GA-78LMT-S2

Revision : 1.21

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Model Name:GA-78LMT-S2

Component value change history

Version: 1.21

P-Code: U99098-0

Date	Change Item		Reason
2012.03.12	E_BOM Release.	PCB: 0.1	Modify from 78LMT-S2P 5.02
2012.04.13	10A P_BOM Release.	PCB: 1.0	change P-BOM to 10A
2012.05.11	10B P_BOM Release.	PCB: 1.0	remove Q12 (MOS_OT BIOS OFF)
2012.07.02	11A P_BOM Release.	PCB: 1.1	Add COM port pin-header
2012.07.12	11B P_BOM Release.	PCB: 1.11	Add Erp for 0.5W Requirement
2012.08.08	11C P_BOM Release.	PCB: 1.11	DU3 change 10TA1-313933-10R
2012.09.01	11D P_BOM Release.	PCB: 1.12	Patch some PSU can't boot when ERP enable.
2013.03.20	12A E_BOM Release.	PCB: 1.2	PWM RT8868 change RT8871
2013.04.25	12B E_BOM Release.	PCB: 1.21	Fix some AM3 CPU can`nt boot(ADD R2559)

Circuit or PCB layout change for next version

Date	Version	Change Item
2012.03.11	0.1 Gerber out	change From 78LMT-S2P 5.02 (RS760=RS780L)
2012.04.13	1.0 Gerber out	1. change PCB Ver 1.0 2. Add "RB" 文字面
2012.07.02	1.1 Gerber out	Change MOS_OT pin. Add COM port pin-header
2012.07.11	1.11 Gerber out	1. Add Erp Schematic for 0.5W Requirement (P22,P27)
2012.08.31	1.12 Gerber out	Patch some PSU can't boot when ERP enable.
2013.03.18	1.2 Gerber out	PWM RT8868 change RT8871
2013.03.19	1.2 Gerber out	PWM RT8868 change RT8872
2013.04.24	1.21 Gerber out	ADD R2559

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Title: BOM & PCB HISTORY

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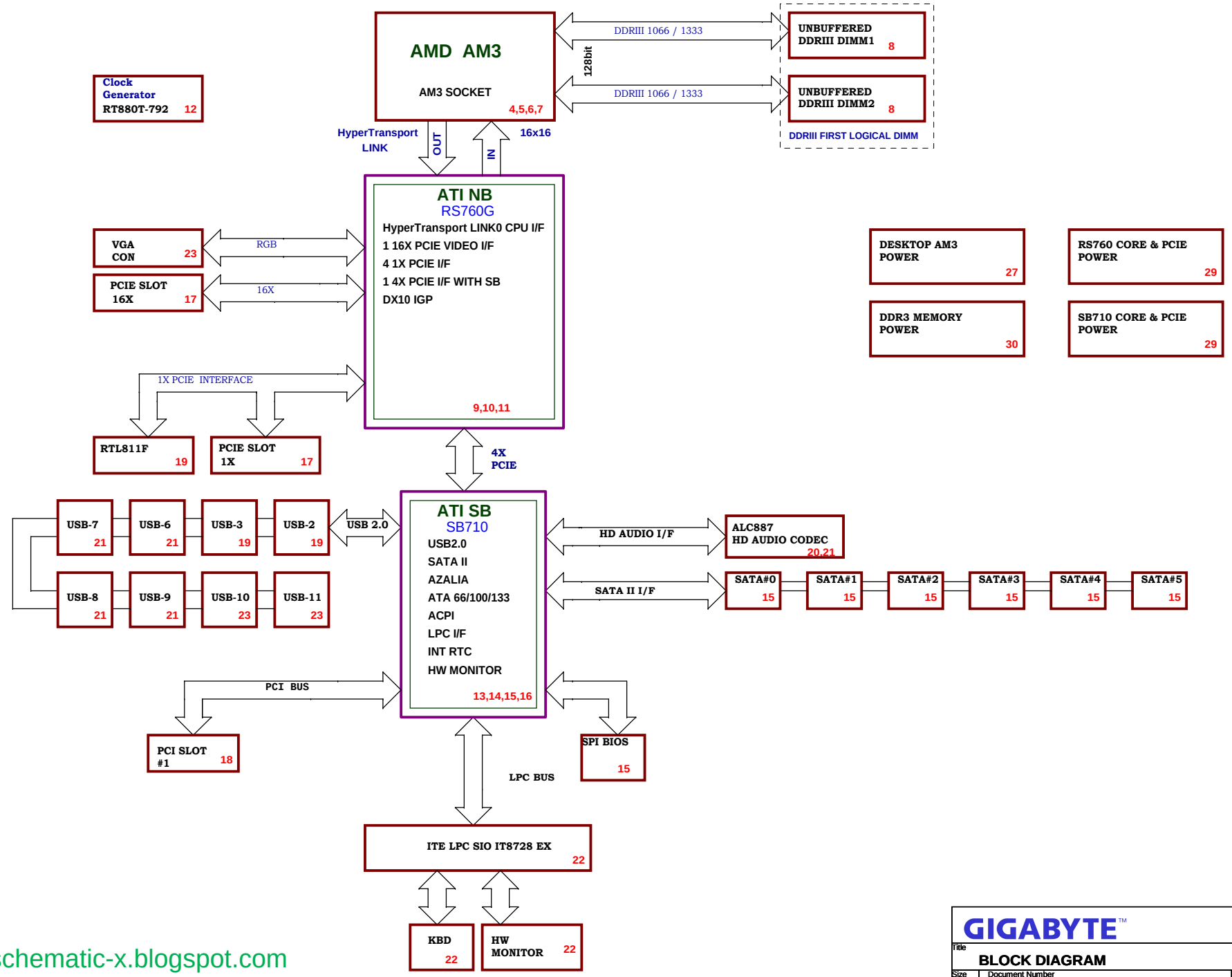
RS780L CUSTOMER DESKTOP DESIGN



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Title: BLOCK DIAGRAM		
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L0_CADIN_L[0..15] L0_CADIN_L[0..15] <9>
L0_CADIN_H[0..15] L0_CADIN_H[0..15] <9>

L0_CADOUT_L[0..15] L0_CADOUT_L[0..15] <9>
L0_CADOUT_H[0..15] L0_CADOUT_H[0..15] <9>

M2CPUA

HYPERTRANSPORT

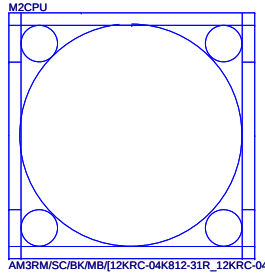
<9> L0_CLKIN_H1	L0_CLKIN_H1	N6	L0_CLKIN_H(1)	L0_CLKOUT_H(1)	AD5	L0_CLKOUT_H1	L0_CLKOUT_H1 <9>
<9> L0_CLKIN_L1	L0_CLKIN_L1	P6	L0_CLKIN_L(1)	L0_CLKOUT_L(1)	AD4	L0_CLKOUT_L1	L0_CLKOUT_L1 <9>
<9> L0_CLKIN_H0	L0_CLKIN_H0	N3	L0_CLKIN_H(0)	L0_CLKOUT_H(0)	AD1	L0_CLKOUT_H0	L0_CLKOUT_H0 <9>
<9> L0_CLKIN_L0	L0_CLKIN_L0	N2	L0_CLKIN_L(0)	L0_CLKOUT_L(0)	AC1	L0_CLKOUT_L0	L0_CLKOUT_L0 <9>
<9> L0_CTLIN_H1	L0_CTLIN_H1	V4	L0_CTLIN_H(1)	L0_CTLOUT_H(1)	Y6	L0_CTLOUT_H1	L0_CTLOUT_H1 <9>
<9> L0_CTLIN_L1	L0_CTLIN_L1	V5	L0_CTLIN_L(1)	L0_CTLOUT_L(1)	W6	L0_CTLOUT_L1	L0_CTLOUT_L1 <9>
<9> L0_CTLIN_H0	L0_CTLIN_H0	U1	L0_CTLIN_H(0)	L0_CTLOUT_H(0)	W2	L0_CTLOUT_H0	L0_CTLOUT_H0 <9>
<9> L0_CTLIN_L0	L0_CTLIN_L0	V1	L0_CTLIN_L(0)	L0_CTLOUT_L(0)	W3	L0_CTLOUT_L0	L0_CTLOUT_L0 <9>
	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)	AE6	L0_CADOUT_H11	
	L0_CADIN_L11	M5	L0_CADIN_L(11)	L0_CADOUT_L(11)	AE5	L0_CADOUT_L11	
	L0_CADIN_H10	L6	L0_CADIN_H(10)	L0_CADOUT_H(10)	AF4	L0_CADOUT_H10	
	L0_CADIN_L10	M6	L0_CADIN_L(10)	L0_CADOUT_L(10)	AH6	L0_CADOUT_L10	
	L0_CADIN_H9	K4	L0_CADIN_H(9)	L0_CADOUT_H(9)	AG6	L0_CADOUT_H9	
	L0_CADIN_L9	K5	L0_CADIN_L(9)	L0_CADOUT_L(9)	AH5	L0_CADOUT_L9	
	L0_CADIN_H8	J6	L0_CADIN_H(8)	L0_CADOUT_H(8)	AH4	L0_CADOUT_H8	
	L0_CADIN_L8	K6	L0_CADIN_L(8)	L0_CADOUT_L(8)		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/15u/[10SC1-A01942-01R_10SC1-A01942-02R]

CPU_VDD_RUN = VCORE
CPU_VDDA_RUN = VDDA25
VLDT_RUN = VCC12_HT
CPU_VDDIO_SUS = DDR18V
CPU_VTT_SUS = DDRVTT

VLDT_A = VCC12_HT
VLDT_B = HT12B

M2CPU



AM3RM/SC/BK/MB/[12KRC-04K812-31R_12KRC-04K812-32R]

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Title: CPU HYPER TRANSPORT		
Size: Custom	Document Number: GA-78LMT-S2	Rev: 1.21
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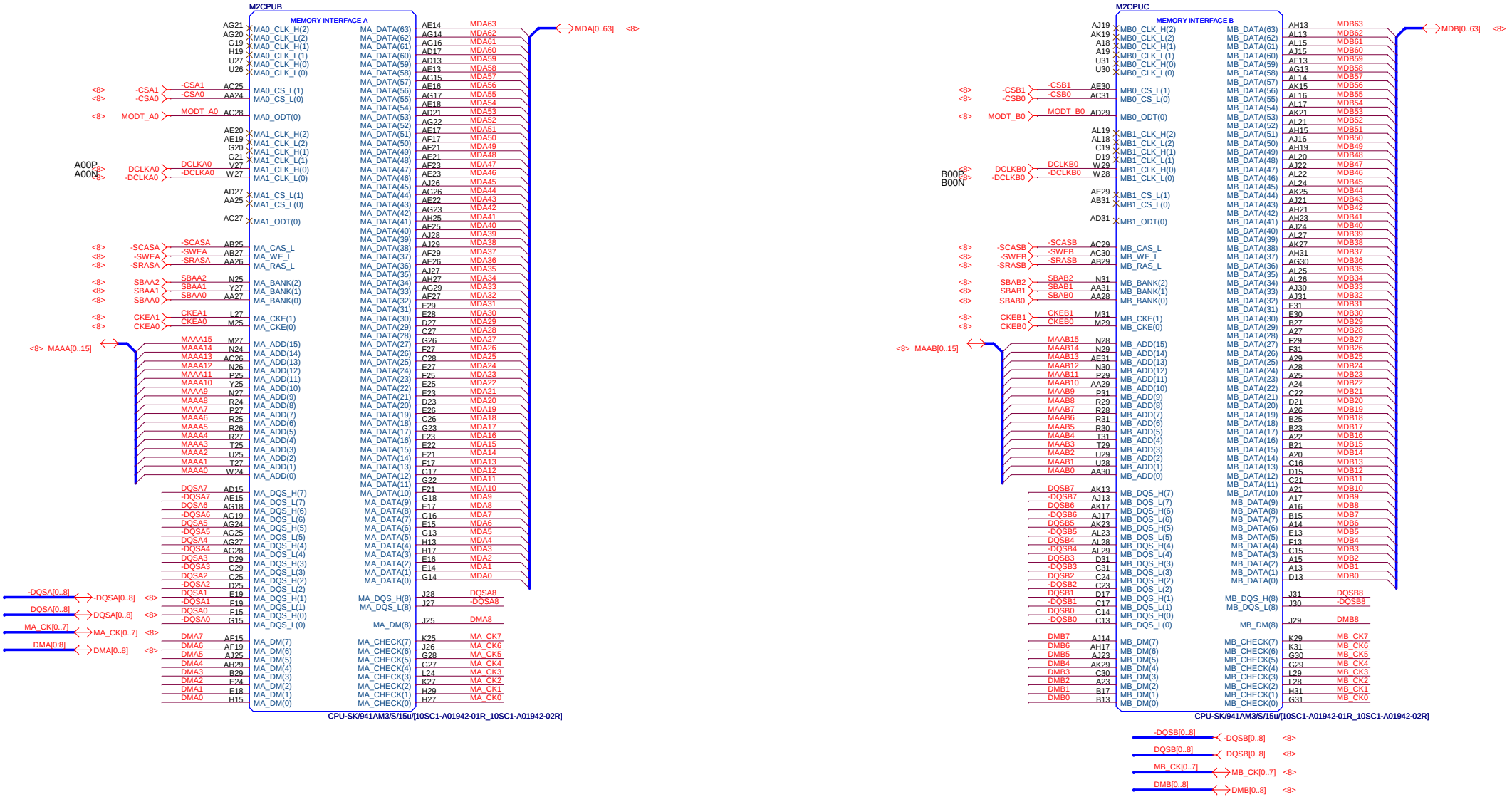

