

MS7301 Version:10

TITLE	SHEET
COVER SHEET	1
BLOCK DIAGRAM	2
PWR MAP/CLOCK MAP	3
GPIO/MEMORY/PCI/HW STRPPING	4
PROCESSOR (LGA775)	5-7
NORTH BRIDGE P4M890	8-11
SOUTH BRIDGE VT8237A	12-14
CLOCK GEN. & Buffer	15
SYS MEM-DDRII	16
PCI-Express Slot x16 / x1	17
PCI 1 & 2	18
Audio - ALC883/888	19
LAN-VT6103L	20
IDE & SATA	21
USB-REAR & FRONT	22
1394-VT6307 COLAY VT6308P	23
LPC IO-W83627EHG & BIOS	24
KB/MS & FAN & VGA	25
VRM- Intersil 6312	26
MS7 ACPI CONTROLLER	27
BULK/Decopuling/ATX POWER CONNECTOR / FRONT PANEL	28
HISTORY	29
Manual Part	30

CPU:
Intel LGA775

System Chipset:
PT890 (North Bridge)
VT8237A (South Bridge)

On Board Chipset:
BIOS -- LPC ROM
Audio - ALC888
LPC Super I/O -- W83627DHG
LAN --VT6103L
CLOCK --ICS953002+ICS9P936AFLF
1394 --VT6308P

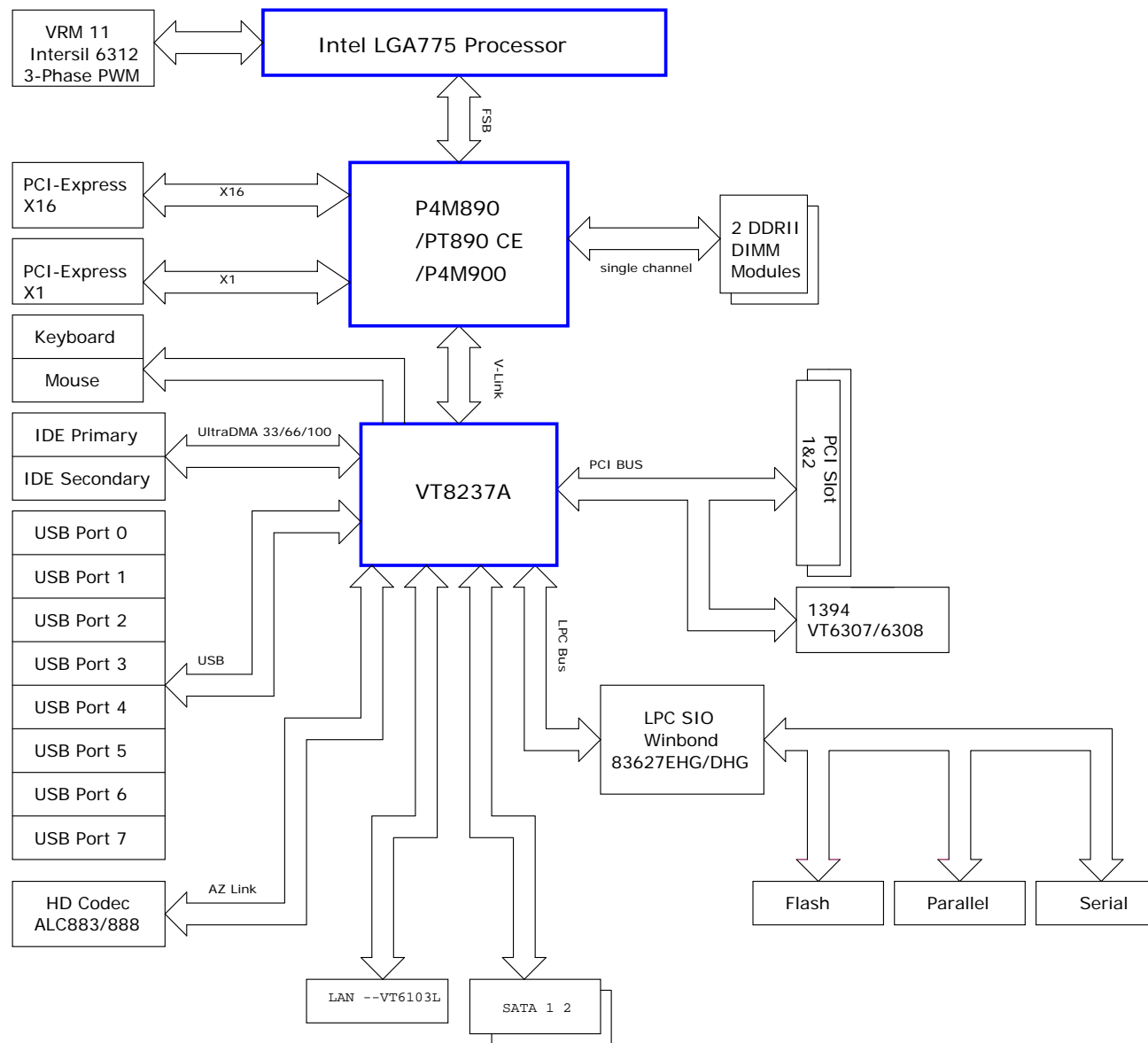
Main Memory:
single-channel --DDRII*2

Expansion Slots:
PCI Express X16 * 1
PCI Express X1 * 1
PCI 2.2Slot * 2

PWM(VRM11/FMB 05B):
Intersil 6312

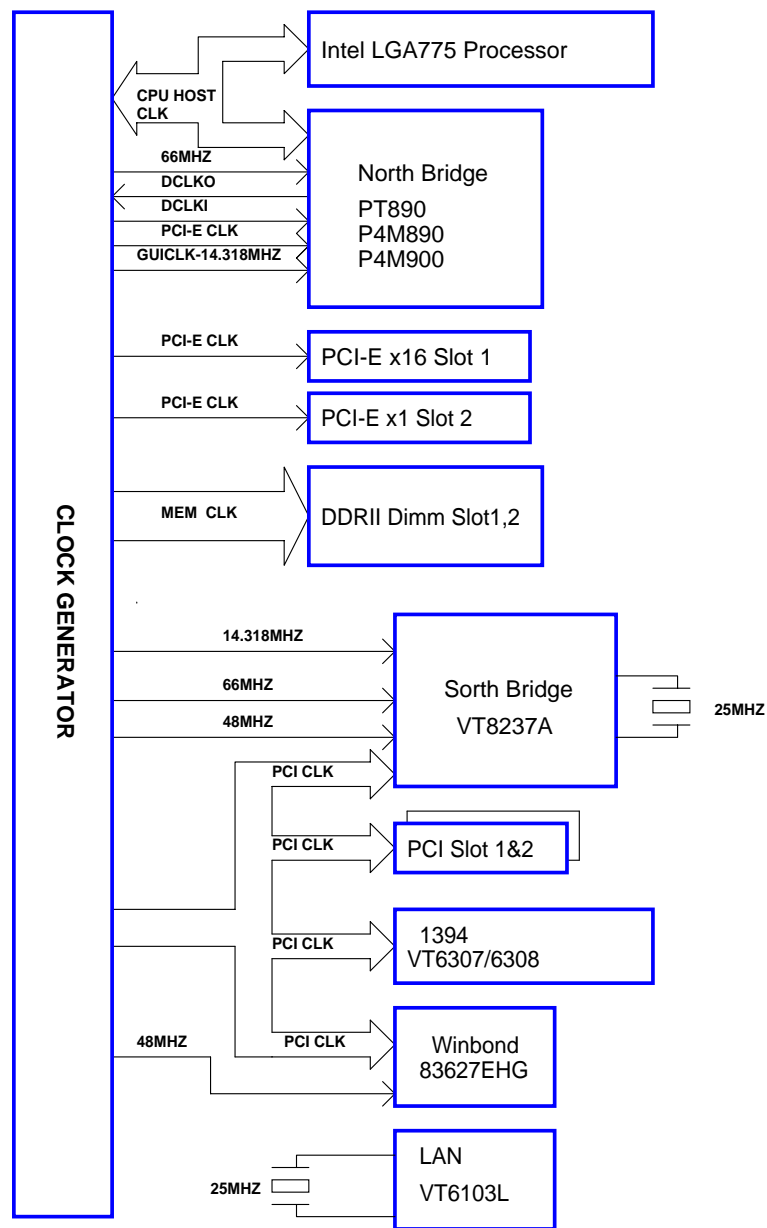
Micro Star Restricted Secret		
Title	COVER SHEET	Rev
Document Number	MS-7301	10
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Friday, July 07, 2006
		Sheet 1 of 30

Block Diagram

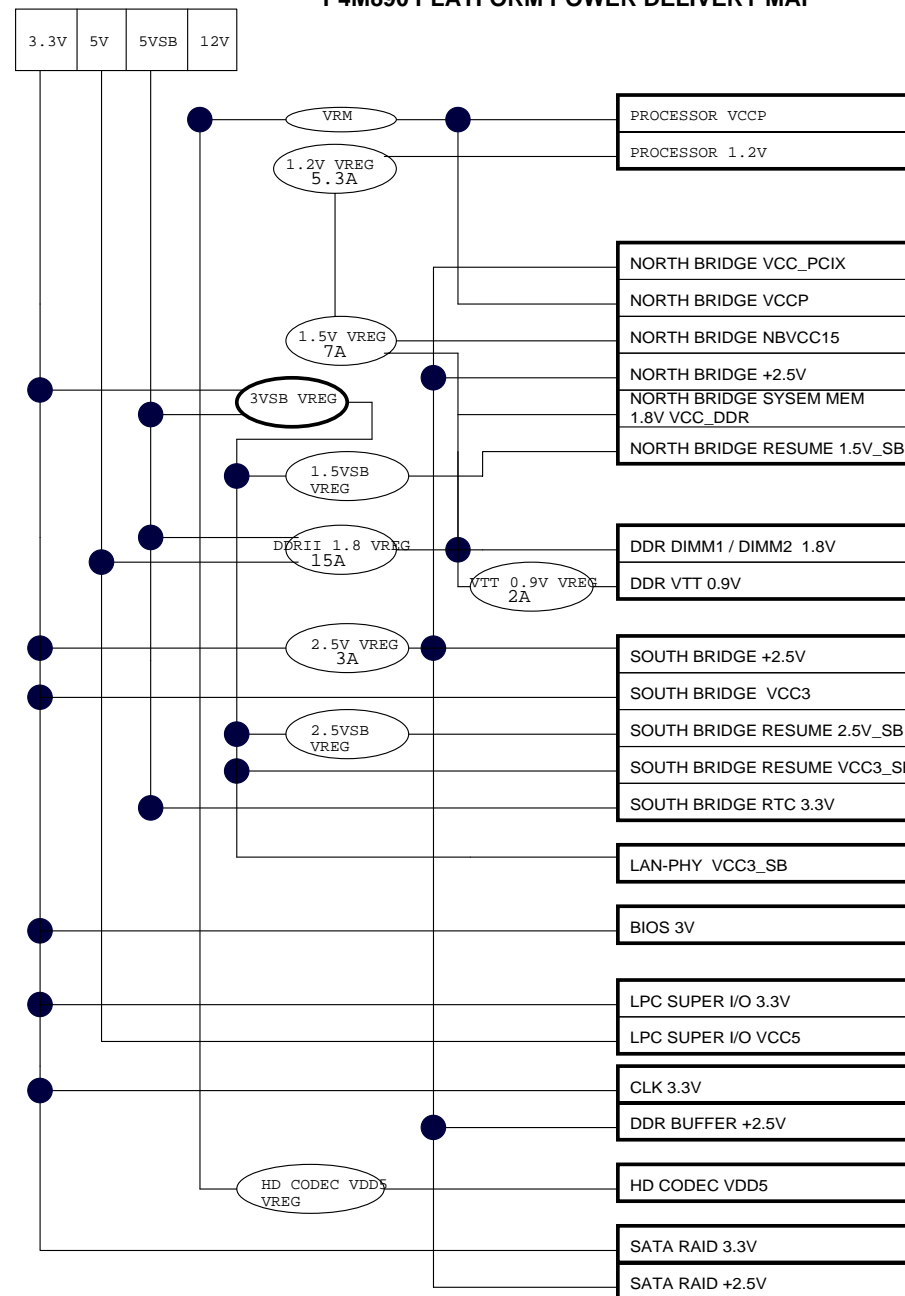


Micro Star Restricted Secret		
Title	BLOCK DIAGRAM	Rev 10
Document Number	MS-7301	
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Friday, July 07, 2006 Sheet 2 of 30

