

Model Name: GA-B85M-D3V-A-SI

SHEET TITLE Revision 1.0

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 8620 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 RTL8111G-CG
25	DISCRETE POWER
26	ATX
27	VCORE ISL95812_1

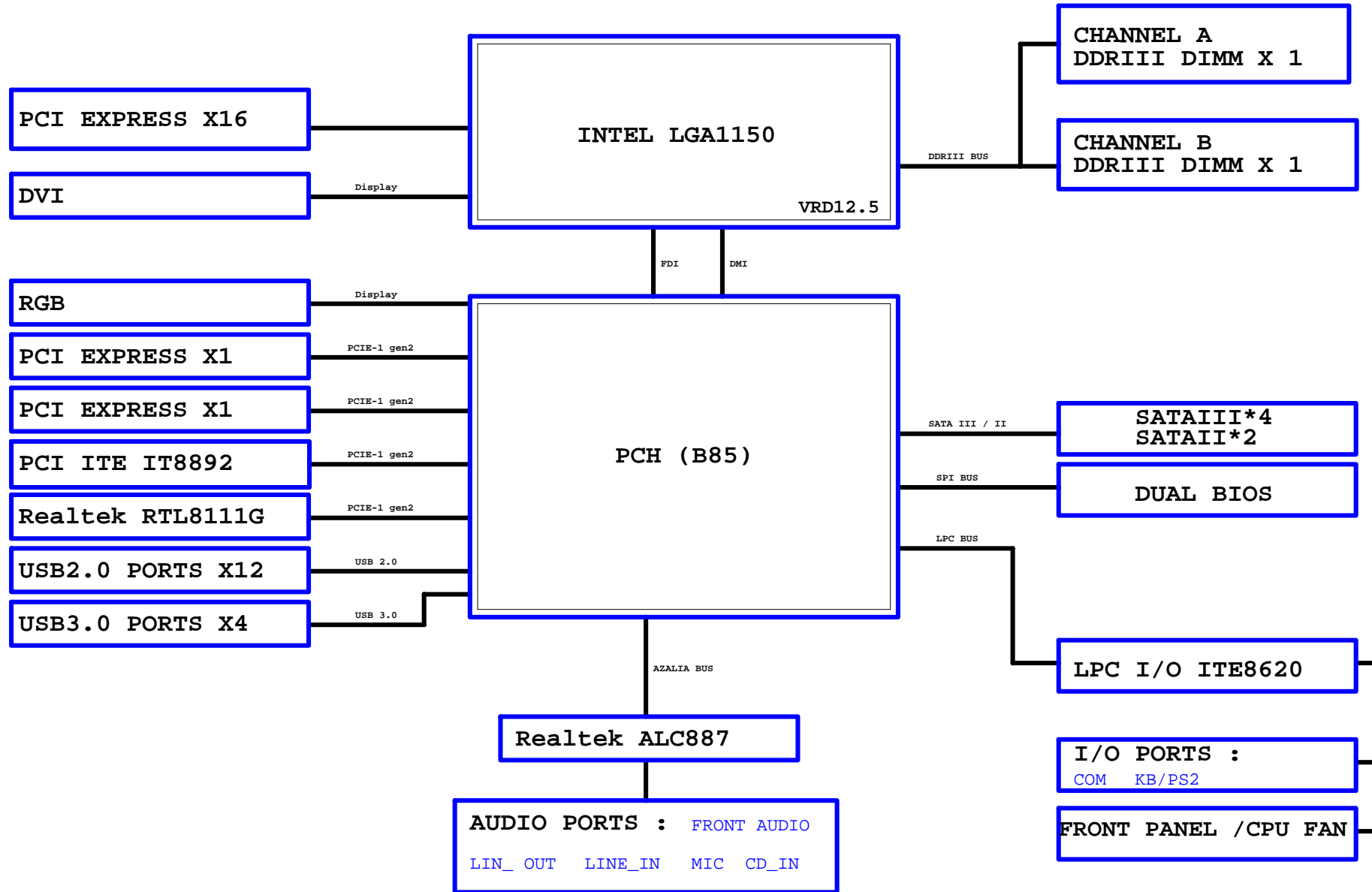
SHEET TITLE

28	VCORE ISL95812_2
29	RT8120_DDR POWER
30	LPT, M3 POWER
31	DVI
32	IT8892E

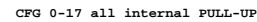
Gigabyte Technology

Cover Sheet

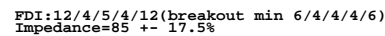
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Date:	Thursday, February 26, 2015	Sheet 1	of 32

BLOCK DIAGRAM

(E)



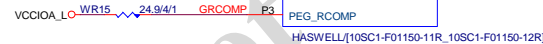
(D)



FDI_TXP[0..1] >> FDI_TXP[0..1] [9]
FDI_TXN[0..1] >> FDI_TXN[0..1] [9]

1. CON
(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%

5% PA_EXP_TXP[0..15] >> PA_EXP_TXP[0..15] [14]
PA_EXP_TXN[0..15] >> PA_EXP_TXN[0..15] [14]
PA_EXP_RXP[0..15] >> PA_EXP_RXP[0..15] [14]
PA_EXP_RXN[0..15] >> PA_EXP_RXN[0..15] [14]

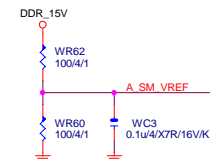
-CPURST

BC102
1n4/X7R/50V/K

CPU SVID



CPU	PU/PI
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LGA1150

(A)

LGA1150

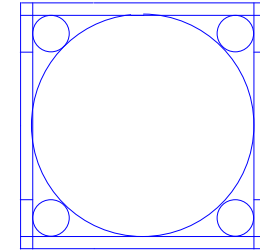
(B)

LGA1150

(CR)

LGA1150A

LGA1150B

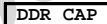
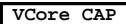
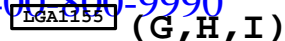
CR
CPU RETAINION/X

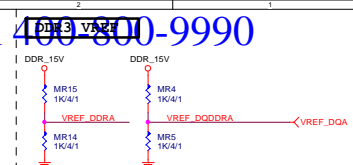
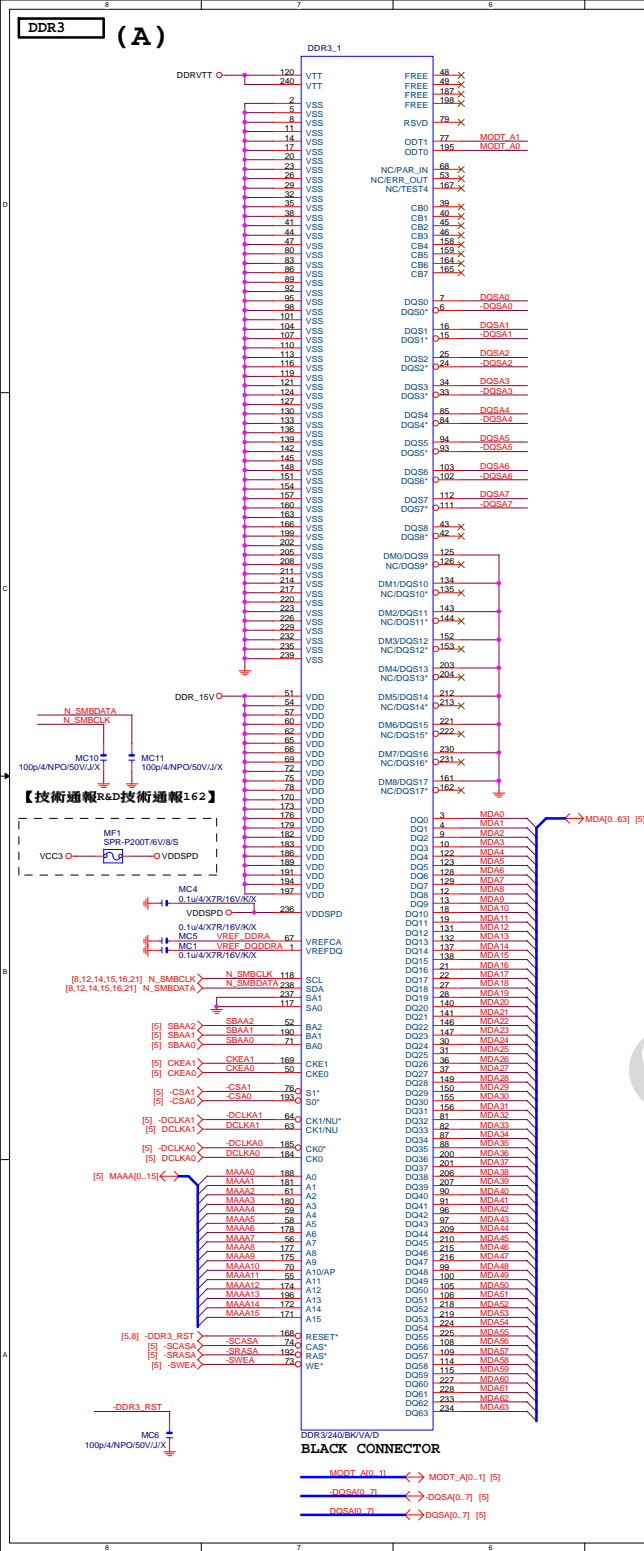
LGA1150_P

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

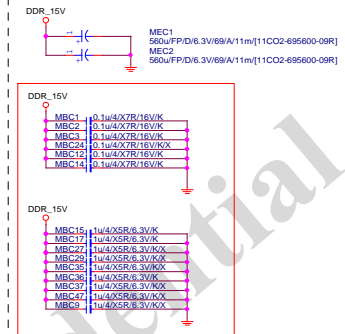
DDR BUS

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	MAAA1	AV16	DDR0_MA1	DDR0_D01	AD39	MDA1
	MAAA2	AU16	DDR0_MA2	DDR0_D02	AF38	MDA2
	MAAA3	AU17	DDR0_MA3	DDR0_D03	AF39	MDA3
	MAAA4	AU17	DDR0_MA4	DDR0_D04	AD37	MDA4
	MAAA5	AW18	DDR0_MA5	DDR0_D05	AD40	MDA5
	MAAA6	AV17	DDR0_MA6	DDR0_D06	AE37	MDA6
	MAAA7	AT18	DDR0_MA7	DDR0_D07	AF40	MDA7
	MAAA8	AU18	DDR0_MA8	DDR0_D08	AH40	MDA9
	MAAA9	AT19	DDR0_MA9	DDR0_D09	AH39	MDA13
	MAAA10	AW11	DDR0_MA10	DDR0_D10	AK38	MDA10
	MAAA11	AV19	DDR0_MA11	DDR0_D11	AK39	MDA11
	MAAA12	AU19	DDR0_MA12	DDR0_D12	AH37	MDA12
	MAAA13	AT20	DDR0_MA13	DDR0_D13	AH38	MDA8
	MAAA14	AW20	DDR0_MA14	DDR0_D14	AK37	MDA14
	MAAA15	AU21	DDR0_MA15	DDR0_D15	AK40	MDA15
	MODT_A0	AW10	DDR0_ODT0	DDR0_D16	AM40	MDA17
	MODT_A1	AY8	DDR0_ODT1	DDR0_D17	AM39	MDA21
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				DDR0_D22	AP37	MDA22
				DDR0_D23	AP40	MDA23
	AW33	DDR0_ECC0	DDR0_D24	AV37	MDA25	
	AU31	DDR0_ECC1	DDR0_D25	AW37	MDA26	
	AV31	DDR0_ECC2	DDR0_D26	AU35	MDA28	
	AT33	DDR0_ECC3	DDR0_D27	AV35	MDA27	
	AU33	DDR0_ECC4	DDR0_D28	AT37	MDA28	
	AT31	DDR0_ECC5	DDR0_D29	AW37	MDA29	
	AW31	DDR0_ECC6	DDR0_D30	AT35	MDA30	
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			DDR0_D44	AR2	MDA44	
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			DDR0_D46	AN2	MDA46	
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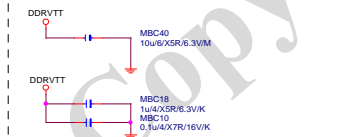


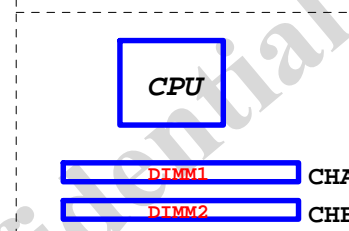
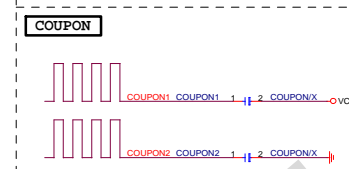
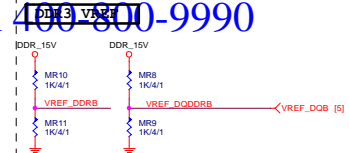
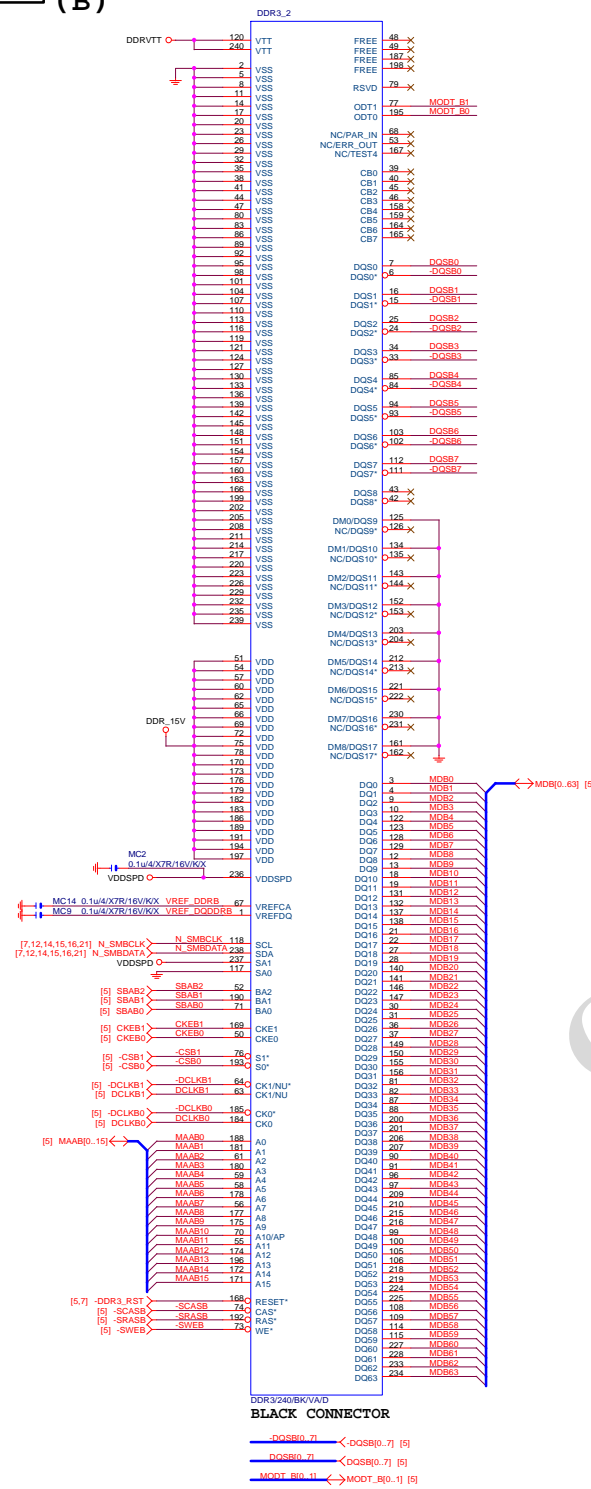


