

| | |
|-------------------------------------|------|
| Cover Sheet | 1 |
| Block Diagram/Clock Map/Power Map | 2-4 |
| Intel LGA775 CPU | 5-7 |
| Intel Lakeport - MCH | 8-11 |
| Intel ICH7 - PCI & DMI & CPU & IRQ | 12 |
| Intel ICH7 - LPC & ATA & USB & GPIO | 13 |
| Intel ICH7 - POWER | 14 |
| Clock - RTM 876-665 | 15 |
| LPC I/O - Fintek 71882FG | 16 |
| LAN REALTEK RTL8111C | 17 |
| DDR II System Memory CHA | 18 |
| DDR II System Memory CHB | 19 |
| DDR II VTT Decoupling | 20 |
| Azalia - ALC888 | 21 |
| PCI EXPRESS X16 Slot | 22 |
| PCI Slot 1 & 2 & 3 | 23 |
| JMicron 381 1394 | 24 |
| ATA33/66/100 IDE & SATA Connectors | 25 |
| USB Connectors | 26 |
| ATX Connetcor & Front Panel | 27 |
| ACPI CONTROLLER UPI | 28 |
| NB CORE POWER & DDR POWER | 29 |
| VGA Connector | 30 |
| VRM ST L6703TR | 31 |
| | |
| | |

MS-7398

Version 1.1

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

On Board Chipset:

BIOS -- FWH EEPROM
 HD -- ALC888
 LPC Super I/O -- F71882FG
 LAN-- REALTEK RTL8111/C Co-lay RTL8101E
 CLOCK -- RTM 876-665

Main Memory:

DDR II *4 (Max 2GB)

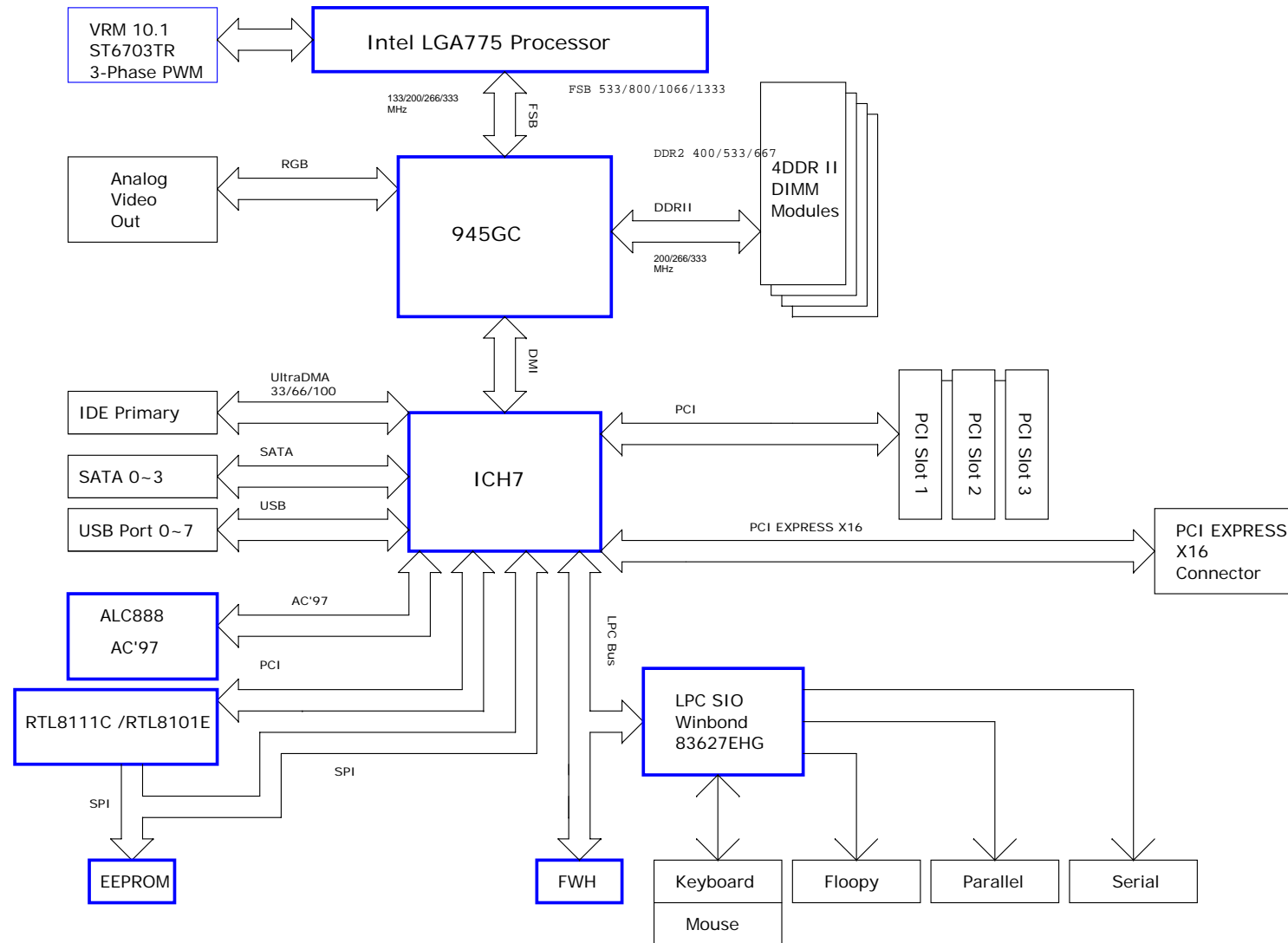
Expansion Slots:

PCI2.3 SLOT * 3
 PCI EXPRESS X16 SLOT

RICH PWM:

VRM ST L6703TR
 Controller: 3 PHASES

Block Diagram

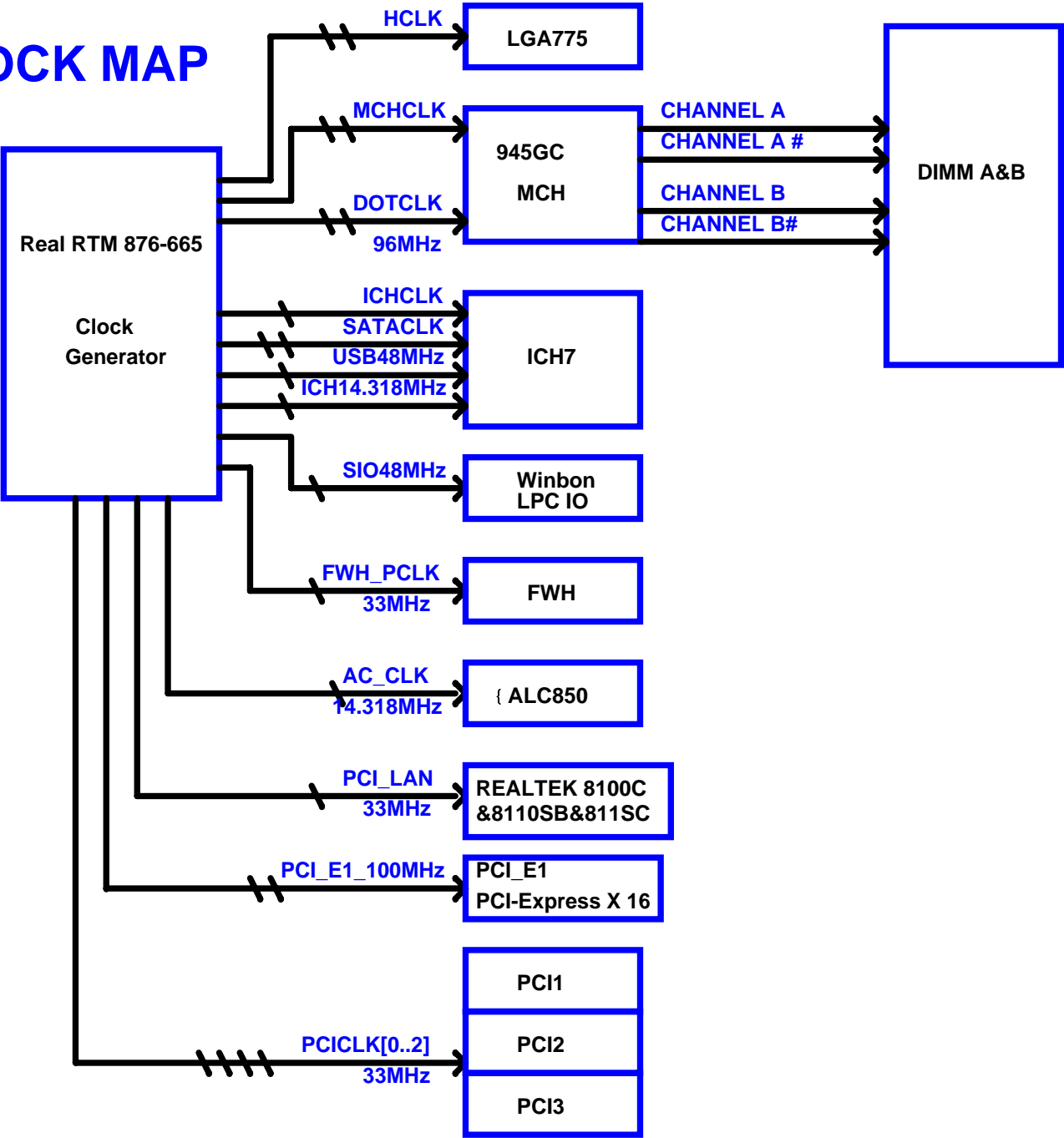


MICRO-STAR INT'L CO.,LTD

MS-7398

| Size | Document Description | Rev |
|-----------------------------------|----------------------|-----|
| Custom | BLOCK DIAGRAM | 1.1 |
| Date: Thursday, November 15, 2007 | Sheet 2 of 34 | |

CLOCK MAP

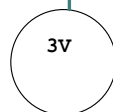


| | | |
|------------------------|---|--------------|
| INTEL 775 | | |
| 0.8375V - 1.6000V Core | - | 125A |
| 1.2V FSB Vtt | - | 5.3+0.8=6.1A |

| | | |
|---------------------|---|--------|
| NB-945GC | | |
| +1.3V REGULATOR | - | 8.81 A |
| +1.3VDUAL REGULATOR | - | 25 mA |
| +1.8V REGULATOR | - | 2.4 A |
| +3.3V REGULATOR | - | 621 mA |
| +3.3V DUAL | - | 163mA |
| RTC (G3) | - | 3 mA |

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

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



| | | |
|-----------------|--------|--|
| ISL6322 | | |
| VCCP | VRM 11 | |
| 0.8375V-1.6000V | 125A | |
| 4-Phase Switch | | |

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

| | | |
|------------------|---------------|---------|
| Regulator | | |
| V_FSB_VTT | | |
| 5.3A+0.85A= | 6.1A | |
| VCC1_3 | | |
| 1.35V | Linear | 8.81A |
| 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_3VDUAL | | |
| 1.35V | | 25mA |

| | | |
|-------------------------|--------|-------------|
| uP6103 Regulator | | |
| VCC_DDR | | |
| 1.8V | Switch | 22.21A (S3) |

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

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

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

| | | |
|----------------------------------|---|-------|
| DDR DIMM & 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 (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 |