P4M890 PLATFORM CLOCK GENERATOR MAP



P4M890 PLATFORM POWER DELIVERY MAP



SB-VT8237A

Name	Pin	Function Description	Value
GPI0	AE2	unused	VBAT
GPI1	AC2	SB_THERMTRIP#	VSUS33
GPI2	AA1	THERM#	VSUS33
GPI3	Y2	RING	VSUS33
GPI4	AC1	ATADET1	VSUS33
GPI5	V4	BATLOW#	VSUS33
GPI6	AD10	AGPBZ	VSUS33
GPI7	R03	PREQ#5	VSUS33
GPI8	AC9	VGATE	VSUS33
GPI9	D26	GPI9	VCC33USB
GPI16	AE1	INTRUDER	VBAT
GPI17	Y1	ATADET0	VSUS33
GPI18	Y4	PEPMESC	VSUS33
GPI19	U23	APICCLK	VCC3
GPO0	AA3	PCIEREAT	VSUS33
GPO1	AE3	GPO1	VSUS33
GPO2	AA2	SUSA#	VSUS33
GPO3	Y3	SUSST#	VSUS33
GPO4	AB3	SUS_CLK	VSUS33
GPO5	AC7	CPUSTP#	VSUS33
GPO6	AD6	PCISTP#	VSUS33
GPO7	R2	PGNT#5	VSUS33
GPO9	D25	unused	VCC33USB
GPI08	AC9	VGATE	VCC3
GPI010	R25	APICD0	VCC3
GPI011	T23	APICD1	VCC3
GPI012	D4	PIRQ#E	VCC3
GPI013	E4	PIRQ#F	VCC3
GPI014	A3	PIRQ#G	VCC3
GPI015	B3	PIRQ#H	VCC3
GPI020	U1	AZ_SDIN2	VCC3
GPI021	V3	AZ_SDIN3	VCC3
GPI022	R22	GHI#	VCC3
GPI023	P21	DPSLP#	VCC3
GPI024	AE5	GPIOA	VCC3
GPI025	AD5	GPIOB	VCC3
GPI026	AD1	FAN_CTRL	VCC3
GPI027	AC3	SMBCK2	VCC3
GPI028	AC8	VIDSEL	VCC3
GPI029	AB9	PCIERST#	VCC3
GPI030	AF5	GPIOC	VCC3
GPI031	AC6	GPIOD	VCC3

DDR DIMM Config.

DEVICE	ADDRESS	CLOCK
DIMM 1	1010000B	MDCLKA0/A#0 MDCLKA1/A#1 MDCLKA2/A#2
DIMM 2	1010001B	MDCLKB0/B#0 MDCLKB1/B#1 MDCLKB2/B#2

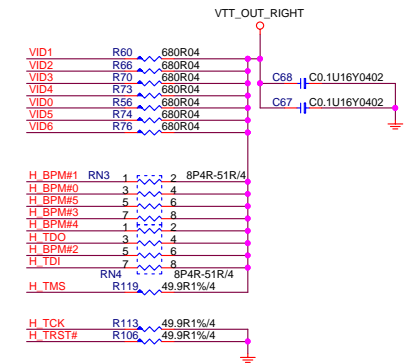
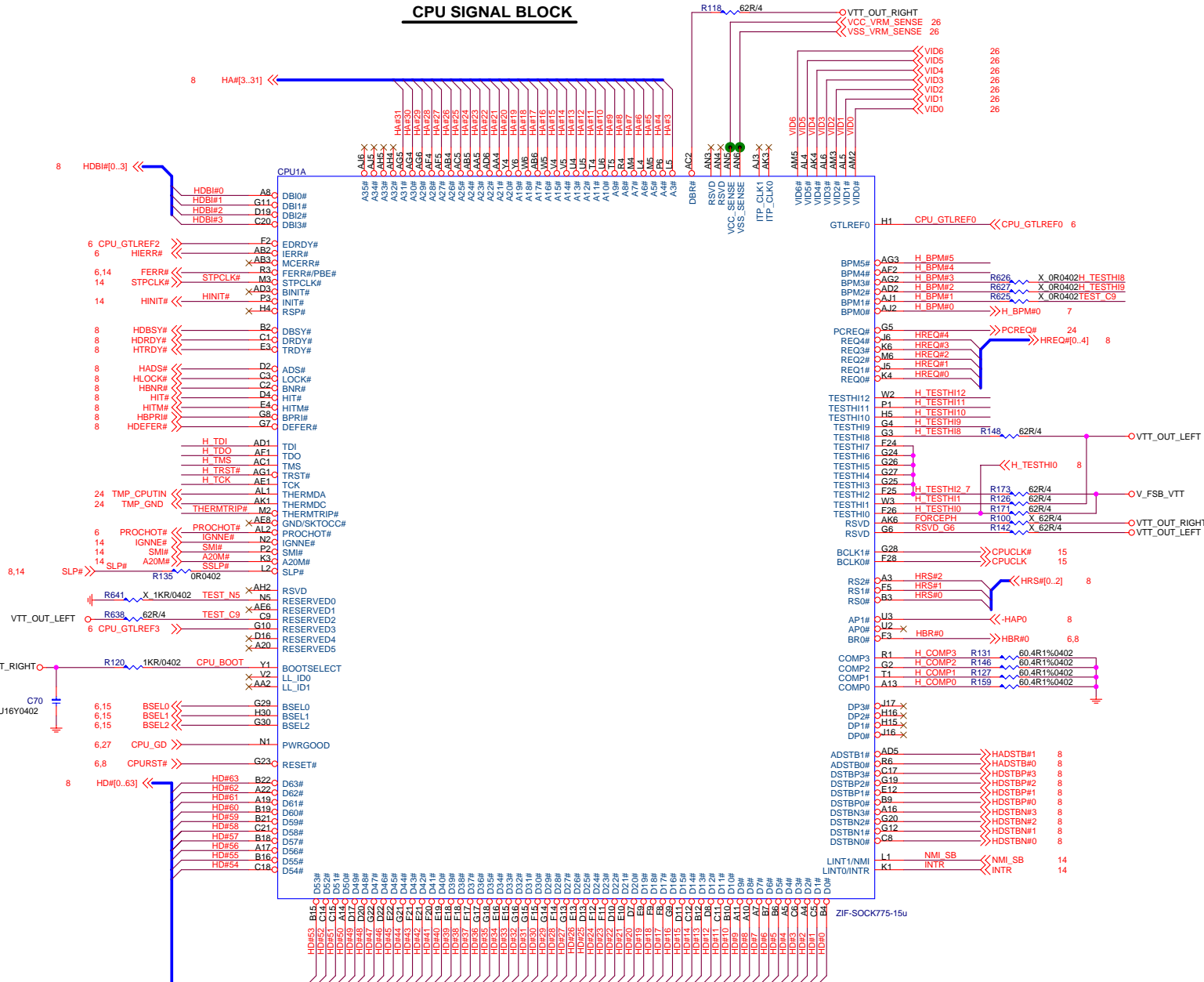
PCI Config.

DEVICE	MCP1 INT Pin	REQ#/GNT#	IDSEL	CLOCK	CLK GEN PIN OUT
PCI Slot 1	PIRQ#A PIRQ#B PIRQ#C PIRQ#D	PREQ#1 PGNT#1	AD21	PCICLK1	13 (PCI_CLK2)
PCI Slot 2	PIRQ#B PIRQ#C PIRQ#D PIRQ#A	PREQ#0 PGNT#0	AD20	PCICLK2	12 (PCI_CLK1)
1394	PIRQ#F	PREQ#3 PGNT#3	AD19	1394_PCLK	11 (PCI_CLK0)

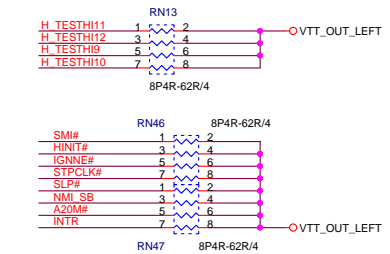
PCI RESET DEVICE

Signals	Source	Target
PCIRST#	SB	MS7
PCIRST#1	MS7	NB & SATA RAID & 1394 & SPIO & BIOS
PCIRST#2	MS7	PCI slot 1-2 & PCIE 1-2
HDRST#	MS7	Primary, Scndary IDE

