

Model Name: GA-Z87X-D3H

Rev 1.11

SHEET

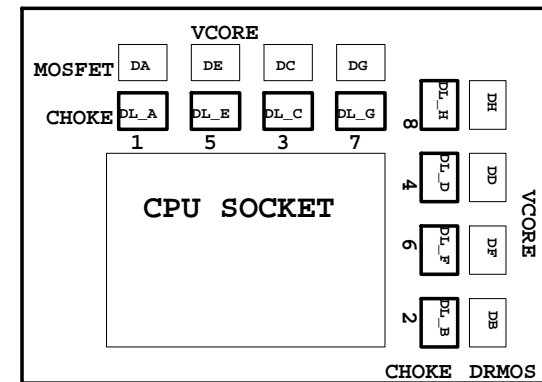
TITLE

01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B
06	CPU_LGA1150-C
07	DDR III CHANNEL A
08	DDR III CHANNEL B
09	PCH_FDI,DMI,USB,PCIE
10	PCH_RGB,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCI EXPRESS X8 SLOT
16	PCI EXPRESS X16 SWITCH
17	PCIEX1*3 , PCIEX4 SLOT
18	I/O ITE8728
19	COM, -PROHOT, R_USB
20	Dual BIOS , TPM SLB9635TT
21	ALC892 CODEC
22	REAR AUDIO JACK
23	ITE8892 PCI BRIDGE
24	PCI SLOT
25	FUSB 3.0
26	NCP3933 OVER VOLTAGE
27	DISCRETE POWER

SHEET

TITLE

28	F_PANEL , F_USB2.0
29	ATX POWER, CLOCK GEN
30	HWM , KB/MS , FAN CTRL
31	LAN INTEL i217
32	DVI
33	HDMI , R_USB30
34	TABLE LIST
35	IR3563B_PWM
36	IR3550-VCORE
37	IR3570_DDR PWM
38	IR 3598-DDR
39	D720210 4port_Hub
40	D720210 4port_Hub POWER
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42	D720210 4port_Hub_B POWER



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GA-Z87X-D3H

Component value change history

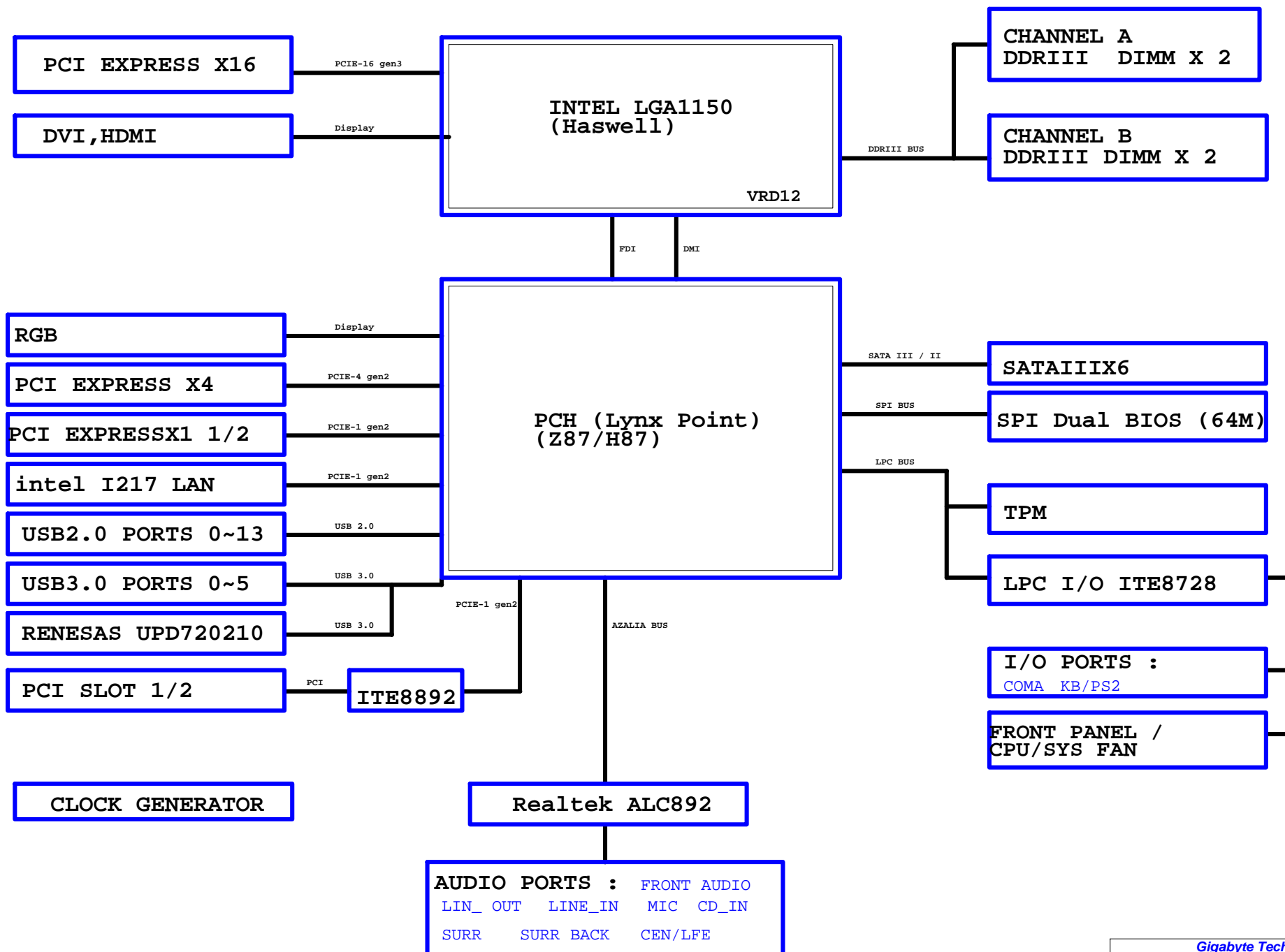
Data	Change Item	Reason
2013/04/01 9MZ87XD3H-00-10B	*** 更換 *** 新舊線路中,元件值不同;共 6 個***** HU2,'PTN3360DBS/HVQFN48/[10TA1-053360-20R]變更為'ASM1442/QFN48/[10TA1-051442-20R] HCR43,HAR43,'316K/4/1變更為'100K/4/1 HAR41,HCR41,'100K/4/1變更為'169K/4/1 HR29,'10K/4/1變更為'3.3K/4/1 *** 增加 *** 只在新線路中,不在舊線路中;共 30 個***** HCC53,HAC53,HCC55,HAC55,C205,'1u/4/X5R/6.3V/K HR22,'4.7K/4 R670,'0/4 HAC46,C50,C51,C52,C53,C54,'0.1u/4/X7R/16V/K HR28,HR30,'10/4 HCU4,HAU4,'RT9018B-18GSP/SO8/3A HCR47,HAR47,'2.2/4 HCR46,HAR46,'100K/4/1 HCC54,HAC54,'10u/6/X5R/6.3V/M HCB2,HABC2,'1u/6/X7R/16V/K R671,'22K/4 HCR54,HAR54,'8.2K/4/1 HAR48,HCR48,'316K/4/1 *** 刪除 *** 只在舊線路中,不在新線路中;共 6 個***** HAR59,HAR60,'0/4 NR110,'8.2K/4 HCR44,HAR44,'0/6 DAJP1,'PH/1*3/BK/2.54/VA/D	
2013/04/03 9MZ87XD3H-00-10C	1. Add 5 pcs 2.7K/8P4R for +12V loading	
2013/05/15 9MZ87XD3H-00-10D	1. MOS_HS 12SP2-S08824-31R to 12SP2-S08824-61R	
2013/06/28 9MZ87XD3H-00-11A	1. PCH CHIP DH82Z87 C1 INTEL to CHIP DH82Z87 C2 INTEL	
2013/06/28 9MZ87XD3H-00-11B	1. Remove OR80	
2013/07/09 9MZ87XD3H-00-11C	1. Add C10,Q10,R705,R706 2. Remove CD1	
2013/09/23 9MZ87XD3H-00-11H	1. MR17,R676,R697,R700,R701,R702 0603 to 0402 2. MOS_HS1 12SP2-S06624-01R to 12SP2-S06624-11R	
2013/10/24 9MZ87XD3H-00-11I	1. NC7,NC8 27P to 10P 2. NX1 X'TAL HALF 25MHz TXC to X'TAL HALF 25 MHz FUJICOM	
2013/11/08 9MZ87XD3H-00-11J	1. NC7,NC8 10P to 12P	

Circuit or PCB layout change

DATE	Change Item	Reason
2012/11/23	1. Change from Z87-D3H-02.DSN	Rev 0.1
2013/01/11	1. Change from Z87X-D3H_R01_1224B.DSN 2. PCIe4 clock change to PCIe_5 3. PCIeX1_1 clock change to PCIe_3 4. PCIeX8 clock change to PEG_B 5. N_PCIE_4_SW change to N_GPIO48 6. -PCIEX1_PR3 change to N_GPIO22 7. Update Note 33,TI H/W charger	Rev 0.2
2013/03/28	1.Add net N_-SLP_A 2.CLR_CMOS文字面修改 3.所有的FAN 加0.1u/4,要非常靠近FAN connect pin 2	Rev 1.01
2013/06/26	1.只修改文字面版本 Rev 1.1(For PCH C2 chip)	Rev 1.1
2013/09/16	1.修改PCH Crystal 走線	Rev 1.11

BLOCK DIAGRAM

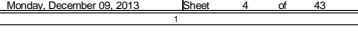
www.xinxunwei.com 400-800-9990



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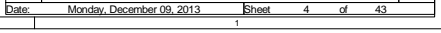
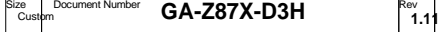
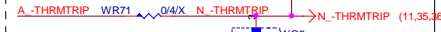
BLOCK DIAGRAM			
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CPU PU/PD

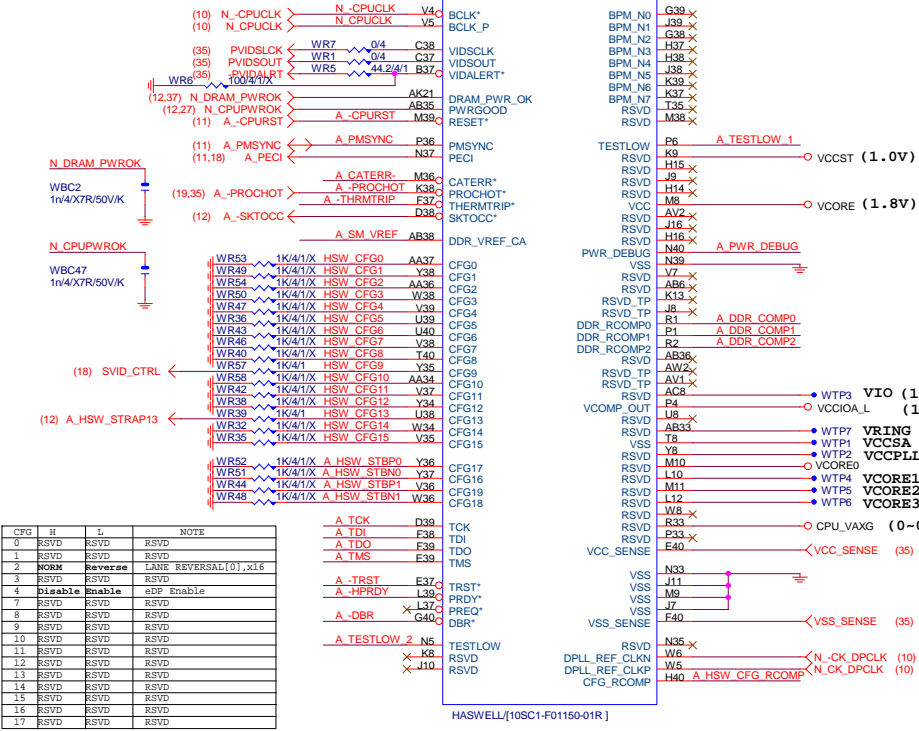


DDR_15V





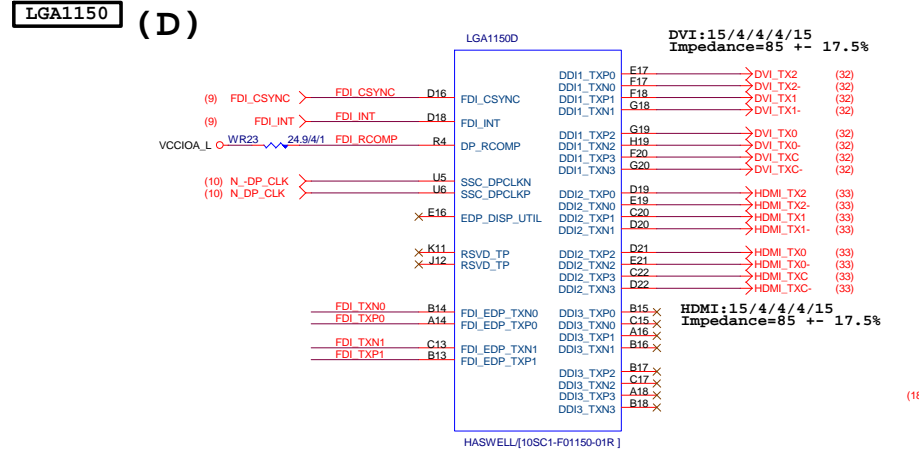
LGA1150 (D)



CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	None	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



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

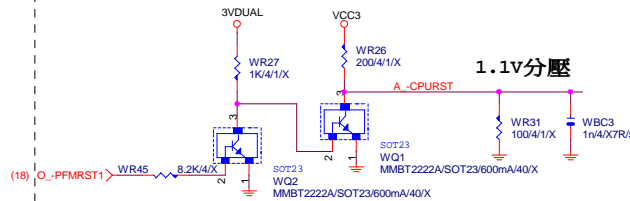


DMI:12/4/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +/- 17.5%

Impedance=05 = 17.5%

PA_EXP_TXP[0..15]	PA_EXP_TXP[0..15]	(14,16)
PA_EXP_TXN[0..15]	PA_EXP_TXN[0..15]	(14,16)
PA_EXP_RXP[0..15]	PA_EXP_RXP[0..15]	(14,16)
PA_EXP_RXN[0..15]	PA_EXP_RXN[0..15]	(14,16)

-CPURST



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CPU LGA1150-A

GA-Z87X-D3H

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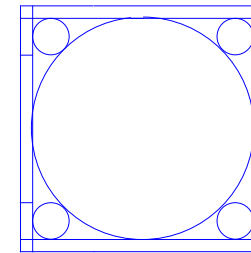
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LGA1150A		MAAA0 AU13	DDR0_MA0	DDR0_D00	AD38 MDA0
		MAAA1 AV16	DDR0_MA1	DDR0_D01	AD39 MDA1
		MAAA2 AU16	DDR0_MA2	DDR0_D02	AF38 MDA2
		MAAA3 AW17	DDR0_MA3	DDR0_D03	AF39 MDA3
		MAAA4 AU17	DDR0_MA4	DDR0_D04	AD37 MDA4
		MAAA5 AW18	DDR0_MA5	DDR0_D05	AD40 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 MDA10
		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 AY10	DDR0_MA13	DDR0_D13	AH38 MDA13
		MAAA14 AT20	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
		MODT_A2 AW9	DDR0_ODT2	DDR0_D18	AP38 MDA18
		MODT_A3 AU8	DDR0_ODT3	DDR0_D19	AP39 MDA19
				DDR0_D20	AM37 MDA20
				DDR0_D21	AM38 MDA16
				DDR0_D22	AP37 MDA22
				DDR0_D23	AP40 MDA23
				DDR0_D24	AW37 MDA29
				DDR0_D25	AU35 MDA26
				DDR0_D26	AU35 MDA27
				DDR0_D27	AT37 MDA28
				DDR0_D28	AU37 MDA24
				DDR0_D29	AT35 MDA30
				DDR0_D30	AW35 MDA31
				DDR0_D31	AW6 MDA33
				DDR0_D32	AW6 MDA37
				DDR0_D33	AW6 MDA38
				DDR0_D34	AW4 MDA39
				DDR0_D35	AW4 MDA45
				DDR0_D36	AN3 MDA42
				DDR0_D37	AN4 MDA43
				DDR0_D38	AR2 MDA44
				DDR0_D39	AR3 MDA40
				DDR0_D40	AN2 MDA46
				DDR0_D41	AN1 MDA47
				DDR0_D42	AL1 MDA49
				DDR0_D43	AL4 MDA53
				DDR0_D44	AL4 MDA50
				DDR0_D45	AL4 MDA51
				DDR0_D46	AL2 MDA52
				DDR0_D47	AL3 MDA48
				DDR0_D48	AJ2 MDA54
				DDR0_D49	AJ1 MDA55
				DDR0_D50	AG1 MDA57
				DDR0_D51	AG4 MDA61
				DDR0_D52	AE3 MDA58
				DDR0_D53	AE4 MDA59
				DDR0_D54	AG2 MDA60
				DDR0_D55	AG3 MDA56
				DDR0_D56	AE2 MDA62
				DDR0_D57	AE1 MDA63
				DDR0_D58	AE39 DQSA0
				DDR0_D59	AJ39 DQSA1
				DDR0_D60	AN39 DQSA2
				DDR0_D61	AV36 DQSA3
				DDR0_D62	AV5 DQSA4
				DDR0_D63	AP3 DQSA5
				DDR0_D64	AK3 DQSA6
				DDR0_D65	AF3 DQSA7
				DDR0_D66	AV32 DQSA0
				DDR0_D67	AE38 DQSA1
				DDR0_D68	AJ38 DQSA2
				DDR0_D69	AN38 DQSA3
				DDR0_D70	AJ36 DQSA4
				DDR0_D71	AW5 DQSA5
				DDR0_D72	AP2 DQSA6
				DDR0_D73	AK2 DQSA7
				DDR0_D74	AF2 DQSA8
				DDR0_D75	AJ32

HASWELL[10SC1-F01150-01R]

LGA1150B		MAAB0 AL19	DDR1_MA0	AE34 MDB0
		MAAB1 AK23	DDR1_MA1	AE35 MDB1
		MAAB2 AM22	DDR1_MA2	AG35 MDB2
		MAAB3 AM23	DDR1_MA3	AH35 MDB3
		MAAB4 AP23	DDR1_MA4	AD34 MDB4
		MAAB5 AL23	DDR1_MA5	AD35 MDB5
		MAAB6 AY24	DDR1_MA6	AG34 MDB6
		MAAB7 AY25	DDR1_MA7	AH34 MDB7
		MAAB8 AU26	DDR1_MA8	AL34 MDB8
		MAAB9 AW25	DDR1_MA9	AL35 MDB9
		MAAB10 MD13	DDR1_MA10	AK31 MDB10
		MAAB11 AY26	DDR1_MA11	AL31 MDB11
		MAAB12 AV26	DDR1_MA12	AK34 MDB12
		MAAB13 AR15	DDR1_MA13	AK35 MDB13
		MAAB14 AV27	DDR1_MA14	AK32 MDB14
		MAAB15 AY28	DDR1_MA15	AL32 MDB15
		MODT_B0 AM17	DDR1_ODT0	AP34 MDB17
		MODT_B1 AL16	DDR1_ODT1	AN31 MDB19
		MODT_B2 AM16	DDR1_ODT2	AP31 MDB23
		MODT_B3 AK15	DDR1_ODT3	AP35 MDB20
				AP35 MDB16
				AN32 MDB18
				AP32 MDB22
				AM29 MDB25
				AM28 MDB28
				AR29 MDB27
				AR28 MDB30
				AL23 MDB34
				AL28 MDB29
				AP29 MDB26
				AP28 MDB31
				AR12 MDB32
				AL13 MDB33
				AL12 MDB35
				AR13 MDB36
				AP13 MDB37
				AM13 MDB38
				AM12 MDB39
				AR9 MDB45
				AP9 MDB41
				AR6 MDB47
				AP6 MDB43
				AR10 MDB44
				AP10 MDB40
				AR7 MDB46
				AP7 MDB42
				AM9 MDB52
				AL9 MDB53
				AL6 MDB50
				AL7 MDB55
				AM10 MDB48
				AL10 MDB49
				AM6 MDB51
				AM2 MDB54
				AH6 MDB61
				AH7 MDB60
				AE6 MDB59
				AE7 MDB63
				AJ6 MDB56
				AJ7 MDB57
				AG6 MDB58
				AF7 MDB62
				AF35 DQSB0
				AL33 DQSB1
				AN28 DQSB2
				AN28 DQSB3
				AN12 DQSB4
				AP8 DQSB5
				AL8 DQSB6
				AG7 DQSB7
				AN25 DQSB0
				AK33 DQSB1
				AN33 DQSB2
				AN29 DQSB3
				AN13 DQSB4
				AR8 DQSB5
				AM8 DQSB6
				AG6 DQSB7
				AN26

HASWELL[10SC1-F01150-01R]

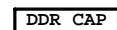
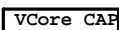
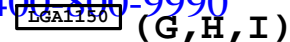
LGA1150
ILM_BP/1156/BKN/[12KRC-0F0001-23R]

DDR BUS

(7) MODT_A[0..3]	MODT_A0..3
(8) MODT_B[0..3]	MODT_B0..3
(7) MDA[0..63]	MDA0..63
(8) MDB[0..63]	MDB0..63
(7) DQSA[0..7]	DQSA0..7
(7) DQSA[0..7]	DQSA0..7
(7) MAA[A0..15]	MAAA0..15
(8) MAA[B0..15]	MAAB0..15
(8) DQSB[0..7]	DQSB0..7
(8) DQSB[0..7]	DQSB0..7

