GA-F2A68HM-S1

APU_VDDIO_SUS=DDR15V

APU_VTT_SUS=DDRVTT
APU_VDDP_RUN=APU_VDDR_RUN=APU_VDDP

+1.1V_RUN=FCH_VDD_11_RUN=VCC_SB

+3.3V_RUN=VCC3
+3.3V_ALW=3VDUAL

PAGE	TITLE	*Revision : 1.0*
01	COVER SHEET	
02	BOM & PCB MODIFY HISTORY	
03	BLOCK DIAGRAM	
04	APU DDRIII MEMORY	
05	APU CONTROL	
06	APU UMI, GFX, GPP	
07	APU POWER & GND	
08	DDRIII CHANNEL A	
09	Bolton 68H UMI, PCIE, PCI, CPU, LPC	
10	Bolton 68H ACPI, GPIO, USB, AUDIO	
11	Bolton 68H SATA,SPI,HWM	
12	Bolton 68H POWER & GND	
13	PCIE x16 , x1	
14	PCI SLOT	
15	ITE 8620 (DUAL BIOS CO-LAY), KB/MS , HWMO	
16	VGA ,RGB	
17	FAN ,USB30,F_USB2	
18	ALC887-VD2 CODEC	
19	ATX, FRONT PANEL	
20	POWER SEQUENCE	
21	VCORE (ISL62773)	
22	VCORE MOS	
23	DDR POWER, 5VDUAL , ERP	
24	RTL8111G	
25	VCC_SB , APU_VDDP , VCC11_DUAL , VDDA25	

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Title: COVER SHEET		
Size: Custom	Document Number: GA-F2A68HM-S1	Rev: 1.0
Date: Tuesday, November 04, 2014	Sheet 1 of 25	

Model Name:GA-F2A68HM-S1

Version: 1.0
111111111111
P-Code:

Component value change history

Date	Change Item	Reason
2014.08.22	3.1A New BOM release PCB:3.1	Modify From F2A88XM-DS2-EC 31A : 1. CEC1,CEC2,CEC6,CEC9 Change to 100uF/D/10V/6*5/[11CE2-651000-05R] 2. PCB Update
2014.08.28	3.1A New BOM release PCB:3.1	Modify From F2A88XM-DS2-EC 31A : 1.CHIPSET CHANGE TO D2H(A68H) 2.ONLY SUPPORT TWO USB3 PORT 3.REMOVE F_USB30 4.ADD SYS_FAN2 5.ADD R_USB
2014.09.26	1.0A New BOM release PCB:1.0	Modify From F2A88XM-DS2 31A : 1. Change model Name : F2A68HM-S1 2. F_USB30 & R_USB30 PIN SWAP 3. DEL F_USB30 4. ADD SYS_FAN2 5. ADD R_USB 6. remove FPBC1 (EMI) 7. -A_RST & IO_KBRST- 有移動(EMI) 8.5VDUAL COLAY (POWER ISSUE) 9.ADD SPEAKER (1*4 pin)
2014.11.04	1.0B P-BOM release PCB:1.0	1. 2N7002 指定用料(NXP) 2. R100 8.2K -- > 1K

Circuit or PCB layout change for next version

Date	Change Item	Reason
2014.08.05	Rev 3.1 Gerber-out	Modify From F2A88XM-DS2 31A : 1. Change model Name : F2A88XM-DS2-TM ，UEFI DualBIOS to UEFI BIOS 2. CEC1,CEC2,CEC6,CEC9 Footprints Change to EC6D8MM-RH-1 3.
2014.10.03	Rev 1.0 Gerber-out	Modify From F2A88XM-DS2 31A : 1. Change model Name : F2A68HM-S1 2. F_USB30 & R_USB30 PIN SWAP 3. DEL F_USB30 4. ADD SYS_FAN2 5. ADD R_USB 6. remove FPBC1 (EMI) 7. -A_RST & IO_KBRST- 有移動(EMI) 8.5VDUAL COLAY (POWER ISSUE) 9.ADD SPEAKER (1*4 pin)

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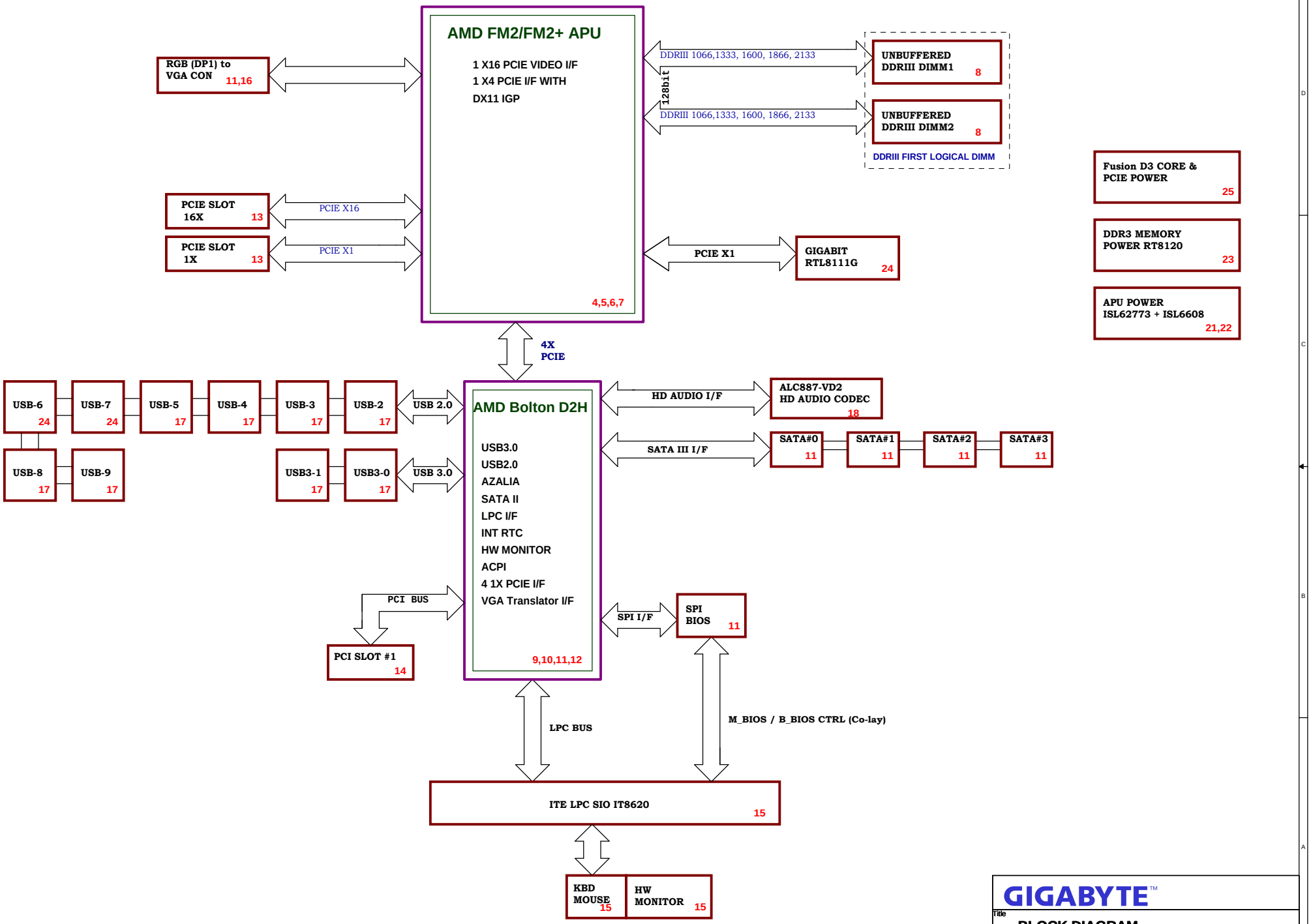
Title: BOM & PCB HISTORY

