

# MS7301 Version:0B

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## CPU:

Intel LGA775

## System Chipset:

PT890/p4m890/P4M900 (North Bridge)  
VT8237A (South Bridge)

## On Board Chipset:

BIOS -- LPC ROM  
Audio - ALC883/888  
LPC Super I/O -- W83627EHG/DHG  
LAN --VT6103L  
CLOCK --ICS953002+ICS9P936AFLF

## Main Memory:

single-channel --DDRII\*2

## Expansion Slots:

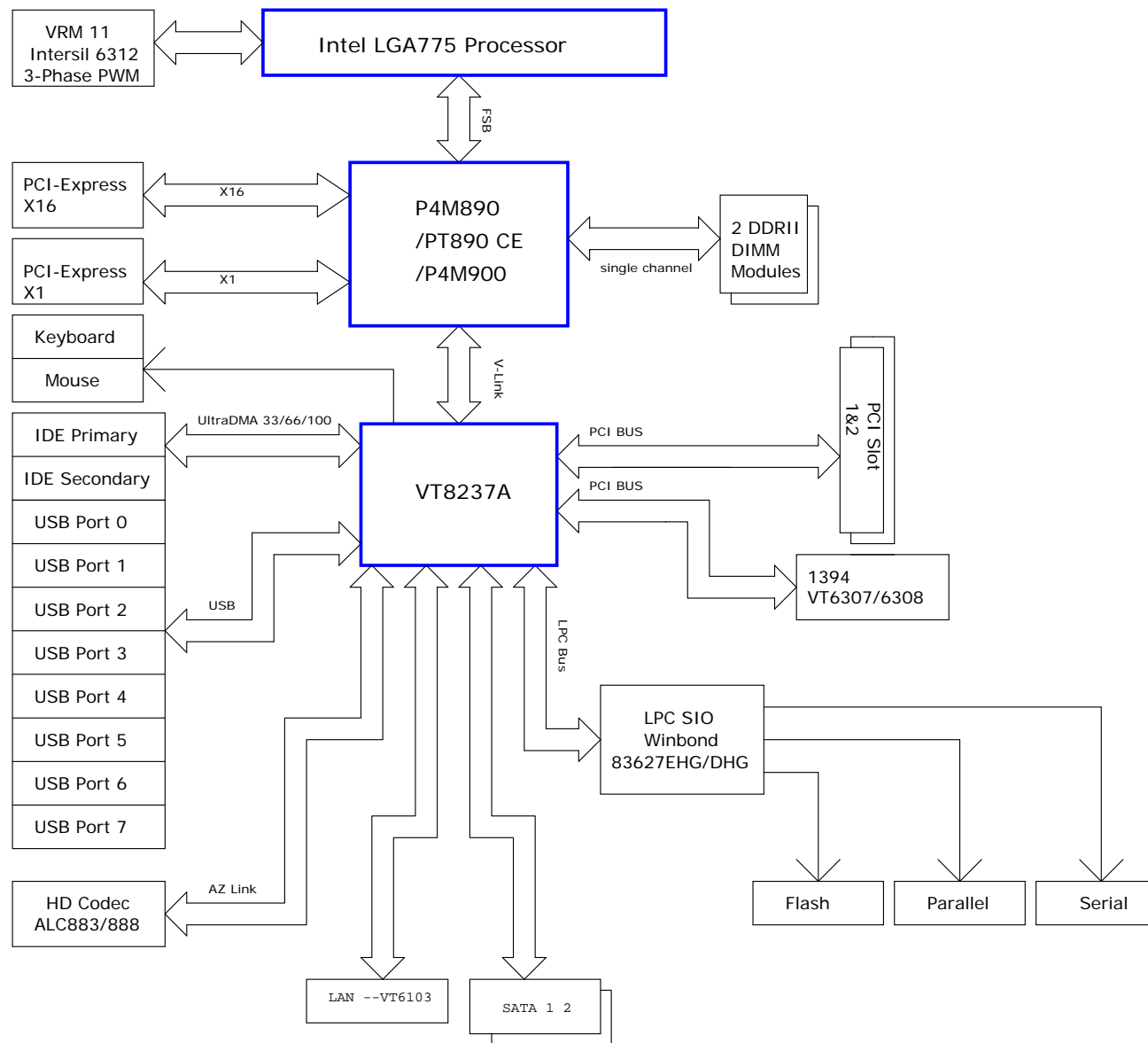
PCI Express X16 \* 1  
PCI Express X1 \* 1  
PCI 2.2Slot \* 2

## PWM(VRM11/FMB 05B):

Intersil 6312

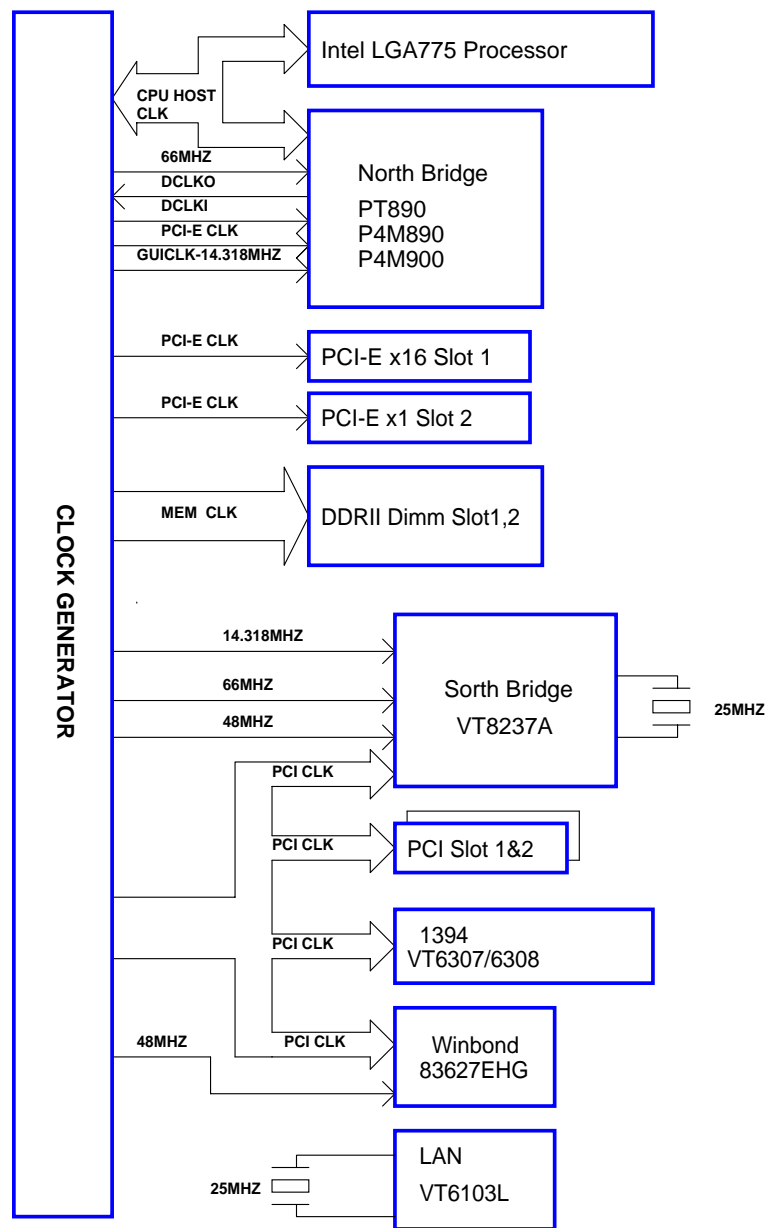
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| COVER SHEET  | 0B      |
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# Block Diagram

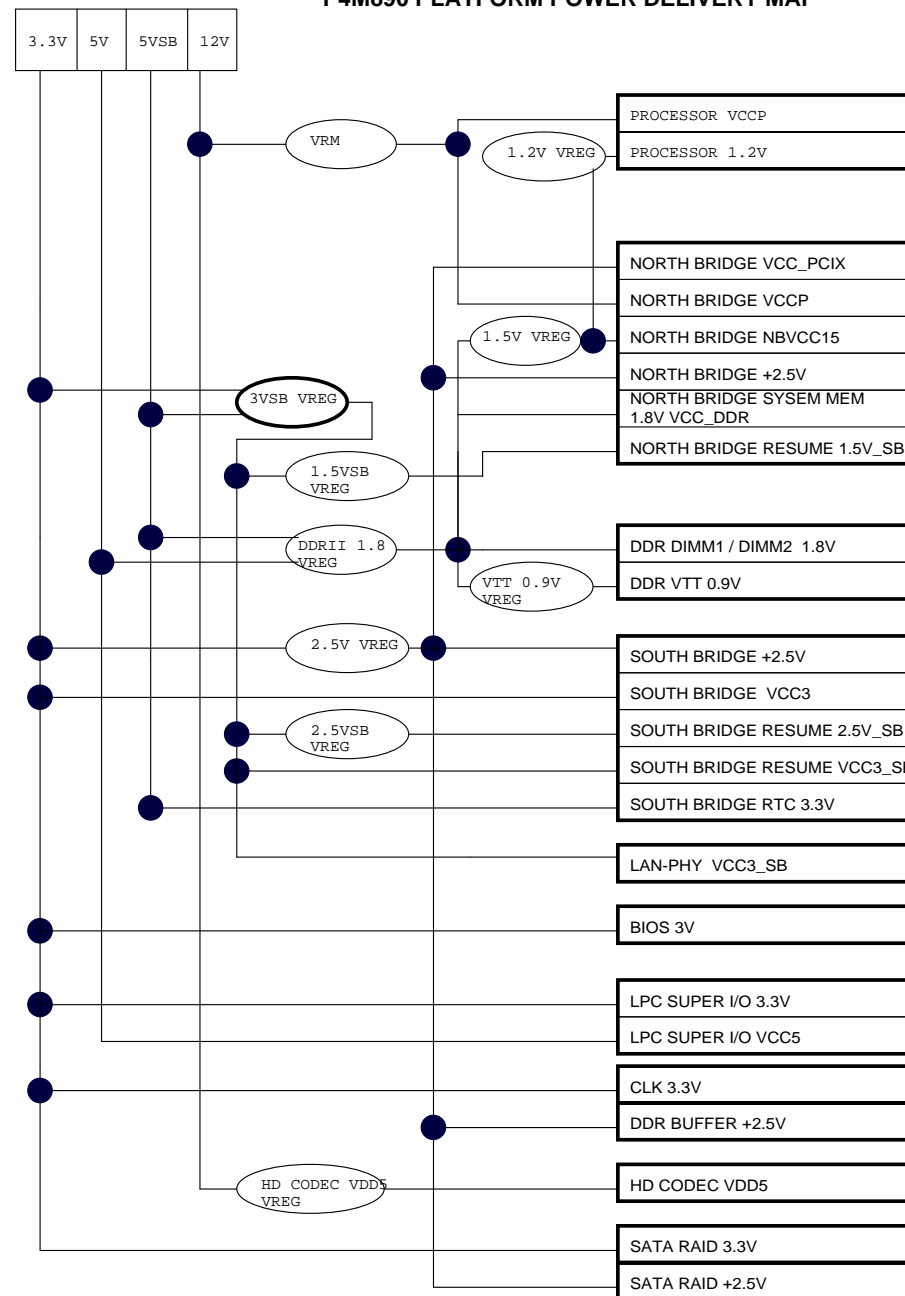


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| Title  | BLOCK DIAGRAM | Rev<br>0B  |
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P4M890 PLATFORM CLOCK GENERATOR MAP



P4M890 PLATFORM POWER DELIVERY MAP



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SB-VT8237A

| Name   | Pin  | Function Description | Value    |
|--------|------|----------------------|----------|
| GPI0   | AE2  | unused               | VBAT     |
| GPI1   | AC2  | SB_THERMTRIP#        | VSUS33   |
| GPI2   | AA1  | THERM#               | VSUS33   |
| GPI3   | Y2   | RING                 | VSUS33   |
| GPI4   | AC1  | ATADET1              | VSUS33   |
| GPI5   | V4   | BATLOW#              | VSUS33   |
| GPI6   | AD10 | AGPBZ                | VSUS33   |
| GPI7   | R03  | PREQ#5               | VSUS33   |
| GPI8   | AC9  | VGATE                | VSUS33   |
| GPI9   | D26  | GPI9                 | VCC33USB |
| GPI16  | AE1  | INTRUDER             | VBAT     |
| GPI17  | Y1   | ATADET0              | VSUS33   |
| GPI18  | Y4   | PEPMESCI             | VSUS33   |
| GPI19  | U23  | APICCLK              | VCC3     |
| GPO0   | AA3  | PCIEREAT             | VSUS33   |
| GPO1   | AE3  | GPO1                 | VSUS33   |
| GPO2   | AA2  | SUSA#                | VSUS33   |
| GPO3   | Y3   | SUSST#               | VSUS33   |
| GPO4   | AB3  | SUS_CLK              | VSUS33   |
| GPO5   | AC7  | CPUSTP#              | VSUS33   |
| GPO6   | AD6  | PCISTP#              | VSUS33   |
| GPO7   | R2   | PGNT#5               | VSUS33   |
| GPO9   | D25  | unused               | VCC33USB |
| GPI08  | AC9  | VGATE                | VCC3     |
| GPI010 | R25  | APICD0               | VCC3     |
| GPI011 | T23  | APICD1               | VCC3     |
| GPI012 | D4   | PIRQ#E               | VCC3     |
| GPI013 | E4   | PIRQ#F               | VCC3     |
| GPI014 | A3   | PIRQ#G               | VCC3     |
| GPI015 | B3   | PIRQ#H               | VCC3     |
| GPI020 | U1   | AZ_SDIN2             | VCC3     |
| GPI021 | V3   | AZ_SDIN3             | VCC3     |
| GPI022 | R22  | GHI#                 | VCC3     |
| GPI023 | P21  | DPSLP#               | VCC3     |
| GPI024 | AE5  | GPIOA                | VCC3     |
| GPI025 | AD5  | GPIOB                | VCC3     |
| GPI026 | AD1  | FAN_CTRL             | VCC3     |
| GPI027 | AC3  | SMBCK2               | VCC3     |
| GPI028 | AC8  | VIDSEL               | VCC3     |
| GPI029 | AB9  | PCIERST#             | VCC3     |
| GPI030 | AF5  | GPIOC                | VCC3     |
| GPI031 | AC6  | GPIOD                | VCC3     |

DDR DIMM Config.

| DEVICE | ADDRESS  | CLOCK                                     |
|--------|----------|---|
| DIMM 1 | 1010000B | MDCLKA0/A#0<br>MDCLKA1/A#1<br>MDCLKA2/A#2 |
| DIMM 2 | 1010001B | MDCLKB0/B#0<br>MDCLKB1/B#1<br>MDCLKB2/B#2 |