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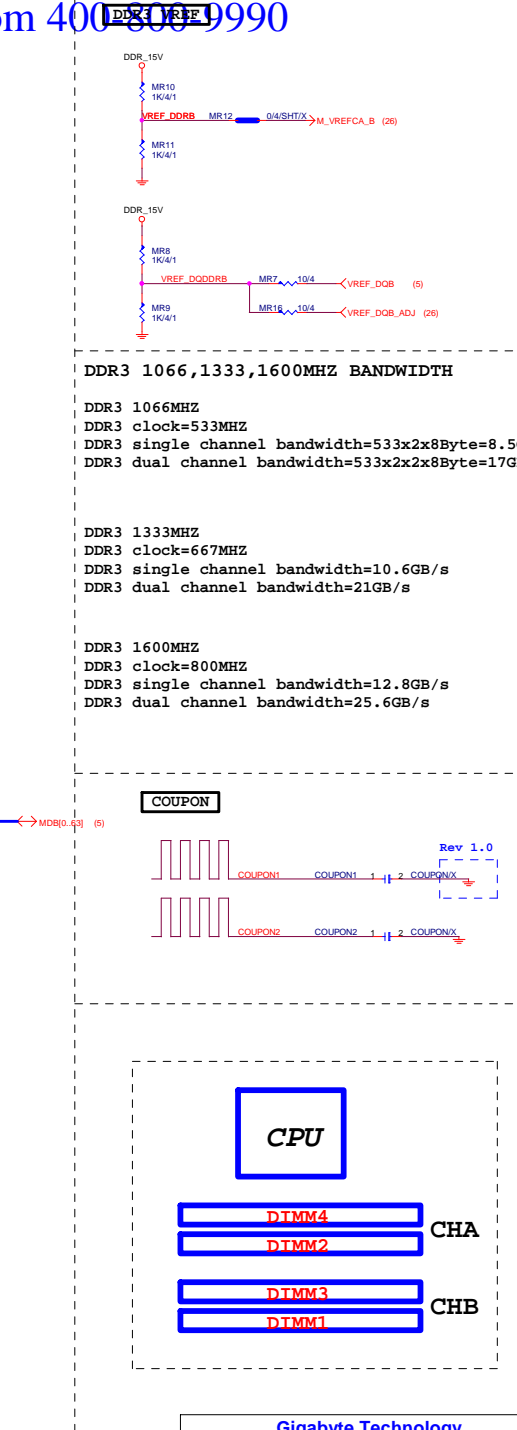
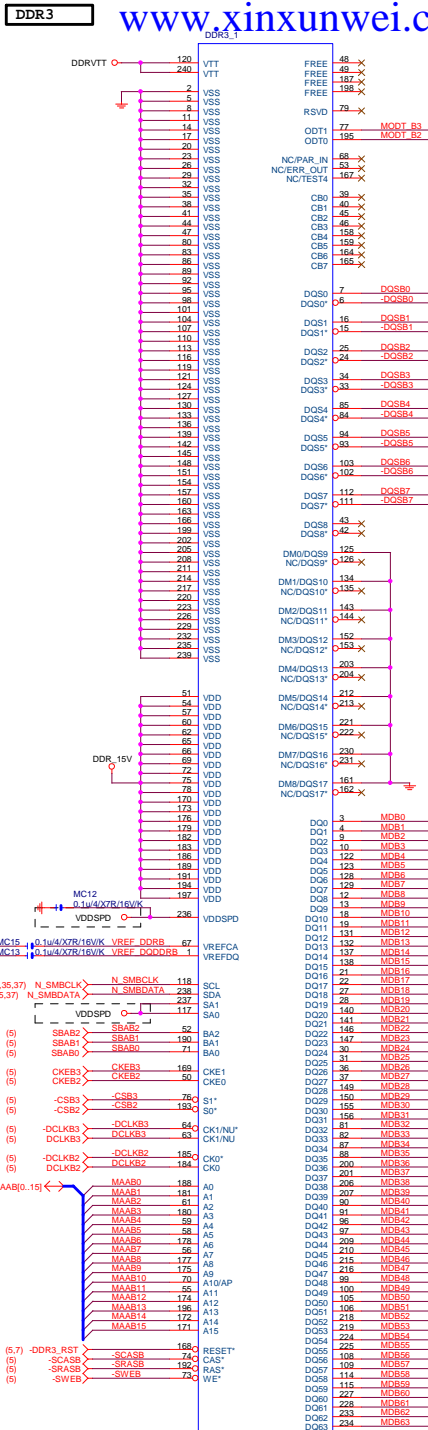
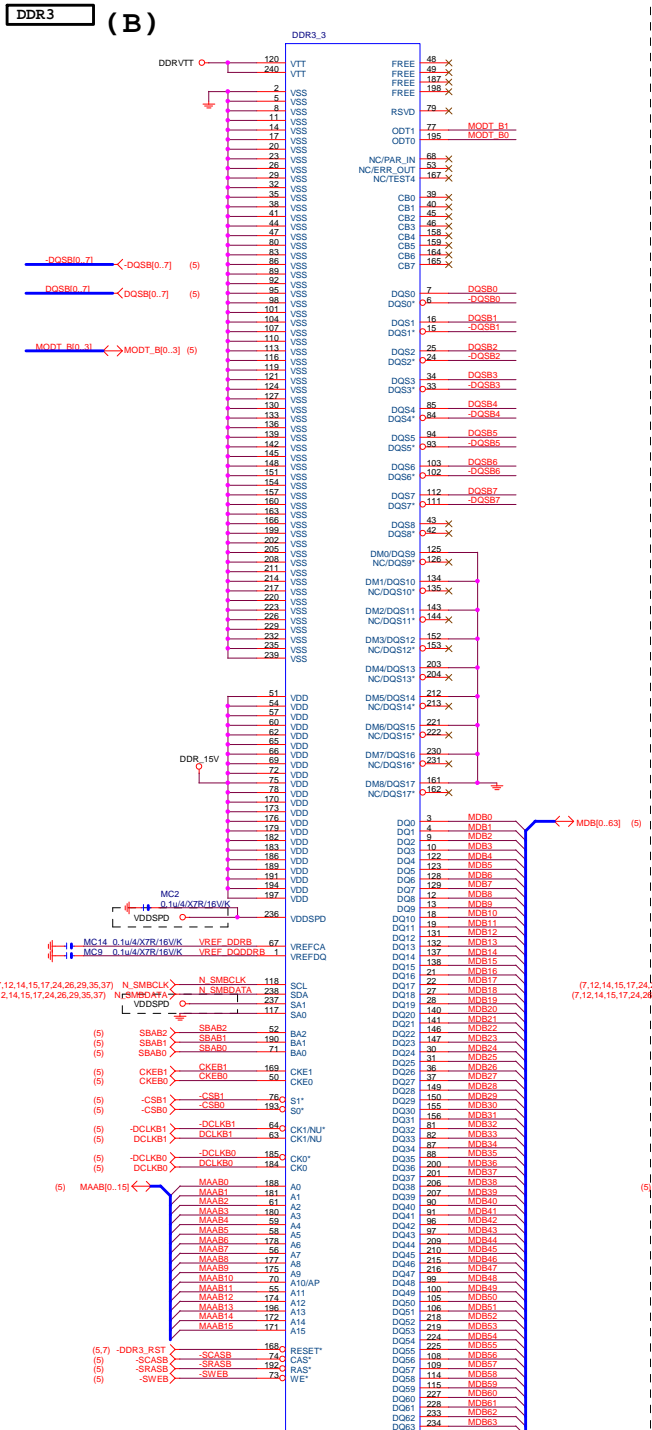


CPU LGA1150-C

GA-Z87X-D3H

Rev	1	1
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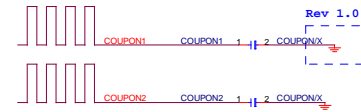
DDR3 1066,1333,1600MHZ BANDWIDTH

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

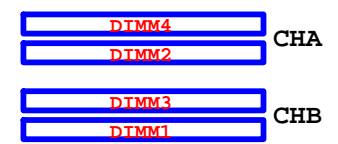
DDR3 1333MHZ
DDR3 clock=667MHZ
DDR3 single channel bandwidth=10.6GB/s
DDR3 dual channel bandwidth=21GB/s

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

COUPON



CPU



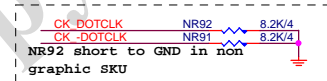
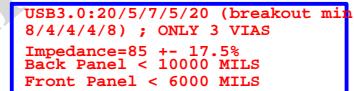
Gigabyte Technology

Title			DDR3 CHANNEL B
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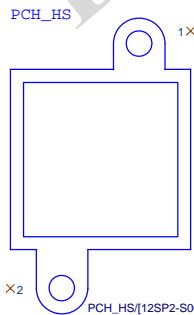
PCHB Impedance=8



BD82Z87/S



PCH H/S



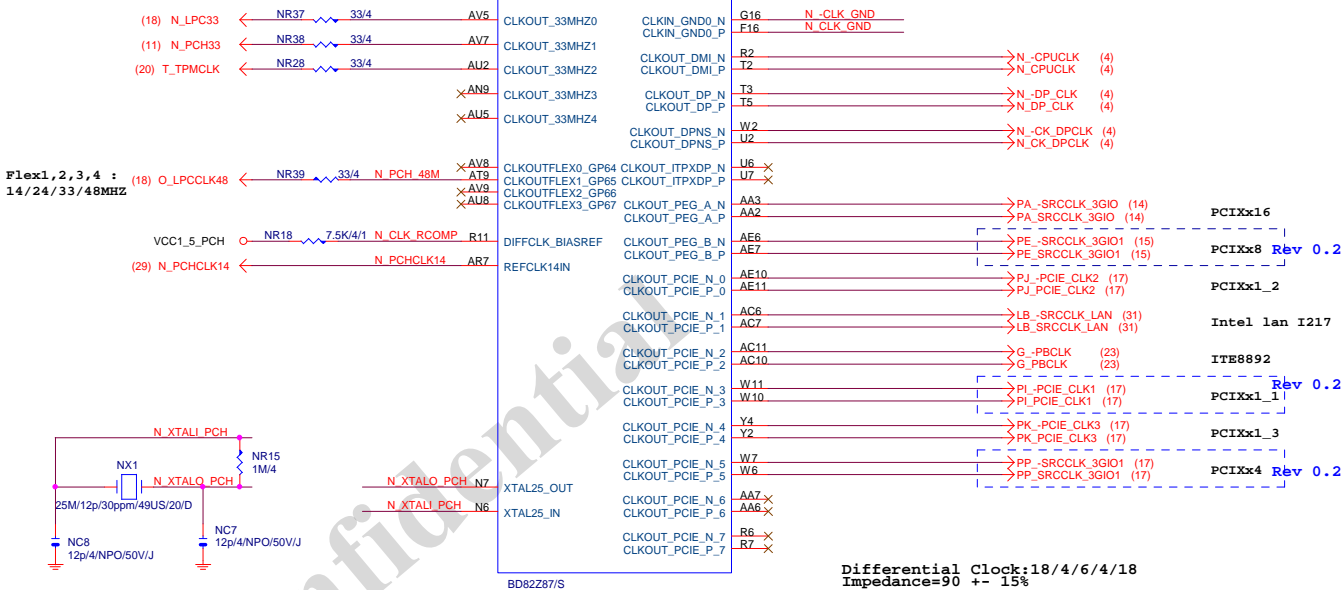
USB TABLE

USB OC#	Configure
OC0#	USB0,1
OC1#	USB2,3
OC2#	USB4,5
OC3#	USB6,7
OC4#	USB8,9
OC5#	USB10,11
OC6#	USB12,13
OC7#	Not Use

Pin 33/4 connections for the BD82Z87/S:

- 33/4 N_DVI_HDP_F → AJ2 DDPB_HPD
- 33/4 N_HDMI_HDP_F → AH5 DDPB_HPD
- AJ4 DDPD_HPD
- AK6 DDPB_AUXN
- AK8 DDPB_AUXP
- AG7 DDPD_AUXN
- AG8 DDPD_AUXP
- AG11 DDPD_AUXN
- AG10 DDPD_AUXP
- AC2 N_R
- AE2 N_G
- AC3 N_B
- AG4 N_DDCDATA
- AI2 N_DDCCLK
- AF5 N_VGA_RSET NR34
- AN3 N_DDPD_CTRLCLK (33)
- AM2 N_DDPD_CTRLDATA (33)
- AM1 N_DDPB_CTRLCLK (33)
- AJ5 N_DDPB_CTRLDATA (33)
- AN4 N_DDPD_CTRLCLK (32)
- AN2 N_DDPB_CTRLDATA (32)

BD82Z87/S

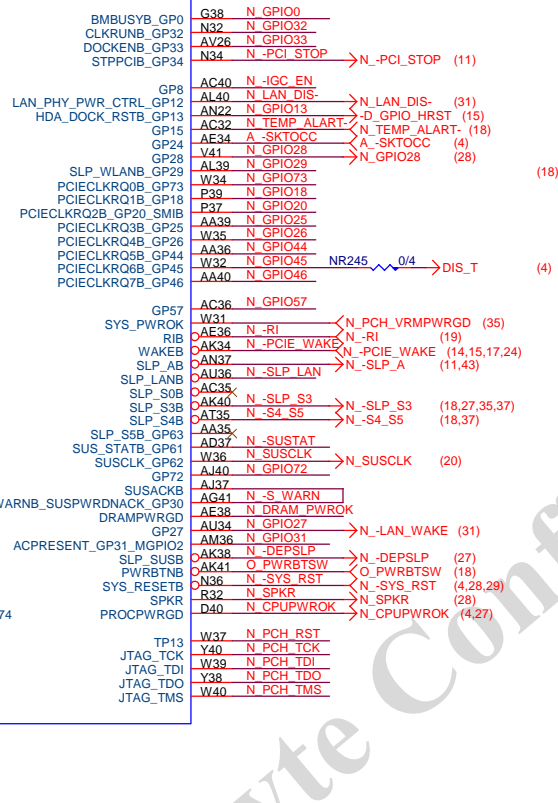


Differential Clock:18/4/6/4/18
Impedance=90 +- 15%

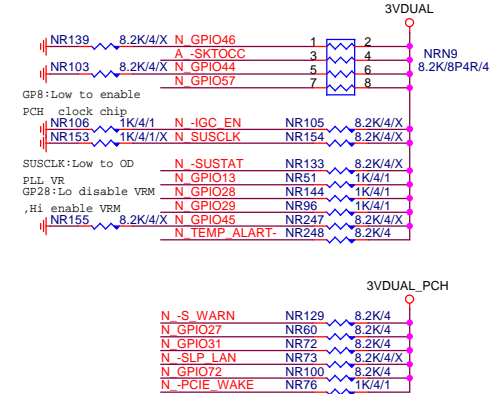
Mount for integrated clock Generation Mode

Title			
PCH DISPLAY ,CLK BUFFER			
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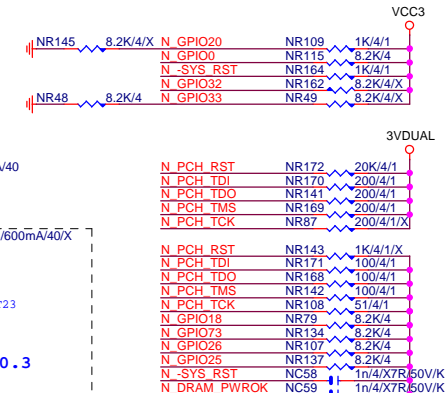
PCHD



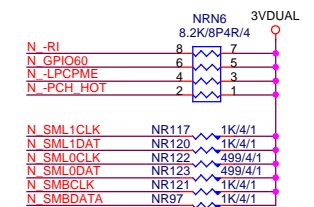
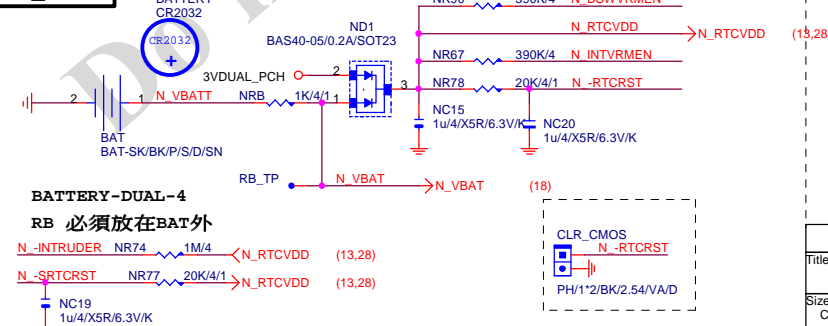
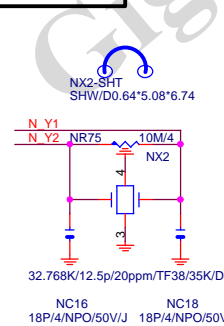
PCH	PU/PD
-----	-------



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



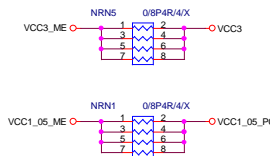
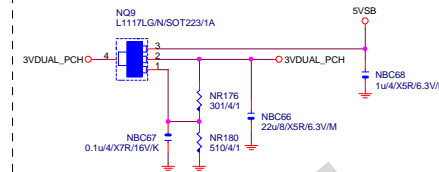
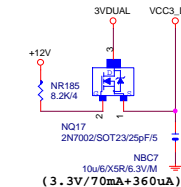
CLR_CMOS



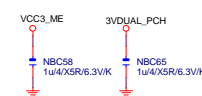
PCH GPIO , CTRL , AUDIO

Title			
PCH GPIO , CTRL , AUDIO			
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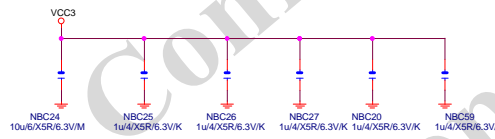
CLOSE北橋(注意震盪水波紋)



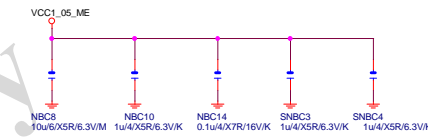
CAP



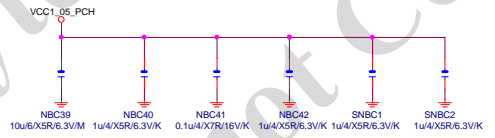
(3.3V) (X6)



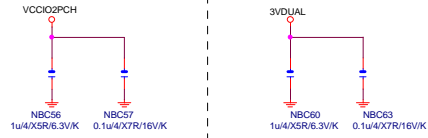
(1.05V) (x5)



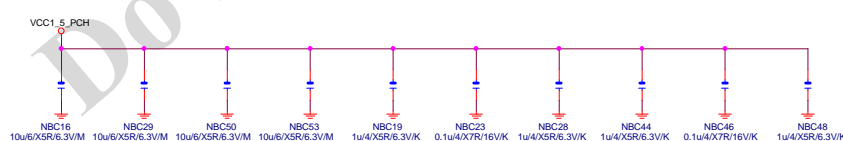
(1.05V) (x6)



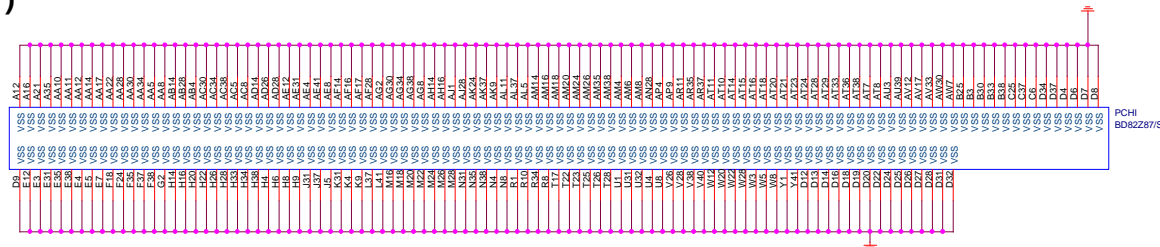
► (1.05V)(x2) (3.3V)(x2)



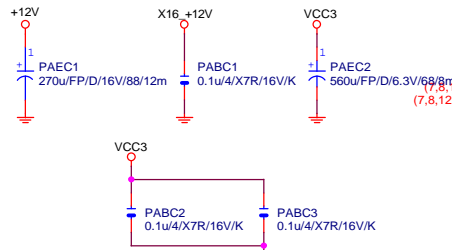
(1.5V) (x10)



PCH (I)