Size: Custom | Document Number: GA-F2A68HM-S1 | Rev: 1.0

Date: Tuesday, November 04, 2014 | Sheet 2 of 25

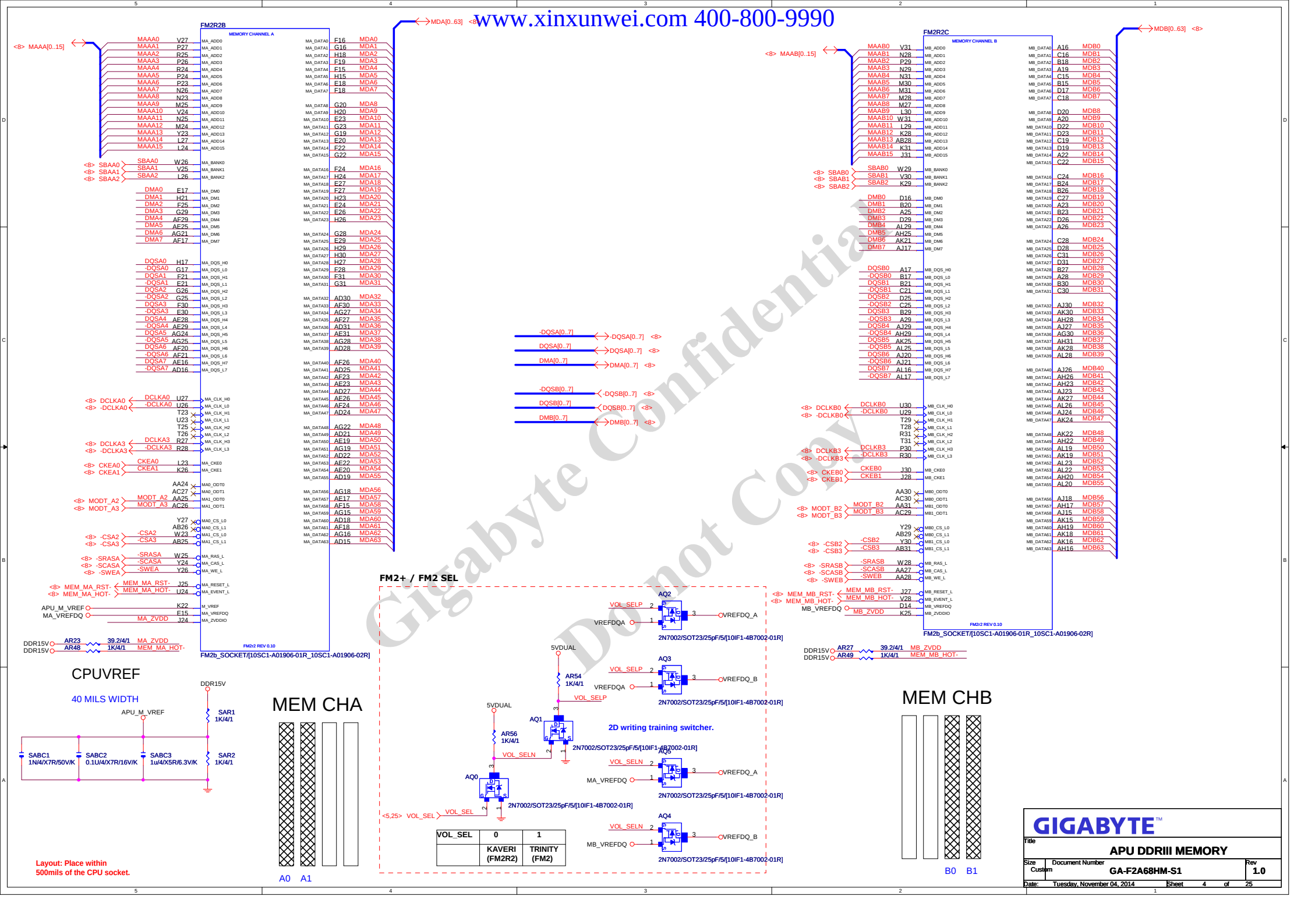


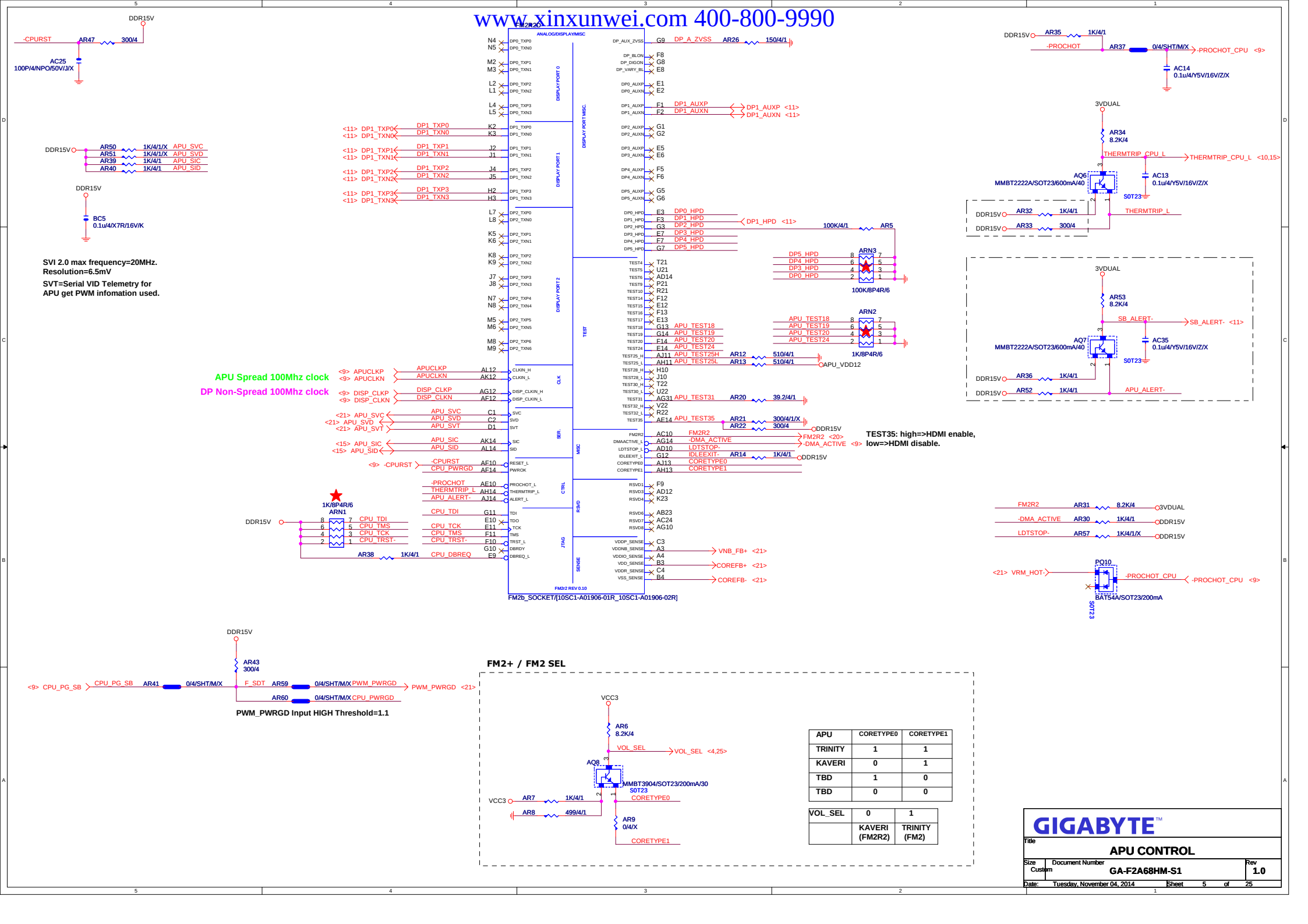
GIGABYTE™

Title: BLOCK DIAGRAM

Size	Document Number	Rev
Custom	GA-F2A68HM-S1	1.0

Date: Tuesday, November 04, 2014 Sheet 3 of 25





APU	CORETYPE0	CORETYPE1
TRINITY	1	1
KAVERI	0	1
TBD	1	0
TBD	0	0

VOL_SEL	0	1
	KAVERI (FM2R2)	TRINITY (FM2)

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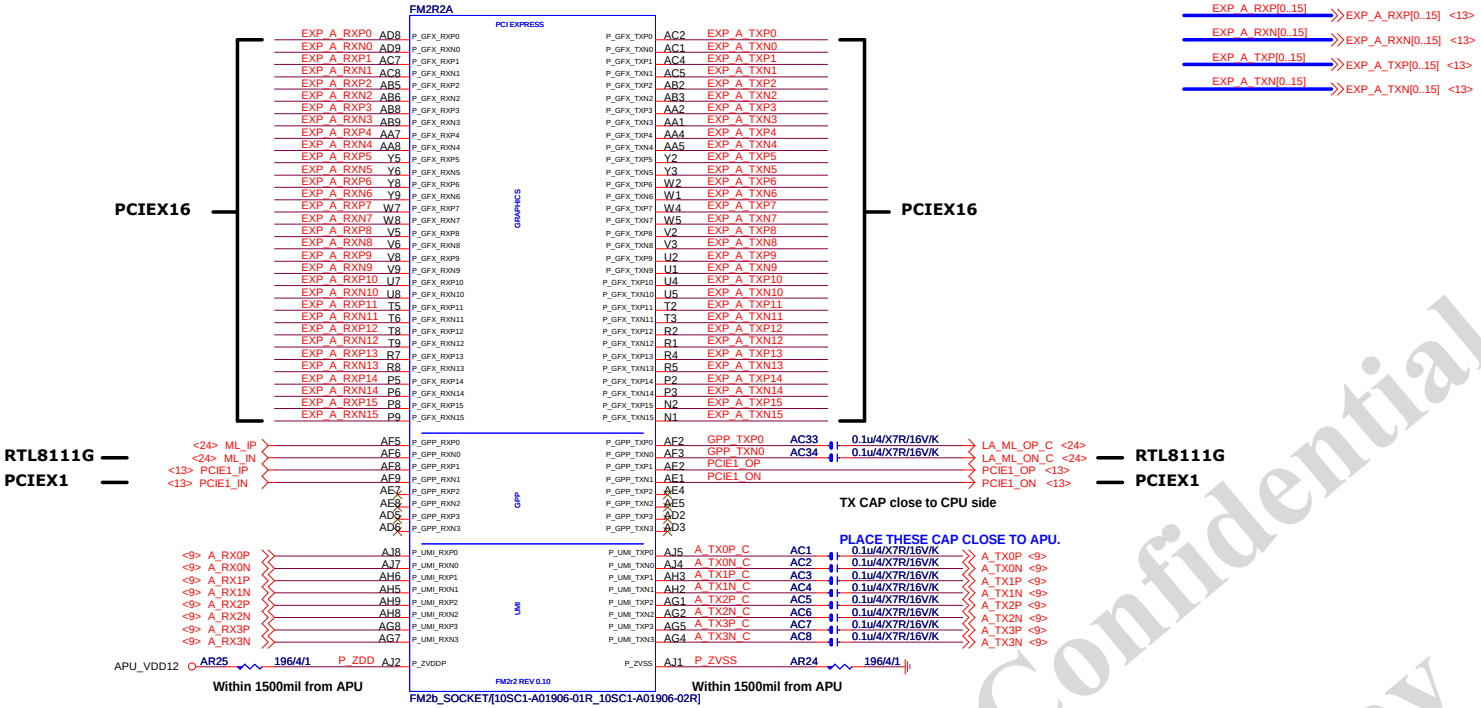
Title: APU CONTROL

Size: Custom | Document Number: GA-F2A68HM-S1 | Rev: 1.0

Date: Tuesday, November 04, 2014 | Sheet 5 of 25



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Title	APU GFX PCIE	
Size: Custom	Document Number: GA-F2A68HM-S1	Rev: 1.0
Date: Tuesday, November 04, 2014	Sheet 6 of 25	

DDR15V=1.25V/1.35V/1.5V(DDR3)

GND:232 pin,
VCORE:99 pin,
VCORE_NB: 30 pin,
DDR15V:49 pin,
VDDP:9 pin, VDDR:9 pin, VDDA25:2 pin,
VDDNB_CAP:2 pin,Total:430 pin.

PCIE_X16 Cross Moat CAP
VCORE
DC1 0.01U/4/X7R/25V/K
DC2 0.01U/4/X7R/25V/K
DC3 0.01U/4/X7R/25V/K

Place close N13, M14 pin inside the backplate cavity opeining.

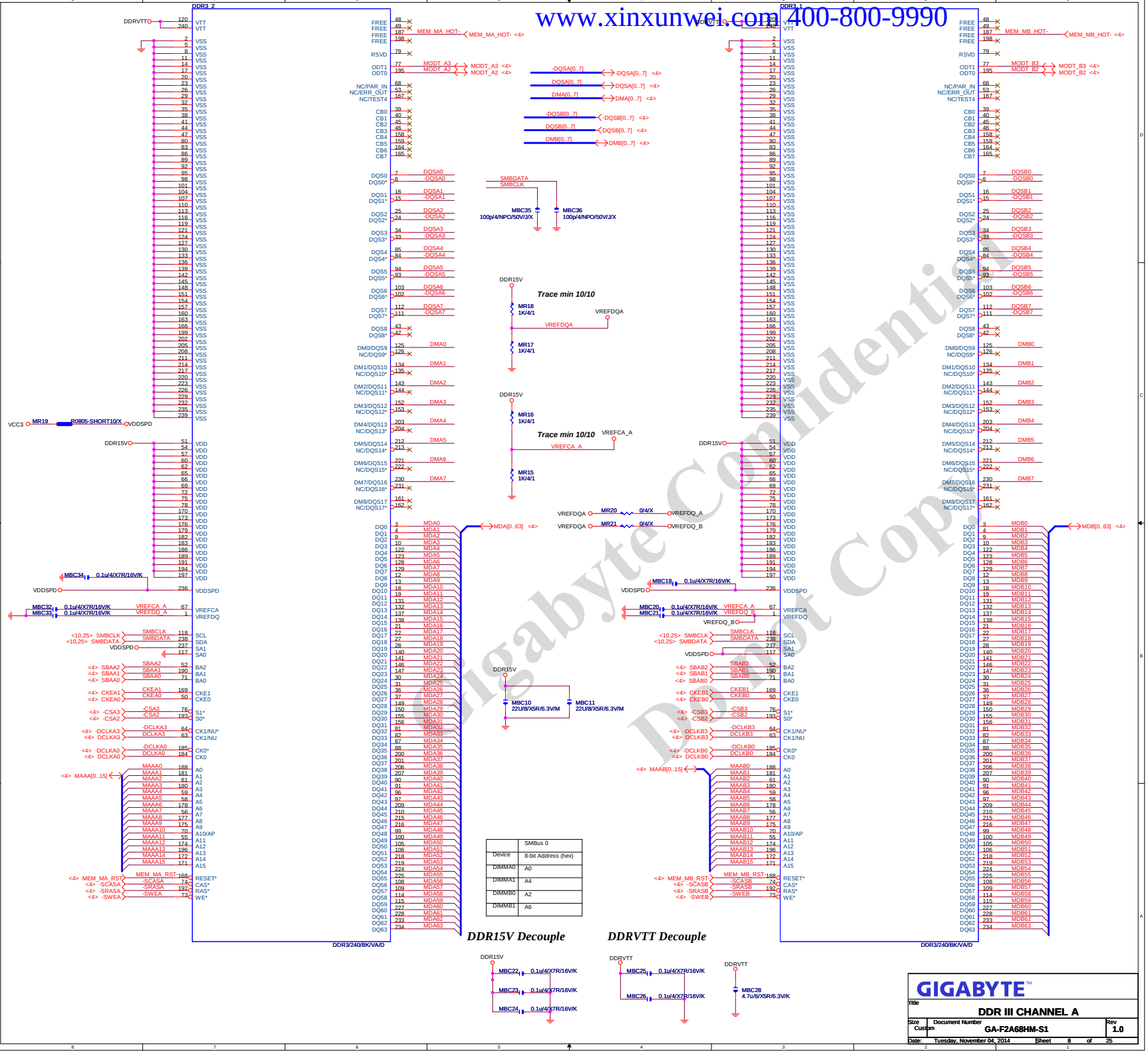
Check Power from AMD

FM2b_SOCKET/[10SC1-A01906-01R_10SC1-A01906-02R]

AMD RM/BLACK/[12KRC-04K812-31R_12KRC-04K812-32R]

BUTTOM SIDE

Title	APU POWER & GND		
Size	Document Number		Rev
Custom	GA-F2A68HM-S1		1.0
Date:	Tuesday, November 04, 2014	Sheet 7 of 25	



GIGABYTE	
Title	DDR III CHANNEL A
Size: Custom	Document Number: GA-F2A68HM-S1
Rev	1.0
Date: Tuesday, November 04, 2014	Sheet 8 of 25

PLACE THESE PCIE AC COUPLING CAPS CLOSE TO SB850

For APU PCI_E devices.

