# ELITEGROUP COMPUTER SYSTEMS

# Project Name : I4xSIx

# Platform :Penryn(CPU)+SIS M672FX(NB)+SIS 968(SB)

PAGE CONTENT



## Schematic Version Change History

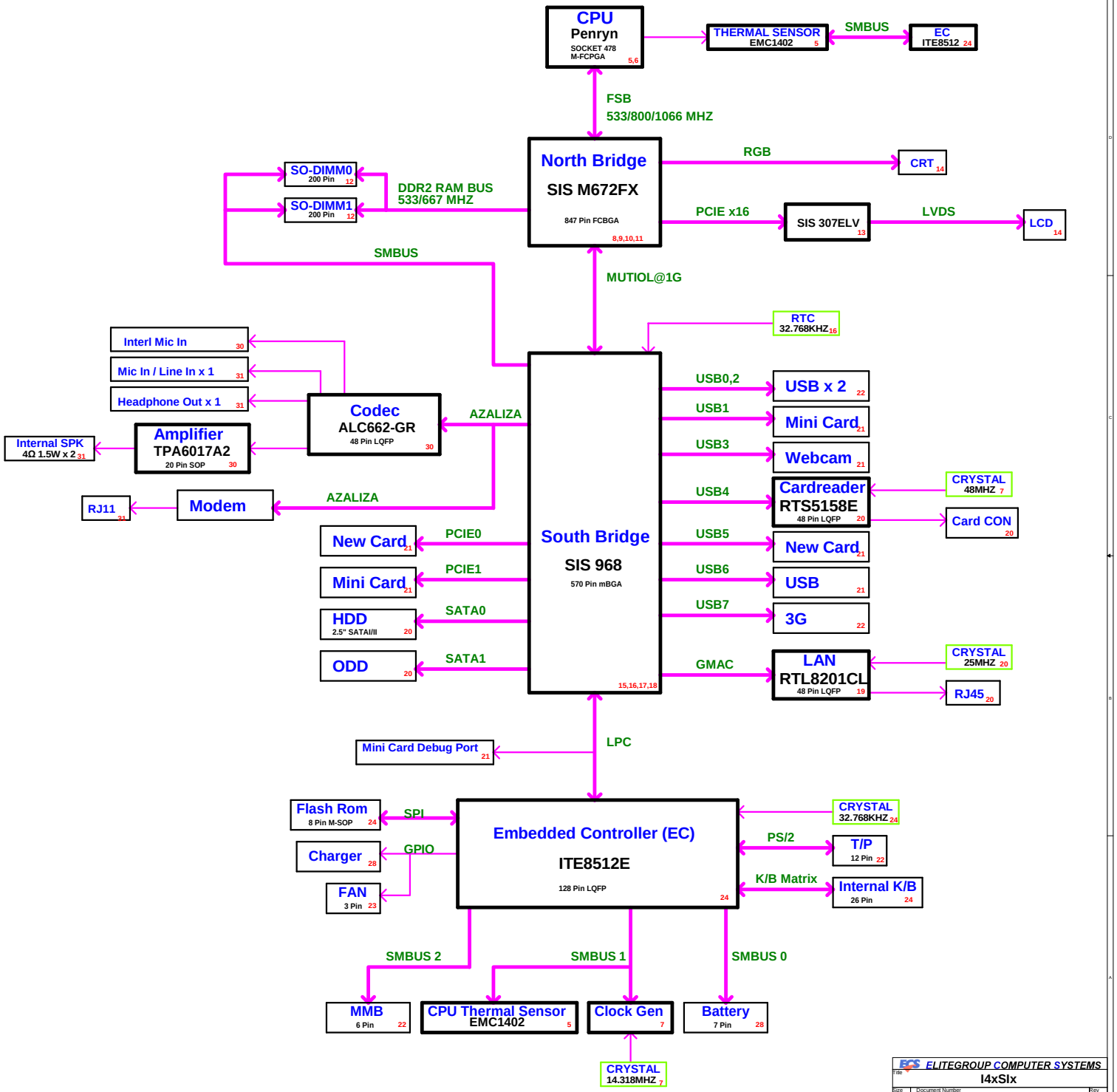
| Release Date | Version | PCB P/N | PCBA P/N | Note |
|---|---|---|---|---|
| 2008/09/16 | Rev.A | 37GI41000-A0 | 82GI41000-A0 | Initial |
| 2008/10/30 | Rev.B | 37GI41000-B0 | 82GI41000-B0 | Update |
| 2008/12/18 | Rev.C | 37GI41000-C0 | 82GI41000-C0 | Update |
| 2009/01/20 | Rev.01 | 37GI41000-10 | 82GI41000-10 | Update |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

ELITEGROUP COMPUTER SYSTEMS

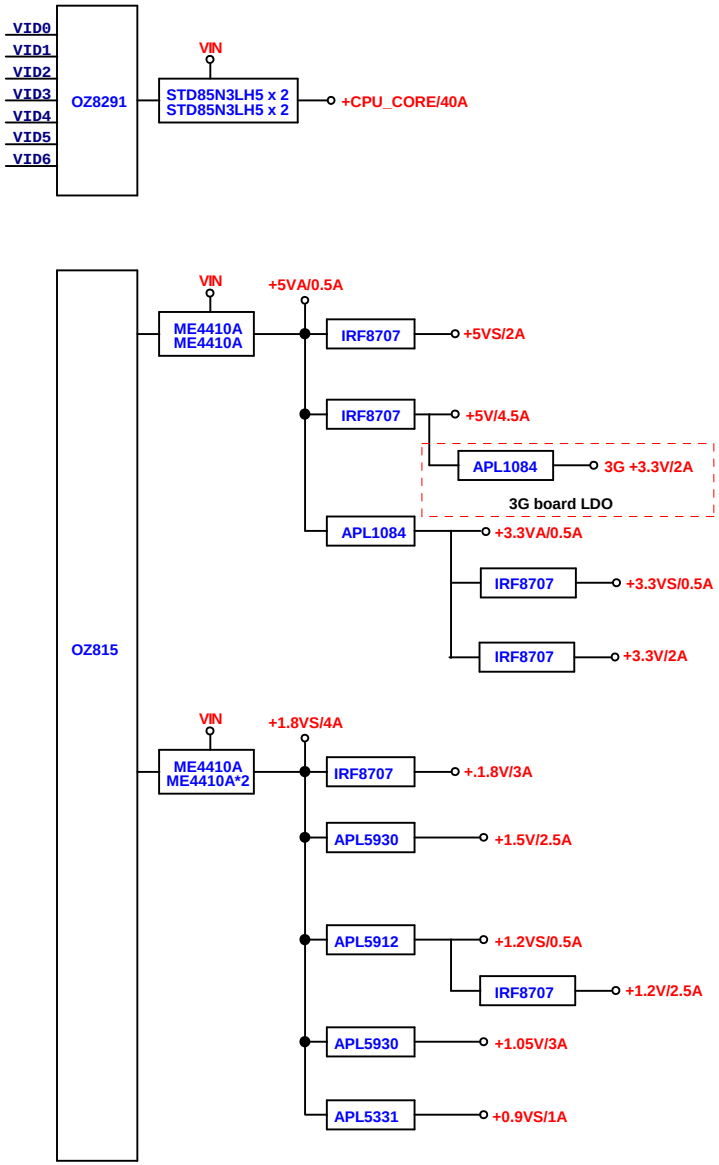
Title: I4xSIx

Size: Custom | Document Number: I4xSIx | INDEX | Rev: 01

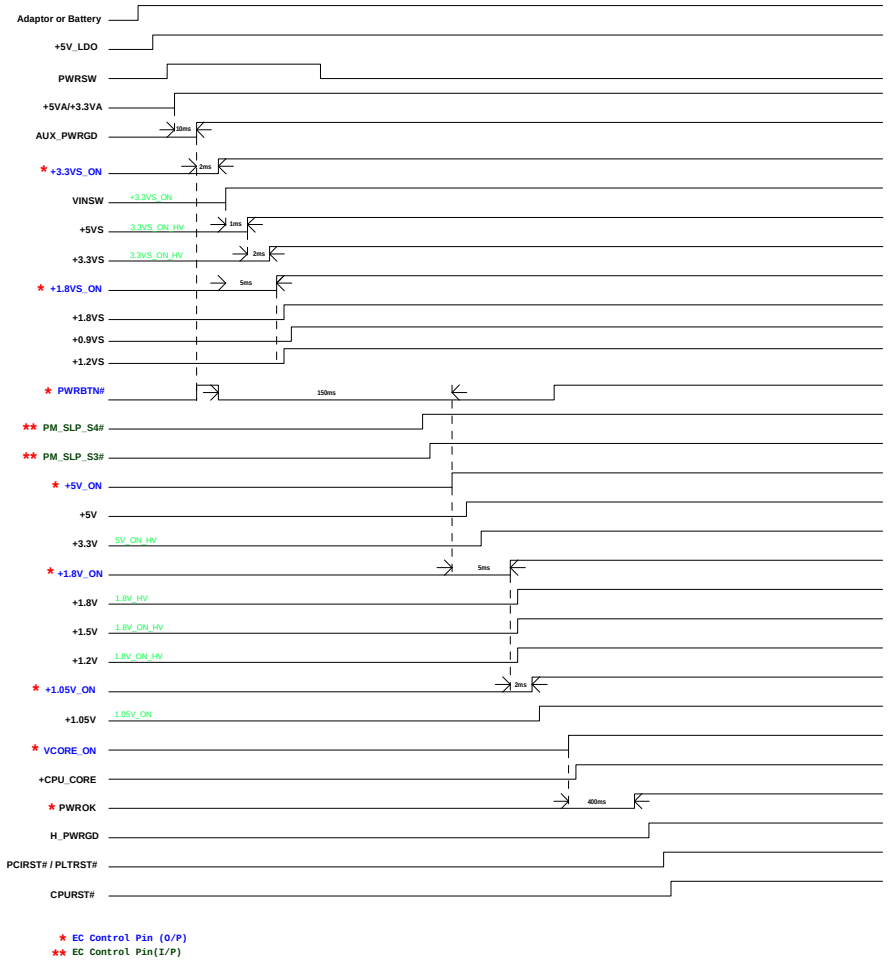
Date: Thursday, February 19, 2009 | Sheet 1 of 34


CPU
Penryn
SOCKET 478
M-FCPGA
5,6
THERMAL SENSOR
EMC1402
5
SMBUS
EC
ITE8512
24
FSB
533/800/1066 MHZ
North Bridge
SIS M672FX
847 Pin FCBGA
8,9,10,11
RGB
CRT
14
SO-DIMM0
200 Pin
12
SO-DIMM1
200 Pin
12
DDR2 RAM BUS
533/667 MHZ
PCIE x16
SIS 307ELV
13
LVDS
LCD
14
SMBUS
MUTIOL@1G
RTC
32.768KHZ
16
Interl Mic In
30
Mic In / Line In x 1
31
Headphone Out x 1
31
Codec
ALC662-GR
48 Pin LQFP
30
AZALIZA
Internal SPK
4Ω 1.5W x 2
31
Amplifier
TPA6017A2
20 Pin SOP
30
RJ11
31
Modem
AZALIZA
South Bridge
SIS 968
570 Pin mBGA
15,16,17,18
USB0,2
USB x 2
22
USB1
Mini Card
21
USB3
Webcam
21
USB4
Cardreader
RTS5158E
48 Pin LQFP
20
CRYSTAL
48MHZ
7
Card CON
20
USB5
New Card
21
USB6
USB
21
USB7
3G
22
GMAC
LAN
RTL8201CL
48 Pin LQFP
19
CRYSTAL
25MHZ
20
RJ45
20
New Card
21
PCIE0
Mini Card
21
PCIE1
HDD
2.5" SATAI/II
20
SATA0
ODD
20
SATA1
Mini Card Debug Port
21
LPC
Flash Rom
8 Pin M-SOP
24
SPI
Charger
28
GPIO
FAN
3 Pin
23
Embedded Controller (EC)
ITE8512E
128 Pin LQFP
24
CRYSTAL
32.768KHZ
24
PS/2
T/P
12 Pin
22
K/B Matrix
Internal K/B
26 Pin
24
SMBUS 2
SMBUS 1
SMBUS 0
MMB
6 Pin
22
CPU Thermal Sensor
EMC1402
5
Clock Gen
7
Battery
7 Pin
28
CRYSTAL
14.318MHZ
7
ELITEGROUP COMPUTER SYSTEMS
Title
I4xSIx
Size
Custom
Document Number
I4xSIx
SYSTEM BLOCK DIAGRAM
Rev
01
Date:
Thursday, February 19, 2009
Sheet
2
of
34

# POWER BLOCK DIAGRAM




# System Poewr On Sequence




* EC Control Pin (O/P)
** EC Control Pin(I/P)

ELITEGROUP COMPUTER SYSTEMS

| | | |
|---|---|---|
| Title | I4xSIx | |
| Size: Custom | Document Number: I4xSIx | Rev: 01 |
| Date: Thursday, February 19, 2009 | Sheet 3 of 34 | |

| SIS968 GPIO | |
|---|---|
| GPIO0 | NC |
| GPIO1 | NC |
| GPIO2 | PM_THROTTING# |
| GPIO3 | EC_EXTSMI# |
| GPIO4 | PM_CLKRUN# |
| GPIO5 | NC |
| GPIO6 | NC |
| GPIO7 | NC |
| GPIO8 | NC |
| GPIO9 | NC |
| GPIO10 | SLP_S5# |
| GPIO11 | AGPSTOP_N |
| GPIO12 | DPSLP# |
| GPIO13 | SB_DPRSLPVR |
| GPIO14 | NC |
| GPIO15 | SLP_S3# |
| GPIO16 | NC |
| GPIO17 | H_A20GATE |
| GPIO18 | H_RCIN# |
| GPIO19 | SB_SMB_CLK |
| GPIO20 | SB_SMB_DATA |

| ITE8512E GPIO | |
|---|---|
| GPA0 | AUX_PWRGD |
| GPA1 | DDR_V_SW# |
| GPA2 | BTL_BEEP |
| GPA3 | RFLED_ON |
| GPA4 | SCROLL/3G_LED |
| GPA5 | NUM_LED |
| GPA6 | CAPS_LED |
| GPA7 | PWRON_LED |
| GPB0 | PM_SLP_S5# |
| GPB1 | PM_SLP_S3# |
| GPB2 | WEBCAM_ON |
| GPB3 | BAT_SMBCLK |
| GPB4 | BAT_SMBDAT |
| GPB5 | H_A20GATE |
| GPB6 | H_RCIN# |
| GPB7 | BT_ON |
| GPC0 | EC_VID5 |
| GPC1 | SMBCLK_EC |
| GPC2 | SMBDAT_EC |
| GPC3 | EC_VID2 |
| GPC4 | RF_SW_ON# |
| GPC5 | EC_VID1 |
| GPC6 | INTERNET# |
| GPC7 | SILENT# |
| GPD0 | EC_PREST# |
| GPD1 | PWRBTN# |
| GPD2 | EC_LPCRST# |
| GPD3 | EC_EXTSCI# |
| GPD4 | EC_EXTSMI# |
| GPD5 | H_PROCHOT# |
| GPD6 | CHG_ON |
| GPD7 | LCDSW |
| GPE0 | EC_PWR_ON |
| GPE1 | SET_V |
| GPE2 | PWROK |
| GPE3 | VCORE_ON |
| GPE4 | LID# |
| GPE5 | AC_IN/OUT# |
| GPE6 | FAN_SPD# or RTCRST |
| GPE7 | AMP_MUTE# |
| GPF0 | 3G_ON |
| GPF1 | EC_BSEL1 |
| GPF2 | CHG_G_LED |
| GPF3 | CHG_R_LED |
| GPF4 | TP_CLK |
| GPF5 | TP_DATA |
| GPF6 | VGA_SMBCLK |
| GPF7 | VGA_SMBDAT |
| GPG0 | EC_VID3 |
| GPG1 | EC_WDOG OK |
| GPG2 | FLFRAME# |
| GPG6 | NEW_CARD_PWR_ON# |
| GPH0 | +1.8V_ON |
| GPH1 | +1.8VS_ON |
| GPH2 | SENBAT_V |
| GPH3 | +3.3VS_ON |
| GPH4 | +5V_ON |
| GPH5 | VDD_CORE_ON |
| GPH6 | EC_VID4 |

| ITE8512E GPIO | |
|---|---|
| GPI0 | BATT_TEMP |
| GPI1 | ADAPTOR_I |
| GPI2 | NC |
| GPI3 | FAN_SPD# |
| GPI4 | BAT_I |
| GPI5 | EC_CPU_PWR |
| GPI6 | DDR2_TEMP |
| GPI7 | BAT_V |
| GPJ0 | EC_BRGHT |
| GPJ1 | CHG_I |
| GPJ2 | FAN_CTRL0 |
| GPJ3 | MMB_RST# |
| GPJ4 | CHG_REF |
| GPJ5 | PM_THROTTING# |

**CPU**

| | CPU CORE(V) | ICC(mA) | W | TEMP(℃) |
|---|---|---|---|---|
| 2.0G | 1.525 | 35.7 | 54.3 | 69 |
| 2.2G | 1.525 | 37.5 | 57.1 | 70 |
| 2.26G | 1.525 | 38.1 | 58.0 | 70 |
| 2.4G | 1.525 | 39.3 | 59.8 | 71 |
| 2.5G | 1.525 | 40 | 61.0 | 72 |
| 2.53G | 1.525 | 40.4 | 61.5 | 72 |
| 2.6G | 1.525 | 41.05 | 62.6 | 72 |
| 2.66G | 1.525 | 43.35 | 66.1 | 74 |
| 2.8G | 1.525 | 44.86 | 68.4 | 75 |
| 3.06G | 1.525 | 55.9 | 85.2 | 81 |

| VCC | ICC(mA) | W | TEMP(℃) |
|---|---|---|---|
| +1.5V | 120 | 0.18 | |
| +1.05V | 2500 | 2.625 | 70 |

**672FX**

| VCC | ICC(mA) | W | TEMP(℃) |
|---|---|---|---|
| +1.2V | 2303 | 2.76 | |
| +1.8V | 1215 | 2.18 | 70 |
| +1.05V | 80 | 0.084 | |

**SIS968**

| VCC | ICC(mA) | W | TEMP(℃) |
|---|---|---|---|
| +3.3V | 86 | 0.283 | |
| +1.8V | 851 | 1.531 | 70 |
| +1.05V | 22 | 0.022 | |

