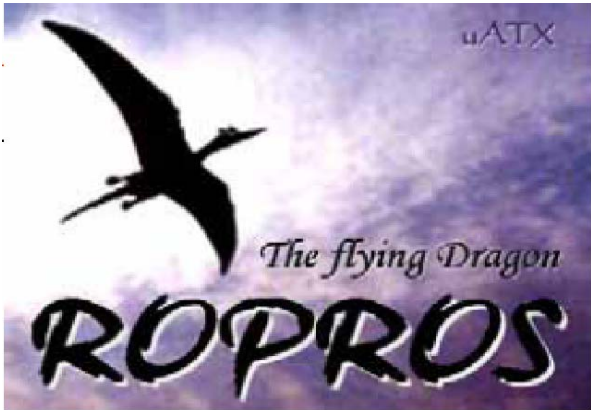


Ropros-E (Mate/VS) / Poseidon-E / GAIA

MS-7428N1 Version 0C



- How to distinguish the different SKU
- BLUE Color which mean all model need use
 - ORANGE Color which mean ROPROS-MA use
 - BROWN Color which mean the part reserve
 - PINK Color which mean ROPROS-VS (G45/G43)
 - Green Color which mean Poseidon-E
 - Purple Color which mean GAIA

| | | |
|------------------|--------------|--------------------|
| MS-6619N1 | ERP Number | Function |
| MS-7428-XX | 601-7428-XXX | Mainboard |
| MS-4032-020 (MA) | 604-4032-020 | Front USB/ PWR BTN |
| MS-4142-010 (VS) | 604-4142-010 | Front USB/ PWR BTN |
| MS-4079- (PSD) | 604-4079- | Front USB |

CPU:
Intel Yorkfield, Wolfdale,
Conroe, Conroe-1M, Conroe-L - 65W CPU
(FSB1333/1066/800)

System Chipset:
Intel EaglelakeG4X - GMCH (North Bridge)
Intel ICH10/ICH10R (South Bridge)

On Board Chipset:
Gigabit LAN - Broadcom BCM5784M
HD Audio Codec - Realtek ALC262 VD
LPC Super I/O : SMSC SCH5617
Clock GEN - IDTCV184-2
TPM - SLB 9635 TT1.2

Main Memory:
Dual Channel DDR II-800*4 (Up to 4GByte)


Intersil PWM:
VRD11 Intersil 6312 (3phase)

Expansion Slots:
PCI-E[X16] Slot *1
PCI-E[X1] Slot *1
PCI Slot *2

| | | |
|------------|--------------|--------------------------|
| MS-XXXXN1 | ERP Number | Function |
| MS-7429-XX | 601-7429-XXX | Mainboard |
| | | SDVO to LVDS - PCIE[X16] |
| | | SIO for control panel |
| | | HD Audio card |

| Model type | Function | BOM Config | ERP BOM No | BOM Opt. |
|--------------|---|------------|--------------|----------|
| MS-7428N1-xx | Eaglelake G43+ICH10+LPT+COM+TPM+KBMS for MATE. | CFG-MA | 601-7428-01 | |
| MS-7428N1-xx | Eaglelake G45+ICH10+F-USB2+KB+HD Audio+SYS FAN for VS. | CFG-VS_G45 | 601-7428-02 | |
| MS-7428N1-xx | Eaglelake G43+ICH10+F-USB2+KB+HD Audio+SYS FAN+2DIMMs for VS. | CFG-VS_G43 | 601-7428-03 | |
| MS-7428N1-xx | Eaglelake G45+ICH10R+F-USB2+KB+HD Audio+SYS FAN+6SATA for VS. | CFG-PSD | 601-7428-04 | |
| MS-7429N1-xx | Eaglelake GXX+ICHXX+ ?????????????? for GAIA | CFG-GAIA | 601-7429-XXX | |

| CONTENT | SHEET |
|---|-------|
| Cover Sheet / Block Diagram | 1-2 |
| Intel LGA775 CPU - Signals / PWR / GND | 3-5 |
| Eaglelake - FSB / PCIE / VGA / MISC | 6-7 |
| Eaglelake - MEM_DDR2 / Power / GND | 8-10 |
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| ICH10 - Host/ DMI/ SATA/ Audio/ SPI / RTC/ MSIC | 12 |
| ICH10 - Power / GND | 13 |
| DDR II - DIMM 1 / 2 / 3 / 4 | 14-15 |
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| SCH5617C / COM1&2 / FDD | 17 |
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| VGA Connector | 22 |
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| MS7 ACPI Controller | 25 |
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MS-7428N1

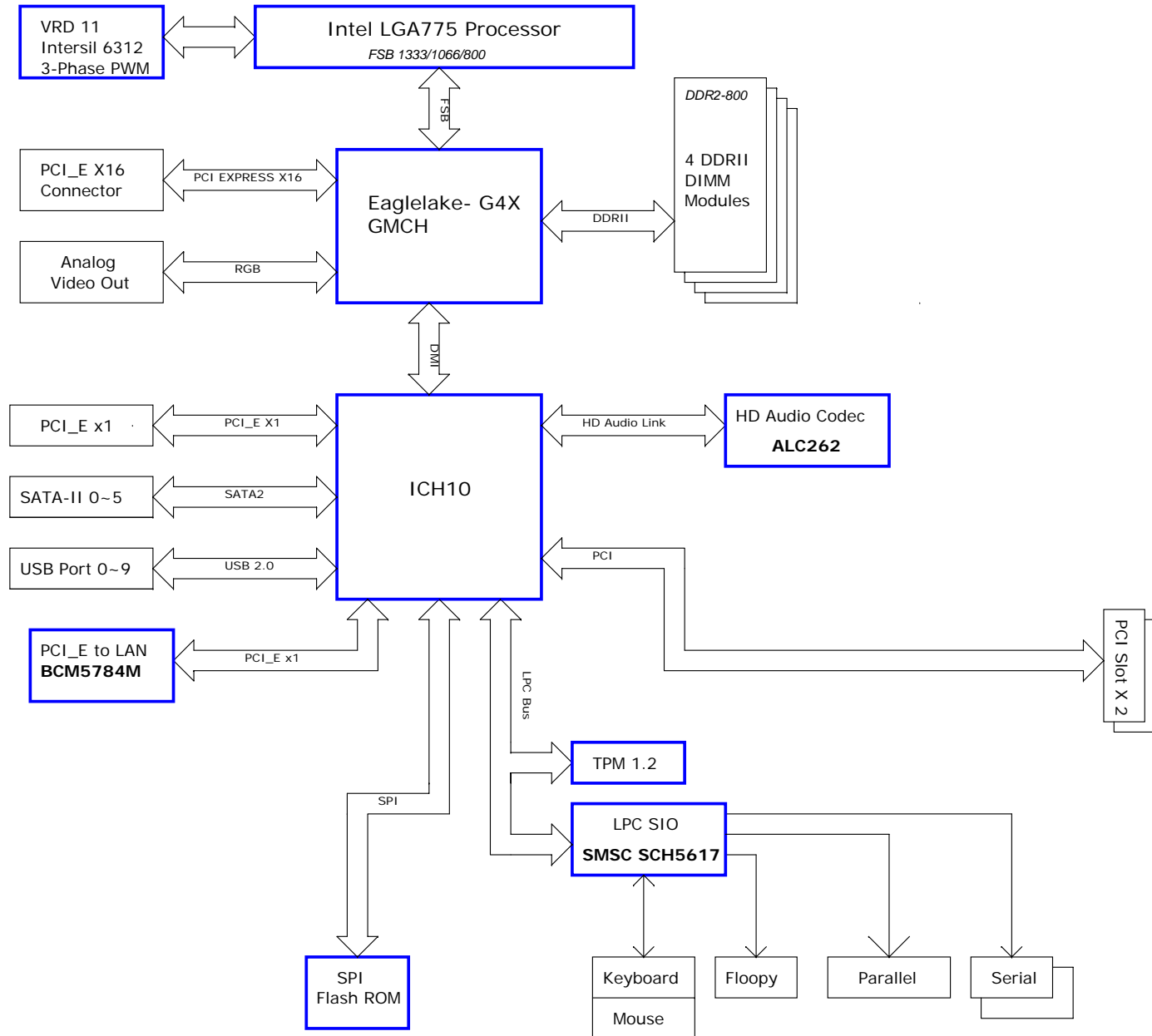
Size Custom

Document Description
COVER SHEET

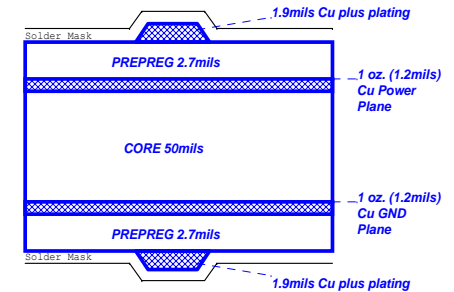
Rev 0C

Date: Monday, August 25, 2008Sheet 1 of 35

Block Diagram



Board Stack-up (1080 Prepreg Considerations)



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

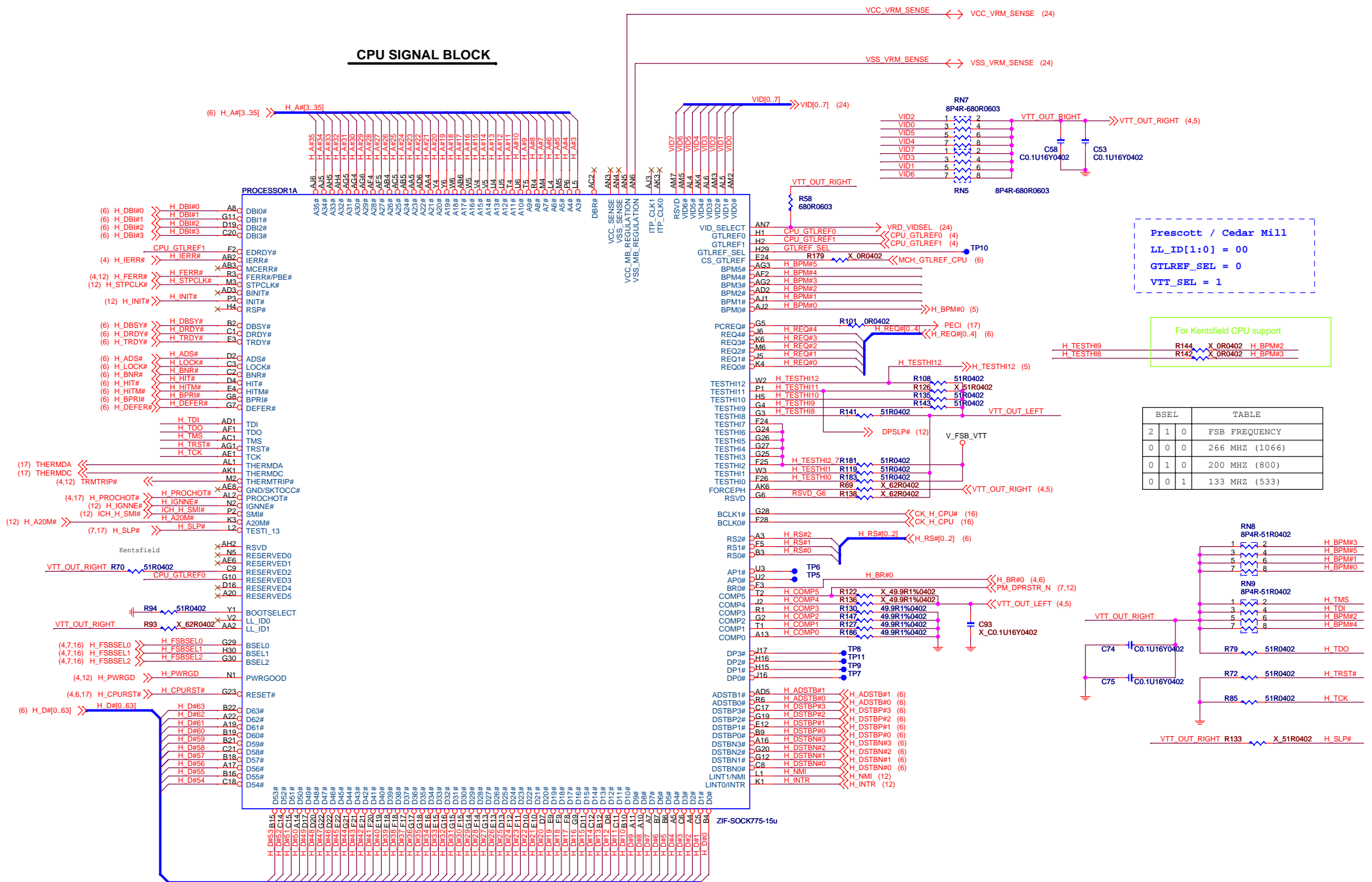


MICRO-STAR INT'L CO.,LTD

MS-7428N1

| Size | Document Description | Rev |
|-------------------------------|----------------------|-----|
| Custom | BLOCK DIAGRAM | 0C |
| Date: Monday, August 25, 2008 | Sheet 2 of 35 | |

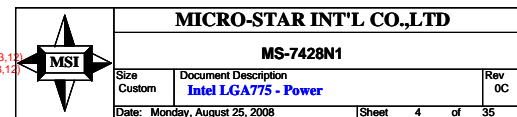
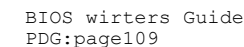
CPU SIGNAL BLOCK