S.B HEATSINK

SB_HS

SB_HS/[12SP2-SA0301-11R _12SP2-SA0301-12R _12SP2-SA0301-13R]

U1E HUDSON-2 Part 1 of 5

PCI EXPRESS INTERFACES

PCI INTERFACE

CLOCK GENERATOR

LPC

APU

SS PLUS

218-0844029/S

DISP CLK

APU CLK

PCIEx16

RTL8111G

PCIEx1

RTC_XI PR6 20M/4 RTC_XO PX1 32.768K/12.5p/20ppm/TF38/35K/D PC13 18P/4/NPO/50V/J PC14 18P/4/NPO/50V/J

PX1 SHW/D0.64*5.08*6.74

25MHZ_X1 PR7 1M/4 25MHZ_X2 PX2 25M/16p/30ppm/49US/20/D PC15 20p/4/NPO/50V/J PC16 20p/4/NPO/50V/J

<15> LPC48 PR94 22/4 LPC48_C J26 14M_25M_48M_OSC

PR5 590/4/1 PR4 2K/4/1 VCC_SB

PR45 2K/4/1 CLK_CAL VCC_SB

PR2 33/4 PR3 33/4

PR8 33/4 PR9 33/4

PR13 33/4 -PPCIRST

PR0 8.2K/4/X VCC3

PR27 100K/4/1 RTCVDD

PBC2 1u/4/X5R/6.3V/K

RTC_CLK PR90 8.2K/4/X PR97 2.2K/4/1 3VDUAL

Pull down for S5+ Mode

PRN2 PCLK3 PCLK4 PCLK1 8.2K/8P4R/6 VCC3

PCLK3

PULL HIGH	USE DEBUG STRAPS
PULL LOW	IGNORE DEBUG STRAPS DEFAULT

CLKGEN Mode: Only for integrated clock mode.

LPC_CLK0 PR20 8.2K/4 3VDUAL

LPC_CLK1 PR95 8.2K/4

	LPC_CLK0	LPC_CLK1
PULL HIGH	IMC ENABLED	CLKGEN ENABLED
	AOD Extreme	
PULL LOW	IMC DISABLED DEFAULT	CLKGEN DISABLED DEFAULT

20mil 20mil 20mil

3VDUAL PQ1 BAT54C/SOT23/200mA PR28 1K/4/1 RTCVDD PBC24 0.1u/4/X7R/16V/K PBC25 1u/4/X5R/6.3V/K

<15> VBAT VBAT_2 RB 1K/4/1

BAT BAT-SK/BK/P/S/D/SN CR2032 BAT CR2032

CLR_CMOS RTCVDD PH/1*2/BK/2.54/VA/D

CLR_CMOS	
SHORT	CLEAR CMOS
OPEN	NORMAL

NOT ADD ICT FOR RTCVDD PIN

Note: LDT_STP# leave NC--DG1.0

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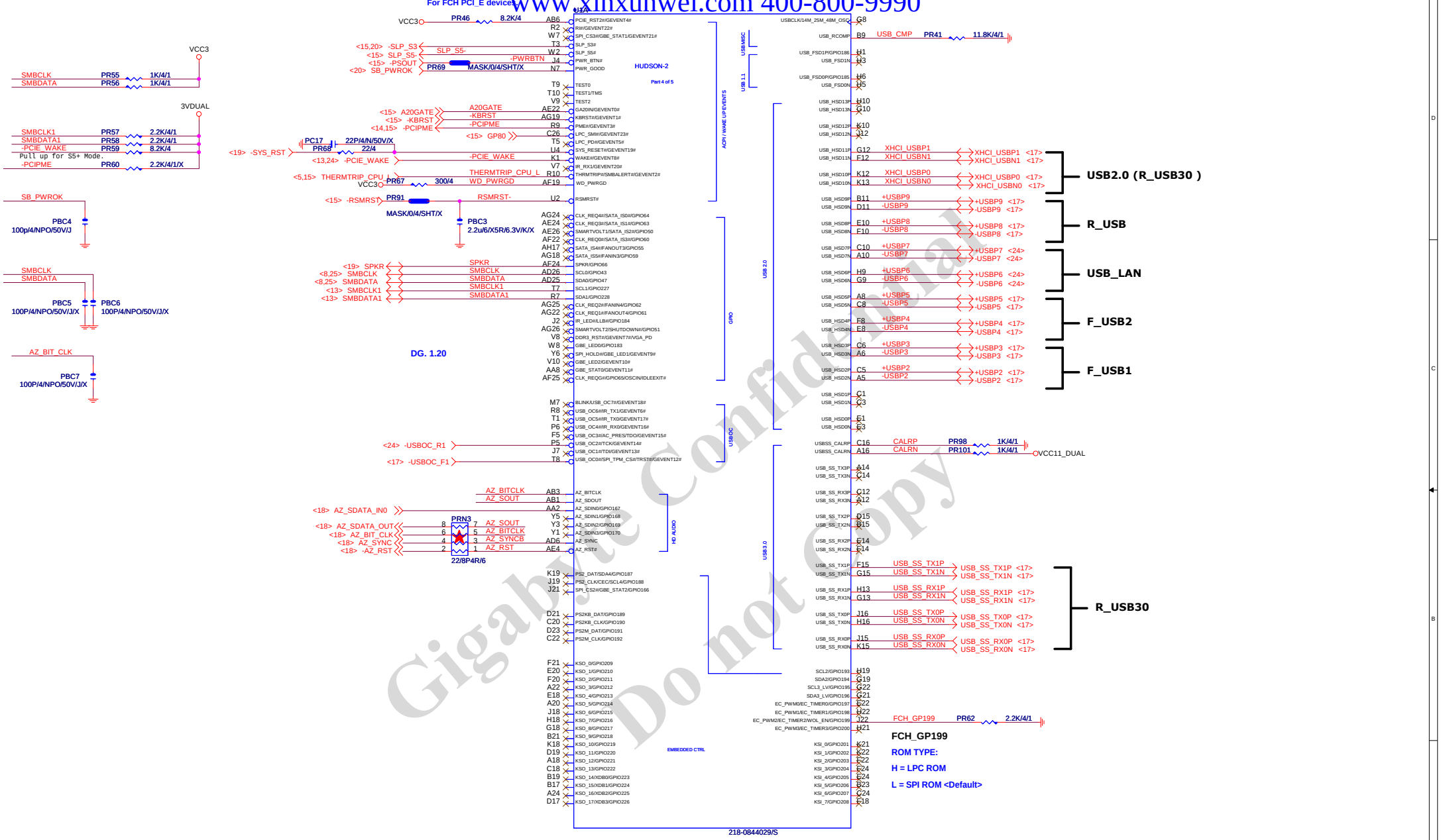
Title: **Bolton D4PCIE/PCI/CPU/LPC**

Size: Custom | Document Number: **GA-F2A68HM-S1** | Rev: **1.0**

Date: Tuesday, November 04, 2014 | Sheet 9 of 25



GIGABYTE			
Title: Bolton D4 ACPI/USB/AUDIO/GPIO			
Size: Custom	Document Number: GA-F2A68HM-S1		Rev: 1.0
Date: Tuesday, November 04, 2014		Sheet 10 of 25	

U1B

HUDSON-2

Part 2 of 5

SATA 6~7 for Hudson D4.

PLACE SATA_CAL RES VERY CLOSE TO BALL OF U1

RGMII NOT SUPPORT. DG:1.20

10" Max for FCH VGA.

MASK

218-0844029/S

SATA2/7/BK/H/OP/VA/D/1/B

SATA2/7/BK/H/OP/VA/D/1/B

SATA2/7/BK/H/OP/VA/D/1/B

SATA2/7/BK/H/OP/VA/D/1/B

64M/SPI/SO8/200mil/S

64M/SPI/SO8/200mil/S/X

22/8P4R/6

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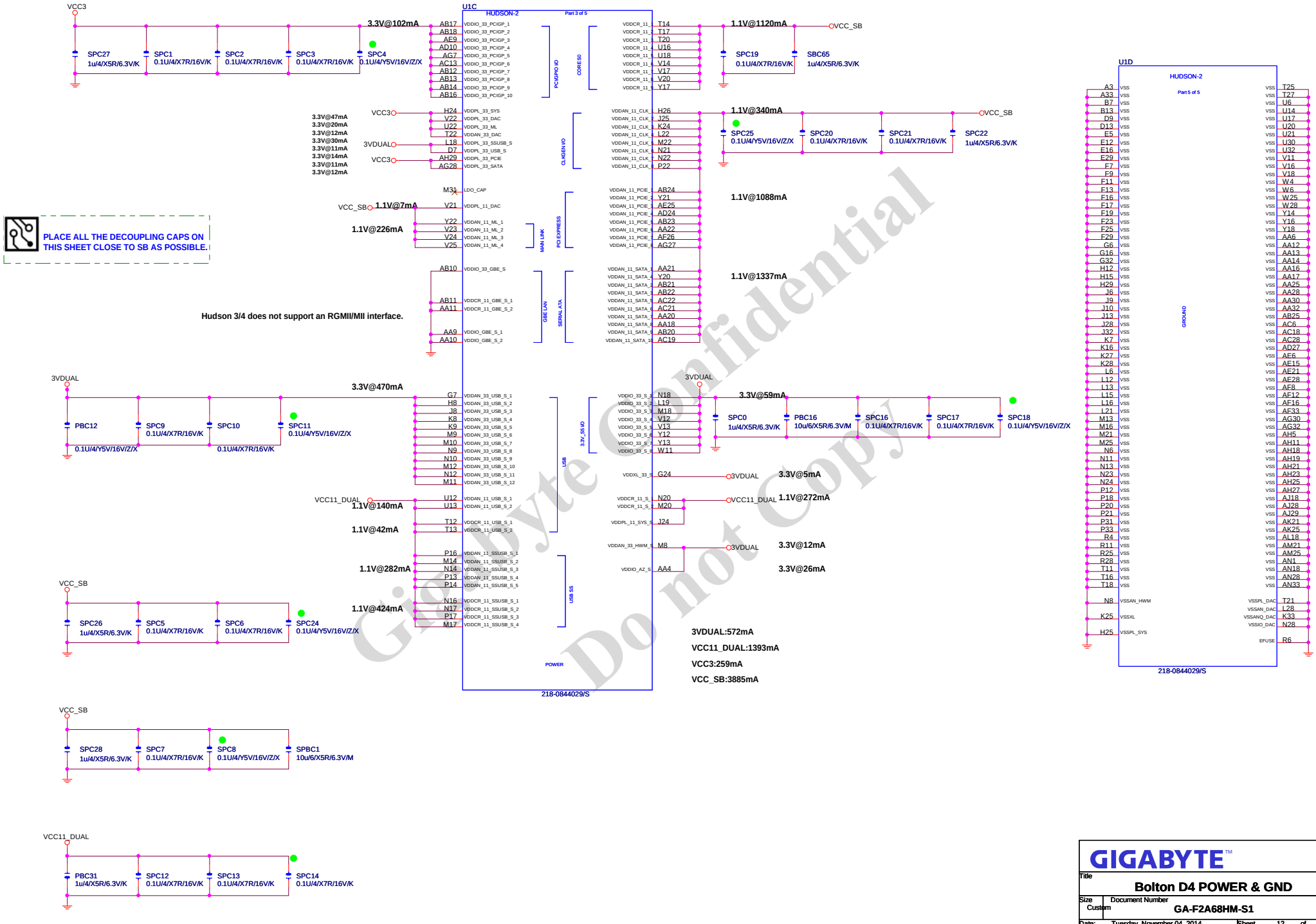
Title: Bolton D4 SATA/HWM/SPI