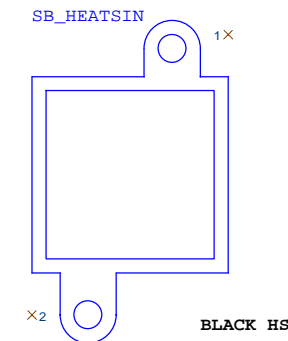
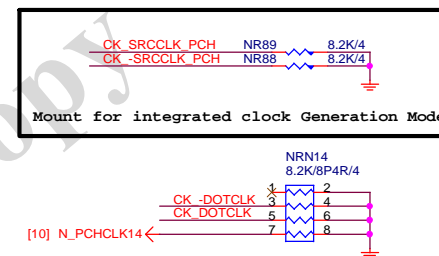
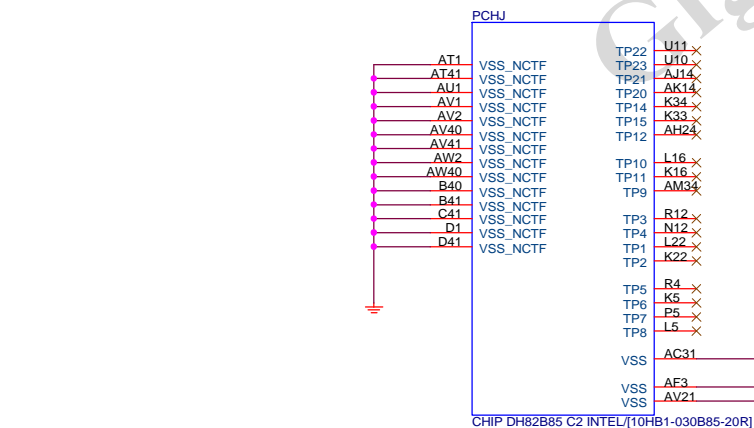
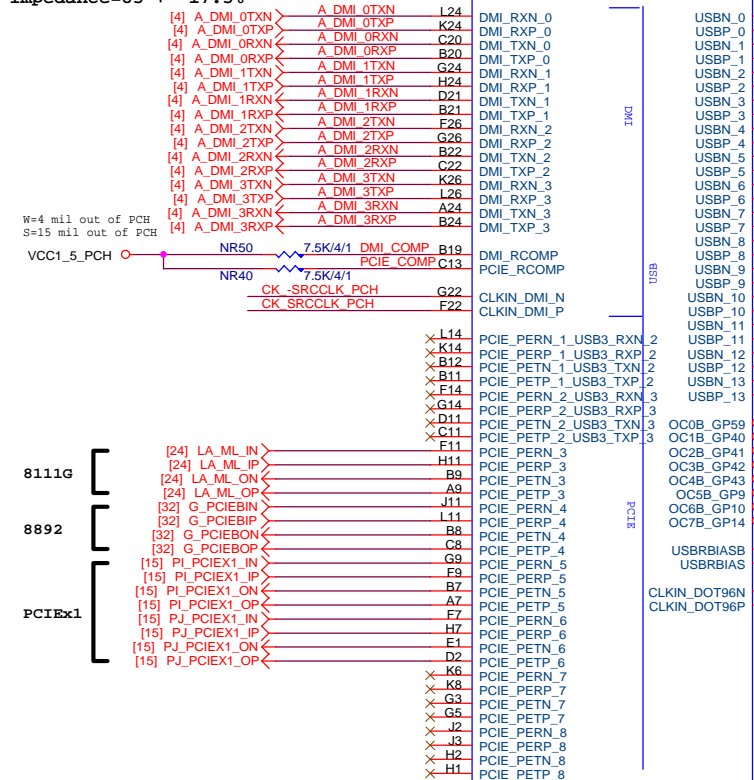
DDR15V Decouple



DDRVTT Decouple

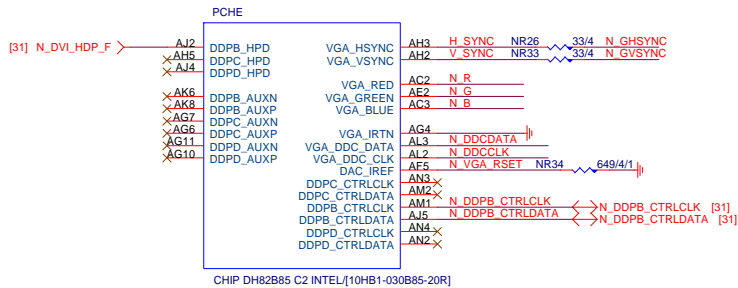






PCH

(E)



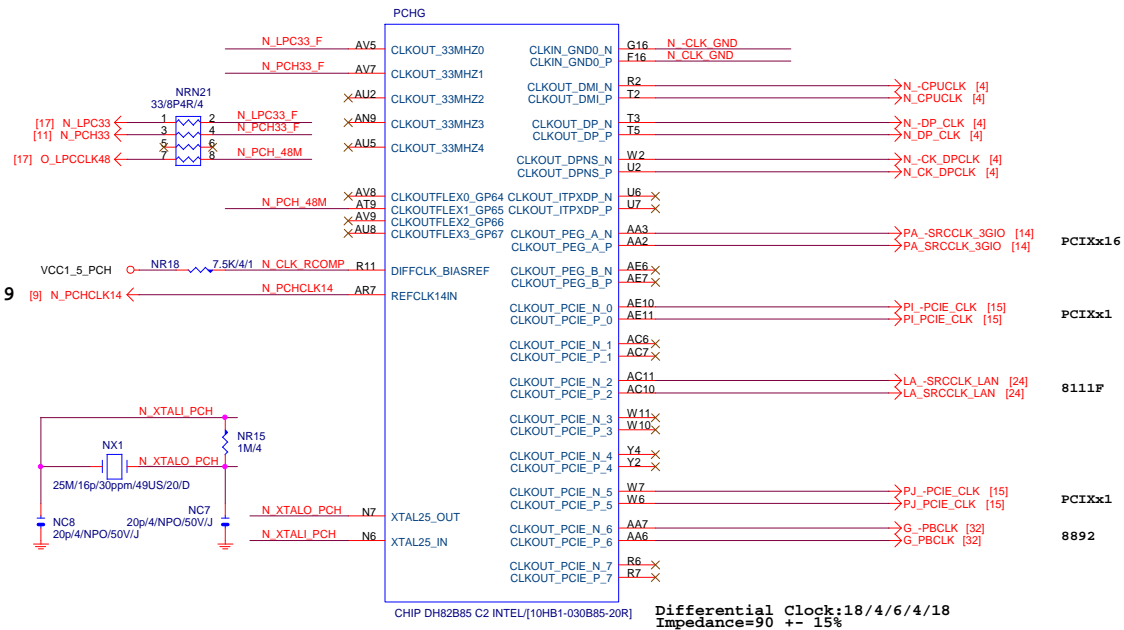
PCH

(G)

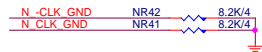
Flex1,2,3,4 :

14/24/33/48MHZ

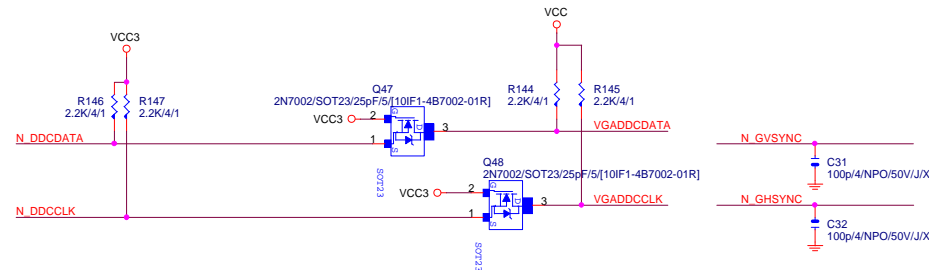
P.D排組PAGE 9



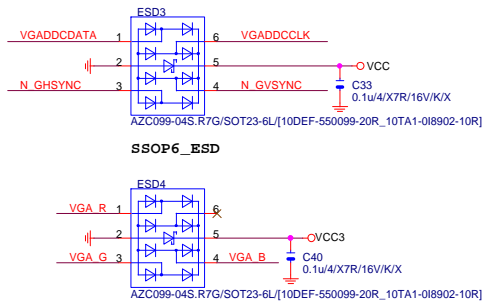
PCH CLK PD



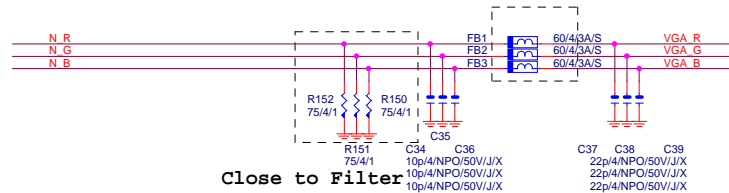
VGA DDC



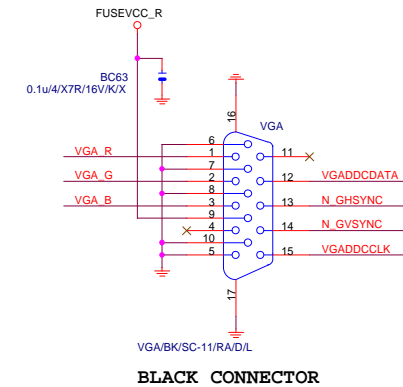
VGA ESD



VGA DDC



VGA CONNECTOR

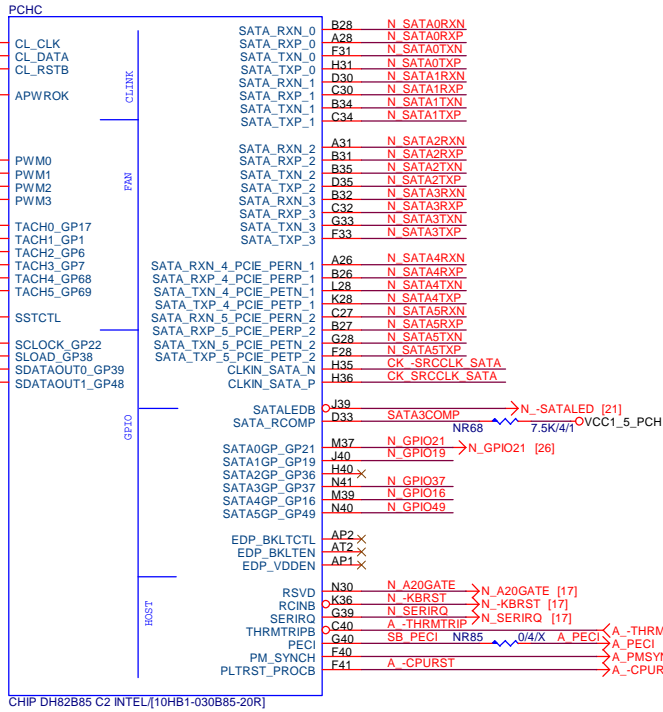


Gigabyte Technology

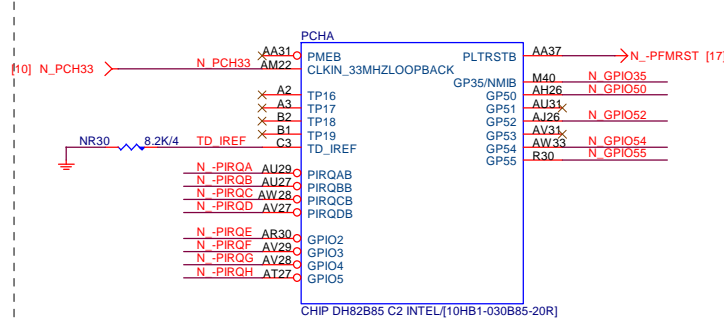
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PCH DISPLAY_CLK BUFFER			
Size	Document Number	Rev	
Custom	GA-B85M-D3V-A-SI	3.0	
Date:	Thursday, February 26, 2015	Sheet	10 of 32

PCH (C)

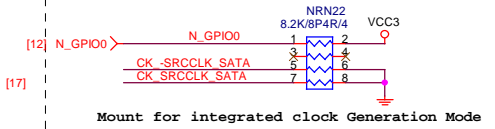
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%



