

MS7293F1 Version: 2.1

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CPU:
Intel LGA775

System Chipset:
PT890CE (North Bridge)
VT8237S (South Bridge)

On Board Chipset:
CLOCK - ICS953002 + ICS9P956
LPC Super I/O - W83627EHG
BIOS - LPC ROM
HD Audio ALC888
LAN - VT6103L
IEEE1394 - VT6308P

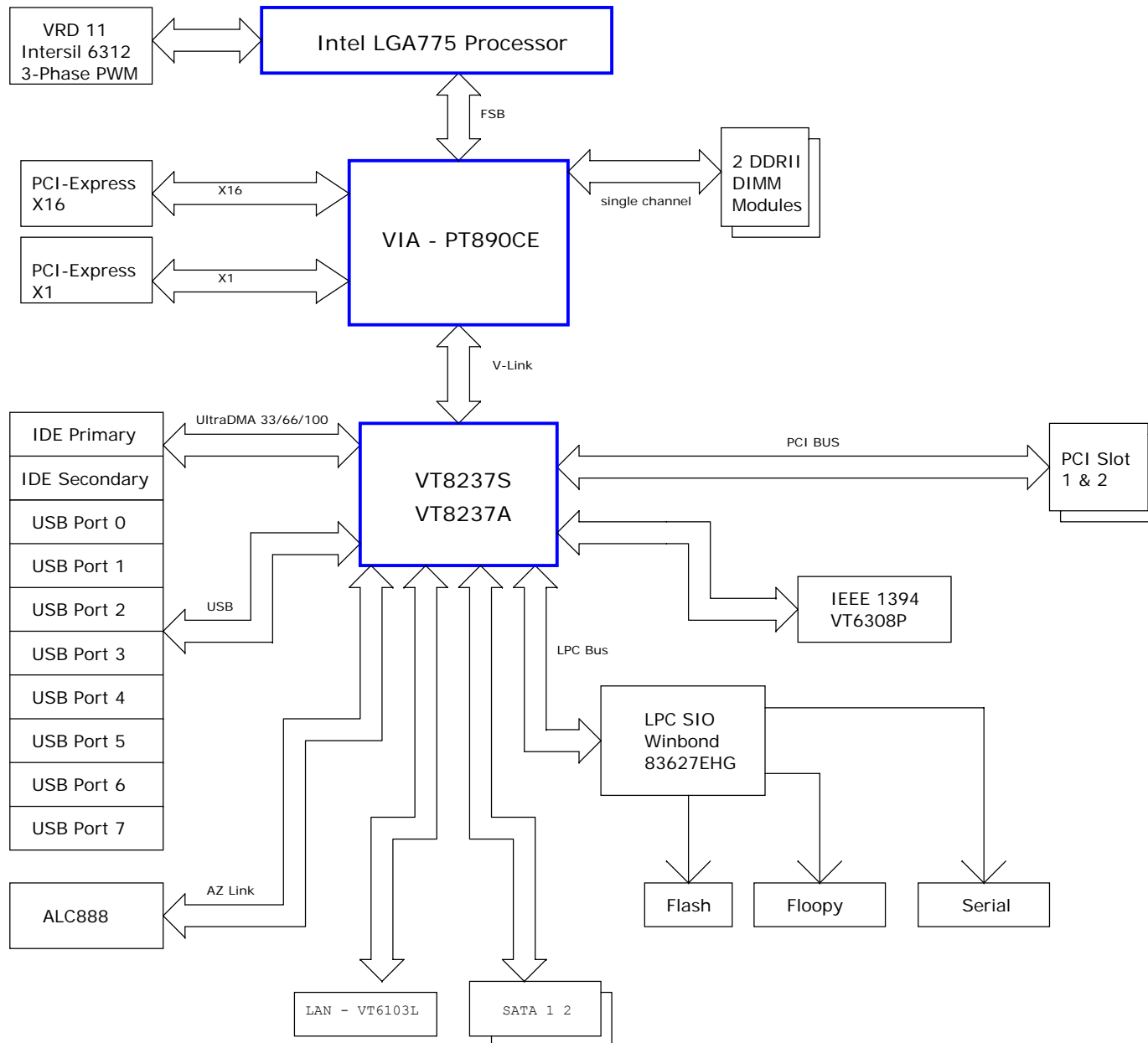
Main Memory:
single-channel - DDRII*2

Expansion Slots:
PCI Express X16 * 1
PCI 2.3 Slot * 2
PCI Express X1 * 1

PWM VRD11 :
Intersil 6312 3 Phase

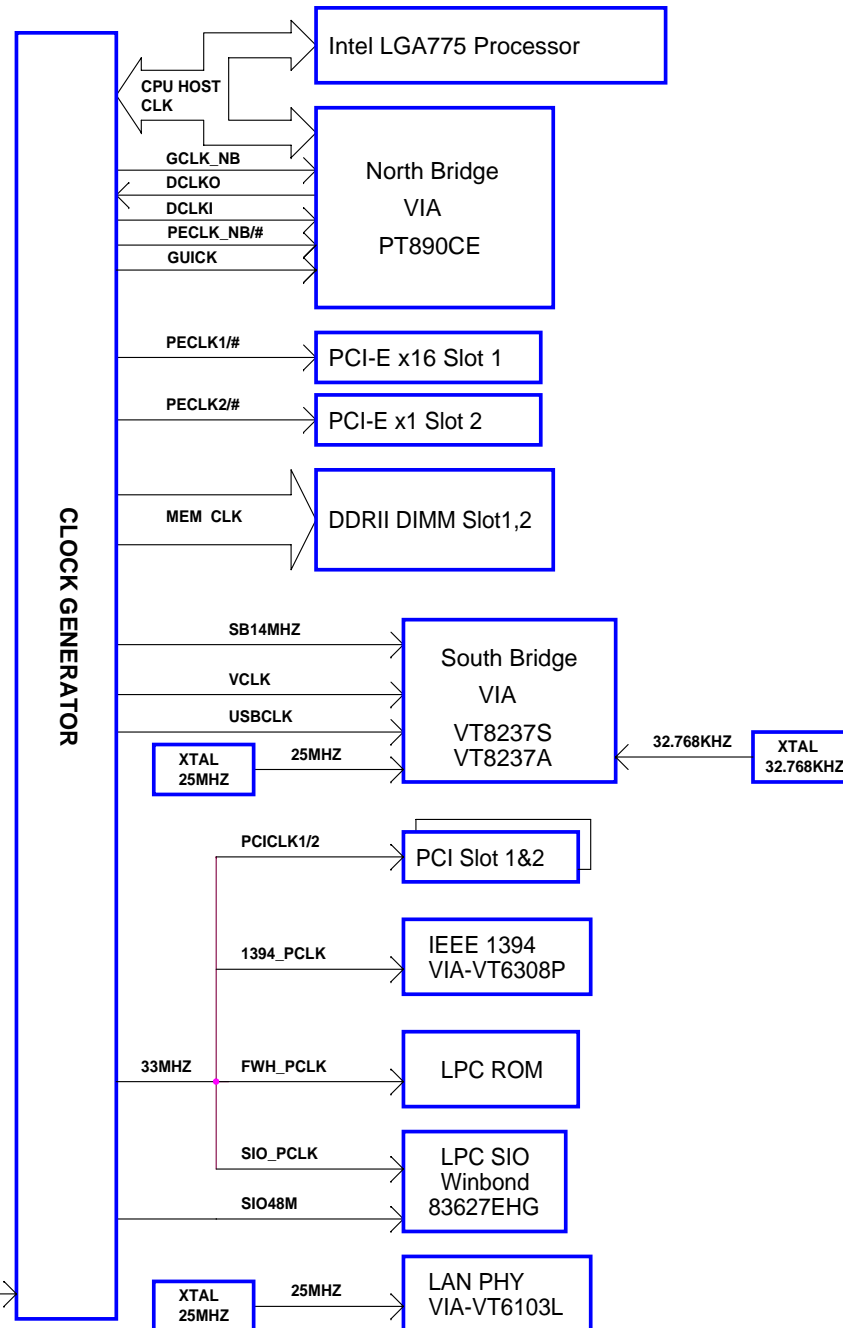
| Micro Star Restricted Secret | | |
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| Title | Cover Sheet | Rev 2.1 |
| Document Number | MS-7293F1 | |
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Block Diagram



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PT890CE PLATFORM CLOCK GENERATOR MAP



Rev1.0 initial

Rev1.1: Add table2 CLK output value for CLK GEN SPEC

P4M890 Preliminary sync mode skew value, this is based on simulation result, will have further update when tester characterization is done.

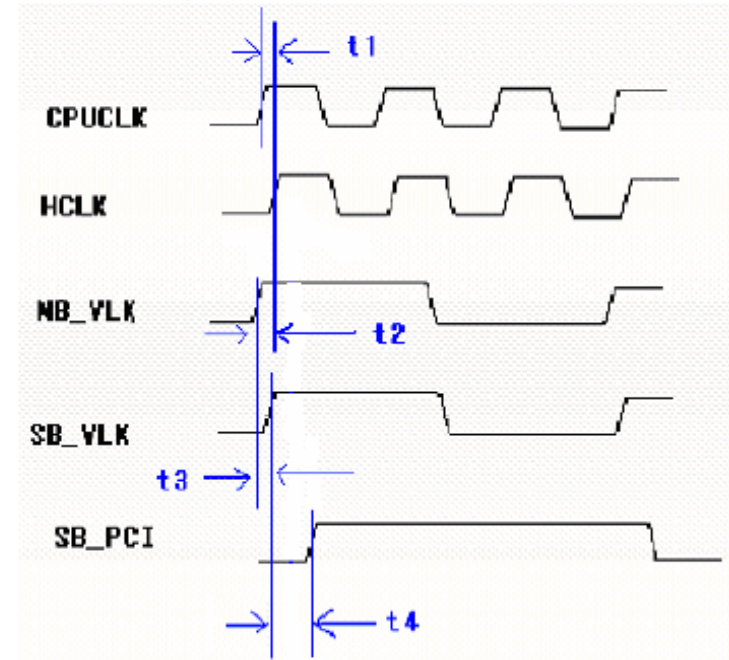


Table1:

| System | t1 | t2 | t3 | t4 |
|--------|------------|------------|-------------|---------|
| value | <+/- 250ps | < +/-500ps | < +/- 750ps | 1~ 3 ns |

T4 : VCLK lead PCICLK(default: 2 ns)

Table2:

| CLK Output | t1 | t2 | t3 | t4 |
|------------|-------|-------------------|-------|------------------|
| value | Align | V lead H 250ps | Align | V lead P 2 ns |

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SB-VT8237S / VT8237A

| GPIO Pin | Pin | Function | Power |
|----------|------|-------------------------|---------|
| GPIO | AE02 | GPIO | VBAT |
| GP11 | AC02 | Trip# | VCC3_SB |
| PD_A0 | W23 | Vlink auto compensation | VCC3 |
| GP14 | AC01 | ATADET1 | VCC3_SB |
| GP19 | D26 | ATADET0 | VCC3_SB |
| GPIOA | AE05 | HOST CLOCK | VCC3 |
| GPIOC | AF05 | Auto mode | VCC3 |
| GPIOB | AD05 | IOQ Depth | GND |
| GP10D | AC06 | GTL pullup | GND |
| GPIO28 | AC08 | SATA LED | VCC5 |
| GP12 | AA1 | OVT# | VCC3_SB |
| GP118 | Y04 | PEPMESCI# | VCC3_SB |
| GP119 | U23 | PEHPSCI# ----- VT8237A | VCC3_SB |
| GP117 | Y1 | PEHPSCI# ----- VT8237S | VCC3_SB |
| GPIO29 | AB9 | PCIE_Reset# | VCC3 |

LPC I/O W83627EHG

| GPIO Pin | Pin | Function | Power |
|----------|-----|----------------|---------|
| GP36 | 69 | BIOS_WP# | VCC3 |
| GP17 | 121 | BIOS_RECOVERY# | VCC3 |
| GP37 | 64 | CLEAR_PWD# | VCC3_SB |
| GP20 | 120 | CPU_FAN_OUT | |
| GP21 | 119 | CPU_FAN_IN | |
| GP30 | 92 | CPU_FAN_CTRL | |
| VTIN2 | 103 | THERMDA | |
| VTIN3 | 102 | CPU_TMP | |
| | 116 | SYS_FAN_OUT | |
| | 113 | SYS_FAN_IN | |
| VTIN1 | 104 | SYS_TMP | |
| GP31 | 91 | SYS_FAN_CTRL | |

PCI Config.

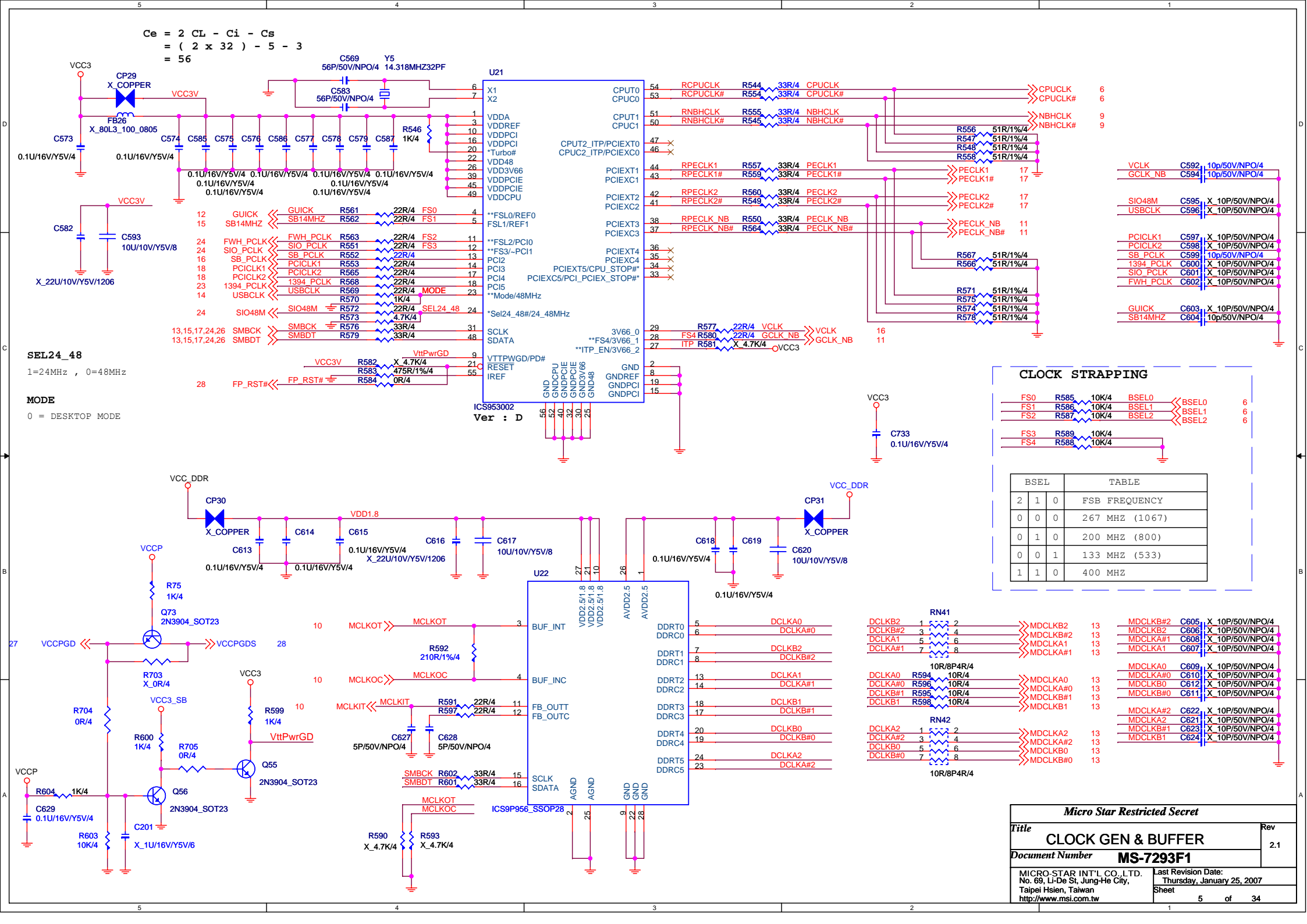
| DEVICE | MCP1 INT Pin | REQ#/GNT# | IDSEL | CLOCK | CLK GEN PIN OUT |
|------------|--------------------------------------|------------------|-------|-----------|-----------------|
| PCI Slot 1 | PIRQ#B PIRQ#C PIRQ#D PIRQ#A | PREQ#0 PGNT#0 | AD20 | PCICLK1 | 14 |
| PCI Slot 2 | PIRQ#C PIRQ#D PIRQ#A PIRQ#B | PREQ#1 PGNT#1 | AD21 | PCICLK2 | 17 |
| 1394 | PIRQ#D | PREQ#3 PGNT#3 | AD22 | 1394_PCLK | 18 |

DDR DIMM Config.

