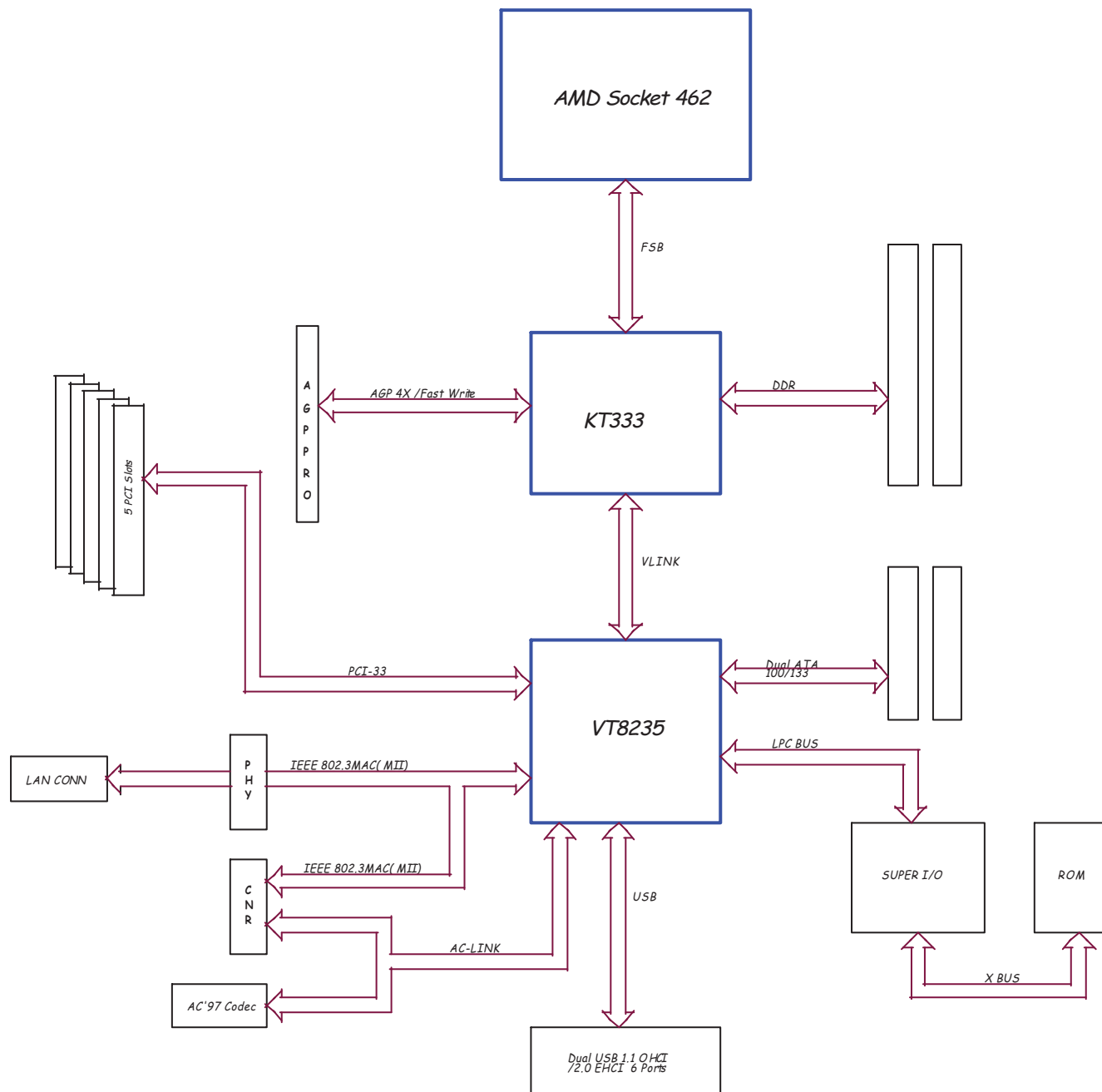


AMD PGA 462 Processor
VIA KT333 / VT8235 Chipset
Winbond 83697HF-VF LPC I/O

HISTORY	47

Block Diagram



GPIO FUNCTION

VT8233 GPIO Function Define

PIN NAME	Function define	PIN NAME	Function define																
GP00 (VSUS33)	GP00	GPI0	GPI0																
GP01/SUSA#(VSUS33)	SUSA#	GPI1	ATADET0==>Detect IDE1 ATA100/66																
GP02/SUSB#(VSUS33)	SUSB#	GPI2/EXTSMI#	EXTSMI#																
GP03/SUSST1#(VSUS33)	SUSST1#	GPI3/RING#	RING#																
GP04/SUSCLK(VSUS33)	SUSCLK	GPI4/LID#	ATADET1==>Detect IDE2 ATA100/66																
GP05/CPUSTP#	CPUSTP#	GPI5/BATLOW#	Exteranl Pull up to 3VDUAL																
GP06/PCISTP#	PCISTP#	GPI6/PME#	PME#																
GP07/SLP#	SLP#	GPI7/SMBALRT#	Exteranl Pull up to 3VDUAL																
GP08/GPI8/IPBIN0	Exteranl Pull up to VCC3	GPI16/INTRUDER#	Exteranl Pull down																
GP09/GPI9/IPBIN1	Exteranl Pull up to VCC3	GPI17/CPUMISS	Exteranl Pull up to 3VDUAL																
GP010/GPI10/IPBRDFR	GPI10(PRI_DOWN)	GPI18/AOLGP1/THRM#	THRM#																
GP011/GPI11/IPBRDCK		GPI19/IORDY	Exteranl Pull up to VCC3																
GP012/GPI12/IPBOUT0	GP012	<table><tr><th>DDR Voltage</th><th>SET1</th><th>SET2</th></tr><tr><td>2.5V</td><td>1</td><td>1</td></tr><tr><td>2.6V</td><td>0</td><td>1</td></tr><tr><td>2.7V</td><td>1</td><td>0</td></tr><tr><td>2.8V</td><td>0</td><td>0</td></tr></table>			DDR Voltage	SET1	SET2	2.5V	1	1	2.6V	0	1	2.7V	1	0	2.8V	0	0
DDR Voltage	SET1				SET2														
2.5V	1				1														
2.6V	0				1														
2.7V	1				0														
2.8V	0				0														
GP013/GPI13/IPBOUT1	GP013																		
GP014/GPI14/IPBTDFR	GP014																		
GP015/GPI15/IPBTDCX	GP015																		
GP016/SA16/STRAP	CPU FID0 Strapping																		
GP017/SA17/STRAP	CPU FID1 Strapping																		
GP018/SA18/STRAP	CPU FID2 Strapping																		
GP019/SA19/STRAP	CPU FID3 Strapping																		
GP020/GPI20/ACSDIN2/PCS0#/EI	GP020																		
GP021/GPI21/ACSDIN3/PCS1#/SLPBTN#	GP021																		
GP022/GPI22/IOR#	GP022																		
GP023/GPI23/IOW#	GP023																		
GP024/GPI24/GPI0A																			
GP025/GPI25/GPI0C																			
GP026/GPI26/SMBDT2(VSUS33)	SMBDATA2/Slave SMBUS																		
GP027/GPI27/SMBCK2(VSUS33)	SMBCLK2/Slave SMBUS																		
GP028/GPI28/APICD0/APICCS#																			
GP029/GPI29/APICD1/APICACK#																			
GP030/GPI30/GPI0D																			
GP031/GPI31/GPI0E																			

PCI

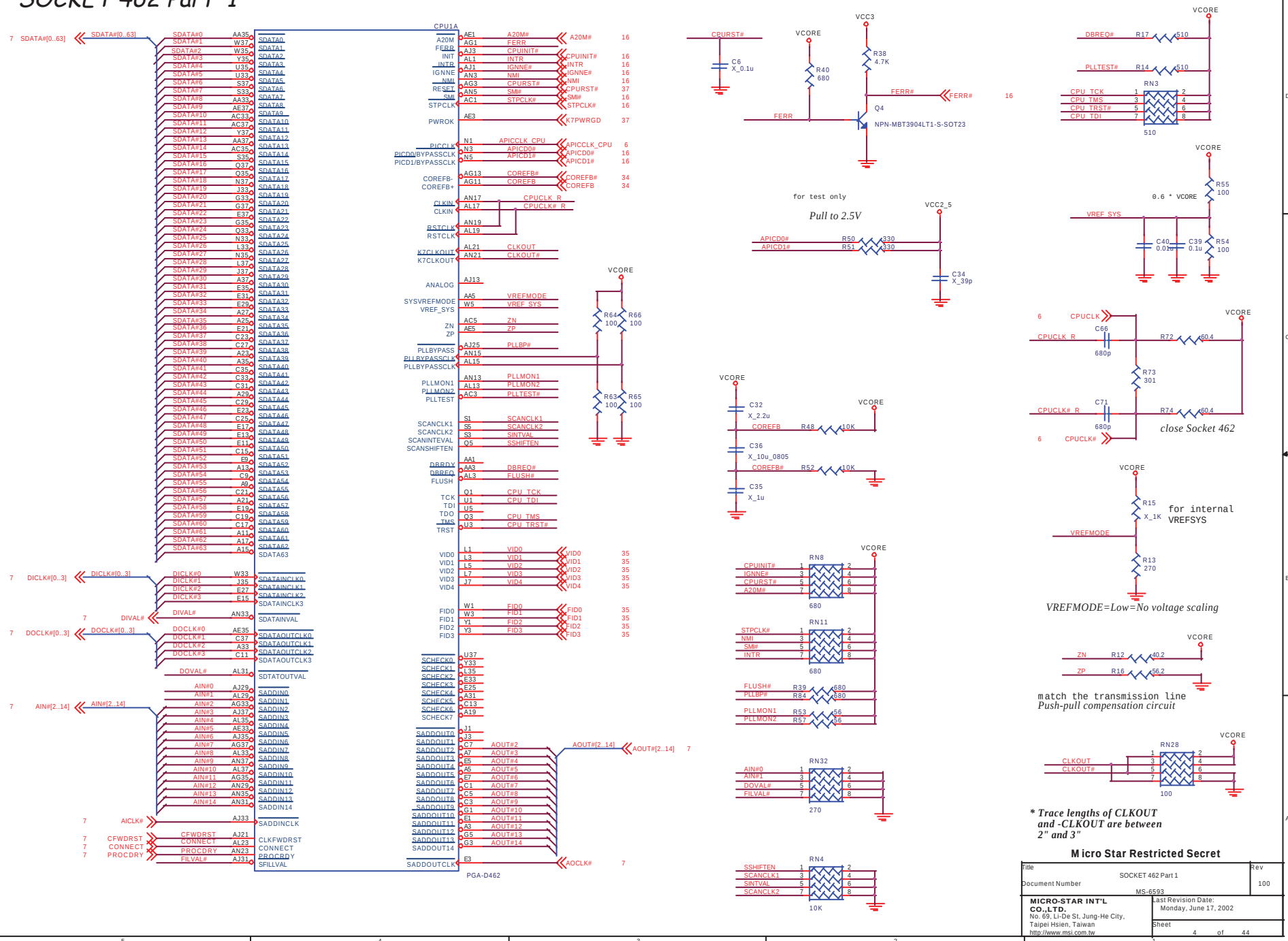
DEVICES	INT#	IDSEL	REQ#/GNT#	CLOCK
PCI SLOT 1	INT#A INT#B INT#C INT#D	AD16	PREQ#0 PGNT#0	PCICLK1
PCI SLOT 2	INT#B INT#C INT#D INT#A	AD17	PREQ#1 PGNT#1	PCICLK2
PCI SLOT 3	INT#C INT#D INT#A INT#B	AD18	PREQ#2 PGNT#2	PCICLK3
PCI SLOT 4	INT#D INT#A INT#B INT#C	AD19	PCIREQ#3 PCIGNT#3	PCICLK4
PCI SLOT 5	INT#B INT#C INT#D INT#A	AD21	PCIREQ#4 PCIGNT#4	PCICLK5
PCI SLOT 6	INT#C INT#D INT#A INT#B	AD23	PCIREQ#5 PCIGNT#5	PCICLK6

Micro Star Restricted Secret

Title	GPIO Spec.	Rev
Document Number	MS-6593	100
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: Tuesday, May 14, 2002
Sheet		3 of 44

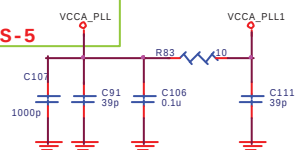
SOCKET 462 Part 1

****All CPU interface are 2.5V tolerant****



SOCKET 462 Part 2

Power supply from MS-5



Used when spec. change

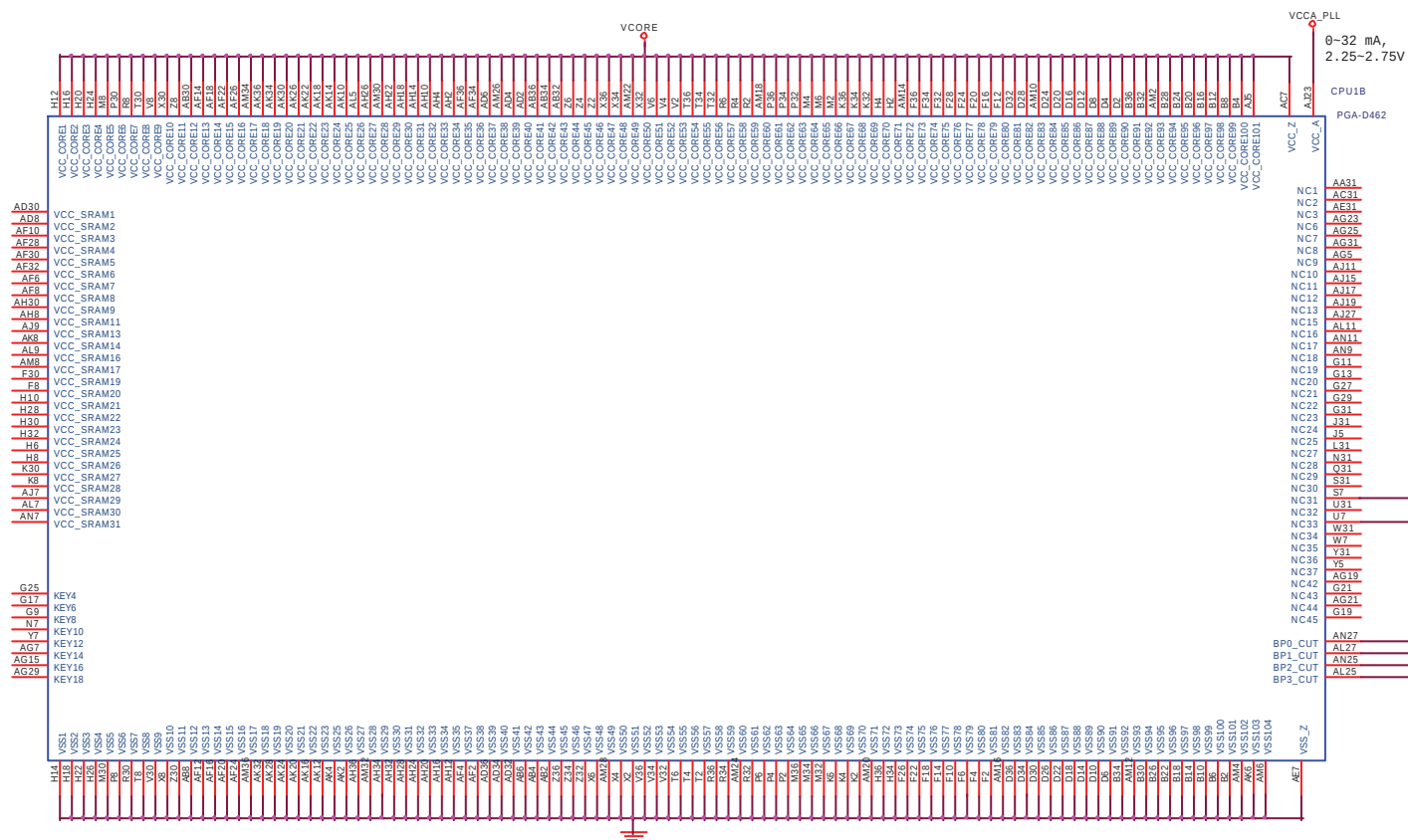
VCCA_PLL trace length from the VR1 to the PGA must be 0.75".

