648FX-M7
661FX-M7

Rev: A

Revision History :

1. Ver A: Initial for 661FX/648FX for LGA775

Page Index

ECS	SIGNATURE	DATE
DESIGNER	LukeLin	
LAYOUT	ECS Layout team	
CHECK	LukeLin	
APPROVAL		

Elitegroup Computer Systems

Title: 648(661)FX-M7

Size: Custom | Document Number: Cover Sheet | Rev: A

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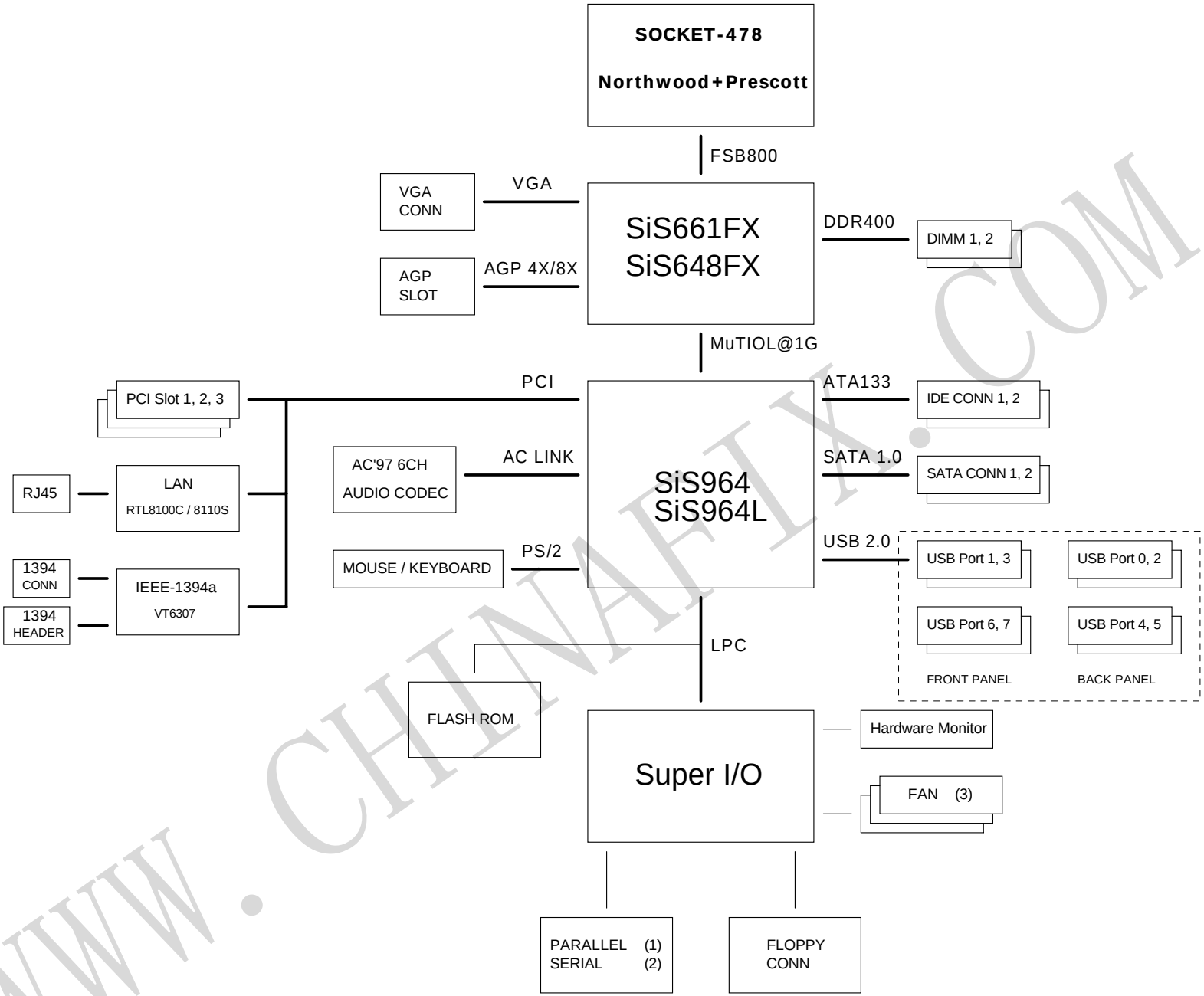

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Title: 648(661)FX-M7

Size: Custom | Document Number: Block Diagram | Rev: A

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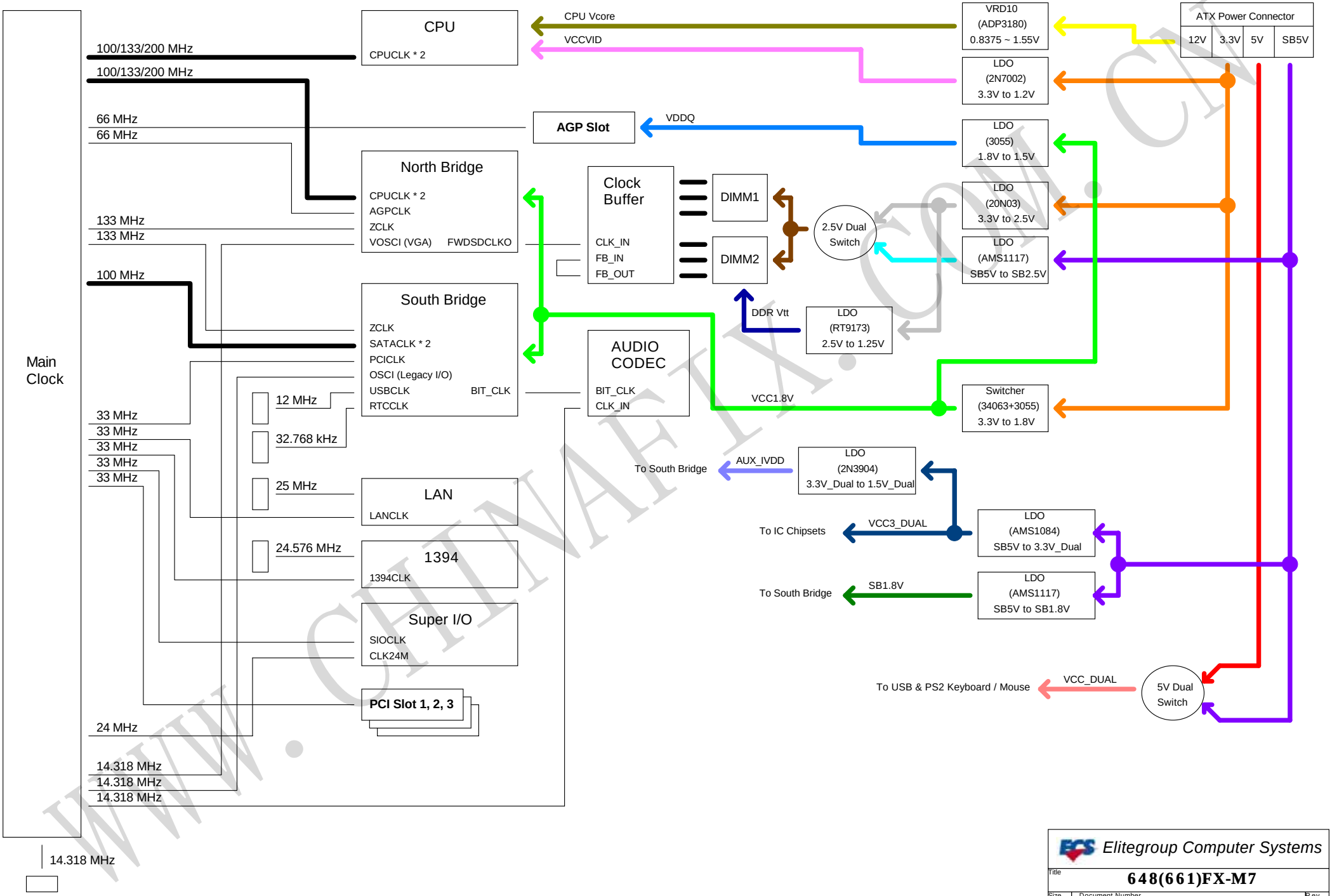

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Title: 648(661)FX-M7

Size: Custom | Document Number: Clock & Power Distribution | Rev: A

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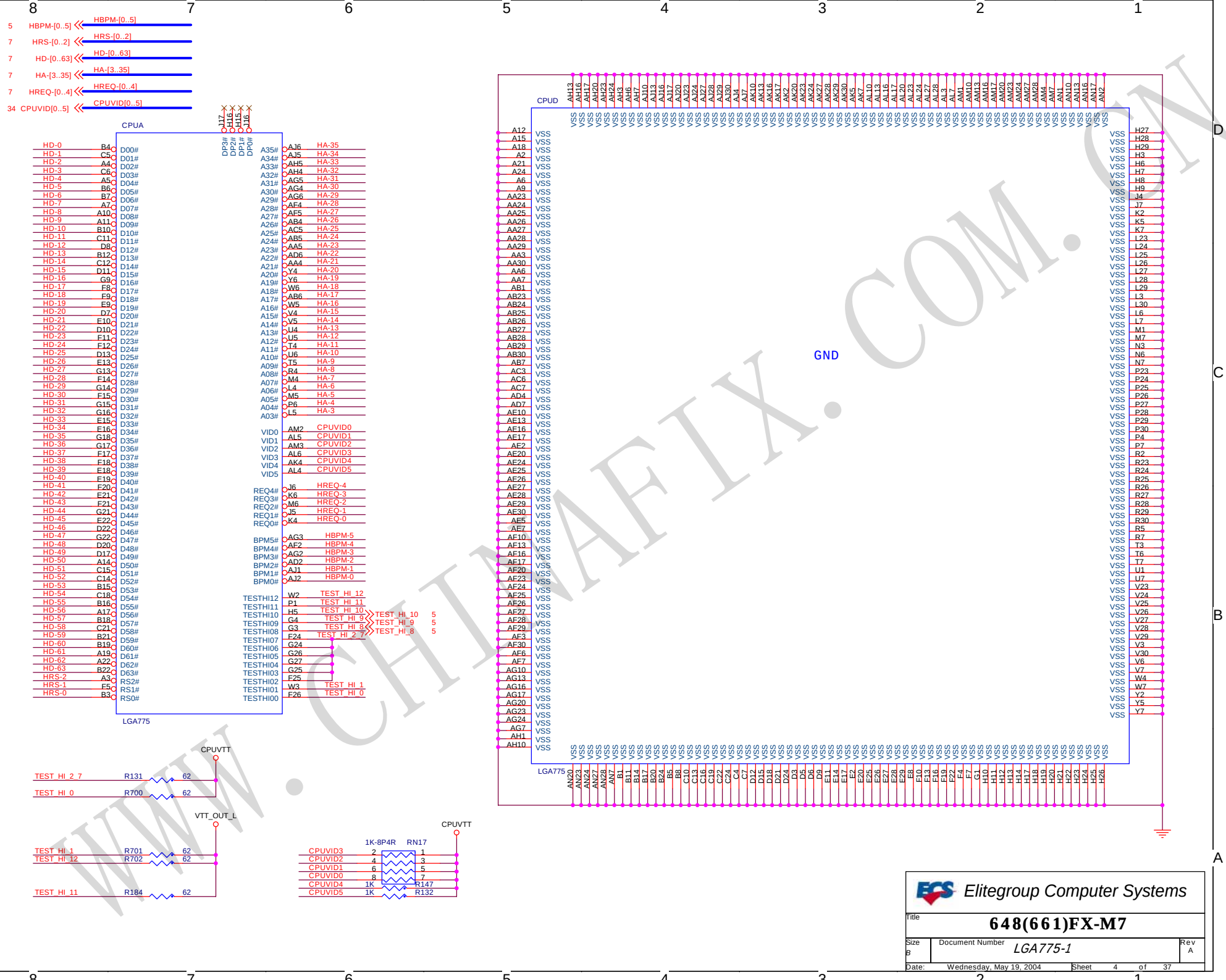

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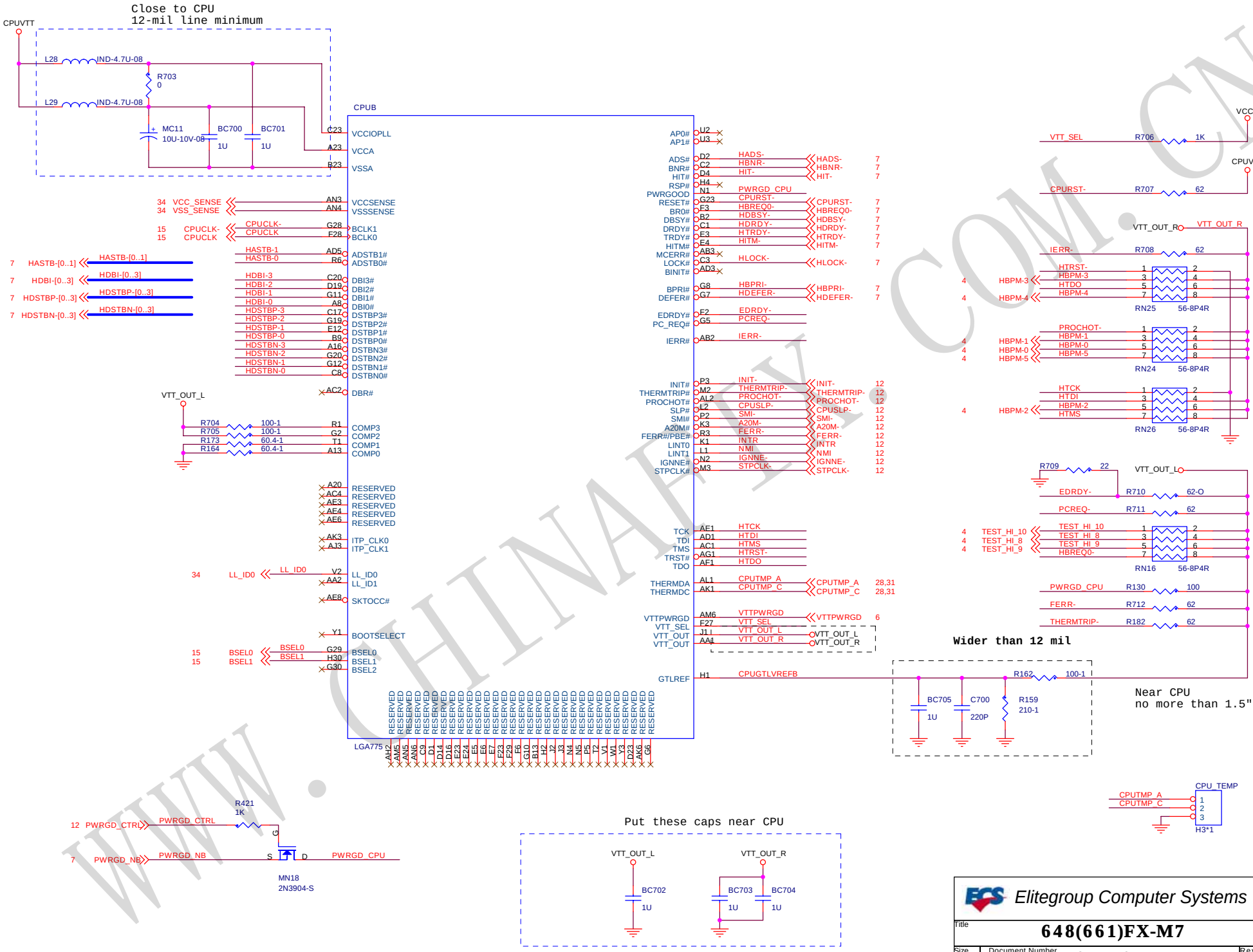

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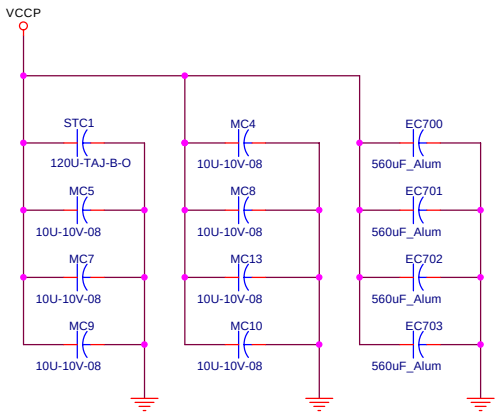
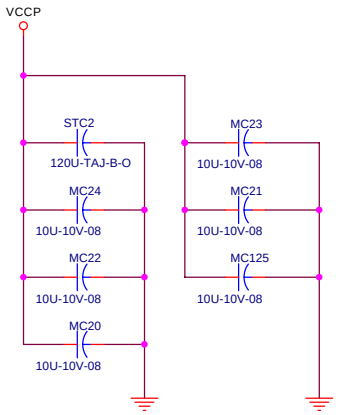
P.S. Choose X5R components instead of Y5V for all 22uF_1206 capacitors on this page.

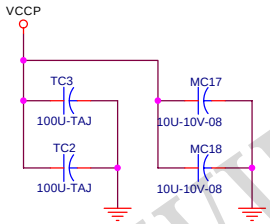
Put these capacitors at processor TOP SIDE

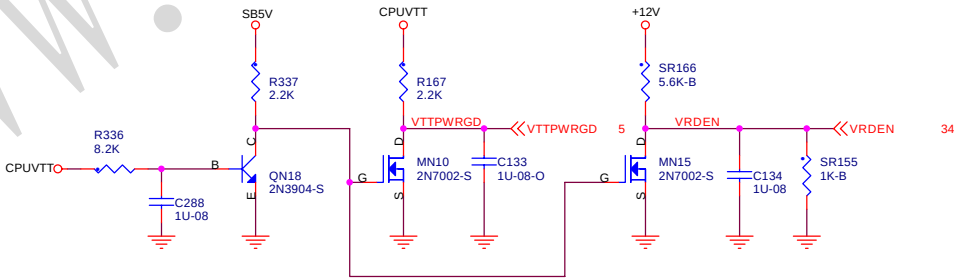


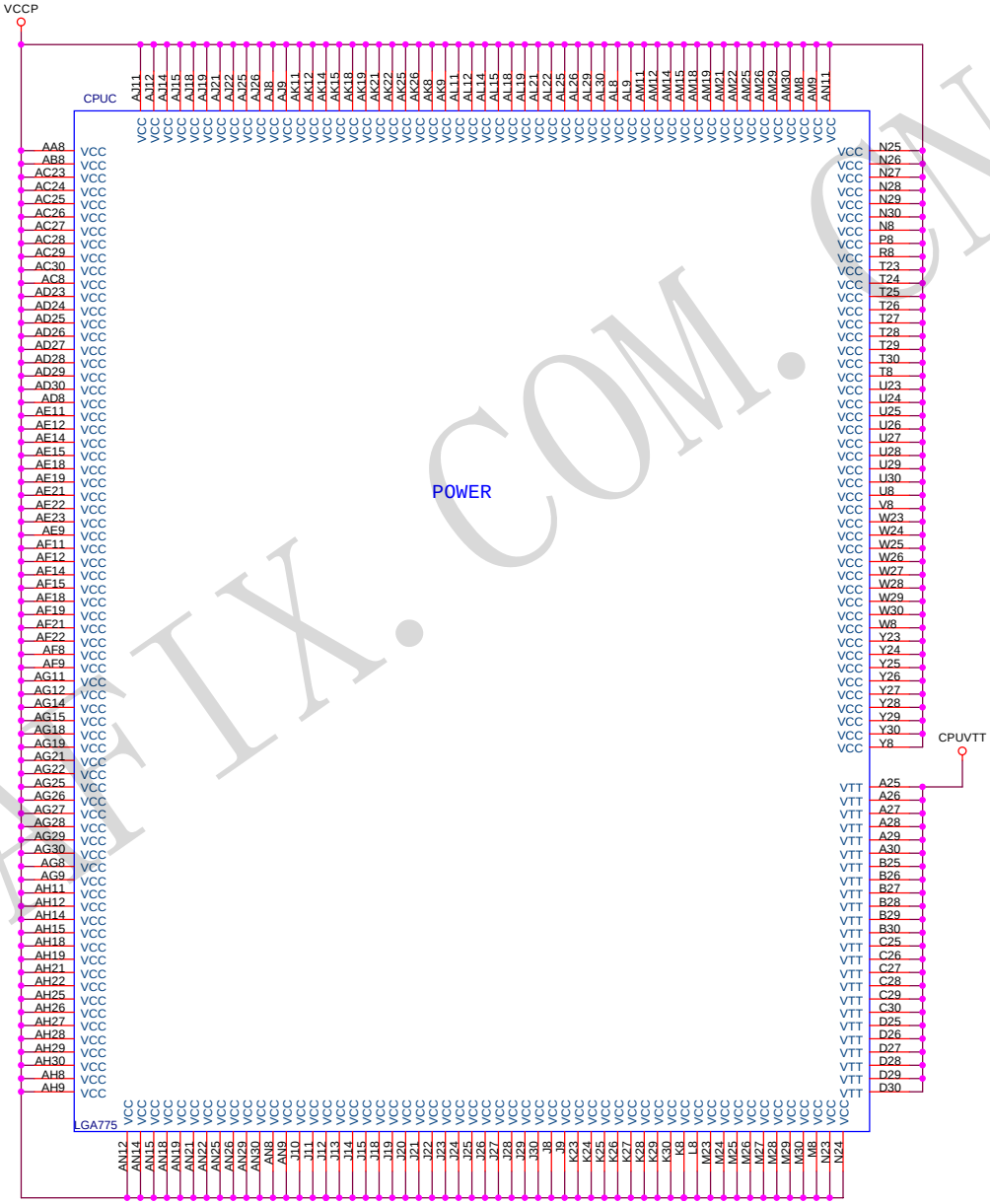
Put these capacitors at processor LEFT SIDE