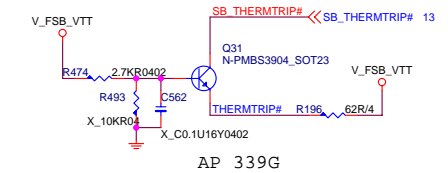
CPU SIGNAL BLOCK

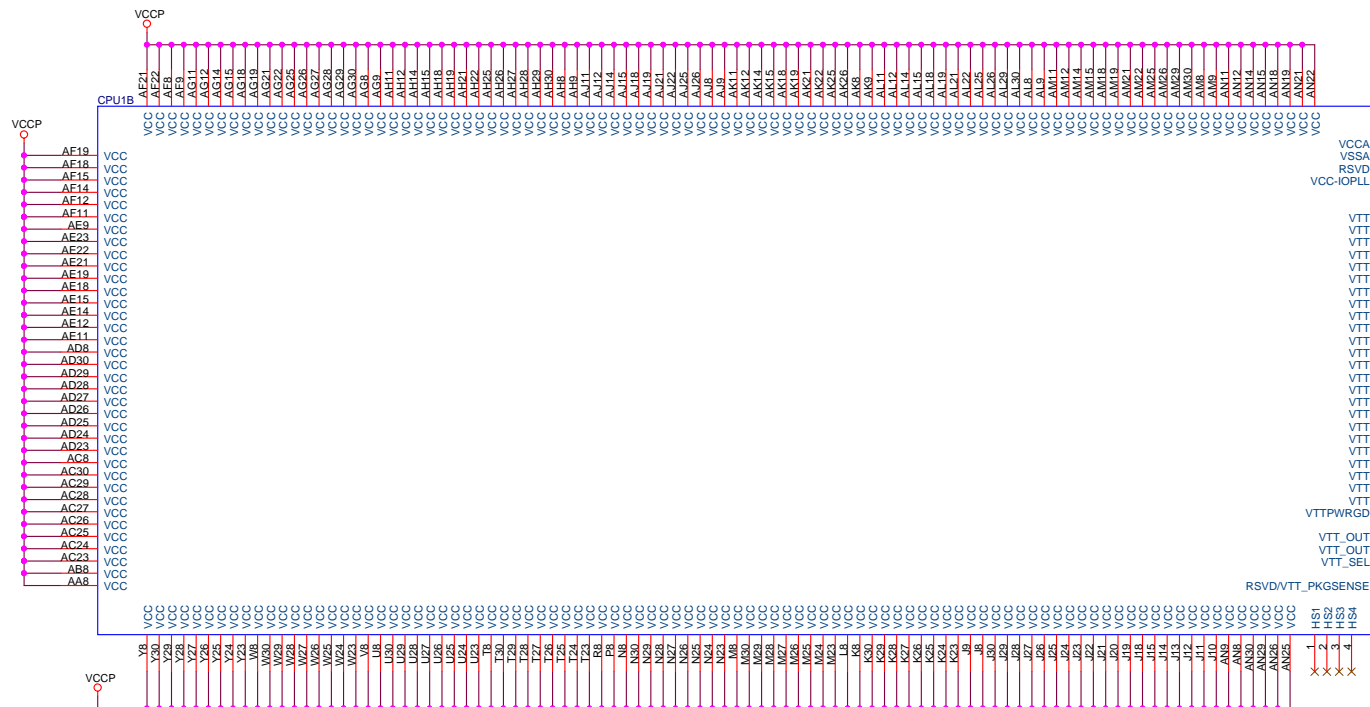


PLACE BPM TERMINATION NEAR CPU

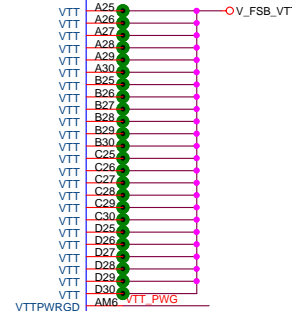


THE VT8327A IS OD PIN NEED TO PULL HIGH





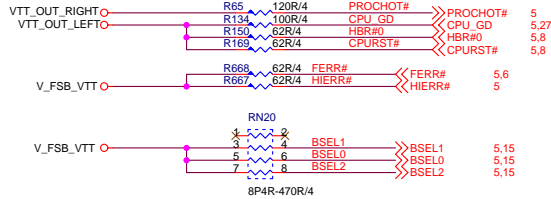
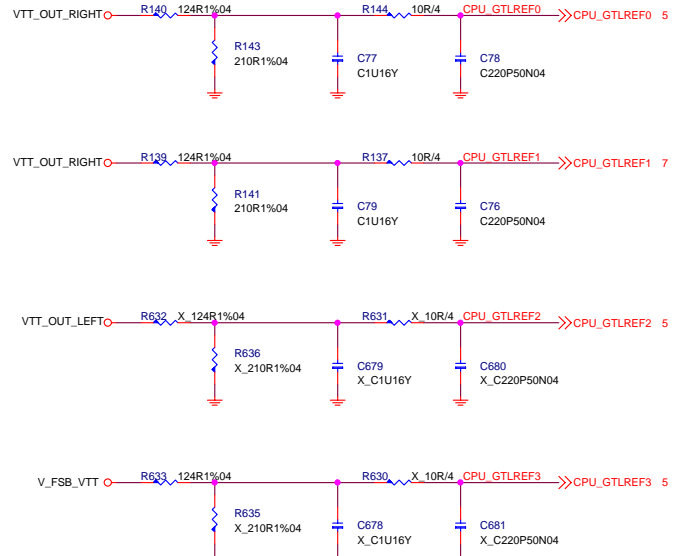
VCCA
VSSA
RSVD
VCC-IOPLL



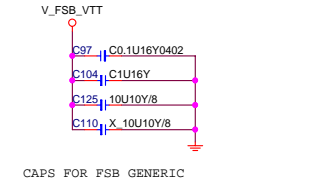
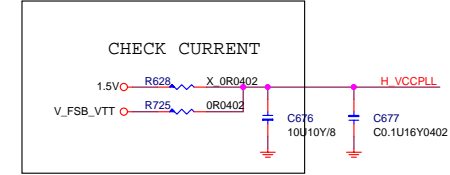
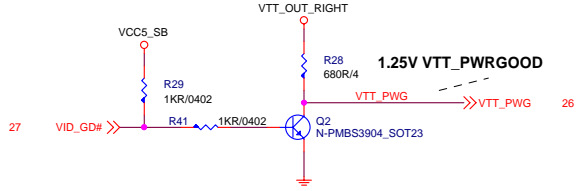
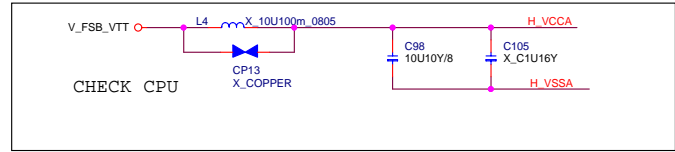
VTT_OUT_RIGHT
VTT_OUT_LEFT
VTT_SEL

RSVD/VTT_PKGSENSE

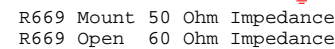
0	TR3/PSC
1	RSVD

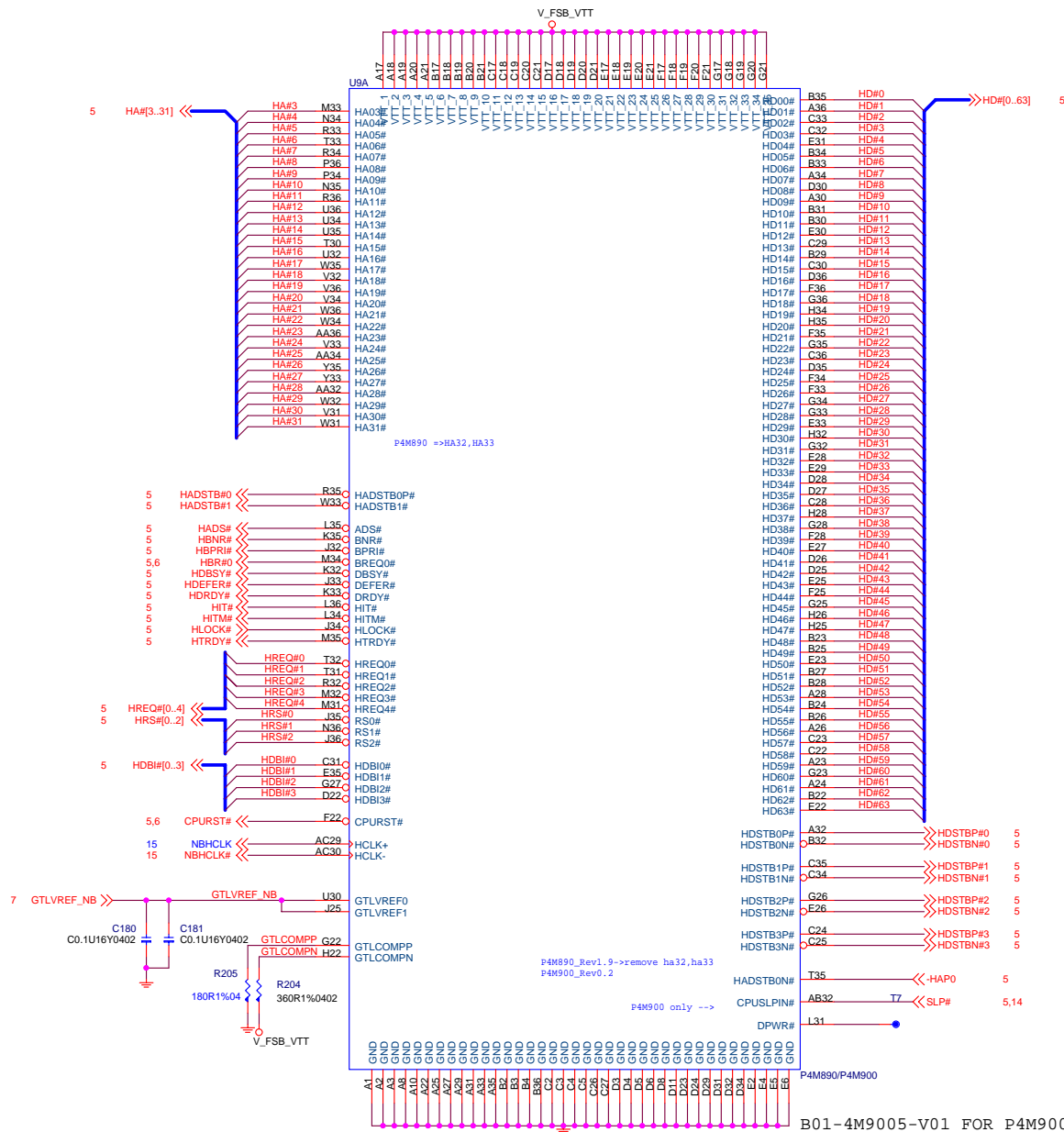


PLACE COMPONENTS AS CLOSE AS POSSIBLE TO PROCESSOR SOCKET
TRACE WIDTH TO CAPS MUST BE SMALLER THAN 12MILS



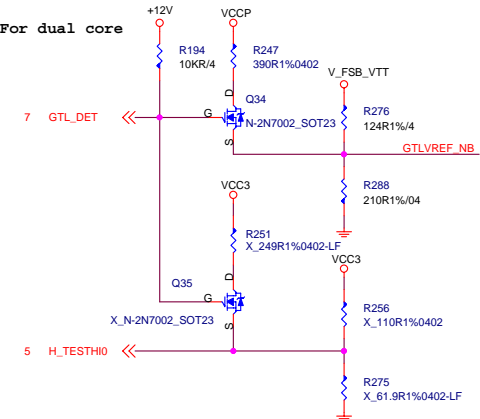
Micro Star Restricted Secret	
Title	Rev
Intel LGA775 CPU - Power	10
Document Number	MS-7301
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	
Last Revision Date: Friday, July 07, 2006	
Sheet	6 of 30



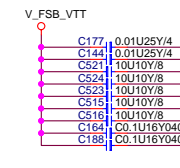
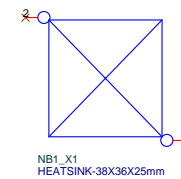


GTL_DET=1 ,GTLVREF_NB=0.8V, H_TESTHIO=1.5V
GTL_DET=0 ,GTLVREF_NB=0.75V, H_TESTHIO=1.2V

For dual core

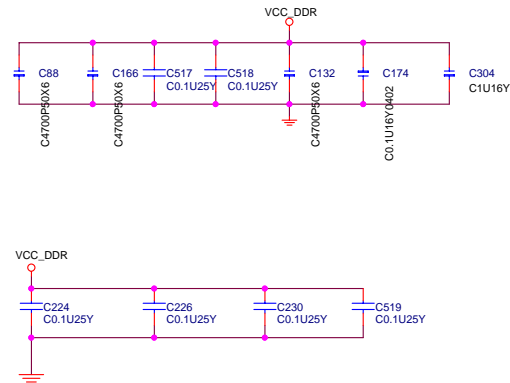
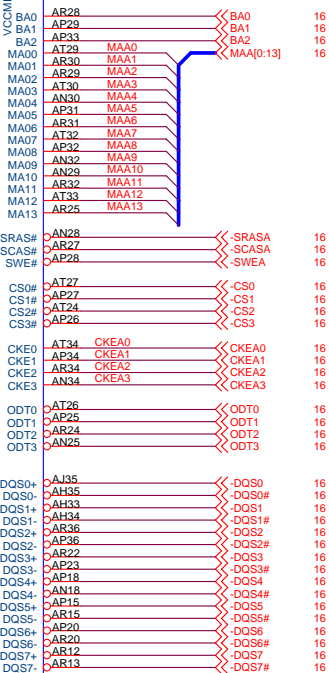
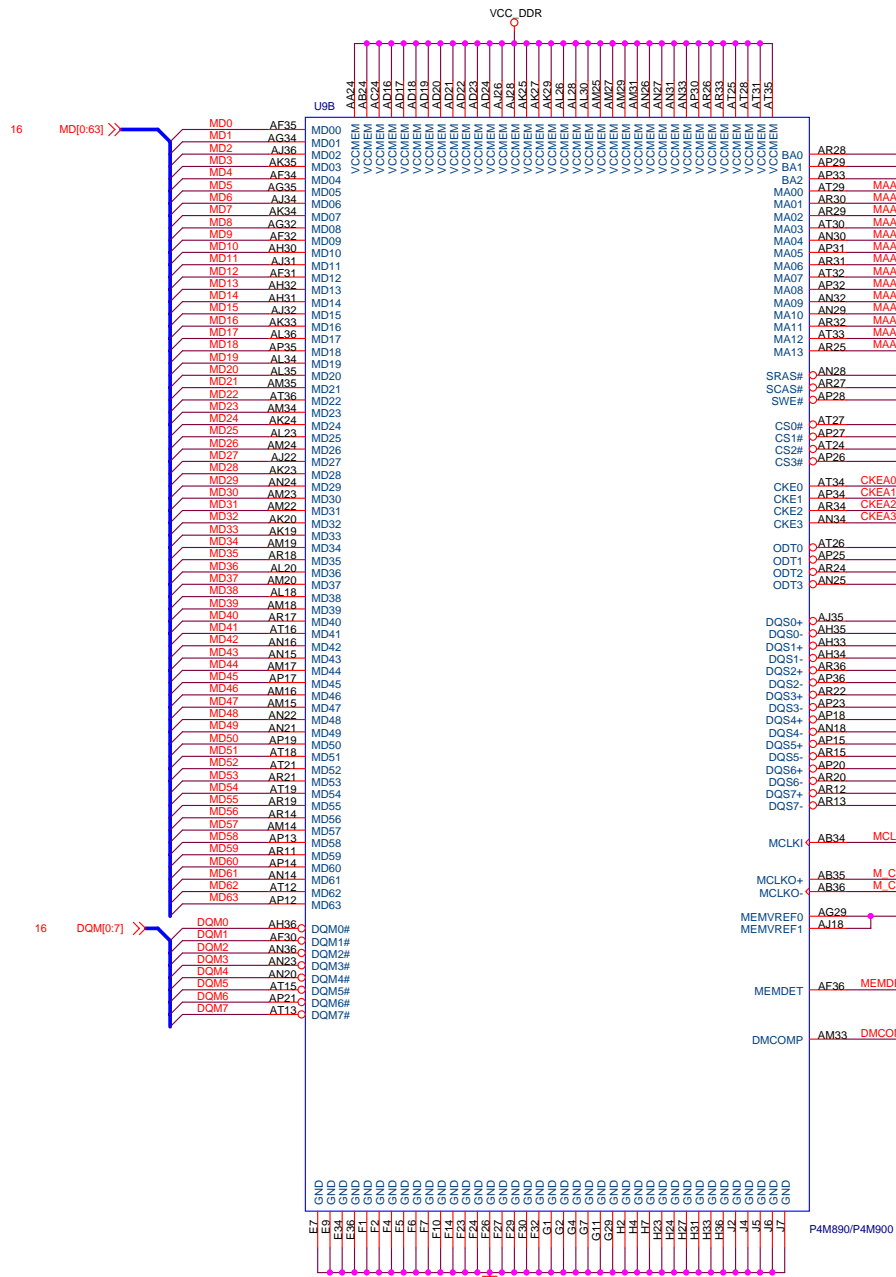


