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MS-7003 u-ATX

Version 1.0A

ATi RS300/350 (IGP) + SB200 (IXP) Chipset
Intel Northwood & Prescott mPGA478B Processor
CPU: Intel Northwood/Prescott - 3.0G & Above
System Chipset: ATi RS300/350 - RADEON IGP (North Bridge)

On Board Chipset: ATi - IXP150 (South Bridge)
BIOS -- XBus EEPROM 4M
AC'97 Codec -- ALC655/658
LPC Super I/O -- W83627THF-AW
LAN - Realtek 8110S/8100C PCI LAN
1394 -- VIA6306


Main Memory: DDR CLOCK BUFFER -- ICS ICS9P750 SSOP
DDR * 2 (Max 2GB)

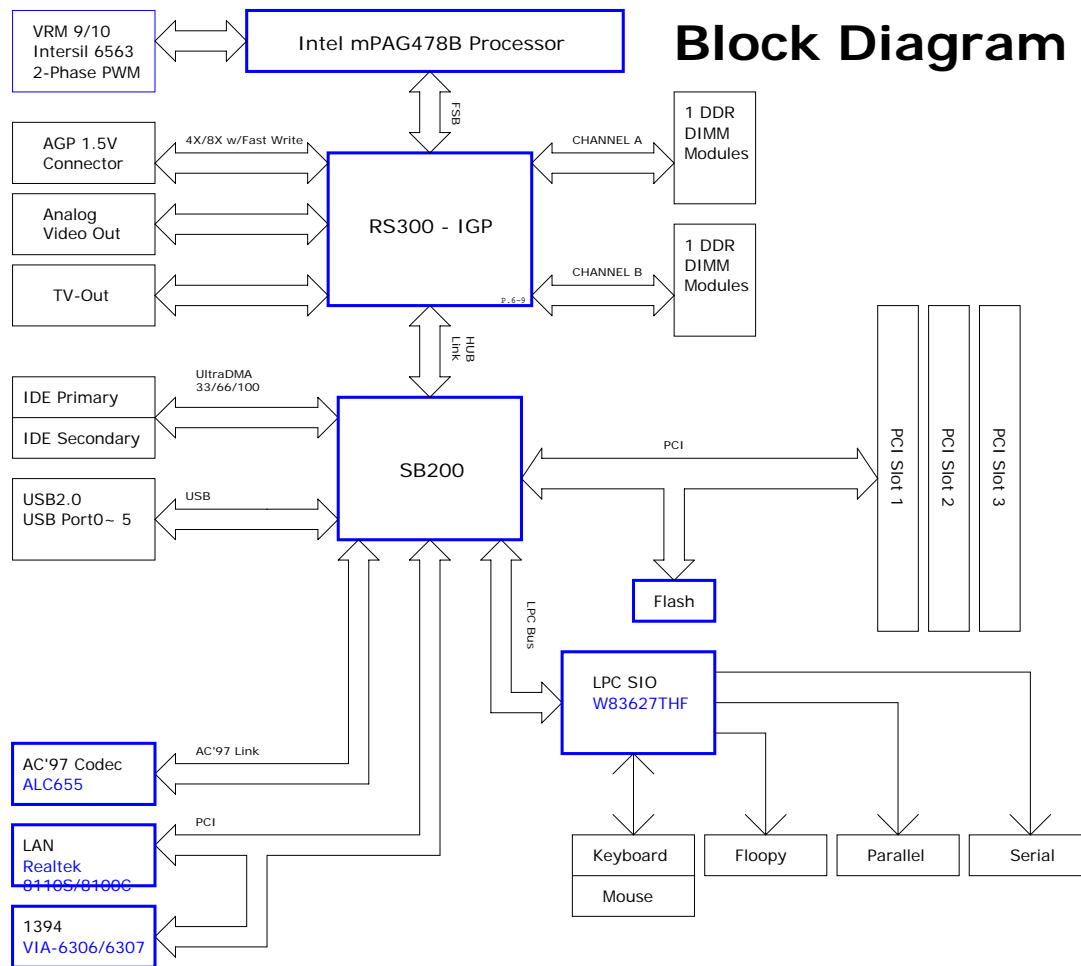
Expansion Slots: PCI2.3 SLOT * 3
AGP4X/8X SLOT * 1
CNR SLOT * 1

Intersil PWM: Controller with driver: HIP6563CR

Regulators MS-7

MODEL Config.	ORCAD Config.	Function	Option	ERP Number
MS7003-10A	Cfg7003-100-L	VT6307 + LAN	L	601-7003-010
MS7003-10A	Cfg7003-100-IL	LAN	IL	601-7003-020
MS7003-10A M1	Cfg7003-10A-M1-IL	VT6307 + LAN	M	601-7003-02S

		MICRO-STAR Int'L CO., LTD.	
Title			
COVER SHEET			
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MICRO-STAR INT'L CO., LTD.		
BLOCK DIAGRAM		
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PCI DEVICES IRQ ROUTING


DEVICE	IDSEL #	REQ/GNT #	PCI_INT	CLOCK
NB VGA	N/A	N/A	A	
SOUTHBRIDGE	AD31 (INT.)	N/A	N/A	
AGP SLOT	AGP_DEVSEL	N/A	A/D	AGP_CLK1
LPC I/O	N/A	N/A	N/A	PCL_CLK3
PCI SLOT 1	AD21	0	A/B/C/D	PCI_CLK0
PCI SLOT 2	AD22	1	B/C/D/A	PCI_CLK1
PCI SLOT 3	AD23	2	C/D/A/B	PCI_CLK2
PCI LAN	AD24	3	B/C/D/A	PCI_CLK5
IEEE-1394	AD25	4	C/D/A/B	PCI_CLK4

I2C / SMBUS ADDRESSING

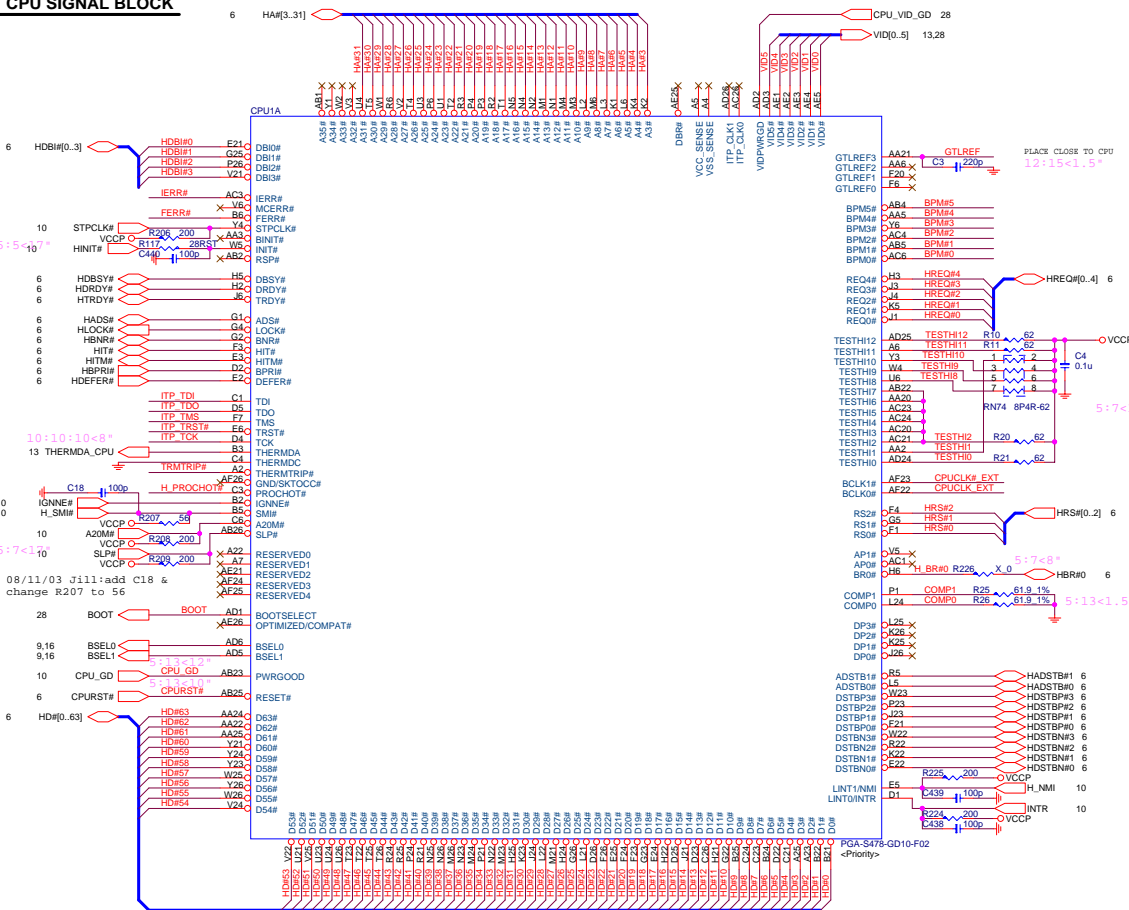
DEVICE	HEX	ADDRESS
DDR DIMM A0	A0	1 0 1 0 0 0 0 X
DDR DIMM B0	A4	1 0 1 0 0 1 0 X
CLOCK GENERATOR (EXT.)	D2	1 1 0 1 0 0 1 X
DDR CLOCK BUFFER	D4	1 1 0 1 0 1 0 X

