Model Name: GA-X99-UD4

Rev 1.1

SHEET	TITLE
01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04-06	CPU_LGA2011-DDR
07	CPU_LGA2011-CTRL
08	CPU_LGA2011-PCIE_DMI
09-10	CPU_LGA2011-PWR
11	PCH_SATA
12	PCH_GPIO_AUDIO
13	PCH_DMI_USB_PCIE
14-15	PCH_PWR_GND
16-17	DDR III CHANNEL A/B
18-19	DDR III CHANNEL C/D
20	PCI EXPRESS X16 SLOT 2
21	PCI EXPRESS X16 SLOT_1
22	PCI EXPRESSX16_X8 SWITCH
23	PCI EXPRESS X8 SLOT 2
24	PCI EXPRESS X8 SLOT 1
25	PCI EXPRESS X1
26	ITE 8620 SIO
27	DUAL BIOS
28-29	VCORE IR3580+3553
30	DDR CH A/B & CH C/D IR3553
31	VPP25 CH A/B & CH C/D IR3553
32	DDR CH A/B & VPP25 IR3570A
33	DDR CH C/D & VPP25 IR3570A
34	VCC1_05_WBG RT8120

SHEET	TITLE
35-36	DISCRETE POWER
37	ATX power
38	HWM ,FAN CTRL , EC FAN CTRL
39	PCIE CLK BUFFER
40	CPU CLK BUFFER
41	IT8791 EC
42	IT8951
43	M2 SLOT
44	M2 WIFI SLOT
45-47	AL1150 & AMP
48	INTEL LAN I218
49	LAN & AUDIO Connector
50-51	HUB & POWER (A)
52	R_USB30/R_USB Connector
53	PS2/USB & HS
54	F_USB30 & F_USB20
55	Front Panel,IPM
56	Sound Level
57	PCH GPIO LIST
58	POSITION

Gigabyte Technology

Title	Cover Sheet	
Size: Custom	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 1 of 58	

GA-X99-UD4

Component value change history

Data	Change Item	Reason
2014/05/09	9MX99UD3-00-01	
2014/05/09 X99-UD3-0.1	1. 注意SLOT配色 2. DAR7=6.49K/4/1 , DAR3=10K/4/1 3. AUDIO connect change to "11NR6-403025-A2R" 4. WIFI天線:12AC2-000001-31R	
2014/07/07 X99-UD4-0.1	1. UPDATE HEATSINK 料號	
2014/07/18 X99-UD4-1.0	1. REMOVE DAJP1 2. REMOVE IT_PH pin header 3. REMOVE BIOS_PH , M_BIOS SOCKET 4. Add NR305=1K/4/1,NR190=1K/4/1 , REMOVE R202=8.2K/4	
2014/07/24 1.0B	1. Remove CKFB8 , 改上 CKFB7=30/4/4A/S 2. MAR6 0/4 --> 2.2/4	
2014/08/04 1.0C	1. Remove ECBR9,ECBR10=8.2K/4	
2014/08/25 1.0D	1. Remove M2 GPIO73 pull-up NR57=8.2K/4 2. NR97 1M/4 --> 10M/4 , BAT放電後, 開機延遲問題	
2014/10/17 1.1A	1. DDR4每個channel 各新增了8組DQS差動訊號/ECC訊號	
	2. ADD CR190 10M/4	
	3. NX2 update footprint "XTALS-RH-N"	
2014/11/21 1.1B	1. CR190 10M/4 --> 1M/4	

Circuit or PCB layout change

DATE	Change Item	Reason
2014-05-16 X99-UD3-0.1	X99-ROG Rev0.2 --> X99-UD3 Rev0.1 1. LAN E2201-->i218 (COPY X99-SOC-Force_01B) 2. AUDIO Creativer -->ALC1150 (COPY X99-SOC-Force_01B) 3. Add TPM Connect 4. Remove USB_DAC power	
2014-07-07 X99-UD4-0.1	1. IT8951 的PIN7 & PIN8留測試點方便debug 2. Modify IR3556 FAULT control circuit 3. Remove "BAT" to PCIE8_2 右邊 4. DDR_LED mapping DDR SLOT 5. Add OC panel 6. Remove MAF1,MAF2,MBF1,MBF2 7. Add SATA/SATA EXPRESS/M2 change to 0 OHM SHORT AD 8. Add EC power diable control in S3 MODE 9. ALL 0 ohm --> 0 ohm short pad	
2014-07-18 X99-UD4-1.0	1. 鏤空GIGABYTE logo移除 2. SATA EXPRESS 文字面確認 3. BIOS_PH mask 4. IT_PH,IT1_PH,ITB_PH,ITB_PH2 --> R0603-RH 4. Add CD2 for AC OFF POP-NOISE 5. EC POWER DISABLE IO_GP95 --> IO_GP67 6. Add ECR35 7. Add N_GPIO53 pull-down "NR305" 8. Add ECR150 For IT8792 ERP Function 9. NRN10 changt to short pad 10. DDR4 SLOT NAME CHANGE "DDR4_1_1A~DDR4_8_2D 11. PCIE SLOT NAME CHANGE "PCIE_1~PCIE_7 12. LED NAME CHANGE "PE2_LED~PE4_LED" 13. ECR142,ECR143 short pad change to "R0402-2"	
2014-07-21 X99-UD4-1.01	1. NR292,NR293,WR60,WR61,WR63,WR65 change to "R0402-2"	
2014-10-13 X99-UD4-1.1	1. DDR4每個channel 各新增了8組DQS差動訊號/ECC訊號	
	2. ADD CR190 10M/4	
	3. NX2 update footprint "XTALS-RH-N"	

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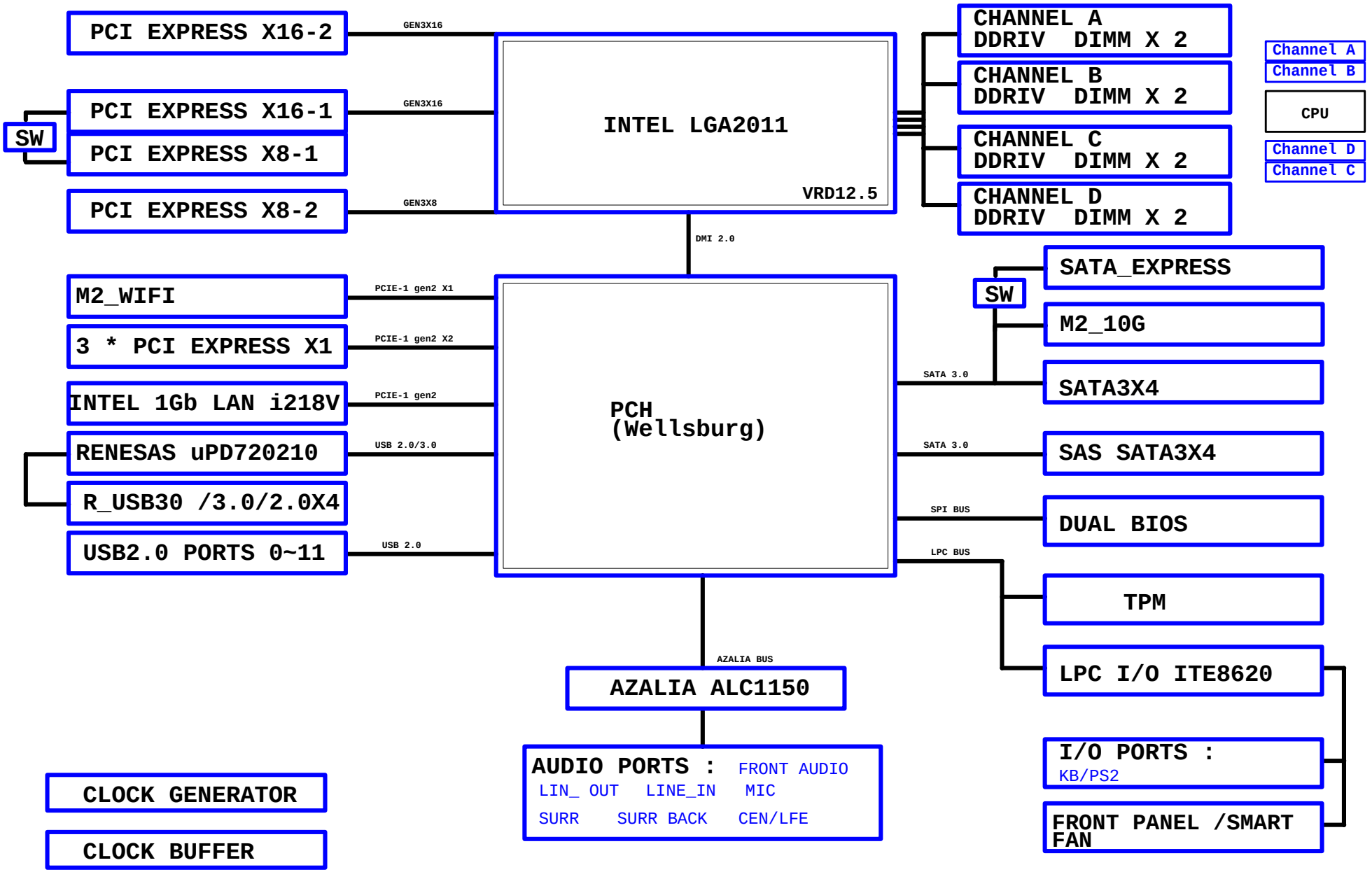
Title: BOM & PCB MODIFY HISTORY

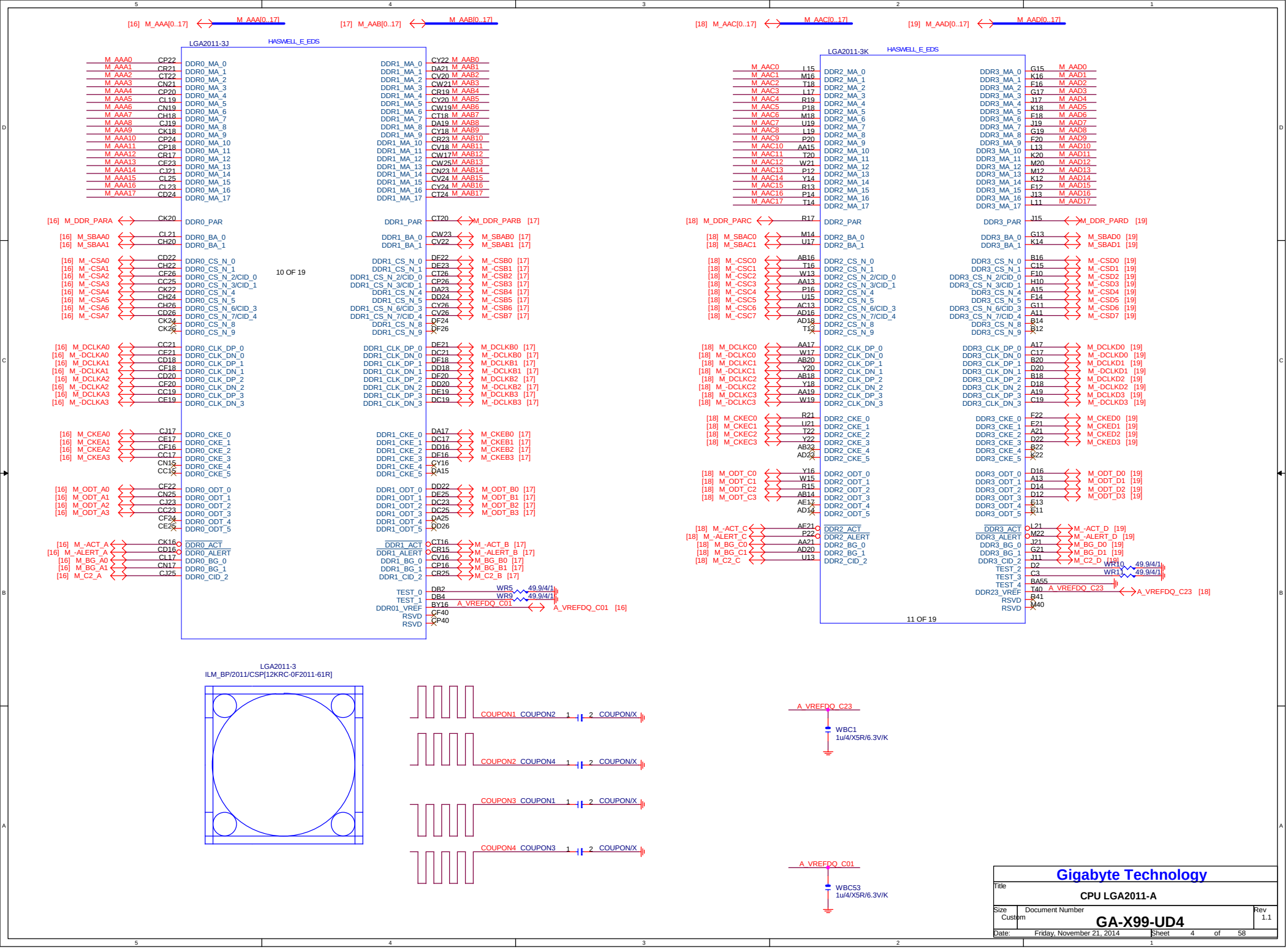
Size: Custom | Document Number: GA-X99-UD4 | Rev: 1.1

Date: Friday, November 21, 2014 | Sheet 2 of 58

BLOCK DIAGRAM



Gigabyte Technology		
Title: BLOCK DIAGRAM		
Size: C	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 3 of 58	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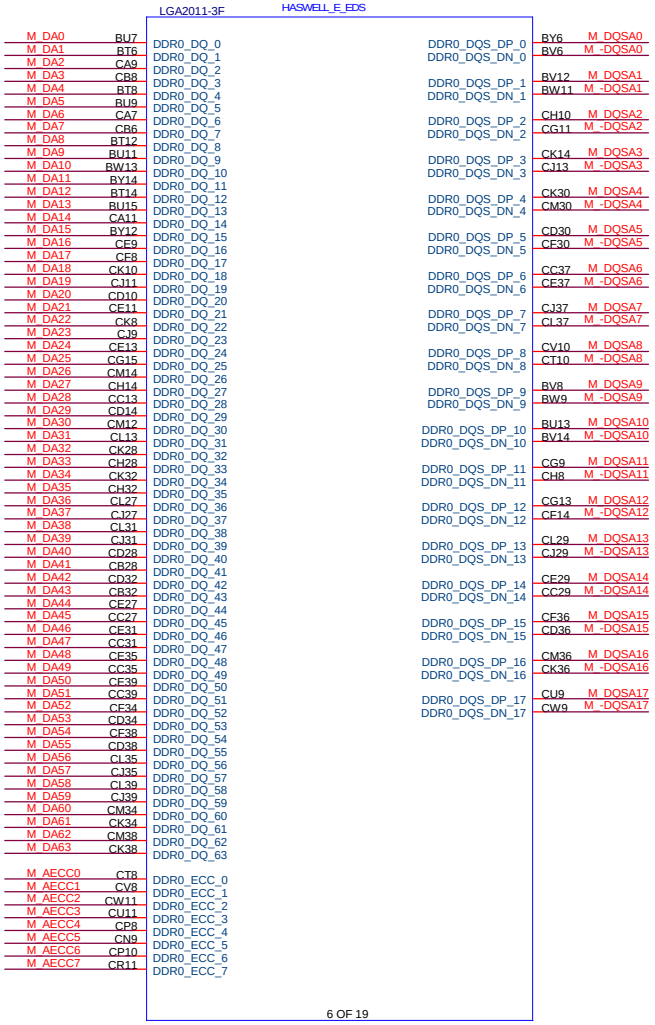
M_AAB[0..17]
LGA2011-3J
HASWELL_E_EDS
10 OF 19
[18] M_AAC[0..17]
M_AAC[0..17]
[19] M_AAD[0..17]
M_AAD[0..17]
LGA2011-3K
HASWELL_E_EDS
11 OF 19
LGA2011-3
ILM_BP/2011/CSP[12KRC-0F2011-61R]
COUPON1 COUPON2 1 2 COUPON/X
COUPON2 COUPON4 1 2 COUPON/X
COUPON3 COUPON1 1 2 COUPON/X
COUPON4 COUPON3 1 2 COUPON/X
A_VREFDQ_C23
WBC1
1u/4/X5R/6.3V/K
A_VREFDQ_C01
WBC53
1u/4/X5R/6.3V/K
Gigabyte Technology
Title
CPU LGA2011-A
Size
Custom
Document Number
GA-X99-UD4
Rev
1.1
Date: Friday, November 21, 2014
Sheet 4 of 58

CHANNEL A



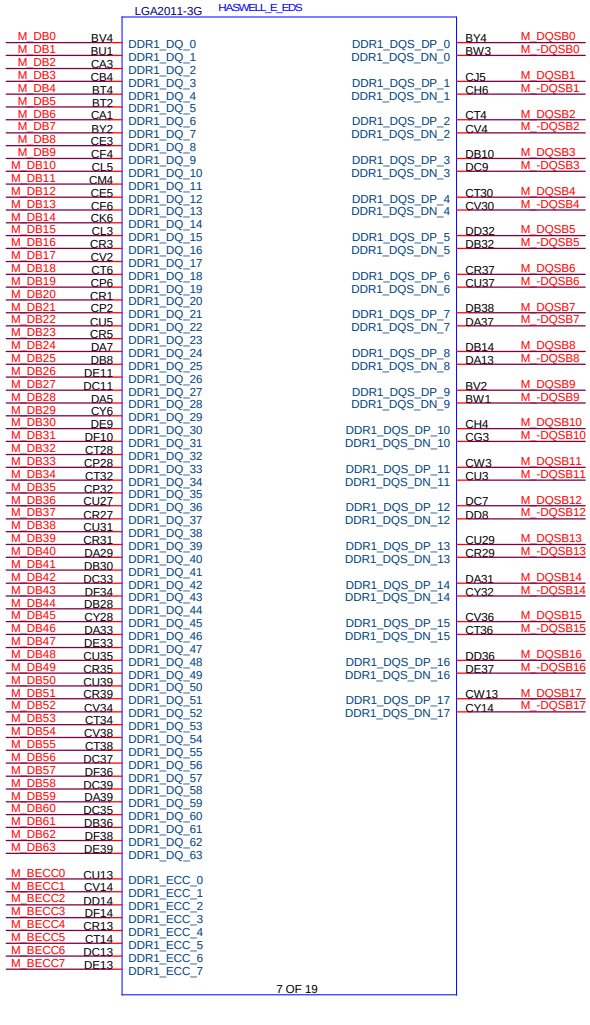
[16] M_DA[0..63] <-> M_DA[0..63]

[16] M_DQSA[0..17] <-> M_DQSA[0..17]

[16] M_-DQSA[0..17] <-> M_-DQSA[0..17]

[16] M_AECC[0..7] <-> M_AECC[0..7]

CHANNEL B



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[17] M_DQSB[0..17] <-> M_DQSB[0..17]

[17] M_-DQSB[0..17] <-> M_-DQSB[0..17]

[17] M_BECC[0..7] <-> M_BECC[0..7]

Gigabyte Technology

Title: CPU LGA2011-A

Size: Custom | Document Number: GA-X99-UD4 | Rev: 1.1

Date: Friday, November 21, 2014 | Sheet 5 of 58

CHANNEL C

LGA2011-3H HASWELL_E_EDS

M_DC0	AD38	DDR2_DQ_0	DDR2_DQS_DP_0	V38	M_DQSC0
M_DC1	AA37	DDR2_DQ_1	DDR2_DQS_DN_0	W37	M_-DQSC0
M_DC2	R37	DDR2_DQ_2			
M_DC3	Y38	DDR2_DQ_3	DDR2_DQS_DP_1	U31	M_DQSC1
M_DC4	AE37	DDR2_DQ_4	DDR2_DQS_DN_1	V32	M_-DQSC1
M_DC5	AC39	DDR2_DQ_5			
M_DC6	T38	DDR2_DQ_6	DDR2_DQS_DP_2	AB32	M_DQSC2
M_DC7	U37	DDR2_DQ_7	DDR2_DQS_DN_2	AD32	M_-DQSC2
M_DC8	V34	DDR2_DQ_8			
M_DC9	U33	DDR2_DQ_9	DDR2_DQS_DP_3	U25	M_DQSC3
M_DC10	V30	DDR2_DQ_10	DDR2_DQS_DN_3	W25	M_-DQSC3
M_DC11	T30	DDR2_DQ_11			
M_DC12	U35	DDR2_DQ_12	DDR2_DQS_DP_4	N7	M_DQSC4
M_DC13	R35	DDR2_DQ_13	DDR2_DQS_DN_4	P8	M_-DQSC4
M_DC14	T32	DDR2_DQ_14			
M_DC15	W31	DDR2_DQ_15	DDR2_DQS_DP_5	AB10	M_DQSC5
M_DC16	AD34	DDR2_DQ_16	DDR2_DQS_DN_5	Y10	M_-DQSC5
M_DC17	AB34	DDR2_DQ_17			
M_DC18	AD30	DDR2_DQ_18	DDR2_DQS_DP_6	AH12	M_DQSC6
M_DC19	AB30	DDR2_DQ_19	DDR2_DQS_DN_6	AJ13	M_-DQSC6
M_DC20	AC35	DDR2_DQ_20			
M_DC21	AA35	DDR2_DQ_21	DDR2_DQS_DP_7	AJ7	M_DQSC7
M_DC22	AE31	DDR2_DQ_22	DDR2_DQS_DN_7	AH8	M_-DQSC7
M_DC23	AC31	DDR2_DQ_23			
M_DC24	U27	DDR2_DQ_24	DDR2_DQS_DP_8	AC25	M_DQSC8
M_DC25	R27	DDR2_DQ_25	DDR2_DQS_DN_8	AE25	M_-DQSC8
M_DC26	U23	DDR2_DQ_26			
M_DC27	R23	DDR2_DQ_27	DDR2_DQS_DP_9	AB38	M_DQSC9
M_DC28	V28	DDR2_DQ_28	DDR2_DQS_DN_9	AC37	M_-DQSC9
M_DC29	T28	DDR2_DQ_29			
M_DC30	V24	DDR2_DQ_30	DDR2_DQS_DP_10	T34	M_DQSC10
M_DC31	T24	DDR2_DQ_31	DDR2_DQS_DN_10	R33	M_-DQSC10
M_DC32	N9	DDR2_DQ_32			
M_DC33	K8	DDR2_DQ_33	DDR2_DQS_DP_11	AC33	M_DQSC11
M_DC34	R7	DDR2_DQ_34	DDR2_DQS_DN_11	AA33	M_-DQSC11
M_DC35	P6	DDR2_DQ_35			
M_DC36	J9	DDR2_DQ_36	DDR2_DQS_DP_12	V26	M_DQSC12
M_DC37	L9	DDR2_DQ_37	DDR2_DQS_DN_12	T26	M_-DQSC12
M_DC38	K6	DDR2_DQ_38			
M_DC39	M6	DDR2_DQ_39	DDR2_DQS_DP_13	M8	M_DQSC13
M_DC40	U9	DDR2_DQ_40	DDR2_DQS_DN_13	L7	M_-DQSC13
M_DC41	W11	DDR2_DQ_41			
M_DC42	AA11	DDR2_DQ_42	DDR2_DQS_DP_14	V8	M_DQSC14
M_DC43	AB8	DDR2_DQ_43	DDR2_DQS_DN_14	W9	M_-DQSC14
M_DC44	T10	DDR2_DQ_44			
M_DC45	U11	DDR2_DQ_45	DDR2_DQS_DP_15	AH16	M_DQSC15
M_DC46	AA9	DDR2_DQ_46	DDR2_DQS_DN_15	AJ15	M_-DQSC15
M_DC47	Y8	DDR2_DQ_47			
M_DC48	AE11	DDR2_DQ_48	DDR2_DQS_DP_16	AH10	M_DQSC16
M_DC49	AF12	DDR2_DQ_49	DDR2_DQS_DN_16	AJ9	M_-DQSC16
M_DC50	AK12	DDR2_DQ_50			
M_DC51	AL13	DDR2_DQ_51	DDR2_DQS_DP_17	AD26	M_DQSC17
M_DC52	AG15	DDR2_DQ_52	DDR2_DQS_DN_17	AB26	M_-DQSC17
M_DC53	AF14	DDR2_DQ_53			
M_DC54	AK14	DDR2_DQ_54			
M_DC55	AL15	DDR2_DQ_55			
M_DC56	AG9	DDR2_DQ_56			
M_DC57	AG7	DDR2_DQ_57			
M_DC58	AK10	DDR2_DQ_58			
M_DC59	AL9	DDR2_DQ_59			
M_DC60	AE7	DDR2_DQ_60			
M_DC61	AF9	DDR2_DQ_61			
M_DC62	AK8	DDR2_DQ_62			
M_DC63	AL7	DDR2_DQ_63			
M_CECC0	AC27	DDR2_ECC_0			
M_CECC1	AA27	DDR2_ECC_1			
M_CECC2	AC23	DDR2_ECC_2			
M_CECC3	AA23	DDR2_ECC_3			
M_CECC4	AD28	DDR2_ECC_4			
M_CECC5	AB28	DDR2_ECC_5			
M_CECC6	AD24	DDR2_ECC_6			
M_CECC7	AB24	DDR2_ECC_7			

8 OF 19

[18] M_DC[0..63] <-> M_DC[0..63]

[18] M_DQSC[0..17] <-> M_DQSC[0..17]

[18] M_-DQSC[0..17] <-> M_-DQSC[0..17]

[18] M_CECC[0..7] <-> M_CECC[0..7]

CHANNEL D

LGA2011-3H HASWELL_E_EDS

M_DD0	D38	DDR3_DQ_0	DDR3_DQS_DP_0	E37	M_DQSD0
M_DD1	B38	DDR3_DQ_1	DDR3_DQS_DN_0	C37	M_-DQSD0
M_DD2	L37	DDR3_DQ_2			
M_DD3	M38	DDR3_DQ_3	DDR3_DQS_DP_1	B32	M_DQSD1
M_DD4	C39	DDR3_DQ_4	DDR3_DQS_DN_1	A33	M_-DQSD1
M_DD5	J39	DDR3_DQ_5			
M_DD6	G37	DDR3_DQ_6	DDR3_DQS_DP_2	M32	M_DQSD2
M_DD7	K38	DDR3_DQ_7	DDR3_DQS_DN_2	K32	M_-DQSD2
M_DD8	A35	DDR3_DQ_8			
M_DD9	B34	DDR3_DQ_9	DDR3_DQS_DP_3	E25	M_DQSD3
M_DD10	G31	DDR3_DQ_10	DDR3_DQS_DN_3	G25	M_-DQSD3
M_DD11	E31	DDR3_DQ_11			
M_DD12	F34	DDR3_DQ_12	DDR3_DQS_DP_4	H2	M_DQSD4
M_DD13	E35	DDR3_DQ_13	DDR3_DQS_DN_4	G3	M_-DQSD4
M_DD14	D32	DDR3_DQ_14			
M_DD15	E33	DDR3_DQ_15	DDR3_DQS_DP_5	E7	M_DQSD5
M_DD16	K34	DDR3_DQ_16	DDR3_DQS_DN_5	C7	M_-DQSD5
M_DD17	M34	DDR3_DQ_17			
M_DD18	K30	DDR3_DQ_18	DDR3_DQS_DP_6	AK2	M_DQSD6
M_DD19	M30	DDR3_DQ_19	DDR3_DQS_DN_6	AJ1	M_-DQSD6
M_DD20	J35	DDR3_DQ_20			
M_DD21	L35	DDR3_DQ_21	DDR3_DQS_DP_7	AB4	M_DQSD7
M_DD22	L31	DDR3_DQ_22	DDR3_DQS_DN_7	AA5	M_-DQSD7
M_DD23	N31	DDR3_DQ_23			
M_DD24	F28	DDR3_DQ_24	DDR3_DQS_DP_8	L25	M_DQSD8
M_DD25	F27	DDR3_DQ_25	DDR3_DQS_DN_8	N25	M_-DQSD8
M_DD26	F24	DDR3_DQ_26			
M_DD27	E23	DDR3_DQ_27	DDR3_DQS_DP_9	F38	M_DQSD9
M_DD28	G29	DDR3_DQ_28	DDR3_DQS_DN_9	H38	M_-DQSD9
M_DD29	F29	DDR3_DQ_29			
M_DD30	C25	DDR3_DQ_30	DDR3_DQS_DP_10	C35	M_DQSD10
M_DD31	B24	DDR3_DQ_31	DDR3_DQS_DN_10	D34	M_-DQSD10
M_DD32	K4	DDR3_DQ_32			
M_DD33	H4	DDR3_DQ_33	DDR3_DQS_DP_11	J33	M_DQSD11
M_DD34	J1	DDR3_DQ_34	DDR3_DQS_DN_11	L33	M_-DQSD11
M_DD35	L1	DDR3_DQ_35			
M_DD36	P4	DDR3_DQ_36	DDR3_DQS_DP_12	F26	M_DQSD12
M_DD37	N3	DDR3_DQ_37	DDR3_DQS_DN_12	D26	M_-DQSD12
M_DD38	K2	DDR3_DQ_38			
M_DD39	R3	DDR3_DQ_39	DDR3_DQS_DP_13	M4	M_DQSD13
M_DD40	F9	DDR3_DQ_40	DDR3_DQS_DN_13	L3	M_-DQSD13
M_DD41	F8	DDR3_DQ_41			
M_DD42	E5	DDR3_DQ_42	DDR3_DQS_DP_14	B8	M_DQSD14
M_DD43	F6	DDR3_DQ_43	DDR3_DQS_DN_14	D8	M_-DQSD14
M_DD44	C9	DDR3_DQ_44			
M_DD45	A9	DDR3_DQ_45	DDR3_DQS_DP_15	AH4	M_DQSD15
M_DD46	D6	DDR3_DQ_46	DDR3_DQS_DN_15	AJ5	M_-DQSD15
M_DD47	G7	DDR3_DQ_47			
M_DD48	AG3	DDR3_DQ_48	DDR3_DQS_DP_16	Y6	M_DQSD16
M_DD49	AG1	DDR3_DQ_49	DDR3_DQS_DN_16	W5	M_-DQSD16
M_DD50	AL3	DDR3_DQ_50			
M_DD51	AL5	DDR3_DQ_51	DDR3_DQS_DP_17	M26	M_DQSD17
M_DD52	AG5	DDR3_DQ_52	DDR3_DQS_DN_17	K26	M_-DQSD17
M_DD53	AF3	DDR3_DQ_53			
M_DD54	AJ3	DDR3_DQ_54			
M_DD55	AL1	DDR3_DQ_55			
M_DD56	V4	DDR3_DQ_56			
M_DD57	W3	DDR3_DQ_57			
M_DD58	AC5	DDR3_DQ_58			
M_DD59	AE5	DDR3_DQ_59			
M_DD60	U5	DDR3_DQ_60			
M_DD61	V6	DDR3_DQ_61			
M_DD62	AC3	DDR3_DQ_62			
M_DD63	AB6	DDR3_DQ_63			
M_DECC0	L27	DDR3_ECC_0			
M_DECC1	J27	DDR3_ECC_1			
M_DECC2	L23	DDR3_ECC_2			
M_DECC3	J23	DDR3_ECC_3			
M_DECC4	K28	DDR3_ECC_4			
M_DECC5	M28	DDR3_ECC_5			
M_DECC6	M24	DDR3_ECC_6			
M_DECC7	K24	DDR3_ECC_7			

9 OF 19

[19] M_DD[0..63] <-> M_DD[0..63]

[19] M_DQSD[0..17] <-> M_DQSD[0..17]

[19] M_-DQSD[0..17] <-> M_-DQSD[0..17]

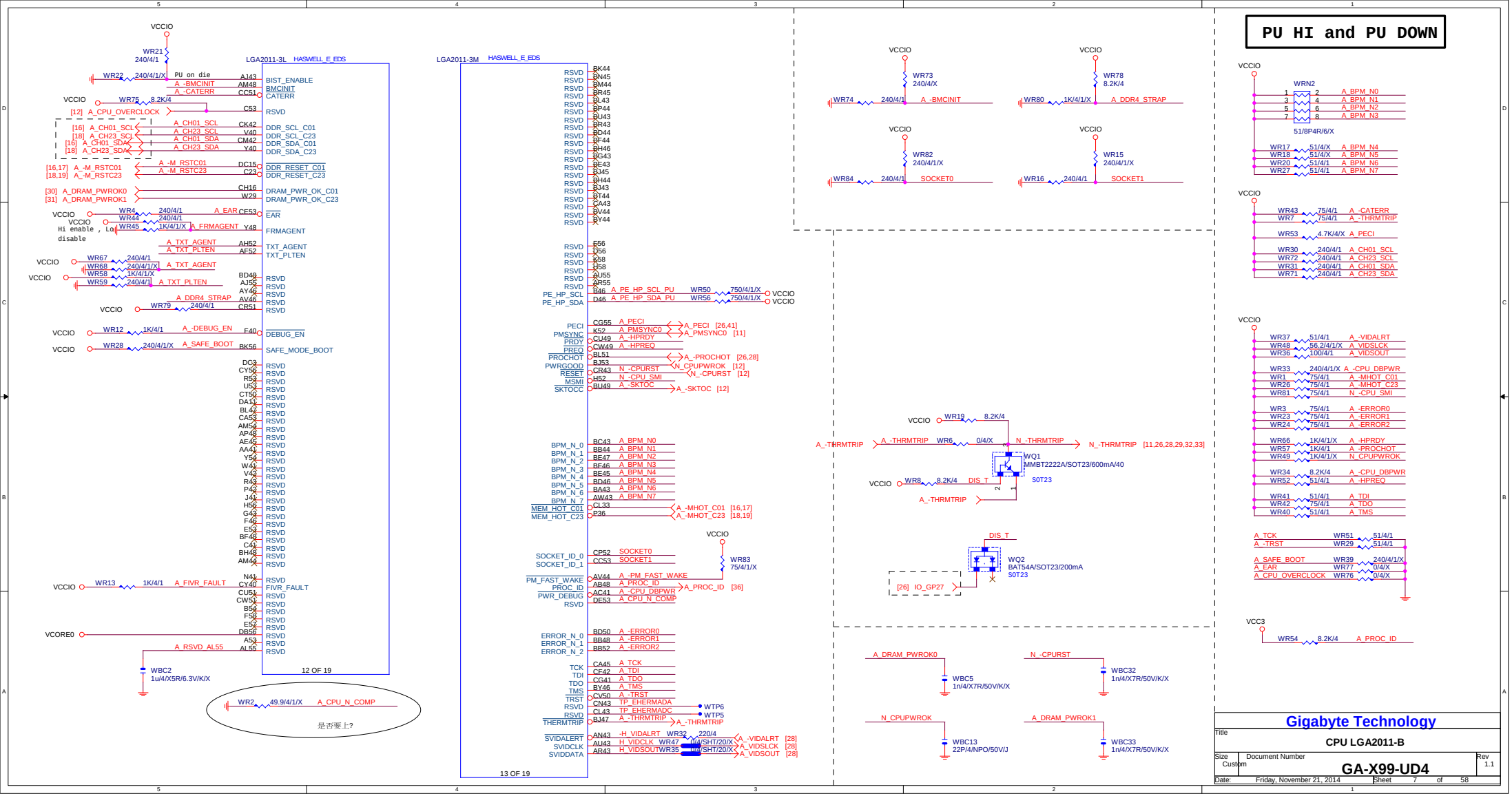
[19] M_DECC[0..7] <-> M_DECC[0..7]

