Model Name: GA-Q87M-D2H

SHEET	TITLE
01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B
06	CPU_LGA1150-C
07	DDR III CHANNEL A
08	DDR III CHANNEL B
09	PCH_FDI,DMI,USB,PCIE,NVRAM
10	PCH_DP,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCI EXPRESSX4 / X1 SLOT
16	PCI SLOT
17	ITE 8728 LPC IO
18	KB_MS, R_USB
19	HWM,FAN CTRL,-PROCHOT
20	DUAL BIOS,TPM
21	FP,FUSB,SPK,SATALED
22	Realtek CODEC
23	REAR AUDIO JACK
24	INTEL i217 PHY
25	DISCRETE POWER
26	ATX, M3 POWER
27	VCORE ISL95820_1

SHEET	TITLE
28	VCORE ISL95820_2
29	RT8120_DDR POWER
30	COM , LPT , 80PORT
31	DVI, HDMI ,DP
32	IT8892E PCI BRIDGE

Gigabyte Technology			
Title: Cover Sheet			
Size: Custom	Document Number: GA-Q87M-D2H		Rev: 1.11
Date: Monday, November 25, 2013	Sheet 1 of 32		

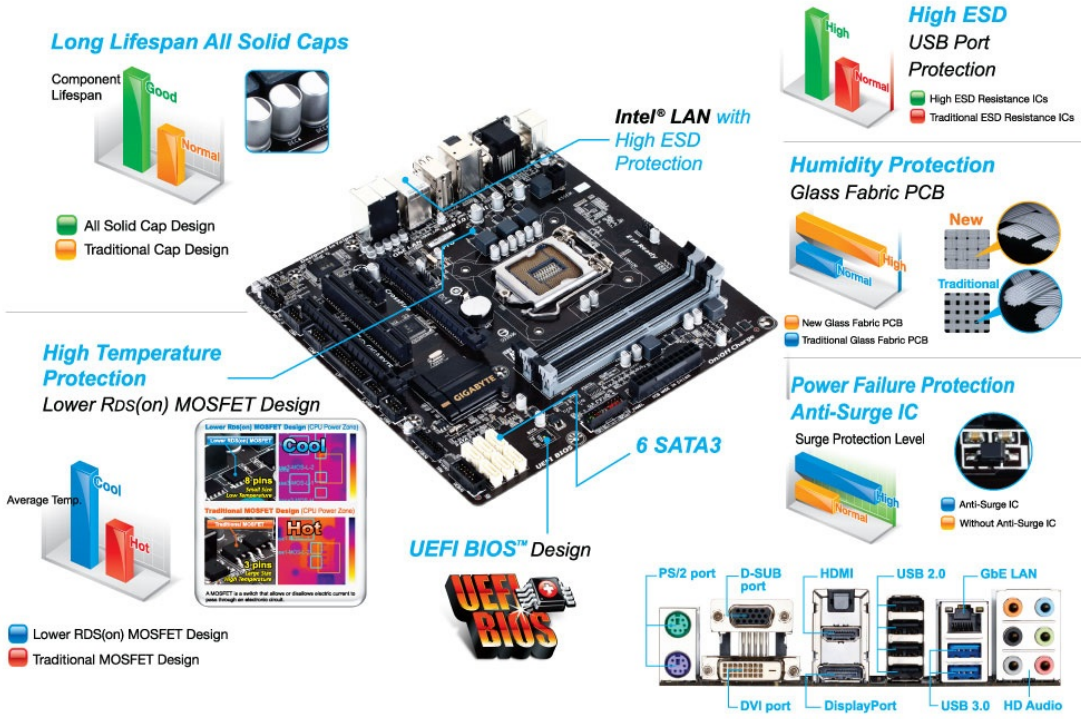
Model Name: GA-Q87M-D2H

Component value change history

Data	Change Item	Reason
2013-05-18	10A BOM build for PVT	
2013-06-19	11A BOM build for C2 PCH chip	
2013-07-10	11B BOM build for 5VDUAL OVP	
2013-09-24	11E BOM build for 1.11 PCB	
2013-11-15	11F BOM build to modify NX1 , NC7,NC8 for design rule, CU1 add 32R for 2nd source.	
2013-11-25	11G BOM ,MR1 change to P100/6V/6/S for DDR SPD fuse	

Circuit or PCB layout change

2013-02-04	PCB 0.1 Build	
2013-03-19	PCB 0.2 Build	
2013-05-17	PCB 1.0 Build , MP	
2013-06-18	Change version to 1.1 for C2 PCH chip	
2013-09-23	PCB change to 1.11 for design notre update	



Gigabyte Technology

Title: BOM & PCB MODIFY HISTORY

Size: Custom | Document Number: GA-Q87M-D2H | Rev: 1.11

Date: Monday, November 25, 2013 | Sheet 2 of 32

BLOCK DIAGRAM

PCI EXPRESS X16

DVI, HDMI , DP

PCIEX16 gen3

Display

INTEL LGA1150

VRD12.5

DDRIII BUS

CHANNEL A
DDRIII DIMM X 2

CHANNEL B
DDRIII DIMM X 2

FDI

DMI

RGB

PCI EXPRESS X4

PCI EXPRESS X1

INTEL PHY i217LM

PCI ITE IT8892

PCI SLOT

Display

PCIE-1 gen2

PCIE-1 gen2

PCIE-1 gen2

PCIE-1 gen2

PCH (Q87)

SATA III / II

SPI BUS

LPC BUS

SATAIII*6

BIOS

TPM

80 PORT

LPC I/O ITE8728

USB2.0 PORTS X12

USB3.0 PORTS X4

USB 2.0

USB 3.0

AZALIA BUS

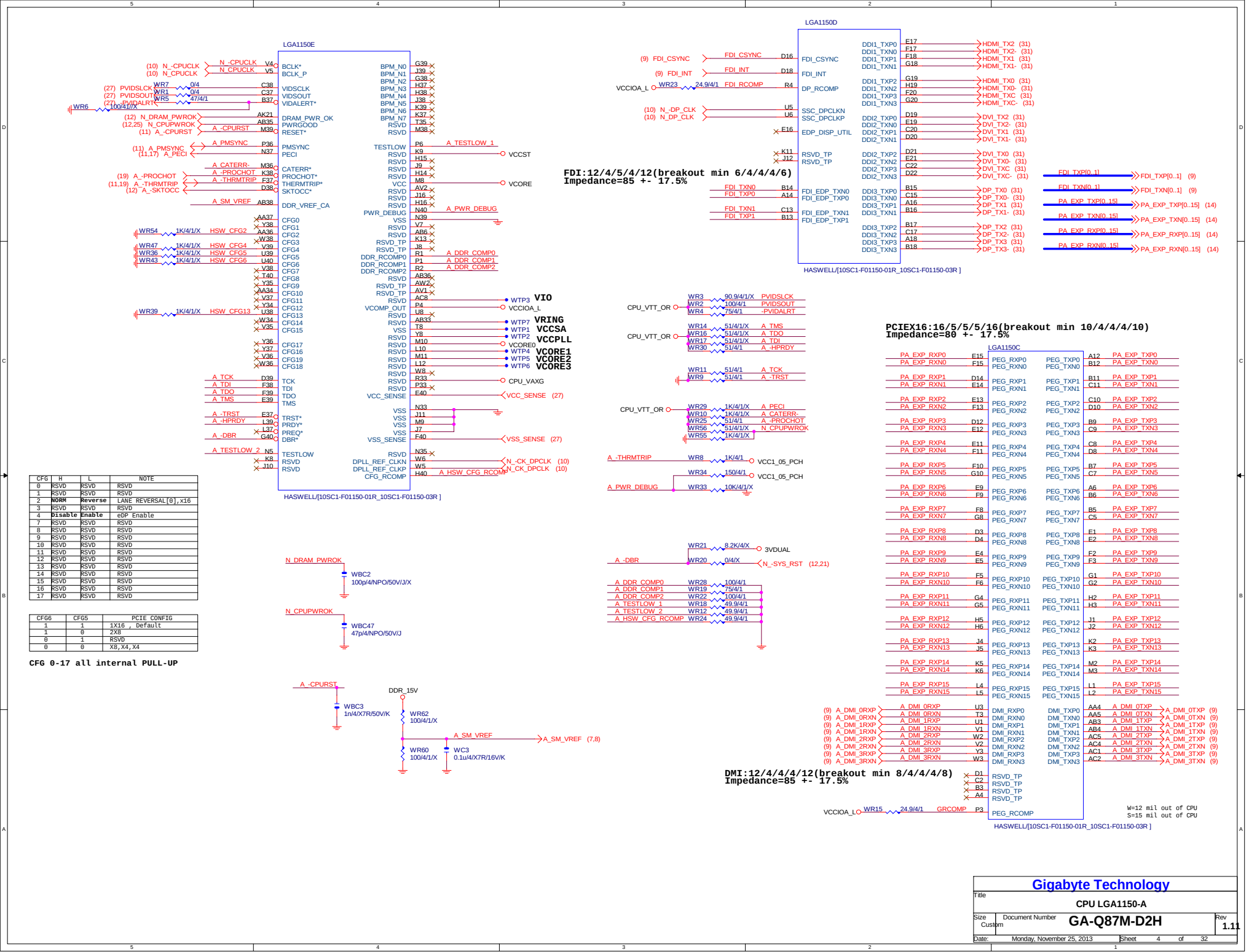
Realtek ALC887-VD2

AUDIO PORTS : FRONT AUDIO
LIN_ OUT LINE_IN MIC CD_IN

I/O PORTS :
COM*2 ,LPT KB/PS2

FRONT PANEL /CPU FAN

Gigabyte Technology			
Title: BLOCK DIAGRAM			
Size: C	Document Number: GA-Q87M-D2H		Rev: 1.11
Date: Monday, November 25, 2013	Sheet 3 of 32		



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

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

Title	CPU LGA1150-A
Size: Custom	Document Number: GA-Q87M-D2H
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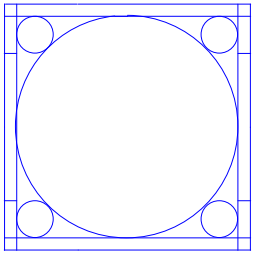
Gigabyte Technology

LGA1155 (CR)

CR
CPU RETAINTION/X



LGA1150

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

LGA1150A

MAAA0	AU13	DDR0_MA0	DDR0_DQ0	AD38	MDA0
MAAA1	AV16	DDR0_MA1	DDR0_DQ1	AD39	MDA1
MAAA2	AU16	DDR0_MA2	DDR0_DQ2	AE38	MDA2
MAAA3	AW17	DDR0_MA3	DDR0_DQ3	AE39	MDA3
MAAA4	AU17	DDR0_MA4	DDR0_DQ4	AD37	MDA4
MAAA5	AW18	DDR0_MA5	DDR0_DQ5	AD40	MDA5
MAAA6	AV17	DDR0_MA6	DDR0_DQ6	AE37	MDA6
MAAA7	AT18	DDR0_MA7	DDR0_DQ7	AF40	MDA7
MAAA8	AU18	DDR0_MA8	DDR0_DQ8	AH40	MDA9
MAAA9	AT19	DDR0_MA9	DDR0_DQ9	AH39	MDA13
MAAA10	AW11	DDR0_MA10	DDR0_DQ10	AK38	MDA10
MAAA11	AV19	DDR0_MA11	DDR0_DQ11	AK39	MDA11
MAAA12	AU19	DDR0_MA12	DDR0_DQ12	AH37	MDA12
MAAA13	AY10	DDR0_MA13	DDR0_DQ13	AH38	MDA8
MAAA14	AT20	DDR0_MA14	DDR0_DQ14	AK37	MDA14
MAAA15	AU21	DDR0_MA15	DDR0_DQ15	AK40	MDA15
			DDR0_DQ16	AM40	MDA17
MODT_A0	AW10	DDR0_ODT0	DDR0_DQ17	AM39	MDA21
MODT_A1	AY8	DDR0_ODT1	DDR0_DQ18	AP38	MDA18
MODT_A2	AW9	DDR0_ODT2	DDR0_DQ19	AP39	MDA19
MODT_A3	AU8	DDR0_ODT3	DDR0_DQ20	AM37	MDA20
			DDR0_DQ21	AM38	MDA16
			DDR0_DQ22	AP37	MDA22
AW33		DDR0_ECC0	DDR0_DQ23	AP40	MDA23
AV33		DDR0_ECC1	DDR0_DQ24	AV37	MDA25
AU31		DDR0_ECC2	DDR0_DQ25	AW37	MDA29
AV31		DDR0_ECC3	DDR0_DQ26	AU35	MDA26
AT33		DDR0_ECC4	DDR0_DQ27	AV35	MDA27
AU33		DDR0_ECC5	DDR0_DQ28	AT37	MDA28
AT31		DDR0_ECC6	DDR0_DQ29	AU37	MDA24
AW31		DDR0_ECC7	DDR0_DQ30	AT35	MDA30
			DDR0_DQ31	AW35	MDA31
SBAA0	AV12	DDR0_BA0	DDR0_DQ32	AY6	MDA33
SBAA1	AY11	DDR0_BA1	DDR0_DQ33	AU6	MDA37
SBAA2	AT21	DDR0_BA2	DDR0_DQ34	AV4	MDA34
			DDR0_DQ35	AU4	MDA35
CKEA0	AV22	DDR0_CKE0	DDR0_DQ36	AW6	MDA36
CKEA1	AT23	DDR0_CKE1	DDR0_DQ37	AV6	MDA32
CKEA2	AU22	DDR0_CKE2	DDR0_DQ38	AW4	MDA38
CKEA3	AU23	DDR0_CKE3	DDR0_DQ39	AY4	MDA39
			DDR0_DQ40	AR1	MDA41
-CSA0	AU14	DDR0_CS_N0	DDR0_DQ41	AR4	MDA45
-CSA1	AV9	DDR0_CS_N1	DDR0_DQ42	AN3	MDA42
-CSA2	AU10	DDR0_CS_N2	DDR0_DQ43	AN4	MDA43
-CSA3	AW8	DDR0_CS_N3	DDR0_DQ44	AR2	MDA44
			DDR0_DQ45	AR3	MDA40
DCLKA0	AY15	DDR0_CLK_P0	DDR0_DQ46	AN2	MDA46
-DCLKA0	AY16	DDR0_CLK_N0	DDR0_DQ47	AN1	MDA47
DCLKA1	AW15	DDR0_CLK_P1	DDR0_DQ48	AL1	MDA49
-DCLKA1	AV15	DDR0_CLK_N1	DDR0_DQ49	AL4	MDA53
DCLKA2	AV14	DDR0_CLK_P2	DDR0_DQ50	AJ3	MDA50
-DCLKA2	AW14	DDR0_CLK_N2	DDR0_DQ51	AJ4	MDA51
DCLKA3	AW13	DDR0_CLK_P3	DDR0_DQ52	AL2	MDA52
-DCLKA3	AY13	DDR0_CLK_N3	DDR0_DQ53	AL3	MDA48
			DDR0_DQ54	AJ2	MDA54
AW12		RSVD	DDR0_DQ55	AJ1	MDA55
			DDR0_DQ56	AG1	MDA57
			DDR0_DQ57	AG4	MDA61
			DDR0_DQ58	AE3	MDA58
			DDR0_DQ59	AE4	MDA59
			DDR0_DQ60	AG2	MDA60
			DDR0_DQ61	AG3	MDA56
-SRASA	AU12	DDR0_RAS*	DDR0_DQ62	AE2	MDA62
-SWEA	AU11	DDR0_WE*	DDR0_DQ63	AE1	MDA63
			DDR0_DQS_P0	AE39	DQSA0
AV20		RSVD	DDR0_DQS_P1	AJ39	DQSA1
AW27		RSVD	DDR0_DQS_P2	AN39	DQSA2
			DDR0_DQS_P3	AV36	DQSA3
-SCASA	AU9	DDR0_CAS*	DDR0_DQS_P4	AV5	DQSA4
			DDR0_DQS_P5	AP3	DQSA5
			DDR0_DQS_P6	AK3	DQSA6
			DDR0_DQS_P7	AF3	DQSA7
			DDR0_DQS_P8	AV32	
WR61	AK22	DDR_RESET*	DDR0_DQS_N0	AE38	-DQSA0
0/4/SHT/MIX			DDR0_DQS_N1	AJ38	-DQSA1
			DDR0_DQS_N2	AN38	-DQSA2
			DDR0_DQS_N3	AU36	-DQSA3
			DDR0_DQS_N4	AW5	-DQSA4
			DDR0_DQS_N5	AP2	-DQSA5
			DDR0_DQS_N6	AK2	-DQSA6
			DDR0_DQS_N7	AF2	-DQSA7
			DDR0_DQS_N8	AU32	

(7) SBAA0 SBAA1 SBAA2
(7) CKEA0 CKEA1 CKEA2 CKEA3
(7) -CSA0 -CSA1 -CSA2 -CSA3
(7) DCLKA0 -DCLKA0 DCLKA1 -DCLKA1 DCLKA2 -DCLKA2 DCLKA3 -DCLKA3
(7) -SRASA
(7) -SWEA
(7) -SCASA
(7,8) -DDR3_RST

WC4
0.1u/4/X7R/16V/K/X

HASWELL/[10SC1-F01150-01R_10SC1-F01150-03R]

LGA1150B

MAAB0	AL19	DDR1_MA0	DDR1_DQ0	AE34	MDB0
MAAB1	AK23	DDR1_MA1	DDR1_DQ1	AE35	MDB1
MAAB2	AM22	DDR1_MA2	DDR1_DQ2	AG35	MDB2
MAAB3	AM23	DDR1_MA3	DDR1_DQ3	AH35	MDB3
MAAB4	AP23	DDR1_MA4	DDR1_DQ4	AD34	MDB4
MAAB5	AL23	DDR1_MA5	DDR1_DQ5	AD35	MDB5
MAAB6	AY24	DDR1_MA6	DDR1_DQ6	AG34	MDB6
MAAB7	AV25	DDR1_MA7	DDR1_DQ7	AH34	MDB7
MAAB8	AU26	DDR1_MA8	DDR1_DQ8	AL34	MDB8
MAAB9	AW25	DDR1_MA9	DDR1_DQ9	AL35	MDB9
MAAB10	AP18	DDR1_MA10	DDR1_DQ10	AK31	MDB10
MAAB11	AY25	DDR1_MA11	DDR1_DQ11	AL31	MDB11
MAAB12	AV26	DDR1_MA12	DDR1_DQ12	AK34	MDB12
MAAB13	AR15	DDR1_MA13	DDR1_DQ13	AK35	MDB13
MAAB14	AV27	DDR1_MA14	DDR1_DQ14	AK32	MDB14
MAAB15	AY28	DDR1_MA15	DDR1_DQ15	AL32	MDB15
			DDR1_DQ16	AN34	MDB17
MODT_B0	AM17		DDR1_DQ17	AP34	MDB21
MODT_B1	AL16	DDR1_ODT0	DDR1_DQ18	AN31	MDB19
MODT_B2	AM16	DDR1_ODT1	DDR1_DQ19	AP31	MDB23
MODT_B3	AK15	DDR1_ODT2	DDR1_DQ20	AN35	MDB20
		DDR1_ODT3	DDR1_DQ21	AP35	MDB16
AM26			DDR1_DQ22	AN32	MDB18
AM25		DDR1_ECC0	DDR1_DQ23	AP32	MDB22
AP25		DDR1_ECC1	DDR1_DQ24	AM29	MDB25
AP26		DDR1_ECC2	DDR1_DQ25	AM28	MDB28
AL26		DDR1_ECC3	DDR1_DQ26	AR29	MDB27
AL25		DDR1_ECC4	DDR1_DQ27	AR28	MDB30
AR26		DDR1_ECC5	DDR1_DQ28	AL29	MDB24
AR25		DDR1_ECC6	DDR1_DQ29	AL28	MDB29
		DDR1_ECC7	DDR1_DQ30	AP29	MDB26
SBAB0	AK17		DDR1_DQ31	AP28	MDB31
SBAB1	AL18	DDR1_BA0	DDR1_DQ32	AR12	MDB32
SBAB2	AW28	DDR1_BA1	DDR1_DQ33	AP12	MDB33
		DDR1_BA2	DDR1_DQ34	AL13	MDB34
			DDR1_DQ35	AL12	MDB35
CKEB0	AW29	DDR1_CKE0	DDR1_DQ36	AR13	MDB36
CKEB1	AY29	DDR1_CKE1	DDR1_DQ37	AP13	MDB37
CKEB2	AU28	DDR1_CKE2	DDR1_DQ38	AM13	MDB38
CKEB3	AU29	DDR1_CKE3	DDR1_DQ39	AM12	MDB39
			DDR1_DQ40	AR9	MDB45
-CSB0	AP17	DDR1_CS_N0	DDR1_DQ41	AP9	MDB41
-CSB1	AN15	DDR1_CS_N1	DDR1_DQ42	AR6	MDB47
-CSB2	AN17	DDR1_CS_N2	DDR1_DQ43	AP6	MDB43
-CSB3	AL15	DDR1_CS_N3	DDR1_DQ44	AR10	MDB44
			DDR1_DQ45	AP10	MDB40
			DDR1_DQ46	AR7	MDB46
			DDR1_DQ47	AP7	MDB42
DCLKB0	AM20		DDR1_DQ48	AM9	MDB52
-DCLKB0	AM21	DDR1_CLK_P0	DDR1_DQ49	AL9	MDB53
DCLKB1	AP22	DDR1_CLK_N0	DDR1_DQ50	AL6	MDB50
-DCLKB1	AP21	DDR1_CLK_P1	DDR1_DQ51	AL7	MDB55
		DDR1_CLK_N1	DDR1_DQ52	AM10	MDB48
DCLKB2	AN20		DDR1_DQ53	AL10	MDB49
-DCLKB2	AN21	DDR1_CLK_P2	DDR1_DQ54	AM6	MDB54
DCLKB3	AP19	DDR1_CLK_N2	DDR1_DQ55	AM7	MDB51
-DCLKB3	AP20	DDR1_CLK_P3	DDR1_DQ56	AH6	MDB61
		DDR1_CLK_N3	DDR1_DQ57	AH7	MDB60
-SCASB	AP16		DDR1_DQ58	AE6	MDB59
	AL20	DDR1_CAS*	DDR1_DQ59	AE7	MDB63
-SRASB	AM18	RSVD	DDR1_DQ60	AJ6	MDB56
-SWEB	AK16	DDR1_RAS*	DDR1_DQ61	AJ7	MDB57
		DDR1_WE*	DDR1_DQ62	AF6	MDB58
			DDR1_DQ63	AE7	MDB62
VREF_DQA	AB39	DDR_VREF_DQ0	DDR1_DQS_P0	AF35	DQSB0
VREF_DQB	AB40	DDR_VREF_DQ1	DDR1_DQS_P1	AL33	DQSB1
			DDR1_DQS_P2	AP33	DQSB2
			DDR1_DQS_P3	AN28	DQSB3
			DDR1_DQS_P4	AN12	DQSB4
			DDR1_DQS_P5	AP8	DQSB5
			DDR1_DQS_P6	AL8	DQSB6
			DDR1_DQS_P7	AG7	DQSB7
			DDR1_DQS_P8	AN25	
			DDR1_DQS_N0	AF34	-DQSB0
			DDR1_DQS_N1	AK33	-DQSB1
			DDR1_DQS_N2	AN33	-DQSB2
			DDR1_DQS_N3	AN29	-DQSB3
			DDR1_DQS_N4	AN13	-DQSB4
			DDR1_DQS_N5	AR8	-DQSB5
			DDR1_DQS_N6	AM8	-DQSB6
			DDR1_DQS_N7	AG6	-DQSB7
			DDR1_DQS_N8	AN26	