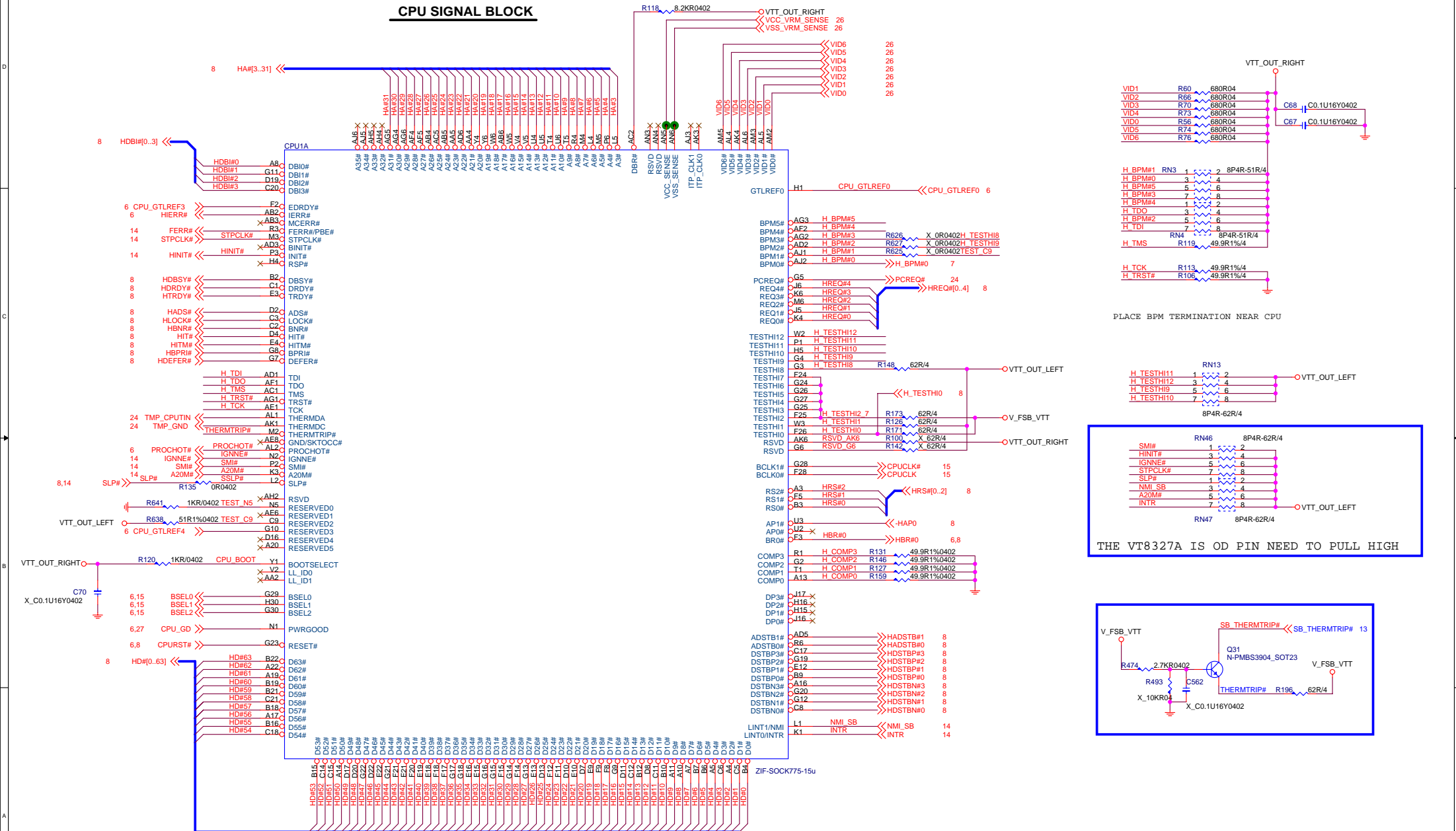
PCI Config.

| DEVICE     | MCP1 INT Pin                         | REQ#/GNT#        | IDSEL | CLOCK     | CLK GEN PIN OUT |
|------------|--------------------------------------|------------------|-------|-----------|-----------------|
| PCI Slot 1 | PIRQ#A<br>PIRQ#B<br>PIRQ#C<br>PIRQ#D | PREQ#1<br>PGNT#1 | AD21  | PCICLK1   | 13 (PCI_CLK2)   |
| PCI Slot 2 | PIRQ#B<br>PIRQ#C<br>PIRQ#D<br>PIRQ#A | PREQ#0<br>PGNT#0 | AD20  | PCICLK2   | 12 (PCI_CLK1)   |
| 1394       | PIRQ#F                               | PREQ#3<br>PGNT#3 | AD19  | 1394_PCLK | 11 (PCI_CLK0)   |

PCI RESET DEVICE

| Signals  | Source | Target                              |
|----------|--------|-------------------------------------|
| PCIRST#  | SB     | MS7                                 |
| PCIRST#1 | MS7    | NB & SATA RAID & 1394 & SPIO & BIOS |
| PCIRST#2 | MS7    | PCI slot 1-2 & PCIE 1-2             |
| HDRST#   | MS7    | Primary, Scndary IDE                |

### CPU SIGNAL BLOCK

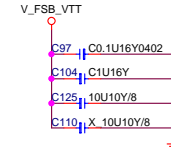


*Micro Star Restricted Secret*

|              |                                   |
|--------------|-----------------------------------|
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|--------------|-----------------------------------|

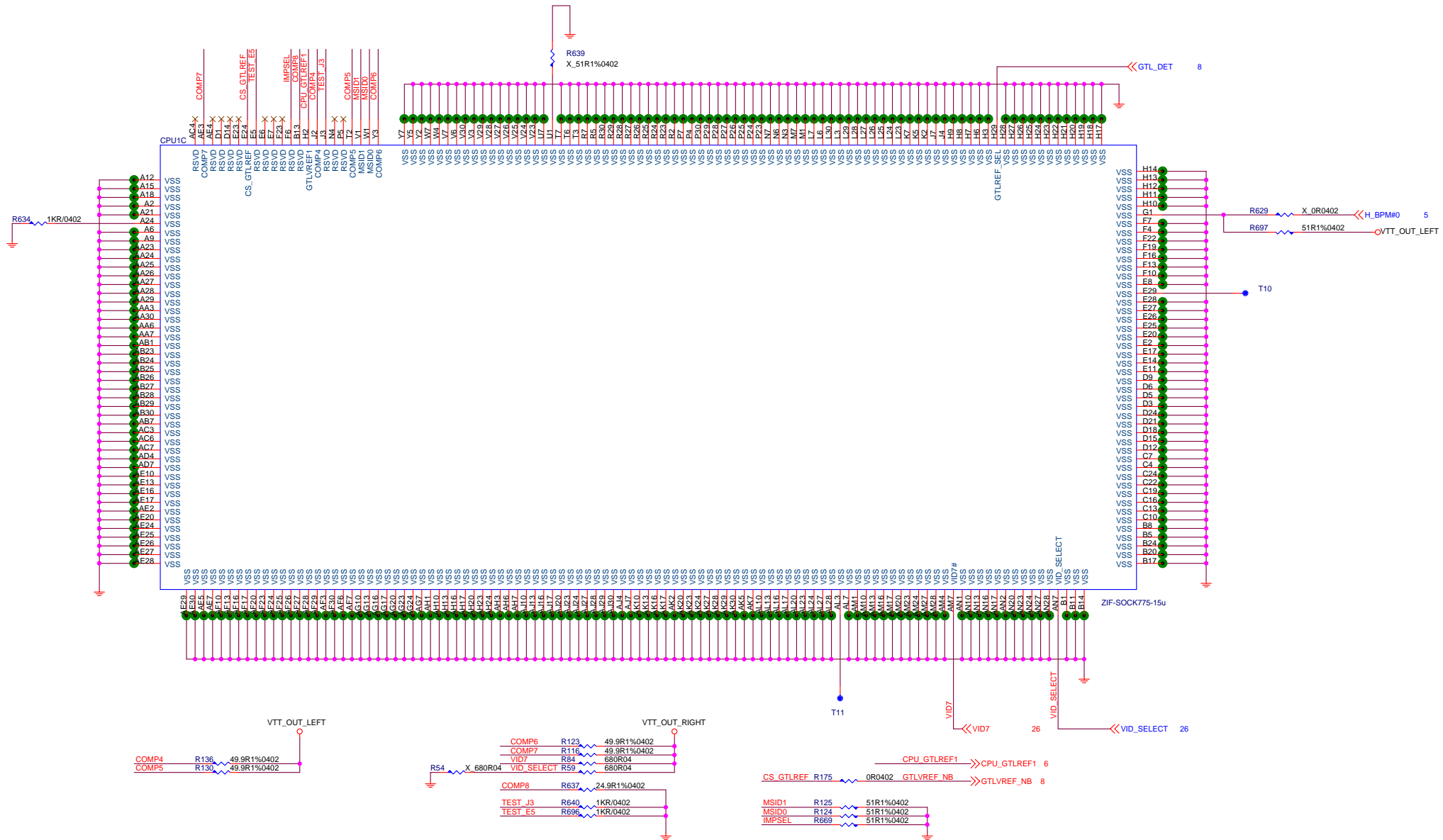
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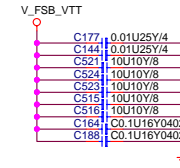
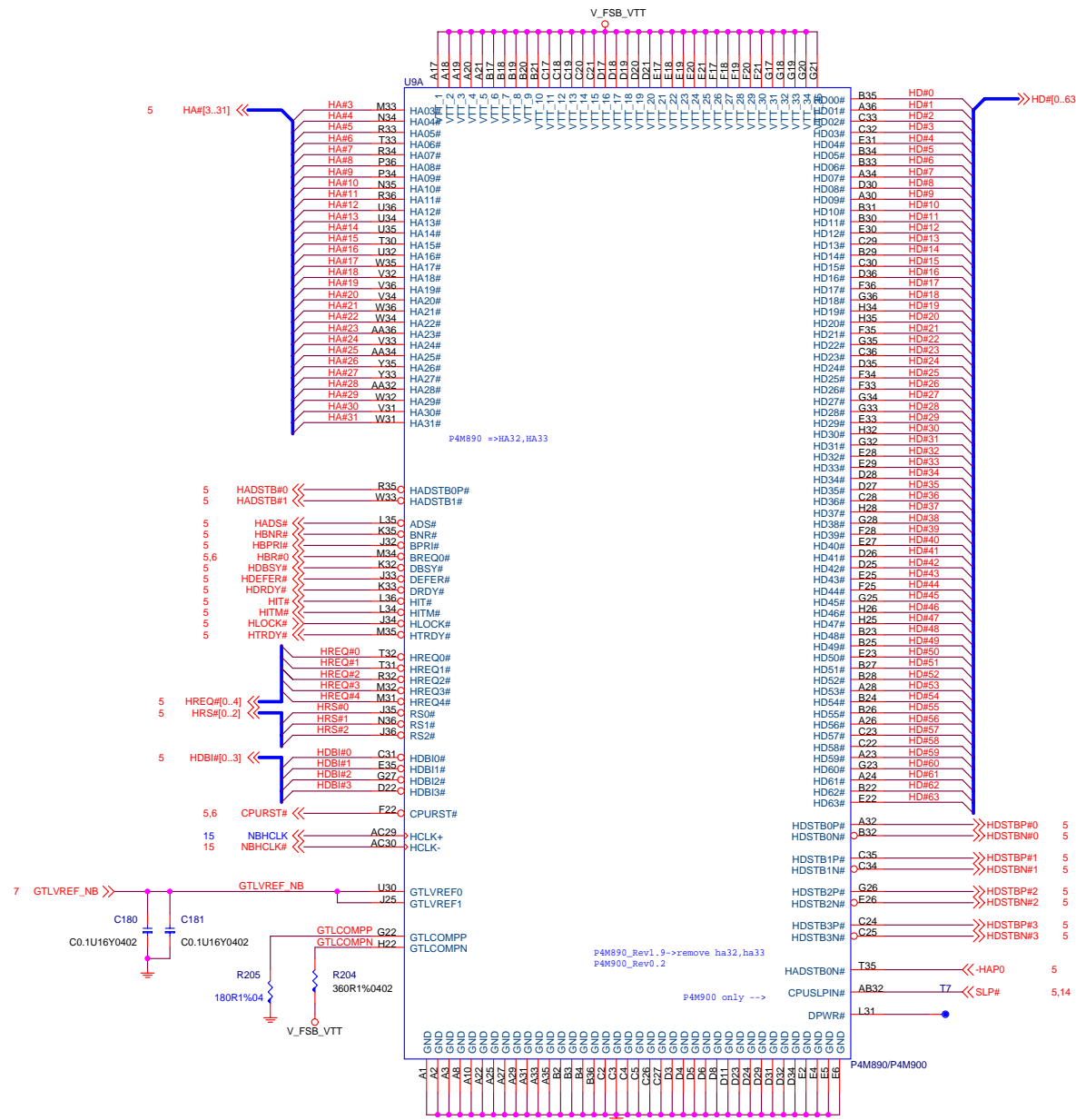
|   |         |
|---|---------|
| 0 | TEJ/PSC |
| 1 | RSVD    |

|  |  |   |
|--|--|---|
| <b>Micro Star Restricted Secret</b>  |  |   |
| <b>Title</b>   |  | Rev   |
| <b>Intel LGA775 CPU - Power</b>  |  | 0B  |
| <b>Document Number</b>   |  |   |
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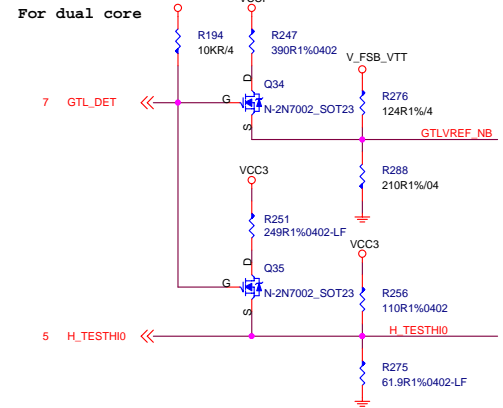


R669 Mount 50 Ohm Impedance  
R669 Open 60 Ohm Impedance

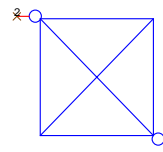
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| Document Number  | MS-7301                | Rev<br>OB |
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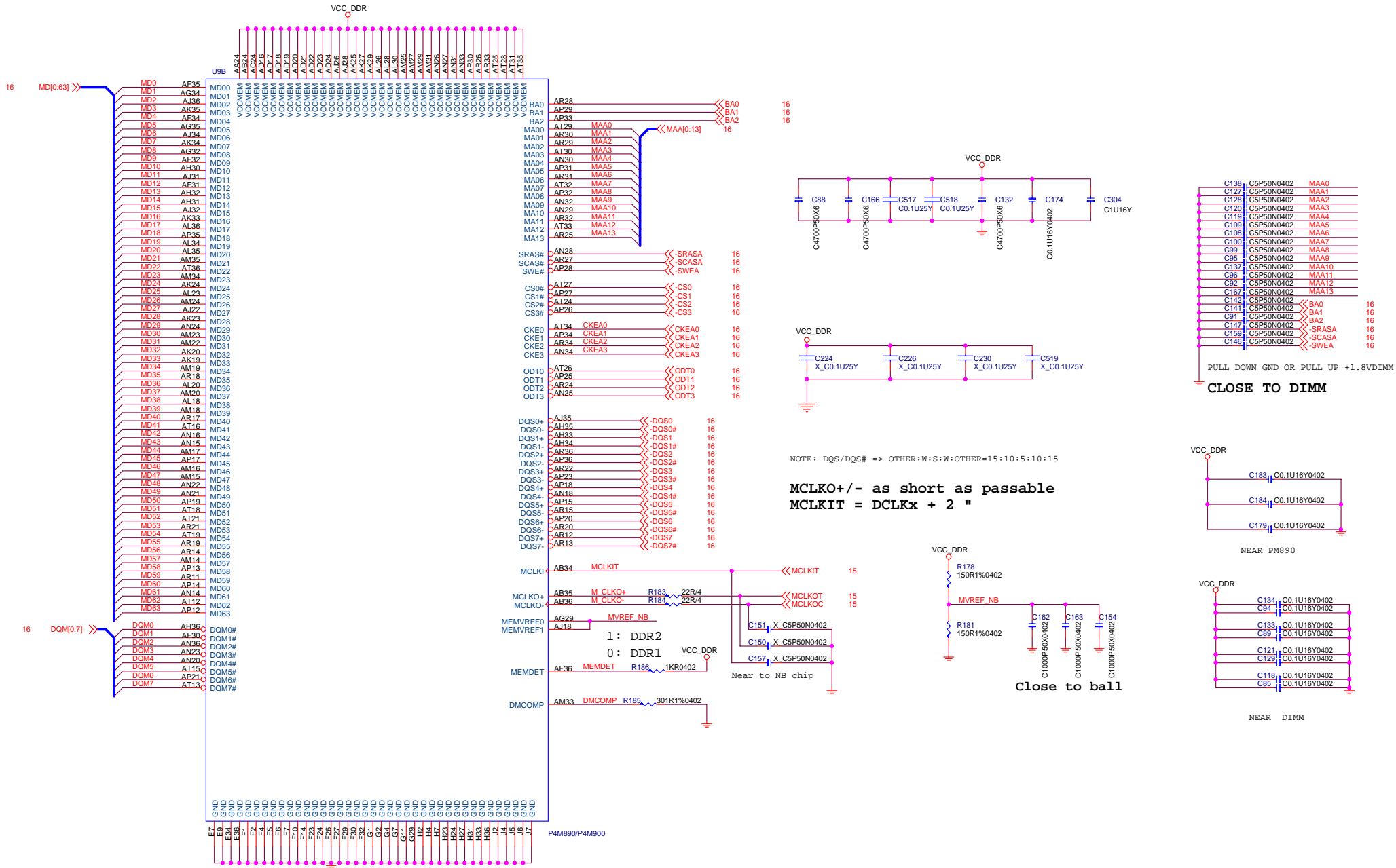
GTL\_DET=1 , GTLVREF\_NB=0.86V, H\_TESTHIO=1.5V  
GTL\_DET=0 , GTLVREF\_NB=0.75V, H\_TESTHIO=1.2V

