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# MS-7024 **IBM Wellfleet**

**Version 130**

Intel (R) Springdale (GMCH) + ICH5 Chipset  
Intel Northwood & Prescott mPGA478B Processor

## CPU:

**Intel Northwood/Prescott - 3.0G & Above**

## System Chipset:

**Intel Springdale - GMCH (North Bridge)  
Intel ICH5 (South Bridge)**

## On Board Chipset:

**BIOS -- FWH EEPROM  
AC'97 Codec -- AD1981B  
LPC Super I/O -- LPC47M233  
LAN -- I82562EZ(10/100) / I82541EI(Giga)  
CLOCK -- Cypress CY28405**

## Main Memory:

**DDR \* 2 (Max 2GB)**

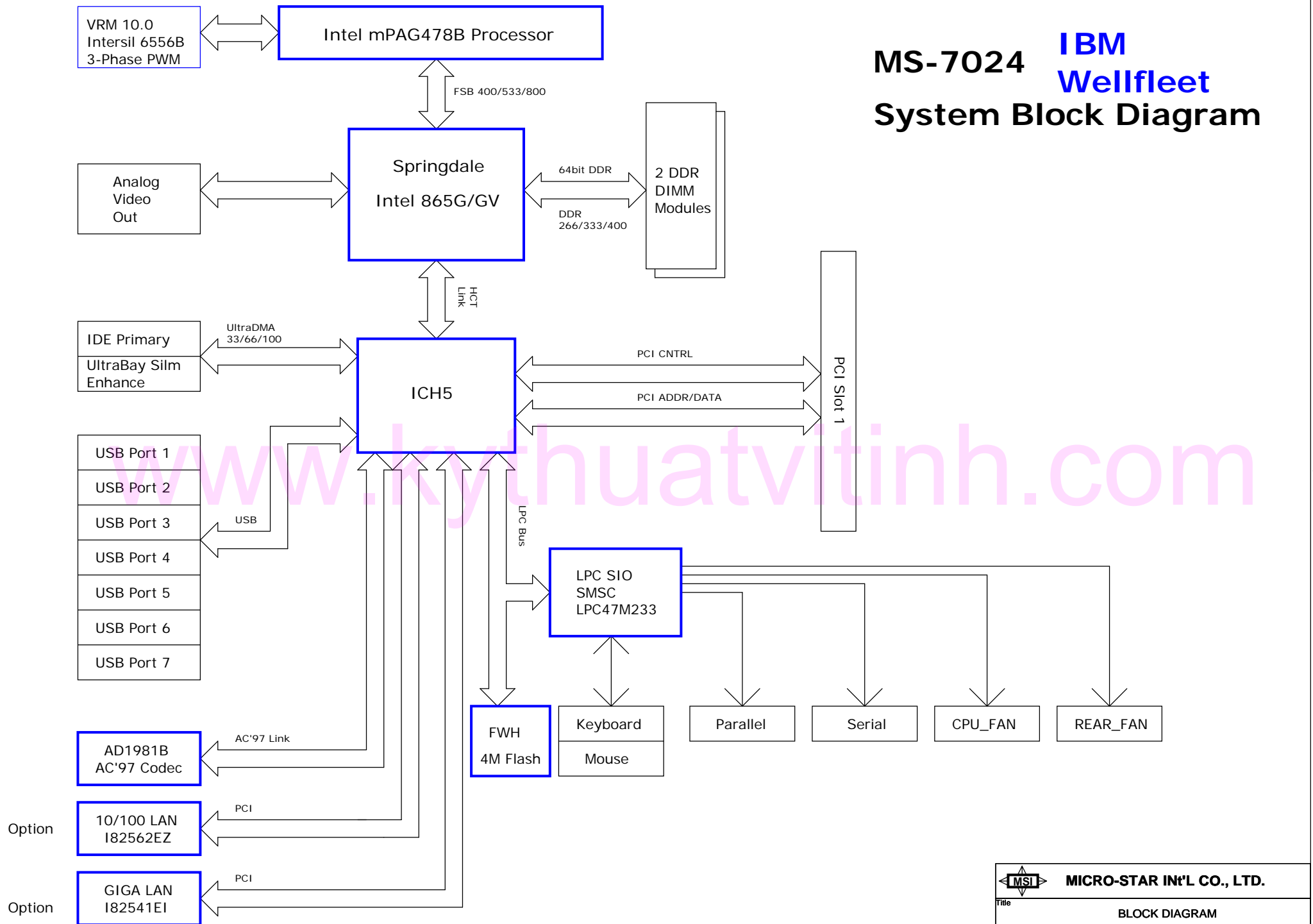
## PCI Slots:

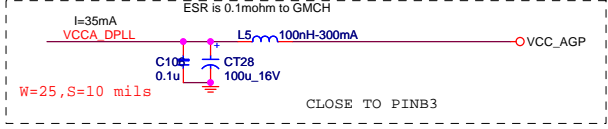
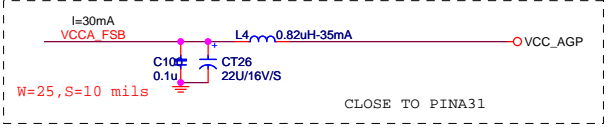
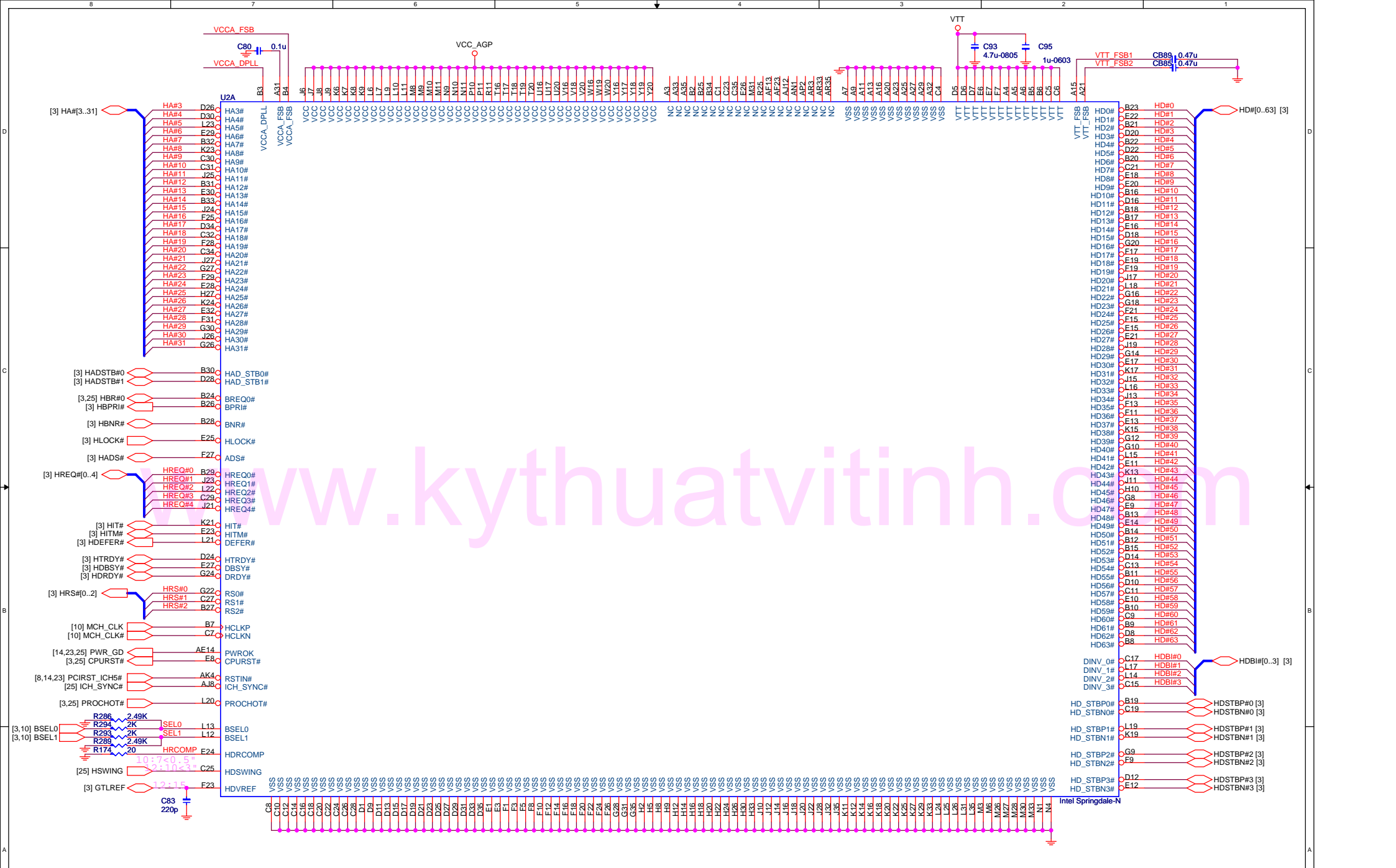
**PCI2.3 SLOT \* 1**

## Intersil PWM:

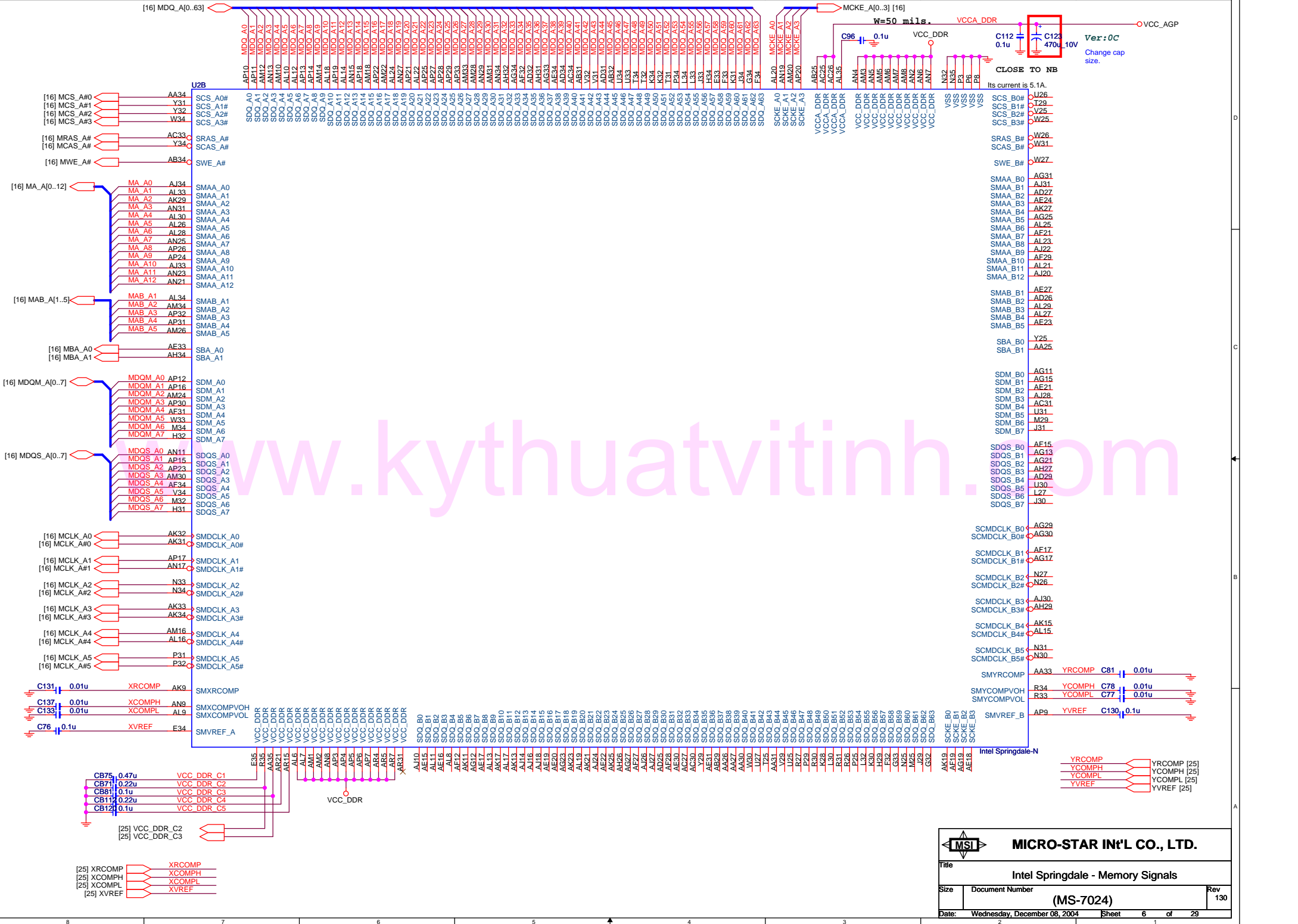
**Controller: HIP6556B (HIP6565)  
Driver: HIP6602B \*1 / HIP6601B \* 1**

# MS-7024 **IBM Wellfleet** System Block Diagram





|  |                              |               |
|--|------------------------------|---------------|
| <b>MSI</b>                                     |                              |               |
| <b>MICRO-STAR IN'L CO., LTD.</b>               |                              |               |
| Title<br><b>Intel Springdale - CPU Signals</b> |                              |               |
| Size   | Document Number              | Rev           |
|  | <b>(MS-7024)</b>             | 130           |
| Date:  | Wednesday, December 08, 2004 | Sheet 5 of 29 |