(8) SBAB0 SBAB1 SBAB2
(8) CKEB0 CKEB1 CKEB2 CKEB3
(8) -CSB0 -CSB1 -CSB2 -CSB3
(8) DCLKB0 -DCLKB0 DCLKB1 -DCLKB1
(8) DCLKB2 -DCLKB2 DCLKB3 -DCLKB3
(8) -SCASB
(8) -SRASB -SWEB
(7) VREF_DQA
(8) VREF_DQB

HASWELL/[10SC1-F01150-01R_10SC1-F01150-03R]

(7) MODT_A[0..3] MODT_A[0..3]
(8) MODT_B[0..3] MODT_B[0..3]
(7) MDA[0..63] MDA[0..63]
(8) MDB[0..63] MDB[0..63]
(7) DQSA[0..7] DQSA[0..7]
(7) -DQSA[0..7] -DQSA[0..7]
(7) MAAA[0..15] MAAA[0..15]
(8) MAAB[0..15] MAAB[0..15]
(8) DQSB[0..7] DQSB[0..7]
(8) -DQSB[0..7] -DQSB[0..7]

VREF_DQA
VREF_DQB
WBC34 0.1u/4/X7R/16V/K
WBC33 0.1u/4/X7R/16V/K
Place in CPU bottom side

Gigabyte Technology			
Title: CPU LGA1150-B			
Size: Custom	Document Number: GA-Q87M-D2H		Rev: 1.11
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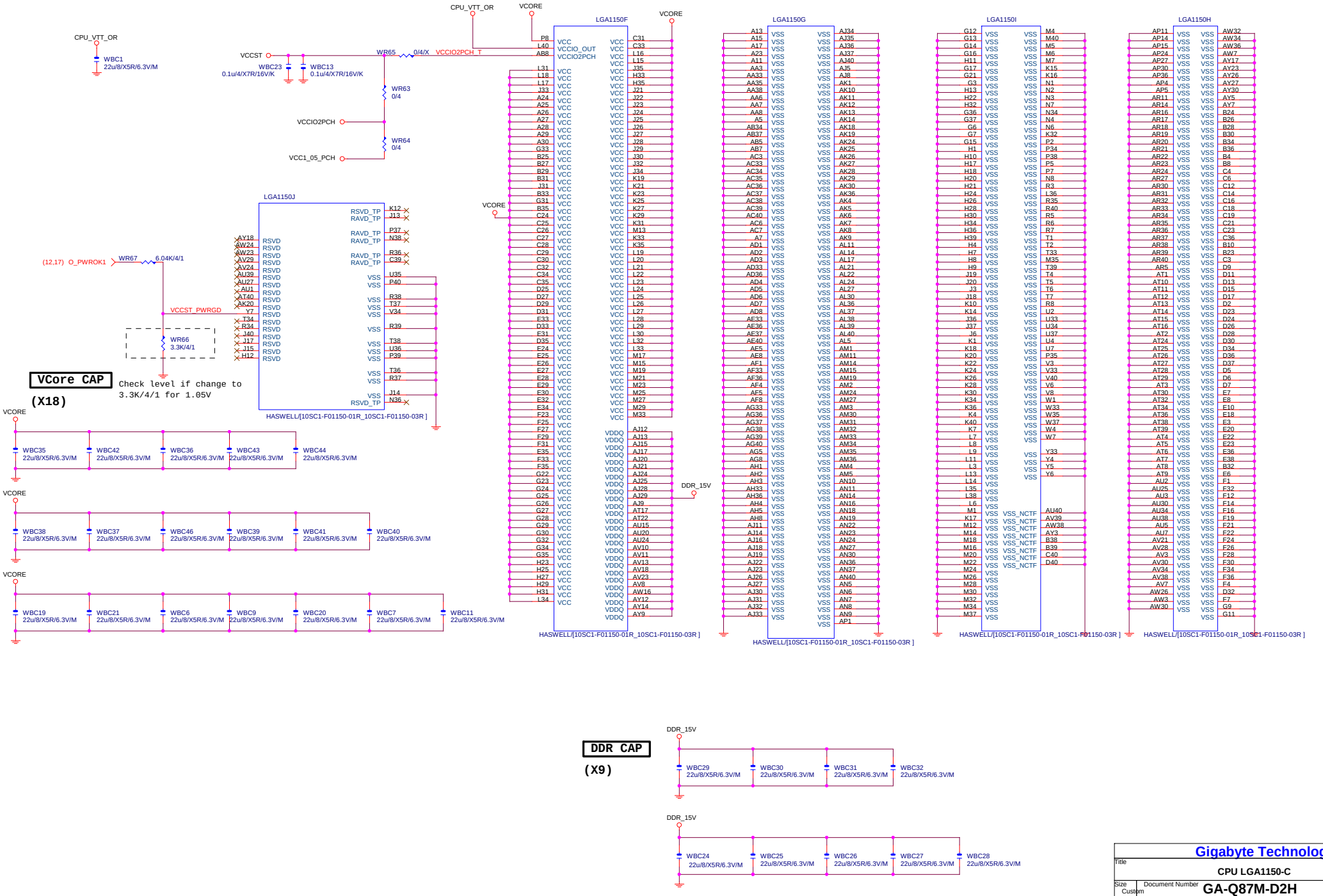
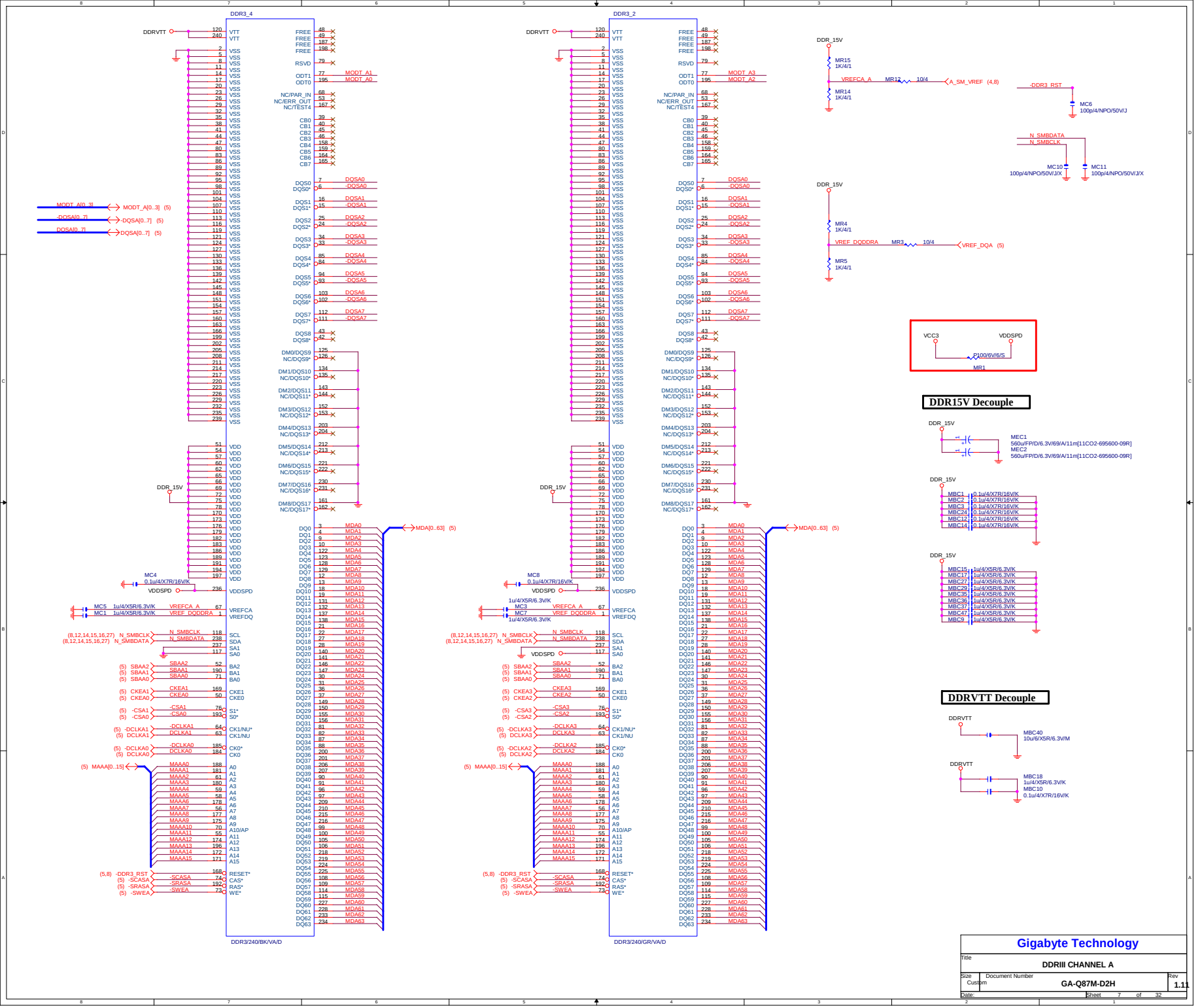


Gigabyte Technology			
Title: CPU LGA1150-C			
Size: Custom	Document Number: GA-Q87M-D2H		Rev: 1.11
Date: Monday, November 25, 2013	Sheet 6 of 32		



Title	DDRIII CHANNEL A
Size	Custom
Document Number	GA-Q87M-D2H
Rev	1.11
Date:	
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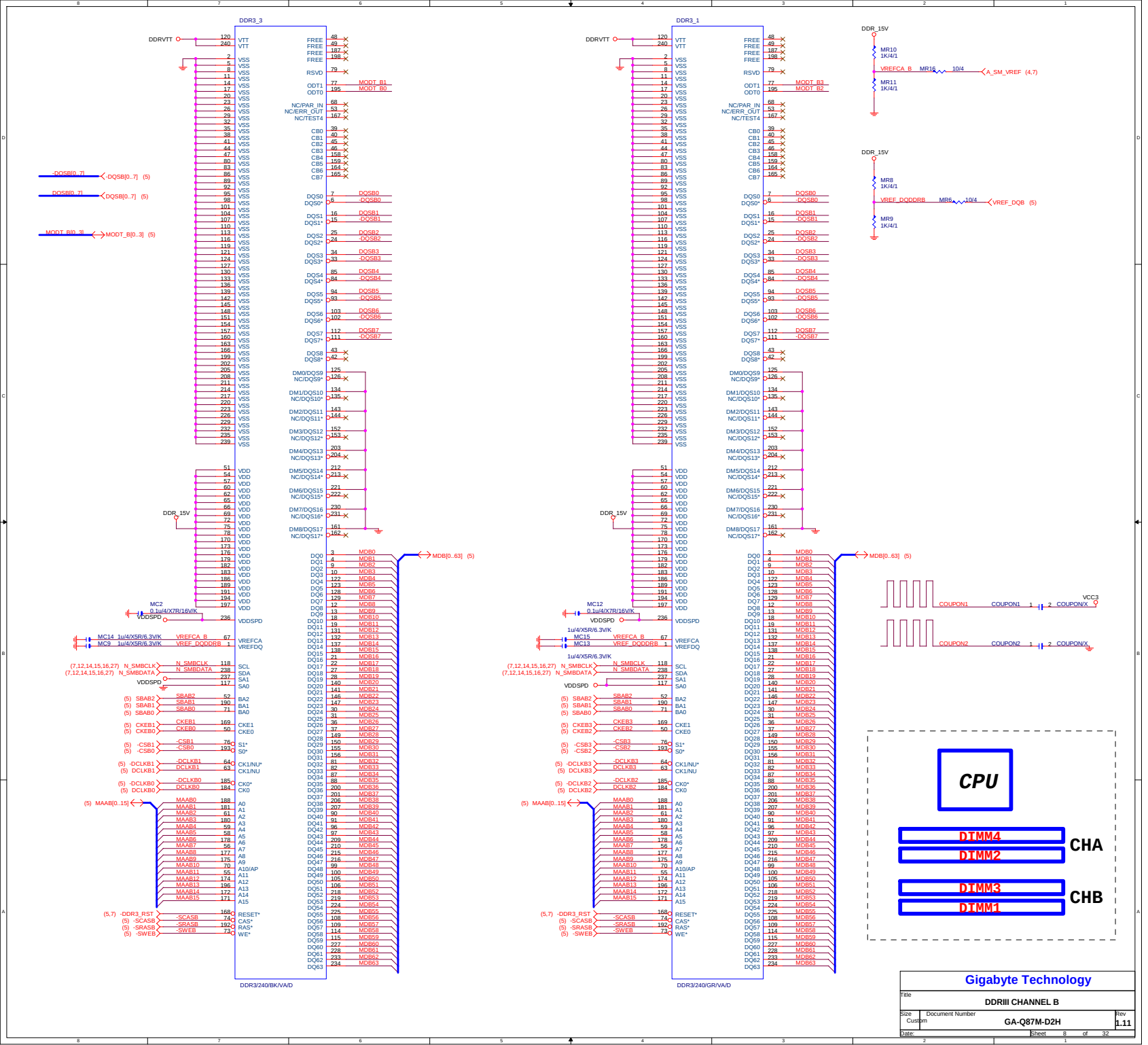
Gigabyte Technology



Gigabyte Technology			
Title: DDRIII CHANNEL B			
Size: Custom	Document Number: GA-Q87M-D2H		Rev: 1.11
Date:		Sheet 8 of 32	

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

PCHB

DMI

USB

PCIE

DH82LPDS C2/S

Disabled in B85

8892

PHY

PCIEx1

PCIEx4

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

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

PCHF

DH82LPDS C2/S

PCHJ

DH82LPDS C2/S

LOW COST ICH7 HEATSINK

SB_HEATSIN

GRAY HS

PCH_HS

PCH_HS[12SP2-S04209-01R_12SP2-S04209-02R_12SP2-S04209-03R]

Mount for integrated clock Generation Mode

NR225 short to GND in non graphic SKU

Title	PCH FDI,DMI,USB ,PCIE,NVRAM
Size	Custom
Document Number	GA-Q87M-D2H
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Date:	Monday, November 25, 2013
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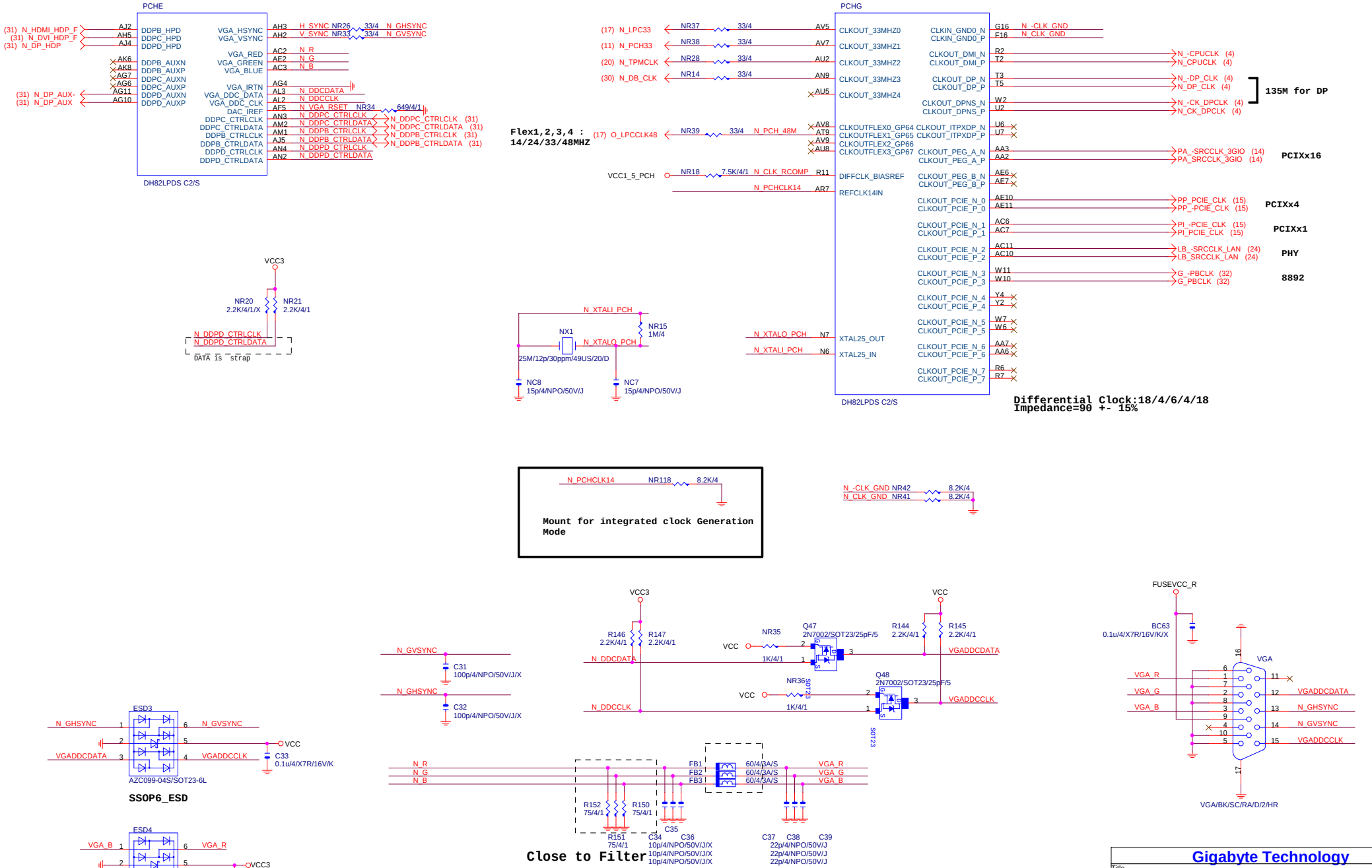
Gigabyte Technology



