR147 9.53K/4/1
DR148 88.7K/4/1
DR149 13K/4/1
DR150 59.0/4/1
DBC68 330p/4/X7R/25V/K/X
DBC69 0.22u/4/X5R/6.3V/K/X
DBC70 1u/4/X5R/6.3V/K
DBC71 0.22u/4/X5R/6.3V/K/X
DR152 11K/4/1
DR151 2.61K/4/1
DR164 4.7M/4
DR154 27.4K/4/1
NTC1 100K/1/4/S
CLOSE L1 Q1
DR2 100/4/1/X
DR153 0/4
NTC2 10K/1/4/S
CLOSE L1 DC SIDE
VSUM-
DBC72 0.1u/4/X7R/16V/K
[19] VCORE_ADJ
DR58
FB_OV
0/4/SHT/M/X
IMAX 160A
Vboot 1.7V
Freq 300KHz
FB
+12V
DR166 5.49K/4/1
DR167 8.2K/4
DQ19 2N7002/SOT23/25pF/5
SOT23
VDIFF
[17] IO_GP21
DR168 8.2K/4
DQ20 MMBT2222A/SOT23/600mA/40
CPU loadline calibration
3VDUAL
VCC3
DR41 1K/4/1/X
DR42 1K/4/1
N_PCH_VRMPWRGD [12]
DQ1
DR43 8.2K/4
DR44 100K/4/1
DBC28 0.1u/4/X7R/16V/K
MMBT2222A/SOT23/600mA/40
DBC29 0.1u/4/X7R/16V/K/X
DQ2
DR45 2K/4/1
VR_RDY
DR46 8.2K/4
DR47 8.2K/4/X
[12,17,25,29] N_-SLP_S3
VSUM+ DR90 3.65K/4/1
ISEN1 DR91 10K/4/1
DR96 10K/4/1 V2N
DR98 DR97 10K/4/1 V3N
DBC47 0.22u/4/X5R/6.3V/K
20K/4/1/X
DR99 10K/4/1 V4N
VSUM- DR101 10/4 V1N
CSP1 [28]
VSUM+ DR102 3.65K/4/1
ISEN2 DR103 10K/4/1
DR109 10K/4/1 V1N
DR111 DR110 10K/4/1 V3N
DBC52 0.22u/4/X5R/6.3V/K
20K/4/1/X
DR112 10K/4/1 V4N
VSUM- DR114 10/4 V2N
CSP2 [28]
VSUM+ DR116 3.65K/4/1
ISEN3 DR118 10K/4/1
DR119 10K/4/1 V1N
DR123 DR121 10K/4/1 V2N
DBC54 0.22u/4/X5R/6.3V/K
20K/4/1/X
DR125 10K/4/1 V4N
VSUM- DR126 10/4 V3N
CSP3 [28]
VSUM+ DR128 3.65K/4/1
ISEN4 DR129 10K/4/1
DR132 10K/4/1 V1N
DR135 DR133 10K/4/1 V2N
DBC61 0.22u/4/X5R/6.3V/K
20K/4/1/X
DR137 10K/4/1 V3N
VSUM- DR139 10/4 V4N
CSP4 [28]
V1N CSN1 [28]
V2N CSN2 [28]
V3N CSN3 [28]
V4N CSN4 [28]
CLOSE PWM
Gigabyte Technology
Title
CPU CORE VR-1
Size Custom
Document Number
GA-B85M-HD3
Rev 1.0
Date: Monday, April 08, 2013
Sheet 27 of 32