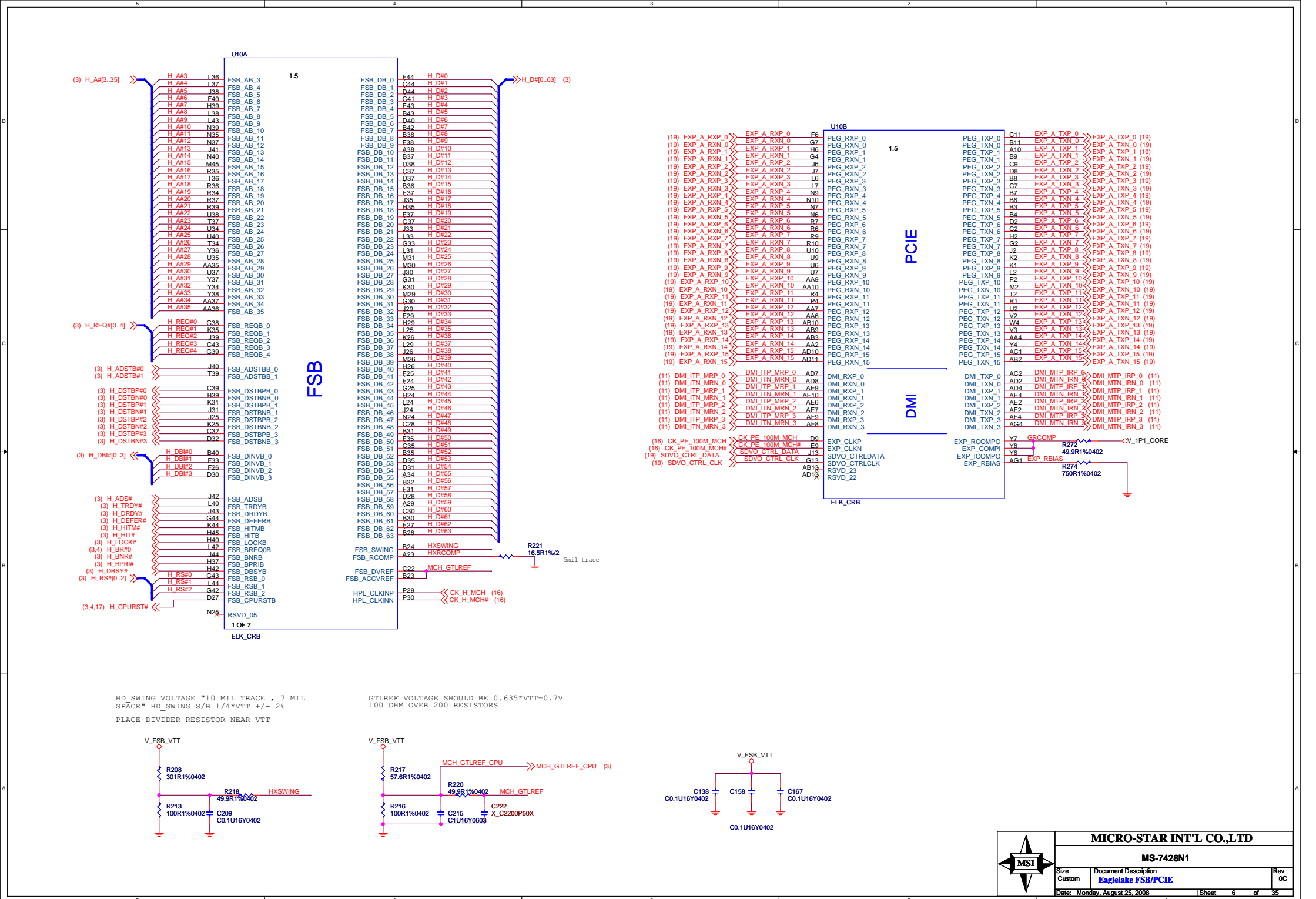
MICRO-STAR INT'L CO.,LTD

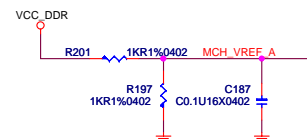
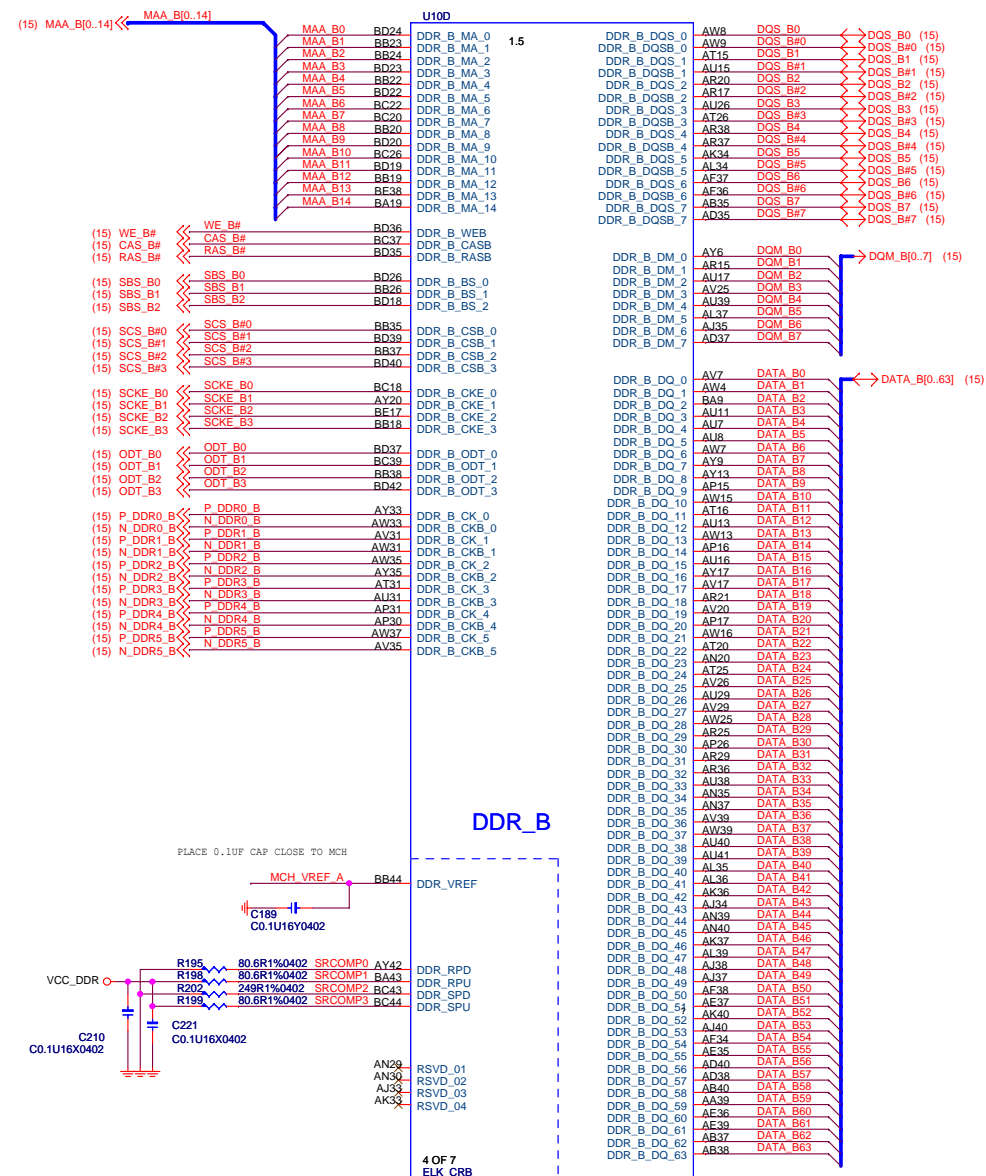
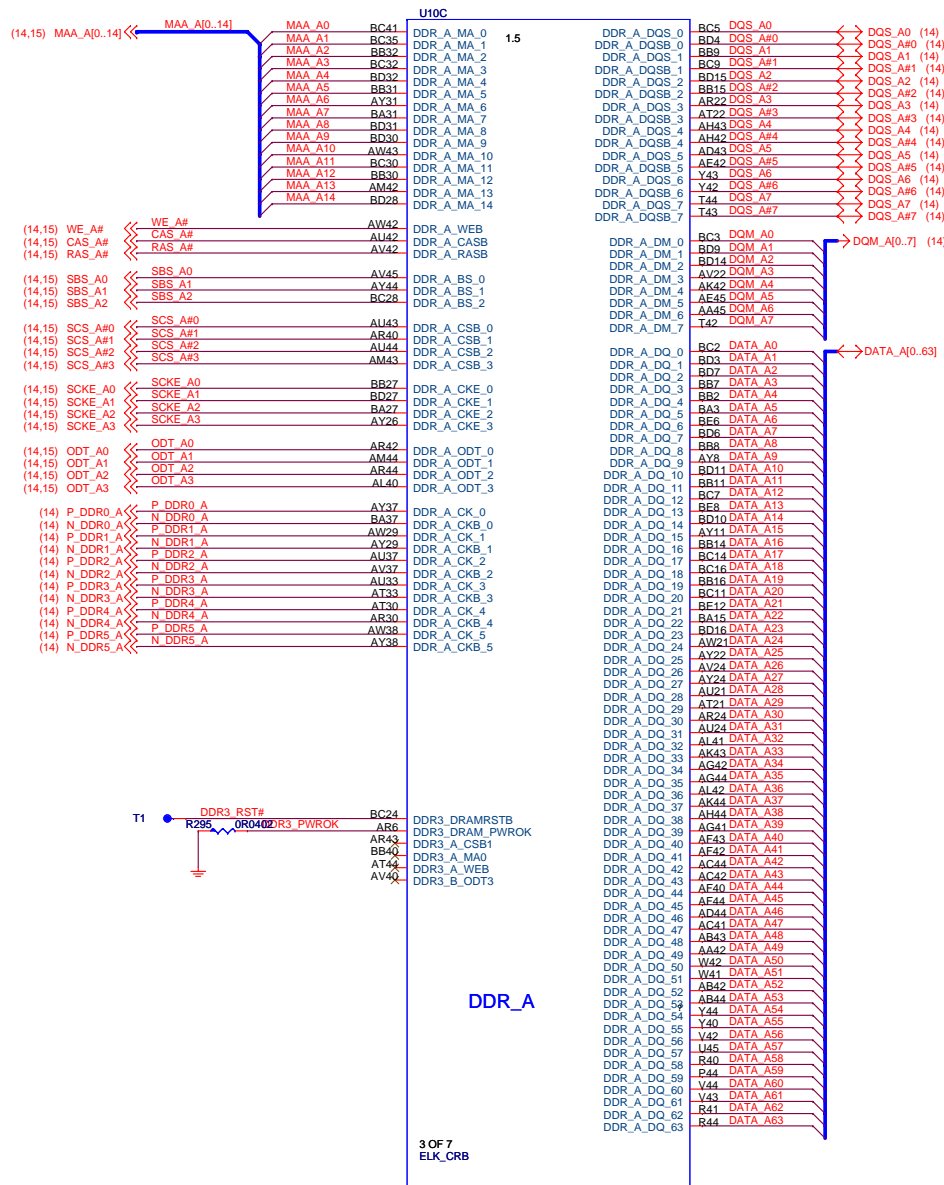
MS-7428N1

| | | |
|-------------------------------|---|-----------|
| Size Custom | Document Description Intel LGA775 - Signals | Rev 0C |
| Date: Monday, August 25, 2008 | Sheet 3 of 35 | |



| | | | | |
|---|---------------------------------|---|---------------|--|
|  | MICRO-STAR INT'L CO.,LTD | | | |
| | MS-7428N1 | | | |
| | Size Custom | Document Description Intel LGA775 CPU - GND | Rev 0C | |
| | Date: Monday, August 25, 2008 | | Sheet 5 of 35 | |

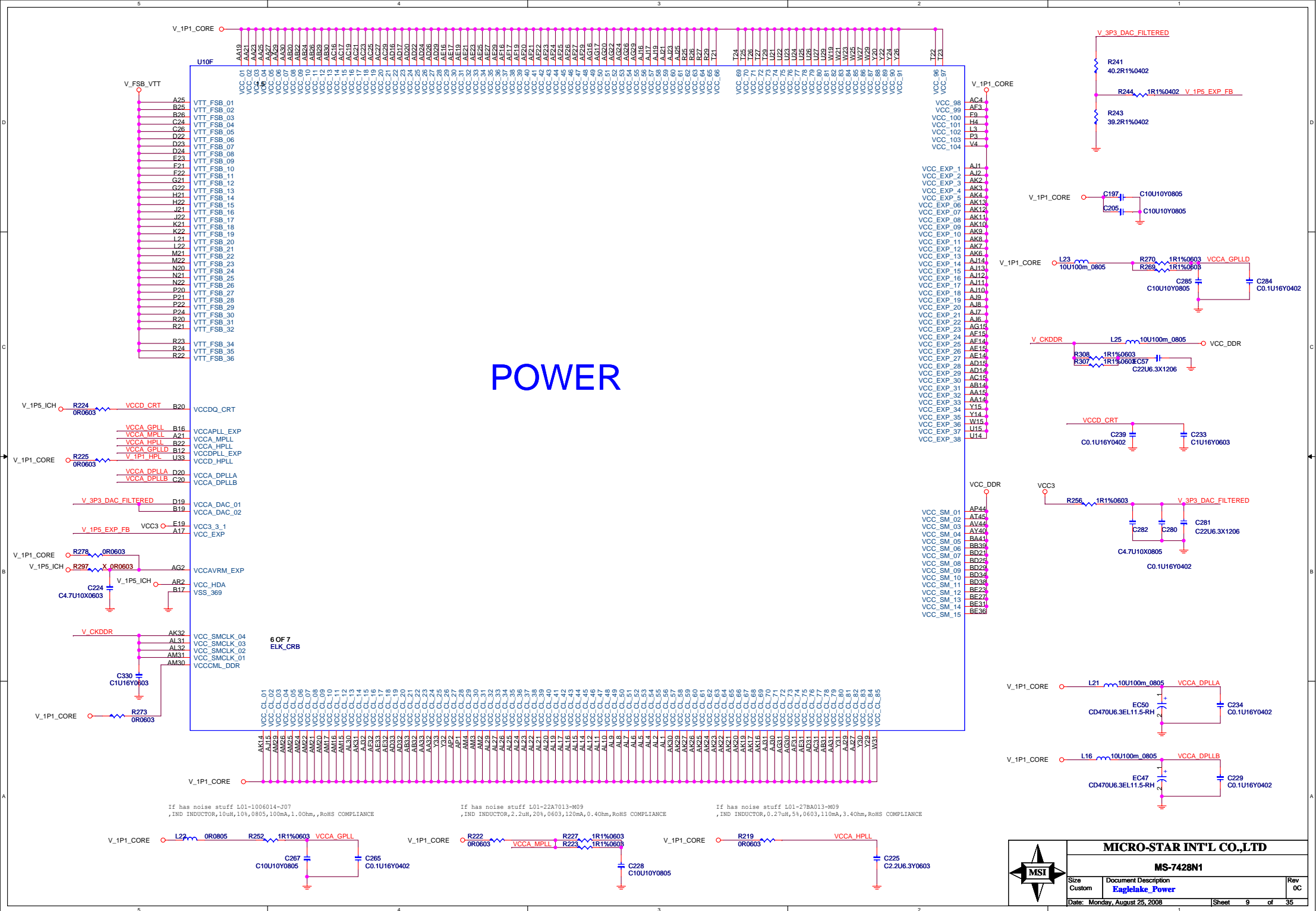


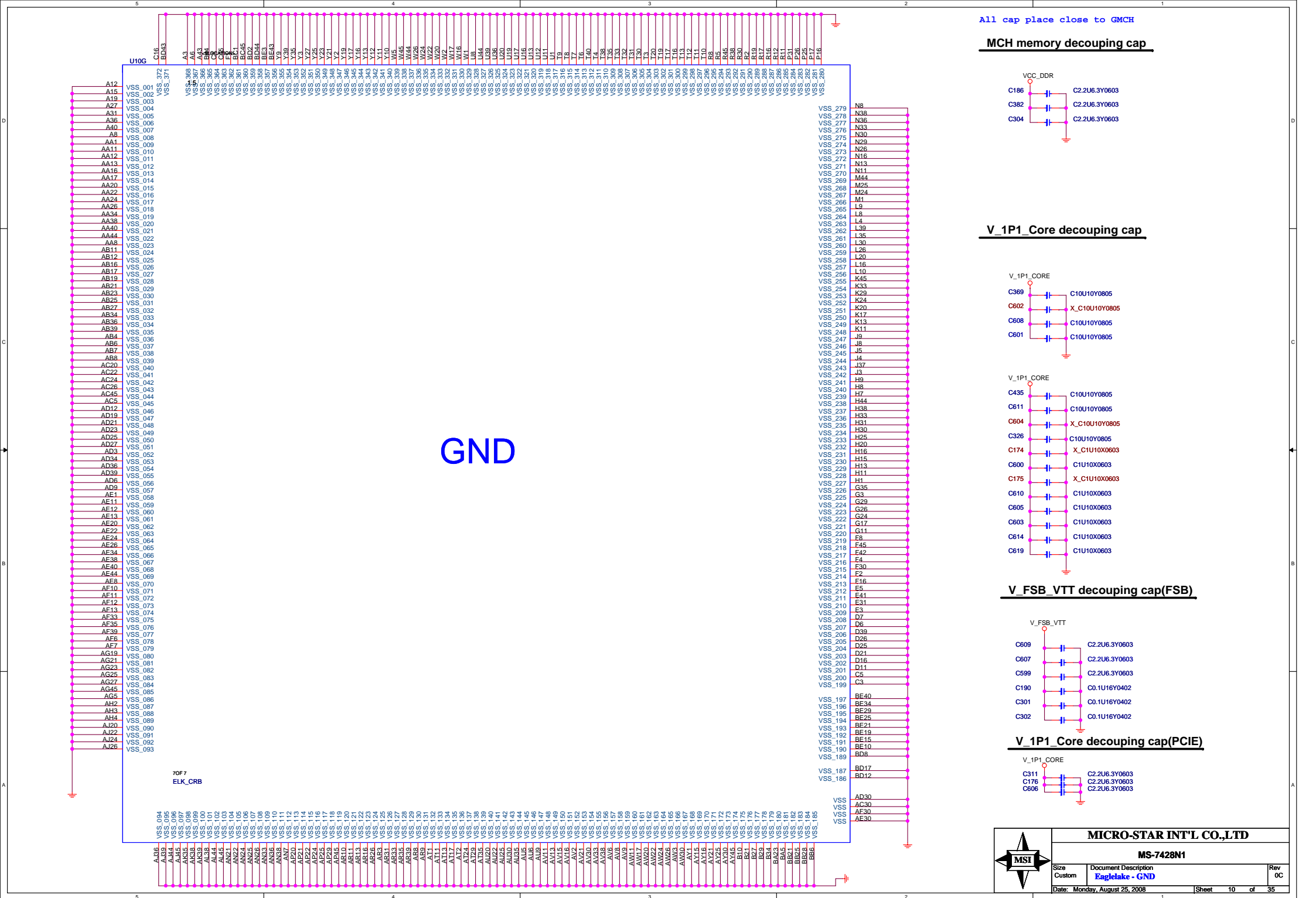


MICRO-STAR INT'L CO.,LTD

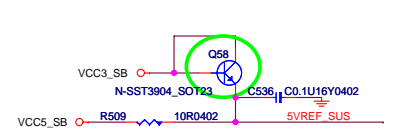
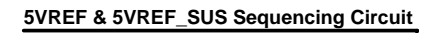
MS-7428N1

| Size | Document Description | Rev |
|-------------------------------|-----------------------|-----|
| Custom | Eaglelake_Memory_DDR2 | 0C |
| Date: Monday, August 25, 2008 | Sheet 8 of 35 | |