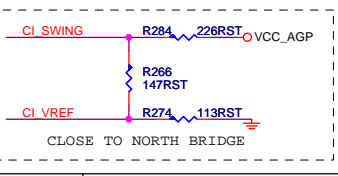
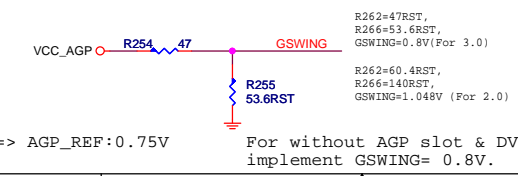
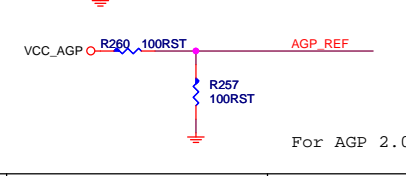
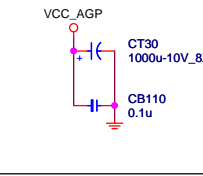
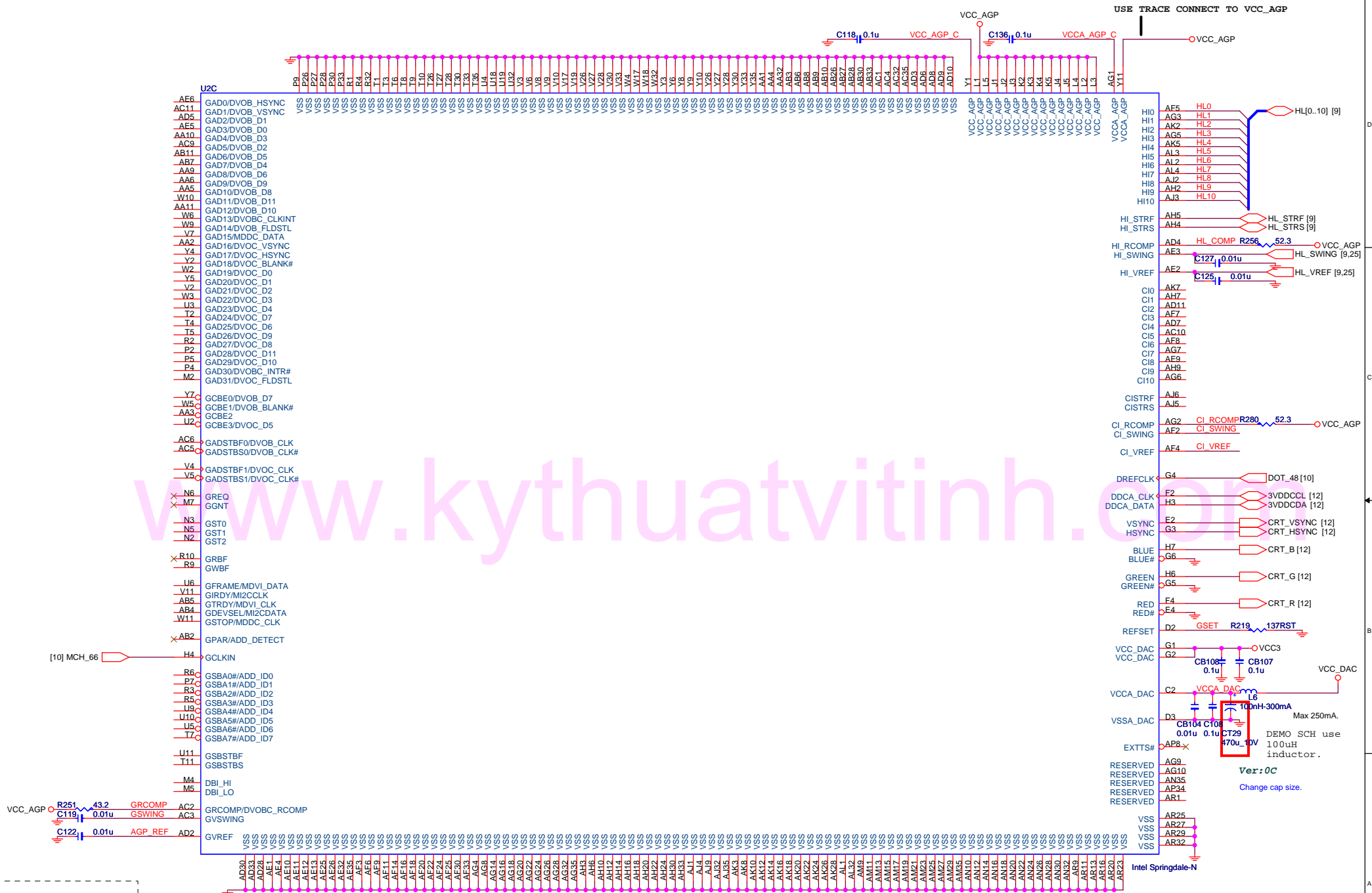


**MICRO-STAR INT'L CO., LTD.**

Title: Intel Springdale - Memory Signals

|      |                 |           |         |
|------|-----------------|-----------|---------|
| Size | Document Number | (MS-7024) | Rev 130 |
|------|-----------------|-----------|---------|

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For AGP 2.0 => AGP\_REF:0.75V

For without AGP slot & DVI implement GSWING= 0.8V.

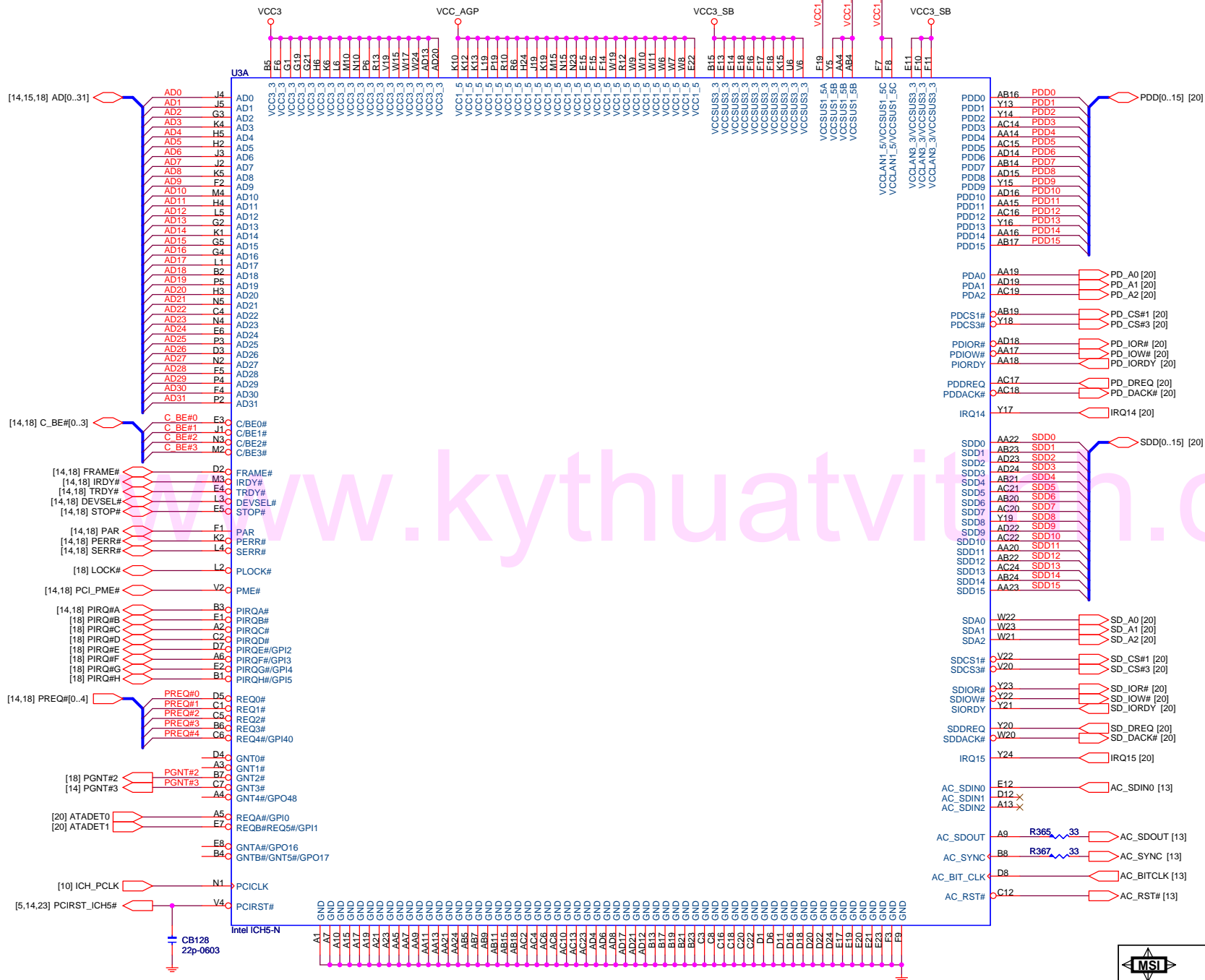
CLOSE TO NORTH BRIDGE

**MSI** MICRO-STAR IN'L CO., LTD.

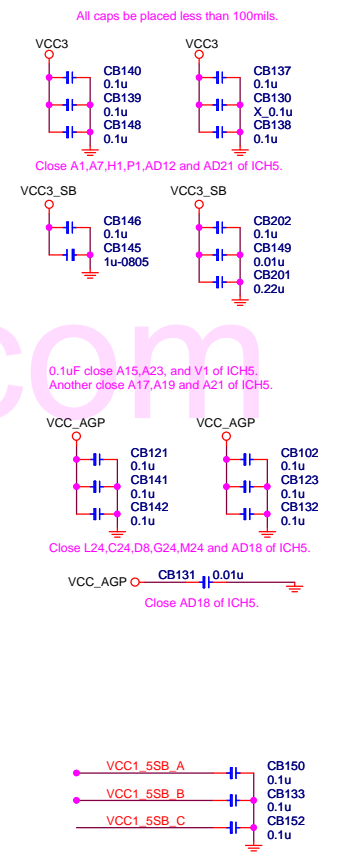
Title: Intel Springdale - AGP & HLink & LAN Signals

|      |                 |     |
|------|-----------------|-----|
| Size | Document Number | Rev |
|      | (MS-7024)       | 130 |

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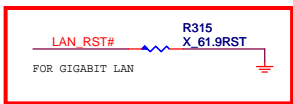
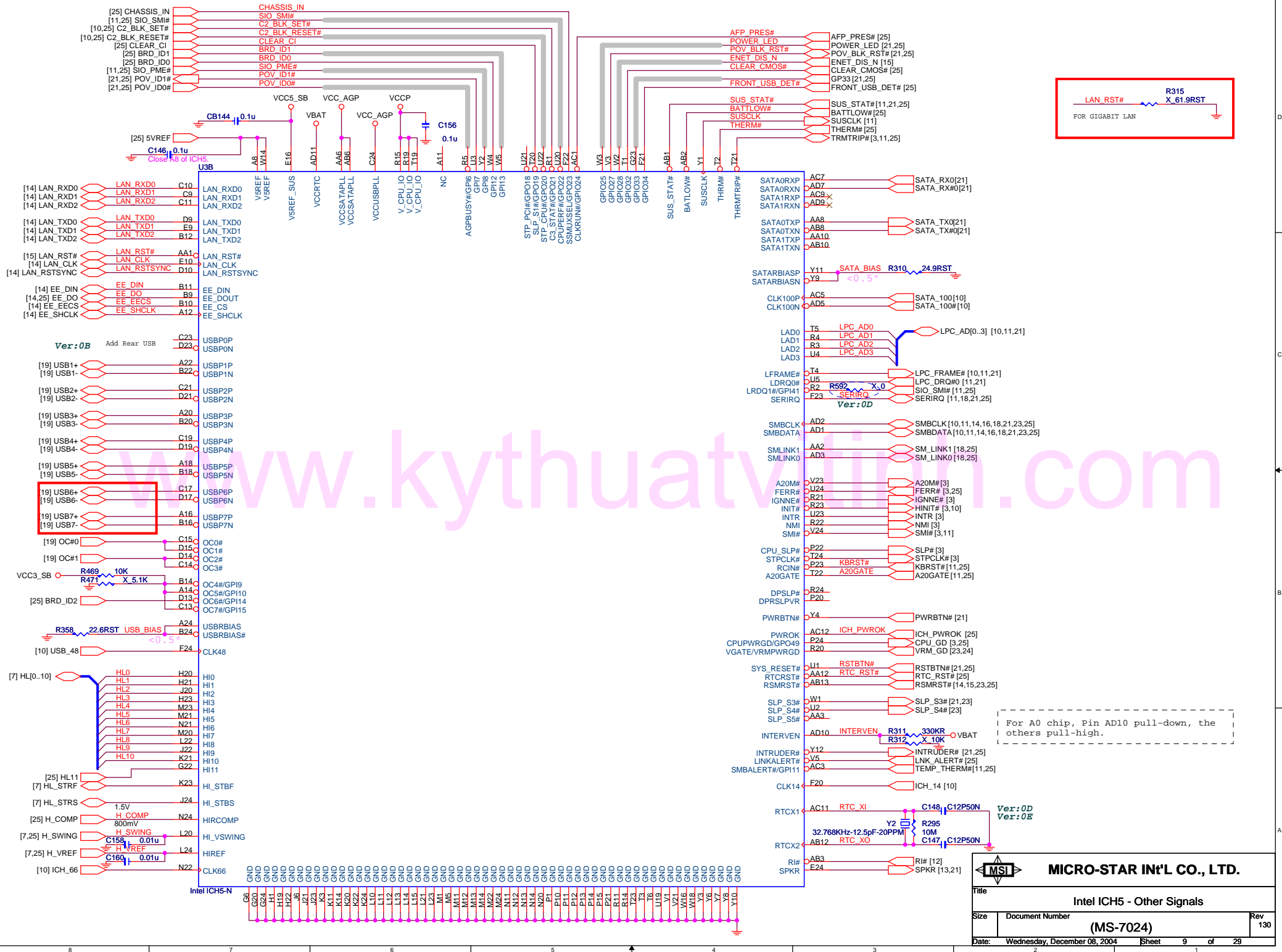


### ICH5 Decoupling Capacitors



**MICRO-STAR IN'L CO., LTD.**

|                                       |                              |               |
|---------------------------------------|------------------------------|---------------|
| Title                                 |                              |               |
| Intel ICH5 - PCI & IDE & AC97 Signals |                              |               |
| Size                                  | Document Number              | Rev           |
|                                       | <b>(MS-7024)</b>             | 130           |
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For A0 chip, Pin Ad10 pull-down, the others pull-high.