VIN
DAQ1
SIRA10DP/N/PPAK/2425pF/3.7m/[10IF9-040406-10R]
DAC1
10u/8/X5R/16V/K
[27] UG1
UG1
DAR1
2.2/6
UG1_1
G
DAR3
8.2K/4
[27] PH1
PH1
DAL1
0.68uH/40A/IMD119/M/D
R50
VCORE
DAR2
0/6/SHT/M/X
[27] LG1
LG1
LG1_1
DAR4
2.2/6
DAC2
1n/4/X7R/50V/K
DAR5
0/4/SHT/M/X
DAR6
0/4/SHT/M/X
[27] CSP1
[27] CSN1
DAQ3
SIRA10DP/N/PPAK/2425pF/3.7m/[10IF9-040406-10R]
DAQ4
SIRA10DP/N/PPAK/2425pF/3.7m/[10IF9-040406-10R]
DBQ1
SIRA10DP/N/PPAK/2425pF/3.7m/[10IF9-040406-10R]
DBC1
10u/8/X5R/16V/K
[27] UG2
UG2
DBR1
2.2/6
UG2_1
DBR3
8.2K/4
[27] PH2
PH2
DBL1
0.68uH/40A/IMD119/M/D
DBR2
0/6/SHT/M/X
[27] LG2
LG2
LG2_1
DBR4
2.2/6
DBC2
1n/4/X7R/50V/K
DBR5
0/4/SHT/M/X
DBR6
0/4/SHT/M/X
[27] CSP2
[27] CSN2
DBQ3
SIRA10DP/N/PPAK/2425pF/3.7m/[10IF9-040406-10R]
DBQ4
SIRA10DP/N/PPAK/2425pF/3.7m/[10IF9-040406-10R]
DCQ1
SIRA10DP/N/PPAK/2425pF/3.7m/[10IF9-040406-10R]
DCC1
10u/8/X5R/16V/K
[27] UG3
UG3
DCR1
2.2/6
UG3_1
DCR3
8.2K/4
[27] PH3
PH3
DCL1
0.68uH/40A/IMD119/M/D
DCR2
0/6/SHT/M/X
[27] LG3
LG3
LG3_1
DCR4
2.2/6
DCC2
1n/4/X7R/50V/K
DCR5
0/4/SHT/M/X
DCR6
0/4/SHT/M/X
[27] CSP3
[27] CSN3
DCQ3
SIRA10DP/N/PPAK/2425pF/3.7m/[10IF9-040406-10R]
DCQ4
SIRA10DP/N/PPAK/2425pF/3.7m/[10IF9-040406-10R]
VCC
VIN
DDR8
1/6/X
DDR9
1/6
DDR7
2.2/6
DDC3
0.22u/6/X7R/16V/K
BOOT
[27] PWM4
PWM4
LVCC
DDU1
BOOT
PWM
VCC
LVCC
GND
UGATE
PHASE
LGATE
GND
ISL6625ACRZ/DFN8
DDC4
1u/6/X7R/16V/K
DDQ1
SIRA10DP/N/PPAK/2425pF/3.7m/[10IF9-040406-10R]
DDC1
10u/8/X5R/16V/K
UG4
DDR1
2.2/6
UG4_1
DDR3
8.2K/4
PH4
DDL1
0.68uH/40A/IMD119/M/D
DDR2
0/6/SHT/M/X
LG4
LG4_1
DDR4
2.2/6
DDC2
1n/4/X7R/50V/K
DDR5
0/4/SHT/M/X
DDR6
0/4/SHT/M/X
[27] CSP4
[27] CSN4
DDQ3
SIRA10DP/N/PPAK/2425pF/3.7m/[10IF9-040406-10R]
DDQ4
SIRA10DP/N/PPAK/2425pF/3.7m/[10IF9-040406-10R]
VCORE
DEC2
DEC3
DEC4
DEC5
DEC6
DEC7
560u/FP/D/6.3V/69/A/11m/[11CO2-695600-09R]
V12
VIN
DBC46
1u/6/X7R/16V/K
DEC10
DEC11
DEC12
270u/FP/D/16V/8C/A/10m/[11CO5-8C2700-09R]
Gigabyte Technology
Title
CPU CORE VR-2
Size
Custom
Document Number
GA-B85M-HD3
Rev
1.0
Date:
Monday, April 08, 2013
Sheet
28
of
32





