MS-6391

Version101
7/19/2001
Update

INTEL (R) Brookdale Chipset
Willamette/Northwood 478pin mPGA-B Processor Schematics

CPU:

Willamette/Northwood mPGA-478B Processor

System Brookdale Chipset:

INTEL MCH (North Bridge) +
INTEL ICH2 (South Bridge)

On Board Chipset:

BIOS -- FWH
AC'97 Codec -- AD1881
LPC Super I/O -- W83627HF
Clock Generation -- CY28324
LAN -- INTEL 82562EM/ET

Expansion Slots:

AGP2.0 SLOT * 1
PCI2.2 SLOT * 5
CNR SLOT * 1
ISA SLOT * 1 (Share PCI5)

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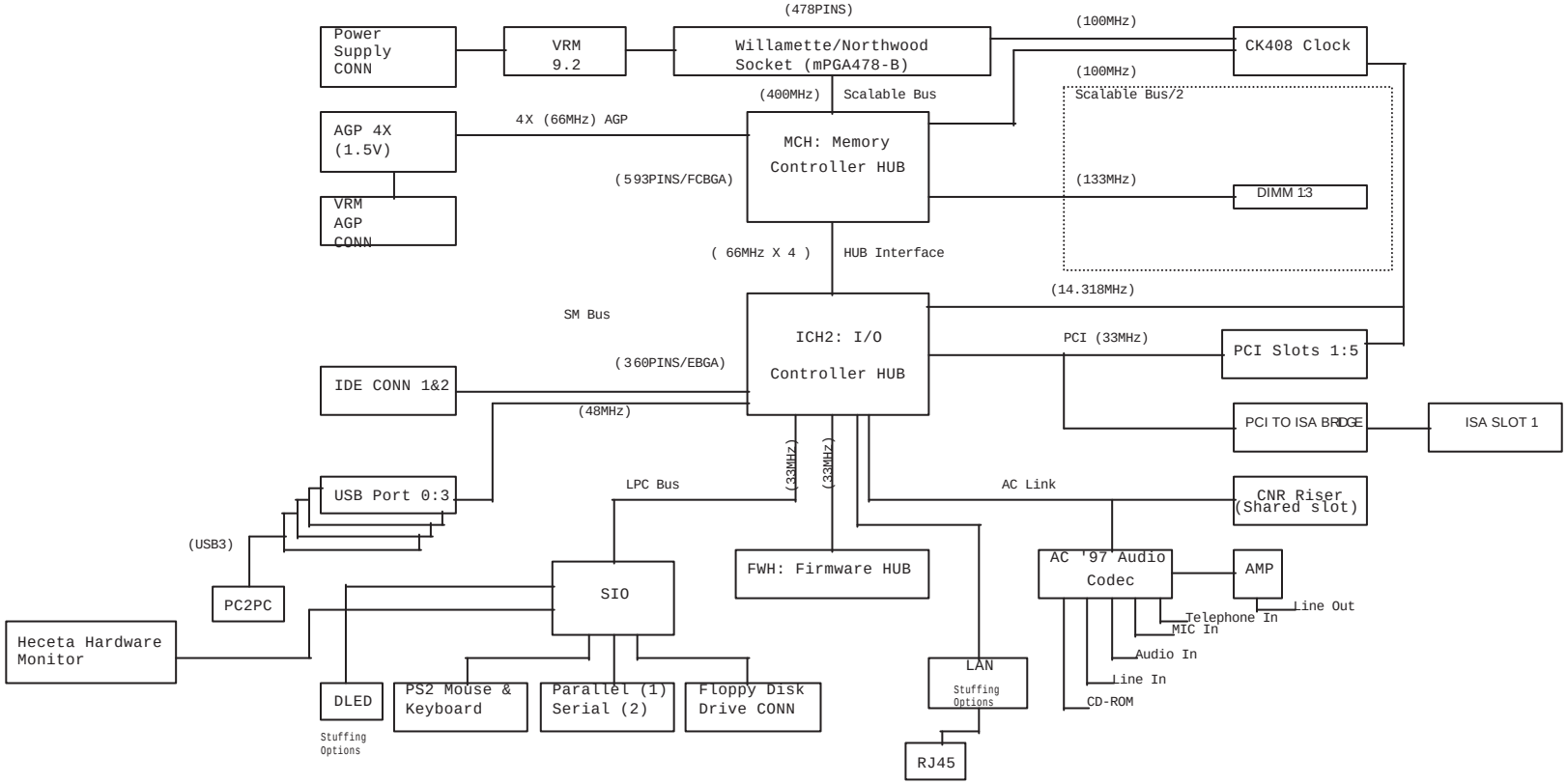
AGP
4X(1.5V)
AGP CONN



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General Purpose I/O Spec.

ICH2

GPIO Pin	Type	Function
GPIO 0	I	PCI TO ISA REQA#
GPIO 1	I	Non Connect (PREQ#5)
GPIO 2	I	INTE#
GPIO 3	I	INTF#
GPIO 4	I	INTG#
GPIO 5	I	INTH#
GPIO 6	I	CNR Detect
GPIO 7	I	None
GPIO 8	I	LAN Wake Up
GPIO 9	I	AC'97 Serial Data In
GPIO 10	I	Non Connect
GPIO 11	I	Non Connect
GPIO 12	I	External SMI
GPIO 13	I	LPC PME
GPIO 14~15	I	Not Implemented
GPIO 16	O	PCI TO ISA GNTA#
GPIO 17	O	Non Connect (PGNT#5)
GPIO 18	O	Not Implemented
GPIO 19	O	VIO Voltage Control
GPIO 20	O	VIO Voltage Control
GPIO 21	O	Over Voltage
GPIO 22	OD	PCI TO ISA NOGO
GPIO 23	O	BIOS Locked/Unlocked
GPIO 24	O	Non Connect
GPIO 25	O	VIO Voltage S3 Control
GPIO 26	O	Non Connect
GPIO 27	I/O	Audio 4 channel control
GPIO 28	I/O	Lan Enable/Disable
GPIO 29~31	I/O	Not Implemented

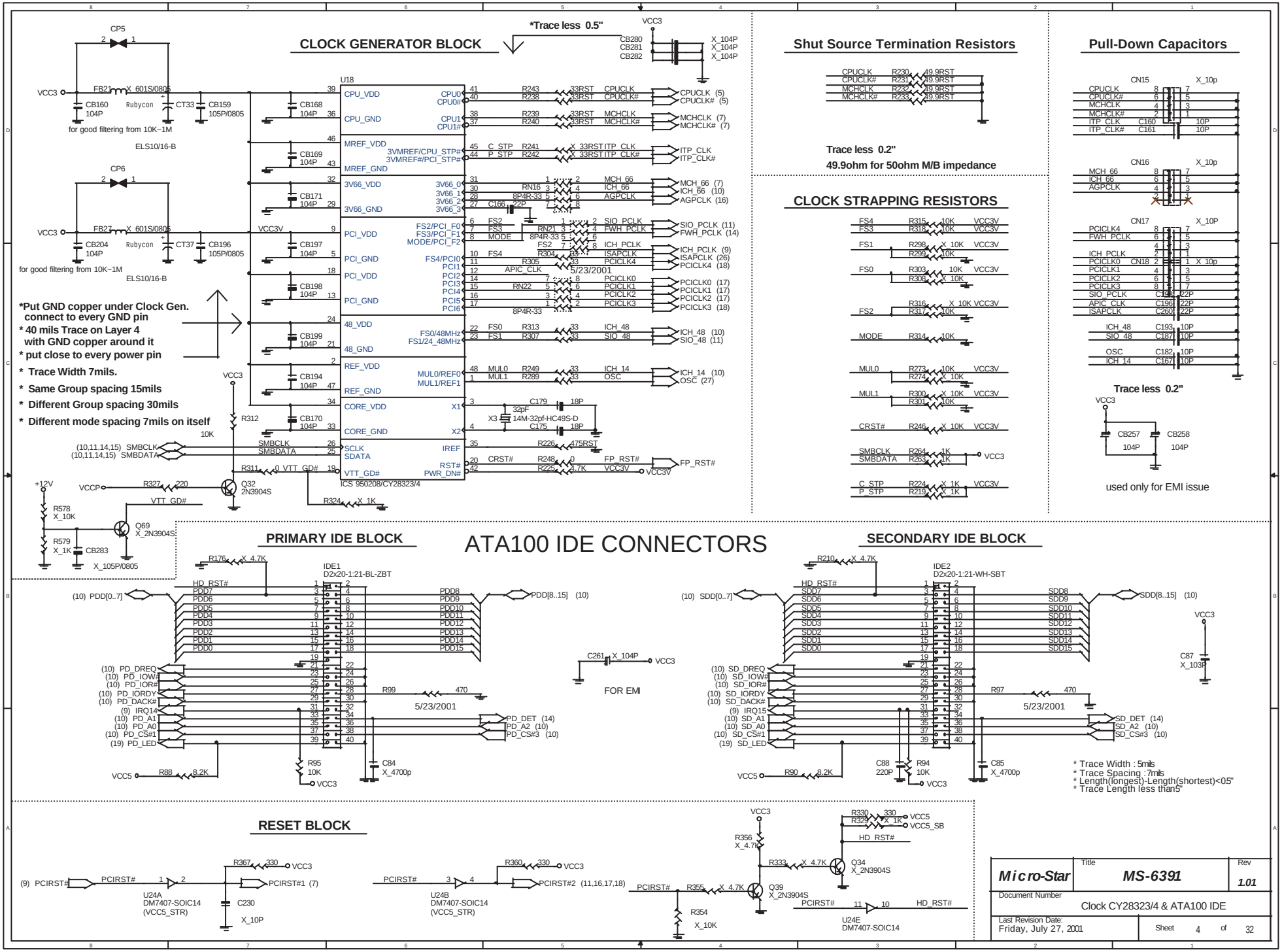
FWH

GPIO Pin	Type	Function
GPI 0	I	ATA IDE 1 Detect
GPI 1	I	ATA IDE 2 Detect
GPI 2	I	Reserved
GPI 3	I	Reserved

DLED

GPIO Pin	Type	Function
GP32	I/OD	DLED1
GP24	I/OD	DLED2
GP34	I/OD	DLED3
GP33	I/OD	DLED4

DEVICE	ICH INT Pin	IDSEL
PCI Slot 1	INTA# INTB# INTC# INTD#	AD16
PCI Slot 2	INTB# INTC# INTD# INTA#	AD17
PCI Slot 3	INTC# INTD# INTA# INTB#	AD18
PCI Slot 4	INTD# INTA# INTB# INTC#	AD19
PCI Slot 5	INTB# INTC# INTD# INTA#	AD21


CLOCK GENERATOR BLOCK
*Trace less 0.5"
U18
ICS 950208/CY28323/4
*Put GND copper under Clock Gen.
connect to every GND pin
* 40 mils Trace on Layer 4
with GND copper around it
* put close to every power pin
* Trace Width 7mils.
* Same Group spacing 15mils
* Different Group spacing 30mils
* Different mode spacing 7mils on itself
Shut Source Termination Resistors
Trace less 0.2"
49.9ohm for 50ohm M/B impedance
CLOCK STRAPPING RESISTORS
Pull-Down Capacitors
Trace less 0.2"
used only for EMI issue
ATA100 IDE CONNECTORS
PRIMARY IDE BLOCK
IDE1
D2x20-1:21-BL-ZBT
SECONDARY IDE BLOCK
IDE2
D2x20-1:21-WH-SBT
FOR EMI
* Trace Width : 5mils
* Trace Spacing : 7mils
* Length(longest)-Length(shortest)<05"
* Trace Length less than5"
RESET BLOCK
Micro-Star
MS-6391
1.01
Clock CY28323/4 & ATA100 IDE
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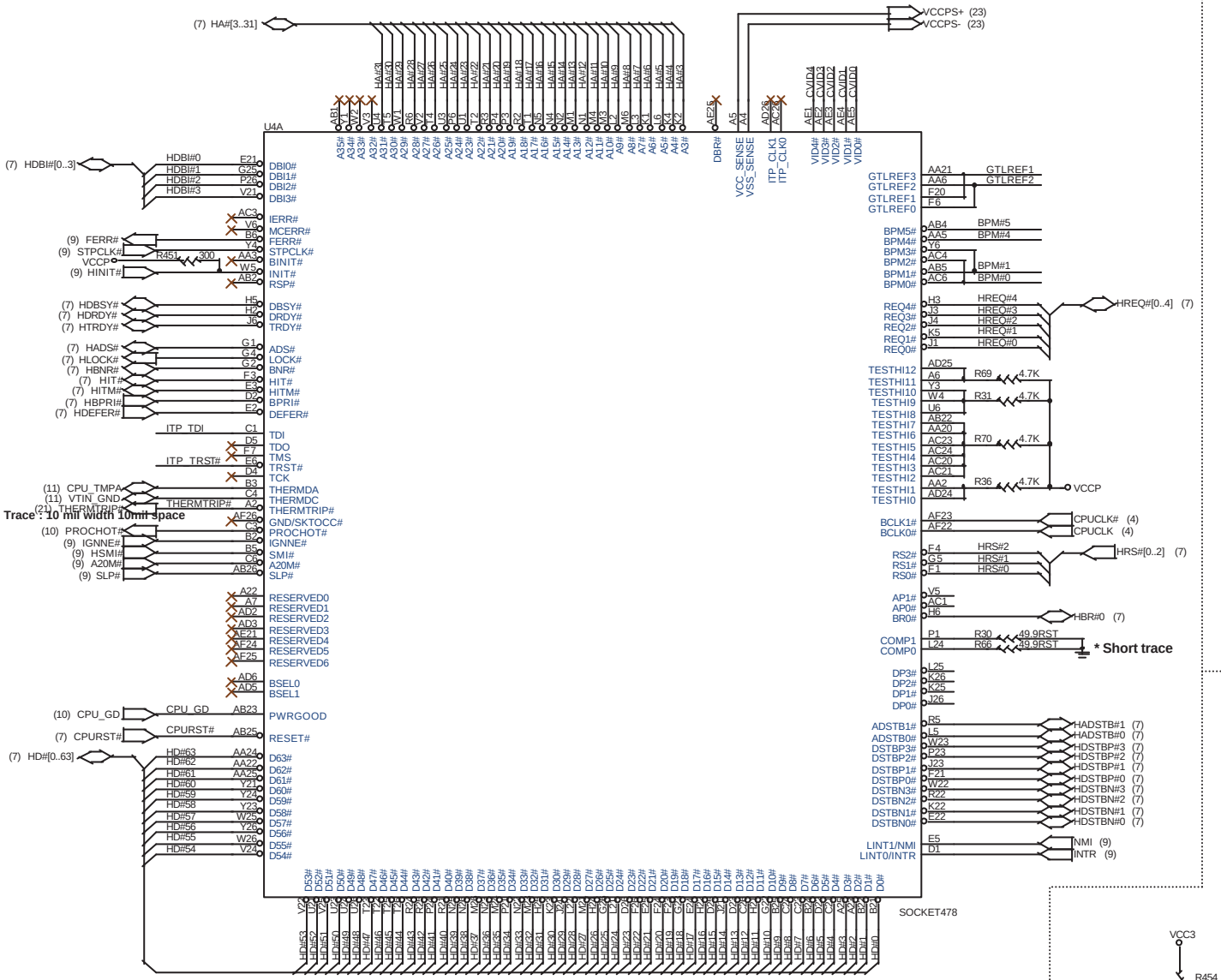
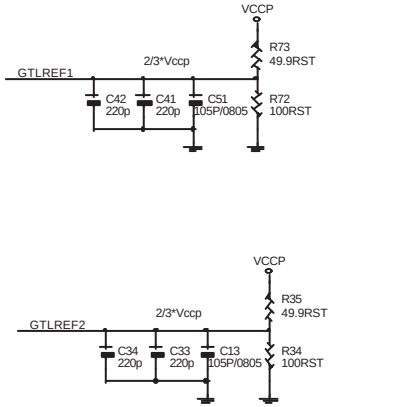
CPU SIGNAL BLOCK

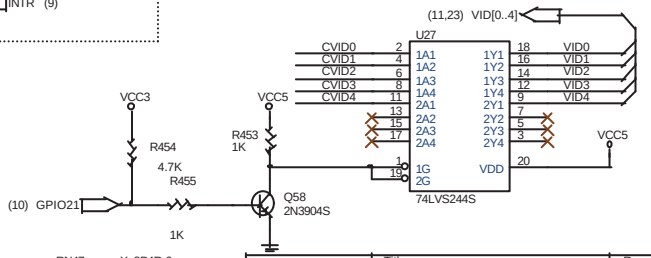


CPU GTL REFERNCE VOLTAGE BLOCK

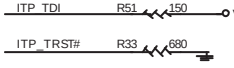


Every pin put one 220pF cap near it.
Trace Width 15mils, Space 15mils.
Keep the voltage dividers within 1.5 inches of the first GTLREF Pin