**MSI**

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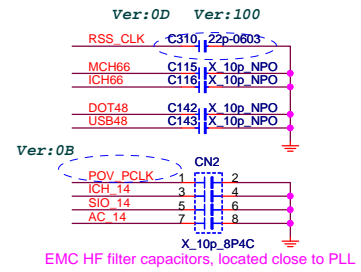
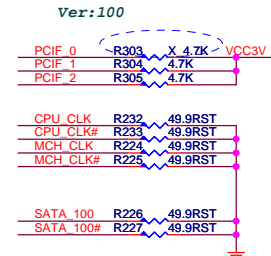
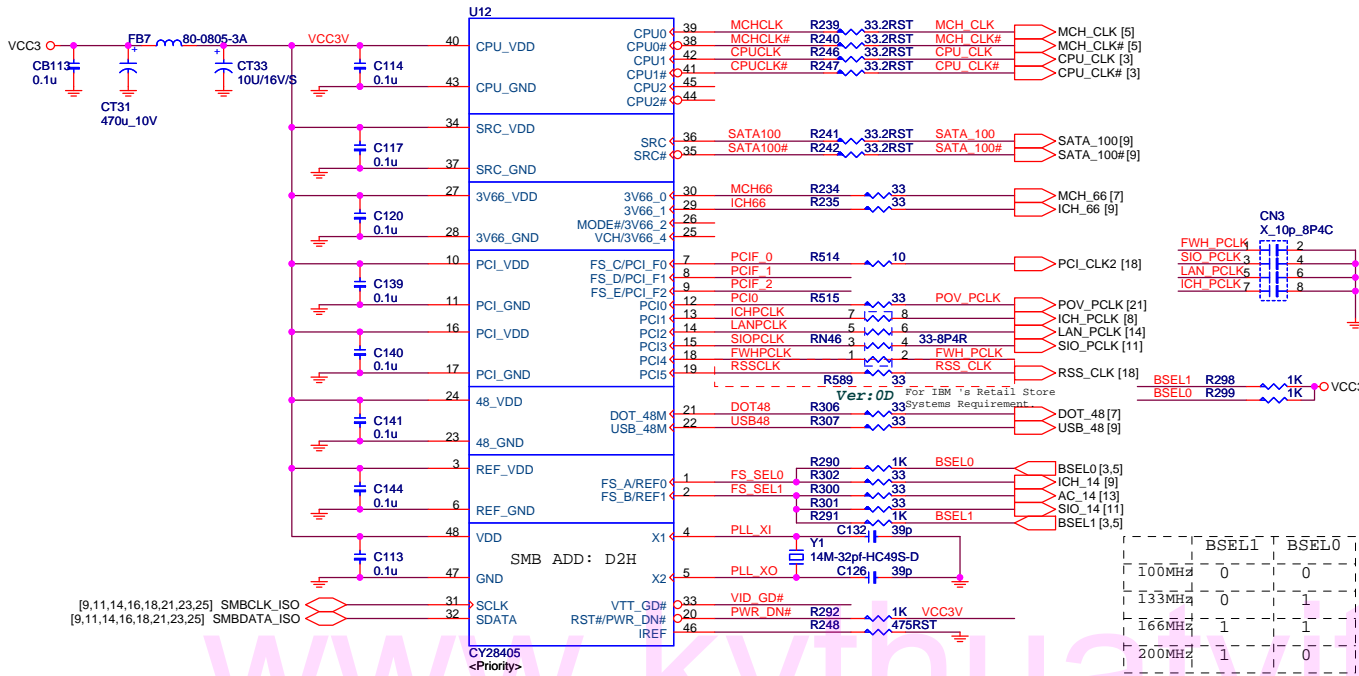
Title: Intel ICH5 - Other Signals

|      |                 |     |
|------|-----------------|-----|
| Size | Document Number | Rev |
|      | (MS-7024)       | 130 |

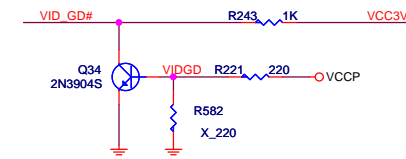
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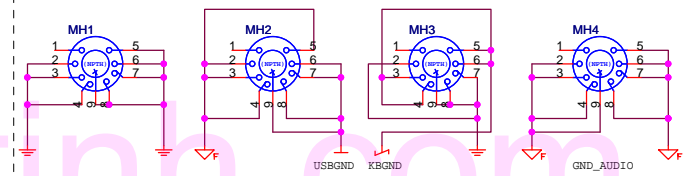
### CLOCK GENERATOR



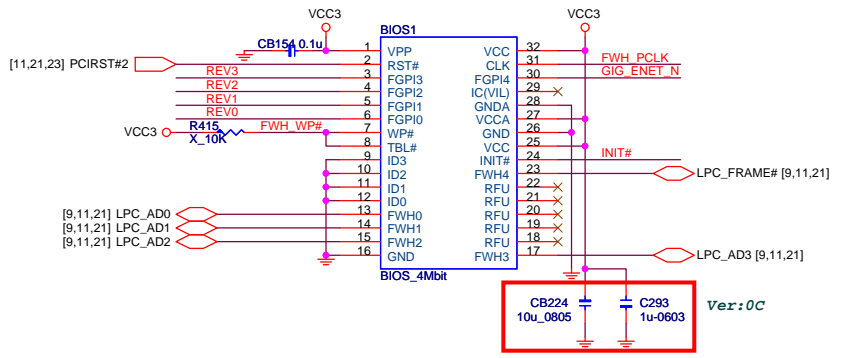
### CLOCK GENERATOR VTT POWER DOWN BLOCK



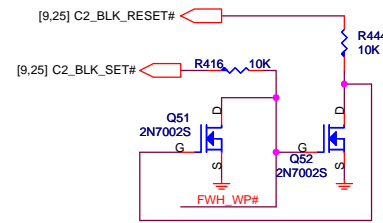
### Mounting Holes



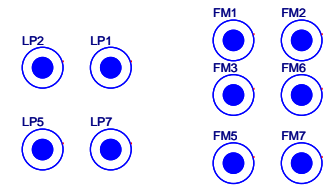
### FIRMWARE HUB (FWH)



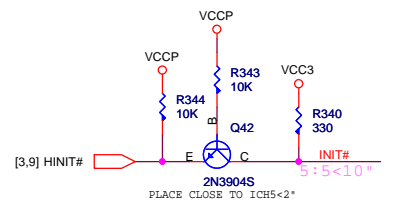
### FWH WRITE PROTECT CIRCUIT



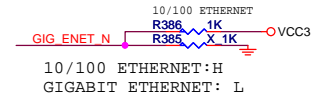
### Optics Orientation Holes



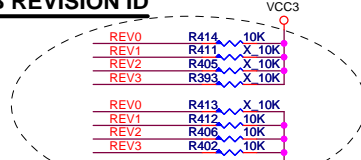
### FWH INIT Signal Voltage Translation



### ETHERNET STRAPPING RESISTORS

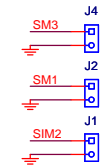


### PCB REVISION ID



Ver:1.3 Change the PCB Revision ID from 0000b to 0001b by pulling REV0 up (R414) instead of down (R413).

### Simulation



**MICRO-STAR IN'L CO., LTD.**

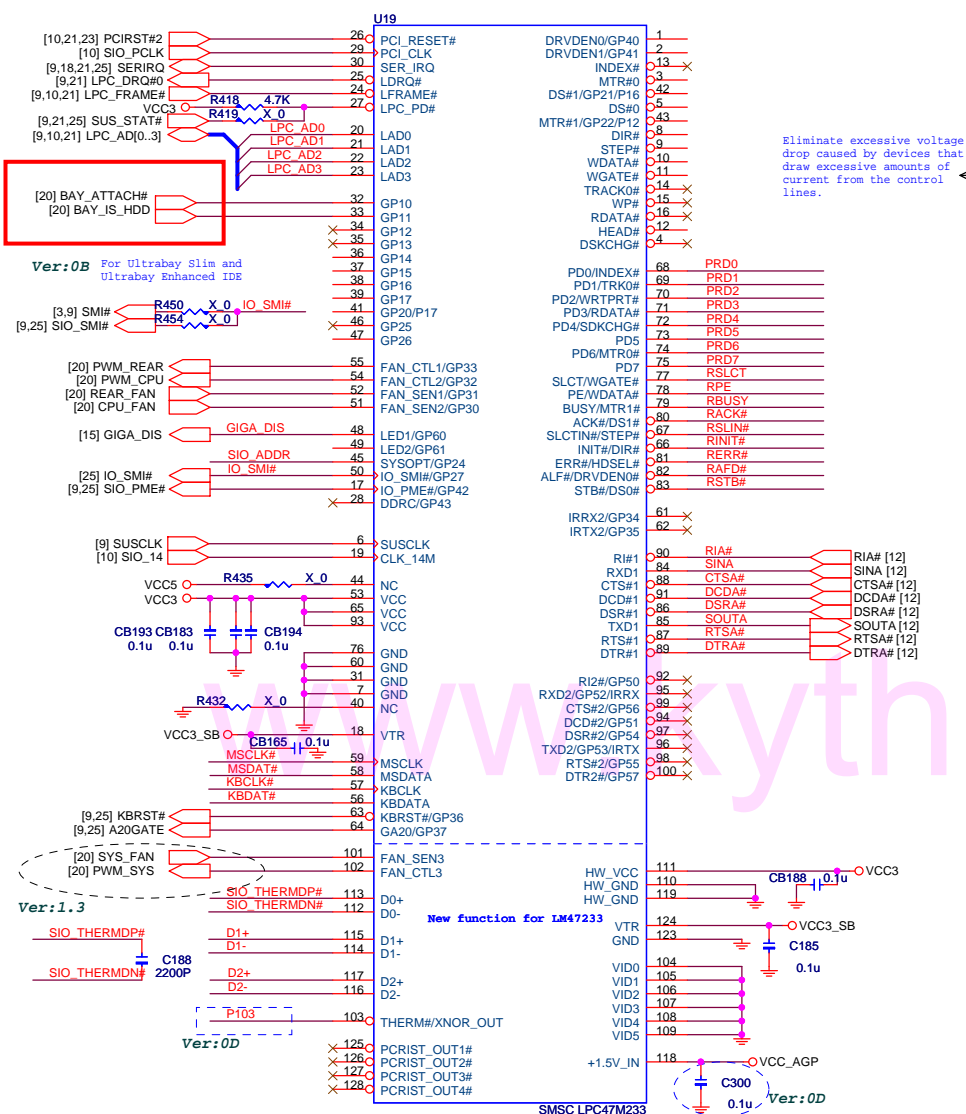
Title: CY28405 & FWH

Size: Document Number (MS-7024) Rev 130

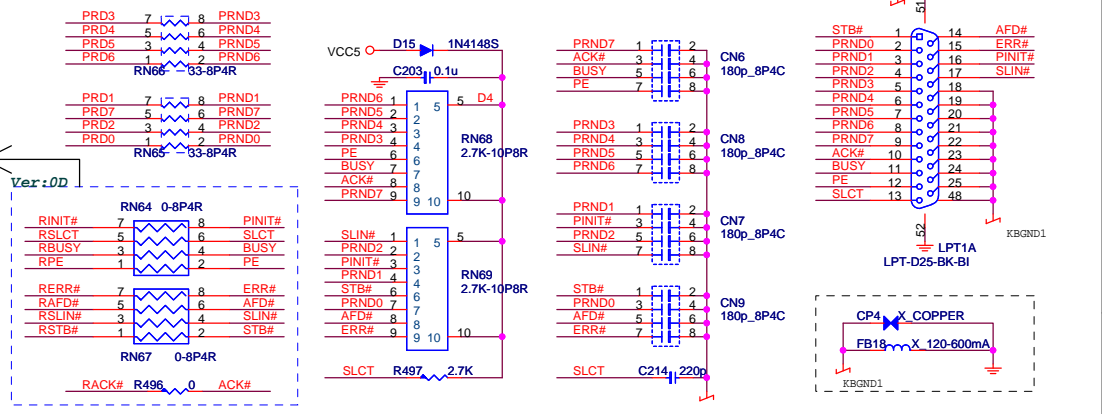
Date: Wednesday, December 08, 2004 Sheet 10 of 29