Gigabyte Technology			
Title: PCH DISPLAY ,CLK BUFFER			
Size: Custom	Document Number: GA-Q87M-D2H		Rev: 1.11
Date: Monday, November 25, 2013	Sheet 10 of 32		

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%

PCHC

DH82LPDS C2/S

GP37 set Hi to enable AMT with TLS

PCHA

DH82LPDS C2/S

Mount for integrated clock Generation Mode

GPIO38 Ctrl

SATA3_0
SATA2/7/WH/H/OP/VA/D/1/B/PA66

SATA3_1
SATA2/7/WH/H/OP/VA/D/1/B/PA66

SATA3_2
SATA2/7/WH/H/OP/VA/D/1/B/PA66

SATA3_3
SATA2/7/WH/H/OP/VA/D/1/B/PA66

SATA3_4
SATA2/7/WH/H/OP/VA/D/1/B/PA66

SATA3_5
SATA2/7/WH/H/OP/VA/D/1/B/PA66

GFX SELECT
DMI RX TERMINATION

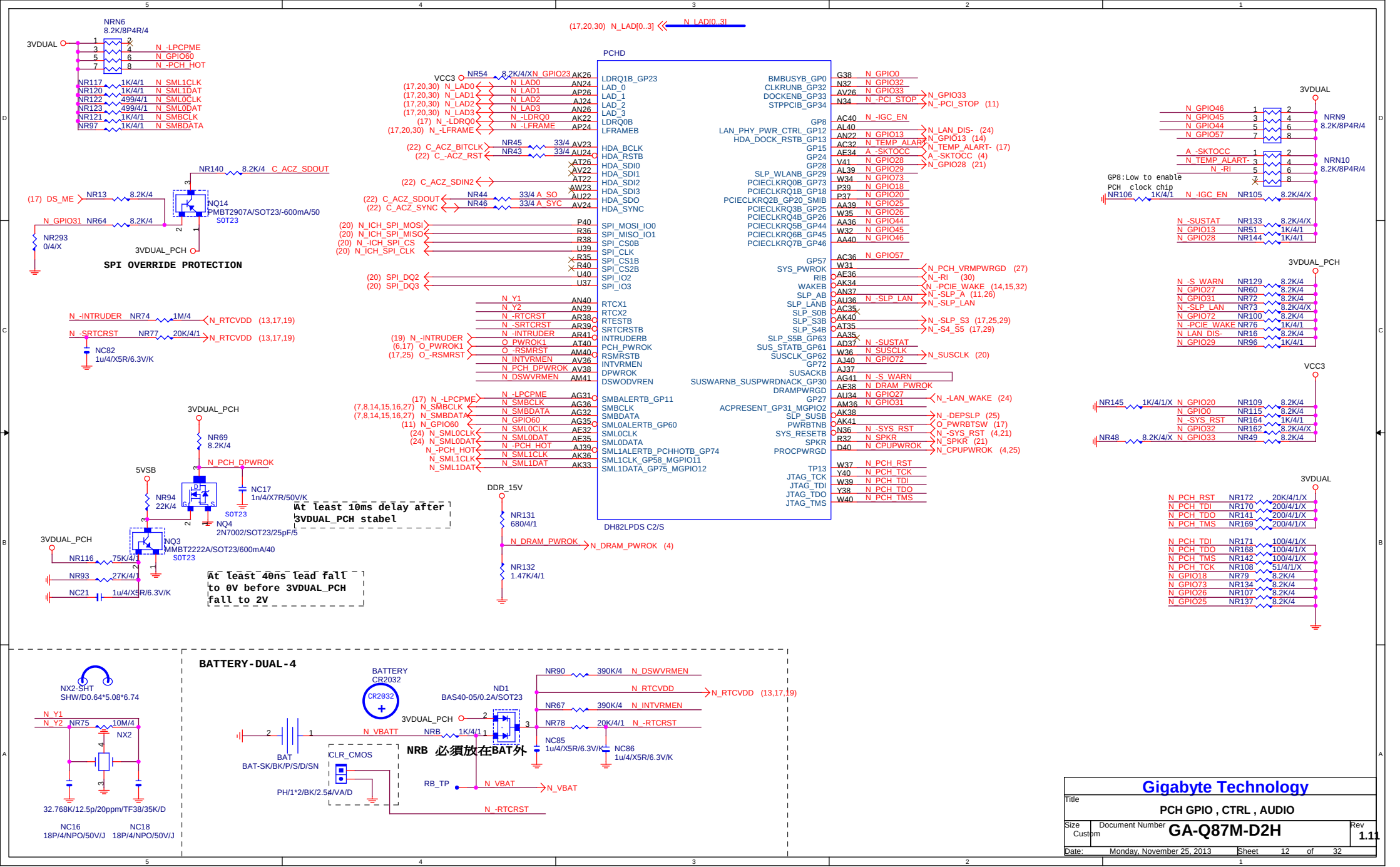
TLS Setting

SV DETECT

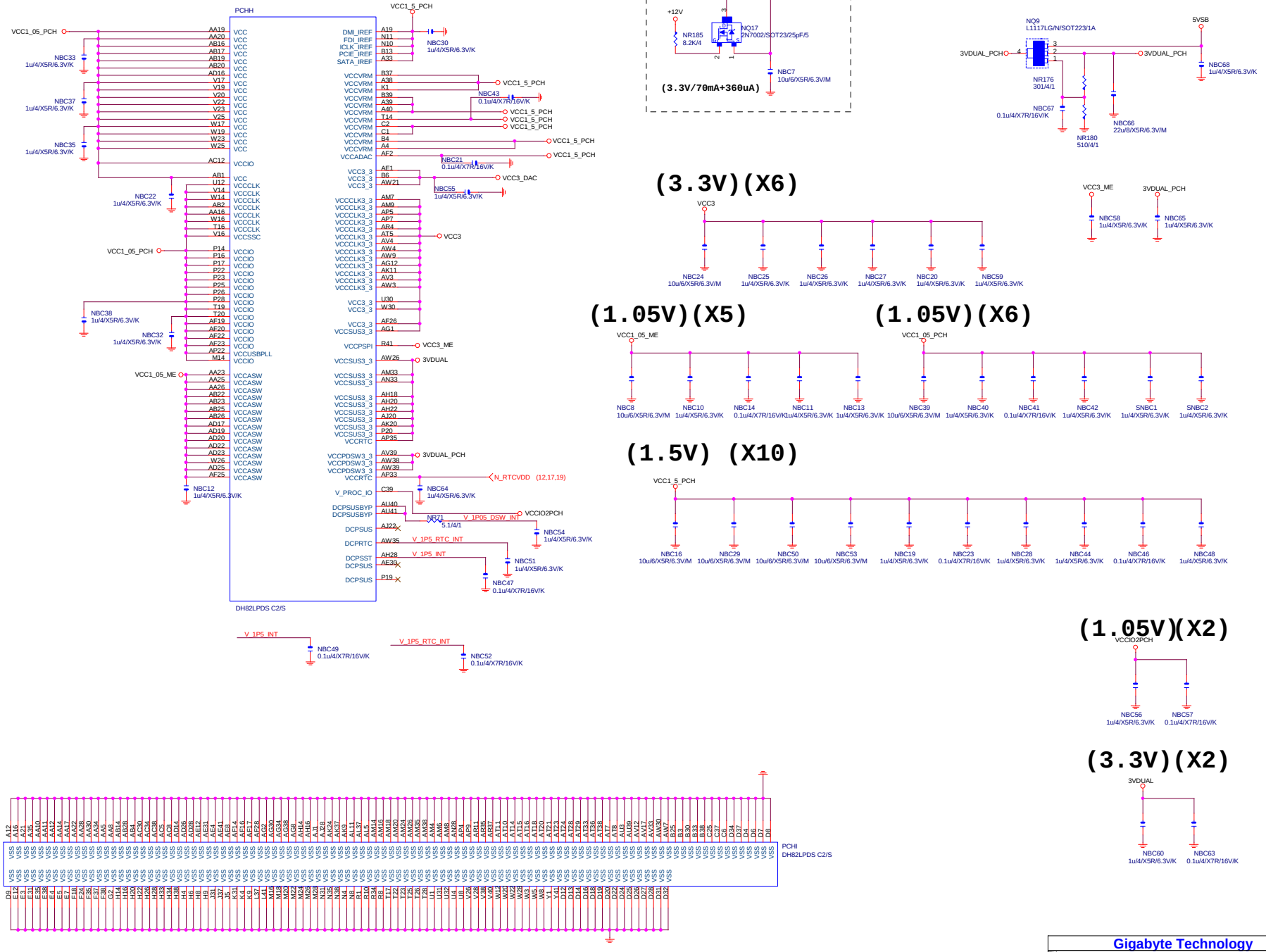
Pu to enable TLS for SBA

Title	PCH HOST , SATA, PCI
Size	Custom
Document Number	GA-Q87M-D2H
Rev	1.11
Date:	Monday, November 25, 2013
Sheet	11 of 32

Gigabyte Technology



Gigabyte Technology			
Title	PCH GPIO , CTRL , AUDIO		
Size: Custom	Document Number: GA-Q87M-D2H		Rev: 1.11
Date: Monday, November 25, 2013	Sheet 12 of 32		



Gigabyte Technology			
Title	PCH PWR ,GND		
Size: Custom	Document Number: GA-Q87M-D2H		Rev: 1.11
Date: Monday, November 25, 2013	Sheet 13 of 32		

PCIEX16 CAP

VCC3

PABC1 0.1u/4/X7R/16V/K
PABC2 0.1u/4/X7R/16V/K/X
PABC3 0.1u/4/X7R/16V/K/X
PABC4 22u/8/X5R/6.3V/M

PCIEX16 PROTECT SHT

+12V
X16_+12V
PARN1 0/8P4R/0402/SHT/X
PARN2 0/8P4R/4/X
PAEC1
270u/FP/D/16V/8C/A/10m[11CO5-8C2700-09R]

PCIEX16 AC CAP

PA_EXP_TXP0	PAC5	0.22u/4/X5R/6.3V/K	PA_EXP_TXP0_C
PA_EXP_TXN0	PAC4	0.22u/4/X5R/6.3V/K	PA_EXP_TXN0_C
PA_EXP_TXP1	PAC6	0.22u/4/X5R/6.3V/K	PA_EXP_TXP1_C
PA_EXP_TXN1	PAC7	0.22u/4/X5R/6.3V/K	PA_EXP_TXN1_C
PA_EXP_TXP2	PAC8	0.22u/4/X5R/6.3V/K	PA_EXP_TXP2_C
PA_EXP_TXN2	PAC9	0.22u/4/X5R/6.3V/K	PA_EXP_TXN2_C
PA_EXP_TXP3	PAC10	0.22u/4/X5R/6.3V/K	PA_EXP_TXP3_C
PA_EXP_TXN3	PAC11	0.22u/4/X5R/6.3V/K	PA_EXP_TXN3_C
PA_EXP_TXP4	PAC12	0.22u/4/X5R/6.3V/K	PA_EXP_TXP4_C
PA_EXP_TXN4	PAC13	0.22u/4/X5R/6.3V/K	PA_EXP_TXN4_C
PA_EXP_TXP5	PAC14	0.22u/4/X5R/6.3V/K	PA_EXP_TXP5_C
PA_EXP_TXN5	PAC15	0.22u/4/X5R/6.3V/K	PA_EXP_TXN5_C
PA_EXP_TXP6	PAC16	0.22u/4/X5R/6.3V/K	PA_EXP_TXP6_C
PA_EXP_TXN6	PAC17	0.22u/4/X5R/6.3V/K	PA_EXP_TXN6_C
PA_EXP_TXP7	PAC19	0.22u/4/X5R/6.3V/K	PA_EXP_TXP7_C
PA_EXP_TXN7	PAC18	0.22u/4/X5R/6.3V/K	PA_EXP_TXN7_C
PA_EXP_TXP8	PAC20	0.22u/4/X5R/6.3V/K	PA_EXP_TXP8_C
PA_EXP_TXN8	PAC21	0.22u/4/X5R/6.3V/K	PA_EXP_TXN8_C
PA_EXP_TXP9	PAC22	0.22u/4/X5R/6.3V/K	PA_EXP_TXP9_C
PA_EXP_TXN9	PAC23	0.22u/4/X5R/6.3V/K	PA_EXP_TXN9_C
PA_EXP_TXP10	PAC24	0.22u/4/X5R/6.3V/K	PA_EXP_TXP10_C
PA_EXP_TXN10	PAC25	0.22u/4/X5R/6.3V/K	PA_EXP_TXN10_C
PA_EXP_TXP11	PAC26	0.22u/4/X5R/6.3V/K	PA_EXP_TXP11_C
PA_EXP_TXN11	PAC27	0.22u/4/X5R/6.3V/K	PA_EXP_TXN11_C
PA_EXP_TXP12	PAC28	0.22u/4/X5R/6.3V/K	PA_EXP_TXP12_C
PA_EXP_TXN12	PAC29	0.22u/4/X5R/6.3V/K	PA_EXP_TXN12_C
PA_EXP_TXP13	PAC30	0.22u/4/X5R/6.3V/K	PA_EXP_TXP13_C
PA_EXP_TXN13	PAC31	0.22u/4/X5R/6.3V/K	PA_EXP_TXN13_C
PA_EXP_TXP14	PAC32	0.22u/4/X5R/6.3V/K	PA_EXP_TXP14_C
PA_EXP_TXN14	PAC33	0.22u/4/X5R/6.3V/K	PA_EXP_TXN14_C
PA_EXP_TXP15	PAC34	0.22u/4/X5R/6.3V/K	PA_EXP_TXP15_C
PA_EXP_TXN15	PAC35	0.22u/4/X5R/6.3V/K	PA_EXP_TXN15_C

PA_EXP_RXP[0..15] >> PA_EXP_RXP[0..15] (4)
PA_EXP_RXN[0..15] >> PA_EXP_RXN[0..15] (4)
PA_EXP_TXP[0..15] >> PA_EXP_TXP[0..15] (4)
PA_EXP_TXN[0..15] >> PA_EXP_TXN[0..15] (4)

PCIEX16 SOFT RESET

VCC3
R123 1K/4/1
R125 1K/4/1
(12) N_GPIO13
SOT23 Q8 2N7002/SOT23/25pF/5
R126 0/4/X
R124 0/4
O_-PCIE_RST (15,17,32)
O_-PFMRST1 (17,30)
-DPCIE_RST
SOT23 Q6 MMBT2222A/SOT23/600mA/40

PCIEX16 SLOT

PCIESLOT-164DN-P

3GIO_*16

X16_+12V
3VDUAL
VCC3
PAR1 0/4/SHT/M/X
PAR2 0/4/SHT/M/X
PAR3 0/4/SHT/M/X
PAC1 22p/4/NPO/50V/J/X
-DPCIE_RST
(7,8,12,15,16,27) N_SMBCLK
(7,8,12,15,16,27) N_SMBDATA
(12,15,32) N_-PCIE_WAKE
PA_SRCCLK_3GIO (10)
PA_-SRCCLK_3GIO (10)

PCIEX16			
B1	12V	PRSNT1*	A1
B2	12V	12V	A2
B3	RSVD	12V	A3
B4	GND	GND	A4
B5	SMCLK	JTAG2	A5
B6	SMDAT	JTAG3	A6
B7	GND	JTAG4	A7
B8	3.3V	JTAG5	A8
B9	JTAG1	3.3V	A9
B10	3.3VAUX	3.3V	A10
B11	WAKE*	PWRGD	A11
KEY			
B12	RSVD	GND	A12
B13	GND	REFCLK+	A13
B14	HSOP0	REFCLK-	A14
B15	HSON0	GND	A15
B16	GND	HSIP0	A16
B17	PRSNT2*	HSIN0	A17
B18	GND	GND	A18
B19	HSOP1	RSVD	A19
B20	HSON1	GND	A20
B21	GND	HSIP1	A21
B22	GND	HSIN1	A22
B23	HSOP2	GND	A23
B24	HSON2	GND	A24
B25	GND	HSIP2	A25
B26	GND	HSIN2	A26
B27	HSOP3	GND	A27
B28	HSON3	GND	A28
B29	GND	HSIP3	A29
B30	RSVD	HSIN3	A30
B31	PRSNT2*	GND	A31
B32	GND	RSVD	A32
B33	HSOP4	RSVD	A33
B34	HSON4	GND	A34
B35	GND	HSIP4	A35
B36	GND	HSIN4	A36
B37	HSOP5	GND	A37
B38	HSON5	GND	A38
B39	GND	HSIP5	A39
B40	GND	HSIN5	A40
B41	HSOP6	GND	A41
B42	HSON6	GND	A42
B43	GND	HSIP6	A43
B44	GND	HSIN6	A44
B45	HSOP7	GND	A45
B46	HSON7	GND	A46
B47	GND	HSIP7	A47
B48	PRSNT2*	HSIN7	A48
B49	GND	GND	A49
B50	HSOP8	RSVD	A50
B51	HSON8	GND	A51
B52	GND	HSIP8	A52
B53	GND	HSIN8	A53
B54	HSOP9	GND	A54
B55	HSON9	GND	A55
B56	GND	HSIP9	A56
B57	GND	HSIN9	A57
B58	HSOP10	GND	A58
B59	HSON10	GND	A59
B60	GND	HSIP10	A60
B61	GND	HSIN10	A61
B62	HSOP11	GND	A62
B63	HSON11	GND	A63
B64	GND	HSIP11	A64
B65	GND	HSIN11	A65
B66	HSOP12	GND	A66
B67	HSON12	GND	A67
B68	GND	HSIP12	A68
B69	GND	HSIN12	A69
B70	HSOP13	GND	A70
B71	HSON13	GND	A71
B72	GND	HSIP13	A72
B73	GND	HSIN13	A73
B74	HSOP14	GND	A74
B75	HSON14	GND	A75
B76	GND	HSIP14	A76
B77	GND	HSIN14	A77
B78	HSOP15	GND	A78
B79	HSON15	GND	A79
B80	GND	HSIP15	A80
B81	PRSNT2*	HSIN15	A81
B82	RSVD	GND	A82

PA_EXP_TXP0_C / PA_EXP_TXN0_C
PA_EXP_TXP1_C / PA_EXP_TXN1_C
PA_EXP_TXP2_C / PA_EXP_TXN2_C
PA_EXP_TXP3_C / PA_EXP_TXN3_C
PA_EXP_TXP4_C / PA_EXP_TXN4_C
PA_EXP_TXP5_C / PA_EXP_TXN5_C
PA_EXP_TXP6_C / PA_EXP_TXN6_C
PA_EXP_TXP7_C / PA_EXP_TXN7_C
PA_EXP_TXP8_C / PA_EXP_TXN8_C
PA_EXP_TXP9_C / PA_EXP_TXN9_C
PA_EXP_TXP10_C / PA_EXP_TXN10_C
PA_EXP_TXP11_C / PA_EXP_TXN11_C
PA_EXP_TXP12_C / PA_EXP_TXN12_C
PA_EXP_TXP13_C / PA_EXP_TXN13_C
PA_EXP_TXP14_C / PA_EXP_TXN14_C
PA_EXP_TXP15_C / PA_EXP_TXN15_C

PA_EXP_RXP0 / PA_EXP_RXN0
PA_EXP_RXP1 / PA_EXP_RXN1
PA_EXP_RXP2 / PA_EXP_RXN2
PA_EXP_RXP3 / PA_EXP_RXN3
PA_EXP_RXP4 / PA_EXP_RXN4
PA_EXP_RXP5 / PA_EXP_RXN5
PA_EXP_RXP6 / PA_EXP_RXN6
PA_EXP_RXP7 / PA_EXP_RXN7
PA_EXP_RXP8 / PA_EXP_RXN8
PA_EXP_RXP9 / PA_EXP_RXN9
PA_EXP_RXP10 / PA_EXP_RXN10
PA_EXP_RXP11 / PA_EXP_RXN11
PA_EXP_RXP12 / PA_EXP_RXN12
PA_EXP_RXP13 / PA_EXP_RXN13
PA_EXP_RXP14 / PA_EXP_RXN14
PA_EXP_RXP15 / PA_EXP_RXN15