NB Heatsink



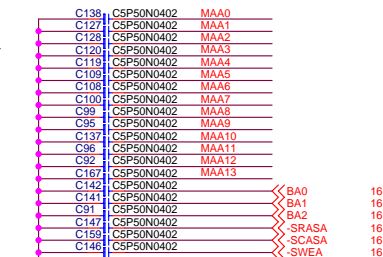
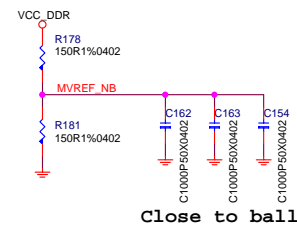
Micro Star Restricted Secret

Title		Rev
P4M890-1(HOST)		10
Document Number		MS-7301
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: Friday, July 07, 2006
Sheet		8 of 30



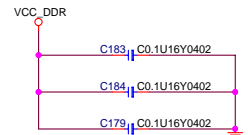
NOTE: DQS/DQS# => OTHER:W:S:W:OTHER=15:10:5:10:15

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

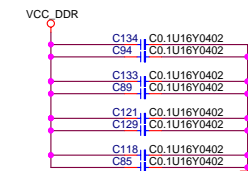


PULL DOWN GND OR PULL UP +1.8VDDIMM

CLOSE TO DIMM



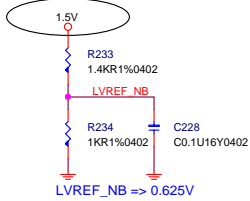
NEAR PM890



NEAR DIMM

Micro Star Restricted Secret

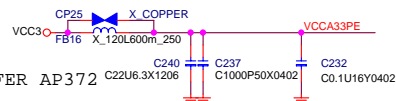
Title		Rev
P4M890-2(MEM)		10
Document Number	MS-7301	
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan		Last Revision Date: Friday, July 07, 2006
http://www.msi.com.tw		Sheet 9 of 30



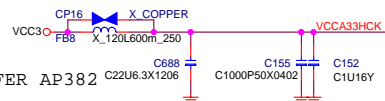
Strapping For NB_TEST Mode
TESTIN BISTIN RBF WBF
1 1 x x
Disable all TEST mode

TESTIN_NB R187 4.7KR0402 VCC_DDR

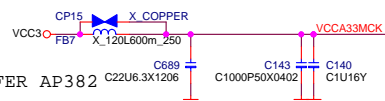
FOR P4M900 DO NOT STUFF R187



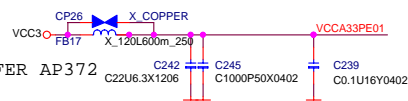
REFER AP372



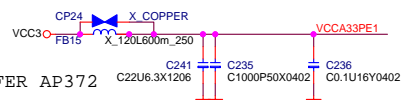
REFER AP382



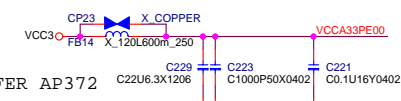
REFER AP382



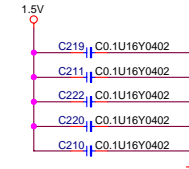
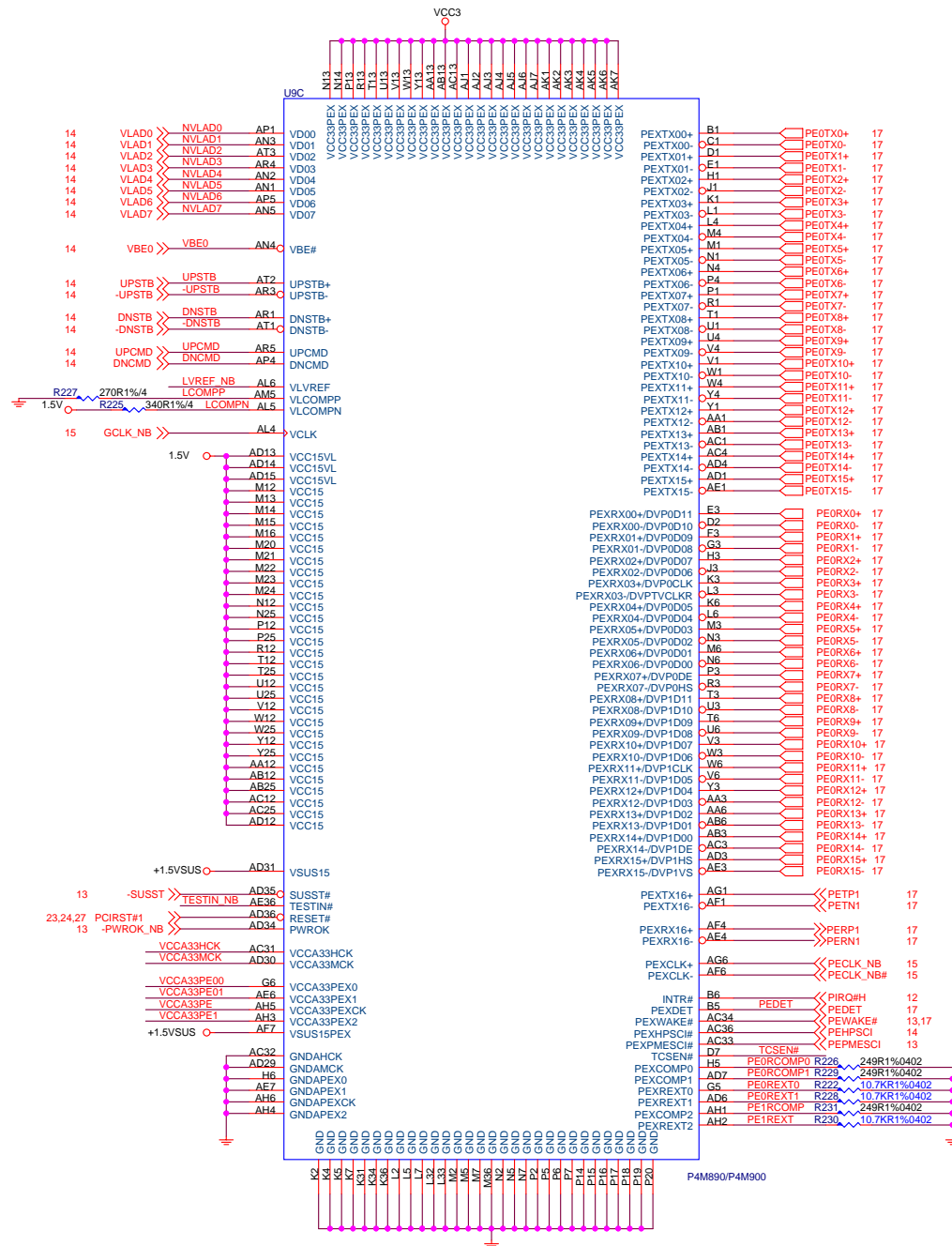
REFER AP372



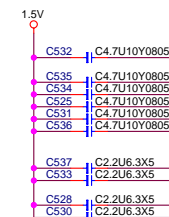
REFER AP372



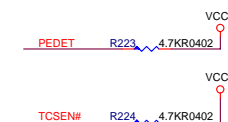
REFER AP372



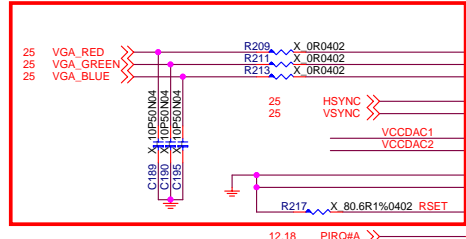
Decoupling capacitors



under NB(solder side)



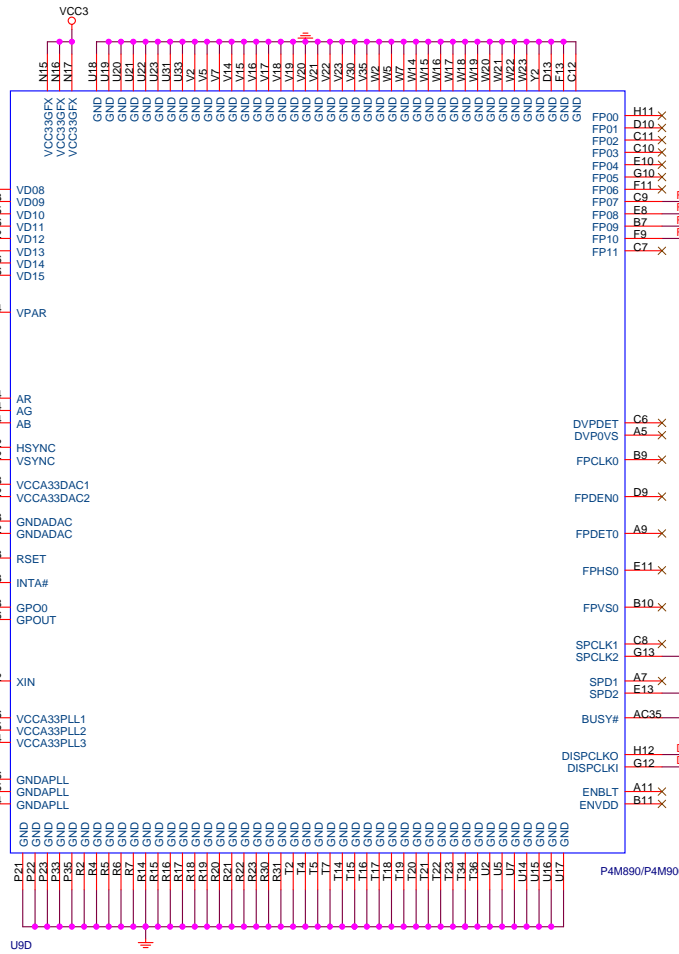
CHECK cO-LAYOUT WITH P4M900



15 GUICK >> GUICKL

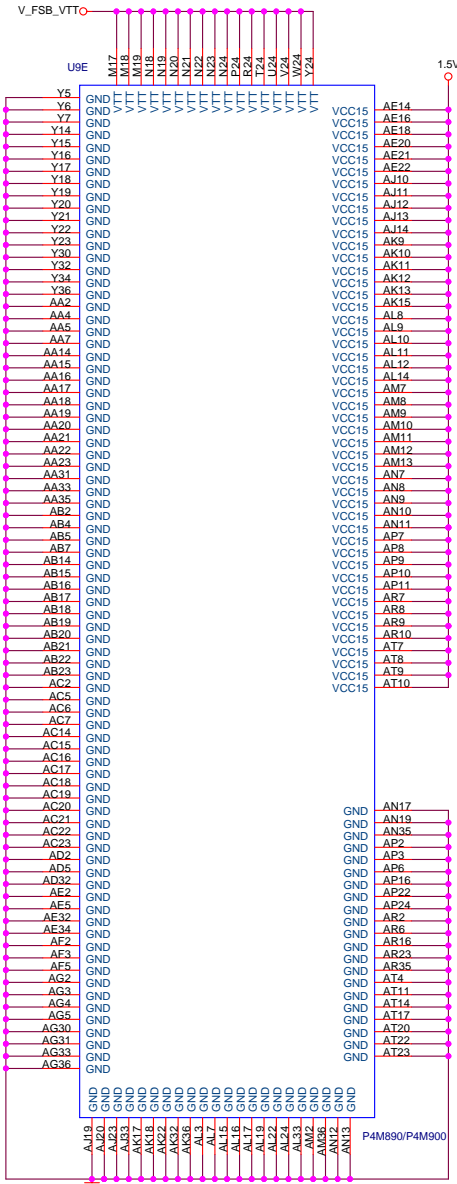
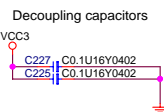
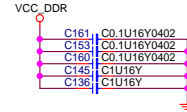
VCCPLL1
VCCPLL2
VCCPLL3