POWER RAILS

	POWER	VOLTAGE	ACTIVE SCOPE	ROUTING
SYSTEM	+12V	+12V	OFF IN S3-S5	80 mils/20 mils
	-12V	-12V	OFF IN S3-S5	40 mils/20 mils
	VCC5	+5V	OFF IN S3-S5	PLANE
	VCC3	+3.3V	OFF IN S3-S5	PLANE
	VCC5_SB	+5V	S0-S5	50 mils/20 mils
	VCC3_SB	+3.3V	S0-S5	20 mils
	USB_STR	+5V	S0-S3	60 mils
	3VDUAL	+3.3V	S0-S3	60 mils/25 mils
	CLK_VDD	+3.3V	OFF IN S3-S5	PLANE/TRACE
Desktop P4	VCCP	VID[0..5]	OFF IN S3-S5	PLANE
	VCC_VID	+1.2V	OFF IN S3-S5	20 mils
RS300 NB	VCC_NB	+1.5V/1.6V	OFF IN S3-S5	PLANE
	VCC_AGP	+1.5V/1.6V	OFF IN S3-S5	20 mils
	AVDD	+2.5V	OFF IN S3-S5	60 mils/25 mils
	AVDDQ	+1.8V	OFF IN S3-S5	25 mils/20 mils
	PLVDD	+1.8V	OFF IN S3-S5	25 mils/20 mils
	VDD_CLKB	+2.5V	OFF IN S3-S5	PLANE/TRACE
	AVDD_B	+2.5V	OFF IN S3-S5	20 mils
	VTT_DDR	+1.25V	OFF IN S3-S5	PLANE
	VCC_DDR	+2.5V	S0-S3	PLANE
	VCC1.8_NB	+1.8V	OFF IN S3-S5	25 mils/20 mils
SB200M SB	VCC_SB	+2.5V	OFF IN S3-S5	PLANE
	2_5DUAL	+2.5V	S0-S3	50 mils/30 mils
	USB_AVDD	+3.3V	S0-S3	PLANE/TRACE
	+3.3V_AVDDC	+3.3V	S0-S3	20 mils
	AVDD_CK	+2.5V	OFF IN S3-S5	10 mils
	V_BAT	+3.0V	S0-S5	10 mils
	+2.5VSB	+2.5V	S0-S5	20 mils
IEEE-1394	P3VA	+3.3V	OFF IN S3-S5	PLANE/TRACE
GIGABIT	DVDD	+1.8V	S0-S5	PLANE/TRACE
	AVDDL	+2.5V	S0-S5	PLANE/TRACE
10/100	DVDD	+2.5V	S0-S5	PLANE/TRACE
	AVDDL	+3.3V	S0-S5	PLANE/TRACE
AC97	+5VR	+5V	OFF IN S3-S5	PLANE/TRACE

<div> MICRO-STAR INT'L CO., LTD.</div>		
TitleTABLE OF CONTENTS		
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CPU SIGNAL BLOCK

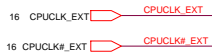


CPU STRAPPING RESISTORS

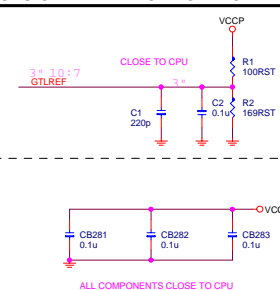
ALL COMPONENTS CLOSE TO CPU



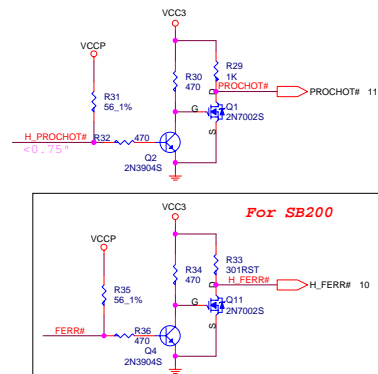
Close to CPU



CPU GTL REFERENCE VOLTAGE BLOCK



ALL COMPONENTS CLOSE TO CPU



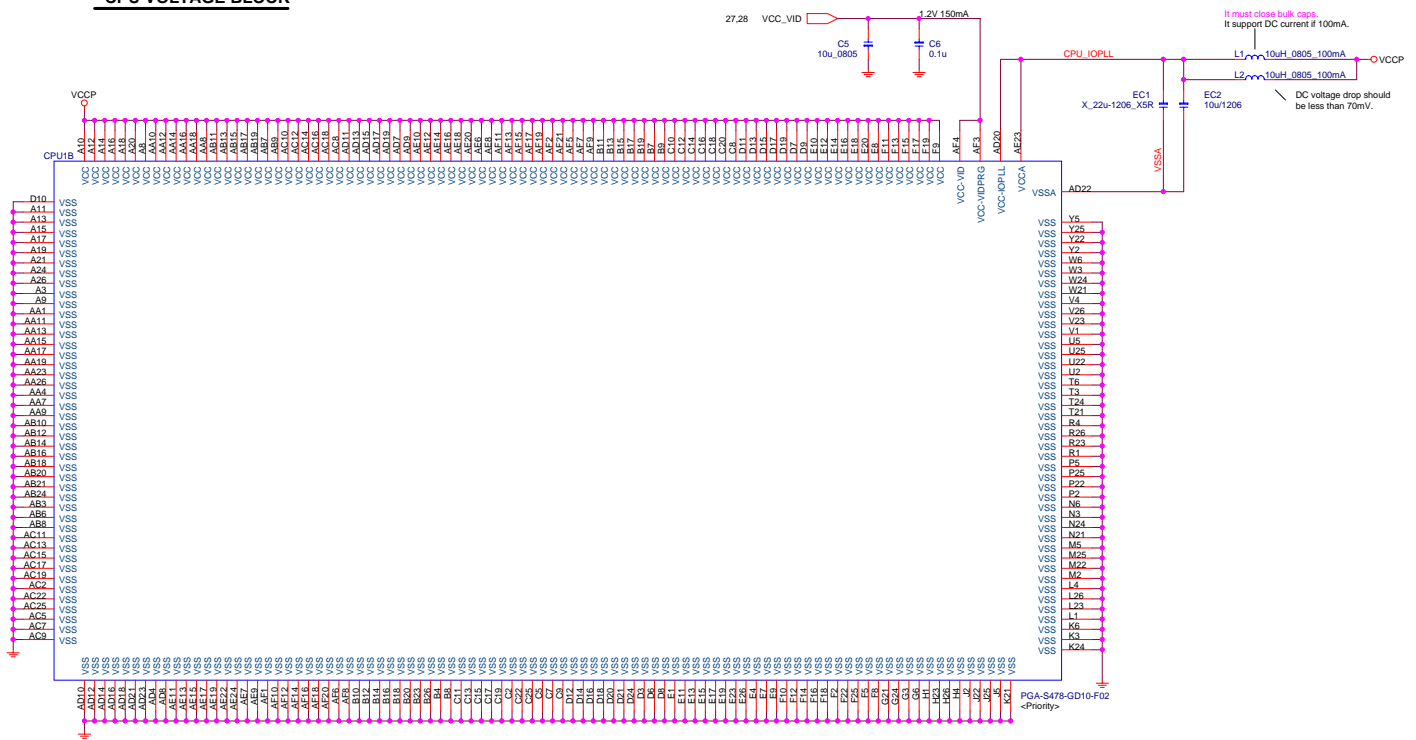
For FB300



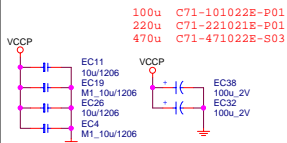
MICRO-STAR INT'L CO., LTD.

Title				Intel mPGA478B - Signals			
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CPU VOLTAGE BLOCK

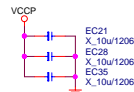


CPU DECOUPLING CAPACITORS

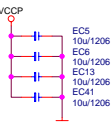


6pcs

Place these caps within socket cavity




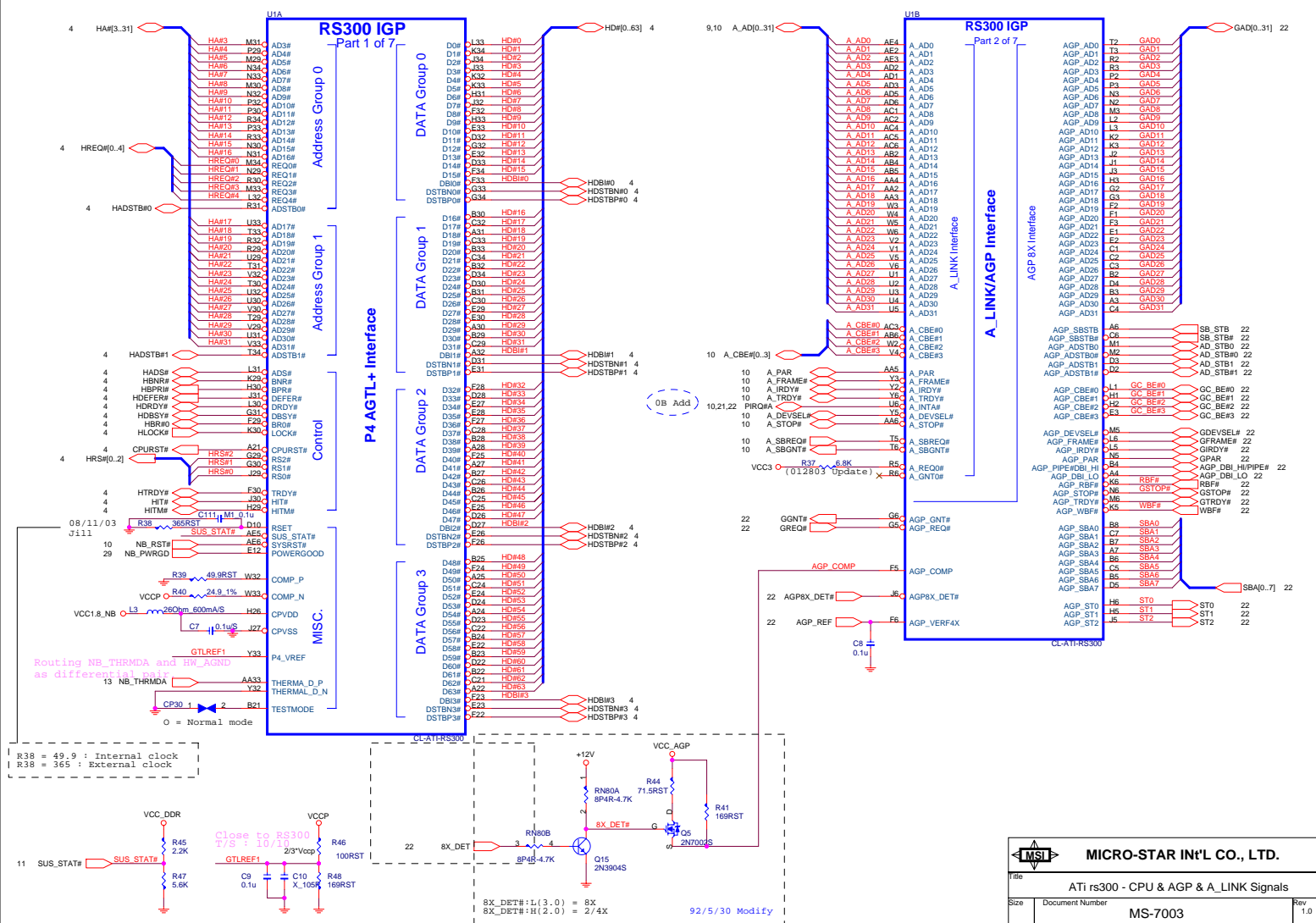
Place these caps within north side of processor