Put these capacitors INSIDE PROCESSOR CAVITY







Elitegroup Computer Systems		
Title	648(661)FX-M7	
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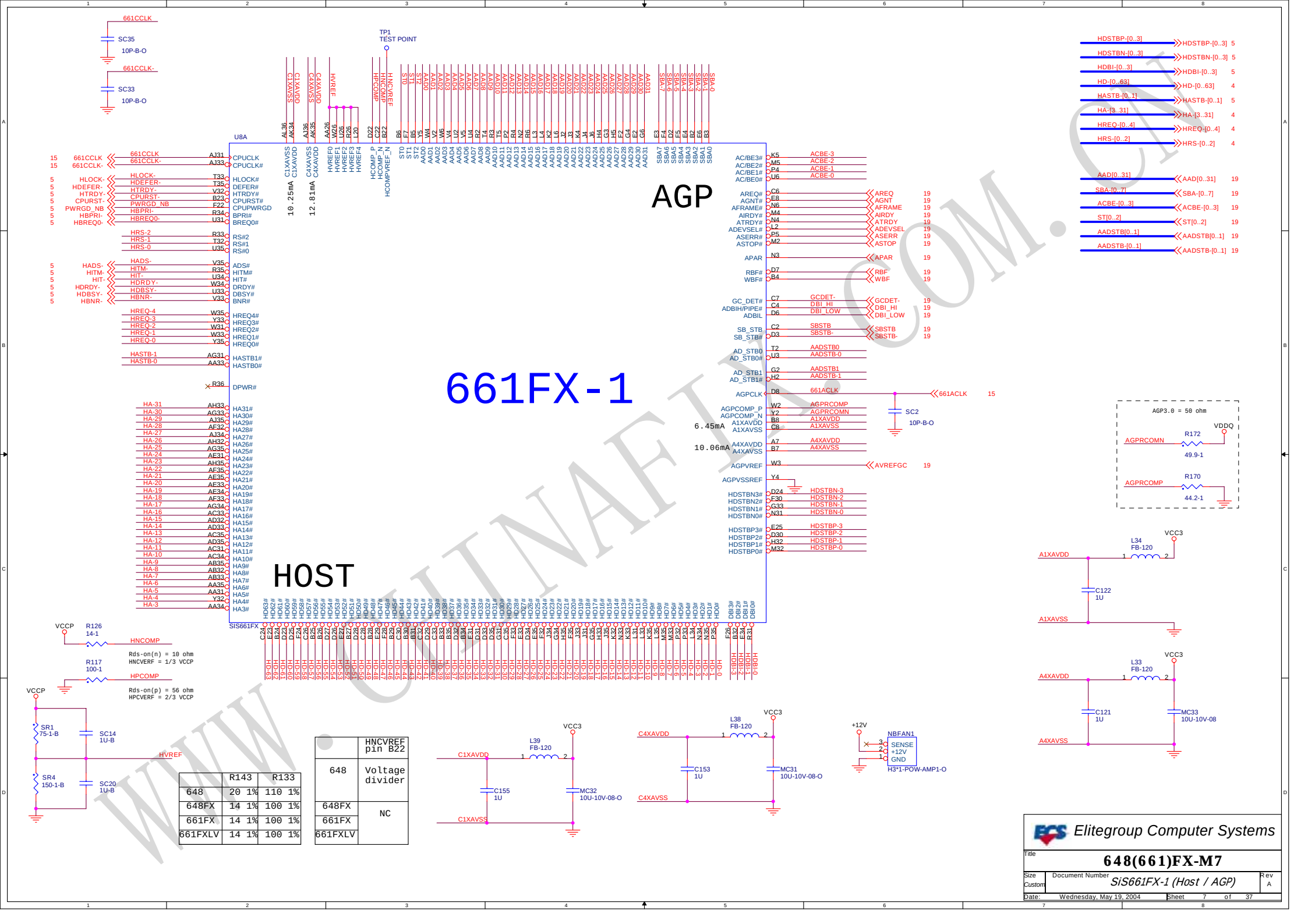

	R143	R133
648	20 1%	110 1%
648FX	14 1%	100 1%
661FX	14 1%	100 1%
661FXLV	14 1%	100 1%

	HNCVREF pin B22
648	Voltage divider
648FX	NC
661FX	
661FXLV	

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Title	648(661)FX-M7	
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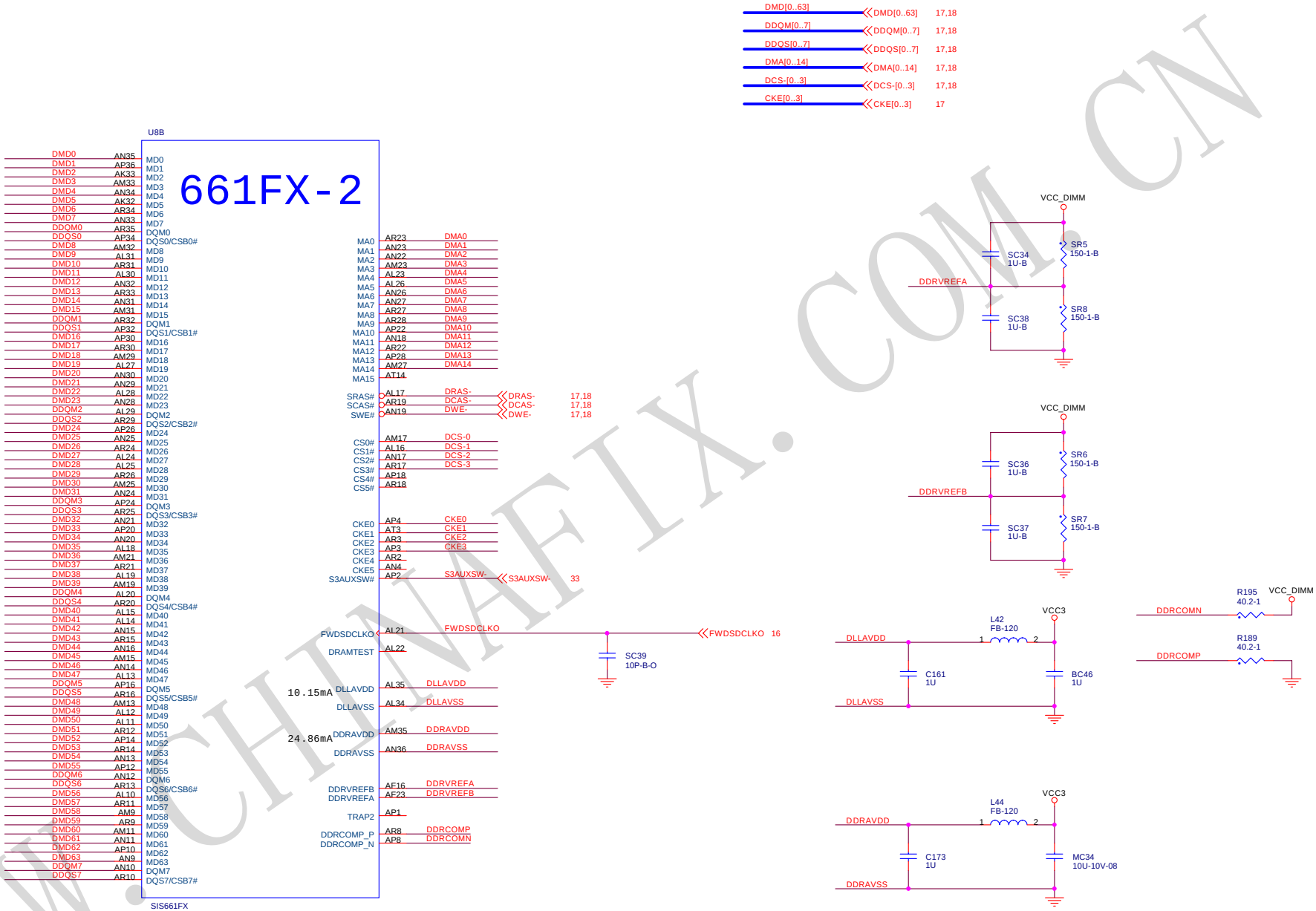

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Title: 648(661)FX-M7

Size: Custom | Document Number: SiS661FX-2 (Memory) | Rev: A

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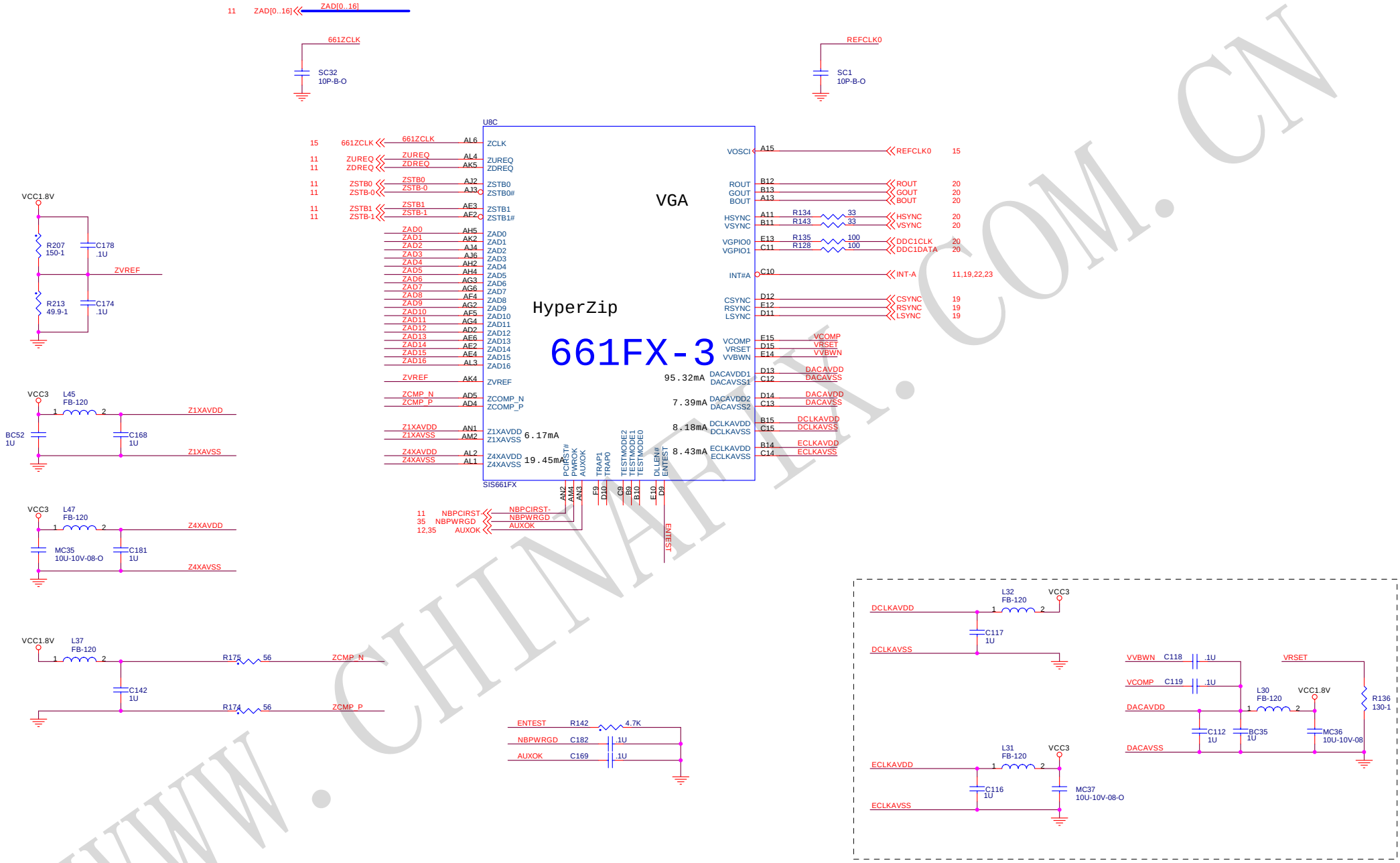

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Title: 648(661)FX-M7

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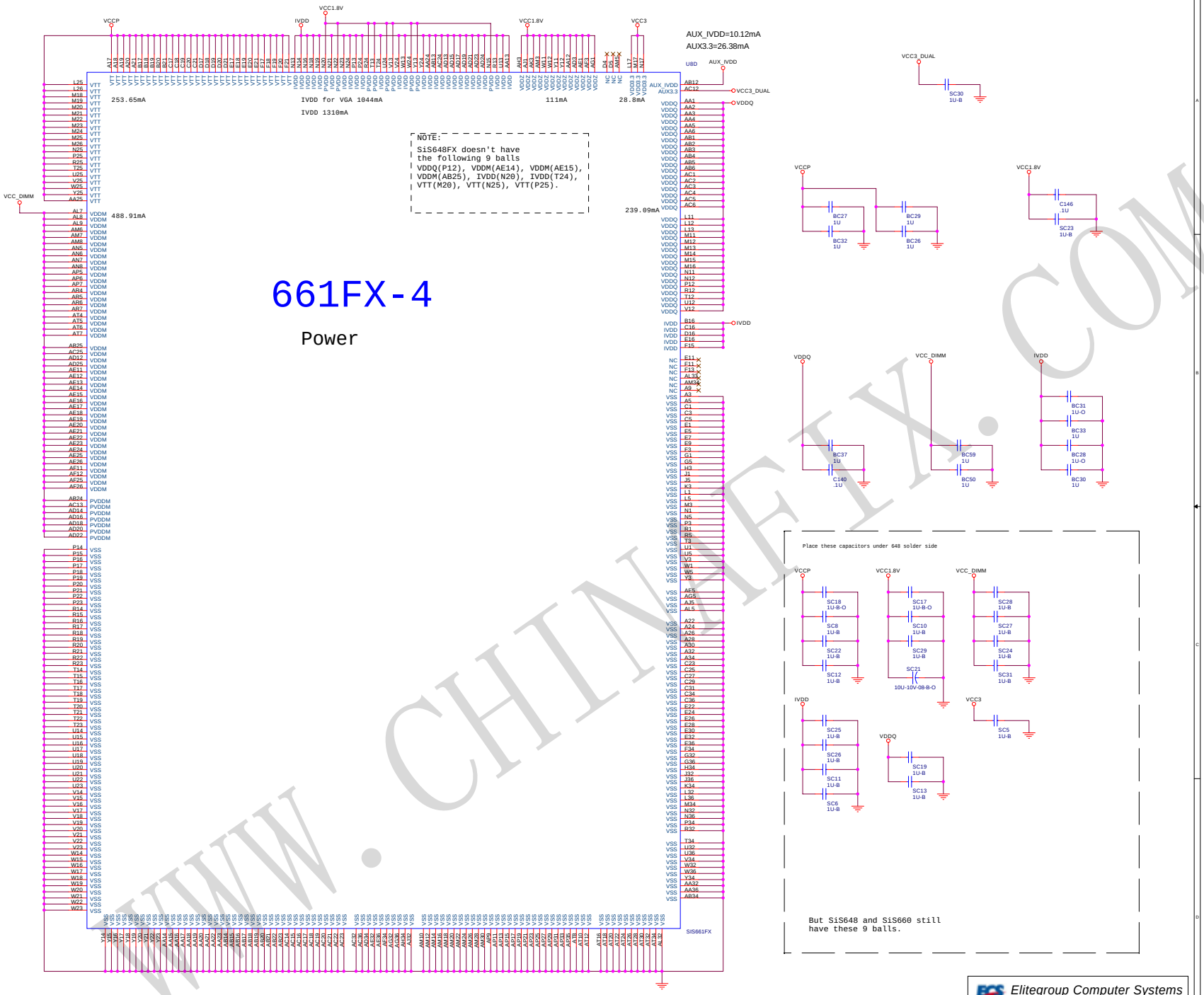

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Title: 648(661)FX-M7

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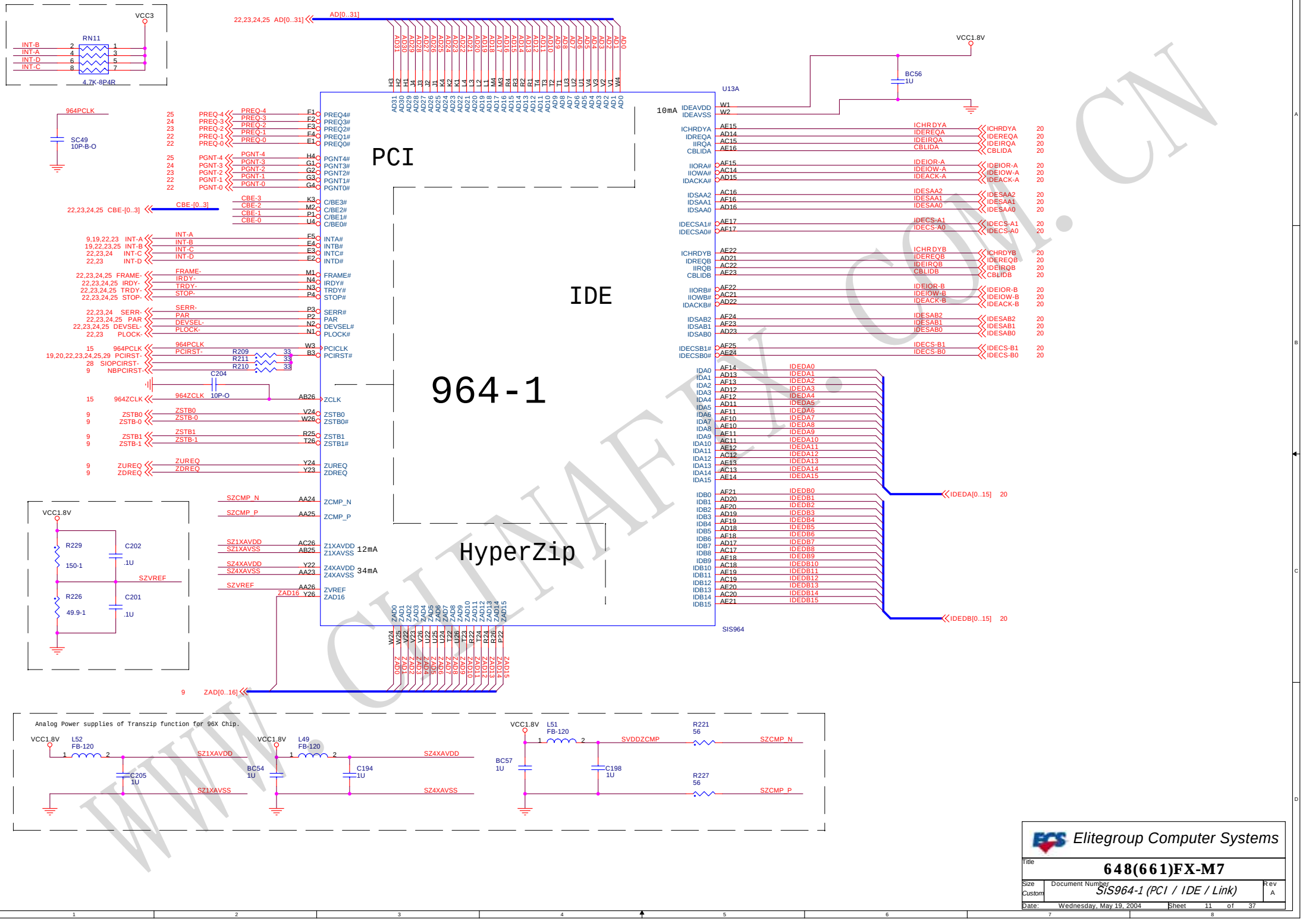

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Title	648(661)FX-M7	
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Programable on-die pull-high strength for CPU_S:
(Infinite, 150, 110, 56 Ohm)

