

Model Name: GA-B85M-DS3H

www.xinxunwei.com 400-800-9990  
Revision 3.0

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 1,2
08	DDR III CHANNEL B 1,2
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	ITE 8620 LPC IO
17	COM,KB MS USB,USB30 20
18	HWM,FAN CTRL,OV,-PROCHOT
19	DUAL BIOS
20	FP,FUSB,SPK,SATALED
21	Realtek ALC887-VD2
22	REAR AUDIO JACK
23	REALTEK RTL8111G
24	DISCRETE POWER
25	ATX
26	VCORE ISL95812 1
27	VCORE ISL95812 2

SHEET TITLE

28	RT8120 DDR POWER
29	LPT, M3 POWER
30	DVI

## Revision 3.0

## Component value change history

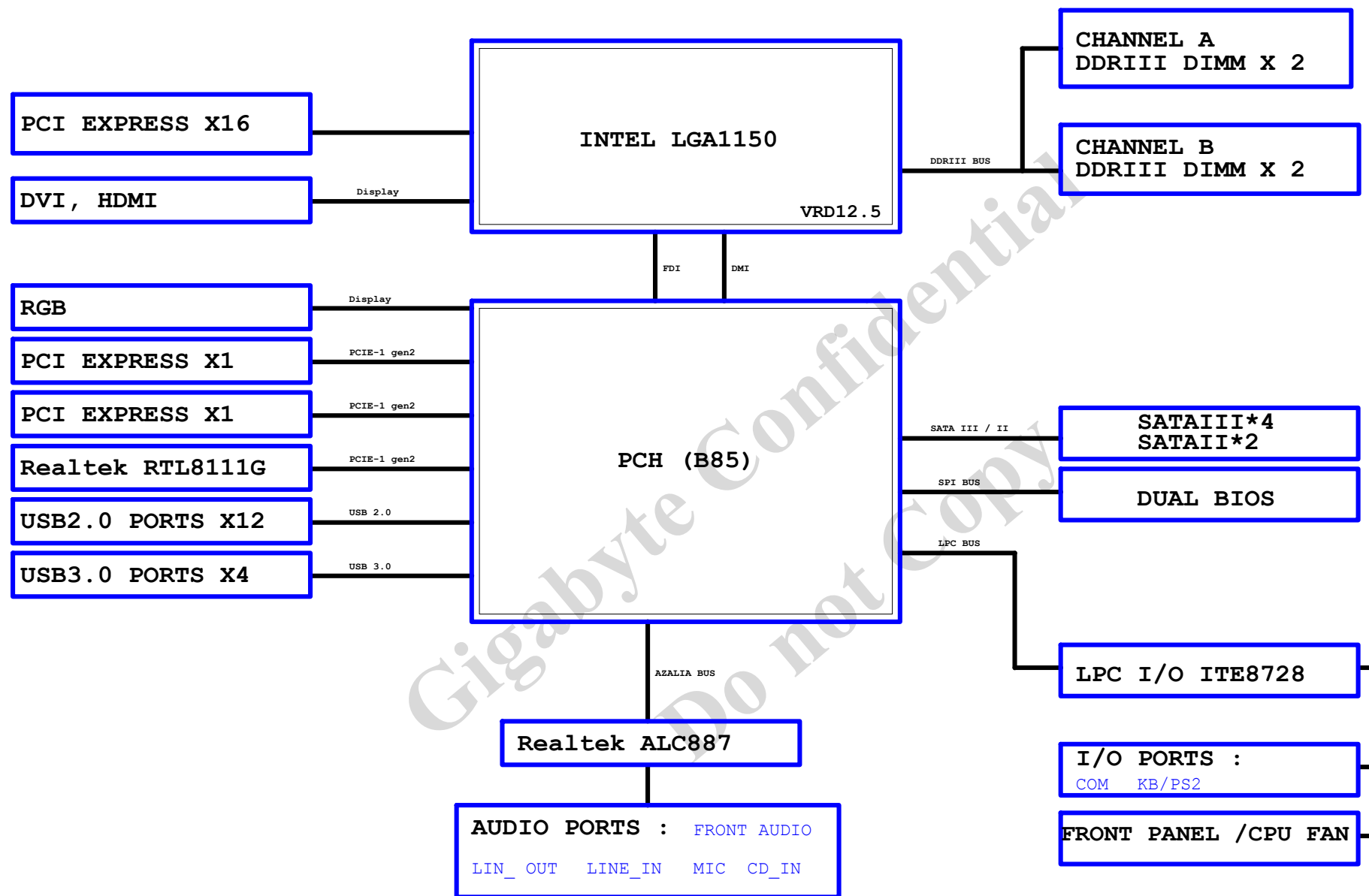
2014/07/31

Data	Change Item	Reason
2013/06/28	ADD RSMRST DELAY	
2013/08/13	Update Rev to 1.1	
	PCIE X16 New Footprint "PCIESLOT-164DN-Q-1"	
2013/08/23		EBOM: 9M85MDS3H-00-11A
2013/09/13	Update to R1.11	
	Follow Crystal Trace Rule	
	SYS_FAN, DDR 0ohm 0402 -> 0603	
	Update Fuse 1206 Footprint "POLYSWITCH-1206-1"	
	Update PPAK Footprint "Q_TDS0N8-GDS-T"	
2013/10/22	NX1: 25M/20p -> 12p	PBOM: 9M85MDS3H-00-11B
	NC7, NX8: 27p -> 10p	
2013/11/04	NC7, NX8: 10p -> 15p	PBOM: 9M85MDS3H-00-11C
2013/11/05	Update to R1.12	PBOM: 9M85MDS3H-00-11D
	Modify NX1 Trace	
2013/11/27	MR17 0ohm -> 0603 FUSE(10FP5-06100B-00R)	PBOM: 9M85MDS3H-00-11E
	ALC887 強壯版 (10HP5-368870-32R)	
2014/02/17	Sales Costdown Rev2.0	
	CPU Power ISL95820 1U2D -> ISL95812 1U1D	
	DVI Non-Level Shift	
	BIOS Size 64M -> 32M	
2014/02/20	SBA線路OPTION,整合電阻成排阻,精簡線路	
2014/02/24	整合電阻成排阻	
2014/02/27	MASK/DEL CAP	
2014/03/07	ADD ESD : NC3,NC4 (22P)	
2014/03/11	NR6改SHT PAD	
2014/03/12	WBC28,30,25,27,31解開MASK	
	COM:BLACK,F_AUDIO:GRAY	
	DEL後窗AUDIO 180P	

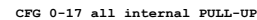
## Circuit or PCB layout change

[illegible]

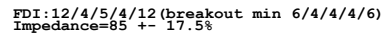
## BLOCK DIAGRAM



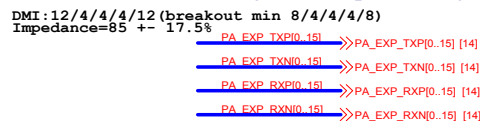
**(E)**



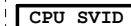
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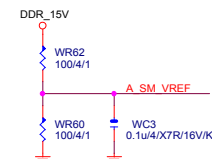
(C)



-CPURST



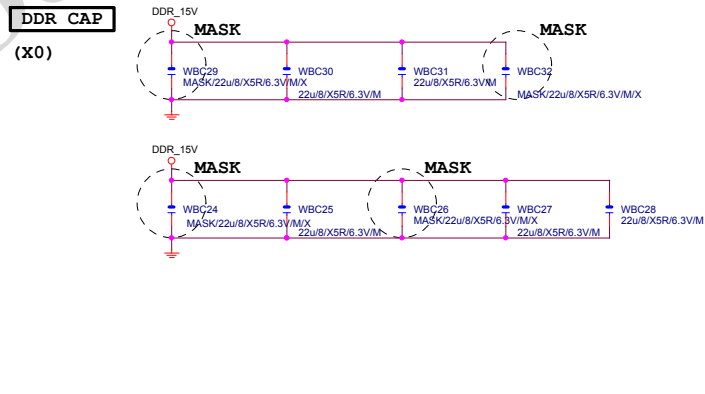
CPU	PU/PD
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LGA1150

(A)

LGA1150A			
MAAA0	AU13	DDR0_MA0	DDR0_D00
MAAA1	AV16	DDR0_MA1	DDR0_D01
MAAA2	AU16	DDR0_MA2	DDR0_D02
MAAA3	AW17	DDR0_MA3	DDR0_D03
MAAA4	AU17	DDR0_MA4	DDR0_D04
MAAA5	AW18	DDR0_MA5	DDR0_D05
MAAA6	AW17	DDR0_MA6	DDR0_D06
MAAA7	AT18	DDR0_MA7	DDR0_D07
MAAA8	AU18	DDR0_MA8	DDR0_D08
MAAA9	AT19	DDR0_MA9	DDR0_D09
MAAA10	AW11	DDR0_MA10	DDR0_D10
MAAA11	AV19	DDR0_MA11	DDR0_D11
MAAA12	AU19	DDR0_MA12	DDR0_D12
MAAA13	AY10	DDR0_MA13	DDR0_D13
MAAA14	AT20	DDR0_MA14	DDR0_D14
MAAA15	AU21	DDR0_MA15	DDR0_D15
MODT_A0	AW10	DDR0_ODT0	DDR0_D16
MODT_A1	AY3	DDR0_ODT1	DDR0_D17
MODT_A2	AW9	DDR0_ODT2	DDR0_D18
MODT_A3	AU8	DDR0_ODT3	DDR0_D19
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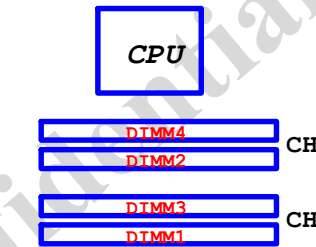
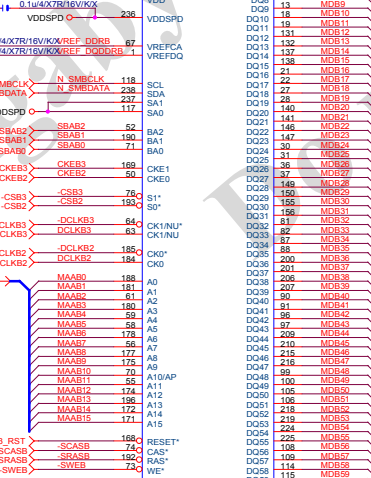




## DDR3\_3



~~-DQSB[0..7]~~      <-DQSB[0..7] [5]  
 DQSB[0..7]      <-DQSB[0..7] [5]  
 MODT\_B[0..31]      <->MODT\_B[0..31] [5]

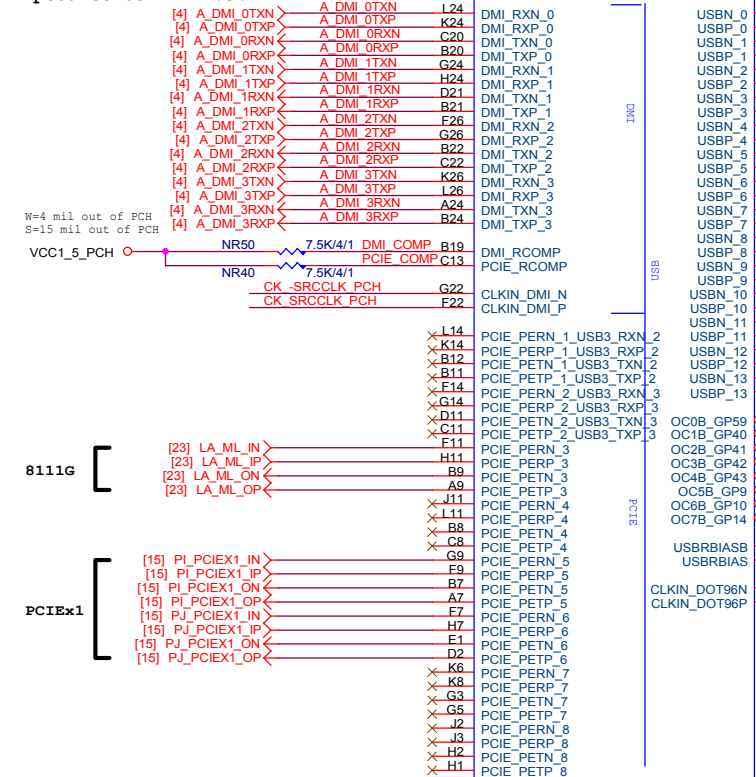


Gigabyte Technology			
Title DDRIII CHANNEL B			
Size Custom	Document Number GA-B85M-DS3H		Rev 3.0
Date:	Sheet	8	of 30



(B)

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



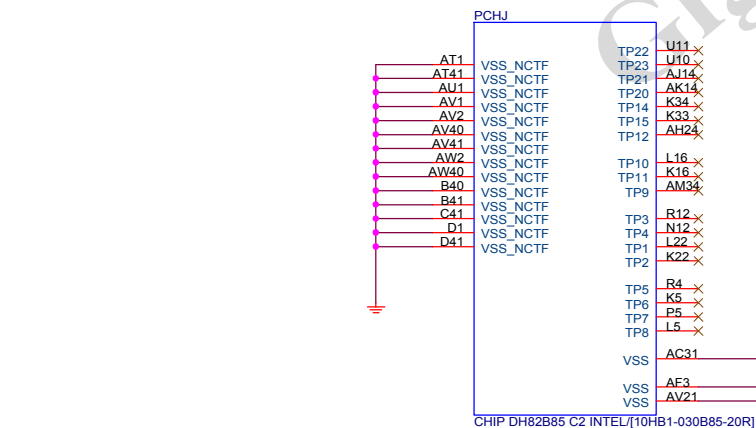
放靠近 Device & PCI-E Slot  
Impedance=80 +- 17.5%

```

_PCIEX1:16/5/5/5/16_(breakout_min_8/4/4/4/8)

