GA-990FXA-UD3

Revision : 1.0

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Model Name:GA-990FXA-UD3

AM2-->AM3 Different: AE9-->AE7, H22-->H20. Extra pin:B2 AM3 socket is 938 pins. Only shift 2 pins.

Component value change history

4 Layer, 4mil 50ohm +/- 15% X

Version: 1.0

P-Code: U98145-0

Date	Version		Change Items
2011.03.17	0.1 New BOM Release.	PCB:0.1	Modify from 9M990FXA5-00-01
2011.04.13	1.0A BOM Release.	PCB:1.0	Add AMD Validation parts ,Add Thermal-Die schematic Delete AZ2025 for AUDIO
2011.04.27	1.0B BOM Release.	PCB:1.01	Remove PCB silkscreen SLI logo
2011.05.05	1.0C BOM Release.	PCB:1.01	更改 CPU RM 爲分離式
2011.05.05	1.0D BOM Release.	PCB:1.0	PCB Change to 1.0 (Silk W/SLI Logo)

Circuit or PCB layout change for next version

Date	Version	Reason
2011.03.16	0.1 Gerber-out	Modify from GA-990FXA-UD5 Rev 0.1
2011.04.12	1.0 Gerber-out	Add AMD Validation parts ,Add Thermal-Die schematic
2011.04.26	1.01 Gerber-out	Remove PCB silkscreen SLI logo

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Title: BOM & PCB HISTORY

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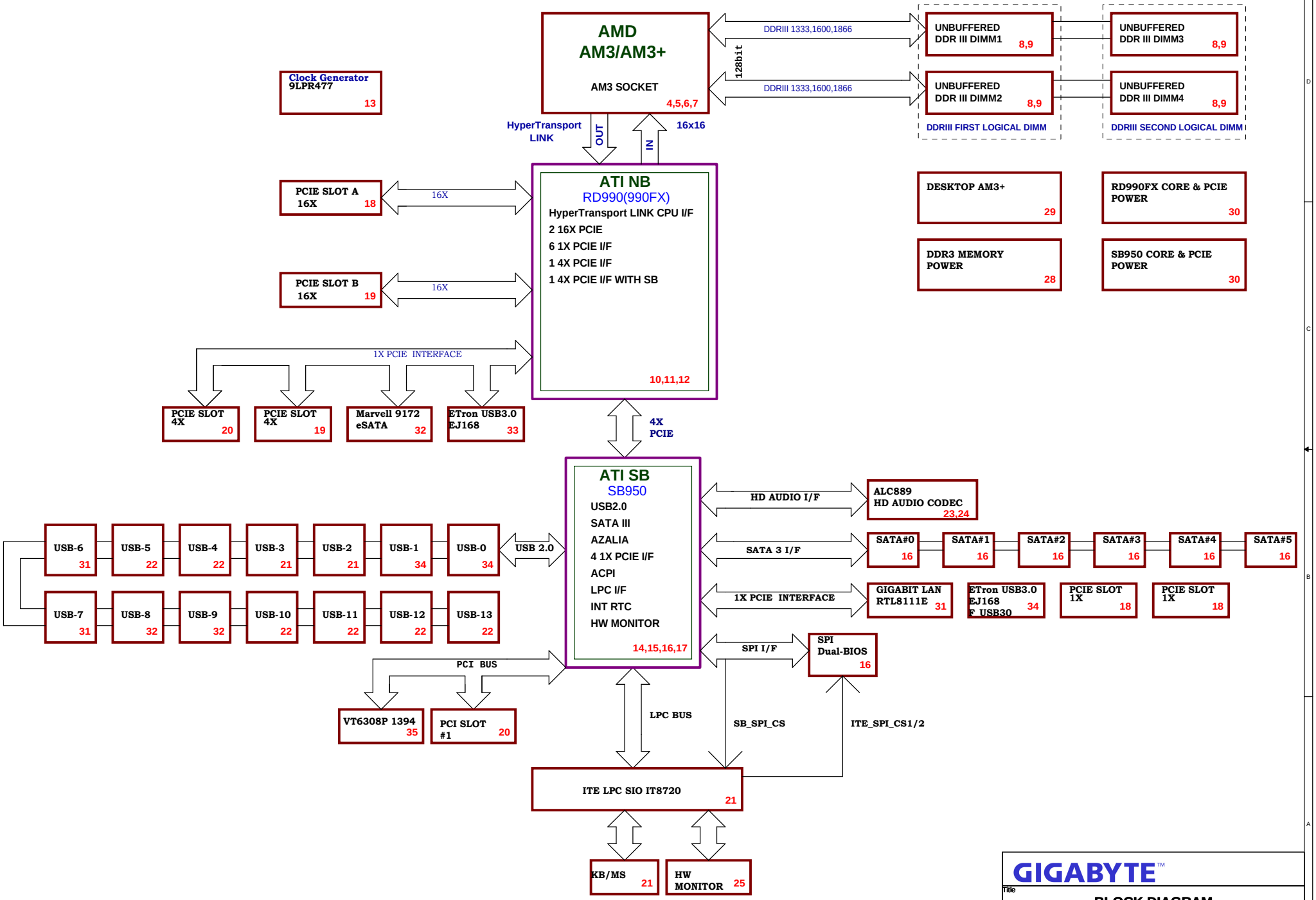

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Title	BLOCK DIAGRAM	
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L0_CADIN_L[0..15] → L0_CADIN_L[0..15] 10
L0_CADIN_H[0..15] → L0_CADIN_H[0..15] 10
L0_CADOUT_L[0..15] → L0_CADOUT_L[0..15] 10
L0_CADOUT_H[0..15] → L0_CADOUT_H[0..15] 10

CPU_VDD_RUN = VCORE
CPU_VDDA_RUN = VDDA25
VLDT_RUN = VCC12_HT
CPU_VDDIO_SUS = DDR15V
CPU_VDDR = CPU_VDDR12

VLDT_A = VCC12_HT
VLDT_B = HT12B

M2CPUA — HYPERTRANSPORT

10 L0_CLKIN_H1	L0_CLKIN_H1	N6	L0_CLKIN_H(1)	L0_CLKOUT_H(1)	AD5	L0_CLKOUT_H1 → L0_CLKOUT_H1 10
10 L0_CLKIN_L1	L0_CLKIN_L1	P6	L0_CLKIN_L(1)	L0_CLKOUT_L(1)	AD4	L0_CLKOUT_L1 → L0_CLKOUT_L1 10
10 L0_CLKIN_H0	L0_CLKIN_H0	N3	L0_CLKIN_H(0)	L0_CLKOUT_H(0)	AD1	L0_CLKOUT_H0 → L0_CLKOUT_H0 10
10 L0_CLKIN_L0	L0_CLKIN_L0	N2	L0_CLKIN_L(0)	L0_CLKOUT_L(0)	AC1	L0_CLKOUT_L0 → L0_CLKOUT_L0 10
10 L0_CTLIN_H1	L0_CTLIN_H1	V4	L0_CTLIN_H(1)	L0_CTLOUT_H(1)	Y6	L0_CTLOUT_H1 → L0_CTLOUT_H1 10
10 L0_CTLIN_L1	L0_CTLIN_L1	V5	L0_CTLIN_L(1)	L0_CTLOUT_L(1)	W6	L0_CTLOUT_L1 → L0_CTLOUT_L1 10
10 L0_CTLIN_H0	L0_CTLIN_H0	U1	L0_CTLIN_H(0)	L0_CTLOUT_H(0)	W2	L0_CTLOUT_H0 → L0_CTLOUT_H0 10
10 L0_CTLIN_L0	L0_CTLIN_L0	V1	L0_CTLIN_L(0)	L0_CTLOUT_L(0)	W3	L0_CTLOUT_L0 → L0_CTLOUT_L0 10
	L0_CADIN_H15	U6	L0_CADIN_H(15)	L0_CADOUT_H(15)	Y5	L0_CADOUT_H15
	L0_CADIN_L15	V6	L0_CADIN_L(15)	L0_CADOUT_L(15)	Y4	L0_CADOUT_L15
	L0_CADIN_H14	T4	L0_CADIN_H(14)	L0_CADOUT_H(14)	AB6	L0_CADOUT_H14
	L0_CADIN_L14	T5	L0_CADIN_L(14)	L0_CADOUT_L(14)	AA6	L0_CADOUT_L14
	L0_CADIN_H13	R6	L0_CADIN_H(13)	L0_CADOUT_H(13)	AB5	L0_CADOUT_H13
	L0_CADIN_L13	T6	L0_CADIN_L(13)	L0_CADOUT_L(13)	AB4	L0_CADOUT_L13
	L0_CADIN_H12	P4	L0_CADIN_H(12)	L0_CADOUT_H(12)	AD6	L0_CADOUT_H12
	L0_CADIN_L12	P5	L0_CADIN_L(12)	L0_CADOUT_L(12)	AC6	L0_CADOUT_L12
	L0_CADIN_H11	M4	L0_CADIN_H(11)	L0_CADOUT_H(11)	AF6	L0_CADOUT_H11
	L0_CADIN_L11	M5	L0_CADIN_L(11)	L0_CADOUT_L(11)	AF6	L0_CADOUT_L11
	L0_CADIN_H10	L6	L0_CADIN_H(10)	L0_CADOUT_H(10)	AF5	L0_CADOUT_H10
	L0_CADIN_L10	M6	L0_CADIN_L(10)	L0_CADOUT_L(10)	AF4	L0_CADOUT_L10
	L0_CADIN_H9	K4	L0_CADIN_H(9)	L0_CADOUT_H(9)	AH6	L0_CADOUT_H9
	L0_CADIN_L9	K5	L0_CADIN_L(9)	L0_CADOUT_L(9)	AG6	L0_CADOUT_L9
	L0_CADIN_H8	J6	L0_CADIN_H(8)	L0_CADOUT_H(8)	AH5	L0_CADOUT_H8
	L0_CADIN_L8	K6	L0_CADIN_L(8)	L0_CADOUT_L(8)	AH4	L0_CADOUT_L8
	L0_CADIN_H7	U3	L0_CADIN_H(7)	L0_CADOUT_H(7)	Y1	L0_CADOUT_H7
	L0_CADIN_L7	U2	L0_CADIN_L(7)	L0_CADOUT_L(7)	W1	L0_CADOUT_L7
	L0_CADIN_H6	R1	L0_CADIN_H(6)	L0_CADOUT_H(6)	AA2	L0_CADOUT_H6
	L0_CADIN_L6	T1	L0_CADIN_L(6)	L0_CADOUT_L(6)	AA3	L0_CADOUT_L6
	L0_CADIN_H5	R3	L0_CADIN_H(5)	L0_CADOUT_H(5)	AB1	L0_CADOUT_H5
	L0_CADIN_L5	R2	L0_CADIN_L(5)	L0_CADOUT_L(5)	AA1	L0_CADOUT_L5
	L0_CADIN_H4	N1	L0_CADIN_H(4)	L0_CADOUT_H(4)	AC2	L0_CADOUT_H4
	L0_CADIN_L4	P1	L0_CADIN_L(4)	L0_CADOUT_L(4)	AC3	L0_CADOUT_L4
	L0_CADIN_H3	L1	L0_CADIN_H(3)	L0_CADOUT_H(3)	AE2	L0_CADOUT_H3
	L0_CADIN_L3	M1	L0_CADIN_L(3)	L0_CADOUT_L(3)	AE3	L0_CADOUT_L3
	L0_CADIN_H2	L3	L0_CADIN_H(2)	L0_CADOUT_H(2)	AF1	L0_CADOUT_H2
	L0_CADIN_L2	L2	L0_CADIN_L(2)	L0_CADOUT_L(2)	AE1	L0_CADOUT_L2
	L0_CADIN_H1	J1	L0_CADIN_H(1)	L0_CADOUT_H(1)	AG2	L0_CADOUT_H1
	L0_CADIN_L1	K1	L0_CADIN_L(1)	L0_CADOUT_L(1)	AG3	L0_CADOUT_L1
	L0_CADIN_H0	J3	L0_CADIN_H(0)	L0_CADOUT_H(0)	AH1	L0_CADOUT_H0
	L0_CADIN_L0	J2	L0_CADIN_L(0)	L0_CADOUT_L(0)	AG1	L0_CADOUT_L0

CPU-SK/941AM3/S/GF/[10SC1-A01942-01R_10SC1-A01942-02R]

VCORE
AC1 100P/4/NPO/50V/J/X
AC2 100P/4/NPO/50V/J/X
AC3 100P/4/NPO/50V/J/X
HT_BUS Vcore use

COUPON1 COUPON1 1 2 COUPON/X VCC
COUPON2 COUPON2 1 2 COUPON/X

K1 K1_ICT/X
K2 K1_ICT/X
K3 K1_ICT/X
K4 K1_ICT/X
K5 K1_ICT/X
K6 K1_ICT/X

M2CPU
AM3RM/SC/BL/MB/[12KRC-04K812-31R]

MH3 HOLE_3/X
MH9 HOLE_3/X
MH8 HOLE_3/X
MH1 HOLE_3/X
MH2 HOLE_3/X
MH4 HOLE_3/X
MH7 HOLE_3/X
MH5 HOLE_3/X
MH6 HOLE_3/X

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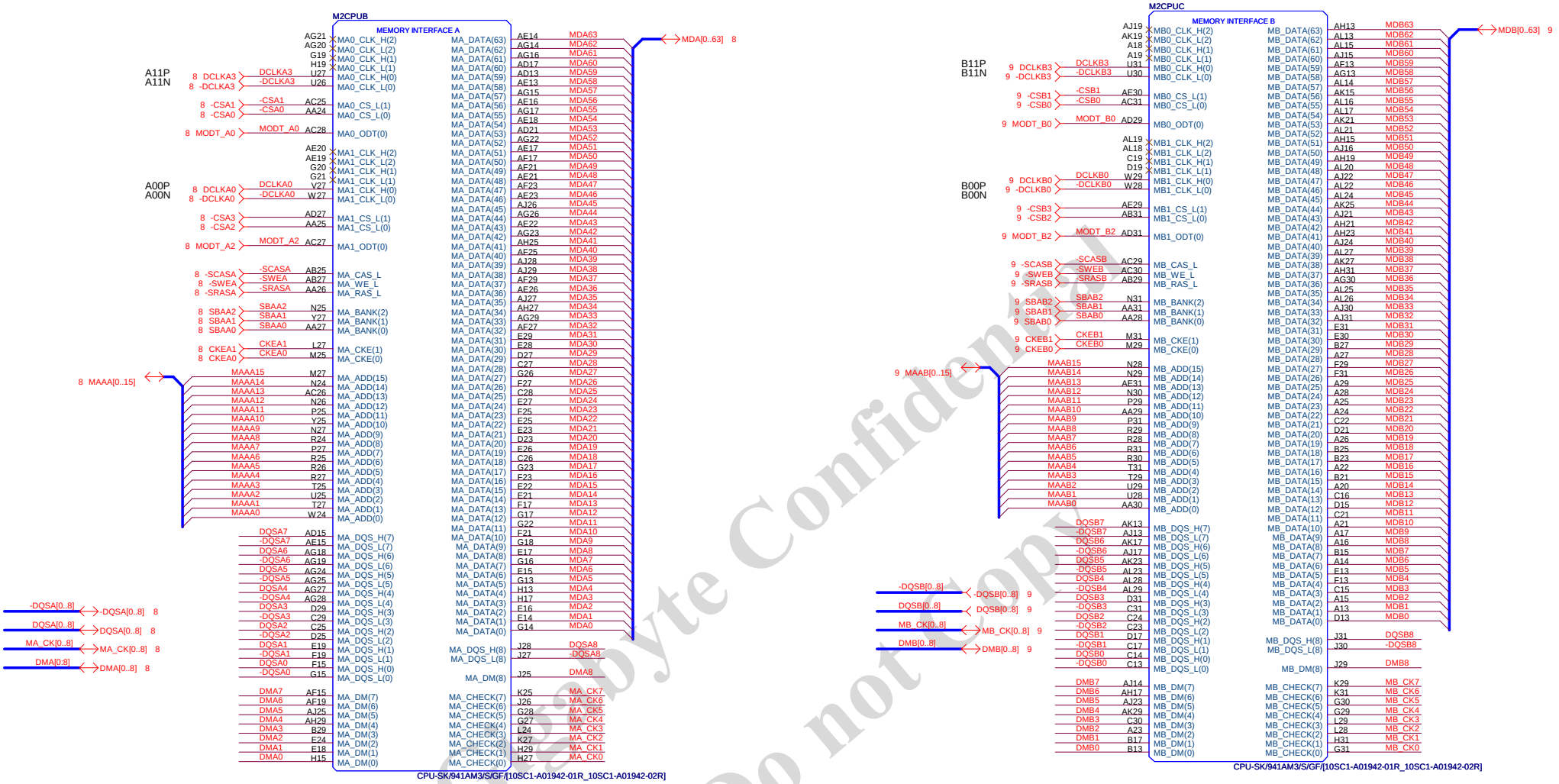

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SB600 CPU_PWR / DDR18V

DDR15V
-CPURST AR1 300/4
-LDT_STOP AR2 300/4
AC4 150P/4/NPO/50V/J/X

-CPURST
AC5 100P4/NPO/50V/J

2.5V/0.5A

VDDA25
ABC1 4.7u/6/X5R/6.3V/K
ABC2 3.3n/4/X7R/50V/K
ABC3 0.22U/6/X7R/16V/K

13 CPUCLK0_H CPUCLK0_H AC6 3.9n/4/X7R/50V/K CLKIN_H
13 CPUCLK0_L CPUCLK0_L AC7 3.9n/4/X7R/50V/K AR3 169/4/1 CLKIN_L

M2CPUD
MISC
C10 VDDA1
D10 VDDA2
A8 CLKIN_H
B8 CLKIN_L

CPU_PWRGD C9 PWROK
-LDT_STOP D8 LDTSTOP_L
-CPURST C7 RESET_L
11,14 -LDT_STOP
11,14,15 -CPURST

CPU_PRESENT_L AL3 CPU_PRESENT_L

VID(5) D2
VID(4) D1
VID(3) C1 SVC
VID(2) E3 SVD
VID(1) E2 AR20 300/4
VID(0) E1

DDR15V
AR16 1K/4/1
AR17 1K/4/1
AR18 1K/4/1
AR19 300/4
SVC 29
SVD 29
AM3 only

DG:AM3 1.04

DDR15V AR4 1K/4/1 SIC AL6
21 SIC SID AK6
21 SID DDR15V AR5 1K/4/1

15 CPU_TDI CPU_TDI AL10
CPU_TRST- AJ10
CPU_TCK AH10
15 CPU_TCK CPU_TMS AL9
15 CPU_TMS
CPU_DBREQ- A5 DBREQ_L

SIC THERMTRIP_L AK7 THERMTRIP_L
SID PROCHOT_L AL7 -PROCHOT

TDI
TRST_L
TCK
TMS
TDO AK10
DBRDY B6

29 COREFB+ G2 VDD_FB_H
29,30 COREFB- G1 VDD_FB_L
VDDIO_FB_H AK11
VDDIO_FB_L AL11

E12 VTT_SENSE
PSI_L F1

VTT_SENSE AM3 only, may not use, like AM2

CPU_M_VREF F12 M_VREF
DDR15V AR6 39.2/4/1 M_ZN AH11
AR7 39.2/4/1/X M_ZP AJ11
HTREF1 V8 AR52 46.4/4/1 VCC12_HT
HTREF0 V7 AR53 46.4/4/1

CPU_TEST25_H A10 TEST25_H
CPU_TEST25_L B10 TEST25_L
F10 TEST19
E9 TEST18
AJ7 TEST13
F6 TEST9
TEST29_H C11 AR54 80.6/4/1/X
TEST29_L D11

AR8 1K/4/1
AR9 1K/4/1

Route as 80-Ohm differential impedance
Keep trace to resistor less than 1" from CPU pin

D6 TEST17
E7 TEST16
F8 TEST15
C5 TEST14
AH9 TEST12
TEST24 AK8 AR55 1K/4/1 CPU_TEST24
TEST23 AH8 CPU_TEST23
TEST22 AJ9 CPU_TEST22
TEST21 AL8 CPU_TEST21
TEST20 AJ8 CPU_TEST20

AR10 1K/4/1

E5 TEST7
AJ5 TEST6
AG9 THERMDC
AG8 THERMDA
AH7 TEST3
AJ6 TEST2
TEST28_H J10
TEST28_L H9
TEST27 AK9 CPU_TEST27
TEST26 AK5 CPU_TEST26
TEST10 G7
TEST8 D4

21 GNDA
21 TMPIN2

CPU-SK/941AM3/S/GF/[10SC1-A01942-01R_10SC1-A01942-02R]

LAYOUT: Route trace 50 mils wide and 500 to 750 mils long between these caps.