U13B

CPU_S
APIC
LPC
RTC
964-2
GPIO
AC97
ACPI /others
GPIO
KBC /geyserville
MII

INIT- A20M- SMI- INTR NMI IGNNE- FERR- STPCLK- CPUSLP-
INIT# A20M# SMI# INTR NMI IGNNE# FERR# STPCLK# CPUSLP#
VCC3 R233 10K PROCHOT- THERMTRIP- R228 GPOFF FB-120
APICCK/LDTREQ# APICD0/THERM2# APICD1/GPIOFF#
LAD[0..3] LAD0 LAD1 LAD2 LAD3
LFRAME- LDRQ- SIRQ
OSC32KHI OSC32KHO BATOK SBPWRGD RTCVDD C163 .1U
RTCVDD RTCVSS
SMBDAT SMBCLK
GPIO20 GPIO19
SDATI0 SDATO SYNC AC97_RST- BIT_CLK R621 33
AC_SDIN0 AC_SDIN1 AC_SDOUT AC_SYNC AC_RESET# AC_BIT_CLK
REFCLK1 SPKR PWRBTN- PME- PSON- AUXOK ACPILED C167 .1U-O
OSCI ENTEST SPK PWRBTN# PME# PSON# AUXOK ACPILED
FLASH_EN- GLED KBDAT KBCLK PMDAT PMCLK
GPIO13 GPIO14 GPIO15/KBDAT GPIO16/KBCLK GPIO17/PMDAT GPIO18/PMCLK
OSC25MHI OSC25MHO TXCLK TXEN TXD0 TXD1 TXD2 TXD3 NC34 NC31 NC32 NC30
R600 1K MCLK25I MCLK25O TXCLK TXEN SR607 22-B SR600 SR601 SR602 SR603 TXD3 TXD2 TXD1 TXD0
Put closed to 964 CHIP
RXCLK RXDV RXER RXD0 RXD1 RXD2 RXD3 NC36 NC35 NC38 NC37 NC33
COL CRS MDC MDIO R602 22 R603 22 L43 FB-120 SB1.8V
MIIAVDD MIIAVSS 1mA
GPIO0/SPDIF GPIO1/LDRQ1# GPIO2/THERM# GPIO3/EXTSMI# GPIO4/CLKRUN# GPIO5/PREQ5# GPIO6/PGNT5# GPIO7 GPIO8/RING GPIO9/AC_SDIN2 GPIO10/AC_SDIN3 GPIO11/OSC25M/STP_PCI# GPIO12/CPUSTP#
GPI_IR THERM- RECOVERY- GPIO4 GPIO5 GPIO6 GPIO7 RING PS2PWR_S5OFF- DDRVJ GPIO11 PWRGD_CTRL
SIS964

Put closed to 964 CHIP
MCLK25O MCLK25I Y600 X-25M C166 4.7K C600 20P

		High	Low
GPIO7	LAN selection	PCILAN	LANPHY
GPIO13	Flash EN-	Write Enable	Write Disable

VCC R340 4.7K GPIO5 JP4 H3*1
VCC3_DUAL PME- R188 4.7K
NEED NOT to place close to 964
VCC3 RN28 1K-8P4R SMBDAT SMBCLK PWRGD_CTRL
VCC VCC R344 4.7K R366 4.7K GPIO4 GPIO6 JP5 H3*1-O
VCC3_DUAL R345 4.7K-O GPIO11 VCC3_DUAL R231 4.7K-O JPT3 H3*1-O
VCC3 R191 4.7K GPIO7 R190 4.7K-O
OSC32KHO OSC32KHI R214 10M Y5 X-32.768K-CY C188 15P C189 22P
BIT_CLK C206 10P-O
SB5V SMBDAT SMBCLK I2C DATA CLK GND KEY 5VSB H5*1-P4E

SiS963, 964 GPIO 0~7 internal pull up
SiS963, 964 GPIO 9,10 internal pull down

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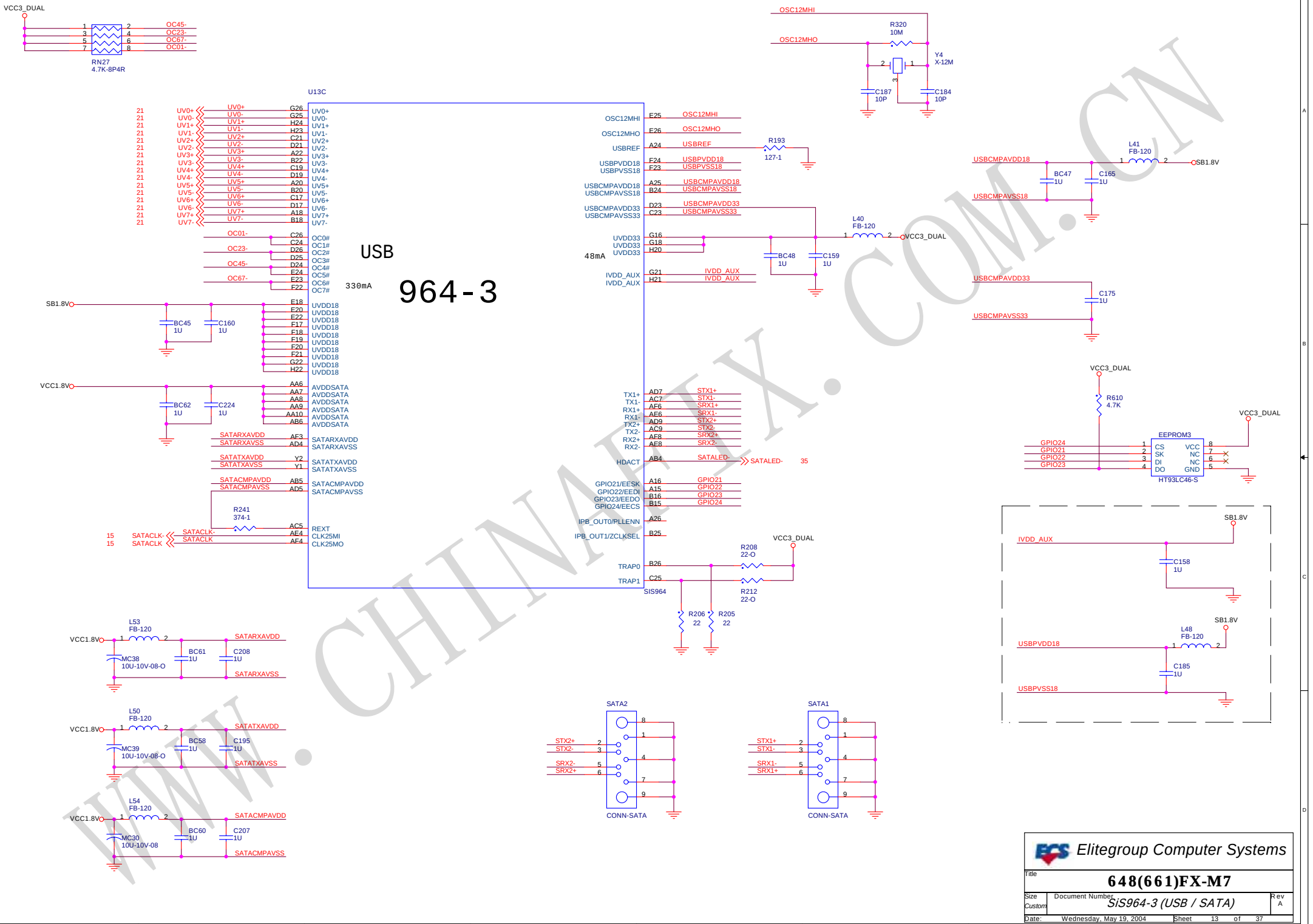

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Title	648(661)FX-M7	
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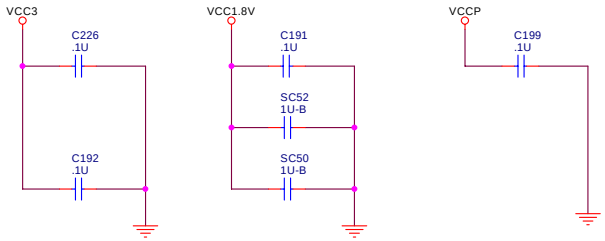

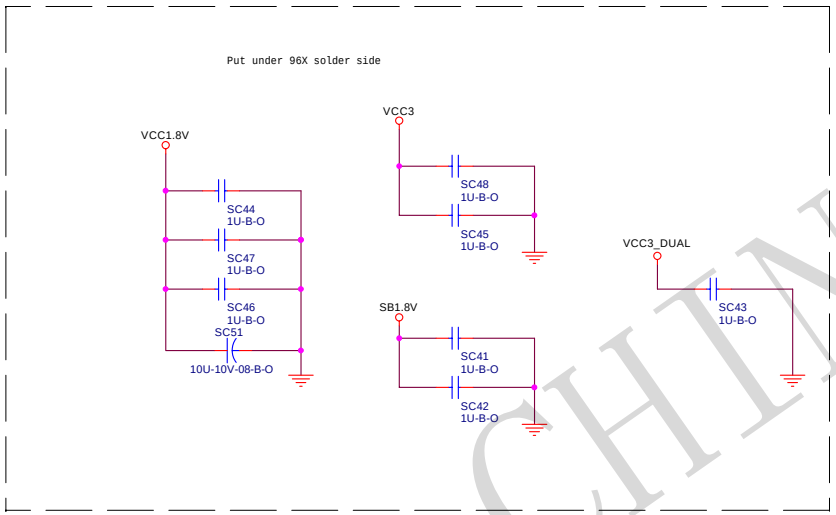

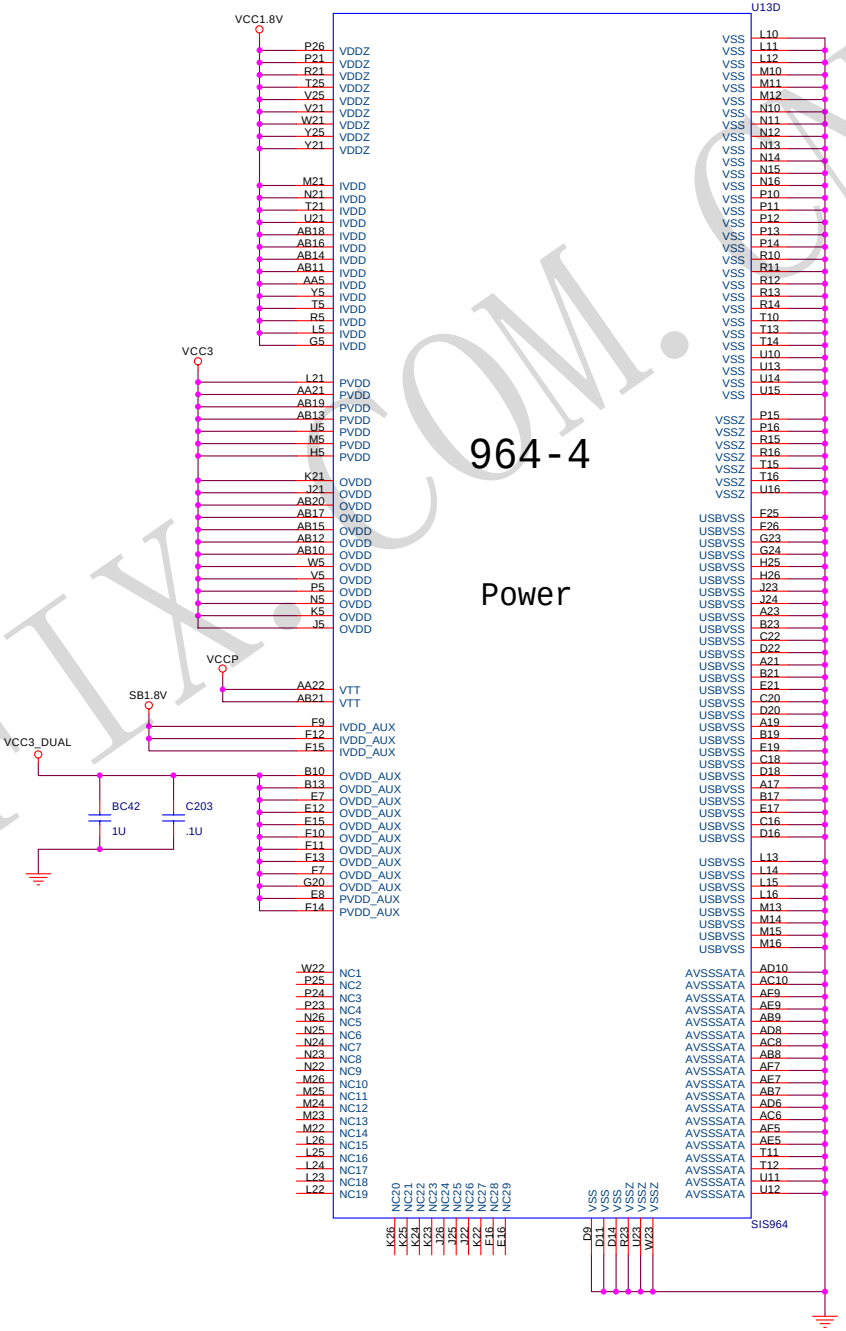

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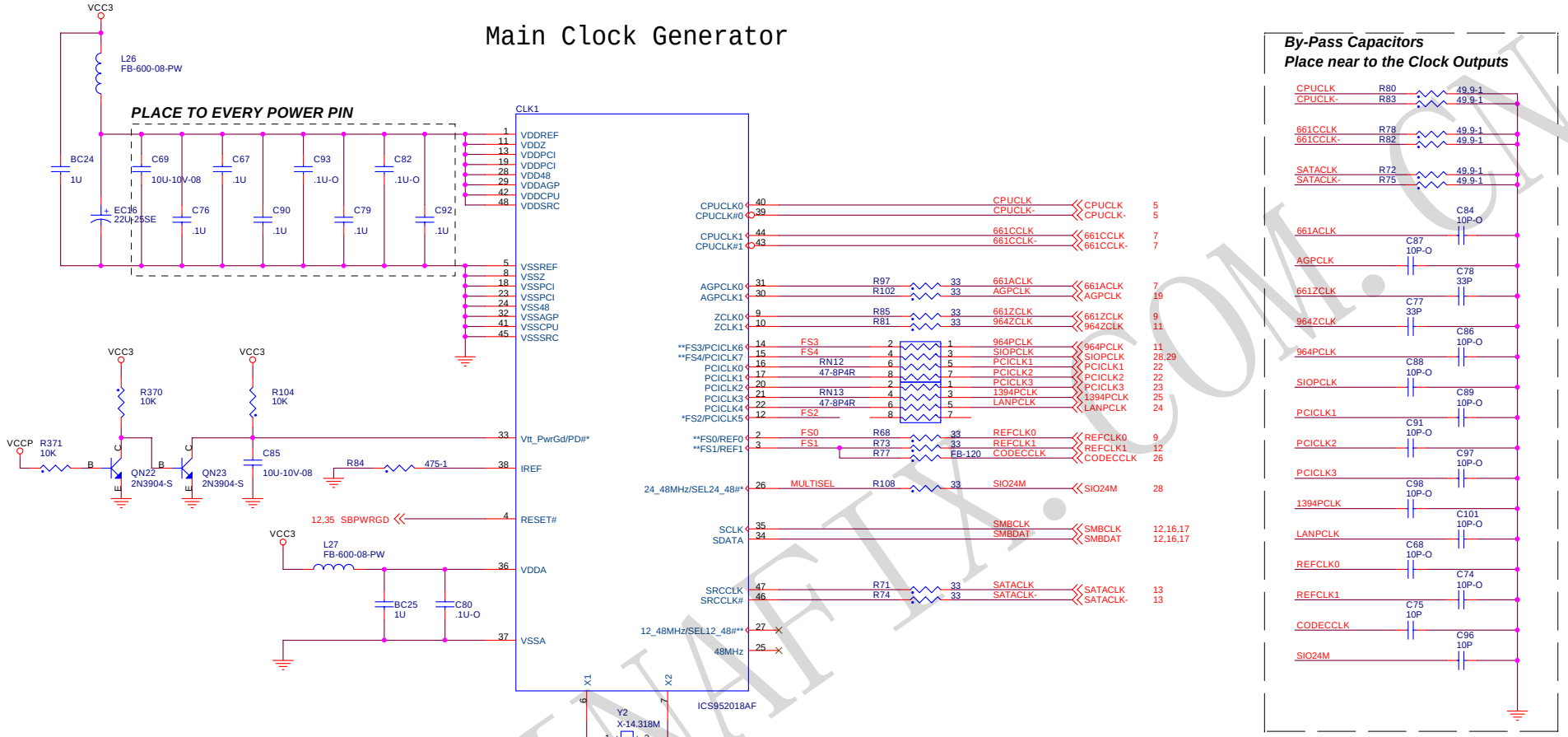
Main Clock Generator



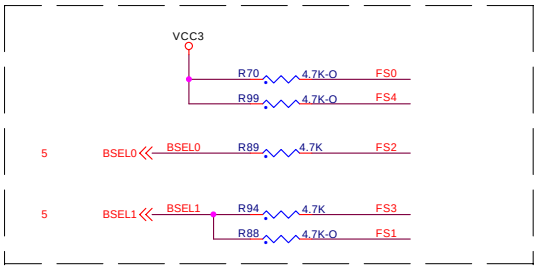
Frequency Table

	FS4	FS3	FS2	FS1	FS0	CPU (MHz)	SRC (MHz)	ZCLK (MHz)	AGP (MHz)	PCI (MHz)
FSB400	0	0	0	0	0	100.00	100.00	133.33	66.67	33.33
	0	0	0	0	1	100.99	100.99	134.65	67.33	33.66
	0	0	0	1	0	103.00	103.00	137.33	68.67	34.33
	0	0	0	1	1	100.00	100.00	133.33	66.67	33.33
FSB533	0	0	1	0	0	133.33	100.00	133.33	66.66	33.33
	0	0	1	0	1	134.65	100.99	134.65	67.32	33.66
	0	0	1	1	0	137.33	103.00	137.33	68.66	34.33
	0	0	1	1	1	133.33	100.00	133.33	66.67	33.33
FSB800	0	1	0	0	0	200.00	100.00	133.33	66.67	33.33
	0	1	0	0	1	201.98	100.99	134.65	67.33	33.66
	0	1	0	1	0	206.00	103.00	137.33	68.67	34.33
	0	1	0	1	1	200.00	100.00	133.33	66.67	33.33
	0	1	1	0	0	166.66	125.00	125.00	66.66	33.33
	0	1	1	0	1	168.31	126.23	126.23	67.32	33.66
	0	1	1	1	0	171.66	128.74	128.74	68.66	34.33
	0	1	1	1	1	166.66	125.00	125.00	66.66	33.33

Frequency Table

FS4	FS3	FS2	FS1	FS0	CPU (MHz)	SRC (MHz)	ZCLK (MHz)	AGP (MHz)	PCI (MHz)
1	0	0	0	0	105.00	105.00	140.00	70.00	35.00
1	0	0	0	1	107.00	107.00	142.67	71.33	35.67
1	0	0	1	0	109.00	109.00	145.33	72.67	36.33
1	0	0	1	1	110.00	110.00	146.67	73.33	36.67
1	0	1	0	0	140.00	105.00	140.00	70.00	35.00
1	0	1	0	1	142.66	107.00	142.67	71.33	35.67
1	0	1	1	0	145.33	109.00	145.33	72.66	36.33
1	0	1	1	1	146.66	110.00	146.66	73.33	36.67
1	1	0	0	0	210.00	105.00	140.00	70.00	35.00
1	1	0	0	1	214.00	107.00	142.67	71.33	35.67
1	1	0	1	0	218.00	109.00	145.33	72.67	36.33
1	1	0	1	1	220.00	110.00	146.67	73.33	36.67
1	1	1	0	0	266.66	100.00	133.33	66.67	33.33
1	1	1	0	1	269.33	101.00	134.67	67.33	33.67
1	1	1	1	0	274.66	103.00	137.33	68.67	34.33
1	1	1	1	1	266.66	100.00	133.33	66.67	33.33

Frequency Selection



MULTISEL R109 4.7K-O

Clock Generator Table / Hardware Traping	FS4 Low	FS3 BSEL1	FS2 BSEL0	FS1 Low	FS0 Low
CPU=100 (BSEL[1:0]=00)	0	0	0	0	0
CPU=133 (BSEL[1:0]=01)	0	0	1	0	0
CPU=200 (BSEL[1:0]=10)	0	1	0	0	0