**307LV**

| VCC | ICC(mA) | W | TEMP(℃) |
|---|---|---|---|
| +3.3V | 236 | 1.107 | |
| +1.8V | 565 | 0.778 | 70 |

**CLOCK GENERATOR+BUFFER**

| VCC | ICC(mA) | W | TEMP(℃) |
|---|---|---|---|
| +3.3V | 400 | 1.32 | 70 |
| +1.8V | 300 | 0.54 | |

**ITE8512E**

| VCC | ICC(mA) | W | TEMP(℃) |
|---|---|---|---|
| +3.3V | 200 | 0.66 | 70 |
| +3.3VA | 500 | 1.65 | |

**RTS5158**

| VCC | ICC(mA) | W | TEMP(℃) |
|---|---|---|---|
| +5V | 76 | 0.38 | 85 |

**RTL8201CL**

| VCC | ICC(mA) | W | TEMP(℃) |
|---|---|---|---|
| +3.3V | 20 | 0.396 | 85 |

**ALC662-GR**

| VCC | ICC(mA) | W | TEMP(℃) |
|---|---|---|---|
| +3.3V | 23 | 0.075 | 70 |
| +5VA | 38 | 0.19 | |

**TPA6017A2**

| VCC | ICC(mA) | W | TEMP(℃) |
|---|---|---|---|
| 5V | 20 | 0.1 | 85 |

**ADM1032**

| VCC | ICC | W | TEMP(℃) |
|---|---|---|---|
| +3.3V | 170uA | 0.56mW | 150 |

**SMART POWER TABLE**

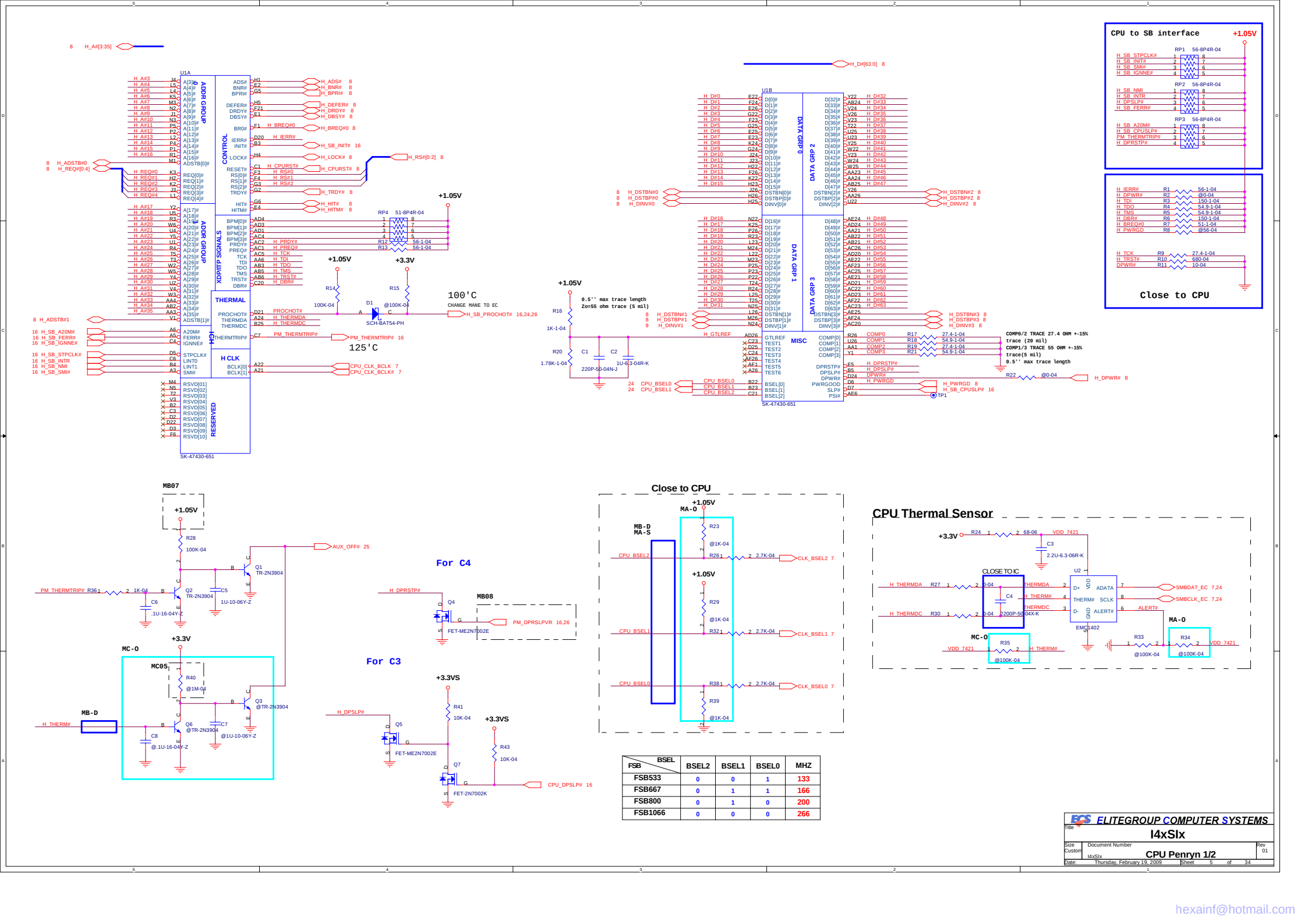
| VID6 | VID5 | VID4 | VID3 | VID2 | VID1 | VID0 | VCORE | +_mV |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.5000 | -0mV |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1.4875 | -2.5mV |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1.4750 | -5mV |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1.4500 | -50mV |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1.4000 | -100mV |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1.3000 | -200mV |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1.1000 | -400mV |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.7000 | -800mV |
| 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1.1625 | |
| 0 | 0 | 1 | 0 | 0 | 0 | 1 | | |
| 0 | 0 | 1 | 0 | 0 | 1 | 0 | | |
| 0 | 0 | 1 | 0 | 1 | 0 | 0 | | |
| 0 | 0 | 1 | 0 | 1 | 1 | 0 | | |
| 0 | 0 | 1 | 1 | 0 | 0 | 1 | | |
| 0 | 0 | 1 | 1 | 0 | 1 | 0 | | |

ELITEGROUP COMPUTER SYSTEMS

Title: I4xSIx

Size: Custom | Document Number: I4xSIx | GPIO & Power Consumption | Rev: 01

Date: Thursday, February 19, 2009 | Sheet 4 of 34



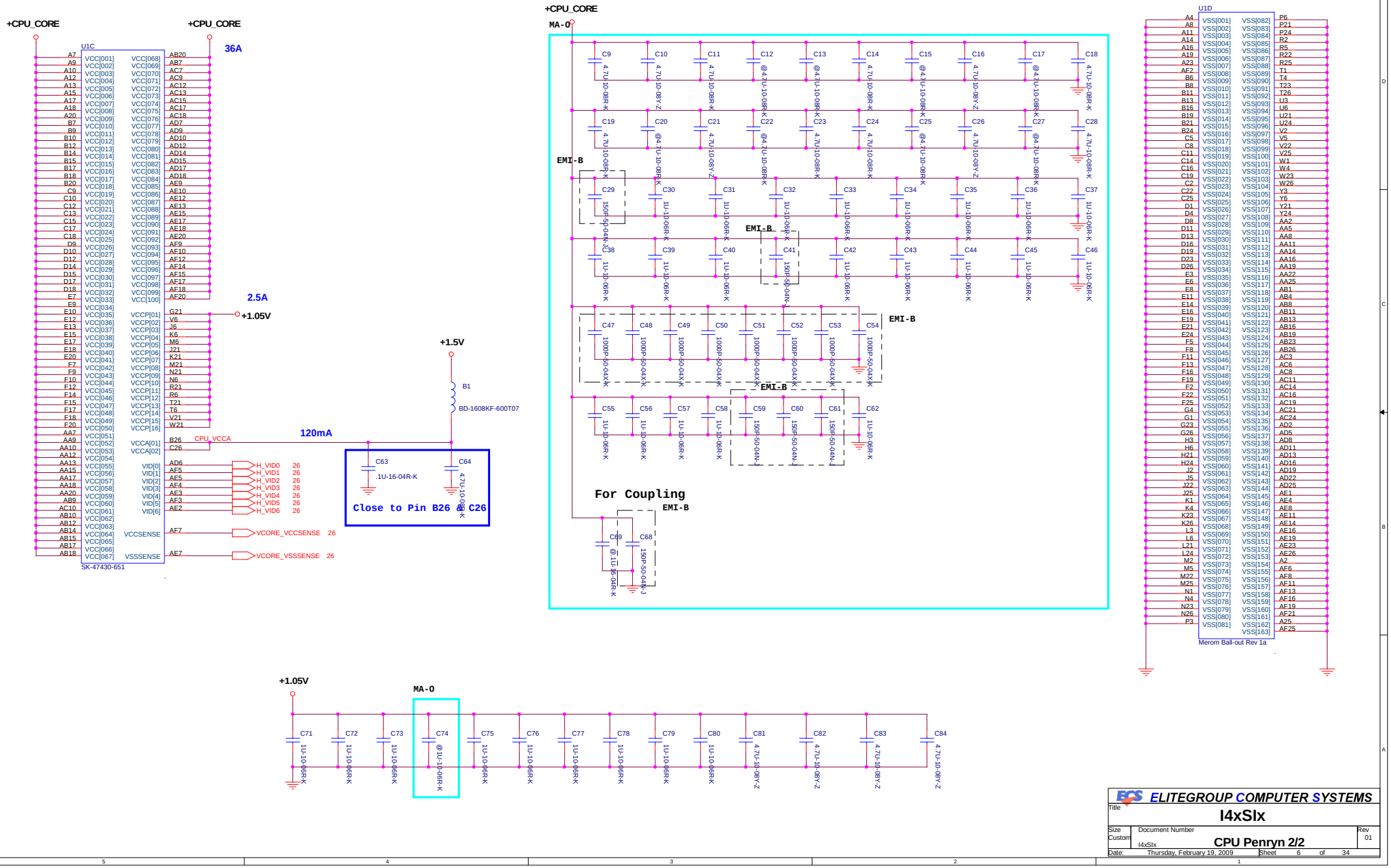

| FSB \ BSEL | BSEL2 | BSEL1 | BSEL0 | MHZ |
|---|---|---|---|---|
| FSB533 | 0 | 0 | 1 | 133 |
| FSB667 | 0 | 1 | 1 | 166 |
| FSB800 | 0 | 1 | 0 | 200 |
| FSB1066 | 0 | 0 | 0 | 266 |

ELITEGROUP COMPUTER SYSTEMS

Title: I4xSIx

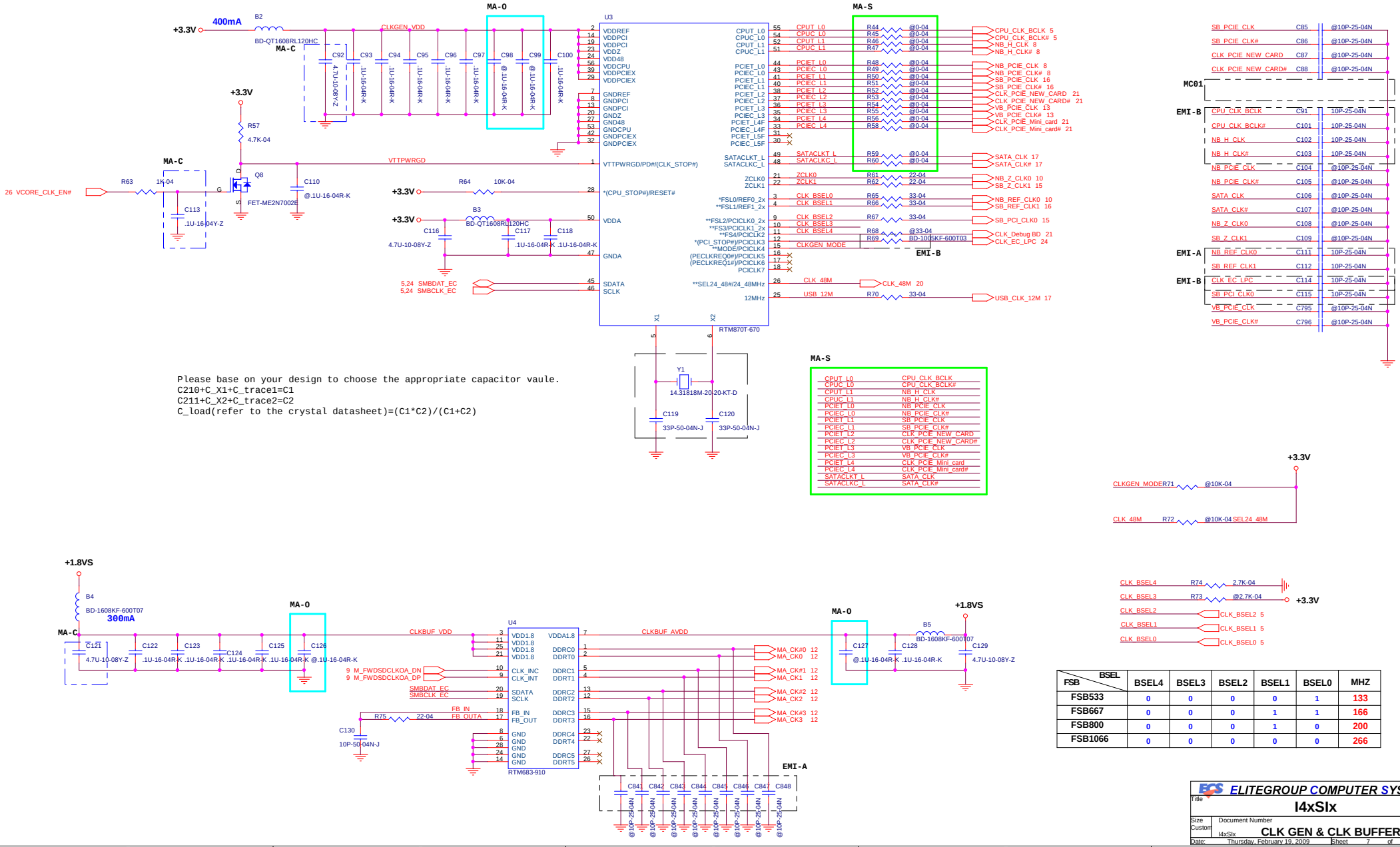
Size: Custom | Document Number: I4xSIx | CPU Penryn 1/2 | Rev: 01

Date: Thursday, February 19, 2009 | Sheet 5 of 34




ELITEGROUP COMPUTER SYSTEMS

| | | |
|---|---|---|
| Title | I4xSIx | |
| Size: Custom | Document Number: I4xSIx | Rev: 01 |
| | CPU Penryn 2/2 | |
| Date: Thursday, February 19, 2009 | Sheet 6 of 34 | |




Please base on your design to choose the appropriate capacitor vaule.
C210+C_X1+C_trace1=C1
C211+C_X2+C_trace2=C2
C_load(refer to the crystal datasheet)=(C1*C2)/(C1+C2)

| FSB \ BSEL | BSEL4 | BSEL3 | BSEL2 | BSEL1 | BSEL0 | MHZ |
|---|---|---|---|---|---|---|
| FSB533 | 0 | 0 | 0 | 0 | 1 | 133 |
| FSB667 | 0 | 0 | 0 | 1 | 1 | 166 |
| FSB800 | 0 | 0 | 0 | 1 | 0 | 200 |
| FSB1066 | 0 | 0 | 0 | 0 | 0 | 266 |