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

Gigabyte Technology

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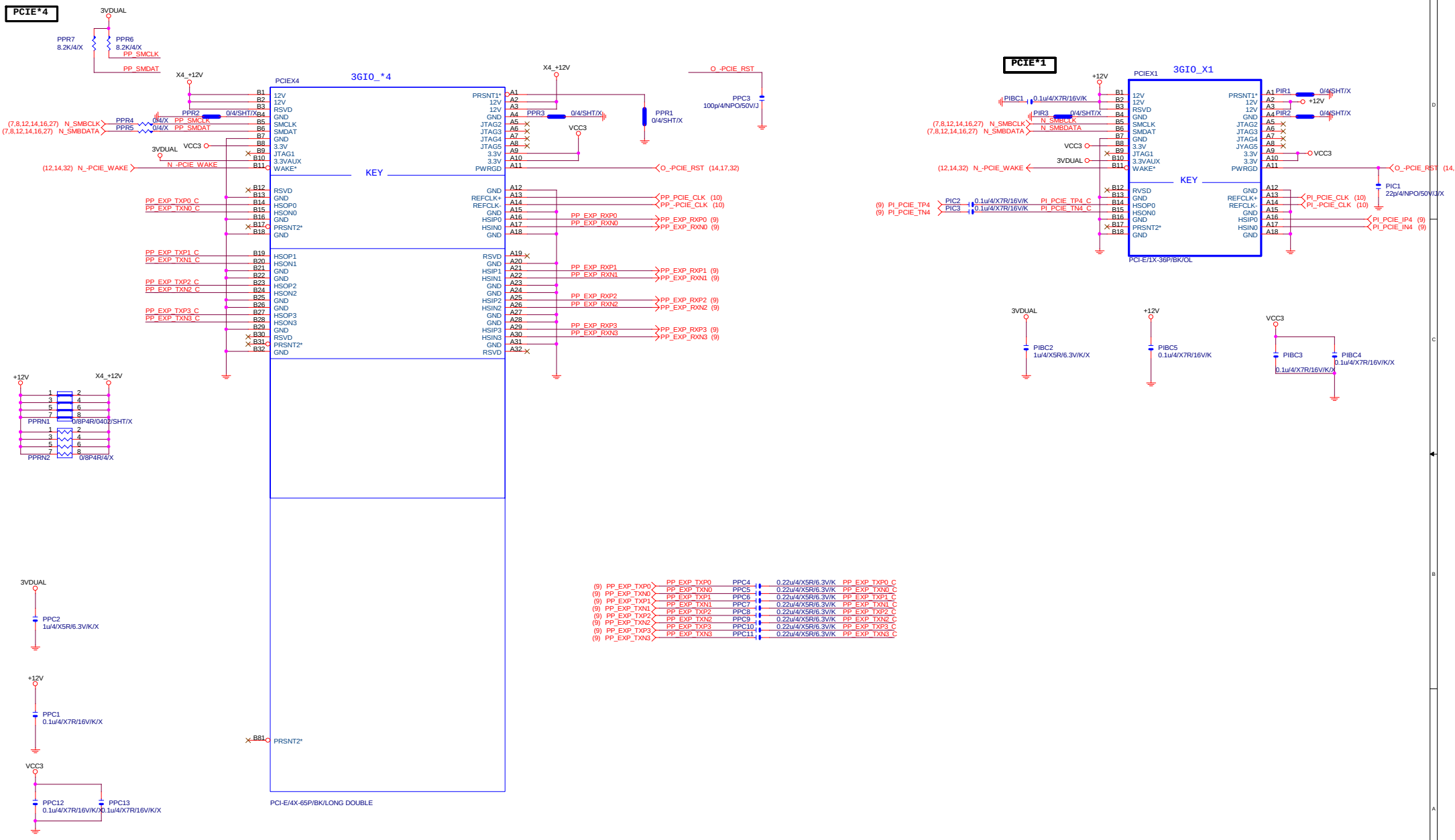
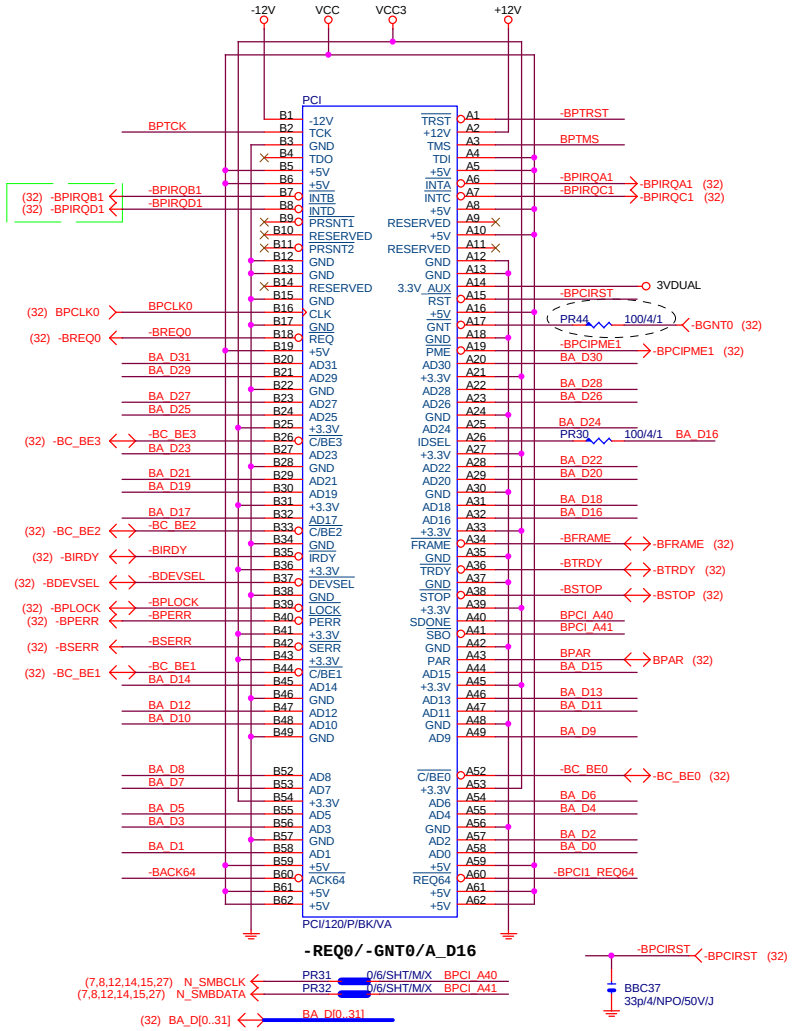
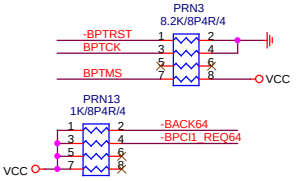
Date: Monday, November 25, 2013	Sheet 14 of 32	


PCIE*4
3VDUAL
PPR7 8.2K/4/X
PPR6 8.2K/4/X
PP_SMCLK
PP_SMDAT
X4_+12V
PCIEX4
3GIO_*4
PPR2 0/4/SHT/X
PPR4 0/4/X PP_SMCLK
PPR5 0/4/X PP_SMDAT
(7,8,12,14,16,27) N_SMBCLK
(7,8,12,14,16,27) N_SMBDATA
VCC3
(12,14,32) N_-PCIE_WAKE
N_-PCIE_WAKE
KEY
PP_EXP_TXP0_C
PP_EXP_TXN0_C
PP_EXP_TXP1_C
PP_EXP_TXN1_C
PP_EXP_TXP2_C
PP_EXP_TXN2_C
PP_EXP_TXP3_C
PP_EXP_TXN3_C
PRSNT2*
PPR3 0/4/SHT/X
PPR1 0/4/SHT/X
O_-PCIE_RST
PPC3 100p/4/NPO/50V/J
PP_PCIE_CLK (10)
PP_-PCIE_CLK (10)
PP_EXP_RXP0
PP_EXP_RXN0
PP_EXP_RXP1
PP_EXP_RXN1
PP_EXP_RXP2
PP_EXP_RXN2
PP_EXP_RXP3
PP_EXP_RXN3
O_-PCIE_RST (14,17,32)
PPRN1 0/8P4R/0402/SHT/X
PPRN2 0/8P4R/4/X
PPC2 1u/4/X5R/6.3V/K/X
PPC1 0.1u/4/X7R/16V/K/X
PPC12 0.1u/4/X7R/16V/K/X
PPC13 0.1u/4/X7R/16V/K/X
PRSNT2*
PCI-E/4X-65P/BK/LONG DOUBLE
PPC4 0.22u/4/X5R/6.3V/K PP_EXP_TXP0_C
PPC5 0.22u/4/X5R/6.3V/K PP_EXP_TXN0_C
PPC6 0.22u/4/X5R/6.3V/K PP_EXP_TXP1_C
PPC7 0.22u/4/X5R/6.3V/K PP_EXP_TXN1_C
PPC8 0.22u/4/X5R/6.3V/K PP_EXP_TXP2_C
PPC9 0.22u/4/X5R/6.3V/K PP_EXP_TXN2_C
PPC10 0.22u/4/X5R/6.3V/K PP_EXP_TXP3_C
PPC11 0.22u/4/X5R/6.3V/K PP_EXP_TXN3_C
PCIE*1
PCIEX1
3GIO_X1
PIBC1 0.1u/4/X7R/16V/K
PIR3 0/4/SHT/X
PIR1 0/4/SHT/X
PIR2 0/4/SHT/X
+12V
PIC2 0.1u/4/X7R/16V/K
PIC3 0.1u/4/X7R/16V/K
PI_PCIE_TP4_C
PI_PCIE_TN4_C
(9) PI_PCIE_TP4
(9) PI_PCIE_TN4
PIC1 22p/4/NPO/50V/J/X
PI_PCIE_CLK (10)
PI_-PCIE_CLK (10)
PCI-E/1X-36P/BK/OL
PIBC2 1u/4/X5R/6.3V/K/X
PIBC5 0.1u/4/X7R/16V/K
PIBC3 0.1u/4/X7R/16V/K/X
PIBC4 0.1u/4/X7R/16V/K/X
Gigabyte Technology
Title
PCI EXPRESS X 1 PORT
Size Custom
Document Number
GA-Q87M-D2H
Rev 1.11
Date: Monday, November 25, 2013
Sheet 15 of 32

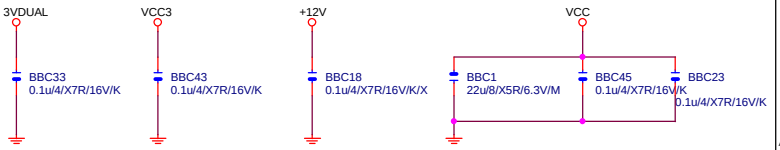
PCI SLOT



PCI PU



PCI CAP



Gigabyte Technology		
Title: PCI SLOT 1&2		
Size: Custom	Document Number: GA-Q87M-D2H	Rev: 1.11
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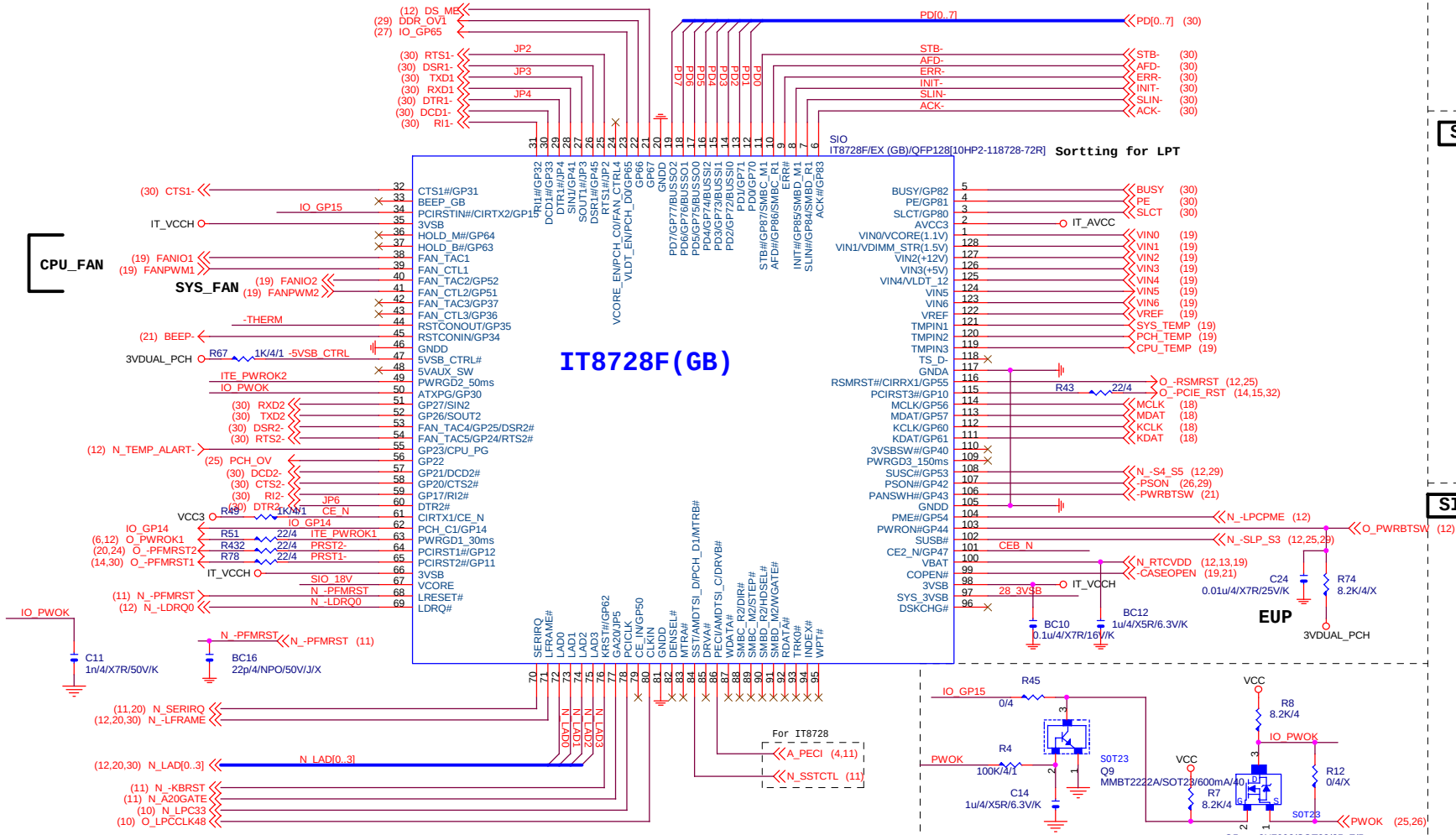
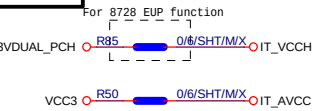
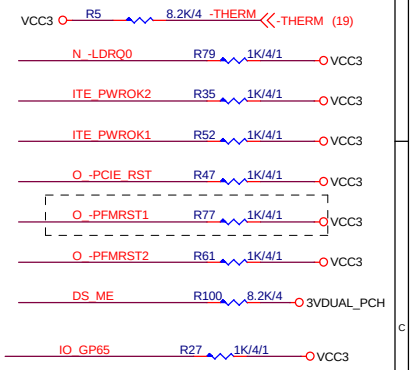
SIO IT8728F



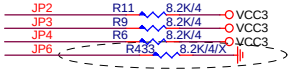
PWR SHT



SIO PU



SIO STRAP



IT8728-EX
PULL DOWN ENABLE FORCE OVP

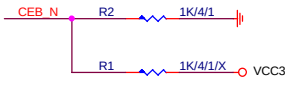
EUP control by PCH

JP3--- High SPI-Flash Disable
Low SPI-Flash Enable

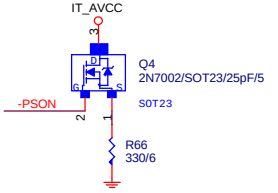
IT8728F NOTE

	IT8728
PIN121	VCORE_EN/PCH_C0
PIN120	VLDT_EN/PCH_D0
PIN19	ATXPG
PIN31	PCH_C1
PIN53	SST/AMDTSI_D/MTRB#/PCH_D1
PIN55	PECI/AMDTSI_C/DRVB#
PIN66	SYS_3VSB
PIN70	GP47
PIN95	VIN2(VCC5)
PIN96	VIN1(VCC12)
PIN97	VIN1/VDIMM_STR(1.5V)
PIN98	VIN0/VCORE(1.1V)/NC

DUAL BIOS OPT STRAP



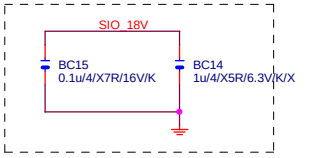
Power leakage



For IT8721 Power leakage

SIO_18V

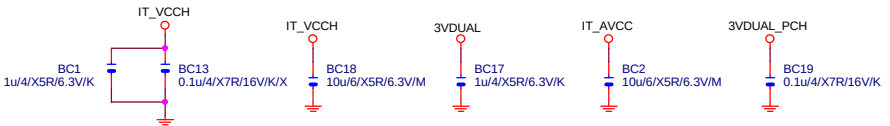
internal power pin, max 22nF cap



FOR LOW TEMP POWER ON INTO TEST MODE ISSUE

MB-ID

SIO CAP



Gigabyte Technology			
Title: ITE 8728 LPC IO			
Size: Custom	Document Number: GA-Q87M-D2H		Rev: 1.11
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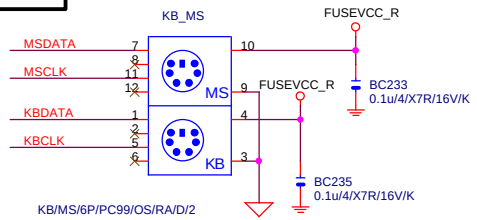
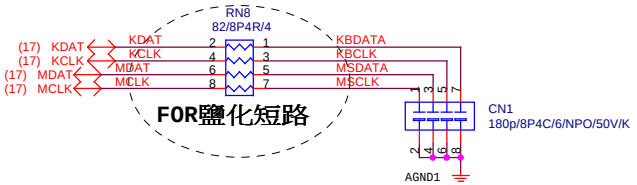
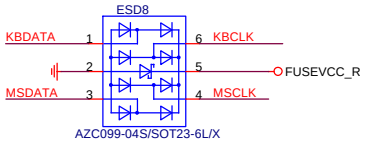
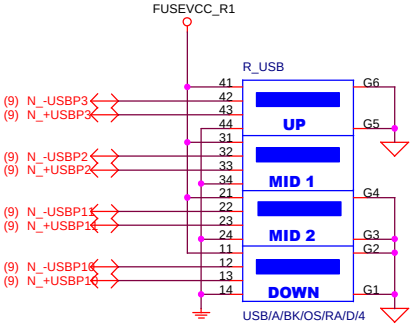
KB/MS



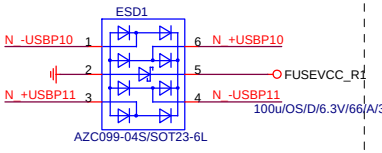


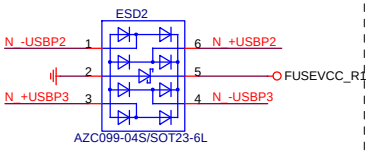


RUSB20

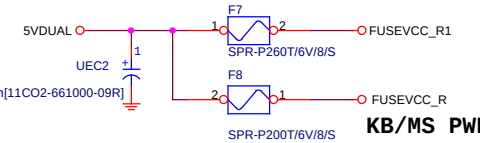


USB2.0 ESD





USB2.0 PWR



KB/MS PWR

Close to USB connector

Gigabyte Technology			
Title: KB/MS,RUSB			
Size: Custom	Document Number: GA-Q87M-D2H		Rev: 1.11
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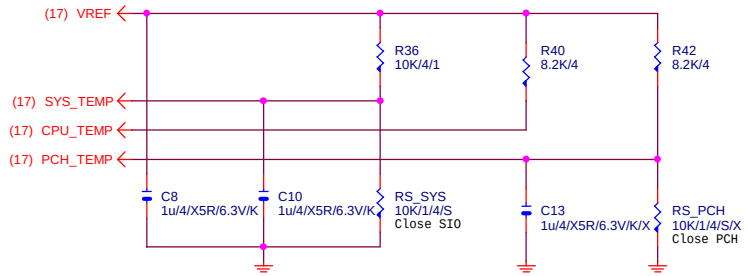
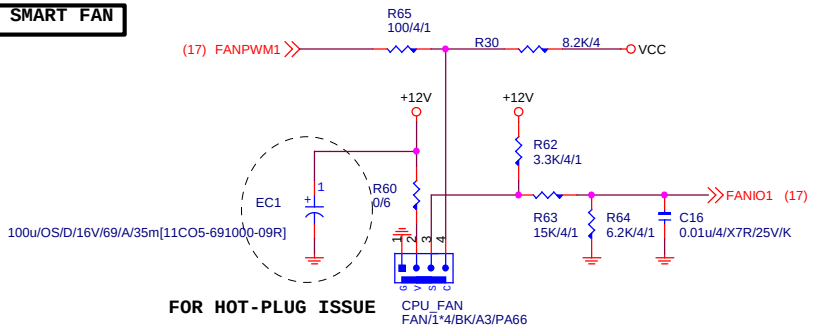
TEMP H/W MONITOR

