

MS-6373 ATX

Revision 0.B

AMD Socket A Processor
nVIDIA CRUSH-12/MCP-1 Chipset
Winbond 83627HF-AW LPC I/O
ICS 1893 LAN PHY

Last Schematic Update Date:
08/23/2001

Model option table

Model type	Function	BOM Config	ERP BOM No.
MS6373	Option:STD(Wo/TV)	Cfg6373-00B-STD	65/60 1-6373-B10
MS6373	Option:A(w/TV)	Cfg6373-00B-A	65/60 1-6373-B20
MS6373F2	For 4MBO	Cfg6373F2-00B-STD	65/60 1-6373-B30

Title	Page
Cover Sheet	1
Block Diagram	2
GPIO SPEC	3
462PGA Socket	4,5
PLL Delay & CPU Ratio Set	6
CRUSH12	7,8,9,10,11
AGP Connector	12
Videos Connectors	13
System Memory	14,15,16
DDR Terminations	17,18
MCP-1	19,20,21
PCI 5 & BIOS	22
CNR Riser	23
AC'97 Codec	24
Audio Amplifier	25
Audio Connectors	26
LAN (PHY)	27
LAN Connector	28
PCI Connectors	29,30
ATA100 Connector	31
USB Connectors	32,33
PC to PC Networking	34
LPC I/O	35
Hardware monitor	36
Parallel Port	37
Serial Port	38
Game Port	39
Keyboard/Mouse Connectors	40
VRM 9.0	41
Vcore Adjustable & D-LED	42
DDR Regulators	43
System Voltage Regulators	44
Front Panel	45
Pull-up Resistors	46
VRM Decoupling	47
System Decoupling	48
TV-Encoder	49
AutoBOM Manual parts	50
History	51

Micro Star Restricted Secret		
Title	Cover Sheet	Rev
Document Number	MS-6373	0B
MICRO-STAR INT'L CO.,LTD. No. 66, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Wednesday, August 29, 2001
Sheet	1	of 50

General Spec.

MCP-1

GPIO Pin	Type	Function
GPIO 0	I/O	PCI_REQ#4 (multifunction pin)
GPIO 1	I/O	PCI_GNT#4 (multifunction pin)
GPIO 2	I/O	PCI_PERR# (multifunction pin)
GPIO 3	I	PCI_IRQ#E (multifunction pin)
GPIO 4	I	MII_RXER (multifunction pin)
GPIO 5	I	Pull up through 8.2K ohms (LPC_DRQ#1)
GPIO 6	I	USB_OC1# (multifunction pin)
GPIO 7	I	USB_OC2# (multifunction pin)
GPIO 8	I	USB_OC2# (multifunction pin)
GPIO 9	I	USB_OC3# (multifunction pin)
GPIO 10	I	USB_OC3# (multifunction pin)
GPIO 11	I	AC_SDIN1 (multifunction pin)
GPIO 12	I	A20GATE (multifunction pin)
GPIO 13	O	SPDIF OUT(multifunction pin)
GPIO 14	I/O	CNR Detected
GPIO 15	I/O	SPDIF switch control
GPIO 16	I/O	Pull Up to 3.3V through 1K ohms (BIOS protect)
GPIO 17	I/O	Pull up through 8.2K ohms (PRDY#)
GPIO 18	I/O	Primary IDE ATA66/100 detection (CPUSLP#)
GPIO 19	I/O	SLPBTN# (multifunction pin)
GPIO 20	I/O	Secondary IDE ATA66/100 detection (SLP_S1#)
GPIO 21	I/O	EXTSMI# (multifunction pin)
GPIO 22	I/O	THERM# (multifunction pin)
GPIO 23	I/O	N/C (INTRUDER#)
GPIO 24	I/O	RI# (multifunction pin)
GPIO 25	I/O	KBRST# (multifunction pin)
SPIO 0	I/O	SM_CLK0 (multifunction pin)
SPIO 1	I/O	SM_DATA0 (multifunction pin)
SPIO 2	I/O	SM_CLK1 (multifunction pin)
SPIO 3	I/O	SM_DATA1 (multifunction pin)
SPIO 4	I/O	DDC_CLK (multifunction pin)
SPIO 5	I/O	DDC_DATA (multifunction pin)
SPIO 6	I	Pull up through 4.7K ohms (SMB_ALERT#)

BIOS Protect Config.	
BIOS_Un_Protected	1
BIOS Protected	0

SPDIF output control Config.	
Analog output	1(default)
SPDIF output	0

PCI Config.

DEVICE	MCP1 INT Pin	REQ# /GNT#	IDSEL	CLOCK	CLK GEN PIN OUT
PCI Slot 1	INTA# INTB# INTC# INTD#	PCI_REQ#0 PCI_GNT#0	AD16	PCICLK0	MCP1/AB20 (PCI_CLK0)
PCI Slot 2	INTB# INTC# INTD# INTA#	PCI_REQ#1 PCI_GNT#1	AD17	PCICLK1	MCP1/AB18 (PCI_CLK1)
PCI Slot 3	INTC# INTD# INTA# INTB#	PCI_REQ#2 PCI_GNT#2	AD18	PCICLK2	MCP1/AB12 (PCI_CLK2)
PCI Slot 4	INTD# INTA# INTB# INTC#	PCI_REQ#3 PCI_GNT#3	AD19	PCICLK3	MCP1/AB8 (PCI_CLK3)
PCI Slot 5	INTA# INTB# INTC# INTD#	PCI_REQ#4 PCI_GNT#4	AD20	PCICLK4	MCP1/AB6 (PCI_CLK4)

LPC I/O

GPIO Pin	Type	Function
GPIO 24	I/O	D-LED 1 (H=Green;L=Red)
GPIO 32	I/O	D-LED 4 (H=Red;L=Green)
GPIO 33	I/O	D-LED 2 (H=Red;L=Green)
GPIO 34	I/O	D-LED 3 (H=Red;L=Green)

DDR DIMM Config.

DEVICE	ADDRESS	CLOCK
DIMM 1	1010000B (A0h)	MCLK_A0/MCLK_A0# MCLK_A1/MCLK_A1# MCLK_A2/MCLK_A2#
DIMM 2	1010001B (A2h)	MCLK_B0/MCLK_B0# MCLK_B2/MCLK_B2# MCLK_B4/MCLK_B4#
DIMM 3	1010010B (A4h)	MCLK_B1/MCLK_B1# MCLK_B3/MCLK_B3# MCLK_B5/MCLK_B5#

MII EEPROM Config.
1010011B (A6h)

CNR Config.
1010100B (A8h)

W83601 Config.
1010111B (ABh)

W83601

GPIO Pin	Type	Function
GP10	I/O	CPU FID0
GP11	I/O	CPU FID1
GP12	I/O	CPU FID2
GP13	I/O	CPU FID3
GP14	I/O	RATIO_SET (H=H/W Default ; L=BIOS Setting)
GP15	I/O	H/W Reset#
GP16	I/O	FSB Clock (H=100;L=133)
GP17	I/O	N/C
GP20	I/O	Pull-High (A0)
GP21	I/O	Pull-High (A1)
GP22	I/O	Pull-High (A2)
GP23	I/O	DDR SET1
GP24	I/O	DDR SET2
GP25	I/O	N/C
GP26	I/O	N/C

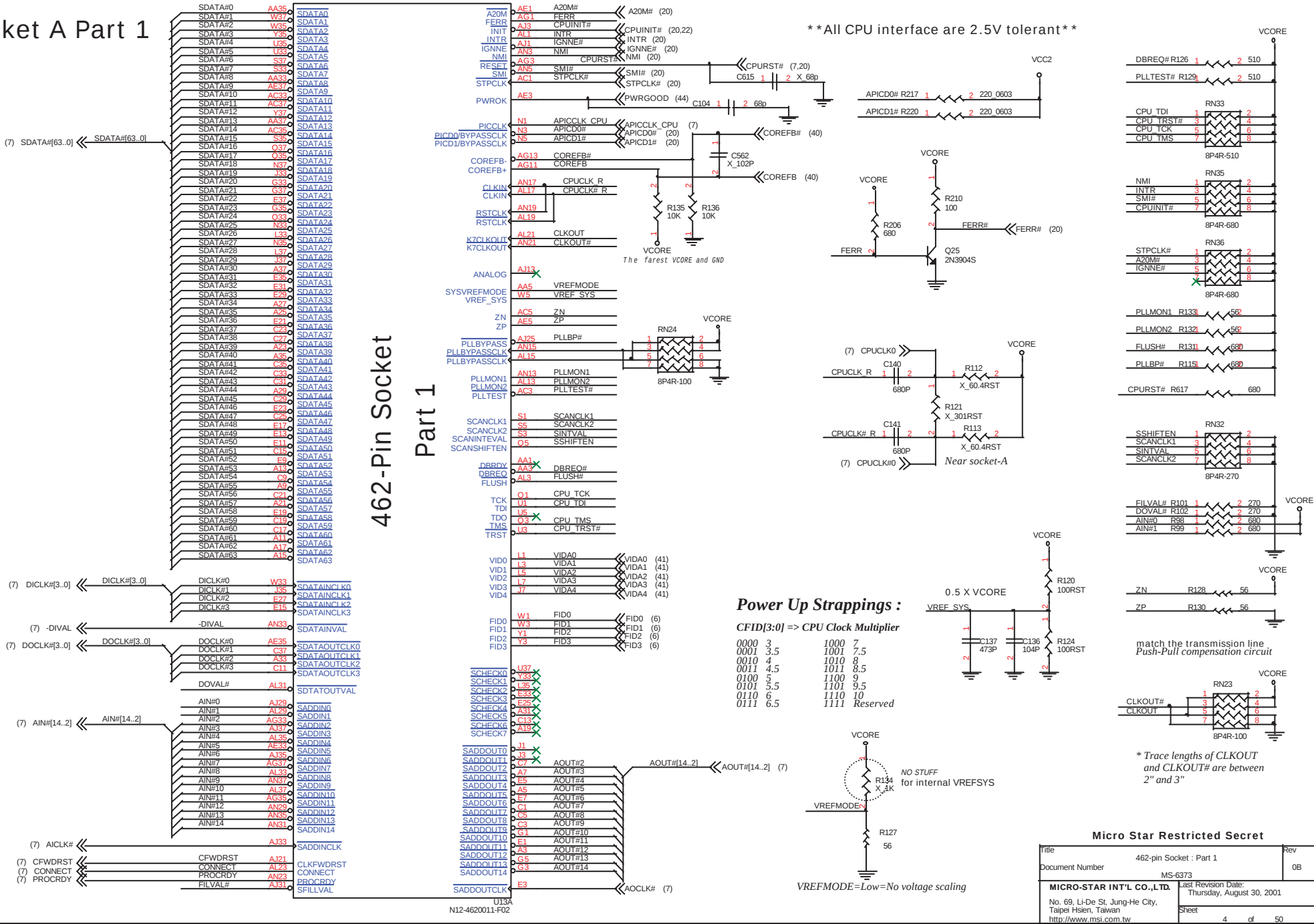
DDR Voltage	SET1	SET2
2.5V	1	1
2.6V	1	0
2.7V	0	1
2.8V	0	0

Micro Star Restricted Secret		
Title	GPIO SPEC	Rev
Document Number	MS-6373	0B
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St., Jung-He City, Taippei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Wednesday, August 29, 2001
Sheet	3 of	50

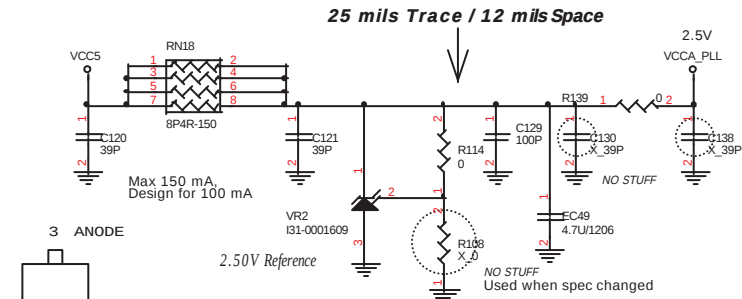
Socket A Part 1

462-Pin Socket Part 1

All CPU interface are 2.5V tolerant



Socket A Part 2

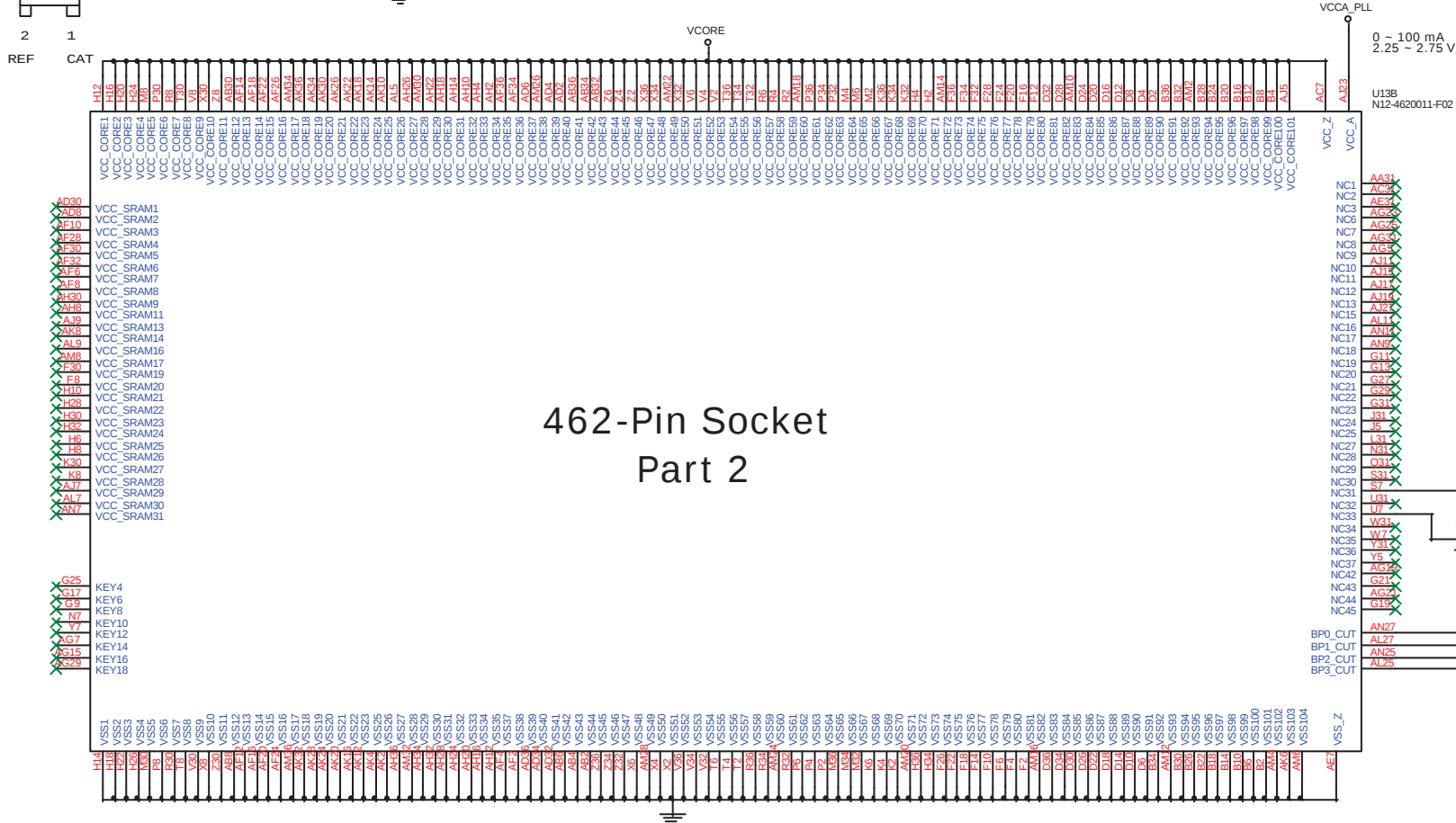


VCCA_PLL trace length from the regulator to the PGA must less be 0.75"

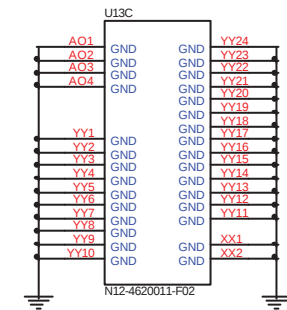
Place all filters close to the PGA

Keep all power and signal trace away from the regulator

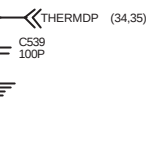
Place a cut in GND plane around the VCCA_PLL regulator circuit



462-Pin Socket Part 2



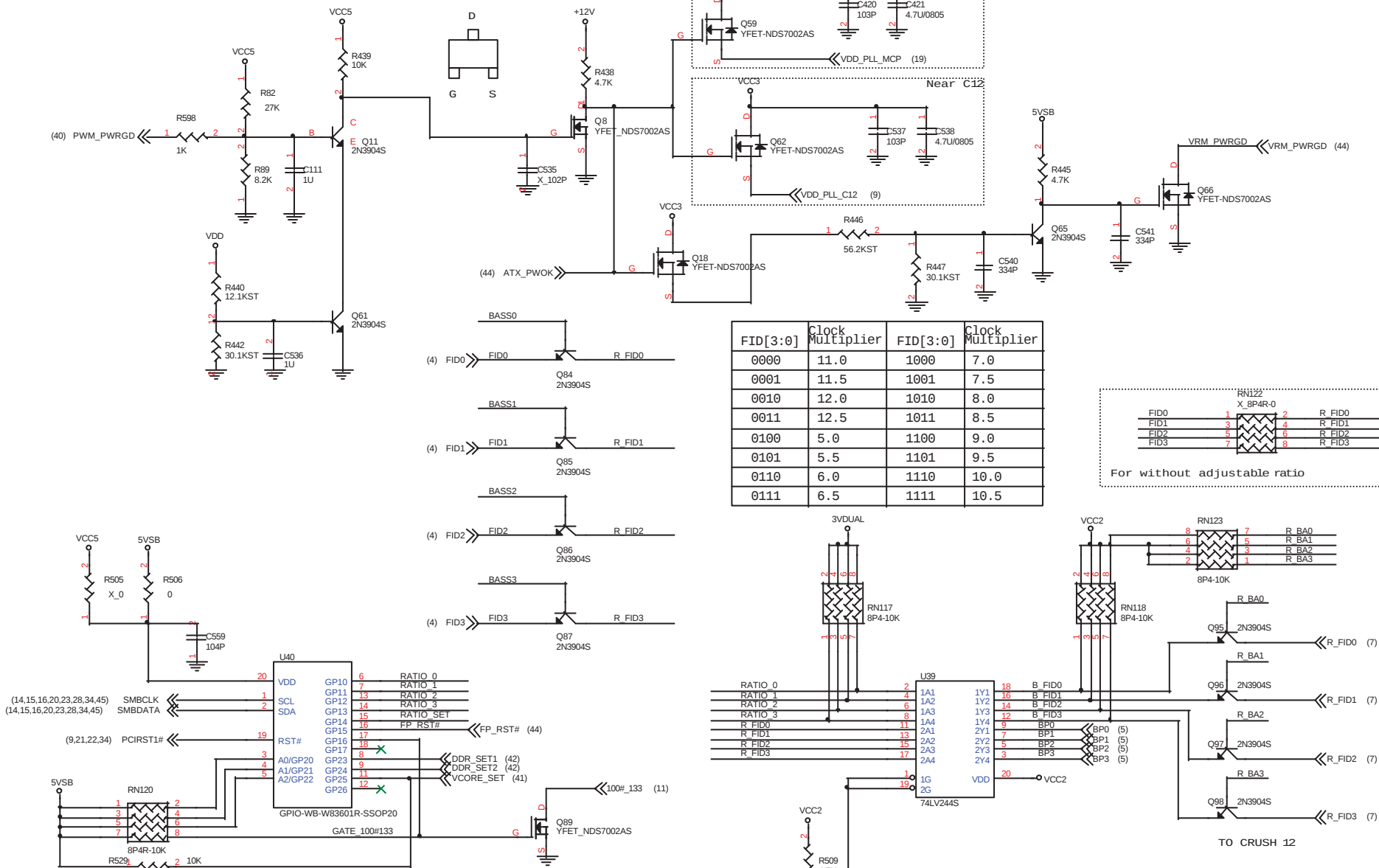
For 1.5GHz CPU Fan Holes



Micro Star Restricted Secret

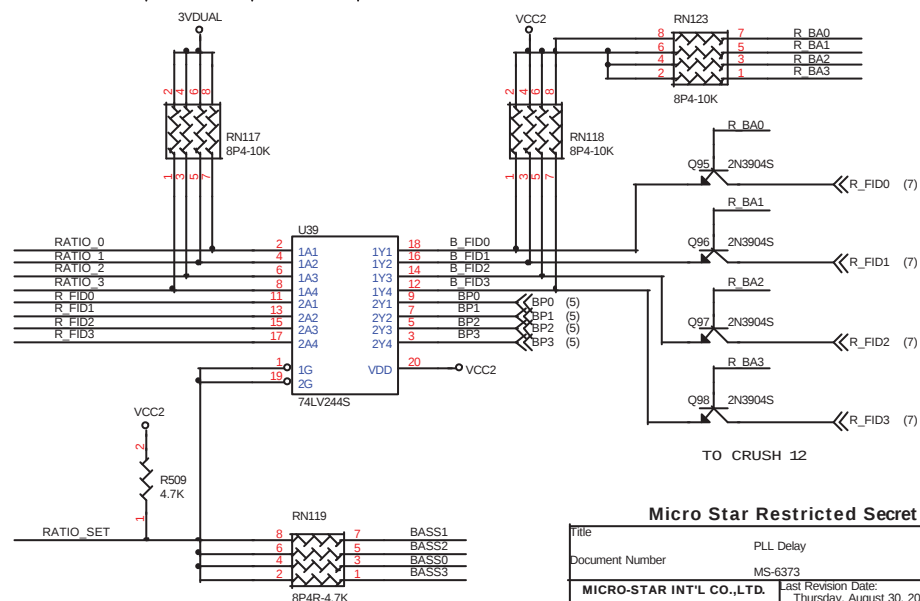
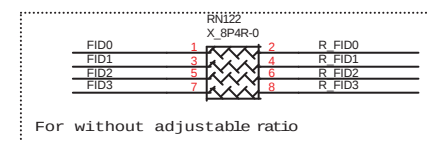
Title	462-pin Socket : Part 2	Rev
Document Number	MS-6373	0B
MICRO-STAR INT'L CO.,LTD.		Last Revision Date:
No. 69, Li-De St, Jung-He City,		Thursday, August 30, 2001
Taipei Hsien, Taiwan		Sheet
http://www.msi.com.tw		5 of 50

PLL Delay



GP15 assert "Low" to hardware rest when setting Ratio or 100/133 frequency from BIOS.

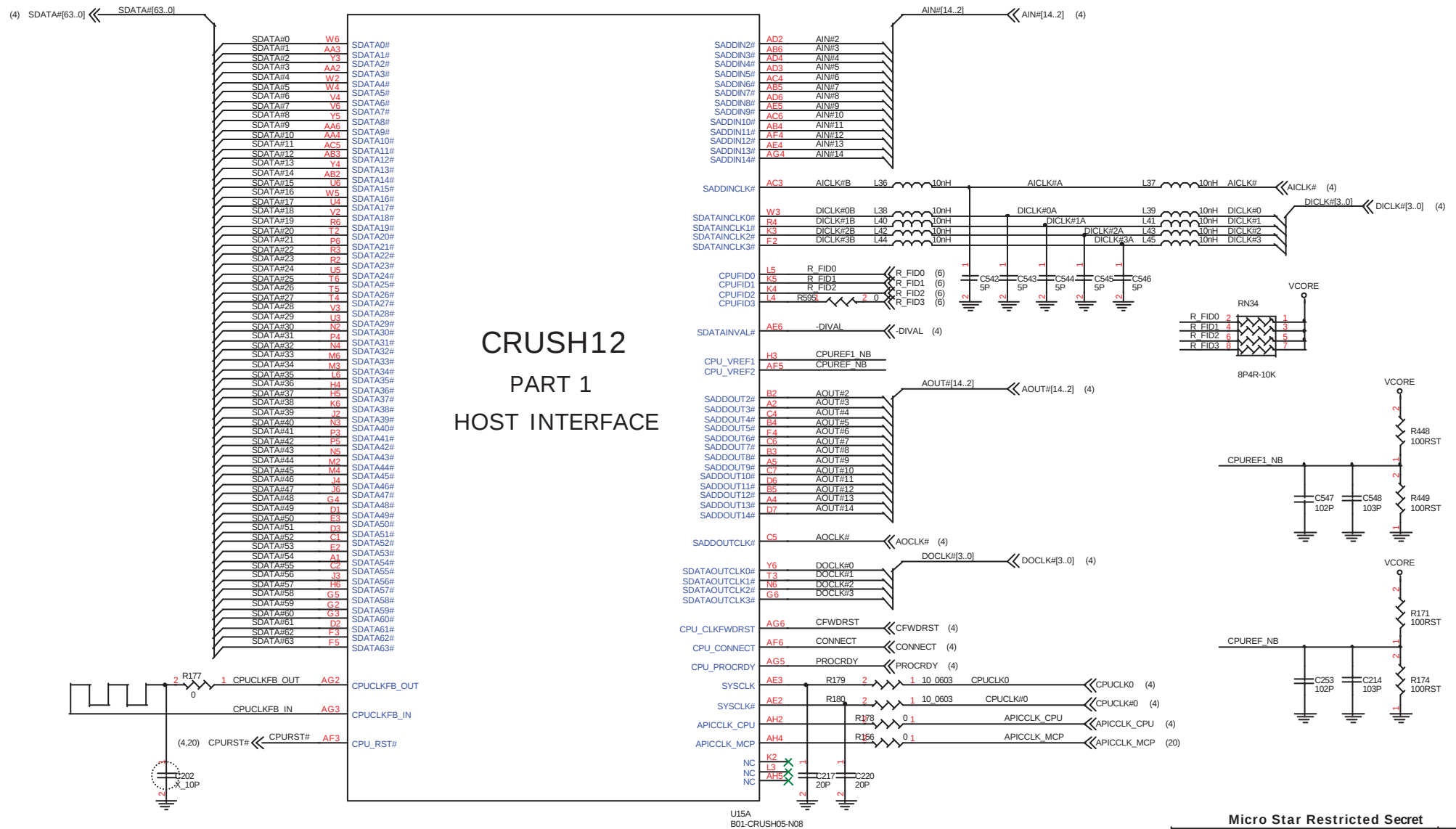
FID[3:0]	Clock Multiplier	FID[3:0]	Clock Multiplier
0000	11.0	1000	7.0
0001	11.5	1001	7.5
0010	12.0	1010	8.0
0011	12.5	1011	8.5
0100	5.0	1100	9.0
0101	5.5	1101	9.5
0110	6.0	1110	10.0
0111	6.5	1111	10.5



Micro Star Restricted Secret

Title		Rev
PLL Delay		
Document Number	MS-6373	0B
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Thursday, August 30, 2001 Sheet 6 of 50

