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# MS-7425

Version 0A

## CPU:

Intel Prescott ( L2=2MB ) - 3.4G & Above  
 Intel Cendar Mill (65nm) - 3.73G & Above  
 Intel Smithfield (90nm Dual core)  
 Intel Conroe (65W Dual core)

## System Chipset:

Intel G31 - MCH (North Bridge)  
 Intel ICH7R (South Bridge)

## On Board Chipset:

BIOS -- SPI EEPROM  
 HD -- ALC888  
 LPC Super I/O -- F71882FG  
 LAN-- REALTEK RTL8111C Co-lay RTL8101E  
 CLOCK -- RTM 876-665  
 DVI -- CH7307C

## Main Memory:

DDR II \*1 (Max 2GB)

## Expansion Slots:

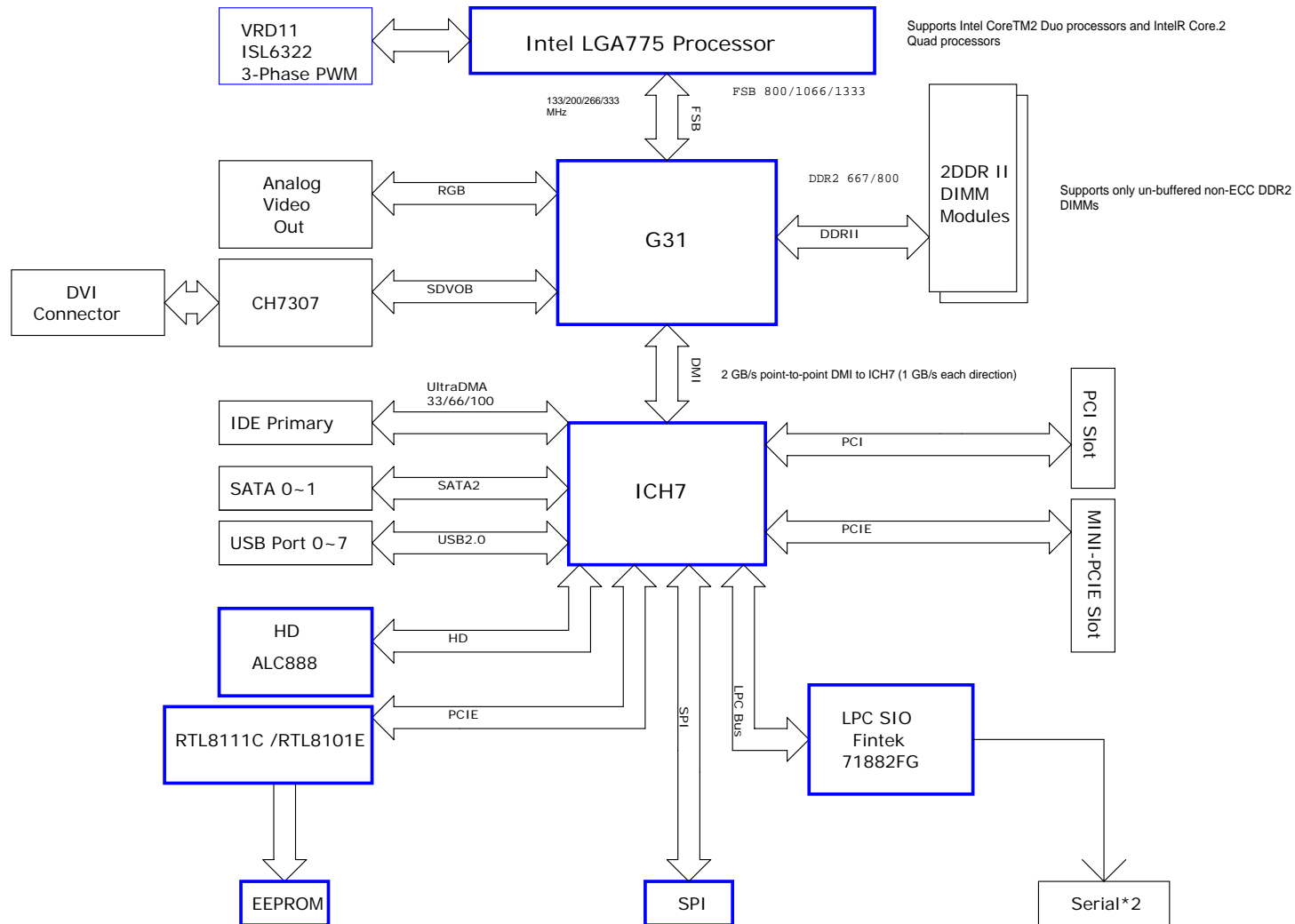
MINI-PCIE SLOT \* 1  
 PCI SLOT \* 1

## RICH PWM:

VRD11 - ISL6322 3-Phase  
 Controller: 3 PHASES

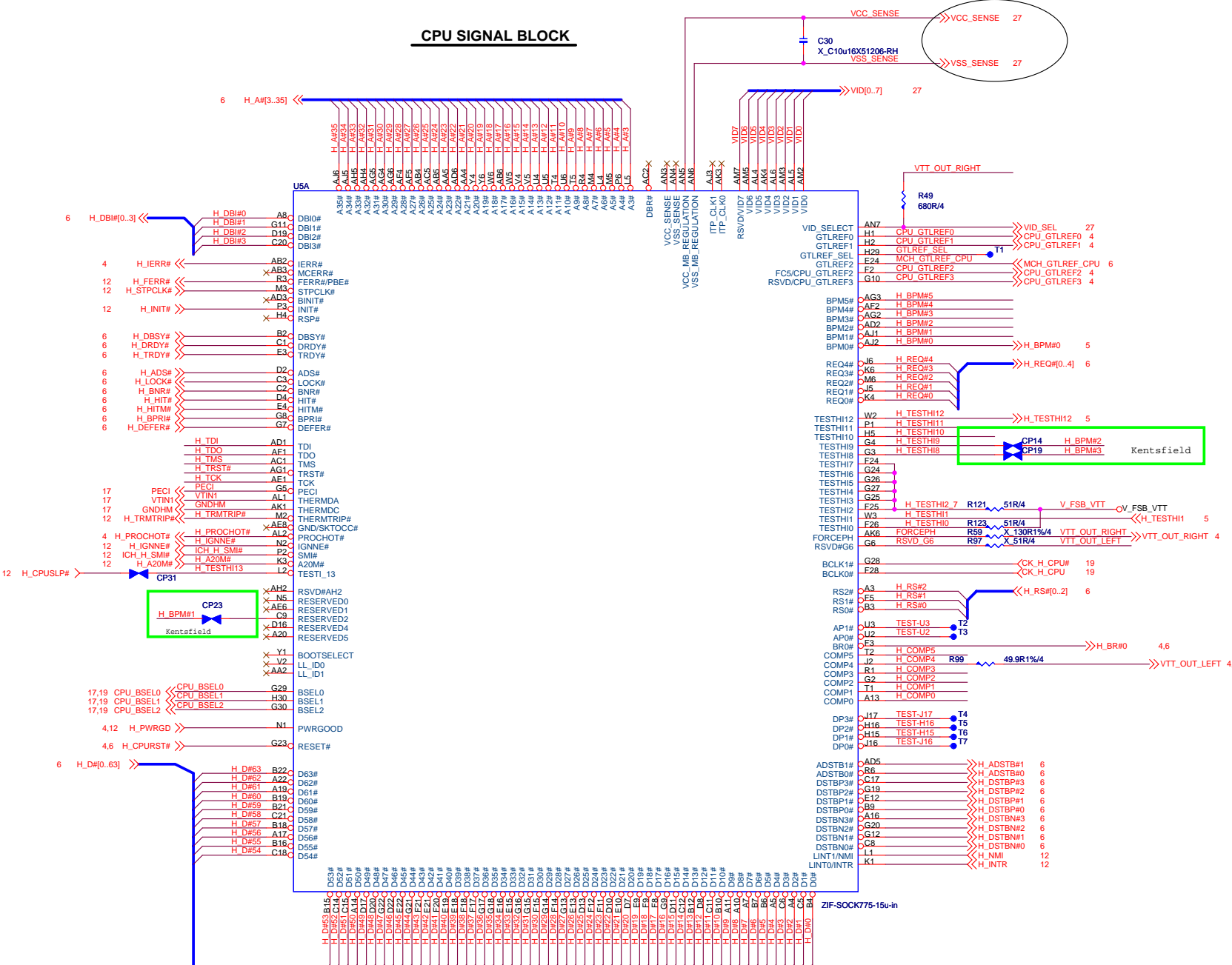


# Block Diagram

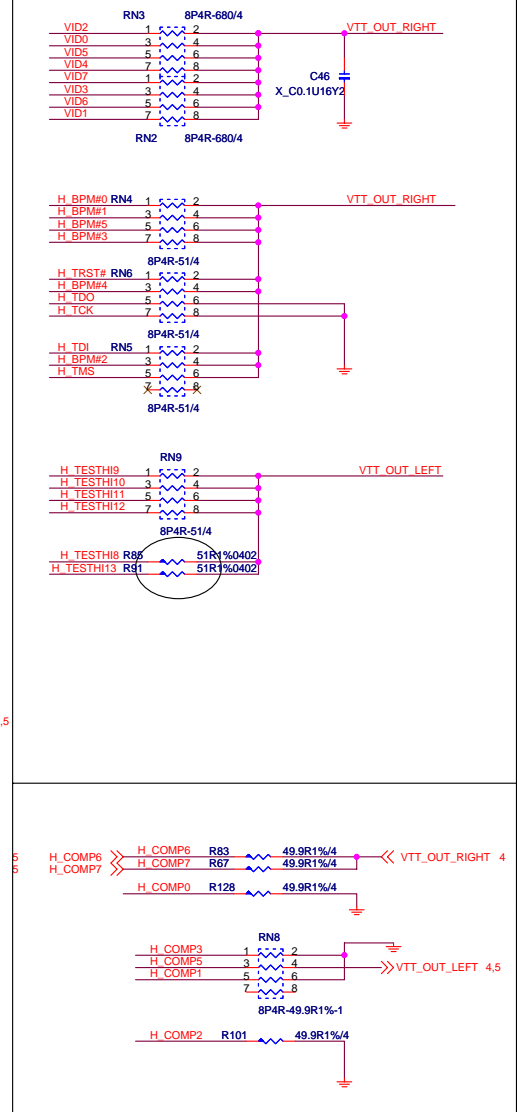




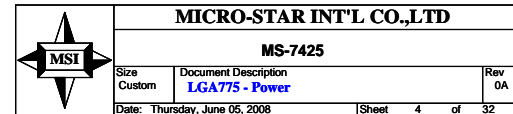
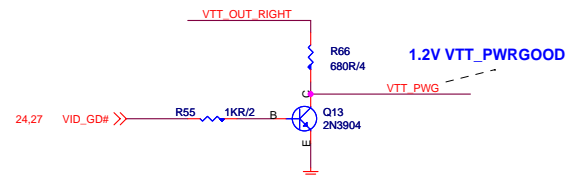
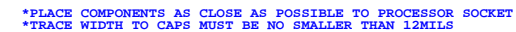
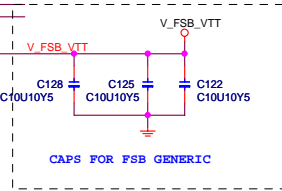
# CPU SIGNAL BLOCK



