GA-F2A78M-D3H

Revision:4.01

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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

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Title	COVER SHEET
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Model Name:GA-F2A78M-D3H

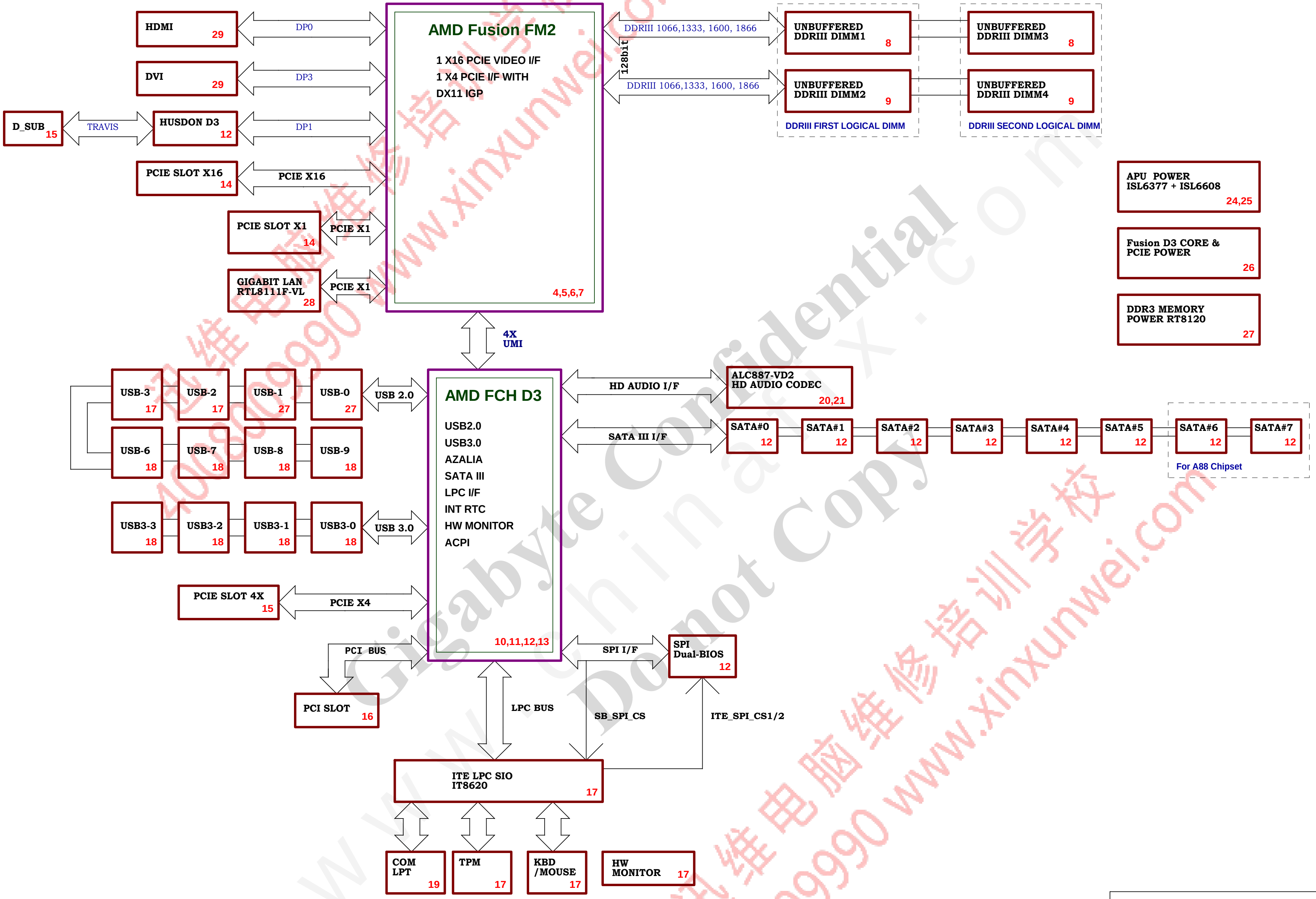
Component value change history

Version: 4.01
P-Code: U13126-0

Date	Change Item	Reason
2014.08.08	4.0 E-BOM Release. PCB:4.0	Modify from GA-F2A78M-D3H Rev3.0
	Add COM; remove OPTICAL; change RTL8111G	
2014.08.21	1.Change Audio CAP 11CE2-651000-05Rx4 pcs 2.Add D47	
	3.Remove D48,OR42 4.R1735 change 301 ,R1737 change 510	
	PCB4.01	

Circuit or PCB layout change for next version

Date	Change Item	Reason
2014.08.07	Rev4.0 Gerber-out	Modify from GA-F2A78M-D3H Rev3.0 後窗同A88X-D3H
2014.08.21	Rev4.01 Gerber-out	SWAP L2-R/L2-L



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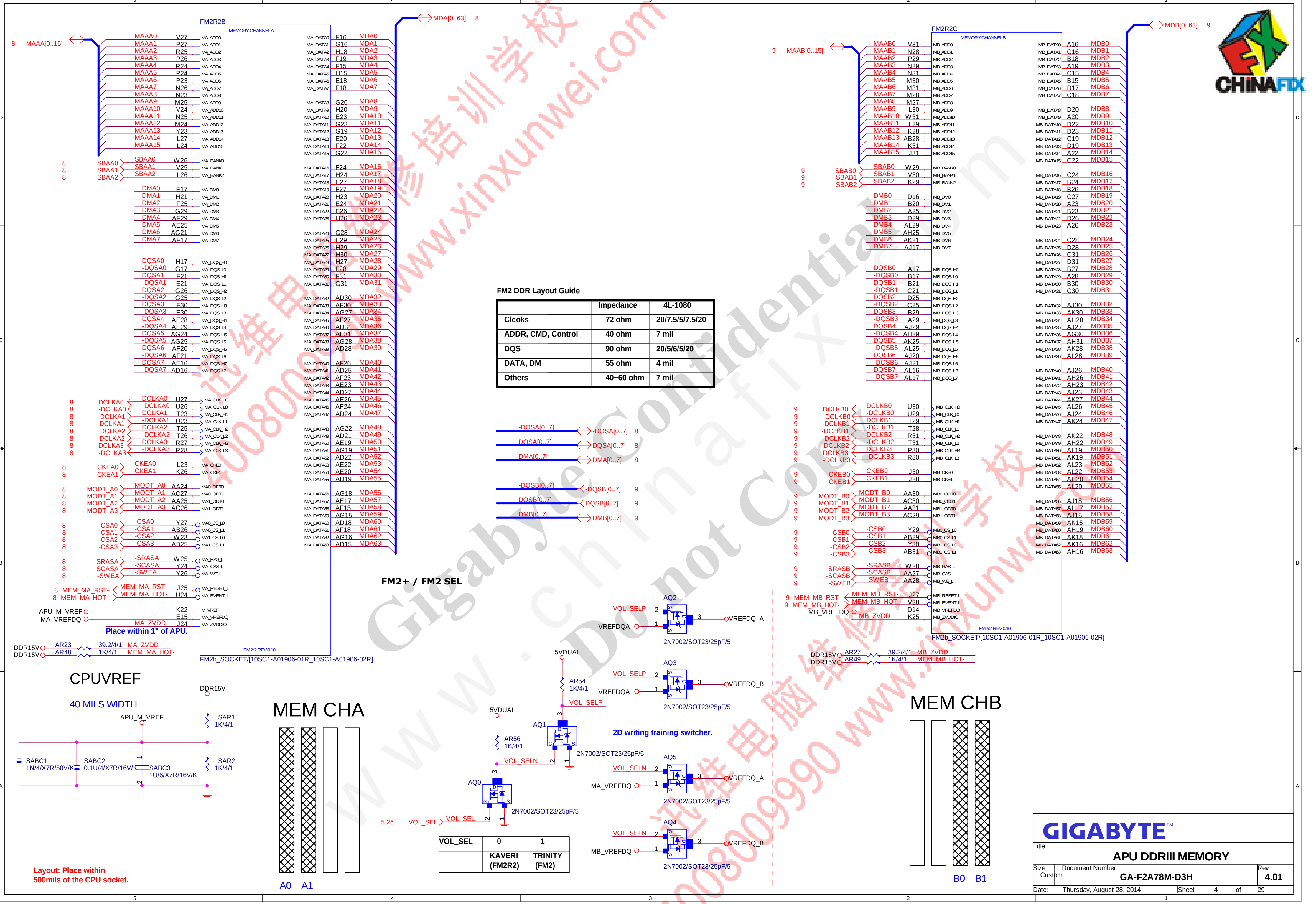
Title: BLOCK DIAGRAM

Size	Document Number	Rev
Custom	GA-F2A78M-D3H	4.01

Date: Thursday, August 28, 2014 Sheet 3 of 29



FM2 DDR Layout Guide

	Impedance	4L-1080
Clcoks	72 ohm	20/7.5/5/7.5/20
ADDR, CMD, Control	40 ohm	7 mil
DQS	90 ohm	20/5/6/5/20
DATA, DM	55 ohm	4 mil
Others	40~60 ohm	7 mil

VOL_SEL	0	1
	KAVERI (FM2R2)	TRINITY (FM2)

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Title: APU DDRIII MEMORY

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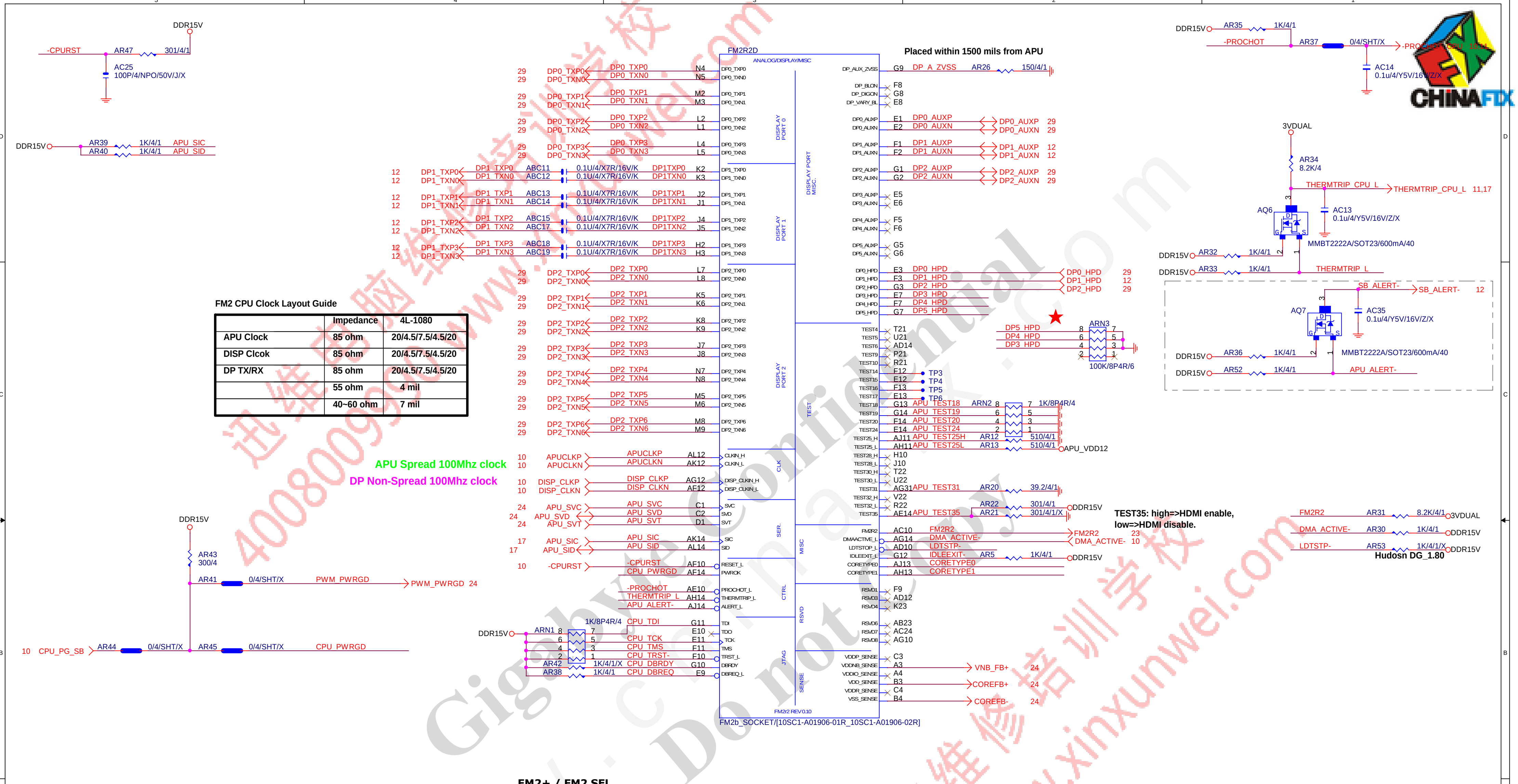

FM2 CPU Clock Layout Guide

	Impedance	4L-1080
APU Clock	85 ohm	20/4.5/7.5/4.5/20
DISP Clcok	85 ohm	20/4.5/7.5/4.5/20
DP TX/RX	85 ohm	20/4.5/7.5/4.5/20
	55 ohm	4 mil
	40~60 ohm	7 mil

FM2+ / FM2 SEL

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

VOL_SEL	0	1
	KAVERI (FM2R2)	TRINITY (FM2)

	APU FM2
Group A	VDDA25:1.8~2.7V/0.5A
Group A	DDR15V:0.8~2.3V/30A
Group B	VCORE: 0.8~2.0V/120A
Group B	VCORE_NB:1.2V/50A
Group B	VDDP:1.2V/5A
Group B	VDDR:1.2V/5A

Gropu A must early than Group B

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Title	APU CONTROL	
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Title: APU GFX, GPP, UMI I/F