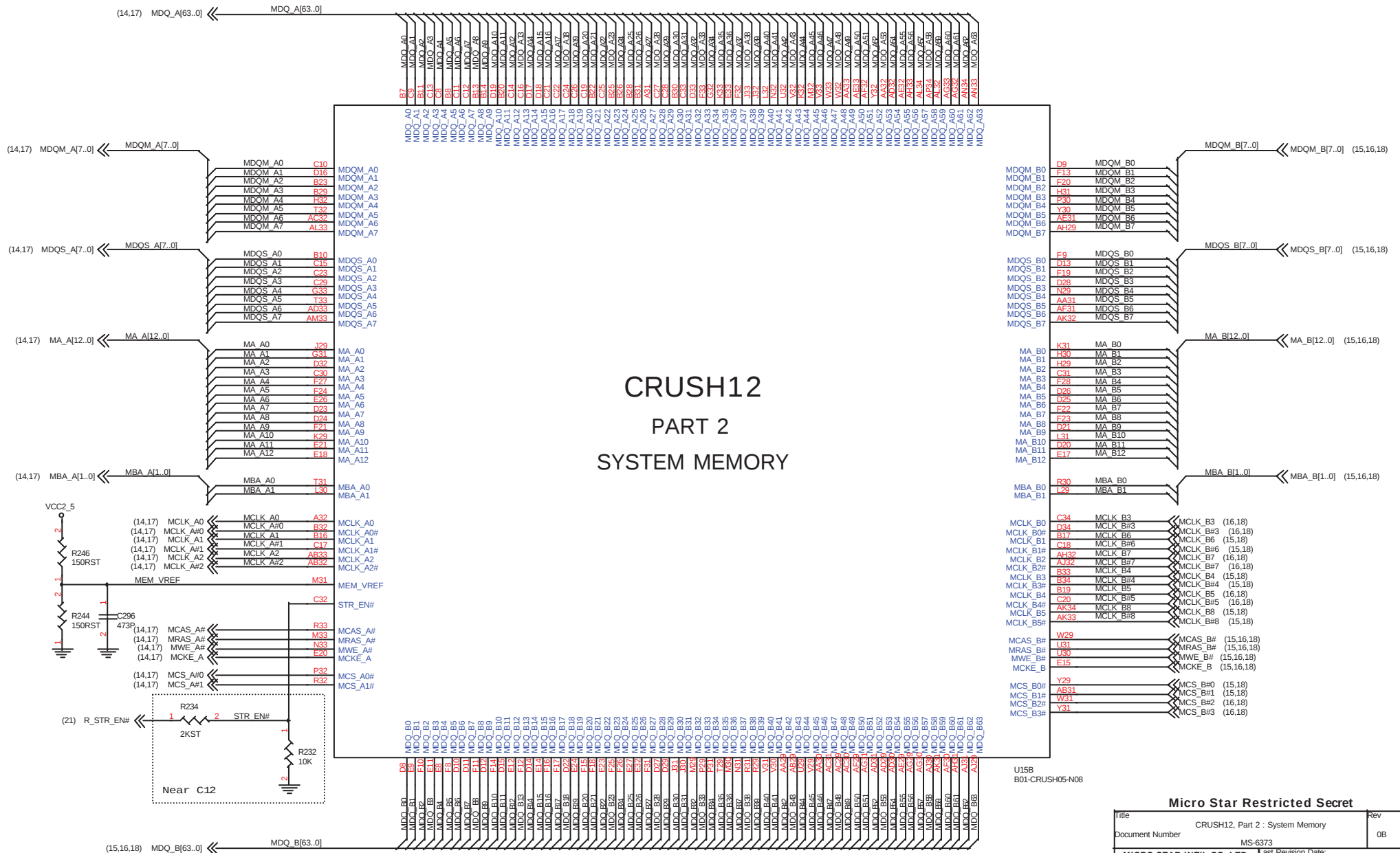
CRUSH12, Part 1 : Host Interface



Micro Star Restricted Secret

Title		Rev
CRUSH12, Part 1 : Host Interface		
Document Number	OB	
	MS-6373	
MICRO-STAR INT'L CO.,LTD.		
No. 69, Li-De St, Jung-Hue City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Thursday, August 30, 2001
Sheet		7 of 50

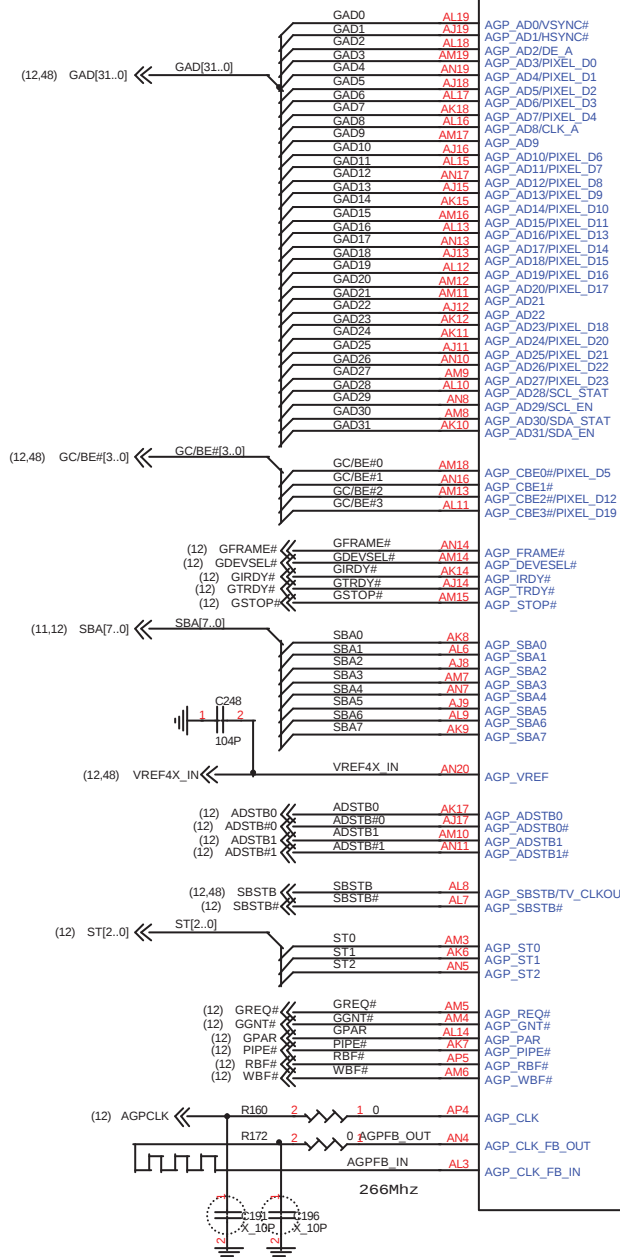
CRUSH12, Part 2 : Memory Interface



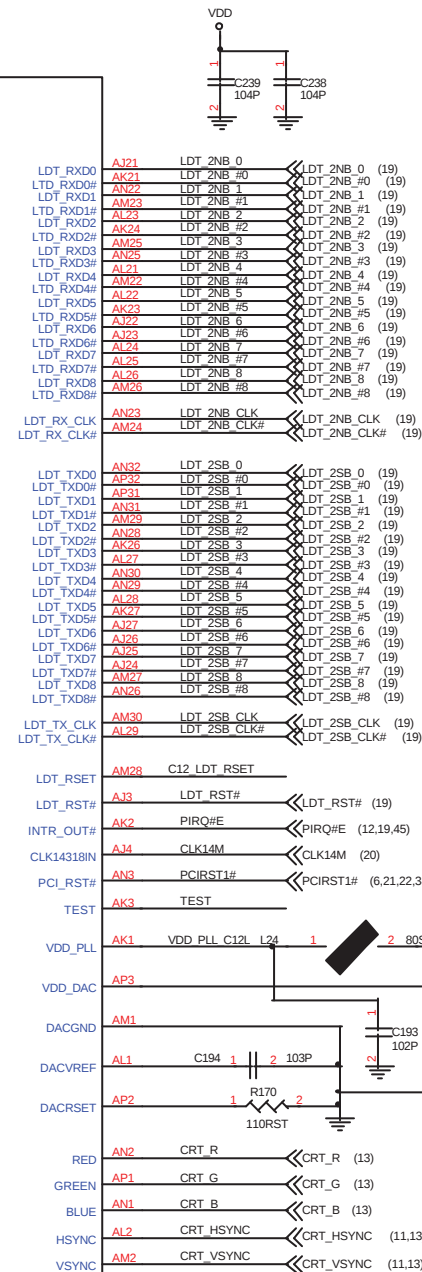
Micro Star Restricted Secret

Title		CRUSH12, Part 2 : System Memory	Rev
Document Number		MS-6373	0B
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-Hw City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Thursday, August 30, 2001	
Sheet		8	of 50

CRUSH12 Part 3 : AGP, Video and LDT Interface

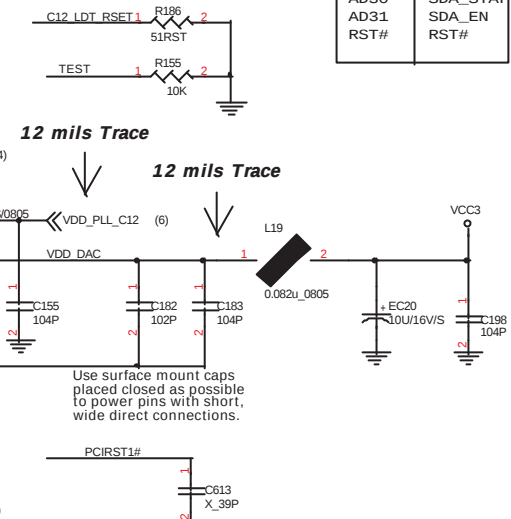


CRUSH12
PART 3
AGP 4X,
VIDEO,
AND
LDT INTERFACE



AGP Signal Mapping to TV Encoder

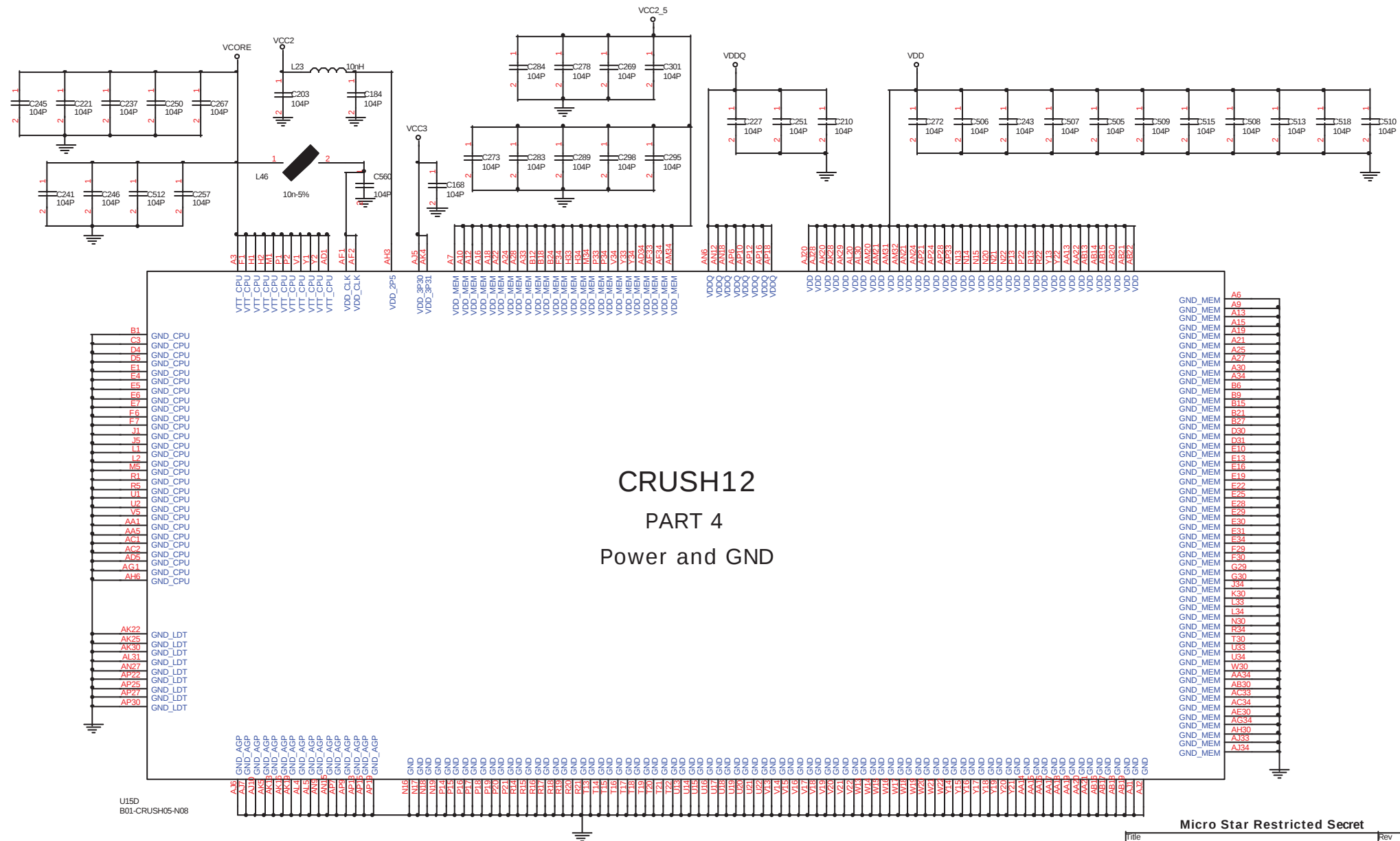
AGP Signal	TV Encoder
AD0	VSYNC
AD1	HSYNC
AD2	BLANK#
AD3	P0
AD4	P1
AD5	P2
AD6	P3
AD7	P4
CBE0#	P5
AD8	CLKIN
AD9	---
AD10	P6
AD11	P7
AD12	P8
AD13	P9
AD14	P10
AD15	P11
CBE1#	---
CBE2#	P12
AD16	P13
AD17	P14
AD18	P15
AD19	P16
AD20	P17
AD21	---
AD22	---
AD23	P18
CBE3#	P19
AD24	P20
AD25	P21
AD26	P22
AD27	P23
AD28	SCL_STATE
AD29	SCL_EN
AD30	SDA_STATE
AD31	SDA_EN
RST#	RST#



Micro Star Restricted Secret

Title		Rev
CRUSH12, Part 3 : AGP4X, Video and LDT Interface		
Document Number	MS-6373	0B
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Thursday, August 30, 2001 Sheet 9 of 50

CRUSH Part 4 : Power and GND



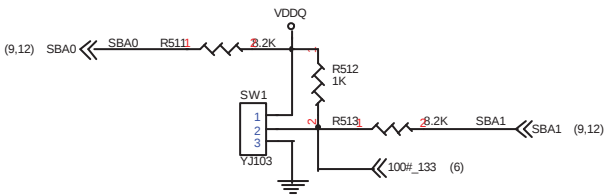
CRUSH12
PART 4
Power and GND

- A6
- A9
- A13
- A15
- A19
- A21
- A25
- A27
- A30
- A34
- B6
- B9
- B15
- B21
- B27
- D30
- D31
- E10
- E13
- E16
- E19
- E22
- E25
- E28
- E29
- E30
- E31
- E34
- F29
- F30
- G29
- G30
- J34
- K30
- L34
- N30
- R34
- T30
- U33
- U34
- W30
- AA34
- AB30
- AC33
- AC34
- AE30
- AE33
- AH30
- AJ33
- AJ34

Micro Star Restricted Secret

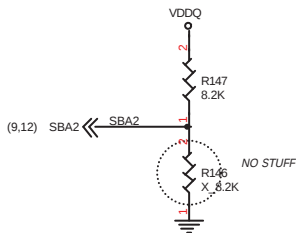
Title	CRUSH12, Part 4 : Power and GND	Rev	08
Document Number	MS-6373		
MICRO-STAR INT'L CO.,LTD.		Last Revision Date:	
No. 69, Li-De St, Jung-He City,		Thursday, August 30, 2001	
Taipei Hsien, Taiwan		Sheet	
http://www.msi.com.tw		10 of 50	

CRUSH12 Strapping Pin



AGP signals SBA[1:0] specify the CPU FSB clock frequency.

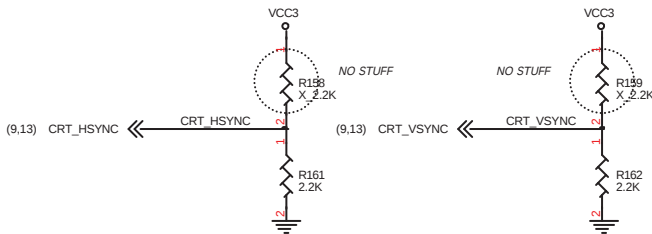
Host Freq.	SBA1	SBA0
66MHz	0	0
100MHz	0	1
RESERVE	1	0
133MHz	1	1



AGP signal SBA2 determine if the CPU FSB frequency should be set based upon the SBA[1:0] straps or those stored in the ROM table.

0 = Use values stored in ROM tables.
1 = AUTO detect by reading SBA[1:0]

FSB Set.	SBA2
ROM	0
AUTO	1



AGP signal SBA3 determine whether to use the USER defined ROM table or the "SAFE" mode ROM table.

0 = "SAFE" mode table
1 = USER defined table

FSB Mode	SBA3
SAFE	0
AUTO	1

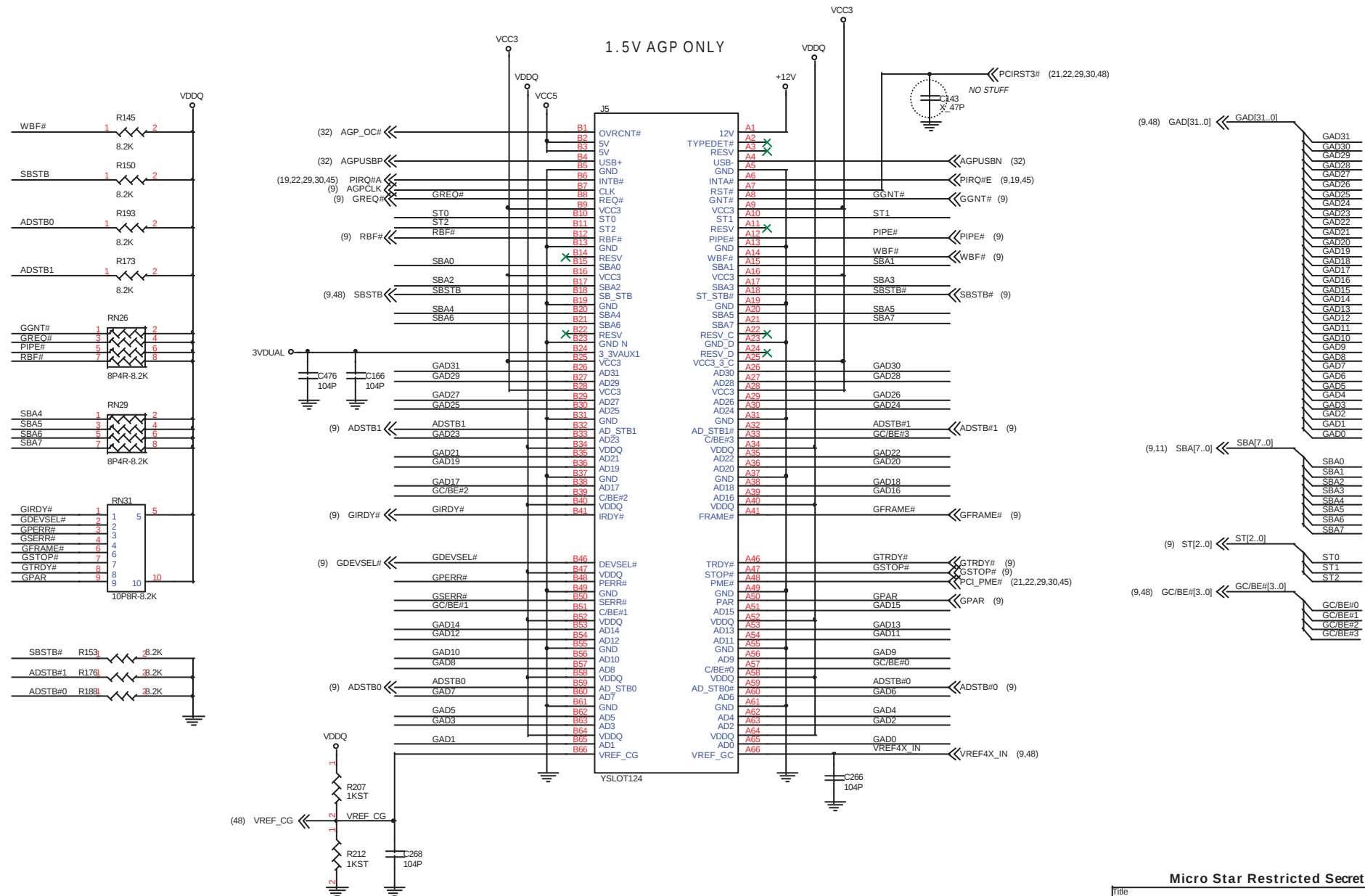
Function		LDT internal terminations		CPU Type strapping	
		Enable	Disable	Intel	AMD
HSYNC	Buffered	0	1	X	X
	Non-Buffered	0*	1	X	X
VSYNC	Buffered	X	X	1	0
	Non-Buffered	X	X	1	0*

Use 10K pu/pd if VSYNC/HSYNC are buffered;
use 2.2K if VSYNC/HSYNC are un-buffered.
* Default

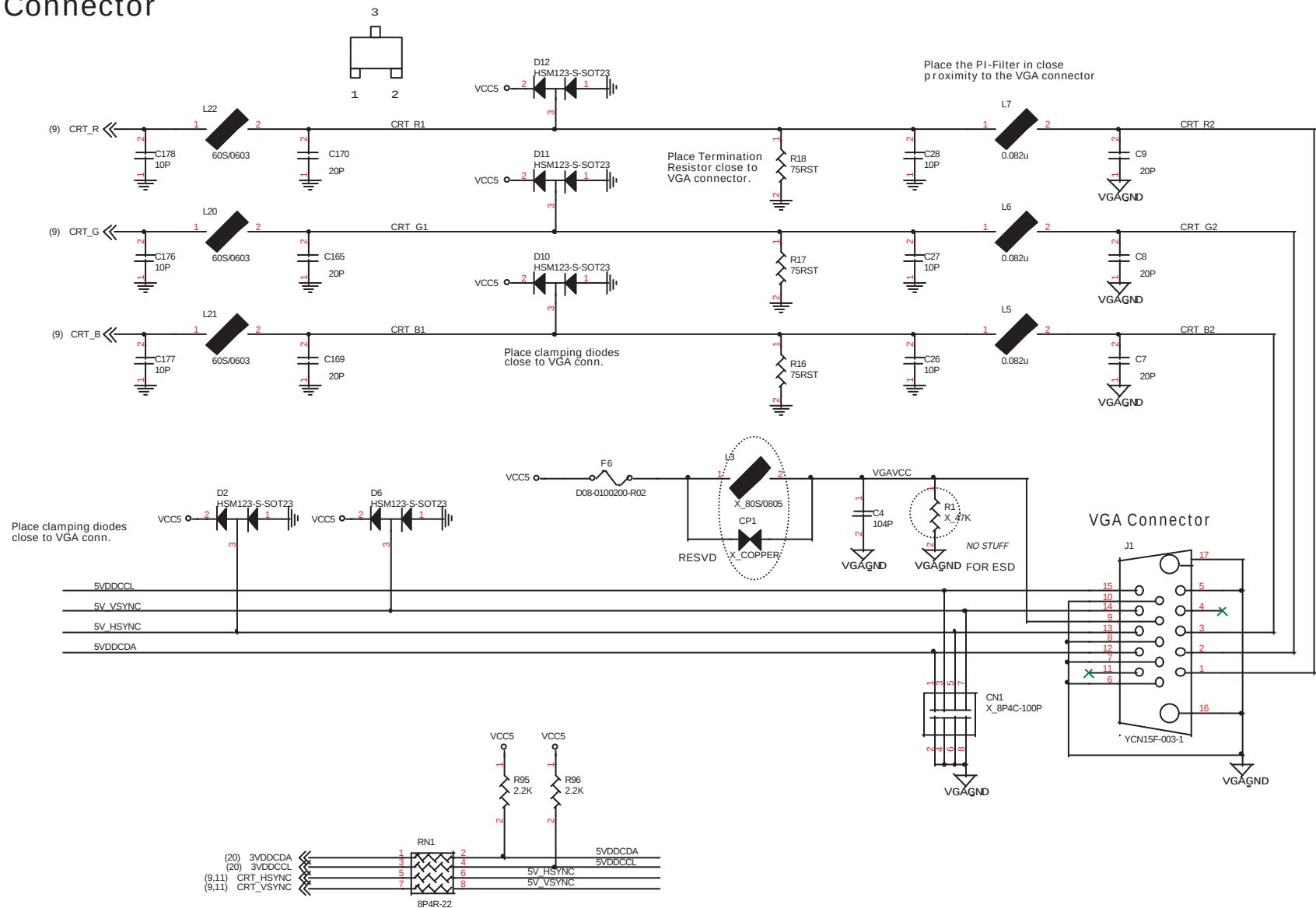
Micro Star Restricted Secret

Title	CRUSH12 Strapping Pins	Rev
Document Number	MS-6373	0B
MICRO-STAR INT'L CO.,LTD.		Last Revision Date:
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Thursday, August 30, 2001
Sheet		11 of 50

