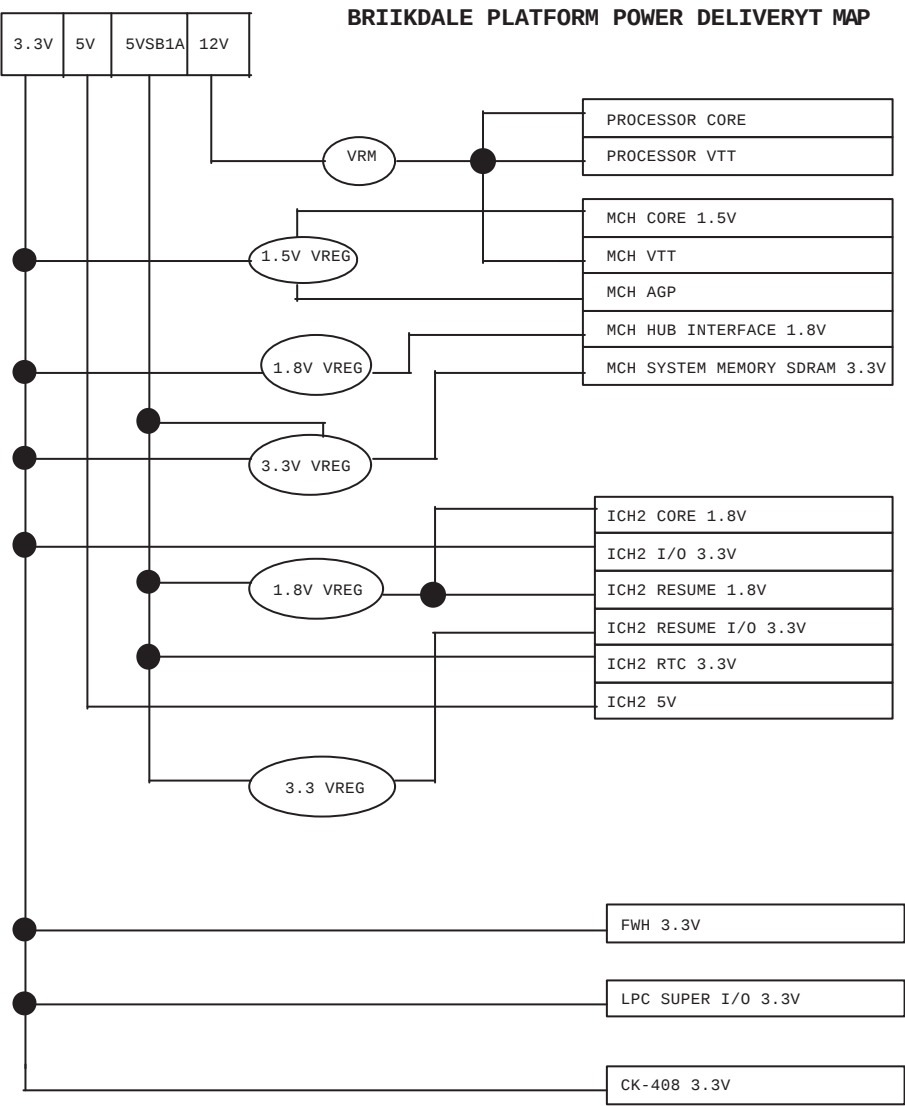
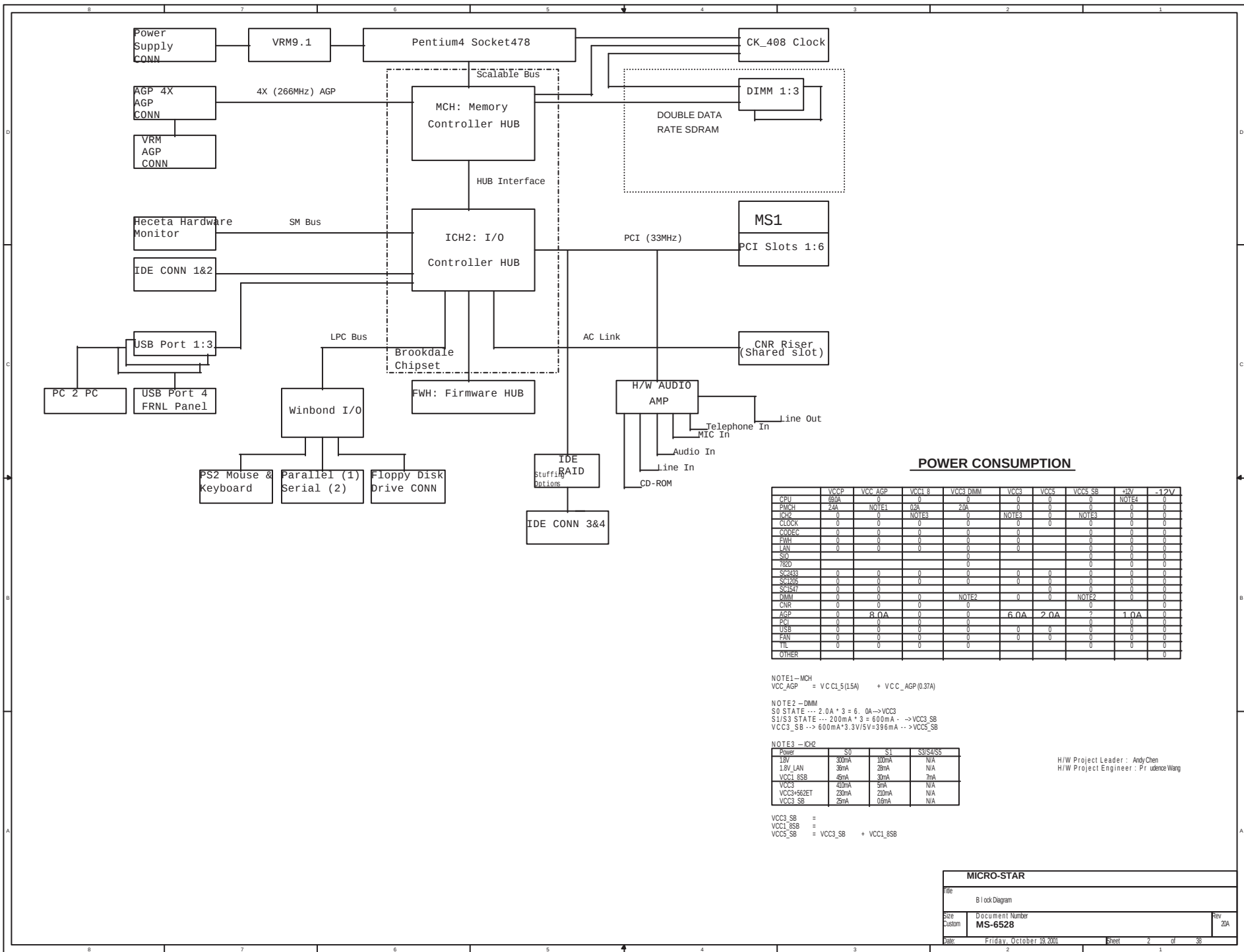
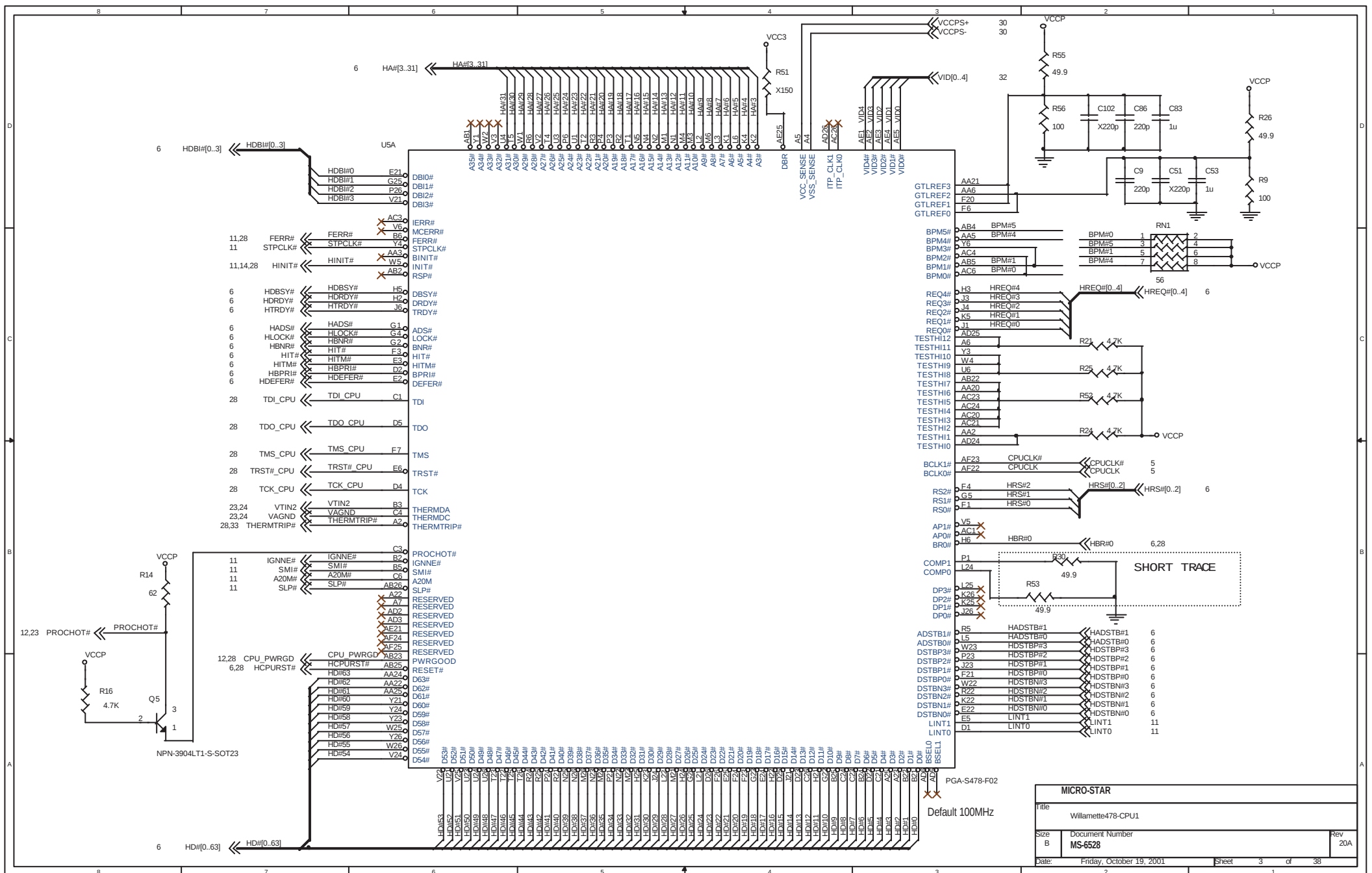


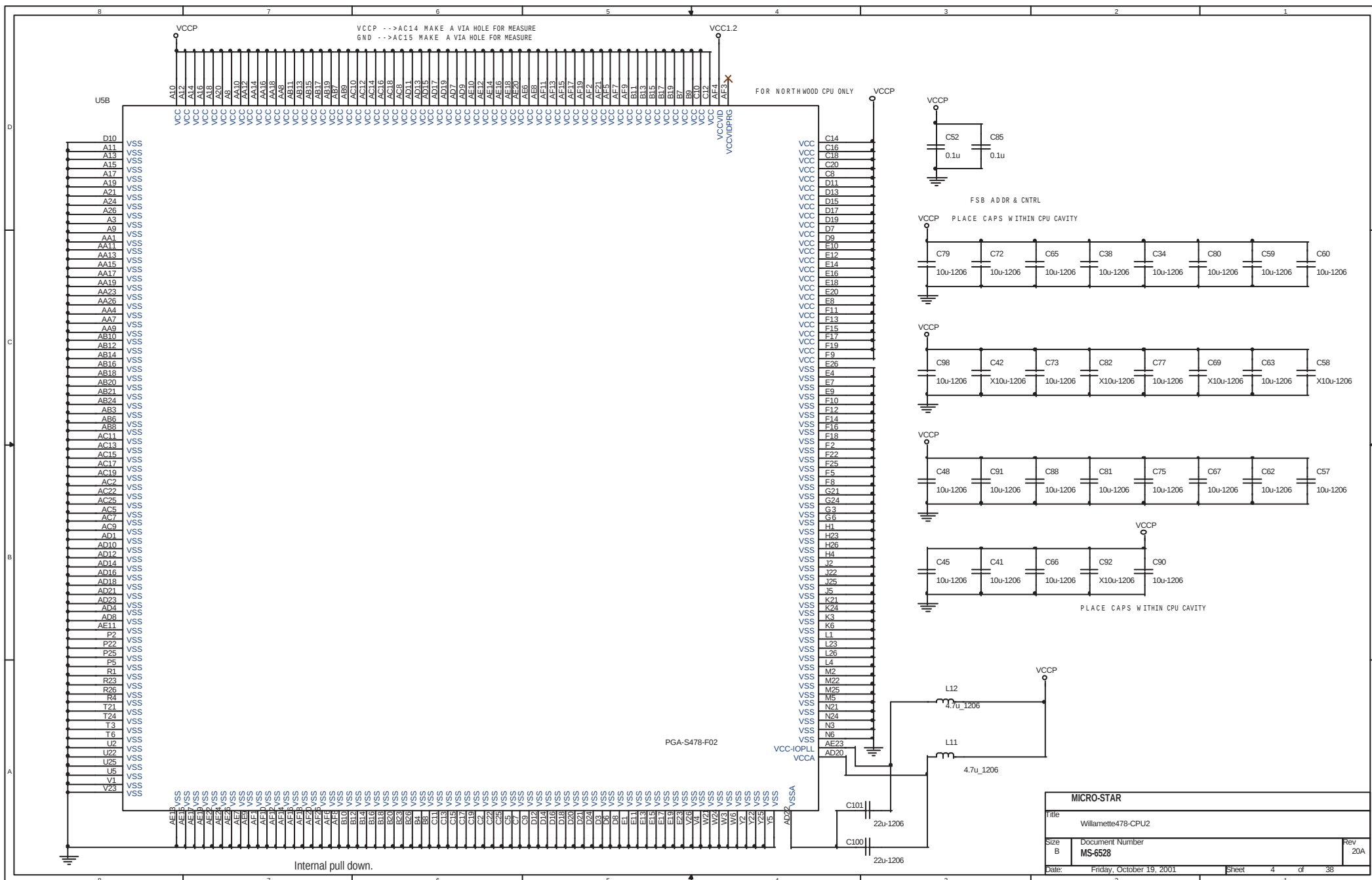