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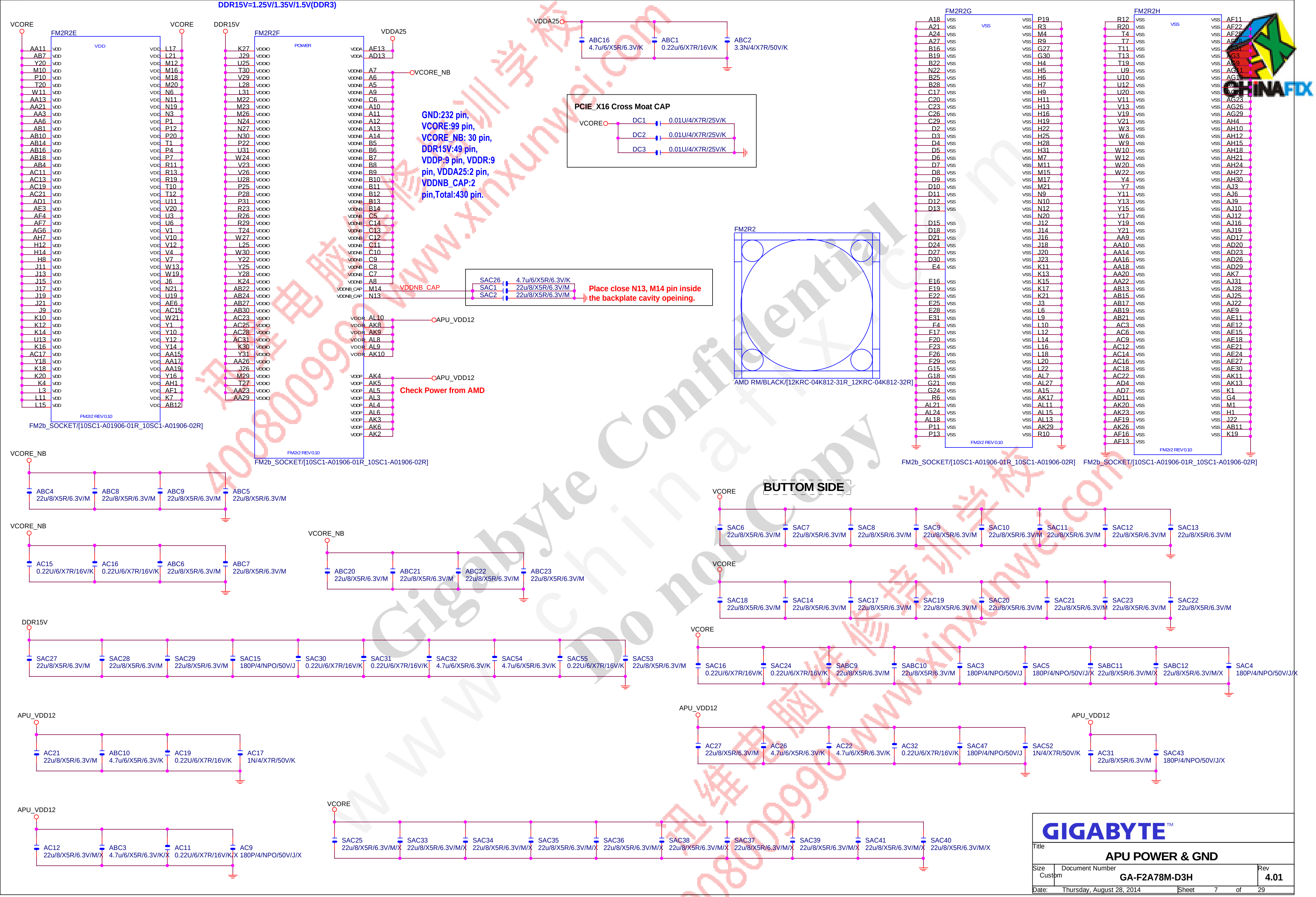
DDR15V=1.25V/1.35V/1.5V(DDR3)
VCORE
FM2R2E
VDD
FM2b_SOCKET/[10SC1-A01906-01R_10SC1-A01906-02R]
DDR15V
FM2R2F
POWER
VDDA25
VCORE_NB
VDDNB_CAP
APU_VDD12
Check Power from AMD
FM2b_SOCKET/[10SC1-A01906-01R_10SC1-A01906-02R]
GND:232 pin,
VCORE:99 pin,
VCORE_NB: 30 pin,
DDR15V:49 pin,
VDDP:9 pin, VDDR:9
pin, VDDA25:2 pin,
VDDNB_CAP:2
pin,Total:430 pin.
ABC16 4.7u/6/X5R/6.3V/K
ABC1 0.22u/6/X7R/16V/K
ABC2 3.3N/4/X7R/50V/K
PCIE_X16 Cross Moat CAP
DC1 0.01U/4/X7R/25V/K
DC2 0.01U/4/X7R/25V/K
DC3 0.01U/4/X7R/25V/K
SAC26 4.7u/6/X5R/6.3V/K
SAC1 22u/8/X5R/6.3V/M
SAC2 22u/8/X5R/6.3V/M
Place close N13, M14 pin inside
the backplate cavity opeining.
FM2R2
AMD RM/BLACK/[12KRC-04K812-31R_12KRC-04K812-32R]
FM2R2G
FM2R2H
VSS
FM2b_SOCKET/[10SC1-A01906-01R_10SC1-A01906-02R]
FM2b_SOCKET/[10SC1-A01906-01R_10SC1-A01906-02R]
ABC4 22u/8/X5R/6.3V/M
ABC8 22u/8/X5R/6.3V/M
ABC9 22u/8/X5R/6.3V/M
ABC5 22u/8/X5R/6.3V/M
AC15 0.22U/6/X7R/16V/K
AC16 0.22U/6/X7R/16V/K
ABC6 22u/8/X5R/6.3V/M
ABC7 22u/8/X5R/6.3V/M
ABC20 22u/8/X5R/6.3V/M
ABC21 22u/8/X5R/6.3V/M
ABC22 22u/8/X5R/6.3V/M
ABC23 22u/8/X5R/6.3V/M
BUTTOM SIDE
SAC6 22u/8/X5R/6.3V/M
SAC7 22u/8/X5R/6.3V/M
SAC8 22u/8/X5R/6.3V/M
SAC9 22u/8/X5R/6.3V/M
SAC10 22u/8/X5R/6.3V/M
SAC11 22u/8/X5R/6.3V/M
SAC12 22u/8/X5R/6.3V/M
SAC13 22u/8/X5R/6.3V/M
SAC18 22u/8/X5R/6.3V/M
SAC14 22u/8/X5R/6.3V/M
SAC17 22u/8/X5R/6.3V/M
SAC19 22u/8/X5R/6.3V/M
SAC20 22u/8/X5R/6.3V/M
SAC21 22u/8/X5R/6.3V/M
SAC23 22u/8/X5R/6.3V/M
SAC22 22u/8/X5R/6.3V/M
SAC27 22u/8/X5R/6.3V/M
SAC28 22u/8/X5R/6.3V/M
SAC29 22u/8/X5R/6.3V/M
SAC15 180P/4/NPO/50V/J
SAC30 0.22U/6/X7R/16V/K
SAC31 0.22U/6/X7R/16V/K
SAC32 4.7u/6/X5R/6.3V/K
SAC54 4.7u/6/X5R/6.3V/K
SAC55 0.22U/6/X7R/16V/K
SAC53 22u/8/X5R/6.3V/M
SAC16 0.22U/6/X7R/16V/K
SAC24 0.22U/6/X7R/16V/K
SABC9 22u/8/X5R/6.3V/M
SABC10 22u/8/X5R/6.3V/M
SAC3 180P/4/NPO/50V/J
SAC5 180P/4/NPO/50V/J/X
SABC11 22u/8/X5R/6.3V/M/X
SABC12 22u/8/X5R/6.3V/M/X
SAC4 180P/4/NPO/50V/J/X
AC21 22u/8/X5R/6.3V/M
ABC10 4.7u/6/X5R/6.3V/K
AC19 0.22U/6/X7R/16V/K
AC17 1N/4/X7R/50V/K
AC27 22u/8/X5R/6.3V/M
AC26 4.7u/6/X5R/6.3V/K
AC22 4.7u/6/X5R/6.3V/K
AC32 0.22U/6/X7R/16V/K
SAC47 180P/4/NPO/50V/J
SAC52 1N/4/X7R/50V/K
AC31 22u/8/X5R/6.3V/M
SAC43 180P/4/NPO/50V/J/X
AC12 22u/8/X5R/6.3V/M/X
ABC3 4.7u/6/X5R/6.3V/K/X
AC11 0.22U/6/X7R/16V/K/X
AC9 180P/4/NPO/50V/J/X
SAC25 22u/8/X5R/6.3V/M/X
SAC33 22u/8/X5R/6.3V/M/X
SAC34 22u/8/X5R/6.3V/M/X
SAC35 22u/8/X5R/6.3V/M/X
SAC36 22u/8/X5R/6.3V/M/X
SAC38 22u/8/X5R/6.3V/M/X
SAC37 22u/8/X5R/6.3V/M/X
SAC39 22u/8/X5R/6.3V/M/X
SAC41 22u/8/X5R/6.3V/M/X
SAC40 22u/8/X5R/6.3V/M/X
GIGABYTE
Title
APU POWER & GND
Size Custom
Document Number
GA-F2A78M-D3H
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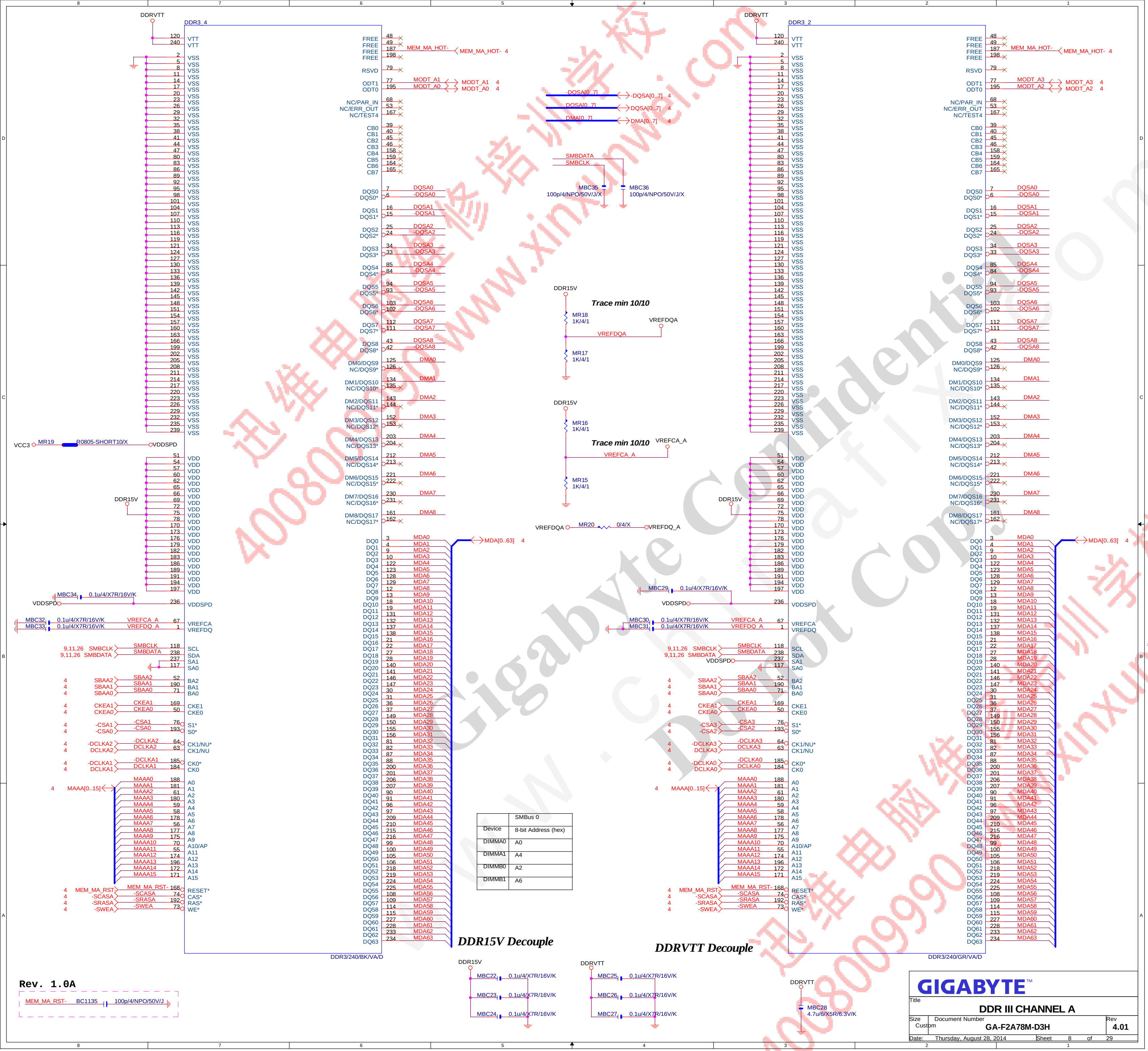

Device	SMBus 0 8-bit Address (hex)
DIMMA0	A0
DIMMA1	A4
DIMMB0	A2
DIMMB1	A6

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Title: DDR III CHANNEL A

Size: Custom | Document Number: GA-F2A78M-D3H | Rev: 4.01

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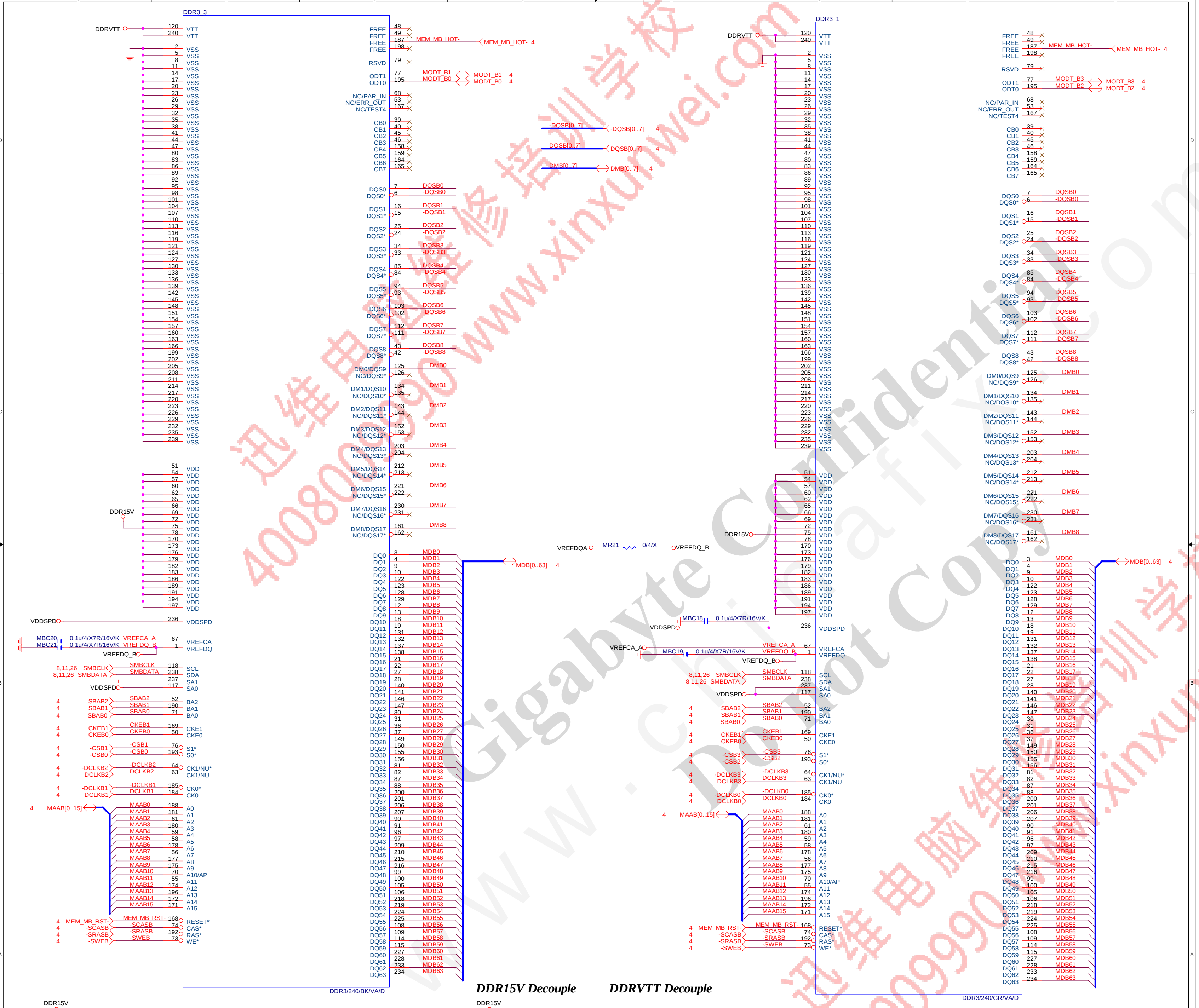