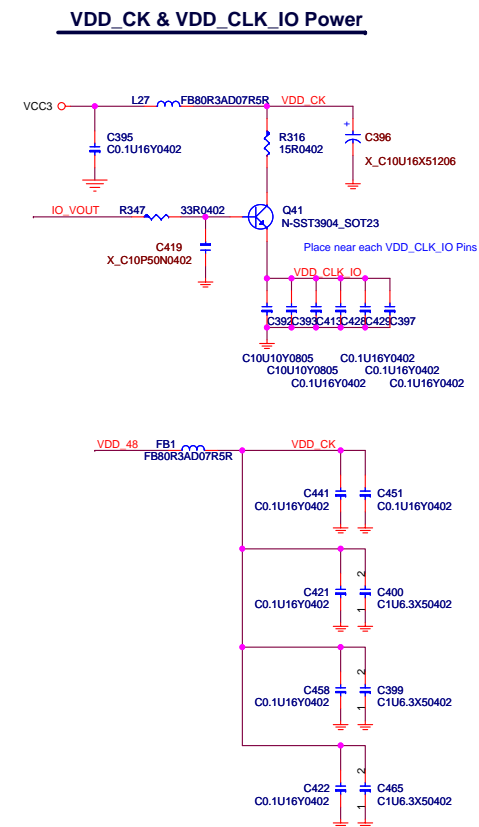
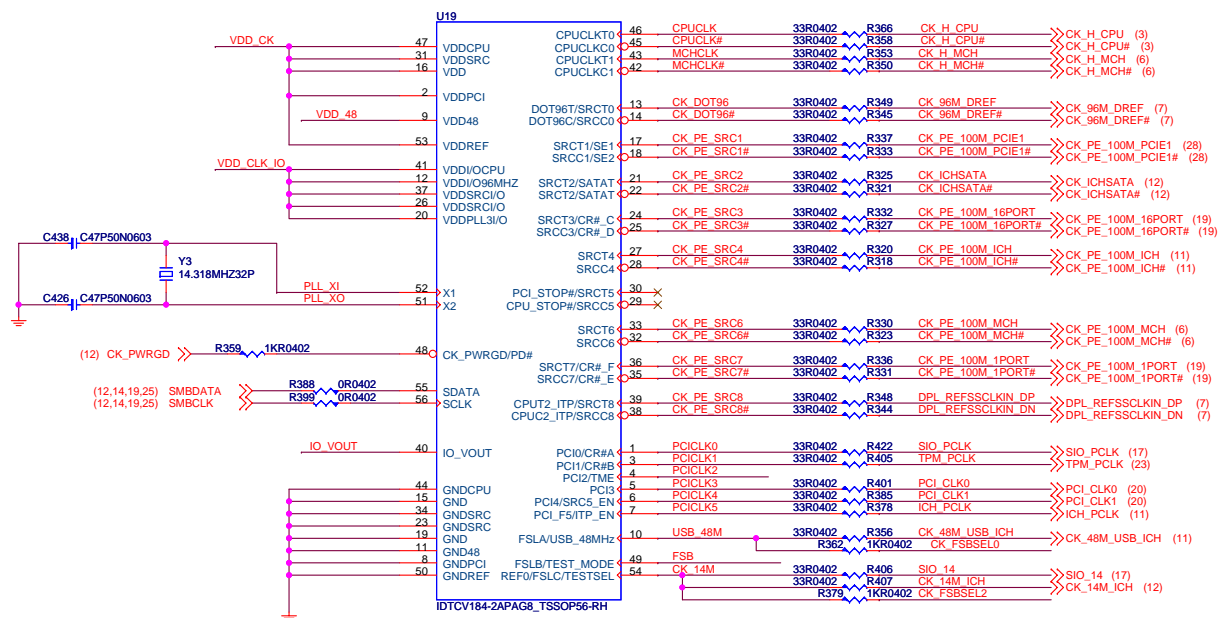


| HDMI | VccHDA | VccSusHDA | Description |
|----------------------|--------|-----------|---|
| Enable | 1.5V | 1.5V_SB | STAFF R485 R499 (R499=0 ohm) |
| Disable (Default) | 3.3V | VCC3_SB | STAFF R484 R499 R568 (R499=18 ohm, R568=15ohm) |

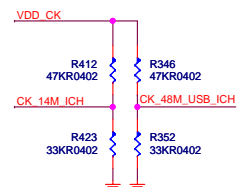
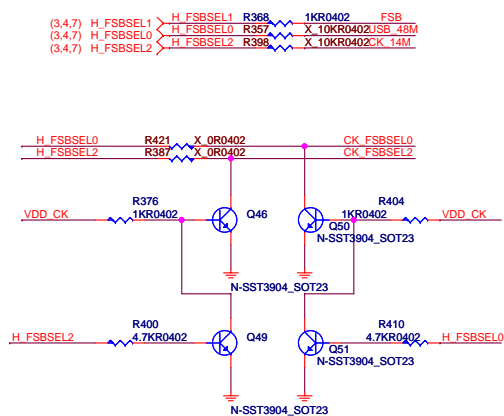


MS-7428N1

| | | |
|-------------------------------|---|----------------|
| Size Custom | Document Description ICH10 - Power, GND | Rev 0C |
| Date: Monday, August 25, 2008 | | Sheet 13 of 35 |



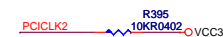
CPU Frequency select



| FS ₁ C ¹ B0b7 | FS ₁ B ¹ B0b6 | FS ₁ A ² B0b5 | CPU MHz |
|--|--|--|------------|
| 0 | 0 | 0 | 266.66 |
| 0 | 0 | 1 | 133.33 |
| 0 | 1 | 0 | 200.00 |
| 0 | 1 | 1 | 166.66 |
| 1 | 0 | 0 | 333.33 |
| 1 | 0 | 1 | 100.00 |
| 1 | 1 | 0 | 400.00 |
| 1 | 1 | 1 | Reserved |

Strapping resistor

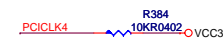
H=Overclocking disable



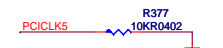
Clock CFG bit, combined with pin 4.
Voltage decoding : L=0.55V.



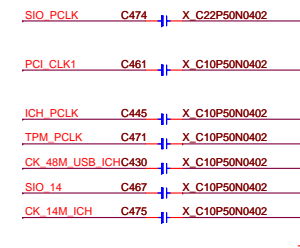
H=SRC5 ; L=CPU/PCI stop



H=CPU_ITP ; L=SRC8



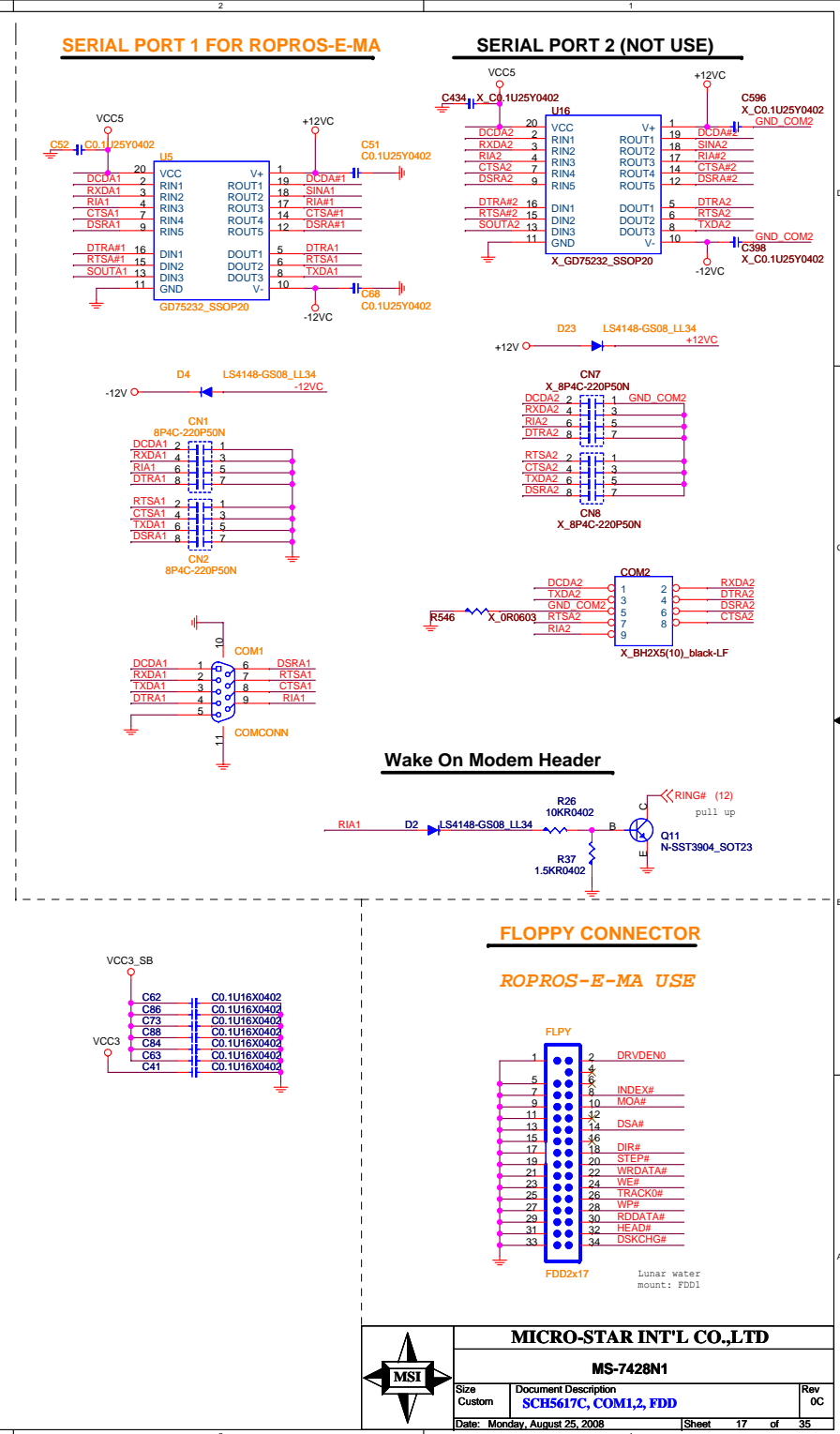
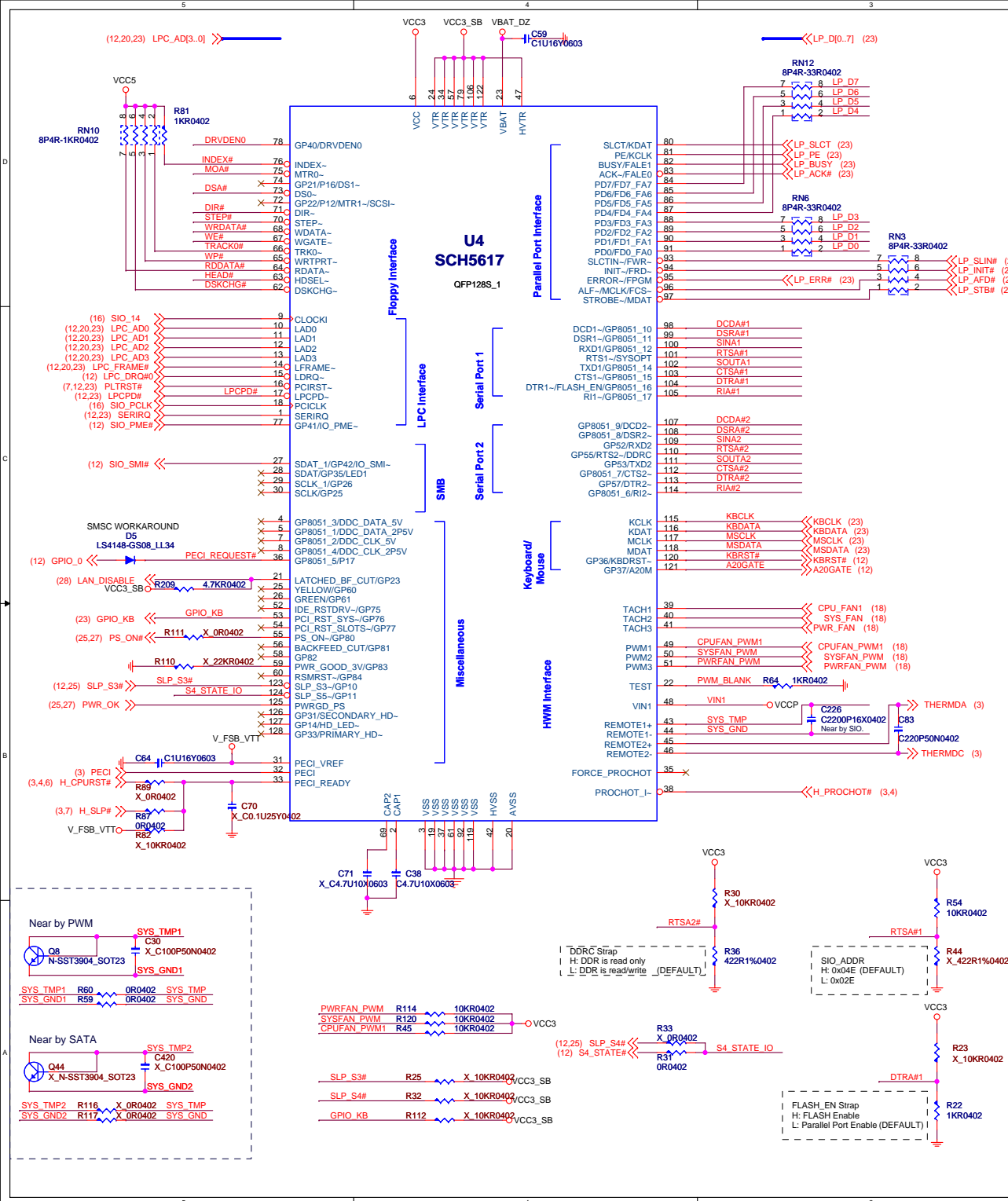
For EMI Reserve