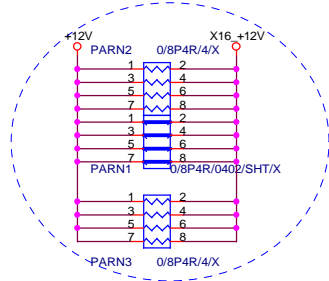


PCIEX16 CAP



PCIEX16 PROTECT SHT

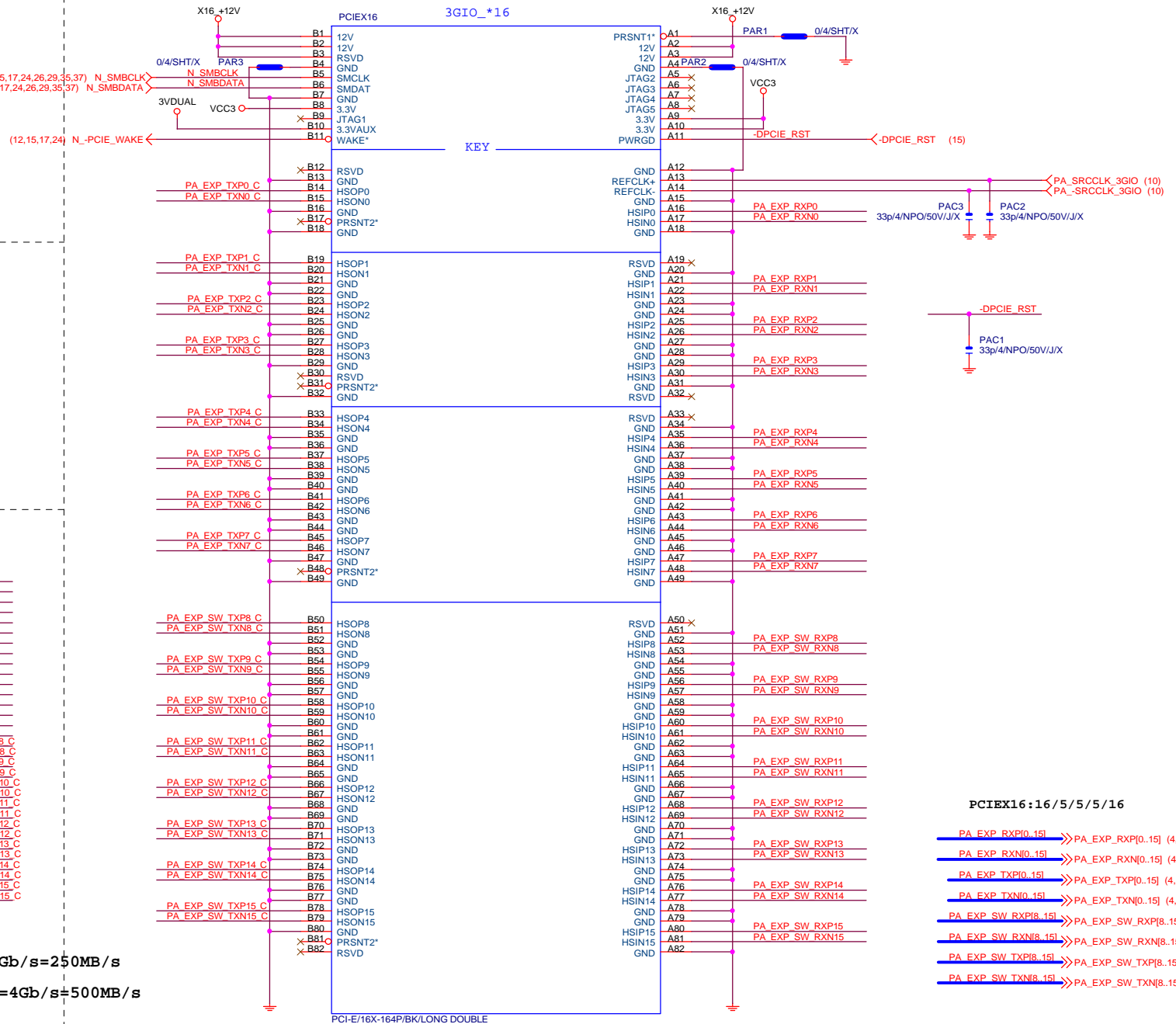
+12 protect
short-wire test



PCIEX16 AC CAP

PA EXP TXP0	PAC5	0.22u/4X5R/6.3V/K	PA EXP TXP0 C
PA EXP TXN0	PAC4	0.22u/4X5R/6.3V/K	PA EXP TXN0 C
PA EXP TXP1	PAC6	0.22u/4X5R/6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC7	0.22u/4X5R/6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC8	0.22u/4X5R/6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC9	0.22u/4X5R/6.3V/K	PA EXP TXN2 C
PA EXP TXP3	PAC10	0.22u/4X5R/6.3V/K	PA EXP TXP3 C
PA EXP TXN3	PAC11	0.22u/4X5R/6.3V/K	PA EXP TXN3 C
PA EXP TXP4	PAC12	0.22u/4X5R/6.3V/K	PA EXP TXP4 C
PA EXP TXN4	PAC13	0.22u/4X5R/6.3V/K	PA EXP TXN4 C
PA EXP TXP5	PAC14	0.22u/4X5R/6.3V/K	PA EXP TXP5 C
PA EXP TXN5	PAC15	0.22u/4X5R/6.3V/K	PA EXP TXN5 C
PA EXP TXP6	PAC16	0.22u/4X5R/6.3V/K	PA EXP TXP6 C
PA EXP TXN6	PAC17	0.22u/4X5R/6.3V/K	PA EXP TXN6 C
PA EXP TXP7	PAC18	0.22u/4X5R/6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC19	0.22u/4X5R/6.3V/K	PA EXP TXN7 C
PA EXP SW TXP8	PAC20	0.22u/4X5R/6.3V/K	PA EXP SW TXP8 C
PA EXP SW TXN8	PAC21	0.22u/4X5R/6.3V/K	PA EXP SW TXN8 C
PA EXP SW TXP9	PAC22	0.22u/4X5R/6.3V/K	PA EXP SW TXP9 C
PA EXP SW TXN9	PAC23	0.22u/4X5R/6.3V/K	PA EXP SW TXN9 C
PA EXP SW TXP10	PAC24	0.22u/4X5R/6.3V/K	PA EXP SW TXP10 C
PA EXP SW TXN10	PAC25	0.22u/4X5R/6.3V/K	PA EXP SW TXN10 C
PA EXP SW TXP11	PAC26	0.22u/4X5R/6.3V/K	PA EXP SW TXP11 C
PA EXP SW TXN11	PAC27	0.22u/4X5R/6.3V/K	PA EXP SW TXN11 C
PA EXP SW TXP12	PAC28	0.22u/4X5R/6.3V/K	PA EXP SW TXP12 C
PA EXP SW TXN12	PAC29	0.22u/4X5R/6.3V/K	PA EXP SW TXN12 C
PA EXP SW TXP13	PAC30	0.22u/4X5R/6.3V/K	PA EXP SW TXP13 C
PA EXP SW TXN13	PAC31	0.22u/4X5R/6.3V/K	PA EXP SW TXN13 C
PA EXP SW TXP14	PAC32	0.22u/4X5R/6.3V/K	PA EXP SW TXP14 C
PA EXP SW TXN14	PAC33	0.22u/4X5R/6.3V/K	PA EXP SW TXN14 C
PA EXP SW TXP15	PAC34	0.22u/4X5R/6.3V/K	PA EXP SW TXP15 C
PA EXP SW TXN15	PAC35	0.22u/4X5R/6.3V/K	PA EXP SW TXN15 C

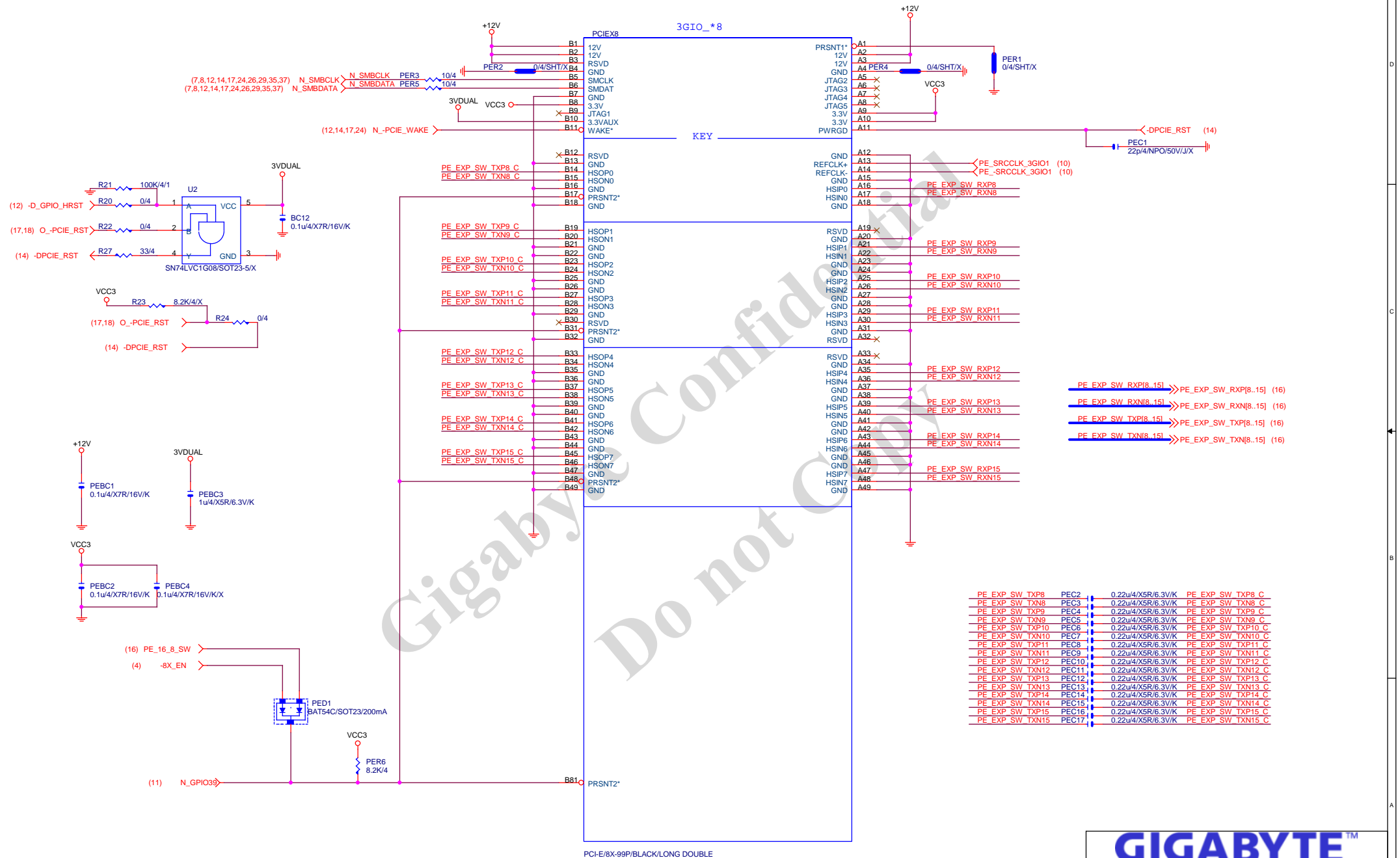
PCIEX16 SLOT



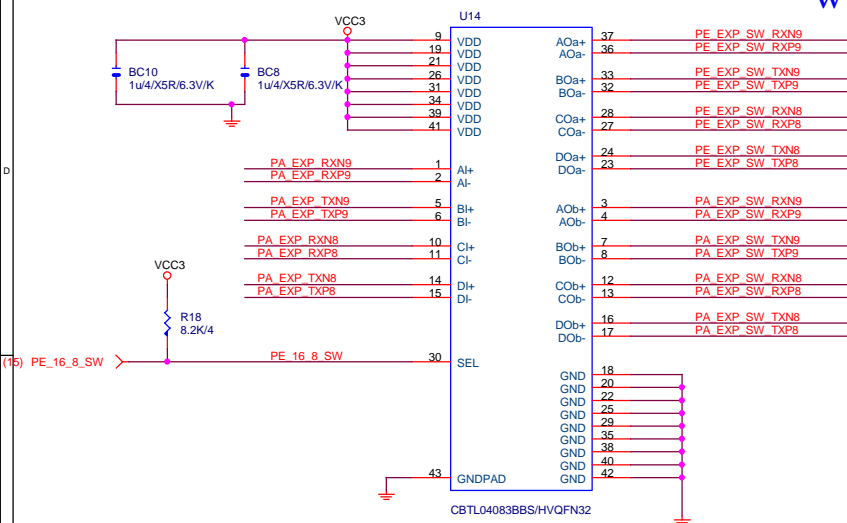
PCI-E/16X-164P/BK/LONG DOUBLE

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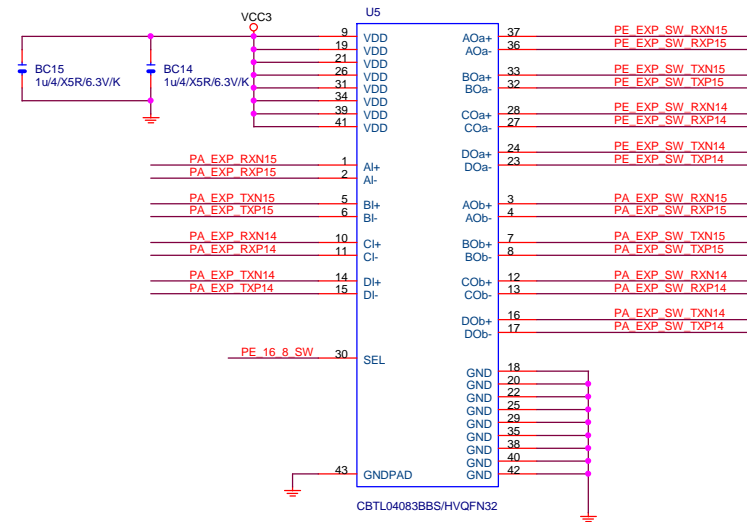
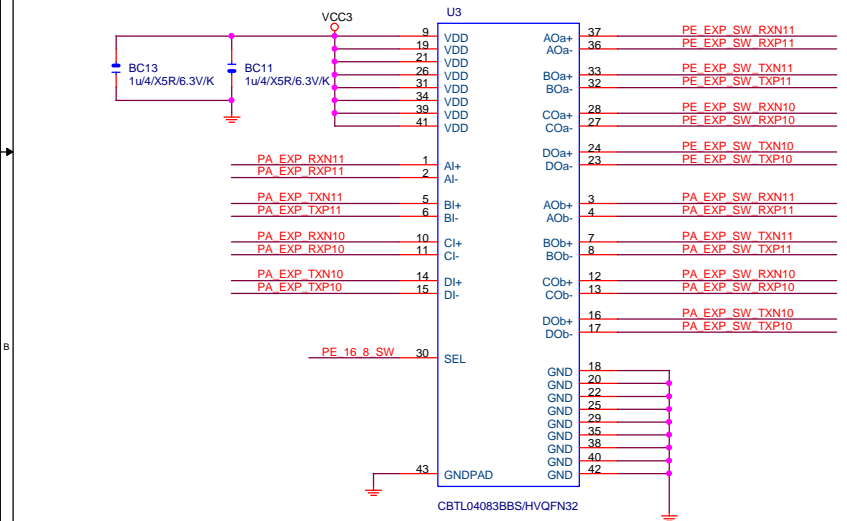
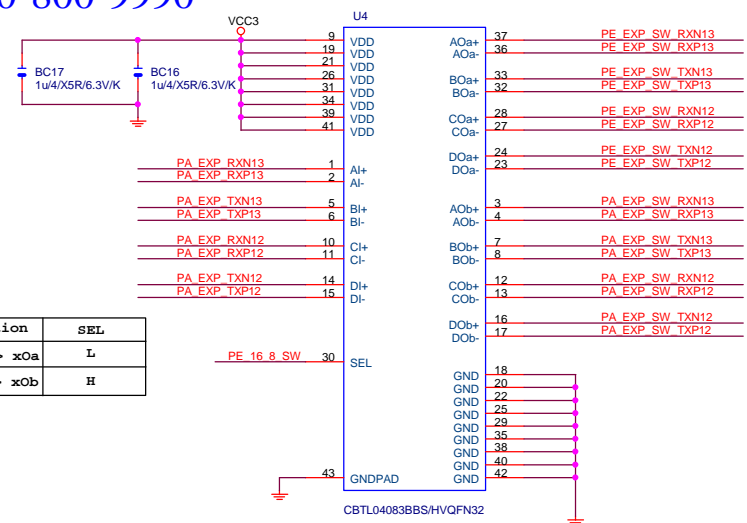
Title			
PCI EXPRESS * 16			
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PCI-E/8X-99P/BLACK/LONG DOUBLE



Function	SEL
xI--> xOa	L
xI--> xOb	H



PA EXP SW RXP8_15] >>> PA_EXP_SW_RXP[8..15] (14)

PA EXP SW RXN8_15] >>> PA_EXP_SW_RXN[8..15] (14)

PA EXP SW TXP8_15] >>> PA_EXP_SW_TXP[8..15] (14)

PA EXP SW TXN8_15] >>> PA_EXP_SW_TXN[8..15] (14)

PE EXP SW RXP8_15] >>> PE_EXP_SW_RXP[8..15] (15)

PE EXP SW RXN8_15] >>> PE_EXP_SW_RXN[8..15] (15)

PE EXP SW TXP8_15] >>> PE_EXP_SW_TXP[8..15] (15)

PE EXP SW TXN8_15] >>> PE_EXP_SW_TXN[8..15] (15)

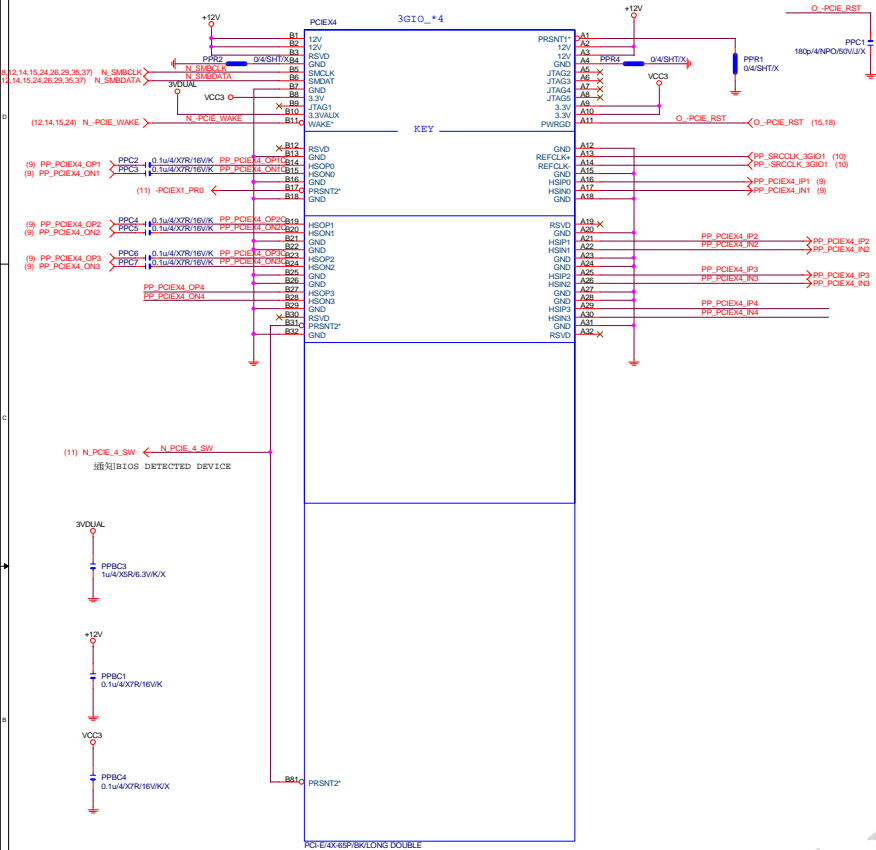
PA EXP RXP0_15] >>> PA_EXP_RXP[0..15] (4,14)

PA EXP RXN0_15] >>> PA_EXP_RXN[0..15] (4,14)

PA EXP TXP0_15] >>> PA_EXP_TXP[0..15] (4,14)

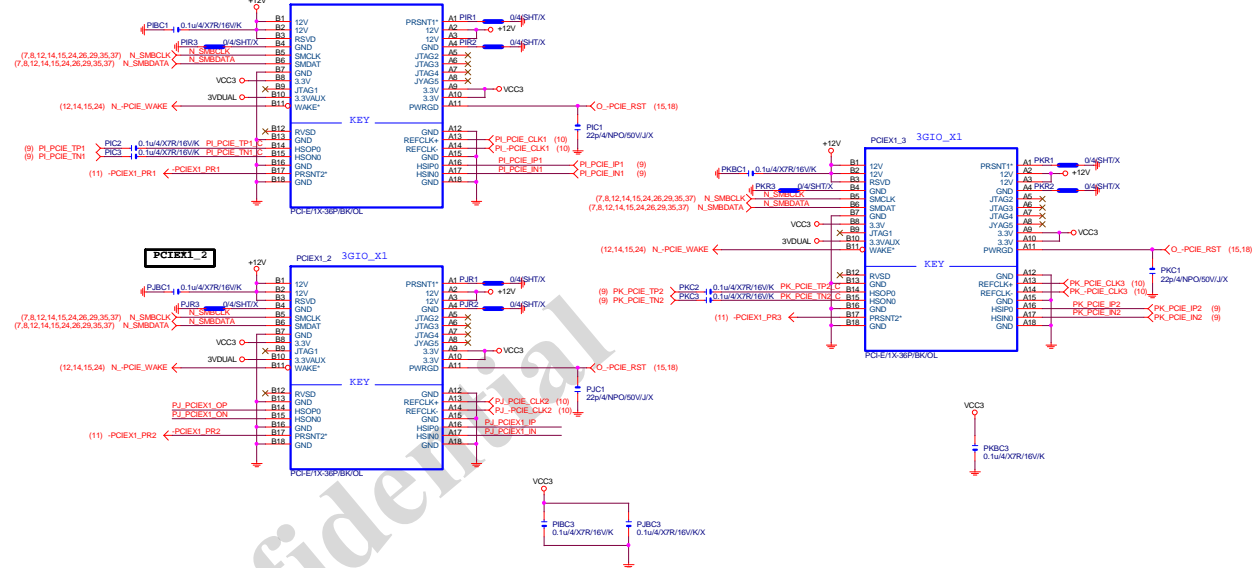
PA EXP TXN0_15] >>> PA_EXP_TXN[0..15] (4,14)

PCIEX4 SLOT

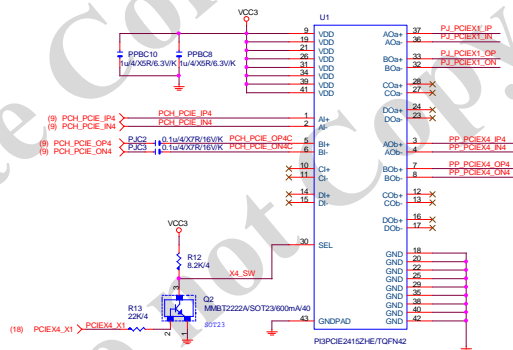


	N_PCIE_4_SW (PCH GPIO48)	PCIEX4_X1 (SIO GPIO26)
PCIE1,PCIE4 --> X1 (Default)	H	H
PCIE4 No devices PCIE4 -> X1	H	H
PCIE4 Have devices PCIE4 -> X4	L	L
PCIE1_1/2 --> N/A		

www.gigabyte.com 400-800-9990



PCIEX4/X1 SWITCH



Function	SEL
x1--> x0b	L,PCIE4 SLOT-->X1
x1--> x0b	H,PCIE4 SLOT-->X4

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Model	PCIE_X1_1,2	Rev	1.11
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SIO IT8728F

3VDUAL_PCH OR46 1K/4/1 DS ME

Rev 0.3

SYS_FAN3(30)

FANPWM4

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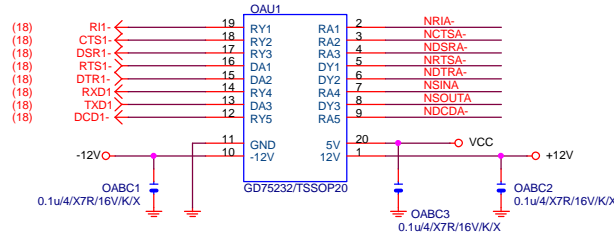
JP342