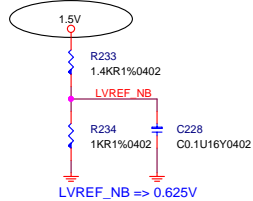


NB Heatsink





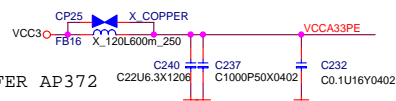




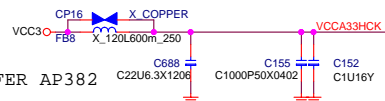
Strapping For NB\_TEST Mode  
TESTIN BISTIN RBF WBF  
1 1 x x  
Disable all TEST mode

TESTIN\_NB R187 4.7KR0402 VCC\_DDR

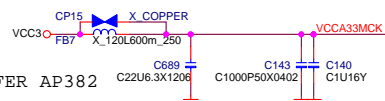
FOR P4M900 DO NOT STUFF R187



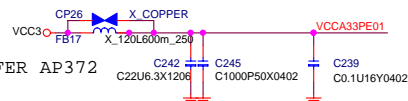
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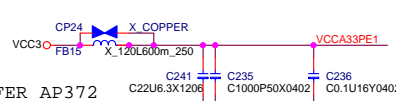
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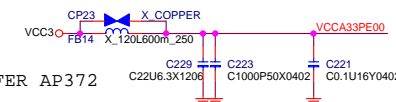
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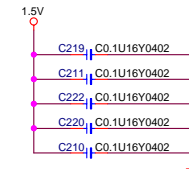
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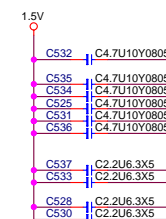
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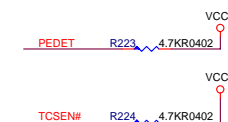
REFER AP372



Decoupling capacitors



under NB( solder side)



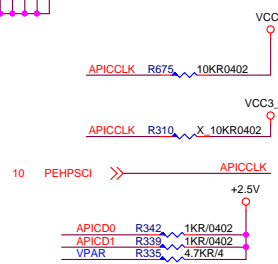
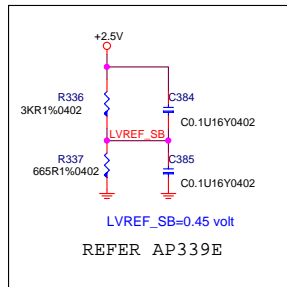
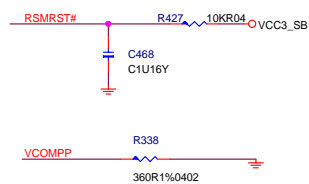
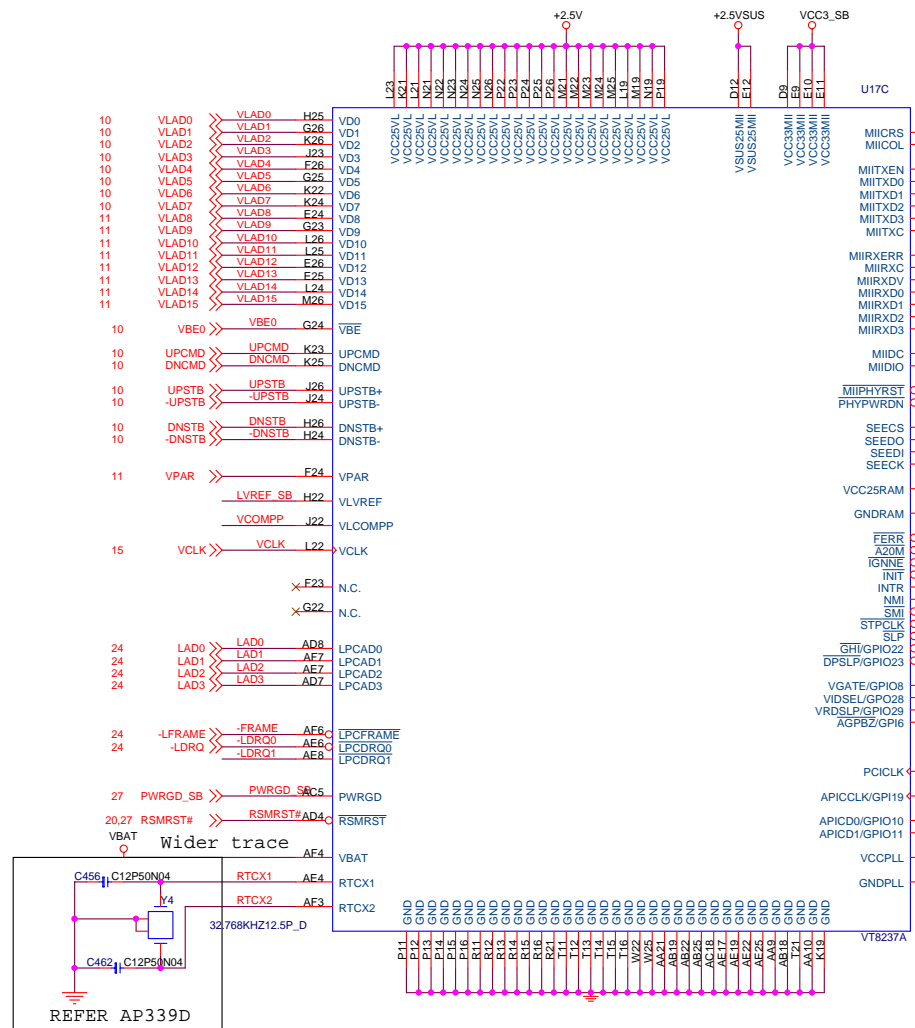
Micro Star Restricted Secret

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| P4M890-3(GFX)   |  | 0B  |
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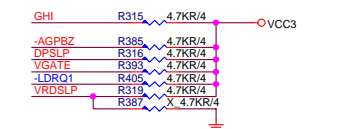
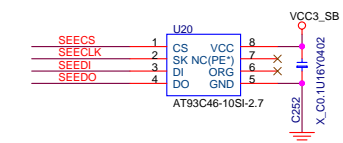
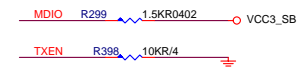
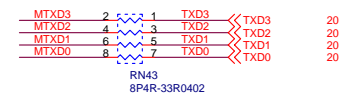




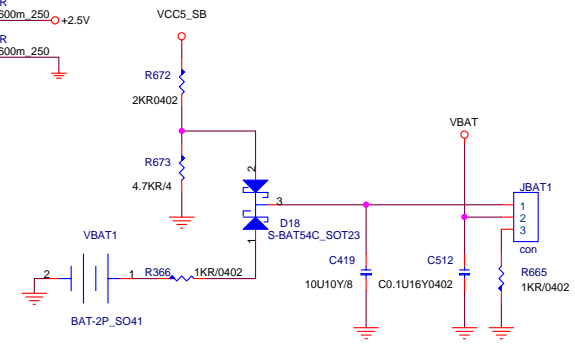




CLOSE TO VT6103L



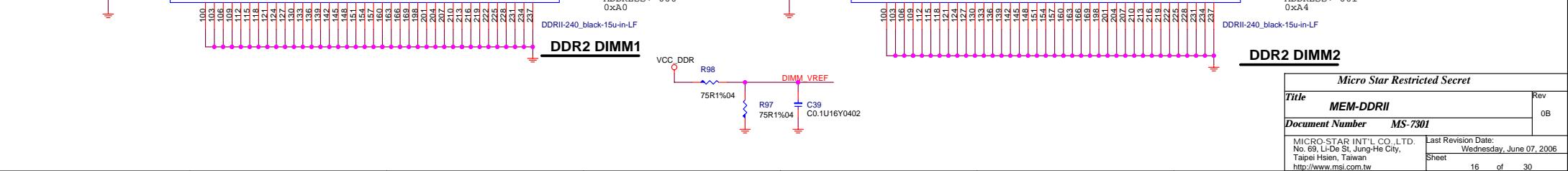
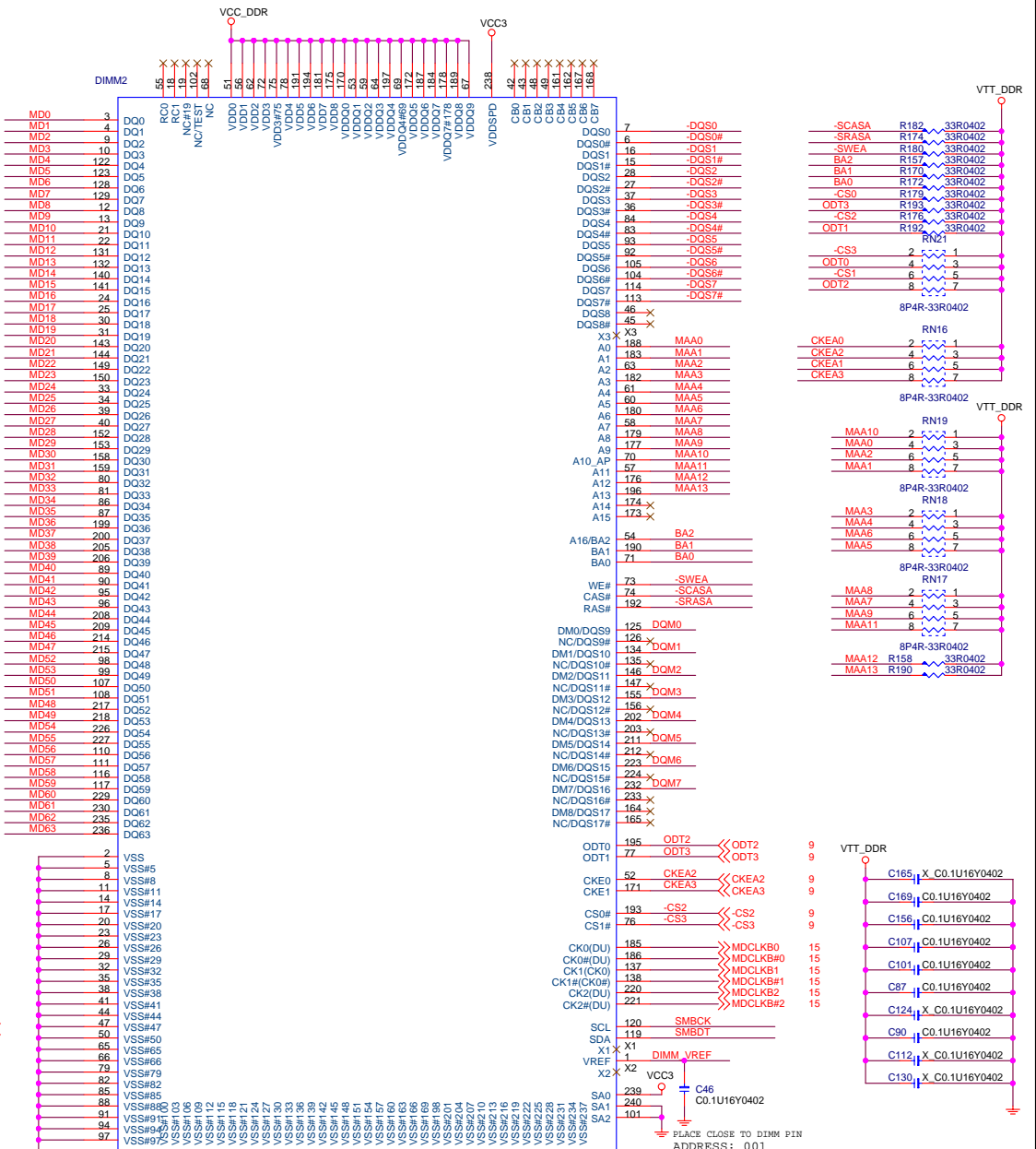
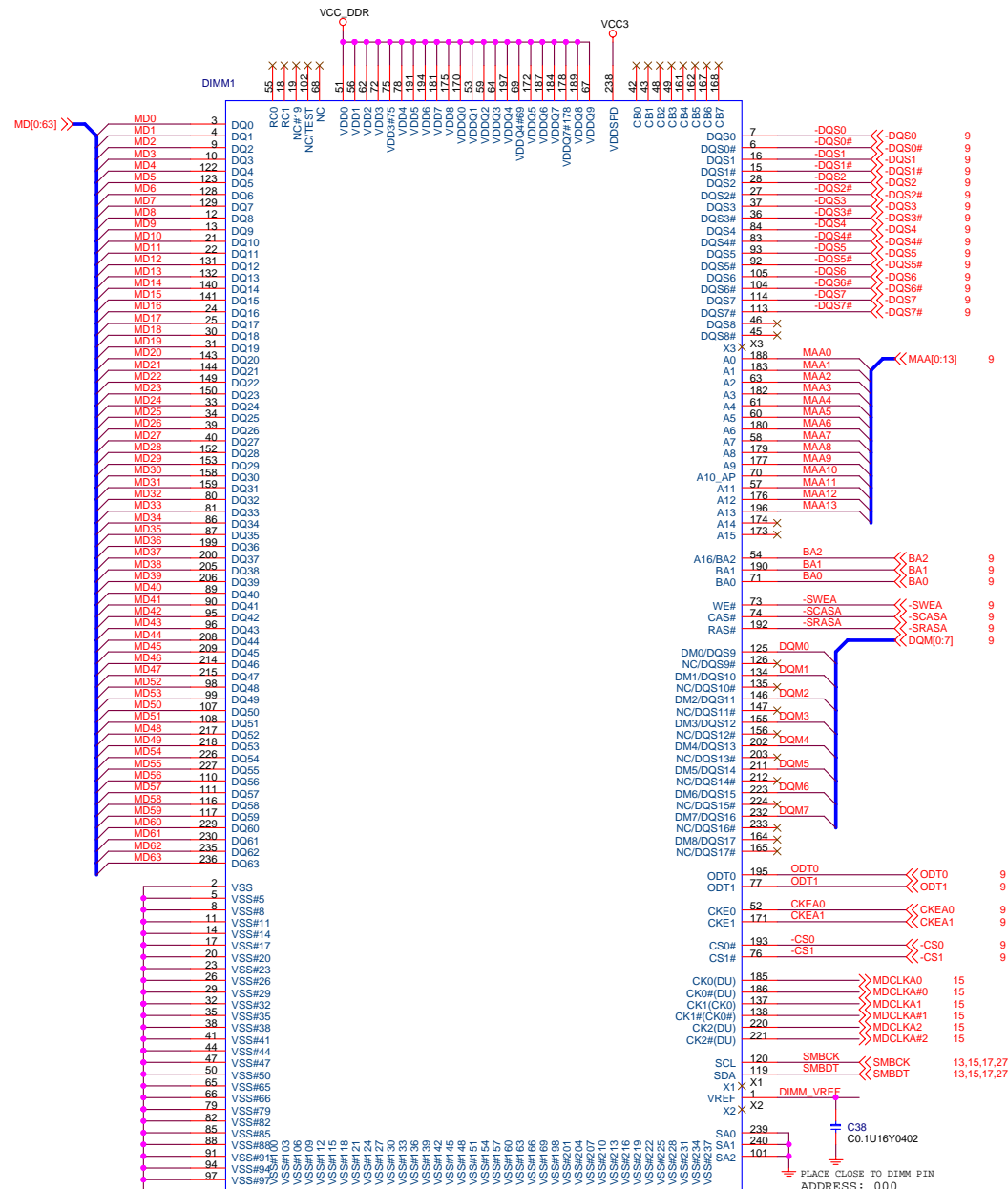
VRDSLPL PULL HIGH FOR GPO29 USED