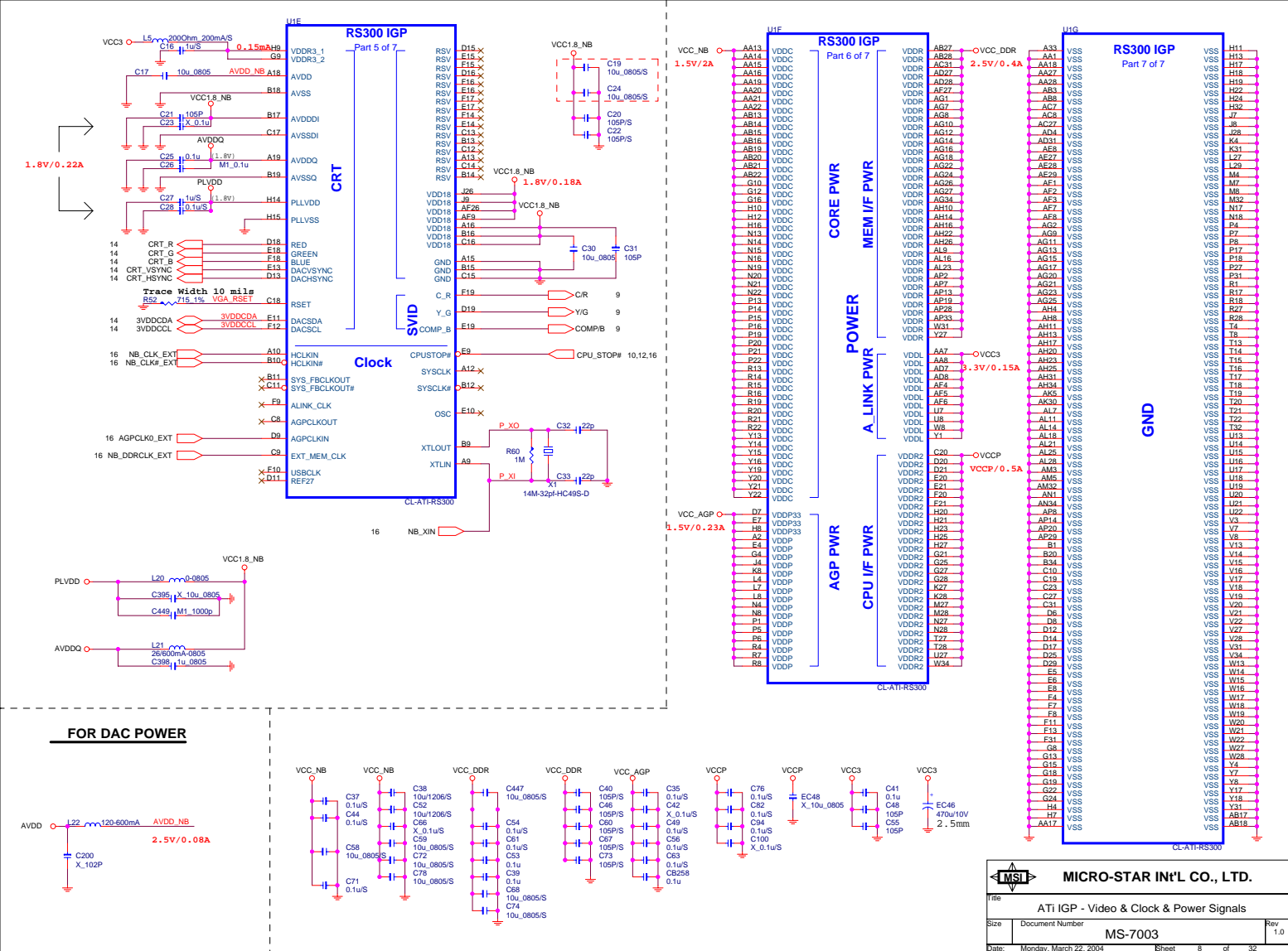


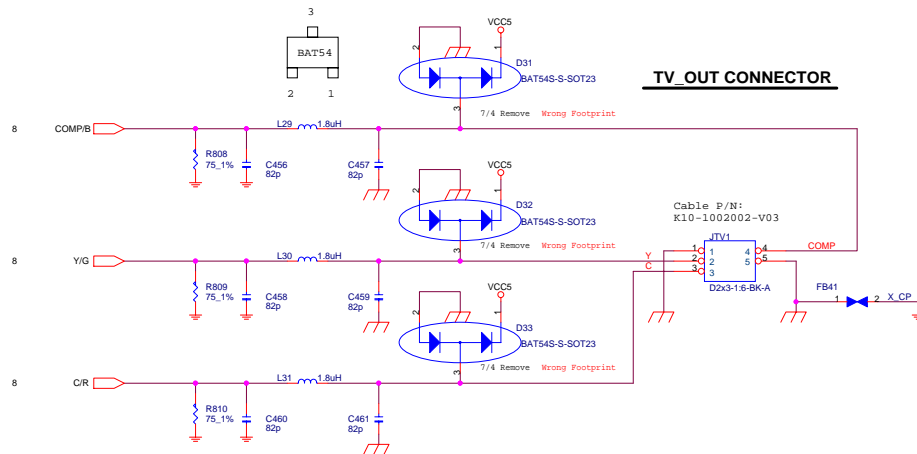
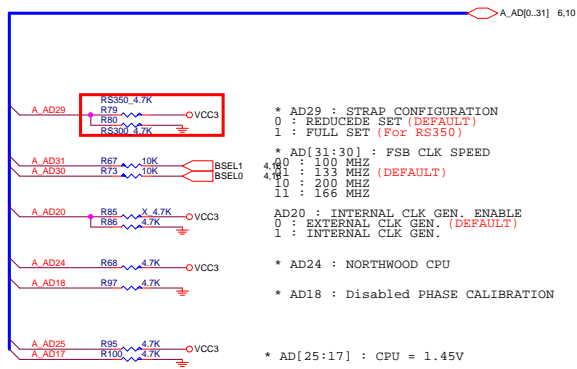
6pcs

Place these caps within south side of processor

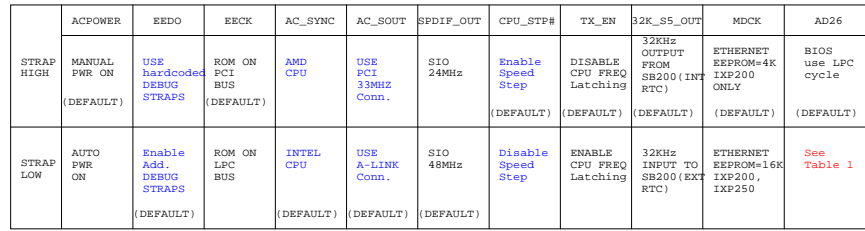
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Title Intel mPGA478B - Power	
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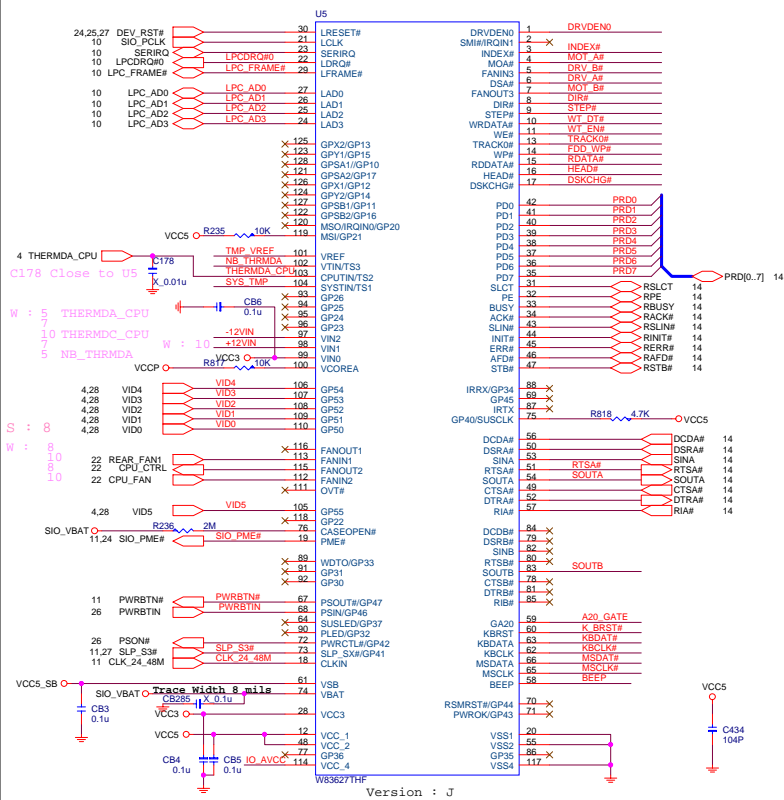
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ATI RS300 - Straps Signals			
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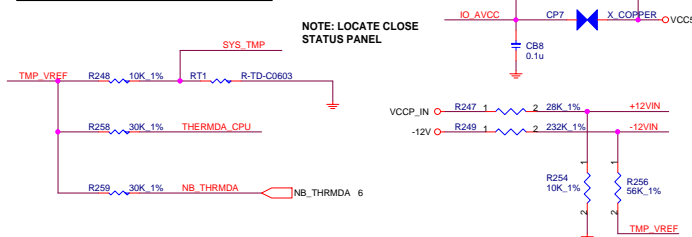
EE_CLK	AD26	ROM Type
0	0	Firmware Hub
0	1	LPC
1	0	LPC(II)(IXP rev:A41 and above)
1	1	PCI (X BUS)

- | | |
|---|------------------------|
|  MICRO-STAR INT'L CO., LTD. | |
| Title | |
| ATi SB250 - STRAPS Signals | |
| Size | Document Number |
| | MS-7003 |
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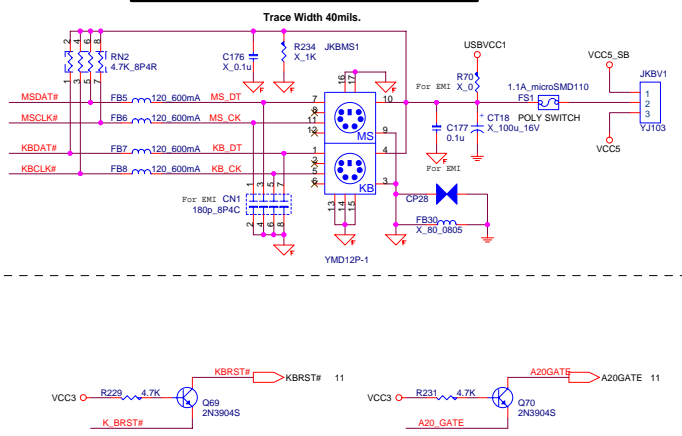
LPC SUPER I/O W83627THF