Size: Custom | Document Number: GA-F2A68HM-S1 | Rev: 1.0

Date: Tuesday, November 04, 2014 | Sheet 11 of 25



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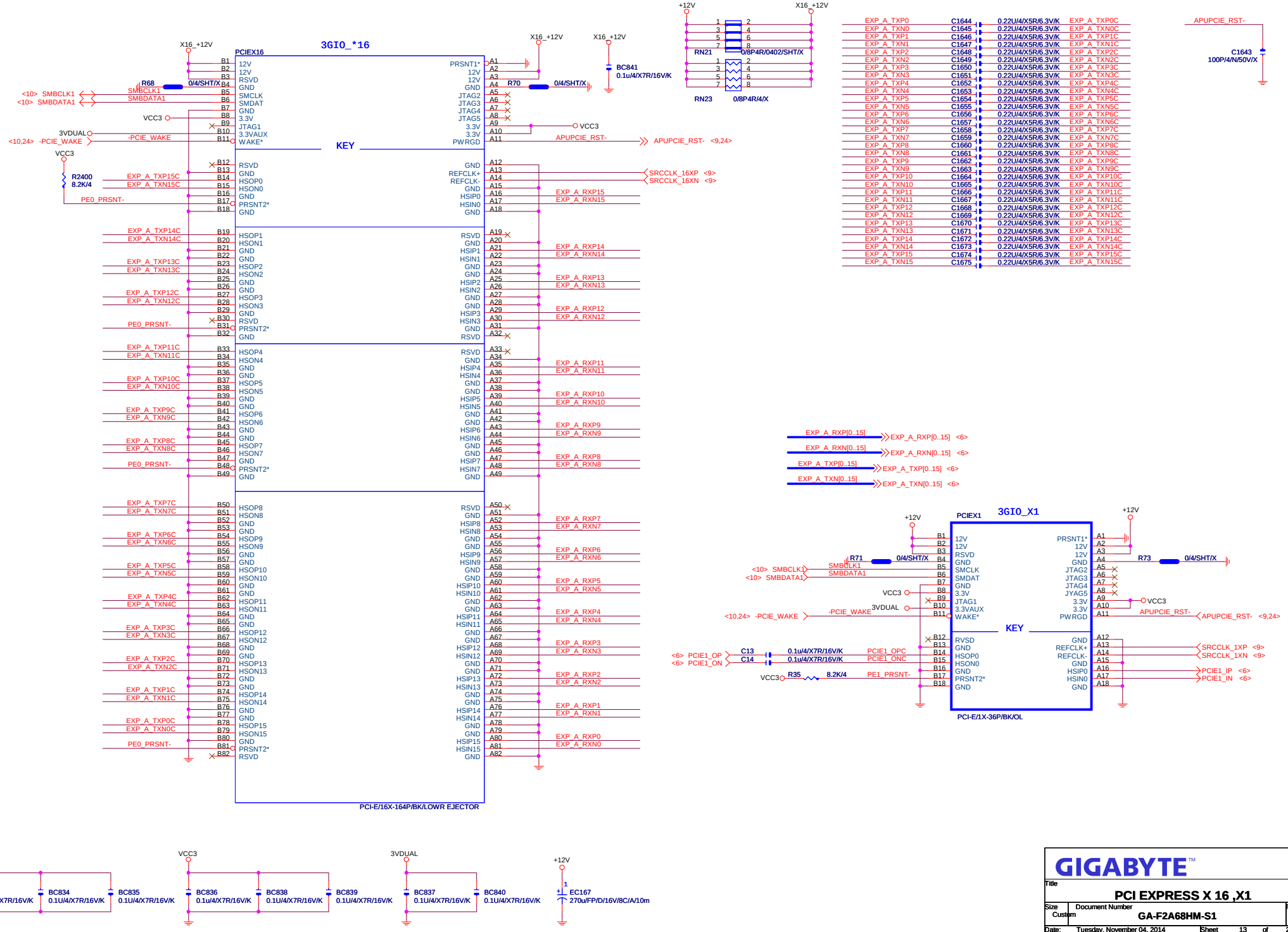
Title	Bolton D4 POWER & GND	
Size: Custom	Document Number: GA-F2A68HM-S1	Rev: 1.0
Date: Tuesday, November 04, 2014	Sheet 12 of 25	



GIGABYTE™

Title	PCI EXPRESS X 16 ,X1	
Size: Custom	Document Number: GA-F2A68HM-S1	Rev: 1.0
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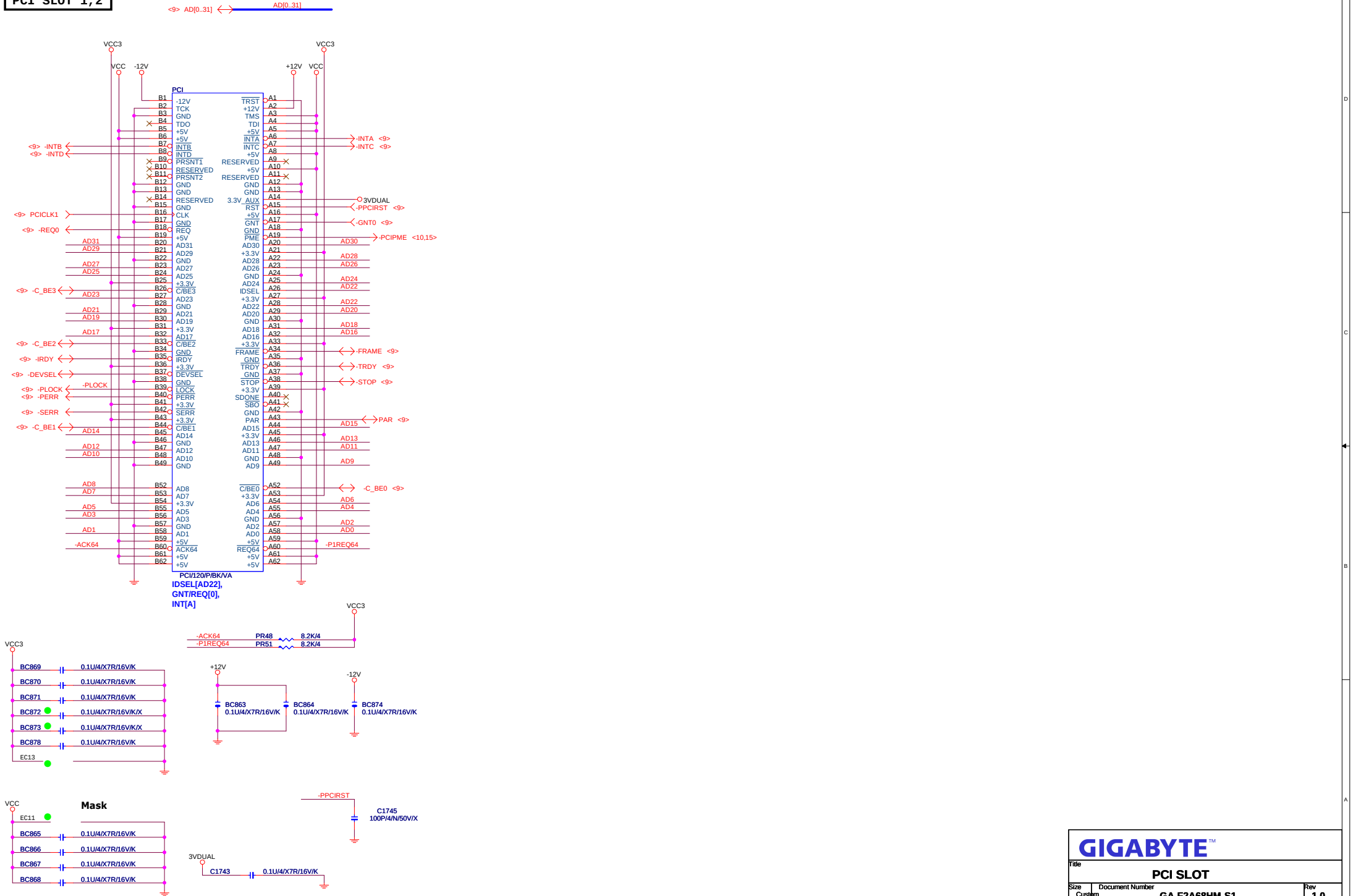
PCI SLOT 1,2



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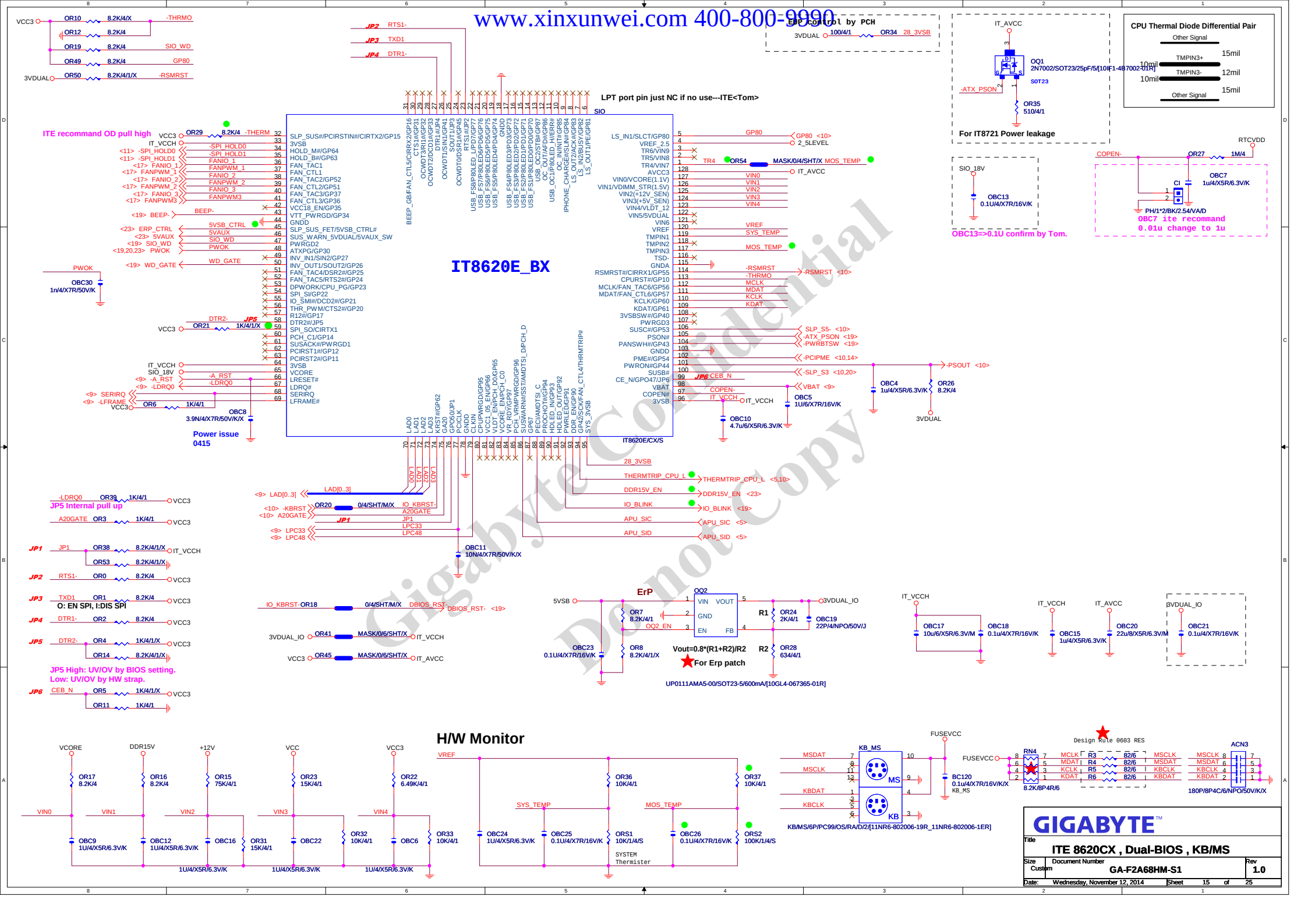
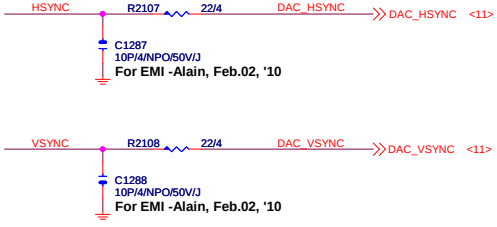
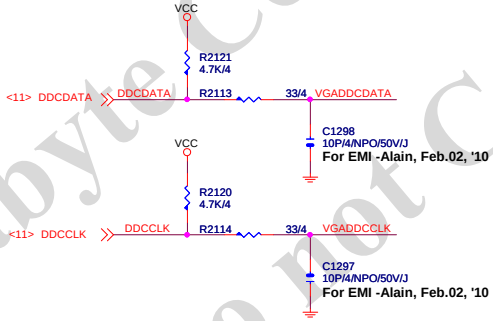
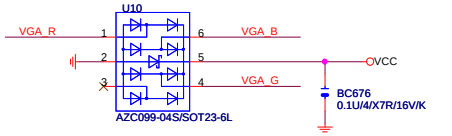
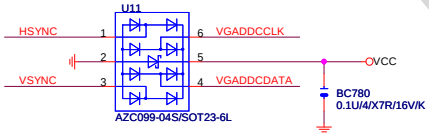
Title: PCI SLOT		
Size: Custom	Document Number: GA-F2A68HM-S1	Rev: 1.0
Date: Tuesday, November 04, 2014	Sheet 14 of 25	