Place all filters close to the PGA.

Max 150mA,
Design for 100mA

Keep all power and signal trace away from the VR1.

Place a cut in the GND plane around the VCCA_PLL regulator circuit.

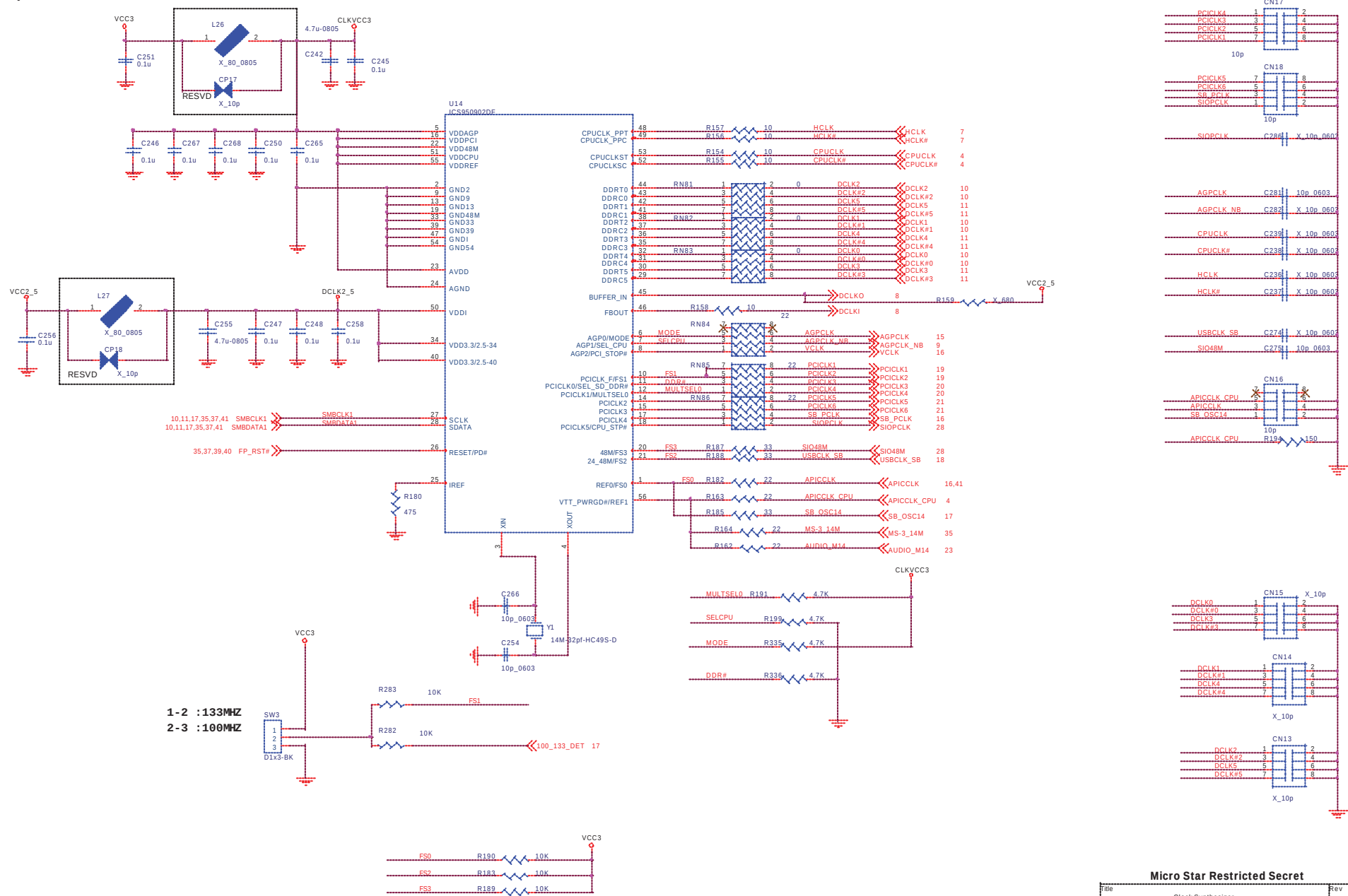


For AMD CPU Thermal protection

Micro Star Restricted Secret

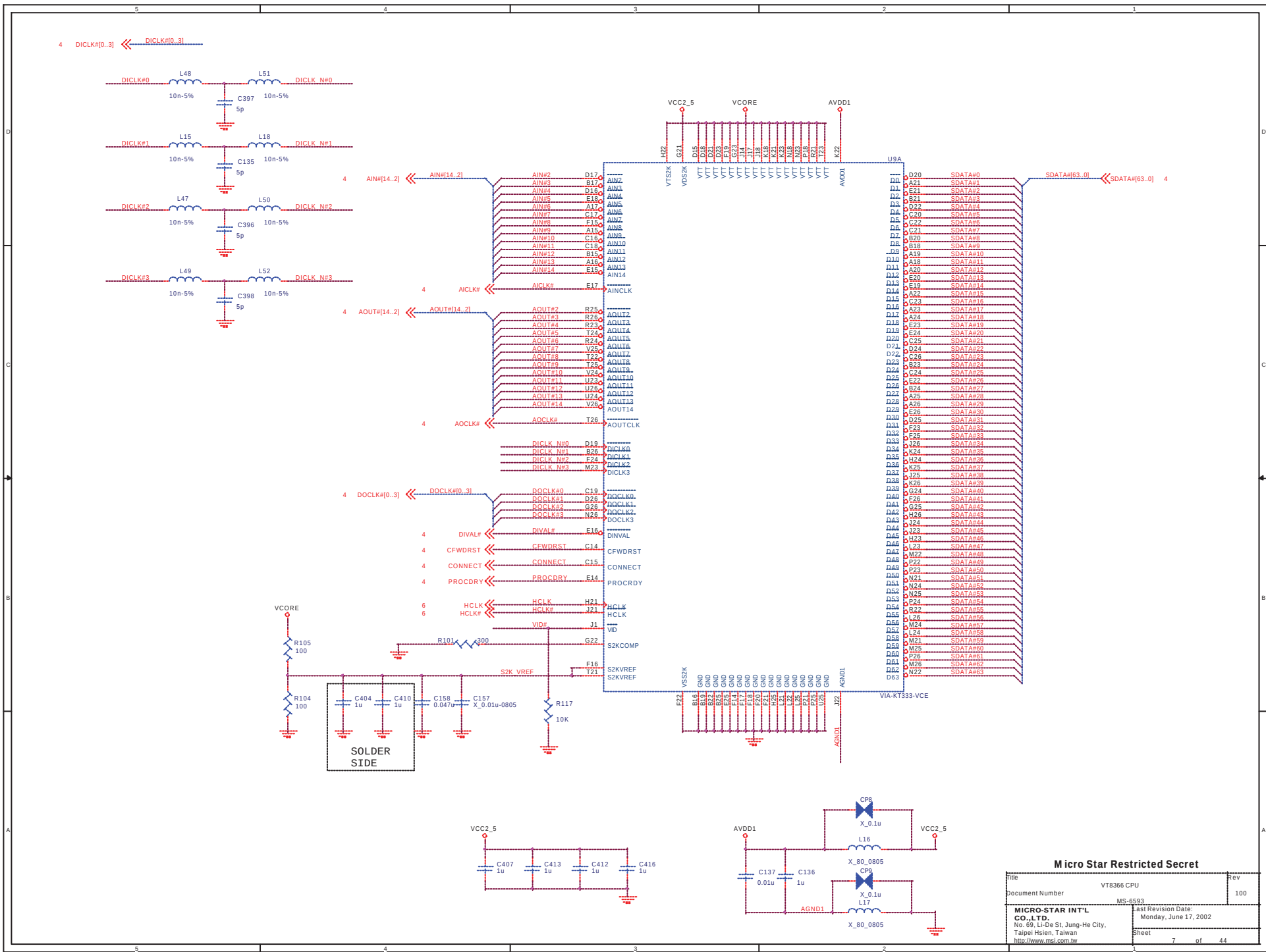
Title	SOCKET 462 Part 2	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO., LTD.		Last Revision Date:
No. 69, Li-De St. Jung-He City, Taipei Hsien, Taiwan		Monday, June 17, 2002
http://www.msi.com.tw		Sheet
		5 of 44

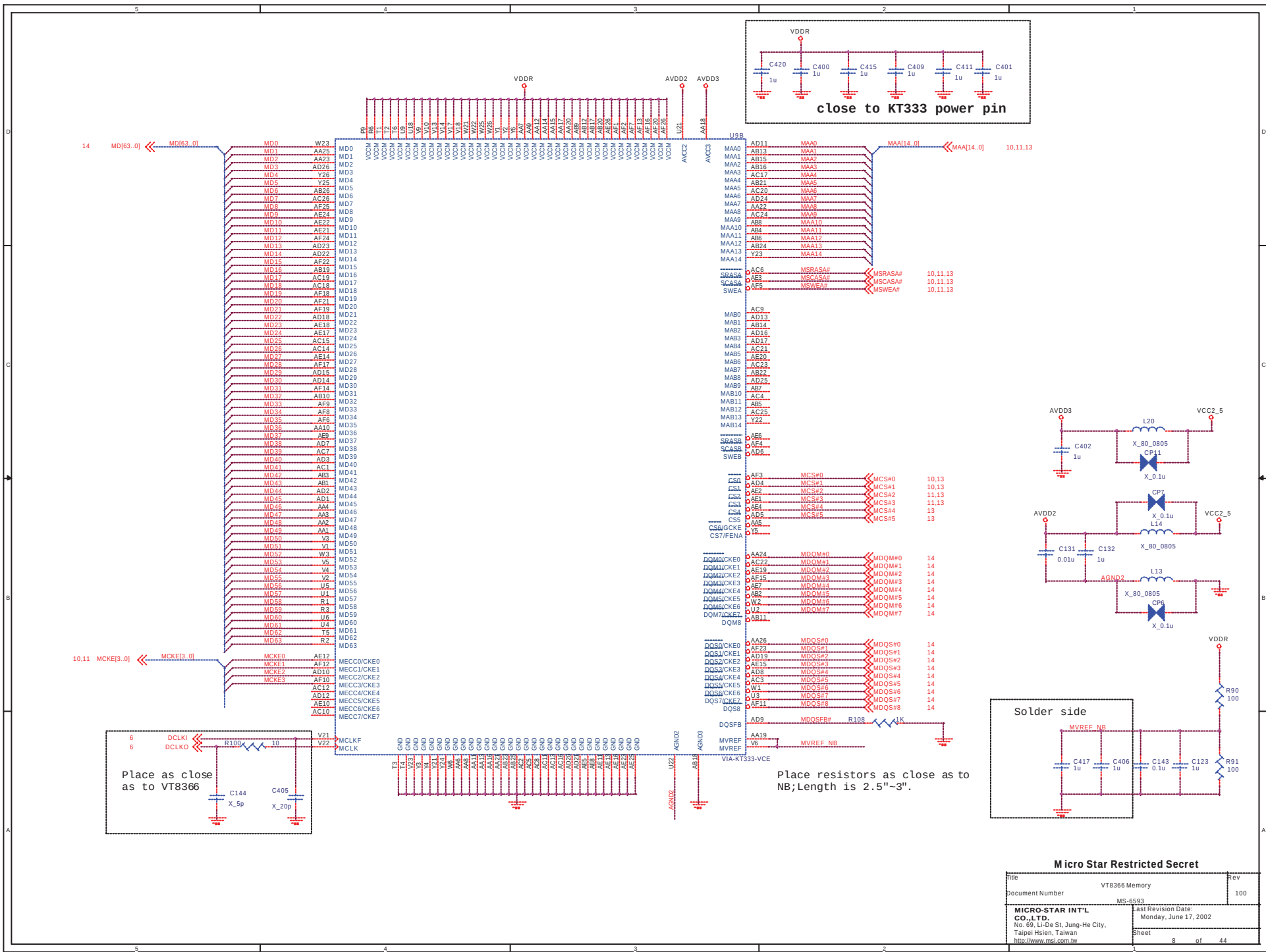
Clock Synthesizer

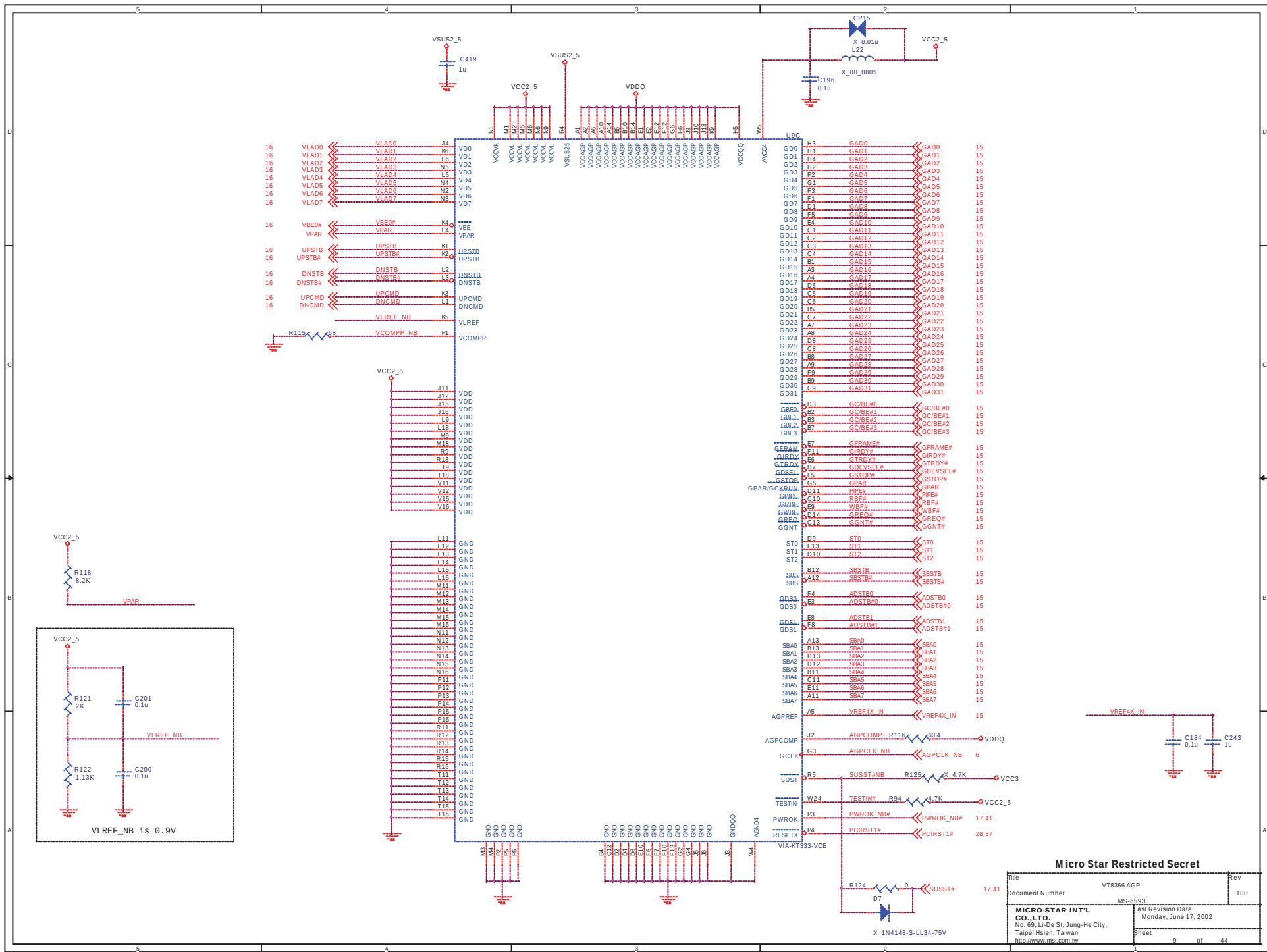


Micro Star Restricted Secret

Title		Rev
Clock Synthesizer		
Document Number	100	
MS-6593		
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: Monday, June 17, 2002 Sheet 6 of 44







SYSTEM MEMORY

DDR DIMM SOCKET I84 PIN

SLAVE ADDRESS = 1010001B

Place 104p Cap. near DIMM

DDR2 DIMM-D184-BK

Micro Star Restricted Secret

File	System Memory : DDR DIMM 2	Rev
Document Number	MS-6593	100
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, June 17, 2002 Sheet 11 of 44		

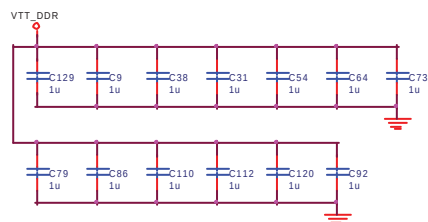
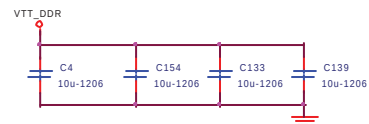
SLAVE ADDRESS = 1010001B

Place 104p Cap. near the DIMM

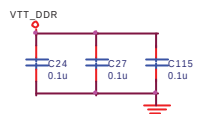
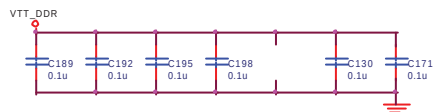
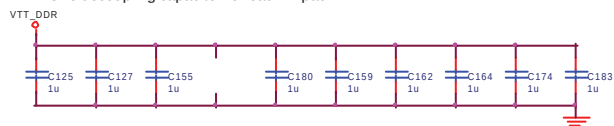
Micro Star Restricted Secret

Title	System Memory : DDR DIMM 2	Rev	
Document Number	MS-6593		100
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: Monday, June 17, 2002	
Sheet		11 of 44	

VTT Termination power



Place these decoupling capacitors close to VTT_DDR termination resistors.
One decoupling capacitor for each R-pack.