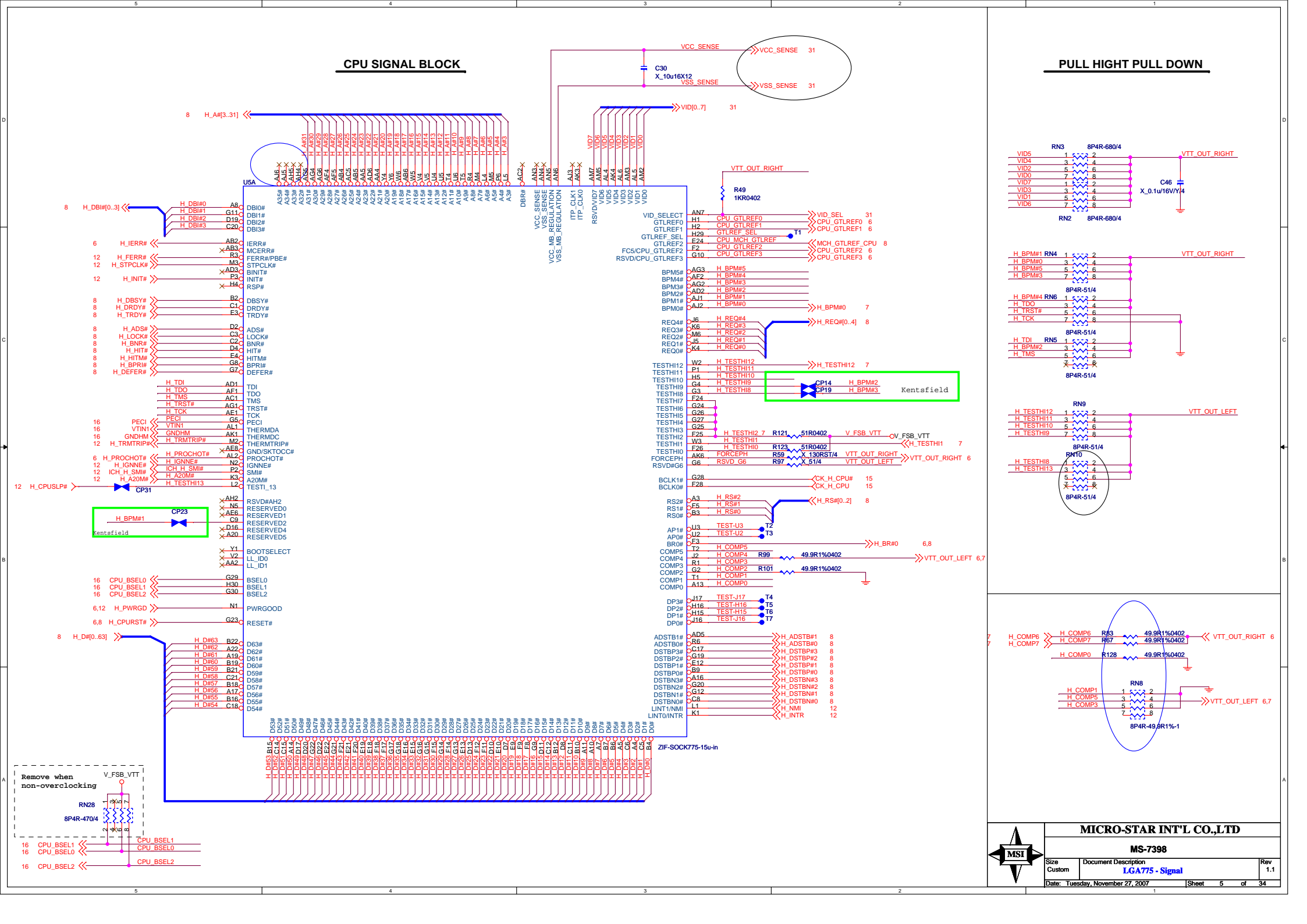
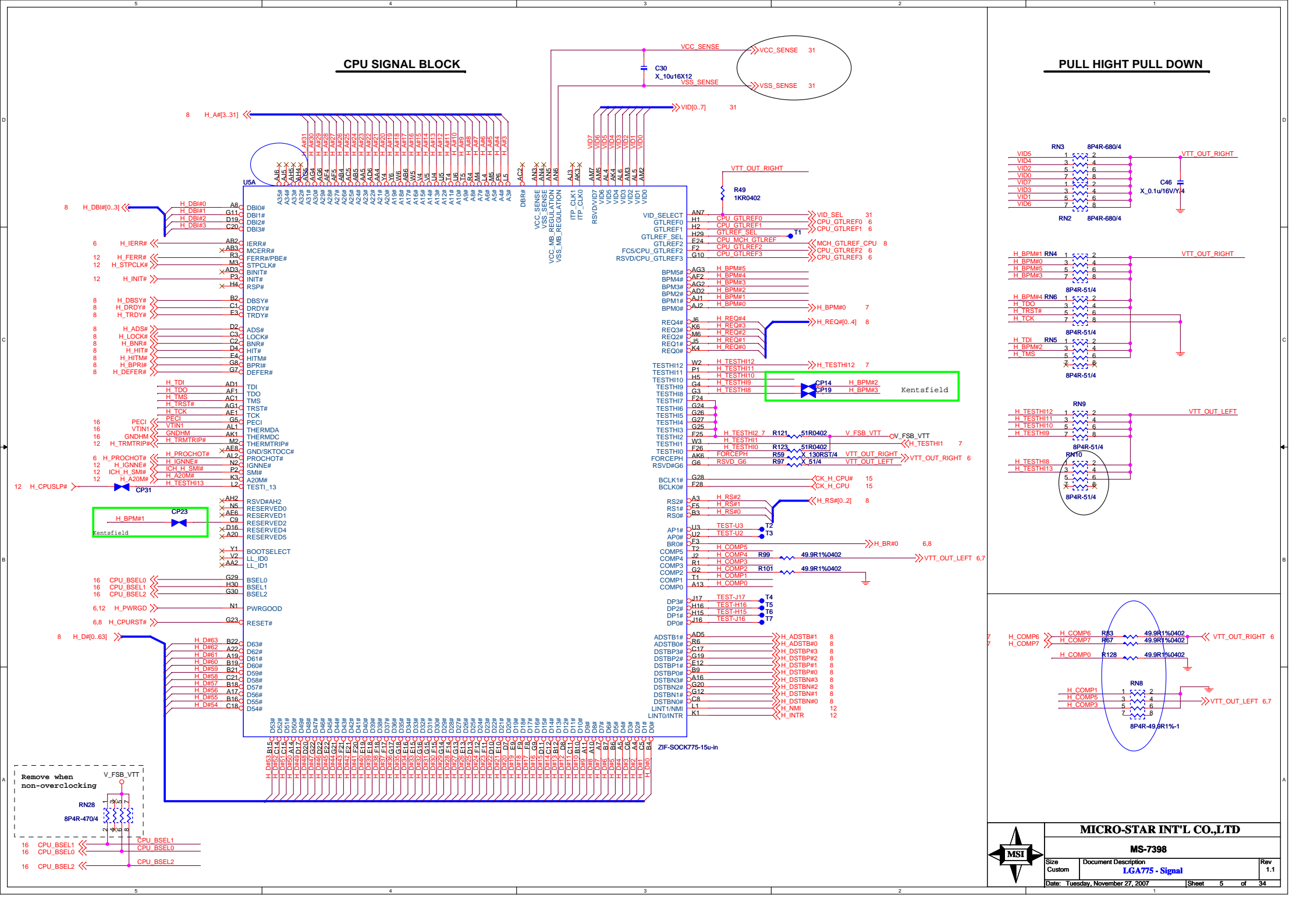
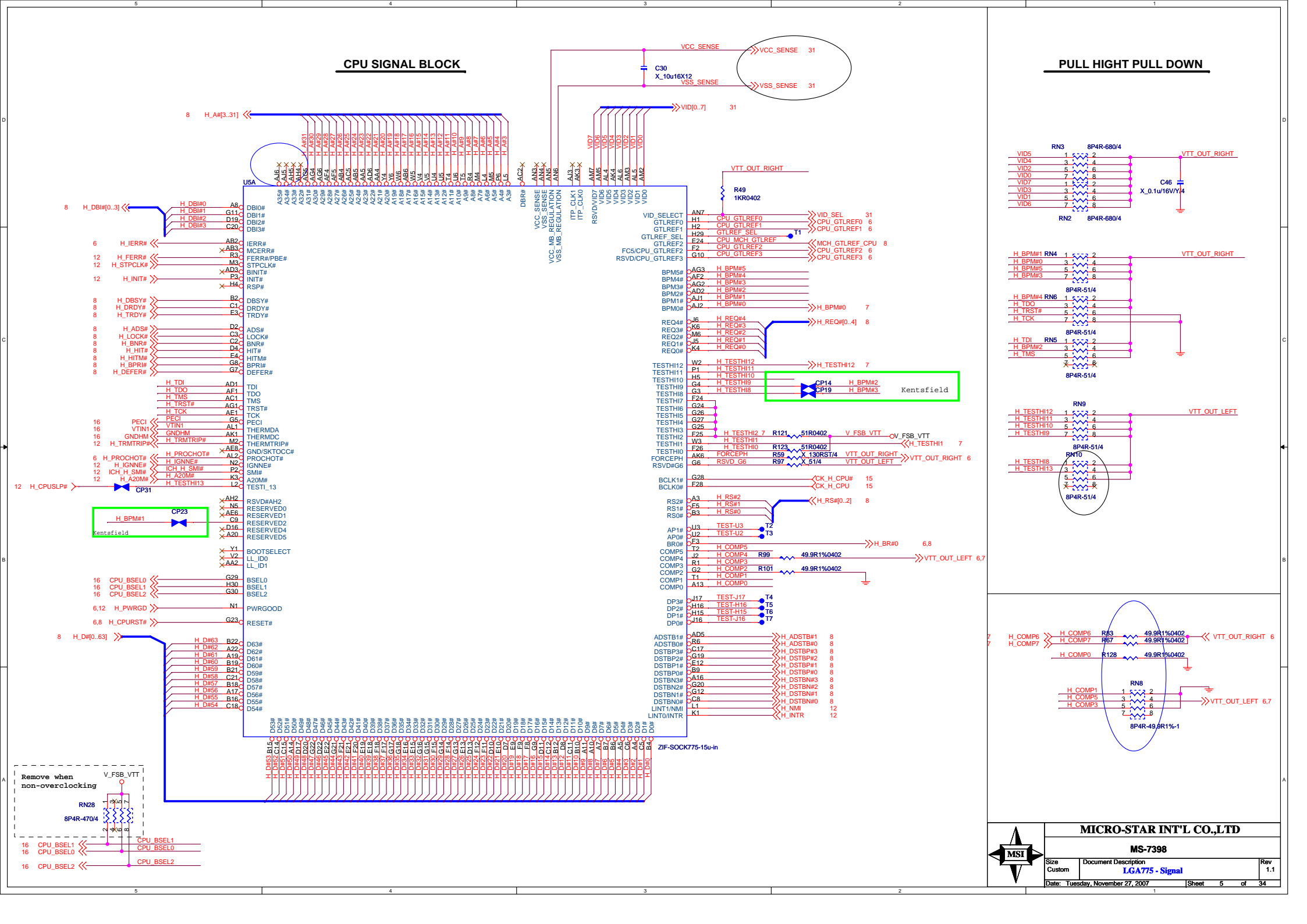
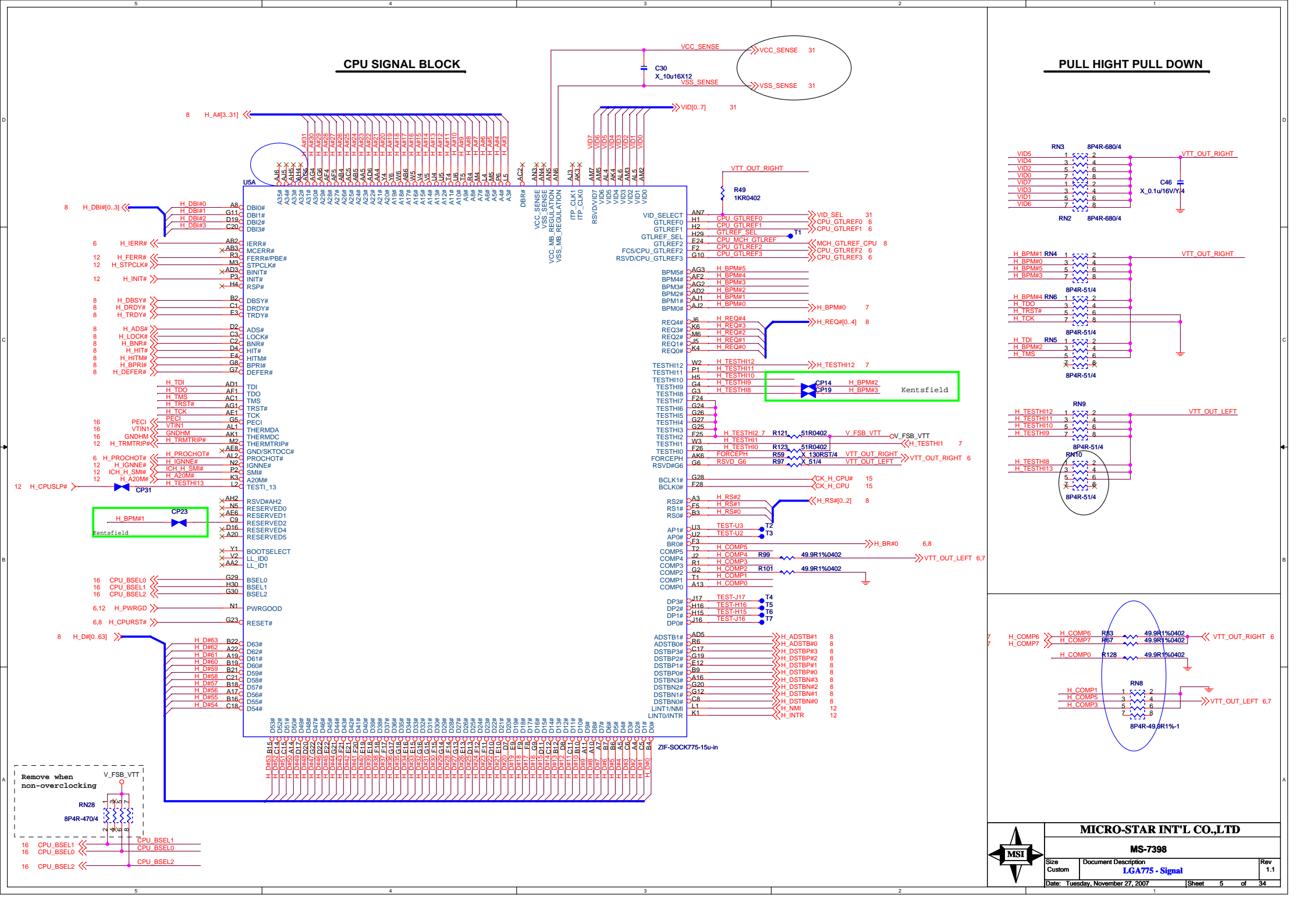
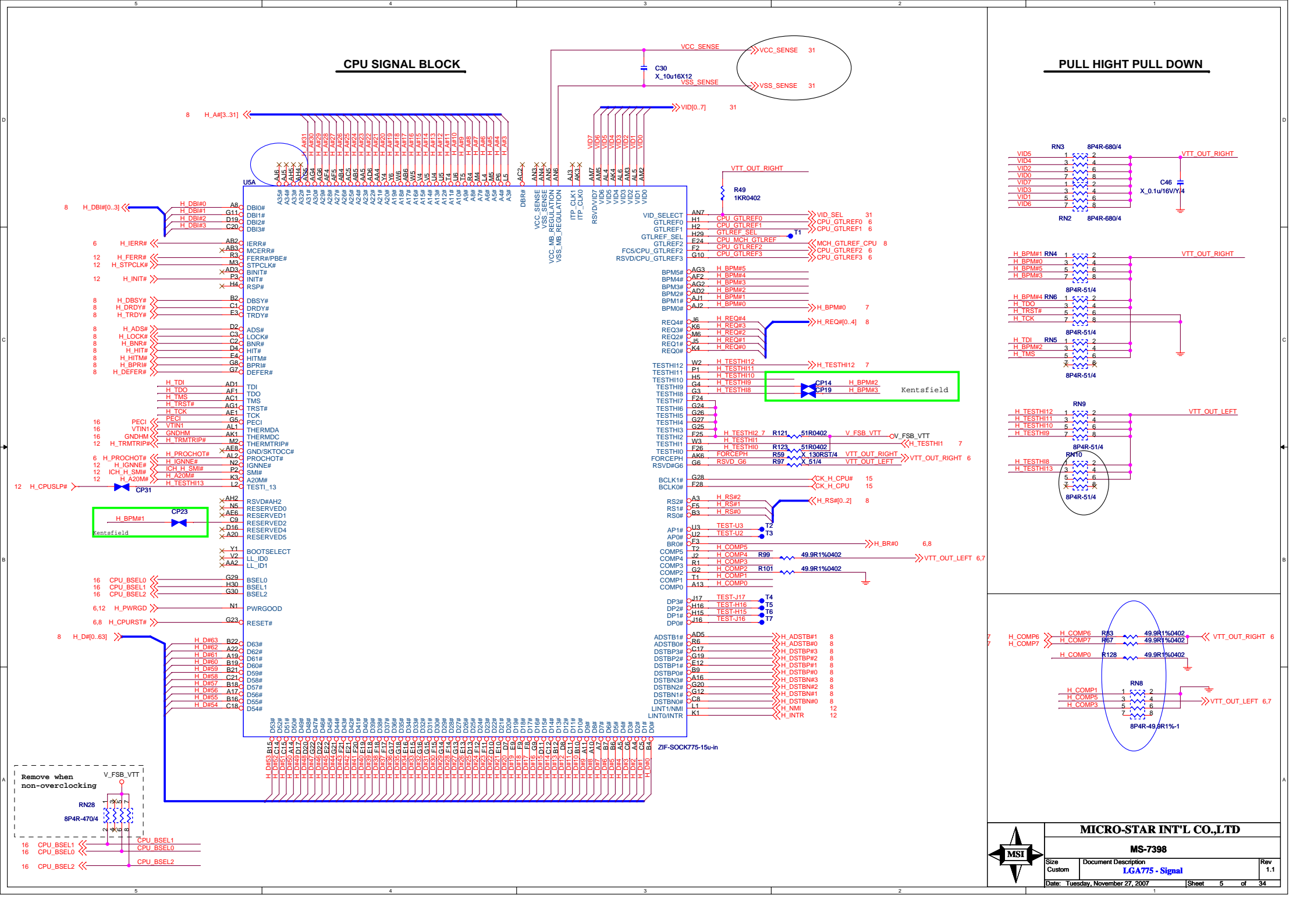
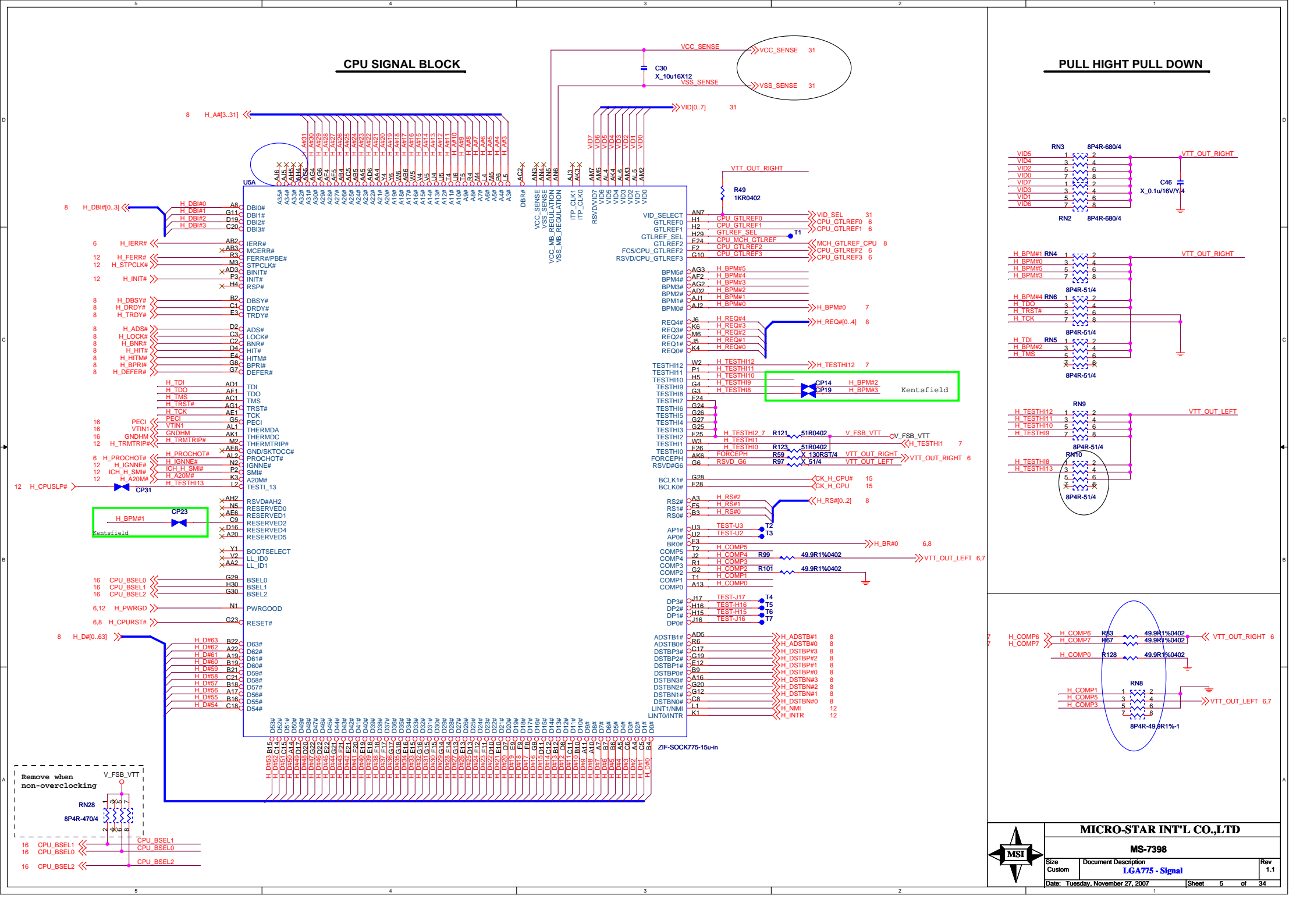
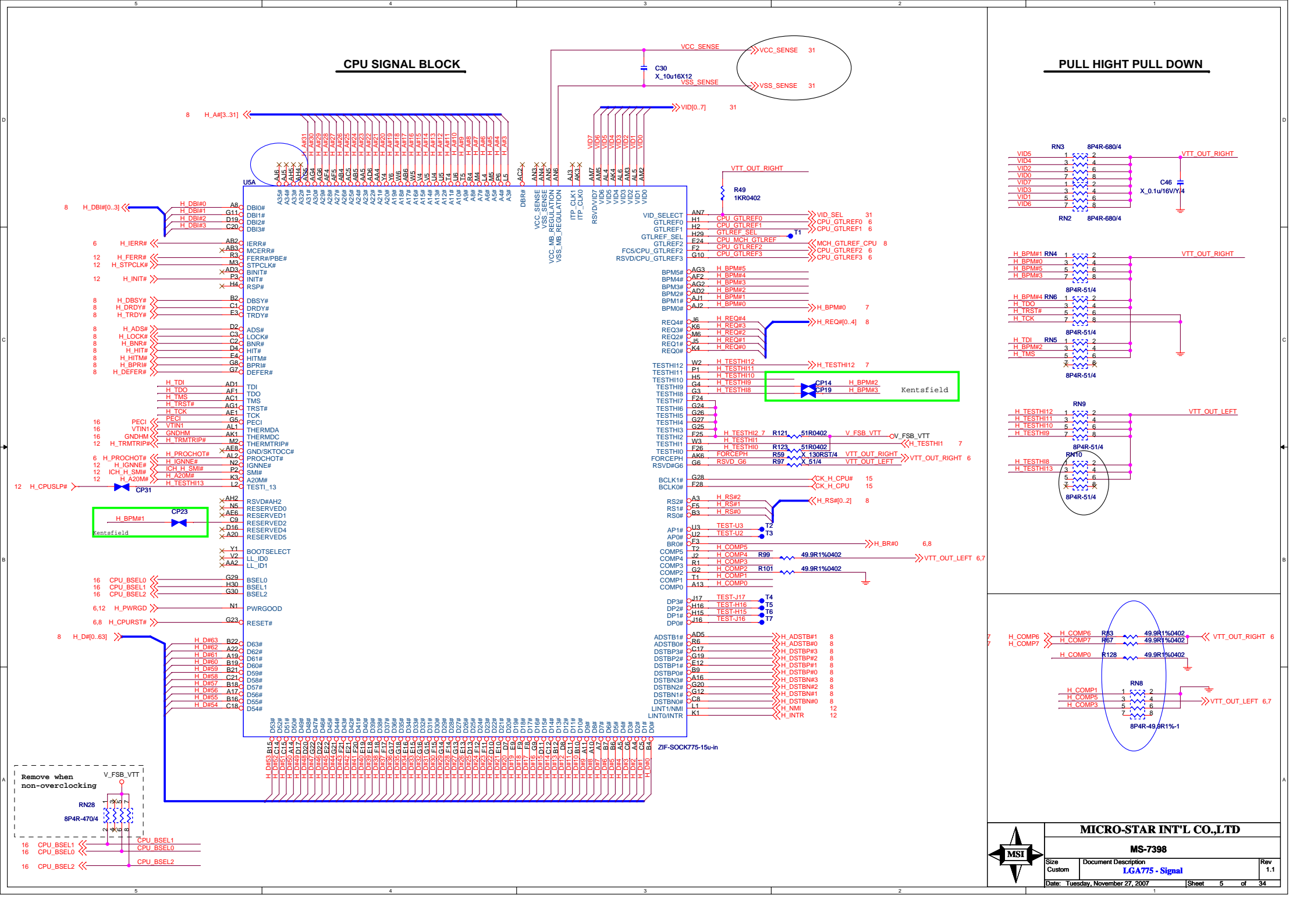
| | | |
|--------------------|---|-------|
| PCI slot x2 | | |
| +3.3Vaux (wake) | - | 750mA |
| +3.3Vaux (no wake) | - | 40mA |
| +3.3V | - | 15.2A |
| +5V | - | 10A |
| +12V | - | 1.0A |

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

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



| | | |
|-----------------------------------|---------------------------------------|---------|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7398 | | |
| Size Custom | Document Description POWER MAP | Rev 1.1 |
| Date: Thursday, November 15, 2007 | Sheet 4 of 34 | |

[illegible][illegible][illegible]