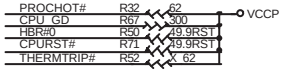
OVER VOLTAGE BLOCK



CPU STRAPPING RESISTORS



ALL COMPONENTS CLOSE TO CPU



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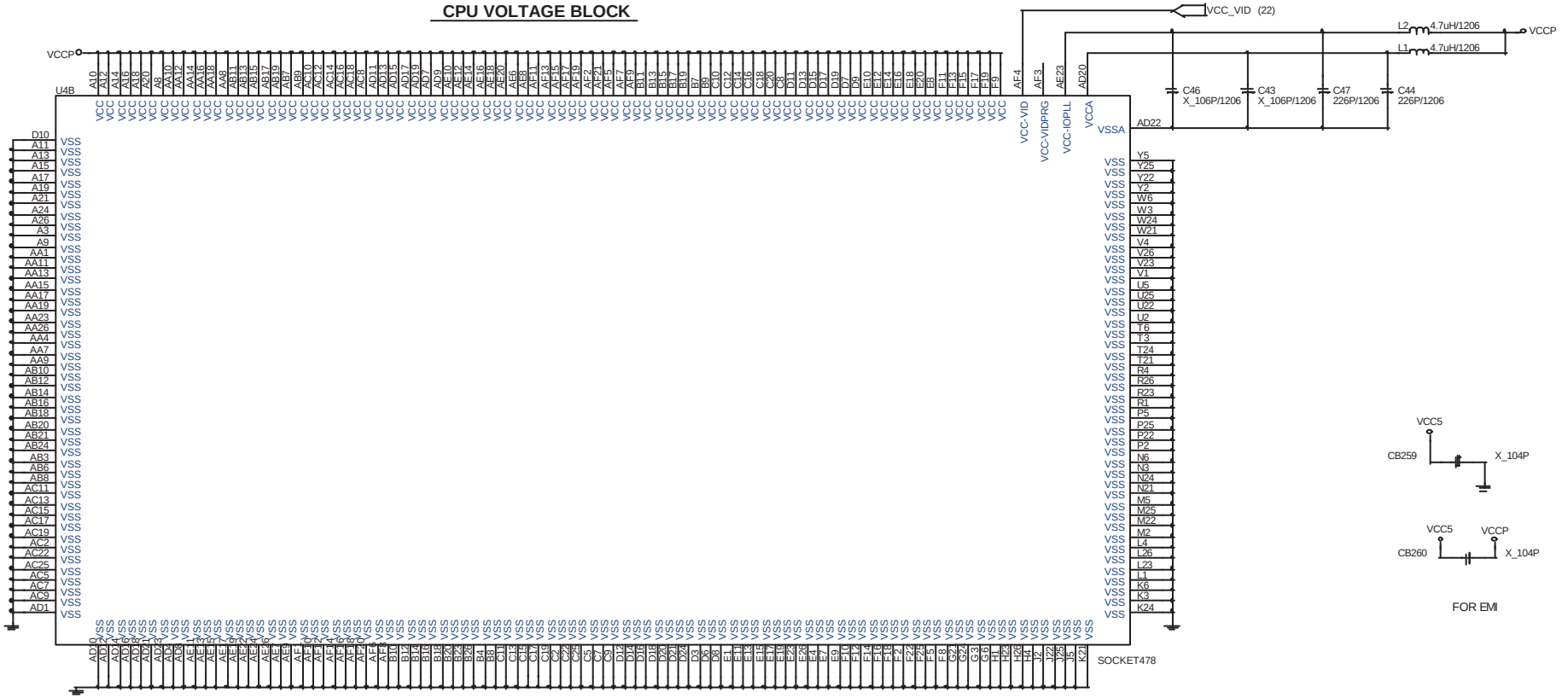
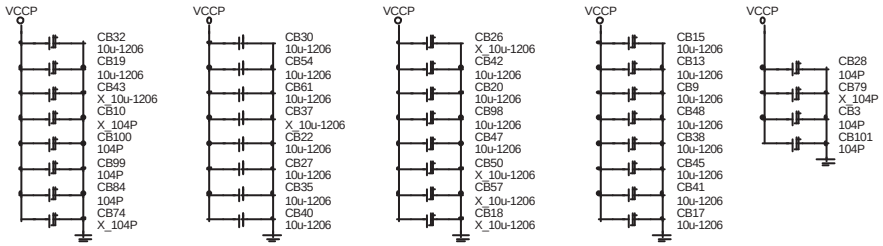
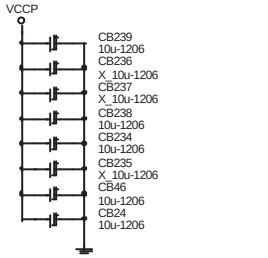
CPU VOLTAGE BLOCK



CPU DECOUPLING CAPACITOR

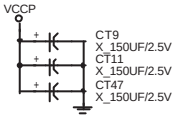


PLACE CAPS WITHIN CPU CAVITY



PLACE CAPS WITHIN CPU CAVITY SOLDER

CPU DECOUPLING CAPACITORS



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Micro-Star	Title: MS-6391	Rev: 1.01
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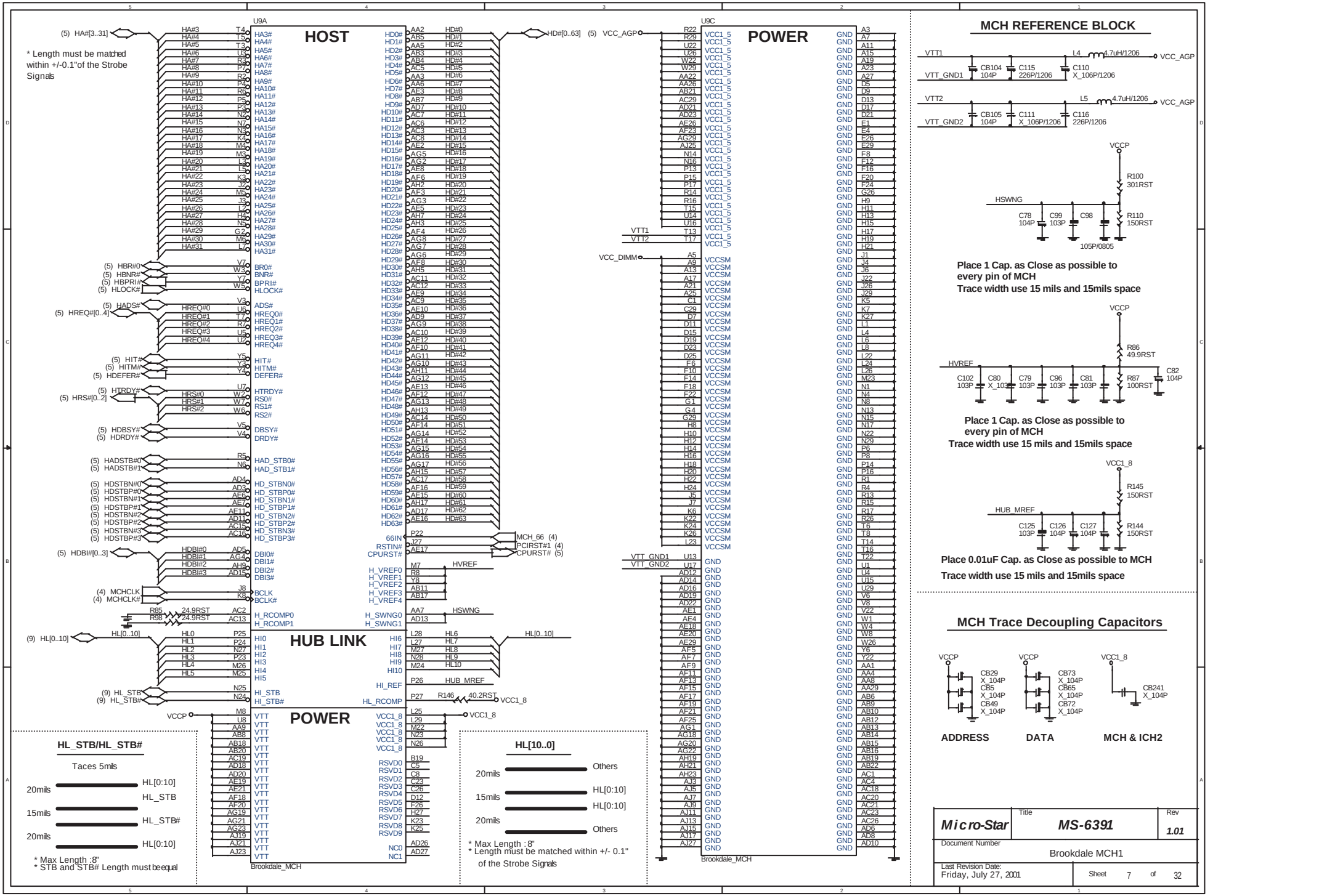
U9A
HOST
(5) HA#[3..31]
* Length must be matched within +/-0.1"of the Strobe Signals
(5) HBR#0
(5) HBNR#
(5) HBPRI#
(5) HLOCK#
(5) HADS#
(5) HREQ#[0..4]
(5) HIT#
(5) HITM#
(5) HDEFER#
(5) HTRDY#
(5) HRS#[0..2]
(5) HDBSY#
(5) HDRDY#
(5) HADSTB#0
(5) HADSTB#1
(5) HDSTBN#0
(5) HDSTBP#0
(5) HDSTBN#1
(5) HDSTBP#1
(5) HDSTBN#2
(5) HDSTBP#2
(5) HDSTBN#3
(5) HDSTBP#3
(5) HDBI#[0..3]
(4) MCHCLK
(4) MCHCLK#
R85 24.9RST
R98 24.9RST
H_RCOMP0
H_RCOMP1
(9) HL[0..10]
HUB LINK
(9) HL_STB
(9) HL_STB#
VCCP
POWER
Brookdale_MCH
HD#[0..63]
66IN
RSTIN#
CPURST#
MCH_66 (4)
PCIRST#1 (4)
CPURST# (5)
HVREF
HSWNG
HUB_MREF
R146 40.2RST
VCC1_8
H_SWNG0
H_SWNG1
H_VREF0
H_VREF1
H_VREF2
H_VREF3
H_VREF4
HI_REF
HL_RCOMP
U9C
POWER
VCC_AGP
VCC_DIMM
VTT1
VTT2
VTT_GND1
VTT_GND2
Brookdale_MCH
HL_STB/HL_STB#
Taces 5mils
20mils HL[0:10]
15mils HL_STB
20mils HL_STB#
20mils HL[0:10]
* Max Length :8"
* STB and STB# Length must be equal
HL[10..0]
20mils Others
15mils HL[0:10]
20mils HL[0:10]
20mils Others
* Max Length :8"
* Length must be matched within +/- 0.1" of the Strobe Signals
MCH REFERENCE BLOCK
VTT1
VTT_GND1
L4 4.7uH/1206
CB104 104P
C115 226P/1206
C110 X_106P/1206
VTT2
VTT_GND2
L5 4.7uH/1206
CB105 104P
C111 X_106P/1206
C116 226P/1206
VCCP
R100 301RST
HSWNG
C78 104P
C99 103P
C98
R110 150RST
105P/0805
Place 1 Cap. as Close as possible to every pin of MCH
Trace width use 15 mils and 15mils space
R86 49.9RST
HVREF
C102 103P
C80 X_103P
C79 103P
C96 103P
C81 103P
R87 100RST
C82 104P
Place 1 Cap. as Close as possible to every pin of MCH
Trace width use 15 mils and 15mils space
VCC1_8
R145 150RST
HUB_MREF
C125 103P
C126 104P
C127 104P
R144 150RST
Place 0.01uF Cap. as Close as possible to MCH
Trace width use 15 mils and 15mils space
MCH Trace Decoupling Capacitors
CB29 X_104P
CB5 X_104P
CB49 X_104P
CB73 X_104P
CB65 X_104P
CB72 X_104P
CB241 X_104P
ADDRESS
DATA
MCH & ICH2
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Title
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1.01
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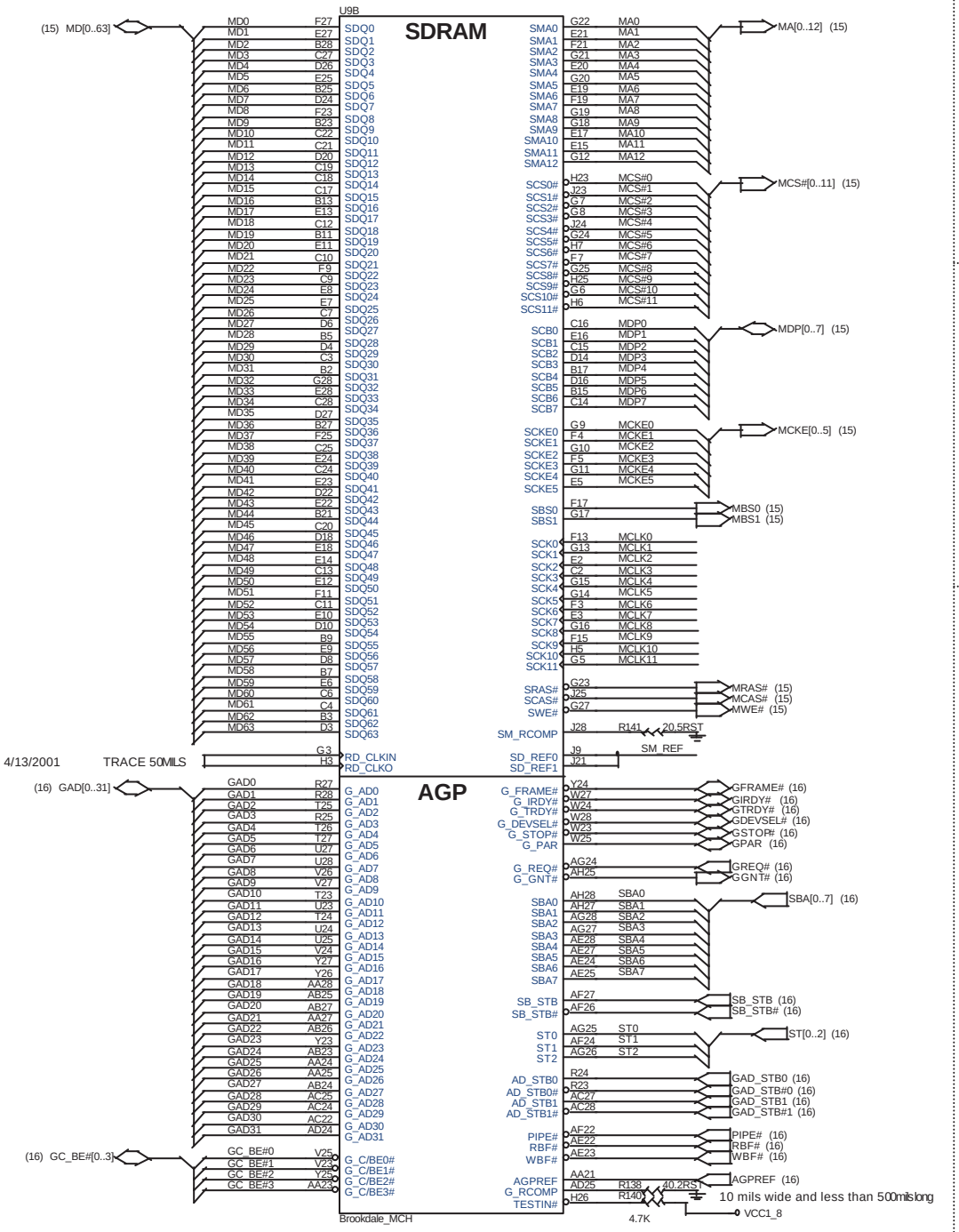
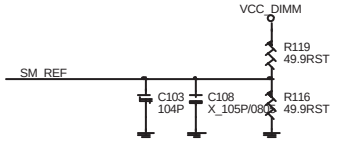
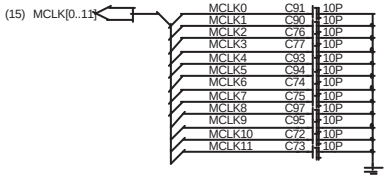


MCH REFERENCE VOLTAGE



MCH MEMORY CLOCK RC CIRCUITS



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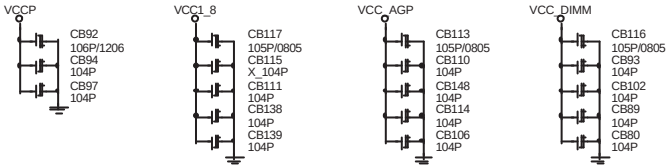
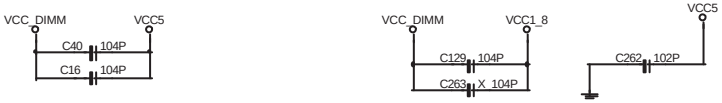
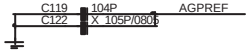
MCH DECOUPLING CAPACITOR





FOR EMI



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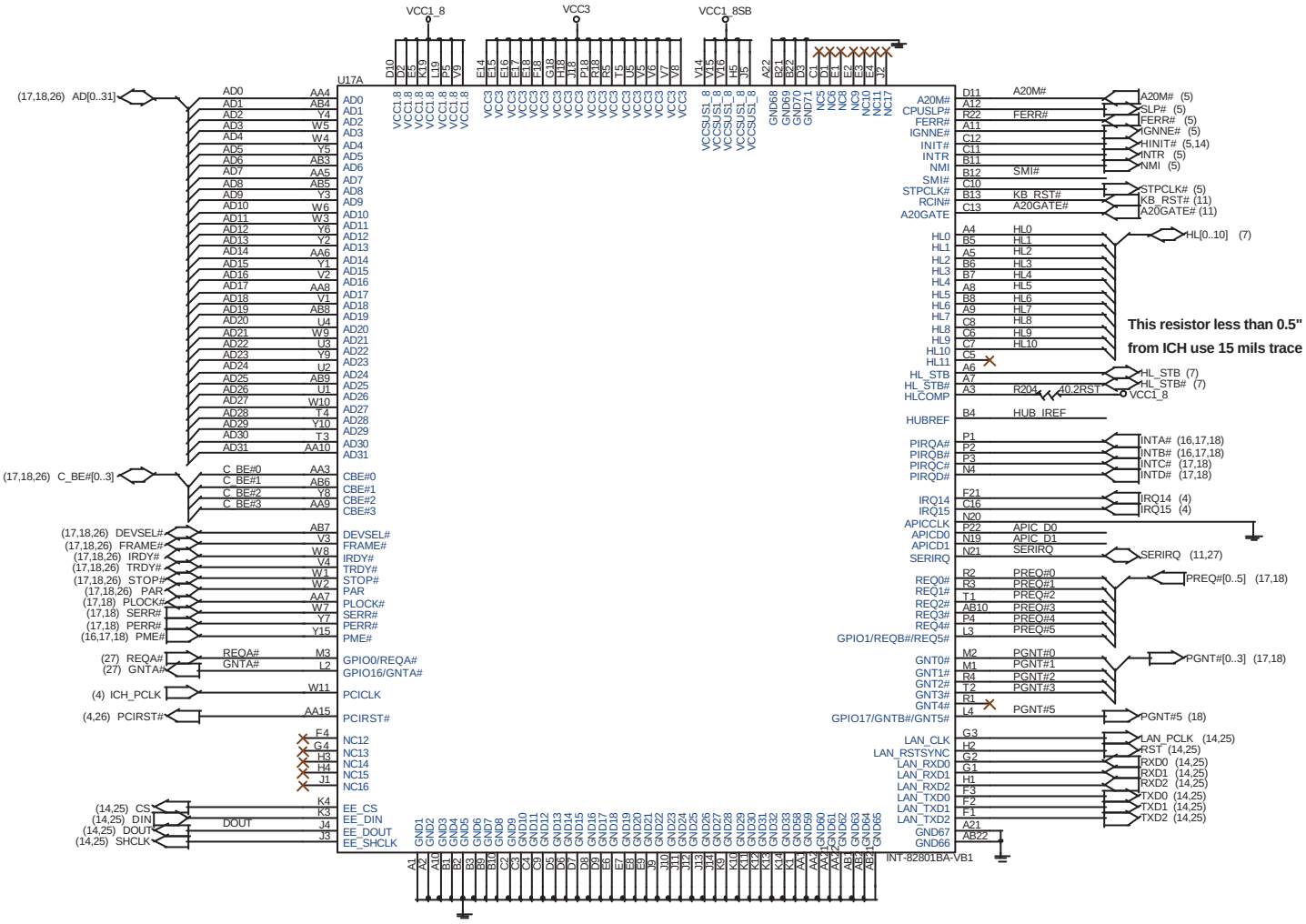
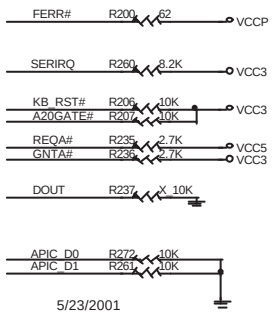
ICH2 PCI / HUB LINK / CPU / LAN / INTERRUPT SIGNALS