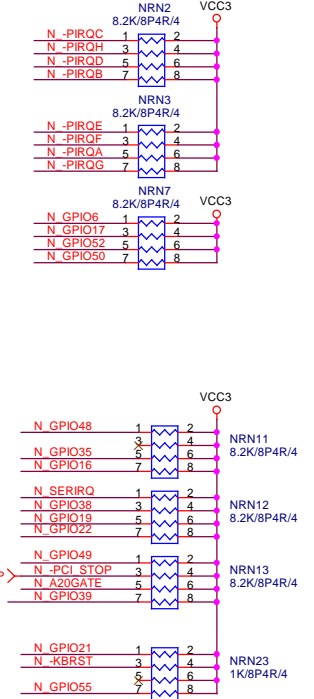
PCH (A)



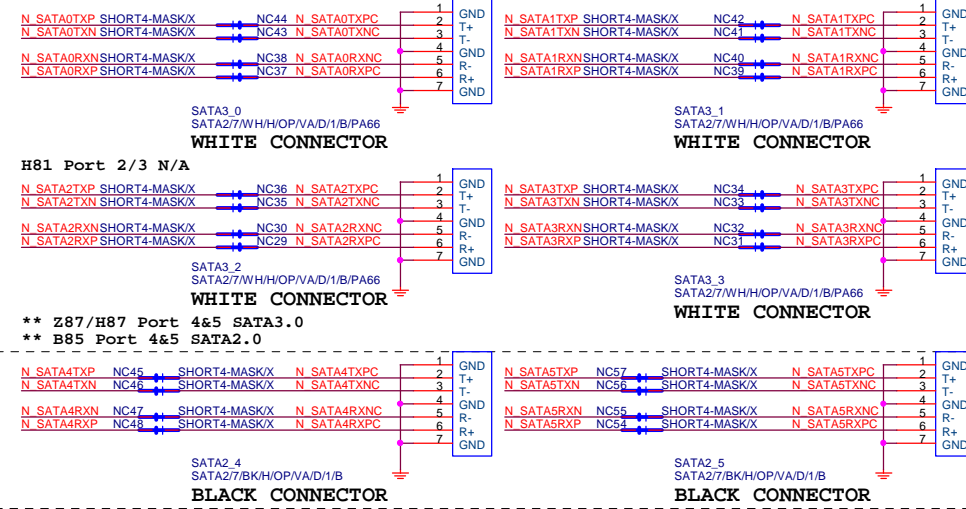
PCH CLK PD



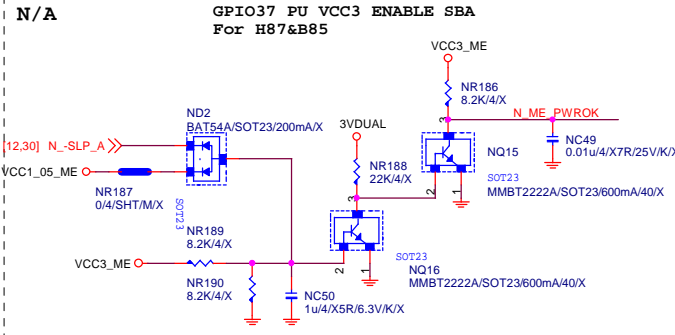
PCH PU/PD



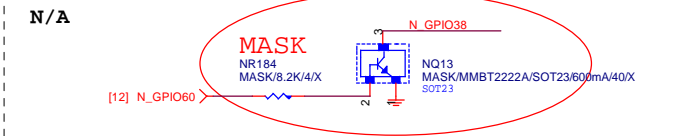
SATA CONNECTOR Remove SATA MLCC [Footprint: C0402-SHORT4-MASK]

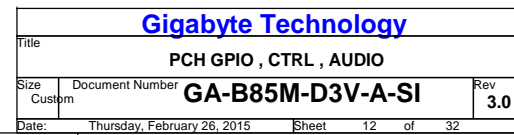
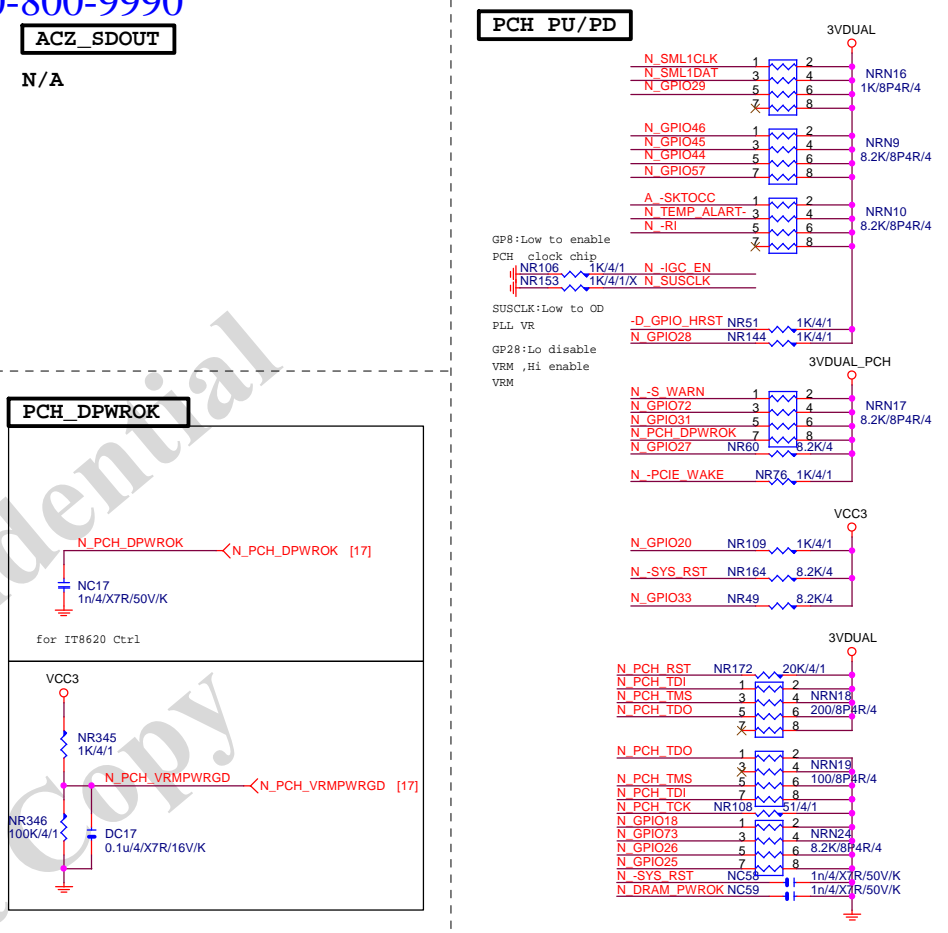


ME PWROK

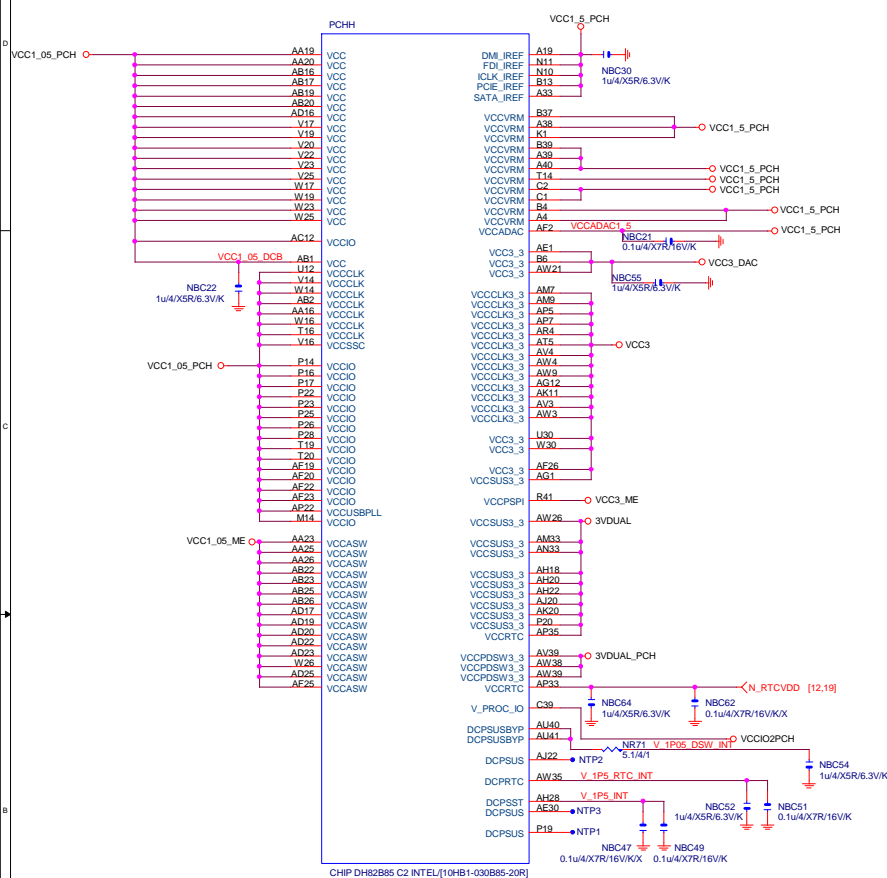


GPIO38 Ctrl

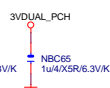
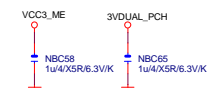
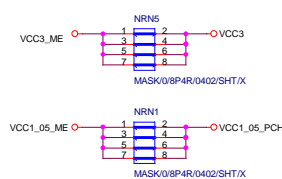
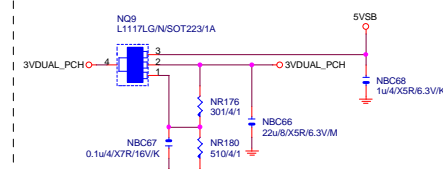
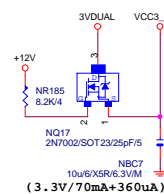




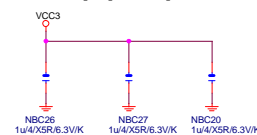
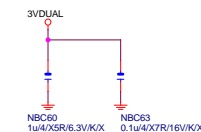
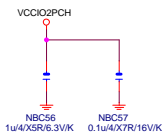
PCH (H)



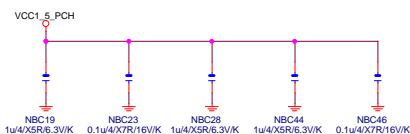
CLOSE北橋(注意震盪水波紋)



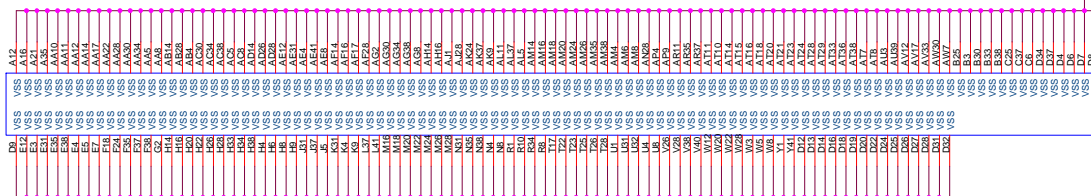
(3.3V) (X3)


$$(1.05V)(x2) \quad (3.3V)(x2)$$


(1.5V) (x5)



PCH (I)