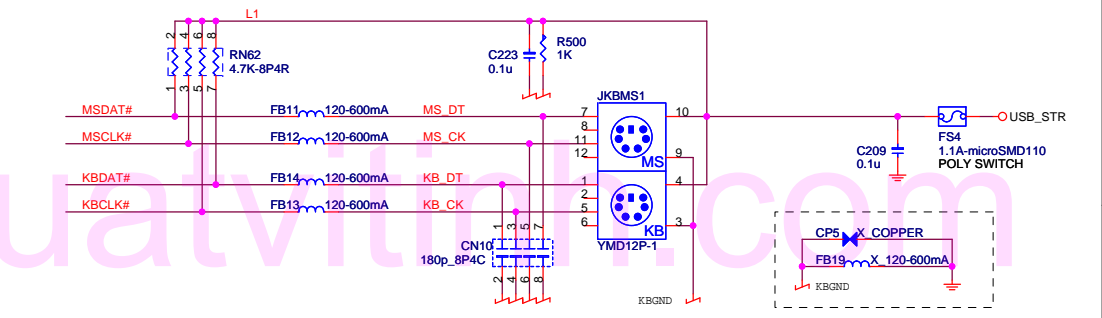
### LPC SUPER I/O LPC47M233



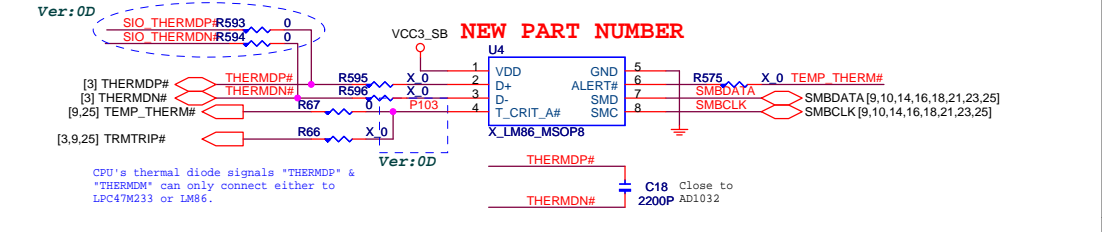
### PARALLEL PORT



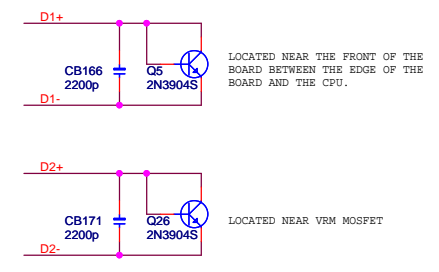
### PS2 KEYBOARD & MOUSE CONNECTOR



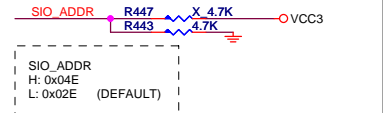
### ADI 1032 TEMPERATURE SENSOR



### REMOTE TEMPERATURE SENSOR



### STRAPPING RESISTOR



**MSI** **MICRO-STAR IN'L CO., LTD.**

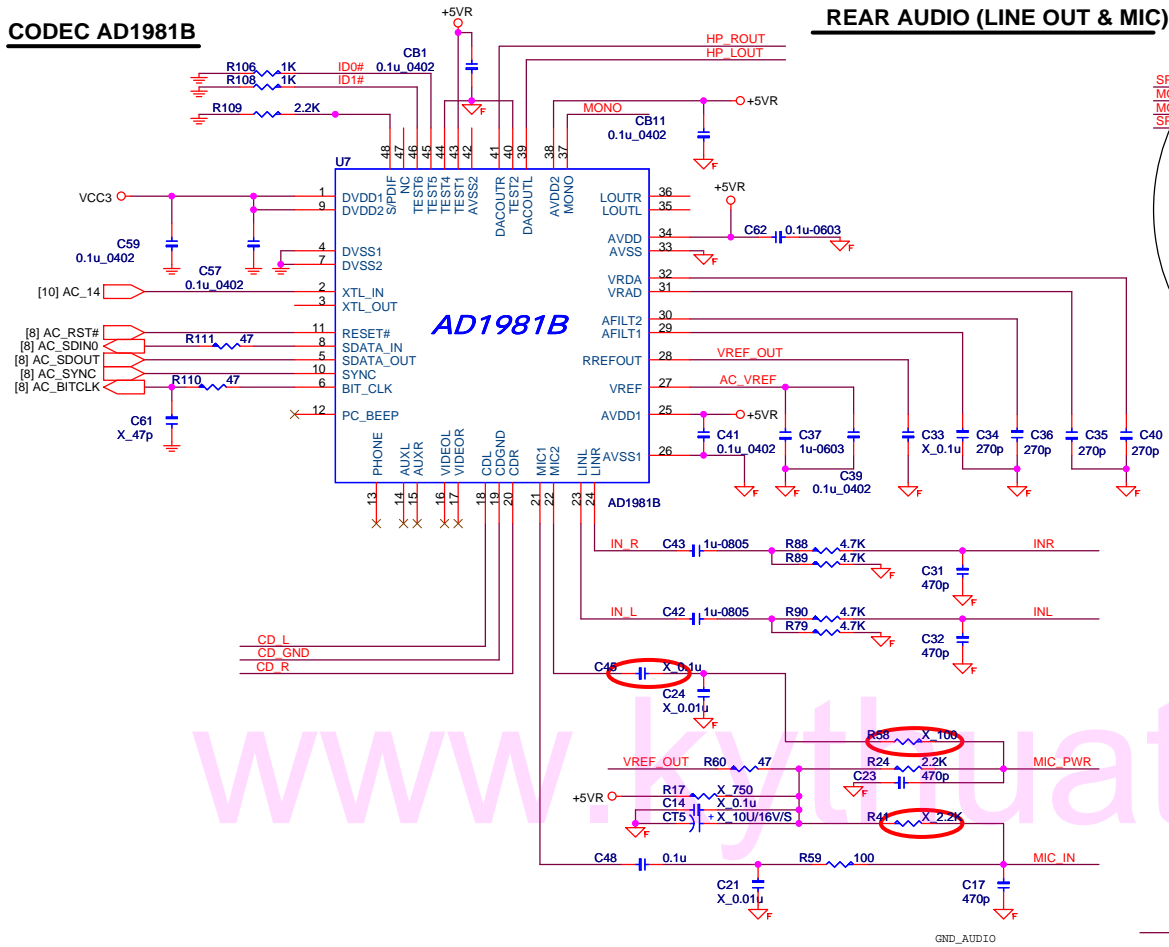
Title: **LPC SUPER I/O & CONNECTORS**

Size: Document Number (MS-7024) Rev 130

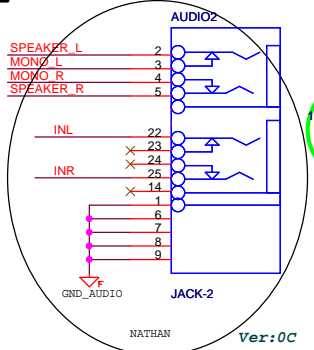
Date: Wednesday, December 08, 2004 Sheet 11 of 29



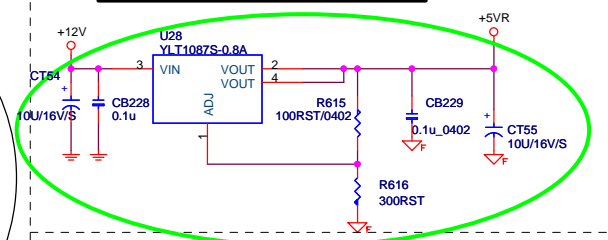
**CODEC AD1981B**



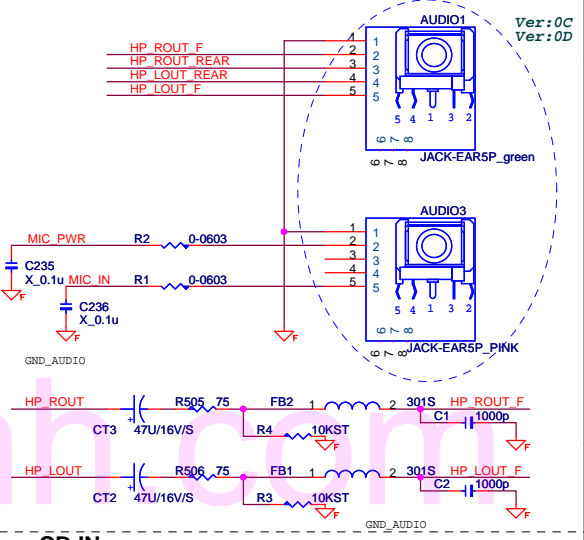
**REAR AUDIO (LINE OUT & MIC)**



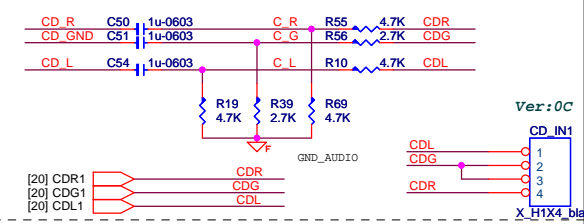
**AUDIO CODE REGULATORS**



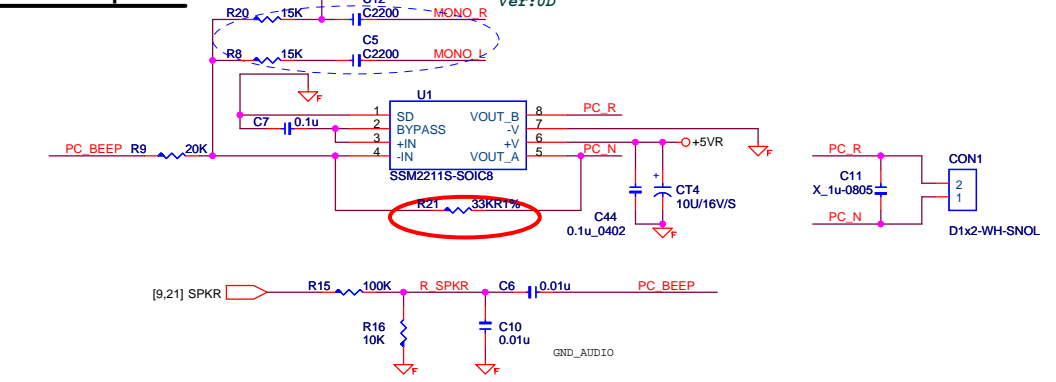
**FRONT AUDIO CONNECTOR (LINE OUT & MIC)**



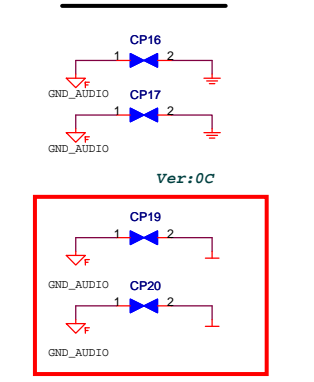
**CD IN**



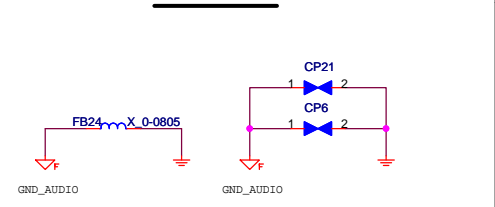
**Internal Speaker**



**EMI COPPER**



**COPPER**



**MSI MICRO-STAR IN'L CO., LTD.**

Title: **AC97 AUDIO - AD1981A/B**

Size: Document Number (MS-7024) Rev 130

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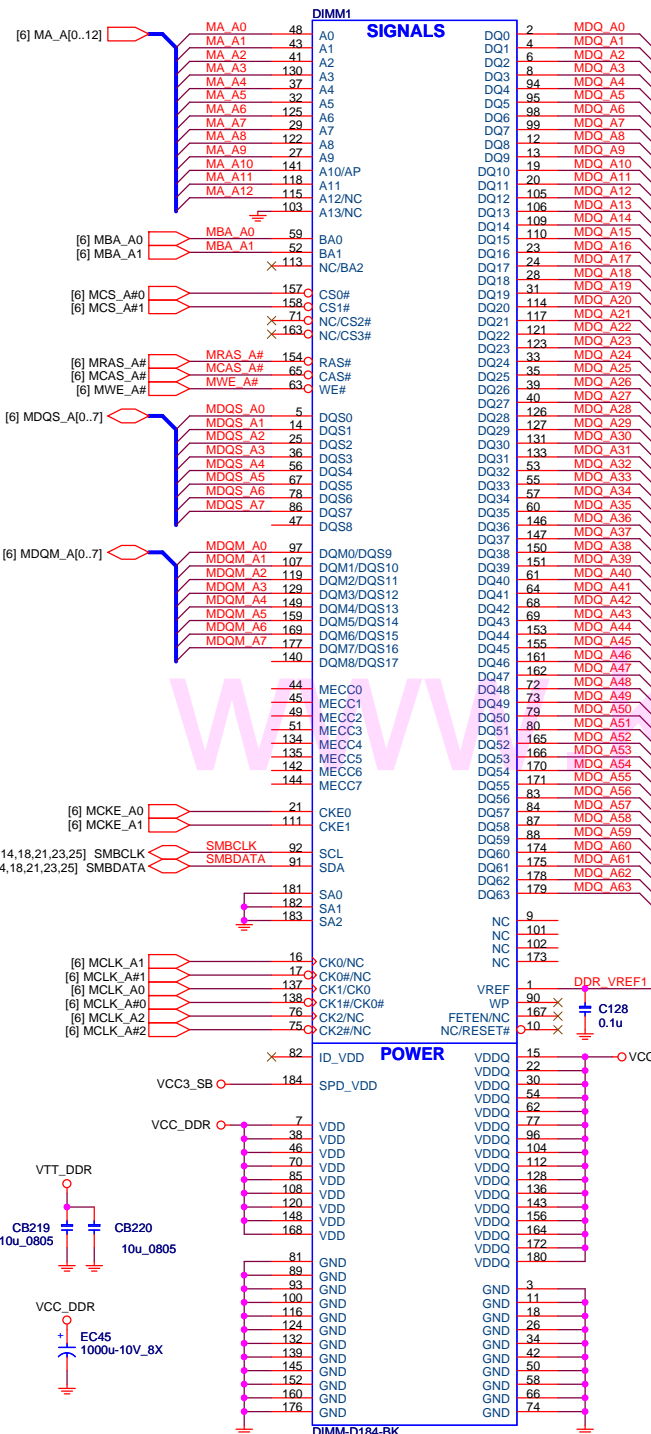