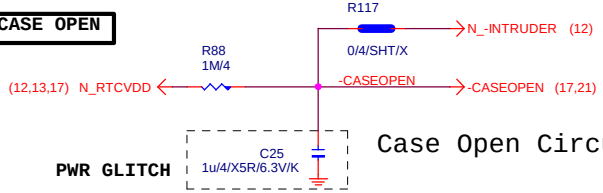


CPU SMART FAN



FOR HOT-PLUG ISSUE

CASE OPEN

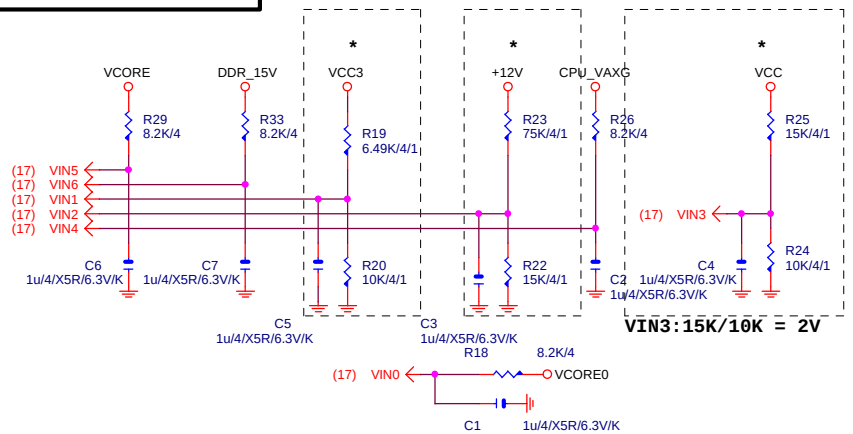


PWR GLITCH

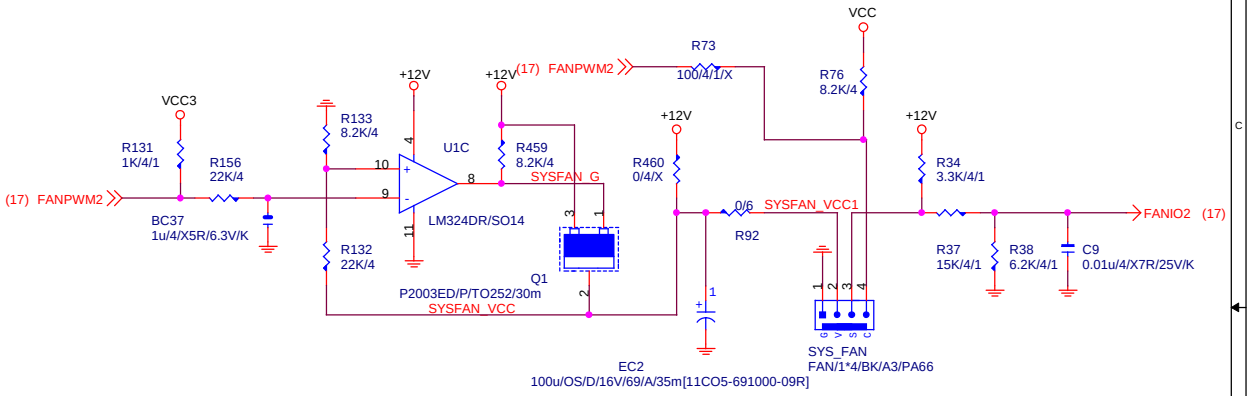
Case Open Circuits

VOLTAGE-- H/W MONITOR

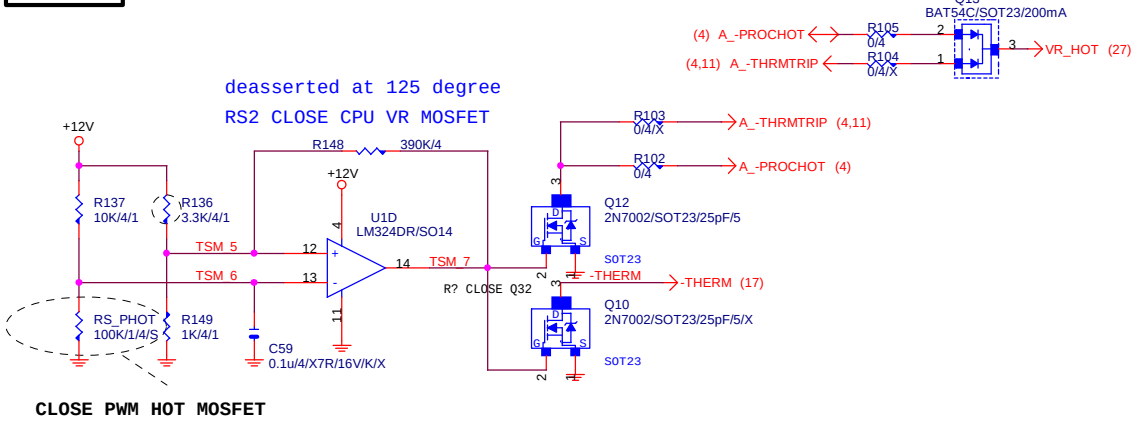
VIN2:75K/15K = 2V



SYS SMART FAN



-PROHOT



CLOSE PWM HOT MOSFET

Gigabyte Technology		
Title: HWM,FAN CTRL,OV		
Size: Custom	Document Number: GA-Q87M-D2H	Rev: 1.11
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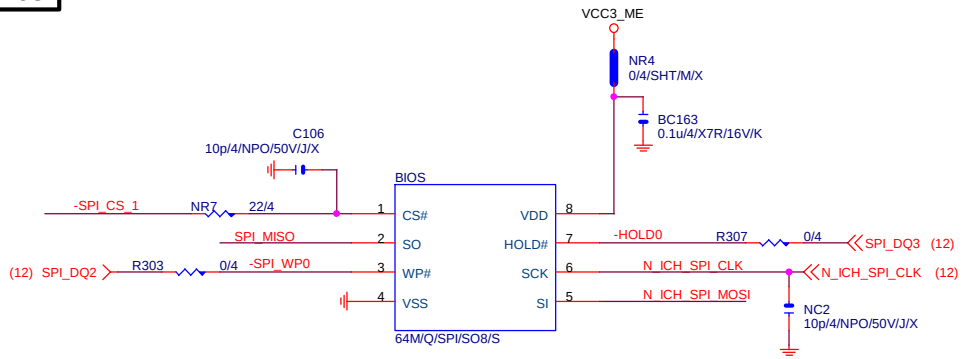
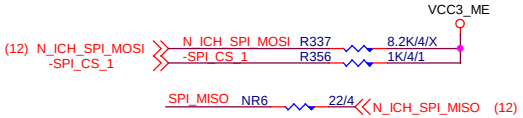
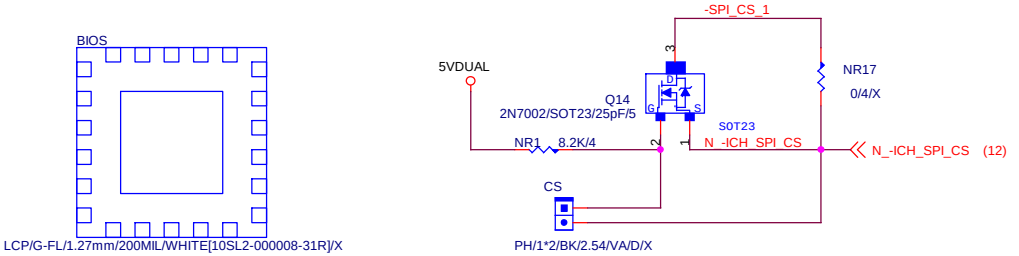
BIOS

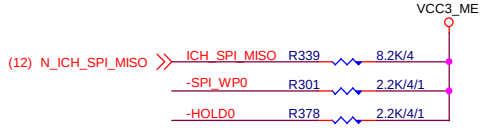


BOOT DEVICE	GP51	GP19
LPC	0	0
SPI	1	1

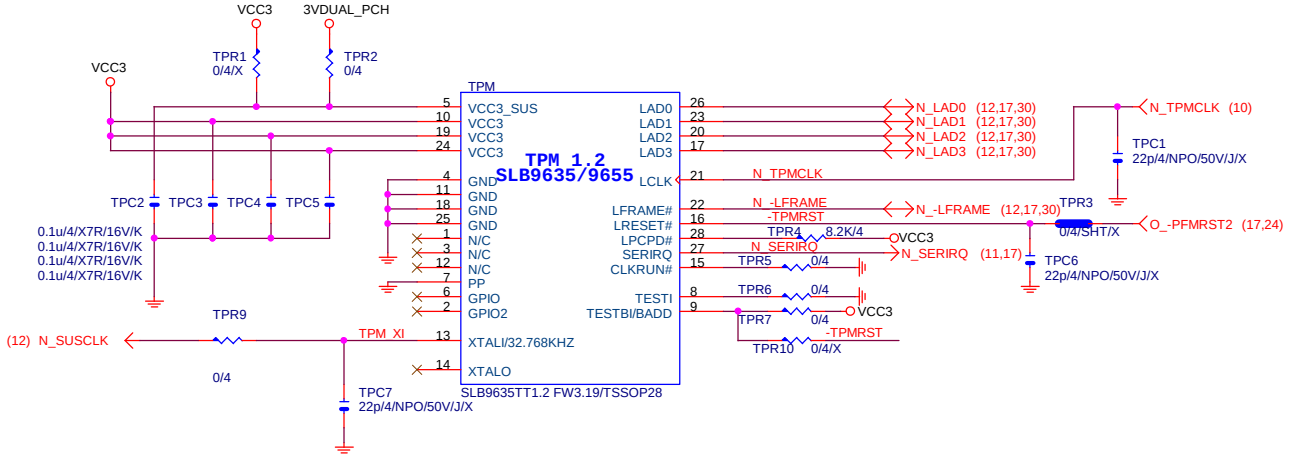
1 means inernal PU
0 means PD 1K







TPM



	SLB9635	SLB9655
TPR2, TPR4, TPR5, TPR6, TPR7, TPR9	MOUNT	N/A
TPR1, TPR10	N/A	MOUNT

Gigabyte Technology

Title: BIOS ,TPM

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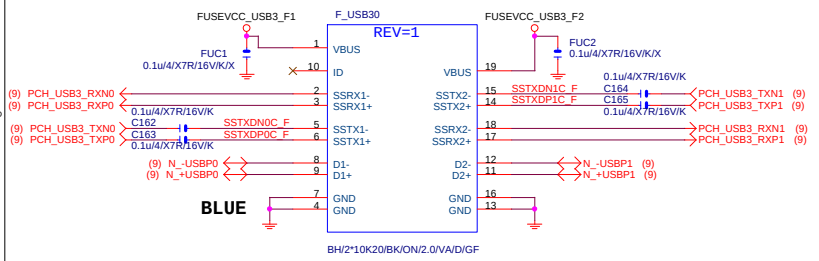
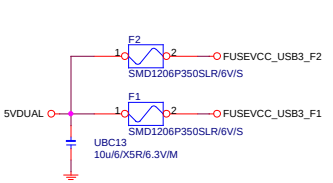
F_USB30

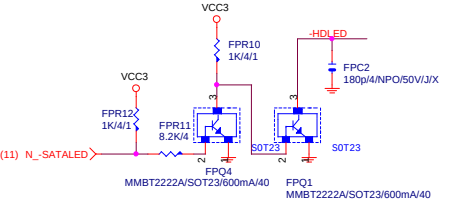


F_USB30 PWR

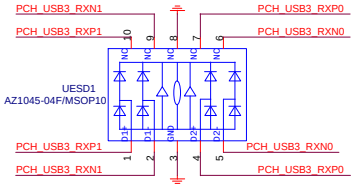


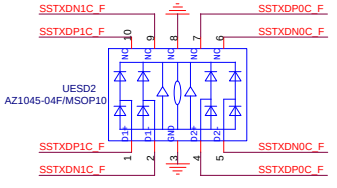
USB3.0 1Port - 1Fuse (3.5A)

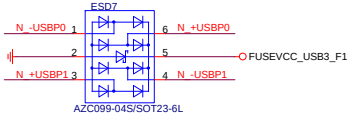
SATA LED



F_USB30 ESD PROTECT

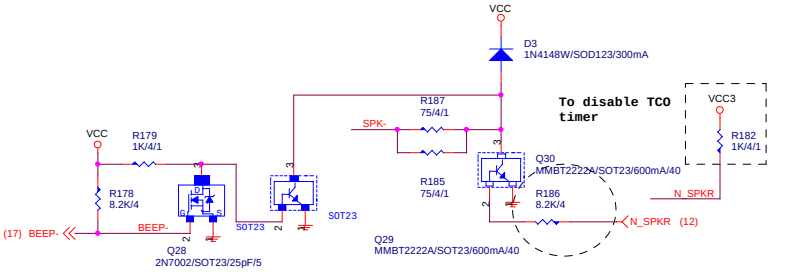




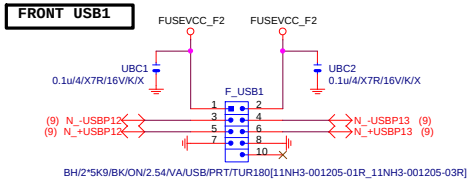


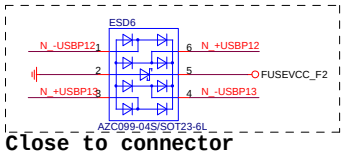
Close to connector

SPKR



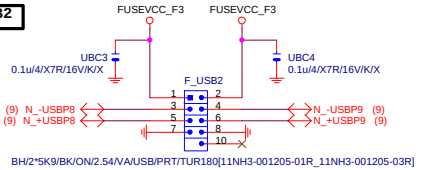
FRONT USB1

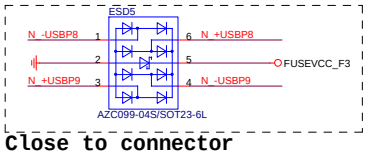




Close to connector

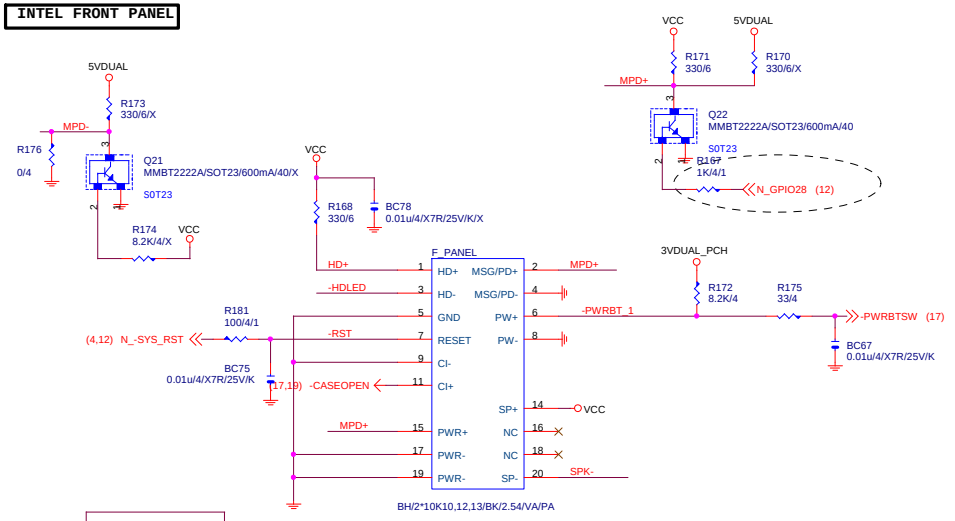
FRONT USB2



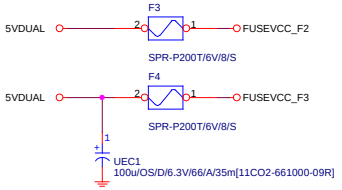


Close to connector

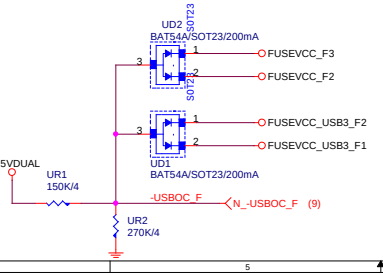
INTEL FRONT PANEL



FUSEVCC_F



-USBOC_F



Title	Gigabyte Technology		
	FP,F_USB,USB PWR,SPKR,SATA LED		
Size: Custom	Document Number: GA-Q87M-D2H		Rev: 1.11
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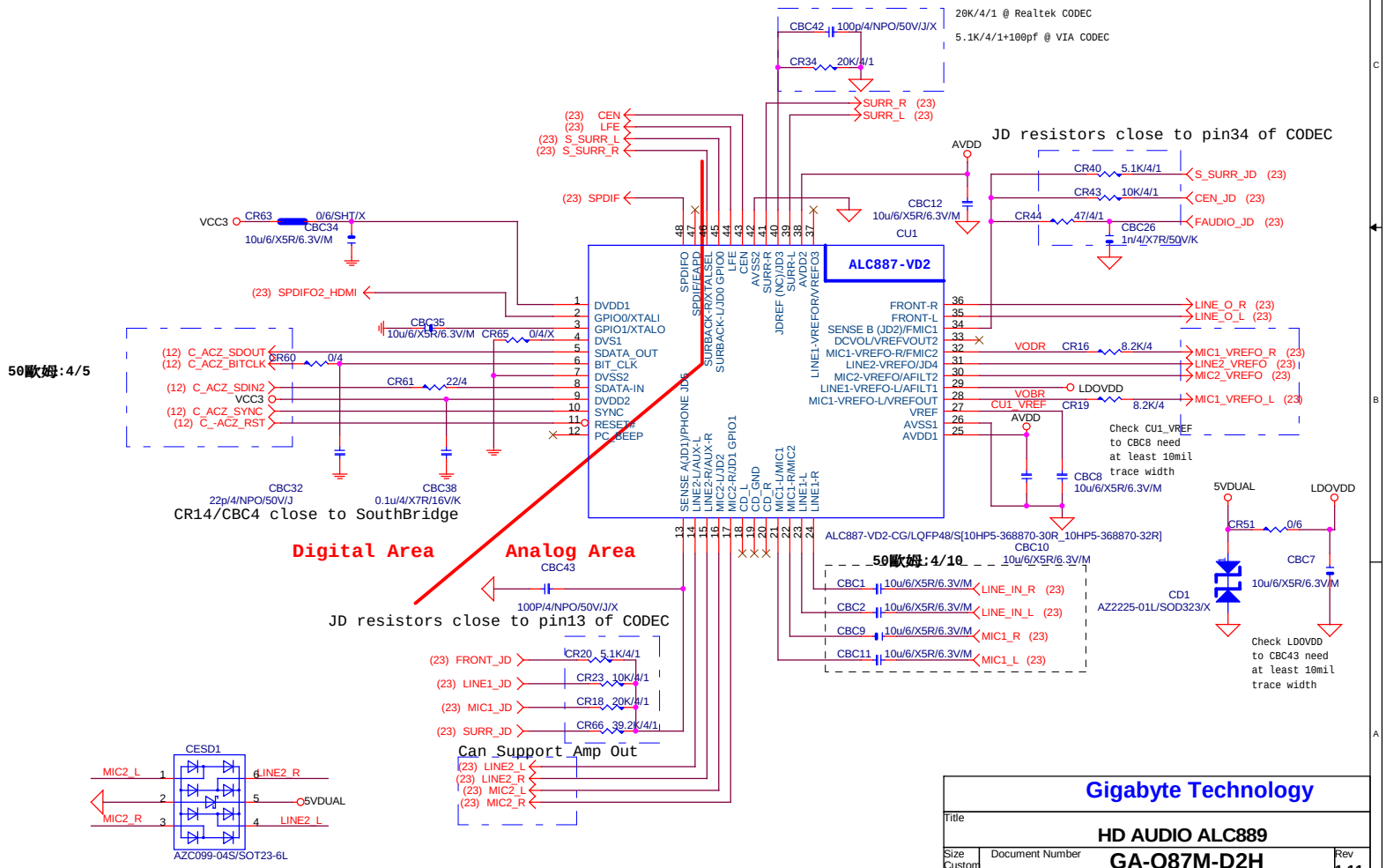
AZALIA CODEC *ALC892/ALC887-VD2/VT1708-CE Colay*