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Title: DDR III CHANNEL B

Size	Document Number	Rev
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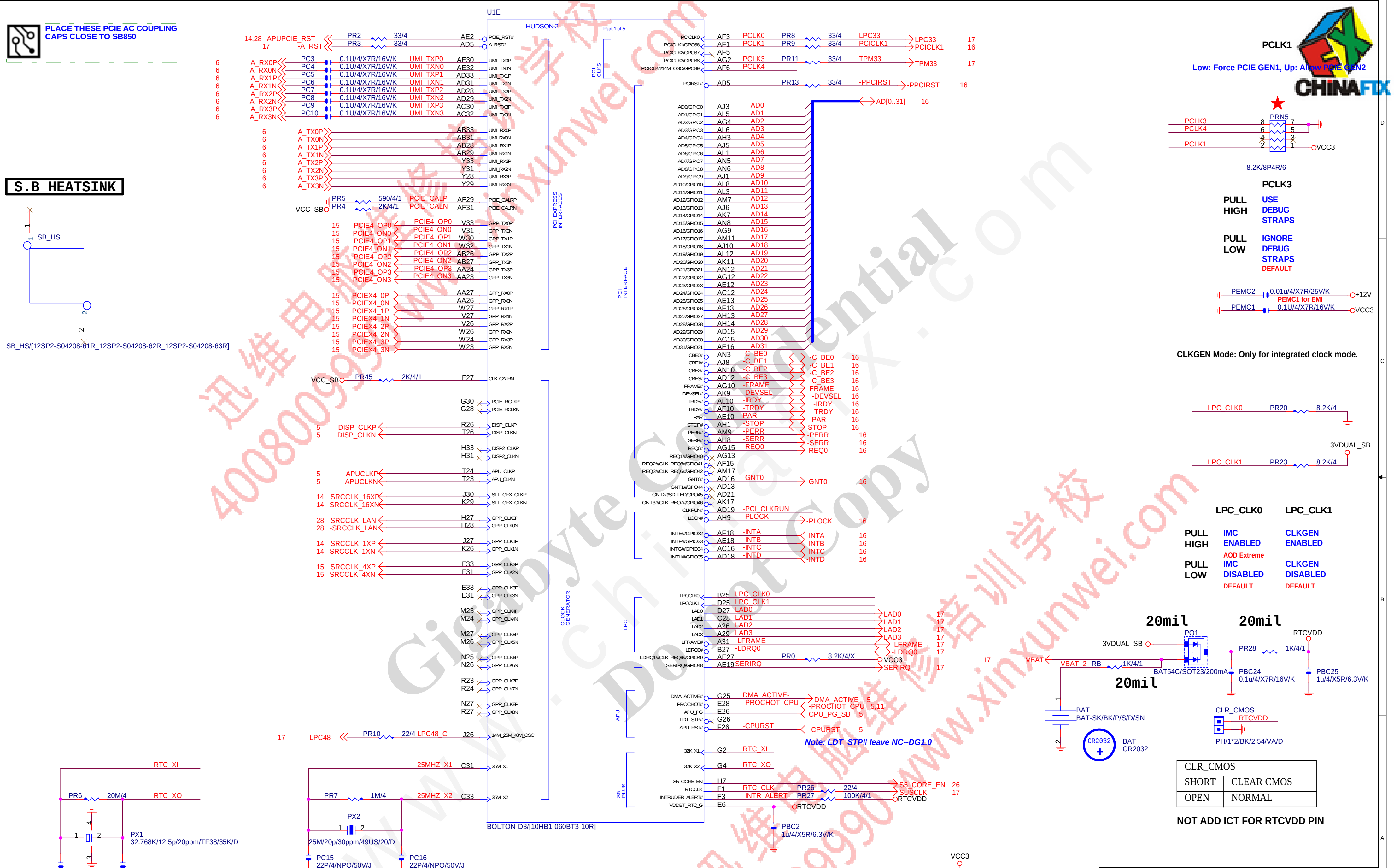

CLR_CMOS	
SHORT	CLEAR CMOS
OPEN	NORMAL

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Title: HUDSON D4 PCIE/PCI/CPU/LPC

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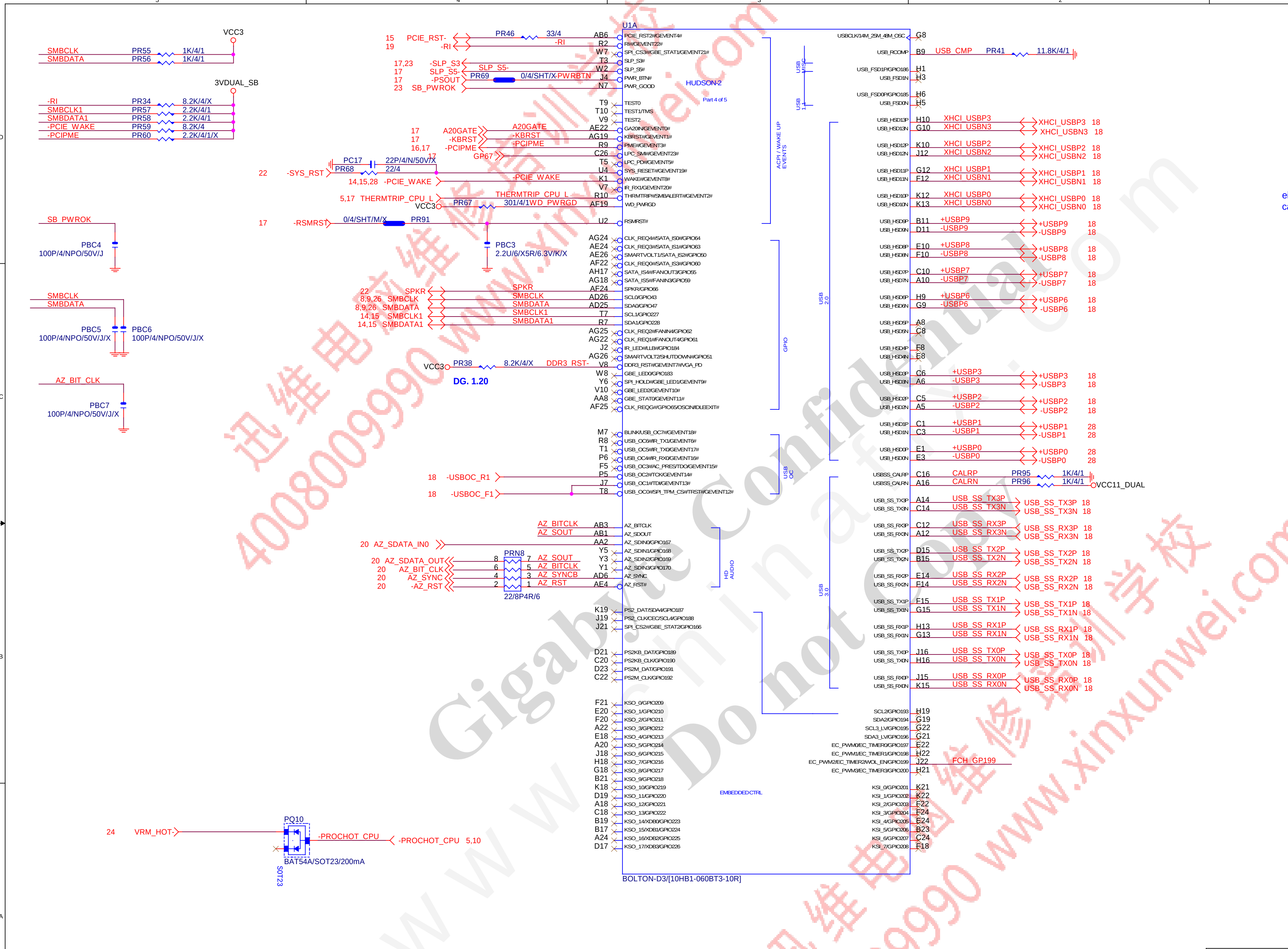

USB11	FRONT PANEL
USB10	FRONT PANEL
USB9	FRONT PANEL
USB8	FRONT PANEL
USB7	FRONT PANEL
USB6	FRONT PANEL
USB5	FRONT PANEL
USB4	FRONT PANEL
USB3	REAR PANEL
USB2	REAR PANEL
USB1	REAR PANEL
USB0	REAR PANEL

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

FCH_GP199

ROM TYPE:

H = LPC ROM

L = SPI ROM <Default>

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Title: HUDSON D4 ACPI/USB/GPIO/AUDIO

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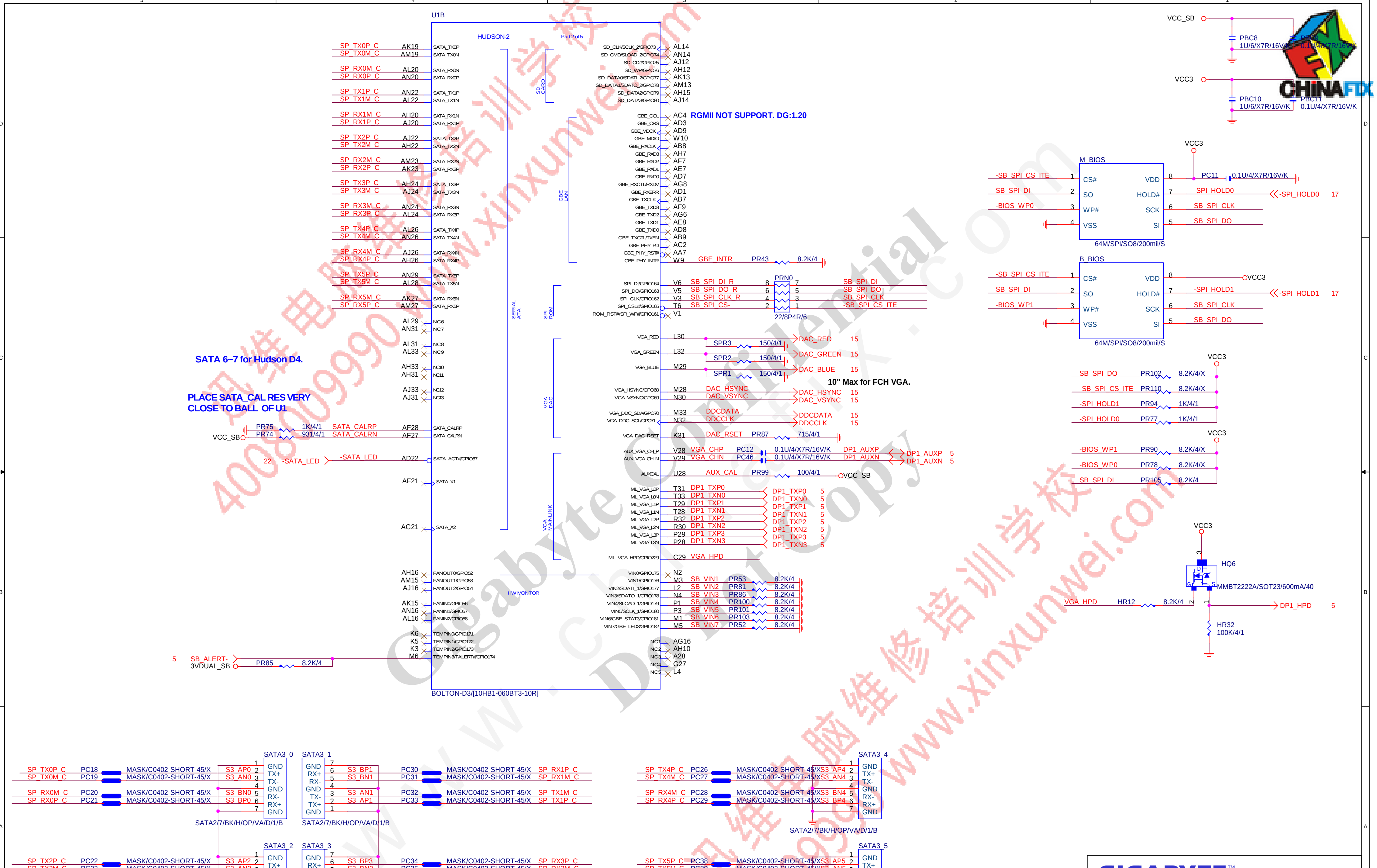