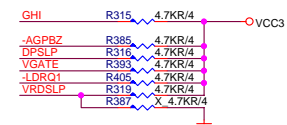
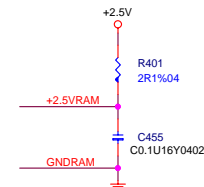
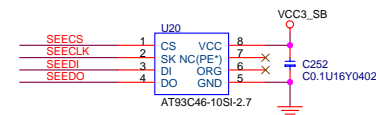
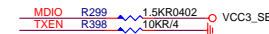
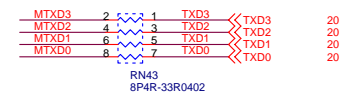
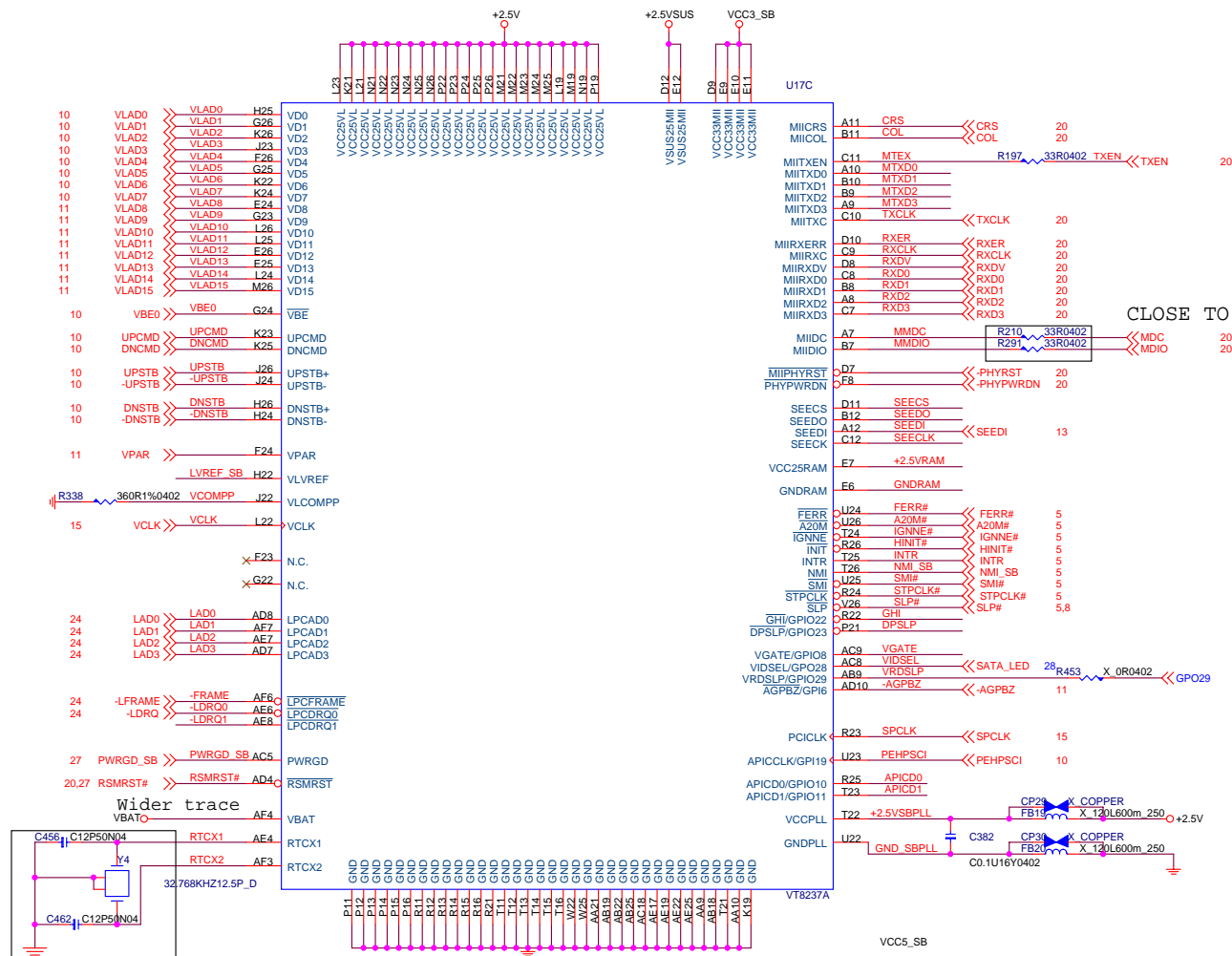
B16
B15
B14



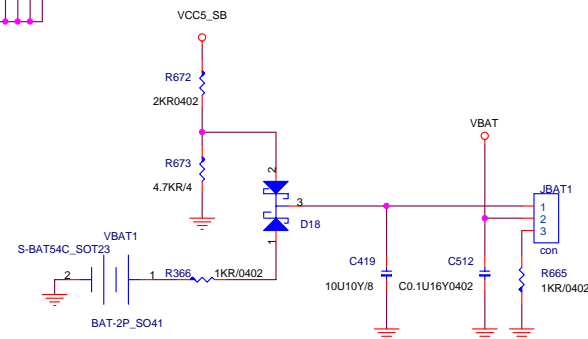
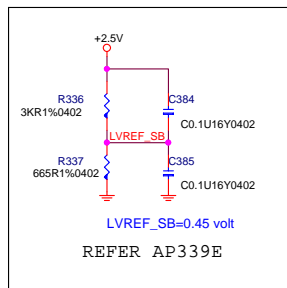
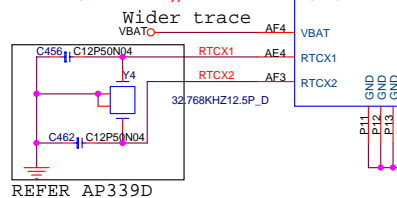
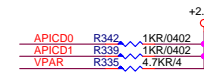
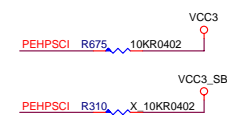
FD4 1: 24bit / 0:2 x 12 bit DVI interface
FD5 Dedicated DVI port configuration 0:TWMS 1:TV-encoder
FD6 Dedicated DVI port 0:disable 1:enable
FD7 GFX clock select(VCK/LCDCK/ECK) 0:refer internal PLL 1:from external
FD10 CPUCK/MCK clock select 0:from NB 1:from external
FD[0:1:2:3:8:9:11] Reserved

CHECK cO-LAYOUT WITH P4M900

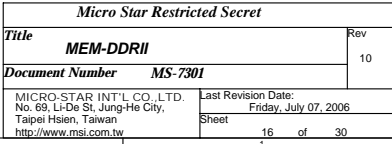




VRDQSLP PULL HIGH FOR GPO29 USED



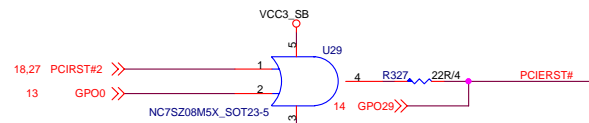
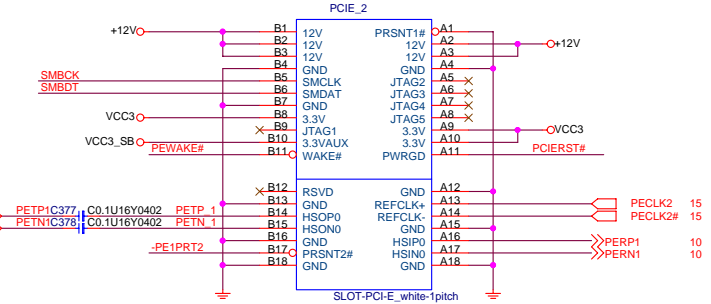
Micro Star Restricted Secret	
Title	Rev
Document Number	MS-7301
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	
Last Revision Date: Friday, July 07, 2006	
Sheet	14 of 30




```
12V==> 5.5A for x16 slot ,75 Watt
3.3V==> 3A
3.3Vaux==>375mA
```

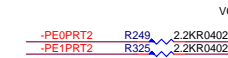


PCI EXPRESS X1-PORT 2



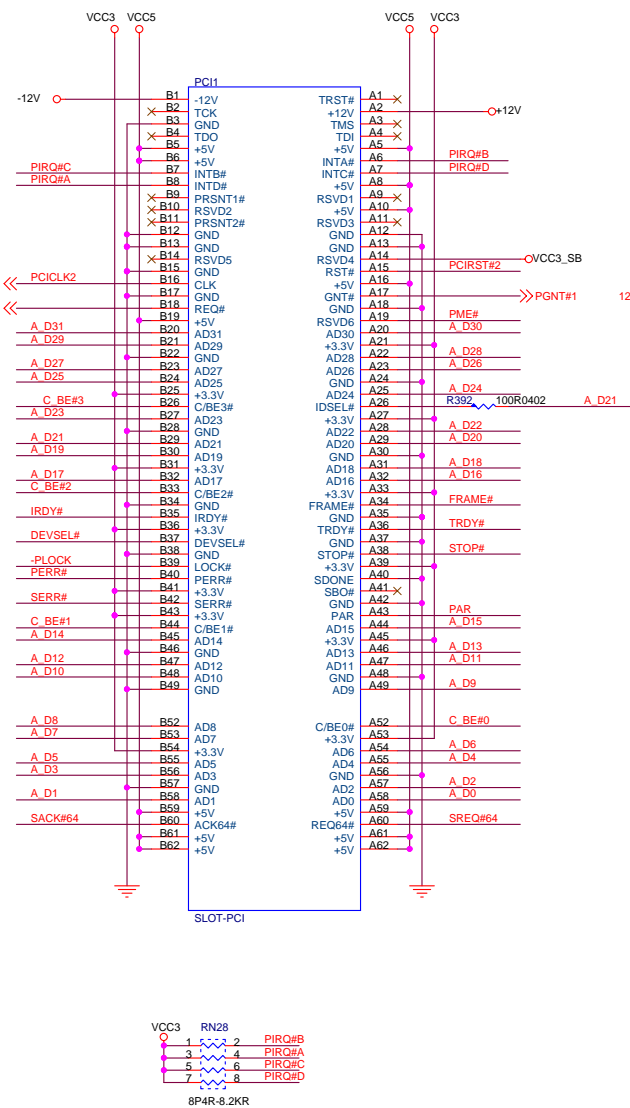
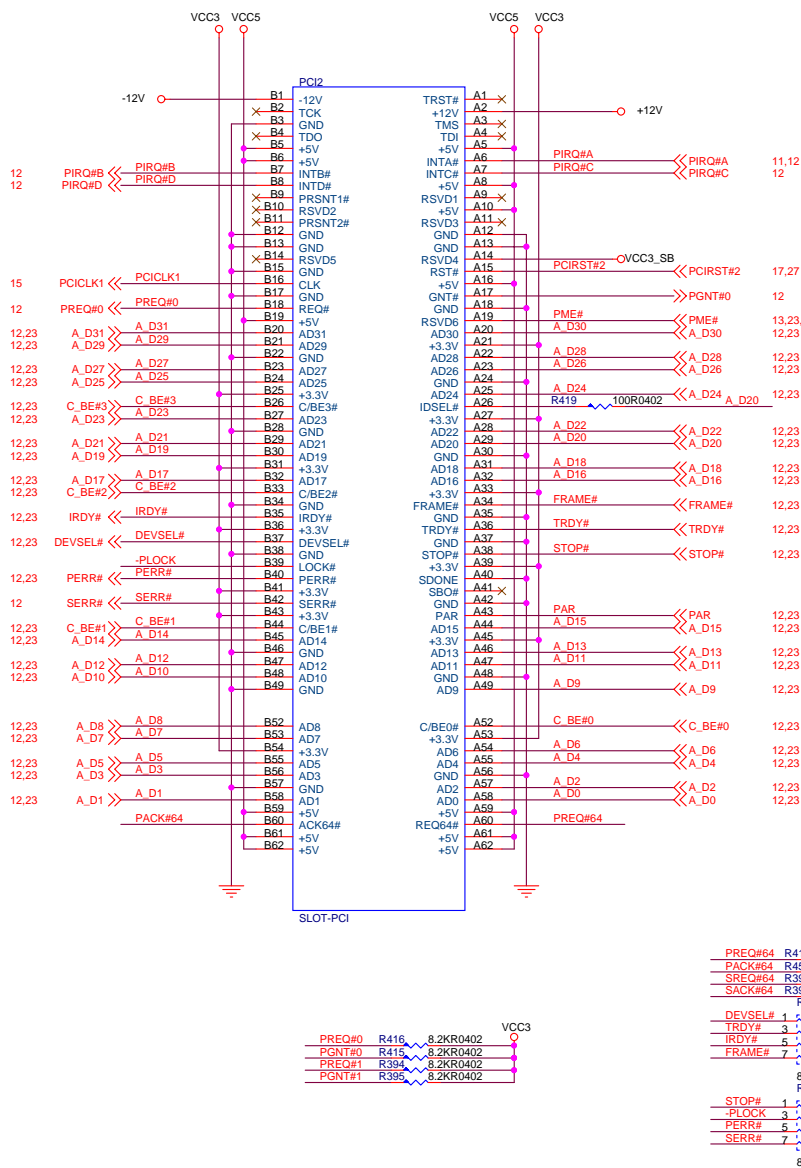
REFER AP379

