



MS-7295 Ver:0C

CPU:

AMD 940 Athlon 64/Athlon 64 FX

System Chipset:

NVIDIA C51PV / C51PVG

NVIDIA MCP 51

On Board Chipset:

LPC Super I/O -- Winbond 83627EHF

LAN Vitesse VSC8601

HD Codec --ALC883

BIOS --LPC FLASH ROM 4M

Main Memory:

DDR * 4 (Max 4GB)

Expansion Slots:

PCI-E X 16 *1

PCI-E X 4 *1

PCI 2.3 Slot * 2

PWM:

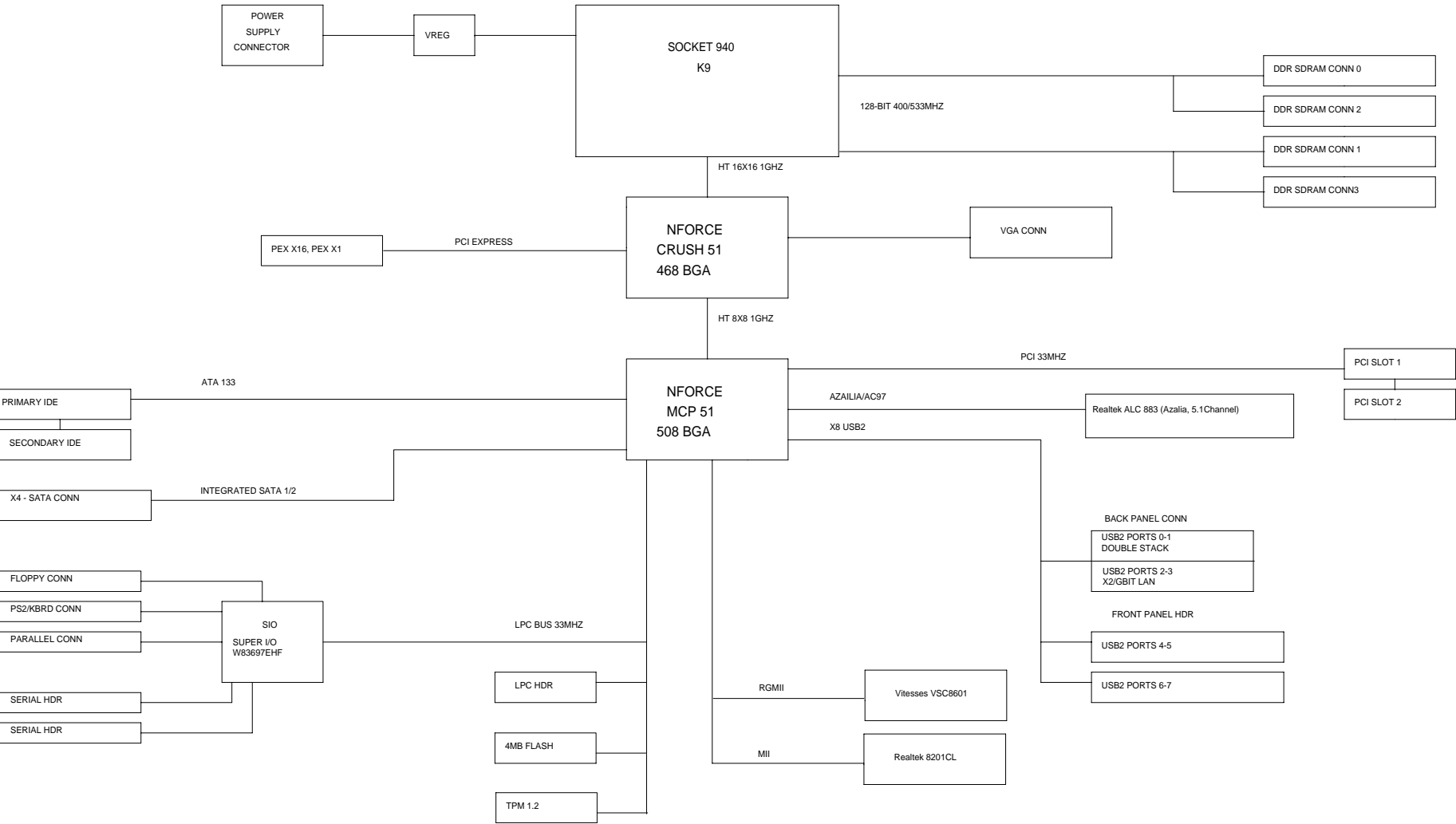
Controller--Intersil ISL6566CR 3 Phase

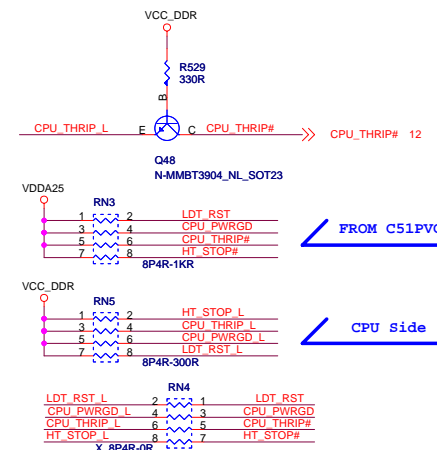
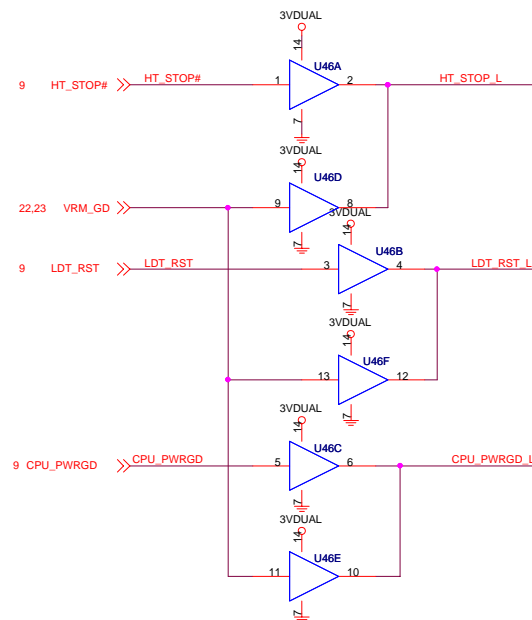
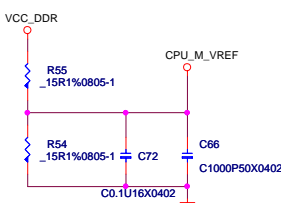
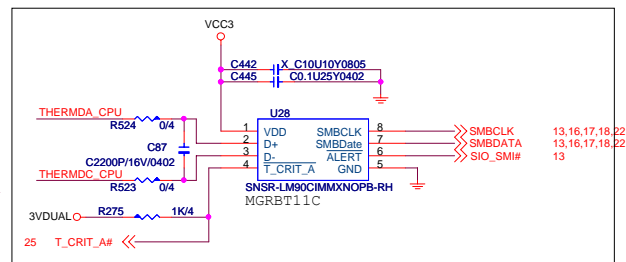
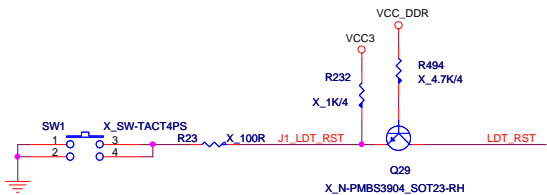
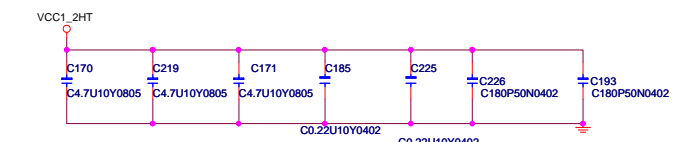
| Title | Page |
|------------------------------------|-------|
| Cover Sheet | 1 |
| Block Diagram | 2 |
| AMD M2 940 | 3,4,5 |
| System Memory | 6,7 |
| DDR Terminations | 8 |
| C51PVG | 9-11 |
| MCP51 | 12-15 |
| PCI Slot 1,2 | 16 |
| PCI-Express X 16 , X4 Slot | 17 |
| SIO-Winbond83627EHF / BIOS | 18 |
| LAN - Vitesse VSC8601 | 19 |
| Azalia CODEC ALC883 & Interanl SPK | 20 |
| USB connectors | 21 |
| MS-6 ACPI Controller & MS-6+ | 22 |
| PWM - ISL6566CRZ | 23 |
| IDE &FDD & FAN | 24 |
| ATX Connector / Front Panel | 25 |
| VGA Connector | 26 |
| DVI CONNECTOR | 27 |
| COM PORTS & TPM1.2 | 28 |
| 10/100 LAN RTL8201BL | 29 |
| MANUAL PARTS | 30 |
| History | 31-32 |
| GPIO SPEC | 33 |
| POWER OK MAP | 34 |
| POWER MAP | 35 |