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Title: CPU DDRII MEMORY		
Size: Custom	Document Number: GA-78LMT-S2	Rev: 1.21
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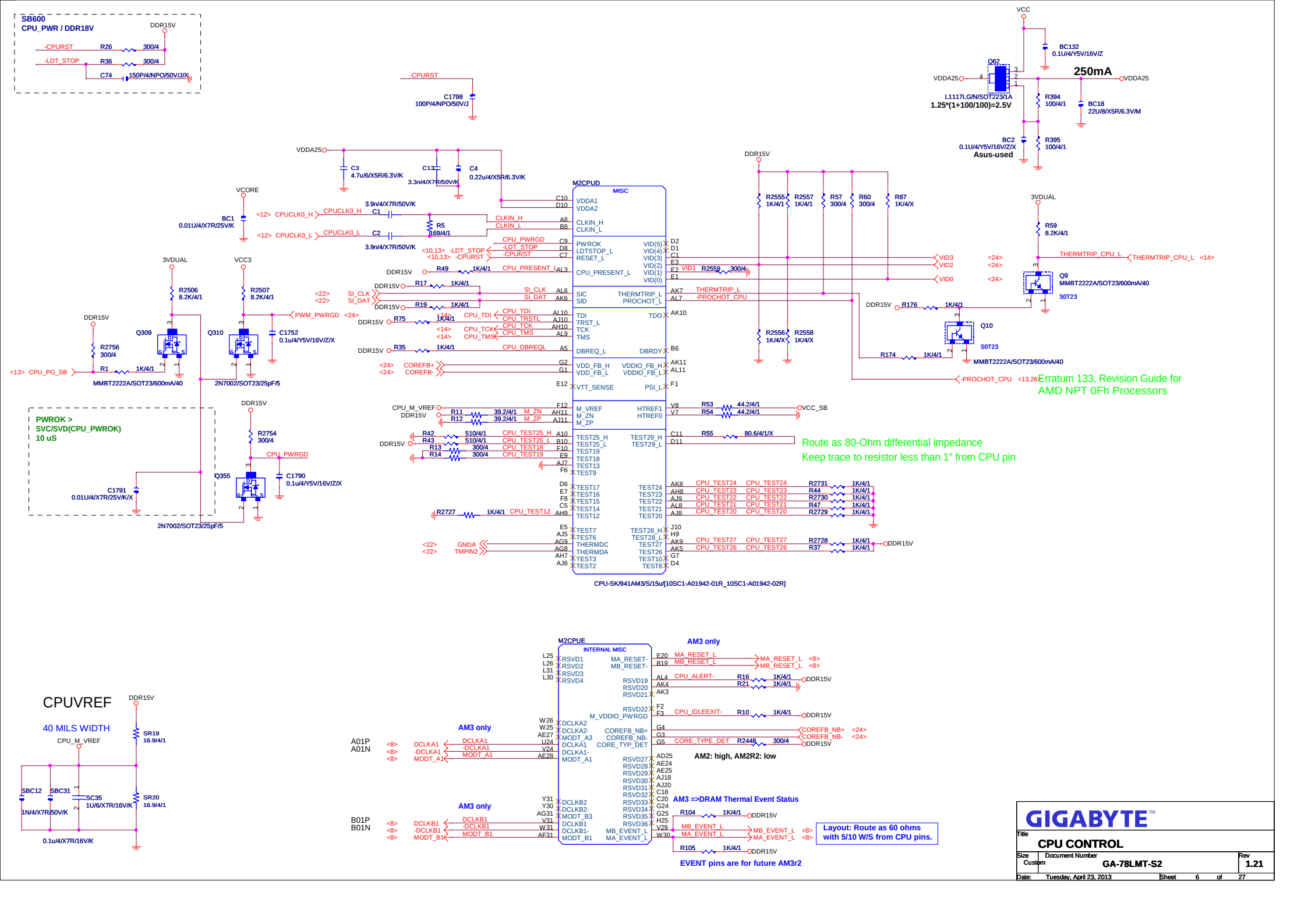
SB600
CPU_PWR / DDR18V
DDR15V
-CPURST
R26
300/4
-LDT_STOP
R36
300/4
C74
150P/4/NPO/50V/J/X
C1798
100P/4/NPO/50V/J
VCC
BC132
0.1U/4/Y5V/16V/Z
Q62
250mA
VDDA25
L1117LG/N/SOT223/1A
1.25*(1+100/100)=2.5V
R394
100/4/1
BC18
22U/8/X5R/6.3V/M
BC2
0.1U/4/Y5V/16V/Z/X
Asus-used
R395
100/4/1
VDDA25
C3
4.7u/6/X5R/6.3V/K
C13
3.3n/4/X7R/50V/K
C4
0.22u/4/X5R/6.3V/K
VCORE
BC1
0.01U/4/X7R/25V/K
3.9n/4/X7R/50V/K
C1
R5
169/4/1
C2
3.9n/4/X7R/50V/K
CPUCLK0_H
CPUCLK0_L
M2CPUD
MISC
VDDA1
VDDA2
CLKIN_H
CLKIN_L
PWROK
LDTSTOP_L
RESET_L
CPU_PRESENT_L
SIC
SID
THERMTRIP_L
PROCHOT_L
TDI
TRST_L
TCK
TMS
TDO
DBREQ_L
DBRDY
VDD_FB_H
VDD_FB_L
VDDIO_FB_H
VDDIO_FB_L
VTT_SENSE
PSI_L
M_VREF
M_ZN
M_ZP
HTREF1
HTREF0
TEST25_H
TEST25_L
TEST19
TEST18
TEST13
TEST9
TEST29_H
TEST29_L
TEST17
TEST16
TEST15
TEST14
TEST12
TEST24
TEST23
TEST22
TEST21
TEST20
TEST7
TEST6
THERMDC
THERMDA
TEST3
TEST2
TEST28_H
TEST28_L
TEST27
TEST26
TEST10
TEST8
VID(5)
VID(4)
VID(3)
VID(2)
VID(1)
VID(0)
CPU-SK/941AM3/S/15u/[10SC1-A01942-01R_10SC1-A01942-02R]
DDR15V
R2555 1K/4/1
R2557 1K/4/1
R57 300/4
R60 300/4
R87 1K/4/X
R2556 1K/4/X
R2558 1K/4/X
3VDUAL
R59
8.2K/4/1
THERMTRIP_CPU_L
Q9
MMBT2222A/SOT23/600mA/40
S0T23
Q10
R176
R174
-PROCHOT_CPU
Erratum 133, Revision Guide for
AMD NPT 0Fh Processors
R2506
8.2K/4/1
R2507
8.2K/4/1
VCC3
PWM_PWRGD
Q309
Q310
C1752
0.1u/4/Y5V/16V/Z/X
R2756
300/4
R1
1K/4/1
CPU_PG_SB
MMBT2222A/SOT23/600mA/40
2N7002/SOT23/25pF/5
PWROK >
SVC/SVD(CPU_PWROK)
10 uS
R2754
300/4
CPU_PWRGD
Q355
C1790
0.1u/4/Y5V/16V/Z/X
C1791
0.01U/4/X7R/25V/K/X
2N7002/SOT23/25pF/5
R49 1K/4/1 CPU_PRESENT_L
R17 1K/4/1 SI_CLK
R19 1K/4/1 SI_DAT
R75 1K/4/1 CPU_TDI
CPU_TRSTL
CPU_TCK
CPU_TMS
R35 1K/4/1 CPU_DBREQL
COREFB+
COREFB-
R11 39.2/4/1 M_ZN
R12 39.2/4/1 M_ZP
R53 44.2/4/1
R54 44.2/4/1
VCC_SB
R42 510/4/1 CPU_TEST25_H
R43 510/4/1 CPU_TEST25_L
R13 300/4 CPU_TEST18
R14 300/4 CPU_TEST19
C11
D11
R55 80.6/4/1/X
Route as 80-Ohm differential impedance
Keep trace to resistor less than 1" from CPU pin
R2727 1K/4/1 CPU_TEST12
R2731 1K/4/1
R44 1K/4/1
R2730 1K/4/1
R47 1K/4/1
R2729 1K/4/1
R2728 1K/4/1
R37 1K/4/1
GNDA
TMPIN2
CPUVREF
40 MILS WIDTH
CPU_M_VREF
SR19
16.9/4/1
SR20
16.9/4/1
SBC12
SBC31
SC35
1U/6/X7R/16V/K
1N/4/X7R/50V/K
0.1u/4/X7R/16V/K
M2CPUE
INTERNAL MISC
RSVD1
RSVD2
RSVD3
RSVD4
MA_RESET-
MB_RESET-
RSVD19
RSVD20
RSVD21
RSVD22
M_VDDIO_PWRGD
DCLKA2
DCLKA2-
MODT_A3
DCLKA1
DCLKA1-
MODT_A1
COREFB_NB+
COREFB_NB-
CORE_TYP_DET
RSVD27
RSVD28
RSVD29
RSVD30
RSVD31
RSVD32
RSVD33
RSVD34
RSVD35
RSVD36
DCLKB2
DCLKB2-
MODT_B3
DCLKB1
DCLKB1-
MODT_B1
MB_EVENT_L
MA_EVENT_L
AM3 only
MA_RESET_L
MB_RESET_L
CPU_ALERT-
R16 1K/4/1
R21 1K/4/1
CPU_IDLEEXIT-
R10 1K/4/1
CORE_TYPE_DET
R2448 300/4
AM2: high, AM2R2: low
AM3 =>DRAM Thermal Event Status
R104 1K/4/1
R105 1K/4/1
MB_EVENT_L
MA_EVENT_L
Layout: Route as 60 ohms
with 5/10 W/S from CPU pins.
EVENT pins are for future AM3r2
A01P
A01N
B01P
B01N
DCLKA1
-DCLKA1
MODT_A1
DCLKB1
-DCLKB1
MODT_B1
GIGABYTE
Title
CPU CONTROL
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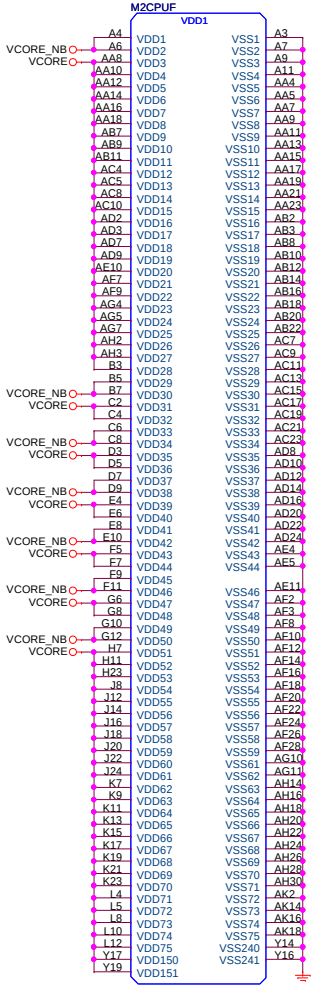
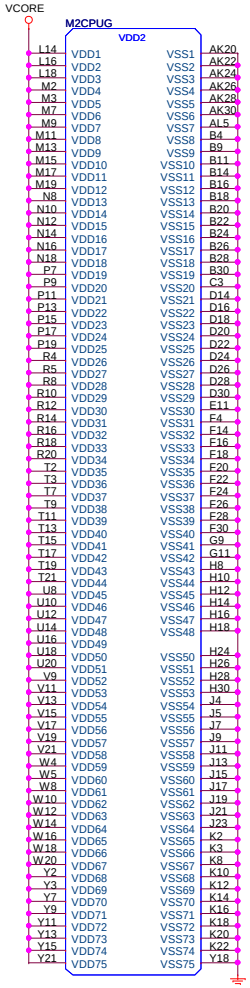
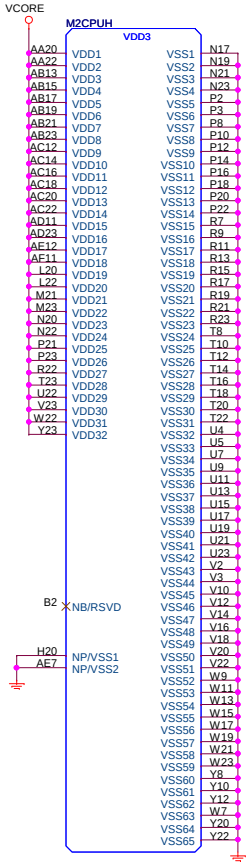
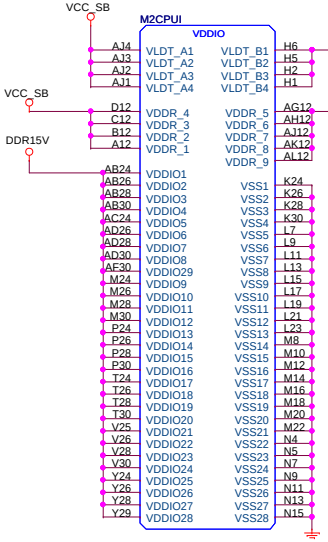
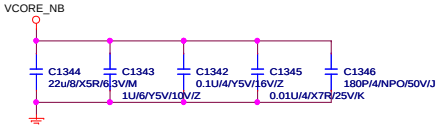
VLDT_RUN_B is connected to the VLDT_RUN power supply through the package or on the die. It is only connected on the board to decoupling near the CPU package.