```

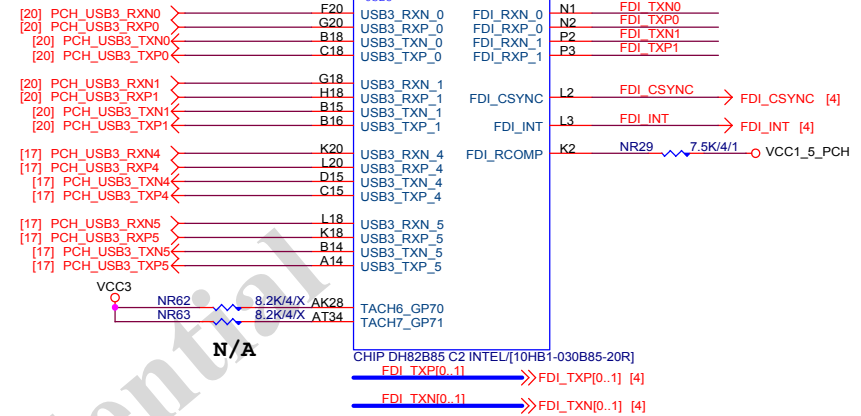
(J)



CHIP DH82B85 C2 INTEL/[10HB1-030B85-20R]

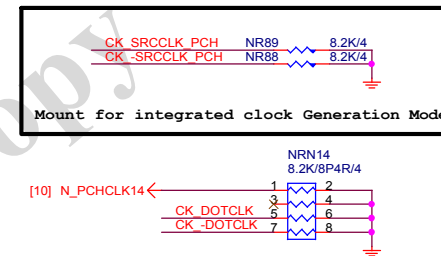
**(F)**

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



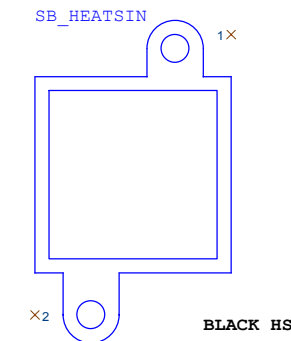
USB3.0:20/5/7/5/20 (breakout min  
8/4/4/4/8) ; ONLY 3 VIAS  
Impedance=85 +- 17.5%  
Back Panel < 10000 MILS  
Front Panel < 6000 MILS

## PCH CLK PD



PCH H/S

## LOW COST ICH7 HEATSINK



PCH\_HS  
PCH\_HS/[12SP2-030005-51R\_12SP2-030005-52R\_12SP2-030005-53R

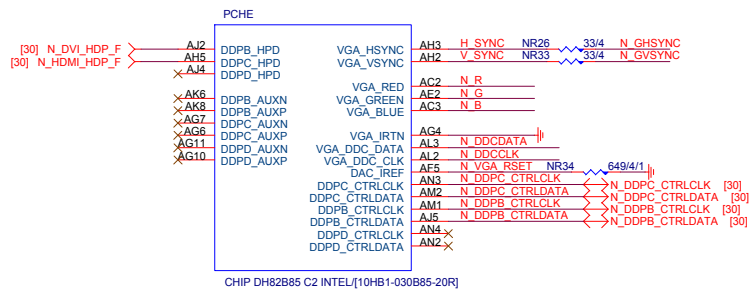
## USB TABLE

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

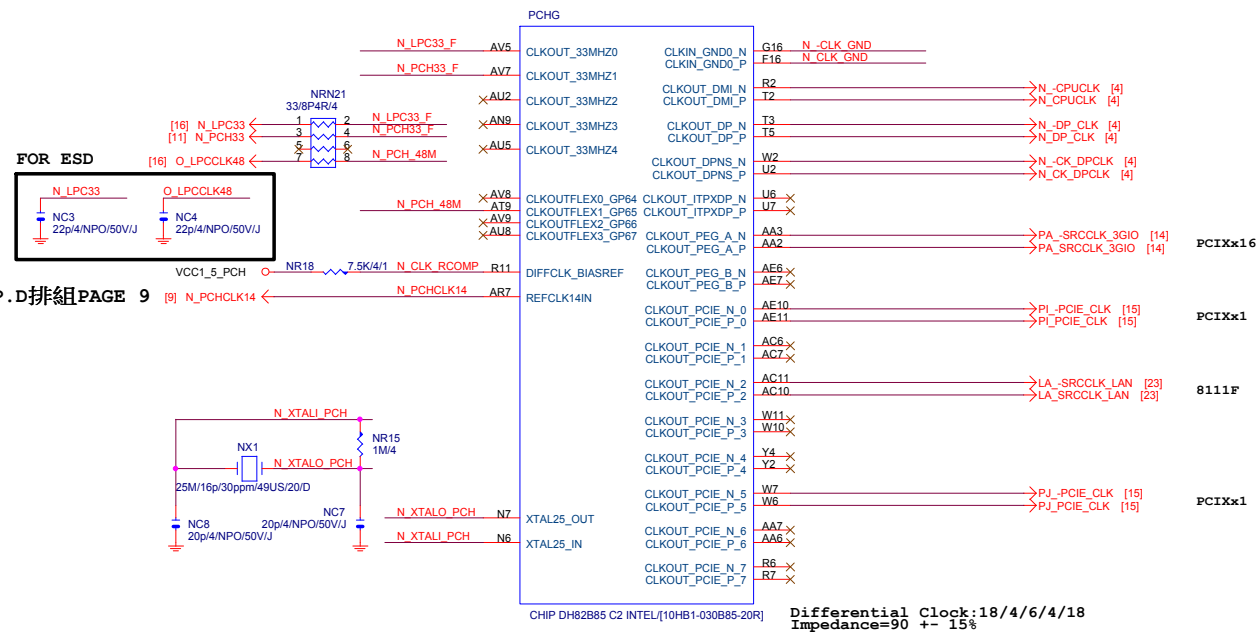
USB OC#	Configure
OC0#	F_USB30
OC1#	USB_LAN
OC2#	R_USB30
OC3#	N/A
OC4#	F_USB1
OC5#	F_USB2
OC6#	KB_MS_USB
OC7#	Not Use

## Gigabyte Technology

Title			
PCH FDI,DMI,USB ,PCIE,NVRAM			
Size	Document Number		Rev
Custom	GA-B85M-DS3H		3.0
Date:	Thursday, September 11, 2014	Sheet	9 of 30

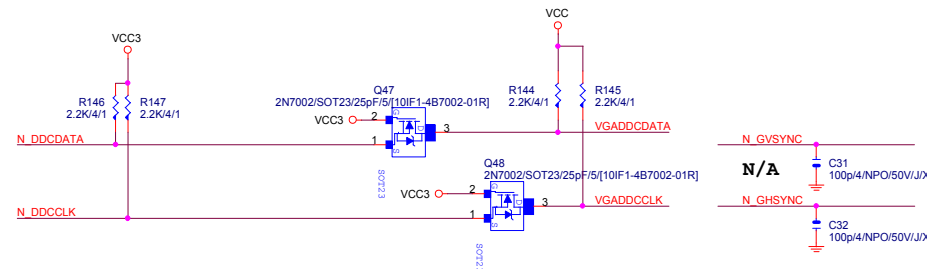
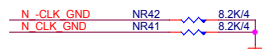


CHIP DH82B85 C2 INTEL/I10HB1-030B85-20R

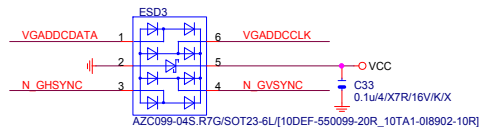


Differential Clock:18/4/6/4/18  
Impedance=90 +- 15%

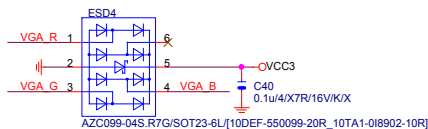
## VGA DDC



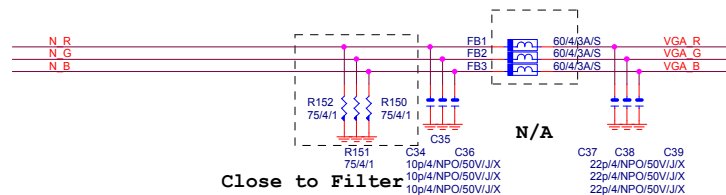
## VGA DDC



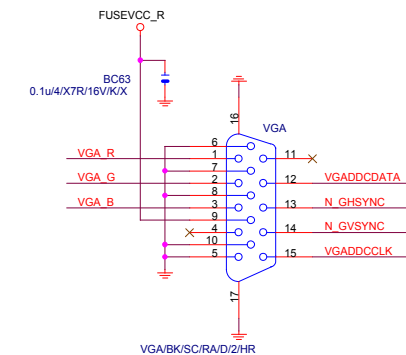
SSOP6 ESD



AZC099-04S.R7G/SOT23-6L/10DEF-550099-20R 10TA1-0I8902-10R



Close to Filter



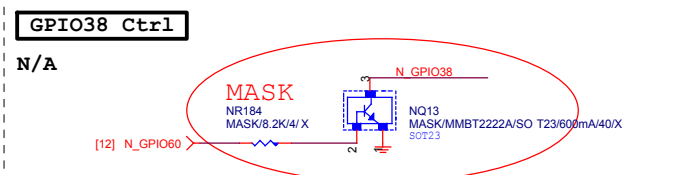
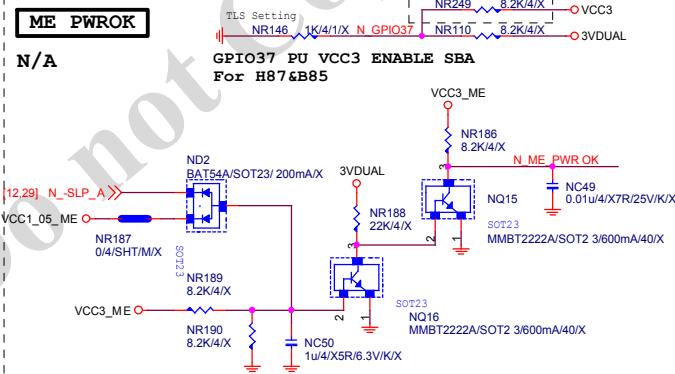
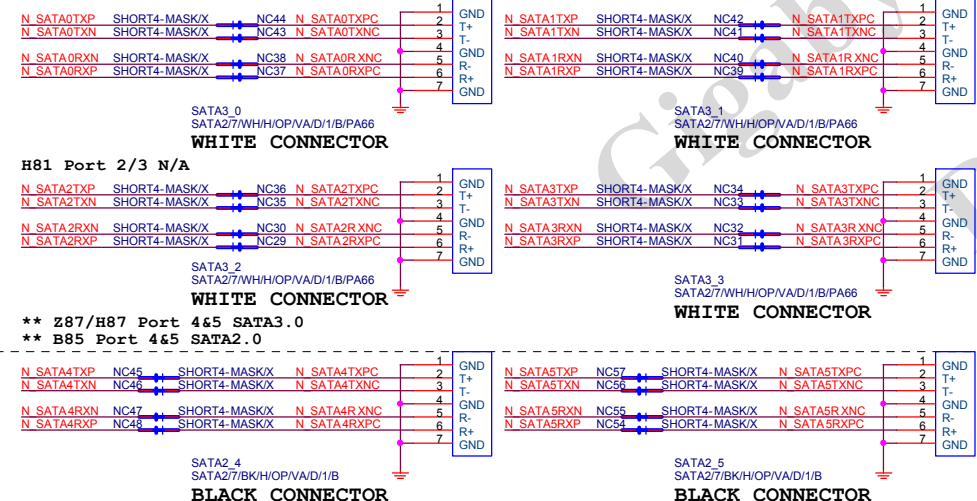
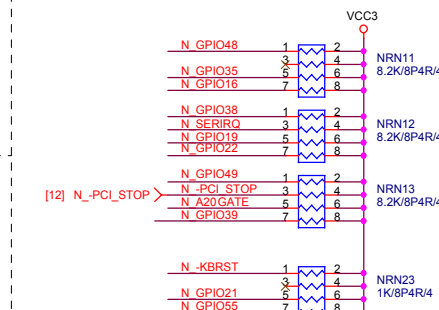
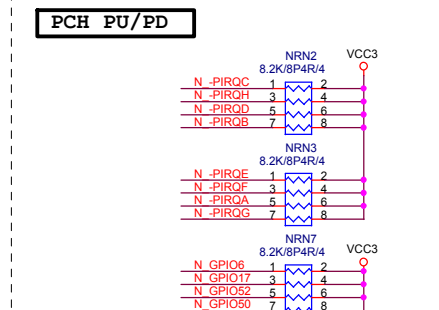
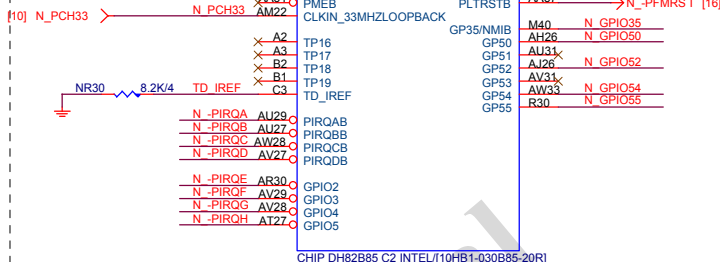
BLACK CONNECTOR

## Gigabyte Technology

Title	PCH DISPLAY ,CLK BUFFER
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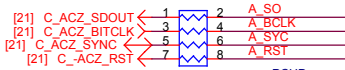
Size	Document Number	<b>GA-B85M-DS3H</b>
Custom		

Date: Thursday, September 11, 2014 Sheet 10



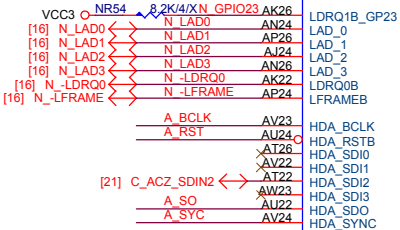
PCH

(D)



[16] N\_LAD[0..3] &lt;&lt; N\_LAD[0..3]

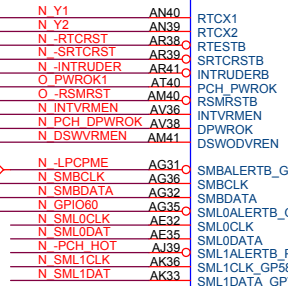
NRN15 33/8P4R/4 PCHD



[21] C\_ACZ\_SDIN2 &lt;&lt; A\_SO, A\_SYNC, A\_RST



[6,11,16] O\_PWROK1, [16,24] O\_RSMRST



CHIP DH82B85 C2 INTEL[10HB1-030B85-20R]