# PULL HIGHT PULL DOWN



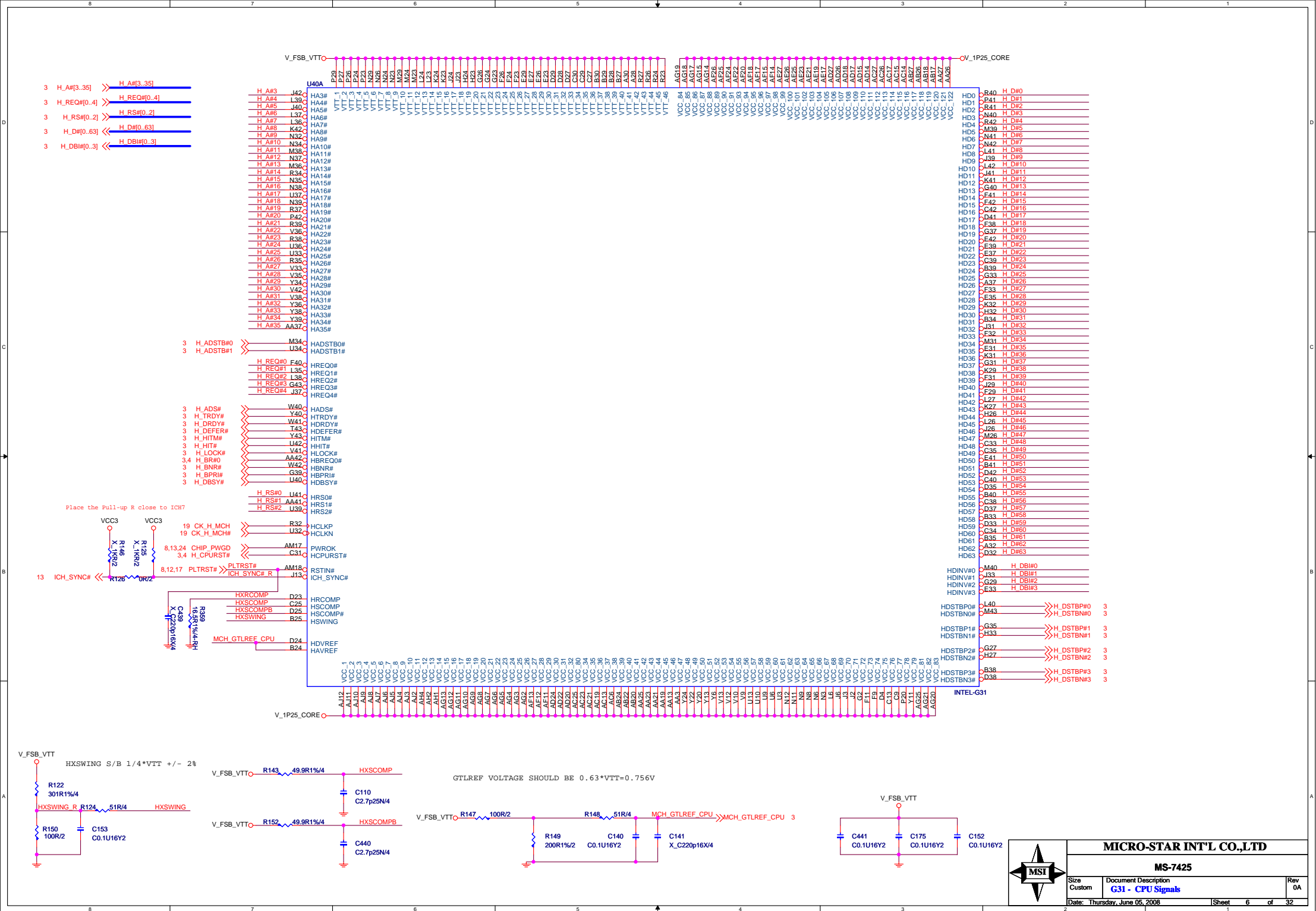






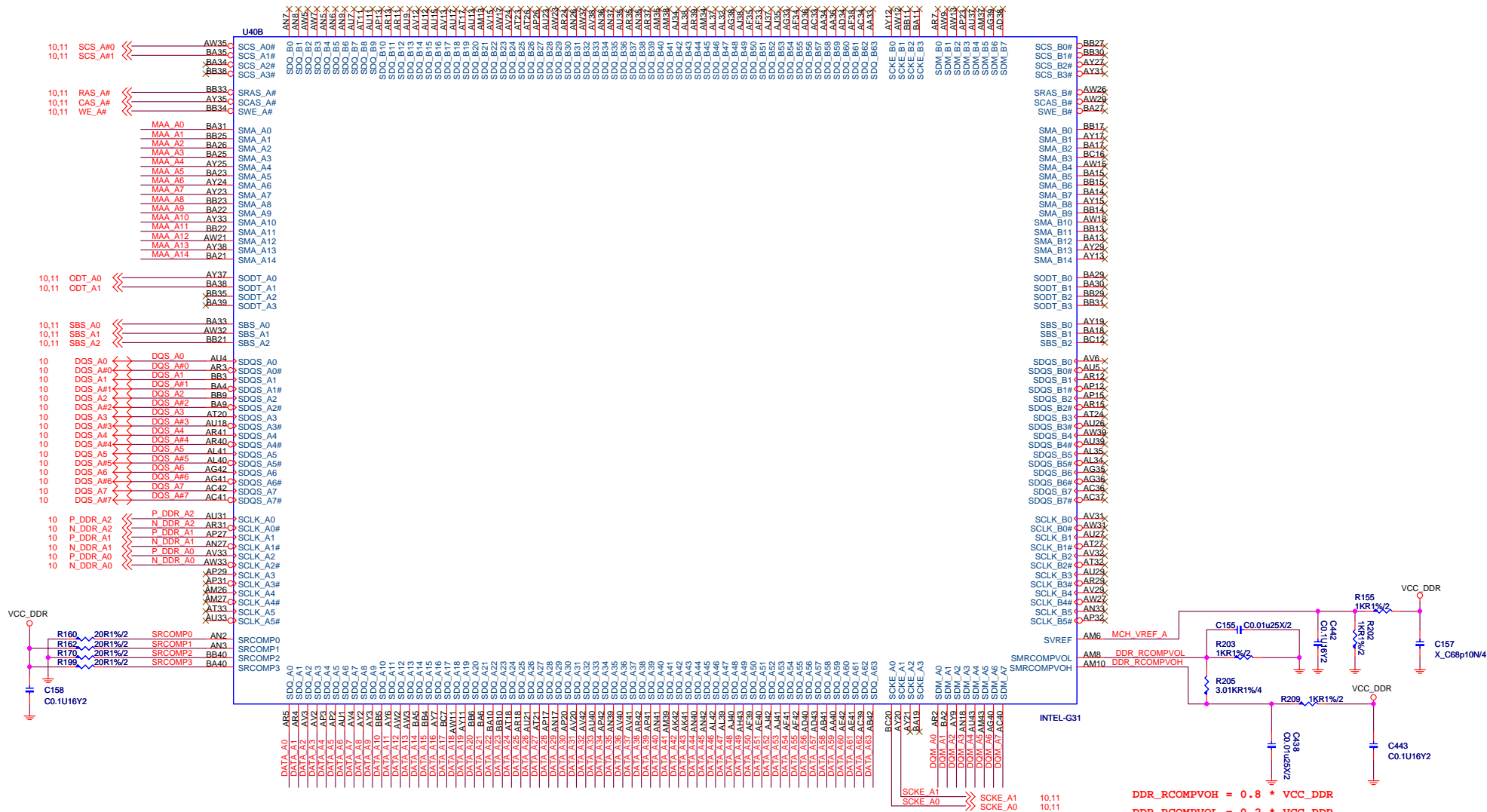








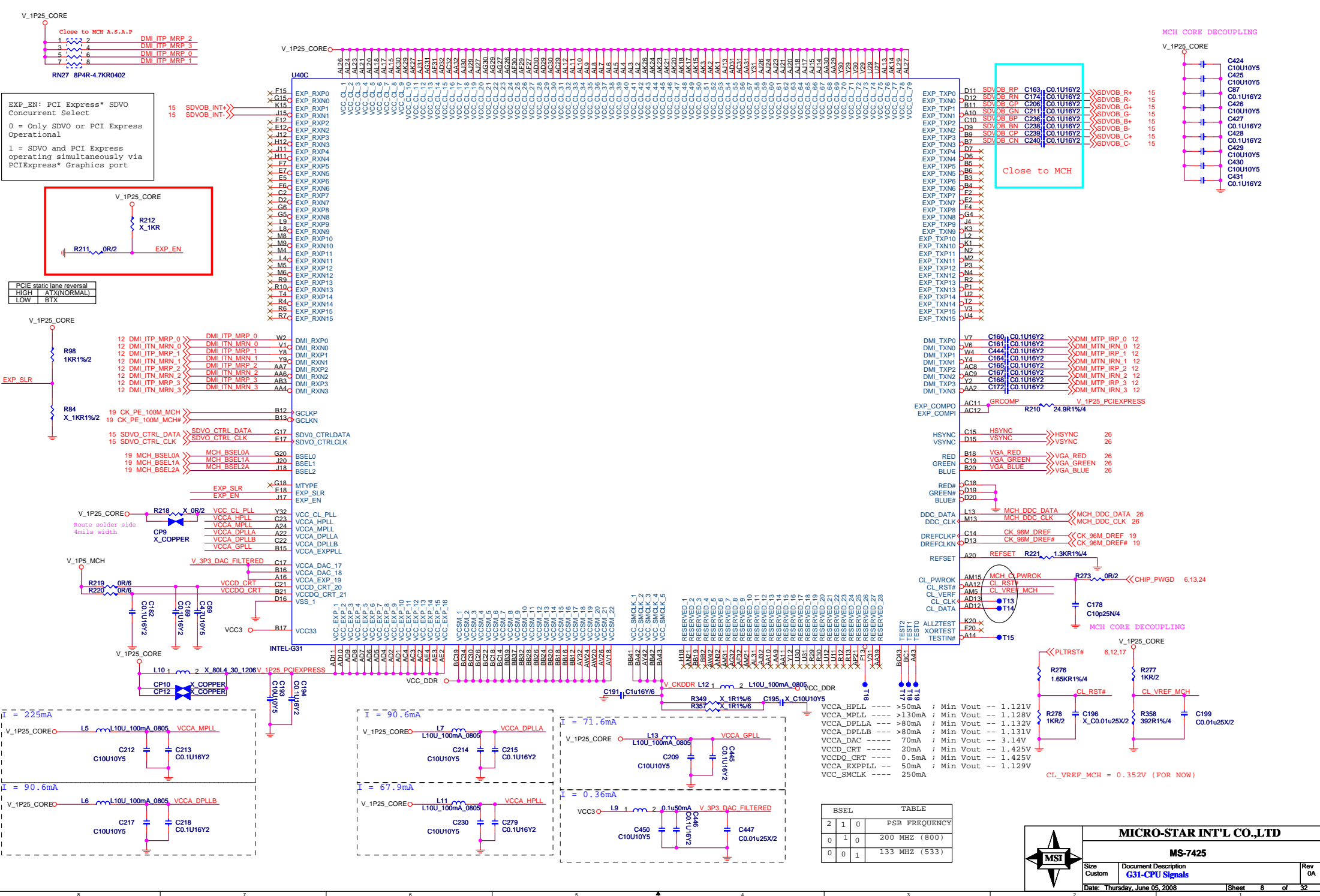
10 DATA\_A[0..63] <-> DATA\_A[0..63]  
10,11 MAA\_A[0..14] <-> MAA\_A[0..14]  
10 DQM\_A[0..7] <-> DQM\_A[0..7]  
10,11 SBS\_A[0..2] <->  
10,11 SCS\_A# [0..1] <->  
10,11 SCKE\_A[0..1] <->  
10,11 ODT\_A[0..1] <->




PLACE 0.1UF CAP CLOSE TO MCH

DDR\_RCOMPVOH = 0.8 \* VCC\_DDR  
DDR\_RCOMPVOL = 0.2 \* VCC\_DDR





| BSEL |   |   | TABLE         |  |
|------|---|---|---------------|--|
| 2    | 1 | 0 | PSB FREQUENCY |  |
| 0    | 1 | 0 | 200 MHZ (800) |  |
| 0    | 0 | 1 | 133 MHZ (533) |  |