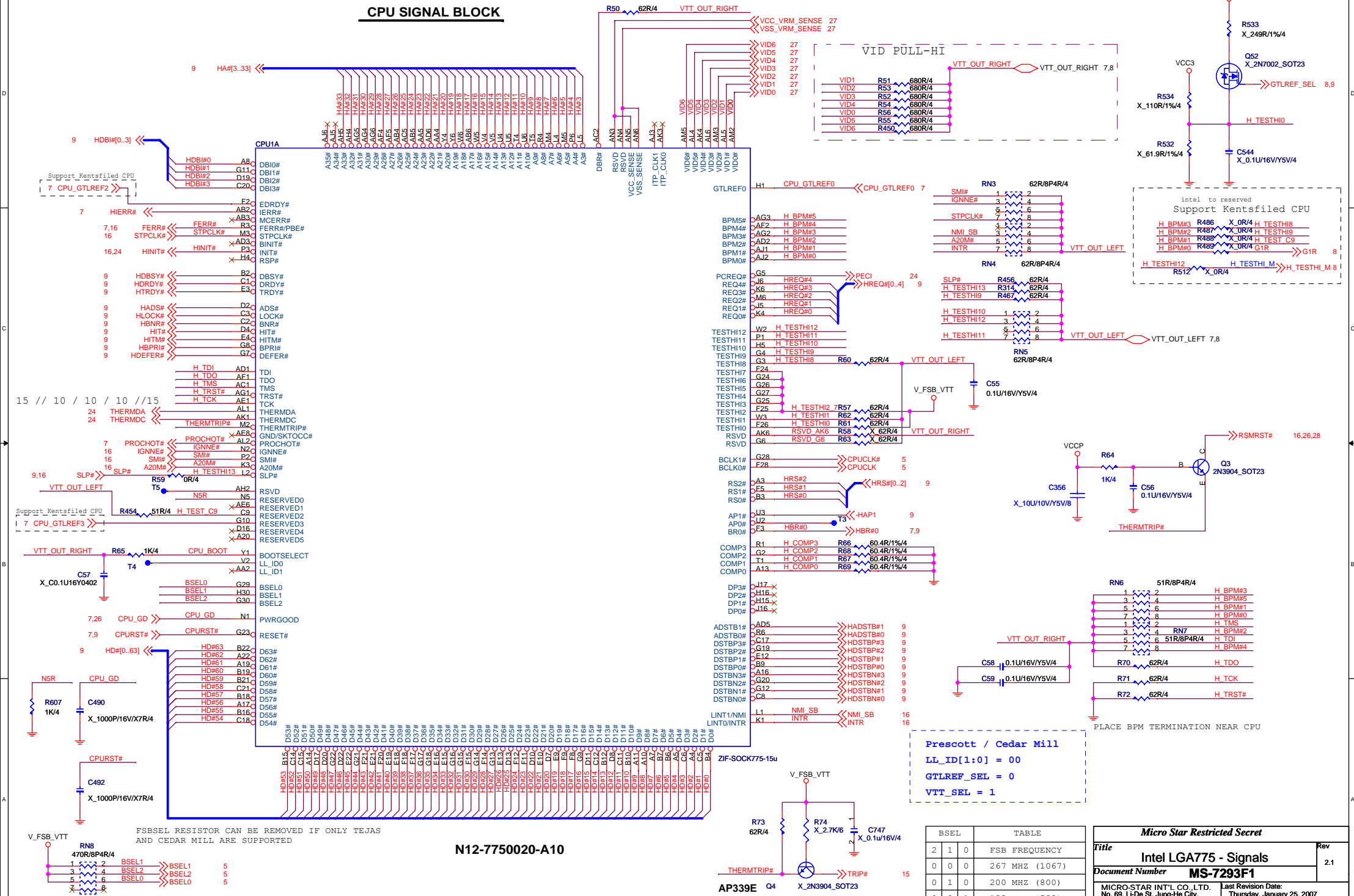
| DEVICE | ADDRESS | CLOCK | CLK GEN PIN OUT |
|--------|-----------|---|-----------------------------|
| DIMM 1 | 10100000B | MDCLKA0/A#0 MDCLKA1/A#1 MDCLKA2/A#2 | 5 / 6 13 / 14 24 / 23 |
| DIMM 2 | 10100010B | MDCLKB0/B#0 MDCLKB1/B#1 MDCLKB2/B#2 | 20 / 19 18 / 17 7 / 8 |

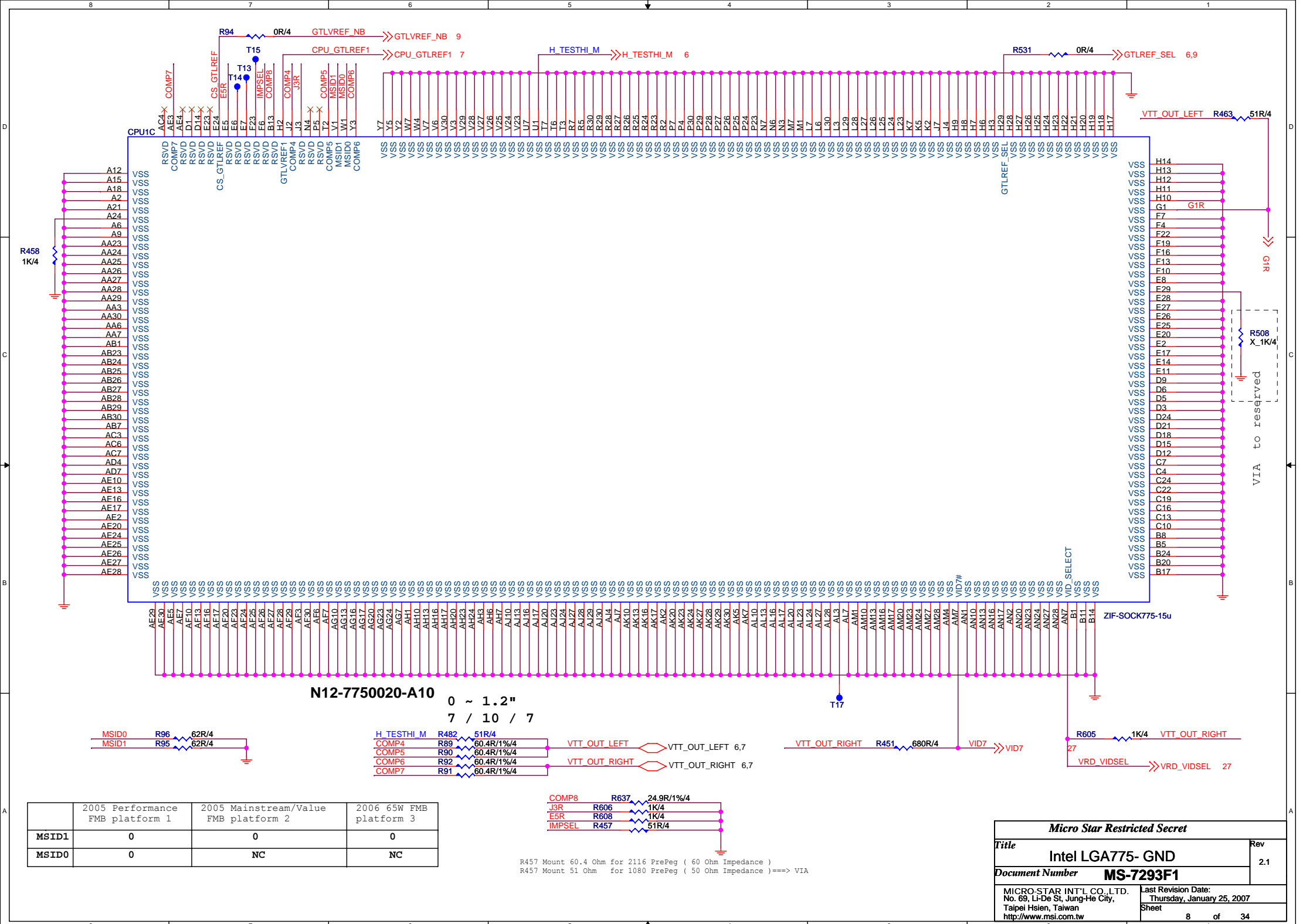
PCI RESET DEVICE

| Signals | Source | Target |
|-------------|---------|-----------------------|
| PCIRST# | VT8237A | MS7 |
| PCIRST#1 | MS7 | 1394 & SPIO & BIOS |
| PCIRST#2 | MS7 | PCI slot 1-2 |
| NB_RST# | MS7 | NB_RST# |
| HDRST# | MS7 | Primary, Scondary IDE |
| Rsmrst# | MS7 | VT8237A |
| PCIE_Reset# | VT8237A | PCIE 1-2 |



CPU SIGNAL BLOCK





13

MD[0:63]

MD0 AF35

MD1 AG34

MD2 AJ36

MD3 AK35

MD4 AF34

MD5 AG35

MD6 AJ34

MD7 AK34

MD8 AG32

MD9 AF32

MD10 AH30

MD11 AJ31

MD12 AF31

MD13 AH32

MD14 AH31

MD15 AJ32

MD16 AK33

MD17 AL36

MD18 AP35

MD19 AL34

MD20 AL35

MD21 AT36

MD22 AM35

MD23 AT34

MD24 AK24

MD25 AL23

MD26 AM24

MD27 AJ22

MD28 AK23

MD29 AN24

MD30 AM23

MD31 AM22

MD32 AK20

MD33 AK19

MD34 AM19

MD35 AR18

MD36 AL20

MD37 AM20

MD38 AL18

MD39 AM18

MD40 AR17

MD41 AT16

MD42 AN16

MD43 AN15

MD44 AM17

MD45 AP17

MD46 AM16

MD47 AM15

MD48 AN22

MD49 AN21

MD50 AP19

MD51 AT18

MD52 AT21

MD53 AR21

MD54 AT19

MD55 AR19

MD56 AR14

MD57 AM14

MD58 AP13

MD59 AP11

MD60 AP14

MD61 AN14

MD62 AT12

MD63 AP12

DQM0 AH36C

DQM1 AF30C

DQM2 AN36C

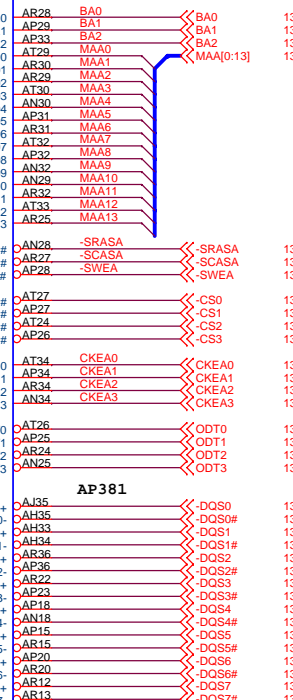
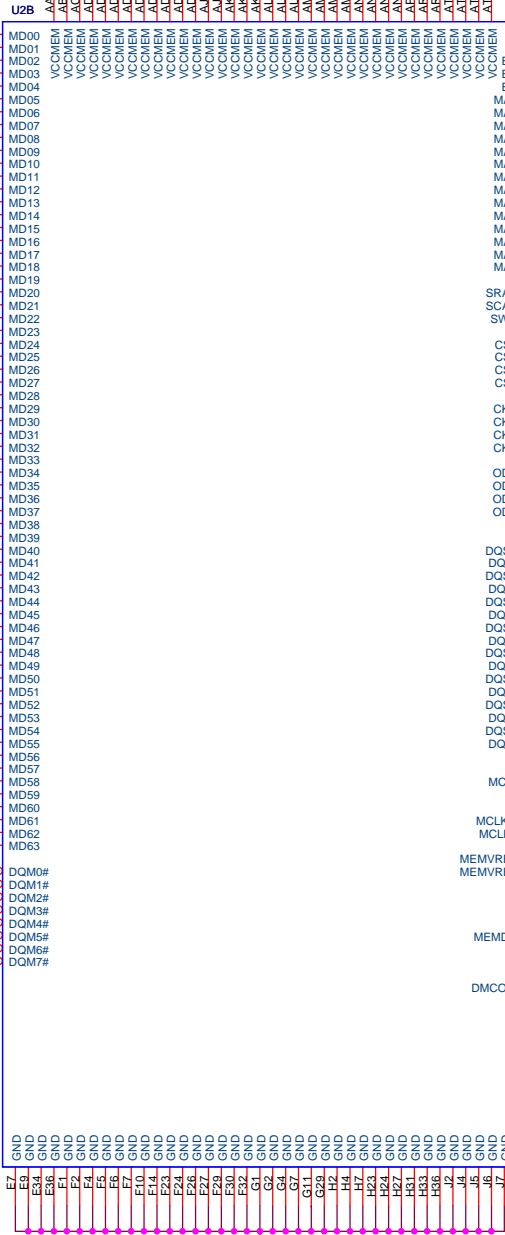
DQM3 AN23C

DQM4 AT20C

DQM5 AT15C

DQM6 AP21C

DQM7 AT13C



Test Point
(Place near their respective balls of NB)

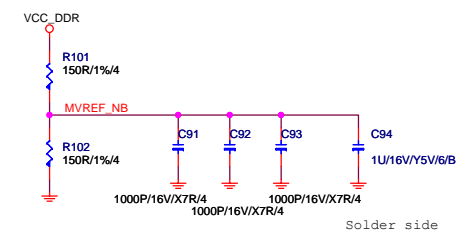
PULL DOWN GND OR PULL UP +1.8VDIMM

CLOSE TO DIMM

NOTE: DQS/DQS# => OTHER:W:S:W:OTHER=15:10:5:10:15

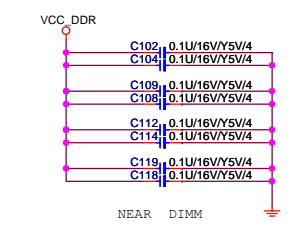
MCLKO+/- as short as passable
MCLKIT = DCLKx + 2 "