CPU SIGNAL BLOCK

PULL HIGHT PULL DOWN

Remove when non-overclocking

V_FSB_VTT

VTT_OUT_RIGHT

VTT_OUT_LEFT

MSI

MICRO-STAR INT'L CO.,LTD

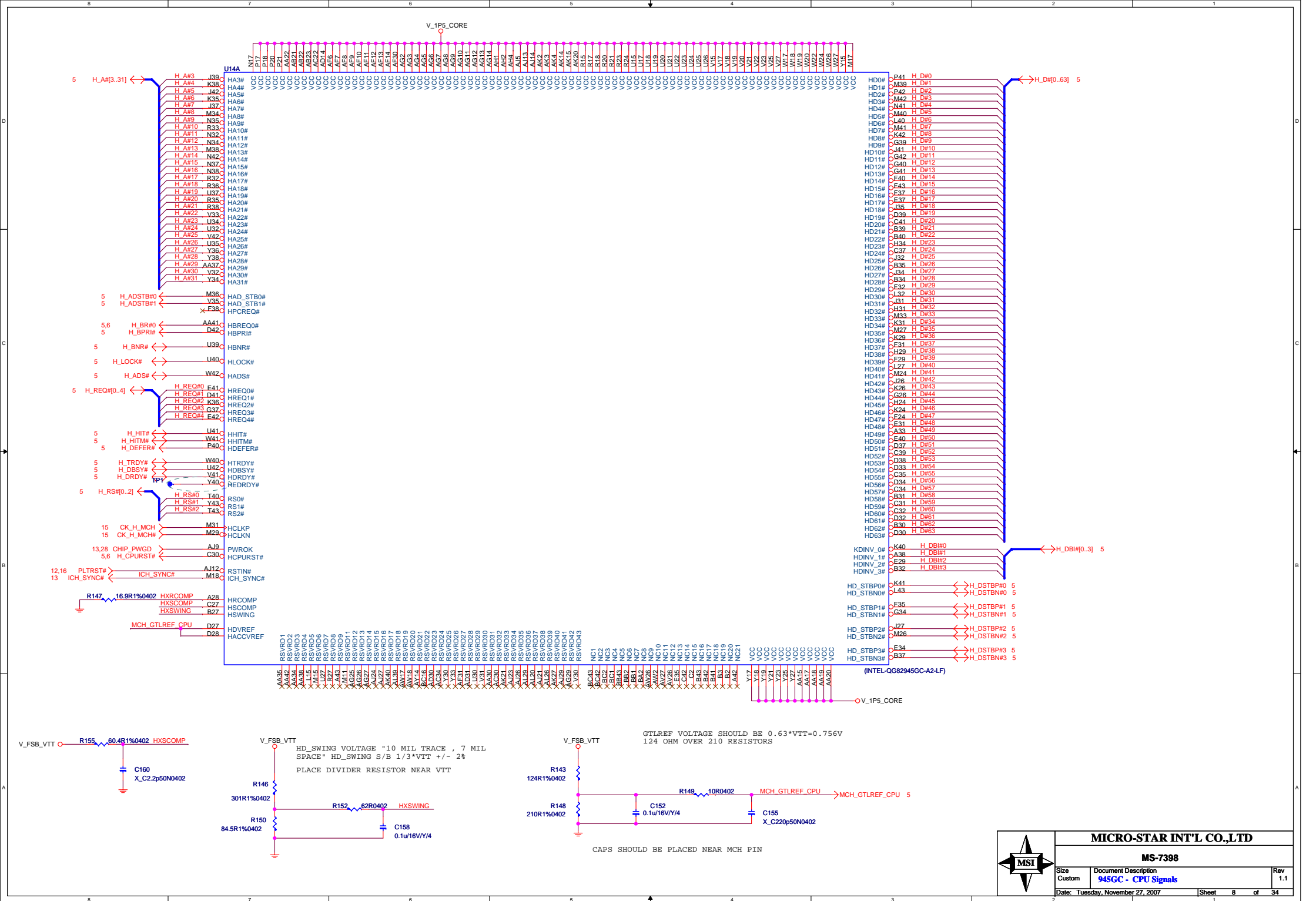
MS-7398

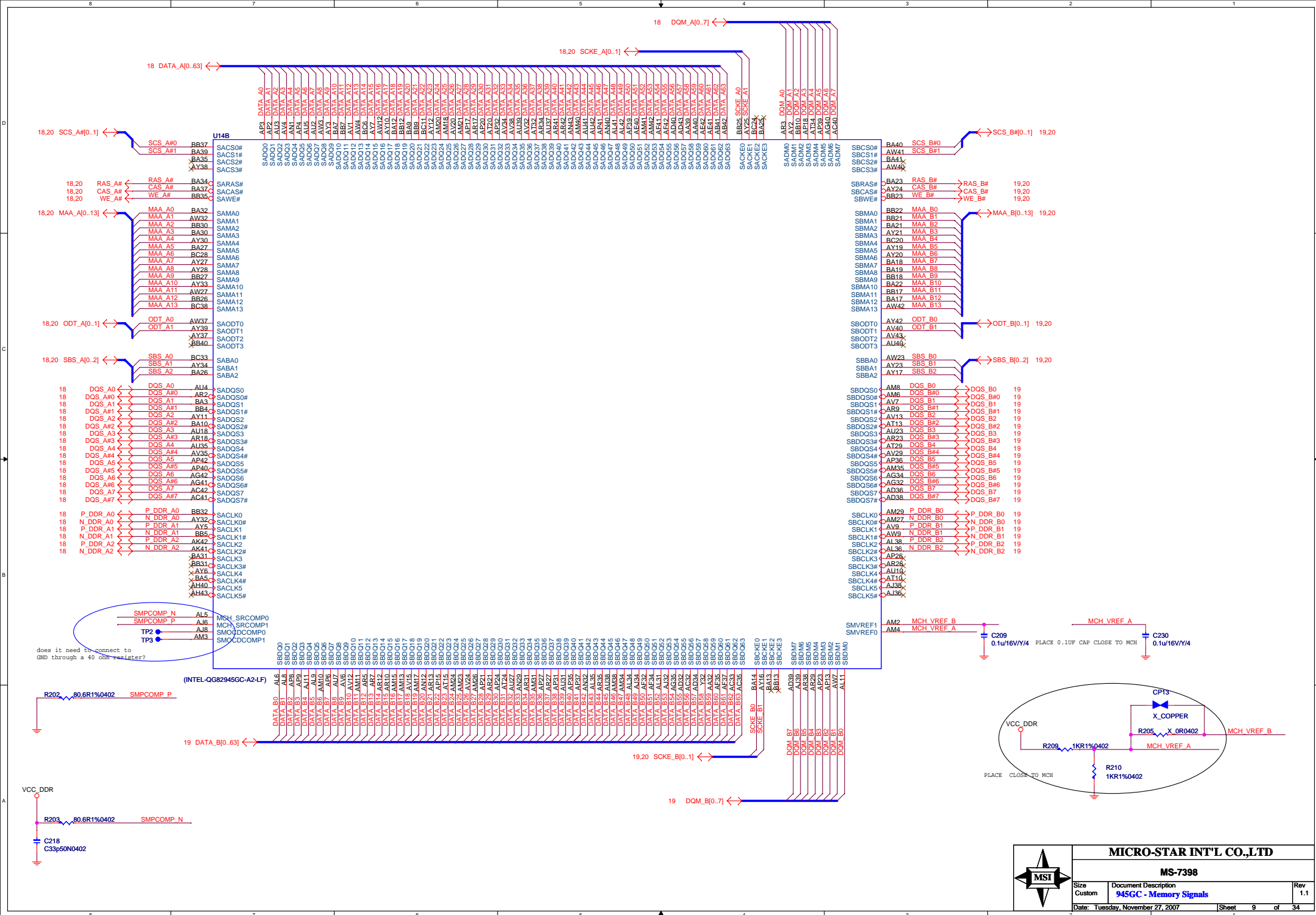
LGA775 - Signal

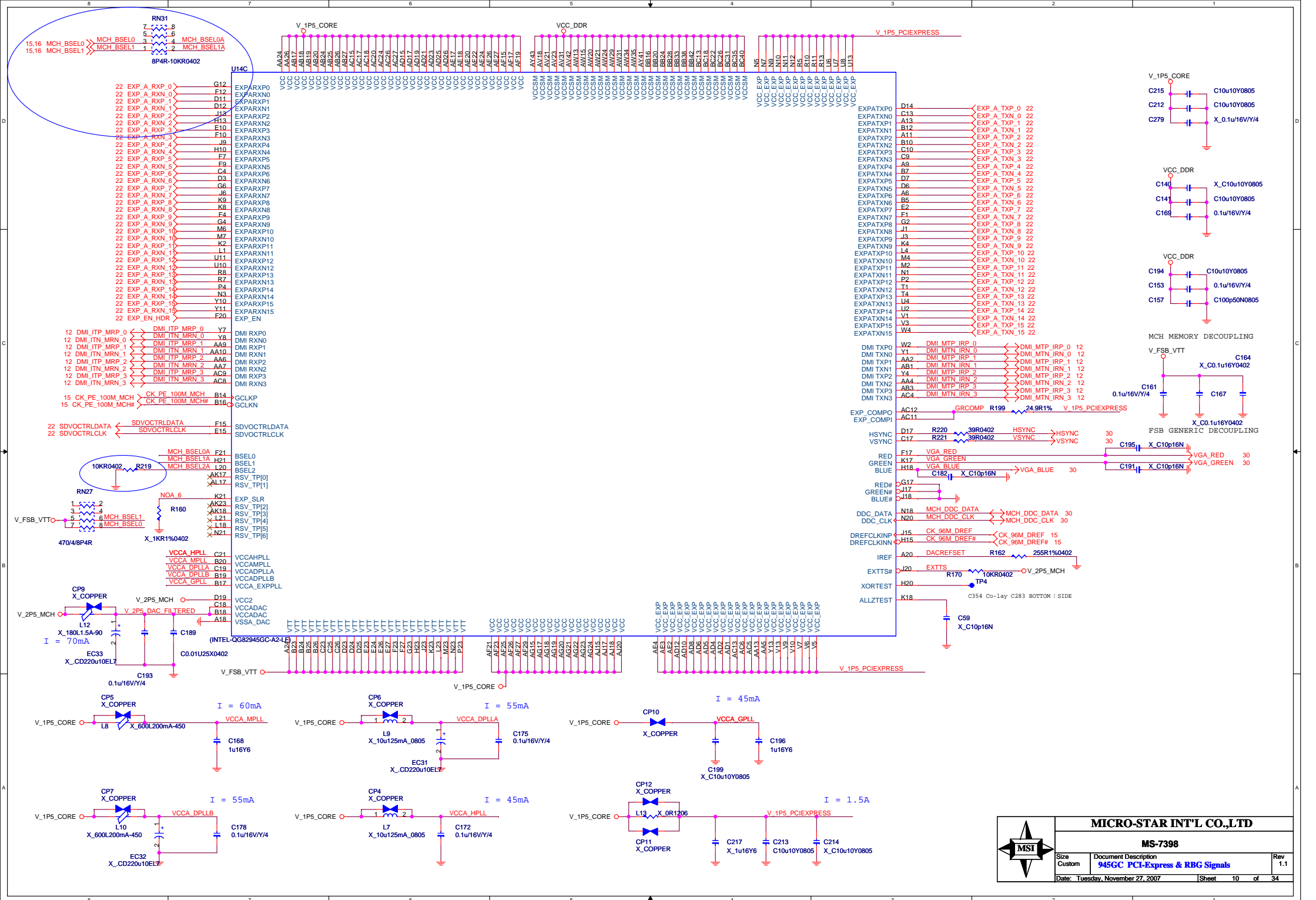
Rev 1.1

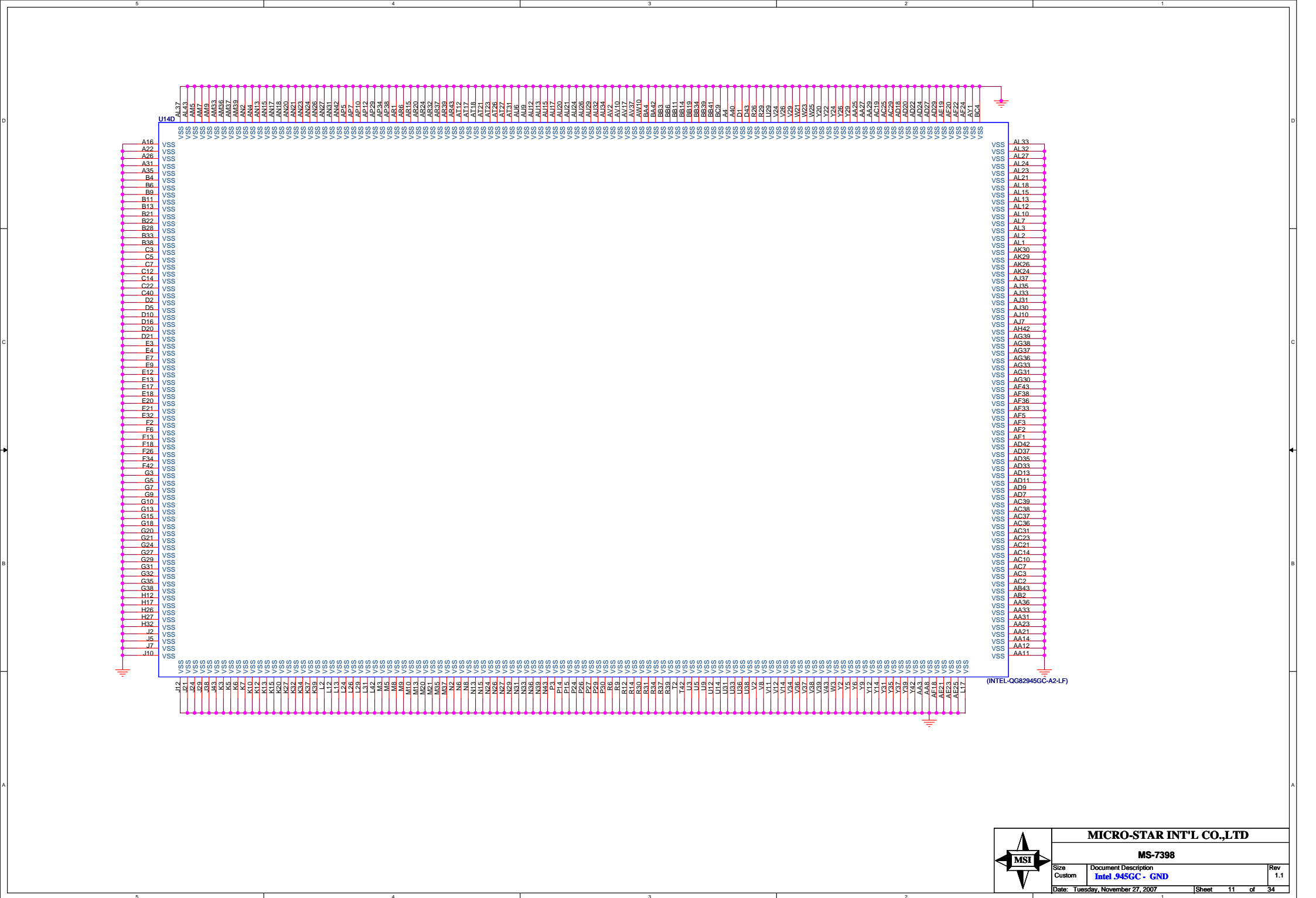
Date: Tuesday, November 27, 2007

Sheet 5 of 34









ICH 7
PART 1/3

PCI INTERFACE

CPU

PCI EXPRESS

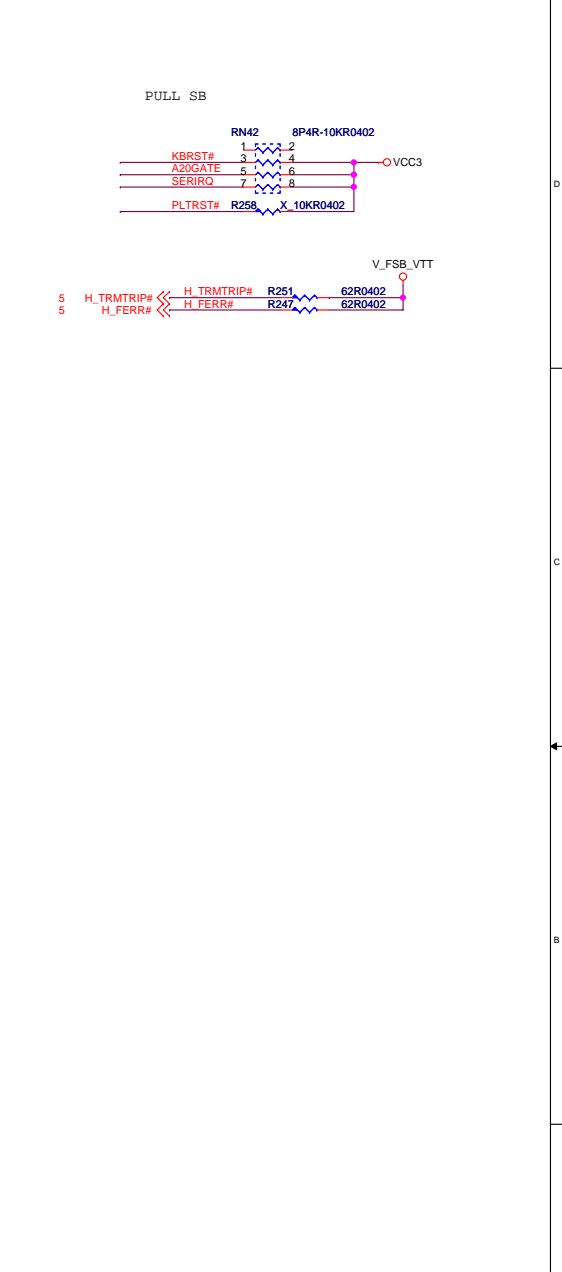
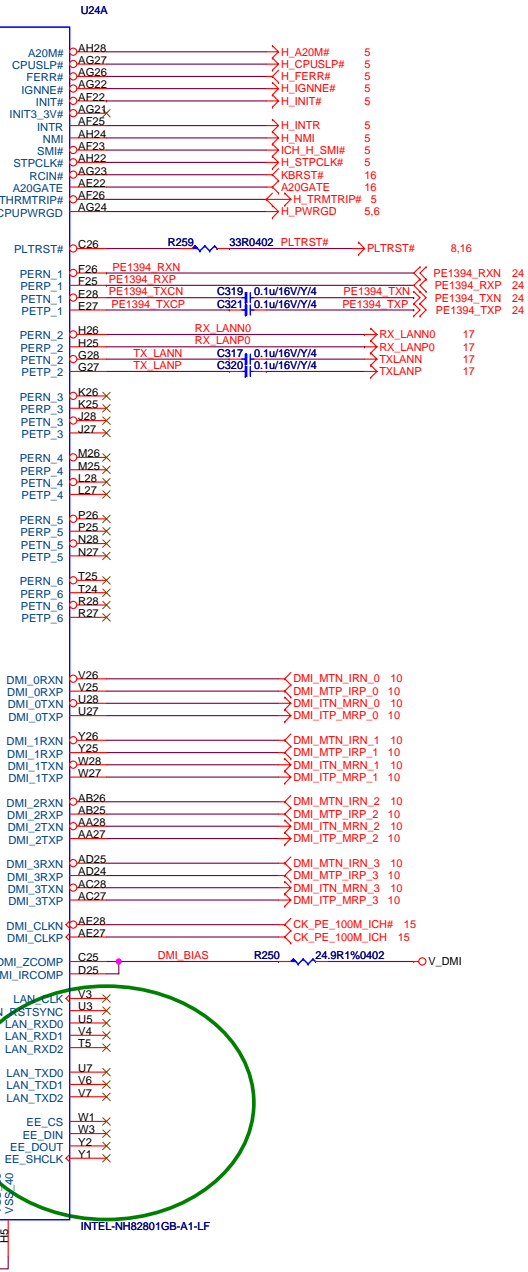
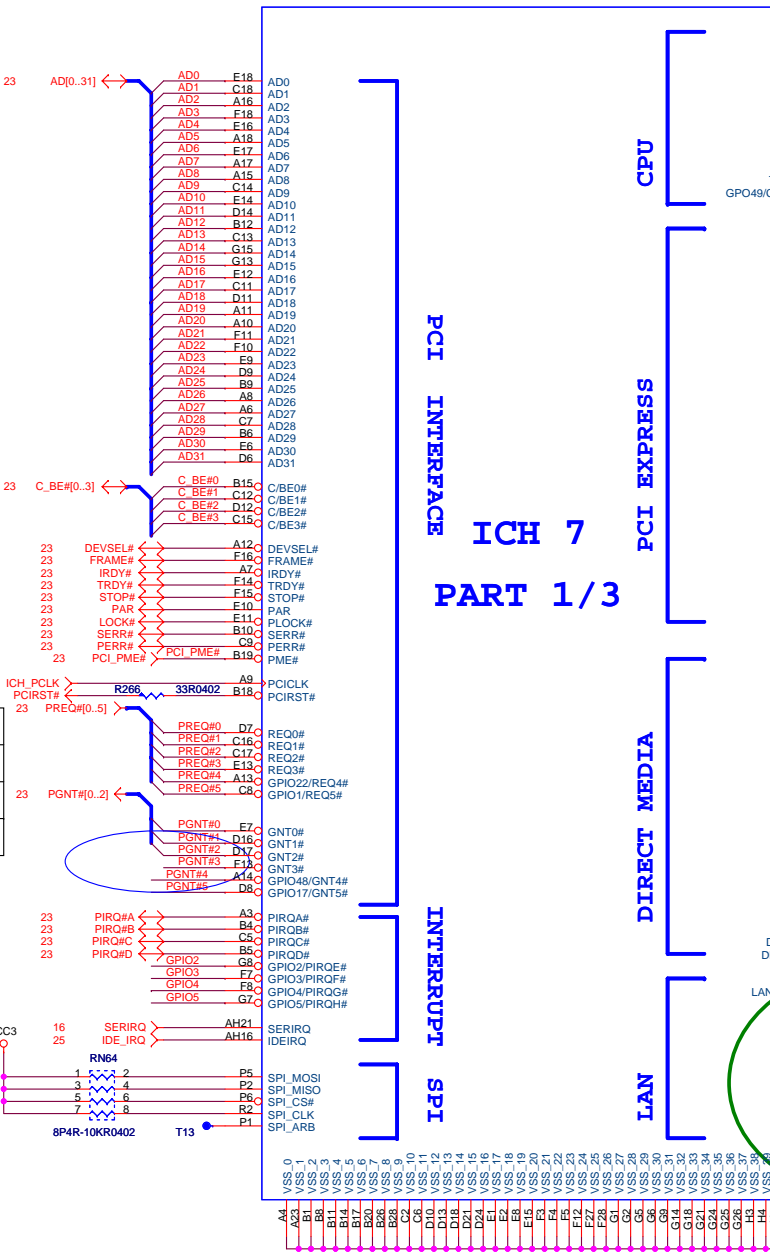
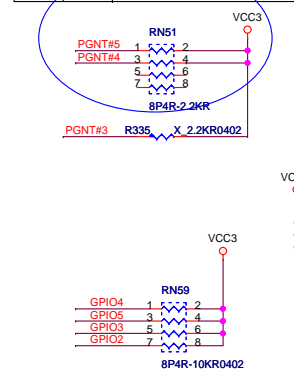
DIRECT MEDIA