THERMAL RESISTOR BLOCK



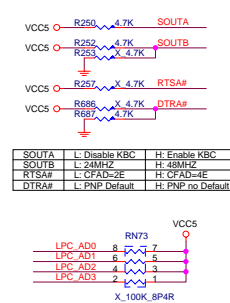
PS2 KEYBOARD & MOUSE CONNECTOR



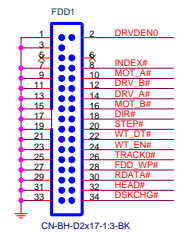
SPEAKER BLOCK



SUPER I/O STRAPPING RESISTOR

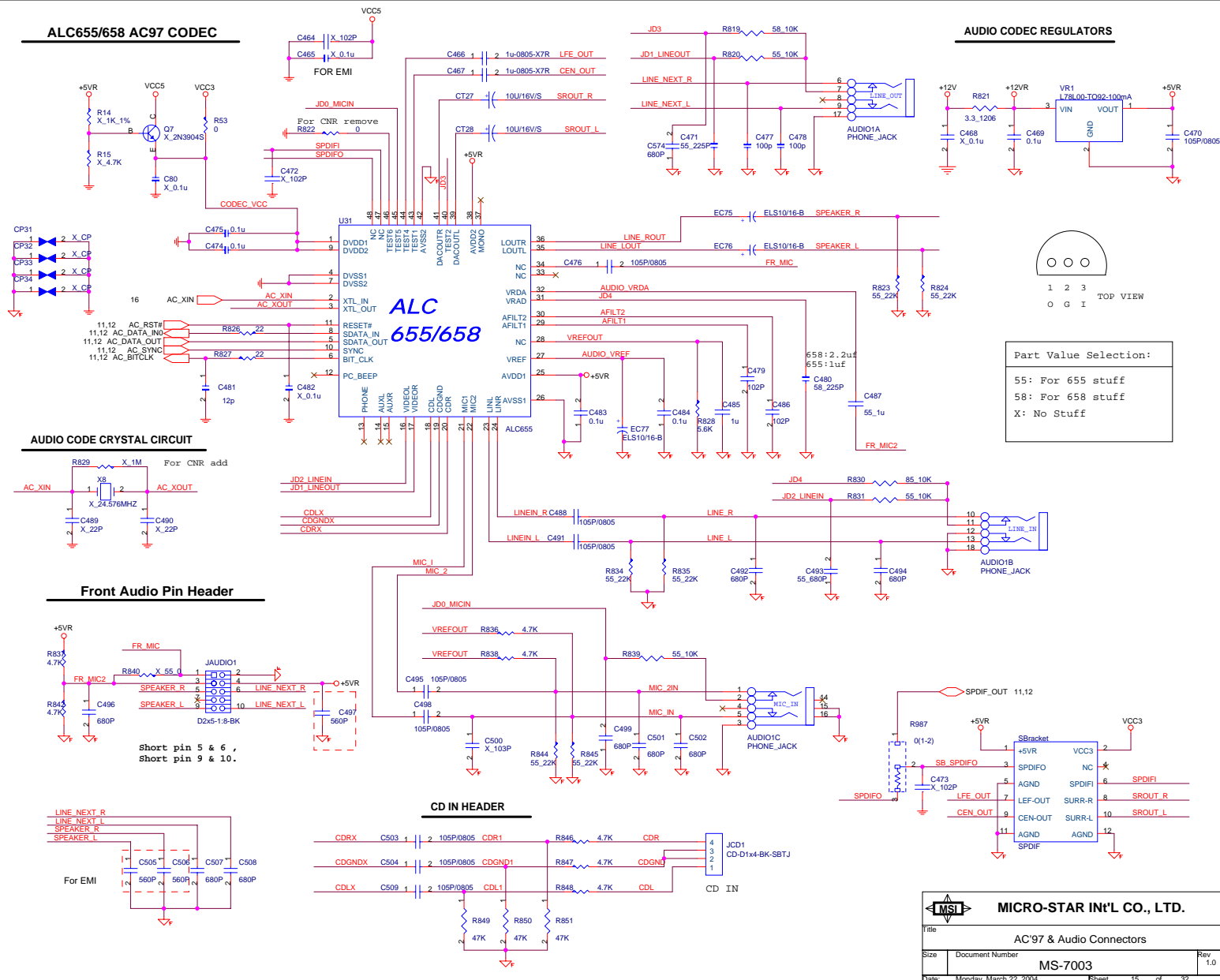


FLOPPY CONNECTOR

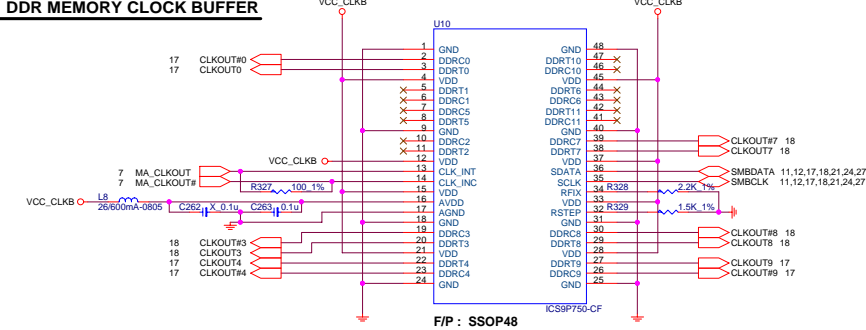


MICRO-STAR INT'L CO., LTD.	
Title: LPC SUPER I/O & CONNECTORS	
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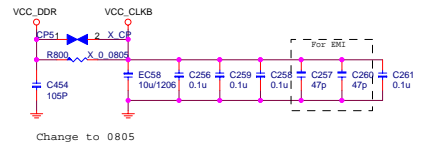
ALC655/658 AC97 CODEC



DDR MEMORY CLOCK BUFFER



CLOCK BUFFER DECOUPLING CAP.

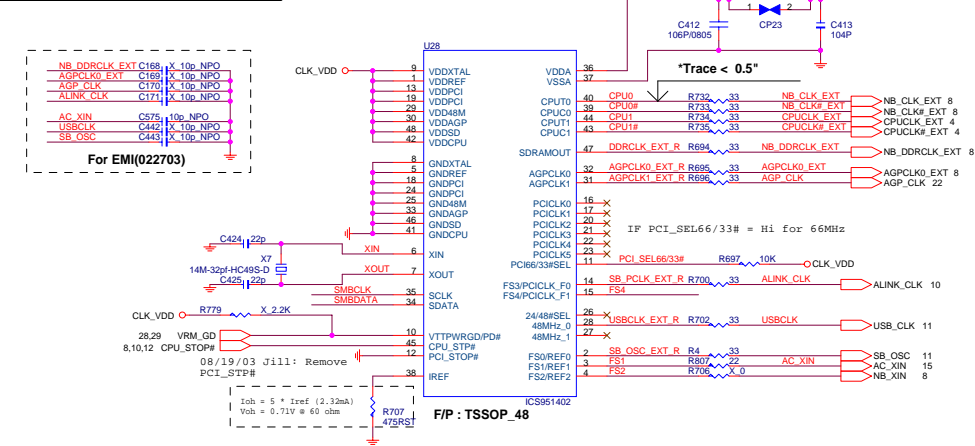


NOTE : CONNECT DDR CLOCKGROUP AS BELOW :

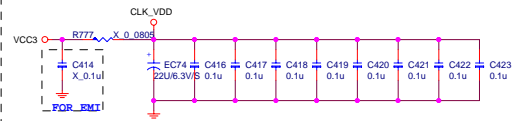
1) DIMM1 : CLKOUT 0/#0 +CLKOUT 4/#4 + CLKOUT 9/#9

3) DIMM3 : CLKOUT 8/#8 +CLKOUT 7/#7 + CLKOUT 3/#3

EXTERNAL CLOCK GENERATOR



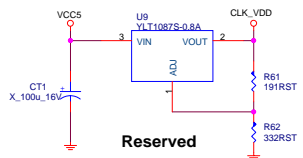
CLOCK GENERATOR DECOUPLING CAP.



Shut Source Termination Resistors

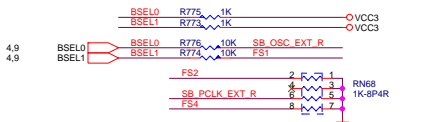


Trace less 0.2"
49.9ohm for 50ohm M/B impedance



Clock Generator Enable

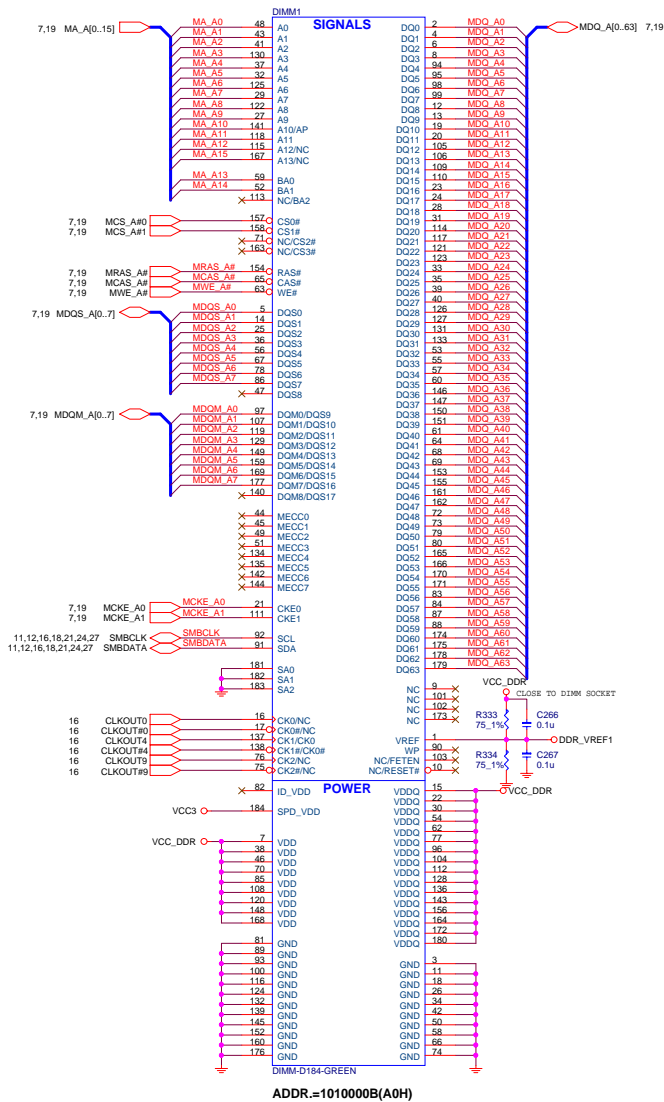
Clock Generator Enable
circuit removed (8/6)