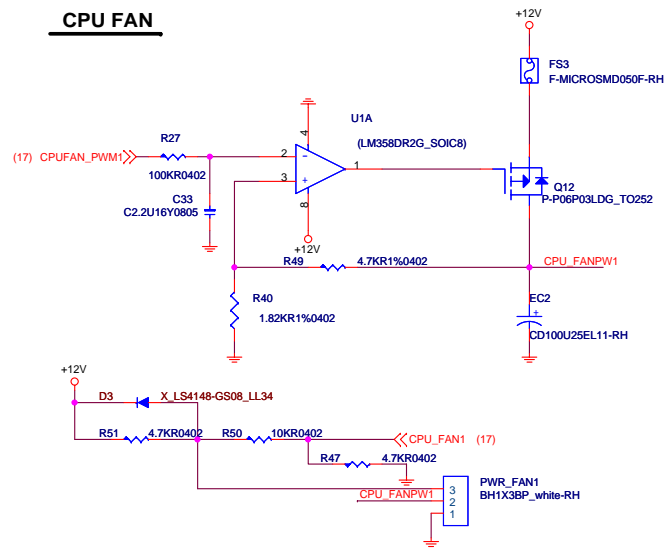
MICRO-STAR INT'L CO.,LTD

MS-7428N1

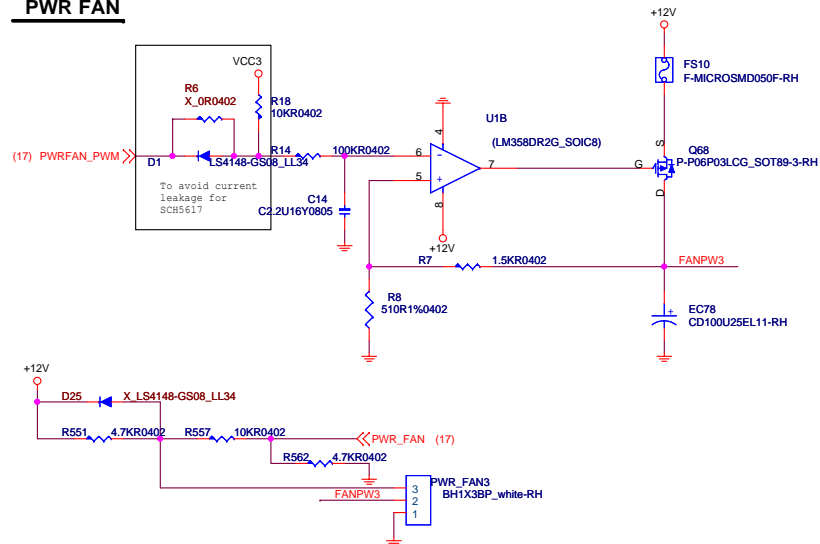
| | | |
|-------------------------------|---|----------------|
| Size Custom | Document Description CLOCK Generator-IDTCV184-2 | Rev 0C |
| Date: Monday, August 25, 2008 | | Sheet 16 of 35 |



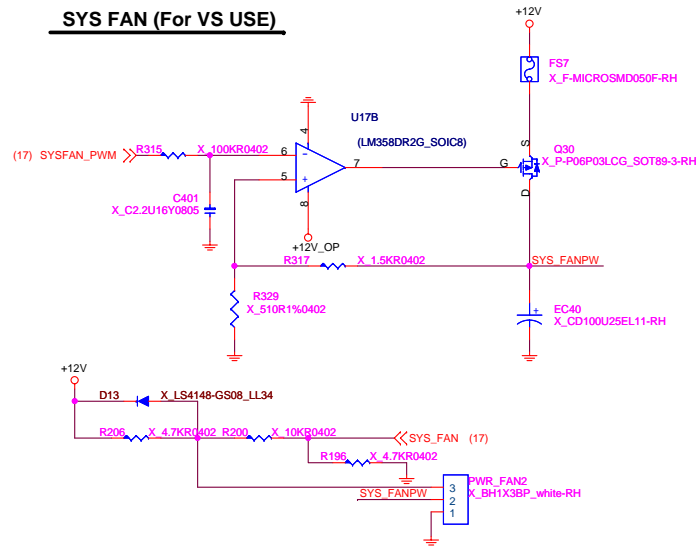
CPU FAN



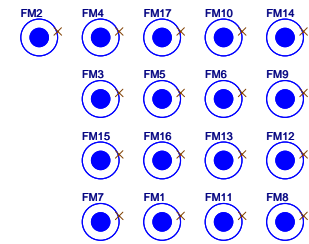
PWR FAN



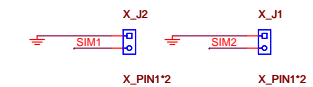
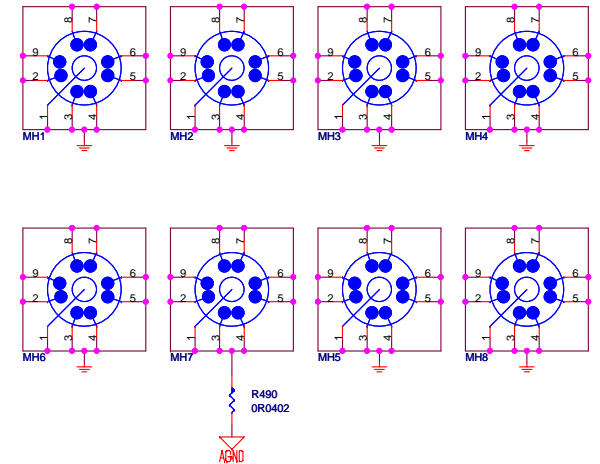
SYS FAN (For VS USE)



Optical Fiducial Marks



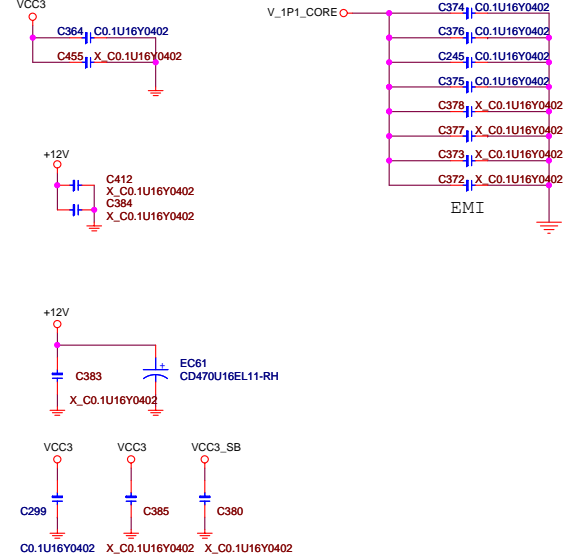
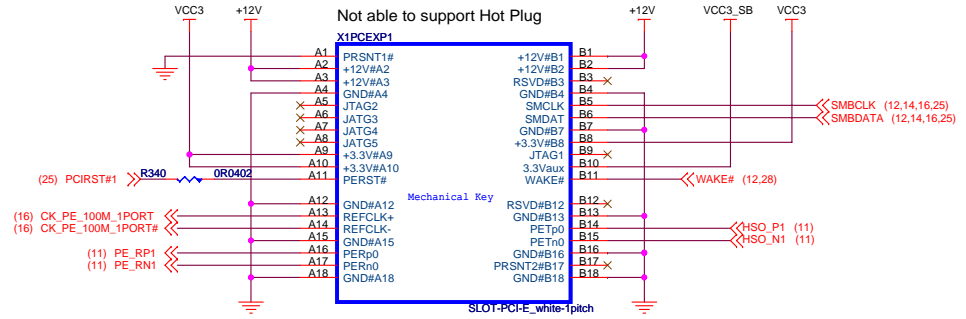
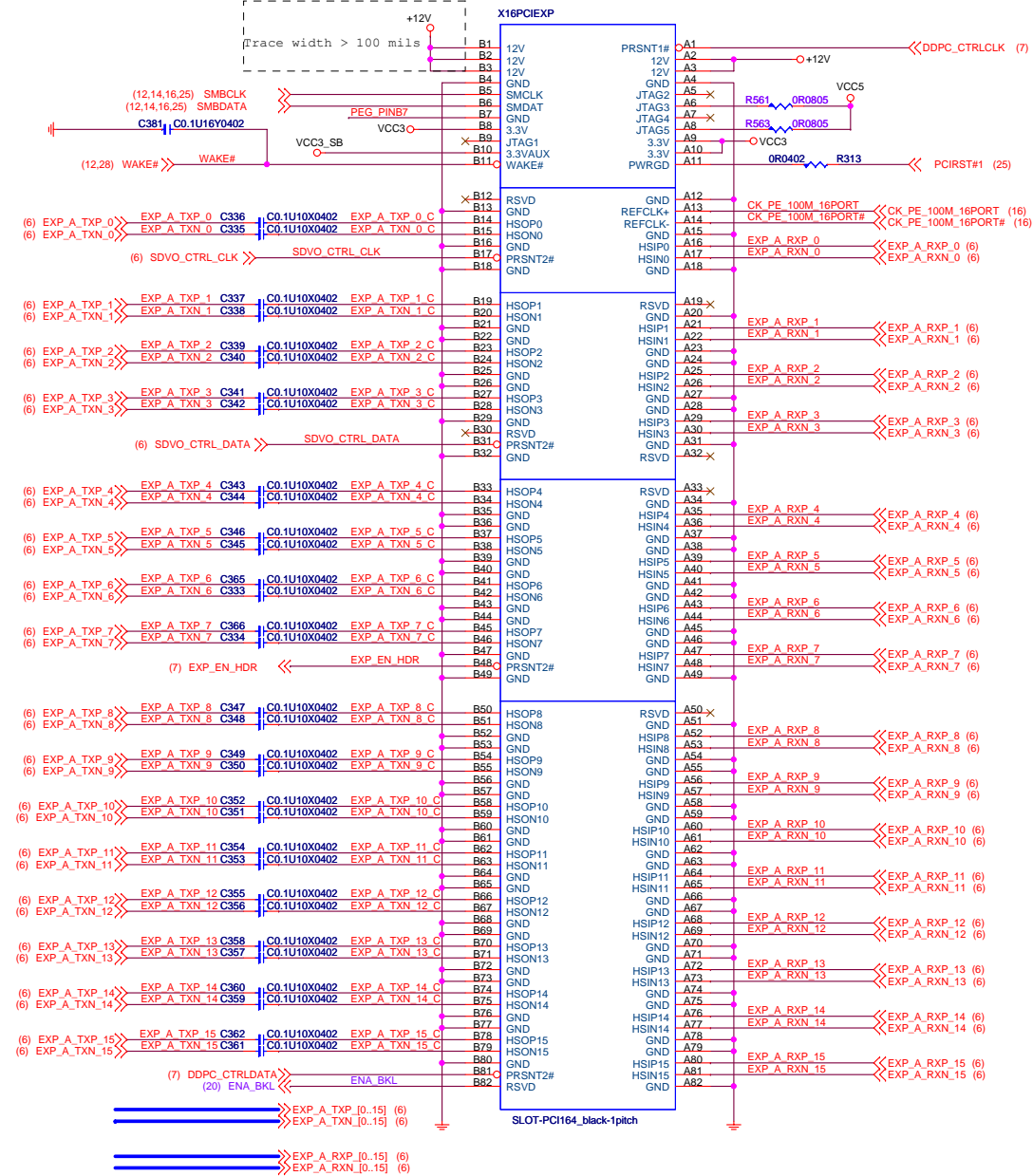
Mounting Holes



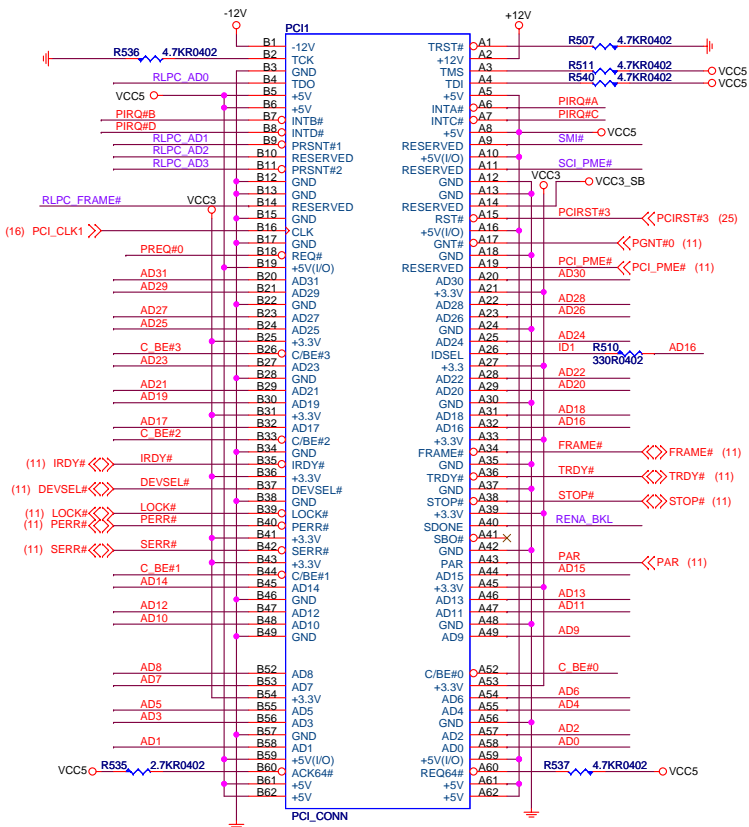
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|-------------------------------|--------------------------|----------------------|-----|
| | MICRO-STAR INT'L CO.,LTD | | |
| | MS-7428N1 | | |
| | Size | Document Description | Rev |
| | Custom | CPU/SYS/PWR FAN | 0C |
| Date: Monday, August 25, 2008 | | Sheet 18 of 35 | |

R309 for MS-4167N1(TMDS to DVI) debug.
PEG PINB7 R309 0R0402

PCI EXPRESS 16-PORT

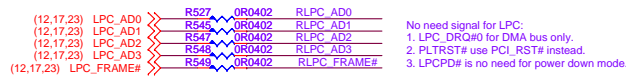


PCI SLOT 1 (PCI VER: 2.2 COMPLY)



ISSEL = AD16
MASTER = PREQ#0
PIRQ#A

Option parts for GAIA's panel control board



(12) GPIO_8 <<> R576 0R0402 SMI#
(12) GPIO_10 <<> R560 0R0402 SCL_PME#
(19) ENA_BKL <<> R564 0R0402 RENA_BKL

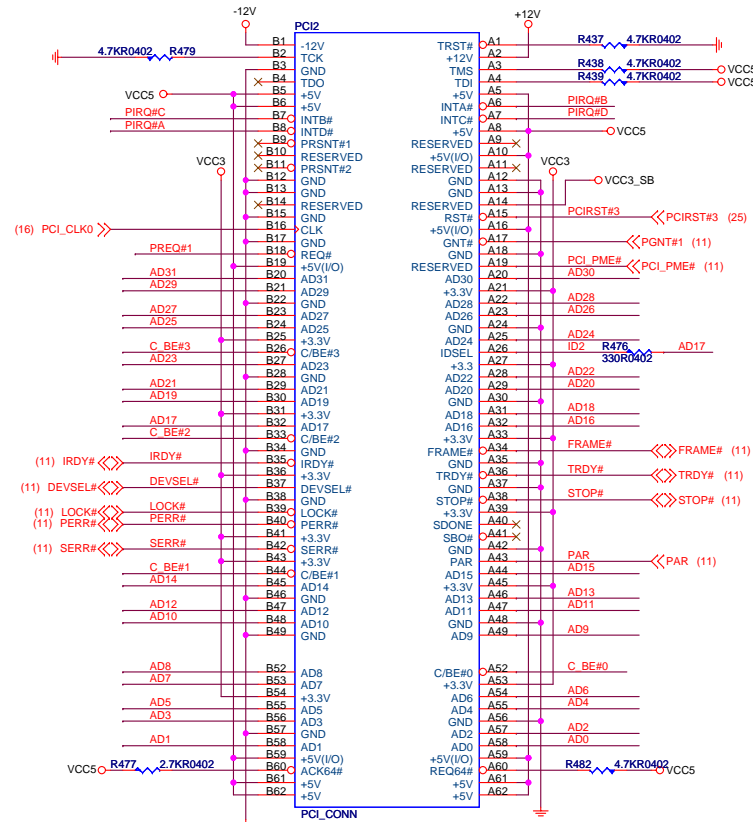
No need signal for LPC:
1. LPC_DRQ#0 for DMA bus only.
2. PLTRST# use PCI_RST# instead.
3. LPPCP# is not need for power down mode.