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Title	HUDSON D4 SATA/VGA	
Size Custom	Document Number GA-F2A78M-D3H	Rev 4.01
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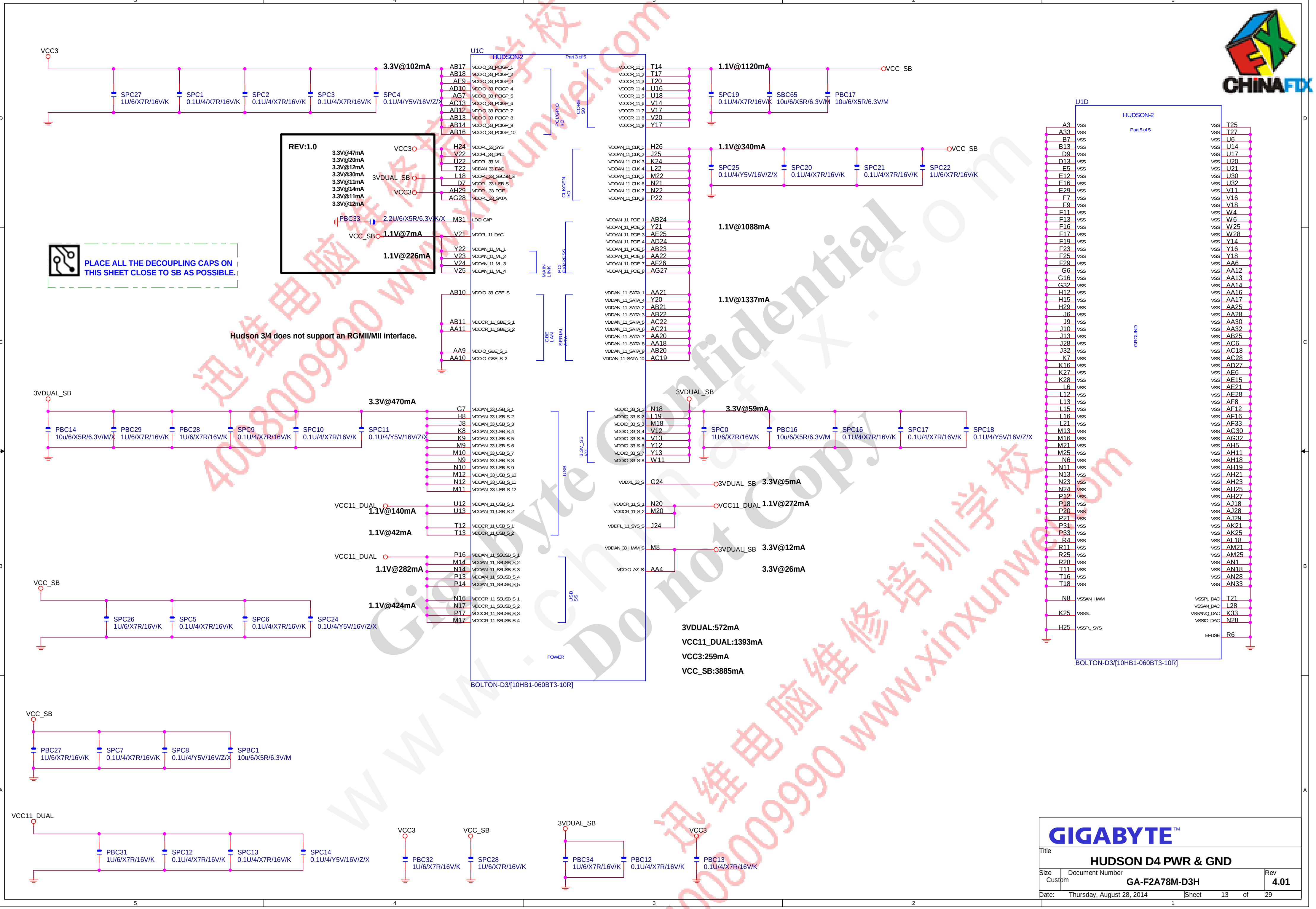
U1C
HUDSON-2
Part 3 of 5
VCC3
3.3V@102mA
SPC27 1U/6/X7R/16V/K
SPC1 0.1U/4/X7R/16V/K
SPC2 0.1U/4/X7R/16V/K
SPC3 0.1U/4/X7R/16V/K
SPC4 0.1U/4/Y5V/16V/Z/X
1.1V@1120mA
VCC_SB
SPC19 0.1U/4/X7R/16V/K
SBC65 10u/6/X5R/6.3V/M
PBC17 10u/6/X5R/6.3V/M
REV:1.0
3.3V@47mA
3.3V@20mA
3.3V@12mA
3.3V@30mA
3.3V@11mA
3.3V@14mA
3.3V@11mA
3.3V@12mA
3VDUAL_SB
PBC33 2.2U/6/X5R/6.3V/K/X
1.1V@7mA
1.1V@226mA
1.1V@340mA
SPC25 0.1U/4/Y5V/16V/Z/X
SPC20 0.1U/4/X7R/16V/K
SPC21 0.1U/4/X7R/16V/K
SPC22 1U/6/X7R/16V/K
1.1V@1088mA
1.1V@1337mA
PLACE ALL THE DECOUPLING CAPS ON
THIS SHEET CLOSE TO SB AS POSSIBLE.
Hudson 3/4 does not support an RGMII/MII interface.
3.3V@470mA
PBC14 10u/6/X5R/6.3V/M/X
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/Y5V/16V/Z/X
3.3V@59mA
SPC0 1U/6/X7R/16V/K
PBC16 10u/6/X5R/6.3V/M
SPC16 0.1U/4/X7R/16V/K
SPC17 0.1U/4/X7R/16V/K
SPC18 0.1U/4/Y5V/16V/Z/X
3.3V@5mA
VCC11_DUAL
1.1V@140mA
1.1V@272mA
1.1V@42mA
3.3V@12mA
1.1V@282mA
3.3V@26mA
1.1V@424mA
SPC26 1U/6/X7R/16V/K
SPC5 0.1U/4/X7R/16V/K
SPC6 0.1U/4/X7R/16V/K
SPC24 0.1U/4/Y5V/16V/Z/X
3VDUAL:572mA
VCC11_DUAL:1393mA
VCC3:259mA
VCC_SB:3885mA
BOLTON-D3/[10HB1-060BT3-10R]
U1D
HUDSON-2
Part 5 of 5
GROUND
BOLTON-D3/[10HB1-060BT3-10R]
PBC27 1U/6/X7R/16V/K
SPC7 0.1U/4/X7R/16V/K
SPC8 0.1U/4/Y5V/16V/Z/X
SPBC1 10u/6/X5R/6.3V/M
PBC31 1U/6/X7R/16V/K
SPC12 0.1U/4/X7R/16V/K
SPC13 0.1U/4/X7R/16V/K
SPC14 0.1U/4/Y5V/16V/Z/X
PBC32 1U/6/X7R/16V/K
SPC28 1U/6/X7R/16V/K
PBC34 1U/6/X7R/16V/K
PBC12 0.1U/4/X7R/16V/K
PBC13 0.1U/4/X7R/16V/K
GIGABYTE
Title
HUDSON D4 PWR & GND
Size Custom
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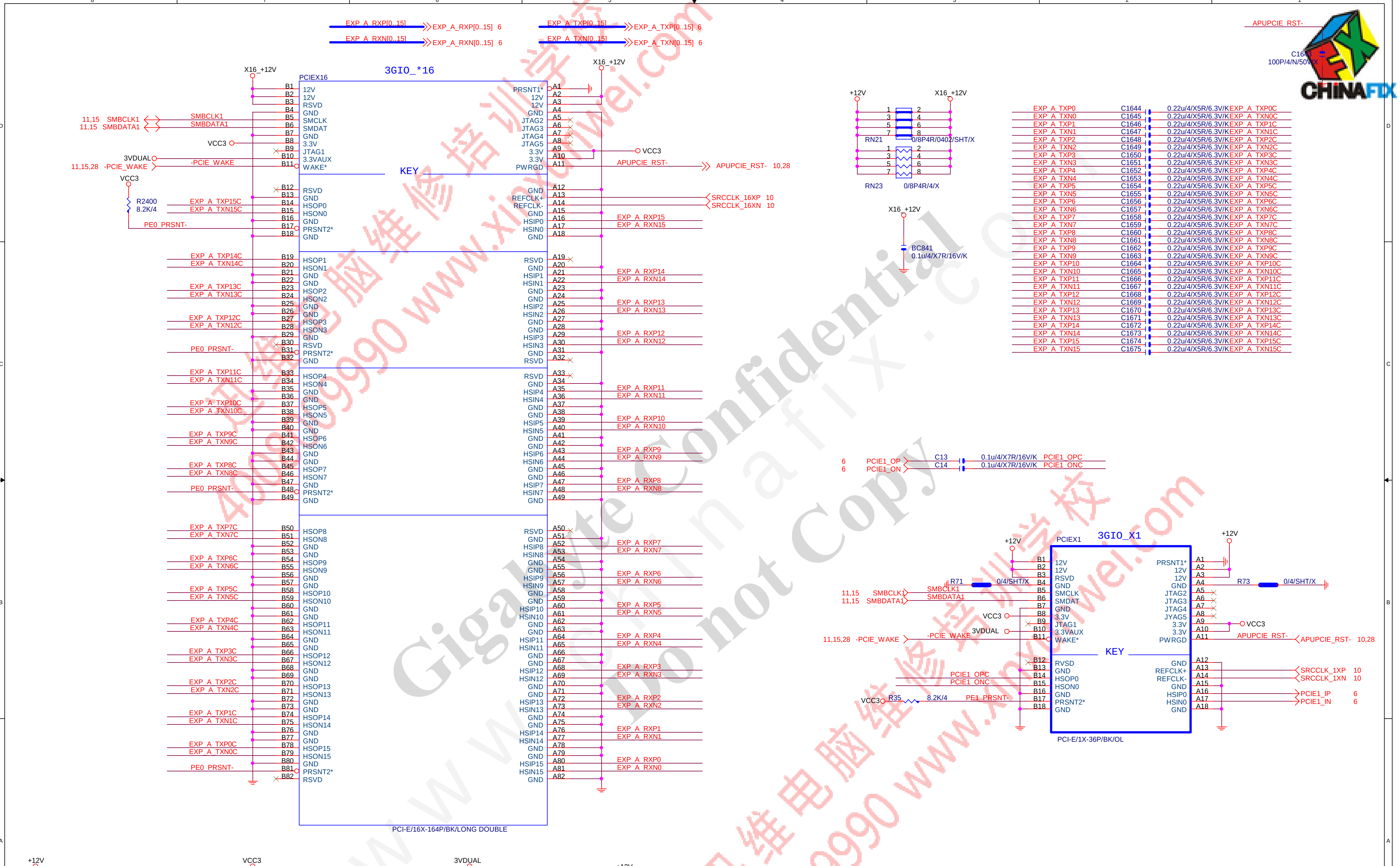

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Title: **PCI EXPRESS X 16 ,X1**

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Custom	GA-F2A78M-D3H	4.01

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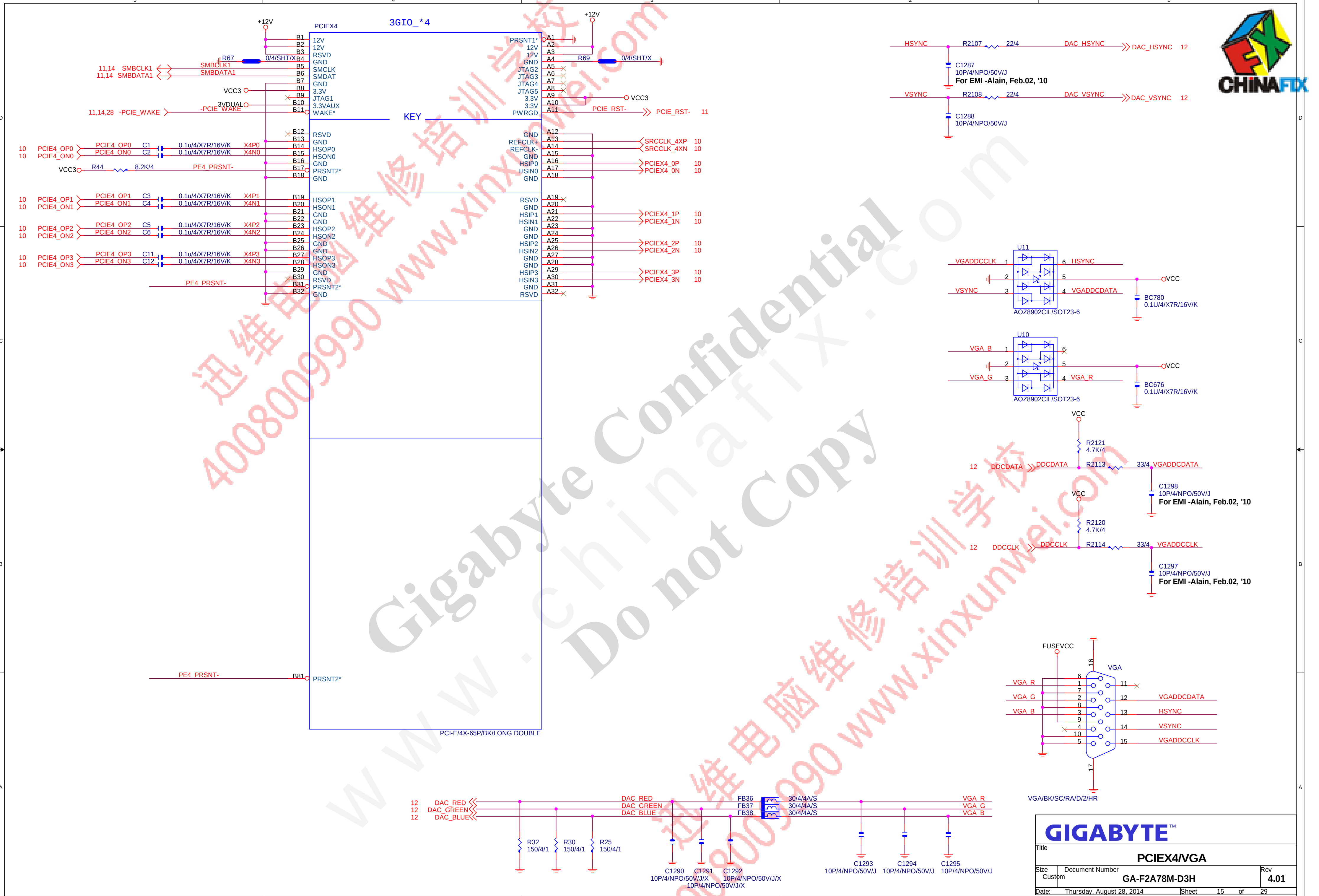

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Title: PCIEX4/VGA

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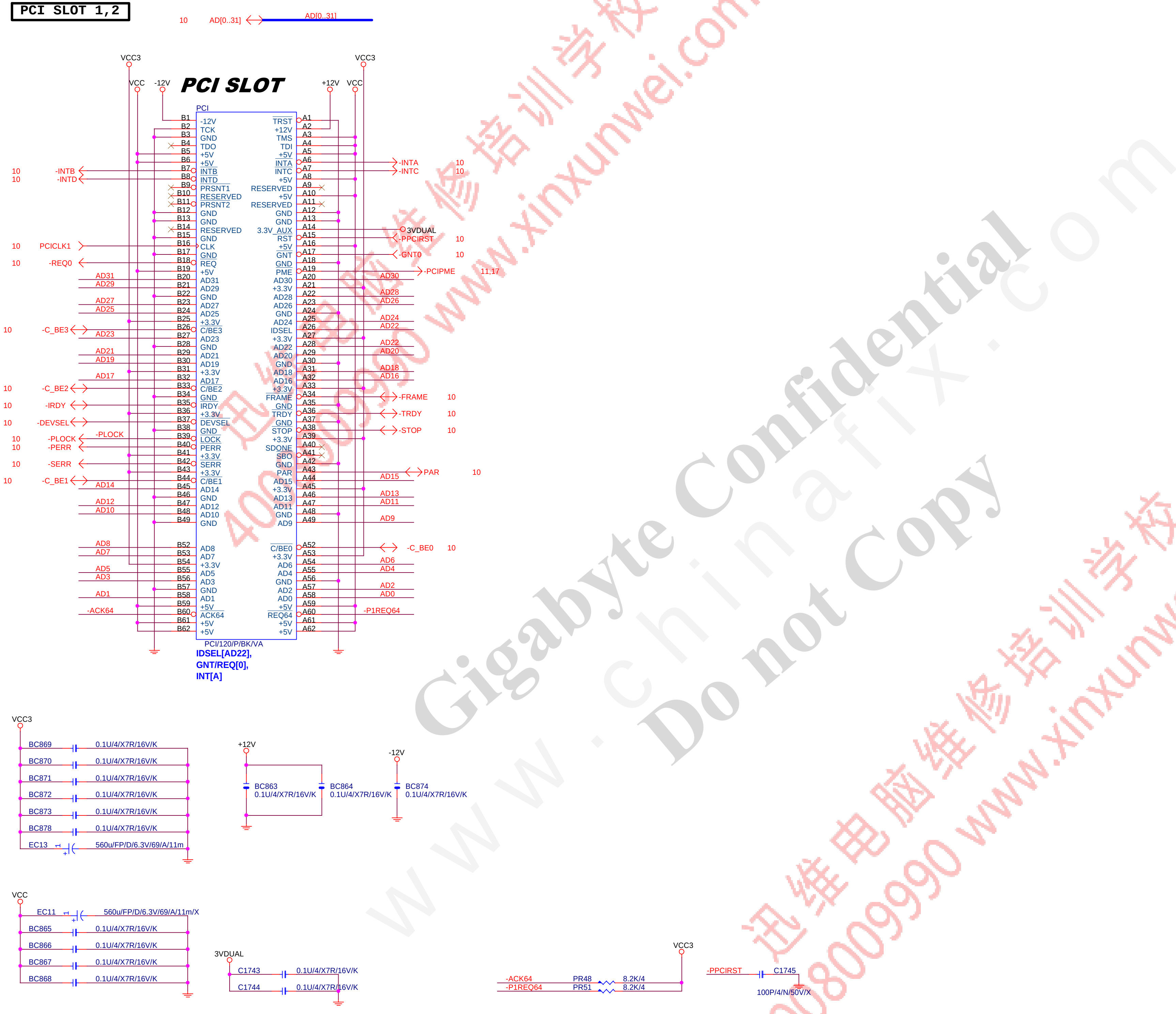
PCI SLOT 1,2