Near to NB chip

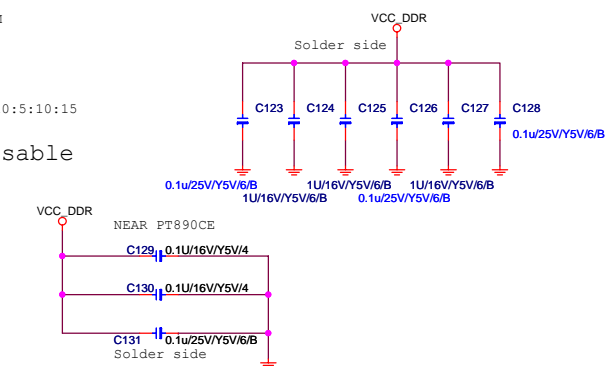


Close to ball

Solder side

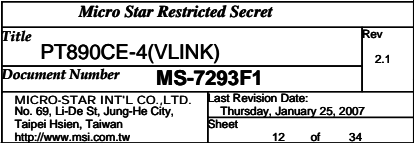


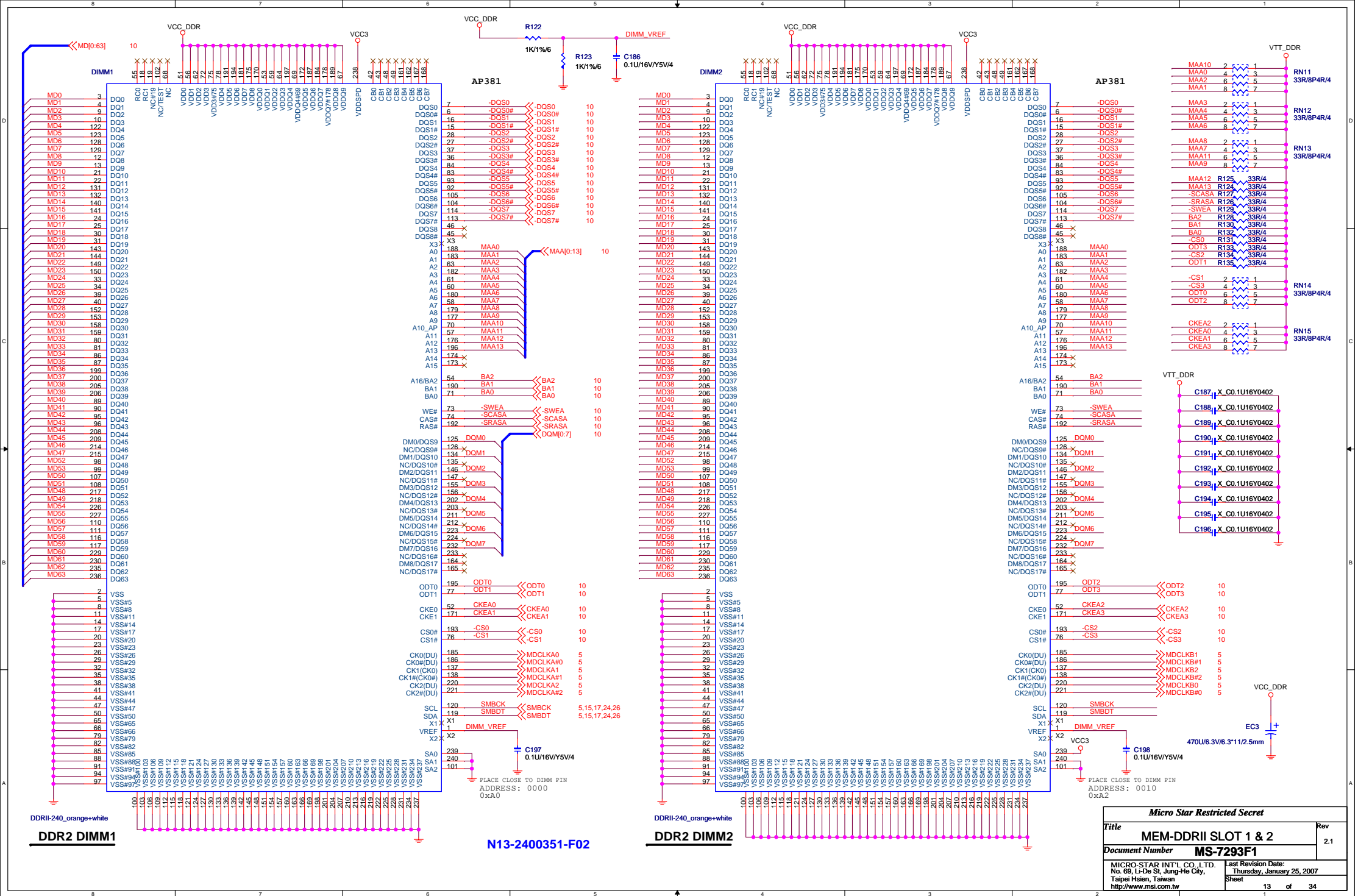
NEAR DIMM

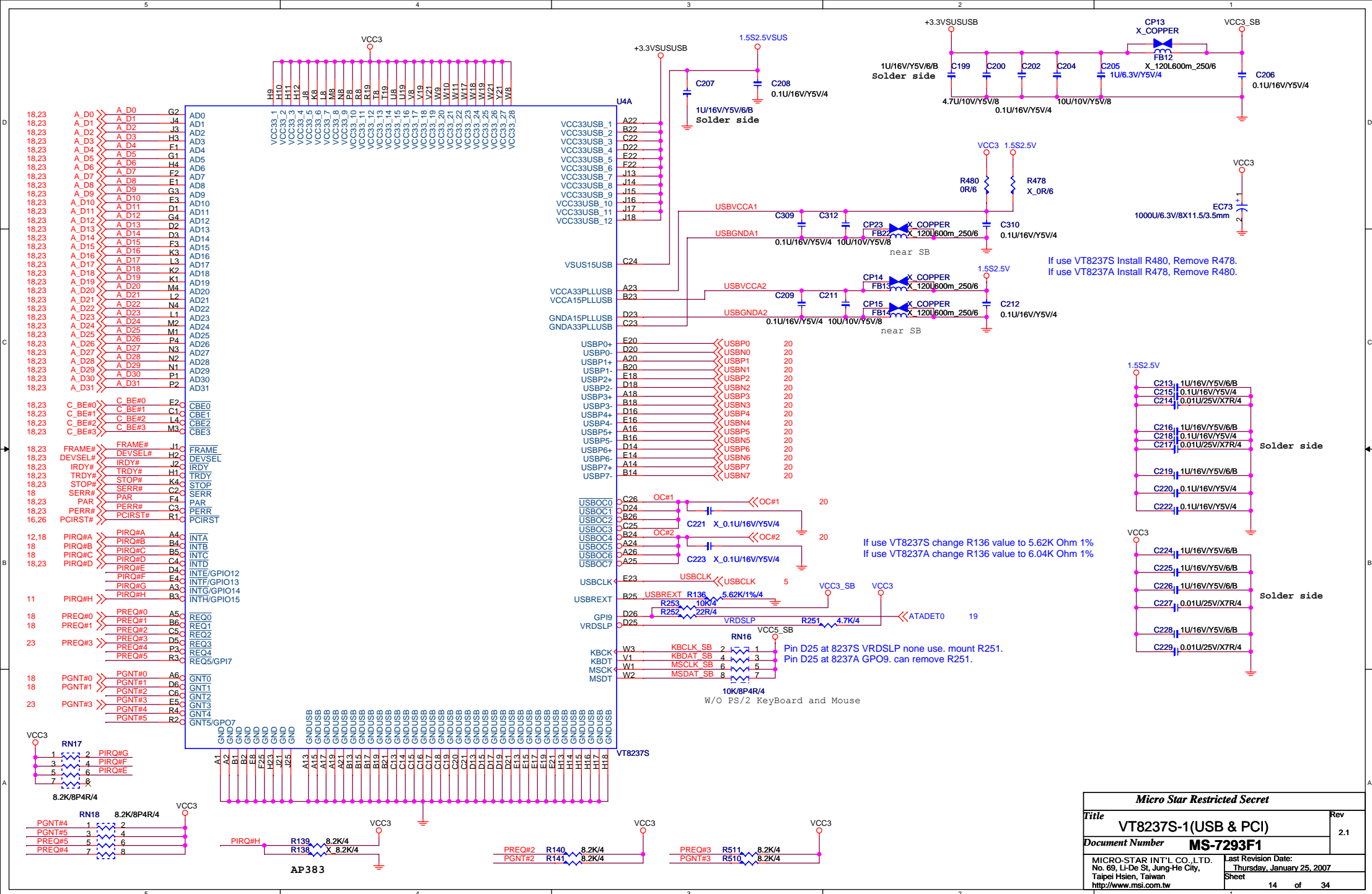


NEAR PT890CE

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| | |
|--|---|
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Power Up Strappings :

| PCS 3 | VKCOMP for Vlink at 4x mode |
|-------|-----------------------------|
| 1 | 0.9V |
| 0 | 0.75V |

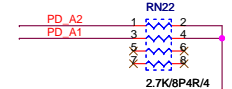
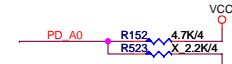
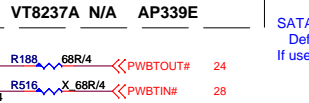
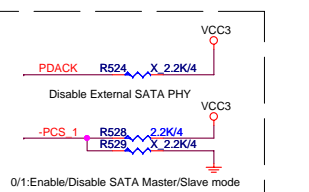
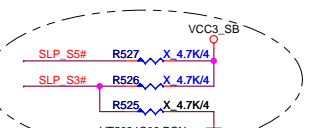
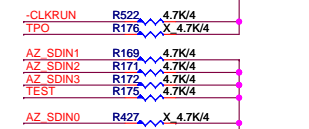
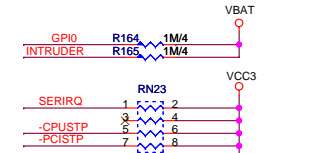
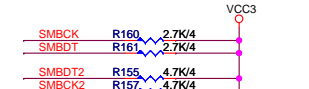
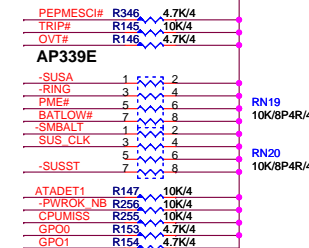
| GPIOA | HOST CLOCK |
|-------|------------|
| GPIOC | AUTO MODE |
| 1 | |

| GPIOB | IOQ Depth |
|-------|-----------|
| 0 | 8 Level |
| 1 | 1 Level |

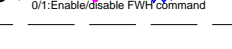
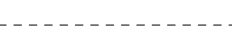
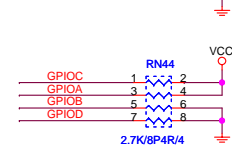
| GPIOD | GPI pullup |
|-------|------------|
| 0 | Enable |
| 1 | Disable |

| PD A0 | Vlink auto compensation |
|-------|-------------------------|
| 0 | Auto mode |
| 1 | Manual mode |

SUSA# :
Integrated LAN Reset method
1 : For desktop
0 : For netbook
(without wake on LAN feature from S4 / S5)



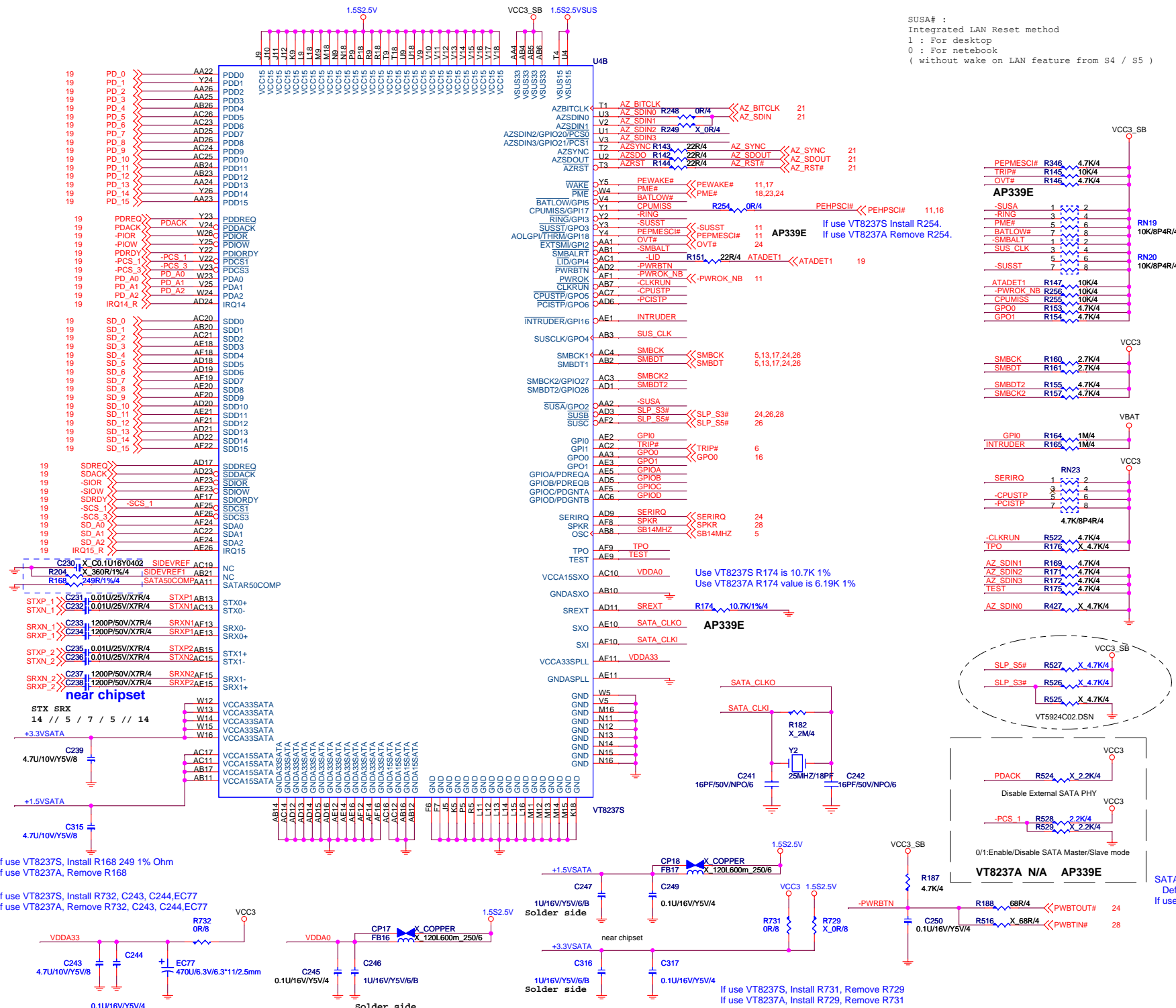
If use VT8237S 1.5V Core Install R163, Remove R162.
If use VT8237A 2.5V Core Install R162, Remove R163.

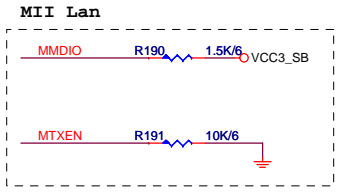
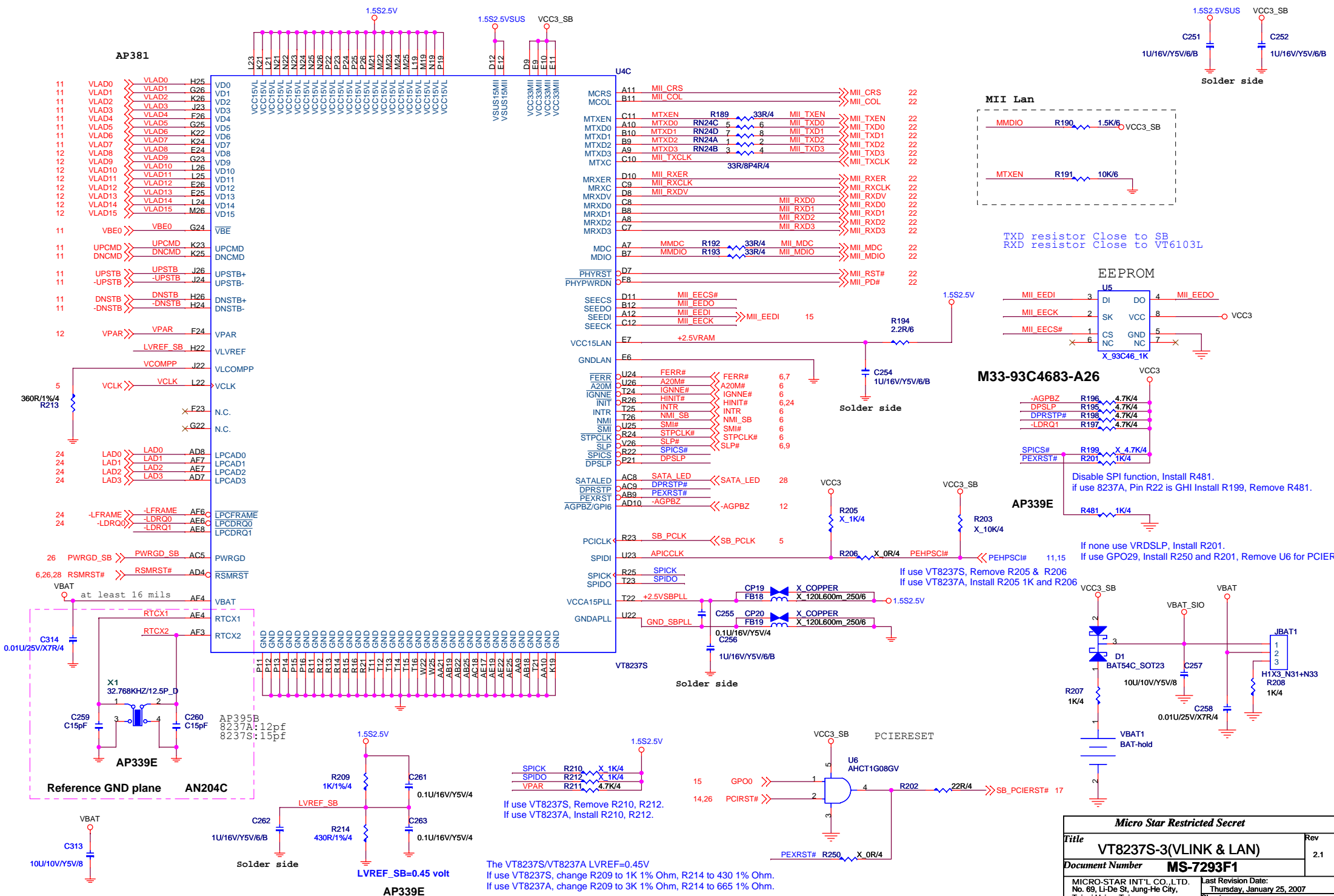


AP339E page 4 SEEDIN

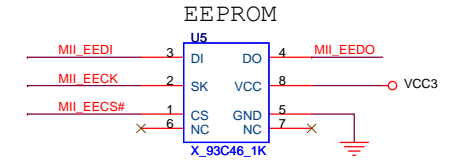
SATA stagger spin for VT8237S only
Default Enabled, if use VT8237S, mount R528.
If use VT8237A, Remove R528.

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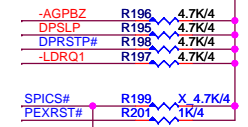




TXD resistor Close to SB
RXD resistor Close to VT6103L



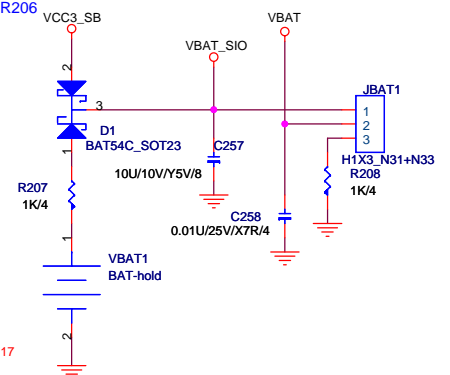
M33-93C4683-A26



Disable SPI function, Install R481.
if use 8237A, Pin R22 is GHI Install R199, Remove R481.