SMI# connect from ICH10 GPI2 to GAIA's panel control board's SIO pin27.
SCL_PME# connect from ICH10 GPI2 to GAIA's panel control board's SIO pin77.
ENA_BKL connect from PCIE[X16] (Chrontel pin1) to PCI slot for GAIA's panel control board's inverter connector.

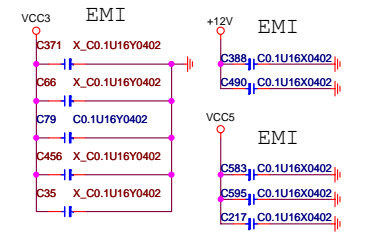
PCI PULL-UP / DOWN RESISTORS



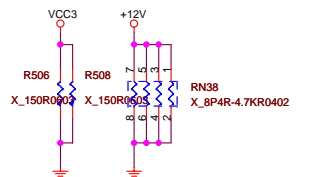
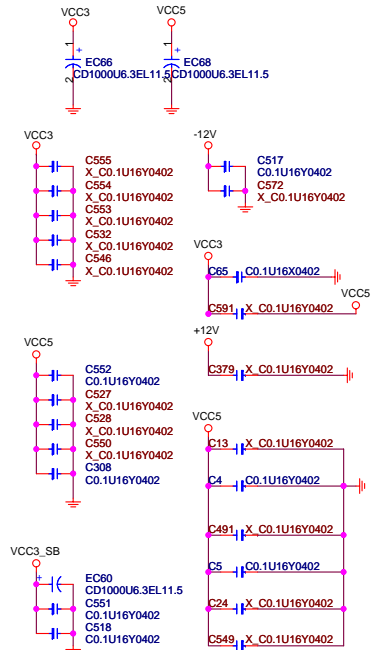
PCI SLOT 2 (PCI VER: 2.2 COMPLY)



ISSEL = AD17
MASTER = PREQ#1
PIRQ#B



PCI SLOT DECOUPLING CAPACITORS

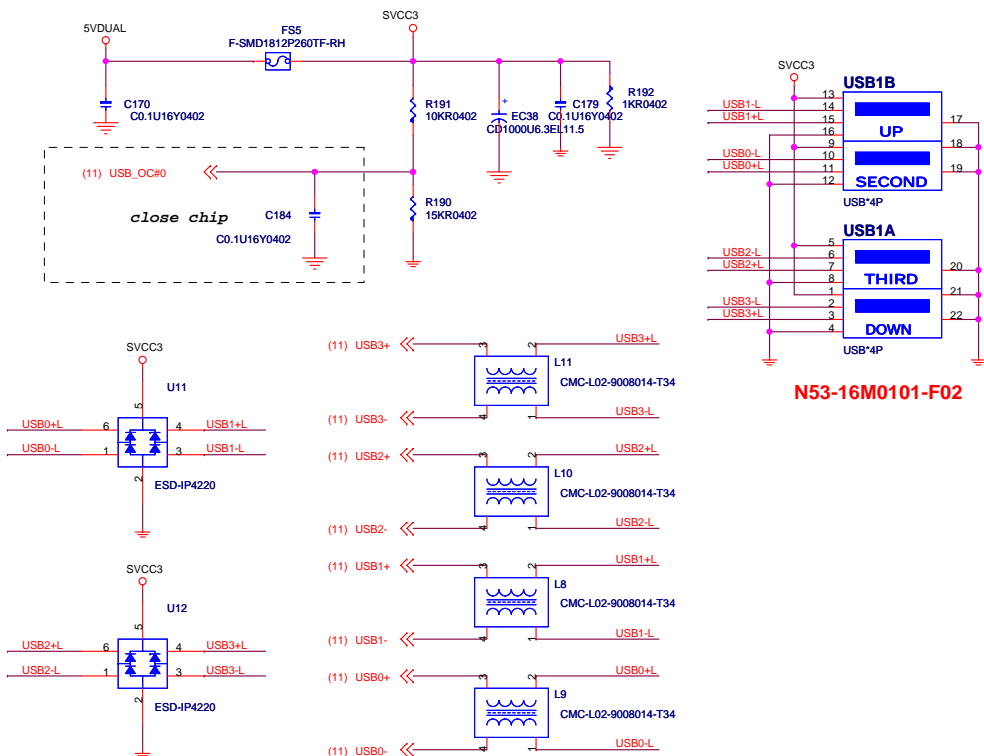


MICRO-STAR INT'L CO.,LTD

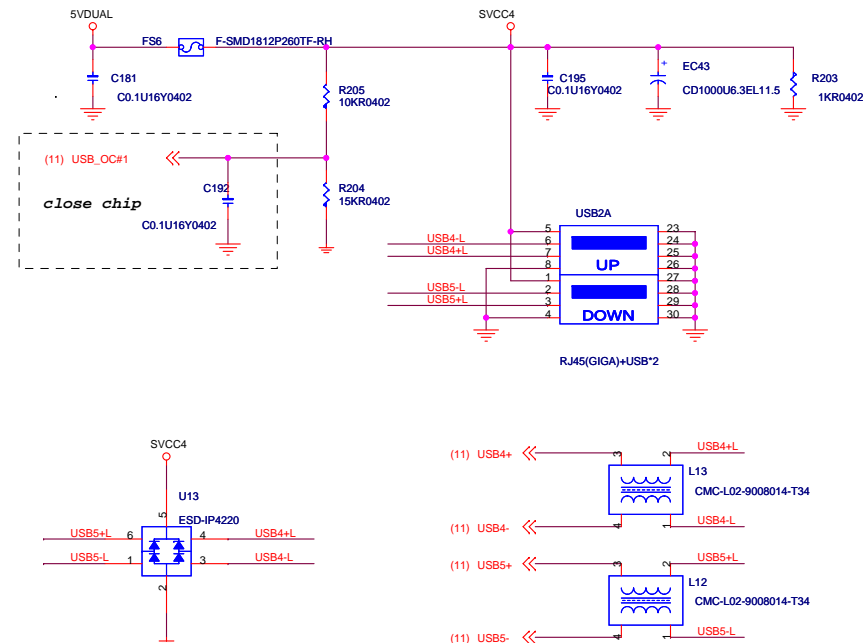
MS-7428N1

| Size | Document Description | Rev |
|-------------------------------|----------------------|-----|
| Custom | PCI Slot | 0C |
| Date: Monday, August 25, 2008 | Sheet 20 of 35 | |

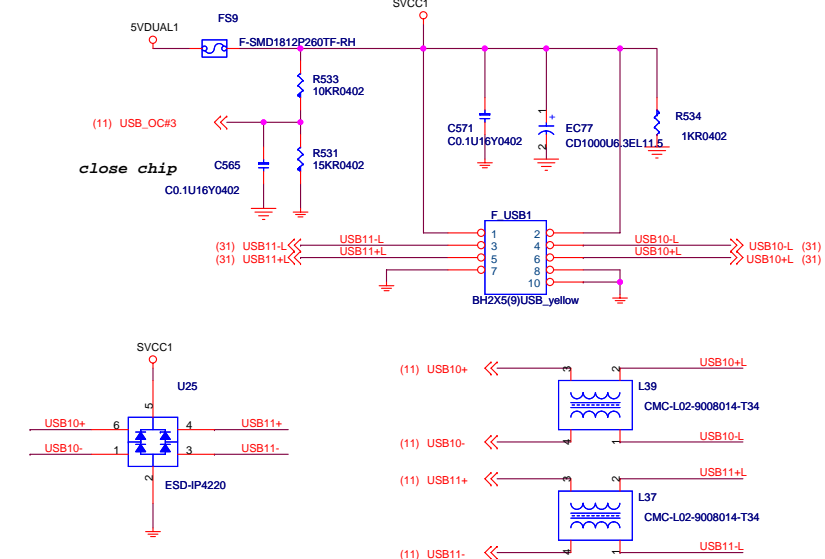
REAR PANEL USB CONNECTOR FOR USB PORT 0,1,2,3 Iout=2A



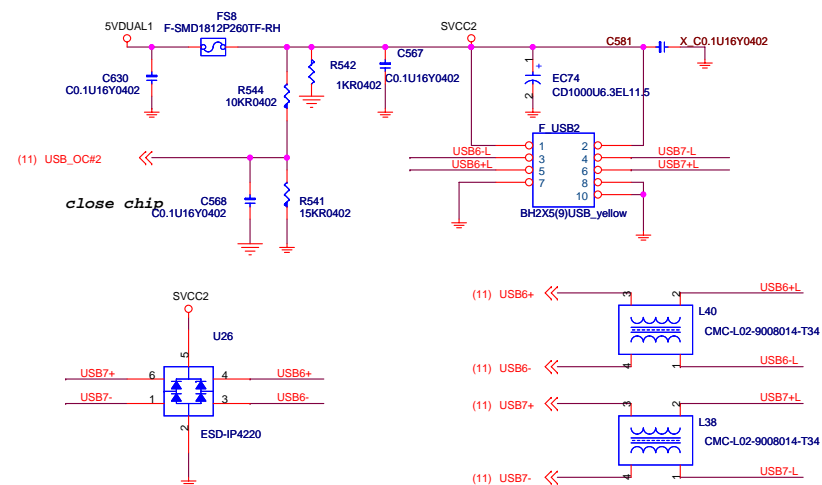
REAR PANEL USB CONNECTOR FOR USB PORT 4,5 Iout=1A



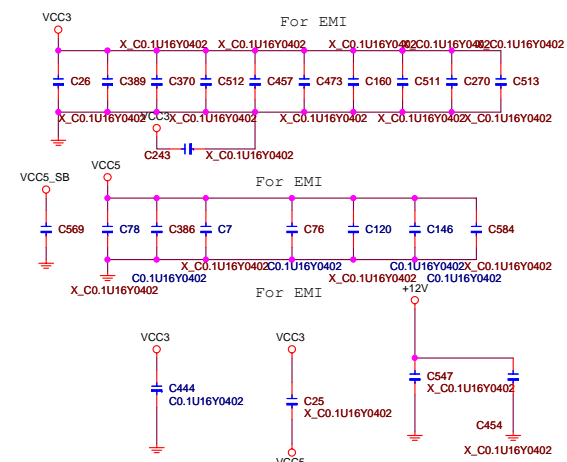
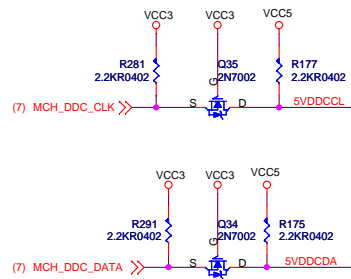
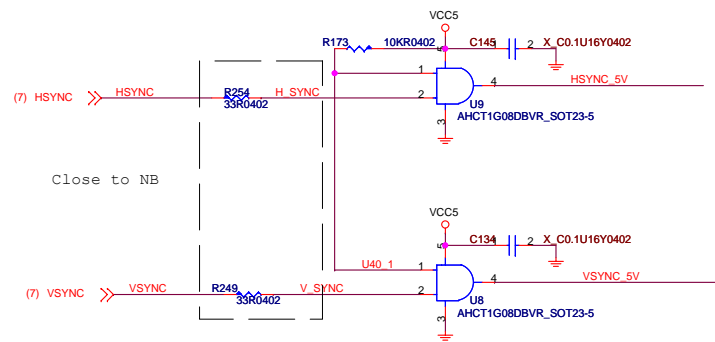
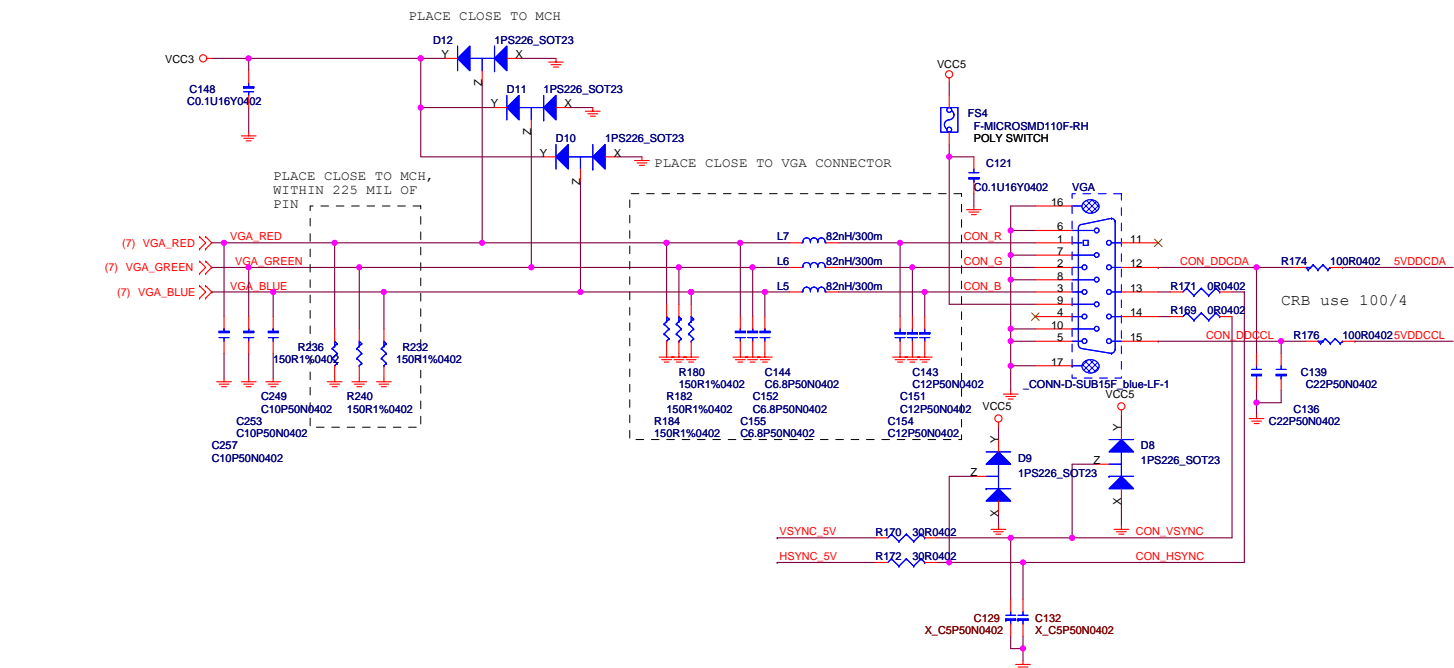
Front USB PORT 10,11 (right angel type) Iout=1A