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Title	PCI SLOT
Size: Custom	Document Number: GA-F2A78M-D3H
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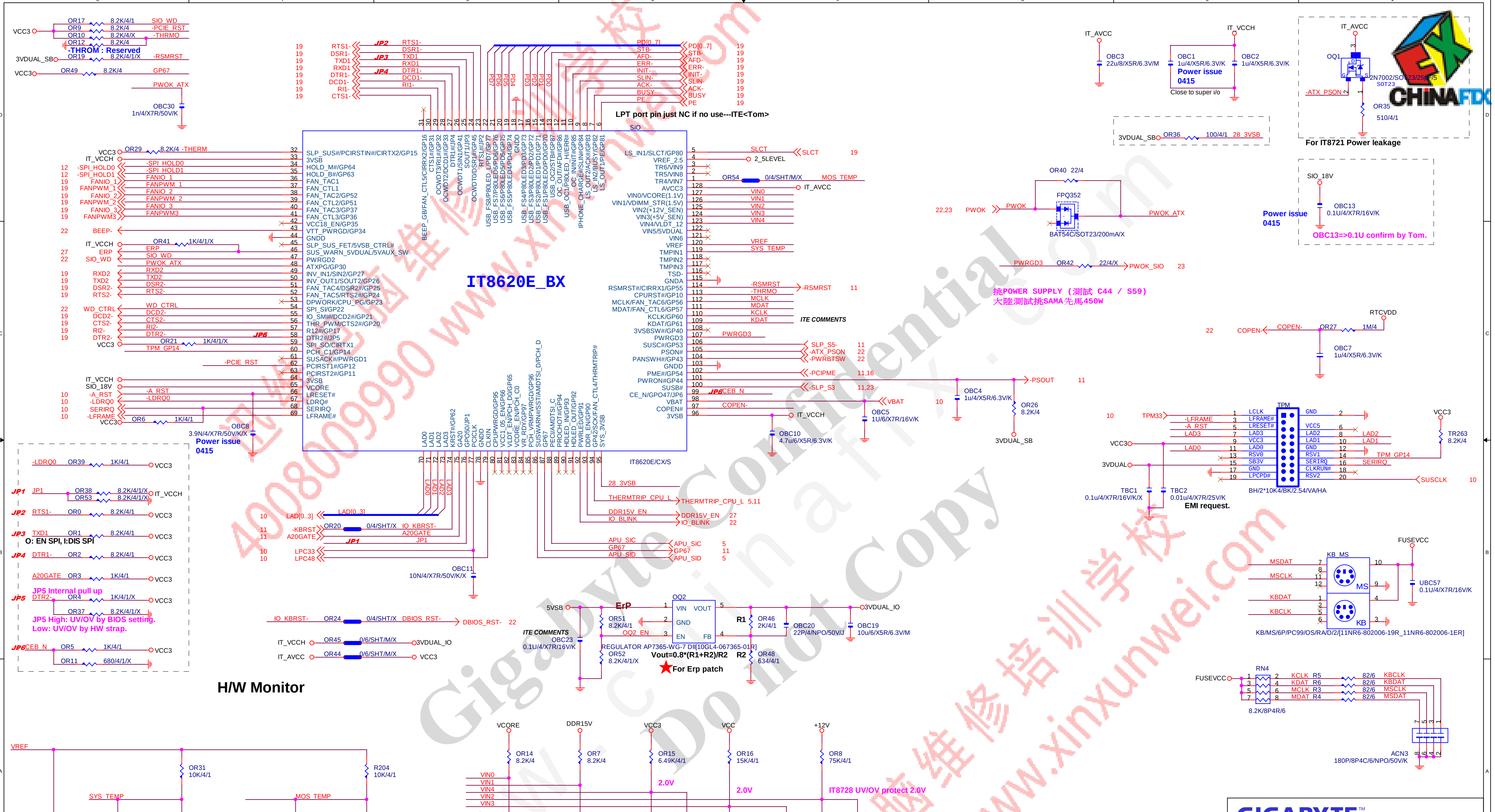

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Title: ITE 8620 ,Dual-BIOS,KB/MS

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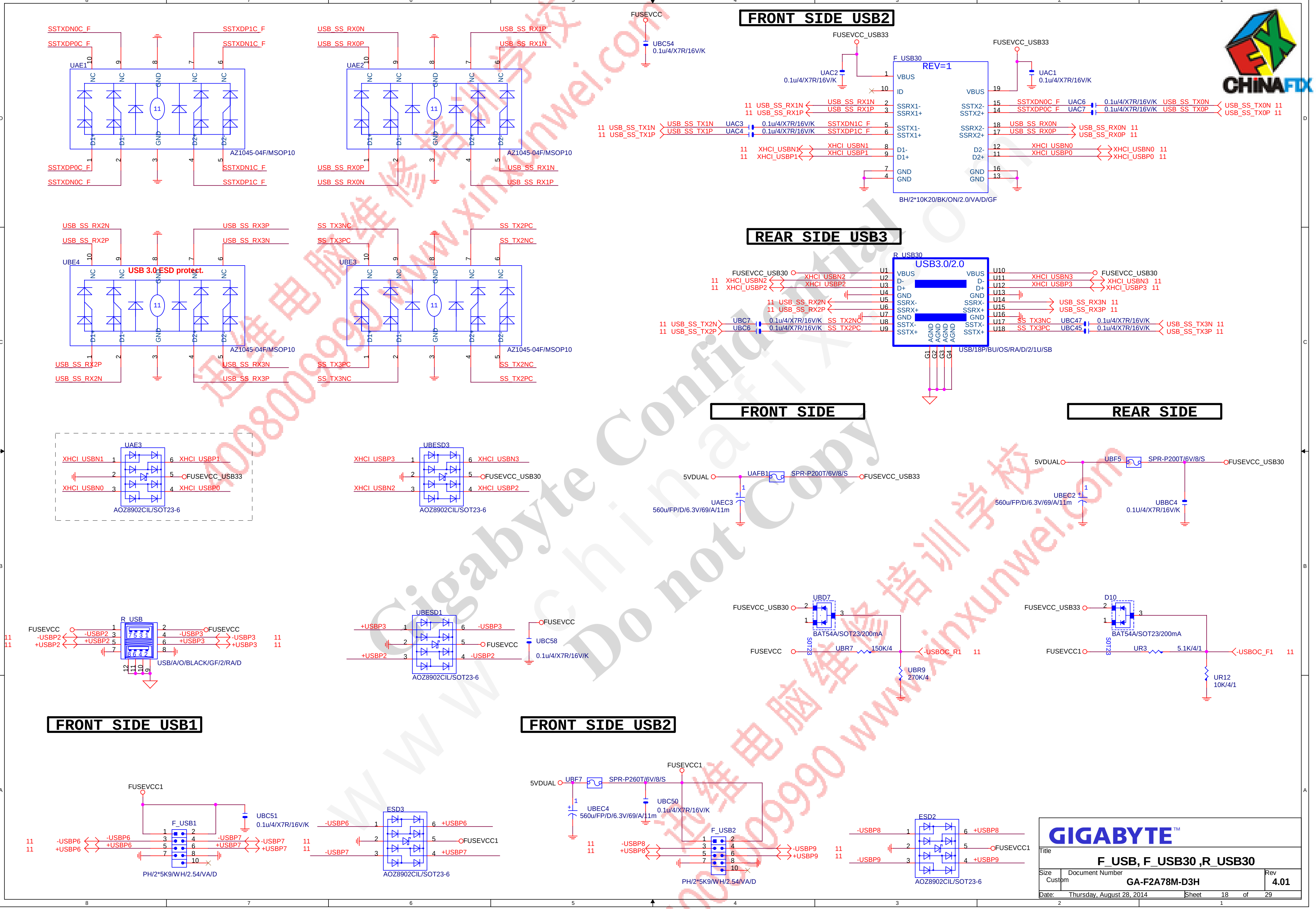
FRONT SIDE USB2
REAR SIDE USB3
FRONT SIDE
REAR SIDE
FRONT SIDE USB1
FRONT SIDE USB2
USB 3.0 ESD protect.
UAE1 AZ1045-04F/MSOP10
UAE2 AZ1045-04F/MSOP10
UBE4 AZ1045-04F/MSOP10
UBE3 AZ1045-04F/MSOP10
F_USB30 REV=1
BH/2*10K20/BK/ON/2.0/VA/D/GF
R_USB30 USB3.0/2.0
USB/18P/BU/OS/RA/D/2/1U/SB
UAE3 AOZ8902CIL/SOT23-6
UBESD3 AOZ8902CIL/SOT23-6
UBESD1 AOZ8902CIL/SOT23-6
ESD3 AOZ8902CIL/SOT23-6
ESD2 AOZ8902CIL/SOT23-6
R_USB USB/A/O/BLACK/GF/2/RA/D
F_USB1 PH/2*5K9/WH/2.54/VA/D
F_USB2 PH/2*5K9/WH/2.54/VA/D
UAFB1 SPR-P200T/6V/8/S
UBF5 SPR-P200T/6V/8/S
UBF7 SPR-P260T/6V/8/S
UAEC3 560u/FP/D/6.3V/69/A/11m
UBEC2 560u/FP/D/6.3V/69/A/11m
UBEC4 560u/FP/D/6.3V/69/A/11m
UBD7 BAT54A/SOT23/200mA
D10 BAT54A/SOT23/200mA
UBR7 150K/4
UBR9 270K/4
UR3 5.1K/4/1
UR12 10K/4/1
CHINAFIX
GIGABYTE
Title: F_USB, F_USB30 ,R_USB30
Size: Custom
Document Number: GA-F2A78M-D3H
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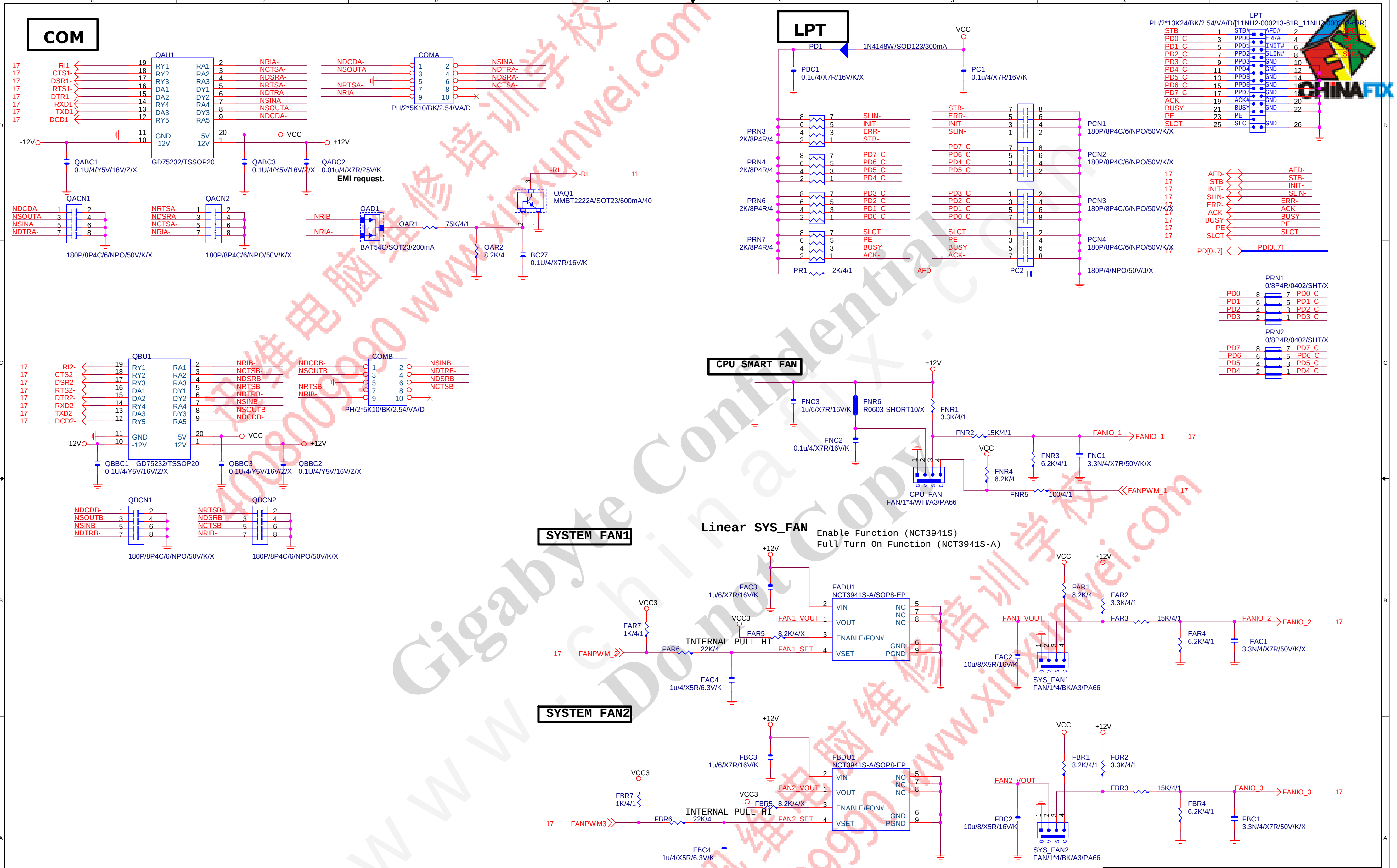