This resistor less than 0.5" from ICH use 15 mils trace

ICH2 SMI# SIGNAL

ICH2 STRAPPING RESISTORS



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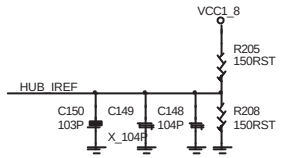
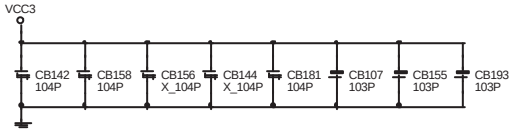
ICH2 REFERENCE VOLTAGE

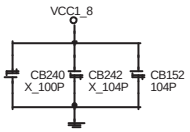


Place Cap. as Close as possible to ICH2
Trace width use 15 mils and 15mils space

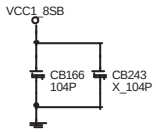
ICH2 DECOUPLING CAPACITORS



Place one 0.1U/0.01U pair in each corner and 2 on opposite sides close to ICH2 if it fit



Distribute near the 1.8V power pin of the ICH2



Distribute near the VCC1_8SB Power pin of the ICH2

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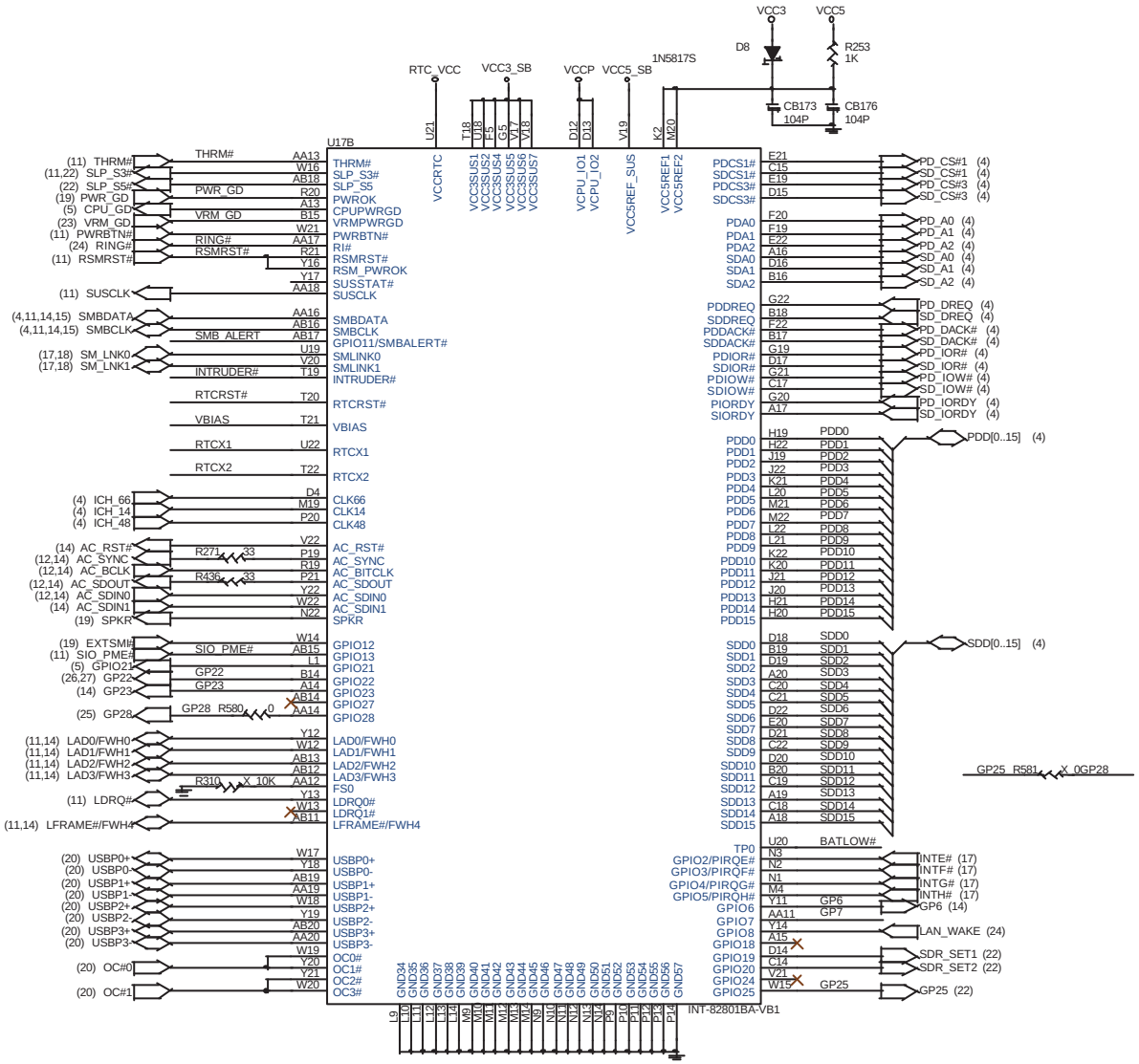
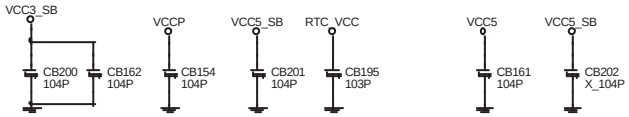
ICH2 ASIC / RTC / AC'97 / GPIO / LPC / USB / IDE SIGNALS

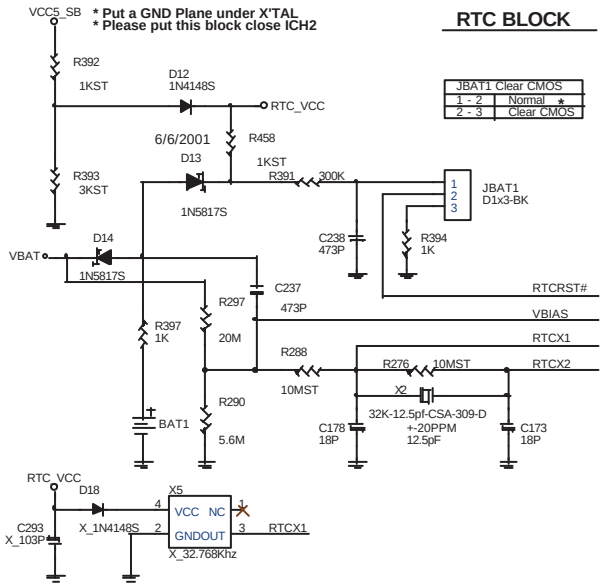


ICH2 DECOUPLING CAPACITOR

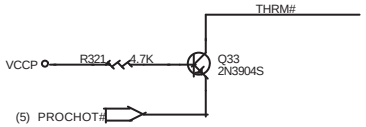


Distribute near the VCC3_SB power pin of the ICH

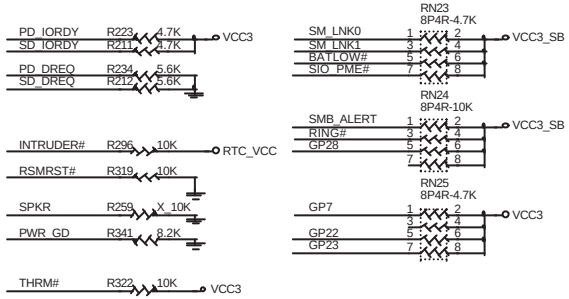
RTC BLOCK



PROCHOT BLOCK



ICH2 STRAPPING RESISTORS



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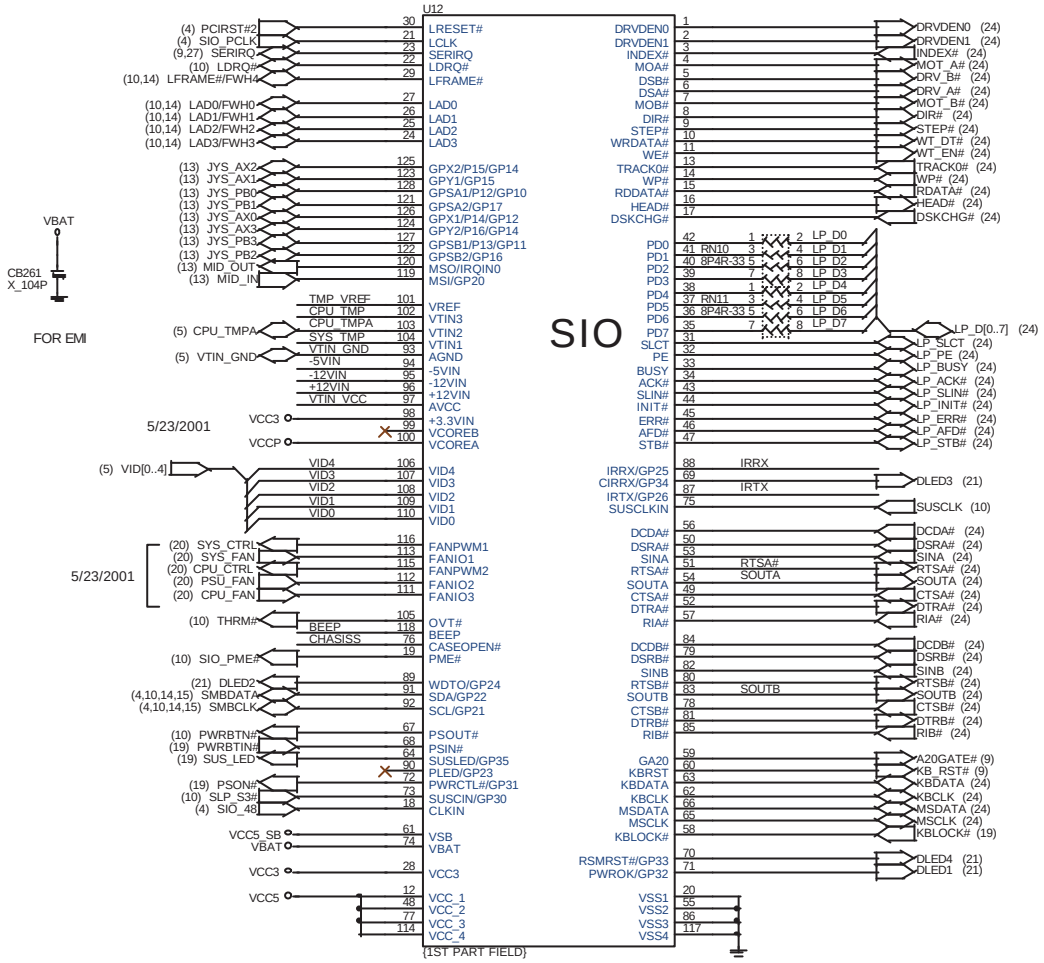
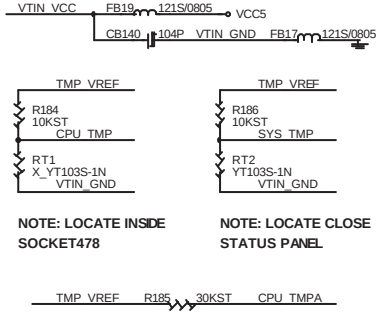
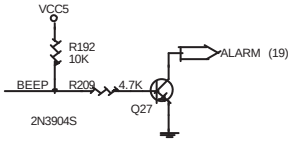
LPC SUPER I/O W83627HF



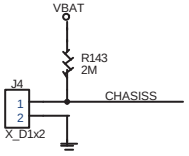
THERMAL RESISTOR BLOCK



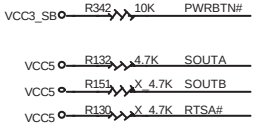
SPEAKER BLOCK



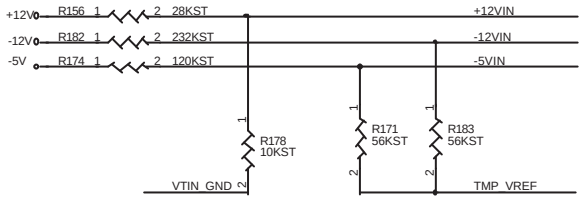
CHASISS INTRUSION HEADER



SUPER I/O STRAPPING RESISTOR



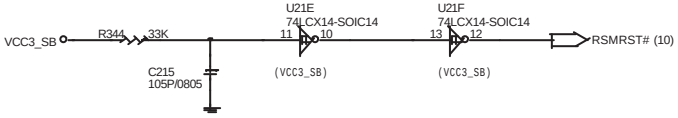
SOUTA	L: Disable KBC	H: Enable KBC
SOUTB	L: 24MHZ	H: 48MHZ
RTSA#	L: CFAD=2E	H: CFAD=4E
DTRA#	L: PNP Default	H: PNP no Default