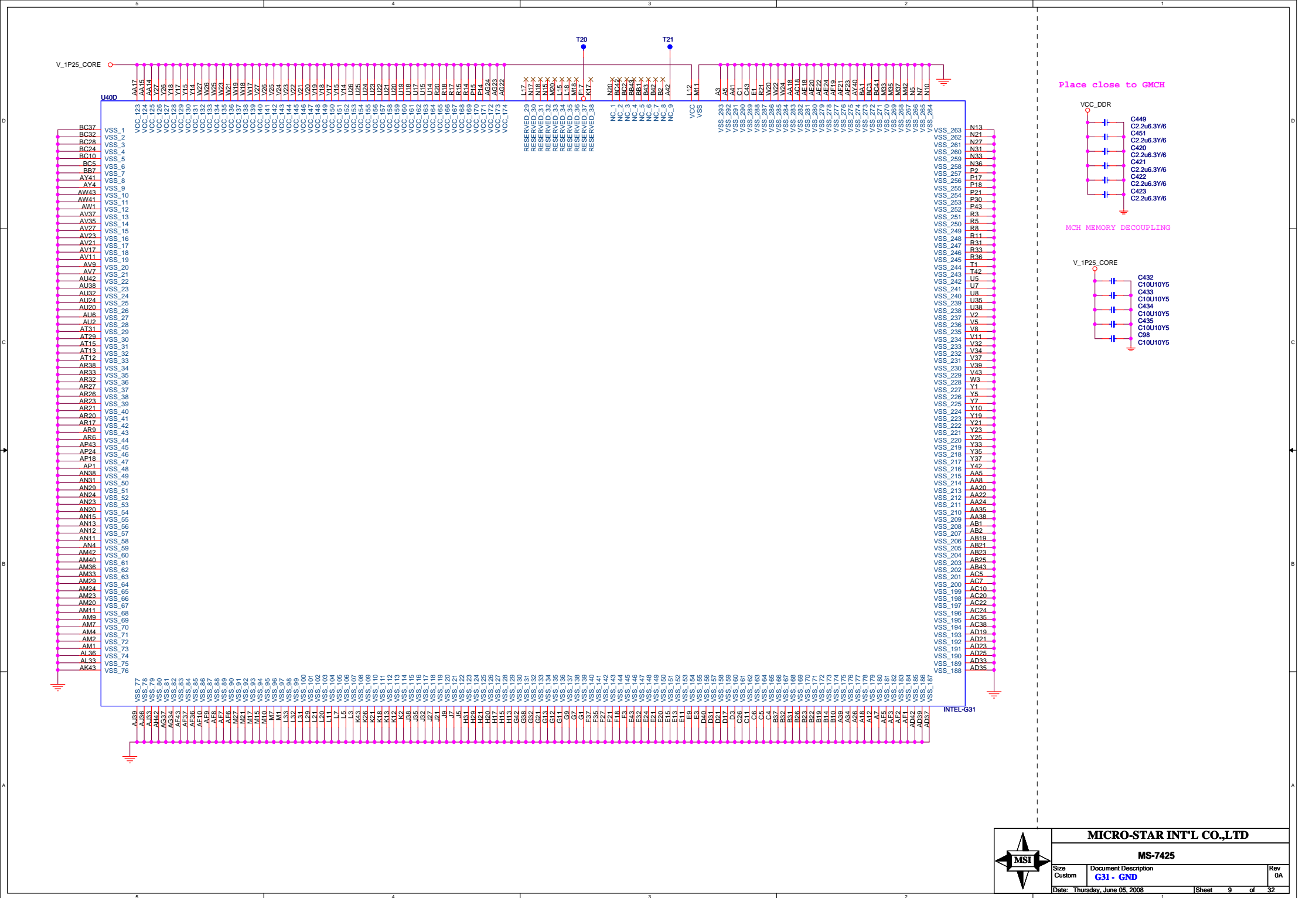
**MICRO-STAR INT'L CO.,LTD**

**MS-7425**

Size Custom    Document Description **G31-CPU Signals**    Rev 0A

Date: Thursday, June 05, 2008    Sheet 8 of 32

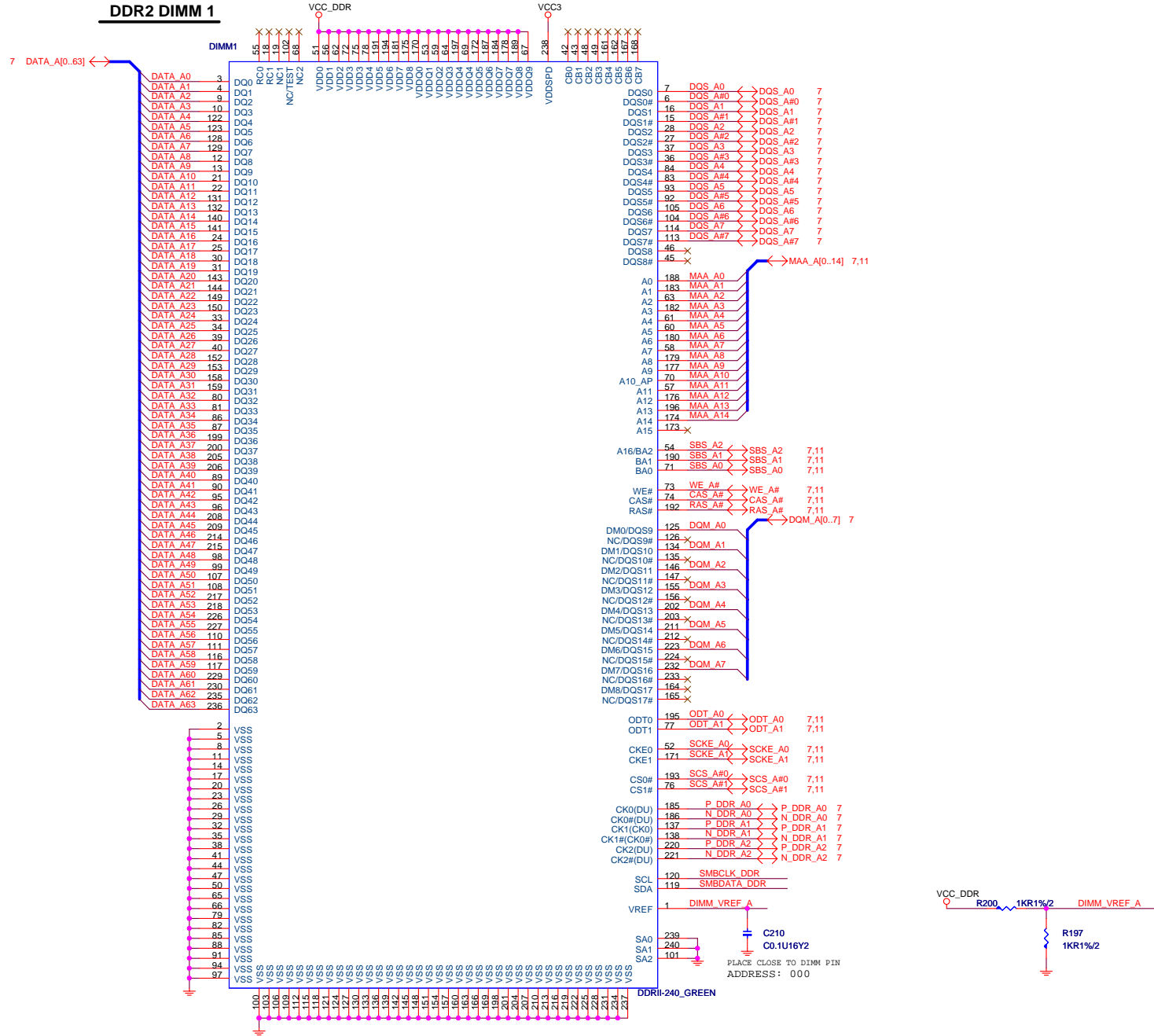




| MICRO-STAR INT'L CO.,LTD      |                      |               |
|-------------------------------|----------------------|---------------|
| MS-7425                       |                      |               |
| Size                          | Document Description | Rev           |
| Custom                        | G31 - GND            | 0A            |
| Date: Thursday, June 05, 2008 |                      | Sheet 9 of 32 |



# DDR2 DIMM 1



SMBCLK\_DDR R69 22R/2 ↔ SMBCLK\_ISO 13,16,19,24,27  
SMBDATA\_DDR R71 22R/2 ↔ SMBDATA\_ISO 13,16,19,24,27



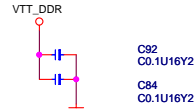
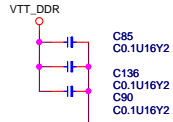
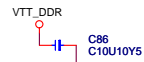
MICRO-STAR INT'L CO.,LTD

MS-7425

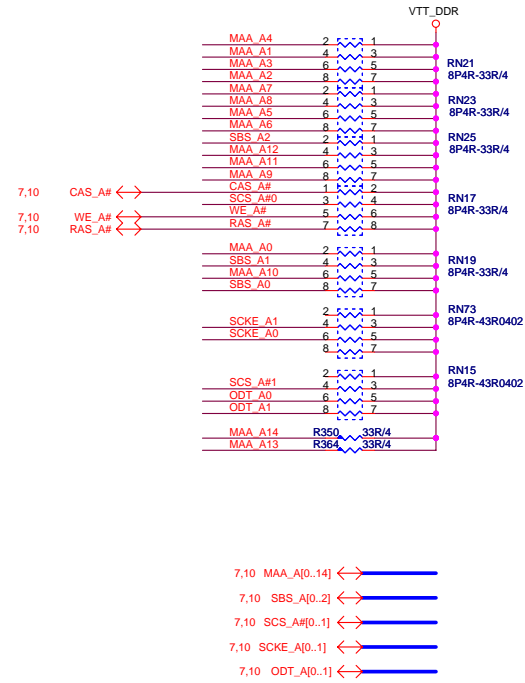
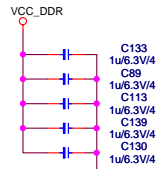
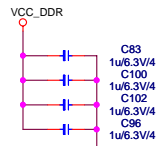
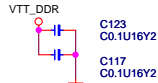
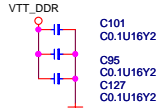
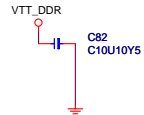
|                               |                      |     |
|-------------------------------|----------------------|-----|
| Size                          | Document Description | Rev |
| Custom                        | DDR II DIMM A & B    | 0A  |
| Date: Thursday, June 05, 2008 | Sheet 10 of 32       |     |