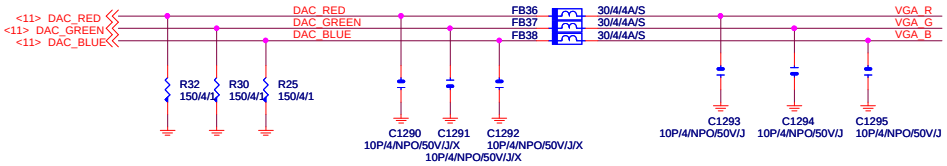


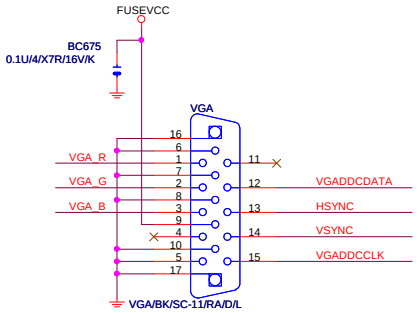


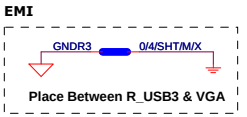












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Title: RGB		
Size: Custom	Document Number: GA-F2A68HM-S1	Rev: 1.0
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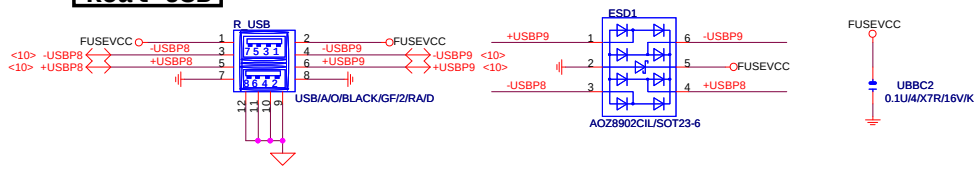
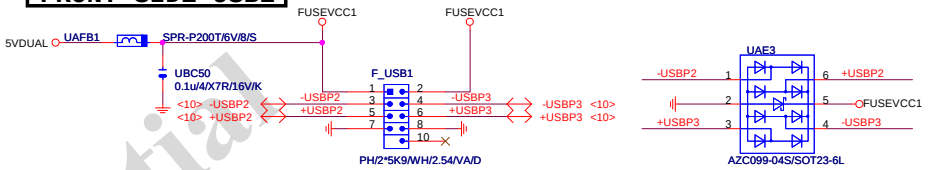
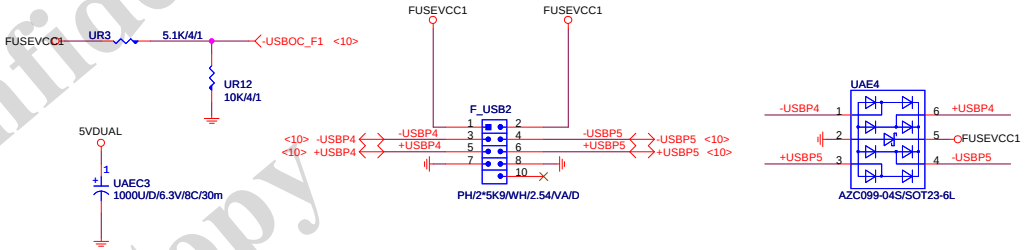
Real USB

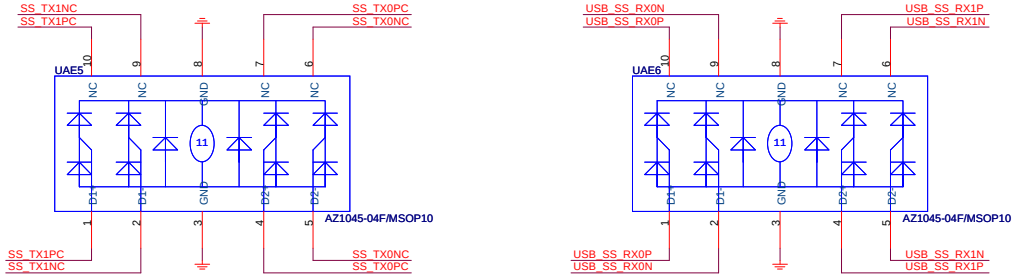


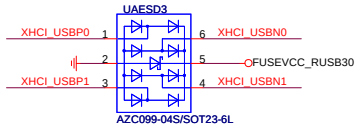
FRONT SIDE USB1



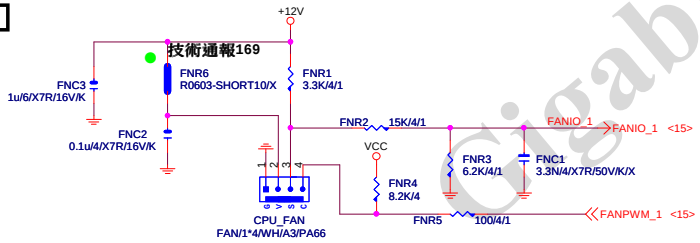
FRONT SIDE USB2



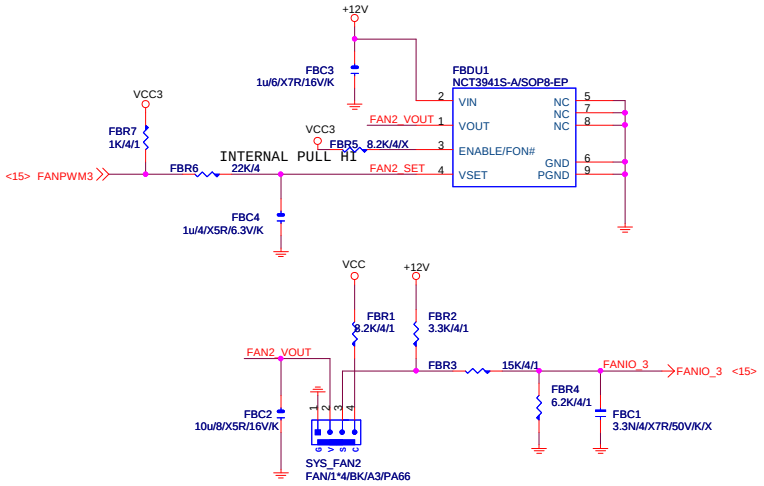




CPU SMART FAN



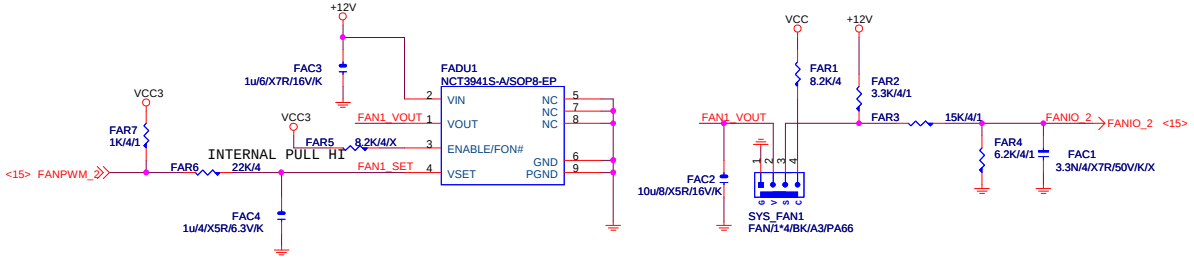
SYSTEM FAN2



SYSTEM FAN1

Linear SYS_FAN

Enable Function (NCT3941S)
Full Turn On Function (NCT3941S-A)



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Title	FAN ,USB30,F_USB2	
Size: Custom	Document Number: GA-F2A68HM-S1	Rev: 1.0
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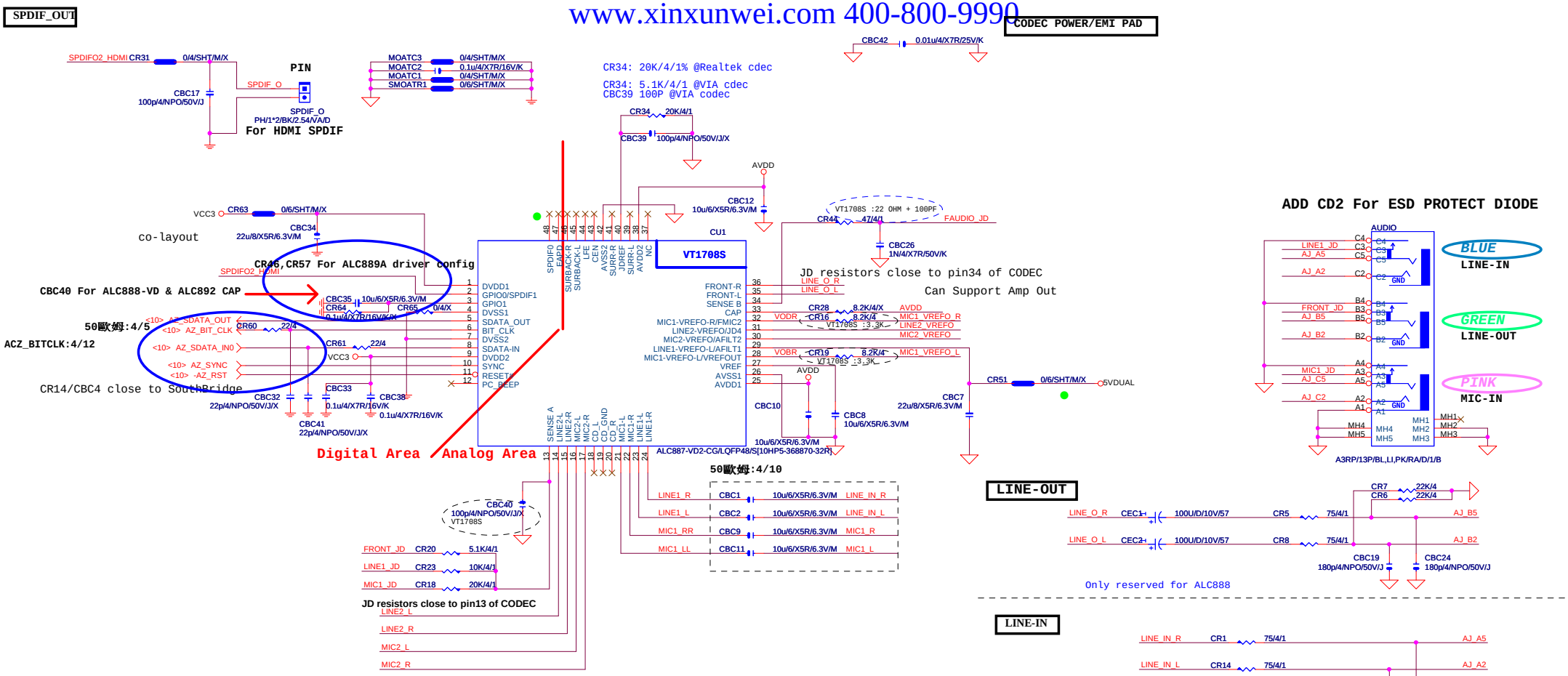

AZALIA CODEC

ALC887-VD2/ALC889/VT1708S/VT1708SCE Colay

	ALC887-VD2	ALC889	VT1708S	VT1708SCE
CR65	X	0	0	X
CR64	X	X	X	0
CR44/CBC26	47ohm+1nF	47ohm+1nF	22ohm+100P	22ohm+100P
CR34	20K/1%	20K/1%	5.1K/1%	20K/1%
CR31	0	0	0	0
CR30	X	X	X	X
CBC1/CBC2	22uF/X5R	22uF/X5R	22uF/X5R	22uF/X5R
CR20	5.11K/4/1	5.11K/4/1	5.1K/4/1	5.1K/4/1
CBC35	0	X	X	0
CBC39/CBC40	N/A	N/A	100P/4	100P/4
CR6/CR7/CR54/CR58	22K/4	22K/4	10K/4	10K/4
CR5/CR8/CR13/CR11/ CR57/CR53	75 ohm	62 ohm	75 ohm	75 ohm
CR51/CD1/CBC7	0	X	X	0
CD2/CD3/CQ3/CQ5	X	0	0	X
CR1/CR14/CR17/CR22	75 ohm	62 ohm	1K ohm	1K ohm