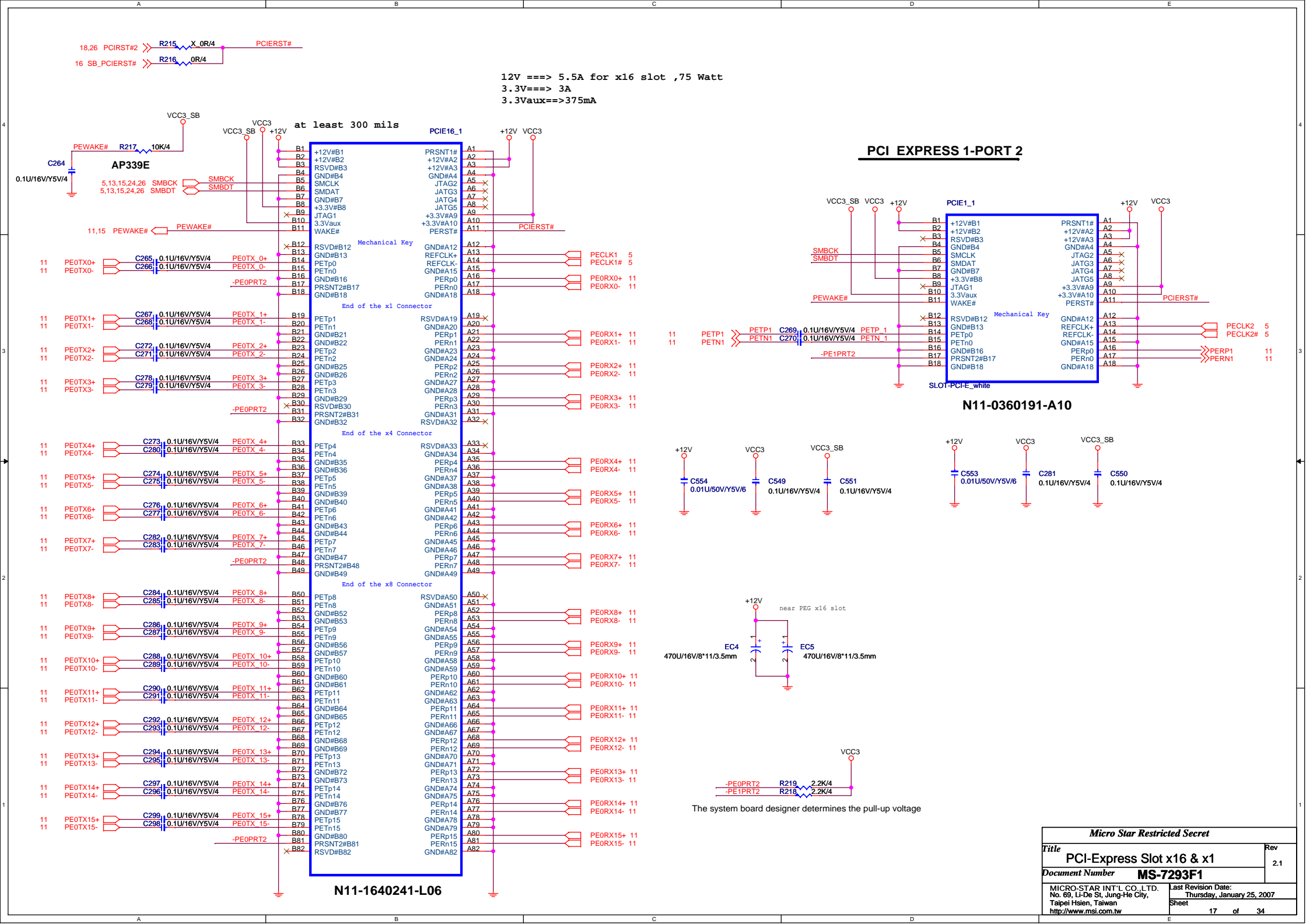
AP339E

If none use VRD5LP, Install R201.
If use GPO29, Install R250 and R201, Remove U6 for PCIERST#

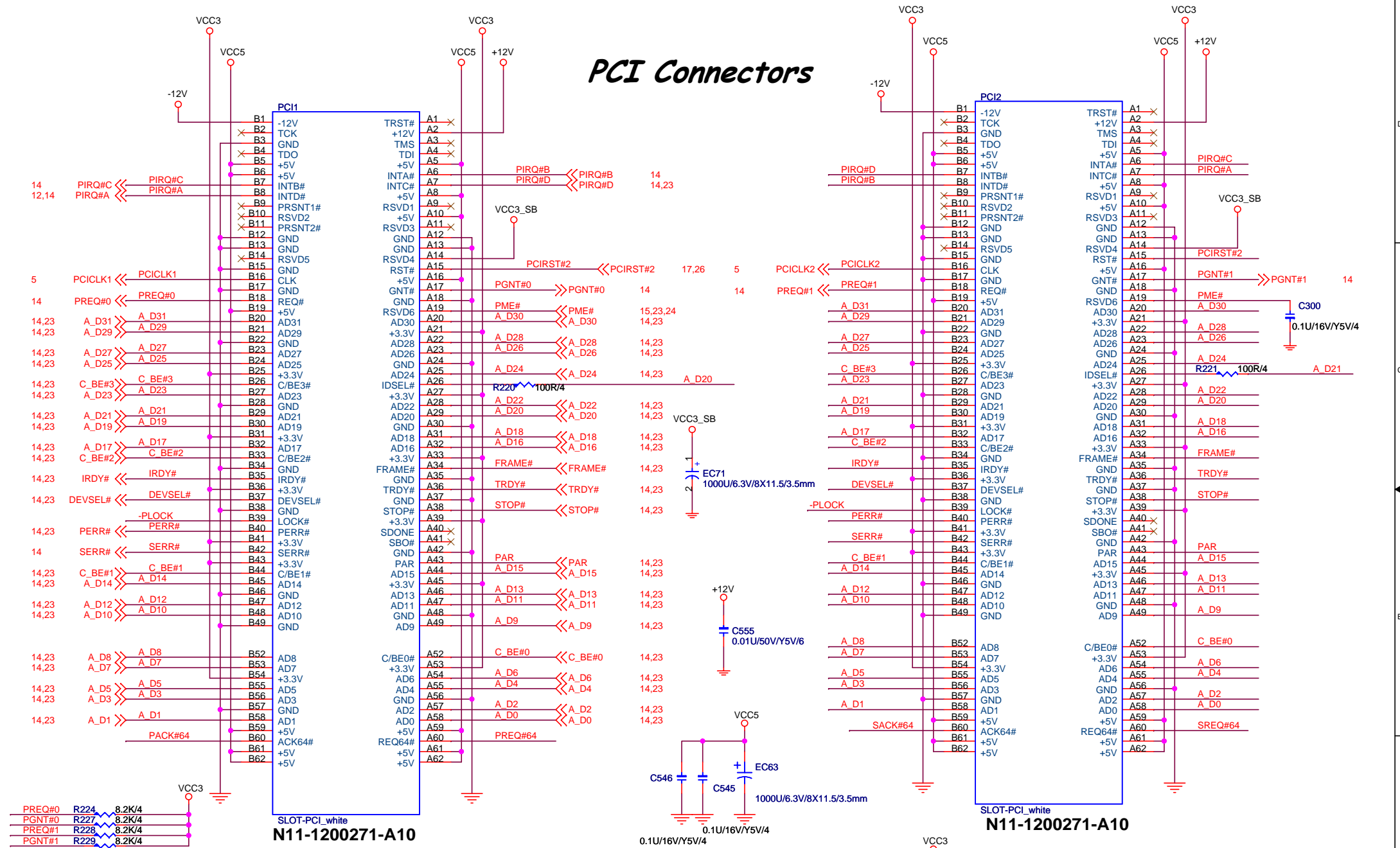


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The VT8237S/VT8237A LVREF=0.45V
If use VT8237S, change R209 to 1K 1% Ohm, R214 to 430 1% Ohm.
If use VT8237A, change R209 to 3K 1% Ohm, R214 to 665 1% Ohm.

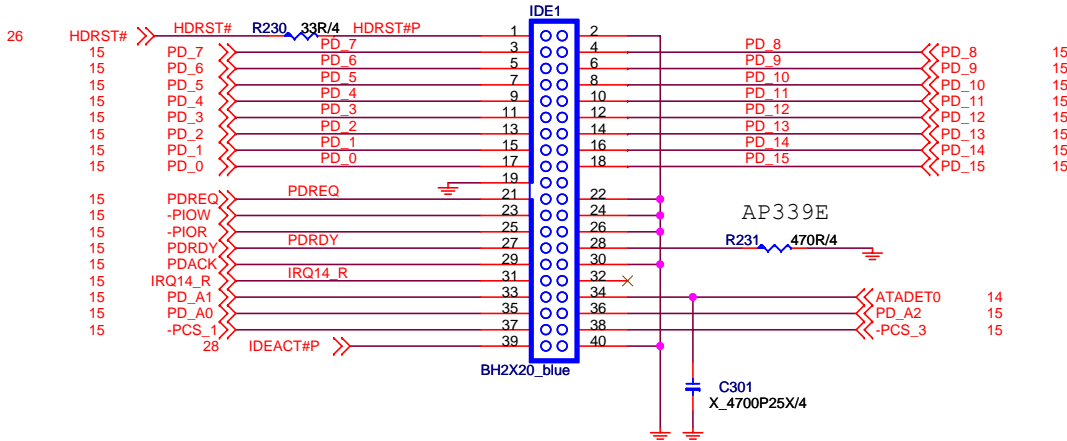


PCI Connectors



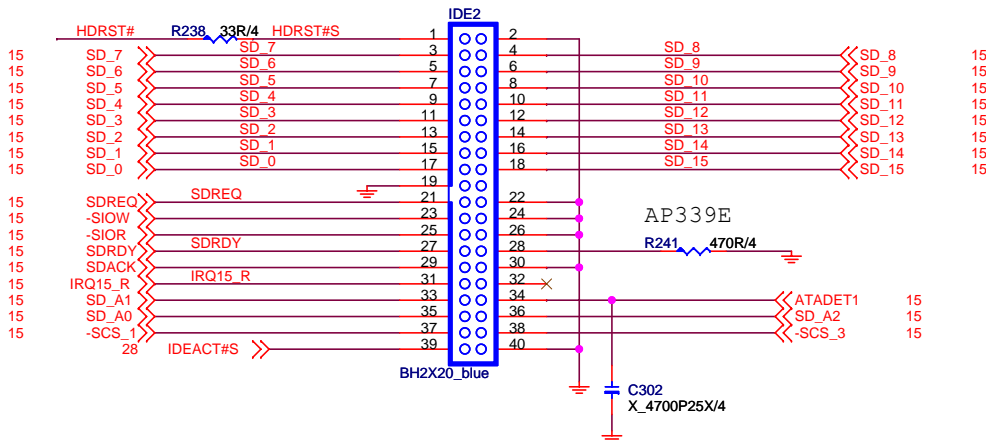
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|---|-----|---|
| Title | Rev | |
| PCI SLOT 1 & 2 | 2.1 | |
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PRIMARY IDE BLOCK

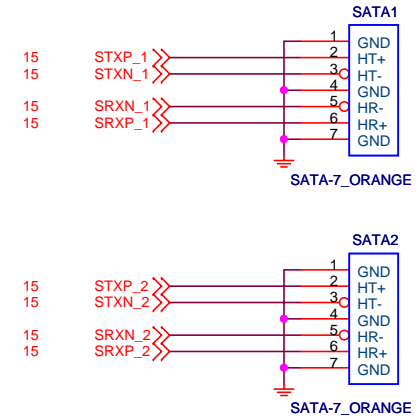


N32-2201221-H06

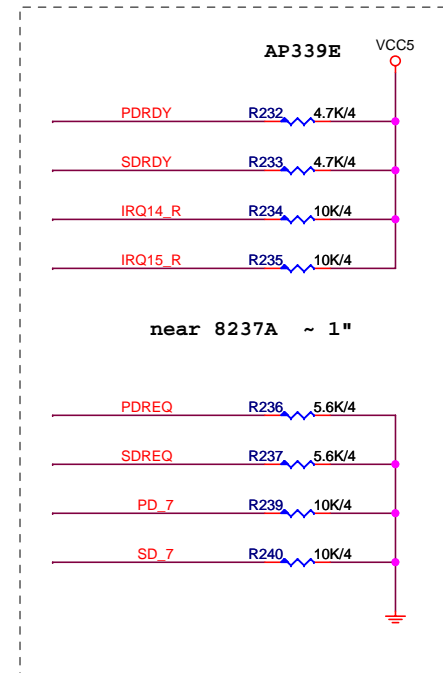
SECONDARY IDE BLOCK



SERIAL ATA CONNECTOR BLOCK

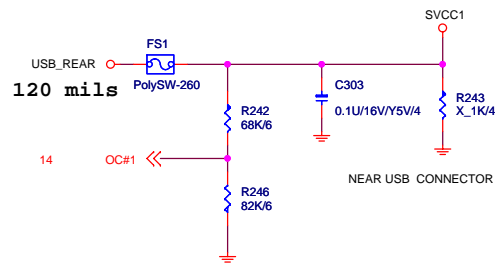


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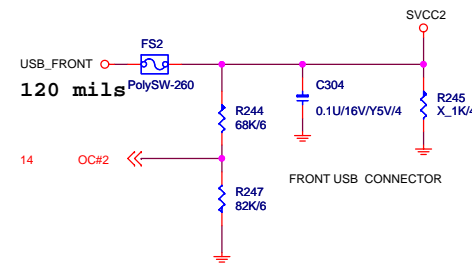


| Micro Star Restricted Secret | | |
|---|--------------|---|
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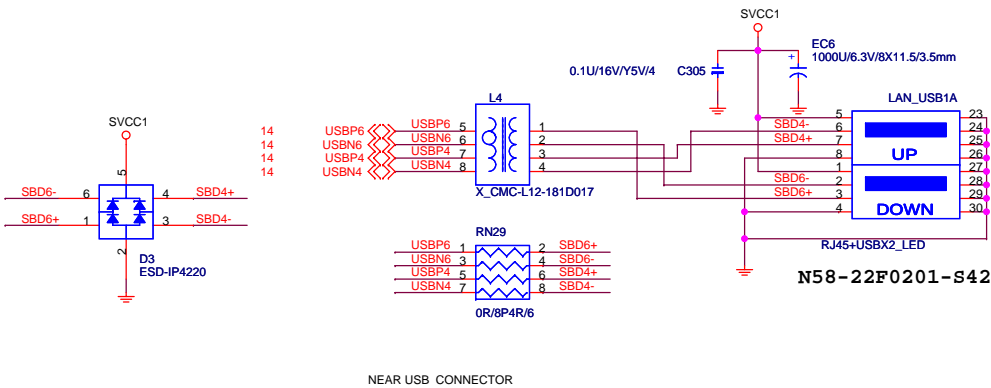
POWER CIRCUIT FOR USB PORT 0,1,2,3



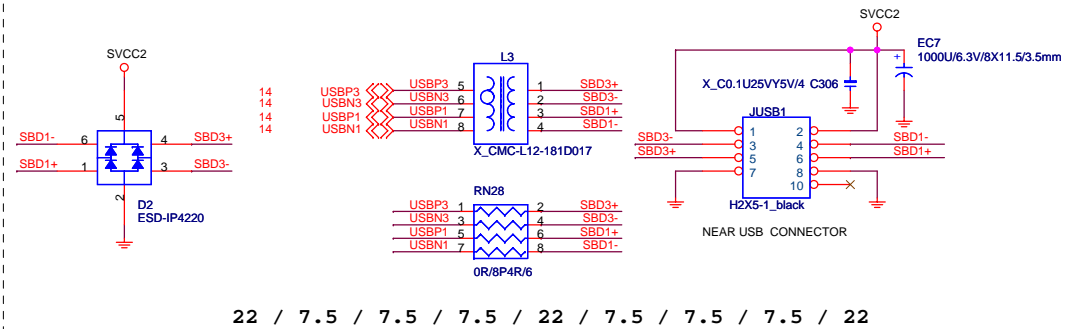
POWER CIRCUIT FOR USB PORT 4,5,6,7



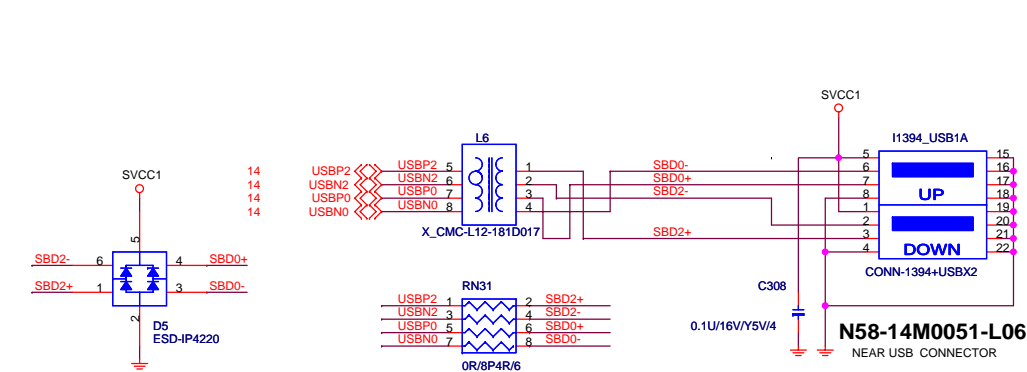
REAR PANEL USB CONNECTOR FOR USB PORT 0,1