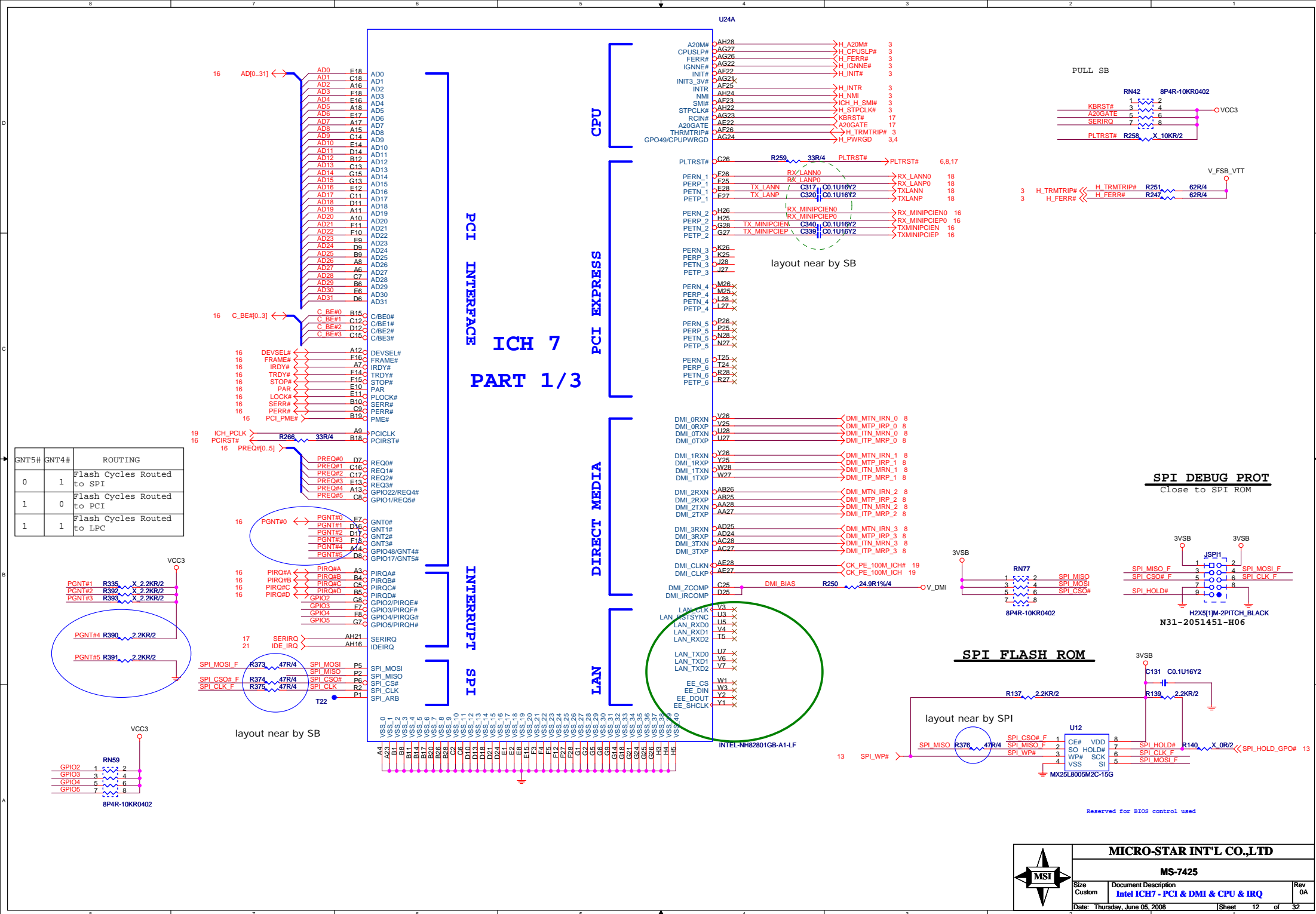
CHANNEL A V\_SM\_VTT DECOUPLING CAPS



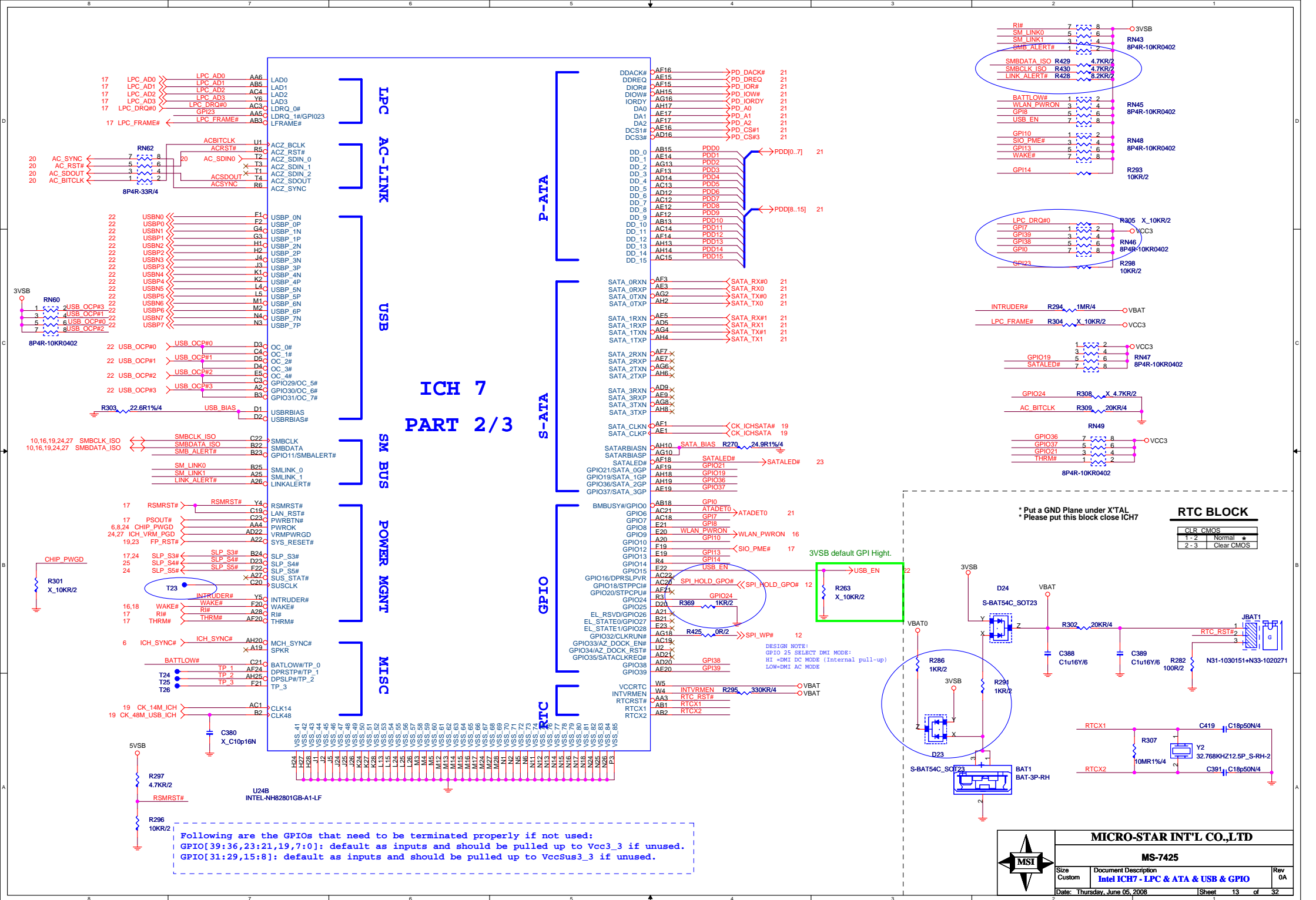
CHANNEL B V\_SM\_VTT DECOUPLING CAPS



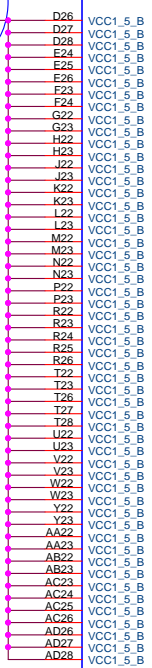
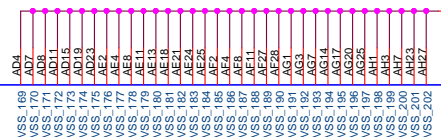
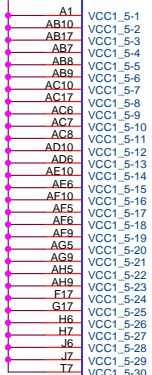
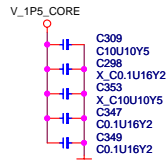
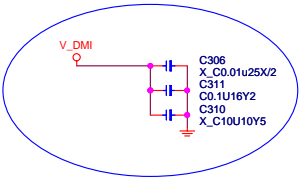










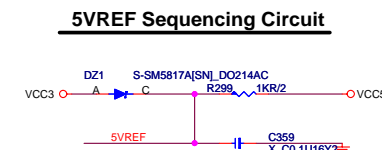
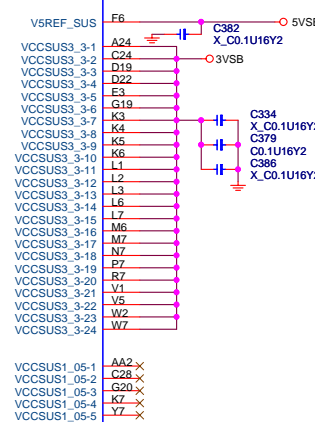
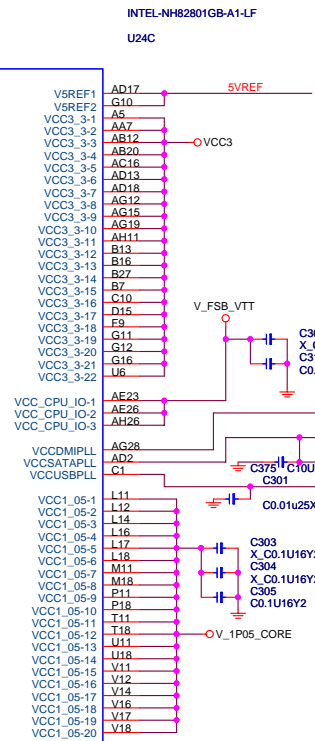
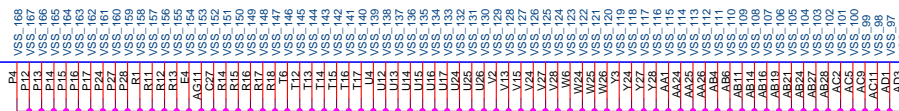


## 1.5V DMI POWER

ICH 7

PART 3/3

## 1.5V CORE WELL POWER



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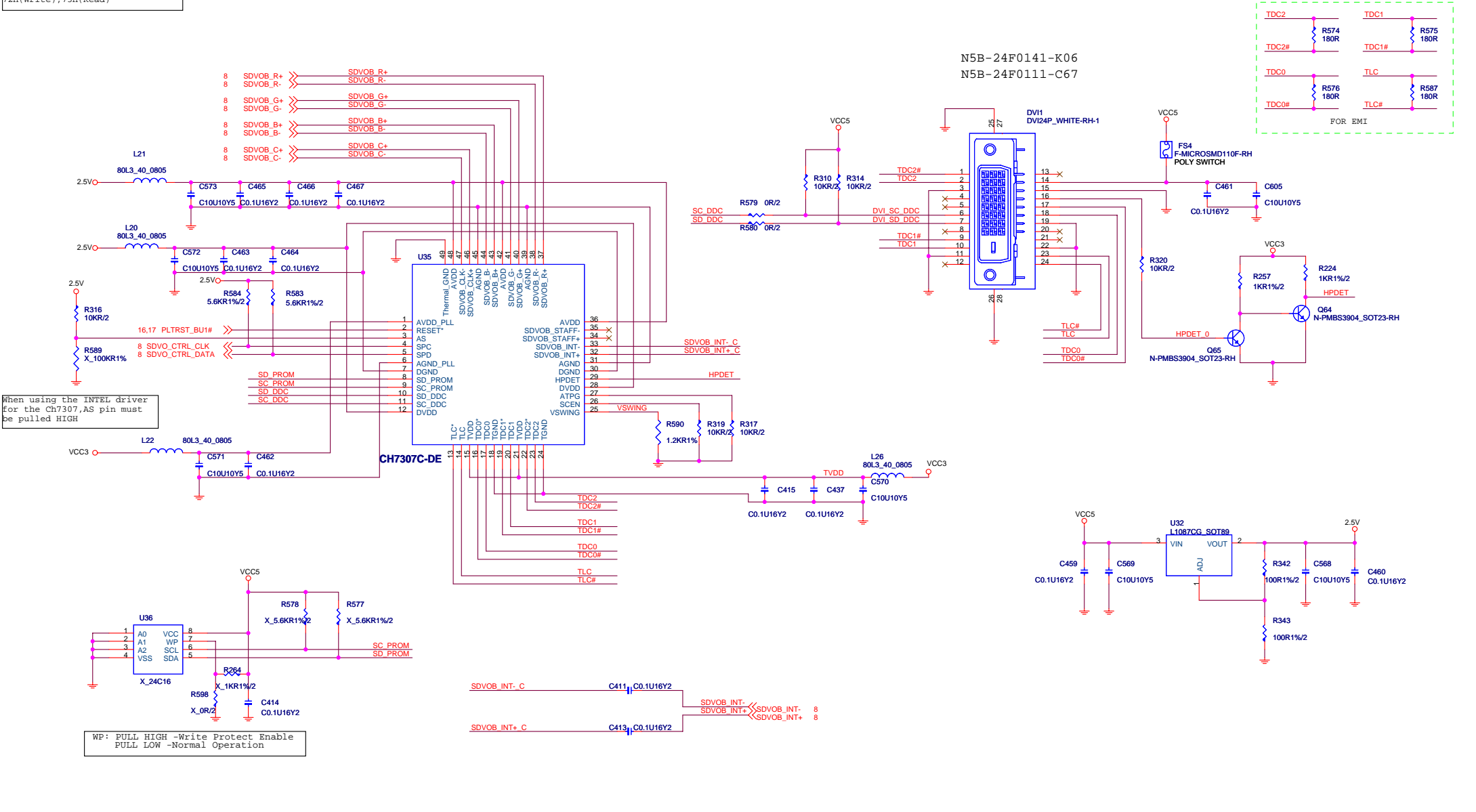
|                               |   |           |
|-------------------------------|---|-----------|
| Size<br>Custom                | Document Description<br><b>Intel ICH7 - POWER</b> | Rev<br>0A |
| Date: Thursday, June 05, 2008 | Sheet 14 of 32                                    |           |



AS pin setting :  
Pull HIGH = Device Address Byte  
70h(Write),71h(Read)  
Pull LOW = Device Address Byte  
72h(Write),73h(Read)

When using the INTEL driver  
for the CH7307C,AS pin must  
be pulled HIGH

WP: PULL HIGH -Write Protect Enable  
PULL LOW -Normal Operation



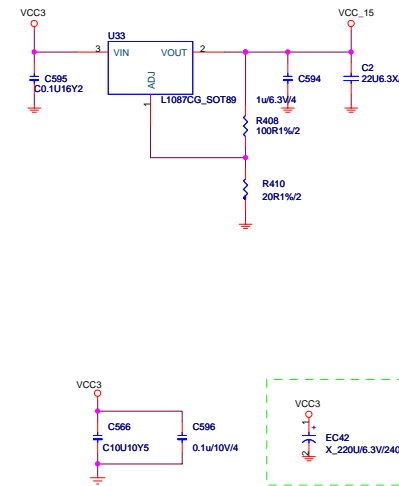


The diagram illustrates the electrical connections for the Mini-PCIE Stand Off. The central component is the COM1 header, which provides connections for various signals and power. The connections are as follows:

- Power Connections:**
  - VCC3:** Connected to pins 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56.
  - VCC15:** Connected to pins 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56.
  - 3VSB:** Connected to pins 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56.
- Signal Connections:**
  - WAKE#:** Connected to pin 1.
  - RSVD1:** Connected to pin 2.
  - RSVD2:** Connected to pin 3.
  - CLKREQ#:** Connected to pin 4.
  - RSVD3:** Connected to pin 5.
  - RSVD4:** Connected to pin 6.
  - PET\_NO:** Connected to pin 7.
  - PER\_NO:** Connected to pin 8.
  - PER\_P0:** Connected to pin 9.
  - GND4:** Connected to pin 10.
  - GND5:** Connected to pin 11.
  - GND6:** Connected to pin 12.
  - GND7:** Connected to pin 13.
  - GND8:** Connected to pin 14.
  - GND9:** Connected to pin 15.
  - GND10:** Connected to pin 16.
  - GND11:** Connected to pin 17.
  - GND12:** Connected to pin 18.
  - GND13:** Connected to pin 19.
  - GND14:** Connected to pin 20.
  - GND15:** Connected to pin 21.
  - GND16:** Connected to pin 22.
  - GND17:** Connected to pin 23.
  - GND18:** Connected to pin 24.
  - GND19:** Connected to pin 25.
  - GND20:** Connected to pin 26.
  - GND21:** Connected to pin 27.
  - GND22:** Connected to pin 28.
  - GND23:** Connected to pin 29.
  - GND24:** Connected to pin 30.
  - GND25:** Connected to pin 31.
  - GND26:** Connected to pin 32.
  - GND27:** Connected to pin 33.
  - GND28:** Connected to pin 34.
  - GND29:** Connected to pin 35.
  - GND30:** Connected to pin 36.
  - GND31:** Connected to pin 37.
  - GND32:** Connected to pin 38.
  - GND33:** Connected to pin 39.
  - GND34:** Connected to pin 40.
  - GND35:** Connected to pin 41.
  - GND36:** Connected to pin 42.
  - GND37:** Connected to pin 43.
  - GND38:** Connected to pin 44.
  - GND39:** Connected to pin 45.
  - GND40:** Connected to pin 46.
  - GND41:** Connected to pin 47.
  - GND42:** Connected to pin 48.
  - GND43:** Connected to pin 49.
  - GND44:** Connected to pin 50.
  - GND45:** Connected to pin 51.
  - GND46:** Connected to pin 52.
  - GND47:** Connected to pin 53.
  - GND48:** Connected to pin 54.
  - GND49:** Connected to pin 55.
  - GND50:** Connected to pin 56.
- Other Connections:**
  - WLAN\_PWRON:** Connected to pin 1.
  - PLTRST\_BU#:** Connected to pin 2.
  - SMBCLK\_ISO:** Connected to pin 3.
  - SMBDATA\_ISO:** Connected to pin 4.

