GA-F2A78M-D3H

Revision : 3.0

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

Model Name:GA-F2A78M-D3H

Version: 3.0

P-Code: U13126-0

Component value change history

Date	Change Item		Reason
2012.05.25	0.1 New BOM Release.	PCB: 0.1	Modify from GA-A75M-UD2H Rev2.0
2012.07.04	1.0A BOM Release.	PCB: 1.0	PM change spec to 4+2 phase ,ISL6377
2012.08.10	1.0B BOM Release.	PCB: 1.01	Colay HDMI_SPDIF connector for 清庫存 ,Mask SATA3_6/7 connector
2012.08.23	1.0C BOM Release.	PCB: 1.01	Change U1 A75 Rev.A13 => Rev.A14 ,轉 P-BOM
2012.09.12	1.0A BOM Release.	PCB: 1.0	Change A85X chipset ,support 8 SATA port
2012.09.19	1.0B BOM Release.	PCB: 1.01	Mask OPTICAL connector
2012.09.21	1.0G BOM Release.	PCB: 1.01	Update BIOS size 32Mb to 64Mb for RAID5 raidrom use
2012.10.25	1.1A P-BOM Release.	PCB: 1.1	HDMI_SPDIF Connector 庫存清完 , 改回單獨 HDMI & OPTICAL connector
2012.12.18	1.1B MP BOM Release.	PCB:1.1	USB_LAN (RU9):11NR6-702009-96R ,使用RU9 USB_LAN可省略LAESD1保護LED
2013.04.11	1.2A E- BOM Release.	PCB:1.2	Update FM2CPU footprint ,改咖啡黑PCB ,slot/connector配色
2013.04.29	1.2B P- BOM Release.	PCB:1.2	Fixed 串接兩層 PS/2 KVM switch issue ,R51,R52 改 8.2k
2013.06.26	3.0A E-BOM Release.	PCB:3.0	Modify Colay FM2+ ,IT8620 ,FAN NCT3941S-A
2013.07.03	3.0A E-BOM Release.	PCB:3.0	Modify from GA-F2A88XM-D3H Rev3.0 Change A75 chipset ,Mask SATA3_6/7 connector
2013.09.24	3.0B P-BOM Release.	PCB:3.01	CPU_FAN change to White color ,PCIEx16 cap change to 0.22uF , modify VDDA25 分壓阻值 ,modify DDR15V 分壓阻值
2013.11.18	3.0A E-BOM Release.	PCB:3.0	Modify from GA-F2A75M-D3H Rev3.01 Change U1 A78 chipset ,CU1 887-VD2 加強版
2013.11.29	3.0A P-BOM Release.	PCB:3.0	轉P-BOM ,Add PCI slot second-source

Circuit or PCB layout change for next version

Date	Change Item	Reason
2012.05.24	Rev 0.1 Gerber-out	Modify from GA-A75M-UD2H Rev2.0
2012.07.03	Rev 1.0 Gerber-out	PM change spec to 4+2 phase ,ISL6377
2012.08.09	Rev 1.01 Gerber-out	Colay HDMI_SPDIF connector for 清庫存 ,Mask SATA3_6/7 connector
2012.09.11	Rev 1.0 Gerber-out	Change A85X chipset ,support 8 SATA port
2012.09.18	Rev 1.01 Gerber-out	Mask OPTICAL connector
2012.10.25	Rev 1.1 Gerber-out	HDMI_SPDIF Connector 庫存清完 , 改回單獨 HDMI & OPTICAL connector
2013.04.10	Rev 1.2 Gerber-out	Update FM2CPU footprint ,改咖啡黑PCB ,slot/connector配色 , DDR layout 貼 F2A85X-UP4-R102 走線
2013.06.25	Rev 3.0 Gerber-out	Modify Colay FM2+ ,IT8620 ,FAN NCT3941S-A
2013.07.02	Rev 3.0 Gerber-out	Modify from GA-F2A88XM-D3H Rev3.0 Change A75 chipset ,Mask SATA3_6/7 connector
2013.09.23	Rev 3.01 Gerber-out	Change SIO GP25 ,VDDSPD colay fuse ,PCB 文字面修改
2013.11.15	Rev 3.0 Gerber-out	Modify from GA-F2A75M-D3H Rev3.01 Only Modify PCB silkscreen

CHINAFIX

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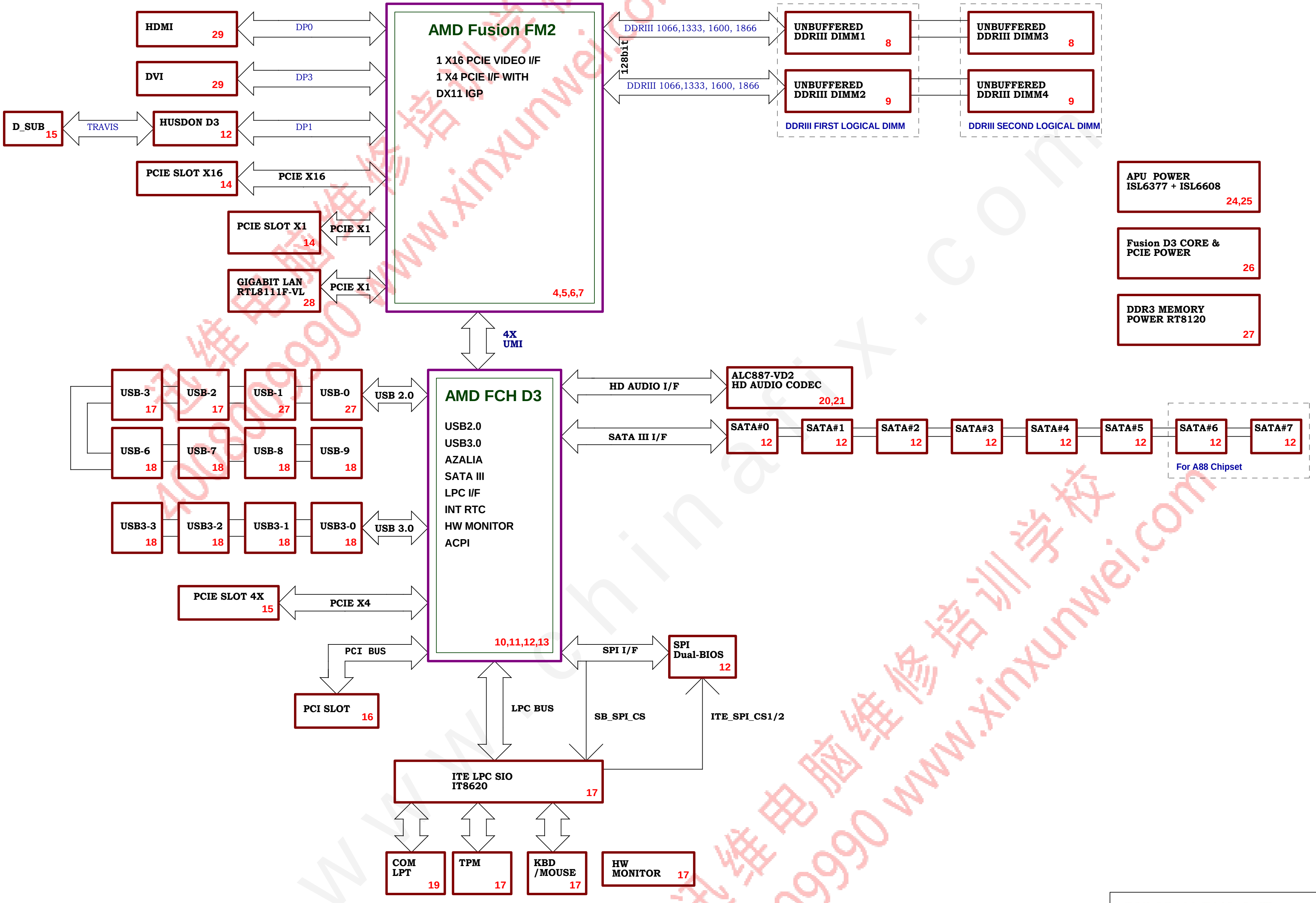
Title: BOM & PCB HISTORY		
Size: Custom	Document Number: GA-F2A78M-D3H	Rev: 3.0
Date: Friday, November 29, 2013	Sheet 2 of 29	



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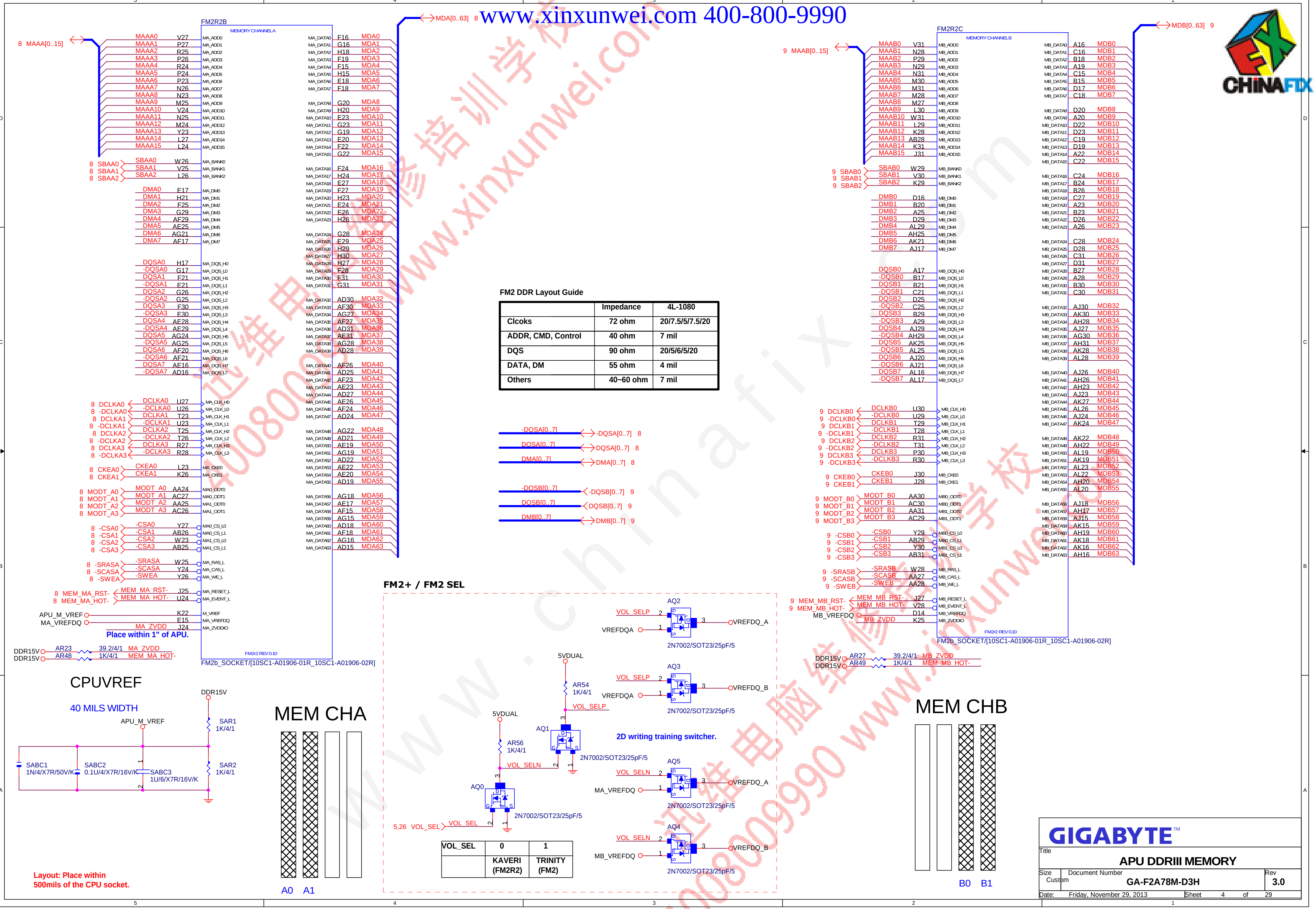
Title: BLOCK DIAGRAM

Size	Document Number	Rev
Custom	GA-F2A78M-D3H	3.0

Date: Friday, November 29, 2013 | 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

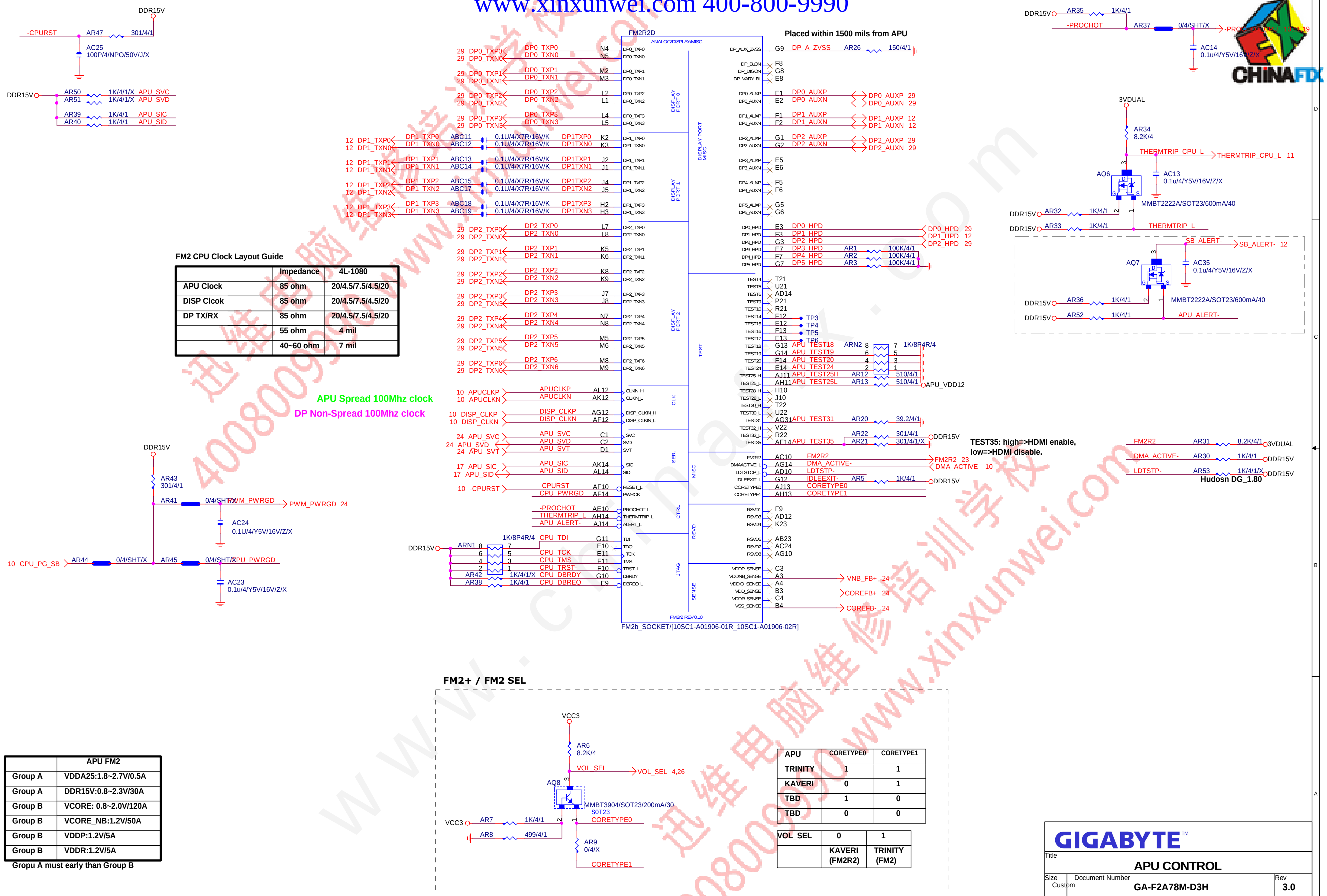
VOL_SEL	0	1
	KAVERI (FM2R2)	TRINITY (FM2)