	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/ CR2/CR4	22K/4	22K/4	10K/4/1
CR5/CR8/CR1/CR14/ CR17/CR22/CR73/CR74/ CR13/CR11/CR57/CR53/ CR75/CR76/CR27/CR29	62 ohm	62 ohm	75 ohm
CR16/CR19	8.2K/4	8.2K/4	3.3K/4
CESD1	0	0	0



Gigabyte Technology		
Title	HD AUDIO ALC889	
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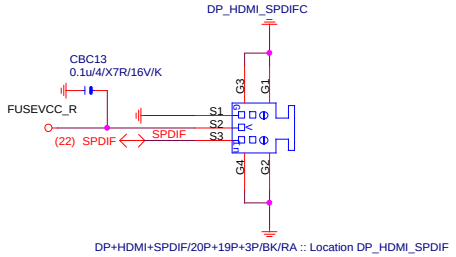
CODEC POWER/EMI PAD

CR49 0/6/SHT/M/X → Close F_AUDIO

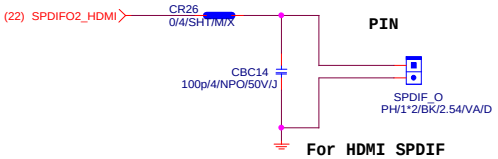
CR50 0/6/SHT/M/X → Close Codec

CR21 2.2/6 → Audio jack <--> USB_LAN

CR24 0/6/X → Under Audio jack



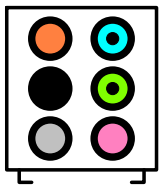
DP+HDMI+SPDIF/20P+19P+3P/BK/RA :: Location DP_HDMI_SPDIF



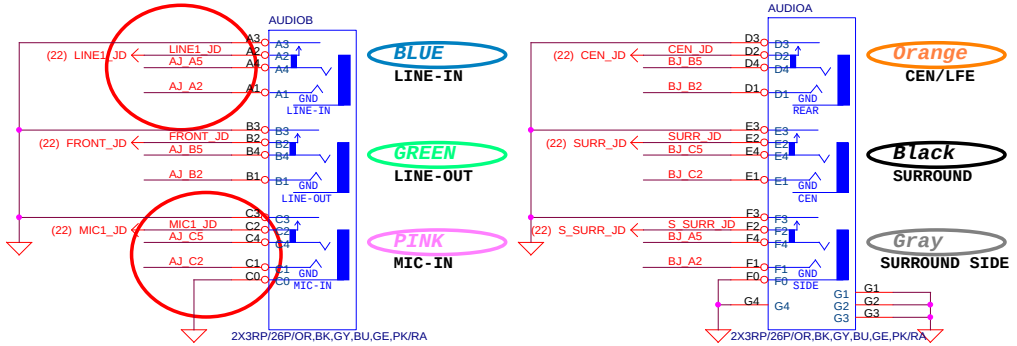
For HDMI SPDIF

AZALIA JACK

BTX AZALIA CONNECTOR



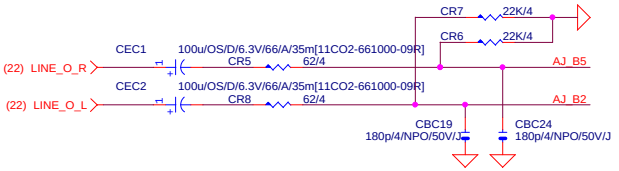
11NR6-403007-21R



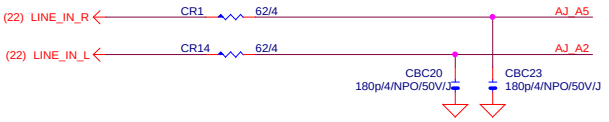
2X3RP/26P/OR,BK,GY,BU,GE,PK/RA

2X3RP/26P/OR,BK,GY,BU,GE,PK/RA

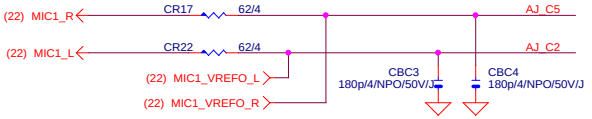
LINE-OUT



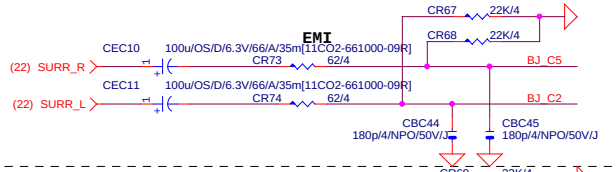
LINE-IN



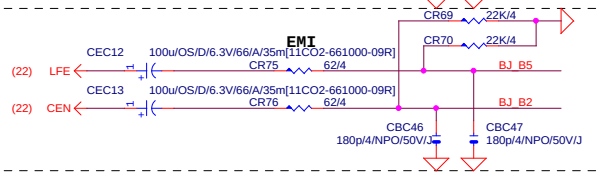
MIC-IN



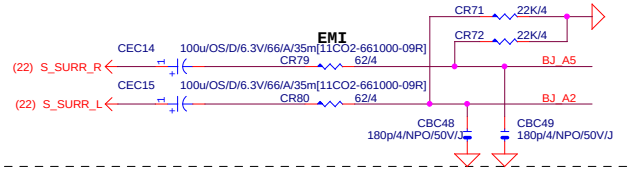
SURROUND



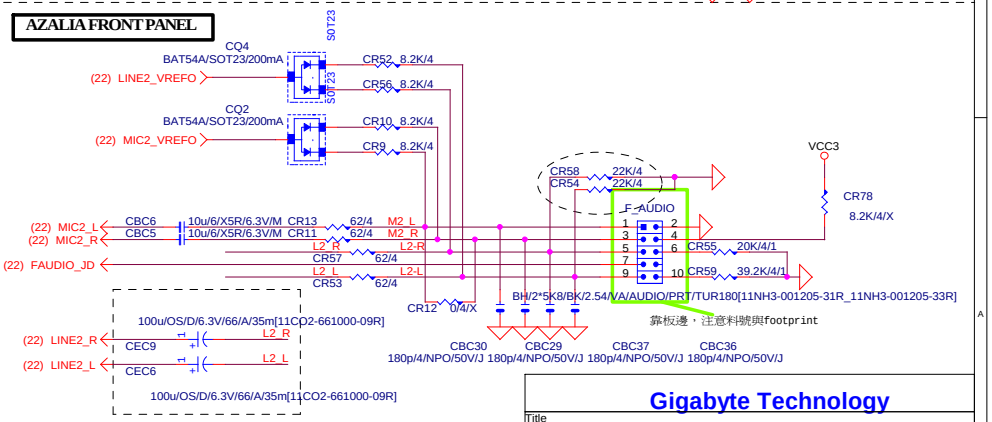
CEN/LFE



SURR BACK



AZALIA FRONT PANEL



Gigabyte Technology			
Title: AUDIO JACK			
Size: Custom	Document Number: GA-Q87M-D2H		Rev: 1.11
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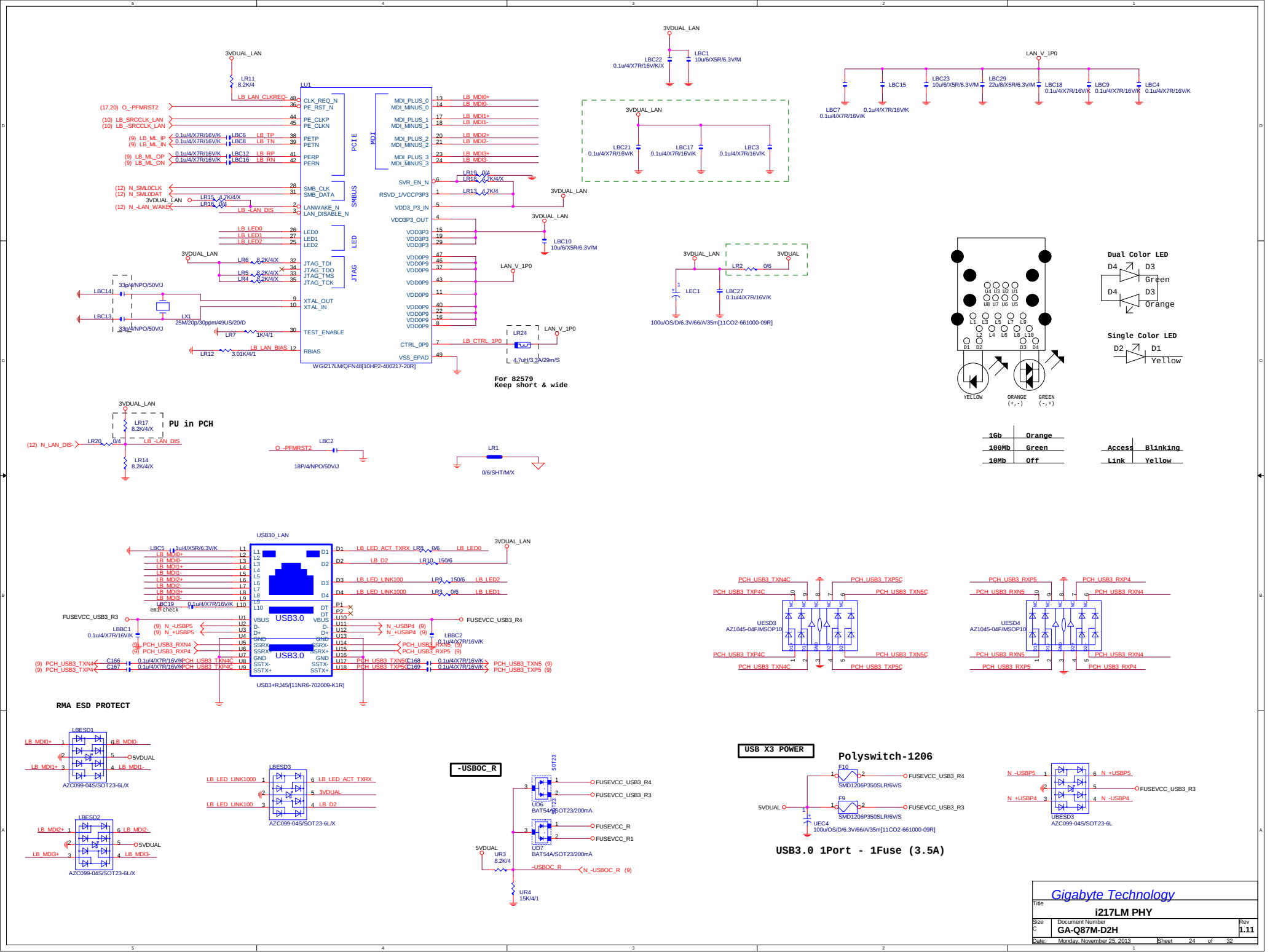
3VDUAL_LAN
LR11 8.2K/4
LU1
LB_LAN_CLKREQ_
(17,20) O_-PFMRST2
(10) LB_SRCCLK_LAN
(10) LB_-SRCCLK_LAN
(9) LB_ML_IP
(9) LB_ML_IN
(9) LB_ML_OP
(9) LB_ML_ON
LBC6 LB_TP
LBC8 LB_TN
LBC12 LB_RP
LBC16 LB_RN
CLK_REQ_N
PE_RST_N
PE_CLKP
PE_CLKN
PETP
PETN
PERP
PERN
PCIE
MDI
SMBUS
LED
JTAG
(12) N_SML0CLK
(12) N_SML0DAT
(12) N_-LAN_WAKE
LR15 4.7K/4/X
LR16 0/4
SMB_CLK
SMB_DATA
LANWAKE_N
LAN_DISABLE_N
LB_LED0
LB_LED1
LB_LED2
LED0
LED1
LED2
JTAG_TDI
JTAG_TDO
JTAG_TMS
JTAG_TCK
LBC14
LBC13
33p/4/NPO/50V/J
LX1
25M/20p/30ppm/49US/20/D
XTAL_OUT
XTAL_IN
LR7 1K/4/1
TEST_ENABLE
LR12 3.01K/4/1
LB_LAN_BIAS
RBIAS
WGI217LM/QFN48[10HP2-400217-20R]
MDI_PLUS_0
MDI_MINUS_0
MDI_PLUS_1
MDI_MINUS_1
MDI_PLUS_2
MDI_MINUS_2
MDI_PLUS_3
MDI_MINUS_3
LB_MDI0+
LB_MDI0-
LB_MDI1+
LB_MDI1-
LB_MDI2+
LB_MDI2-
LB_MDI3+
LB_MDI3-
SVR_EN_N
RSVD_1/VCCP3P3
VDD3_P3_IN
VDD3P3_OUT
LR19 0/4
LR18 4.7K/4/X
LR13 4.7K/4
VDD3P3
VDD0P9
CTRL_0P9
VSS_EPAD
LB_CTRL_1P0
LR24
4.7uH/3.3A/29m/S
LAN_V_1P0
LBC10 10u/6/X5R/6.3V/M
LBC22 0.1u/4/X7R/16V/K/X
LBC1 10u/6/X5R/6.3V/M
LBC7 0.1u/4/X7R/16V/K
LBC15 0.1u/4/X7R/16V/K
LBC23 10u/6/X5R/6.3V/M
LBC29 22u/8/X5R/6.3V/M
LBC18 0.1u/4/X7R/16V/K
LBC9 0.1u/4/X7R/16V/K
LBC4 0.1u/4/X7R/16V/K
LBC21 0.1u/4/X7R/16V/K
LBC17 0.1u/4/X7R/16V/K
LBC3 0.1u/4/X7R/16V/K
LR2 0/6
LEC1
LBC27 0.1u/4/X7R/16V/K
100u/OS/D/6.3V/66/A/35m[11CO2-661000-09R]
For 82579
Keep short & wide
PU in PCH
LR17 8.2K/4/X
LR20 0/4
LR14 8.2K/4/X
LBC2
18P/4/NPO/50V/J
LR1
0/6/SHT/M/X
Dual Color LED
D4 D3 Green
D4 D3 Orange
Single Color LED
D2 D1 Yellow
YELLOW
ORANGE (+,-)
GREEN (-,+)
1Gb Orange
100Mb Green
10Mb Off
Access Blinking
Link Yellow
USB30_LAN
LBC5 1u/4/X5R/6.3V/K
LBC19 0.1u/4/X7R/16V/K
LR8 0/6
LR10 150/6
LR9 150/6
LR3 0/6
LB_LED_ACT_TXRX
LB_D2
LB_LED_LINK100
LB_LED_LINK1000
LB_LED0
LB_LED2
LB_LED1
USB3.0
FUSEVCC_USB3_R3
FUSEVCC_USB3_R4
LBBC1 0.1u/4/X7R/16V/K
LBBC2 0.1u/4/X7R/16V/K
N_-USBP5
N_+USBP5
N_-USBP4
N_+USBP4
PCH_USB3_RXN4
PCH_USB3_RXP4
PCH_USB3_RXN5
PCH_USB3_RXP5
C166 0.1u/4/X7R/16V/K
C167 0.1u/4/X7R/16V/K
C168 0.1u/4/X7R/16V/K
C169 0.1u/4/X7R/16V/K
PCH_USB3_TXN4C
PCH_USB3_TXP4C
PCH_USB3_TXN5C
PCH_USB3_TXP5C
PCH_USB3_TXN4
PCH_USB3_TXP4
PCH_USB3_TXN5
PCH_USB3_TXP5
USB3+RJ45/[11NR6-702009-K1R]
RMA ESD PROTECT
UESD3 AZ1045-04F/MSOP10
UESD4 AZ1045-04F/MSOP10
LBESD1
LBESD2
LBESD3
AZC099-04S/SOT23-6L/X
-USB0C_R
UD6 BAT54A/SOT23/200mA
UD7 BAT54A/SOT23/200mA
UR3 8.2K/4
UR4 15K/4/1
-USBOC_R
N_-USBOC_R (9)
USB X3 POWER
Polyswitch-1206
F10 SMD1206P350SLR/6V/S
F9 SMD1206P350SLR/6V/S
UEC4 100u/OS/D/6.3V/66/A/35m[11CO2-661000-09R]
USB3.0 1Port - 1Fuse (3.5A)
UBESD3 AZC099-04S/SOT23-6L
Gigabyte Technology
Title
i217LM PHY
Size C
Document Number GA-Q87M-D2H
Rev 1.11
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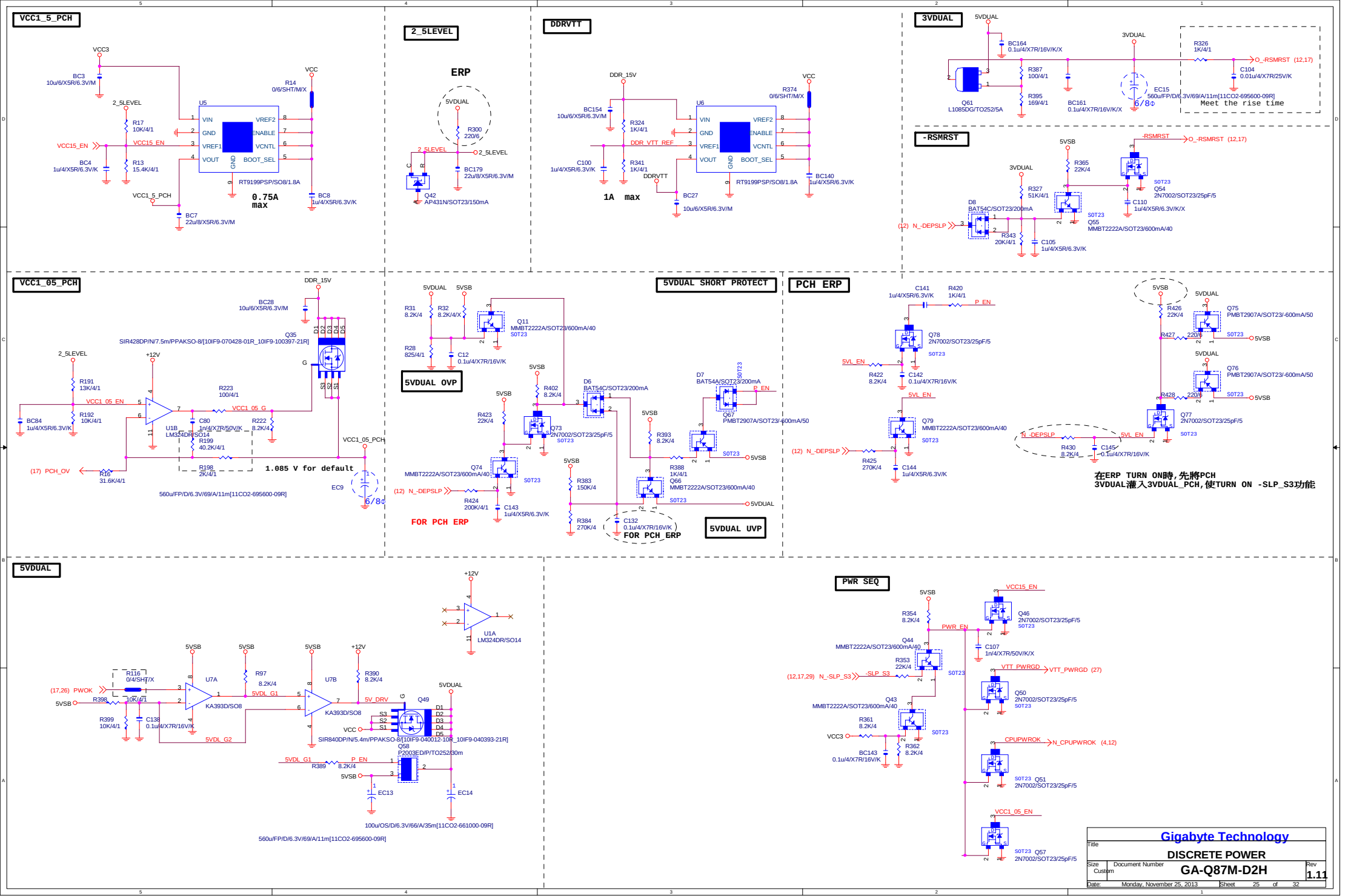
VCC1_5_PCH
VCC3
BC3
10u/6/X5R/6.3V/M
2_5LEVEL
R17
10K/4/1
VCC15_EN
R13
15.4K/4/1
BC4
1u/4/X5R/6.3V/K
U5
VIN
GND
VREF1
VOUT
VREF2
ENABLE
VCNTL
BOOT_SEL
RT9199PSP/SO8/1.8A
VCC
R14
0/6/SHT/M/X
BC8
1u/4/X5R/6.3V/K
VCC1_5_PCH
BC7
22u/8/X5R/6.3V/M
0.75A
max
2_5LEVEL
ERP
5VDUAL
R300
220/6
2_5LEVEL
BC179
22u/8/X5R/6.3V/M
Q42
AP431N/SOT23/150mA
DDRVTT
DDR_15V
BC154
10u/6/X5R/6.3V/M
R324
1K/4/1
DDR_VTT_REF
R341
1K/4/1
C100
1u/4/X5R/6.3V/K
U6
RT9199PSP/SO8/1.8A
R374
0/6/SHT/M/X
BC140
1u/4/X5R/6.3V/K
BC27
10u/6/X5R/6.3V/M
1A max
3VDUAL
5VDUAL
BC164
0.1u/4/X7R/16V/K/X
R387
100/4/1
R395
169/4/1
Q61
L1085DG/TO252/5A
BC161
0.1u/4/X7R/16V/K/X
EC15
560u/FP/D/6.3V/69/A/11m[11CO2-695600-09R]
R326
1K/4/1
O_-RSMRST (12,17)
C104
0.01u/4/X7R/25V/K
Meet the rise time
-RSMRST
-RSMRST
O_-RSMRST (12,17)
5VSB
R365
22K/4
3VDUAL
R327
51K/4/1
D8
BAT54C/SOT23/200mA
(12) N_-DEPSLP
R343
20K/4/1
C105
1u/4/X5R/6.3V/K
S0T23
Q54
2N7002/SOT23/25pF/5
C110
1u/4/X5R/6.3V/K/X
Q55
MMBT2222A/SOT23/600mA/40
VCC1_05_PCH
DDR_15V
BC28
10u/6/X5R/6.3V/M
Q35
SIR428DP/N/7.5m/PPAKSO-8/[10IF9-070428-01R_10IF9-100397-21R]
2_5LEVEL
+12V
R191
13K/4/1
VCC1_05_EN
R192
10K/4/1
BC84
1u/4/X5R/6.3V/K
R223
100/4/1
C80
1n/4/X7R/50V/K
U1B
LM324DR/SO14
R222
8.2K/4
R199
40.2K/4/1
VCC1_05_G
VCC1_05_PCH
(17) PCH_OV
R16
31.6K/4/1
R198
2K/4/1
1.085 V for default
EC9
560u/FP/D/6.3V/69/A/11m[11CO2-695600-09R]
5VDUAL_OVP
5VDUAL
5VSB
R31
8.2K/4
R32
8.2K/4/X
Q11
MMBT2222A/SOT23/600mA/40
R28
825/4/1
C12
0.1u/4/X7R/16V/K
R402
8.2K/4
D6
BAT54C/SOT23/200mA
R423
22K/4
Q73
2N7002/SOT23/25pF/5
Q74
MMBT2222A/SOT23/600mA/40
(12) N_-DEPSLP
R424
200K/4/1
C143
1u/4/X5R/6.3V/K
FOR PCH ERP
R393
8.2K/4
D7
BAT54A/SOT23/200mA
Q67
PMBT2907A/SOT23/-600mA/50
P_EN
R388
1K/4/1
Q66
MMBT2222A/SOT23/600mA/40
R383
150K/4
R384
270K/4
C132
0.1u/4/X7R/16V/K
FOR PCH ERP
5VDUAL_UVP
5VDUAL_SHORT_PROTECT
PCH_ERP
C141
1u/4/X5R/6.3V/K
R420
1K/4/1
P_EN
Q78
2N7002/SOT23/25pF/5
5VL_EN
R422
8.2K/4
C142
0.1u/4/X7R/16V/K
Q79
MMBT2222A/SOT23/600mA/40
(12) N_-DEPSLP
R425
270K/4
C144
1u/4/X5R/6.3V/K
R426
22K/4
Q75
PMBT2907A/SOT23/-600mA/50
R427
220/6
Q76
PMBT2907A/SOT23/-600mA/50
R428
220/6
Q77
2N7002/SOT23/25pF/5
N_-DEPSLP
R430
8.2K/4
C145
0.1u/4/X7R/16V/K
在ERP TURN ON時,先將PCH
3VDUAL灌入3VDUAL_PCH,使TURN ON -SLP_S3功能
5VDUAL
+12V
U1A
LM324DR/SO14
5VSB
R116
0/4/SHT/X
10K/4/1
(17,26) PWOK
R398
R399
10K/4/1
U7A
KA393D/SO8
C138
0.1u/4/X7R/16V/K
R97
8.2K/4
5VDL_G1
5VDL_G2
U7B
KA393D/SO8
R390
8.2K/4
5V_DRV
Q49
SIR840DP/N/5.4m/PPAKSO-8/[10IF9-040012-10R_10IF9-040393-21R]
VCC
Q58
P2003ED/P/TO252/30m
R389
8.2K/4
P_EN
EC13
EC14
100u/OS/D/6.3V/66/A/35m[11CO2-661000-09R]
560u/FP/D/6.3V/69/A/11m[11CO2-695600-09R]
PWR SEQ
5VSB
R354
8.2K/4
PWR_EN
Q44
MMBT2222A/SOT23/600mA/40
R353
22K/4
(12,17,29) N_-SLP_S3
-SLP_S3
Q43
MMBT2222A/SOT23/600mA/40
R361
8.2K/4
VCC3
BC143
0.1u/4/X7R/16V/K
R362
8.2K/4
VCC15_EN
Q46
2N7002/SOT23/25pF/5
C107
1n/4/X7R/50V/K/X
VTT_PWRGD
VTT_PWRGD (27)
Q50
2N7002/SOT23/25pF/5
CPUPWROK
N_CPUPWROK (4,12)
Q51
2N7002/SOT23/25pF/5
VCC1_05_EN
Q57
2N7002/SOT23/25pF/5
Gigabyte Technology
Title
DISCRETE POWER
Size
Custom
Document Number
GA-Q87M-D2H
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1.11
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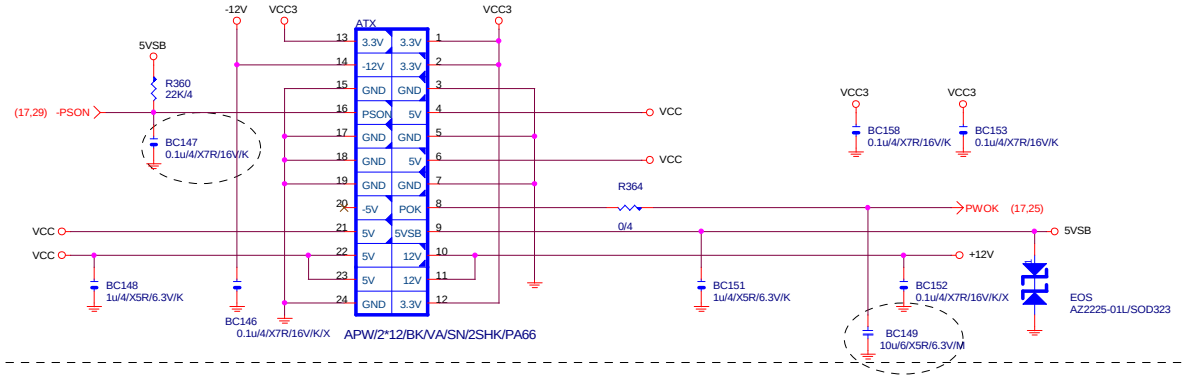
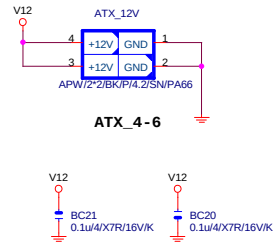
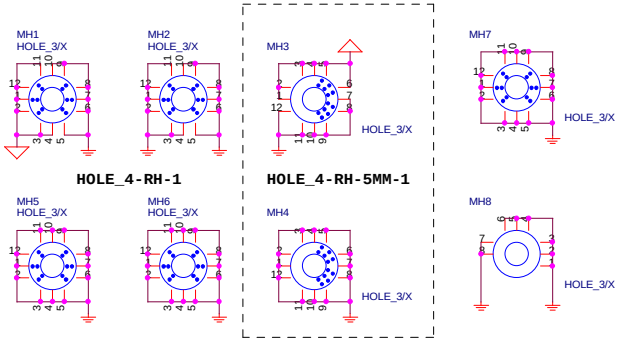
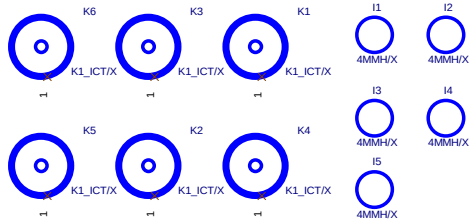
ATXX24 POWER CONNECTOR