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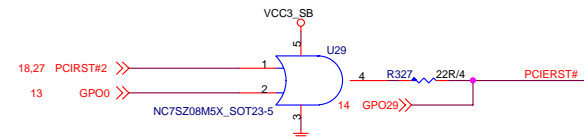
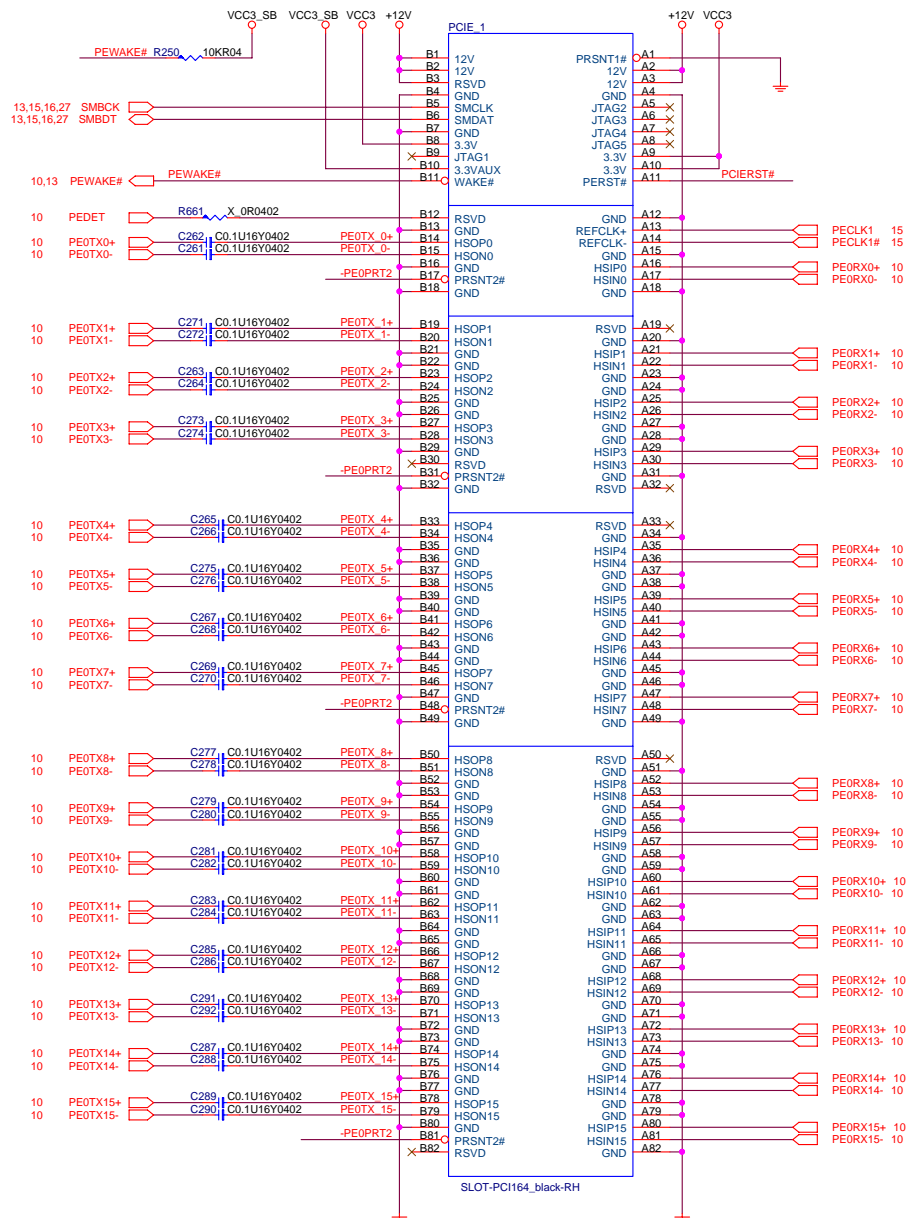






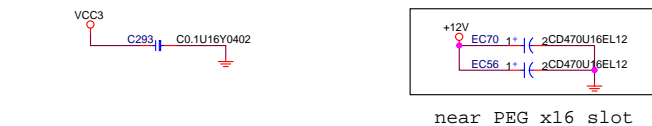
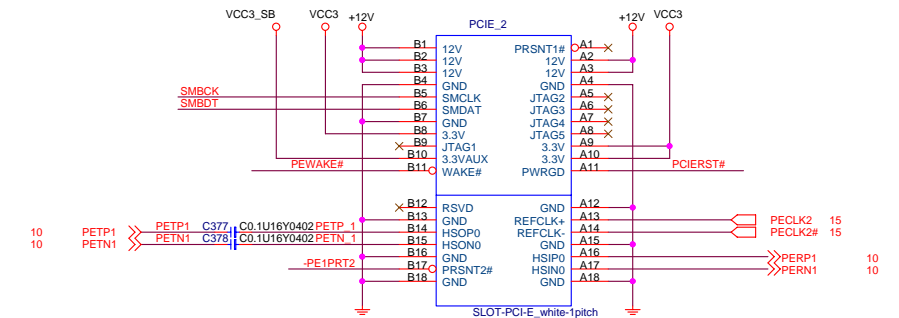


12V ==> 5.5A for x16 slot ,75 Watt  
3.3V==> 3A  
3.3Vaux==>375mA



REFER AP379

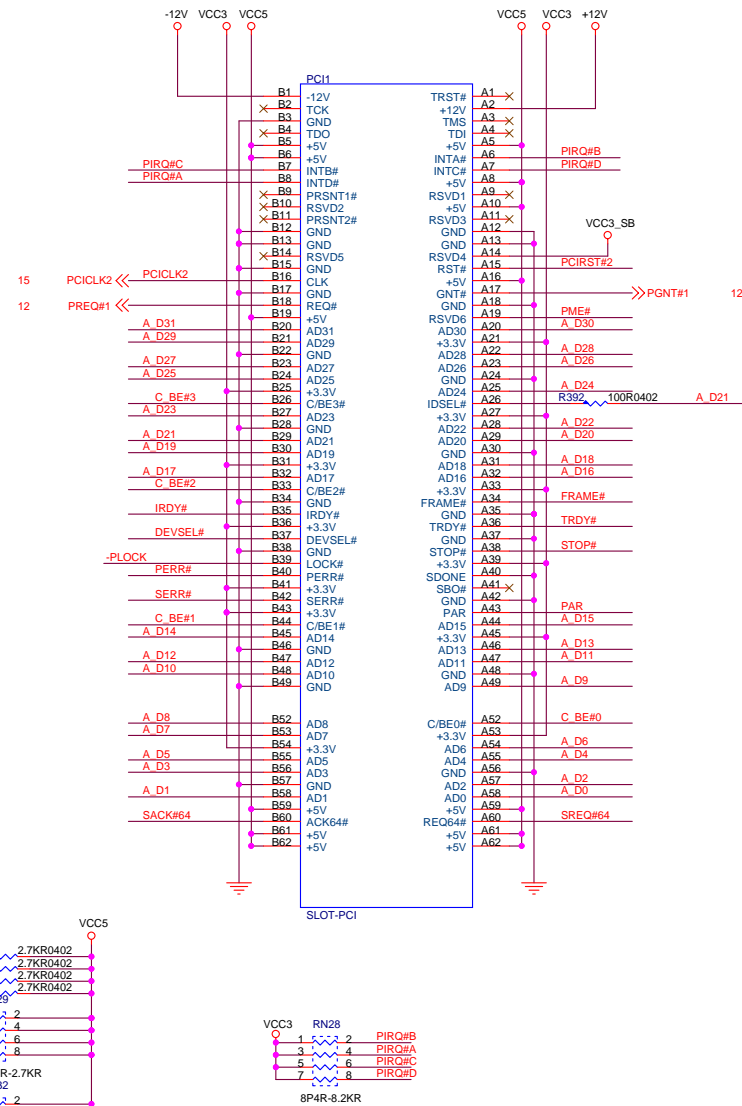
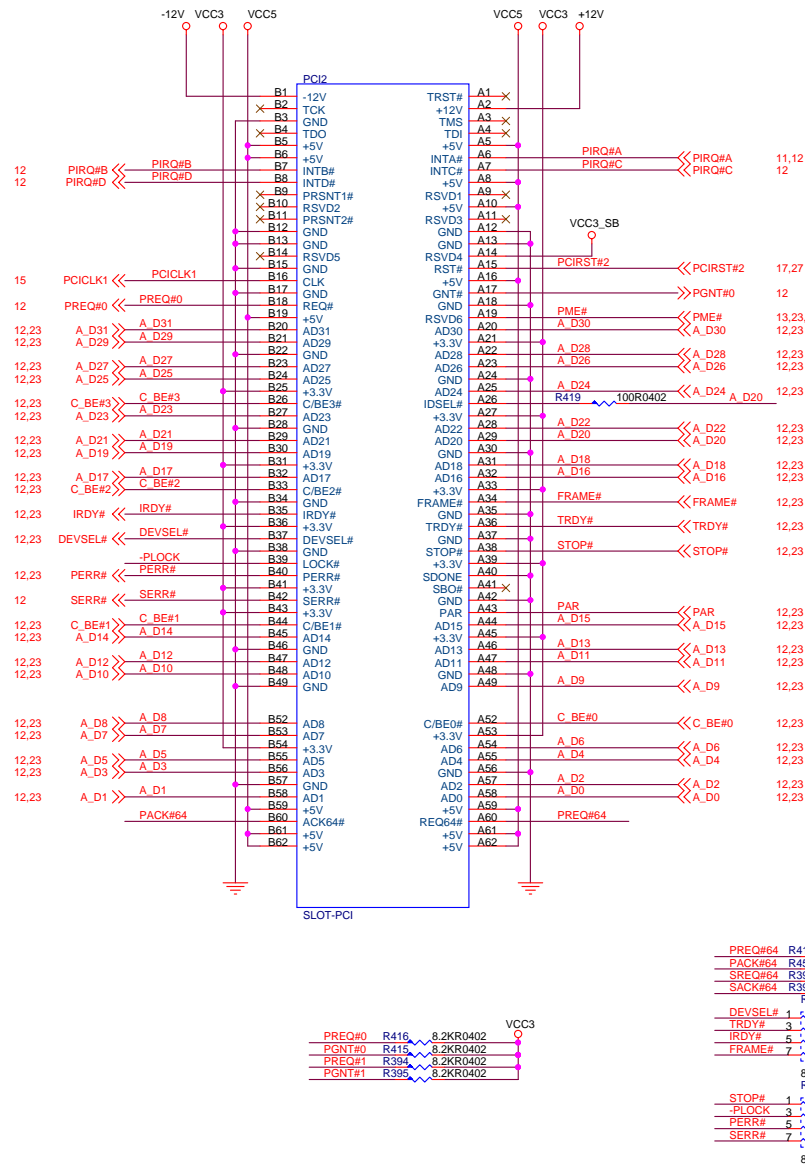
## PCI EXPRESS 1-PORT 2