DDR15V
AR47 1K/4/1/X CPU_TDI
AR48 1K/4/1/X CPU_TRST-
AR49 1K/4/1/X CPU_TCK
AR50 1K/4/1/X CPU_TMS
AR51 300/4/X CPU_DBREQ-

3VDUAL
AR24 8.2K/4/1
THERMTRIP_CPU_L
THERMTRIP_CPU_L 15,28
AQ5 MMBT2222A/SOT23/600mA/40 S0T23

DDR15V AR22 1K/4/1 AR23 1K/4/1
AQ4 MMBT2222A/SOT23/600mA/40 S0T23
AR21 1K/4/1
AR25 0/4/SHT/X -PROCHOT_CPU
-PROCHOT_CPU 14

Erratum 133, Revision Guide for AMD NPT 0Fh Processors

DDR15V
CPU_TEST26 AR26 1K/4/1
CPU_PRESENT_L AR27 1K/4/1
CPU_TEST25_H AR28 510/4/1/X
AR29 510/4/1
CPU_TEST25_L AR30 510/4/1/X
AR31 510/4/1
CPU_TEST21 AR32 1K/4/1

Erratum 133, Revision Guide for AMD NPT 0Fh Processors

DDR15V
CPU_TEST27 AR33 1K/4/1
CPU_TEST20 AR34 1K/4/1
CPU_TEST22 AR35 1K/4/1
CPU_TEST24 AR36 1K/4/1

3VDUAL
AR13 8.2K/4/1
VCC3
AR14 8.2K/4/1
PWM_PWRGD 29

DDR15V
AR11 300/4
AQ1
AQ2
AC8 0.1u/4/Y5V/16V/Z/X
14 CPU_PG_SB
AR12 1K/4/1
MMBT2222A/SOT23/600mA/40
2N7002/SOT23/25pF/5

DDR15V
AR15 1K/4/1
CPU_PWRGD
AMD comment for validation.
AQ3
AC9 0.1u/4/Y5V/16V/Z/X
2N7002/SOT23/25pF/5

CPUVREF

40 MILS WIDTH

DDR15V
CPU_M_VREF
SAR1 15/4/1
SABC1 SABC2 1N/4/X7R/50V/K
SABC3 1U/6/X7R/16V/K
SAR2 15/4/1
0.1U/4/X7R/16V/K

Layout: Place within 500mils of the CPU socket.

M2CPUE
INTERNAL MISC

L25 RSVD1
L26 RSVD2
L31 RSVD3
L30 RSVD4
MA_RESET-
MB_RESET-
ALERT-
SA0
RSVD21

AM3 only
E20 MA_RESET_L
B19 MB_RESET_L
MA_RESET_L 8
MB_RESET_L 9
AR37 1K/4/1 DDR15V
CPU_ALERT-
AL4
AK4 AR40 1K/4/1
AK3

VCC3
3VDUAL
AR38 1K/4/1
AQ6
AR39 8.2K/4/1
SB_ALERT- 16
2N7002/SOT23/25pF/5

RSVD22
M_VDDIO_PWRGD
F2
F3 CPU_IDLEEXIT-
AR41 1K/4/1 DDR15V
M_VDDIO_PWRGD AM3 Not support PID:40778

COREFB_NB+
COREFB_NB-
CORE_TYP_DET
G4
G3
G5 CORE_TYPE_DET
TP6
AR42 1K/4/1 DDR15V
COREFB_NB+ 29
AM2: high, AM2R2: low

AM3 only
A10P A10N
8 DCLKA2 DCLKA2 W26
8 -DCLKA2 -DCLKA2 W25
8 MODT_A3 MODT_A3 AE27
A01P A01N
8 DCLKA1 DCLKA1 U24
8 -DCLKA1 -DCLKA1 V24
8 MODT_A1 MODT_A1 AE28

DCLKA2
DCLKA2-
MODT_A3
DCLKA1
DCLKA1-
MODT_A1

AM3 only
B10P B10N
9 DCLKB2 DCLKB2 Y31
9 -DCLKB2 -DCLKB2 Y30
9 MODT_B3 MODT_B3 AG31
B01P B01N
9 DCLKB1 DCLKB1 W31
9 -DCLKB1 -DCLKB1 W31
9 MODT_B1 MODT_B1 AF31

DCLKB2
DCLKB2-
MODT_B3
DCLKB1
DCLKB1-
MODT_B1

RSVD27 AD25
RSVD28 AE24
RSVD29 AE25
RSVD30 AJ18
RSVD31 AJ20
RSVD32 C18
RSVD33 C20
RSVD34 G24
RSVD35 G25
RSVD36 H25
MB_EVENT_L V29
MA_EVENT_L W30

AM3 =>DRAM Thermal Event Status
AR43 1K/4/1 DDR15V
MB_EVENT_L MB_EVENT_L 9
MA_EVENT_L MA_EVENT_L 8
AR44 1K/4/1 DDR15V
EVENT pins are for future AM3r2

Layout: Route as 60 ohms with 5/10 W/S from CPU pins.

3VDUAL
AR45 1K/4/1
AQ7
3VDUAL
AR46 8.2K/4/1
CPU_IDLEEXIT-
SB_IDLEEXIT- 15
2N7002/SOT23/25pF/5

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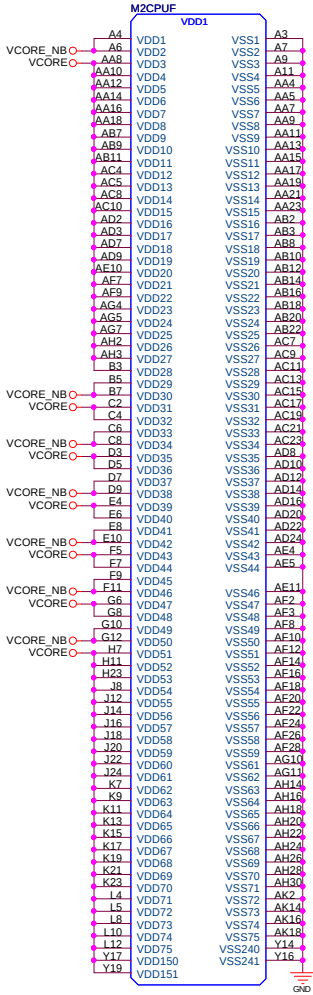
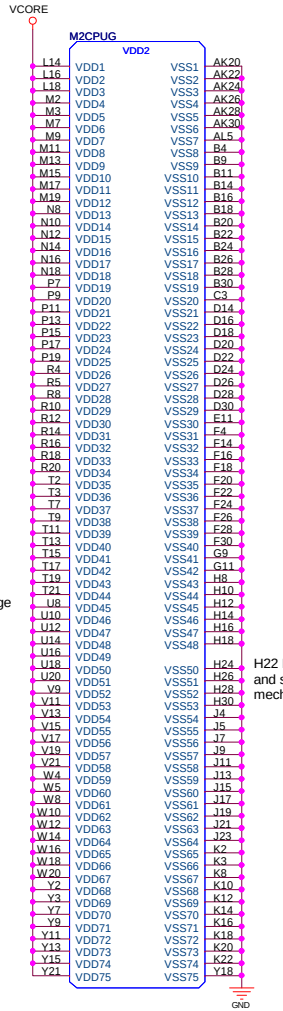
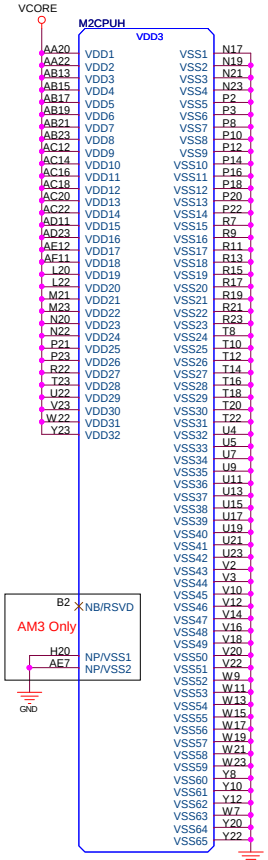
VLDT_RUN_B is connected to the VLDT_RUN power supply through the package or on the die. It is only connected on the board to decoupling near the CPU package.

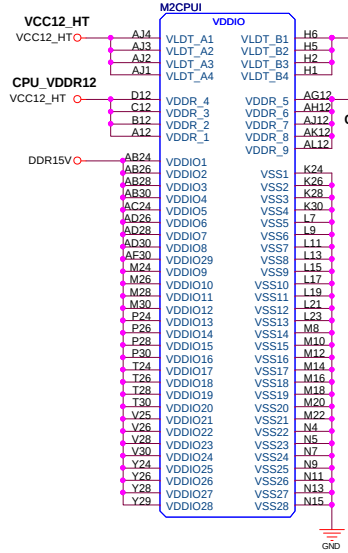


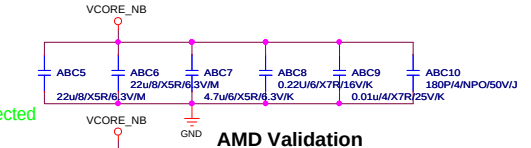
AE9 Missing pins on package and socket used for mechanical keying. =>AM3

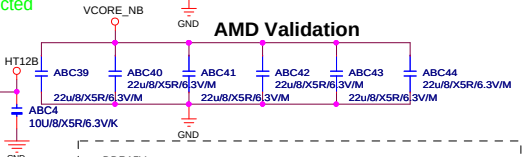


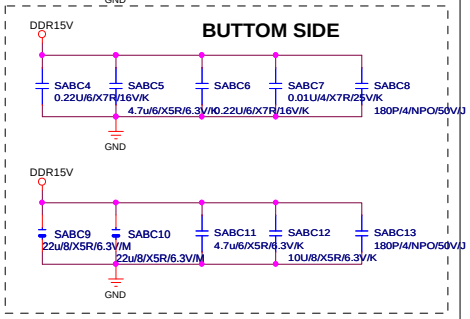
H22 Missing pins on package and socket used for mechanical keying. =>AM3

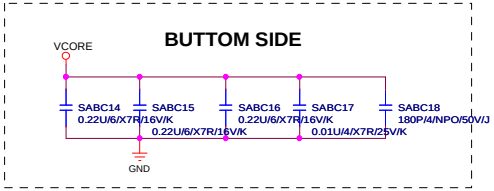


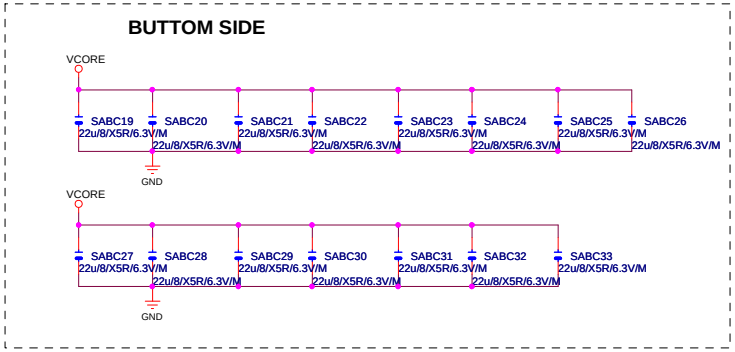


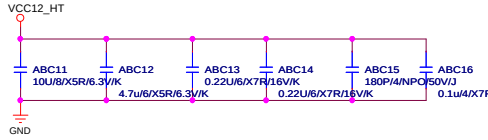


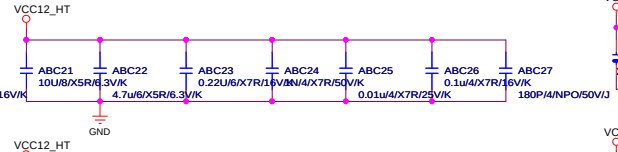


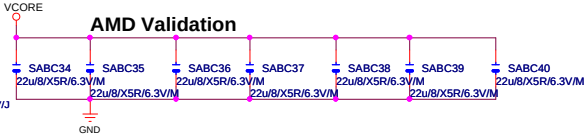


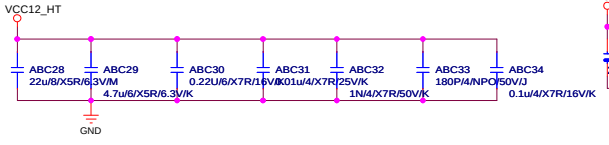


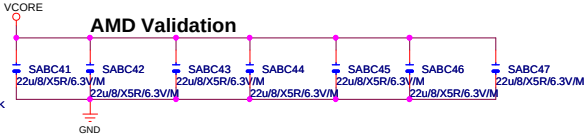


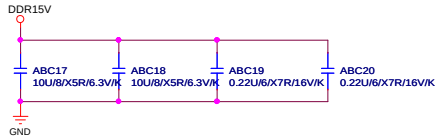


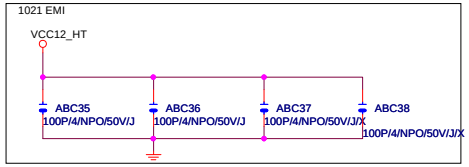












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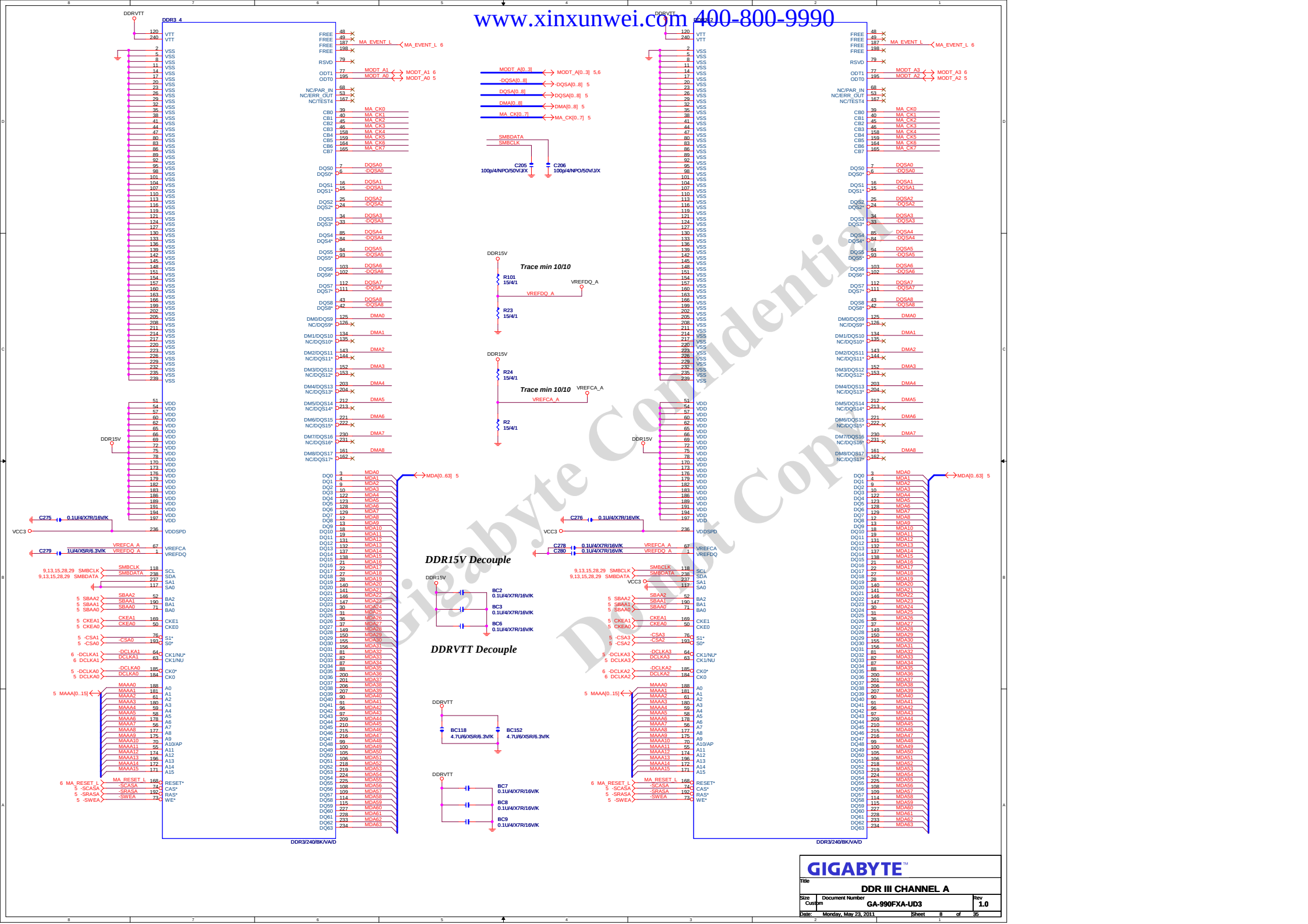
Title: CPU POWER & GND		
Size: Custom	Document Number: GA-990FXA-UD3	Rev: 1.0
Date: Monday, May 23, 2011	Sheet 7 of 35	



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Title	DDR III CHANNEL A		
Size: Custom	Document Number: GA-990FXA-UD3		Rev: 1.0
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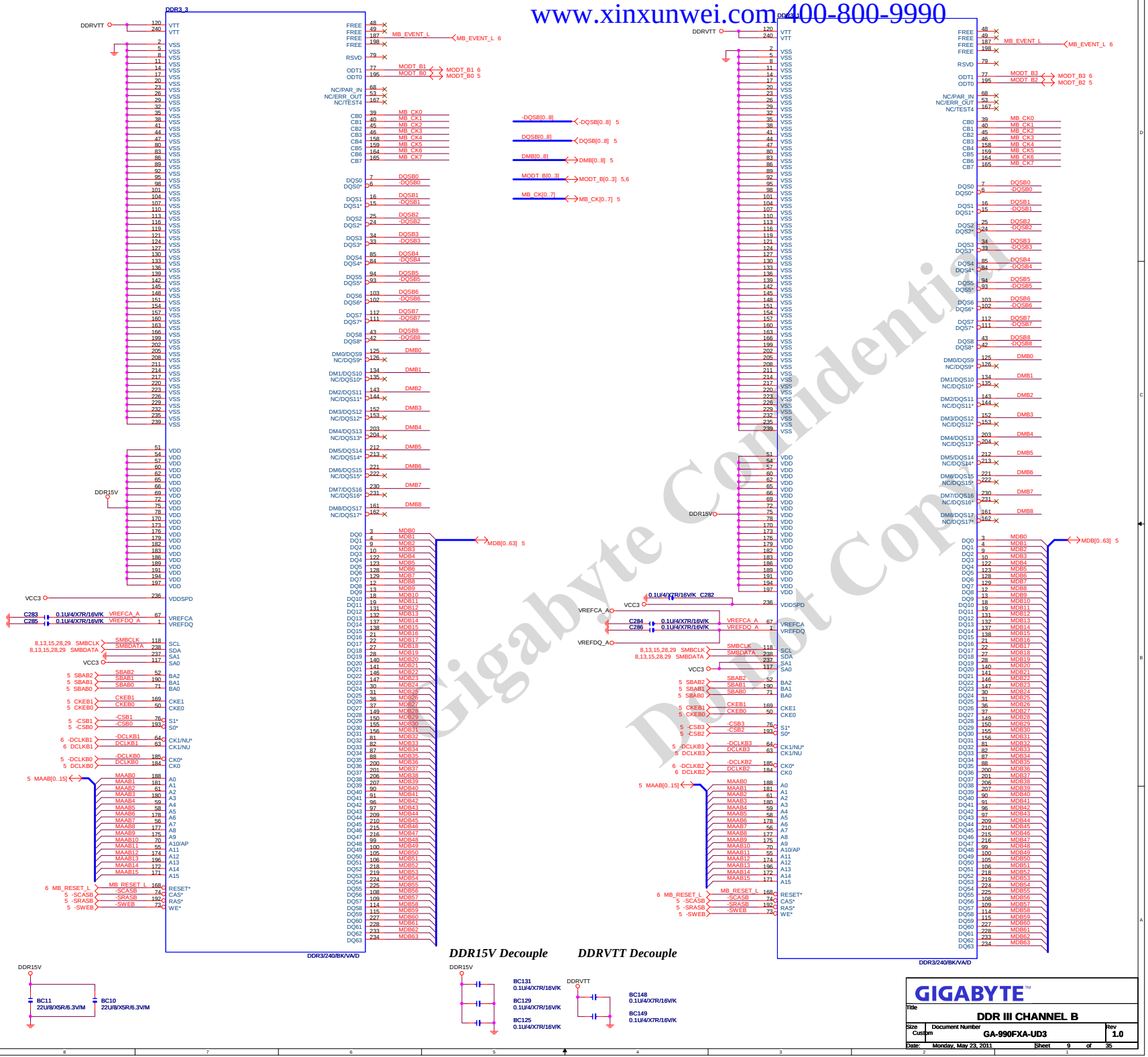

GIGABYTE™

Title	DDR III CHANNEL B	
Size: Custom	Document Number: GA-990FXA-UD3	Rev: 1.0
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U3A

PART 1/5

HYPERTRANSPORT IF

RD990/BGA692

U38

PART 2/5

PCIE GPP1

PCIE GPP2

PCIE GPP3

PCIE ALINK

RD990/BGA692

PLACE THESE CAP CLOSE TO CONNECTOR

PCI_E slot TX need CAP close to slot side

PLACE THESE CAP CLOSE TO CONNECTOR

PLACE THESE CAP CLOSE TO NB.