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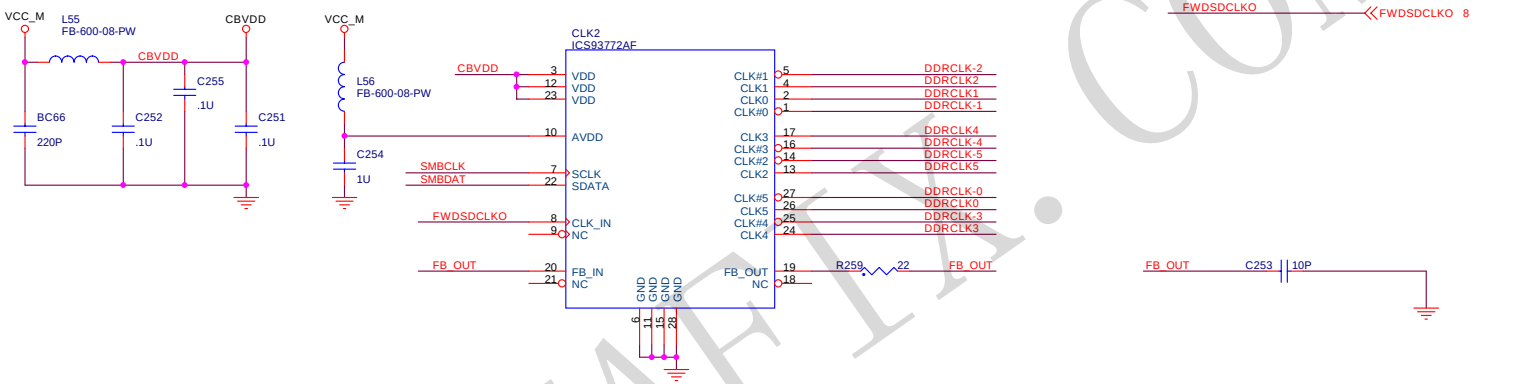
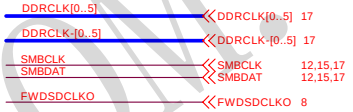
Clock Buffer (DDR)

(5 OPTIONS)
1: (ICS) ICS93716
2: (Winbond)
3: (ICWorks)
4: (IMI)
5: (AMI)

By-Pass Capacitors
Place near to the Clock Buffer





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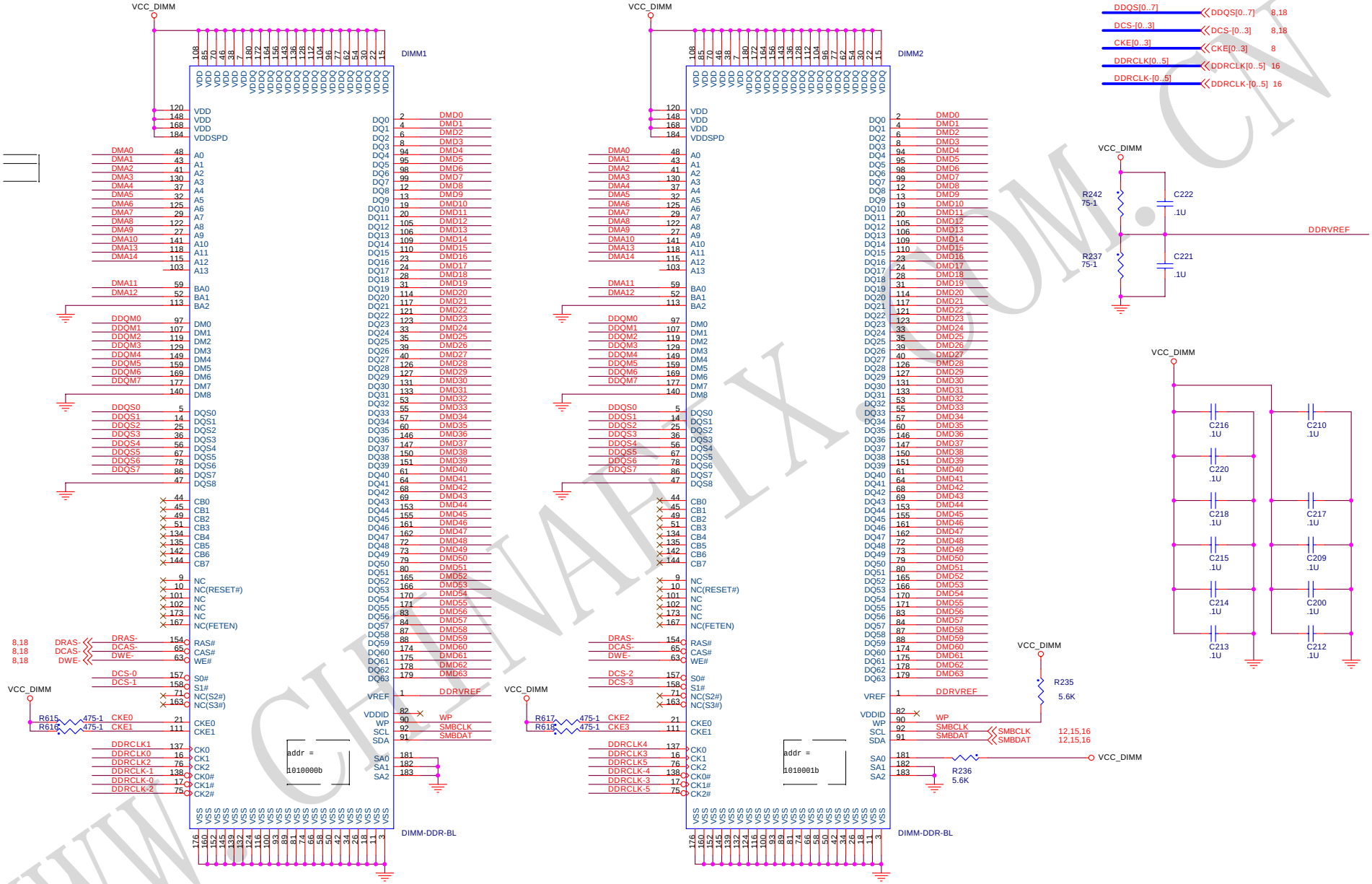
NOTE:

VDDID IS A TRAP ON THE DIMM
MODULE TO INDICATE:

VDDID	REQUIRED POWER
OPEN	VDD=VDDQ
GND	VDD!=VDDQ

MEMORY MUX TABLE:

SDR	DDR
CS0	CS0
CS1	CS1
CS2	CS2
CS3	CS3
CS4	CS4
CS5	CS5
CSB0	DQS0
CSB1	DQS1
CSB2	DQS2
CSB3	DQS3
CSB4	DQS4
CSB5	DQS5
CSB6	DQS6
CSB7	DQS7



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SSTL-2 Termination Resistors

	SDR		DDR		
		Rs		Rs	Rtt
MD/DQM(/DQS)	LV-CMOS	0/10/-	SSTL-2	10	33
MA/Control	LV-CMOS	10	SSTL-2	0	33
CS	LV-CMOS	0	SSTL-2	0	47
CKE	OD 3.3V		OD 2.5V		

DMD[0..63] → DMD[0..63] 8,17
DMA[0..14] → DMA[0..14] 8,17
DDQM[0..7] → DDQM[0..7] 8,17
DDQS[0..7] → DDQS[0..7] 8,17
DCS-[0..3] → DCS-[0..3] 8,17

DDR_VTT

RN30 56-8P4R: DMD1, DMD5, DMD0, DMD4
RN29 56-8P4R: DMD6, DMD2, DDQS0, DDQM0
RN42 56-8P4R: DMD9, DMD8, DMD3, DMD7
RN41 56-8P4R: DDQM1, DDQS1, DMD13, DMD12
RN40 56-8P4R: DMD11, DMD10, DMD15, DMD14
RN37 56-8P4R: DMA7, DMD22, DMD18, DMA9
RN39 56-8P4R: DMD17, DMA14, DMD16, DMD20
RN36 56-8P4R: DMA5, DMD19, DMD23, DMA8
RN33 56-8P4R: DMD26, DMD27, DMD30, DMA3
RN34 56-8P4R: DDQM3, DMA4, DDQS3, DMD25

RN52 56-8P4R: DMD34, DMD37, DDQS4, DMD33
RN51 56-8P4R: DMD39, DMA11, DMD38, DDQM4
8,17 DRAS- → DRAS-
RN50 56-8P4R: DRAS-, DMD44, DMD40, DMD35
RN46 56-8P4R: DMD42, DMD46, DDQS5, DDQM5
RN49 56-8P4R: DCS-0, DMD41, DMD45, DWE-
8,17 DWE- → DWE-
RN45 56-8P4R: DMD52, DMD48, DMD47, DMD43
RN44 56-8P4R: DMD50, DDQS6, DMD54, DDQM6
RN48 56-8P4R: DMD56, DMD60, DMD51, DMD55
RN43 56-8P4R: DMD62, DDQM7, DMD57, DMD61
RN53 56-8P4R: DMD59, DMD63, DMD58, DDQS7
RN47 56-8P4R: DCS-3, DCS-1, DCS-2, DCAS-
8,17 DCAS- → DCAS-

DDR_VTT

RN32 56-8P4R: DMA0, DMA1, DMD31, DMA2
RN35 56-8P4R: DMD29, DMD28, DMA6, DMD24
RN31 56-8P4R: DMD36, DMD32, DMA12, DMA10
RN38 56-8P4R: DDQM2, DMA13, DMD21, DDQS2

R250 56: DMD49
R249 56: DMD53

DECOUPLING CAPACITOR FOR SSTL-2 END TERMIANTION VTT ISLAND
0603 Package placed within 200mils of VTT Termination R-packs

DDR_VTT

C248 .1U, C247 .1U, C246 .1U, C245 .1U
C244 .1U, C243 .1U, C242 .1U, C241 .1U
C240 .1U, C239 .1U, C238 .1U, C237 .1U
C236 .1U, C235 .1U, C234 .1U, C233 .1U

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Title	648(661)FX-M7	
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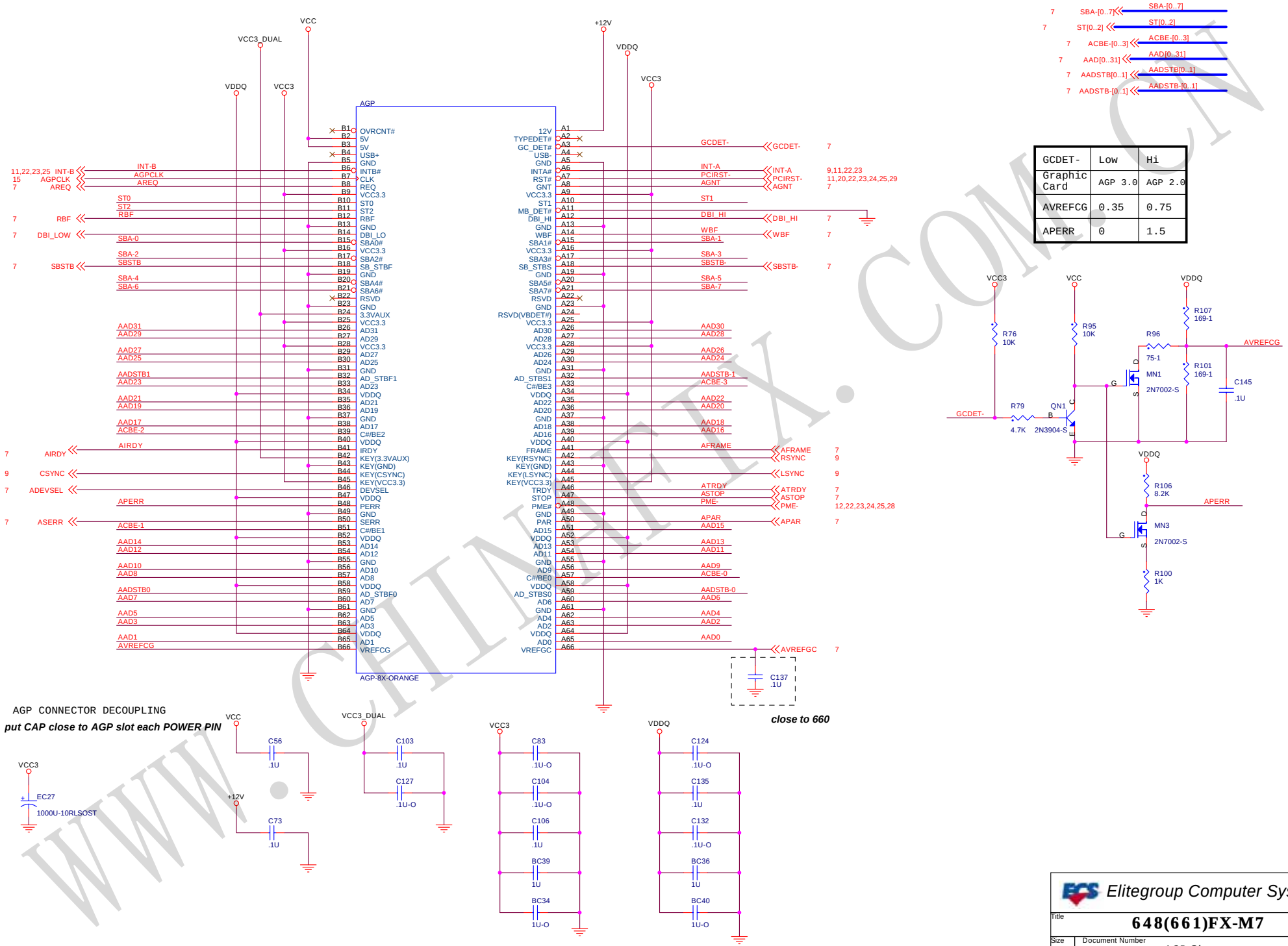

GCDET-	Low	Hi
Graphic Card	AGP 3.0	AGP 2.0
AVREFCG	0.35	0.75
APERR	0	1.5

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Title: 648(661)FX-M7

Size: Custom | Document Number: AGP Slot | Rev: A

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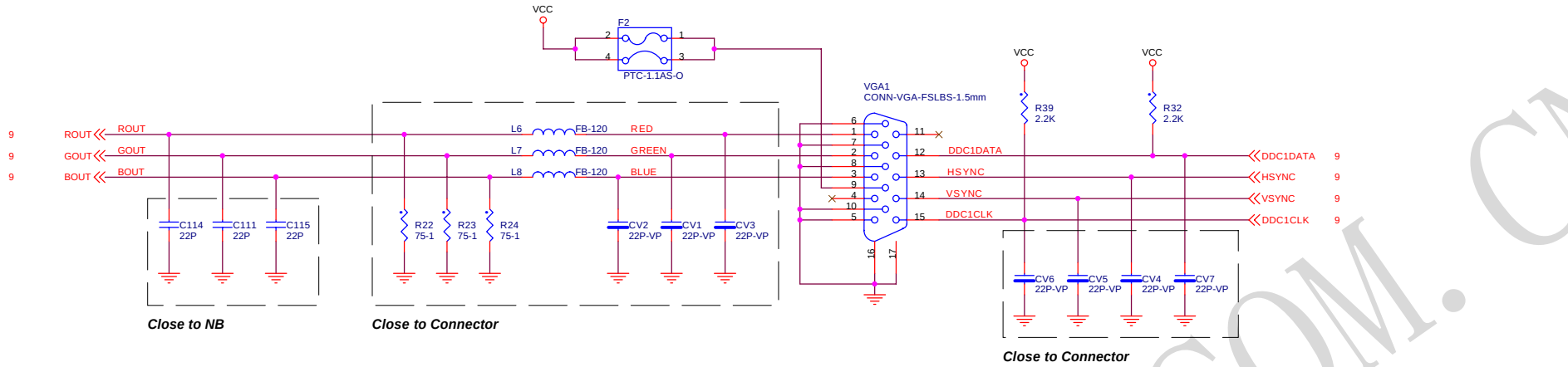
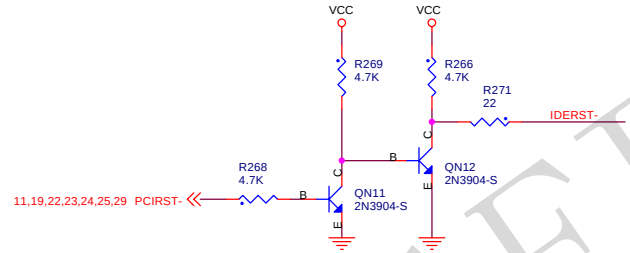


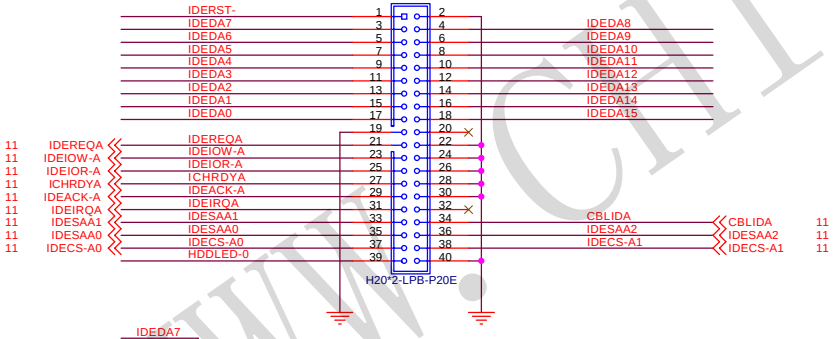


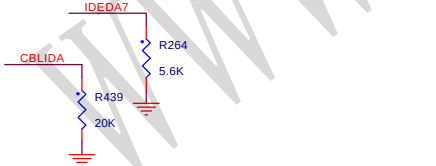
11 IDEDA[0..15] IDEDA[0..15]

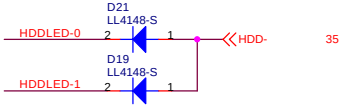
11 IDEDB[0..15] IDEDB[0..15]

PRIMARY

IDE1

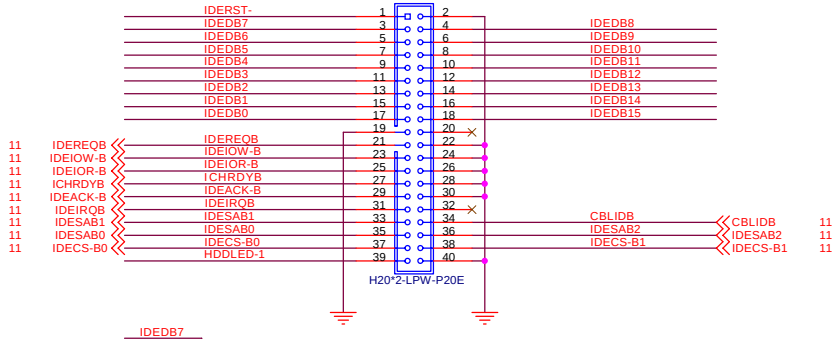


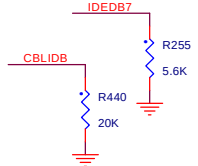




SECONDARY

IDE2





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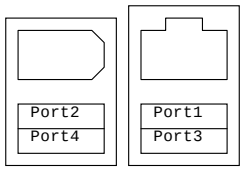
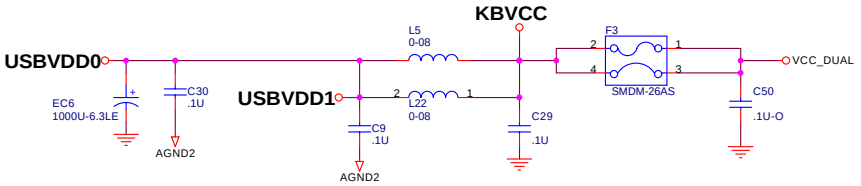
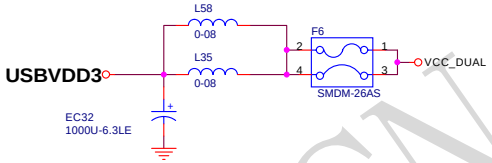
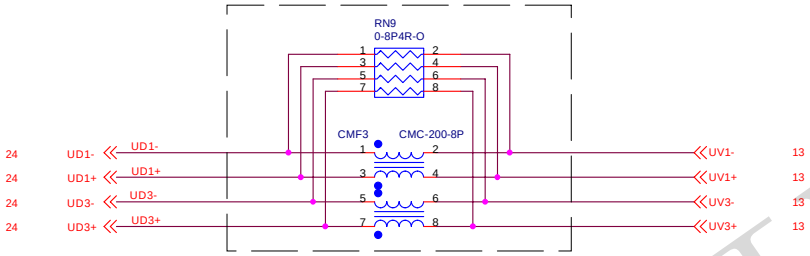
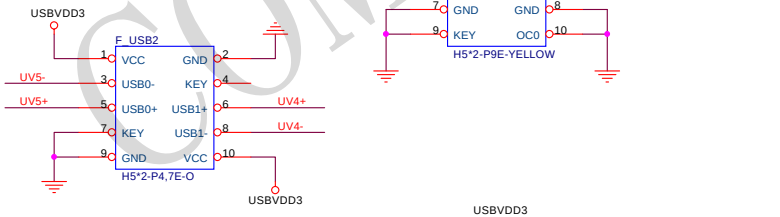