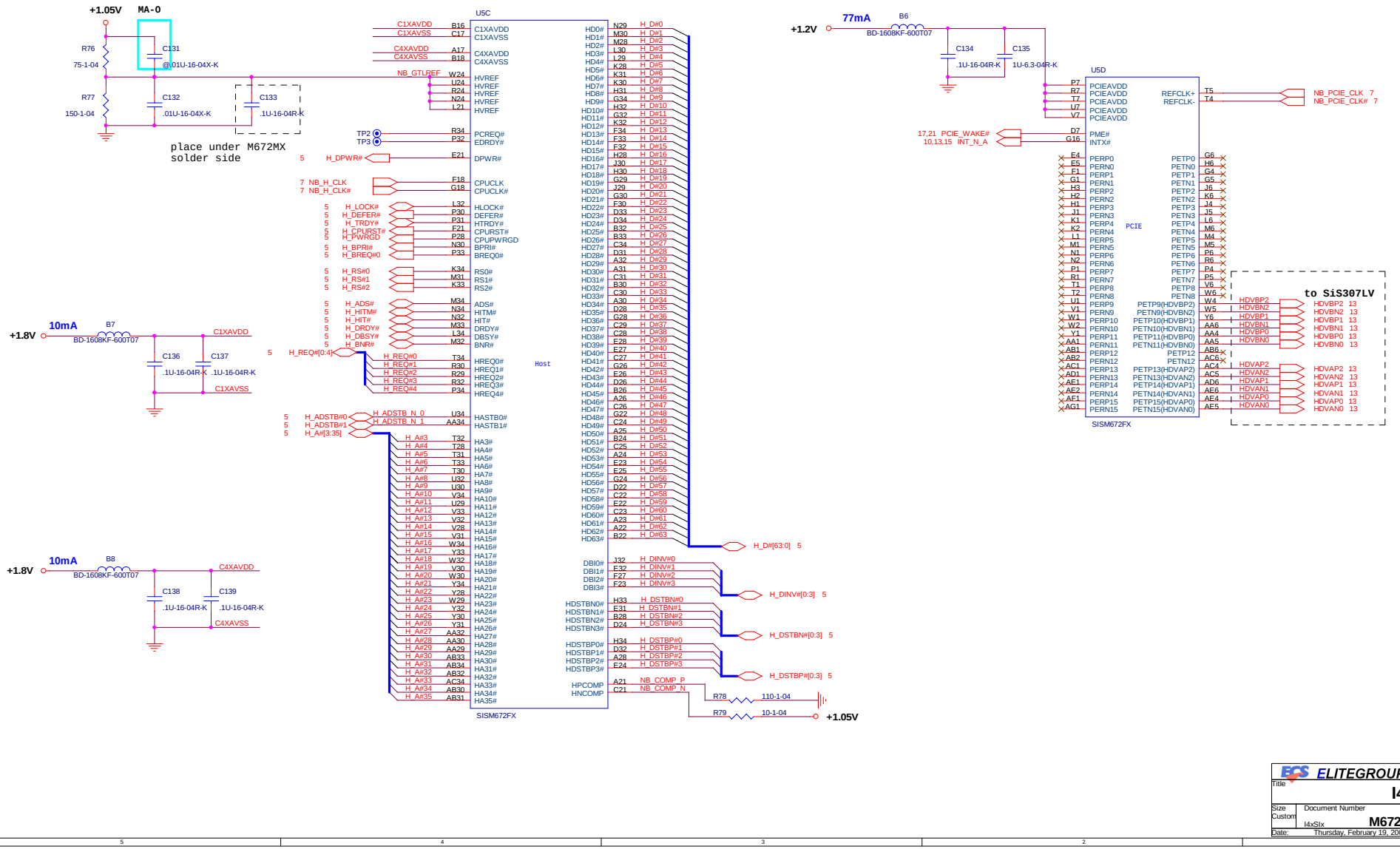
ELITEGROUP COMPUTER SYSTEMS

Title: I4xSIx

Size: Custom | Document Number: I4xSIx | Rev: 01

CLK GEN & CLK BUFFER

Date: Thursday, February 19, 2009 | Sheet 7 of 34

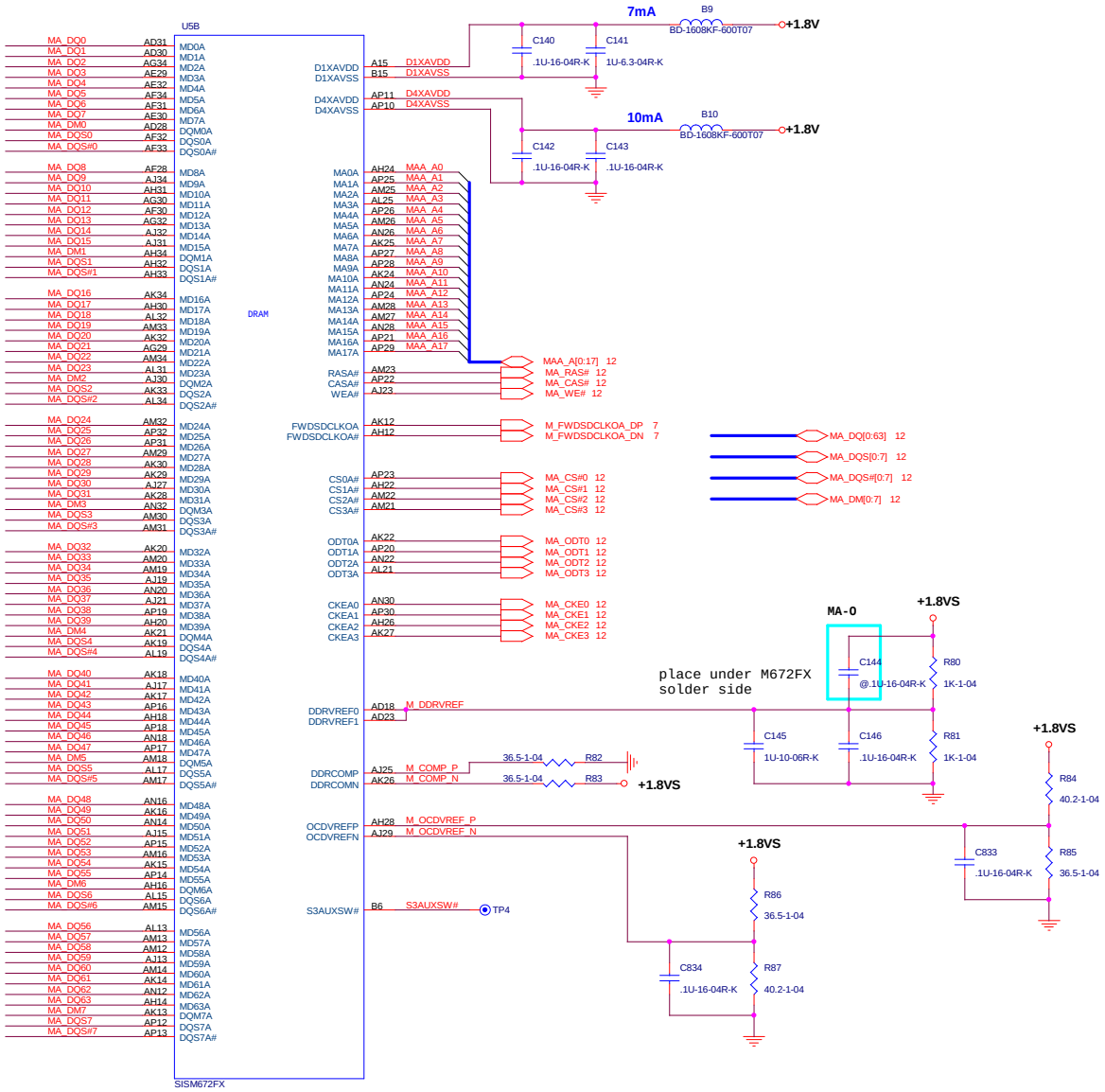



ELITEGROUP COMPUTER SYSTEMS

Title: I4xSIx

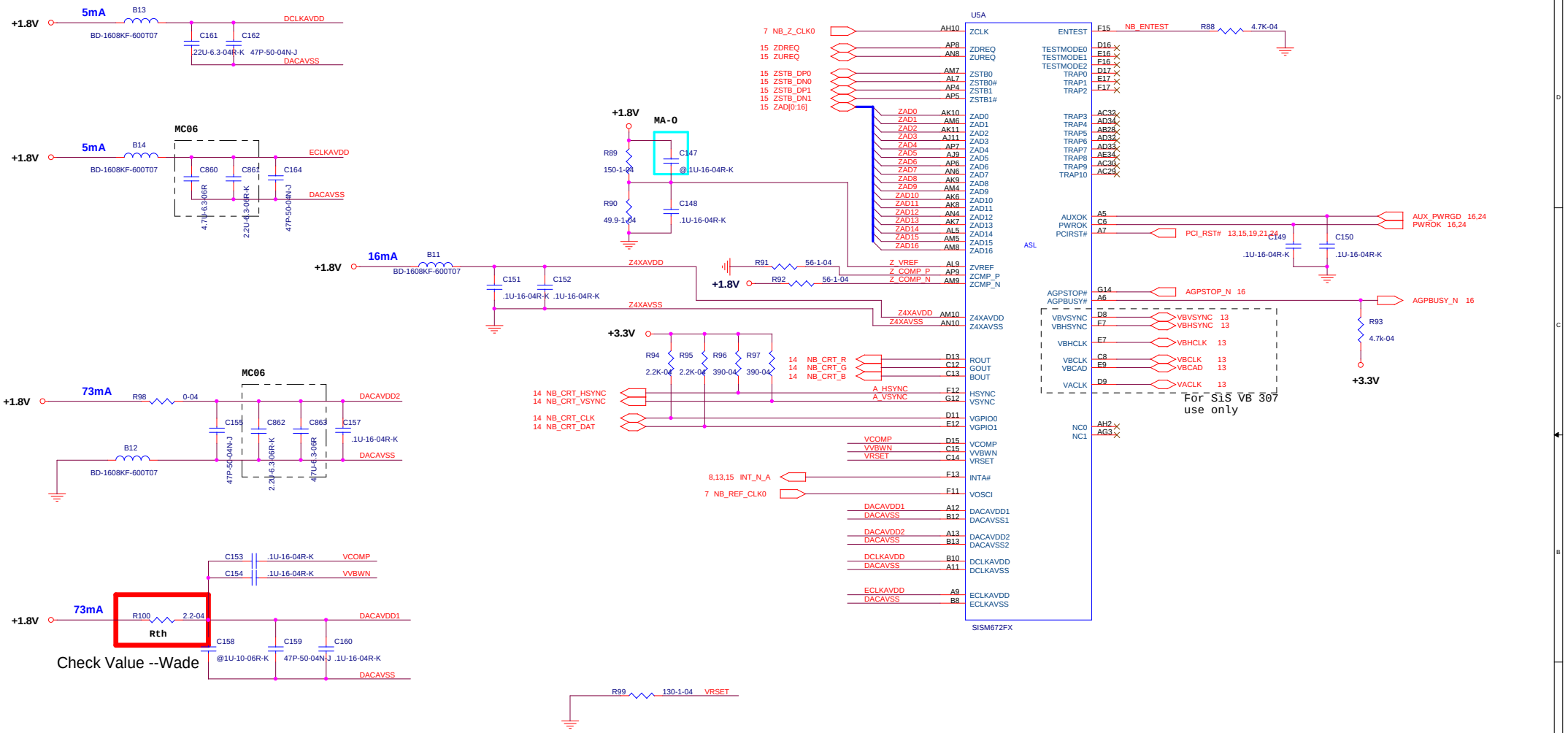
| Size | Document Number | Rev |
|---|---|---|
| Custom | I4xSIx M672FX HOST / PCIE | 01 |

Date: Thursday, February 19, 2009 Sheet 8 of 34




ELITEGROUP COMPUTER SYSTEMS

| | | |
|---|---|---|
| Title | I4xSIx | |
| Size: Custom | Document Number: I4xSIx — M672FX DRAM | Rev: 01 |
| Date: Thursday, February 19, 2009 | Sheet 9 of 34 | |

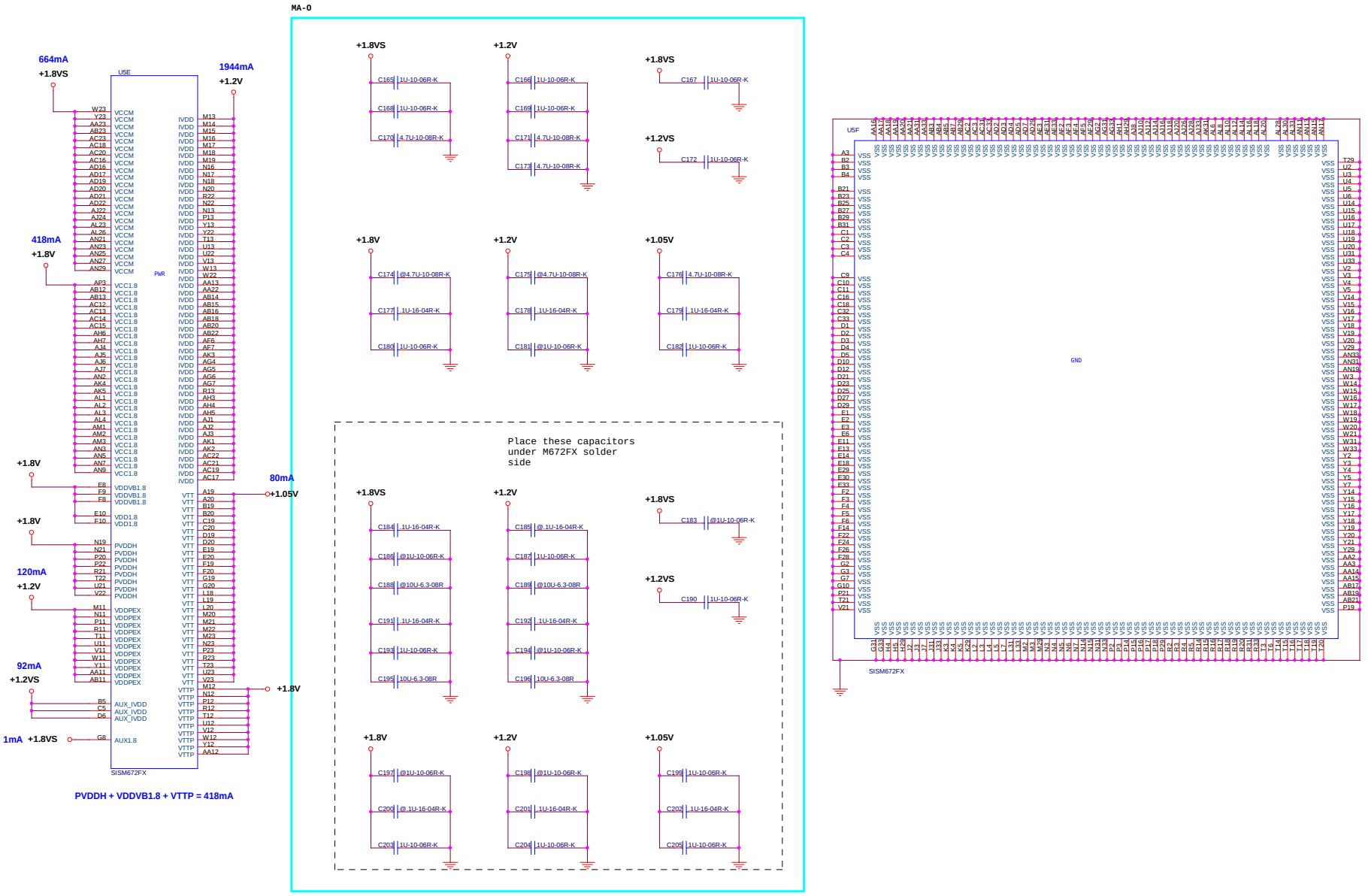



Check Value --Wade

DACAVDD1 Spec.
Voltage: 1.5V +/- 5%
Current: 100mA
Rth use a 3.3 ohm resister make a voltage drop about 0.3V to meet the voltage above.

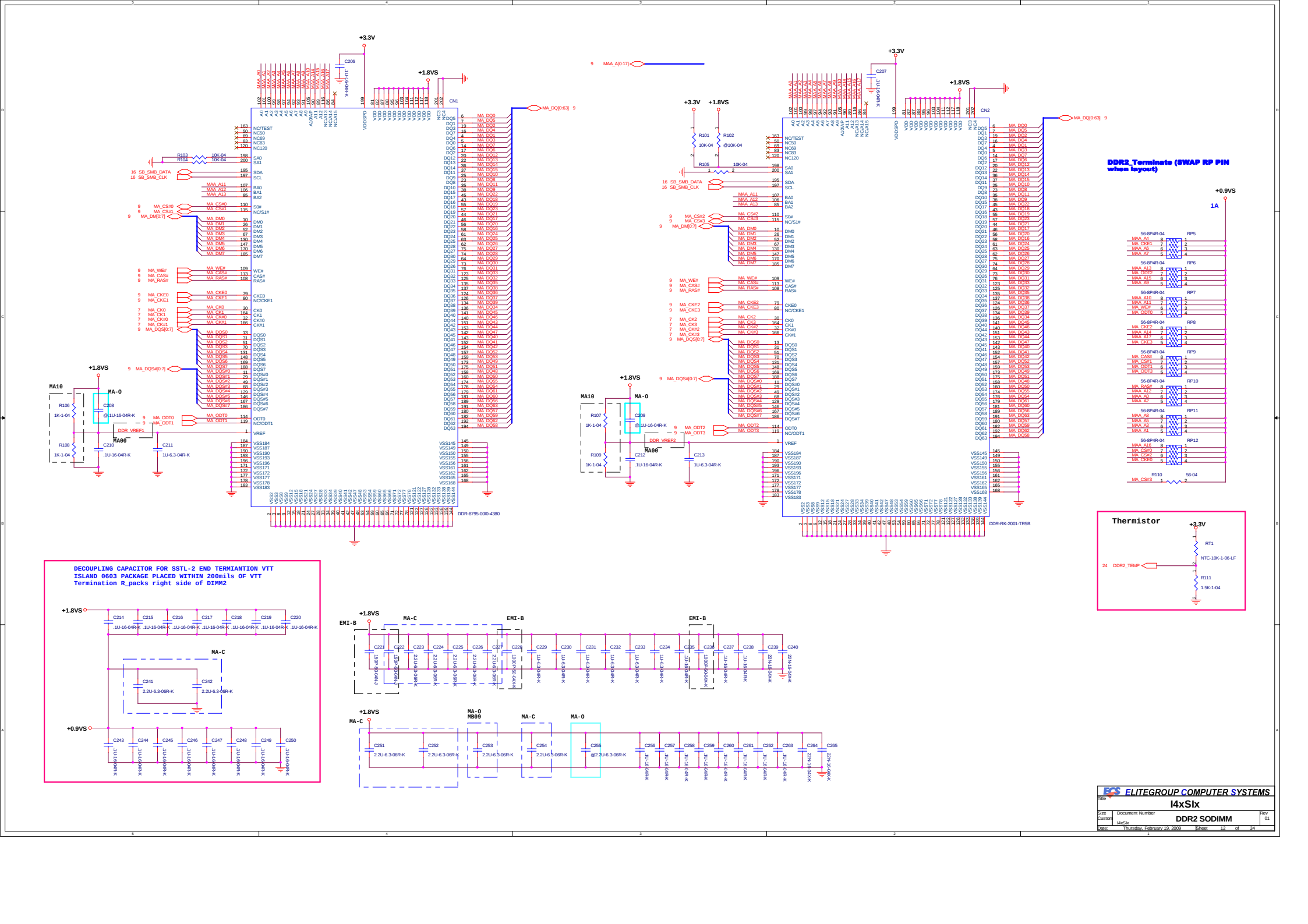
ELITEGROUP COMPUTER SYSTEMS

| | | |
|---|---|---|
| Title | I4xSIx | |
| Size: Custom | Document Number: I4xSIx | Rev: 01 |
| | M672FX MUTIOL / VGA | |
| Date: Thursday, February 19, 2009 | Sheet 10 of 34 | |




ELITEGROUP COMPUTER SYSTEMS

| | | |
|---|---|---|
| Title | I4xSIx | |
| Size: Custom | Document Number: M672FX PWR | Rev: 01 |
| Date: Thursday, February 19, 2009 | Sheet 11 of 34 | |


+3.3V
+1.8VS
+0.9VS
CN1
CN2
DDR-8795-0I0I-4380
DDR-RK-2001-TR5B
DDR2_Terminate (SWAP RP PIN when layout)
1A
MA10
MA-0
MA00
DDR_VREF1
DDR_VREF2
Thermistor
DDR2_TEMP
NTC-10K-1-06-LF
DECOUPLING CAPACITOR FOR SSTL-2 END TERMIANTION VTT
ISLAND 0603 PACKAGE PLACED WITHIN 200mils OF VTT
Termination R_packs right side of DIMM2
MA-C
EMI-B
MB09
ELITEGROUP COMPUTER SYSTEMS
I4xSIx
DDR2 SODIMM
Thursday, February 19, 2009

We "must" put the capacitors for each HDV lane
The capacitors can be
1) close to NB or 307 side(both NB and 307 are on board).
2) close to PCIE slot side(when 307 on the daughter card)

# 307LV/ELV//307DV/307CP

## HDV Signals

## General I/O Power

## Internal Core Power

## For 307LV/ELV only

## DDC pull-up

307ELV: stuff R1, un-stuff R2
307LV/DV/CP: stuff R2, un-stuff R1

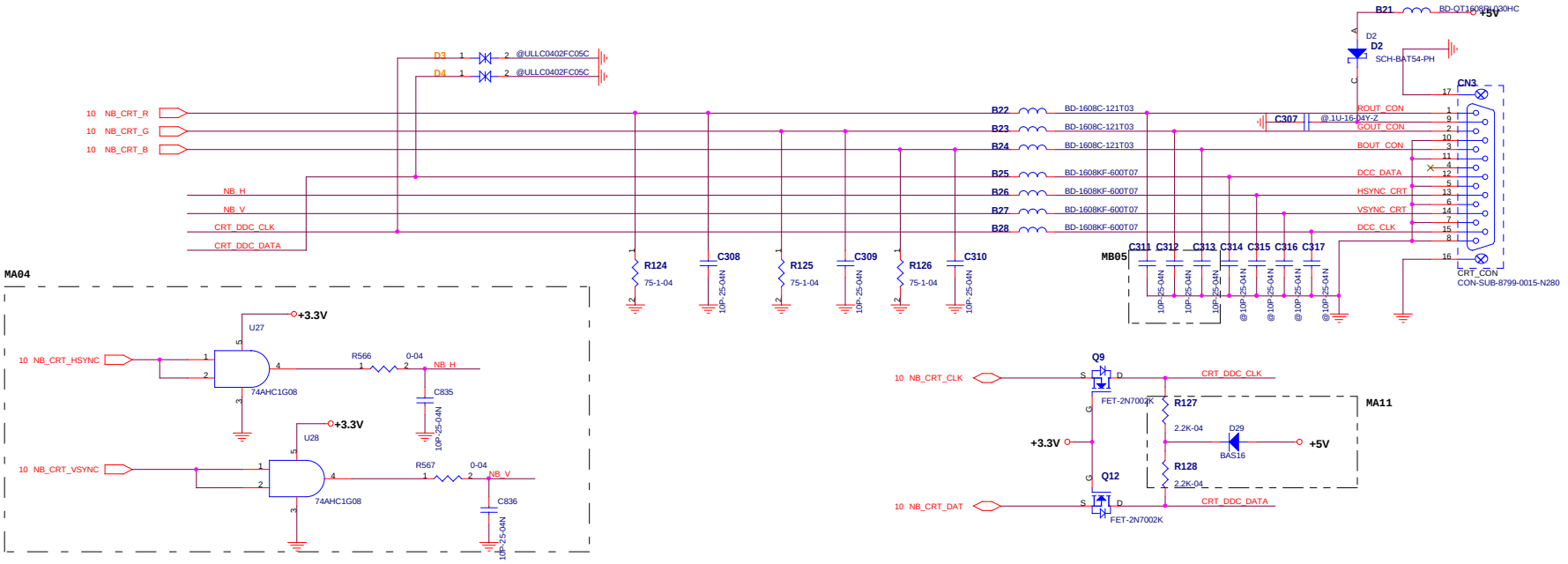
307ELV: Change C51 to 0 ohm resistor.
307LV/DV/CP: change C51=0.1uF.

un-stuff => for 307LV/ELV

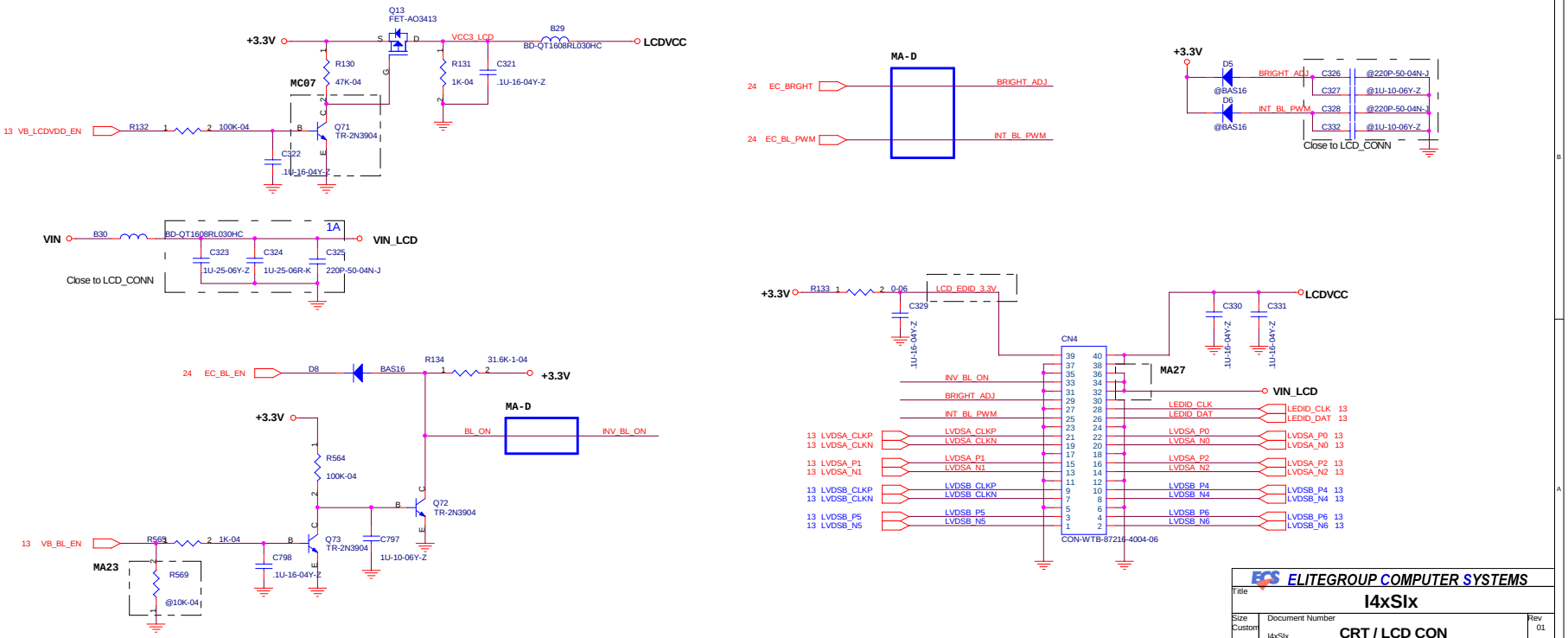
| | |
|---|---|
| Title | I4xSIx |
| Size: Custom | Document Number: SIS 307LV LVDS / TV |
| Rev | 01 |
| Date: Thursday, February 19, 2009 | Sheet 13 of 34 |