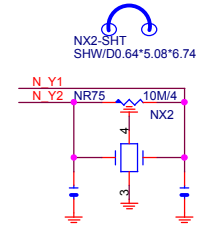
O\_FWROK1

Reserve for EMI test

HSW STRAP13

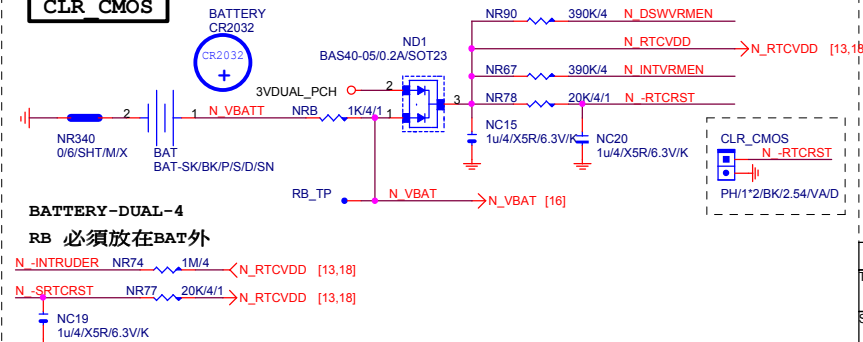
N/A

32.768KHZ



XTALS-RH-N

CLR CMOS



BATTERY-DUAL-4

RB 必須放在BAT外

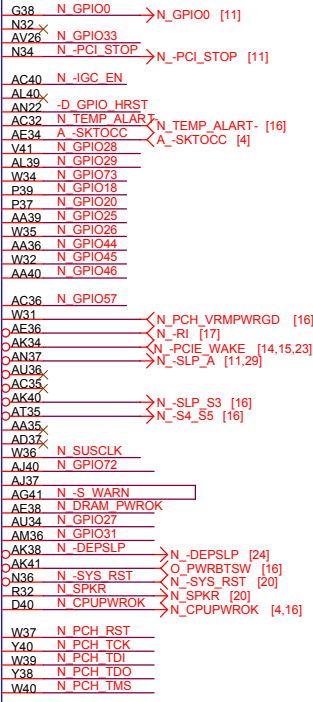
N\_INTRUDER NR74 1M/4 &lt;&lt; N\_RTCVDD [13,18]

N\_SRTICRST NR77 20K/4/1 &lt;&lt; N\_RTCVDD [13,18]

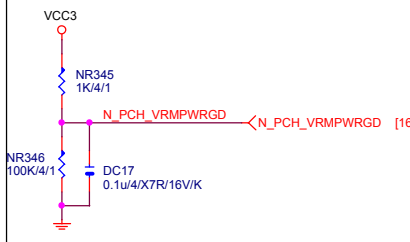
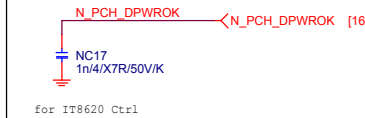
NC19 1u4/X5R/6.3V/K

ACZ SDOUT

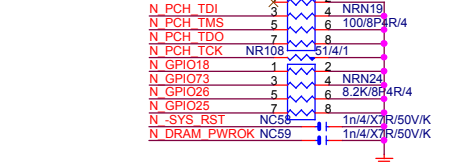
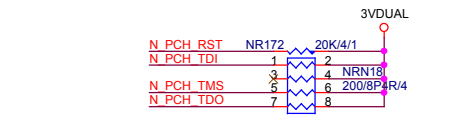
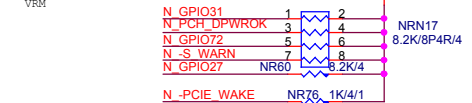
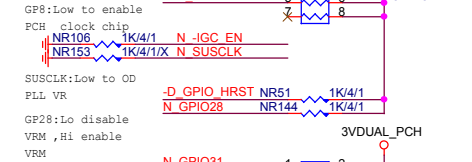
N/A



PCH DPWROK



PCH PU/PD



Gigabyte Technology

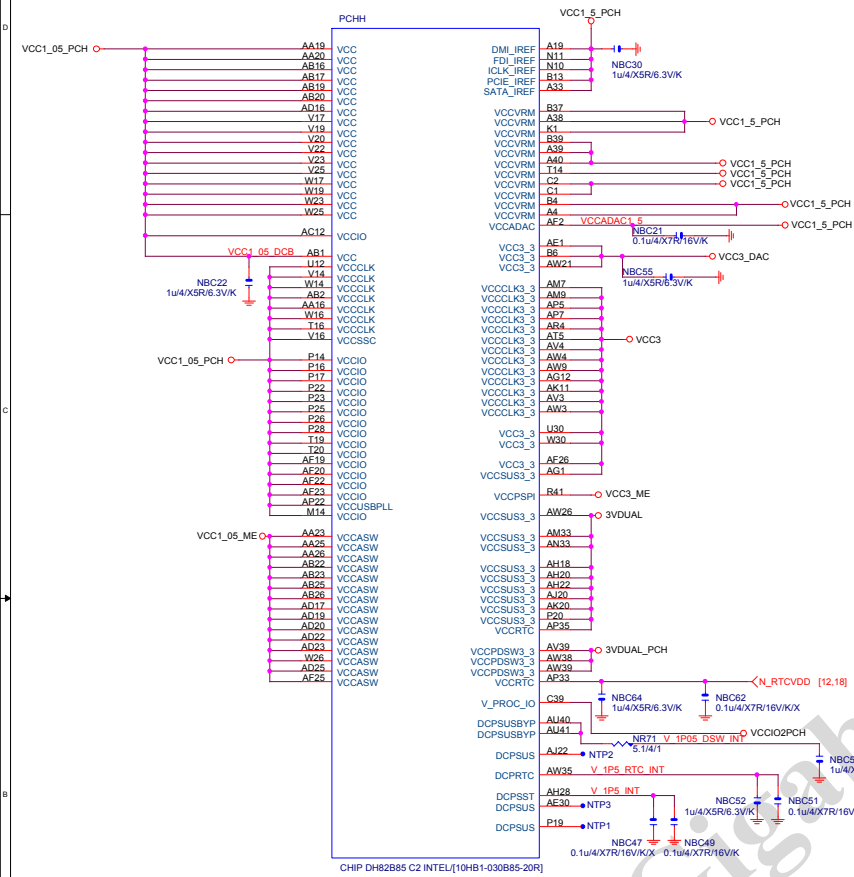
Title		PCH GPIO, CTRL, AUDIO	
Size	Document Number	GA-B85M-DS3H	
Custom		Rev 3.0	
Date:	Thursday, September 11, 2014	Sheet 12	of 30

PCH (H)

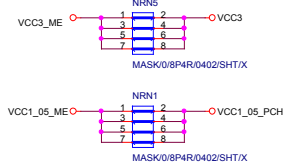
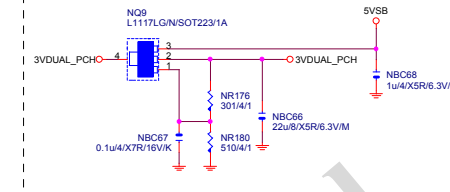
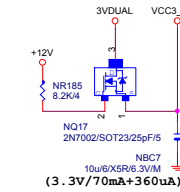
VCC3\_DAC

3VDUAL\_PCH

SHT\_PWR

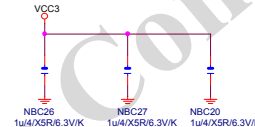


CLOSE北橋 (注意震盪水波紋)

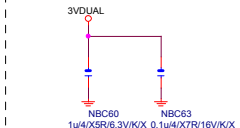
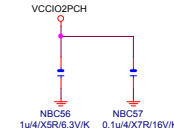


CAP

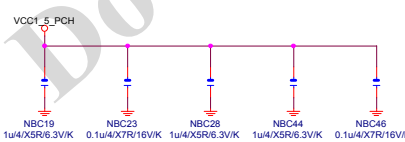
(3.3V) (X3)



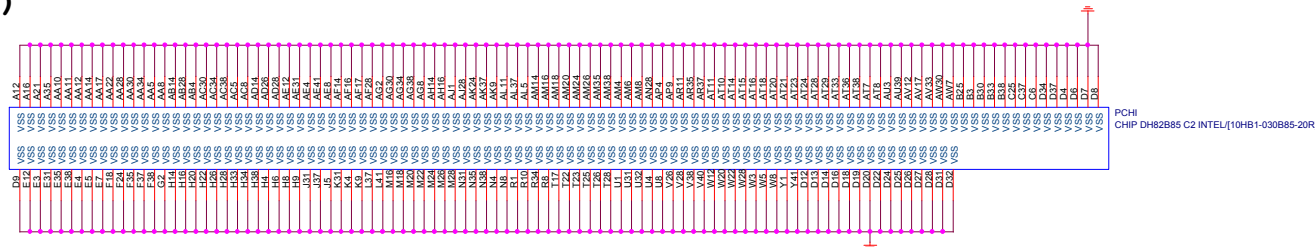
(1.05V)(X2) (3.3V) (X2)



(1.5V) (X5)



PCH (I)



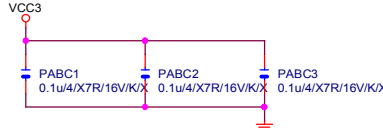
Gigabyte Technology

Title		
PCH_PWR_GND		
Size	Document Number	Rev
Custom	GA-B85M-DS3H	3.0
Date	Thursday, September 11, 2014	Sheet 13 of 30

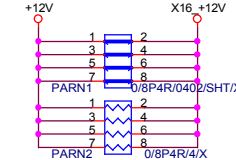


# PCIEX16 CAP

N/A



# PCIEX16 PROTECT SHT



# PCIEX16 AC CAP

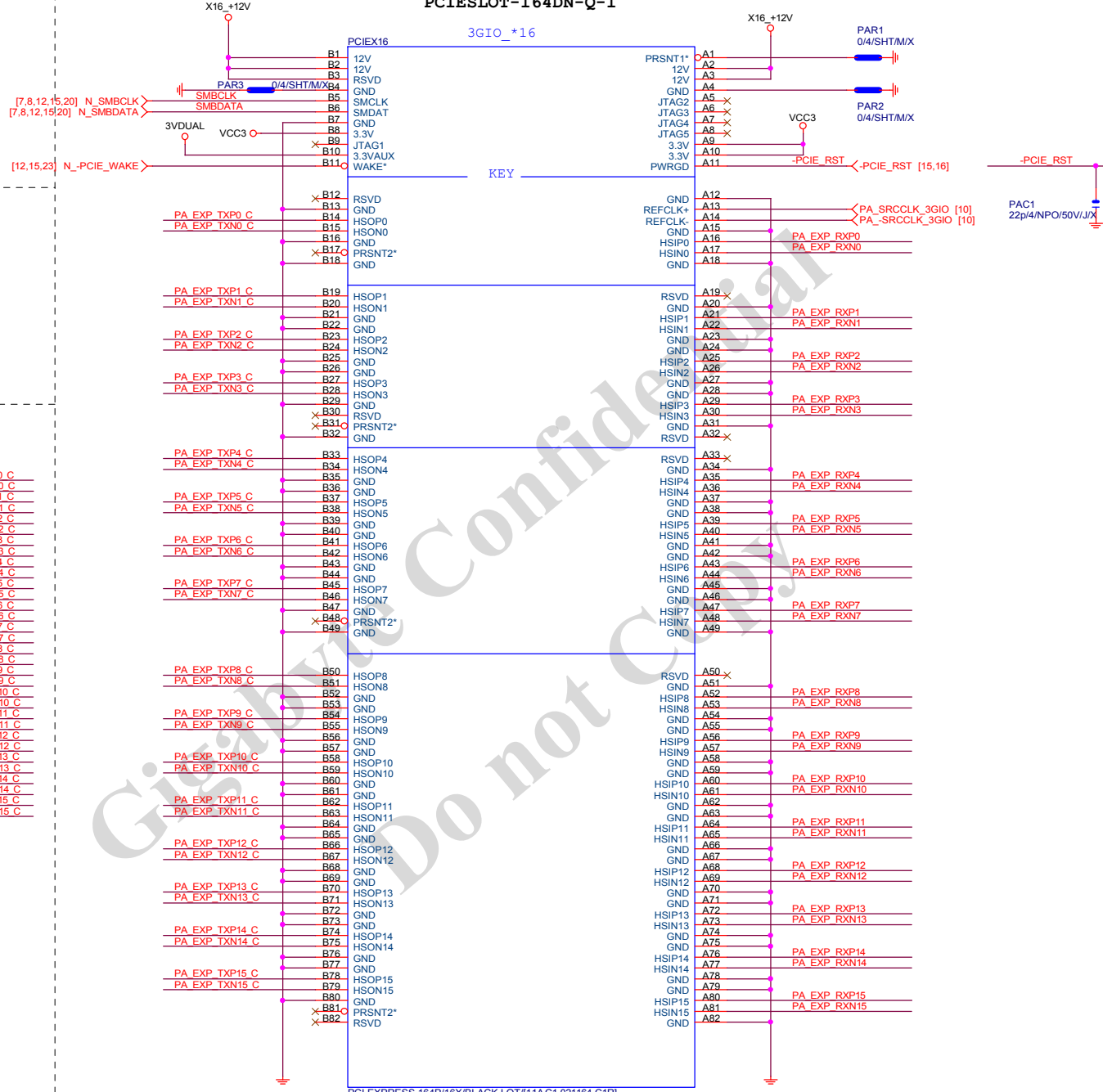
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PA EXP TXN0	PAC4	0.22u4/X5R/6.3V/K	PA EXP TXN0 C
PA EXP TXP1	PAC6	0.22u4/X5R/6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC7	0.22u4/X5R/6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC8	0.22u4/X5R/6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC9	0.22u4/X5R/6.3V/K	PA EXP TXN2 C
PA EXP TXP3	PAC10	0.22u4/X5R/6.3V/K	PA EXP TXP3 C
PA EXP TXN3	PAC11	0.22u4/X5R/6.3V/K	PA EXP TXN3 C
PA EXP TXP4	PAC12	0.22u4/X5R/6.3V/K	PA EXP TXP4 C
PA EXP TXN4	PAC13	0.22u4/X5R/6.3V/K	PA EXP TXN4 C
PA EXP TXP5	PAC14	0.22u4/X5R/6.3V/K	PA EXP TXP5 C
PA EXP TXN5	PAC15	0.22u4/X5R/6.3V/K	PA EXP TXN5 C
PA EXP TXP6	PAC16	0.22u4/X5R/6.3V/K	PA EXP TXP6 C
PA EXP TXN6	PAC17	0.22u4/X5R/6.3V/K	PA EXP TXN6 C
PA EXP TXP7	PAC18	0.22u4/X5R/6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC19	0.22u4/X5R/6.3V/K	PA EXP TXN7 C
PA EXP TXP8	PAC20	0.22u4/X5R/6.3V/K	PA EXP TXP8 C
PA EXP TXN8	PAC21	0.22u4/X5R/6.3V/K	PA EXP TXN8 C
PA EXP TXP9	PAC22	0.22u4/X5R/6.3V/K	PA EXP TXP9 C
PA EXP TXN9	PAC23	0.22u4/X5R/6.3V/K	PA EXP TXN9 C
PA EXP TXP10	PAC24	0.22u4/X5R/6.3V/K	PA EXP TXP10 C
PA EXP TXN10	PAC25	0.22u4/X5R/6.3V/K	PA EXP TXN10 C
PA EXP TXP11	PAC26	0.22u4/X5R/6.3V/K	PA EXP TXP11 C
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PA EXP TXP12	PAC28	0.22u4/X5R/6.3V/K	PA EXP TXP12 C
PA EXP TXN12	PAC29	0.22u4/X5R/6.3V/K	PA EXP TXN12 C
PA EXP TXP13	PAC30	0.22u4/X5R/6.3V/K	PA EXP TXP13 C
PA EXP TXN13	PAC31	0.22u4/X5R/6.3V/K	PA EXP TXN13 C
PA EXP TXP14	PAC32	0.22u4/X5R/6.3V/K	PA EXP TXP14 C
PA EXP TXN14	PAC33	0.22u4/X5R/6.3V/K	PA EXP TXN14 C
PA EXP TXP15	PAC34	0.22u4/X5R/6.3V/K	PA EXP TXP15 C
PA EXP TXN15	PAC35	0.22u4/X5R/6.3V/K	PA EXP TXN15 C