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Title: HD AUDIO ALC887-VD2

Size: Custom | Document Number: GA-F2A68HM-S1 | Rev: 1.0

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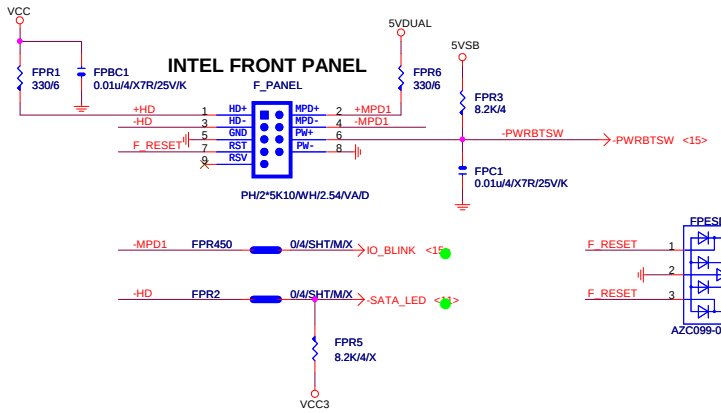
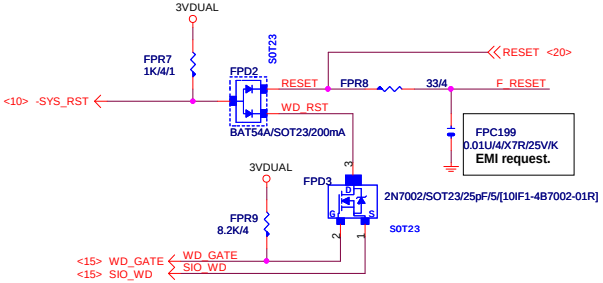
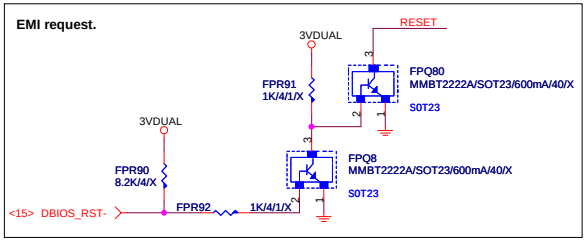
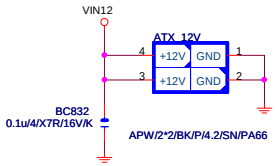
INTEL FRONT PANEL

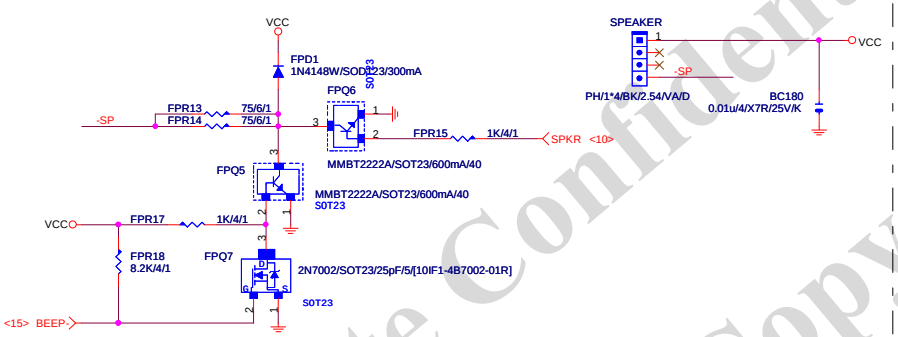






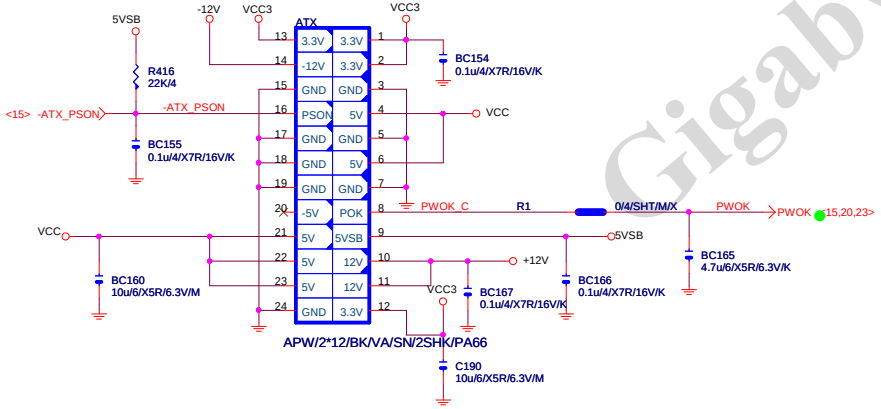
VRM 12V POWER CONNECTOR

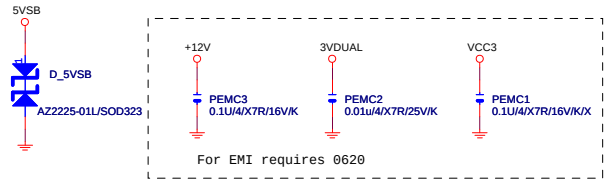




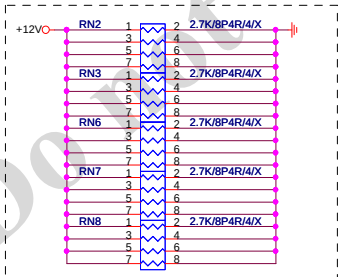
For SPKR voltage issue. FPQ6=>2222, FPQ7=>7002

ATX POWER CONNECTOR

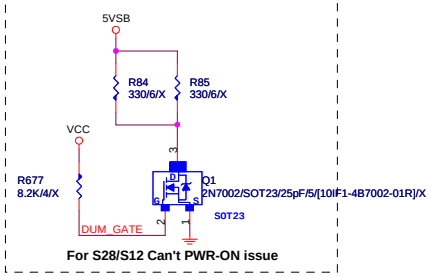




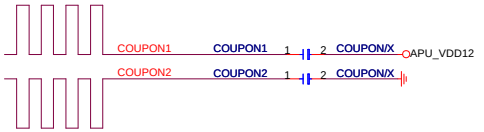
【技術通報R&D技術通報153】

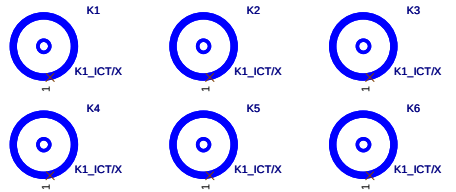


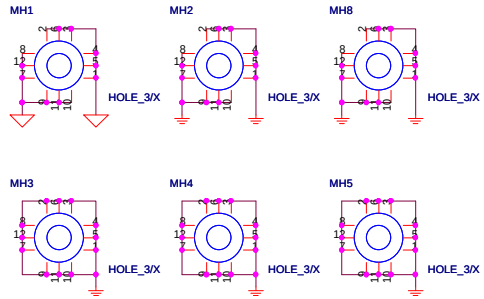
To fix 12V light load abnromal issue



For S28/S12 Can't PWR-ON issue







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Title: ATX, FRONT PANEL

Size: Custom | Document Number: GA-F2A68HM-S1 | Rev: 1.0

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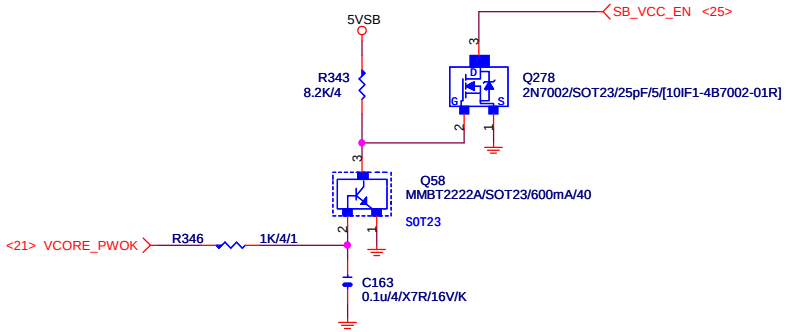
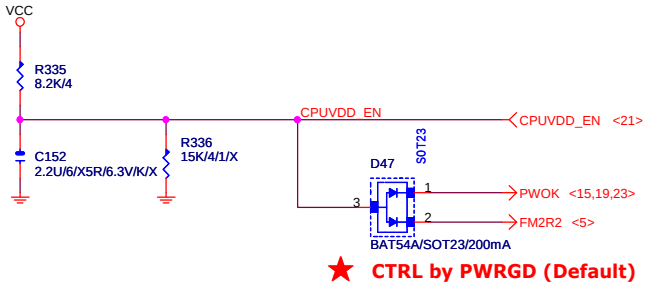
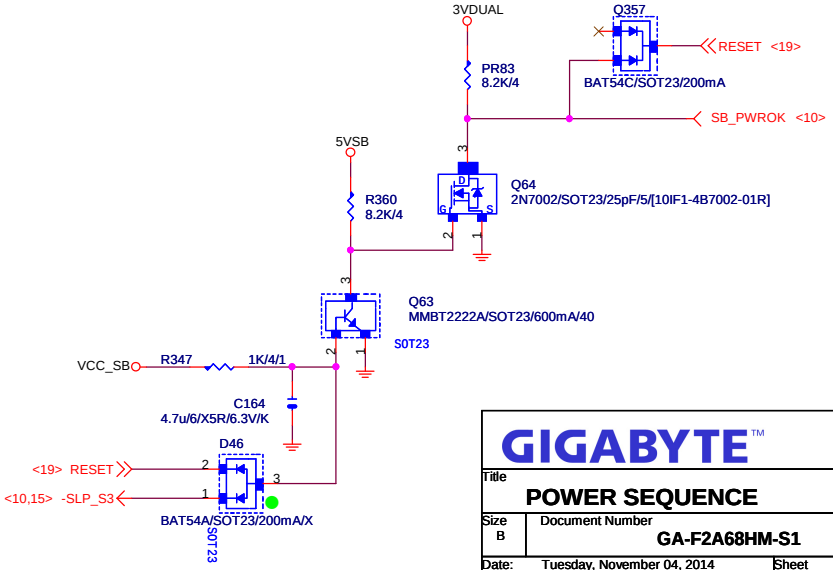