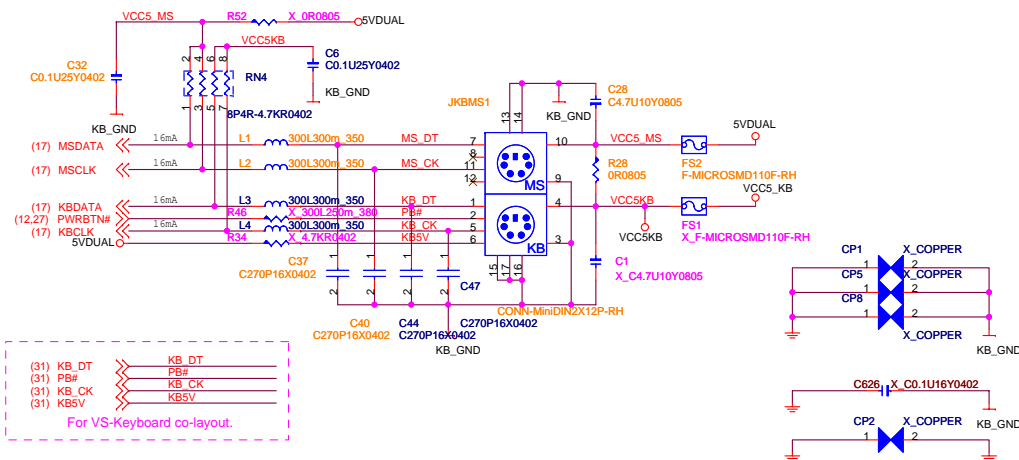
Memory card reader USB CONNECTOR FOR USB PORT 8,9 (pinth 2.0) Iout=1A



Video Connector

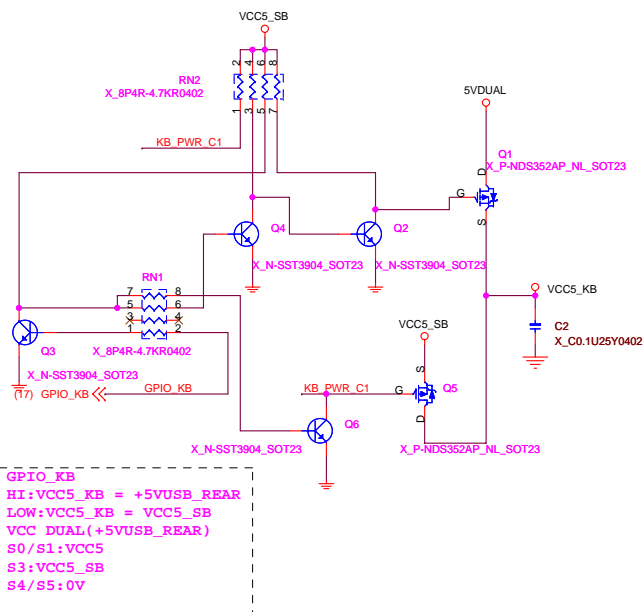


PS2 KEYBOARD & MOUSE CONNECTOR

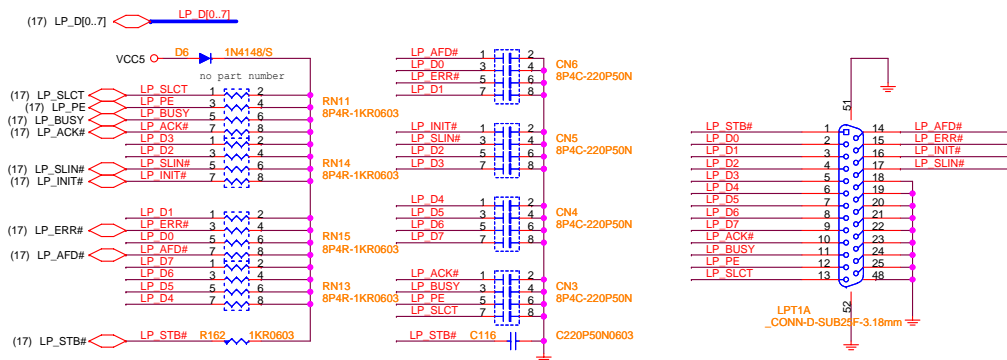


| | FS2 | R20 | C24 | L1 | L2 | C33 | C34 | C38 | FS1 | C1 | R27 | R36 |
|--------------|-----|-----|-----|----|----|-----|-----|-----|-----|----|-----|-----|
| ROPROS-MA | V | V | V | V | V | V | V | V | X | X | X | X |
| ROPROS-VS | X | X | X | X | X | X | X | X | V | V | V | V |
| ROPROS-NECCA | V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

K/B Power supply function for ROPROS-VS



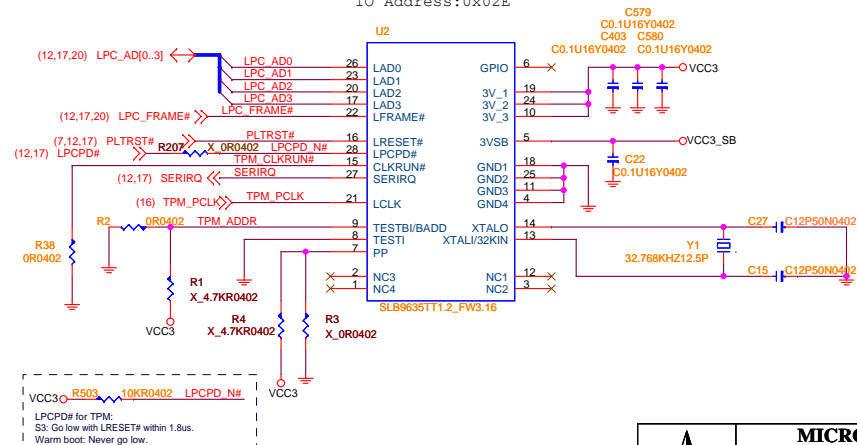
PARALLEL PORT



T.P.M FOR ROPROS-MA

TPM 1.2

IO Address: 0x02E



MICRO-STAR INT'L CO.,LTD

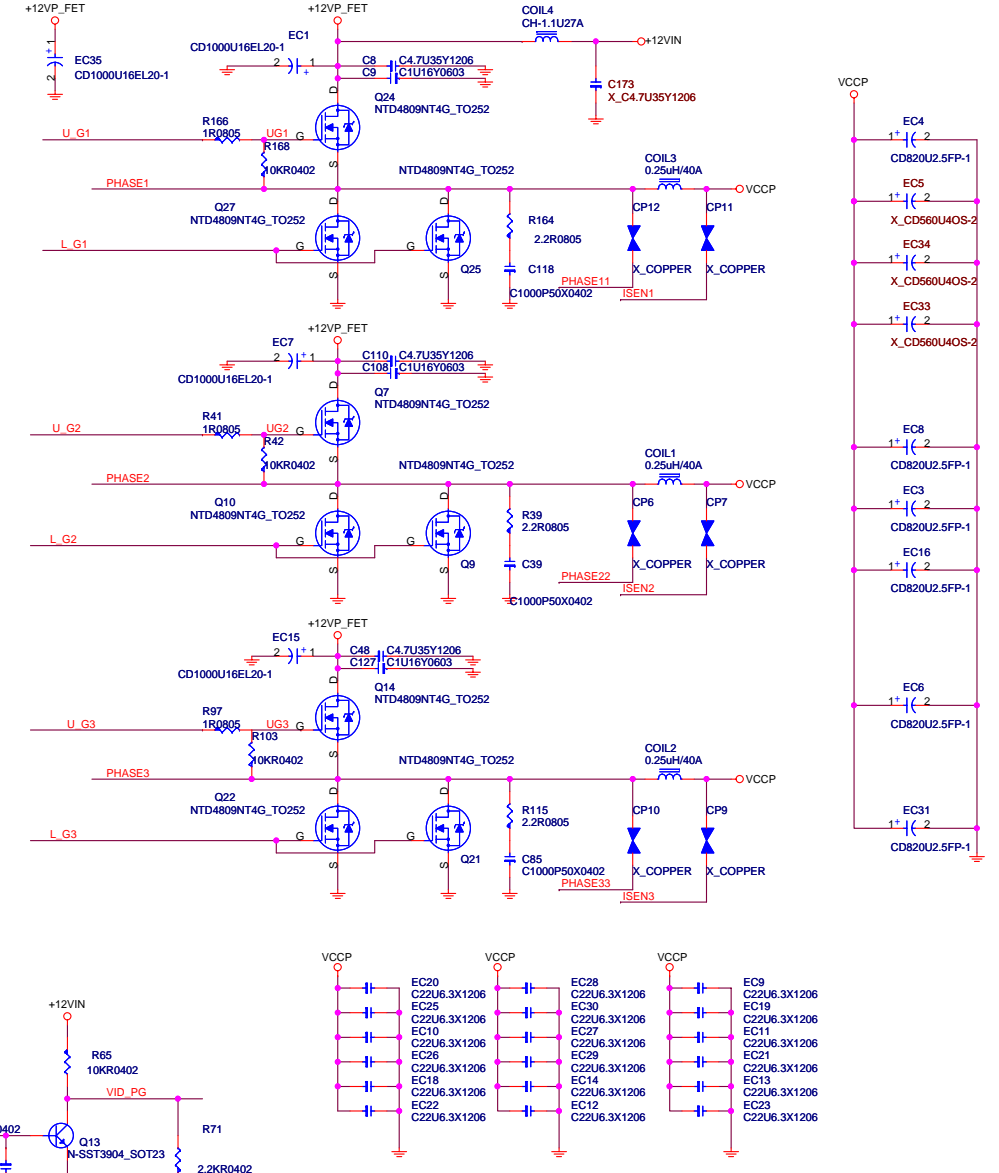
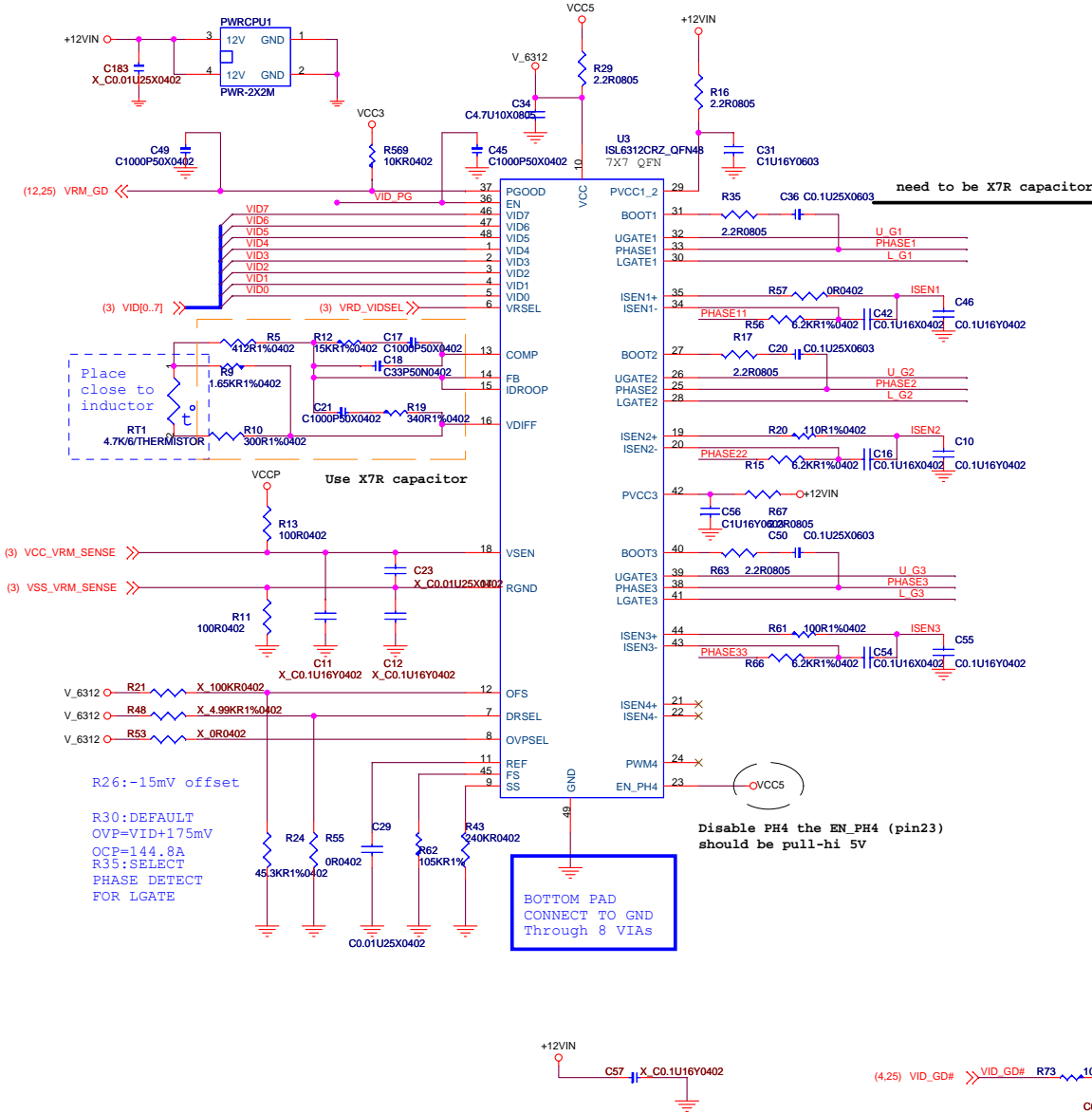
MS-7428N1

| Size | Document Description | Rev |
|-------------------------------|----------------------|-----|
| Custom | KB/MS/TPM/PARALLEL | 0C |
| Date: Monday, August 25, 2008 | Sheet 23 of 35 | |