Micro Star Restricted Secret

Title	VTT Termination power	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO., LTD. No. 89, Li-De St. Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, June 11, 2002
Sheet		12 of 44

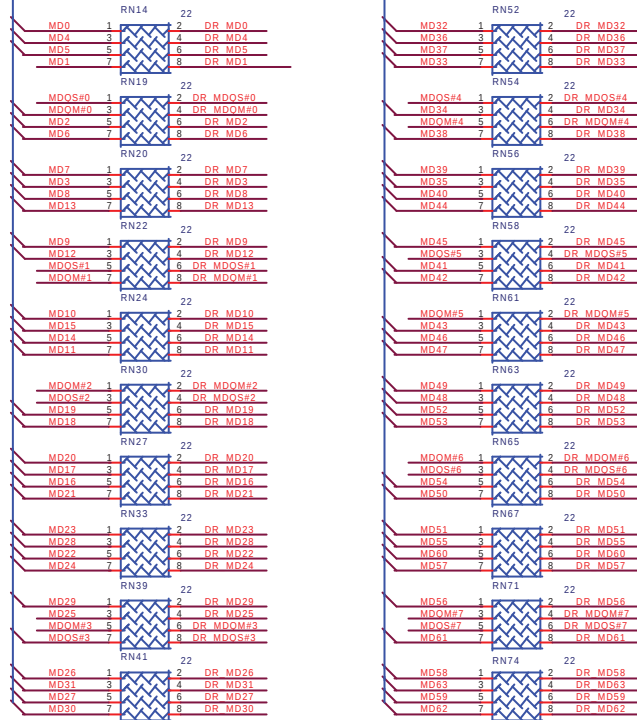
[illegible]

Title	DDR Terminations Bank 0	Rev	
Document Number	MS-6593		100
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:		
	Monday, June 17, 2002		
	Sheet	13	of 44

DDR Terminations

10,11,13 DR_MD[63..0] << DR_MD[63..0]

8 MD[63..0] << MD[63..0]



MDQS#8 R99 << 22 DR_MDQS#8

8 MDQM#[7..0] << MDQM#[7..0]

10,11,13 DR_MDQM#[7..0] << DR_MDQM#[7..0]

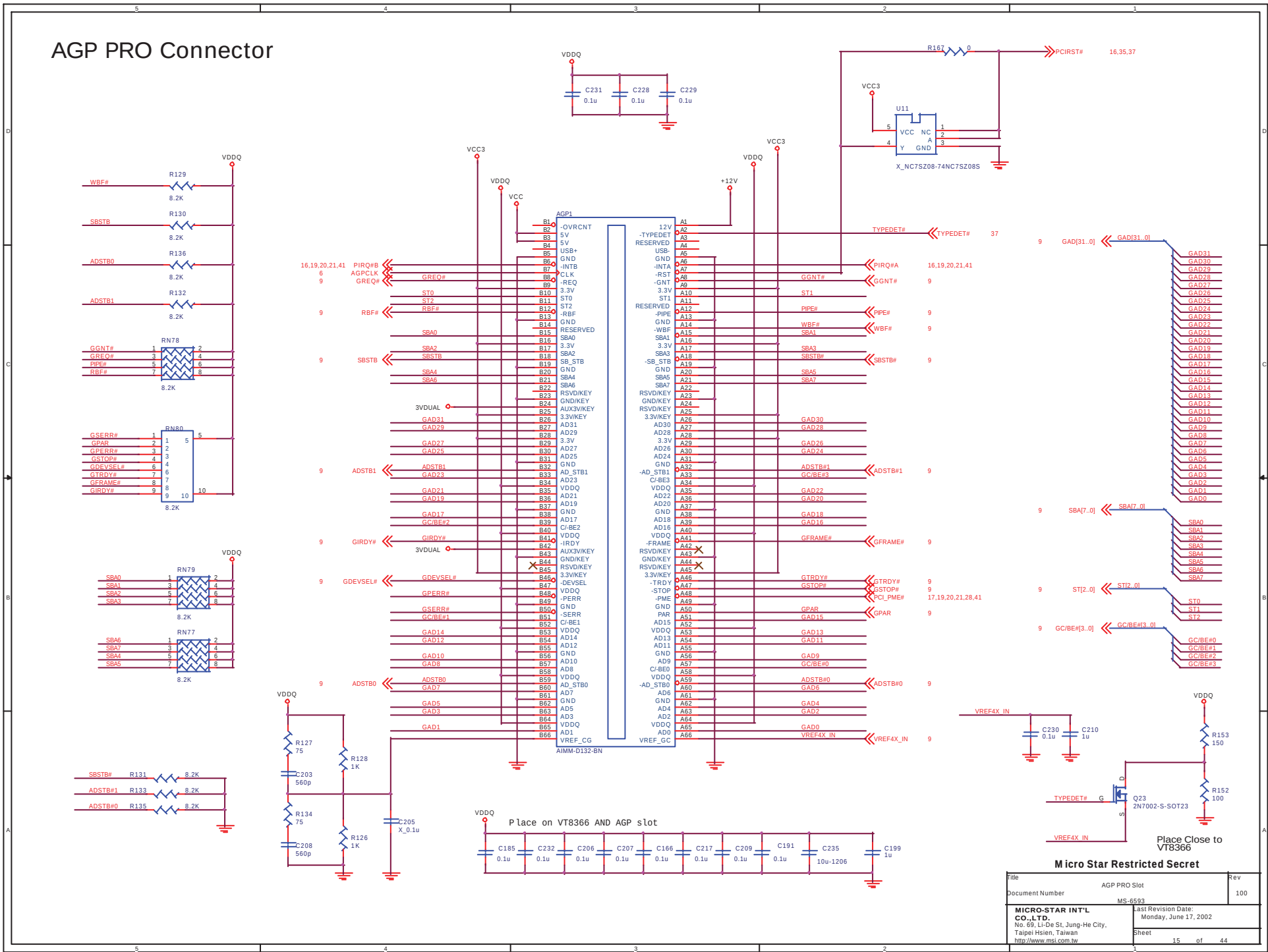
8 MDQS#[8..0] << MDQS#[8..0]

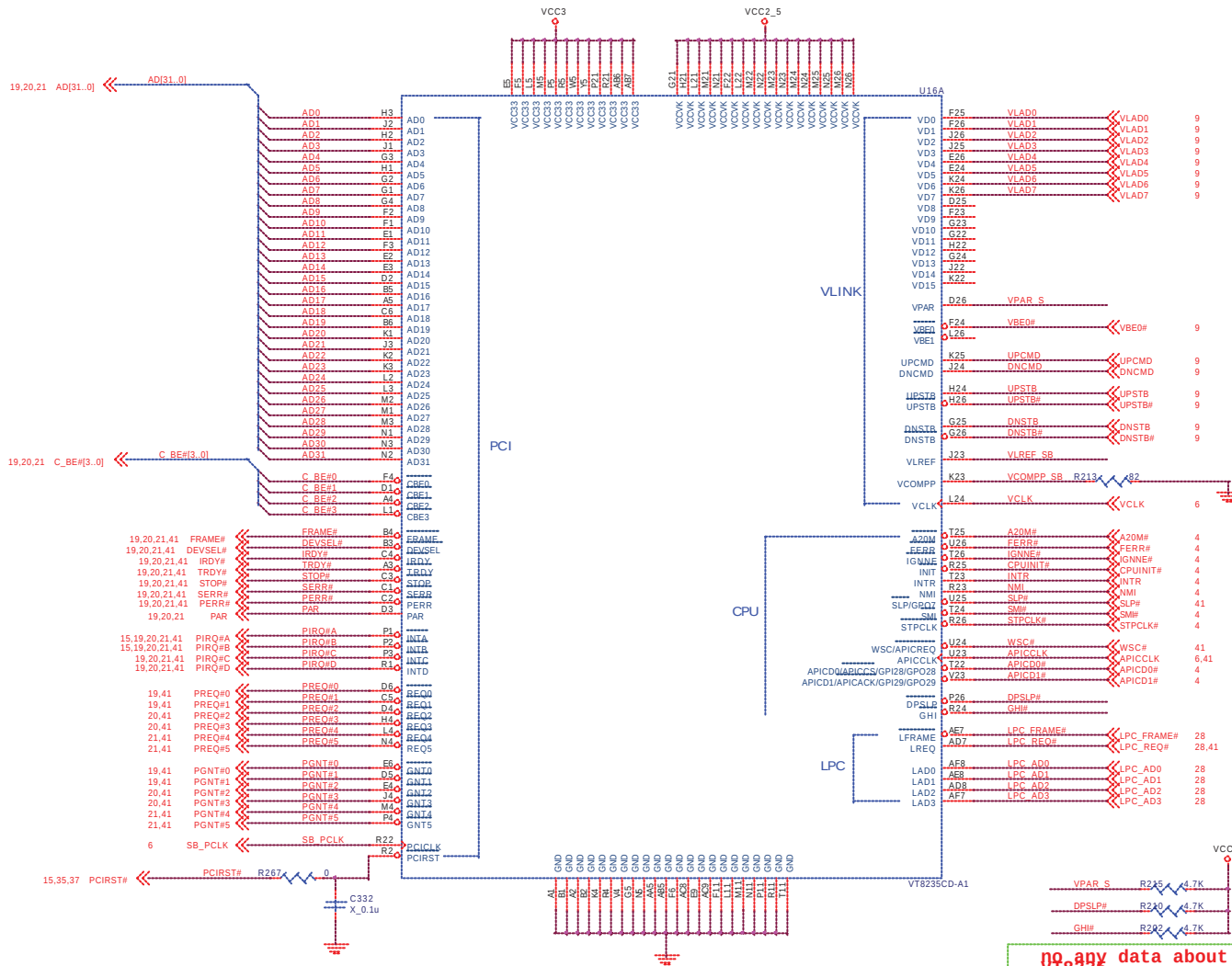
10,11,13 DR_MDQS#[8..0] << DR_MDQS#[8..0]

Micro Star Restricted Secret

Title	DDR Terminations Bank 1	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO., LTD. No. 59, Li-De St. Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Monday, June 17, 2002
Sheet		14 of 44