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

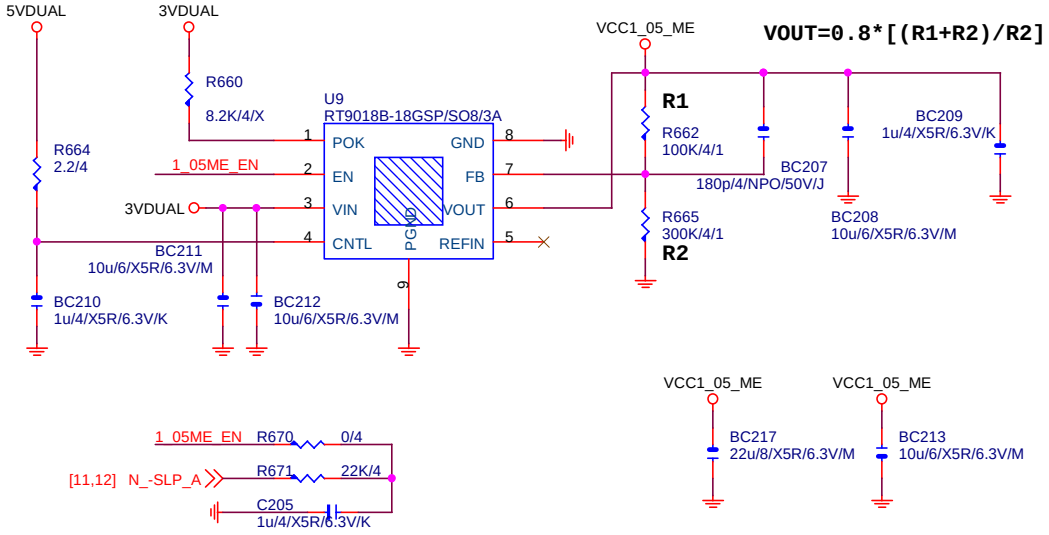
Rocset=(Iocp*Lgate,rdson)/Iocset
Rocset=(45A*6.7mOhm)/10uA = 30K
Iocset=10uA

Gigabyte Technology			
Title: DDR POWER			
Size: Custom	Document Number: GA-B85M-HD3		Rev: 1.0
Date: Monday, April 08, 2013	Sheet 29 of 32		

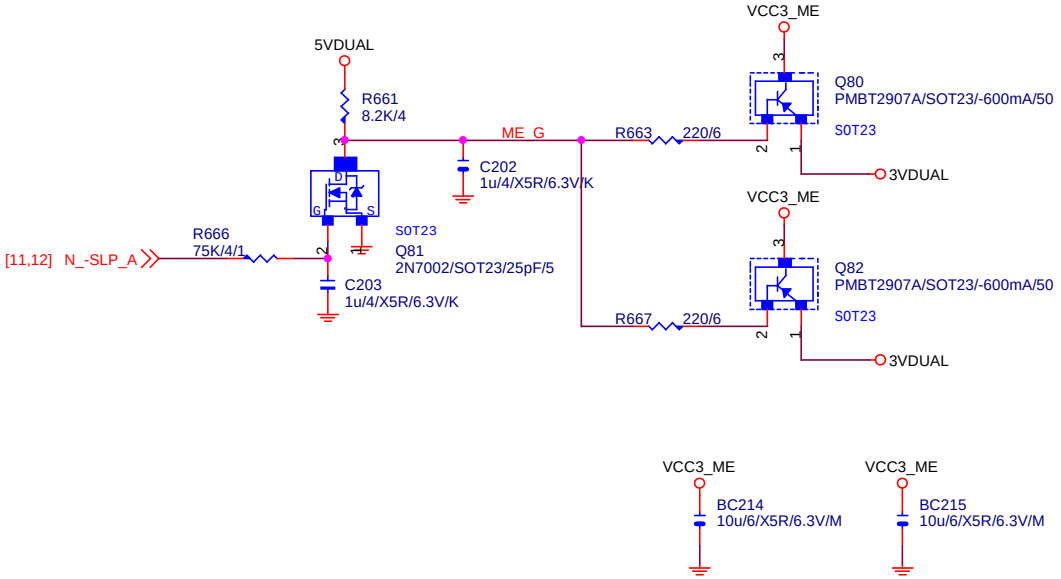
VCC1_05_ME

【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

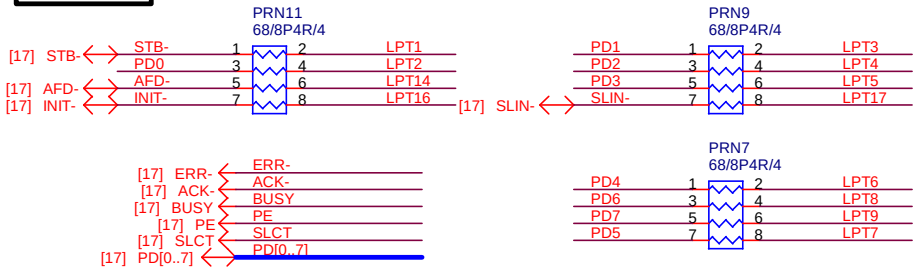
VOUT=0.8*[(R1+R2)/R2]