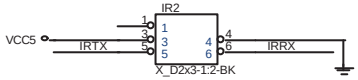
3/16/2001

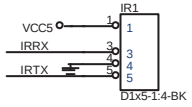
RESUME RESET CIRCUIT BLOCK

Stuff all for D Version bug

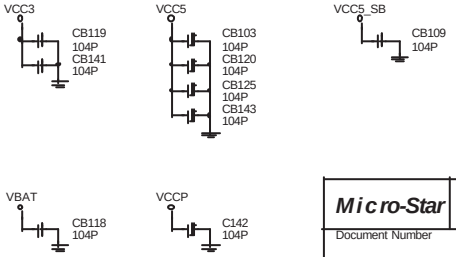


IR HEADER





DECOUPLING CAPACITOR



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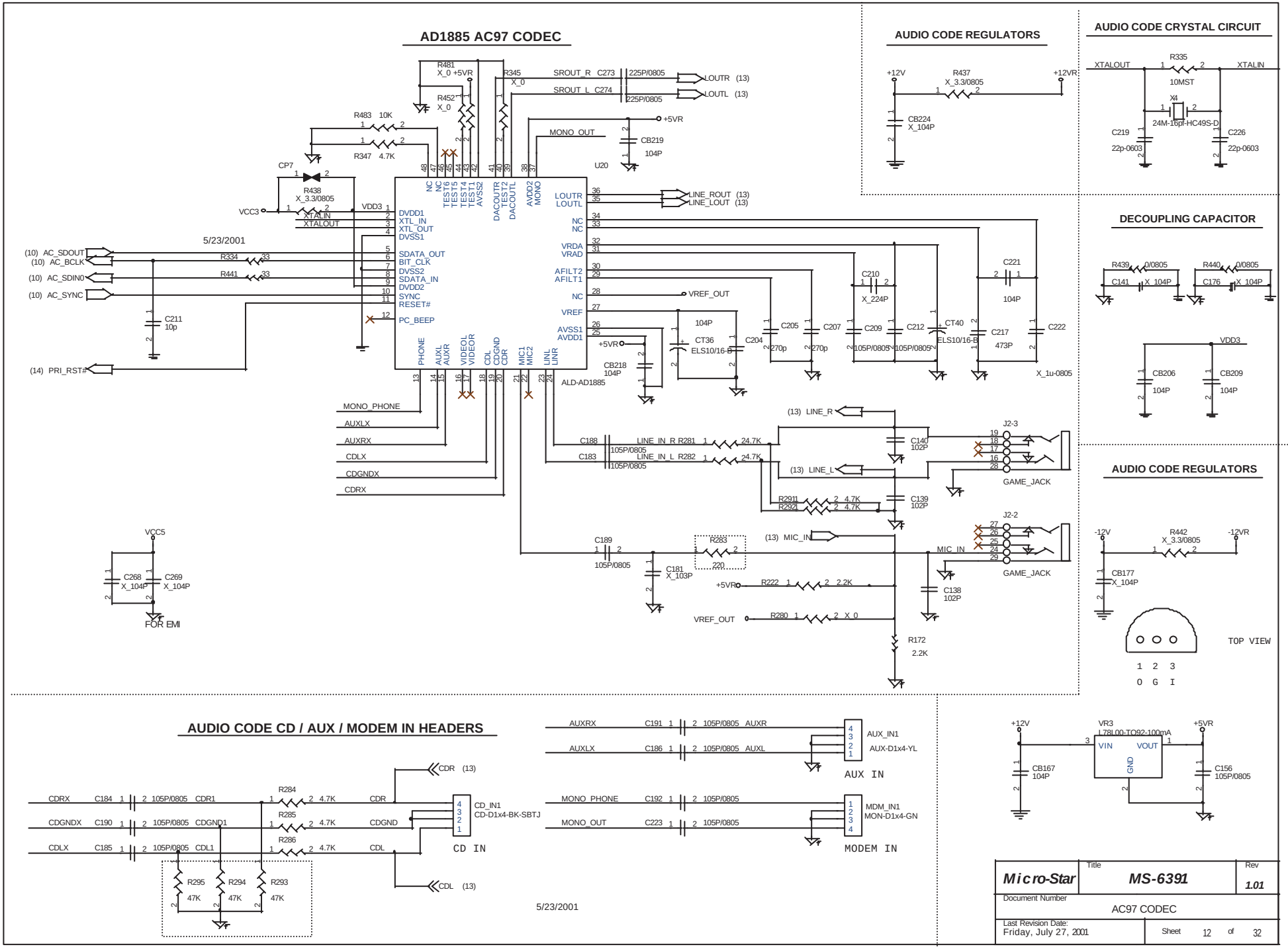
AD1885 AC97 CODEC
AUDIO CODE REGULATORS
AUDIO CODE CRYSTAL CIRCUIT
DECOUPLING CAPACITOR
AUDIO CODE REGULATORS
AUDIO CODE CD / AUX / MODEM IN HEADERS
ALD-AD1885
5/23/2001
FOR EMI
GAME_JACK
TOP VIEW
CD IN
AUX IN
MODEM IN
Micro-Star
MS-6391
1.01
AC97 CODEC
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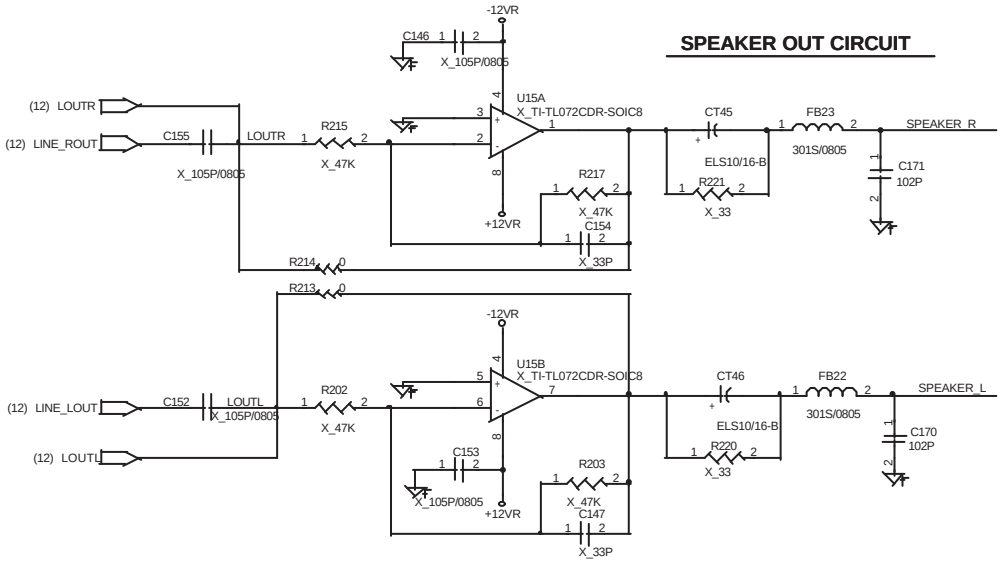
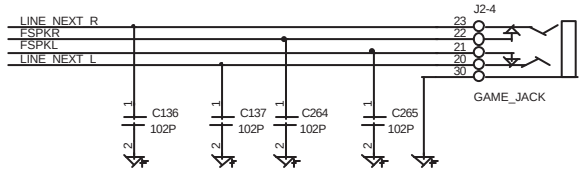
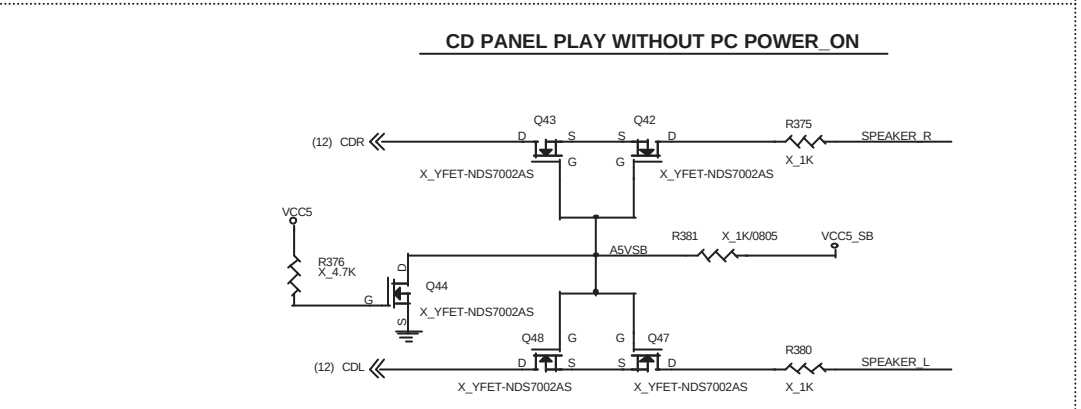
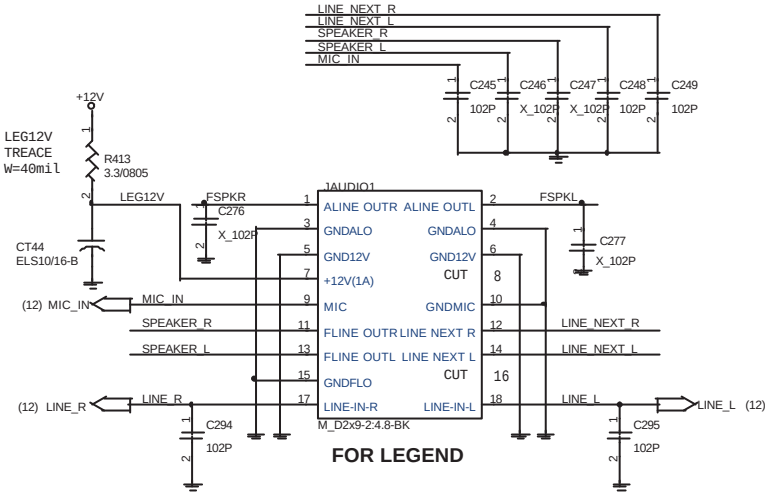
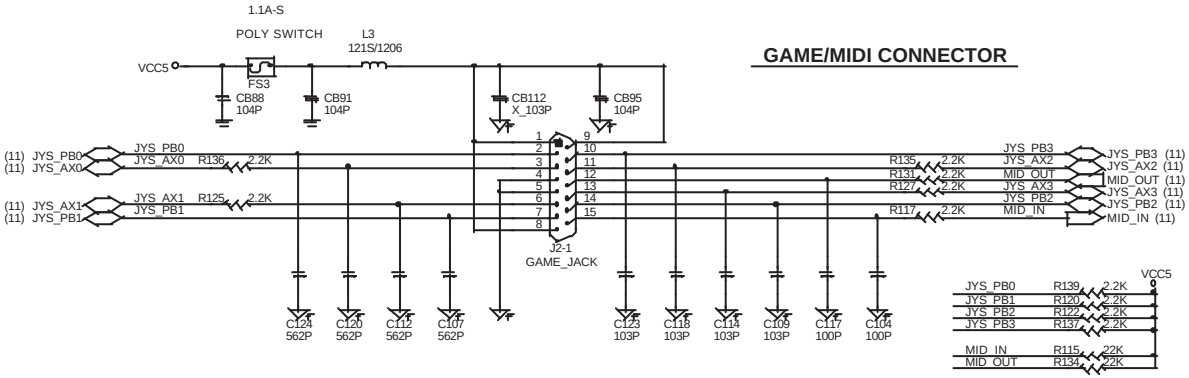
Sheet 12 of 32

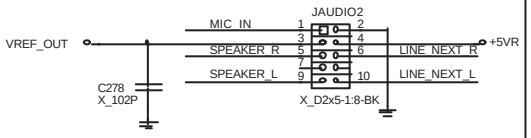












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Document Number: Audio Amp TL072 & GAME		
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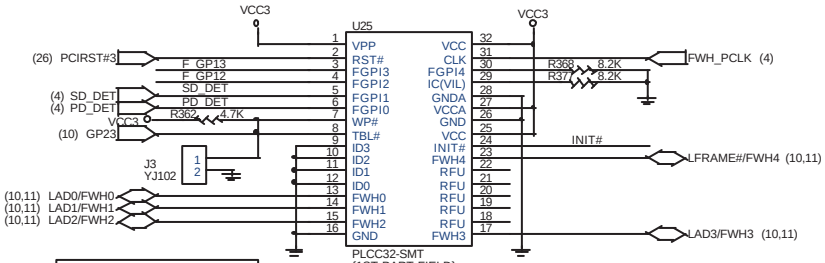
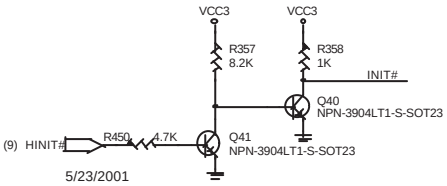
Firware Hub (FWH)

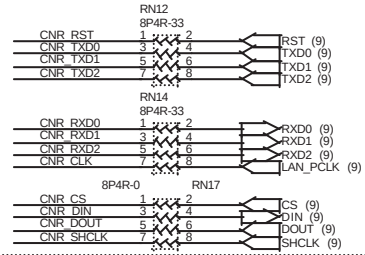


J3 BIOS Update	
SHORT	Locked
* OPEN	Unlocked

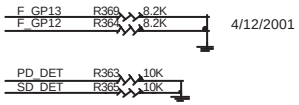
FWH INIT Signal Voltage Translation Block



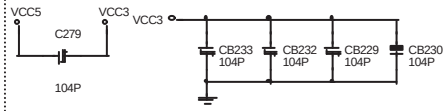
CNR Damping Resistor Net



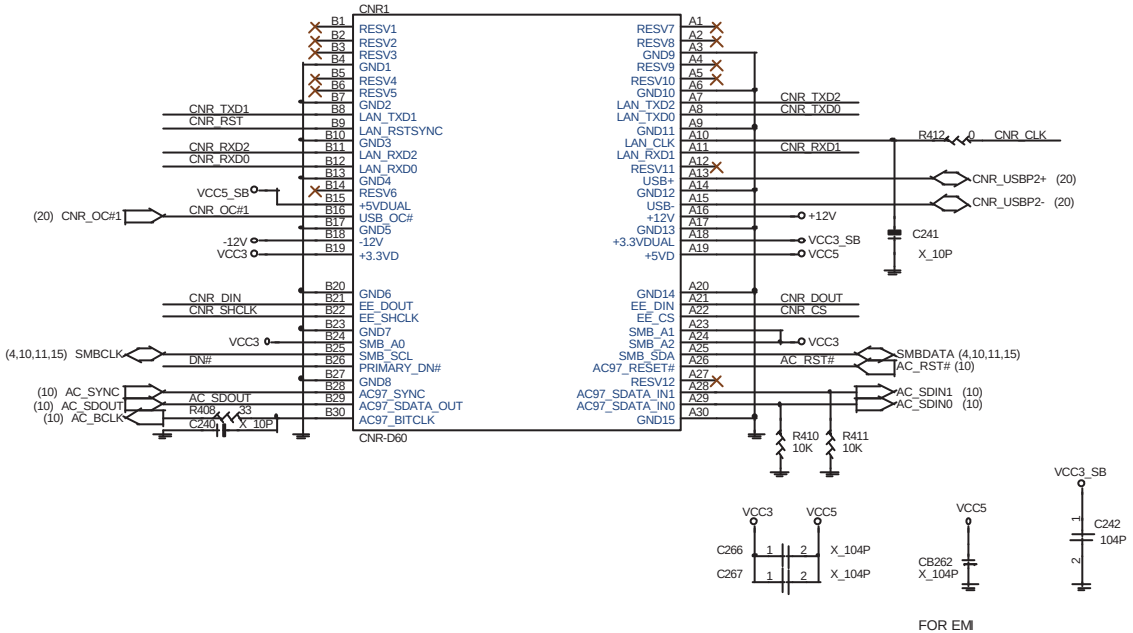
FWH RESISTORS

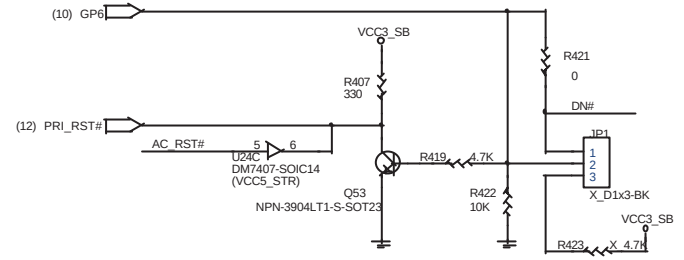


FWH DECOUPLING CAPACITORS



CNR RISER





JP1	AUDIO DOWN
1 - 2	Auto mode
2 - 3	Disabled onboard audio codec

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	Document Number: FWH & CNR RISER	
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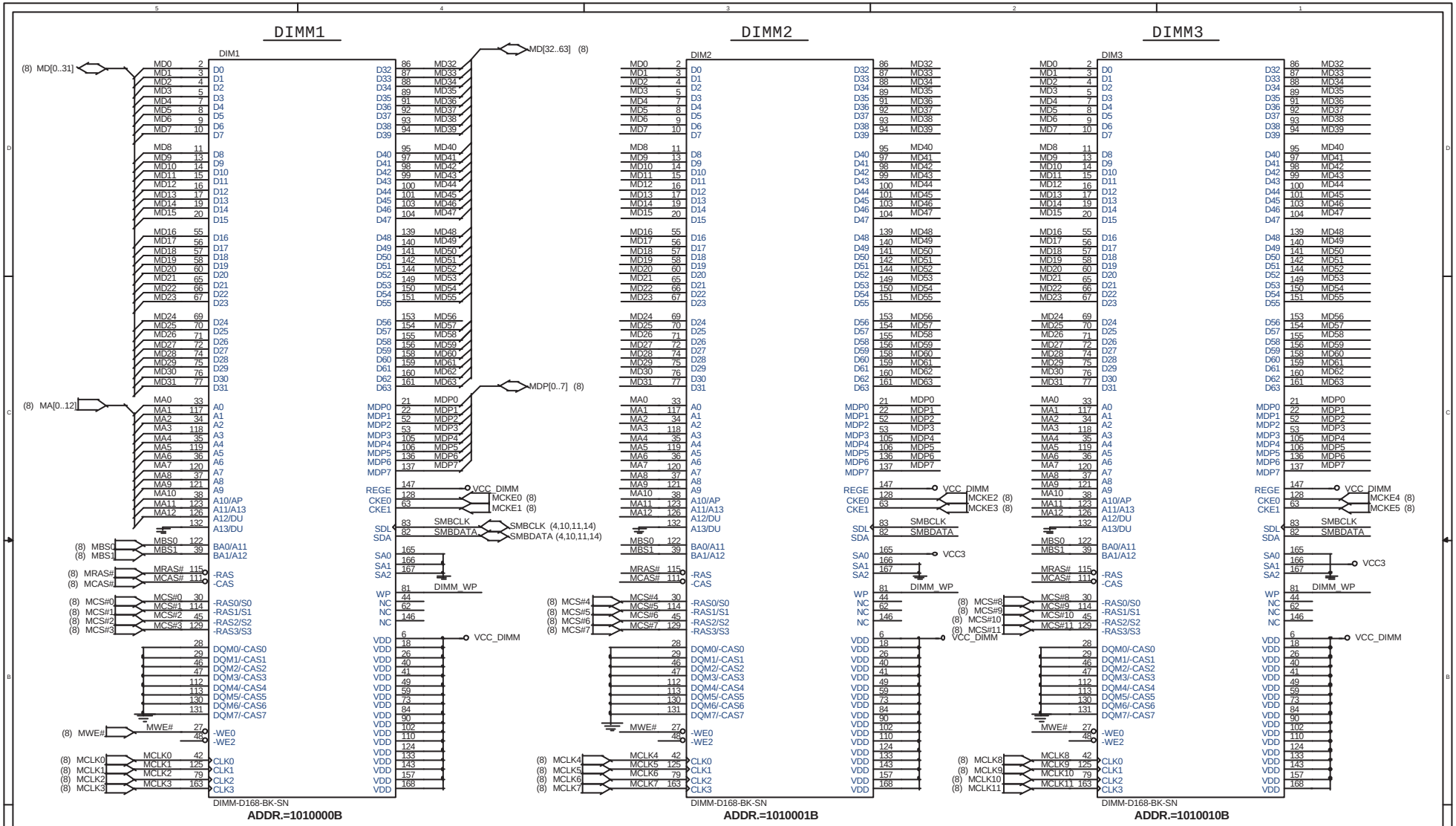
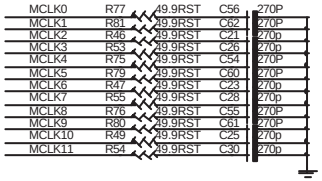
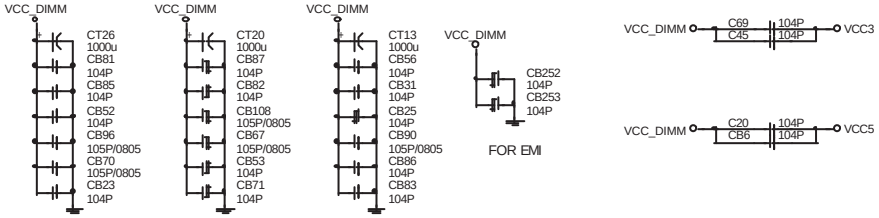


DIMM CLOCK



DECOUPLING CAPACITORS



DIMM SPD WE BLOCK

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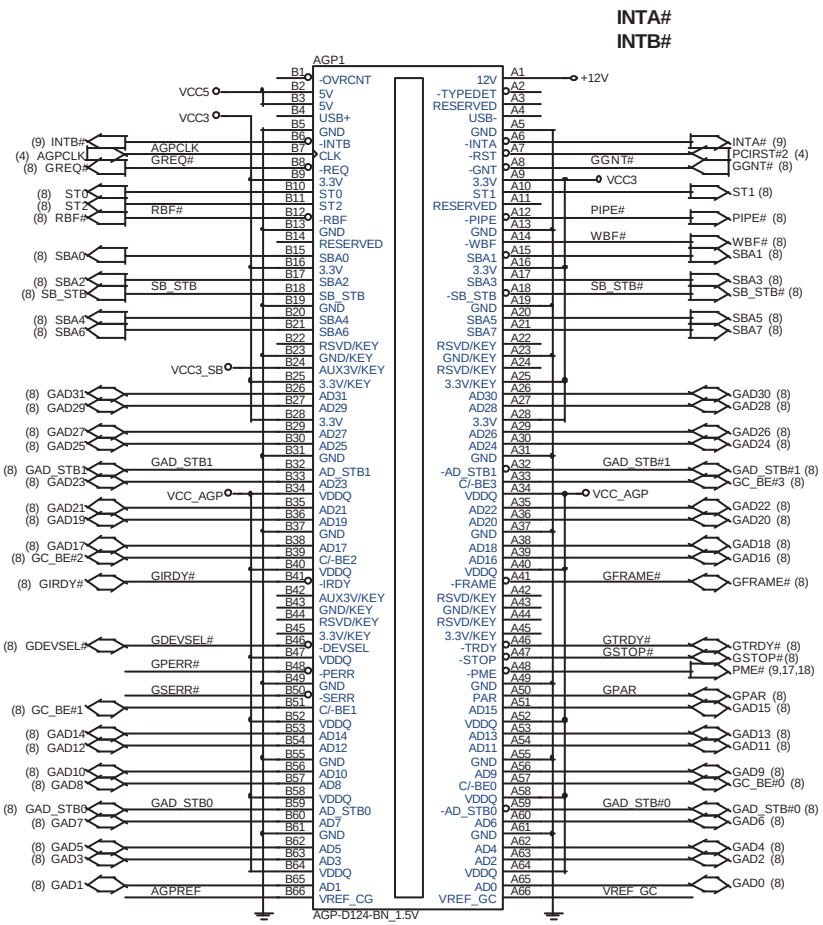
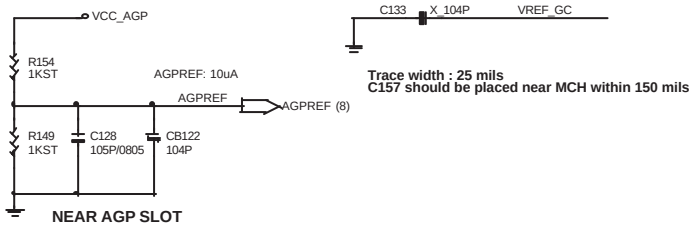
AGP UNIVERSAL 2X/4X SLOT(AGP VER:2.0 COMPLY)