JP343

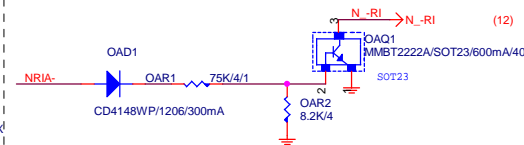
JP344

JP345

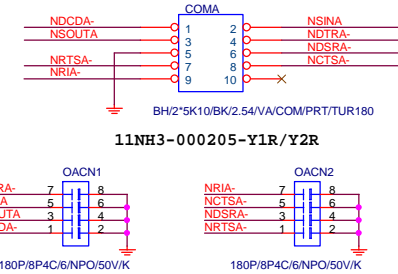
COMA



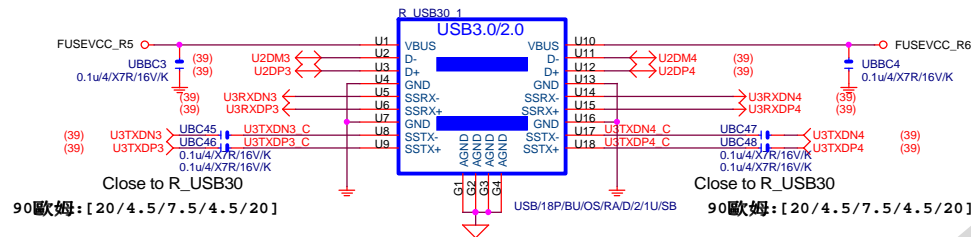
COM R1



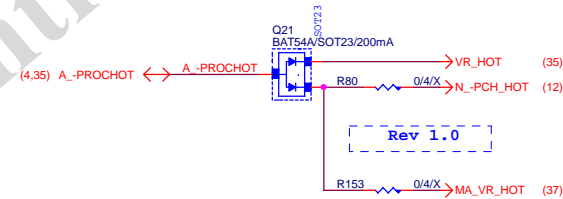
COM BUFFER



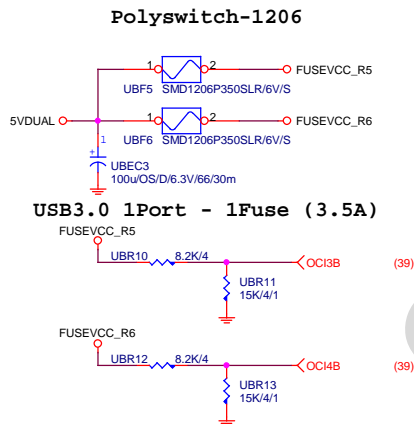
USB30_20 CONNECT



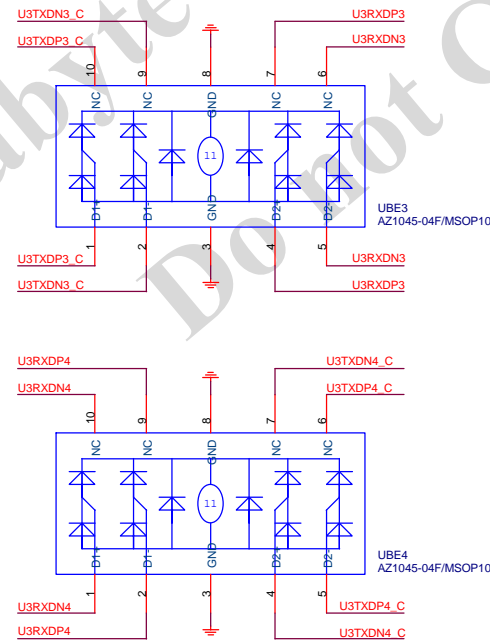
-PROHOT



USB30 PWR

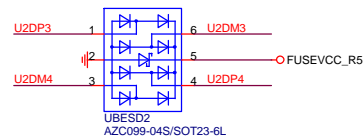


USB30 ESD PROTECT



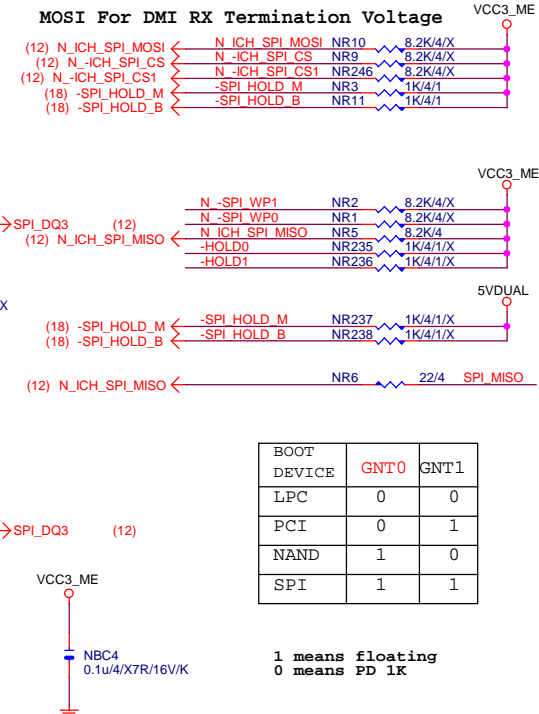
-PROHOT

USB20 ESD PROTECT



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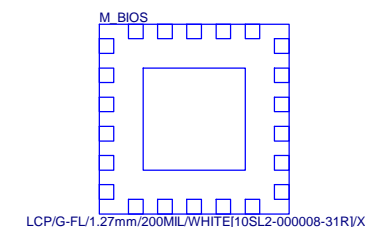
Title			
COM & PROHOT/Dynamic O.C.			
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BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

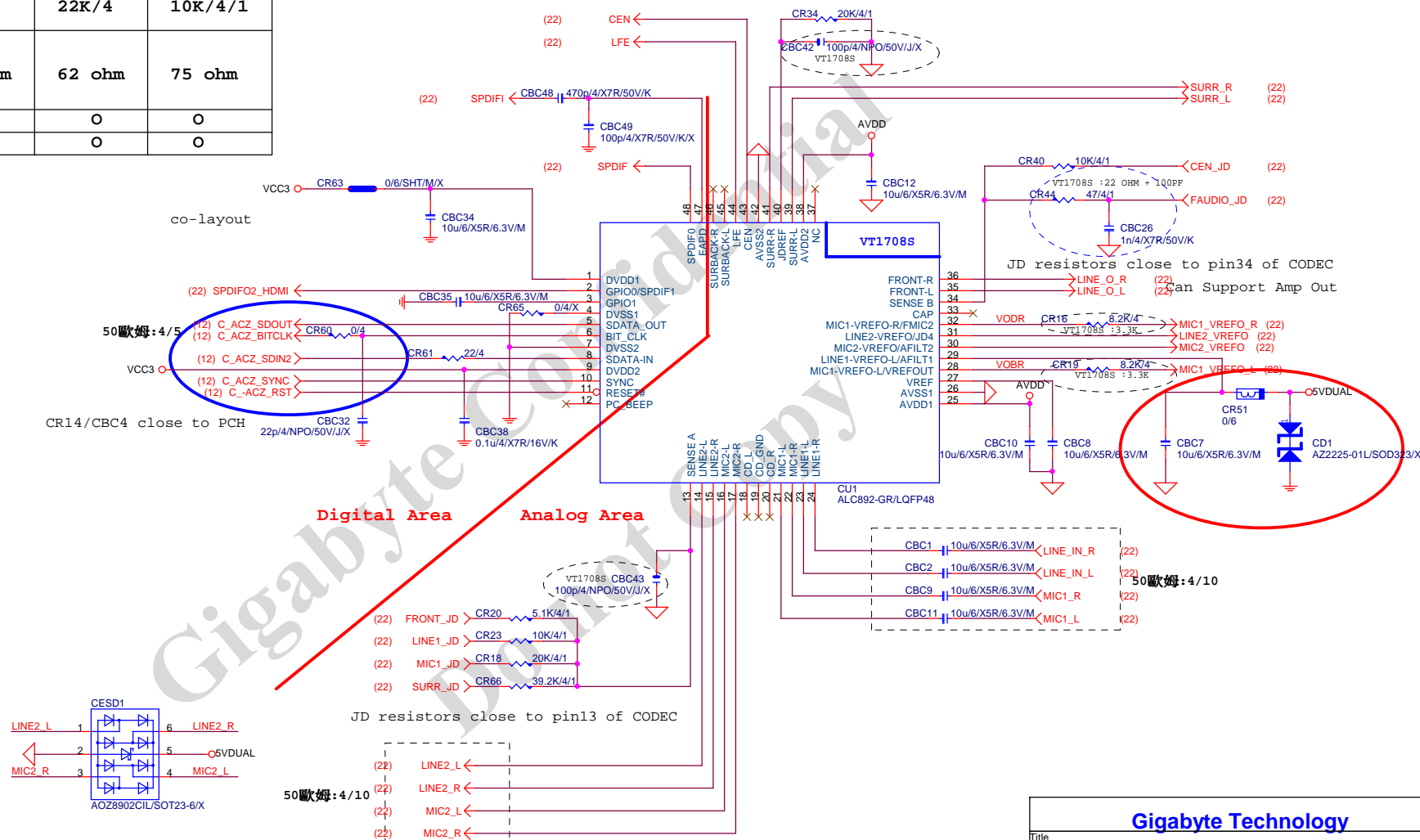
1 means floating
0 means PD 1K

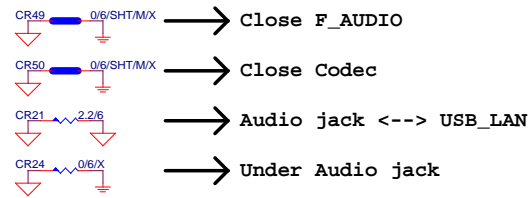
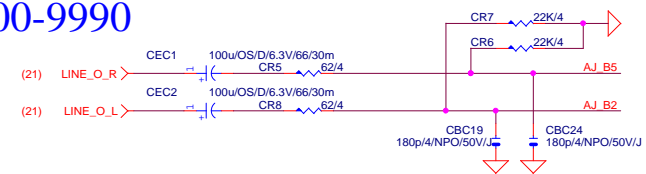
TPM CONNECT



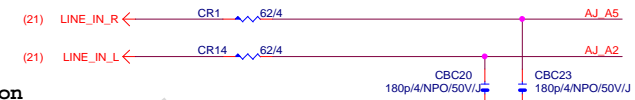
Gigabyte Technology

<i>Gigabyte Technology</i>			
Title BIOS			
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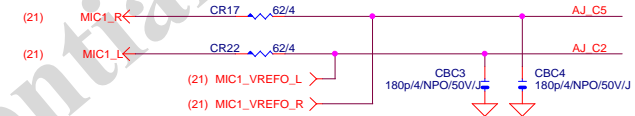
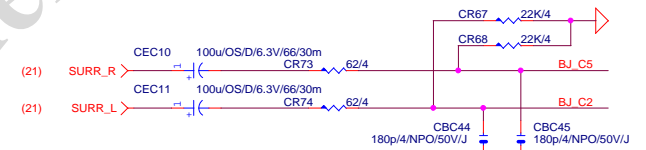
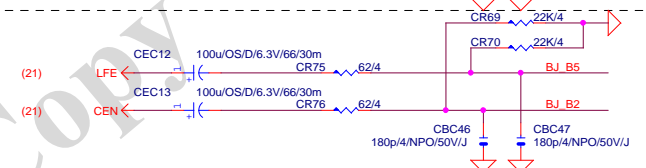
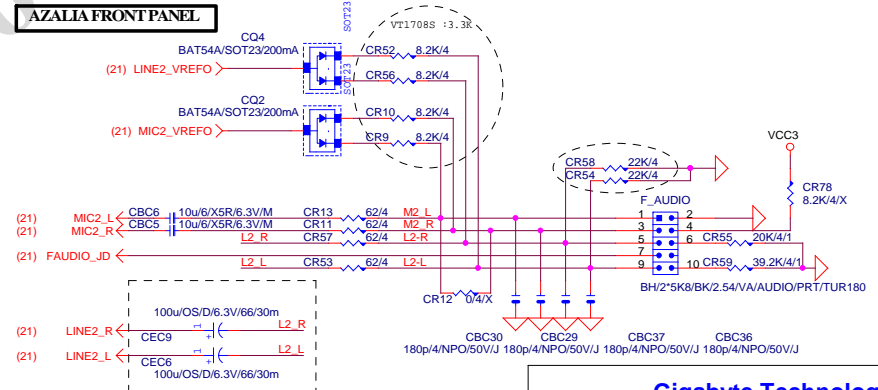


**LINE-OUT****LINE-IN**

Verify MIC function in LINE-in

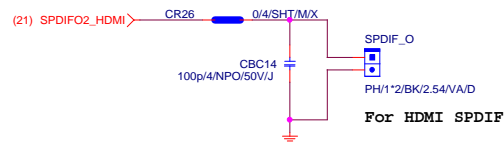
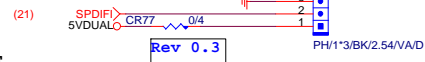
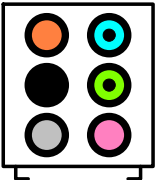
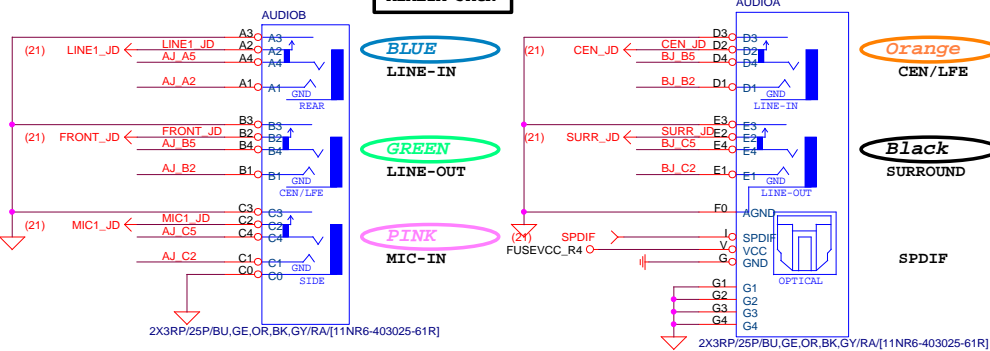


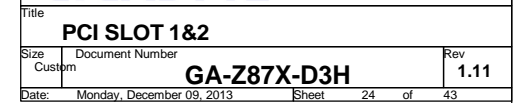
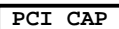
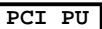
For 889A/888

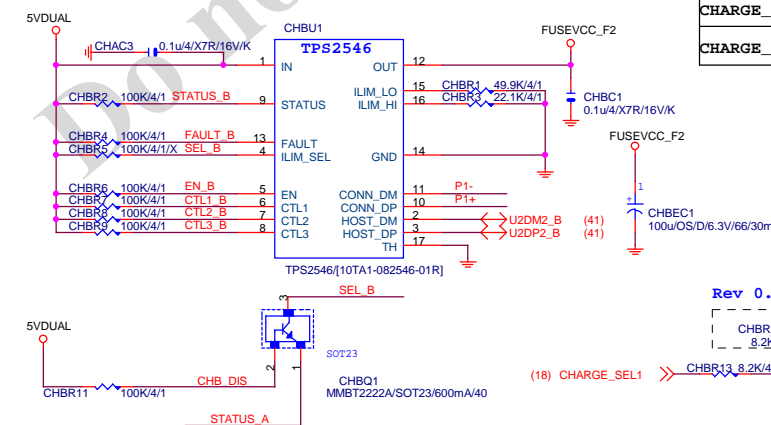
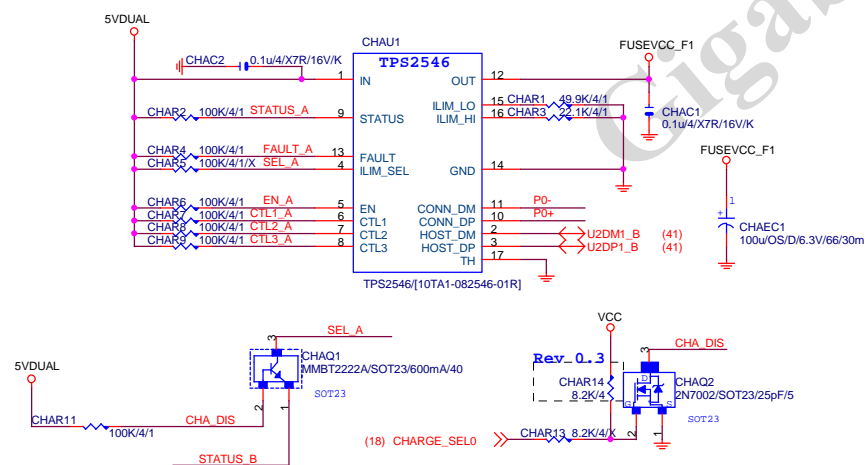
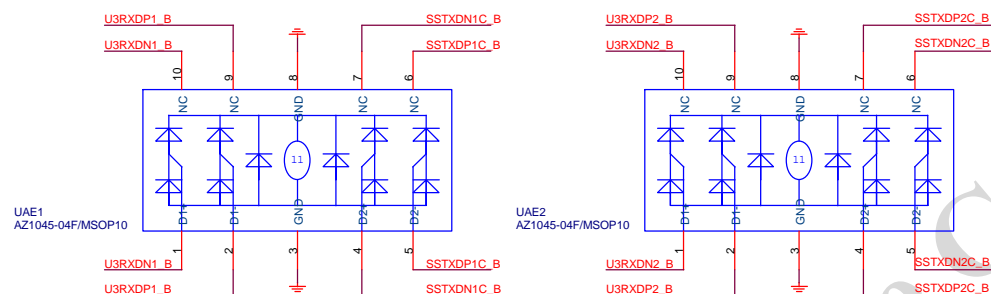
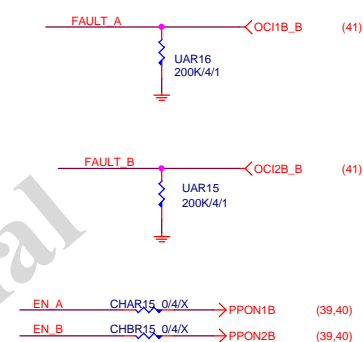
MIC-IN**SURROUND****CEN/LFE****SURRBACK****AZALIA FRONT PANEL**

Gigabyte Technology

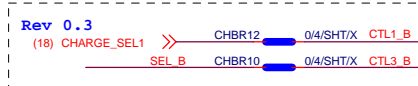
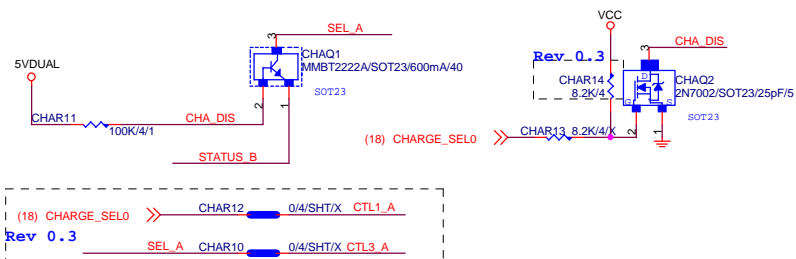
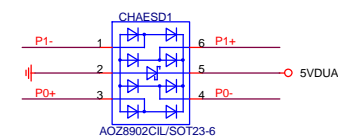
Title		
AUDIO JACK		
Size Custom	Document Number	Rev
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SPDIF_OUT**SPDIF_IN****AZALIA JACK****AZALIA JACK**

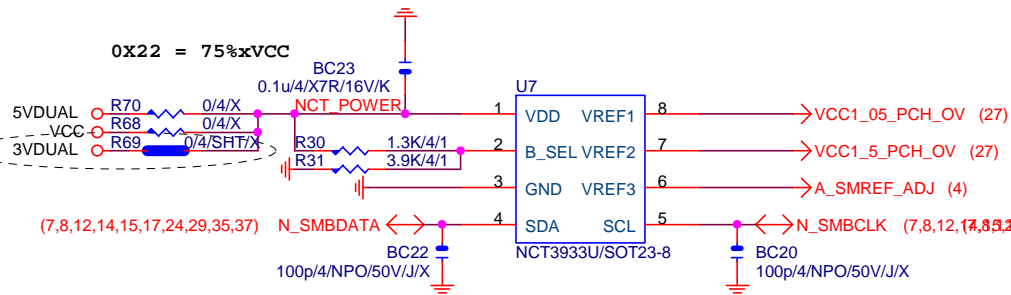




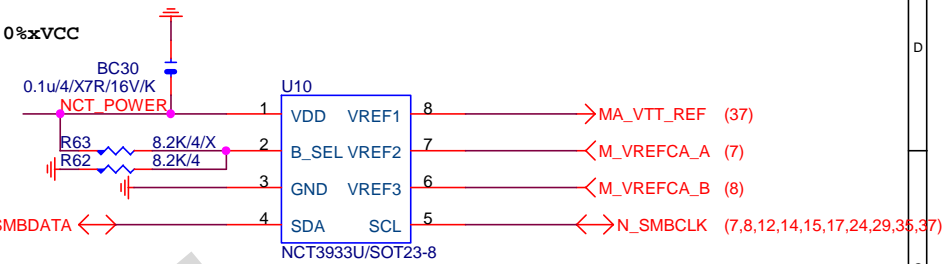
	S0	S3/S4/S5
CHARGE_SEL0	1	0
CHARGE_SEL1	1	0



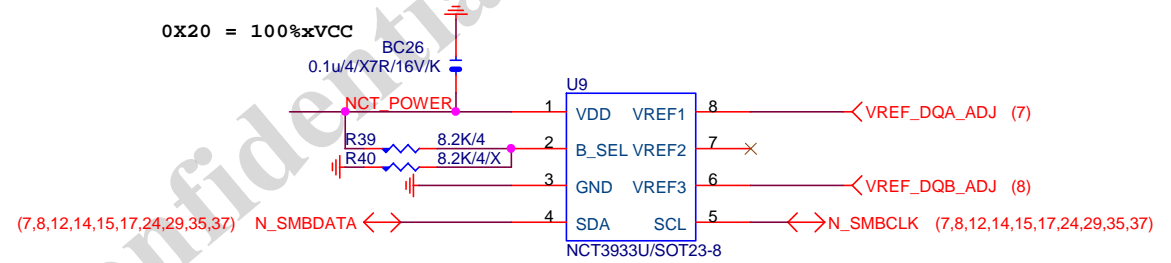
OVER VOLTAGE



0X2A = 0%xVCC



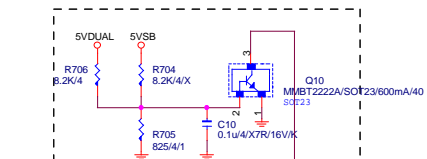
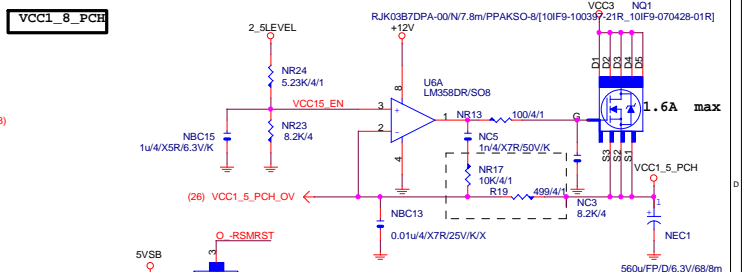
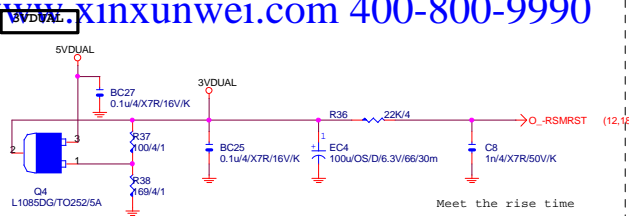
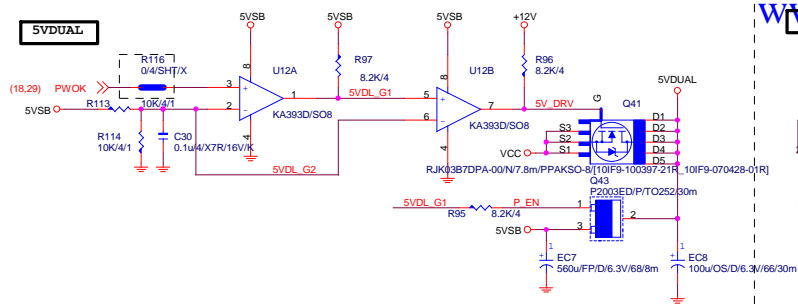
0X20 = 100%xVCC