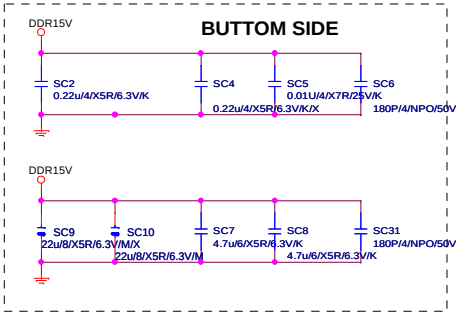


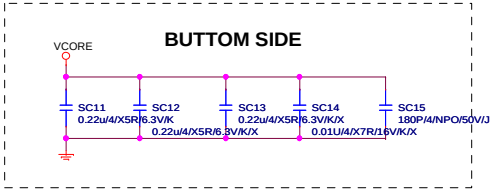


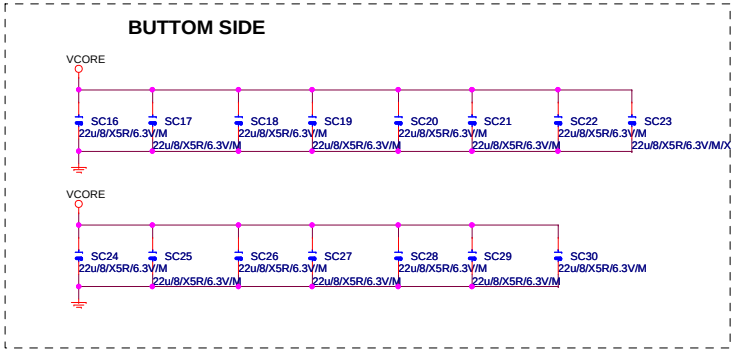


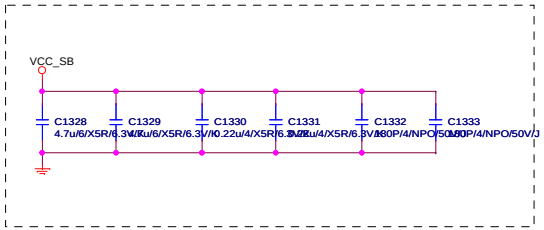


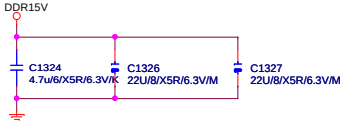


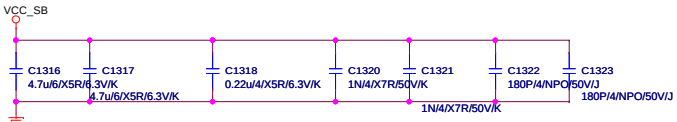


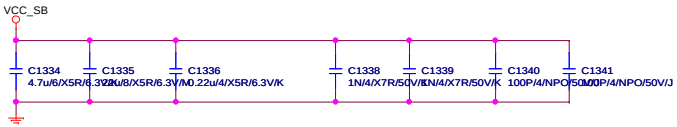


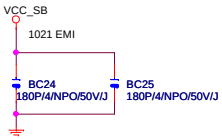






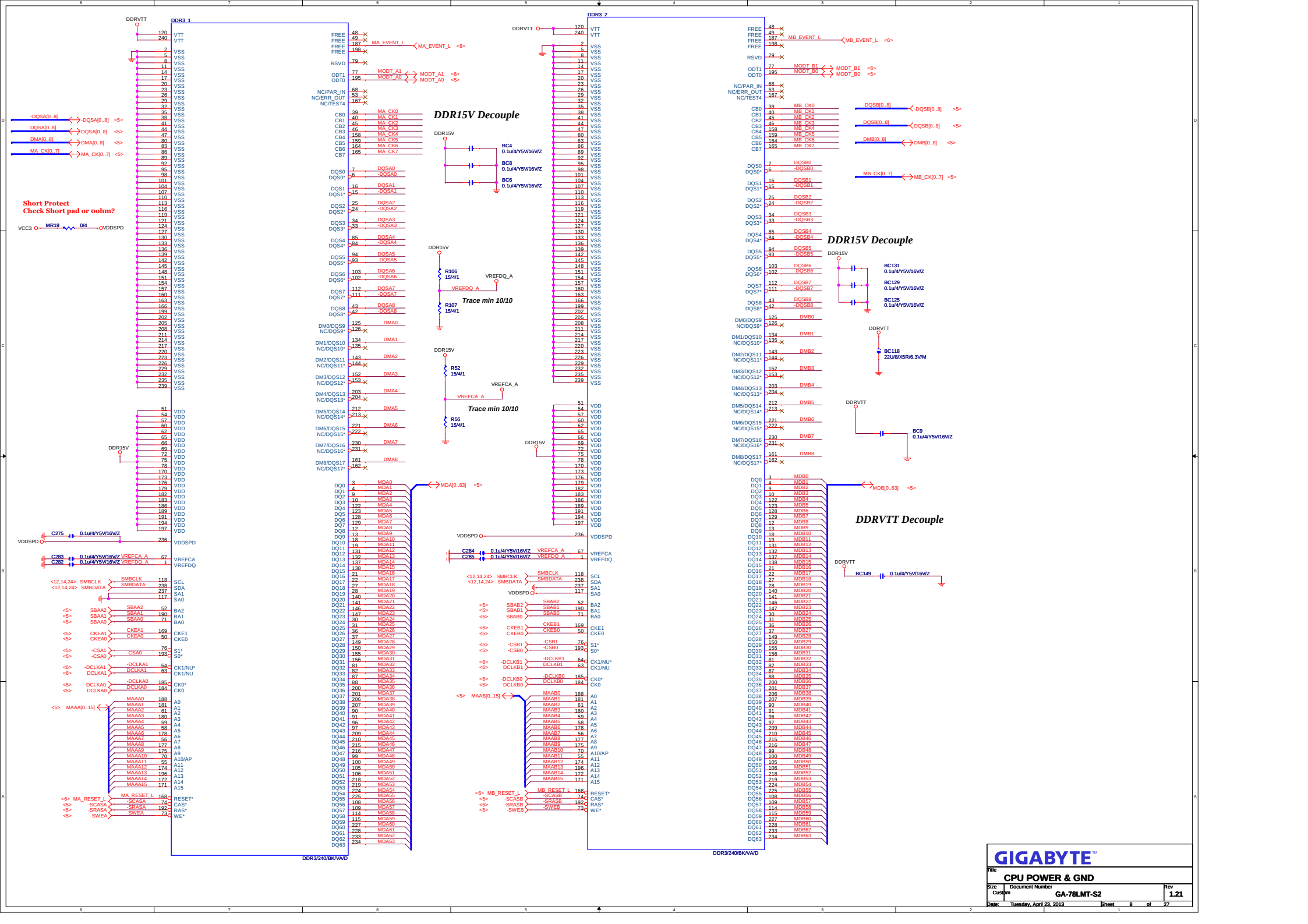






GIGABYTE™

Title: CPU POWER & GND		
Size: Custom	Document Number: GA-78LMT-S2	Rev: 1.21
Date: Tuesday, April 23, 2013	Sheet 7 of 27	


DDR3_1
DDR3_2
DDR3/240/BK/VA/D
DDR15V Decouple
DDRVTT Decouple
Short Protect
Check Short pad or oohm?
Trace min 10/10
Trace min 10/10
GIGABYTE
CPU POWER & GND
GA-78LMT-S2
1.21
Tuesday, April 23, 2013
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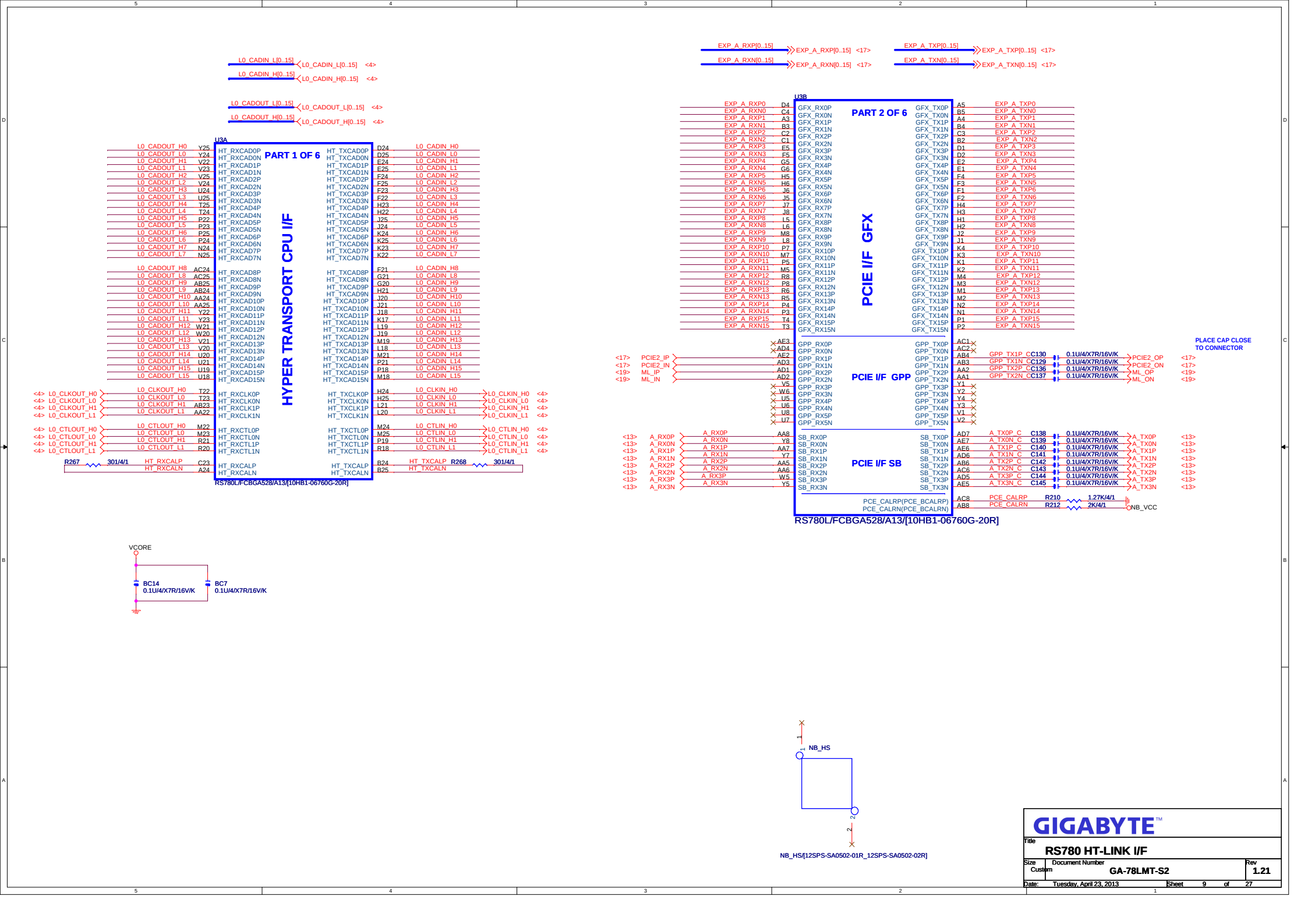
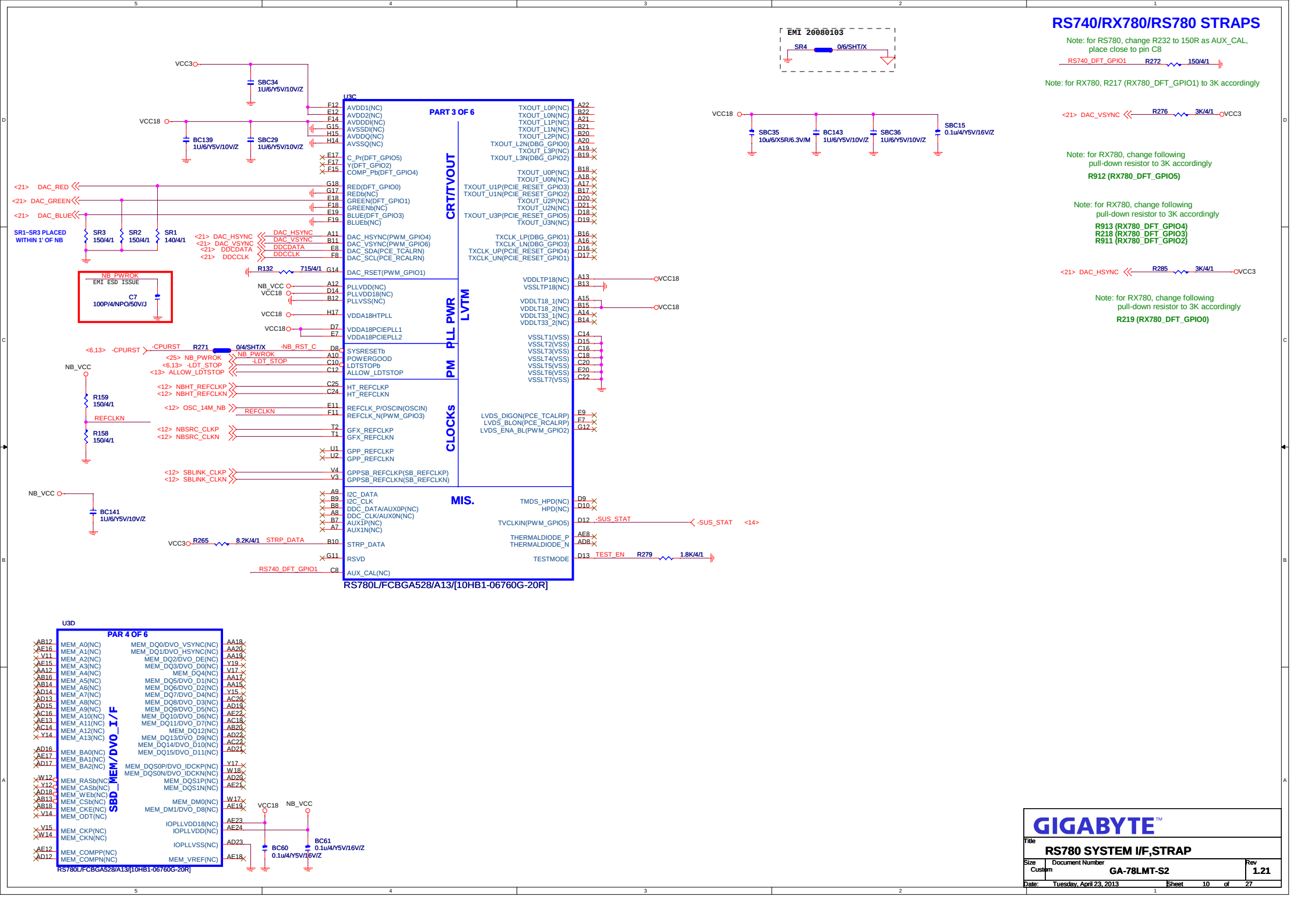

L0_CADIN_L[0..15]
L0_CADIN_H[0..15]
L0_CADOUT_L[0..15]
L0_CADOUT_H[0..15]
U3A
PART 1 OF 6
HYPER TRANSPORT CPU I/F
RS780L/FCBGA528/A13/[10HB1-06760G-20R]
R267 301/4/1 HT_RXCALP
HT_RXCALN
R268 301/4/1
VCORE
BC14 0.1U/4/X7R/16V/K
BC7 0.1U/4/X7R/16V/K
EXP_A_RXP[0..15]
EXP_A_RXN[0..15]
EXP_A_TXP[0..15]
EXP_A_TXN[0..15]
U3B
PART 2 OF 6
PCIE I/F GFX
PCIE I/F GPP
PCIE I/F SB
PCE_CALRP(PCE_BCALRP)
PCE_CALRN(PCE_BCALRN)
RS780L/FCBGA528/A13/[10HB1-06760G-20R]
PLACE CAP CLOSE TO CONNECTOR
GPP_TX1P_C C130 0.1U/4/X7R/16V/K
GPP_TX1N_C C129 0.1U/4/X7R/16V/K
GPP_TX2P_C C136 0.1U/4/X7R/16V/K
GPP_TX2N_C C137 0.1U/4/X7R/16V/K
PCE_CALRP R210 1.27K/4/1
PCE_CALRN R212 2K/4/1
NB_VCC
NB_HS
NB_HS/[12SPS-SA0502-01R_12SPS-SA0502-02R]
GIGABYTE
Title
RS780 HT-LINK I/F
Size Custom
Document Number GA-78LMT-S2
Rev 1.21
Date: Tuesday, April 23, 2013
Sheet 9 of 27


RS740/RX780/RS780 STRAPS
Note: for RS780, change R232 to 150R as AUX_CAL, place close to pin C8
RS740_DFT_GPIO1 R272 150/4/1
Note: for RX780, R217 (RX780_DFT_GPIO1) to 3K accordingly
<21> DAC_VSYNC R276 3K/4/1 VCC3
Note: for RX780, change following pull-down resistor to 3K accordingly
R912 (RX780_DFT_GPIO5)
Note: for RX780, change following pull-down resistor to 3K accordingly
R913 (RX780_DFT_GPIO4)
R218 (RX780_DFT_GPIO3)
R911 (RX780_DFT_GPIO2)
<21> DAC_HSYNC R285 3K/4/1 VCC3
Note: for RX780, change following pull-down resistor to 3K accordingly
R219 (RX780_DFT_GPIO0)
EMI 20080103
SR4 0/6/SHT/X
U3C
PART 3 OF 6
CRT/TVOUT
PLL PWR
LVTM
PM
CLOCKs
MIS.
RS780L/FCBGA528/A13/[10HB1-06760G-20R]
U3D
PAR 4 OF 6
SBD_MEM/DVO_I/F
RS780L/FCBGA528/A13/[10HB1-06760G-20R]
SR1~SR3 PLACED WITHIN 1' OF NB
NB_PWROK
EMI ESD ISSUE
C7 100P/4/NPO/50V/J
SBC34 1U/6/Y5V/10V/Z
BC139 1U/6/Y5V/10V/Z
SBC29 1U/6/Y5V/10V/Z
SBC35 10u/6/X5R/6.3V/M
BC143 1U/6/Y5V/10V/Z
SBC36 1U/6/Y5V/10V/Z
SBC15 0.1u/4/Y5V/16V/Z
SR3 150/4/1
SR2 150/4/1
SR1 140/4/1
R159 150/4/1
R158 150/4/1
BC141 1U/6/Y5V/10V/Z
R271 0/4/SHT/X
R265 8.2K/4/1
R279 1.8K/4/1
R132 715/4/1
BC60 0.1u/4/Y5V/16V/Z
BC61 0.1u/4/Y5V/16V/Z
GIGABYTE
Title
RS780 SYSTEM I/F,STRAP
Size Custom
Document Number GA-78LMT-S2
Rev 1.21
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Sheet 10 of 27