VCC5 = 60mils trace / 15 mils space

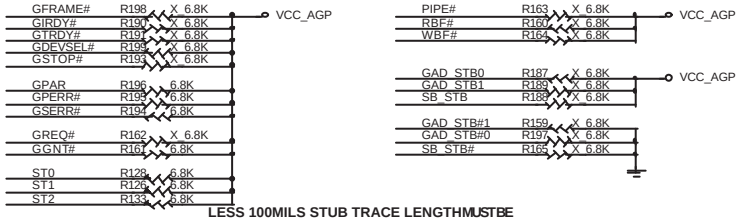


AGP SIGNAL REFERENCE CIRCUIT

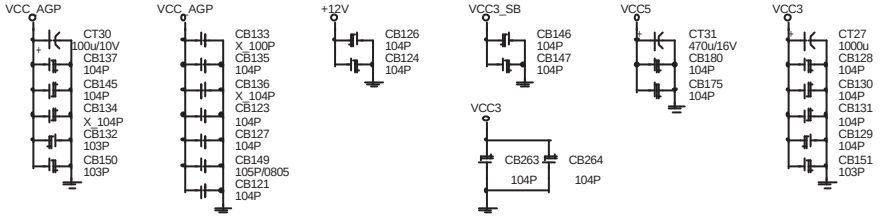
05/24/2001



AGP TERMINATION RESISTORS

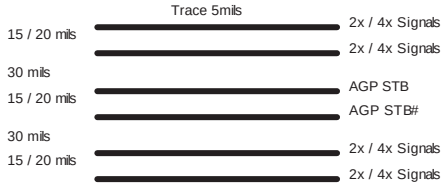


AGP SLOT DECOUPLING CAPACITORS



1X Timing group	2X/4X Timing group
AGPCLK PIPE# RBF# WBF# ST[2..0] GFRAME# GIRDY# GTRDY# GSTOP# GDEVSEL# GREQ# GGNT# GPAR	SET#1 GAD[15..0] GC_BE#[1..0] GAD_STB0 GAD_STB0# SET#2 GAD[31..16] GC_BE#[3..2] GAD_STB1 GAD_STB1# SET#3 SBA[7..0] SB_STB SB_STB#

SIGNALS	Maximum Length	Width	Space	Dismatch Length	Relative to
1X Timing group	7.5"	5 mil	5 mil	X	X
2X/4X Timing group SET#1	7.25"	5 mil	20 mil	+/- 0.125"	GAD_STB0 GAD_STB0#
2X/4X Timing group SET#2	7.25"	5 mil	20 mil	+/- 0.125"	GAD_STB1 GAD_STB1#
2X/4X Timing group SET#3	7.25"	5 mil	20 mil	+/- 0.125"	SB_STB SB_STB#
2X/4X Timing group SET#1	6"	5 mil	15 mil	+/- 0.25"	GAD_STB0 GAD_STB0#
2X/4X Timing group SET#2	6"	5 mil	15 mil	+/- 0.25"	GAD_STB1 GAD_STB1#
2X/4X Timing group SET#3	6"	5 mil	15 mil	+/- 0.25"	SB_STB SB_STB#



Micro-Star	Title: MS-6391		Rev: 1.01
	Document Number: AGP Slot		
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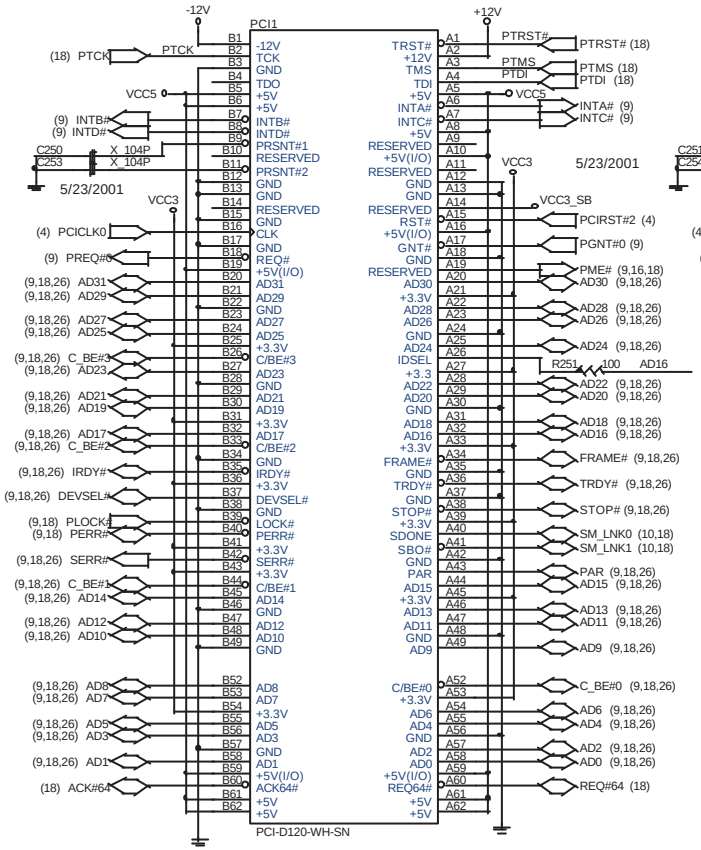
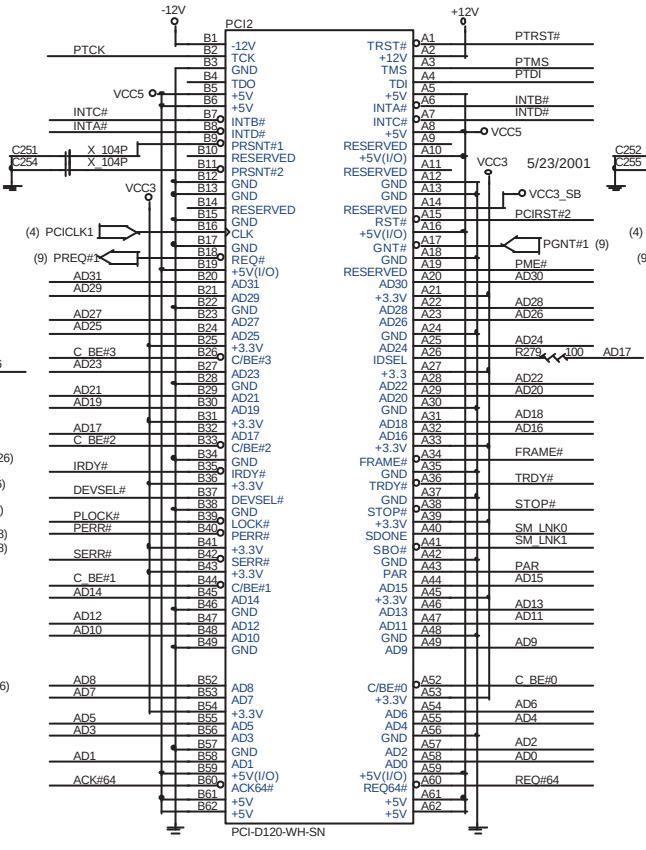
PCI SLOT 1 (PCI VER: 2.2 COMPLY)



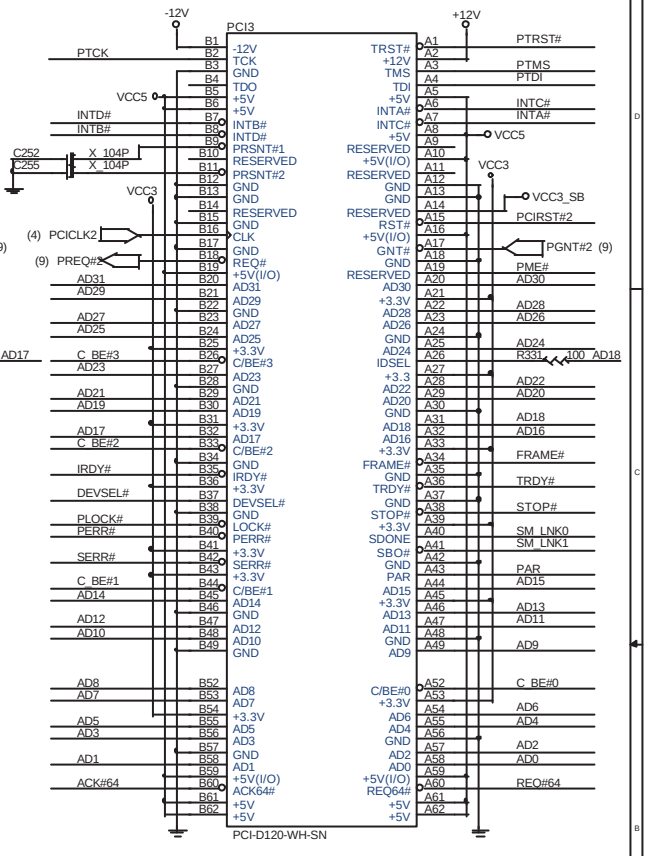
IDSEL = AD16
MASTER = PREQ0
INTA#

PCI SLOT 2 (PCI VER: 2.2 COMPLY)



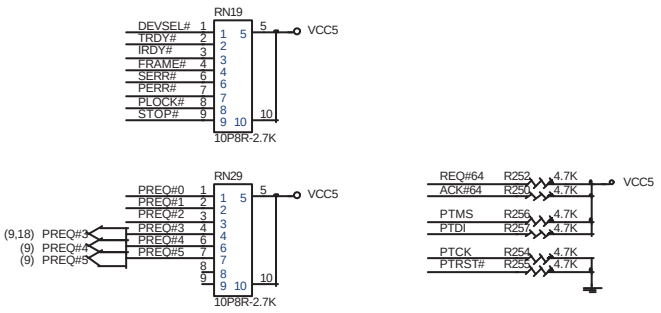
IDSEL = AD17
MASTER = PREQ1
INTB#

PCI SLOT 3 (PCI VER: 2.2 COMPLY)

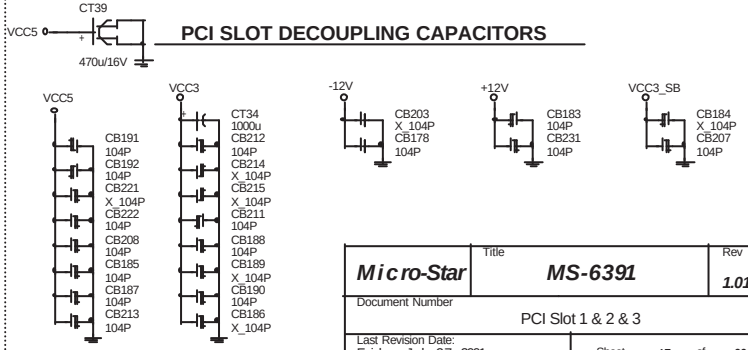


IDSEL = AD18
MASTER = PREQ2
INTC#

PCI PULL-UP / DOWN RESISTORS



PCI SLOT DECOUPLING CAPACITORS



Micro-Star	Title: MS-6391	Rev: 1.01
Document Number: PCI Slot 1 & 2 & 3		
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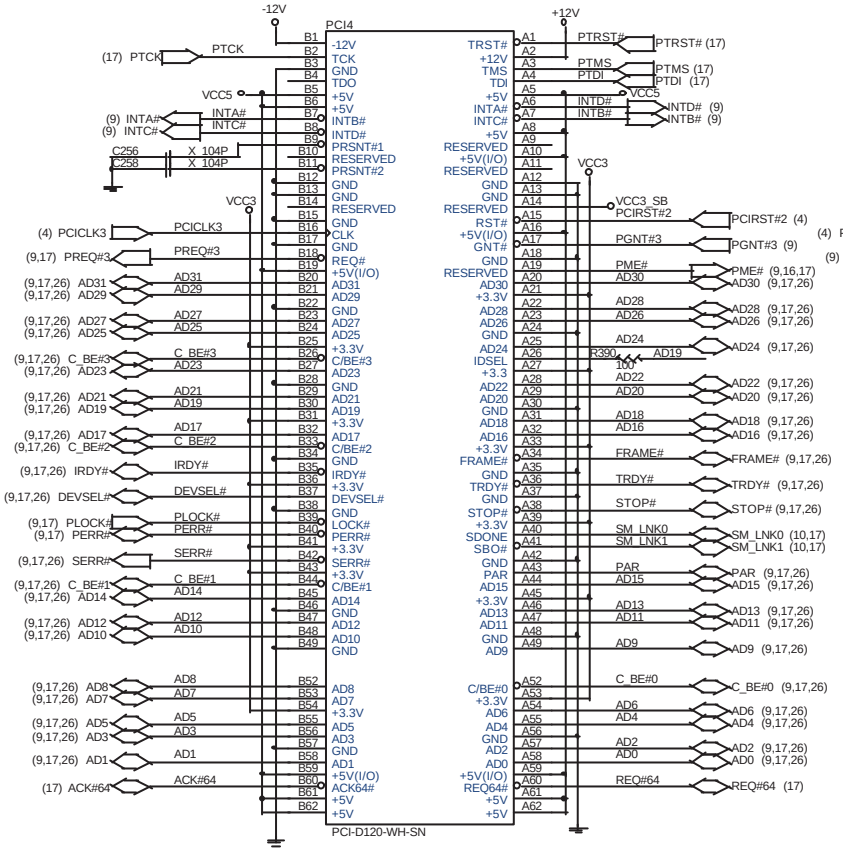
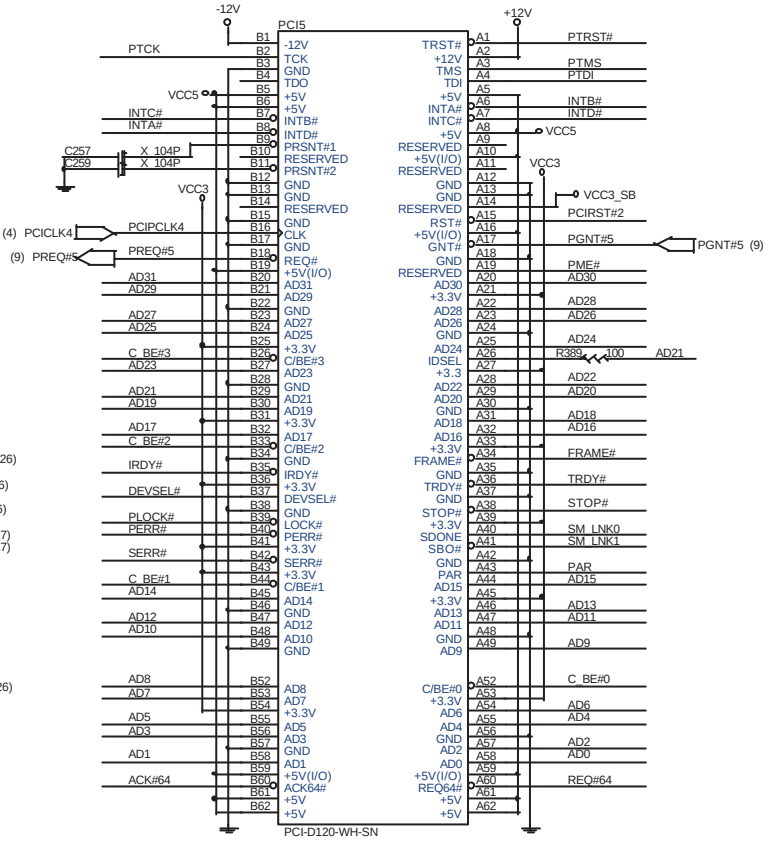
PCI SLOT 4 (PCI VER: 2.2 COMPLY)

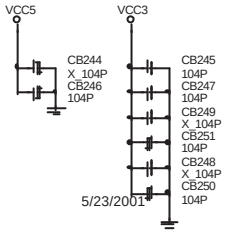


IDSEL = AD19
MASTER = PREQ3
INTD#

PCI SLOT 5 (PCI VER: 2.2 COMPLY)



IDSEL = AD21
MASTER = PREQ5
INTB#



Micro-Star	Title: MS-6391	Rev: 1.01
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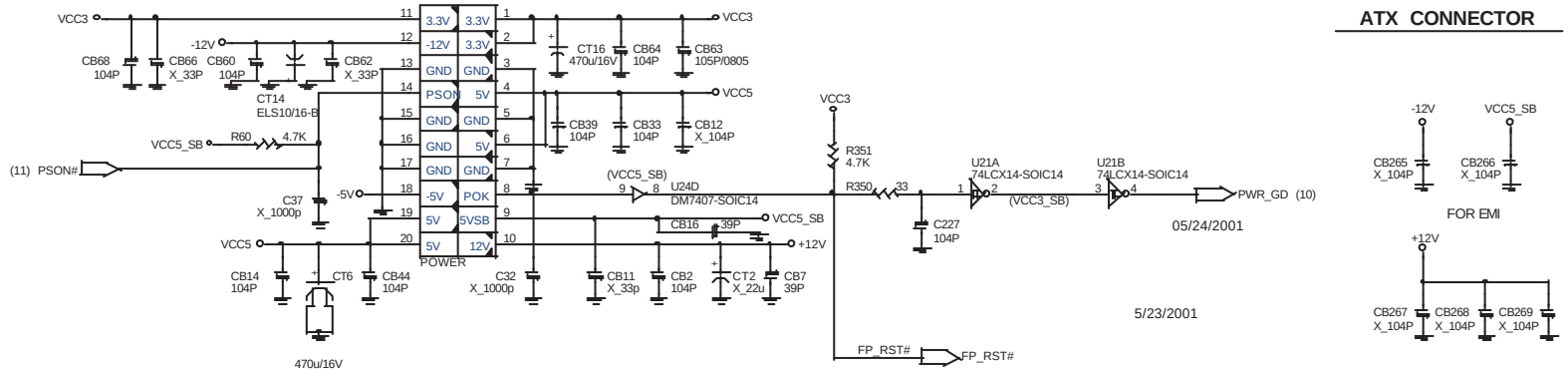
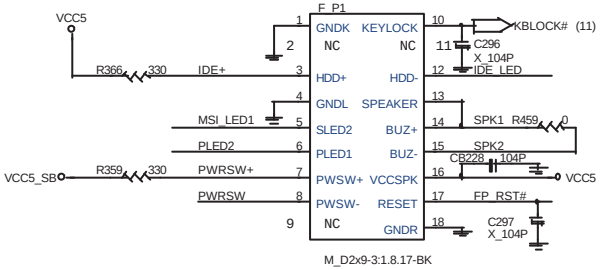
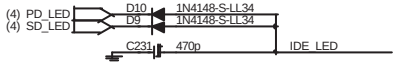
ATX CONNECTOR