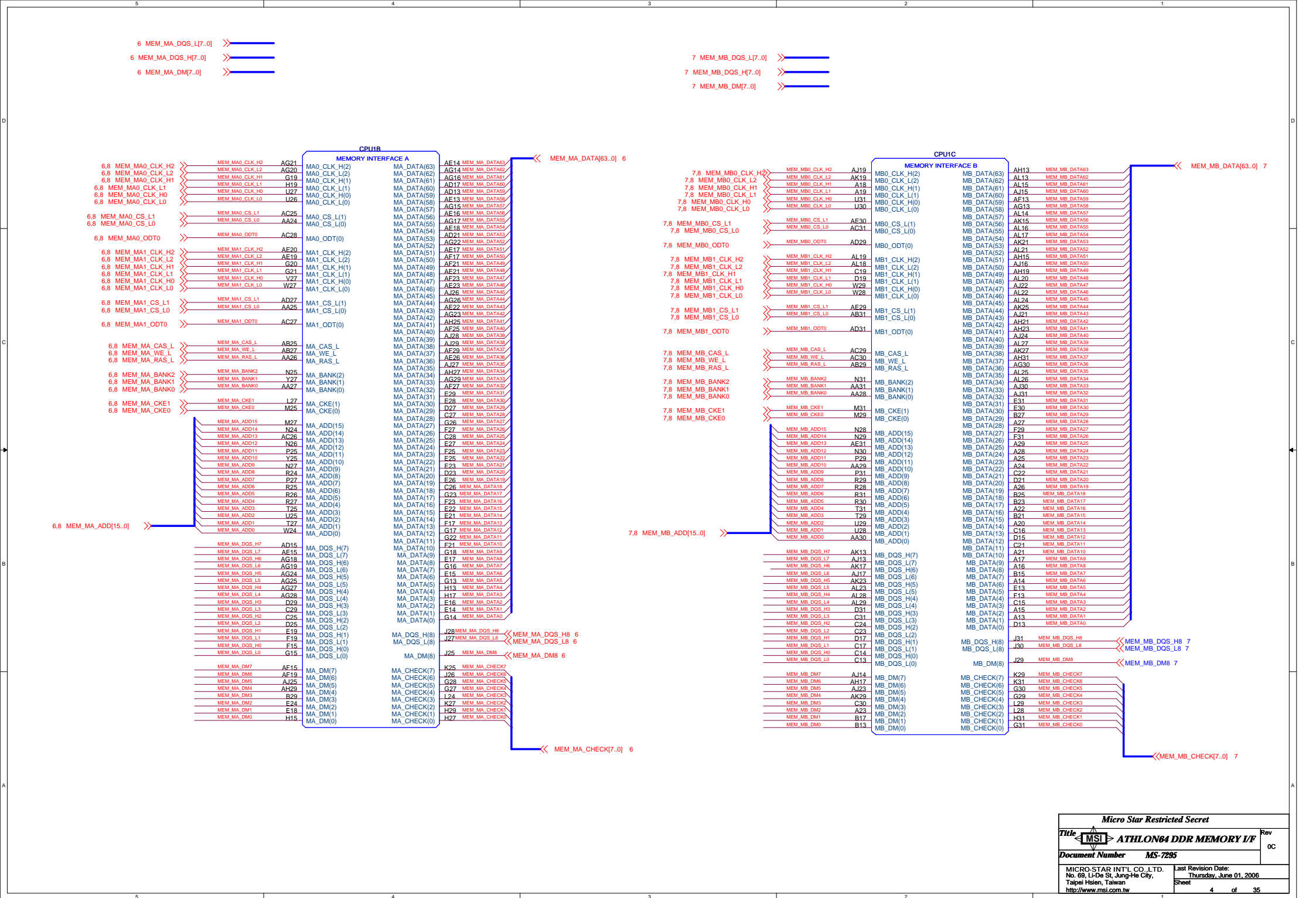
NECCI BOGOTA

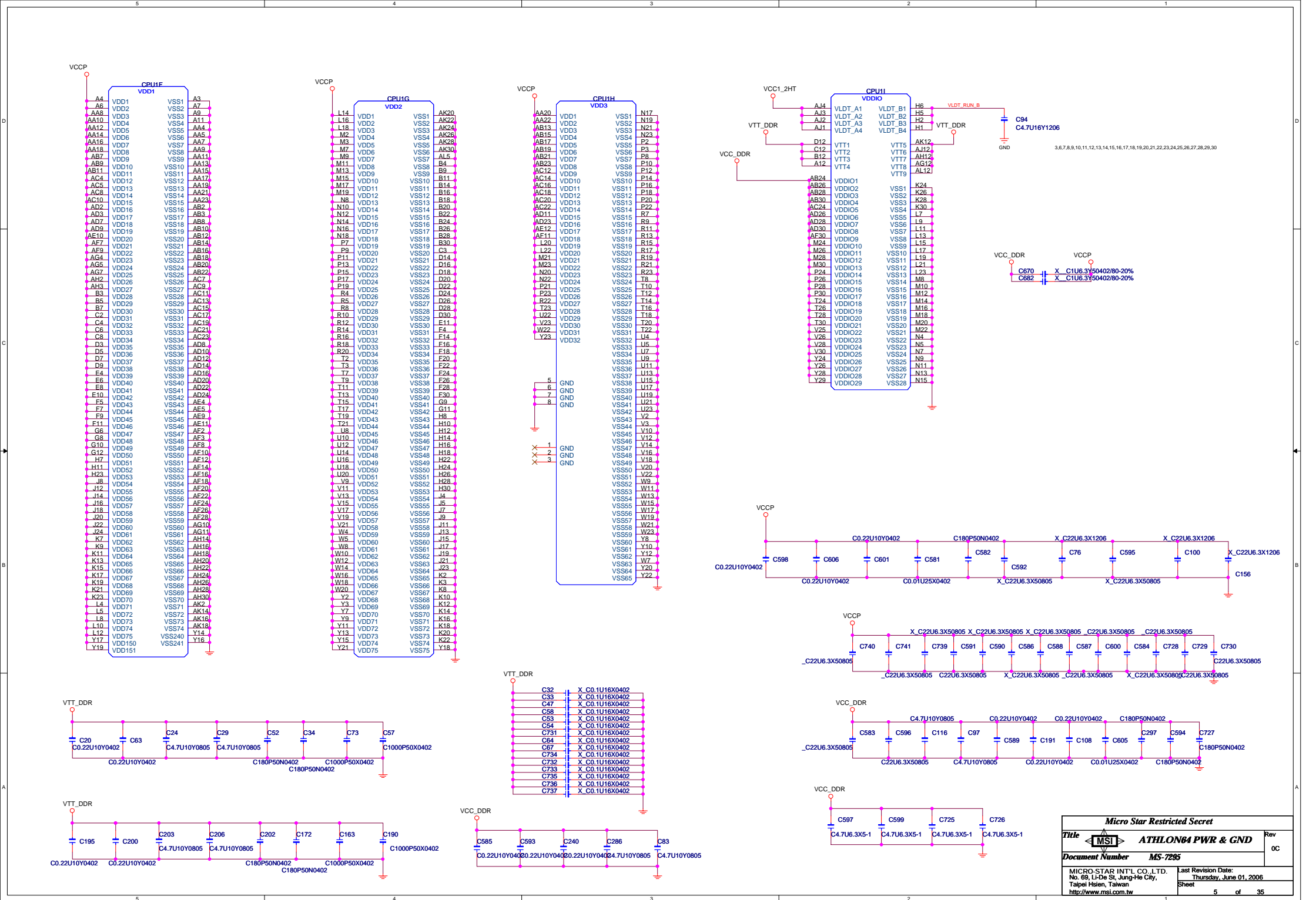
| Micro Star Restricted Secret | | |
|--|-------------|--|
| Title | Cover Sheet | Rev 0C |
| Document Number | MS-7295 | |
| MICRO-STAR INT'L CO., LTD. No. 69, Li-De St., Jung-Hsi City, Taipei Hsien, Taiwan http://www.msi.com.tw | | Last Revision Date: Wednesday, May 17, 2006 Sheet 1 of 35 |

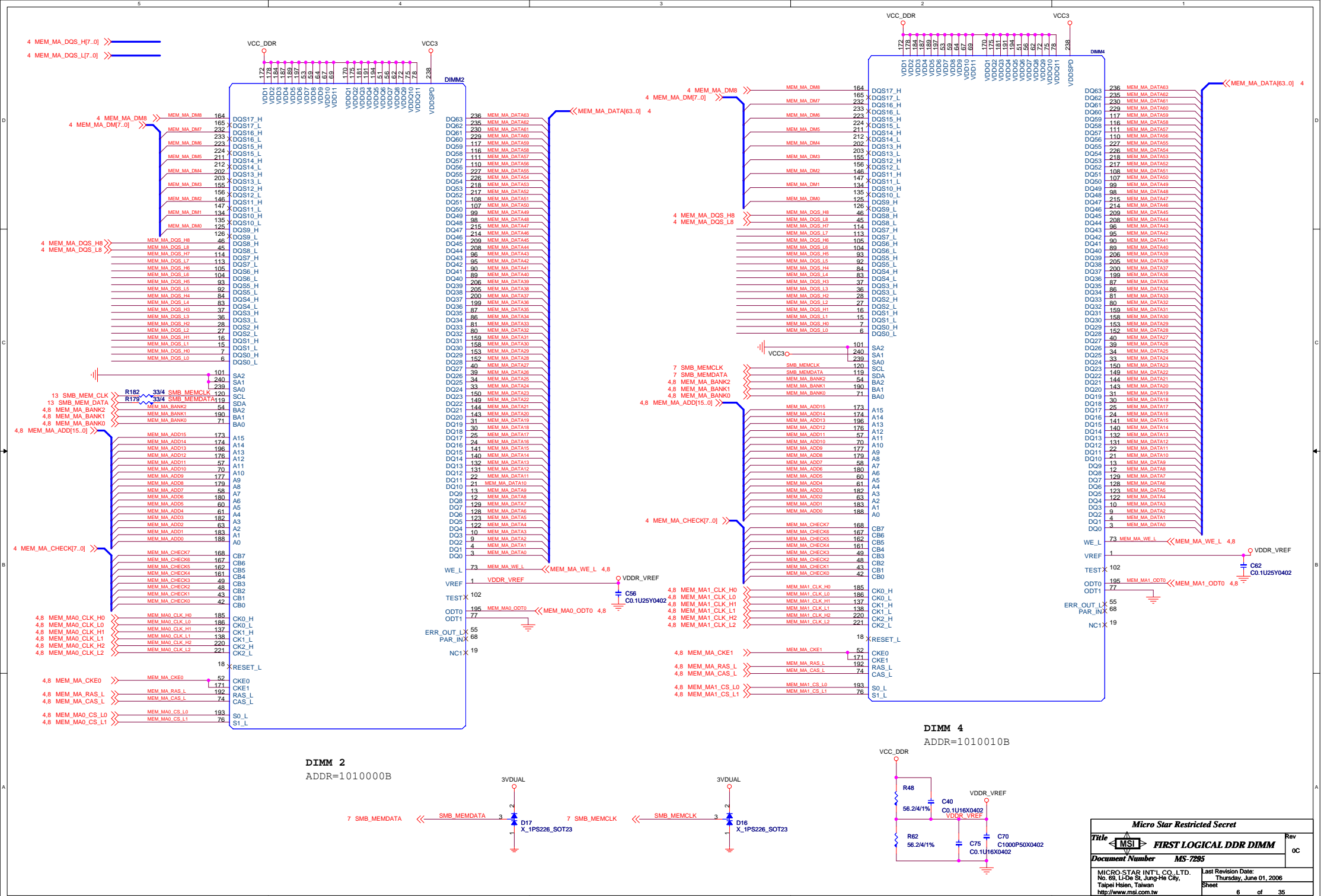
BLOCK DIAGRAM

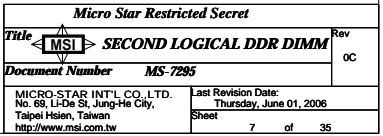


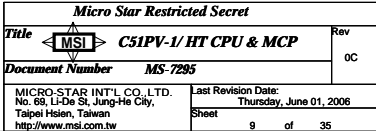


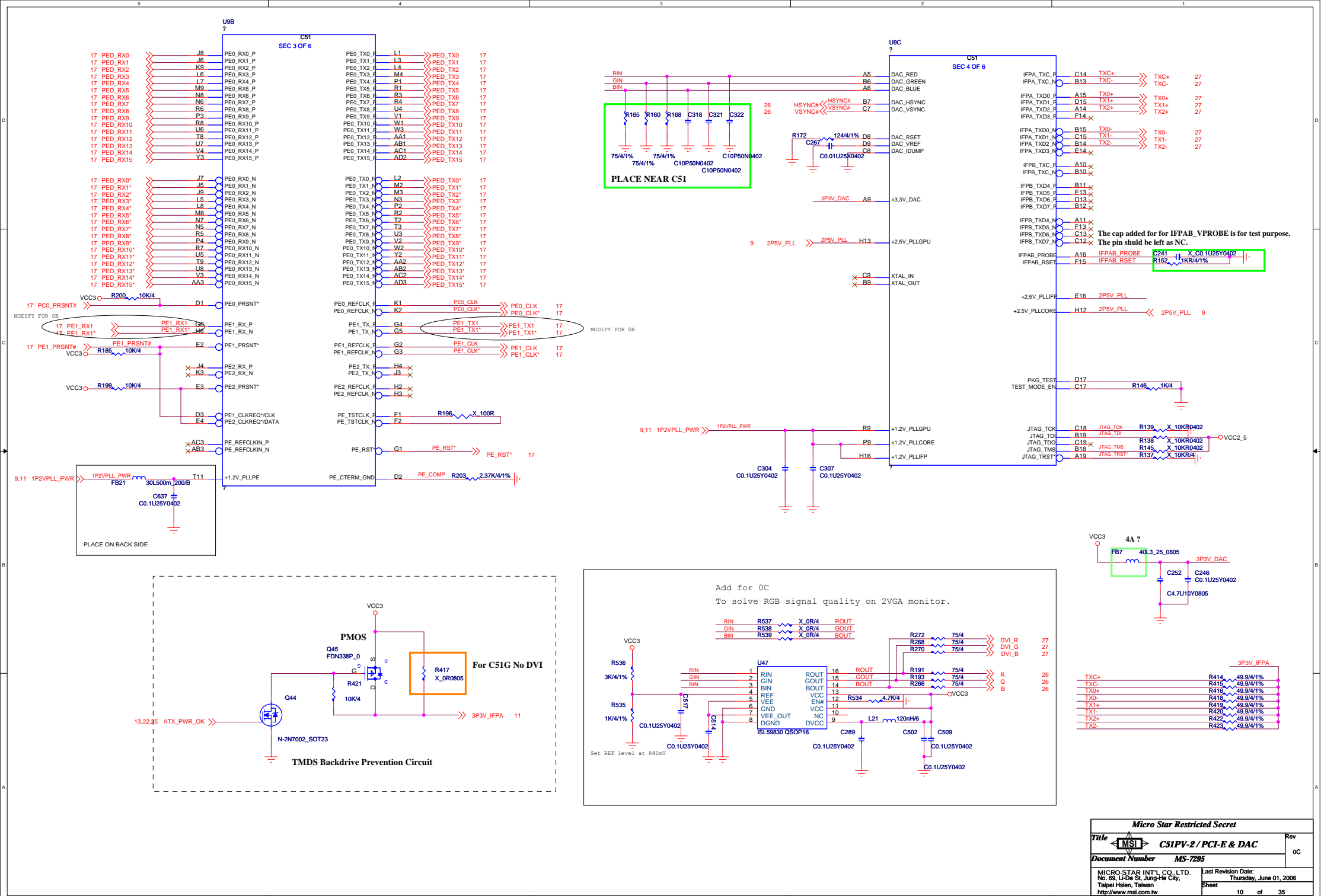


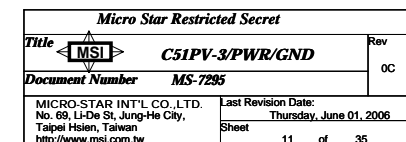
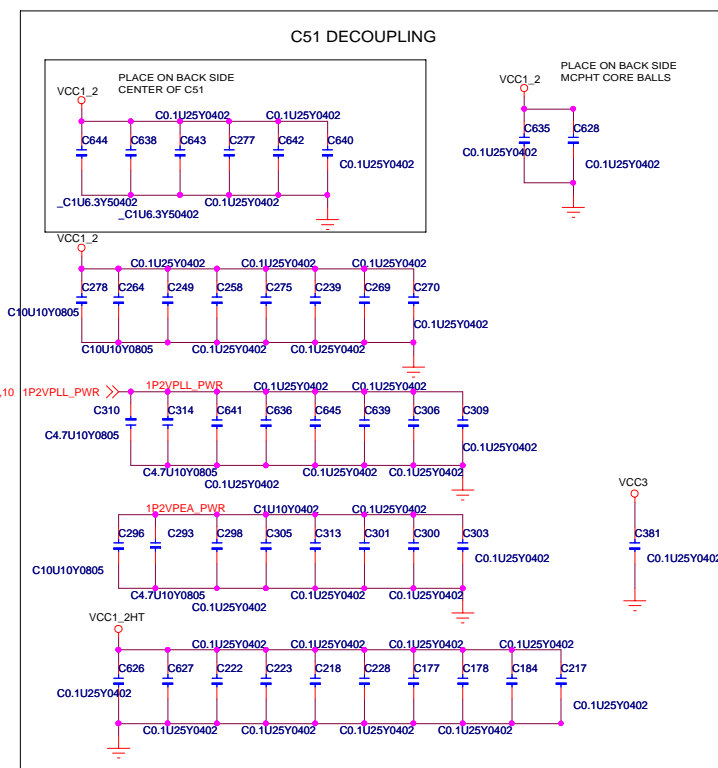