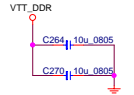
			BSEL1		BSEL0					PCIIsel=0		PCIIsel=1			
S4	S3	S2	S1	S0	CPU	MEM	AGP	PCIIsel=0	PCIIsel=1						
0	0	0	0	0	100	100	66.6	33.3	66.6						
0	0	0	0	1	133	133	66.6	33.3	66.6					CPU/SDRAM	
0	0	0	1	0	200	200	66.6	33.3	66.6					SYNC	
0	0	0	1	1	166	166	66.6	33.3	66.6						

MSI		MICRO-STAR INT'L CO., LTD.	
File			
EXTERNAL CLOCK & DDR CLOCK BUFFER			
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DDR DIMM1

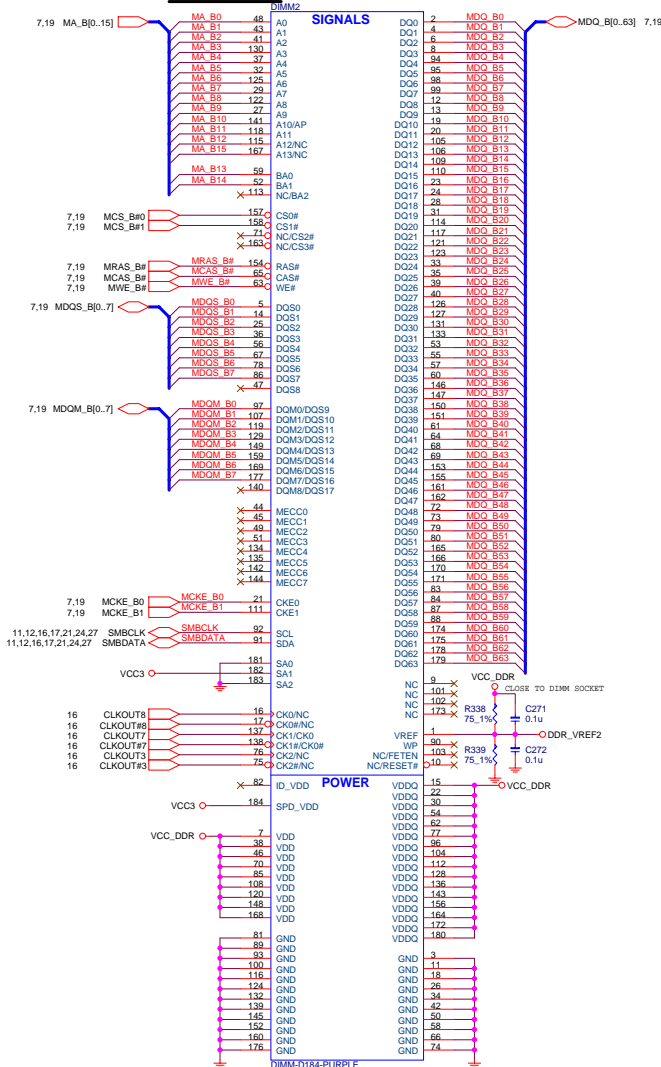


DECOUPLING CAPACITORS



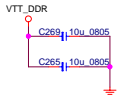
MICRO-STAR INT'L CO., LTD.			
DDR DIMM 1 CHANNEL A			
MS-7003			
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DDR DIMM2



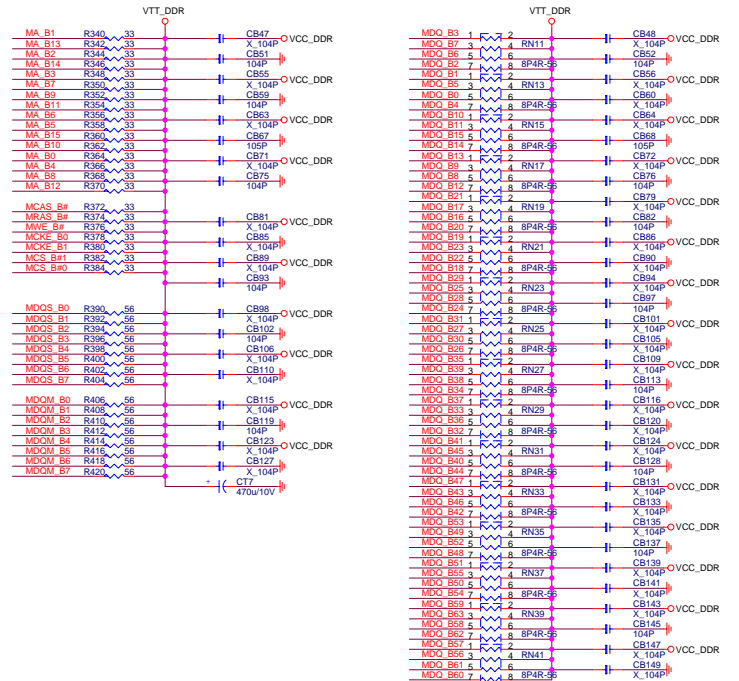
ADDR.=1010010B(A4H)

DECOUPLING CAPACITORS



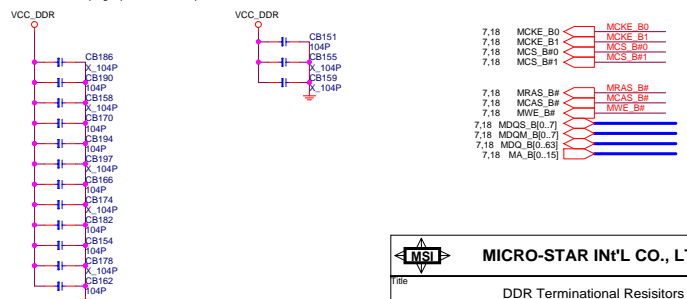
<div> MICRO-STAR INT'L CO., LTD. </div>			
Title			
DDR DIMM 3 & 4 CHANNEL B			
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DDR Channel B Terminational Resisitors



DDR Channel_B DECOUPLING CAPACITORS

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



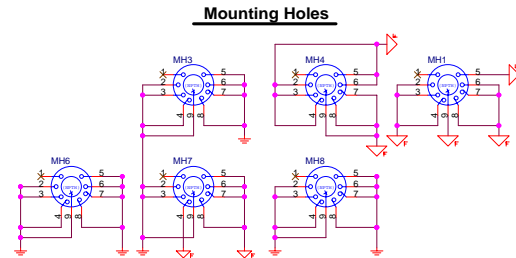
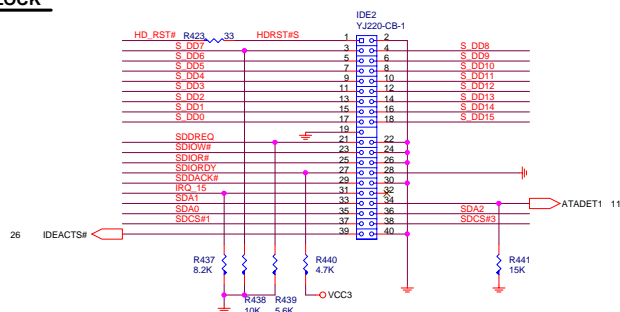
For Ch_B DIMM2



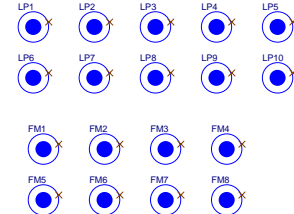
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SECONDARY IDE BLOCK

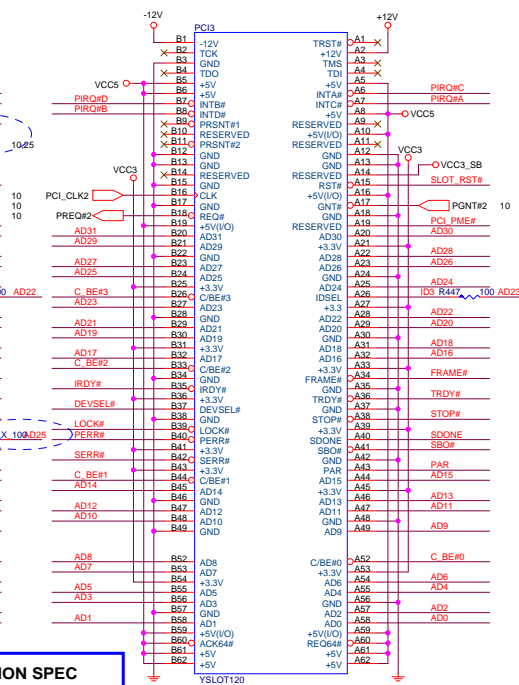


Optics Orientation Holes



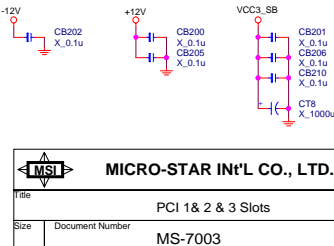
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Title IDE CONNECTORS	
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	Rev 1.0


PCI SLOT 3 (PCI VER: 2.2 COMPLY)



```
IDSEL = AD23
MASTER = PREQ#2
PIRQ#C
```

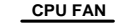
PCI SLOT DECOUPLING CAPACITORS



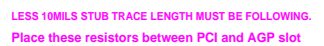
		MICRO-STAR INT'L CO., LTD.	
Title			
PCI 1 & 2 & 3 Slots			
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VCC5 = 60mils trace / 15 mils space