PA EXP RXP0 [15] >>> PA\_EXP\_RXP[0..15] [4]  
 PA EXP RXN0 [15] >>> PA\_EXP\_RXN[0..15] [4]  
 PA EXP TXP0 [15] >>> PA\_EXP\_TXP[0..15] [4]  
 PA EXP TXN0 [15] >>> PA\_EXP\_TXN[0..15] [4]

# PCIEX16 SLOT

www.xinxunwei.com 400-800-9990

PCIESLOT-164DN-Q-1



PCI EXPRESS 164P/16X/BLACK LOT/(11AC1-021164-C1R)

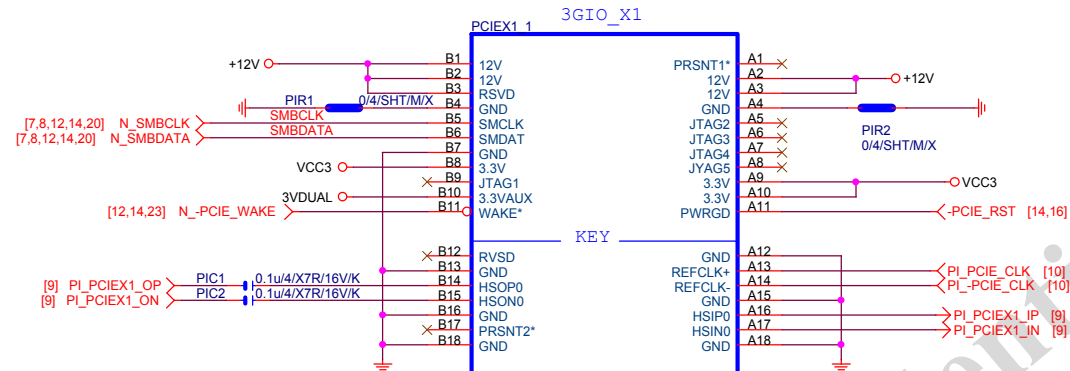
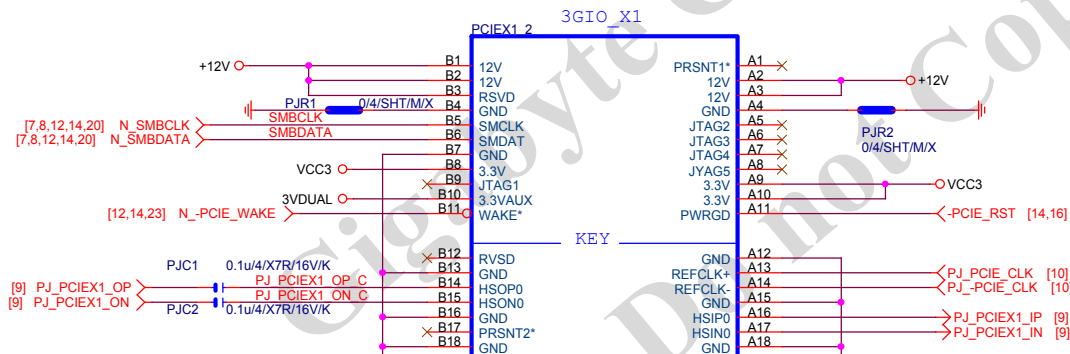
BLACK CONNECTOR

Gigabyte Technology

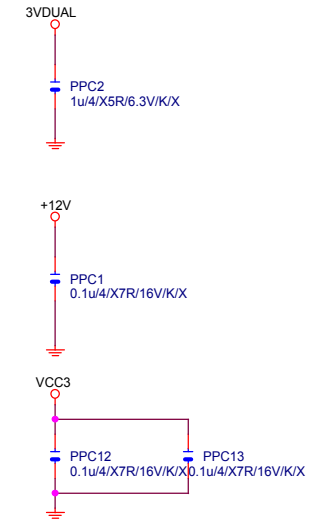
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Size			GA-B85M-DS3H		
Custom			Rev 3.0		
Date:			Thursday, September 11, 2014		
			Sheet 14 of 30		



## PCIEX1 SLOT

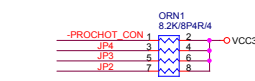
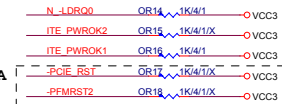
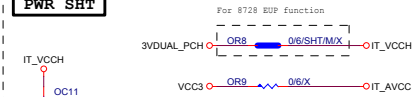
PCI-E/1X-36P/BK/OL  
BLACK CONNECTORPCI-E/1X-36P/BK/OL  
BLACK CONNECTOR

N/A

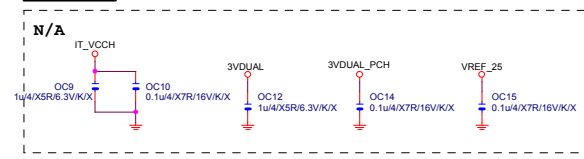
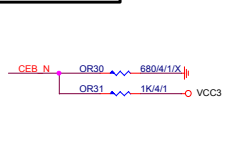
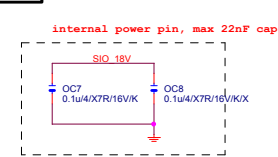
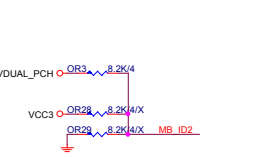
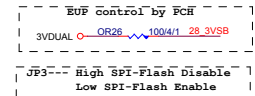


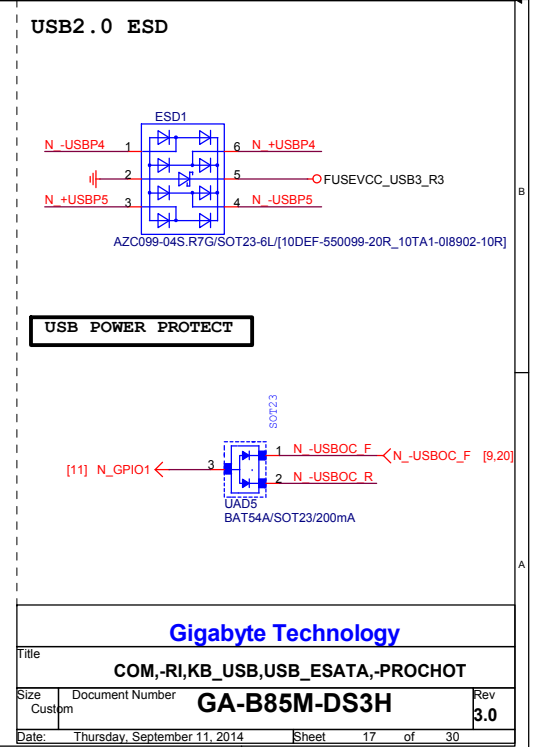
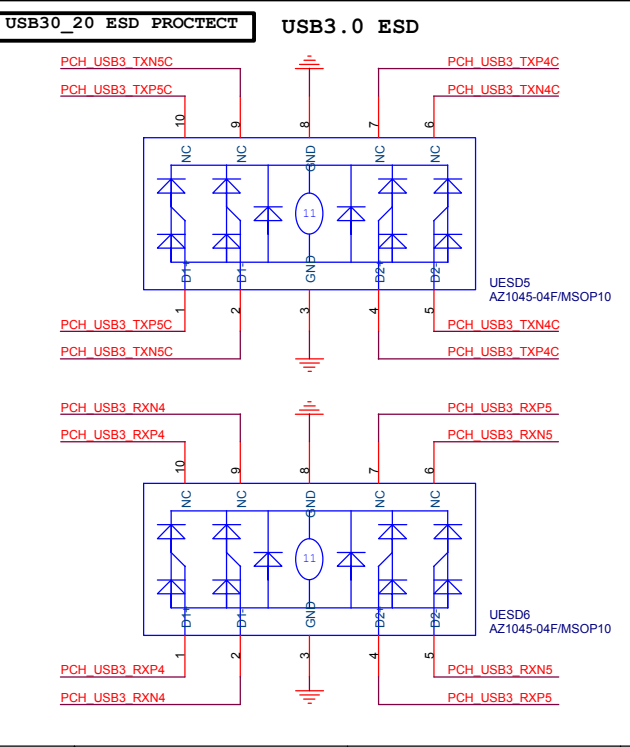
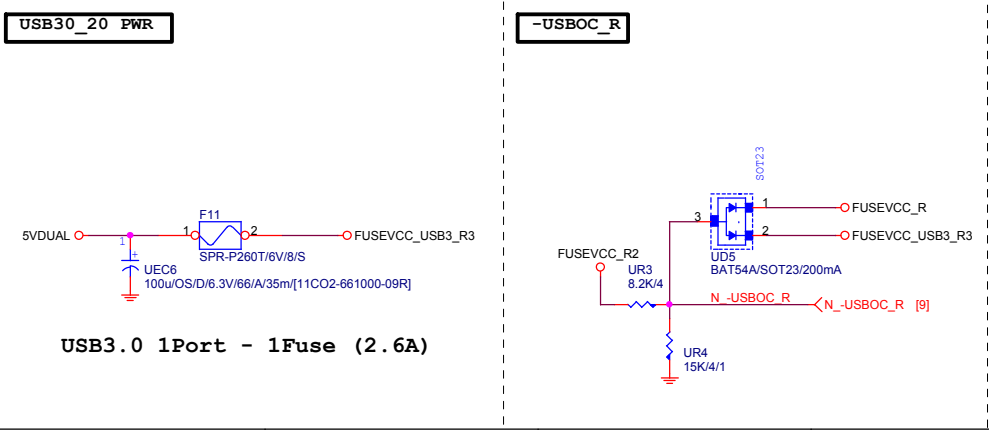
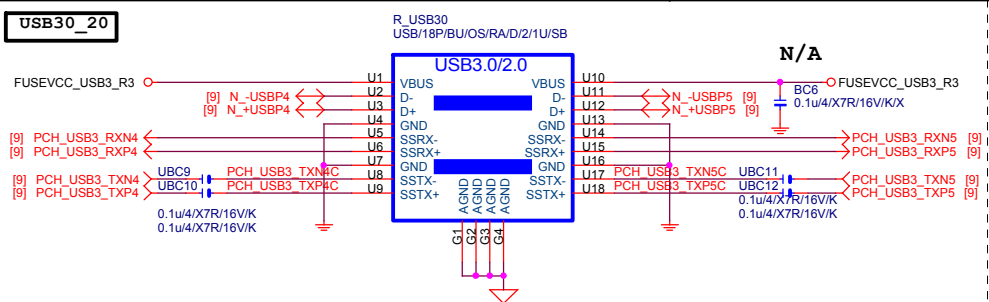
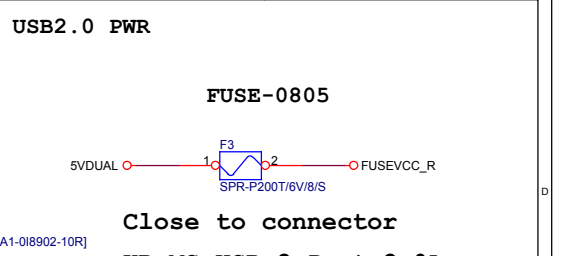
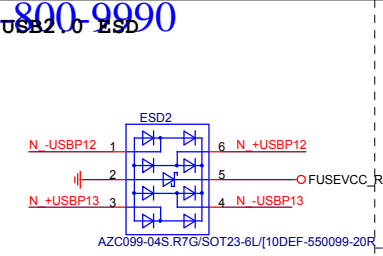
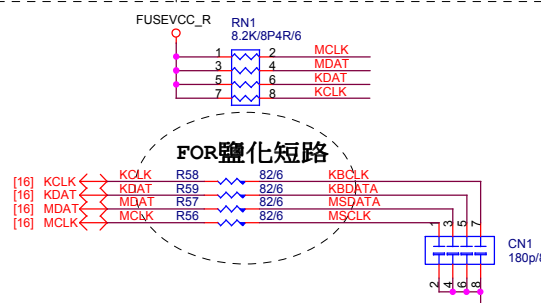
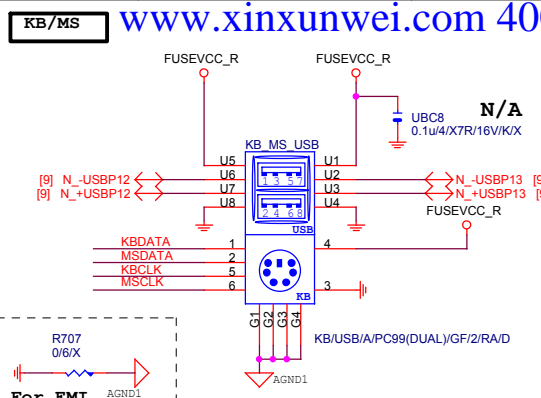
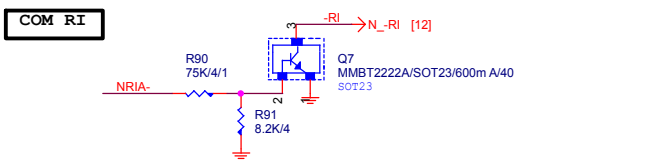
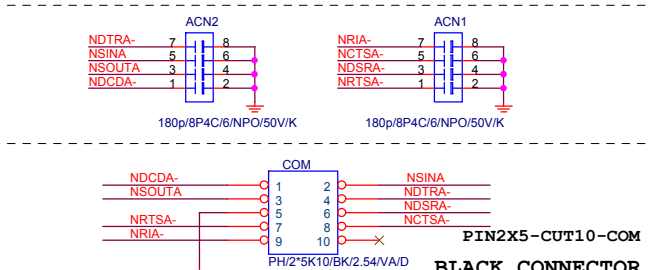
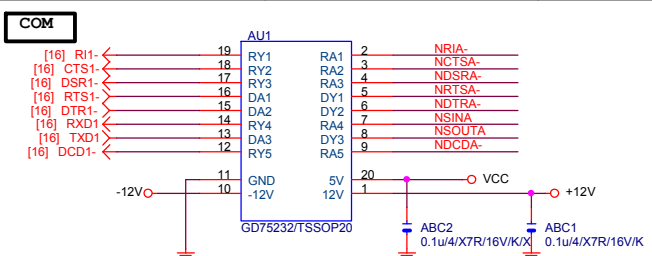
Gigabyte Technology