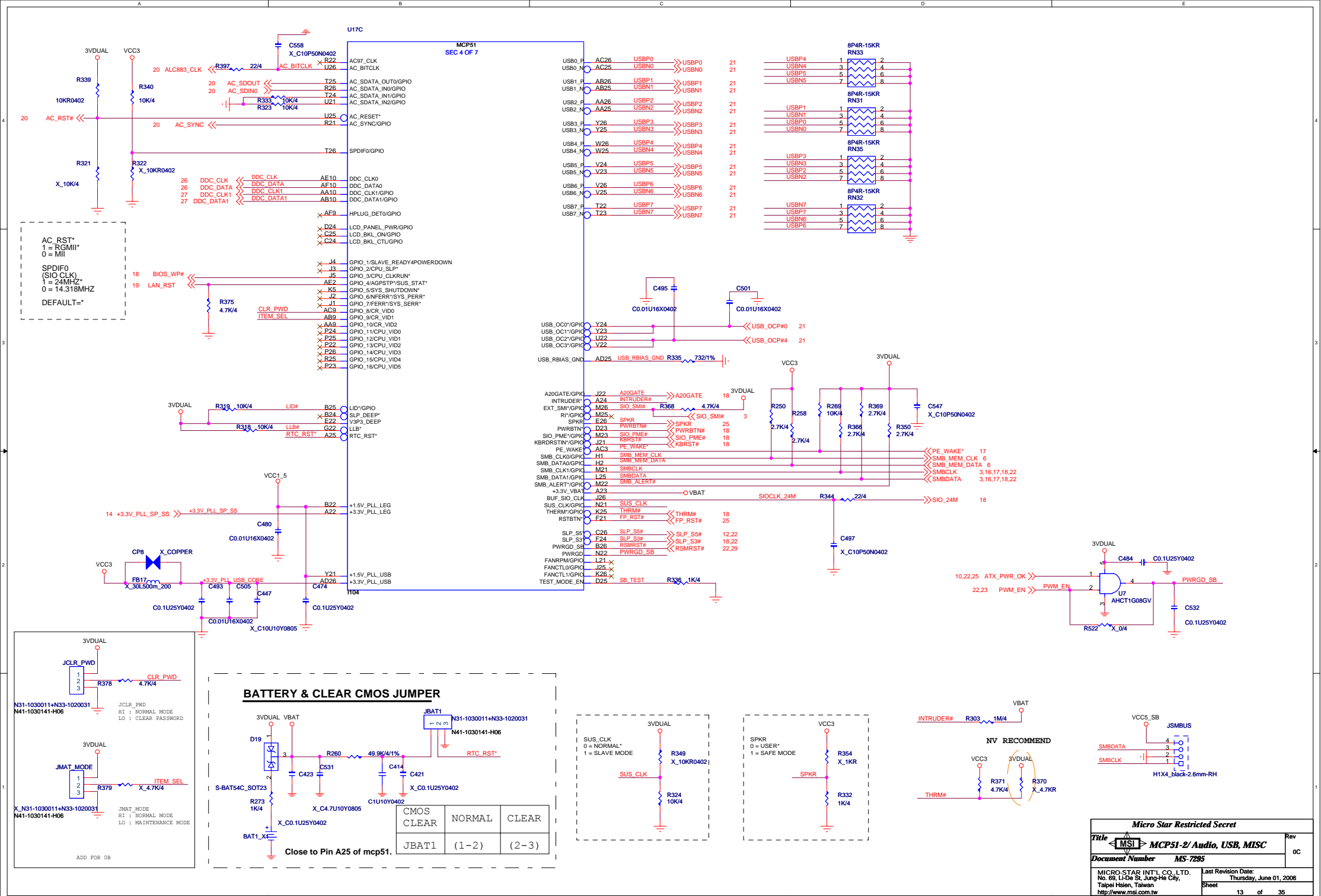


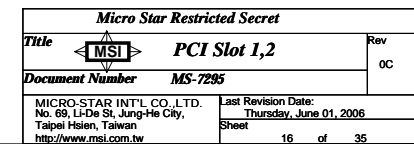
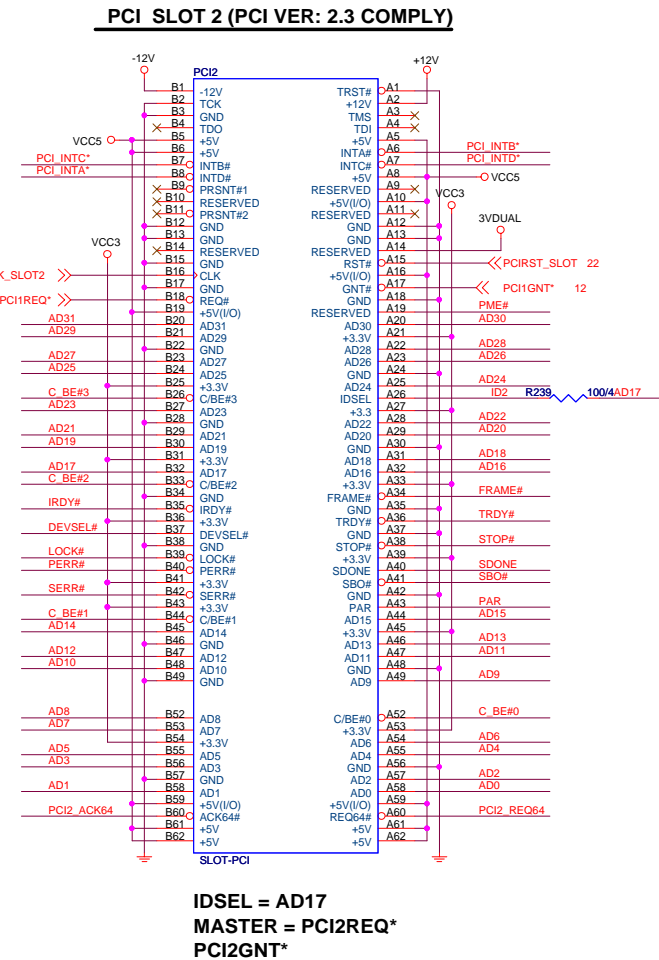




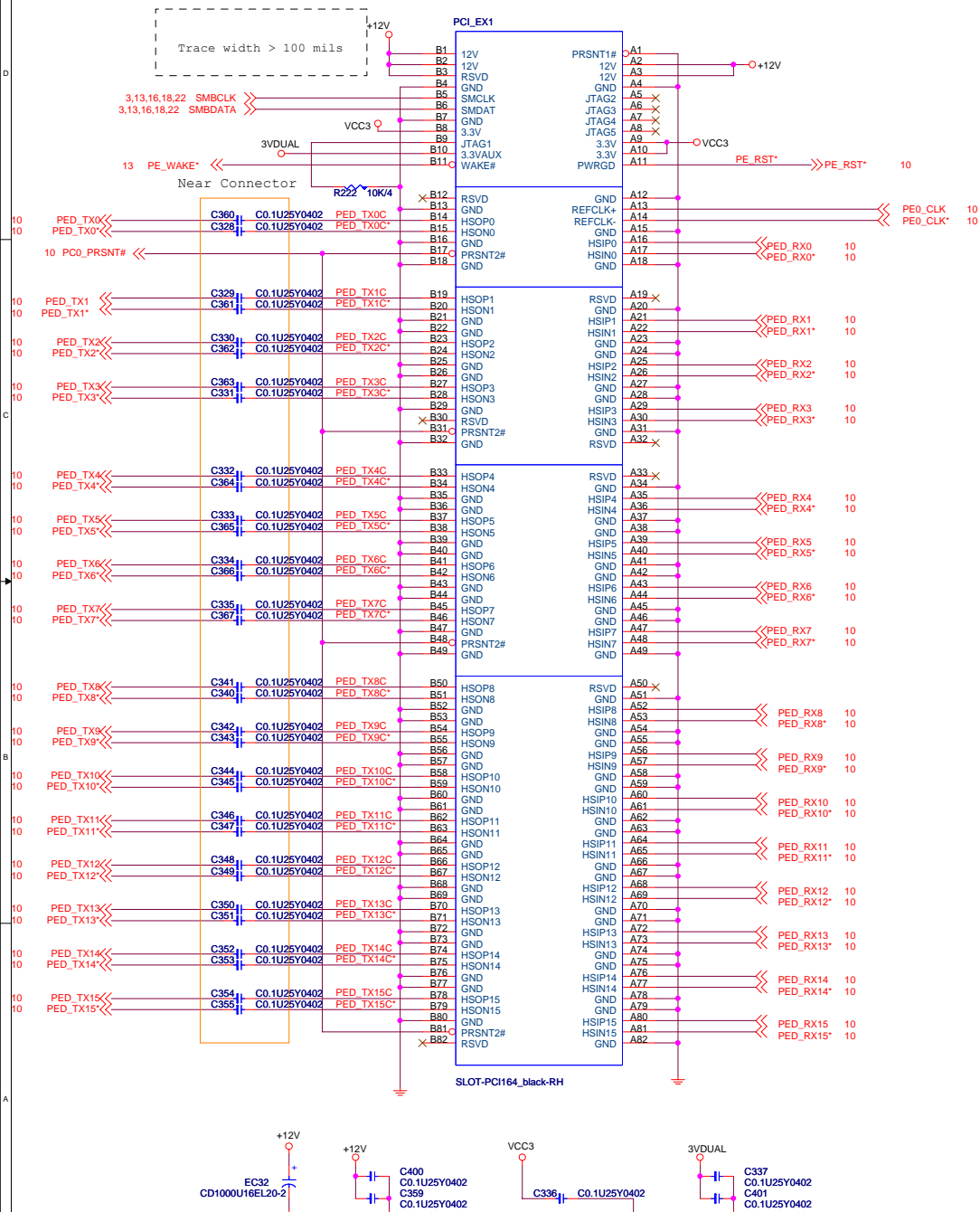




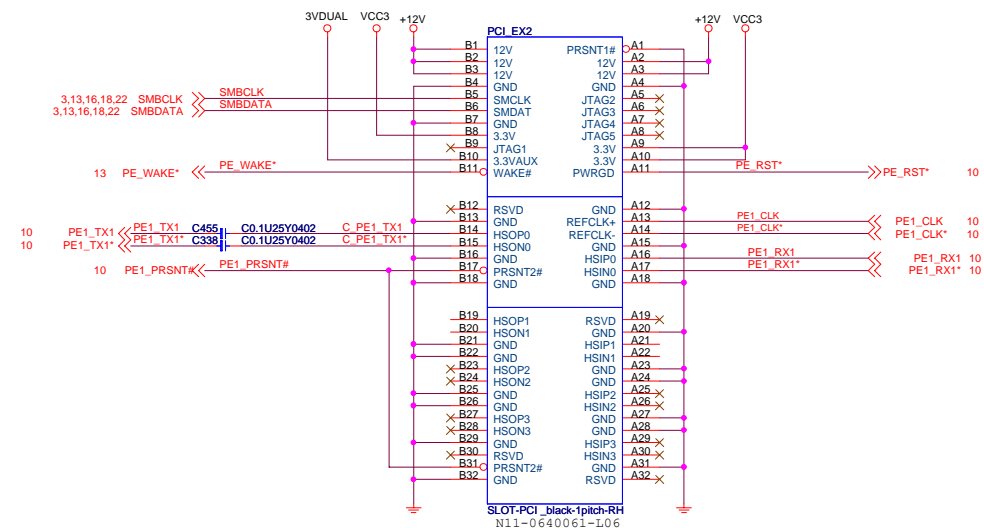


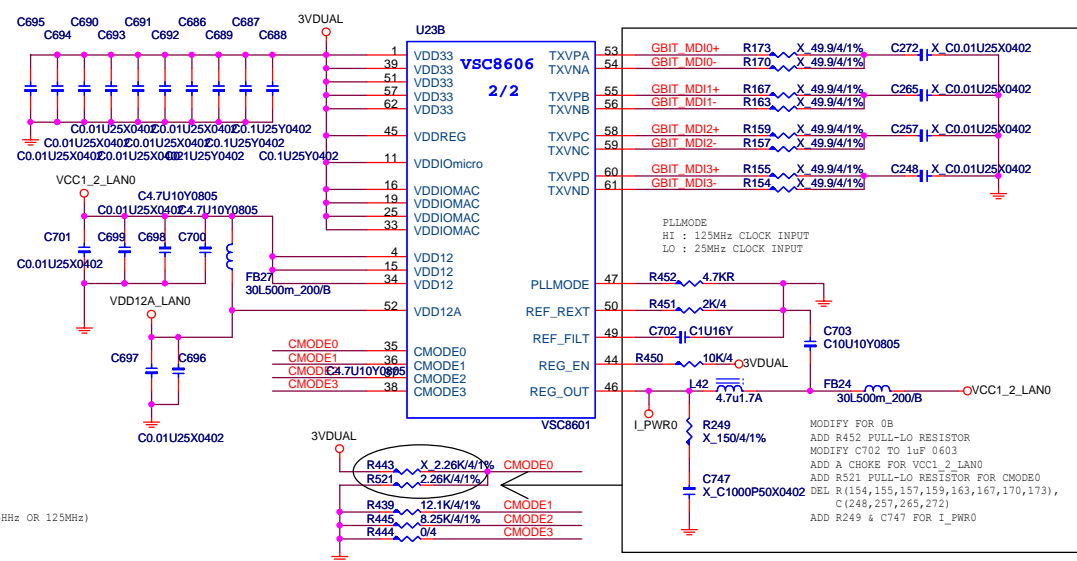
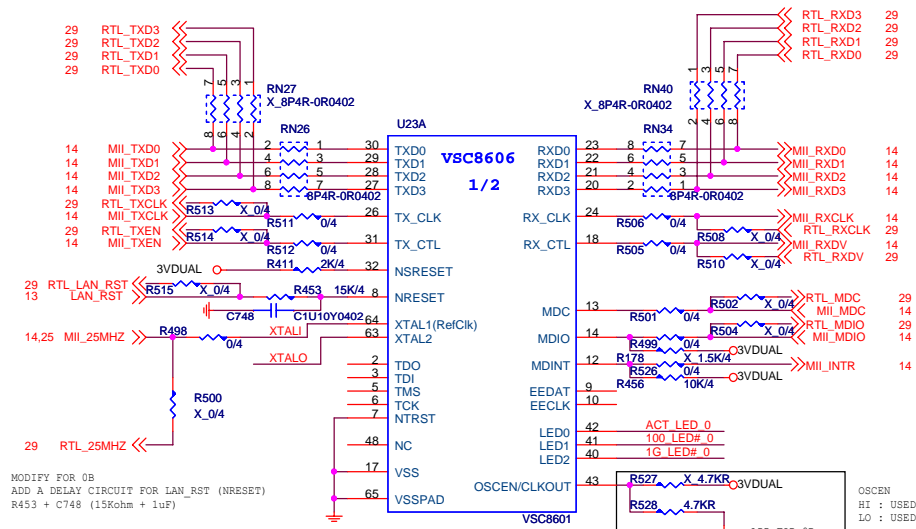