GIGABYTE

Title: APU DDRIII MEMORY

Size: Custom | Document Number: GA-F2A78M-D3H | Rev: 3.0

Date: Friday, November 29, 2013 | Sheet 4 of 29



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

	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

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

VOL_SEL	0	1
	KAVERI (FM2R2)	TRINITY (FM2)

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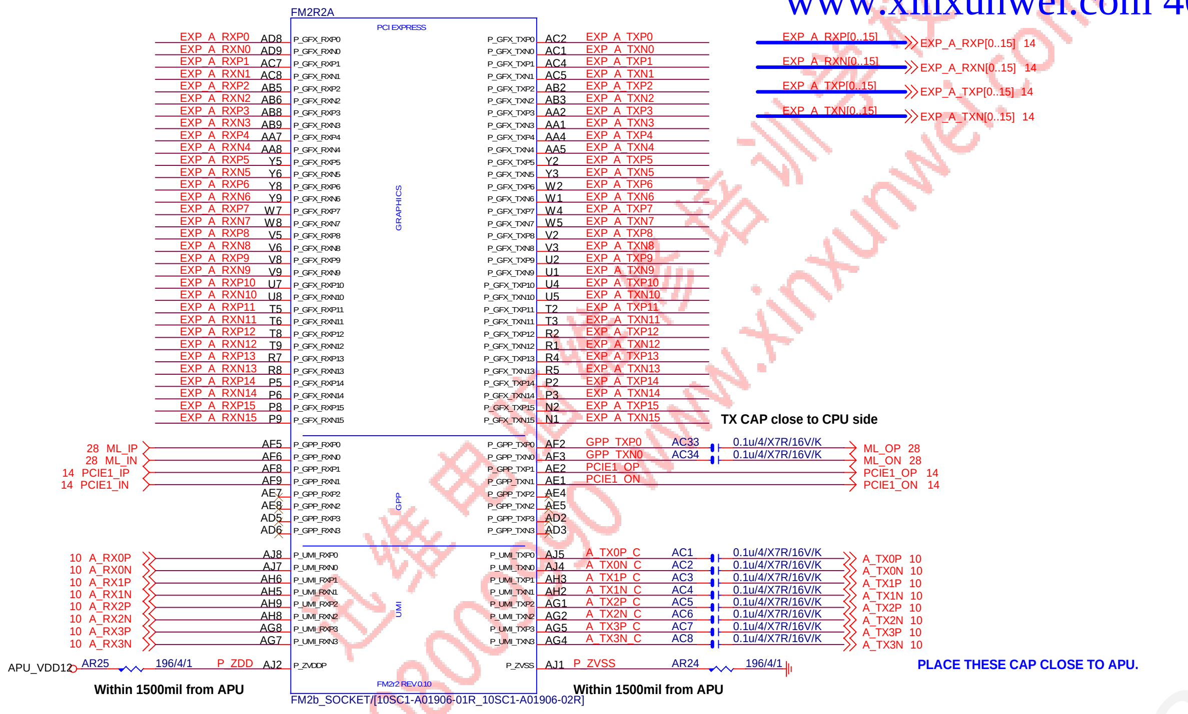
Title: APU CONTROL

Size: Custom | Document Number: GA-F2A78M-D3H | Rev: 3.0

Date: Friday, November 29, 2013 | Sheet 5 of 29



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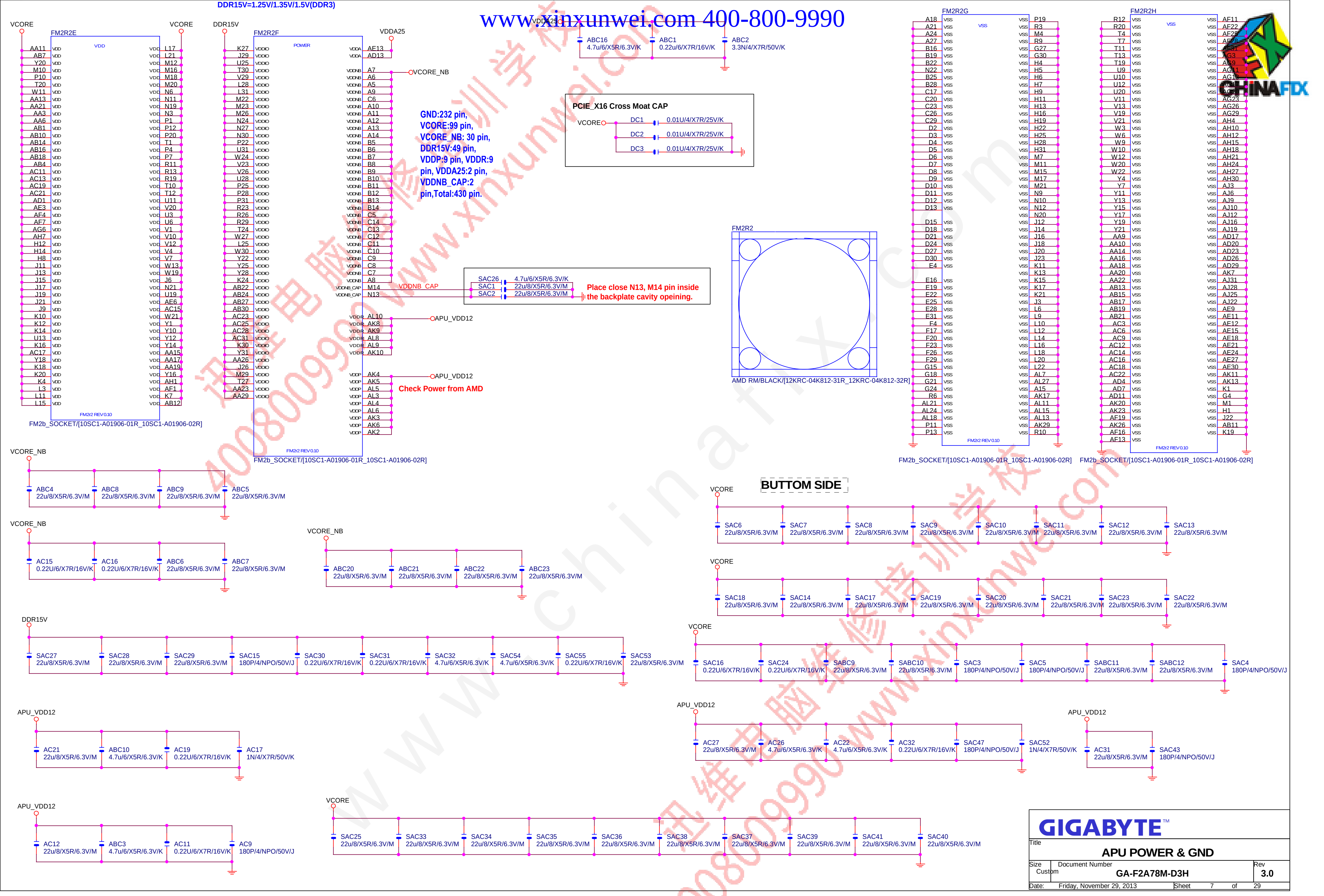
Title	APU GFX, GPP, UMI I/F	
Size: Custom	Document Number: GA-F2A78M-D3H	Rev: 3.0
Date: Friday, November 29, 2013	Sheet 6 of 29	



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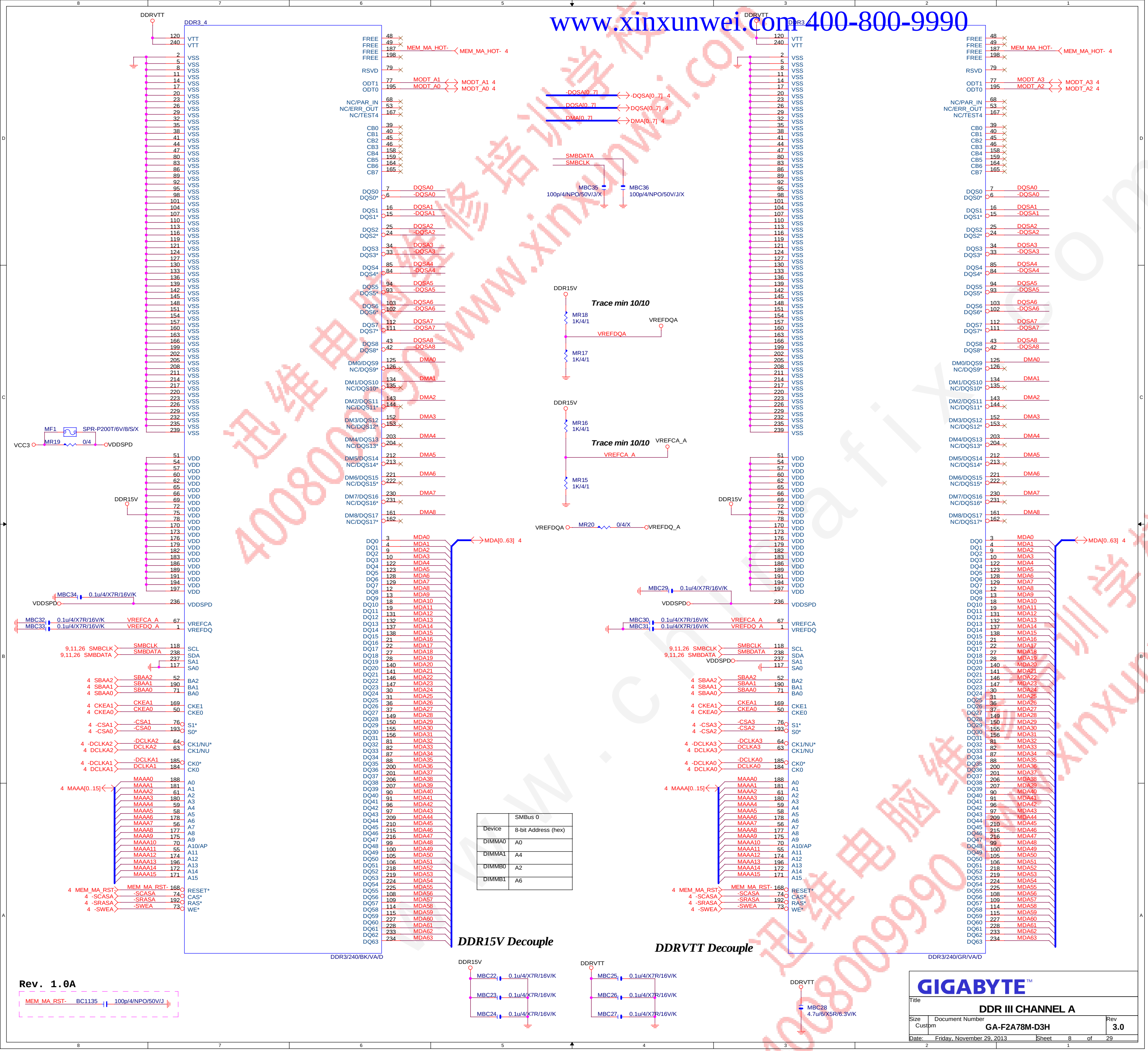
Title: APU POWER & GND