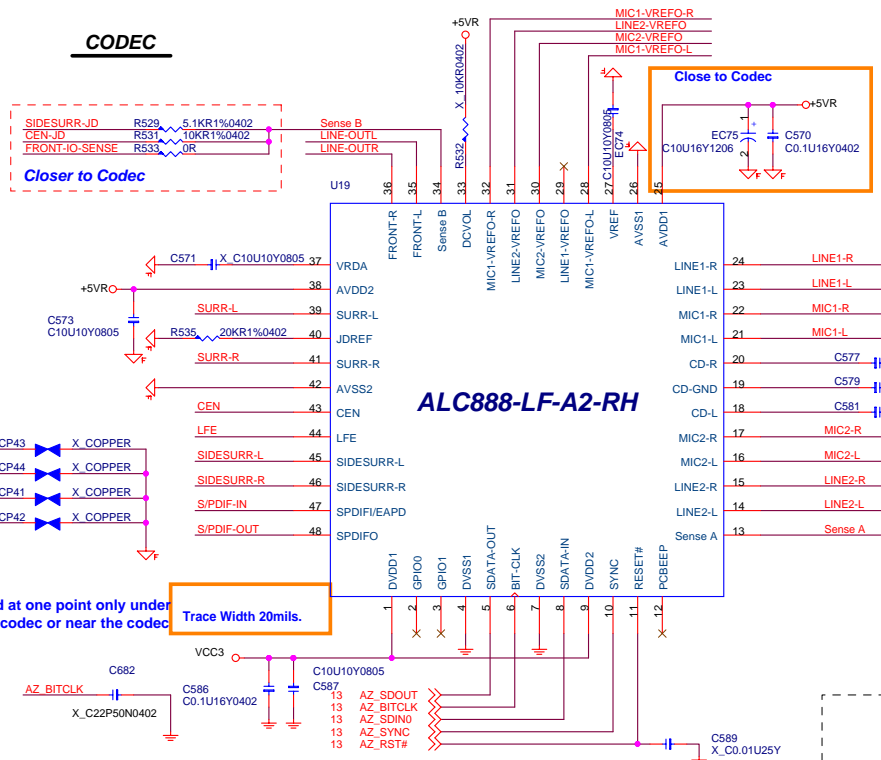


near PEG x16 slot

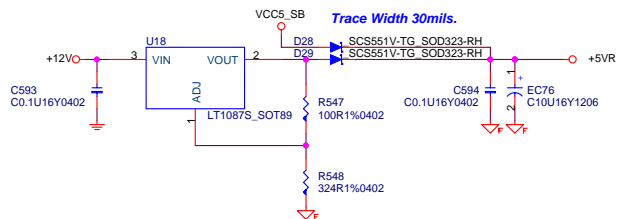
The system board designer determines the pull-up voltage

PCI Connectors

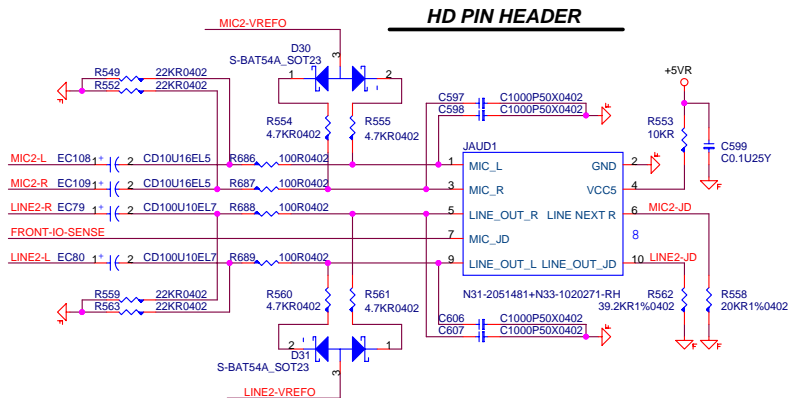


CODEC

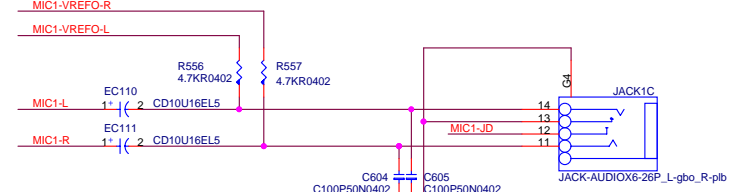
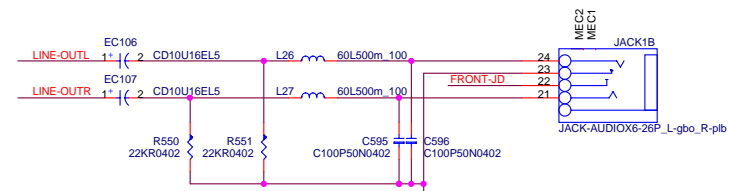
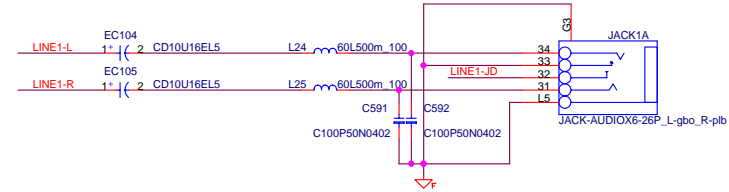
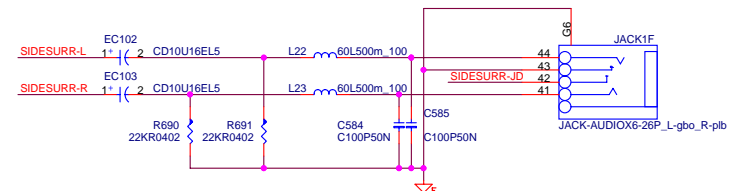
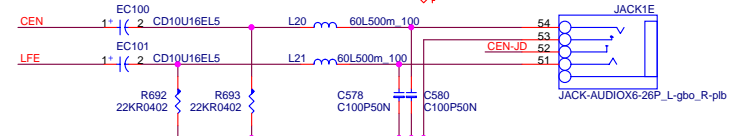
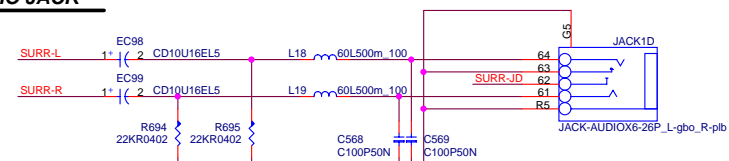
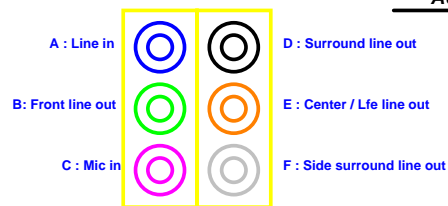
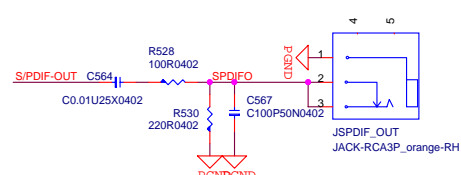
AUDIO CODE REGULATORS



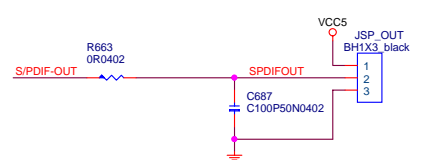
HD PIN HEADER



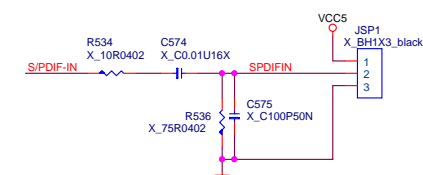
AUDIO JACK

**SPDIF**

SPDIF OUT

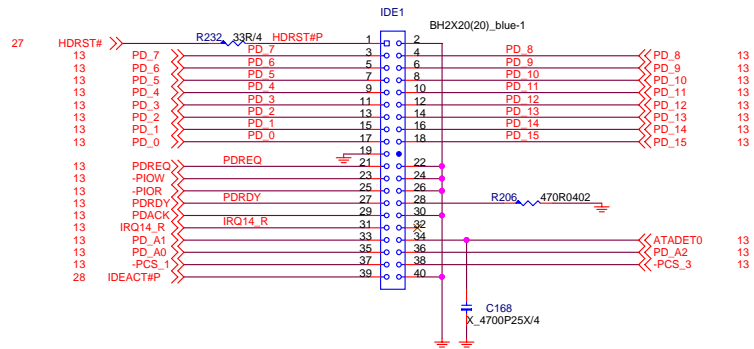


SPDIF IN

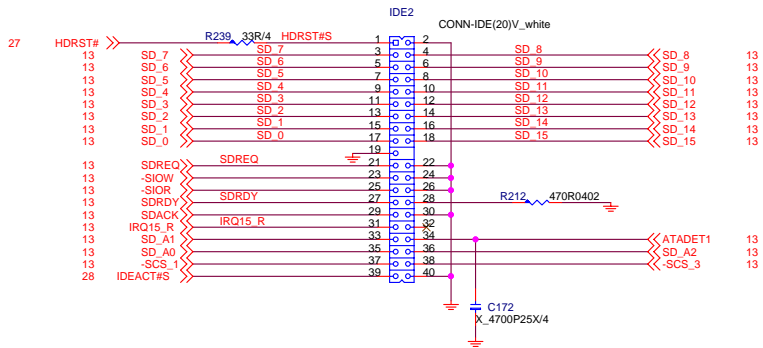


<i>Micro Star Restricted Secret</i>			
Title HD 1708			Rev
Document Number MS-7301			10
MICRO STAR INT'L CO. LTD. No. 68, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Thursday, July 13, 2006 <hr/> Sheet 19 of 30	