N.B HEATSINK

NB_HS

NB_HS/[12SP2-070018-01R_12SP2-070018-02R]

GIGABYTE™

Title: RD990 HT & GFX I/F

Size: Custom | Document Number: GA-990FXA-UD3 | Rev: 1.0

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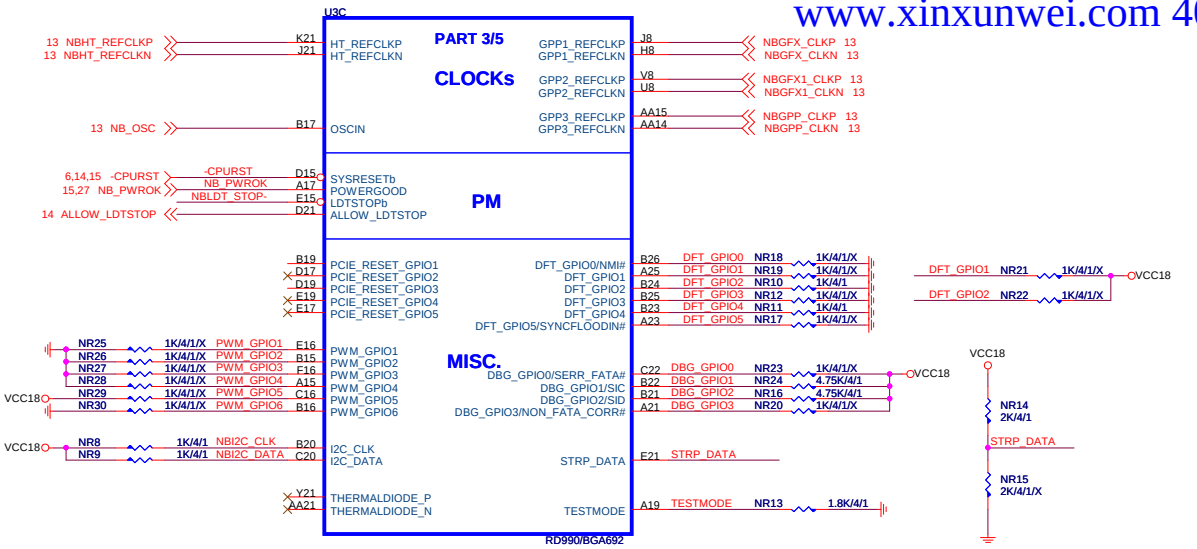

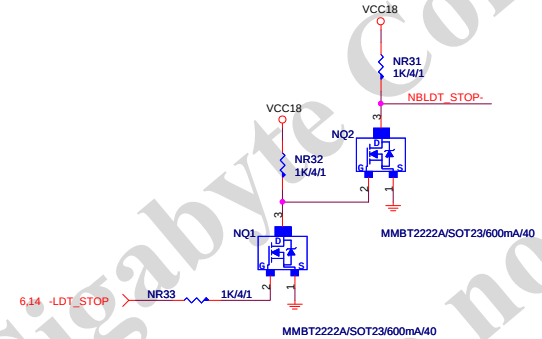

DFT_GPIO5: STRAP_DEBUG_BUS_GPIO_ENABLEb

Enables the Test Debug Bus using GPIO.
1 : Disable (Can still be enabled using nbcfg register access)
0 : Enable

DFT_GPIO[4:2]: STRAP_PCIE_GPP_CFG[2:0]

These pin straps are used to configure PCI-E GPP mode.
GPIO4:3:2
000 : 4:2:4 B
001 : 4:1:1:4 C
010 : 1:1:1:1:1:1:4 L (Hardware Default)
011 : 2:1:1:1:1:4 E
100 : 2:2:1:1:4 K
101: 2:2:2:4 C2
110: Hardware default (mode L) or EEPROM
111: Hardware default (mode L) or EEPROM
101 : 01100
111 : 01011

DFT_GPIO1: LOAD_EEPROM_STRAPS

Selects Loading of STRAPS from EPROM
1 : Bypass the loading of EEPROM straps and use Hardware Default Values
0 : I2C Master can load strap values from EEPROM if connected, or use default values if not connected

DFT_GPIO0: STRAP_DEBUG_BUS_PCIE_ENABLEb

Enables the Test Debug Bus using PCIE bus
1 : Disable (Can still be enabled using nbcfg register access)
0 : Enable

GIGABYTE™

Title	RD990 CLOCK & SYSB I/F	
Size: Custom	Document Number: GA-990FXA-UD3	Rev: 1.0
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U3E
PART 5/5
GROUND
RD990/BGA692

U3D
PART 4/5
POWER
RD990/BGA692

NB_VCC
VDDHT=>1.1V@3.25A
SNC1 1U/6/X7R/16V/K
NBC1 0.1U/6/X7R/25V/K
NBC2 10U/8/X5R/6.3V/K

VDDHT_1 VDDHT_2 VDDHT_3 VDDHT_4 VDDHT_5 VDDHT_6 VDDHT_7 VDDHT_8 VDDHT_9 VDDHT_10 VDDHT_11 VDDHT_12 VDDHT_13 VDDHT_14 VDDHT_15 VDDHT_16 VDDHT_17 VDDHT_18 VDDHT_19 VDDHT_20 VDDHT_21

NB_VCC
VDDPCIE=>1.1V@5.5A
NBC3 10U/8/X5R/6.3V/K
SNC2 1U/6/X7R/16V/K
NBC4 0.1U/6/X7R/25V/K

VDDPCIE_1 VDDPCIE_2 VDDPCIE_3 VDDPCIE_4 VDDPCIE_5 VDDPCIE_6 VDDPCIE_7 VDDPCIE_8 VDDPCIE_9 VDDPCIE_10 VDDPCIE_11 VDDPCIE_12 VDDPCIE_13 VDDPCIE_14 VDDPCIE_15 VDDPCIE_16 VDDPCIE_17 VDDPCIE_18 VDDPCIE_19 VDDPCIE_20 VDDPCIE_21 VDDPCIE_22 VDDPCIE_23 VDDPCIE_24 VDDPCIE_25 VDDPCIE_26 VDDPCIE_27 VDDPCIE_28 VDDPCIE_29 VDDPCIE_30 VDDPCIE_31 VDDPCIE_32 VDDPCIE_33 VDDPCIE_34 VDDPCIE_35 VDDPCIE_36 VDDPCIE_37 VDDPCIE_38 VDDPCIE_39 VDDPCIE_40

NB_VCC
1.1V@8500mA
SNBC7 0.1U/6/X7R/25V/K
SNBC8 0.1U/6/X7R/25V/K
SNC6 0.1U/6/X7R/25V/K
SNC7 1U/6/X7R/16V/K
SNC8 1U/6/X7R/16V/K
SNC9 22u/8/X5R/6.3V/M
SNC10 1u/4/X5R/6.3V/K

VDDC_1 VDDC_2 VDDC_3 VDDC_4 VDDC_5 VDDC_6 VDDC_7 VDDC_8 VDDC_9 VDDC_10 VDDC_11 VDDC_12 VDDC_13 VDDC_14 VDDC_15 VDDC_16 VDDC_17 VDDC_18

VCC12_HT
VDDHTTX=>1.2V@1A
NBC9 0.1U/6/X7R/25V/K
NBC10 0.1U/6/X7R/25V/K
NBC11 0.1U/6/X7R/25V/K
SNC11 1U/6/X7R/16V/K
SNC12 10U/8/X5R/6.3V/K

VDDHTTX_1 VDDHTTX_2 VDDHTTX_3 VDDHTTX_4 VDDHTTX_5 VDDHTTX_6 VDDHTTX_7 VDDHTTX_8 VDDHTTX_9 VDDHTTX_10 VDDHTTX_11

VDD18_1 VDD18_2 VDD18_3 VDD18_4 VDD18_5
VDDA18=>1.8V@0.1A

VDDA18HTPLL
VDDA18HTPLL=>1.8V@0.05A

VDDA18PCIE_21 VDDA18PCIE_20

VDDA18PCIE_1 VDDA18PCIE_2 VDDA18PCIE_3 VDDA18PCIE_4 VDDA18PCIE_5 VDDA18PCIE_6 VDDA18PCIE_7 VDDA18PCIE_8 VDDA18PCIE_9 VDDA18PCIE_10 VDDA18PCIE_11 VDDA18PCIE_12 VDDA18PCIE_13 VDDA18PCIE_14 VDDA18PCIE_15 VDDA18PCIE_16 VDDA18PCIE_17 VDDA18PCIE_18 VDDA18PCIE_19

VCC18
VDDA18PCIE=>1.8V@2A
NBC13 2.2U/6/X5R/6.3V/K

VCC18
NBC14 10U/8/X5R/6.3V/K
SNC13 1U/4/X5R/6.3V/K
NBC15 0.1U/4/X7R/16V/K
SNBC10 0.1U/6/X7R/25V/K
SNBC11 0.1U/6/X7R/25V/K
SNBC12 1U/4/X5R/6.3V/K

NB_VCC
SNC3 10U/8/X5R/6.3V/K
SNC4 1U/6/X7R/16V/K
SNC5 1u/4/X5R/6.3V/K
SNBC5 0.1U/6/X7R/25V/K
SNBC6 0.1U/6/X7R/25V/K
SNBC9 0.1U/6/X7R/25V/K

VCC18
SNC14 22U/8/X5R/6.3V/M
SNC15 1U/6/X7R/16V/K
NBC16 0.1U/4/X7R/16V/K
NBC17 0.1U/4/X7R/16V/K
NBC18 0.1U/4/X7R/16V/K

GIGABYTE™

Title	RD990 POWER	
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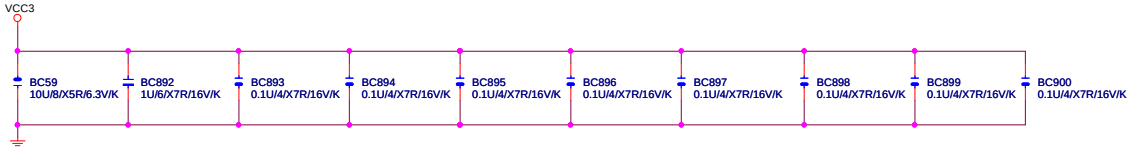
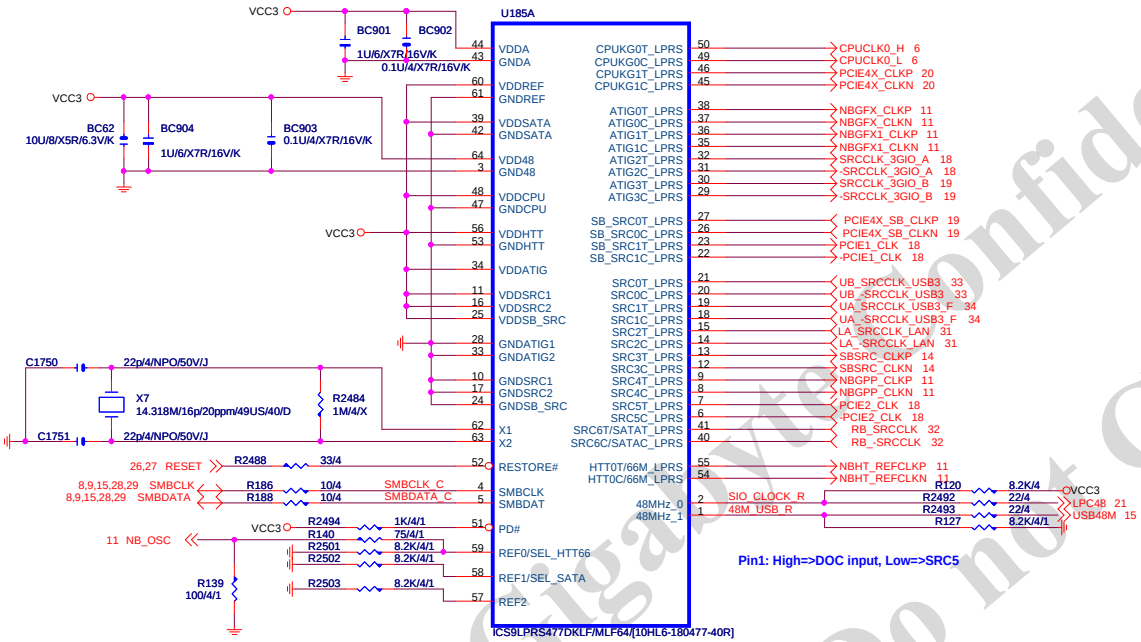


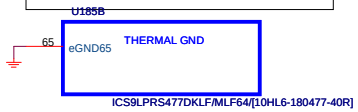
NB CLOCK INPUT TABLE

NB CLOCKS	RS740	RX780	RS780	
HT_REFCLKP	66M SE(SE)	100M DIFF	100M DIFF	
HT_REFCLKN	NC	100M DIFF	100M DIFF	
REFCLK_P	14M SE (3.3V)	14M SE (1.8V)	14M SE (1.1V)	100M DIFF
REFCLK_N	NC	NC	vref	100M DIFF
GFX_REFCLK*	100M DIFF	100M DIFF	100M DIFF	
GPP_REFCLK	NC	100M DIFF	100M DIFF(OUT)	
GPPSB_REFCLK	100M DIFF	100M DIFF	100M DIFF	

* the GFX_REFCLK input is required for all cases



Clock chip has internal serial terminations for differencial pairs, external resistors are reserved for debug purpose.



	OSC_14M_NB
RS740	3.3V 33R serial
RX780	1.8V 82.5R/130R
RS780 (Single-ended)	1.1V 158R/90.9R

REF0/SEL_HTT66	HTT CLOCK
0	100.00 DIFFERENTIAL
1	66.66 SINGLE END

REF1/SEL_SATA	SRC6/SATA
0	100.00 DIFFERENTIAL SPREADING SRC CLOCK
1	100.00 NON-SPREADING DIFFERENTIAL SATA CLOCK

GIGABYTE™

Title: ICS9LPRS477

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PLACE THESE PCIE AC COUPLING CAPS CLOSE TO SB850

S.B HEATSINK

SB_HS

SB_HS/[12SP2-S06510-11R_12SP2-S06510-12R_12SP2-S06510-13R]

U2A SB800 Part 1 of 5

SB950/BGA605

PCI CLKS

PCI EXPRESS INTERFACES

PCI INTERFACE

CLOCK GENERATOR

LPC

CPU

RTC

EMI

PEMC1 0.01U/4/X7R/25V/K

Low: Force PCIE GEN1, Up: Allow PCIE GEN2

	PCLK2	PCLK3
PULL HIGH	WATCHDOG TIMER ON NB_PWRGD ENABLED	USE DEBUG STRAPS
PULL LOW	WATCHDOG TIMER ON NB_PWRGD DISABLED DEFAULT	IGNORE DEBUG STRAPS DEFAULT

BIOS after boot setting
EC AOD-ACC

	LPC_CLK0 Rev.A12	LPC_CLK1
PULL HIGH	IMC ENABLED	CLKGEN ENABLED
AOD Extreme PULL LOW	IMC DISABLED DEFAULT	CLKGEN DISABLED DEFAULT

Note: LDT_PG, LDT_STP# & LDT_RST# are OD and require a PU to the CPU I/O rail. They are also in the S5 domain to prevent glitching at power up.

CLR_CMOS	
SHORT	CLEAR CMOS
OPEN	NORMAL

NOT ADD ICT FOR RTCVDD PIN

GIGABYTE

Title: ATI SB950 PCIE/PCI/CPU/LPC

Size: Custom | Document Number: GA-990FXA-UD3 | Rev: 1.0

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USB11	FRONT PANEL
USB10	FRONT PANEL
USB9	FRONT PANEL
USB8	FRONT PANEL
USB7	FRONT PANEL
USB6	FRONT PANEL
USB5	FRONT PANEL
USB4	FRONT PANEL
USB3	REAR PANEL
USB2	REAR PANEL
USB1	REAR PANEL
USB0	REAR PANEL

either HWM inputs or PWR_GD signals can be used for power-up sequencer

3VDUAL_SB
IMC_GPIO200 PR61 2.2K/4/1
IMC_GPIO199 PR62 2.2K/4/1

IMC_GPIO200 IMC_GPIO199

ROM TYPE:

H, H = Reserved

H, L = SPI ROM DEFAULT

L, H = LPC ROM

L, L = FWH ROM

SB_TEST2 PR29 8.2K/4
SB_TEST1 PR30 8.2K/4
SB_TEST0 PR31 8.2K/4

VCC3
-SUS_STAT PR32 8.2K/4
SMBCLK PR55 1K/4/1
SMBDATA PR56 1K/4/1
WD_PWRGD PR33 8.2K/4

3VDUAL_SB
-RI PR34 8.2K/4
SMBCLK1 PR57 2.2K/4/1
SMBDATA1 PR58 2.2K/4/1
-PCIE_WAKE PR59 2.2K/4/1

-PCIPME PR60 2.2K/4/1 3VDUAL
UB_SMIB PR76 8.2K/4/1 3VDUAL

SB_PWROK
PBC4 100P/4/NPO/50V/J/X

3VDUAL_SB PR91 20K/4/1 -RSMRST
PBC3 2.2U/6/X5R/6.3V/K

SMBCLK
SMBDATA
PBC5 100P/4/NPO/50V/J/X
PBC6 100P/4/NPO/50V/J/X

AZ_BIT_CLK
PBC7 100P/4/NPO/50V/J/X

VCC3
AZ_SDATA_OUT PR36 8.2K/4/X
PR35 8.2K/4

Low: Performance Mode(D),
Up: Low Power Mode.

-AZ_RST PR37 8.2K/4

Low: Disable PCI MEM boot(D),
Up: Enable PCI MEM boot

26 -SYS_RST PR68 22/4
PC17 22P/4/N/50V/X
18,19,20,31,33,34 -PCIE_WAKE -PCIE_WAKE
6,28 THERMTRIP_CPU_L THERMTRIP_CPU_L
11,27 NB_PWROK PR67 0/4/X WD_PWRGD

U2D

20,35 -PCIPME	-RI	J2	PCI_PME#/GEVENT4#
25 -RI		K1	RI#/GEVENT22#
		D3	SPI_CS3#/GBE_STAT1/GEVENT21#
21,27,28 -SLP_S3	SLP_S5-	F1	SLP_S3#
27 SLP_S5-	PR69 0/4/SHT/X -PWRBTN	H1	SLP_S5#
21 -PSOUT		F2	PWR_BTN#
27 SB_PWROK		H5	PWR_GOOD
	-SUS_STAT	G6	SUS_STAT#
	SB_TEST2	B3	TEST0
	SB_TEST1	C4	TEST1/TMS
	SB_TEST0	F6	TEST2
21 A20GATE		AD21	GA20IN/GEVENT0#
21 -KBRST		AE21	KBRST#/GEVENT1#
21 -LPCPME	-LPCPME	K2	LPC_PME#/GEVENT3#
21 GP53		J29	LPC_SMI#/GEVENT23#
		H2	GEVENT5#
		J1	SYS_RESET#/GEVENT19#
	-PCIE_WAKE	H6	WAKE#/GEVENT8#
		F3	IR_RX1/GEVENT20#
	THERMTRIP_CPU_L	J6	THRMTRIP#/SMBALERT#/GEVENT2#
	WD_PWRGD	AC19	NB_PWRGD
	-RSMRST	G1	RSMRST#

ACPI / WAKE UP EVENTS

19 EXP_B_PRSNT-		AD19	CLK_REQ4#/SATA_IS0#/GPIO64
		AA16	CLK_REQ3#/SATA_IS1#/GPIO63
19 PE4_2PRSNT_SB_R-		AB21	SMARTVOLT1/SATA_IS2#/GPIO50
18 PE0_PRSNT-	PE0_PRSNT-	AC18	CLK_REQ0#/SATA_IS3#/GPIO60
20 PE4_2PRSNT_R-		AF20	SATA_IS4#/FANOUT3/GPIO55
		AE19	SATA_IS5#/FANIN3/GPIO59
26 SPKR	SPKR	AF19	SPKR/GPIO66
8,9,13,28,29 SMBCLK	SMBCLK	AD22	SCL0/GPIO43
8,9,13,28,29 SMBDATA	SMBDATA	AE22	SDA0/GPIO47
18,19,20 SMBCLK1	SMBCLK1	F5	SCL1/GPIO227
18,19,20 SMBDATA1	SMBDATA1	F4	SDA1/GPIO228
		AH21	CLK_REQ2#/FANIN4/GPIO62
		AB18	CLK_REQ1#/FANOUT4/GPIO61
		E1	IR_LED#/LLB#/GPIO184
		AJ21	SMARTVOLT2/SHUTDOWN#/GPIO51
VCC3 PR38 8.2K/4	DDR3_RST-	H4	DDR3_RST#/GEVENT7#
		D5	GBE_LED0/GPIO183
		D7	GBE_LED1/GEVENT9#
		G5	GBE_LED2/GEVENT10#
		K3	GBE_STAT0/GEVENT11#
6 SB_IDLEEXIT-		AA20	CLK_REQG#/GPIO65/OSCIN

GPIO

34 UA_SMIB	PR93 0/4/SHT/X	H3	BLINK/USB_OC7#/GEVENT18#
		D1	USB_OC6#/IR_TX1/GEVENT6#
33 UB_SMIB		E4	USB_OC5#/IR_TX0/GEVENT17#
		D4	USB_OC4#/IR_RX0/GEVENT16#
		E8	USB_OC3#/AC_PRES/TDO/GEVENT15#
31 -USBOC_R1		F7	USB_OC2#/TCK/GEVENT14#
		E7	USB_OC1#/TDI/GEVENT13#
22 -USBOC_F1		F8	USB_OC0#/TRST#/GEVENT12#

