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# NEC:ROPROS

## MS-7410 uATX

Version: 0C

**CPU:** Intel, Socket 775 (Intel Core 2 Duo Processors, Intel Pentium D Processors, Intel Pentium 4 Processors, Intel Celeron D Processors)--  
65-95 watts Intel Core 2 Duo, Pentium D, Celeron D

### System Chipset:

Intel Bearlake - Q (North Bridge)

Intel ICH9 Series (South Bridge)

ROPROS-MA use ICH9 / ROPROS-VS use ICH9DH / ROPROS-NECCAP use ICH9R

### On Board Device:

CLOCK Gen -- SLG84516BT CLK Gen.

LPC Super I/O -- SCH5617

LAN -- Broadcom-BCM5787M

LAN -- INTEL 82566 (Support ViiV)

HD Audio Codec -- ALC262 VER:C2

TPM - SLB9635

### Main Memory:

Dual-channel DDR-II \* 4

### Expansion Slots:

PCI EXPRESS X16 SLOT \*1








PCI EXPRESS X1 SLOT \* 1

PCI SLOT \* 2

**PWM:** VRD11 Intersil 6312 3Phase

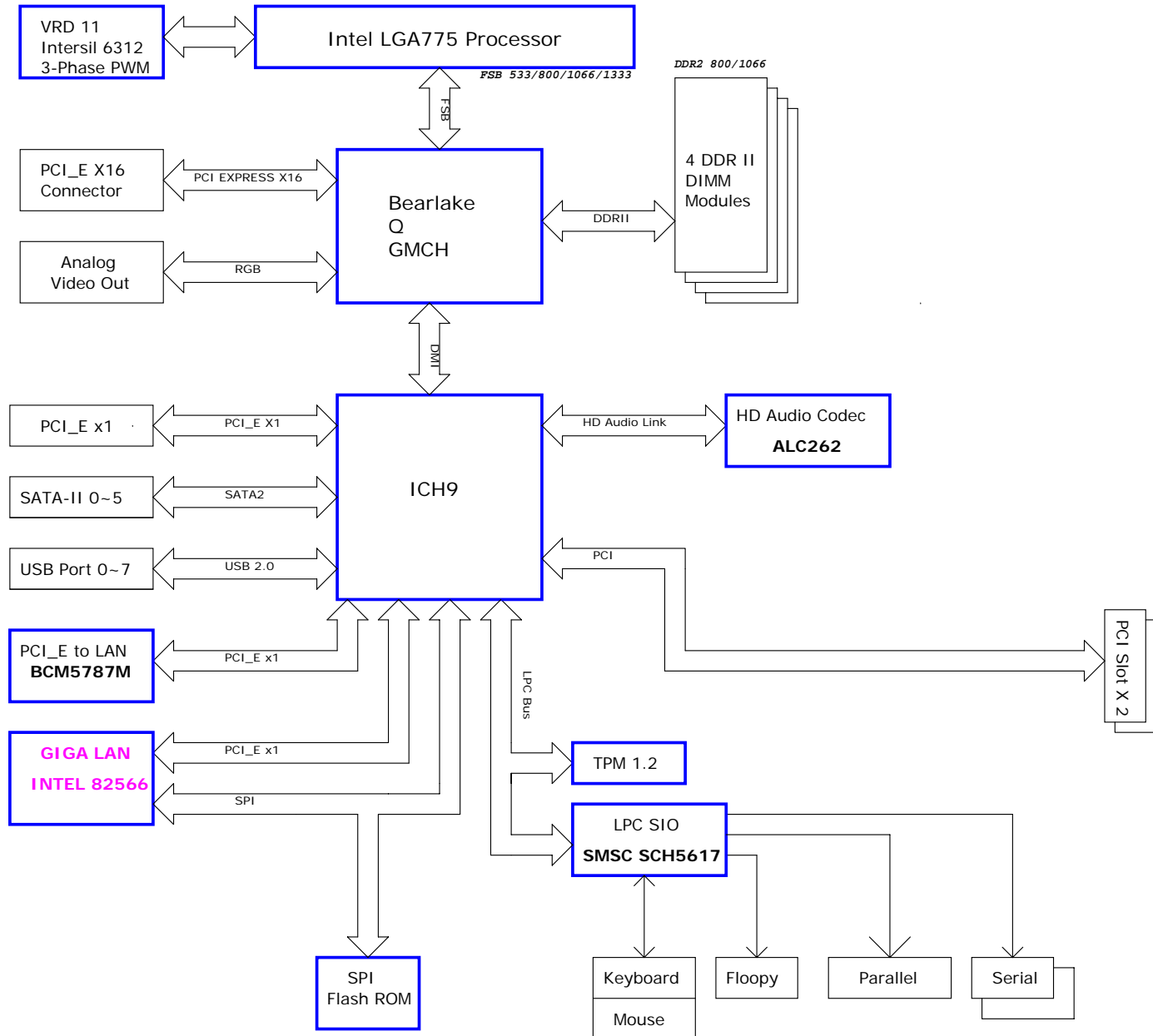


How to distinguish the different SKU

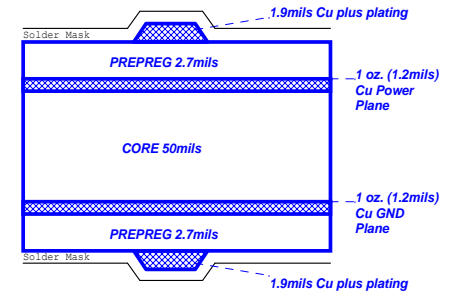
|                                                                                       |                                                |
|---------------------------------------------------------------------------------------|------------------------------------------------|
|  | BLUE Color which mean all model need use       |
|  | PURPLE Color which mean ROPROS-MA/Vs use       |
|  | SKY BLUE Color which mean ROPROS-MA/NECCAP use |
|  | ORANGE Color which mean ROPROS-MA use          |
|  | PINK Color which mean ROPROS-VS                |
|  | GREEN Color which mean ROPROS-NECCAP           |
|  | BROWN Color which mean the part reserve        |

|                                    |                      |        |  |
|------------------------------------|----------------------|--------|--|
| MICRO-STAR INT'L CO.,LTD           |                      |        |  |
| MS-7410                            |                      |        |  |
| Size Custom                        | Document Description | Rev 0C |  |
|                                    | COVER SHEET          |        |  |
| Date: Wednesday, November 07, 2007 | Sheet 1 of 34        |        |  |

# Block Diagram



## Board Stack-up (1080 Prepreg Considerations)



Single End 50ohm Top/Bottom : 4mils  
 USB2.0 - 90ohm : 15/7.5/4.5/7.5/15  
 SATA - 95ohm : 15/8/4/8/15  
 LAN - 100ohm : 15/10/4/10/15  
 PCIe - 95ohm : 15/8/4/8/15

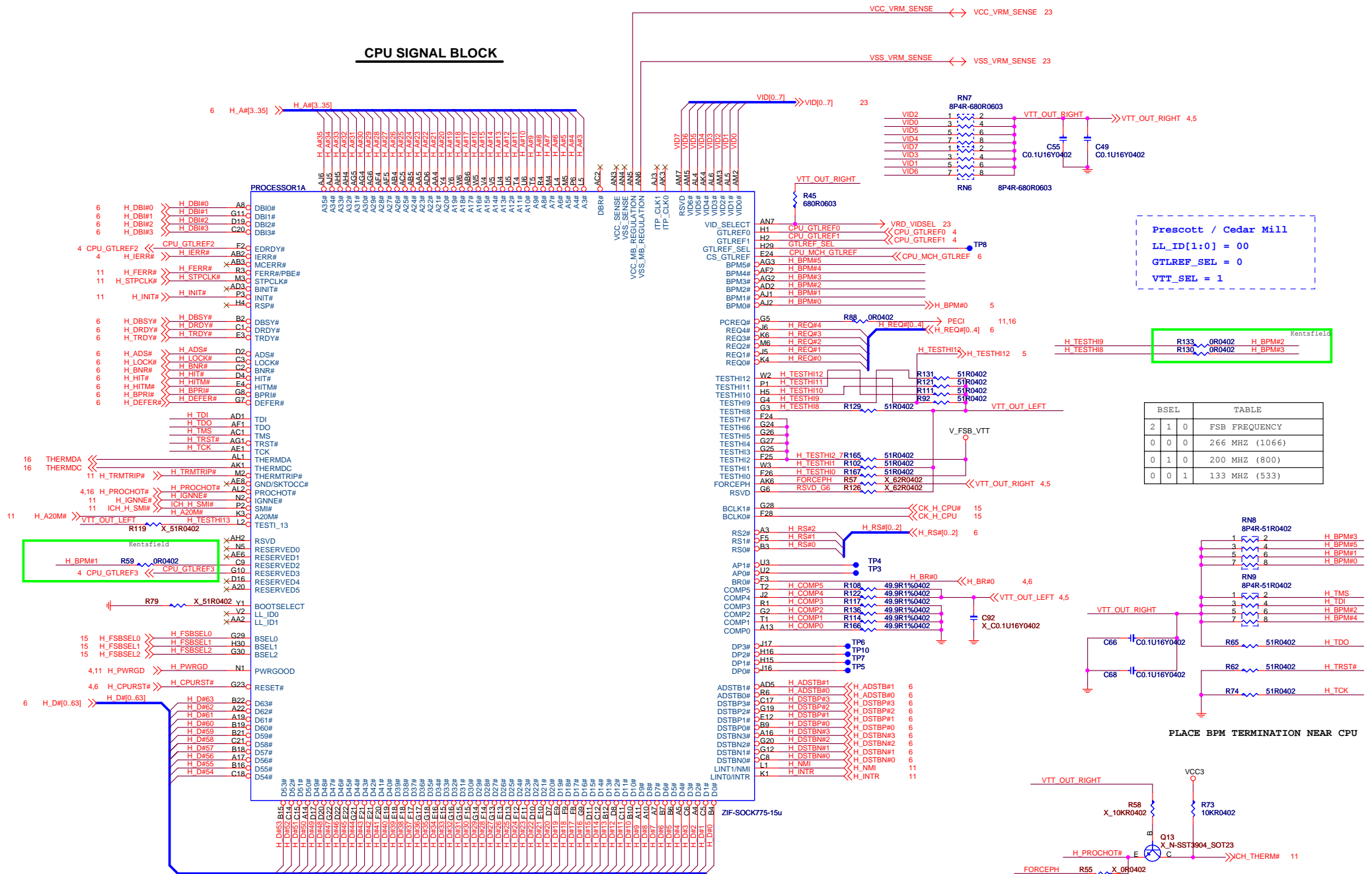


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**MS-7410**

| Size                               | Document Description | Rev |
|------------------------------------|----------------------|-----|
| Custom                             | <b>BLOCK DIAGRAM</b> | 0C  |
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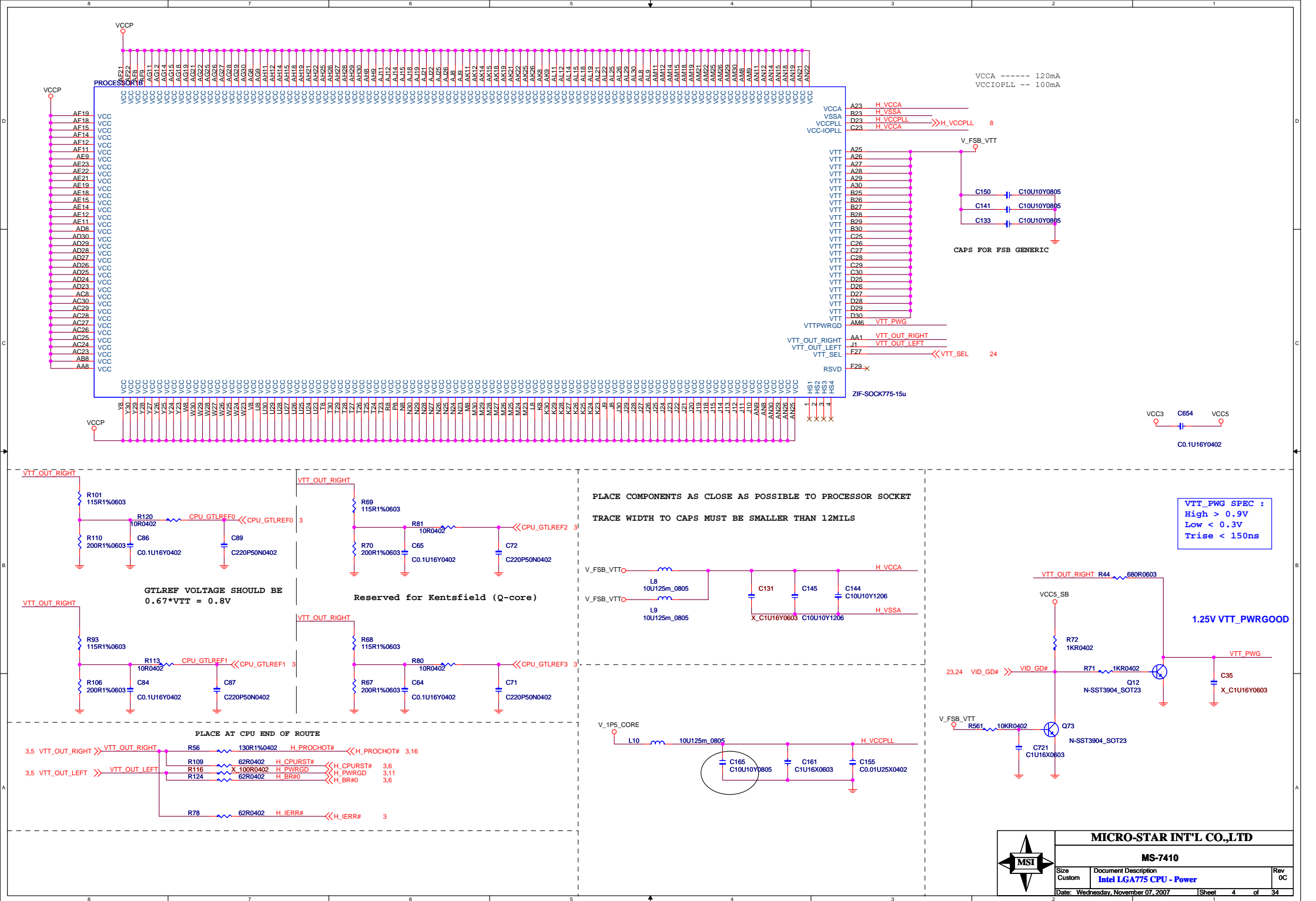
## CPU SIGNAL BLOCK



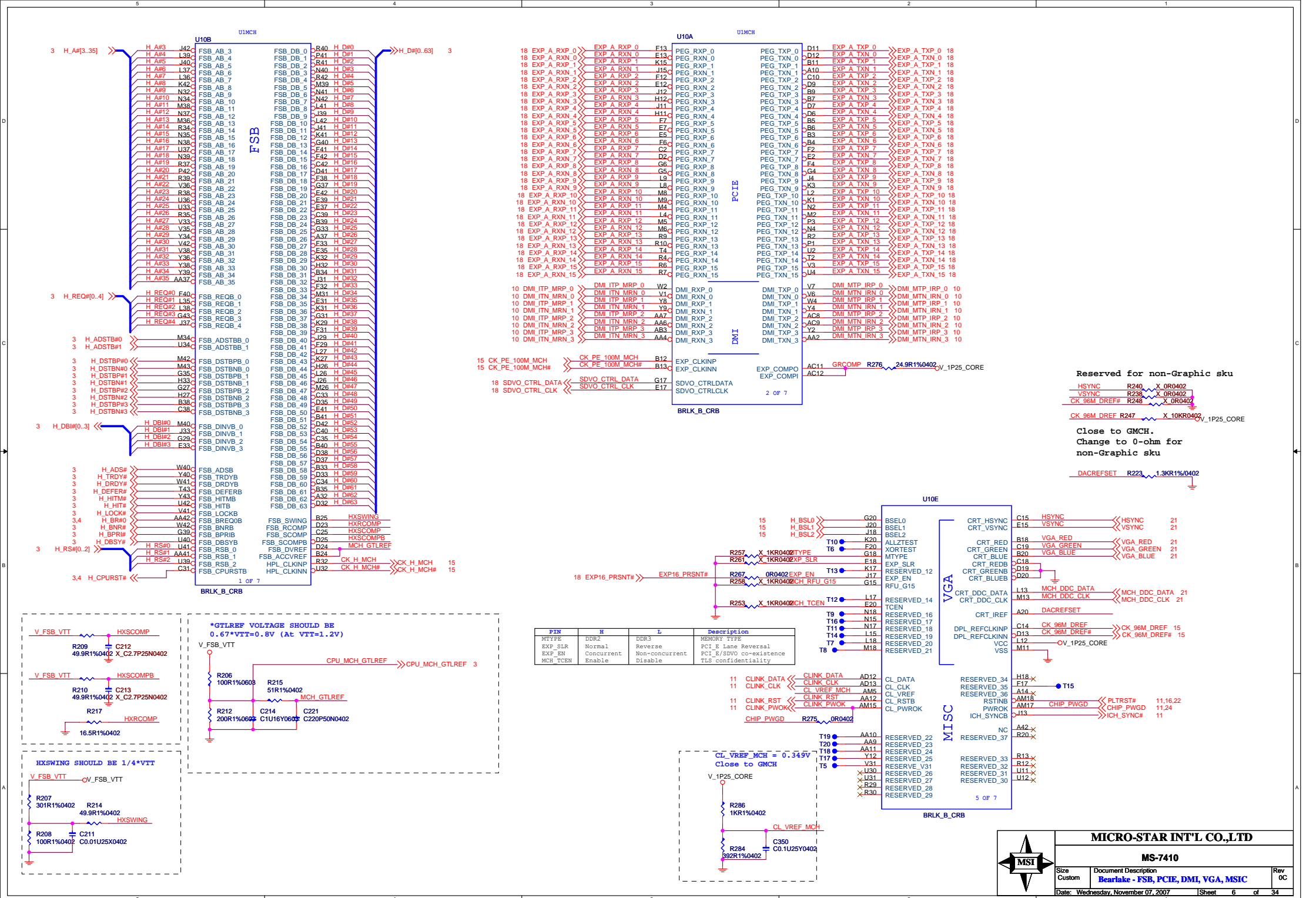
**MICRO-STAR INT'L CO.,LTD**

MS-7410

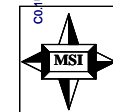
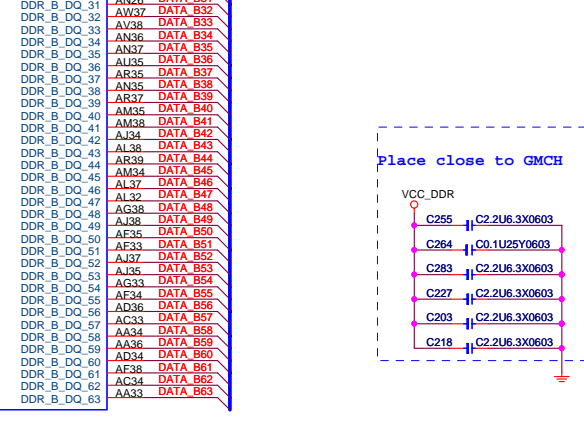
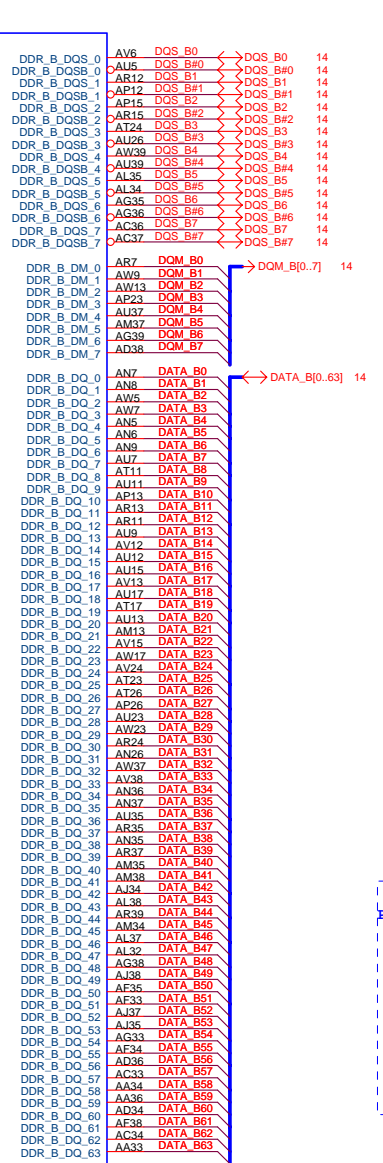
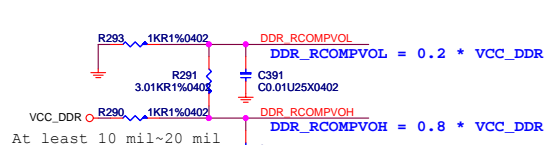
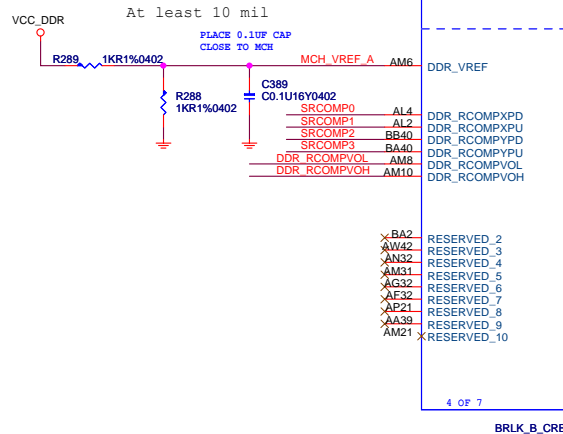
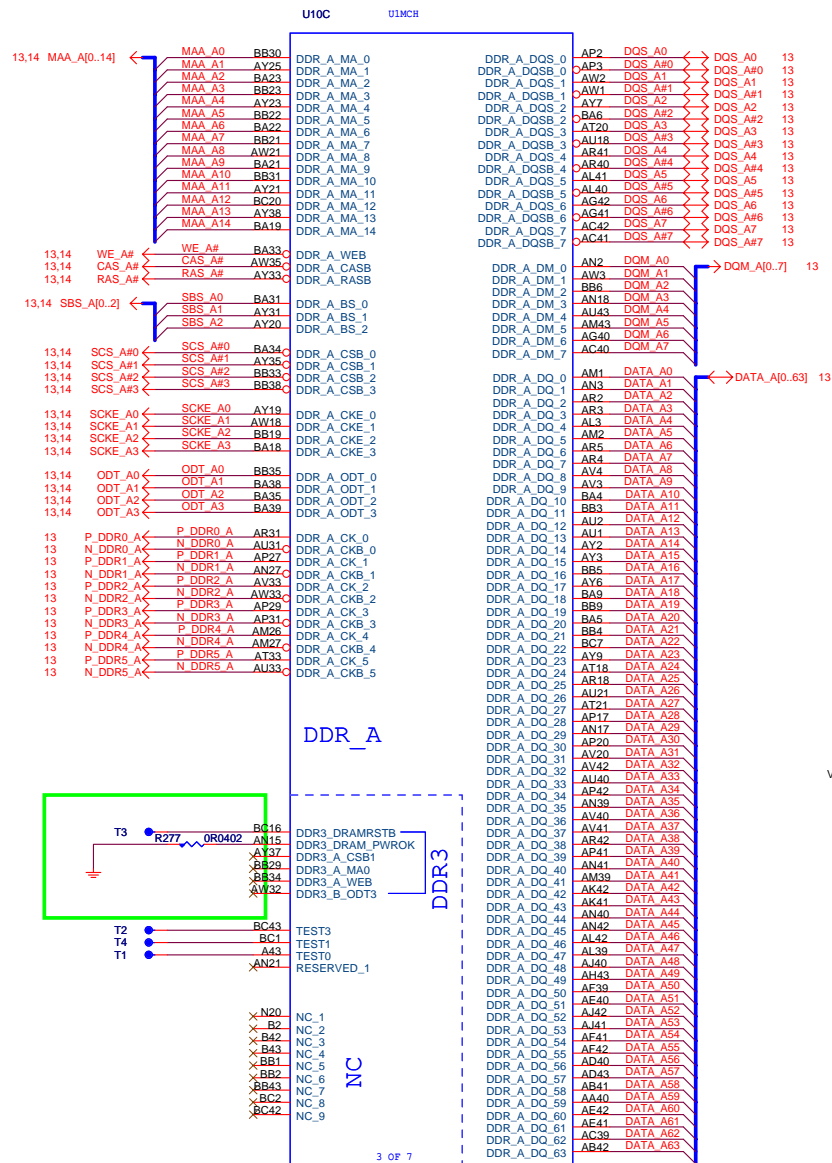
|                                    |                                                       |           |
|------------------------------------|-------------------------------------------------------|-----------|
| Size<br>Custom                     | Document Description<br><b>Intel LGA775 - Signals</b> | Rev<br>0C |
| Date: Wednesday, November 07, 2007 | Sheet 3 of 34                                         |           |