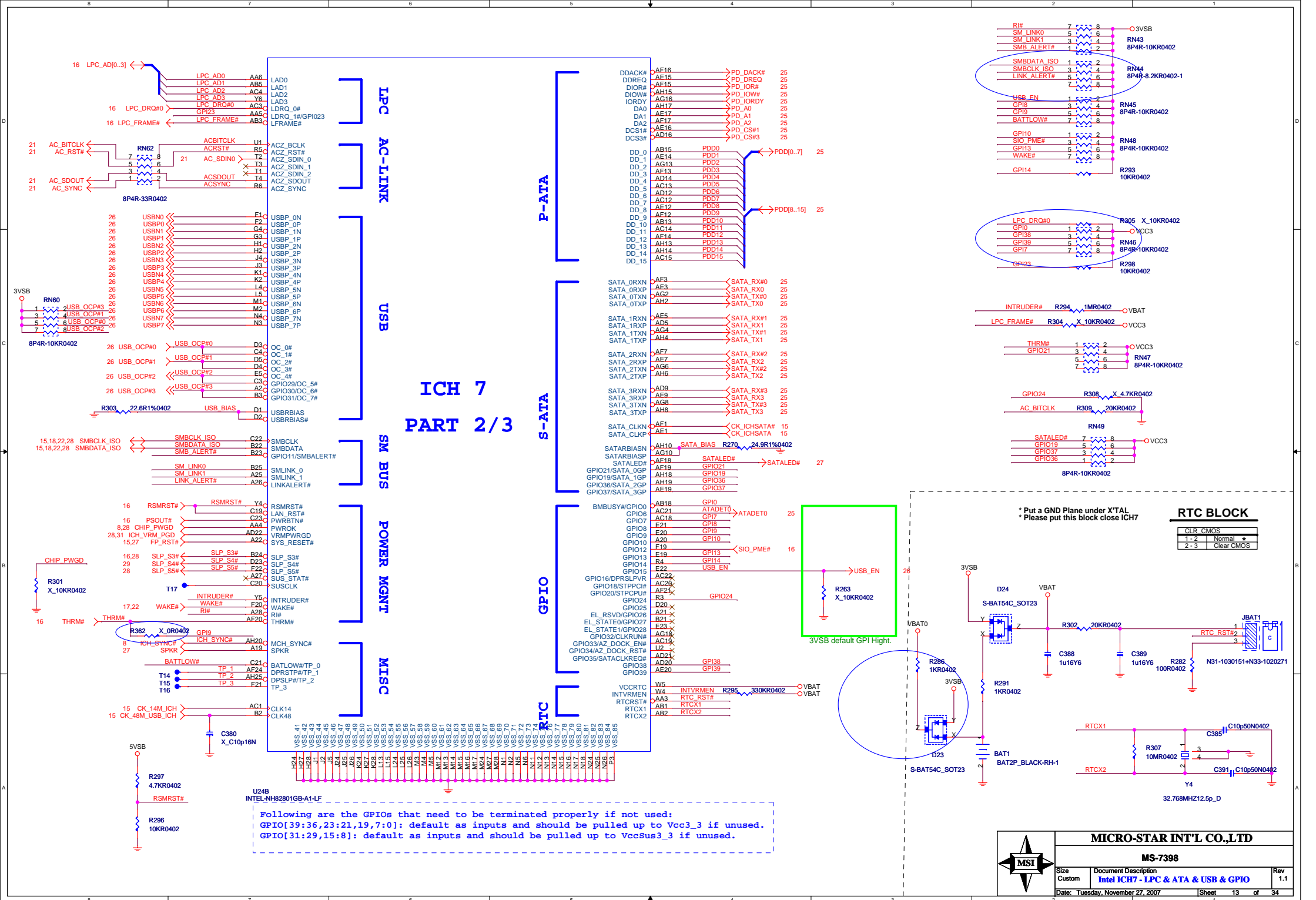
LAN

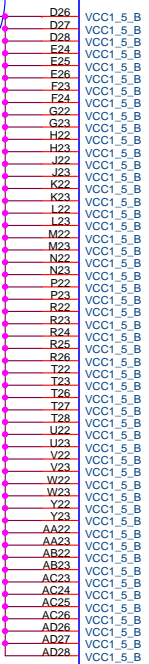
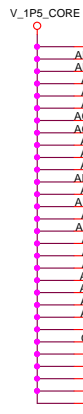
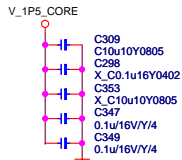
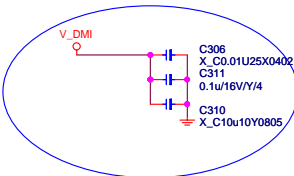
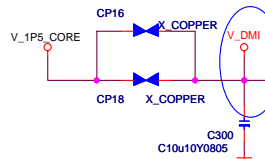
INTERRUPT

SPI

| GNT5# | GNT4# | ROUTING |
|-------|-------|----------------------------|
| 0 | 1 | Flash Cycles Routed to SPI |
| 1 | 0 | Flash Cycles Routed to PCI |
| 1 | 1 | Flash Cycles Routed to LPC |







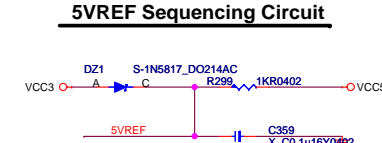
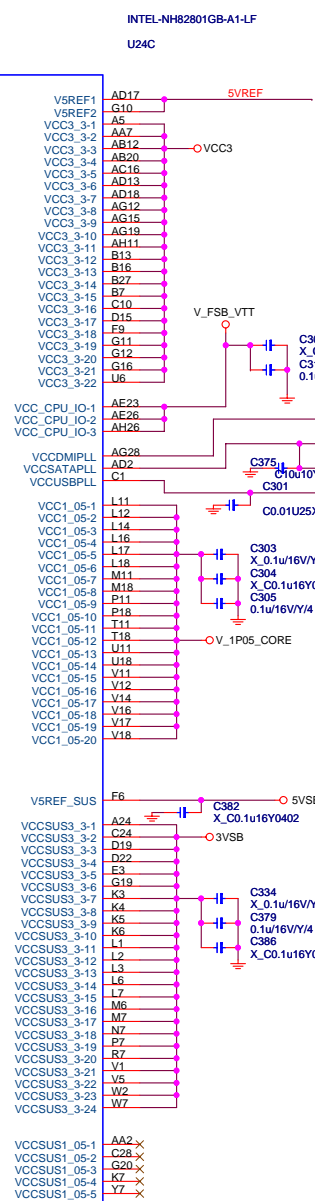
1.5V DMI POWER

1.5V CORE WELL POWER

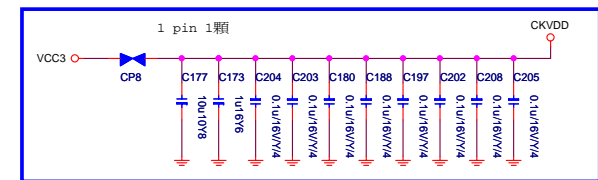
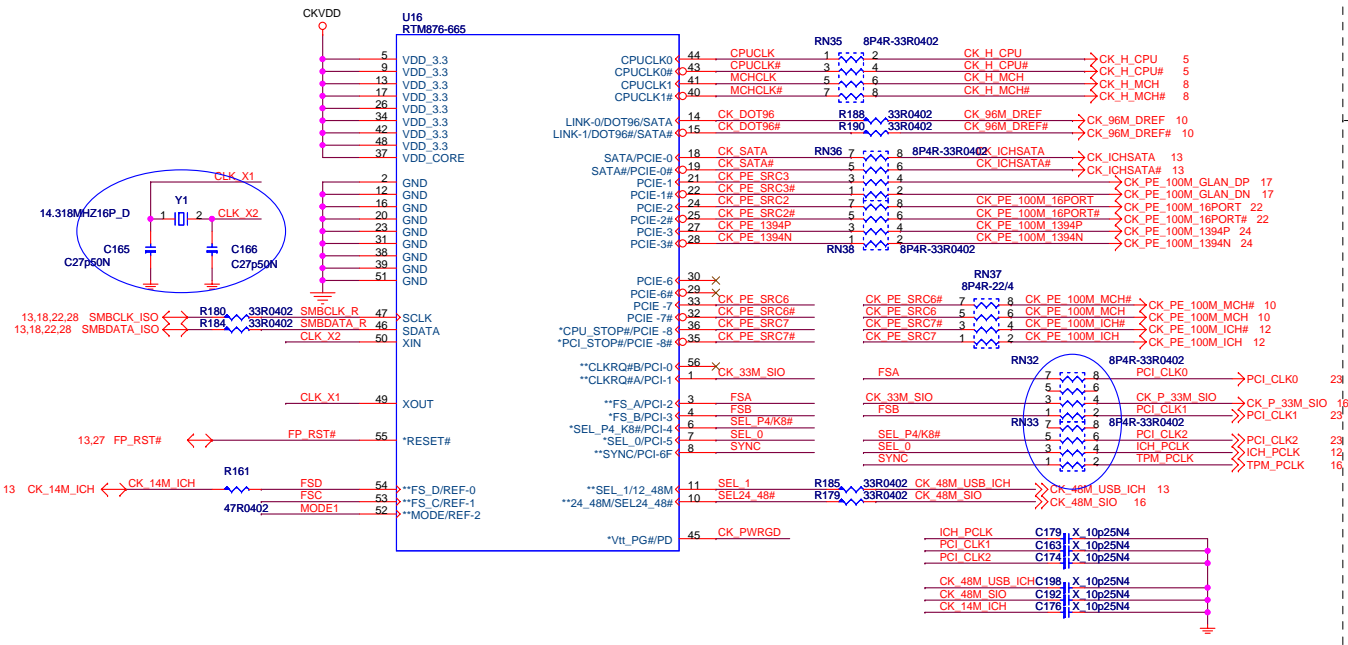
ICH 7
PART 3/3

S0 POWER

S5 POWER



| MICRO-STAR INT'L CO.,LTD | | | |
|----------------------------------|----------------------|-------|----------|
| MS-7398 | | | |
| Size | Document Description | | Rev |
| Custom | Intel ICH7 - POWER | | 1.1 |
| Date: Tuesday, November 27, 2007 | | Sheet | 14 of 34 |



SEL_0 R158 10KR0402 CKVDD

SEL_1 R186 10KR0402

SEL_P4/K8# R159 X 10K/4 CKVDD

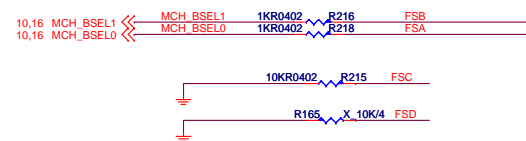
Internal pull high,
no need to stuff

| | | |
|-----------|---------------------|-----------------------|
| SEL_1 | SEL_0 | Chipset Support |
| 0 | 0 | SIS |
| 1 | 0 | VIA |
| 0 | 1 | Intel with graphic |
| 1 | 1 | Intel without graphic |
| SEL_P4/R# | PIN#40,41,43,44 | |
| 0 | K8_3.3V swing | |
| 1 | P4_0.8V swing | |
| MODE | PIN#35/36 | |
| 0 | PCIR-8 T/C | |
| 1 | PCI_STOP#/CPU_STOP# | |
| SEL24_48# | Pin#10 | |
| 0 | 48Mhz | |
| 1 | 24Mhz | |

Clock Generator Power Good Block

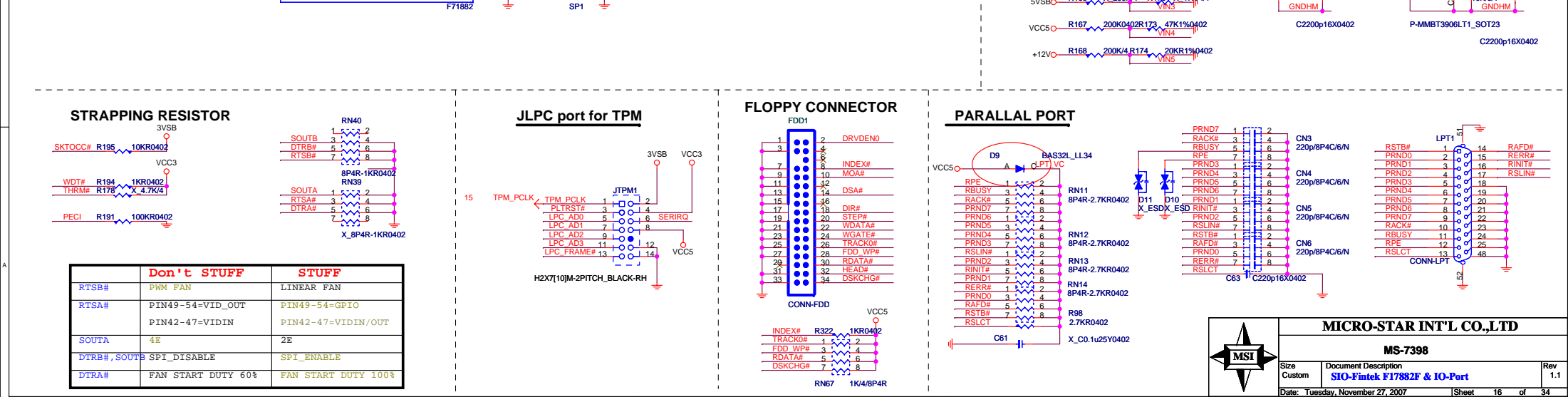
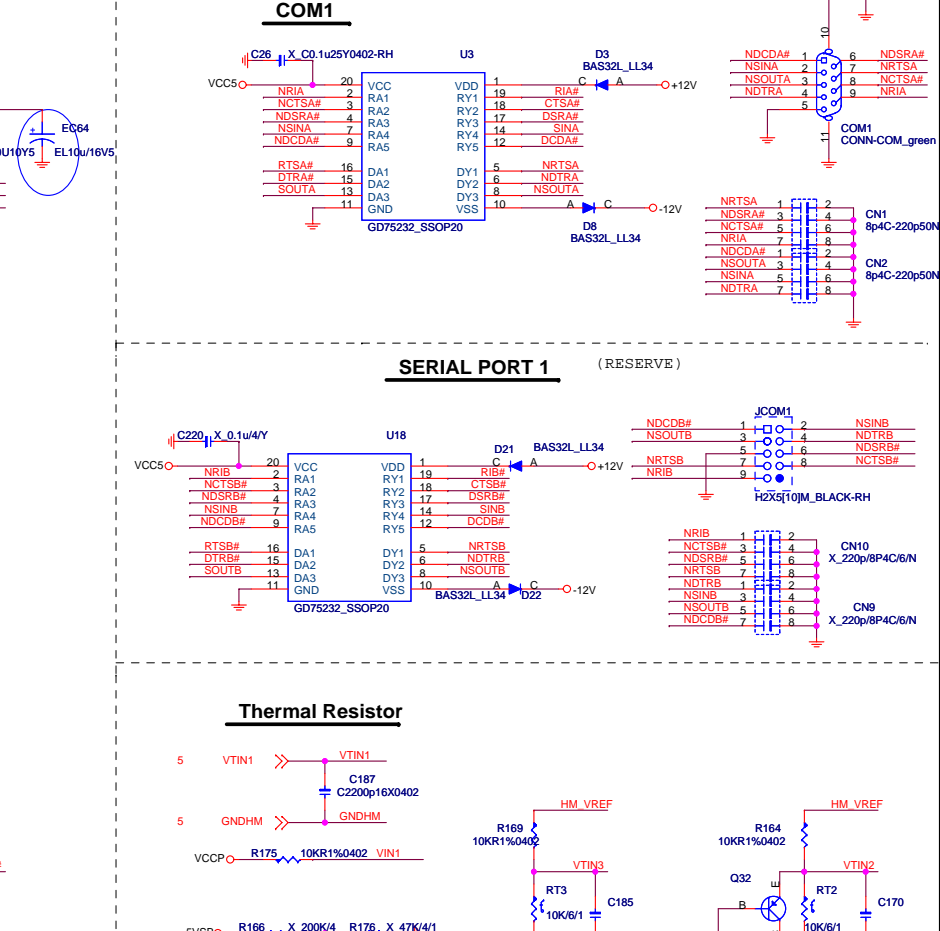
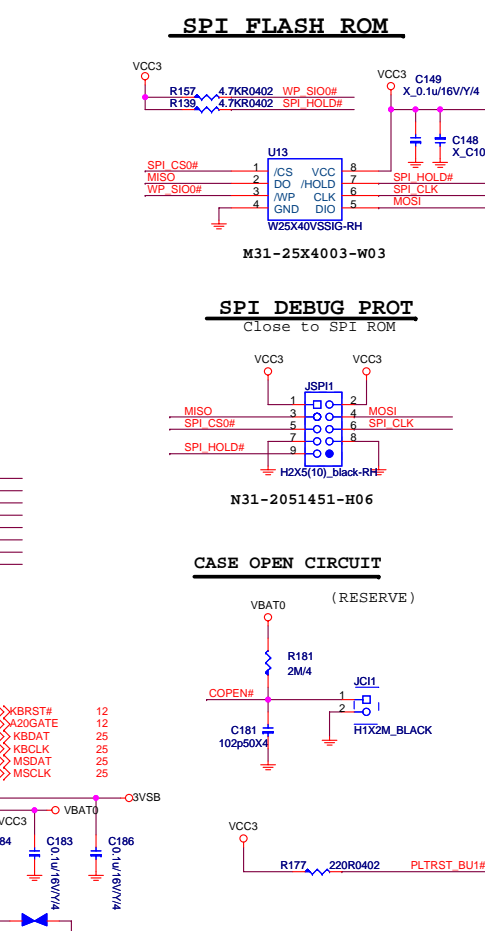
The schematic shows the internal circuitry of the Power Good block. It features an N-MMBT3904 transistor (Q31) configured as an emitter follower. The base of the transistor is connected to the VTT_PG signal through a 1KR0402 resistor (R156). A 10KR0402 resistor (R154) is connected between VTT_PG and ground. The collector of the transistor is connected to the CK PWRGD signal. The emitter of the transistor is connected to ground. A 0.1uF16V4 capacitor (C171) is connected between the CK pin of the transistor and ground. The CK pin is also connected to a 1KR0402 resistor (R163) and the VCC3 supply.