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Title

CPU & SYS FAN COM,LPT,MOSFET HOT

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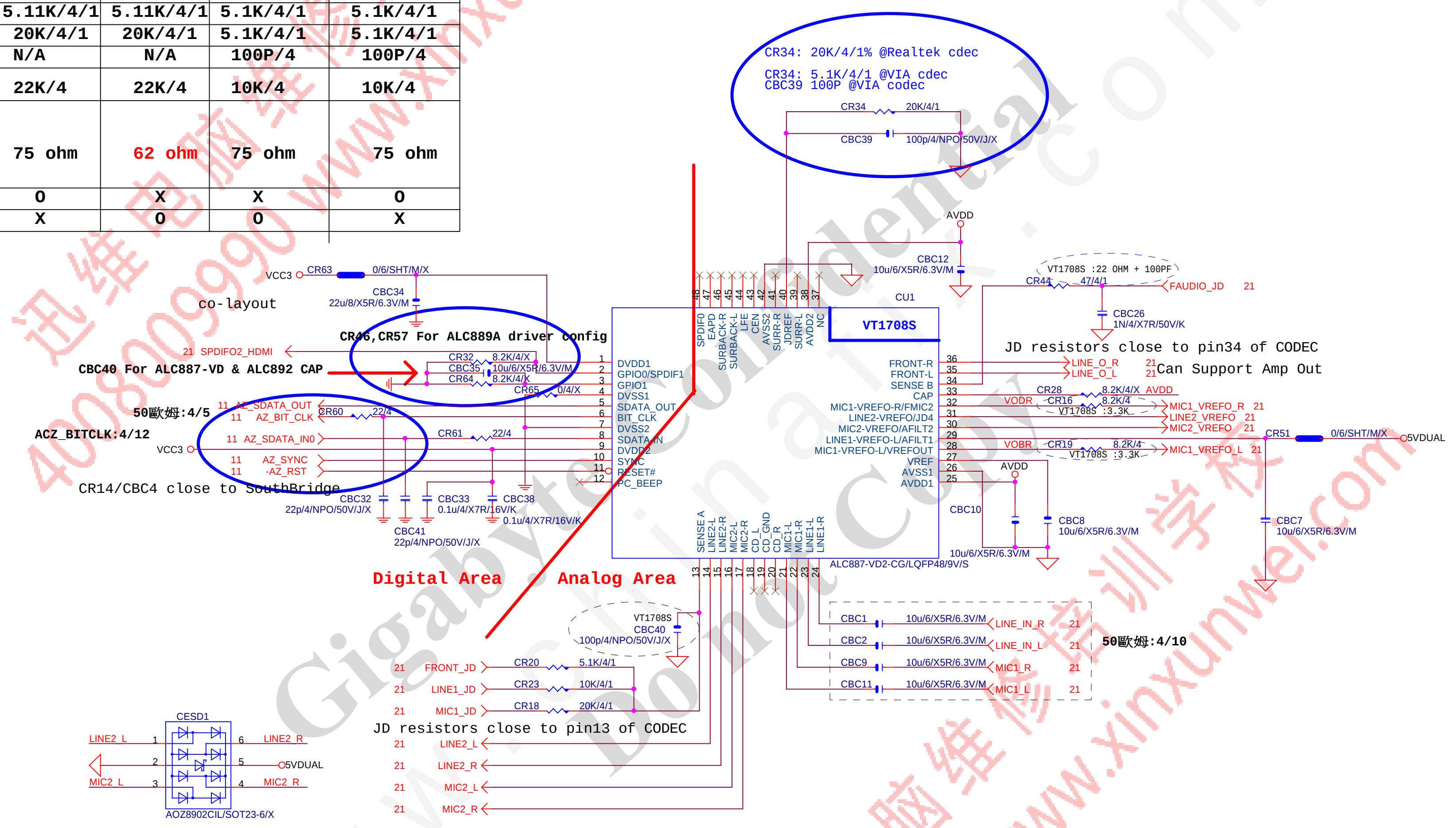
AZALIA CODEC

ALC883/ALC888-A/ALC888B/ALC888-VD/ALC892R/ALC889/ALC889A Colay

	ALC887-VD2	ALC889	VT1708S	VT1708SCE
CR65	X	O	O	X
CR64	X	X	X	O
CR44/CBC6	47ohm+1nF	47ohm+1nF	22ohm+100P	22ohm+100P
CR34	20K/1%	20K/1%	5.1K/1%	5.1K/1%
CR31	O	O	O	O
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
CR34	20K/4/1	20K/4/1	5.1K/4/1	5.1K/4/1
CBC39/CBC40	N/A	N/A	100P/4	100P/4
CR6/CR7/CR54/CR58	22K/4	22K/4	10K/4	10K/4
CR5/CR8/CR1/CR14/ CR17/CR22/CR13/CR11/ CR57/CR53	75 ohm	62 ohm	75 ohm	75 ohm
CR51/CD1/CBC7	O	X	X	O
CD2/CD3/CQ3/CQ5	X	O	O	X



GIGABYTE™

Title: ALC887-VD2 CODEC

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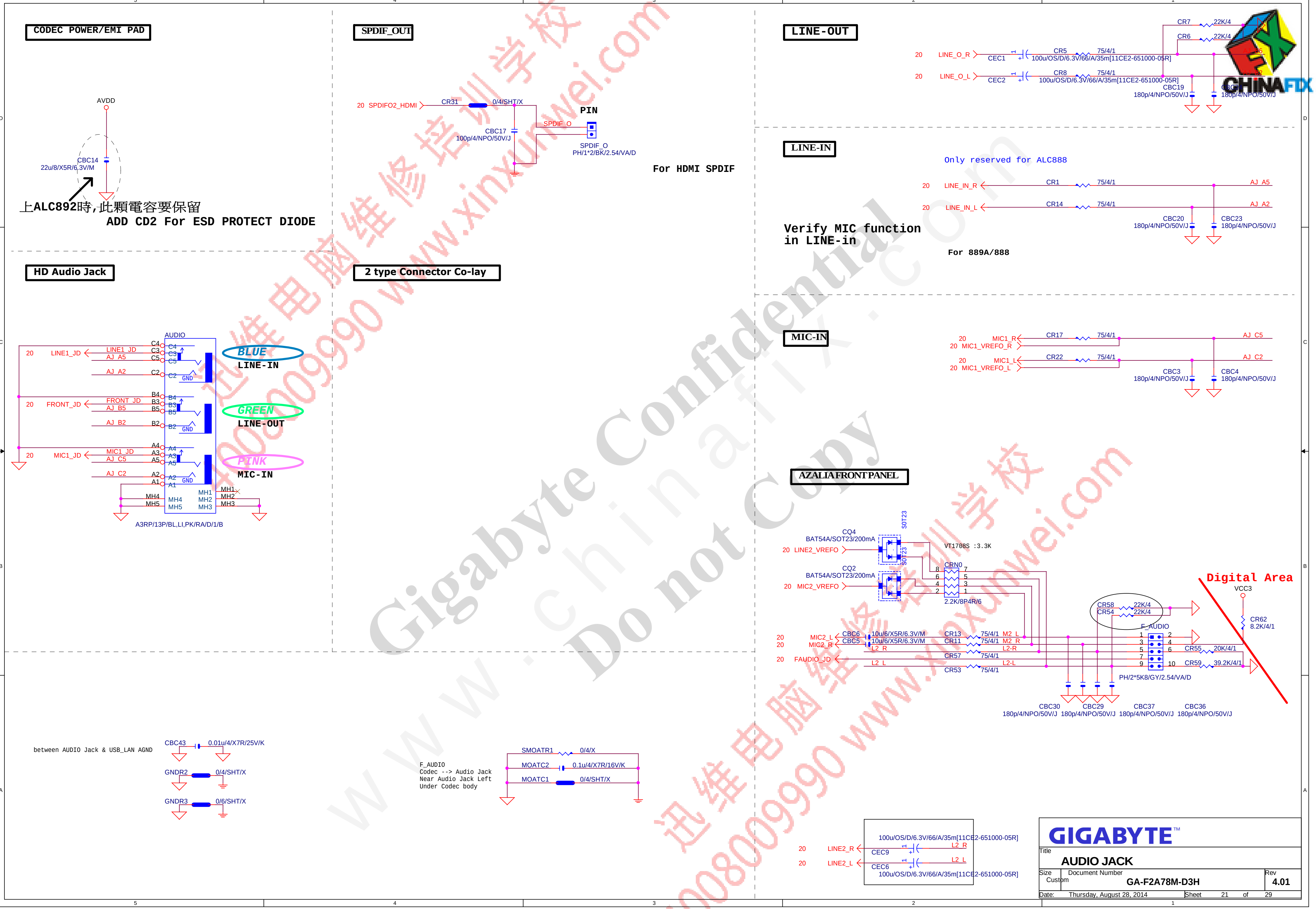
CODEC POWER/EMI PAD
AVDD
CBC14
22u/8/X5R/6.3V/M
上ALC892時,此顆電容要保留
ADD CD2 For ESD PROTECT DIODE
SPDIF_OUT
20 SPDIFO2_HDMI
CR31 0/4/SHT/X
CBC17
100p/4/NPO/50V/J
SPDIF_O
PIN
SPDIF_O
PH/1*2/BK/2.54/VA/D
For HDMI SPDIF
LINE-OUT
20 LINE_O_R
CEC1
CR5 75/4/1
100u/OS/D/6.3V/66/A/35m[11CE2-651000-05R]
20 LINE_O_L
CEC2
CR8 75/4/1
100u/OS/D/6.3V/66/A/35m[11CE2-651000-05R]
CR7 22K/4
CR6 22K/4
CBC19
180p/4/NPO/50V/J
180p/4/NPO/50V/J
LINE-IN
Only reserved for ALC888
20 LINE_IN_R
CR1 75/4/1
AJ_A5
20 LINE_IN_L
CR14 75/4/1
AJ_A2
CBC20
180p/4/NPO/50V/J
CBC23
180p/4/NPO/50V/J
Verify MIC function
in LINE-in
For 889A/888
HD Audio Jack
2 type Connector Co-lay
AUDIO
20 LINE1_JD
LINE1_JD
AJ_A5
AJ_A2
20 FRONT_JD
FRONT_JD
AJ_B5
AJ_B2
20 MIC1_JD
MIC1_JD
AJ_C5
AJ_C2
BLUE
LINE-IN
GREEN
LINE-OUT
PINK
MIC-IN
A3RP/13P/BL,LI,PK/RA/D/1/B
MIC-IN
20 MIC1_R
20 MIC1_VREFO_R
CR17 75/4/1
AJ_C5
20 MIC1_L
20 MIC1_VREFO_L
CR22 75/4/1
AJ_C2
CBC3
180p/4/NPO/50V/J
CBC4
180p/4/NPO/50V/J
AZALIA FRONT PANEL
CQ4
BAT54A/SOT23/200mA
20 LINE2_VREFO
CQ2
BAT54A/SOT23/200mA
20 MIC2_VREFO
VT1708S :3.3K
CRN0
2.2K/8P4R/6
20 MIC2_L
20 MIC2_R
20 FAUDIO_JD
CBC6 10u/6/X5R/6.3V/M
CBC5 10u/6/X5R/6.3V/M
CR13 75/4/1 M2_L
CR11 75/4/1 M2_R
CR57 75/4/1
CR53 75/4/1
L2_R
L2_L
CR58 22K/4
CR54 22K/4
F_AUDIO
PH/2*5K8/GY/2.54/VA/D
CR55 20K/4/1
CR59 39.2K/4/1
Digital Area
VCC3
CR62
8.2K/4/1
CBC30
180p/4/NPO/50V/J
CBC29
180p/4/NPO/50V/J
CBC37
180p/4/NPO/50V/J
CBC36
180p/4/NPO/50V/J
between AUDIO Jack & USB_LAN AGND
CBC43 0.01u/4/X7R/25V/K
GNDR2 0/4/SHT/X
GNDR3 0/6/SHT/X
F_AUDIO
Codec --> Audio Jack
Near Audio Jack Left
Under Codec body
SMOATR1 0/4/X
MOATC2 0.1u/4/X7R/16V/K
MOATC1 0/4/SHT/X
100u/OS/D/6.3V/66/A/35m[11CE2-651000-05R]
20 LINE2_R
CEC9
L2_R
20 LINE2_L
CEC6
L2_L
100u/OS/D/6.3V/66/A/35m[11CE2-651000-05R]
GIGABYTE
Title
AUDIO JACK
Size Custom
Document Number
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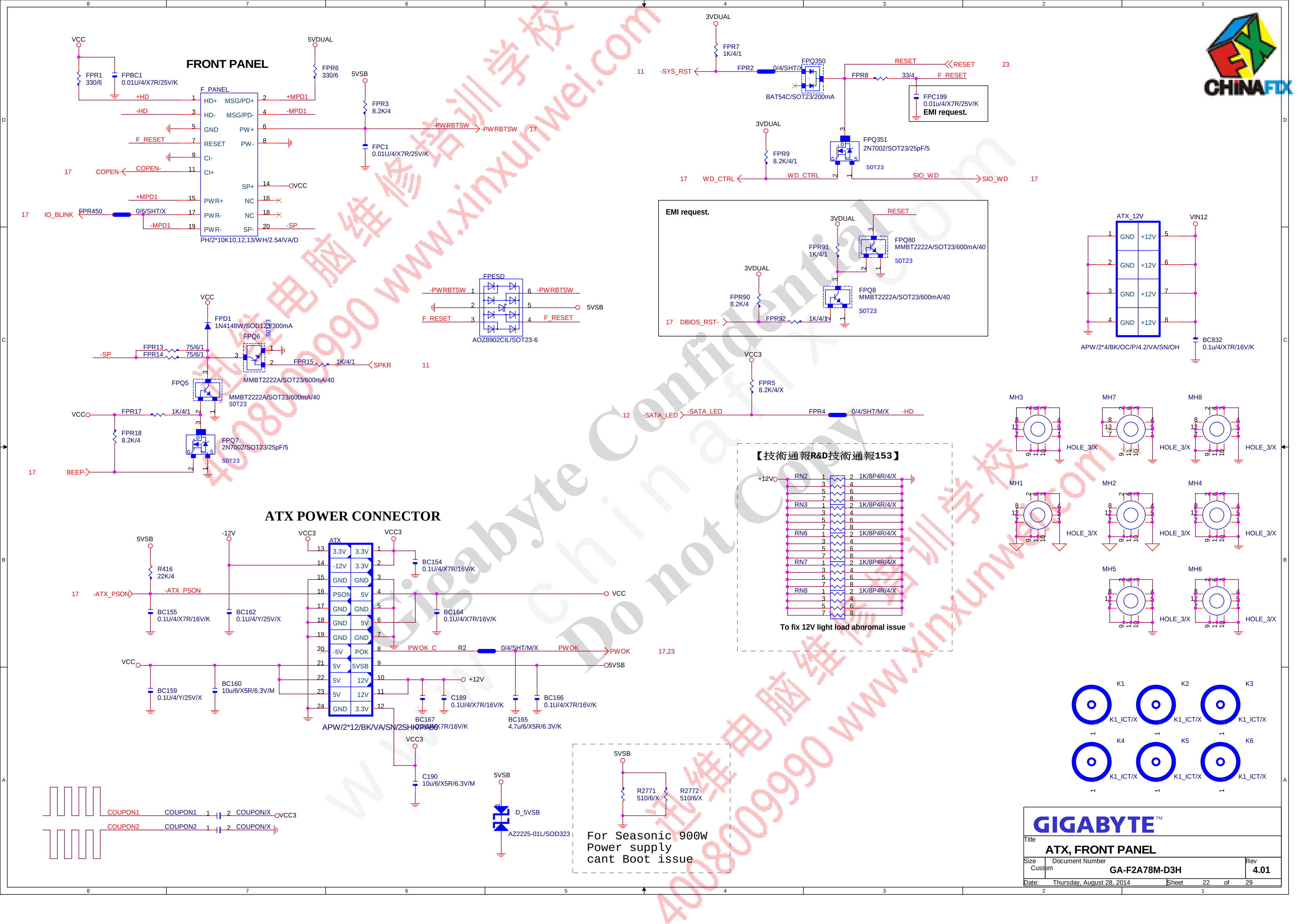
FRONT PANEL
F_PANEL
HD+ MSG/PD+
HD- MSG/PD-
GND PW+
RESET PW-
CI-
CI+
SP+
PWR+ NC
PWR- NC
PWR- SP-
PH/2*10K10,12,13/WH/2.54/VA/D
FPR1 330/6
FPBC1 0.01U/4/X7R/25V/K
FPR6 330/6
FPR3 8.2K/4
FPC1 0.01U/4/X7R/25V/K
-PWRBTSW
COPEN-
IO_BLINK
FPR450 0/6/SHT/X
3VDUAL
FPR7 1K/4/1
-SYS_RST
FPR2 0/4/SHT/X
FPQ350
BAT54C/SOT23/200mA
RESET
FPR8 33/4
F_RESET
FPC199 0.01U/4/X7R/25V/K
EMI request.
FPQ351 2N7002/SOT23/25pF/5
FPR9 8.2K/4/1
WD_CTRL
SIO_WD
FPR91 1K/4/1
FPQ80 MMBT2222A/SOT23/600mA/40
FPR90 8.2K/4
FPQ8 MMBT2222A/SOT23/600mA/40
DBIOS_RST-
FPR92 1K/4/1
FPESD
AOZ8902CIL/SOT23-6
FPD1 1N4148W/SOD123/300mA
FPQ6 MMBT2222A/SOT23/600mA/40
FPR13 75/6/1
FPR14 75/6/1
FPR15 1K/4/1
SPKR
FPQ5 MMBT2222A/SOT23/600mA/40
FPR17 1K/4/1
FPR18 8.2K/4
FPQ7 2N7002/SOT23/25pF/5
BEEP-
VCC3
FPR5 8.2K/4/X
-SATA_LED
FPR4 0/4/SHT/M/X
ATX_12V
APW/2*4/BK/OC/P/4.2/VA/SN/OH
BC832 0.1u/4/X7R/16V/K
VIN12
MH1 MH2 MH3 MH4 MH5 MH6 MH7 MH8
HOLE_3/X
【技術通報R&D技術通報153】
RN2 RN3 RN6 RN7 RN8 1K/8P4R/4/X
To fix 12V light load abnromal issue
ATX POWER CONNECTOR
ATX
APW/2*12/BK/VA/SN/2SH/KP/A66
R416 22K/4
-ATX_PSON
BC155 0.1U/4/X7R/16V/K
BC162 0.1U/4/Y/25V/X
BC154 0.1U/4/X7R/16V/K
BC164 0.1U/4/X7R/16V/K
PWOK_C
R2 0/4/SHT/M/X
PWOK
BC159 0.1U/4/Y/25V/X
BC160 10u/6/X5R/6.3V/M
C189 0.1U/4/X7R/16V/K
BC166 0.1U/4/X7R/16V/K
BC167
BC165 4.7u/6/X5R/6.3V/K
C190 10u/6/X5R/6.3V/M
COUPON1
COUPON2
COUPON/X
D_5VSB
AZ2225-01L/SOD323
R2771 510/6/X
R2772 510/6/X
For Seasonic 900W
Power supply
cant Boot issue
K1 K2 K3 K4 K5 K6
K1_ICT/X
GIGABYTE
Title
ATX, FRONT PANEL
Size Custom
Document Number
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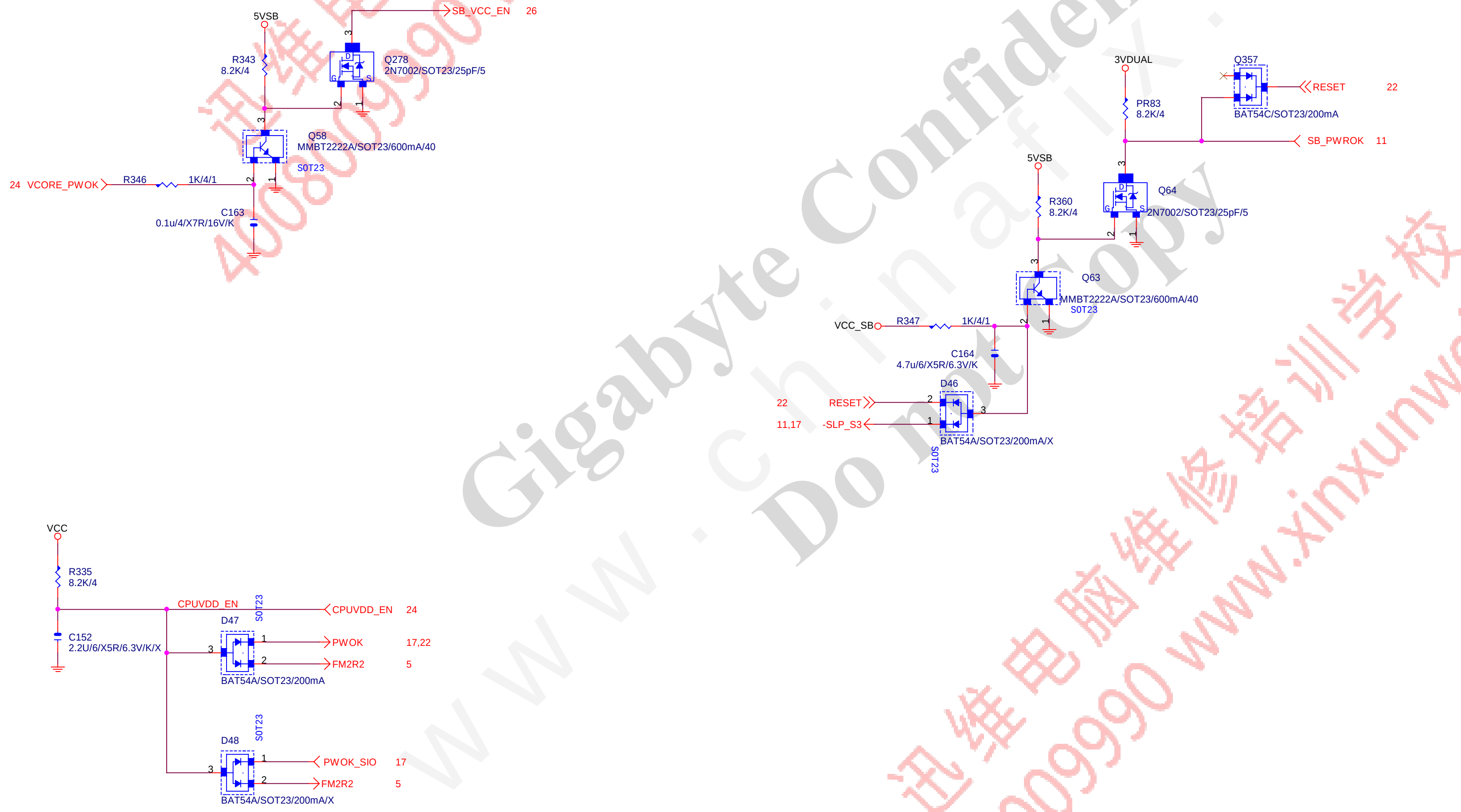