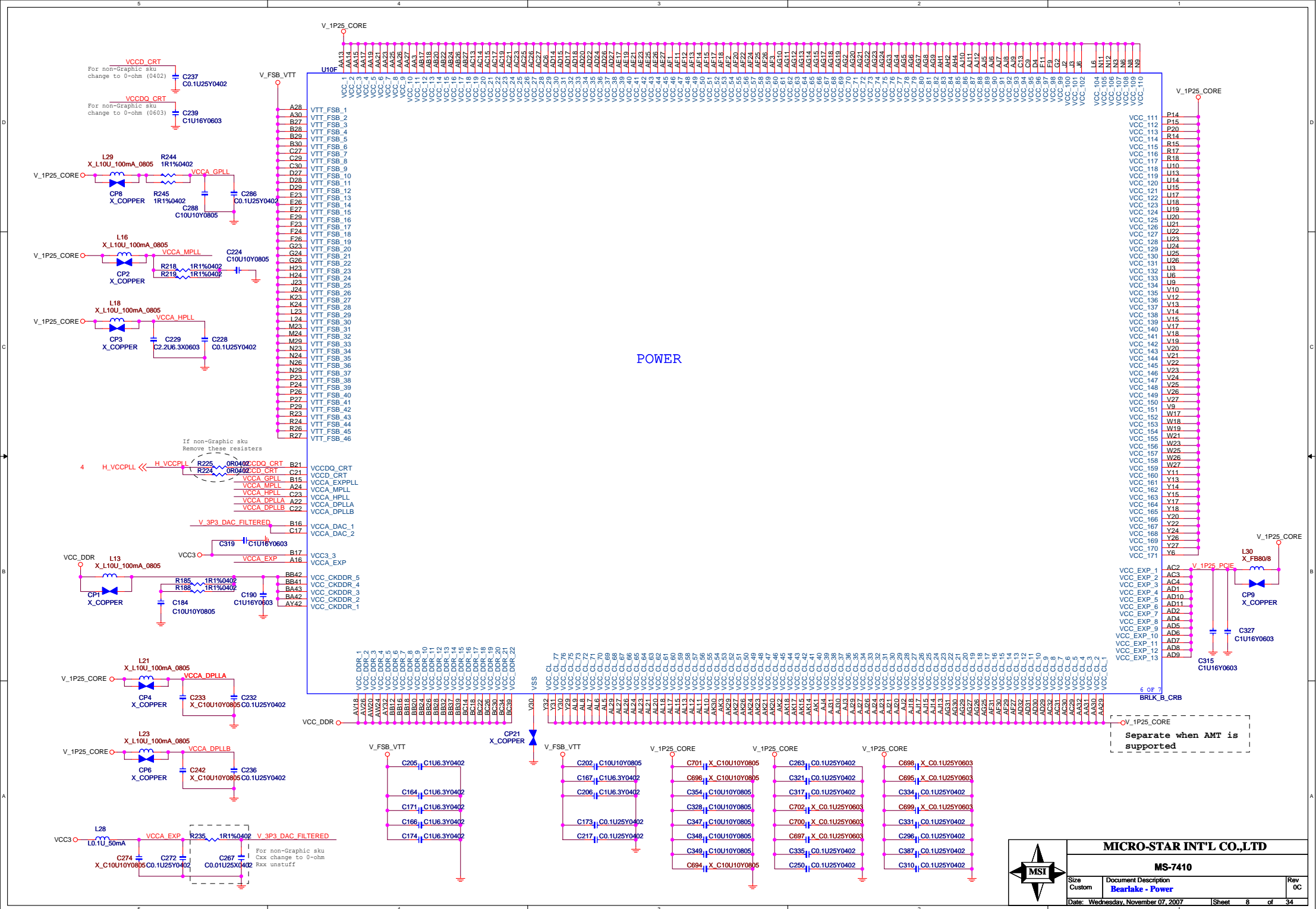
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|---------------------------------------------------------------------------------------|------------------------------------|--------------------------------------------------------|---------------|
|  | <b>MICRO-STAR INT'L CO.,LTD</b>    |                                                        |               |
|                                                                                       | <b>MS-7410</b>                     |                                                        |               |
|                                                                                       | Size<br>Custom                     | Document Description:<br><b>Intel LGA775 CPU - GND</b> | Rev<br>0C     |
|                                                                                       | Date: Wednesday, November 07, 2007 |                                                        | Sheet 5 of 34 |





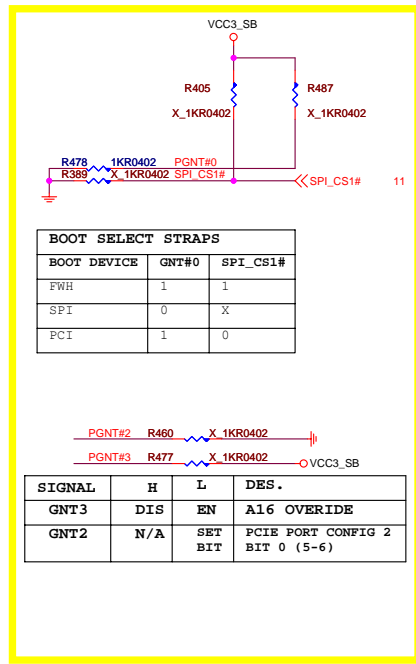
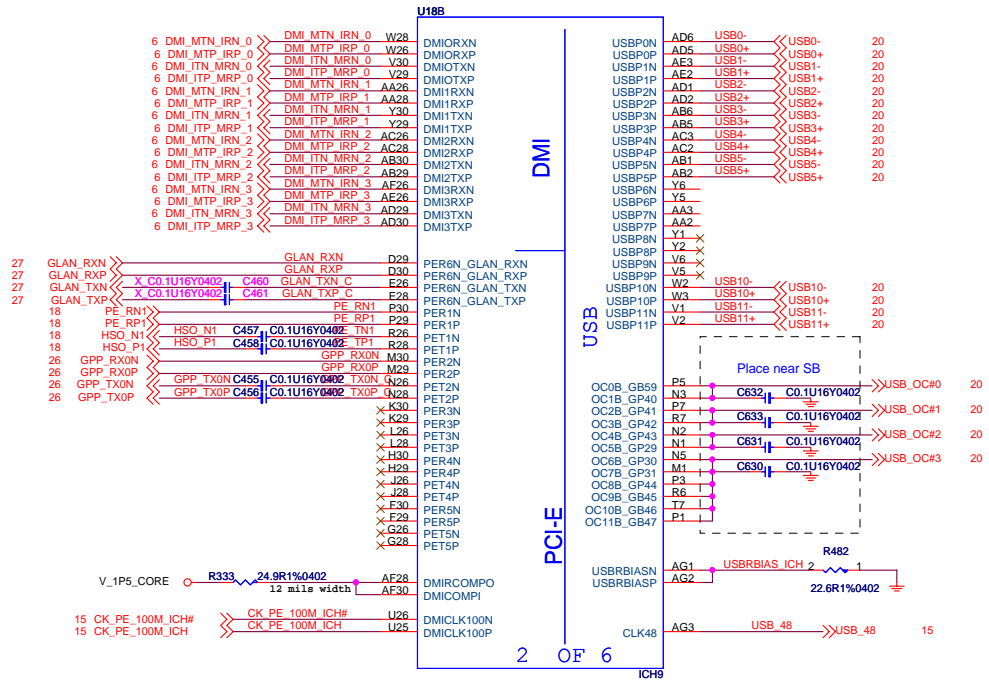
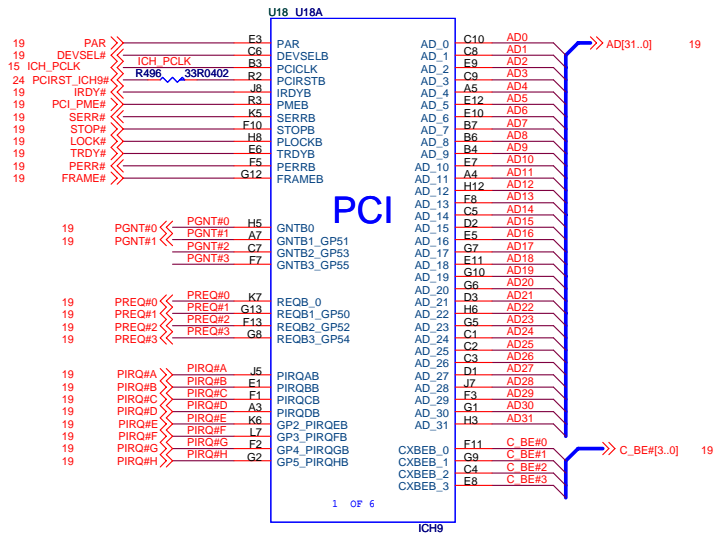


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|------------------------------------|----------------------|-----|
| MS-7410                            |                      |     |
| Size                               | Document Description | Rev |
| Custom                             | Bearlake - Memory    | 0C  |
| Date: Wednesday, November 07, 2007 |                      |     |
| Sheet 7 of 34                      |                      |     |

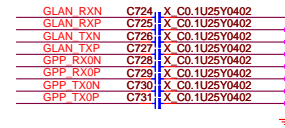


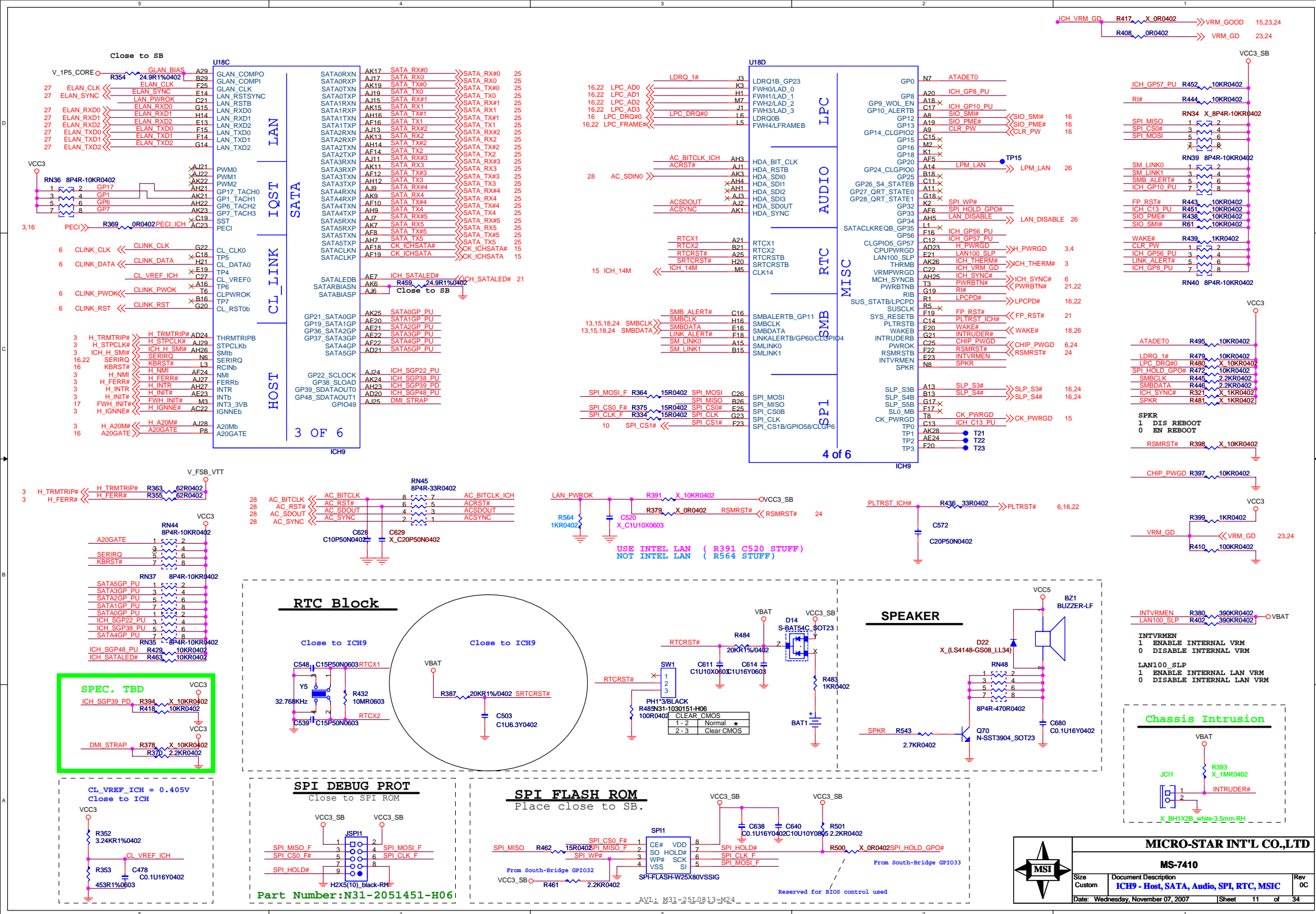




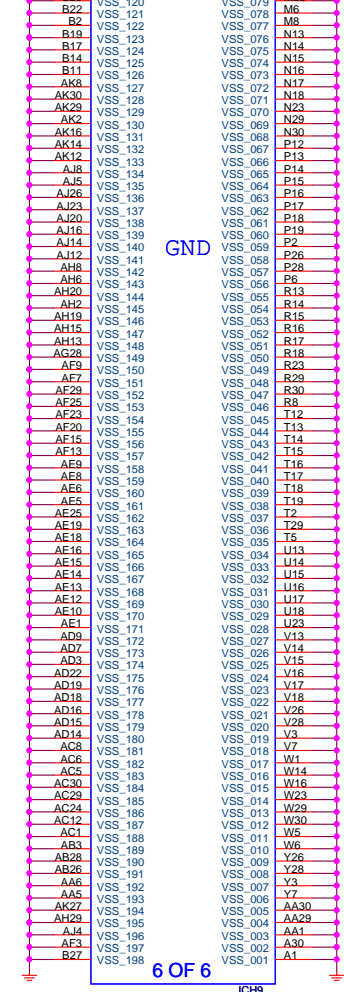
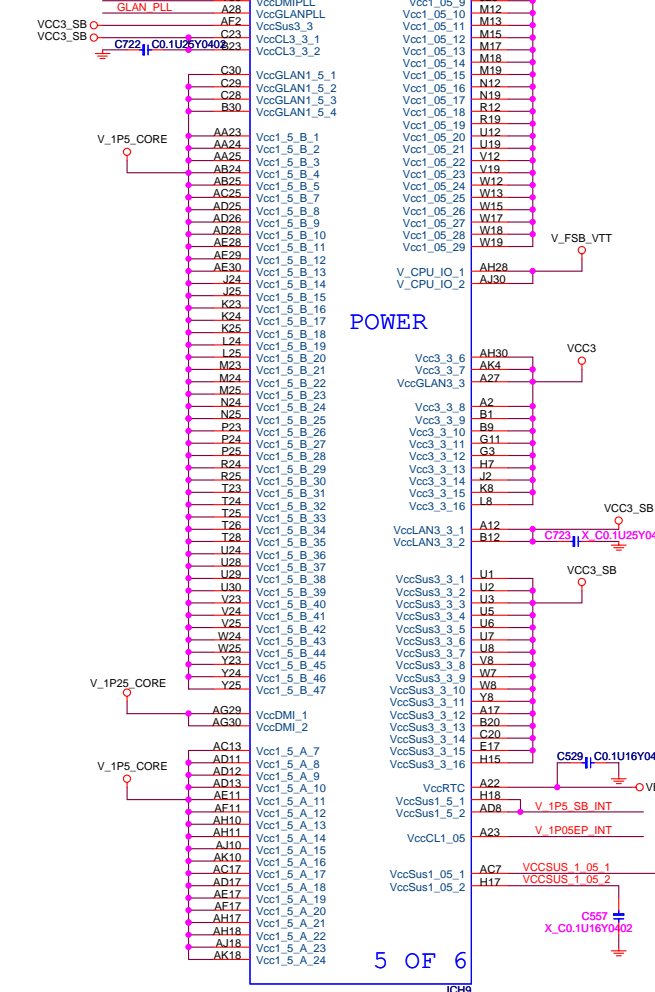
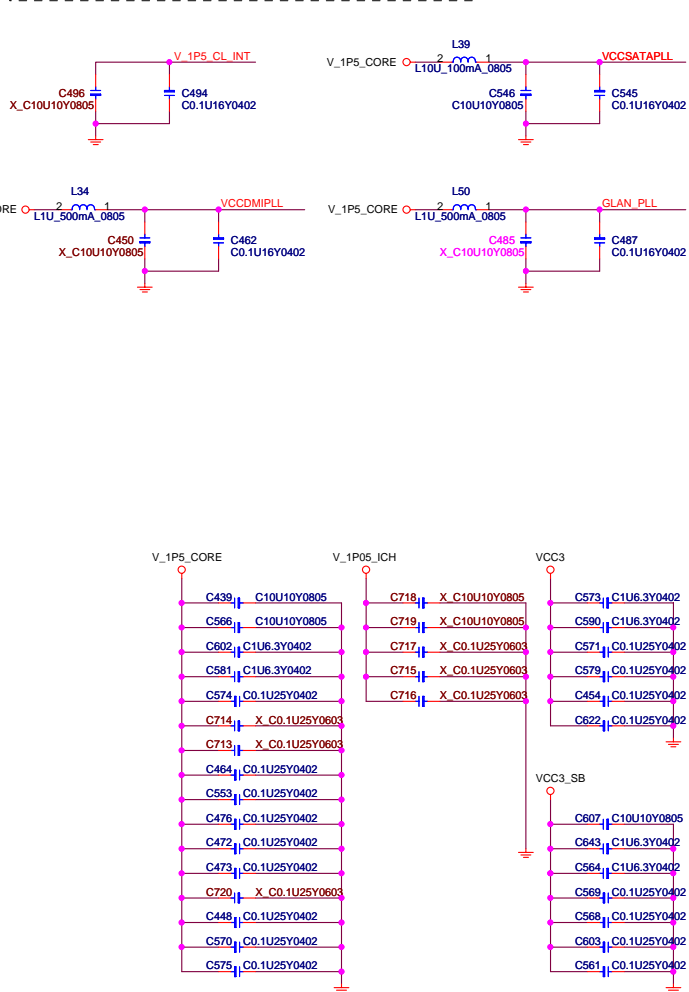


| ICH9 H/W STRAPS |          |         |                                 |
|-----------------|----------|---------|---------------------------------|
| SIGNAL          | H        | L       | DES.                            |
| SPKR            | DIS      | EN      | REBOOT                          |
| GNT3            | DIS      | EN      | A16 OVERRIDE                    |
| INTVRMEN        | EN       | DIS     | INT VRM                         |
| SATALED         | NORM     | REVERSE | PCIE 0-3 ORDER                  |
| HDA_SDOUT       | DFX/PCIE | N/A     | XOR MODE/PCIE PORT CONFIG BIT 1 |
| HDA_SYNC        | SET BIT  | N/A     | PCIE PORT CONFIG BIT 0 (1-4)    |
| GNT2            | N/A      | SET BIT | PCIE PORT CONFIG 2 BIT 0 (5-6)  |