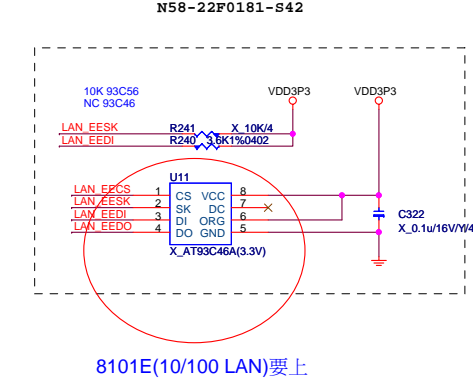
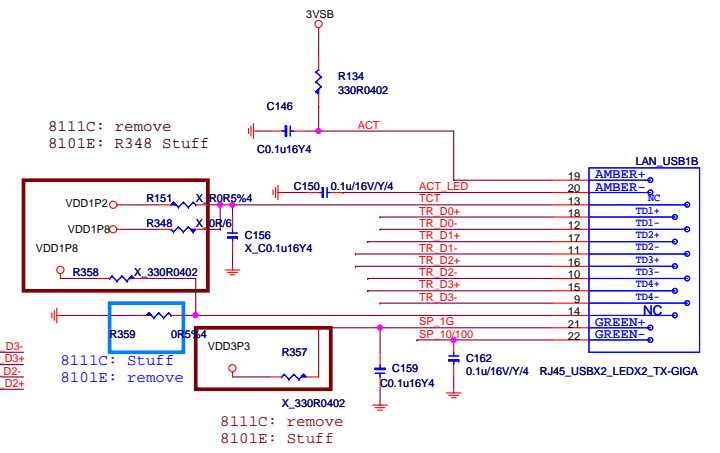
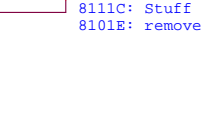
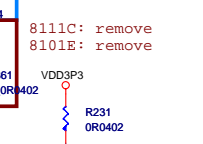
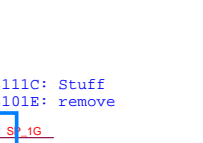
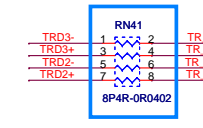
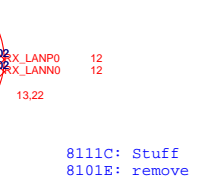
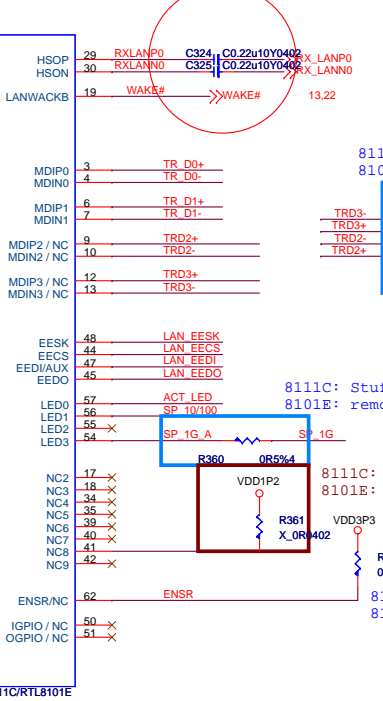
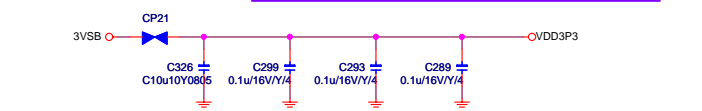
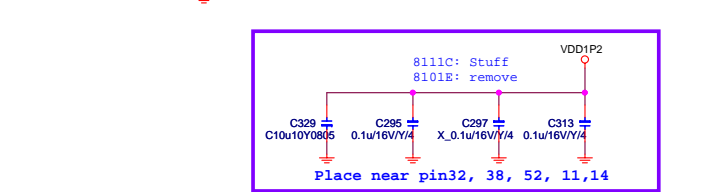
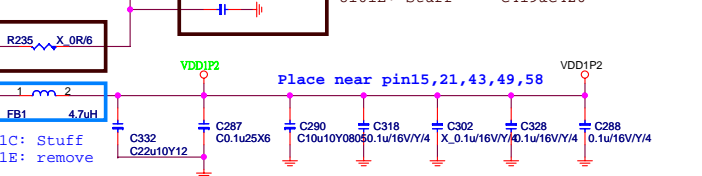
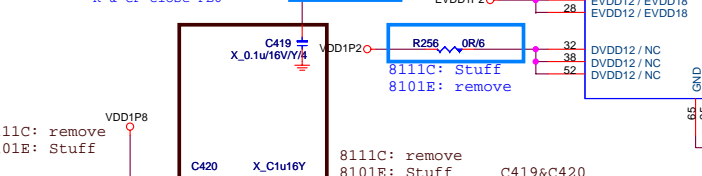
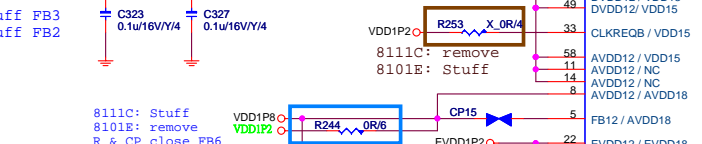
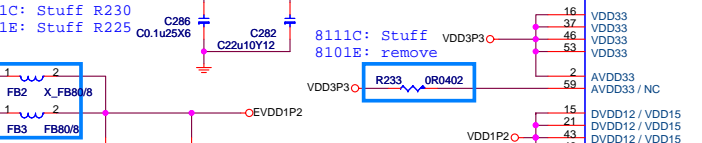
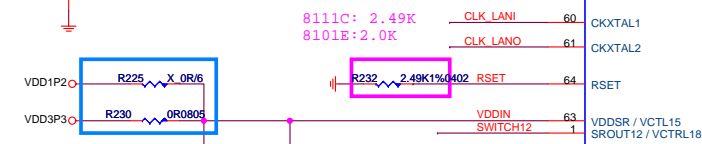
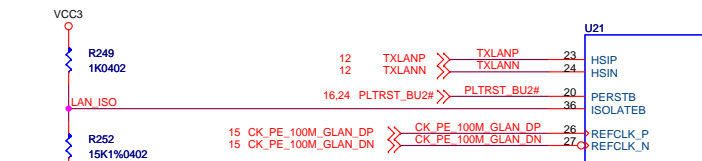
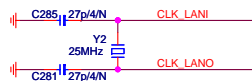
| BSEL | | | TABLE |
|------|---|---|----------------|
| 2 | 1 | 0 | FSB FREQUENCY |
| 0 | 0 | 0 | 266 MHz (1066) |
| 1 | 0 | 0 | 333 MHz (1333) |
| 0 | 1 | 0 | 200 MHz (800) |
| 1 | 1 | 0 | 400 MHz (1600) |



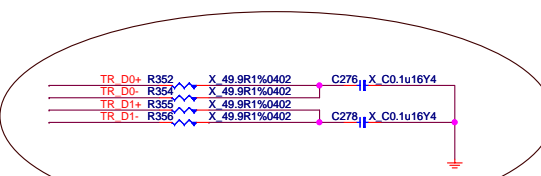
MS-7398

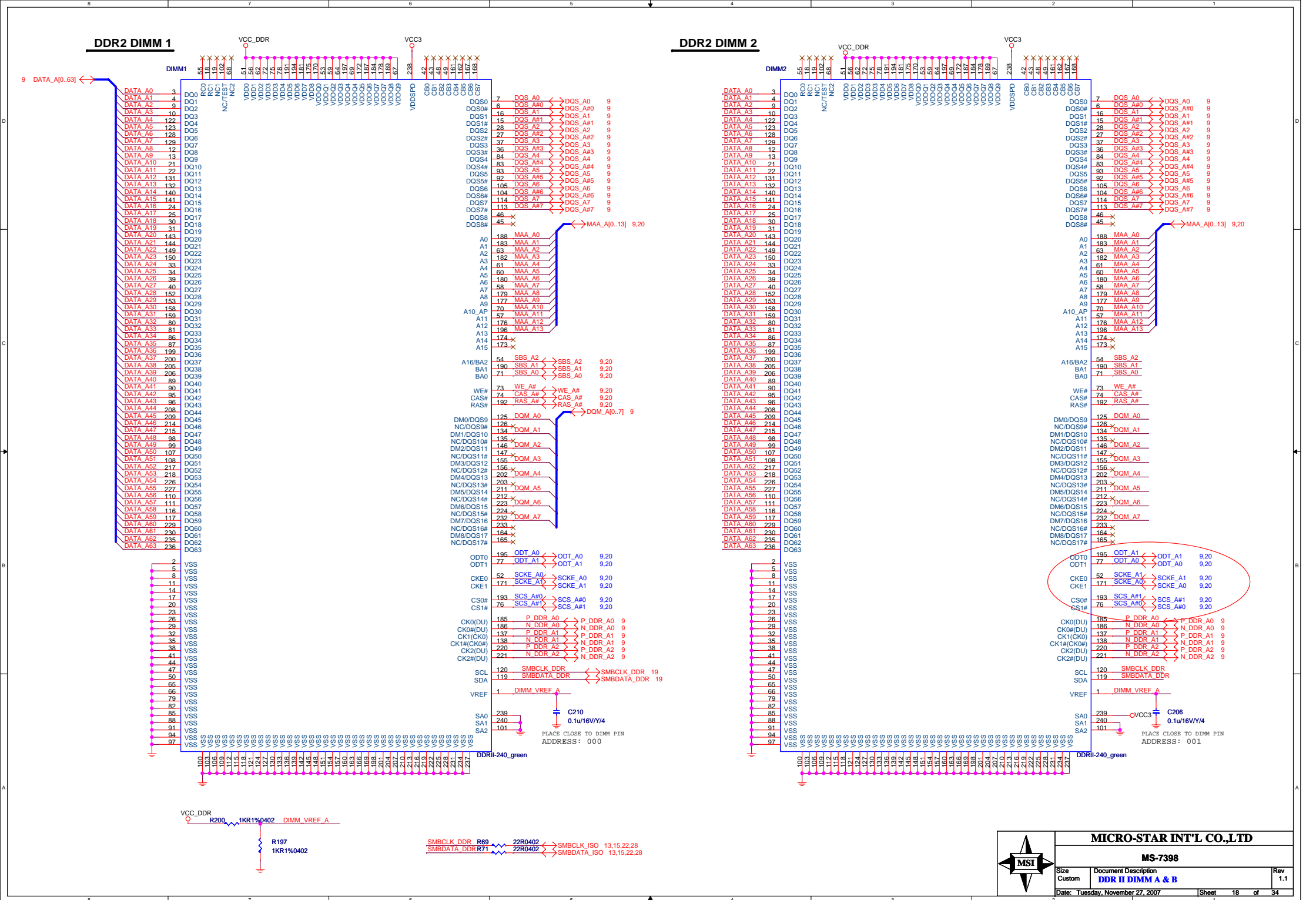
| | | |
|---------------------------------|--|----------------|
| Size Custom | Document Description CLK-RTM 876-665 | Rev 1.1 |
| Date: Monday, December 03, 2007 | | Sheet 15 of 34 |



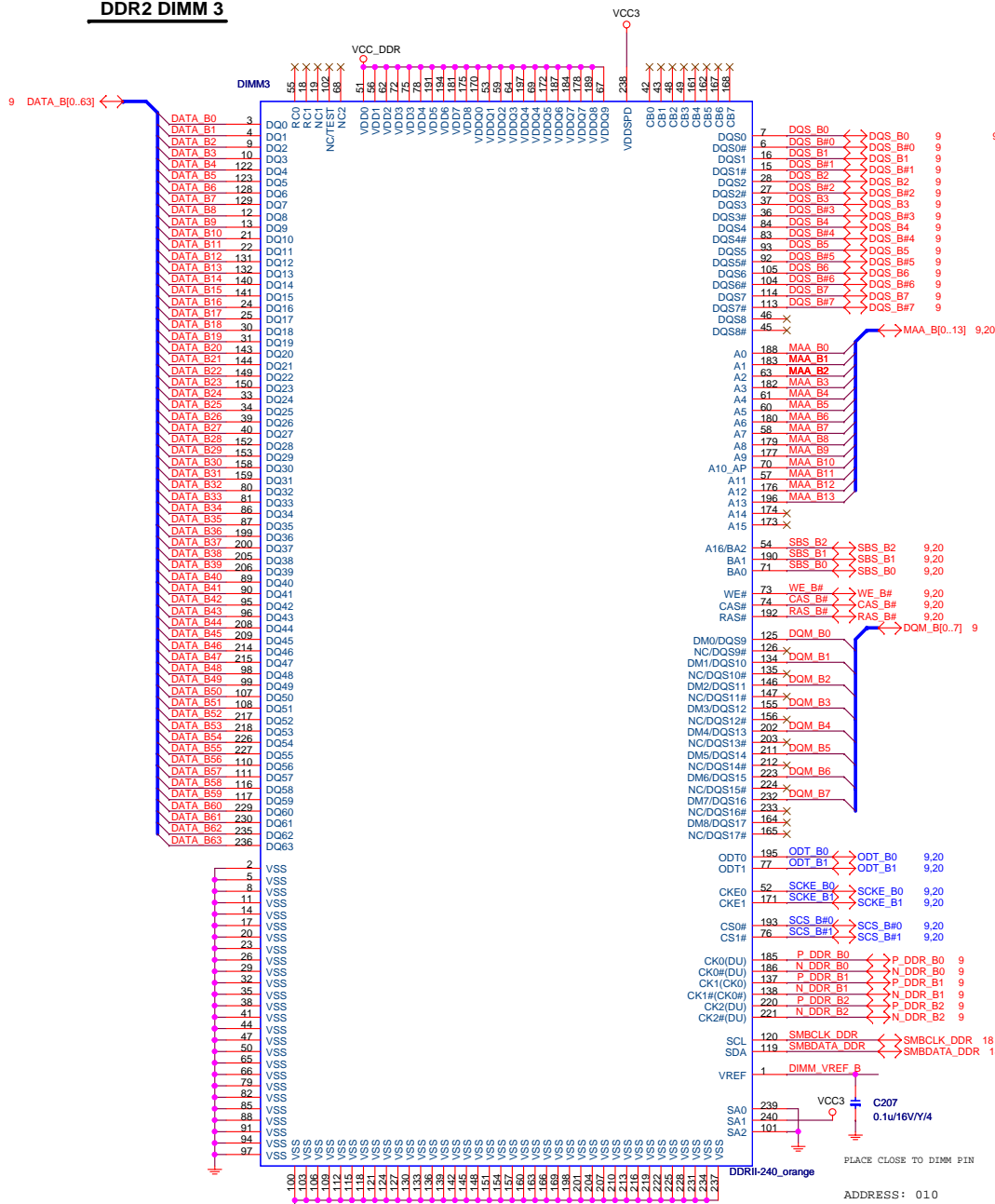


FOR 8101E





DDR2 DIMM 3



DDR2 DIMM 4

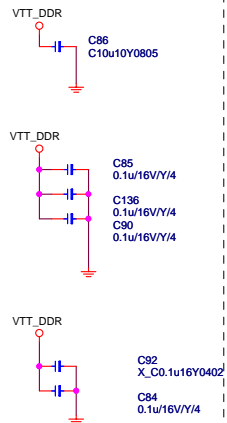


MICRO-STAR INT'L CO.,LTD

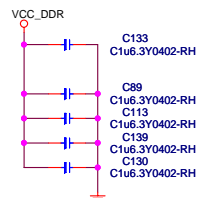
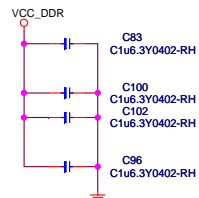
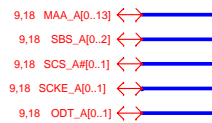
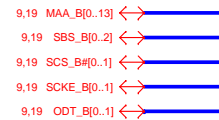
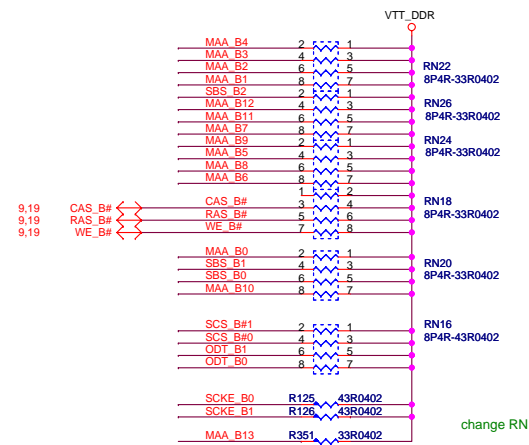
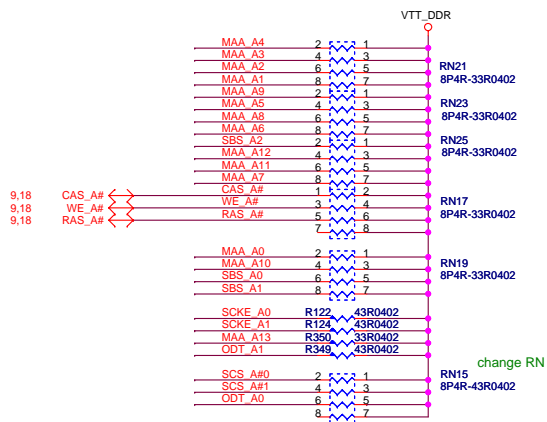
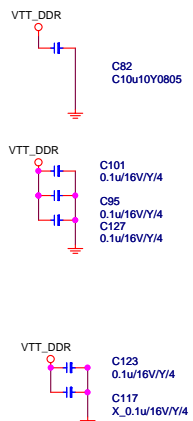
MS-7398

| Size | Document Description | Rev |
|--------|----------------------------|----------------|
| Custom | DDR II DIMM A & B | 1.1 |
| Date: | Tuesday, November 27, 2007 | Sheet 19 of 34 |