ELITEGROUP COMPUTER SYSTEMS

# CRT CON

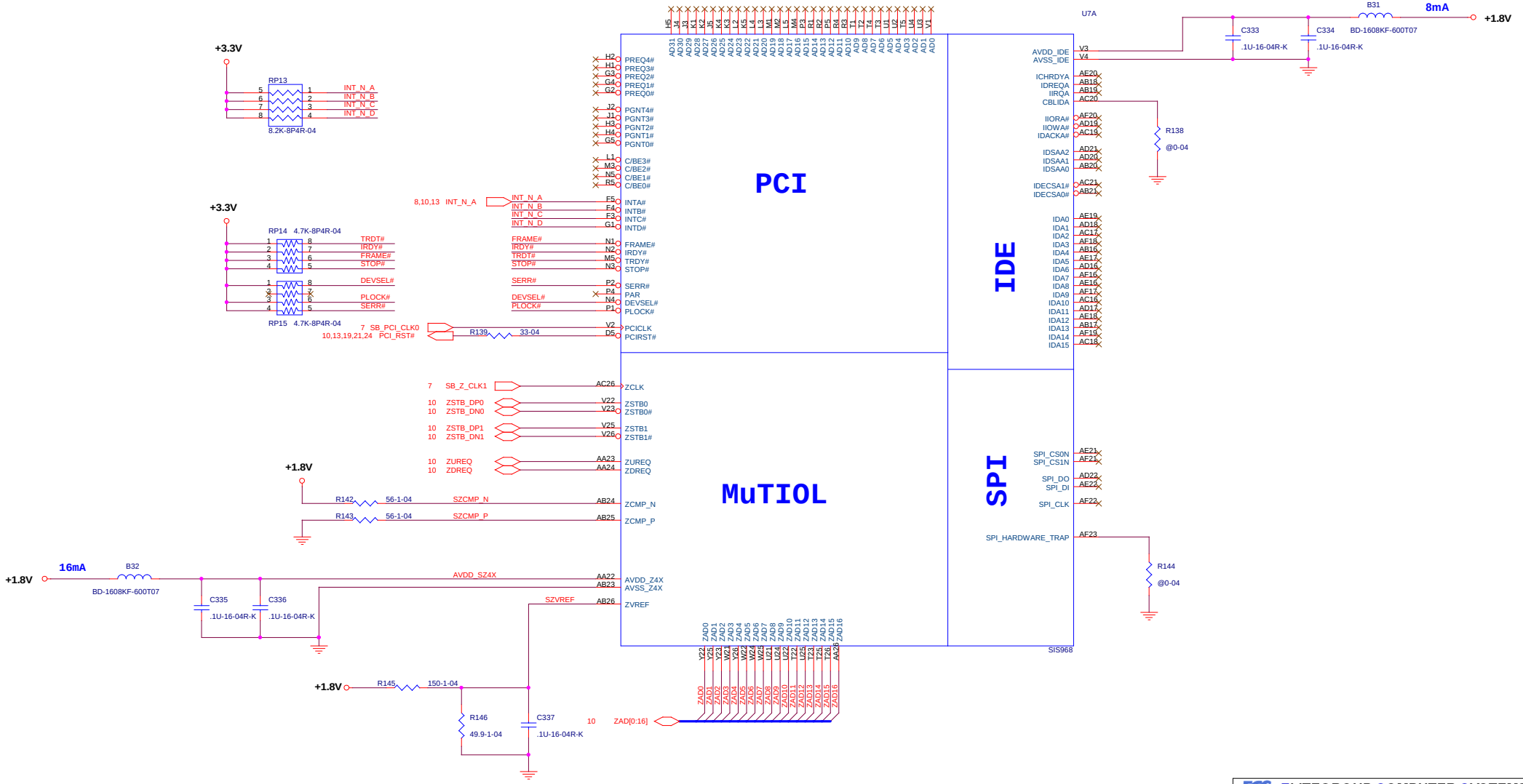



# LCD CON



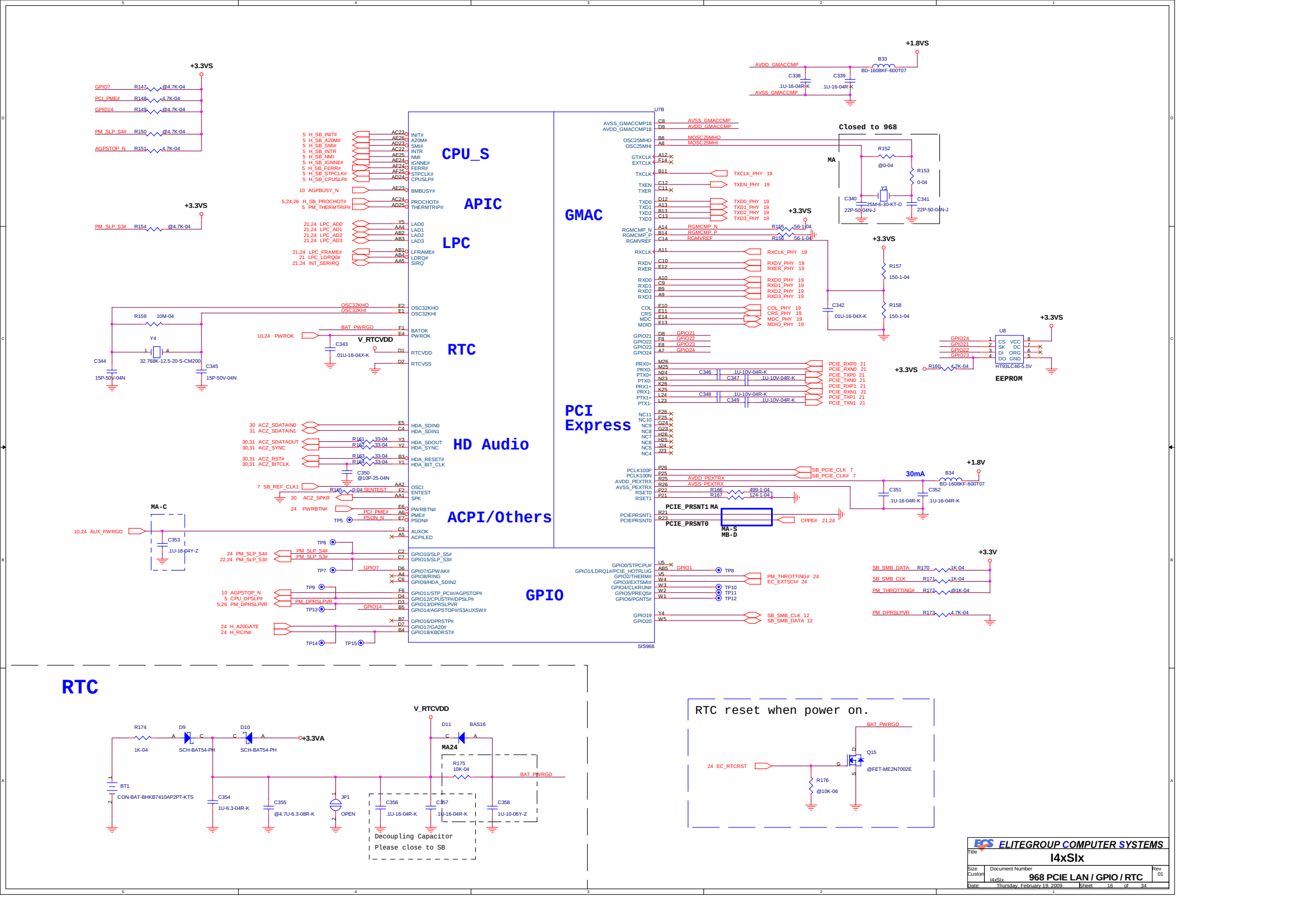

ELITEGROUP COMPUTER SYSTEMS

| | | |
|---|---|---|
| Title | I4xSIx | |
| Size: Custom | Document Number: I4xSIx — CRT / LCD CON | Rev: 01 |
| Date: Thursday, February 19, 2009 | Sheet 14 of 34 | |

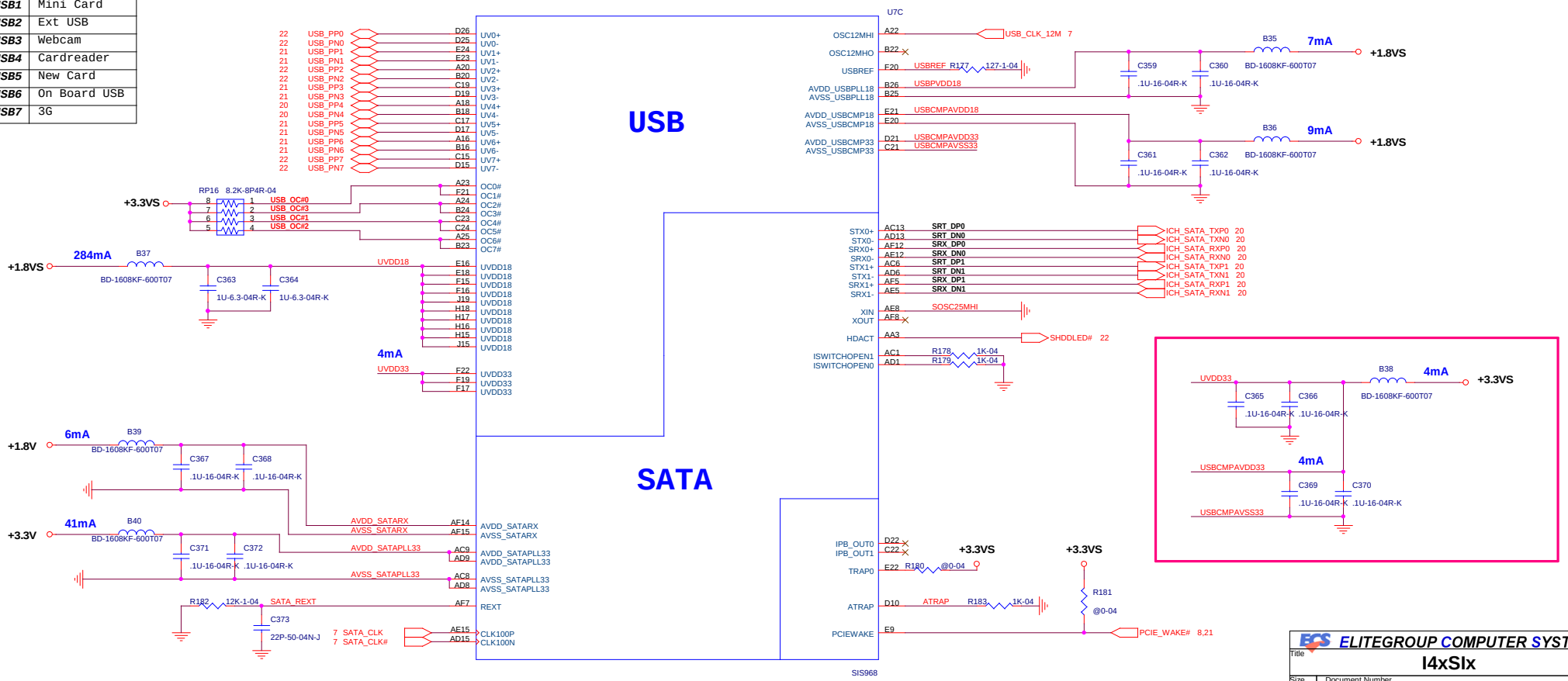



ELITEGROUP COMPUTER SYSTEMS

| | | |
|---|---|---|
| Title | I4xSIx | |
| Size: Custom | Document Number: I4xSIx 968 PCI/ IDE / MUTIOL / SPI | Rev: 01 |
| Date: Thursday, February 19, 2009 | Sheet 15 of 34 | |


CPU_S
APIC
LPC
RTC
HD Audio
ACPI/Others
GPIO
GMAC
PCI Express
SIS968
U7B
Closed to 968
MA
MA-C
MA-S
MB-D
PCIE_PRSNT1 MA
PCIE_PRSNT0
EEPROM
U8
HT93LC46-5.5V
V_RTCVDD
MA24
RTC reset when power on.
Decoupling Capacitor
Please close to SB
ELITEGROUP COMPUTER SYSTEMS
I4xSIx
968 PCIE LAN / GPIO / RTC
Thursday, February 19, 2009

| | I41SIx |
|---|---|
| ***USB0*** | Ext USB |
| ***USB1*** | Mini Card |
| ***USB2*** | Ext USB |
| ***USB3*** | Webcam |
| ***USB4*** | Cardreader |
| ***USB5*** | New Card |
| ***USB6*** | On Board USB |
| ***USB7*** | 3G |



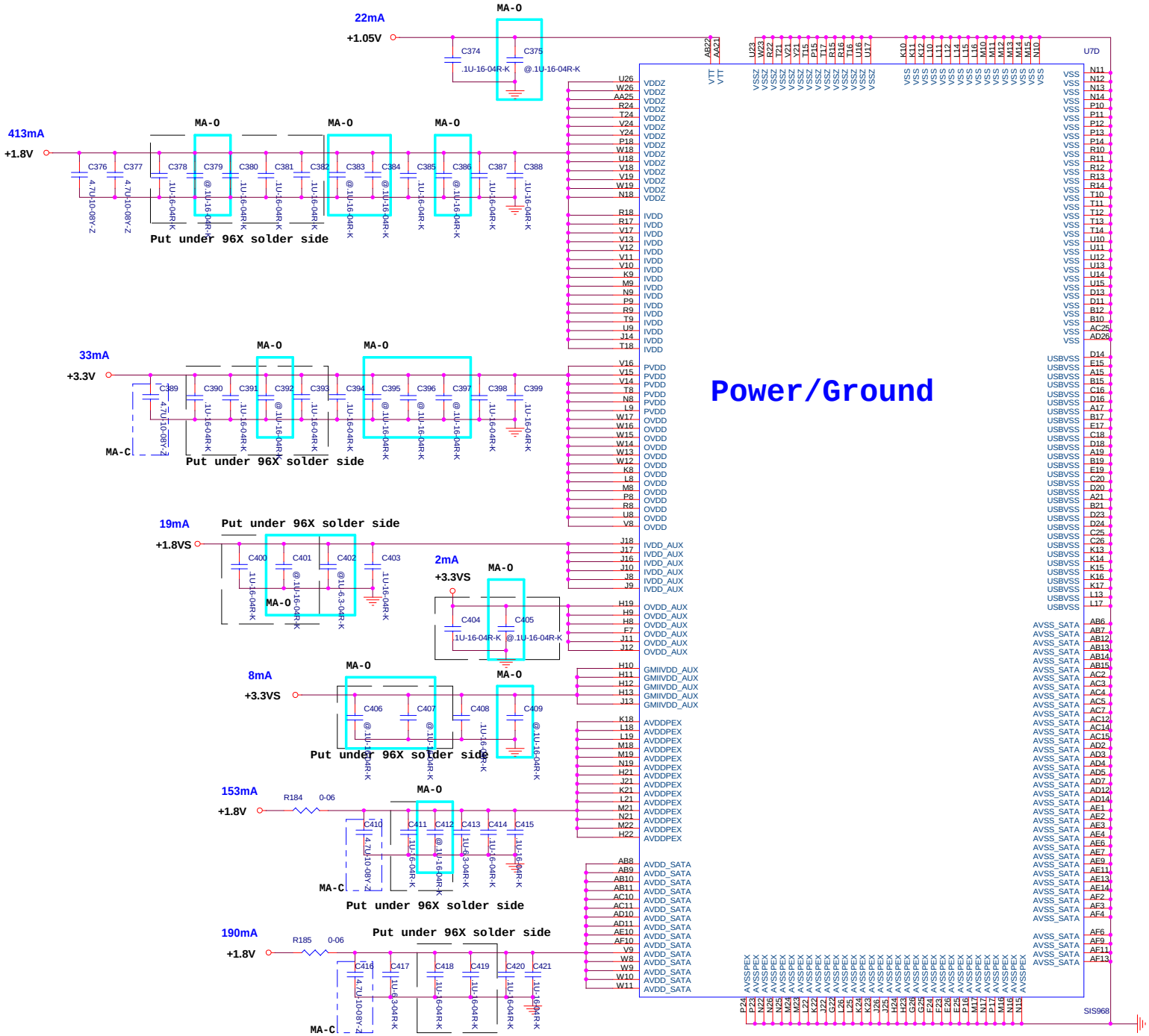

ELITEGROUP COMPUTER SYSTEMS

Title: I4xSIx

Size: Custom | Document Number: 968 USB / SATA | Rev: 01

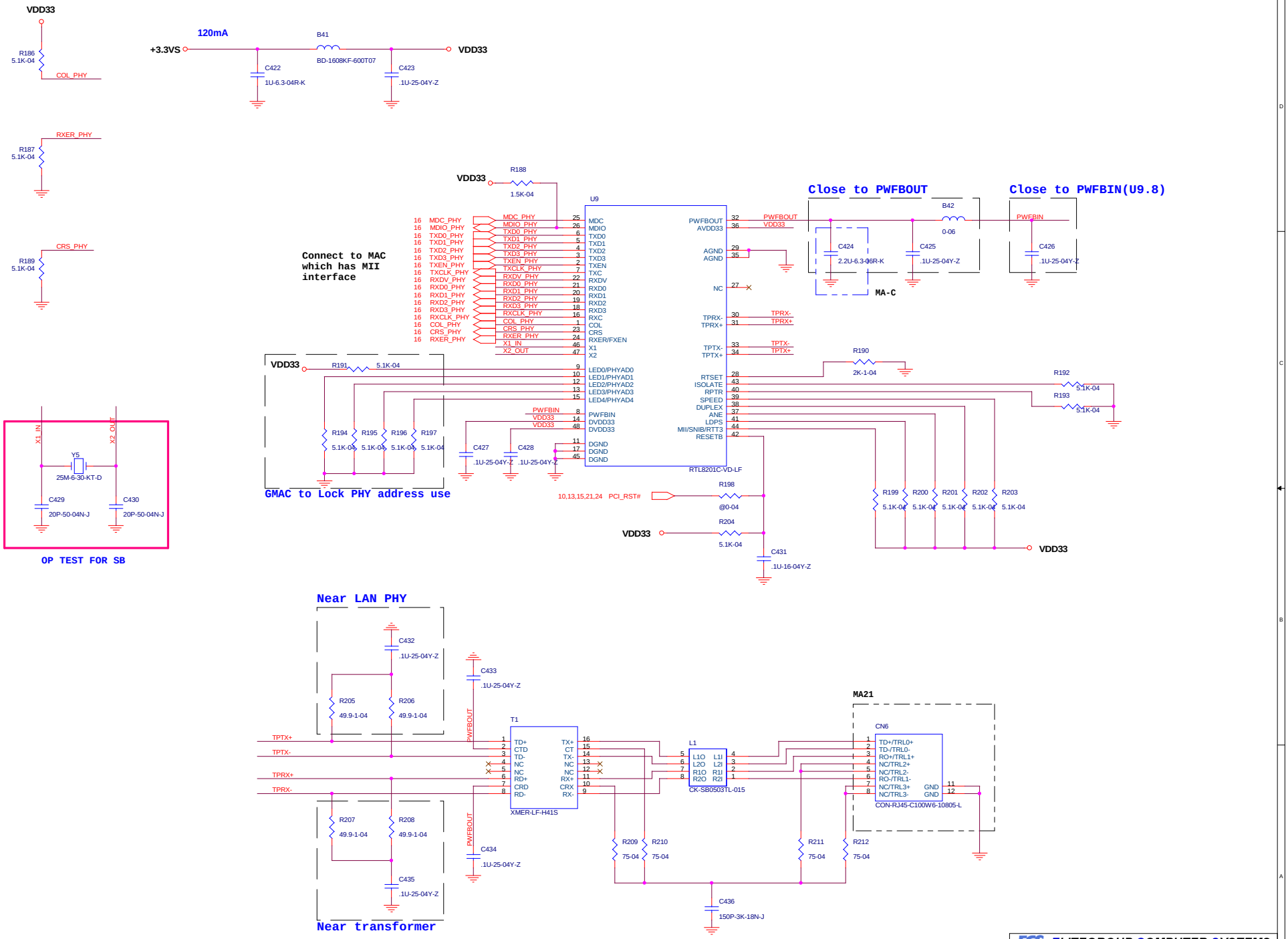
I4xSIx

Date: Thursday, February 19, 2009 | Sheet 17 of 34



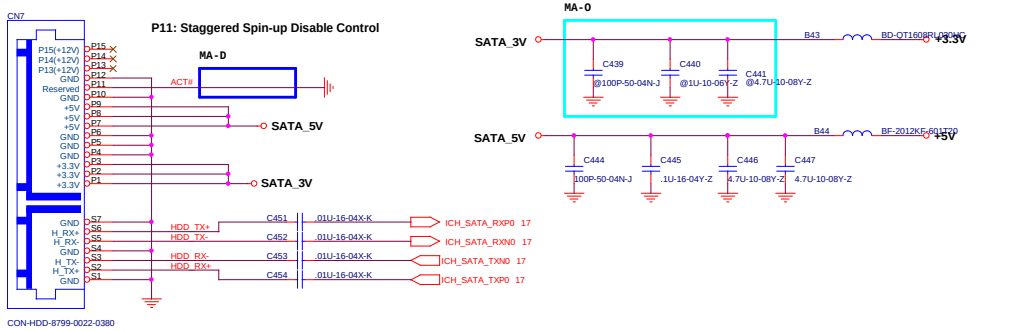

| | |
|---|---|
| Title | I4xSIx |
| Size: Custom | Document Number: 968 PWR |
| Rev | 01 |
| Date: | Thursday, February 19, 2009 |
| Sheet | 18 of 34 |