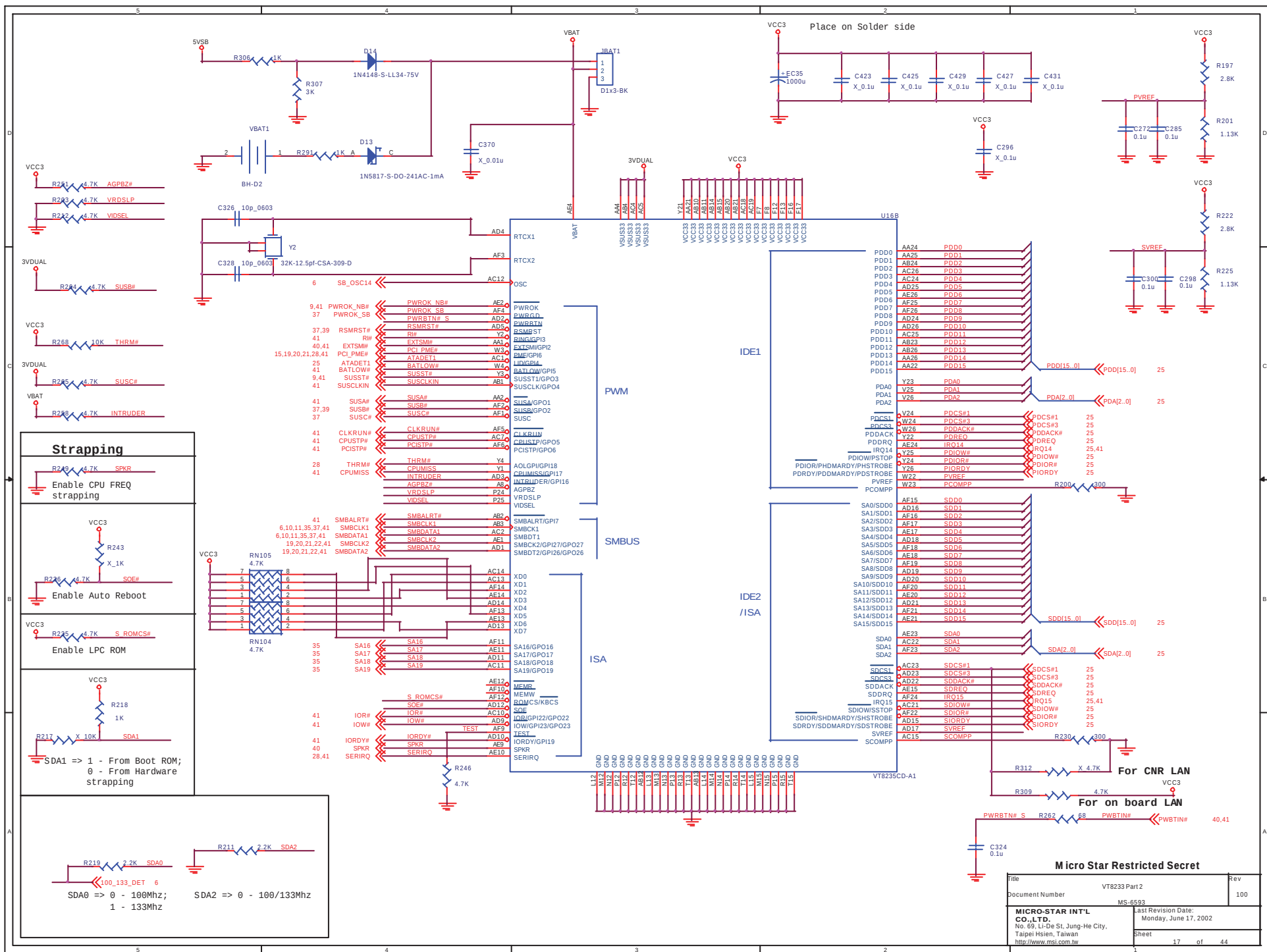
AGP PRO Connector



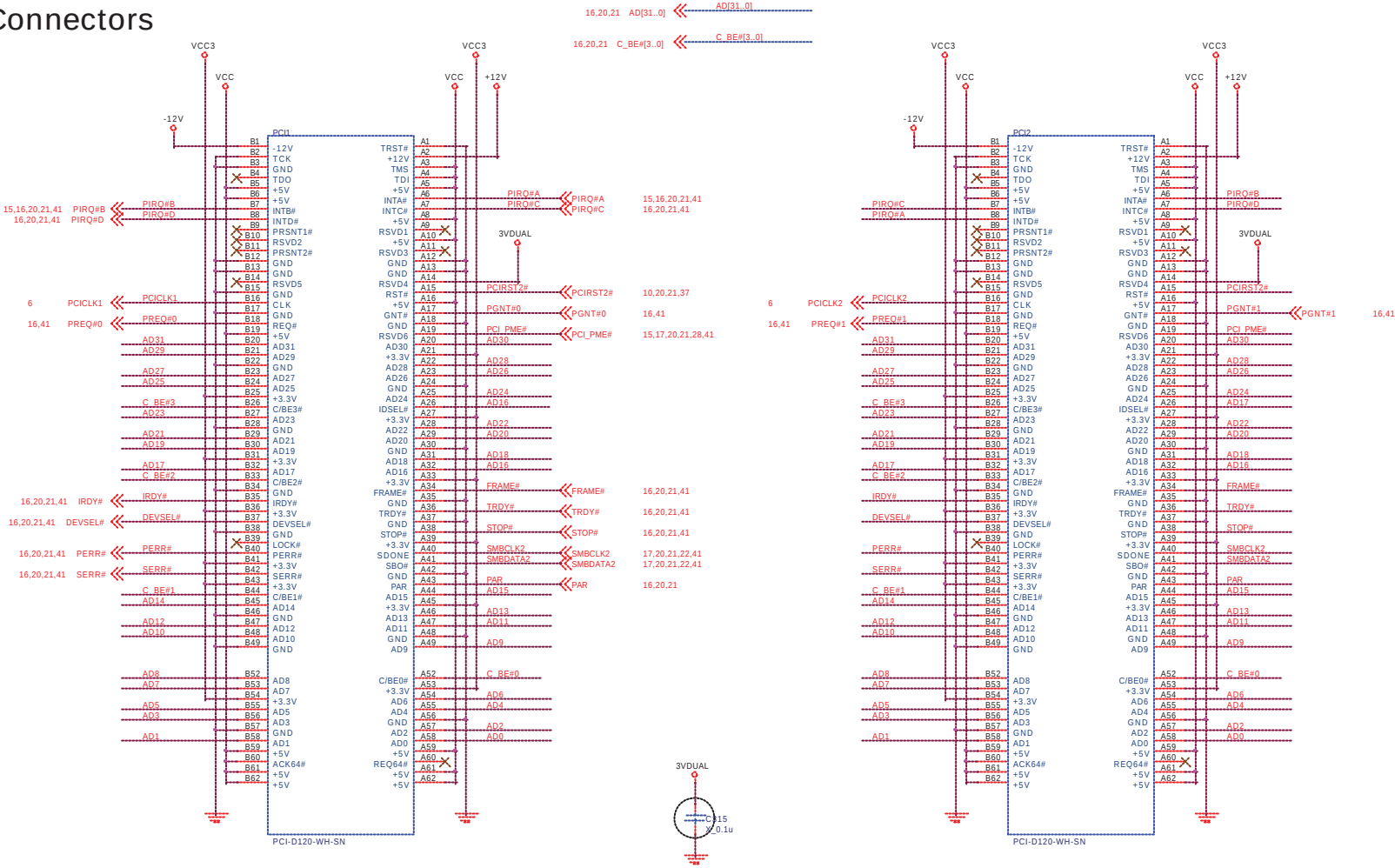


Micro Star Restricted Secret

Title	VT8233 Part1	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO., LTD.		Last Revision Date:
No. 89, Li-De St. Jung-He City, Taipei Hsien, Taiwan		Monday, June 17, 2002
http://www.msi.com.tw		Sheet
		16 of 44



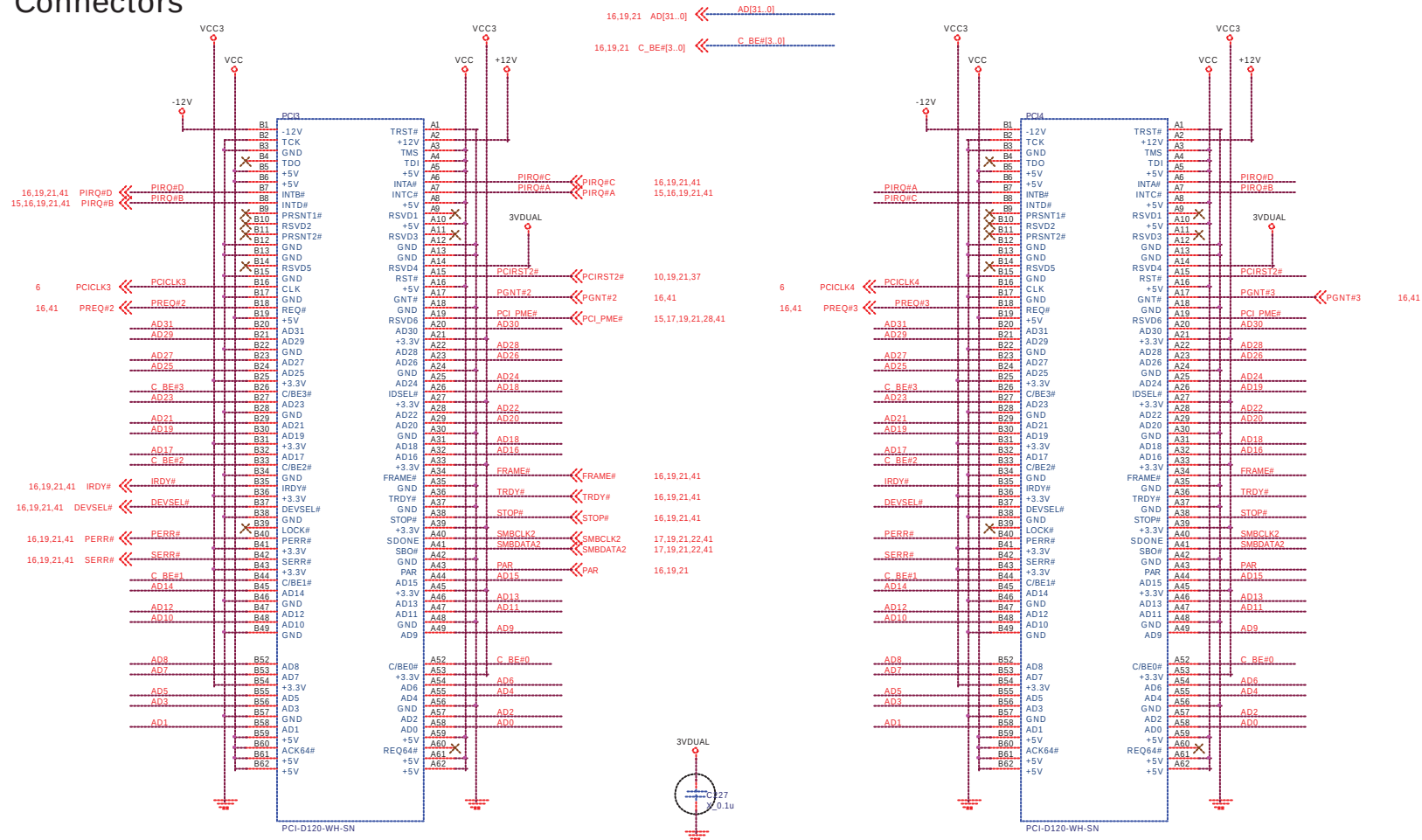
PCI Connectors



Micro Star Restricted Secret

Title		Rev
PCI Connector 1 & 2		100
Document Number		MS-6593
Last Revision Date:		Tuesday, May 14, 2002
MICRO-STAR INT'L CO., LTD.		Sheet
No. 59, Li-De St. Jung-He City, Taipei Hsien, Taiwan		19 of 44
http://www.msi.com.tw		

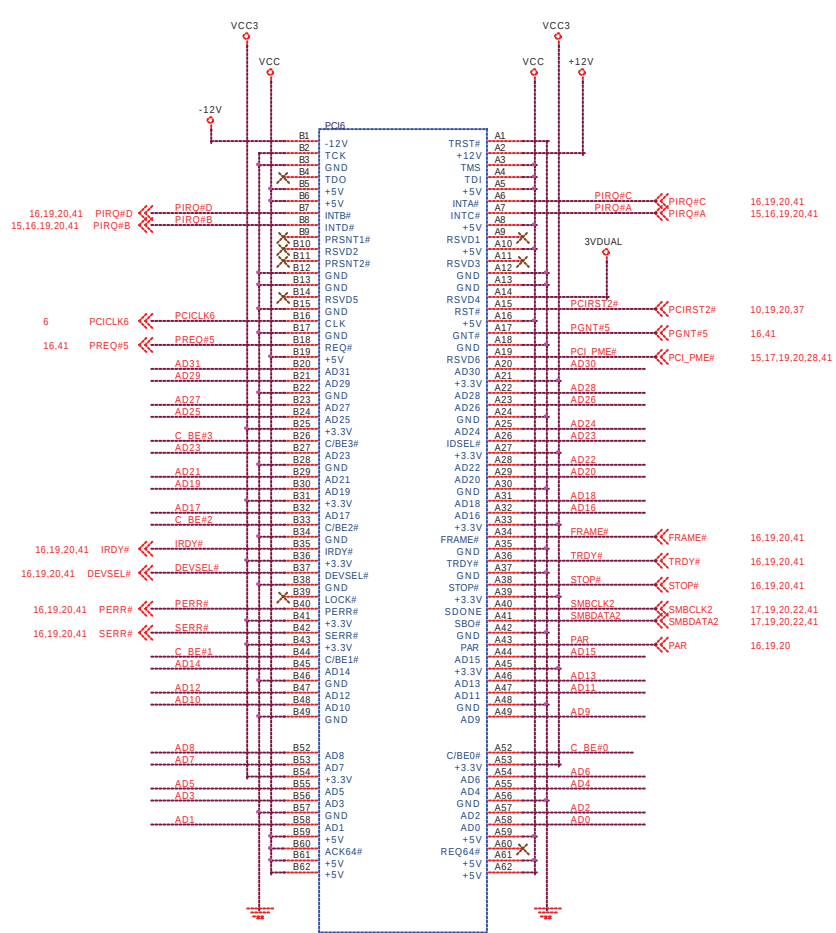
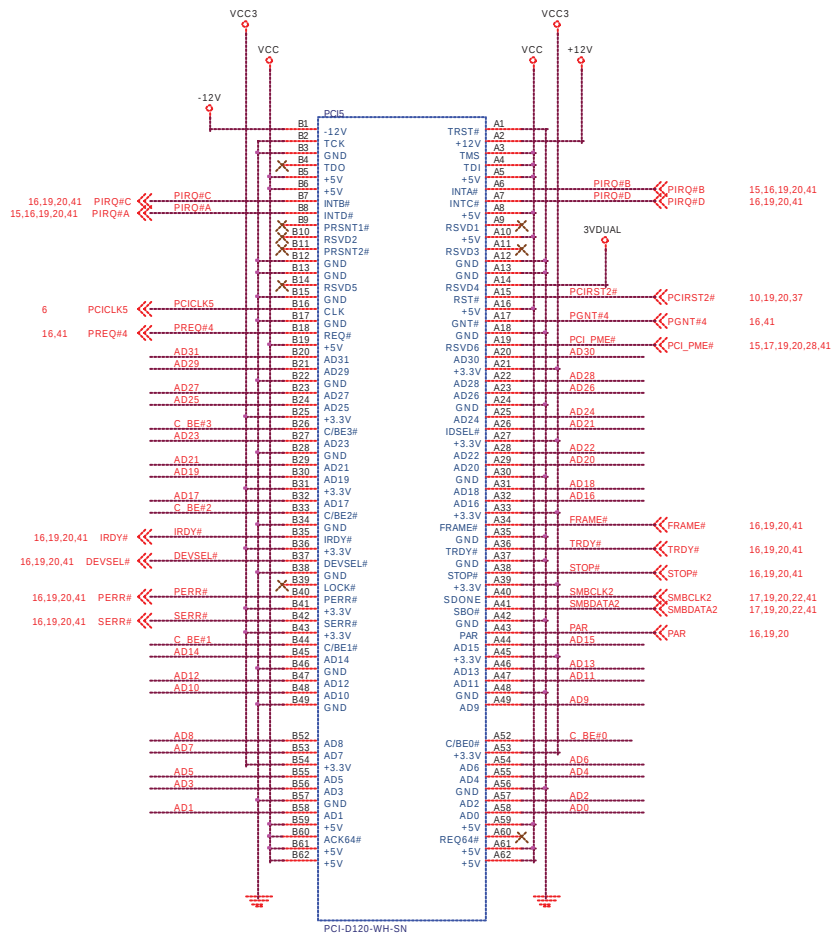
PCI Connectors



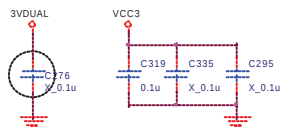
Micro Star Restricted Secret

Title	PCI Connector 3 & 4	Rev	
Document Number	MS-6593		100
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: Tuesday, May 14, 2002	
Sheet		20 of 44	

PCI Connectors



16,19,20 AD[31..0] << AD[31..0]
16,19,20 C_BE#[3..0] << C_BE#[3..0]



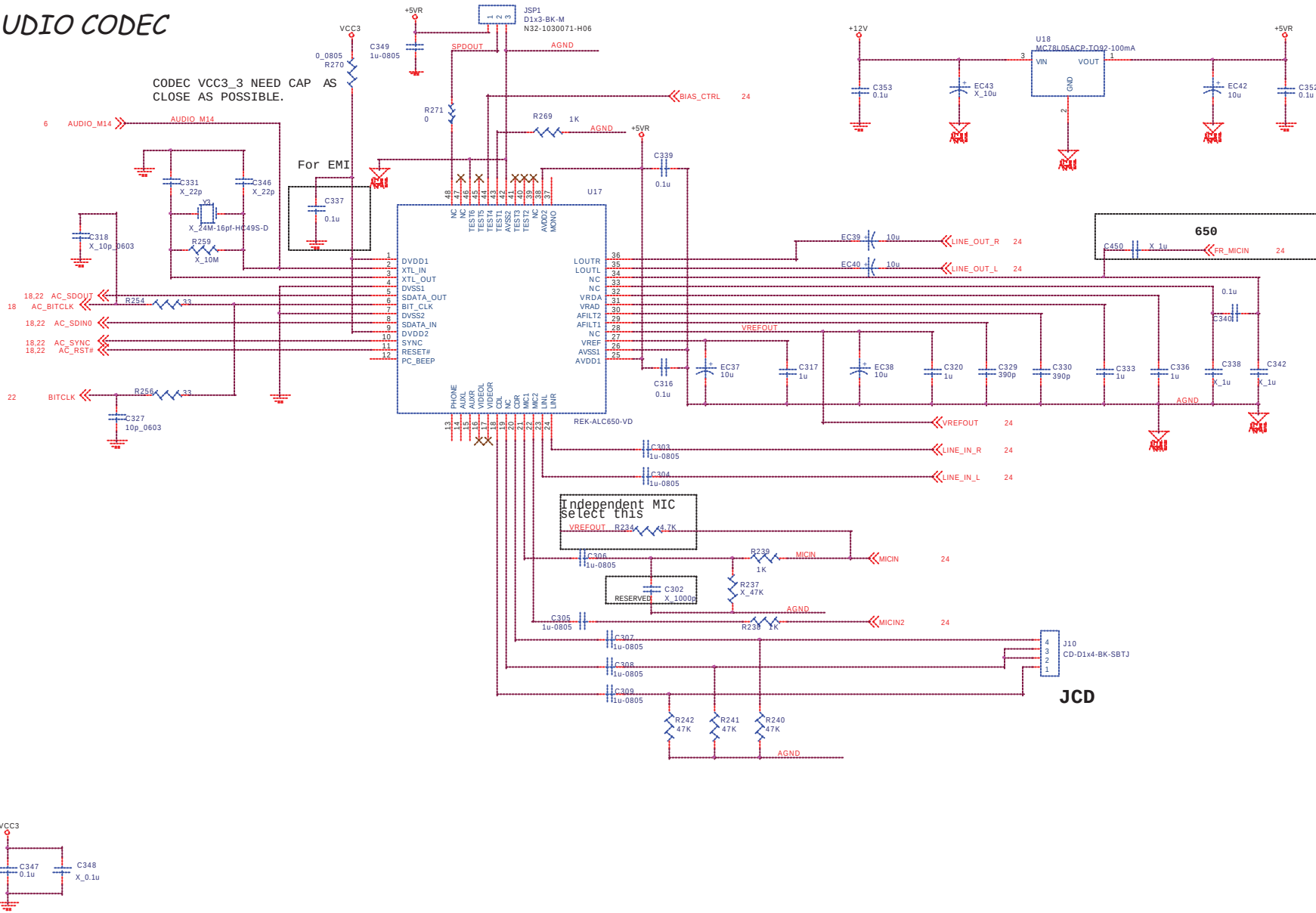
Micro Star Restricted Secret

Title	PCI Connector 5 & 6	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO., LTD.		Last Revision Date:
No. 69, Li-De St. Jung-He City, Taipei Hsien, Taiwan		Tuesday, May 14, 2002
Sheet	21	of 44
http://www.msi.com.tw		