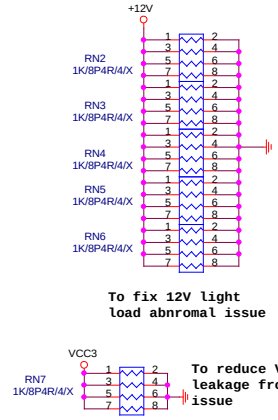


ATXX4 POWER CONNECTOR

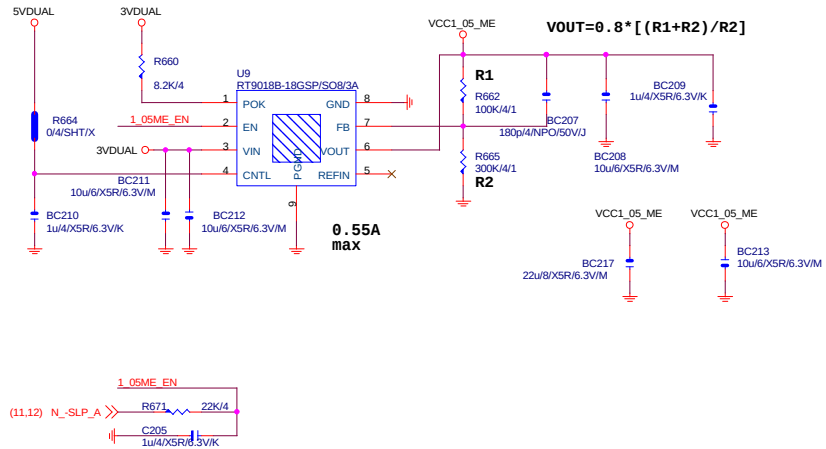




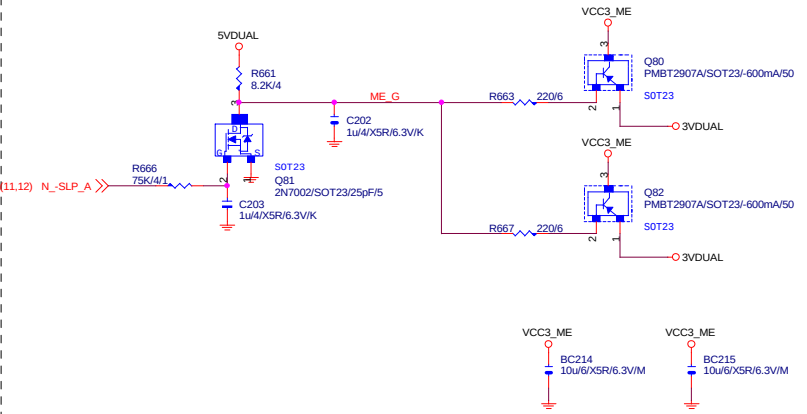




VCC1_05_ME



VCC3_ME



Gigabyte Technology		
Title: ATX CONNECTOR		
Size: Custom	Document Number: GA-Q87M-D2H	Rev: 1.11
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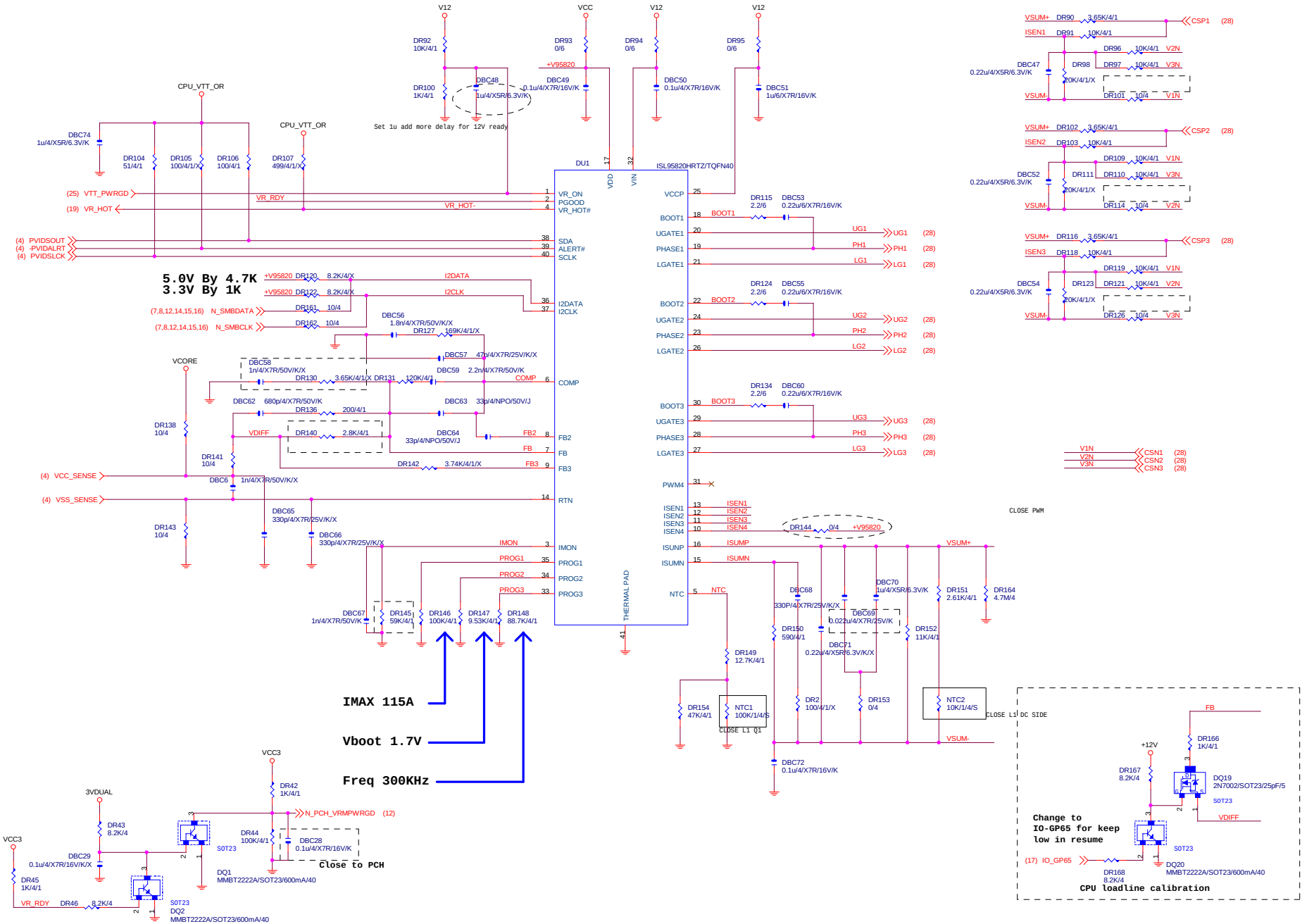

Title	CPU CORE VR-1
Size	Custom
Document Number	GA-Q87M-D2H
Rev	1.11
Date:	Monday, November 25, 2013
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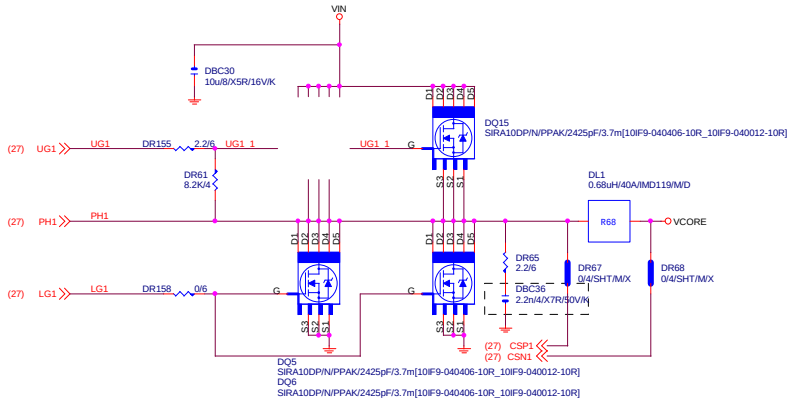
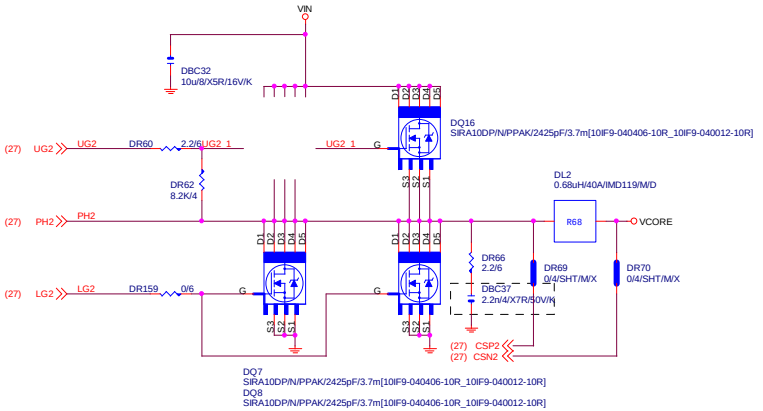
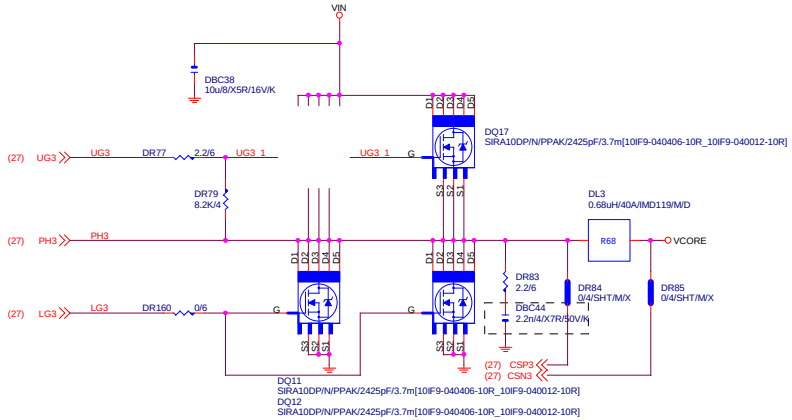
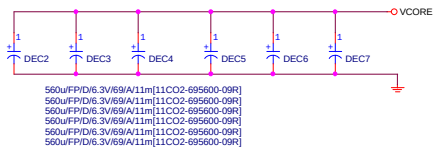
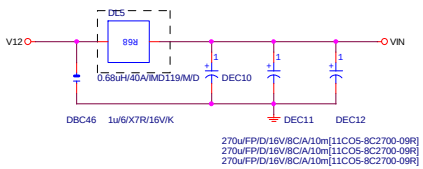
Gigabyte Technology