ELITEGROUP COMPUTER SYSTEMS

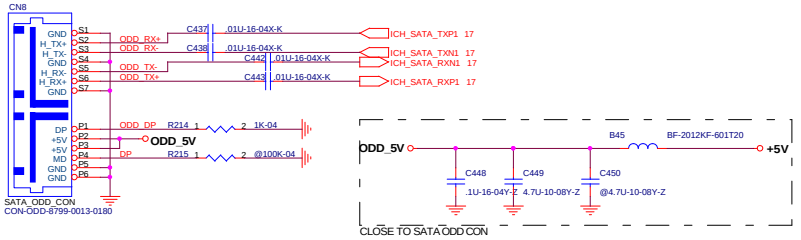


SD_DAT1/XD_D3/MS_D1

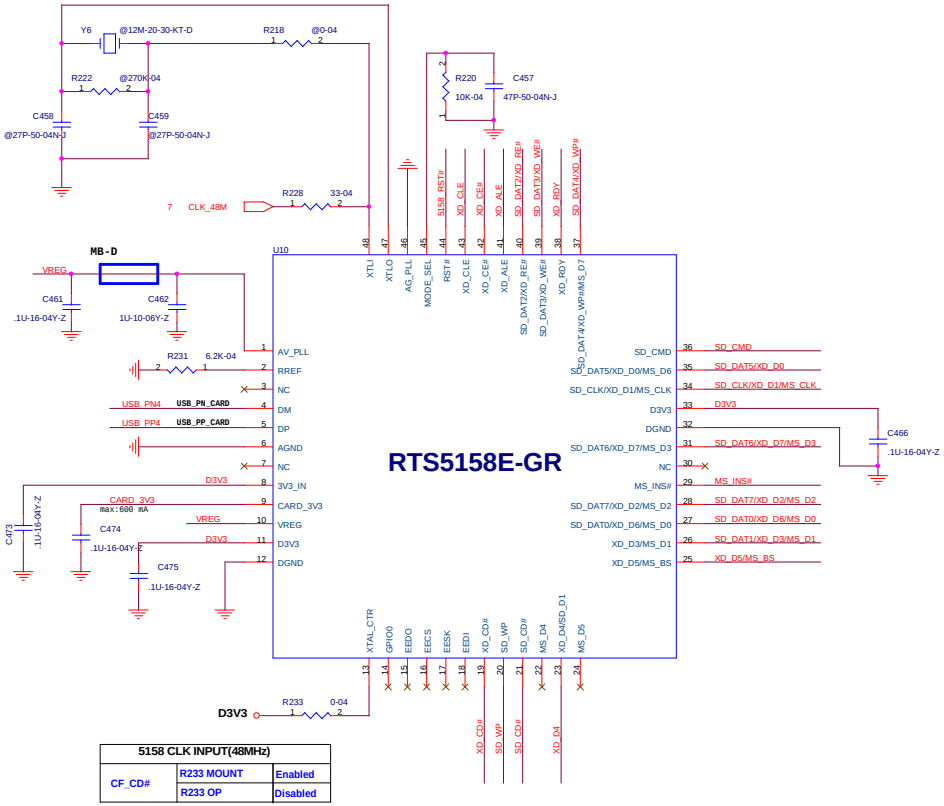
# MASTER HDD CON




# SATA ODD CON

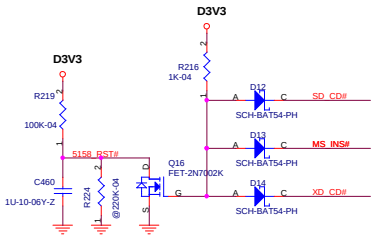


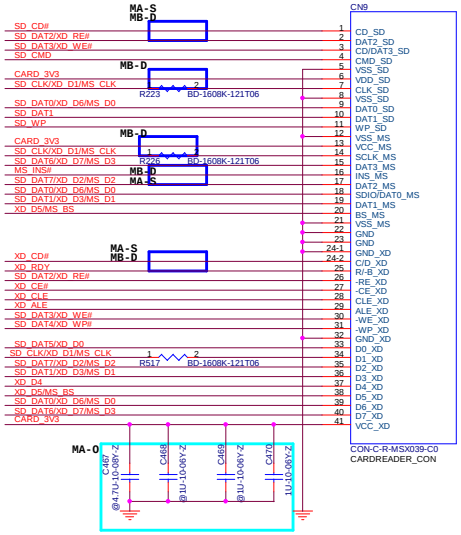

# CARDREADER

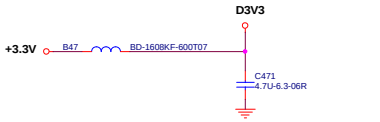


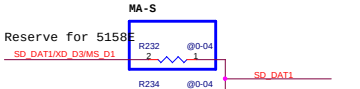

| 5158 CLK INPUT(48MHz) | | |
|---|---|---|
| CF_CD# | R233 MOUNT | Enabled |
| | R233 OP | Disabled |

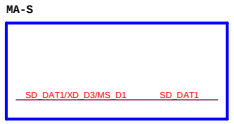
using RTS5158E, don't need hard ware reset circuit. But change AR65 to CHIP-R KOHM 100 1/16W J SMD 0402 LF, AC72 to MC UF 1 10V Y5V Z 0603 LF.

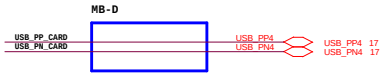


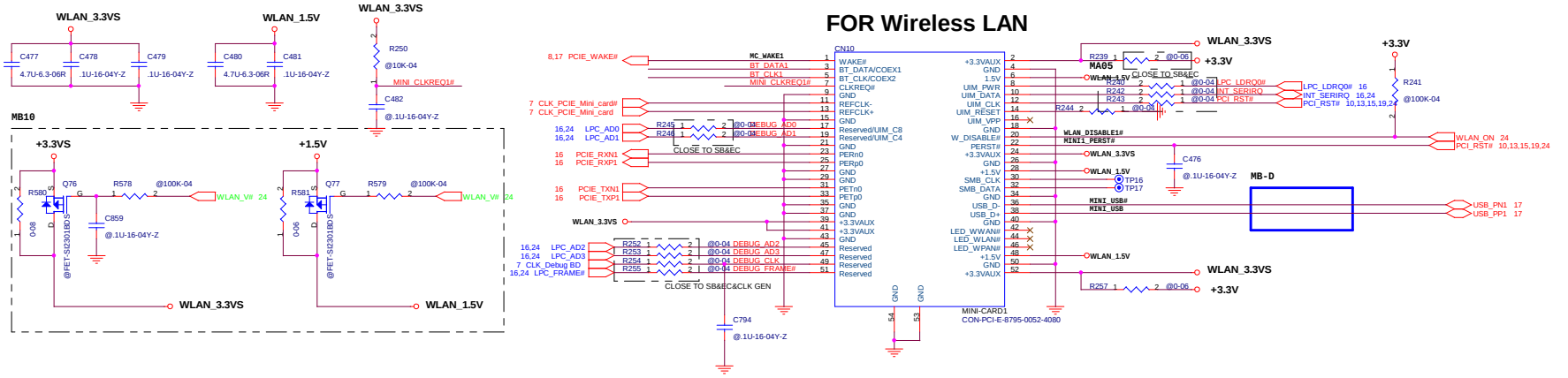




ECS ELITEGROUP COMPUTER SYSTEMS

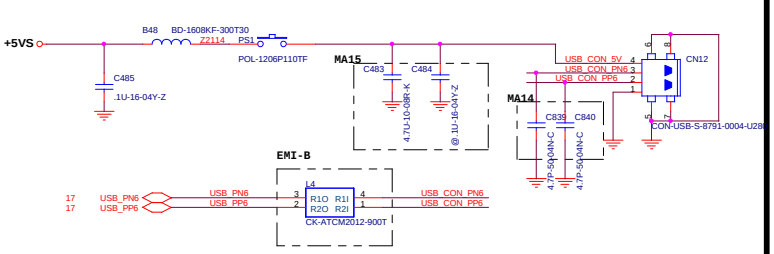
Title: I4xSIx

| Size | Document Number | Rev |
|---|---|---|
| Custom | I4xSIx HDD / ODD / CARDREADER | 01 |
| Date: Thursday, February 19, 2009 | Sheet 20 of 34 | |

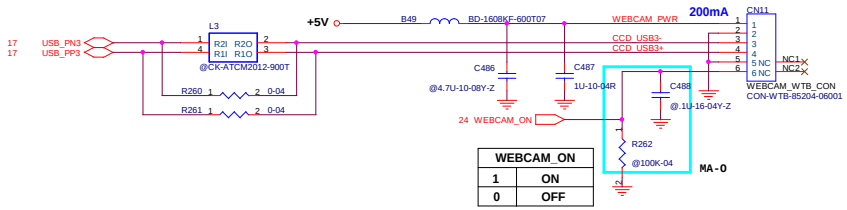
# MINI CARD CON



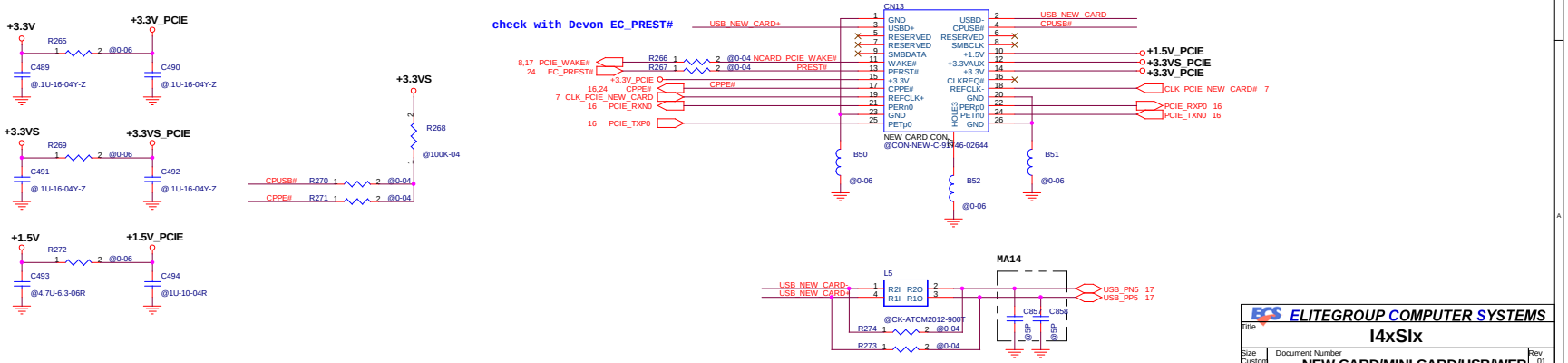

# USB CON




# WEBCAM CON



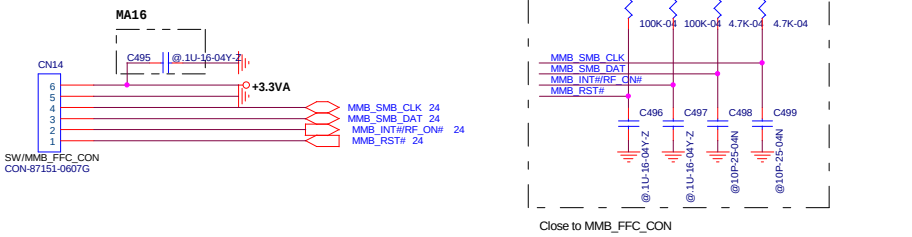

# NEW CARD SOCKET



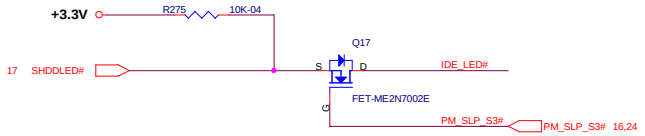

| | |
|---|---|
| Title | I4xSIx |
| Size / Custom | Document Number: NEW CARD/MINI CARD/USB/WEB (I4xSIx) — Rev 01 |
| Date: Thursday, February 19, 2009 | Sheet 21 of 34 |

ELITEGROUP COMPUTER SYSTEMS

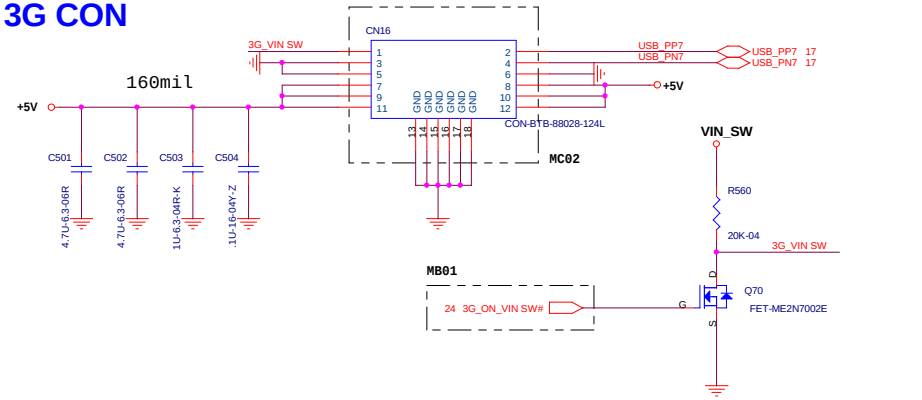
# MMB CON



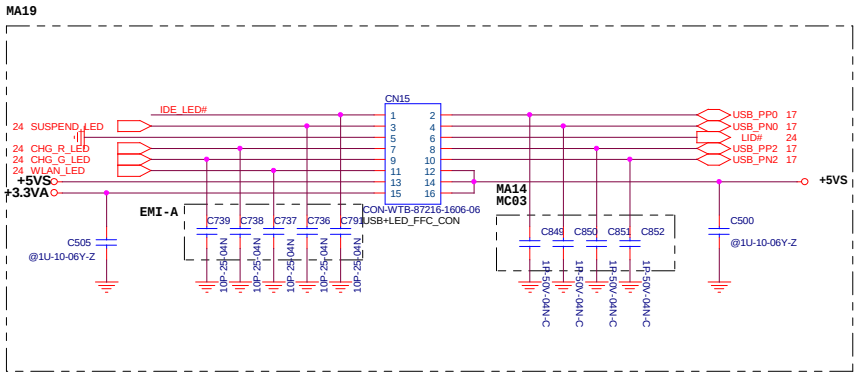

# HDD Led



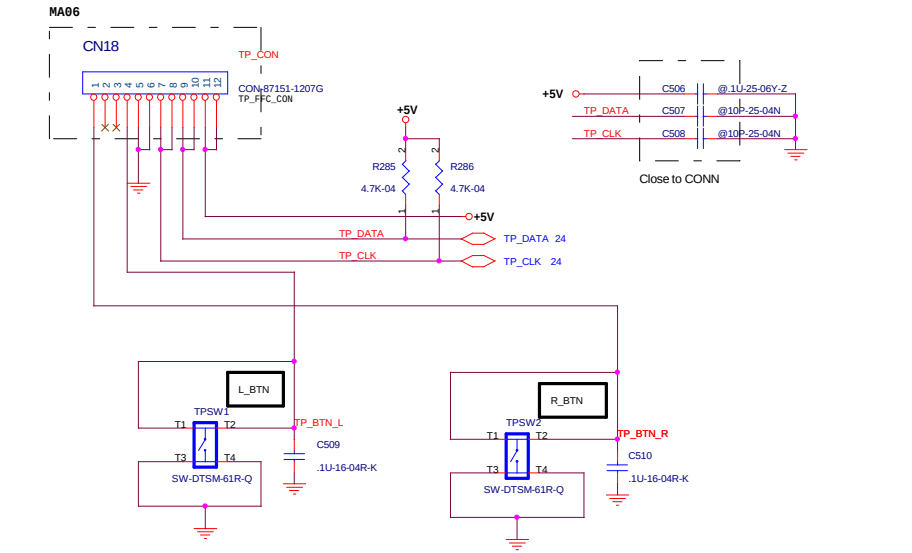

# 3G CON



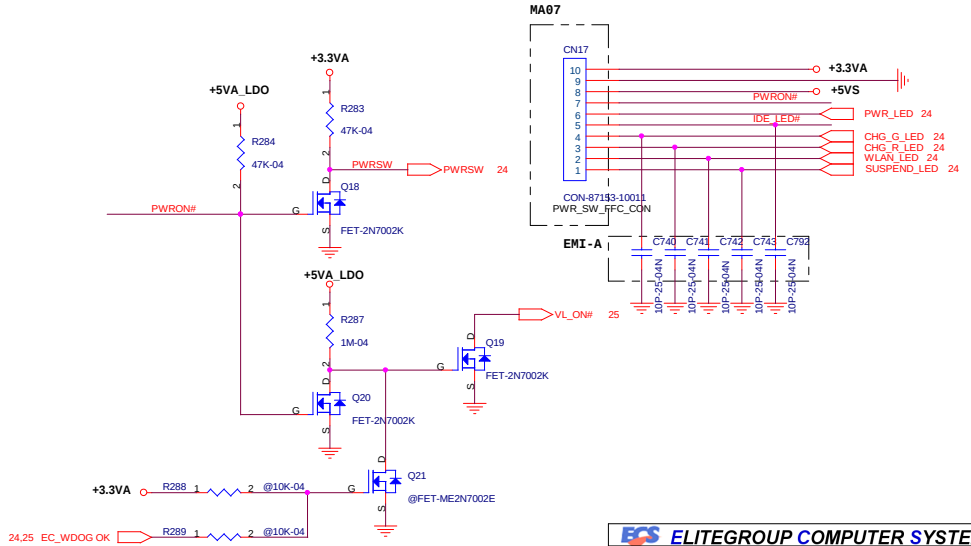

# USB+LED CON




# TP CON



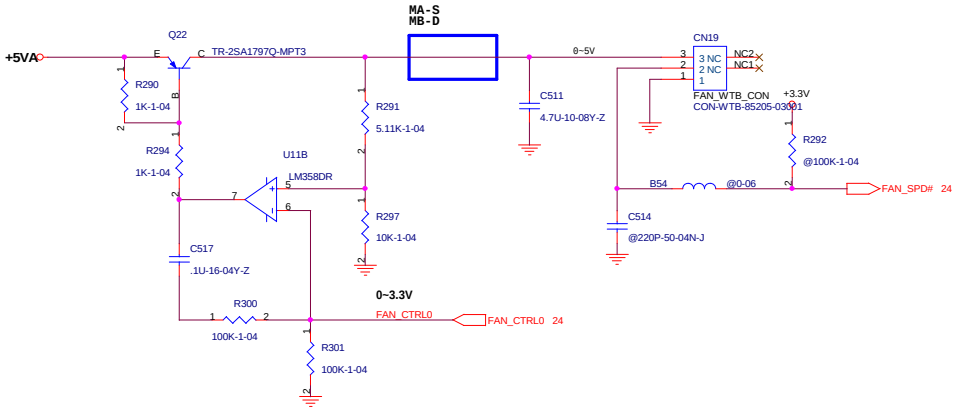

# PWR SW CON



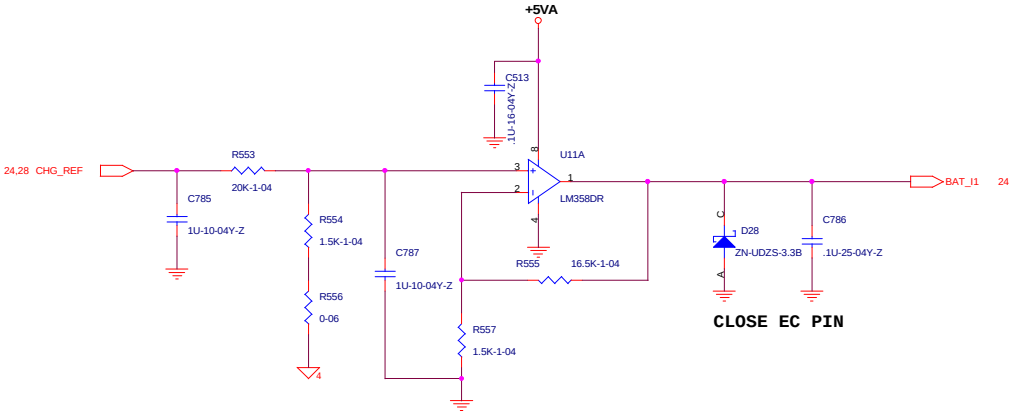

ELITEGROUP COMPUTER SYSTEMS

| | | |
|---|---|---|
| Title | I4xSIx | |
| Size: Custom | Document Number: 3G/MMB/SW/TP/IO CON/ HDD LED | Rev: 01 |
| Date: Thursday, February 19, 2009 | Sheet 22 of 34 | |