### 5VREF & 5VREF\_SUS Sequencing Circuit



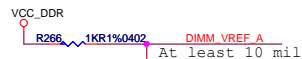
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|                                    |                                                  |           |
|------------------------------------|--------------------------------------------------|-----------|
| Size<br>Custom                     | Document Description<br><b>ICH9 - Power, GND</b> | Rev<br>0C |
| Date: Wednesday, November 07, 2007 | Sheet 12 of 34                                   |           |



## DDRII DIMM\_A1

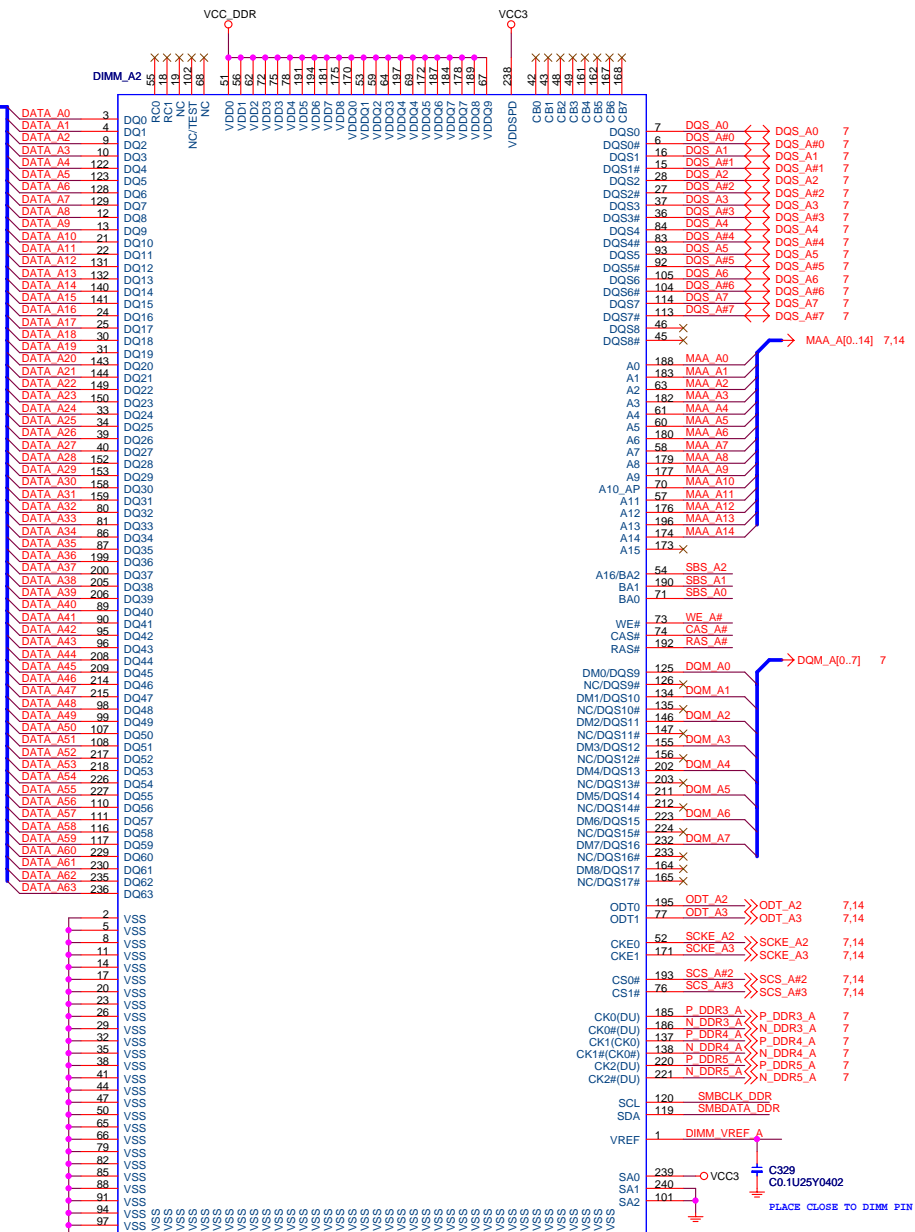


SMBCLK\_DDR R63 33R0402

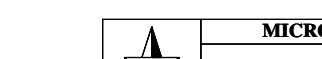
SMBDATA\_DDR R66 33R0402

SMBCLK 11.15,18,24

SMBDATA 11.15,18,24



## DDRII DIMM\_A2



SMBCLK\_DDR R63 33R0402

SMBDATA\_DDR R66 33R0402

SMBCLK 11.15,18,24

SMBDATA 11.15,18,24

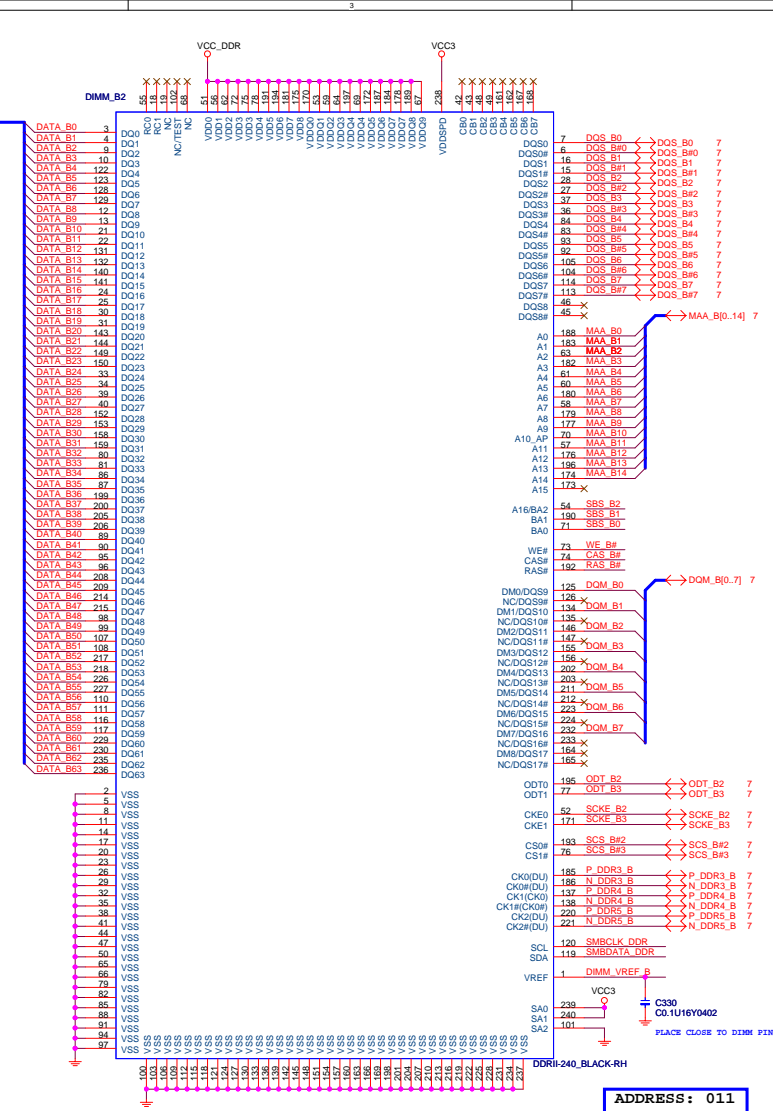


MICRO-STAR INT'L CO.,LTD

MS-7410

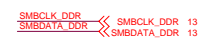
| Size                               | Document Description | Rev |
|------------------------------------|----------------------|-----|
| Custom                             | DDR2 CHANNEL-1       | 0C  |
| Date: Wednesday, November 07, 2007 | Sheet 13 of 34       |     |





VCC\_DDR

R265 1KR1%0402 DIMM\_VREF\_B



ADDRESS: 011  
0xA6

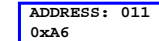
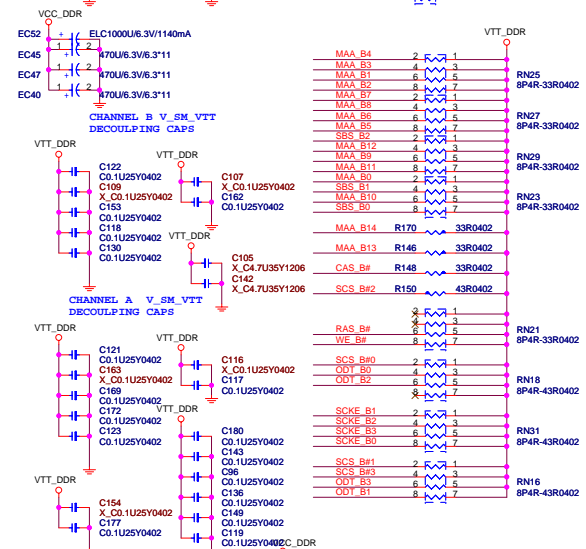


Figure 1: Pin connections for the 8P4R-33R0402 module. The diagram shows two rows of pins. The top row (VTT\_DDR) includes pins for MAA\_A4 through MAA\_A14, RAS\_A#0, WE\_A#, CAS\_A#, and MAA\_A13. The bottom row (VCC\_DDR) includes pins for C157, C288, C311, C311, C80, C116, C156, C276, C193, C125, C234, C116, C135, C316, C316, C301, C282, C201, C83, C116, C198, C116, C170, and C125. Each pin is connected to a specific component or signal, with some pins having multiple connections indicated by arrows.

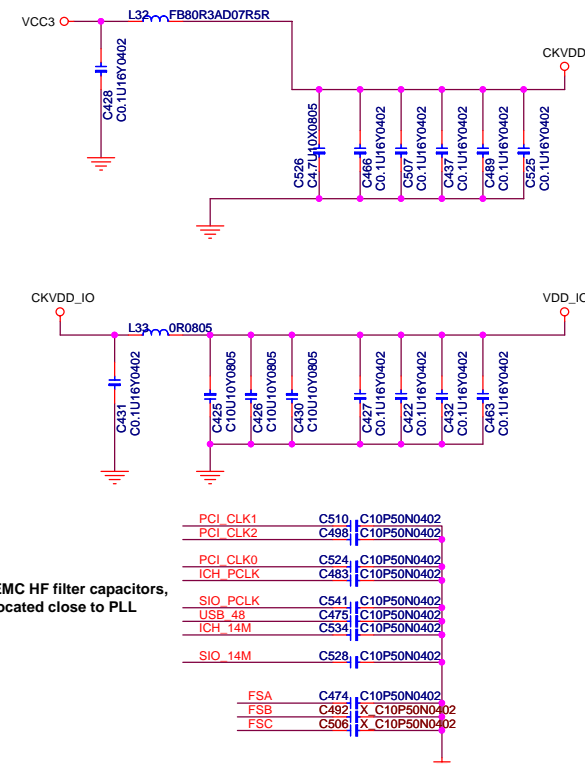
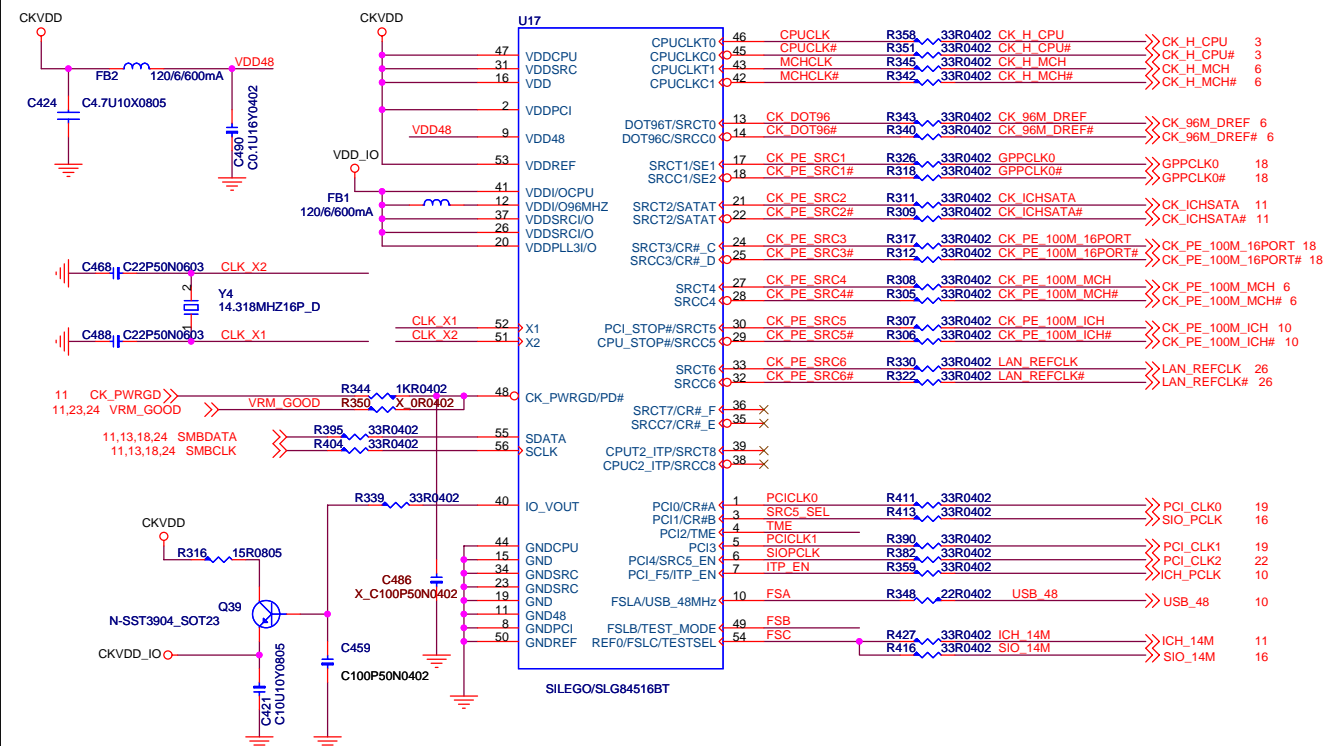


MS-7410

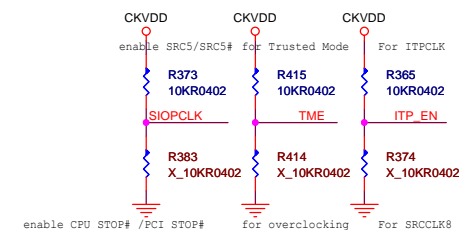
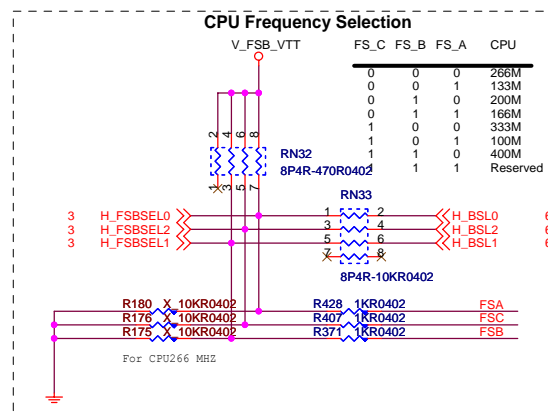
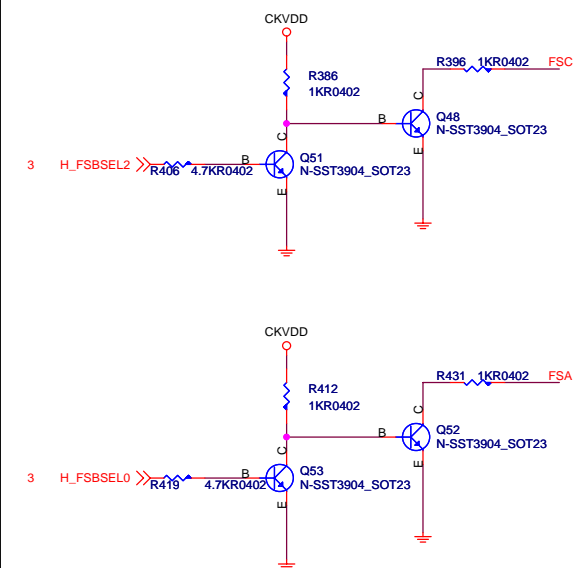
|                                    |                                                                  |    |
|------------------------------------|------------------------------------------------------------------|----|
| Size Custom                        | Document Description<br><b>DDR2 CHANNEL-2/DDR II Termination</b> | Re |
| Date: Wednesday, November 07, 2007 | Sheet 14 of 34                                                   |    |