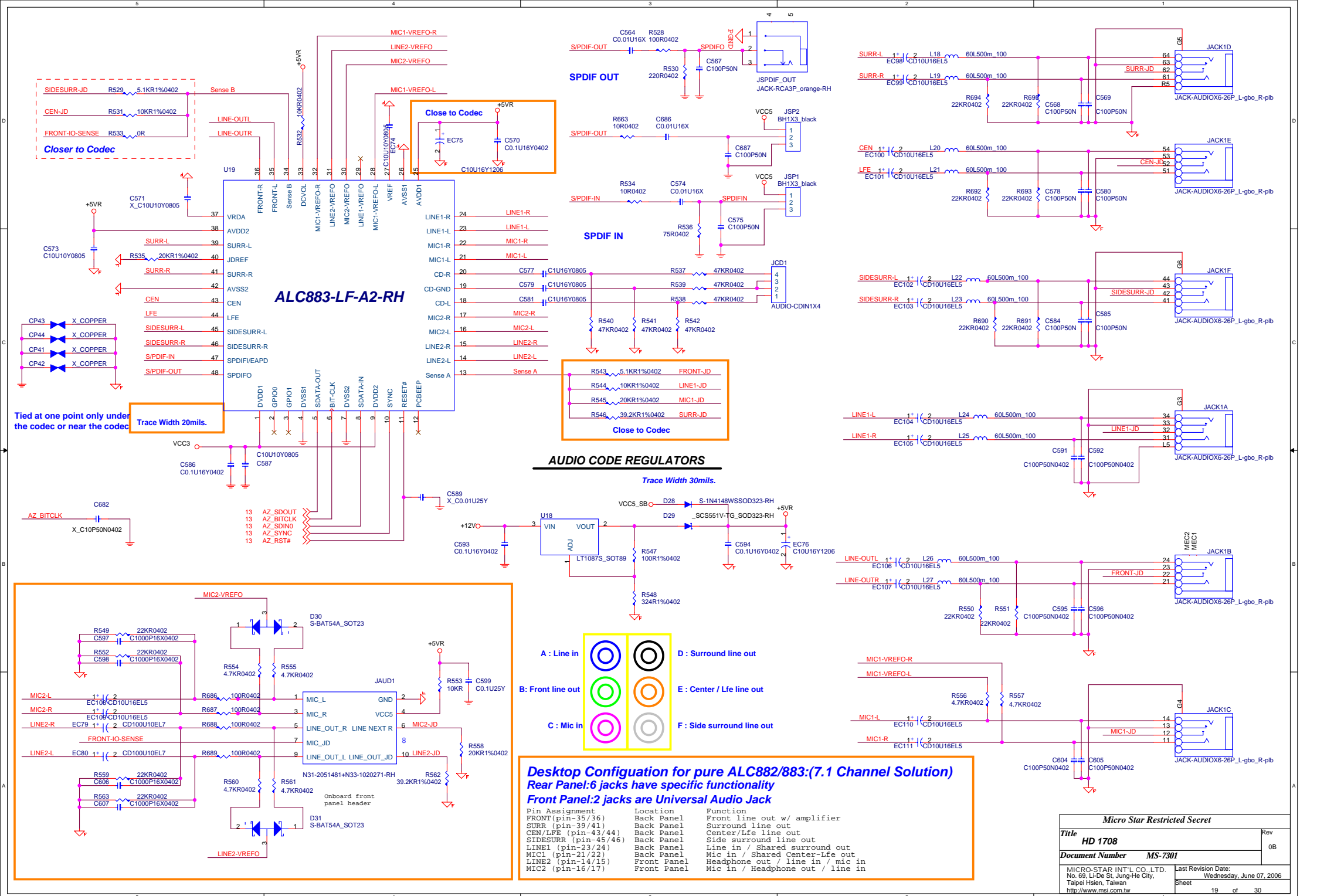


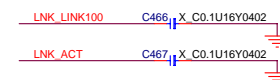
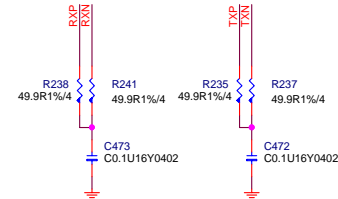
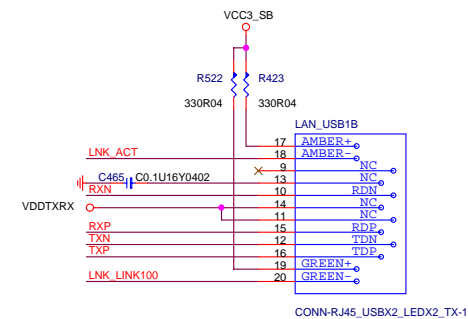
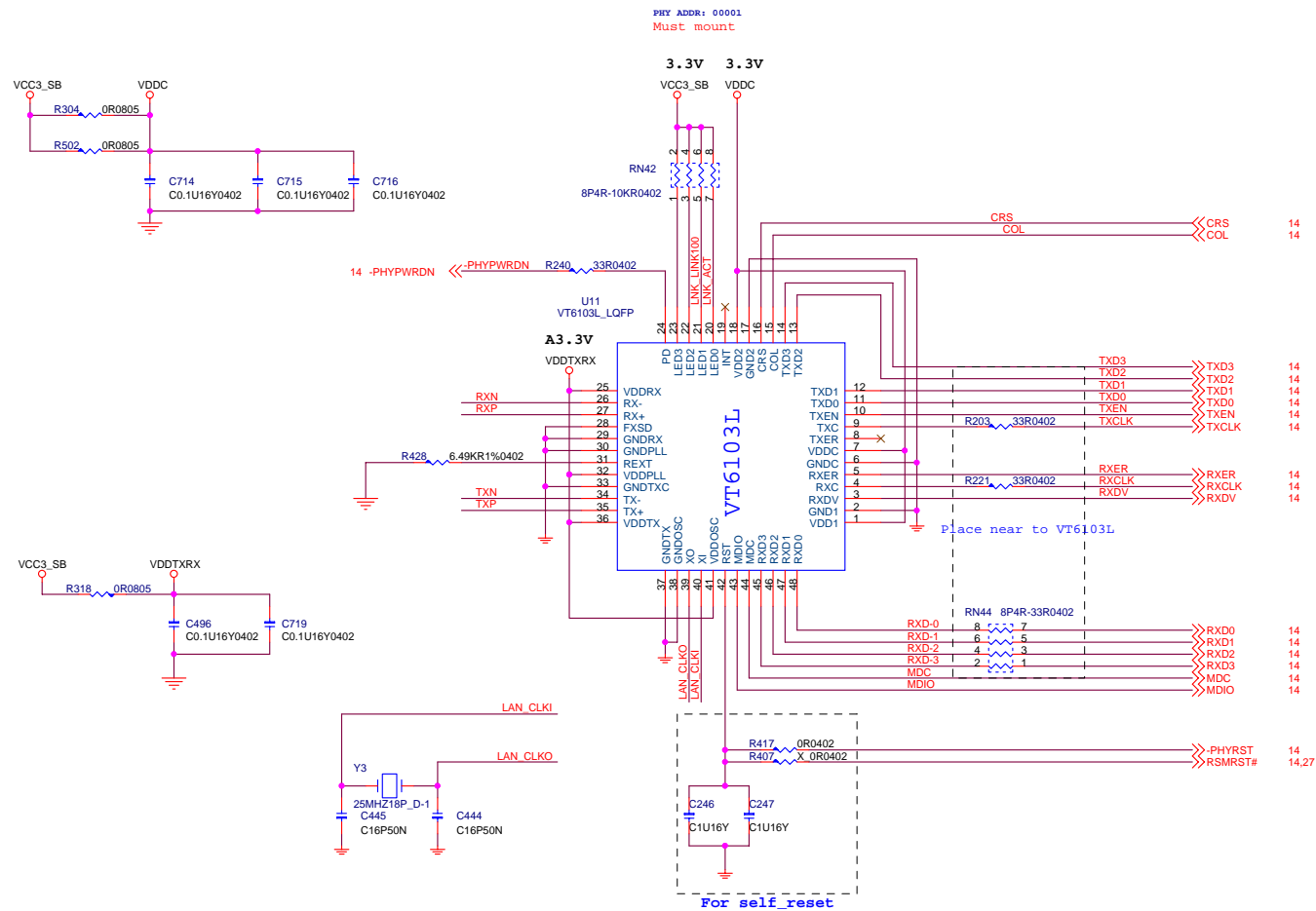
The system board designer determines the pull-up voltage

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|--|---------------------------|-----------|
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## PCI Connectors

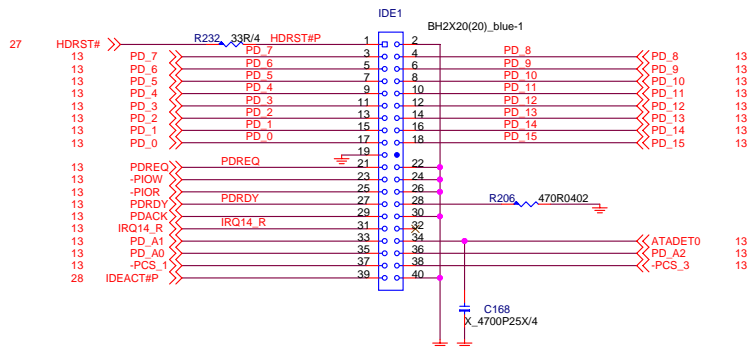




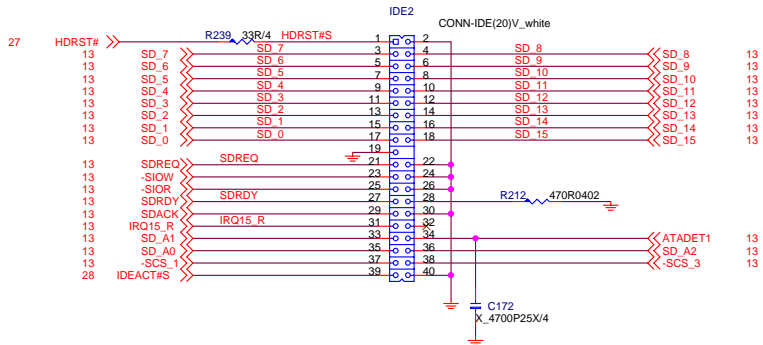


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| Document Number  | MS-7301    | 0B  |
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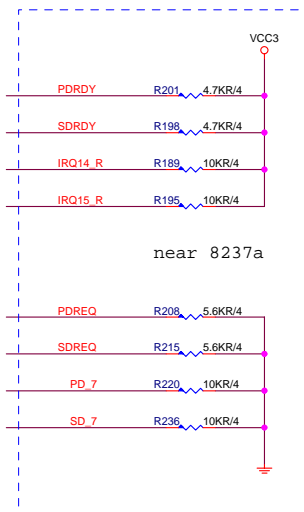
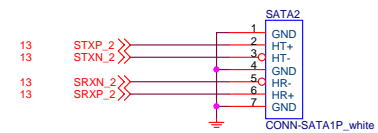
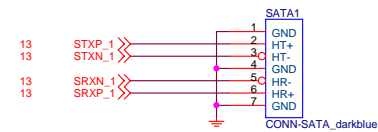
## PRIMARY IDE BLOCK



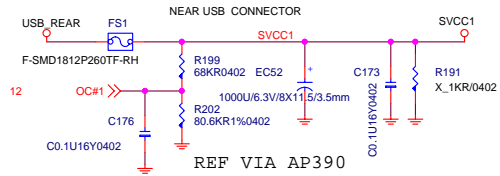
## SECONDARY IDE BLOCK



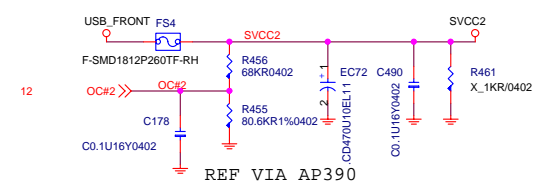
## SERIAL ATA CONNECTOR BLOCK



## POWER CIRCUIT FOR USB PORT 0,1,2,3 (REAR)

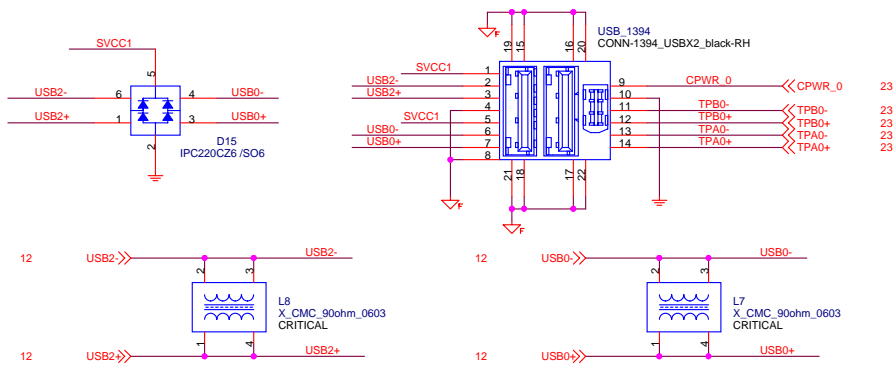


## POWER CIRCUIT FOR USB PORT 4,5,6,7 (FRONT)

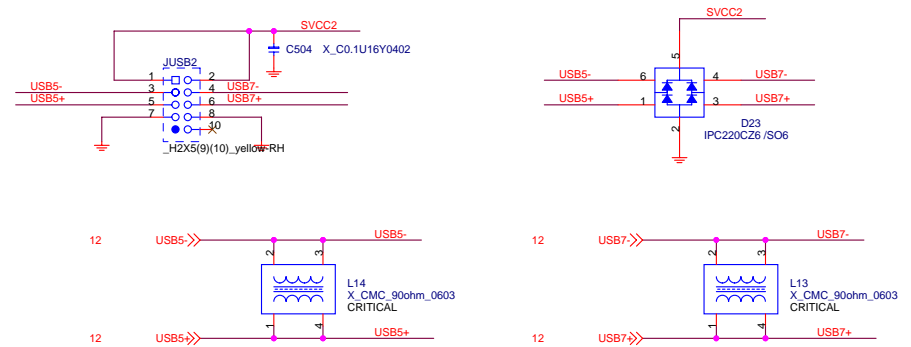


## REAR PANEL USB CONNECTOR FOR USB PORT 0,1 & 1394 PORT

USB Interface  
Diff. Trace width 7.5 mils & 7.5 mils space.  
Diff. & other space 20 mils.  
Length matching: < 150 mils  
Trace length 0" to 17"



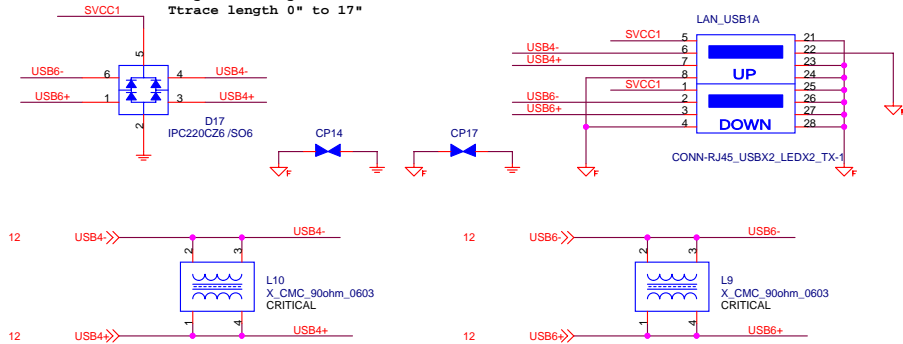
## FRONT PANEL USB CONNECTOR FOR USB PORT 6,7



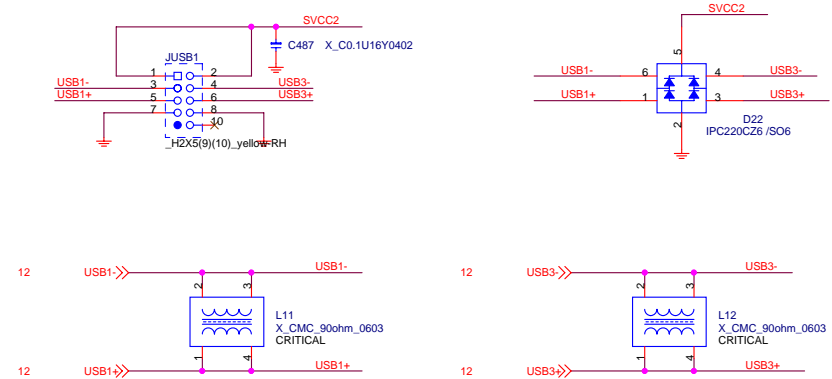
## REAR PANEL USB CONNECTOR FOR USB PORT 2,3

USB Interface  
Diff. Trace width 7.5 mils & 7.5 mils space.  
Diff. & other space 20 mils.  
Length matching: < 150 mils  
Trace length 0" to 17"