PCI EXPRESS_16



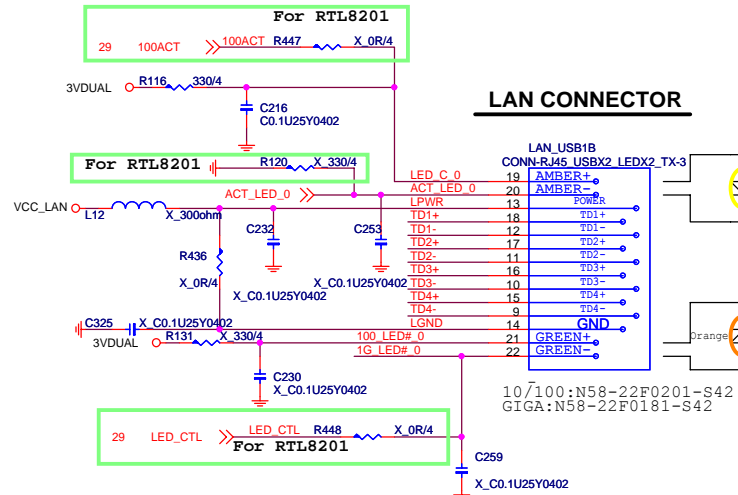
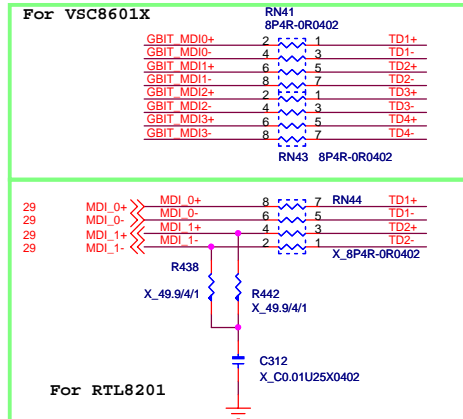
PCI EXPRESS x4-PORT





CMODE configuration setting reference datasheet

bit3 0000 --> 0 ohm to VSS
bit2 0100 --> 8.25k ohm to VSS
bit1 0101 --> 12.1k ohm to VSS
bit0 1001 --> 2.26k ohm to 3.3V



For 10/100 Lan
SPEED/LINK
LINK
10 MBPS
100 MBPS
1000 MBPS

LEFT
YELLOW
YELLOW
YELLOW
YELLOW

RIGHT
OFF
OFF
OFF
GREEN
ORANGE

For Giga-bit Lan
SPEED/LINK
LINK
10 MBPS
100 MBPS
1000 MBPS

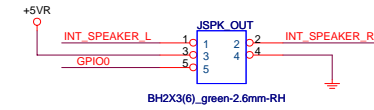
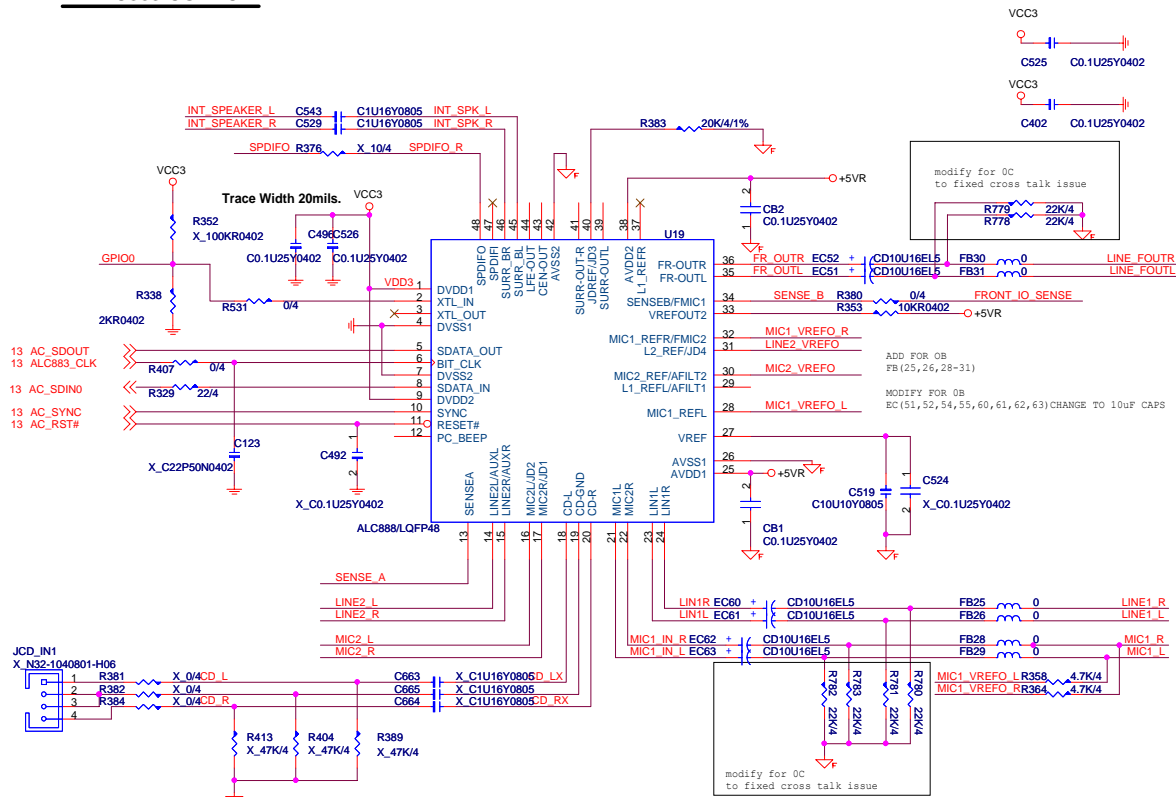
LEFT
YELLOW
YELLOW
YELLOW
YELLOW

RIGHT
OFF
OFF
GREEN
ORANGE

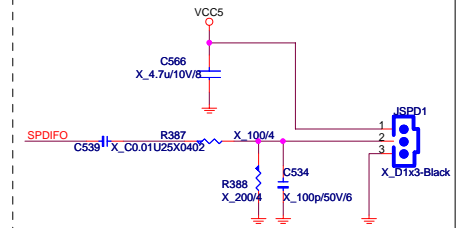


| | | | |
|----------------------------|-------------------------|---------|----------|
| MICRO-STAR INT'L CO., LTD. | | | |
| Title | | | |
| LAN Vitesse VC8601 | | | |
| Size | Document Number | MS-7295 | Rev OC |
| Date: | Thursday, June 01, 2006 | Sheet | 19 of 35 |

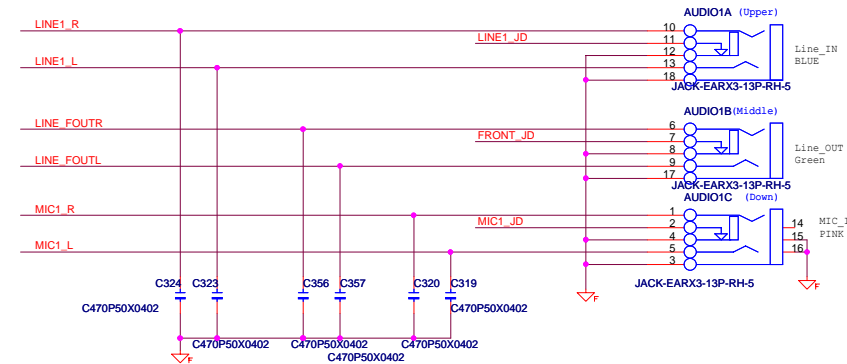
ALC883 CODEC



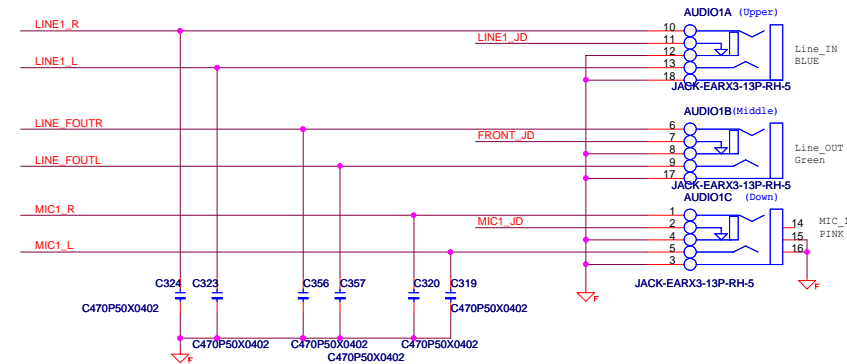
SPDIF OUT



Rear audio jack

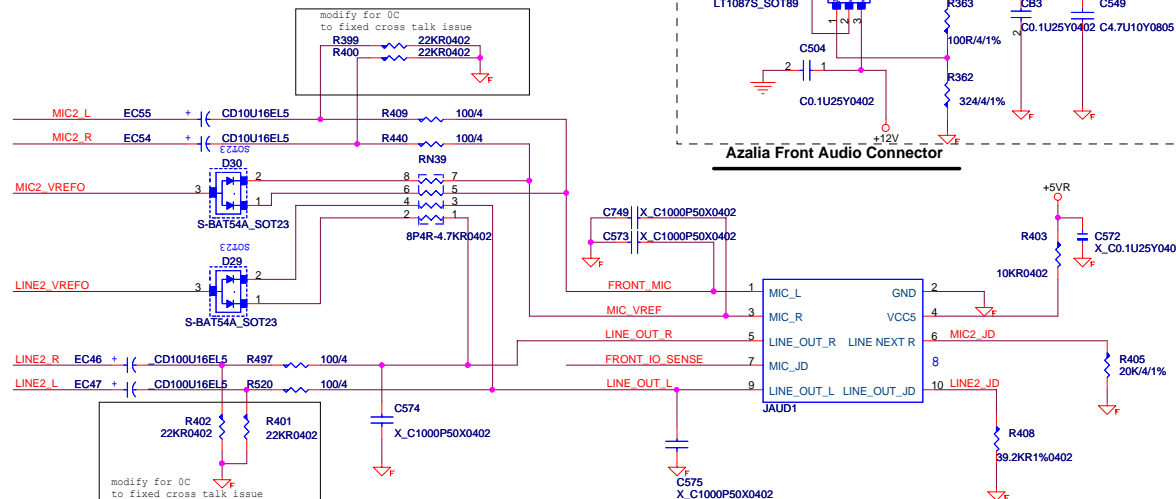


ALC883 JACK

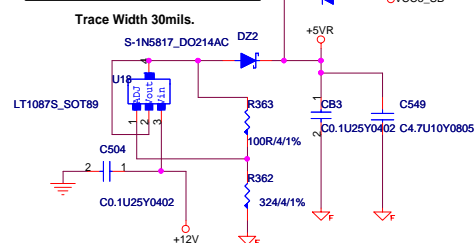


Speaker Out Decoupling

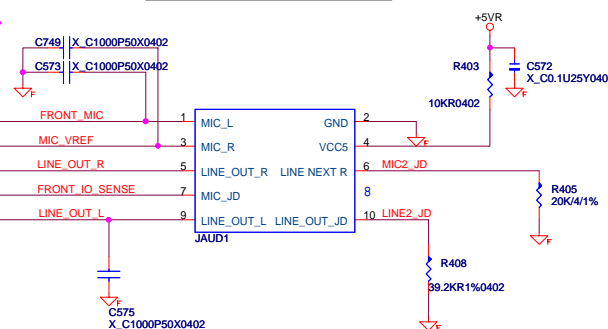
Place those component close to audio connector.



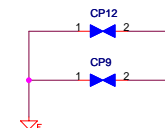
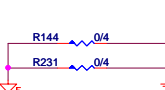
AUDIO CODE REGULATORS



Azalia Front Audio Connector



EMI Solution



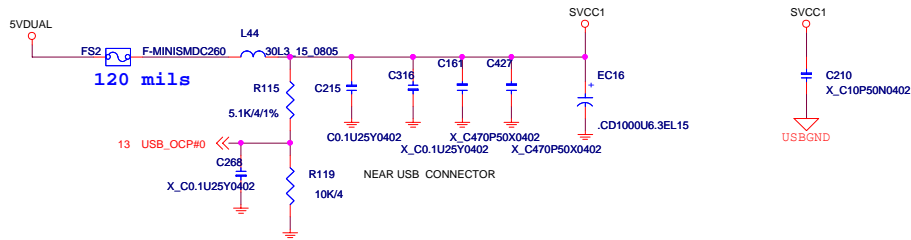
ALC883 JACK DETECT



Closer to Codec.