[illegible]

Title	CNR Riser	Rev
Document Number	MS-6593	100
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: Monday, June 17, 2002	
	Sheet 22 of 44	

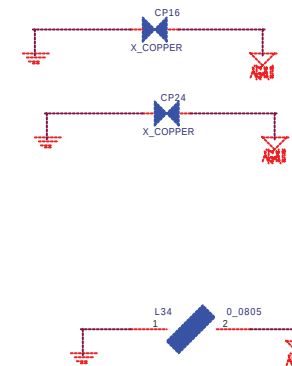
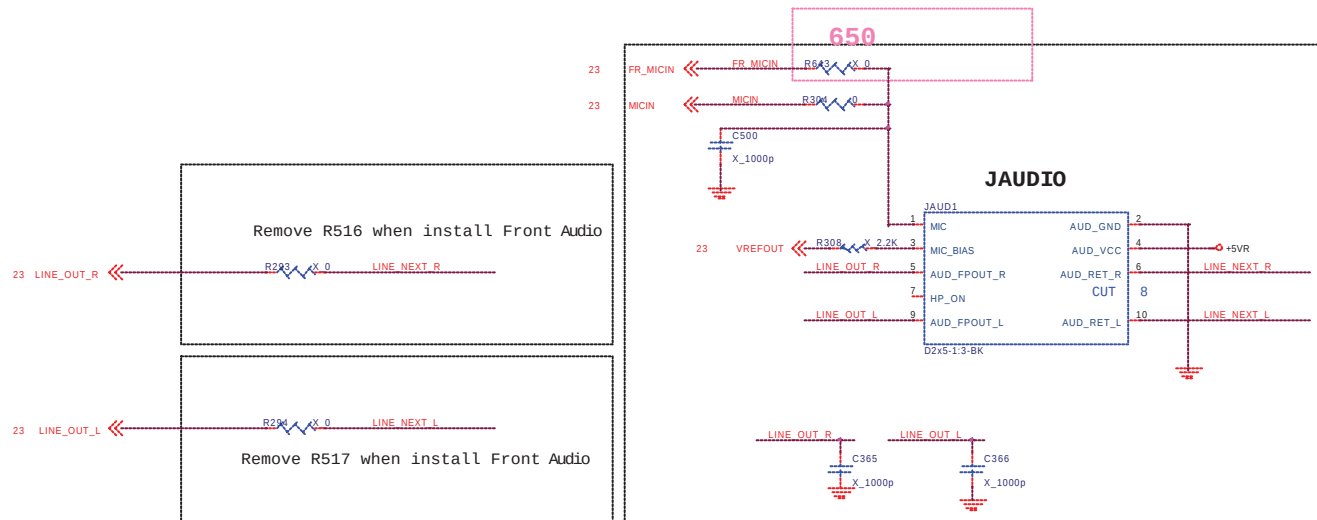
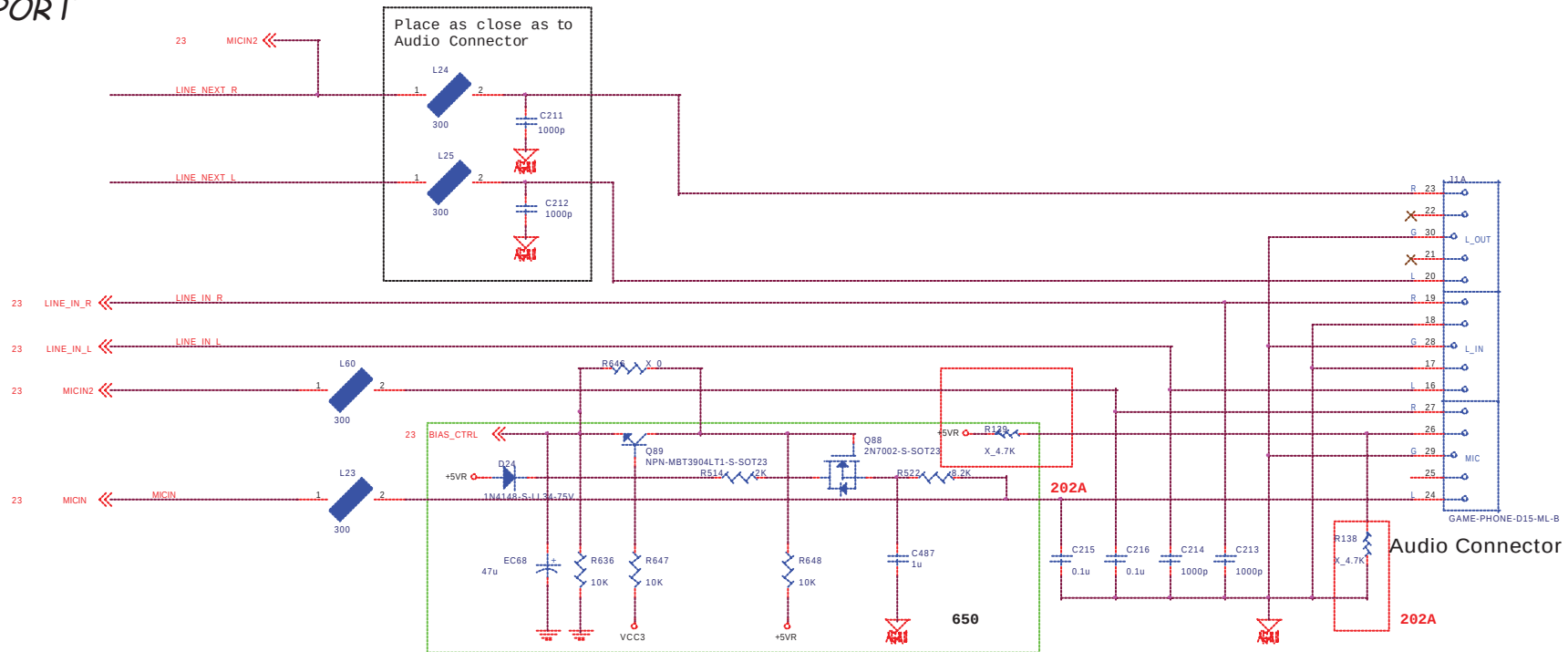
AUDIO CODEC



Micro Star Restricted Secret

Title	Audio Codec	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO., LTD. No. 89, Li-De St. Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Monday, June 17, 2002
Sheet		23 of 44

AUDIO PORT



Title	Audio Port	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO., LTD. No. 89, Li-De St. Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		
Last Revision Date: Monday, June 17, 2002		Sheet 24 of 44

5	4	3	2	1
---	---	---	---	---

D



4

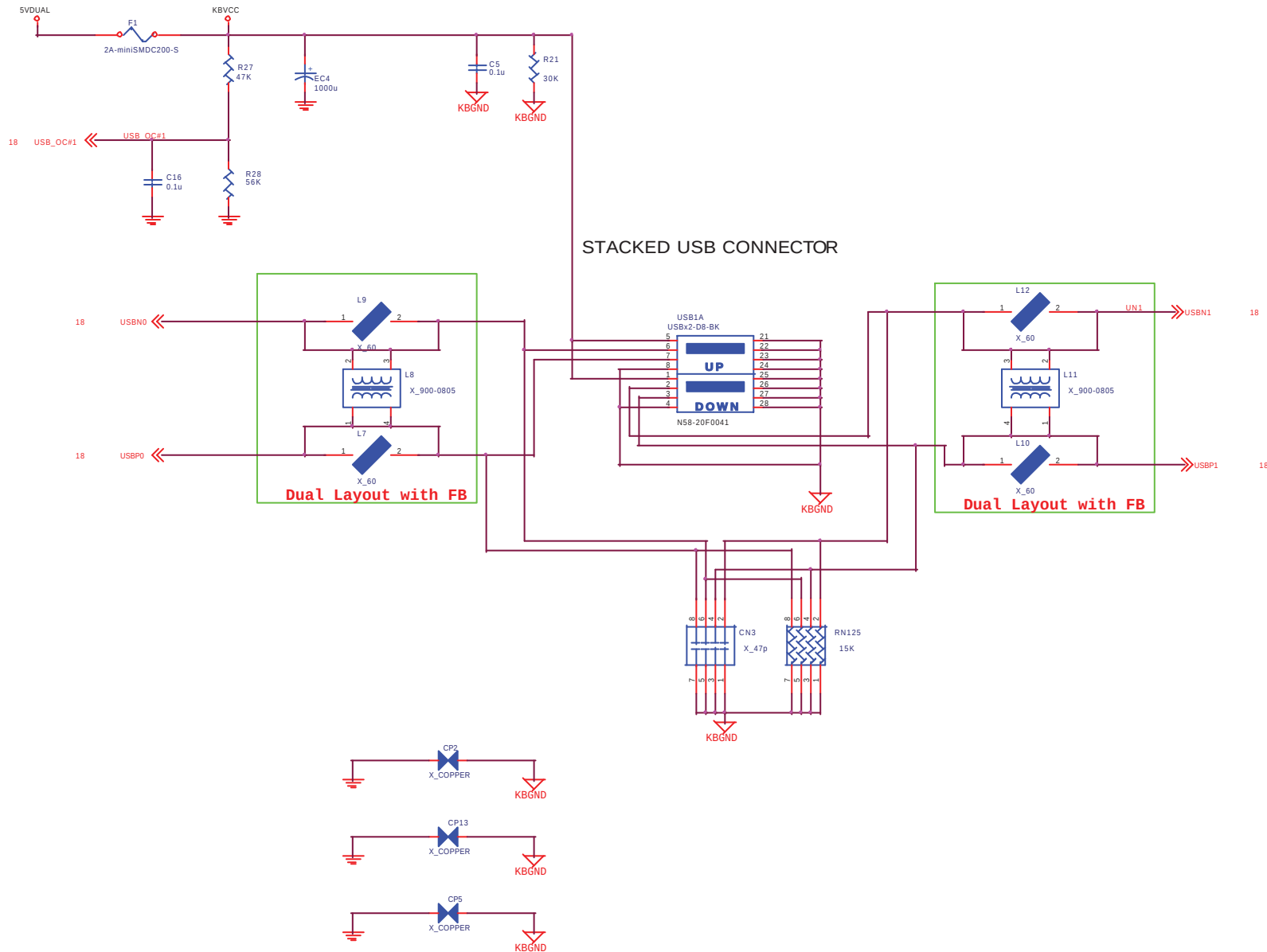


Title		ATA 33/66/100 Connector	Rev
Document Number		MS-6593	100
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St. Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Monday, June 17, 2002 Sheet 25 of 44	

[illegible]

Title		Rev
Document Number		100
MS-5993		
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: Monday, June 17, 2002
Sheet		26 of 44

REAR USB PORT



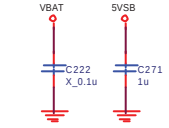
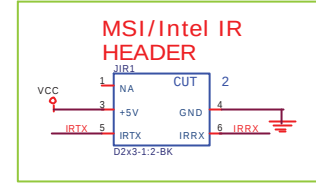
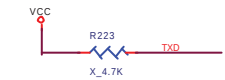
Micro Star Restricted Secret

Title	Rear USB Port	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO., LTD. No. 89, Li-De St. Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Monday, June 17, 2002
Sheet		27 of 44

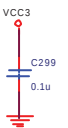
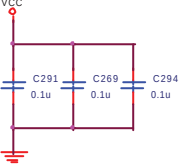
Super I/O



Power-on strap, enable 48MHz



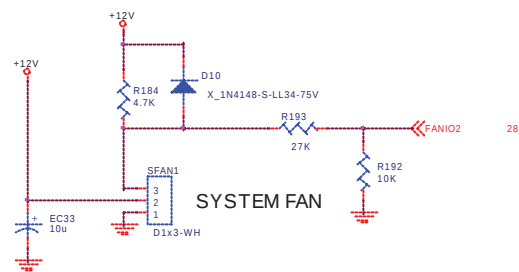
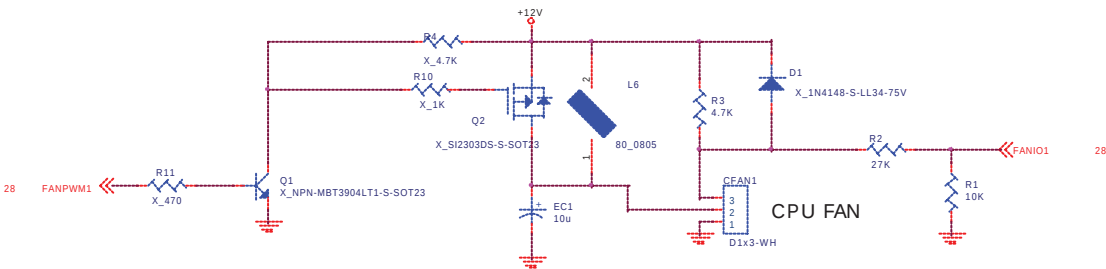
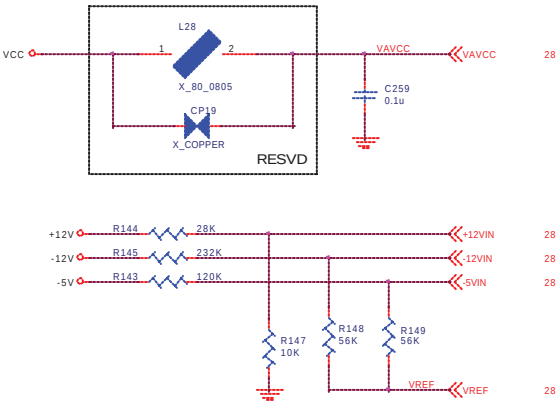
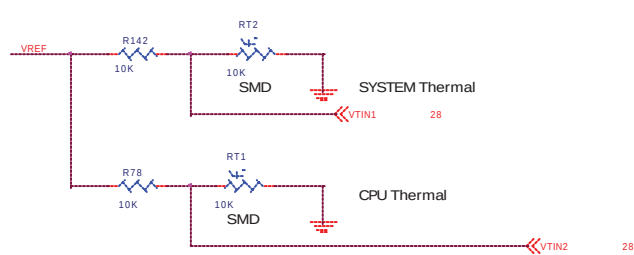
Distribute near the VCC power pin of the LPC



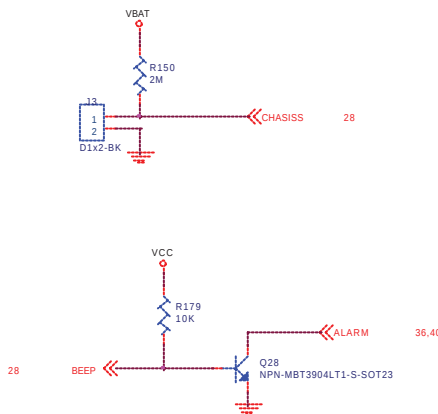
Micro Star Restricted Secret

Title	Winbond W627HF	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO., LTD.		Last Revision Date:
No. 89, Li-De St. Jung-He City, Taipei Hsien, Taiwan		Monday, June 17, 2002
http://www.msi.com.tw		Sheet
		28 of 44