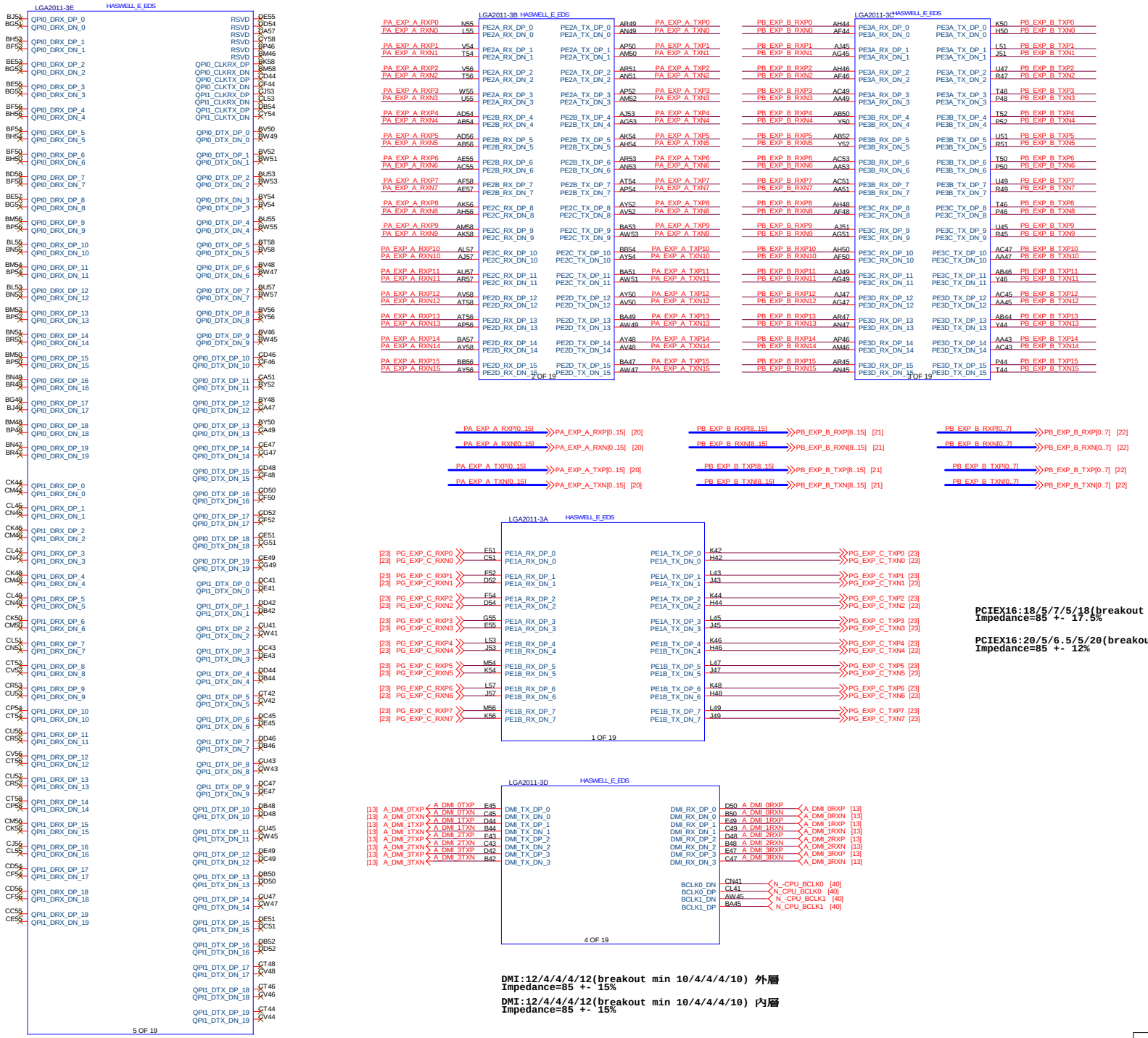
Gigabyte Technology

Title: CPU LGA2011-A

Size: Custom | Document Number: GA-X99-UD4 | Rev: 1.1

Date: Friday, November 21, 2014 | Sheet 6 of 58


PU HI and PU DOWN
LGA2011-3L HASWELL_E_EDS
LGA2011-3M HASWELL_E_EDS
12 OF 19
13 OF 19
是否要上?
Gigabyte Technology
Title
CPU LGA2011-B
Size
Custom
Document Number
GA-X99-UD4
Rev
1.1
Date: Friday, November 21, 2014
Sheet 7 of 58



PCIEX16:18/5/7/5/18(breakout min 10/4/4/4/10) 外層 Impedance=85 +- 17.5%

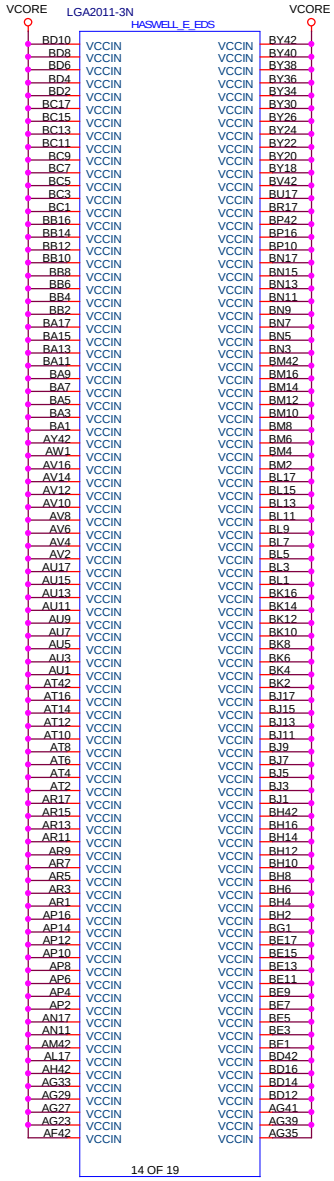
PCIEX16:20/5/6.5/5/20(breakout min 10/4/4/4/10) 內層 Impedance=85 +- 12%

DMI:12/4/4/4/12(breakout min 10/4/4/4/10) 外層 Impedance=85 +- 15%

DMI:12/4/4/4/12(breakout min 10/4/4/4/10) 內層 Impedance=85 +- 15%

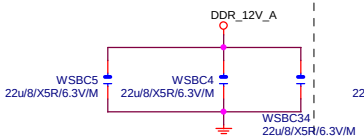
Gigabyte Technology

Title	CPU LGA2011-B	
Size: Custom	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 8 of 58	

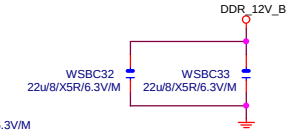


VCORE

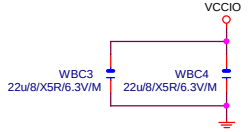
DDR_12V_A



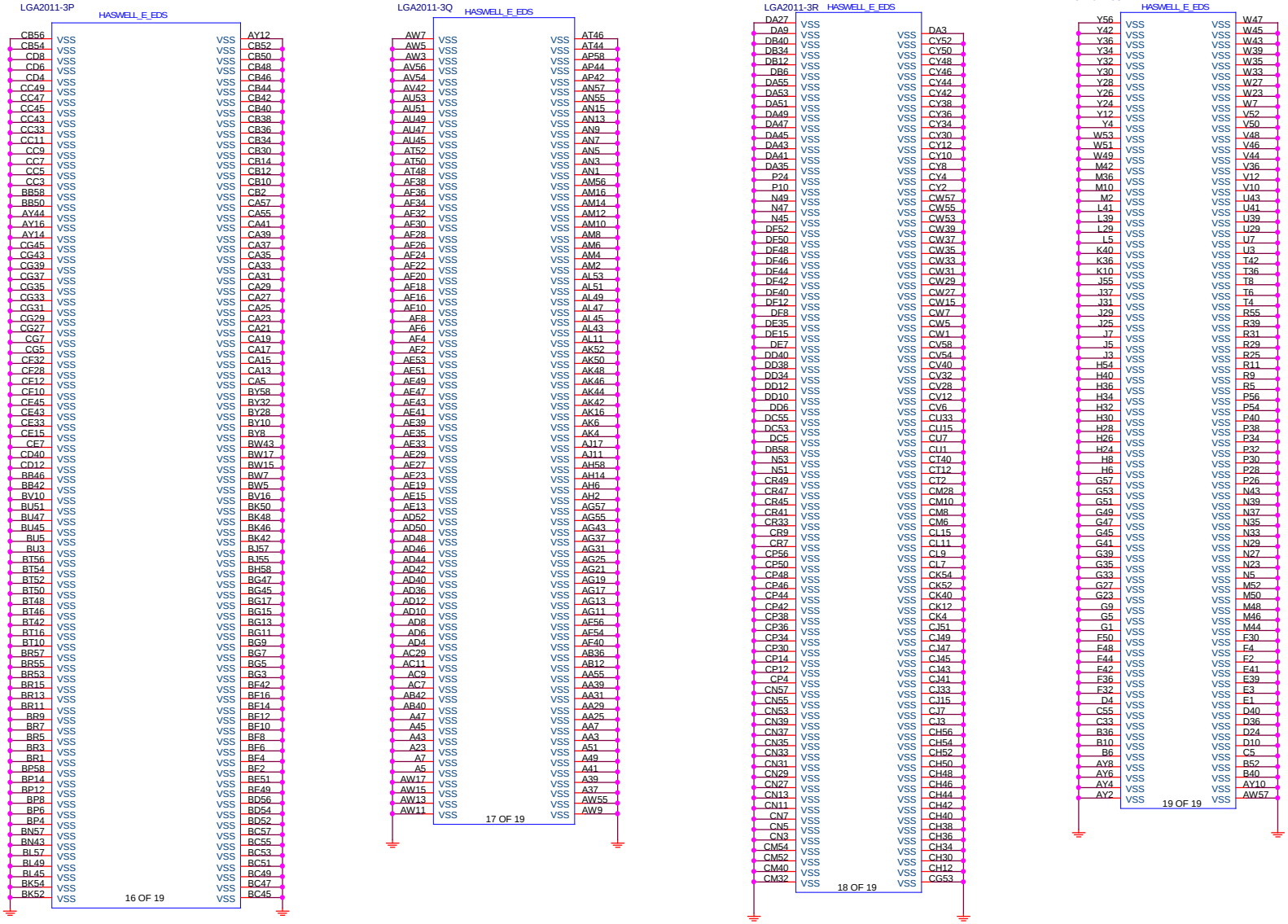
DDR_12V_B



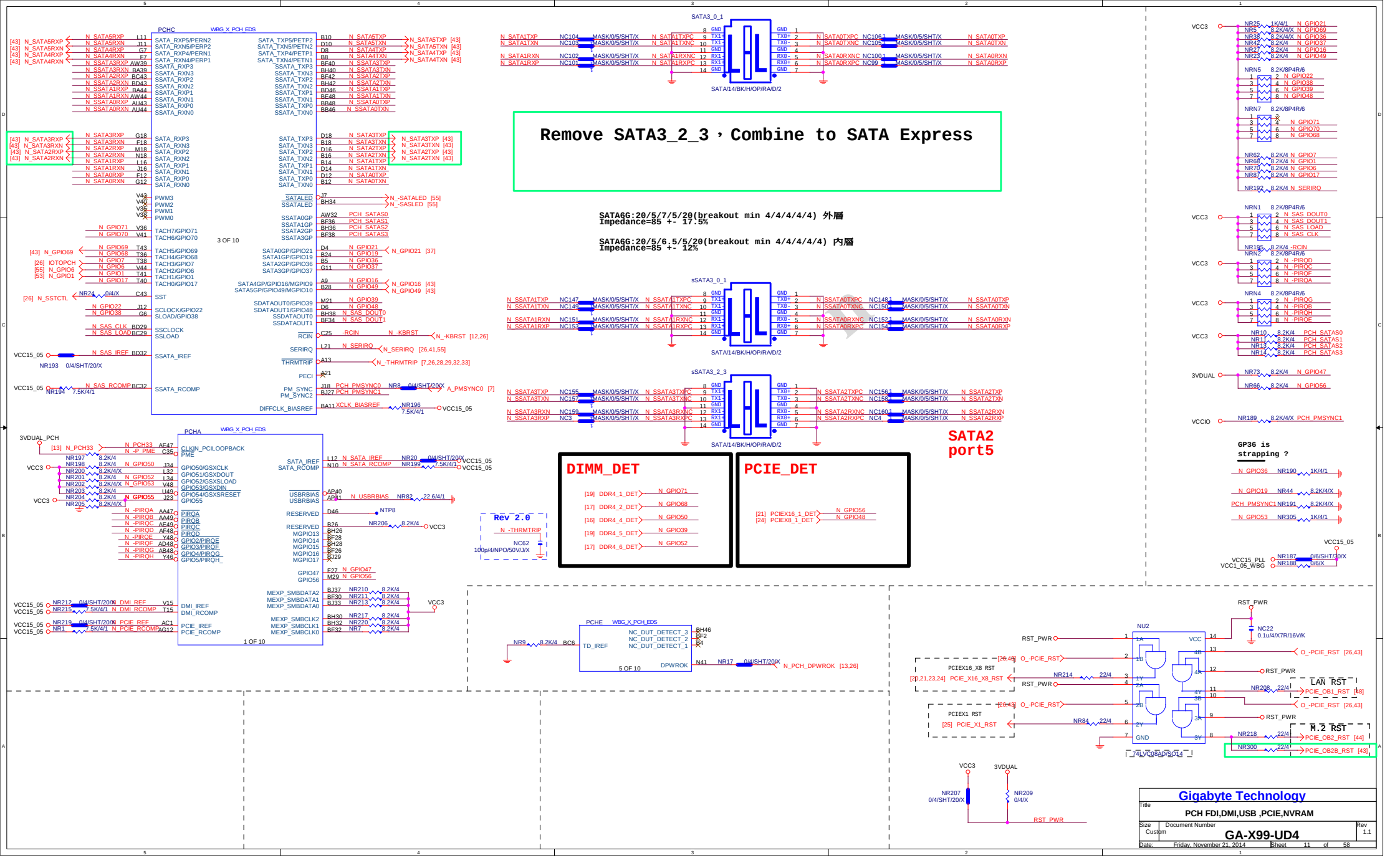
VCCIO

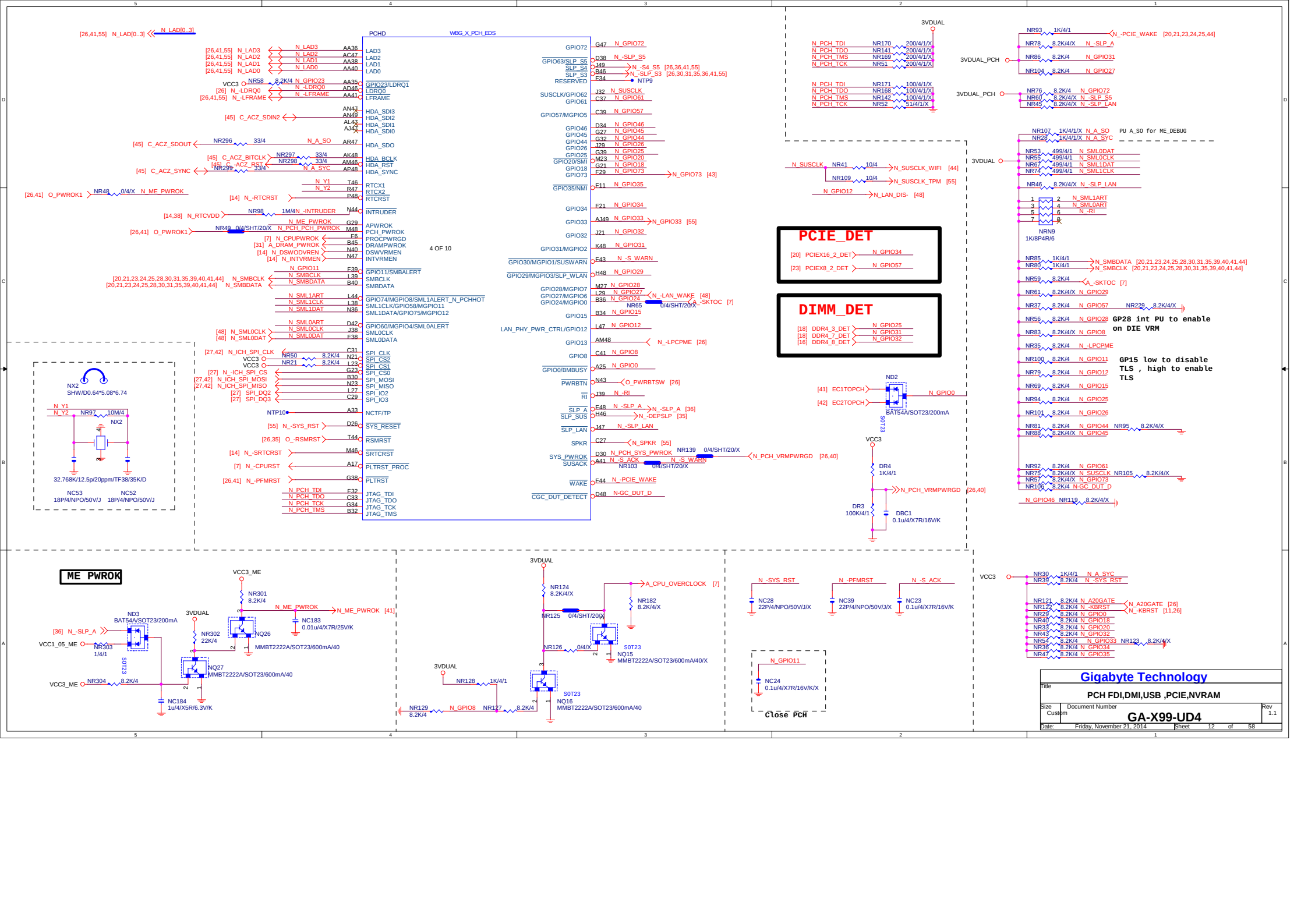


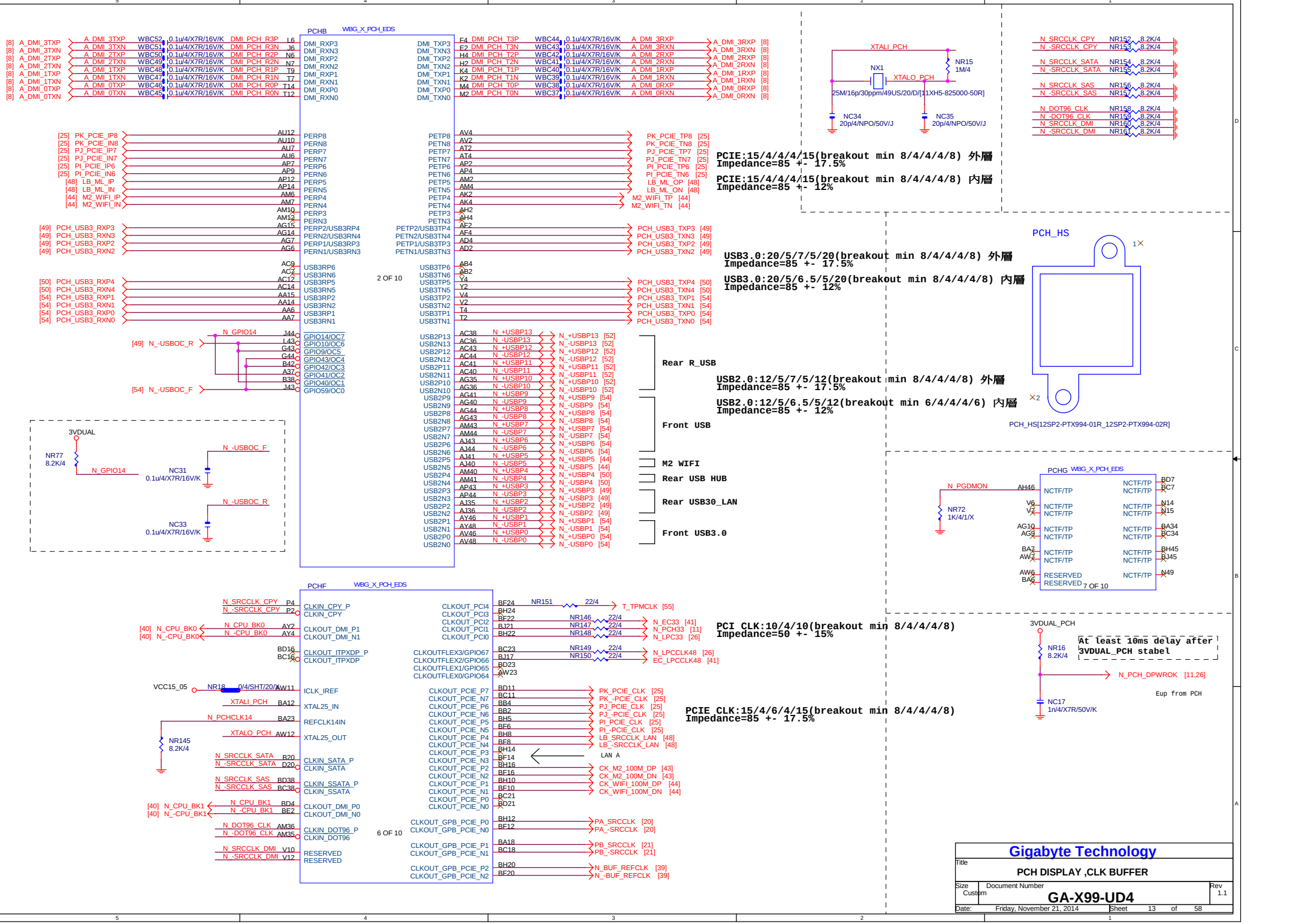
Gigabyte Technology		
Title: CPU LGA2011-C		
Size: Custom	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 9 of 58	

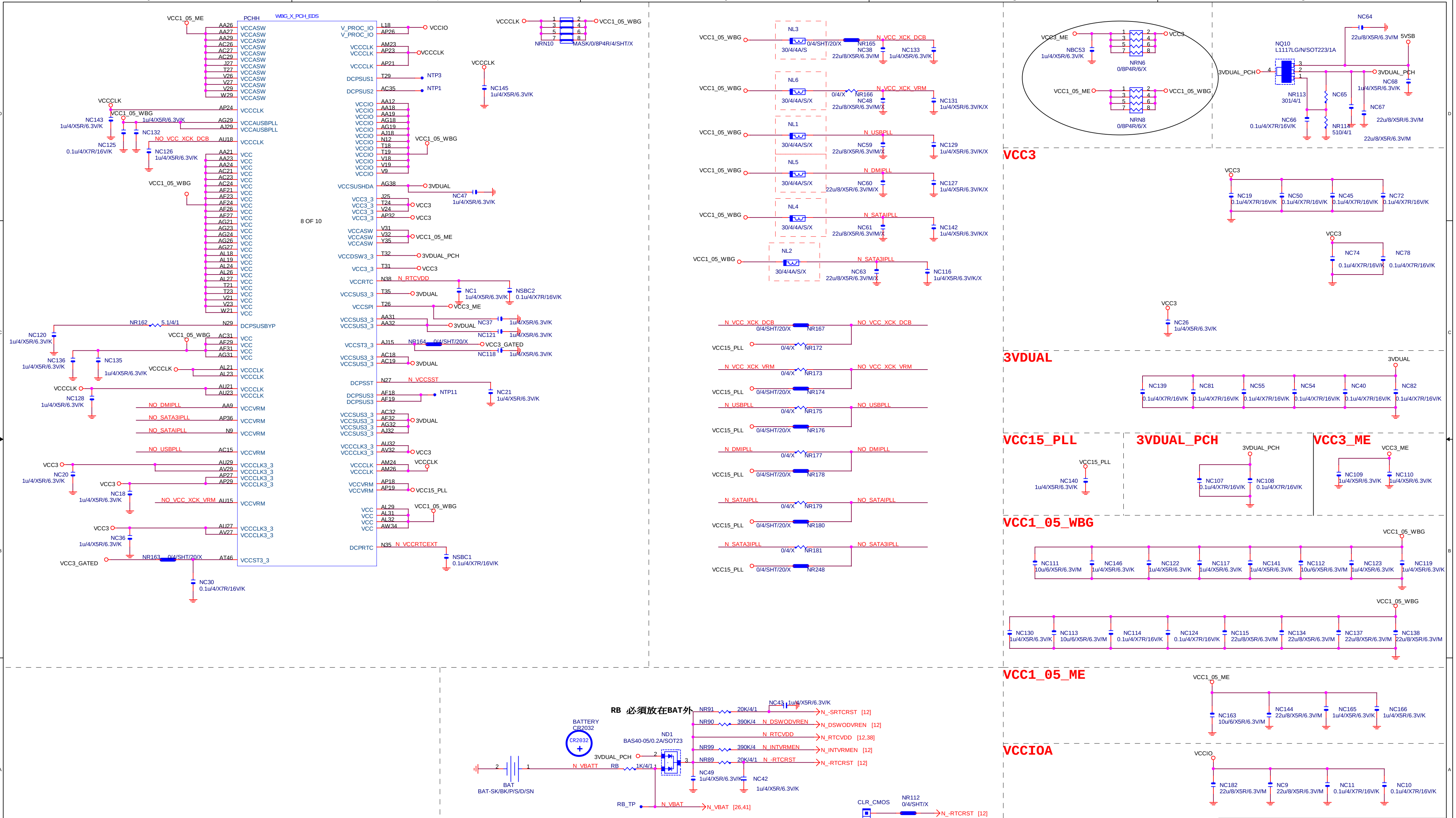


Gigabyte Technology		
Title: CPU LGA2011-C		
Size: Custom	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 10 of 58	


Remove SATA3_2_3，Combine to SATA Express
SATA6G:20/5/7/5/20(breakout min 4/4/4/4/4) 外層
Impedance=85 +- 17.5%
SATA6G:20/5/6.5/5/20(breakout min 4/4/4/4/4) 內層
Impedance=85 +- 12%
SATA2 port5
DIMM_DET
PCIE_DET
Rev 2.0
GP36 is strapping ?
LAN RST
M.2 RST
Gigabyte Technology
PCH FDI,DMI,USB ,PCIE,NVRAM
GA-X99-UD4


PCHD
WBG_X_PCH_EDS
4 OF 10
PCIE_DET
DIMM_DET
ME_PWROK
GP28 int PU to enable on DIE VRM
GP15 low to disable TLS , high to enable TLS
Close PCH
Gigabyte Technology
PCH FDI,DMI,USB ,PCIE,NVRAM
GA-X99-UD4
Custom
Rev 1.1
Date: Friday, November 21, 2014
Sheet 12 of 58


PCHB
WBG_X_PCH_EDS
2 OF 10
Rear R_USB
Front USB
M2 WIFI
Rear USB HUB
Rear USB30_LAN
Front USB3.0
PCHF
6 OF 10
PCHG
7 OF 10
PCH_HS
PCH_HS[12SP2-PTX994-01R_12SP2-PTX994-02R]
PCIE:15/4/4/4/15(breakout min 8/4/4/4/8) 外層
Impedance=85 +- 17.5%
PCIE:15/4/4/4/15(breakout min 8/4/4/4/8) 內層
Impedance=85 +- 12%
USB3.0:20/5/7/5/20(breakout min 8/4/4/4/8) 外層
Impedance=85 +- 17.5%
USB3.0:20/5/6.5/5/20(breakout min 8/4/4/4/8) 內層
Impedance=85 +- 12%
USB2.0:12/5/7/5/12(breakout min 8/4/4/4/8) 外層
Impedance=85 +- 17.5%
USB2.0:12/5/6.5/5/12(breakout min 6/4/4/4/6) 內層
Impedance=85 +- 12%
PCI CLK:10/4/4/10(breakout min 8/4/4/4/8)
Impedance=50 +- 15%
PCIE CLK:15/4/6/4/15(breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%
At least 10ms delay after 3VDUAL_PCH stabel
Gigabyte Technology
PCH DISPLAY ,CLK BUFFER
GA-X99-UD4
Custom
Rev 1.1
Friday, November 21, 2014
Sheet 13 of 58

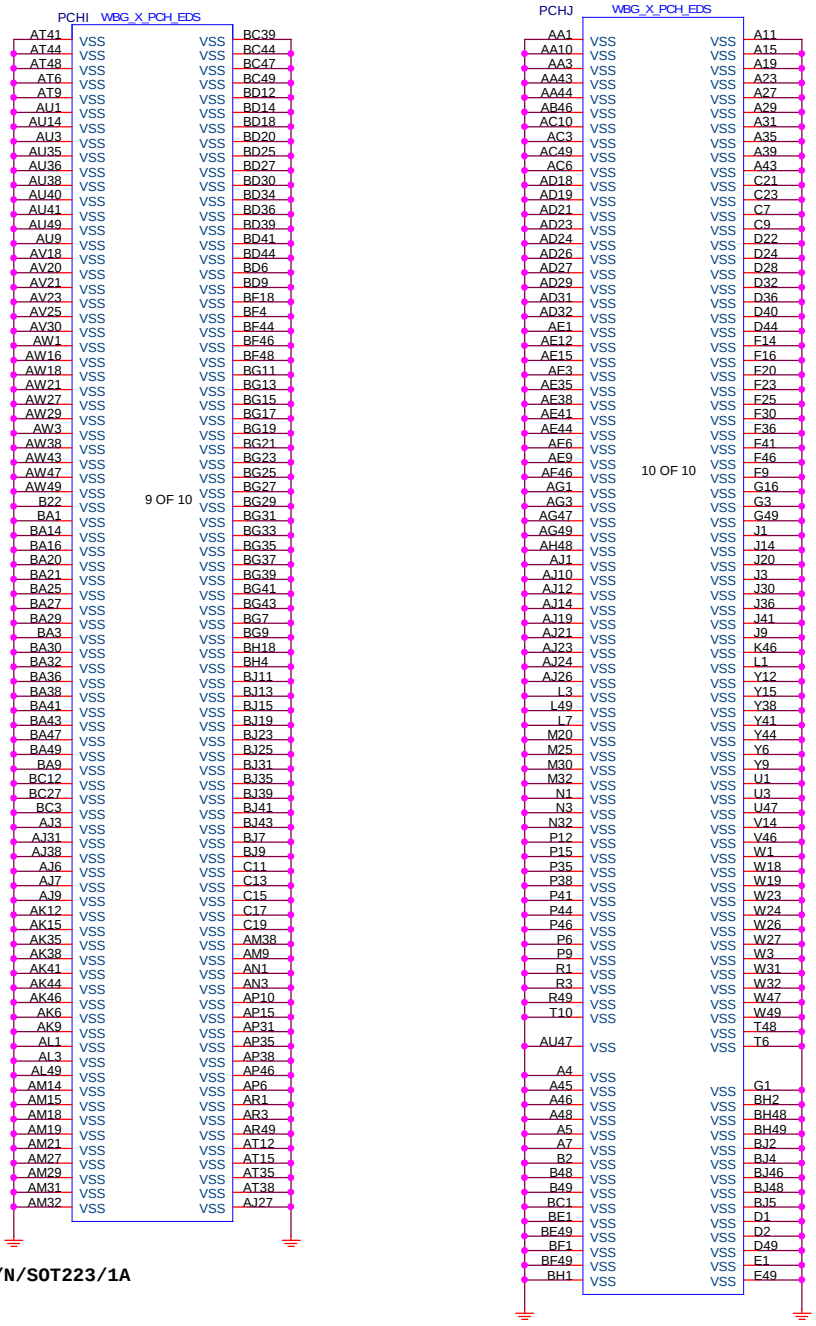


Gigabyte Technology

Title: PCH PWR ,GND

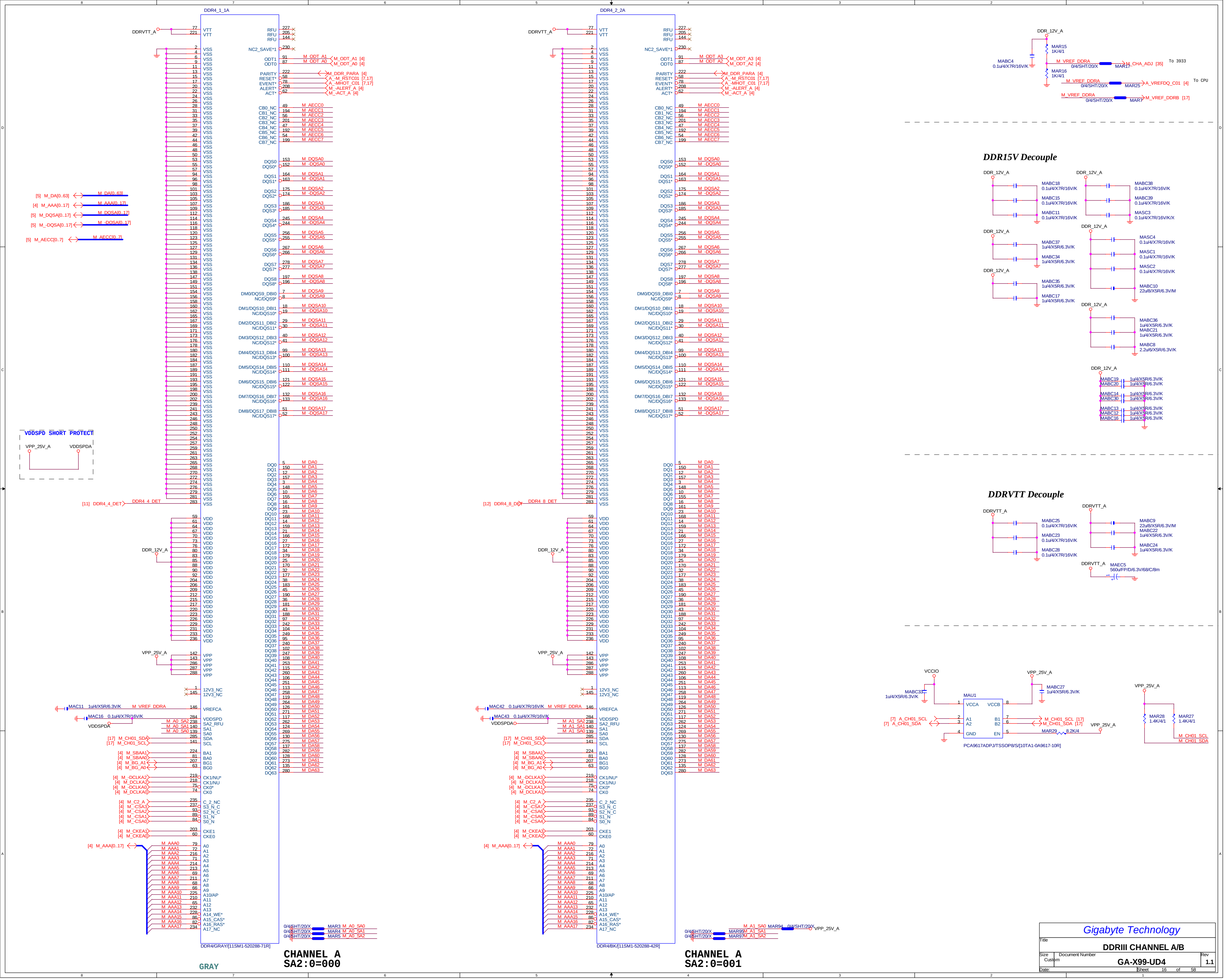
Size	Document Number	Rev
Custom	GA-X99-UD4	1.1