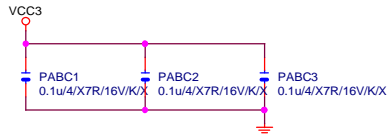


PCH1
CHIP DH82B85 C2 INTEL/I10HB1-030B85-20R

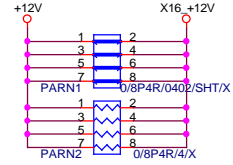
Gigabyte Technology

PCIEX16 CAP

N/A



PCIEX16 PROTECT SHT



PCIEX16 AC CAP

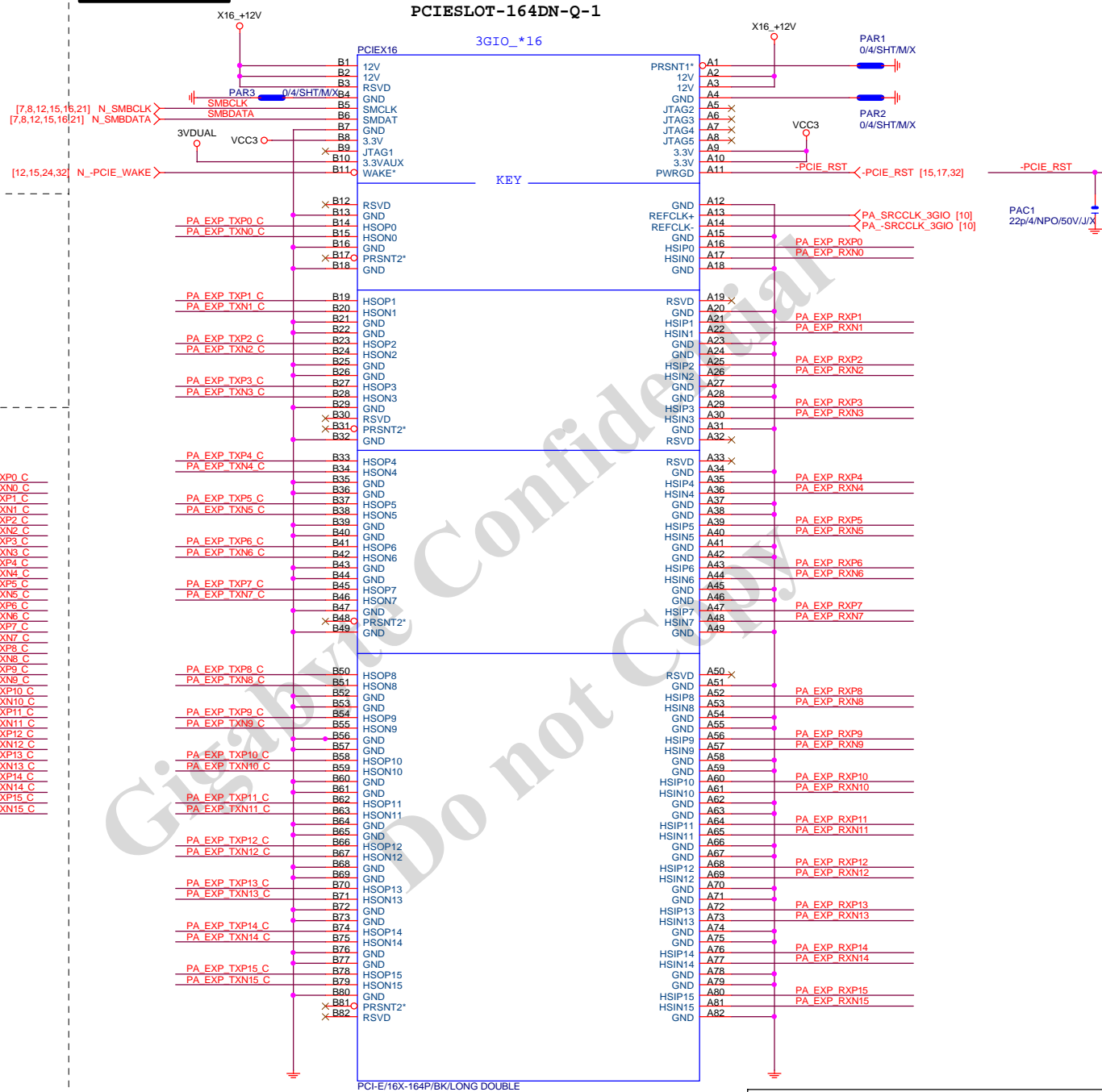
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PA EXP TXN0	PAC4	0.22uF/4X5R/6.3V/K	PA EXP TXN0 C
PA EXP TXP1	PAC6	0.22uF/4X5R/6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC7	0.22uF/4X5R/6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC8	0.22uF/4X5R/6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC9	0.22uF/4X5R/6.3V/K	PA EXP TXN2 C
PA EXP TXP3	PAC10	0.22uF/4X5R/6.3V/K	PA EXP TXP3 C
PA EXP TXN3	PAC11	0.22uF/4X5R/6.3V/K	PA EXP TXN3 C
PA EXP TXP4	PAC12	0.22uF/4X5R/6.3V/K	PA EXP TXP4 C
PA EXP TXN4	PAC13	0.22uF/4X5R/6.3V/K	PA EXP TXN4 C
PA EXP TXP5	PAC14	0.22uF/4X5R/6.3V/K	PA EXP TXP5 C
PA EXP TXN5	PAC15	0.22uF/4X5R/6.3V/K	PA EXP TXN5 C
PA EXP TXP6	PAC16	0.22uF/4X5R/6.3V/K	PA EXP TXP6 C
PA EXP TXN6	PAC17	0.22uF/4X5R/6.3V/K	PA EXP TXN6 C
PA EXP TXP7	PAC19	0.22uF/4X5R/6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC18	0.22uF/4X5R/6.3V/K	PA EXP TXN7 C
PA EXP TXP8	PAC20	0.22uF/4X5R/6.3V/K	PA EXP TXP8 C
PA EXP TXN8	PAC21	0.22uF/4X5R/6.3V/K	PA EXP TXN8 C
PA EXP TXP9	PAC22	0.22uF/4X5R/6.3V/K	PA EXP TXP9 C
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PA EXP TXP11	PAC26	0.22uF/4X5R/6.3V/K	PA EXP TXP11 C
PA EXP TXN11	PAC27	0.22uF/4X5R/6.3V/K	PA EXP TXN11 C
PA EXP TXP12	PAC28	0.22uF/4X5R/6.3V/K	PA EXP TXP12 C
PA EXP TXN12	PAC29	0.22uF/4X5R/6.3V/K	PA EXP TXN12 C
PA EXP TXP13	PAC30	0.22uF/4X5R/6.3V/K	PA EXP TXP13 C
PA EXP TXN13	PAC31	0.22uF/4X5R/6.3V/K	PA EXP TXN13 C
PA EXP TXP14	PAC32	0.22uF/4X5R/6.3V/K	PA EXP TXP14 C
PA EXP TXN14	PAC33	0.22uF/4X5R/6.3V/K	PA EXP TXN14 C
PA EXP TXP15	PAC34	0.22uF/4X5R/6.3V/K	PA EXP TXP15 C
PA EXP TXN15	PAC35	0.22uF/4X5R/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-E16X-164P/BK/LONG DOUBLE

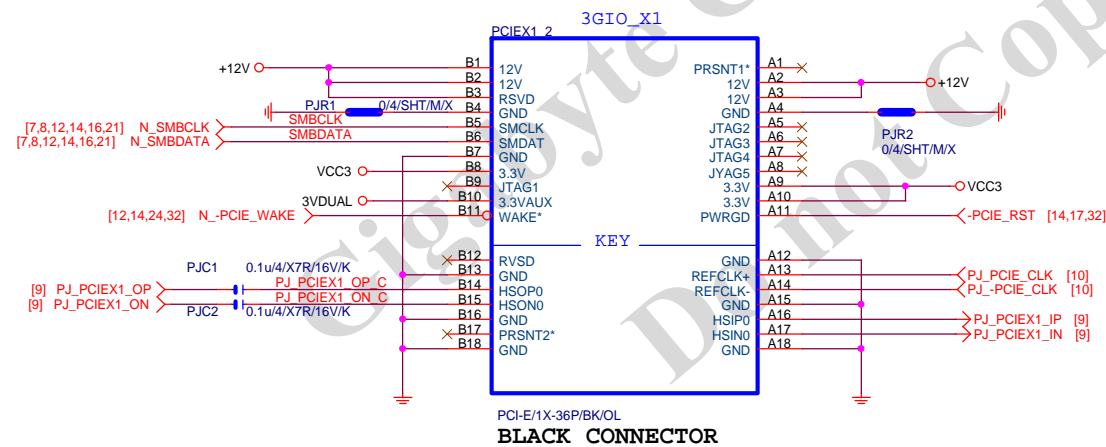
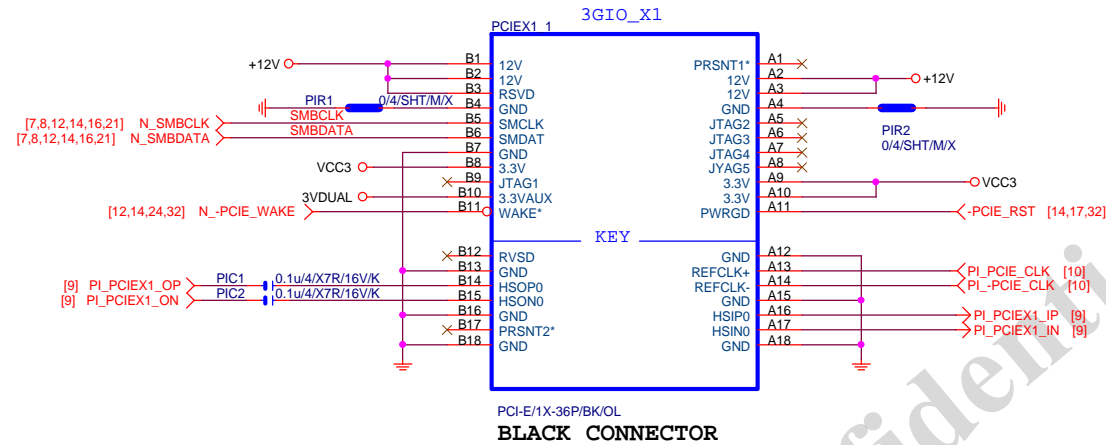
PCIESLOT-164DN-Q-1

BLACK CONNECTOR

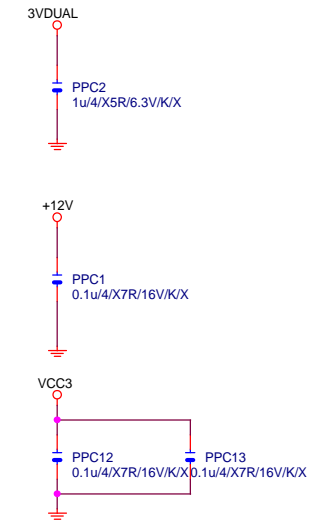
Gigabyte Technology

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PCI EXPRESS * 16			
Size	Document Number	Rev	
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Date:	Thursday, February 26, 2015	Sheet	14 of 32
		2	1

PCIEX1 SLOT

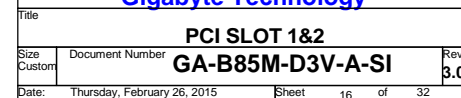
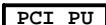


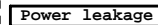
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Gigabyte Technology

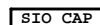
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Size	Document Number		Rev
Custom	GA-B85M-D3V-A-SI		3.0
Date:	Thursday, February 26, 2015	Sheet	15 of 32





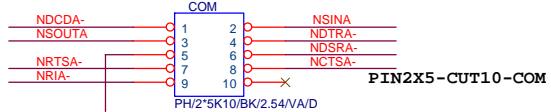
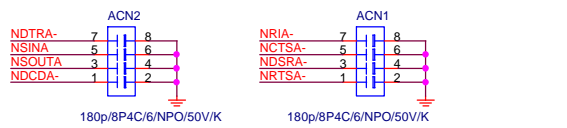
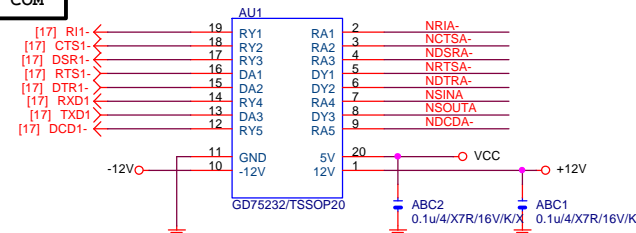
PULL HIGH: R2.0 VCC3

PULL LOW: R2.1

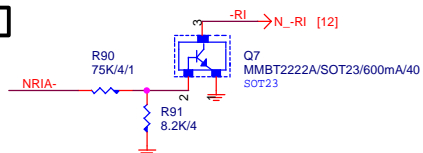


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Date:	Thursday, February 26, 2015	Sheet	17 of 32

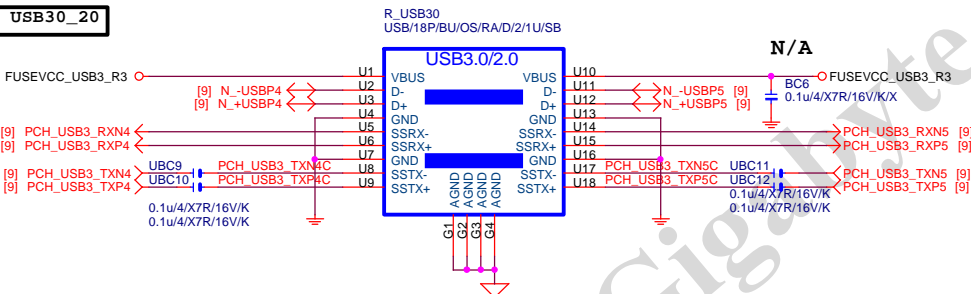
COM



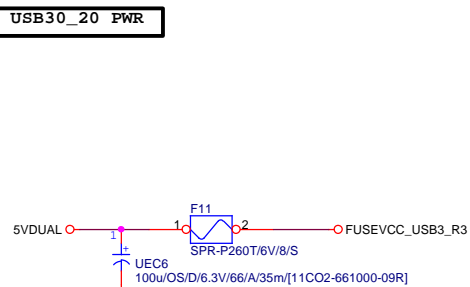
COM RI



USB30_20

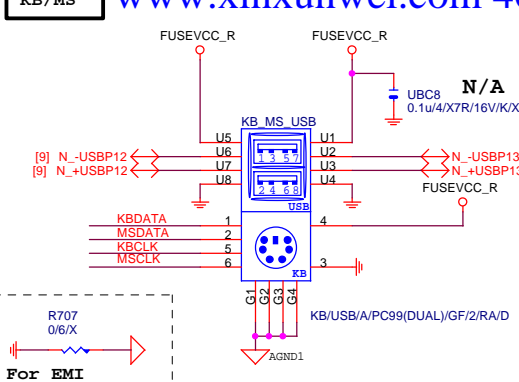


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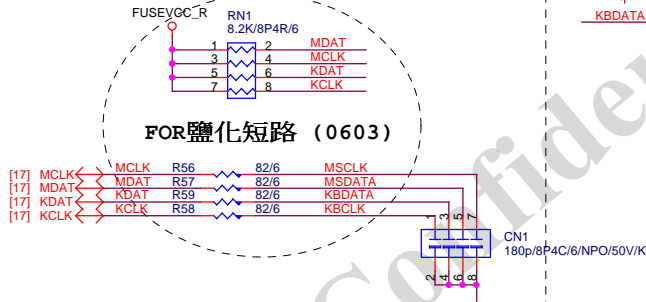


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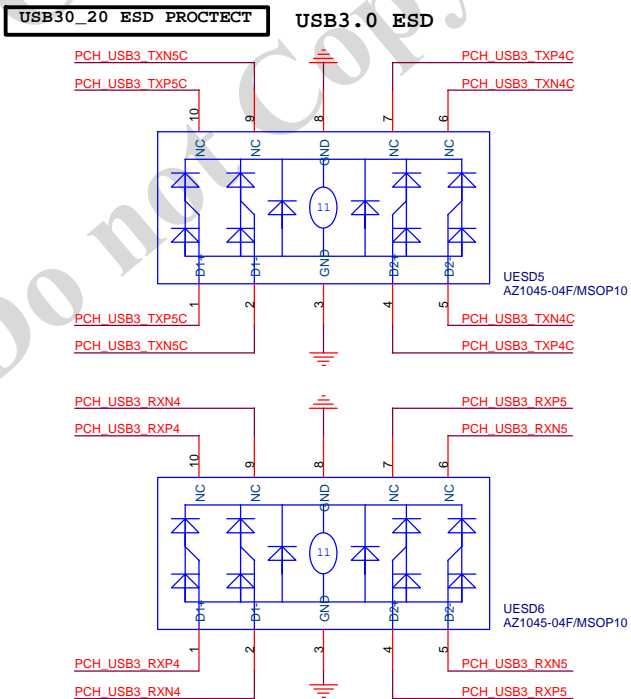
KB/MS