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Title: POWER SEQUENCE

Size	Document Number	Rev
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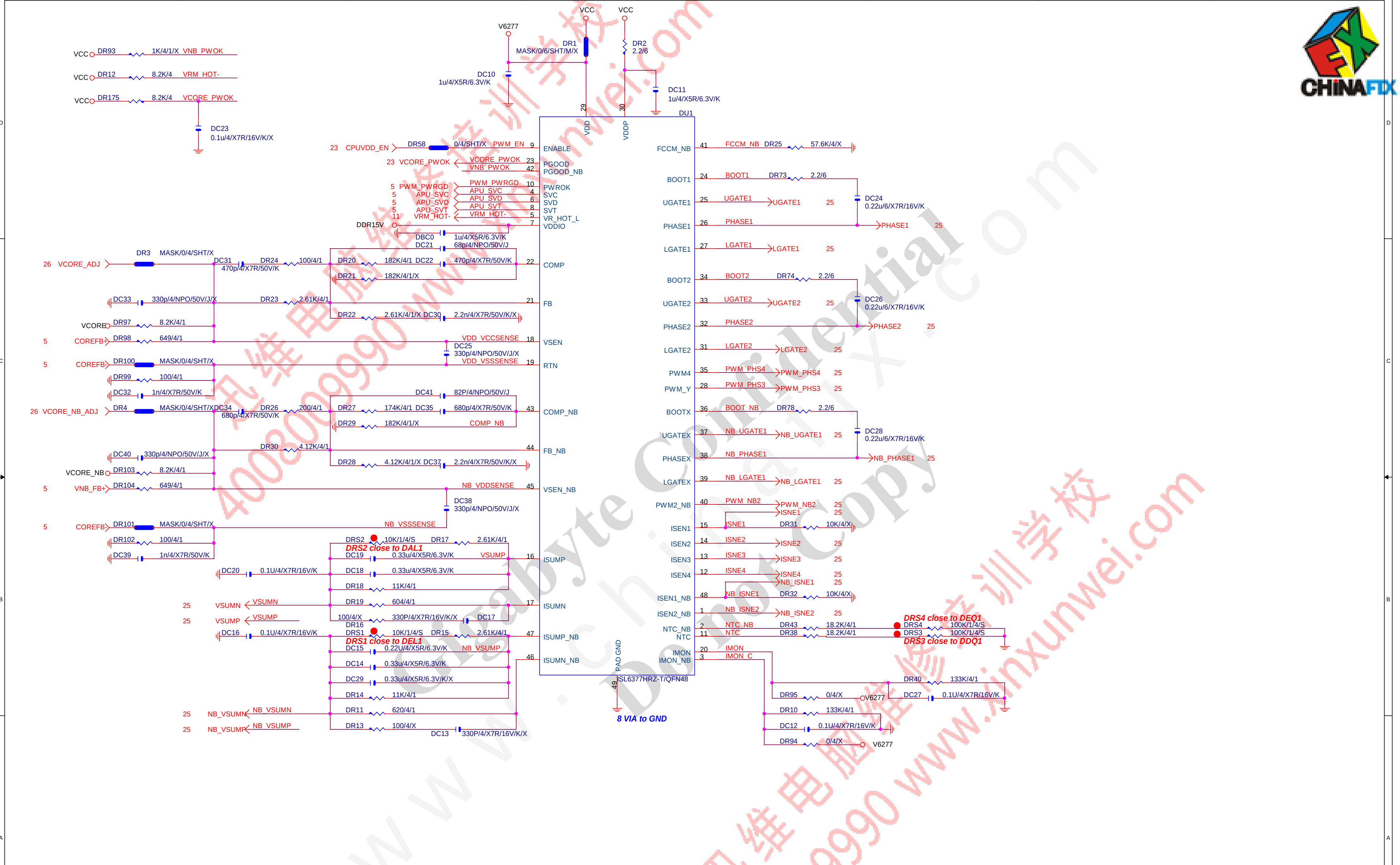
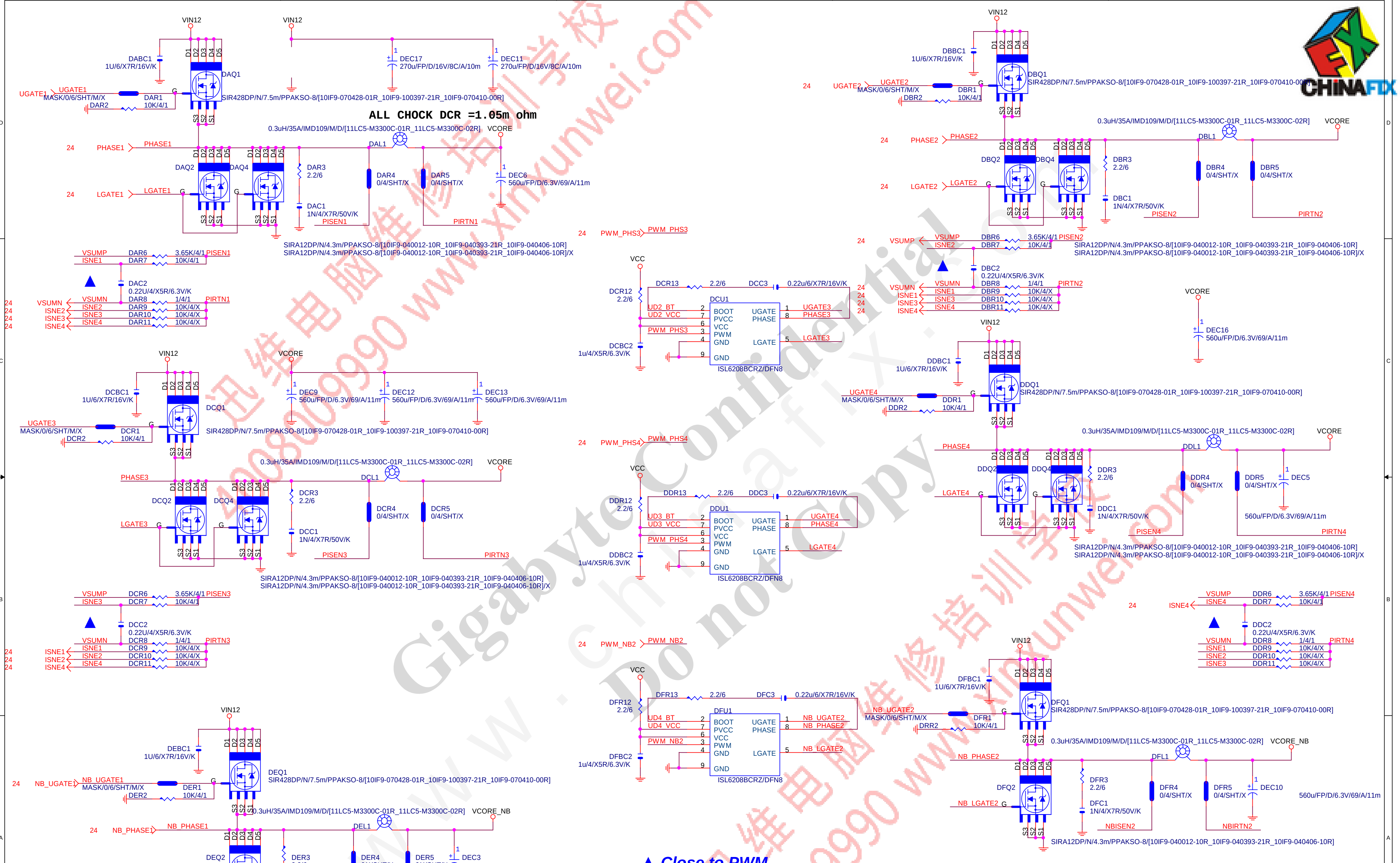


GIGABYTE™

Title: VCORE (PWM ISL6377+ISL6208B)