The diagram also shows the following components and their connections:

- Capacitors:** C567 (0.1uF/10V5), C584 (0.1uF/10V4), C580 (C2.2uF/3V6).
- Resistors:** R421 (4.7K/R2), R407 (0R/2).
- Connectors:** COM1, Mini-PCIE Stand Off.
- Labels:** H1, B2B-1037020-163, SLOT-MINIPCI2P\_BLACK.



```

IDSEL = AD16
MASTER = PREQ#0
PIRQ#A

```

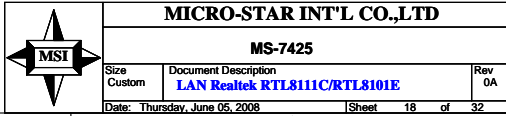
The diagram illustrates the timing of the 8P4R-2.7KR0402 module. It shows the relationship between the module's internal clock (8P4R-2.7KR0402) and the VCC5 supply voltage. The signals are categorized into two groups: PREQ# (Pre-Enable) and REQ# (Request). The PREQ# signals (PREQ#2, PREQ#3, PREQ#4, PREQ#5, PREQ#0, PREQ#1) are shown as active-low signals (indicated by a bubble on the input pin) that transition from high to low. The REQ# signals (REQ#64, ACK#64, R437) are shown as active-low signals (indicated by a bubble on the input pin) that transition from high to low. The diagram also shows the timing of the module's internal clock (8P4R-2.7KR0402) and the VCC5 supply voltage. The signals are labeled with their respective pin numbers and the module's internal clock (8P4R-2.7KR0402). The VCC5 supply voltage is shown as a constant high level.

[illegible]



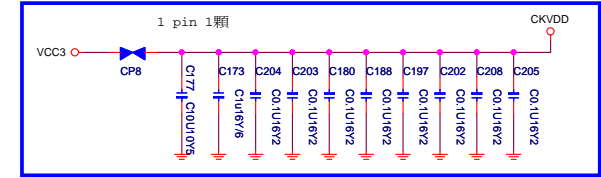
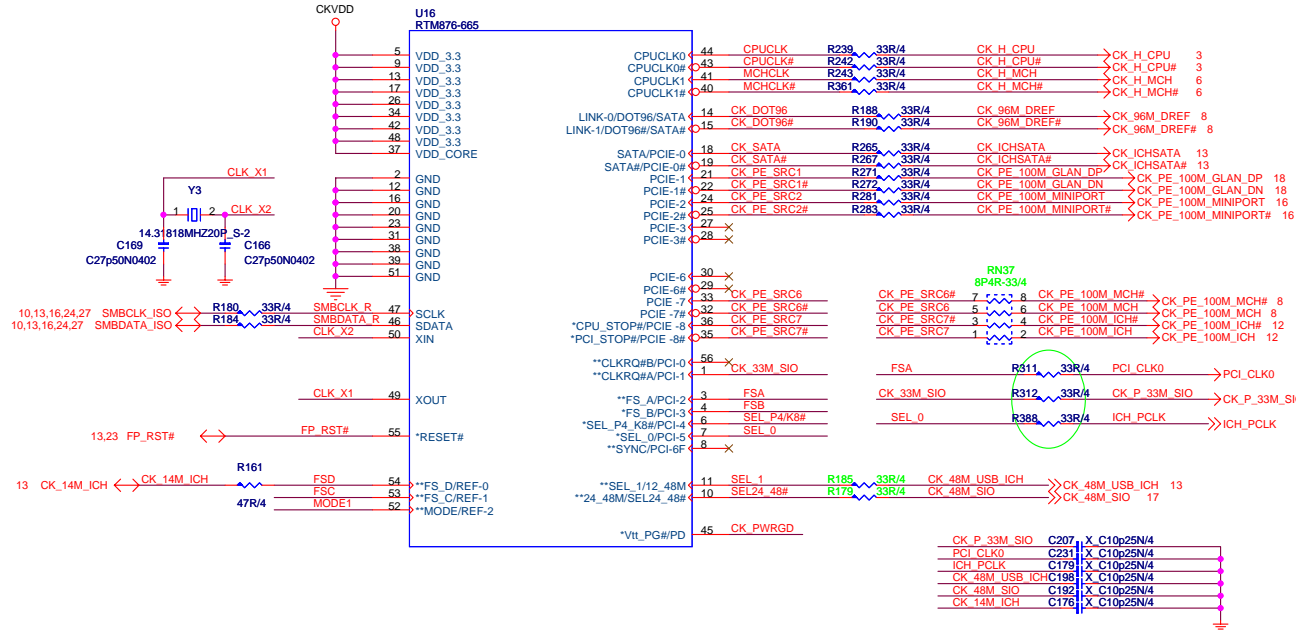




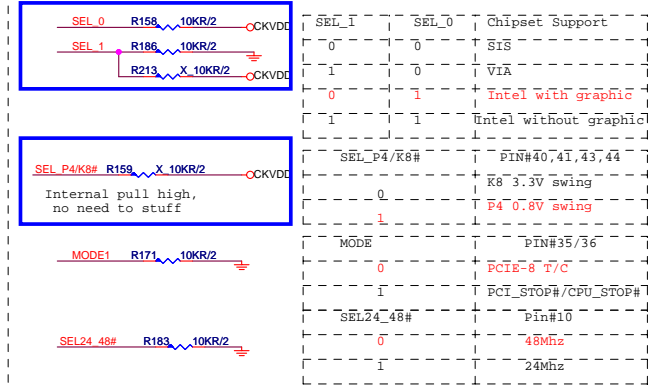




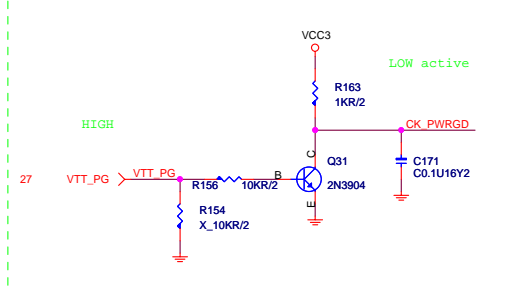
## Clock Generator - RTM876-665



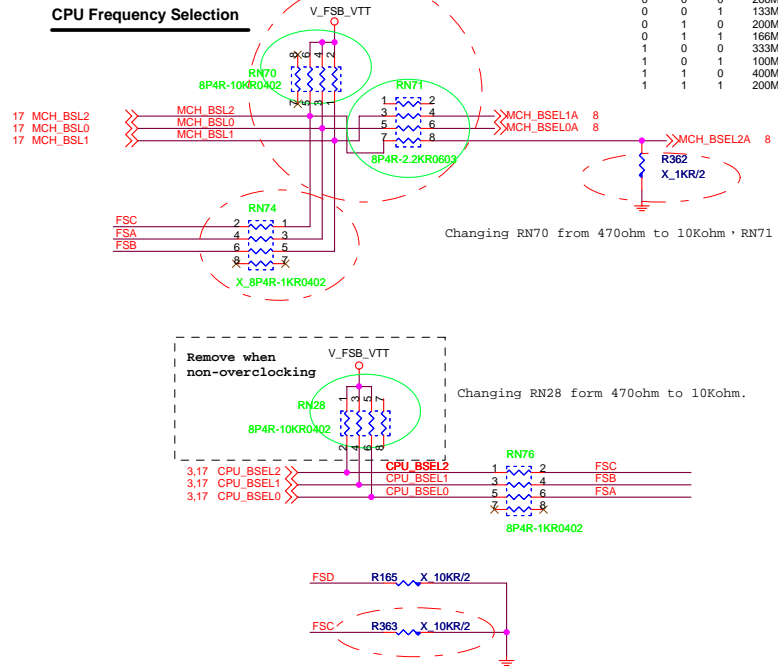
## STRAPPING RESISTOR



## Clock Generator Power Good Block



## CPU Frequency Selection



| FS_C | FS_B | FS_A | CPU  |
|------|------|------|------|
| 0    | 0    | 0    | 266M |
| 0    | 0    | 1    | 133M |
| 0    | 1    | 0    | 200M |
| 0    | 1    | 1    | 166M |
| 1    | 0    | 0    | 333M |
| 1    | 0    | 1    | 100M |
| 1    | 1    | 0    | 400M |
| 1    | 1    | 1    | 200M |

Changing RN70 from 470ohm to 10Kohm · RN71 form 10Kohm to 2.2Kohm.

Changing RN28 form 470ohm to 10Kohm.



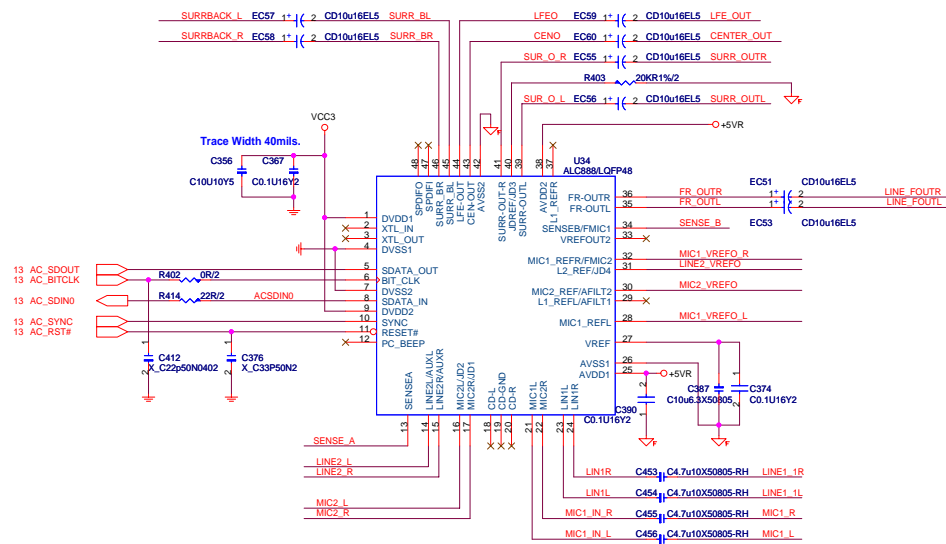
MICRO-STAR INT'L CO.,LTD

MS-7425

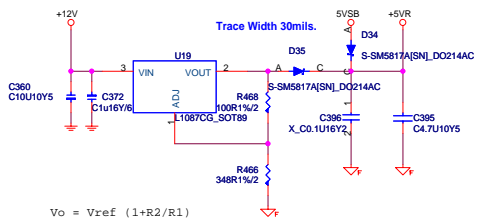
| Size                          | Document Description | Rev |
|-------------------------------|----------------------|-----|
| Custom                        | CLK-RTM 876-665      | 0A  |
| Date: Thursday, June 05, 2008 | Sheet 19 of 32       |     |



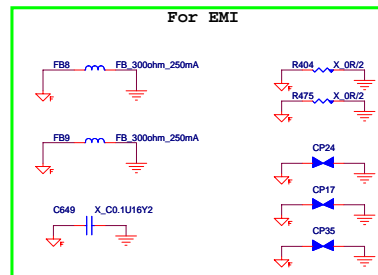
# ALC888 CODEC



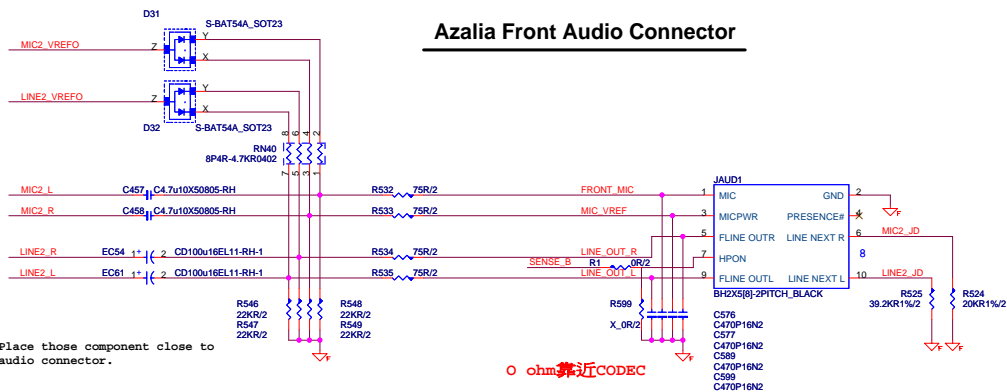
## AUDIO CODE REGULATORS



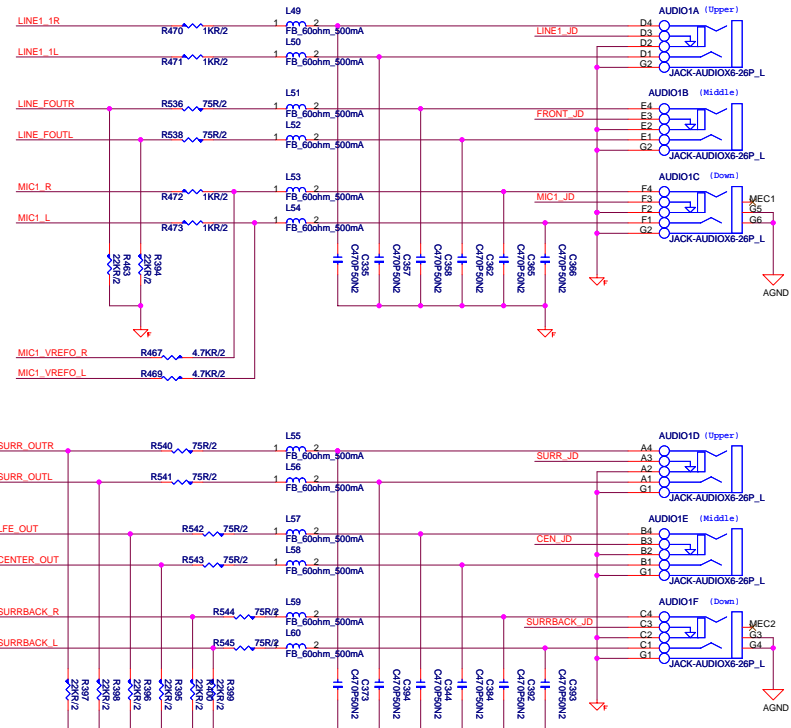
## For EMI



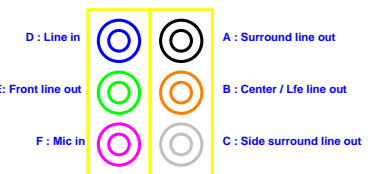
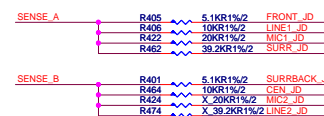
## Azalia Front Audio Connector