RS740/RX780/RS780 POWER DIFFERENCE TABLE

PIN NAME	RS740	RX780	RS780	PIN NAME	RS740	RX780	RS780
VDDHT	NC	+1.1V	+1.1V	IOPLLVDD	+1.2V	NC	+1.1V
VDDHTRX	NC	+1.1V	+1.1V	AVDD	+3.3V	NC	+3.3V
VDDHTTX	+1.2V	+1.2V	+1.2V	AVDDDI	+1.8V	NC	+1.8V
VDDA18PCIE	NC	+1.8V	+1.8V	AVDDQ	+1.8V	NC	+1.8V
VDD18	+1.8V	+1.8V	+1.8V	PLLVDD	+1.2V	NC	+1.1V
VDD18_MEM	NC	NC	+1.8V	PLLVDD18	+1.8V	NC	+1.8V
VDDPCIE	+1.2V	+1.1V	+1.1V	VDDA18PCIEPLL	+1.2V	+1.8V	+1.8V
VDDC	+1.2V	+1.1V	+1.1V	VDDA18HTPLL	+1.8V	+1.8V	+1.8V
VDD_MEM	+1.8V	NC	+1.8V(DDR2) +1.5V(DDR3)	VDDLTP18	+1.8V	NC	+1.8V
VDD33	+3.3V	NC	+3.3V	VDDLT18	+1.8V	NC	+1.8V
IOPLLVDD18	+1.8V	NC	+1.8V	VDDLT33	+3.3V	NC	NC

U3F

PART 6/6

GROUND

RS780L/FCBGA528/A13/[10HB1-06760G-20R]

Please use 1mm pad size, place all ELT test pads on bottom side only

U3E

PART 5/6

POWER

RS780L/FCBGA528/A13/[10HB1-06760G-20R]

NB_VCC

VCC_SB

VCC18

1.1V

1.2V

SBC19 0.1u/4/Y5V/16V/Z

SBC14 0.1u/4/Y5V/16V/Z

BC31 22U/8/X5R/6.3V/M

BC68 1U/6/Y5V/10V/Z

BC70 0.1u/4/Y5V/16V/Z

BC32 10u/6/X5R/6.3V/M

BC91

SBC25

SBC18

SBC22 0.1u/4/Y5V/16V/Z

0.1u/4/Y5V/16V/Z

BC33 22u/8/X5R/6.3V/M

BC37 1U/6/Y5V/10V/Z

BC58

SBC26

SBC23

SBC24

BC42 1U/6/Y5V/10V/Z

BC34 1u/4/X5R/6.3V/K

SBC27

SBC6

BC88

BC69

BC54

BC83

BC43

BC94 10u/6/X5R/6.3V/M

1U/6/Y5V/10V/Z

SBC9

SBC10

SBC11

SBC13

SBC8

SBC7

SBC4

SBC2 10u/6/X5R/6.3V/M

10u/6/X5R/6.3V/M

BC65

BC56

SBC16

SBC17 0.1u/4/Y5V/16V/Z

SBC32 0.1u/4/Y5V/16V/Z

SBC33 0.1u/4/Y5V/16V/Z

VCC3

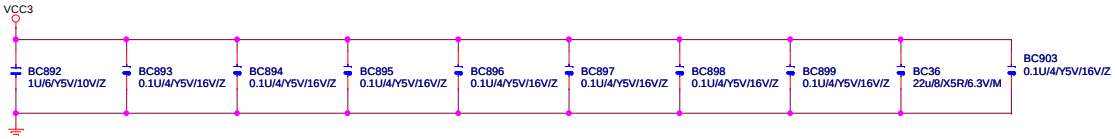
BC53 1U/6/Y5V/10V/Z

SBC30 0.1u/4/Y5V/16V/Z

0.1u/4/Y5V/16V/Z

GIGABYTE™

Title	RS780 POWER & GND	
Size: Custom	Document Number: GA-78LMT-S2	Rev: 1.21
Date: Tuesday, April 23, 2013	Sheet 11 of 27	



1- PLACE ALL THE SERIES TERMINATION RESISTORS AS CLOSE TO U800 AS POSSIBLE

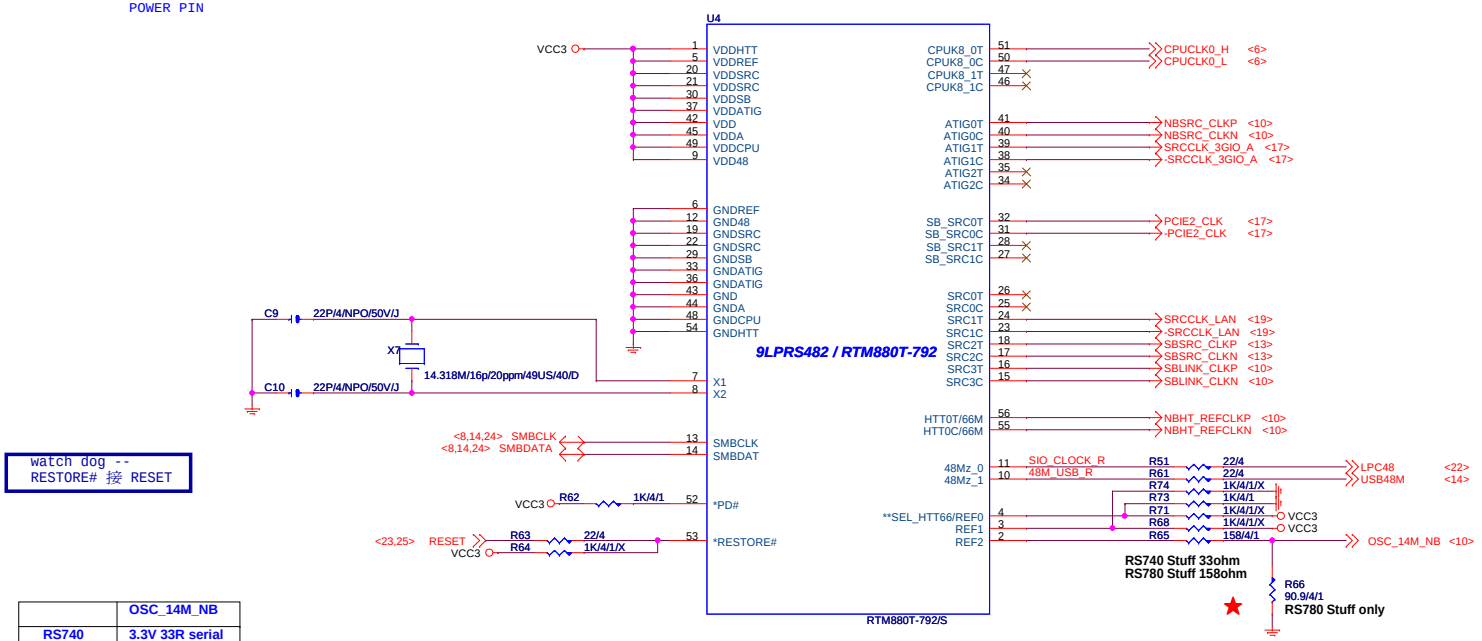
2- ROUTE ALL SRCCLKTx AND SRCCLKCx AS DIFFERENT PAIR RULE

3- PUT DECOUPLING CAPS CLOSE TO U800 POWER PIN

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



watch dog --
RESTORE# 接 RESET

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

**SEL_HTT66/REF0		OUT 3.3V 14.318MHz REF output.
IN	Low	100MHz differential HT clock, (Internal 120KΩ pull-down)
	High	66MHz 3.3V single ended HT clock.

GIGABYTE™

Title: RTM880T-792

Size: Custom | Document Number: GA-78LMT-S2 | Rev: 1.21

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PLACE THESE PCIE AC COUPLING CAPS CLOSE TO U600

S.B HEATSINK

SB_HS

SB_HS/[12SP2-SA0301-01R_12SP2-SA0301-02R_12SP2-SA0301-03R]

U2A

SB700

Part 1 of 5

SB710/FCBGA528/A14/[10HB1-06B710-11R]

PCI CLKS

PCI EXPRESS INTERFACE

PCI INTERFACE

CLOCK GENERATOR

LPC

RTC

CPU

RTC XTAL

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.