Size: Custom | Document Number: GA-F2A78M-D3H | Rev: 3.0

Date: Friday, November 29, 2013 | Sheet 7 of 29



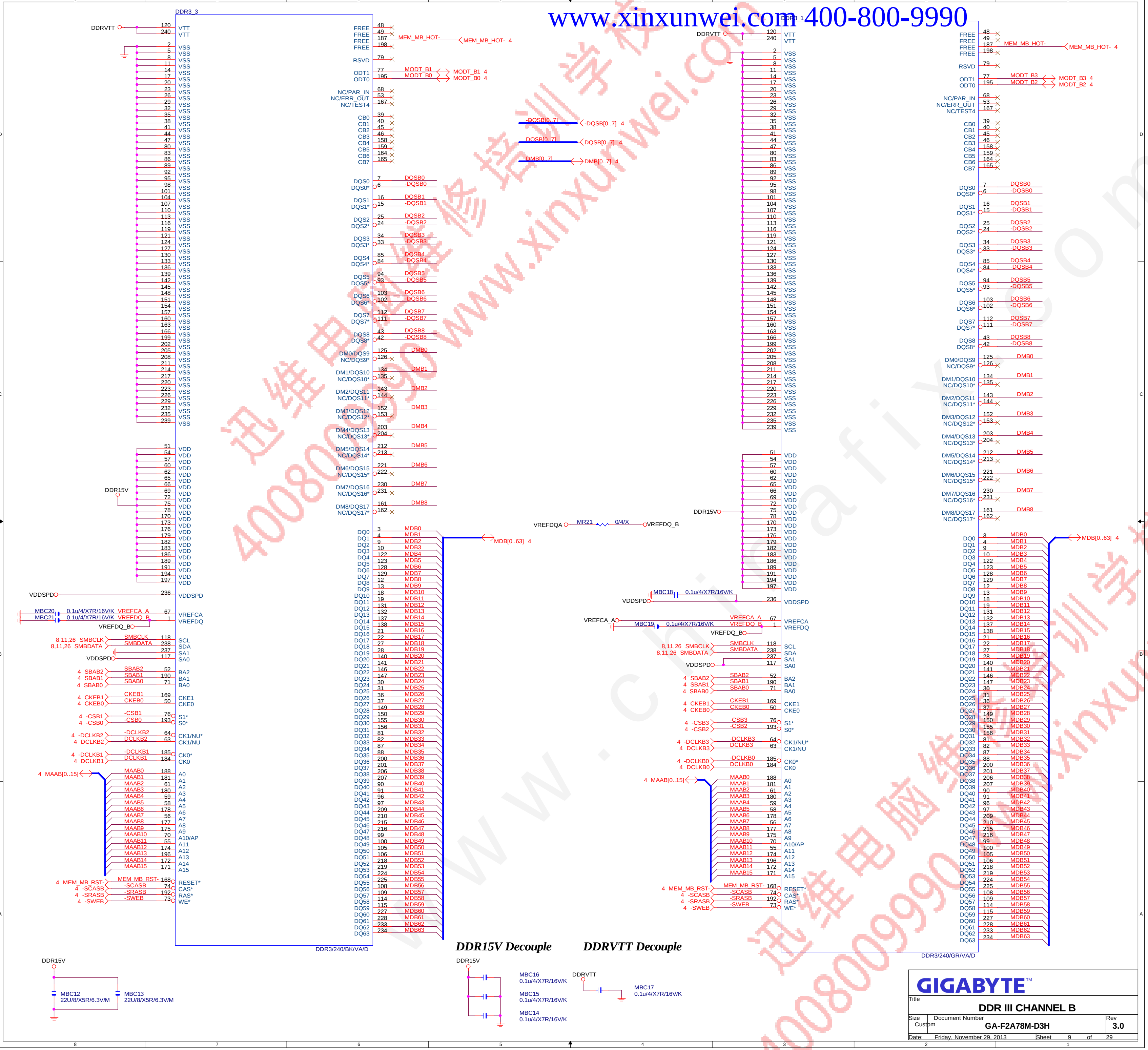
	SMBus 0
Device	8-bit Address (hex)
DIMMA0	A0
DIMMA1	A4
DIMMB0	A2
DIMMB1	A6

GIGABYTE

Title: DDR III CHANNEL A

Size	Document Number	Rev
Custom	GA-F2A78M-D3H	3.0

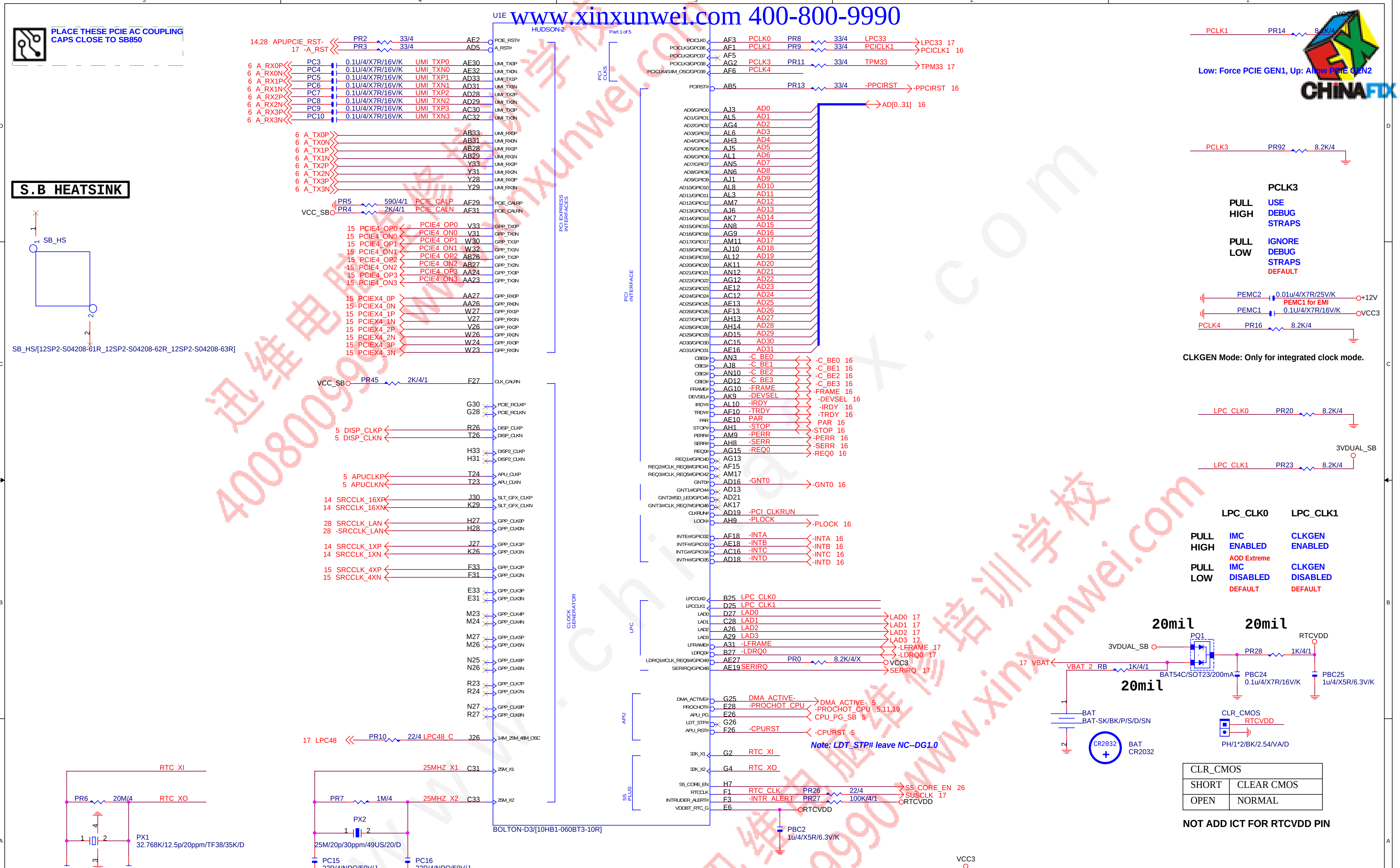
Date: Friday, November 29, 2013 Sheet 8 of 29



Title: DDR III CHANNEL B

Size: Custom | Document Number: GA-F2A78M-D3H | Rev: 3.0

Date: Friday, November 29, 2013 | Sheet 9 of 29



CLR_CMOS	
SHORT	CLEAR CMOS
OPEN	NORMAL

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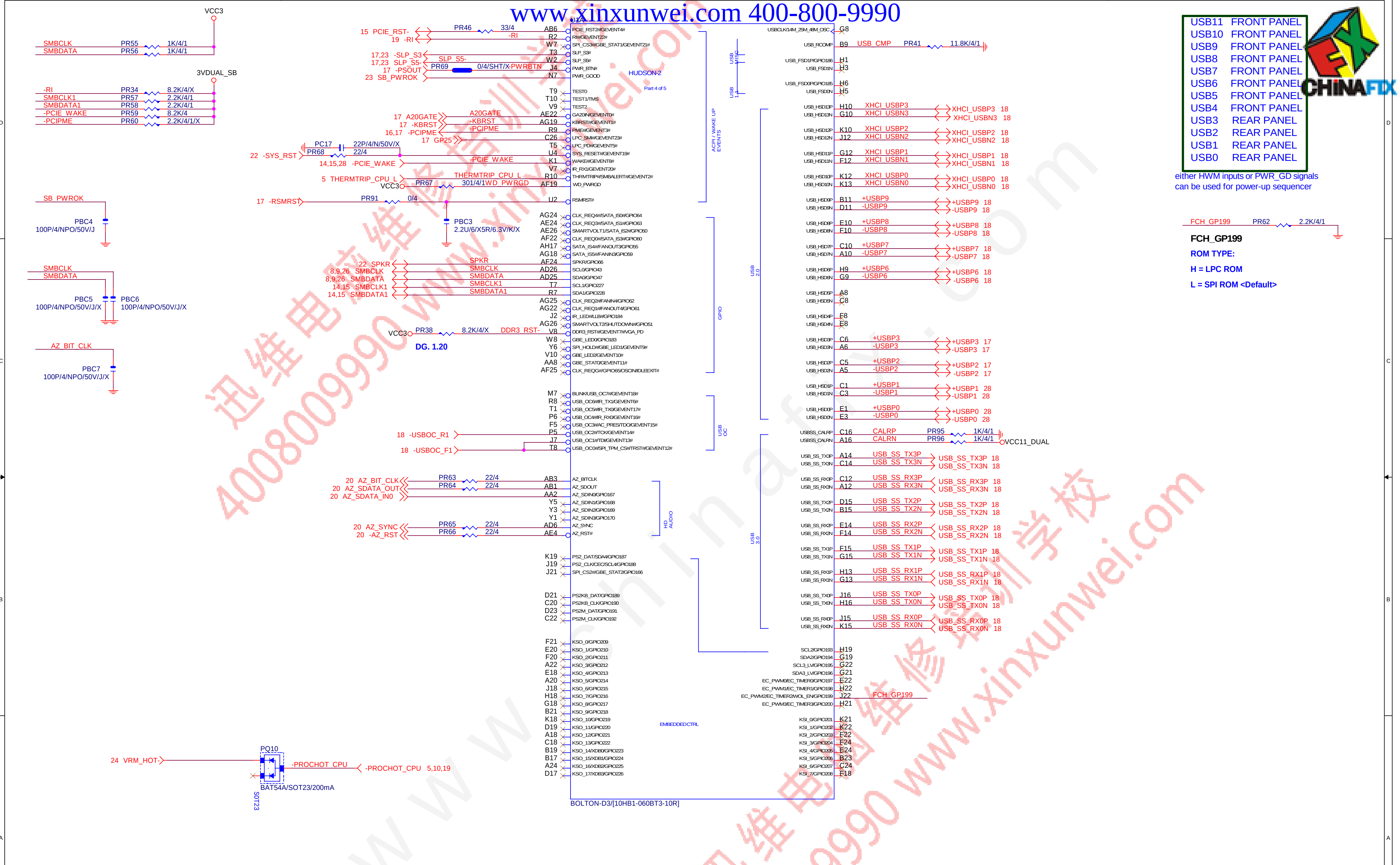
Title: HUDSON D4 PCIE/PCI/CPU/LPC