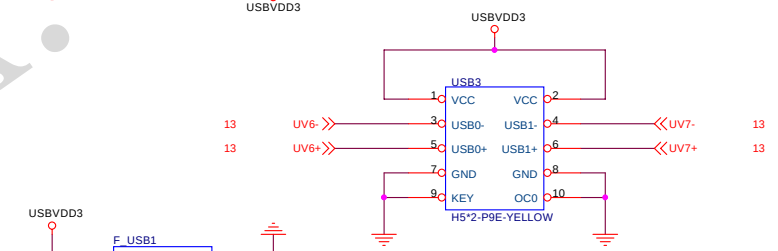


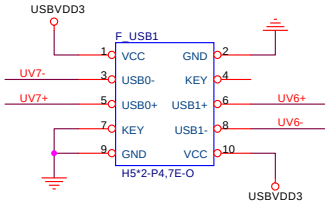


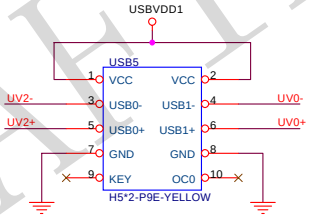


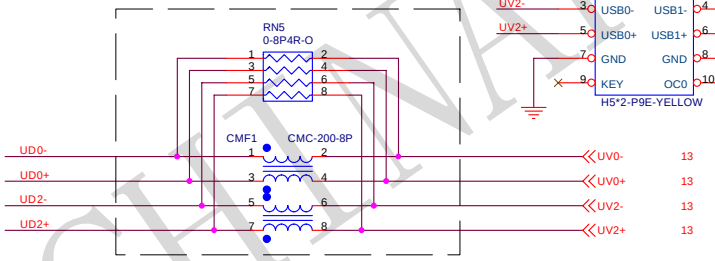
Close to USBLAN1 connector



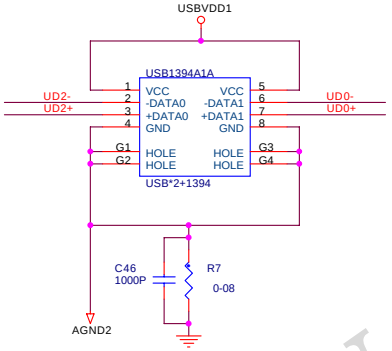




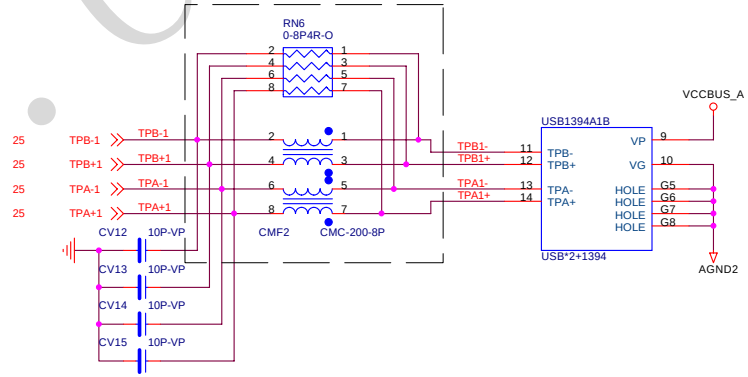




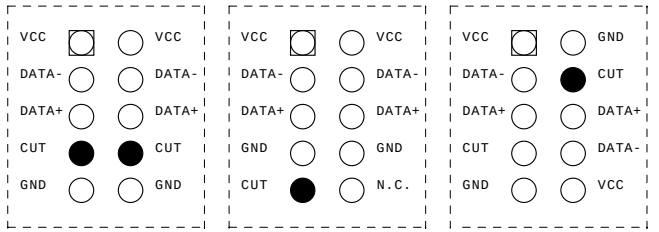
Close to USB1394A_J1 connector



Close to 1394 Connector



	USB port
Control 0	0, 3, 6
Control 1	1, 4, 7
Control 2	2, 5



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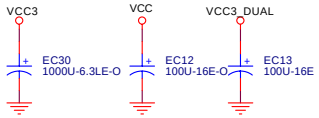
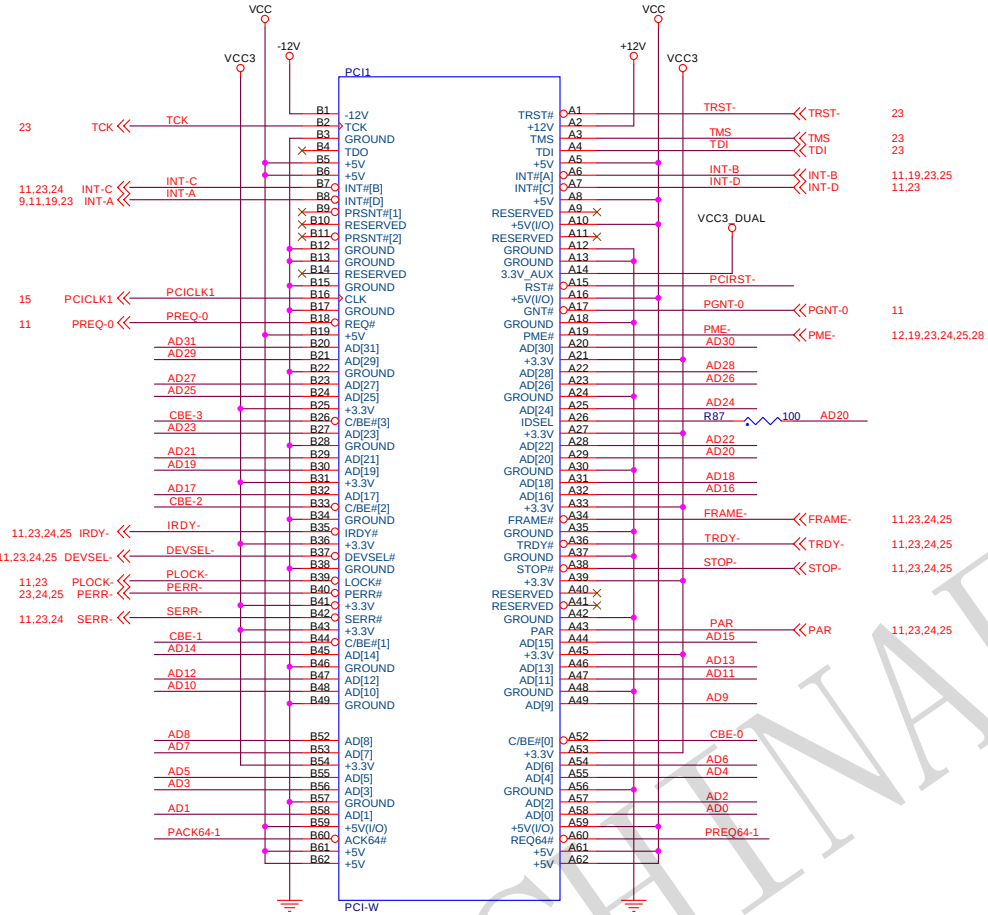
PCI Slot 1 & 2





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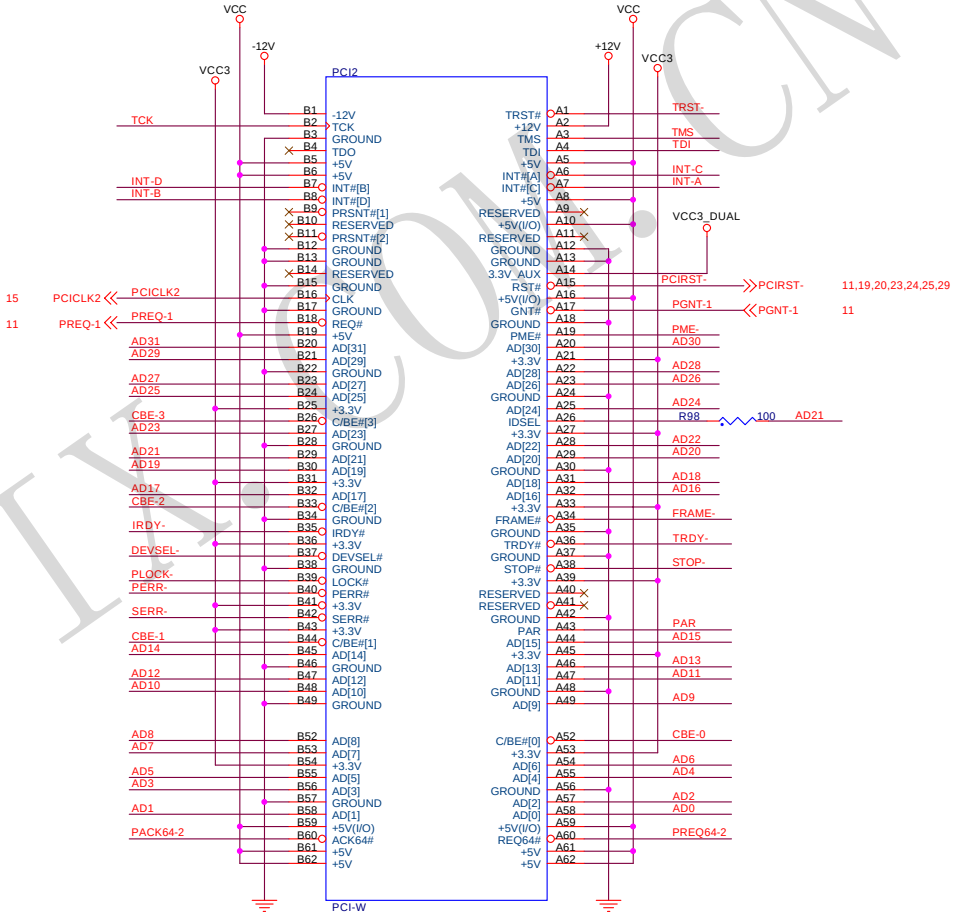
INT[B,C,D,A]



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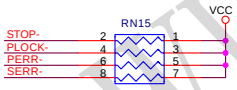

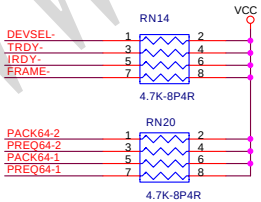

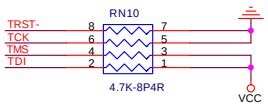

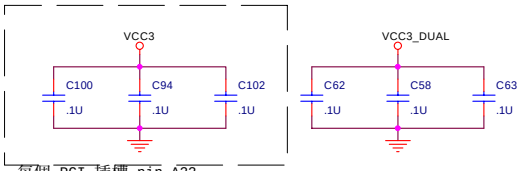

每個 PCI 插槽 pin A33
各放一顆

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Title	648(661)FX-M7	
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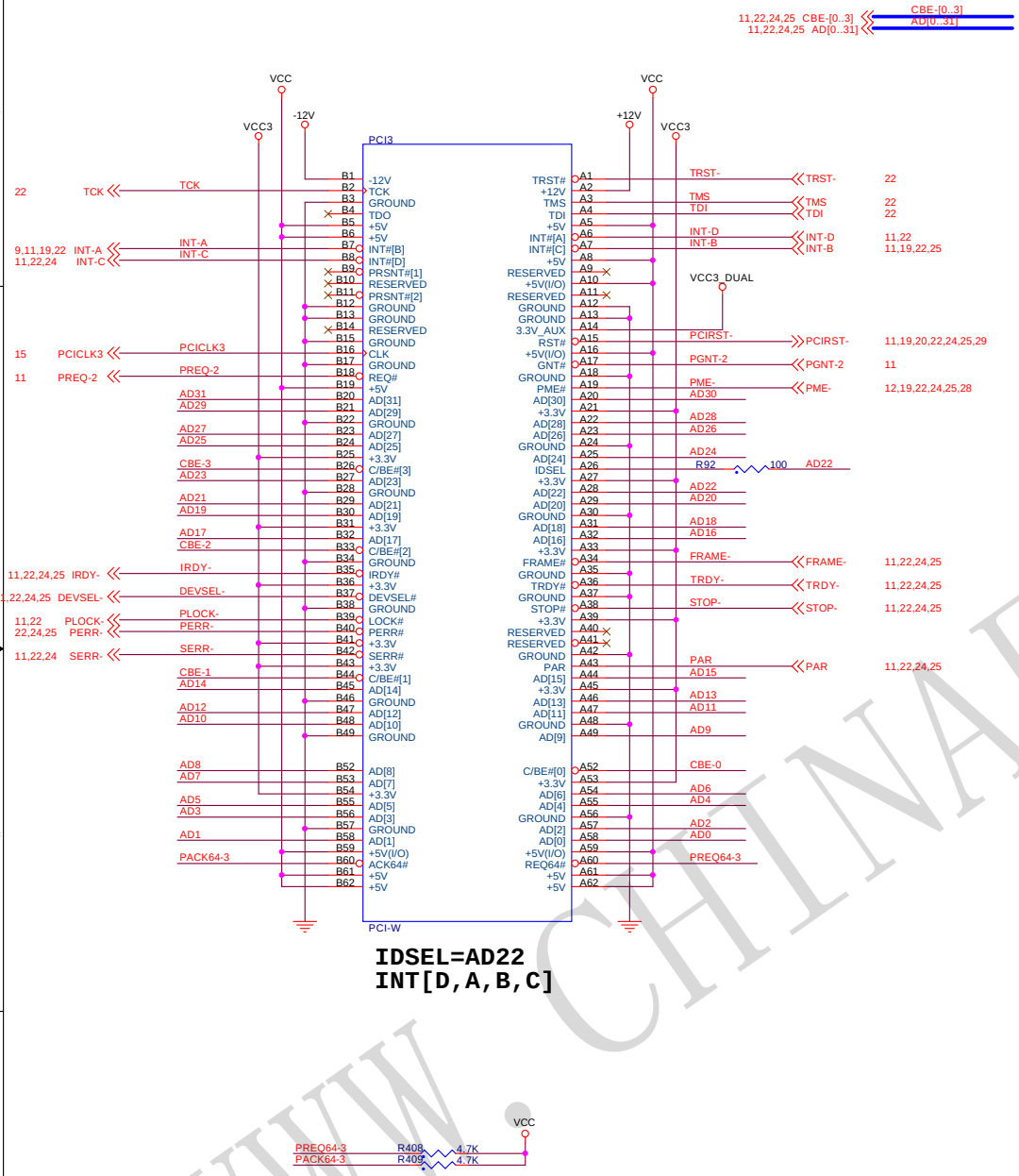

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Title	648(661)FX-M7	
Size: Custom	Document Number: PCI Slot3	Rev: A
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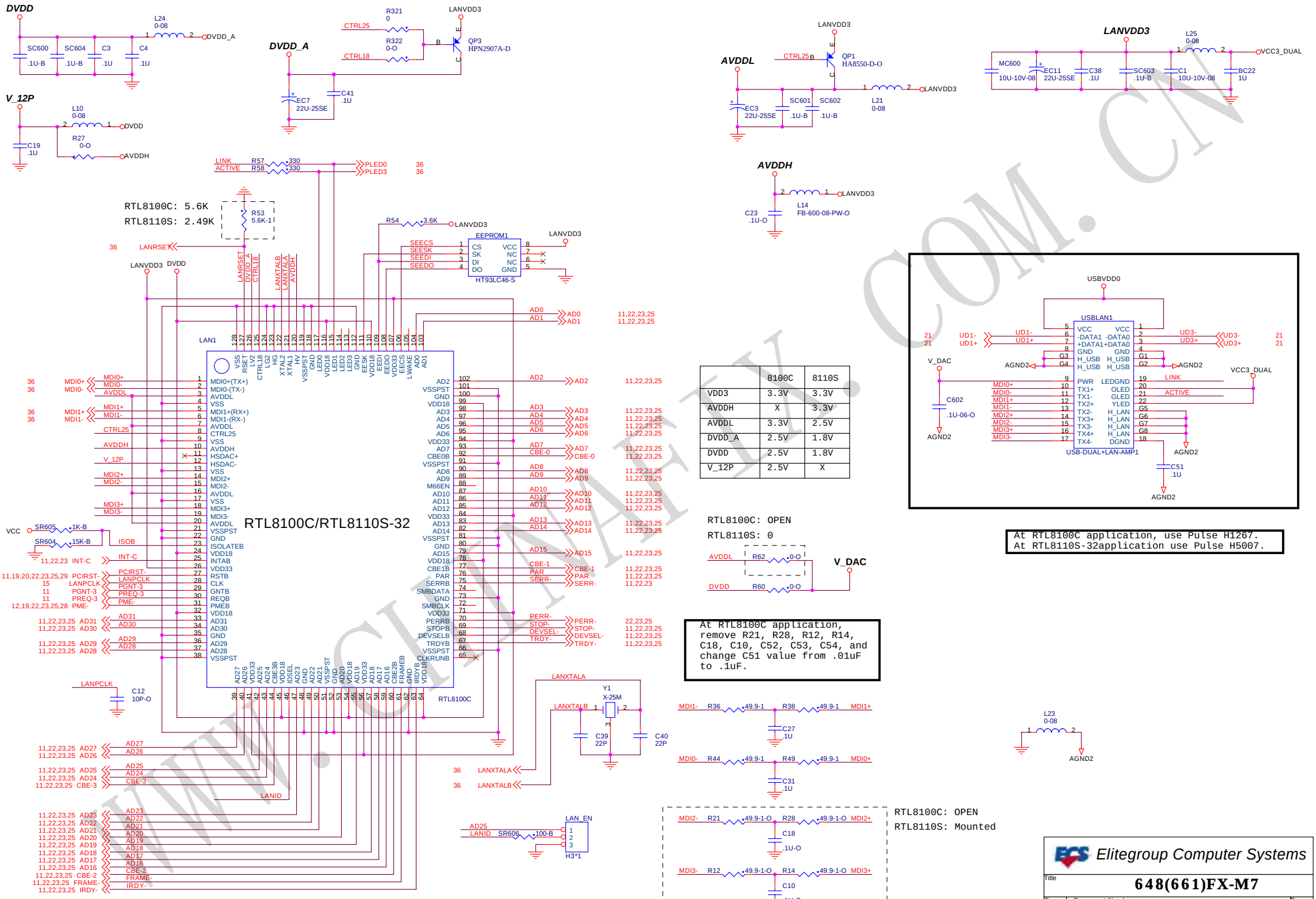

	8100C	8110S
VDD3	3.3V	3.3V
AVDDH	X	3.3V
AVDDL	3.3V	2.5V
DVDD_A	2.5V	1.8V
DVDD	2.5V	1.8V
V_12P	2.5V	X

RTL8100C: OPEN
RTL8110S: 0

At RTL8100C application, remove R21, R28, R12, R14, C18, C10, C52, C53, C54, and change C51 value from .01uF to .1uF.

At RTL8100C application, use Pulse H1267.
At RTL8110S-32application use Pulse H5007.