Hardware Monitor



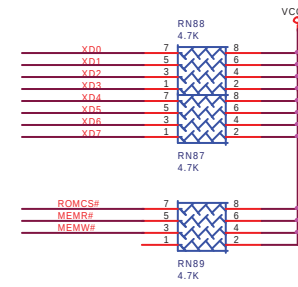
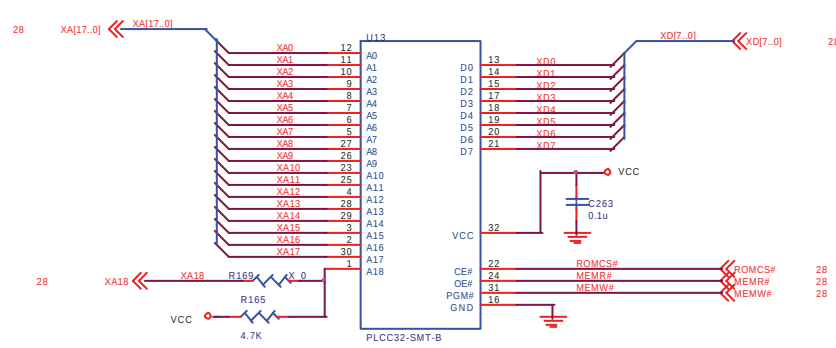
Chassis Intrusion Header



Micro Star Restricted Secret

Title	Hardware Monitor	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO., LTD. No. 89, Li-De St. Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Monday, June 17, 2002
Sheet		29 of 44

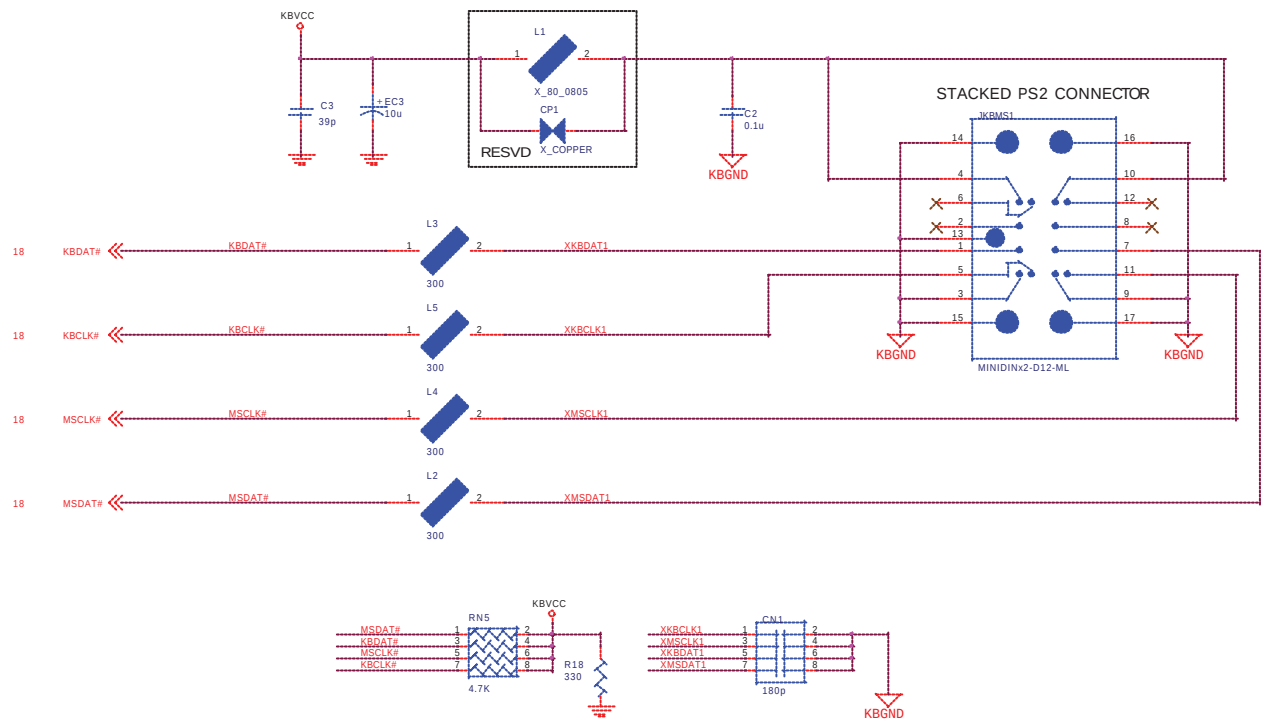
SYSTEM ROM



Micro Star Restricted Secret

Title	System ROM & POWER MANGEMENT	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO., LTD. No. 89, Li-De St. Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Monday, June 17, 2002
Sheet		30 of 44

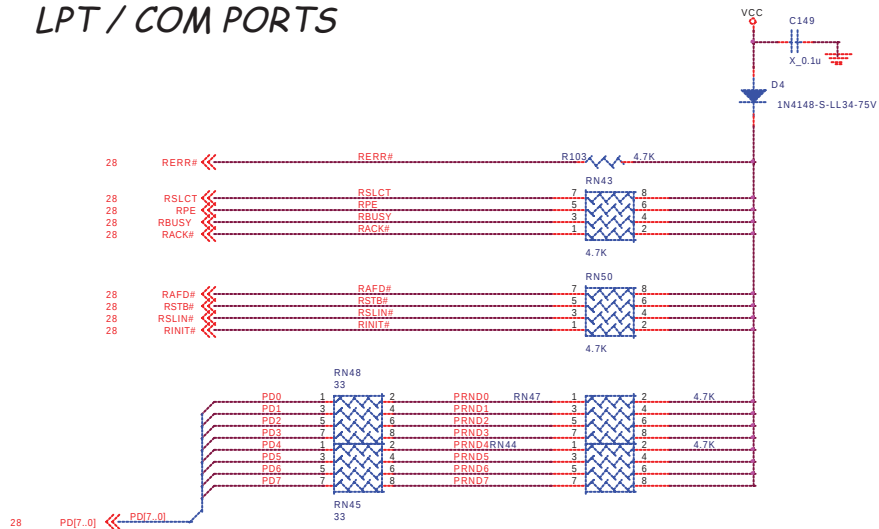
Keyboard/Mouse Ports



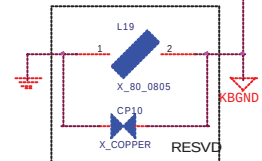
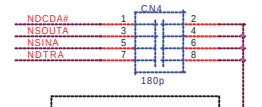
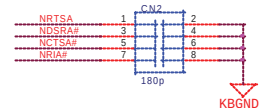
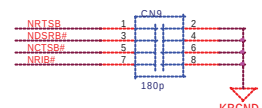
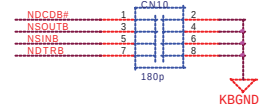
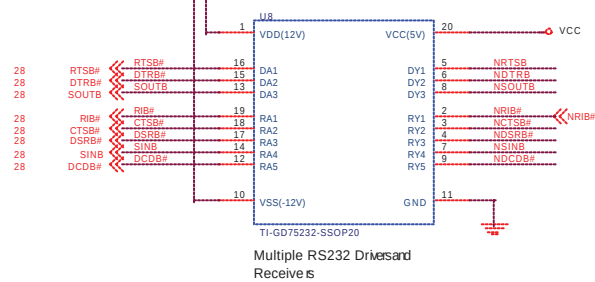
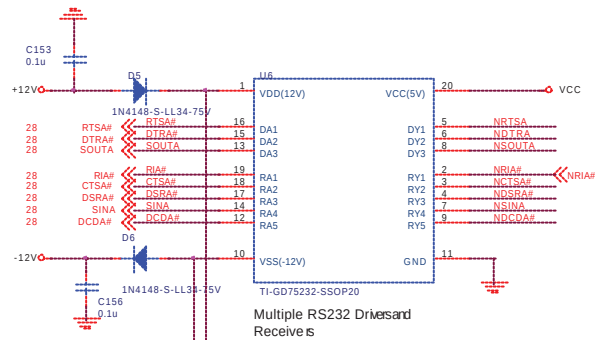
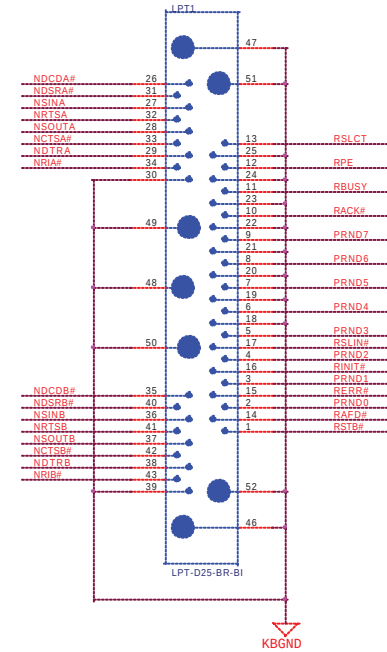
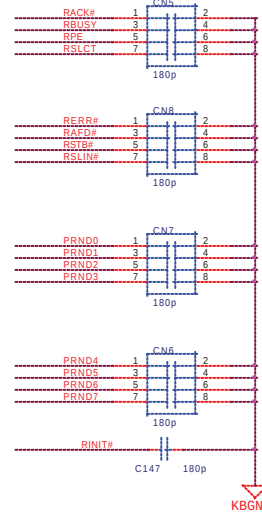
Micro Star Restricted Secret

File	Keyboard / Mouse Port	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO.,LTD. No. 89, Li-De St. Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Monday, June 17, 2002
Sheet		31 of 44

LPT / COM PORTS



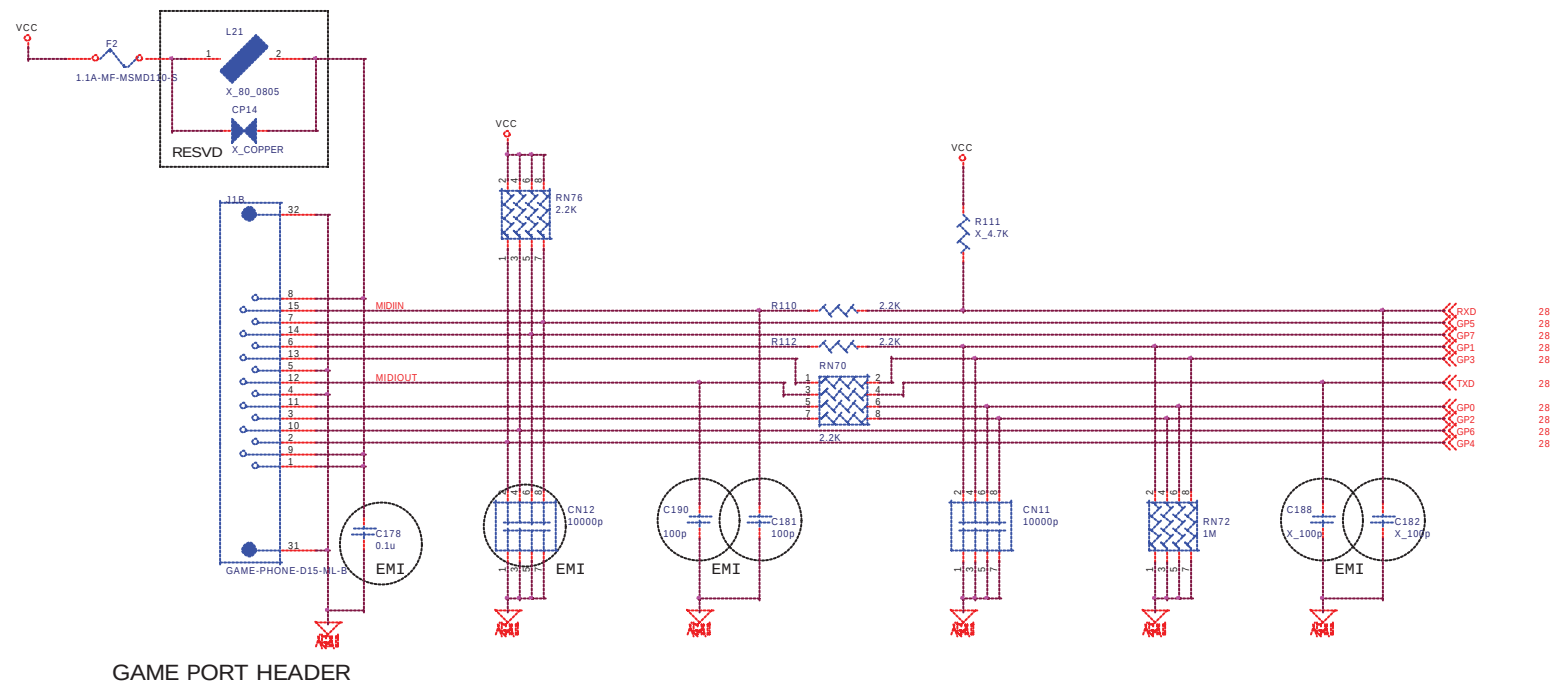
For EMI



Micro Star Restricted Secret

File	LPT / COM Port	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO., LTD.		Last Revision Date:
No. 89, Li-De St. Jung-He City, Taipei Hsien, Taiwan		Monday, June 17, 2002
http://www.msi.com.tw		Sheet
		32 of 44

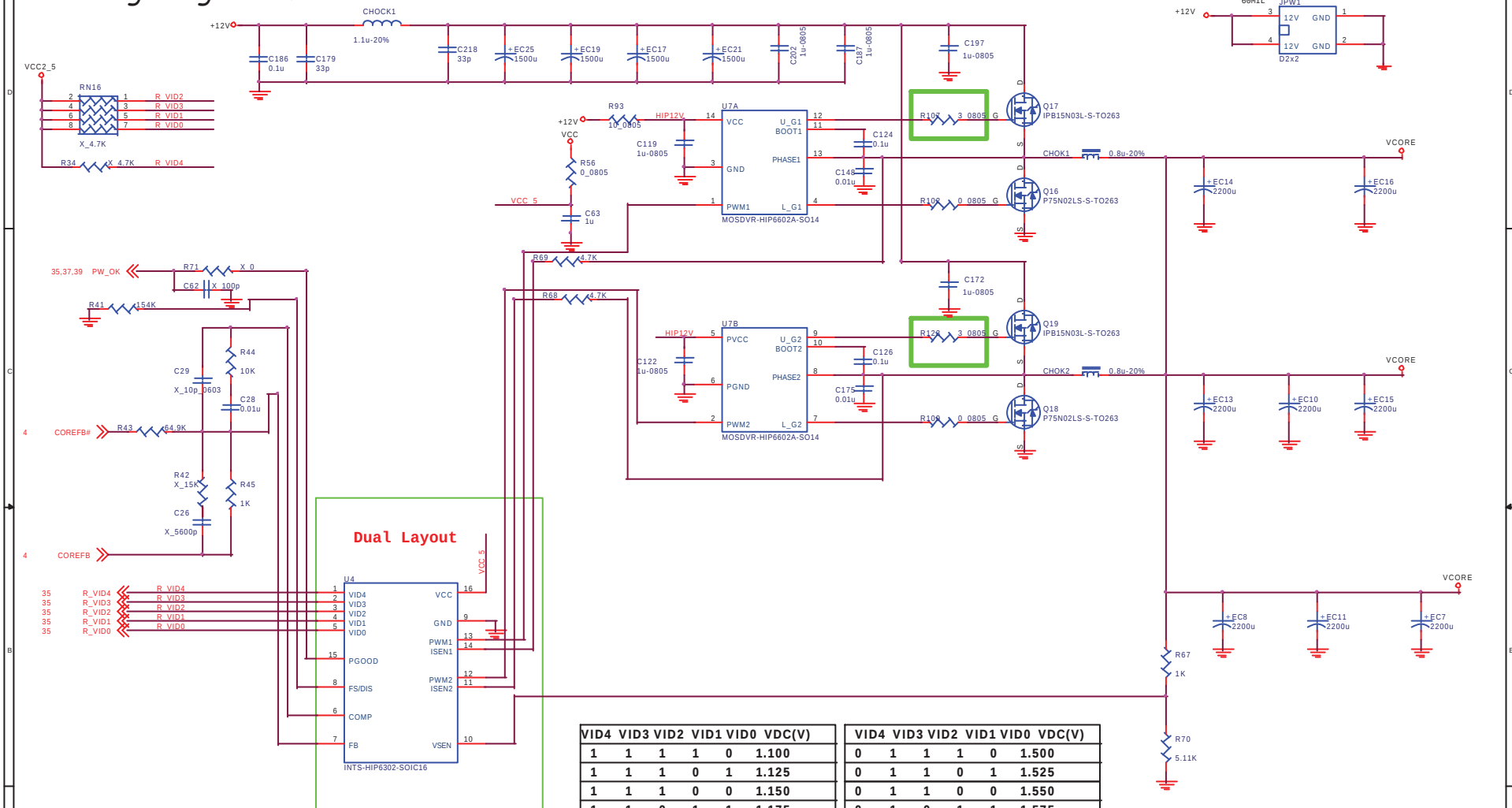
GAME PORT



Micro Star Restricted Secret

Title	Game Port	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO.,LTD. No. 89, Li-De St. Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Monday, June 17, 2002
Sheet		33 of 44