Size: Custom | Document Number: GA-F2A78M-D3H | Rev: 3.0

Date: Friday, November 29, 2013 | Sheet 10 of 29

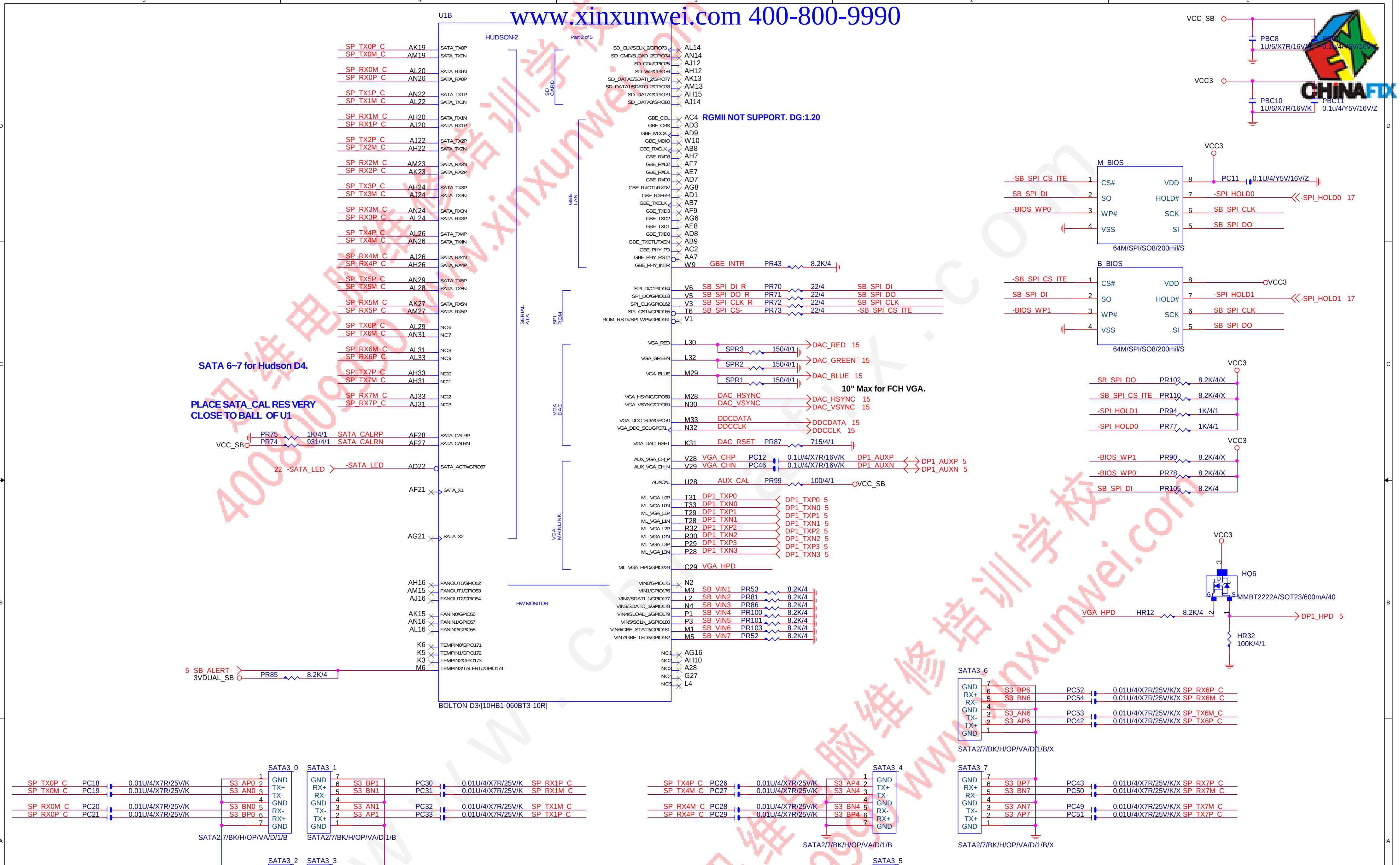


GIGABYTE™

Title: HUDSON D4 ACPI/USB/GPIO/AUDIO

Size	Document Number	Rev
Custom	GA-F2A78M-D3H	3.0

Date: Friday, November 29, 2013 Sheet 11 of 29

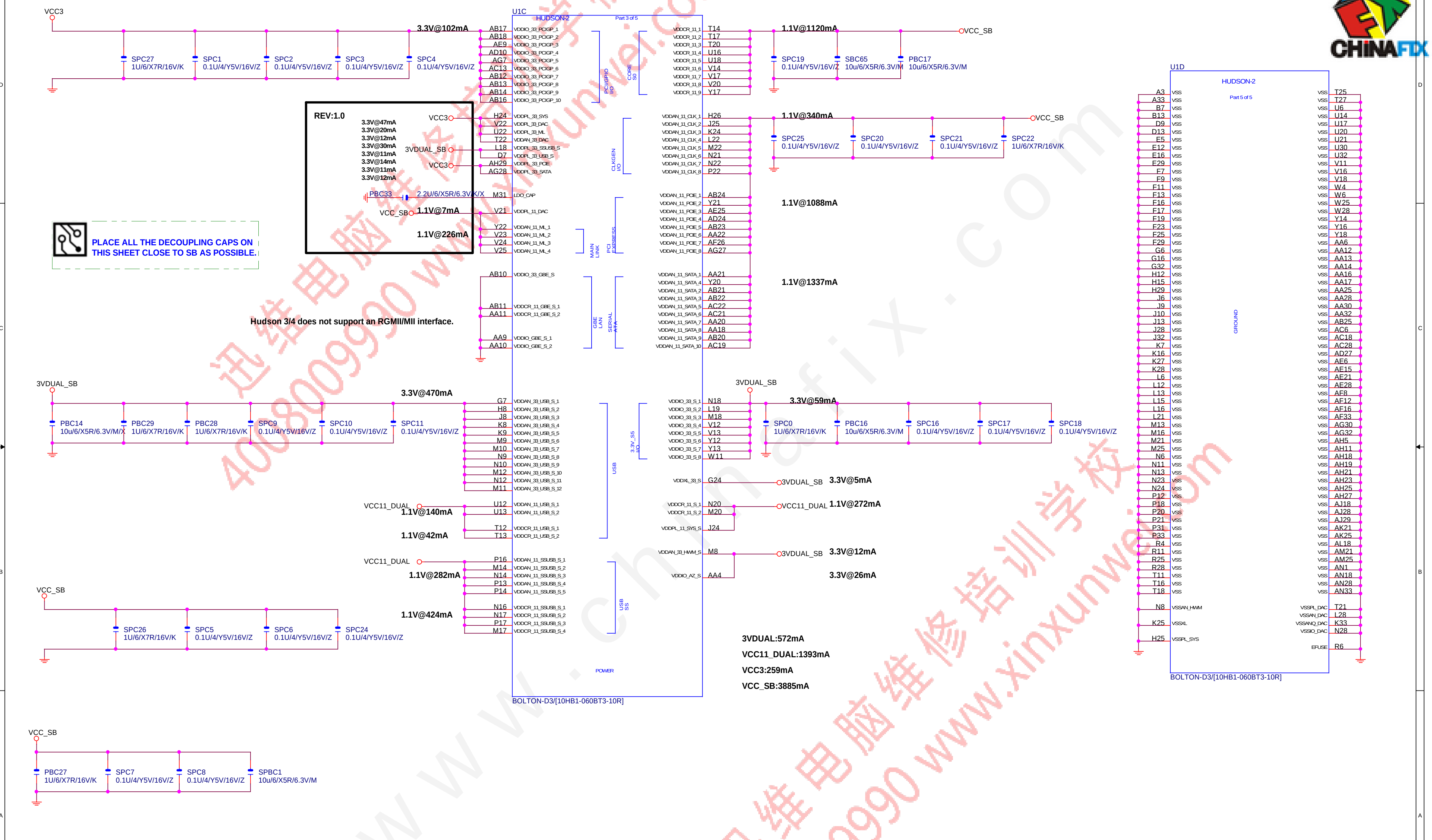


GIGABYTE

Title: HUDSON D4 SATA/VGA

Size	Document Number	Rev
Custom	GA-F2A78M-D3H	3.0

Date: Friday, November 29, 2013 Sheet 12 of 29



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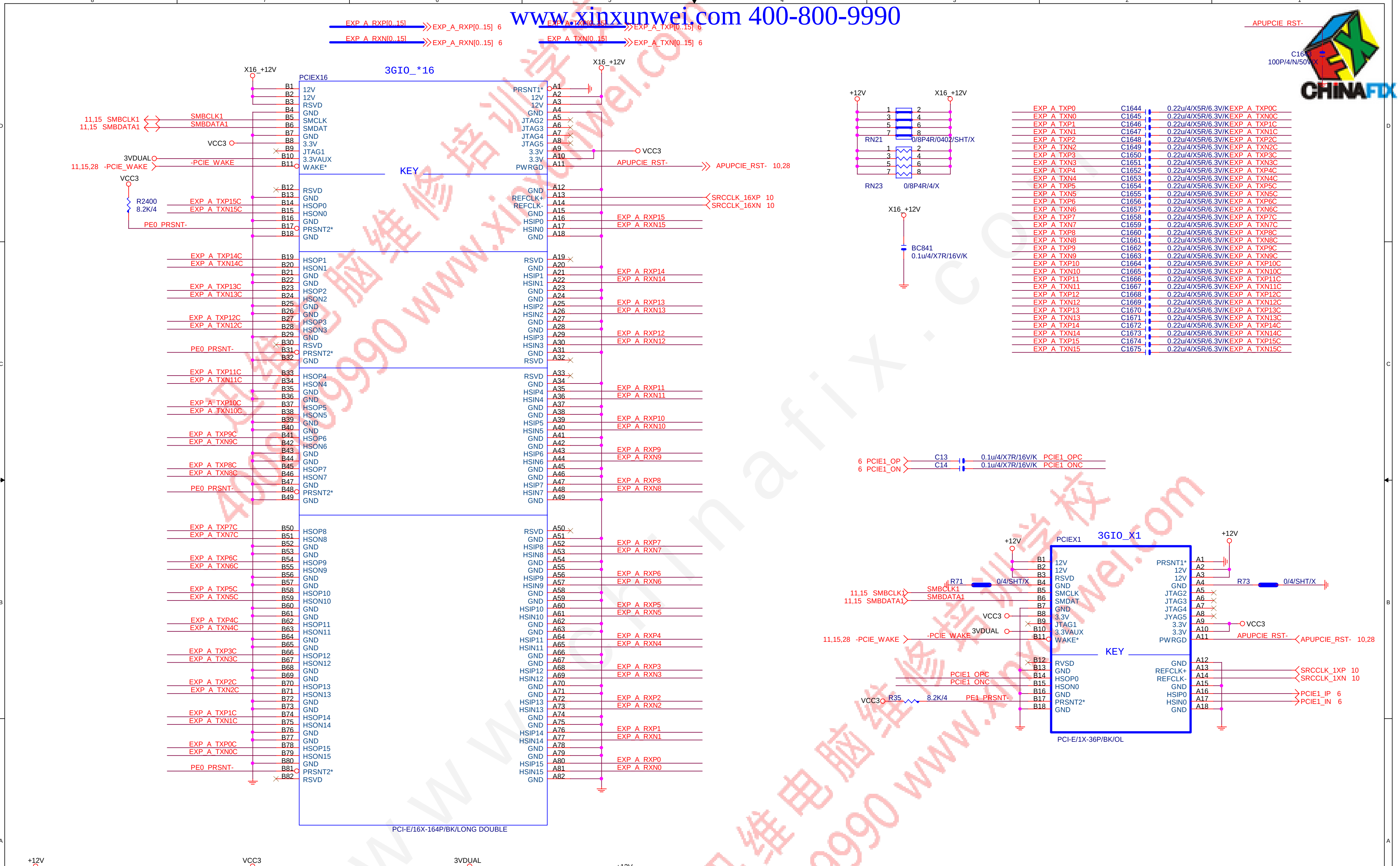
Title: HUDSON D4 PWR & GND

Size	Document Number	Rev
Custom	GA-F2A78M-D3H	3.0

Date: Friday, November 29, 2013 | Sheet 13 of 29



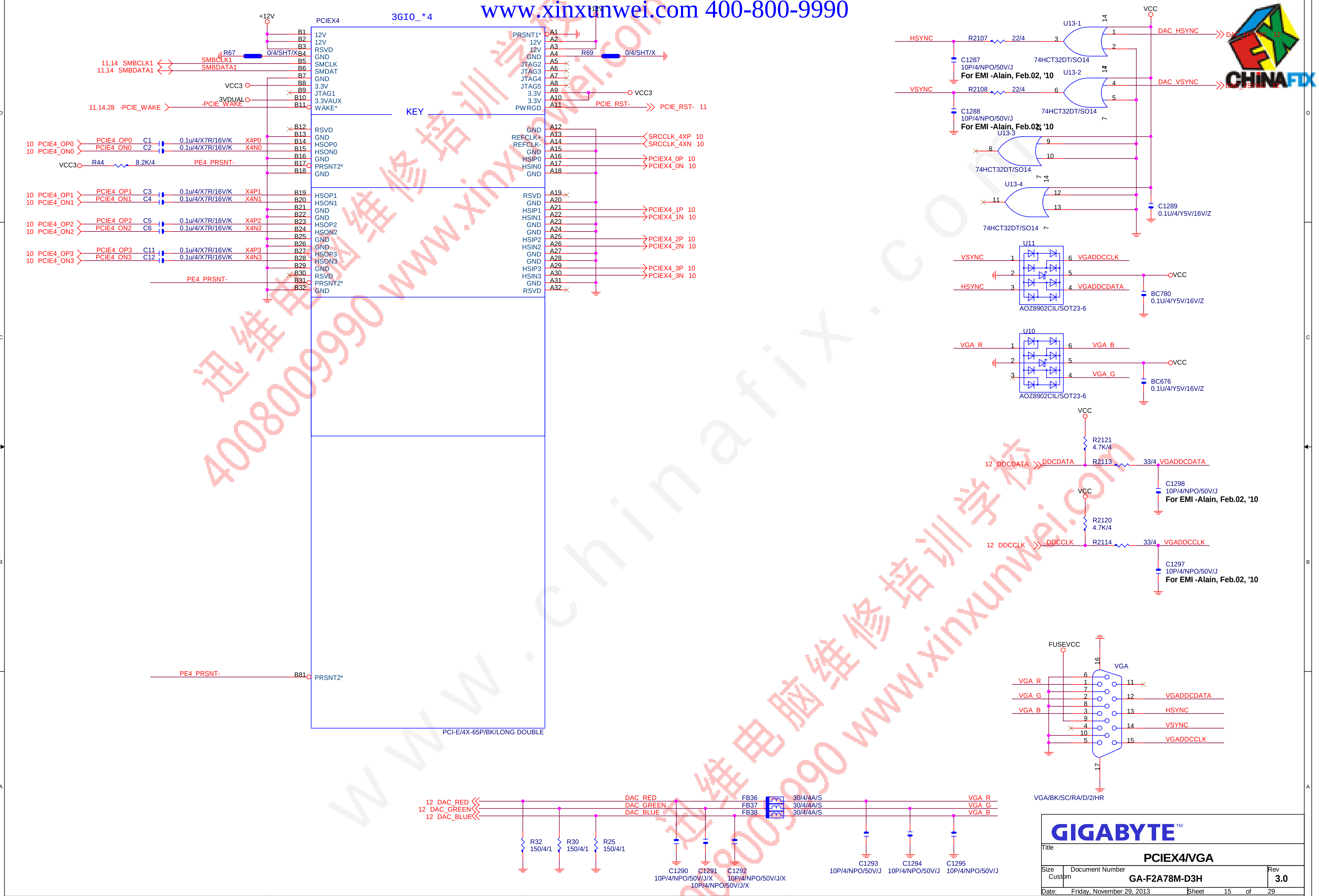
GIGABYTE

Title

PCI EXPRESS X 16 ,X1

Size	Document Number	Rev
Custom	GA-F2A78M-D3H	3.0

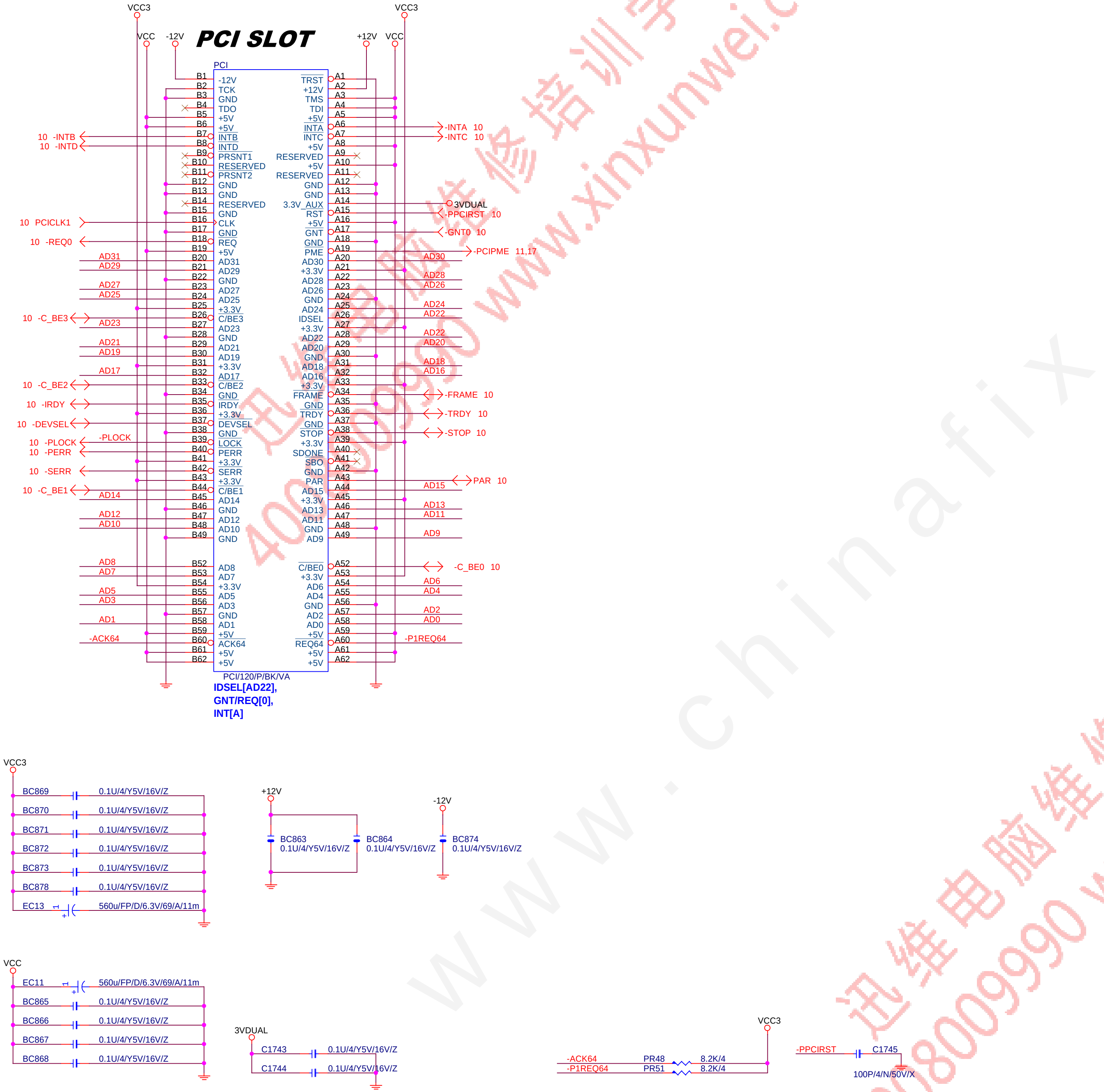
Date: Friday, November 29, 2013 Sheet 14 of 29