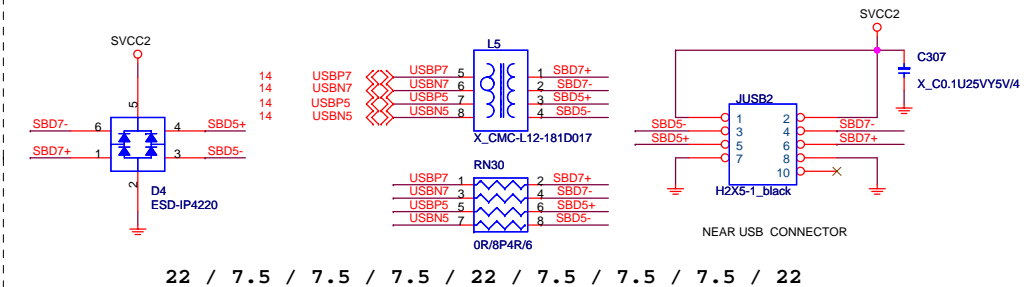
FRONT PANEL USB CONNECTOR FOR USB PORT 4,5



REAR PANEL USB CONNECTOR FOR USB PORT 2,3

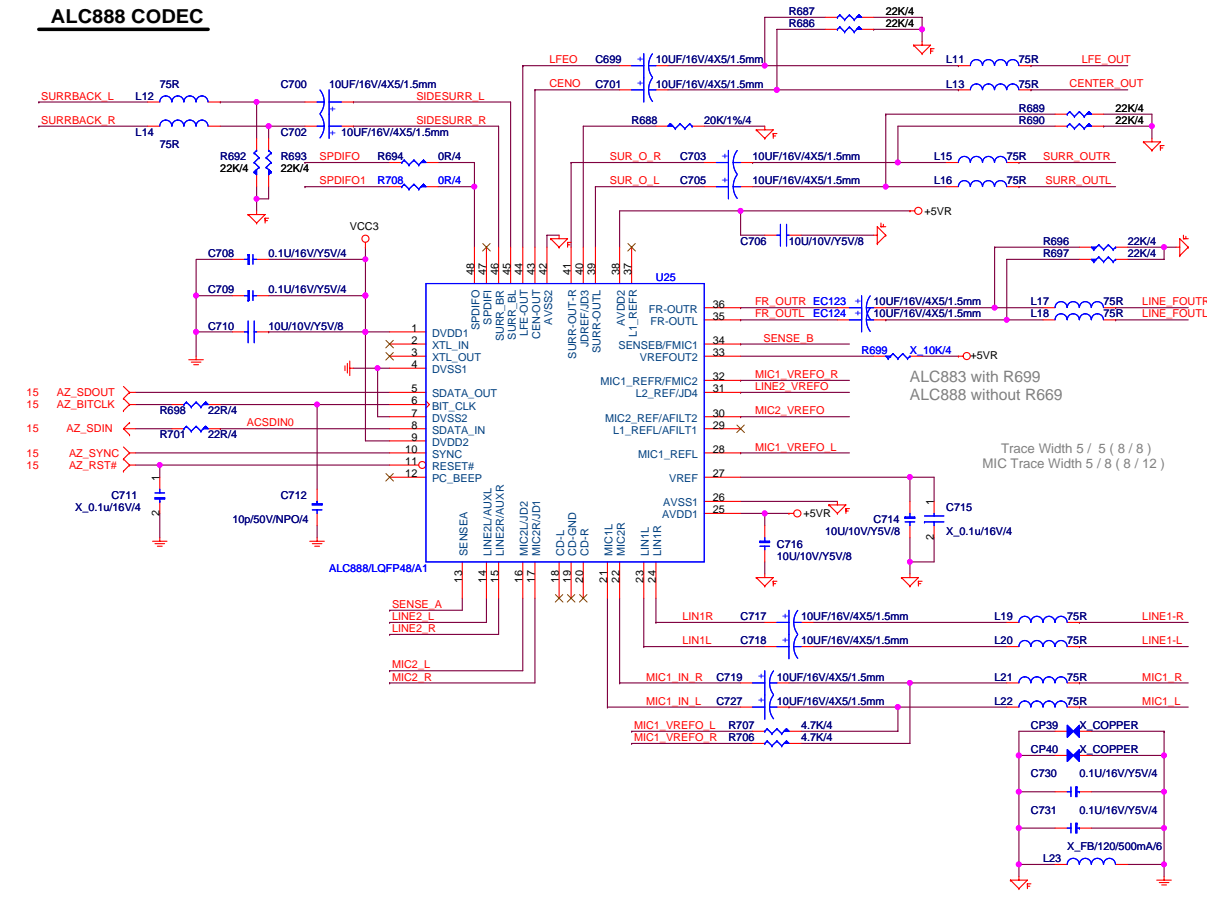


FRONT PANEL USB CONNECTOR FOR USB PORT 6,7

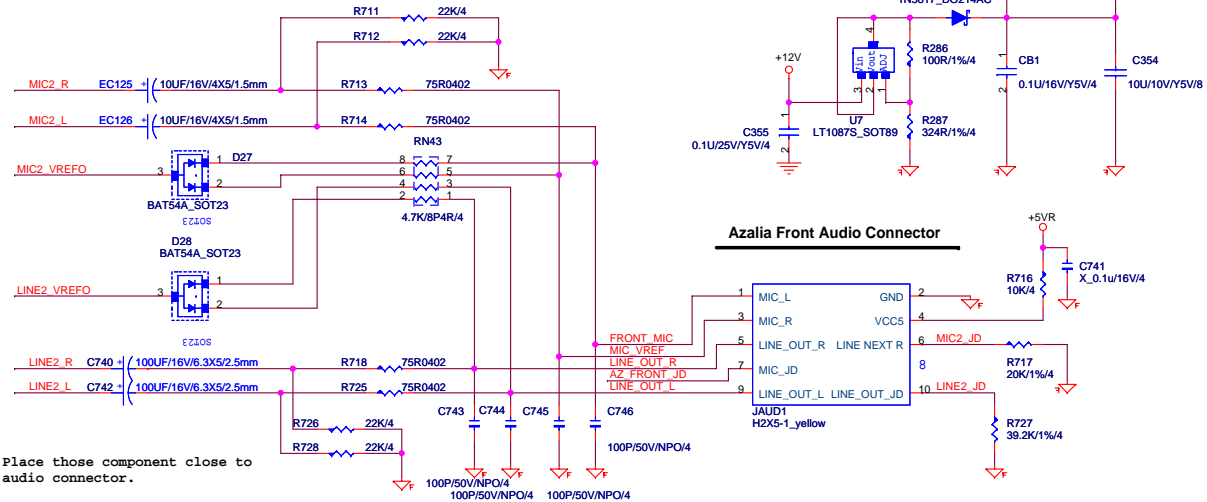


| Micro Star Restricted Secret | | |
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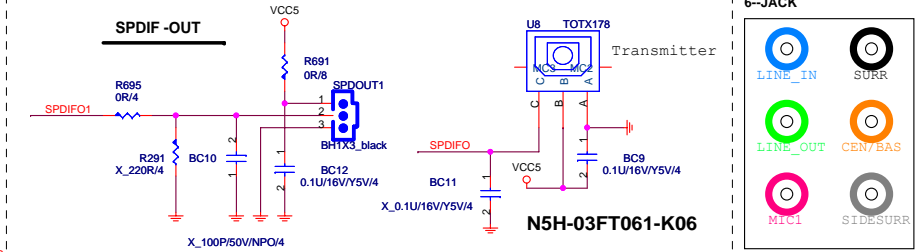
ALC888 CODEC



Speaker Out Decoupling

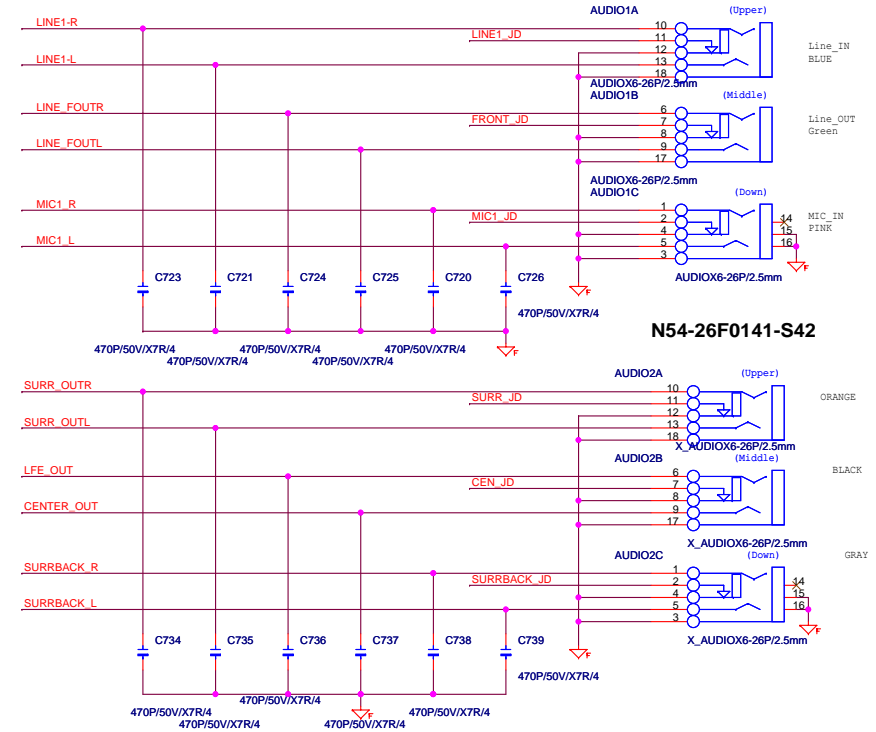


Optical : C704 / 0 Ohm ; R695 / 0 Ohm ; R291 / NC ; BC10 / NC ; R691 / 0 Ohm ; BC12 / 0.1UF
RCA : C704 / 0.01UF ; R695 / 100 Ohm ; R291 / 220 Ohm ; BC10 / 100 PF ; R691 / NC ; BC12 / NC



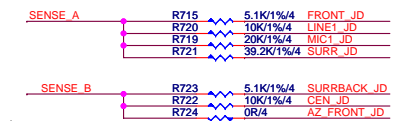
ALC883/888 JACK

Rear audio jack



| Pin/Port Assignment | Location | Functions |
|------------------------------|-------------|-------------------------|
| FRONT (pin-35,36) / Port-D | Rear Panel | Front-Out, HP-Out |
| SURR (pin-39,41) / Port-A | Rear Panel | Surr-Out |
| CEN/LFE (pin-43,44) / Port-G | Rear Panel | Cen/Lfe-Out |
| SIDE (pin-45,46) / Port-H | Rear Panel | Side-Out |
| LINE1 (pin-23,24) / Port-B | Rear Panel | Line-In |
| MIC1 (pin-21,22) / Port-C | Rear Panel | Mic-In |
| LINE2 (pin-14,15) / Port-E | Front Panel | HP-Out, Line-In, Mic-In |
| MIC2 (pin-16,17) / Port-F | Front Panel | Mic-In, Line-In, HP-Out |

ALC883/888 JACK DETECT

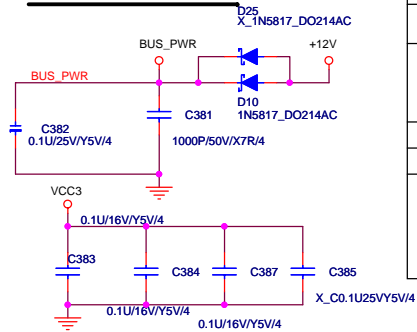


Closer to Codec.

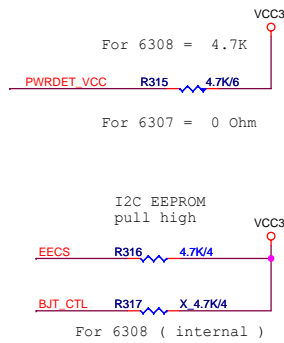
Configuration: (INTEL Reference)
Rear Panel: 6 dedicated audio jacks
Front Panel: 2 re-tasking audio jacks

| Micro Star Restricted Secret | | |
|---|-----------------|---|
| Title | HD Audio ALC888 | Rev 2.1 |
| Document Number | MS-7293F1 | |
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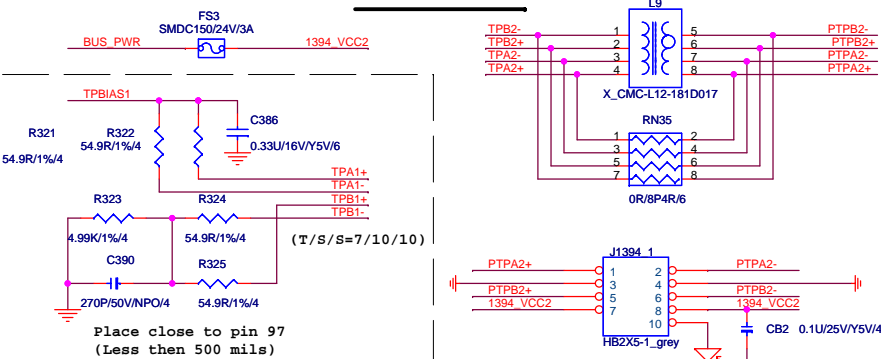
IEEE-1394



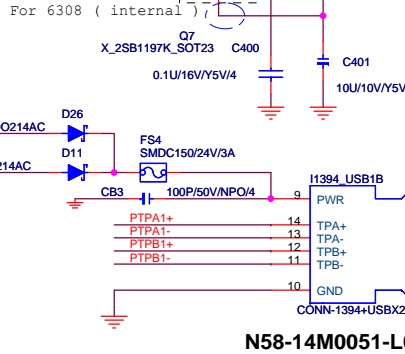
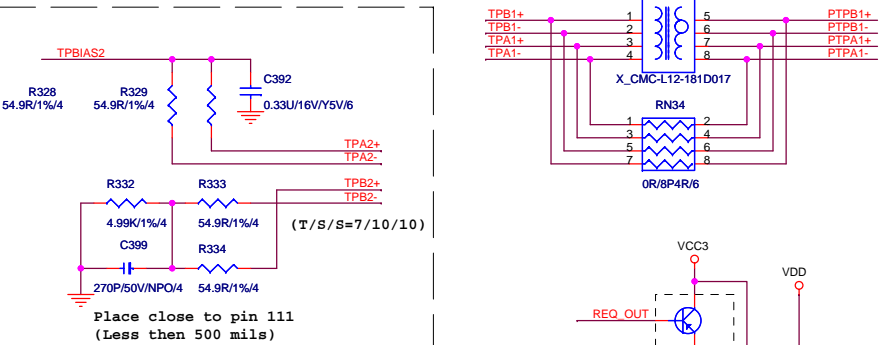
| Pin | VT6307 | VT6308P |
|-----|--------|------------|
| 84 | NC | BJT_CTL |
| 87 | NC | REG_FB |
| 88 | NC | REQ_OUT |
| 35 | VCC3 | PWRDET_VCC |
| 39 | VCC3 | VCC3 |
| 49 | VCC3 | VDD |
| 24 | VCC3 | VDD |
| 114 | VCC3 | VDD |
| 33 | VCC3 | VDD |