Title		PCI EXPRESS X 1 PORT	
Size	Document Number	GA-B85M-DS3H	
Custom		Rev 3.0	
Date:	Thursday, September 11, 2014	Sheet 15	of 30

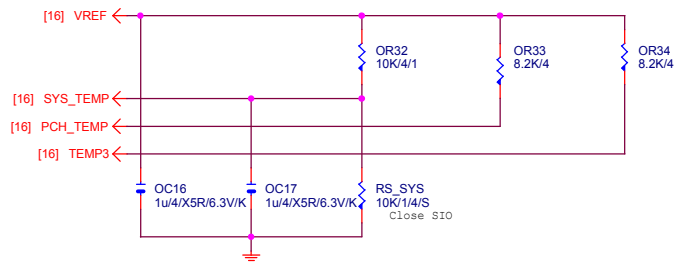
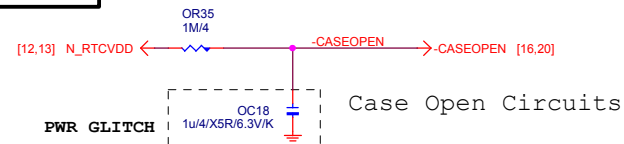


ITE recommend



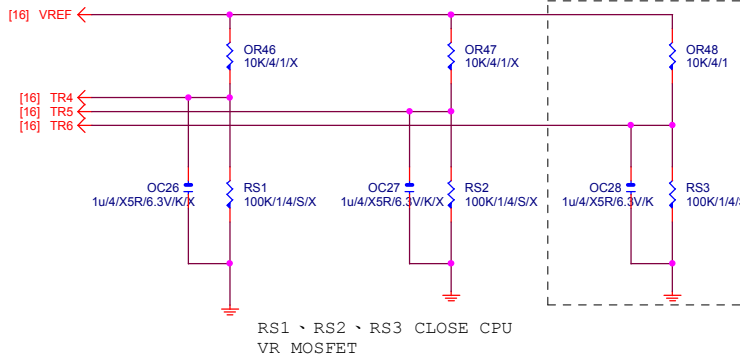
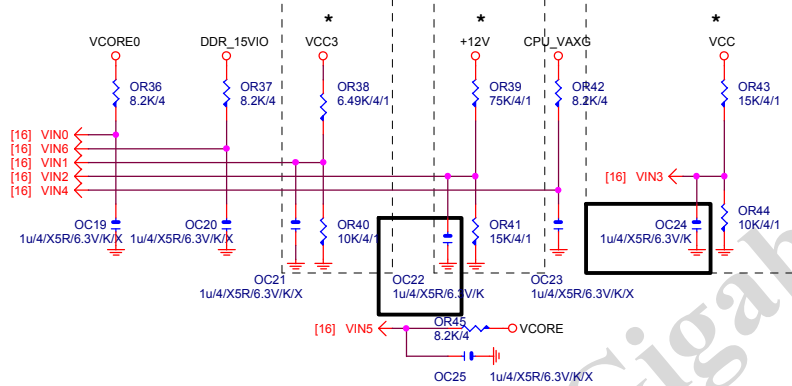
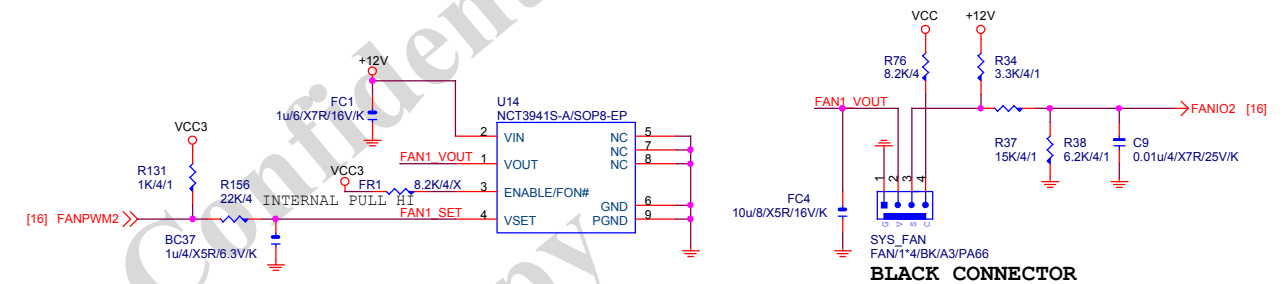


Gigabyte Technology			
Title			
COM,-RI,KB_USB,USB_ESATA,-PROCHOT			
Size	Document Number	GA-B85M-DS3H	
Custom		Rev 3.0	
Date:	Thursday, September 11, 2014	Sheet	17 of 30

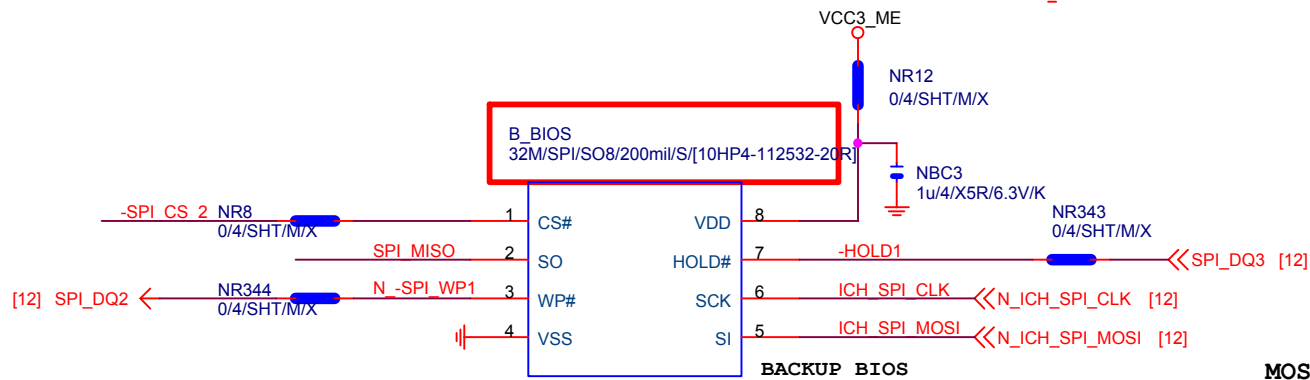
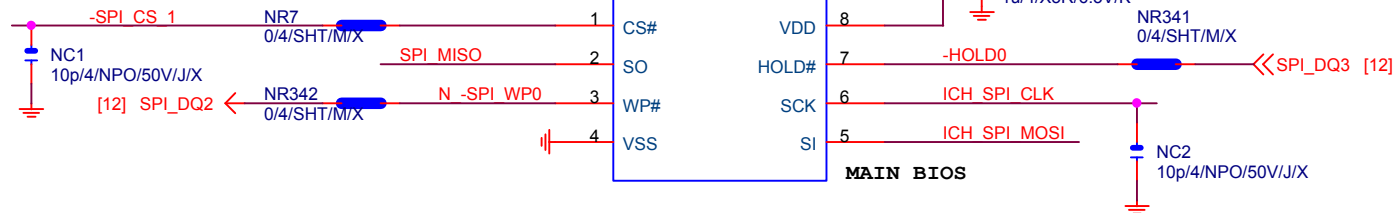
**TEMP H/W MONITOR****CASE OPEN****VOLTAGE-- H/W MONITOR**

VIN2: 75K/15K = 2V

VIN3: 15K/10K = 2V

**SYS SMART FAN****BLACK CONNECTOR****Gigabyte Technology**

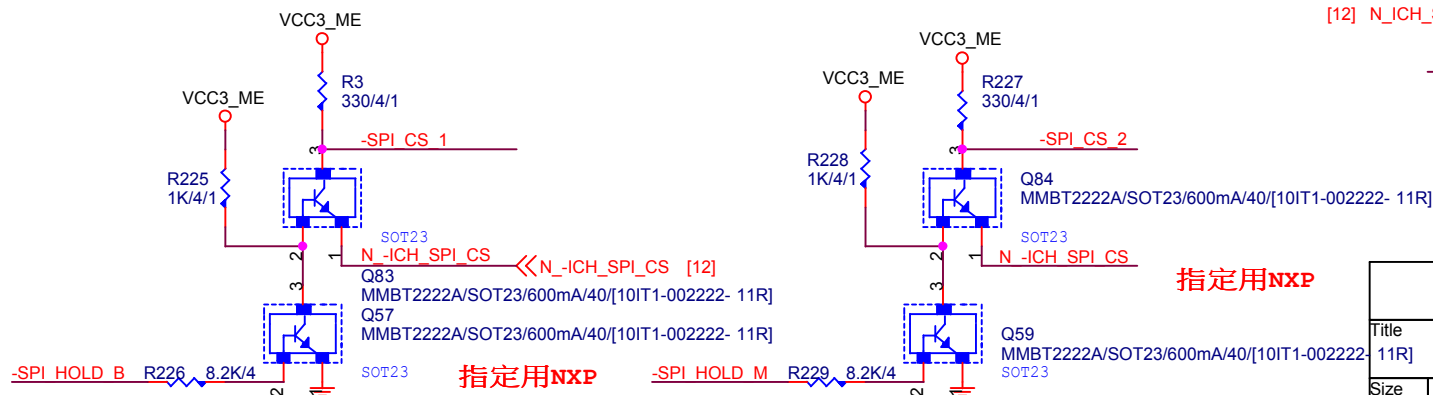
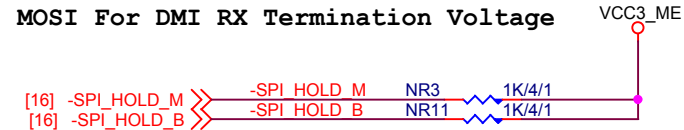
Title			HWM,FAN CTRL,OV	
Size	Document Number	GA-B85M-DS3H		Rev
Custom				3.0
Date:	Thursday, September 11, 2014	Sheet	18	of 30



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

1 means floating  
0 means PD 1K

MOSI For DMI RX Termination Voltage

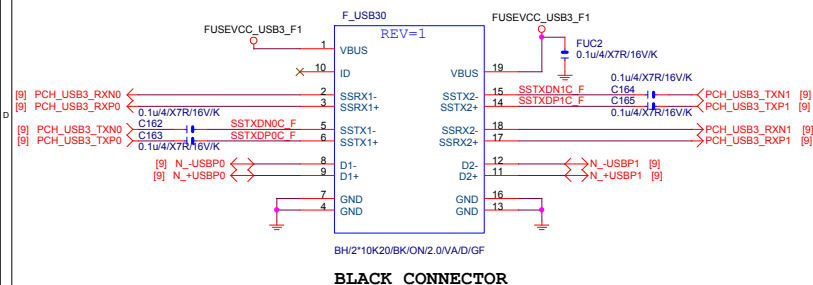


指定用NXP

Gigabyte Technology

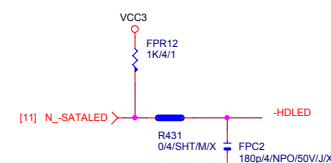
Title		DUAL BIOS	
Size		GA-B85M-DS3H	
Custom		Rev 3.0	
Date:		Thursday, September 11, 2014	
Sheet		19 of 30	

## F\_USB30

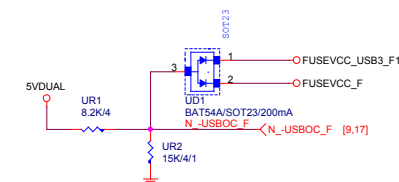


USB3.0 1Port - 1Fuse (3.5A)