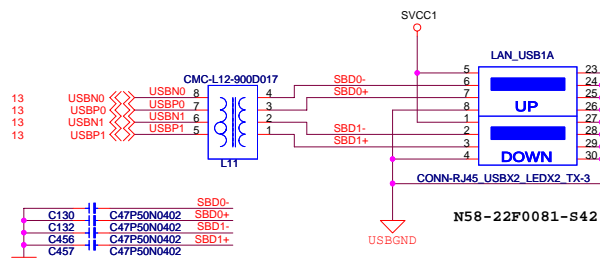
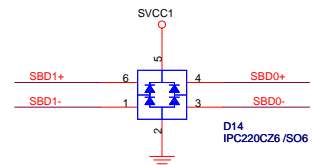
| MSI MICRO-STAR INT'L CO., LTD. | | | |
|--------------------------------|-------------------------|---------|----------|
| Title Azalia & Interanl SPK | | | |
| Size | Document Number | MS-7295 | |
| Date | Thursday, June 01, 2006 | Sheet | 20 of 35 |

POWER CIRCUIT FOR USB PORT 0,1,2,3



REAR PANEL USB CONNECTOR FOR USB PORT 0,1

ESD Protection

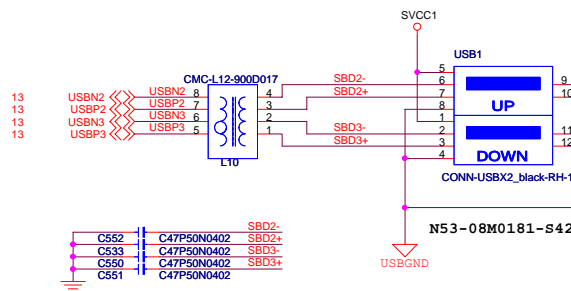
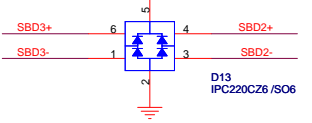


NEAR USB CONNECTOR

22 / 7.5 / 7.5 / 7.5 / 22 / 7.5 / 7.5 / 7.5 / 22

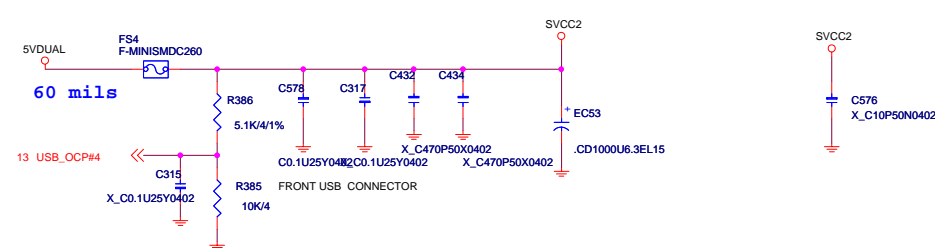
REAR PANEL USB CONNECTOR FOR USB PORT 2,3

ESD Protection



22 / 7.5 / 7.5 / 7.5 / 22 / 7.5 / 7.5 / 7.5 / 22

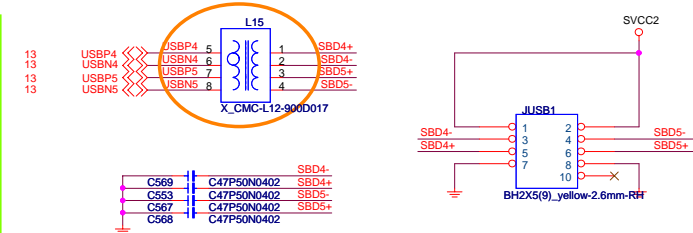
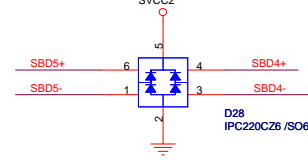
POWER CIRCUIT FOR USB PORT 4,5,6,7



FRONT PANEL USB CONNECTOR FOR USB PORT 4,5

Reserved, can be taken off riser card within bead

ESD Protection

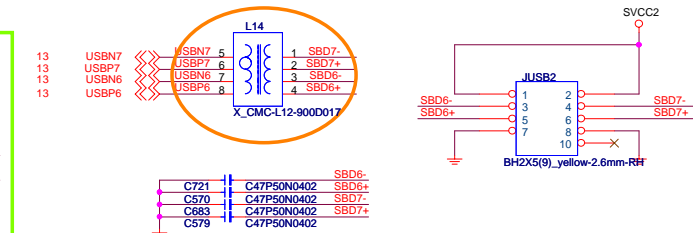
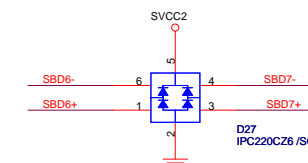


NEAR USB CONNECTOR

22 / 7.5 / 7.5 / 7.5 / 22 / 7.5 / 7.5 / 7.5 / 22

FRONT PANEL USB CONNECTOR FOR USB PORT 6,7

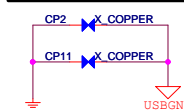
ESD Protection



NEAR USB CONNECTOR

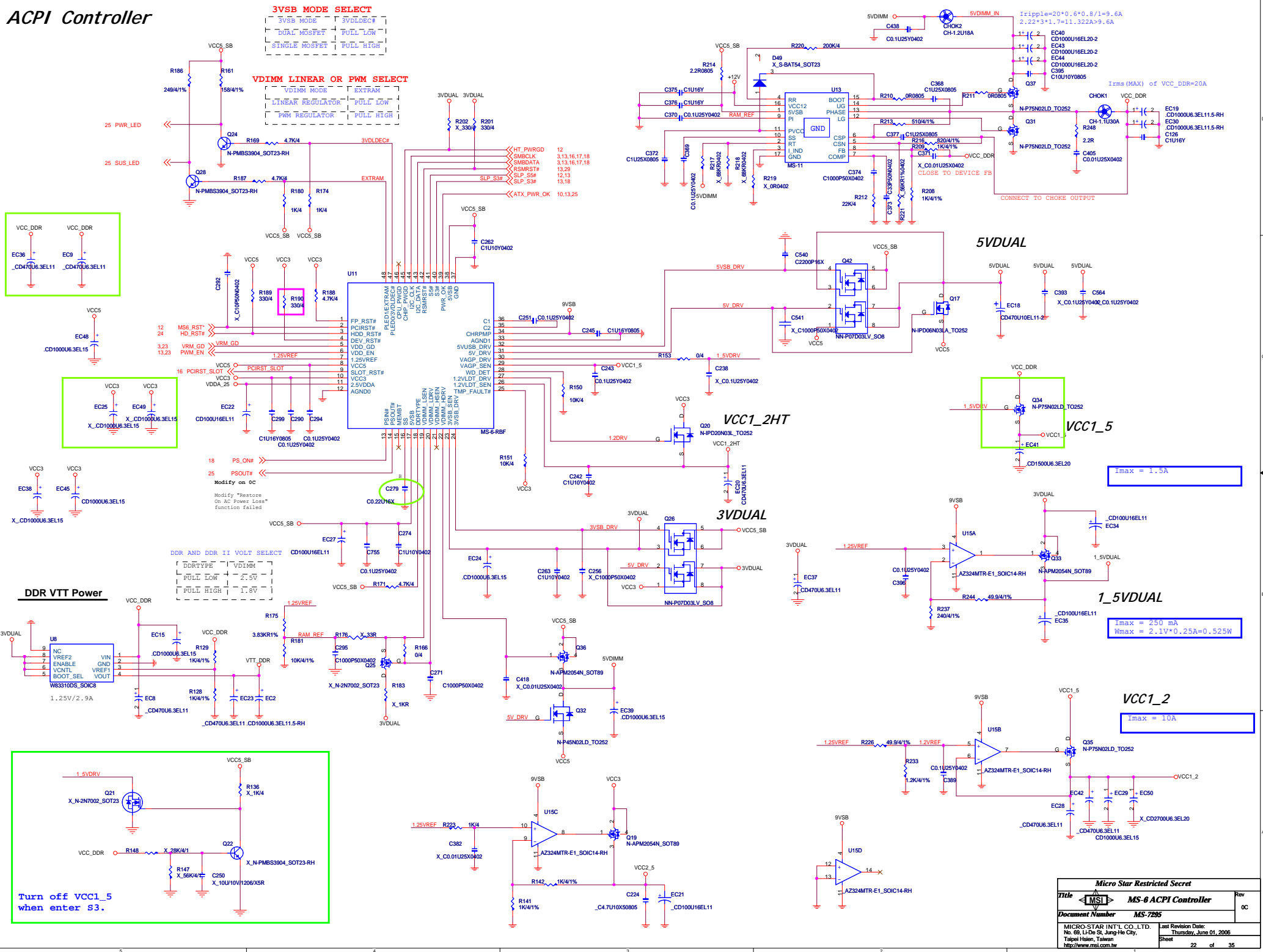
22 / 7.5 / 7.5 / 7.5 / 22 / 7.5 / 7.5 / 7.5 / 22

EMI TEST



| | | | | | |
|-----------|-------------------------|----------------|--|----------------------------|--|
| OrgAddr1> | | MSI | | MICRO-STAR INT'L CO., LTD. | |
| Title | | USB CONNECTORS | | Rev 0C | |
| Size | Document Number | MS-7295 | | Sheet 21 of 35 | |
| Date: | Thursday, June 01, 2006 | | | | |

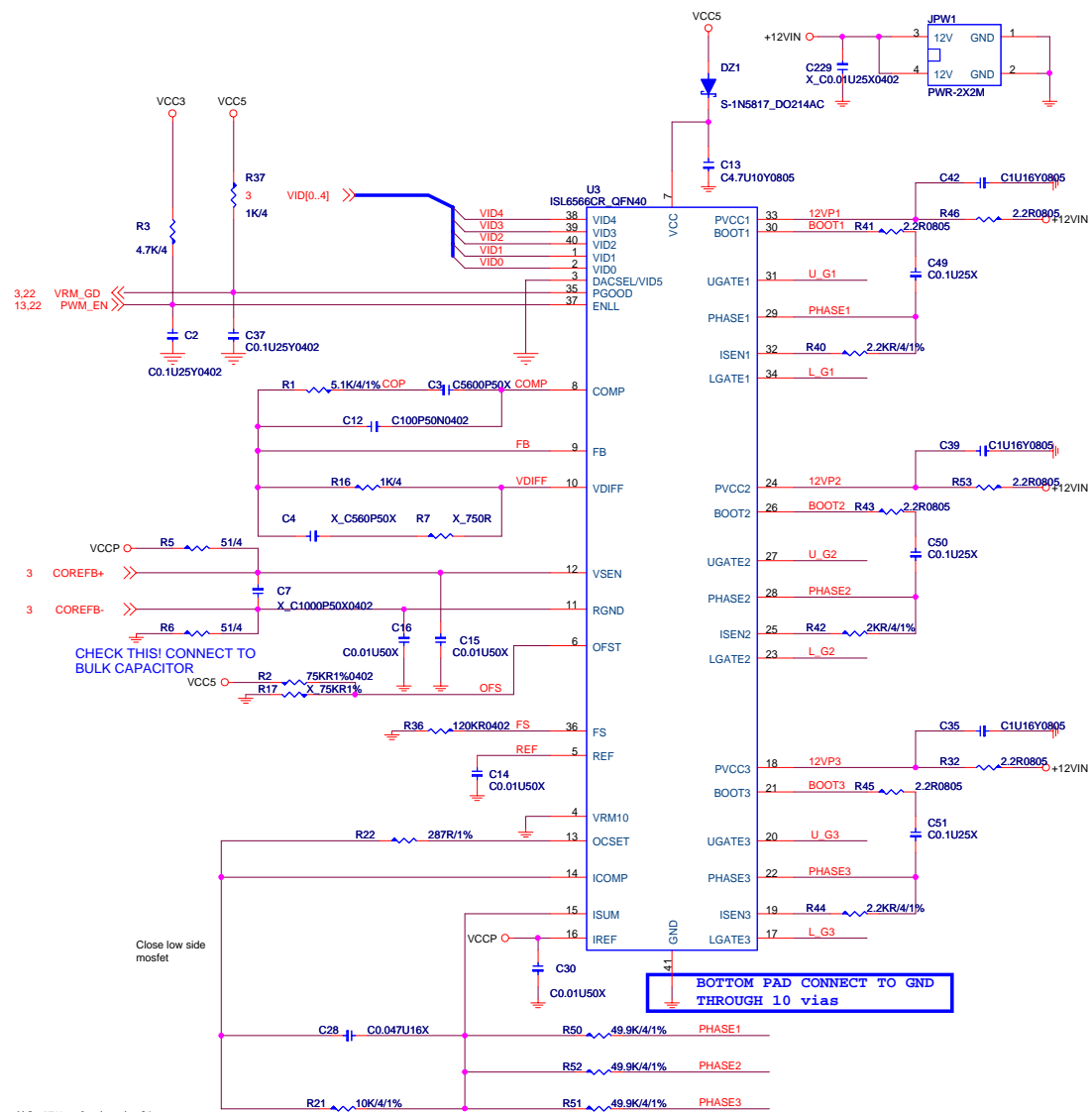
ACPI Controller



Voltage Regular Module

| | |
|-----------------|---|
| 1PF06N031A | Rds(on)=8.7mΩ(@4.5V,30A), Vgs(on)=1.2~2V, Id=50A, Ciss=3110pf, Qg=10nC, Vds=25V, Vgs=±20V |
| C100U2SP | ESR<13mΩ, Ripple cur.<2.7A, LC<12uA, 105C |
| .CD3300U6.3EL25 | ESR<12mΩ, Ripplecur.<2800mA, 105C, longlife3000hrs, KZGSeries |
| 560u_2.5V | ESR=6mΩ, Ripplecur=4400mA, Lc.<500uA, 105C/2000hrs |
| 1800UF/6.3V | ESR<12mΩ, Ripplecur<2350mA, 105C, longlife change from 2000hrs to 3000hrs ,KZJ series |
| 0.6uH/40A | 0.6u/20%, Isat=40A, Rdc=1.2m ohm, PEW wire |
| CH-1.2U18A | 1.2u/20%, Dip-2/vertical7.5mm, 1.2ψ/5.5turns, 18A |