USB OC

23 AZ_BIT_CLK	PR63 22/4	M3	AZ_BITCLK
23 AZ_SDATA_OUT	PR64 22/4	N1	AZ_SDOUT
23 AZ_SDATA_IN0		L2	AZ_SDIN0/GPIO167
		M2	AZ_SDIN1/GPIO168
		M1	AZ_SDIN2/GPIO169
		M4	AZ_SDIN3/GPIO170
23 AZ_SYNC	PR65 22/4	N2	AZ_SYNC
23 -AZ_RST	PR66 22/4	P2	AZ_RST#

HD AUDIO

	PR39 8.2K/4 GBE_COL	T1	GBE_COL
	PR40 8.2K/4 GBE_CRS	T4	GBE_CRS
		L6	GBE_MDCK
3VDUAL PR41 8.2K/4	GBE_MDIO	L5	GBE_MDIO
		T9	GBE_RXCLK
		U1	GBE_RXD3
		U3	GBE_RXD2
		T2	GBE_RXD1
		U2	GBE_RXD0
		T5	GBE_RXCTL/RXDV
PR42 8.2K/4	GBE_RXERR	V5	GBE_RXERR
		P5	GBE_TXCLK
		M5	GBE_TXD3
		P9	GBE_TXD2
		T7	GBE_TXD1
		P7	GBE_TXD0
		M7	GBE_TXCTL/TXEN
		P4	GBE_PHY_PD
		M9	GBE_PHY_RST#
3VDUAL PR43 8.2K/4	GBE_INTR	V7	GBE_PHY_INTR

GBE LAN

		E23	PS2_DAT/SDA4/GPIO187
		E24	PS2_CLK/SCL4/GPIO188
		F21	SPI_CS2#/GBE_STAT2/GPIO166
		G29	FC_RST#/GPO160
		D27	
		F28	PS2KB_DAT/GPIO189
		F29	PS2KB_CLK/GPIO190
		E27	PS2M_DAT/GPIO191
			PS2M_CLK/GPIO192

EMBEDDED CTRL

		A10	USBCLK/14M_25M_48M_OSC
		G19	USB_RCOMP

USB 1.1 USB MISC

		J10	USB_FSD1P/GPIO186
		H11	USB_FSD1N
		H9	USB_FSD0P/GPIO185
		J8	USB_FSD0N

USB 2.0

		B12	USB_HSD13P
		A12	USB_HSD13N
		F11	USB_HSD12P
		E11	USB_HSD12N
		E14	USB_HSD11P
		E12	USB_HSD11N
		J12	USB_HSD10P
		J14	USB_HSD10N
		A13	USB_HSD9P
		B13	USB_HSD9N
		D13	USB_HSD8P
		C13	USB_HSD8N
		G12	USB_HSD7P
		G14	USB_HSD7N
		G16	USB_HSD6P
		G18	USB_HSD6N
		D16	USB_HSD5P
		C16	USB_HSD5N
		B14	USB_HSD4P
		A14	USB_HSD4N
		E18	USB_HSD3P
		E16	USB_HSD3N
		J16	USB_HSD2P
		J18	USB_HSD2N
		B17	USB_HSD1P
		A17	USB_HSD1N
		A16	USB_HSD0P
		B16	USB_HSD0N

		D25	SCL2/GPIO193
		F23	SDA2/GPIO194
		B26	SCL3_LV/GPIO195
		E26	SDA3_LV/GPIO196
		F25	EC_PWM0/EC_TIMER0/GPIO197
		E22	EC_PWM1/EC_TIMER1/GPIO198
		F22	EC_PWM2/EC_TIMER2/GPIO199
		E21	EC_PWM3/EC_TIMER3/GPIO200
		G24	KSI_0/GPIO201
		G25	KSI_1/GPIO202
		E28	KSI_2/GPIO203
		E29	KSI_3/GPIO204
		D29	KSI_4/GPIO205
		D28	KSI_5/GPIO206
		C29	KSI_6/GPIO207
		C28	KSI_7/GPIO208
		B28	KSO_0/GPIO209
		A27	KSO_1/GPIO210
		B27	KSO_2/GPIO211
		D26	KSO_3/GPIO212
		A26	KSO_4/GPIO213
		C26	KSO_5/GPIO214
		A24	KSO_6/GPIO215
		B25	KSO_7/GPIO216
		A25	KSO_8/GPIO217
		D24	KSO_9/GPIO218
		B24	KSO_10/GPIO219
		C24	KSO_11/GPIO220
		B23	KSO_12/GPIO221
		A23	KSO_13/GPIO222
		D22	KSO_14/GPIO223
		C22	KSO_15/GPIO224
		A22	KSO_16/GPIO225
		B22	KSO_17/GPIO226

EMBEDDED CTRL

SB800
Part 4 of 5

SB950/BGA605

USB48M 13

SPR1 11.8K/4/1

D25 PR52 8.2K/4
F23 PR53 8.2K/4
SCL3 PR95 8.2K/4
SDA3 PR96 8.2K/4
3VDUAL_SB

IMC_GPIO199 IMC_GPIO200

IMC_TDO PR54 IMC_TDO
IMC_TMS PR55 IMC_TMS
IMC_TCK PR56 IMC_TCK
IMC_CRST- PR57 IMC_CRST-

DDR15V
PR51 8.2K/4/X
PQ9
IMC_CRST- PR98 100/4/1/X1
3 -CPURST -CPURST 6,11,14
MMBT3904/SOT23/200mA/30/X
SOT23

DDR15V
PR50 8.2K/4
PQ8
IMC_TMS PR10 100/4/1
3 CPU_TMS CPU_TMS 6
MMBT3904/SOT23/200mA/30
PBC19 33P/4/NPO/50V/J/X
SOT23

DDR15V
PR49 8.2K/4
PQ7
IMC_TCK PR88 100/4/1
3 CPU_TCK CPU_TCK 6
MMBT3904/SOT23/200mA/30
PBC23 33P/4/NPO/50V/J/X
SOT23

DDR15V
PR47 8.2K/4
PQ5
IMC_TDO PR54 100/4/1
3 CPU_TDI CPU_TDI 6
MMBT3904/SOT23/200mA/30
SOT23

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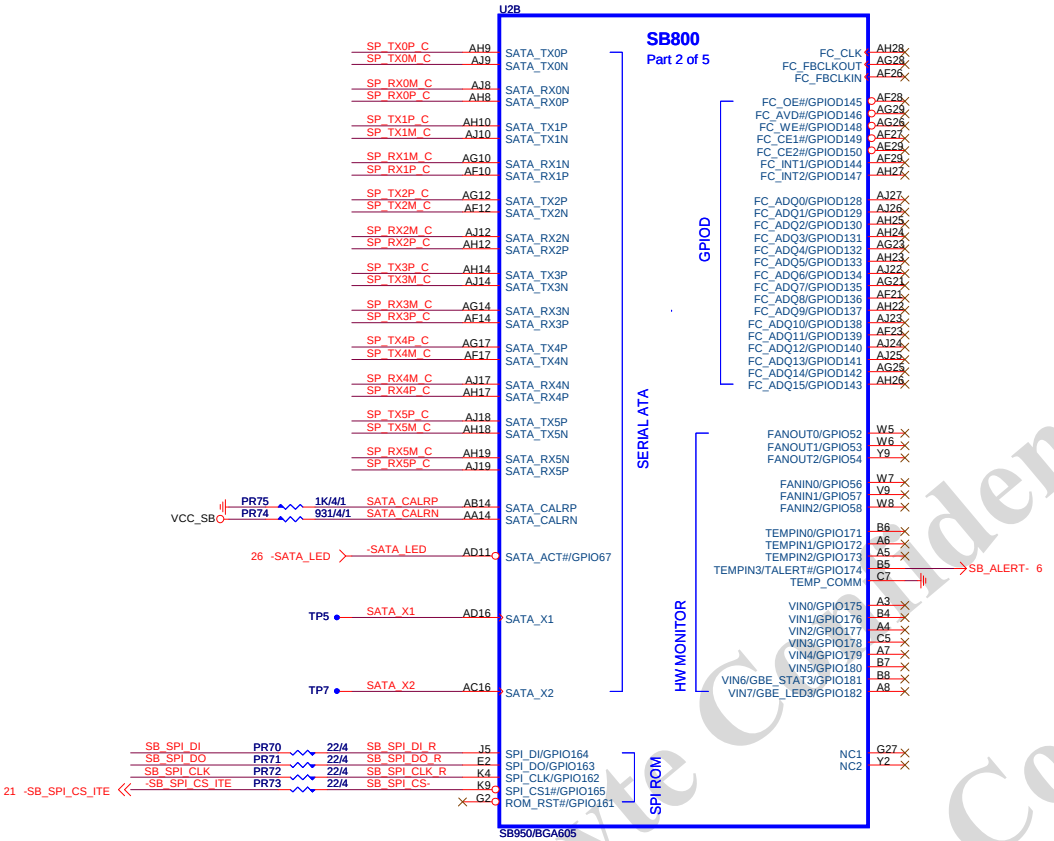
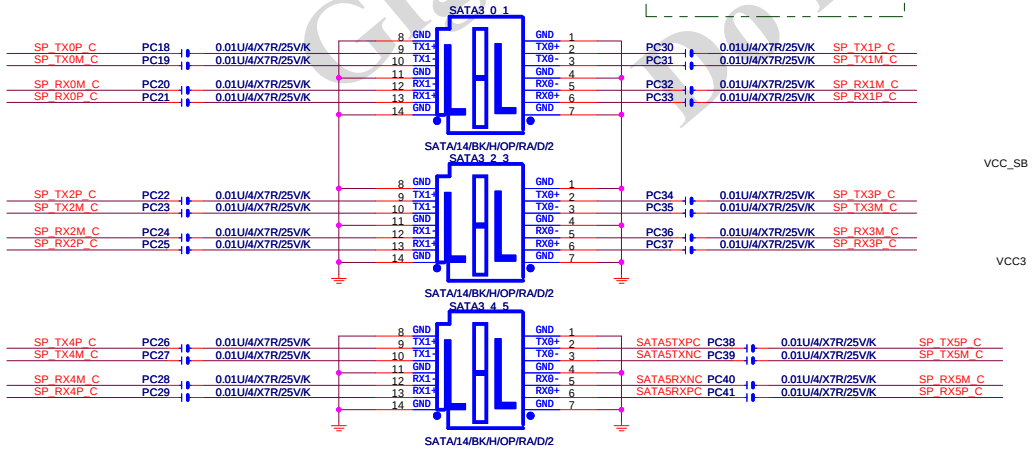
Title	ATI SB950 ACPI/USB/GPIO/AUDIO	
Size: Custom	Document Number: GA-990FXA-UD3	Rev: 1.0
Date: Monday, May 23, 2011	Sheet 15 of 35	

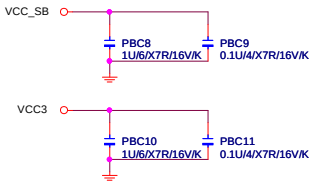


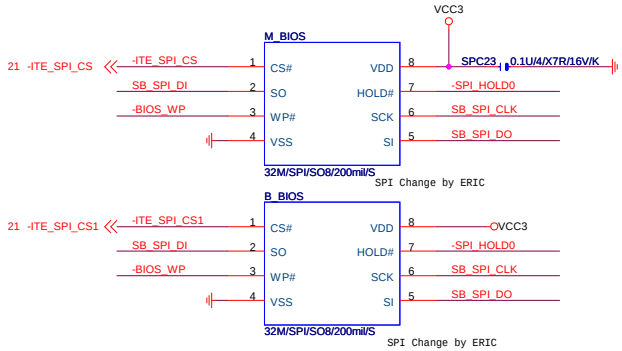
PLACE SATA_CAL RES VERY CLOSE TO BALL OF U600

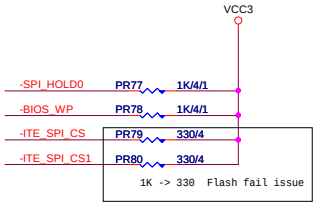
NOTE:
R650 IS 1K 1% FOR 25MHz XTAL, 4.99K 1% FOR 100MHz INTERNAL CLOCK



PLACE SATA AC COUPLING CAPS CLOSE TO SB850







GIGABYTE™

Title: ATI SB950 SATA/IDE/HWM/SPI

Size	Document Number	Rev
Custom	GA-990FXA-UD3	1.0

Date: Monday, May 23, 2011 Sheet 16 of 35

PLACE ALL THE DECOUPLING CAPS ON THIS SHEET CLOSE TO SB AS POSSIBLE.

U2C SB800 Part 3 of 5

VCC3 PBC13 10U/8/X5R/6.3V/K SPC27 1U/6/X7R/16V/K SPC1 0.1U/4/X7R/16V/K SPC2 0.1U/4/X7R/16V/K SPC3 0.1U/4/X7R/16V/K SPC4 0.1U/4/X7R/16V/K

VCC_SB PBC0 10U/8/X5R/6.3V/K SPC26 1U/6/X7R/16V/K SPC5 0.1U/4/X7R/16V/K SPC6 0.1U/4/X7R/16V/K SPC24 0.1U/4/X7R/16V/K

VCC_SB PBC27 1U/6/X7R/16V/K SPC7 0.1U/4/X7R/16V/K SPC8 0.1U/4/X7R/16V/K SPBC1 10U/8/X5R/6.3V/K

3VDUAL_SB PBC14 10U/8/X5R/6.3V/K PBC29 1U/6/X7R/16V/K PBC28 1U/6/X7R/16V/K SPC9 0.1U/4/X7R/16V/K SPC10 0.1U/4/X7R/16V/K SPC11 0.1U/4/X7R/16V/K

VCC11_DUAL PBC15 10U/8/X5R/6.3V/K PBC31 1U/6/X7R/16V/K SPC12 0.1U/4/X7R/16V/K SPC13 0.1U/4/X7R/16V/K SPC14 0.1U/4/X7R/16V/K

VCC3 PBC32 1U/6/X7R/16V/K VCC_SB SPC28 1U/6/X7R/16V/K

3VDUAL_SB PBC34 1U/6/X7R/16V/K PBC12 0.1U/4/X7R/16V/K

VCC_SB SPC19 0.1U/4/X7R/16V/K SPC29 1U/6/X7R/16V/K PBC17 10U/8/X5R/6.3V/K

SPC20 0.1U/4/X7R/16V/K SPC21 0.1U/4/X7R/16V/K SPC22 1U/6/X7R/16V/K

VCC_SB SPC25 0.1U/4/X7R/16V/K

3VDUAL_SB SPC0 1U/6/X7R/16V/K PBC16 10U/8/X5R/6.3V/K SPC16 0.1U/4/X7R/16V/K SPC17 0.1U/4/X7R/16V/K SPC18 0.1U/4/X7R/16V/K

AH1	VDDIO_33_PCIGP_1	PCI/GPIO I/O
V6	VDDIO_33_PCIGP_2	
Y19	VDDIO_33_PCIGP_3	
AE5	VDDIO_33_PCIGP_4	
AC21	VDDIO_33_PCIGP_5	
AA2	VDDIO_33_PCIGP_6	
AB4	VDDIO_33_PCIGP_7	
AC8	VDDIO_33_PCIGP_8	
AA7	VDDIO_33_PCIGP_9	
AA9	VDDIO_33_PCIGP_10	
AF7	VDDIO_33_PCIGP_11	
AA19	VDDIO_33_PCIGP_12	
N13	VDDCR_11_1	CORE S0
R15	VDDCR_11_2	
N17	VDDCR_11_3	
U13	VDDCR_11_4	
U17	VDDCR_11_5	
V12	VDDCR_11_6	
V18	VDDCR_11_7	
W12	VDDCR_11_8	
W18	VDDCR_11_9	
AF22	VDDIO_18_FC_1	FLASH I/O
AE25	VDDIO_18_FC_2	
AF24	VDDIO_18_FC_3	
AC22	VDDIO_18_FC_4	
K28	VDDAN_11_CLK_1	CLKGEN I/O
K29	VDDAN_11_CLK_2	
J28	VDDAN_11_CLK_3	
K26	VDDAN_11_CLK_4	
J21	VDDAN_11_CLK_5	
J20	VDDAN_11_CLK_6	
K21	VDDAN_11_CLK_7	
J22	VDDAN_11_CLK_8	
V1	VDDRF_GBE_S	GBE LAN
M10	VDDIO_33_GBE_S	
AE28	VDDPL_33_PCIE	PCI EXPRESS
U26	VDDAN_11_PCIE_1	
V22	VDDAN_11_PCIE_2	
V26	VDDAN_11_PCIE_3	
V27	VDDAN_11_PCIE_4	
V28	VDDAN_11_PCIE_5	
V29	VDDAN_11_PCIE_6	
W22	VDDAN_11_PCIE_7	
W26	VDDAN_11_PCIE_8	
L7	VDDCR_11_GBE_S_1	
L9	VDDCR_11_GBE_S_2	
M6	VDDIO_GBE_S_1	
P8	VDDIO_GBE_S_2	
AD14	VDDPL_33_SATA	SERIAL ATA
AJ20	VDDAN_11_SATA_1	
AF18	VDDAN_11_SATA_4	
AH20	VDDAN_11_SATA_2	
AG19	VDDAN_11_SATA_3	
AE18	VDDAN_11_SATA_5	
AD18	VDDAN_11_SATA_6	
AE16	VDDAN_11_SATA_7	
A21	VDDIO_33_S_1	3.3V_S5 I/O
D21	VDDIO_33_S_2	
B21	VDDIO_33_S_3	
K10	VDDIO_33_S_4	
L10	VDDIO_33_S_5	
J9	VDDIO_33_S_6	
T6	VDDIO_33_S_7	
T8	VDDIO_33_S_8	
A18	VDDAN_33_USB_S_1	USB I/O
A19	VDDAN_33_USB_S_2	
A20	VDDAN_33_USB_S_3	
B18	VDDAN_33_USB_S_4	
B19	VDDAN_33_USB_S_5	
B20	VDDAN_33_USB_S_6	
C18	VDDAN_33_USB_S_7	
C20	VDDAN_33_USB_S_8	
D18	VDDAN_33_USB_S_9	
D19	VDDAN_33_USB_S_10	
D20	VDDAN_33_USB_S_11	
E19	VDDAN_33_USB_S_12	
F26	VDDCR_11_S_1	CORE S5
G26	VDDCR_11_S_2	
M8	VDDIO_AZ_S	
A11	VDDCR_11_USB_S_1	
B11	VDDCR_11_USB_S_2	
M21	VDDPL_33_SYS	PLL
L22	VDDPL_11_SYS_S	
F19	VDDPL_33_USB_S	
D6	VDDAN_33_HWM_S	
L20	VDDXL_33_S	
C11	VDDAN_11_USB_S_1	
D11	VDDAN_11_USB_S_2	

SB950/BGA605

U2E SB800 GROUND Part 5 of 5

Y14	VSSIO_SATA_1	VSS_1	AJ2
Y16	VSSIO_SATA_2	VSS_2	A28
AB16	VSSIO_SATA_3	VSS_3	A2
AC14	VSSIO_SATA_4	VSS_4	E5
AE12	VSSIO_SATA_5	VSS_5	D23
AE14	VSSIO_SATA_6	VSS_6	E25
AF9	VSSIO_SATA_7	VSS_7	E6
AF11	VSSIO_SATA_8	VSS_8	F24
AF13	VSSIO_SATA_9	VSS_9	N15
AF16	VSSIO_SATA_10	VSS_10	R13
AG8	VSSIO_SATA_11	VSS_11	R17
AH7	VSSIO_SATA_12	VSS_12	T10
AH11	VSSIO_SATA_13	VSS_13	P10
AH13	VSSIO_SATA_14	VSS_14	V11
AH16	VSSIO_SATA_15	VSS_15	U15
AJ7	VSSIO_SATA_16	VSS_16	M18
AJ11	VSSIO_SATA_17	VSS_17	V19
AJ13	VSSIO_SATA_18	VSS_18	M11
AJ16	VSSIO_SATA_19	VSS_19	L12
		VSS_20	L18
A9	VSSIO_USB_1	VSS_21	J7
B10	VSSIO_USB_2	VSS_22	P3
K11	VSSIO_USB_3	VSS_23	V4
B9	VSSIO_USB_4	VSS_24	AD6
D10	VSSIO_USB_5	VSS_25	AD4
D12	VSSIO_USB_6	VSS_26	AB7
D14	VSSIO_USB_7	VSS_27	AC9
D17	VSSIO_USB_8	VSS_28	V8
E9	VSSIO_USB_9	VSS_29	W9
F9	VSSIO_USB_10	VSS_30	W10
F12	VSSIO_USB_11	VSS_31	AJ28
F14	VSSIO_USB_12	VSS_32	B29
F16	VSSIO_USB_13	VSS_33	U4
C9	VSSIO_USB_14	VSS_34	Y18
G11	VSSIO_USB_15	VSS_35	Y10
F18	VSSIO_USB_16	VSS_36	Y12
D9	VSSIO_USB_17	VSS_37	Y11
H12	VSSIO_USB_18	VSS_38	AA11
H14	VSSIO_USB_19	VSS_39	AA12
H16	VSSIO_USB_20	VSS_40	G4
H18	VSSIO_USB_21	VSS_41	J4
J11	VSSIO_USB_22	VSS_42	G8
J19	VSSIO_USB_23	VSS_43	G9
K12	VSSIO_USB_24	VSS_44	M12
K14	VSSIO_USB_25	VSS_45	AF25
K16	VSSIO_USB_26	VSS_46	H7
K18	VSSIO_USB_27	VSS_47	AH29
H19	VSSIO_USB_28	VSS_48	V10
		VSS_49	P6
		VSS_50	N4
Y4	EFUSE	VSS_51	L4
		VSS_52	L8
D8	VSSAN_HWM		
M19	VSSXL	VSSPL_SYS	M20
P21	VSSIO_PCIECLK_1	VSSIO_PCIECLK_14	H23
P20	VSSIO_PCIECLK_2	VSSIO_PCIECLK_15	H26
M22	VSSIO_PCIECLK_3	VSSIO_PCIECLK_16	AA21
M24	VSSIO_PCIECLK_4	VSSIO_PCIECLK_17	AA23
M26	VSSIO_PCIECLK_5	VSSIO_PCIECLK_18	AB23
P22	VSSIO_PCIECLK_6	VSSIO_PCIECLK_19	AD23
P24	VSSIO_PCIECLK_7	VSSIO_PCIECLK_20	AA26
P26	VSSIO_PCIECLK_8	VSSIO_PCIECLK_21	AC26
T20	VSSIO_PCIECLK_9	VSSIO_PCIECLK_22	Y20
T22	VSSIO_PCIECLK_10	VSSIO_PCIECLK_23	W21
T24	VSSIO_PCIECLK_11	VSSIO_PCIECLK_24	W20
V20	VSSIO_PCIECLK_12	VSSIO_PCIECLK_25	AE26
J23	VSSIO_PCIECLK_13	VSSIO_PCIECLK_26	L21
		VSSIO_PCIECLK_27	K20