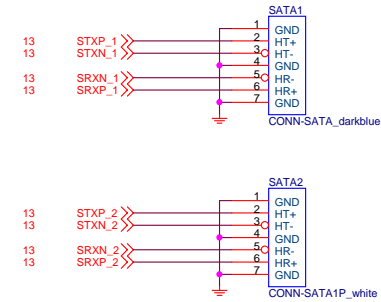
PRIMARY IDE BLOCK



SECONDARY IDE BLOCK

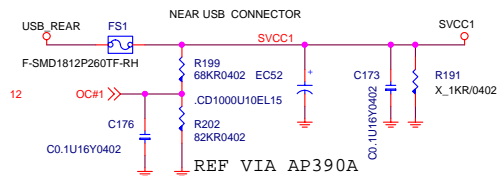


SERIAL ATA CONNECTOR BLOCK

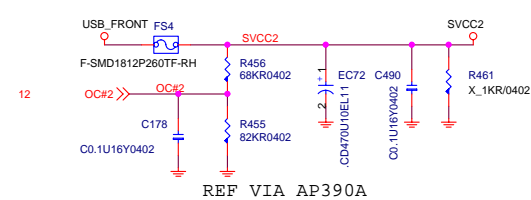


Micro Star Restricted Secret		
Title	IDE & SATA	Rev
Document Number	MS-7301	10
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Friday, July 07, 2006
Sheet		21 of 30

POWER CIRCUIT FOR USB PORT 0,1,2,3 (REAR)

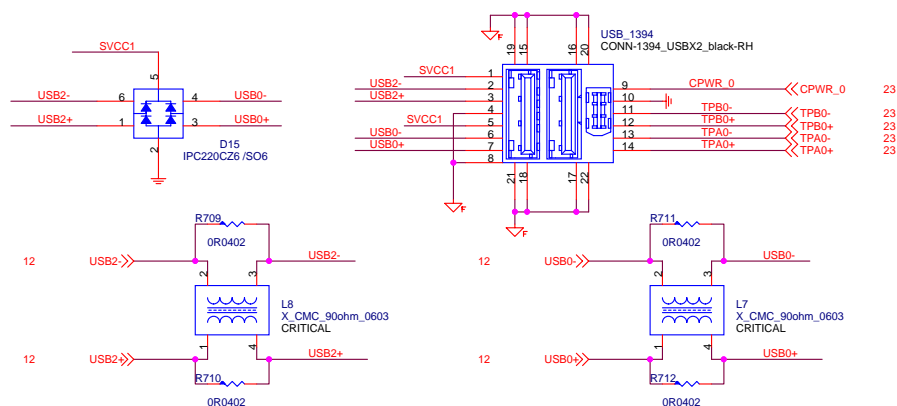


POWER CIRCUIT FOR USB PORT 4,5,6,7 (FRONT)

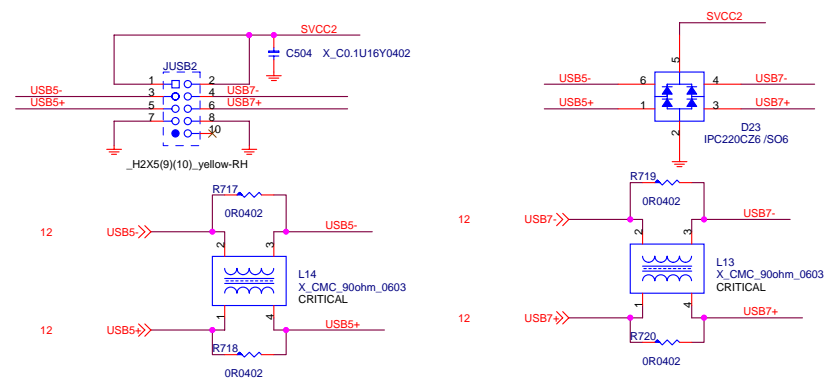


REAR PANEL USB CONNECTOR FOR USB PORT 0,1 & 1394 PORT

USB Interface
Diff. Trace width 7.5 mils & 7.5 mils space.
Diff. & other space 20 mils.
Length matching: < 150 mils
Trace length 0" to 17"

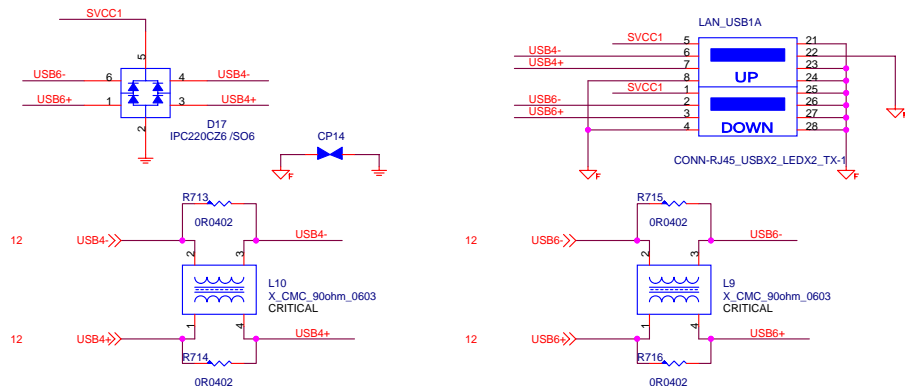


FRONT PANEL USB CONNECTOR FOR USB PORT 6,7

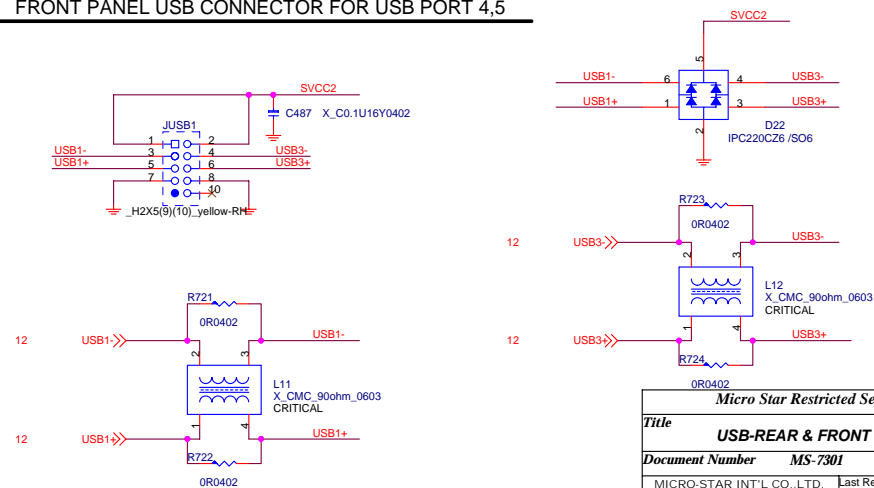


REAR PANEL USB CONNECTOR FOR USB PORT 2,3

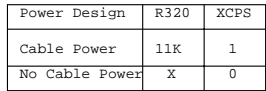
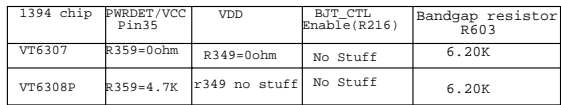
NEAR USB CONNECTOR



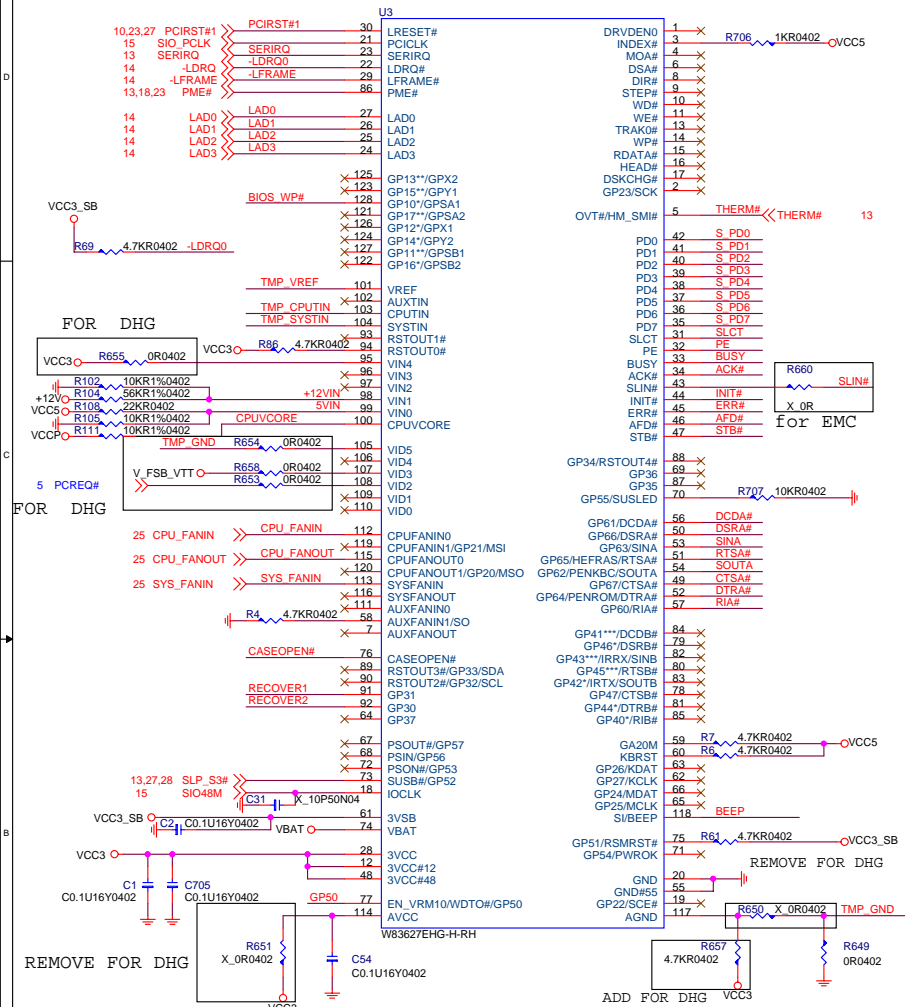
FRONT PANEL USB CONNECTOR FOR USB PORT 4,5



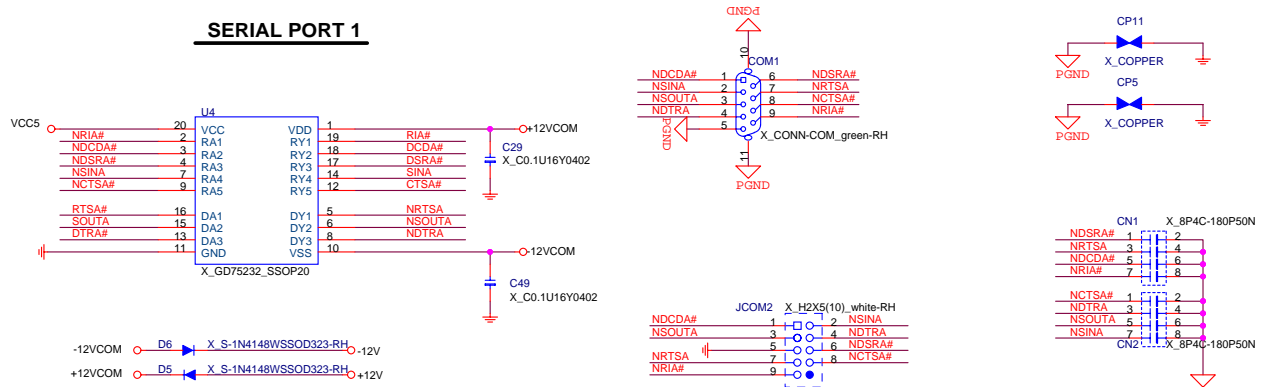
Micro Star Restricted Secret		
Title		Rev
USB-REAR & FRONT		10
Document Number		MS-7301
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Friday, July 07, 2006
Sheet		22 of 30