# ALC888 JACK

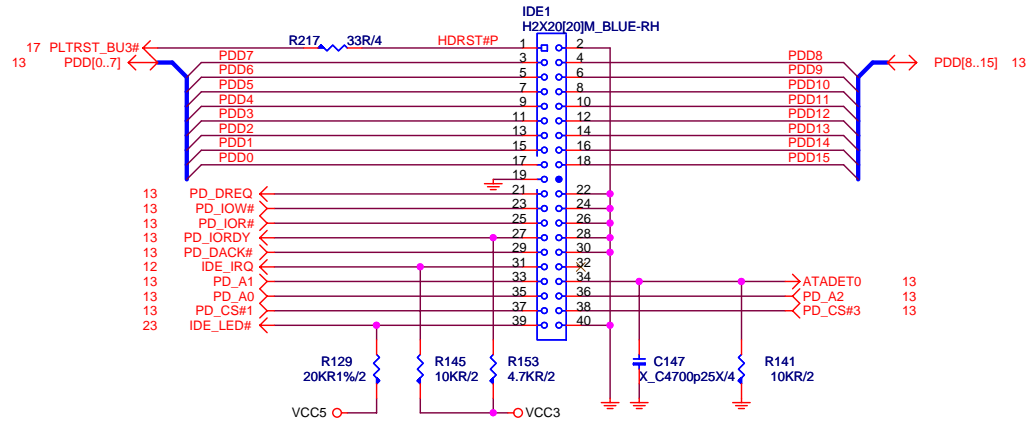


## ALC888 JACK DETECT

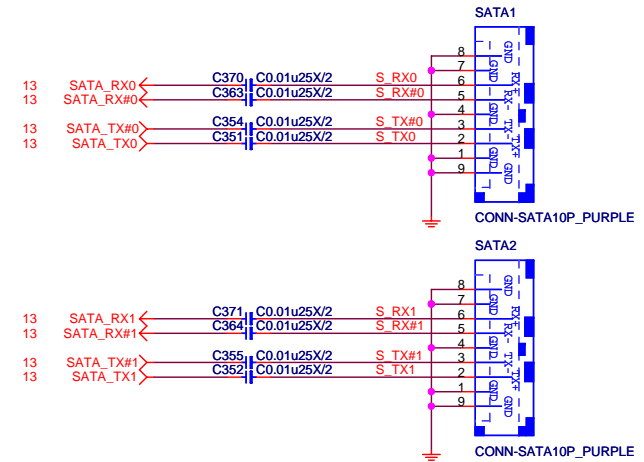




## ATA 33/66/100 IDE Connectors



## SERIAL ATA CONNECTOR BLOCK



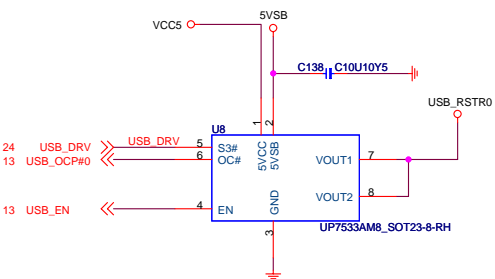
MICRO-STAR INT'L CO.,LTD

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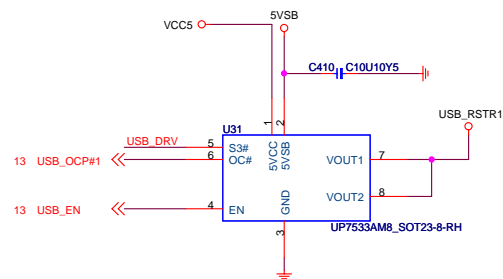
| Size                          | Document Description  | Rev |
|-------------------------------|-----------------------|-----|
| B                             | IDE & SATA Connectors | 0A  |
| Date: Thursday, June 05, 2008 | Sheet 21 of 32        |     |



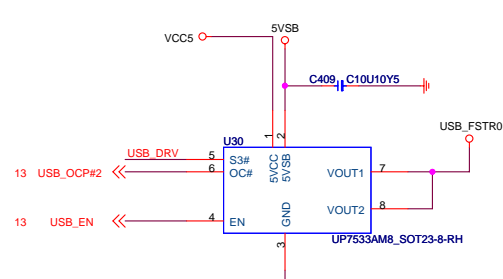
### POWER CIRCUIT FOR USB PORT 0,1



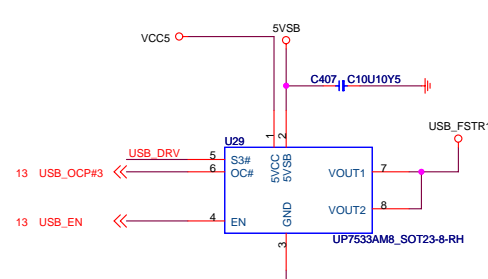
### POWER CIRCUIT FOR USB PORT 2,3



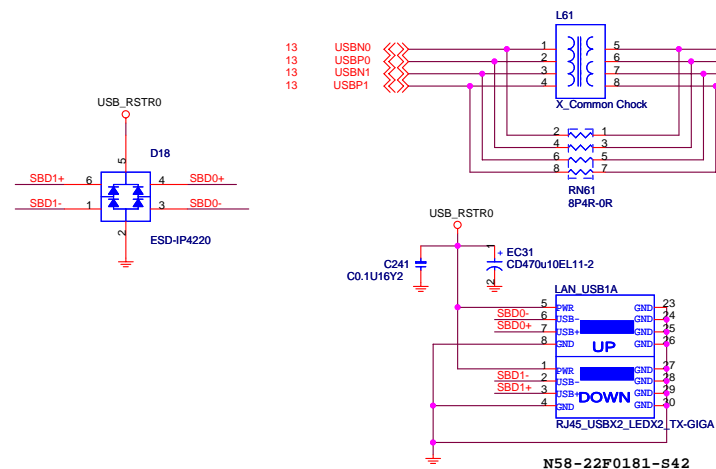
### POWER CIRCUIT FOR USB PORT 4,5



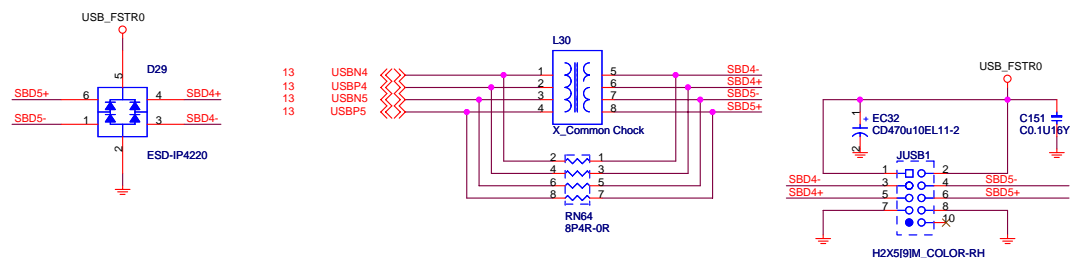
### POWER CIRCUIT FOR USB PORT 6,7



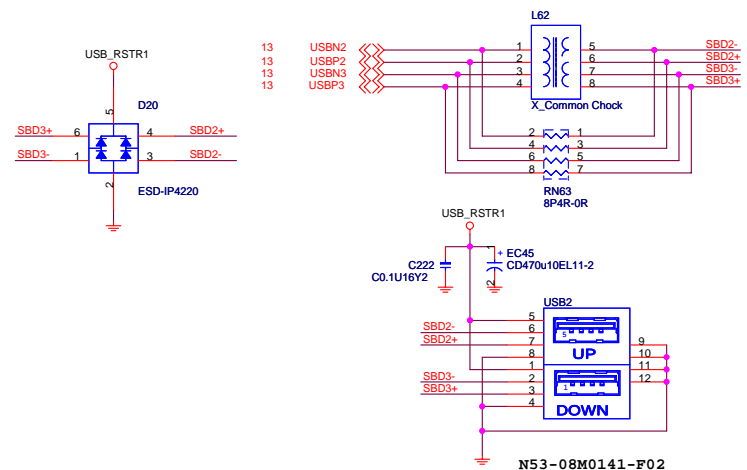
### REAR PANEL USB CONNECTOR FOR USB PORT 0,1



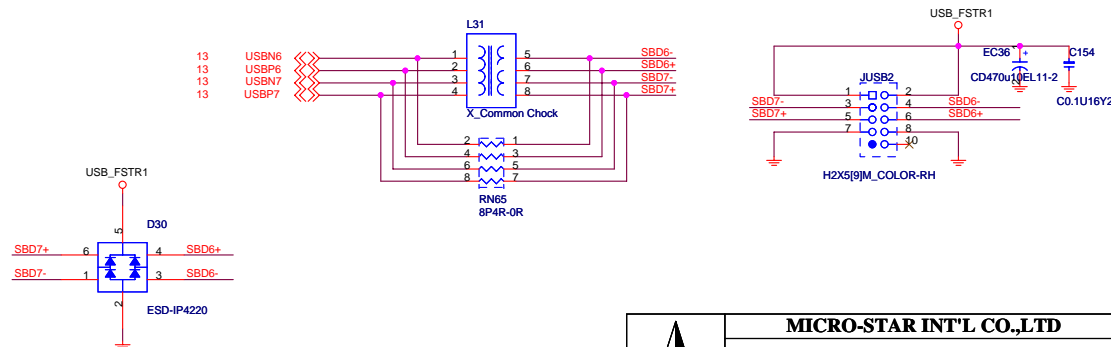
### FRONT PANEL USB CONNECTOR FOR USB PORT 4,5



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



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



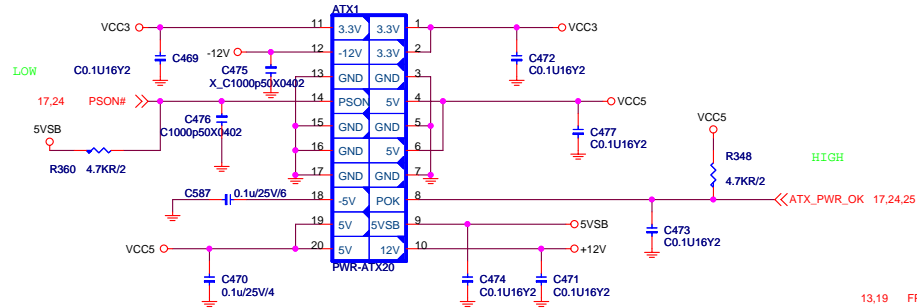
**MICRO-STAR INT'L CO.,LTD**

**MS-7425**

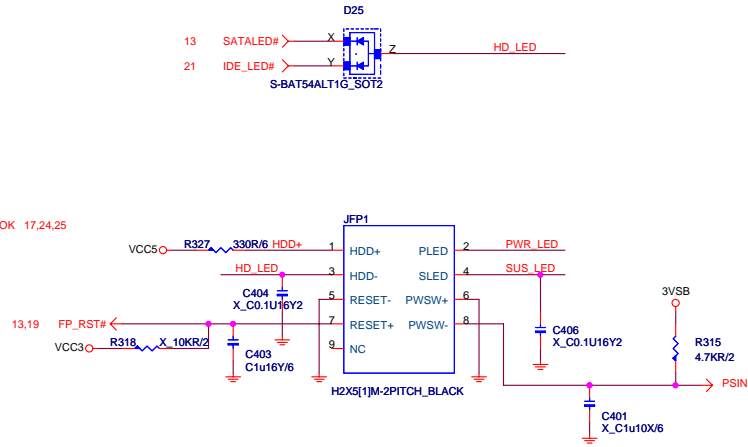
| Size                          | Document Description  | Rev |
|-------------------------------|-----------------------|-----|
| Custom                        | <b>USB CONNECTORS</b> | 0A  |
| Date: Thursday, June 05, 2008 | Sheet 22 of 32        |     |