SB950/BGA605

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Title: ATI SB950 POWER & GND

Size: Custom | Document Number: GA-990FXA-UD3 | Rev: 1.0

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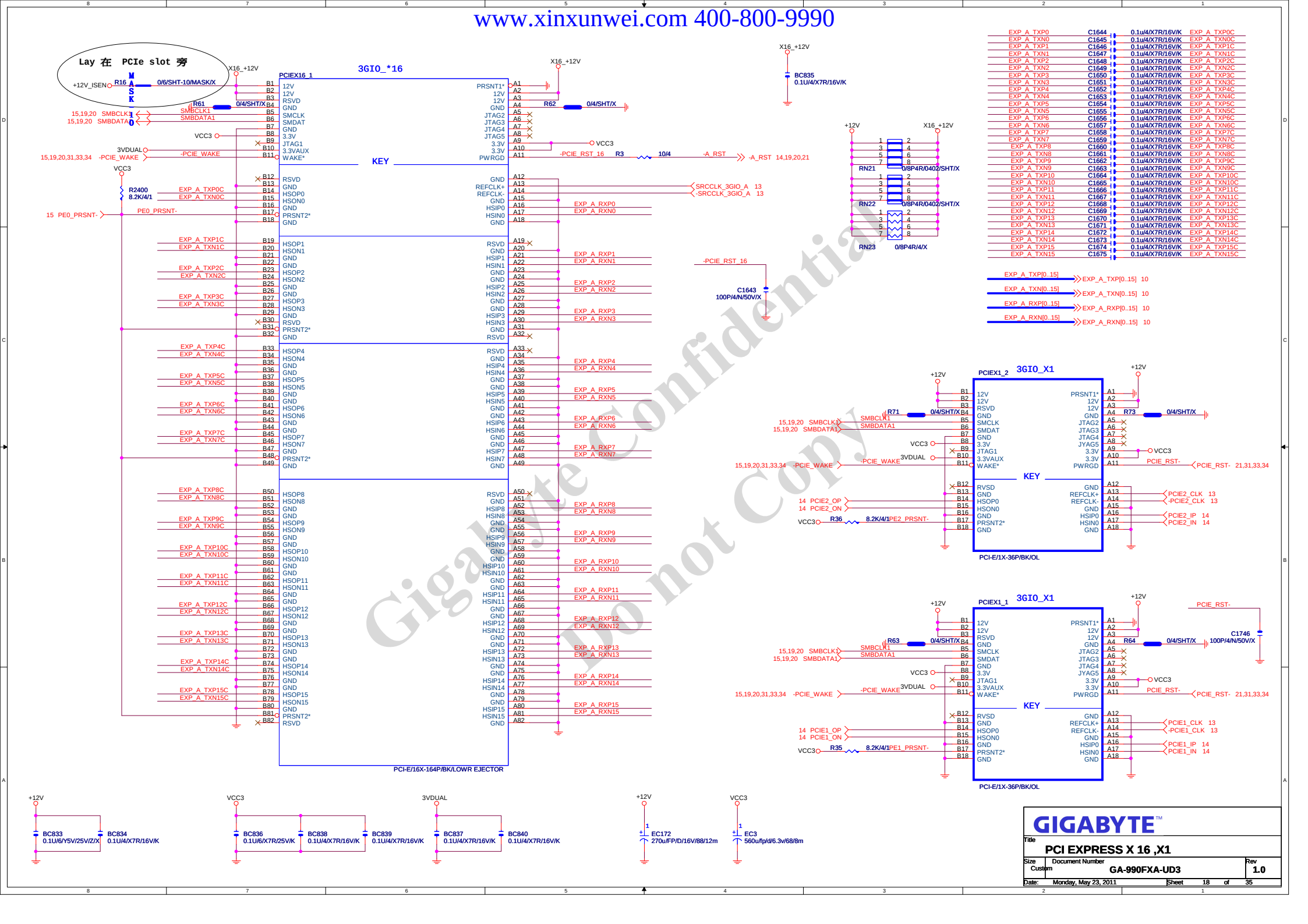

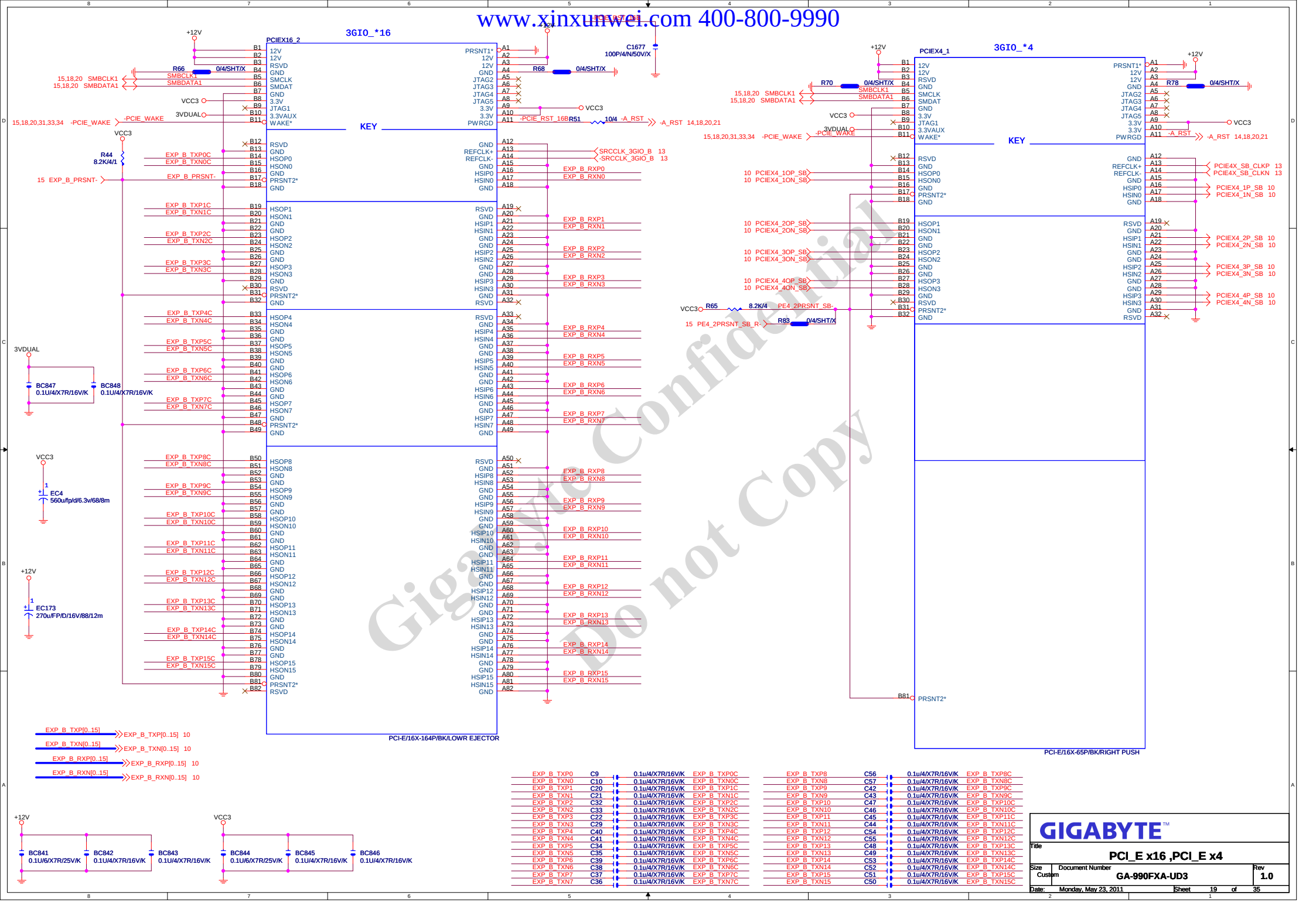

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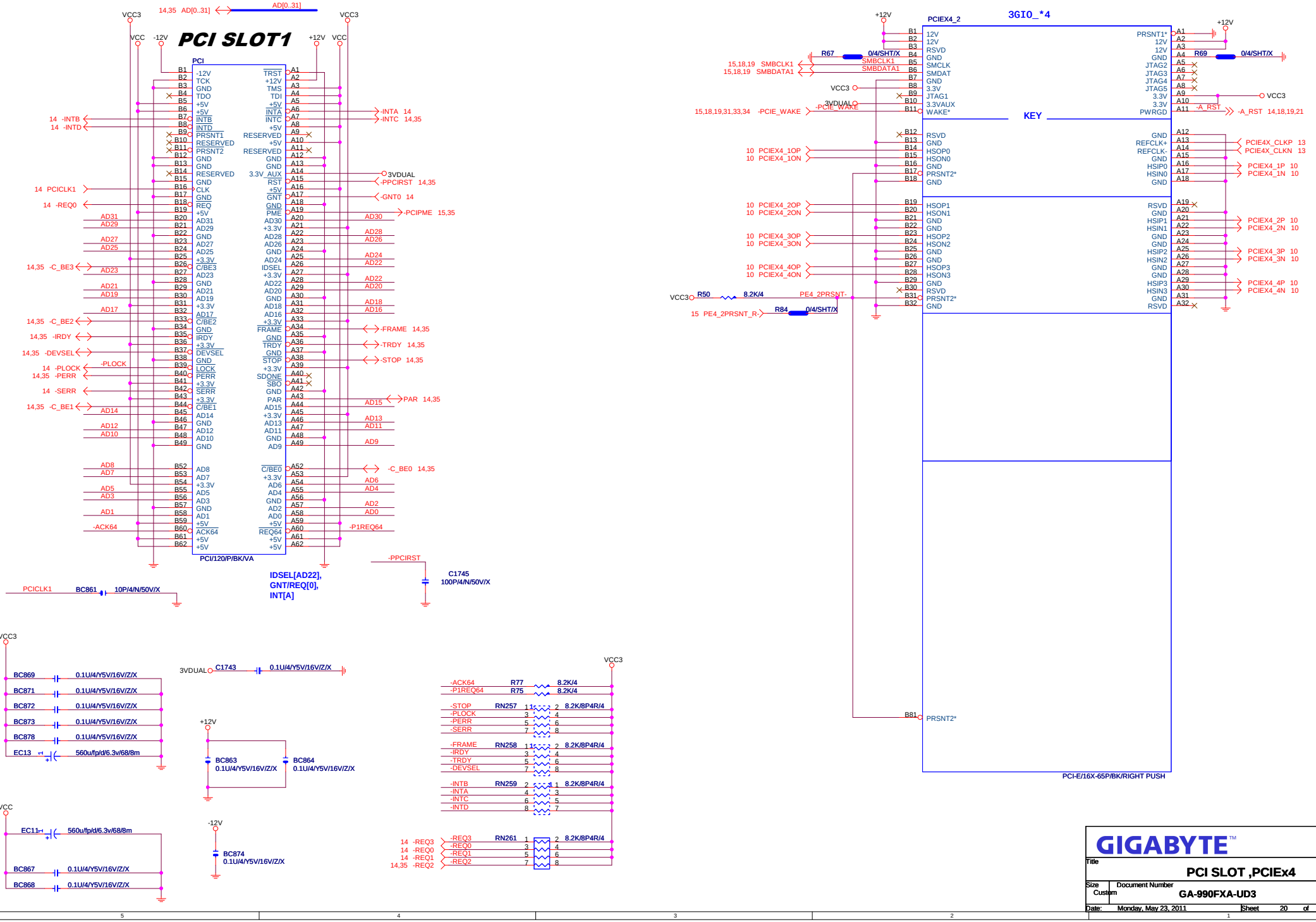
EXP_B_TXP2	C32	0.1u/4/X7R/16V/K	EXP_B_TXP2C	EXP_B_TXP10	C47	0.1u/4/X7R/16V/K	EXP_B_TXP10C
EXP_B_TXN2	C33	0.1u/4/X7R/16V/K	EXP_B_TXN2C	EXP_B_TXN10	C46	0.1u/4/X7R/16V/K	EXP_B_TXN10C
EXP_B_TXP3	C22	0.1u/4/X7R/16V/K	EXP_B_TXP3C	EXP_B_TXP11	C45	0.1u/4/X7R/16V/K	EXP_B_TXP11C
EXP_B_TXN3	C29	0.1u/4/X7R/16V/K	EXP_B_TXN3C	EXP_B_TXN11	C44	0.1u/4/X7R/16V/K	EXP_B_TXN11C
EXP_B_TXP4	C40	0.1u/4/X7R/16V/K	EXP_B_TXP4C	EXP_B_TXP12	C54	0.1u/4/X7R/16V/K	EXP_B_TXP12C
EXP_B_TXN4	C41	0.1u/4/X7R/16V/K	EXP_B_TXN4C	EXP_B_TXN12	C55	0.1u/4/X7R/16V/K	EXP_B_TXN12C
EXP_B_TXP5	C34	0.1u/4/X7R/16V/K	EXP_B_TXP5C	EXP_B_TXP13	C48	0.1u/4/X7R/16V/K	EXP_B_TXP13C
EXP_B_TXN5	C35	0.1u/4/X7R/16V/K	EXP_B_TXN5C	EXP_B_TXN13	C49	0.1u/4/X7R/16V/K	EXP_B_TXN13C
EXP_B_TXP6	C39	0.1u/4/X7R/16V/K	EXP_B_TXP6C	EXP_B_TXP14	C53	0.1u/4/X7R/16V/K	EXP_B_TXP14C
EXP_B_TXN6	C38	0.1u/4/X7R/16V/K	EXP_B_TXN6C	EXP_B_TXN14	C52	0.1u/4/X7R/16V/K	EXP_B_TXN14C
EXP_B_TXP7	C37	0.1u/4/X7R/16V/K	EXP_B_TXP7C	EXP_B_TXP15	C51	0.1u/4/X7R/16V/K	EXP_B_TXP15C
EXP_B_TXN7	C36	0.1u/4/X7R/16V/K	EXP_B_TXN7C	EXP_B_TXN15	C50	0.1u/4/X7R/16V/K	EXP_B_TXN15C

GIGABYTE™

Title	PCI_E x16 ,PCI_E x4	
Size: Custom	Document Number: GA-990FXA-UD3	Rev: 1.0
Date: Monday, May 23, 2011	Sheet 19 of 35	



IT8720F (GB)

KB & USB

GP35 for SB-TSI use, defaule low

JP7 : LOW DUAL BIOS DISABLE(DX)
HI DUAL BIOS ENABLE

-THRMO:
2.0T : Hi --> EC by BIOS CTRL
Lo --> EC by IT8590E CTRL

CPU Thermal Diode Differential Pair

close to super i/o

O: EN SPI, I:DIS SPI

IT8720GB Power On Strapping Options

	Symbol	value	Description
JP1 Pin 69	Flashseg1_EN	1	Disabled.
		0	Flash I/F Address Segment 1 is enabled
JP2 Pin 25	VIDO_EN	1	Disable VID output pins
		0	Enable VID output pins
JP3 Pin 27	CHIP_SEL		Chip selection in Configuration
JP4 Pin 29	K8PWR_EN	1	K8 power sequence disabled
		0	K8 power sequence enabled
JP3 & JP5 Pin 27 & Pin 77	FAN_CTL_SEL	11 Half Run	Default value of EC Index 15h/16h/17h is 40h
		10 No Run	Default value of EC Index 15h/16h/17h is 7Fh
		01 Full Run	Default value of EC Index 15h/16h/17h is 00h
		00 75% Run	Default value of EC Index 15h/16h/17h is 20h
JP5 Pin 77	WDT_EN	1	Disable WDT to rest PWROK
		0	Enable WDT to rest PWROK
JP6 Pin 60	SVID_EN	1	Disable SVID Function
		0	Enable SVID Function
JP7 Pin 97	Dual_BIOS_EN	1	Enable Dual BIOS Function for GigaByte Only
		0	Disable Dual BIOS Function for GigaByte Only

Title	ITE 8718 LPC IO ,Dual-BIOS
Size	Custom
Document Number	GA-990FXA-UD3
Rev	1.0
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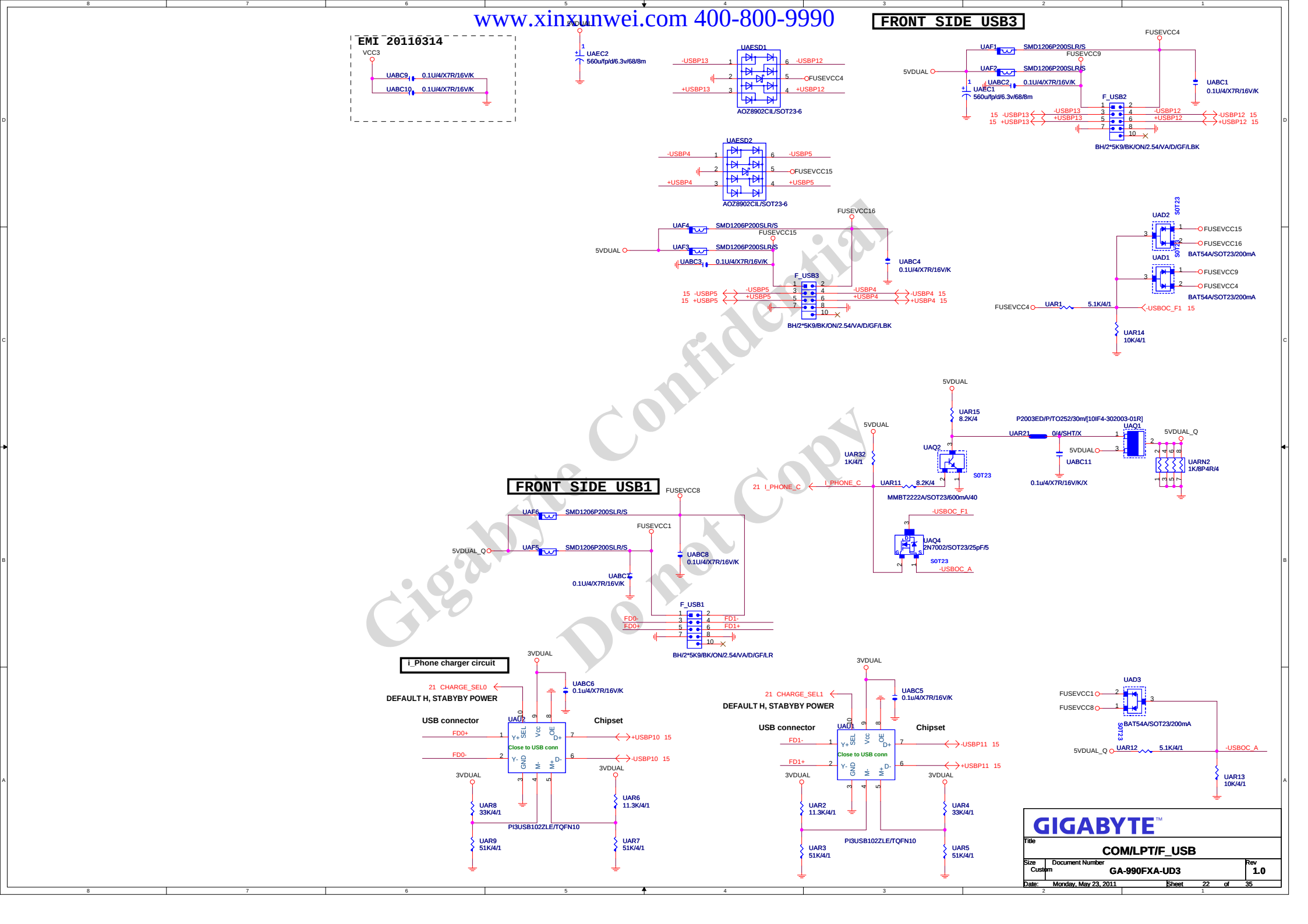
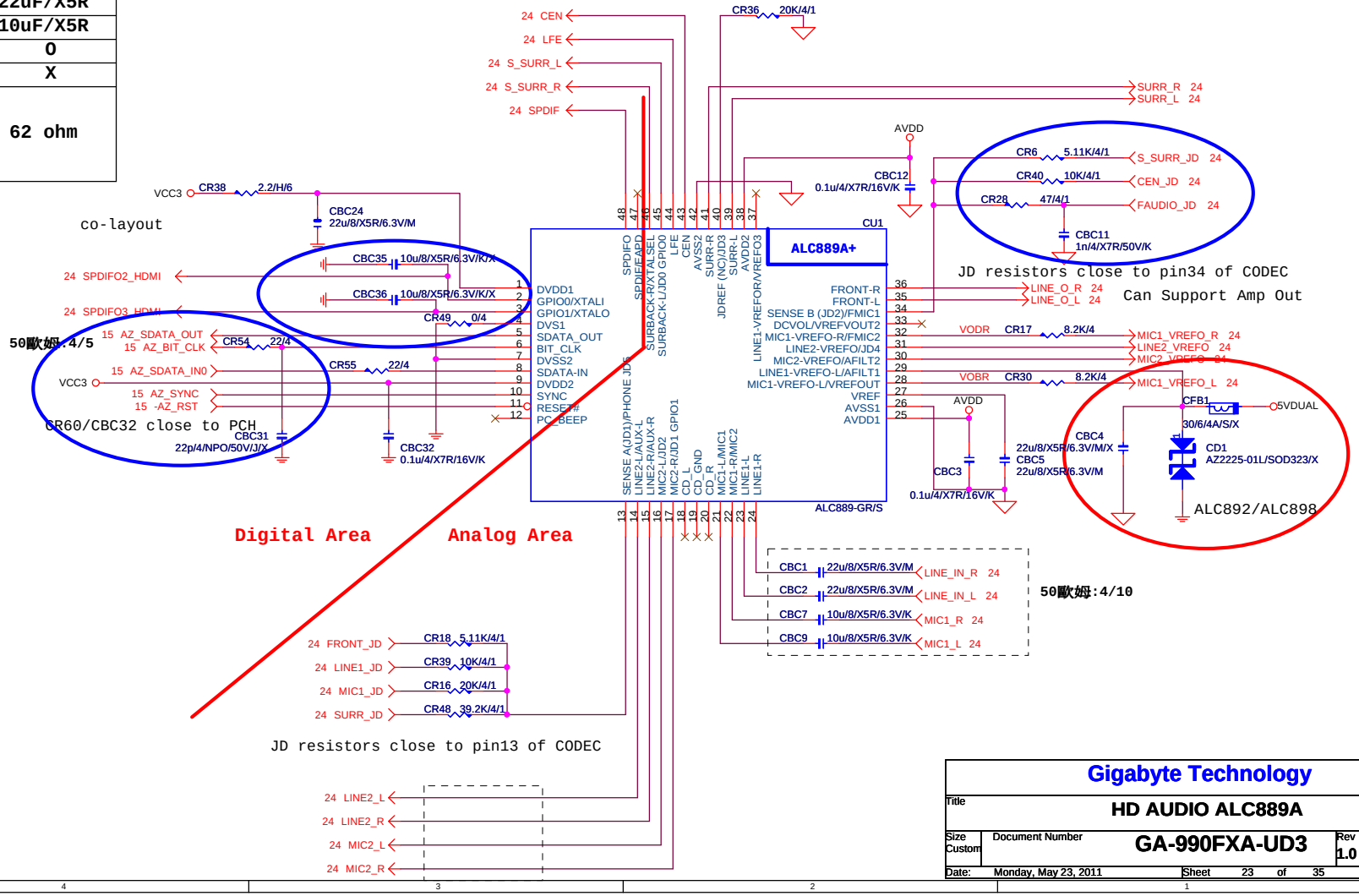