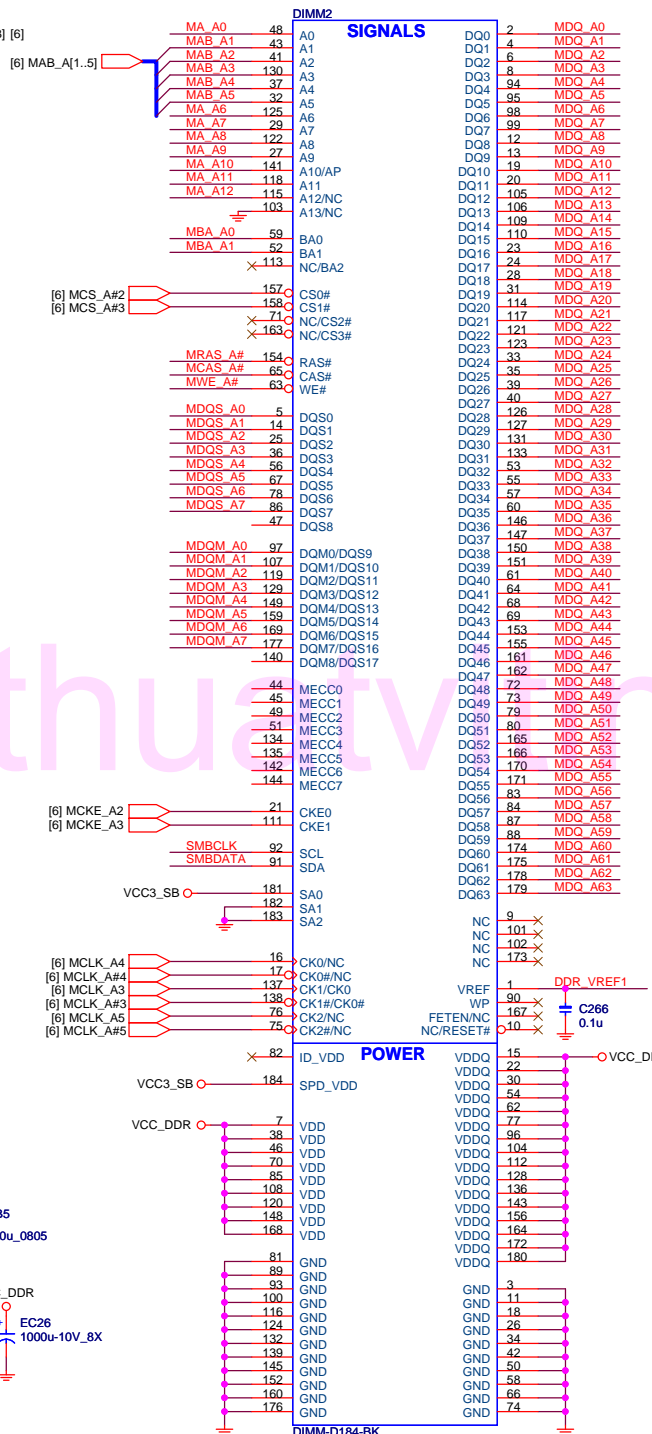
DDR DIMM1

DDR DIMM2

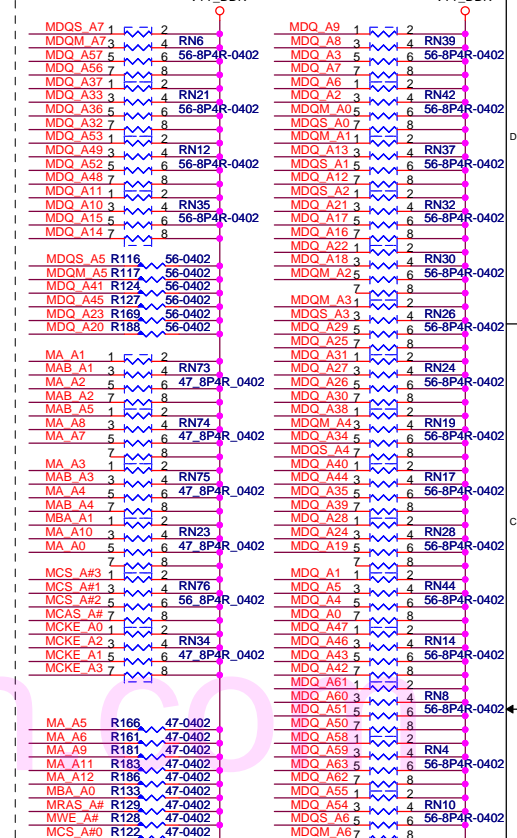
DDR Termination Resistors



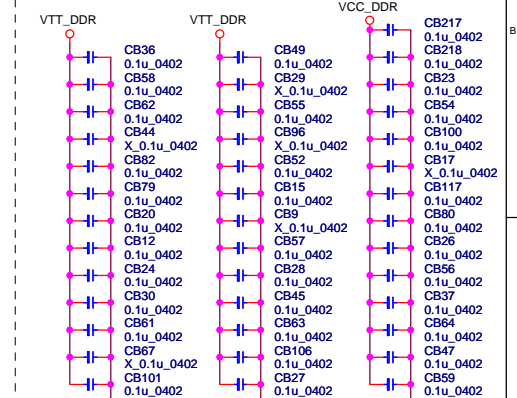
ADDR.=1010000B(A0H)



ADDR.=1010000B(A2H)



DECOUPLING CAPACITORS




MSI MICRO-STAR IN'L CO., LTD.

Title: DDR DIMM 1,2

Size: Document Number (MS-7024) Rev 130

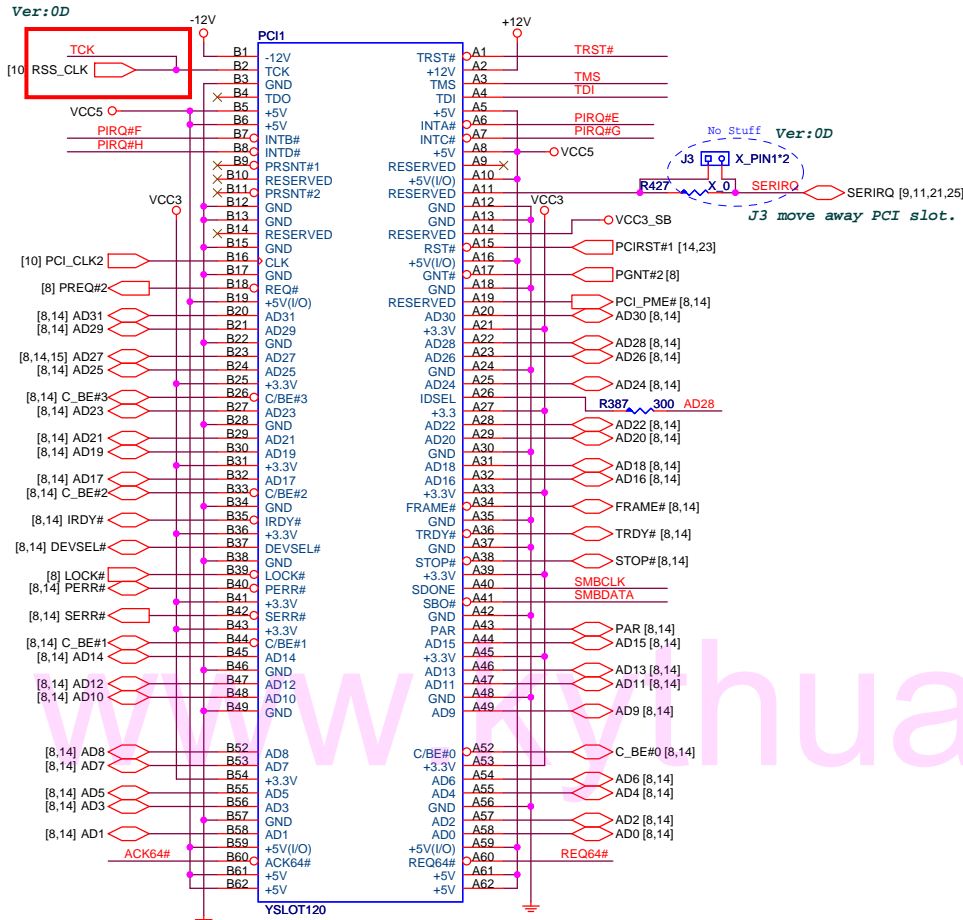
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|   |                              |                                   |          |
|---|------------------------------|-----------------------------------|----------|
|  |                              | <b>MICRO-STAR INT'L CO., LTD.</b> |          |
| Title   |                              | BLANK                             |          |
| Size  | Document Number              | Rev                               |          |
|   | (MS-7024)                    | 130                               |          |
| Date:   | Wednesday, December 08, 2004 | Sheet                             | 17 of 29 |

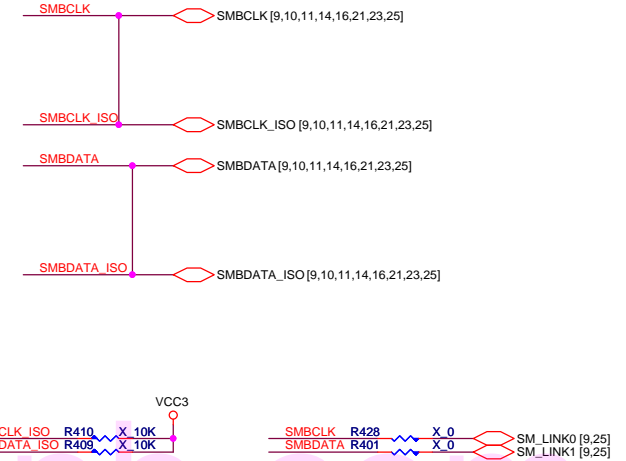


### PCI RISER SLOT (PCI VER: 2.2 COMPLY)

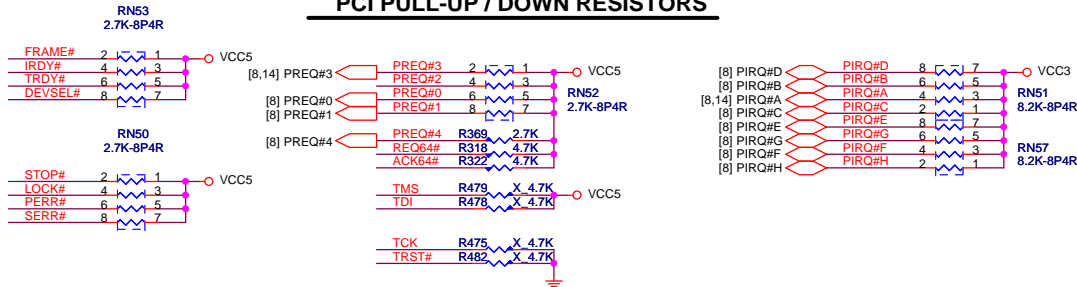


**IDSEL = AD28**  
**MASTER = PREQ#2**  
**PIRQ#E**

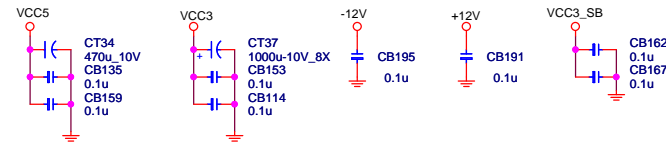
### SMBus Isolation



### PCI PULL-UP / DOWN RESISTORS



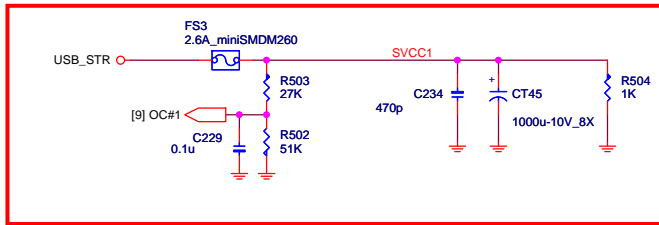
### PCI SLOT DECOUPLING CAPACITORS



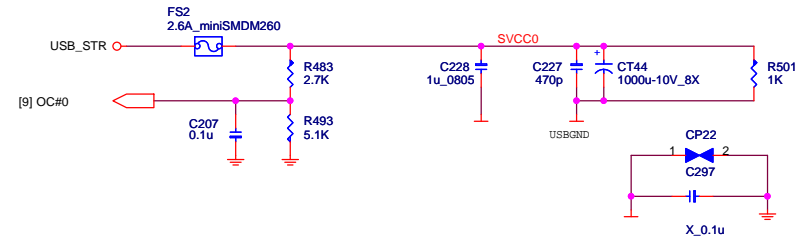
|                                    |                  |          |
|------------------------------------|------------------|----------|
| <b>MICRO-STAR INT'L CO., LTD.</b>  |                  |          |
| Title: <b>PCI Slot</b>             |                  |          |
| Size:                              | Document Number: | Rev: 130 |
| <b>(MS-7024)</b>                   |                  |          |
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**POWER CIRCUIT FOR USB PORT 4,5,6,7**

Ver: 0B

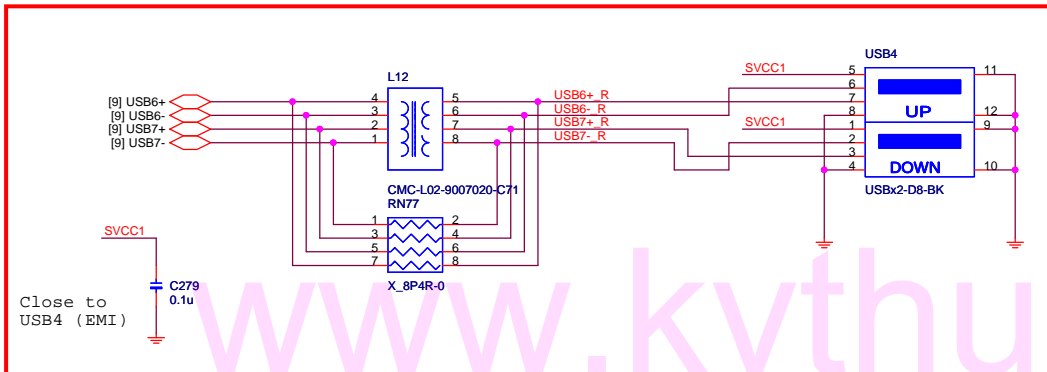


**POWER CIRCUIT FOR USB PORT 0,1,2,3**

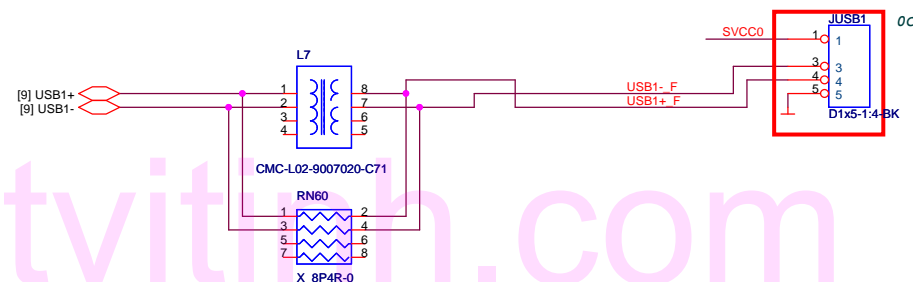


**REAR PANEL USB CONNECTOR FOR USB PORT 6,7**

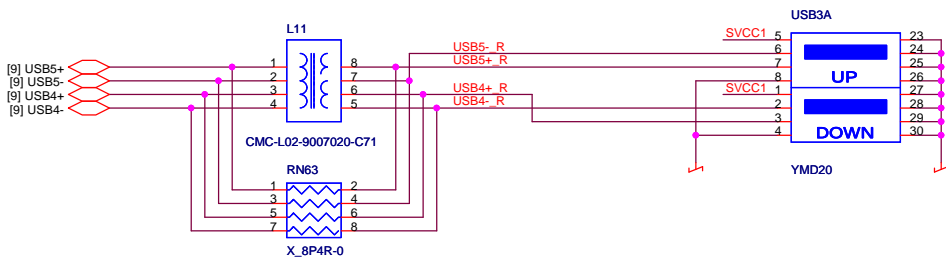
0B



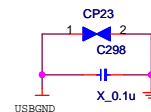
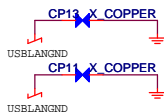
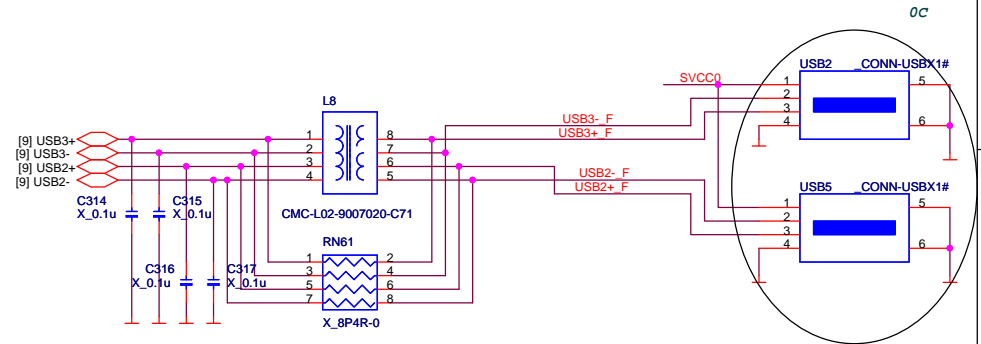
**FRONT PANEL USB CONNECTOR FOR USB PORT 0,1**