CHANNEL A V_SM_VTT DECOUPLING CAPS



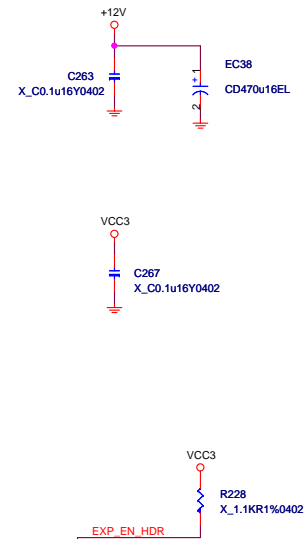
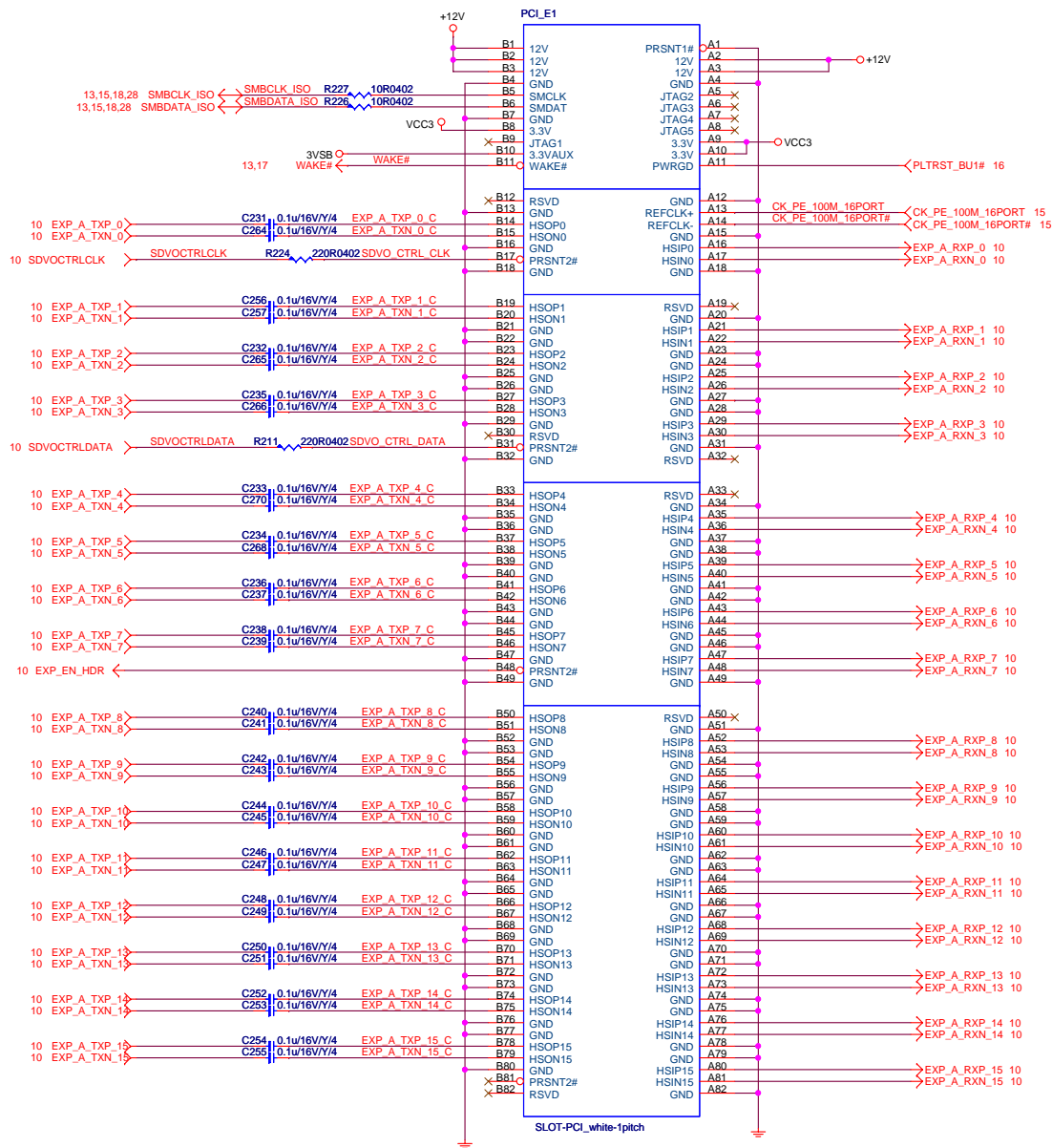
CHANNEL B V_SM_VTT DECOUPLING CAPS



MICRO-STAR INT'L CO.,LTD

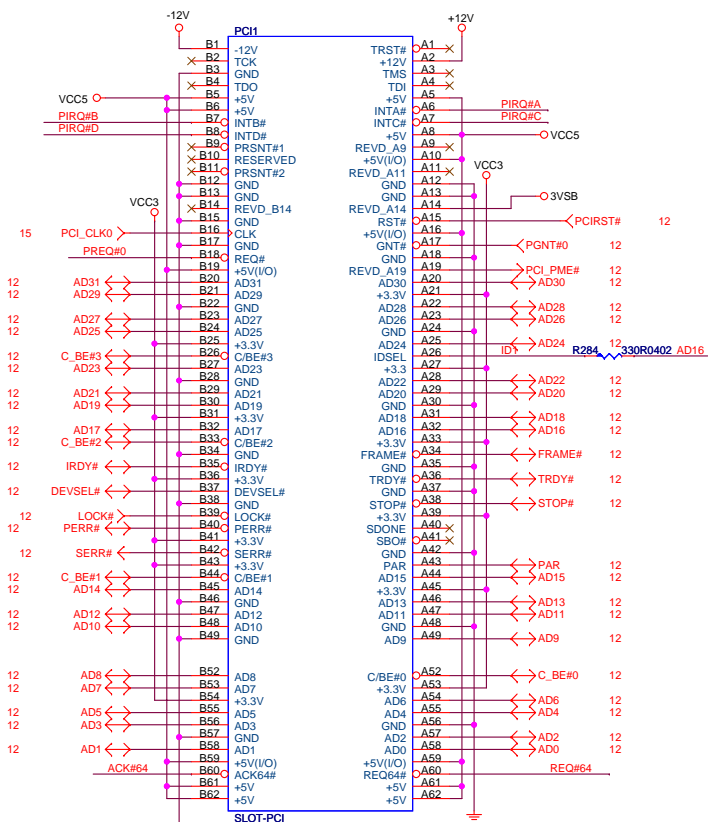
MS-7398

| Size | Document Description | Rev |
|----------------------------------|-----------------------|-----|
| Custom | DDR II VTT DECOUPLING | 1.1 |
| Date: Tuesday, November 27, 2007 | | |
| Sheet 20 of 34 | | |



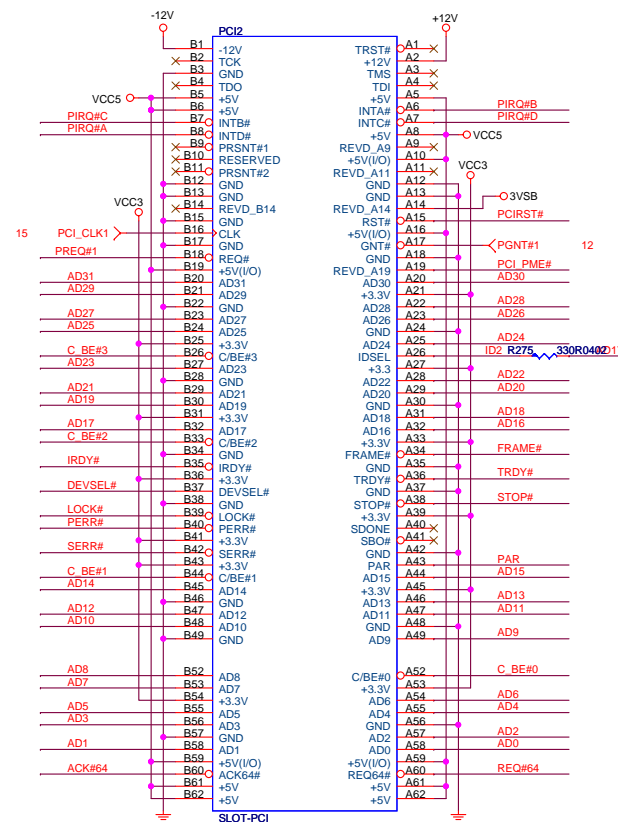
| MICRO-STAR INT'L CO.,LTD | | | |
|----------------------------------|----------------------|-------|----------|
| MS-7398 | | | |
| Size | Document Description | | Rev |
| Custom | PCI EXPRESSX16 | | 1.1 |
| Date: Tuesday, November 27, 2007 | | Sheet | 22 of 34 |

PCI SLOT 1 (PCI VER: 2.2 COMPLY)



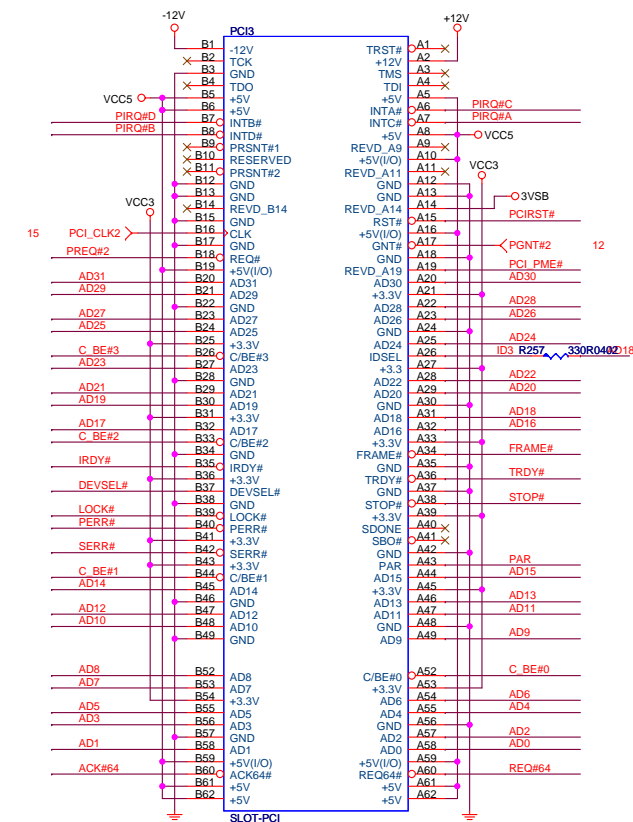
IDSEL = AD16
MASTER = PREQ#0
PIRQ#A

PCI SLOT 2 (PCI VER: 2.2 COMPLY)



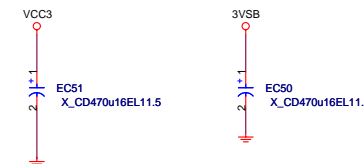
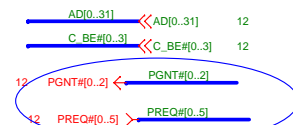
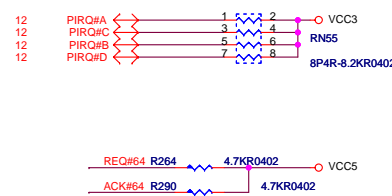
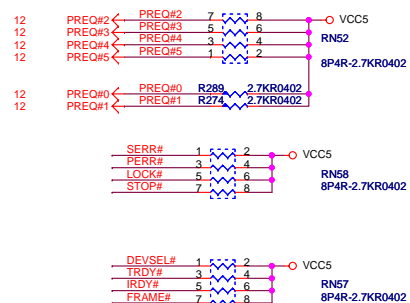
IDSEL = AD17
MASTER = PREQ#1
PIRQ#B

PCI SLOT 2 (PCI VER: 2.2 COMPLY)



IDSEL = AD18
MASTER = PREQ#2
PIRQ#C

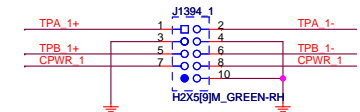
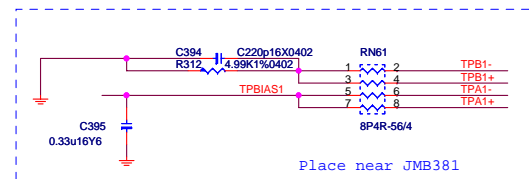
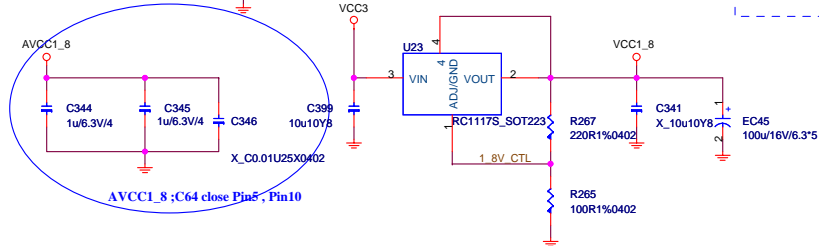
PCI PULL-UP / DOWN RESISTORS



MICRO-STAR INT'L CO.,LTD

MS-7398

| Size | Document Description | Rev |
|----------------------------------|----------------------|-----|
| Custom | PCI Slot 1 & 2&3 | 1.1 |
| Date: Tuesday, November 27, 2007 | Sheet 23 of 34 | |

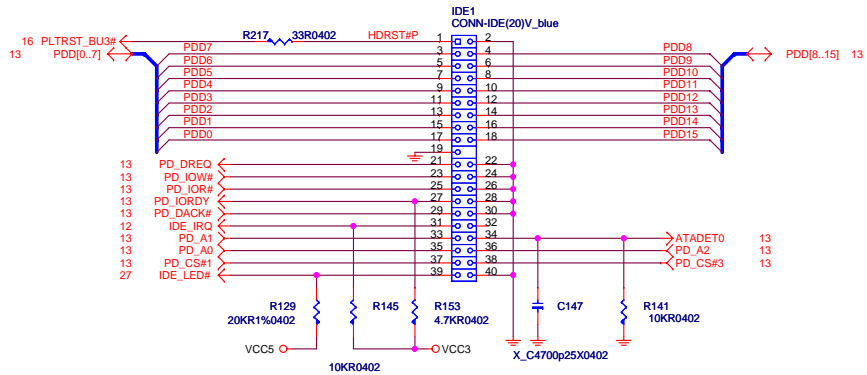


For Intel 1394 pinheader

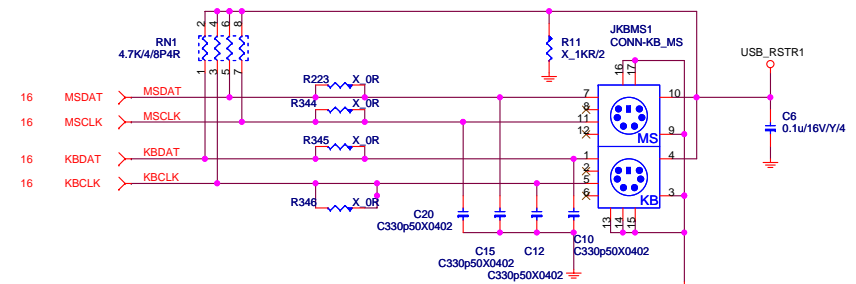


| | | |
|----------------------------------|---|----------------|
| Size Custom | Document Description JMircon 1394 | Rev 1.1 |
| Date: Tuesday, November 27, 2007 | | Sheet 24 of 34 |