AZALIA CODEC

ALC889/ALC889B/ALC892/ALC898 Colay

	ALC889	ALC889B	ALC898/ALC892
CR65	0	0	X
CBC35	X	X	10uF/X5R
CBC39	X	10uF/X5R	X
CR31	0	X	0
CR66	X	0	X
CBC1/CBC2	22uF/X5R	22uF/X5R	22uF/X5R
CBC5/CBC6/CBC9/CBC11	10uF/X5R	10uF/X5R	10uF/X5R
CR51/CD1/CBC7	X	X	0
CD2/CD3/CQ3/CQ5	0	0	X
CR5/CR8/CR1/CR14/ CR17/CR22/CR45/CR33/ CR47/CR40/CR26/CR37/ CR13/CR11/CR57/CR53	62 ohm	62 ohm	62 ohm



Gigabyte Technology	
Title	HD AUDIO ALC889A
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CODEC POWER/EMI PAD

EUP

5VDUAL CR44 0/6/SHT/X

CBC38 0.01u/4/X7R/25V/K

+12V CD3 CD4148WP/1206/300mA

AVDD CQ4 CD4148WP/1206/300mA

CQ3 78L05/SOT89/0.1A

CBC21 0.1u/4/X7R/16V/K/X

CBC8 22u/8/X5R/6.3V/M

CD2 AZ2225-01L/SOD323

ADD CD2 For ESD PROTECT DIODE

CR37 0/4/X

上ALC892時,此顆電容要保留

CR4 0/6/SHT/X

FUSEVCC14

23 SPDIF

OPTICAL

FR/5P/BK/T/D/S(GY)

CESD1

M2_L M2_R L2_R L2_L

AZ2025-04S/SOT23-5L/X

23 SPDIFO2_HDMI CR52 0/4 SPDIFO_HDMI

23 SPDIFO3_HDMI CR53 0/4/X

CBC37 100p/4/NPO/50V/J

PIN

SPDIF_O PH/1*2/BK/2.54/VA/D

For HDMI SPDIF

CESD5

SPDIF SPDIFO_HDMI

AZ2025-04S/SOT23-5L/X

AZALIA JACK

BTX AZALIA CONNECTOR

11NR6-403007-21R

CESD2 AJ_A2 AJ_B2 AJ_C2 AJ_C5

CESD4 AJ_B5 AJ_A5 BJ_C2 BJ_A2

CESD3 BJ_B5 BJ_A5 BJ_C5 BJ_B2

AZ2025-04S/SOT23-5L/X

AUDIOB

23 LINE1_JD LINE1_JD AJ_A5 AJ_A2 GND LINE-IN

23 FRONT_JD FRONT_JD AJ_B5 AJ_B2 GND LINE-OUT

23 MIC1_JD MIC1_JD AJ_C5 AJ_C2 GND MIC-IN

BLUE LINE-IN

GREEN LINE-OUT

PINK MIC-IN

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

AUDIOA

23 CEN_JD CEN_JD BJ_B5 BJ_B2 GND REAR

23 SURR_JD SURR_JD BJ_C5 BJ_C2 GND CEN

23 S_SURR_JD S_SURR_JD BJ_A5 BJ_A2 GND SIDE

Orange CEN/LFE

Black SURROUND

Gray SURROUND SIDE

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

LINE-OUT

23 LINE_O_R CEC2 100u/OS/D/16V/66/30m CR7 62/4 AJ_B5

23 LINE_O_L CEC3 100u/OS/D/16V/66/30m CR9 62/4 AJ_B2

CR10 22K/4 CR8 22K/4

CBC23 180p/4/NPO/50V/J CBC26 180p/4/NPO/50V/J

LINE-IN

23 LINE_IN_R CR5 62/4 AJ_A5

23 LINE_IN_L CR13 62/4 AJ_A2

CBC18 180p/4/NPO/50V/J CBC27 180p/4/NPO/50V/J

MIC-IN

23 MIC1_R CR29 62/4 AJ_C5

23 MIC1_L CR32 62/4 AJ_C2

23 MIC1_VREFO_L

23 MIC1_VREFO_R

CBC19 180p/4/NPO/50V/J CBC22 180p/4/NPO/50V/J

SURROUND

EMI

23 SURR_R CEC5 100u/OS/D/16V/66/30m CR46 62/4 BJ_C5

23 SURR_L CEC7 100u/OS/D/16V/66/30m CR19 62/4 BJ_C2

CR20 22K/4 CR45 22K/4

CBC29 180p/4/NPO/50V/J CBC28 180p/4/NPO/50V/J

CEN/LFE

EMI

23 LFE CEC9 100u/OS/D/16V/66/30m CR50 62/4 BJ_B5

23 CEN CEC10 100u/OS/D/16V/66/30m CR41 62/4 BJ_B2

CR42 22K/4 CR51 22K/4

CBC25 180p/4/NPO/50V/J CBC34 180p/4/NPO/50V/J

SURR BACK

EMI

23 S_SURR_R CEC8 100u/OS/D/16V/66/30m CR21 62/4 BJ_A5

23 S_SURR_L CEC4 100u/OS/D/16V/66/30m CR47 62/4 BJ_A2

CR43 22K/4 CR22 22K/4

CBC33 180p/4/NPO/50V/J CBC30 180p/4/NPO/50V/J

AZALIA FRONT PANEL

CQ2 BAT54A/SOT23/200mA

23 LINE2_VREFO CR25 8.2K/4 CR15 8.2K/4

CQ1 BAT54A/SOT23/200mA

23 MIC2_VREFO CR12 8.2K/4 CR3 8.2K/4

EMI

23 MIC2_L 23 MIC2_R CBC20 10u/8/X5R/6.3V/K CBC15 10u/8/X5R/6.3V/K CR2 62/4 CR11 62/4 M2_L M2_R L2_R L2_L

23 FAUDIO_JD CR14 62/4 CR24 62/4 L2_L L2_L

CR1 0/4/X

F_AUDIO CR35 20K/4/1 CR31 39.2K/4/1

bh/2*5k8/bk/2.54/va/[11NH3-000205-P1R]

CR27 22K/4 CR26 22K/4

Digital Area

VCC3 CR56 8.2K/4 C_-ACZ_DET

23 LINE2_R 23 LINE2_L CEC6 CEC1 100u/OS/D/16V/66/30m L2_R L2_L

CBC10 180p/4/NPO/50V/J CBC16 180p/4/NPO/50V/J CBC17 180p/4/NPO/50V/J CBC6 180p/4/NPO/50V/J

Gigabyte Technology

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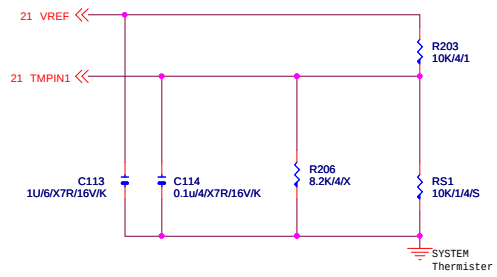
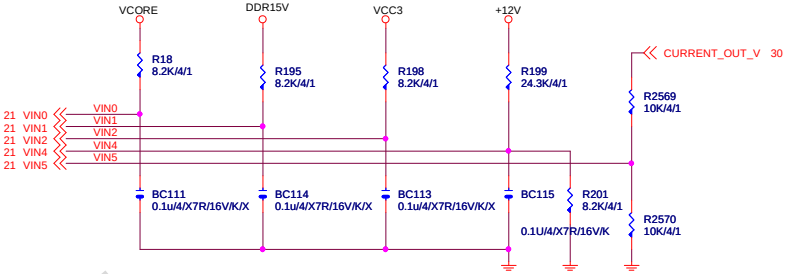
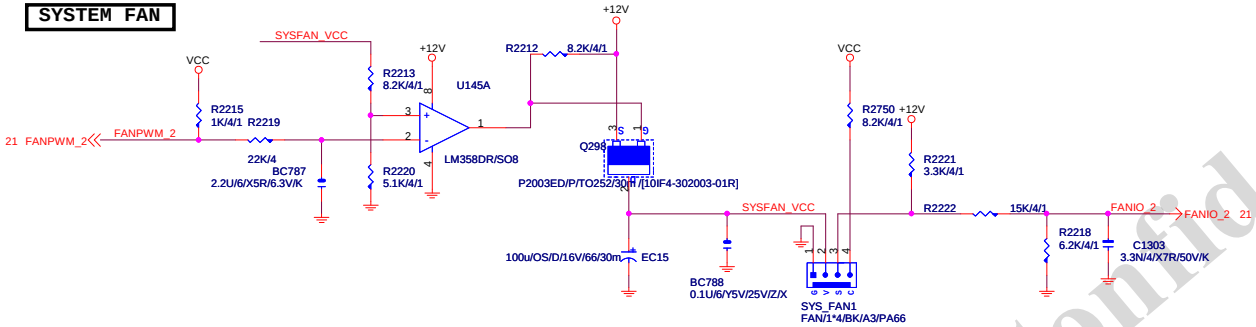
Hardware Monitor circuits

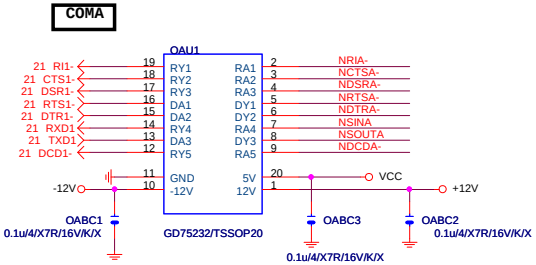




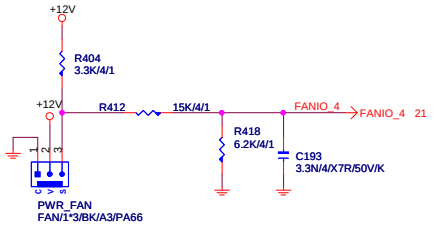
SYSTEM FAN



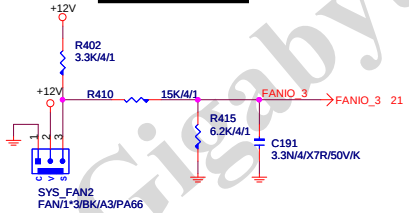
COMA



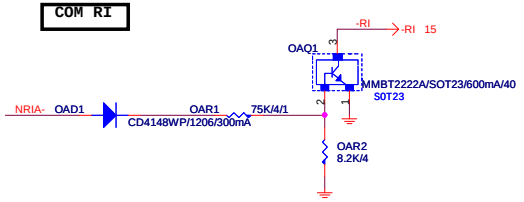
POWER FAN

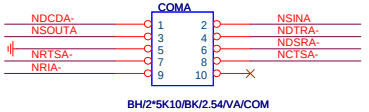


SYSTEM FAN2



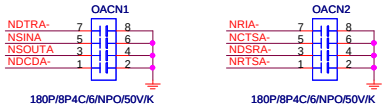
COM RI



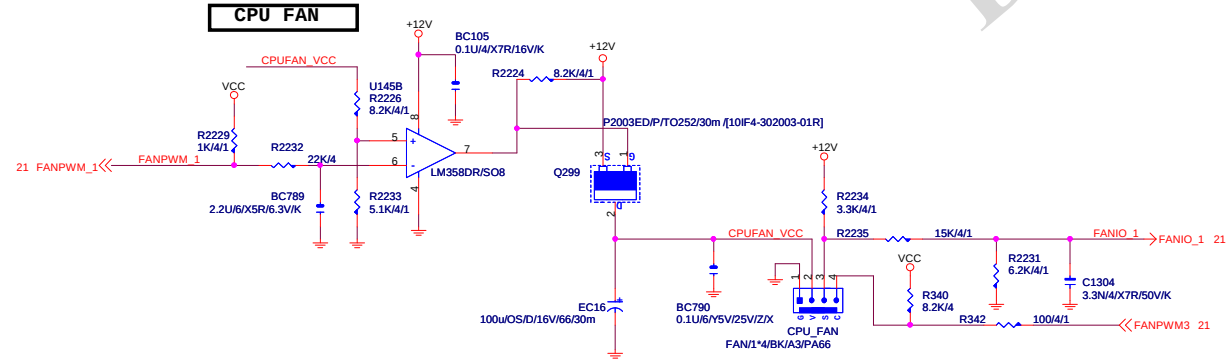


BH/2*5K10/BK/2.54/VA/COM

11NH3-000205-Y1R/Y2R



CPU FAN



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Title	FAN/HWMO/COM
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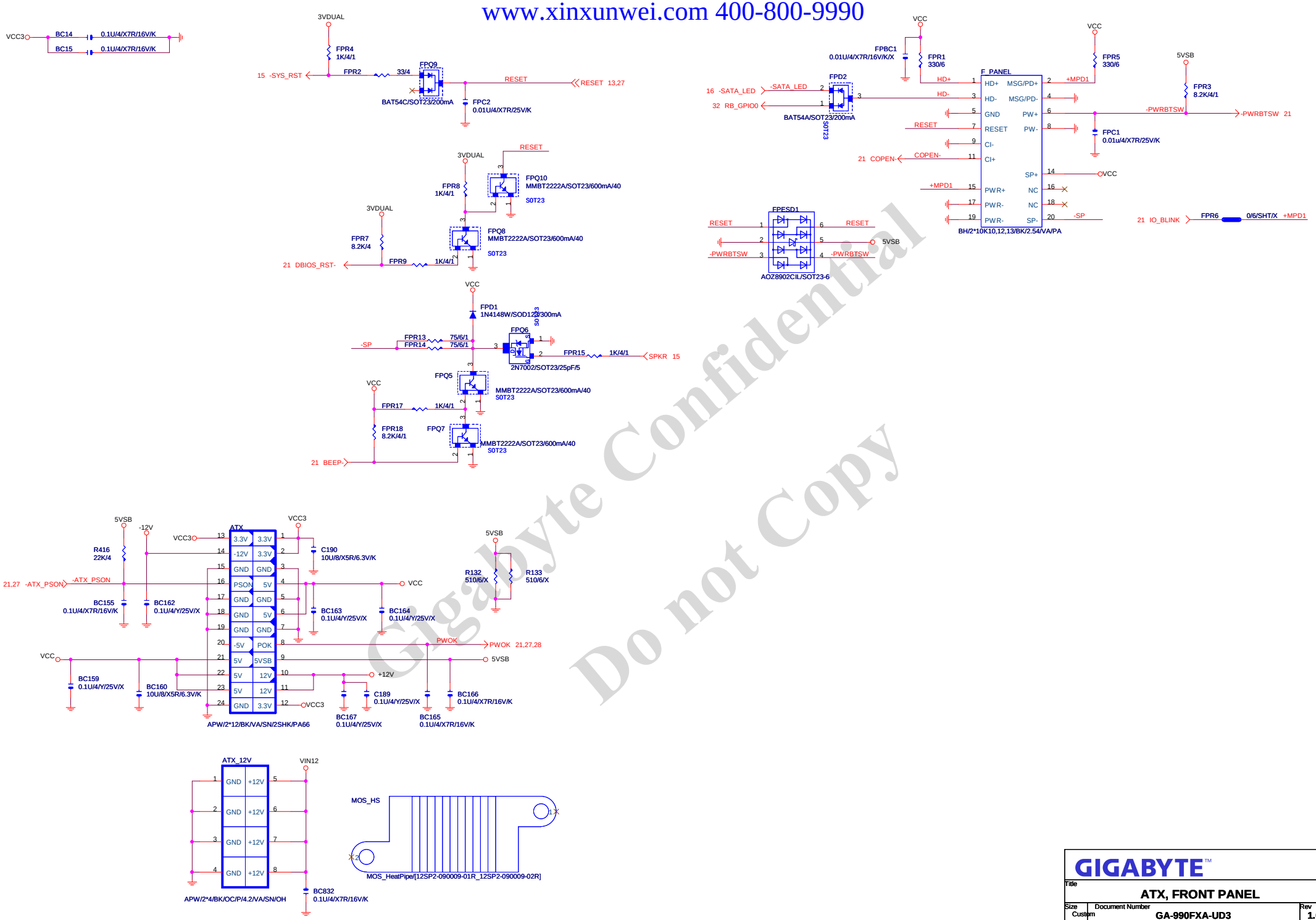

GIGABYTE™

Title	ATX, FRONT PANEL	
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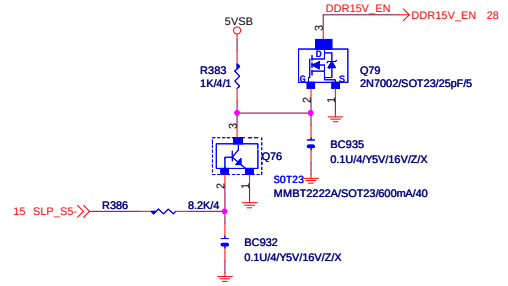