AGP 1.5V Connector



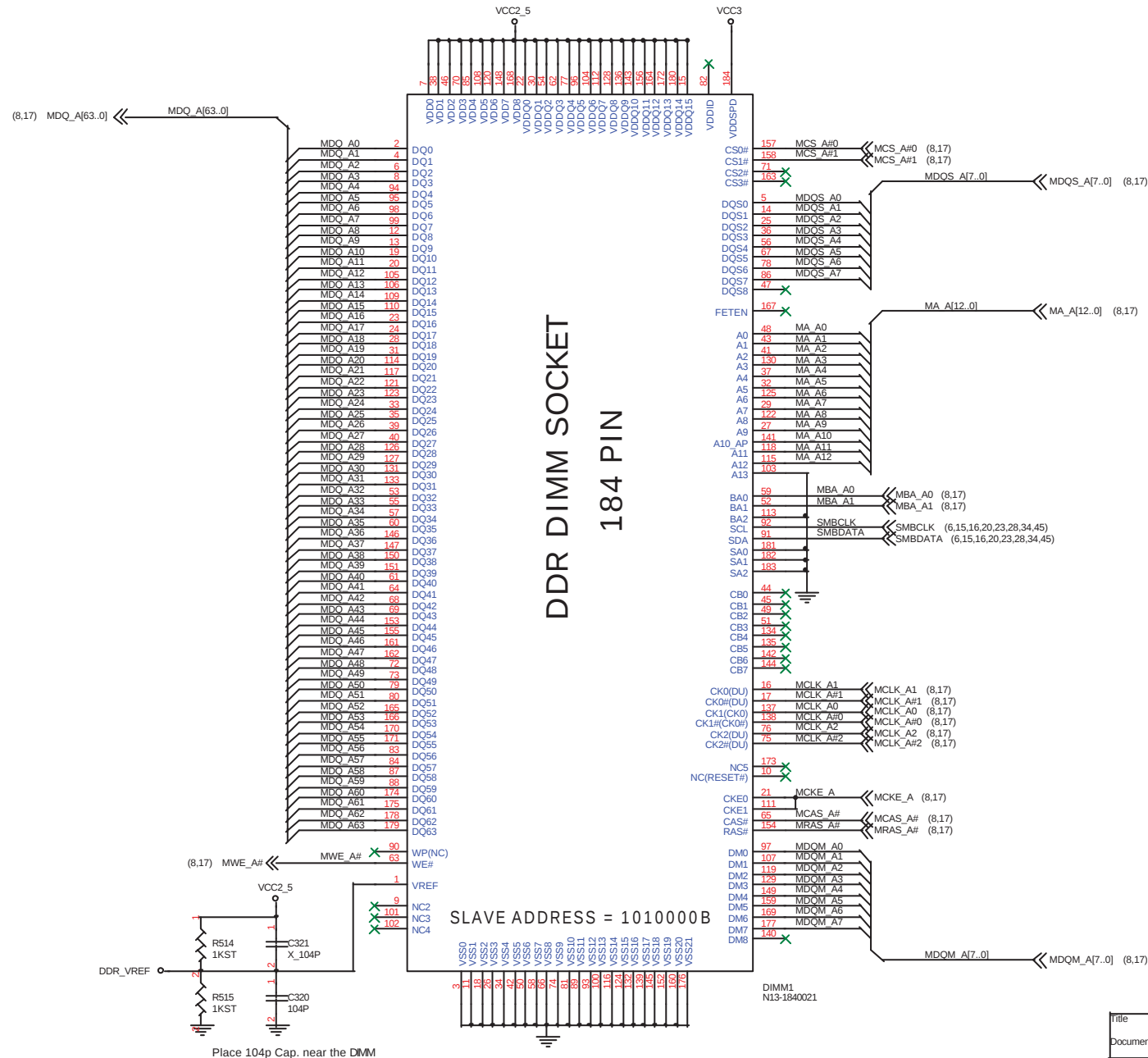
Video Connector



Micro Star Restricted Secret

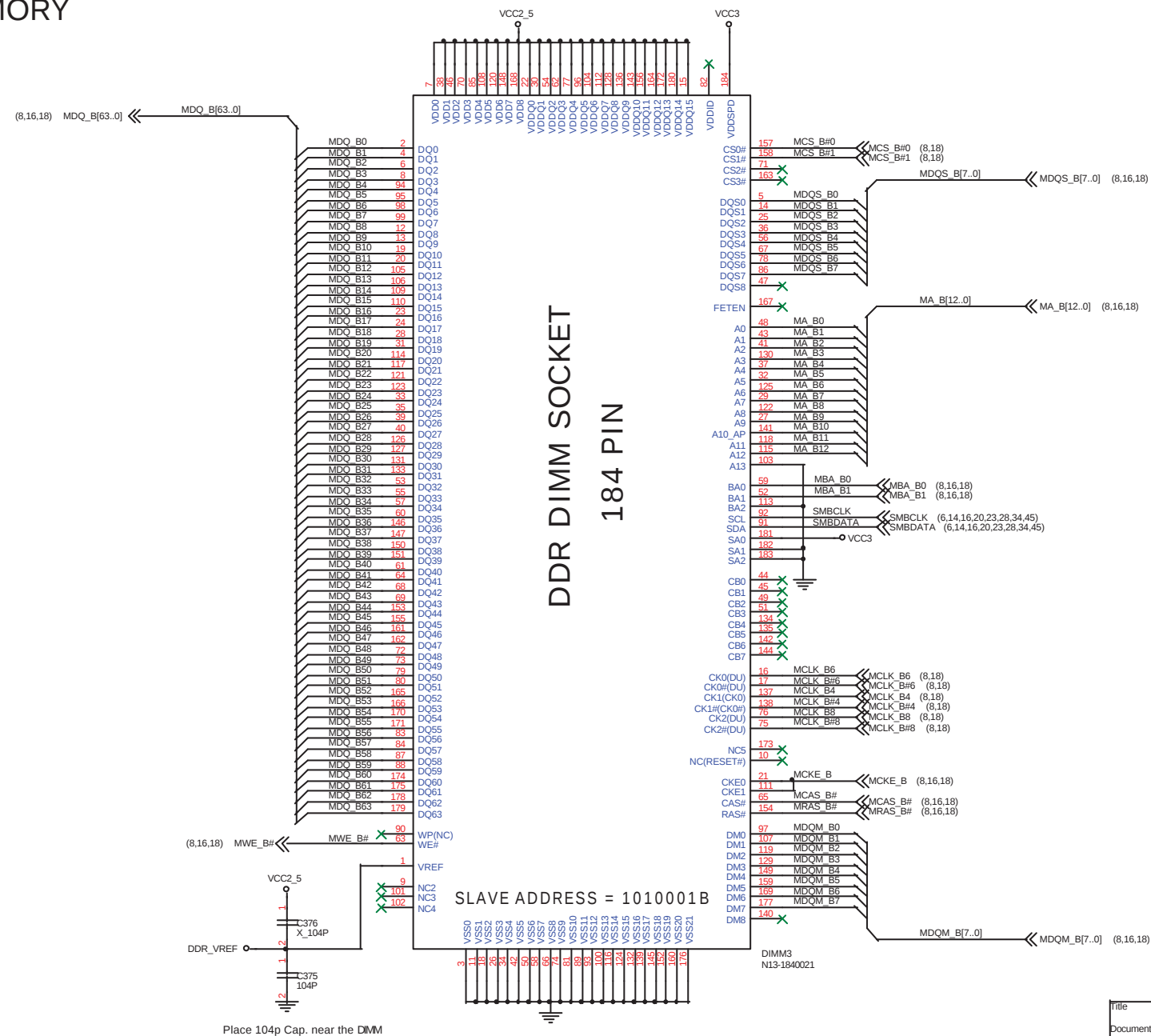
Title	Video Connector	Rev
Document Number	MS-6373	0B
MICRO-STAR INT'L CO.,LTD.		
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan		
http://www.msi.com.tw		
Last Revision Date: Thursday, August 30, 2001		
Sheet 13 of 50		

SYSTEM MEMORY



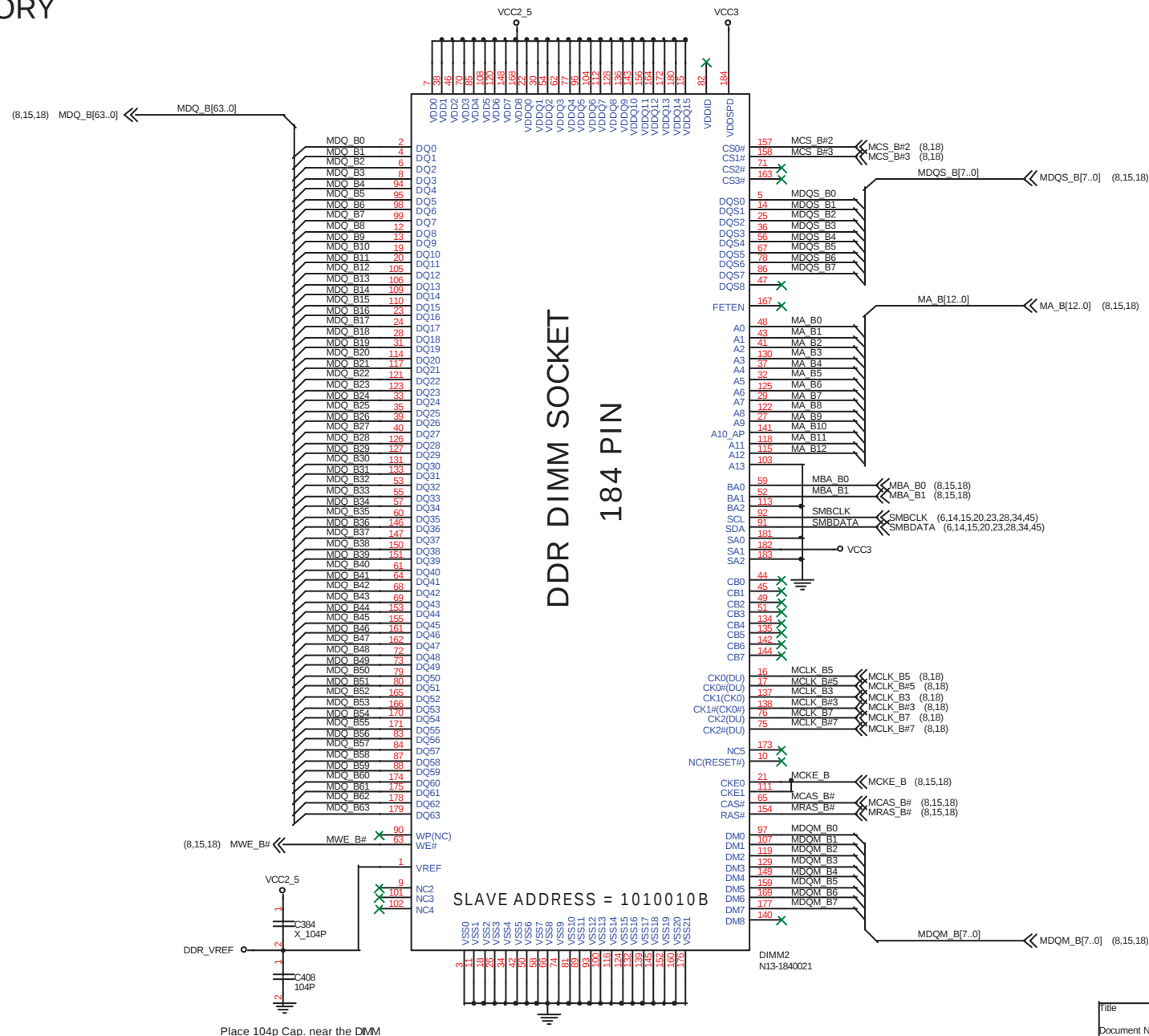
Micro Star Restricted Secret		
Title	System Memory : DDR DIMM 1	Rev
Document Number	MS-6373	08
MICRO-STAR INT'L CO.,LTD.		
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan		
http://www.msi.com.tw		
Last Revision Date: Thursday, August 30, 2001		Sheet
		14 of 50

SYSTEM MEMORY



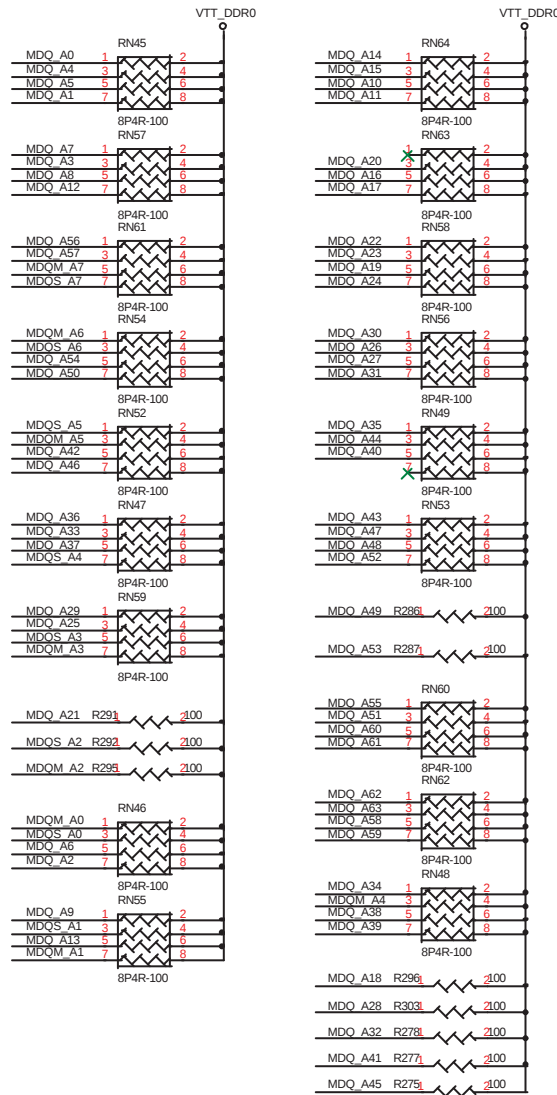
Micro Star Restricted Secret		
Title	System Memory : DDR DIMM 3	Rev
Document Number	MS-6373	08
MICRO-STAR INT'L CO.,LTD.		
Last Revision Date: Thursday, August 30, 2001		
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan		
http://www.msi.com.tw		
Sheet		15 of 50

SYSTEM MEMORY

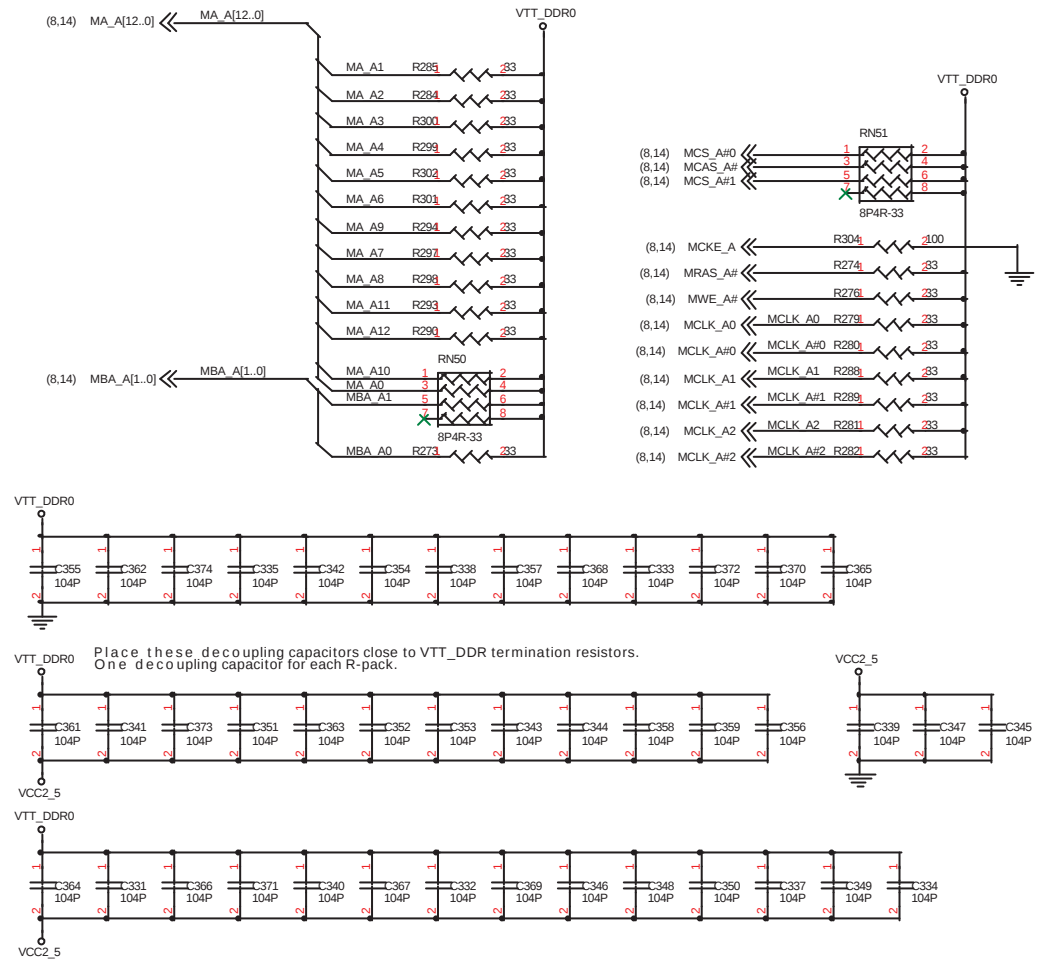


Micro Star Restricted Secret		
Title	System Memory : DDR DIMM 2	Rev
Document Number	MS-6373	08
MICRO-STAR INT'L CO.,LTD.		
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan		
http://www.msi.com.tw		
Last Revision Date: Thursday, August 30, 2001		
Sheet		
16 of 50		

DDR Terminations (SET 1)



(8,14) MDQ_A[63..0] << MDQ_A[63..0]
 (8,14) MDQM_A[7..0] << MDQM_A[7..0]
 (8,14) MDQS_A[7..0] << MDQS_A[7..0]

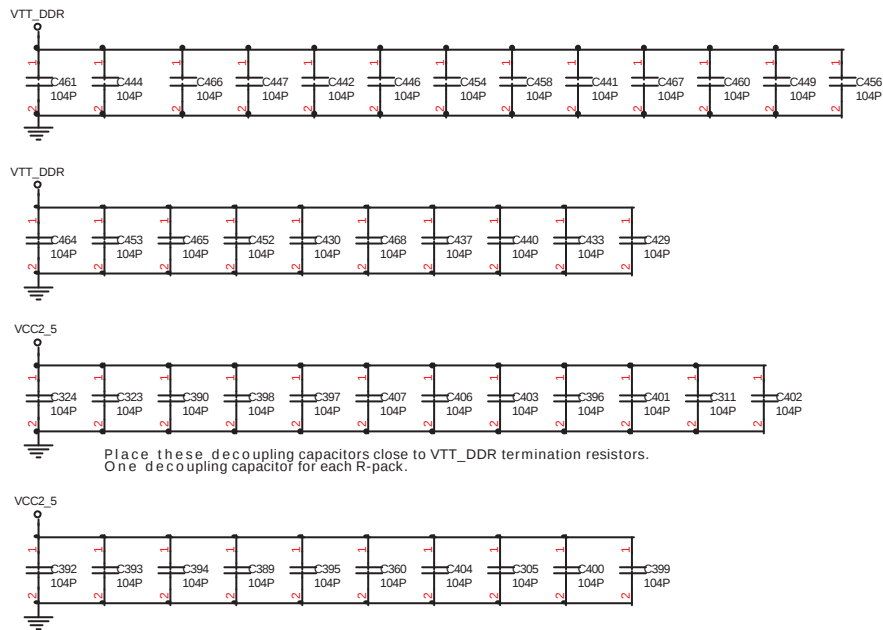
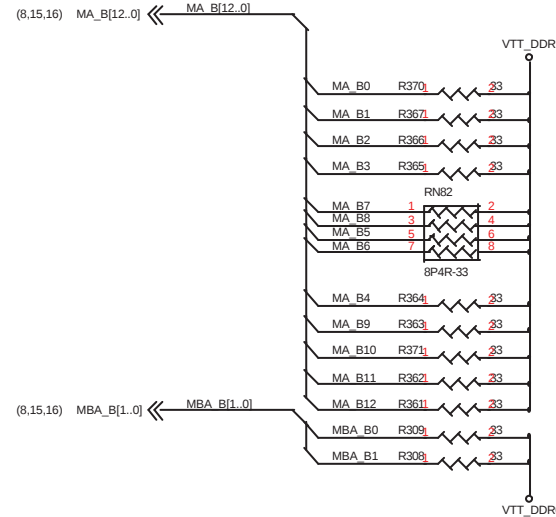
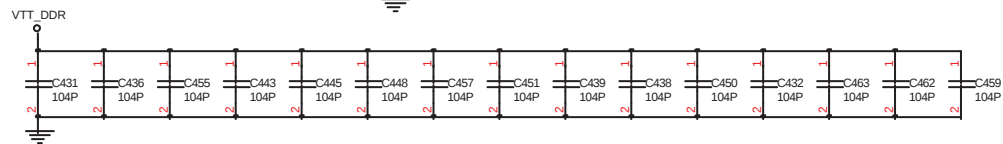
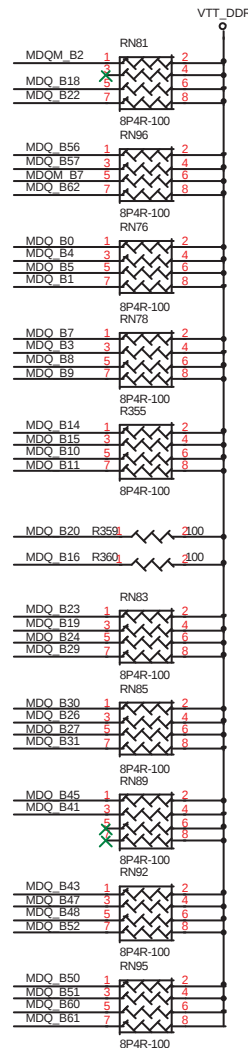
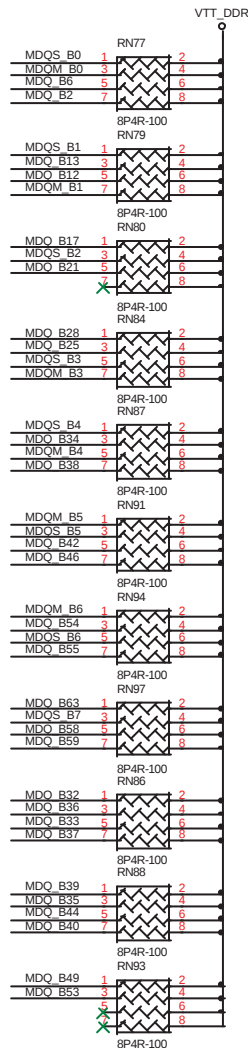


Micro Star Restricted Secret

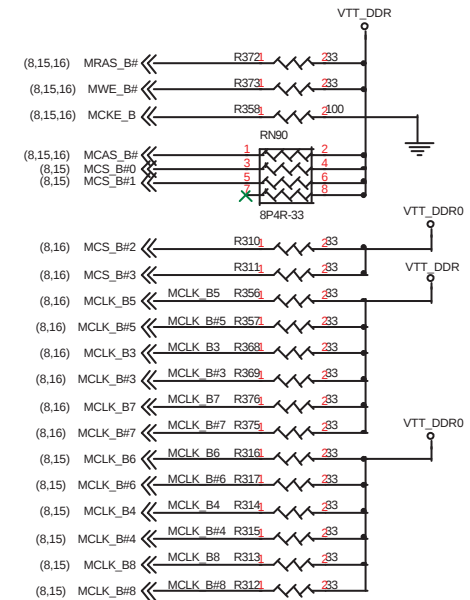
Title	DDR Terminations Bank 0	Rev	08
Document Number	MS-6373	Last Revision Date:	Thursday, August 30, 2001
MICRO-STAR INT'L CO.,LTD.			
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw			
Sheet	17	of	50

DDR Terminations (SET 2)

(8,15,16) MDQ_B[63..0] << MDQ_B[63..0]
(8,15,16) MDQS_B[7..0] << MDQS_B[7..0]
(8,15,16) MDQM_B[7..0] << MDQM_B[7..0]

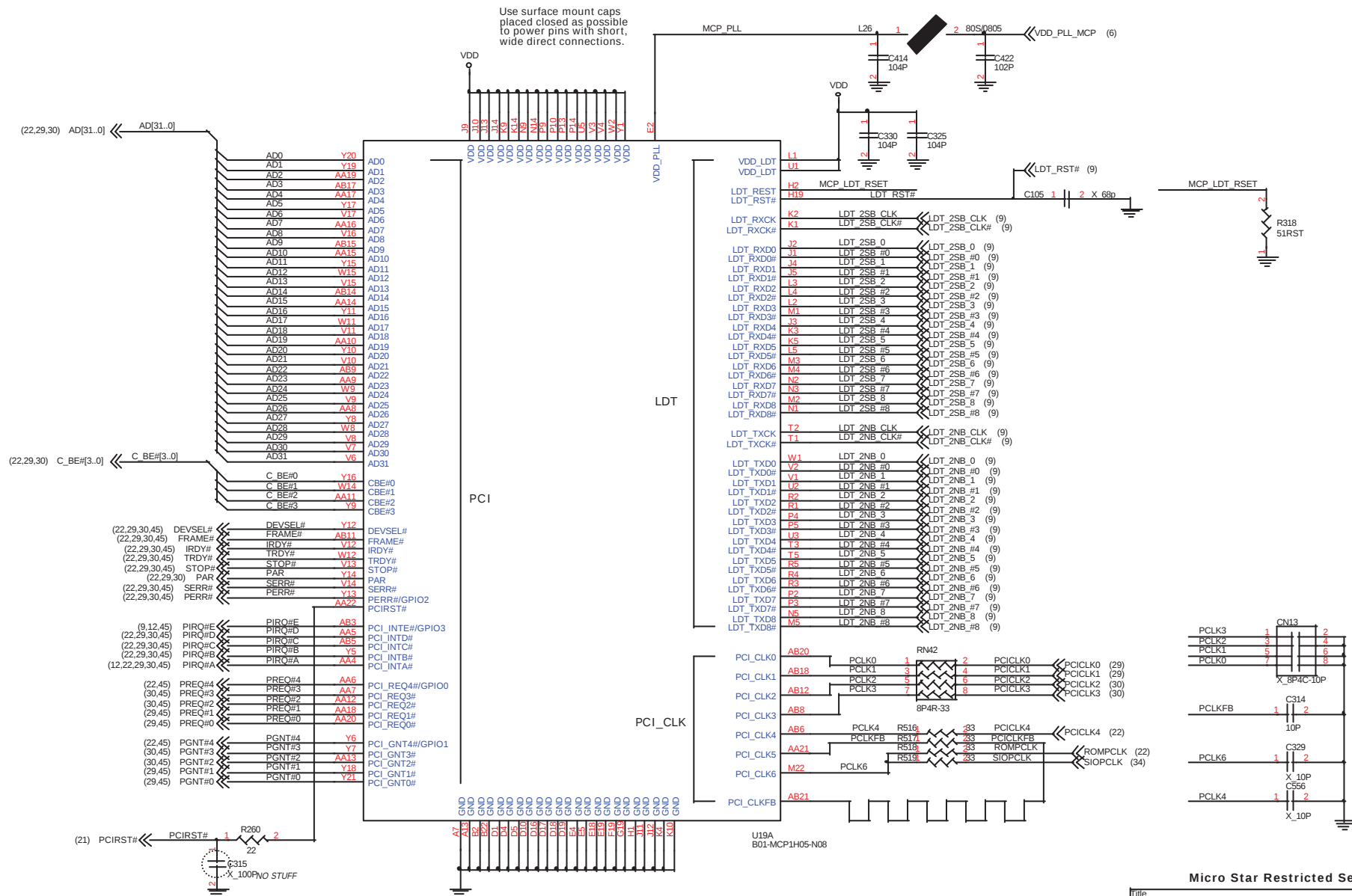


Place these decoupling capacitors close to VTT_DDR termination resistors.
One decoupling capacitor for each R-pack.