**REAR PANEL USB CONNECTOR FOR USB PORT 4,5**



**FRONT PANEL USB CONNECTOR FOR USB PORT 2,3**



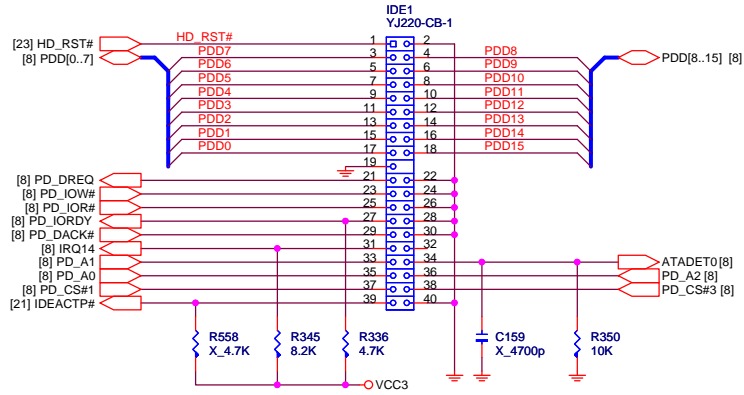
**MSI MICRO-STAR INT'L CO., LTD.**

Title: **H/W Monitor & FAN & USB Connectors**

Size: Document Number **(MS-7024)** Rev 130

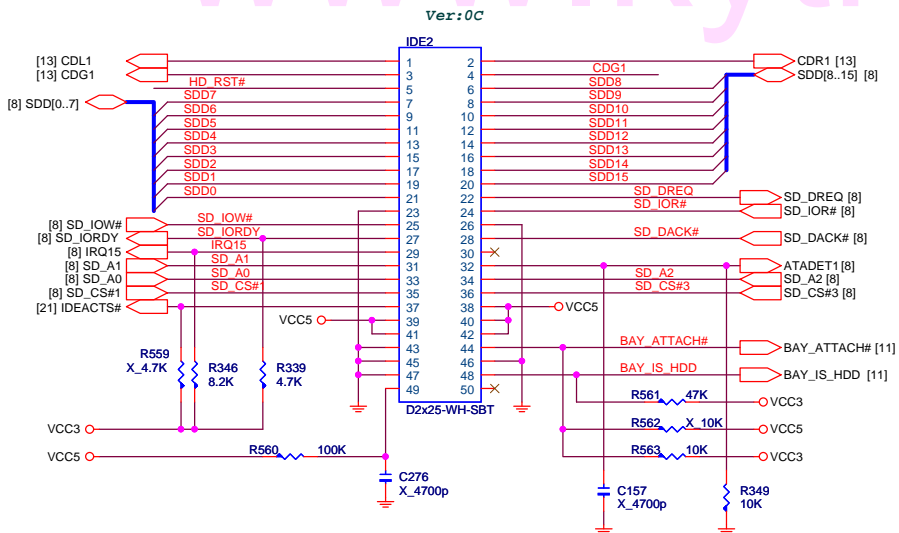
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### PRIMARY IDE BLOCK

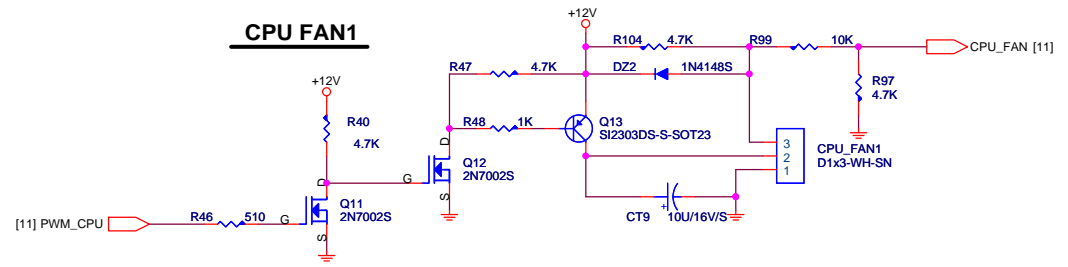


### SECONDARY SLIME IDE

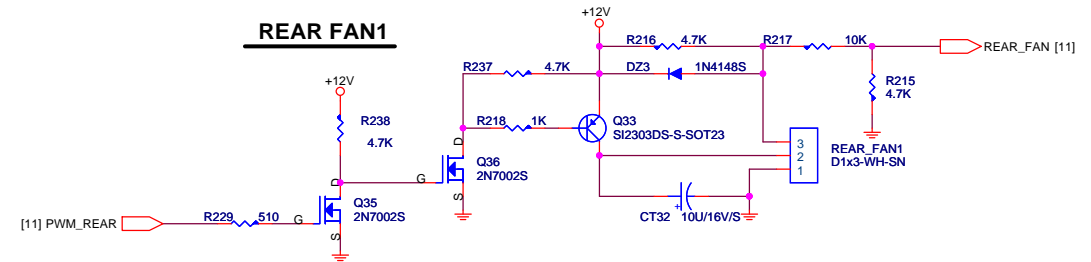
IBM Ultrabay Slim and Ultrabay Enhanced



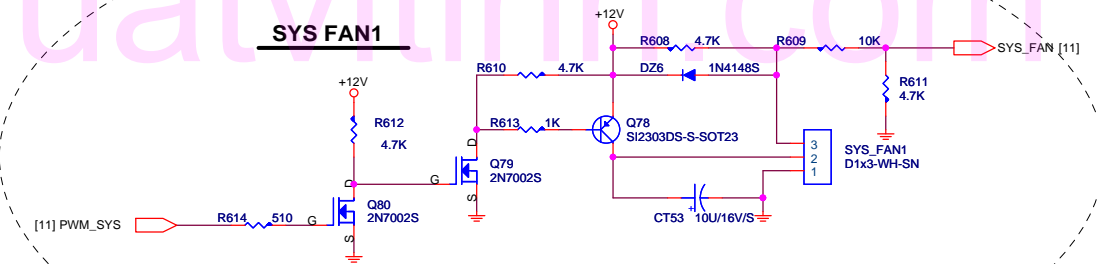
### CPU FAN1



### REAR FAN1



### SYS FAN1



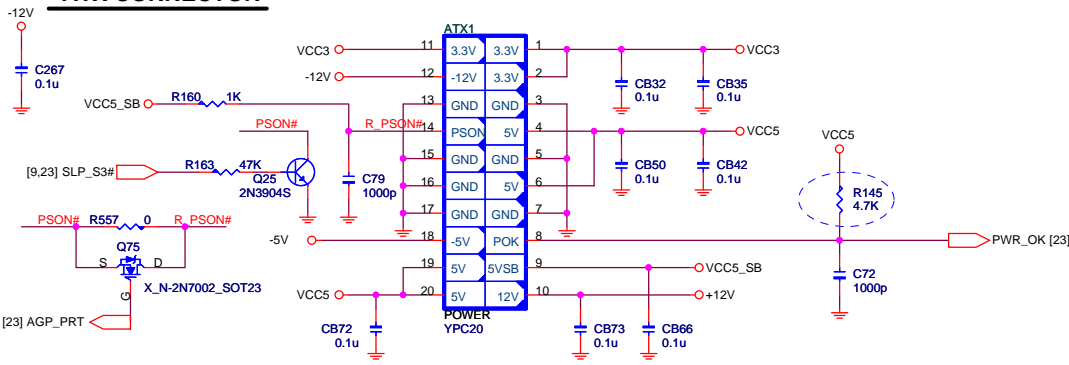
Ver: 1.3



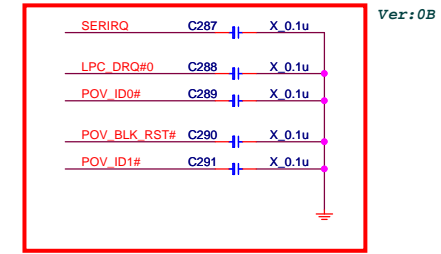
**MICRO-STAR INT'L CO., LTD.**

|       |                              |       |                          |
|-------|------------------------------|-------|--------------------------|
| Title |                              |       | ATA IDE & FAN CONNECTORS |
| Size  | Document Number              | Rev   |                          |
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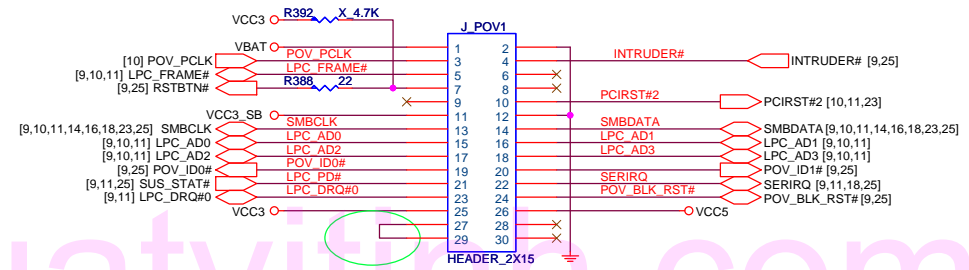
### ATX CONNECTOR



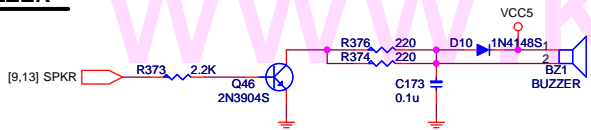
### EMI Reserve



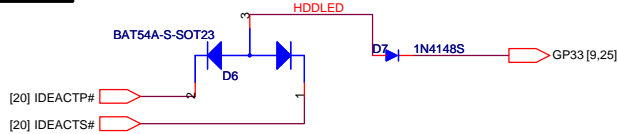
### POV3 CONNECTOR



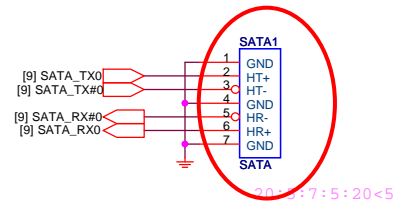
### BUZZER



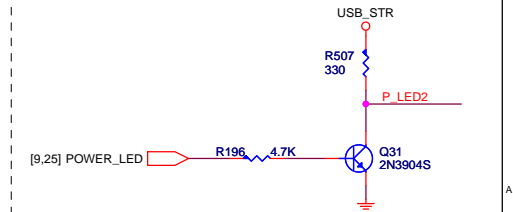
### IDE LED



### SERIAL ATA CONNECTOR BLOCK

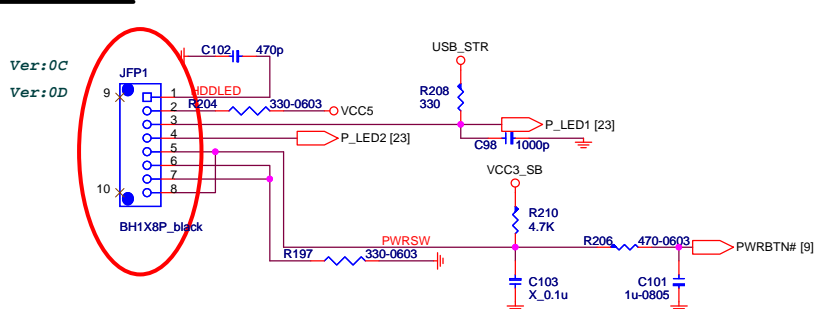


### POWER LED



### FRONT PANEL

NATHAN



**MSI MICRO-STAR IN'L CO., LTD.**

Title: **ATX & FRONT PANEL & POV3**

Size: Document Number **(MS-7024)** Rev 130

Date: Wednesday, December 08, 2004 Sheet 21 of 29

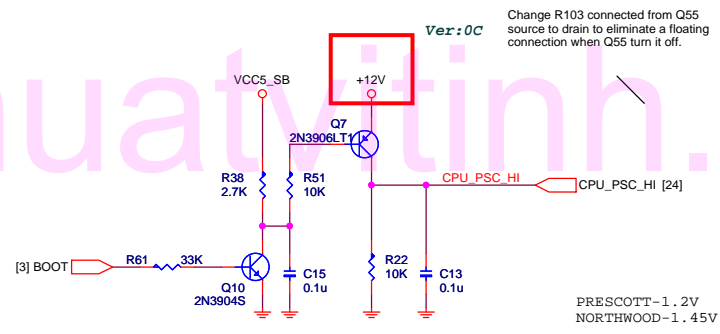
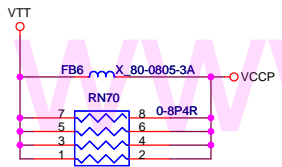
GMCH\_VTT ON/OFF CIRCUIT