For EMI



USB30_20 ESD PROTECT



USB3.0 ESD

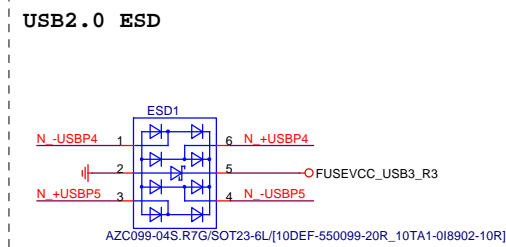
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FUSE-0805

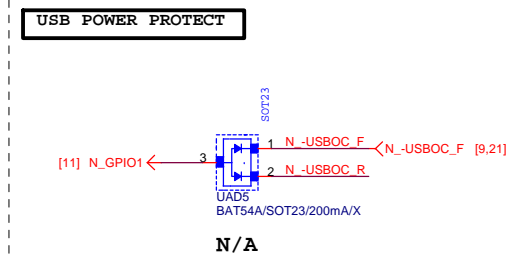


Close to connector
KB_MS_USB 2-Port 2.0A

USB2.0 ESD



USB POWER PROTECT

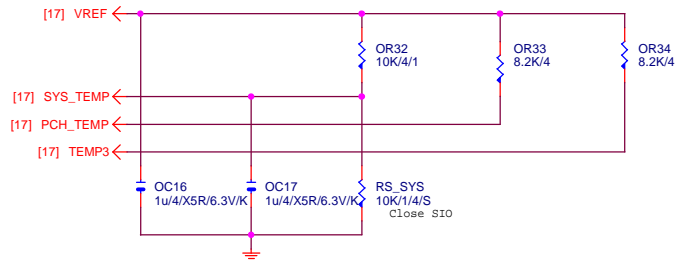


Gigabyte Technology

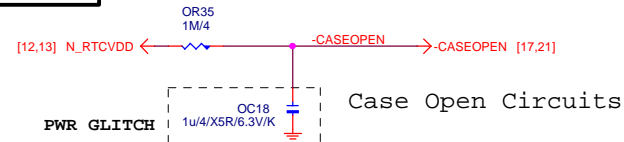
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Size Custom	Document Number GA-B85M-D3V-A-SI	Rev 3.0
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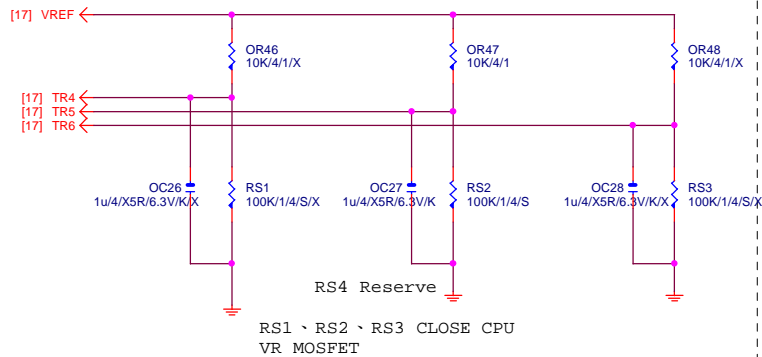
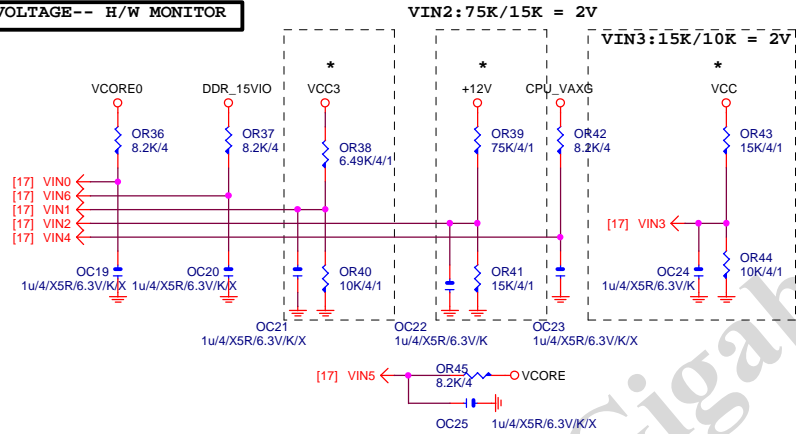
TEMP H/W MONITOR



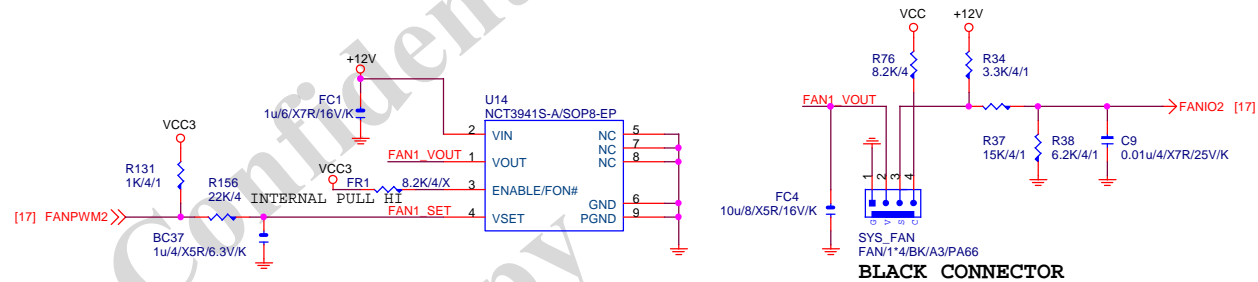
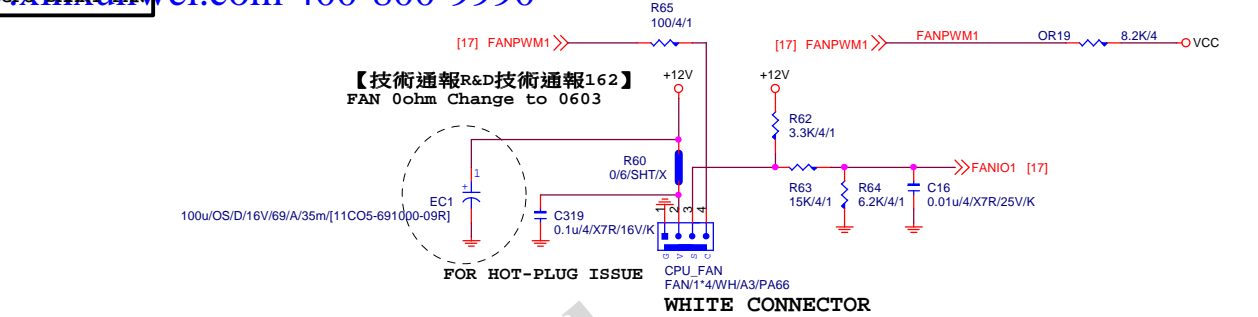
CASE OPEN



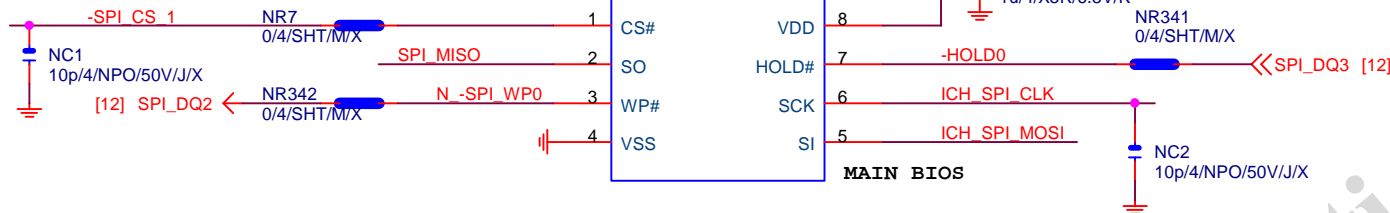
VOLTAGE-- H/W MONITOR



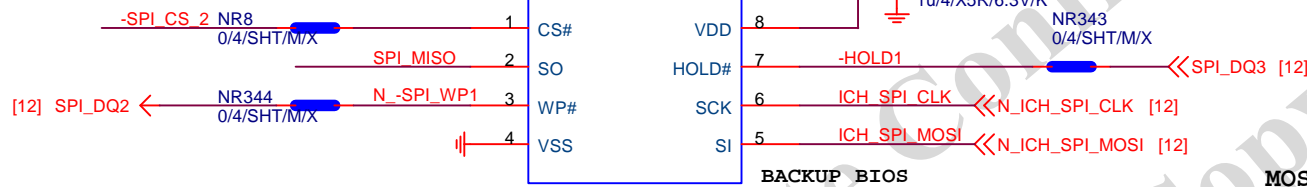
SYS SMART FAN



M_BIOS
32M/SPI/SO8/200mil/S/[10HP4-112532-20R]



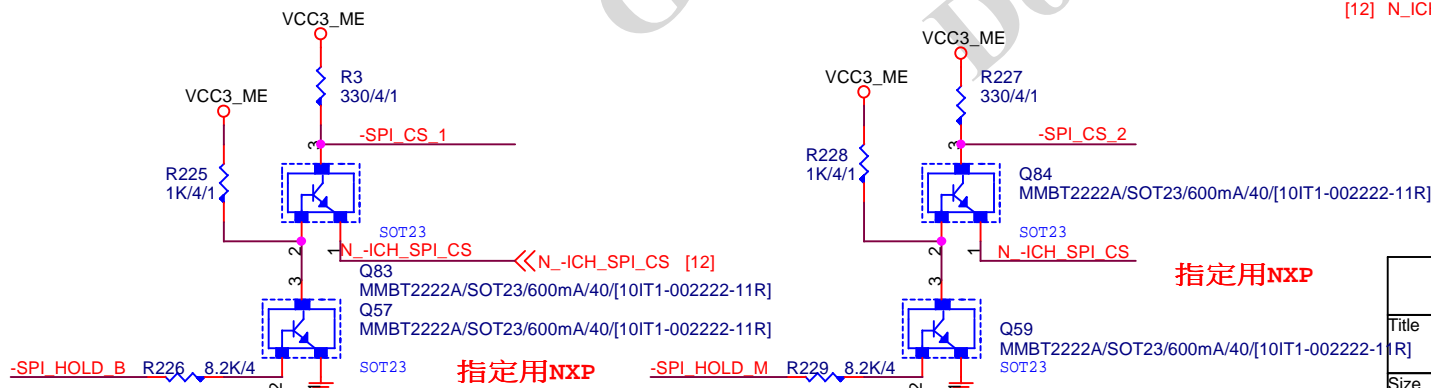
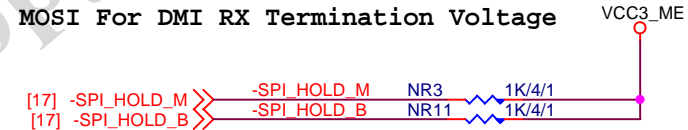
B_BIOS
32M/SPI/SO8/200mil/S/[10HP4-112532-20R]