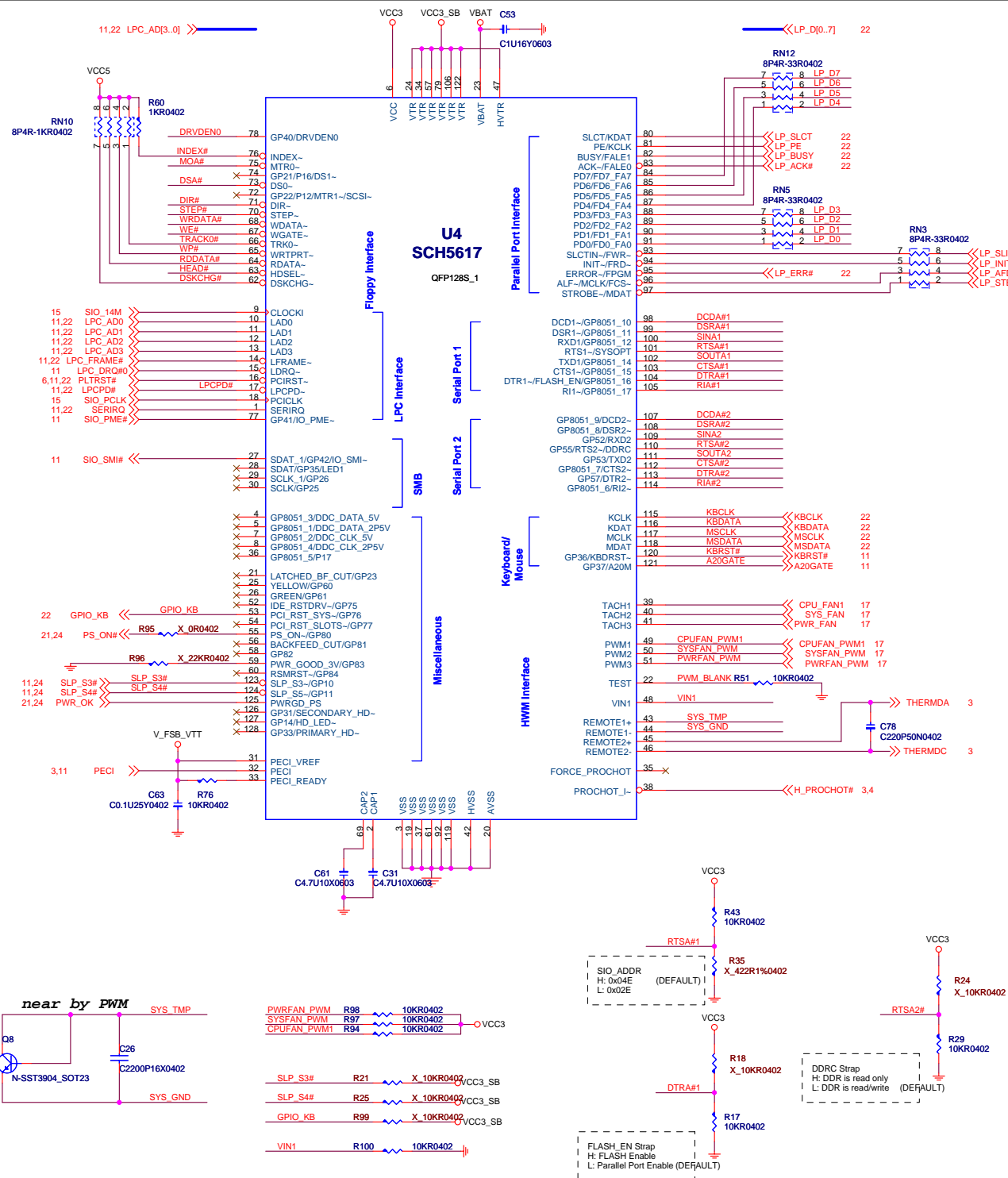


# Clock Generator -SILEGO/SLG84516BT

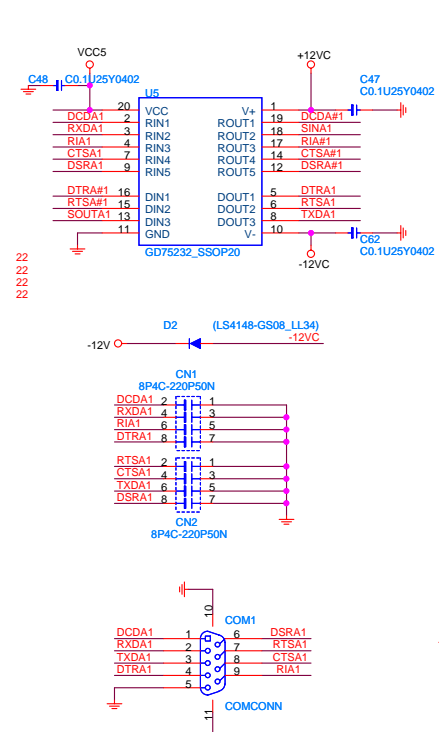


EMC HF filter capacitors,  
located close to PLL

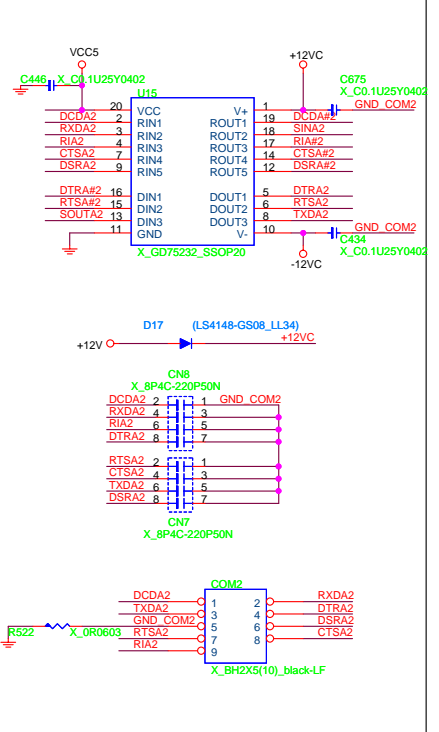




### SERIAL PORT 1

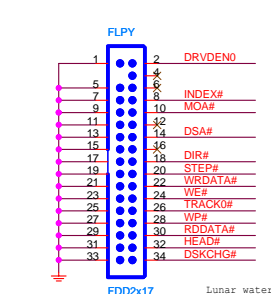


### SERIAL PORT 2

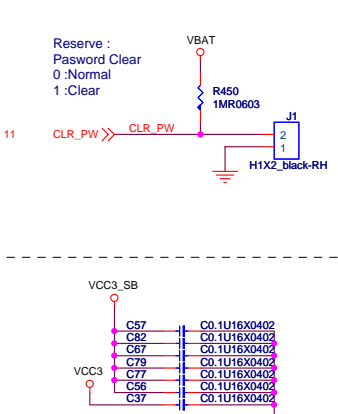


### FLOPPY CONNECTOR

ROPROS-VS UNSTUFF

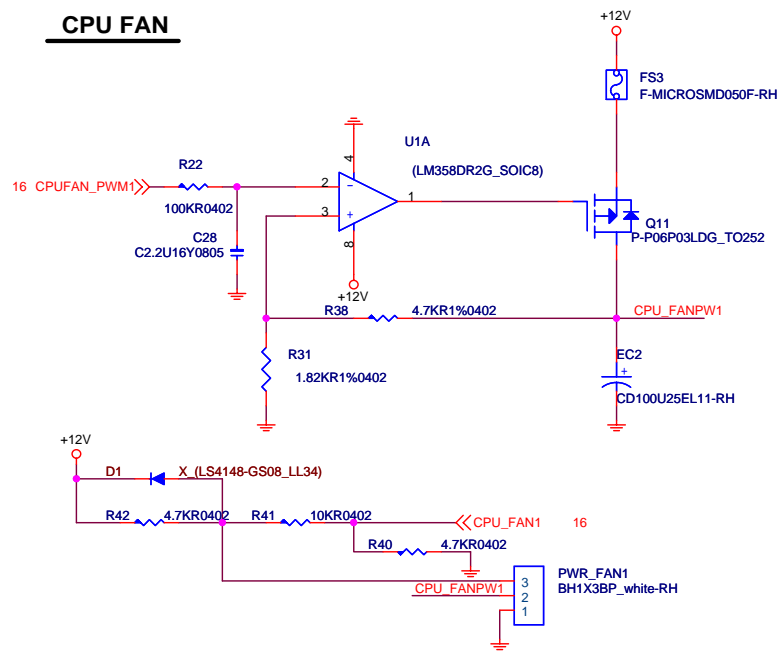


### Password Clear

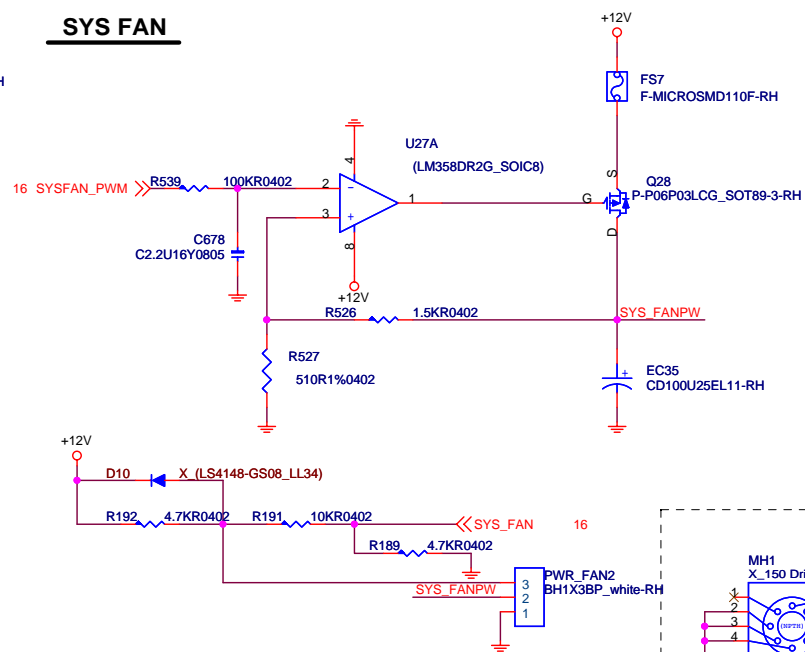


| MICRO-STAR INT'L CO.,LTD           |                      |     |
|------------------------------------|----------------------|-----|
| MS-7410                            |                      |     |
| Size                               | Document Description | Rev |
| Custom                             | SCH5617, COM1,2, FDD | OC  |
| Date: Wednesday, November 07, 2007 |                      |     |
| Sheet 16 of 34                     |                      |     |

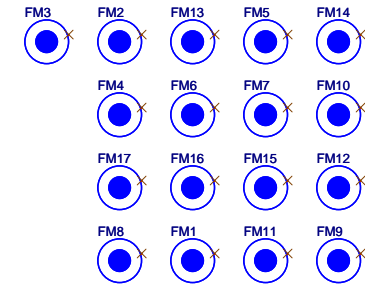
## CPU FAN



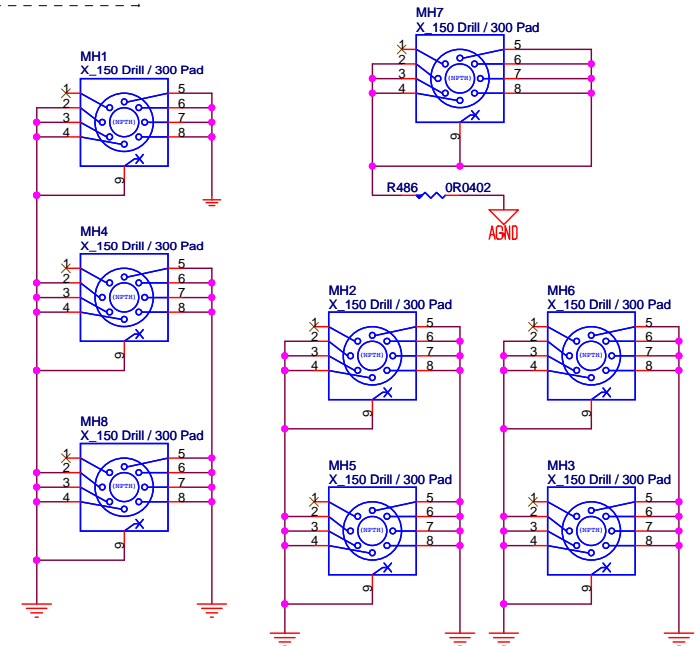
## SYS FAN



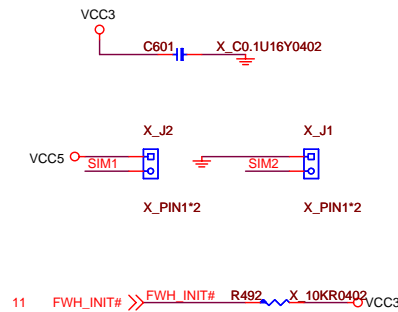
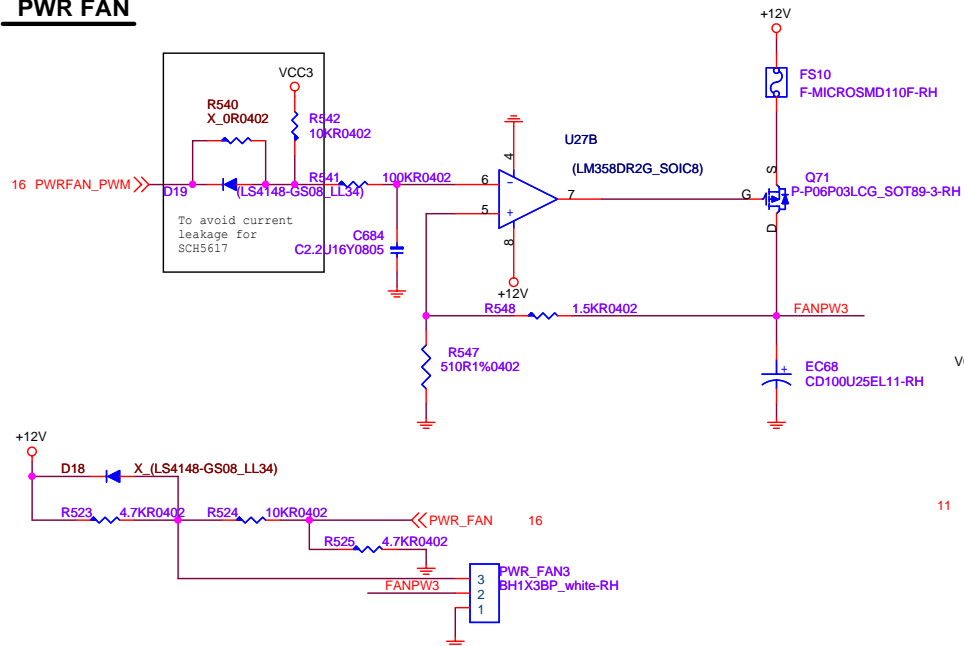
## Optical Fiducial Marks




## Mounting Holes

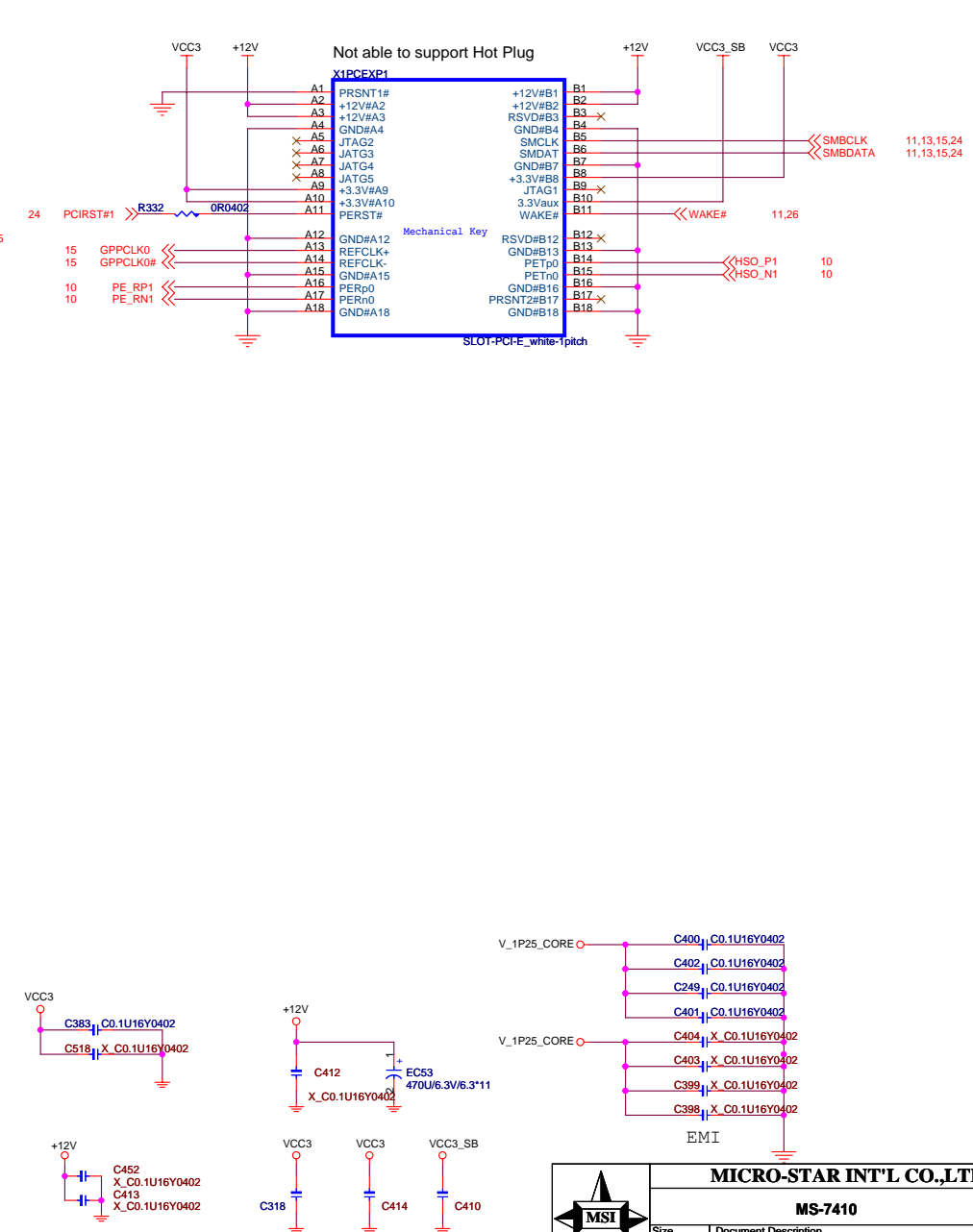
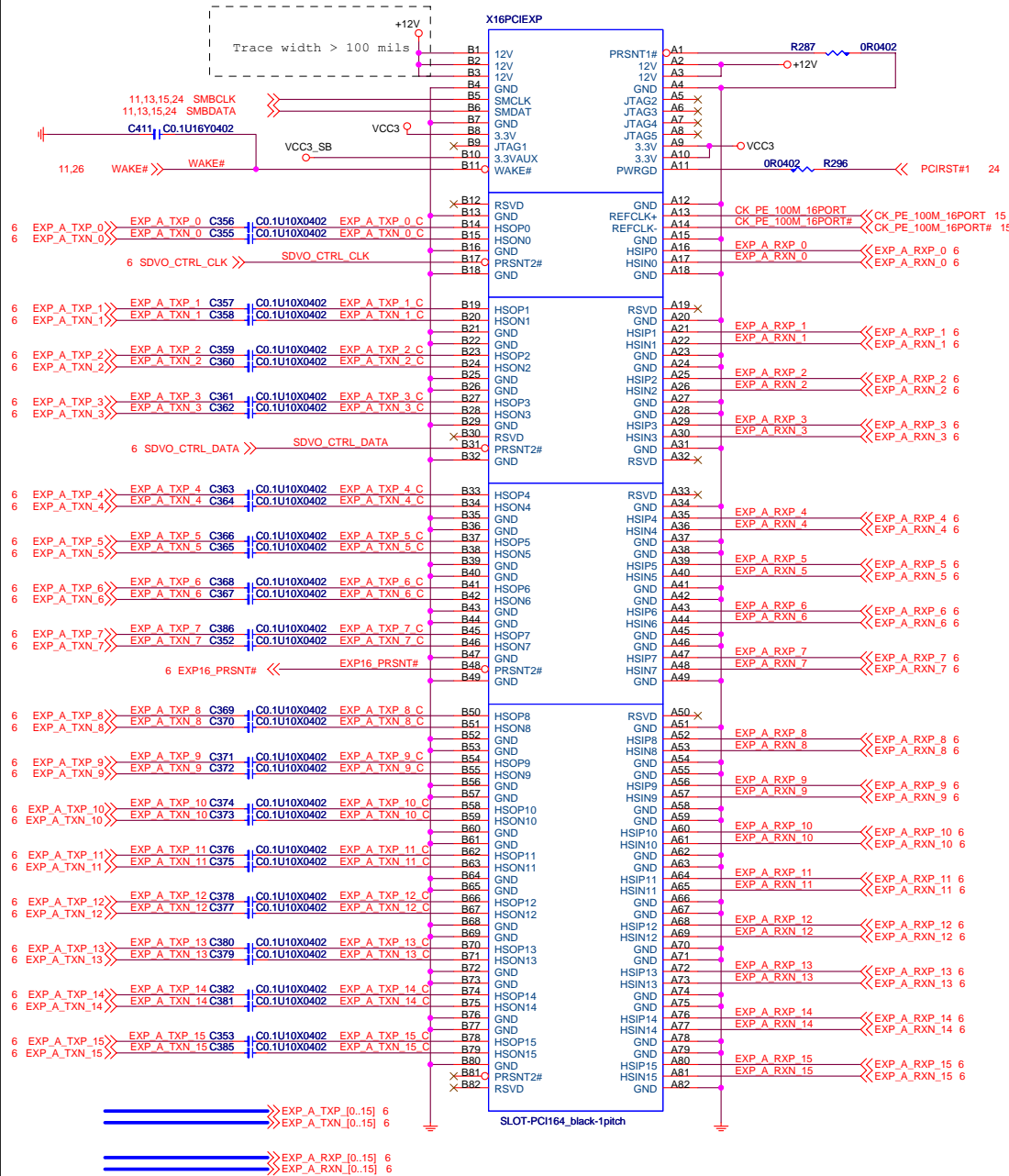


## PWR FAN

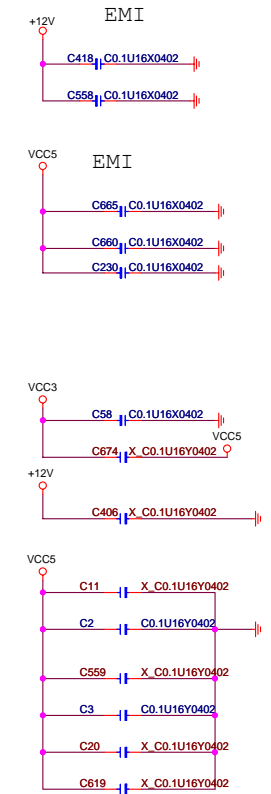
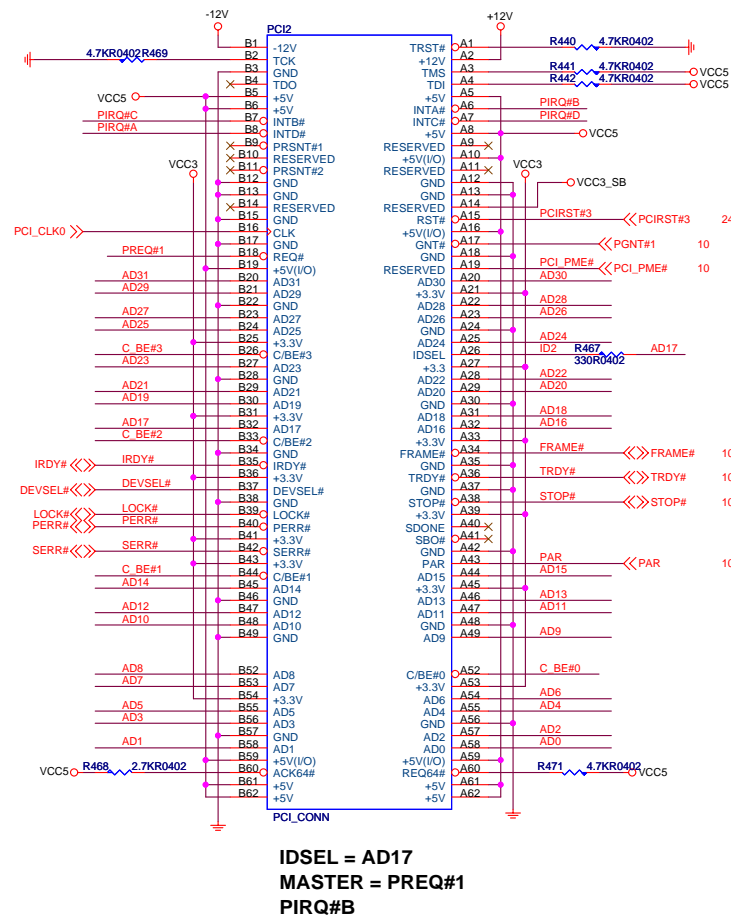


|                                                                                       |                                                |                |                                 |        |
|---------------------------------------------------------------------------------------|------------------------------------------------|----------------|---------------------------------|--------|
|  |                                                |                | <b>MICRO-STAR INT'L CO.,LTD</b> |        |
|                                                                                       |                                                |                | <b>MS-7410</b>                  |        |
| Size B                                                                                | Document Description<br><b>CPU/SYS/PWR FAN</b> |                |                                 | Rev 0C |
| Date: Wednesday, November 07, 2007                                                    |                                                | Sheet 17 of 34 |                                 |        |