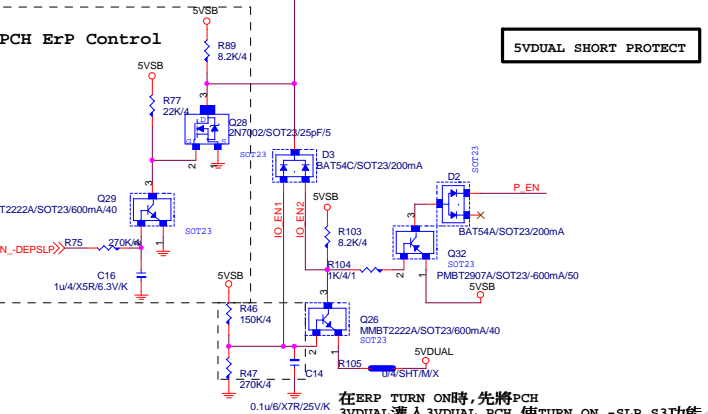
NCT3933	0X2A	0X20	0X22
VREF1	DDRVTT	VREF_DDRA_DQ	PCH Core
VREF2	VREF_DDRA_CA	N/A	VCC1_5_PCH
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	SMREF

Gigabyte Technology

Title		
CPU CORE VR-2		
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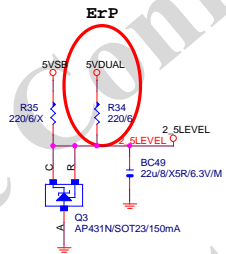


5VSB OVP:7.5V protection

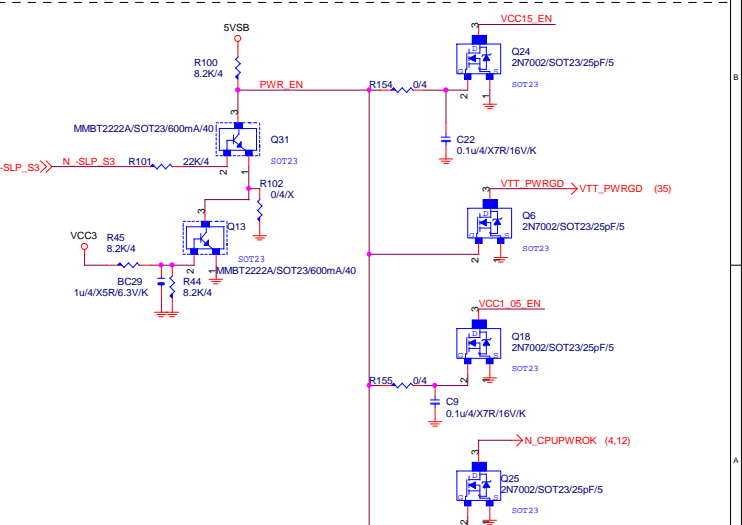
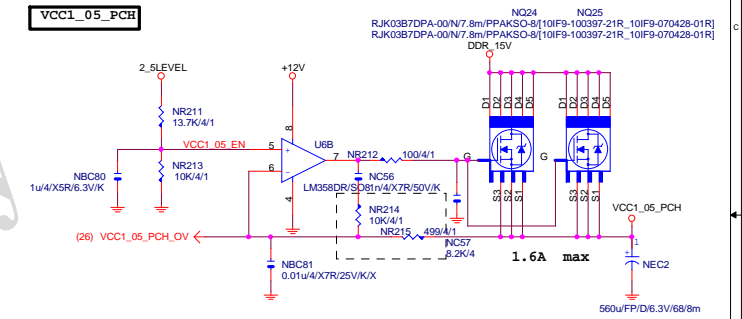
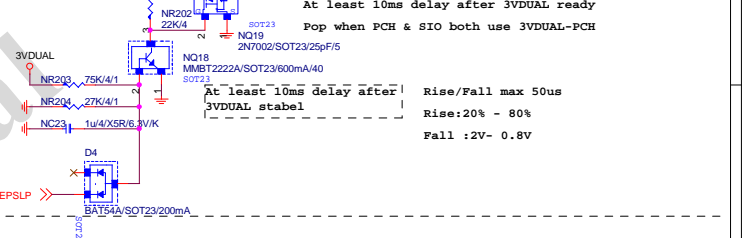


5VDUAL SHORT PROTECT

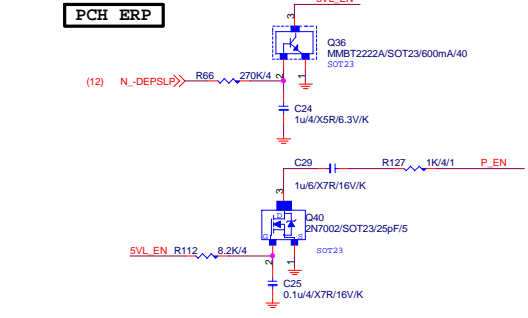
2_5LEVEL



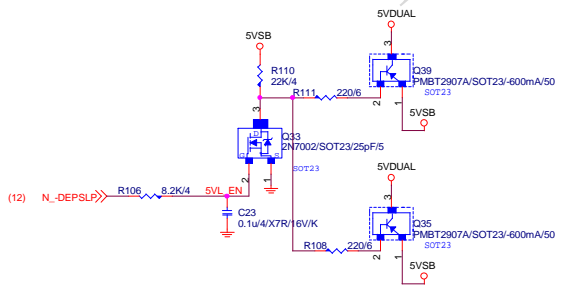
ErP



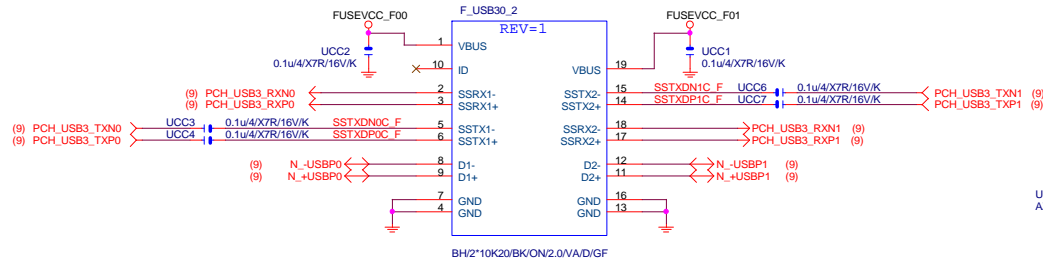
PWR SEQ



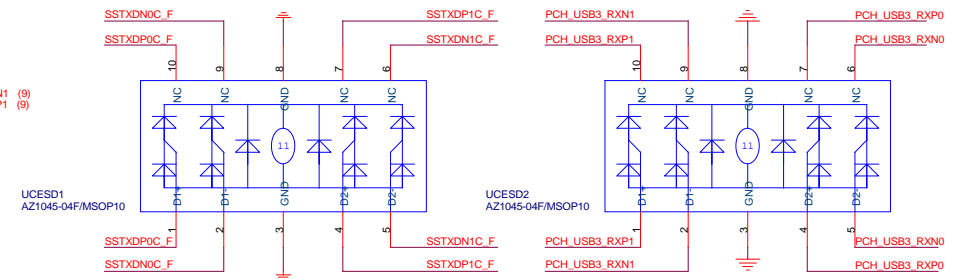
PCH ERP



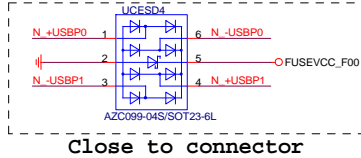
Front USB3.0



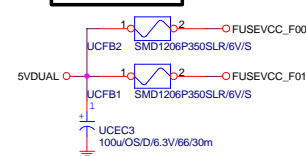
F_USB30	ESD PROTEC
---------	------------