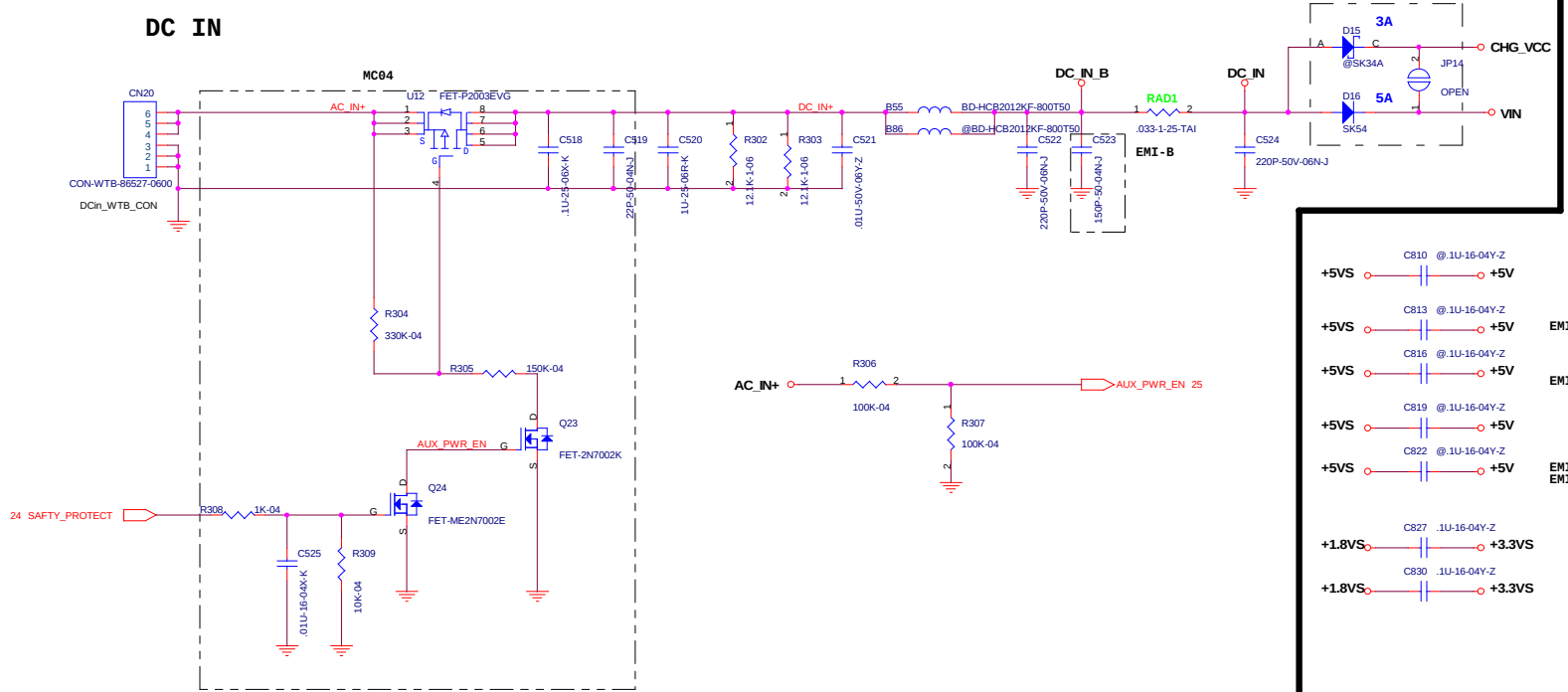
# CPU FAN CONTROL



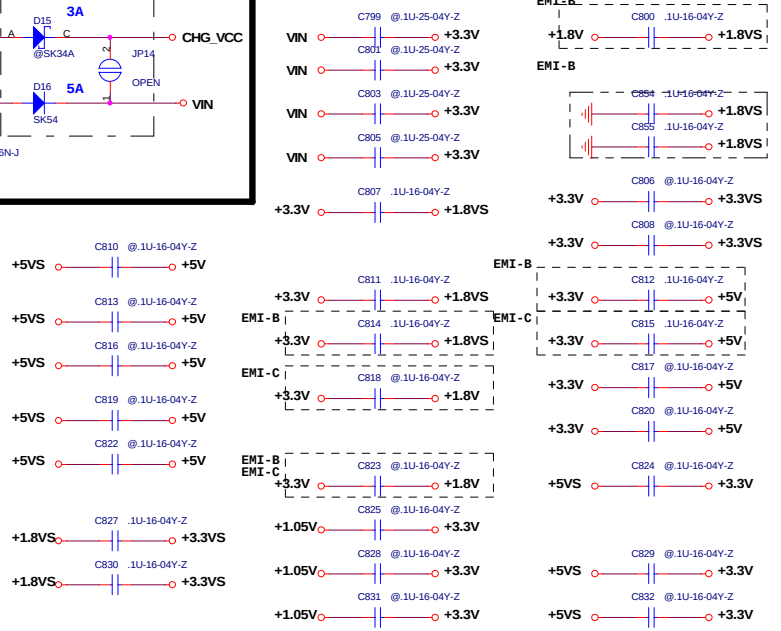

# Charge / Discharge Detect




# DC IN




# High speed current return path Capactor

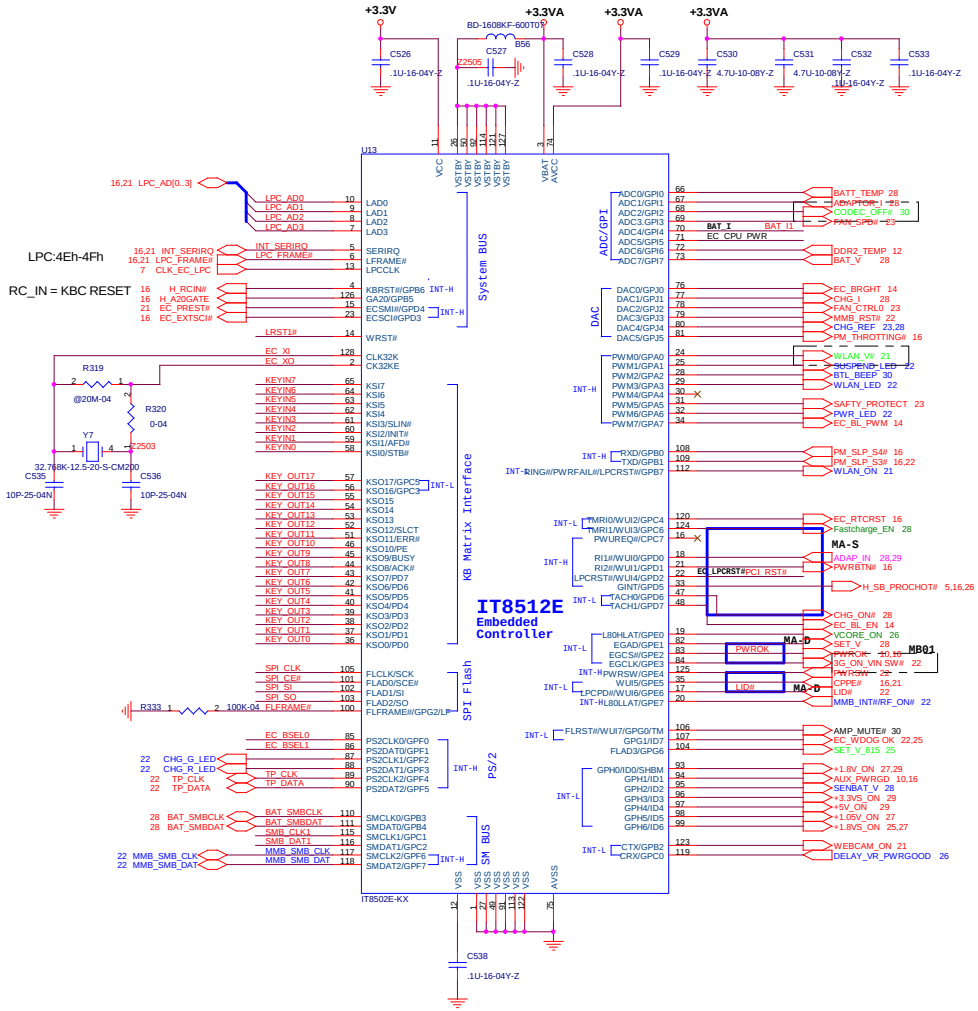



ELITEGROUP COMPUTER SYSTEMS

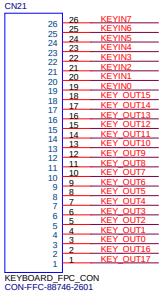
Title: I4xSIx

Size: Custom | Document Number: I4xSIx | DC IN / CPU FAN / EMI* | Rev: 01

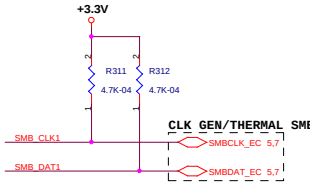
Date: Thursday, February 19, 2009 | Sheet 23 of 34

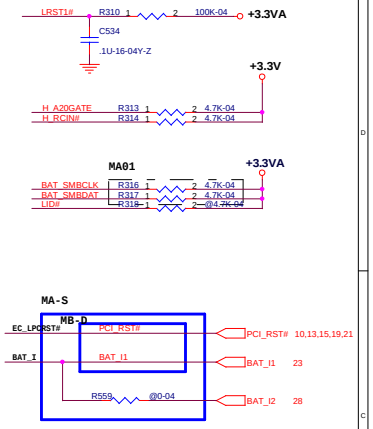



## KEYBOARD CON

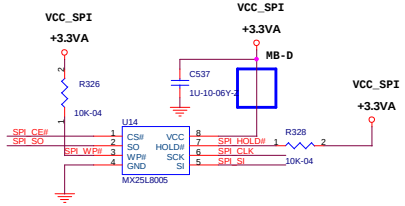



## SMBUS LEVEL SHIFT

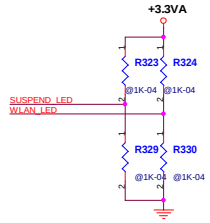



## FLASH ROM(SPI)

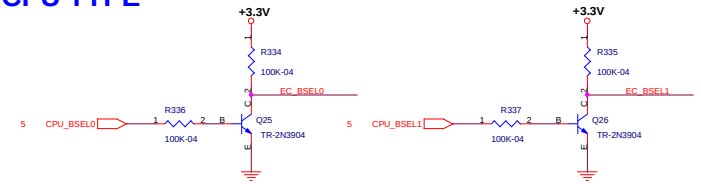



## Platform ID




| MODEL \ ID | (ID0) SUSPEND_LED | (ID1) WLAN/BT_LED |
|---|---|---|
| I4xII/SI | 0 | 0 |
| I5xII/SI | 0 | 1 |
| I7xII/SI | 1 | 0 |
| RESERVED | 1 | 1 |

## CPU TYPE




FOR EC

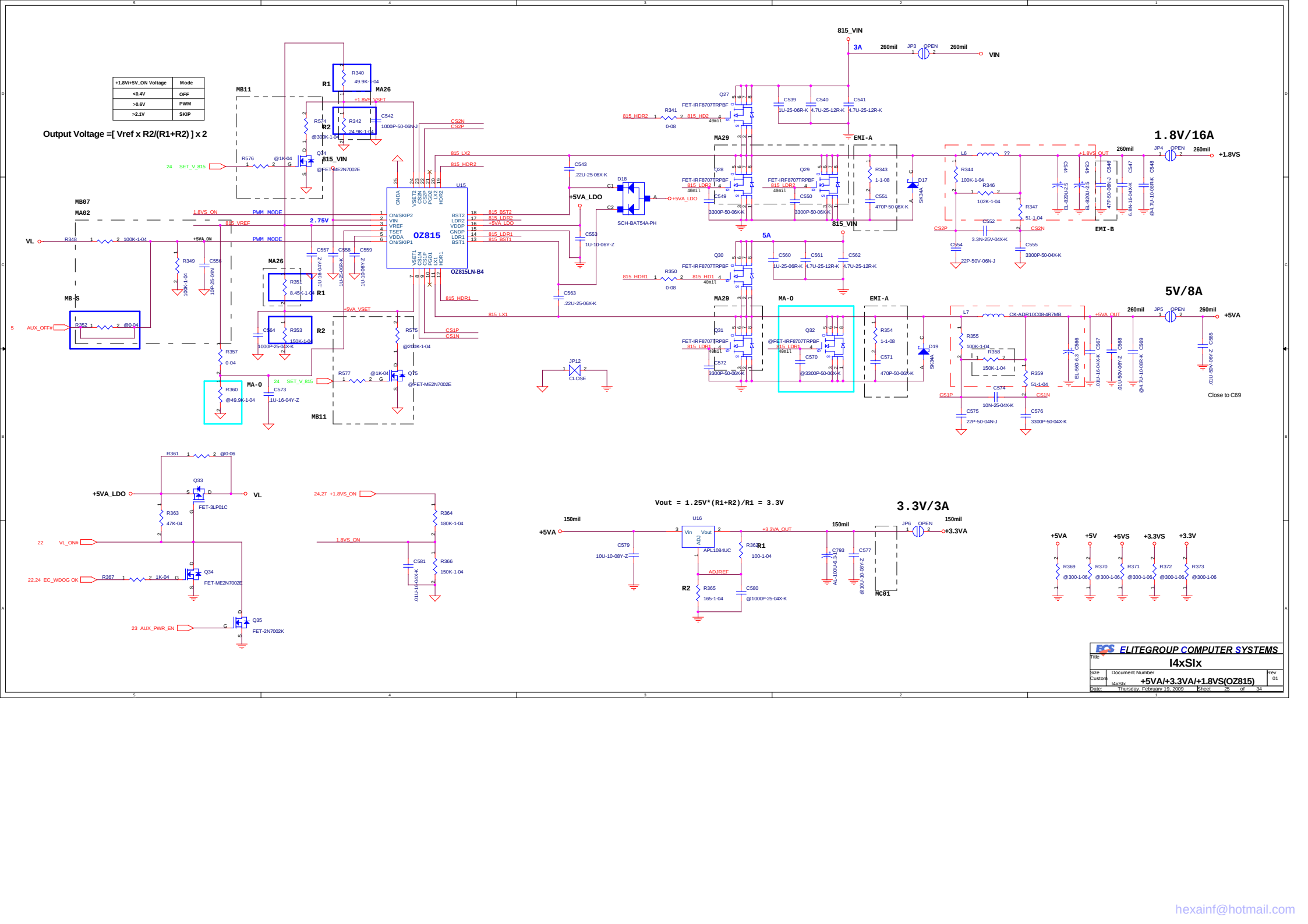
| FSB \ BSEL | BSEL2 | BSEL1 | BSEL0 | MHZ |
|---|---|---|---|---|
| FSB533 | 1 | 1 | 0 | 133 |
| FSB667 | 1 | 0 | 0 | 166 |
| FSB800 | 1 | 0 | 1 | 200 |
| FSB1066 | 1 | 1 | 1 | 266 |

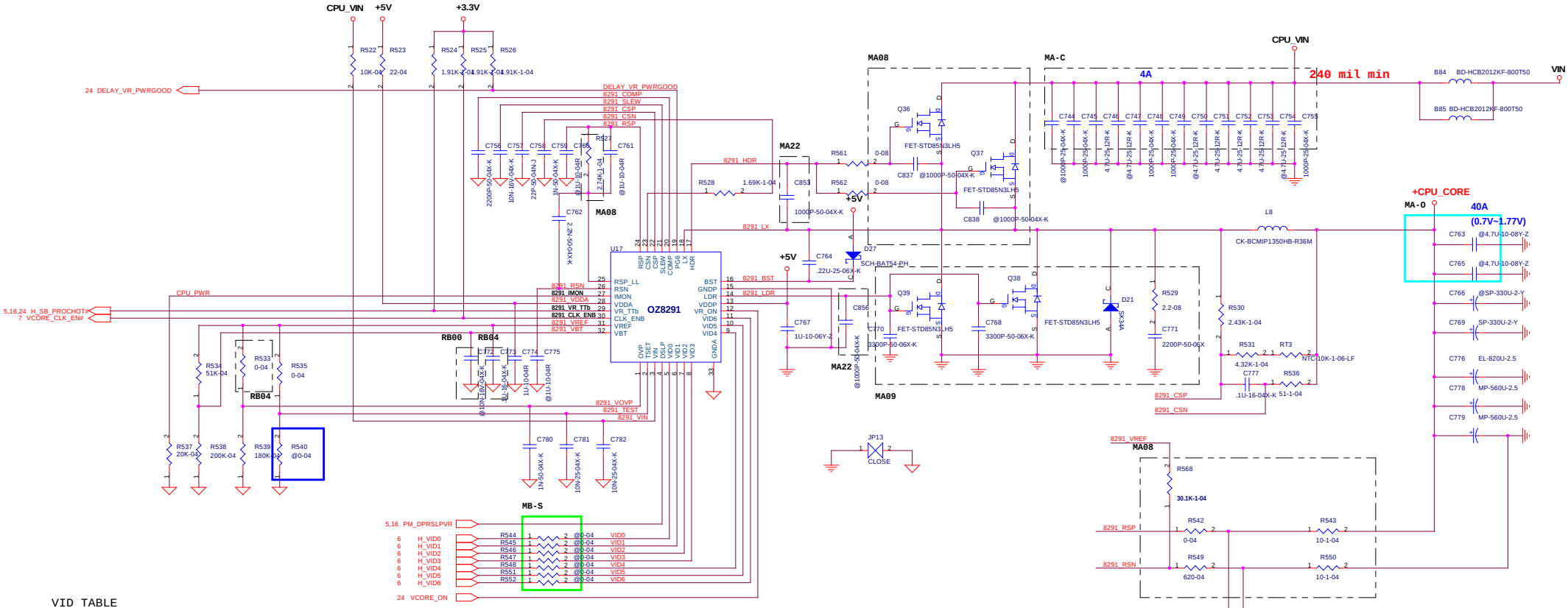
ELITEGROUP COMPUTER SYSTEMS

Title: I4xSIx

Size: Custom | Document Number: I4xSIx | EC / BIOS / KEY CON | Rev: 01

Date: Thursday, February 19, 2009 | Sheet 24 of 34






## VID TABLE

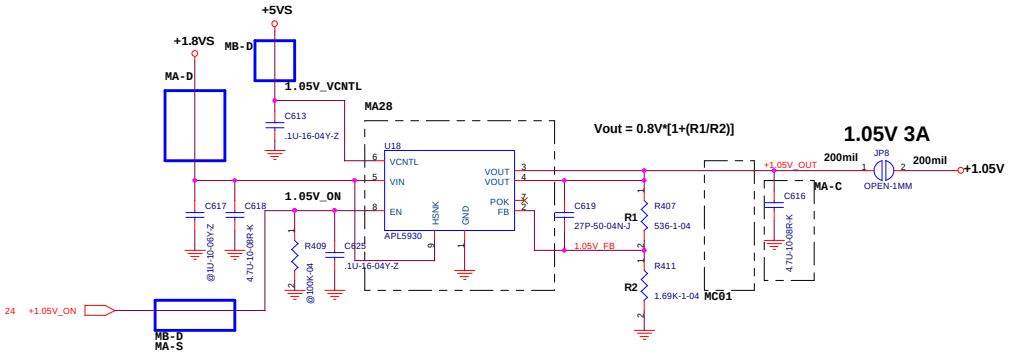
| 6 | 5 | 4 | 3 | 2 | 1 | 0 | Vcore | Status |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1.2875 | Yonah(HFM) |
| 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1.2000 | Boot Vout |
| 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1.1500 | Merom(HFM) |
| 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0.8375 | Y&M(LFM) |
| 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0.7625 | Y&M(Deeper Sleep) |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.0000 | Shut down |