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

20mil 20mil 20mil

CLR_CMOS	
SHORT	CLEAR CMOS
OPEN	NORMAL

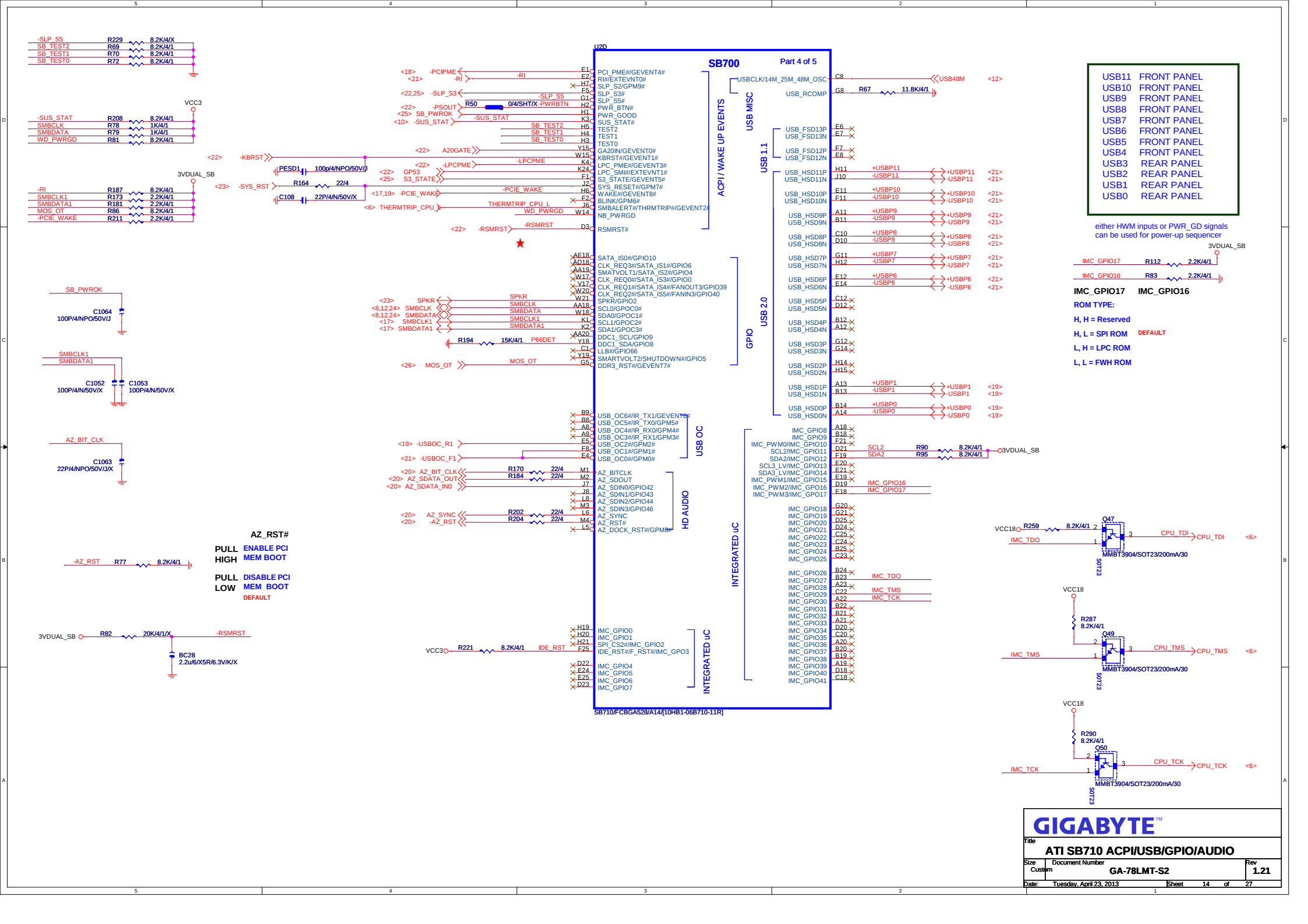
NOT ADD ICT FOR RTCVDD PIN

GIGABYTE™

Title: ATI SB710 PCIE/PCI/CPU/LPC

Size	Document Number	Rev
Custom	GA-78LMT-S2	1.21

Date: Tuesday, April 23, 2013 Sheet 13 of 27


SB700
Part 4 of 5
U2D
SB710/FCBGA528/A14/[10HB1-06B710-11R]
ACPI / WAKE UP EVENTS
USB MISC
USB 1.1
USB 2.0
GPIO
USB OC
HD AUDIO
INTEGRATED uC
INTEGRATED uC
PCI_PME#/GEVENT4#
RI#/EXTEVNT0#
SLP_S2/GPM9#
SLP_S3#
SLP_S5#
PWR_BTN#
PWR_GOOD
SUS_STAT#
TEST2
TEST1
TEST0
GA20IN/GEVENT0#
KBRST#/GEVENT1#
LPC_PME#/GEVENT3#
LPC_SMI#/EXTEVNT1#
S3_STATE/GEVENT5#
SYS_RESET#/GPM7#
WAKE#/GEVENT8#
BLINK/GPM6#
SMBALERT#/THRMTRIP#/GEVENT2#
NB_PWRGD
RSMRST#
USBCLK/14M_25M_48M_OSC
USB_RCOMP
USB_FSD13P
USB_FSD13N
USB_FSD12P
USB_FSD12N
USB_HSD11P
USB_HSD11N
USB_HSD10P
USB_HSD10N
USB_HSD9P
USB_HSD9N
USB_HSD8P
USB_HSD8N
USB_HSD7P
USB_HSD7N
USB_HSD6P
USB_HSD6N
USB_HSD5P
USB_HSD5N
USB_HSD4P
USB_HSD4N
USB_HSD3P
USB_HSD3N
USB_HSD2P
USB_HSD2N
USB_HSD1P
USB_HSD1N
USB_HSD0P
USB_HSD0N
SATA_IS0#/GPIO10
CLK_REQ3#/SATA_IS1#/GPIO6
SMATVOLT1/SATA_IS2#/GPIO4
CLK_REQ0#/SATA_IS3#/GPIO0
CLK_REQ1#/SATA_IS4#/FANOUT3/GPIO39
CLK_REQ2#/SATA_IS5#/FANIN3/GPIO40
SPKR/GPIO2
SCL0/GPOC0#
SDA0/GPOC1#
SCL1/GPOC2#
SDA1/GPOC3#
DDC1_SCL/GPIO9
DDC1_SDA/GPIO8
LLB#/GPIO66
SMARTVOLT2/SHUTDOWN#/GPIO5
DDR3_RST#/GEVENT7#
USB_OC6#/IR_TX1/GEVENT6#
USB_OC5#/IR_TX0/GPM5#
USB_OC4#/IR_RX0/GPM4#
USB_OC3#/IR_RX1/GPM3#
USB_OC2#/GPM2#
USB_OC1#/GPM1#
USB_OC0#/GPM0#
AZ_BITCLK
AZ_SDOUT
AZ_SDIN0/GPIO42
AZ_SDIN1/GPIO43
AZ_SDIN2/GPIO44
AZ_SDIN3/GPIO46
AZ_SYNC
AZ_RST#
AZ_DOCK_RST#/GPM8#
IMC_GPIO0
IMC_GPIO1
SPI_CS2#/IMC_GPIO2
IDE_RST#/F_RST#/IMC_GPO3
IMC_GPIO4
IMC_GPIO5
IMC_GPIO6
IMC_GPIO7
IMC_GPIO8
IMC_GPIO9
IMC_PWM0/IMC_GPIO10
SCL2/IMC_GPIO11
SDA2/IMC_GPIO12
SCL3_LV/IMC_GPIO13
SDA3_LV/IMC_GPIO14
IMC_PWM1/IMC_GPIO15
IMC_PWM2/IMC_GPIO16
IMC_PWM3/IMC_GPIO17
IMC_GPIO18
IMC_GPIO19
IMC_GPIO20
IMC_GPIO21
IMC_GPIO22
IMC_GPIO23
IMC_GPIO24
IMC_GPIO25
IMC_GPIO26
IMC_GPIO27
IMC_GPIO28
IMC_GPIO29
IMC_GPIO30
IMC_GPIO31
IMC_GPIO32
IMC_GPIO33
IMC_GPIO34
IMC_GPIO35
IMC_GPIO36
IMC_GPIO37
IMC_GPIO38
IMC_GPIO39
IMC_GPIO40
IMC_GPIO41
-SLP_S5 R229 8.2K/4/X
SB_TEST2 R69 8.2K/4/1
SB_TEST1 R70 8.2K/4/1
SB_TEST0 R72 8.2K/4/1
VCC3
-SUS_STAT R208 8.2K/4/1
SMBCLK R78 1K/4/1
SMBDATA R79 1K/4/1
WD_PWRGD R81 8.2K/4/1
3VDUAL_SB
-RI R187 8.2K/4/1
SMBCLK1 R173 2.2K/4/1
SMBDATA1 R181 2.2K/4/1
MOS_OT R86 8.2K/4/1
-PCIE_WAKE R211 2.2K/4/1
-PCIPME
-RI
-SLP_S3
-SLP_S5
-PSOUT
R50 0/4/SHT/X
-PWRBTN
SB_PWROK
-SUS_STAT
SB_TEST2
SB_TEST1
SB_TEST0
A20GATE
-KBRST
PESD1 100p/4/NPO/50V/J
-LPCPME
GP53
S3_STATE
-SYS_RST
R164 22/4
-PCIE_WAKE
C108 22P/4/N/50V/X
THERMTRIP_CPU_L
THERMTRIP_CPU
WD_PWRGD
-RSMRST
SPKR
SMBCLK
SMBDATA
SMBCLK1
SMBDATA1
R194 15K/4/1 P66DET
MOS_OT
-USBOC_R1
-USBOC_F1
AZ_BIT_CLK
R170 22/4
R184 22/4
AZ_SDATA_OUT
AZ_SDATA_IN0
AZ_SYNC
-AZ_RST
R202 22/4
R204 22/4
VCC3
R221 8.2K/4/1 IDE_RST
USB48M
R67 11.8K/4/1
+USBP11
-USBP11
+USBP10
-USBP10
+USBP9
-USBP9
+USBP8
-USBP8
+USBP7
-USBP7
+USBP6
-USBP6
+USBP1
-USBP1
+USBP0
-USBP0
SCL2
SDA2
R90 8.2K/4/1
R95 8.2K/4/1
3VDUAL_SB
IMC_GPIO16
IMC_GPIO17
IMC_TDO
IMC_TMS
IMC_TCK
SB_PWROK
C1064 100P/4/NPO/50V/J
SMBCLK1
SMBDATA1
C1052 100P/4/N/50V/X
C1053 100P/4/N/50V/X
AZ_BIT_CLK
C1063 22P/4/NPO/50V/J/X
-AZ_RST R77 8.2K/4/1
3VDUAL_SB R82 20K/4/1/X -RSMRST
BC28 2.2u/6/X5R/6.3V/K/X
AZ_RST#
PULL HIGH ENABLE PCI MEM BOOT
PULL LOW DISABLE PCI MEM BOOT
DEFAULT
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_GPIO17 R112 2.2K/4/1
IMC_GPIO16 R83 2.2K/4/1
IMC_GPIO17 IMC_GPIO16
ROM TYPE:
H, H = Reserved
H, L = SPI ROM DEFAULT
L, H = LPC ROM
L, L = FWH ROM
VCC18
R259 8.2K/4/1
Q47
MMBT3904/SOT23/200mA/30
SOT23
CPU_TDI
R287 8.2K/4/1
Q49
CPU_TMS
R290 8.2K/4/1
Q50
CPU_TCK
GIGABYTE
Title
ATI SB710 ACPI/USB/GPIO/AUDIO
Size Custom
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PLACE SATA AC COUPLING CAPS CLOSE TO SB600

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

U2B

SB700
Part 2 of 5

SB710/FCBGA528/A14/[10HB1-06B710-11R]

SERIAL ATA
ATA 66/100/133
SPI ROM
HW MONITOR
SATA PWR

Close to M_BIOS

M_BIOS
16M/SPI/SO8/200mil/S

B_BIOS
16M/SPI/SO8/200mil/S/X

SATA2_0
SATA2_1
SATA2_2
SATA2_3
SATA2_4
SATA2_5
SATA2/7/BK/H/OP/VA/D/1/B

Title	ATI SB710 SATA/IDE/HWM/SPI
Size	Custom
Document Number	GA-78LMT-S2
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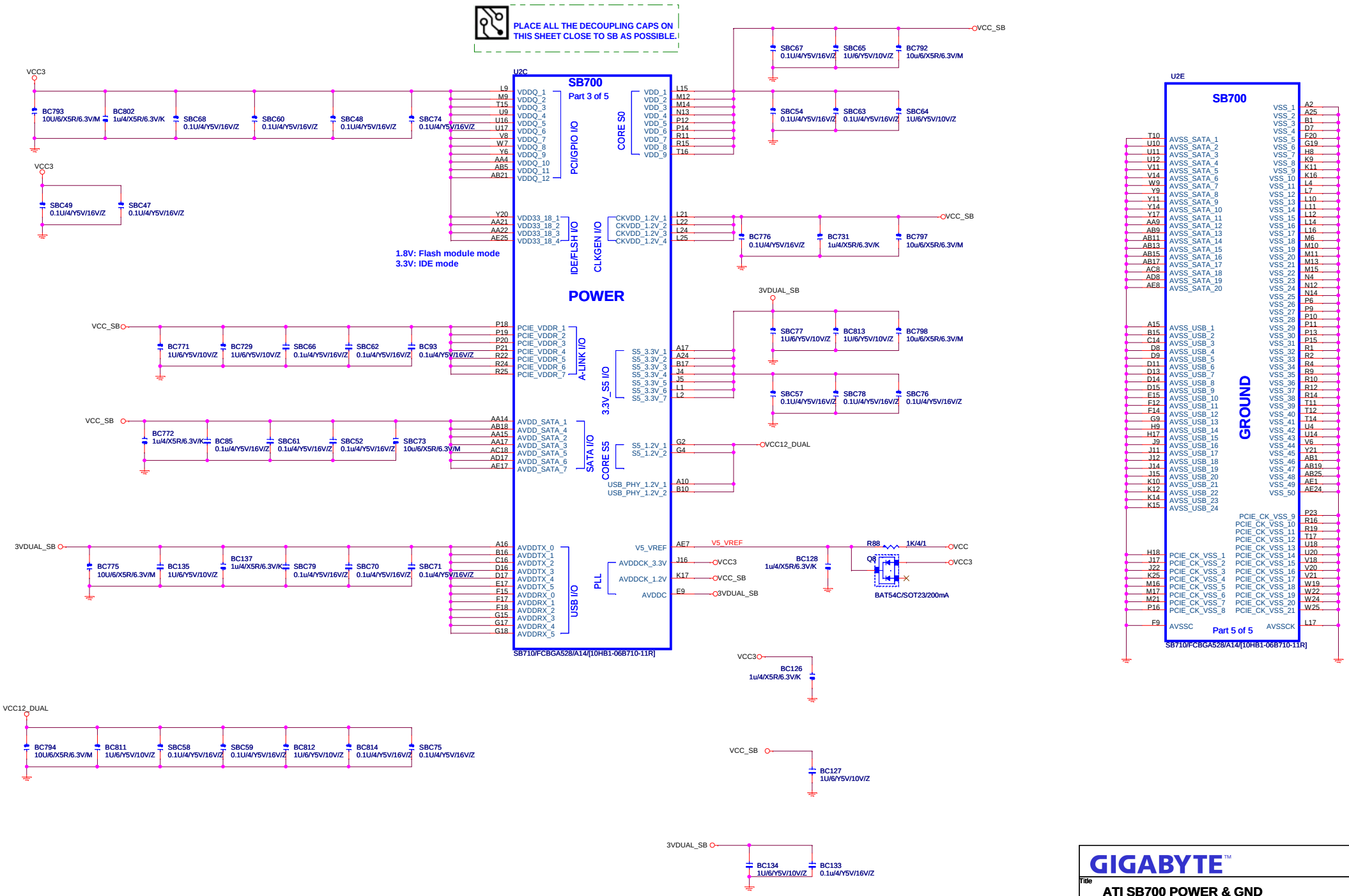
PLACE ALL THE DECOUPLING CAPS ON THIS SHEET CLOSE TO SB AS POSSIBLE.
U2C
SB700
Part 3 of 5
POWER
1.8V: Flash module mode
3.3V: IDE mode
SB710/FCBGA528/A14/[10HB1-06B710-11R]
U2E
SB700
GROUND
Part 5 of 5
SB710/FCBGA528/A14/[10HB1-06B710-11R]
VCC3
VCC_SB
3VDUAL_SB
VCC12_DUAL
V5_VREF
BAT54C/SOT23/200mA
GIGABYTE
ATI SB700 POWER & GND
GA-78LMT-S2
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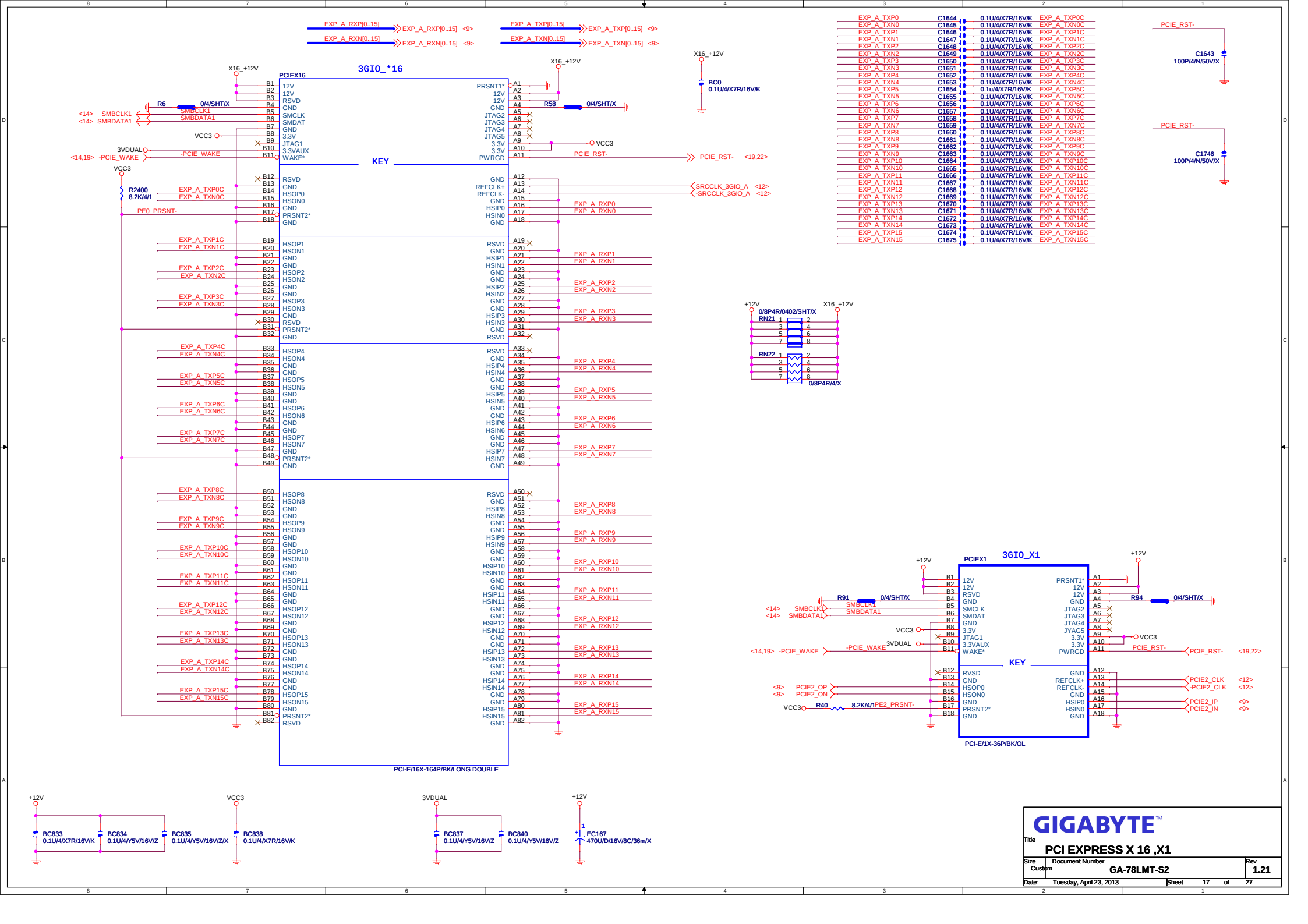
3GIO_*16
PCIEX16
KEY
PCI-E/16X-164P/BK/LONG DOUBLE
3GIO_X1
PCIEX1
PCI-E/1X-36P/BK/OL
EXP_A_RXP[0..15]
EXP_A_RXN[0..15]
EXP_A_TXP[0..15]
EXP_A_TXN[0..15]
X16_+12V
+12V
VCC3
3VDUAL
R6
R58
R91
R94
R2400
8.2K/4/1
RN21
RN22
0/8P4R/0402/SHT/X
0/8P4R/4/X
BC0
0.1U/4/X7R/16V/K
PCIE_RST-
SMBCLK1
SMBDATA1
-PCIE_WAKE
PE0_PRSNT-
SRCCLK_3GIO_A
-SRCCLK_3GIO_A
PCIE2_CLK
-PCIE2_CLK
PCIE2_IP
PCIE2_IN
PCIE2_OP
PCIE2_ON
PE2_PRSNT-
BC833
0.1U/4/X7R/16V/K
BC834
0.1U/4/Y5V/16V/Z
BC835
0.1U/4/Y5V/16V/Z/X
BC838
0.1U/4/X7R/16V/K
BC837
0.1U/4/Y5V/16V/Z
BC840
0.1U/4/Y5V/16V/Z
EC167
470U/D/16V/8C/36m/X
C1643
100P/4/N/50V/X
C1746
100P/4/N/50V/X
GIGABYTE
Title
PCI EXPRESS X 16 ,X1
Size
Custom
Document Number
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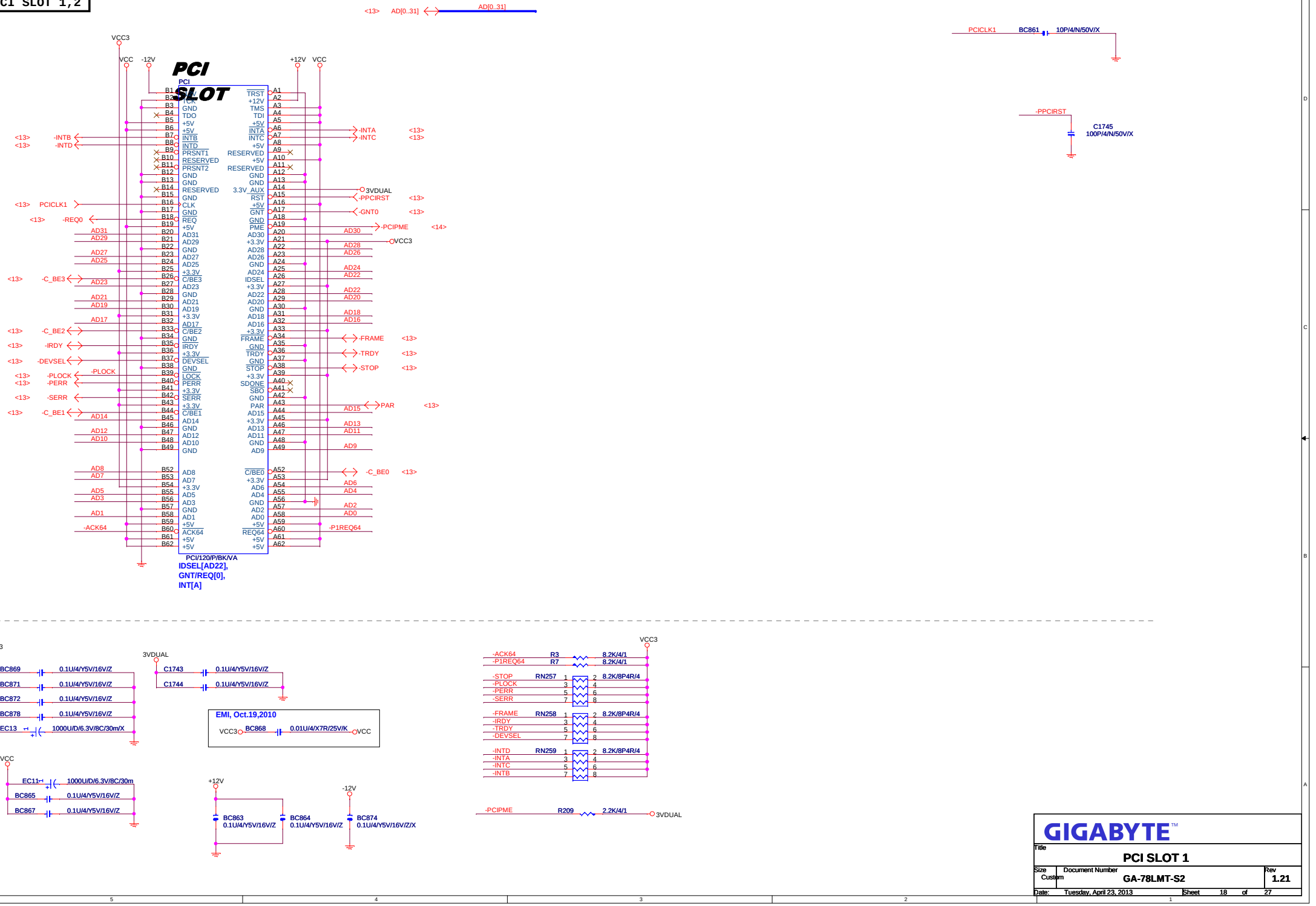
27