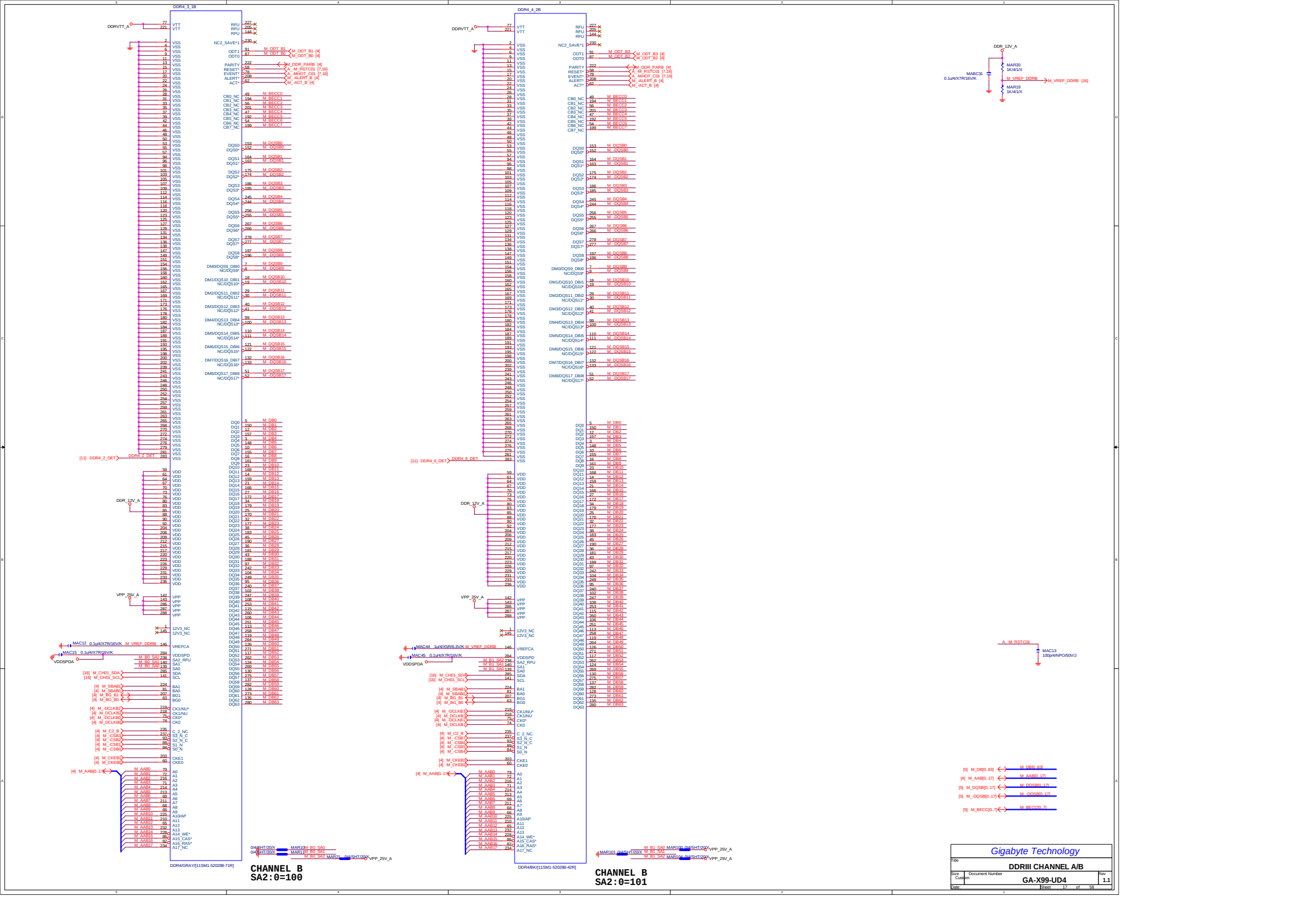
Date: Friday, November 21, 2014 Sheet 14 of 58

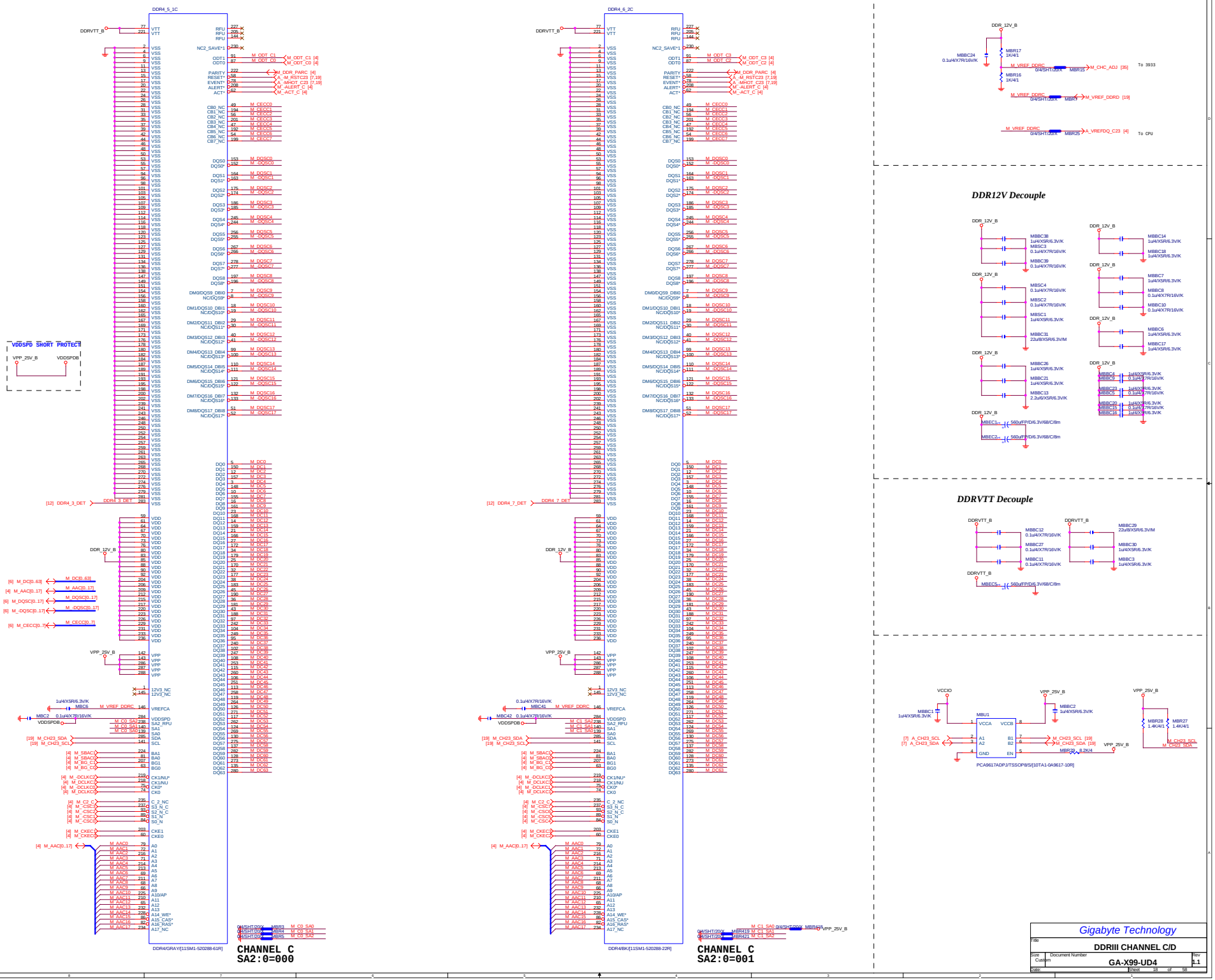


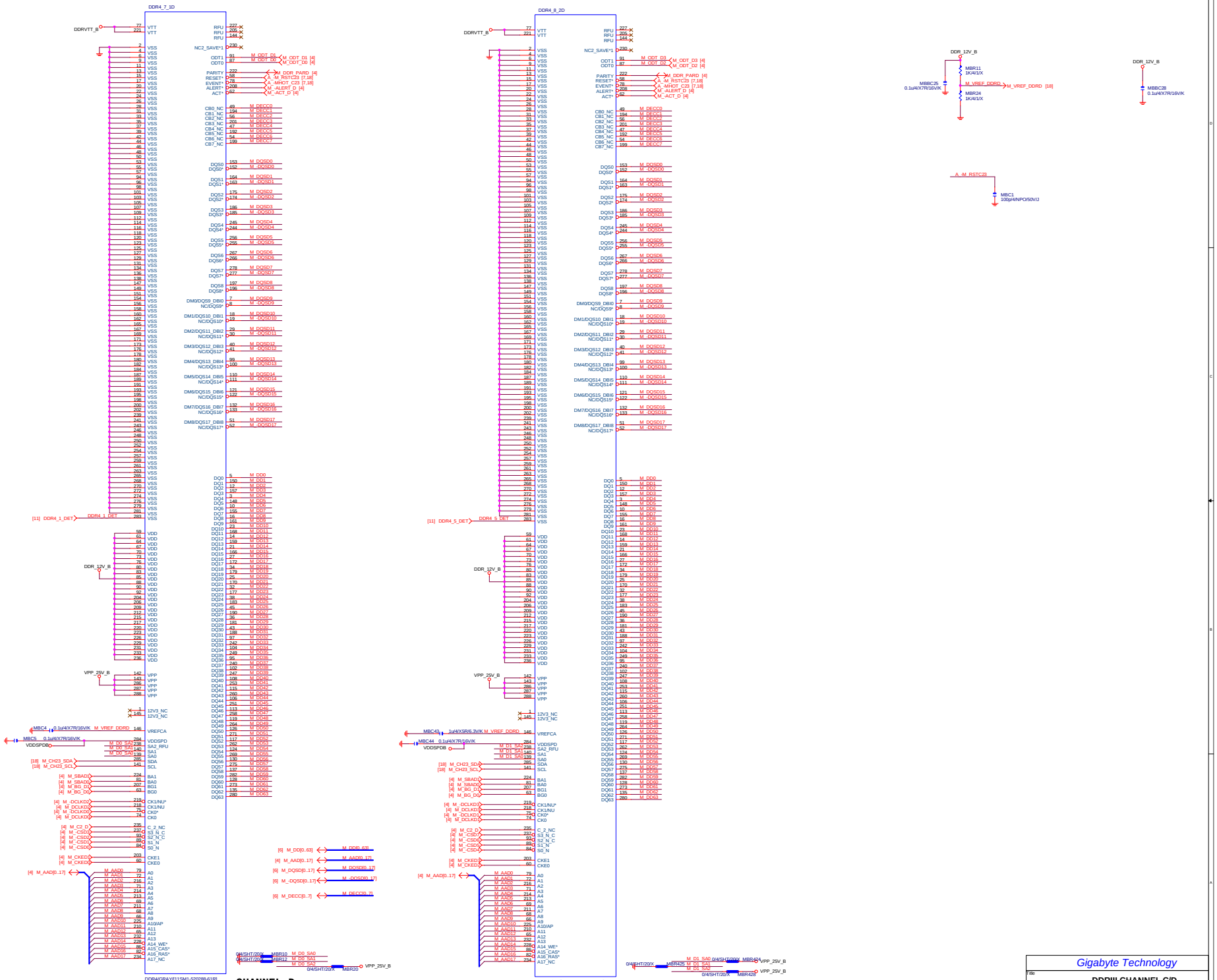
L1117LG/N/SOT223/1A

Gigabyte Technology	
Title	PCH PWR ,GND
Size: Custom	Document Number: GA-X99-UD4
Rev	1.1
Date: Friday, November 21, 2014	Sheet 15 of 58


DDR4_1_1A
DDR4_2_2A
DDR15V Decouple
DDRVTT Decouple
VDDSPD SHORT PROTECT
DDR4/GRAY/[11SM1-520288-71R]
DDR4/BK/[11SM1-520288-42R]
CHANNEL A
SA2:0=000
GRAY
CHANNEL A
SA2:0=001
MAU1
PCA9617ADPJ/TSSOP8/S/[10TA1-0A9617-10R]
To 3933
To CPU
Gigabyte Technology
Title
DDRIII CHANNEL A/B
Size
Custom
Document Number
GA-X99-UD4
Rev
1.1
Date:
Sheet 16 of 58


DDR4_3_1B
DDR4_4_2B
DDRVTT_A
DDR_12V_A
VPP_25V_A
VDDSPDA
MAC12 0.1u/4/X7R/16V/K M_VREF_DDRB
MAC15 0.1u/4/X7R/16V/K
MAC44 1u/4/X5R/6.3V/K M_VREF_DDRB
MAC45 0.1u/4/X7R/16V/K
MAR10 0/4/SHT/200X
MAR11 0/4/SHT/200X
MAR101 0/4/SHT/200X
MAR100 0/4/SHT/200X
MABC31 0.1u/4/X7R/16V/K
MAR20 1K/4/1/X
MAR19 1K/4/1/X
M_VREF_DDRB
M_VREF_DDRB [16]
MAC13 100p/4/NPO/50V/J
A_M_RST C01
DDR4/GRAY[11SM1-520288-71R]
DDR4/BK/[11SM1-520288-42R]
CHANNEL B
SA2:0=100
CHANNEL B
SA2:0=101
Gigabyte Technology
DDRIII CHANNEL A/B
GA-X99-UD4
1.1
Sheet 17 of 58


DDR4_5_1C
DDR4_6_2C
VDDSPD SHORT PROTECT
DDR12V Decouple
DDRVTT Decouple
CHANNEL C
SA2:0=000
CHANNEL C
SA2:0=001
DDR4/GRAY/[11SM1-520288-61R]
DDR4/BK/[11SM1-520288-22R]
PCA9617ADPJ/TSSOP8/S/[10TA1-0A9617-10R]
Gigabyte Technology
DDRIII CHANNEL C/D
GA-X99-UD4
Rev 1.1



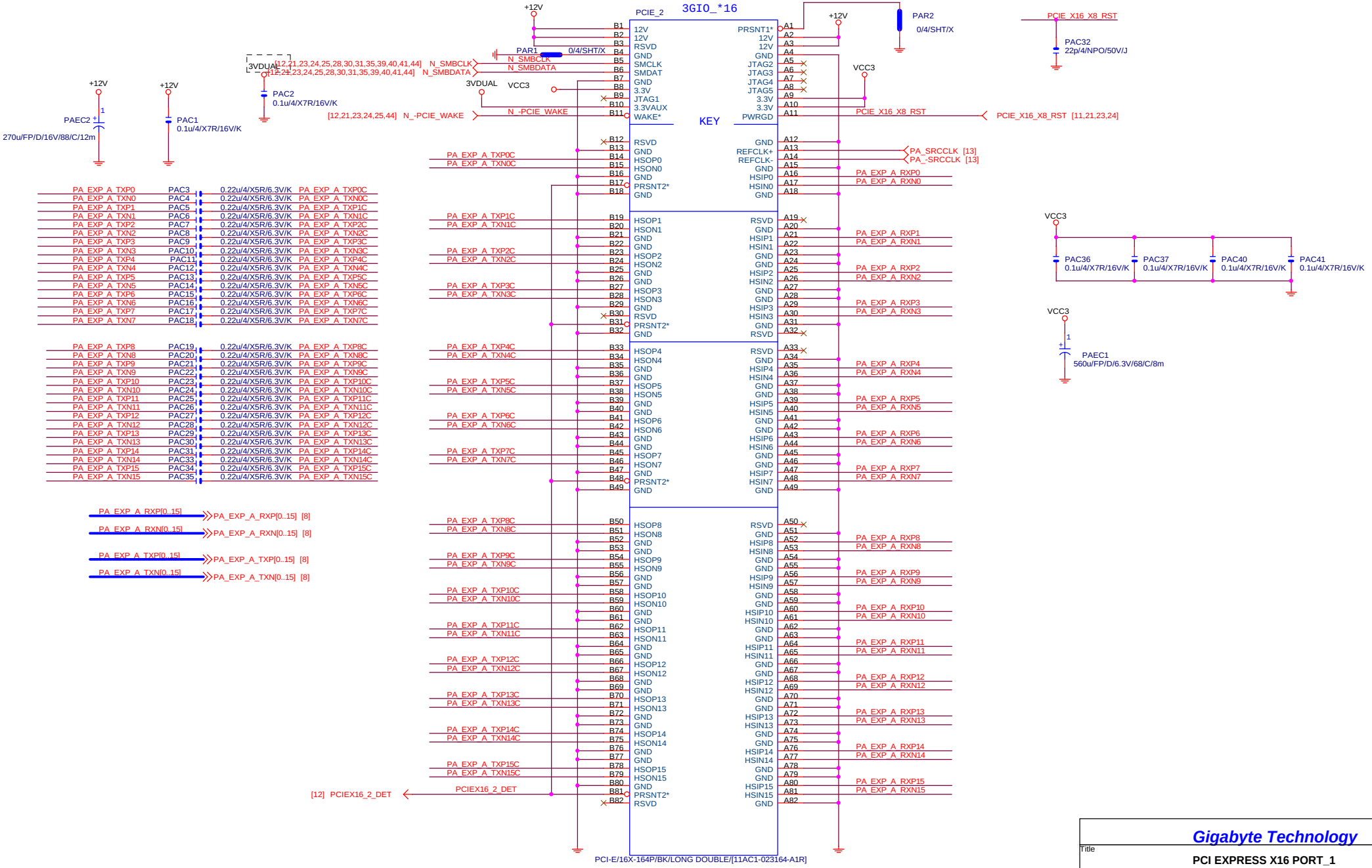
Gigabyte Technology

Title: DDRIII CHANNEL C/D

Size: Custom | Document Number: GA-X99-UD4 | Rev: 1.1

Date: | Sheet 19 of 58

PCIESLOT-164DN-2



PA_EXP_A_TXP0	PAC3	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP0C
PA_EXP_A_TXN0	PAC4	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN0C
PA_EXP_A_TXP1	PAC5	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP1C
PA_EXP_A_TXN1	PAC6	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN1C
PA_EXP_A_TXP2	PAC7	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP2C
PA_EXP_A_TXN2	PAC8	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN2C
PA_EXP_A_TXP3	PAC9	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP3C
PA_EXP_A_TXN3	PAC10	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN3C
PA_EXP_A_TXP4	PAC11	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP4C
PA_EXP_A_TXN4	PAC12	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN4C
PA_EXP_A_TXP5	PAC13	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP5C
PA_EXP_A_TXN5	PAC14	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN5C
PA_EXP_A_TXP6	PAC15	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP6C
PA_EXP_A_TXN6	PAC16	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN6C
PA_EXP_A_TXP7	PAC17	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP7C
PA_EXP_A_TXN7	PAC18	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN7C
PA_EXP_A_TXP8	PAC19	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP8C
PA_EXP_A_TXN8	PAC20	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN8C
PA_EXP_A_TXP9	PAC21	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP9C
PA_EXP_A_TXN9	PAC22	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN9C
PA_EXP_A_TXP10	PAC23	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP10C
PA_EXP_A_TXN10	PAC24	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN10C
PA_EXP_A_TXP11	PAC25	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP11C
PA_EXP_A_TXN11	PAC26	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN11C
PA_EXP_A_TXP12	PAC27	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP12C
PA_EXP_A_TXN12	PAC28	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN12C
PA_EXP_A_TXP13	PAC29	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP13C
PA_EXP_A_TXN13	PAC30	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN13C
PA_EXP_A_TXP14	PAC31	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP14C
PA_EXP_A_TXN14	PAC33	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN14C
PA_EXP_A_TXP15	PAC34	0.22u/4/X5R/6.3V/K PA_EXP_A_TXP15C
PA_EXP_A_TXN15	PAC35	0.22u/4/X5R/6.3V/K PA_EXP_A_TXN15C

PA_EXP_A_RXP[0..15] >> PA_EXP_A_RXP[0..15] [8]
PA_EXP_A_RXN[0..15] >> PA_EXP_A_RXN[0..15] [8]
PA_EXP_A_TXP[0..15] >> PA_EXP_A_TXP[0..15] [8]
PA_EXP_A_TXN[0..15] >> PA_EXP_A_TXN[0..15] [8]

[12,21,23,24,25,28,30,31,35,39,40,41,44] N_SMBCLK
[12,21,23,24,25,28,30,31,35,39,40,41,44] N_SMBDATA
[12,21,23,24,25,44] N_-PCIE_WAKE
[12] PCIEX16_2_DET
[11,21,23,24] PCIE_X16_X8_RST

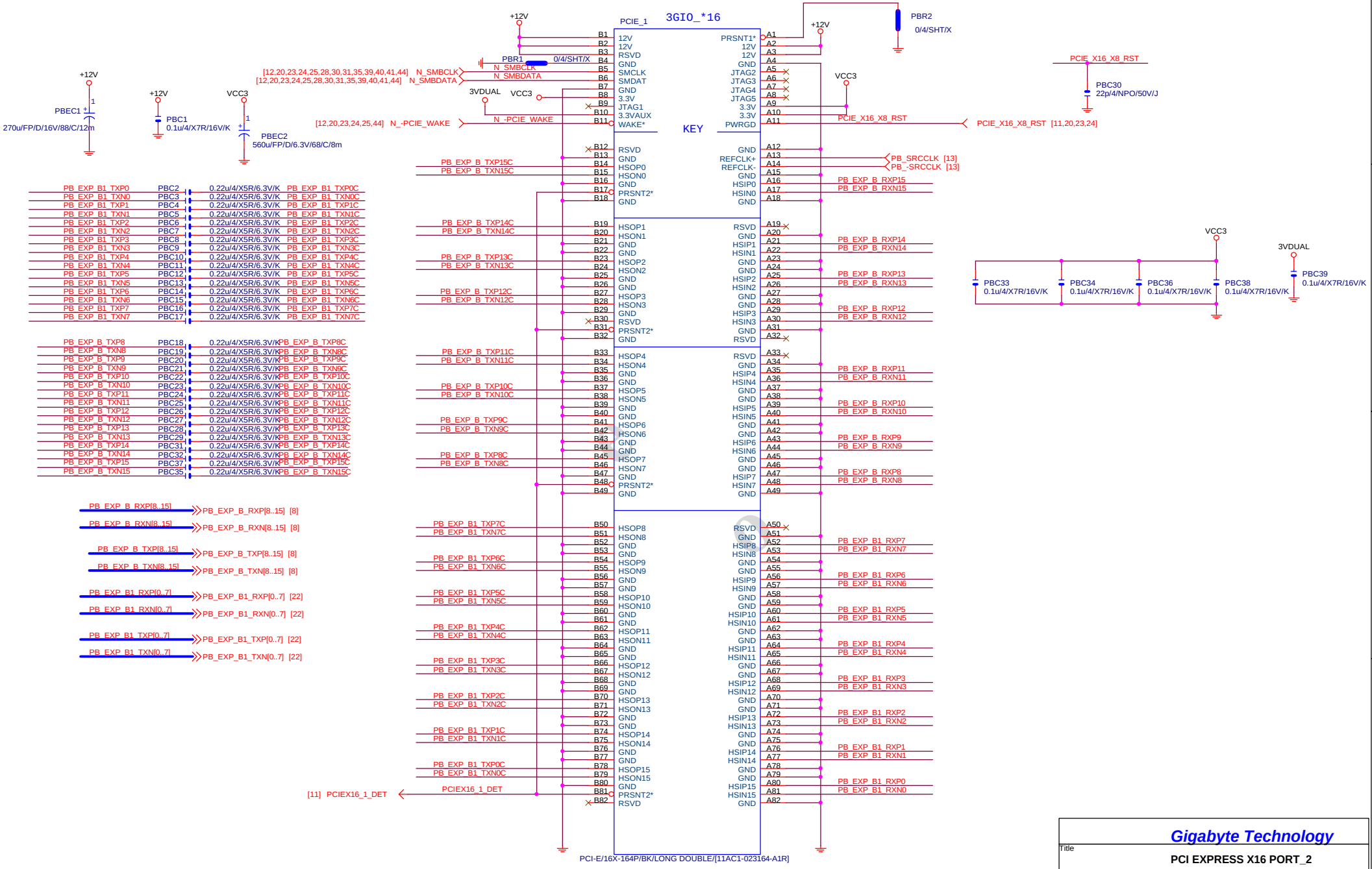
B1	12V	PRSNT1*	A1		
B2	12V	12V	A2	+12V	
B3	RSVD	12V	A3		
B4	GND	GND	A4		
B5	SMCLK	JTAG2	A5		
B6	SMDAT	JTAG3	A6		
B7	GND	JTAG4	A7		
B8	3.3V	JTAG5	A8		
B9	JTAG1	3.3V	A9	VCC3	
B10	3.3VAUX	3.3V	A10		
B11	WAKE*	PWRGD	A11	PCIE_X16_X8_RST	
B12	RSVD	GND	A12		
B13	GND	REFCLK+	A13	PA_SRCCLK [13]	
B14	HSOP0	REFCLK-	A14	PA_-SRCCLK [13]	
B15	HSON0	GND	A15		
B16	GND	HSIP0	A16	PA_EXP_A_RXP0	
B17	PRSNT2*	HSIN0	A17	PA_EXP_A_RXN0	
B18	GND	GND	A18		
B19	HSOP1	RSVD	A19		
B20	HSON1	GND	A20		
B21	GND	HSIP1	A21	PA_EXP_A_RXP1	
B22	GND	HSIN1	A22	PA_EXP_A_RXN1	
B23	HSOP2	GND	A23		
B24	HSON2	GND	A24		
B25	GND	HSIP2	A25	PA_EXP_A_RXP2	
B26	GND	HSIN2	A26	PA_EXP_A_RXN2	
B27	HSOP3	GND	A27		
B28	HSON3	GND	A28		
B29	GND	HSIP3	A29	PA_EXP_A_RXP3	
B30	RSVD	HSIN3	A30	PA_EXP_A_RXN3	
B31	PRSNT2*	GND	A31		
B32	GND	RSVD	A32		
B33	HSOP4	RSVD	A33		
B34	HSON4	GND	A34		
B35	GND	HSIP4	A35	PA_EXP_A_RXP4	
B36	GND	HSIN4	A36	PA_EXP_A_RXN4	
B37	HSOP5	GND	A37		
B38	HSON5	GND	A38		
B39	GND	HSIP5	A39	PA_EXP_A_RXP5	
B40	GND	HSIN5	A40	PA_EXP_A_RXN5	
B41	HSOP6	GND	A41		
B42	HSON6	GND	A42		
B43	GND	HSIP6	A43	PA_EXP_A_RXP6	
B44	GND	HSIN6	A44	PA_EXP_A_RXN6	
B45	HSOP7	GND	A45		
B46	HSON7	GND	A46		
B47	GND	HSIP7	A47	PA_EXP_A_RXP7	
B48	PRSNT2*	HSIN7	A48	PA_EXP_A_RXN7	
B49	GND	GND	A49		
B50	HSOP8	RSVD	A50		
B51	HSON8	GND	A51		
B52	GND	HSIP8	A52	PA_EXP_A_RXP8	
B53	GND	HSIN8	A53	PA_EXP_A_RXN8	
B54	HSOP9	GND	A54		
B55	HSON9	GND	A55		
B56	GND	HSIP9	A56	PA_EXP_A_RXP9	
B57	GND	HSIN9	A57	PA_EXP_A_RXN9	
B58	HSOP10	GND	A58		
B59	HSON10	GND	A59		
B60	GND	HSIP10	A60	PA_EXP_A_RXP10	
B61	GND	HSIN10	A61	PA_EXP_A_RXN10	
B62	HSOP11	GND	A62		
B63	HSON11	GND	A63		
B64	GND	HSIP11	A64	PA_EXP_A_RXP11	
B65	GND	HSIN11	A65	PA_EXP_A_RXN11	
B66	HSOP12	GND	A66		
B67	HSON12	GND	A67		
B68	GND	HSIP12	A68	PA_EXP_A_RXP12	
B69	GND	HSIN12	A69	PA_EXP_A_RXN12	
B70	HSOP13	GND	A70		
B71	HSON13	GND	A71		
B72	GND	HSIP13	A72	PA_EXP_A_RXP13	
B73	GND	HSIN13	A73	PA_EXP_A_RXN13	
B74	HSOP14	GND	A74		
B75	HSON14	GND	A75		
B76	GND	HSIP14	A76	PA_EXP_A_RXP14	
B77	GND	HSIN14	A77	PA_EXP_A_RXN14	
B78	HSOP15	GND	A78		
B79	HSON15	GND	A79		
B80	GND	HSIP15	A80	PA_EXP_A_RXP15	
B81	PRSNT2*	HSIN15	A81	PA_EXP_A_RXN15	
B82	RSVD	GND	A82		

PA_EXP_A_TXP0C
PA_EXP_A_TXN0C
PA_EXP_A_TXP1C
PA_EXP_A_TXN1C
PA_EXP_A_TXP2C
PA_EXP_A_TXN2C
PA_EXP_A_TXP3C
PA_EXP_A_TXN3C
PA_EXP_A_TXP4C
PA_EXP_A_TXN4C
PA_EXP_A_TXP5C
PA_EXP_A_TXN5C
PA_EXP_A_TXP6C
PA_EXP_A_TXN6C
PA_EXP_A_TXP7C
PA_EXP_A_TXN7C
PA_EXP_A_TXP8C
PA_EXP_A_TXN8C
PA_EXP_A_TXP9C
PA_EXP_A_TXN9C
PA_EXP_A_TXP10C
PA_EXP_A_TXN10C
PA_EXP_A_TXP11C
PA_EXP_A_TXN11C
PA_EXP_A_TXP12C
PA_EXP_A_TXN12C
PA_EXP_A_TXP13C
PA_EXP_A_TXN13C
PA_EXP_A_TXP14C
PA_EXP_A_TXN14C
PA_EXP_A_TXP15C
PA_EXP_A_TXN15C