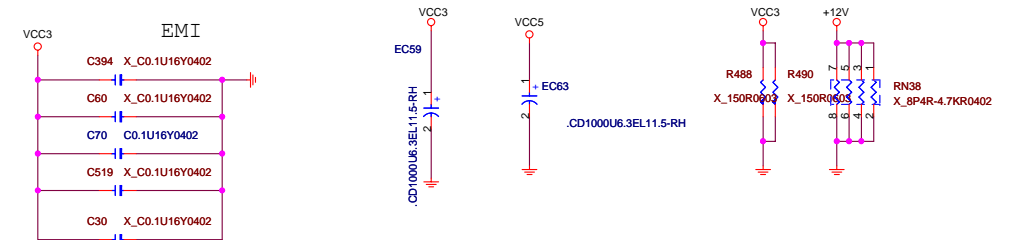
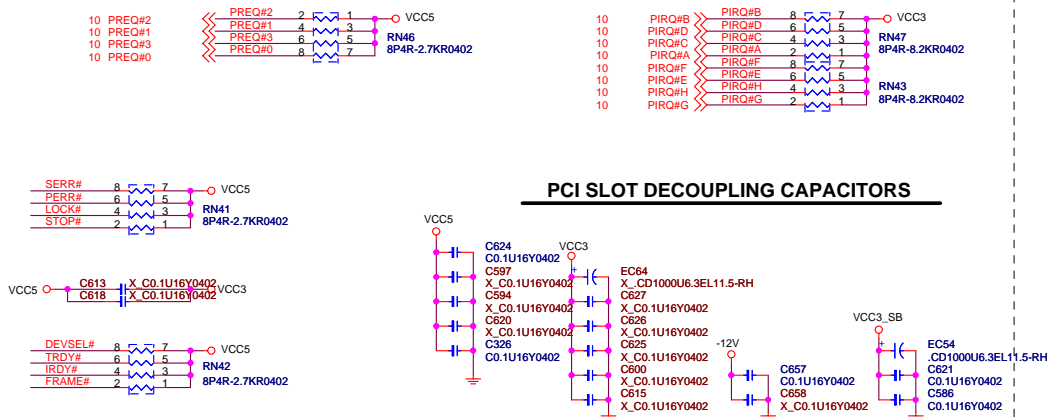
# PCI EXPRESS 16-PORT



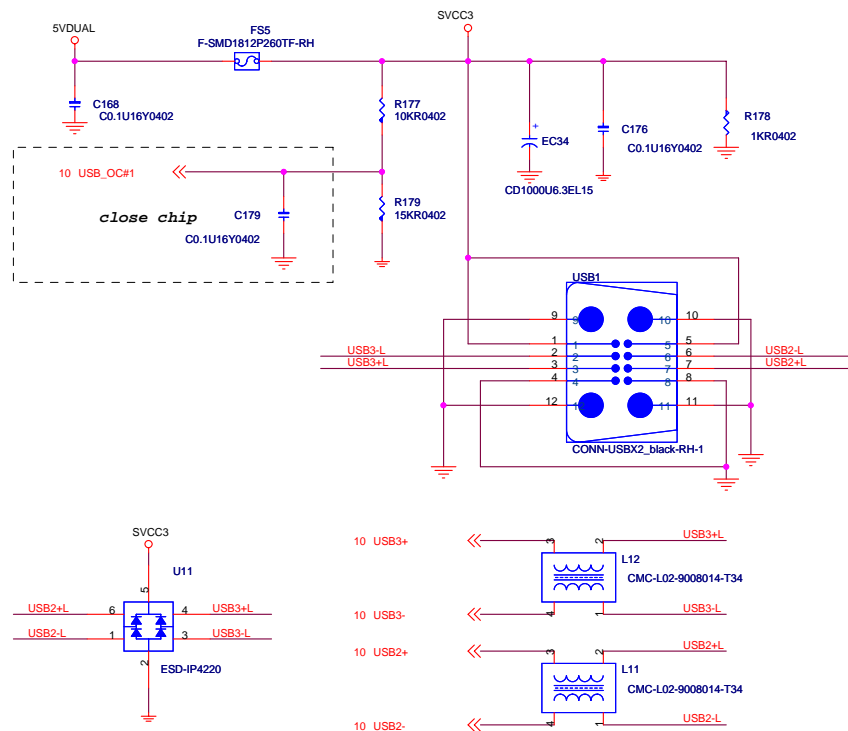
**PCI SLOT 2 (PCI VER: 2.2 COMPLY)**



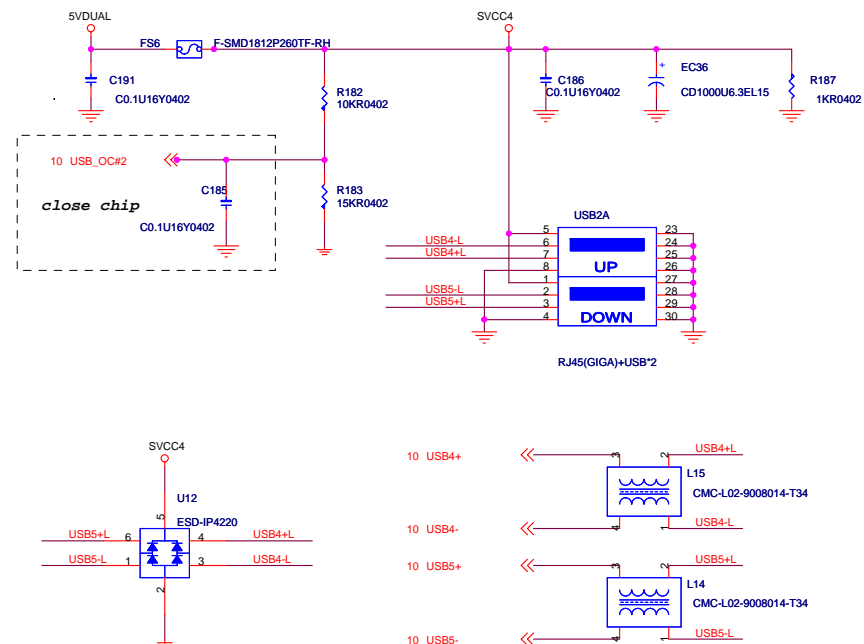
## PCI SLOT DECOUPLING CAPACITORS



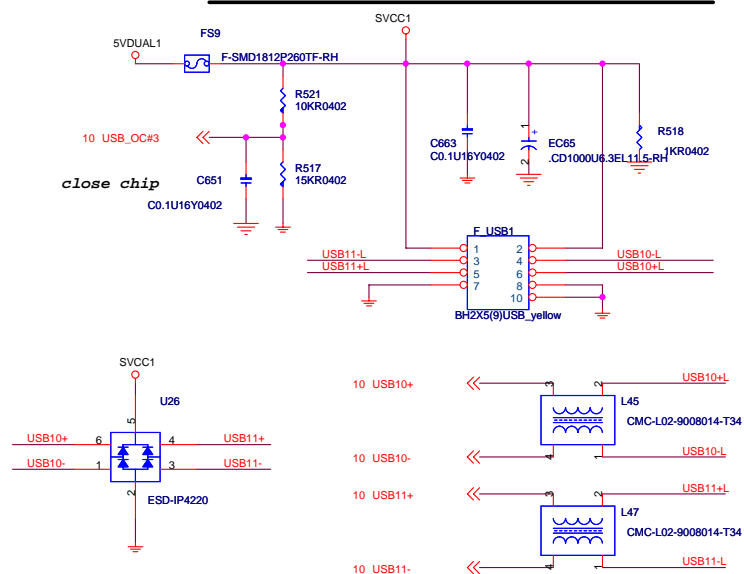
## REAR PANEL USB CONNECTOR FOR USB PORT 2,3



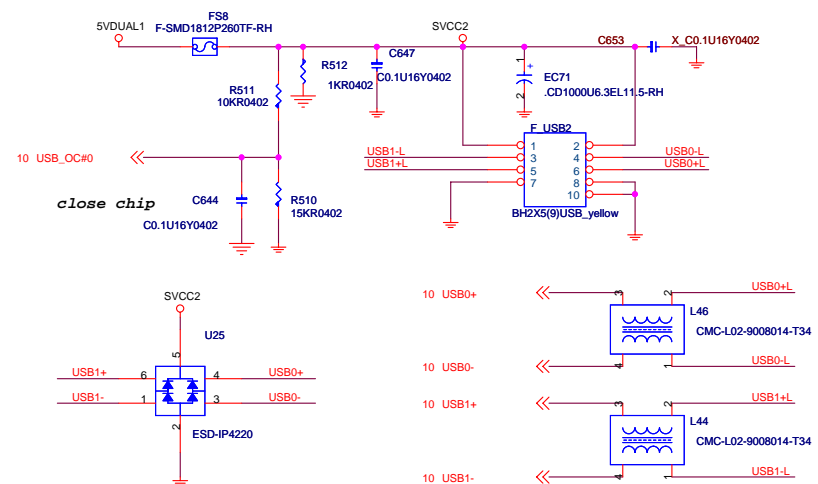
## REAR PANEL USB CONNECTOR FOR USB PORT 4,5



## Front USB PORT 10,11 (right angel type)

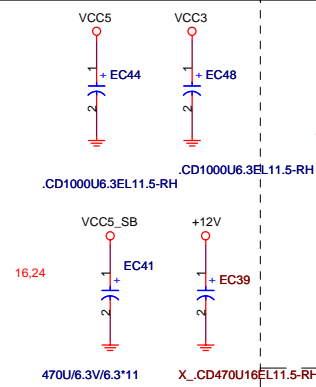
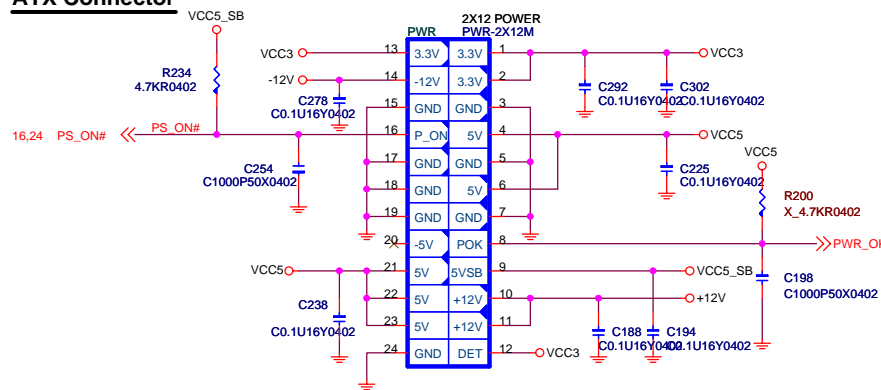


## Memory card reader USB CONNECTOR FOR USB PORT 0,1

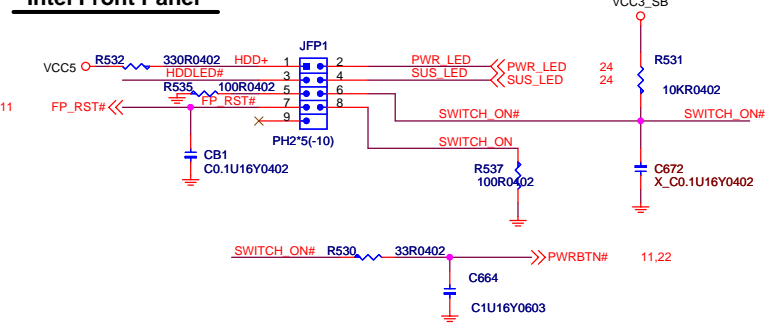




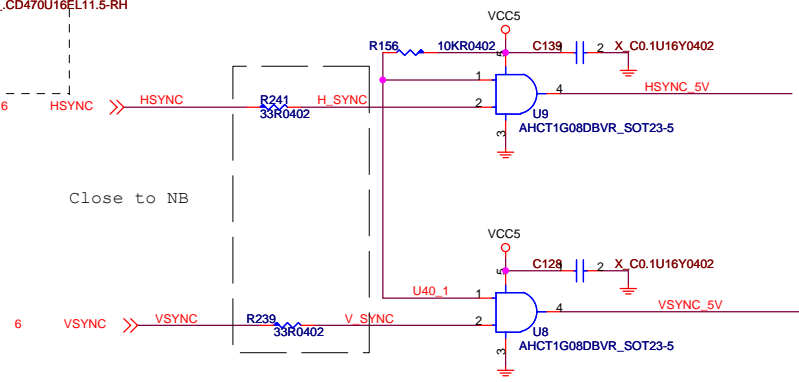
## ATX Connector



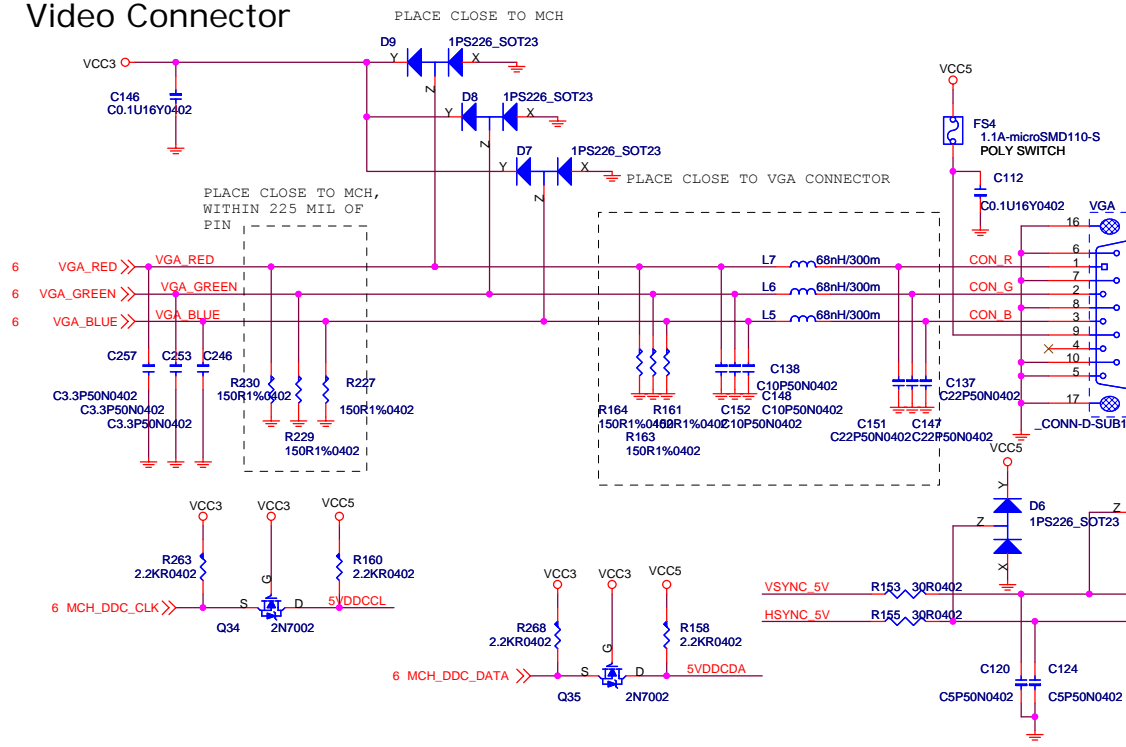
## Intel Front Panel



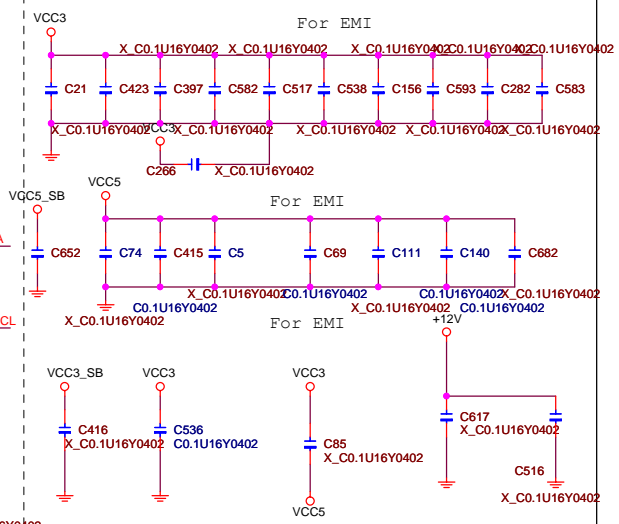
## IDE LED



## Video Connector

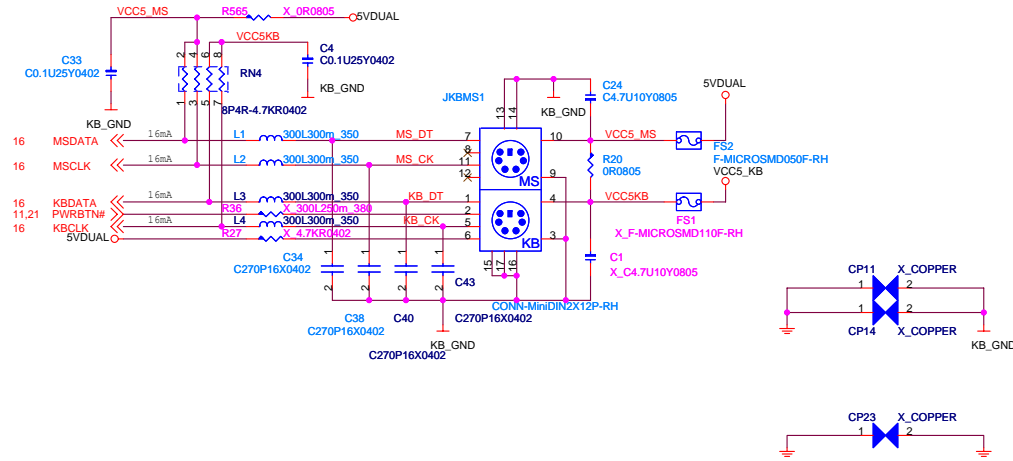


| Part Value Selection: |                  |
|-----------------------|------------------|
| G:                    | With 915G option |
| X:                    | No Stuff         |



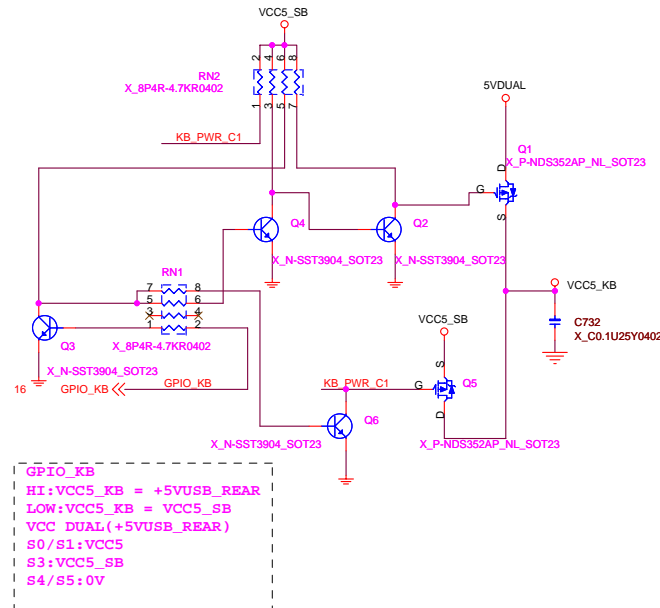
| MICRO-STAR INT'L CO.,LTD           |                                                                |        |
|------------------------------------|----------------------------------------------------------------|--------|
| MS-7410                            |                                                                |        |
| Size Custom                        | Document Description<br><b>ATX, Front Panel &amp; VGA Conn</b> | Rev 0C |
| Date: Wednesday, November 07, 2007 | Sheet 21                                                       | of 34  |

## PS2 KEYBOARD & MOUSE CONNECTOR

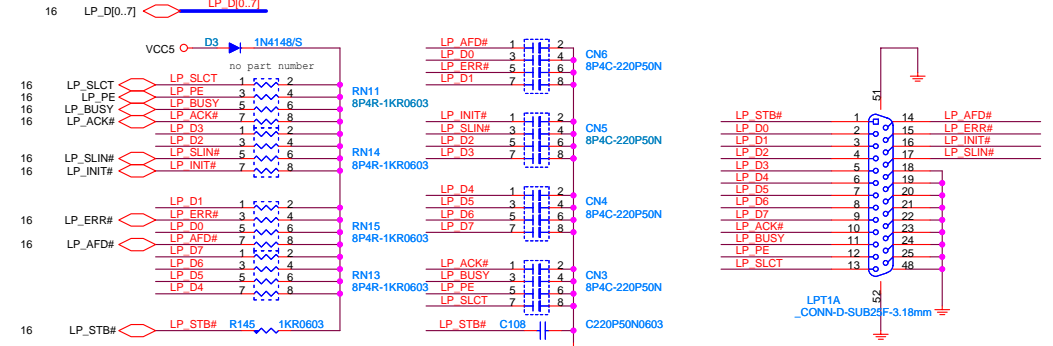


|              | FS2 | R20 | C24 | L1 | L2 | C33 | C33 | C34 | C38 | FS1 | C1 | R27 | R36 |
|--------------|-----|-----|-----|----|----|-----|-----|-----|-----|-----|----|-----|-----|
| ROPROS-MA    | V   | V   | V   | V  | V  | V   | V   | V   | V   | X   | X  | X   | X   |
| ROPROS-VS    | X   | X   | X   | X  | X  | X   | X   | X   | X   | V   | V  | V   | V   |
| ROPROS-NECCA | V   | V   | V   | V  | V  | V   | V   | V   | V   | X   | X  | X   | X   |

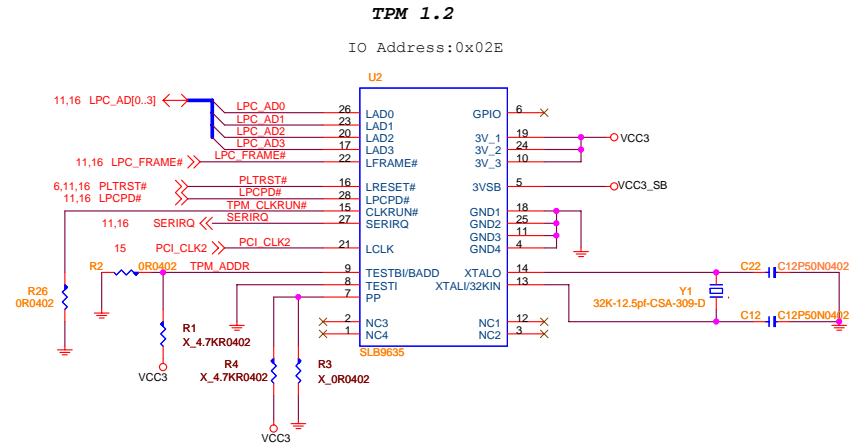
## K/B Power supply function for ROPROS-VS