GIGABYTE

Title	PCIEX4/VGA
Size	Custom
Document Number	GA-F2A78M-D3H
Rev	3.0
Date:	Friday, November 29, 2013
Sheet	15 of 29

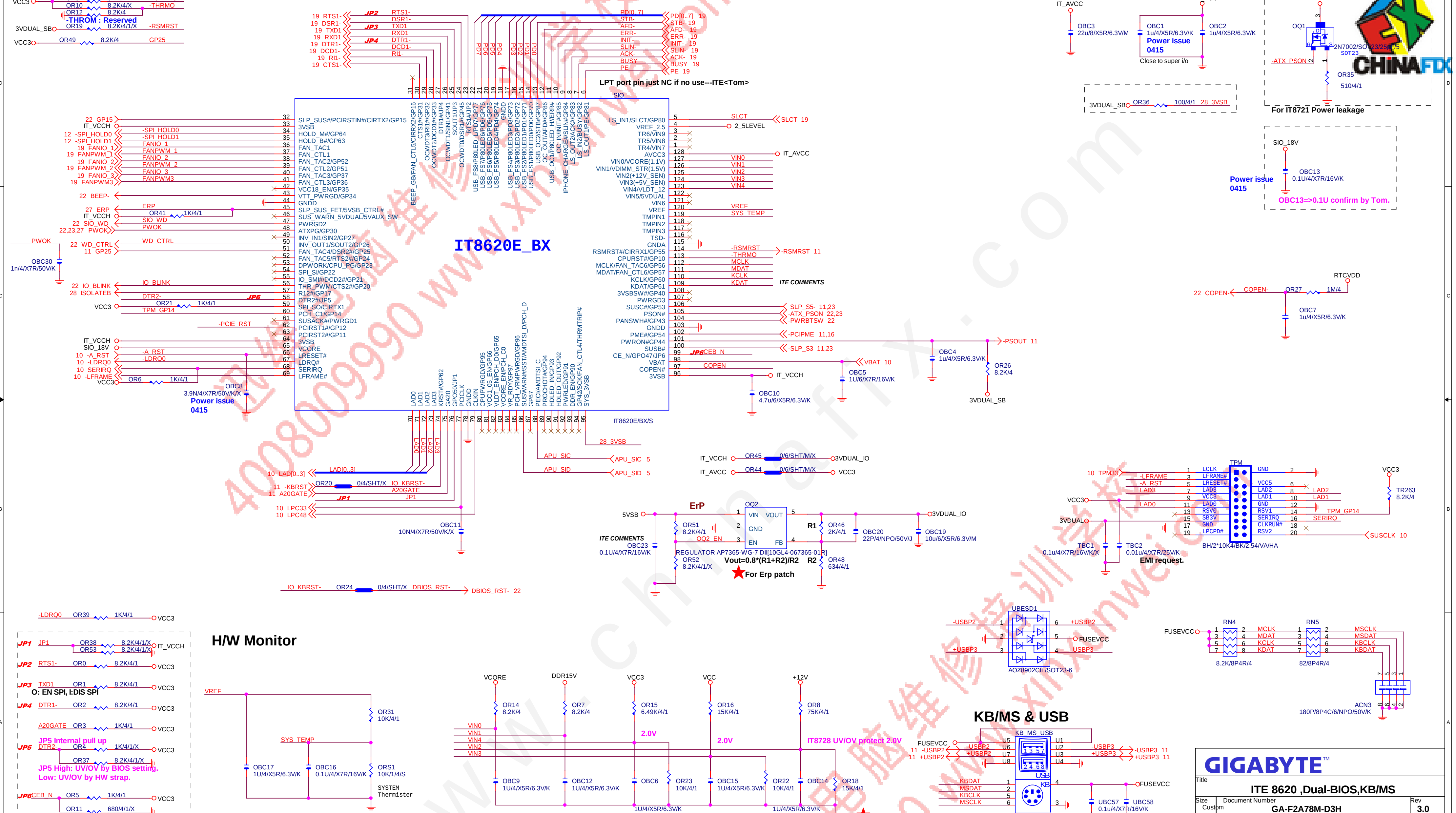
PCI SLOT 1,2



GIGABYTE™

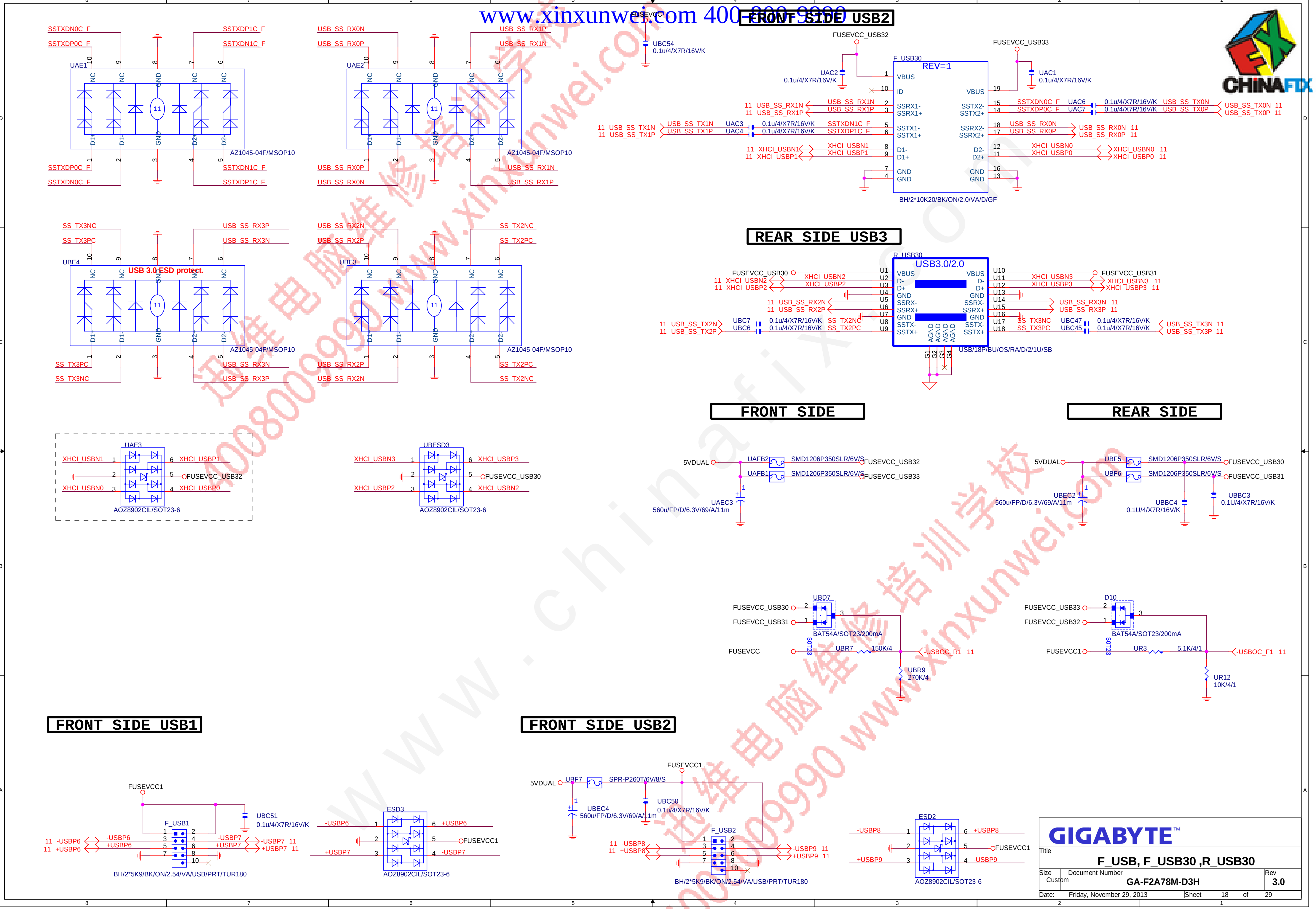
Title	PCI SLOT
Size	Custom
Document Number	GA-F2A78M-D3H
Rev	3.0
Date:	Friday, November 29, 2013
Sheet	16 of 29

www.xinxunwei.com 400-800-9990



Title	ITE 8620 ,Dual-BIOS,KB/MS
Size	Custom
Document Number	GA-F2A78M-D3H
Rev	3.0
Date:	Friday, November 29, 2013
Sheet	17 of 29