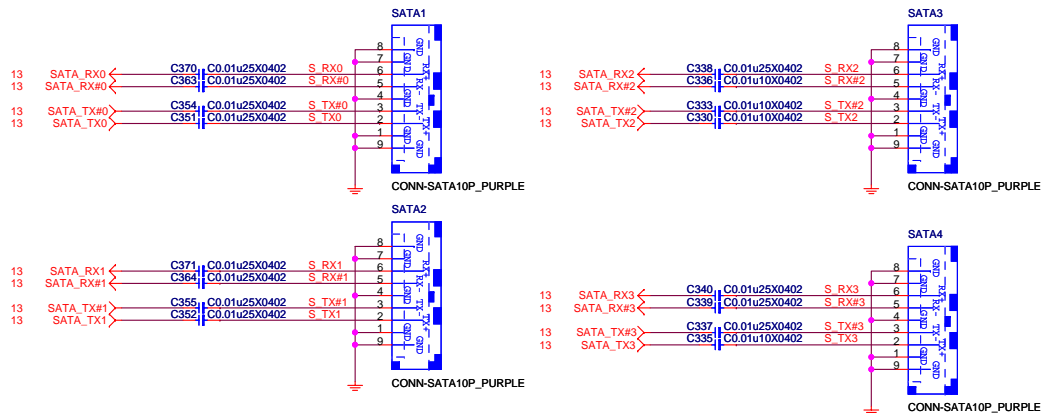
ATA 33/66/100 IDE Connectors



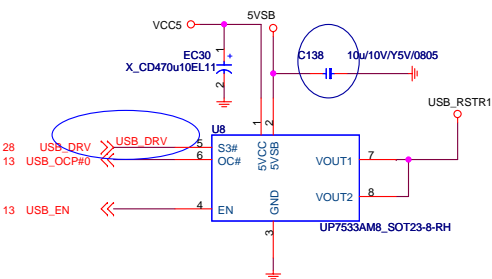
PS2 KEYBOARD & MOUSE CONNECTOR



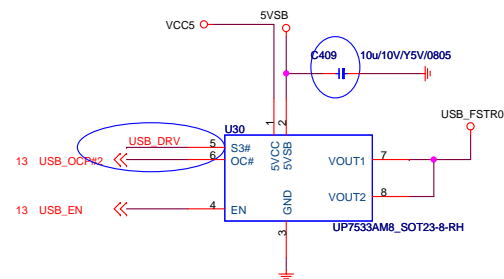
SERIAL ATA CONNECTOR BLOCK



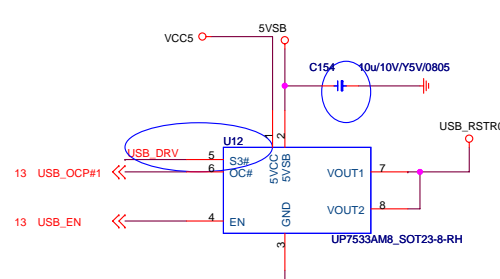
POWER CIRCUIT FOR USB PORT 0,1



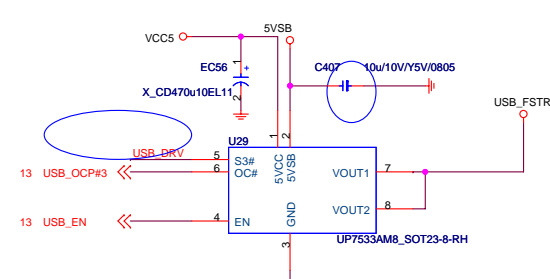
POWER CIRCUIT FOR USB PORT 4,5



POWER CIRCUIT FOR USB PORT 2,3

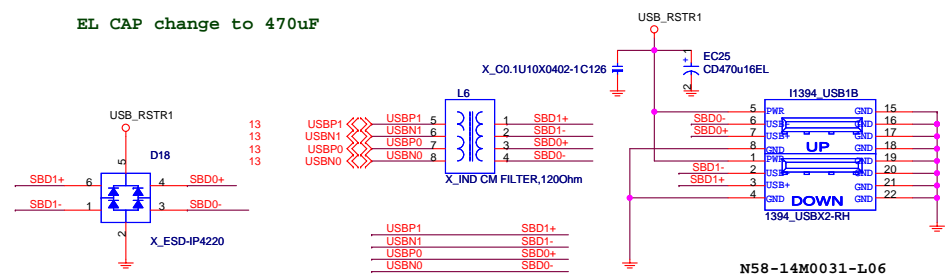


POWER CIRCUIT FOR USB PORT 6,7



REAR PANEL USB CONNECTOR FOR USB PORT 0,1

EL CAP change to 470uF

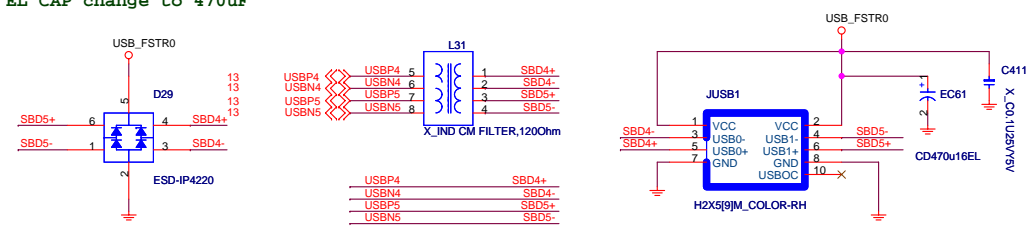


NO 1394 時的料號 N53-08M0141-F02

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

FRONT PANEL USB CONNECTOR FOR USB PORT 4,5

EL CAP change to 470uF

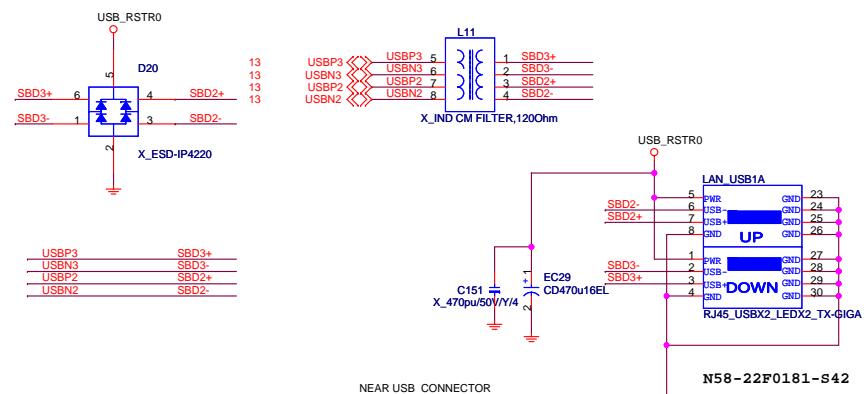


22 / 7.5 / 7.5 / 7.5 / 22 / 7.5 / 7.5 / 7.5 / 22

EL CAP change to 470uF

REAR PANEL USB CONNECTOR FOR USB PORT 2,3

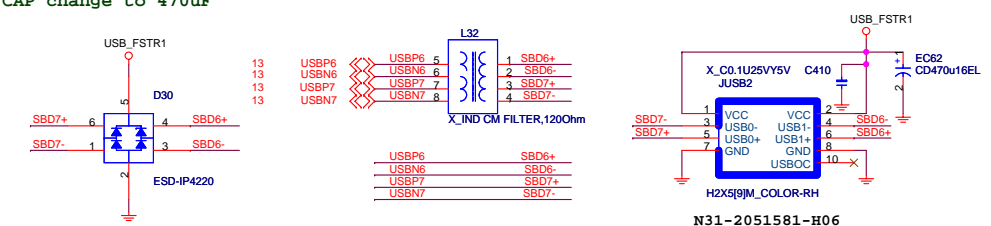
Stuff for channel and gateway



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

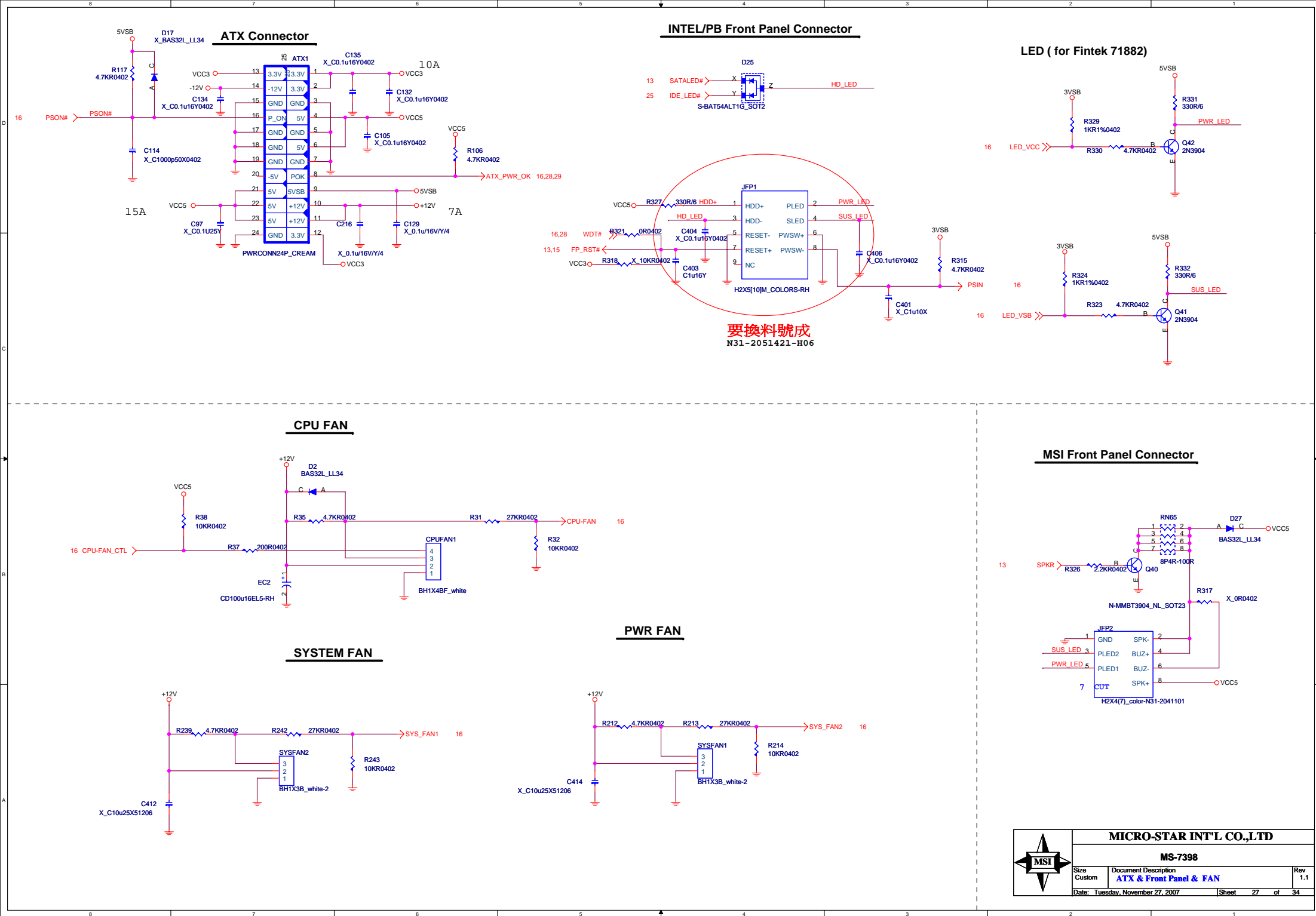
FRONT PANEL USB CONNECTOR FOR USB PORT 6,7

EL CAP change to 470uF

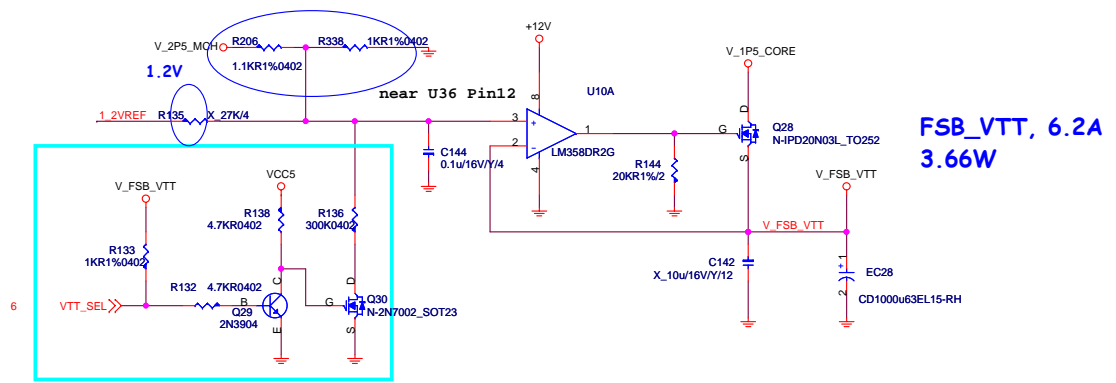
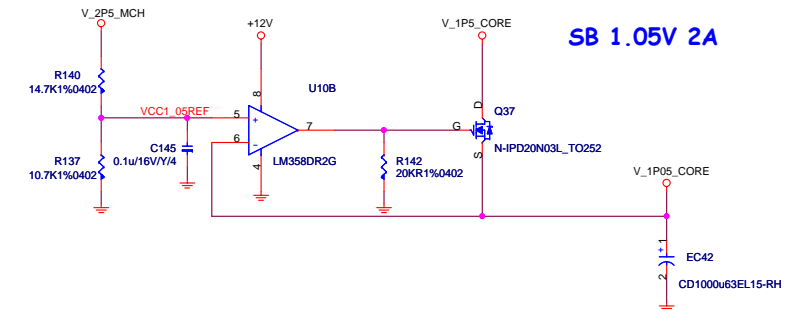
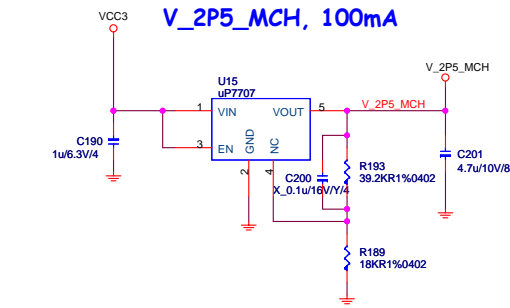
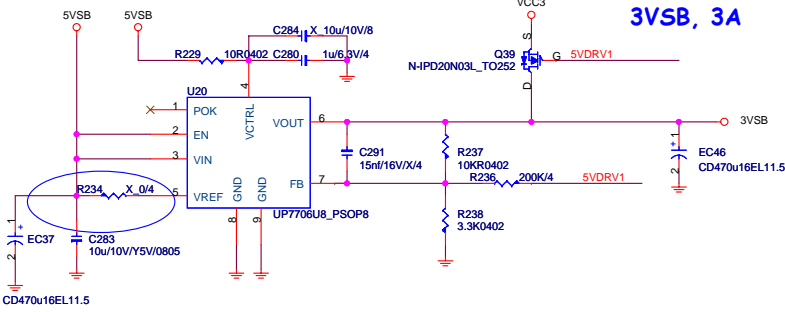
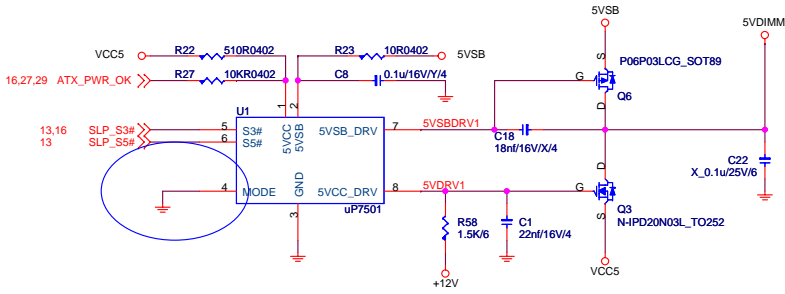


22 / 7.5 / 7.5 / 7.5 / 22 / 7.5 / 7.5 / 7.5 / 22

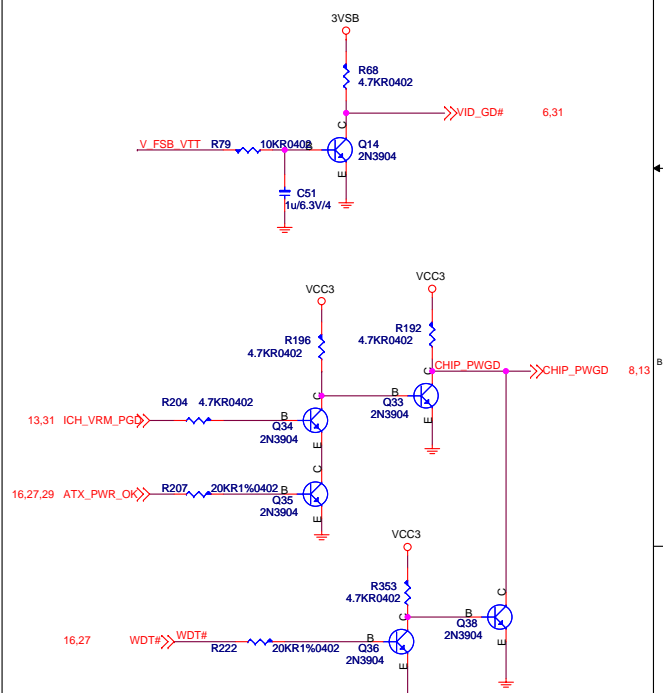
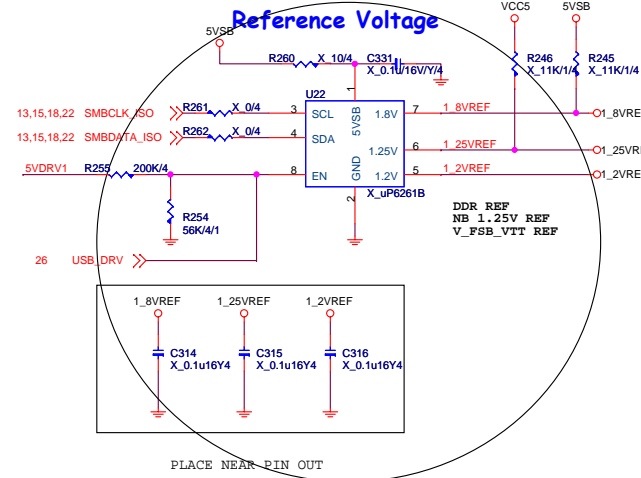
| MICRO-STAR INT'L CO.,LTD | | | |
|--------------------------|----------------------------|-------|----------|
| MS-7398 | | | |
| Size | Document Description | Rev | |
| Custom | USB CONNECTORS | 1.1 | |
| Date: | Tuesday, November 27, 2007 | Sheet | 26 of 34 |



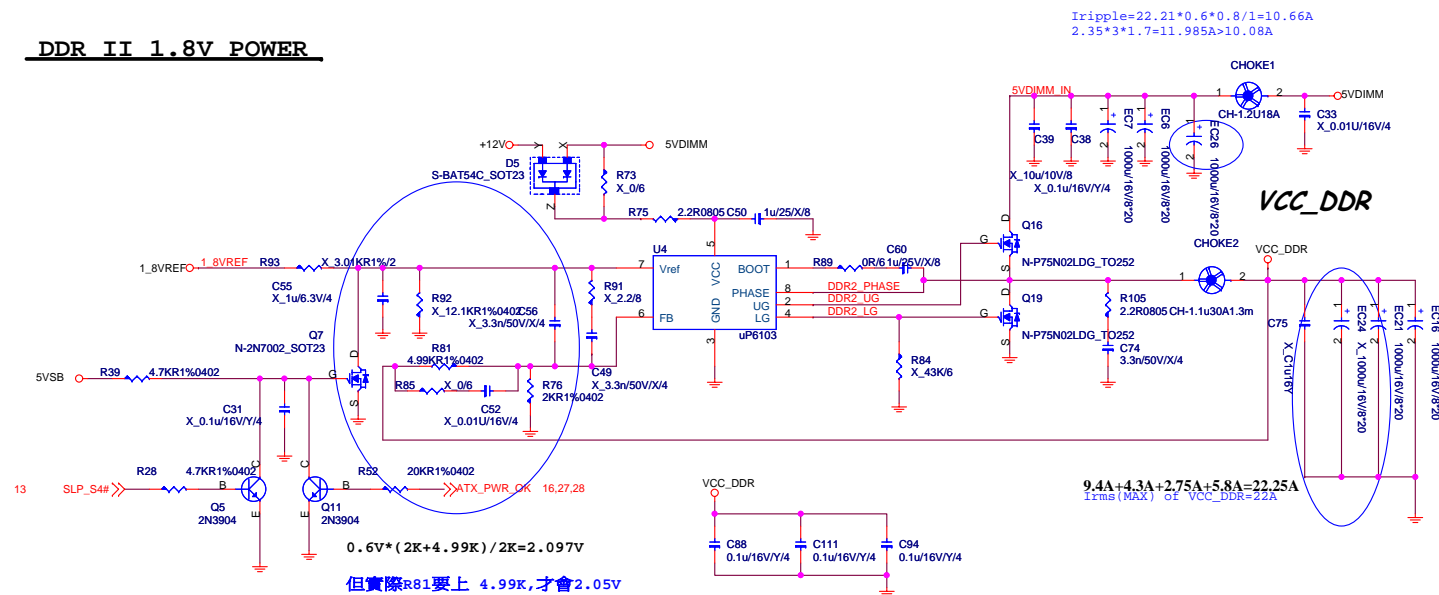
5VDIMM FOR DDR



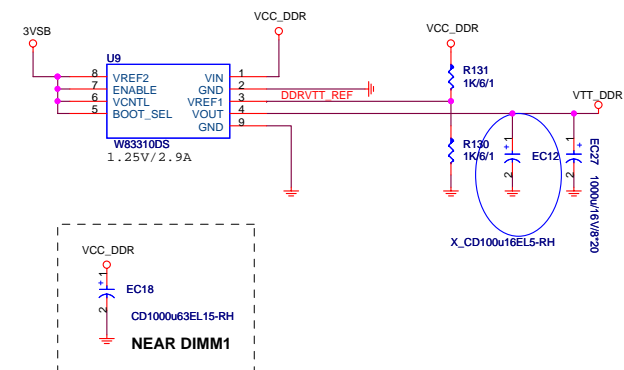
| | | |
|-------------|----------------|--|
| VTT_SEL = L | V_FSB_VTT=1.1V | For future KENTSFIELD processor. (FSB1333, Quad-Core) |
| VTT_SEL = H | V_FSB_VTT=1.2V | For normal processors. |