## PARALLAL PORT



## T.P.M FOR ROPROS-MA



### Voltage Regular Module

N-P0903BDG\_TO252  
P75N02LDG/TO252  
C100U2SP  
CD560U4OS-2  
1800UF/6.3V  
0.25uH/40A  
CH-1.1U25A-LF  
CD1000U16EL20-2

mosfet/n-channel, P0903BDG, SMT/TO252, Rds(on)=9.5mΩ(10V, 25A), Vgs(on)=1~3V, Id=50A, Ciss=1800pF, Qg=50nC, Vds=25V, Vgs=±20V, RoHS compliance

mosfet/n-channel, P75N02LDG, SMT/TO252, Rds(on)=7mΩ(810V, 30A), Vgs(on)=1~3V, Id=75A, Ciss=5000pF, Qg=140nC, Vds=25V, Vgs=±20V, RoHS compliance

ESR<13mΩ, Ripple cur.<2.7A, 12mC12uA, 105C

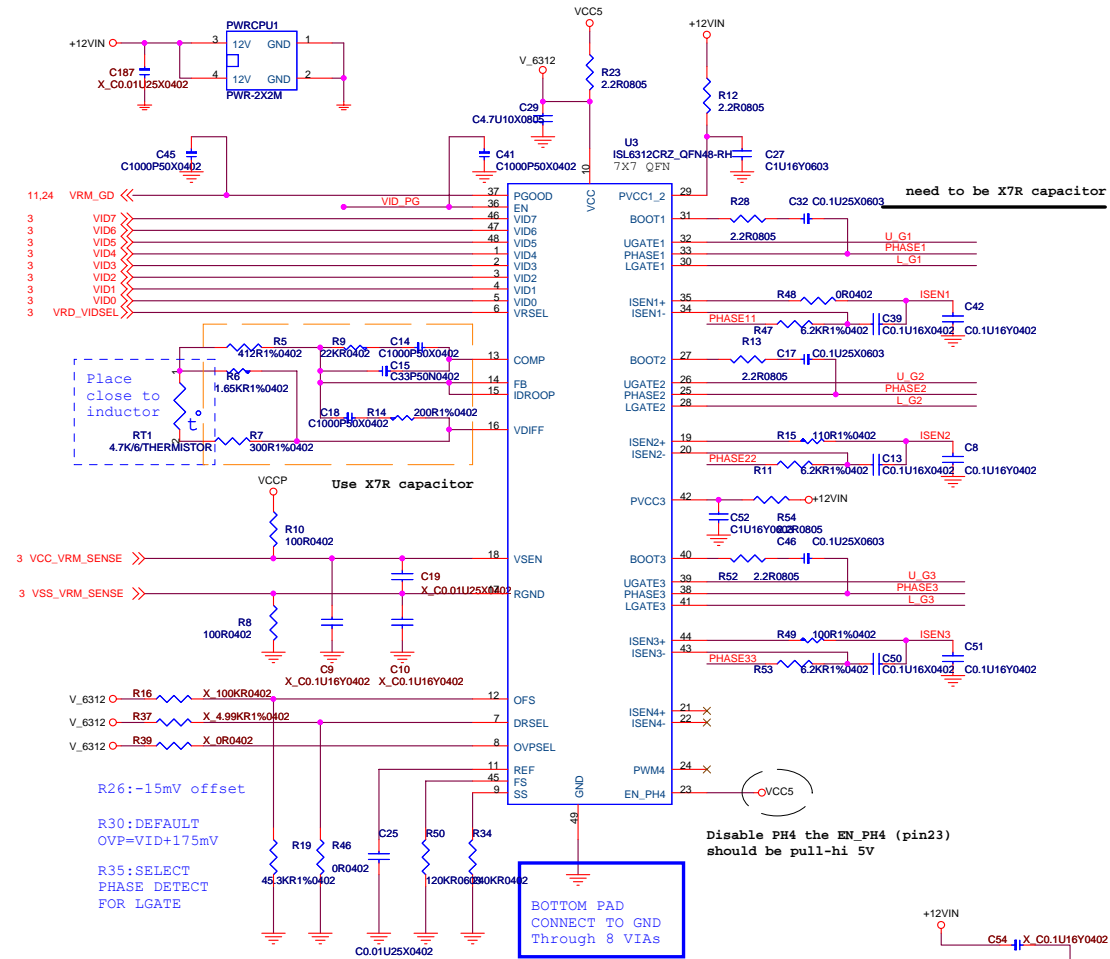
CAP, OS-CON, 560u/4V, Dip-2/8\*9/3.5mm, ESR<7mohm, Ripplecur.=6100mA, Lc. <500uA, SPEC series, RoHS compliance

ESR<12mΩ, Ripplecur<2350mA, 105C, longlife change from 2000hrs to 3000hrs ,KZJ series

, IND CHOKE, 0.25uH, 20%, DIP/8.5mm, 40A, 0.6mOhm, ,, PEW, FERRITE, SQUARE, RoHS COMPLIANCE

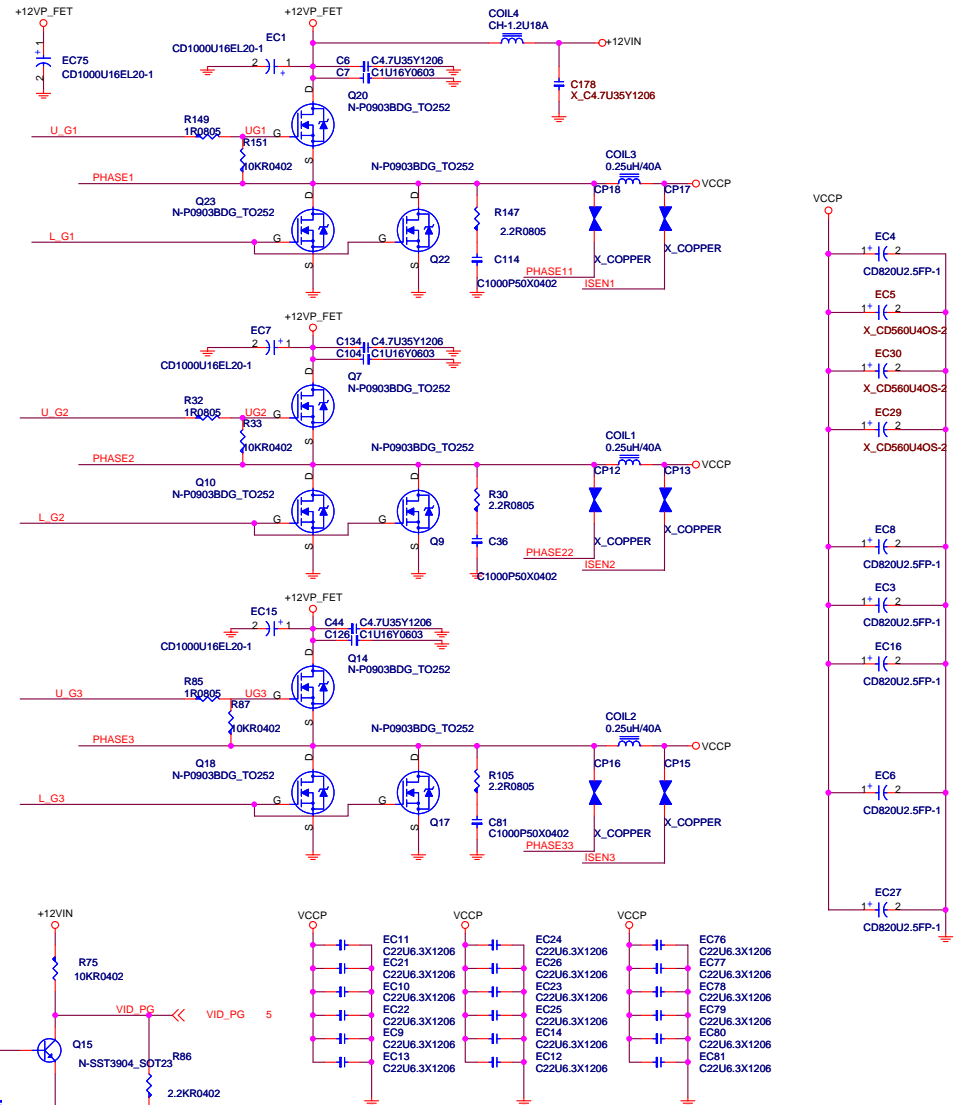
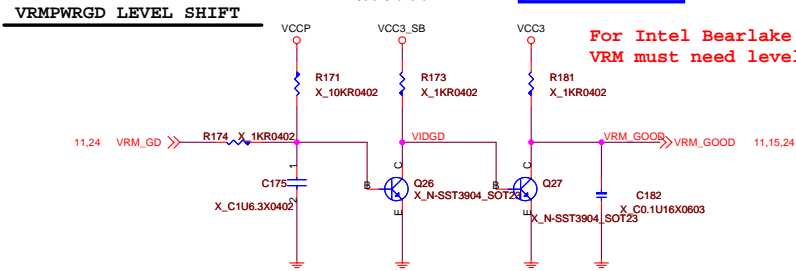
IND CHOKE, 1.1uH, 20%, DIP/9mm, 25A, 1.4mOhm, 5.5T, 0.9mmx3, PEW, IRON,, LEAD FREE

CAP, EL, 1000u, 16V, Dip-8x20/3.5mm, 20%, 12mOhm, 2350mA, 105C, 3000hrs, RoHS COMPLIANCE



Disable PH4 the EN\_PH4 (pin23)  
should be pull-hi 5V

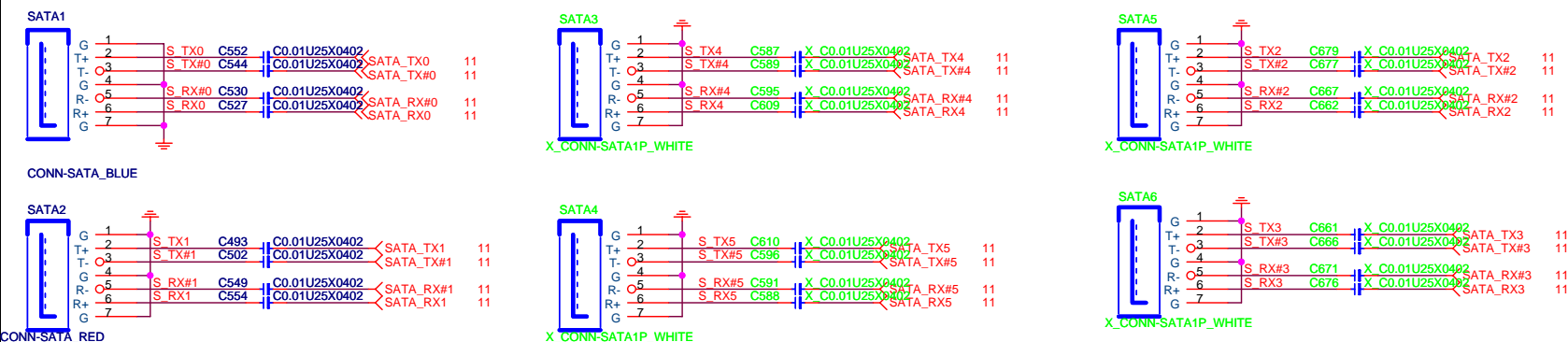
For Intel Bearlake Design Guide.  
VRM must need level shift



|                                    |                                                           |                |           |
|------------------------------------|-----------------------------------------------------------|----------------|-----------|
| <b>MICRO-STAR INT'L CO.,LTD</b>    |                                                           |                |           |
| <b>MS-7410</b>                     |                                                           |                |           |
| Size<br>Custom                     | Document Description<br><b>VRD11 Intersil 6312 3Phase</b> |                | Rev<br>0C |
| Date: Wednesday, November 07, 2007 |                                                           | Sheet 23 of 34 |           |

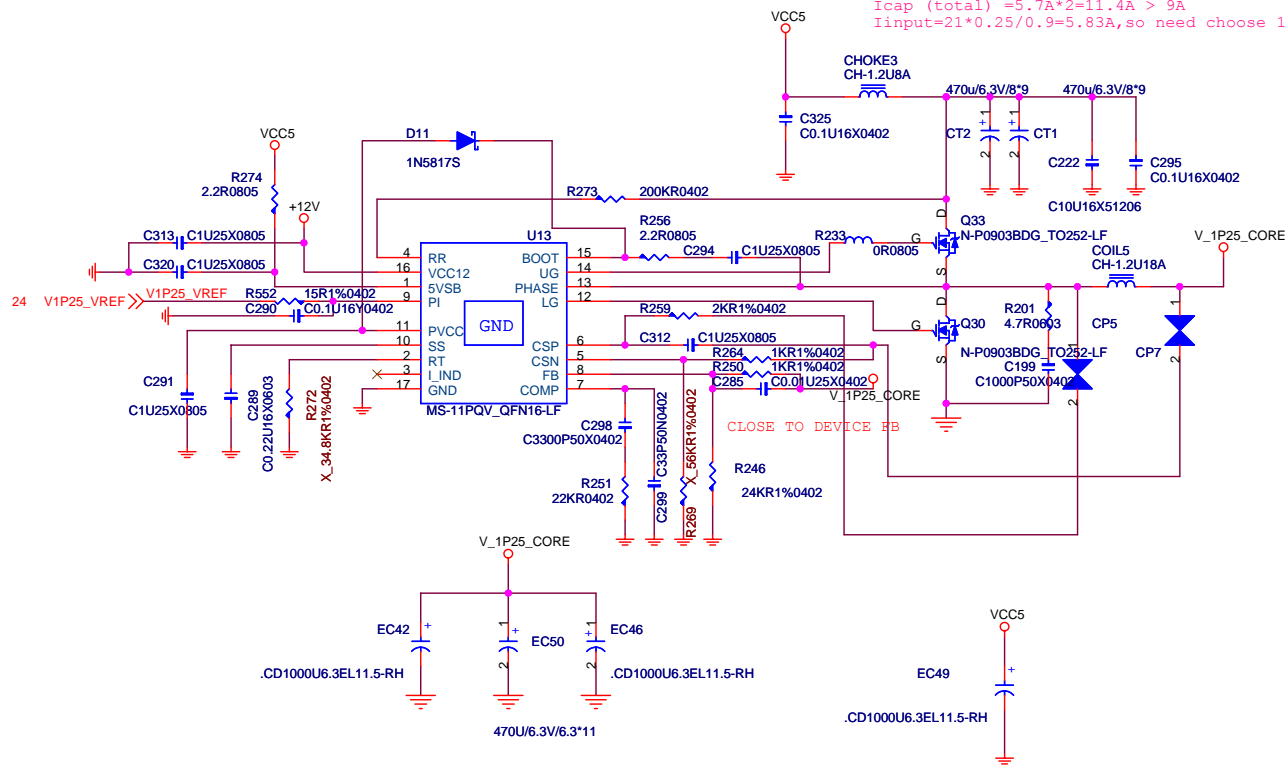


# SERIAL ATA CONNECTOR BLOCK SATA1&SATA2 FOR ROPROS-MA/VS USE



## GMCH 1.25V POWER (21.3A)

$I_{rms} = 21 \times 0.433 = 9.09A$   
 $I_{cap} (total) = 5.7A \times 2 = 11.4A > 9A$   
 $I_{input} = 21 \times 0.25 / 0.9 = 5.83A$ , so need choose 1.2UH/8A choke



MICRO-STAR INT'L CO.,LTD

MS-7410

Size  
B

Document Description  
SATA&V\_1P25\_CORE

Rev  
0C

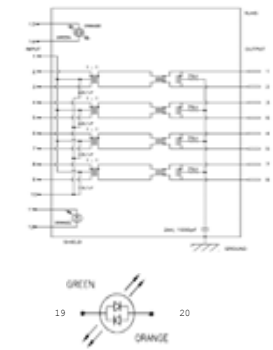
Date: Wednesday, November 07, 2007

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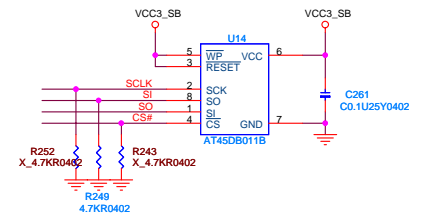
## BCM5787M LAN CHIP (ROPROS-MA/NECCAP USE)

## LAN Connector

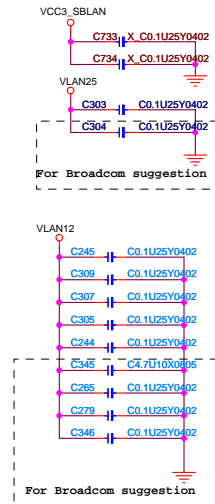
| Giga-Lan        |          |
|-----------------|----------|
| N58-22F0271-S42 |          |
| Link            | Yellow   |
| Active          | Blinking |
| 1000            | Orange   |
| 100             | Green    |
| 10              | None     |
| 21              | Orange   |
| 22              | Yellow   |
| 20              | Orange   |
| 19              | Green    |



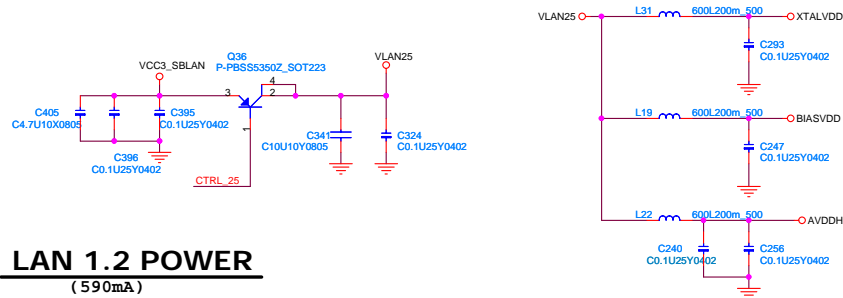
## LAN EEPROM



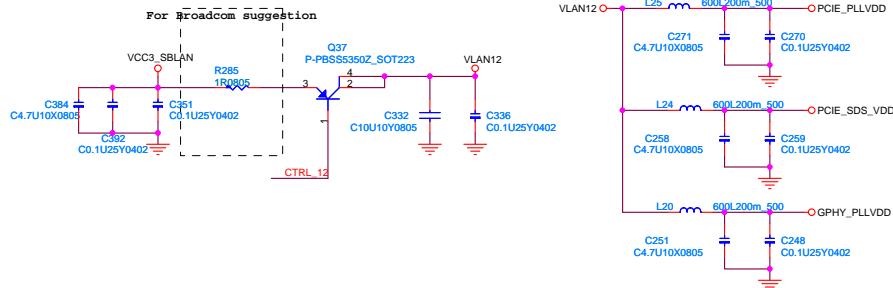
## Bypass CAPs



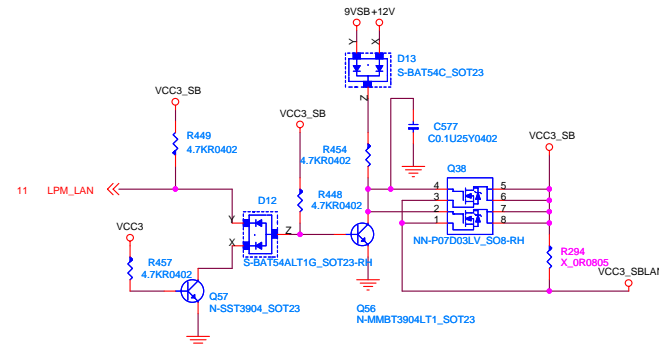
## LAN 2.5 POWER (235mA)



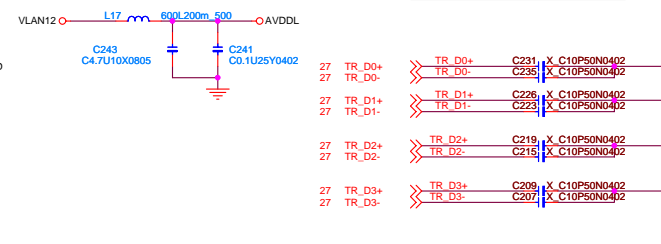
## LAN 1.2 POWER (590mA)



## Power control for power consumption

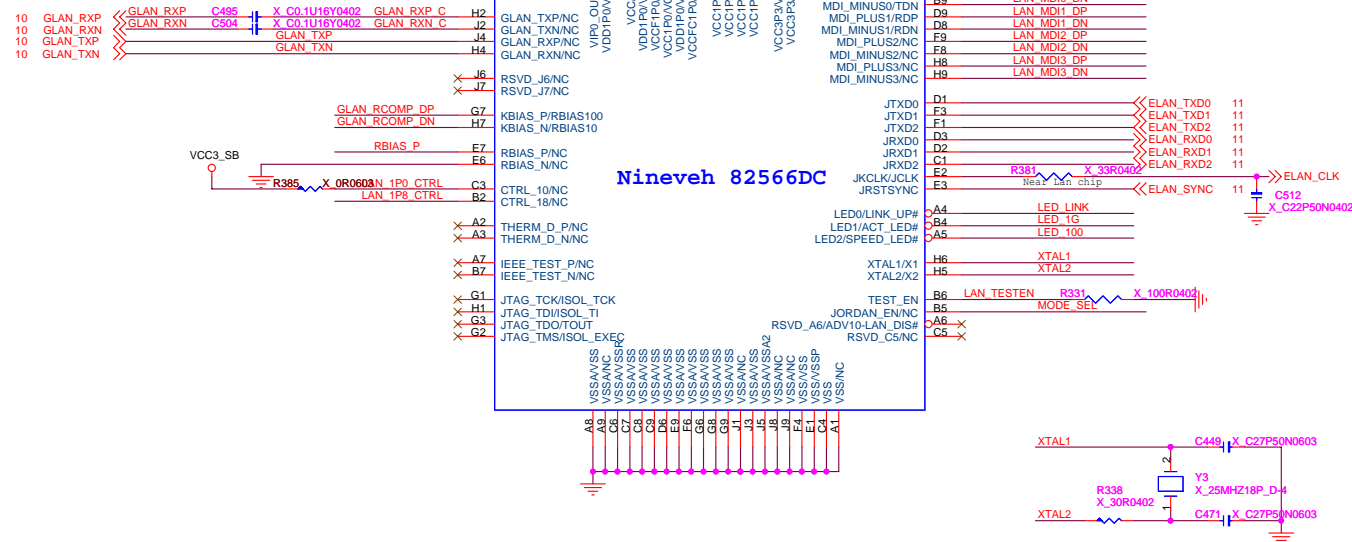
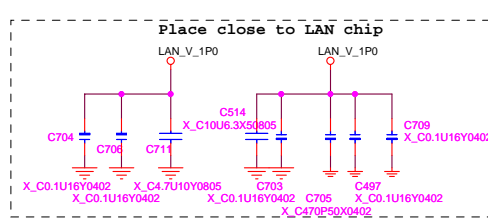