NEAR USB CONNECTOR



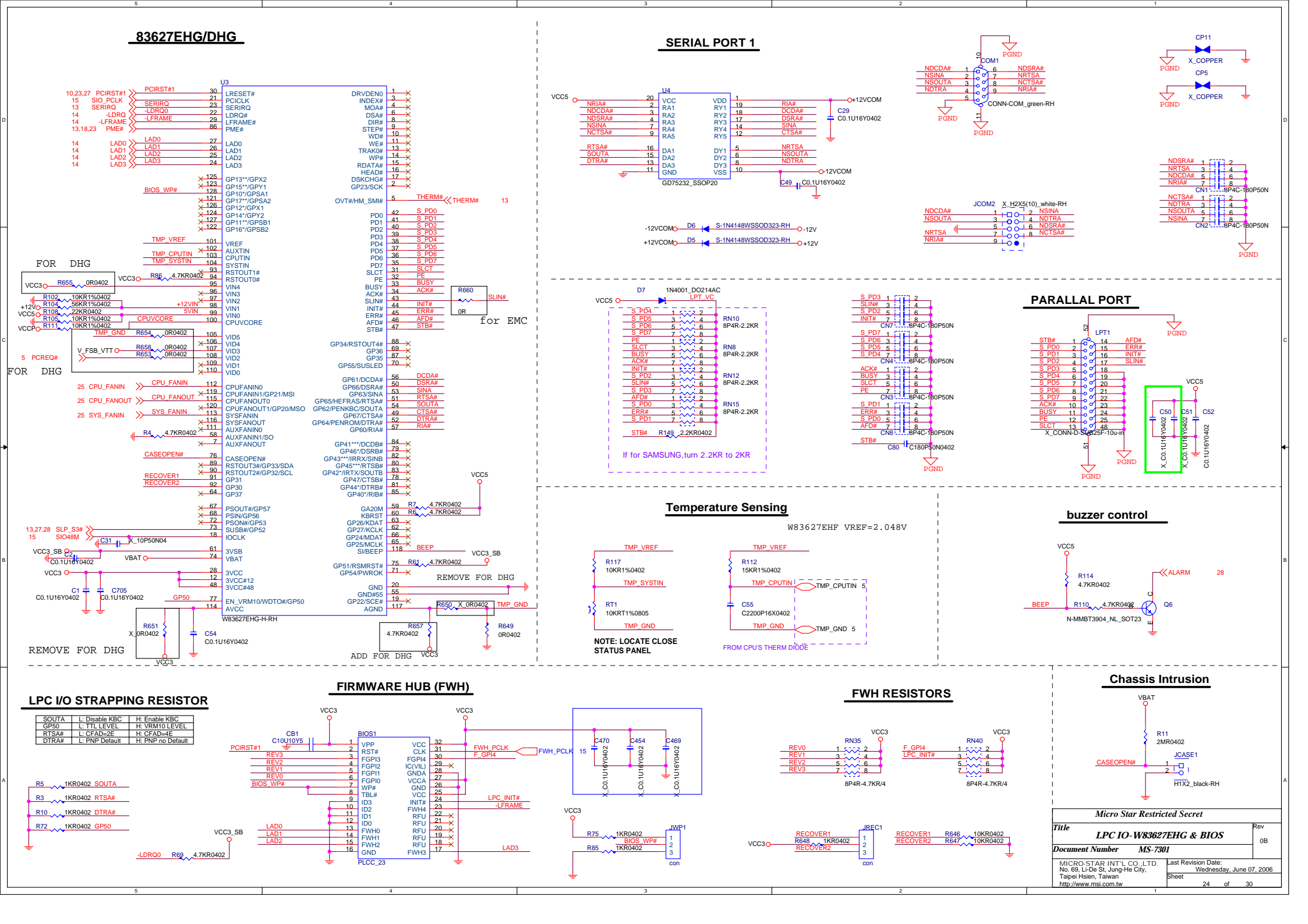
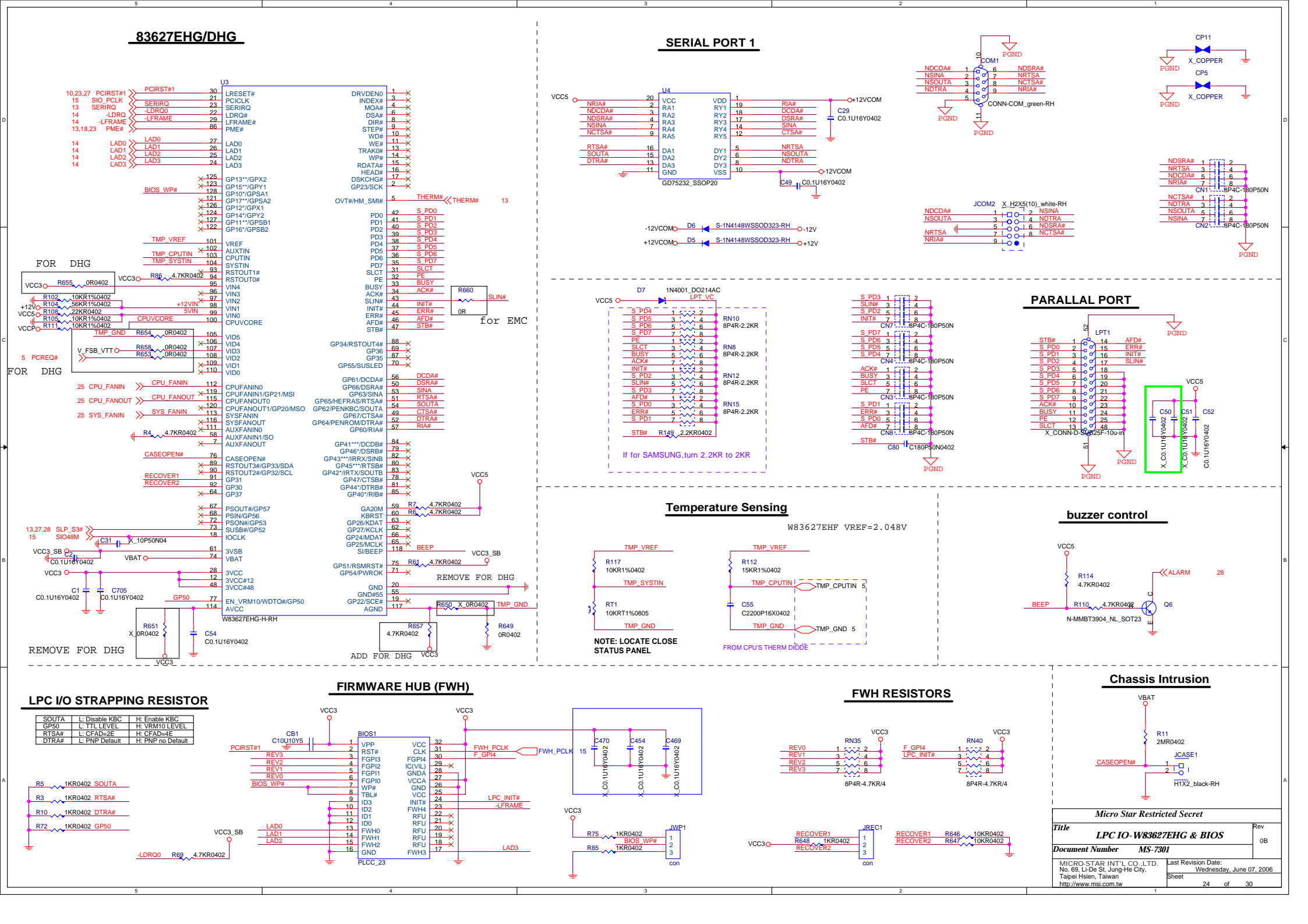
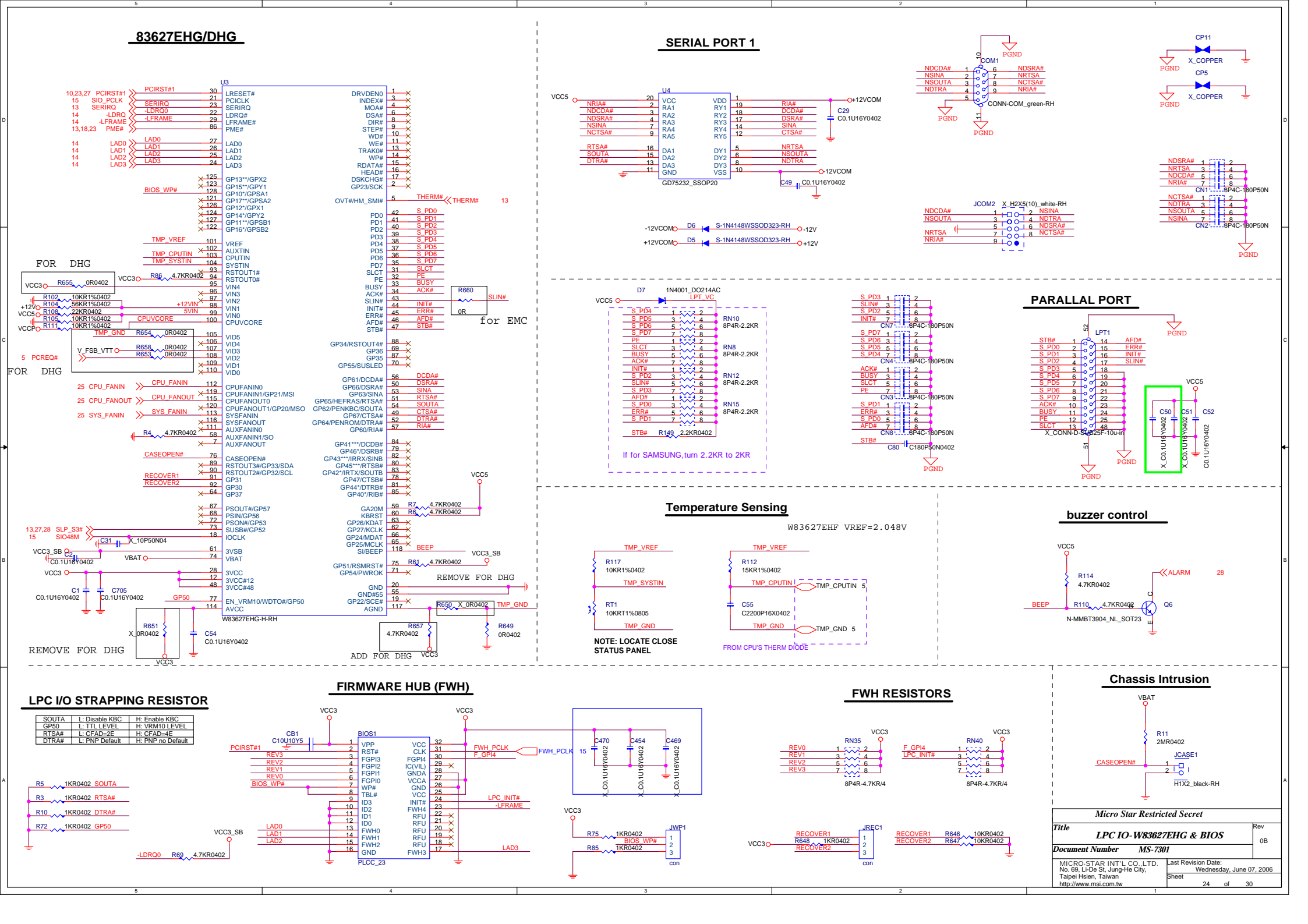
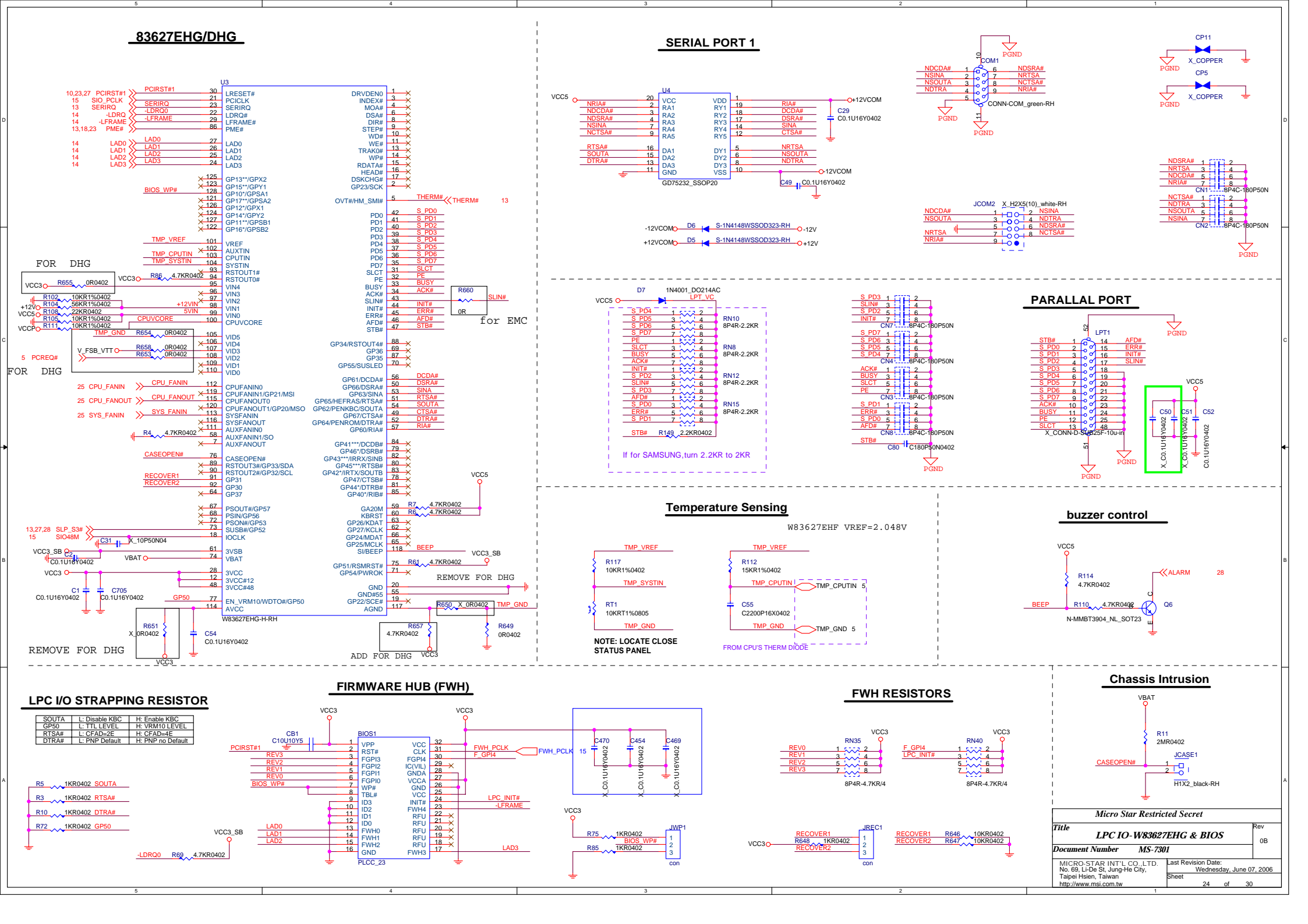
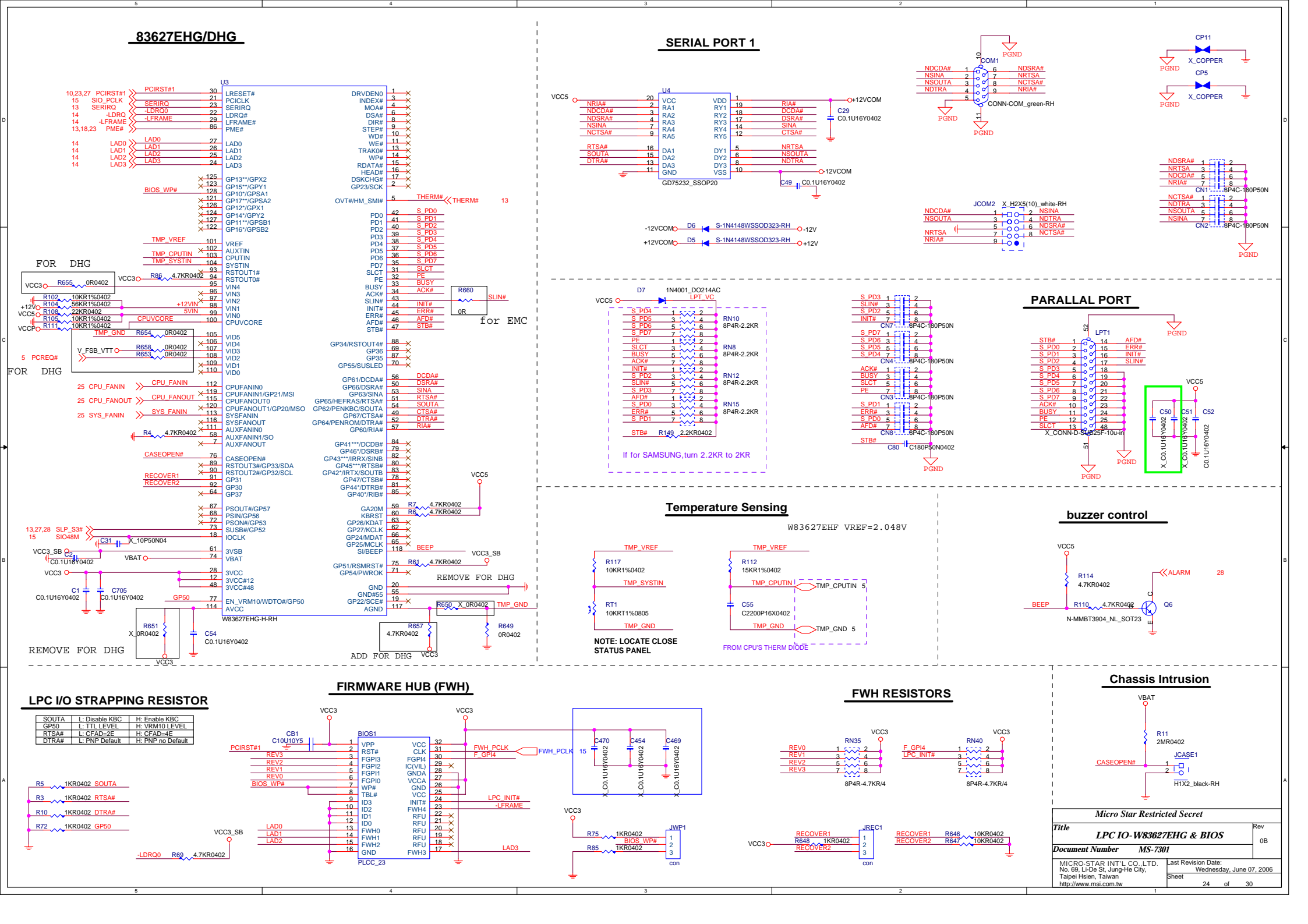
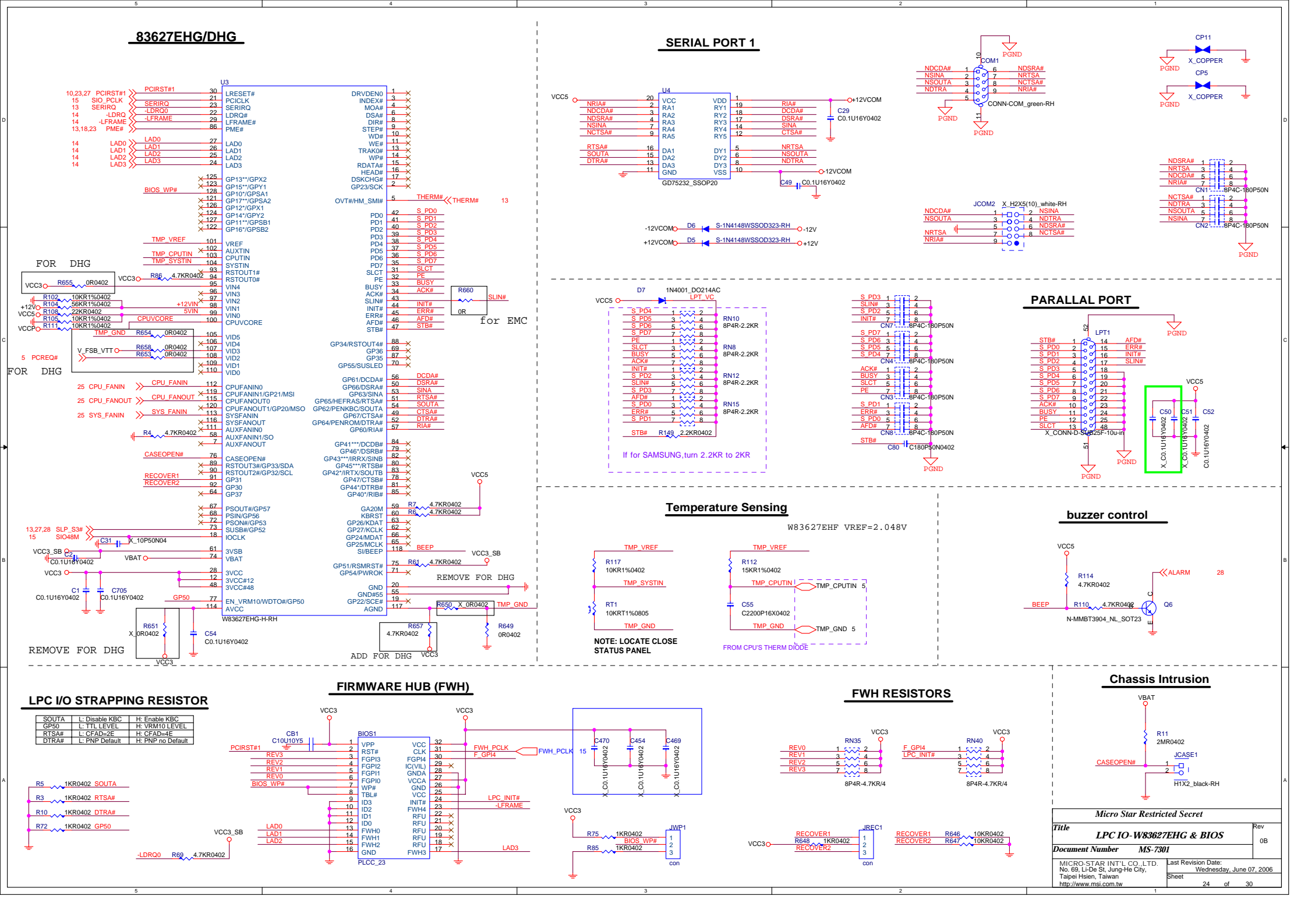
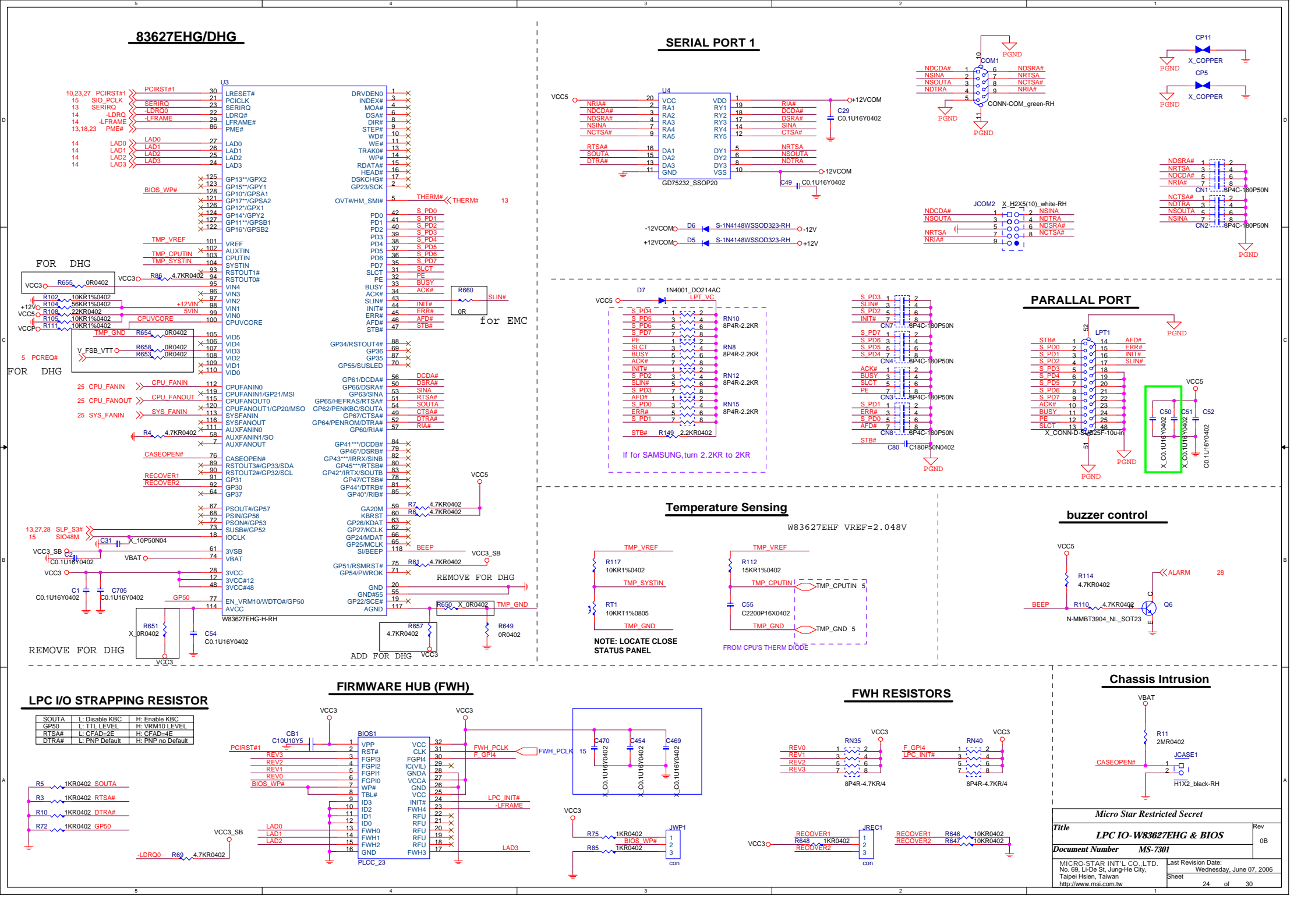
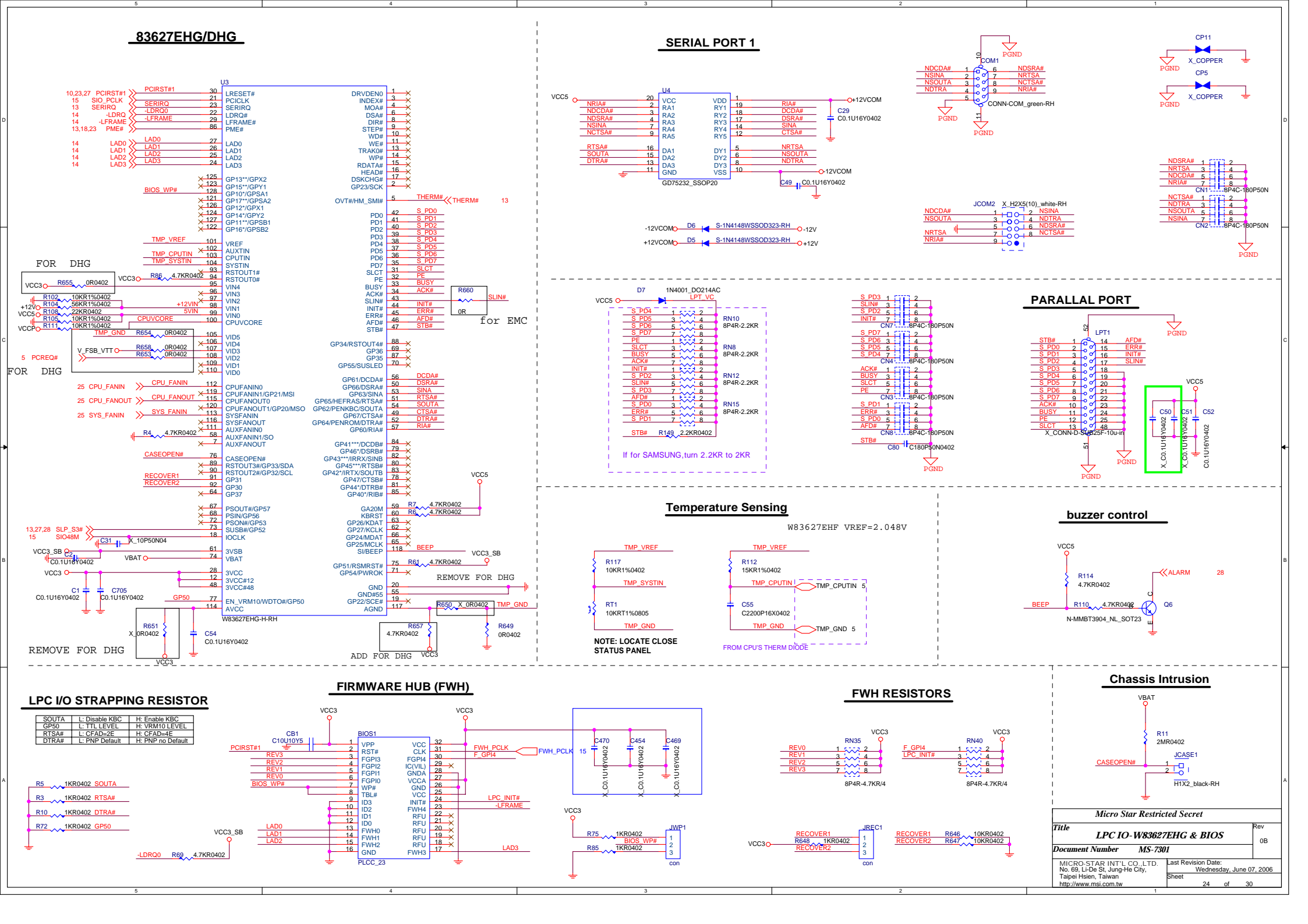
## FRONT PANEL USB CONNECTOR FOR USB PORT 4,5