GMCH VCC\_DAC Voltage Supplier

Intel reference GMCH VTT power circuit

GMCH VTT Generator

NW/ PSC Load Line Selection



### 3VSB MODE SELECT

|               |           |
|---------------|-----------|
| 3VSB MODE     | 3VSDLDEC# |
| SINGLE MOSFET | PULL HIGH |
| DUAL MOSFET   | PULL LOW  |

Ver:0C

Ver:0C

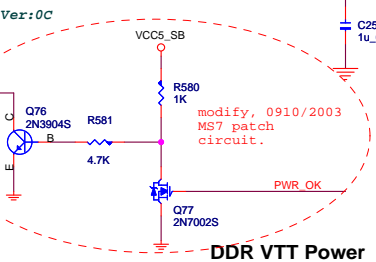
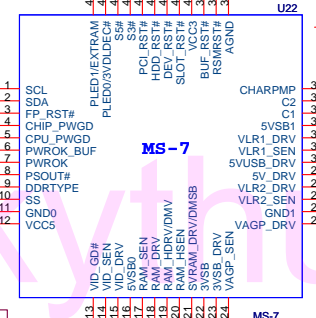
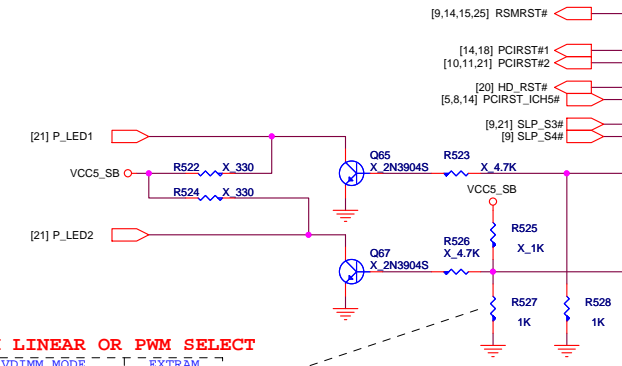
### 5V DUAL Power

INCREASE VCC5 COPPER & VIA HOLE

INCREASE GND COPPER & VIA HOLE

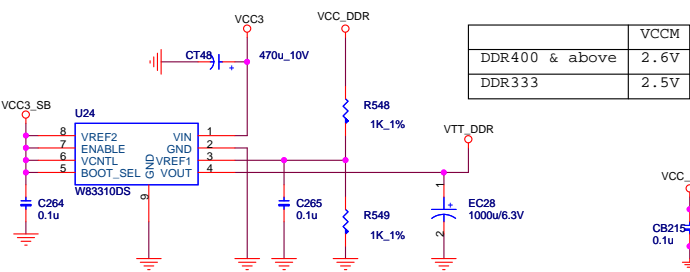
### VDIMM LINEAR OR PWM SELECT

|                  |           |
|------------------|-----------|
| VDIMM MODE       | EXTRAM    |
| LINEAR REGULATOR | PULL LOW  |
| PWM REGULATOR    | PULL HIGH |



### DDR VTT Power

|                | VCCM |
|----------------|------|
| DDR400 & above | 2.6V |
| DDR333         | 2.5V |



### WIDE TRACE

3VDUAL MOS  
APM2054N (SOT89)  
P3055LL (SOT89)

Dual NMOS  
D03-07D0303-N03  
D03-0731303-A30

### SWITCH:

- D03-40N030B-A36
- D03-20N030B-I14
- D03-45N030B-P03
- Regulator (TO-252)
- D03-07D0303-N03
- D03-50N034B-N03
- D03-50N031B-P03
- Dual NMOS
- D03-07D0303-N03
- D03-0731303-A30
- 3VDUAL MOS
- APM2054N
- P3055LL

### SWITCH:

- D03-40N030B-A36
- D03-20N030B-I14
- D03-45N030B-P03

### Regulator (TO-252)

- D03-45N020B-N03
- D03-40N030B-A36
- D03-6530A0B-F01
- Regulator (TO-263)
- D03-50N034B-N03
- D03-50N031B-P03

**MICRO-STAR INT'L CO., LTD.**

Title: ACPI (MS-7)

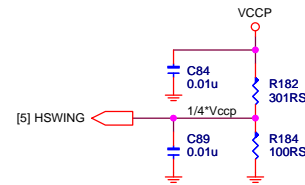
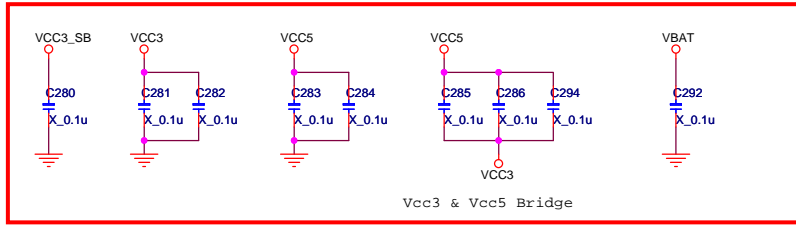
Size: Document Number: (MS-7024) Rev: 130

Date: Wednesday, December 08, 2004 Sheet: 23 of 29





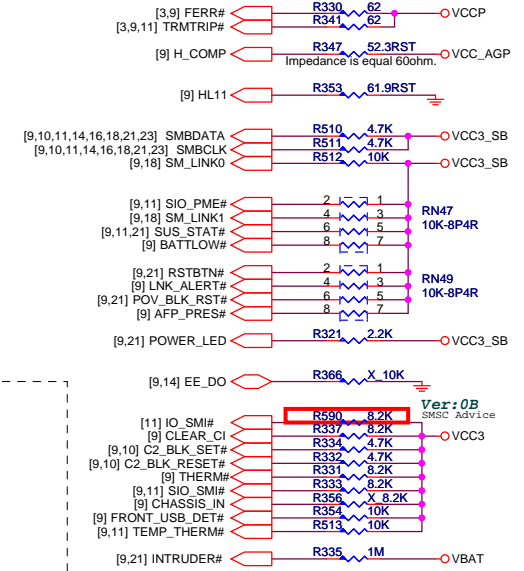
### EMI Decoupling CAP



### ICH5 STRAPPING RESISTORS

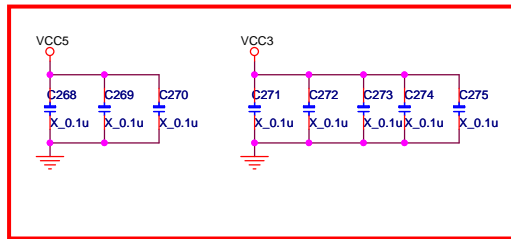
ALL COMPONENTS CLOSE TO ICH5

Trace length is less than 3inchs to ICH5.



### Decoupling CAP

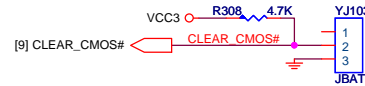
Ver:0B



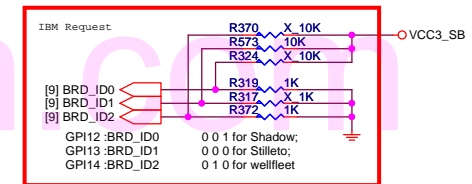
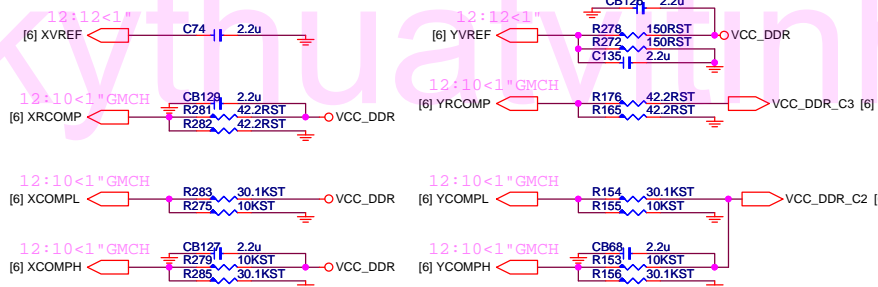
### 5VREF Sequencing Circuit



### CLEAR CMOS JUMPER

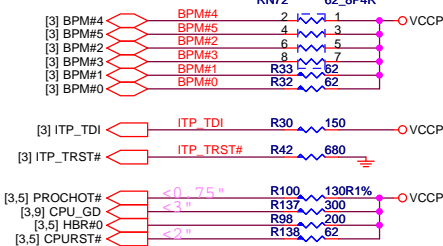


| CMOS CLEAR | NORMAL | CLEAR |
|------------|--------|-------|
| JBAT1      | (1-2)  | (2-3) |

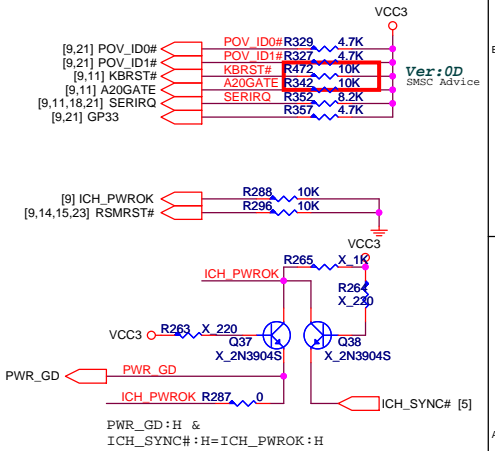
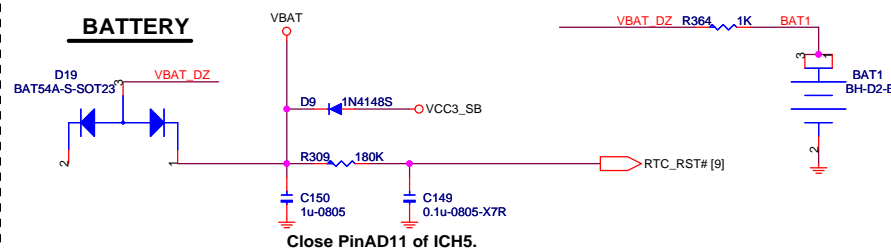


### CPU STRAPPING RESISTORS

ALL COMPONENTS CLOSE TO CPU



### BATTERY



**MSI MICRO-STAR IN'L CO., LTD.**

Title: CPU & GMCH & ICH5 PULL UP / DOWN RESISTORS

Size: Document Number (MS-7024) Rev: 130

Date: Wednesday, December 08, 2004 Sheet: 25 of 29

# ICH5

| GPIO Pin | Type  | Function                          |
|----------|-------|-----------------------------------|
| GPIO 0   | I     | ATADET0 (multifunction pin)       |
| GPIO 1   | I     | Unused (multifunction pin)        |
| GPIO 2   | I     | PCI_IRQ#E (multifunction pin)     |
| GPIO 3   | I     | PCI_IRQ#F (multifunction pin)     |
| GPIO 4   | I     | PCI_IRQ#G (multifunction pin)     |
| GPIO 5   | I     | PCI_IRQ#H (multifunction pin)     |
| GPIO 6   | I     | POV_ID0# (multifunction pin)      |
| GPIO 7   | I     | POV_ID1# (multifunction pin)      |
| GPIO 8   | I     | SIO_PME# (multifunction pin)      |
| GPIO 9   | I     | USB_OC2# (multifunction pin)      |
| GPIO 10  | I     | USB_OC2# (multifunction pin)      |
| GPIO 11  | I     | TEMP_THERM# (multifunction pin)   |
| GPIO 12  | I     | BRD_ID0 (multifunction pin)       |
| GPIO 13  | I     | BRD_ID1 (multifunction pin)       |
| GPIO 14  | I     | BRD_ID2 (multifunction pin)       |
| GPIO 15  | I     | USB_OC3# (multifunction pin)      |
| GPIO 16  | O     | Unused (multifunction pin)        |
| GPIO 17  | O     | Unused (multifunction pin)        |
| GPIO 18  | O     | Unused (multifunction pin)        |
| GPIO 19  | O     | CLEAR_C1 (multifunction pin)      |
| GPIO 20  | O     | C2_BLK_RESET# (multifunction pin) |
| GPIO 21  | O     | C2_BLK_SET# (multifunction pin)   |
| GPIO 22  | O(OD) | SIO_SMI# (multifunction pin)      |
| GPIO 23  | O     | CHASSIS_IN (multifunction pin)    |
| GPIO 24  | I/O   | Unused (multifunction pin)        |
| GPIO 25  | I/O   | POWER_LED (multifunction pin)     |
| GPIO 27  | I/O   | POV_BLK_RST# (multifunction pin)  |
| GPIO 28  | I/O   | ENET_DIS_N (multifunction pin)    |
| GPIO 32  | I/O   | CLEAR_CMOS# (multifunction pin)   |
| GPIO 33  | I/O   | Unused (multifunction pin)        |
| GPIO 34  | I/O   | Unused (multifunction pin)        |
| GPIO 40  | I     | PREQ#4 (multifunction pin)        |
| GPIO 41  | I     | Unused (multifunction pin)        |
| GPIO 48  | O     | PGNT#4 (multifunction pin)        |
| GPIO 49  | O     | CPU_GD (multifunction pin)        |

## Flash ROM(PCB REVISION ID)

| GPIO Pin | Type | OA   | OB | OC |  |
|----------|------|--|----|----|--|
| GPI 0    | I    | 0  | 1  | 0  |  |
| GPI 1    | I    | 0  | 0  | 1  |  |
| GPI 2    | I    | 0  | 0  | 0  |  |
| GPI 3    | I    | 0  | 0  | 0  |  |
| GPI 4    | I    | H: 10/100 ETHERNET L: GIGABIT ETHERNET LAN |    |    |  |

## PCI Config.

| DEVICE         | MCP1 INT Pin | REQ#/GNT# | IDSEL | CLOCK   | CLK GEN PIN OUT |
|----------------|--------------|-----------|-------|---------|-----------------|
| PCI Riser Slot | PIRQE        | PCI_REQ#2 | AD28  | PCICLK2 | 7 (PCI_CLK2)    |
|                | PIRQF        | PCI_GNT#2 |       | PCICLK1 | 8 (PCI_CLK1)    |
|                | PIRQG        | PCI_REQ#4 |       |         |                 |
|                | PIROH        | PCI_GNT#4 |       |         |                 |