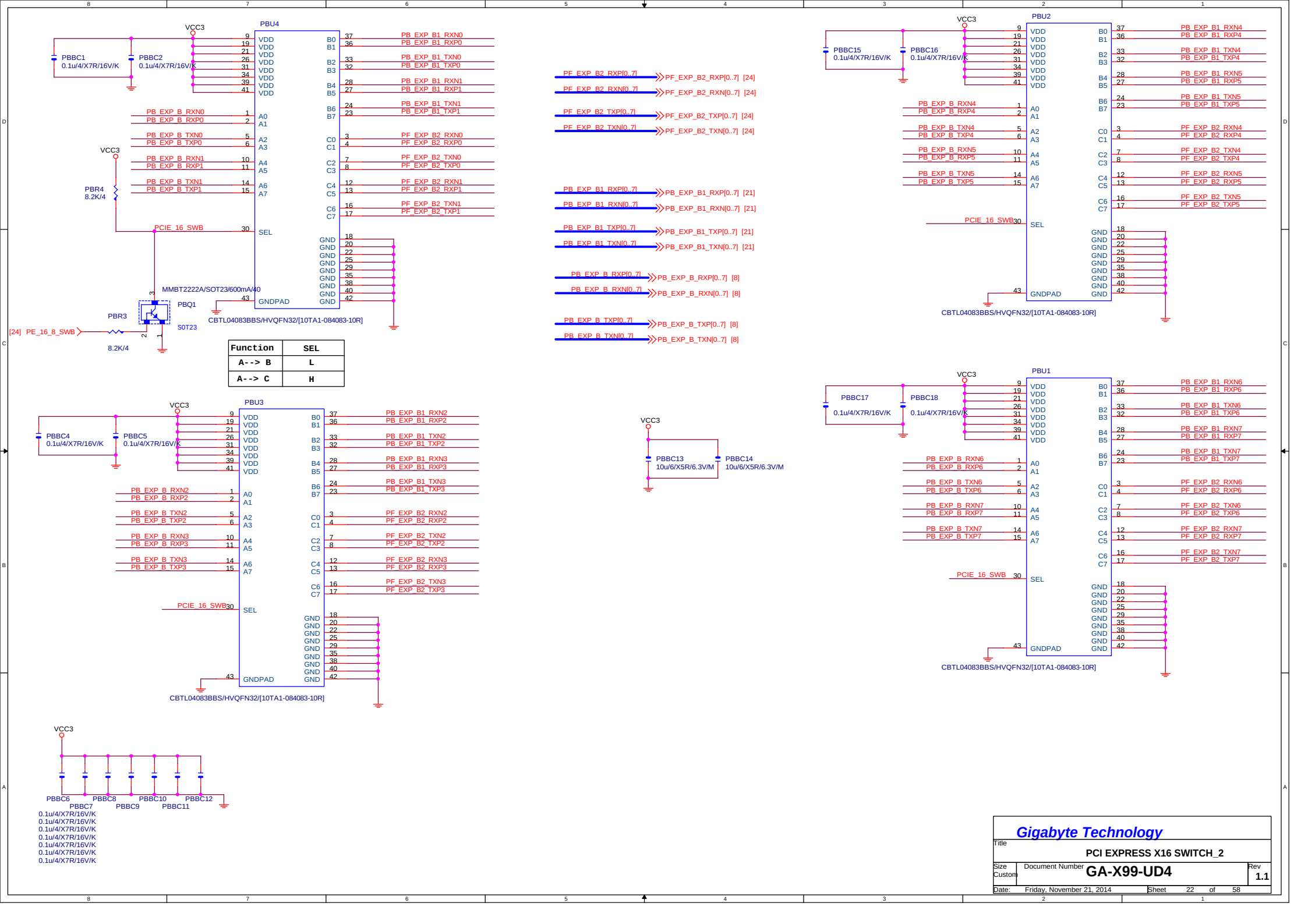
Gigabyte Technology

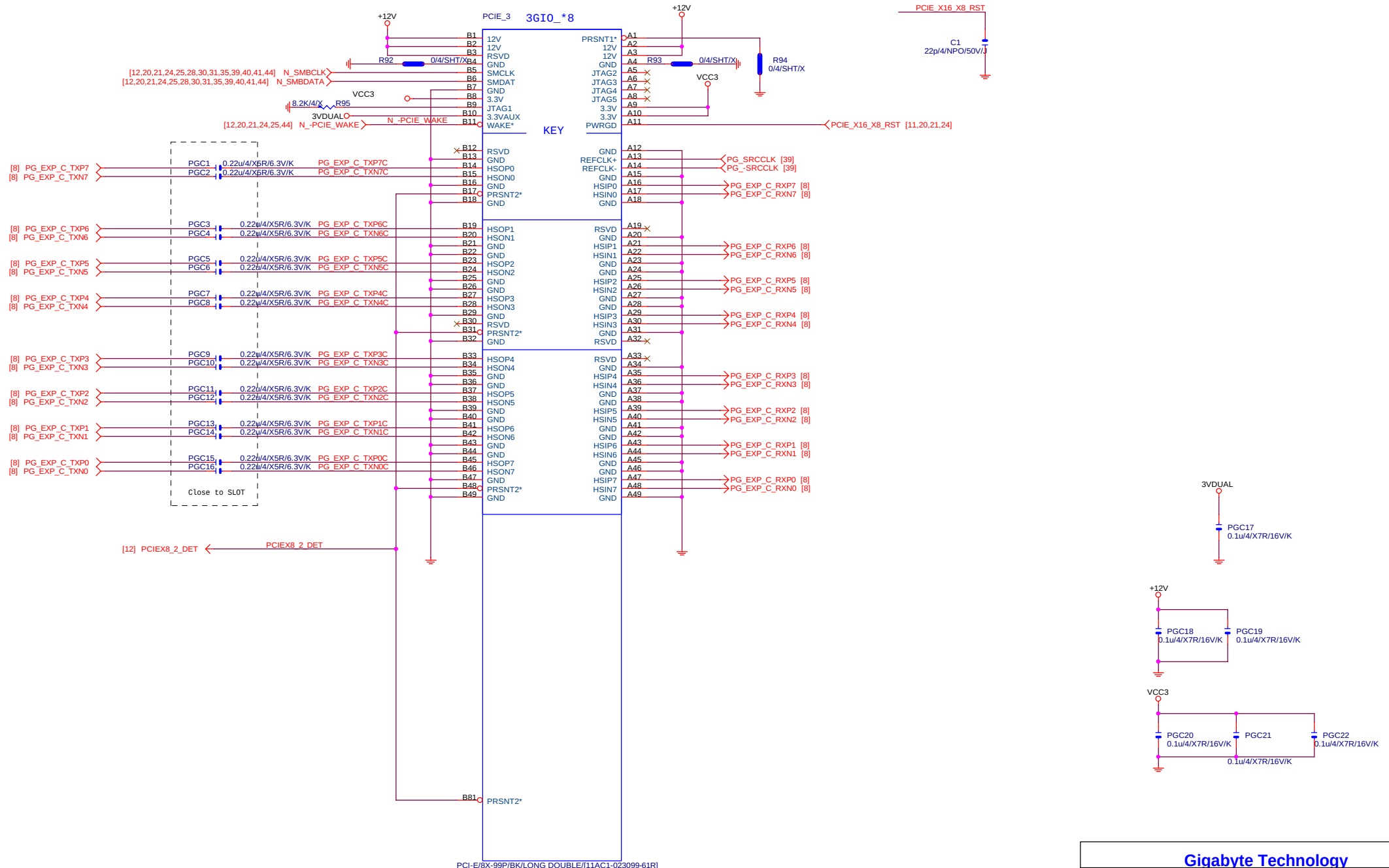
Title	PCI EXPRESS X16 PORT_1		
Size: Custom	Document Number: GA-X99-UD4		Rev: 1.1
Date: Friday, November 21, 2014	Sheet 20 of 58		

PCIESLOT-164DN-2

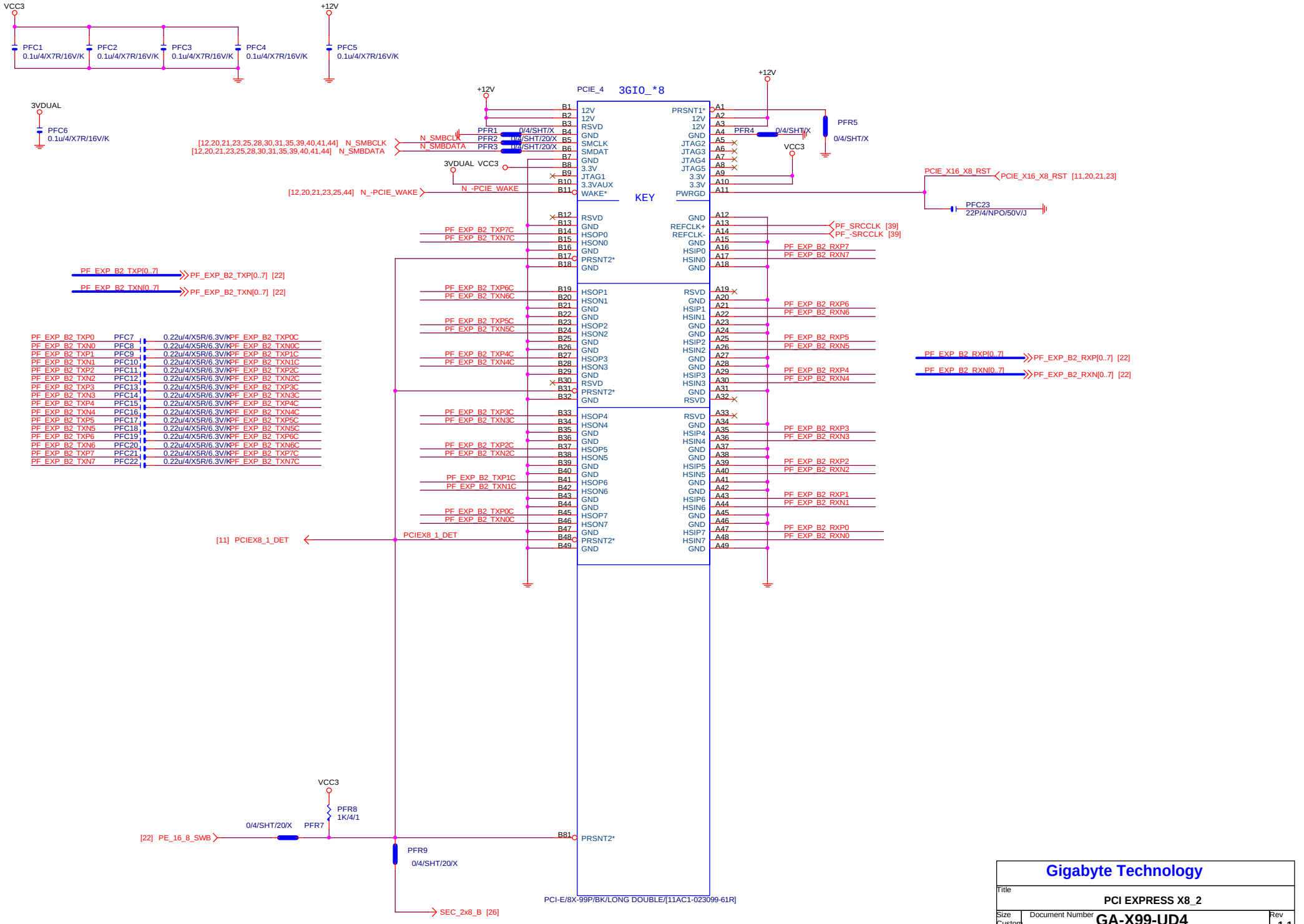


Gigabyte Technology	
Title	PCI EXPRESS X16 PORT_2
Size: Custom	Document Number: GA-X99-UD4
Rev: 1.1	
Date: Friday, November 21, 2014	Sheet 21 of 58


PBU4
VCC3
PBBC1 0.1u/4/X7R/16V/K
PBBC2 0.1u/4/X7R/16V/K
PBR4 8.2K/4
PCIE_16_SWB
MMBT2222A/SOT23/600mA/40
PBQ1
S0T23
PBR3
[24] PE_16_8_SWB
8.2K/4
CBTL04083BBS/HVQFN32/[10TA1-084083-10R]
PB_EXP_B_RXN0
PB_EXP_B_RXP0
PB_EXP_B_TXN0
PB_EXP_B_TXP0
PB_EXP_B_RXN1
PB_EXP_B_RXP1
PB_EXP_B_TXN1
PB_EXP_B_TXP1
PB_EXP_B1_RXN0
PB_EXP_B1_RXP0
PB_EXP_B1_TXN0
PB_EXP_B1_TXP0
PB_EXP_B1_RXN1
PB_EXP_B1_RXP1
PB_EXP_B1_TXN1
PB_EXP_B1_TXP1
PF_EXP_B2_RXN0
PF_EXP_B2_RXP0
PF_EXP_B2_TXN0
PF_EXP_B2_TXP0
PF_EXP_B2_RXN1
PF_EXP_B2_RXP1
PF_EXP_B2_TXN1
PF_EXP_B2_TXP1
PF_EXP_B2_RXP[0..7] [24]
PF_EXP_B2_RXN[0..7] [24]
PF_EXP_B2_TXP[0..7] [24]
PF_EXP_B2_TXN[0..7] [24]
PB_EXP_B1_RXP[0..7] [21]
PB_EXP_B1_RXN[0..7] [21]
PB_EXP_B1_TXP[0..7] [21]
PB_EXP_B1_TXN[0..7] [21]
PB_EXP_B_RXP[0..7] [8]
PB_EXP_B_RXN[0..7] [8]
PB_EXP_B_TXP[0..7] [8]
PB_EXP_B_TXN[0..7] [8]
Function | SEL
A--> B | L
A--> C | H
PBU3
PBBC4 0.1u/4/X7R/16V/K
PBBC5 0.1u/4/X7R/16V/K
PB_EXP_B_RXN2
PB_EXP_B_RXP2
PB_EXP_B_TXN2
PB_EXP_B_TXP2
PB_EXP_B_RXN3
PB_EXP_B_RXP3
PB_EXP_B_TXN3
PB_EXP_B_TXP3
PB_EXP_B1_RXN2
PB_EXP_B1_RXP2
PB_EXP_B1_TXN2
PB_EXP_B1_TXP2
PB_EXP_B1_RXN3
PB_EXP_B1_RXP3
PB_EXP_B1_TXN3
PB_EXP_B1_TXP3
PF_EXP_B2_RXN2
PF_EXP_B2_RXP2
PF_EXP_B2_TXN2
PF_EXP_B2_TXP2
PF_EXP_B2_RXN3
PF_EXP_B2_RXP3
PF_EXP_B2_TXN3
PF_EXP_B2_TXP3
CBTL04083BBS/HVQFN32/[10TA1-084083-10R]
PBBC13 10u/6/X5R/6.3V/M
PBBC14 10u/6/X5R/6.3V/M
PBU2
PBBC15 0.1u/4/X7R/16V/K
PBBC16 0.1u/4/X7R/16V/K
PB_EXP_B_RXN4
PB_EXP_B_RXP4
PB_EXP_B_TXN4
PB_EXP_B_TXP4
PB_EXP_B_RXN5
PB_EXP_B_RXP5
PB_EXP_B_TXN5
PB_EXP_B_TXP5
PB_EXP_B1_RXN4
PB_EXP_B1_RXP4
PB_EXP_B1_TXN4
PB_EXP_B1_TXP4
PB_EXP_B1_RXN5
PB_EXP_B1_RXP5
PB_EXP_B1_TXN5
PB_EXP_B1_TXP5
PF_EXP_B2_RXN4
PF_EXP_B2_RXP4
PF_EXP_B2_TXN4
PF_EXP_B2_TXP4
PF_EXP_B2_RXN5
PF_EXP_B2_RXP5
PF_EXP_B2_TXN5
PF_EXP_B2_TXP5
CBTL04083BBS/HVQFN32/[10TA1-084083-10R]
PBU1
PBBC17 0.1u/4/X7R/16V/K
PBBC18 0.1u/4/X7R/16V/K
PB_EXP_B_RXN6
PB_EXP_B_RXP6
PB_EXP_B_TXN6
PB_EXP_B_TXP6
PB_EXP_B_RXN7
PB_EXP_B_RXP7
PB_EXP_B_TXN7
PB_EXP_B_TXP7
PB_EXP_B1_RXN6
PB_EXP_B1_RXP6
PB_EXP_B1_TXN6
PB_EXP_B1_TXP6
PB_EXP_B1_RXN7
PB_EXP_B1_RXP7
PB_EXP_B1_TXN7
PB_EXP_B1_TXP7
PF_EXP_B2_RXN6
PF_EXP_B2_RXP6
PF_EXP_B2_TXN6
PF_EXP_B2_TXP6
PF_EXP_B2_RXN7
PF_EXP_B2_RXP7
PF_EXP_B2_TXN7
PF_EXP_B2_TXP7
CBTL04083BBS/HVQFN32/[10TA1-084083-10R]
PBBC6 PBBC8 PBBC10 PBBC12
PBBC7 PBBC9 PBBC11
0.1u/4/X7R/16V/K
Gigabyte Technology
Title
PCI EXPRESS X16 SWITCH_2
Size Custom
Document Number GA-X99-UD4
Rev 1.1
Date: Friday, November 21, 2014
Sheet 22 of 58

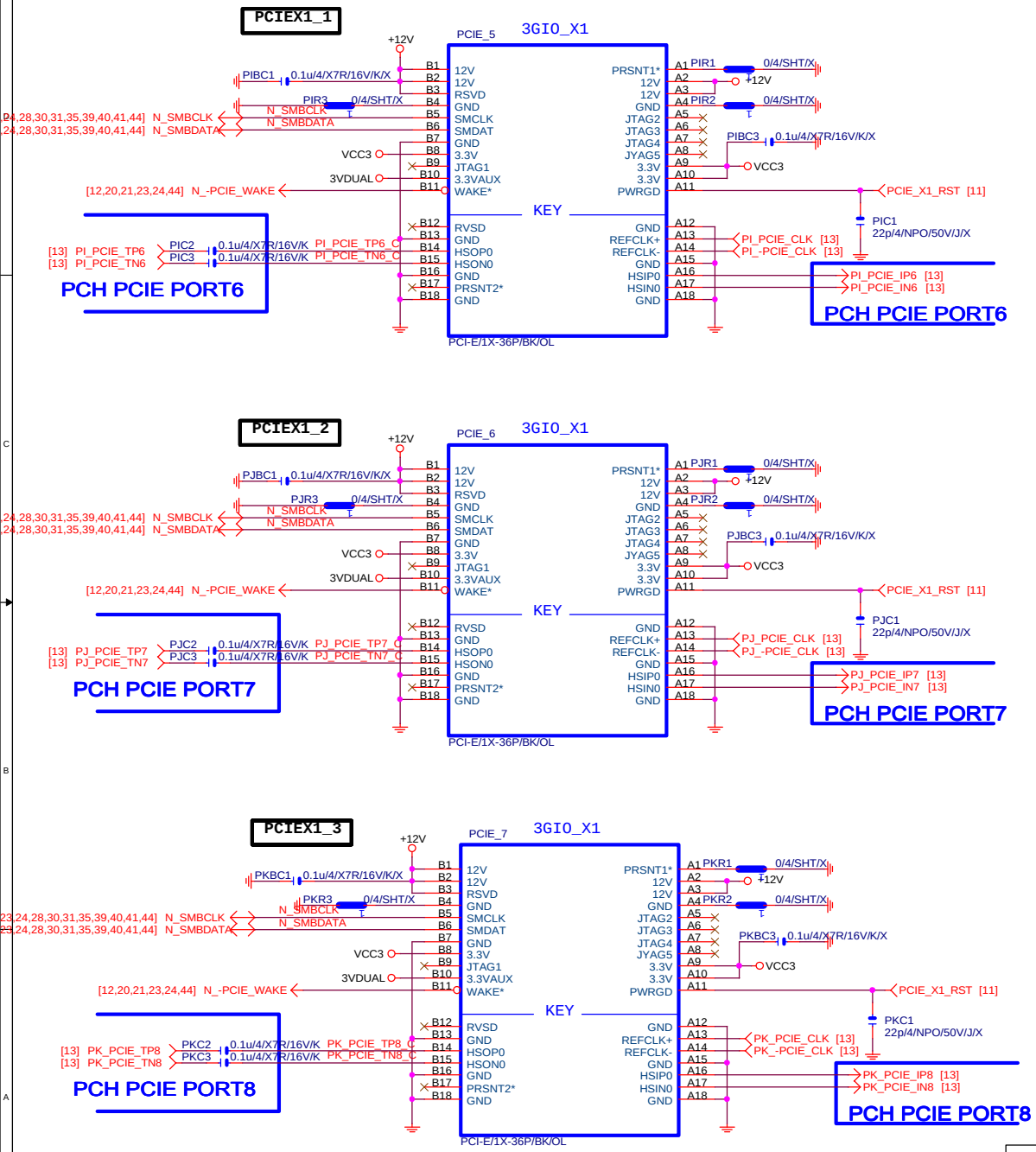


Gigabyte Technology		
Title	PCI EXPRESS X 8 PORT	
Size: Custom	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 23 of 58	

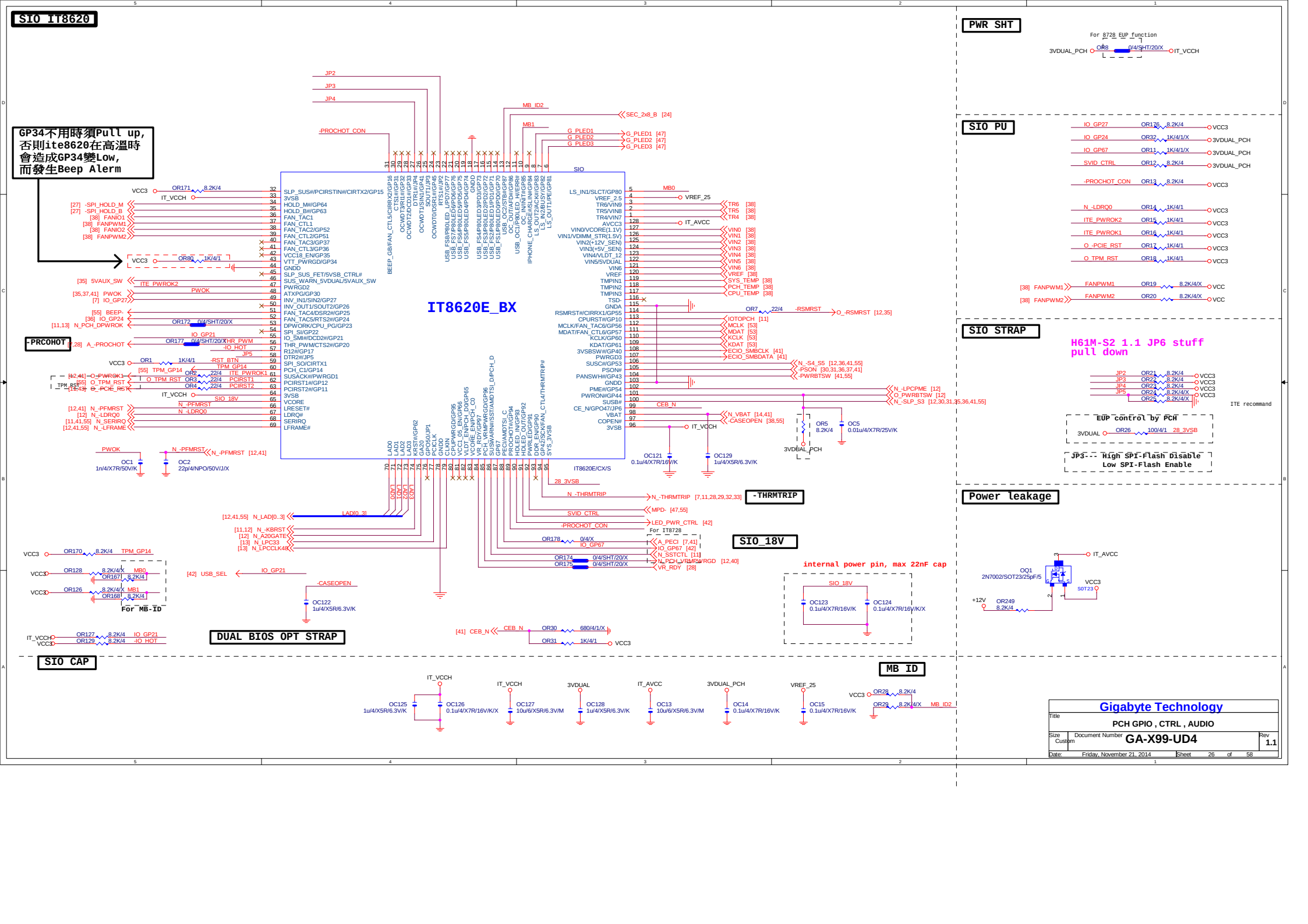


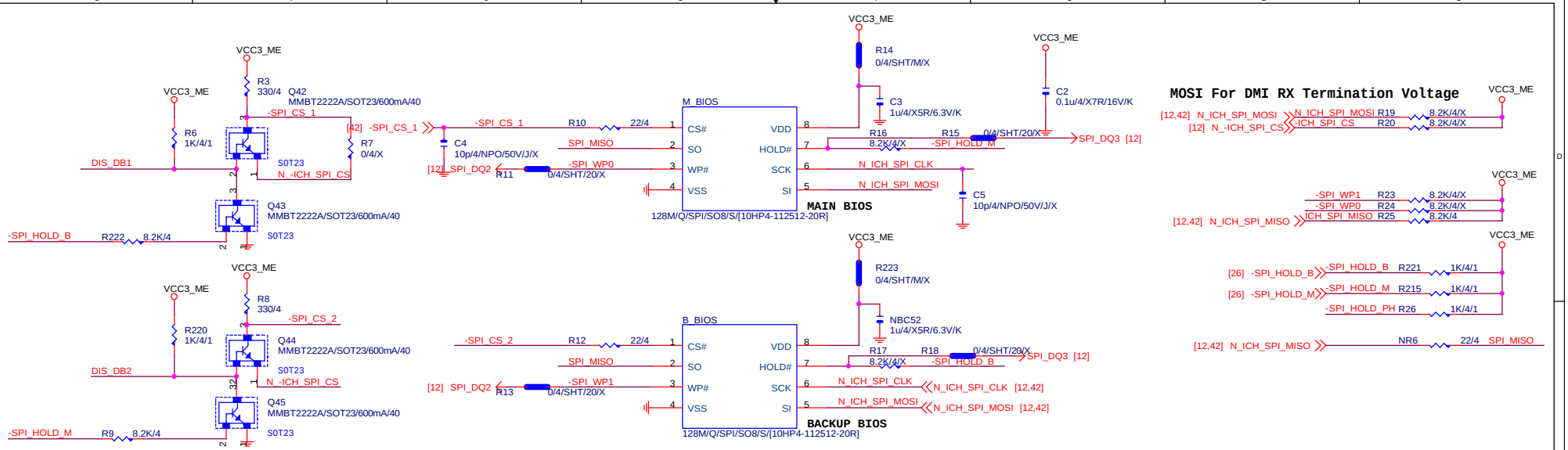
Gigabyte Technology	
Title	PCI EXPRESS X8_2
Size: Custom	Document Number: GA-X99-UD4
Rev	1.1
Date:	Friday, November 21, 2014
Sheet	24 of 58

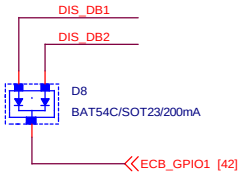
PCIEX1 SLOT



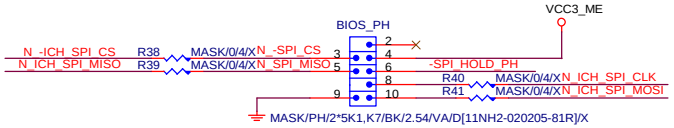
Gigabyte Technology		
Title: PCIE_X1 1,2,3		
Size: Custom	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 25 of 58	

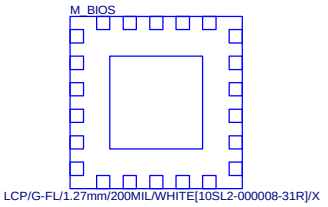

SIO IT8620
GP34不用時須Pull up,
否則ite8620在高溫時
會造成GP34變Low,
而發生Beep Alerm
IT8620E_BX
SIO
IT8620E/CX/S
-PRCOHOT
-THRMTRIP
SIO_18V
DUAL BIOS OPT STRAP
For MB-ID
SIO CAP
PWR SHT
For 8728 EUP function
SIO PU
SIO STRAP
H61M-S2 1.1 JP6 stuff
pull down
EUP control by PCH
JP3--- High SPI-Flash Disable
Low SPI-Flash Enable
Power leakage
internal power pin, max 22nF cap
MB ID
Gigabyte Technology
PCH GPIO , CTRL , AUDIO
GA-X99-UD4
Rev 1.1
Friday, November 21, 2014
Sheet 26 of 58