Micro Star Restricted Secret		
Title	DDR Terminations Bank 1	Rev
Document Number	MS-6373	08
MICRO-STAR INT'L CO.,LTD.		
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan		
http://www.msi.com.tw		
Last Revision Date: Thursday, August 30, 2001		Sheet
		18 of 50

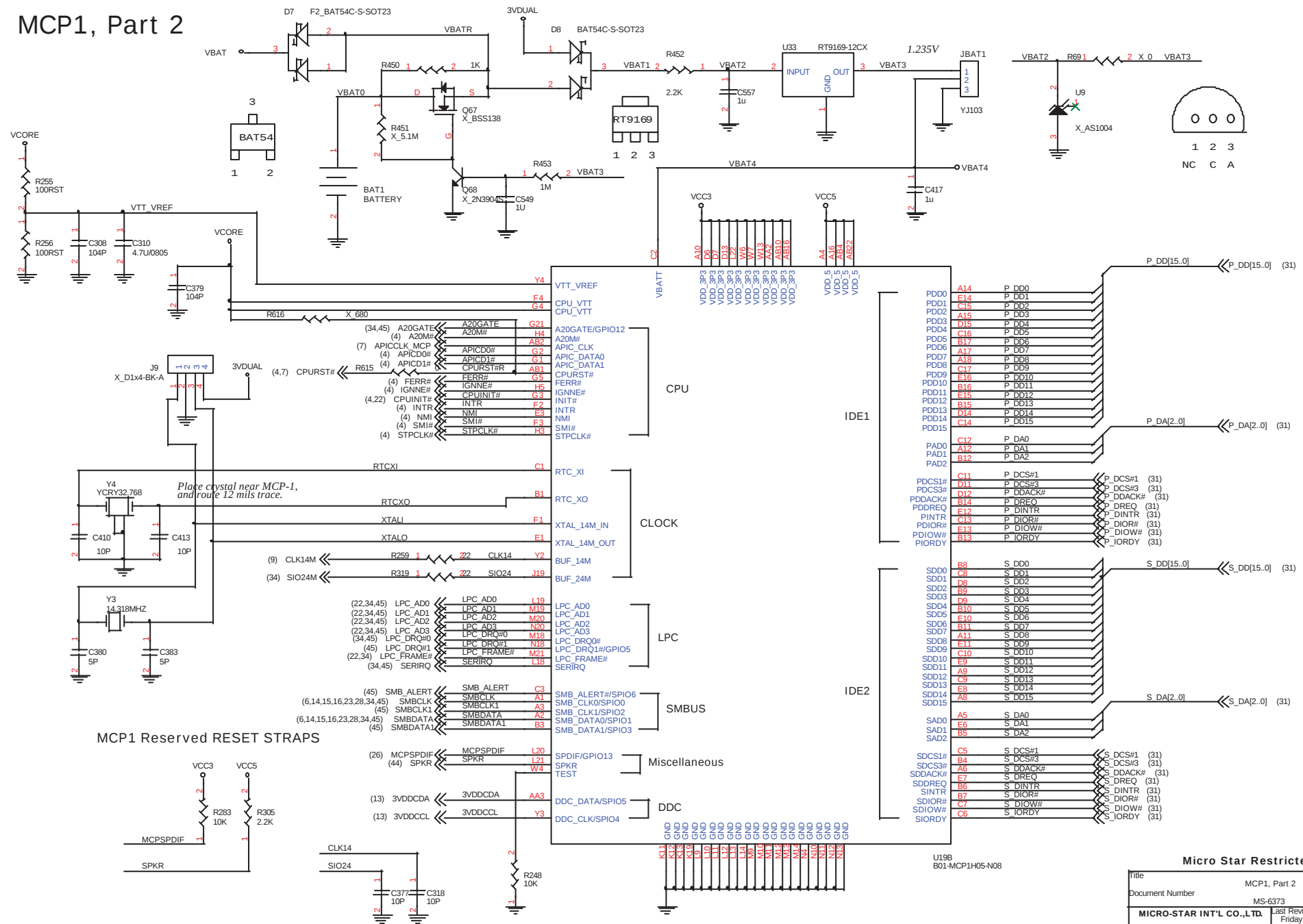
MCP1, Part 1



Micro Star Restricted Secret

Title	MCP1, Part 1	Rev
Document Number	MS-6373	0B
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Thursday, August 30, 2001 Sheet 19 of 50

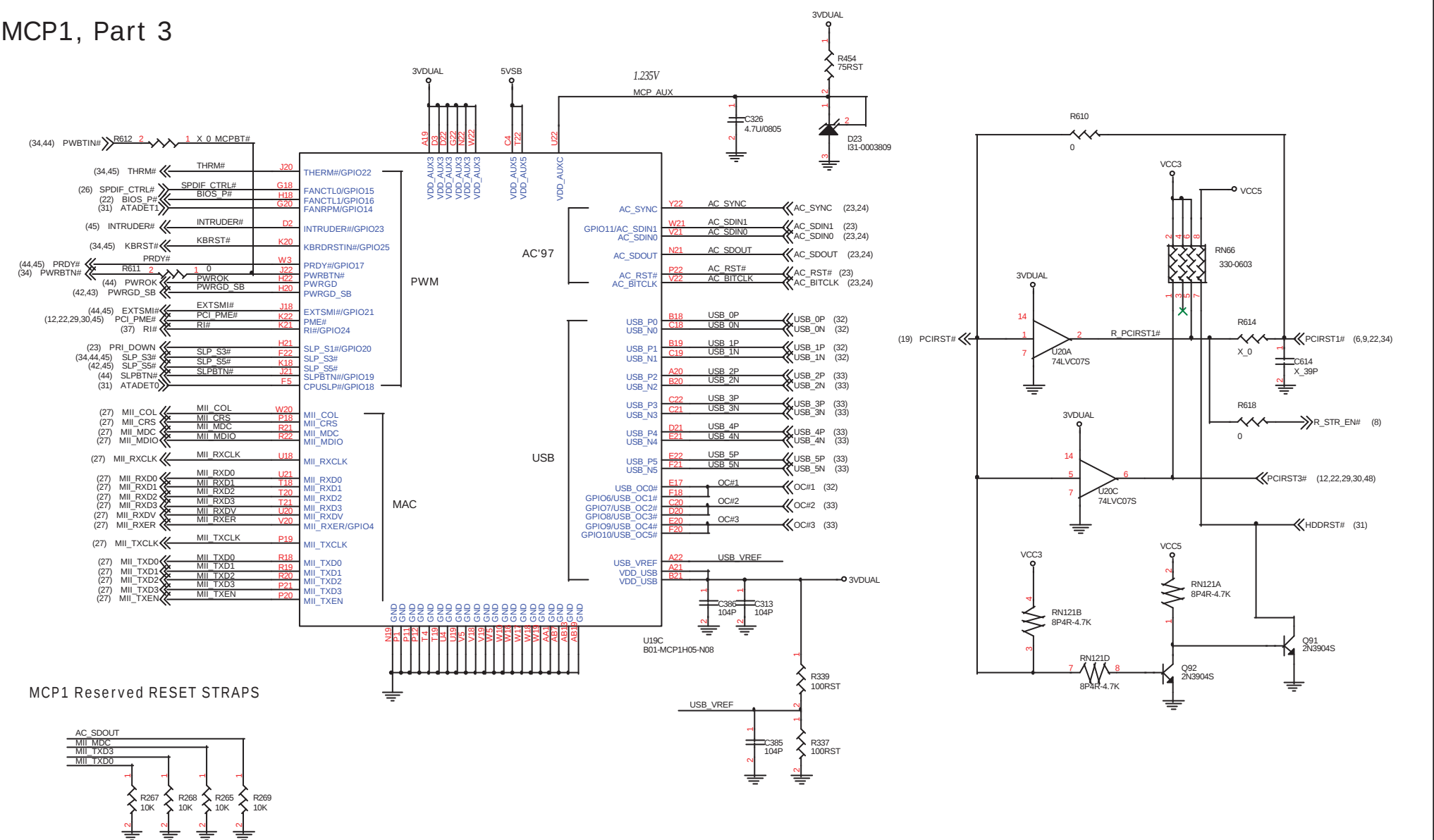
MCP1, Part 2



Micro Star Restricted Secret

Title	MCP1, Part 2	Rev
Document Number	MS-6373	0B
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, August 31, 2001 Sheet 20 of 50

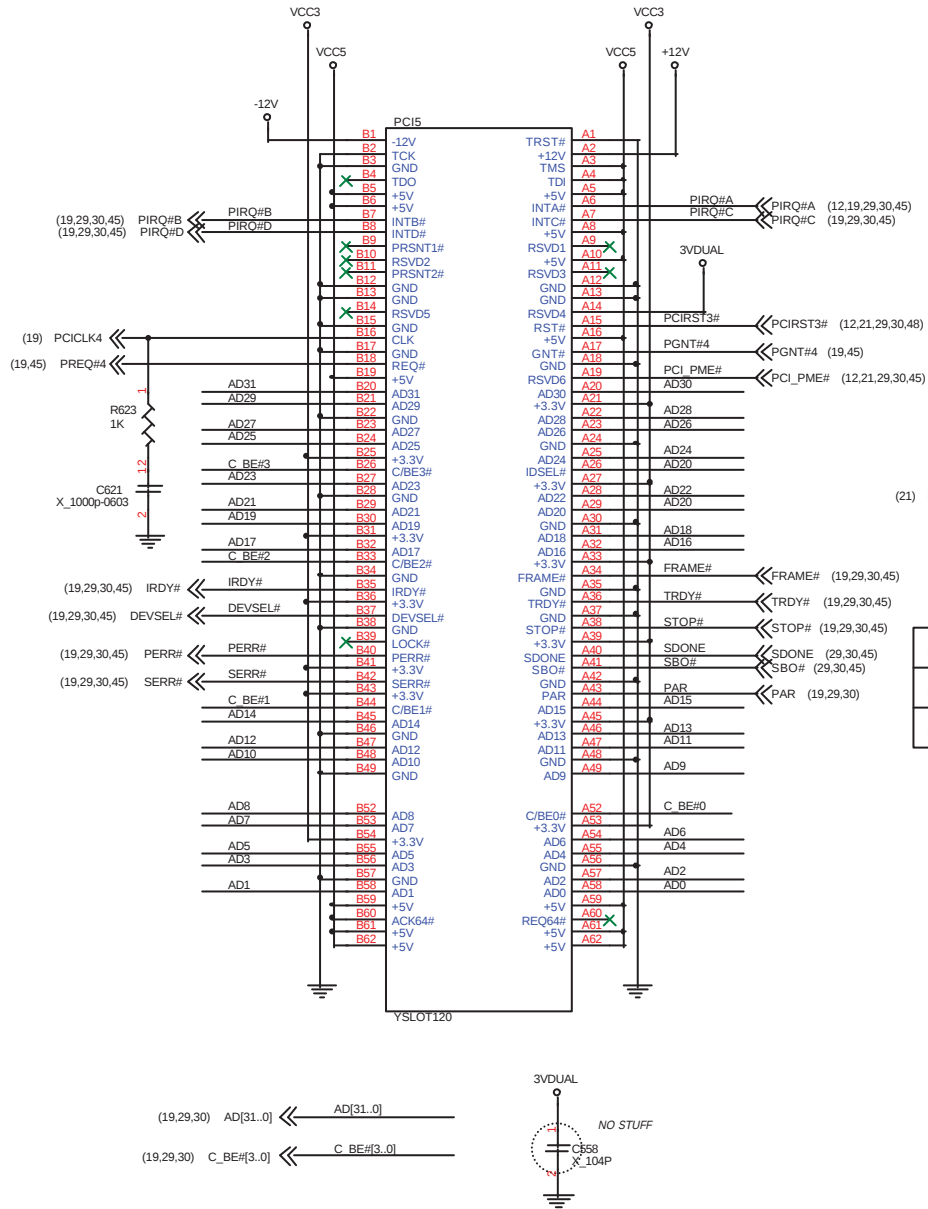
MCP1, Part 3



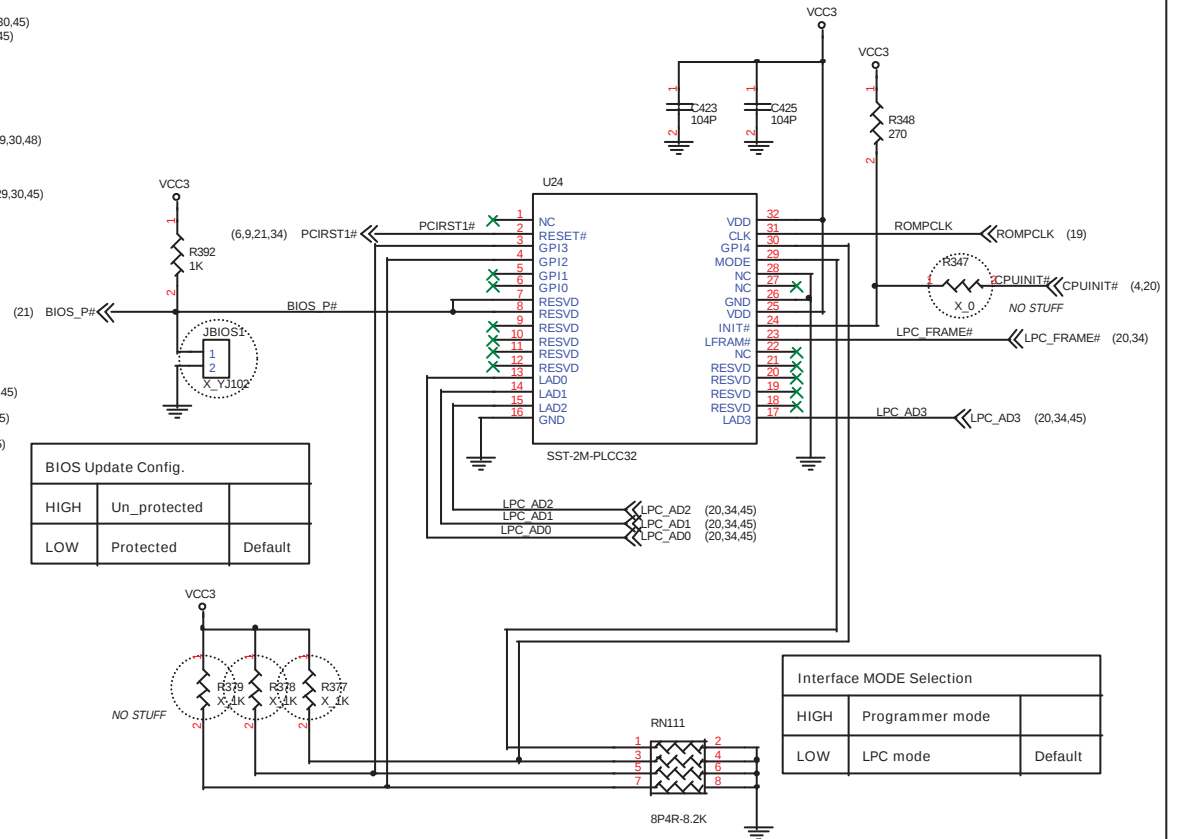
Micro Star Restricted Secret

Title	MCP1, Part 3	Rev	08
Document Number	MS-6373		
MICRO-STAR INT'L CO.,LTD.			
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan			
http://www.msi.com.tw			
Last Revision Date: Thursday, August 30, 2001			
Sheet 21 of 50			

PCI Slot 5



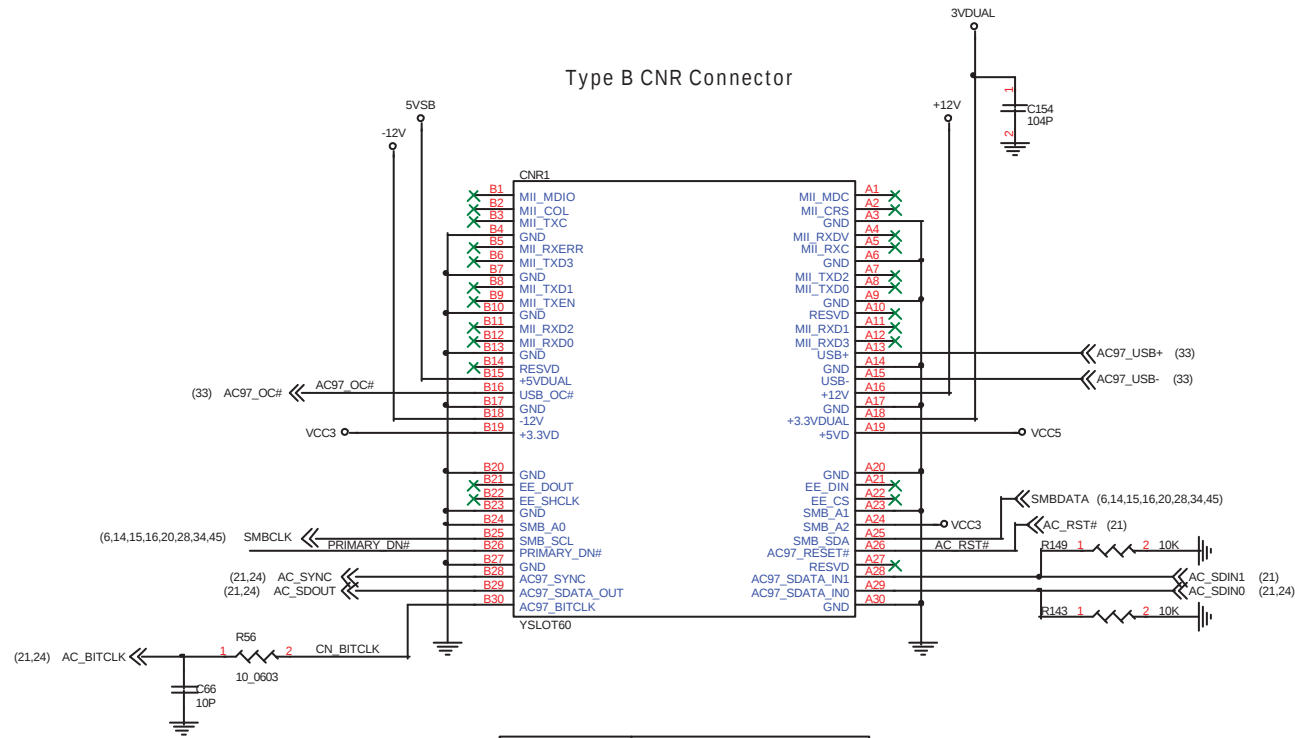
Flash ROM



Micro Star Restricted Secret

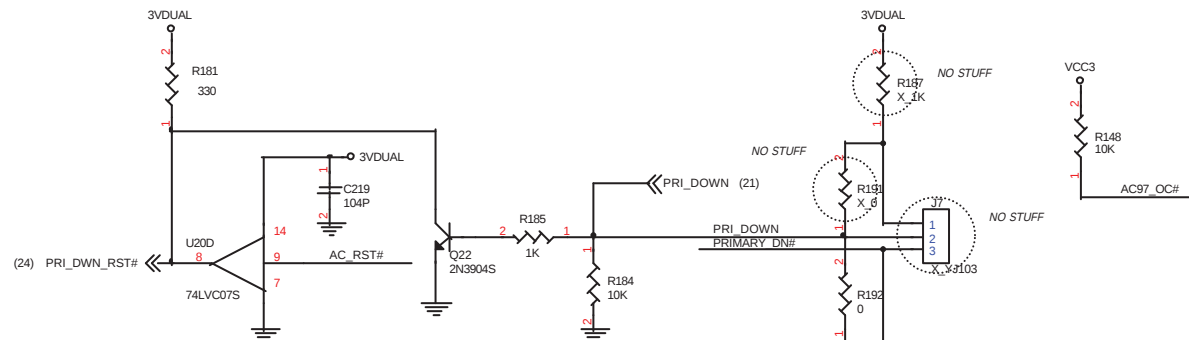
Title		Rev	
Flash ROM		0B	
Document Number		MS-6373	
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date:	
		Thursday, August 30, 2001	
		Sheet	
		22 of 50	

Comm. Networking Riser



PRIMARY_DN#	AUDIO DOWN
LOW	Enable onboard audio codec
HIGH	Disable onboard audio codec

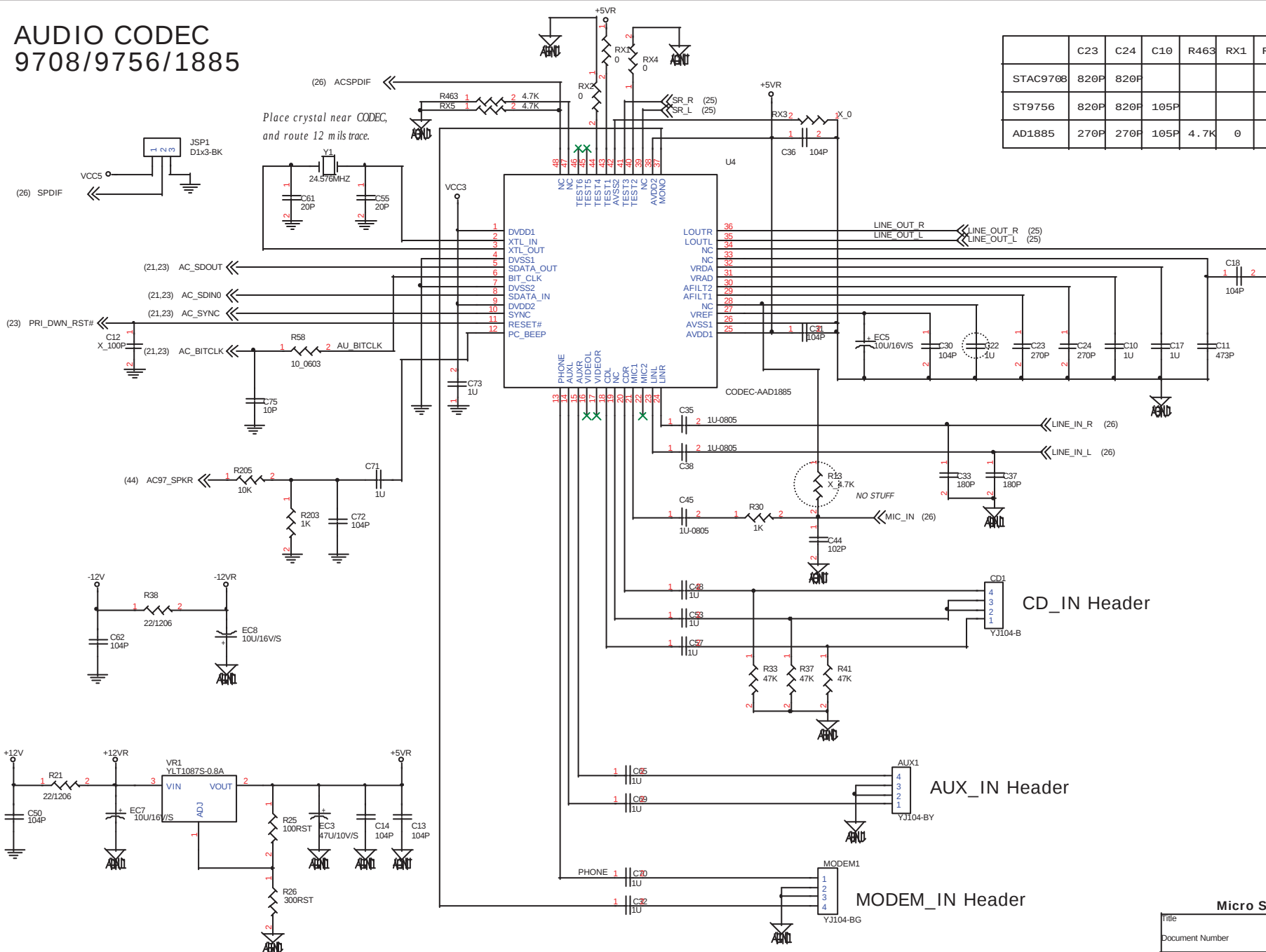
PRIMARY_DN# : Default LOW



Micro Star Restricted Secret

Title		Rev
Communication Networking Riser		
Document Number	MS-6373	OB
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-Hue City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Thursday, August 30, 2001 Sheet 23 of 50

AUDIO CODEC
9708/9756/1885



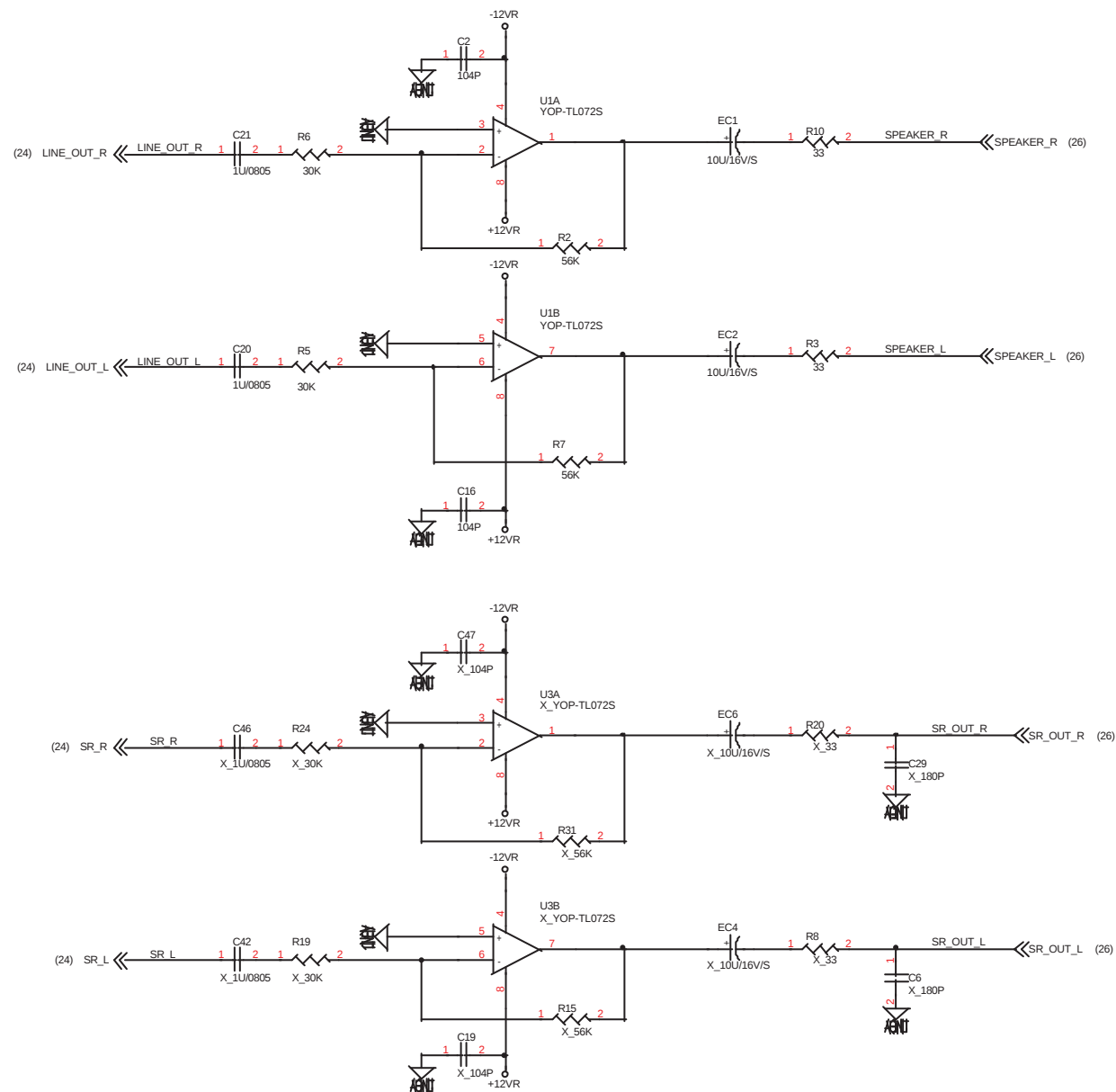
	C23	C24	C10	R463	RX1	RX2	RX3	RX4	RX5
STAC9708	820P	820P					0		
ST9756	820P	820P	105P				0		
AD1885	270P	270P	105P	4.7K	0	0		0	4.7K