GIGABYTE™

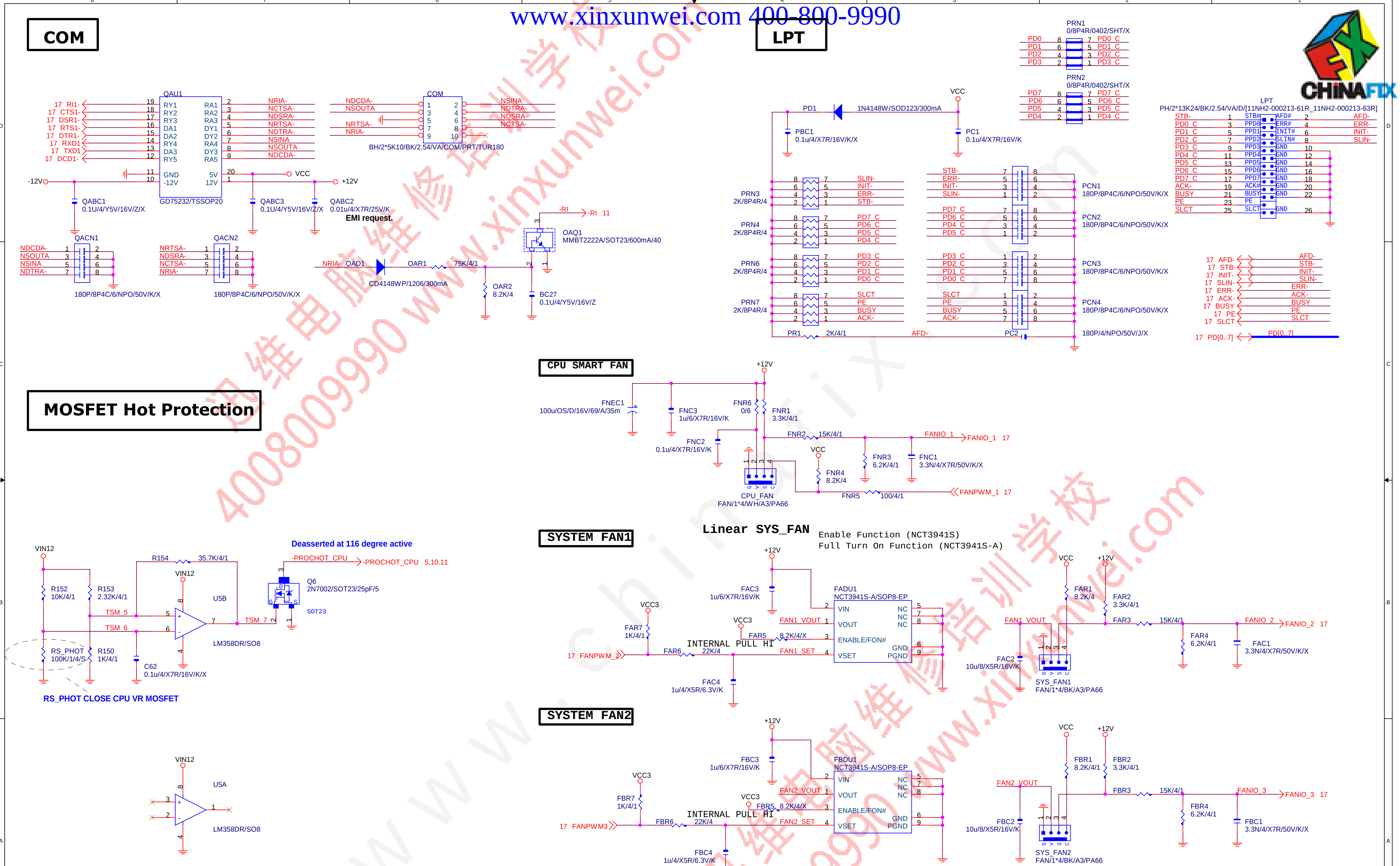


GIGABYTE

Title: F_USB, F_USB30 ,R_USB30

Size	Document Number	Rev
Custom	GA-F2A78M-D3H	3.0

Date: Friday, November 29, 2013 Sheet 18 of 29



GIGABYTE

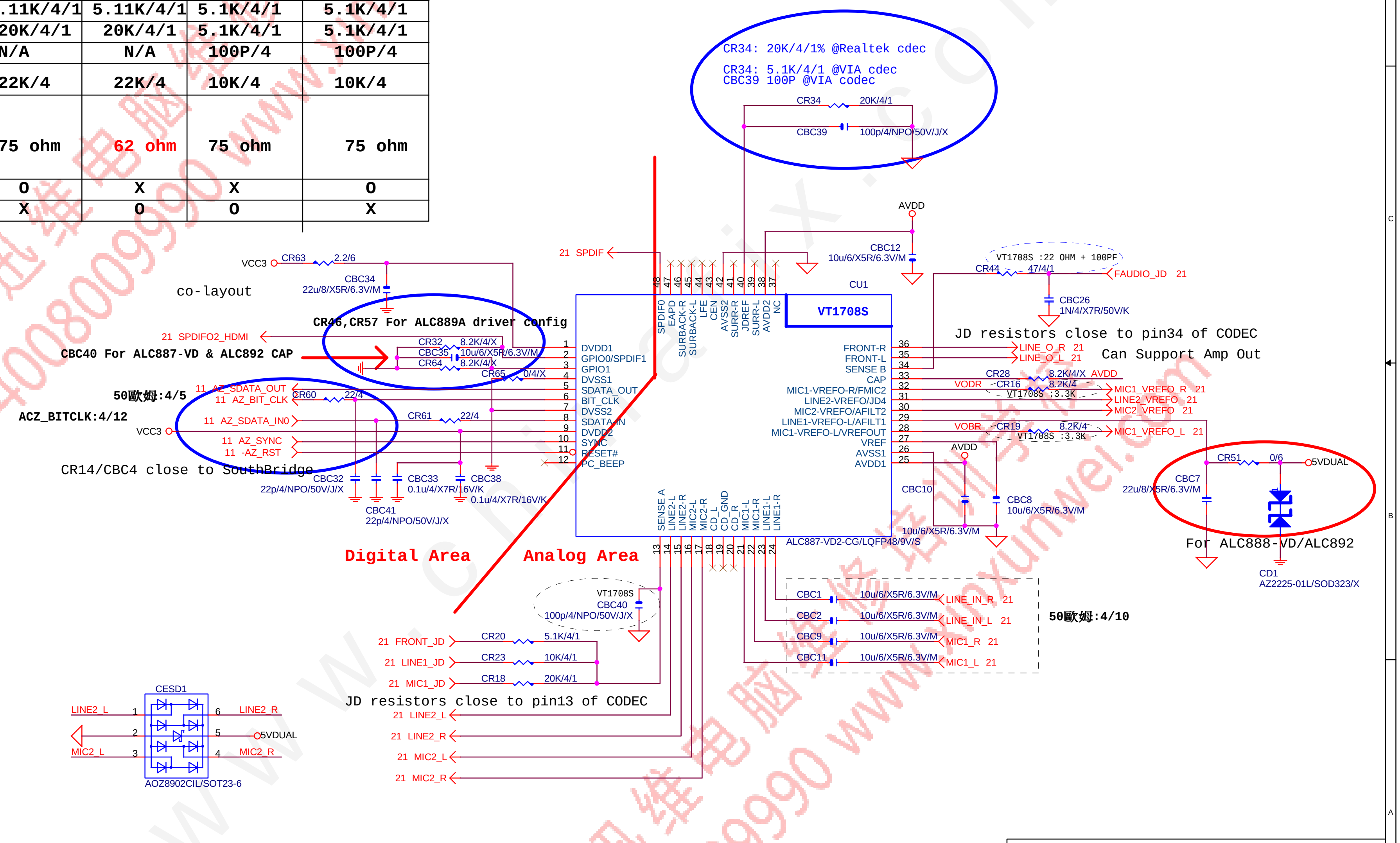
Title: CPU & SYS FAN COM,LPT,MOSFET HOT

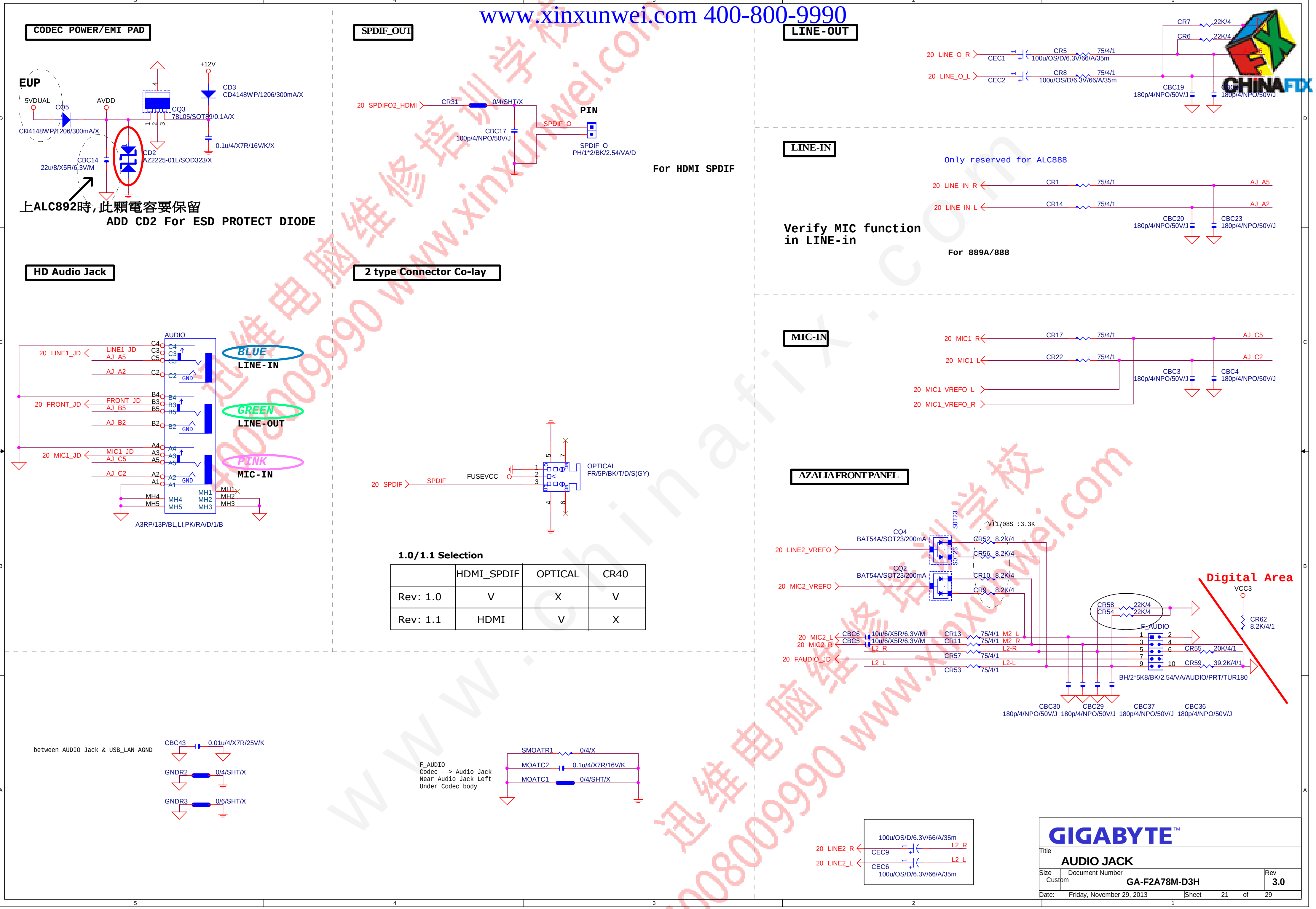
Size	Document Number	Rev
Custom	GA-F2A78M-D3H	3.0

Date: Friday, November 29, 2013 — Sheet 19 of 29

ALC883/ALC888-A/ALC888B/ALC888-VD/ALC892R/ALC888/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



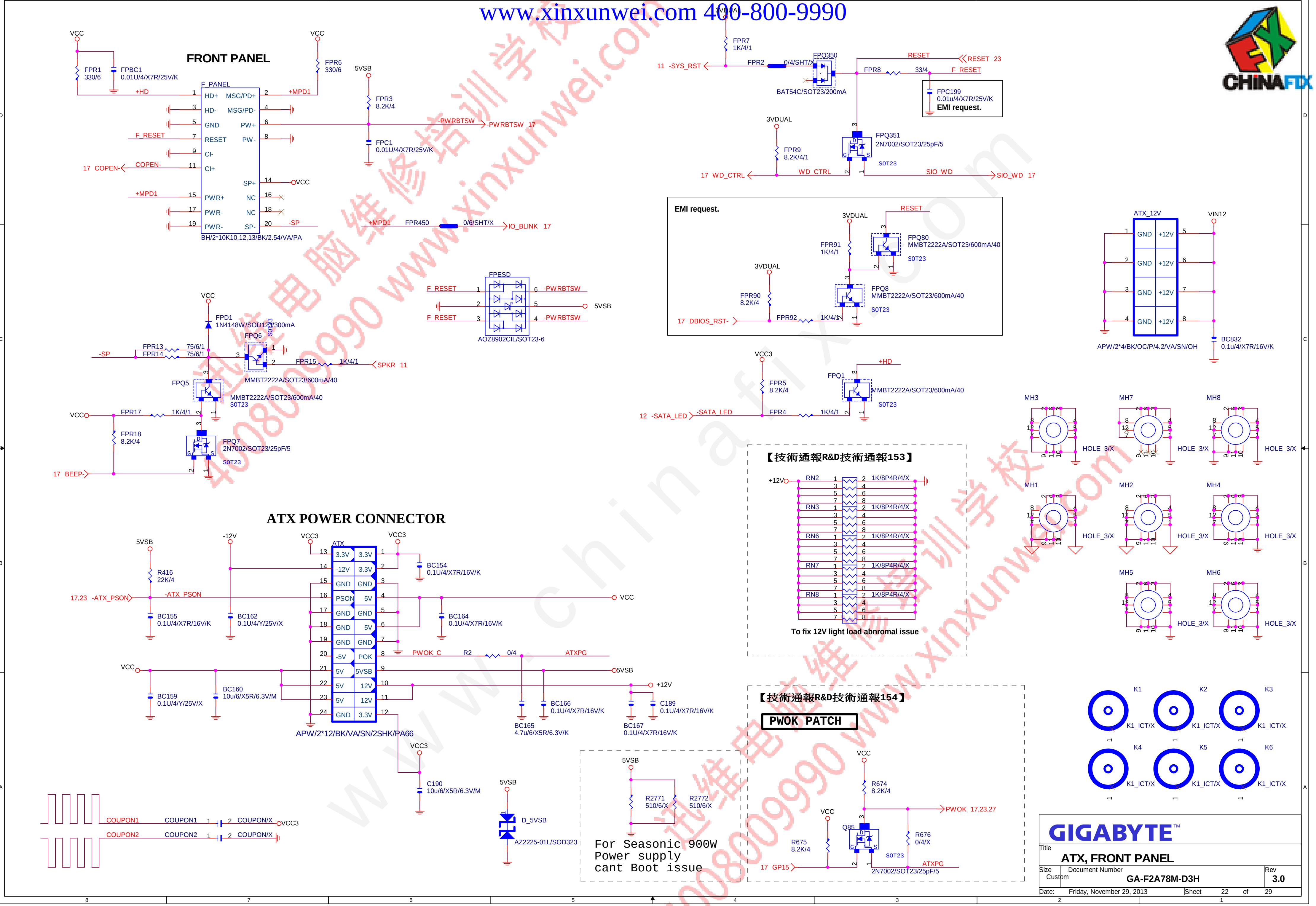


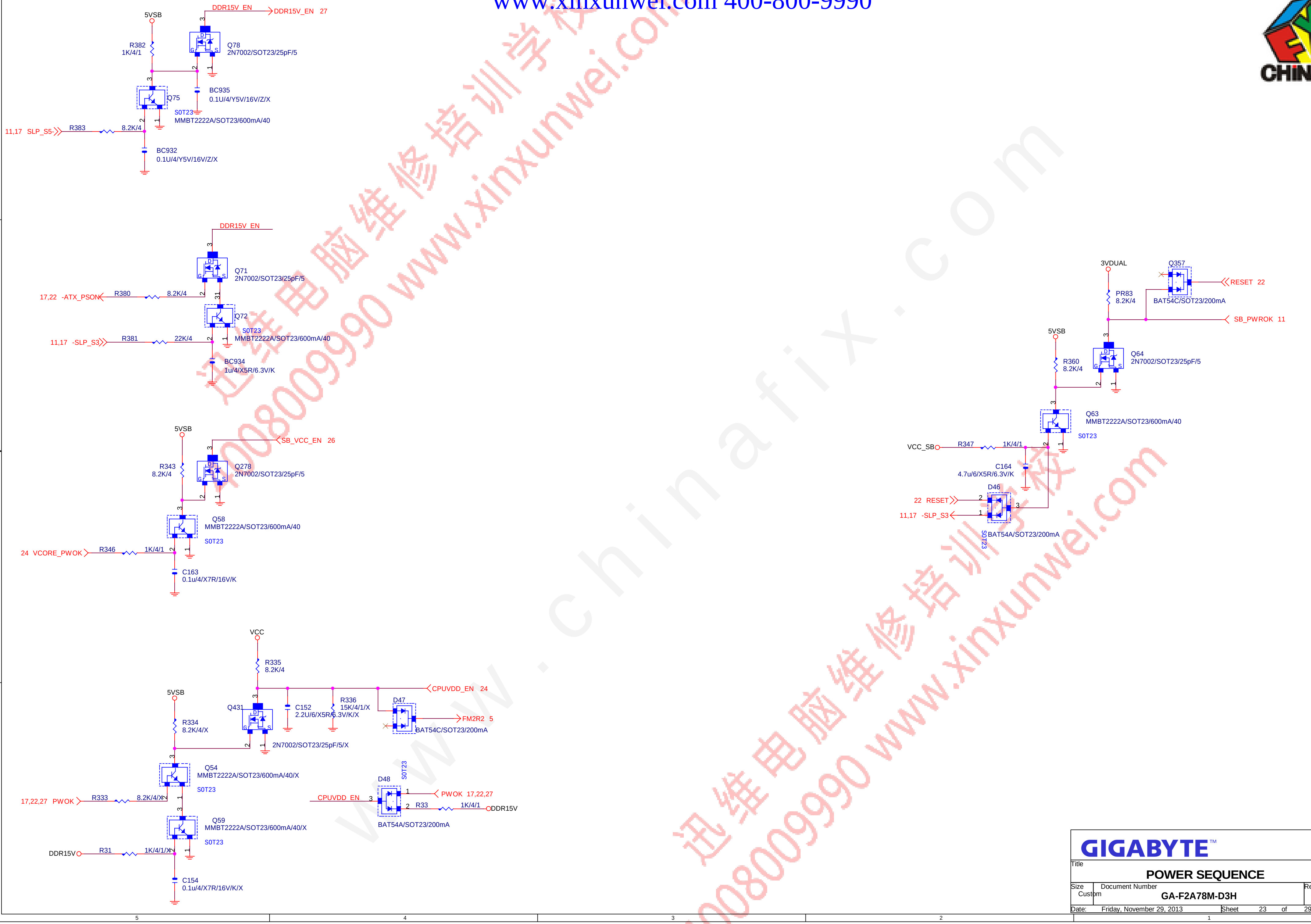
1.0/1.1 Selection

	HDMI_SPDIF	OPTICAL	CR40
Rev: 1.0	V	X	V
Rev: 1.1	HDMI	V	X

GIGABYTE

Title	AUDIO JACK
Size: Custom	Document Number: GA-F2A78M-D3H
Rev	3.0
Date:	Friday, November 29, 2013
Sheet	21 of 29