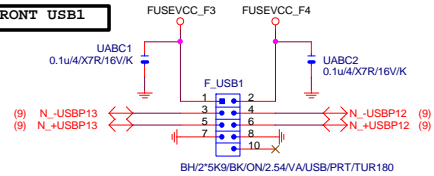
BLUE



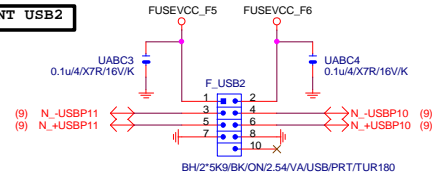
F_USB30 PWR



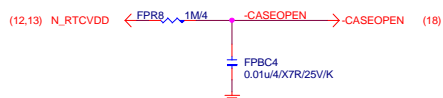
FRONT USB1



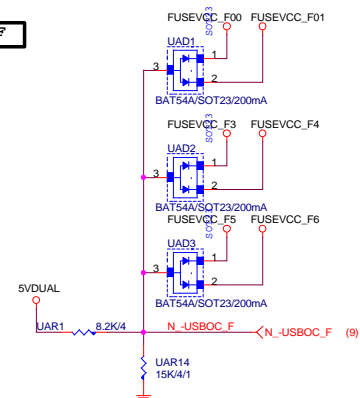
FRONT USB2



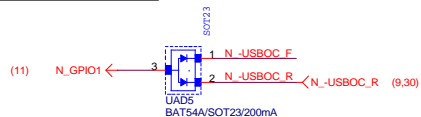
CASE OPEN



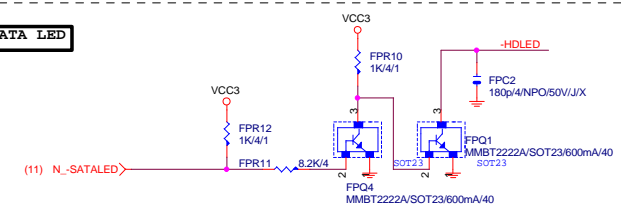
-USB0C_F



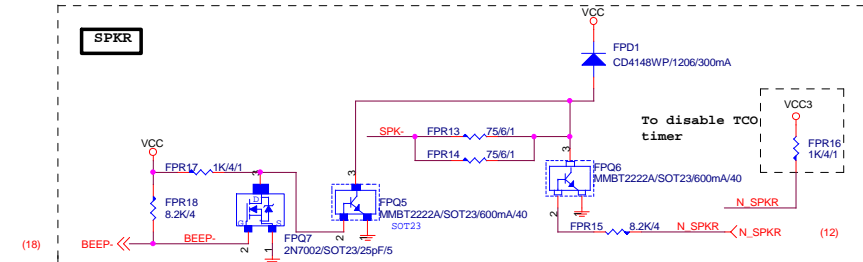
F_USB POWER PROTECT



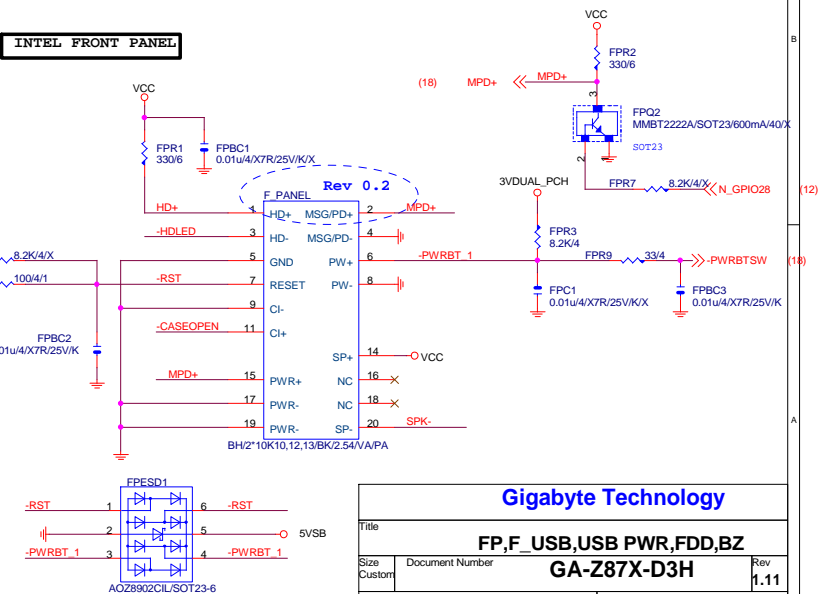
SATA LED

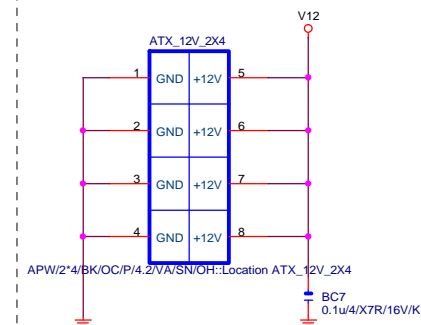


SPKR



INTEL FRONT PANEL

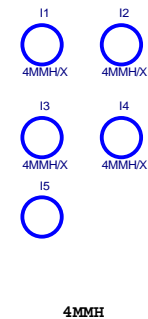




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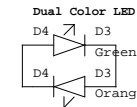
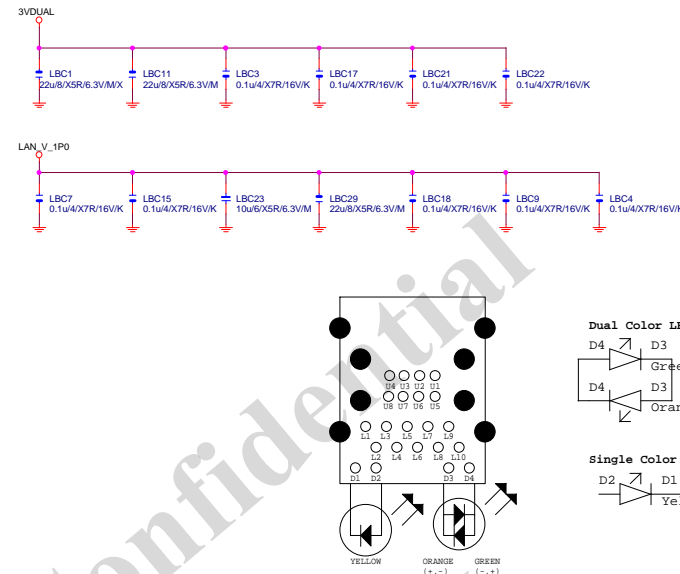
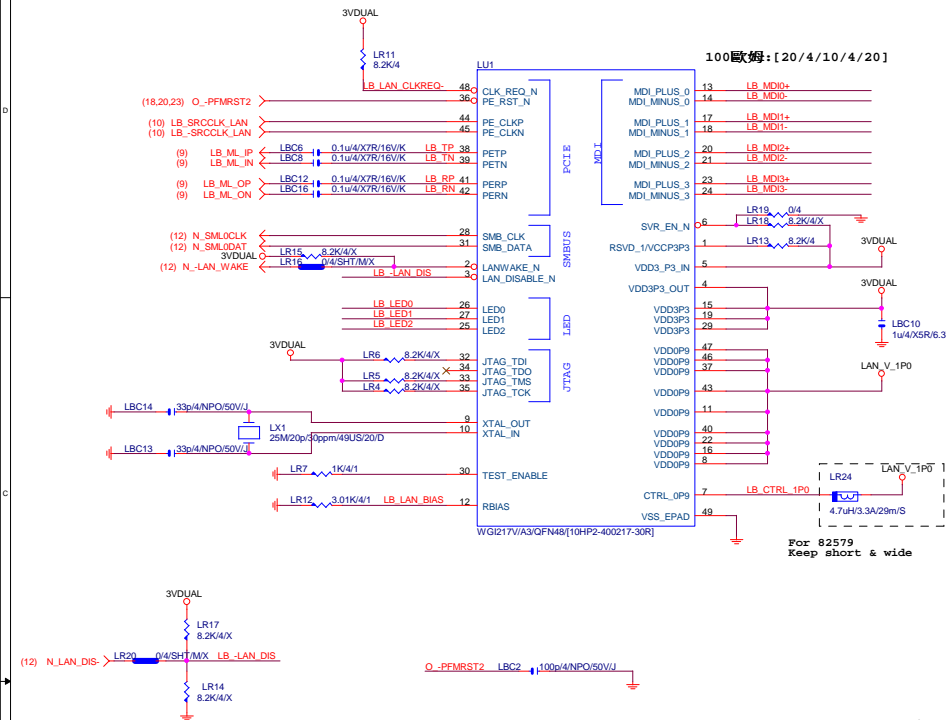
510/6X
To prevent the 5VSB
under loading when
boot-----

```

[illegible][illegible]

Title			
ATX POWER CONNECTOR			
Size Custom	Document Number	GA-Z87X-D3H	Rev 1.11
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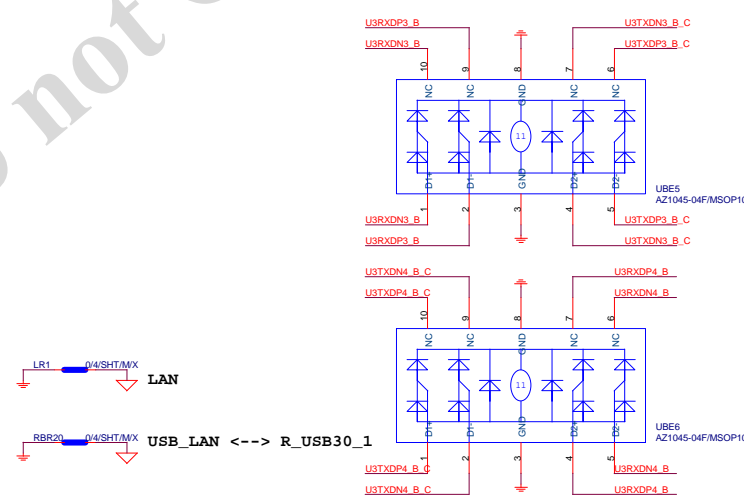
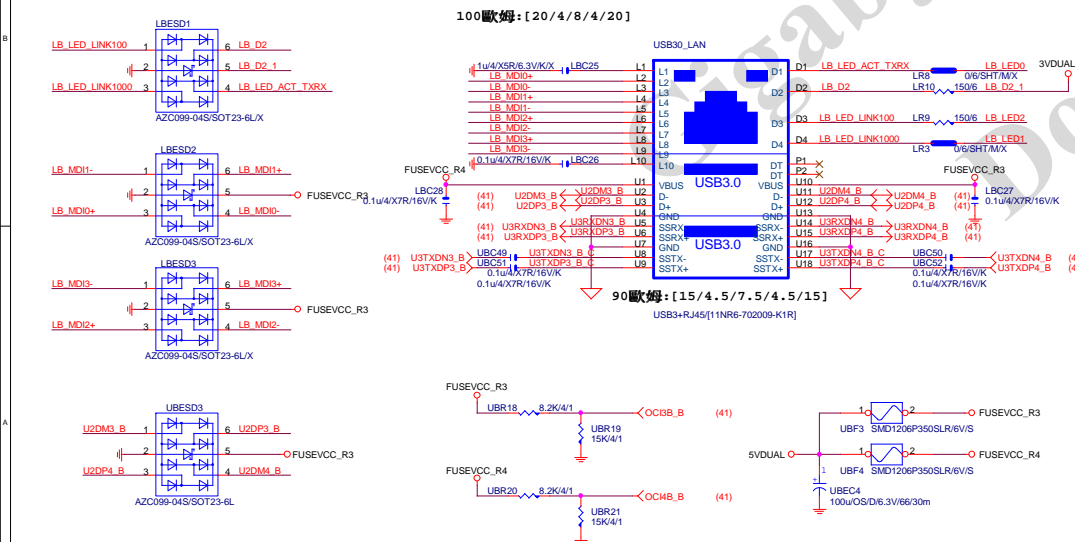
LAN: INTEL I217



1Gb	Orange
100Mb	Green
10Mb	Off

Access	Blinking
Link	Yellow

USB30 LAN CONNECTOR

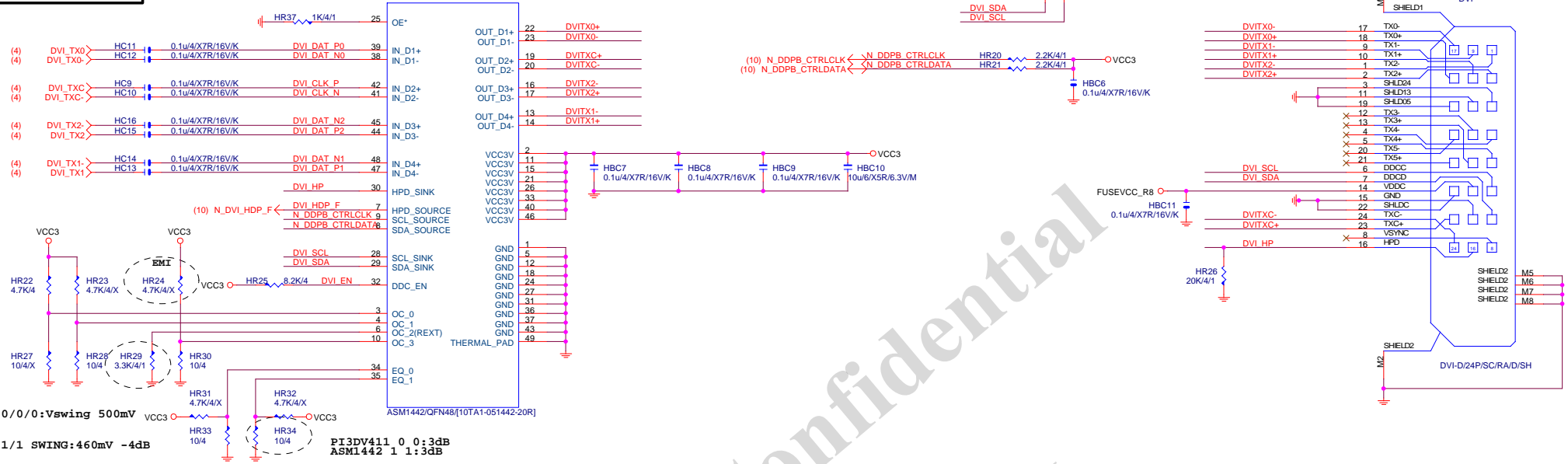


Gigabyte Technology			
INTEL LAN I217			
File	Document Number	GA-Z87X-D3H	Rev 1.1
Date: Monday, December 09, 2013	Sheet 31 of 43		

DVI:15/4/4/15

Impedance=85 +- 17.5%

DVI LEVEL SHIFT



Gigabyte Technology

Title		
TI TSB43AB23 1394		
Size	Document Number	Rev
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HDMI LEVEL SHIFT

HDMI:15/4/4/15

Impedance=85 +- 17.5%

HU1

ASM1442
Default [0,1,0]
450mv,-3dB

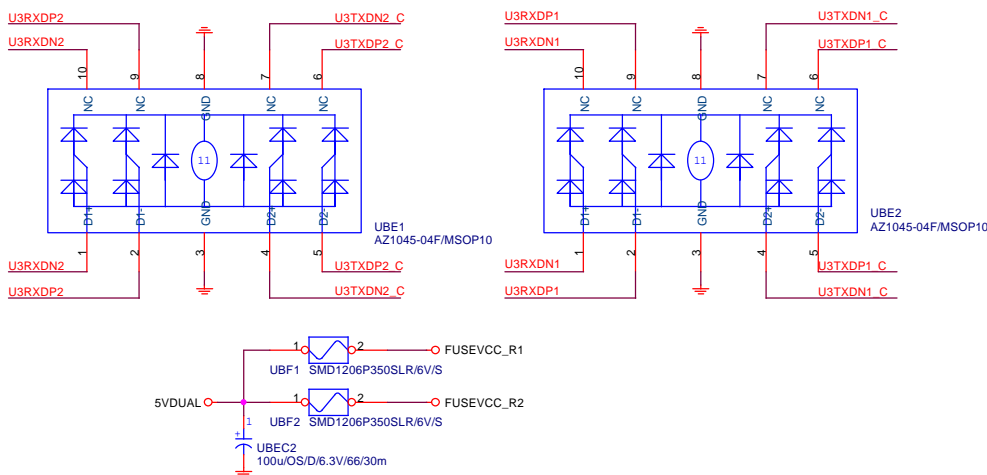
ASM1442 Default [0,0] 3dB
[0,1]6dB

【技術通報R&D技術通報150】

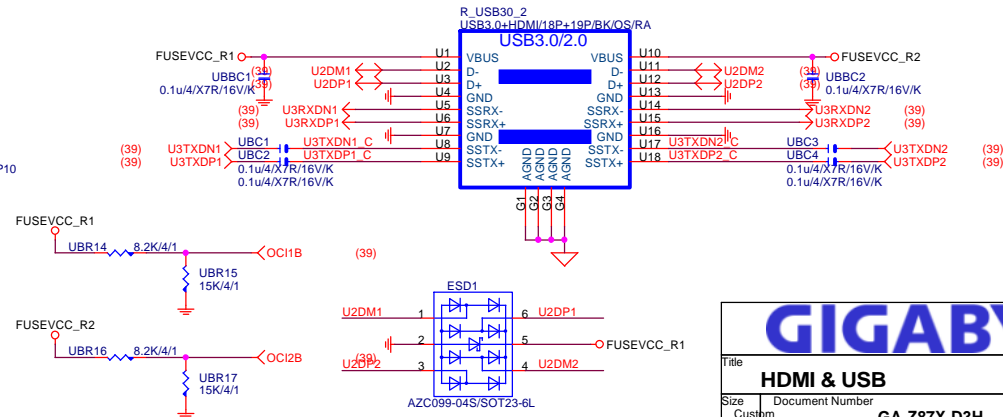
HDMI eye diagram1.4版(deep color)會fail

原因: 因目前的HDMI訊號過長,造成RISING TIME過慢,而會壓到eye diagram

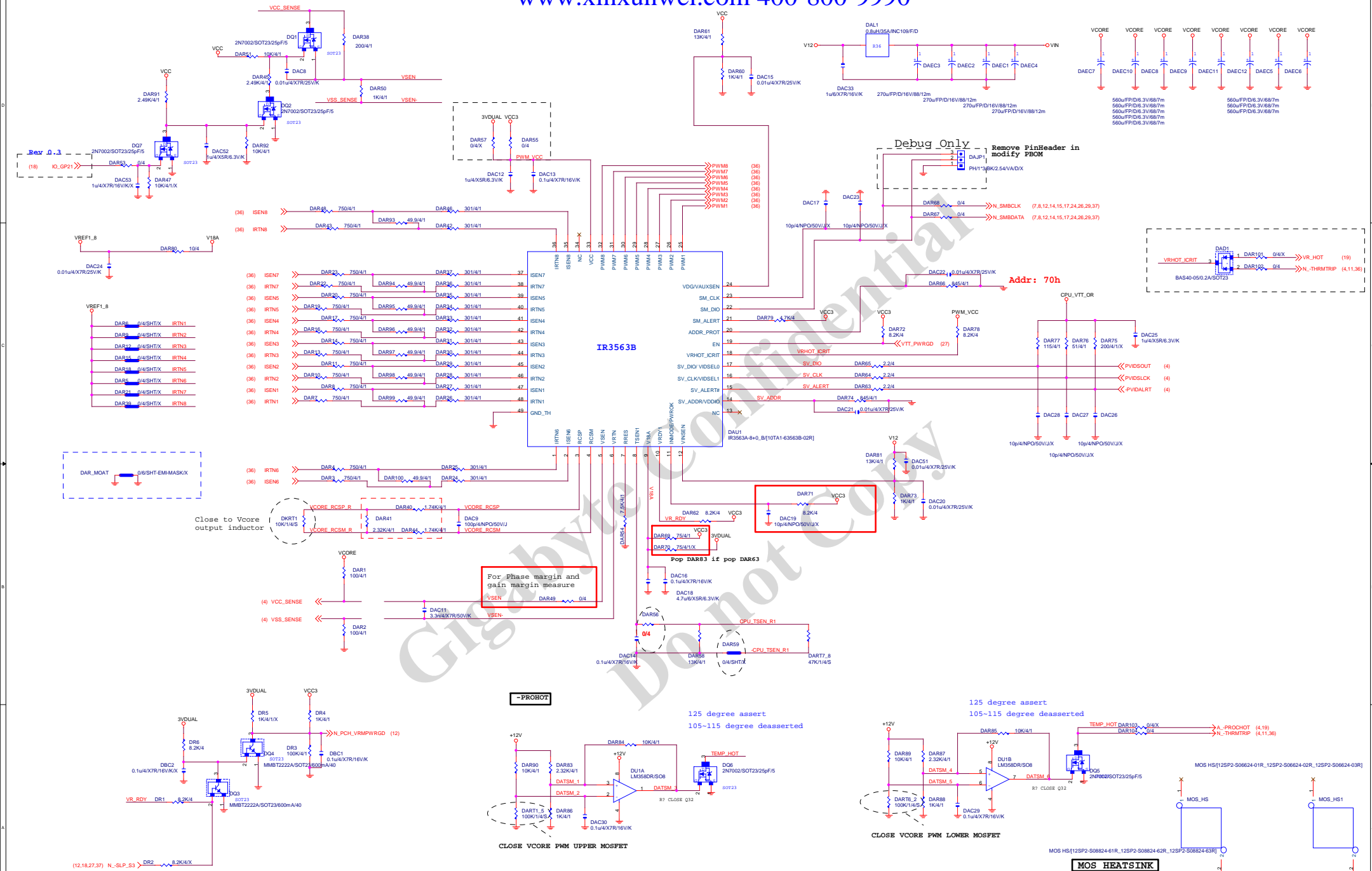
改善: ASMEDIA ASM1442 : 3.16K(PIN6 PULL DOWN電阻) 10ohm(PIN4 PULL DOWN電阻)



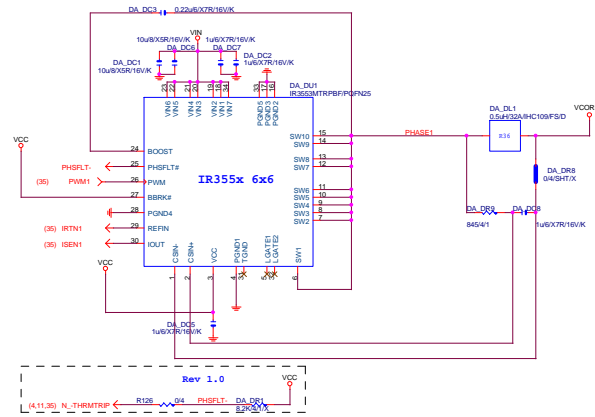
R_USB30



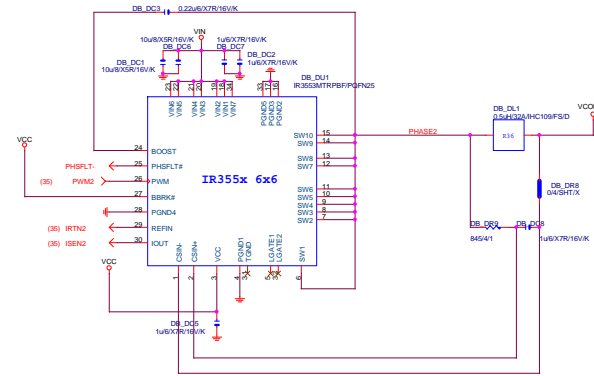
GIGABYTE™			
HDMI & USB			
Size	Document Number	GA-Z87X-D3H	
Custom			Rev 1.11
Date:	Monday, December 09, 2013	Sheet	33 of 43



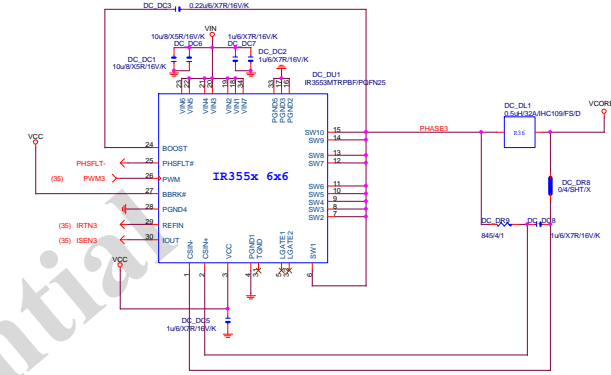
VCORE-PHASE1



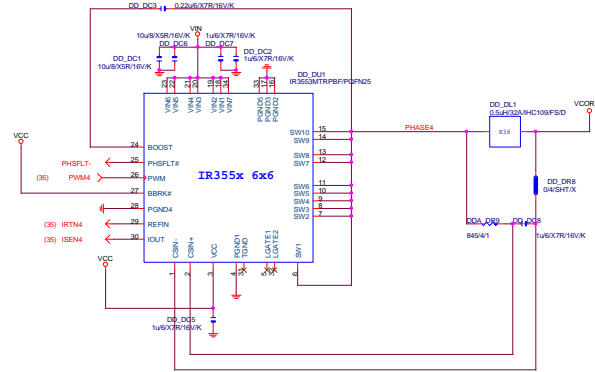
VCORE-PHASE2



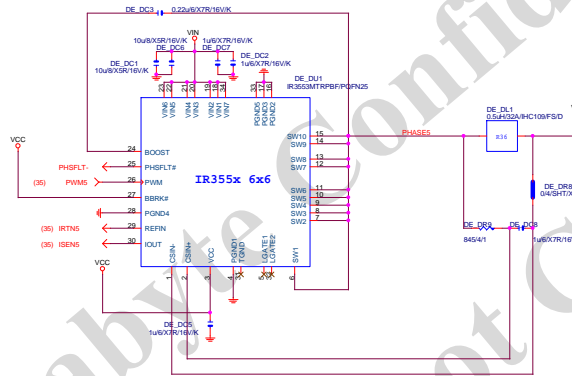
VCORE-PHASE3



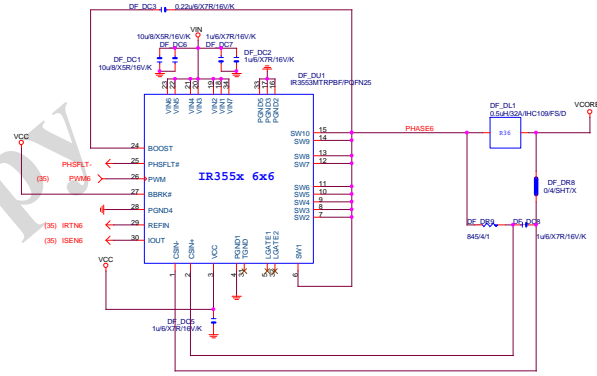
VCORE-PHASE4



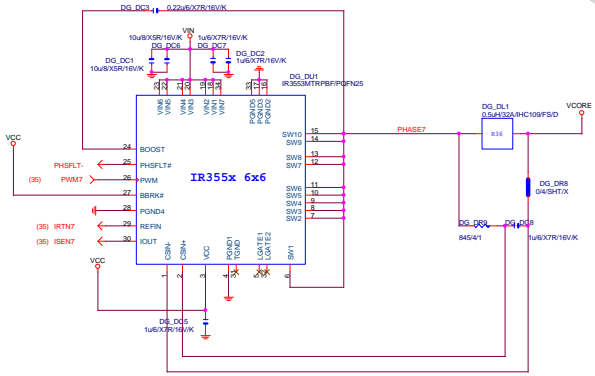
VCORE-PHASE5



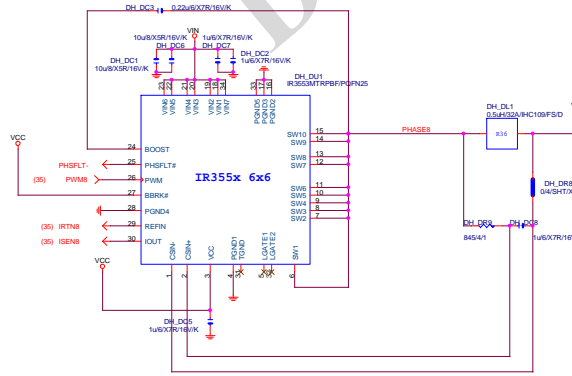
VCORE-PHASE6

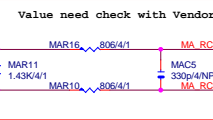
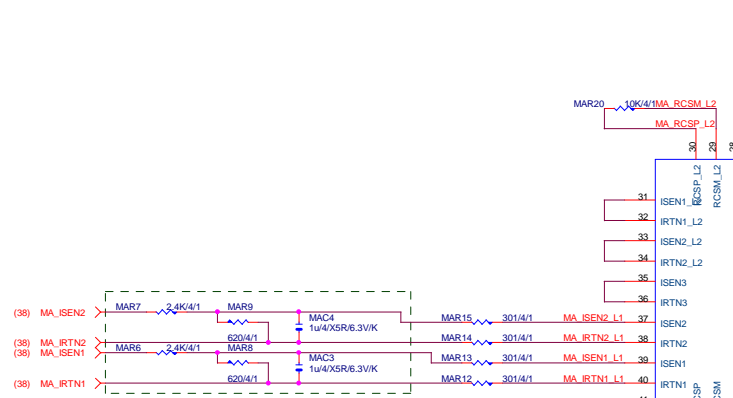
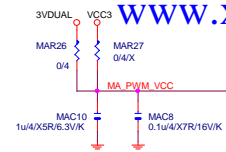
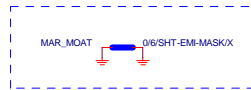


VCORE-PHASE7



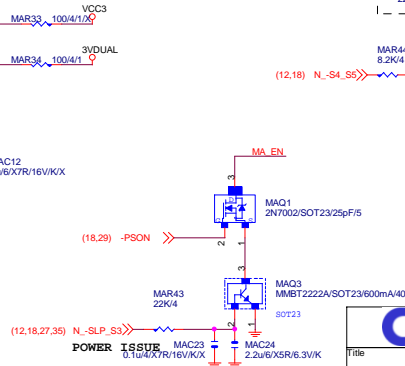
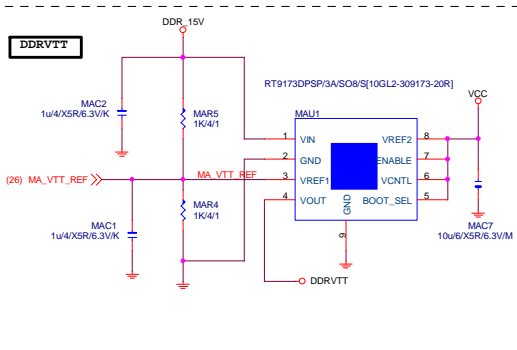
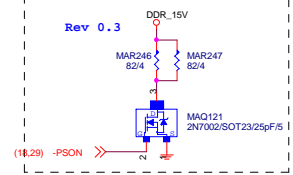
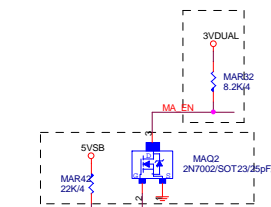
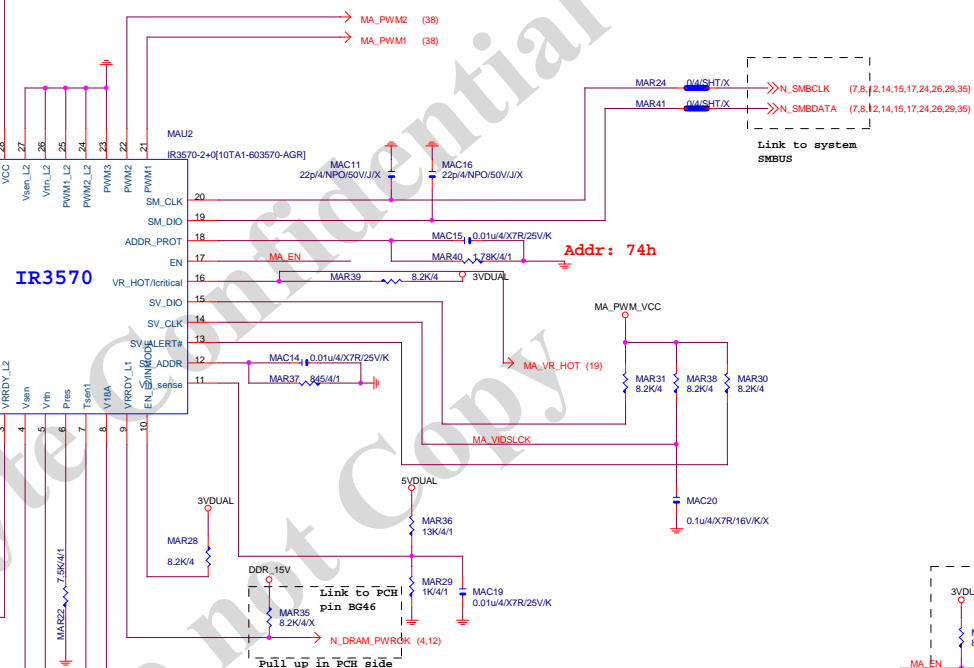
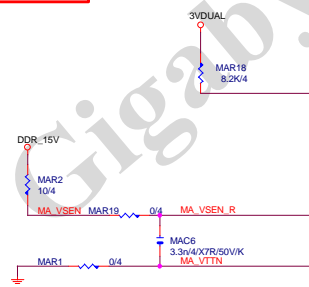
VCORE-PHASE8





Close to DDR
output inductor

should be routed as
differential pair,
7mil width, 8mil
spacing



GIGABYTE™		
Title: DDR POWER IR3570		
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DDR_15V

The schematic illustrates the power delivery system for the DDR_15V memory module. It features two identical MOSFET driver stages, labeled MA and MB. Each stage uses an IR3598 (MAU3) or IR3597 (MBU3) IC to drive a MOSFET (MA_QD1/QD2 or MB_QD1/QD2). The input to these drivers is derived from a 5VDUAL source through a network of capacitors and resistors. The output of each driver is filtered by a combination of capacitors (DC-link, gate-drive, and output) and an inductor (ML1, ML2, or ML3). The final output is connected to the DDR_15V rail.

FUNCTION	MODE	PWM MODE	PHASE MODE
0	1	IR ATL	DUAL
1	1	IR ATL	Doubler
0	0	Tri-Saate	DUAL
1	0	Tri-Saate	Doubler
OPEN	0	Tri-Saate	Quad
OPEN	1	IR ATL	Quad

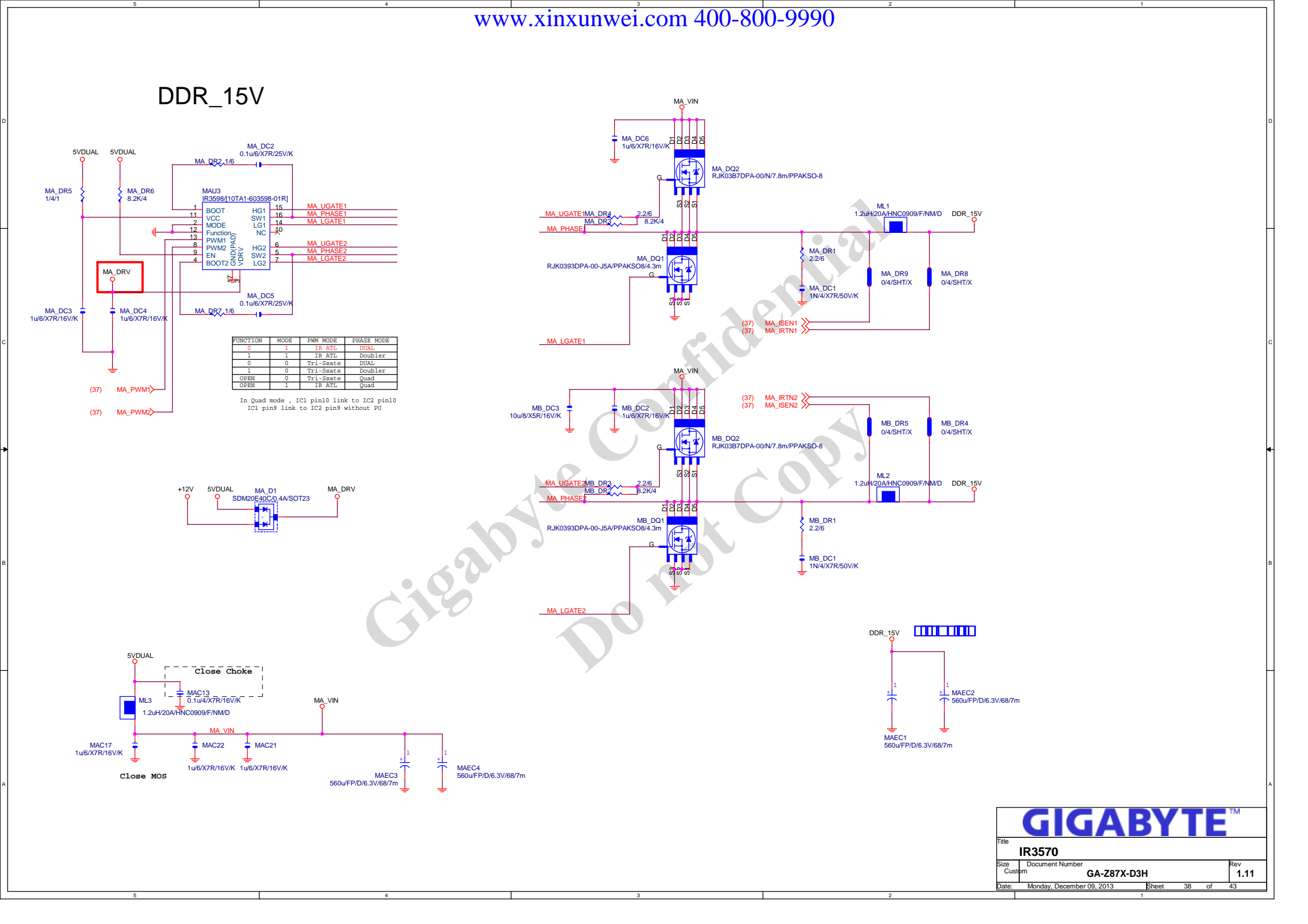
In Quad mode , IC1 pin10 link to IC2 pin10