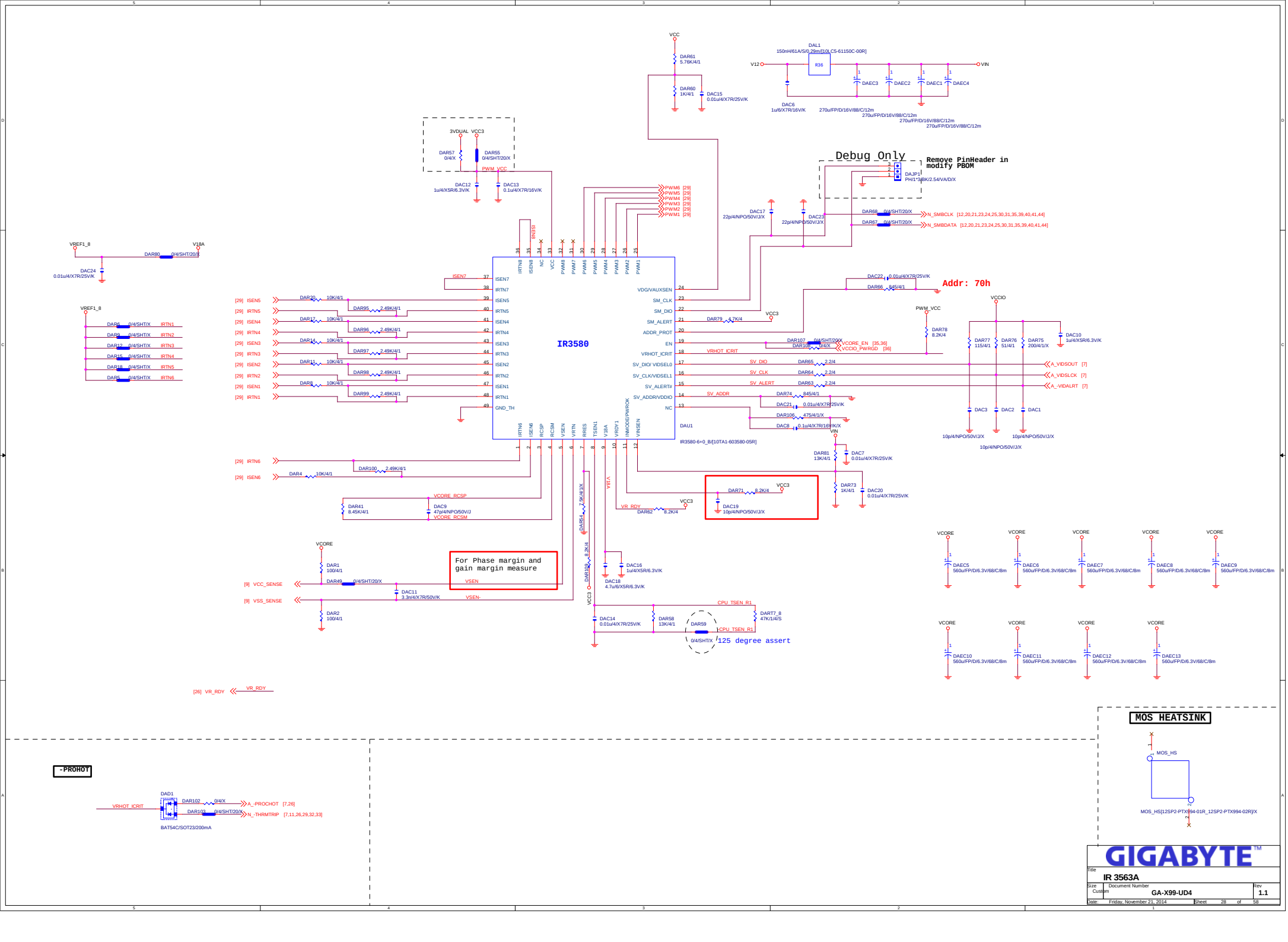


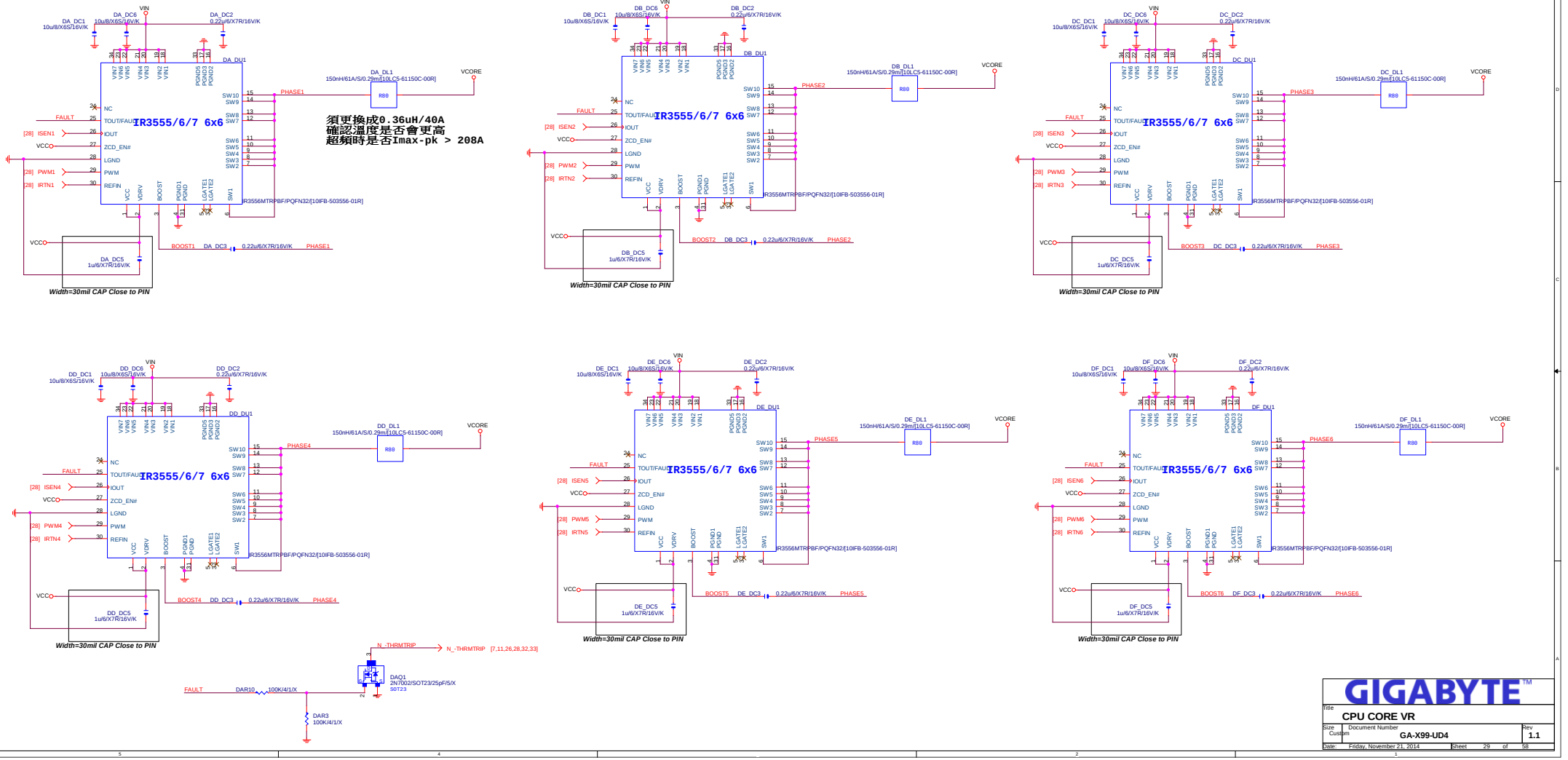
BIOS_PH

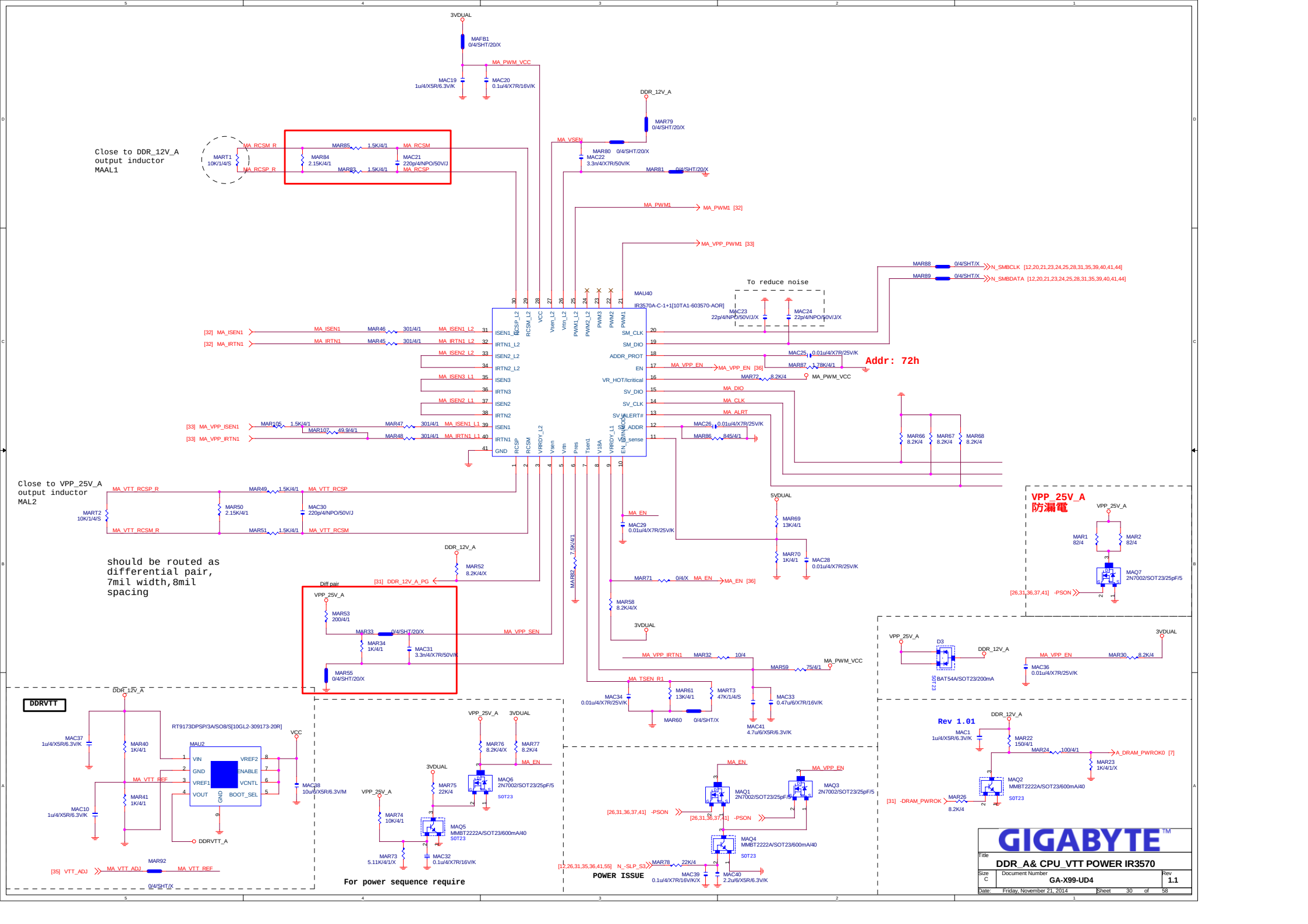


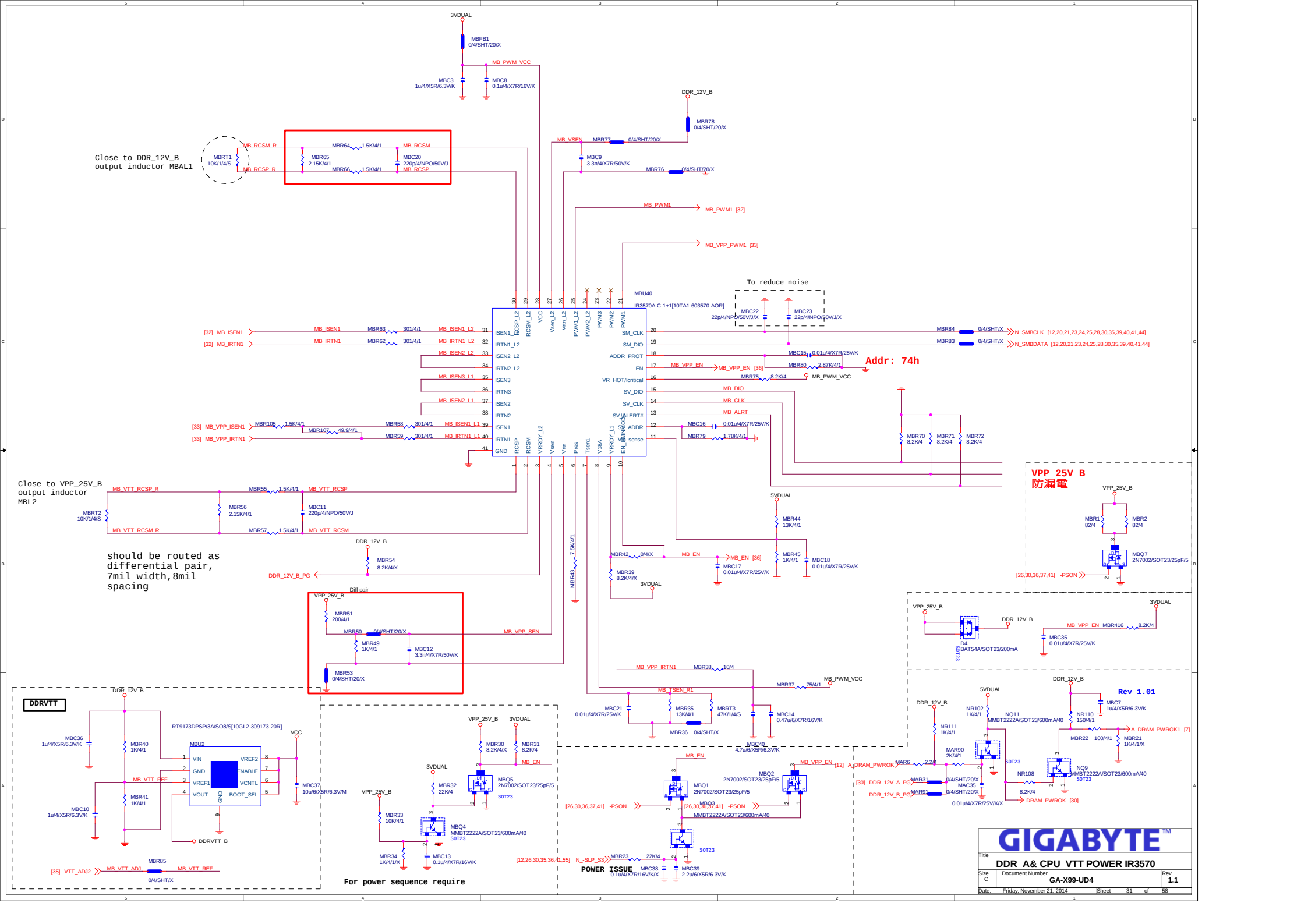


	Gigabyte Technology	
Title	DUAL BIOS TPM	
Size: Custom	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 27 of 58	


IR3580
IR3580-6+0_B/[10TA1-603580-05R]
DAU1
Debug Only
Remove PinHeader in modify PBOM
Addr: 70h
For Phase margin and gain margin measure
125 degree assert
-PROHOT
MOS HEATSINK
MOS_HS
MOS_HS[12SP2-PTX994-01R_12SP2-PTX994-02R]/X
BAT54C/SOT23/200mA
GIGABYTE
Title
IR 3563A
Size
Custom
Document Number
GA-X99-UD4
Rev
1.1
Date:
Friday, November 21, 2014
Sheet
28
of
58

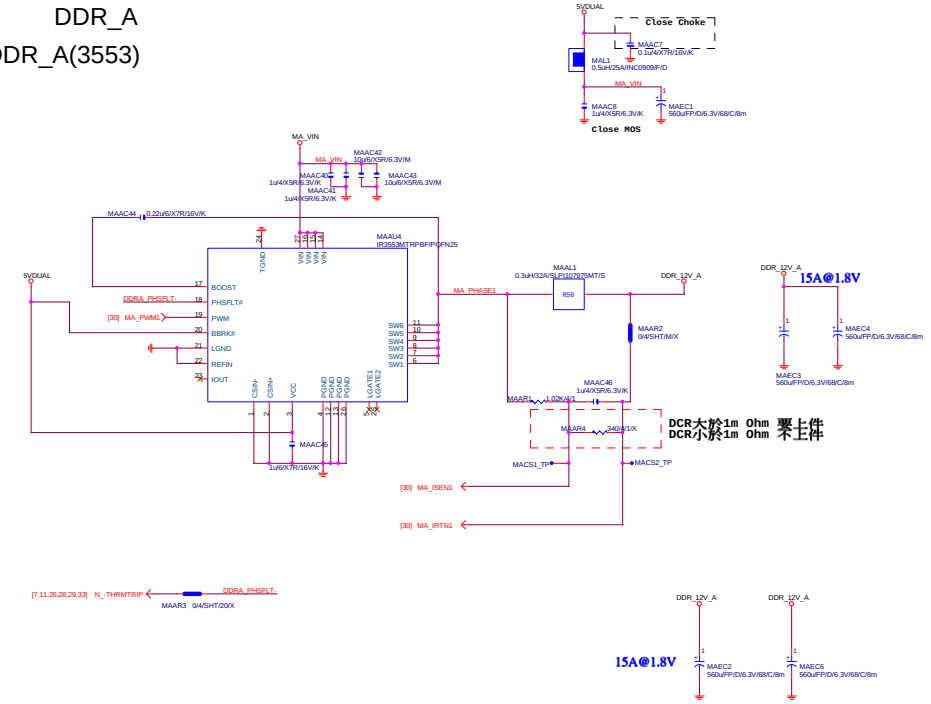

DA_DC1 10u/8/X6S/16V/K
DA_DC6 10u/8/X6S/16V/K
DA_DC2 0.22u/6/X7R/16V/K
VIN
DA_DU1
IR3555/6/7 6x6
R3556MTRPBF/PQFN32/[10IFB-503556-01R]
DA_DL1 150nH/61A/S/0.29m/[10LC5-61150C-00R]
R80
PHASE1
VCORE
須更換成0.36uH/40A
確認溫度是否會更高
超頻時是否Imax-pk > 208A
DA_DC5 1u/6/X7R/16V/K
BOOST1 DA_DC3 0.22u/6/X7R/16V/K PHASE1
Width=30mil CAP Close to PIN
DB_DC1 10u/8/X6S/16V/K
DB_DC6 10u/8/X6S/16V/K
DB_DC2 0.22u/6/X7R/16V/K
DB_DU1
DB_DL1 150nH/61A/S/0.29m/[10LC5-61150C-00R]
PHASE2
DB_DC5 1u/6/X7R/16V/K
BOOST2 DB_DC3 0.22u/6/X7R/16V/K PHASE2
Width=30mil CAP Close to PIN
DC_DC1 10u/8/X6S/16V/K
DC_DC6 10u/8/X6S/16V/K
DC_DC2 0.22u/6/X7R/16V/K
DC_DU1
DC_DL1 150nH/61A/S/0.29m/[10LC5-61150C-00R]
PHASE3
DC_DC5 1u/6/X7R/16V/K
BOOST3 DC_DC3 0.22u/6/X7R/16V/K PHASE3
Width=30mil CAP Close to PIN
DD_DC1 10u/8/X6S/16V/K
DD_DC6 10u/8/X6S/16V/K
DD_DC2 0.22u/6/X7R/16V/K
DD_DU1
DD_DL1 150nH/61A/S/0.29m/[10LC5-61150C-00R]
PHASE4
DD_DC5 1u/6/X7R/16V/K
BOOST4 DD_DC3 0.22u/6/X7R/16V/K PHASE4
Width=30mil CAP Close to PIN
DE_DC1 10u/8/X6S/16V/K
DE_DC6 10u/8/X6S/16V/K
DE_DC2 0.22u/6/X7R/16V/K
DE_DU1
DE_DL1 150nH/61A/S/0.29m/[10LC5-61150C-00R]
PHASE5
DE_DC5 1u/6/X7R/16V/K
BOOST5 DE_DC3 0.22u/6/X7R/16V/K PHASE5
Width=30mil CAP Close to PIN
DF_DC1 10u/8/X6S/16V/K
DF_DC6 10u/8/X6S/16V/K
DF_DC2 0.22u/6/X7R/16V/K
DF_DU1
DF_DL1 150nH/61A/S/0.29m/[10LC5-61150C-00R]
PHASE6
DF_DC5 1u/6/X7R/16V/K
BOOST6 DF_DC3 0.22u/6/X7R/16V/K PHASE6
Width=30mil CAP Close to PIN
N_THRMTRIP
N_THRMTRIP [7,11,26,28,32,33]
DAQ1 2N7002/SOT23/25pF/5/X SOT23
FAULT
DAR10 100K/4/1/X
DAR3 100K/4/1/X
GIGABYTE
Title
CPU CORE VR
Size Custom
Document Number GA-X99-UD4
Rev 1.1
Date: Friday, November 21, 2014
Sheet 29 of 58


Close to DDR_12V_A output inductor MAAL1
Close to VPP_25V_A output inductor MAL2
should be routed as differential pair, 7mil width,8mil spacing
Diff pair
To reduce noise
Addr: 72h
VPP_25V_A 防漏電
DDRVTT
For power sequence require
POWER ISSUE
Rev 1.01
GIGABYTE
DDR_A& CPU_VTT POWER IR3570
GA-X99-UD4
1.1
Friday, November 21, 2014
30 of 58


Close to DDR_12V_B output inductor MBAL1
Close to VPP_25V_B output inductor MBL2
should be routed as differential pair, 7mil width,8mil spacing
Diff pair
To reduce noise
Addr: 74h
VPP_25V_B 防漏電
DDRVTT
For power sequence require
POWER ISSUE
Rev 1.01
GIGABYTE
DDR_A& CPU_VTT POWER IR3570
GA-X99-UD4
1.1
Friday, November 21, 2014
31 of 58

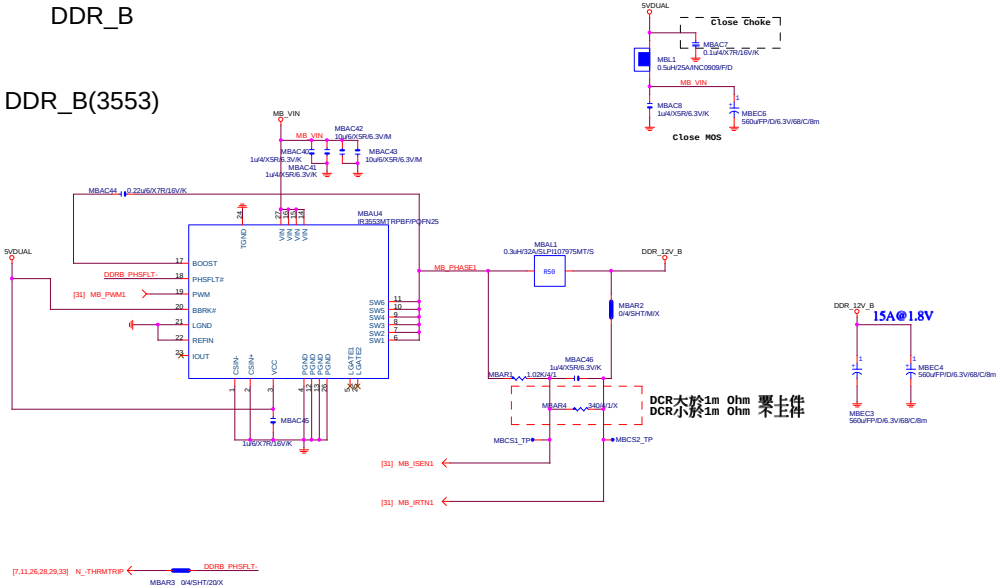
DDR_A

DDR_A(3553)



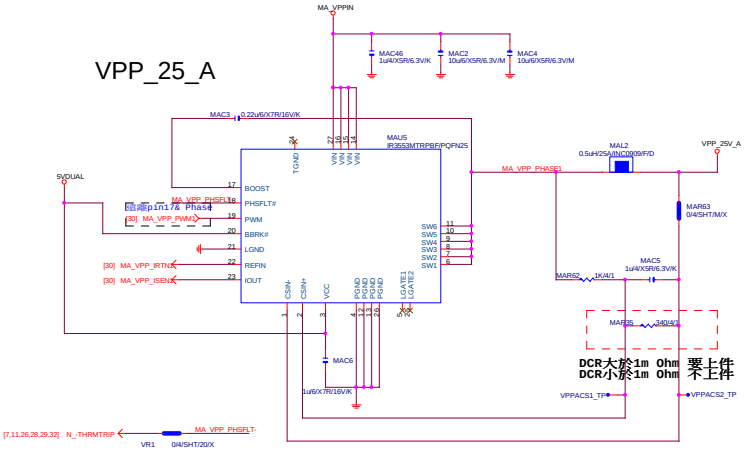
DDR_B

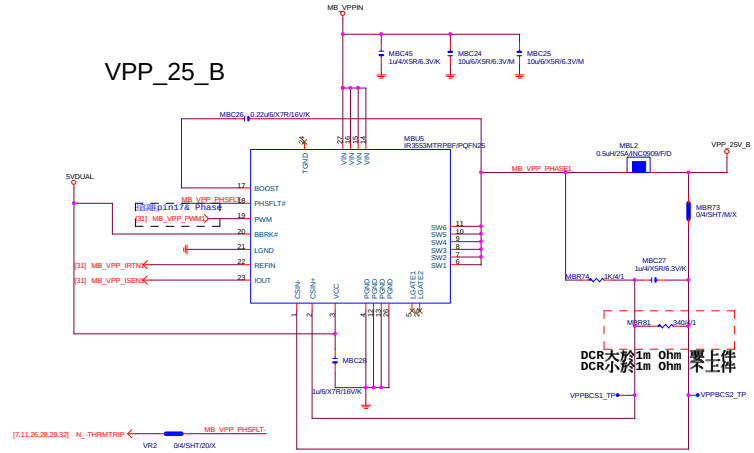
DDR_B(3553)

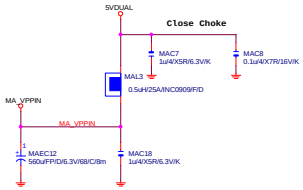


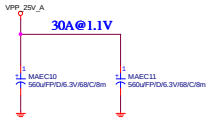
GIGABYTE

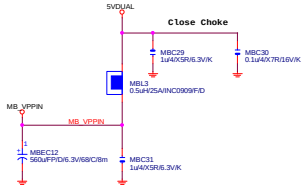
Title	ISL6322 CPUVTT	
Size: Custom	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 32 of 58	

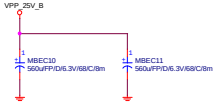




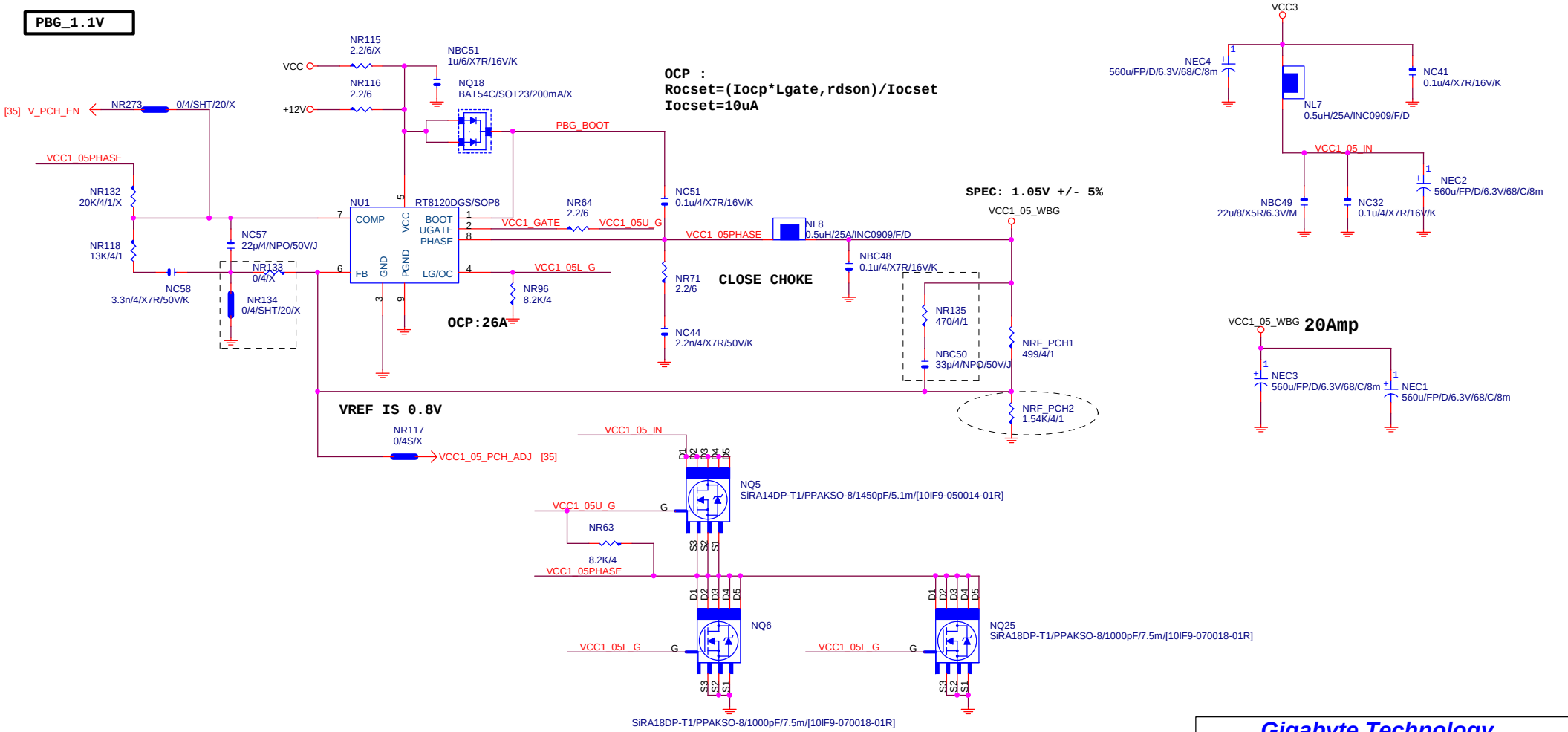






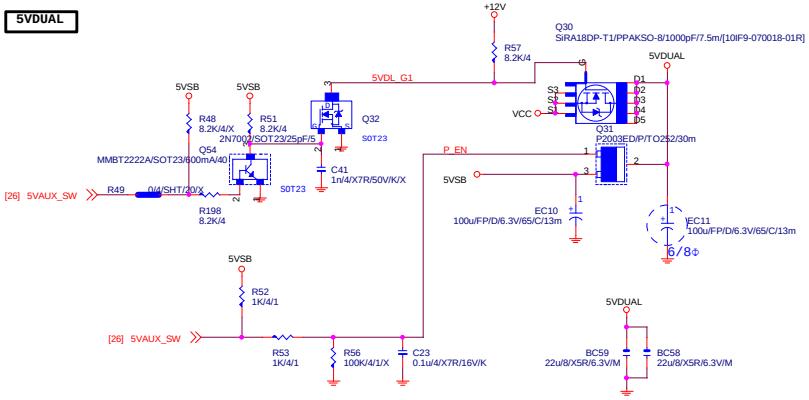


Title	<Title>	
Size	Document Number	Rev
Custom	DA-X99-UD4	1.1
Date:	Friday, November 21, 2014	Sheet 33 of 58

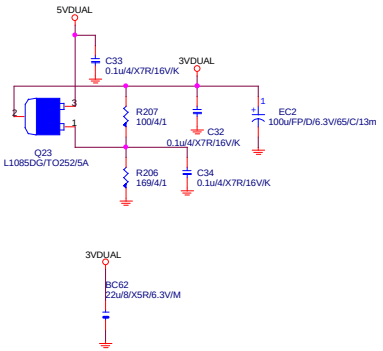


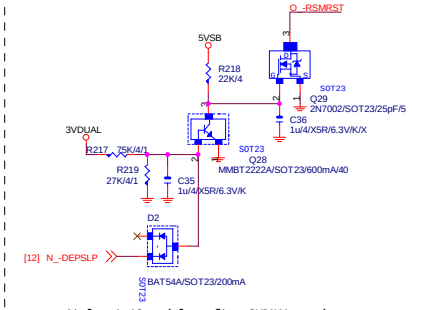
Gigabyte Technology		
Title: ISL6545 PCH		
Size: Custom	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 34 of 58	

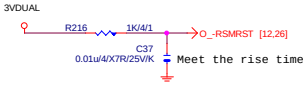
5VDUAL

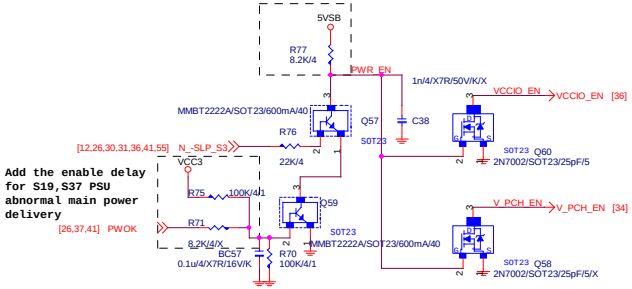


3VDUAL_LDO

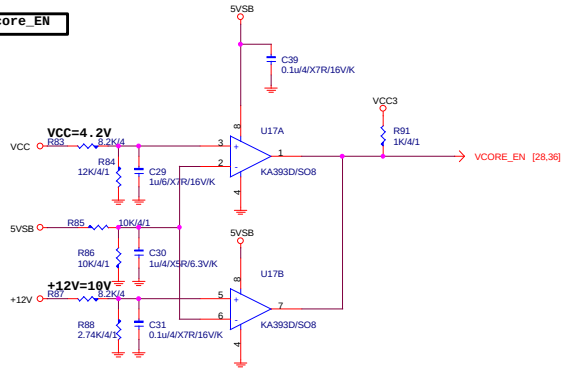


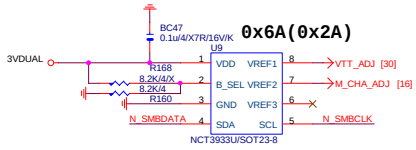


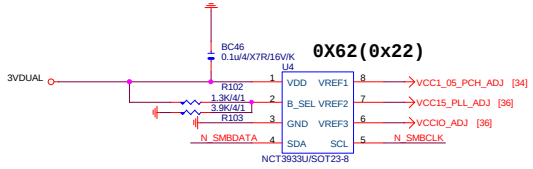


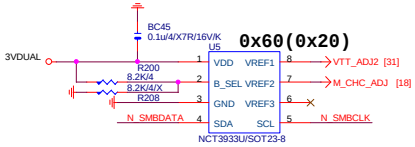


Vcore_EN









N_SMBCLK ↔ N_SMBCLK [12,20,21,23,24,25,28,30,31,39,40,41,44]

N_SMBDATA ↔ N_SMBDATA [12,20,21,23,24,25,28,30,31,39,40,41,44]

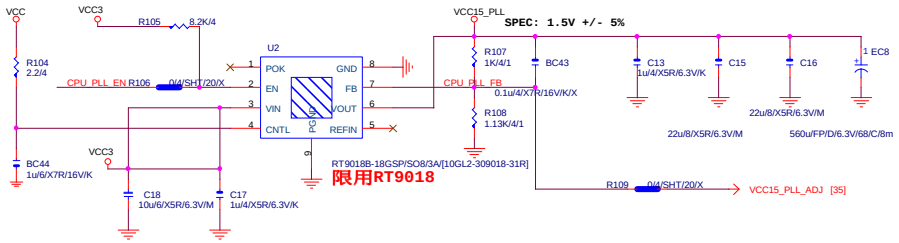
Gigabyte Technology

Title: **DISCRETE POWER**

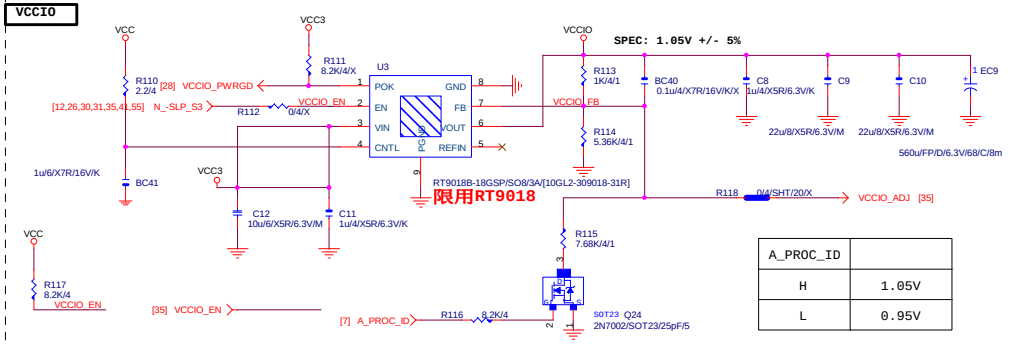
Size	Document Number	Rev
C	GA-X99-UD4	1.1

Date: Friday, November 21, 2014 Sheet 35 of 58

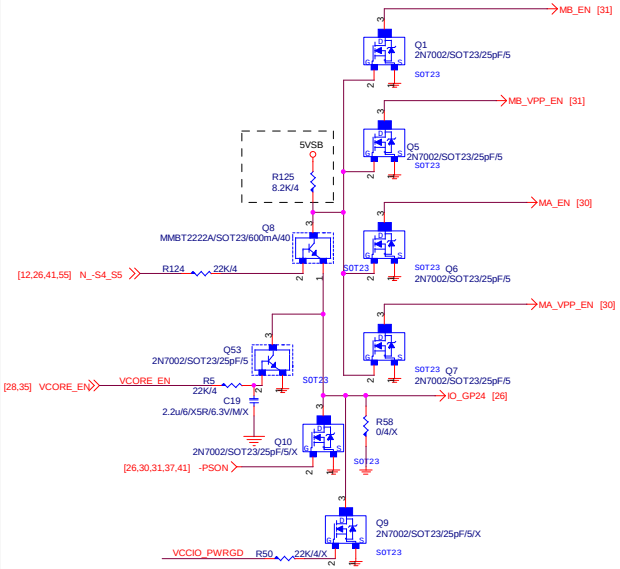
VCC15_PLL

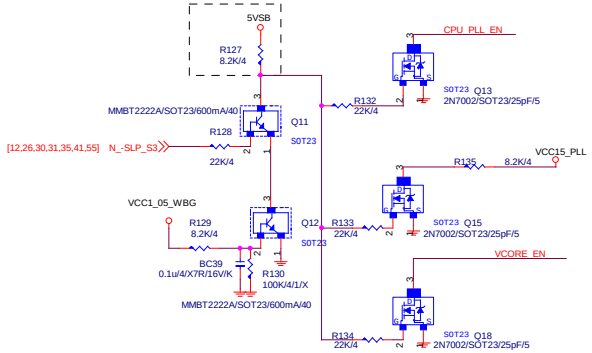


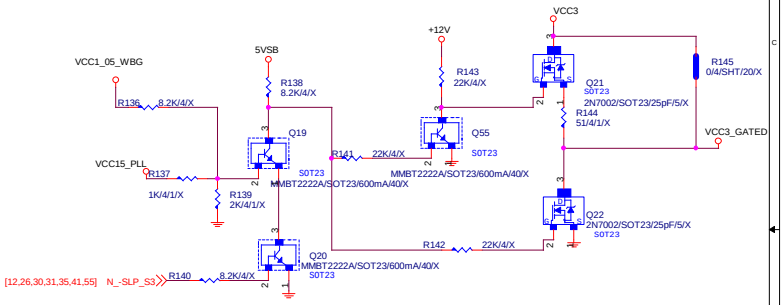
VCCIO



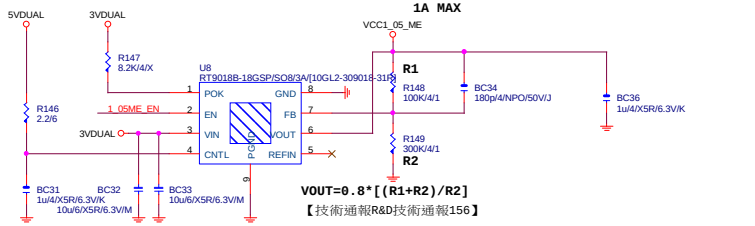
A_PROC_ID	
H	1.05V
L	0.95V

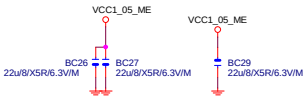




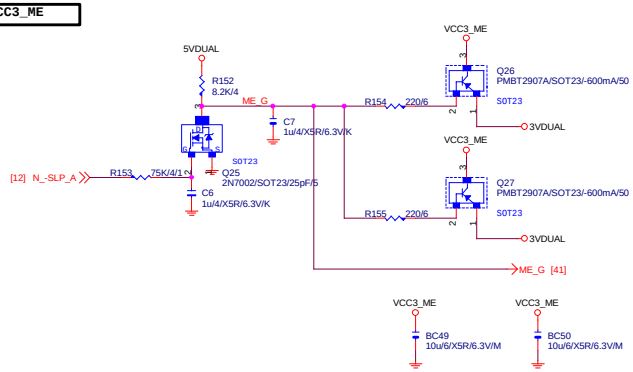


VCC1_05_ME



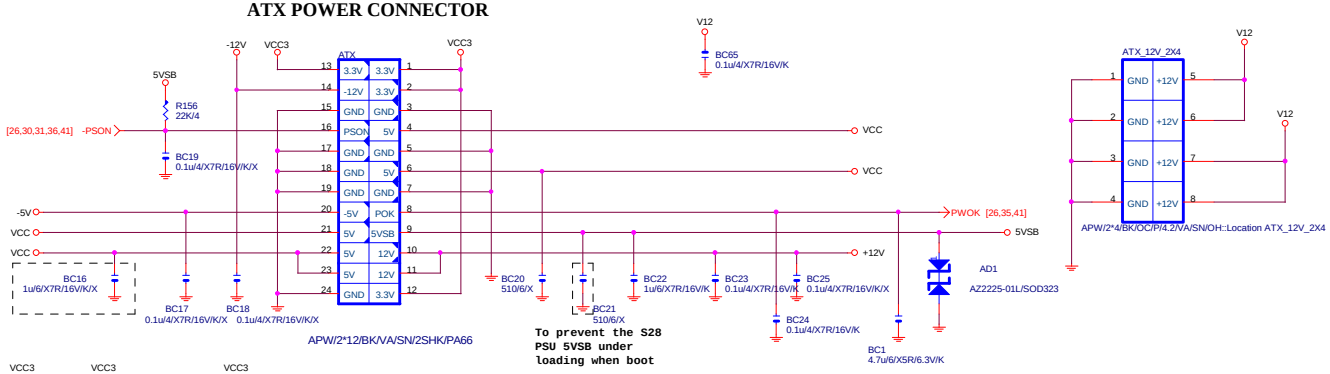


VCC3_ME

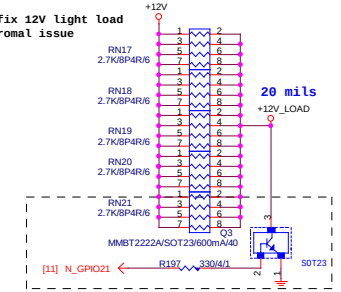


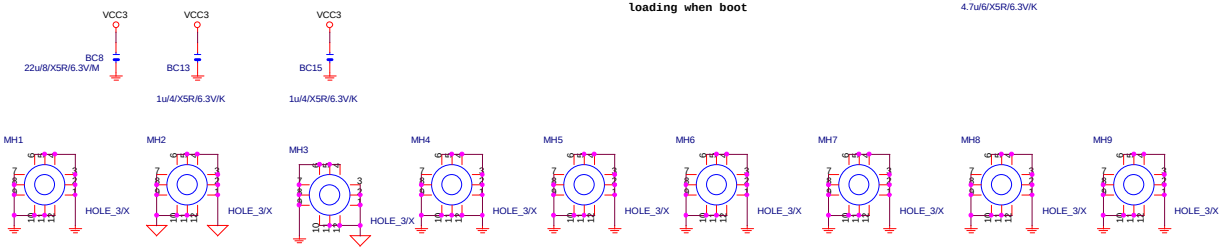
Gigabyte Technology		
Title: DISCRETE POWER II		
Size: C	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 36 of 58	