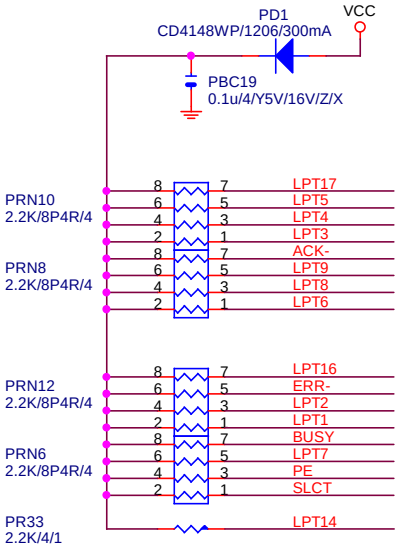
VCC3_ME

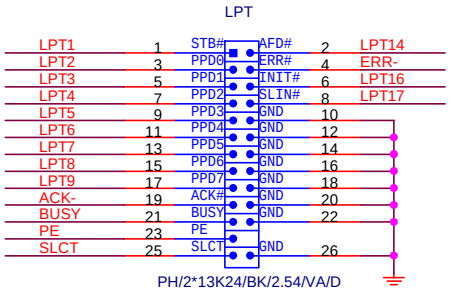


LPT PORT



【技術通報R&D技術通報151】
33ohm Change to 68ohm

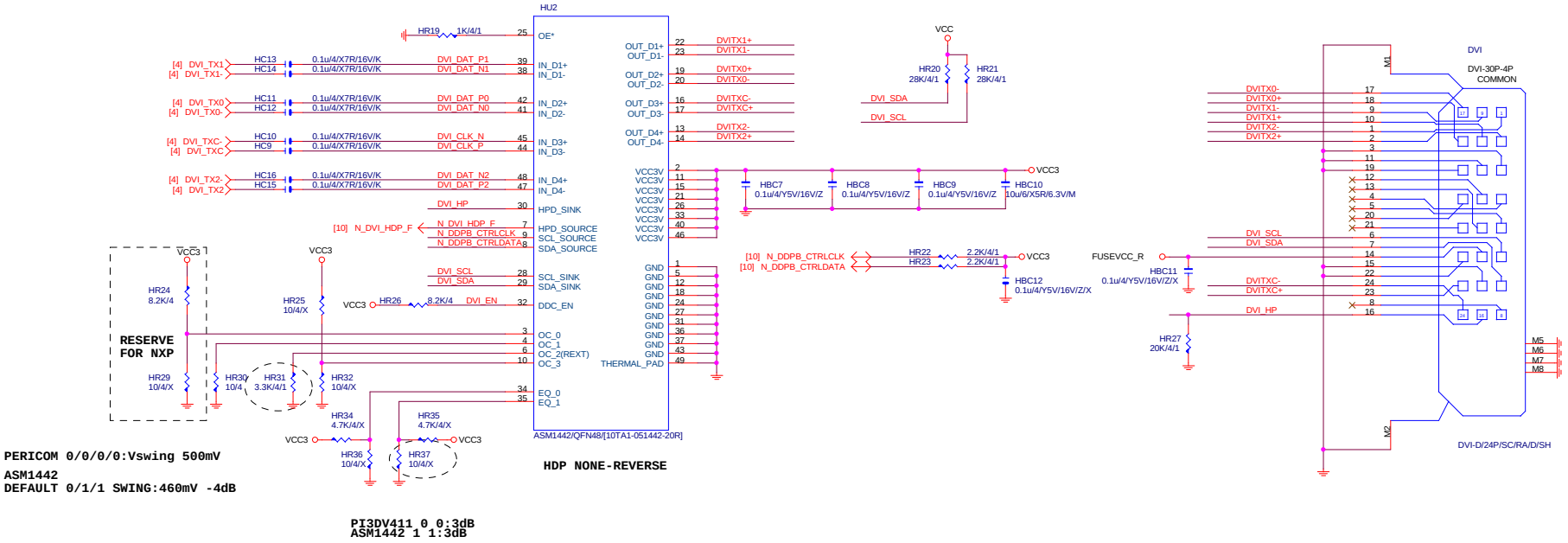




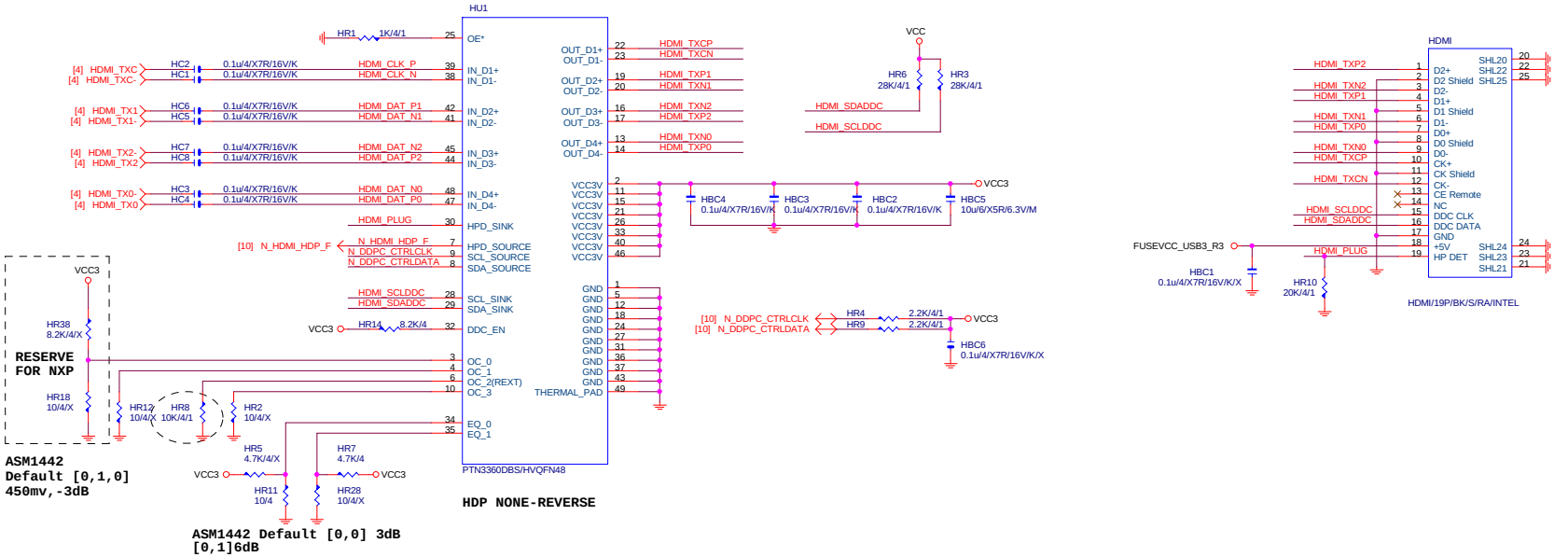
Gigabyte Technology

Title	LPT		
Size: Custom	Document Number: GA-B85M-HD3		Rev: 1.0
Date: Monday, April 08, 2013	Sheet 30 of 32		

DVI LEVEL SHIFT



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)

Gigabyte Technology			
Title: DVI			
Size: Custom	Document Number: GA-B85M-HD3		Rev: 1.0
Date: Monday, April 08, 2013		Sheet 31 of 32	

PCIE TO PCI

PCI:5/4/5 Impedance=50 +- 15%

IT8892: PR24 -> 47ohm
IT8893: PR24 -> 22ohm

BA_D[0..31] [16]

-BC_BE0 [16]
-BC_BE1 [16]
-BC_BE2 [16]
-BC_BE3 [16]

-BPERR [16]
-BSERR [16]

BPAR [16]
-BPLOCK [16]
-BDEVSEL [16]
-BSTOP [16]
-BTRDY [16]
-BIRDY [16]