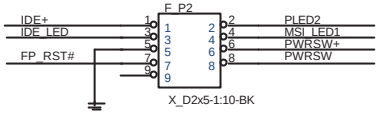
Brookdale FRONT PANEL-M

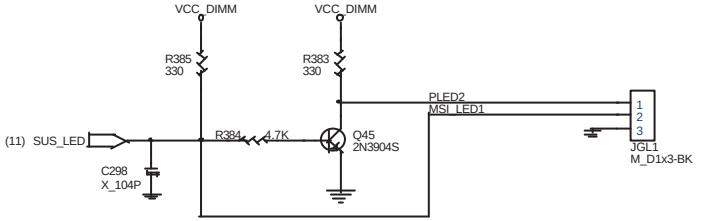


LEGEND	STANDARD
RN33	RN35



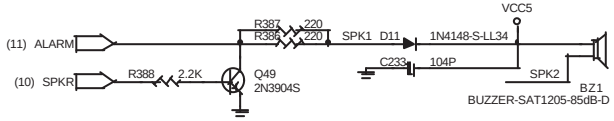
Brookdale FRONT PANEL-I





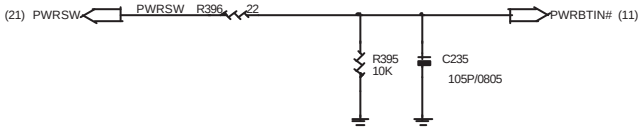
05/24/2001

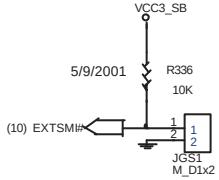
SPEAKER



5/23/2001

POWER BUTTON





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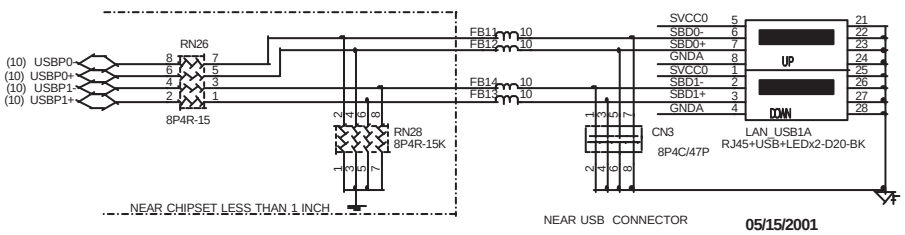
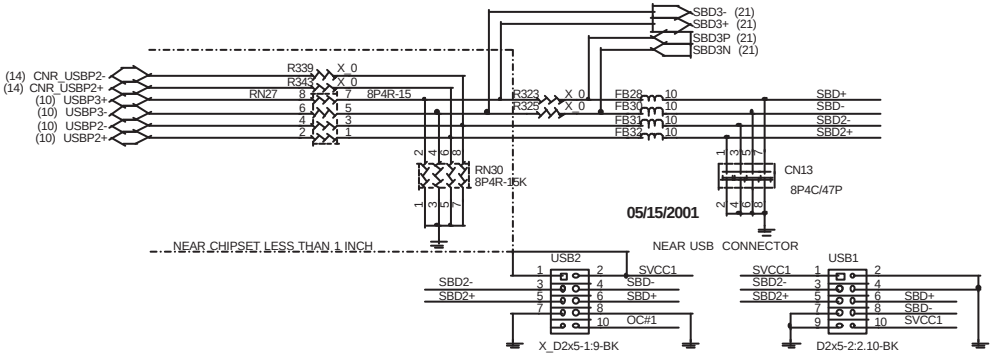
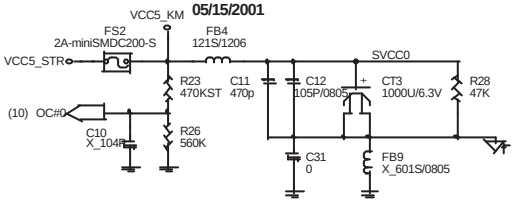
BACK PANEL USB CONNECTOR FOR USB PORT 0,1



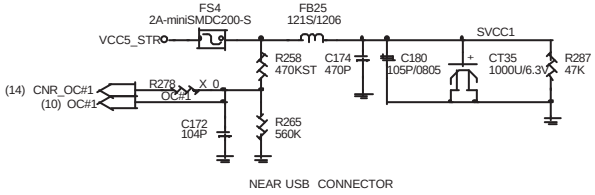
FRONT PANEL USB CONNECTOR FOR USB PORT 2,3



POWER CIRCUIT FOR USB PORT 0,1



POWER CIRCUIT FOR USB PORT 2, 3

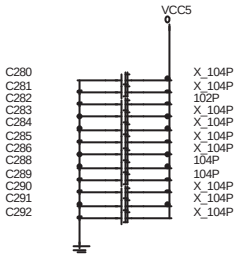


*** USB Trace width : 9 mils**

*** USB Trace Spacing : 25 mils**

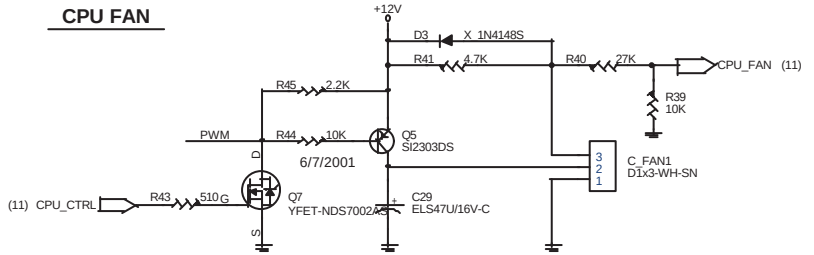
*** Differential USB Signlas Trace Spacing : 18 mils**

*** USB Power Trace must be 40mils width**

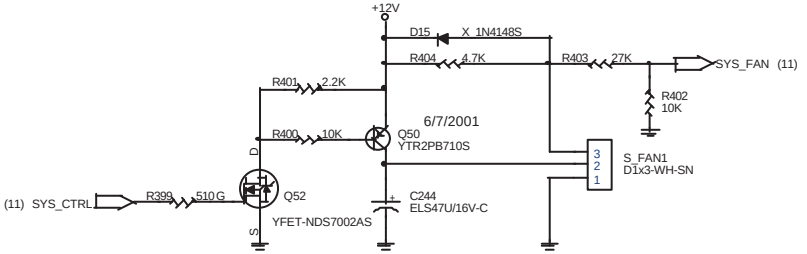


For EMI

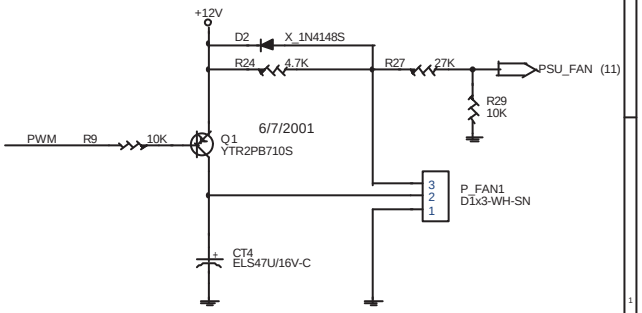
CPU FAN



SYSTEM FAN



ATX PSU FAN ON/OFF CONTROL



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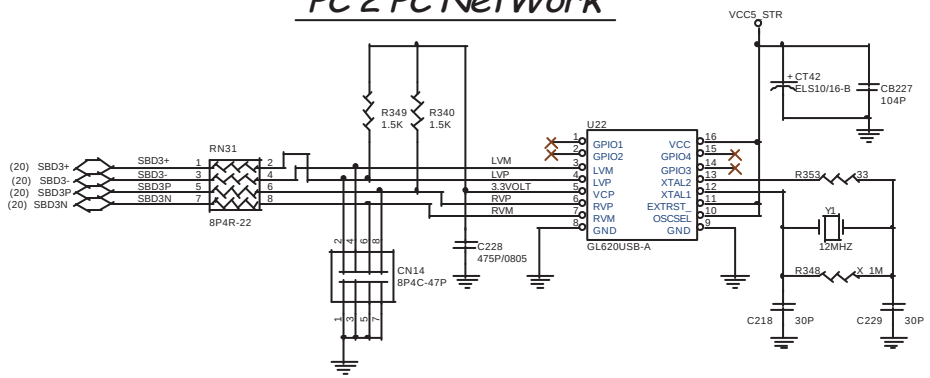
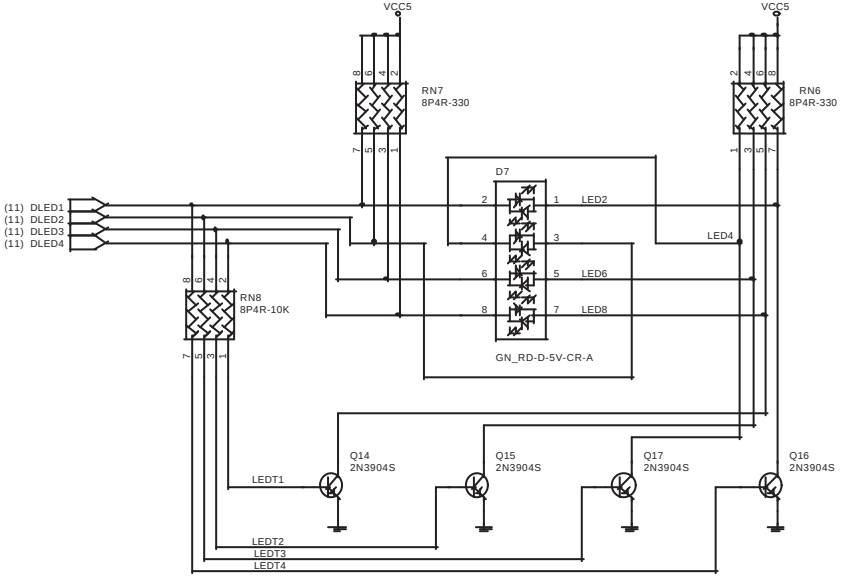
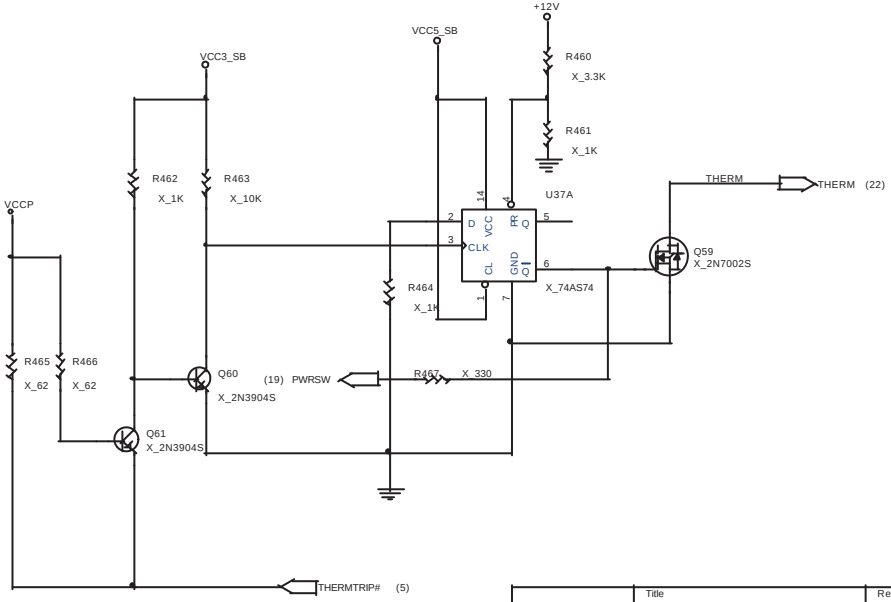
PC 2 PC NetWork



DLED



THERMTRIP



Micro-Star	Title: MS-6391	Rev: 1.01
Document Number: PC2PC & D-LED		
Last Revision Date: Friday, July 27,2001	Sheet 21 of 32	

POWER TRANSLATOR

Power	S0	S3	S5
VCC3_SB	Main	Standby	Standby
VCC5_STR	Main	Standby	0V
VCC_DIMM	Main	Standby	0V

KB/MOUSE/USB WAKEUP	R179	R180
ENABLE	OFF	ON
DISABLE	ON	OFF

VCC3STR	GPO19	GPO20
3.3V	1	1
3.4V	0	1
3.5V	1	0
3.6V	0	0

1.8V STANDBY POWER TRANSLATOR

(40mils trace / 20 mils space)

VCC_AGP

VCC1_8

VCC_VID / VID_GOOD

1.8V/3.3V SEQUENCE CIRCUIT

REGULATORS OUTPUT DECOUPLING CAPACITORS

Micro-Star	MS-6391
Rev	1.01
Document Number	Voltage Regulator
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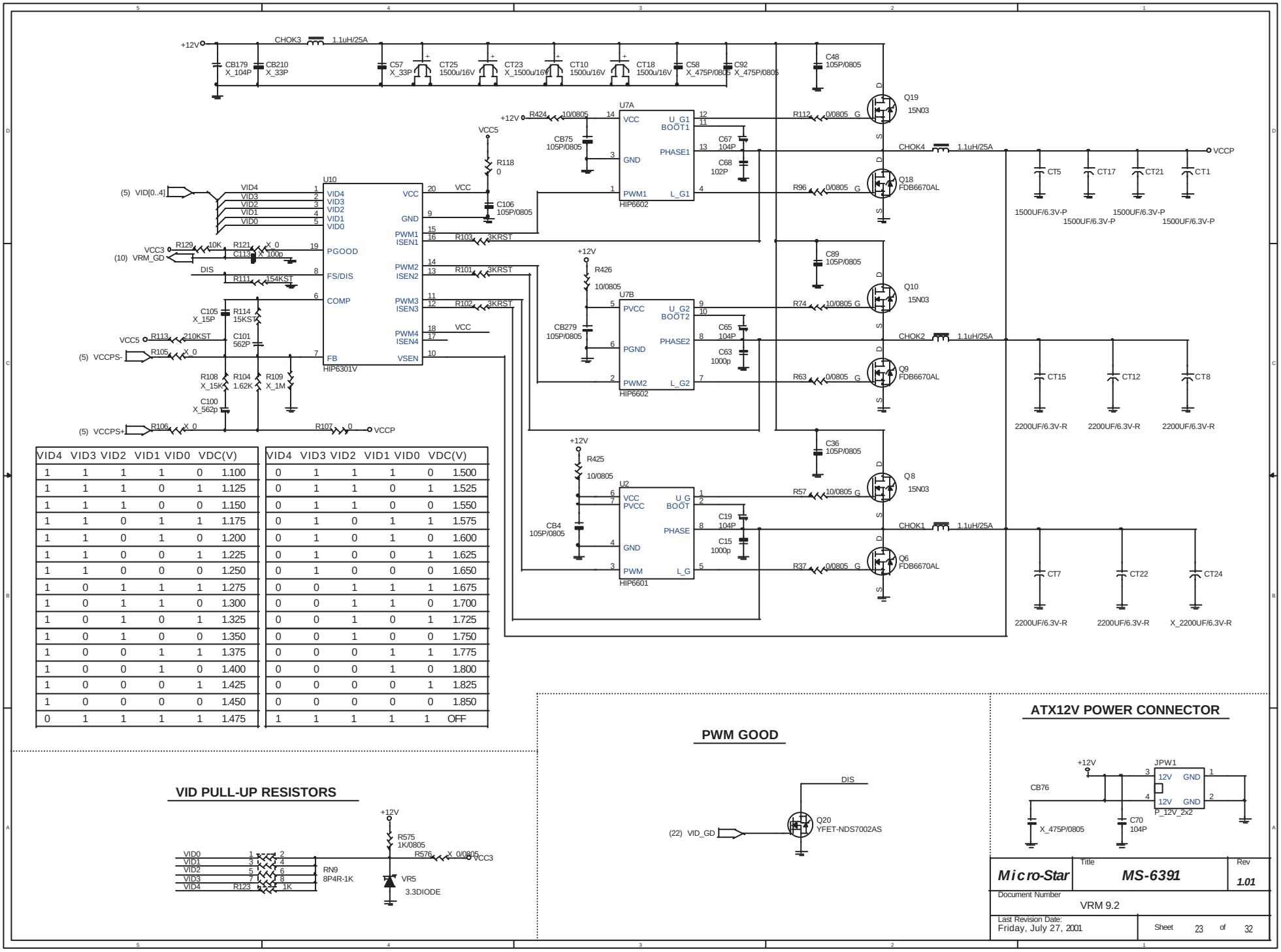


VID4	VID3	VID2	VID1	VID0	VDC(V)
1	1	1	1	0	1.100
1	1	1	0	1	1.125
1	1	1	0	0	1.150
1	1	0	1	1	1.175
1	1	0	1	0	1.200
1	1	0	0	1	1.225
1	1	0	0	0	1.250
1	0	1	1	1	1.275
1	0	1	1	0	1.300
1	0	1	0	1	1.325
1	0	1	0	0	1.350
1	0	0	1	1	1.375
1	0	0	1	0	1.400
1	0	0	0	1	1.425
1	0	0	0	0	1.450
0	1	1	1	1	1.475

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

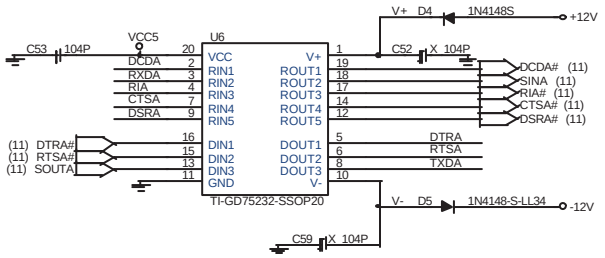
VID PULL-UP RESISTORS

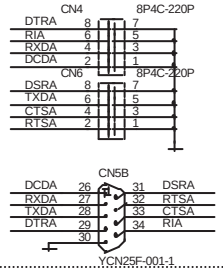
PWM GOOD

ATX12V POWER CONNECTOR

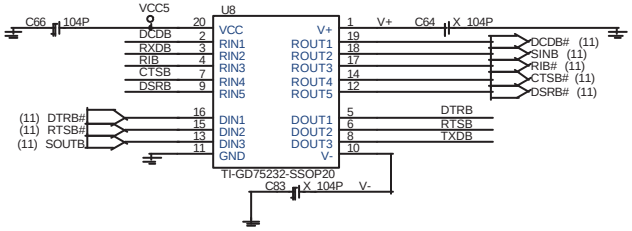
Micro-Star	Title: MS-6391	Rev: 1.01
Document Number: VRM 9.2		
Last Revision Date: Friday, July 27, 2001	Sheet 23 of 32	