ATX POWER CONNECTOR

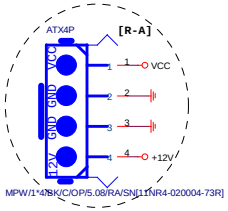


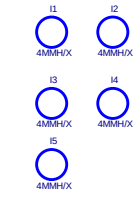
To fix 12V light load abnormal issue



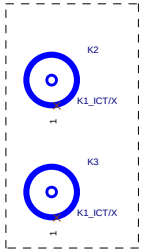


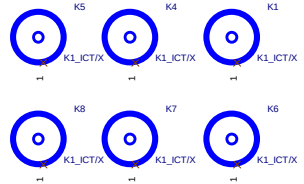
OVER CLOCKING





For CPU





INPUT				OUTPUT	
PR	CL	CLOCK	DATA	Q	-Q
L	H	X	X	H	L
H	L	X	X	L	H
L	L	X	X	H	H
H	H	Rising	H	H	L
H	H	Rising	L	L	H
H	H	L	X	No Change	
H	H	H	X	No Change	
H	H	Falling	X	No Change	

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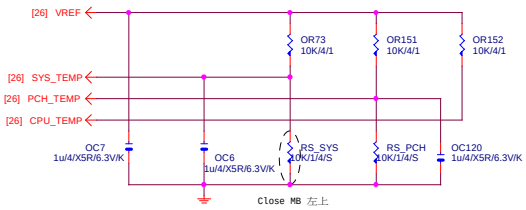
Title: ATX / CLOCK BUFFER

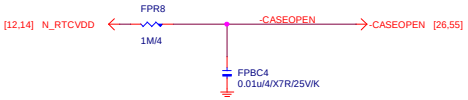
Size: C | Document Number: GA-X99-UD4 | Rev: 1.1

Date: Friday, November 21, 2014 | Sheet 37 of 58

TEMP H/W MONITOR

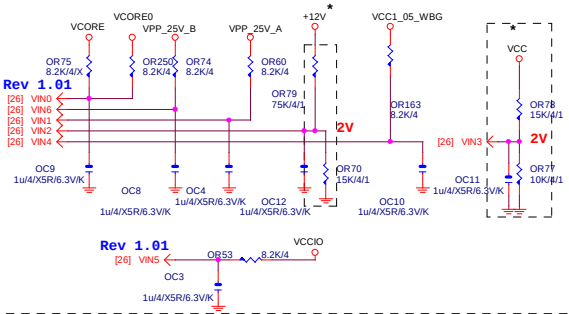


CASE OPEN

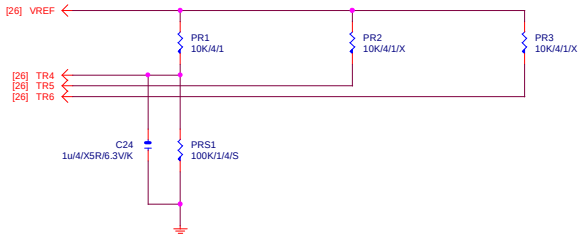


VOLTAGE-- H/W MONITOR

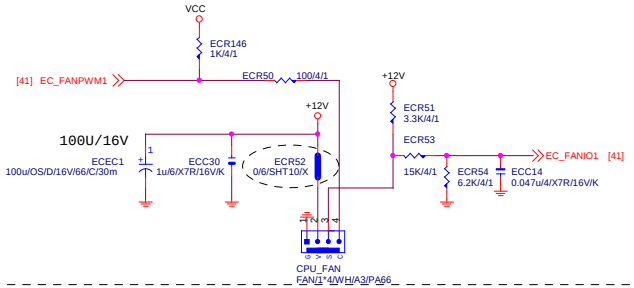
VIN2 must +12V input
VIN3 must VCC input



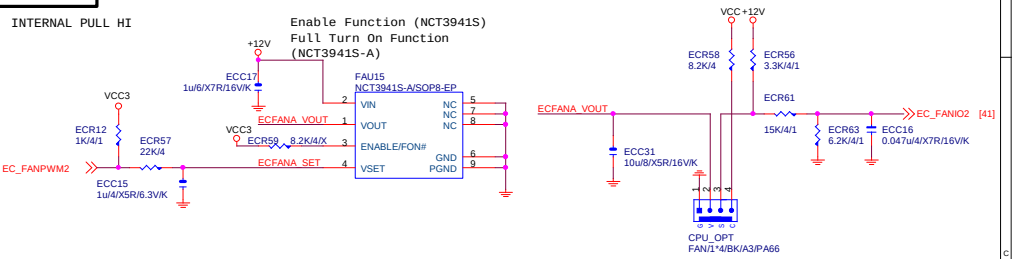
8620 PROCHOT



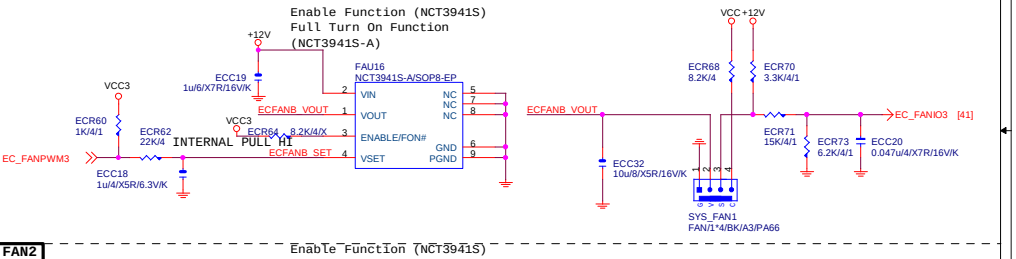
CPU SMART FAN



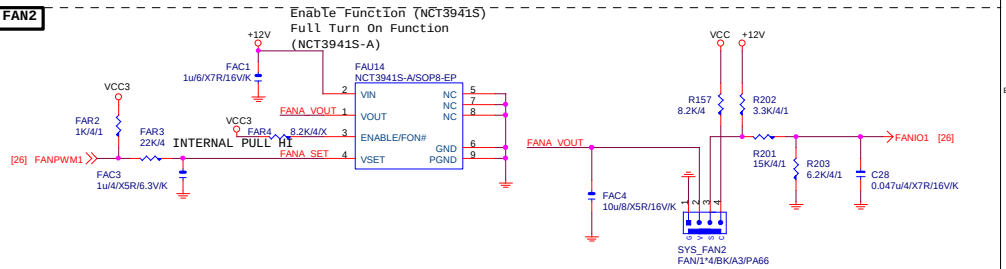
CPUOPT FAN



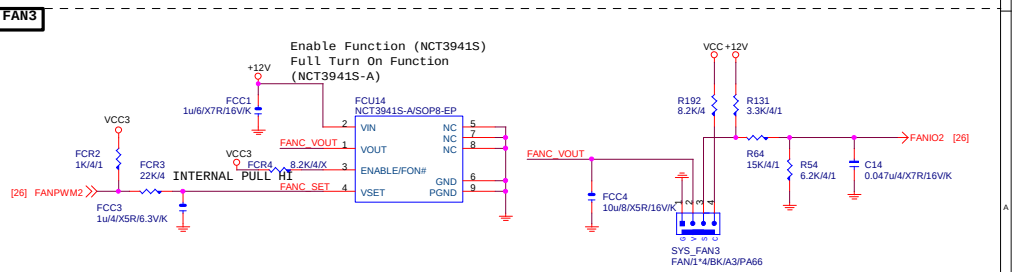
SYS FAN1



SYS FAN2



SYS FAN3

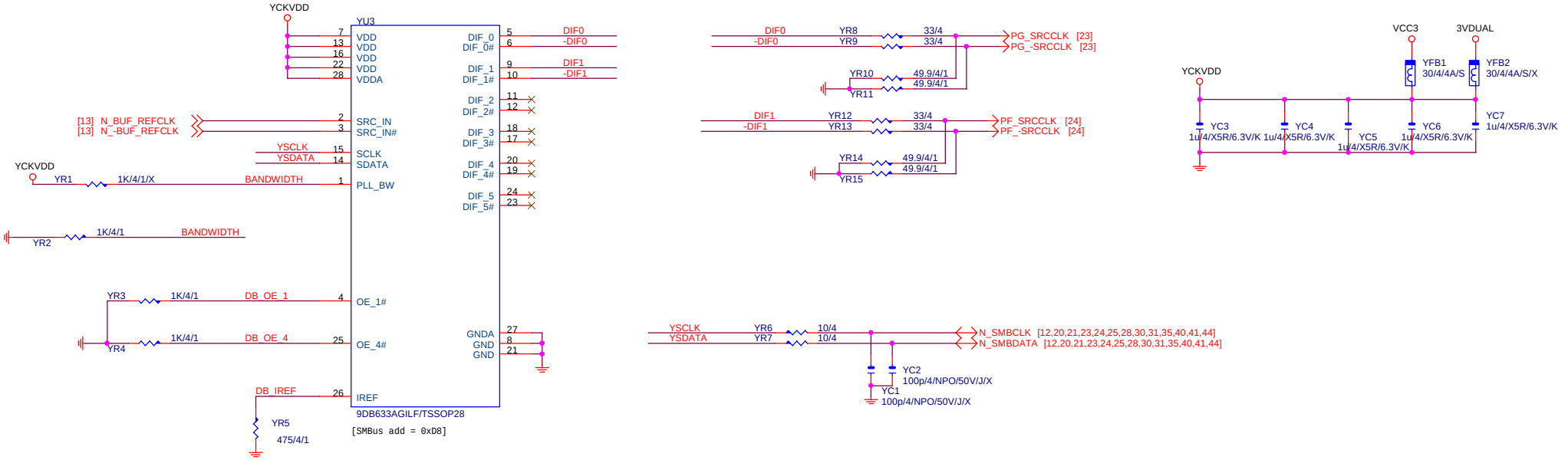


Gigabyte Technology

Title: HWM,FAN CTRL

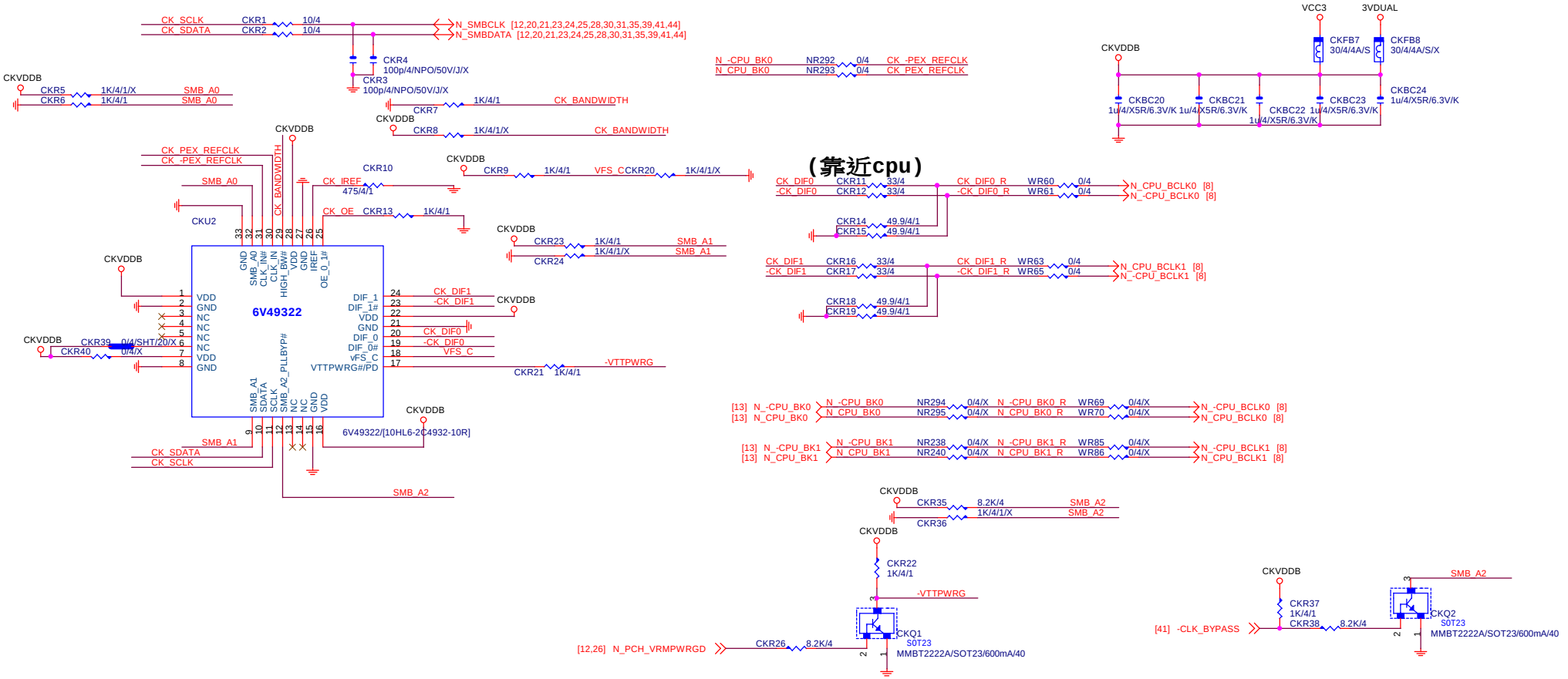
Size: Custom | Document Number: GA-X99-UD4 | Rev: 1.1

Date: Friday, November 21, 2014 | Sheet 38 of 58



GIGABYTE™

Title: REFCLK		
Size: Custom	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 39 of 58	



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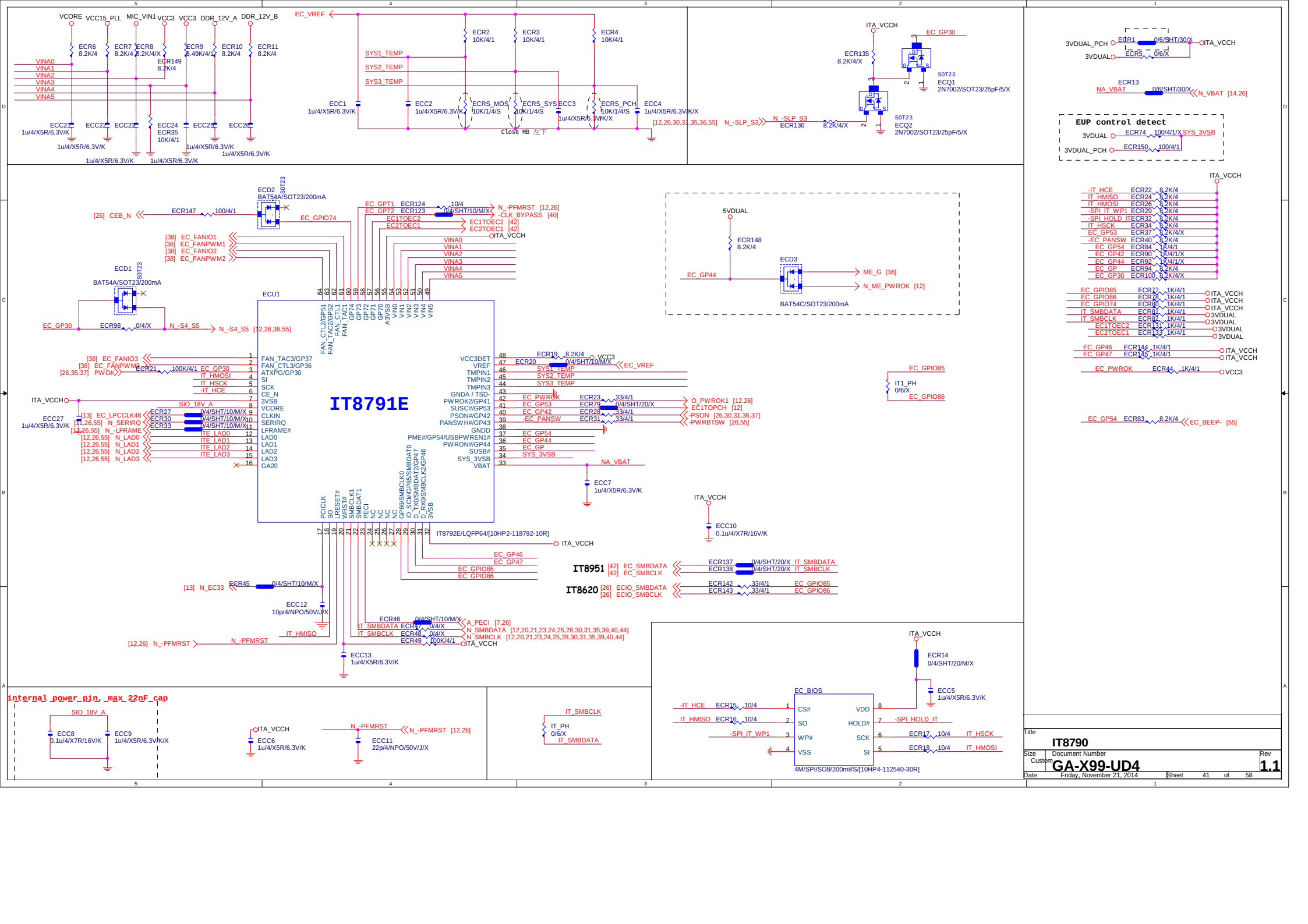
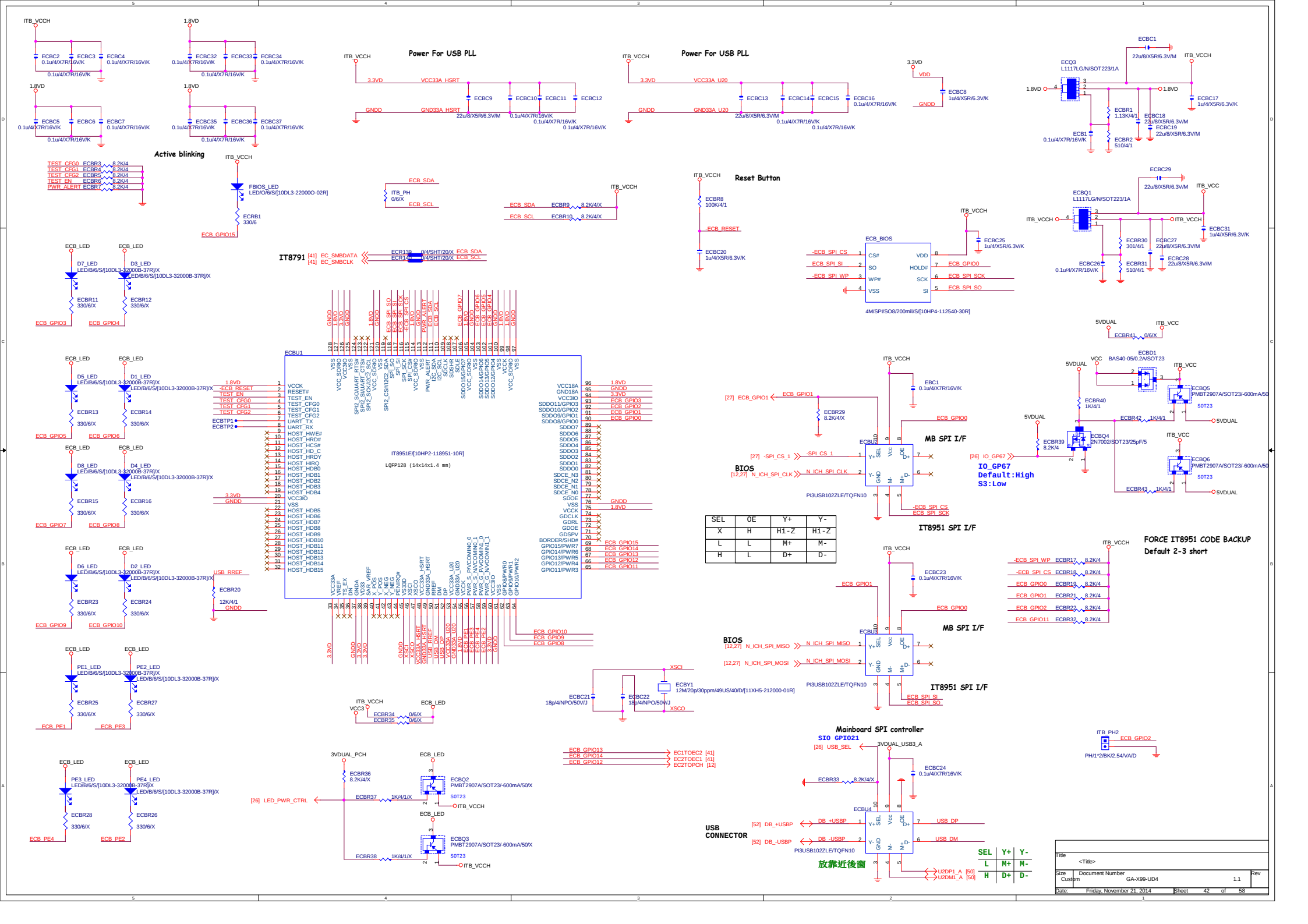
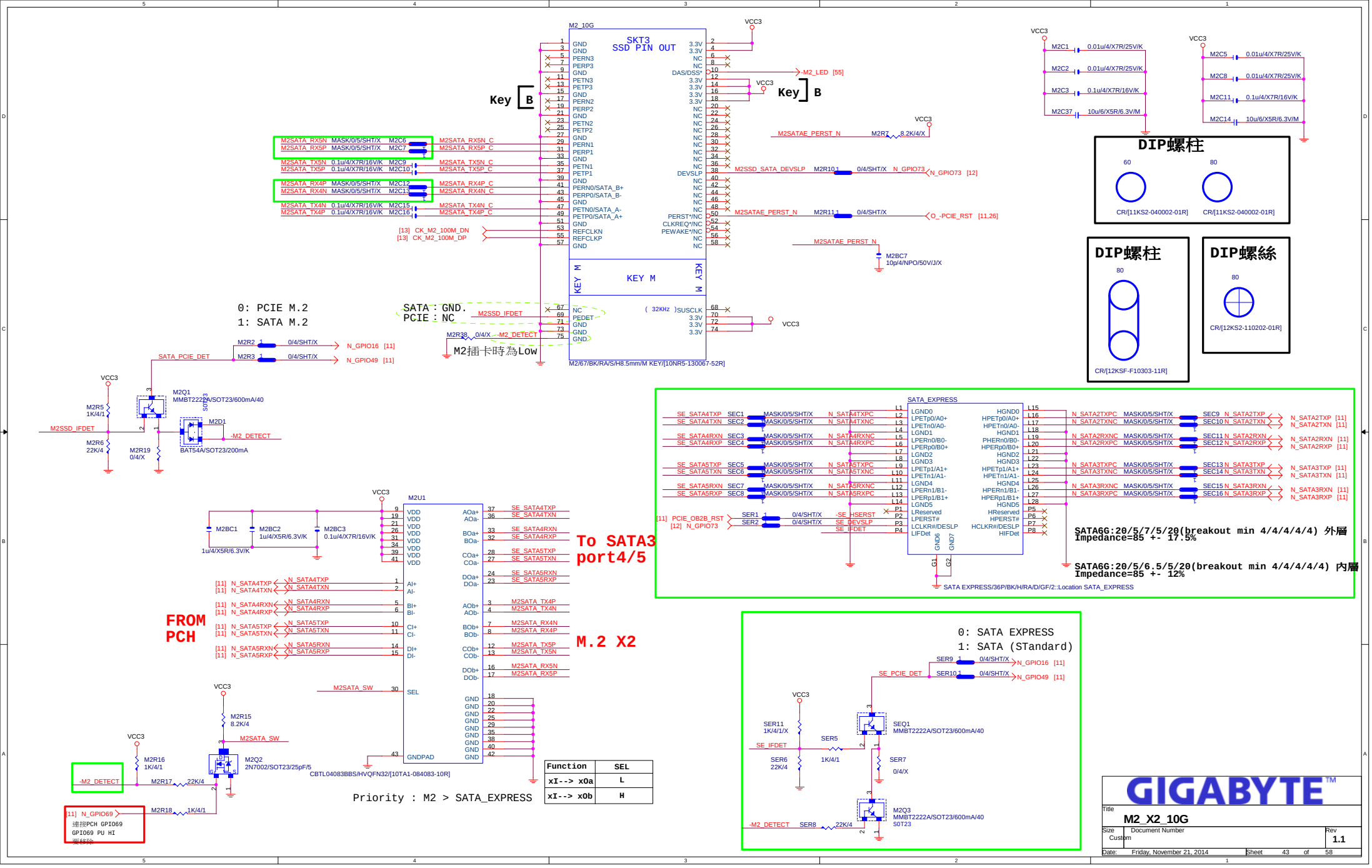
Title: PCH DISPLAY ,CLK BUFFER

Size	Document Number	Rev
Custom	GA-X99-UD4	1.1

Date: Friday, November 21, 2014 Sheet 40 of 58


IT8791E
ECU1
EUP control detect
internal power pin, max 22nF cap
IT8790
GA-X99-UD4
Rev 1.1
Friday, November 21, 2014
Sheet 41 of 58
IT8792E/LQFP64[10HP2-118792-10R]
4M/SPI/SO8/200mil/S/[10HP4-112540-30R]
BAT54A/SOT23/200mA
BAT54C/SOT23/200mA
2N7002/SOT23/25pF/5/X
IT8951
IT8620
Close MB 左下


ITB_VCCH
1.8VD
ECBC2 0.1u/4/X7R/16V/K
ECBC3 0.1u/4/X7R/16V/K
ECBC4 0.1u/4/X7R/16V/K
ECBC32 0.1u/4/X7R/16V/K
ECBC33 0.1u/4/X7R/16V/K
ECBC34 0.1u/4/X7R/16V/K
ECBC5 0.1u/4/X7R/16V/K
ECBC6 0.1u/4/X7R/16V/K
ECBC7 0.1u/4/X7R/16V/K
ECBC35 0.1u/4/X7R/16V/K
ECBC36 0.1u/4/X7R/16V/K
ECBC37 0.1u/4/X7R/16V/K
Power For USB PLL
3.3VD
VCC33A_HSRT
GNDD
GND33A_HSRT
ECBC9
ECBC10 0.1u/4/X7R/16V/K
ECBC11 0.1u/4/X7R/16V/K
ECBC12 0.1u/4/X7R/16V/K
22u/8/X5R/6.3V/M
Power For USB PLL
VCC33A_U20
GND33A_U20
ECBC13
ECBC14 22u/8/X5R/6.3V/M
ECBC15 0.1u/4/X7R/16V/K
ECBC16 0.1u/4/X7R/16V/K
3.3VD
VDD
ECBC8 1u/4/X5R/6.3V/K
ECBC1 22u/8/X5R/6.3V/M
ECQ3 L1117LG/N/SOT223/1A
ECBR1 1.13K/4/1
ECBC18 22u/8/X5R/6.3V/M
ECBC19 22u/8/X5R/6.3V/M
ECB1 0.1u/4/X7R/16V/K
ECBR2 510/4/1
ECBC17 1u/4/X5R/6.3V/K
Active blinking
TEST_CFG0 ECBR3 8.2K/4
TEST_CFG1 ECBR4 8.2K/4
TEST_CFG2 ECBR5 8.2K/4
TEST_EN ECBR6 8.2K/4
PWR_ALERT ECBR7 8.2K/4
FBIOS_LED LED/O/6/S/[10DL3-22000O-02R]
ECRB1 330/6
ECB_GPIO15
ECB_SDA
ITB_PH 0/6/X
ECB_SCL
ECB_SDA ECBR9 8.2K/4/X
ECB_SCL ECBR10 8.2K/4/X
Reset Button
ECBR8 100K/4/1
ECB_RESET
ECBC20 1u/4/X5R/6.3V/K
ECB_BIOS
-ECB_SPI_CS
ECB_SPI_SI
-ECB_SPI_WP
ECB_SPI_SCK
ECB_SPI_SO
ECB_GPIO0
4M/SPI/SO8/200mil/S/[10HP4-112540-30R]
ECBC25 1u/4/X5R/6.3V/K
ECBC29 22u/8/X5R/6.3V/M
ECBQ1 L1117LG/N/SOT223/1A
ECBC31 1u/4/X5R/6.3V/K
ECBR30 301/4/1
ECBC27 22u/8/X5R/6.3V/M
ECBC28 22u/8/X5R/6.3V/M
ECBC26 0.1u/4/X7R/16V/K
ECBR31 510/4/1
IT8791
[41] EC_SMBDATA
[41] EC_SMBCLK
ECR139 0/4/SHT/20/X ECB_SDA
ECR140 0/4/SHT/20/X ECB_SCL
ECBU1
IT8951E/[10HP2-118951-10R]
LQFP128 (14x14x1.4 mm)
D7_LED LED/B/6/S/[10DL3-32000B-37R]/X
D3_LED LED/B/6/S/[10DL3-32000B-37R]/X
ECBR11 330/6/X
ECBR12 330/6/X
ECB_GPIO3
ECB_GPIO4
D5_LED LED/B/6/S/[10DL3-32000B-37R]/X
D1_LED LED/B/6/S/[10DL3-32000B-37R]/X
ECBR13 330/6/X
ECBR14 330/6/X
ECB_GPIO5
ECB_GPIO6
D8_LED LED/B/6/S/[10DL3-32000B-37R]/X
D4_LED LED/B/6/S/[10DL3-32000B-37R]/X
ECBR15 330/6/X
ECBR16 330/6/X
ECB_GPIO7
ECB_GPIO8
D6_LED LED/B/6/S/[10DL3-32000B-37R]/X
D2_LED LED/B/6/S/[10DL3-32000B-37R]/X
ECBR23 330/6/X
ECBR24 330/6/X
ECB_GPIO9
ECB_GPIO10
USB_RREF
ECBR20 12K/4/1
PE1_LED LED/B/6/S/[10DL3-32000B-37R]/X
PE2_LED LED/B/6/S/[10DL3-32000B-37R]/X
ECBR25 330/6/X
ECBR27 330/6/X
ECB_PE1
ECB_PE3
PE3_LED LED/B/6/S/[10DL3-32000B-37R]/X
PE4_LED LED/B/6/S/[10DL3-32000B-37R]/X
ECBR28 330/6/X
ECBR26 330/6/X
ECB_PE4
ECB_PE2
XSCI
XSCO
ECBY1 12M/20p/30ppm/49US/40/D/[11XH5-212000-01R]
ECBC21 18p/4/NPO/50V/J
ECBC22 18p/4/NPO/50V/J
ECB_GPIO13
ECB_GPIO14
ECB_GPIO12
EC1TOEC2 [41]
EC2TOEC1 [41]
EC2TOPCH [12]
3VDUAL_PCH
ECBR36 8.2K/4/X
ECBR37 1K/4/1/X
ECBR38 1K/4/1/X
ECBQ2 PMBT2907A/SOT23/-600mA/50/X
ECBQ3 PMBT2907A/SOT23/-600mA/50/X
S0T23
[26] LED_PWR_CTRL
VCC3
ECBR34 0/6/X
ECBR35 0/6/X
5VDUAL
ECBR41 0/6/X
ECBD1 BAS40-05/0.2A/SOT23
ECBQ5 PMBT2907A/SOT23/-600mA/50/X
ECBQ6 PMBT2907A/SOT23/-600mA/50/X
ECBR40 1K/4/1
ECBR42 1K/4/1
ECBR43 1K/4/1
ECBQ4 PN7002/SOT23/25pF/5
ECBR39 8.2K/4
[26] IO_GP67
IO_GP67
Default:High
S3:Low
[27] ECB_GPIO1
ECBR29 8.2K/4/X
EBC1 0.1u/4/X7R/16V/K
ECBU2
[27] -SPI_CS_1
[12,27] N_ICH_SPI_CLK
PI3USB102ZLE/TQFN10
MB SPI I/F
BIOS
IT8951 SPI I/F
SEL OE Y+ Y-
X H Hi-Z Hi-Z
L L M+ M-
H L D+ D-
ECBC23 0.1u/4/X7R/16V/K
ECBU3
[12,27] N_ICH_SPI_MISO
[12,27] N_ICH_SPI_MOSI
FORCE IT8951 CODE BACKUP
Default 2-3 short
-ECB_SPI_WP ECBR17 8.2K/4
-ECB_SPI_CS ECBR18 8.2K/4
ECB_GPIO0 ECBR19 8.2K/4
ECB_GPIO1 ECBR21 8.2K/4
ECB_GPIO2 ECBR22 8.2K/4
ECB_GPIO11 ECBR32 8.2K/4
ITB_PH2
ECB_GPIO2
PH/1*2/BK/2.54/VA/D
Mainboard SPI controller
SIO GPIO21
[26] USB_SEL
3VDUAL_USB3_A
ECBR33 8.2K/4/X
ECBC24 0.1u/4/X7R/16V/K
ECBU4
USB CONNECTOR
[52] DB_+USBP
[52] DB_-USBP
DB_+USB
DB_-USB
USB_DP
USB_DM
U2DP1_A [50]
U2DM1_A [50]
放靠近後窗
SEL Y+ Y-
L M+ M-
H D+ D-
Title
<Title>
Size Custom
Document Number GA-X99-UD4
Rev 1.1
Date: Friday, November 21, 2014
Sheet 42 of 58