-BFRAME [16]

-PCIE_RST [14,15,17]

-BPCIRST [16]

-BREQ0 [16]

-BGNT0 [16]

-BPCIPME1 [16]

[16] BPCLK0 — PR24 47/4/1 — CLKOUT0

RREF PR13 12K/4/1
TEST_EN PR21 10K/4/1
EXT_ARB PR22 10K/4/1
RST_SEL PR7 10K/4/1

VCC3

PR14 1K/4/1/X M66EN
PR42 1K/4/1

High: Enable PCI CLK 66MHz
Low: Disable PCI CLK 66MHz

VCC3

PR35 8.2K/4/X PCICLK_SEL
PR37 10K/4/1

High: PCICLK INTPUT form CLK Gen
Low: PCICLK OUTPUT form IT8893 chip

PU1

IT8892E/BX LQFP128

PCIEWAKE
-BPCIPME
VCCP
LDOAUX_18V
1.8V_AUX
[10] G_-PBCLK
[10] G_PBCLK
1.8VA
1.8VA
RREF
1.8V_AUXA
1.8VD
BA_D0
BA_D1

[9] G_PCIEBOP — PBC61 0.1u/4/X7R/16V/K — G_PCIEBOP_C
[9] G_PCIEBON — PBC62 0.1u/4/X7R/16V/K — G_PCIEBON_C
[9] G_PCIEBIN — PBC43 0.1u/4/X7R/16V/K — G_PCIEBIN_C
[9] G_PCIEBIP — PBC44 0.1u/4/X7R/16V/K — G_PCIEBIP_C
PBC63 10p/4/NPO/50V/J/X
PBC64 10p/4/NPO/50V/J/X