CD_IN Header

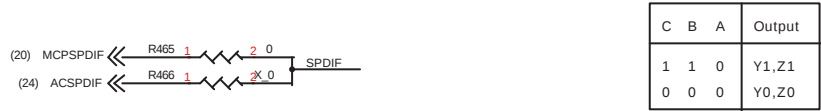
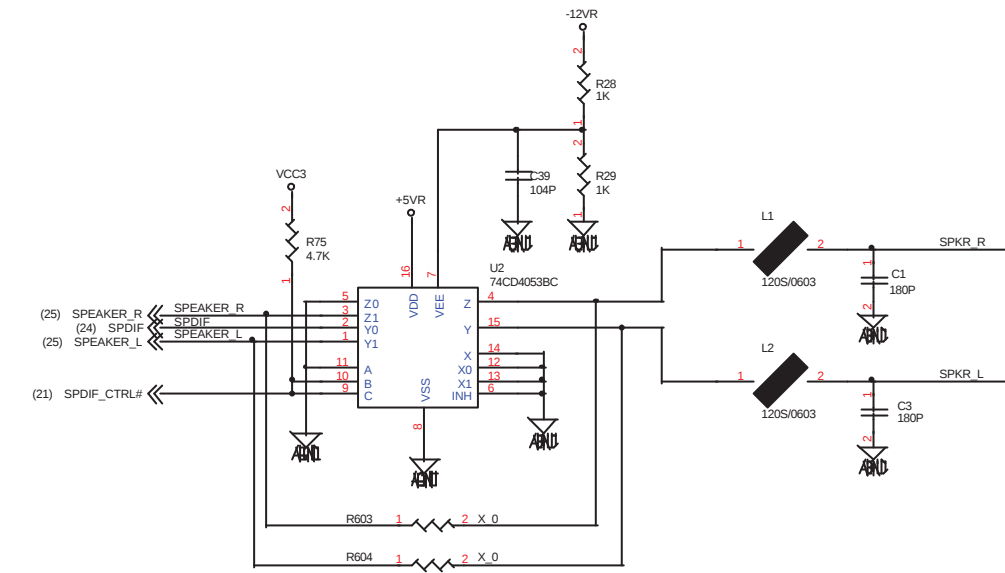
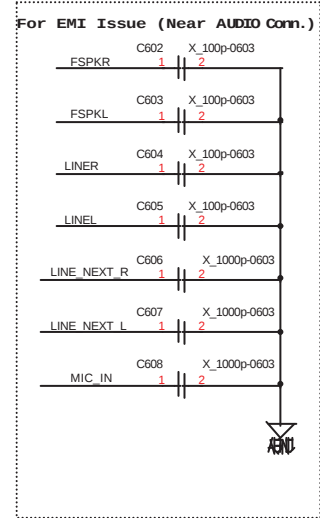
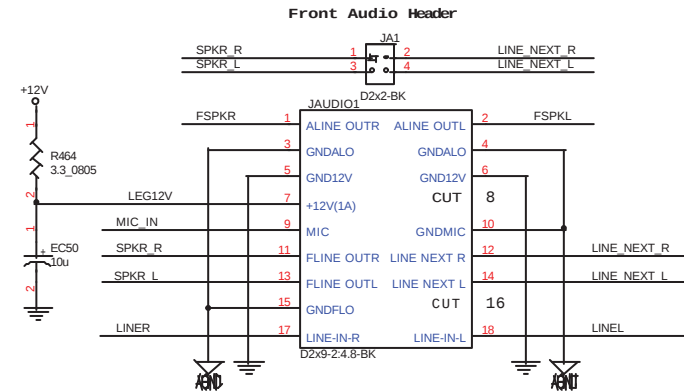
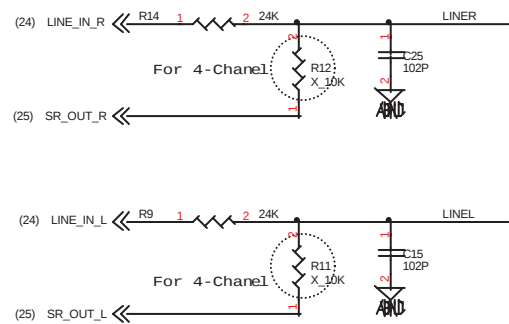
AUX IN Header

MODEM IN Header

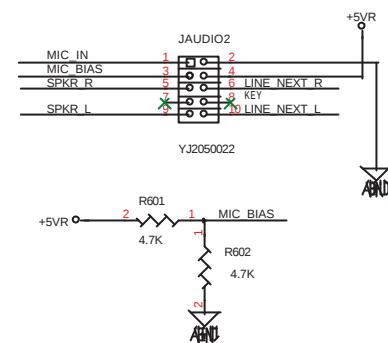
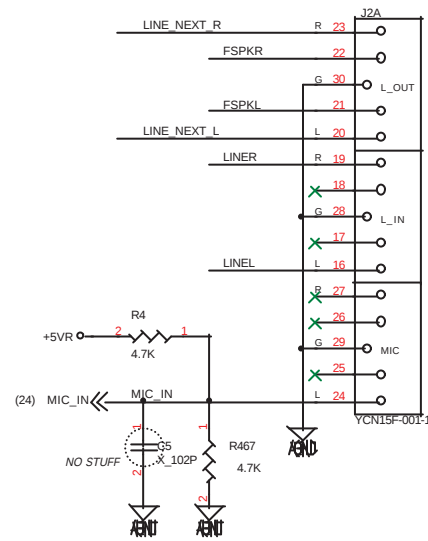
Audio Amplifier



Audio Connector



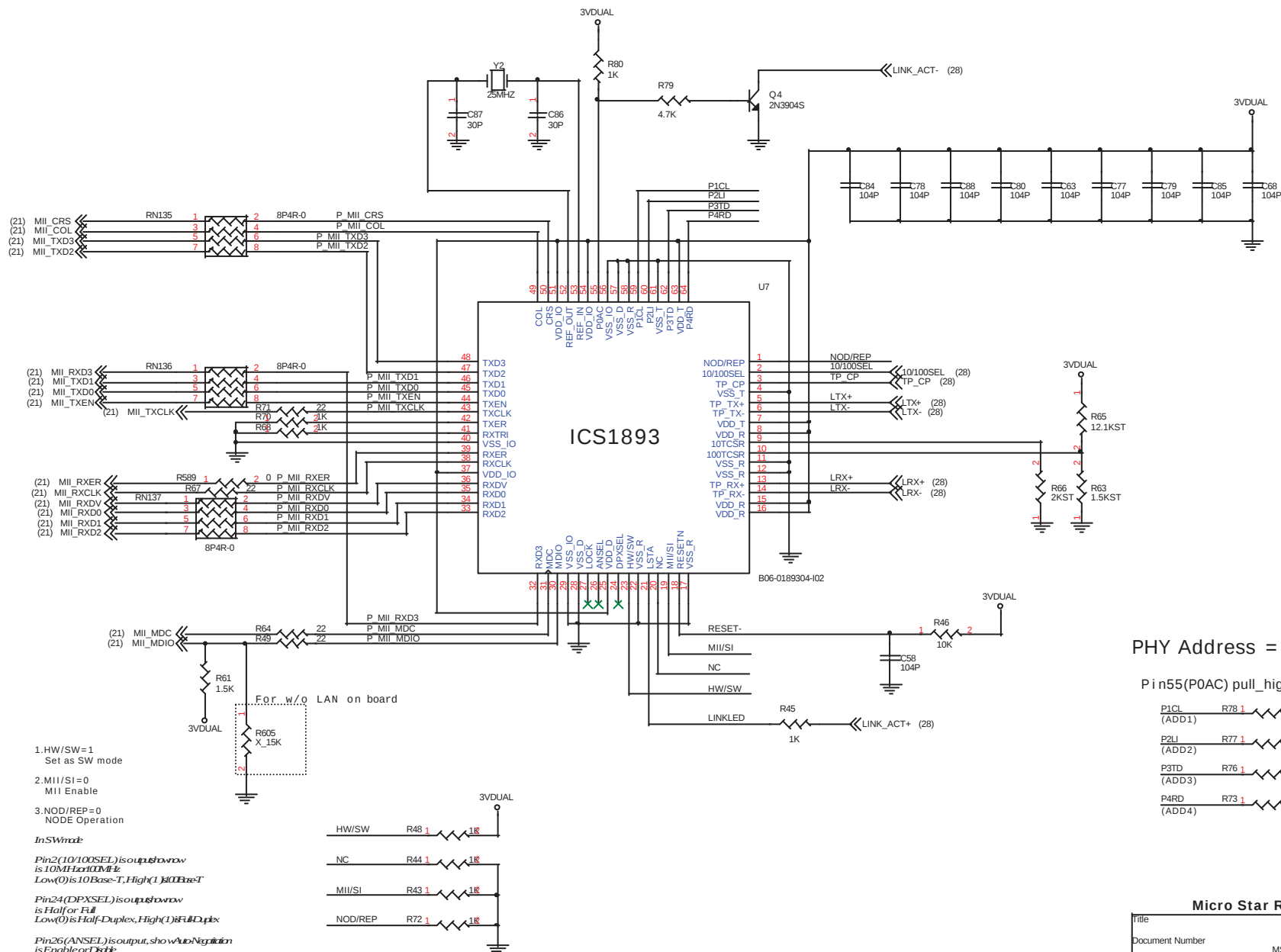
Audio Connector



Micro Star Restricted Secret

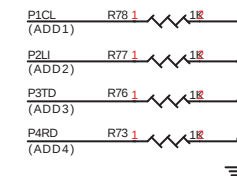
Title	Audio Connector	Rev
Document Number	MS-6373	0B
MICRO-STAR INT'L CO.,LTD.		
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan		
http://www.msi.com.tw		
Last Revision Date: Thursday, August 30, 2001		
Sheet 26 of 50		

LAN



PHY Address = 00001

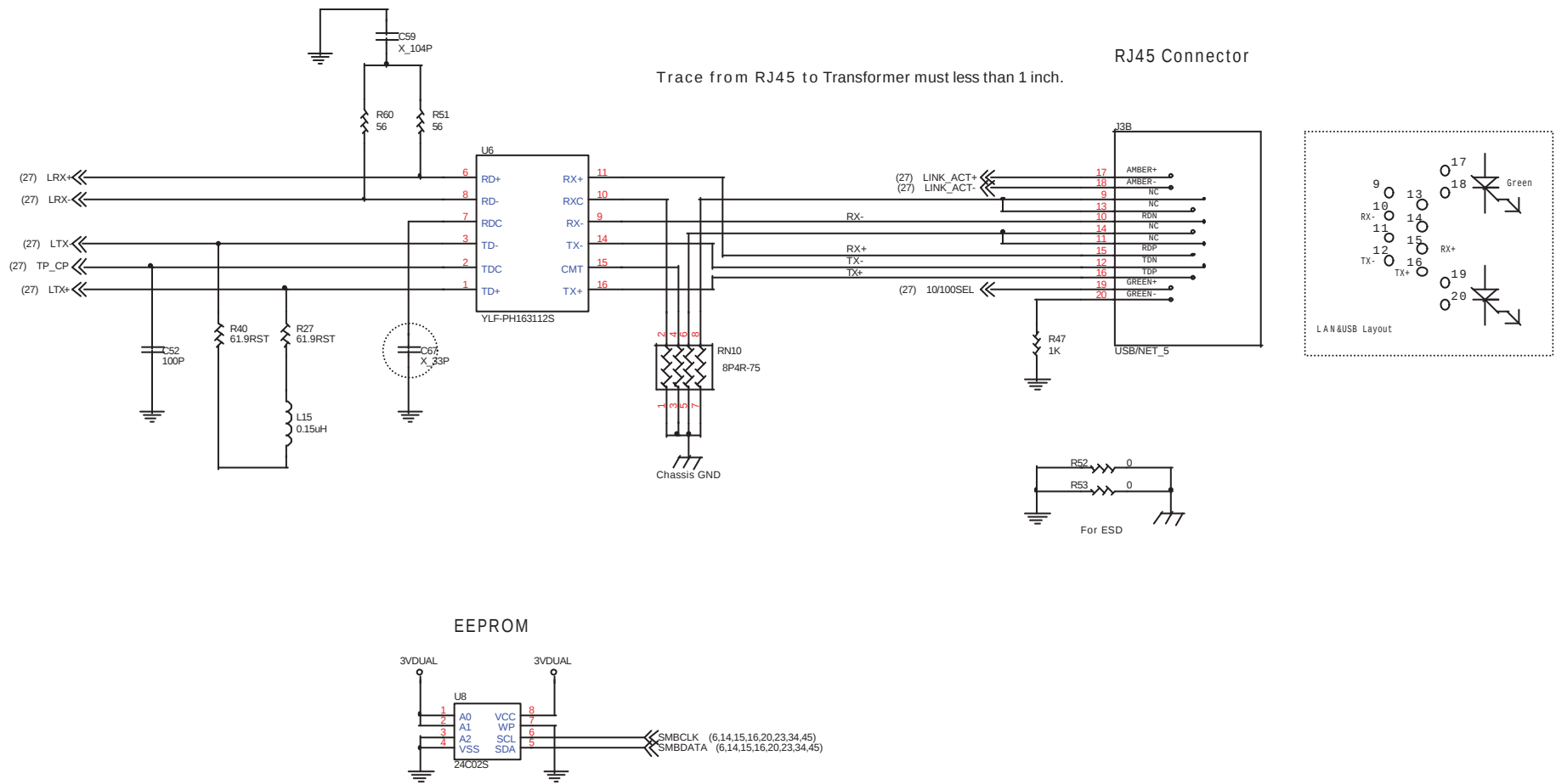
Pin55(P0AC) pull_high ADD0 = 1



Micro Star Restricted Secret

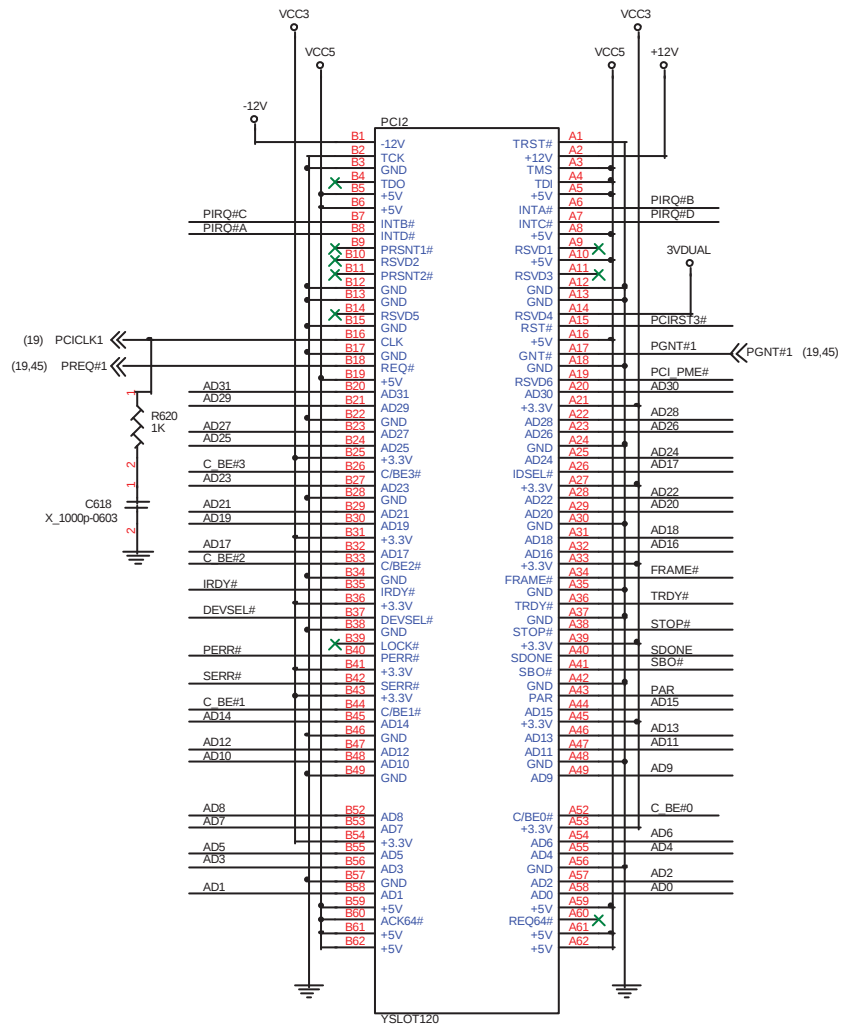
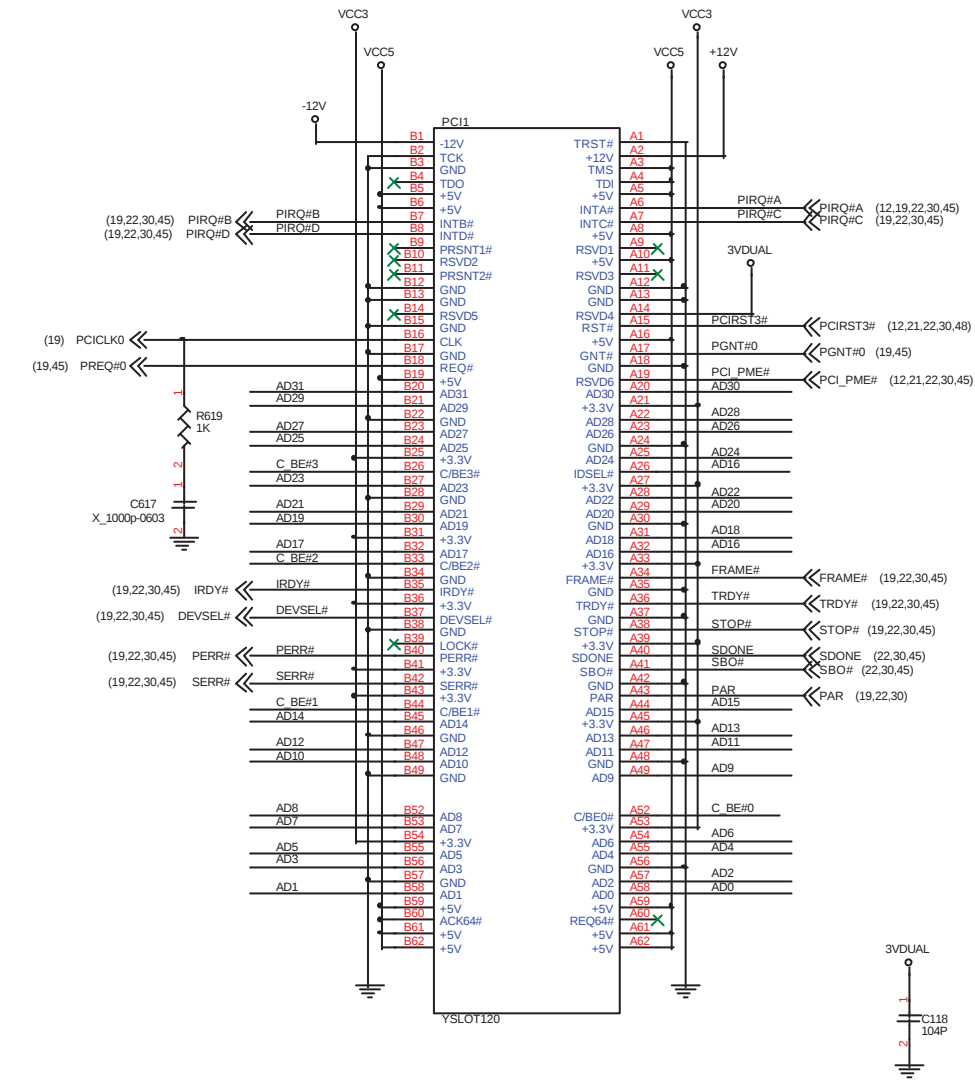
Title	LAN	Rev
Document Number	MS-6373	0B
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Thursday, August 30, 2001 Sheet 27 of 50

LAN Connector



PCI Connectors

PCI Slot 1 & 2

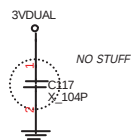
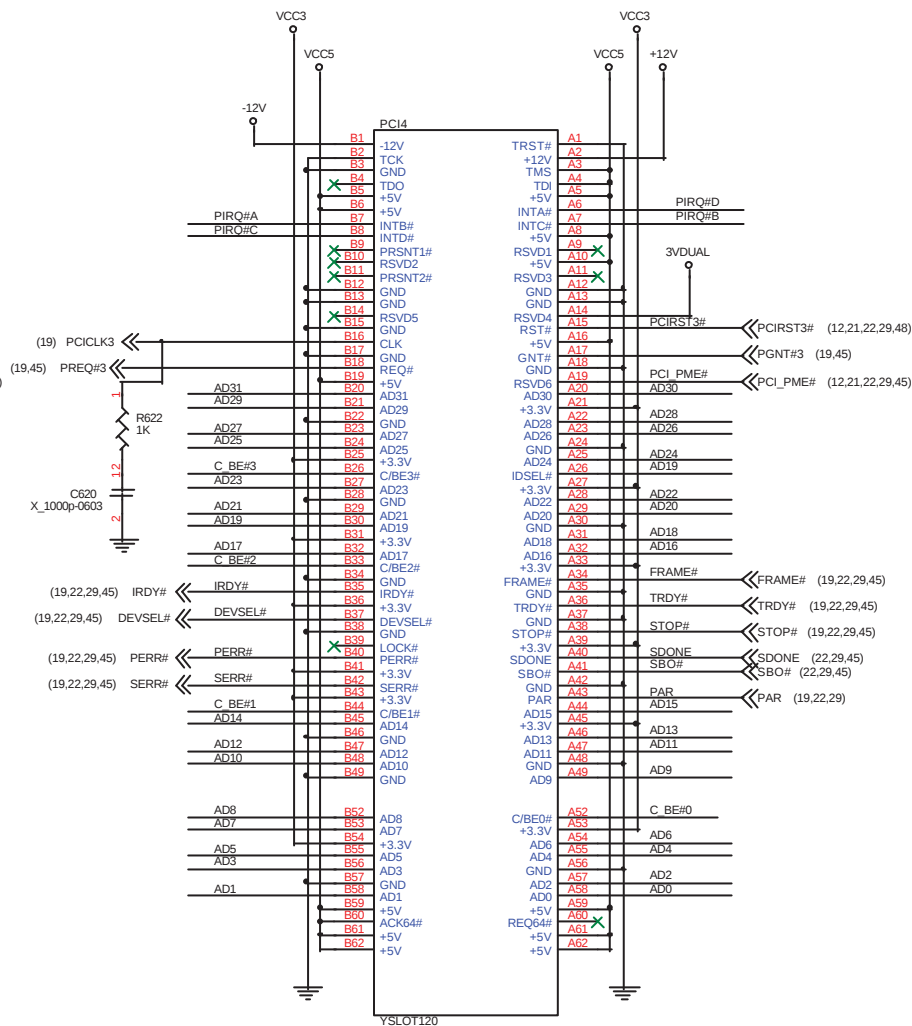
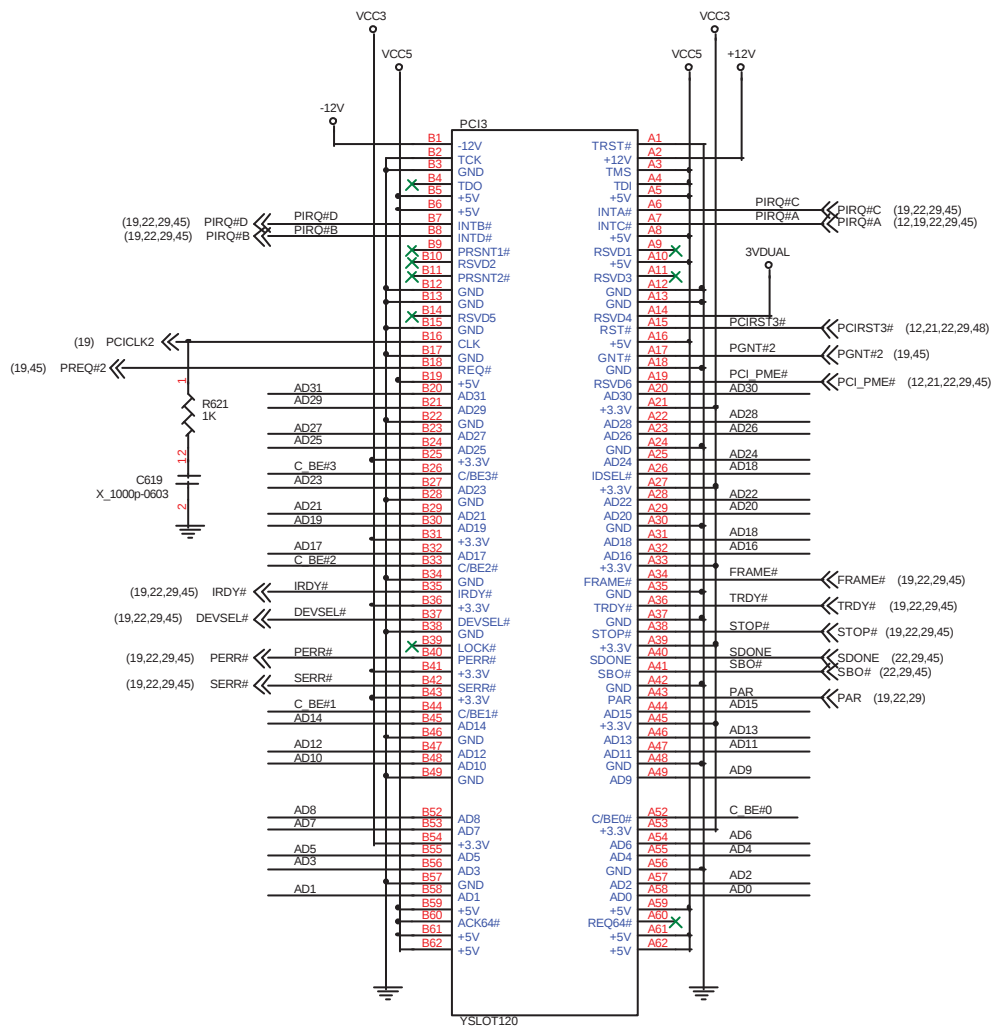