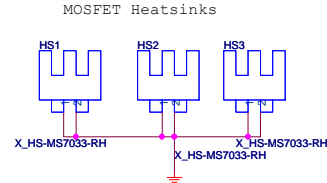
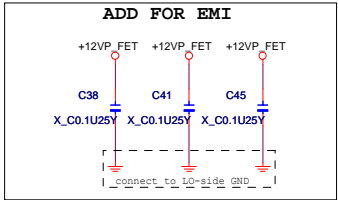
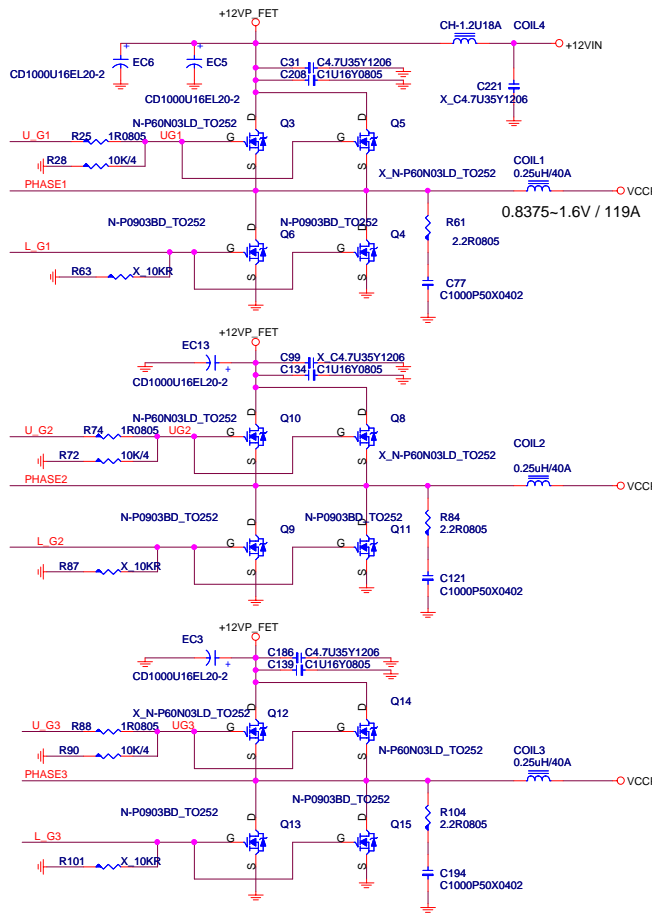
```
TDP = 115 W
VR_TDC = 101 A
Icc(max) = 119 A
Tejas Tcase = [P x 0.213] + 43.3
Prescott Tcase = [P x 0.25] +
43.3
```



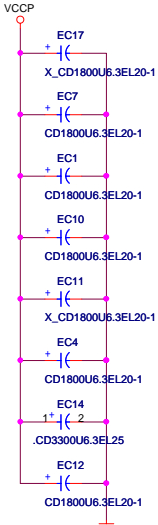
```

modify VRM solution in OC
R2 change to 75K ohm 1%
R36 change to 120K ohm
R42 change to 2K ohm
remove Q5,Q8,Q12 in bom
Q(4,6,9,11,13,15) change to NIKOS 0903BEG (D03-0903BDB-N03)

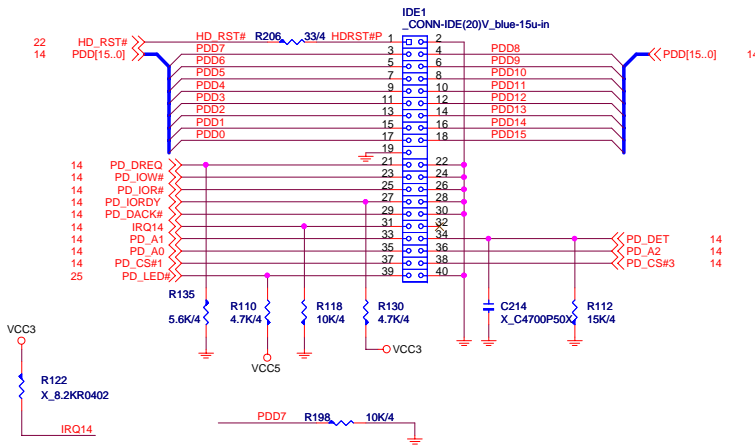
```