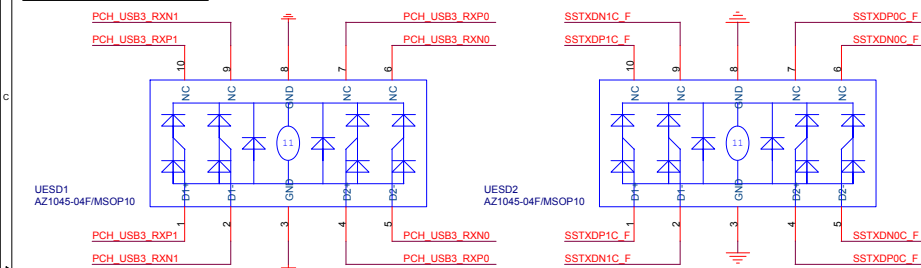
## SATA\_355



## -USBOC\_F

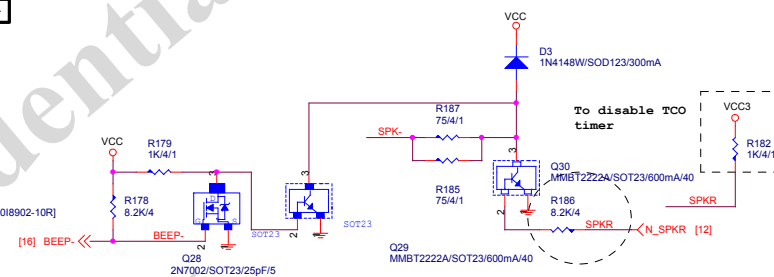


## F\_USB30 ESD PROTECT

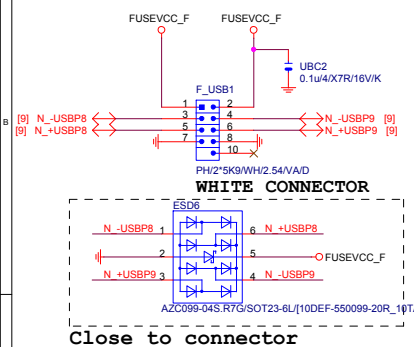


Close to connector

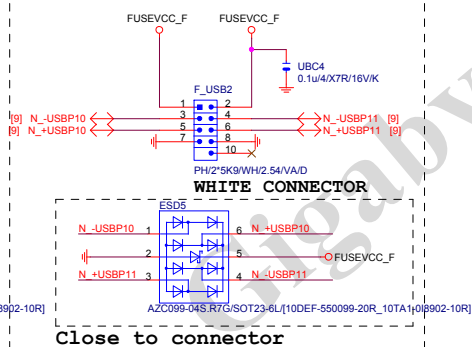
## SPKR



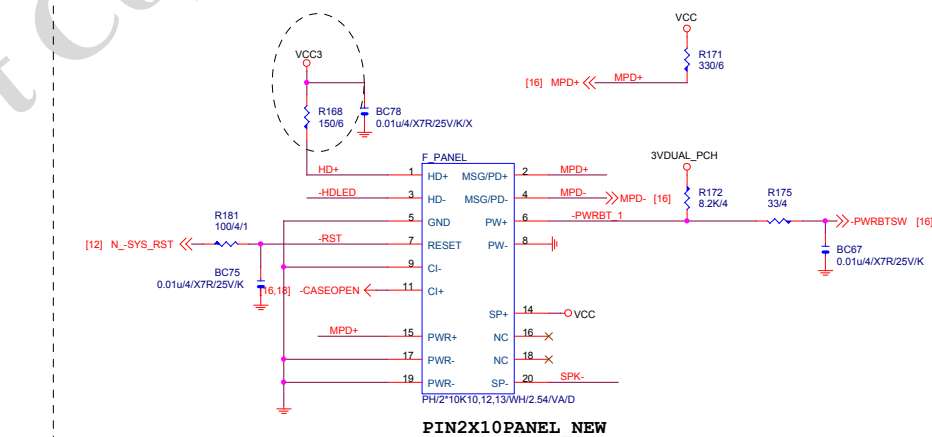
## FRONT USB1



## FRONT USB2



## INTEL FRONT PANEL



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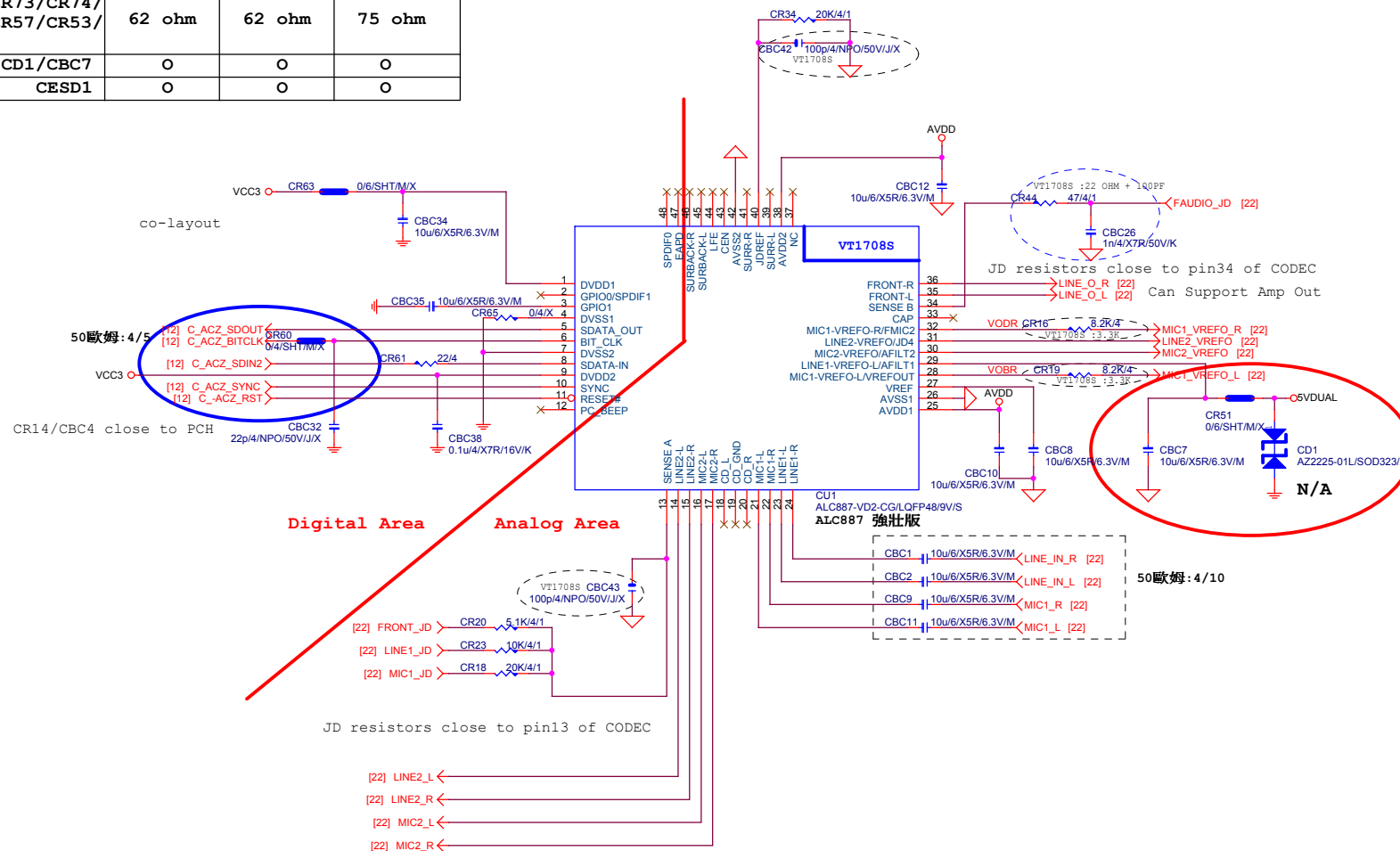
File	Document Number	Rev
FP,F_USB,USB PWR,SPKR,SATA LED	GA-B85M-DS3H	3.0
Size	Custom	
Date	Thursday, September 11, 2014	Sheet 20 of 30



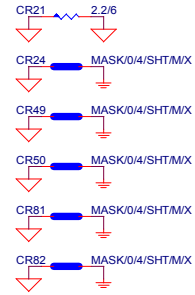
AZALIA CODEC

ALC892/ALC887-VD2/VT1708-CE Colay

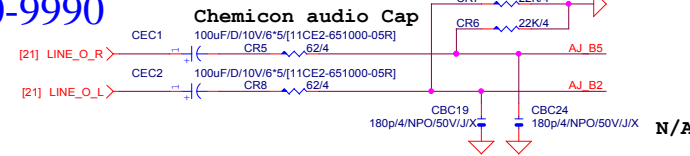
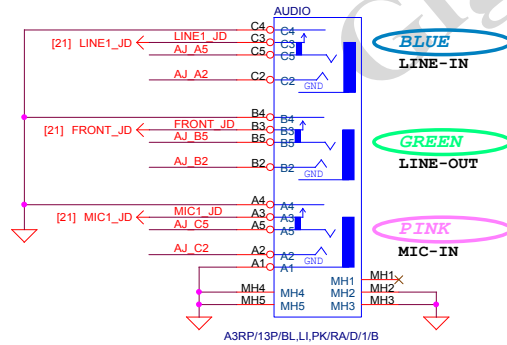
	ALC892	ALC887-VD2	VT1708S-CE
CR44/CBC26	47ohm+1nF	47ohm+1nF	22ohm+100P
CBC42/CBC43	X	X	100P/4
CR6/CR7/CR58/CR54/ CR67/CR68/CR69/CR70	22K/4	22K/4	10K/4/1
CR5/CR8/CR1/CR14/ CR17/CR22/CR73/CR74/ CR13/CR11/CR57/CR53/ CR75/CR76	62 ohm	62 ohm	75 ohm
CR51/CD1/CBC7	O	O	O
CESD1	O	O	O



CONFIDENTIAL



SPDIF\_OUT



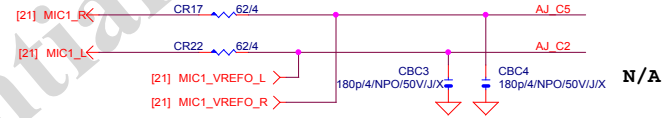
LINE-IN

Verify MIC function  
 in LINE-in

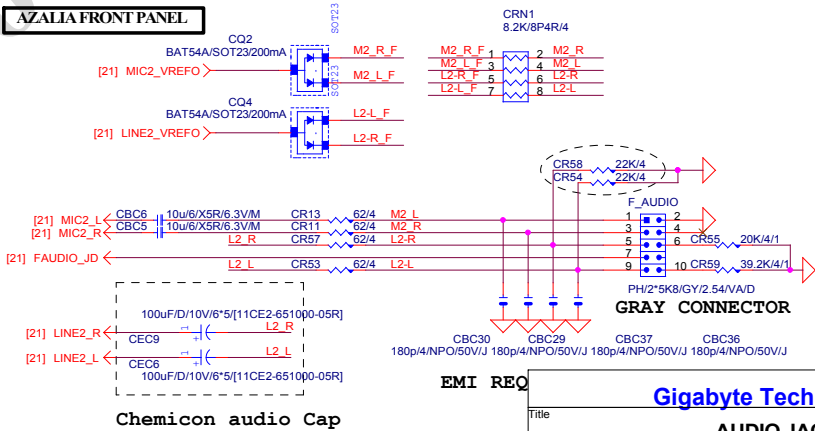
Only reserved for ALC888

For 889A/888

MIC-IN



AZALIA FRONT PANEL

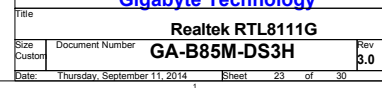


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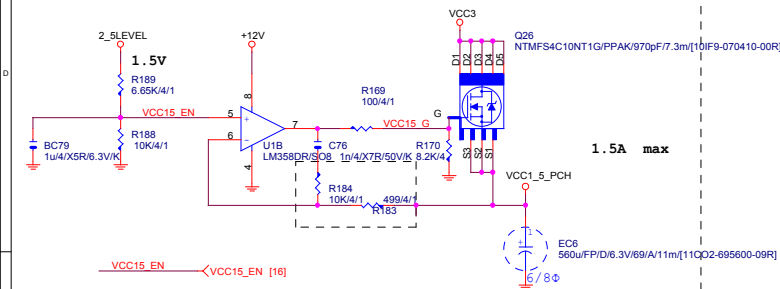
AUDIO JACK