(19,22,30) AD[31..0] << AD[31..0]
(19,22,30) C_BE#[3..0] << C_BE#[3..0]

Micro Star Restricted Secret		
Title	PCI Connector 1 & 2	Rev
Document Number	MS-6373	08
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, August 30, 2001		
Sheet	29	of 50

PCI Connectors

PCI Slot 3 & 4



(19.22.29) $AD[31..0] \ll \overline{AD[31..0]}$

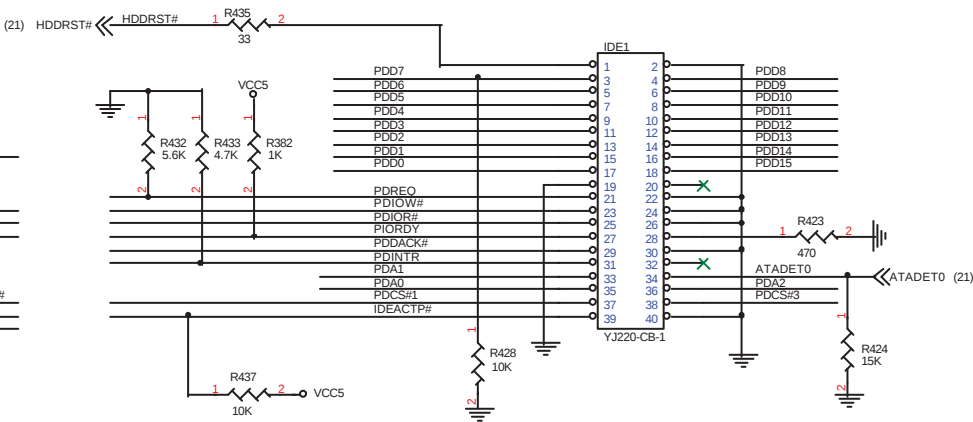
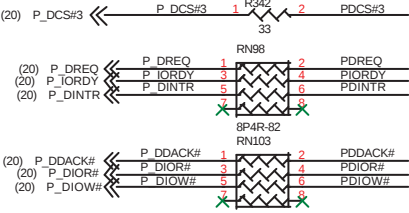
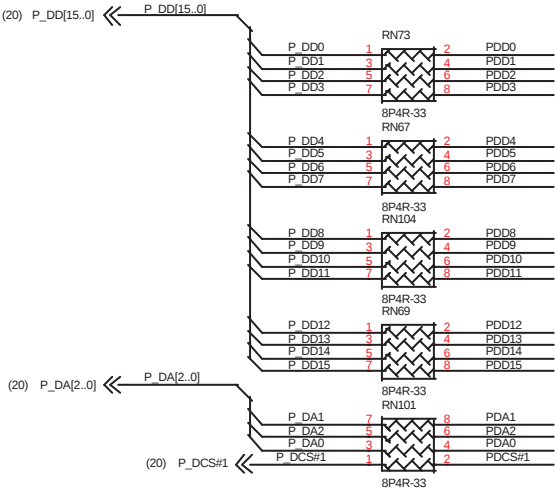
(19,22,29) C_BE#[3..0] << C_BE#[3..0]

Micro Star Restricted Secret

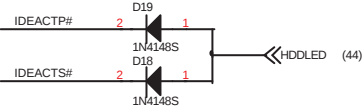
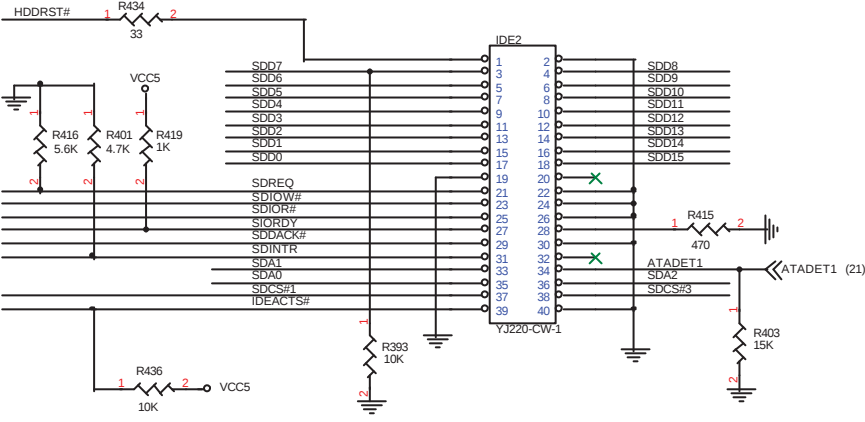
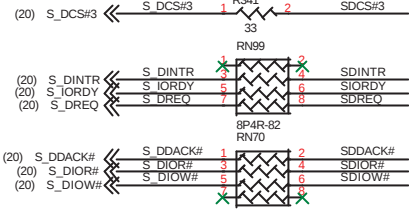
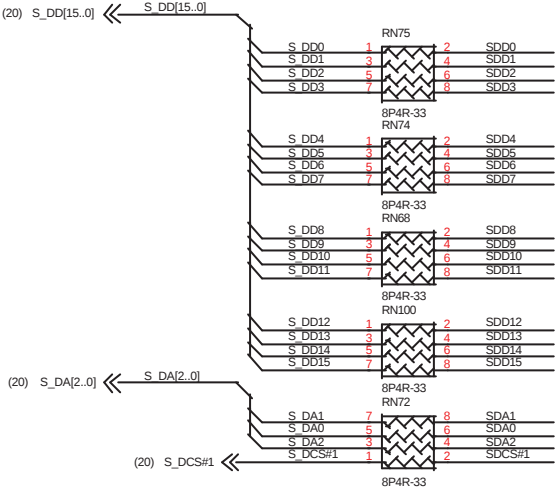
Title		Rev
PCI Connector 3		
Document Number	MS-6373	0B
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Thursday, August 30, 2001 Sheet 30 of 50

ATA100 IDE CONNECTORS

PRIMARY IDE CONN.

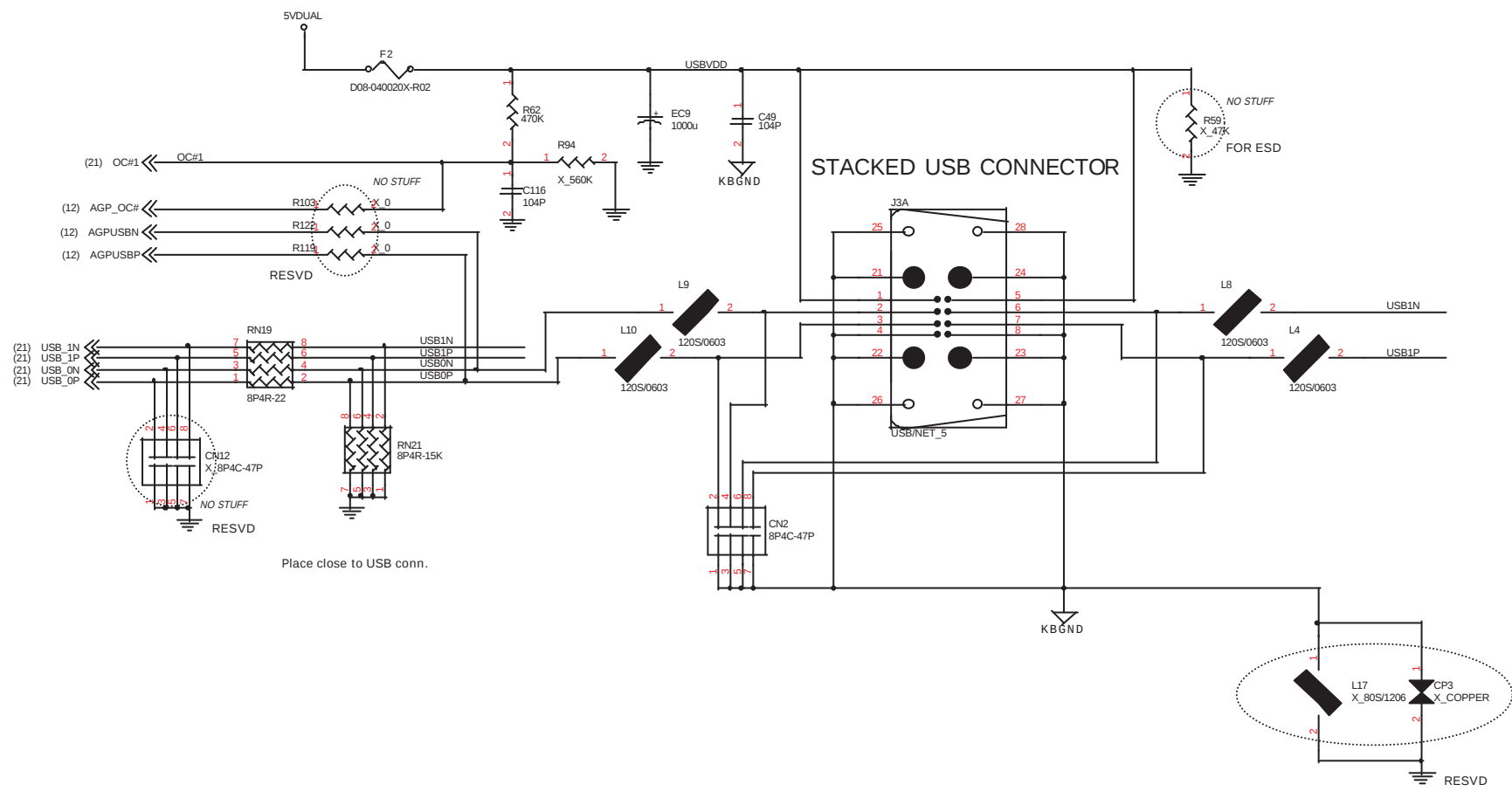


SECONDARY IDE CONN.



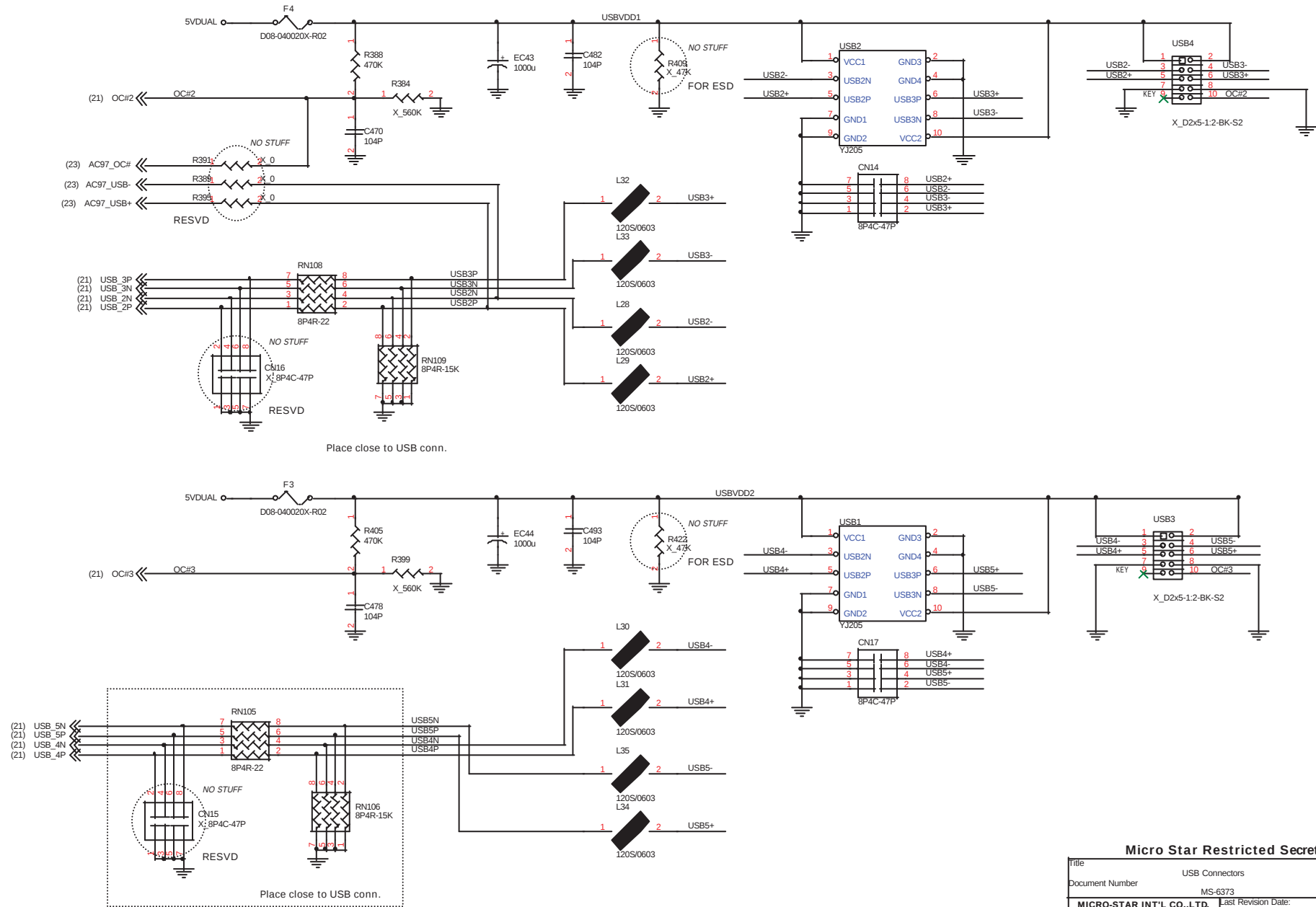
Micro Star Restricted Secret		
Title	ATA 100 IDE Connectors	Rev
Document Number	MS-6373	08
MICRO-STAR INT'L CO., LTD.		
Last Revision Date: Thursday, August 30, 2001		
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan		
http://www.msi.com.tw		
Sheet	31	of 50

USB Rear Connectors



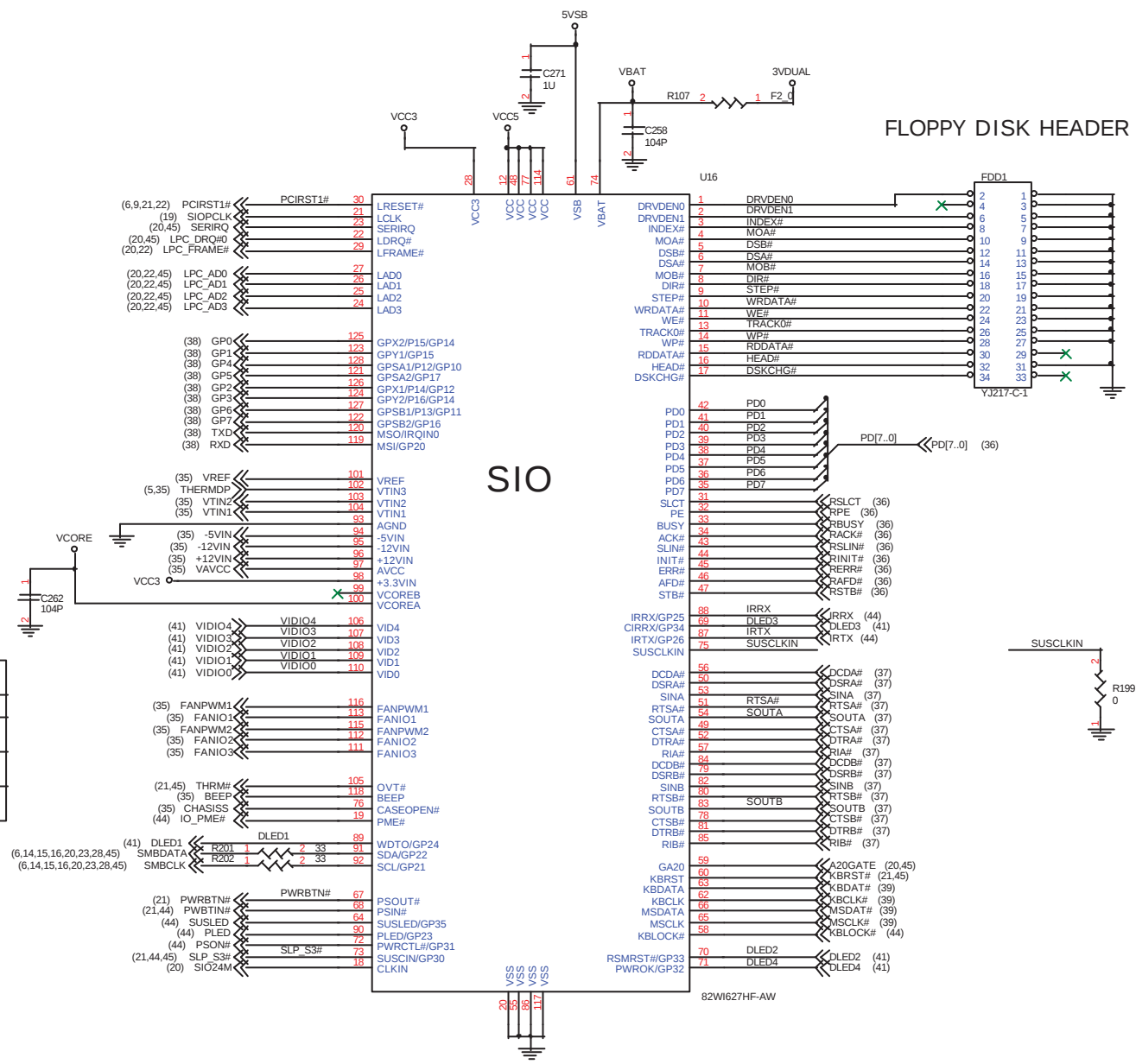
USB Front Connectors

FRONT PANEL USB CONNECTOR

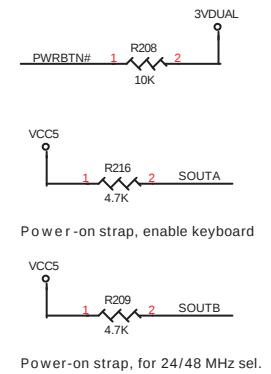


Micro Star Restricted Secret		
Title	USB Connectors	Rev
Document Number	MS-6373	08
MICRO-STAR INT'L CO.,LTD.		
No. 69, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan		
http://www.msi.com.tw		
Last Revision Date: Thursday, August 30, 2001		
Sheet 33 of 50		

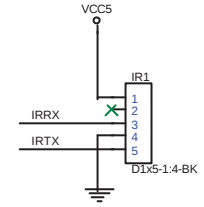
Super I/O



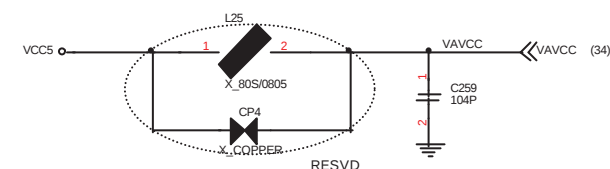
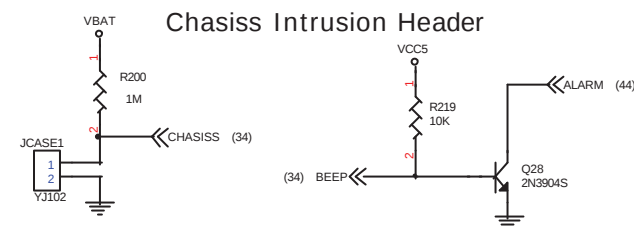
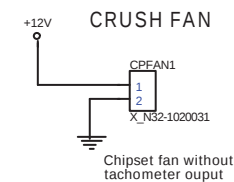
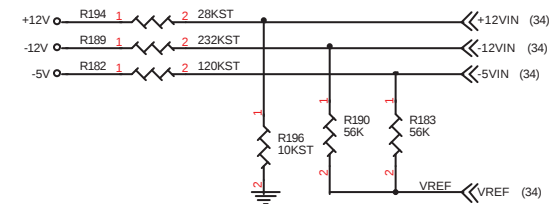
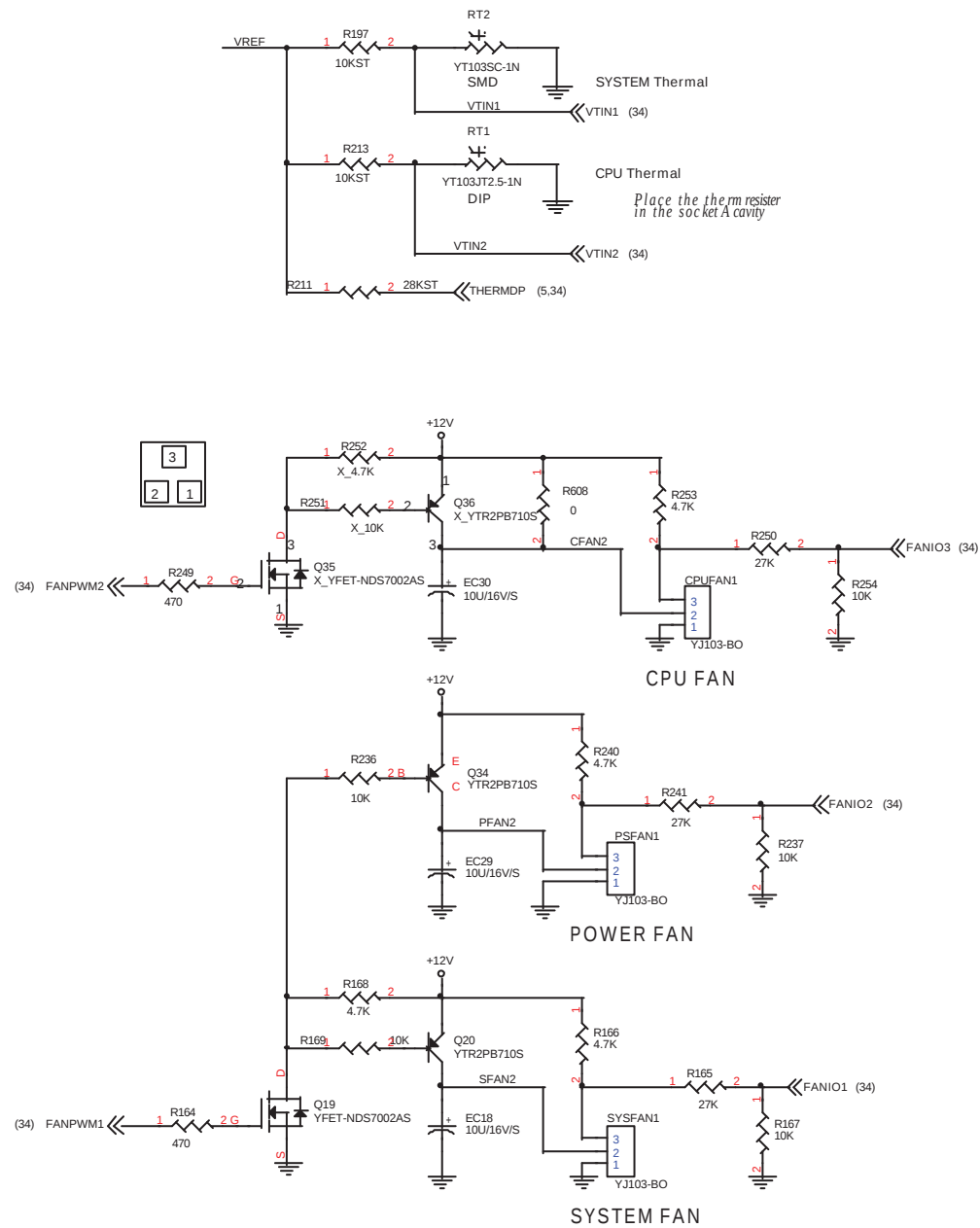
	H/W	Default
GP24 (D-LED1)	Low	
GP33 (D-LED2)	High	
GP34 (D-LED3)	High	
GP32 (D-LED4)	High	



IR HEADER

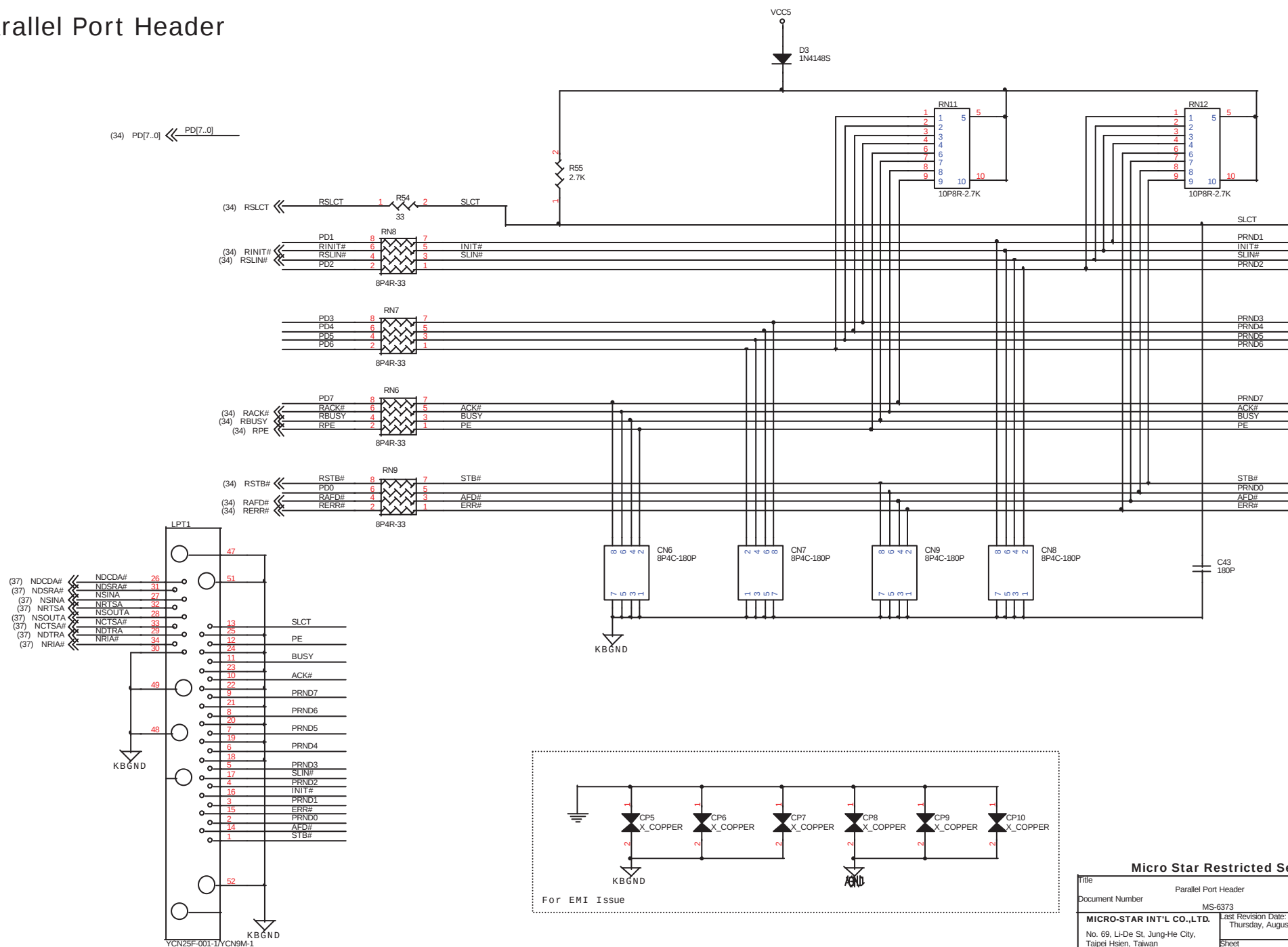


Hardware Monitor



Micro Star Restricted Secret		
Title	Hardware Monitor	Rev
Document Number	MS-6373	0A
MICRO-STAR INT'L CO.,LTD.		
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan		
http://www.msi.com.tw		
Last Revision Date: Thursday, August 30, 2001		
Sheet 35 of 50		