Voltage Regular Module



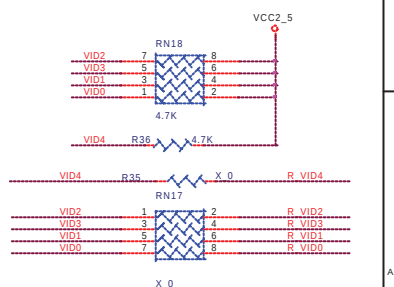
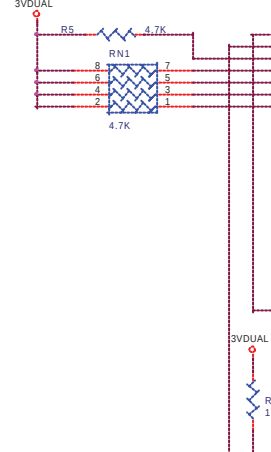
V1D4	V1D3	V1D2	V1D1	V1D0	V1DC(V)	V1D4	V1D3	V1D2	V1D1	V1D0	V1DC(V)
1	1	1	1	0	1.100	0	1	1	1	0	1.500
1	1	1	0	1	1.125	0	1	1	0	1	1.525
1	1	1	0	0	1.150	0	1	1	0	0	1.550
1	1	0	1	1	1.175	0	1	0	1	1	1.575
1	1	0	1	0	1.200	0	1	0	1	0	1.600
1	1	0	0	1	1.225	0	1	0	0	1	1.625
1	1	0	0	0	1.250	0	1	0	0	0	1.650
1	0	1	1	1	1.275	0	0	1	1	1	1.675
1	0	1	1	0	1.300	0	0	1	1	0	1.700
1	0	1	0	1	1.325	0	0	1	0	1	1.725
1	0	1	0	0	1.350	0	0	1	0	0	1.750
1	0	0	1	1	1.375	0	0	0	1	1	1.775
1	0	0	1	0	1.400	0	0	0	1	0	1.800
1	0	0	0	1	1.425	0	0	0	0	1	1.825
1	0	0	0	0	1.450	0	0	0	0	0	1.850
0	1	1	1	1	1.475	1	1	1	1	1	OFF

Micro Star Restricted Secret

Title		Rev
Document Number		100
MS-6593		
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: Monday, June 17, 2002
Sheet		34 of 44

A vertical bar divided into four segments labeled A, B, C, and D from bottom to top. Segment B contains a right-pointing arrow.

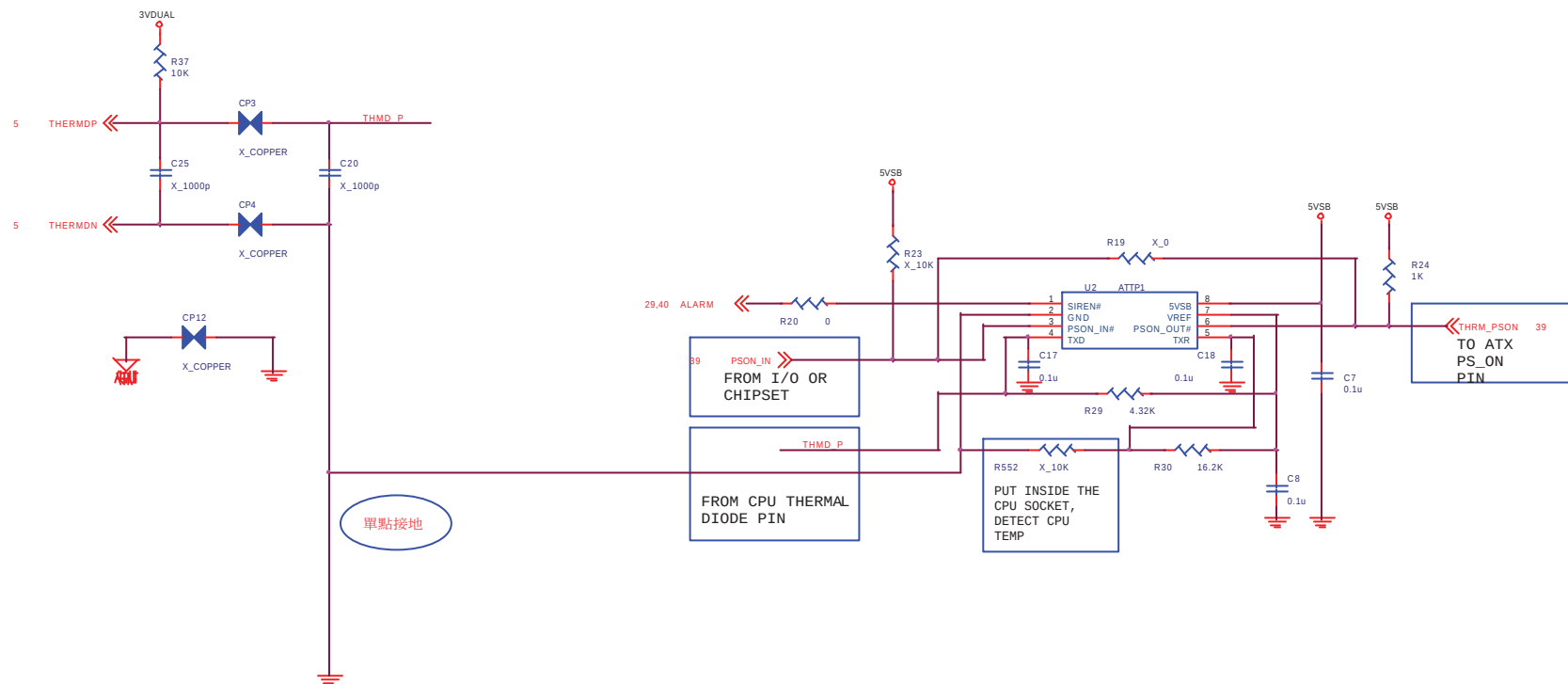
3	
---	--



Micro Star Restricted Secret

Title		Rev	
CPU Ratio Setting		100	
Document Number		MS-6593	
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:	
		Monday, June 17, 2002	
Sheet		35 of 44	

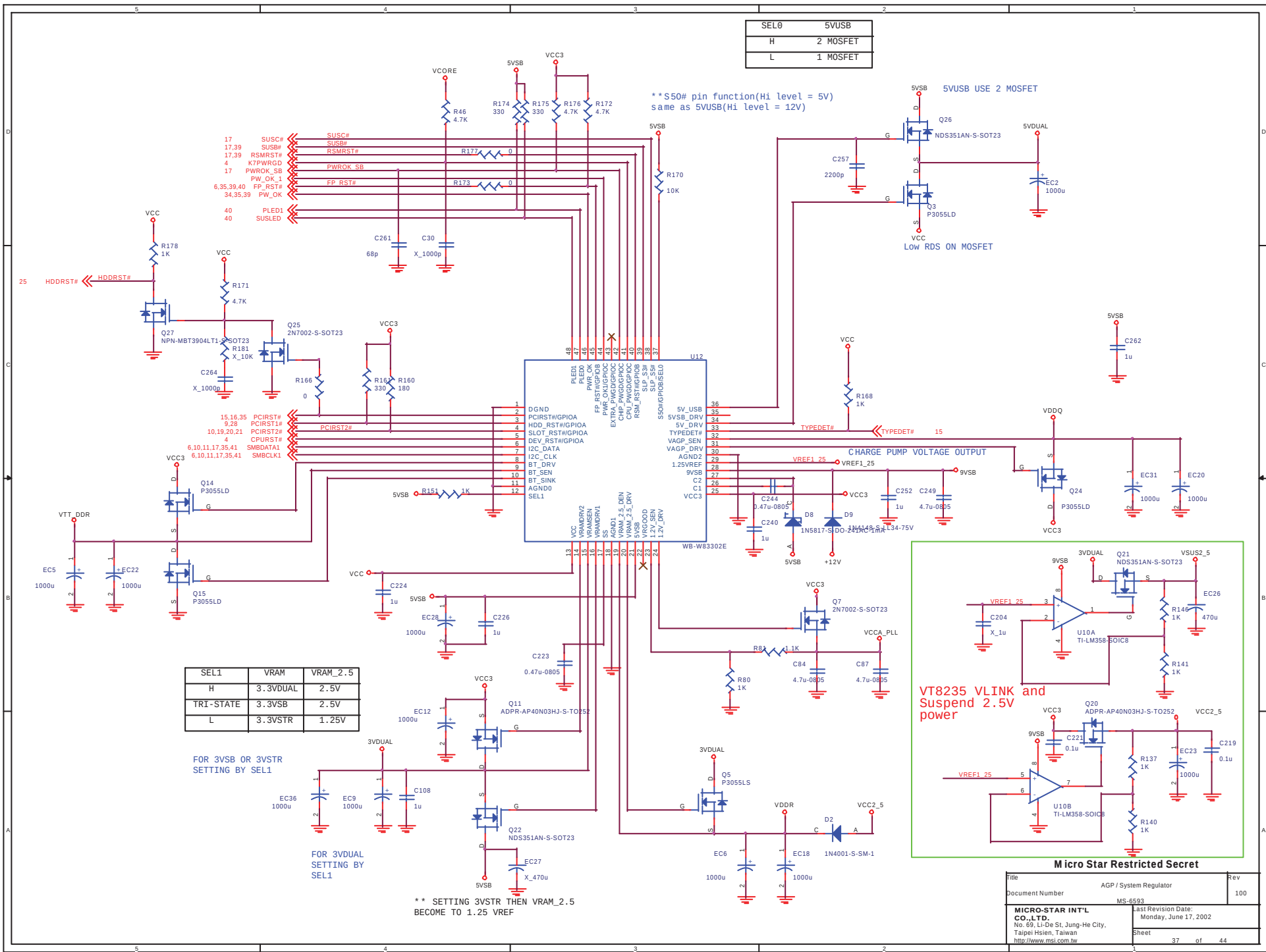
AMD CPU Thermal Protection Circuit



Micro Star Restricted Secret

Title		Rev
AMD CPU Thermal Protection Circuit		
Document Number	100	
MS-6593		
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: Monday, June 17, 2002
		Sheet 36 of 44

SEL0	5VUSB
H	2 MOSFET
L	1 MOSFET



Title	AGP / System Regulator	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO., LTD.		
No. 59, Li-De St. Jung-He City, Taipei Hsien, Taiwan		
http://www.msi.com.tw		
Last Revision Date: Monday, June 17, 2002		
Sheet 37 of 44		

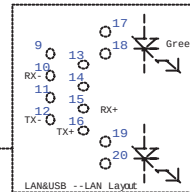
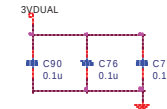
Place Termination R as close to 82562EM as possible

Near U5 (Intel 82562)

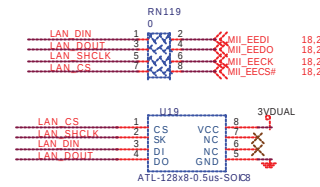
Trace : 6mil
Space : 8mil

Space : 30mil

Trace : 6mil
Space : 8mil



LAN EEPROM

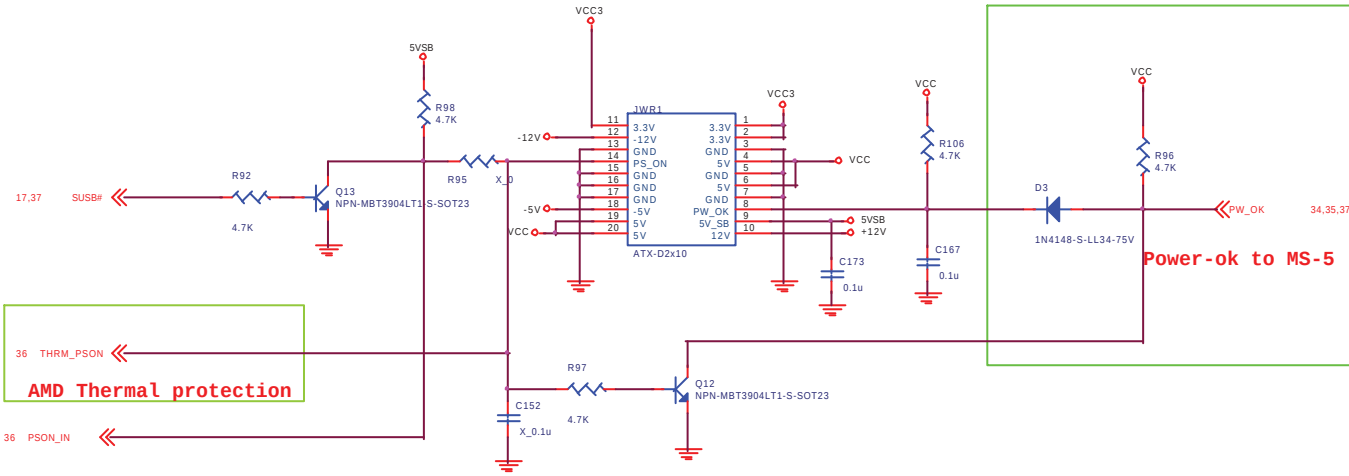
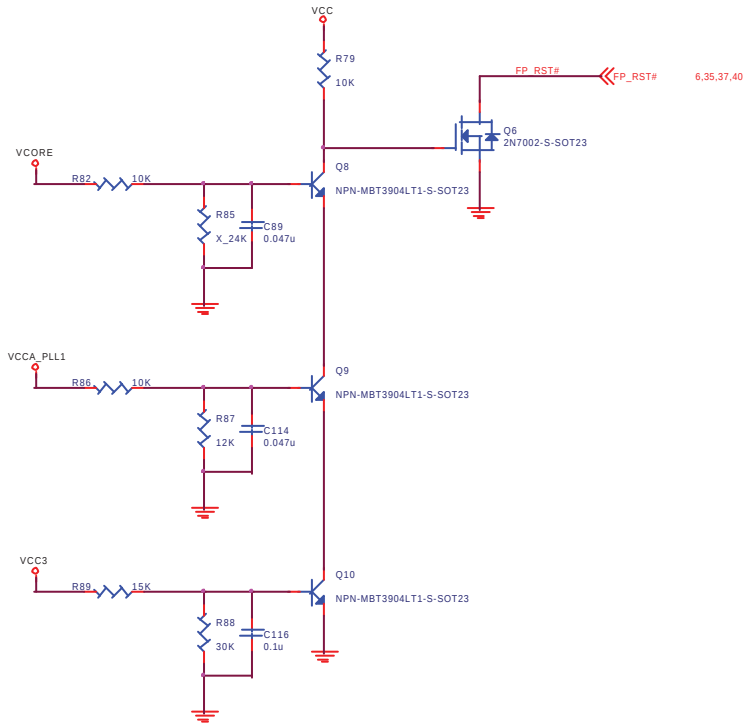


Near VT8235

Micro Star Restricted Secret

File		VIA_LAN	Rev
Document Number		MS-6593	100
MICRO-STAR INTL CO., LTD.		Last Revision Date:	
No. 69, Li-De St, Jung-He City,		Monday, June 17, 2002	
Taipei Hsien, Taiwan		Sheet	
http://www.msi.com.tw		38 of 44	