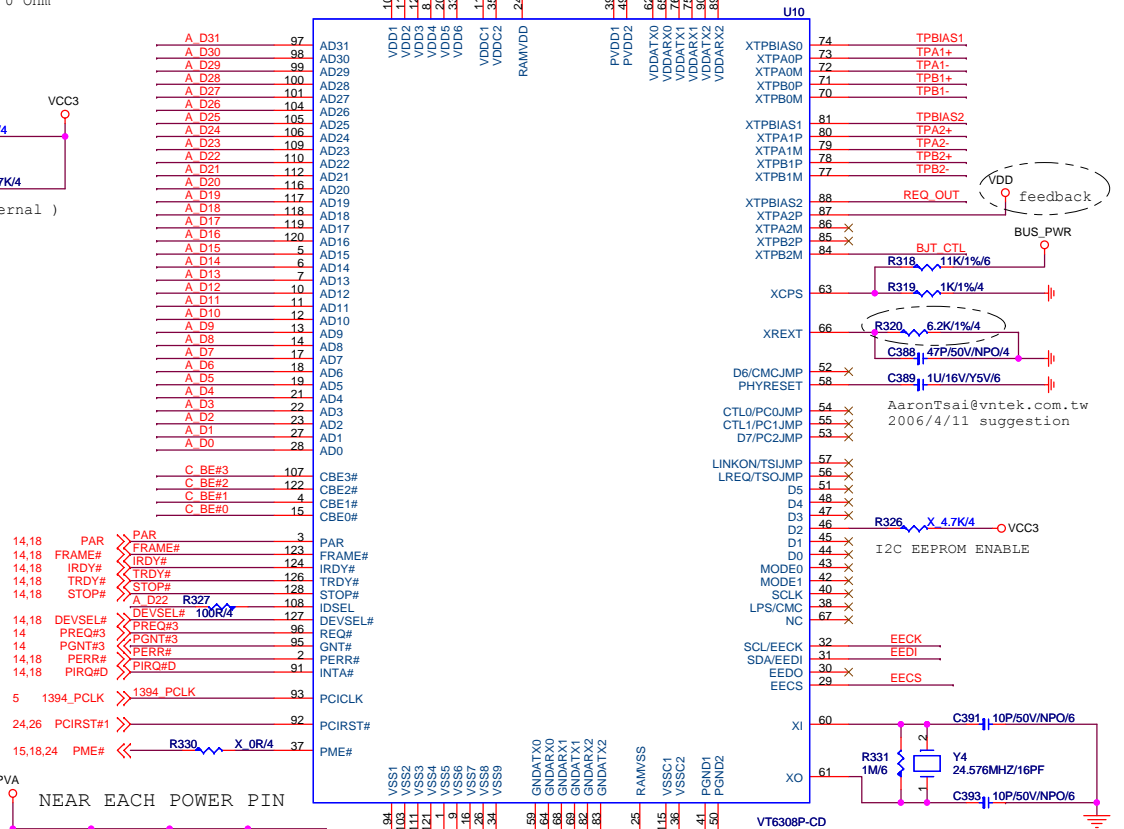
FRONT 1394 PORT 1



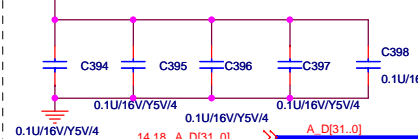
N32-2051571-H06



N58-14M0051-L06



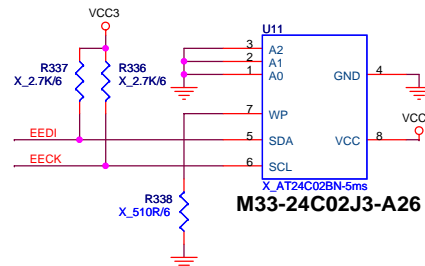
NEAR EACH POWER PIN



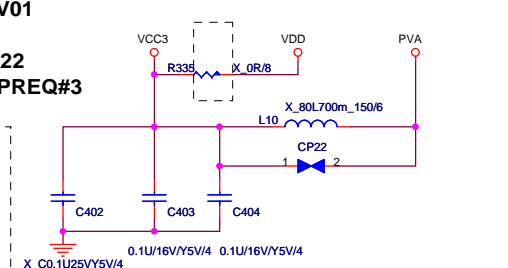
B07-6308P04-V01

PIRQ#D
IDSEL = AD22
MASTER = PREQ#3

1394-EEPROM 24C02 for 6307



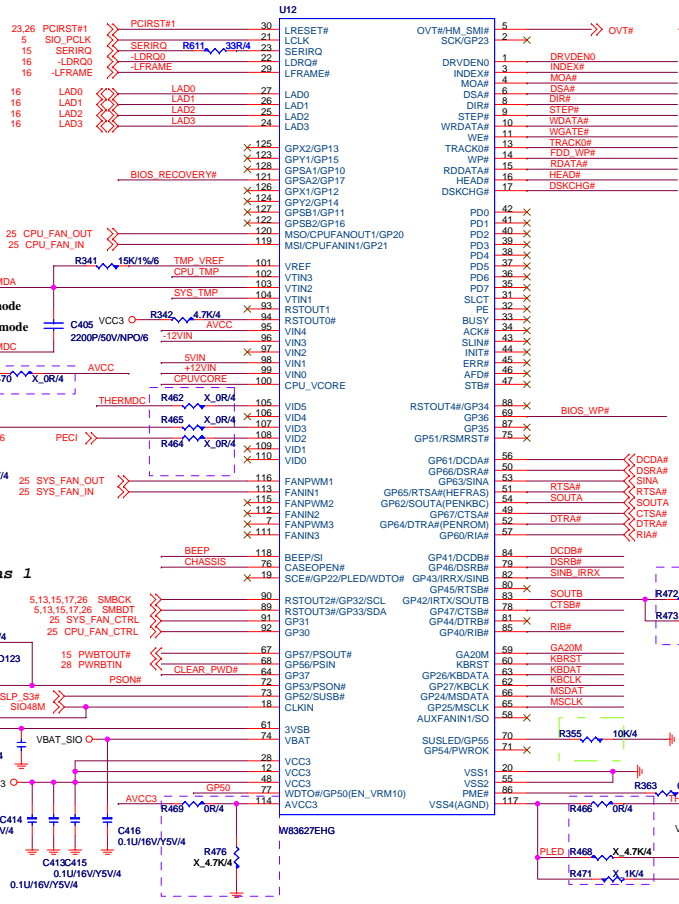
For 6307



| Micro Star Restricted Secret | | |
|---|-------------------|---|
| Title | IEEE-1394_VT6308P | Rev 2.1 |
| Document Number | MS-7293F1 | |
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Super I/O

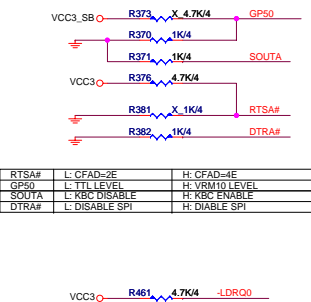
LPC SUPER I/O W83627EHG



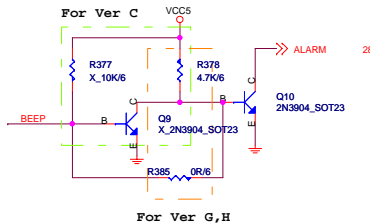
FANPWM2 & FANPWM3 are default PWM mode
FANPWM1 & CPUFANOUT1 are default DC mode

When PSIN function is disable, set CRE7 bit 0 as 1

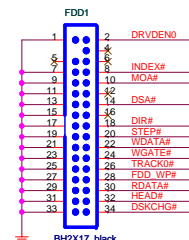
LPC I/O STRAPPING RESISTOR



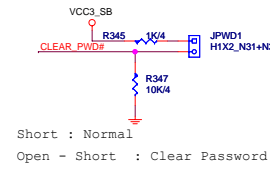
SPEAKER BLOCK



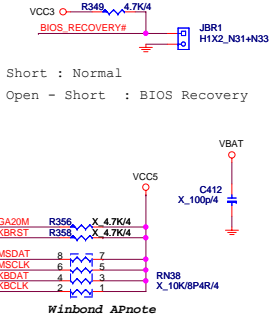
FLOPPY CONNECTOR



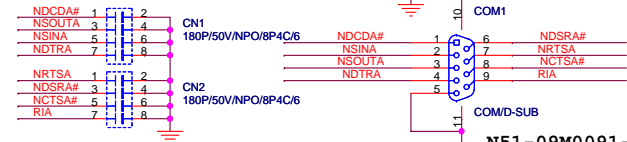
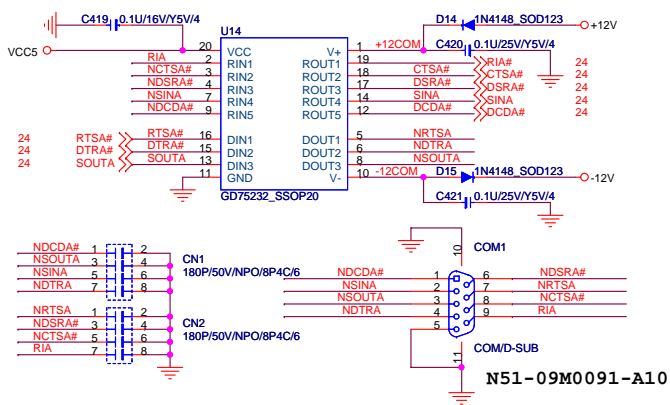
PASSWORD CLEAR JUMPER



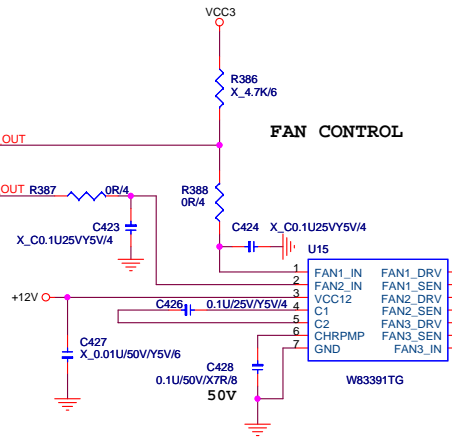
BIOS Recovery



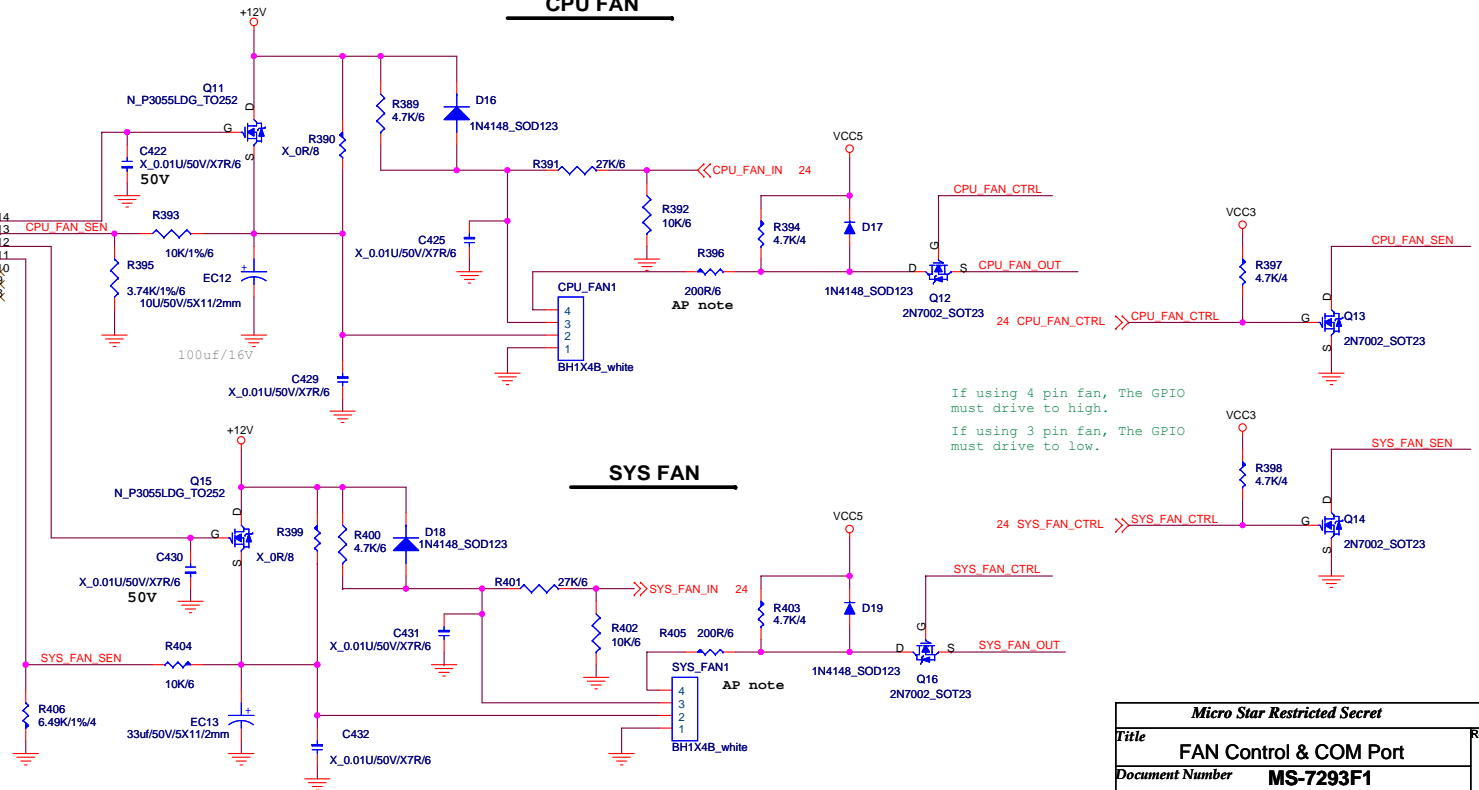
SERIAL PORT 1



FAN CONTROL



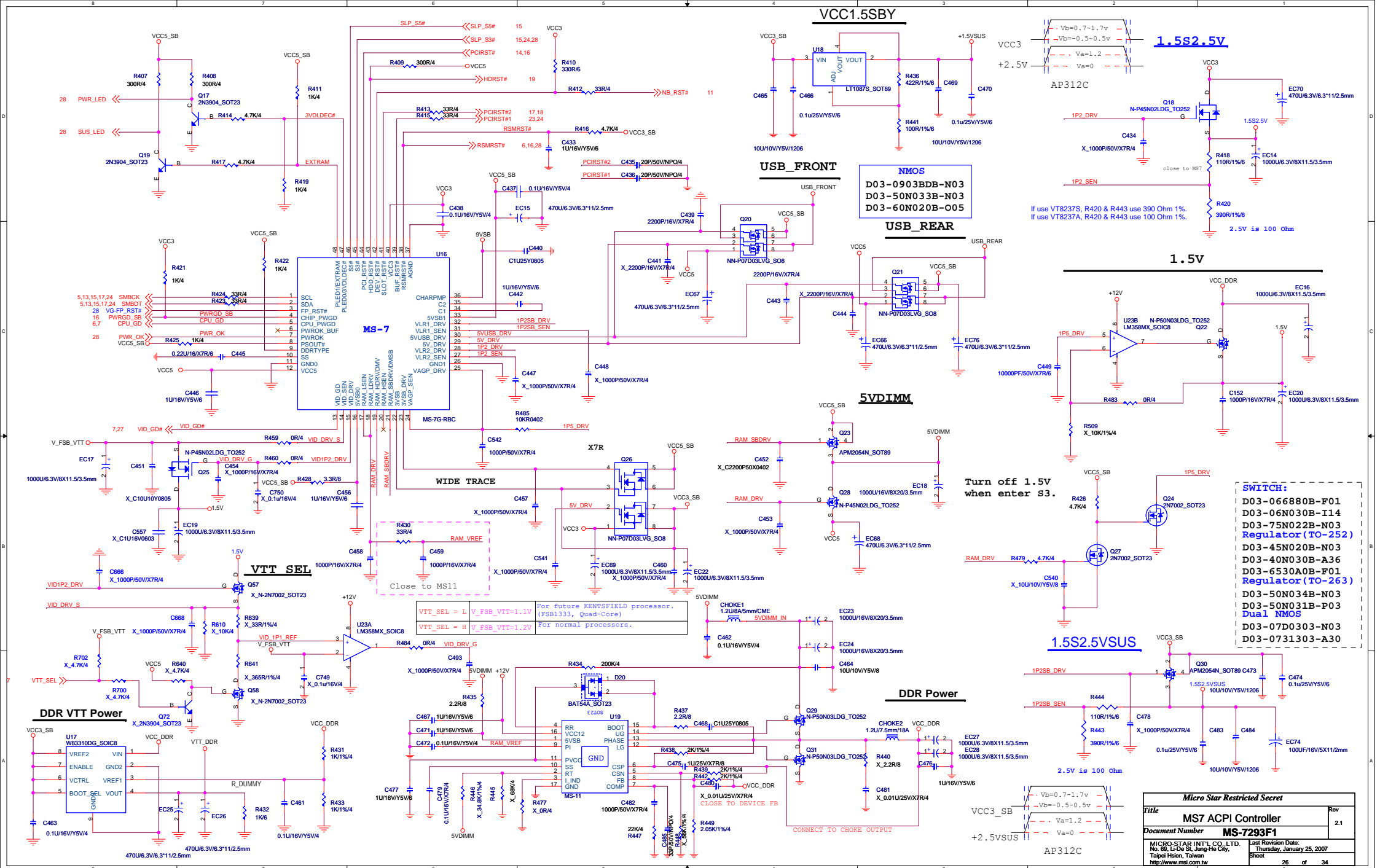
CPU FAN



SYS FAN

If using 4 pin fan, The GPIO must drive to high.
If using 3 pin fan, The GPIO must drive to low.