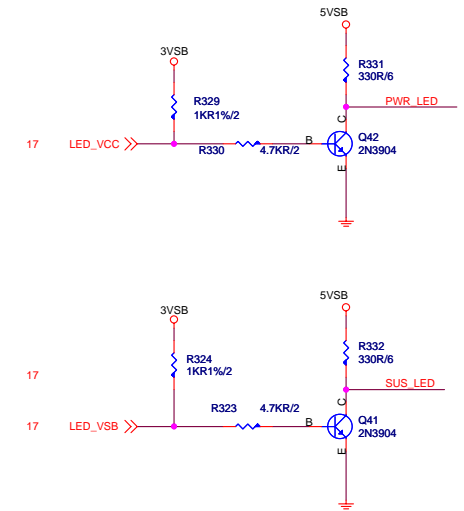
### ATX Connector



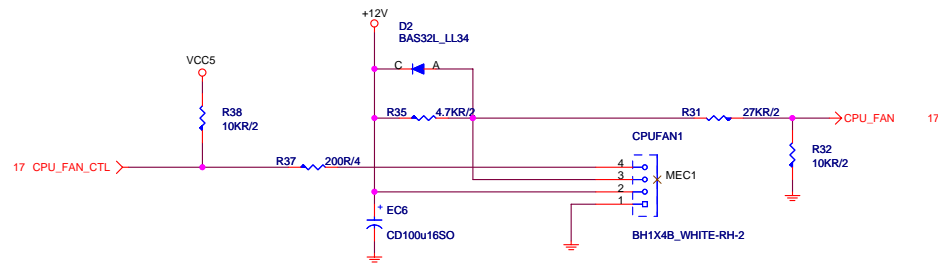
### INTEL/PB Front Panel Connector



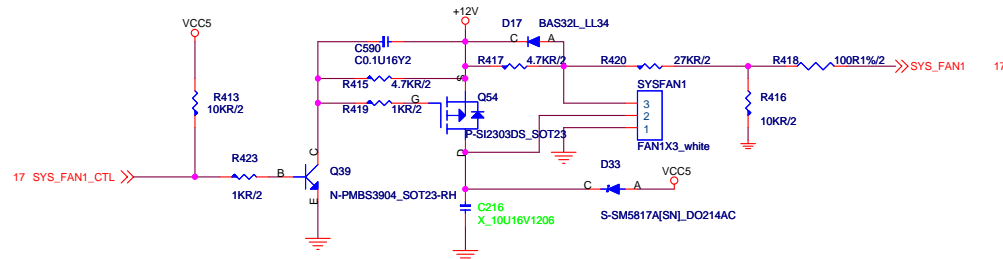
**LED ( for Fintek 71882)**



**CPU FAN**  
**PWM MODE**



**SYS FAN**  
**PWM MODE**



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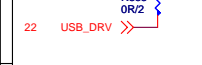
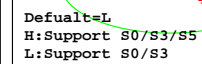
|                |  |
|----------------|--|
| Size<br>Custom | Document Description<br><b>ATX &amp; Front Panel &amp; FAN</b> |
|----------------|--|

Rev  
0A

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Issue (5.1-1.6) / 35K-100uA



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NO 7425

[illegible]

Custom

ACPI controller UPI

0A

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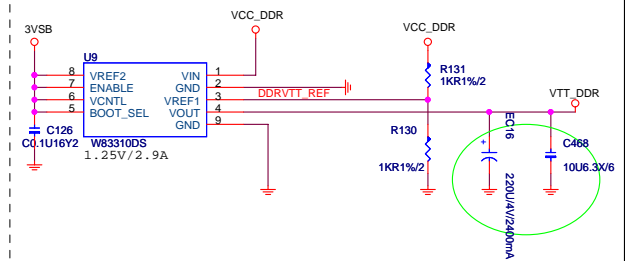


## DDR II 1.8V POWER

**VCC\_DDR**



### DDR VTT Power



***SB 1.5V 2.75A***



NB 1.25V POWER



|     |  |
|-----|--|
| Rev |  |
|-----|--|

|                               |                                      |    |
|-------------------------------|--------------------------------------|----|
| Custom                        | <b>NB Core Power &amp; DDR Power</b> | 0A |
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# Video Connector

37 ohm route (7.5 mils)  
300 mils max length

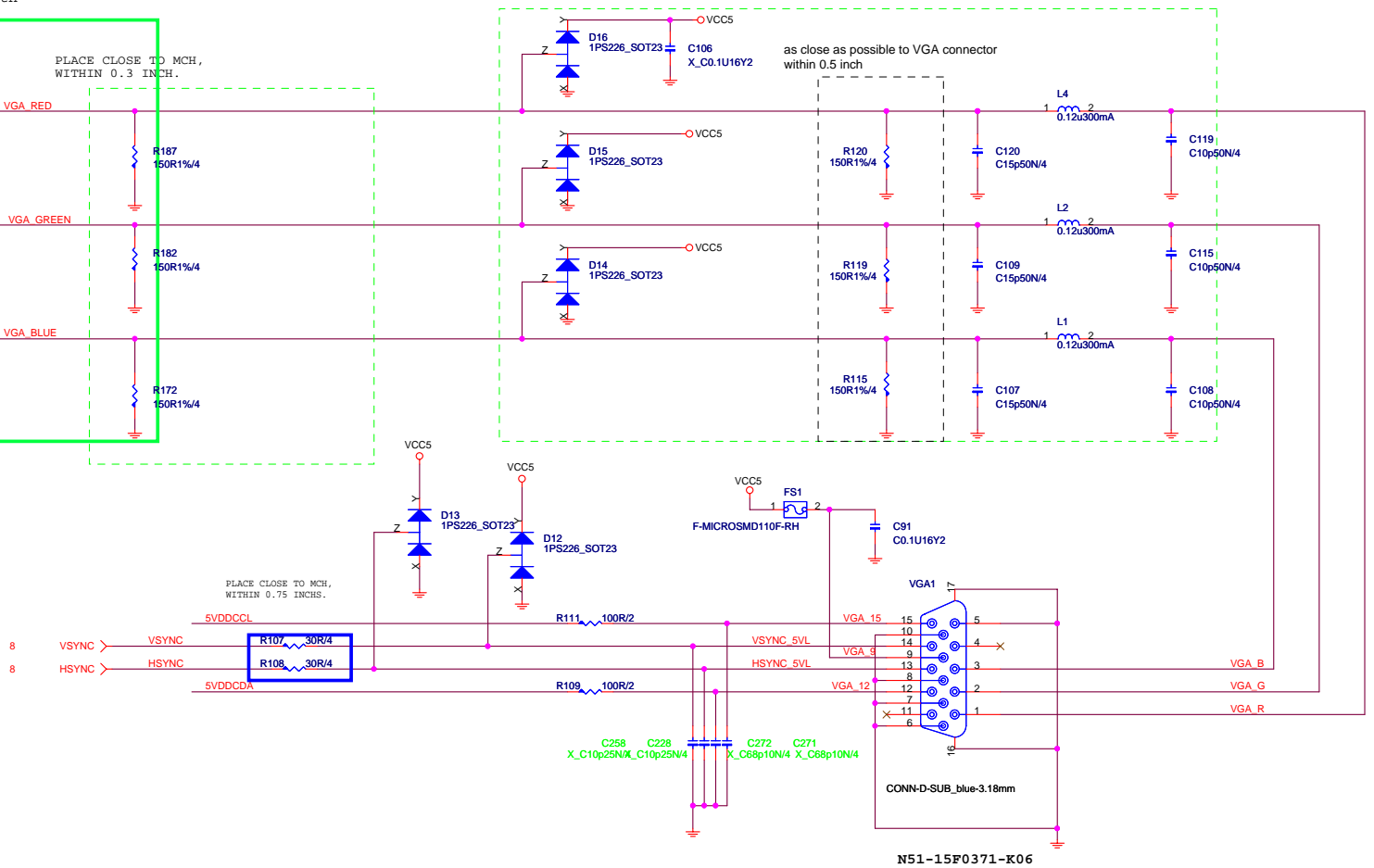
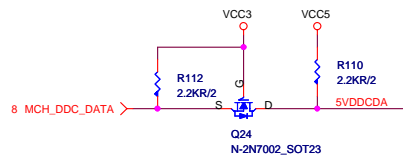
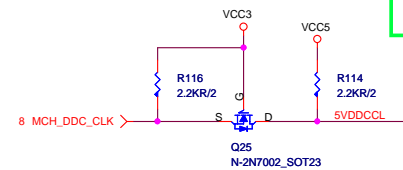
Thw R,G,B route lengths should be length match to 200mils.

PLACE CLOSE TO MCH,  
WITHIN 0.3 INCH.

PLACE CLOSE TO VGA CONNECTOR

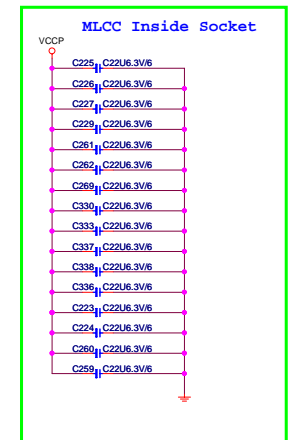
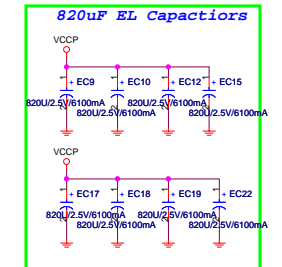
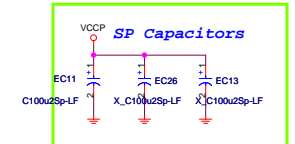
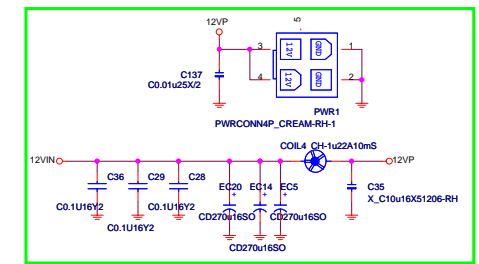
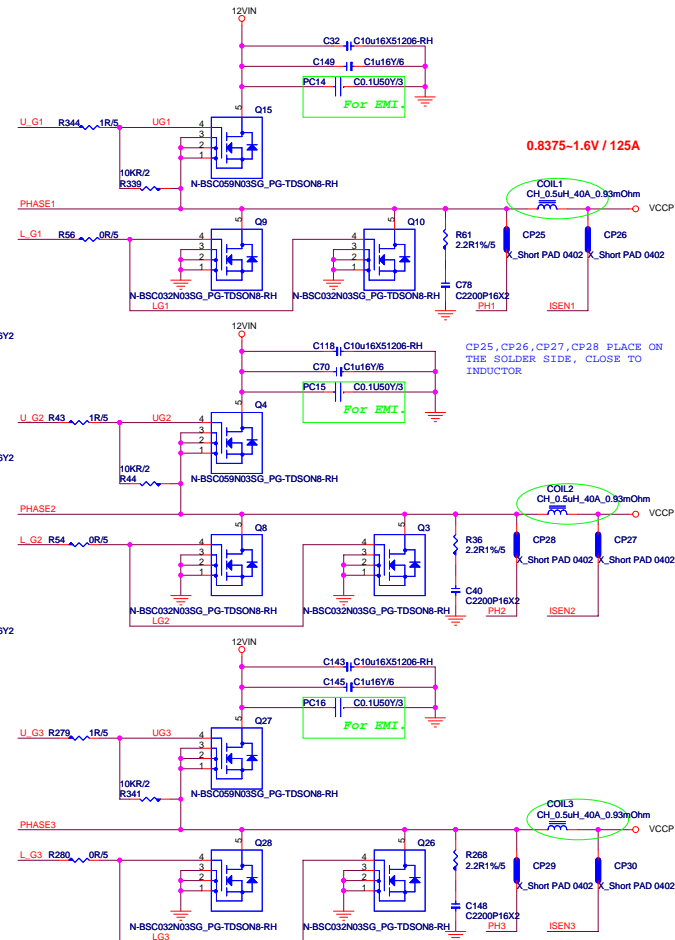
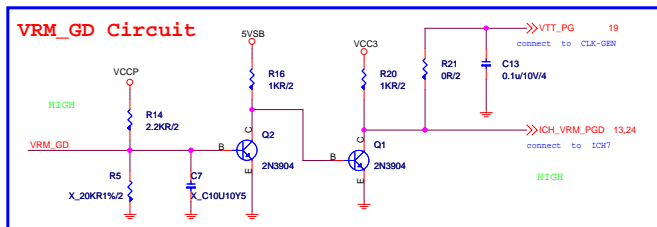
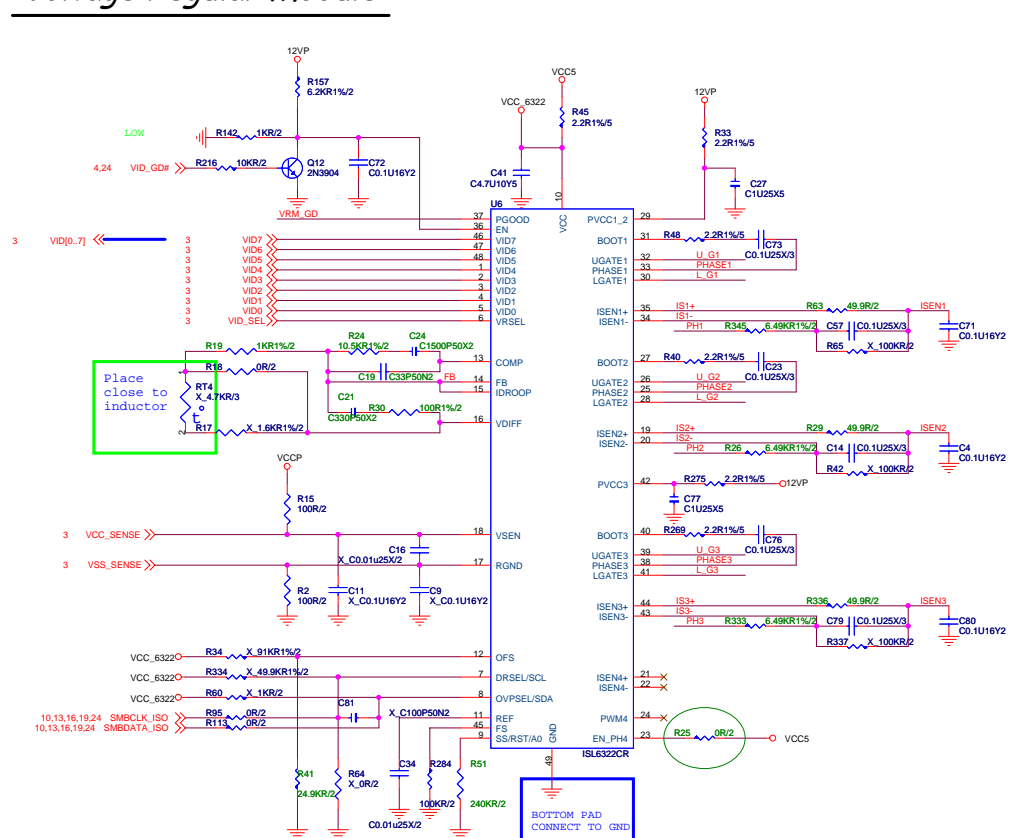
as close as possible to VGA connector  
within 0.5 inch

PLACE CLOSE TO MCH,  
WITHIN 0.75 INCHS.