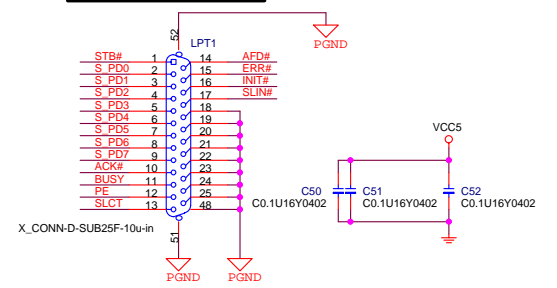
83627EHG/DHG



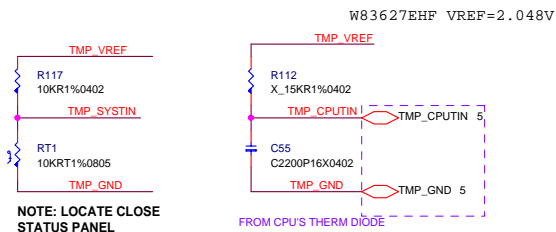
SERIAL PORT 1



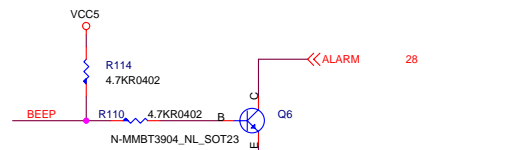
PARALLEL PORT



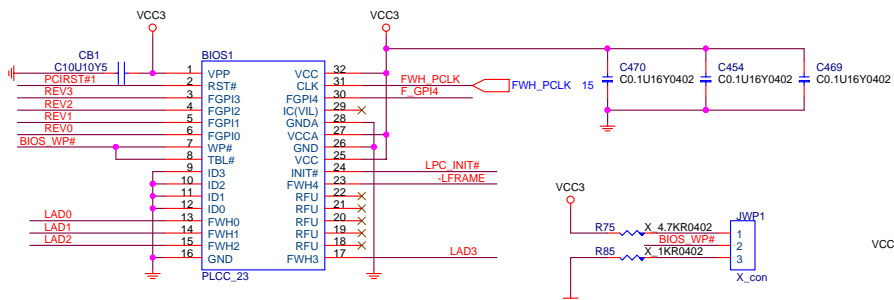
Temperature Sensing



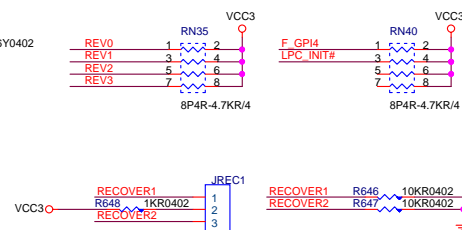
buzzer control



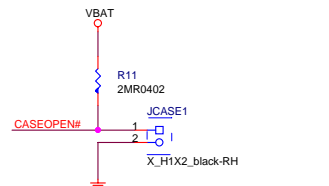
FIRMWARE HUB (FWH)



FWH RESISTORS



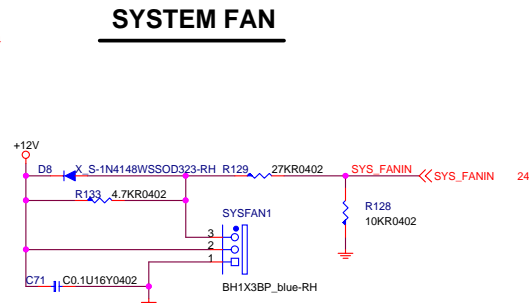
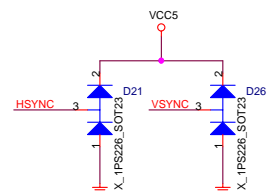
Chassis Intrusion

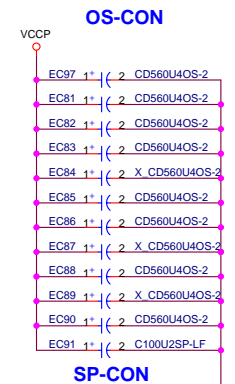


LPC I/O STRAPPING RESISTOR

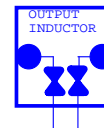
SOUTA	L: Disable KBC	H: Enable KBC
GP50	L: TTL LEVEL	H: VRM10 LEVEL
RTSA#	L: CFAD=2E	H: CFAD=4E
DTRA#	L: PNP Default	H: PNP no Default

<i>Micro Star Restricted Secret</i>		
Title	LPC IO-W83627EHG & BIOS	Rev
Document Number	MS-7301	10
MICRO STAR INT'L CO. LTD. No. 69, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Monday, July 17, 2006 Sheet 24 of 30

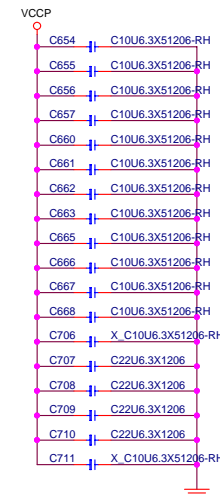
[illegible][illegible]



CP46,CP47,CP48,CP49,
CP50,CP51 PLACE ON
THE SOLDER SIDE,
CLOSE INDUCTOR



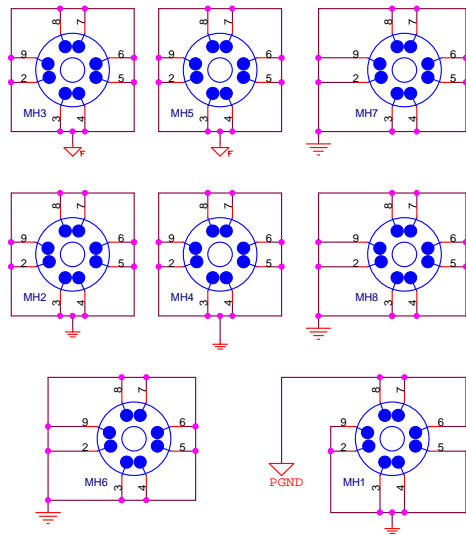
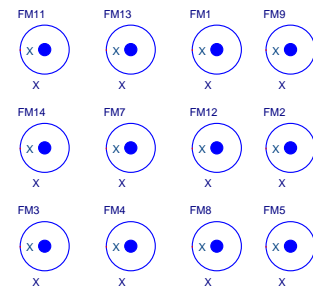
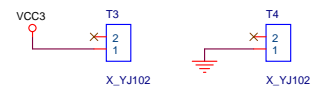
Ceramic



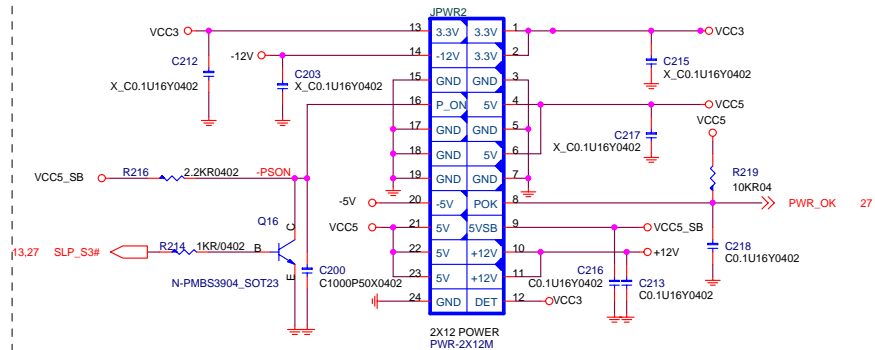
Micro Star Restricted Secret

Title	VRM-RT8802A+9607+9619	Rev	10
Document Number	MS-730I		
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Thursday, July 13, 2006 Sheet 26 of 30		

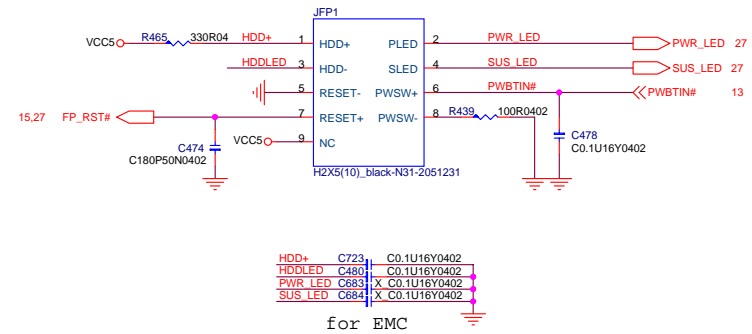
Impedance Test



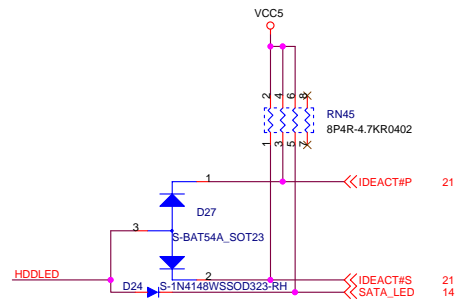
ATX Connector



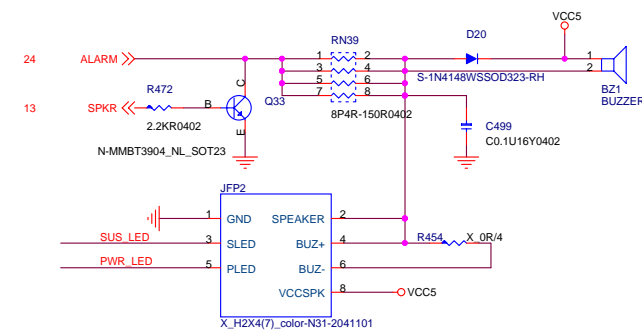
For MSI / Intel Front Panel



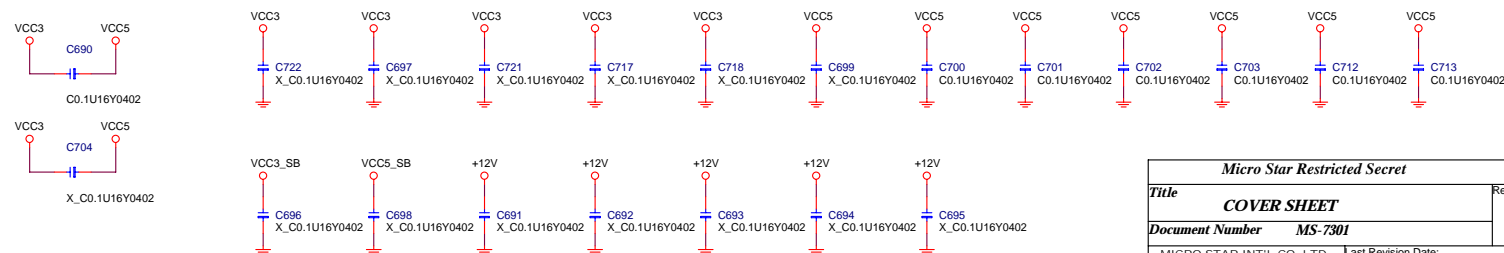
IDE LED & SERIAL ATA LED



BUZZER



For EMI



Micro Star Restricted Secret		
Title	COVER SHEET	Rev
Document Number	MS-7301	10
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: Friday, July 07, 2006
Sheet		28 of 30

MS-7301-0A bug history list

1	change RN44 singals to solve the swap error	2006.05.05
2	add a 240k resistor at u27 pin 9 to gnd to solve the vcore =0	2006.05.11
3	add a 100OMH resistor PULL HIGH THE SIGNAL"CPU_GD"FOR MS7 CPU _GD PIN IS OD PIN R134	2006.05.12
4	SLP#,STPCLK,NMI_SB,A20M#,SMLHINIT,IGNNE,INTR,FERR# AT SB SIDE ARE OD PINS NEED TO PULL HIGH TO VTT_OUT_LEFT	2006.05.12
5	change cpu fan for block pin error	2006.05.15
6	changer391 to r389 for enable lan ceprom	2006.05.15
7	changer458 to r457 for via ap note	2006.05.15
8	add r428 for enable lan function	2006.05.15
9	add vcc3_sb to lan tx isingals for enable lan function	2006.05.15
10	CHANGE EC92,93,94,95,96,112 TO 1000uf 16v FOR BOM ERROR	2006.06.10
11	ADD R637 FOR CONROE CPU SUPPORT	2006.06.13