PCI SLOT 1,2


PCI SLOT
PCI
PCI/120/P/BK/VA
IDSEL[AD22],
GNT/REQ[0],
INT[A]
AD[0..31]
PCICLK1
BC861
10P/4N/50V/X
-PPCIRST
C1745
100P/4N/50V/X
EMI, Oct.19,2010
BC868
0.01U/4/X7R/25V/K
-PCIPME
R209
2.2K/4/1
3VDUAL
GIGABYTE
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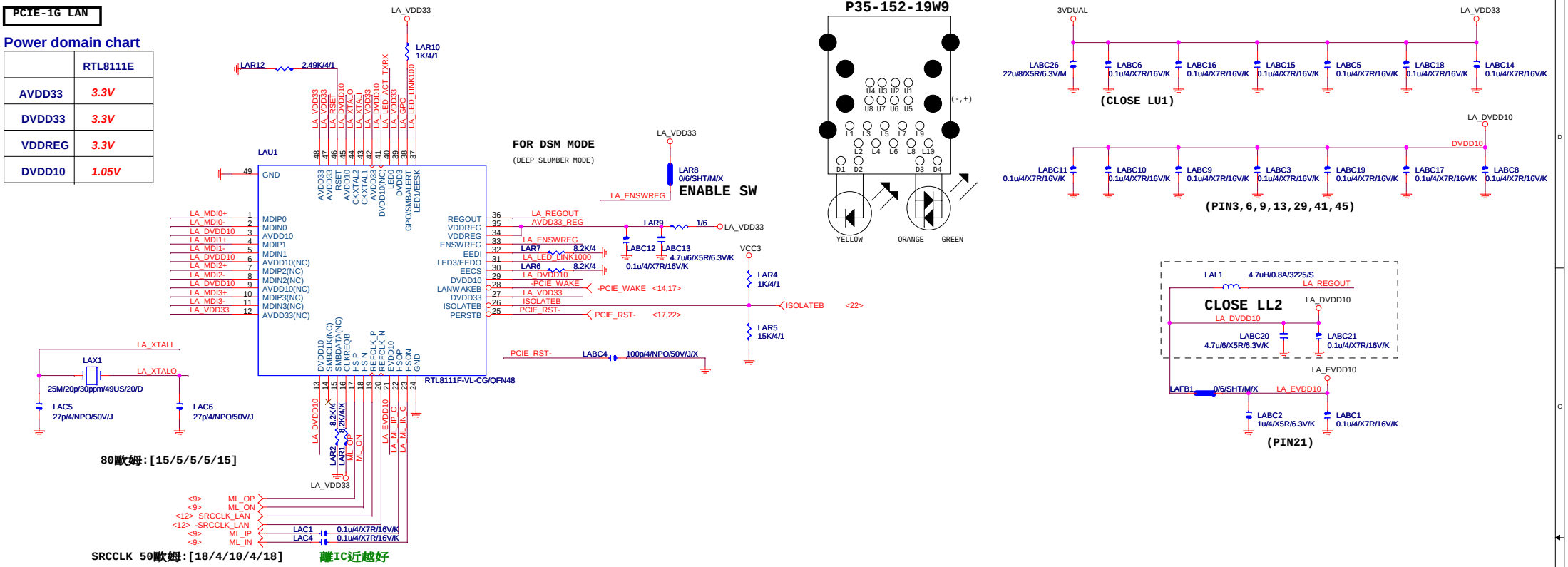
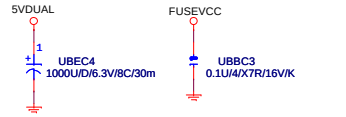
PCIE-1G LAN

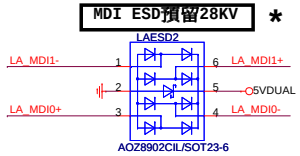
Power domain chart

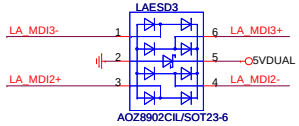
	RTL8111E
AVDD33	3.3V
DVDD33	3.3V
VDDREG	3.3V
DVDD10	1.05V

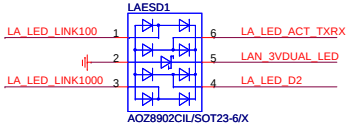


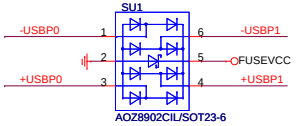
USB_LAN

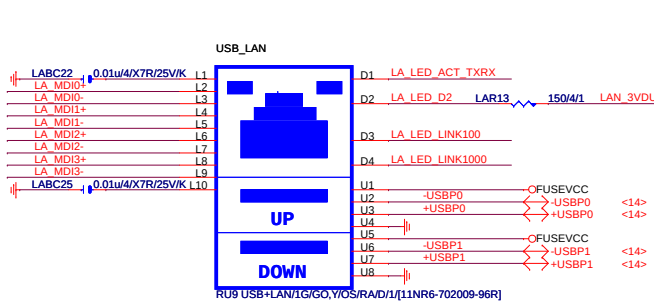


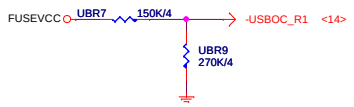


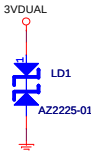


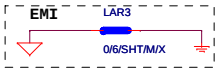












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Title: AR8151

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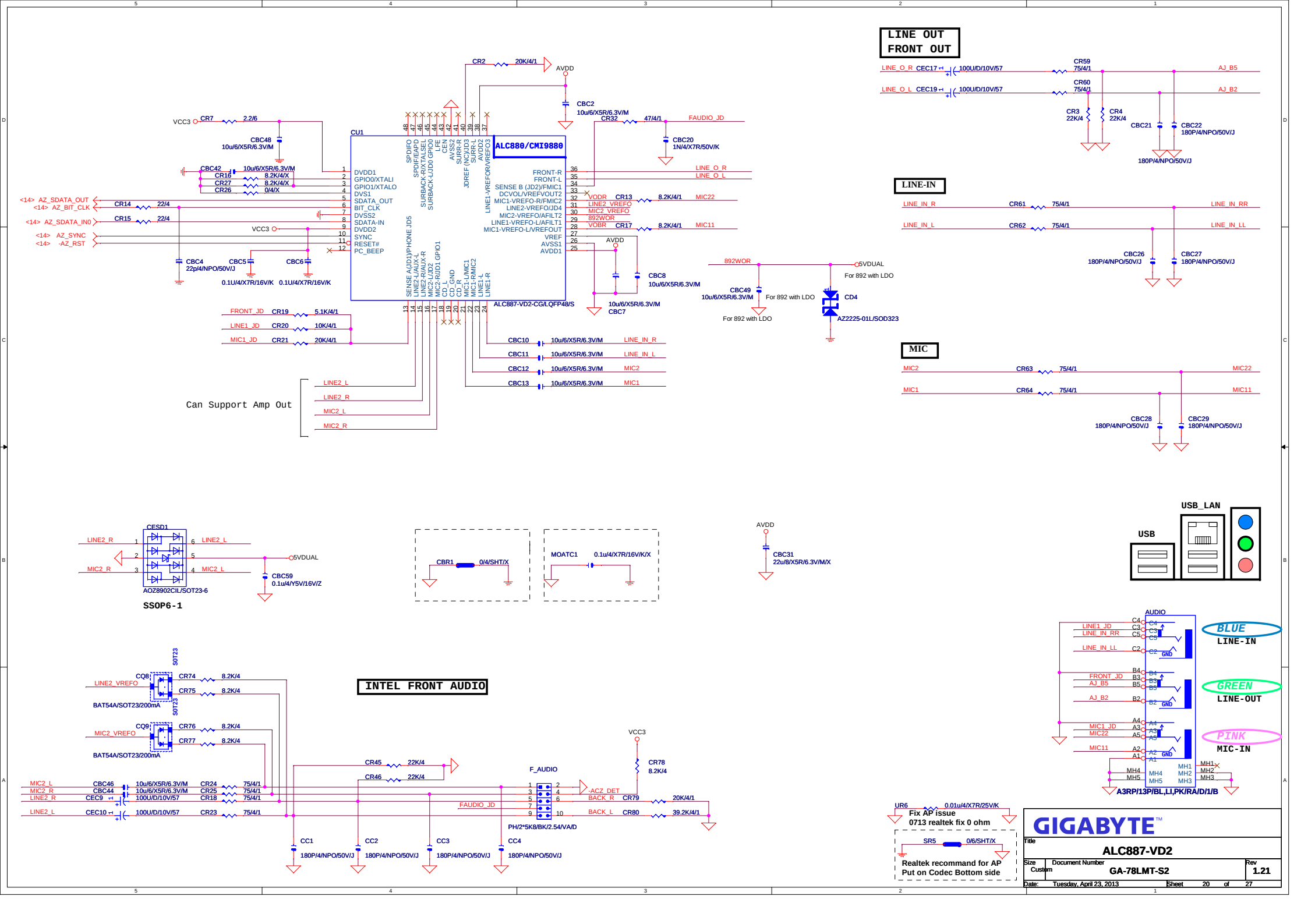
LINE OUT
FRONT OUT
LINE-IN
MIC
CU1
ALC880/CMI9880
ALC887-VD2-CG/LQFP48/S
Can Support Amp Out
INTEL FRONT AUDIO
USB_LAN
USB
AUDIO
BLUE
LINE-IN
GREEN
LINE-OUT
PINK
MIC-IN
A3RP/13P/BL,LI,PK/RA/D/1/B
SSOP6-1
Fix AP issue
0713 realtek fix 0 ohm
Realtek recommand for AP
Put on Codec Bottom side
GIGABYTE
ALC887-VD2
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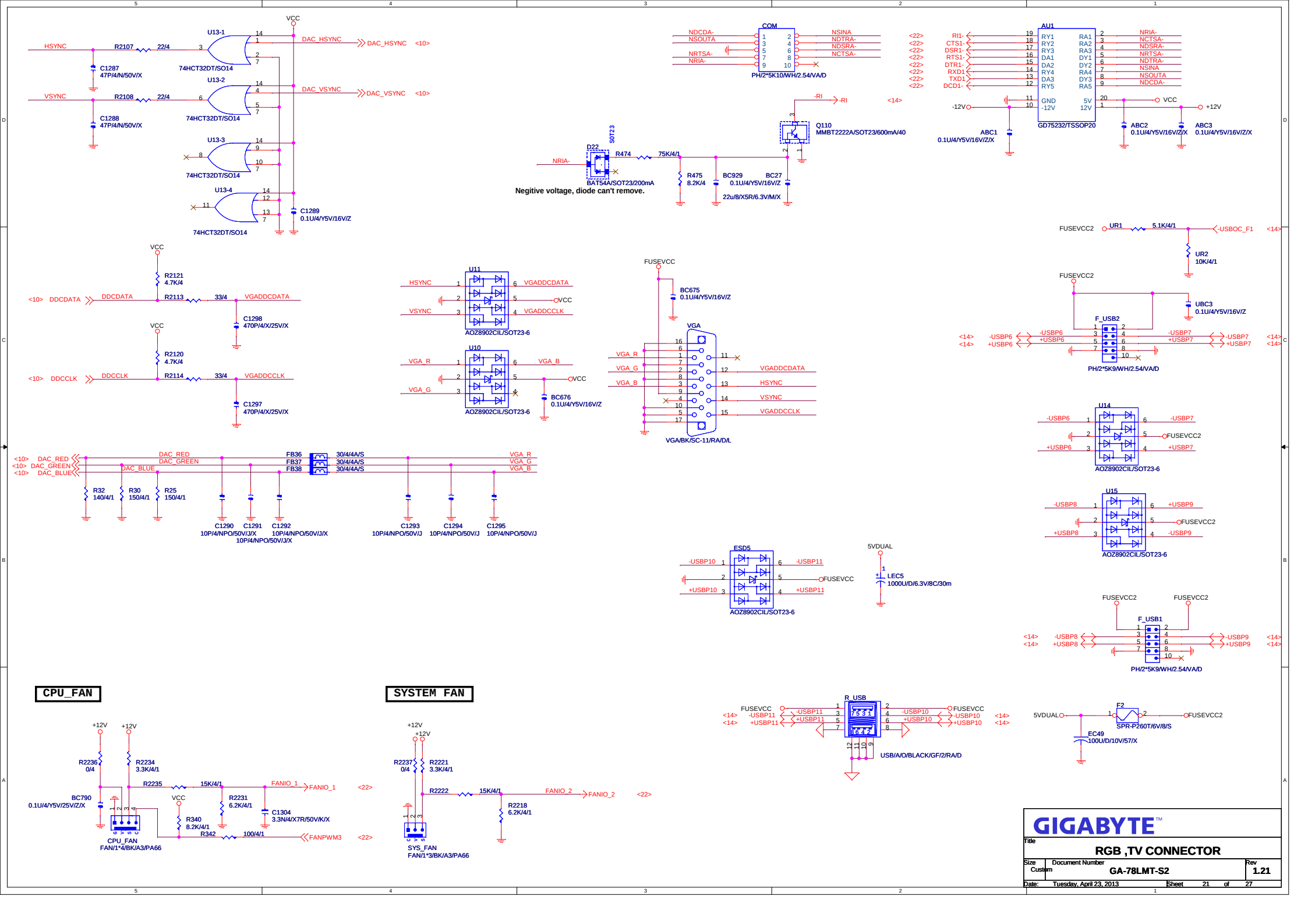