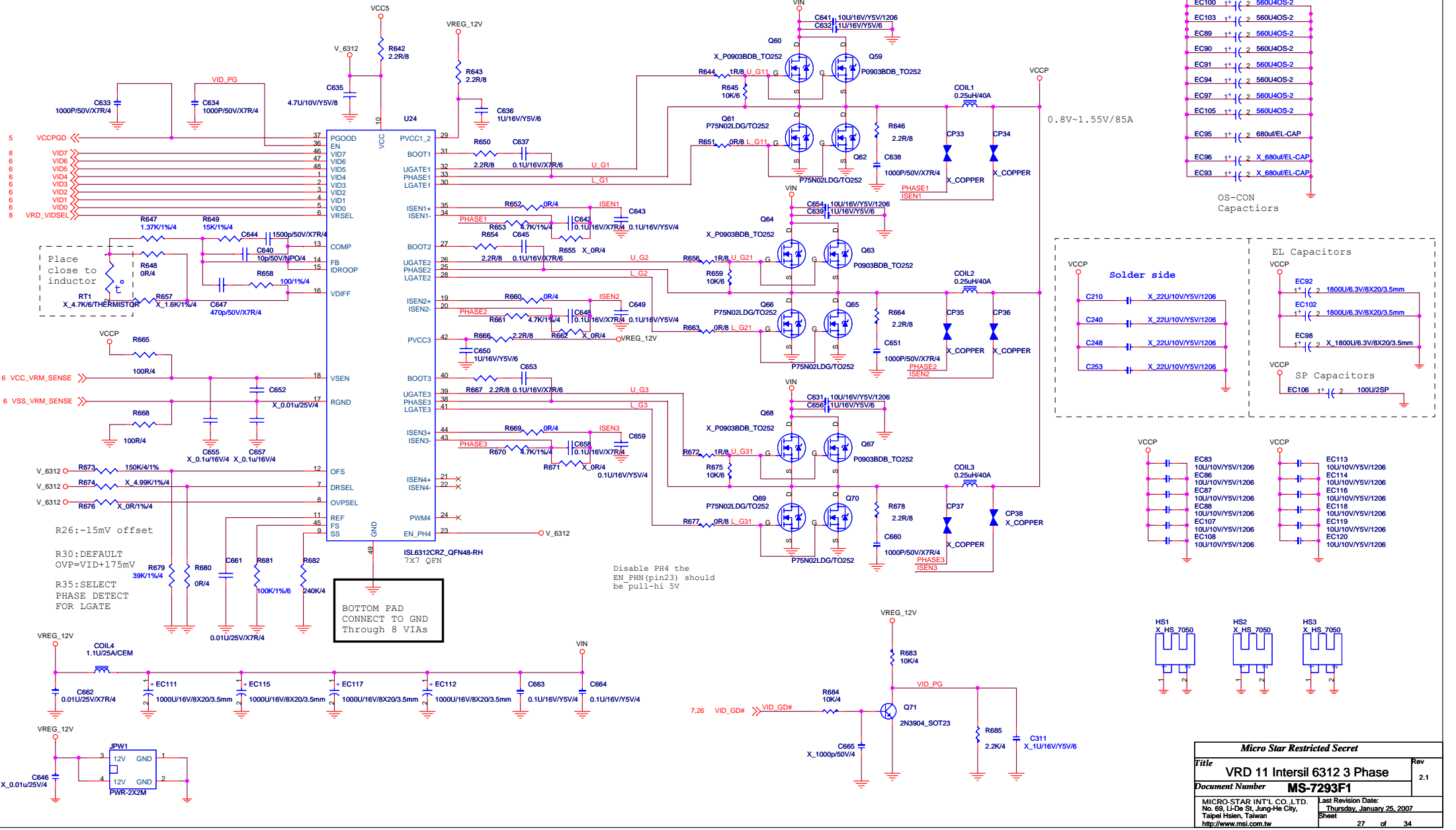
| | | |
|---|------------------------|---|
| Micro Star Restricted Secret | | |
| Title | FAN Control & COM Port | Rev 2.1 |
| Document Number | MS-7293F1 | |
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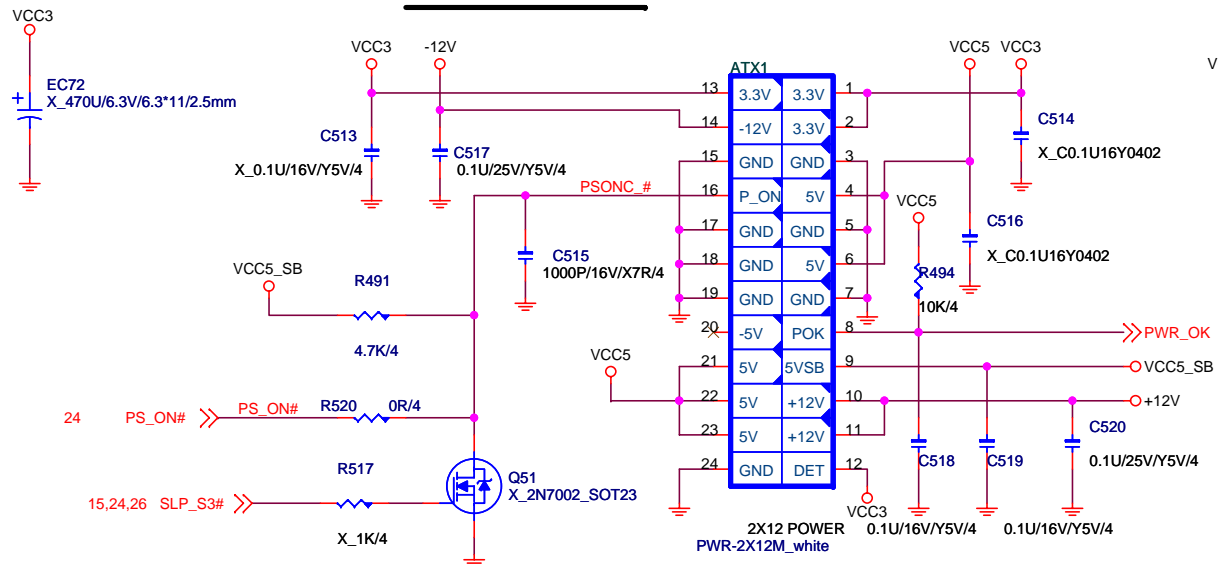
Voltage Regular Module

N-P0903BDG_TO252
P75N02LDG/TO252
C100U2SP
560U4OS-2
1800UF/6.3V
0.25uH/40A
CH-1.1U25A-LF
1000U16EL20-2

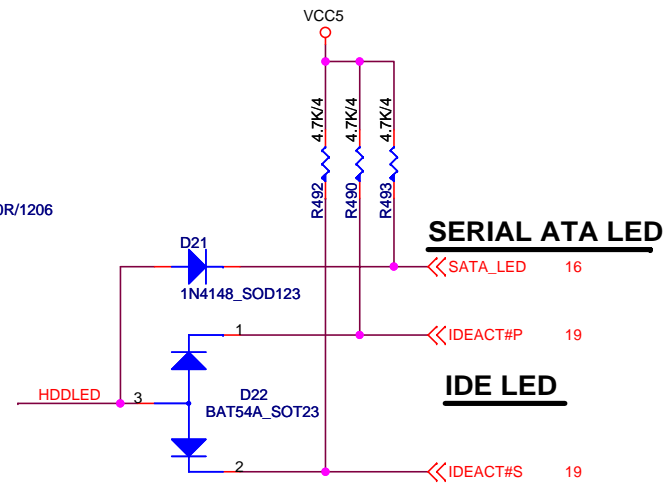
mosfet/n-channel, P0903BDG, SMT/TO252, Rds(on)=9.5mΩ(10V/25A), Vgs(on)=1~3V, Id=50A, Ciss=1800pf, Qg=50nC, Vds=25V, Vgs=±20V, RoHS compliance
ESR<13mΩ, Ripple cur.<2.7A, LC<12uA, 105C
CAP, OS-CON, 560u/4V, Dip-2/8*9/3.5mm, ESR<7mohm, Ripplecur.=6100mA, Lc. <500uA, SPEC series, RoHS compliance
ESR<12mΩ, Ripplecur<2350mA, 105C, longlife change from 2000hrs to 3000hrs, K2J 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



ATX Connector

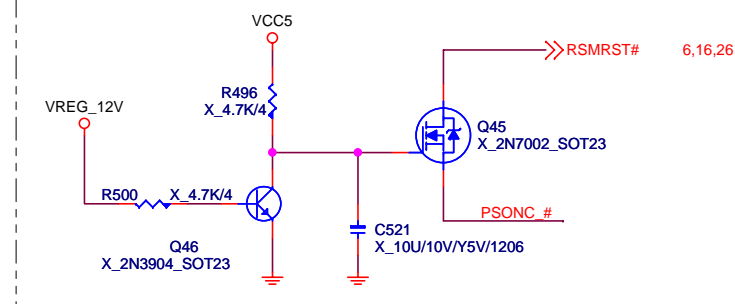


SERIAL ATA LED

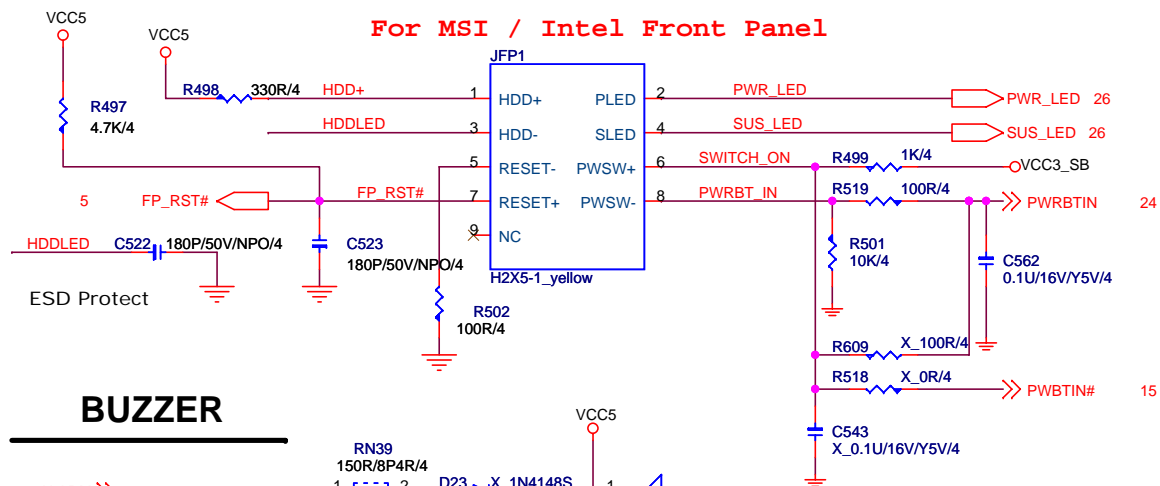


IDE LED

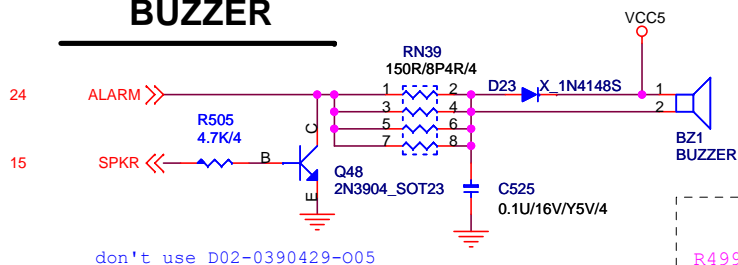
Support when not plug in 2x2 +12V power cable
,system will auto shutdown.



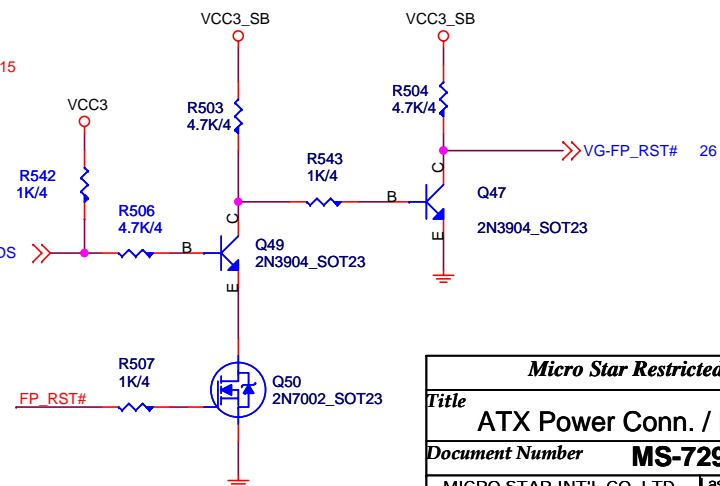
For MSI / Intel Front Panel



BUZZER



| | W83627EHG | W83627DHG | SUSB# |
|------|-----------|-----------|---------|
| R499 | 1K Ohm | 4.7K Ohm | Remove |
| R519 | 100 Ohm | Remove | Remove |
| R501 | 10K Ohm | 100 Ohm | 100 Ohm |
| R609 | Remove | 100 Ohm | Remove |
| R518 | Remove | Remove | Stuff |



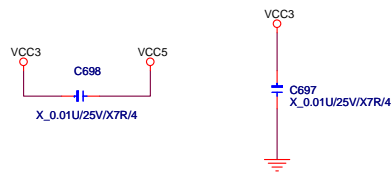
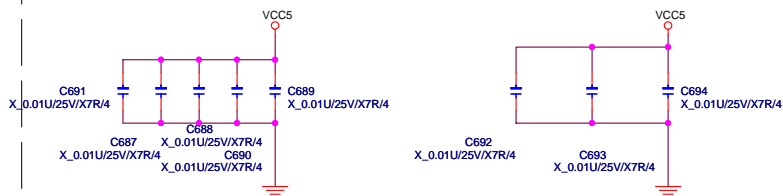
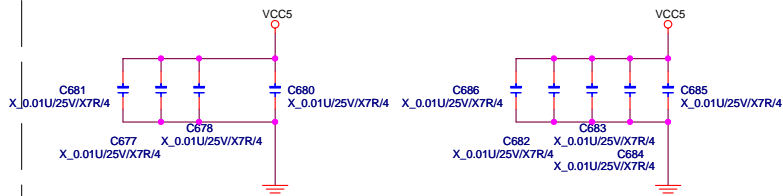
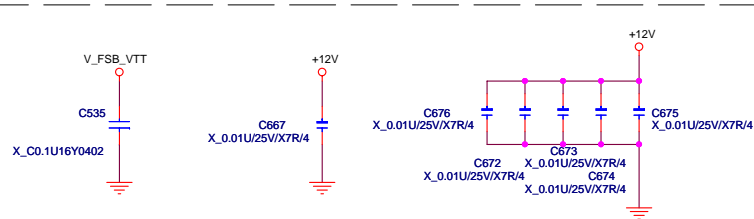
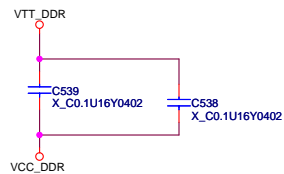
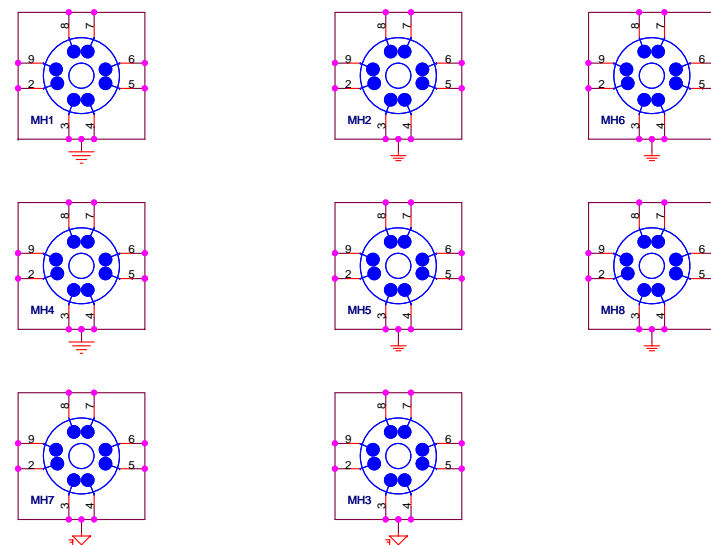
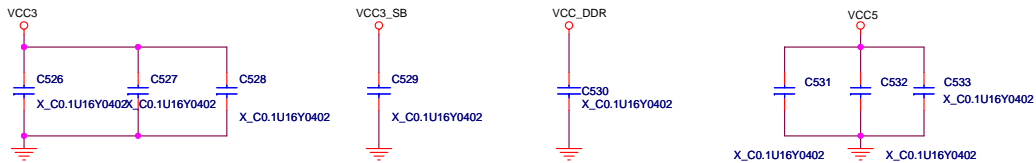
Micro Star Restricted Secret

| | |
|--------------|-------------------------------|
| Title | ATX Power Conn. / Front Panel |
|--------------|-------------------------------|