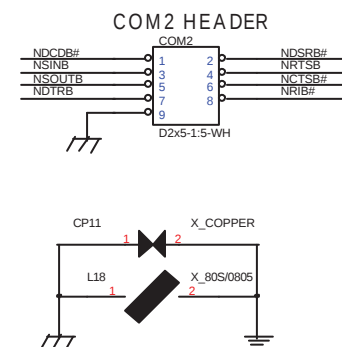
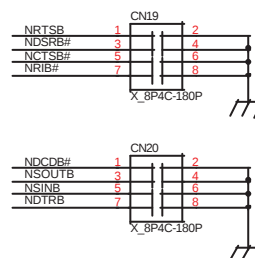
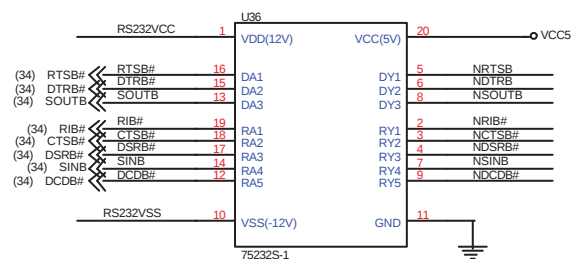
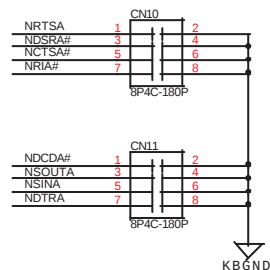
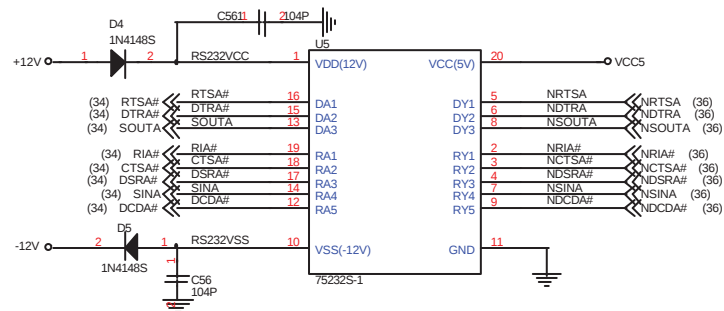
Parallel Port Header



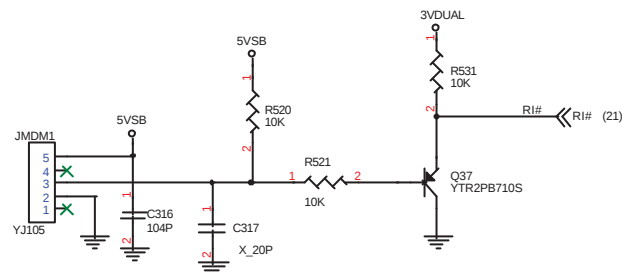
Micro Star Restricted Secret

Title		Rev
Parallel Port Header		
Document Number	MS-6373	0A
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Thursday, August 30, 2001
Sheet		36 of 50

Serial Port/COM Headers



INTERNAL MODEM WAKEUP HEADER

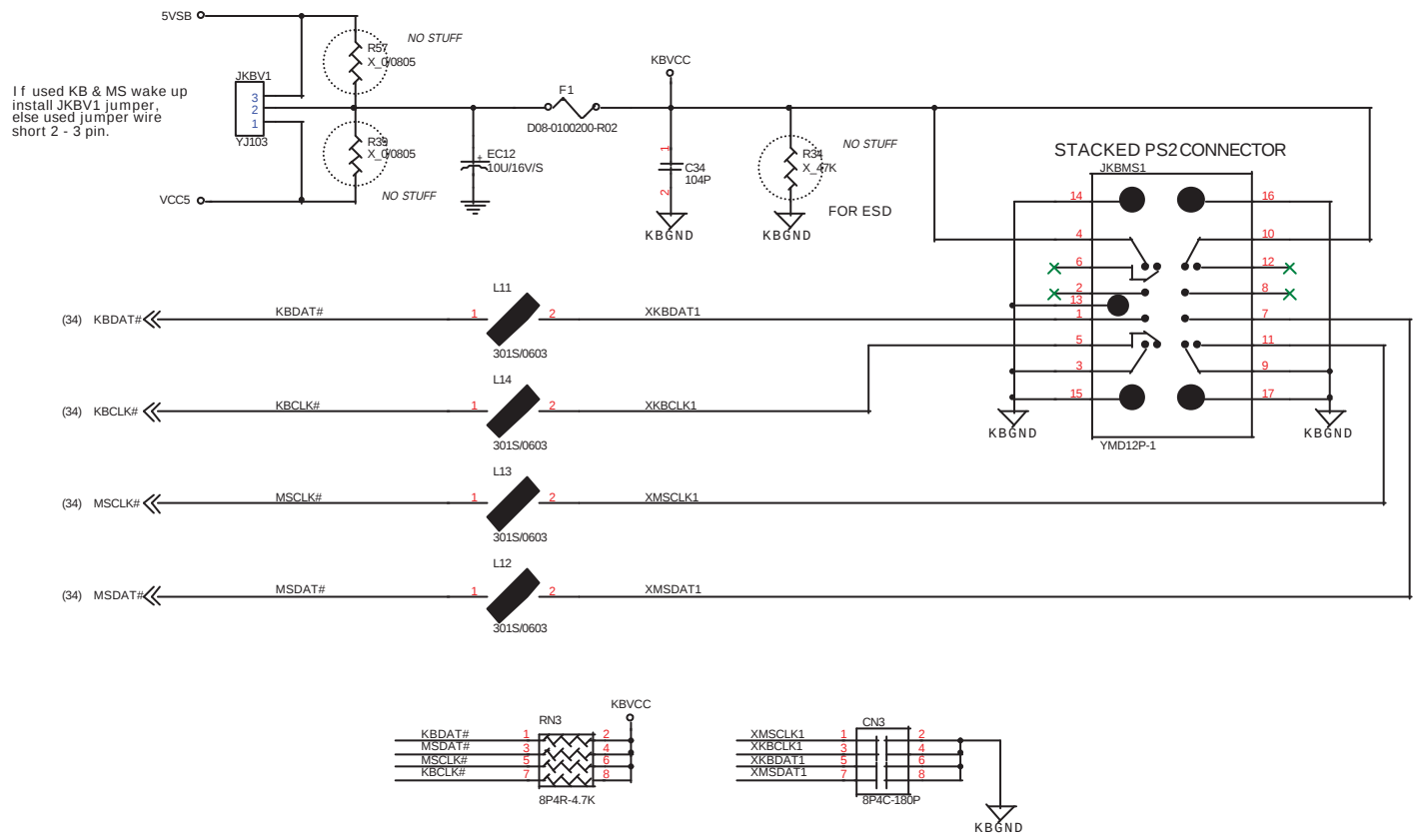


[illegible][illegible]

Title		Game Port Header		Rev
Document Number		MS-6373		0A
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Thursday, August 30, 2001		
Sheet		38	of	50

Title		Game Port Header		Rev
Document Number		MS-6373		0A
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Thursday, August 30, 2001		
Sheet		38	of	50

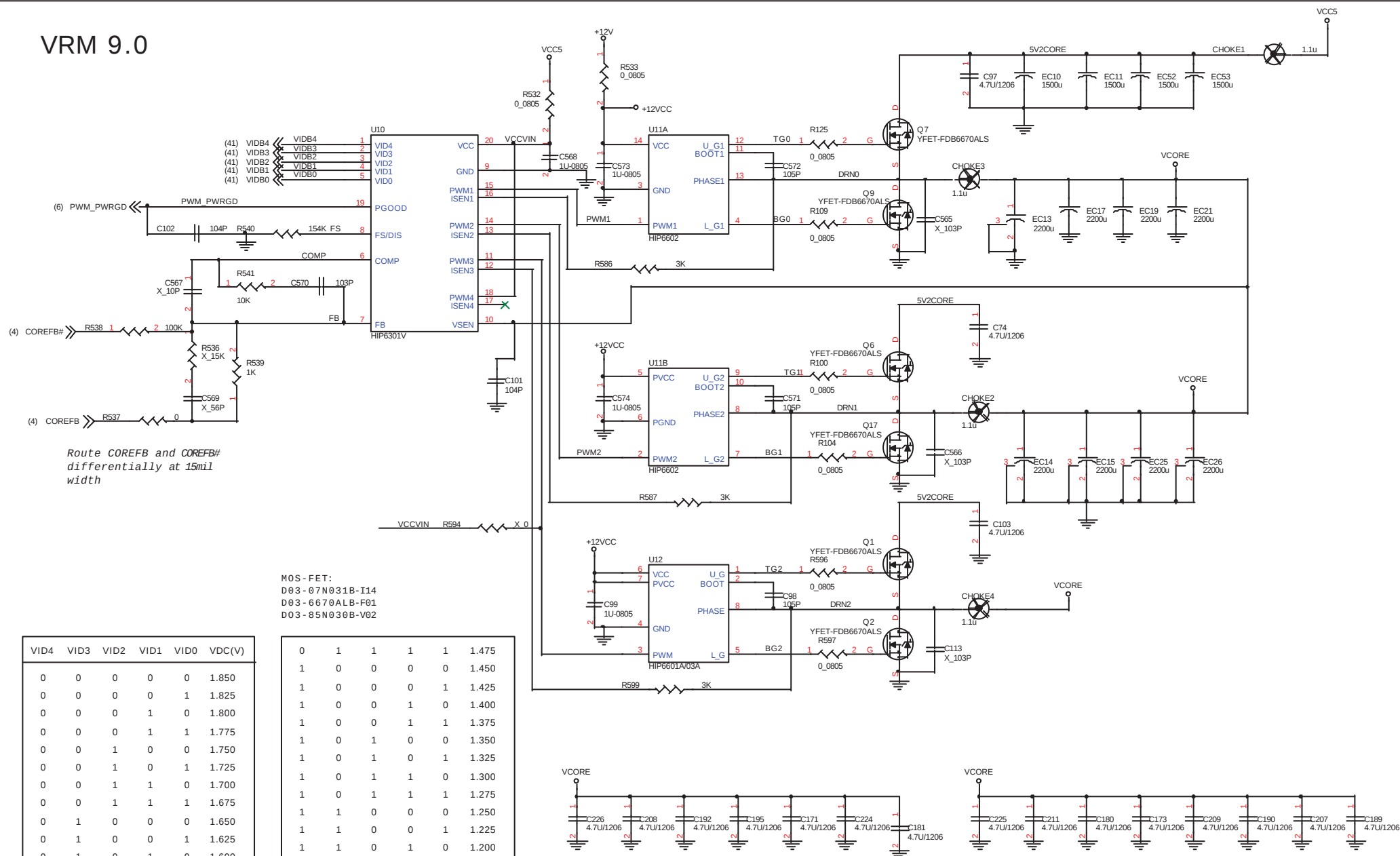
Keyboard/Mouse Ports



Micro Star Restricted Secret

Title	Keyboard/Mouse Ports	Rev
Document Number	MS-6373	0A
MICRO-STAR INT'L CO.,LTD.		
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan		
http://www.msi.com.tw		
Last Revision Date: Thursday, August 30, 2001		
Sheet 39 of 50		

VRM 9.0



VID4	VID3	VID2	VID1	VID0	VDC(V)
0	0	0	0	0	1.850
0	0	0	0	1	1.825
0	0	0	1	0	1.800
0	0	0	1	1	1.775
0	0	1	0	0	1.750
0	0	1	0	1	1.725
0	0	1	1	0	1.700
0	0	1	1	1	1.675
0	1	0	0	0	1.650
0	1	0	0	1	1.625
0	1	0	1	0	1.600
0	1	0	1	1	1.575
0	1	1	0	0	1.550
0	1	1	0	1	1.525
0	1	1	1	0	1.500

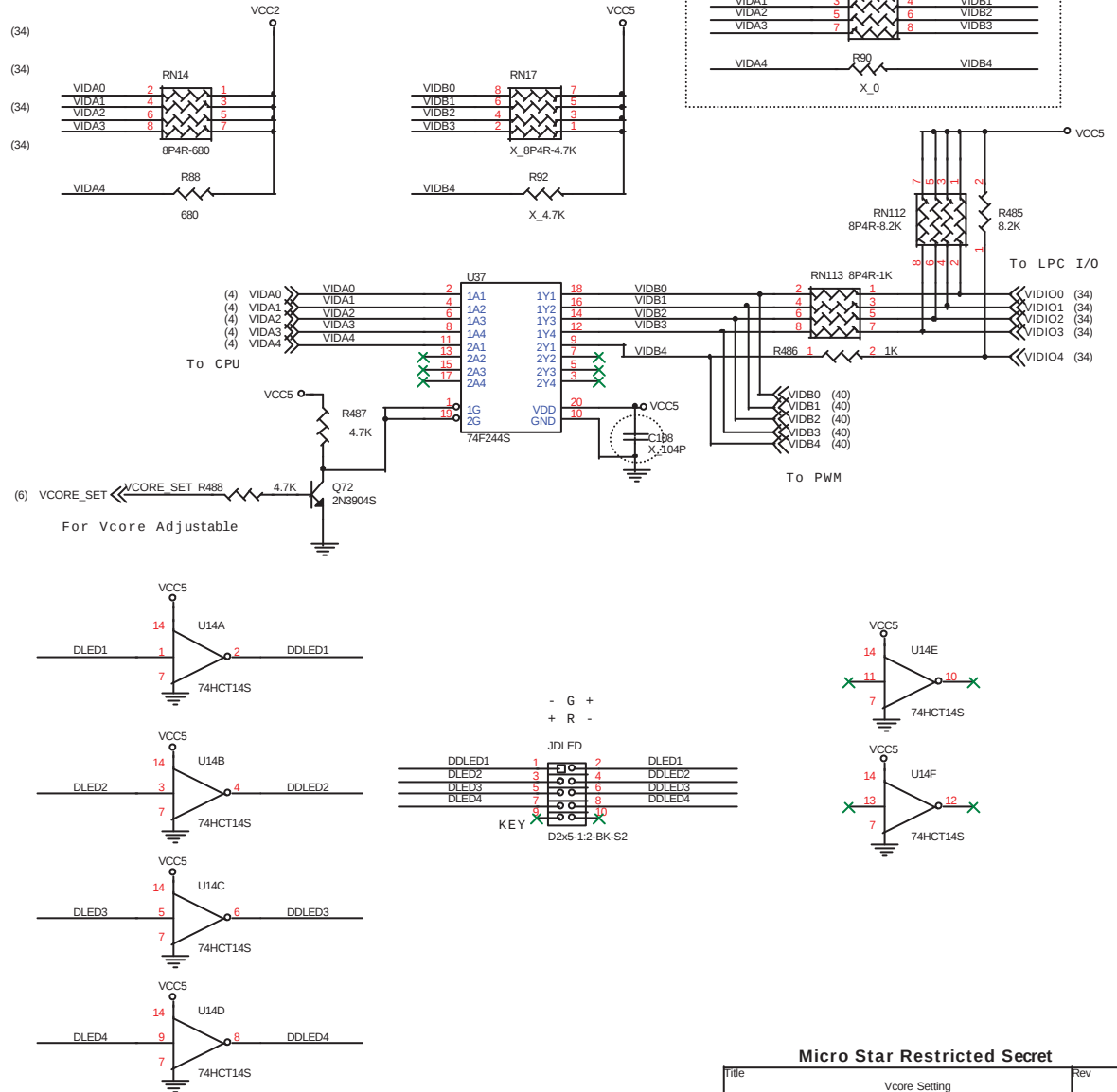
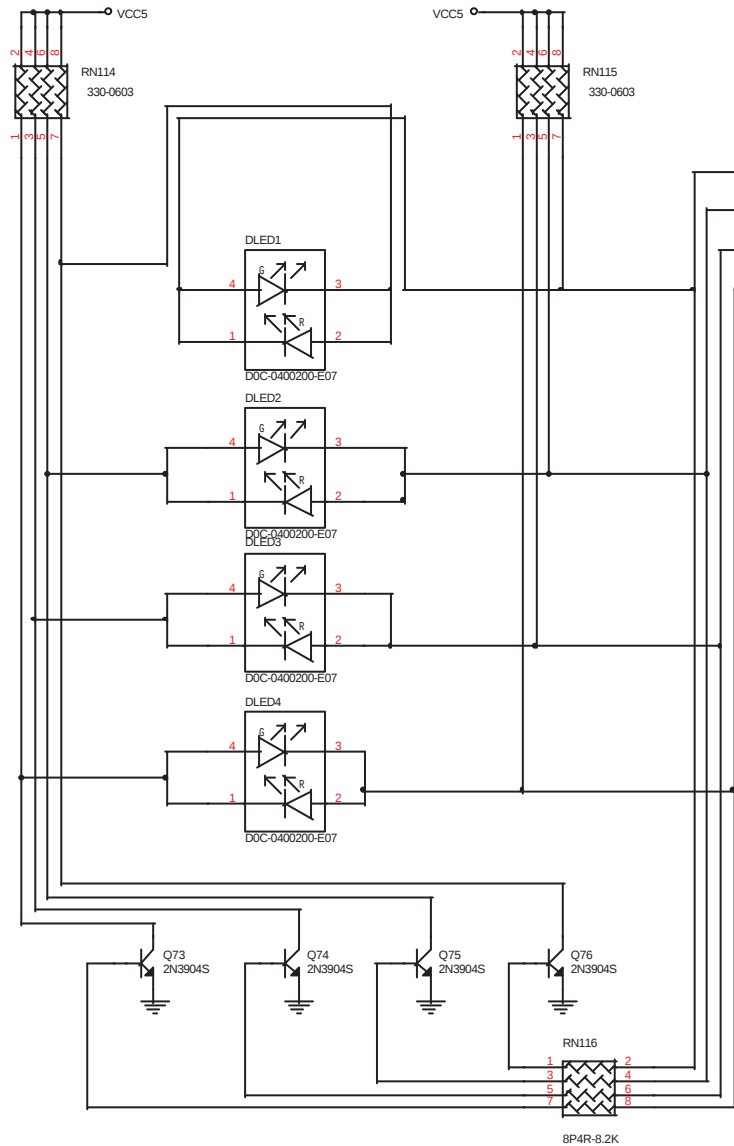
0	1	1	1	1	1.475
1	0	0	0	0	1.450
1	0	0	0	1	1.425
1	0	0	1	0	1.400
1	0	0	1	1	1.375
1	0	1	0	0	1.350
1	0	1	0	1	1.325
1	0	1	1	0	1.300
1	0	1	1	1	1.275
1	1	0	0	0	1.250
1	1	0	0	1	1.225
1	1	0	1	0	1.200
1	1	0	1	1	1.175
1	1	1	0	0	1.150
1	1	1	1	1	NoCPU

Design for 45A @+/- 100 mV

Micro Star Restricted Secret

Title		VRM 9.0	Rev
Document Number		MS-6373	QA
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Thursday, August 30, 2001	
Sheet		40	of 50

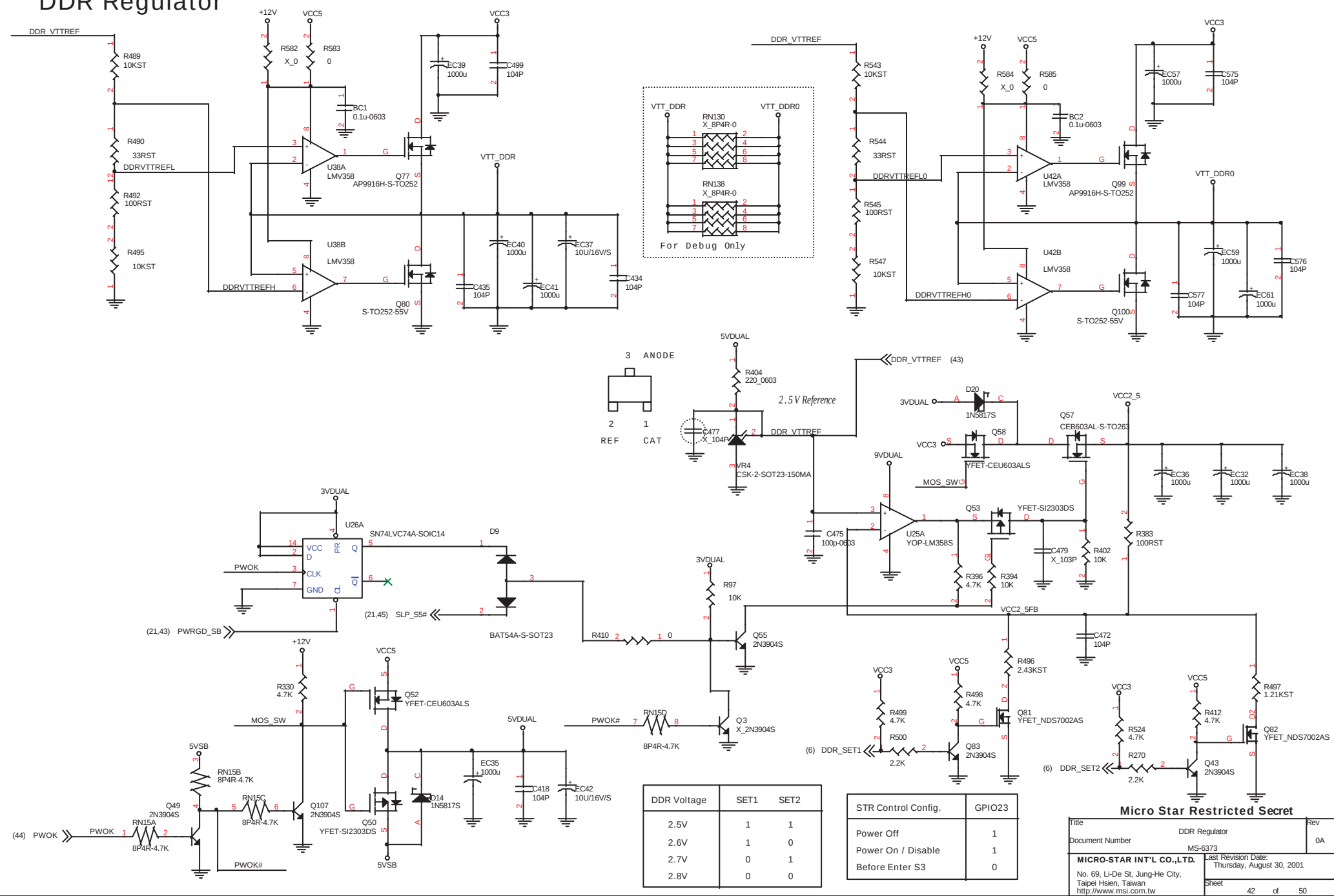
Vcore Setting



Micro Star Restricted Secret

Title	Vcore Setting	Rev
Document Number	MS-6373	0A
MICRO-STAR INT'L CO.,LTD.		
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan		
http://www.msi.com.tw		
Last Revision Date: Thursday, August 30, 2001		Sheet
		41 of 50

DDR Regulator



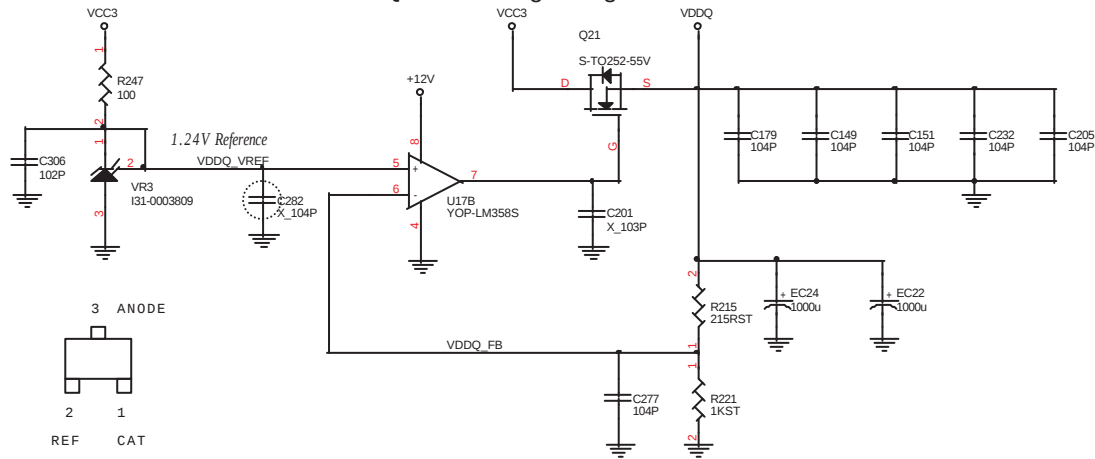
DDR Voltage	SET1	SET2
2.5V	1	1
2.6V	1	0
2.7V	0	1
2.8V	0	0