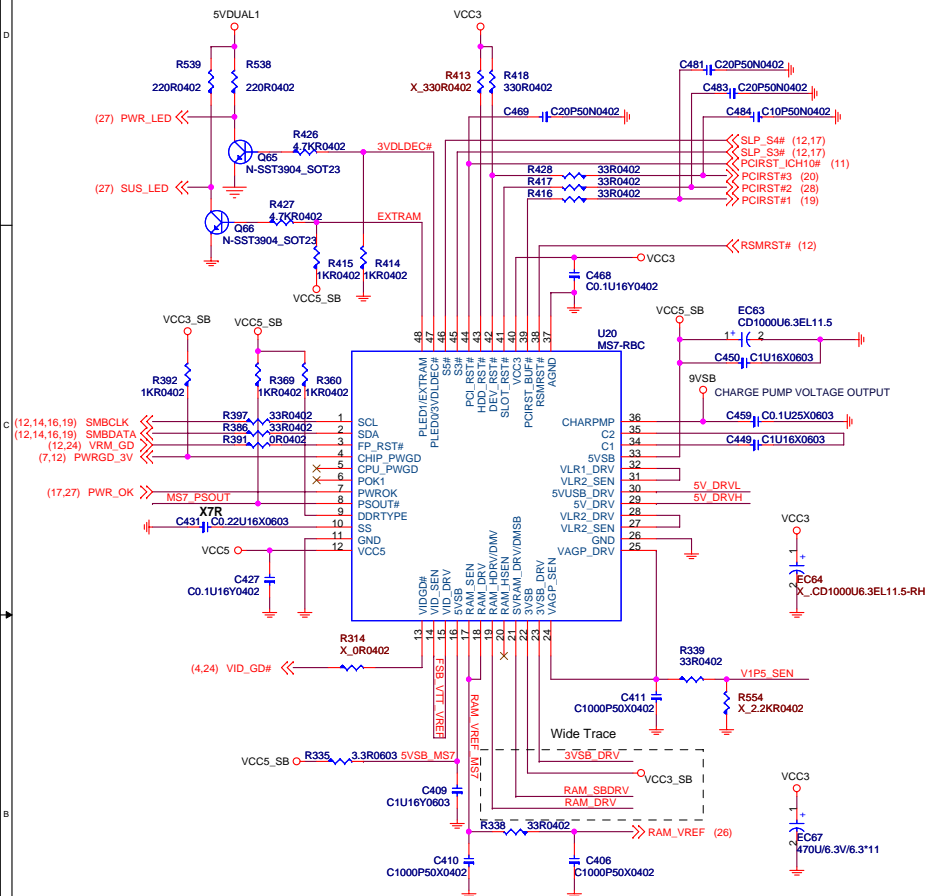
Voltage Regular Module

N-P0903BDG_TO252
P75N02LDG/TO252
C100U2SP
CD560U40S-2
1800UF/6.3V
0.25uH/40A
CH-1.1U25A-LF
CD1000U16EL20-2

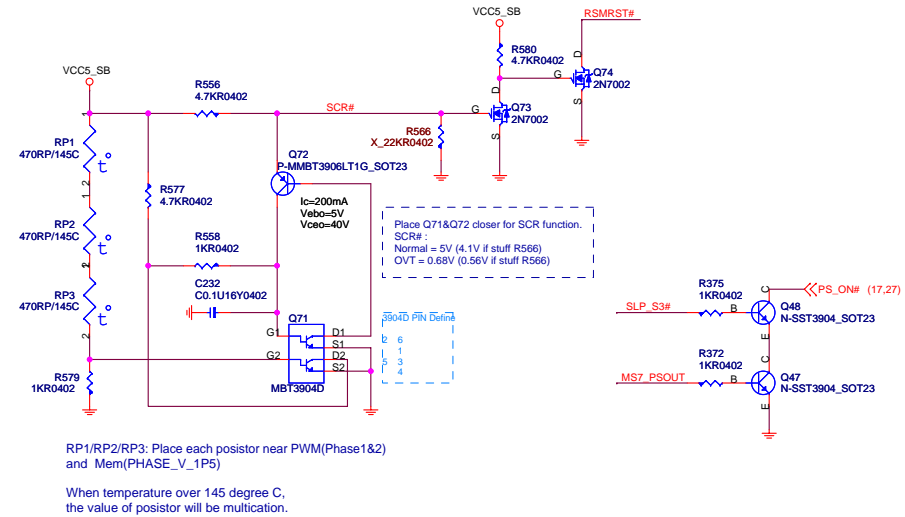
mosfet/n-channel, P0903BDG, SMT/TO252, Rds(on)=9.5mΩ(10V/25A), Vgs(on)=1~3V, Id=50A, Ciss=1800pf, Qg=50nC, Vds=25V, Vgs=±20V, RoHS compliance
mosfet/n-channel, P75N02LDG, SMT/TO252, Rds(on)=7mΩ(10V/30A), Vgs(on)=1~3V, Id=75A, Ciss=5000pf, Qg=140nC, Vds=25V, Vgs=±20V, RoHS compliance
ESR<13mΩ, Ripple cur.<2.7A, LC<12uA, 105C
CAP, OS-CON, 560u/4V, Dip-2/8*9/3.5mm, ESR<7mohm, Ripple cur.=6100mA, Lc. <500uA, SPEC series, RoHS compliance
ESR<12mΩ, Ripple cur.<2350mA, 105C, longlife change from 2000hrs to 3000hrs, KZJ series
, IND CHOKE, 0.25uH, 20%, DIP/8.5mm, 40A, 0.6mOhm, , , PEW, FERRITE, SQUARE, RoHS COMPLIANCE
IND CHOKE, 1.1uH, 20%, DIP/9mm, 25A, 1.4mOhm, 5.5T, 0.9mmx3, PEW, IRON, , LEAD FREE
CAP, EL, 1000u, 16V, Dip-8x20/3.5mm, 20%, 12mOhm, 2350mA, 105C, 3000hrs, RoHS COMPLIANCE



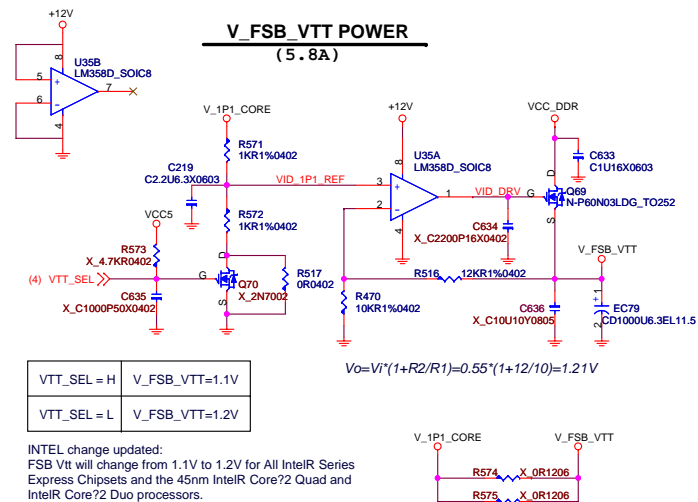
ACPI Controller MS-7



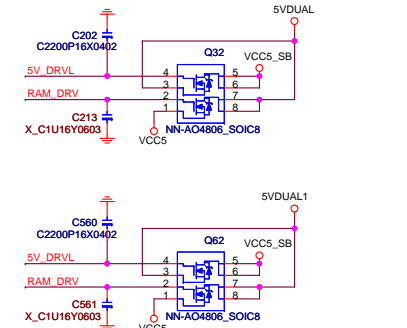
PSON# & Posister for thermal sense



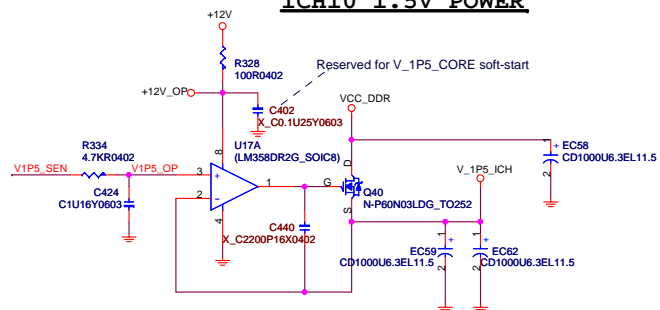
V_FSB_VTT POWER
(5.8A)



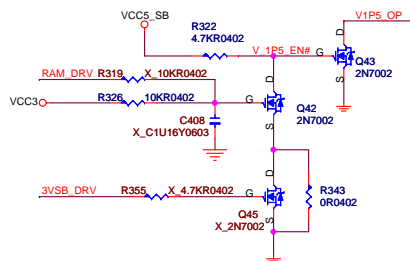
5V DUAL Power



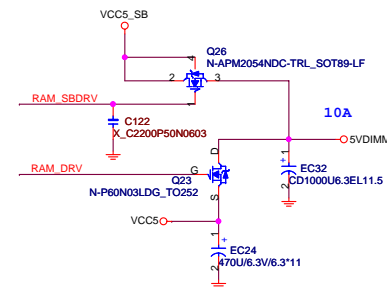
ICH10 1.5V POWER



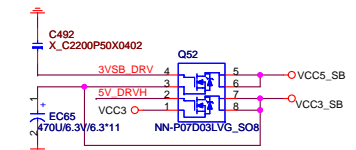
V1P5_SEN S3 power sequency



5V DIMM



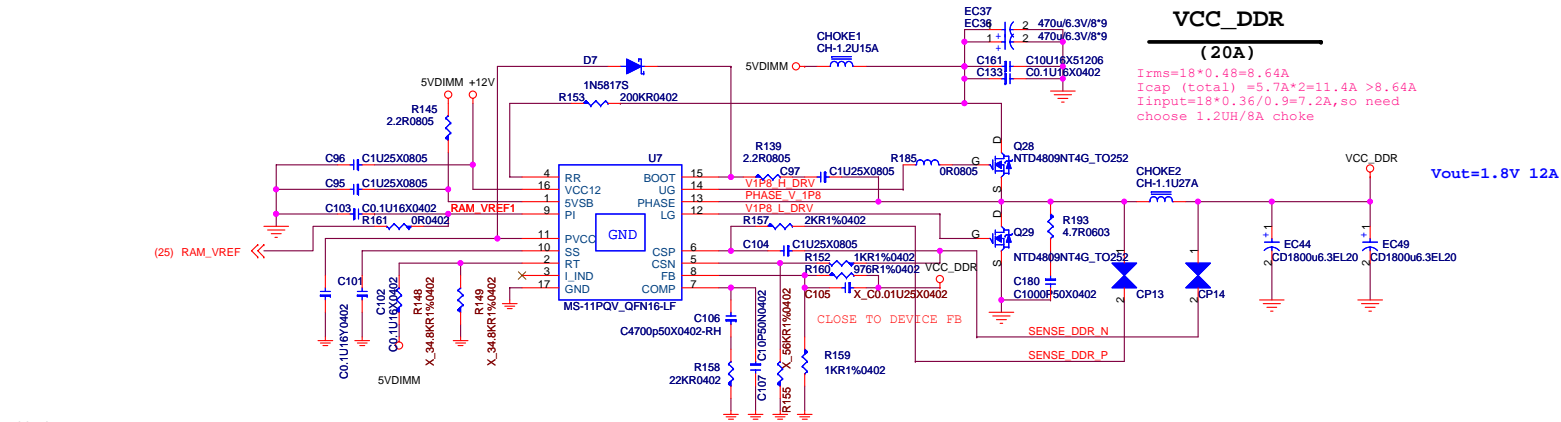
VCC3_SB Power



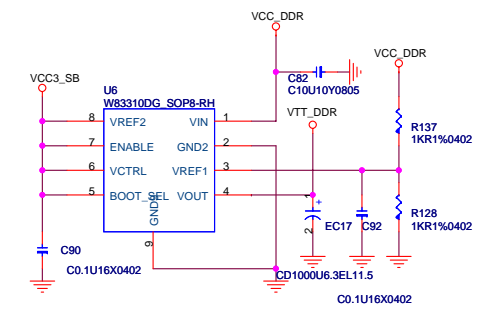
MICRO-STAR INT'L CO.,LTD

MS-7428N1

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|-------------------------------|--|----------------|
| Size Custom | Document Description MS7 ACPI Controller | Rev 0C |
| Date: Monday, August 25, 2008 | | Sheet 25 of 35 |

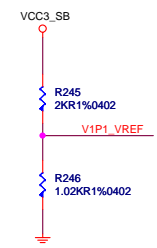
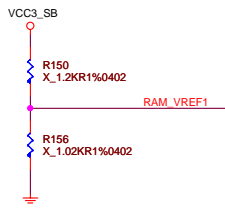
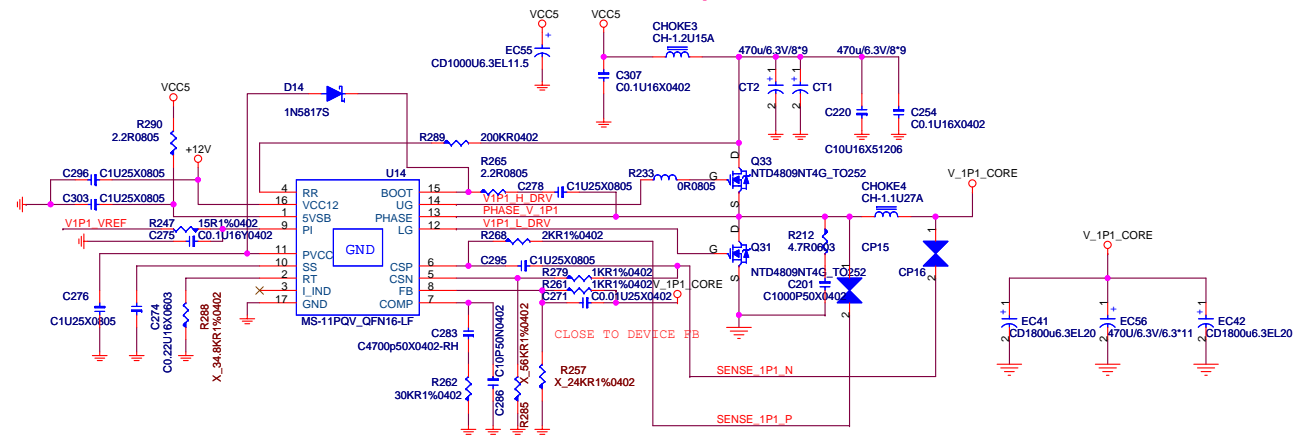


DDR VTT Power
(0.83A)

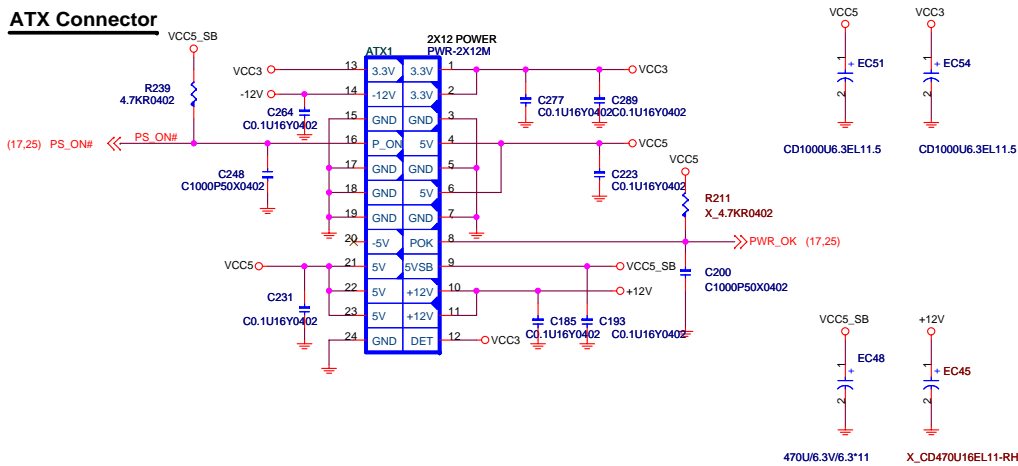


GMCH 1.1V POWER
(20A)

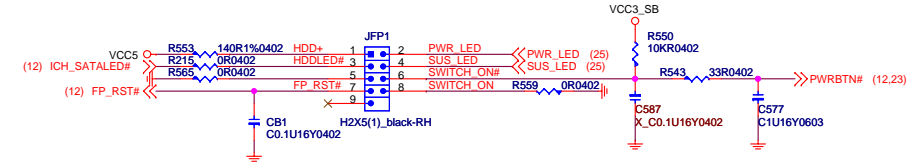
$I_{rms} = 21 \times 0.433 = 9.09A$
 $I_{cap} (total) = 5.7A \times 2 = 11.4A > 9A$
 $I_{input} = 21 \times 0.25 / 0.9 = 5.83A$, so need choose 1.2uH/8A choke