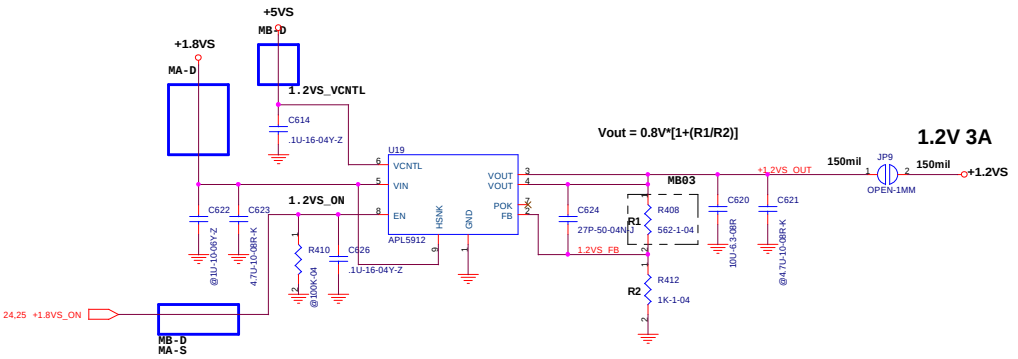
ELITEGROUP COMPUTER SYSTEMS

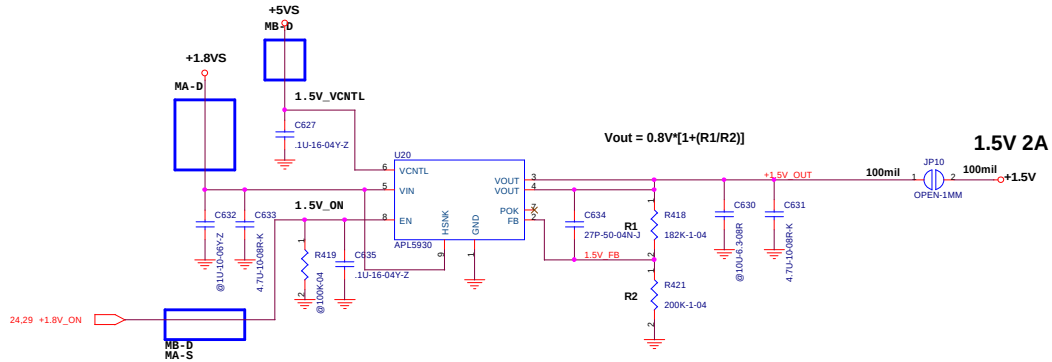
Title: I4xSIx

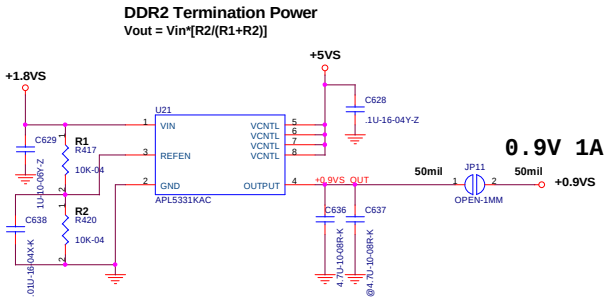
Size: Custom | Document Number: I4xSIx | CPU CORE(OZ8291) | Rev: 01

Date: Thursday, February 19, 2009 | Sheet 26 of 34



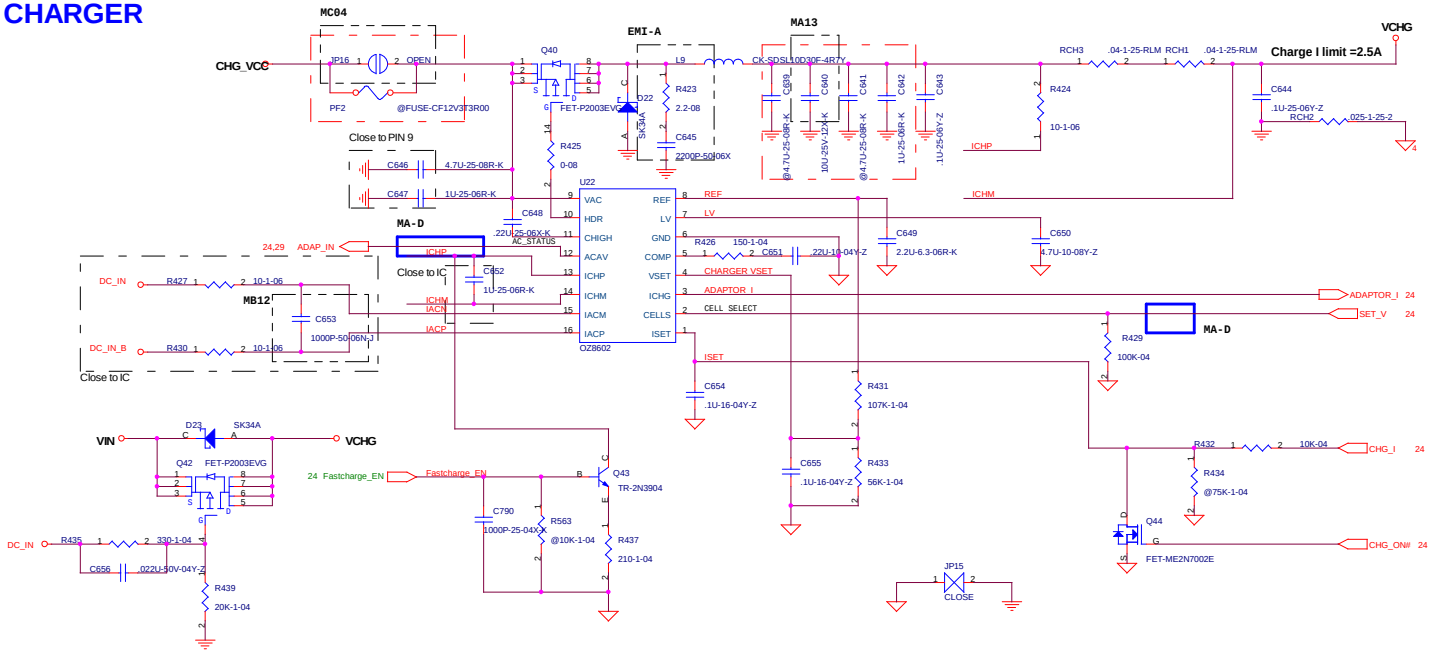

ELITEGROUP COMPUTER SYSTEMS

Title: I4xSIx

| Size | Document Number | Rev |
|---|---|---|
| Custom | I4xSIx 0.9VS/1.05VS/1.2VS/1.5V | 01 |

Date: Thursday, February 19, 2009 Sheet 27 of 34

# CHARGER




| SET_V | |
|---|---|
| H | 16.84V ( 4CELL ) |
| L | 12.71V ( 3CELL ) |

Vch =Nx(4.1 +Vset/10)
N=Cell (pin2 =high
-->4, low -->3)

| CHG_ON | |
|---|---|
| L | CHARGER ON |
| H | CHARGER OFF |

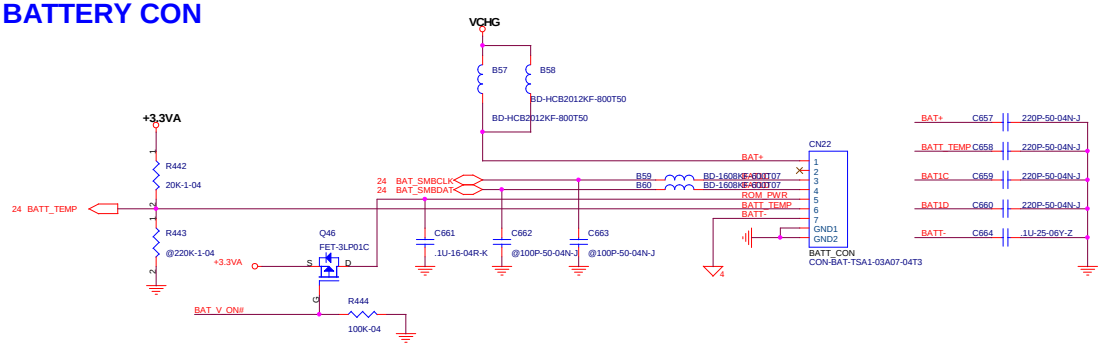
| ADAPTOR_I | |
|---|---|
| F50II0 | |
| Voltage | W |
| 330mV | 20W |
| 660mV | 40W |
| 990mV | 60W |
| 1.32V | 80W |
| X | X |
| X | X |

Vichg =RAD1*Irsense*10

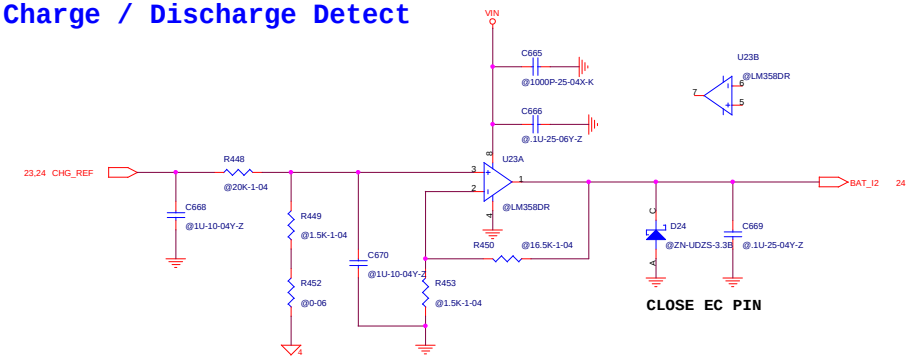
CHARGER CURRENT CGH_I=(Ich*Rch-V_R424)*30

| Fast-charge-EN | CHG_I | Ich |
|---|---|---|
| H | 3.3V | 3A |
| H | 2.82V | 2.8A |
| H | 2.1V | 2.5A |
| H | 0.9V | 2A |
| H | 0.3V | 1.6A |
| L | 3V | 1.25A |
| L | 2.4V | 1A |
| L | 0.48V | 0.200A |
| L | 0.3V | 0.125A |

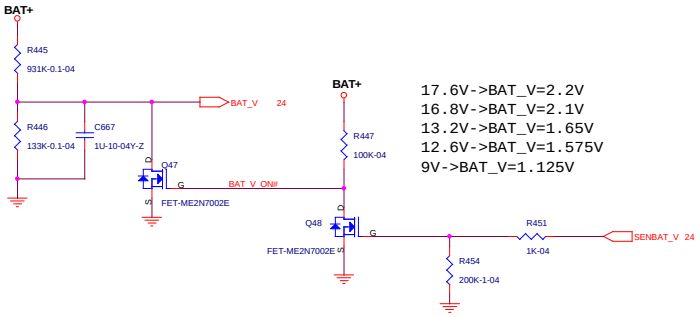
# BATTERY CON




# Charge / Discharge Detect

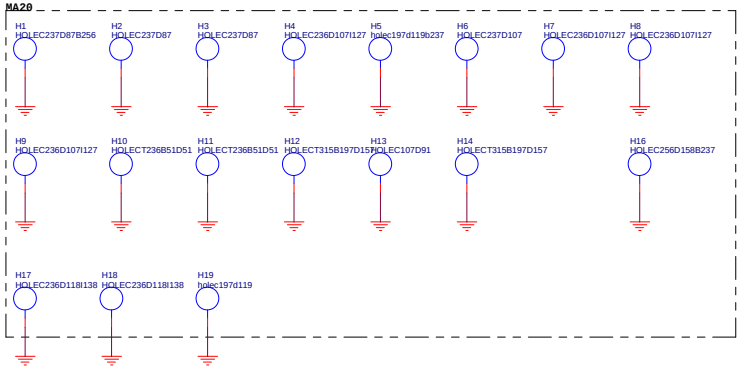



# Battery Voltage Detect




17.6V->BAT_V=2.2V
16.8V->BAT_V=2.1V
13.2V->BAT_V=1.65V
12.6V->BAT_V=1.575V
9V->BAT_V=1.125V

MA20



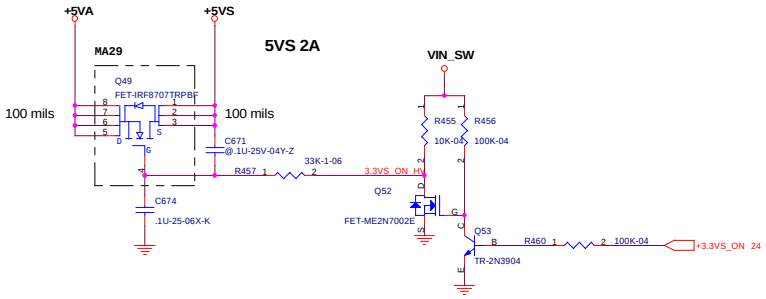

| Item | drill | Ring(TOP) | Ring(BOT) | Footprint Name |
|---|---|---|---|---|
| 1 | 2.7 | 6 | 6 | HOLEC236D107I127 |
| 2 | 1.3 | 6 | 0 | HOLECT236B51D51 |
| 3 | 4 | 8 | 5 | HOLECT315B197D157 |
| 4 | 4 | 6 | 6 | HOLEC236D157I177 |
| 5 | 3 | 6 | 6 | HOLEC236D118I138 |
| 6 | 1.5 | 5 | 5 | HOLEC197D59 |
| 7 | 2.7 | 7.5 | 7.5 | HOLECT236B295D107 |

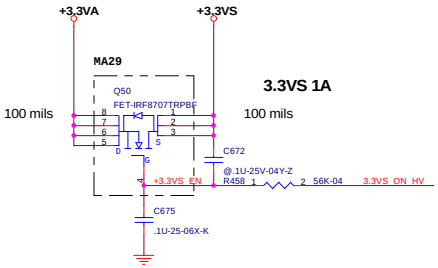
ELITEGROUP COMPUTER SYSTEMS

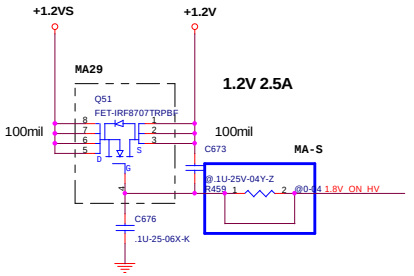
Title: I4xSIx

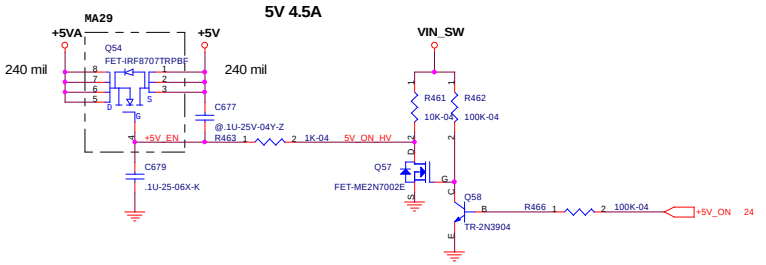
Size: Custom | Document Number: I4xSIx | BATT IN / CHARGER(8602) | Rev: 01

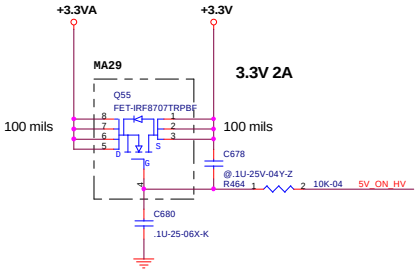
Date: Thursday, February 19, 2009 | Sheet 28 of 34

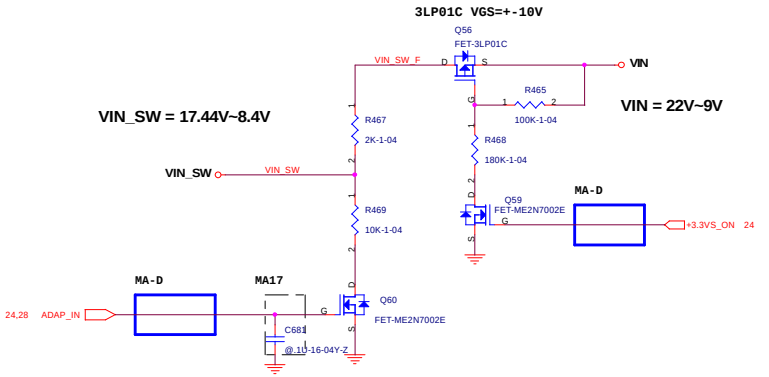


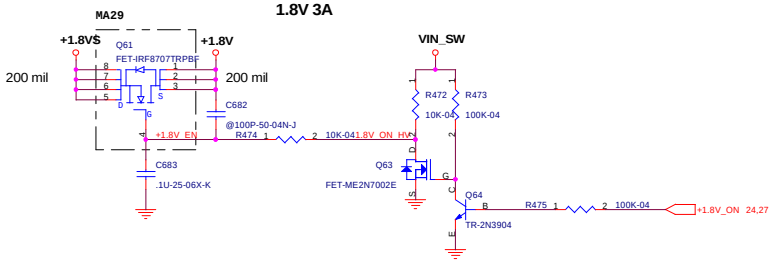



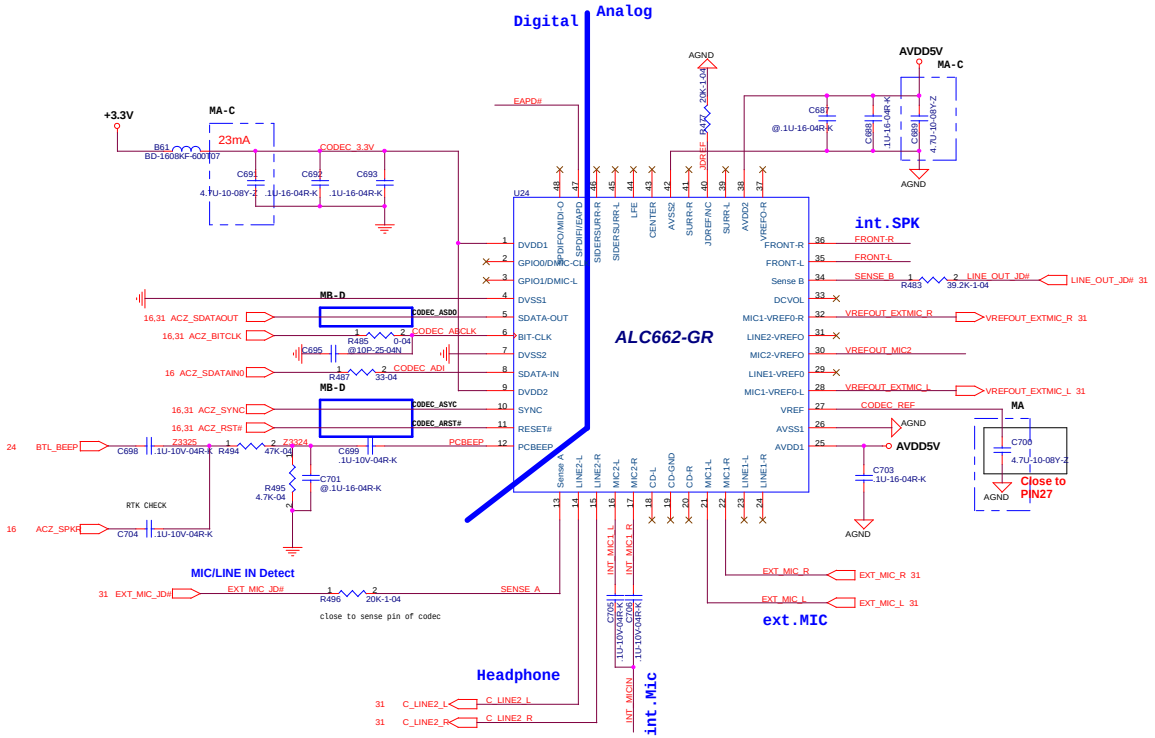



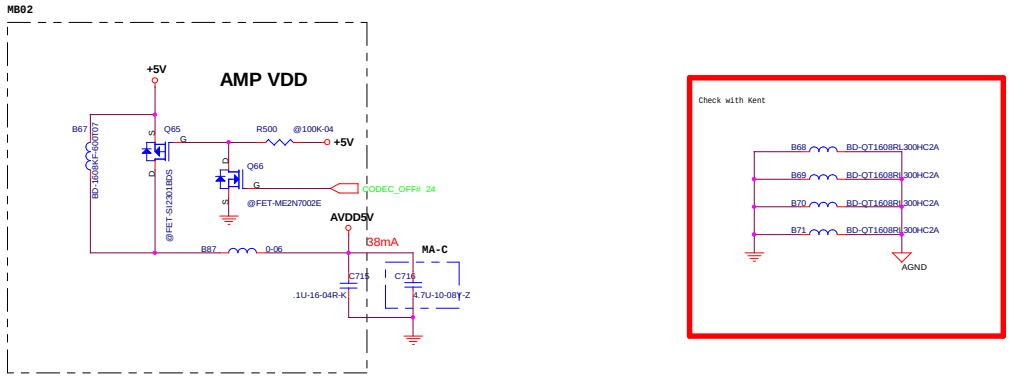




ELITEGROUP COMPUTER SYSTEMS

| | | |
|---|---|---|
| Title | I4xSIx | |
| Size: Custom | Document Number: VCC SW | Rev: 01 |
| Date: Thursday, February 19, 2009 | Sheet 29 of 34 | |