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

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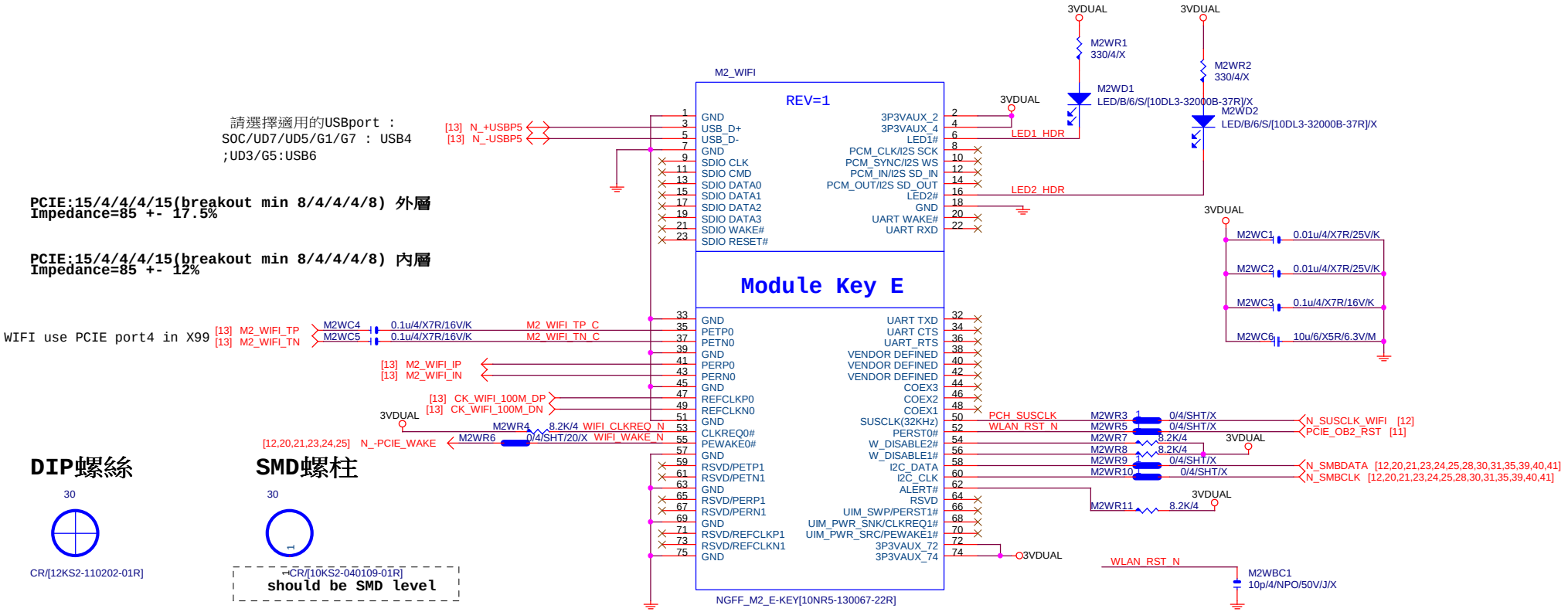
Title: M2_X2_10G

Size: Custom | Document Number | Rev: 1.1

Date: Friday, November 21, 2014 | Sheet 43 of 58



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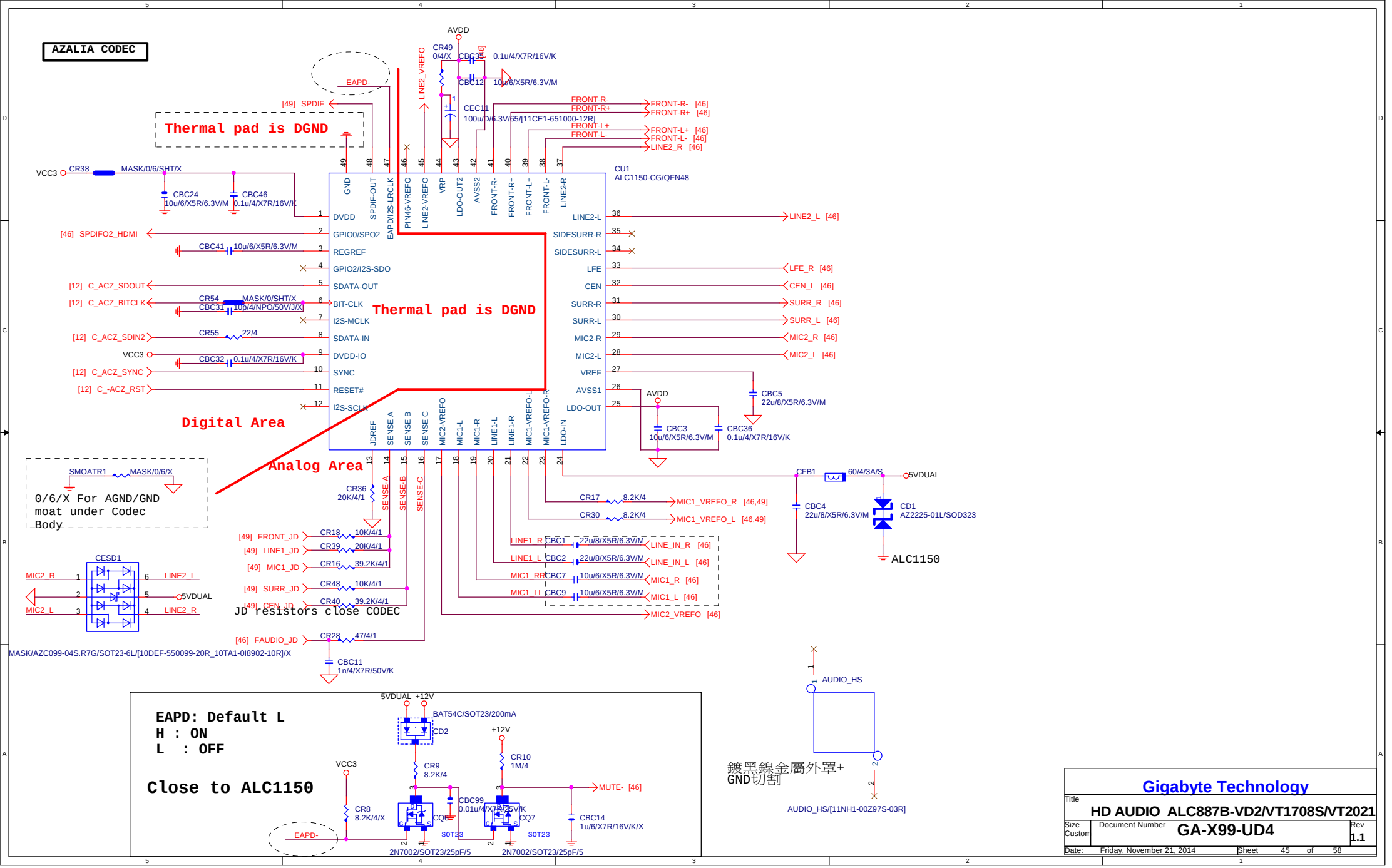
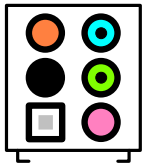
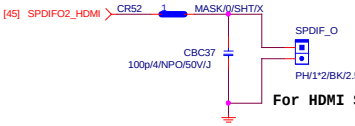
Size	B
Document Number	
Rev	1.1
Date:	Friday, November 21, 2014
Sheet	44 of 58

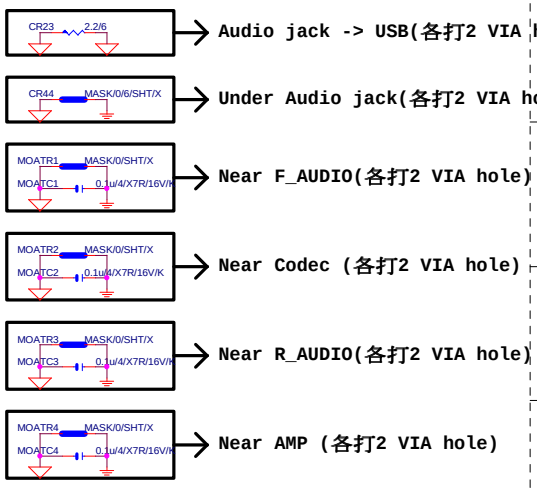

AZALIA CODEC
Thermal pad is DGND
Thermal pad is DGND
Digital Area
Analog Area
CU1
ALC1150-CG/QFN48
0/6/X For AGND/GND
moat under Codec
Body
JD resistors close CODEC
EAPD: Default L
H : ON
L : OFF
Close to ALC1150
鍍黑鎳金屬外罩+
GND切割
ALC1150
Gigabyte Technology
HD AUDIO ALC887B-VD2/VT1708S/VT2021
GA-X99-UD4
Rev 1.1
Friday, November 21, 2014
Sheet 45 of 58

AZALIA JACK

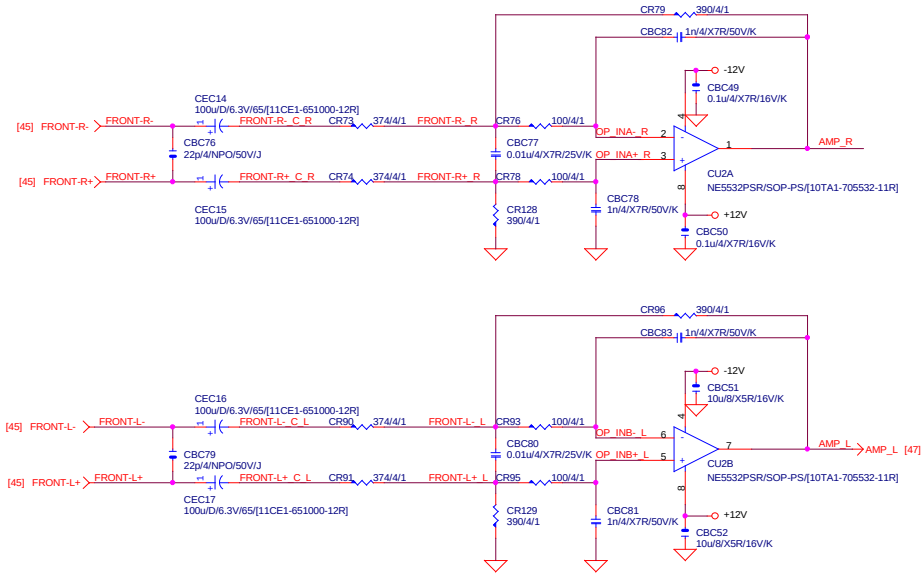


SPDIF_OUT

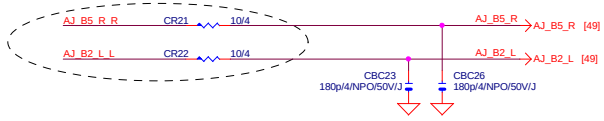




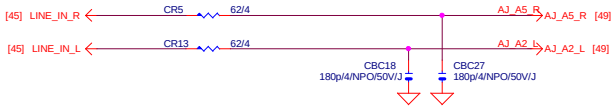
Differential to Single-End AMPLIFIED



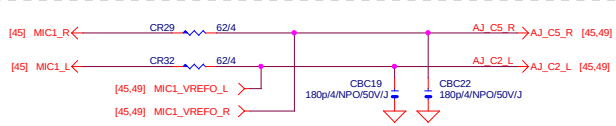
LINE-OUT



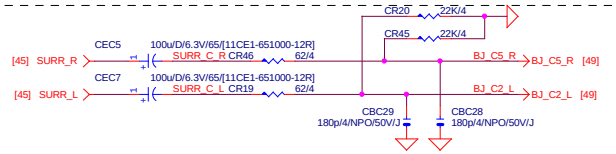
LINE-IN



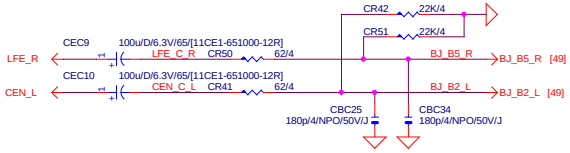
MIC-IN

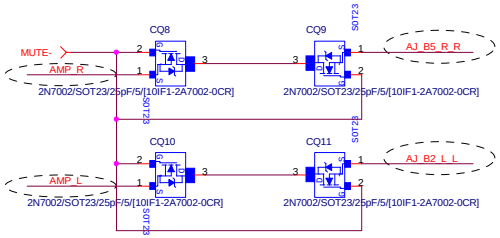


SURROUND

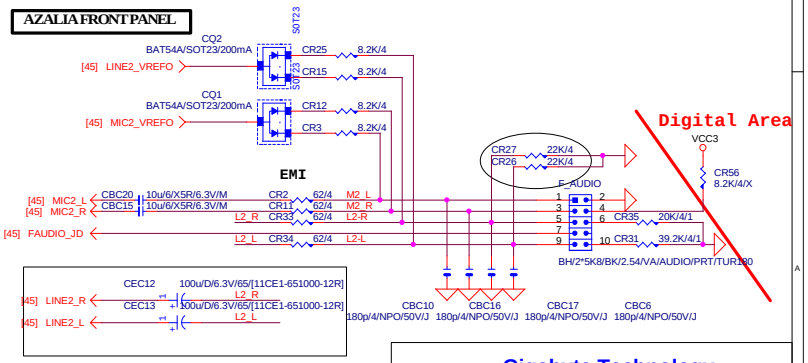


CEN/LFE



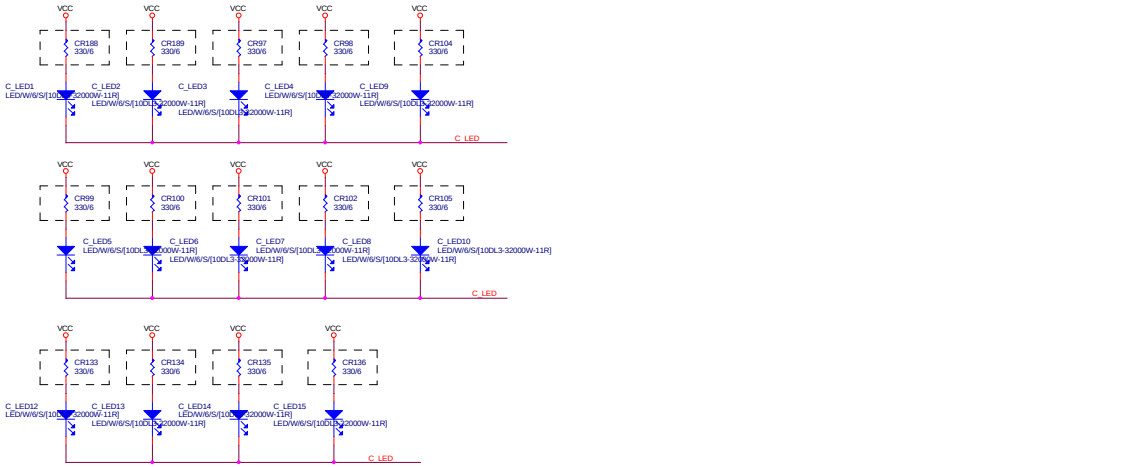


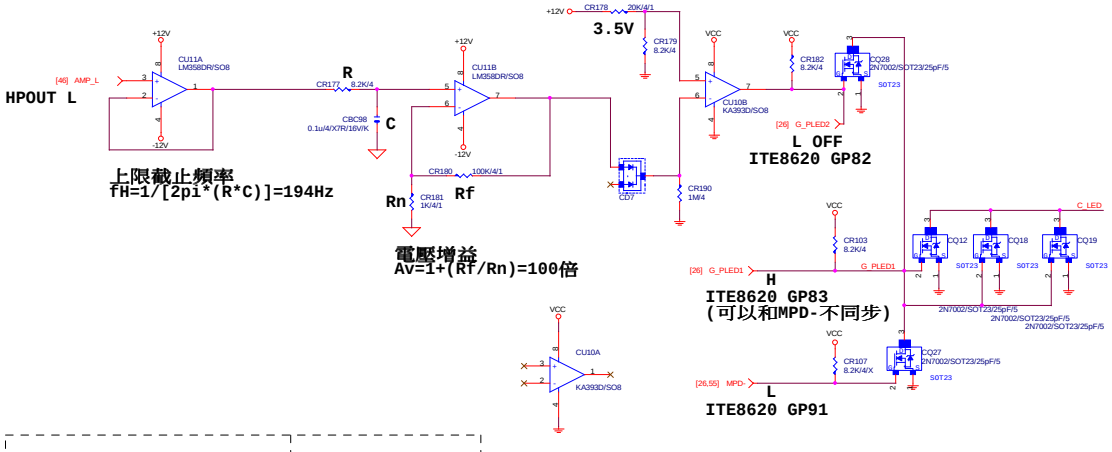
AZALIA FRONT PANEL

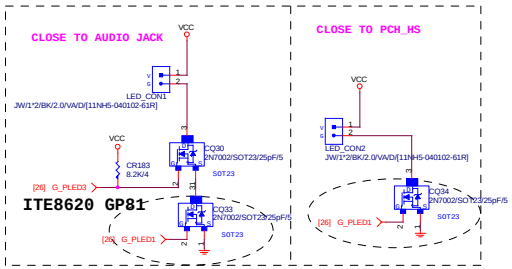


Gigabyte Technology

Title	AUDIO JACK	
Size: Custom	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 46 of 58	







AUDIO LED Control

	IO_GP82	IO_GP83	IO_GP91
Still Mode	L	H	L
OFF Mode	L	L	L
Pluse Mode	L	H	BREATH
Beat Mode	OD	H	L

Rear Panel LED ON/OFF

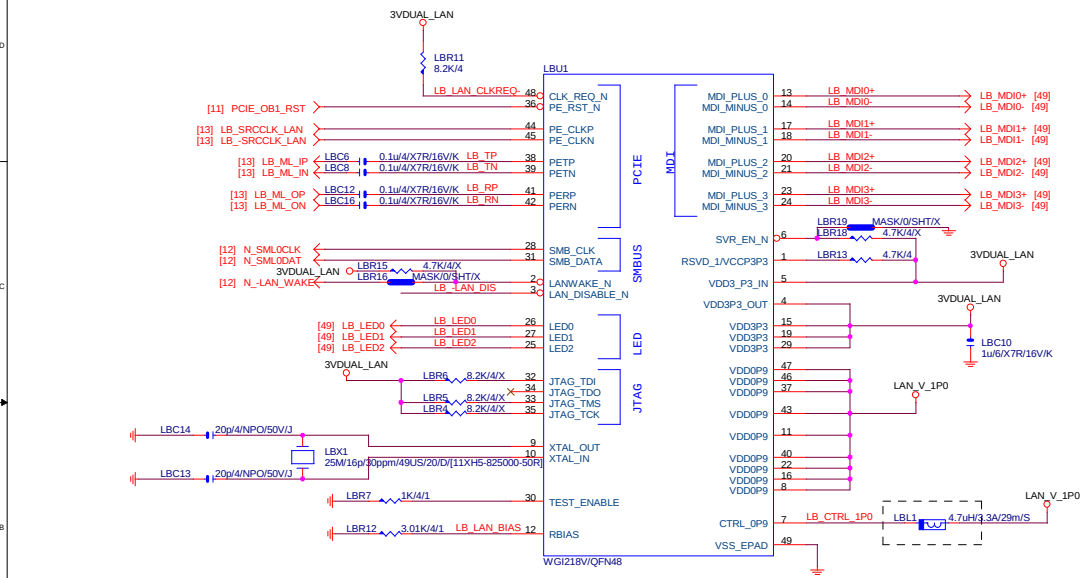
	IO_GP81
R AR LED ON	H
R AR LED OFF	L

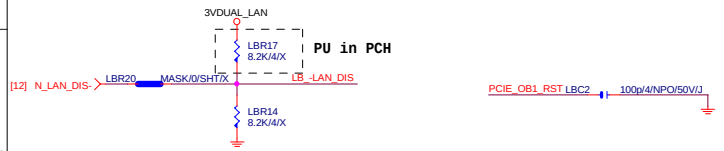
GIGABYTE™

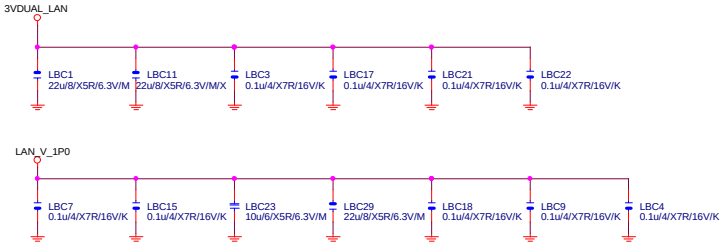
Title: Creative Sound3Di

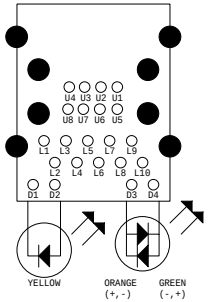
Size: Custom | Document Number: GA-X99-UD4 | Rev: 1.1

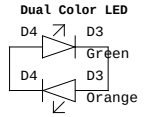
Date: Friday, November 21, 2014 | Sheet 47 of 58

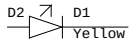












1Gb	Orange
100Mb	Green
10Mb	Off

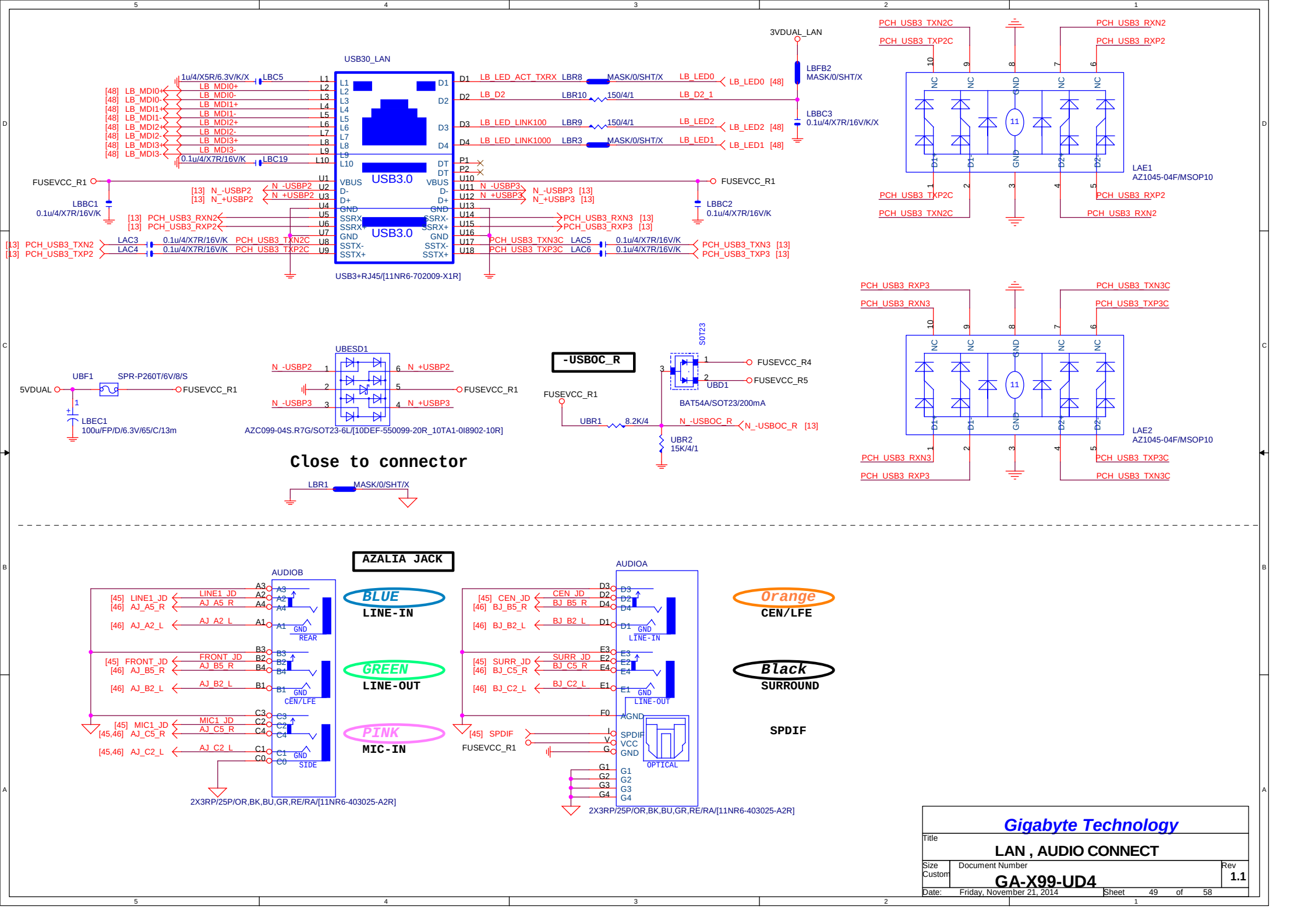
Access	Blinking
Link	Yellow

Gigabyte Technology

Title: INTEL LAN 2 - i218V

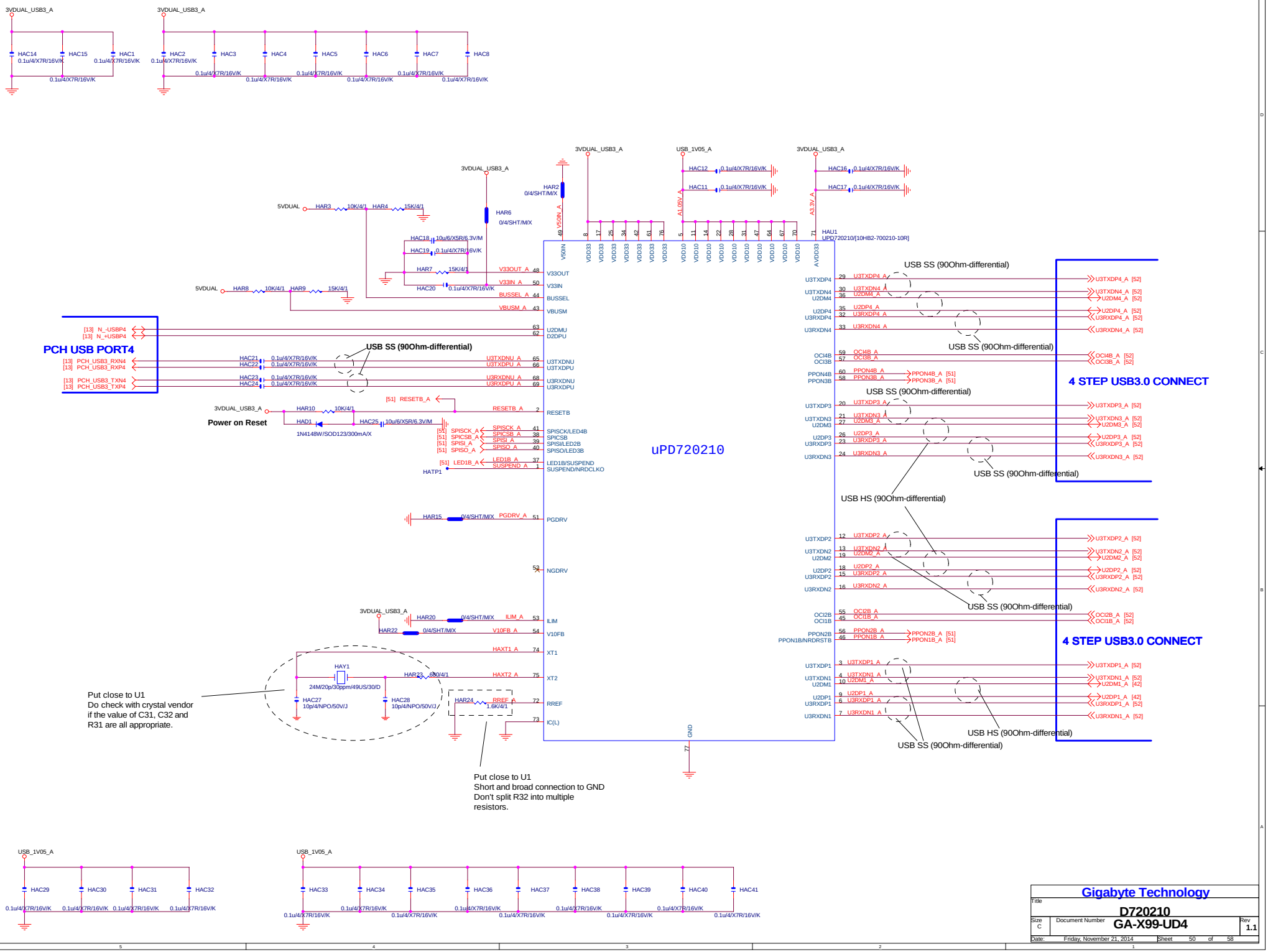
Size: Custom | Document Number: GA-X99-UD4 | Rev: 1.1

Date: Friday, November 21, 2014 | Sheet 48 of 58

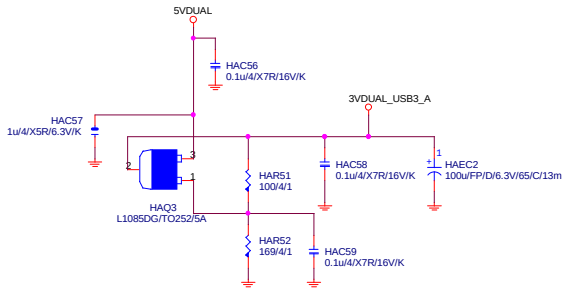


Title	LAN , AUDIO CONNECT
Size	Custom
Document Number	GA-X99-UD4
Rev	1.1
Date:	Friday, November 21, 2014
Sheet	49 of 58

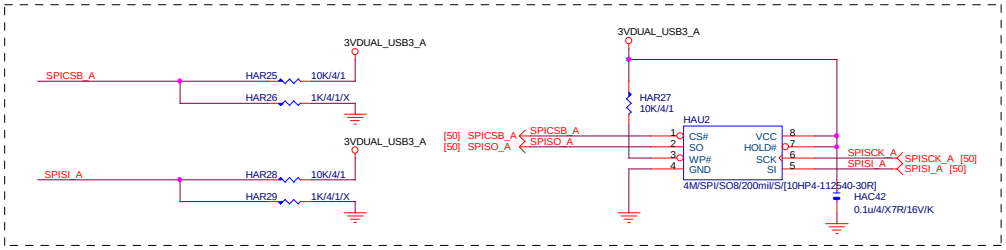
Gigabyte Technology


3VDUAL_USB3_A
HAC14 0.1u/4/X7R/16V/K
HAC15 0.1u/4/X7R/16V/K
HAC1 0.1u/4/X7R/16V/K
HAC2 0.1u/4/X7R/16V/K
HAC3 0.1u/4/X7R/16V/K
HAC4 0.1u/4/X7R/16V/K
HAC5 0.1u/4/X7R/16V/K
HAC6 0.1u/4/X7R/16V/K
HAC7 0.1u/4/X7R/16V/K
HAC8 0.1u/4/X7R/16V/K
USB_1V05_A
HAC12 0.1u/4/X7R/16V/K
HAC11 0.1u/4/X7R/16V/K
HAC16 0.1u/4/X7R/16V/K
HAC17 0.1u/4/X7R/16V/K
HAR2 0/4/SHT/M/X
HAR6 0/4/SHT/M/X
5VDUAL
HAR3 10K/4/1
HAR4 15K/4/1
HAC18 10u/6/X5R/6.3V/M
HAC19 0.1u/4/X7R/16V/K
HAR7 15K/4/1
HAC20 0.1u/4/X7R/16V/K
HAR8 10K/4/1
HAR9 15K/4/1
HAU1
UPD720210/[10HB2-700210-10R]
V5VIN
VDD33
VDD10
AVDD33
V33OUT_A
V33IN_A
BUSSEL_A
VBUSM_A
U2DMU
U2DPU
PCH USB PORT4
[13] N_-USBP4
[13] N_+USBP4
[13] PCH_USB3_RXN4
[13] PCH_USB3_RXP4
[13] PCH_USB3_TXN4
[13] PCH_USB3_TXP4
HAC21 0.1u/4/X7R/16V/K
HAC22 0.1u/4/X7R/16V/K
HAC23 0.1u/4/X7R/16V/K
HAC24 0.1u/4/X7R/16V/K
U3TXDNU_A
U3TXDPU_A
U3RXDNU_A
U3RXDPU_A
USB SS (90Ohm-differential)
Power on Reset
HAR10 10K/4/1
HAD1
1N4148W/SOD123/300mA/X
HAC25 10u/6/X5R/6.3V/M
[51] RESETB_A
RESETB_A
[51] SPISCK_A
[51] SPICSB_A
[51] SPISI_A
[51] SPISO_A
SPISCK_A
SPICSB_A
SPISI_A
SPISO_A
[51] LED1B_A
SUSPEND_A
HATP1
HAR15 0/4/SHT/M/X
PGDRV_A
NGDRV
HAR20 0/4/SHT/M/X
ILIM_A
HAR22 0/4/SHT/M/X
V10FB_A
HAXT1_A
HAXT2_A
HAY1
24M/20p/30ppm/49US/30/D
HAR23 680/4/1
HAC27 10p/4/NPO/50V/J
HAC28 10p/4/NPO/50V/J
HAR24 1.6K/4/1
RREF_A
IC(L)
GND
uPD720210
USB SS (90Ohm-differential)
USB HS (90Ohm-differential)
4 STEP USB3.0 CONNECT
U3TXDP4_A
U3TXDN4_A
U2DM4_A
U2DP4_A
U3RXDP4_A
U3RXDN4_A
OCI4B_A
OCI3B_A
PPON4B_A
PPON3B_A
U3TXDP3_A
U3TXDN3_A
U2DM3_A
U2DP3_A
U3RXDP3_A
U3RXDN3_A
U3TXDP2_A
U3TXDN2_A
U2DM2_A
U2DP2_A
U3RXDP2_A
U3RXDN2_A
OCI2B_A
OCI1B_A
PPON2B_A
PPON1B_A
U3TXDP1_A
U3TXDN1_A
U2DM1_A
U2DP1_A
U3RXDP1_A
U3RXDN1_A
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.
HAC29 0.1u/4/X7R/16V/K
HAC30 0.1u/4/X7R/16V/K
HAC31 0.1u/4/X7R/16V/K
HAC32 0.1u/4/X7R/16V/K
HAC33 0.1u/4/X7R/16V/K
HAC34 0.1u/4/X7R/16V/K
HAC35 0.1u/4/X7R/16V/K
HAC36 0.1u/4/X7R/16V/K
HAC37 0.1u/4/X7R/16V/K
HAC38 0.1u/4/X7R/16V/K
HAC39 0.1u/4/X7R/16V/K
HAC40 0.1u/4/X7R/16V/K
HAC41 0.1u/4/X7R/16V/K
Gigabyte Technology
Title
D720210
Size C
Document Number GA-X99-UD4
Rev 1.1
Date: Friday, November 21, 2014
Sheet 50 of 58