FRONT PANEL
F_PANEL
HD+ MSG/PD+
HD- MSG/PD-
GND PW+
RESET PW-
CI-
CI+
SP+
PWR+ NC
PWR- NC
PWR- SP-
BH/2*10K10,12,13/BK/2.54/VA/PA
FPR1 330/6
FPBC1 0.01U/4/X7R/25V/K
FPR6 330/6
5VSB
FPR3 8.2K/4
FPC1 0.01U/4/X7R/25V/K
-PWRBTSW 17
17 COPEN-
F_RESET
+MPD1
FPR450 0/6/SHT/X
IO_BLINK 17
FPR7 1K/4/1
11 -SYS_RST
FPR2 0/4/SHT/X
FPQ350
BAT54C/SOT23/200mA
RESET 23
FPR8 33/4
F_RESET
FPC199 0.01U/4/X7R/25V/K
EMI request.
3VDUAL
FPR9 8.2K/4/1
FPQ351 2N7002/SOT23/25pF/5
17 WD_CTRL
SIO_WD 17
EMI request.
FPR91 1K/4/1
FPQ80 MMBT2222A/SOT23/600mA/40
FPR90 8.2K/4
FPQ8 MMBT2222A/SOT23/600mA/40
17 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
-SP
FPR15 1K/4/1
SPKR 11
FPQ5 MMBT2222A/SOT23/600mA/40
FPR17 1K/4/1
FPR18 8.2K/4
FPQ7 2N7002/SOT23/25pF/5
17 BEEP-
VCC3
FPR5 8.2K/4
FPQ1 MMBT2222A/SOT23/600mA/40
+HD
12 -SATA_LED
FPR4 1K/4/1
ATX_12V
VIN12
GND +12V
APW/2*4/BK/OC/P/4.2/VA/SN/OH
BC832 0.1u/4/X7R/16V/K
MH3 MH7 MH8 MH1 MH2 MH4 MH5 MH6
HOLE_3/X
【技術通報R&D技術通報153】
+12V
RN2 RN3 RN6 RN7 RN8 1K/8P4R/4/X
To fix 12V light load abnromal issue
ATX POWER CONNECTOR
ATX
3.3V -12V GND PSON GND GND GND -5V 5V 5V 5V GND
3.3V 3.3V GND 5V GND 5V GND POK 5VSB 12V 12V 3.3V
APW/2*12/BK/VA/SN/2SHK/PA66
R416 22K/4
17,23 -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 ATXPG
BC159 0.1U/4/Y/25V/X
BC160 10u/6/X5R/6.3V/M
BC166 0.1U/4/X7R/16V/K
BC165 4.7u/6/X5R/6.3V/K
C189 0.1U/4/X7R/16V/K
BC167 0.1U/4/X7R/16V/K
C190 10u/6/X5R/6.3V/M
D_5VSB
AZ2225-01L/SOD323
COUPON1 COUPON2 COUPON/X
R2771 510/6/X
R2772 510/6/X
For Seasonic 900W Power supply cant Boot issue
【技術通報R&D技術通報154】
PWOK PATCH
R674 8.2K/4
PWOK 17,23,27
Q85
R675 8.2K/4
R676 0/4/X
17 GP15
2N7002/SOT23/25pF/5
K1 K2 K3 K4 K5 K6 K1_ICT/X
GIGABYTE
Title ATX, FRONT PANEL
Size Custom
Document Number GA-F2A78M-D3H
Rev 3.0
Date: Friday, November 29, 2013
Sheet 22 of 29



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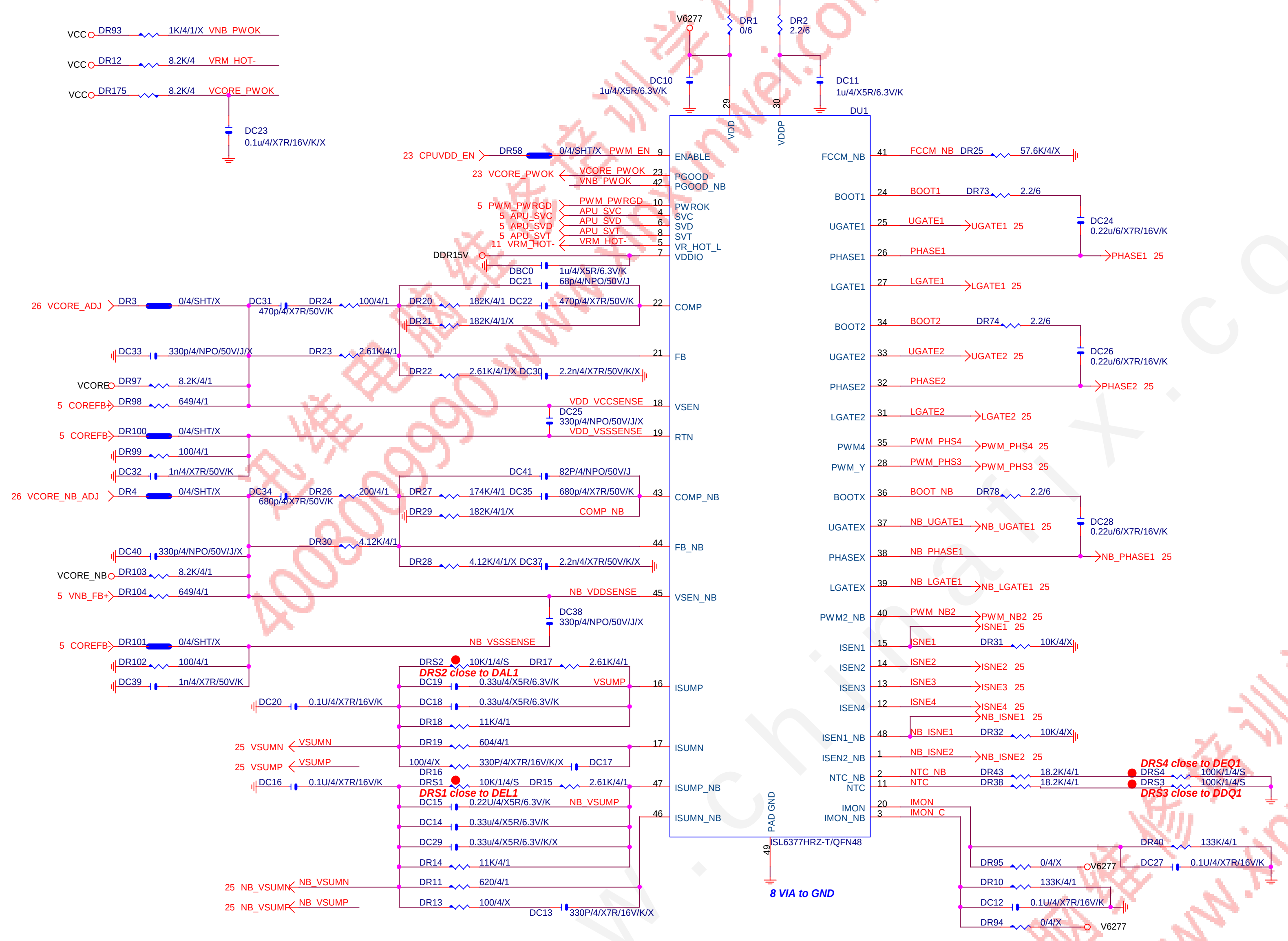
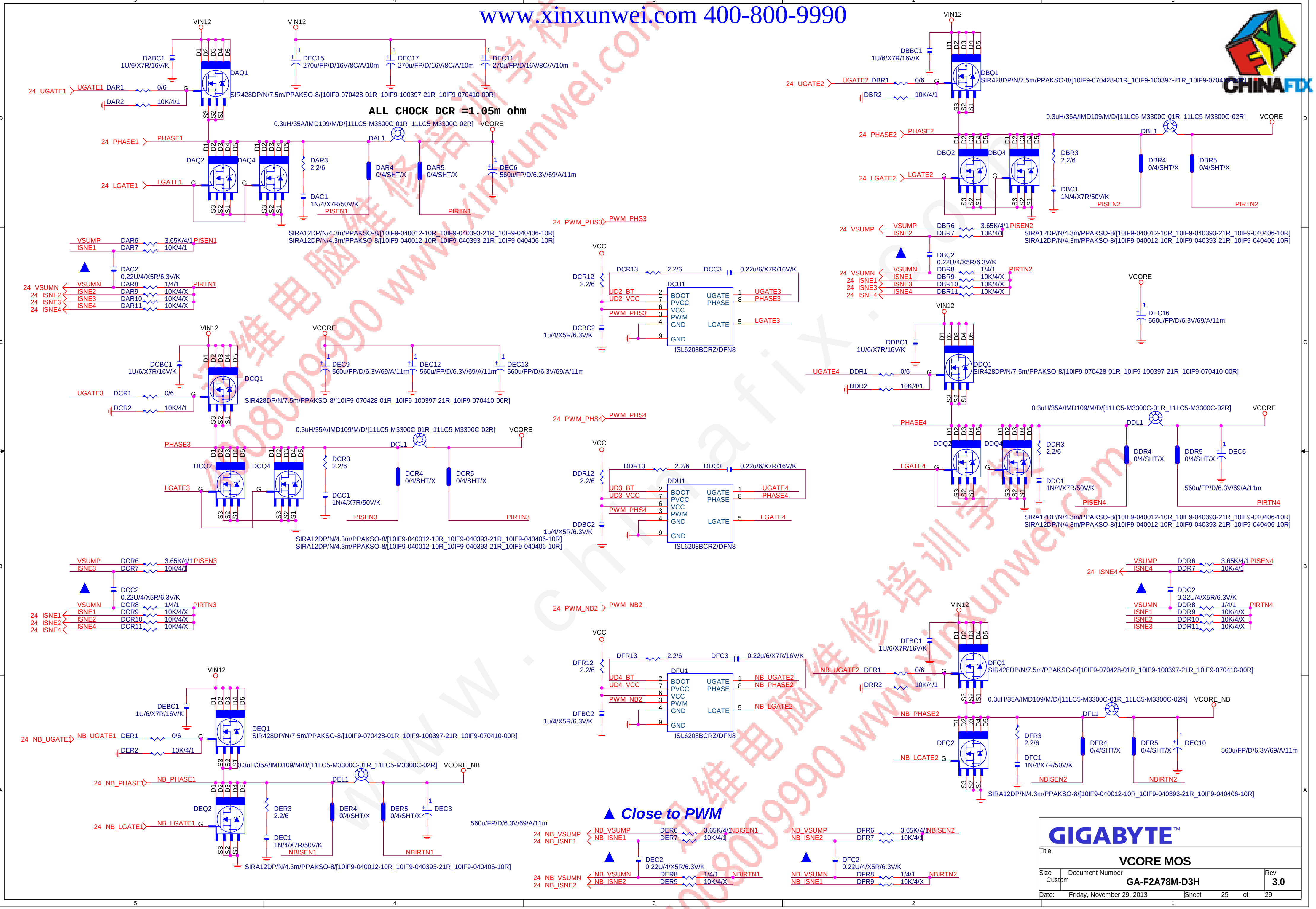
Title	POWER SEQUENCE	
Size Custom	Document Number GA-F2A78M-D3H	Rev 3.0
Date: Friday, November 29, 2013	Sheet 23 of 29	



GIGABYTE™

Title	VCORE (PWM ISL6377+ISL6208B)
Size: Custom	Document Number: GA-F2A78M-D3H
Rev	3.0
Date:	Friday, November 29, 2013
Sheet	24 of 29