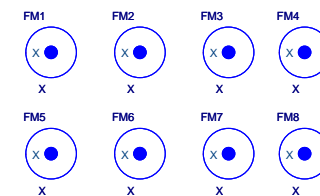
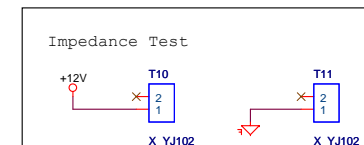
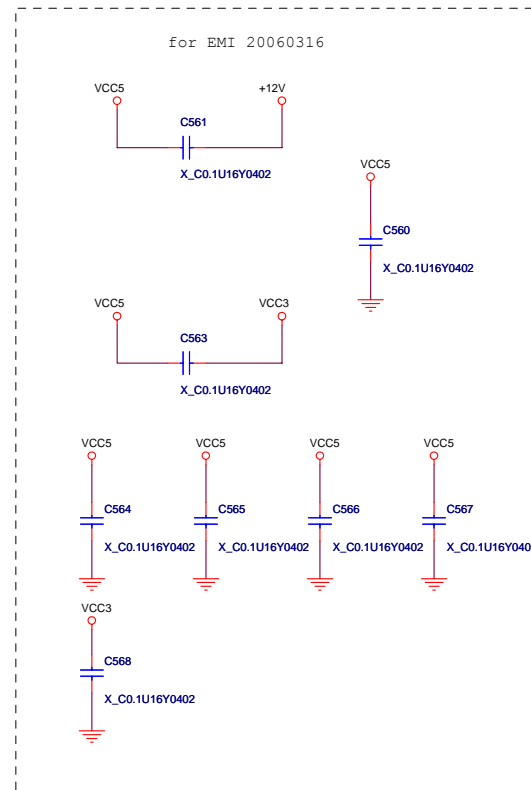
Document Number MS-7293F1

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for EMI Request 20060414



| | | |
|--|--------------------|---|
| Micro Star Restricted Secret | | |
| Title | Holes / Decoupling | Rev 2.1 |
| Document Number | MS-7293F1 | |
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- 1. Page 6 :To reserved r486 r487 r488 r489 r508 r512 to support kentsfield CPU
- 2. Page 14 : U4 chane to BT8237S (SouthBridge)
- 3. Page 14 , Page15 : C200 ,C239, C315,C243 change to 0805 part
- 4. Page 26 : S3 Ctrl circuit and 1.5V power regulator circuit modify
- 5. Page 26 : C440 C468 change to 1U/25V/0805

| | | |
|--|---------|---|
| Micro Star Restricted Secret | | |
| Title | History | Rev 2.1 |
| Document Number MS-7293F1 | | |
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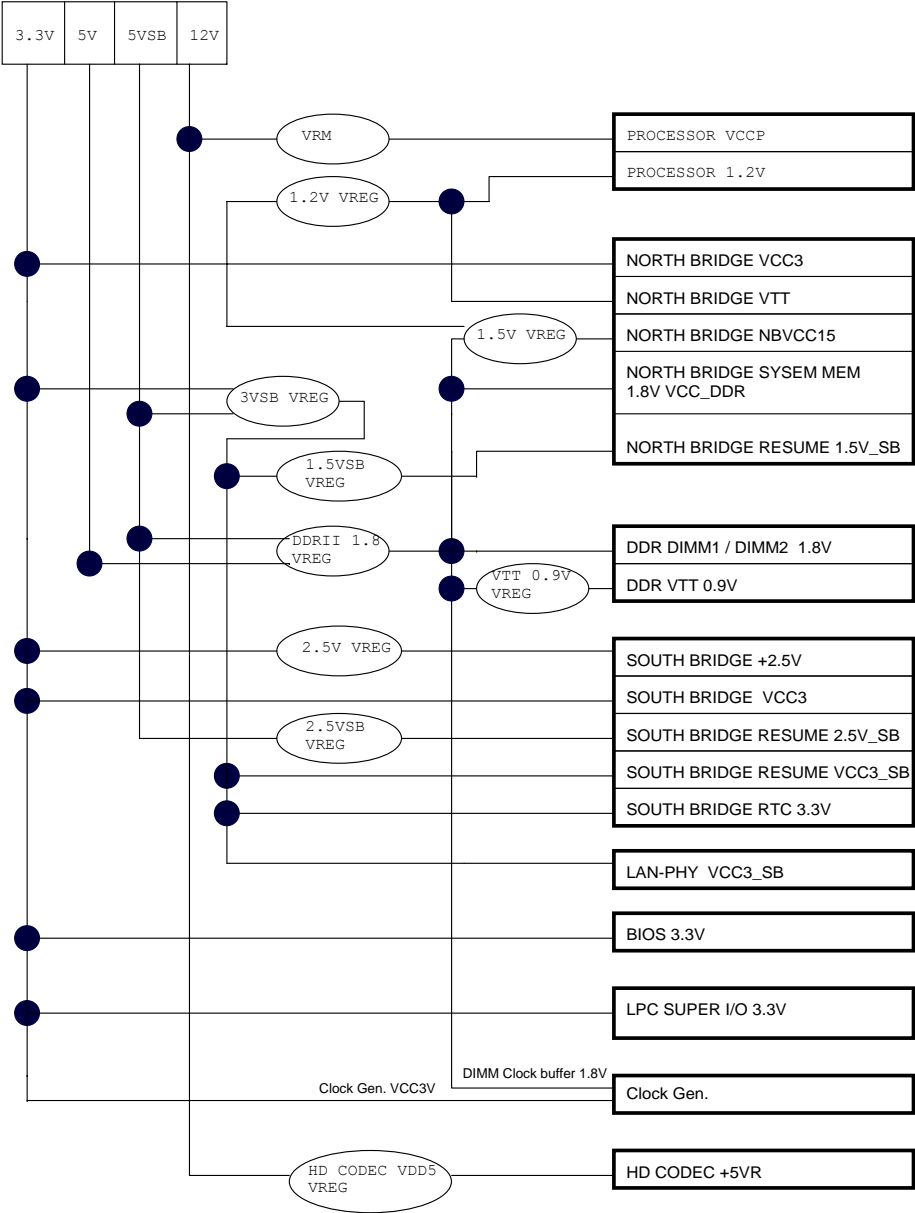
BAT-BCR2032P

M31-39V0468-W03 P80-0729320-G37

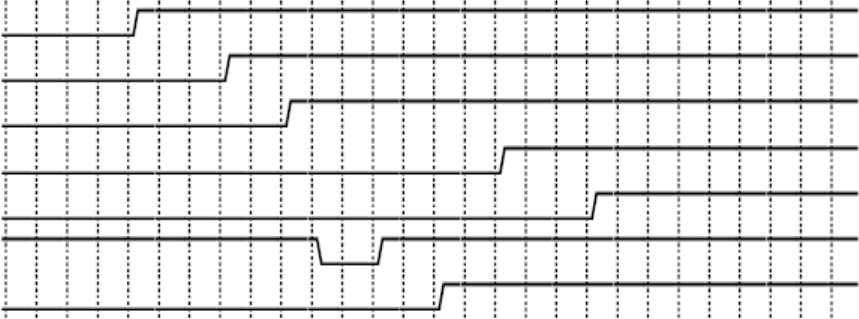


| | | |
|---|-------------|--|
| Micro Star Restricted Secret | | |
| Title | Manual Part | Rev 2.1 |
| Document Number | MS-7293F1 | |
| MICRO-STAR INT'L CO.,LTD. No. 68, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw | | Last Revision Date: Thursday, January 25, 2007 Sheet 31 of 34 |

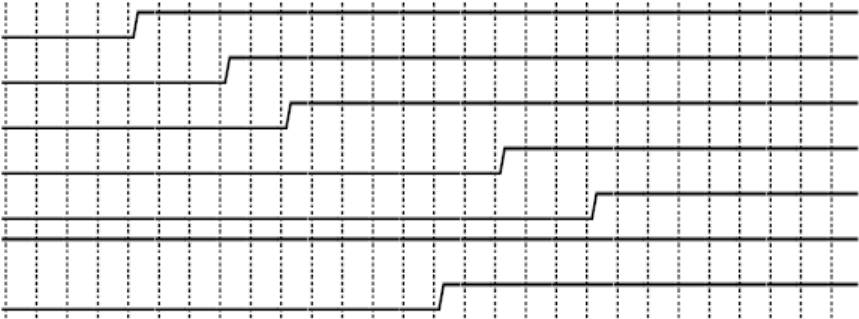
PT890CE PLATFORM POWER DELIVERY Map



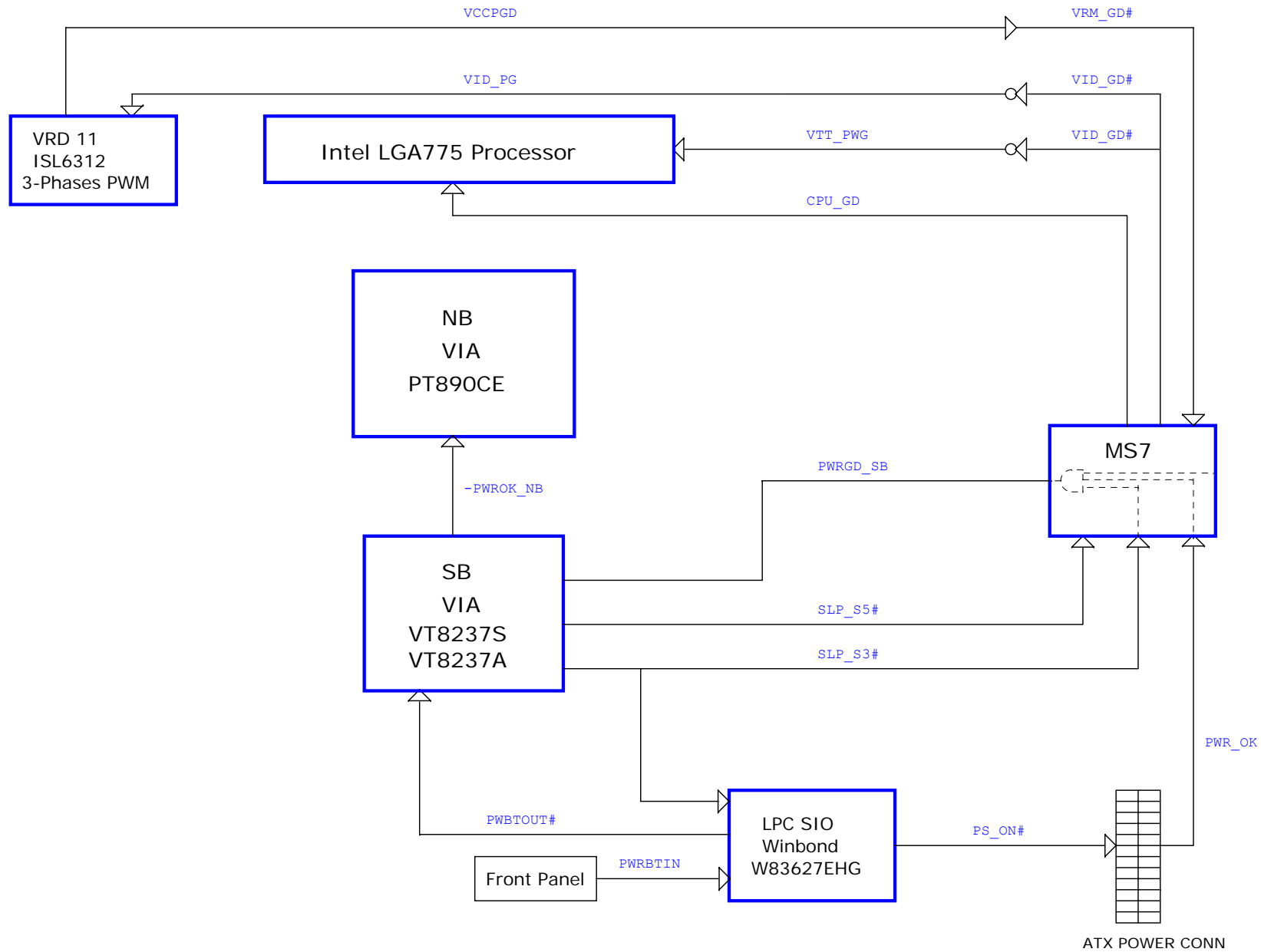
Power On Sequence with default OFF



Power On Sequence with default ON

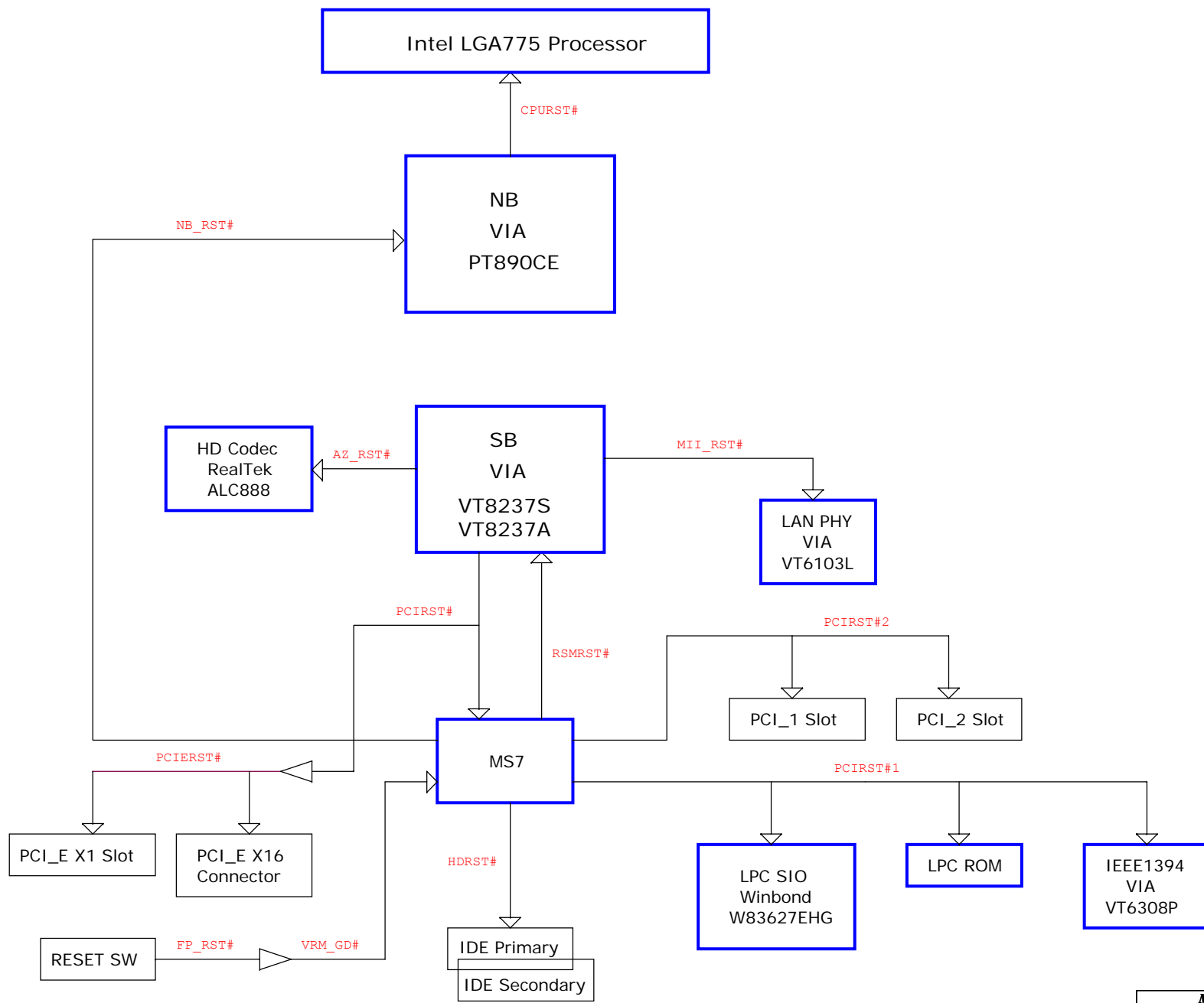


PWROK Map



| Micro Star Restricted Secret | | |
|--|-----------|---|
| Title | PWROK Map | Rev 2.1 |
| Document Number | MS-7293F1 | |
| MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw | | Last Revision Date: Thursday, January 25, 2007 Sheet 33 of 34 |

RESET Map



| Micro Star Restricted Secret | | |
|--|-----------|--|
| Title | RESET Map | Rev 2.1 |
| Document Number | MS-7293F1 | |
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