RTL8100C: OPEN
RTL8110S: Mounted

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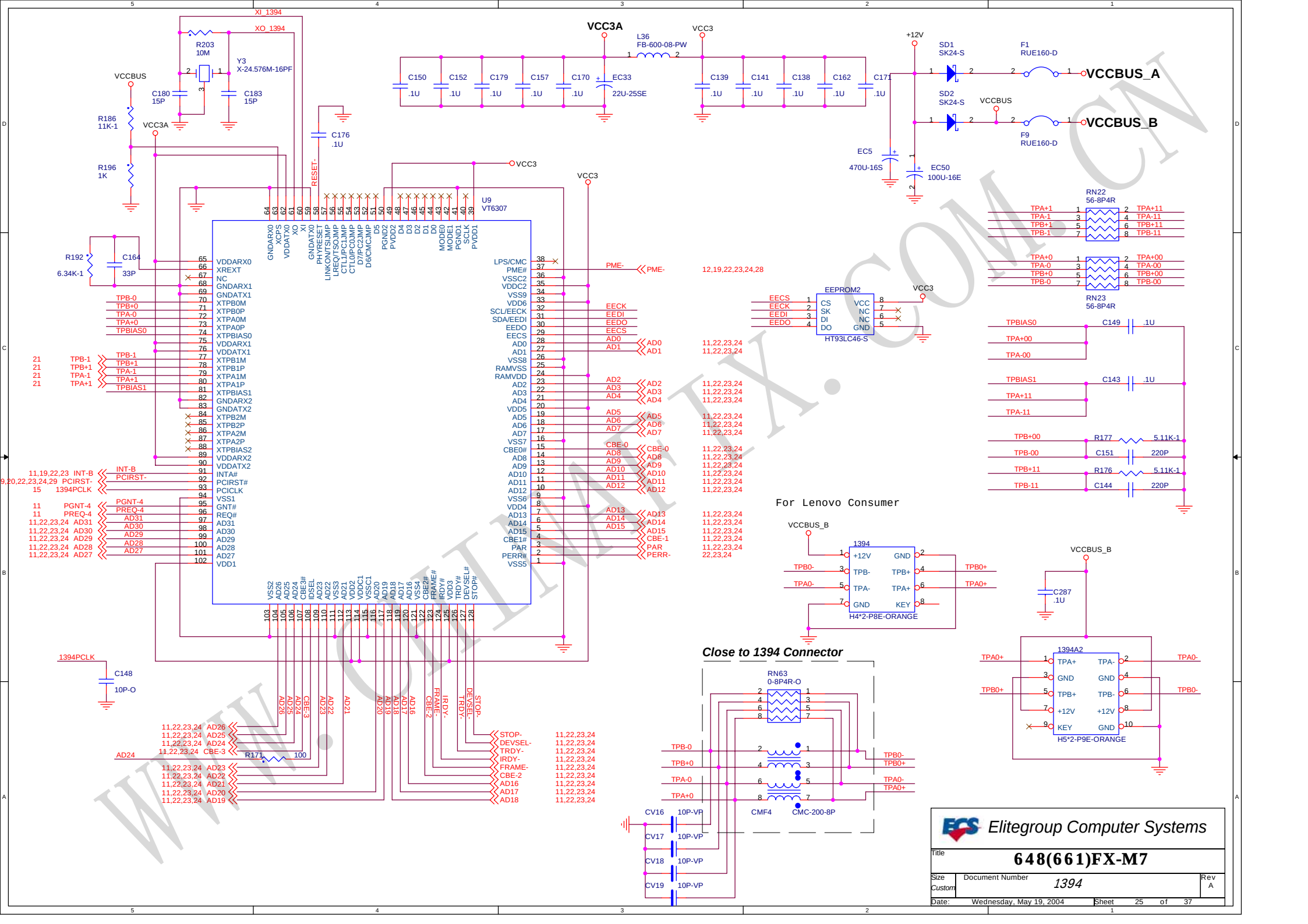

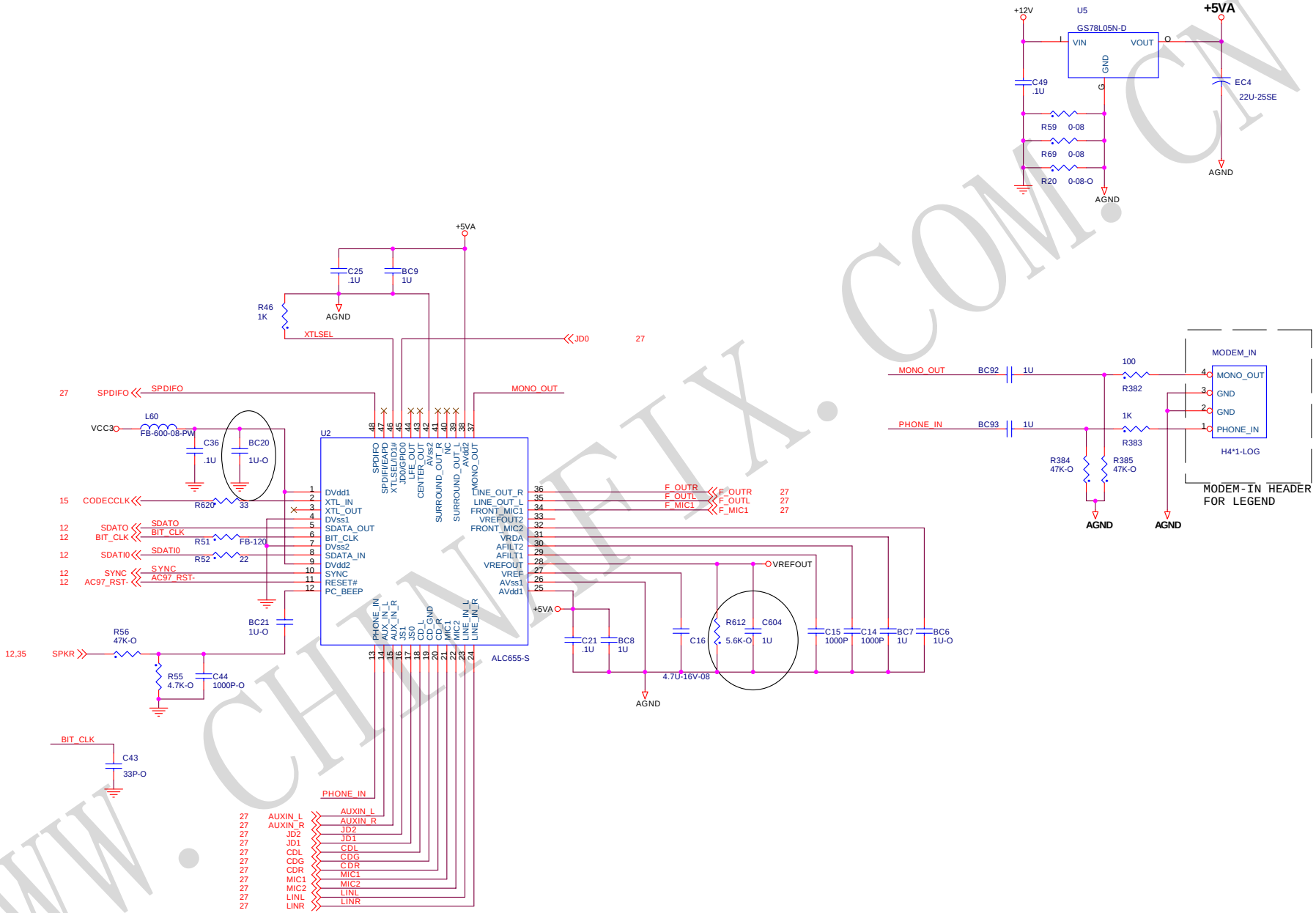

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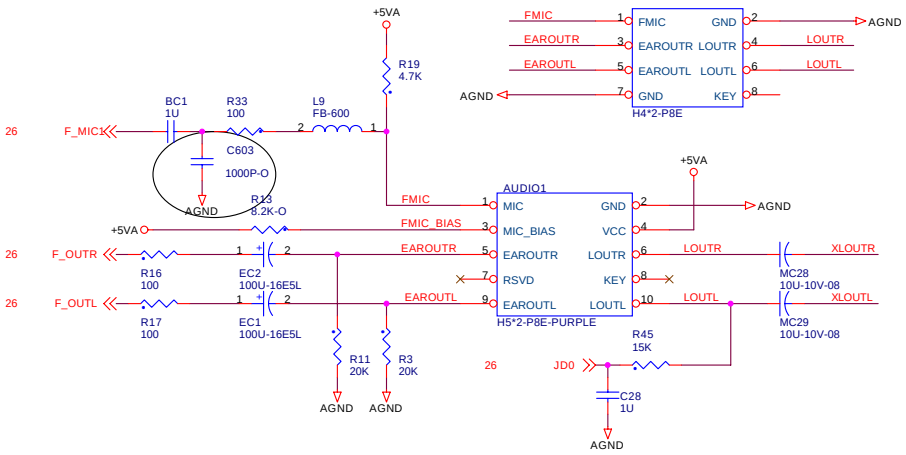

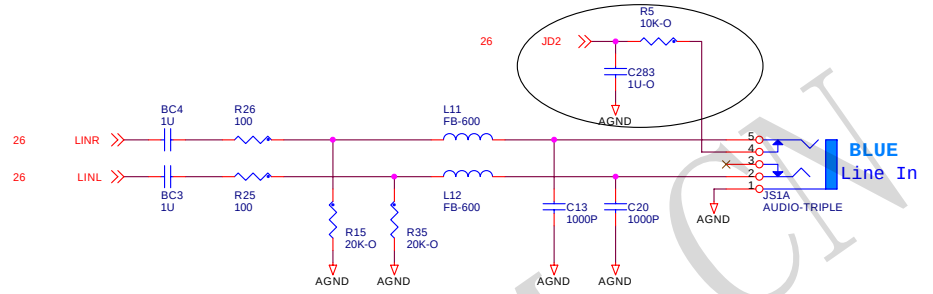

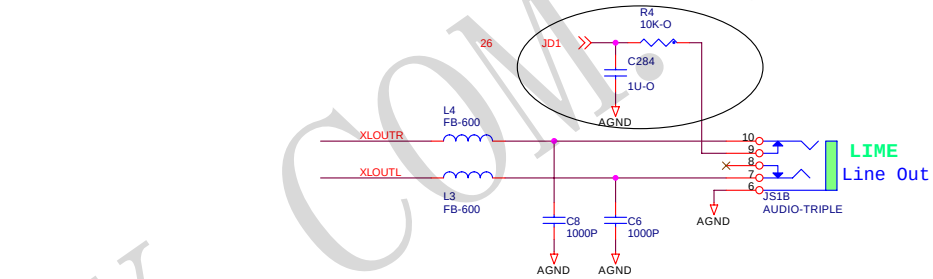

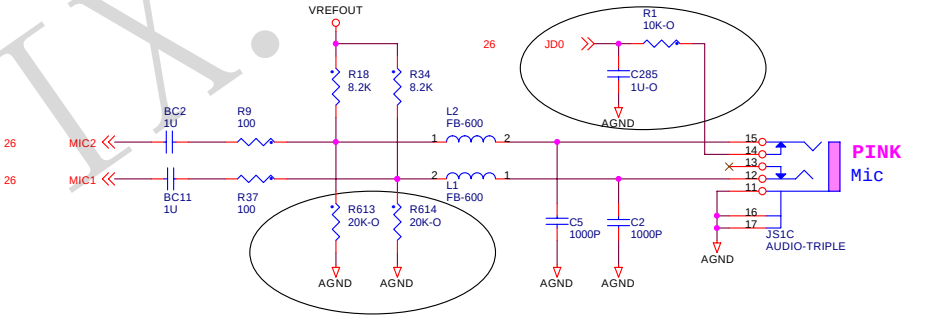

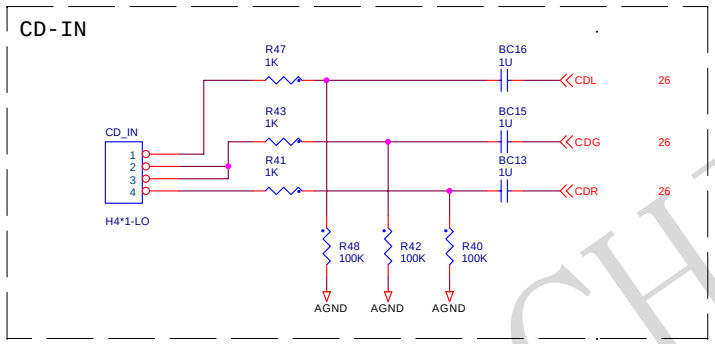

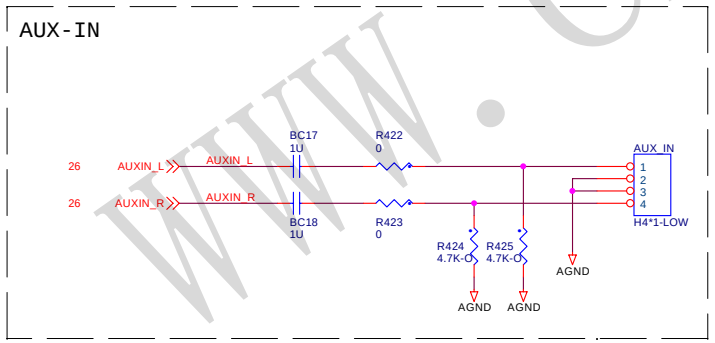

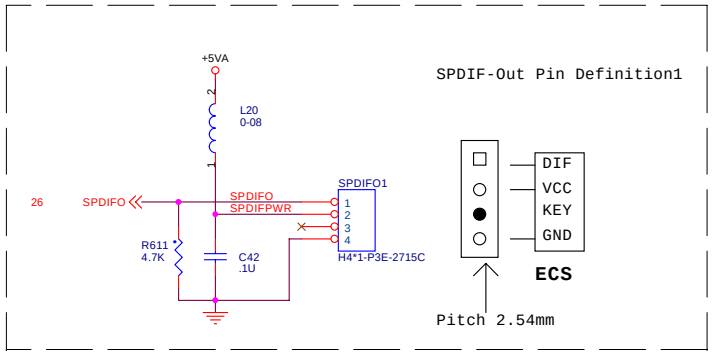

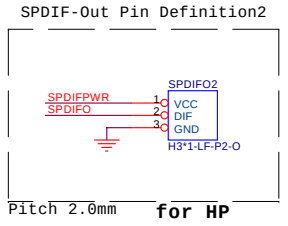

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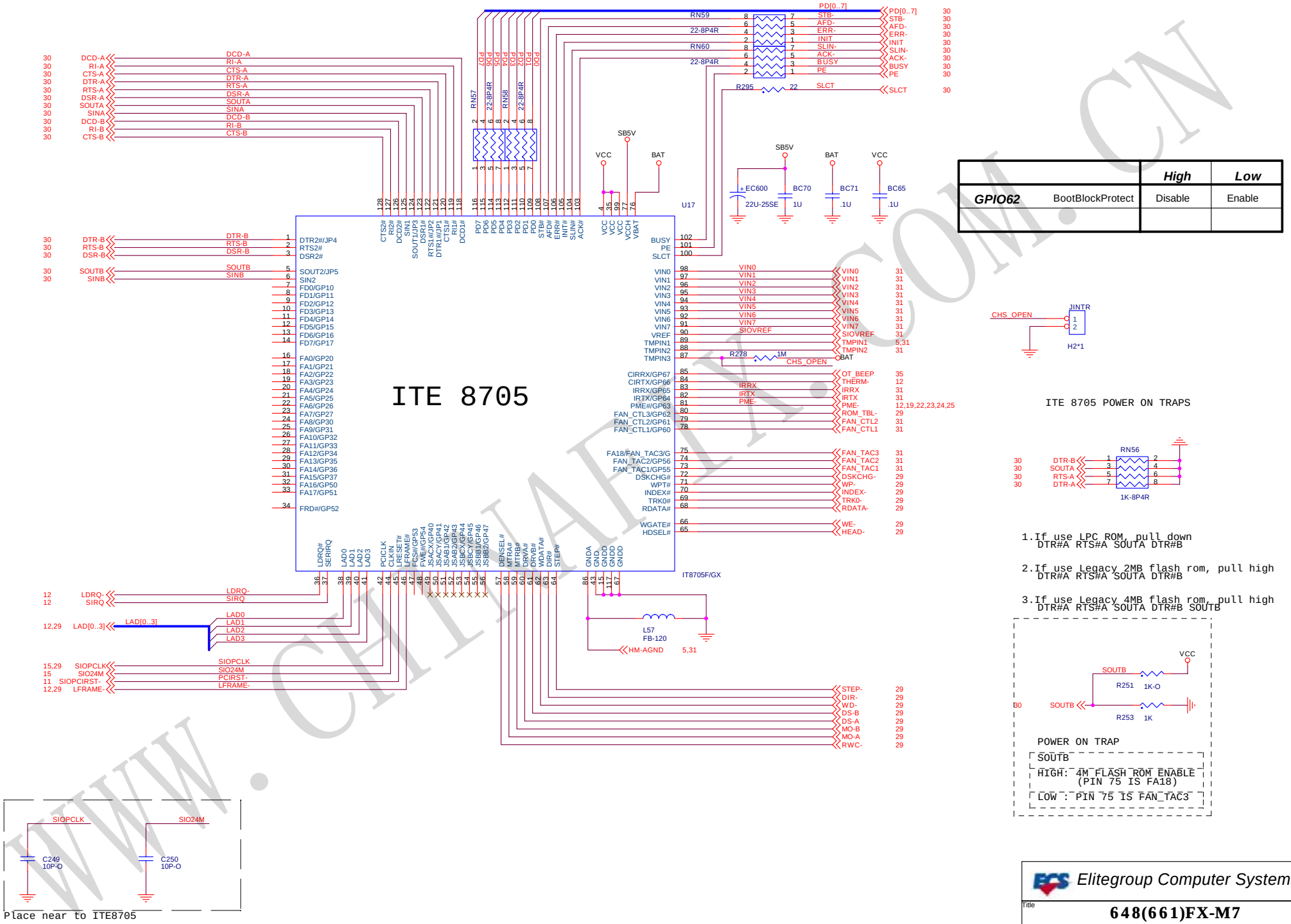

		High	Low
GPIO62	BootBlockProtect	Disable	Enable

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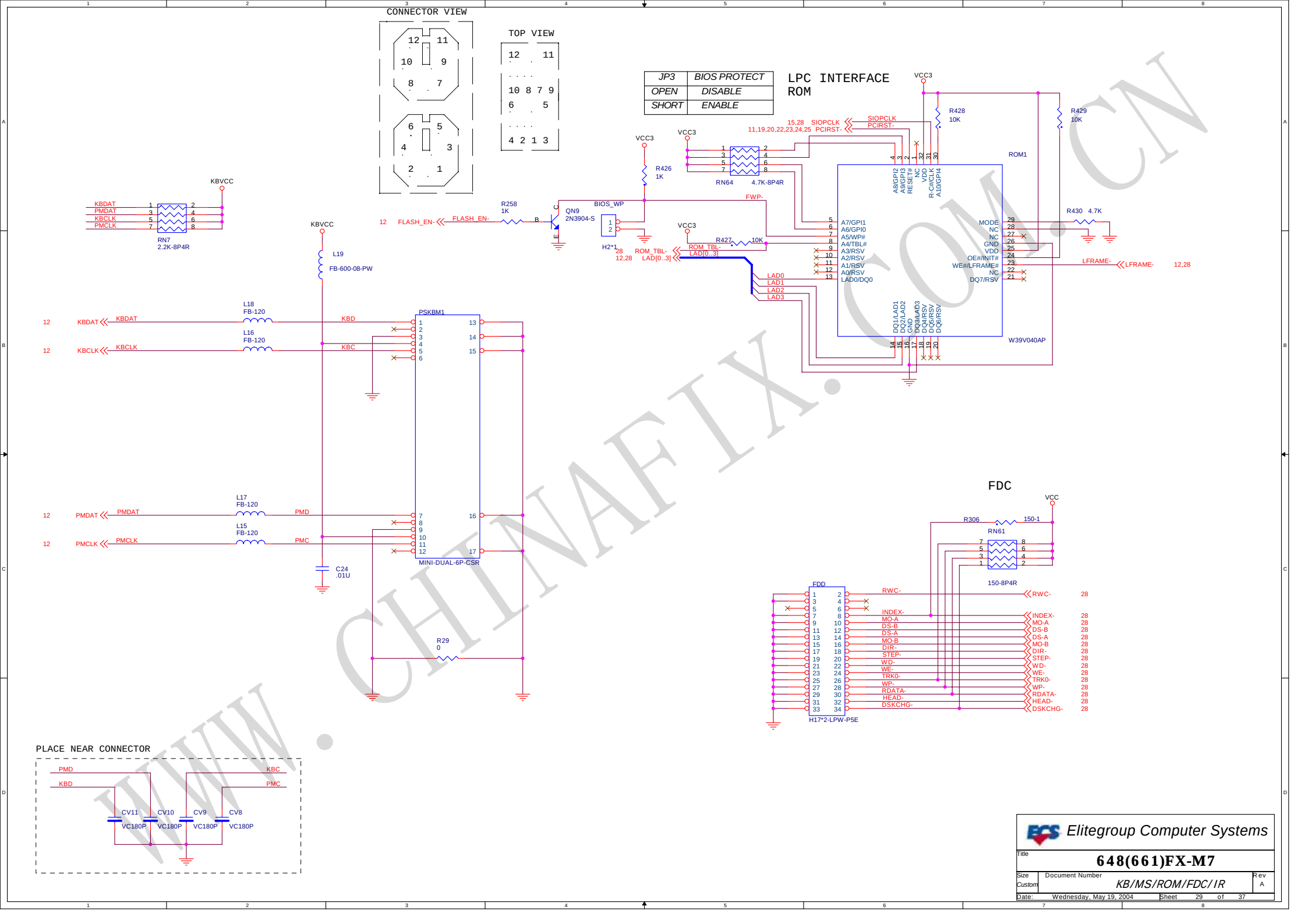