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

DUAL BIOS

GA-B85M-D3V-A-SI

Rev
3.0

Title

Size

Custom

Document Number

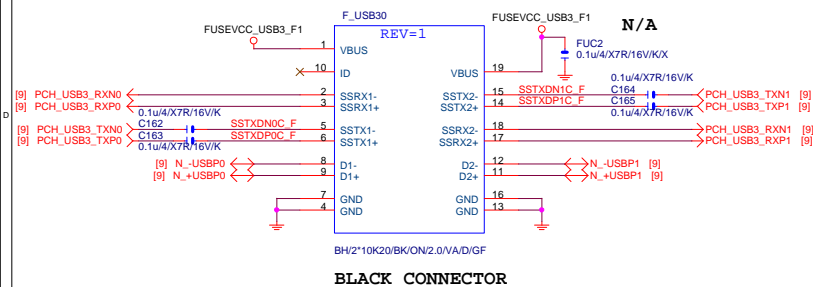
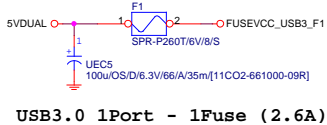
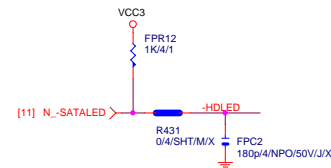
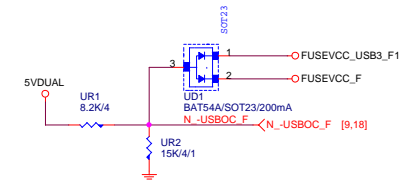
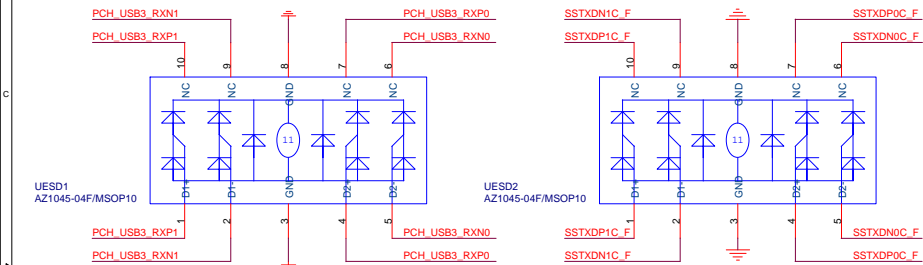
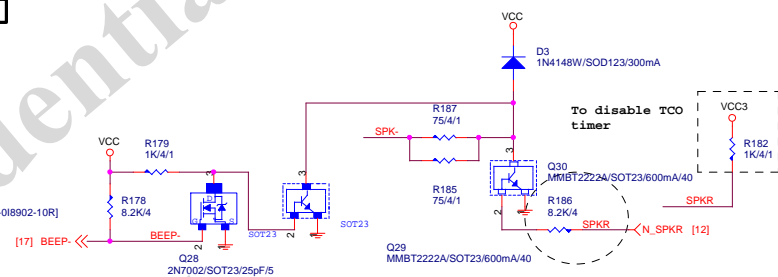
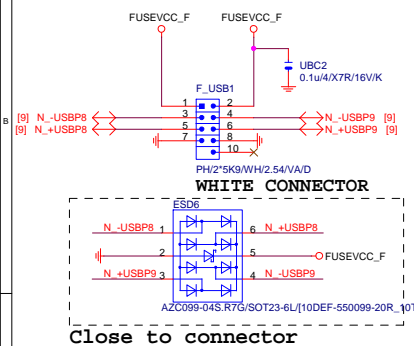
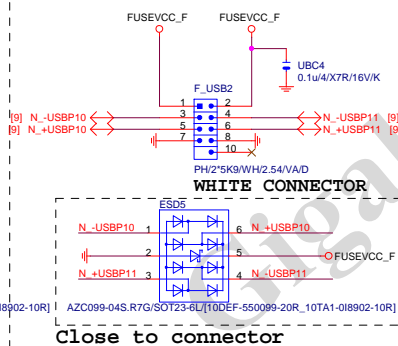
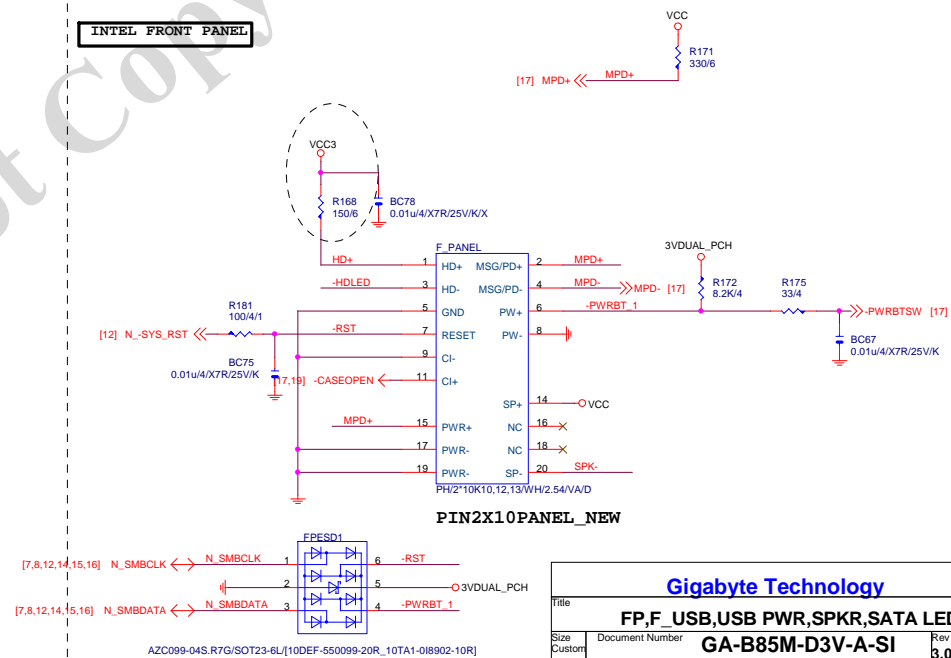
Date: Thursday, February 26, 2015

Sheet

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32

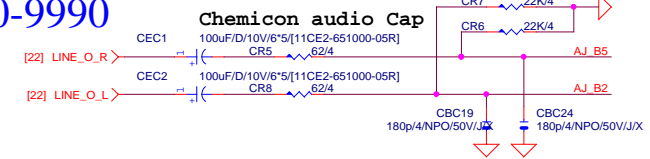
F_USB30**FUSE-0805****F_USB30_PWR****-USBOC_F****F_USB30 ESD PROTECT****SPKR****FRONT USB1****FRONT USB2****INTEL FRONT PANEL**

Gigabyte Technology

File	Document Number	Rev
FP_F_USB,USB PWR,SPKR,SATA LED	GA-B85M-D3V-A-SI	3.0

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CONFIDENTIAL



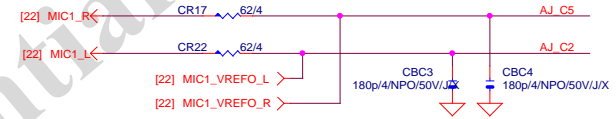
Only reserved for ALC888

LINE-IN

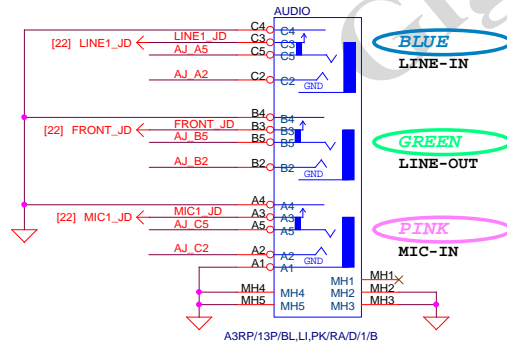
Verify MIC function
in LINE-in

For 889A/888

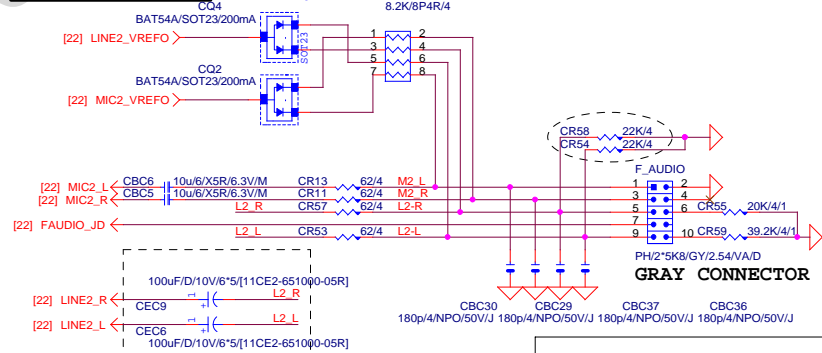
MIC-IN



SPDIF_OUT



AZALIA FRONT PANEL

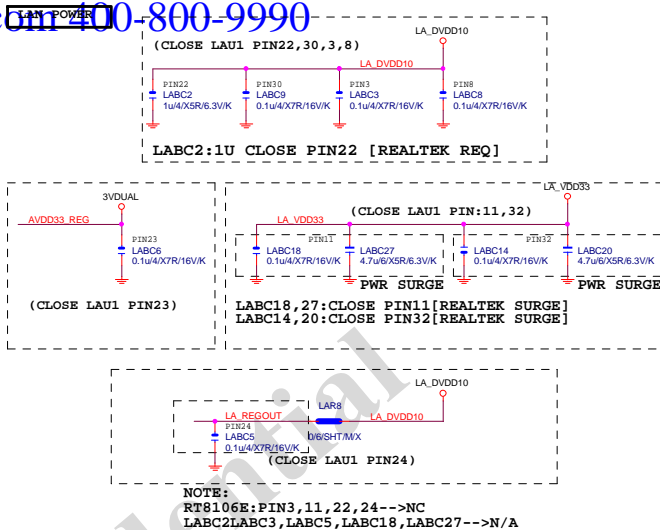
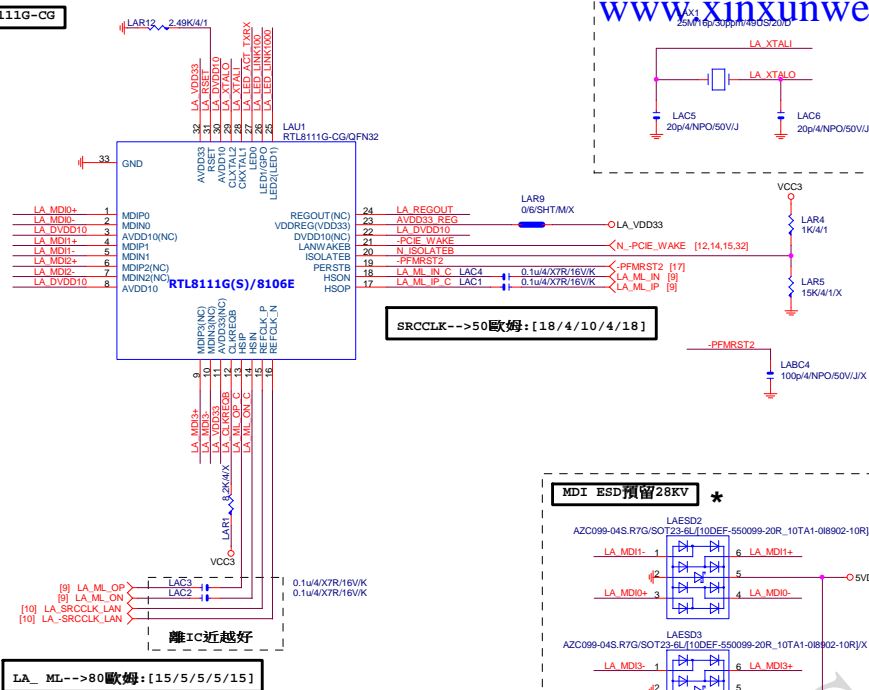


Chemicon audio Cap

Gigabyte Technology

AUDIO JACK

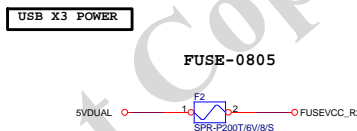
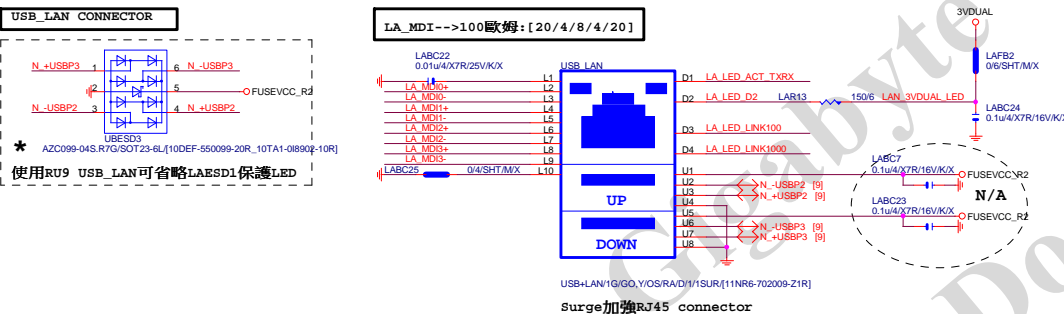
Size	Document Number	GA-B85M-D3V-A-SI	Rev
Custom			3.0
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BOM NOTICE

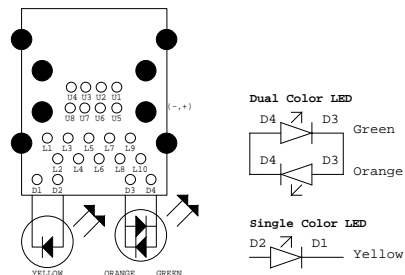
料號	規格	廠商
11NR6-702009-96R	1G LAN (12core)	UDE(RU9 ESD+)
[LED獨立走線,可省略外加AZC099料件LAESD1]		

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



EMI SHORT PAD

PS:視EMI需求



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

BOM NOTICE *

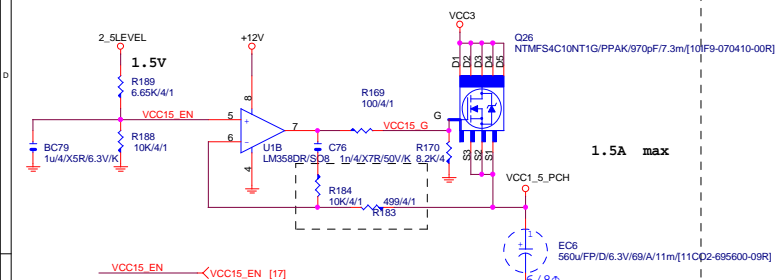
料號	規格	廠商
11NR6-702009-96R 1G LAN (12core)		UDE(RU9 ESD+)
[LED獨立走線,可省略外加AZC099料件LAESD1]		

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

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Title			
Realtek RTL8111G			
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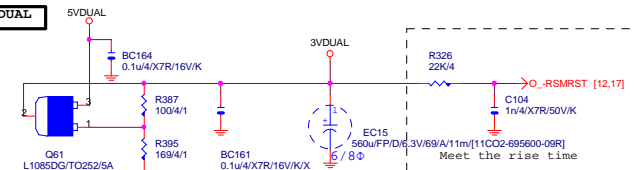
VCC1_5_PCH