GA-B85M-DS3H

Rev 3.0



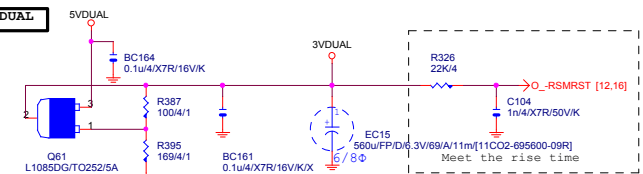
VCC1\_5\_PCH



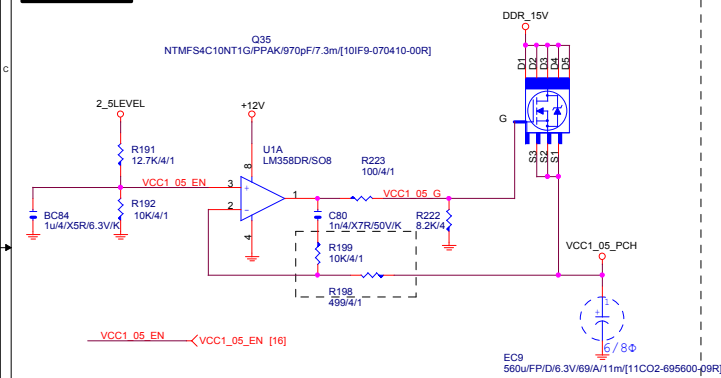
2\_5LEVEL



3VDUAL

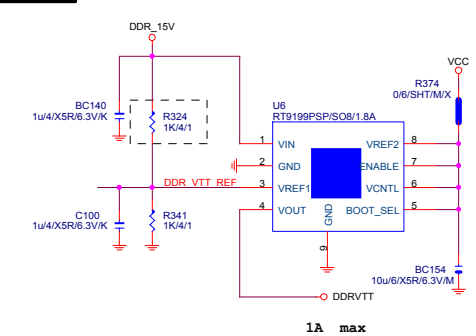


VCC1\_05\_PCH

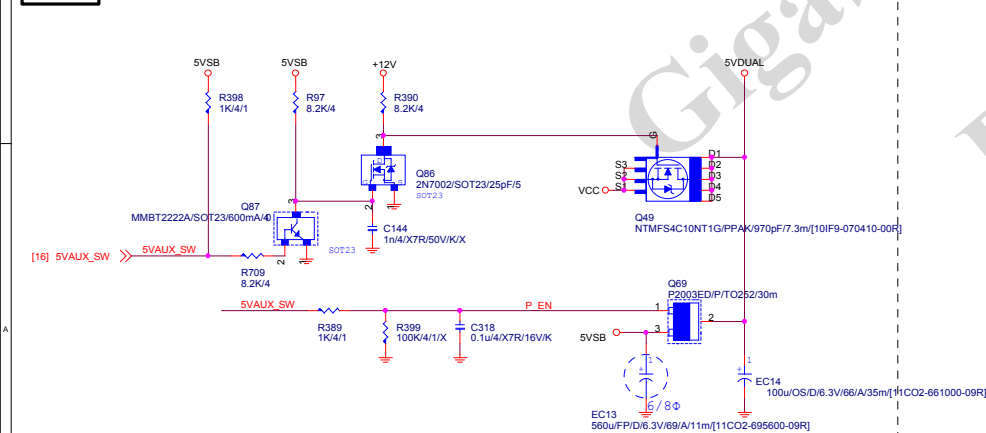


N/A

DDR\_VTT



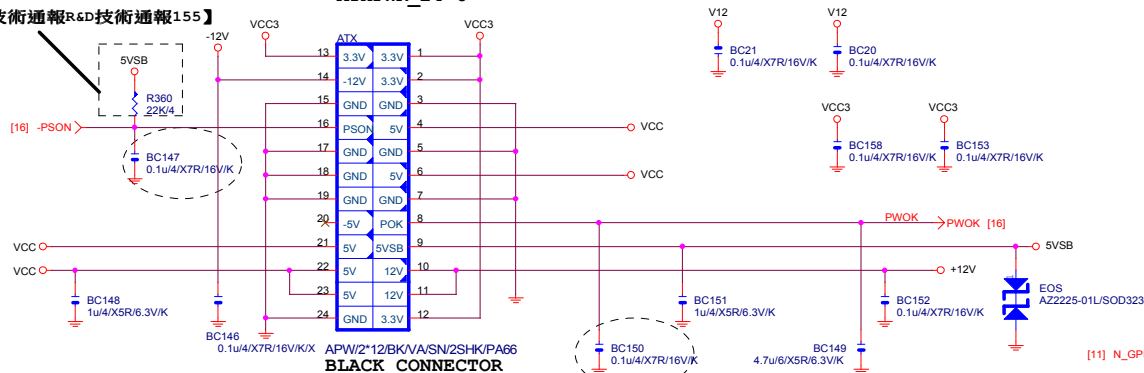
5VDUAL



# ATXX24 POWER CONNECTOR

【技術通報R&D技術通報155】

ATXPWR\_24-6

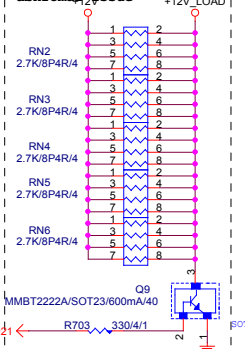


APW/2\*12/BK/VA/SN/2SHK/PA66  
BLACK CONNECTOR

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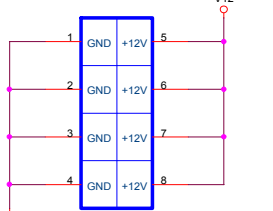
【技術通報R&D技術通報155】

To fix 12V light load abnormal issue



# ATXX4 POWER CONNECTOR

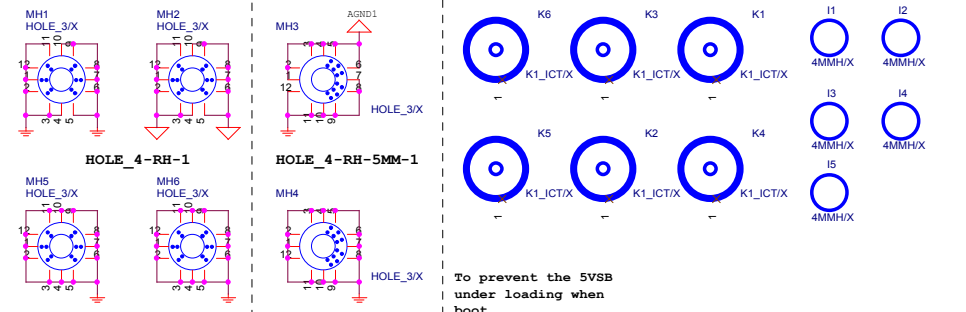
ATXPW2X4-6



BLACK CONNECTOR

ATX\_12V\_2x4  
APW/2\*4/BK/OC/PI/4.2VA/SN/OH

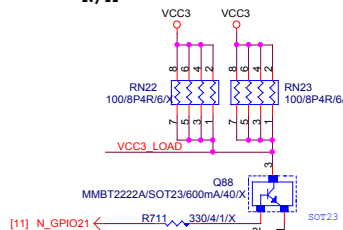
TPM



To prevent the 5VSB under loading when boot

FIX PWR MINMUN LOAD

N/A



PWOK PATCH

【技術通報R&D技術通報154】

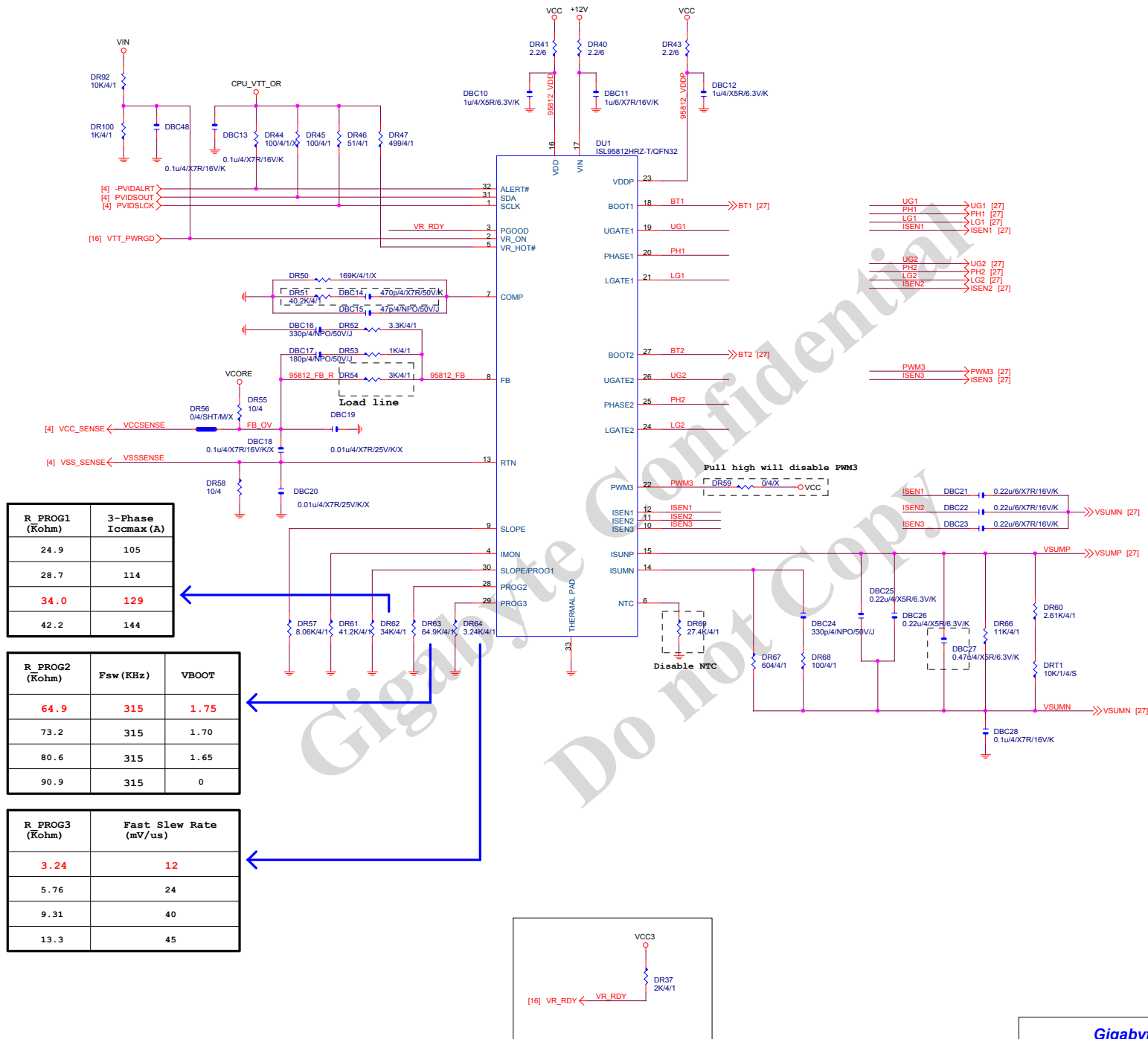
Gigabyte Technology

ATX CONNECTOR

GA-B85M-DS3H

Rev 3.0

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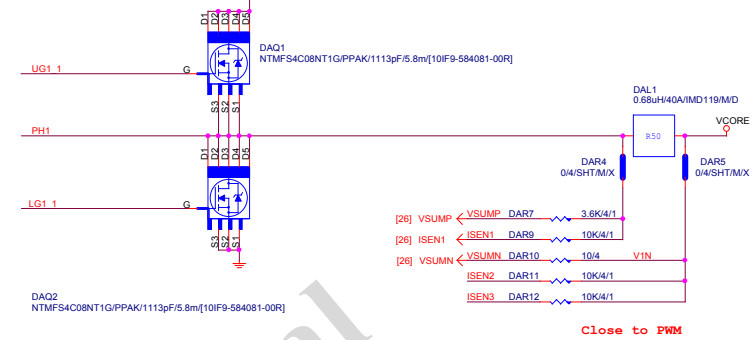
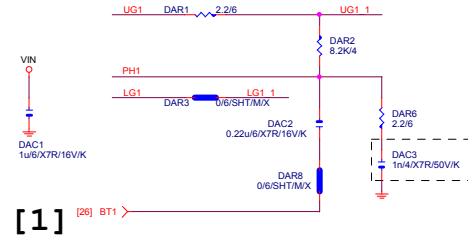
Gigabyte Technology

File			CPU CORE VR-1
Size	Custom	Document Number	GA-B85M-DS3H
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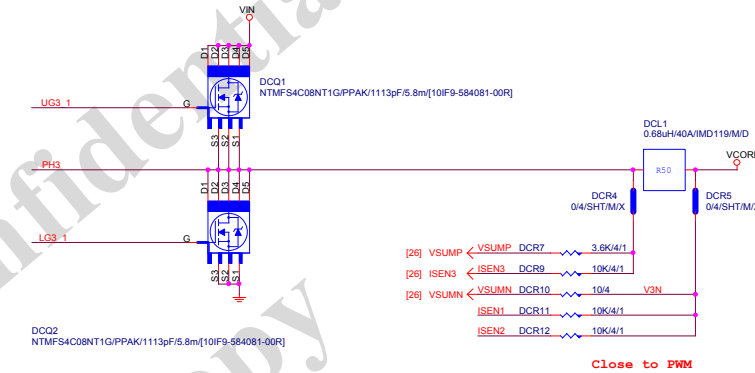
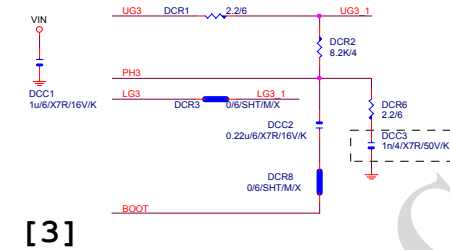
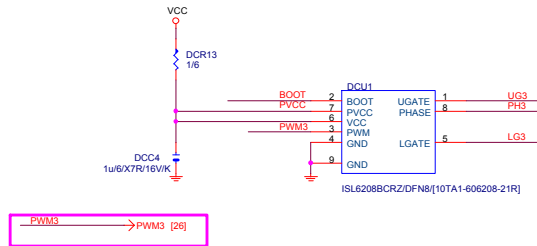
Rev  
3.0



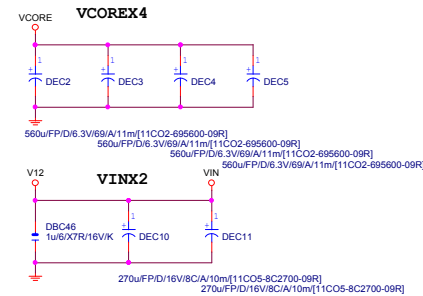
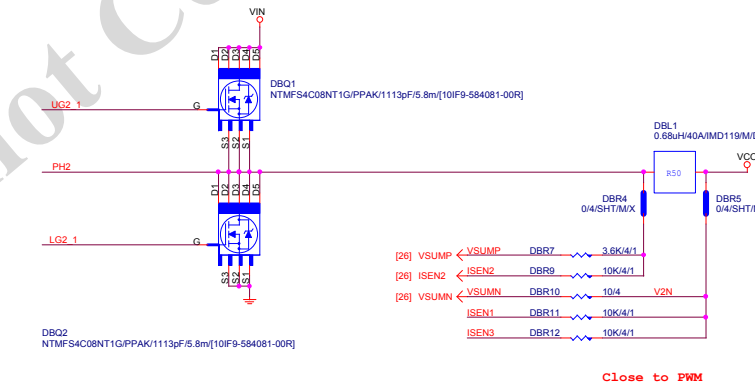
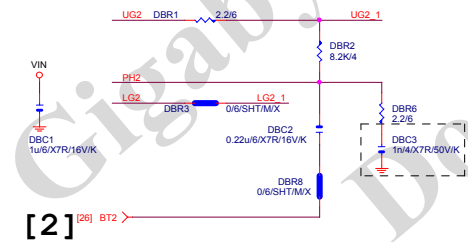
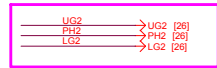
## PHASE 1