Micro Star Restricted Secret

| Title  |         | Rev   |
|--|---------|---|
| USB-REAR & FRONT   |         | 0B  |
| Document Number  | MS-7301 |   |
| MICRO-STAR INT'L CO., LTD.<br>No. 69, Li-De St, Jung-Ho City,<br>Taipei Hsien, Taiwan<br><a href="http://www.msi.com.tw">http://www.msi.com.tw</a> |         | Last Revision Date:<br>Wednesday, June 07, 2006<br>Sheet 22 of 30 |

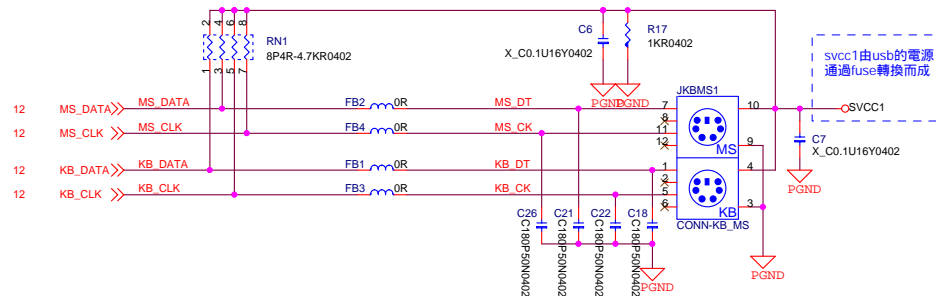




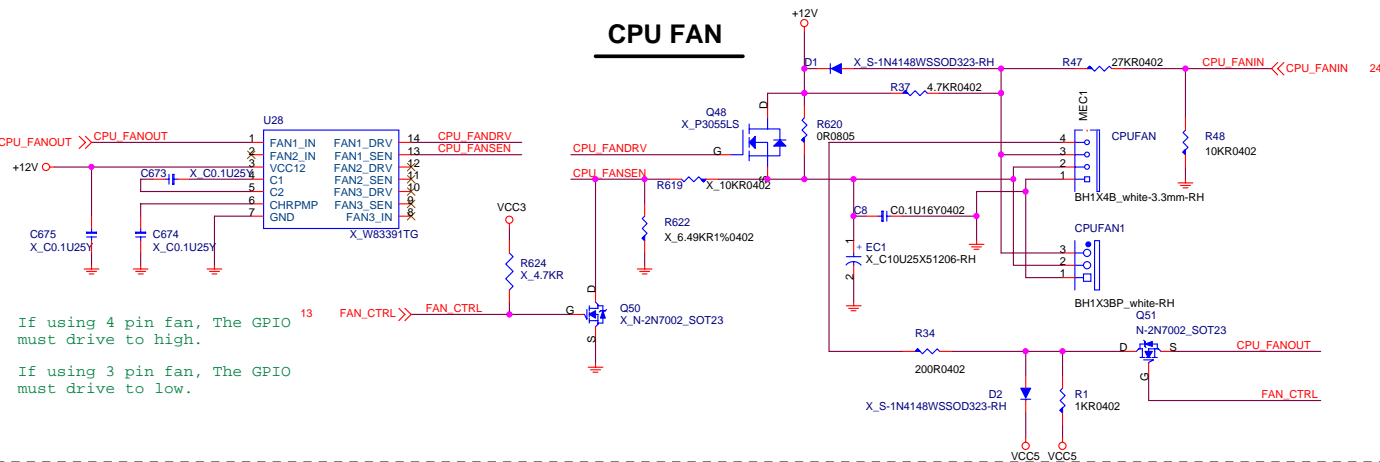


| Fan   | Description |
|-------|-------------|
| Pin 1 | GND         |
| Pin 2 | POWER       |
| Pin 3 | Taco        |
| Pin 4 | PWM         |