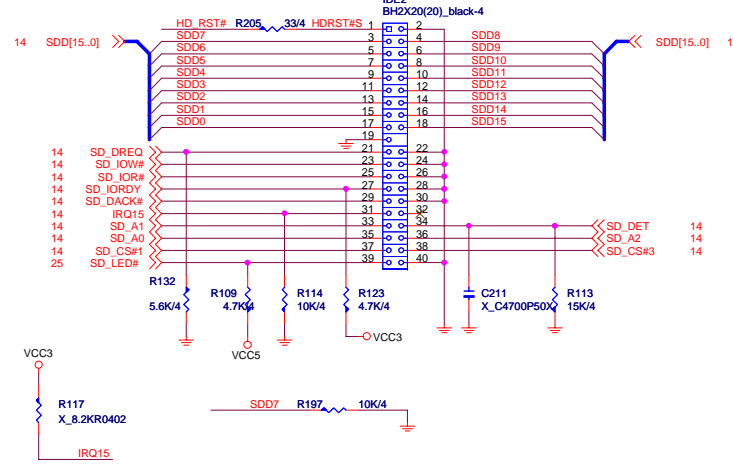
EL Capacitors



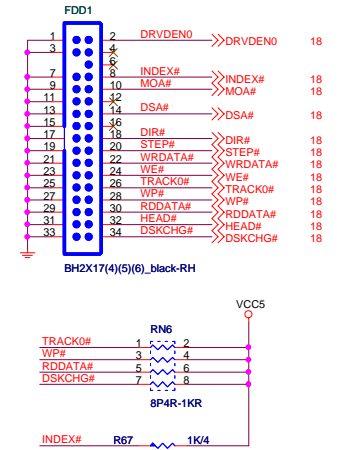
IDE 1



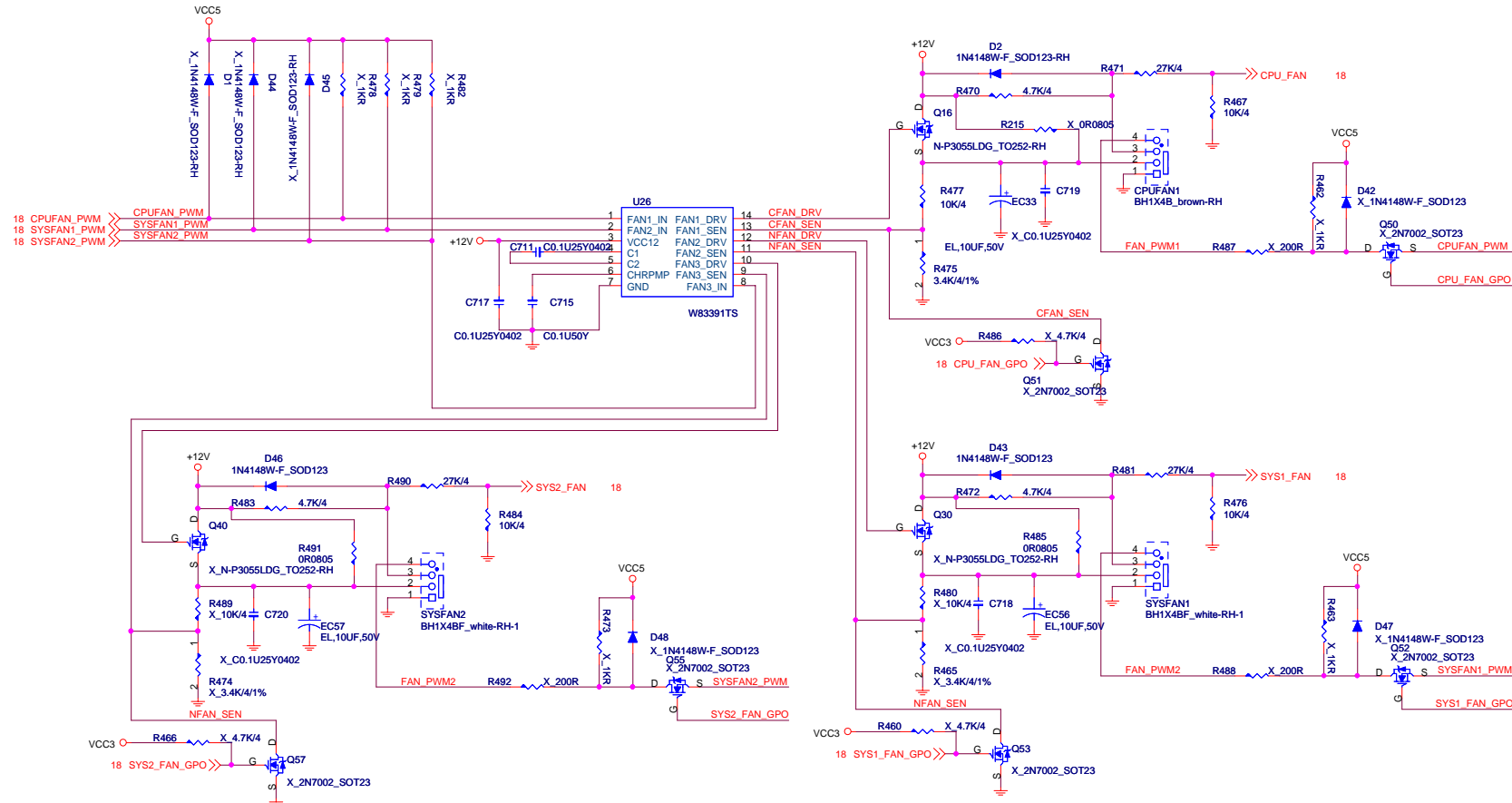
IDE 2



Floppy

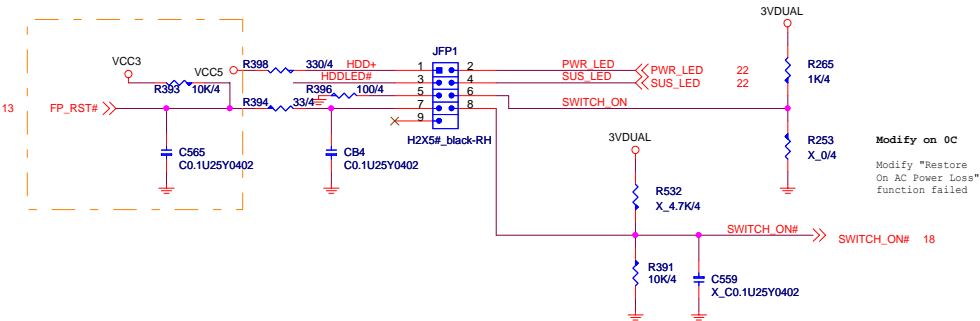


FAN CONNECTOR



ATX connector / Front Panel

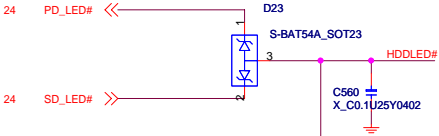
Intel Front Panel



DHG : Low active
R256->N/I
R391->N/I
R253->00HM
R532->4.7K

EHG : High active
R256->1K
R391->10K
R253->N/I
R532->N/I

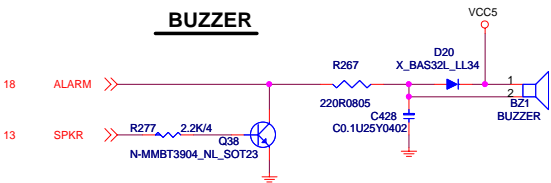
IDE LED



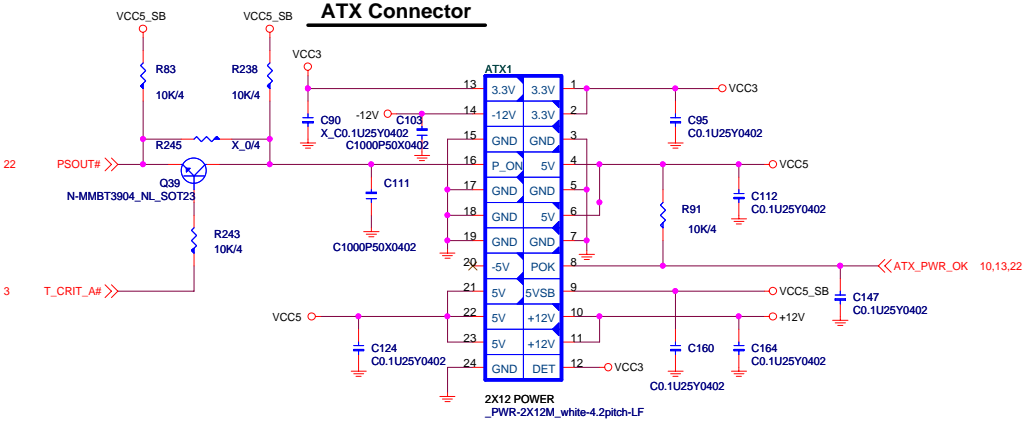
SERIAL ATA LED



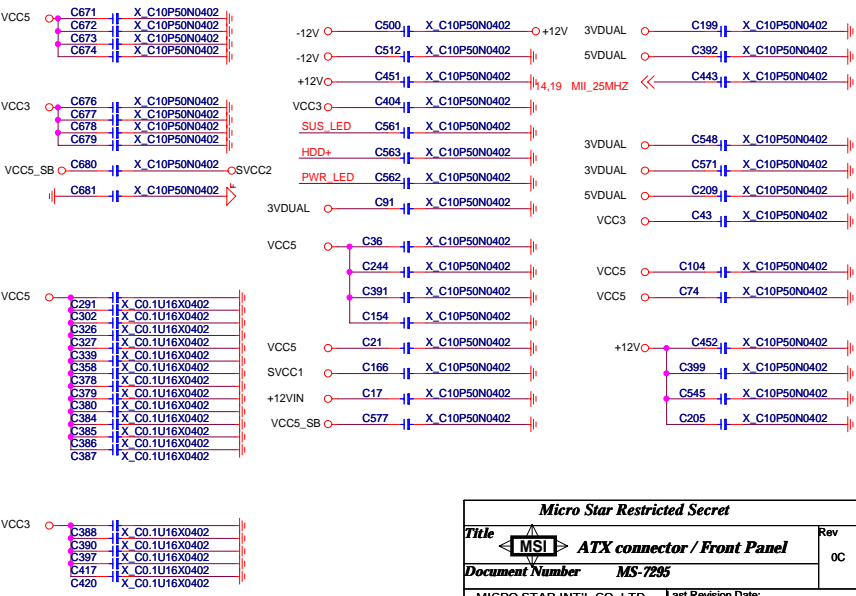
BUZZER



ATX Connector

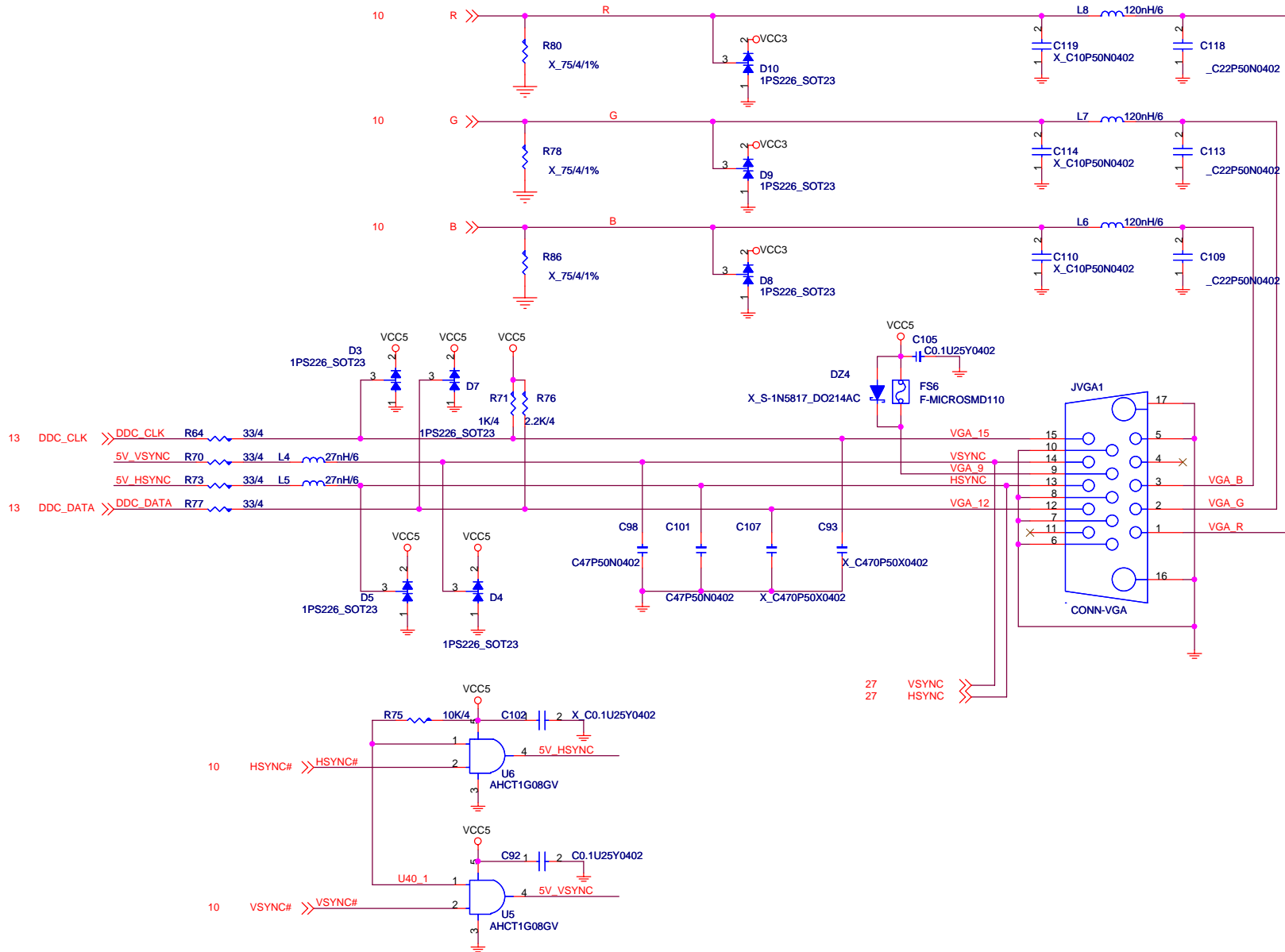


For EMI

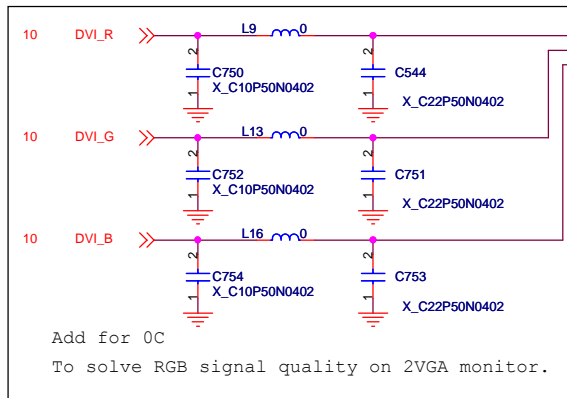
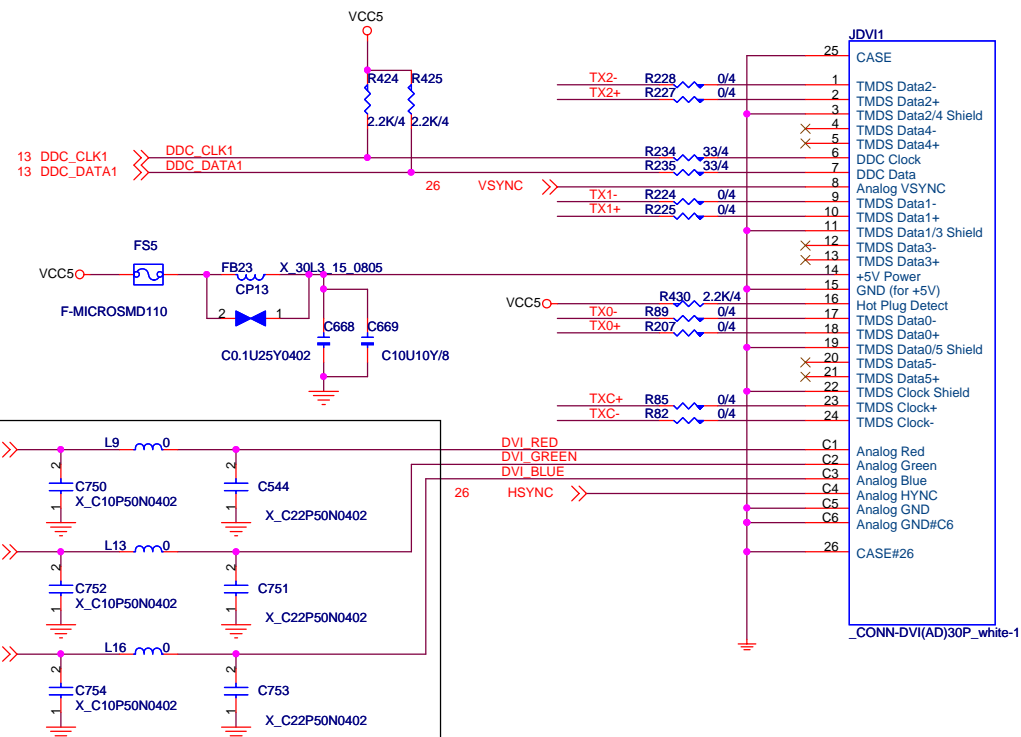
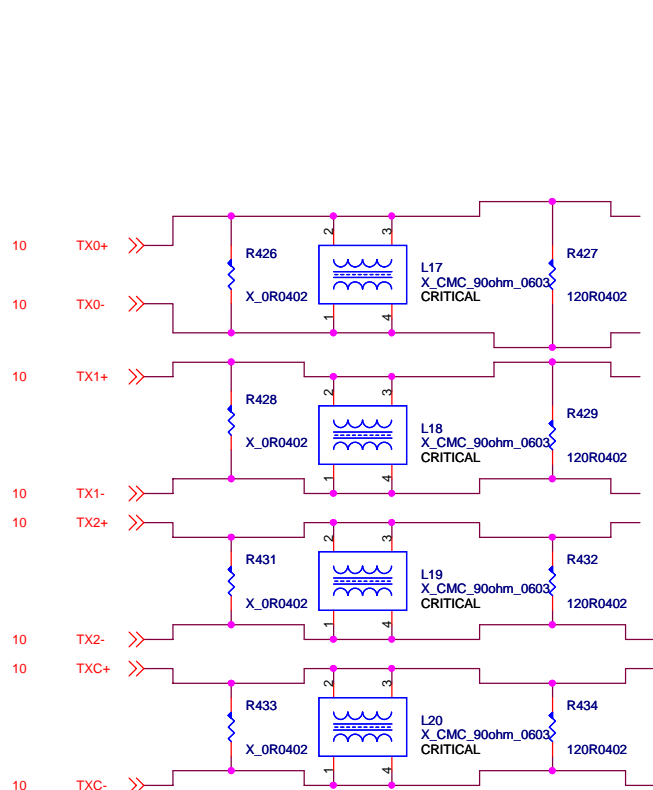


VGA CONNECTOR

close VGA connector

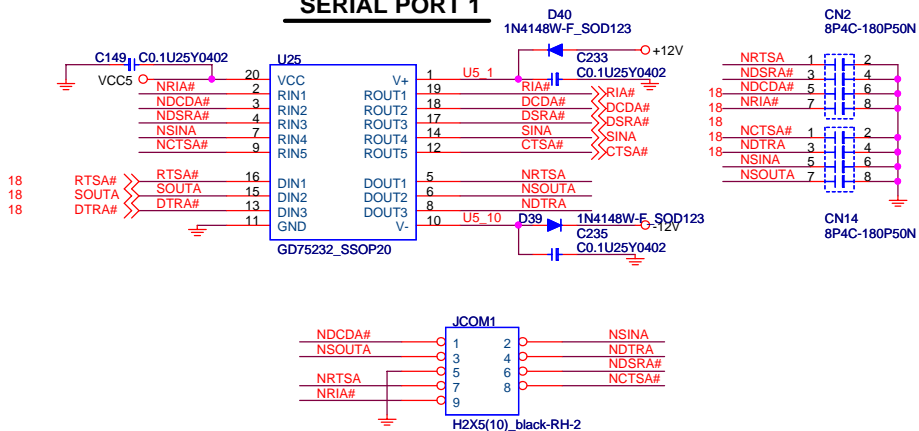


| | | |
|--|---------------|--|
| Micro Star Restricted Secret | | |
| Title | VGA CONNECTOR | Rev 0C |
| Document Number | MS-7295 | |
| MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw | | Last Revision Date: Thursday, June 01, 2006 |
| Sheet | | 26 of 35 |

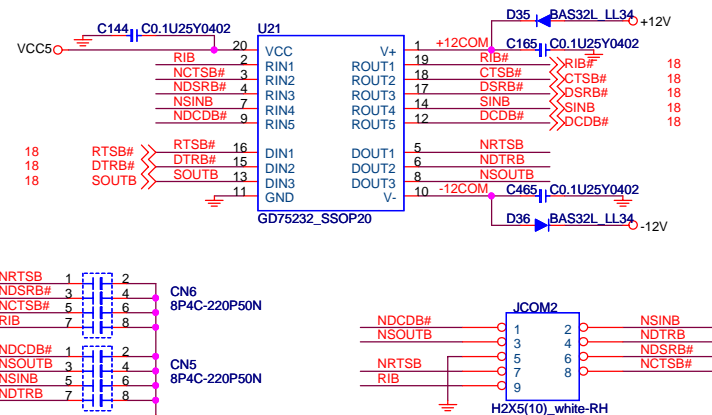


| Micro Star Restricted Secret | | | |
|---|---------|--|-----|
| Title | MSI | DVI CONNECTOR | Rev |
| Document Number | MS-7295 | | 0C |
| MICRO-STAR INT'L CO.,LTD. No. 89, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw | | Last Revision Date: Thursday, June 01, 2006 Sheet 27 of 35 | |