★ **CTRL by PWRGD (Default)**



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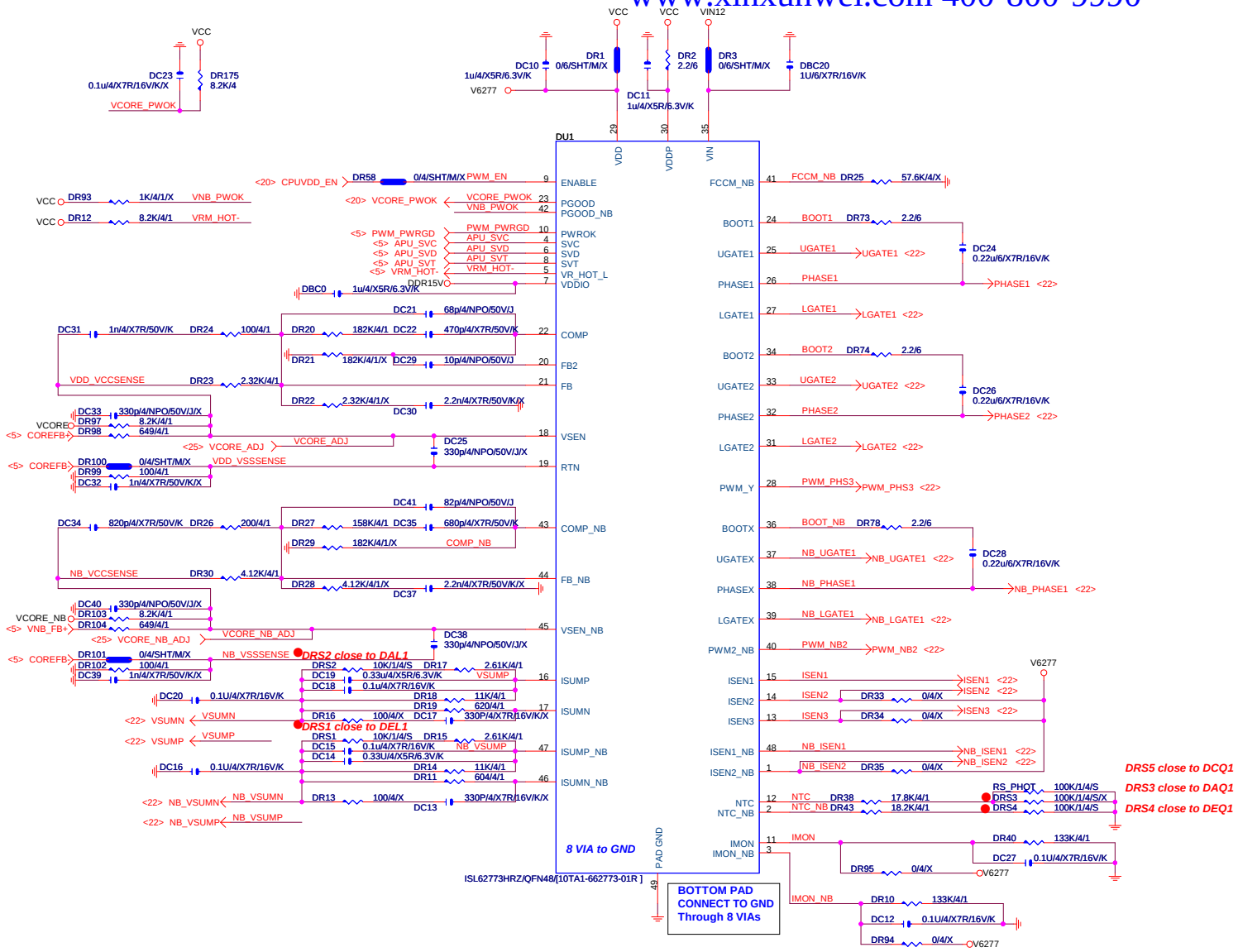
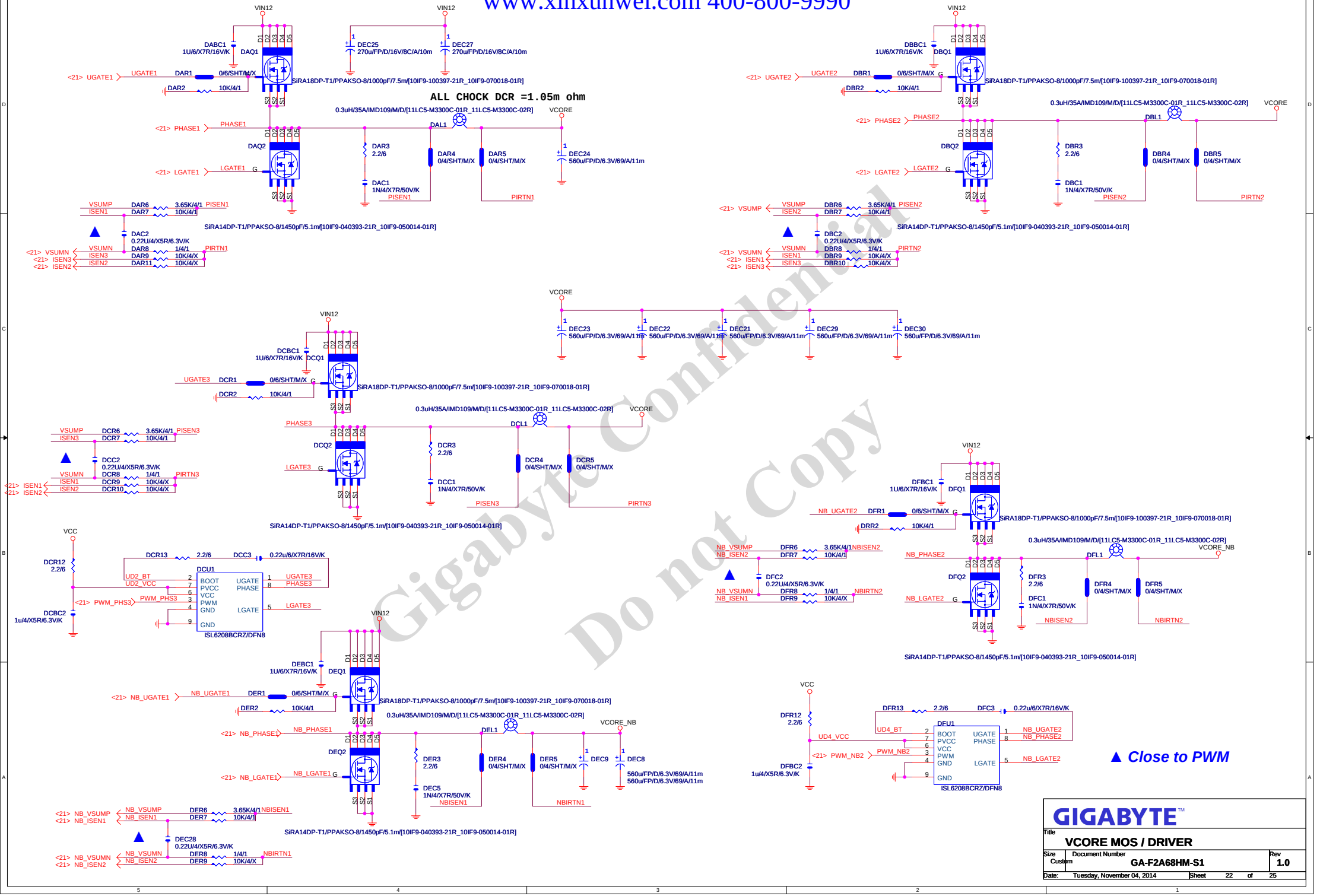
Title: POWER SEQUENCE		
Size: B	Document Number: GA-F2A68HM-S1	Rev: 1.0
Date: Tuesday, November 04, 2014	Sheet 20 of 25	

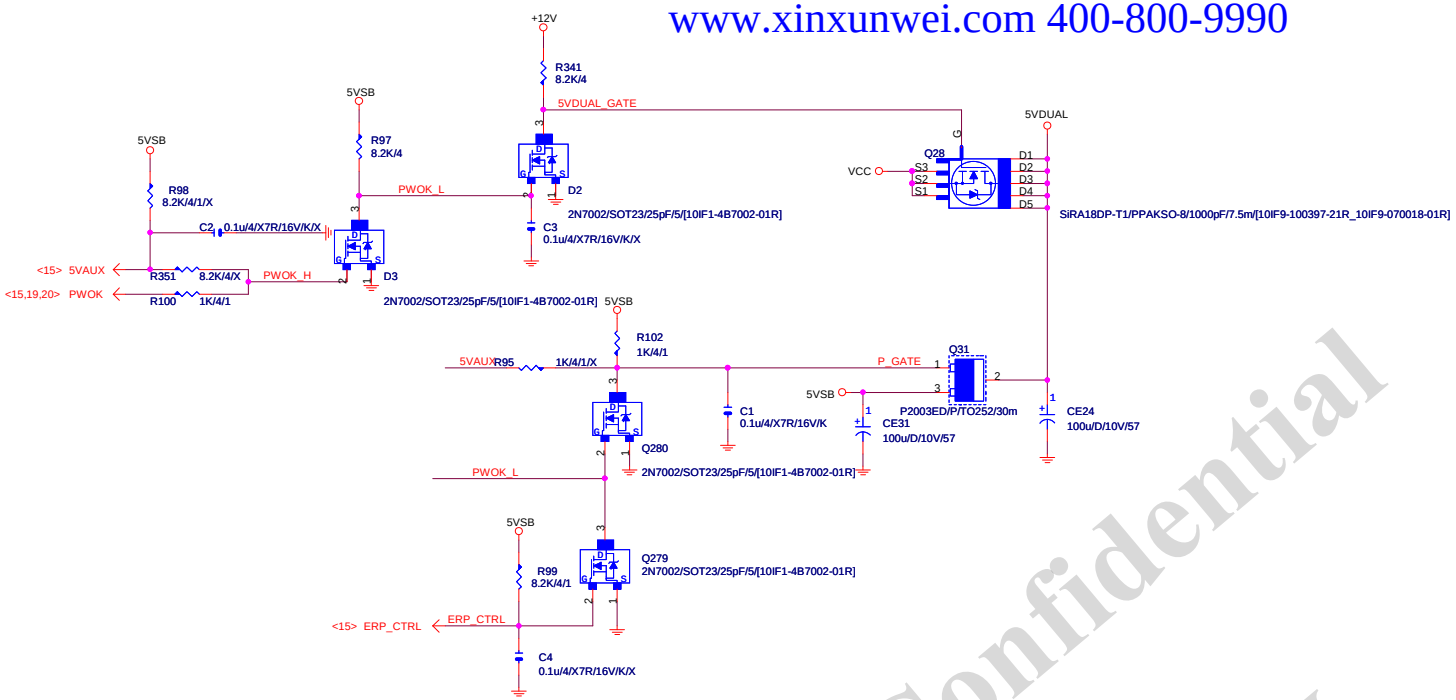


GIGABYTE™			
Title: VCORE (ISL62773)			
Size: Custom	Document Number: GA-F2A68HM-S1		Rev: 1.0
Date: Tuesday, November 04, 2014	Sheet 21 of 25		

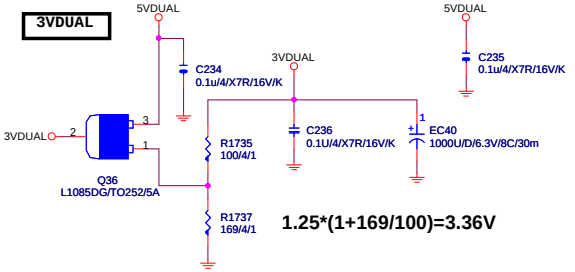


GIGABYTE™			
Title: VCORE MOS / DRIVER			
Size: Custom	Document Number: GA-F2A68HM-S1	Rev: 1.0	
Date: Tuesday, November 04, 2014	Sheet 22 of 25		

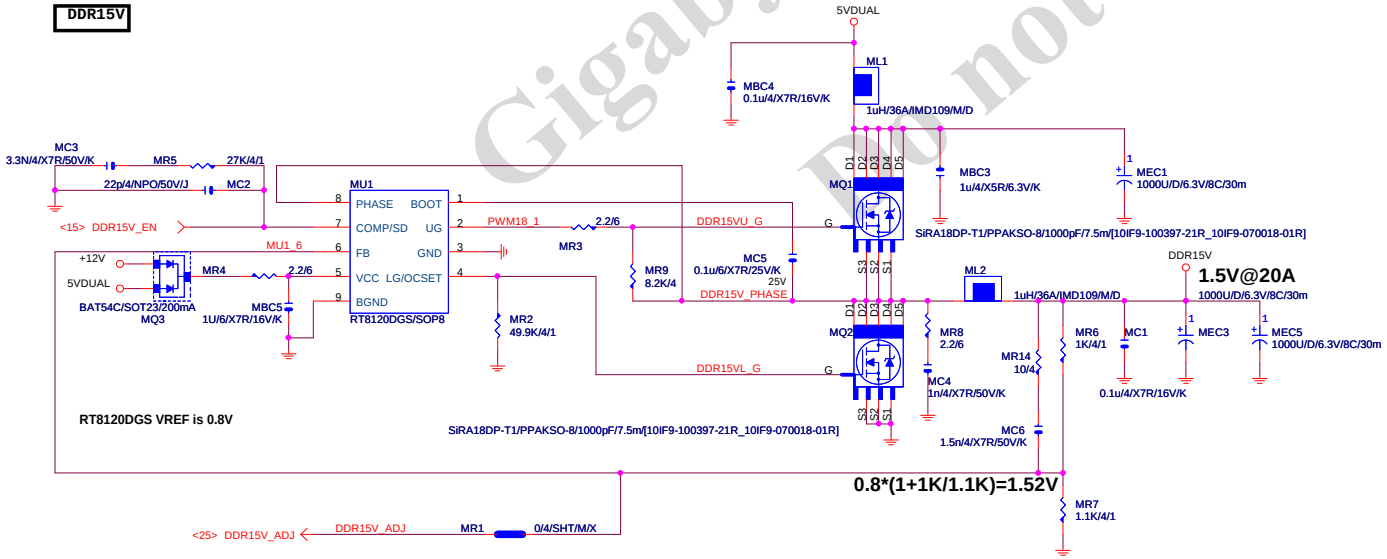
5VDUAL

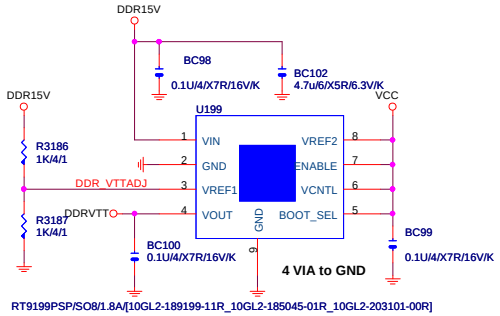


3VDUAL



DDR15V





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Title	DDR POWER , 5VDUAL , ErP	
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LAN:RTL8111G