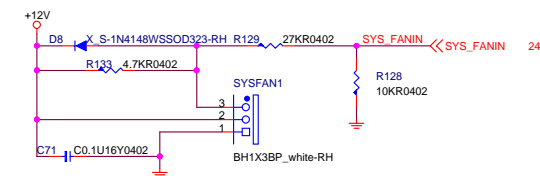
## PS2 KEYBOARD & MOUSE CONNECTOR



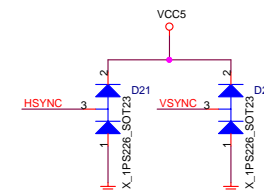
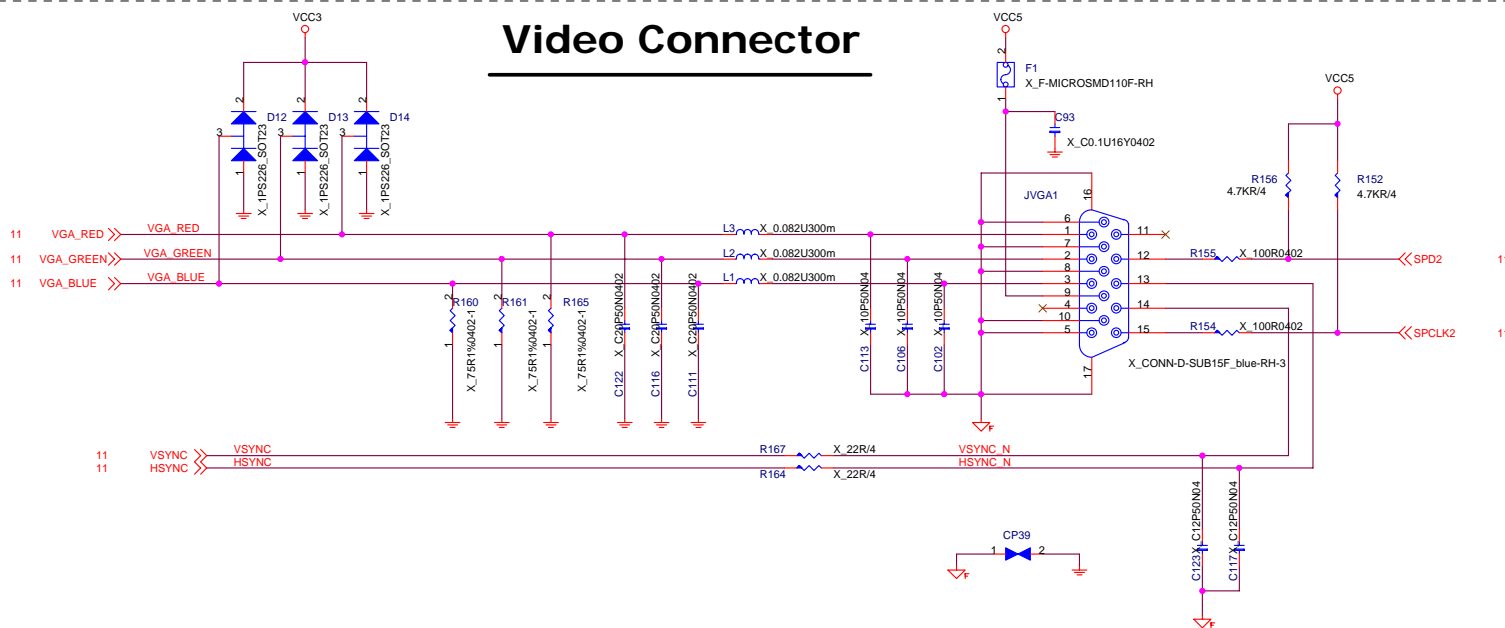
## CPU FAN



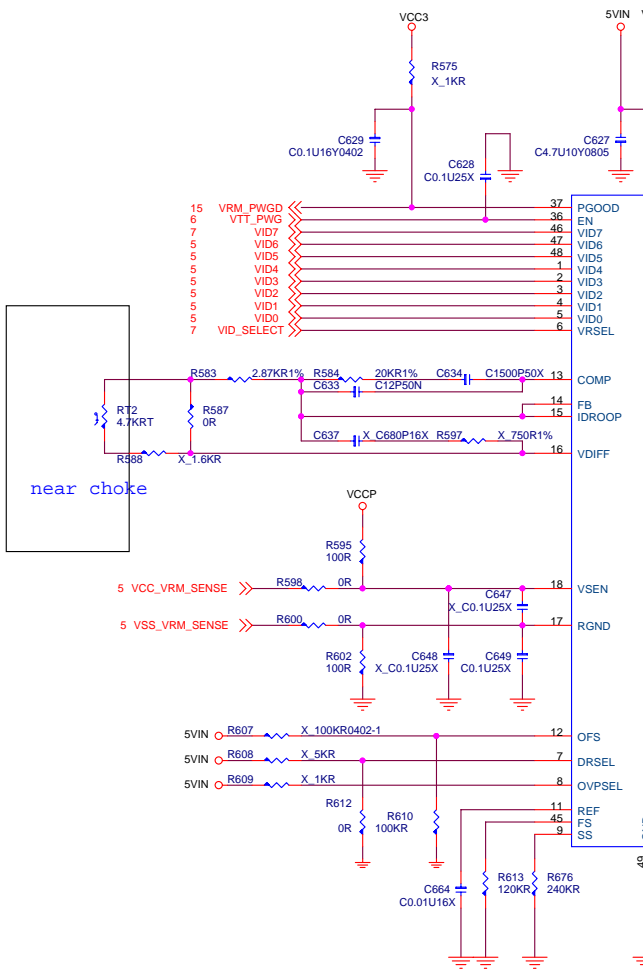
## SYSTEM FAN



## Video Connector

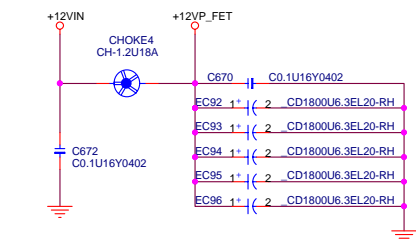
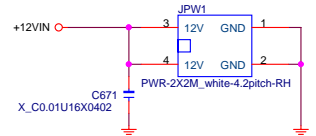


|   |                   |   |
|---|-------------------|---|
| Micro Star Restricted Secret  |                   |   |
| Title   | KB/MS & FAN & VGA | Rev   |
| Document Number   | MS-7301           | 0B  |
| MICRO-STAR INT'L CO., LTD.<br>No. 69, Li-De St, Jung-Ho City,<br>Taipei Hsien, Taiwan |                   | Last Revision Date:<br>Wednesday, June 07, 2006 |
| http://www.msi.com.tw   |                   | Sheet 25 of 30                                  |

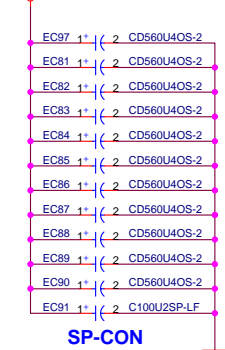


**BOTTOM PAD CONNECT TO GND Through 8 VIAs**

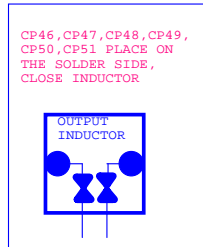
**ATX12V Power Connector**



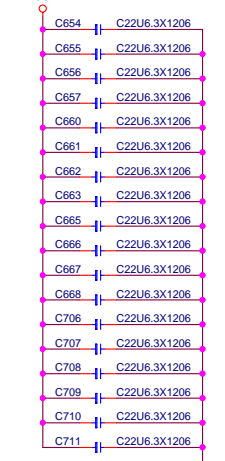
**OS-CON**



**SP-CON**

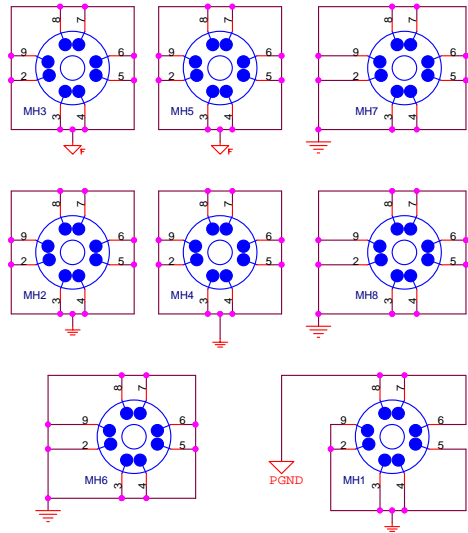
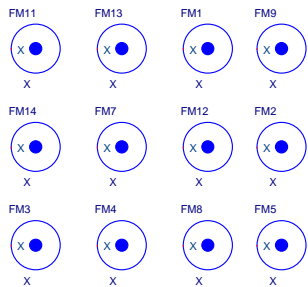
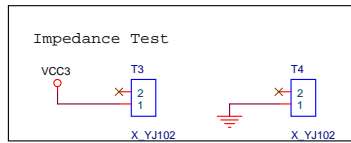


**Ceramic**

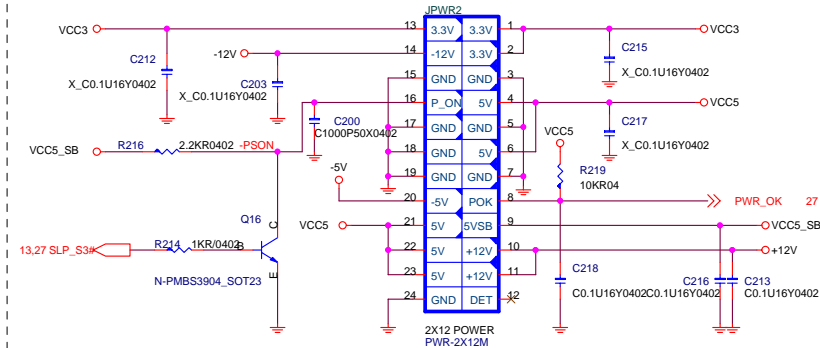


|   |                       |                          |
|---|-----------------------|--------------------------|
| Micro Star Restricted Secret  |                       |                          |
| Title   | VRM-RT8802A+9607+9619 | Rev                      |
| Document Number   | MS-7301               | OB                       |
| MICRO-STAR INT'L CO., LTD.<br>No. 69, Li-De St, Jung-He City,<br>Taipei Hsien, Taiwan |                       |                          |
| Last Revision Date:   |                       | Wednesday, June 07, 2006 |
| Sheet   | 26                    | of 30                    |
| http://www.msi.com.tw   |                       |                          |

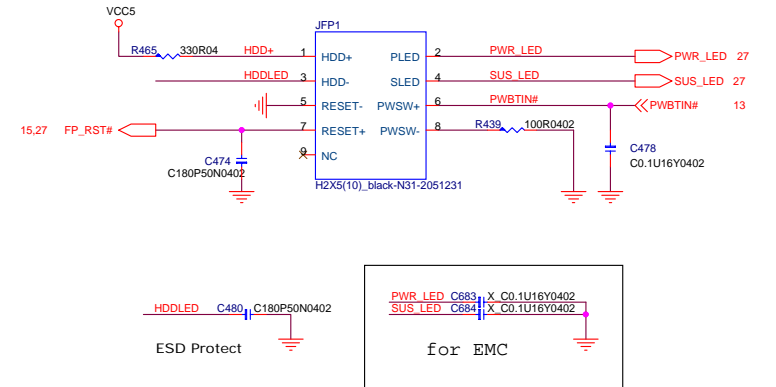




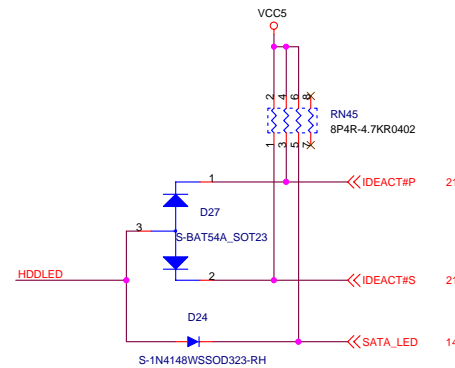
## ATX Connector



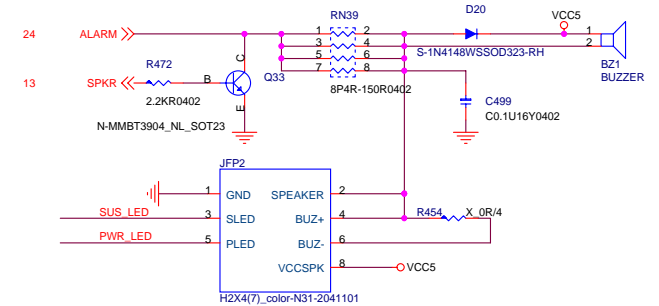
## For MSI / Intel Front Panel



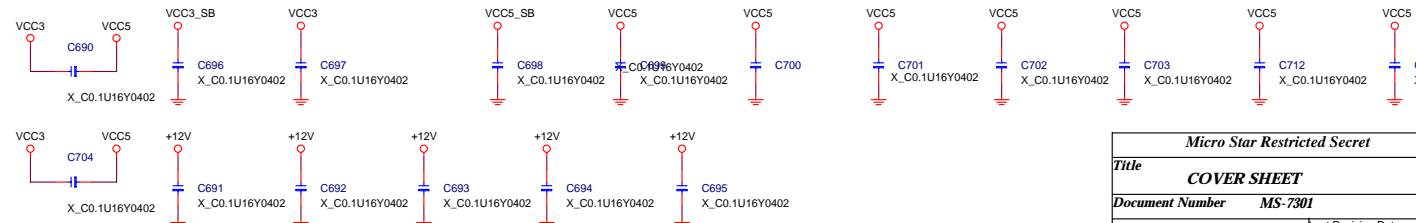
## IDE LED & SERIAL ATA LED



## BUZZER



## For EMI



|  |             |   |
|--|-------------|---|
| Micro Star Restricted Secret   |             |   |
| Title  | COVER SHEET |   |
| Document Number  | MS-7301     | Rev 0B  |
| MICRO-STAR INT'L CO., LTD.<br>No. 69, Li-De St, Jung-He City,<br>Taipei Hsien, Taiwan<br>http://www.msi.com.tw |             | Last Revision Date:<br>Wednesday, June 07, 2006 |
| Sheet  |             | 28 of 30  |

MS-7301-0A bug history list

|   |  |            |
|---|--|------------|
| 1 | change RN44 singals to solve the swap error  | 2006.05.05 |
| 2 | add a 240k resistor at u27 pin 9 to gnd to solve the vcore =0  | 2006.05.11 |
| 3 | add a 100OMH resistor PULL HIGH THE SIGNAL"CPU_GD"FOR MS7 CPU _GD PIN IS OD PIN R134                         | 2006.05.12 |
| 4 | SLP#,STPCLK,NMI_SB,A20M#,SML,HINIT,IGNNE,INTR,FERR# AT SB SIDE ARE OD PINS NEED TO PULL HIGH TO VTT_OUT_LEFT | 2006.05.12 |
| 5 | change cpu fan for block pin error   | 2006.05.15 |
| 6 | changer391 to r389 for enable lan ceprom   | 2006.05.15 |
| 7 | changer458 to r457 for via ap note   | 2006.05.15 |
| 8 | add r428 for enable lan function   | 2006.05.15 |
| 9 | add vcc3_sb to lan tx isingals for enable lan function   | 2006.05.15 |