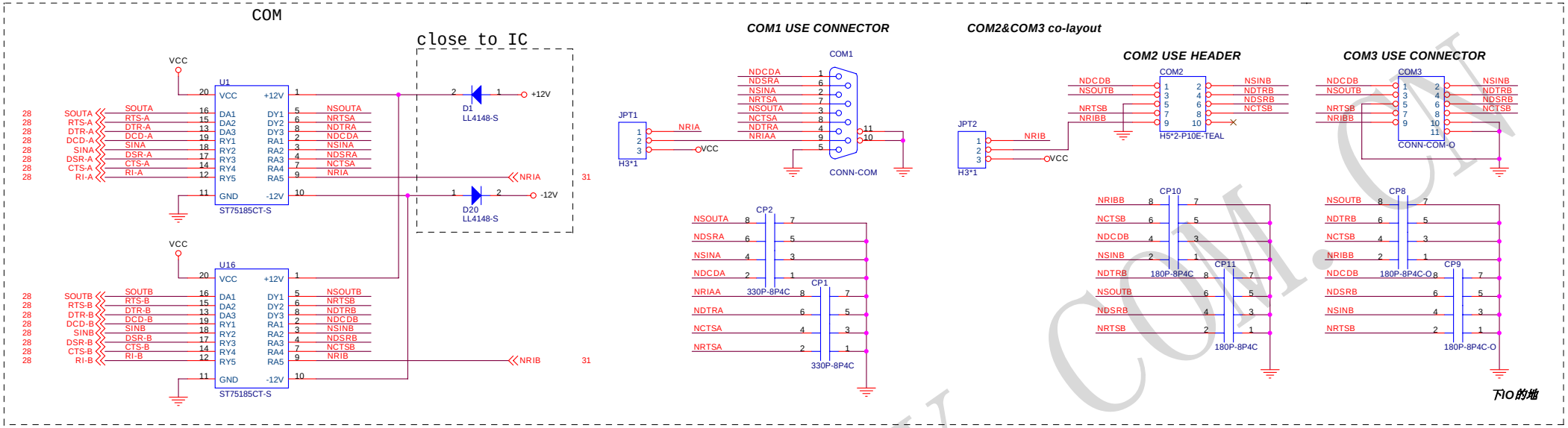

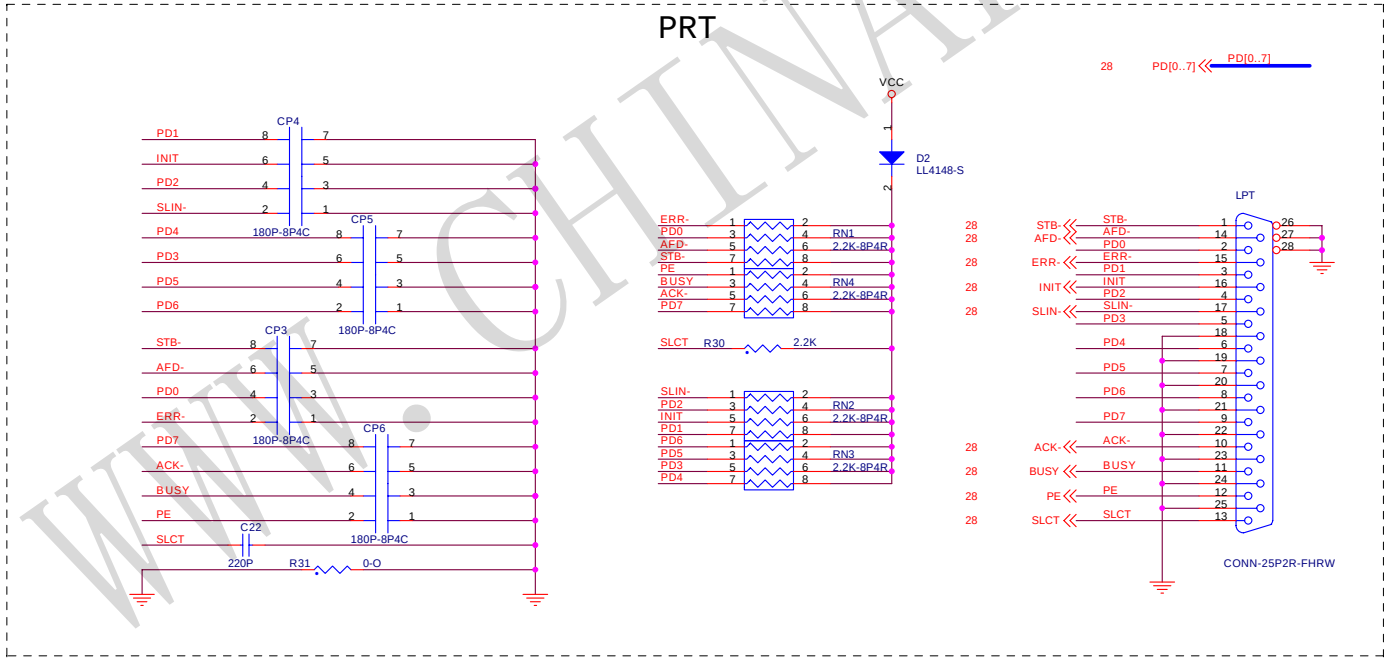

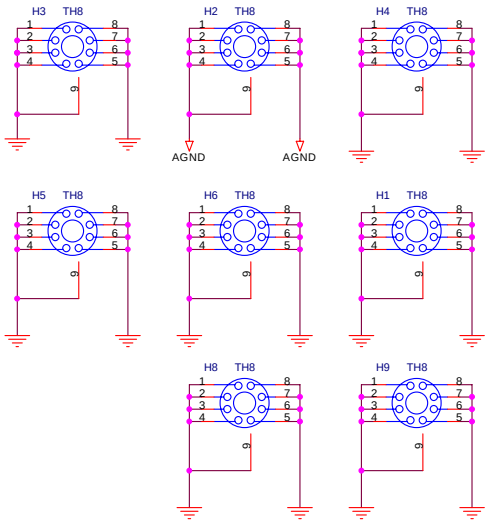

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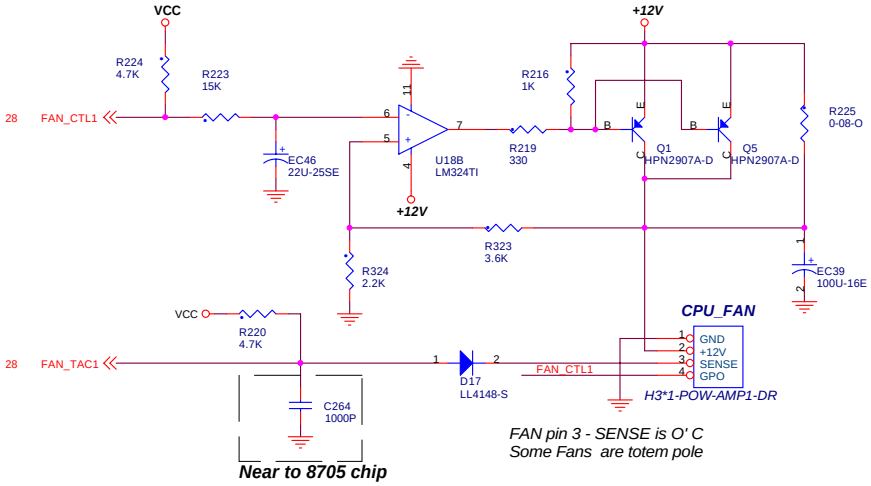
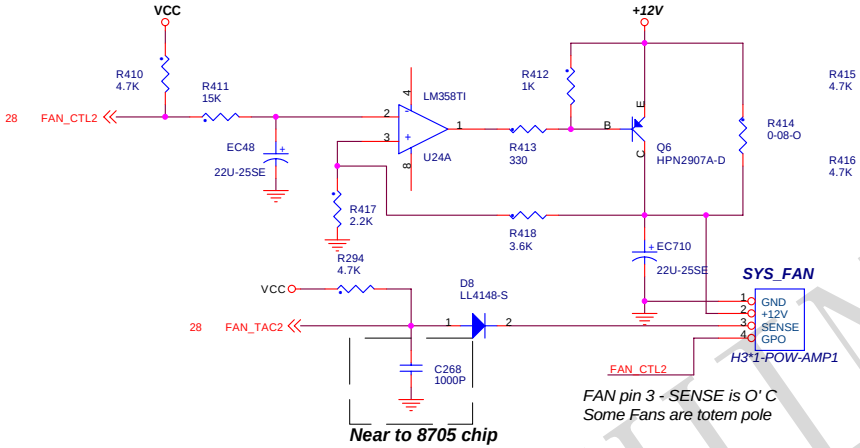
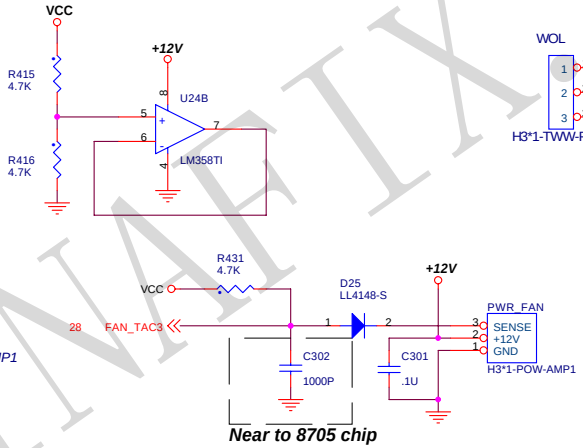
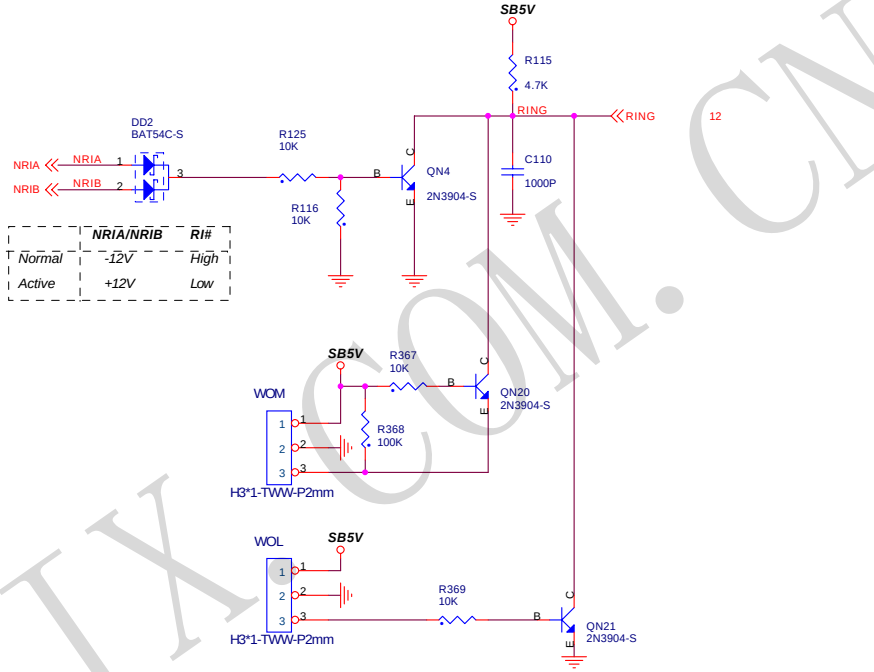
Layout :

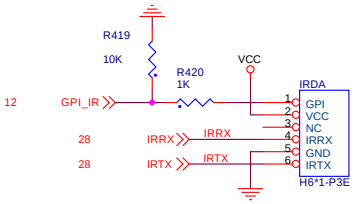
Power Signals : CPUFAN, CASEFAN, PWRFAN trace width should > 20 mil with current 200 mA .



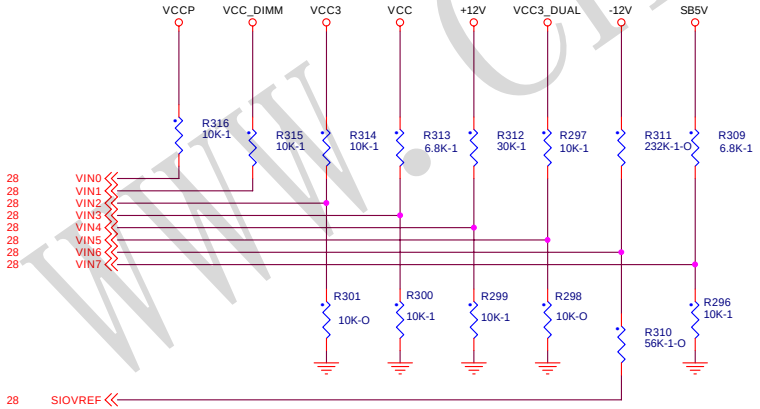






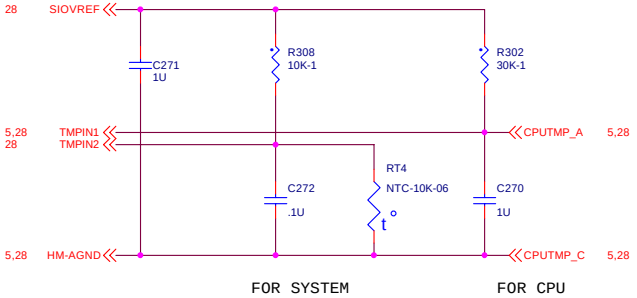


Voltage Monitor



Temperature Monitor

Choosing method of measuring temperature by either thermistor or diode



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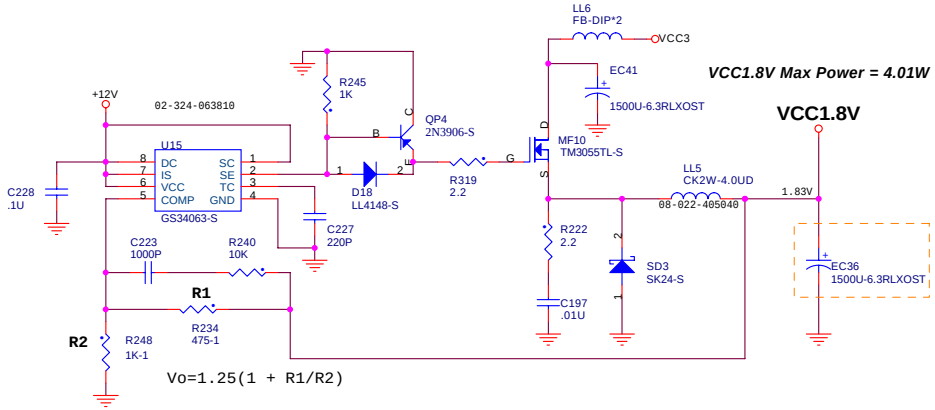
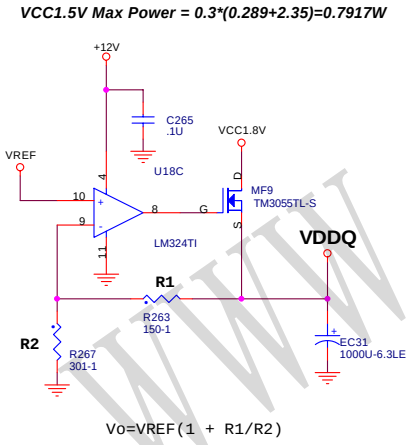
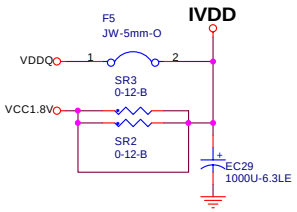
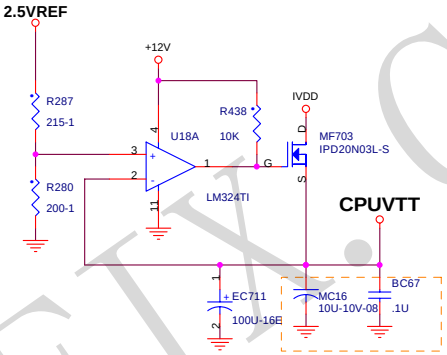


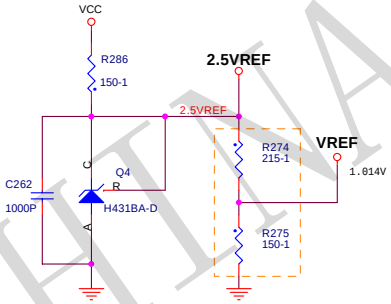
	IVDD	VCC1.8V	
648	1.8V	1.8V	short two power plane, one regulator
648FX	1.9V	1.9V	short two power plane, one regulator
661FX	1.8V	1.8V	short two power plane, one regulator or two regulator

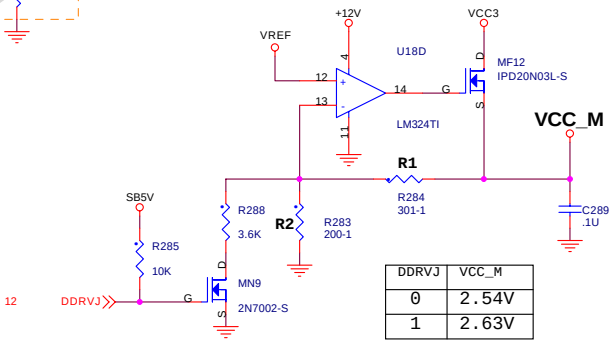
	AUX_IVDD	SB1.8V	
648	1.8V	1.8V	short two power plane, one regulator
648FX	1.9V	1.9V	short two power plane, one regulator
661FX	1.8V	1.8V	short two power plane, one regulator



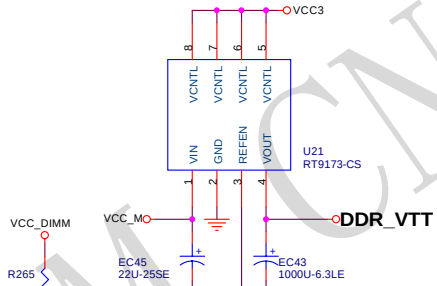


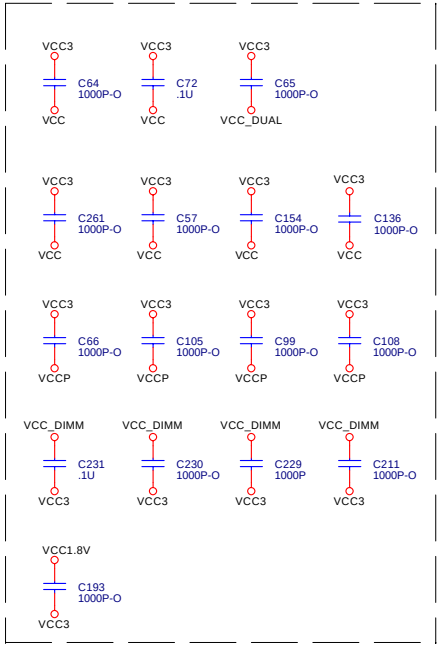






DDRVJ	VCC_M
0	2.54V
1	2.63V





平均分佈在POWER PLAN 和 PLAN 之間

Elitegroup Computer Systems

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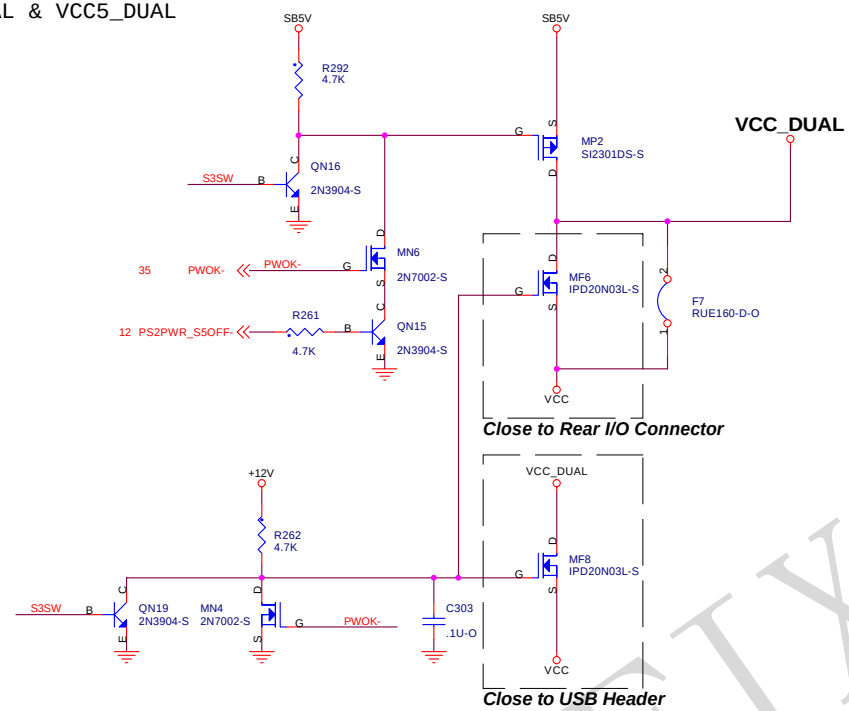
AUTO VOLTAGE SWITCH FOR ACPI STATE 3