IC1 pin9 link to IC2 pin9 without PU

GIGABYTE™

Title: **IR3570**

Size: Custom Document Number: **GA-Z87X-D3H** Rev: **1.11**

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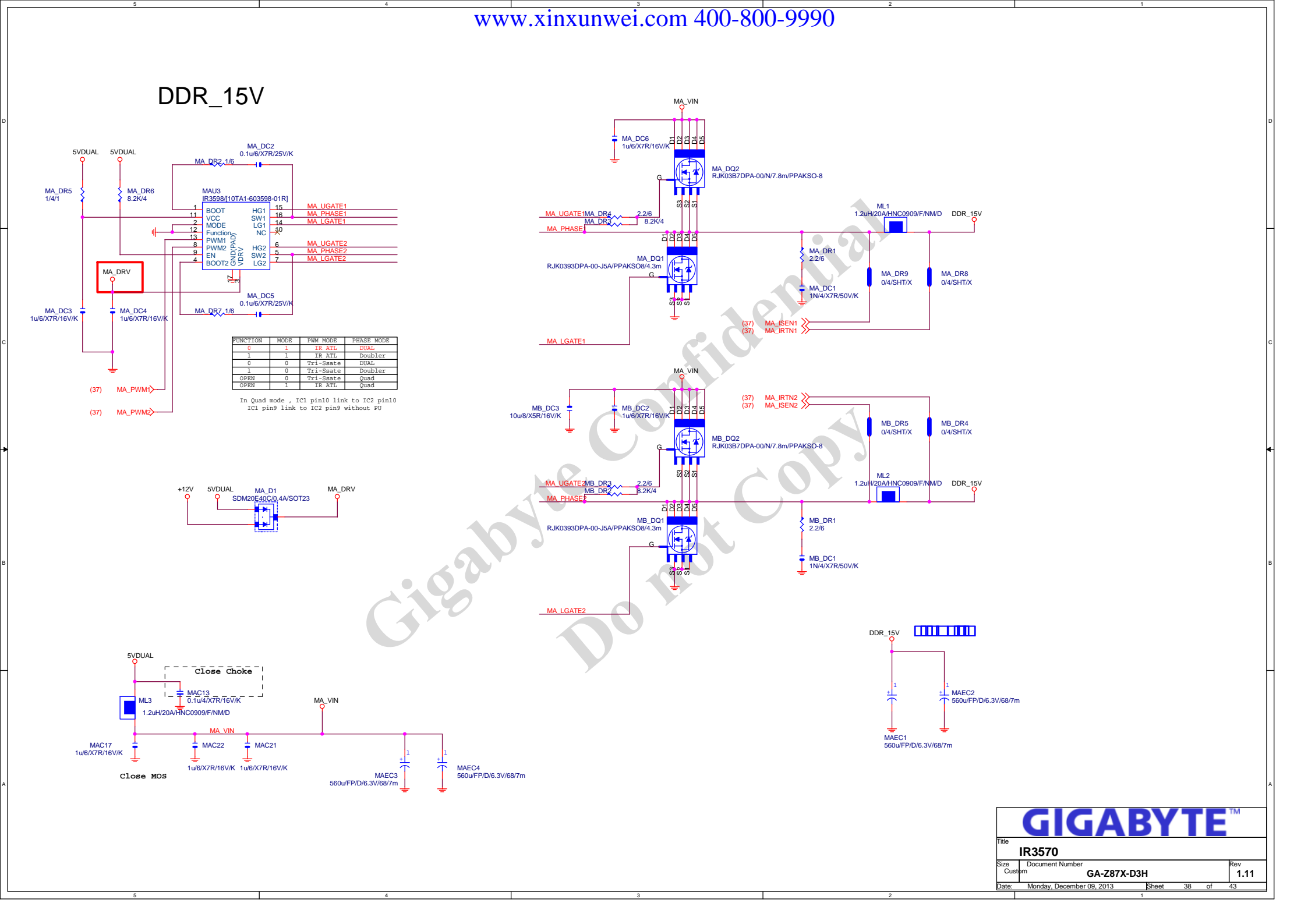
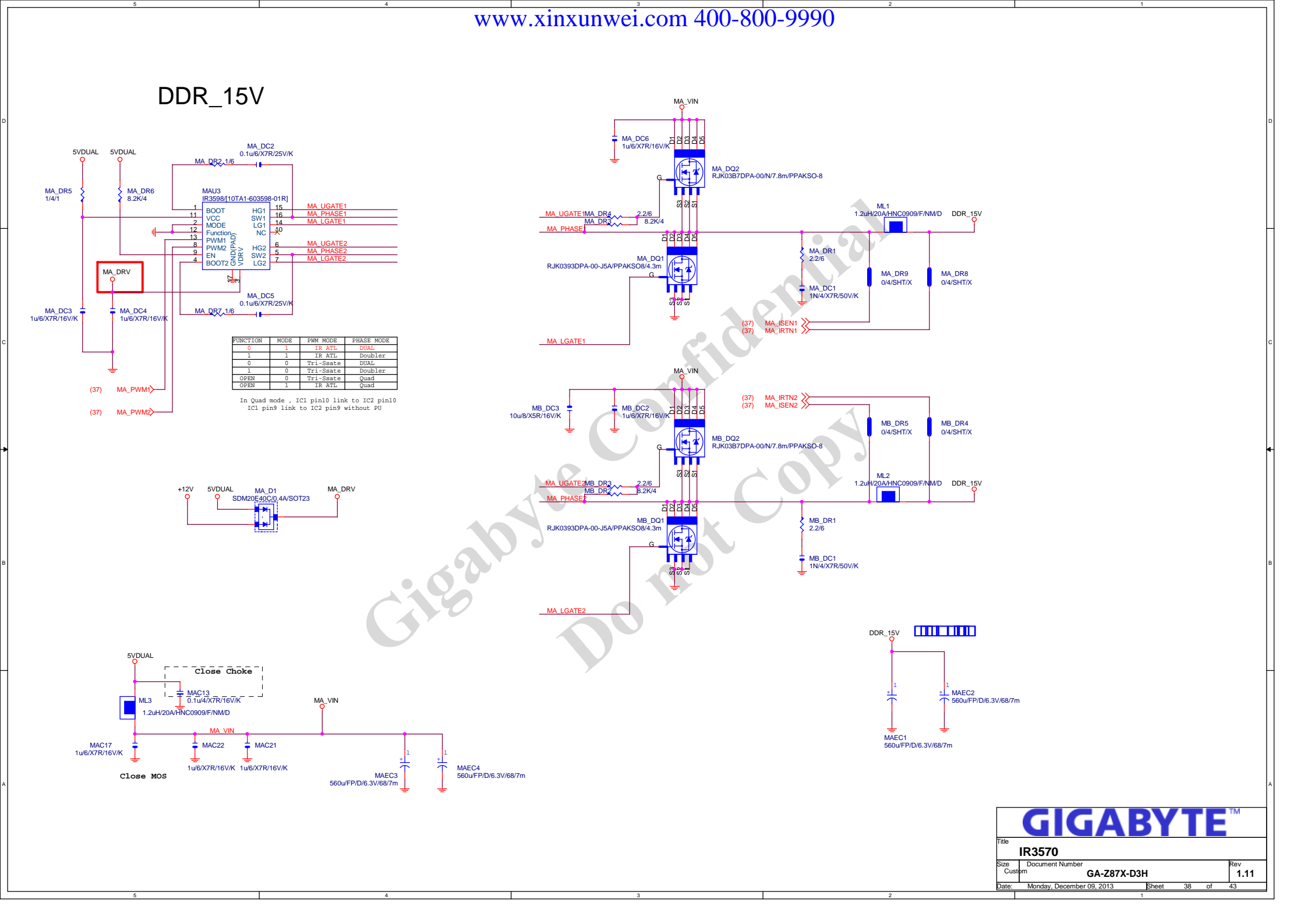
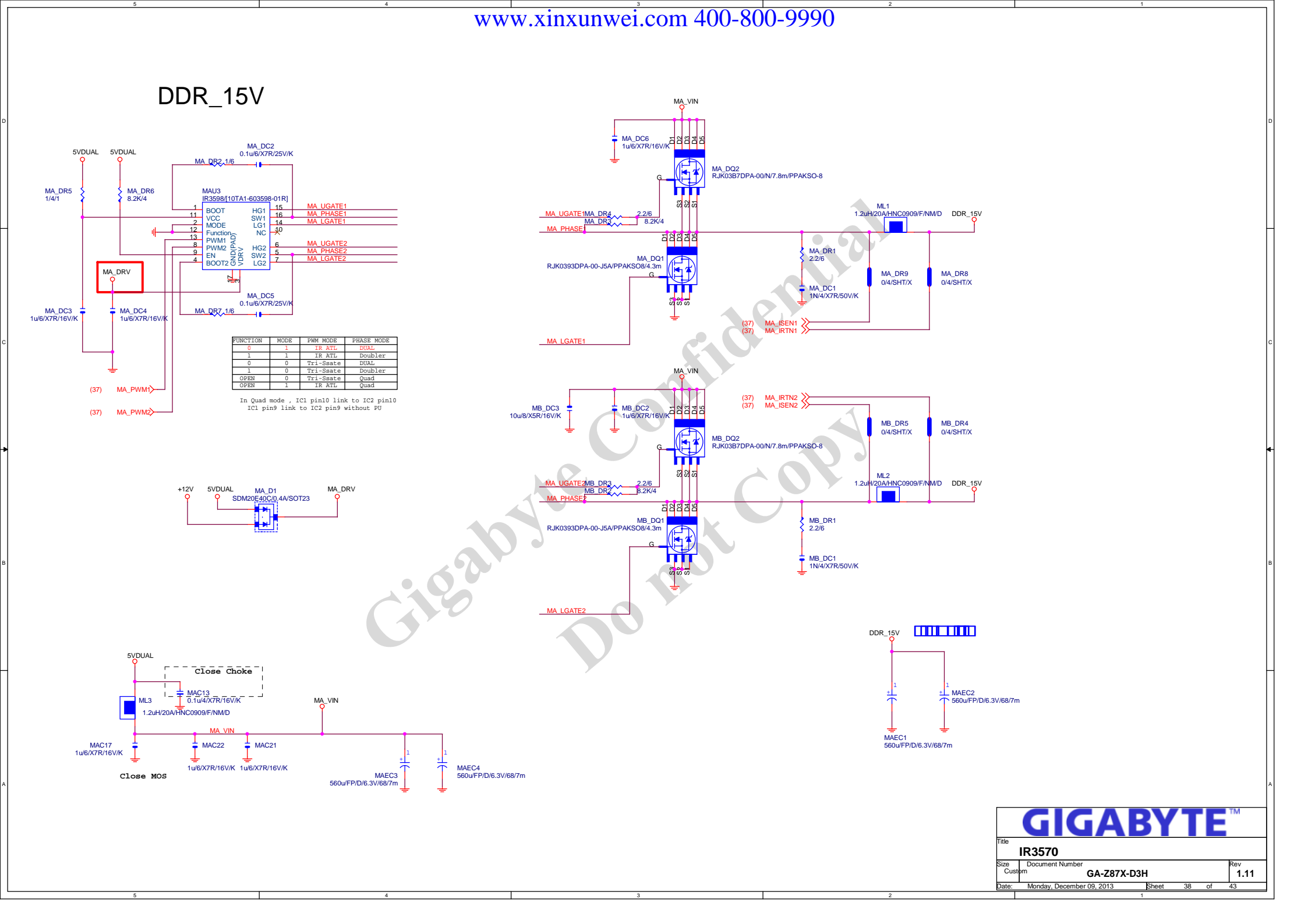
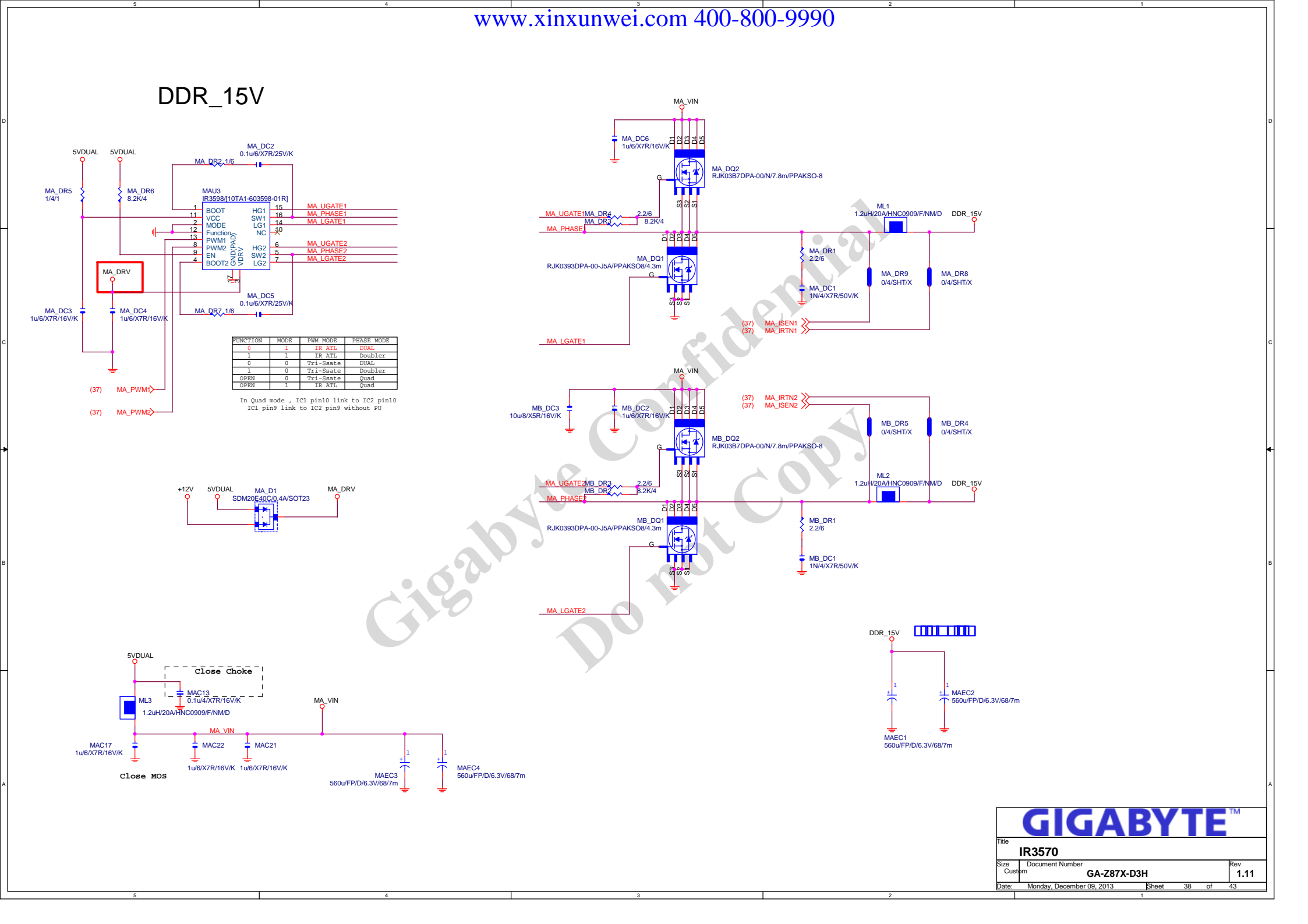
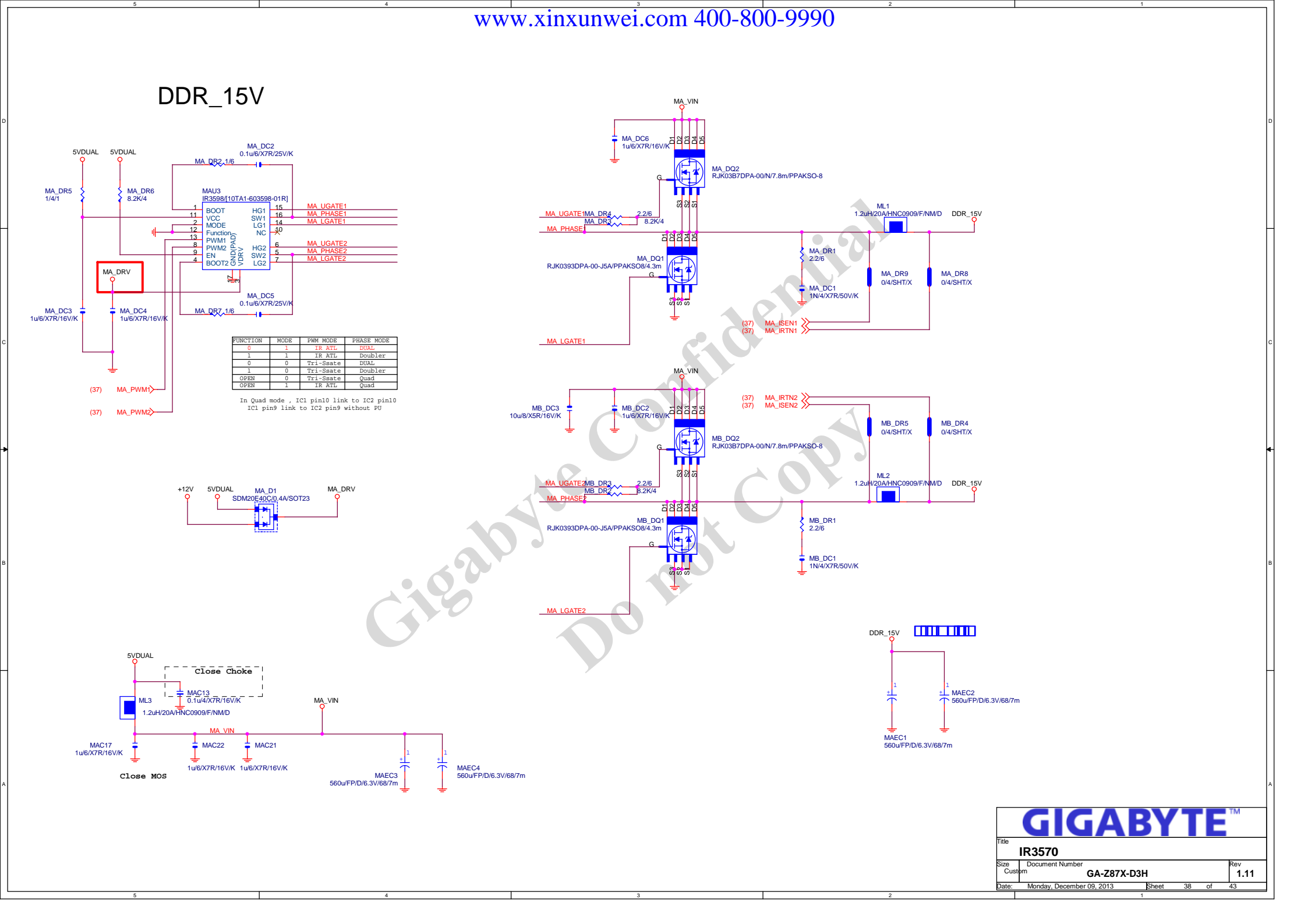
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DDR_15V

FUNCTION	MODE	PWM MODE	PHASE MODE
0	1	IR ATL	DUAL
1	1	IR ATL	Doubler
0	0	Tri-Scate	DUAL
1	0	Tri-Scate	Doubler
OPEN	0	Tri-Scate	Quad
OPEN	1	IR ATL	Quad

In Quad mode, IC1 pin10 link to IC2 pin10
IC1 pin9 link to IC2 pin9 without PU



[illegible]

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uPD720210

Put close to U1
Do check with crystal vendor
if the value of C31, C32 and R31 are all appropriate.

Put close to U1
Short and broad connection to GND
Don't split R32 into multiple resistors.

Put close to CN5

Put close to CN4

Put close to CN3

Put close to CN2

Put close to CN1

Gigabyte Technology

D720210
GA-Z87X-D3H

Rev 1.11

Monday, December 09, 2013

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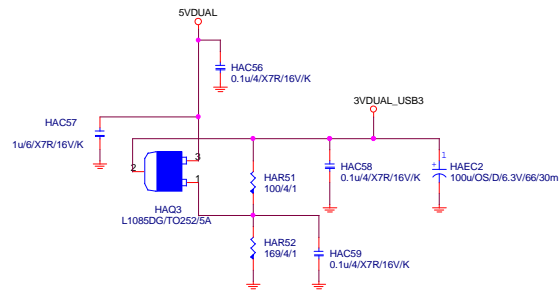
The schematic diagram illustrates the USB interface for the uPD720210. It includes the following components and connections:

- Power Management:**
 - 3VDUAL_USB3:** Connected to various capacitors (HAC14, HAC15, HAC1, HAC2, HAC3, HAC4, HAC5, HAC6, HAC7, HAC8, HAC9, HAC10, HAC11, HAC12, HAC13, HAC16, HAC17, HAC21, HAC22, HAC23, HAC24, HAC25, HAC26, HAC27, HAC28, HAC29, HAC30, HAC31, HAC32, HAC33, HAC34, HAC35, HAC36, HAC37, HAC38, HAC39, HAC40, HAC41) and resistors (HAR1, HAR2, HAR3, HAR4, HAR5, HAR6, HAR7, HAR8, HAR9, HAR10, HAR15, HAR20, HAR22, HAR23, HAR24, HAR25, HAR26, HAR27, HAR28, HAR29, HAR30, HAR31, HAR32, HAR33, HAR34, HAR35, HAR36, HAR37, HAR38, HAR39, HAR40, HAR41).
 - 5VDUAL:** Connected to various capacitors (HAC18, HAC19, HAC20, HAC21, HAC22, HAC23, HAC24, HAC25, HAC26, HAC27, HAC28, HAC29, HAC30, HAC31, HAC32, HAC33, HAC34, HAC35, HAC36, HAC37, HAC38, HAC39, HAC40, HAC41) and resistors (HAR1, HAR2, HAR3, HAR4, HAR5, HAR6, HAR7, HAR8, HAR9, HAR10, HAR15, HAR20, HAR22, HAR23, HAR24, HAR25, HAR26, HAR27, HAR28, HAR29, HAR30, HAR31, HAR32, HAR33, HAR34, HAR35, HAR36, HAR37, HAR38, HAR39, HAR40, HAR41).
 - USB_1V05:** Connected to various capacitors (HAC10, HAC11, HAC12, HAC13, HAC16, HAC17, HAC21, HAC22, HAC23, HAC24, HAC25, HAC26, HAC27, HAC28, HAC29, HAC30, HAC31, HAC32, HAC33, HAC34, HAC35, HAC36, HAC37, HAC38, HAC39, HAC40, HAC41) and resistors (HAR1, HAR2, HAR3, HAR4, HAR5, HAR6, HAR7, HAR8, HAR9, HAR10, HAR15, HAR20, HAR22, HAR23, HAR24, HAR25, HAR26, HAR27, HAR28, HAR29, HAR30, HAR31, HAR32, HAR33, HAR34, HAR35, HAR36, HAR37, HAR38, HAR39, HAR40, HAR41).
- USB HS (90Ohm-differential):**
 - USB HS (90Ohm-differential):** Connected to various capacitors (HAC10, HAC11, HAC12, HAC13, HAC16, HAC17, HAC21, HAC22, HAC23, HAC24, HAC25, HAC26, HAC27, HAC28, HAC29, HAC30, HAC31, HAC32, HAC33, HAC34, HAC35, HAC36, HAC37, HAC38, HAC39, HAC40, HAC41) and resistors (HAR1, HAR2, HAR3, HAR4, HAR5, HAR6, HAR7, HAR8, HAR9, HAR10, HAR15, HAR20, HAR22, HAR23, HAR24, HAR25, HAR26, HAR27, HAR28, HAR29, HAR30, HAR31, HAR32, HAR33, HAR34, HAR35, HAR36, HAR37, HAR38, HAR39, HAR40, HAR41).
 - USB HS (90Ohm-differential):** Connected to various capacitors (HAC10, HAC11, HAC12, HAC13, HAC16, HAC17, HAC21, HAC22, HAC23, HAC24, HAC25, HAC26, HAC27, HAC28, HAC29, HAC30, HAC31, HAC32, HAC33, HAC34, HAC35, HAC36, HAC37, HAC38, HAC39, HAC40, HAC41) and resistors (HAR1, HAR2, HAR3, HAR4, HAR5, HAR6, HAR7, HAR8, HAR9, HAR10, HAR15, HAR20, HAR22, HAR23, HAR24, HAR25, HAR26, HAR27, HAR28, HAR29, HAR30, HAR31, HAR32, HAR33, HAR34, HAR35, HAR36, HAR37, HAR38, HAR39, HAR40, HAR41).
- USB SS (90Ohm-differential):**