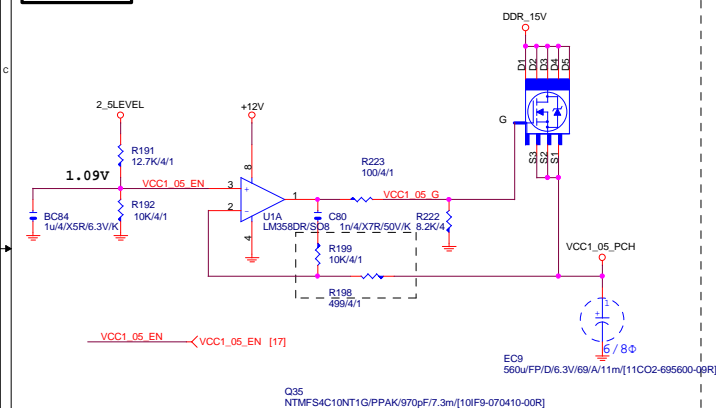
2_5LEVEL



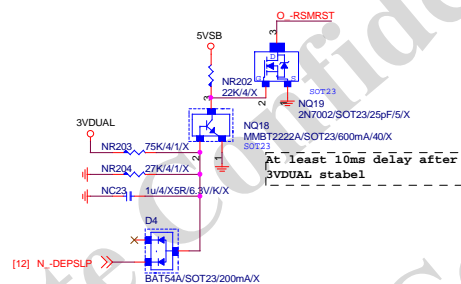
3VDUAL



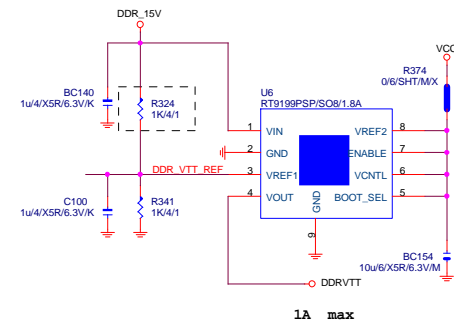
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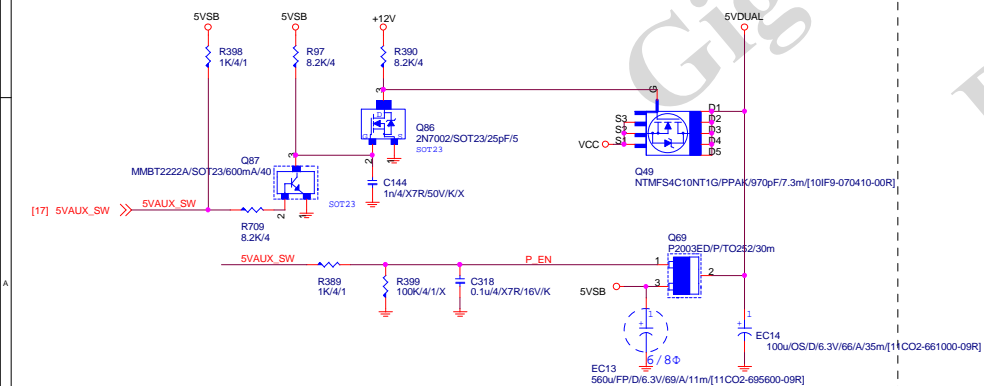
N/A



DDR_VTT

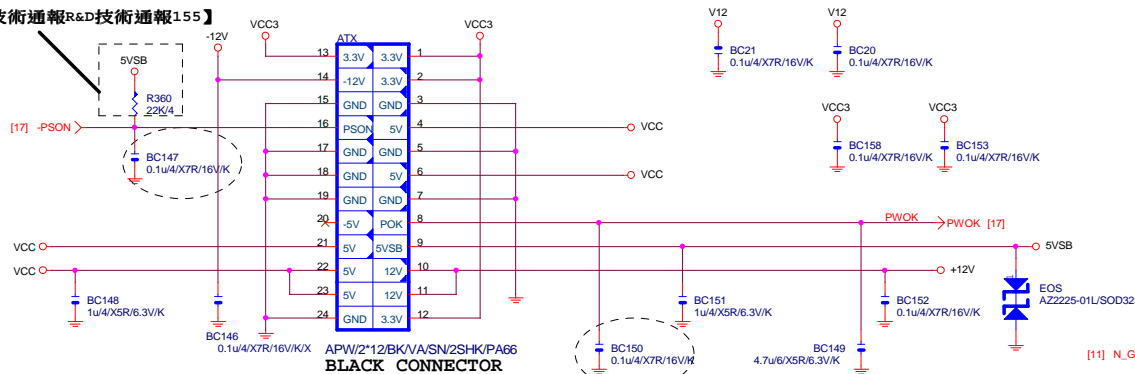


5VDUAL



ATXX24 POWER CONNECTOR

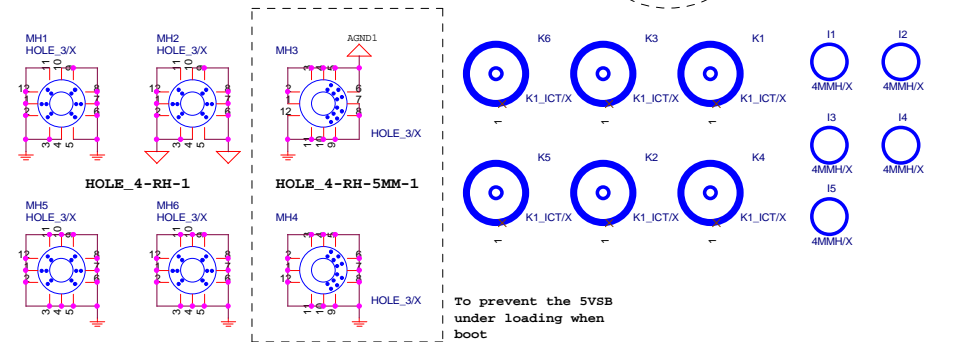
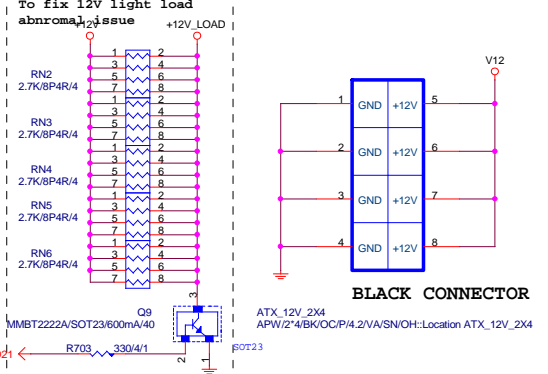
【技術通報R&D技術通報155】



www.xinxunwei.com 400-800-9990

ATXX4 POWER CONNECTOR

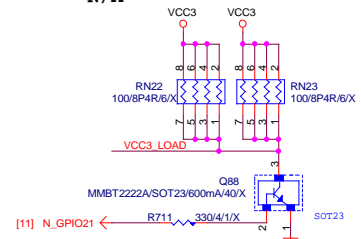
【技術通報R&D技術通報155】



TPM

FIX PWR MINMUN LOAD

N/A



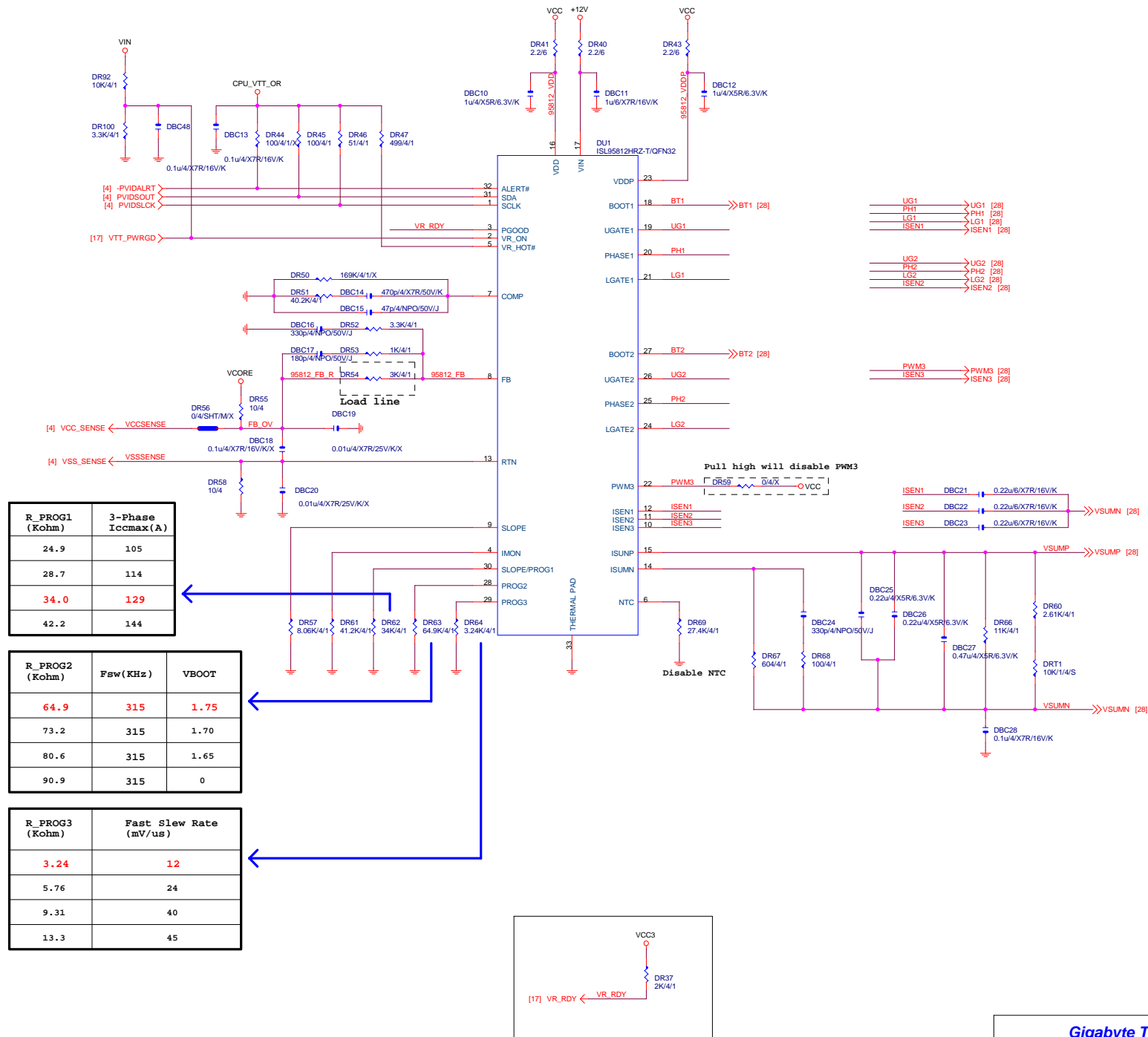
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ATX CONNECTOR

GA-B85M-D3V-A-SI

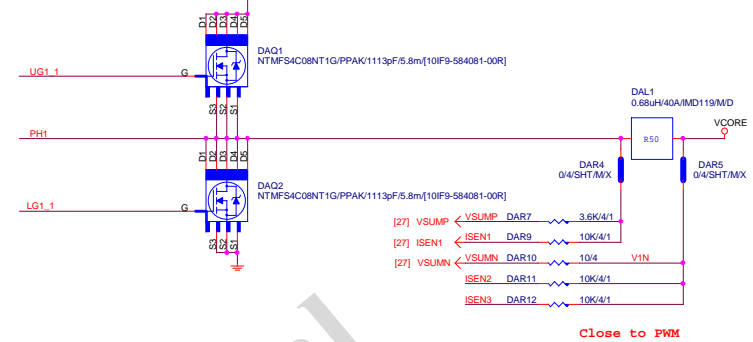
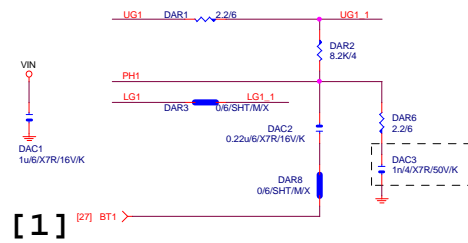
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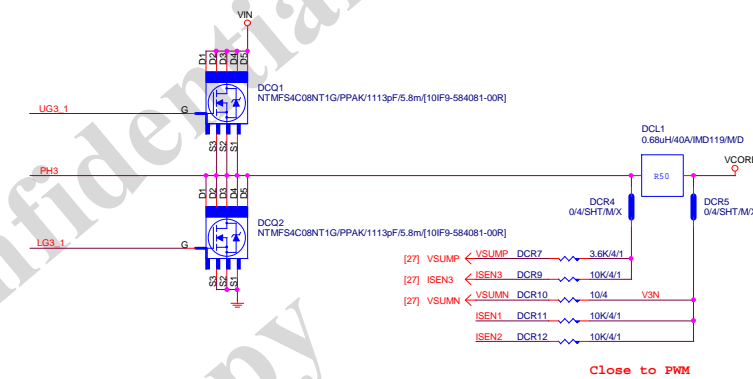
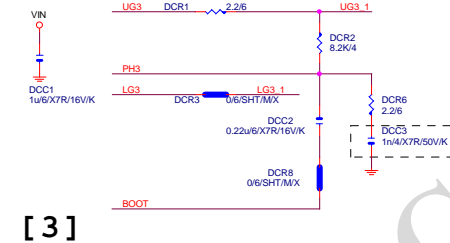
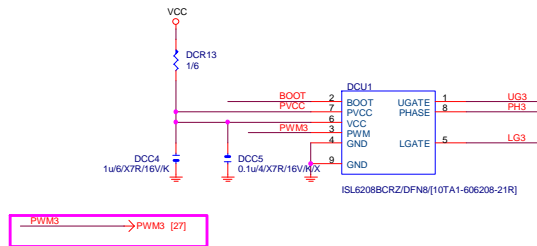


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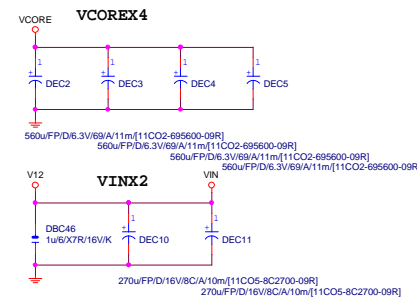
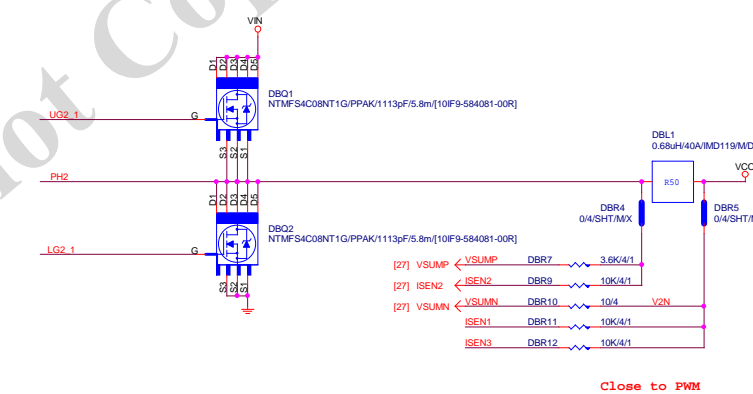
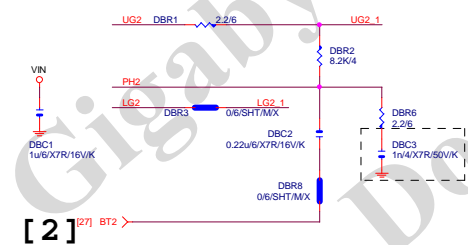
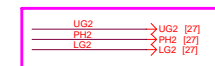
PHASE 1