## EMI SUGGESTION

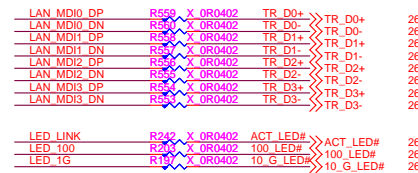




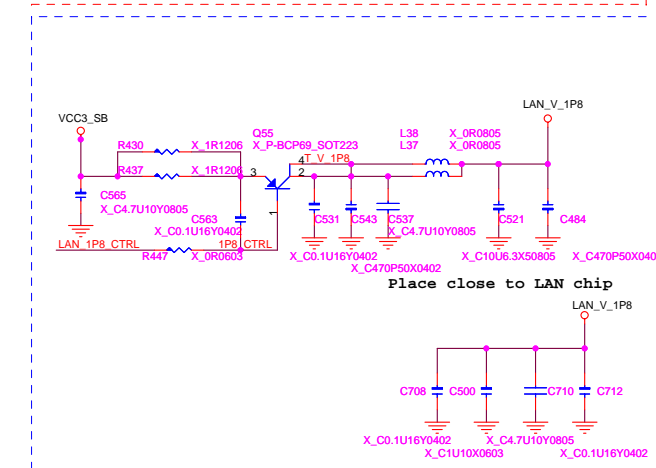
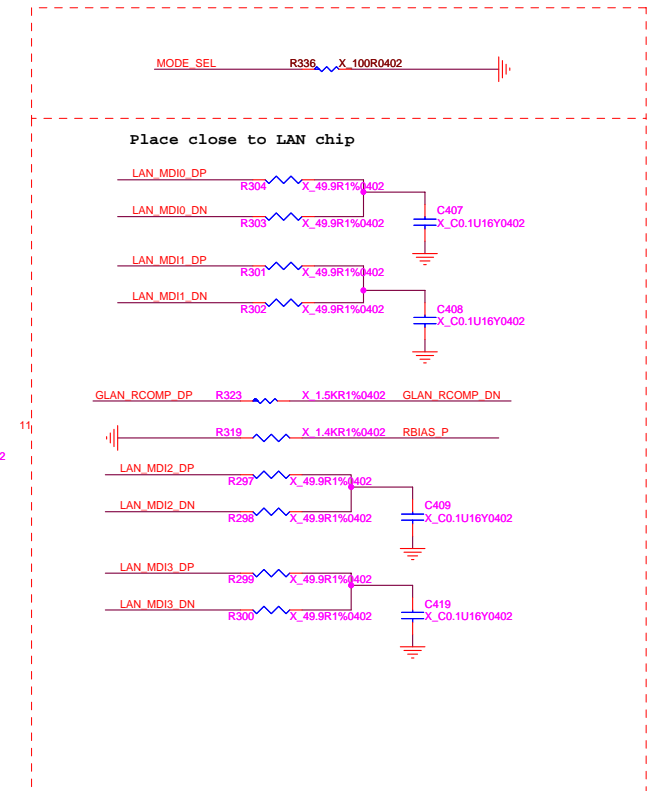
LAN - NINEVEH (ROPROS-VS USE)



## LAN CONNECTOR



|                   |                                          |
|-------------------|------------------------------------------|
| ACT_LED           | Link_LED                                 |
| S0: LOW           | S0: LOW                                  |
| S1/S3/S4/S5: HIGH | S5: HIGH                                 |
|                   | S1/S3/S4: WOL EN-->LOW<br>WOL DIS-->HIGH |



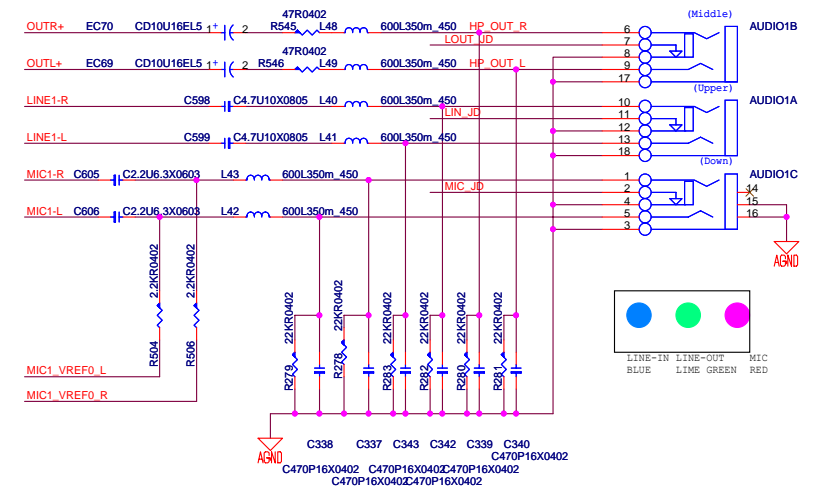
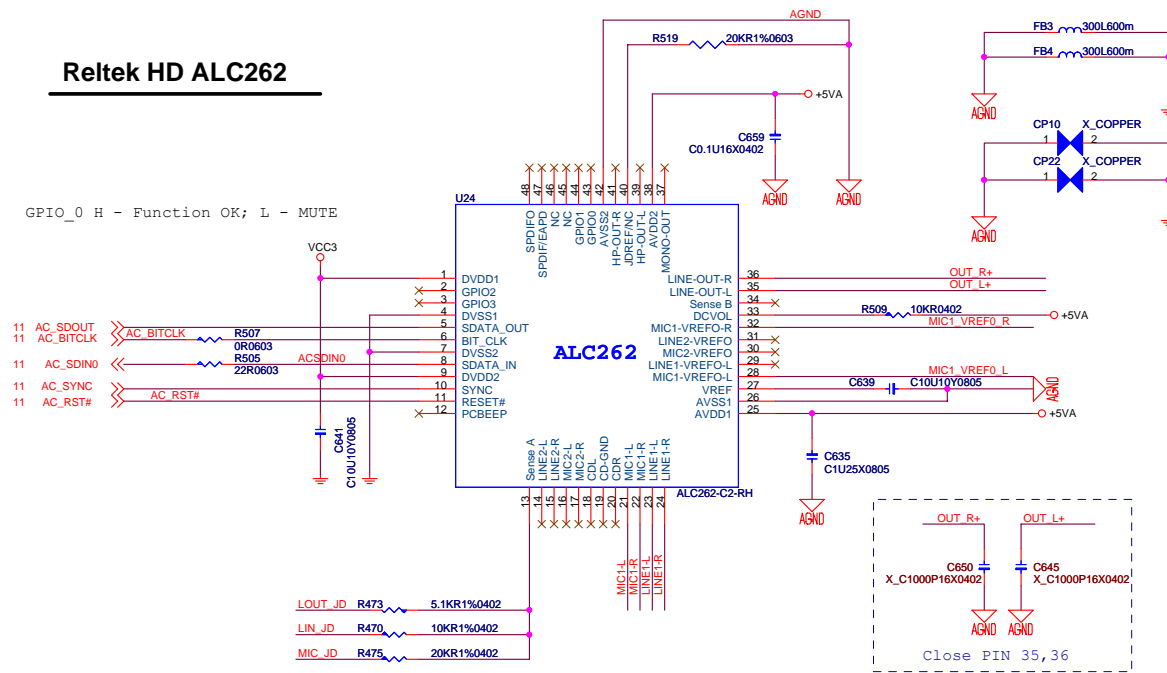
**MICRO-STAR INT'L CO.,LTD**

**MS-7410**

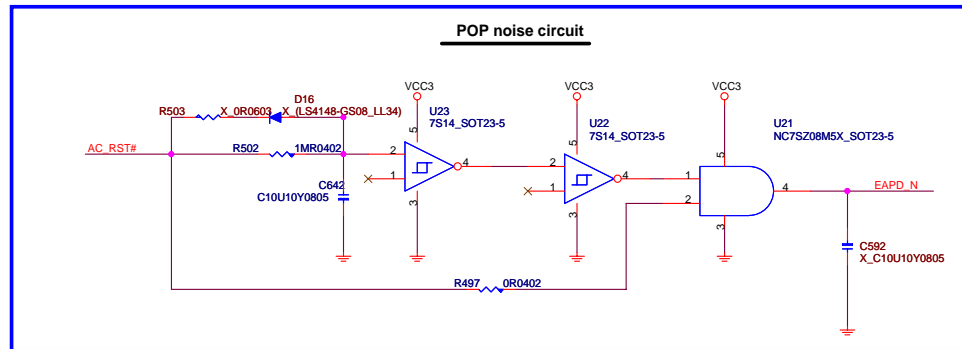
|                                    |                                                  |                |
|------------------------------------|--------------------------------------------------|----------------|
| Size<br>Custom                     | Document Description<br><b>LAN-NINEVEH 82566</b> | Rev<br>0C      |
| Date: Wednesday, November 07, 2007 |                                                  | Sheet 27 of 34 |

# Reltek HD ALC262

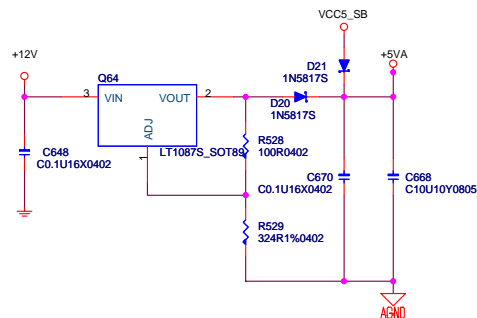
GPIO\_0 H - Function OK; L - MUTE



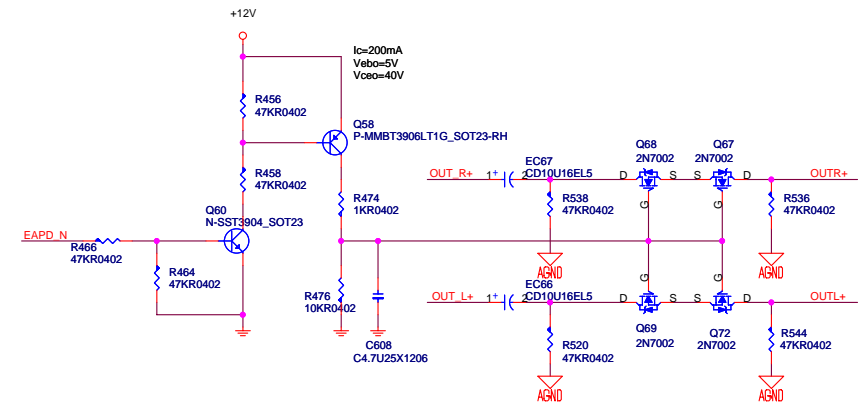
08/01 UPDATE



## AUDIO CODE REGULATORS



## Smooth pop noise circuit for Line-out



ICH9

| GPIO     | Alt Func      | Pin  | I/O/NC | Power  | PÜ | Tol | Default     | Signal Name or condition |           |     |
|----------|---------------|------|--------|--------|----|-----|-------------|--------------------------|-----------|-----|
| GPIO[0]  | ATADET0       | N7   | I/O    | Vcc3   | Y  | 3.3 | INPUT       | ATADET0                  | PULL HIGH | 10K |
| GPIO[1]  | PULL HIGH     | AK21 | I/O    | Vcc3   | Y  | 3.3 | INPUT       | PULL HIGH                | 10K       |     |
| GPIO[2]  | PIRQ#E        | K6   | I/O    | Vcc3   | Y  | 3.3 | INPUT       | PULL HIGH                | 8.2K      |     |
| GPIO[3]  | PIRQ#F        | L7   | I/O    | Vcc3   | Y  | 3.3 | INPUT       | PULL HIGH                | 8.2K      |     |
| GPIO[4]  | PIRQ#G        | F2   | I/O    | Vcc3   | Y  | 3.3 | INPUT       | PULL HIGH                | 8.2K      |     |
| GPIO[5]  | PIRQ#H        | G2   | I/O    | Vcc3   | Y  | 3.3 | INPUT       | PULL HIGH                | 8.2K      |     |
| GPIO[6]  | PULL HIGH     | AH22 | I/O    | Vcc3   | Y  | 3.3 | INPUT       | PULL HIGH                | 10K       |     |
| GPIO[7]  | PULL HIGH     | AK23 | I/O    | Vcc3   | Y  | 3.3 | INPUT       | PULL HIGH                | 10K       |     |
| GPIO[8]  | ICH GP8 PU    | A20  | I/O    | Vcc3SB | Y  | 3.3 | INPUT       | PULL HIGH                | 10K       |     |
| GPIO[9]  | SIO SMI#      | A18  | NC     | Vcc3   | N  | 3.3 | WOL EN      | NC                       |           |     |
| GPIO[10] | ICH GP10 PU   | C17  | I/O    | Vcc3SB | Y  | 3.3 | INPUT       | PULL HIGH                | 10K       |     |
| GPIO[11] | SMB ALERT#    | C16  | I/O    | Vcc3SB | Y  | 3.3 | SMB ALERT#  | PULL HIGH                | 10K       |     |
| GPIO[12] | NC            | A8   | NC     | Vcc3SB | N  | 3.3 | OUTPUT      | SIO SMI#                 |           |     |
| GPIO[13] | SIO PME#      | A19  | I/O    | Vcc3SB | Y  | 3.3 | INPUT       | SIO PME#                 |           |     |
| GPIO[14] | CLR PW        | A9   | I/O    | Vcc3SB | Y  | 3.3 | INPUT       | PULL HIGH                | 10K       |     |
| GPIO[15] | NC            | C15  | NC     | Vcc3SB | Y  | 3.3 | STP PCI#    | NC                       |           |     |
| GPIO[16] | NC            | M2   | NC     | Vcc3   | Y  | 3.3 | OUTPUT      | NC                       |           |     |
| GPIO[17] | PULL HIGH     | AH21 | I/O    | Vcc3   | Y  | 3.3 | INPUT       | PULL HIGH                | 10K       |     |
| GPIO[18] | NC            | K1   | NC     | Vcc3   | N  | 3.3 | OUTPUT      | NC                       |           |     |
| GPIO[19] | SATA1GP PU    | AE20 | I/O    | Vcc3   | Y  | 3.3 | INPUT       | PULL HIGH                | 10K       |     |
| GPIO[20] | NC            | AF5  | NC     | Vcc3   | N  | 3.3 | OUTPUT      | NC                       |           |     |
| GPIO[21] | SATA0GP PU    | AK25 | I/O    | Vcc3   | Y  | 3.3 | INPUT       | PULL HIGH                | 10K       |     |
| GPIO[22] | ICH SGP22 PU  | AJ24 | I/O    | Vcc3   | Y  | 3.3 | INPUT       | PULL HIGH                | 10K       |     |
| GPIO[23] | LDRQ 1#       | J3   | I/O    | Vcc3   | Y  | 3.3 | LDRQ 1#     | PULL HIGH                | 10K       |     |
| GPIO[24] | LPM LAN       | A14  | NC     | Vcc3SB | N  | 3.3 | OUTPUT      | LPM LAN                  |           |     |
| GPIO[25] | NC            | B18  | NC     | Vcc3SB | N  | 3.3 | STP CPU#    | NC                       |           |     |
| GPIO[26] | NC            | C11  | NC     | Vcc3SB | N  | 3.3 | S4 STATE#   | NC                       |           |     |
| GPIO[27] | NC            | A11  | NC     | Vcc3SB | N  | 3.3 | QRT STATE0  | NC                       |           |     |
| GPIO[28] | NC            | G18  | NC     | Vcc3SB | N  | 3.3 | QRT STATE1  | NC                       |           |     |
| GPIO[29] | USB OC#2      | N1   | I/O    | Vcc3SB | Y  | 3.3 | OC#2        | USB OC#2                 |           |     |
| GPIO[30] | USB OC#3      | N5   | I/O    | Vcc3SB | Y  | 3.3 | OC#3        | USB OC#3                 |           |     |
| GPIO[31] | USB OC#3      | M1   | I/O    | Vcc3SB | Y  | 3.3 | OC#3        | USB OC#3                 |           |     |
| GPIO[32] | SPI WP#       | K2   | I/O    | Vcc3   | N  | 3.3 | OUTPUT      | SPI WP#                  |           |     |
| GPIO[33] | SPI HOLD GPO# | AF6  | I/O    | Vcc3   | N  | 3.3 | OUTPUT      | SPI HOLD GPO#            |           |     |
| GPIO[34] | LAN DISABLE   | AH5  | I/O    | Vcc3   | N  | 3.3 | OUTPUT      | LAN DISABLE              |           |     |
| GPIO[35] | NC            | L1   | NC     | Vcc3   | N  | 3.3 | OUTPUT      | NC                       |           |     |
| GPIO[36] | SATA2GP PU    | AE21 | I/O    | Vcc3   | Y  | 3.3 | INPUT       | SATA2GP PU               |           |     |
| GPIO[37] | SATA3GP PU    | AE22 | I/O    | Vcc3   | Y  | 3.3 | INPUT       | SATA3GP PU               |           |     |
| GPIO[38] | ICH SGP38 PU  | AK24 | I/O    | Vcc3   | Y  | 3.3 | INPUT       | ICH SGP38 PU             |           |     |
| GPIO[39] | ICH SGP39 PD  | AH23 | I/O    | Vcc3   | Y  | 3.3 | SDATAOUT0   | ICH SGP39 PD             |           |     |
| GPIO[40] | USB OC#0      | N3   | I/O    | Vcc3SB | Y  | 3.3 | OC#0        | USB OC#0                 |           |     |
| GPIO[41] | USB OC#1      | P7   | I/O    | Vcc3SB | Y  | 3.3 | OC#1        | USB OC#1                 |           |     |
| GPIO[42] | USB OC#1      | R7   | I/O    | Vcc3SB | Y  | 3.3 | OC#1        | USB OC#1                 |           |     |
| GPIO[43] | USB OC#2      | N2   | I/O    | Vcc3SB | Y  | 3.3 | OC#2        | USB OC#2                 |           |     |
| GPIO[44] | USB OC#3      | P3   | I/O    | Vcc3SB | Y  | 3.3 | OC#3        | USB OC#3                 |           |     |
| GPIO[45] | USB OC#3      | R6   | I/O    | Vcc3SB | Y  | 3.3 | OC#3        | USB OC#3                 |           |     |
| GPIO[46] | USB OC#3      | T7   | I/O    | Vcc3SB | Y  | 3.3 | OC#3        | USB OC#3                 |           |     |
| GPIO[47] | USB OC#3      | P1   | I/O    | Vcc3SB | Y  | 3.3 | OC#3        | USB OC#3                 |           |     |
| GPIO[48] | ICH SGP48 PD  | AD20 | I/O    | Vcc3   | Y  | 3.3 | SDATAOUT1   | PULL HIGH                | 10K       |     |
| GPIO[49] | DMI STRAP     | AJ25 | I/O    | Vcc3   | N  | 3.3 | OUTPUT      | PULL LOW                 | 2.2K      |     |
| GPIO[50] | PREQ#1        | G13  | I/O    | Vcc5   | Y  | 5.5 | PREQ#1      | PULL HIGH                | 2.7K      |     |
| GPIO[51] | PGNT#1        | A7   | I/O    | Vcc3   | N  | 3.3 | PGNT#1      | PGNT#1                   |           |     |
| GPIO[52] | PREQ#2        | F13  | I/O    | Vcc5   | Y  | 5.5 | PREQ#2      | PULL HIGH                | 2.7K      |     |
| GPIO[53] | PGNT#2        | C7   | I/O    | Vcc3   | N  | 3.3 | PGNT#2      | STRAP PIN                |           |     |
| GPIO[54] | PREQ#3        | G8   | I/O    | Vcc5   | Y  | 5.5 | PREQ#3      | PULL HIGH                | 2.7K      |     |
| GPIO[55] | PGNT#3        | F7   | I/O    | Vcc3   | N  | 3.3 | PGNT#3      | STRAP PIN                |           |     |
| GPIO[56] | ICH GP56 PU   | F16  | I/O    | Vcc3SB | Y  | 3.3 | GPIO SEL    | PULL HIGH                | 10K       |     |
| GPIO[57] | ICH GP57 PU   | C12  | I/O    | Vcc3SB | Y  | 3.3 | INPUT       | PULL HIGH                | 10K       |     |
| GPIO[58] | SPI CS1#      | F23  | I/O    | Vcc3SB | Y  | 3.3 | SPI CS1#    | SPI CS1#                 |           |     |
| GPIO[59] | USB OC#0      | P5   | I/O    | Vcc3SB | Y  | 3.3 | OC#0        | USB OC#0                 |           |     |
| GPIO[60] | LINK ALERT#   | F18  | I/O    | Vcc3SB | Y  | 3.3 | LINK ALERT# | LINK ALERT#              |           |     |
|          |               |      |        |        |    |     |             |                          |           |     |