Size	Document Number	Rev
Custom	GA-F2A78M-D3H	4.01

Date: Thursday, August 28, 2014 Sheet 24 of 29

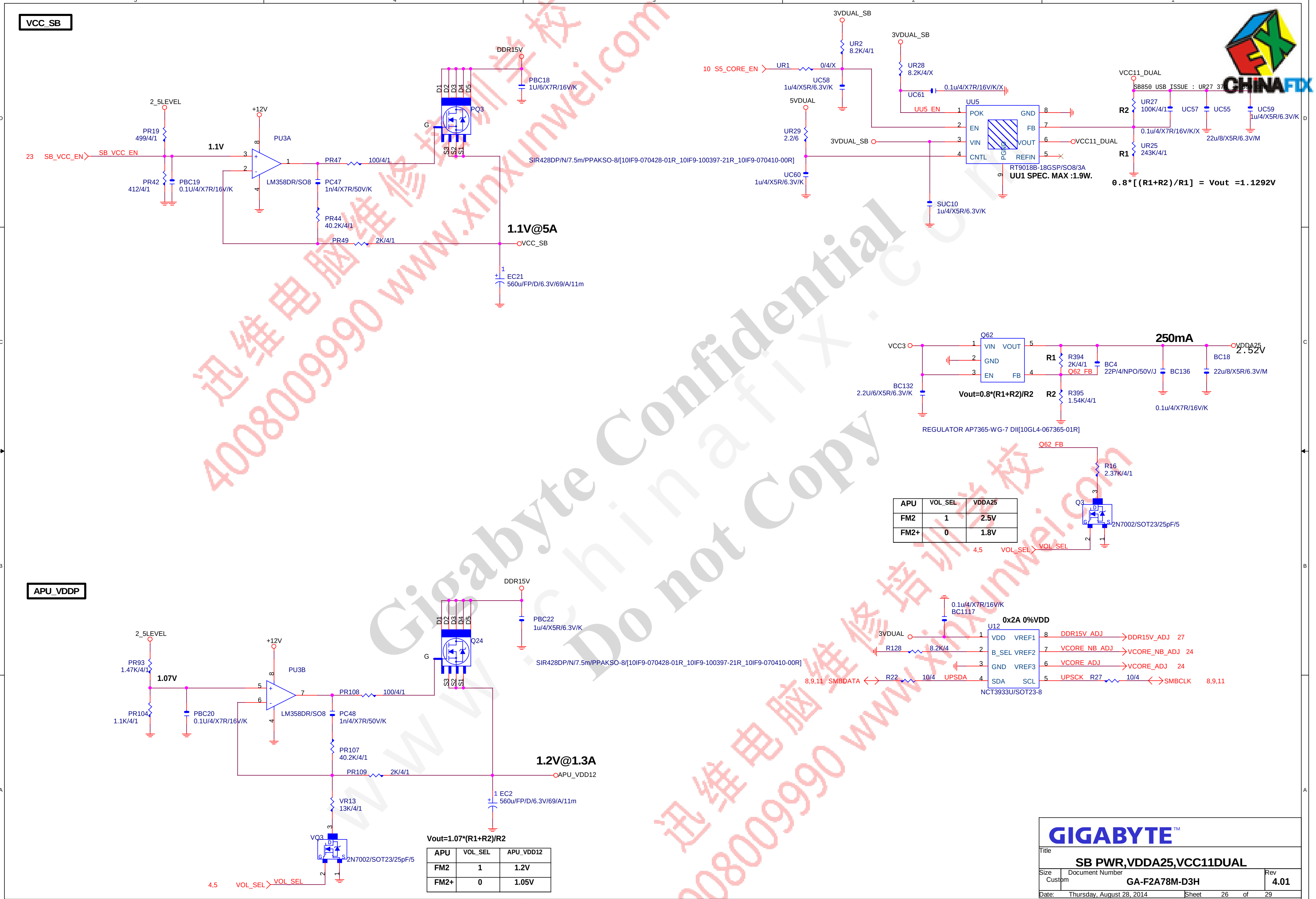


GIGABYTE

Title: VCORE MOS

Size	Document Number	Rev
Custom	GA-F2A78M-D3H	4.01

Date: Thursday, August 28, 2014 Sheet 25 of 29



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

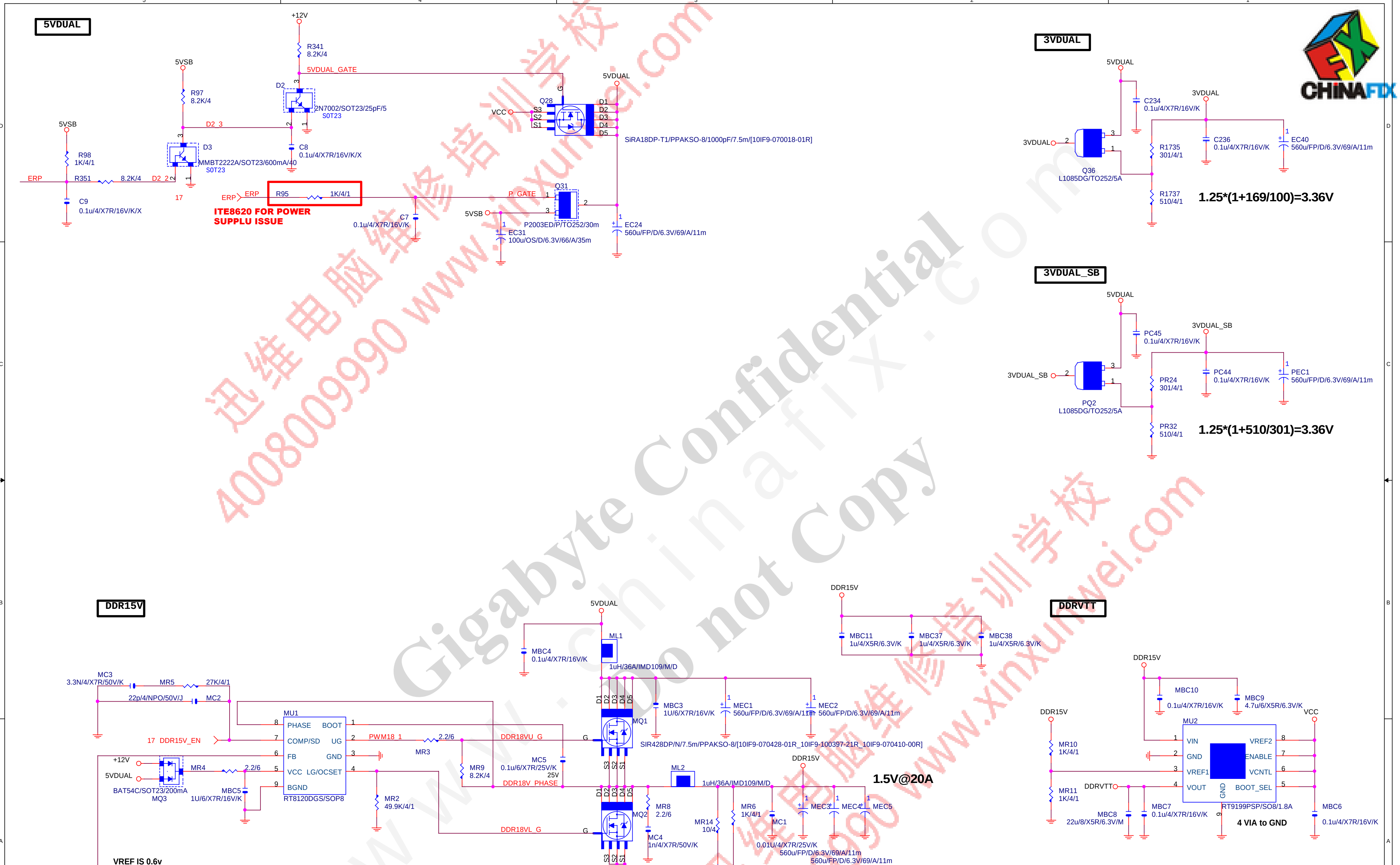
APU	VOL_SEL	APU_VDD12
FM2	1	1.2V
FM2+	0	1.05V

GIGABYTE™

Title: SB PWR,VDDA25,VCC11DUAL

Size: Custom | Document Number: GA-F2A78M-D3H | Rev: 4.01

Date: Thursday, August 28, 2014 | Sheet 26 of 29

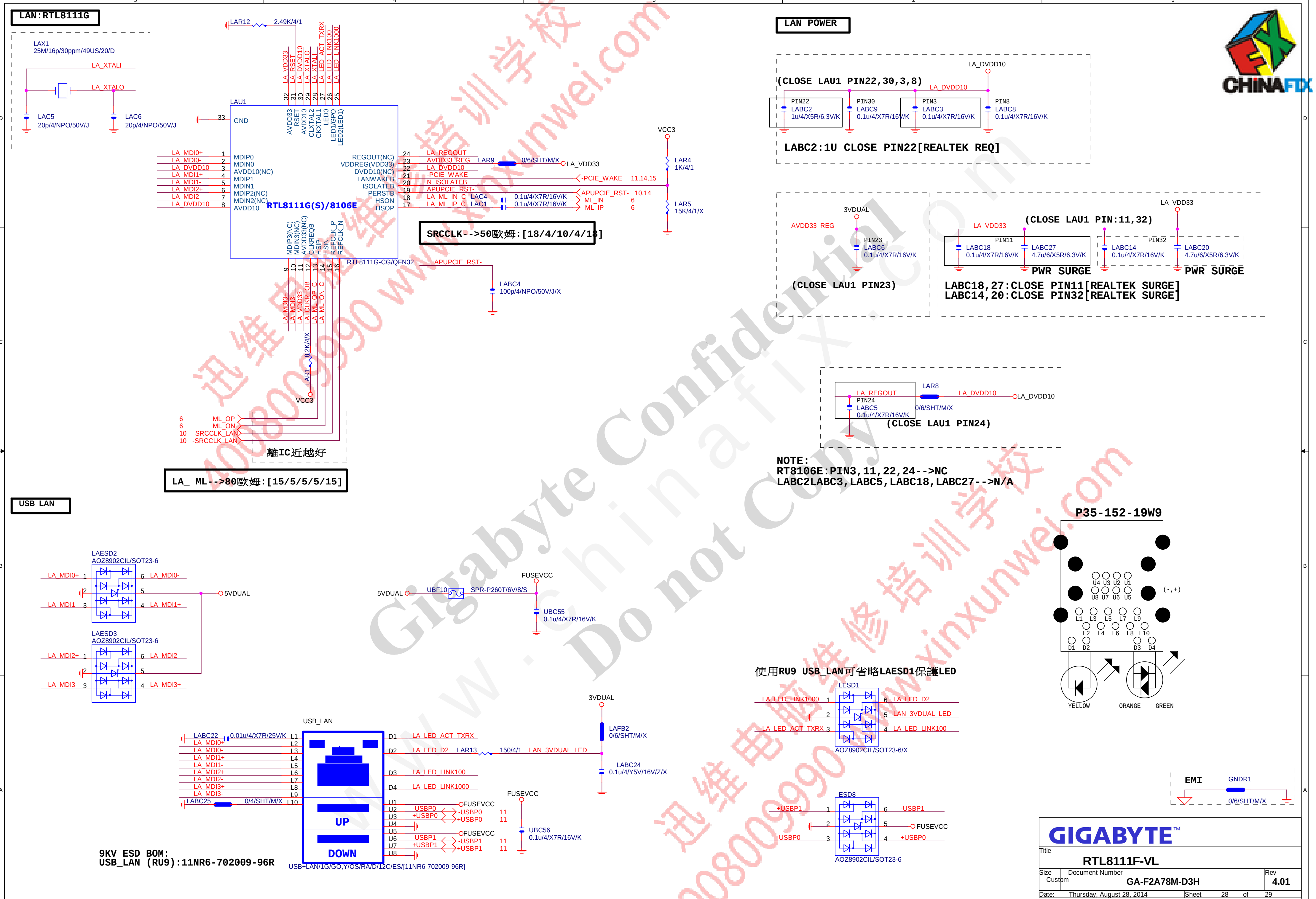


GIGABYTE™

Title: DDR PWR, 5VDUAL, ERP

Size	Document Number	Rev
Custom	GA-F2A78M-D3H	4.01

Date: Thursday, August 28, 2014 Sheet 27 of 29

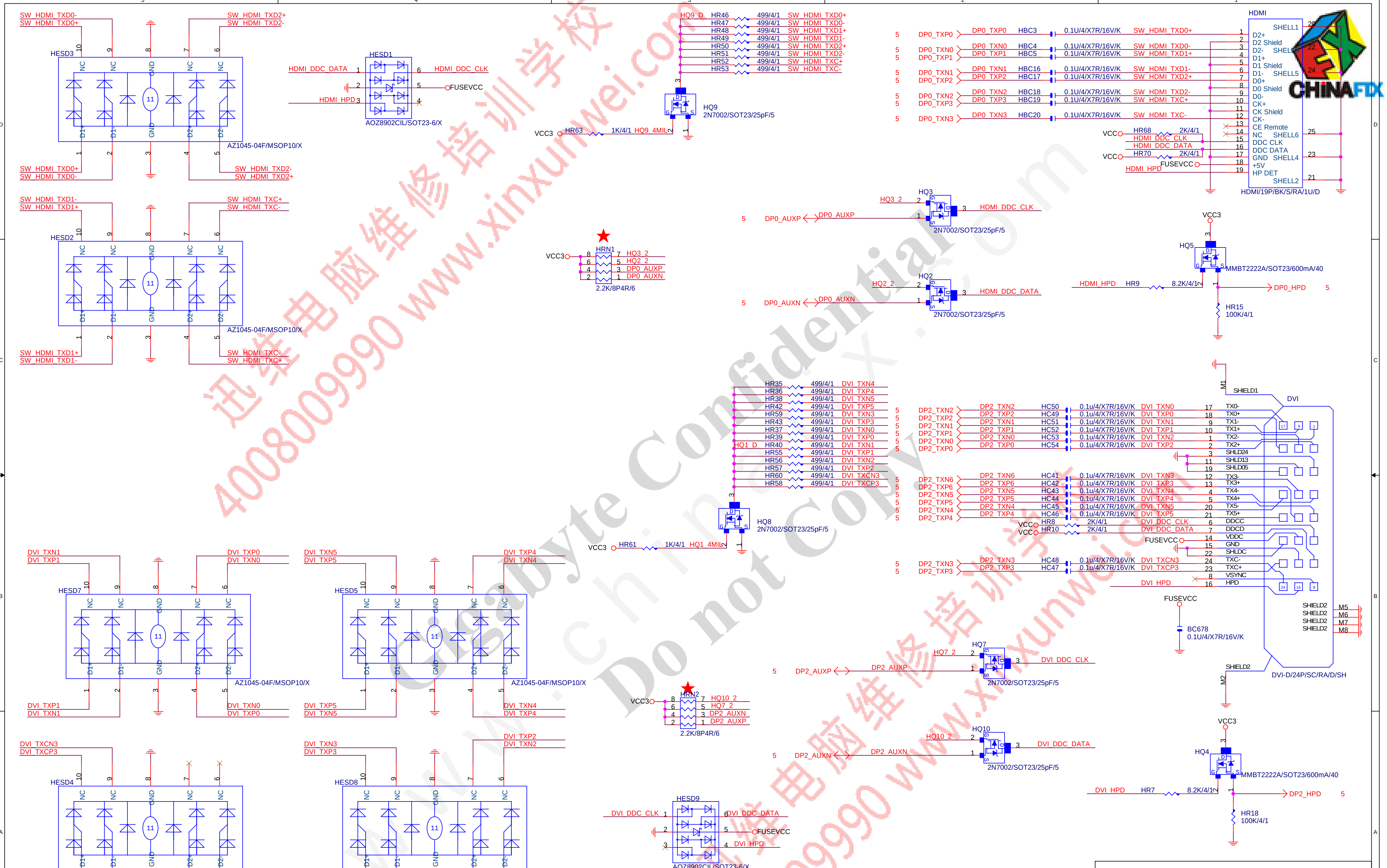


GIGABYTE

Title: RTL8111F-VL

Size: Custom | Document Number: GA-F2A78M-D3H | Rev: 4.01

Date: Thursday, August 28, 2014 | Sheet 28 of 29



GIGABYTE

Title: HDMI,DVI

Size	Document Number	Rev
Custom	GA-F2A78M-D3H	4.01

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