IT8892E/FX/S

EXT_ARB
RST_SEL
TEST_EN
BA_D27
BA_D26
-BC_BE3
BA_D25
BA_D24
BA_D23
BA_D22
BA_D21
BA_D20
BA_D19
BA_D18
BA_D17
BA_D16
-BFRAME
-BIRDY
-BC_BE2
-BTRDY
-BSTOP
-BDEVSEL
-BPIRQA

IT8892

PRN14 0/8P4R/0402/SHT/X
-BPIRQA 1 2 -BPIRQA1 [16]
-BPIRQD 3 4 -BPIRQD1 [16]
-BPIRQB 5 6 -BPIRQB1 [16]
-BPIRQC 7 8 -BPIRQC1 [16]

PCI slot

VCCP PR26 0/4/SHT/M/X 3VDUAL

PCI slot

-BPCIPME1 PR27 0/4/SHT/M/X N_-PCIE_WAKE [12,14,15,24]

chipset side

3VDUAL
PR2 0/4/SHT/M/X
PCIEWAKE PR34 10K/4/1
-BPCIPME PR43 10K/4/1

PRN1 2.2K/8P4R/4 VCC
-BFRAME 1 2
-BTRDY 3 4
-BSTOP 5 6
-BDEVSEL 7 8

PRN2 2.2K/8P4R/4
-BIRDY 1 2
-BPERR 3 4
-BSERR 5 6
-BPLOCK 7 8

PRN15 2.2K/8P4R/4
-BPIRQC 1 2
-BPIRQB 3 4
-BPIRQD 5 6
-BPIRQA 7 8

PRN4 2.2K/8P4R/4
-BGNT3 1 2
-BREQ3 3 4
-BGNT1 5 6
-BREQ1 7 8

PRN5 2.2K/8P4R/4
-BGNT2 1 2
-BREQ2 3 4
-BGNT0 5 6
-BREQ0 7 8

BPAR PR41 2.2K/4/1/X

LDO_18V PFB1 0/6/SHT/M/X 1.8VA
PFB2 0/6/SHT/M/X 1.8VD
LDOAUX_18V PFB3 0/6/SHT/M/X 1.8V_AUX
PFB4 0/6/SHT/M/X 1.8V_AUXA

VCC3
PBC60 10u/6/X5R/6.3V/M
PBC21 1u/4/X5R/6.3V/K
PBC22 0.1u/4/X7R/16V/K
PBC33 1u/4/X5R/6.3V/K
PBC34 0.1u/4/X7R/16V/K
PBC35 0.1u/4/X7R/16V/K

3VDUAL PBC29 0.1u/4/X7R/16V/K/X
1.8V_AUX PBC30 0.1u/4/X7R/16V/K
1.8V_AUXA PBC31 0.1u/4/X7R/16V/K

1.8VD
PBC23 10u/6/X5R/6.3V/M
PBC24 1u/4/X5R/6.3V/K
PBC25 0.1u/4/X7R/16V/K

LDOAUX_18V
PBC32 10u/6/X5R/6.3V/M
PBC40 1u/4/X5R/6.3V/K
PBC41 0.01u/4/X7R/25V/K

1.8VD
PBC59 1u/4/X5R/6.3V/K
PBC38 0.1u/4/X7R/16V/K
PBC39 0.01u/4/X7R/25V/K

PCB layout note:
Close to chip

LDO_18V
PBC58 10u/6/X5R/6.3V/M
PBC42 1u/4/X5R/6.3V/K
PBC45 0.01u/4/X7R/25V/K

PCB layout note:
Close to chip

1.8VA
PBC26 10u/6/X5R/6.3V/M
PBC27 1u/4/X5R/6.3V/K
PBC28 0.1u/4/X7R/16V/K

Close to chip

Gigabyte Technology

Title: **ITE IT8892E**

Size: Custom | Document Number: **GA-B85M-HD3** | Rev: **1.0**

Date: Monday, April 08, 2013 | Sheet 32 of 32