Title	RGB ,TV CONNECTOR		
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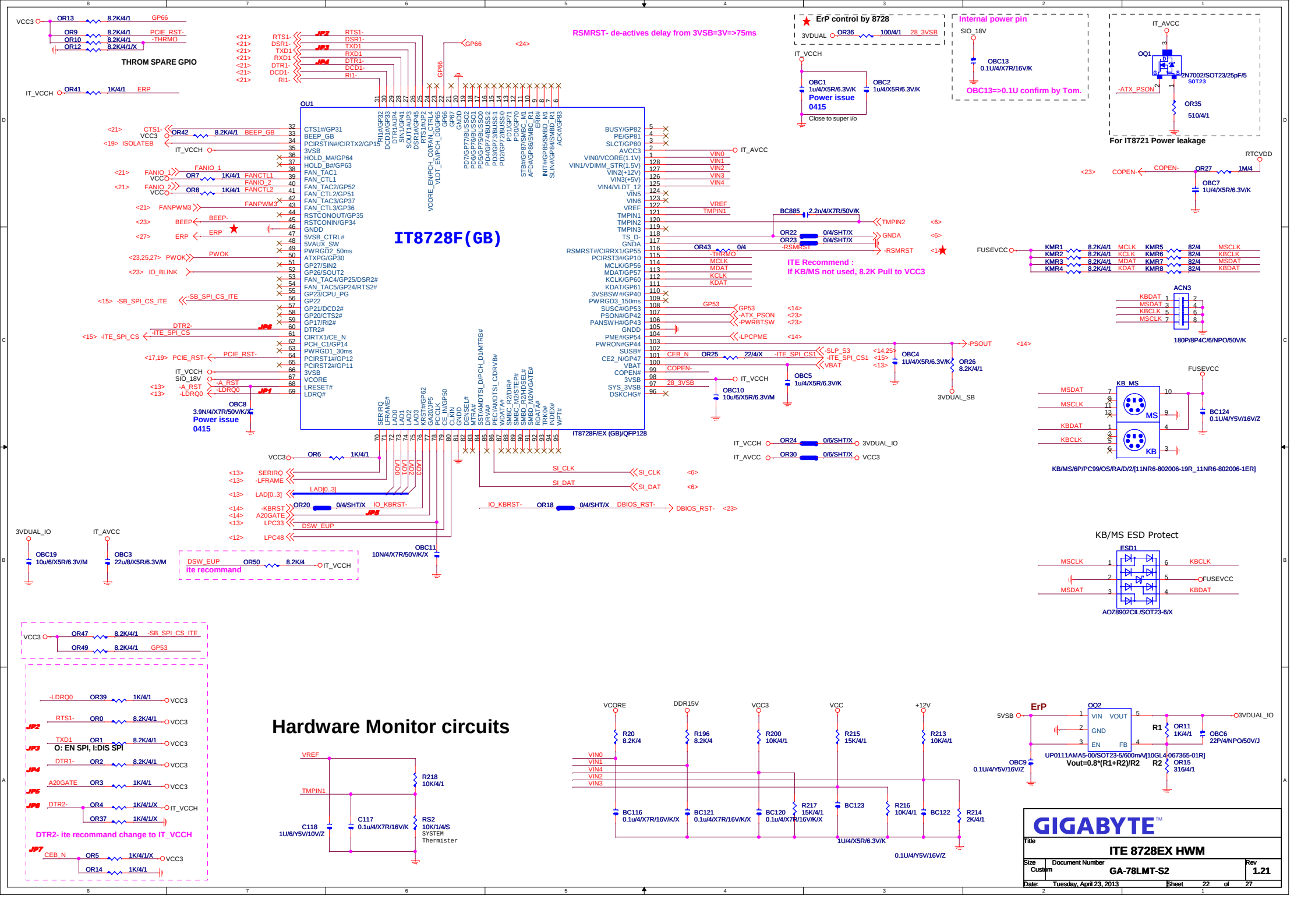
IT8728F(GB)
IT8728F/EX (GB)/QFP128
RSMRST- de-actives delay from 3VSB=3V=>75ms
ErP control by 8728
Internal power pin
OBC13=>0.1U confirm by Tom.
For IT8721 Power leakage
ITE Recommend :
If KB/MS not used, 8.2K Pull to VCC3
THROM SPARE GPIO
Power issue 0415
Close to super i/o
ite recommand
DTR2- ite recommand change to IT_VCCH
O: EN SPI, I:DIS SPI
Hardware Monitor circuits
KB/MS ESD Protect
ACN3
180P/8P4C/6/NPO/50V/K
KB/MS/6P/PC99/OS/RA/D/2/[11NR6-802006-19R_11NR6-802006-1ER]
AOZ8902CIL/SOT23-6/X
UP0111AMA5-00/SOT23-5/600mA/[10GL4-067365-01R]
Vout=0.8*(R1+R2)/R2
2N7002/SOT23/25pF/5
GIGABYTE
ITE 8728EX HWM
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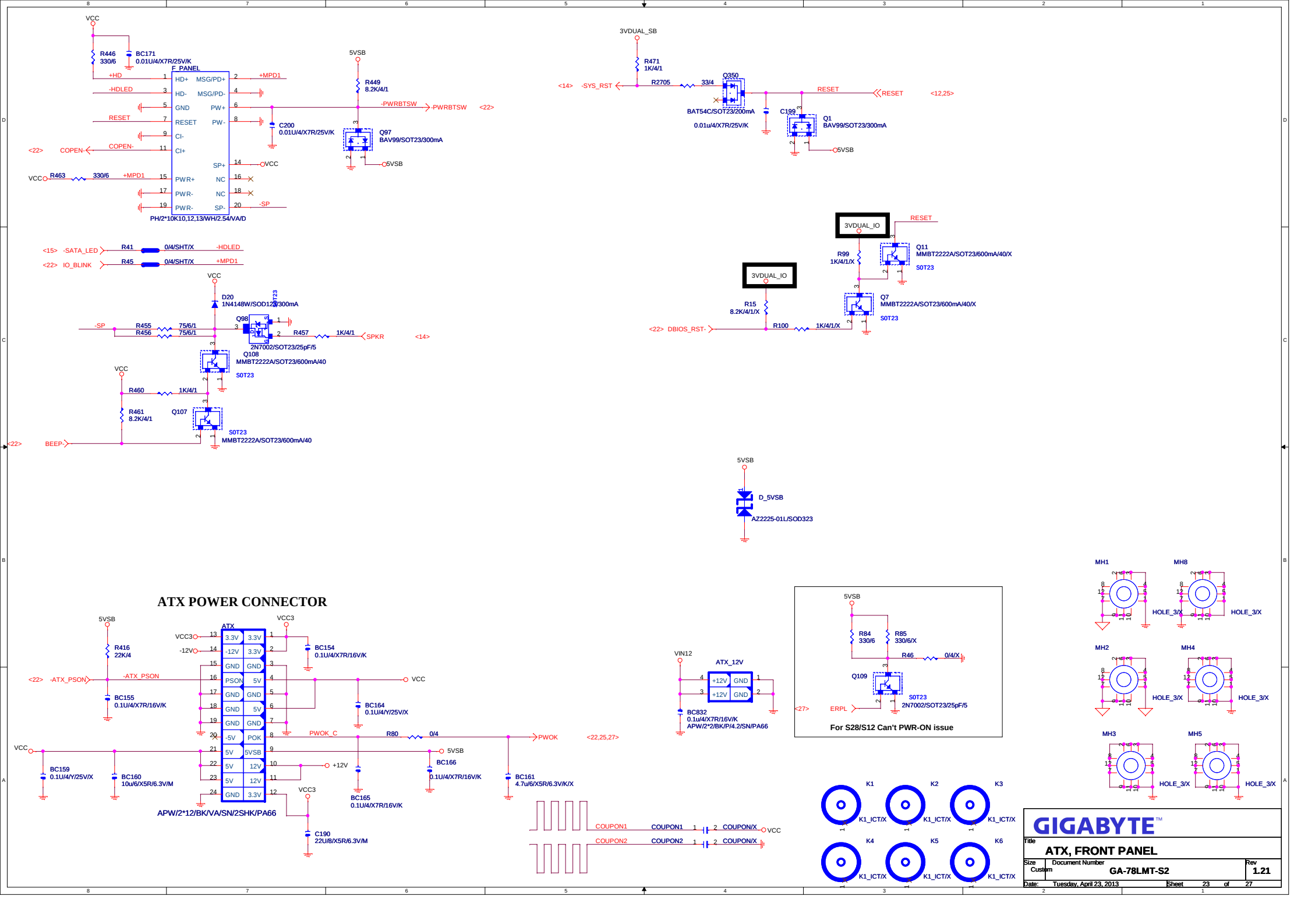
F_PANEL
PH/2*10K10,12,13/WH/2.54/VA/D
R446 330/6
BC171 0.01U/4/X7R/25V/K
R449 8.2K/4/1
C200 0.01U/4/X7R/25V/K
Q97 BAV99/SOT23/300mA
R463 330/6
R471 1K/4/1
R2705 33/4
Q350 BAT54C/SOT23/200mA
C199 0.01u/4/X7R/25V/K
Q1 BAV99/SOT23/300mA
R41 0/4/SHT/X
R45 0/4/SHT/X
D20 1N4148W/SOD123/300mA
Q98 2N7002/SOT23/25pF/5
R455 75/6/1
R456 75/6/1
R457 1K/4/1
Q108 MMBT2222A/SOT23/600mA/40
R460 1K/4/1
R461 8.2K/4/1
Q107 MMBT2222A/SOT23/600mA/40
R99 1K/4/1/X
Q11 MMBT2222A/SOT23/600mA/40/X
R15 8.2K/4/1/X
R100 1K/4/1/X
Q7 MMBT2222A/SOT23/600mA/40/X
D_5VSB AZ2225-01L/SOD323
ATX POWER CONNECTOR
ATX
APW/2*12/BK/VA/SN/2SHK/PA66
R416 22K/4
BC155 0.1U/4/X7R/16V/K
BC154 0.1U/4/X7R/16V/K
BC164 0.1U/4/Y/25V/X
BC159 0.1U/4/Y/25V/X
BC160 10u/6/X5R/6.3V/M
BC165 0.1U/4/X7R/16V/K
BC166 0.1U/4/X7R/16V/K
BC161 4.7u/6/X5R/6.3V/K/X
C190 22U/8/X5R/6.3V/M
R80 0/4
ATX_12V
BC832 0.1u/4/X7R/16V/K APW/2*2/BK/P/4.2/SN/PA66
R84 330/6
R85 330/6/X
R46 0/4/X
Q109 2N7002/SOT23/25pF/5
For S28/S12 Can't PWR-ON issue
COUPON1
COUPON2
K1_ICT/X
MH1
MH2
MH3
MH4
MH5
MH8
HOLE_3/X
GIGABYTE
ATX, FRONT PANEL
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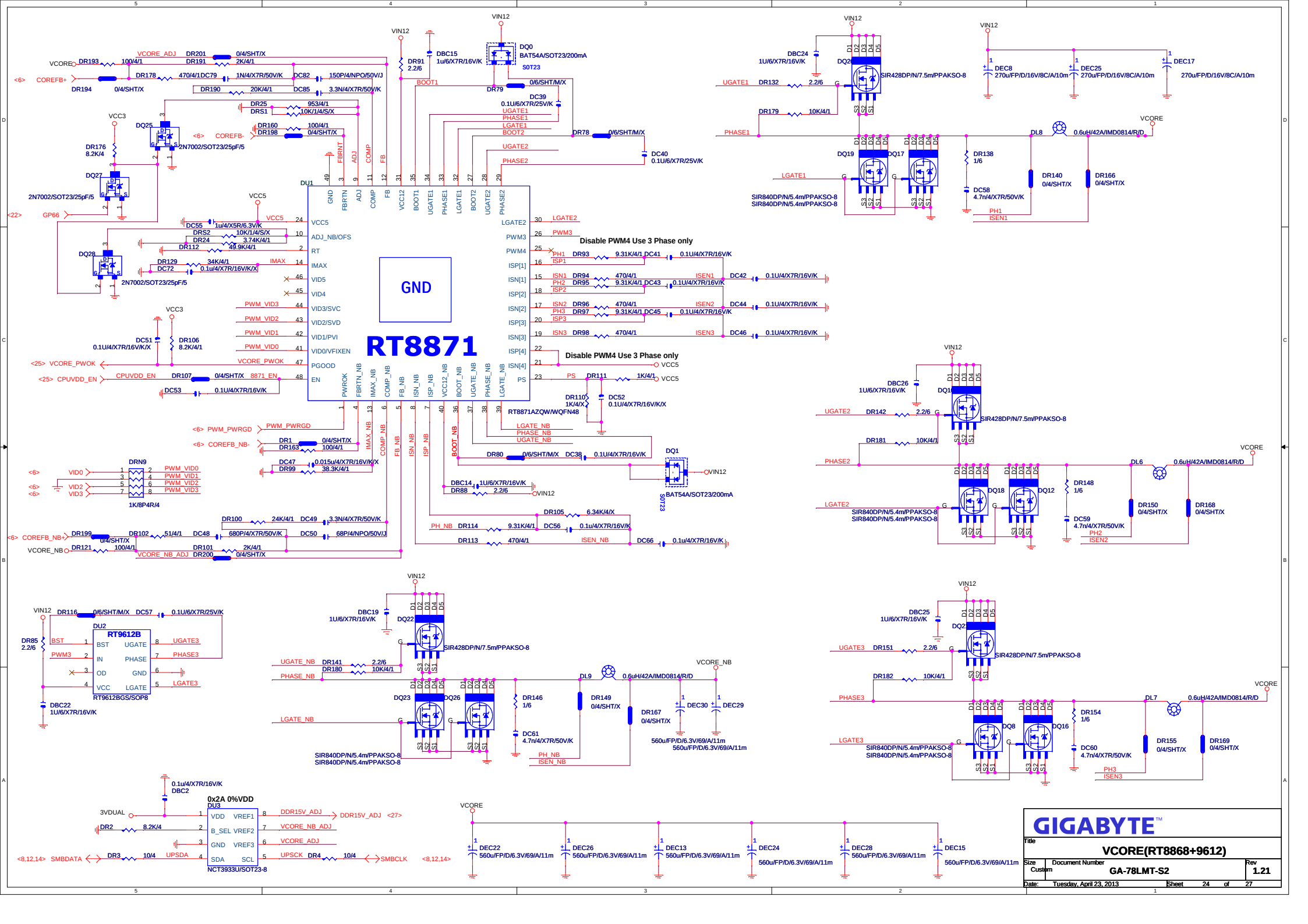
RT8871
RT8871AZQW/WQFN48
GND
Disable PWM4 Use 3 Phase only
Disable PWM4 Use 3 Phase only
RT9612B
RT9612BGS/SOP8
NCT3933U/SOT23-8
0x2A 0%VDD
SIR428DP/PN/7.5m/PPAKSO-8
SIR840DP/PN/5.4m/PPAKSO-8
BAT54A/SOT23/200mA
2N7002/SOT23/25pF/5
1K/8P4R/4
0.6uH/42A/IMD0814/R/D
560u/FP/D/6.3V/69/A/11m
270u/FP/D/16V/8C/A/10m
GIGABYTE
VCORE(RT8868+9612)
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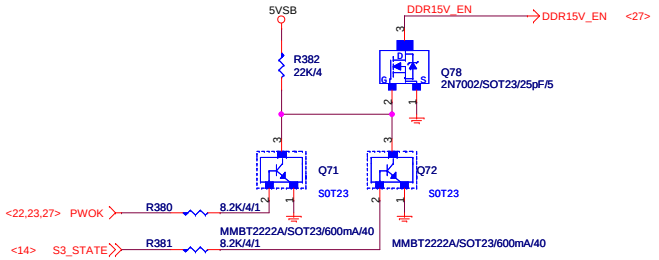