RS300 AGP Reference Voltage Circuit



SYS FAN

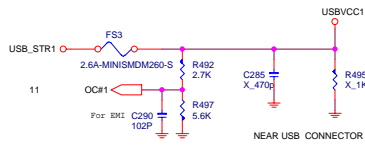


Title	AGP 1.5V SLOT & FAN CONNECTORS
-------	--------------------------------

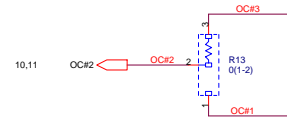
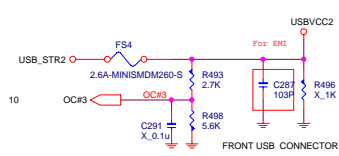
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MS-7003									
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POWER CIRCUIT FOR USB PORT 0,1

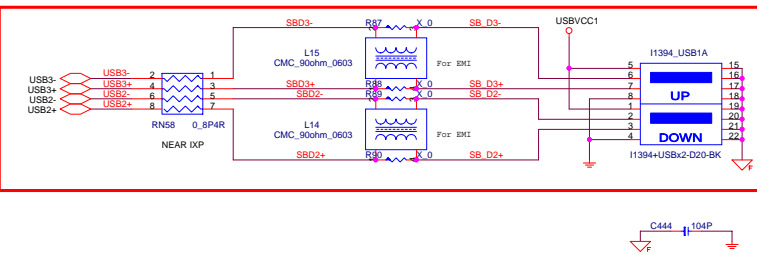


POWER CIRCUIT FOR USB PORT 2,3

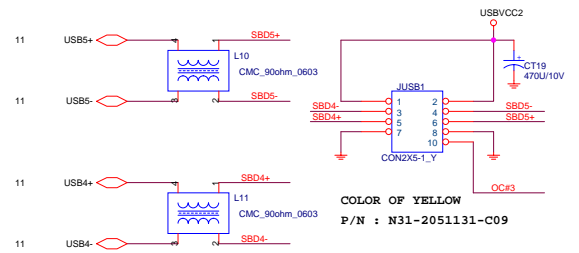


REAR PANEL USB CONNECTOR FOR USB PORT 2,3

For STD

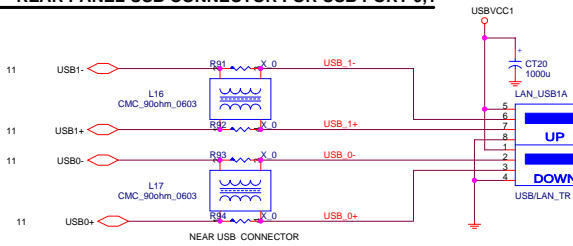


FRONT PANEL USB CONNECTOR FOR USB PORT 4,5



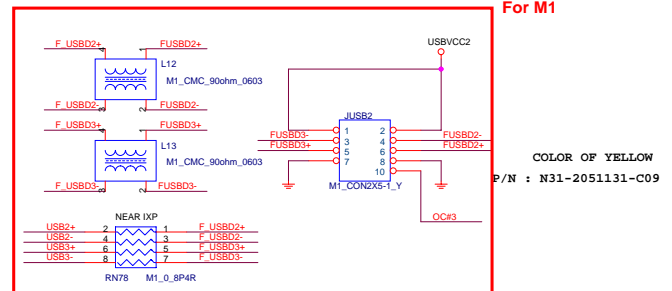
COLOR OF YELLOW
P/N : N31-2051131-C09

REAR PANEL USB CONNECTOR FOR USB PORT 0,1



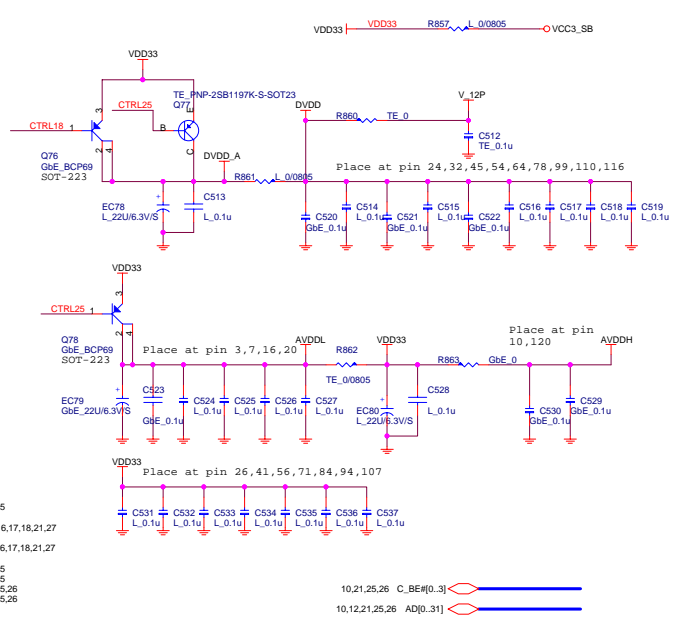
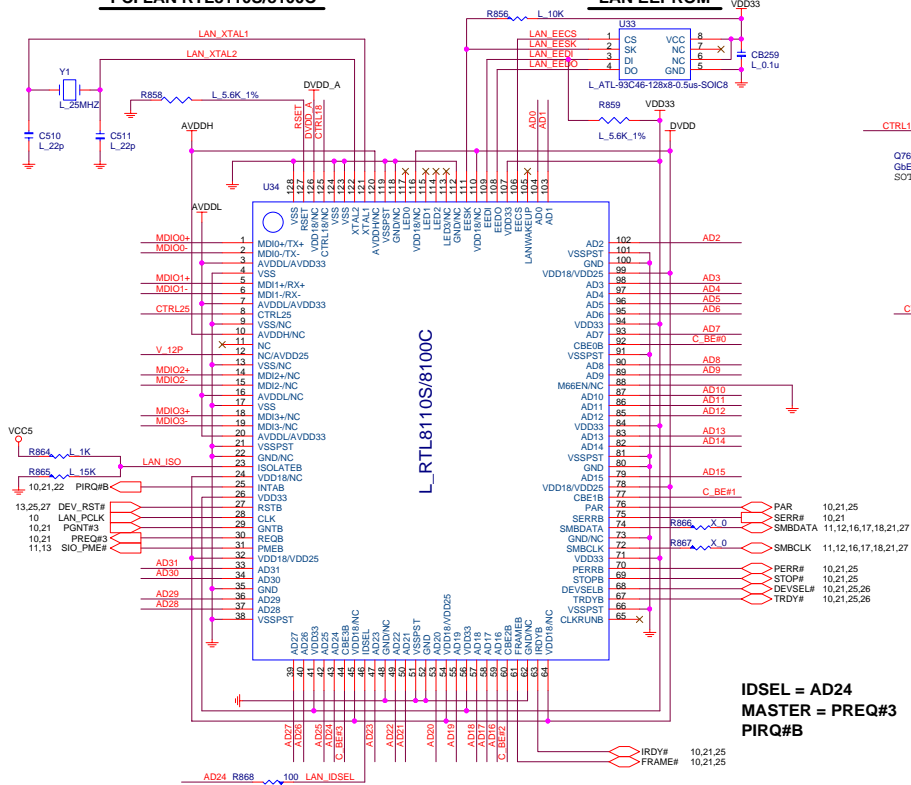
FRONT PANEL USB CONNECTOR SHARE WITH REAR USB PORT 2,3

For M1



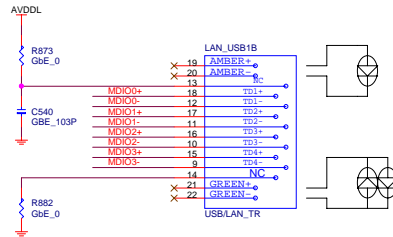
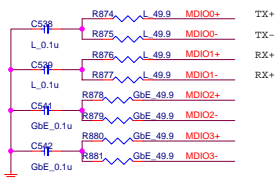
COLOR OF YELLOW
P/N : N31-2051131-C09

MICRO-STAR INT'L CO., LTD.			
23 USB CONNECTORS			
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	DVDD	DVDDA	AVDDL	AVDDH	V-12P
8100C	2.5V	2.5V	3.3V	X	2.5V
8110S	1.8V	1.8V	2.5V	3.3V	X

RJ45 Connector (with transformer)



1- MDIO+ & MDIO- pairs should be 100-ohm differential impedance. Route equal length and symmetrically. Separate every pairs.

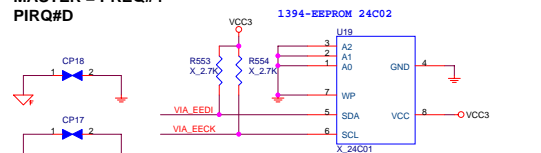
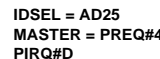
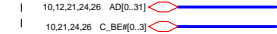
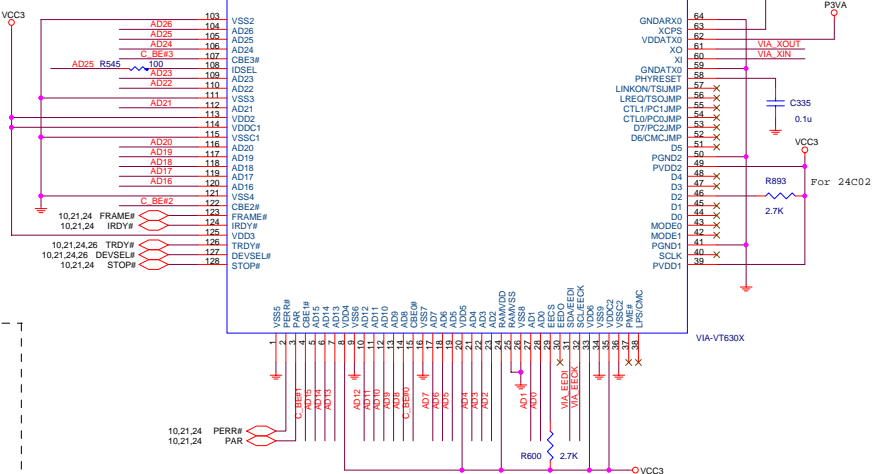
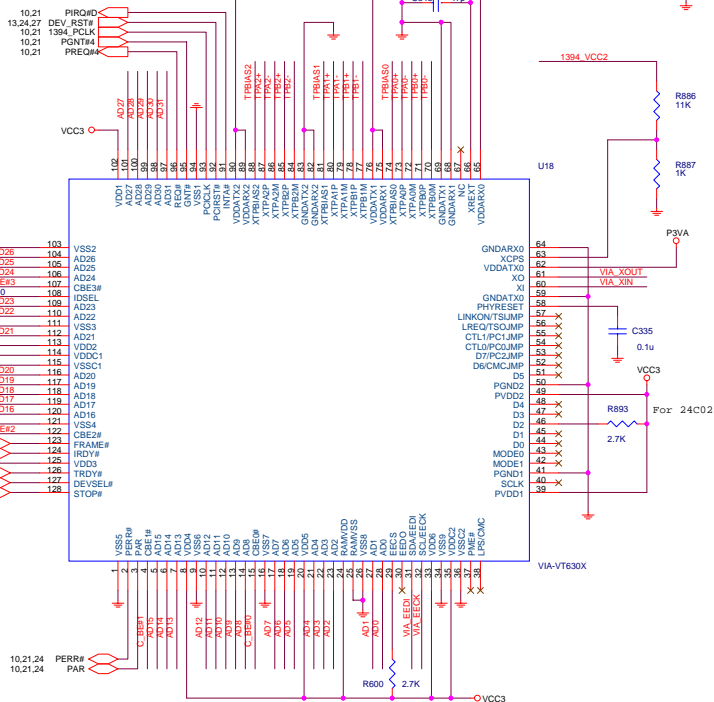
Part Value Selection:

GbE: 8110S LAN(1000M)
TE: 8100C LAN(10/100M)
L: With LAN option
X: No Stuff

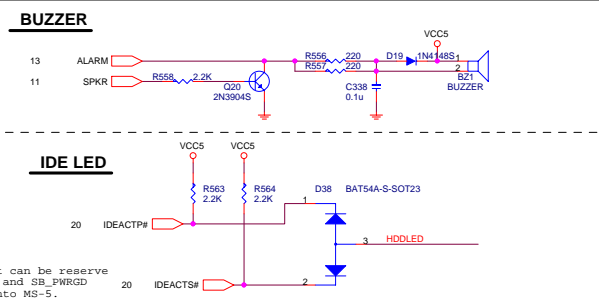
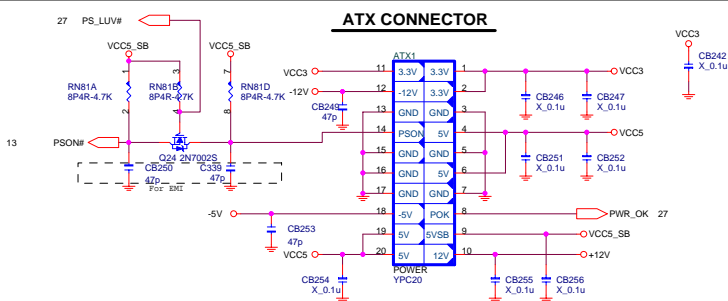


MICRO-STAR INT'L CO., LTD.

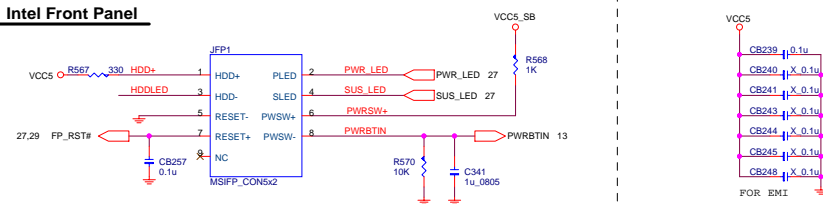
Title			
PCI LAN RTL8110S/8100C LAN Controller			
Size	Document Number		Rev
	MS-7003		1.0
Date:	Monday, March 22, 2004	Sheet	24 of 32



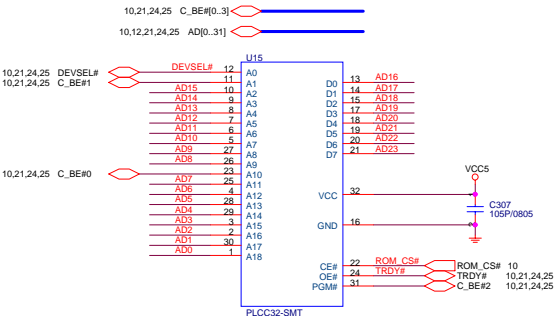
MICRO-STAR			
Title			
VIA 6306 IEEE-1394 Controller			
Size	Document Number		Rev
	MS-7003		1.0
Date:	Monday, March 22, 2004	Sheet	25 of 32