# CODEC 662

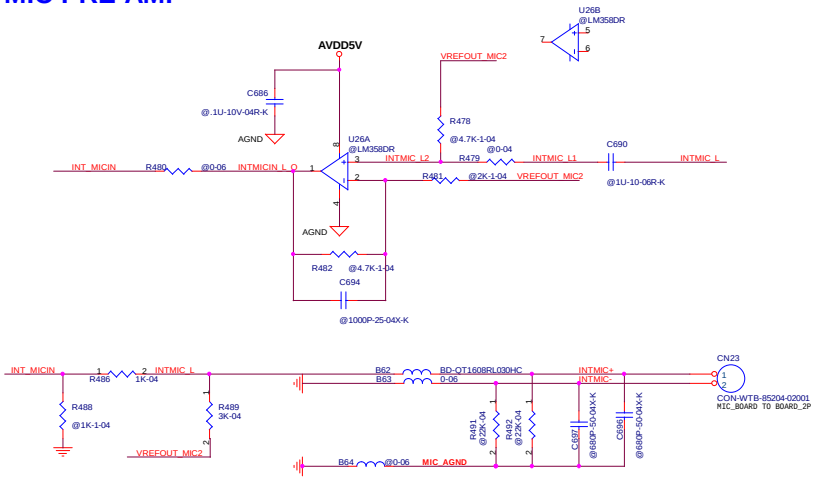


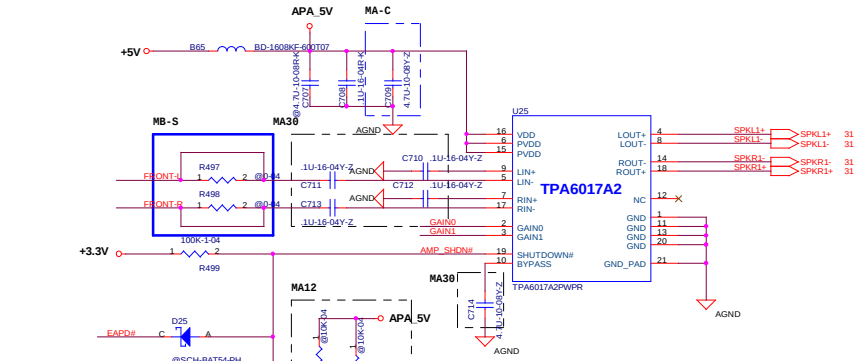




# INT MIC & MIC PRE-AMP




# INT SPK AMP




**Gain Table**

| GAIN0 | GAIN1 | Gain |
|---|---|---|
| L | L | 6dB |
| L | H | 10dB |
| H | L | 15.6dB |
| H | H | 21.6dB |

ELITEGROUP COMPUTER SYSTEMS

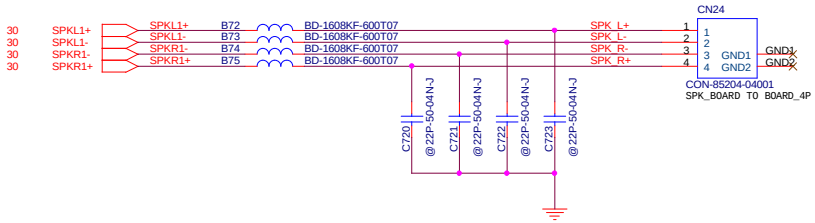
Title: I4xSIx

Size: Custom | Document Number: I4xSIx | Rev: 01

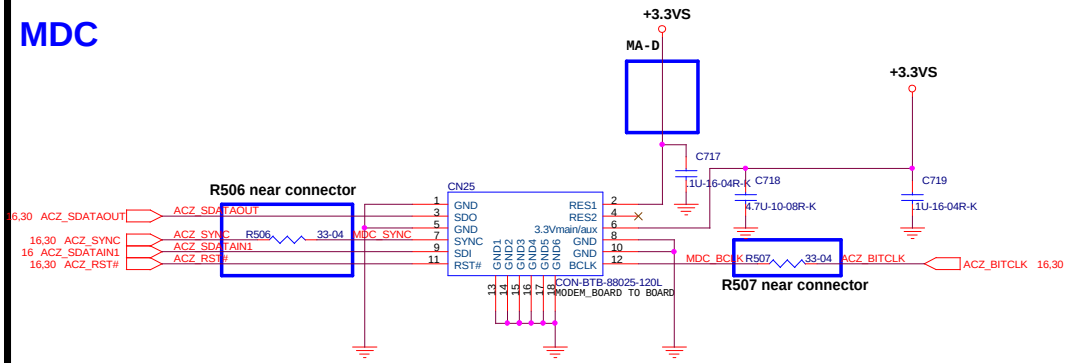
CODEC(662) / AMP / INT MIC

Date: Thursday, February 19, 2009 | Sheet 30 of 34

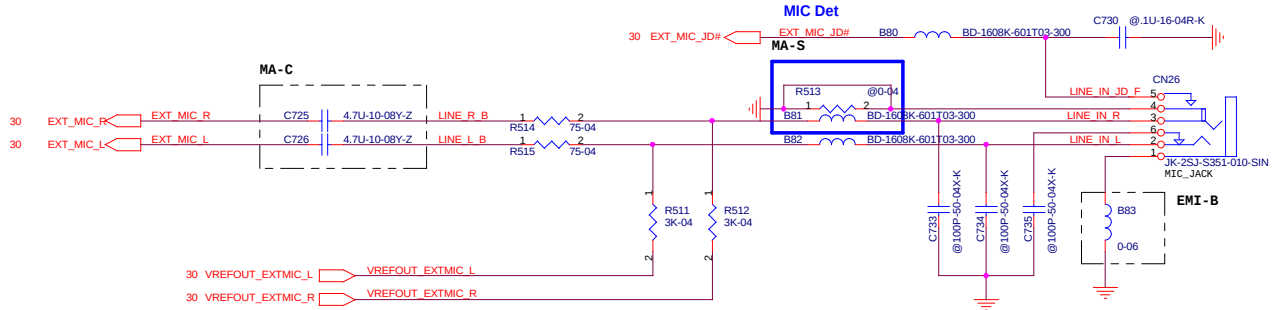
# Int SPK



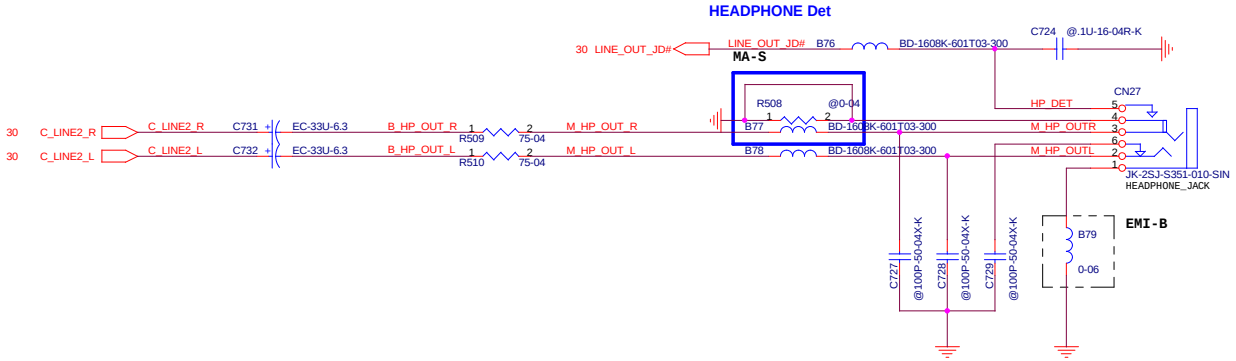

# MDC




# EXTERNAL MIC




# HEADPHONE




| | | |
|---|---|---|
| ELITEGROUP COMPUTER SYSTEMS | | |
| Title: I4xSIx | | |
| Size: Custom | Document Number: EXT SPK / JACK / MDC (I4xSIx) | Rev: 01 |
| Date: Thursday, February 19, 2009 | Sheet 31 of 34 | |

## RA to RB Modify list:

| Symbol | Modify Item | Modify Reason | Page | Note |
|---|---|---|---|---|
| MA00 | NET NAME CHANGE | Schematic ERROR | PAGE 12 | |
| MA01 | SMBUS HIGH 3.3V | BATTERY SMBUS,BOM ERROR | PAGE 24 | |
| MA02 | MODIFY NET AUX_OFF TO VL | CANNOT POWER ON | PAGE 25 | |
| MA03 | ADD JP14, D15 OP | COST DOWN | PAGE 23 | |
| MA04 | DELL Q10,Q11 ADD U27,U28,R566,R567,C835,C836 | FOR DQA H,V VOLTAGE TO LOW FOR DQA | PAGE 14 | |
| MA05 | R239 CHANGE TO 0603 | Schematic ERROR | PAGE 21 | |
| MA06 | MODIFY TP CON PIN NET CN18 | Schematic ERROR | PAGE 22 | |
| MA07 | CN17 CHANGE 180 DEGREE | Layout ERROR | PAGE 22 | |
| MA08 | CPU ADD C837,C838,R568 | Vcore MODIFY | PAGE 26 | |
| MA09 | Vcore POWER MODIFY | Vcore MODIFY | PAGE 26 | |
| MA10 | R106,R107 CHANGE TO 10K | MODIFY DDR VREF VOLTAGE | PAGE 12 | |
| MA11 | 5V POWER OFF HAVE 1V(CRT DDC) | FOR S3 5VA OFF HAVE 1V | PAGE 14 | |
| MA12 | Modify AMP gain(6DB) | FOR DQA TEST | PAGE 30 | |
| MA13 | C640 CHANGE TO 1206 | COST DOWN | PAGE 28 | |
| MA14 | USB ADD 5P CAP | FOR DQA TEST(USB PORT) | PAGE 21,22 | |
| MA15 | USB CAP CHANGE TO 4.7UF OP 1UF | COST DOWN | PAGE 21 | |
| MA16 | MMB 3.3VA CAP OP | COST DOWN | PAGE 22 | |
| MA17 | C681 OP | COST DOWN | PAGE 29 | |
| MA18 | MODIFY CN6 FOOTPRINT | ME CHANGE | PAGE 19 | |
| MA19 | MODIFY CN15 CON 20PIN TO 16PIN,ADD USP CAP | ME CHANGE | PAGE 22 | |
| MA20 | MODIFY HOLE FOOTPRINT | ME CHANGE | PAGE 28 | |
| MA21 | CN6 FOOTPRINT CHANGE | | PAGE 19 | |
| MA22 | ADD CAP FOR Vcore dead time | | PAGE 26 | |
| MA23 | FOR LCD BL ON | PANEL BL ON FOR WHITE DISPLAY | PAGE 14 | |
| MA24 | CHANGE FOR BAT PWRGD TIME | COST DOWN | PAGE 16 | |
| MA25 | FOR BATTERY FUNTION(OP R563) | Schematic ERROR | PAGE 28 | |
| MA26 | change 5V,1.8V VOLTAGE | FOR 5V, 1.8V VOLTAGE TO LOW | PAGE 25 | |
| MA27 | MODIFY PIN32,34,36 NET VIN_LCD | FOR 16:9 PANEL | PAGE 14 | |
| MA28 | U18 IC:5912 CHAGE TO 5930 | | PAGE 27 | |
| MA29 | MODFIY MOS MA4410TO IR8707 | FOR POWER | PAGE 25,29 | |
| MA30 | CHANGE C711,C713,C714 VULE | FOR AMP POP NOISE | PAGE 30 | |

| Symbol | Modify Item (Component count less than 10% with U50) | | | Page |
|---|---|---|---|---|
| MA | MA-O(OP)<br>R23,R29,R39,R34 | MA-S(SHORT)<br>R25,R31,R37 | | PAGE 5 |
| | MA-O(OP)<br>C12,C13,C15,C17,C20,C22,C25,C27,C29,C41,C47,C48,C49<br>C51,C52,C53,C54,C59,C60,C61,C68,C69,C74 | | | PAGE 6 |
| | MA-O(OP)<br>C98,C99,C126,C127 | MA-S(SHORT)<br>R44~R56,R58~R60 | | PAGE 7 |
| | MA-O(OP)<br>C131 | | | PAGE 8 |
| | MA-O(OP)<br>C144 | | | PAGE 9 |
| | MA-O(OP)<br>C147 | | | PAGE 10 |
| | MA-O(OP)<br>C174,C175,C183,C185,C186,C188,C189,C194,C197,C198,C200 | | | PAGE 11 |
| | MA-O(OP)<br>C208,C209,C221,C222,C228,C253,C255 | | | PAGE 12 |
| | MA-O(OP)<br>C270,C284 | MA-S(SHORT)<br>R117 | | PAGE 13 |
| | MA-S(SHORT)<br>R168,R169 | | | PAGE 16 |
| | MA-O(OP)<br>C375,C379,C383,C384,C386,C392,C395,C396,C397,C401,C402,C405<br>C406,C407,C409,C412 | | | PAGE 18 |
| | MA-O(OP)<br>C439,C440,C441,C467,C468,C469 | MA-S(SHORT)<br>R222,R217,R227,R229 | MA-D(DELL)<br>R213 | PAGE 20 |
| | MA-O(OP)<br>C486,C488,R262 | MA-S(SHORT)<br>R321,R323 | | PAGE 21 |
| | MA-S(SHORT)<br>R413,R422,R414 | MA-D(DEL)<br>R405,R406,R416 | | PAGE 27 |
| | MA-S(SHORT)<br>R459 | MA-D(DEL)<br>R470,R471 | | PAGE 29 |
| | MA-S(SHORT)<br>R520,R558,R321 | MA-D(DEL)<br>R332,R338,R339 | | PAGE 24 |
| | MA-D(DEL)<br>R135,R136,R137 | | | PAGE 14 |
| | MA-S(SHORT)<br>B53 | | | PAGE 23 |
| | MA-O(OP)<br>Q32,C570 | | | PAGE 25 |
| | MA-O(OP)<br>C763,C765 | | | PAGE 26 |
| | MA-D(DEL)<br>R428,R441 | | | PAGE 28 |
| | MA-D(DEL)<br>R505 | MA-S(SHORT)<br>R508,R513 | | PAGE 31 |

ELITEGROUP COMPUTER SYSTEMS

Title: I4xSIx

Size: Custom | Document Number: I4xSIx | RA to RB Ver. History | Rev: 01

Date: Thursday, February 19, 2009 | Sheet 32 of 34

## RB to R01 Modify list:

| Symbol | Modify Item | Modify Reason | Page | Note |
|---|---|---|---|---|
| MB00 | OP C772 | FOR CPU POWER UP | PAGE 26 | |
| MB01 | Net change 3G VIN SW add # | MODIFY EC CONTROL NET NAME | PAGE 22,24 | |
| MB02 | Add CODE 662 AMP 5V power control | FOR ENGRGY STAR AND BATTERY LIFE | PAGE 30 | |
| MB03 | Modify 1.2V voltage | | PAGE 27 | |
| MB04 | Modify R533 to 0-04,C773 to .1uf | FOR VCORE POWER MODIFY | PAGE 26 | |
| MB05 | Modify C311,C312,C313 TO 10P | FOR QDA TEST | PAGE 14 | |
| MB06 | ADD MMB SMBUS FOR 3.3V | FOR MMB FUNTION | PAGE 22 | |
| MB07 | PM_THERMTRIP# HIGH VOLTAGE TO 1.05V(NET AUX_OFF TO +5VA_ON) | FOR AUX_OFF FUNTION | PAGE 5,25 | |
| MB08 | CPU Vcore C4 net cheage to PM_DPRSLPVR | FOR A PHASE C4 OPEN SYSTEM WILL HAND UP | PAGE 5,26 | |
| MB09 | ADD 2.2UF FOR PMEM TEST | FOR QE TEST | PAGE 12 | |
| MB10 | FOR PCIE CUT OFF POWER 3.3VS/V AND 1.5V | CUT OFF PCIE POWER TO WLAN ADD BATTEY LIFE | PAGE 21 | |
| MB11 | FOR SETTING 5V AND 1.8V VOLTAGE | CHANGE 5V AND 1.8V VOLTAGE TO ADD BATTEY LIFE | PAGE 25 | |
| MB12 | C653 0.1UF CHANGE TO 1000P | FOR R427,R430 TO BURN | PAGE 28 | |
| MC01 | Del C578,C615,C89,C90 | For M1 request | PAGE 25,27,7 | |
| MC02 | MODIFY 3G CON FOOTPRINT | For M1 request | PAGE 22 | |
| MC03 | FOR USB EYE FAIL ADD CAP | For DQA bug | PAGE 22 | |
| MC04 | SAFETY FUNTION,DEL JP2,PF1,ADD JP16 | For SAFETY | PAGE 23,28 | |
| MC05 | FOR AUX_OFF FUNTION R40 TO 1M | FOR POWER ON EC WILL GET TURN ON THE AUX_OFF | PAGE 5 | |
| MC06 | ADD C860,C863(4.7U) C861,C862(2.2U) | For DQA bug(CRT JITTER) | PAGE 10 | |
| MC07 | MODIFY THE Q71 NET ERROR | Schematic ERROR | PAGE 14 | |
| | | | | |

| Symbol | Modify Item (Component count less than 10% with U50) | | Page |
|---|---|---|---|
| MB | MB-D(DEL)<br>R42,R25,R31,R37 | MC-O(OP)<br>R35,R40,Q6,Q3,C7,C8 | PAGE 5 |
| | MB-D(DEL)<br>R117 | | PAGE 13 |
| | MB-D(DEL)<br>R168,R169 | | PAGE 16 |
| | MB-D(DEL)<br>R217,R221,R225,R227,R229,R230 | | PAGE 20 |
| | MB-D(DEL)<br>R518,R519 | | PAGE 21 |
| | MB-D(DEL)<br>B53 | | PAGE 23 |
| | MB-D(DEL)<br>R520,R558,R322 | | PAGE 24 |
| | MB-S(SHORT)<br>R352 | | PAGE 25 |
| | MB-S(SHORT)<br>R544~R548,R551,R552 | | PAGE 26 |
| | MB-D(DEL)<br>R403,R404,R413,R414,R422 | | PAGE 27 |
| | MB-D(DEL)<br>R484,R490,R493 | MB-S(SHORT)<br>R497,R498 | PAGE 30 |

ELITEGROUP COMPUTER SYSTEMS

Title: I4xSIx

Size: Custom | Document Number: I4xSIx RB to RC Ver. History | Rev: 01

Date: Thursday, February 19, 2009 | Sheet 33 of 34

| Symbol | Modify Item | Page | Note |
|---|---|---|---|
| EMI-A | 1.CLK_GEN:NB_REF_CLK0,SB_REF_CLK1,SB_PCI_CLK0, PART:C111,C112,C115(10P) 2.DDR BUFFER CAP: C841~C848@10P-25-04N | PAGE 7 | |
| | ADD C736~C739,C791~C792,C740~C743(10P) FOR I/O | PAGE 22 | |
| | 1.ADD R343(1OHM),C551(470P) FOR 5V 2.ADD R354(1OHM),C571(470P) | PAGE 25 | |
| | ADD R423(2.2OHM),C645(2200P) FOR CHG | PAGE 28 | |
| EMI-B | FOR VCORE POWER ADD CAP:C29,C41,C59,C60,C61,C68(150P) CAP:C47,C48,C49,C50,C51,C52,C53,C54(1000P) | PAGE 5 | |
| | 1.CLK_GEN:CPU_CLK_BLCK,CPU_CLK_BLCK#,NB_H_CLK,NB_H_CLK#,CLK_EC_LPC(10P) 2.R69:CHANGE BEAD 1005KF-600T03 | PAGE 7 | |
| | FOR 1.8VS POWER ADD CAP:C221,C222(150P) CAP:C228,C238(1000P) | PAGE 12 | |
| | USB PORT ADD L4(CK-ATCM2012-900T) | PAGE 21 | |
| | 1.ADD CAP:C523(150P) FOR DCIN 2.+1.8V TO +1.8VS:C800(0.1U) 3.+1.8VS TO GND:C854,C855(0.1U)<br>4.+3.3V TO +5V:C812(0.1U) 5.+3.3V TO +1.8V:C823(0.1U) | PAGE 23 | |
| | B79,B83(0OHM) | PAGE 31 | |
| EMI-C | 1.+3.3V TO +5V:C815(0.1U) 2.+3.3V TO +1.8V:C818(@0.1U) 3.+3.3V TO +1.8V:C823(@0.1U) | PAGE 23 | |

ELITEGROUP COMPUTER SYSTEMS

Title: I4xSIx

Size: Custom | Document Number: I4xSIx | EMI History Ver. A,B,C,01 | Rev: 01

Date: Thursday, February 19, 2009 | Sheet 34 of 34