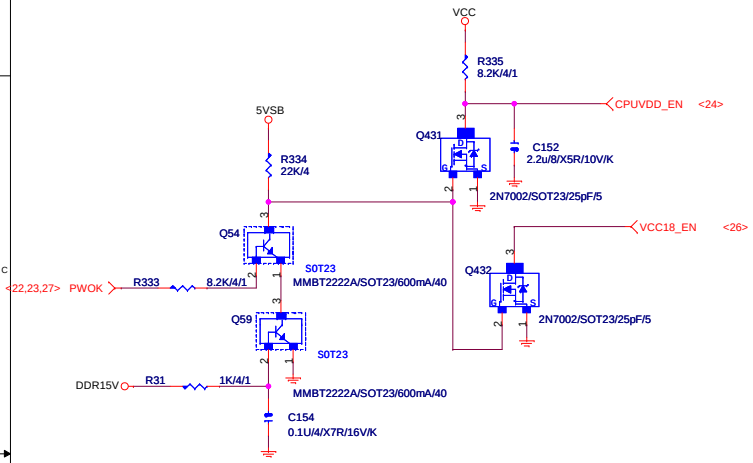

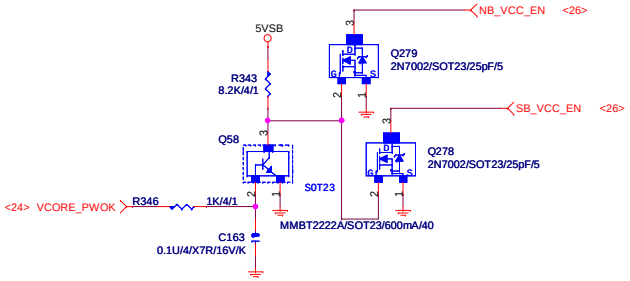

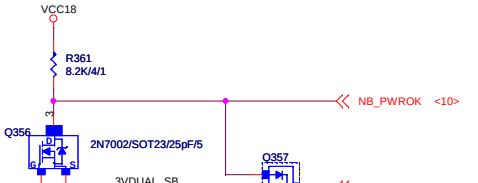

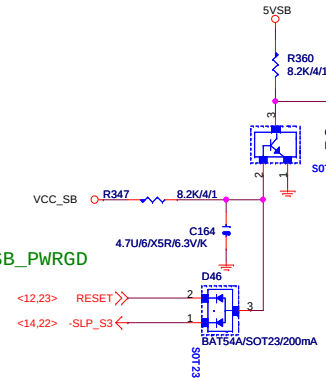

PWOK > NB_PWRGD / SB_PWRGD

(1.8V , 1.2V , 1.1V) > NB_PWRGD 前 1ms

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Title: POWER SEQUENCE,EUP		
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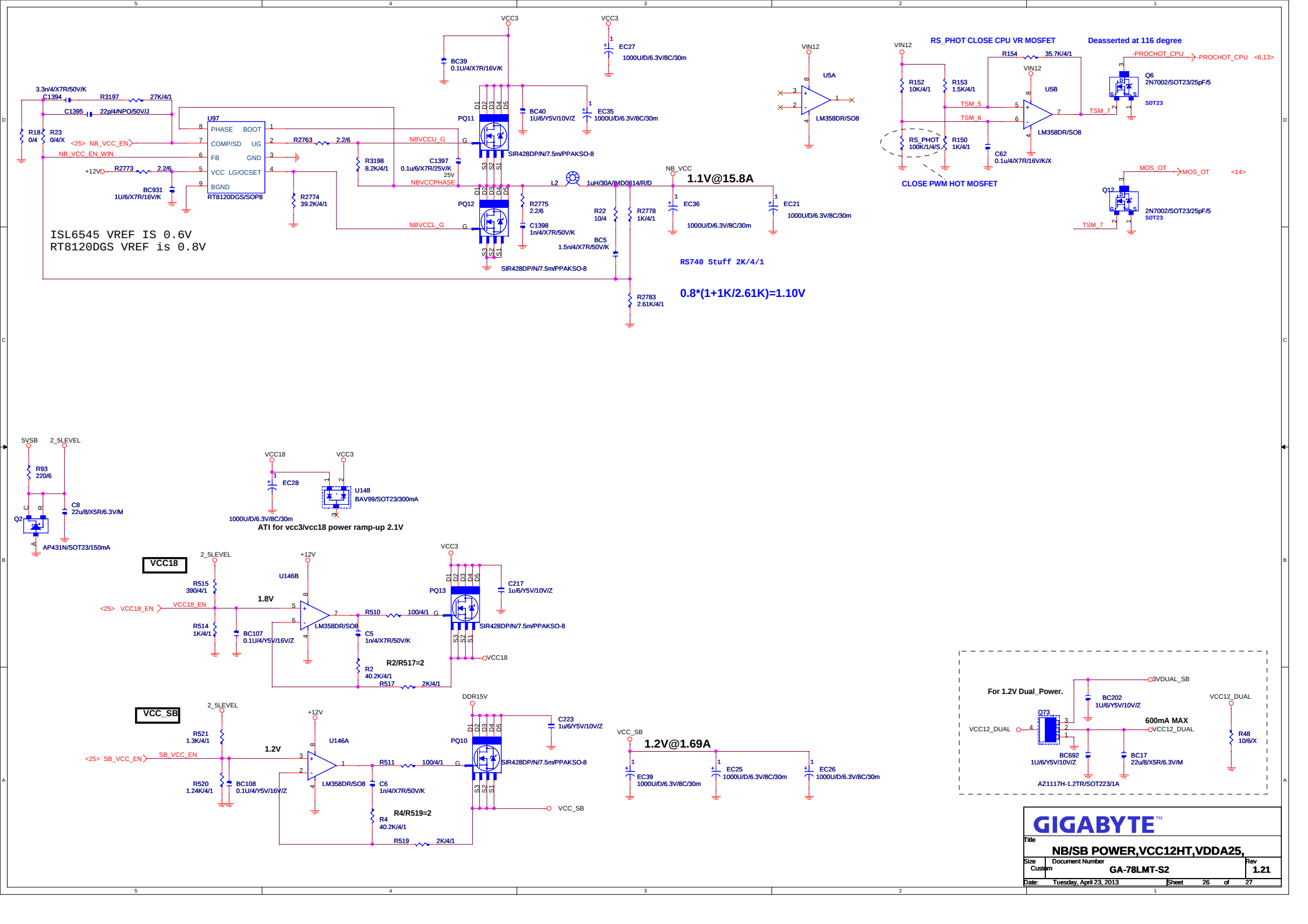

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Title	NB/SB POWER,VCC12HT,VDDA25,	
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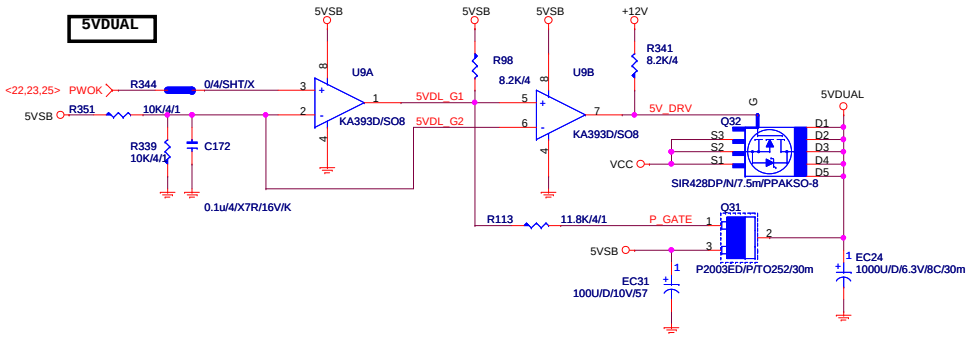

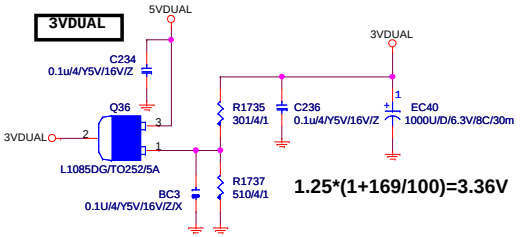

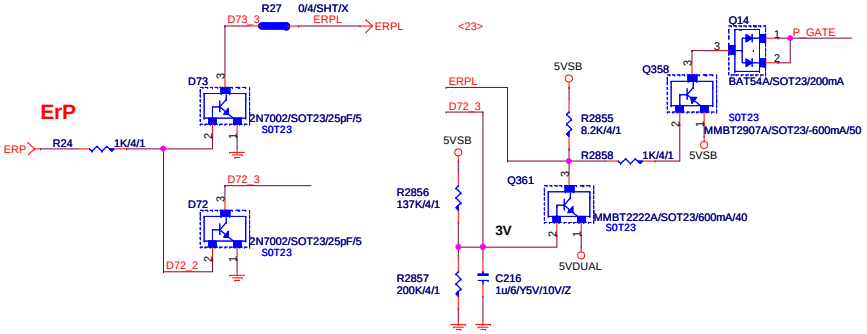

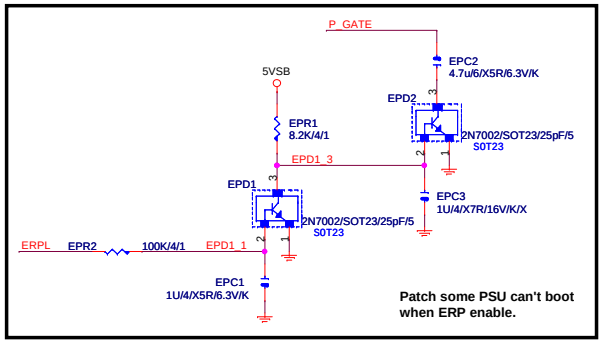

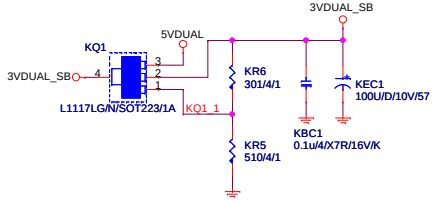

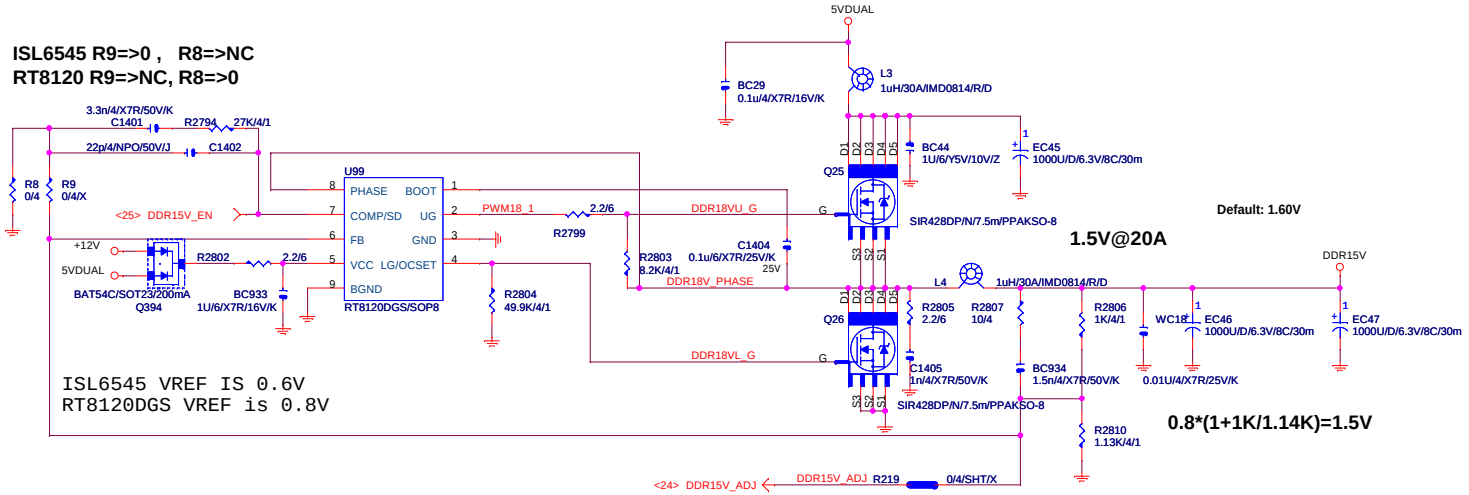

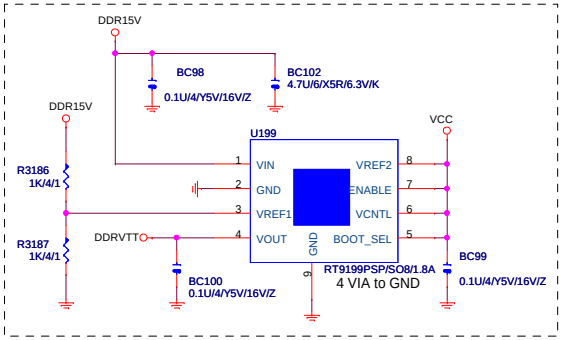

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Title: DDRII POWER , VCC18		
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