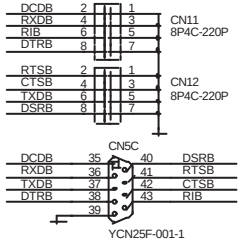
SERIAL PORT 1



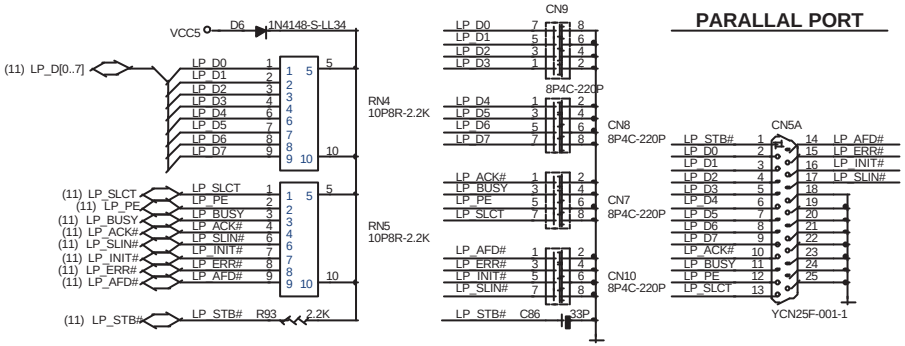


SERIAL PORT 2

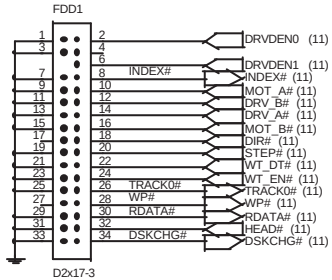




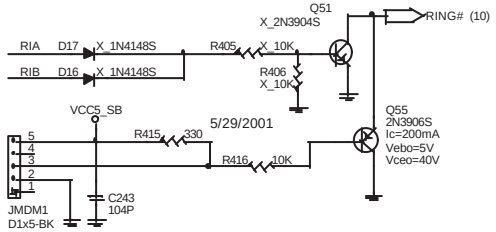
PARALLAL PORT



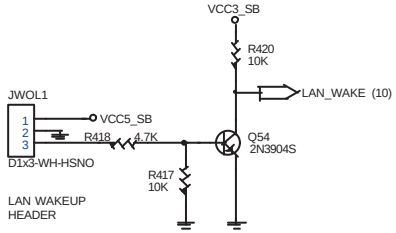
FLOPPY CONNECTOR



MODEM RING BLOCK

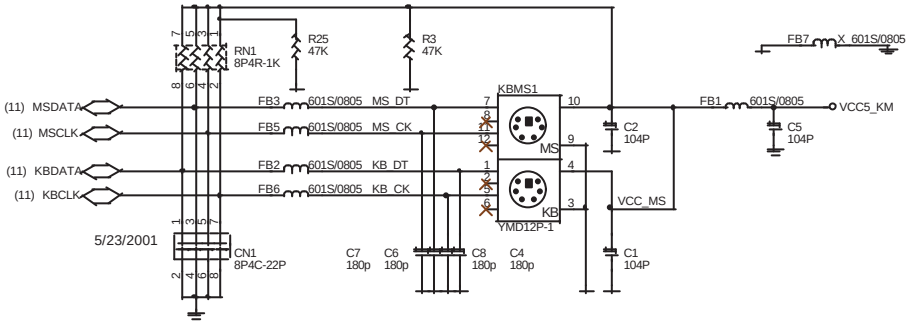


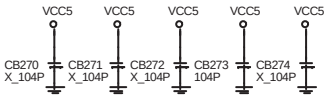
LAN WAKEUP BLOCK



PS2 KEYBOARD & MOUSE CONNECTOR

05/15/2001





Micro-Star	Title: MS-6391	Rev: 1.01
Document Number: IO Connector		
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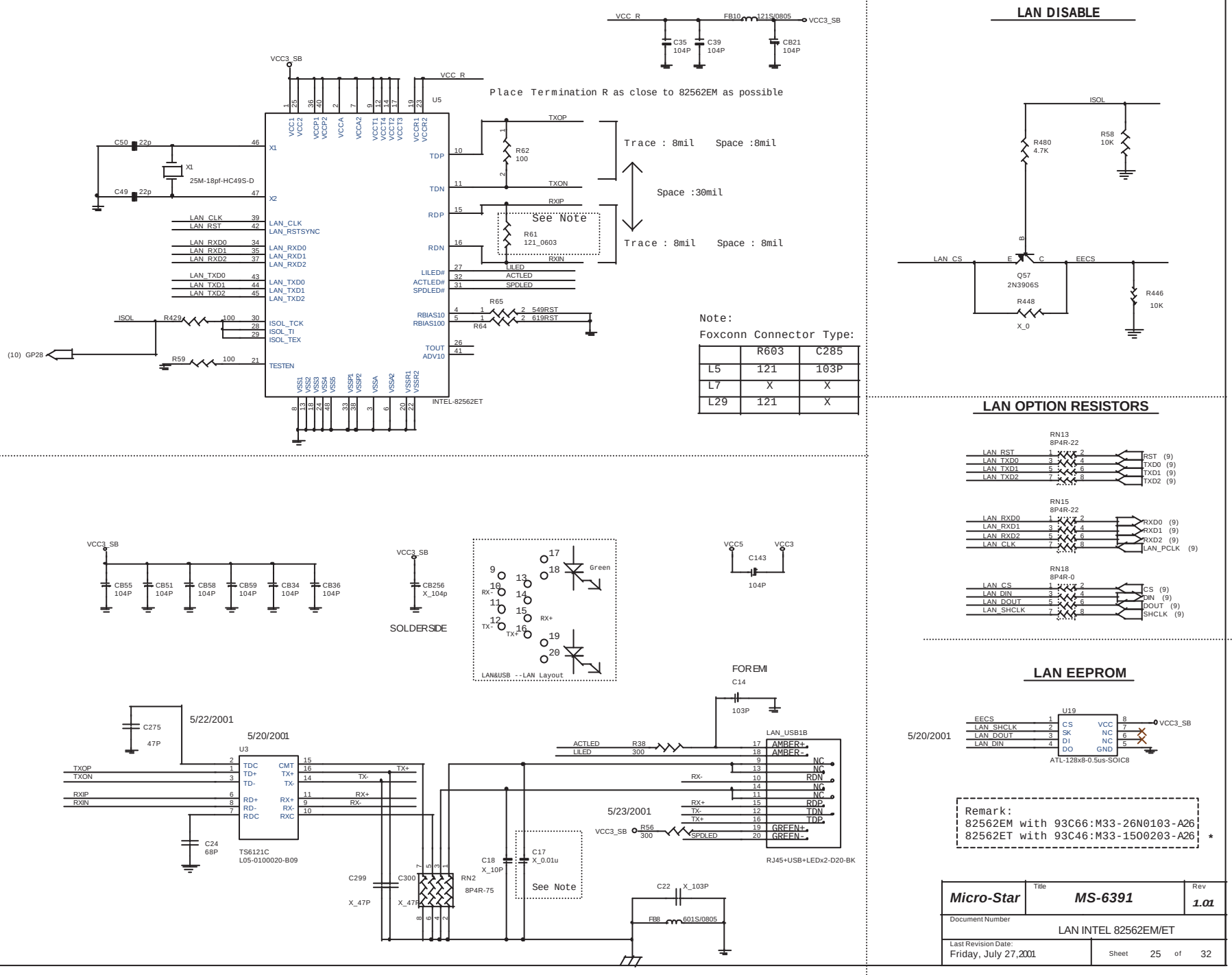


	R603	C285
L5	121	103P
L7	X	X
L29	121	X

LAN DISABLE

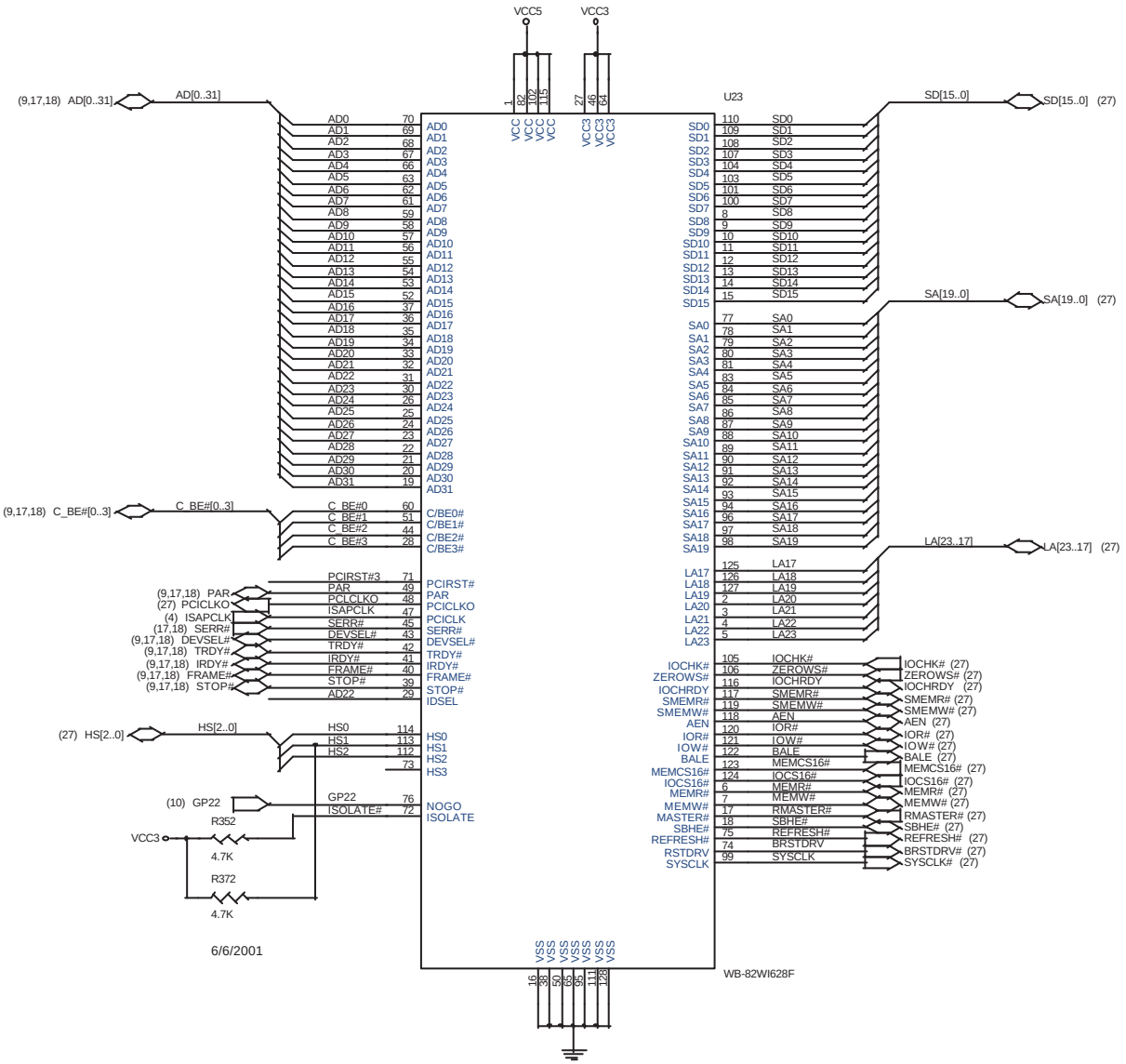
LAN OPTION RESISTORS

LAN EEPROM

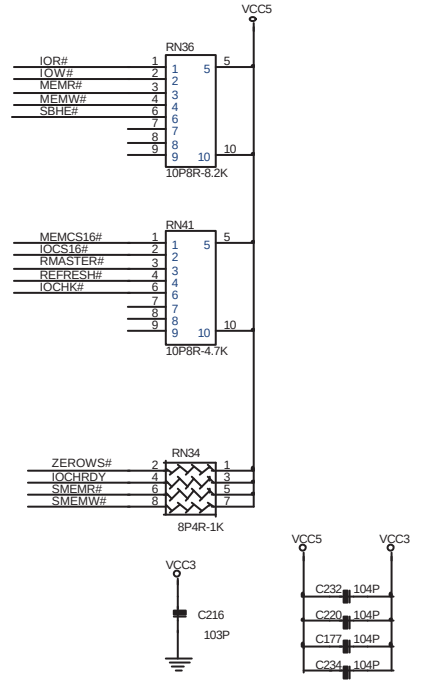
Remark:
82562EM with 93C66:M33-26N0103-A26
82562ET with 93C46:M33-1500203-A26 *

Micro-Star	Title: MS-6391	Rev: 1.01
Document Number: LAN INTEL 82562EM/ET		
Last Revision Date: Friday, July 27,2001	Sheet 25 of 32	

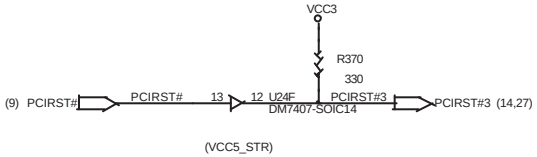
PCI To ISA Bridge, Part 1



PCI to ISA Bridge Pull Up / Low



PCI to ISA Bridge Reset



Micro-Star	Title: MS-6391	Rev: 1.01
Document Number: ISA Bridge Part 1		
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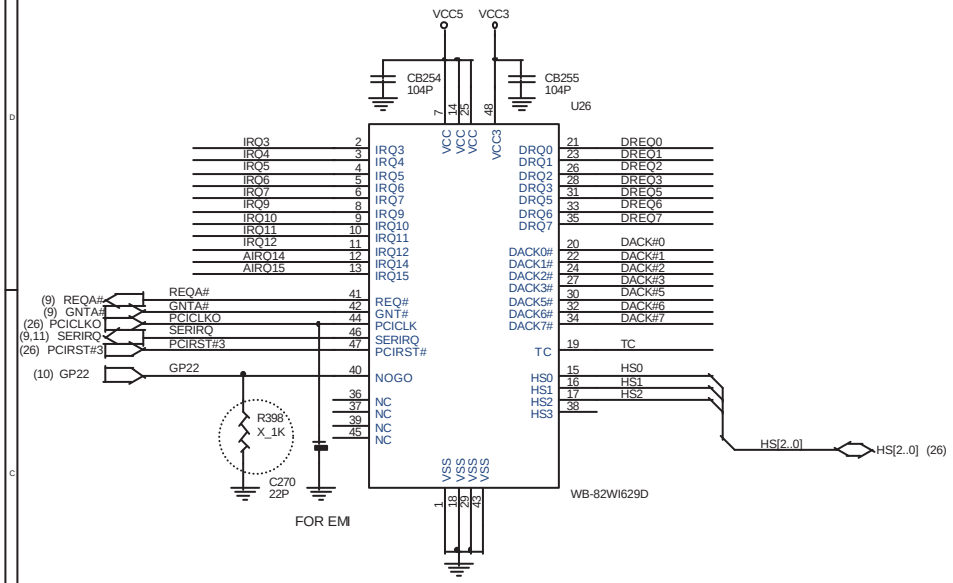
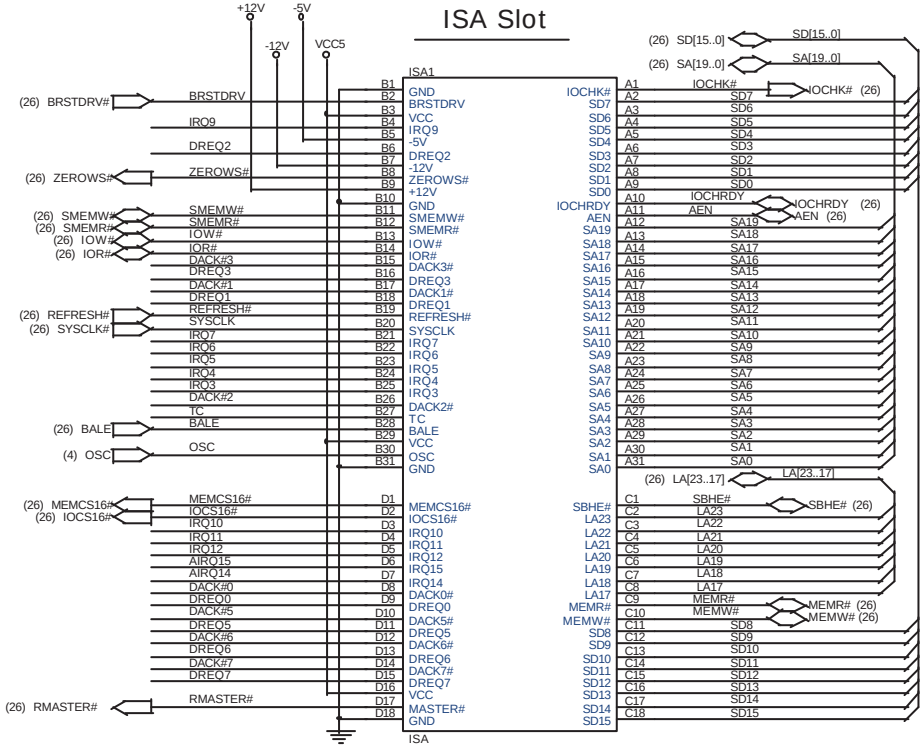
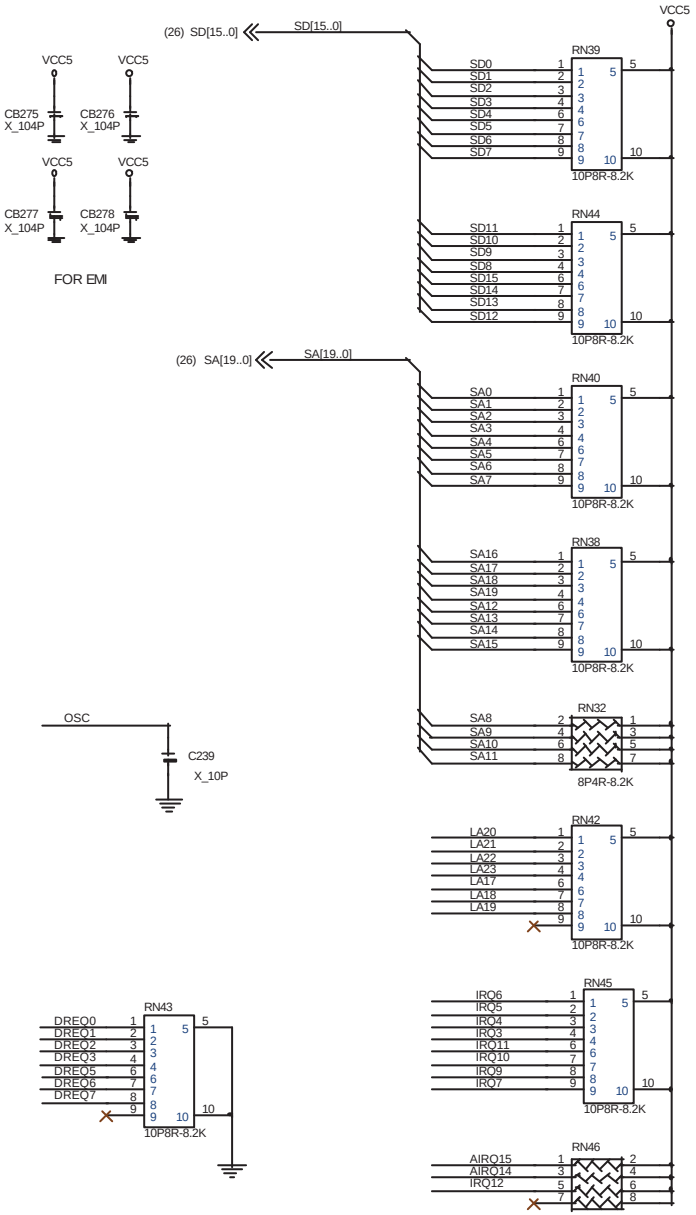
PCI To ISA Bridge, Part 2