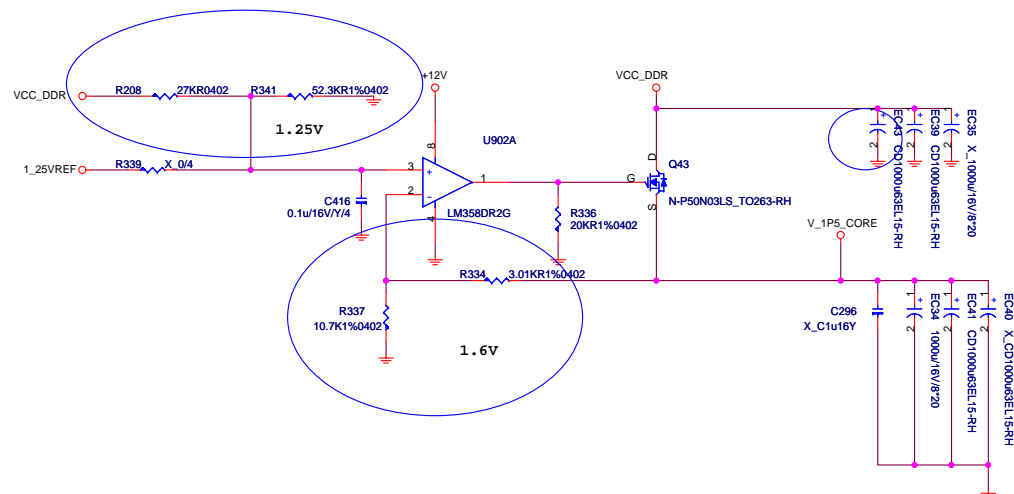
DDR II 1.8V POWER



DDR VTT Power



NB 1.5V POWER



NB_V1.5

$\text{I}_{\text{rms}}(\text{MAX}) \text{ of } \text{V_1P5_CORE}$

$13.8\text{A} + 6.2\text{A} = 20\text{A}$

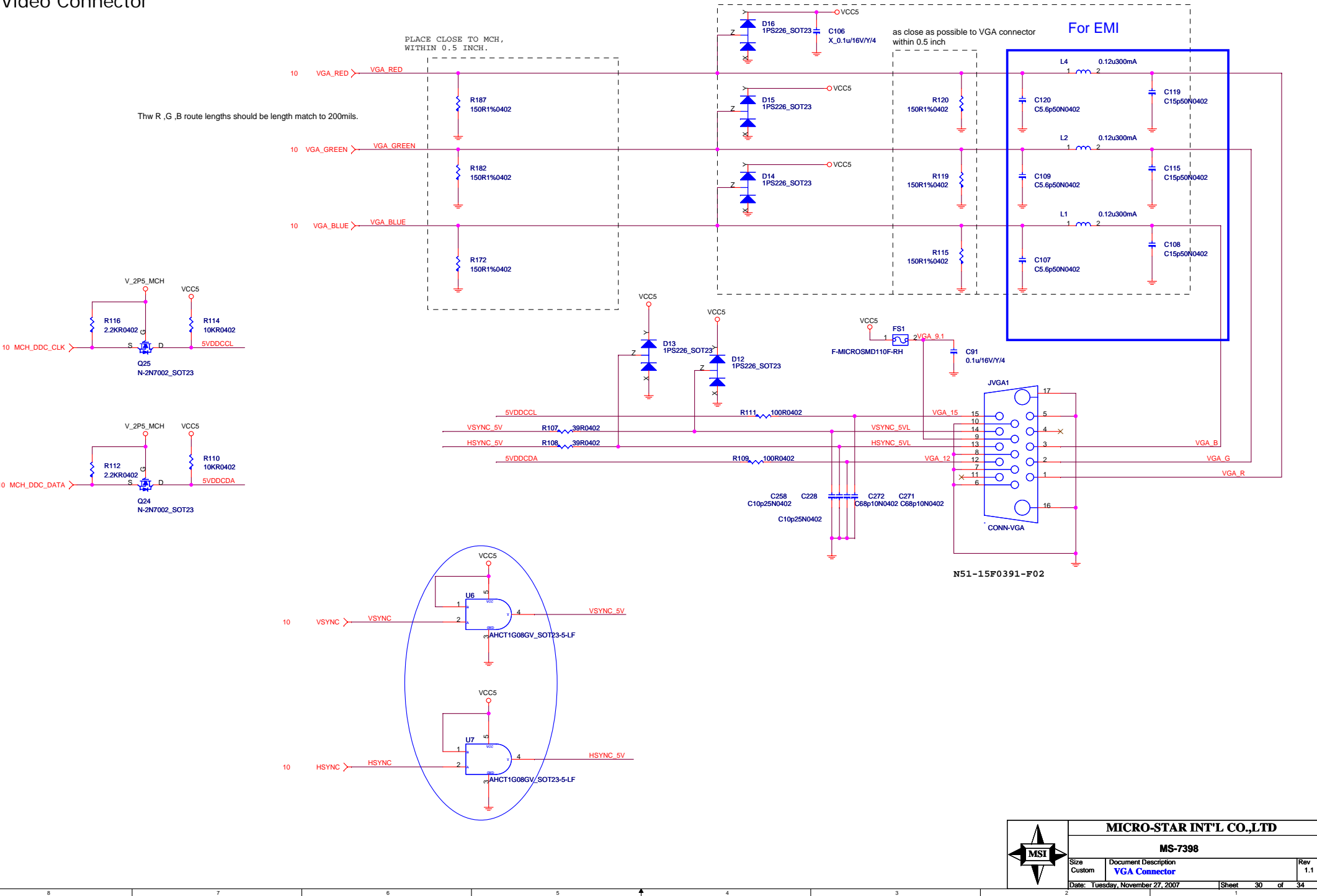


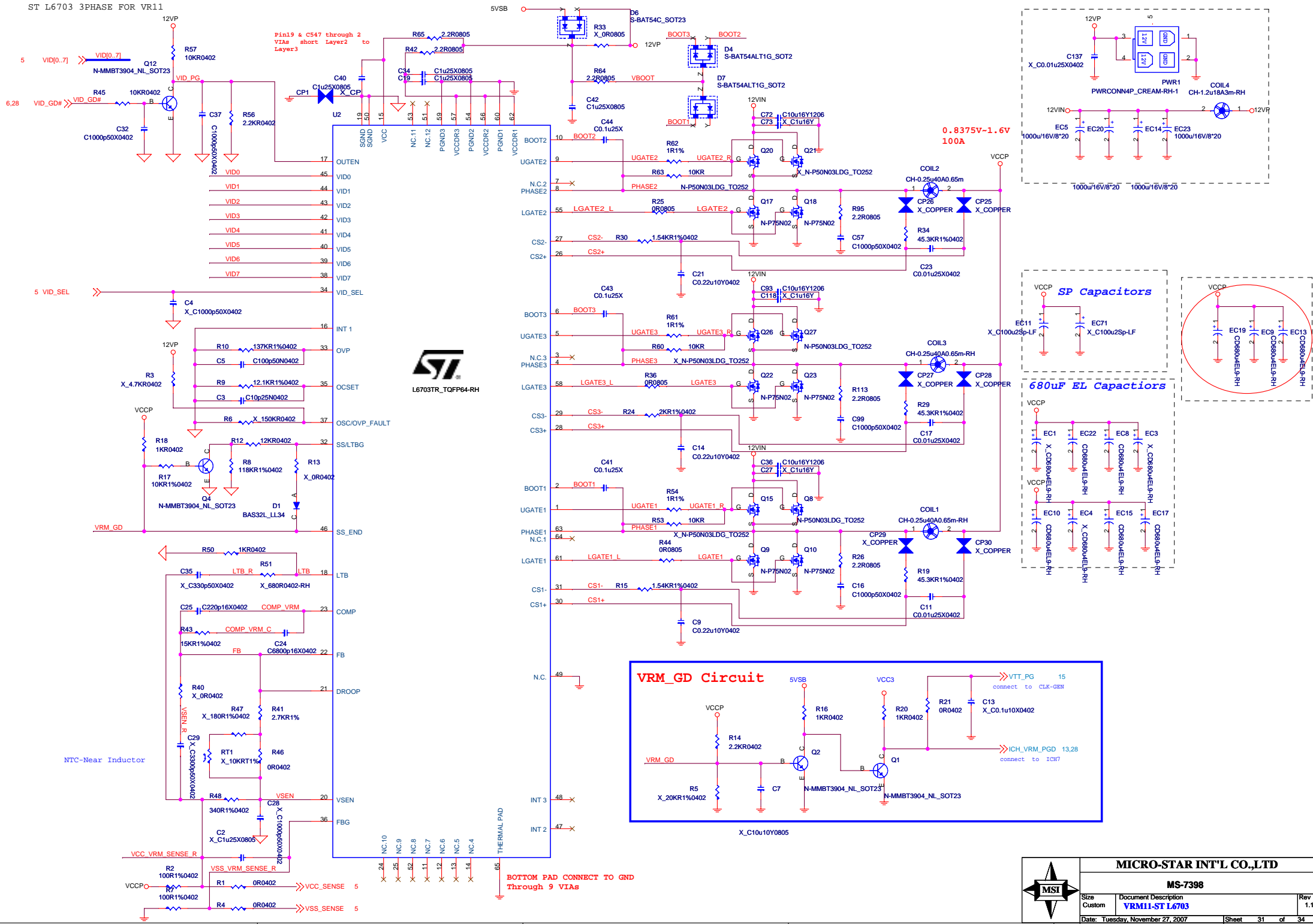
MICRO-STAR INT'L CO.,LTD

MS-7398

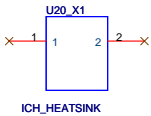
| Size | Document Description | Rev |
|----------------------------------|---------------------------|-----|
| Custom | NB Core Power & DDR Power | 1.1 |
| Date: Tuesday, November 27, 2007 | Sheet 29 of 34 | |

Video Connector

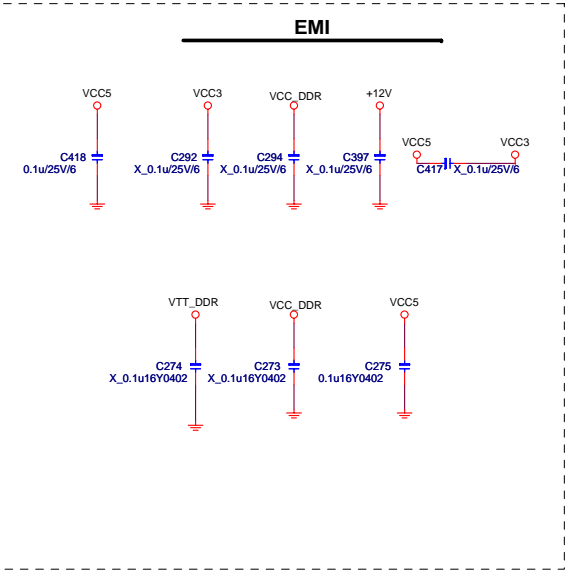
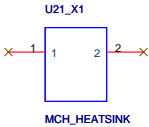




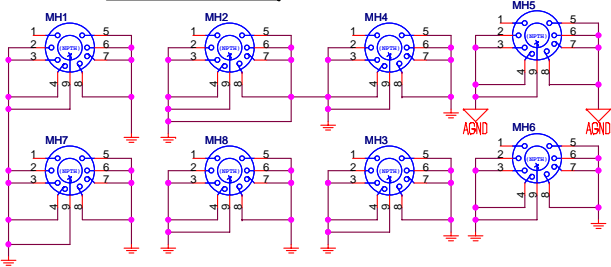
ICH7 HEATSINK



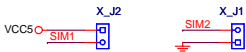
MCH HEATSINK



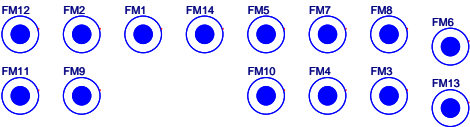
Mounting Holes








Simulation



Optics Orientation Holes



| Opt-part | |
|---|-----------|
| Opt-part | |
|  | AUDIO 3孔 |
| JACK-AUDIOX3F_PK/GR/BU-RH-2 | |
|  | LAN 8101E |
| REALTEK/RTL8101E | |
|  | |
| R/GR+L/YL/10/100 LAN 8101E 10/100 CONNECT | |
|  | |
| 2KR1%0402-1 LAN 8101E 10/100 RSET | |

| Opt-part | |
|---|-------------|
| Opt-part | |
|  | NO 1394 USB |
| USB CONNECT | |
| | |
| | |
| | |

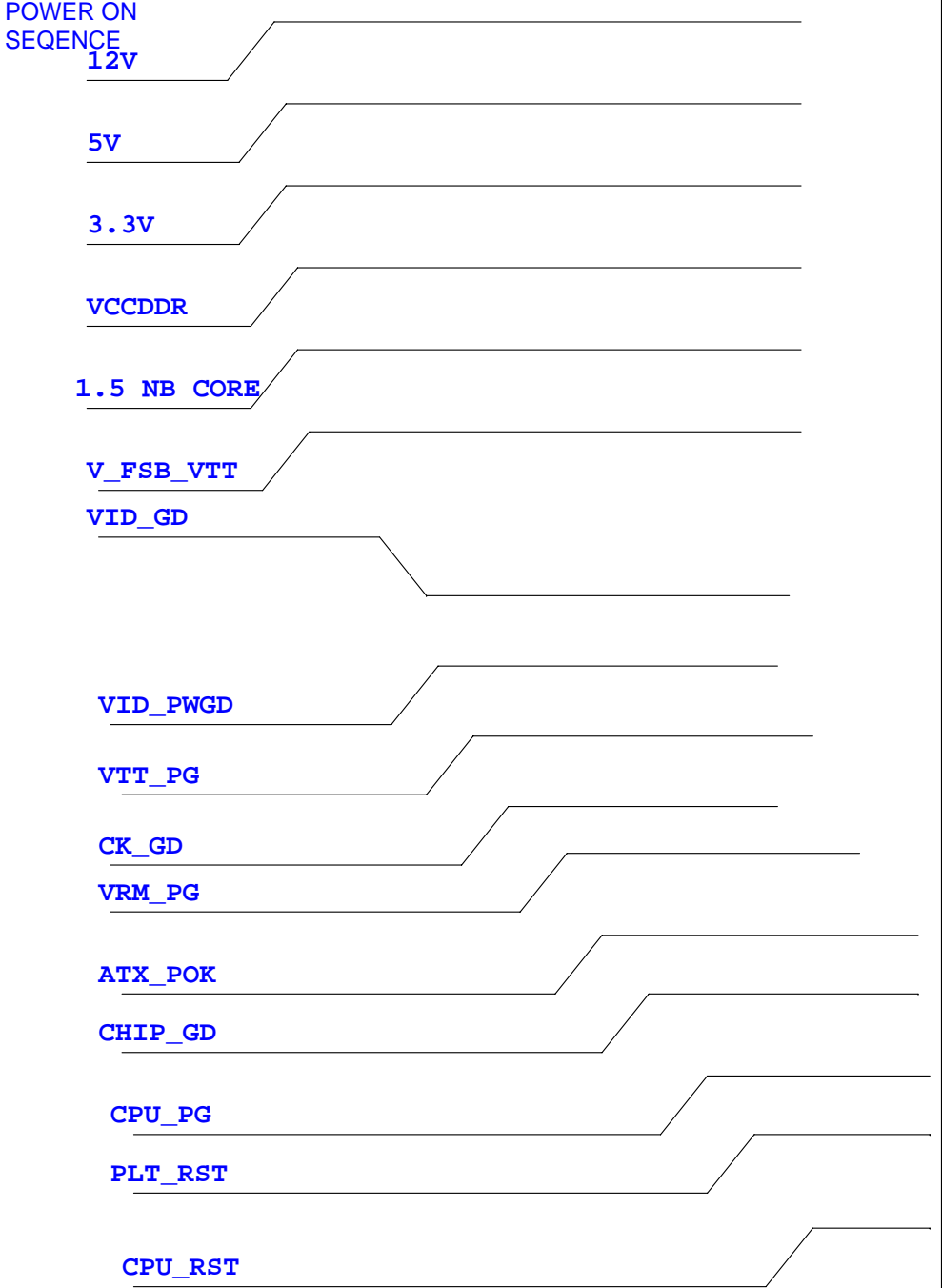
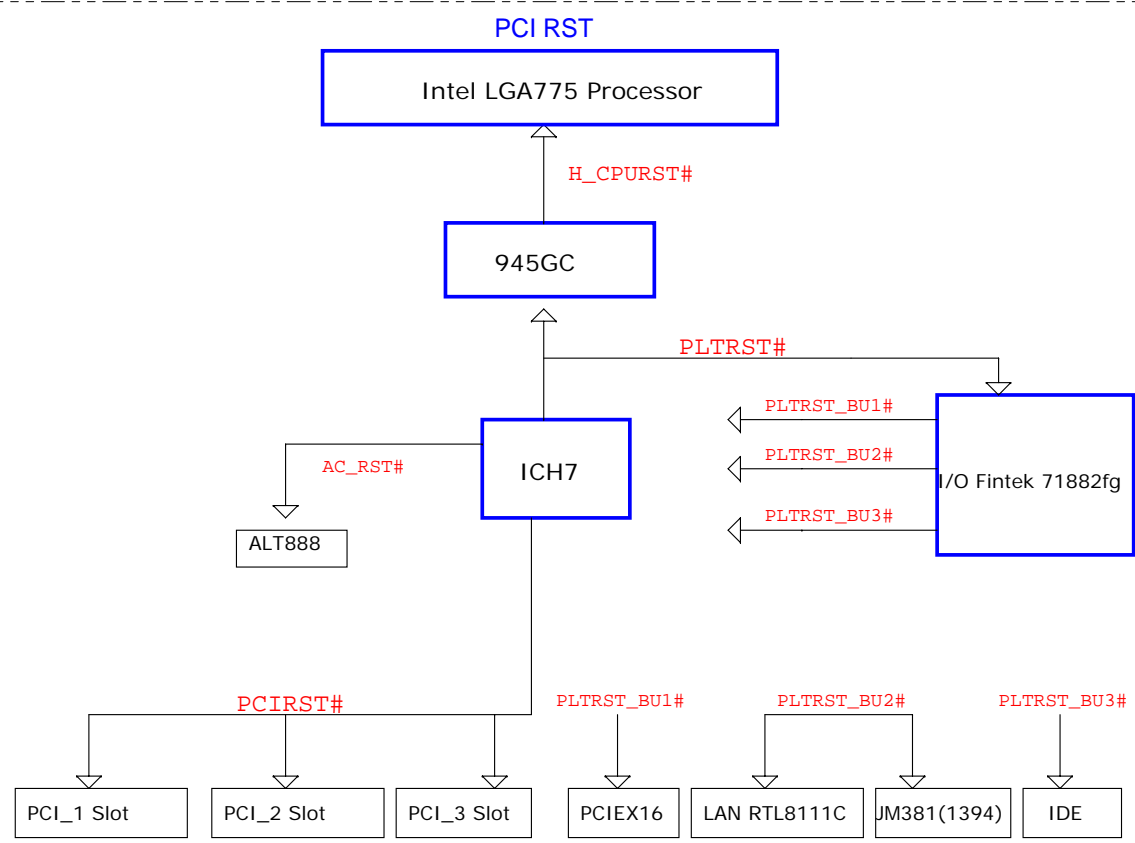


MICRO-STAR INT'L CO.,LTD

MS-7398

| Size | Document Description | Rev |
|---------------------------------|----------------------|----------------|
| Custom | MANUAL PARTS | 1.1 |
| Date: Friday, November 30, 2007 | | Sheet 32 of 34 |

| POWER | Function | CURRENT(A) | IC |
|-------------------------|--------------------|-------------|--------|
| 3VSB | For All System | 3 | 7706 |
| 5VSB | For VDDR SOURCE | 3 | 7501 |
| VCCP | FOR CPU CORE | 100 | 6322 |
| VCC_DDR | FOR DDR & NB_CORE | 14 | 6103 |
| V_1P5_CORE | FOR NB CORE POWER | 17 | OP+MOS |
| DDR_VTT | FOR DDR TERMINATOR | 1.2 | W83310 |
| V_FSB_VTT | FOR CPU BUS | 6 | OP+MOS |
| V_2P5_MCH | FOR NB VGA DAC | 100m | 7707 |
| V_1P05_CORE | FOR SB CORE POWER | 1.3 | OP+MOS |
| USB_RSTR0~1&USB_FSTR0~1 | FOR USB POWER | 1 port 500m | 7533 |
| VOLTAGE ADJ | OVER VOLTAGE | | 6261 |



| | | | | |
|---|---|---|---|---|
| 5 | 4 | 3 | 2 | 1 |
| D | | | | D |
| C | | | | C |
| B | | | | B |
| A | | | | A |
| 5 | 4 | 3 | 2 | 1 |



| | | |
|-----------------------------------|--|------------|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7398 | | |
| Size Custom | Document Description HISTORY | Rev 1.1 |
| Date: Thursday, November 15, 2007 | Sheet 34 of | 34 |