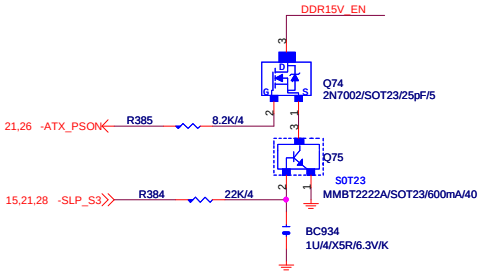

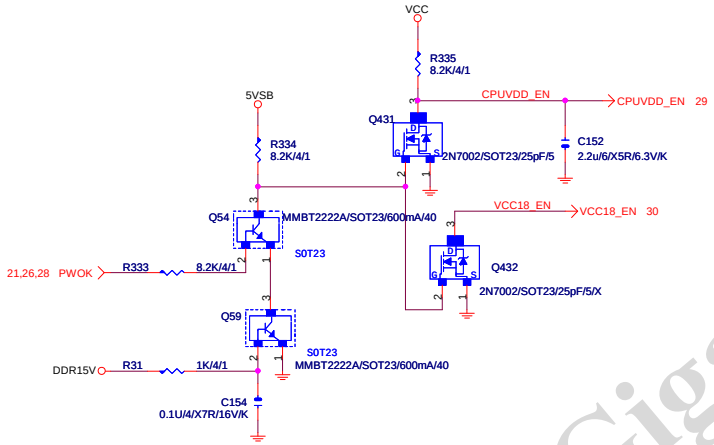

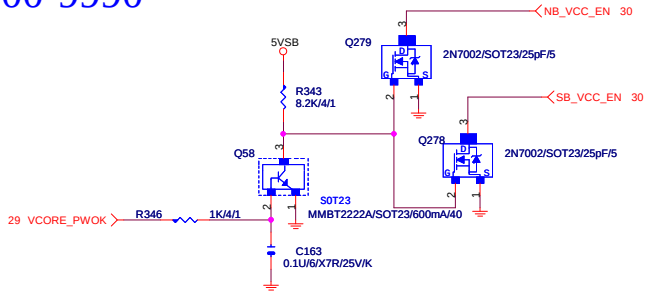

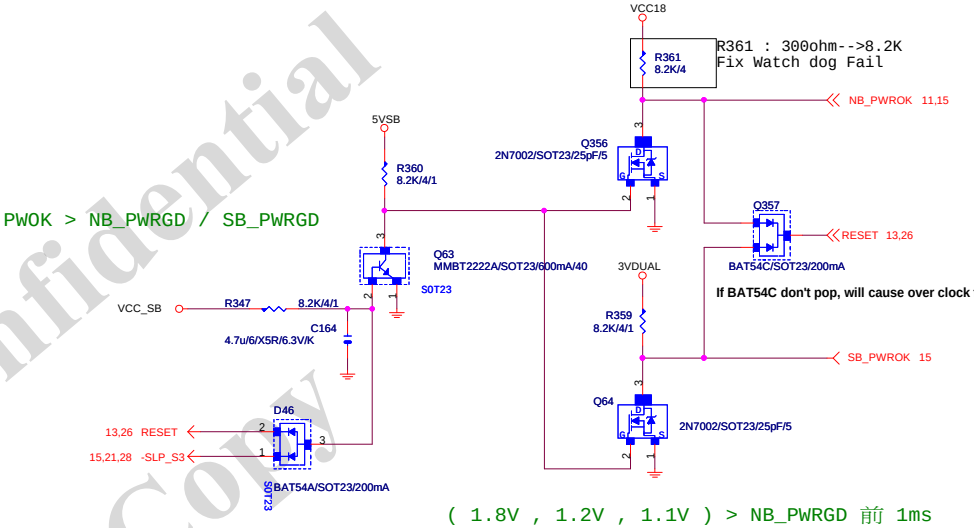

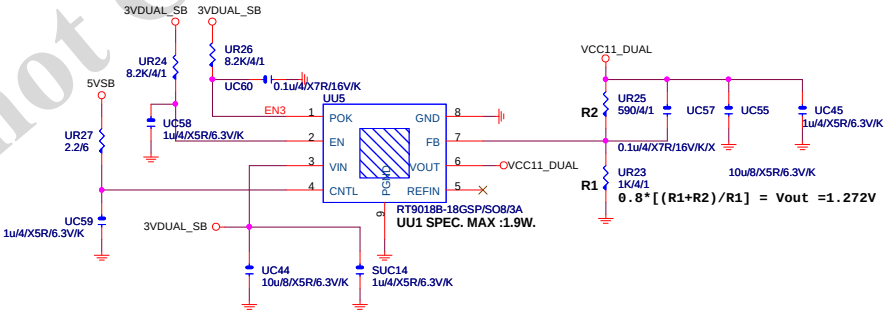

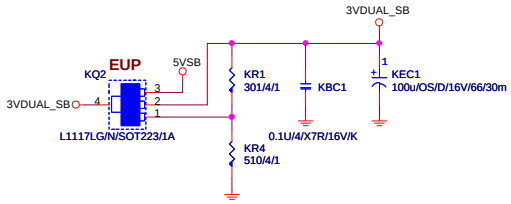

GIGABYTE™

Title: POWER SEQUENCE		
Size: Custom	Document Number: GA-990FXA-UD3	Rev: 1.0
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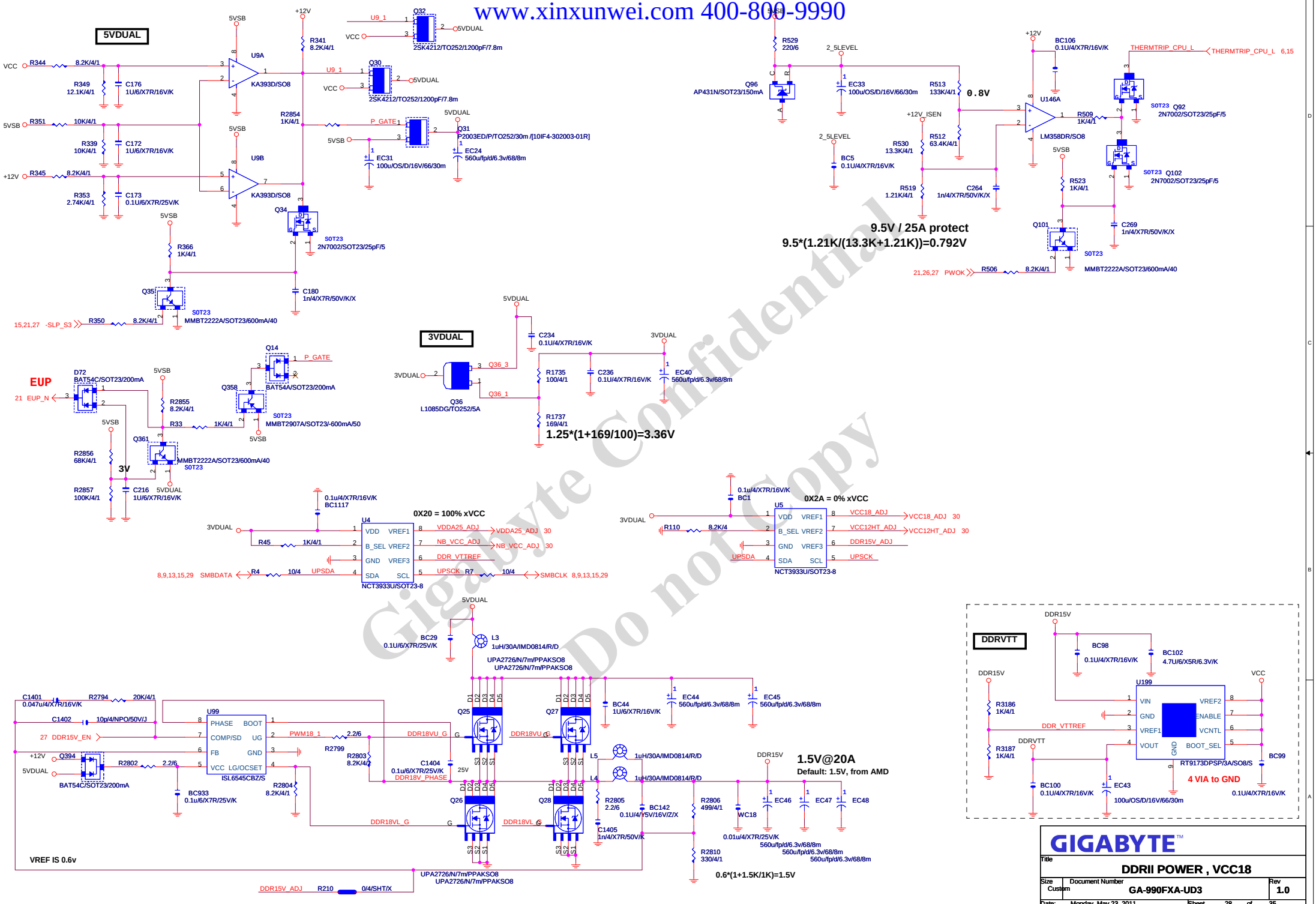
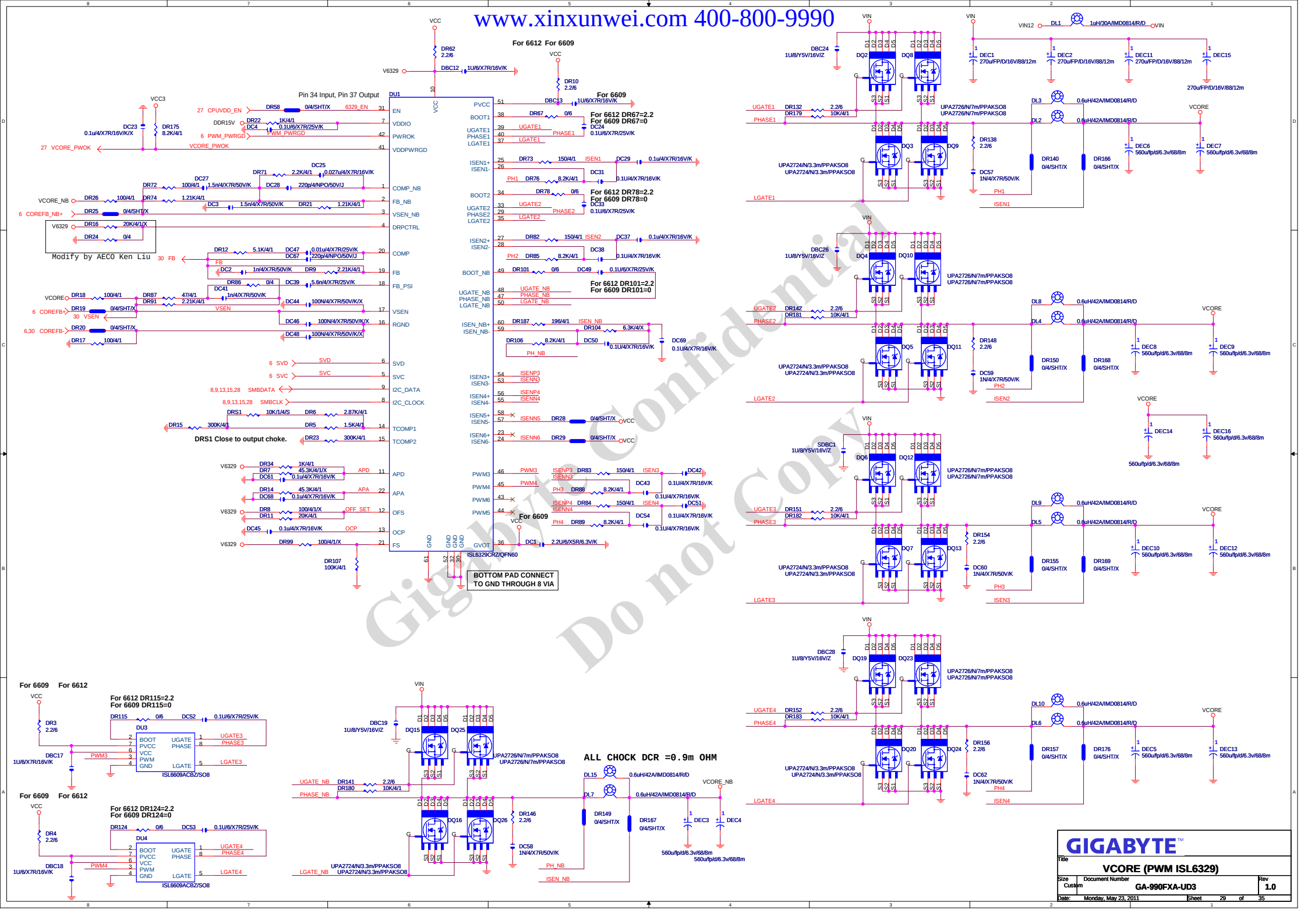
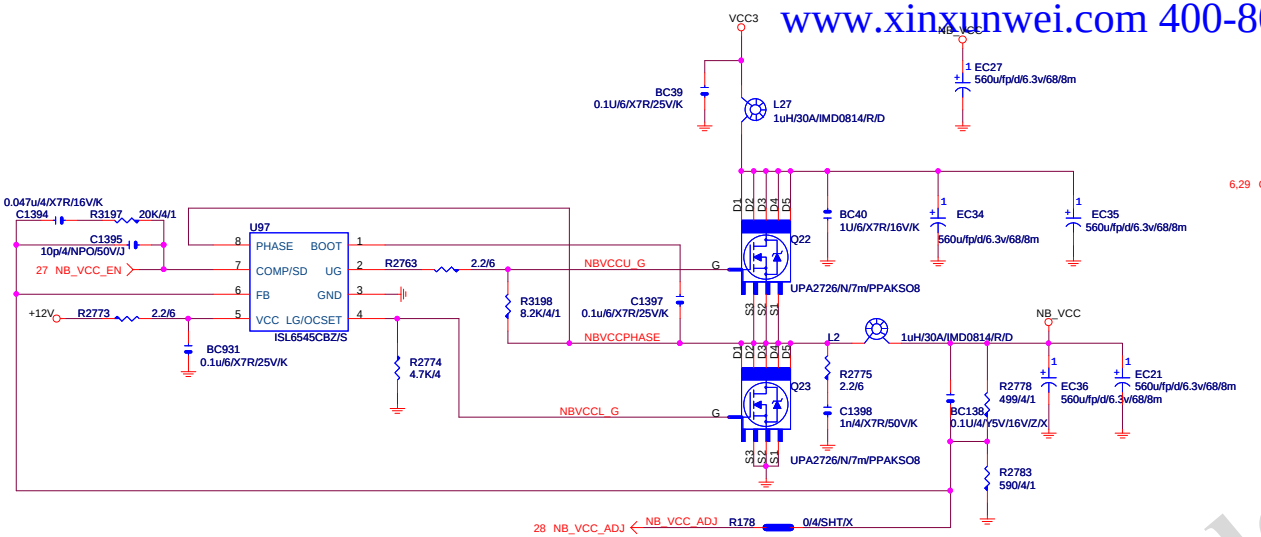
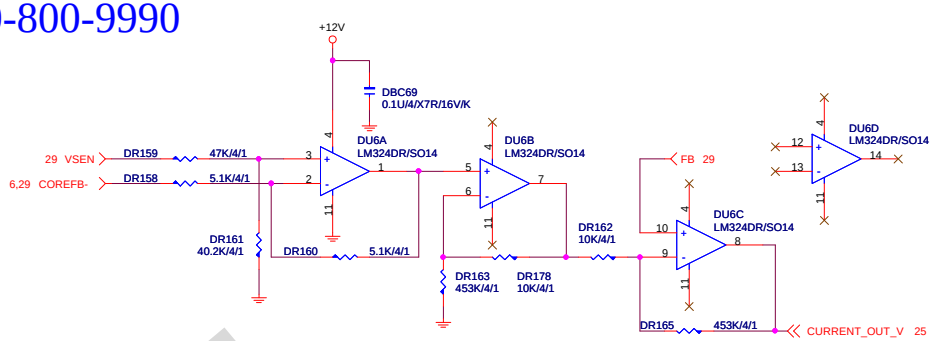
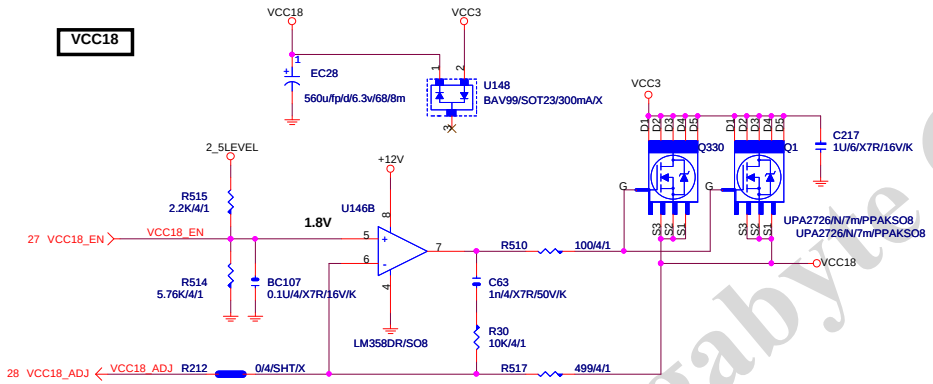


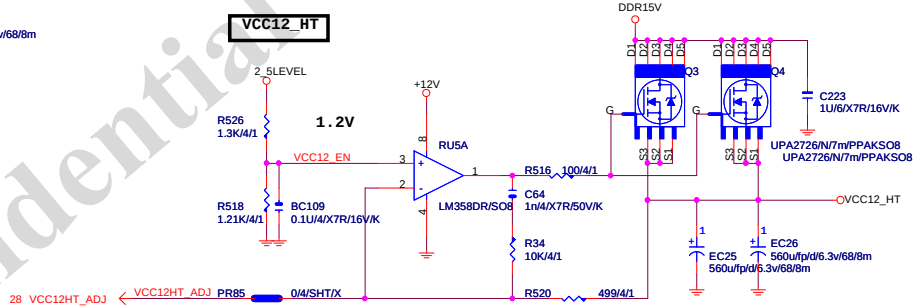


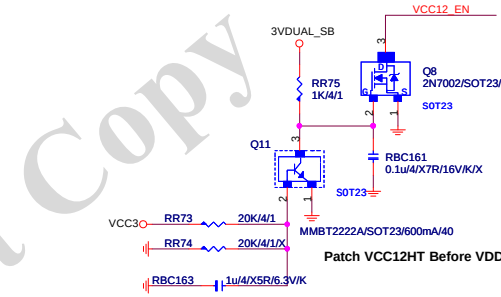


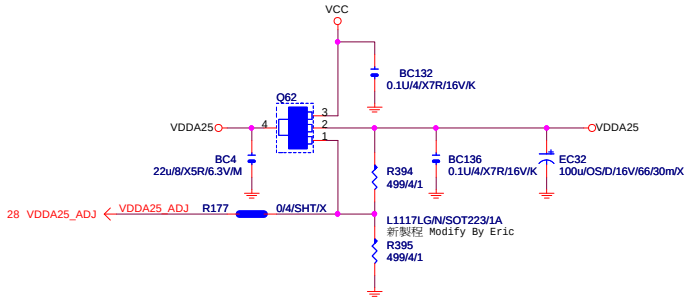


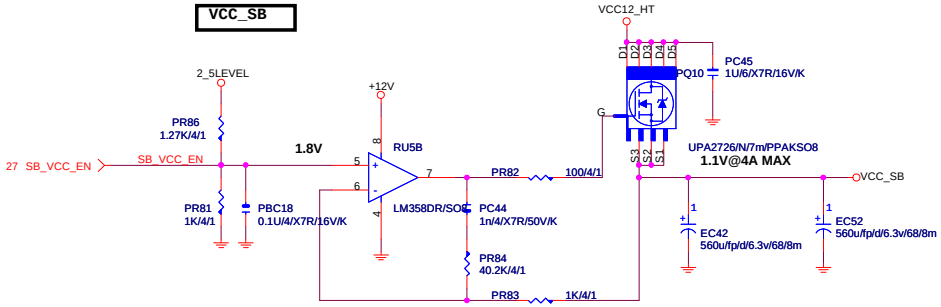
ATI for VCC3/VCC18 power ramp-up 2.1V
U148 for IGP type Only











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Title: NB/SB POWER,VCC12HT,VDDA25