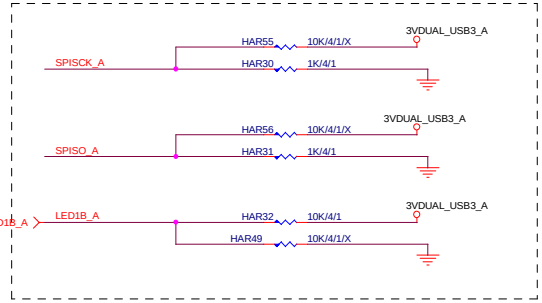
3VDUAL_USB_1



 # External SPI ROM ; SPI ROM attached mode

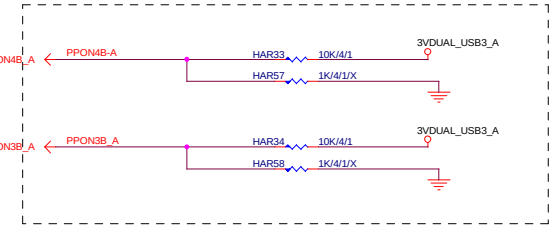


 # Battery Charging

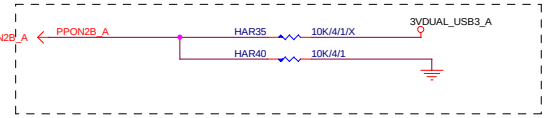


 # Number of Ports ; 4Ports mode

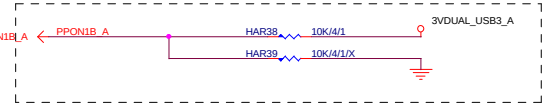
PPON3B / PPON4B : H / H (4 port)
PPON3B / PPON4B : L / L (2 port)

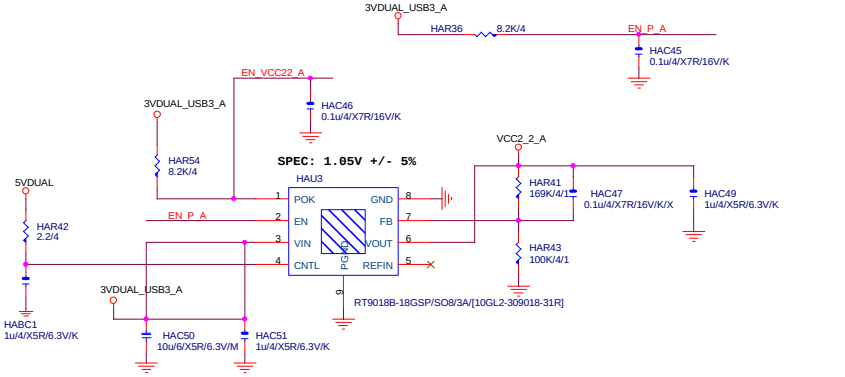


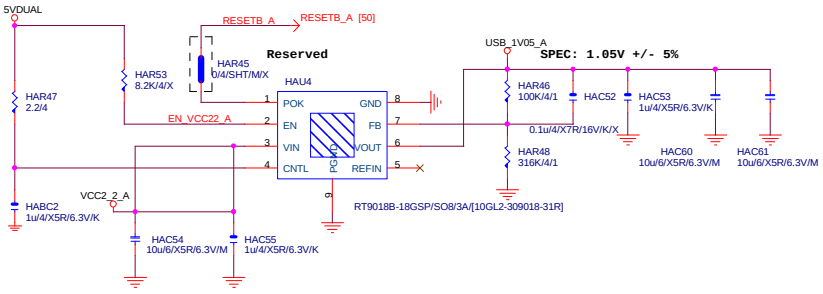
#5 VBUS Power Control ; Individual mode



 # PPON1B Pin Function ; Port1 PPONB mode



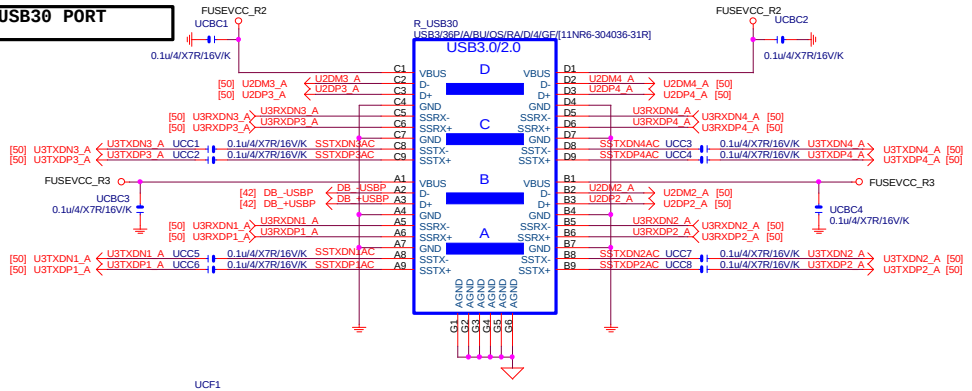


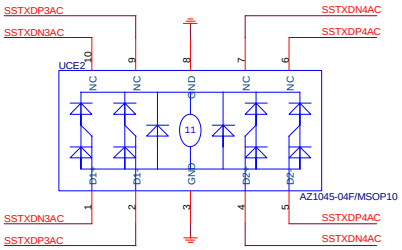


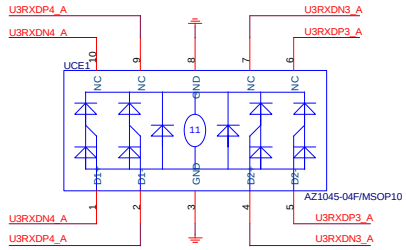
Gigabyte Technology

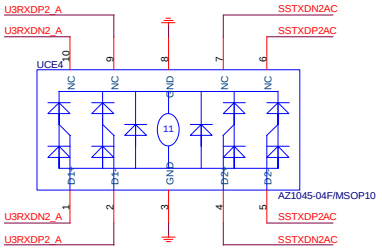
Title	D720210	
Size: Custom	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 51 of 58	

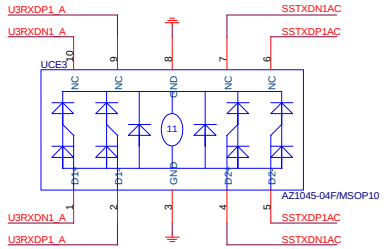
R_USB30 PORT

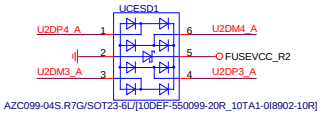




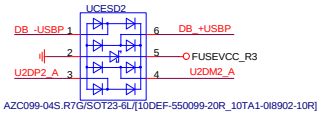




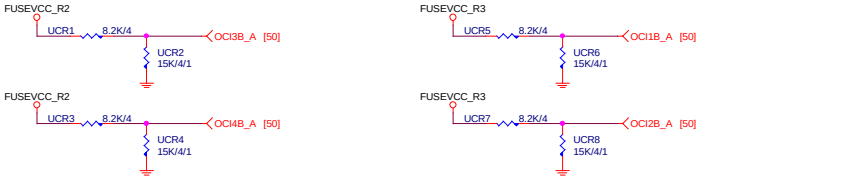




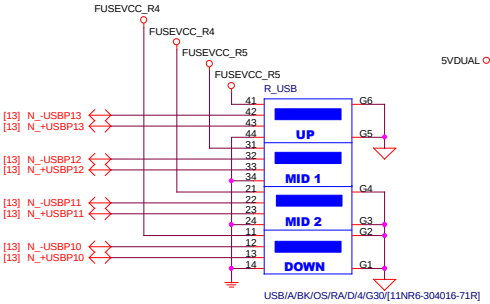
Close to connector



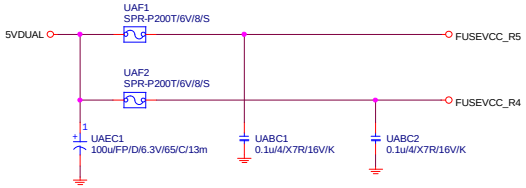
Close to connector



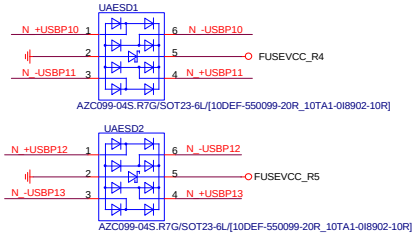
R_USB



USB20 FUSE

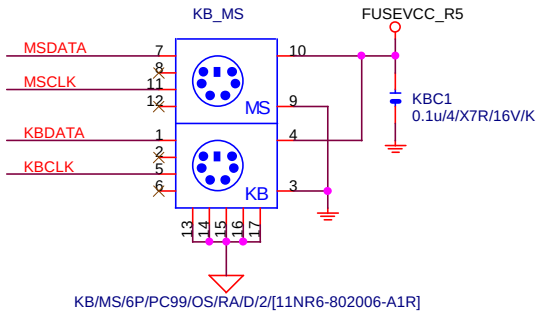


USB20 ESD PROCTECT

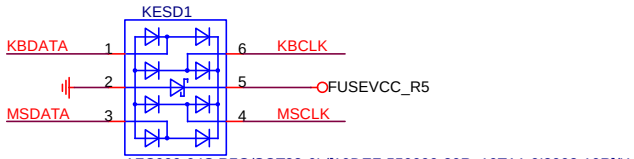


Gigabyte Technology

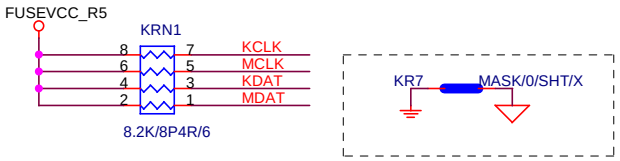
Title	R_USB30 , R_USB3	
Size: Custom	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 52 of 58	

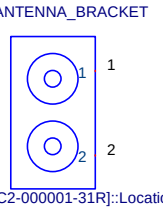


KB/MS/6P/PC99/OS/RA/D/2/[11NR6-802006-A1R]

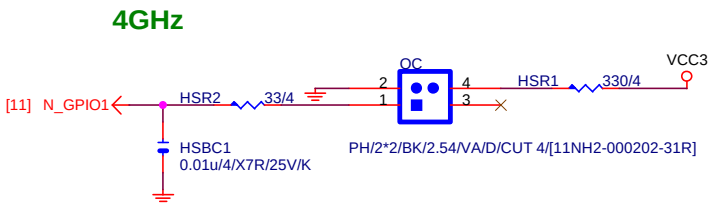


AZC099-04S.R7G/SOT23-6L/[10DEF-550099-20R_10TA1-0I8902-10R]/X





WIFI-BRACKET_Vertical/[12AC2-000001-31R]::Location ANTENNA_BRACKET



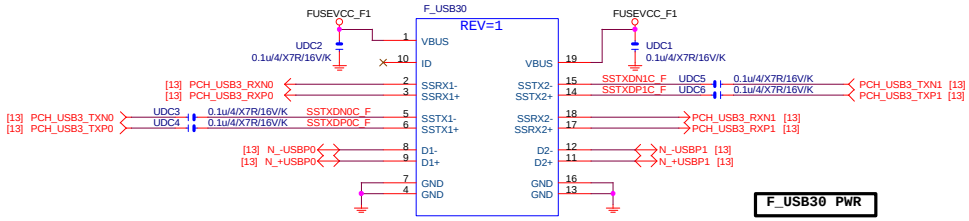
Gigabyte Technology

Title: **USB DAC-UP , PS2 ,WIFI**

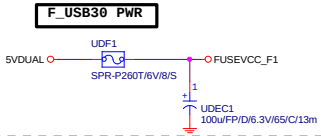
Size	Document Number	Rev
Custom	GA-X99-UD4	1.1

Date: Friday, November 21, 2014 Sheet 53 of 58

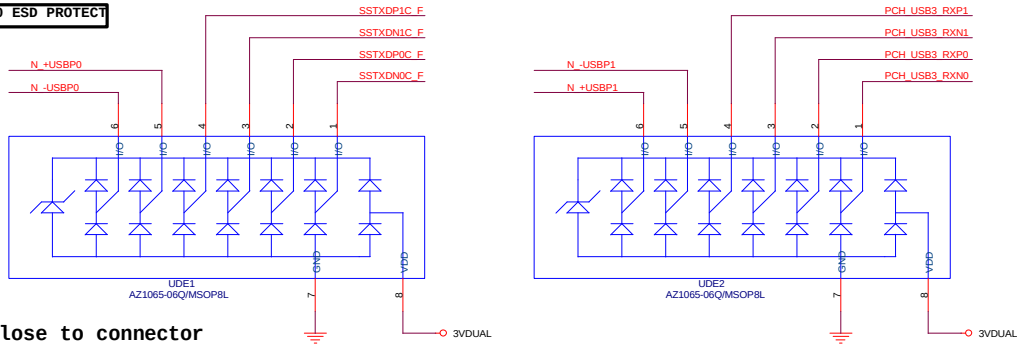
Front USB3.0



F_USB30 PWR

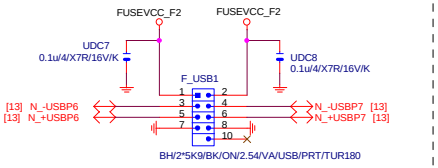


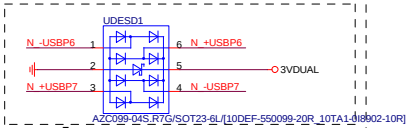
F_USB30 ESD PROTECT



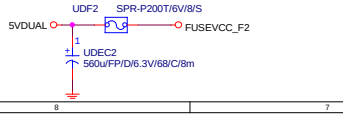
Close to connector

FRONT USB1





Close to connector



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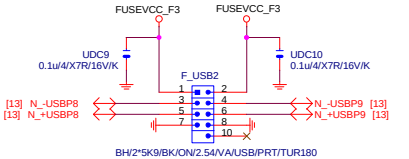
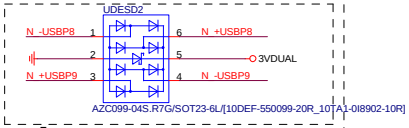
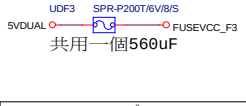




Close to connector



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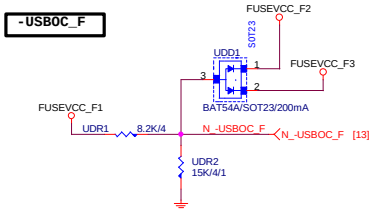
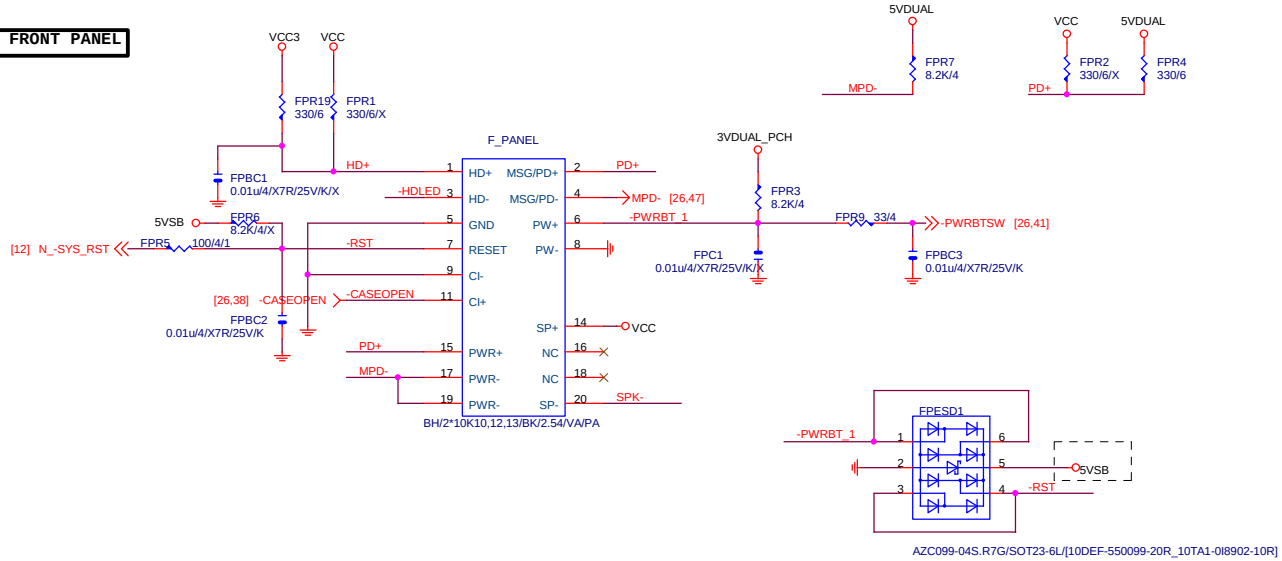
-USBOC_F

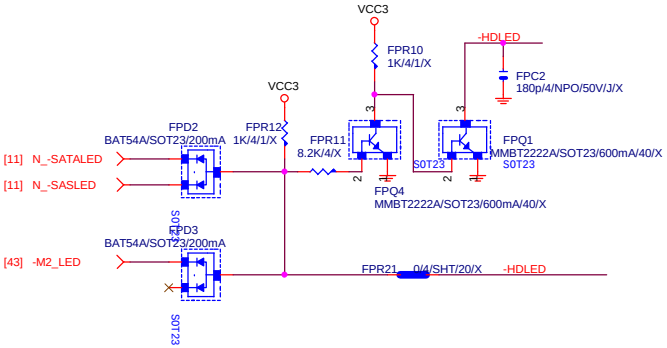


Gigabyte Technology		
Title: F_USB		
Size: Custom	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 54 of 58	

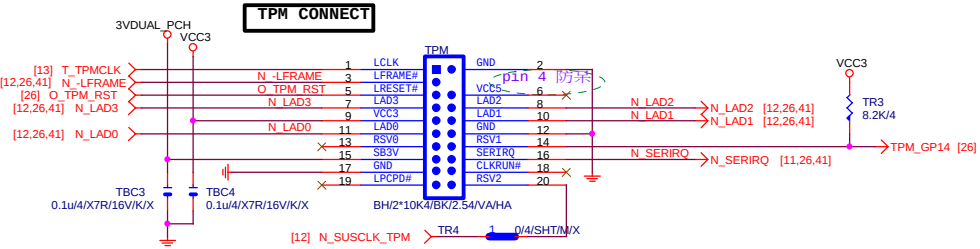
INTEL FRONT PANEL



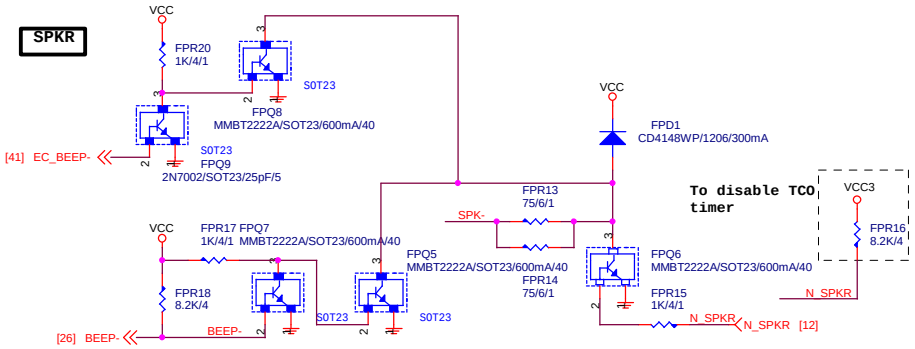
SATA LED



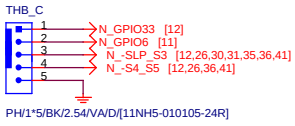
TPM CONNECT



SPKR



Thunderbolt



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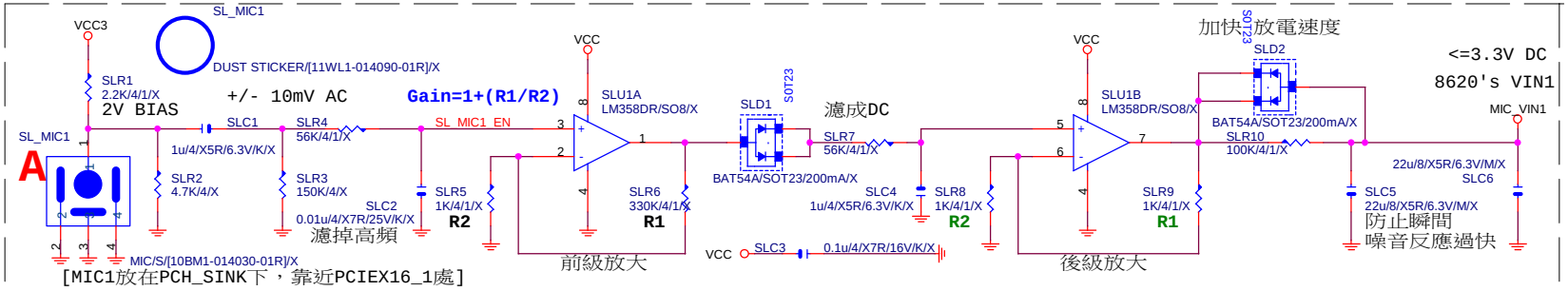
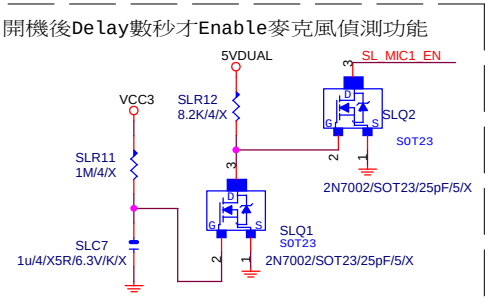
Title: FP,F_USB,USB PWR,BZ

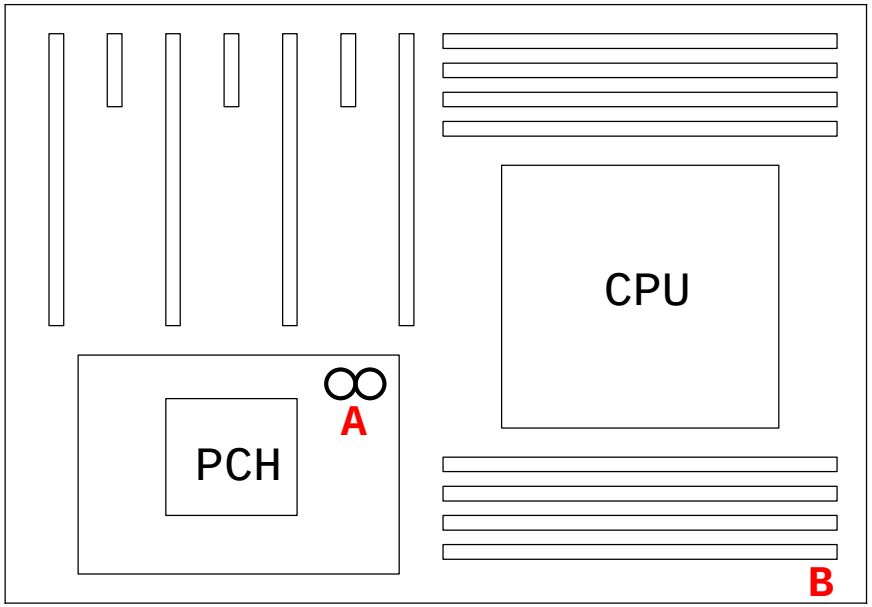
Size: Custom | Document Number: GA-X99-UD4 | Rev: 1.1

Date: Friday, November 21, 2014 | Sheet 55 of 58

Sound Level (dB-->DC Level)



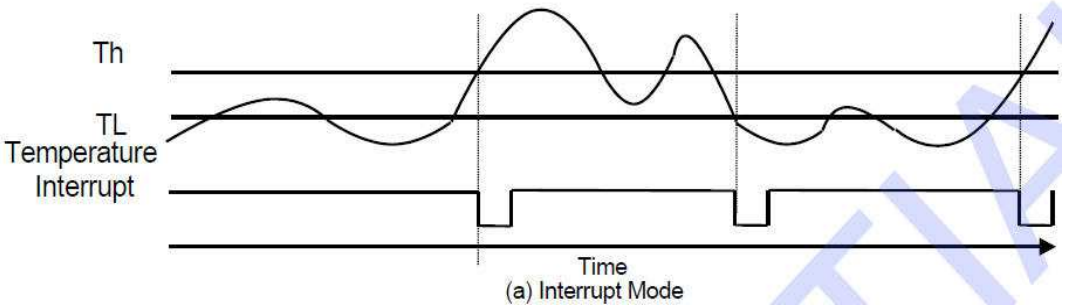




BIOS & S/W Notice:

1. 假設User設定系統噪音要低於45dB(即VINx=1.75V)，當VINx高於1.75V，8620會把PCH的GPI7拉Low一次。
2. 當噪音降低到VINx低於1.65V(即1.75V-0.1V)時，8620會再把PCH的GPI7拉Low一次。
3. 超過Th時，將CPU & VGA降頻或Throttle。低於Tl時，則回復正常頻率運作。

Figure 9-5. Temperature Interrupt Response Diagram



dB	VINx
30	1.30V
35	1.45V
40	1.60V
45	1.75V
50	1.90V
55	2.05V
60	2.20V
65	2.35V
70	2.50V
75	2.65V
80	2.80V
85	2.95V
90	3.10V
95	3.25V
100	3.33V

此Table只是假設值， 需至無響室測試後確認。

H/W Notice:

1. 麥克風不可被CPU_FAN & VGA_FAN吹到，用DIP電容擋住顯卡的風。
2. 麥克風需和OP-AMP越靠近越好，<1000mil。
3. IT8620偵測到dB值超過user設定值，通知PCH的GPI7發SMI。
4. 麥克風料號為：[10BM1-014030-01R]

Gigabyte Technology		
Title: Sound Level		
Size: B	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 56 of 58	

PCH GPIO

PIN NAME	POWER WELL	USAGE	AFTER PLTRST	S3/S5	NOTES
GP[0]	VCC3	-ICH_PSI	IN		8.2K P/U TO VCC3
GP[1]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[2]	VCC3	-PIRQE	IN		8.2K P/U TO VCC3
GP[3]	VCC3	-PIRQF	IN		8.2K P/U TO VCC3
GP[4]	VCC3	-PIRQG	IN		8.2K P/U TO VCC3
GP[5]	VCC3	-PIRQH	IN		8.2K P/U TO VCC3
GP[6]	VCC3	GPIO6	IN		8.2K P/U TO VCC3
GP[7]	VCC3	GPIO7	IN		8.2K P/U TO VCC3
GP[8]	3VDUAL	GPIO8	OUT		8.2K P/U TO 3VDUAL
GP[9]	3VDUAL	-USBOC5	IN		USB OVER-CURRENT
GP[10]	3VDUAL	-USBOC6	IN		USB OVER-CURRENT
GP[11]	3VDUAL	GPIO11	IN		8.2K P/U TO 3VDUAL
GP[12]	3VDUAL	GPIO12	OUT		8.2K P/U TO 3VDUAL
GP[13]	3VDUAL	-LPCPME	IN		8.2K P/U TO 3VDUAL
GP[14]	3VDUAL	GPIO14	IN		8.2K P/U TO 3VDUAL
GP[15]	3VDUAL	SPARE	OUT		8.2K P/U TO 3VDUAL (N/A)
GP[16]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[17]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[18]	VCC3	-SPI_WP0	OUT		8.2K P/U TO VCC3
GP[19]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[20]	VCC3	-SPI_WP1	OUT		8.2K P/U TO VCC3
GP[21]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[22]	VCC3	SPARE	IN		1K P/U TO VCC3
GP[23]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[24]	3VDUAL	-SKTOC	IN		8.2K P/U TO 3VDUAL (N/A)
GP[25]	3VDUAL	GPIO25	OUT		8.2K P/U TO 3VDUAL
GP[26]	3VDUAL	SPARE	OUT		8.2K P/U TO 3VDUAL
GP[27]	3VDUAL_PCH	SPARE	OUT		8.2K P/U TO 3VDUAL_PCH
GP[28]	3VDUAL	GPIO28	OUT		8.2K P/U TO 3VDUAL
GP[29]	3VDUAL	SPARE	OUT		8.2K P/U TO 3VDUAL (N/A)
GP[30]	3VDUAL	-S_WARN	OUT		CONNECT TO -S_ACK
GP[31]	3VDUAL_PCH	SPARE	IN		8.2K P/U TO 3VDUAL_PCH(N/A)
GP[32]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[33]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[34]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[35]	VCC3	-ACZ_DET	OUT		8.2K P/U TO VCC3
GP[36]	VCC3	SPARE	IN		8.2K P/U TO VCC3(N/A)
GP[37]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[38]	VCC3	SPARE	IN		1K P/U TO VCC3

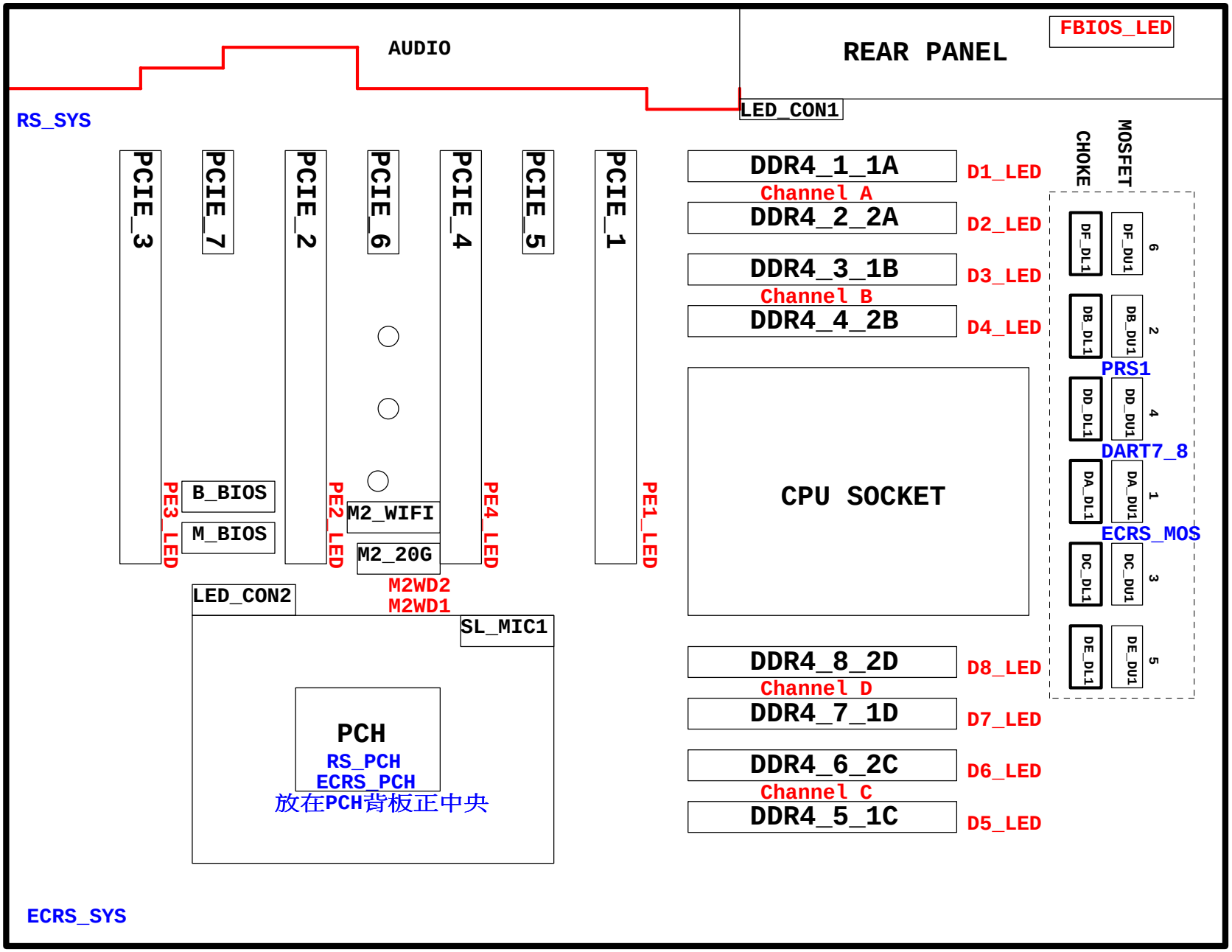
PIN NAME	POWER WELL	USAGE	AFTER PLTRST	S3/S5	NOTES
GP[39]	VCC3	SPARE	IN		1K P/U TO VCC3
GP[40]	3VDUAL	-USBOC1	IN		USB OVER-CURRENT
GP[41]	3VDUAL	-USBOC2	IN		USB OVER-CURRENT
GP[42]	3VDUAL	-USBOC3	IN		USB OVER-CURRENT
GP[43]	3VDUAL	-USBOC4	IN		USB OVER-CURRENT
GP[44]	3VDUAL	SPARE	IN		1K P/U TO 3VDUAL
GP[45]	3VDUAL	SPARE	IN		1K P/U TO 3VDUAL
GP[46]	3VDUAL	SPARE	IN		1K P/U TO 3VDUAL
GP[47]	3VDUAL	SPARE	IN		1K P/U TO 3VDUAL
GP[48]	VCC3	SPARE	IN		1K P/U TO VCC3
GP[49]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[50]	VCC3	-REQ1	OUT		8.2K P/U TO VCC3
GP[51]	VCC3	-GNT1	OUT		1K P/U TO VCC3
GP[52]	VCC3	-REQ2	OUT		8.2K P/U TO VCC3
GP[53]	VCC3	-GNT2	IN		8.2K P/U TO VCC3(N/A)
GP[54]	VCC3	-REQ3	IN		8.2K P/U TO VCC3
GP[55]	VCC3	-GNT3	IN		8.2K P/U TO VCC3(N/A)
GP[56]	3VDUAL	SPARE	IN		8.2K P/U TO 3VDUAL
GP[57]	3VDUAL	SPARE	IN		8.2K P/U TO 3VDUAL
GP[58]	3VDUAL	SML1CLK	OUT		8.2K P/U TO 3VDUAL
GP[59]	3VDUAL	-USBOC0	IN		USB OVER-CURRENT
GP[60]	3VDUAL	SML0ART	OUT		1K P/U TO 3VDUAL
GP[61]	3VDUAL	SPARE	OUT		8.2K P/U TO 3VDUAL
GP[62]	3VDUAL	SUSCLK	OUT		8.2K P/U TO 3VDUAL(N/A)
GP[63]	3VDUAL	-SLP_S5	OUT		8.2K P/U TO 3VDUAL(N/A)
GP[64]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[65]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[66]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[67]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[68]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[69]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[70]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[71]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[72]	3VDUAL	SPARE	OUT		8.2K P/U TO 3VDUAL
GP[73]	3VDUAL	SPARE	OUT		8.2K P/U TO 3VDUAL
GP[74]	3VDUAL	SML1ART	OUT		1K P/U TO 3VDUAL
GP[75]	3VDUAL	SML1DAT	IN/OUT		8.2K P/U TO 3VDUAL

Gigabyte Technology

Title: PCH GPIO LIST

Size: Custom | Document Number: GA-X99-UD4 | Rev: 1.1

Date: Friday, November 21, 2014 | Sheet 57 of 58



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Title	FRONT PANEL	
Size: Custom	Document Number: GA-X99-UD4	Rev: 1.1
Date: Friday, November 21, 2014	Sheet 58 of 58	