LAX1
25M/16p/30ppm/49US/20/D
LA_XTALI
LA_XTALO
LAC5 20p/4/NPO/50V/J
LAC6 20p/4/NPO/50V/J

LAR12 2.49K/4/1

LAU1
RTL8111G(S)/8106E
RTL8111G-CG/QFN32

1	LA_MDI0+	MDIP0	
2	LA_MDI0-	MDIN0	
3	LA_DVDD10	AVDD10(NC)	
4	LA_MDI1+	MDIP1	
5	LA_MDI1-	MDIN1	
6	LA_MDI2+	MDIP2(NC)	
7	LA_MDI2-	MDIN2(NC)	
8	LA_DVDD10	AVDD10	
9	LA_MDI3+	MDIP3(NC)	
10	LA_MDI3-	MDIN3(NC)	
11	LA_VDD33	AVDD33(NC)	
12	LA_CLKREQB	CLKREQB	
13	LA_ML_OP_C	HSIP	
14	LA_ML_ON_C	HSIN	
15	SRCCLK_P	REFCLK_P	
16	SRCCLK_N	REFCLK_N	
17	LA_ML_IP_C	HSOP	LAC1 0.1u/4/X7R/16V/K
18	LA_ML_IN_C	HSON	LAC4 0.1u/4/X7R/16V/K
19	APUPCIE_RST-	PERSTB	
20	N_ISOLATEB	ISOLATEB	
21	-PCIE_WAKE	LANWAKEB	
22	LA_DVDD10	DVDD10(NC)	
23	AVDD33_REG	VDDREG(VDD33)	LAR9 0/6/SHT/M/X
24	LA_REGOUT	REGOUT(NC)	
33	GND		

32	LA_VDD33	AVDD33	
31	LA_RSET	RSET	
30	LA_DVDD10	AVDD10	
29	LA_XTALO	CLXTAL2	
28	LA_XTALI	CKXTAL1	
27	LA_LED_ACT_TXRX	LED1/GPO	
26	LA_LED_LINK100	LED2(LED1)	
25	LA_LED_LINK1000		

VCC3
LAR4 1K/4/1
LAR5 15K/4/1/X
LAR1 8.2K/4/X
LABC4 100p/4/NPO/50V/J/X

<6> LA_ML_OP_C
<6> LA_ML_ON_C
<9> SRCCLK_LAN
<9> -SRCCLK_LAN

LA_ ML-->80歐姆:[15/5/5/5/15]
SRCCLK-->50歐姆:[18/4/10/4/18]

LAN POWER

(CLOSE LAU1 PIN22,30,3,8)
LA_DVDD10
PIN22 LABC2 1u/4/X5R/6.3V/K
PIN30 LABC9 0.1u/4/X7R/16V/K
PIN3 LABC3 0.1u/4/X7R/16V/K
PIN8 LABC8 0.1u/4/X7R/16V/K

LABC2:1U CLOSE PIN22[REALTEK REQ]

3VDUAL
AVDD33_REG
PIN23 LABC6 0.1u/4/X7R/16V/K
(CLOSE LAU1 PIN23)

LA_VDD33
(CLOSE LAU1 PIN:11,32)
PIN11 LABC18 0.1u/4/X7R/16V/K
LABC27 4.7u/6/X5R/6.3V/K PWR SURGE
PIN32 LABC14 0.1u/4/X7R/16V/K
LABC20 4.7u/6/X5R/6.3V/K PWR SURGE

LABC18,27:CLOSE PIN11[REALTEK SURGE]
LABC14,20:CLOSE PIN32[REALTEK SURGE]

LA_REGOUT
PIN24 LABC5 0.1u/4/X7R/16V/K
LAR8 0/6/SHT/M/X
LA_DVDD10
(CLOSE LAU1 PIN24)

NOTE:
RT8106E:PIN3,11,22,24-->NC
LABC2LABC3,LABC5,LABC18,LABC27-->N/A

USB_LAN

LAESD2 AZC099-04S/SOT23-6L/X
LA_MDI1- LA_MDI1+ LA_MDI0+ LA_MDI0- 5VDUAL

LAESD3 AZC099-04S/SOT23-6L/X
LA_MDI3- LA_MDI3+ LA_MDI2+ LA_MDI2- 5VDUAL

ESD2 AZC099-04S/SOT23-6L
+USBP7 -USBP7 -USBP6 +USBP6 FUSEVCC

UAD5 BAT54A/SOT23/200mA SOT23
FUSEVCC_RUSB30
FUSEVCC
5VDUAL
UBR7 5.1K/4/1
-USBOC_R1 <10>
UBR9 10K/4/1

USB_LAN CONNECTOR

LABC22 0.01u/4/X7R/25V/K
USB_LAN
LA_MDI0+ LA_MDI0- LA_MDI1+ LA_MDI1- LA_MDI2+ LA_MDI2- LA_MDI3+ LA_MDI3-
UP
DOWN
LA_LED_ACT_TXRX
LA_LED_D2
LA_LED_LINK100
LA_LED_LINK1000
LAR13 150/4/1
LAN_3VDUAL_LED
3VDUAL
LAFB2 0/6/SHT/M/X
LABC24 0.1u/4/Y5V/16V/Z/X
-USBP6 +USBP6 FUSEVCC
-USBP7 +USBP7 FUSEVCC
-USBP6 <10> +USBP6 <10>
-USBP7 <10> +USBP7 <10>

USB+LAN/1G/GO,Y/OS/RA/D/12C/ES/[11NR6-702009-Z1R_11NR6-702009-R2R]
Close to USB_LAN

5VDUAL
UAFB5 SPR-P200T/6V/8/S
FUSEVCC
UBC54 0.1u/4/X7R/16V/K/X
UBBC1 0.1U/4/X7R/16V/K USB_LAN
5VDUAL
UBEC5 1000U/D/6.3V/8C/30m

EMI

GNDR2 0/4/SHT/M/X
Place Between R_USB30 & USB_LAN
GNDR1 0/6/SHT/M/X
Place Between AUDIO & USB_LAN

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Title	REALTK RTL8111G	
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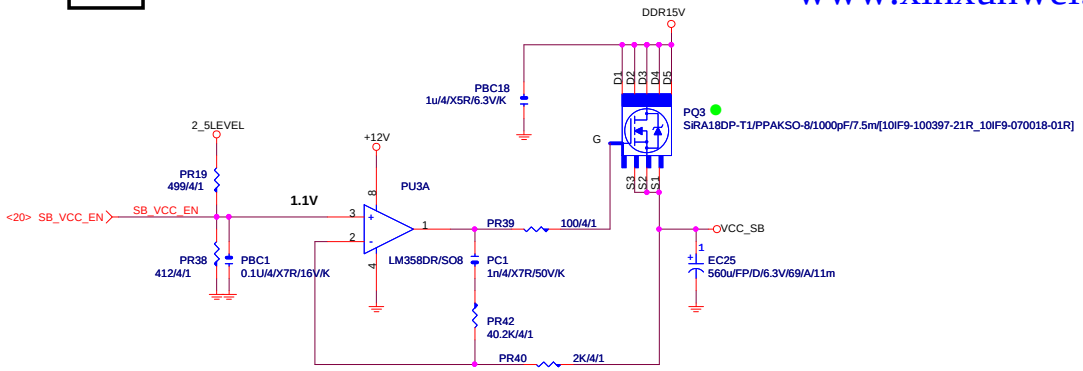
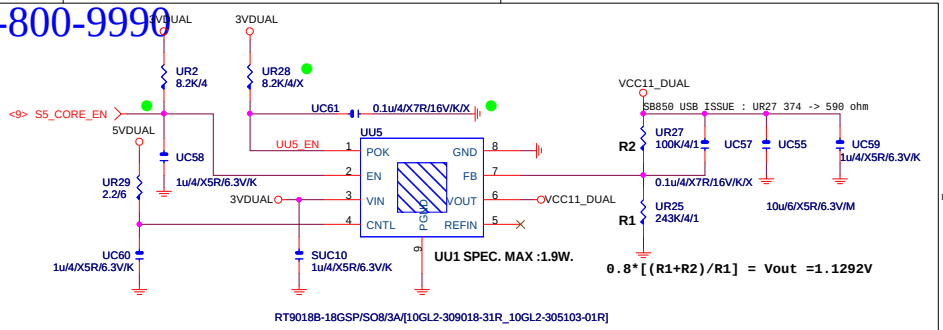
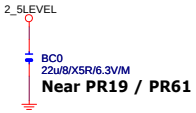
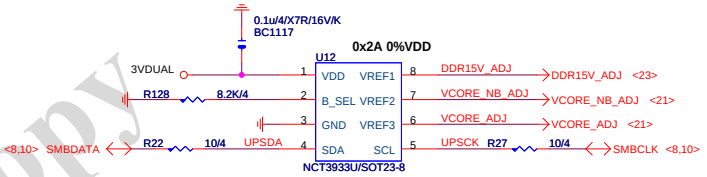
VCC_SB



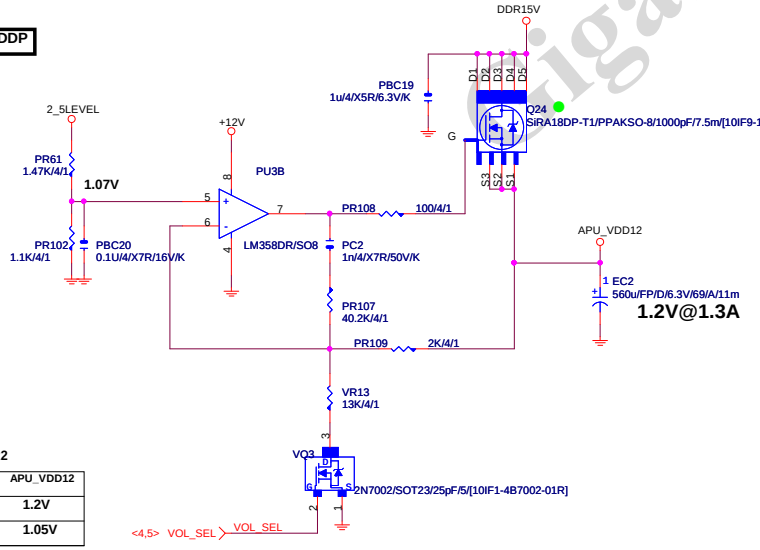


【技術通報R&D技術通報156】
RT9018(RICHTEK)與NCT3730(NUVOTON),
EM5103GE(EMC)做共用,針對PIN7(FB)分壓阻值部份
(R1/R2)須做修改為100K以上電阻值



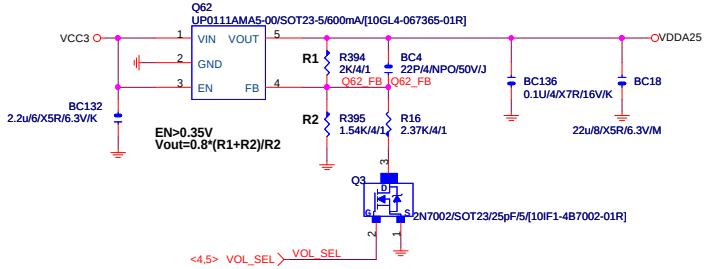


APU_VDDP



Vout=1.07*(R1+R2)/R2

APU	VOL_SEL	APU_VDD12
FM2	1	1.2V
FM2+	0	1.05V



APU	VOL_SEL	VDDA25
FM2	1	2.5V
FM2+	0	1.8V

GIGABYTE™

Title: VCC_SB , APU_VDDP,VCC11_DUAL,VDDA25

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