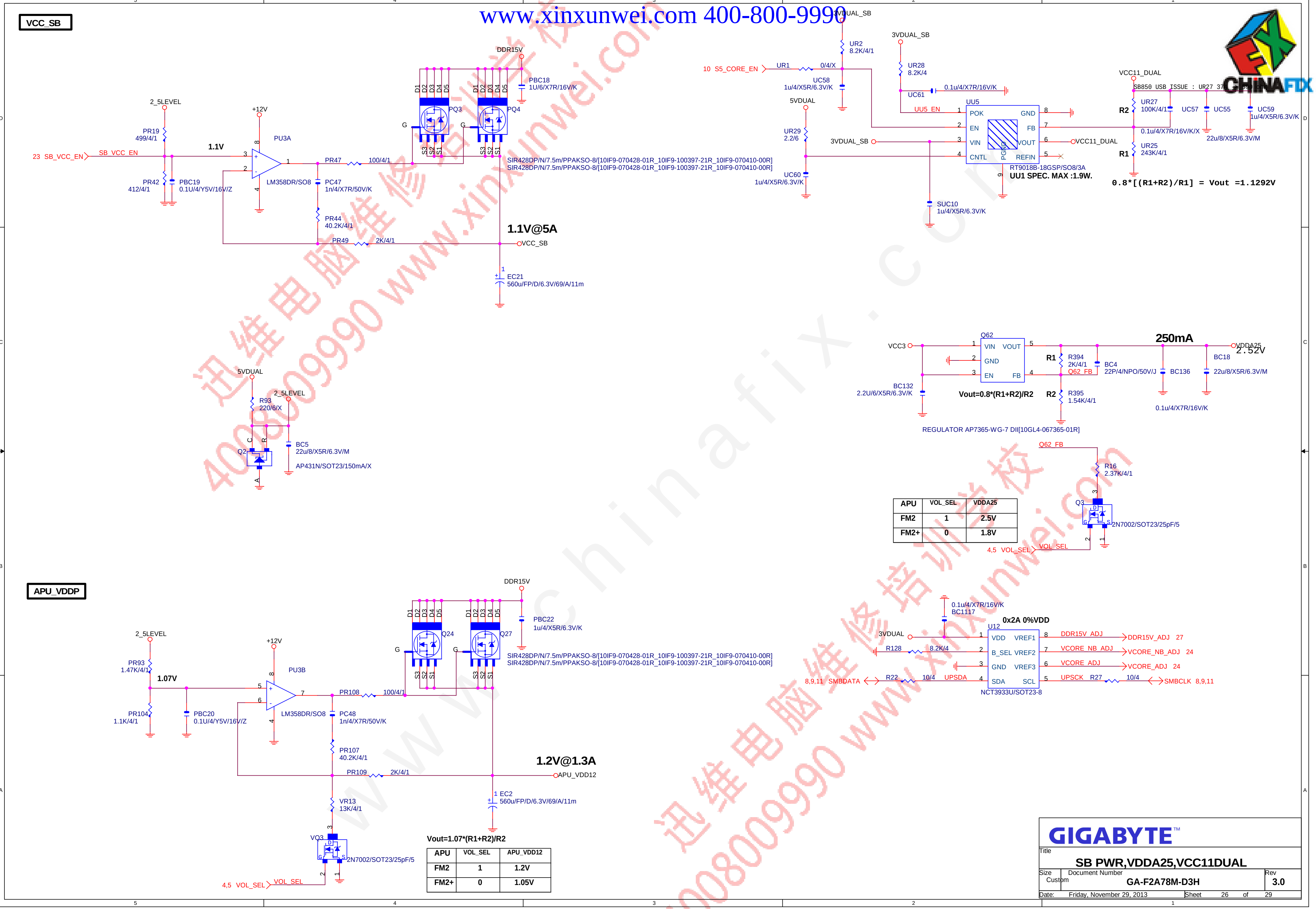


GIGABYTE

Title: VCORE MOS

Size	Document Number	Rev
Custom	GA-F2A78M-D3H	3.0

Date: Friday, November 29, 2013 — Sheet 25 of 29



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

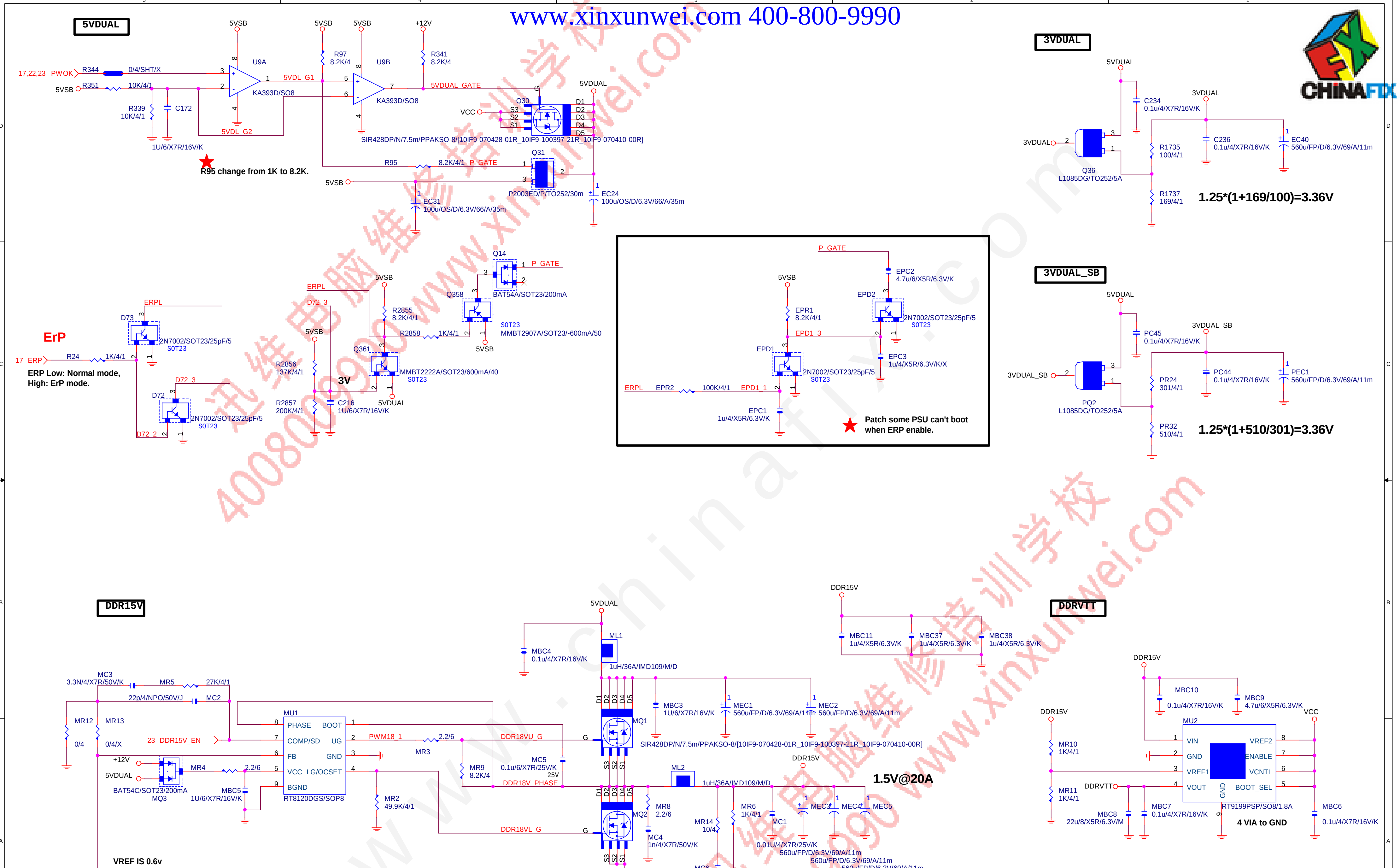
APU	VOL_SEL	APU_VDD12
FM2	1	1.2V
FM2+	0	1.05V

GIGABYTE™

Title: SB PWR,VDDA25,VCC11DUAL

Size	Document Number	Rev
Custom	GA-F2A78M-D3H	3.0

Date: Friday, November 29, 2013 Sheet 26 of 29



GIGABYTE

Title: DDR PWR, 5VDUAL, ERP

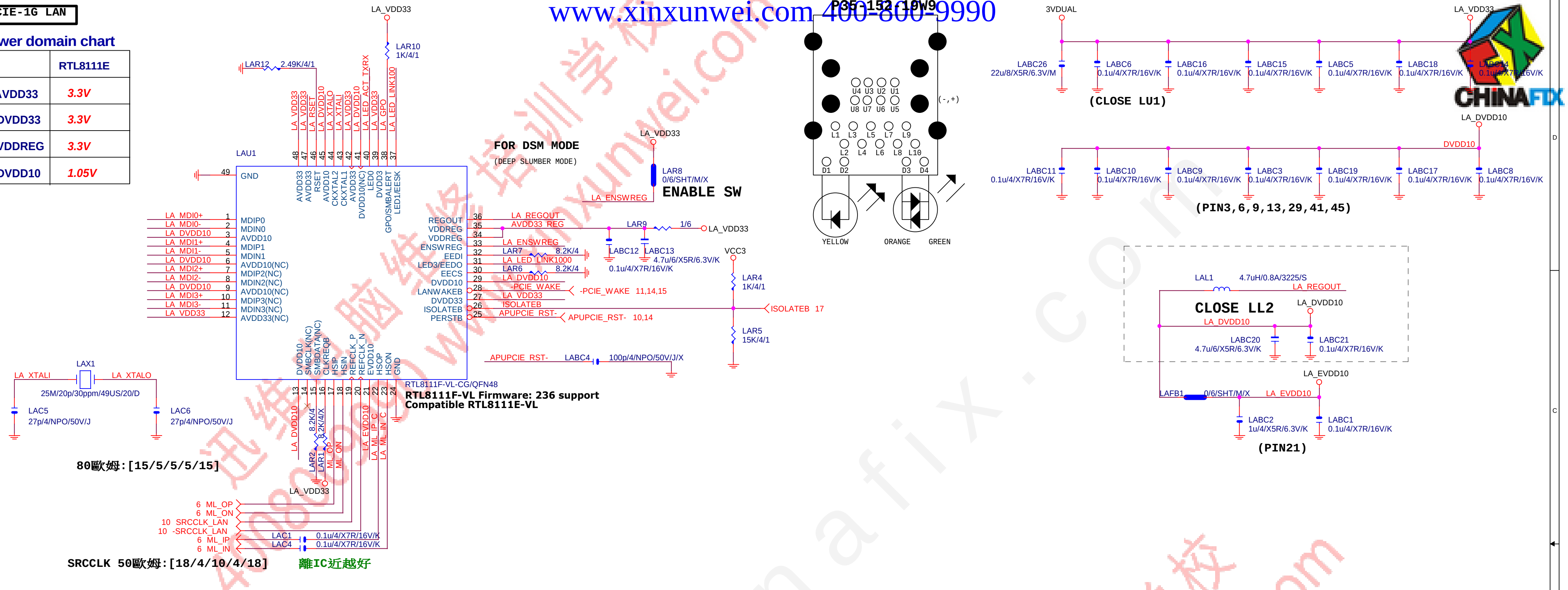
Size: Custom | Document Number: GA-F2A78M-D3H | Rev: 3.0

Date: Friday, November 29, 2013 | Sheet 27 of 29

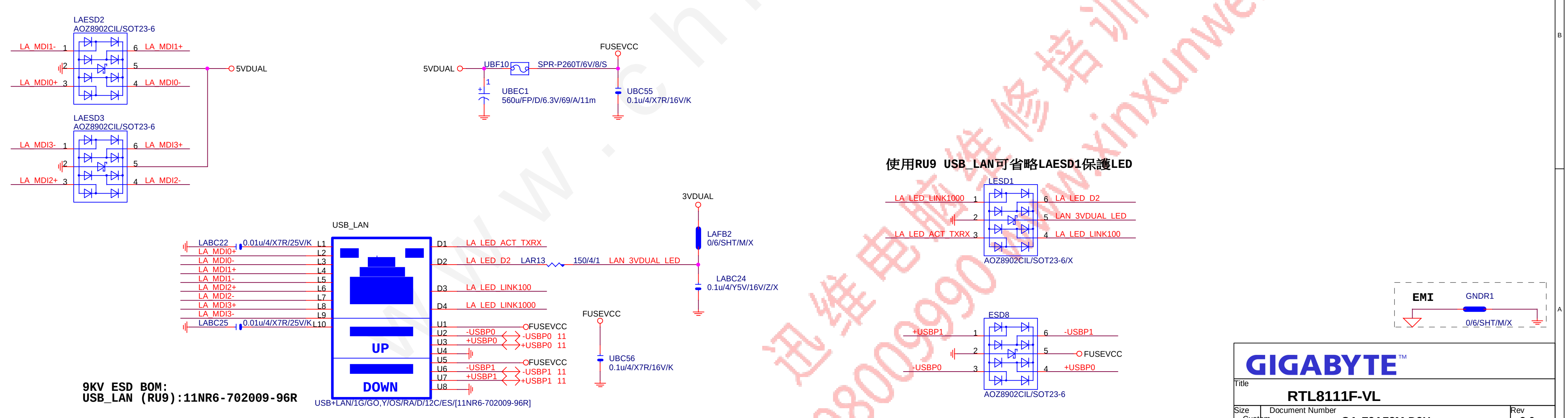
PCIE-1G LAN

Power domain chart

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



USB_LAN



9KV ESD BOM:
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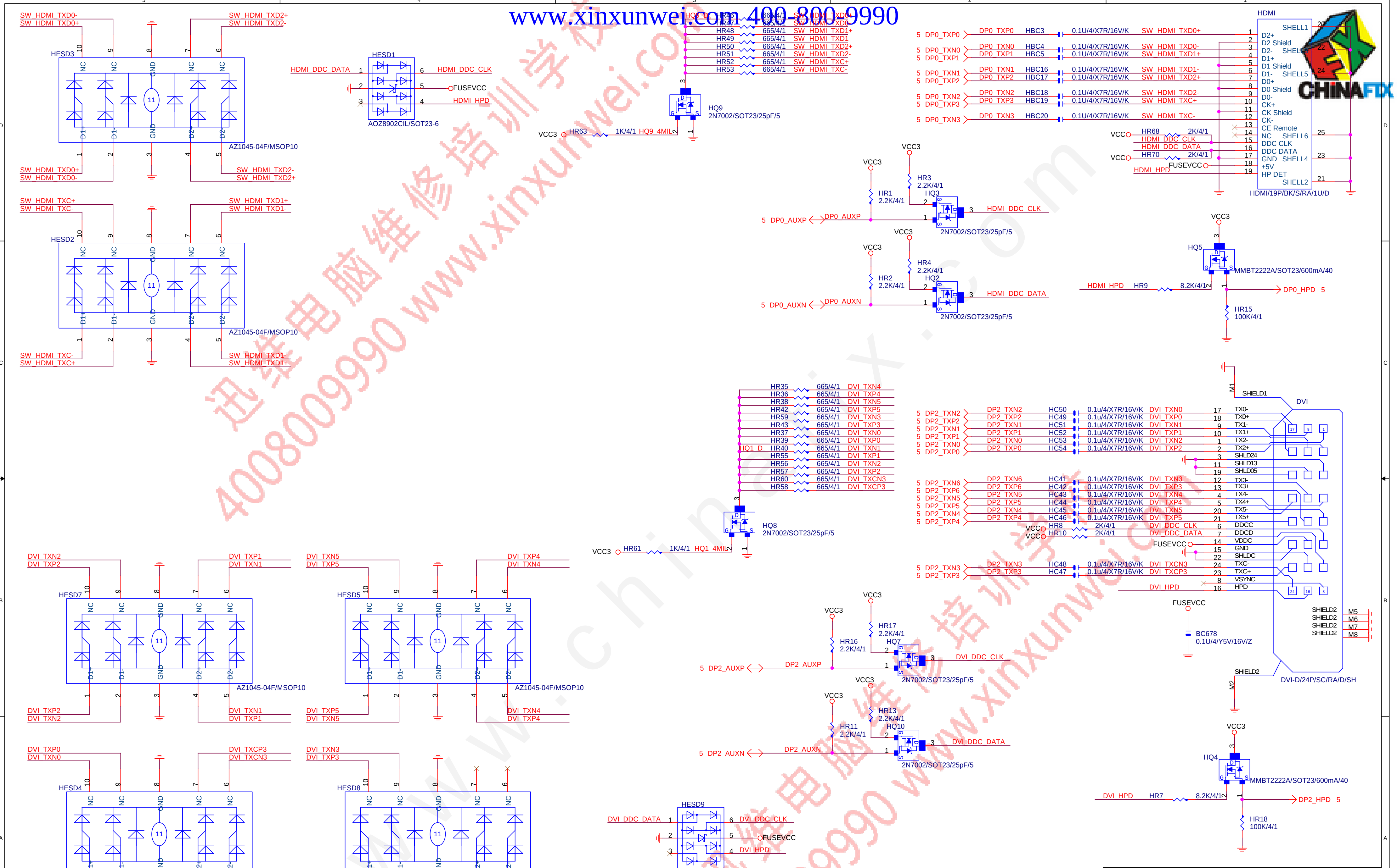

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