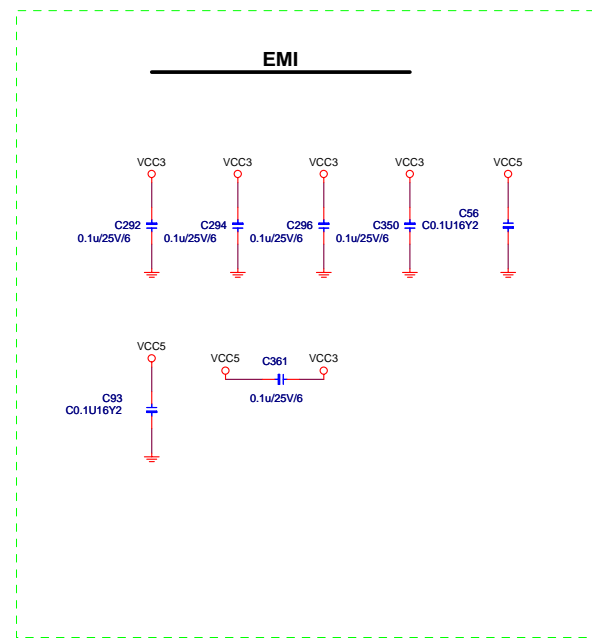
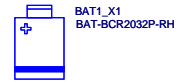
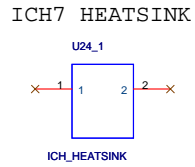
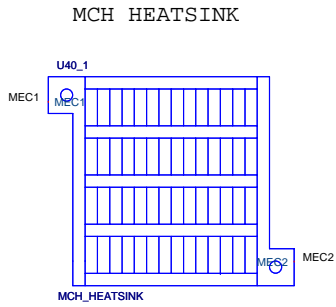




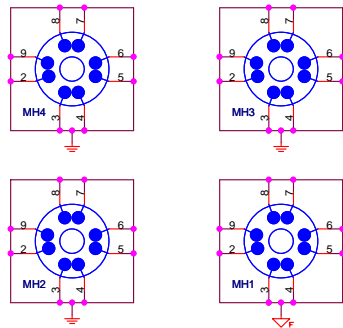
### Voltage Regular Module



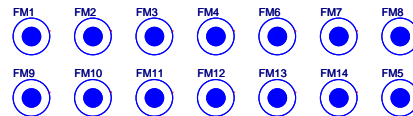




### Mounting Holes



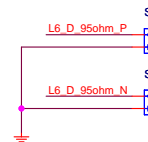
### Optics Orientation Holes



### Simulation

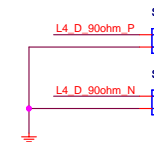


### Impedance Test Port: Differential-95ohm



layer 6 differential pair 4/8/4 95 ohm±10%

### Impedance Test Port: Differential-90ohm



layer 4 differential pair 4.5/7.5/4.5 90 ohm±10%



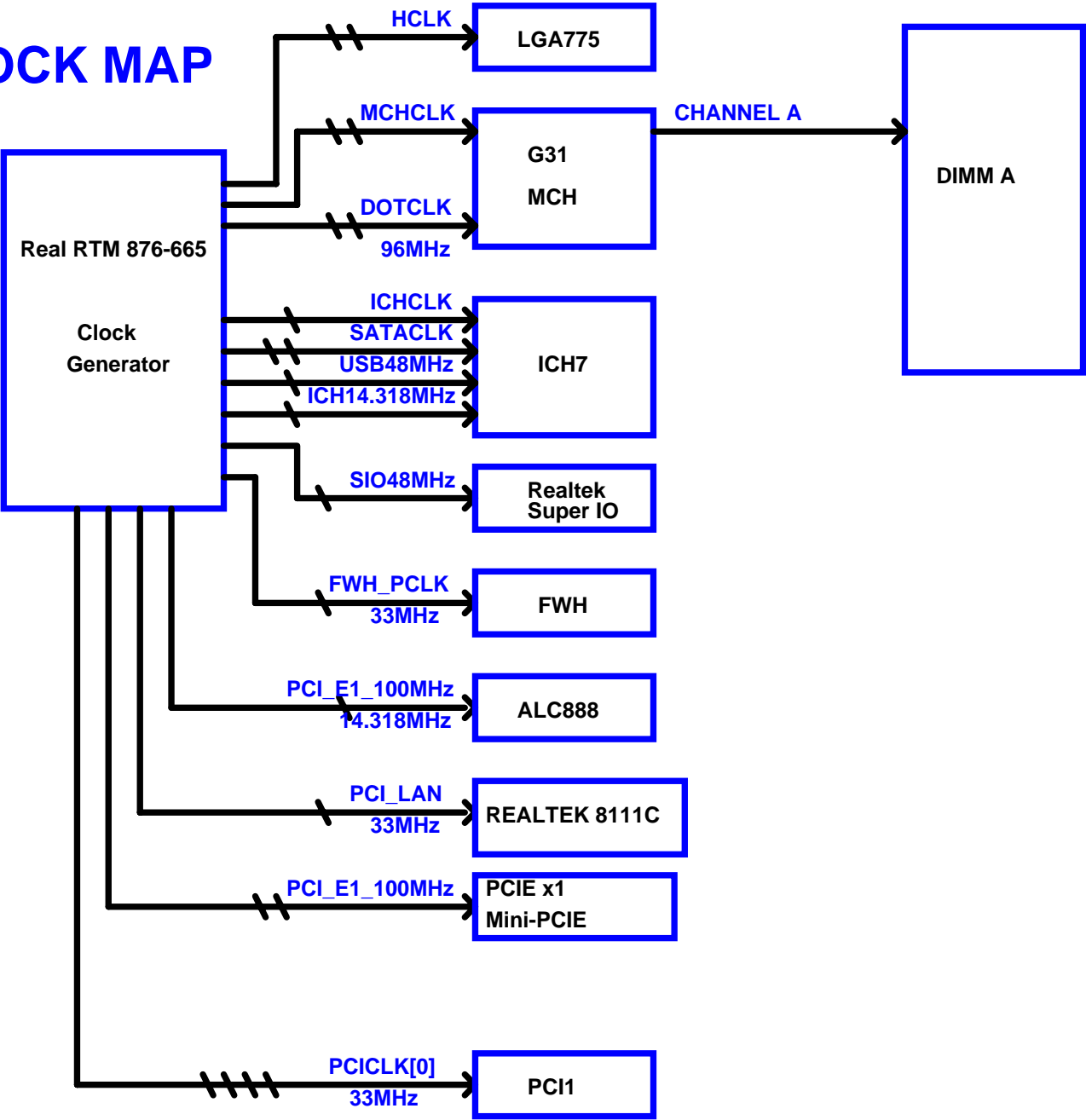
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|                               |                                      |           |
|-------------------------------|--------------------------------------|-----------|
| Size<br>Custom                | Document Description<br>MANUAL PARTS | Rev<br>0A |
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# CLOCK MAP





| INTEL 775              |   |              |
|------------------------|---|--------------|
| 0.8375V - 1.6000V Core | - | 125A         |
| 1.2V FSB Vtt           | - | 5.3+0.8=6.1A |

| Bearlake G31         |   |        |
|----------------------|---|--------|
| 1.2V FSB_VTT         | - | 1.0 A  |
| 1.25V Core           | - | 18.1A  |
| 1.25V DMI/PCI Exp.   | - | 2.5 A  |
| 1.8V VCC_DDR (S0,S1) | - | 3.2A   |
| 1.8V VCC_SMCLK       | - | TBD    |
| 3.3V VCCA_DAC        | - | 66 mA  |
| 3.3V VCC33           | - | 15.8mA |
| 1.25V Vcc CL         | - | TBD A  |

| ICH7            |   |       |
|-----------------|---|-------|
| 1.05V Core      | - | 1.31A |
| V5REF           | - | 6 mA  |
| 1.2V FSB_VTT    | - | 14 mA |
| 1.5V_A USB/SATA | - | 1.01A |
| 1.5V_B PCI Exp. | - | 0.77A |
| VCCRTC (G3)     | - | 6 uA  |
| 3.3V CL         | - | 12 mA |
| 1.5V GbE LAN    | - | 74 mA |
| 3.3V 10/100 LAN | - | 12 mA |
| V5REF_SUS       | - | 10 mA |
| VCCSUS3_3       | - | 0.7A  |
| VCC3_3          | - | 0.33A |

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

| SPI           |   |      |
|---------------|---|------|
| +3.3V (S0,S1) | - | 30mA |

| ISL6322         |        |  |
|-----------------|--------|--|
| VCCP            | VRM 11 |  |
| 0.8375V-1.6000V | 125A   |  |
| 3-Phase Switch  |        |  |

| W83310DS    |      |  |
|-------------|------|--|
| VTT_DDR     |      |  |
| 0.9V Linear | 1.2A |  |

| Regulator        |               |  |
|------------------|---------------|--|
| V_FSB_VTT        |               |  |
| 5.3A+0.85A+1A=   | 7.1A          |  |
| V_1P5_CORE       |               |  |
| 1.5V Linear      | 24.7A         |  |
| 5VUSB_REAR/FRONT |               |  |
| 5V Linear        | 2A / 3A       |  |
| 5VSB             | 400mA / 600mA |  |
| 5VDIMM           |               |  |
| 5V               | 9.34A         |  |
| 5VSB             | 225mA         |  |

| uP7706 Regulator |      |  |
|------------------|------|--|
| 3VDUAL           |      |  |
| 3.3V             | 1.7A |  |

| uP7707 Regulator |       |  |
|------------------|-------|--|
| 1.5V             | 100mA |  |

| uP6103 Regulator |            |  |
|------------------|------------|--|
| VCC_DDR          |            |  |
| 1.8V Switch      | 37.6A (S3) |  |

| 5VAudio |  |  |
|---------|--|--|
| +5VR    |  |  |
| 800mA   |  |  |

## DDR DIMM & TERMINATOR

|                      |   |       |
|----------------------|---|-------|
| 0.9V VTT_DDR         | - | 1.2A  |
| 1.8V VCC_DDR (S0,S1) | - | 4.8A  |
| 1.8V VCC_DDR (S3)    | - | 400mA |

## PCI Express x16 slot (X1)

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

## PCI Express x1 slot (X1)

|                    |   |       |
|--------------------|---|-------|
| +12V               | - | 0.5 A |
| +3.3Vaux (wake)    | - | 375mA |
| +3.3Vaux (no wake) | - | 20mA  |
| +3.3V              | - | 3.0A  |

## PCI slot x2

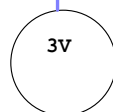
|                    |   |       |
|--------------------|---|-------|
| +3.3Vaux (wake)    | - | 750mA |
| +3.3Vaux (no wake) | - | 40mA  |
| +3.3V              | - | 15.2A |
| +5V                | - | 10A   |
| +12V               | - | 1.0A  |

## USB

|             |   |      |
|-------------|---|------|
| +5V (S0,S1) | - | 5.0A |
| +5V (S3)    | - | 25mA |

## PS2

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



| +12V    |  |
|---------|--|
| ATX 2x2 |  |

| +12V      | +5V | +3.3V | +5VSB |
|-----------|-----|-------|-------|
| ATX POWER |     |       |       |



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|                               |                                |        |
|-------------------------------|--------------------------------|--------|
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Size Custom

|                      |
|----------------------|
| Document Description |
|----------------------|

## HISTORY

|     |    |
|-----|----|
| Rev | 0A |
|-----|----|

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|       |    |    |    |
|-------|----|----|----|
| Sheet | 31 | of | 32 |
|-------|----|----|----|