Gigabyte Technology

Title: CPU CORE VR-2

Size: Custom | Document Number: GA-Q87M-D2H | Rev: 1.11

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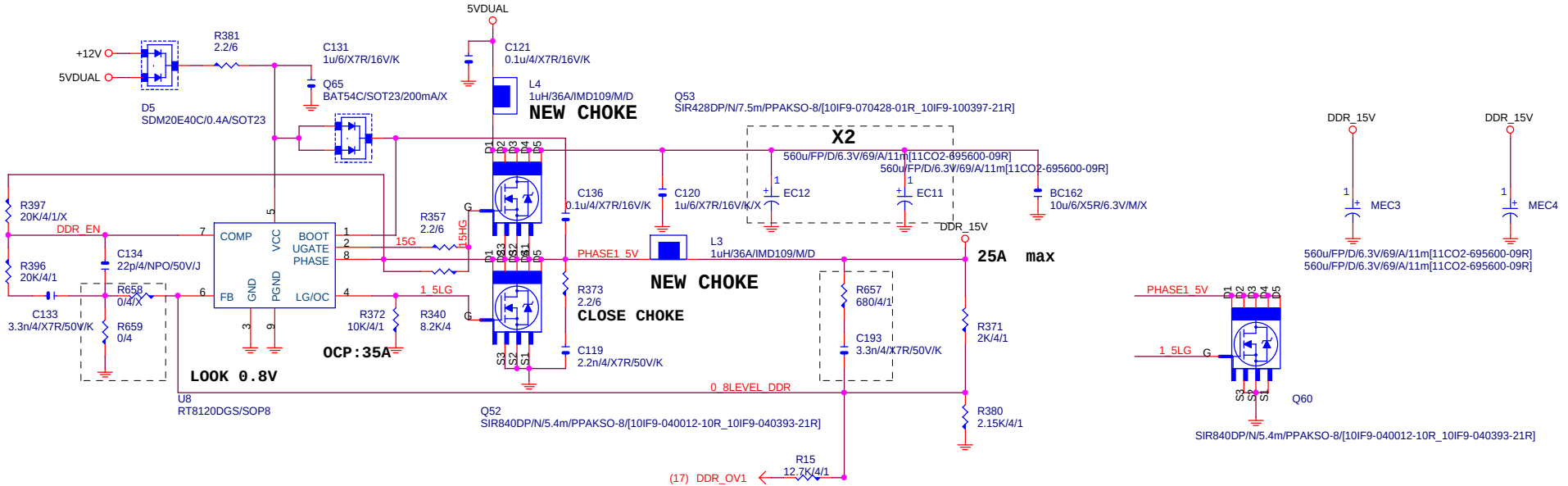
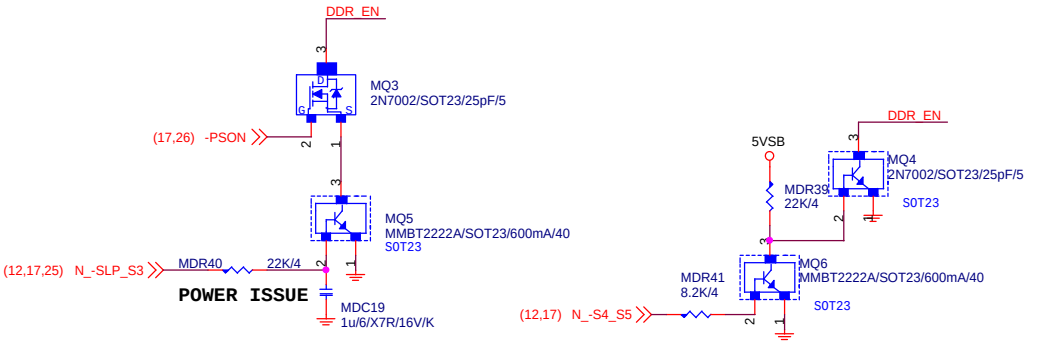
DDR15V



PWR SEQ



VIN=5V,VOUT=1.5V,IOUT=25A,PHASE=1
IRMS=11.45A

560u/FP/D/6.3V/68/8m RIPPLE CURRENT=4.7A
Coefficient=1.7(85℃),1(105℃)

VIN Ripple current=4.7X1.7=7.99A(85℃)
-->故固態電容須2X7.99=15.98>11.45A

Rocset=(Iocp*Lgate,rdson)/Iocset

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

Iocset=10uA

Gigabyte Technology			
Title: DDR POWER			
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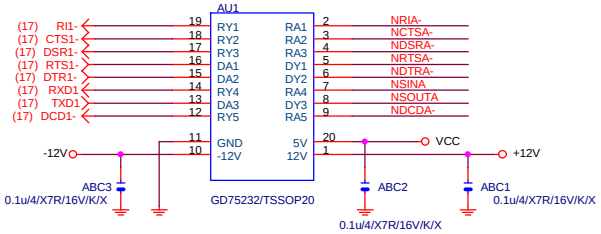
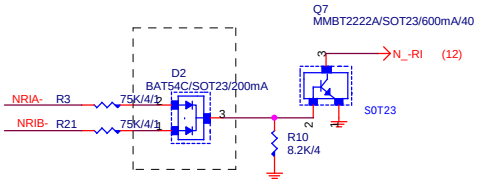
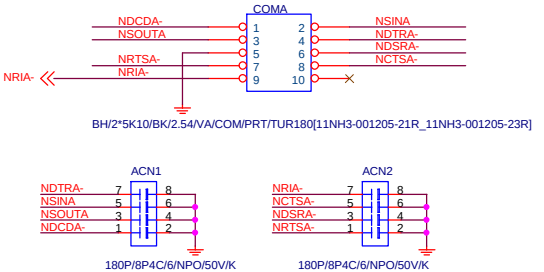
COMA

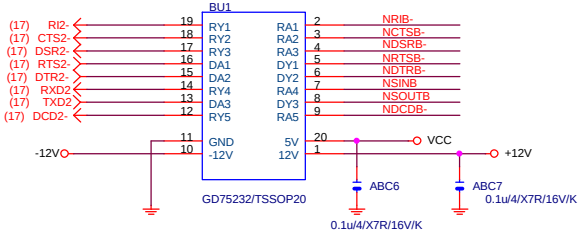


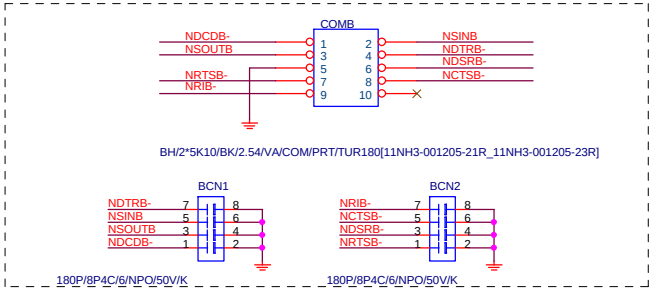
COM RI





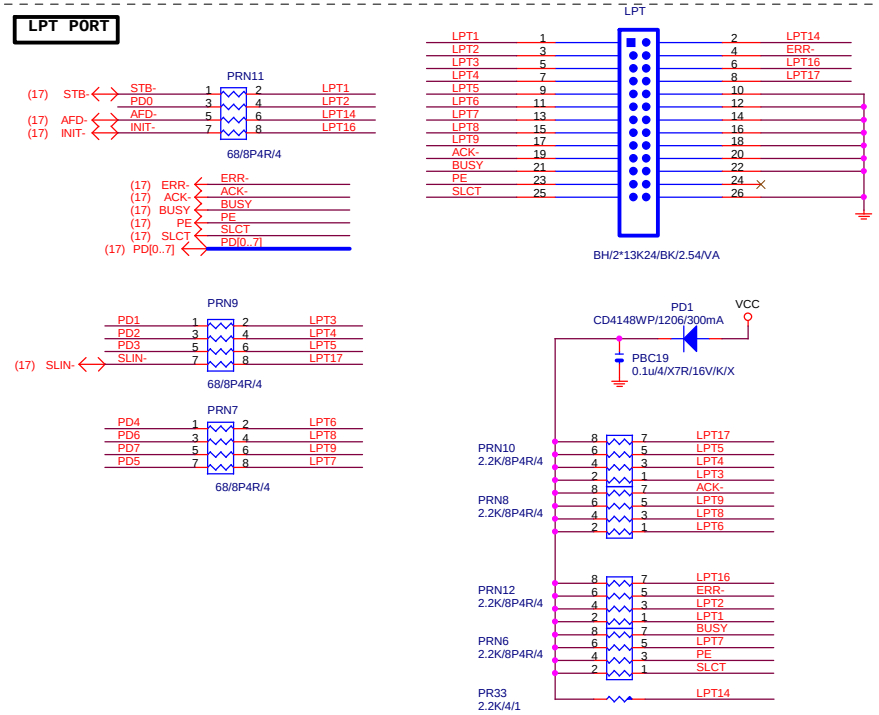
COMB



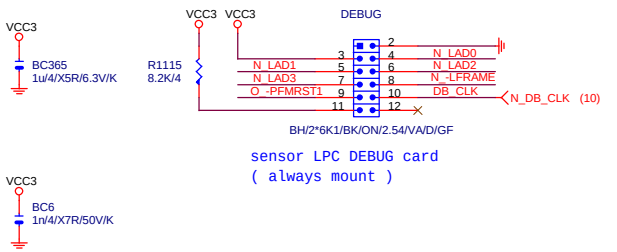


PLACE NEAR COM CONNECTOR

LPT PORT



80 PORT



Gigabyte Technology		
Title: COM A/B & LPT & 80 PORT		
Size: Custom	Document Number: GA-Q87M-D2H	Rev: 1.11
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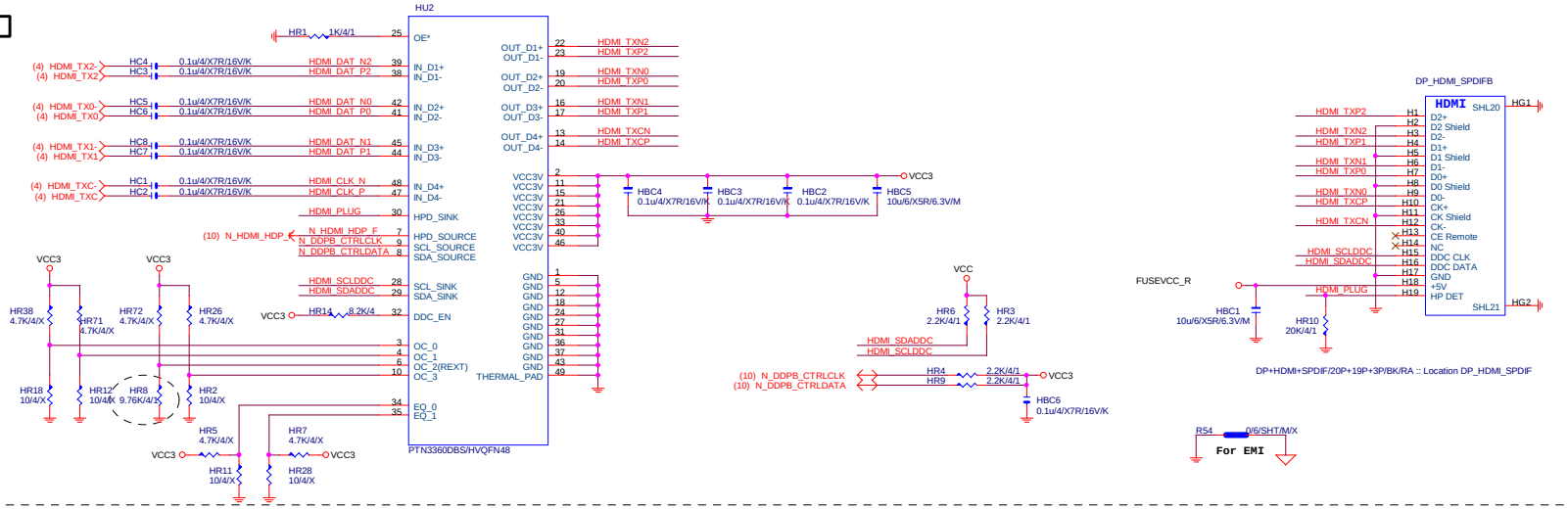
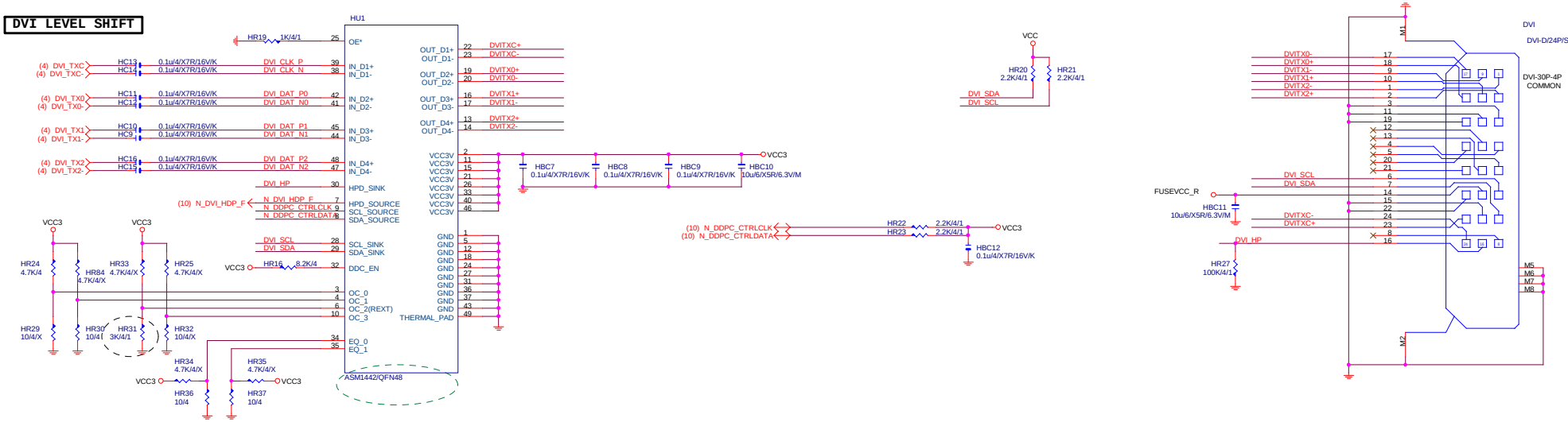
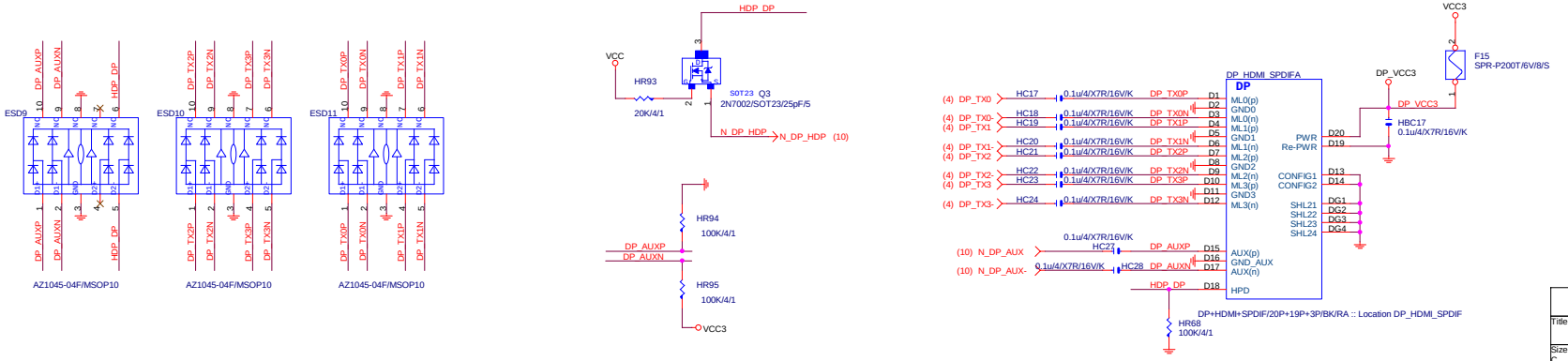
HDMI LEVEL SHIFT



DVI LEVEL SHIFT





Gigabyte Technology			
Title: DVI			
Size: C	Document Number: GA-Q87M-D2H		Rev: 1.11
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PCIE TO PCI

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

BA_D[0..31] ↔ BA_D[0..31] (16)

-BC_BE0 ↔ -BC_BE0 (16)
-BC_BE1 ↔ -BC_BE1 (16)
-BC_BE2 ↔ -BC_BE2 (16)
-BC_BE3 ↔ -BC_BE3 (16)

-BPERR ↔ -BPERR (16)
-BSERR ↔ -BSERR (16)

BPAR ↔ BPAR (16)
-BPLOCK ↔ -BPLOCK (16)
-BDEVSEL ↔ -BDEVSEL (16)
-BSTOP ↔ -BSTOP (16)
-BTRDY ↔ -BTRDY (16)
-BIRDY ↔ -BIRDY (16)
-BFRAME ↔ -BFRAME (16)

-PCIE_RST ↔ O_-PCIE_RST (14,15,17)

-BPCIRST ↔ -BPCIRST (16)

-BREQ0 ↔ -BREQ0 (16)

-BGNT0 ↔ -BGNT0 (16)

-BPCIPME1 ↔ -BPCIPME1 (16)

(16) BPCLK0 — PR24 47/4/1 — CLKOUT0

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

VCC3
PR14 1K/4/1/X M66EN
PR42 1K/4/1

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

VCC3
PR35 8.2K/4/X PCICLK_SEL
PR37 10K/4/1

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

IT8892

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

PCI slot

VCCP — PR26 0/4/SHT/M/X — 3VDUAL

PCI slot

-BPCIPME1 — PR27 0/4/SHT/M/X — N_-PCIE_WAKE (12,14,15)

chipset side

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

PU1 — IT8892E/BX LQFP128 — IT8892E/FX/S

VCC3
PCICLK_SEL 1.8VD GND M66EN -PCIE_RST -BPIROD -BPCIRST -BGNT2 1.8VD -BREQ2 -BREQ0 -BGNT3 -BREQ3 CLKOUT0 -BGNT1 -BREQ1 BA_D31 BA_D30 BA_D29 BA_D28

PCIEWAKE — WAKE#
-BPCIPME — PME#
VCCP — VCCP_AUX
LDOAUX_18V — LDOAUX_18V
1.8V_AUX — VCCK_AUX
(10) G_-PBCLK — CLKN
(10) G_PBCLK — CLKP
1.8VA — VCC18A
1.8VA — VCC18A
GNDA
GNDA
GNDA
RREF
(9) G_PCIEBOP — PBC61 0.1u/4/X7R/16V/K — PU_DIP
(9) G_PCIEBON — PBC62 0.1u/4/X7R/16V/K — PU_DIN
1.8V_AUXA — DIN
(9) G_PCIEBIN — PBC43 0.1u/4/X7R/16V/K — PU_DON
(9) G_PCIEBIP — PBC44 0.1u/4/X7R/16V/K — PU_DOP
DOP
VSS
1.8VD — VCCK
SEG_EN1/GP3
SEG_EN2/GP4
EECS#
EECLK
EEWRDATA
EERDDATA
BA_D0 — AD0
BA_D1 — AD1
SEG_G

VCCK — 1.8VD
GNDP
VCCP — VCC3
NC — EXT_ARB
EXT_ARB — RST_SEL
RST_SEL — TEST_EN
TEST_EN — BA_D27
AD27 — BA_D26
AD26 — -BC_BE3
CBE3# — BA_D25
AD25 — BA_D24
AD24
VCCP — VCC3
AD23 — BA_D23
AD22 — BA_D22
AD21 — BA_D21
AD20 — BA_D20
VSS
VCCK — 1.8VD
AD19 — BA_D19
AD18 — BA_D18
AD17 — BA_D17
AD16 — BA_D16
GNDP
VCCP — VCC3
FRAME# — -BFRAME
IRDY# — -BIRDY
CBE2# — -BC_BE2
TRDY# — -BTRDY
STOP# — -BSTOP
DEVSEL# — -BDEVSEL
INTA# — -BPIRQA

AD2 AD3 VCCP GNDP AD4 AD5 AD6 AD7 VCCK VSS AD8 AD9 AD10 CBE0# VCCP GNDP CBE1# AD11 AD12 AD13 AD14 AD15 PERR# SERR# VCCP GNDP LDO_18V VSS PAR LOCK# INTB# INTC#

BA_D2 BA_D3 — BA_D4 BA_D5 BA_D6 BA_D7 1.8VD — BA_D8 BA_D9 BA_D10 BA_BE0 — VCC3 — BA_BE1 BA_D11 BA_D12 BA_D13 BA_D14 BA_D15 -BPERR -BSERR — VCC3 — LDO_18V — BPAR -BPLOCK -BPIRQB -BPIRQC

VCC3

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

PRN20 2.2K/8P4R/4
-BIRDY 1 2
-BPERR 3 4
-BSERR 5 6
-BPLOCK 7 8

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

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

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

BPAR — PR41 2.2K/4/1/X

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

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

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

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

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

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

PCB layout note:
Close to chip

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

PCB layout note:
Close to chip

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

Close to chip

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