## PHASE 3



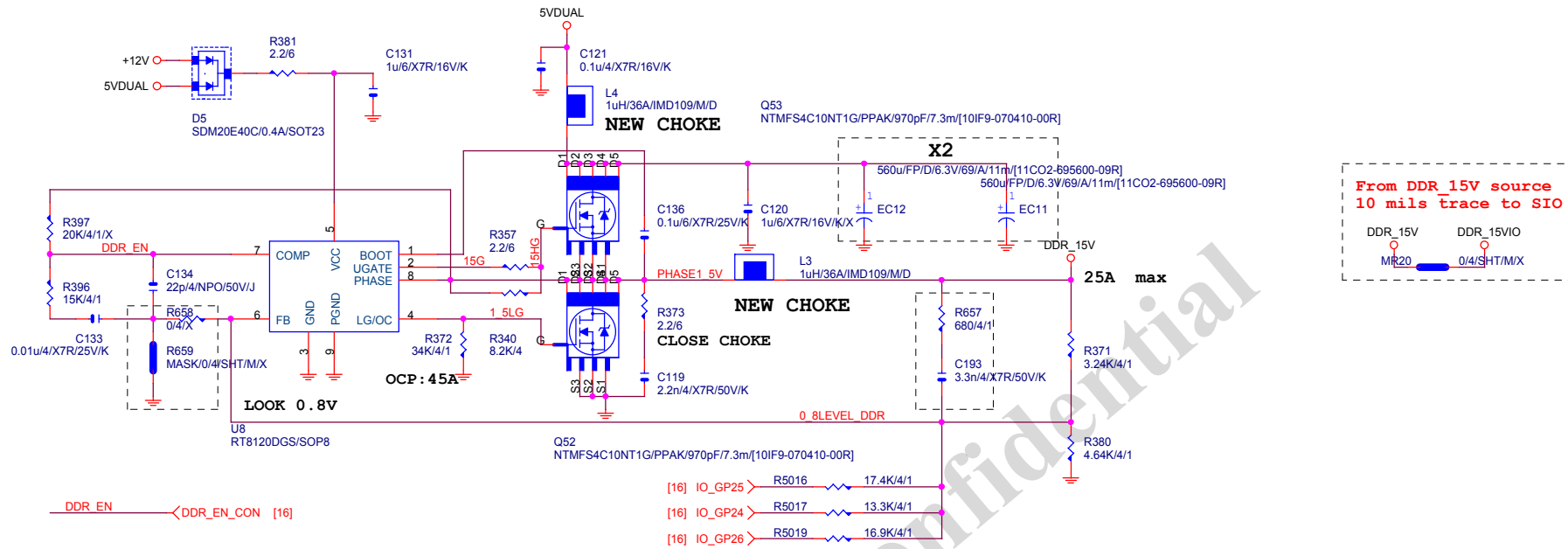
## PHASE 2



Gigabyte Technology

File		CPU CORE VR-2	
Size	Document Number	GA-B85M-DS3H	
Custom			Rev 3.0
Date	Thursday, September 11, 2014	Sheet	27 of 30

## DDR15V



## PWR\_SEQ

GP26	H	L	L	L
GP25	H	H	L	H
GP24	H	H	H	L
	1.35V	1.50V	1.65V	1.70V

VIN=5V, VOUT=1.5V, IOUT=25A, PHASE=1

IRMS=11.45A

560u/FP/D/6.3V/68/8m RIPPLE CURRENT=4.7A

Coefficient=1.7 (85°C), 1 (105°C)

VIN Ripple current=4.7X1.7=7.99A (85°C)

-->故固態電容須2X7.99=15.98>11.45A

Rocset= (Iocp\*Lgate, rdson) / Iocset

Rocset= (45A\*6.7mOhm) / 10uA = 30K

Iocset=10uA

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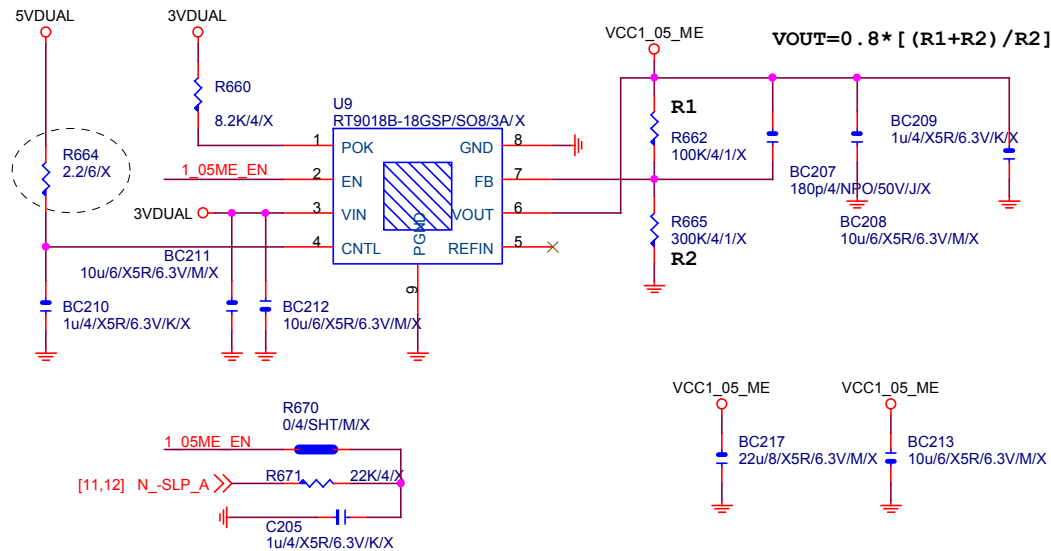
Title			
DDR POWER			
Size	Document Number	GA-B85M-DS3H	
Custom			Rev 3.0
Date:	Thursday, September 11, 2014	Sheet 28 of 30	

VCC1\_05\_ME

## 【技術通報R&amp;D技術通報156】

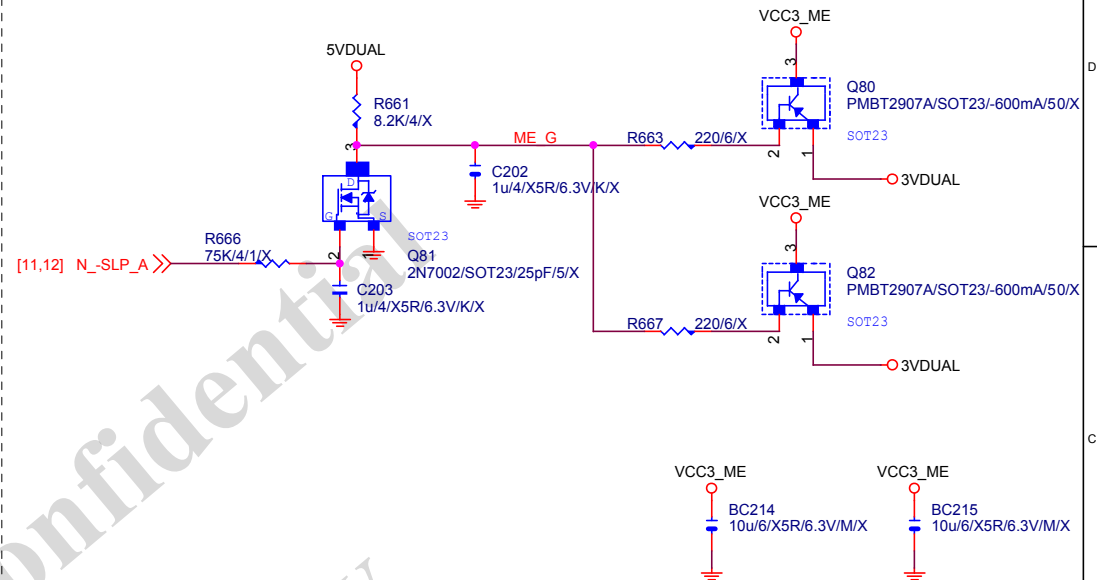
(RICHTER), (NUVOTON), (EMC) 做共用  
PIN7分壓阻值須做修改為100K以上電阻值

N/A



VCC3\_ME

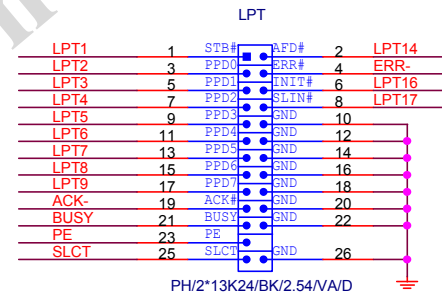
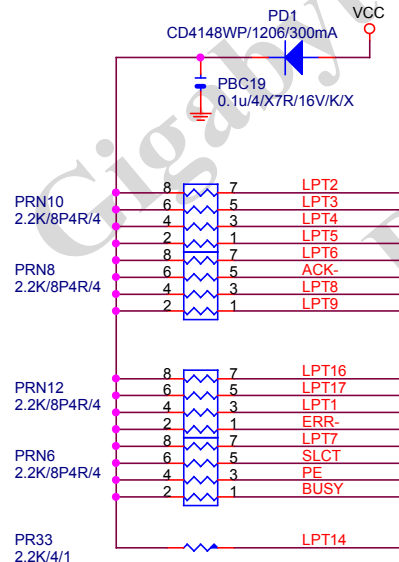
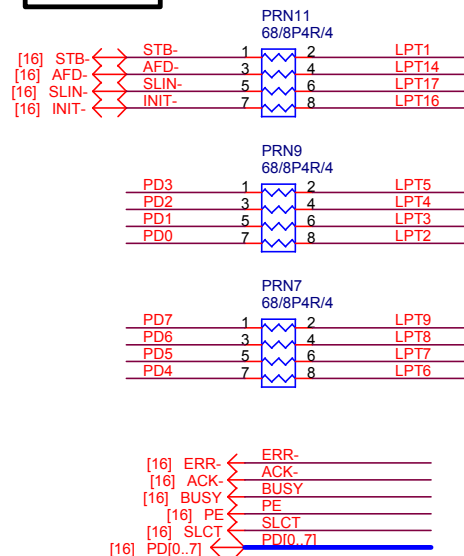
N/A



## 【技術通報R&amp;D技術通報151】

33ohm Change to 68ohm

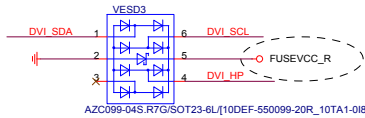
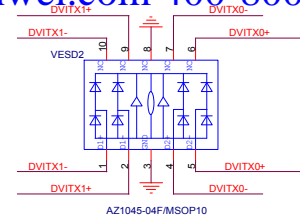
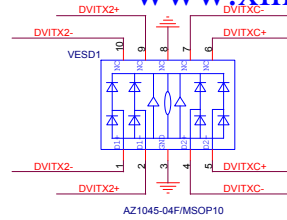
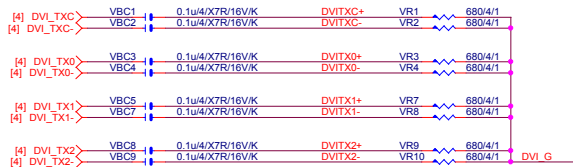
LPT PORT



Gigabyte Technology			
Title			
LPT			
Size Custom	Document Number	GA-B85M-DS3H	
Date:	Thursday, September 11, 2014	Sheet	29 of 30
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# DVI

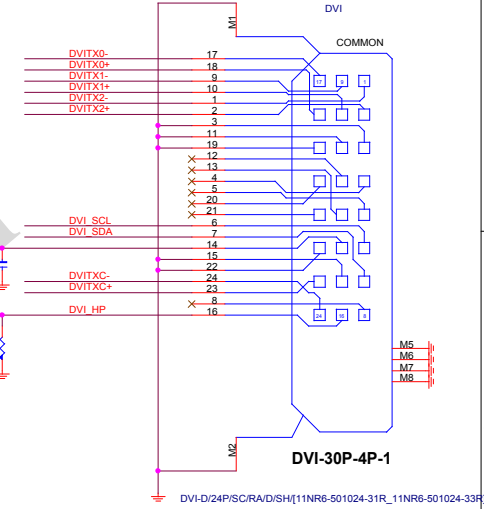
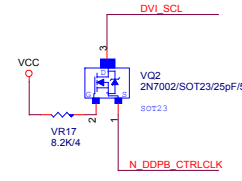
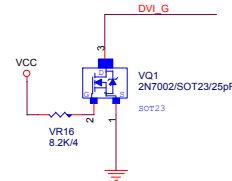
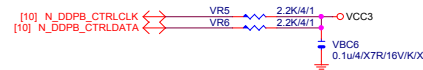
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Close to connector

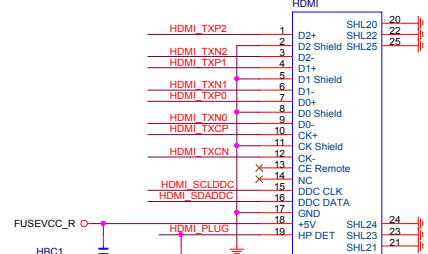
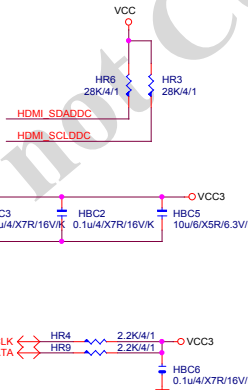
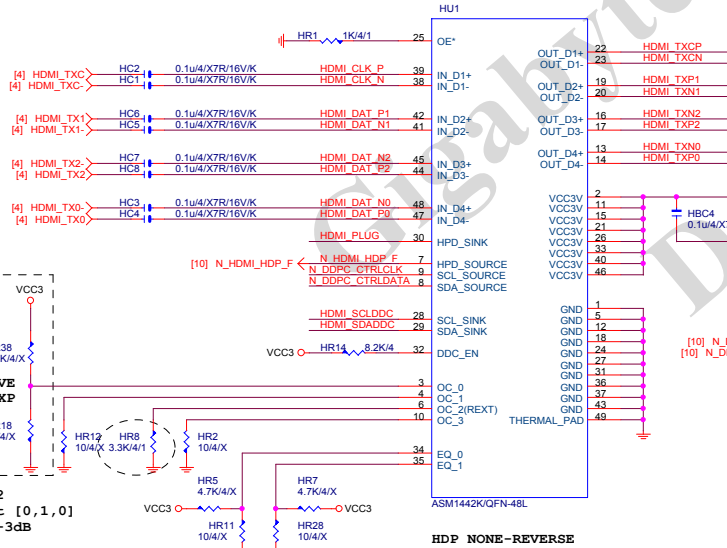
Close to connector

Close to connector

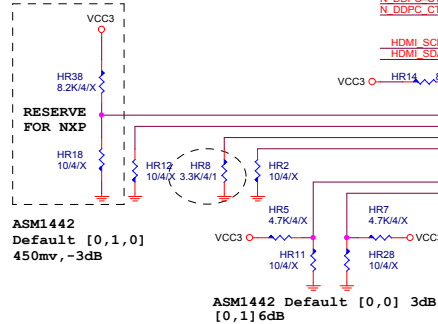


DVI-30P-4P-1

# HDMI LEVEL SHIFT



HDMI-3



HDP NONE-REVERSE