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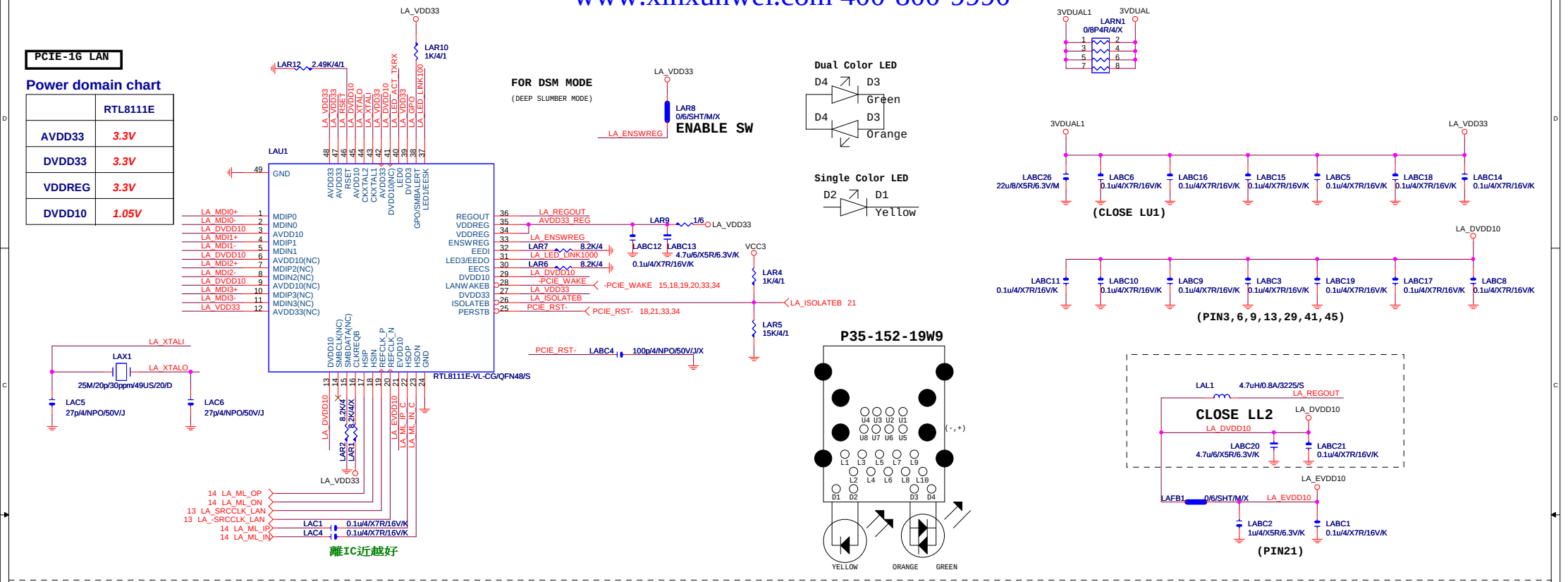
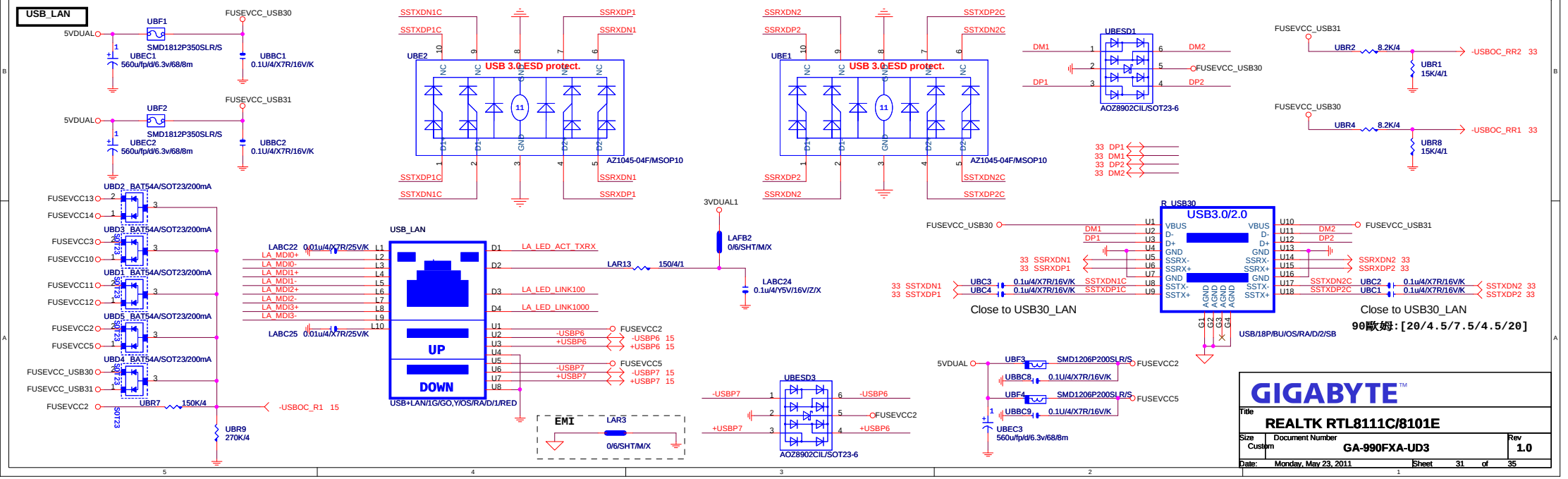
PCIE-1G LAN

Power domain chart

	RTL8111E
AVDD33	3.3V
DVDD33	3.3V
VDDREG	3.3V
DVDD10	1.05V



USB_LAN



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3A

Near to PIN

RB_VDD10
RBC26 RBC13 RBC11 RBC17 RBC34 RBC6 RBC23
2.2u/6/X5R/6.3V/K
0.1u/4/X7R/16V/K

Near to PIN

VCC3
RBC30 RBC36 RBC35 RBC20
0.1u/4/X7R/16V/K

Near to PIN

RB_VDD1_8
RB_AVDD0
RBFB5 0/4/SHT/M/X
RBC31 RBC15 RBC9 RBC10 RBC24
1n/4/X7R/50V/K
1u/4/X5R/6.3V/K
2.2u/6/X5R/6.3V/K
0.1u/4/X7R/16V/K
0.1u/4/X7R/16V/K

Near to PIN

RB_VDD1_8
RB_VAA2_0
RBFB1 0/4/SHT/M/X
RBC7
0.1u/4/X7R/16V/K

SE9172 N/A

RB_VDD1_8
RB_AVDD1
RBFB4 0/6/X
RBC16
0.1u/4/X7R/16V/K/X

Near to PIN

RB_VDD1_8
RB_VAA2_1
RBFB2 0/4/SHT/M/X
RBC8
0.1u/4/X7R/16V/K

Near to PIN

RB_VDD1_8
RB_VAA1
RBFB3 0/4/SHT/M/X
RBC5
0.1u/4/X7R/16V/K

VCC3
RBR3 1K/4/1/X
RB_TESTMODE
RBR2 10K/4/1

RBTP2

RBU1
88SE9172
88SE9172A1/S

RB_RXP1 RB_RXN1 RB_VAA2_1 RB_TXN1 RB_TXP1 RB_RXP0 RB_RXN0 RB_VAA2_0 RB_TXN0 RB_TXP0 RB_VDD10 RB_VAA1
RBTP1

GND TST5 TST4 GPIO2 GPIO1 VDDIO2 TST3 TST2 TST1 TST0 GPIO0 VDD6 PERST_N CLKN CLKP
RBTP6 RBTP7 RB_GPIO2 RB_GPIO1 VCC3 RBTP5 RBTP4 RBTP8 RBTP3 RB_GPIO0 RB_VDD10
PCIE_RSTS- 21
RB_-SRCCLK 13
RB_SRCCLK 13
RBC33 100P/4/NPO/50V/J/X

RB_SL_OP 10
RB_SL_ON 10
RB_AVDD0
RBC21 0.1u/4/X7R/16V/K
RBC18 0.1u/4/X7R/16V/K
RB_SL_IP 10
RB_SL_IN 10
RB_AVDD1
RBR7 6.04K/4/1
RBFB6 30/6/4A/S

RB_XTALI RBC19 12P/4/NPO/50V/J
RBR13 1M/4/X
RBX1 25M/20p/30ppm/49US/20/D
RB_XTALO RBC25 12P/4/NPO/50V/J

RB_VDD1_8
RBC22 22u/8/X5R/6.3V/M
RBC28 22u/8/X5R/6.3V/M/X

3.3V to 1.8V Voltage Regulator

VCC3
RBC32 0.1u/4/X7R/16V/K
RB_VDD1_8
RBR11 100/4/1
RBR20 46.4/4/1
RBQ2 L1085DSG/TO252/5A
RBC39 0.1u/4/X7R/16V/K/X

RB_VDD1_8
RBEC1 100u/OS/D/16V/66/30m

90歐姆:[20/4.5/7.5/4.5/20]

RB_TXP0 RB_TXN0 RB_RXN0 RB_RXP0 RB_TXP1 RB_TXN1 RB_RXN1 RB_RXP1
0.01u/4/X7R/25V/K
RBC3 RB_TXP0C
RBC4 RB_TXN0C
RBC1 RB_RXN0C
RBC2 RB_RXP0C
RBC27 RB_TXP1C
RBC29 RB_TXN1C
RBC41 RB_RXN1C
RBC40 RB_RXP1C

VCC3
RB_GPIO2 RB_GPIO3 RB_GPIO4 RB_GPIO5
RBR19 RBR1 RBR9 RBR8 1K/4/1/X
RBR18 RBR1 RBR9 RBR8 1K/4/1/X

VCC3
RBR15 1K/4/1/X
RB_GPIO0
RB_GPIO0 26
RBR14 1K/4/1/X
RBR17 1K/4/1/X
RB_GPIO1
RBR16 1K/4/1/X

USB_ESATA
USBx2
eSATA
FUSEVCC3 -USBP8 +USBP8
FUSEVCC10 -USBP9 +USBP9
RB_RXN0C RB_RXP0C
RB_TXP0C RB_TXN0C
V16 V15 V14 V13
G4 G3 G2 G1
2USB+eSATA/RED/OS/RA/GF::Location USB_ESATA

UBESD2
AOZ8902CIL/SOT23-6
+USBP8 -USBP8 -USBP9 FUSEVCC3 +USBP9

UBESD4
AOZ8902CIL/SOT23-6
+USBP1 -USBP1 -USBP0 FUSEVCC11 +USBP0

USB_1394_ESATA
USBx2
1394
eSATA
FUSEVCC11 -USBP0 +USBP0
FUSEVCC12 -USBP1 +USBP1
I_BUSVCC1
IBC13 0.1u/4/X7R/16V/K
I_TPB0- I_TPB0+ I_TPA0- I_TPA0+
RB_RXN1C RB_RXP1C
RB_TXP1C RB_TXN1C
V16 V15 V14 V13
G4 G3 G2 G1
USB+1394+eSATA/8P+6P+7P/RE/OS::Location USB_1394_ESATA

FUSEVCC3
FUSEVCC10
FUSEVCC11
FUSEVCC12
5VDUAL
UBF5 SMD1206P200SLR/S UBBC3 0.1u/4/X7R/16V/K
UBF6 SMD1206P200SLR/S UBBC4 0.1u/4/X7R/16V/K
UBF7 SMD1206P200SLR/S UBBC5 0.1u/4/X7R/16V/K
UBF8 SMD1206P200SLR/S UBBC6 0.1u/4/X7R/16V/K

VCC18
RBR1 5.11K/4/1/X
RB_VCONT_10
RBQ1
PBSS53502/SOT223
(1A , 1.4W)
RBC14 22u/8/X5R/6.3V/M
RBC12 0.1u/4/X7R/16V/K
RB_VDD10
900mA@1.0V
RBC38 22u/8/X5R/6.3V/M
RBC37 22u/8/X5R/6.3V/M
For B0 final IC

EMI
UBR20
0/6/SHT/X

Title	Marvell 9172_ESATA
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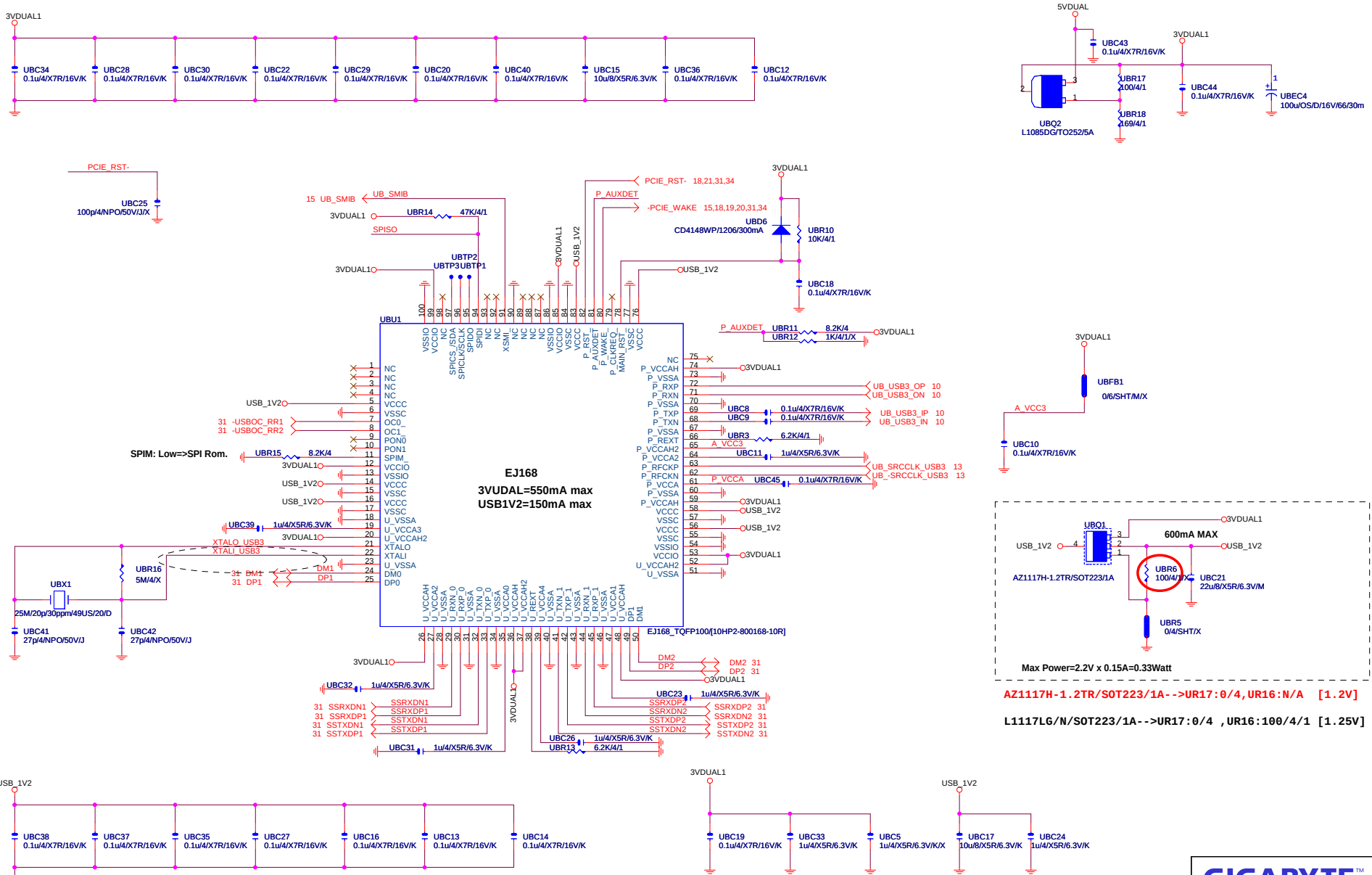

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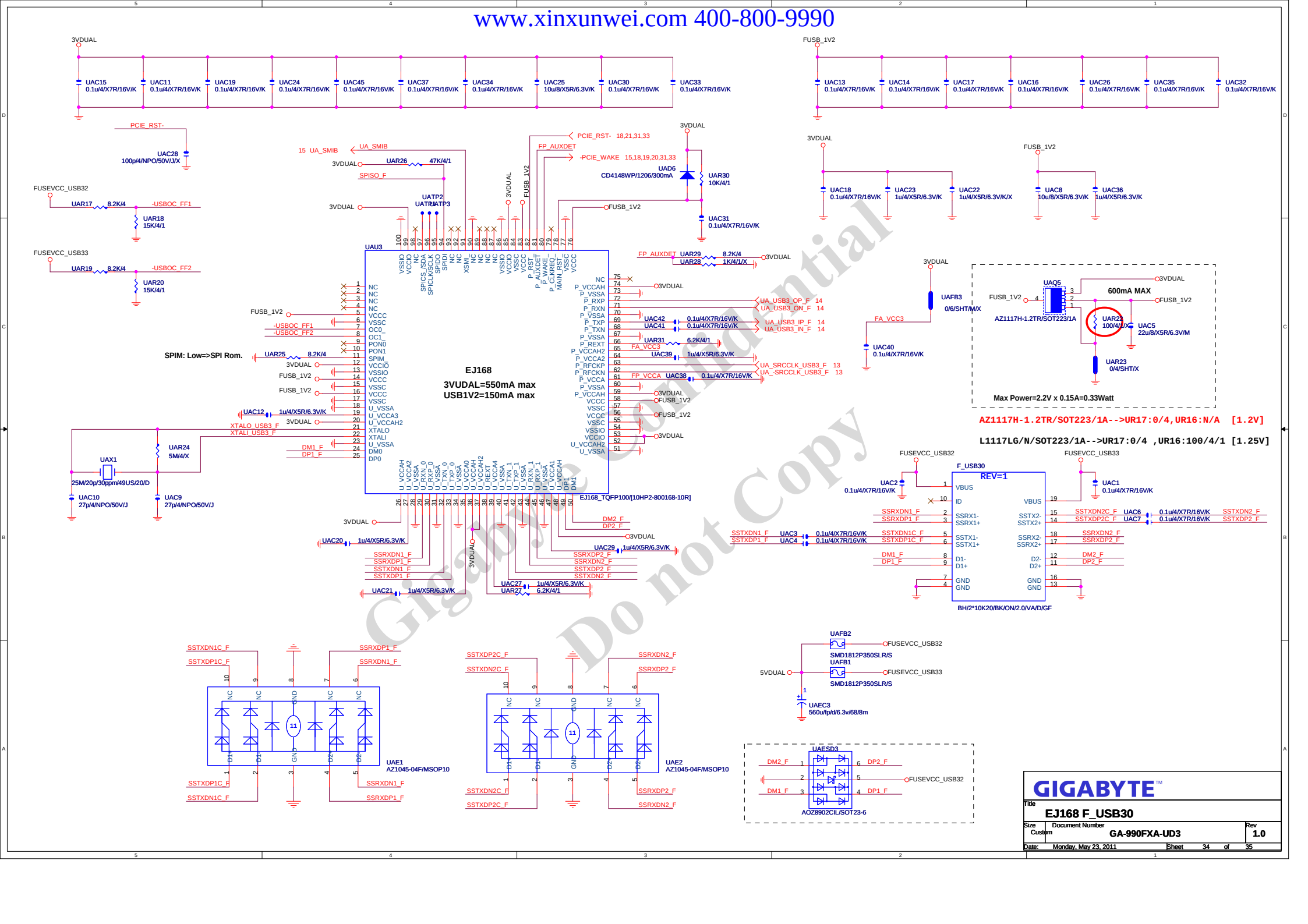

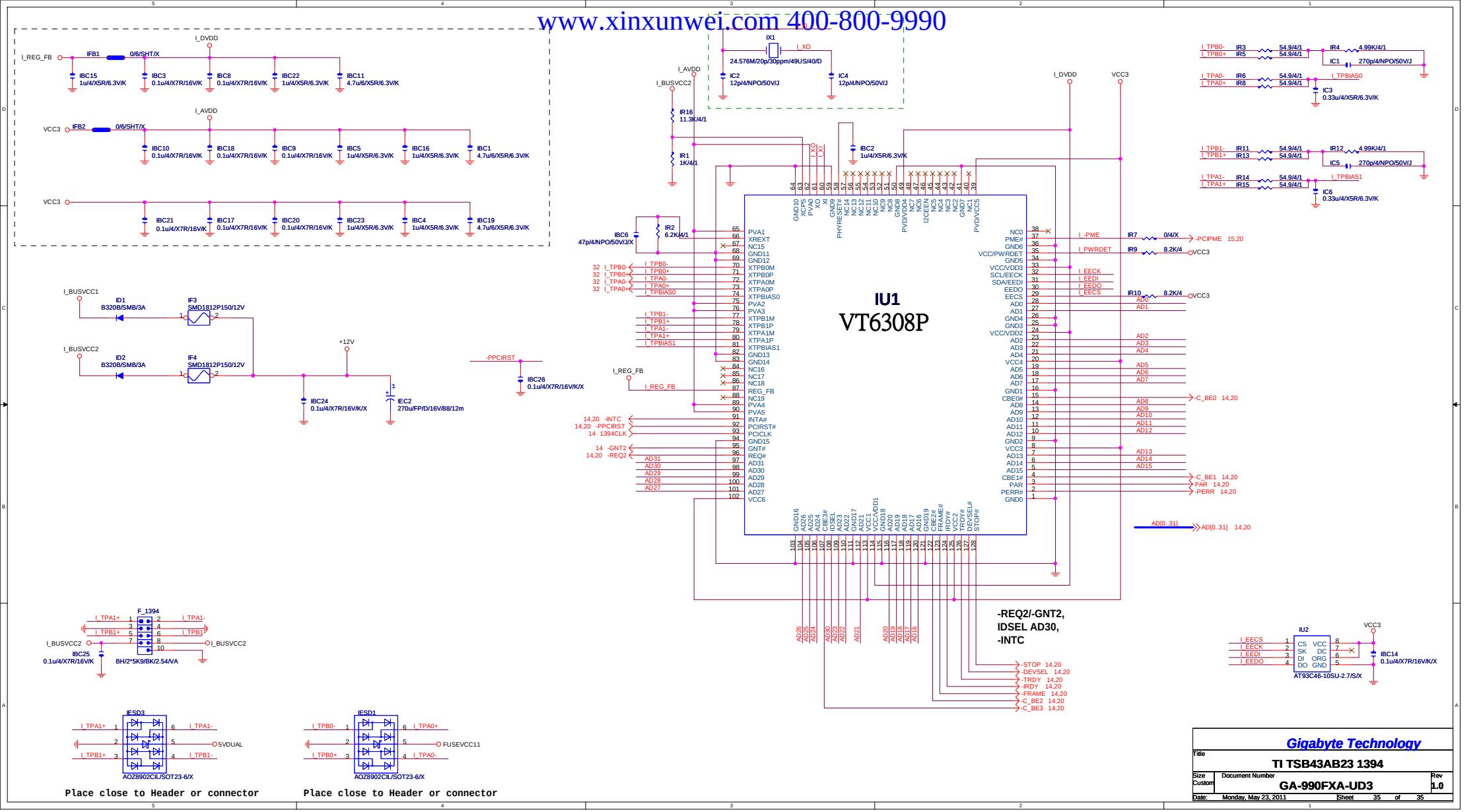

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