 - USB SS (90Ohm-differential):** Connected to various capacitors (HAC10, HAC11, HAC12, HAC13, HAC16, HAC17, HAC21, HAC22, HAC23, HAC24, HAC25, HAC26, HAC27, HAC28, HAC29, HAC30, HAC31, HAC32, HAC33, HAC34, HAC35, HAC36, HAC37, HAC38, HAC39, HAC40, HAC41) and resistors (HAR1, HAR2, HAR3, HAR4, HAR5, HAR6, HAR7, HAR8, HAR9, HAR10, HAR15, HAR20, HAR22, HAR23, HAR24, HAR25, HAR26, HAR27, HAR28, HAR29, HAR30, HAR31, HAR32, HAR33, HAR34, HAR35, HAR36, HAR37, HAR38, HAR39, HAR40, HAR41).
 - USB SS (90Ohm-differential):** Connected to various capacitors (HAC10, HAC11, HAC12, HAC13, HAC16, HAC17, HAC21, HAC22, HAC23, HAC24, HAC25, HAC26, HAC27, HAC28, HAC29, HAC30, HAC31, HAC32, HAC33, HAC34, HAC35, HAC36, HAC37, HAC38, HAC39, HAC40, HAC41) and resistors (HAR1, HAR2, HAR3, HAR4, HAR5, HAR6, HAR7, HAR8, HAR9, HAR10, HAR15, HAR20, HAR22, HAR23, HAR24, HAR25, HAR26, HAR27, HAR28, HAR29, HAR30, HAR31, HAR32, HAR33, HAR34, HAR35, HAR36, HAR37, HAR38, HAR39, HAR40, HAR41).
- Other Components:**
 - uPD720210:** The main USB controller chip, connected to various pins (VDD33, VDD10, VDD18, VDD19, VDD20, VDD21, VDD22, VDD23, VDD24, VDD25, VDD26, VDD27, VDD28, VDD29, VDD30, VDD31, VDD32, VDD33, VDD34, VDD35, VDD36, VDD37, VDD38, VDD39, VDD40, VDD41, VDD42, VDD43, VDD44, VDD45, VDD46, VDD47, VDD48, VDD49, VDD50, VDD51, VDD52, VDD53, VDD54, VDD55, VDD56, VDD57, VDD58, VDD59, VDD60, VDD61, VDD62, VDD63, VDD64, VDD65, VDD66, VDD67, VDD68, VDD69, VDD70, VDD71, VDD72, VDD73, VDD74, VDD75, VDD76, VDD77, VDD78, VDD79, VDD80, VDD81, VDD82, VDD83, VDD84, VDD85, VDD86, VDD87, VDD88, VDD89, VDD90, VDD91, VDD92, VDD93, VDD94, VDD95, VDD96, VDD97, VDD98, VDD99, VDD100).
 - Crystal:** Connected to pins XT1 and XT2, with capacitors HAC27 and HAC28.
 - Resistors:** Various resistors (R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R77, R78, R79, R80, R81, R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, R92, R93, R94, R95, R96, R97, R98, R99, R100) are used for various functions.

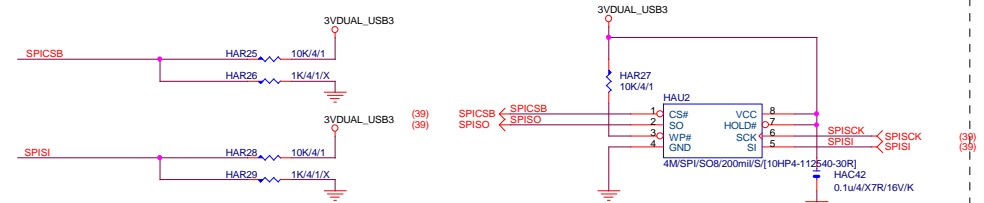
The diagram also includes a table of components and their values, and a note about the crystal vendor.

Component	Value
HAC14	0.1uF/4X7R/16V/K
HAC15	0.1uF/4X7R/16V/K
HAC1	0.1uF/4X7R/25V/K
HAC2	0.1uF/4X7R/25V/K
HAC3	0.1uF/4X7R/25V/K
HAC4	0.1uF/4X7R/25V/K
HAC5	0.1uF/4X7R/25V/K
HAC6	0.1uF/4X7R/25V/K
HAC7	0.1uF/4X7R/25V/K
HAC8	0.1uF/4X7R/25V/K
HAC9	0.1uF/4X7R/16V/K
HAC10	0.1uF/4X7R/16V/K
HAC11	0.1uF/4X7R/16V/K
HAC12	0.1uF/4X7R/25V/K
HAC13	10uF/6XSR/6.3V/M/X
HAC16	0.1uF/4X7R/16V/K
HAC17	0.1uF/4X7R/25V/K
HAC18	4.7uF/6XSR/6.3V/K
HAC19	0.1uF/4X7R/16V/K
HAC20	0.1uF/4X7R/25V/K
HAC21	0.1uF/4X7R/16V/K
HAC22	0.1uF/4X7R/16V/K
HAC23	0.1uF/4X7R/16V/K
HAC24	0.1uF/4X7R/16V/K
HAC25	10uF/6XSR/6.3V/M
HAC26	0.1uF/4X7R/16V/K
HAC27	10pF/4NPO/50V/J
HAC28	10pF/4NPO/50V/J
HAC29	0.1uF/4X7R/16V/K
HAC30	0.1uF/4X7R/16V/K
HAC31	0.1uF/4X7R/16V/K
HAC32	0.1uF/4X7R/16V/K
HAC33	0.01uF/4X7R/25V/K
HAC34	0.01uF/4X7R/2

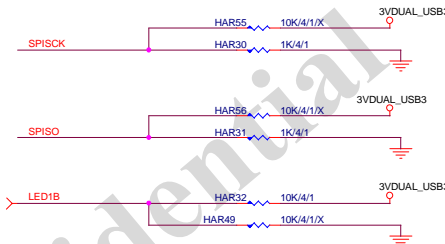
3VDUAL_USB_1



External SPI ROM ; SPI ROM attached mode

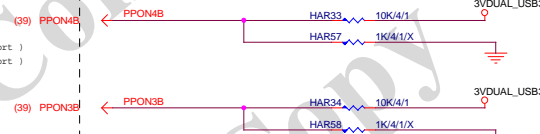


Battery Charging

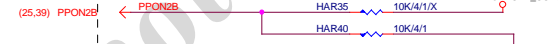


Number of Ports ; 4Ports mode

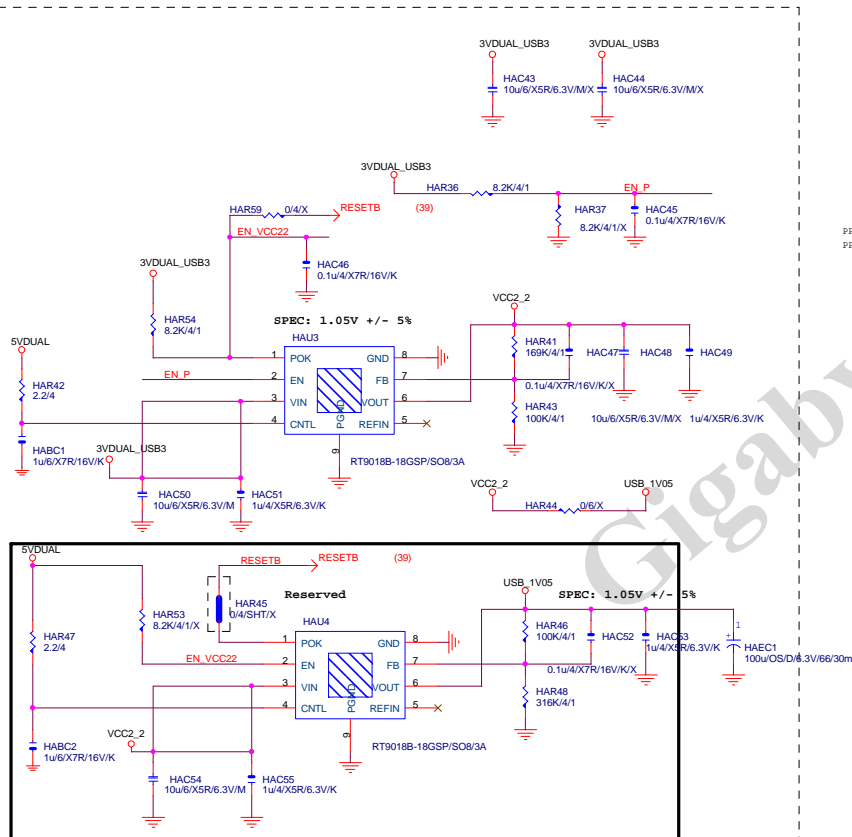
PPON3B / PPON4B : H / H (4 port)
PPON3B / PPON4B : L / L (2 port)

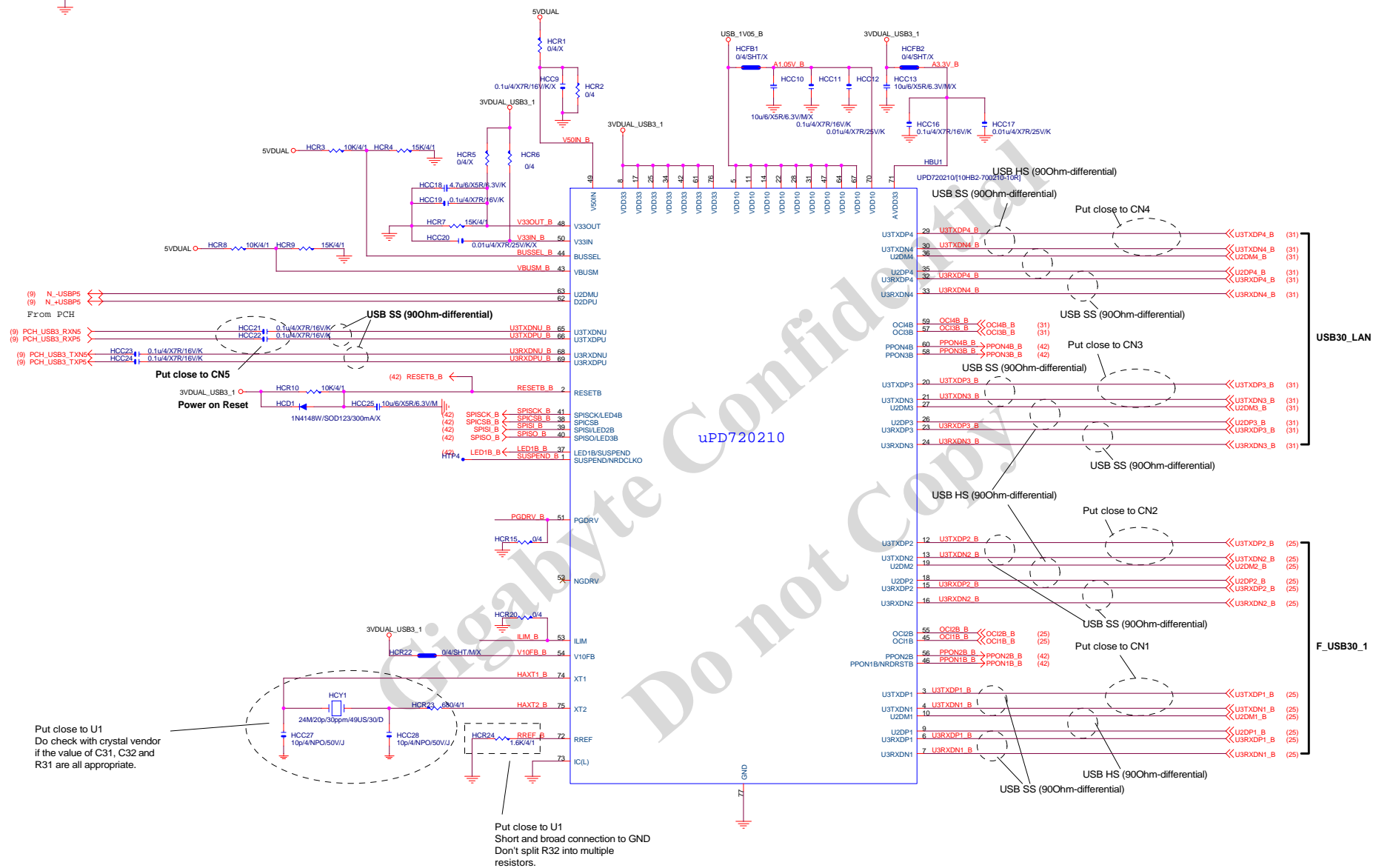


#5 VBUS Power Control ; Individual mode

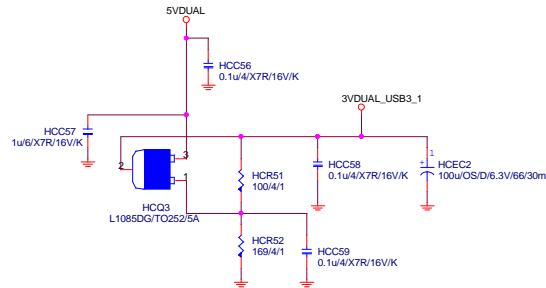


PPON1B Pin Function ; Port1 PPONB mode

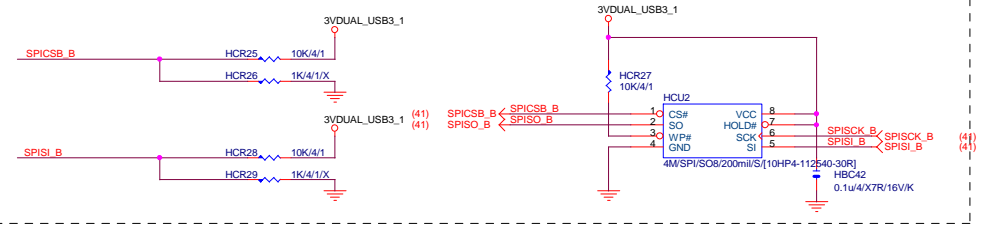




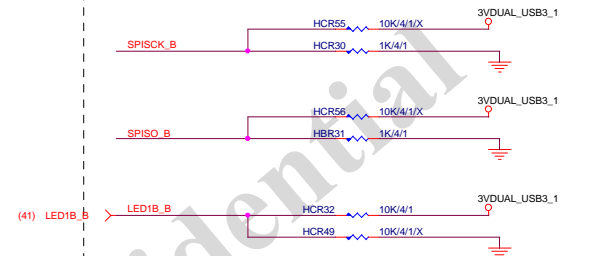
3VDUAL_USB_2



External SPI ROM ; SPI ROM attached mode

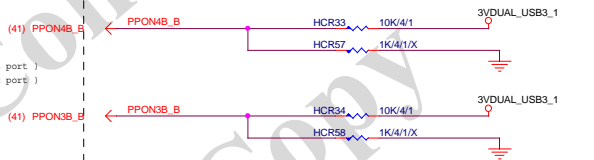


Battery Charging

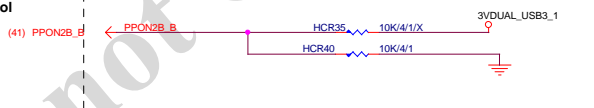


Number of Ports ; 4Ports mode

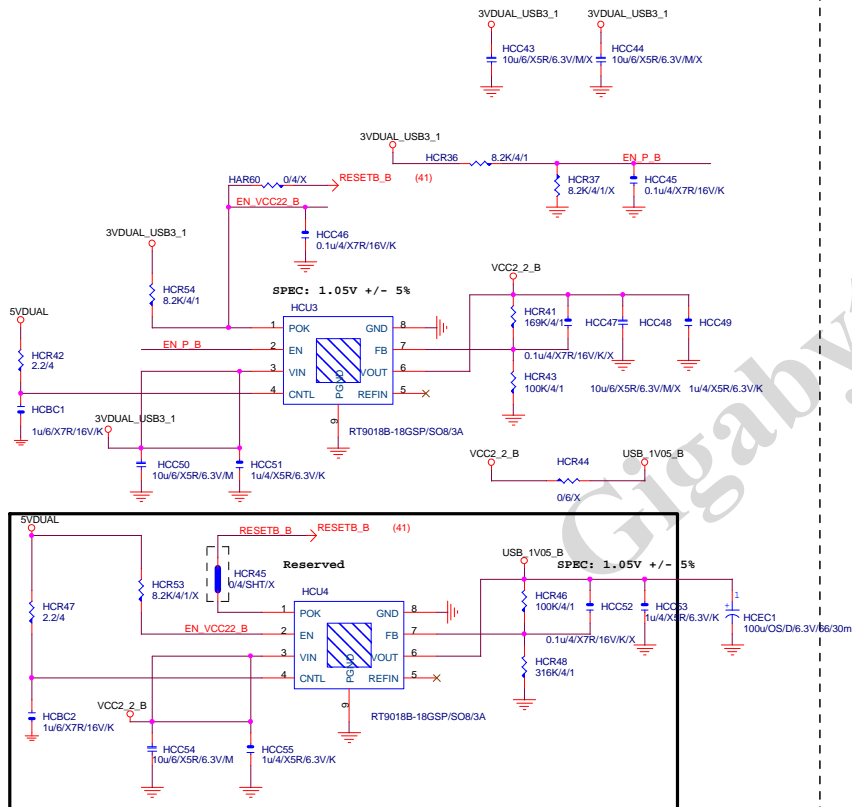
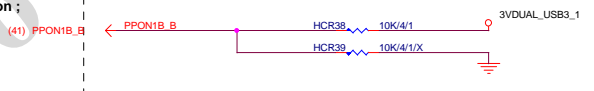
PPON3B / PPON4B : H / H (4 port)
PPON3B / PPON4B : L / L (2 port)



#5 VBUS Power Control ; Individual mode



PPON1B Pin Function ; Port1 PPONB mode



Gigabyte Technology

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