SERIAL PORT 1

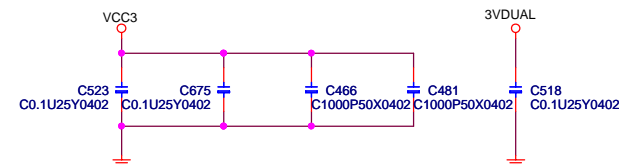
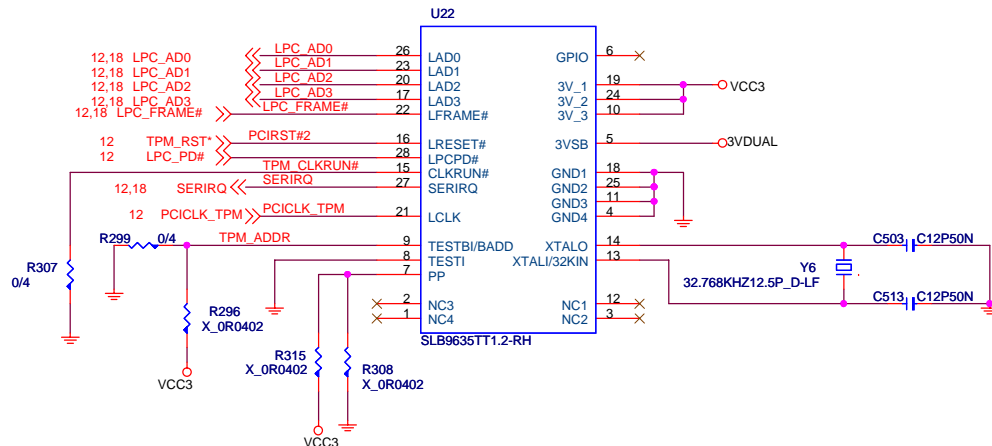


SERIAL PORT 2

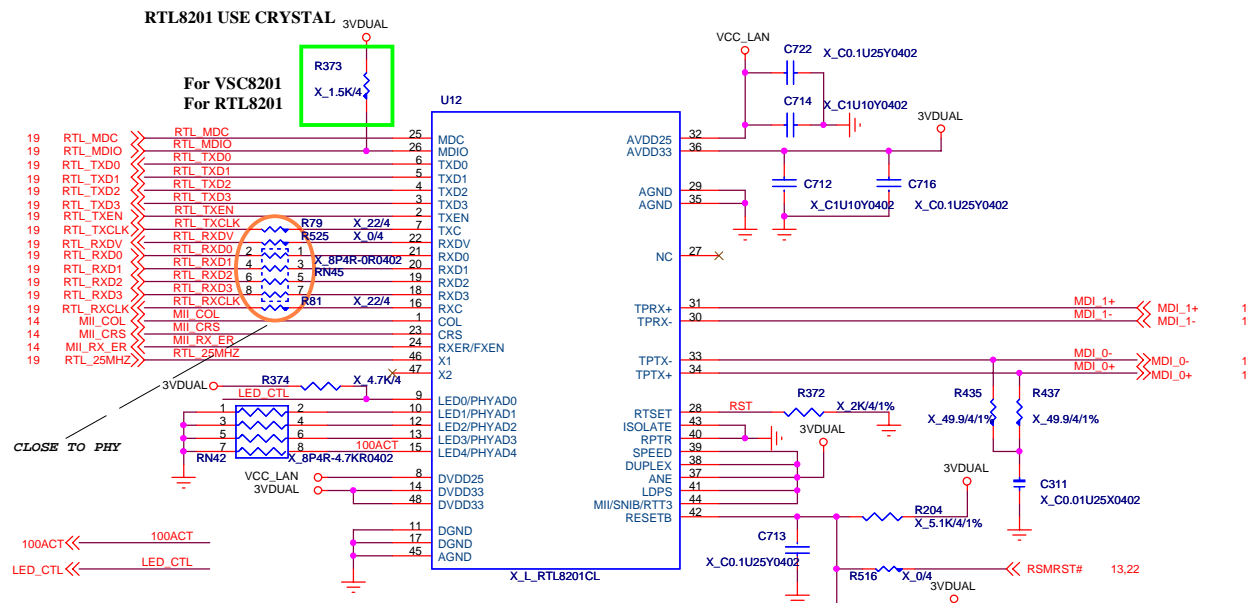


TPM 1.2

IO Address:0x02E

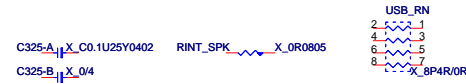
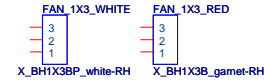
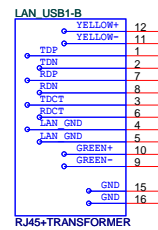
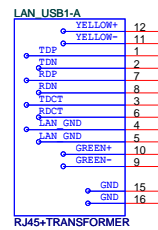
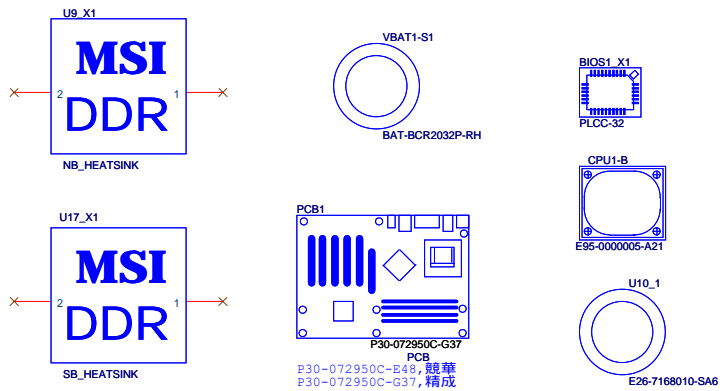


| | | | |
|----------------------------|-------------------------|-----------------------------------|----------------|
| | | MICRO-STAR INT'L CO., LTD. | |
| Title: COM PORTS & TPM 1.2 | | | |
| Size | Document Number | | Rev |
| | MS-7295 | | 0C |
| Date: | Thursday, June 01, 2006 | | Sheet 28 of 35 |

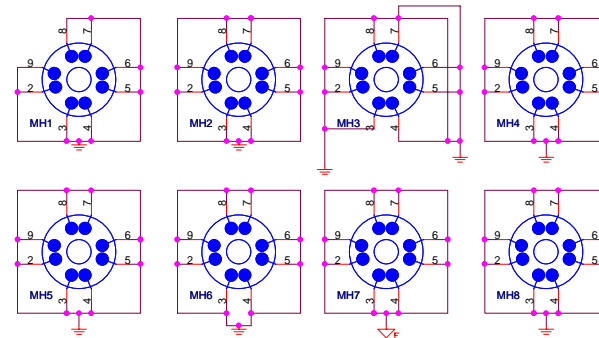


MII_CRS: Ensure to operate in normal mode

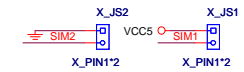
MII_RX_ER: H:Fiber mode, L:UTP mode



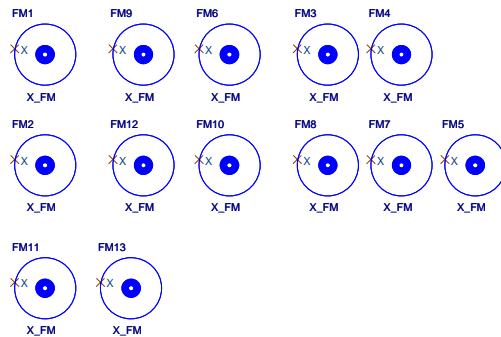
Mounting Holes



Simulation



Optics Orientation Holes



ver : 0A data : 2006 / 03 / 23

Modify for AMD check list

Page03 : HT_STOP_L, LDT_RST_L and CPU_PWRGD_L have 330 ohm pullup resistors (RN5). The recommend value for the pullup resistors is 300 ohms (5%).
Page03 : Add level shifting to RESET_L . modify R23 pin1 & J1 pin24 from LDT_RST_L to LDT_RST.
Page05 : change caps(C34,C52,C202,C172) value to 180-pF.
Page03 : Change the part of L2 position , change the part to L02-4008044-C08.
Page03 : Add a level shift circuit for AMD test tool.
Page05 : Add 2x 1uF caps (C670 & C682) from VDDIO to VCCP .
Page05 : Add a fuse (FS3) for PS2 power .

Modify for nVidia check list

Page26 : Remove D21,D31, R285,R440 for MCP51 A03 .
Page26 : Add a poly fuse (FS6) for VGA power.
Page27 : Reserved 0Ω series resistor close to DVI connector.
Page14 : Add 10 kΩ pull-down resistors for MII_RXER,MII_COL,MII_CRS
Page14 : Add a Pull-up resistor(R377=1.5 kΩ) to RG/MII_MDIO
Page13 : Change strap pin (AC_RESET#) to pull up , to select RGMII mode.
Page15 : Add a bypass cap (C425 0.01uF) for 3P3_IFPA_L .
Page27 : Add damping resistors (R234 & R235 33ohm) for DDC_CLK1 & DDC_DATA1 .
Page19 : Add a damping resistor (R526 0ohm) for RG/MII_INTR .
Page21 : Reserved bypass caps (C161 , C427 , C432 & C434 470pF) for SVCC1 & SVCC2 .
Page16 : Add Pull-up resistors (RN36= 8.2KΩ) for ACK64# & REQ64# (PCI solt pin)
Page14 : Reserved bypass cap (C494 10uF) for +3.3V_PLL_SP_SS
Page15 : Reserved bypass caps (C527 & C528 0.1uF) for +1.5V_SP_A & +1.5V_SP_D
Page15 : Add a damping resistor (R236 100ohm) for +5V
Page15 : Rerserved a ferrite bead (FB18) for +3.3V_HT
Page14 : Reserved bypass cap (C530 4.7uF) for +1.5V_SP_A
Page13 : Reserved bypass cap (C531 4.7uF) for +3.3V_VBAT
Page09 : Reserved bypass cap (C435 4.7uF) for 2P5V_PLL
Page13 : Reserved bypass cap (C447 10uF) for +3.3V_PLL_USB_CORE
Page26 : Reserved bypass caps (C107 & C93 470pF) for DDC_CLK & DDC_DATA .
Page21 : Reserved bypass caps (47pF) for USB1.1 mode .
Page22 : Reserved bypass caps and place near Q35 (EC50 2700uF) for VCC1_2.
Page11 : Reserved bypass caps (C80 & C81 22uF) for VCC1_2.
Page11 : Reserved bypass caps (C85 47uF) for 1P2VPLL_PWR.
Page15 : Reserved bypass caps place near MCP51(EC58 & EC59 2700uF) for VCC1_2.
Page15 : Reserved bypass caps place near MCP51(C88,C89,C723 & C724 22uF) for VCC1_2.
Page26 : Reserved a diode(DZ4 1N5817) co-lay with FS6 for VGA power.

Modify for MSI

Page03 : Modify LM90 circuit , THERMDA_CPU connected to D+ & THERMDC_CPU connected to D- .

| Micro Star Restricted Secret | | |
|--|--------------------|--|
| Title | MSI HISTORY FOR 0A | Rev |
| Document Number | MS-7295 | 0C |
| MICRO-STAR INT'L CO., LTD. No. 68, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw | | Last Revision Date: Wednesday, May 17, 2006 Sheet 31 of 35 |

ver : 0B data : 2006 / 05 / 04

Modify for MSI

Page19 : Modify lan circuit (MII_RXD0~3)
Page10 : Modify PCI_EX2 CIRCUIT (PE1_RX1/PE1_RX1* & PE1_TX1/PE1_TX*)
Page13 : ADD JUMPER SELECT FOR CLEAR PASSWORD & MAINTENANCE MODE
Page20 : Modify codec circuit for co-lay ALC888

ver : 0C data : 2006 / 05 / 17

Modify for MSI

Page28 : Change JCOM1 color to black
Page21 : L10 & L11 change to common choke
Page23 : modify VRM solution
Page17 : PCI-express X16 CHANGE TO AUTOMATIC CLIP
Page21 : JUSB1 & JUSB2 change to 2*4pin header without housing
Page28 : JCOM1 change to black color
Page28 : JAUD1 change to blue color
Page30 : CPU retention module change vender to AVC
Page18,22,25 : Modify "Restore On AC Power Loss function" failed
Page10,27 : Add amplifier to solve RGB signal quality on 2VGA monitor.

Modify for LAYOUT

- 1. Add mask on CPU screw and connect the shape to GND
- 2. FS3,EC46 move out the MH7 & MH1
- 3. Fix mechanical issue of audio caps
- 4. Modify VTT_DDR plane to 200mil (at least 200mil)
- 5. Modify CPU_VDDIOFB_H/L route to VCC_DDR power supply
- 6. Modify processor clocks route as 5mil trace with 5mil spacing
- 7. Modify data group signals failed length matching with clks
- 8. Modify MA-MEN_MB_DATA49 failed length matching

Modify for AMD

Page05 : Add C206 (4.7uF) for VTT_DDR

Modify for NECCI

Page20 : Codec change to ALC888

| | | |
|--|--------------------|---|
| Micro Star Restricted Secret | | |
| Title | MSI HISTORY FOR 0B | Rev |
| Document Number | MS-7295 | 0C |
| MICRO-STAR INT'L CO., LTD. No. 68, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw | | Last Revision Date: Monday, May 29, 2006 Sheet 32 of 35 |