ISA Slot



PCI to ISA Bridge Pull Up / Low



Micro-Star	Title: MS-6391	Rev: 1.01
Document Number: ISA Bridge Part 2 / ISA SLOT		
Last Revision Date: Friday, July 27, 2001	Sheet 27 of 32	

Jumper Setting & Connector Setting

Jumper	Description	
J3	BIOS function	
1-2	Normal	(Default)
2-3	Configuration Mode	
JBAT1	CLEAR CMOS	
1-2	NORMAL	(Default)
2-3	CLEAR CMOS	
JP1	CNR RISER CODEC SELECT HEADER	
1-2	AUTO MODE	(Default)
2-3	PRIMARY AUDIO CODEC ONBOARD	
JP4	LEGEND LAN HEADER	
1-3/2-4	Enable	
3-5/4-6	Disable	

Connector	Description
U3	INTEL mPGA478-B CPU
IDE1	Primary
IDE2	Secondary
DIM1	SDRAM DIMM1
DIM2	SDRAM DIMM2
DIM3	SDRAM DIMM3
AGP1	AGP Slot
PCI1	PCI Slot1
PCI2	PCI Slot2
PCI3	PCI Slot3
PCI4	PCI Slot4
PCI5	PCI Slot5
COM1	Serial Port
COM2	Serial Port
LPT	Parallel Port
FDD1	Floopy
JMDM1	MODEM RING HEADER
JWOL1	LAN WAKEUP HEADER
KBMS1	PS/2 Keyboard and PS/2 mouse
USB1	USB REAR CONNECTOR
USB2	USB INTERNAL HEADER
POWER	ATX Power
F_P1	Front Panel
C_FAN1	CPU FAN HEADER
S_FAN1	SYS FAN HEADER
P_FAN1	ATX FAN HEADER
JAUDIO1	AUDIO HEADER FOR LEGEND
CD_IN1	CD IN HEADER
CD_IN2 / JSCD1	CD-IN HEADER FOR LEGEND
AUX_IN1	AUX_IN HEADER
MDM_IN1	MODEM_IN HEADER
IR1	IR HEADER
JPW1	ATX12V Power

Micro-Star	Title: MS-6391	Rev: 1.01
Document Number: JUMPER SETTING		
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JBAT1 Clear CMOS		
1 - 2	Normal	*
2 - 3	Clear CMOS	

JBAT1(1-2)
YJUMPER-MG

LEGEND AUDIO

(KKK)
JC-D2x2-GN

BAT SOCKET

BAT1[A]
YSKTBT

J7 BIOS Update	
SHORT	Locked
OPEN	Unlocked *

J3(1)
YJUMPER-MG

AGP

B1	-OVRCNT	12V	A1
B2	5V	-TYPEDET	A2
B3	5V	RESERVED	A3
B4	USB+	USB-	A4
B5	GND	GND	A5
B6	-INTB	-INTA	A6
B7	CLK	-RST	A7
B8	-REQ	-GNT	A8
B9	3.3V	3.3V	A9
B10	ST0	ST1	A10
B11	ST2	RESERVED	A11
B12	-RBF	-PIPE	A12
B13	GND	GND	A13
B14	RESERVED	-WBF	A14
B15	SBA0	SBA1	A15
B16	3.3V	3.3V	A16
B17	SBA2	SBA3	A17
B18	SB_STB	-SB_STB	A18
B19	GND	GND	A19
B20	SBA4	SBA5	A20
B21	SBA6	SBA7	A21
B22	RSVD/KEY	RSVD/KEY	A22
B23	GND/KEY	GND/KEY	A23
B24	AUX3V/KEY	RSVD/KEY	A24
B25	3.3V/KEY	3.3V/KEY	A25
B26	AD31	AD30	A26
B27	AD29	AD28	A27
B28	3.3V	3.3V	A28
B29	AD27	AD26	A29
B30	AD25	AD24	A30
B31	GND	GND	A31
B32	AD_STB1	-AD_STB1	A32
B33	AD23	C/-BE3	A33
B34	VDDQ	VDDQ	A34
B35	AD21	AD22	A35
B36	AD19	AD20	A36
B37	GND	GND	A37
B38	AD17	AD18	A38
B39	C/-BE2	AD16	A39
B40	VDDQ	VDDQ	A40
B41	-IRDY	-FRAME	A41
B42	AUX3V/KEY	RSVD/KEY	A42
B43	GND/KEY	GND/KEY	A43
B44	RSVD/KEY	RSVD/KEY	A44
B45	3.3V/KEY	3.3V/KEY	A45
B46	-DEVSEL	-TRDY	A46
B47	VDDQ	-STOP	A47
B48	-PERR	-PME	A48
B49	GND	GND	A49
B50	-SERR	PAR	A50
B51	C/-BE1	AD15	A51
B52	VDDQ	VDDQ	A52
B53	AD14	AD13	A53
B54	AD12	AD11	A54
B55	GND	GND	A55
B56	AD10	AD9	A56
B57	AD8	C/-BE0	A57
B58	VDDQ	VDDQ	A58
B59	AD_STB0	-AD_STB0	A59
B60	AD7	AD6	A60
B61	GND	GND	A61
B62	AD5	AD4	A62
B63	AD3	AD2	A63
B64	VDDQ	VDDQ	A64
B65	AD1	AD0	A65
B66	VREF_CG	VREF_GC	A66

AGP-D124-BN_1.5V

MS6391 PCB

PCB
MS-6391-101

COM1
YCN9M-1

COM2
YCN9M-1

USB1
D2x5-2:7.4-BK

U9-A
845-MCH-PIN

U9-B
845-MCH-PIN

U9-C
845-MCH-PIN

U9-D
845-MCH-PIN

U9_X
845-MCH-H

U4_RM

BIOS

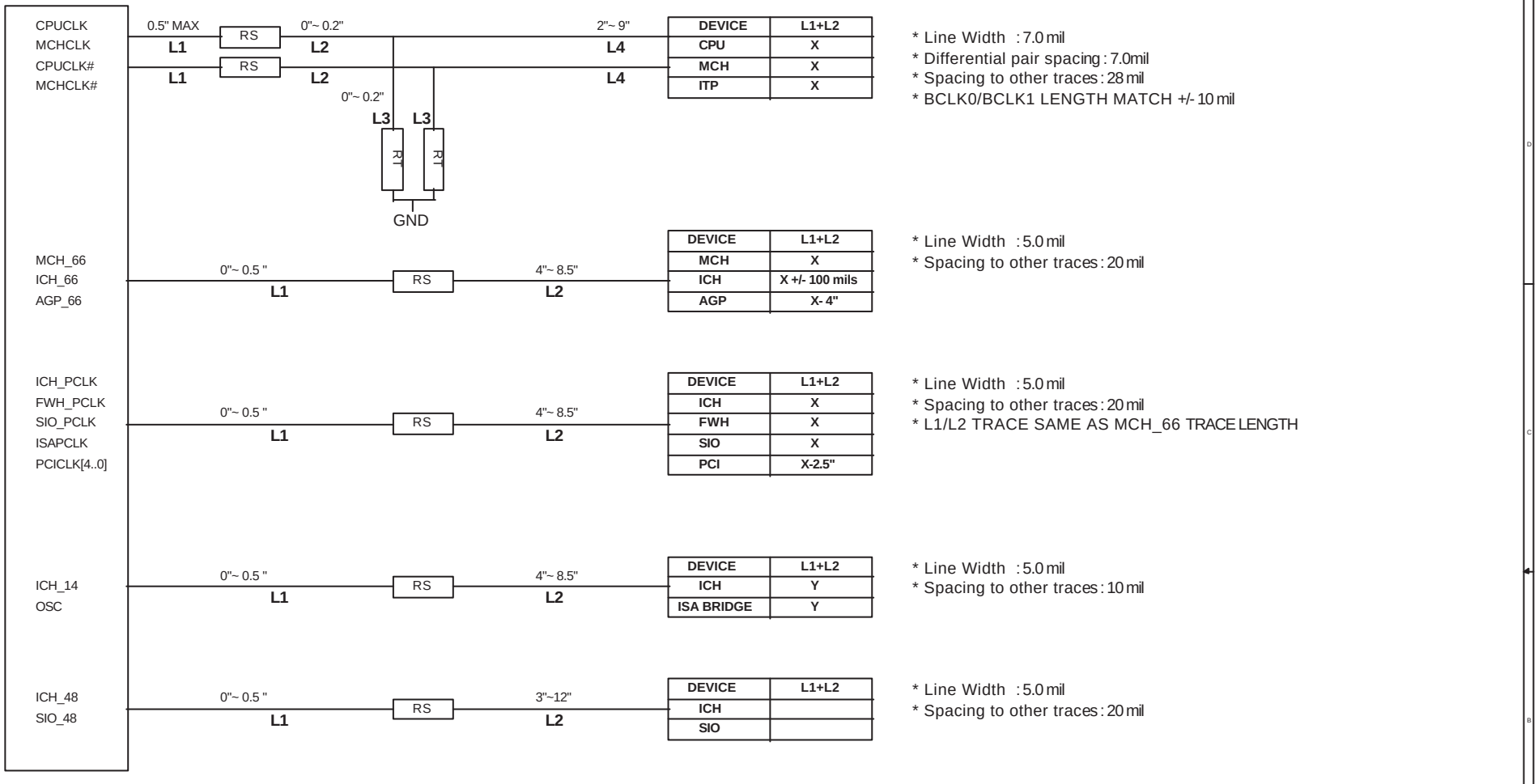
U25[1]

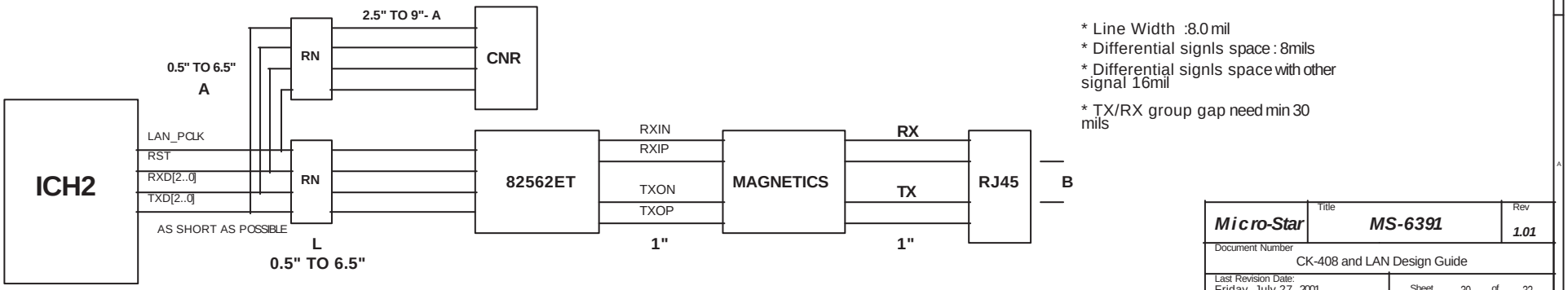
1	VPP	VCC	32
2	RST#	CLK	31
3	FGPI3	FGPI4	30
4	FGPI2	IC(VIL)	29
5	FGPI1	GNDA	28
6	FGPI0	VCCA	27
7	WP#	GND	26
8	TBL#	VCC	25
9	ID3	INIT#	24
10	ID2	FWH4	23
11	ID1	RFU	22
12	ID0	RFU	21
13	FWH0	RFU	20
14	FWH1	RFU	19
15	FWH2	RFU	18
16	GND	FWH3	17

SST49LF002A

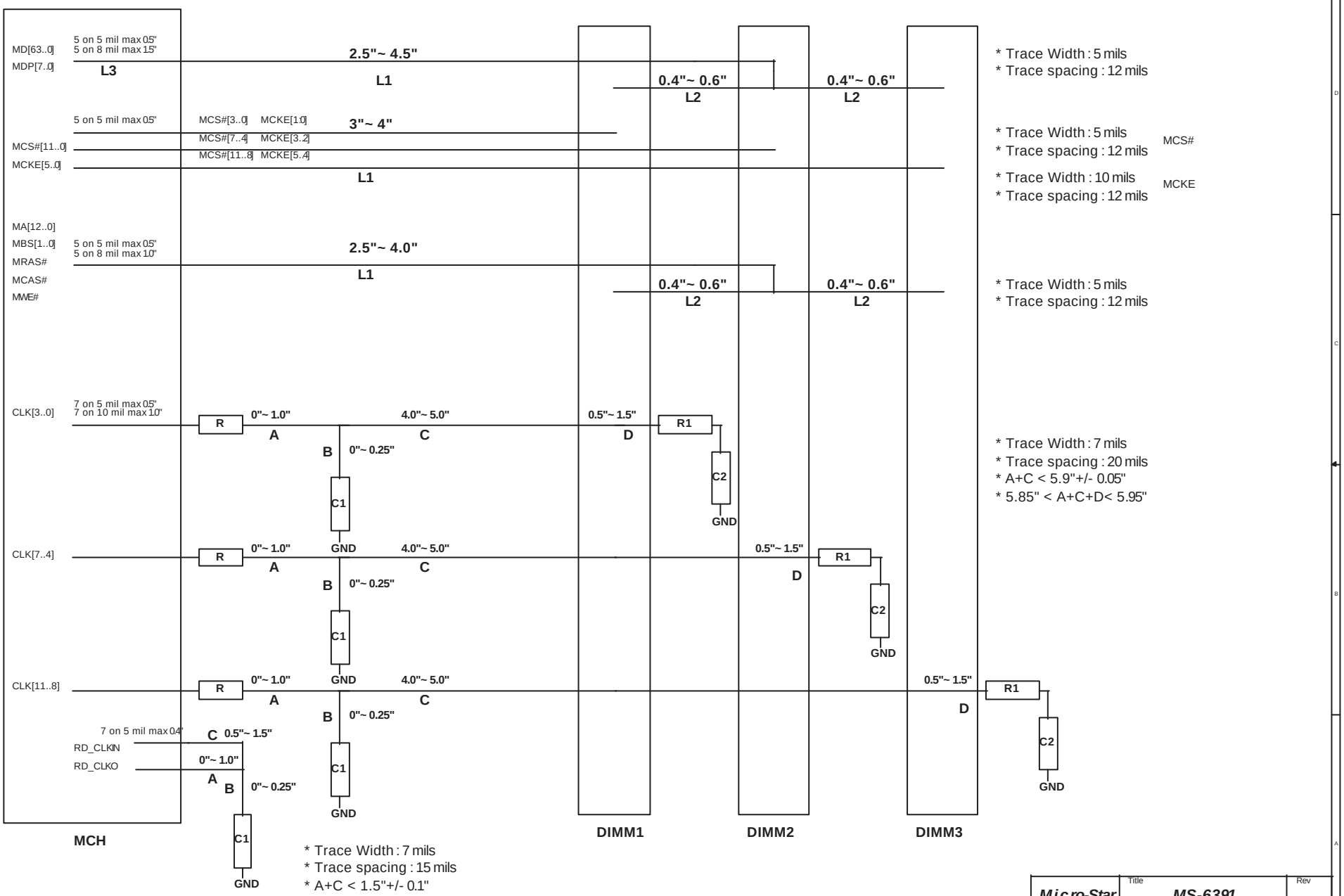
LAN_USB1A
RJ45+USB+LEDx2-D20-BK

Micro-Star	Title: MS-6391		Rev: 1.01
Document Number: MANUAL			
Last Revision Date: Thursday, July 26, 2001		Sheet 29 of 32	





Micro-Star	Title: MS-6391		Rev: 1.01
Document Number: CK-408 and LAN Design Guide			
Last Revision Date: Friday, July 27, 2001		Sheet 30 of 32	


MD[63..0]
MDP[7..0]
5 on 5 mil max 0.5"
5 on 8 mil max 1.5"
L3
2.5"~ 4.5"
L1
0.4"~ 0.6"
L2
0.4"~ 0.6"
L2
* Trace Width : 5 mils
* Trace spacing : 12 mils
5 on 5 mil max 0.5"
MCS#[3..0] MCKE[1:0]
MCS#[7..4] MCKE[3..2]
MCS#[11..8] MCKE[5..4]
3"~ 4"
MCS#[11..0]
MCKE[5..0]
L1
* Trace Width : 5 mils
* Trace spacing : 12 mils
MCS#
* Trace Width : 10 mils
* Trace spacing : 12 mils
MCKE
MA[12..0]
MBS[1..0]
MRAS#
MCAS#
MWE#
5 on 5 mil max 0.5"
5 on 8 mil max 1.0"
2.5"~ 4.0"
L1
0.4"~ 0.6"
L2
0.4"~ 0.6"
L2
* Trace Width : 5 mils
* Trace spacing : 12 mils
CLK[3..0]
7 on 5 mil max 0.5"
7 on 10 mil max 1.0"
R
0"~ 1.0"
A
4.0"~ 5.0"
C
0.5"~ 1.5"
D
R1
C2
GND
B
0"~ 0.25"
C1
GND
* Trace Width : 7 mils
* Trace spacing : 20 mils
* A+C < 5.9"+/- 0.05"
* 5.85" < A+C+D< 5.95"
CLK[7..4]
CLK[11..8]
7 on 5 mil max 0.4"
RD_CLKIN
RD_CLKO
C
0.5"~ 1.5"
A
0"~ 1.0"
B
0"~ 0.25"
C1
GND
MCH
DIMM1
DIMM2
DIMM3
* Trace Width : 7 mils
* Trace spacing : 15 mils
* A+C < 1.5"+/- 0.1"
Micro-Star
Title
MS-6391
Rev
1.01
Document Number
PC133 DIMM DG
Last Revision Date:
Friday, July 27, 2001
Sheet 31 of 32

Revision Initial ver: 0A on 05/10/01

1.Revision 0A to 0B	**05/25/2001**
a.Modify Lan Control schematic	**Page 25**
b.Chang Keyboard/Mouse signals	**Page 20/24**
c.Fix Buzzer schematic	**Page 19**
d.Change USB Power and Connector GND	**Page 20**
e.Add Intel Front Panel/IR/Audio/USB Connector	**05/28/2001**
2.Revision 0A to 10	**07/05/2001**
3.Revision 10 to 101	**07/19/2001**

Micro-Star	Title ***MS-6391***	Rev ***1.01***
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Last Revision Date: Friday, July 27, 2001	Sheet 32 of 32	