POWER OK Circuits

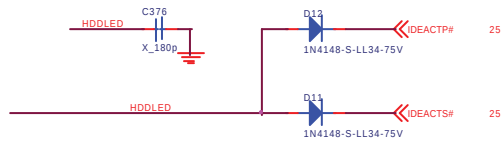


Micro Star Restricted Secret

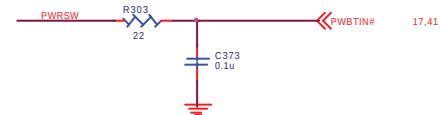
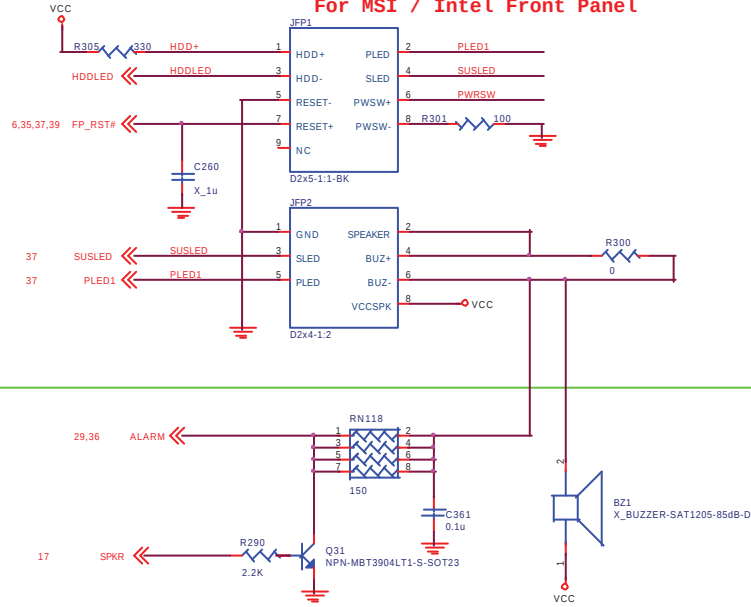
Title	Power OK Circuits	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO., LTD. No. 89, Li-De St. Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Monday, June 17, 2002
Sheet		39 of 44

FRONT PANEL

ESD Protect



For MSI / Intel Front Panel

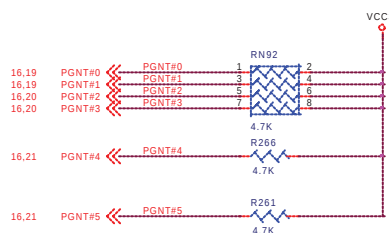
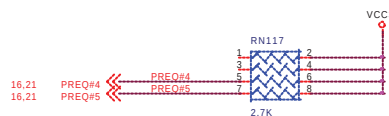
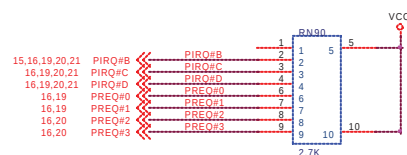
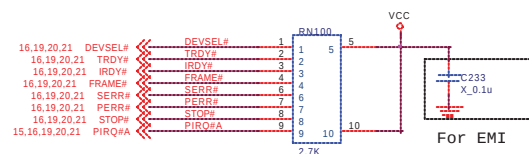


Micro Star Restricted Secret

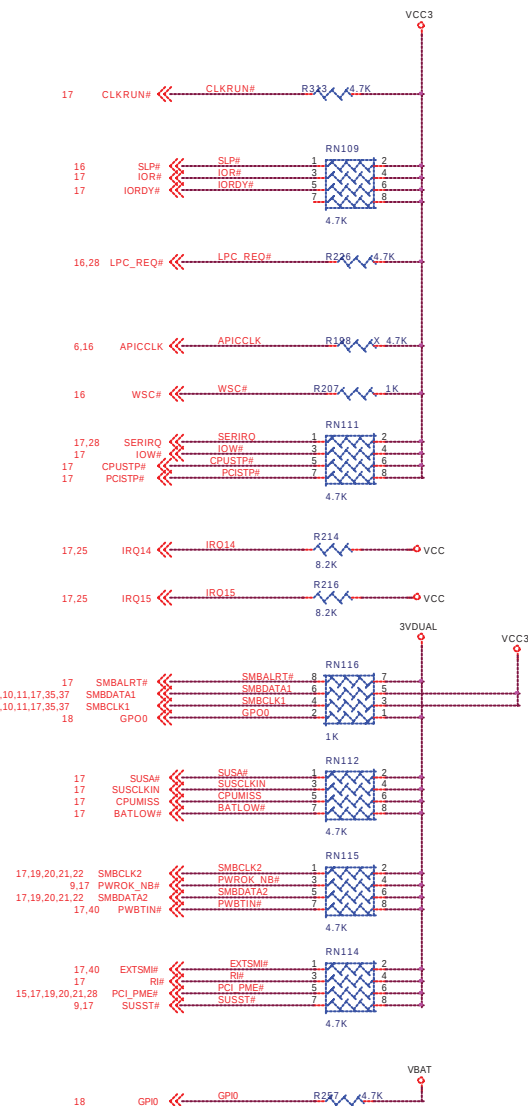
Title	Front Panel	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO.,LTD. No. 89, Li-De St. Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Monday, June 17, 2002 Sheet 40 of 44

PULL-UP RESISTORS

PCI BUS



SB Pull up resistors



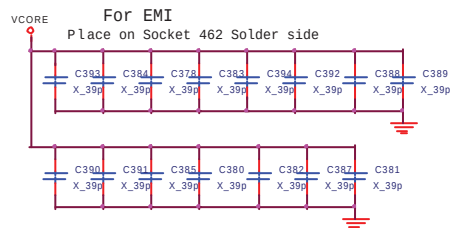
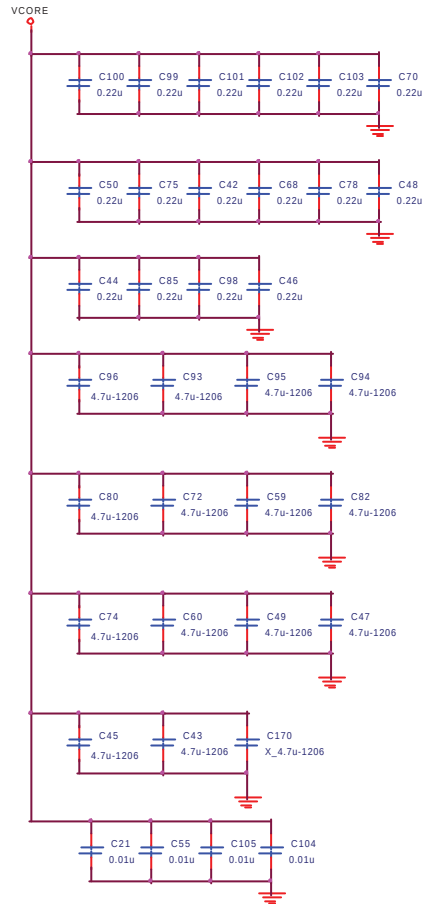
Micro Star Restricted Secret

Title	Pull up Resistor	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO.,LTD. No. 89, Li-De St. Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		
Last Revision Date:		Monday, June 17, 2002
Sheet		41 of 44

BULK / Decoupling

CPU

Place on SOCKET 462 Cavity



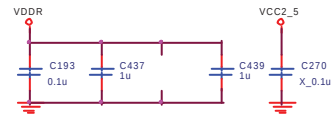
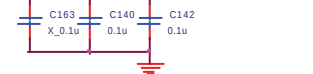
VT8366

Place on VT8366 Solder side

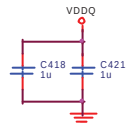


0B C392, C393 REMEMBER CHANGE PACKAGE TO C0603MSB

Place around VT8366

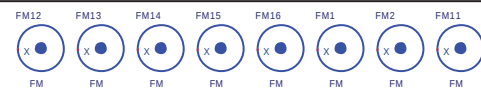
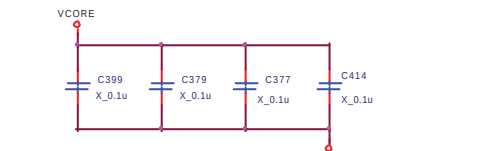
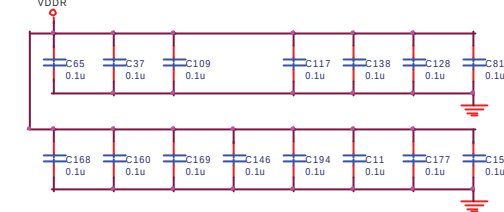


Place on VT8366

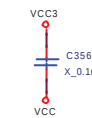
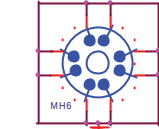
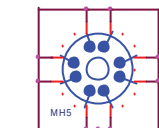
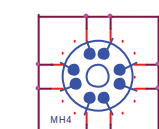
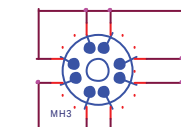
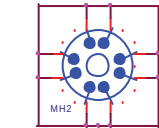
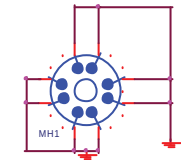
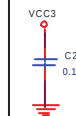
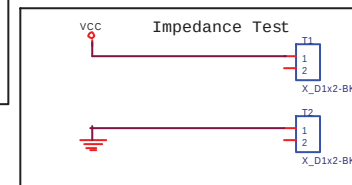
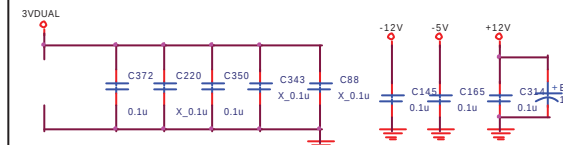
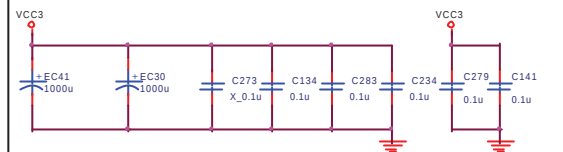
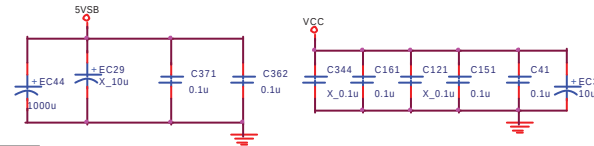
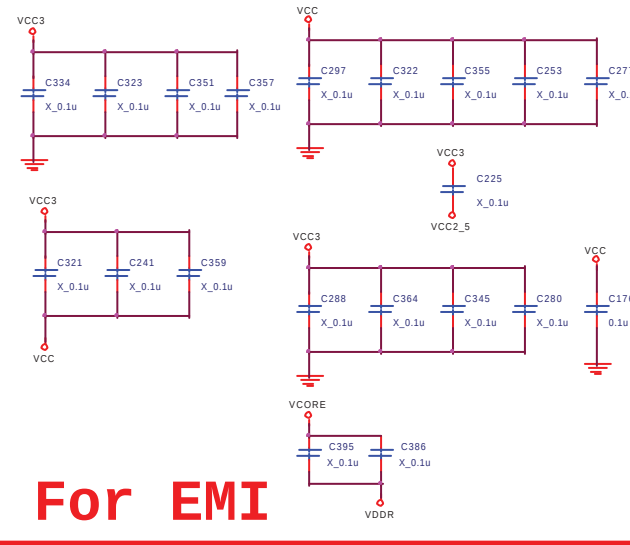


Place on VT8366 Solder side

DDR



For EMI
SYSTEM



Micro Star Restricted Secret

File	BULK / Decoupling	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO., LTD.		Last Revision Date:
No. 69, Li-De St. Jung-He City, Taipei Hsien, Taiwan		Monday, June 17, 2002
http://www.msi.com.tw		Sheet
		42 of 44

1.MS-6380E-10A CHANGE TO 6593-00A.

6593-00B

- 1.HOST_CLK & CPU_CLK SWAP PIN OUT.(PAGE 6)
- 2.CLOCK STRAPING FS0 CHANGE TO FS1.(PAGE 6)
- 3.SB_OSC14 & APICCLK_CPU SWAP PIN OUT.(PAGE 6)
- 4.U14 PIN 6 (MODE) ADD PULL HI 4,7K.(PAGE 6)
- 5.DDR TERMINATIONS DR_MD[0..63] & DQS[0..8] VALUE 33 ohm CHANGE TO 47 ohm.(PAGE 13)
- 6.U16 PIN=P22(PLLVCC) ADD OPTUINAL VCC3 FOR VT8233A(CE) CHIPSET.(PAGE 18)
- 7.REMOVE R292 (AC_RST#),ADD C433 CAP .FOR CNR MODEM CARD.(PAGE 22)
- 8.C500 FOR EMI REQUEST.(PAGE 24)
- 9.U19 PIN 3 & 4 SWAP.(PAGE 38)
- 10.U5 PIN 26 & 27 SWAP.(PAGE 38)
- 11.U3 PIN 15 CONNECTOR TO 3VDUAL.(PAGE 38)
- 12.U5 PIN 31,38,42,47 CONNECTOR TO 3VDUAL.(PAGE 38)

6593-100

- 1.Support 6CH Codec Ali650.
- 2.R312 support CNR EEPROM function.
- 3.R311 Fixed clock generator internal resistor bug.
- 4.Modify DDR Bus danping resistor value 10 to 22.(Fixed Kinmax DDR333 256MB DRAM).
- 5.Modify R217 1K to 0 ohm for electric.

Micro Star Restricted Secret

Title	History	Rev
Document Number	MS-6593	100
MICRO-STAR INT'L CO.,LTD. No. 89, Li-De St. Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Monday, June 10, 2002
Sheet		43 of 44

1.DDR routing recommendations :

- A.5 mil trace and 10 mil spacing.
- B.MD[0-7],DQM0,DQS0 :trace length =100mil .MD[8-15]DQM1,DQS1 the same.
- C.Trace to danping max=4 inch , trace to frist DIMM max=5 inch , danping to frist DIMM max=1 inch.
- D.Three DIMM to Rtt (terminations) max=2 inch.

2.Clock routing recommendations :

- A.CPU differential clock spacing/trace+/spacing/trace-/spacing 20:5:10:5:20 .
- B.Host clock routing same as CPU , trace length = CPU clock trace + 1 inch .
- C.DCLK0 as short as possible , DCLKI = (DCLK0+/DCLK-)+2 inch.
- D.DDR clock (DCLK0+/DCLK0-)-(DCLK8+/DCLK8-) =100 mil.
- E.DDR clock trace / spacing =25:5:15:5:25 .
- F.AGPCLK=AGPCLK_NB+4 inch=VCLK+4 inch , Trace spacing =6:20 .
- G.PCICLK0=PCICLK1...PCICLK6=SB_PCLK+3 inch=SIOPCLK+3 inch , Trace/spacing = 6:15 .

3. Vlink Interface Layout and Routing Guide :

- A.VLAD[0..7] trace length max=6 inch , trace/spacing 5:10.
- B.(UPSTB/UPSTB#)and(DNSTB/DNSTB#) differential trace, 10:5:10:5:10 trace routing.

4.IDE routing recommendations :

- A.The series resistors(Ra and Rb) should be placed within 1 inch near VT8235 SB.
- B.Trace routing 5:10.

5.USB routing recommendations :

- A.D+/D- differential trace routing 7.5:7.5:7.5.

6.S2K Signal routing recommendations :

- A.Address,data and clock trace 5 mil ,spacing 10 mil.
- B.Data ,address,clock Maximum length <6 inch , length match <1 inch.
- C.DICLK[3:0]=DOCLK-1 inch.

7.AGP routing recommendations :

- A.Data GD[0:31] and control trace / spacing 5:15.length max <6 inch.
- B.Strobe SBA,SBS[0:2] trace / spacing 5:20 , length max <6 inch .

Micro Star Restricted Secret

Title	Design Layout Guide	Rev
Document Number	MS-6593	100
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: Tuesday, May 14, 2002
Sheet		44 of 44