ATX Connector

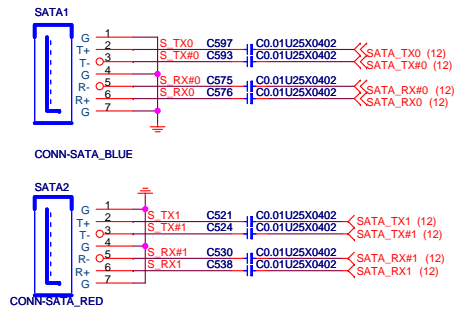


Intel Front Panel

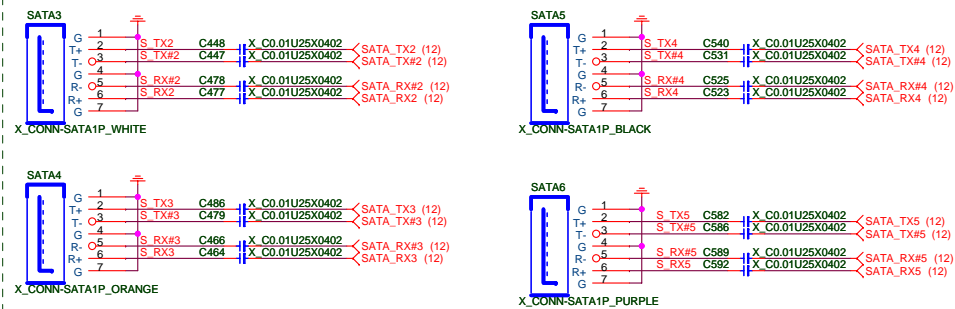


Serial ATA Connectors

SATA1&SATA2 for Ropros-E (MA/VS)



SATA3 to SATA6 for Poseidon-E

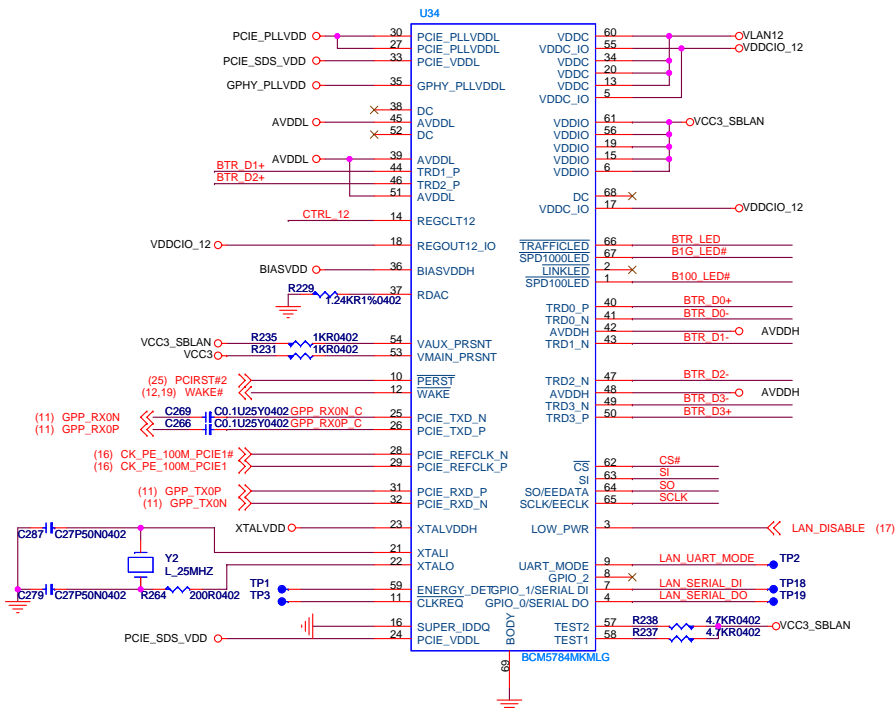


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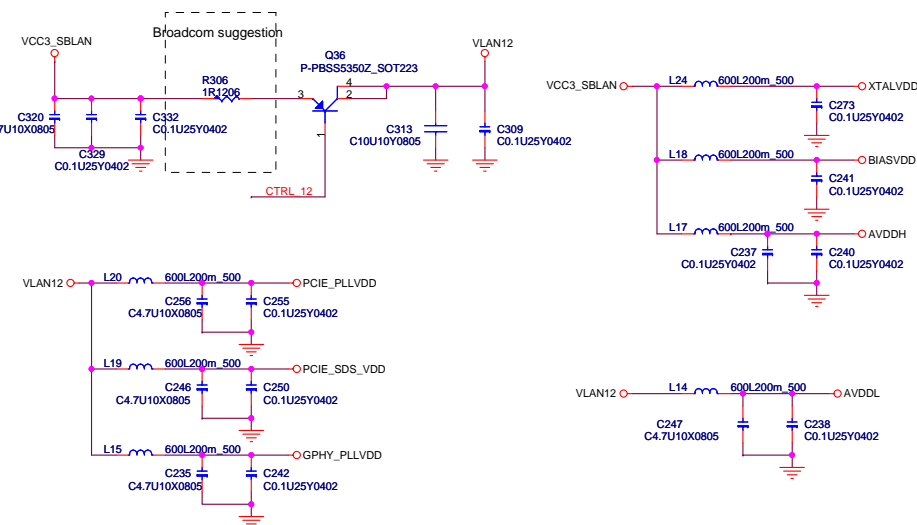
| Size | Document Description | Rev |
|--------|---------------------------|----------------|
| Custom | ATX Front Panel,SATA Conn | 0C |
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BCM5784M

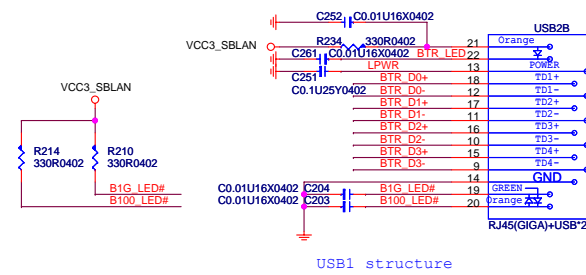


LAN 1.2 POWER

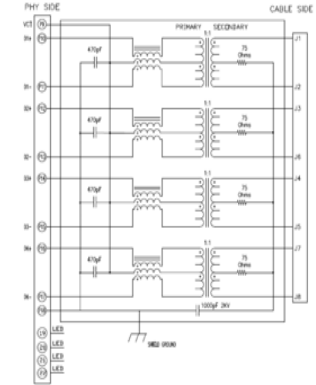
(590mA)



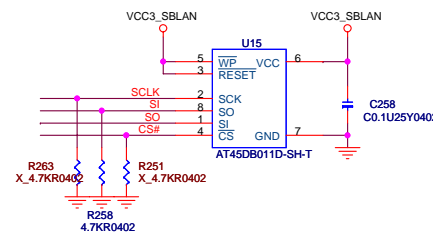
LAN Connector



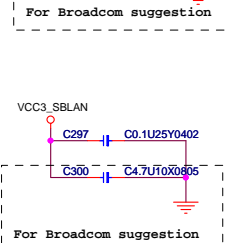
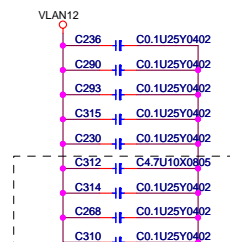
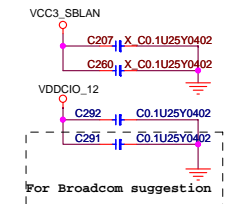
| Giga-Lan | |
|-----------------|----------|
| N58-22F0571-F02 | |
| Link | Orange |
| Active | Blinking |
| 1000 | Orange |
| 100 | Green |
| 10 | None |
| 21 | |
| 22 | Orange |
| 20 | Green |
| 19 | Orange |



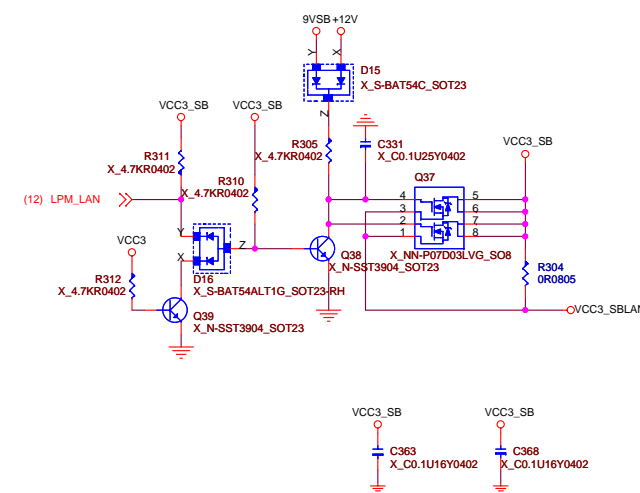
LAN EEPROM



Bypass CAPs

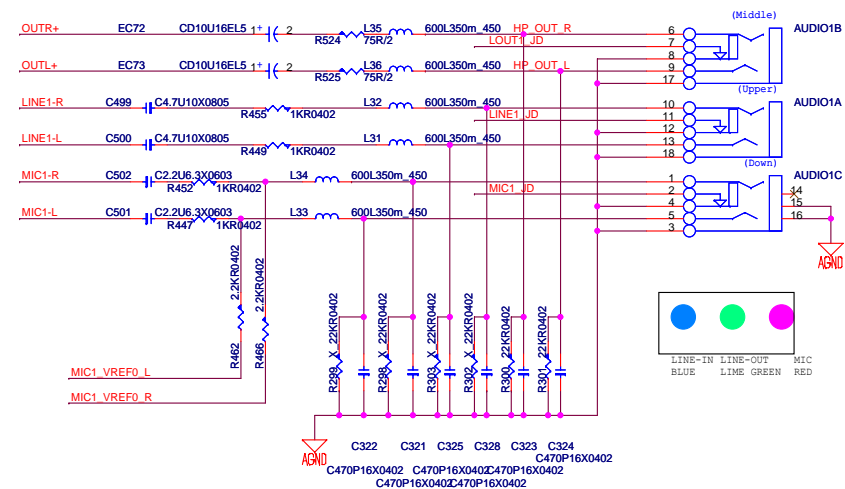
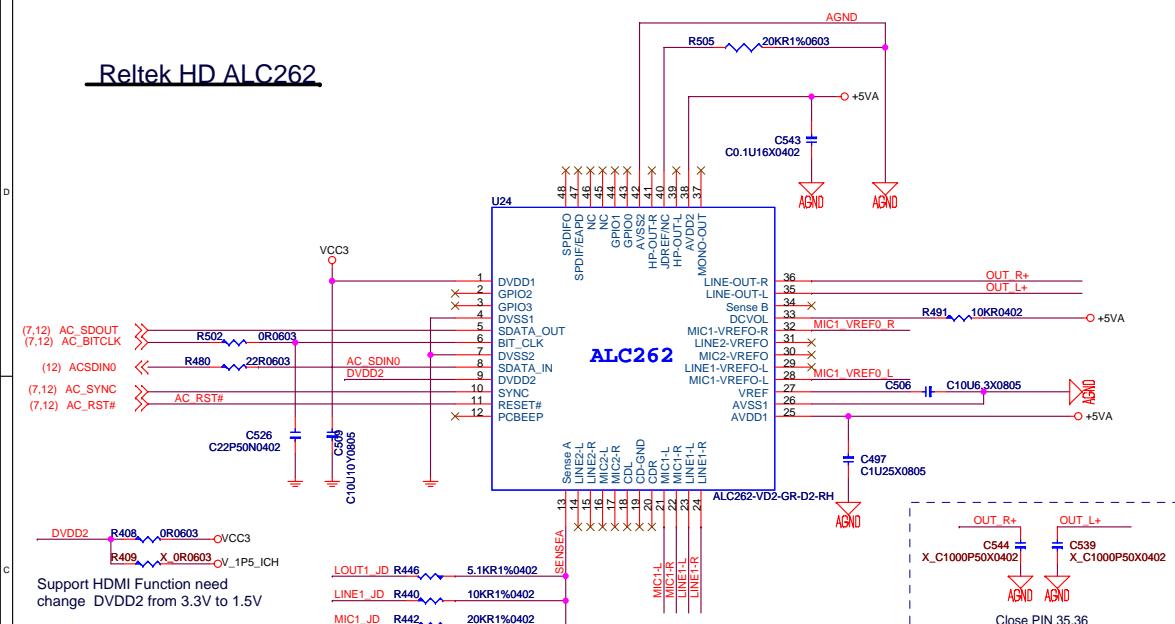


Power control for power consumption



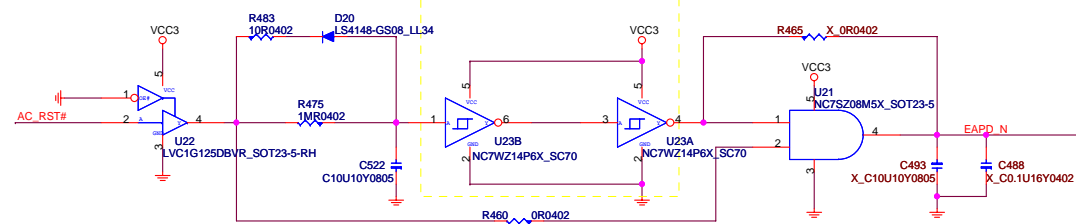
| MICRO-STAR INT'L CO.,LTD | | | |
|--------------------------|-------------------------|-------|----------|
| MS-7428N1 | | | |
| Size | Document Description | Rev | |
| Custom | Broadcom-BCM5784M | 0C | |
| Date: | Monday, August 25, 2008 | Sheet | 28 of 35 |

Reltek HD ALC262

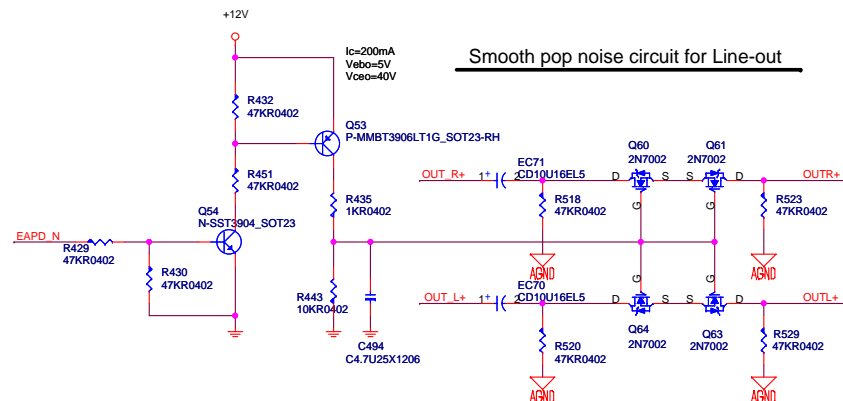


POP noise circuit

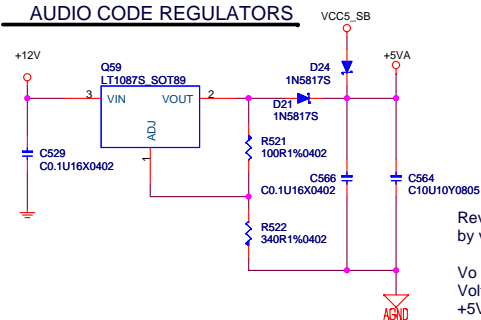
06/18/2008 update - To change buffer type to schmitt trigger*2



Smooth pop noise circuit for Line-out



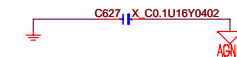
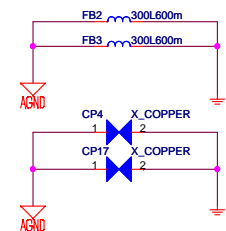
AUDIO CODE REGULATORS



Rev.0C change R522 from 324R to 340R by vender's suggestion (To prevent current from VCC5_SB):

$$V_o = 1.25 \times [1 + (340/100)] + [55 \times 300 \times 10^{-6}] \geq 5.5V$$

Voltage drop from D21=0.1~0.25V
+5VA = 5.25~5.4V



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|--------------------------|-------------------------|-------|----------|
| MS-7428N1 | | | |
| Size | Document Description | Rev | |
| Custom | HD Audio ALC262 | 0C | |
| Date: | Monday, August 25, 2008 | Sheet | 29 of 35 |