PHASE 3

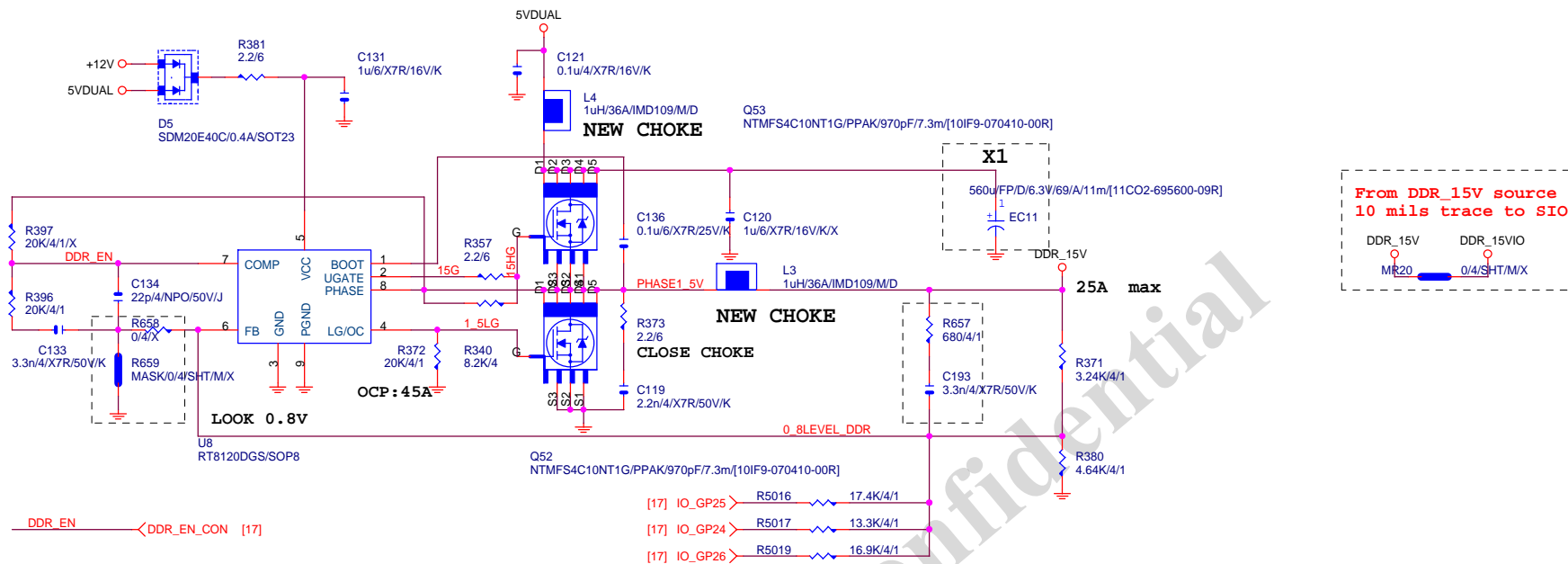


PHASE 2



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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 $2 \times 7.99 = 15.98 > 11.45A$

$$\text{Rocset} = (\text{Iocp} * \text{Lgate}, \text{rdson}) / \text{Iocset}$$

$$R_{ocset} = (45A * 6.7m\Omega) / 10\mu A = 30K$$

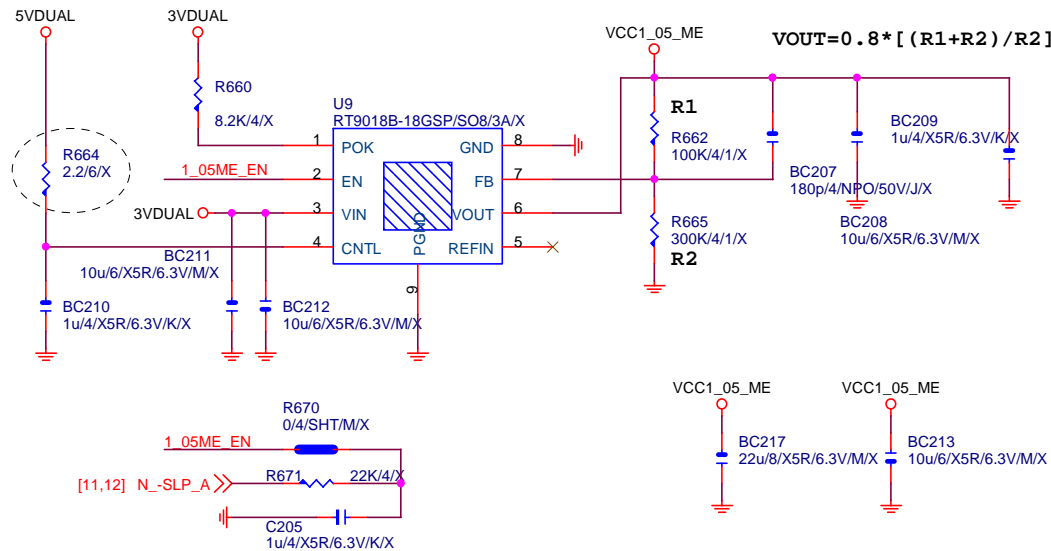
Iocset=10uA

VCC1_05_ME

【技術通報R&D技術通報156】

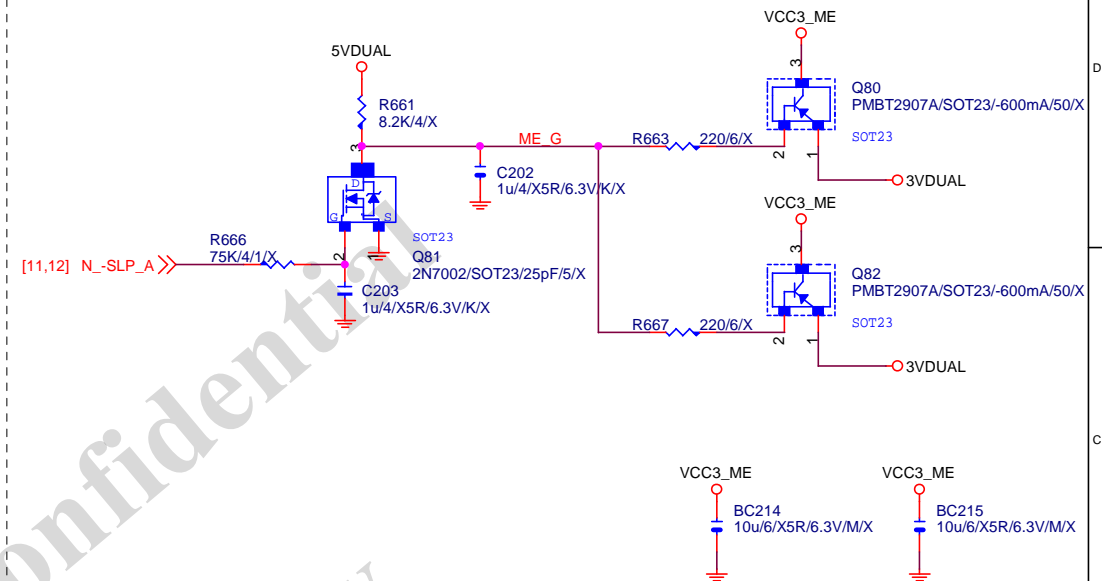
(RICHTER), (NUVOTON), (EMC)做共用
PIN7分壓阻值須做修改為100K以上電阻值

N/A



VCC3_ME

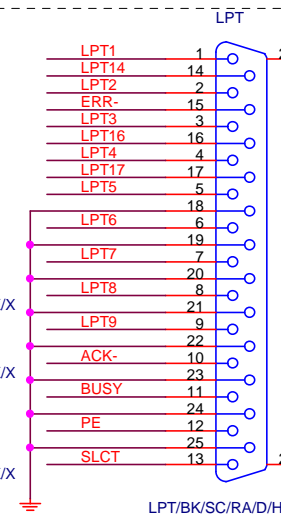
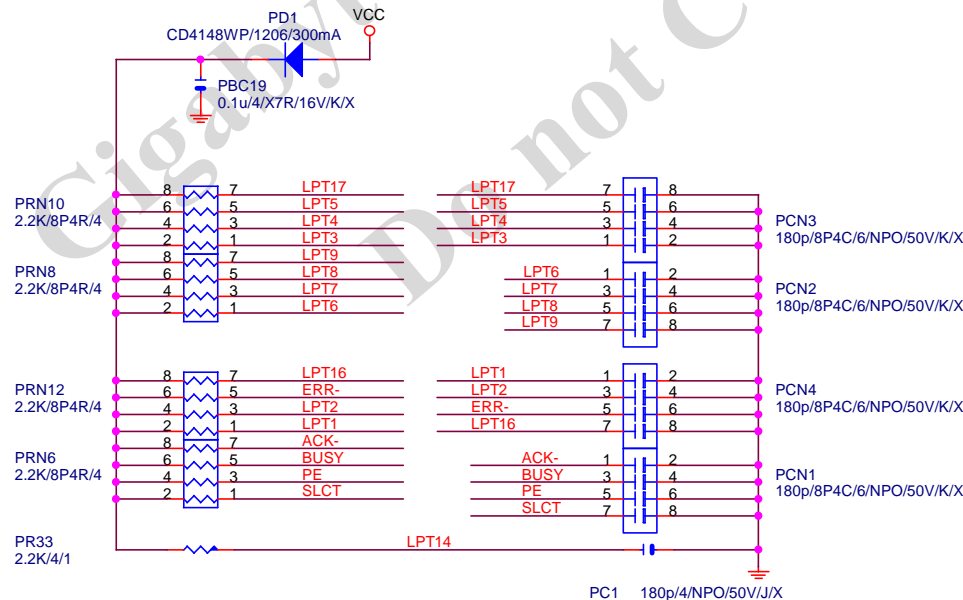
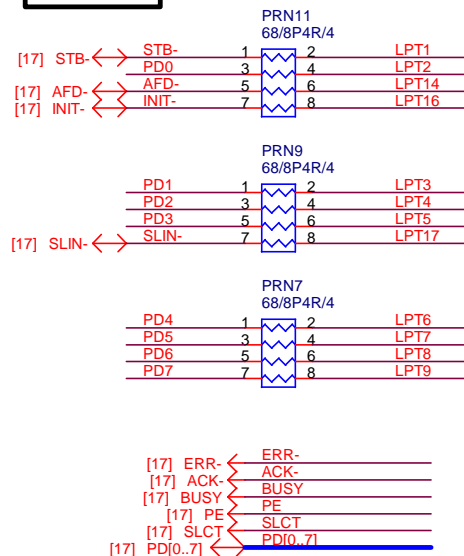
N/A



【技術通報R&D技術通報151】

33ohm Change to 68ohm

LPT PORT

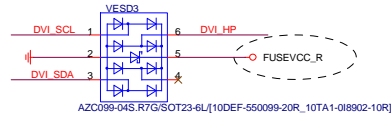


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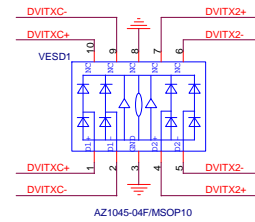
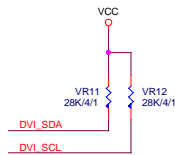
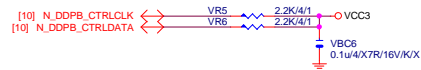
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Title		
LPT		
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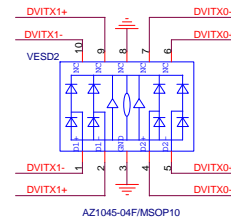
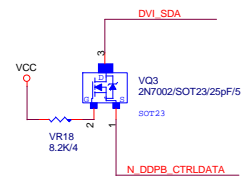
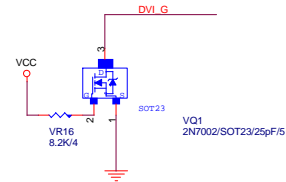
DVI



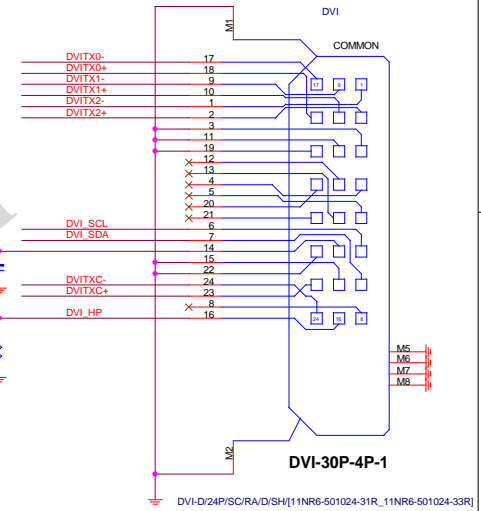
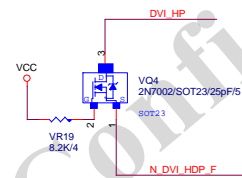
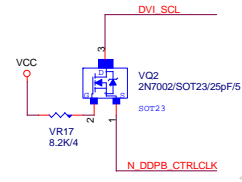
Close to connector



Close to connector



Close to connector



DVI-30P-4P-1

DVI-D/24P/SC/RA/D/SH[11NR6-501024-31R_11NR6-501024-33R]

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File			
DVI			
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Title				
ITE IT8892E				
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