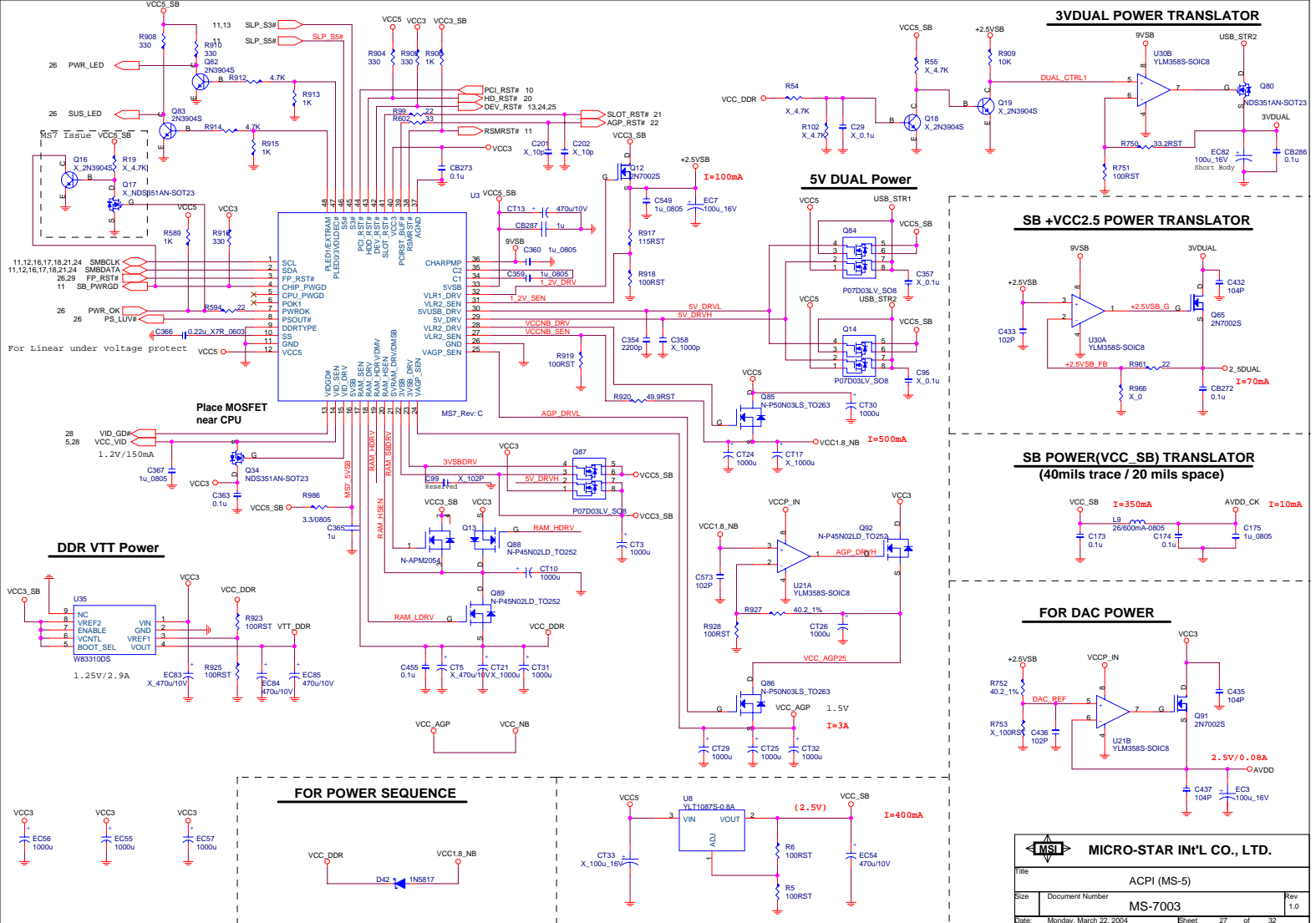
Intel Front Panel



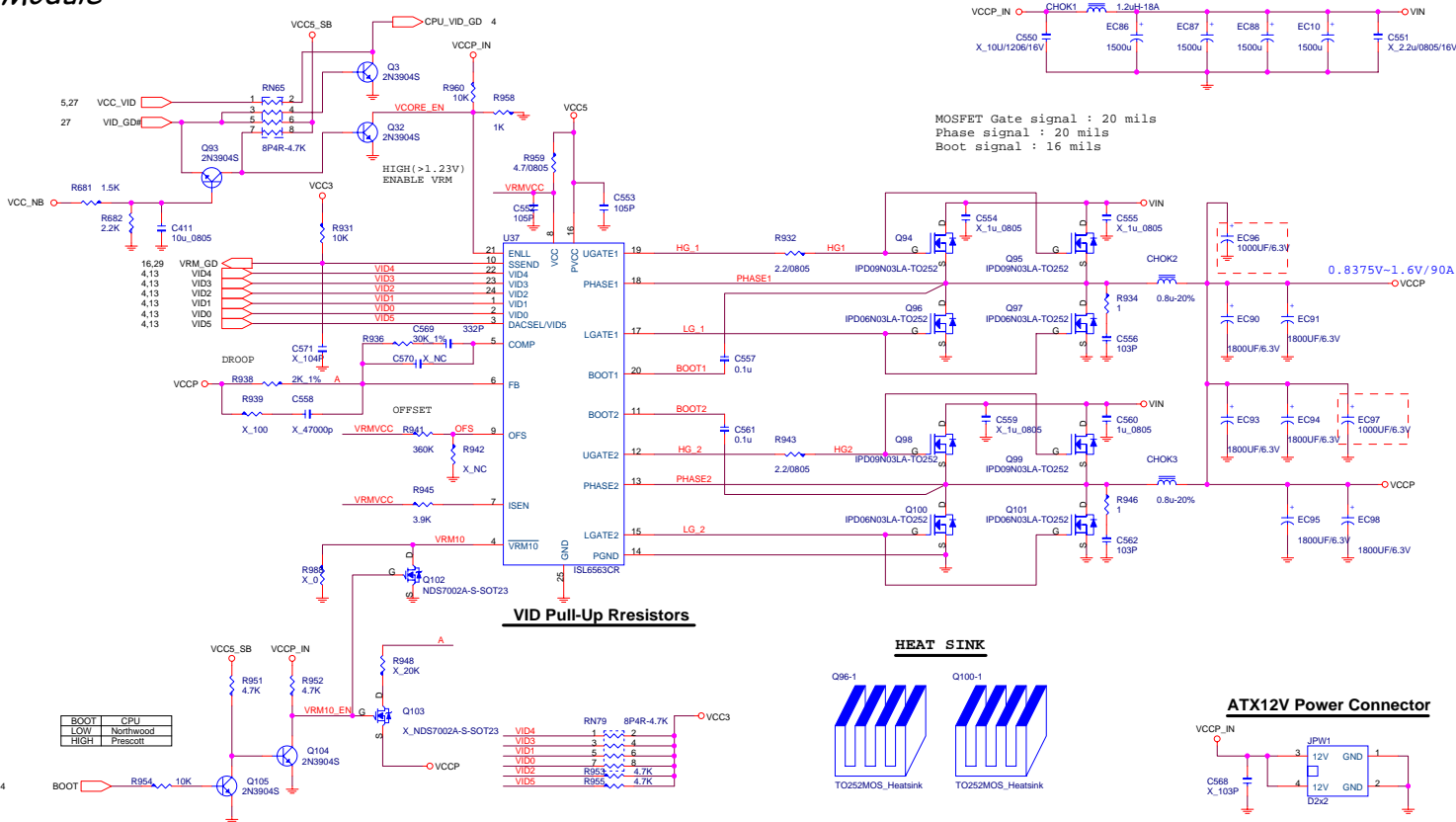
XBus ROM BLOCK



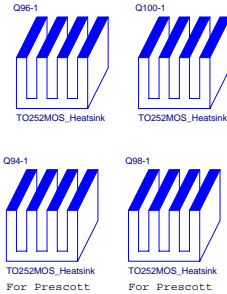
MICRO-STAR INT'L CO., LTD.			
Title			
ATX,Front Panel & X-BUS ROM			
Size			
Document Number			
MS-7003			
Date			
Monday, March 22, 2004			
Sheet			
26 of 32			
Rev			
1.0			



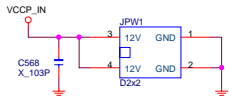
Voltage Regular
Module



HEAT SINK

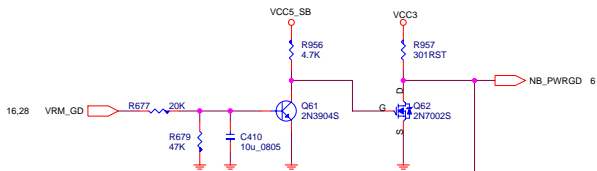


ATX12V Power Connector

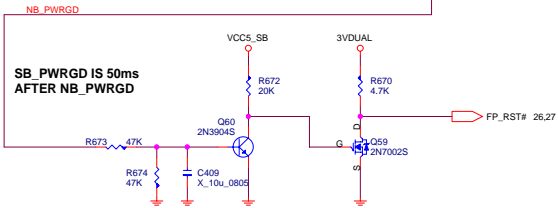


MICRO-STAR INT'L CO., LTD.			
File	VRM 10 - Intersil 6563CR		
Size	Document Number	MS-7003	Rev 1.0
Date:	Monday, March 22, 2004	Sheet 28	of 32


RS300 POWER GOOD CIRCUIT



SB200 POWER GOOD CIRCUIT



SB_PWRGD IS 50ms
AFTER NB_PWRGD

 MICRO-STAR INT'L CO., LTD.		
Title RS300 & SB200 PWR GOOD		
Size	Document Number MS-7003	Rev 1.0
Date: Monday, March 22, 2004 Sheet 29 of 32		

IXP 200

GPIO Pin	Type	Function
GPIO 0	I/O	Unused, Pull-Up
GPIO 1	I	ROM_CS#
GPIO 2	I	USB_OC#2
GPIO 3	I	USB_OC#3
GPM0	I/O	Unused, Pull-Up
GPM1	I	USB_OC#3
GPM2	I	USB_OC#2
GPM3	O	Unused, RTC CLK out
GPM4	I	USB_OC#1
GPM5	I	System Speaker out
GPM6	I/O	Unused, Pull-Up
GPM7	I	USB_OC#1
GPIO_EXTRA0	I	Unused, Pull-Up
GPIO_EXTRA1	I/O	Unused, Pull-Up
GPIO_EXTRA2	OD	Unused, Pull-Up
GPIO_EXTRA3	I	Unused, Pull-Up
GPIO_EXTRA4	I	Unused, Pull-Up
GPIO_EXTRA5	I/O	Unused, Pull-Down

SIO

PIN NAME	USAGE	Input/Output	NOTES
GPIO50	VID0	INPUT	CPU Voltage ID
GPIO51	VID1	INPUT	CPU Voltage ID
GPIO52	VID2	INPUT	CPU Voltage ID
GPIO53	VID3	INPUT	CPU Voltage ID
GPIO54	VID4	INPUT	CPU Voltage ID
GPIO55	VID5	INPUT	CPU Voltage ID

DDR DIMM Config.

DEVICE	ADDRESS	CLOCK
DIMM 1	A0H	CLKOUT0/CLKOUT#0 CLKOUT4/CLKOUT#4 CLKOUT9/CLKOUT#9
DIMM 2	A4H	CLKOUT8/CLKOUT#8 CLKOUT7/CLKOUT#7 CLKOUT3/CLKOUT#3


PCI RESET DEVICE

Signals	Target
SLOT_RST#	PCI slot 1-3, 1394
AGP_RST#	AGP slot
DEV_RST#	SIO,LAN,1394
HD_RST#	Primary, Scondary IDE

JUMPER SETTING


JBAT1	(1-2) NORMAL	(2-3) CLEAR

PCB Version



PCB1
MS-7003-100


P01-7003100~D05
P01-7003100~L20
P01-7003100~P42
P01-7003100~T53




PCB1_A
MS-7003-10A

P01-700310A~D05
P01-700310A~T53
P01-700310A~L20
P01-700310A~P42


Chipset




U18-1
VIA6307 2-Ports
VIA6307-2 Ports



U18-2
VIA6306 3-Ports
VIA6306-3 Ports




U1_300
ATi RS300
ATi RS300




U1_350
ATi RS350
ATi RS350


Connector




I1394_USB2
2-PORTS USB




I1394_USB3
1-PORT 1394



COM1




BAT1-1




U15-1
MX29F040QC-90
M31-2904048-P06


MANUAL PART




CPU1_M6
478-PIN Retention Module
CPU_Retention




R987(1-2)
0




JBAT1(1-2)
0-3
YJUMPER-MG




JAUDIO1(5/6)
0-3
YJUMPER-MG




JAUDIO1(9/10)
0-3
YJUMPER-MG



JKBV1(2-3)
0-3
YJUMPER-MG




U1-1
RS300-Heatsink




R13(1-2)
0


M1




CPU1_M5
SCREW




CPU1_M2
SCREW




CPU1_M3
SCREW




CPU1_M4
SCREW




CPU1_M1
478-PIN Retention Module
CPU_Retention_M1




CPU1_MB1
CPU bottom bracket



EC38_1
470u 2.5V



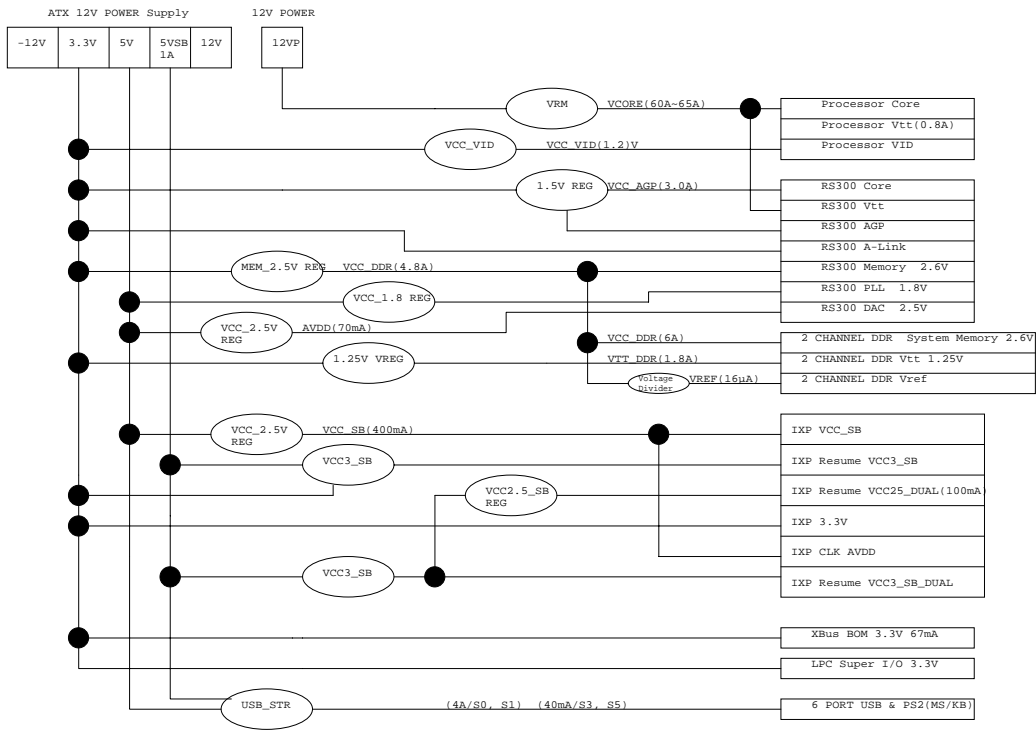
EC32_1
470u 2.5V



L20
26500mA-GB05

MSI MICRO-STAR INT'L CO., LTD.			
Title		General Purpose Spec & JUMPER SETTING	
Size	Document Number	MS-7003	Rev 1.0
Date: Monday, March 22, 2004		Sheet 30	of 31

POWER DELIVERY MAP



Revision History (Changes from Rev 100)

Sheet	Description
EMI Solution	1. Added Cap 104pf at CB220. CM choke 90 ohm at L10 and L11. Cap 103pf at CB199 and C287. 2. Change 0.1uf to 103pf at C120. 3. Change EC96 ,EC97 1800u-->1000u 4. Change RN69 10 ohm-->22 ohm 5. Add capacitor 560pf on C505,506,C497