SIO SCH5617

| PIN NAME | PIN# | USAGE    | Input/Output |
|----------|------|----------|--------------|
| GP76     | 53   | GPIO_KB  | OUTPUT       |
| GP42     | 27   | SIO_SMI# | OUTPUT       |
| GP41     | 77   | SIO_PME# | OUTPUT       |
|          |      |          |              |

PCI Config.

| DEVICE | MCP1 INT Pin                         | REQ# / GNT#      | IDSEL | CLOCK    |
|--------|--------------------------------------|------------------|-------|----------|
| PCI1   | PIRQ#A<br>PIRQ#B<br>PIRQ#C<br>PIRQ#D | PREQ#0<br>PGNT#0 | AD16  | PCI_CLK0 |
| PCI2   | PIRQ#B<br>PIRQ#D<br>PIRQ#C<br>PIRQ#A | PREQ#1<br>PGNT#1 | AD17  | PCI_CLK1 |

DDRII DIMM Config.

| DEVICE | ADDRESS | CLOCK                                                    |
|--------|---------|----------------------------------------------------------|
| DIMM 1 | A0H     | MCLK_A0/MCLK_A#0<br>MCLK_A1/MCLK_A#1<br>MCLK_A2/MCLK_A#2 |
| DIMM 2 | A2H     | MCLK_A1/MCLK_A#3<br>MCLK_A2/MCLK_A#4<br>MCLK_A2/MCLK_A#5 |
| DIMM 3 | A4H     | MCLK_B0/MCLK_B#0<br>MCLK_B2/MCLK_B#1<br>MCLK_B1/MCLK_B#2 |
| DIMM 4 | A6H     | MCLK_B0/MCLK_B#3<br>MCLK_B1/MCLK_B#4<br>MCLK_B2/MCLK_B#5 |

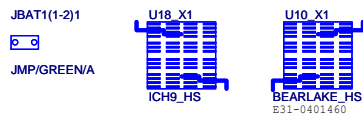
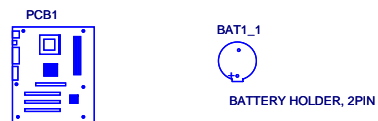
JUMPER SETTING

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



| MICRO-STAR INT'L CO.,LTD           |                                               |                |           |
|------------------------------------|-----------------------------------------------|----------------|-----------|
| MS-7410                            |                                               |                |           |
| Size<br>Custom                     | Document Description<br>GPIO & Jumper setting |                | Rev<br>0C |
| Date: Wednesday, November 07, 2007 |                                               | Sheet 29 of 34 |           |

## MANUAL PART



### CPU Retention Module

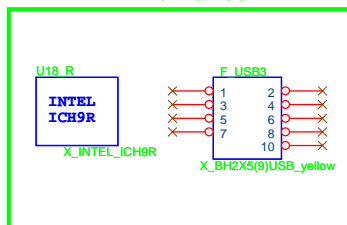
PROCESSOR1\_1



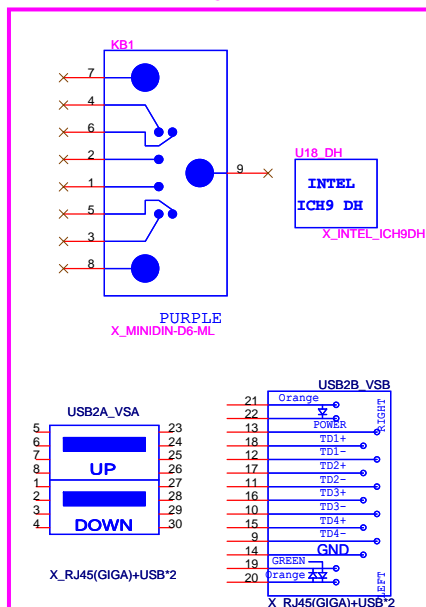
CPU Retention w/screw w/washer

| VS Giga-Lan     |          |
|-----------------|----------|
| N58-22F0391-S42 |          |
| Link            | Yellow   |
| Active          | Blinking |
| 1000            | Orange   |
| 100             | Green    |
| 10              | None     |
| 21              | Yellow   |
| 22              | Yellow   |
| 20              | Orange   |
| 19              | Green    |

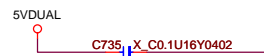
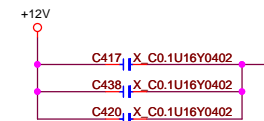
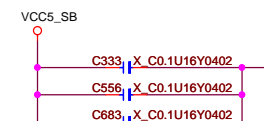
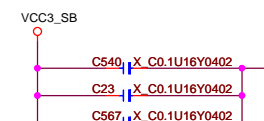
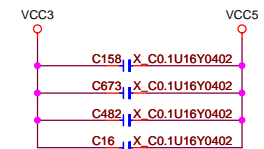
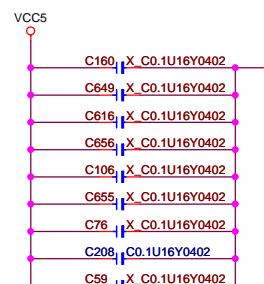
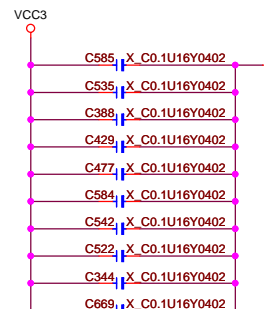
## REPOS-NECCAP



## REPOS-VS



## EMI SUGGESTION



## Model option table

| Model type    | Function                                  | BOM Config | ERP BOM No. |
|---------------|-------------------------------------------|------------|-------------|
| MS7410-MA     | INTEL G33 + ICH9 + Broadcom Giga Lan      |            |             |
| MS7410-VS     | INTEL G33 + ICH9DH + Intel 82566 Giga Lan |            |             |
| MS7410-NECCAP | INTEL G33 + ICH9R + Broadcom Giga Lan     |            |             |
|               |                                           |            |             |
|               |                                           |            |             |
|               |                                           |            |             |



MICRO-STAR INT'L CO.,LTD

MS-7410

Size Custom Document Description  
MANUAL PARTS

Rev 0C

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|                        |   |      |
|------------------------|---|------|
| CedarMill / Smithfield |   |      |
| 0.8375V - 1.6000V Core | - | 100A |
| 1.2V FSB Vtt           | - | 5.3A |

|                      |   |        |
|----------------------|---|--------|
| Bearlake-Q           |   |        |
| 1.2V FSB_VTT         | - | 1.3 A  |
| 1.25V Core           | - | 18.8A  |
| 1.25V DMI/PCI Exp.   | - | 2.5 A  |
| 1.8V VCC_DDR (S0,S1) | - | 3.73A  |
| 1.8V VCC_SMCLK       | - | TBD    |
| 3.3V VCCA_DAC        | - | 66 mA  |
| 3.3V VCC33           | - | 15.8mA |
| 1.25V Vcc CL         | - | 4.24A  |

|                 |   |       |
|-----------------|---|-------|
| ICH9            |   |       |
| 1.05V Core      | - | 1.17A |
| 1.25V DMI       | - | 40 mA |
| 1.2V FSB_VTT    | - | 14 mA |
| 1.5V_A USB/SATA | - | 1.12A |
| 1.5V_B PCI Exp. | - | 0.77A |
| VCCRTC          | - | 6 uA  |
| 3.3V CL         | - | 12 mA |
| 1.5V GbE LAN    | - | 74 mA |
| 3.3V 10/100 LAN | - | 12 mA |
| 3.3V GbE LAN    | - | 1 mA  |
| 3.3V SushDA     | - | 4 mA  |
| 3.3V HDA        | - | 24 mA |

|                 |   |       |
|-----------------|---|-------|
| HD Audio ALC662 |   |       |
| 3.3V AUDIO      | - | 40mA  |
| 5V AUDIO        | - | 200mA |

|                           |   |      |
|---------------------------|---|------|
| CK505                     |   |      |
| 3.3V VDD 48/PCI/REF       | - | TBDA |
| 0.3V - 1V CPU/SRC/DOT/PLL | - | TBDA |

|                   |   |        |
|-------------------|---|--------|
| BCM5786           |   |        |
| 3.3V_SB I/O & LED | - | 15.5mA |
| 2.5V ANALOG       | - | 0.418A |

|                     |  |  |
|---------------------|--|--|
| ISL6312             |  |  |
| VCCP VRM 11         |  |  |
| 0.8375V-1.6000V 85A |  |  |
| 3-Phase Switch      |  |  |

|                |  |  |
|----------------|--|--|
| W83310DS       |  |  |
| VTT_DDR        |  |  |
| 0.9V Linear 2A |  |  |

|                 |  |  |
|-----------------|--|--|
| MS11+ Regulator |  |  |
| VCC_DDR         |  |  |
| 1.8V PWM 15A    |  |  |

|                    |  |  |
|--------------------|--|--|
| MS7 Regulator      |  |  |
| V_1P25_CORE        |  |  |
| 1.25V PWM 21.34A   |  |  |
| V_1P25_CL          |  |  |
| 1.25V Linear 4.24A |  |  |
| V_FSB_VTT          |  |  |
| 1.2V Linear 6.2A   |  |  |
| V_1P5_ICH          |  |  |
| 2A                 |  |  |
| 1.5V Linear        |  |  |
| V_1P05_ICH         |  |  |
| 1.05V Linear 2 A   |  |  |
| VCC3_SB            |  |  |
| 3.3V Linear 1.5A   |  |  |
| 5V Switch 5A       |  |  |
| 5VSB Switch 500mA  |  |  |
| 5V Switch 15A      |  |  |
| 5VSB Switch 500mA  |  |  |

|                       |   |       |
|-----------------------|---|-------|
| DDRII x4 & TERMINATOR |   |       |
| 0.9V VTT_DDR          | - | 1.2A  |
| 1.8V VCC_DDR (S0,S1)  | - | 9.4A  |
| 1.8V VCC_DDR (S3)     | - | 400mA |

|                      |   |       |
|----------------------|---|-------|
| PCI Express x16 slot |   |       |
| +12V                 | - | 5.5 A |
| +3.3Vaux (wake)      | - | 375mA |
| +3.3Vaux (no wake)   | - | 20mA  |
| +3.3V                | - | 3.0A  |

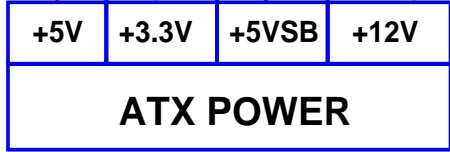
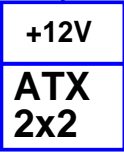
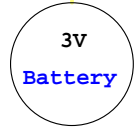
|                    |   |       |
|--------------------|---|-------|
| PCI slot x1        |   |       |
| +3.3Vaux (wake)    | - | 375mA |
| +3.3Vaux (no wake) | - | 20mA  |
| +3.3V              | - | 7.6A  |
| +5V                | - | 5.0A  |
| +12V               | - | 0.5A  |

|                         |   |       |
|-------------------------|---|-------|
| PCI Express x 1 slot *2 |   |       |
| +12V                    | - | 0.5 A |
| +3.3Vaux (wake)         | - | 375mA |
| +3.3Vaux (no wake)      | - | 20mA  |
| +3.3V                   | - | 3.0A  |

|             |   |      |
|-------------|---|------|
| USB x12     |   |      |
| +5V (S0,S1) | - | 6.0A |
| +5V (S3)    | - | 20mA |

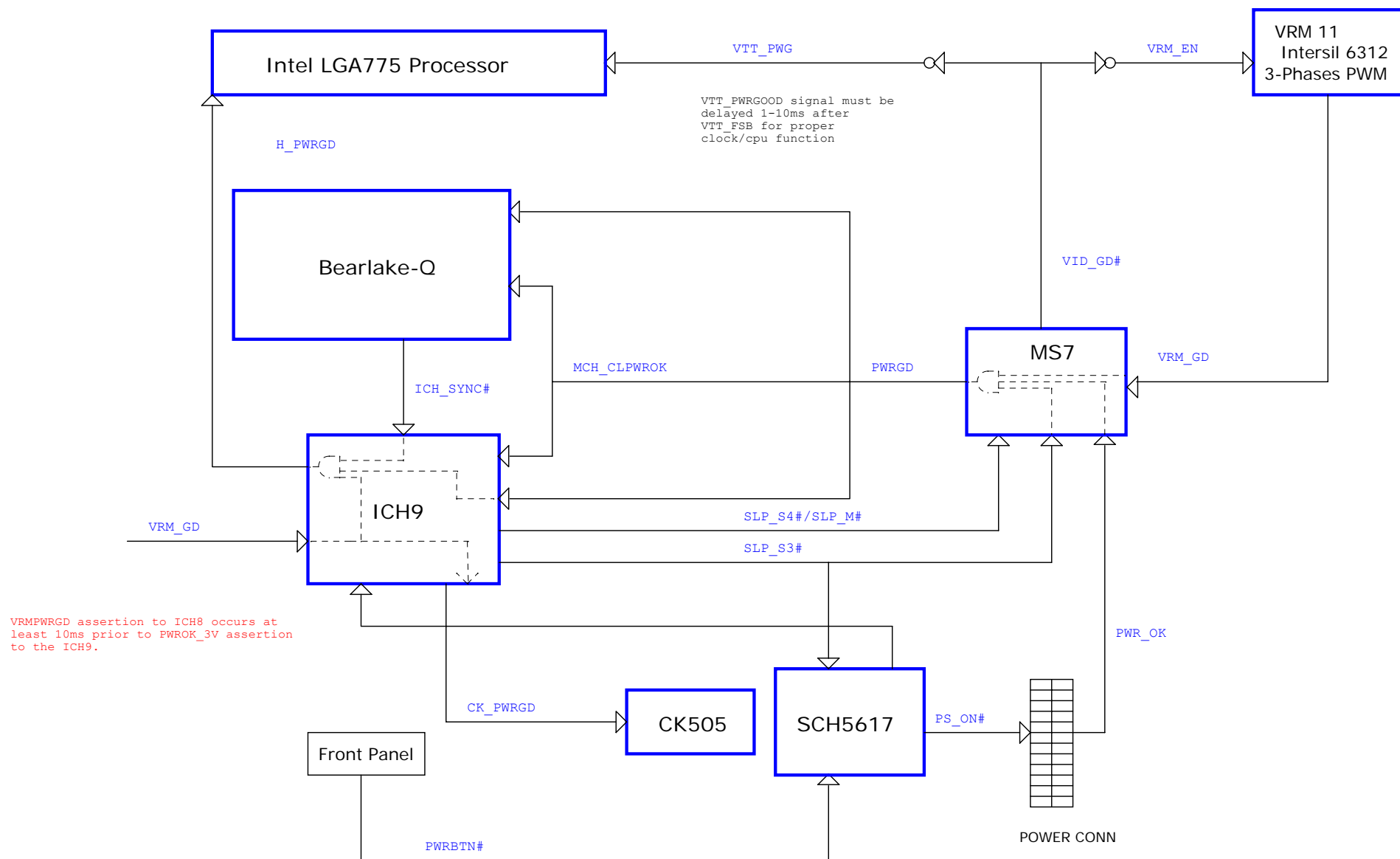
|             |   |       |
|-------------|---|-------|
| PS2         |   |       |
| +5V (S0,S1) | - | 345mA |
| +5V (S3)    | - | 2.0mA |

|       |  |  |
|-------|--|--|
| 5VAUD |  |  |
| 5V    |  |  |
| 500mA |  |  |



|                                    |                      |        |
|------------------------------------|----------------------|--------|
| MICRO-STAR INT'L CO.,LTD           |                      |        |
| MS-7410                            |                      |        |
| Size Custom                        | Document Description | Rev OC |
|                                    | POWER Distribution   |        |
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# PWROK MAP



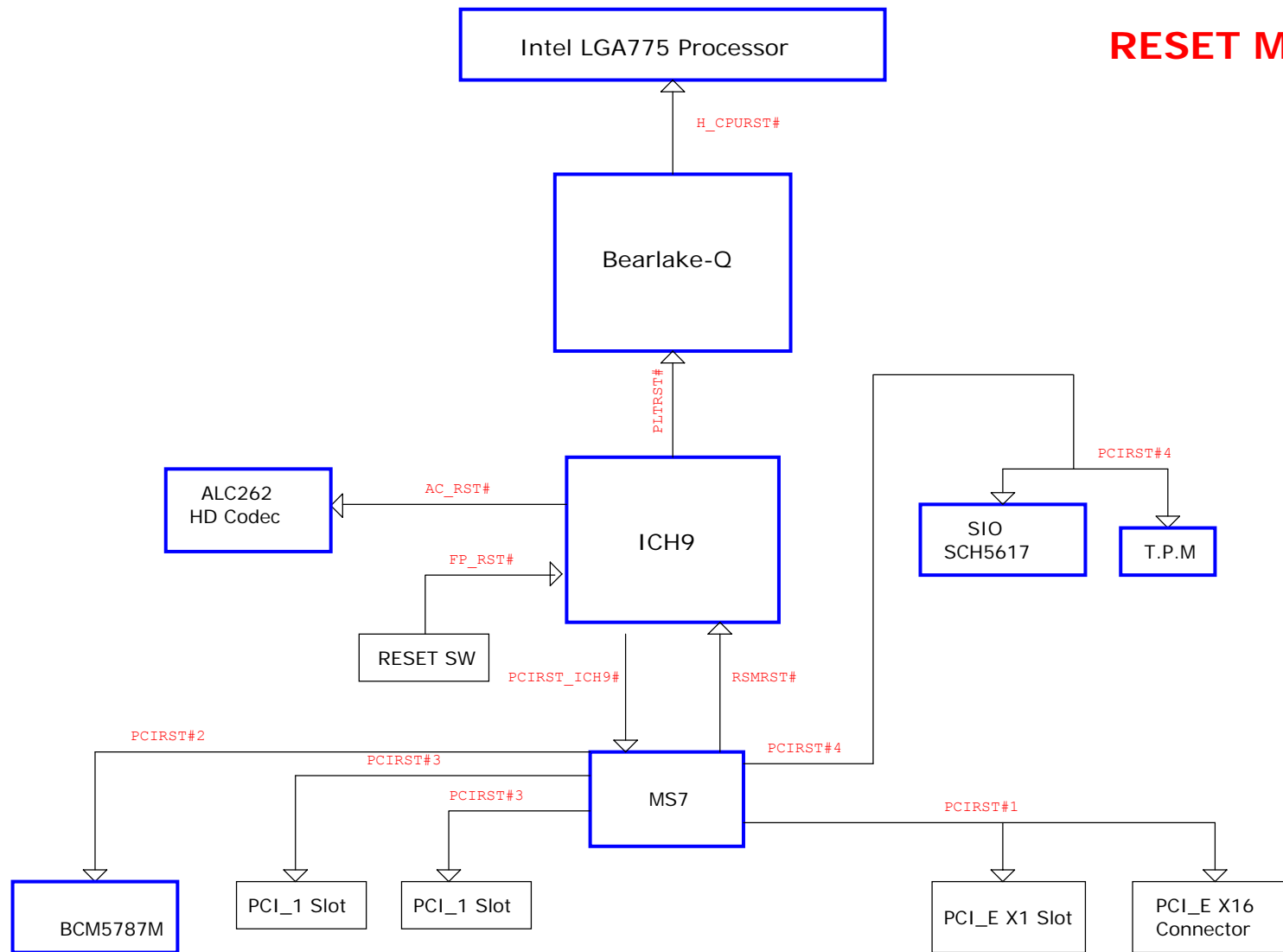
**MICRO-STAR INT'L CO.,LTD**

**MS-7410**

| Size                               | Document Description | Rev |
|------------------------------------|----------------------|-----|
| Custom                             | <b>PWROK MAP</b>     | 0C  |
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# RESET MAP



MICRO-STAR INT'L CO.,LTD

MS-7410

|                                    |                                          |                |
|------------------------------------|------------------------------------------|----------------|
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Change Note

Ver:0A


2007/09/06

- 1.PAGE 4:Add R561 C721 Q73 for VTT SEL control circuit
- 2.PAGE 11:change the net name of SATA2.3&SATA4.5 to avoid confuse
- 3.PAGE 11: add R564 pull-down resister to LAN\_PWROK ,when not use intel lan ,the LAN\_PWROK need tied to gnd
- 4.PAGE 12: To change the net of VccCL3\_3&VccLAN3\_3 power source form VCC3 to VCC3\_SB for INTEL LAN W/O F/T
- 5.PAGE 20:Front\_USB1&Front\_USB2 PIN5 tied to gnd for MCR Device use
- 6.PAGE 22:change VCC5\_MS power rail to 5VDUAL to avoid MS have voltage when enter S5 state
- 7.PAGE 24:change VTT\_SEL control circuit to follow up 7400 design
- 8.PAGE10& PAGE20:change USB PORT from6&7 port to 10&11 port
- 9.PAGE23:remove EC18 ,add EC76~EC81 for CPU power quility

Ver:0B

2007/11/05

- 1.PAGE 17:Change PWR&SYS resister vaule for FAN linear control circuit
- 2.PAGE 18:Change +12V EL CAP from 1000uf/6.3v to 470uf/16v
- 3.PAGE 21:Change D-SUB RGB Filter vaule for EMI
- 4.PAGE 24:Change PWR&SUS LED power resource from VCC5\_SB to 5VDUAL1
- 5.PAGE 11:Reserve D22 for BEEP Noise
- 6.PAGE 11:Modify R387&C503 value of Exrernal RTC Circuit



|                                    |                                                 |                |
|------------------------------------|-------------------------------------------------|----------------|
| MICRO-STAR INT'L CO.,LTD           |                                                 |                |
| MS-7410                            |                                                 |                |
| Size<br>B                          | Document Description<br><a href="#">History</a> | Rev<br>0C      |
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