STR Control Config.	GPIO23
Power Off	1
Power On / Disable	1
Before Enter S3	0

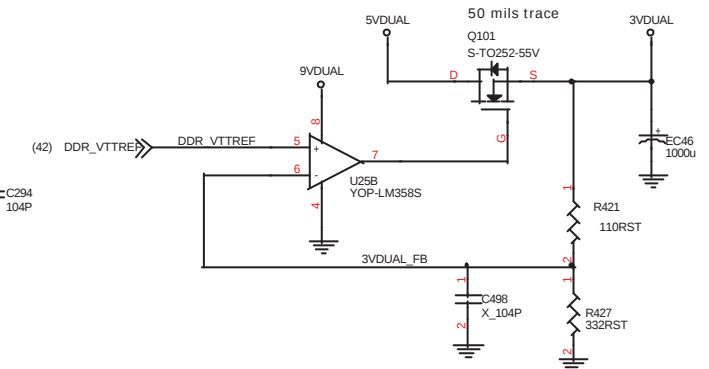
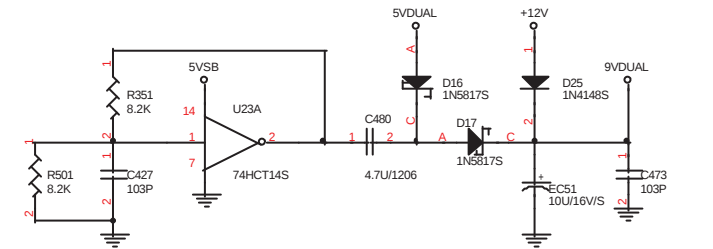
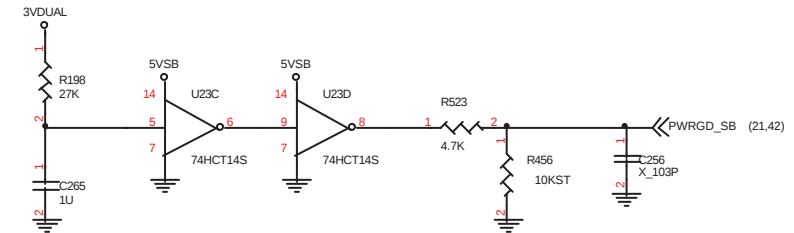
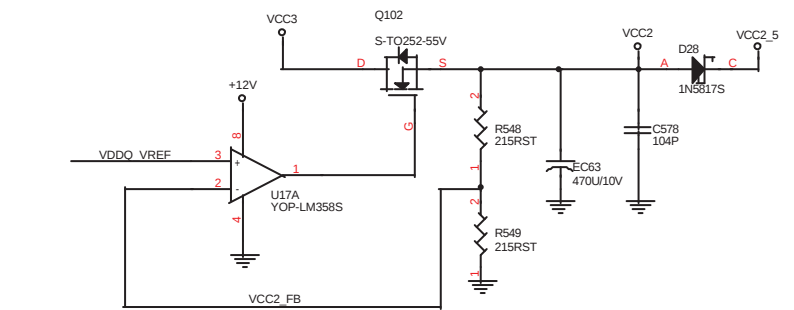
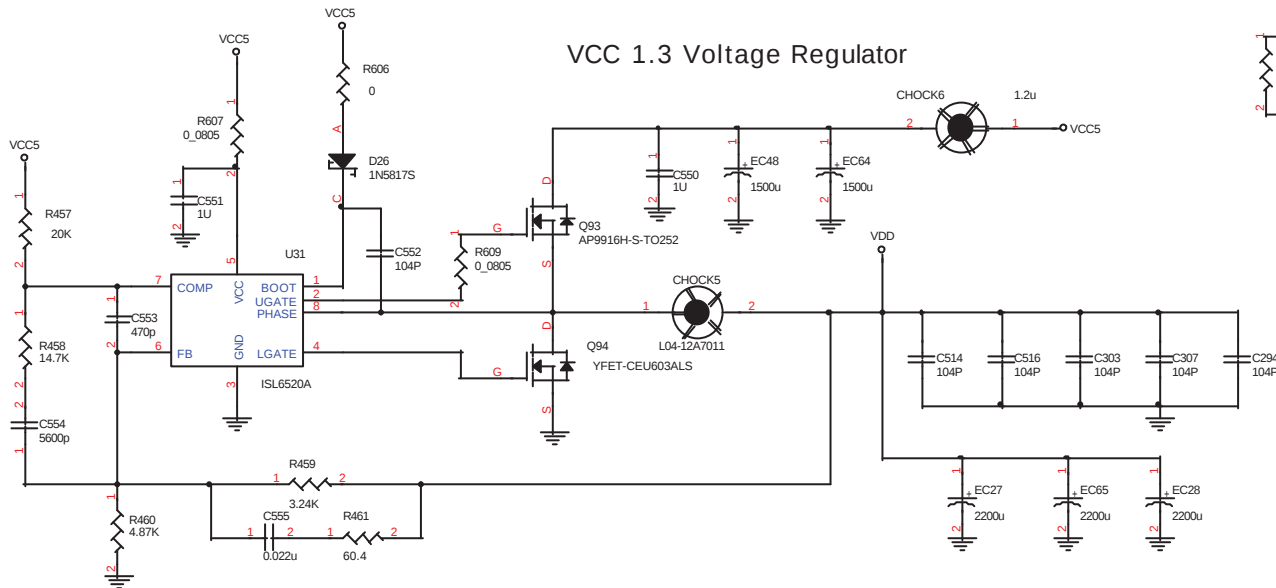
Micro Star Restricted Secret		
Title	DDR Regulator	Rev
Document Number	MS-6373	0A
Last Revision Date: Thursday, August 30, 2001		
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan		
http://www.msi.com.tw		
Sheet	42	of 50

Voltage Regulators

AGP VDDQ 1.5 Voltage Regulator



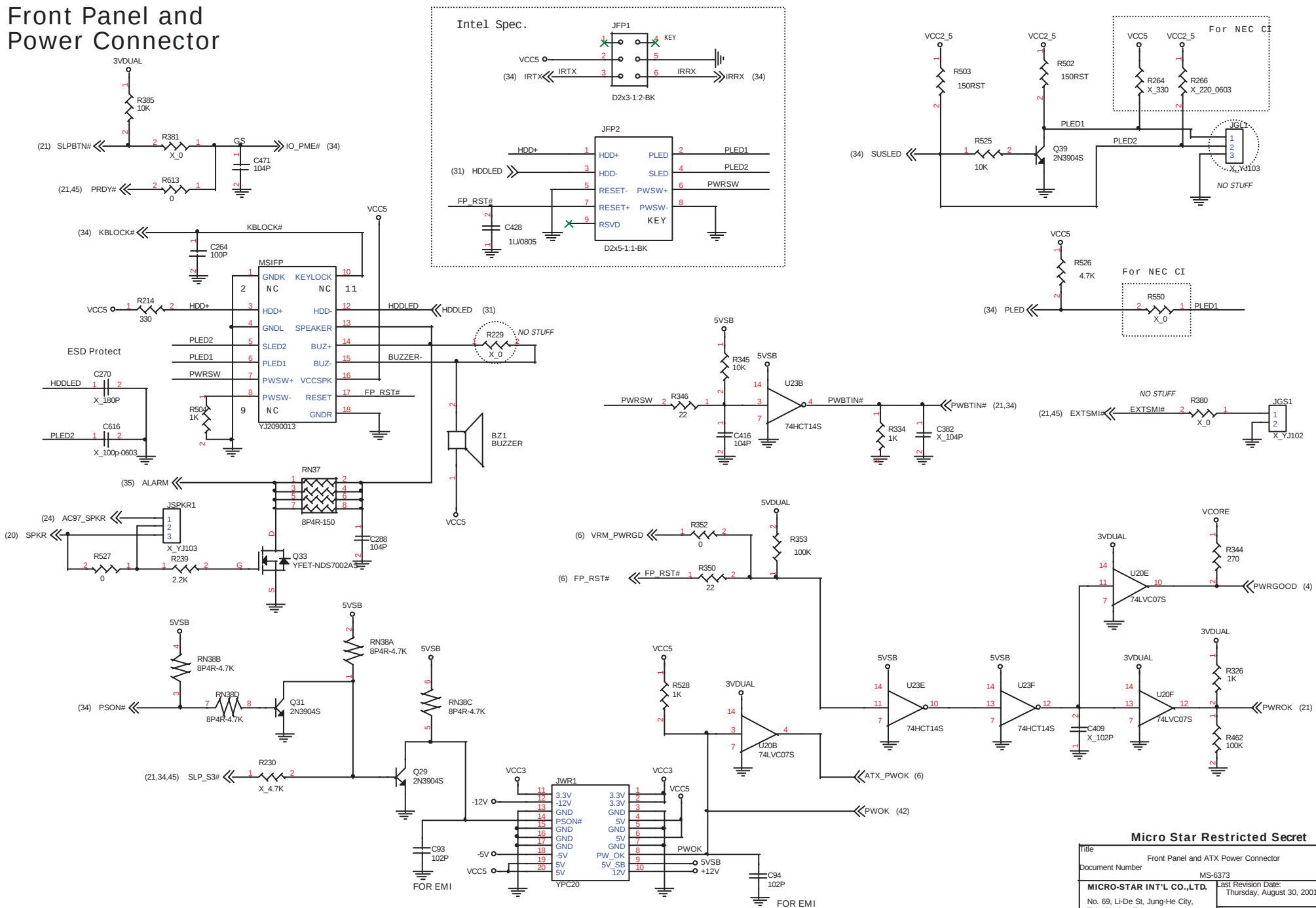
VCC 1.3 Voltage Regulator



Micro Star Restricted Secret

Title		Rev
System Voltage Regulators		
Document Number	MS-6373	0A
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Thursday, August 30, 2001
Sheet		43 of 50

Front Panel and Power Connector

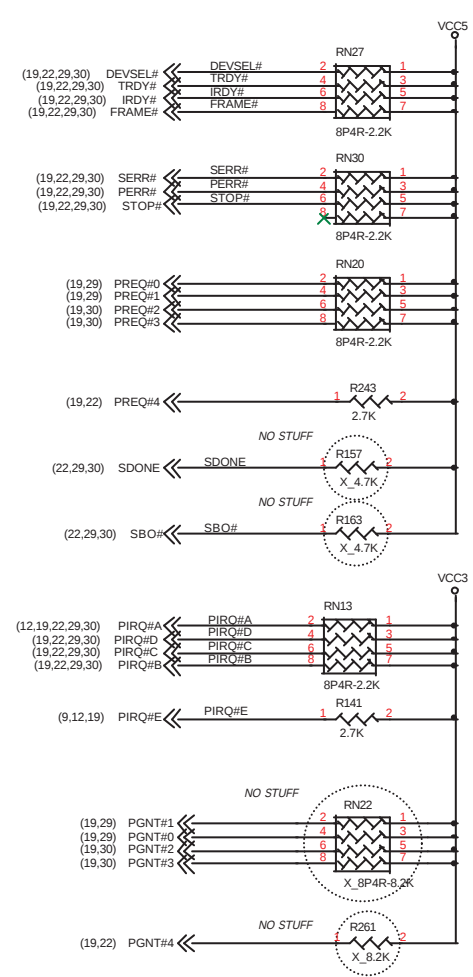


Micro Star Restricted Secret

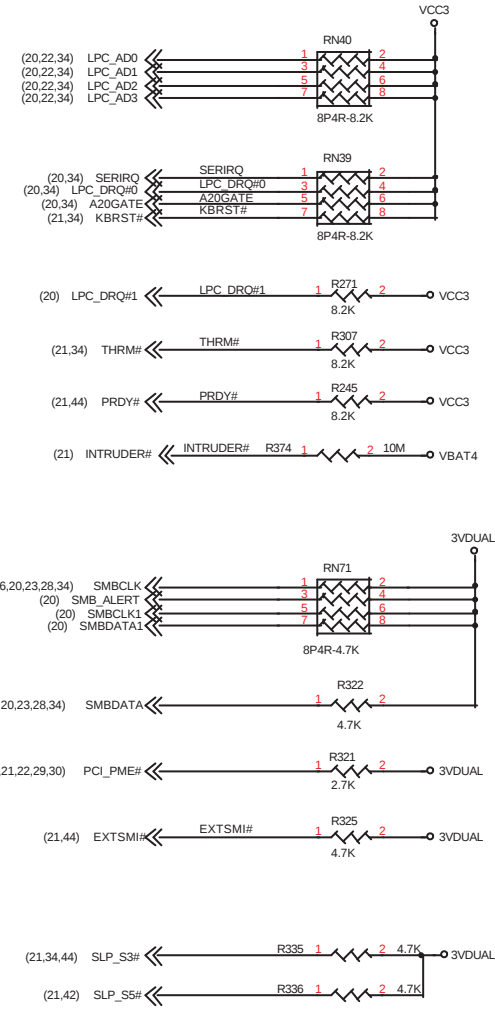
Title		Rev
Front Panel and ATX Power Connector		
Document Number	MS-6373	08
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Thursday, August 30, 2001
Sheet		44 of 50

PULL-UP RESISTORS

PCI BUS

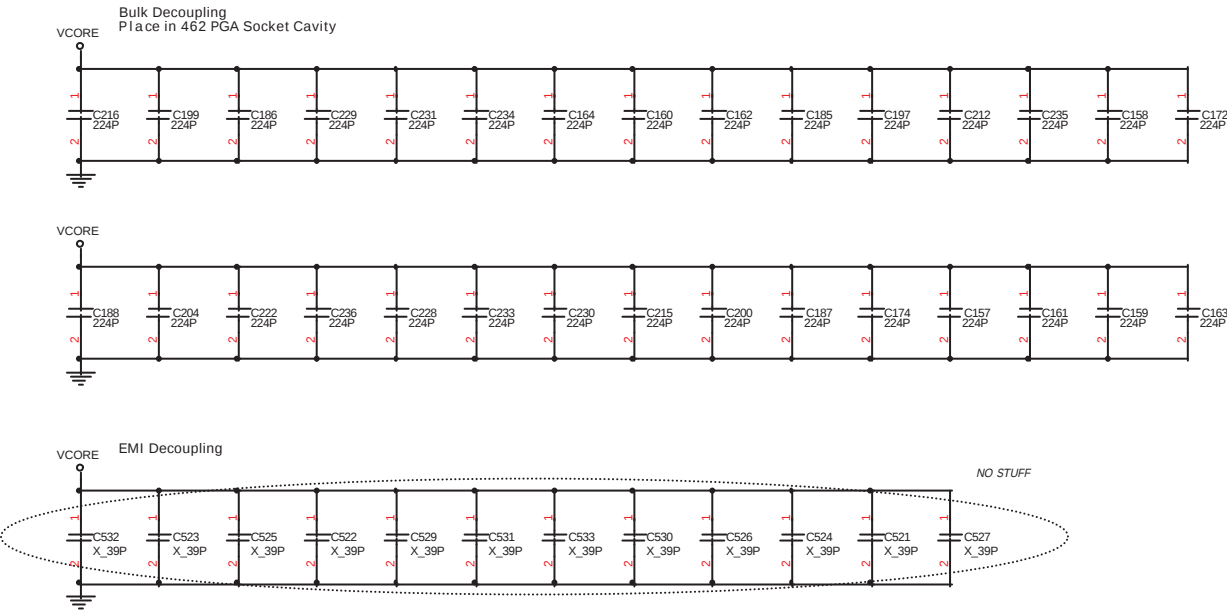


MCP-1



462-pin Socket Decoupling

VCORE DECOUPLING

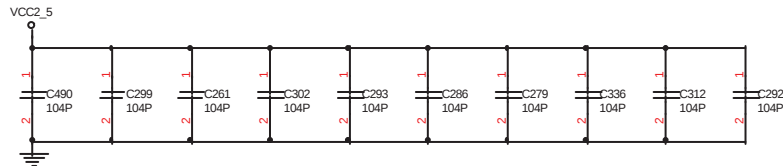


Chipset, and BULK Power Decoupling

CRUSH12 Decoupling

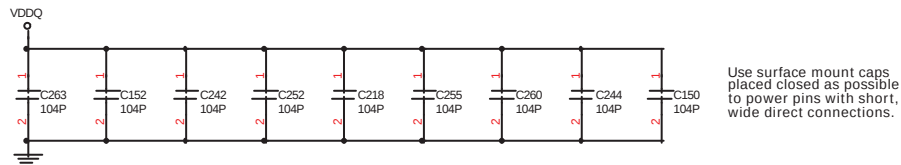
CRUSH12 Core Plane Decoupling

Distribute as close as possible to CRUSH12 System Memory Quadrant



CRUSH12 VDDQ Decoupling

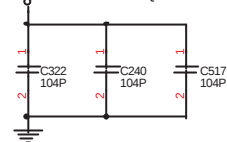
Place near CRUSH12 AGP interface Quadrant



MCP1 Decoupling

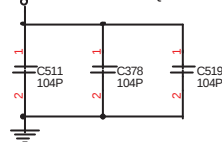
MCP1 Core Plane Decoupling

Distribute as close as possible to MCP1 1.2V Quadrant

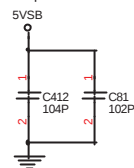


MCP1 VCC5 Decoupling

Distribute as close as possible to MCP1 VCC5 Quadrant

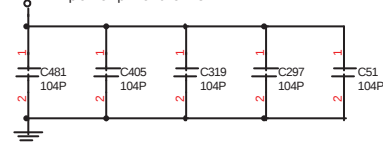


Distribute near the 5V standby Power pin of the MCP1



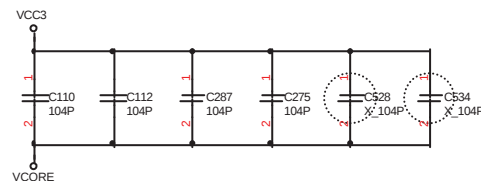
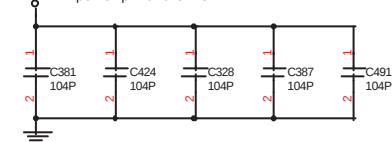
MCP1 3.3V Plane Decoupling:

Distribute near the 3.3V power pin of the MCP1

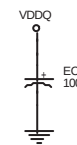


MCP1 3VDUAL Decoupling

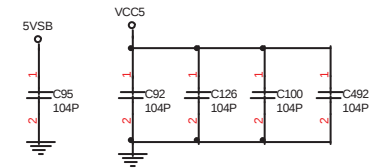
Distribute near the 3.3V standby power pin of the MCP1



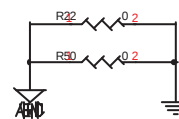
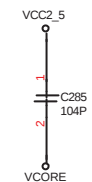
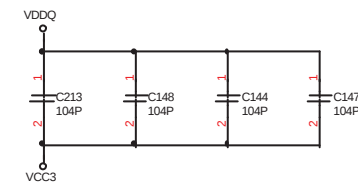
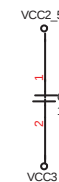
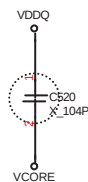
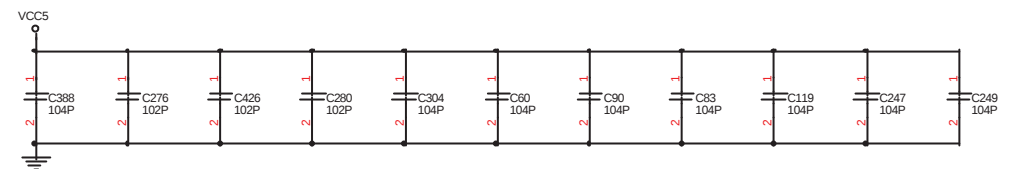
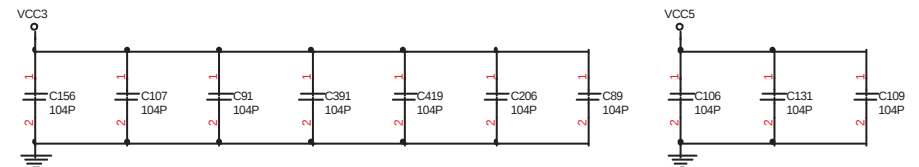
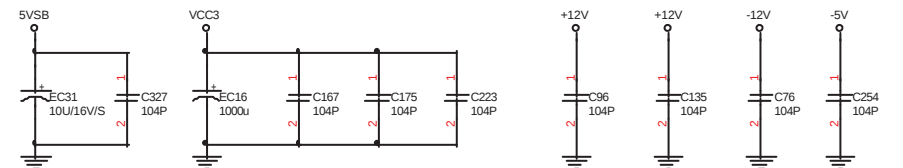
AGP Decoupling



Distribute near the VCC power pin of the LPC



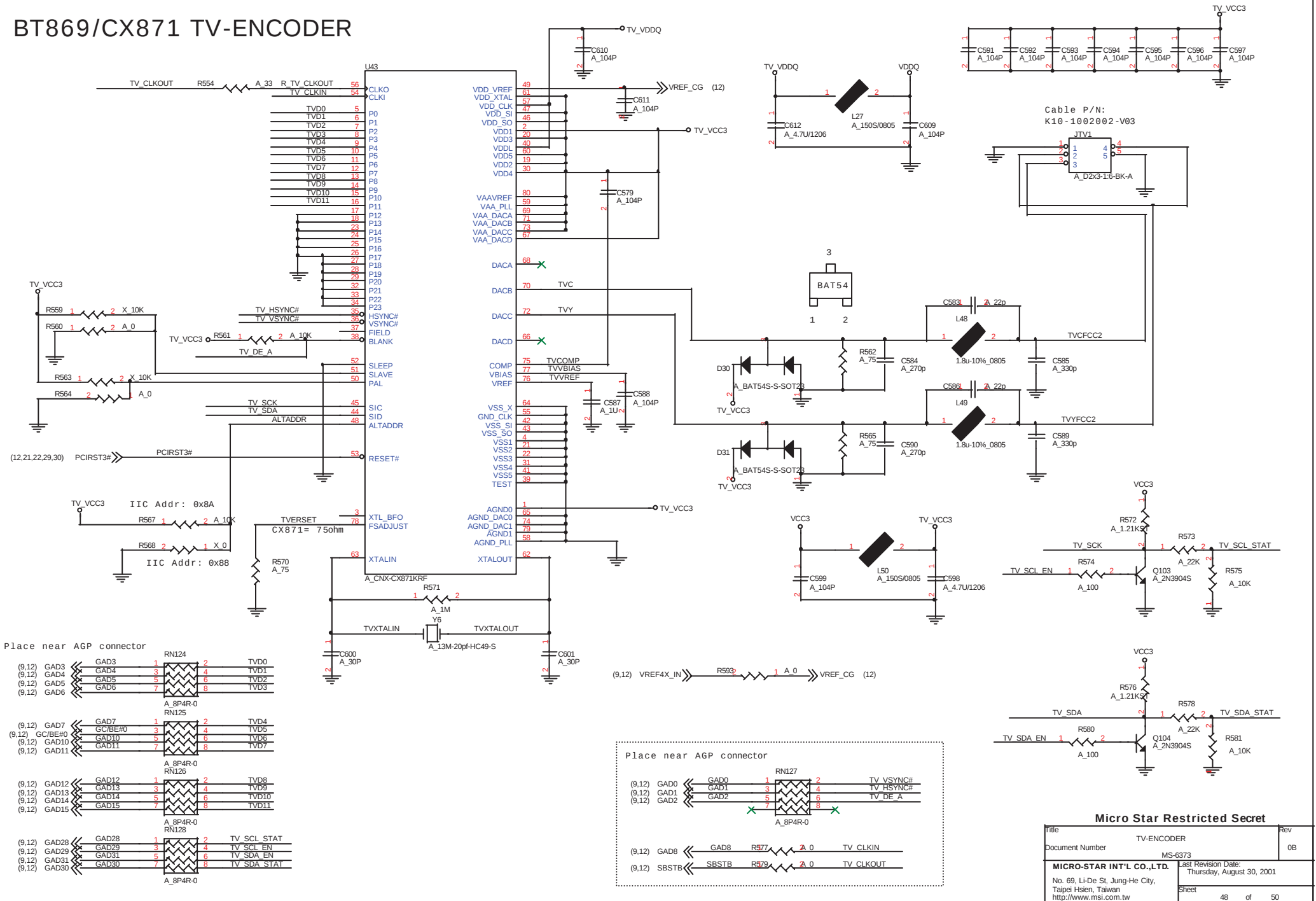
Bulk Power Decoupling



Micro Star Restricted Secret

Title	CRUSH12 and MCP1 Decoupling	Rev	0B
Document Number	MS-6373		
MICRO-STAR INT'L CO.,LTD.			
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan			
http://www.msi.com.tw			
Last Revision Date: Thursday, August 30, 2001		Sheet 47 of 50	

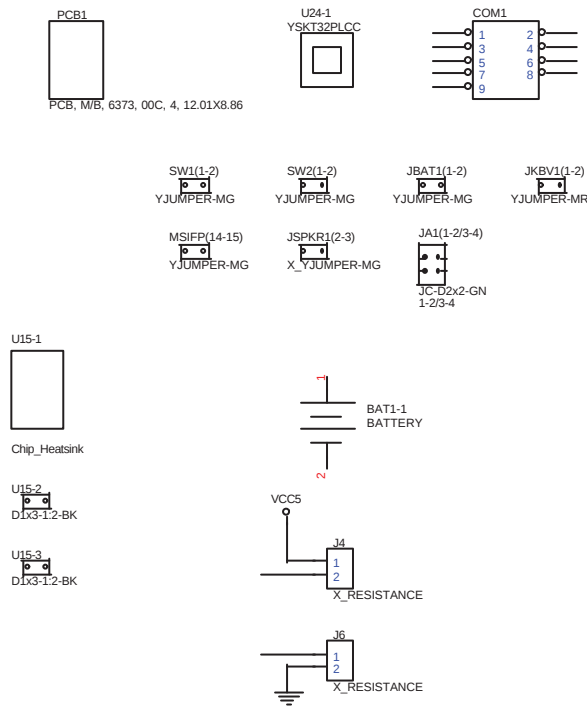
BT869/CX871 TV-ENCODER



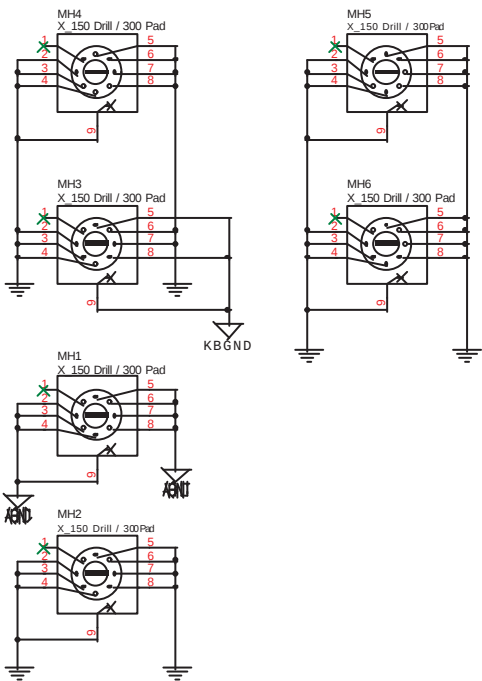
Micro Star Restricted Secret

Title	TV-ENCODER	Rev	08
Document Number	MS-6373		
Last Revision Date: Thursday, August 30, 2001			
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan			
http://www.msi.com.tw			
Sheet	48	of	50

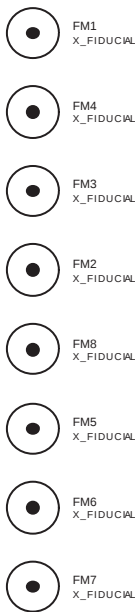
AutoBOM Manual Parts



MOUNTINGHOLES



FIDUCIALS



Pin Header Key Protect

JAUDIO01 Pin 8,16
JAUDIO02 Pin 8
USB3 Pin 9
USB4 Pin 9
IR1 Pin 2
JDLED Pin 9
JFP1 Pin 4
JFP2 Pin 10
JTV1 Pin 6

Micro Star Restricted Secret

Title	AutoBOM Manual parts	Rev
Document Number	MS-6373	0B
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, August 30, 2001		Sheet
		49 of 50

Micro Star Restricted Secret

Title	Revision History	Rev
Document Number	MS-6373	0B
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Tainan Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Wednesday, August 29, 2001
Sheet		50 of 50