## LPC Super I/O

| GPIO Pin | Type | Function      |
|----------|------|---------------|
| GPIO 10  | I    | BAY_ATTACH#   |
| GPIO 11  | I    | BAY_IS_HDD    |
| GPIO 12  | I    | Unused        |
| GPIO 13  | I    | Unused        |
| GPIO 14  | I    | Unused        |
| GPIO 15  | I    | Unused        |
| GPIO 16  | I/O  | Unused        |
| GPIO 17  | I/O  | Unused        |
| GPIO 20  | I/O  | Unused        |
| GPIO 21  | I/O  | DSB#          |
| GPIO 22  | I/O  | MOB#          |
| GPIO 24  | I/O  | SIO_ADDR      |
| GPIO 25  | I/O  | Unused        |
| GPIO 26  | I    | Unused        |
| GPIO 27  | I    | IO_SMI#       |
| GPIO 30  | O    | CPU_FAN1      |
| GPIO 31  | O    | REAR_FAN1     |
| GPIO 32  | I/O  | PWM_CPU       |
| GPIO 33  | I/O  | PWM_REAR      |
| GPIO 34  | O    | Unused        |
| GPIO 35  | I/O  | Unused        |
| GPIO 36  | O    | KBRST#        |
| GPIO 37  | O    | A2OGATE       |
| GPIO 40  | O    | DRVDENO       |
| GPIO 41  | I/O  | DRVDEN1       |
| GPIO 42  | O    | SIO_PME#      |
| GPIO 43  | I    | DDRC_LOCK_DIS |
| GPIO 50  | I/O  | RIB#          |
| GPIO 51  | I/O  | DCDB#         |
| GPIO 52  | I    | SINB          |
| GPIO 53  | I/O  | SOUTB         |
| GPIO 54  | I/O  | DSRB#         |
| GPIO 55  | I/O  | RTSB#         |
| GPIO 56  | I/O  | CTSB#         |
| GPIO 57  | I/O  | DTRB#         |
| GPIO 60  | I/O  | Unused        |
| GPIO 61  | I/O  | Unused        |

## DDR DIMM Config.

| DEVICE | ADDRESS | CLOCK            |
|--------|---------|------------------|
| DIMM 1 | A0H     | MCLK_A0/MCLK_A#0 |
|        |         | MCLK_A1/MCLK_A#1 |
|        |         | MCLK_A2/MCLK_A#2 |
| DIMM 2 | A2H     | MCLK_B0/MCLK_B#0 |
|        |         | MCLK_B1/MCLK_B#1 |
|        |         | MCLK_B2/MCLK_B#2 |

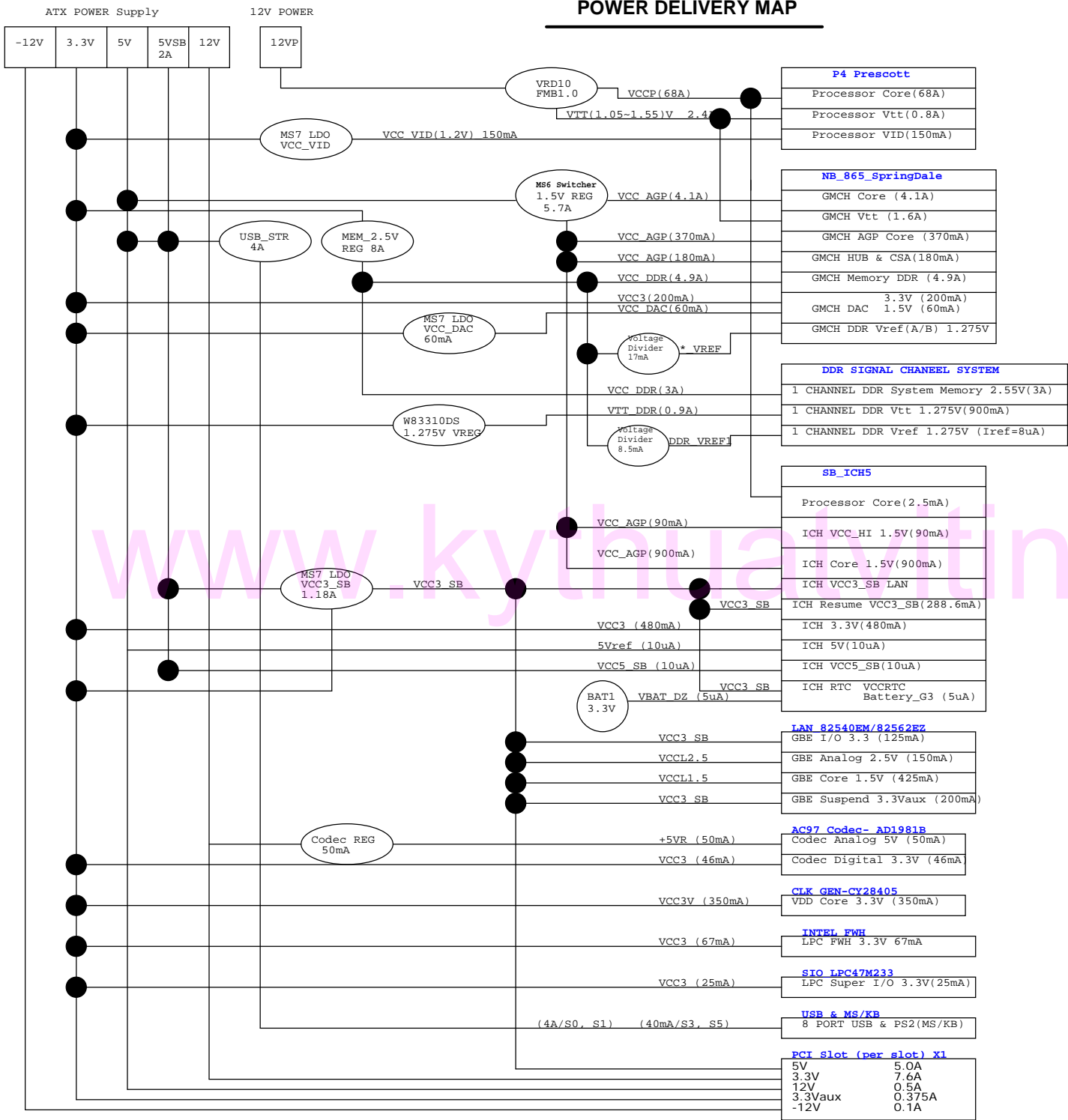
## PCI RESET DEVICE

| Signals      | Target               |
|--------------|----------------------|
| PCIRST#1     | PCI slot, LAN        |
| PCIRST#2     | Super I/O, FWH, POV3 |
| PCIRST_ICH5# | Northbridge, MS-5    |
| HDDRST#      | Primary IDE          |

## JUMPER SETTING

|              |              |             |
|--------------|--------------|-------------|
| <b>JBAT1</b> | (1-2) NORMAL | (2-3) CLEAR |
|--------------|--------------|-------------|

# POWER DELIVERY MAP



| VRM SPEC | Transition | Sustain | Power Consumption |
|----------|------------|---------|-------------------|
| VRM9.0   | FMB1.0     | 60A     | 50A               |
|          | FMB2.0     | 70A     | 60A               |
| VRM10.0  | FMB1.0     | 78A     | 68A 89W/69        |
|          | FMB1.5     | 91A     | 80A 103W/74       |

| P4 Prescott    |         |
|----------------|---------|
| Processor Core | (68A)   |
| Processor Vtt  | (0.8A)  |
| Processor VID  | (150mA) |

| NB_865_Springdale  |                             |
|--------------------|-----------------------------|
| GMCH Core          | (4.1A)                      |
| GMCH Vtt           | (1.6A)                      |
| GMCH AGP Core      | (370mA)                     |
| GMCH HUB & CSA     | (180mA)                     |
| GMCH Memory DDR    | (4.9A)                      |
| GMCH DAC           | 3.3V (200mA)<br>1.5V (60mA) |
| GMCH DDR Vref(A/B) | 1.275V                      |

| DDR SIGNAL CHANEEL SYSTEM   |                   |
|-----------------------------|-------------------|
| 1 CHANNEL DDR System Memory | 2.55V(3A)         |
| 1 CHANNEL DDR Vtt           | 1.275V(900mA)     |
| 1 CHANNEL DDR Vref          | 1.275V (Iref=8uA) |

| SB_ICH5            |             |
|--------------------|-------------|
| Processor Core     | (2.5mA)     |
| ICH VCC_HI         | 1.5V(90mA)  |
| ICH Core           | 1.5V(900mA) |
| ICH VCC3_SB LAN    |             |
| ICH Resume VCC3_SB | (288.6mA)   |
| ICH 3.3V           | (480mA)     |
| ICH 5V             | (10uA)      |
| ICH VCC5_SB        | (10uA)      |
| ICH RTC VCCRTC     |             |
| Battery_G3         | (5uA)       |

| LAN_82540EM/82562EZ |                 |
|---------------------|-----------------|
| GBE I/O             | 3.3 (125mA)     |
| GBE Analog          | 2.5V (150mA)    |
| GBE Core            | 1.5V (425mA)    |
| GBE Suspend         | 3.3Vaux (200mA) |

| AC97 Codec- AD1981B |             |
|---------------------|-------------|
| Codec Analog        | 5V (50mA)   |
| Codec Digital       | 3.3V (46mA) |

| CLK_GEN-CY28405 |              |
|-----------------|--------------|
| VDD Core        | 3.3V (350mA) |

| INTEL_FWH |           |
|-----------|-----------|
| LPC FWH   | 3.3V 67mA |

| SIO_LPC47M233 |            |
|---------------|------------|
| LPC Super I/O | 3.3V(25mA) |

| USB & MS/KB             |  |
|-------------------------|--|
| 8 PORT USB & PS2(MS/KB) |  |

| PCI Slot (per slot) X1 |        |
|------------------------|--------|
| 5V                     | 5.0A   |
| 3.3V                   | 7.6A   |
| 12V                    | 0.5A   |
| 3.3Vaux                | 0.375A |
| -12V                   | 0.1A   |

**MSI** MICRO-STAR INT'L CO., LTD.


Title: Power delivery map

Size: Document Number (MS-7024) Rev 130

Date: Wednesday, December 08, 2004 Sheet 27 of 29

| MS-7024 Revision History List |                              |  |   |
|-------------------------------|------------------------------|--|---|
| Ver.                          | DATE                         | Schematic Change List  | Page  |
| 0A                            | 2003.09.24                   | 1. Create MS-7024 Project for IBM (Wellfleet) design.  |   |
| 0B                            | 2004.02.13<br><br>2004.02.20 | 1. Front 4 port USB change to 2 port USB.<br>2. Add JUSB1 pin header (1x5) for card reader..<br>3. Add Rear 2 port USB connector.<br>4. Secondary Silm IDE change to IBM Ultrabay Slim and Ultrabay Enhanced spec.<br>5. Add Front_FAN1 for thermal issue reserve.<br>6. EMI coupling cap reserve.<br>7. Intel LAN Kinnereth / Kenai 2 EMI issue update. | P.19<br>P.19<br>P.19<br>P.19<br>P.20<br>P.21 P.25<br>P.14 |
| 0C                            | 2004.02.13                   | 1. Front panel spec update: Line-Out, MIC, USB, USB<br>2. Rear panel spec update: Line-Out, Line-In.<br>3. IBM Wellfleet broad ID circuit update.<br>4. IBM Wellfleet Logo location update.<br>5. POV3 card mechanical issue with C128, JBAT1.<br>6. Video sink buffers circuit added in.<br>7. IEEE 10/100/1000 LAN solution update.                    | Layout<br>P.13<br><br>Layout<br>Layout<br>P.12            |
| 0D                            | 2004.03.31                   | 1. Change LAN chipset for 82540EM to 82541EI.<br>2. Parallel port proposal from IBM suggestion change 33ohm to 0ohm.<br>3. Add RSS_CLK for IBM Retail Store Systems (RSS) group requirement.<br>4. Change H-sync and V-sync resistor value form 47ohm to 33ohm for EMI issue.<br>5. Add C301, C302, C303 cap at North-Bridge side for EMI concern.       | P.14 P.15<br>P.11<br>P.10<br>P.11<br>P.12                 |
| 0E                            | 2004.04.30                   | 1. Update 82541EI LAN Enable/Disable circuit.<br>2. Update component RSL0005 for IBM request.<br>3. Reserve SIO/GPIO pin for LAN enable/disable function used.<br>4. Change SATA connector with housing spec.  | P.15<br>P.1 P.15<br>P.21                                  |
| 100                           | 2004.05.20                   | 1. Change R21 to 27Kohm for internal speaker small volume issue.   | P.13  |
| 110                           | 2004.06.25                   | 1. Update mounting hole for EMI concern.<br>2. Reserve C314, C315, C316, C317 for USB EMI concern.<br>3. Change R8, R20 to 15Kohm, R21 to 33Kohm for internal speaker small olume issue.   | P.19  |
| 11A                           | 2004.07.21                   | 1. Add RGB signal protection diode for No display issue.<br>2. Add L-C filter for RGB signal (Reference Intel Grantsdale suggestion).  | P.12  |
| 11B                           | 2004.07.23                   | 1. Add DDCCL, DDCDA signal protection diode for No display issue.<br>2. Add serier resistor (R607, R606 )on H-sync, Vsync signal at VGA connector and buffer side.   | P.12  |
| 120                           | 2004.08.27                   | 1. Change to Ver.120   |   |

| Ver. | DATE       | Schematic Change List  |
|------|------------|--|
| 1.3  | 2004.11.12 | 1. Modify J_POV1 schematic (Slove password issue when using POV3), short pin 27 & 29<br>2. Change board ID (Just change the PCB Revision ID from 0000b to 0001b by pulling REV0 up (R414) instead of down (R413).<br>3. Add system FAN |
| 1.3  | 2004.12.02 | 1. Change LM78L05-SOT89 to YLT1087S-0.8A for AUDIO regulator on page 13.   |

|   |                                     |            |
|---|-------------------------------------|------------|
|  <b>MICRO-STAR INT'L CO., LTD.</b> |                                     |            |
| Title<br><b>REVISION HISTORY</b>  |                                     |            |
| Size  | Document Number<br><b>(MS-7024)</b> | Rev<br>130 |
| Date: Wednesday, December 08, 2004  |                                     |            |
| Sheet   |                                     | 28 of 29   |