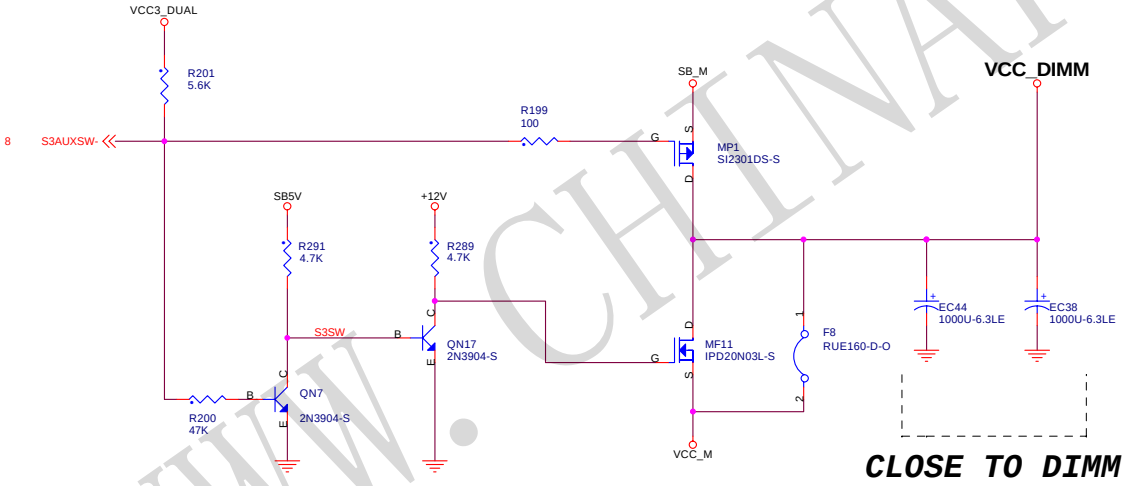
1.IN S0,S1
THIS CIRCUIT PASSES THE NORMAL POWER

2.IN S3,S4,S5
THIS CIRCUIT PASSES THE STANDBY POWER

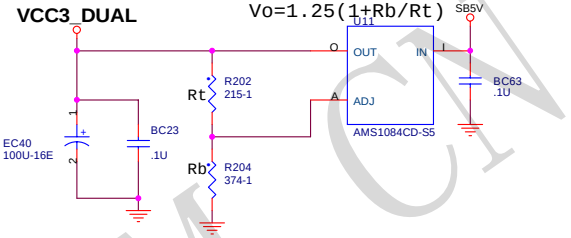
NOTE:
BECAUSE OF THE MAXIMUM CURRENT FROM POWER SUPPLY IS ONLY ABOUT 750~1000mA SO IF YOU WANT TO SUPPORT WAKE UP FROM S3 BY USB, YOU MUST HAVE A POWER SUPPLY WITH LARGER POWER.(ADDITIONAL 500mA PER USB PORT)

VCC3_DUAL & VCC5_DUAL

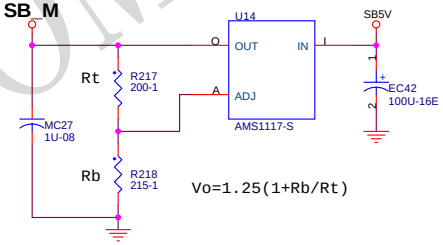




VCC3_DUAL Vo=1.25(1+Rb/Rt)

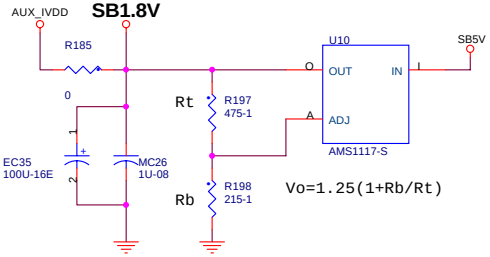


SB_M

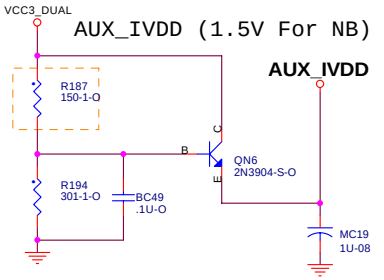


SB1.8V (For SB) 450mA

SB1.8V



AUX_IVDD (1.5V For NB) 10mA



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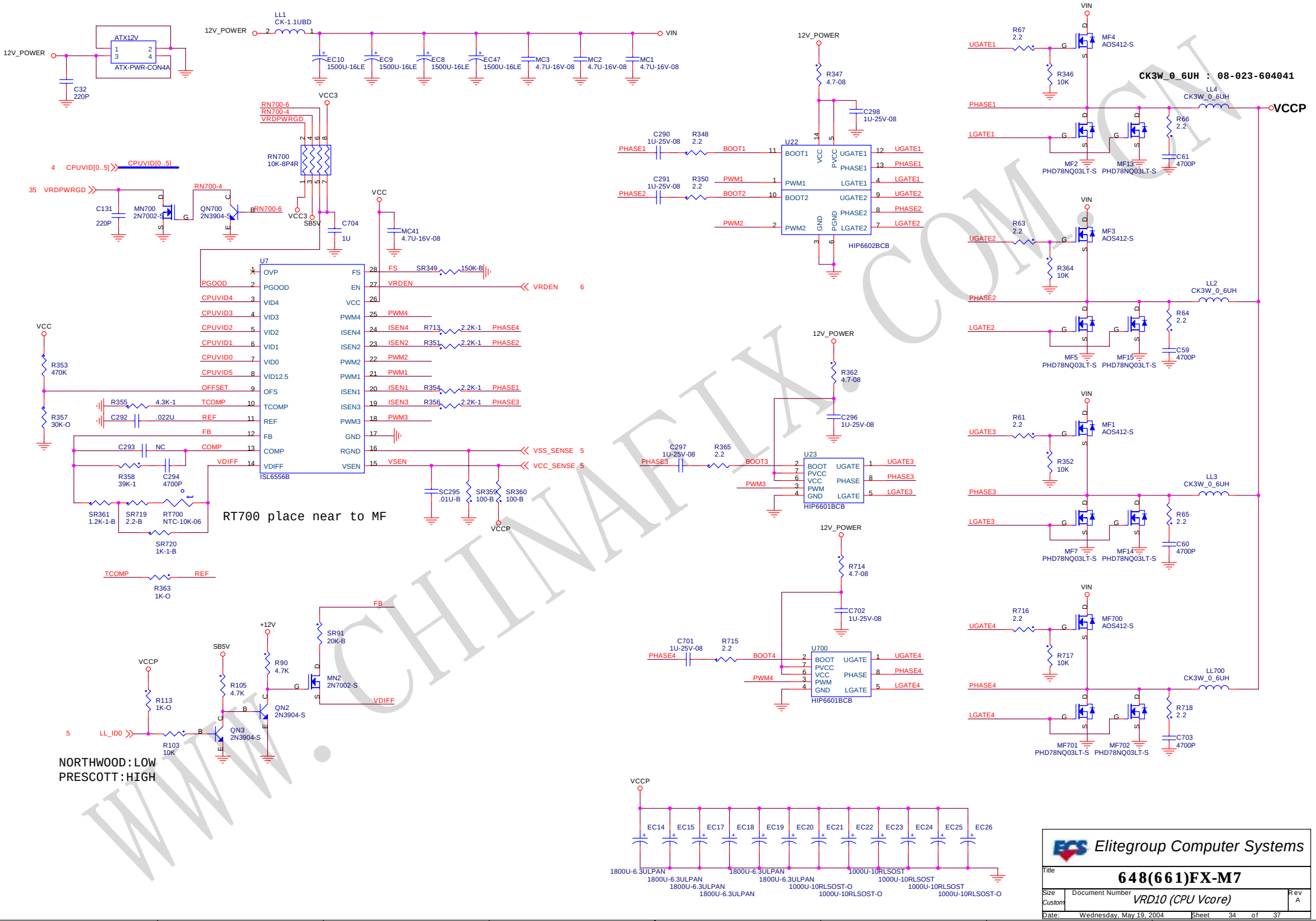
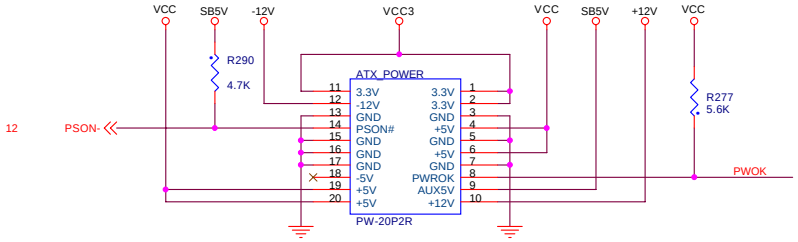
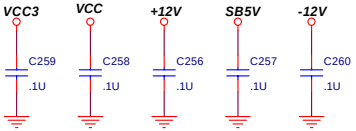
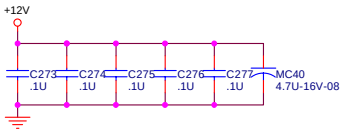


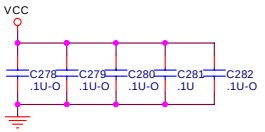


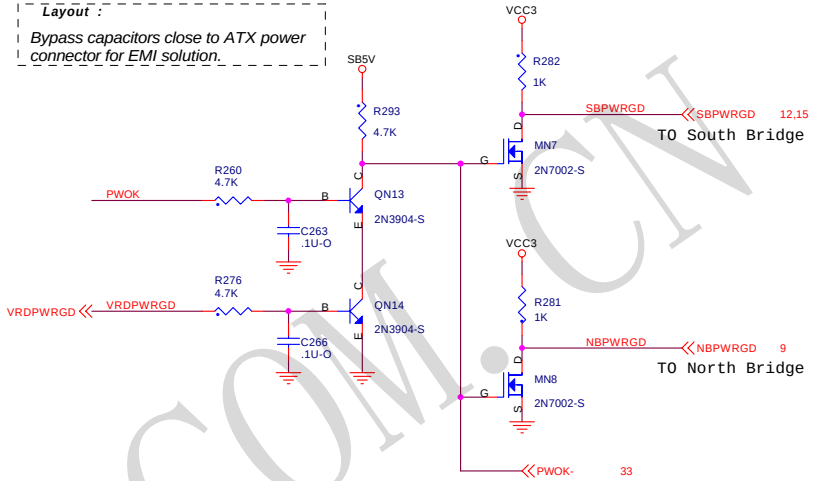


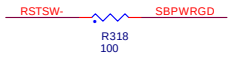
Layout :

Bypass capacitors close to ATX power connector for EMI solution.



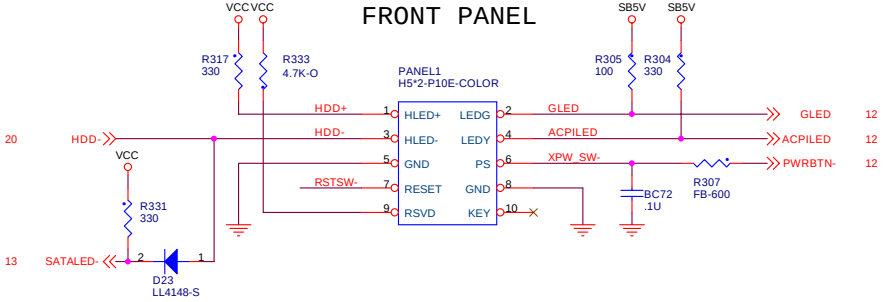


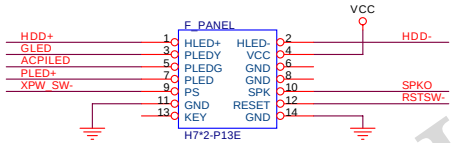




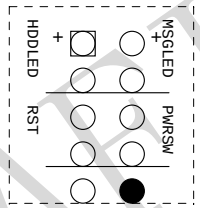
Hardware Reset Circuit

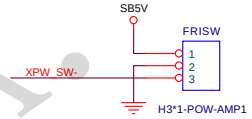
FRONT PANEL

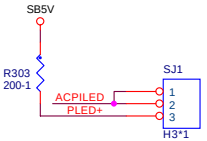


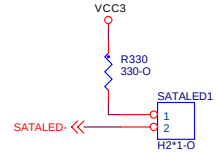


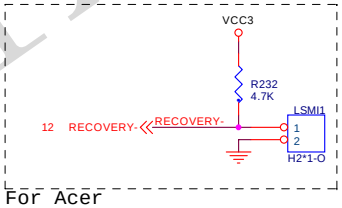
Intel Front Panel





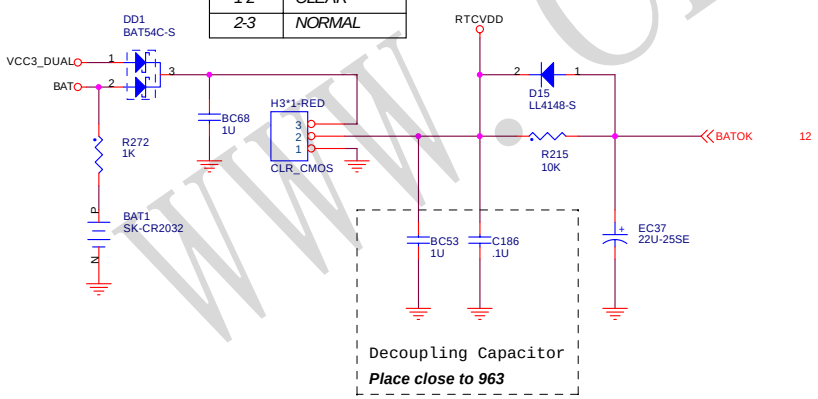


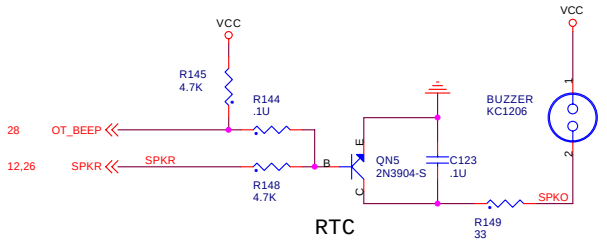


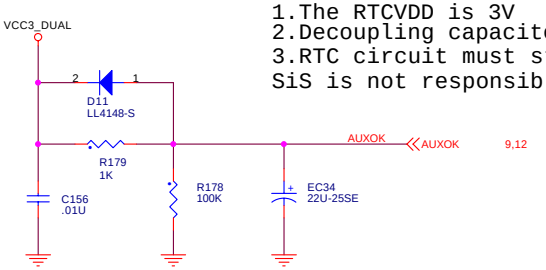


For Acer

JP1	CLEAR CMOS
1-2	CLEAR
2-3	NORMAL







NOTE!
1.The RTCVDD is 3V
2.Decoupling capacitor must be close to 635 RTCVDD pin.
3.RTC circuit must strictly follow SiS's recommended design
SiS is not responsible for RTC problems from foreign designs.

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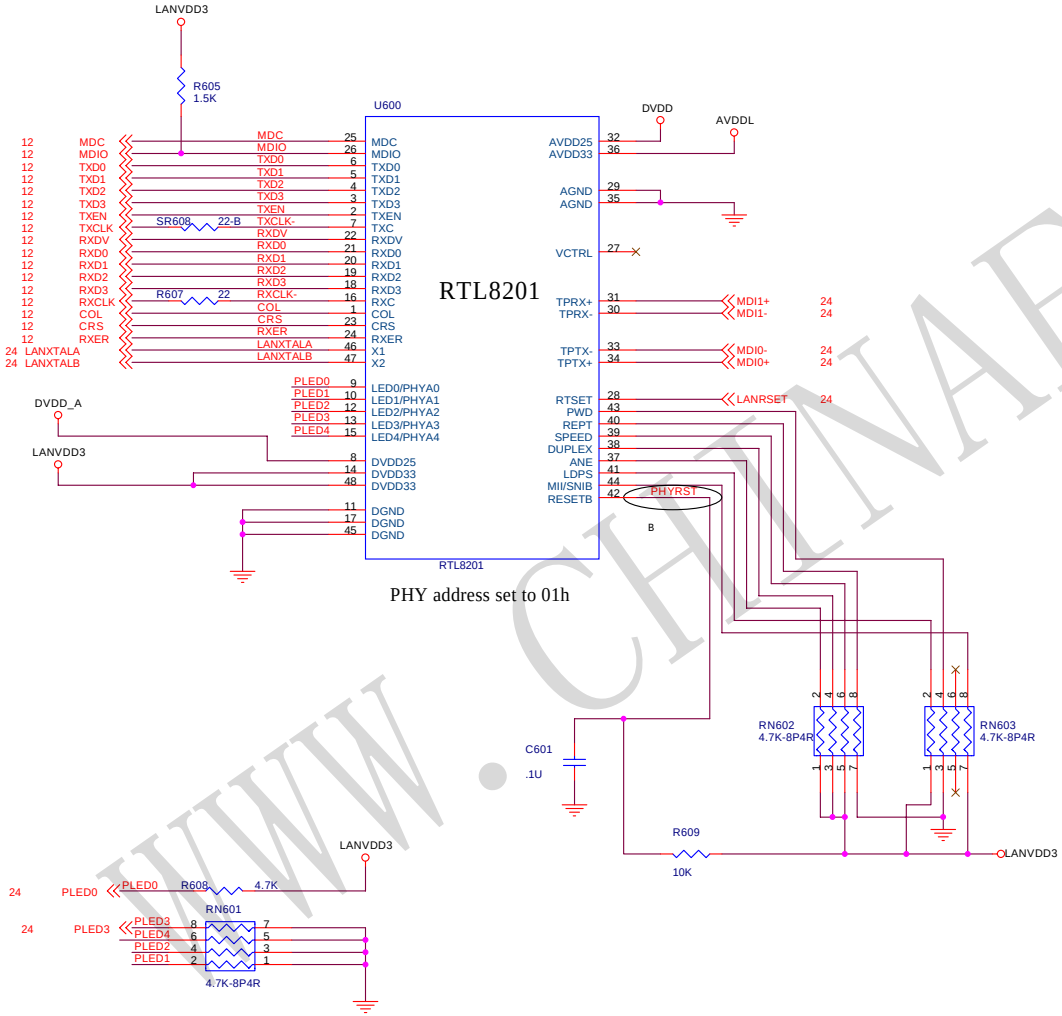

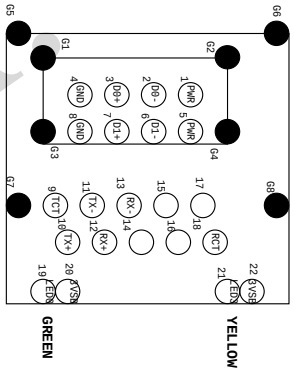

Elitegroup Computer Systems

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1. BOM Attention

(1) South Bridge

Components \ Option	SIS964	SIS964L
U13	964	964L
R241	374	X
R71, R74	33	X
R72, R75	49.9	X
R331	330	X
D23	1N4148	X
SATA1	O	X
SATA2	O	X

(2) LAN

Components \ Option	10/100 Mbps	1Gbps
LAN1	RTL8100C	RTL8110S
R53	5.6K	2.49K
R12, R14, R21, R28	X	49.9
C10, C18	X	0.1u
C51	0.1u	0.01u
C52, C53, C54	X	0.01u
RN62	75-8P4R	X
R62	X	0 ohm
T1	LF-H59X	HQ-H40B
L14	X	0 ohm
C23	X	0.1u
L21	0 ohm	X
QP1	X	HA8550
R321	0 ohm	X
R322	X	0 ohm
L10	0 ohm	X

(3) On-Board VGA

Components \ Option	Support	No Support
U8	661FX	648FX
L30, L31, L32	FB-120	X
C112, C116, C117, BC35	1U	X
C118, C119	.1U	X
MC36, MC37	10U	X
R136	130	X
R134, R143	33	X
R128, R135	100	X
VGA1	O	X
L6, L7, L8	FB-80	X
C111, C114, C115	22P	X
R22, R23, R24	75	X
R32, R39	2.2K	X
CV1~7	22P	X
F2	O	X
R234	475	169
R248	1K	301
R197	475	374
R198	215	200

2. GPIO Function

GPIO \ Status		0	1	Jumper
GPIO5	* RESERVED	RESERVED	RESERVED	JP4
GPIO6	* RESERVED	RESERVED	RESERVED	JP5
GPIO7	* LAN Selection	LANPHY	PCILAN	N/A
GPIO9	USB, PS/2 S4/S5 Wake Up	Disable	Enable	N/A
GPIO10	DDR Voltage	2.54V	2.63V	N/A
GPIO11	* WHQL	No Support	Support	JPT3
GPIO13	Flash Write Protect	Un-Protect	Protect	

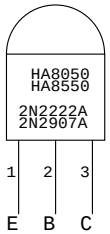
(1) "*" means that the function is selective and ECS may make changes at any time, without notice in this page.

(2) Jumper Setting (Header 3*1):

1: (1-2)

0: (2-3)

(3) Please see Page.12 for more detail jumper function.



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Title: 648(661)FX-M7

Size: Custom | Document Number: BOM Attention & GPIO Distribution | Rev: A

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