MS-6528 INTEL (R)
Brookdale/ICH2
CHIPSET
Pentium 4 in 478 pinPackage/Northwood
Processor SCHEMATICS

Title	Page
Cover Sheet	1
Block Diagram	2
Processor Sockets	3,4
Clock Synthesizer CK408	5
MCH BROOKDALE	6,7,8
DIMM 1 & 2 & 3	9,10
ICH2 CPU/AC97/SYS	11
ICH2 LPC/USB/PWR	12
IDE1 & IDE2	13
FWH / MS1(PC TO PC BRIDGE)	14
PCI Connectors	15,16,17
USB / PC 2 PC	18
AGP	19
CNR RISER	20
C-MEDIA HARDWARE AUDIO	21
AUDIO GAME PORT	22
LPC/Flopy Connector	23
Hardware Monitor	24
Parallel Port TERMINATION	25
Parallel Port/Serial Port	26
KB / MOUSE CONNECTOR	27
PULL UP RESISTOR	28
Front Pannel	29
VRM 9.1 VERSION 0.5	30
Voltage Regulator	31
D_LED & OVER VOLTAGE	32
MISC	33
IDE RAID	34
IDE RAID CONNECTOR	35
MANUAL PART	36
VERSION HISTORY	37

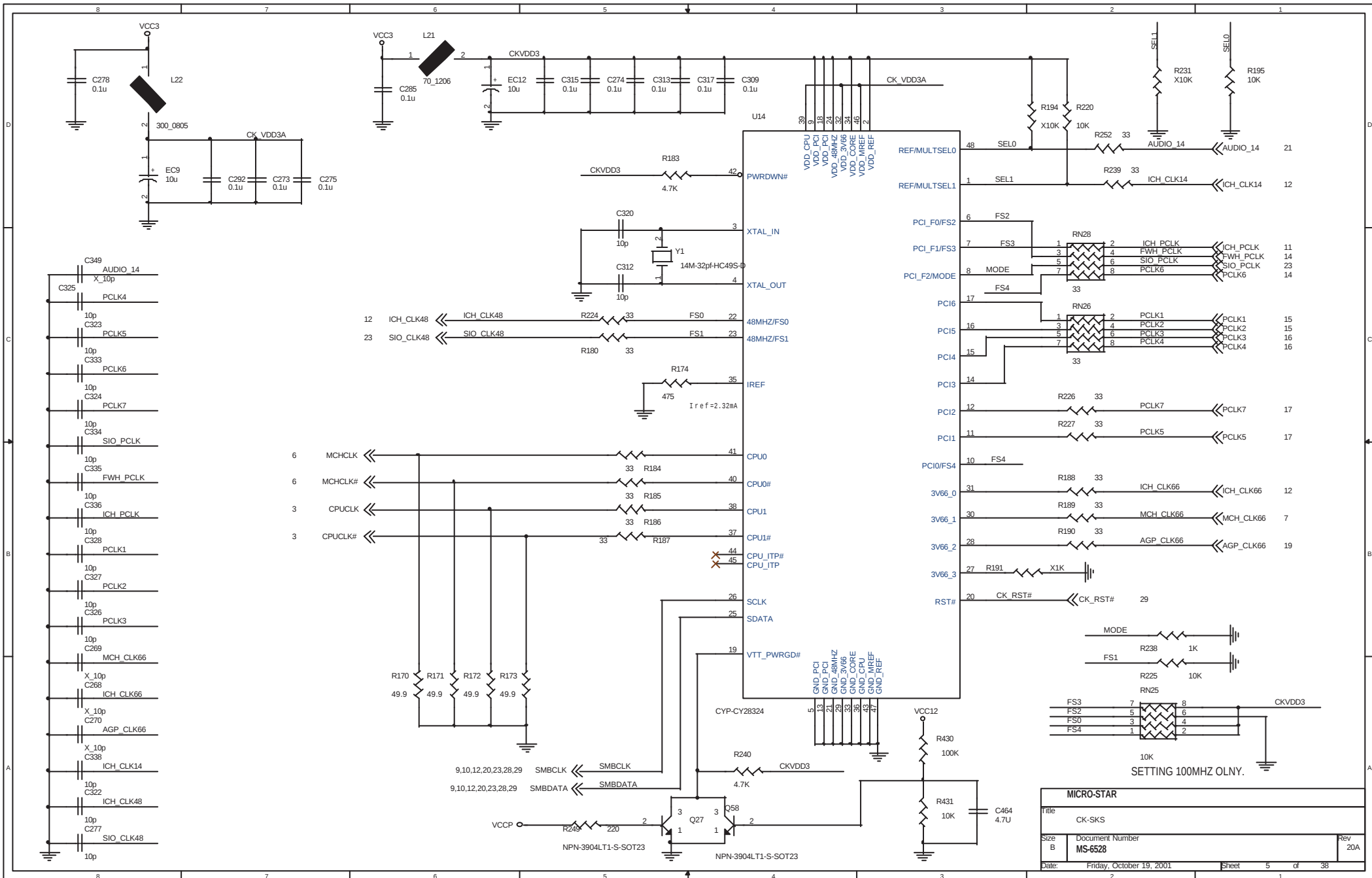


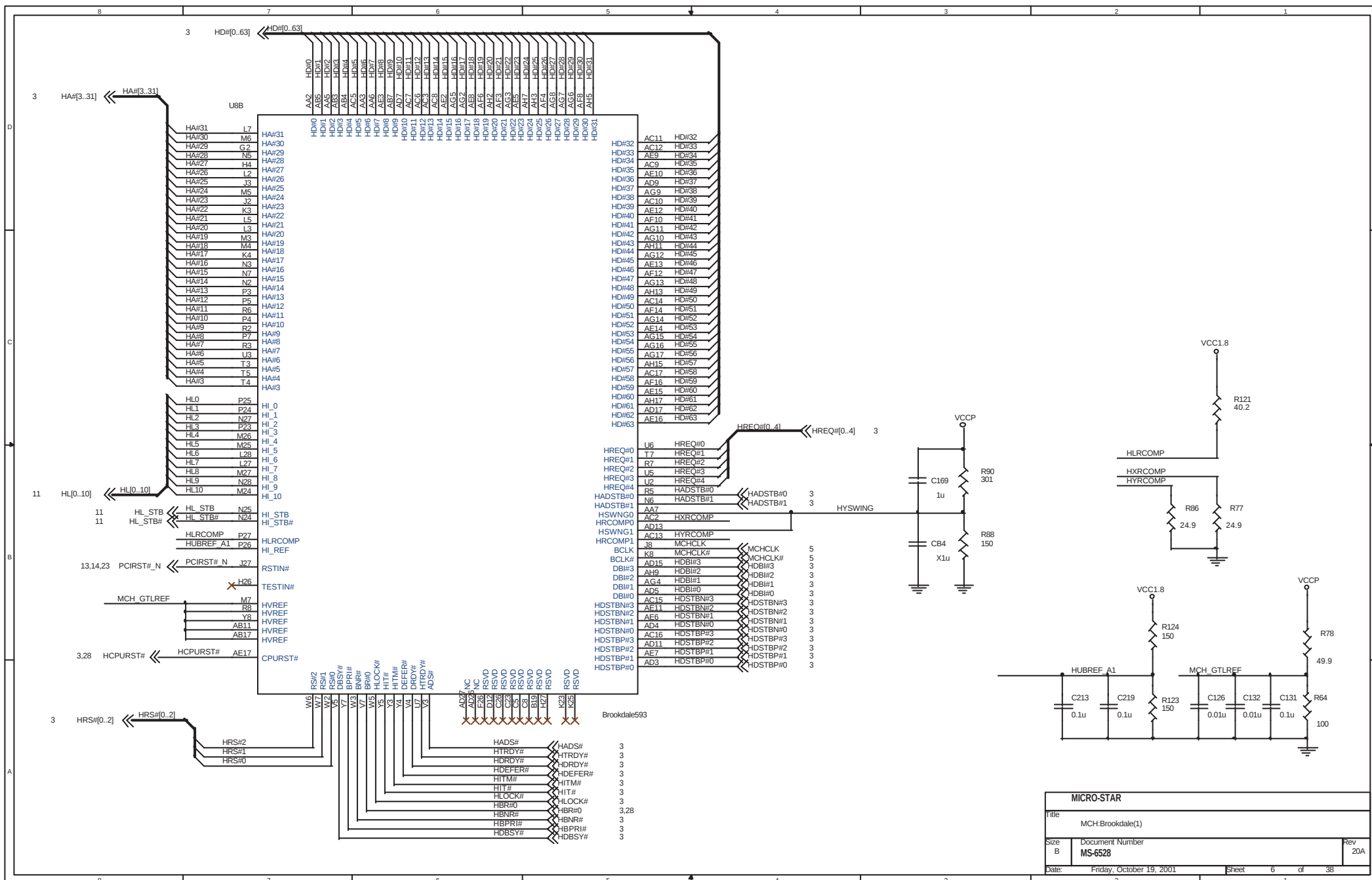


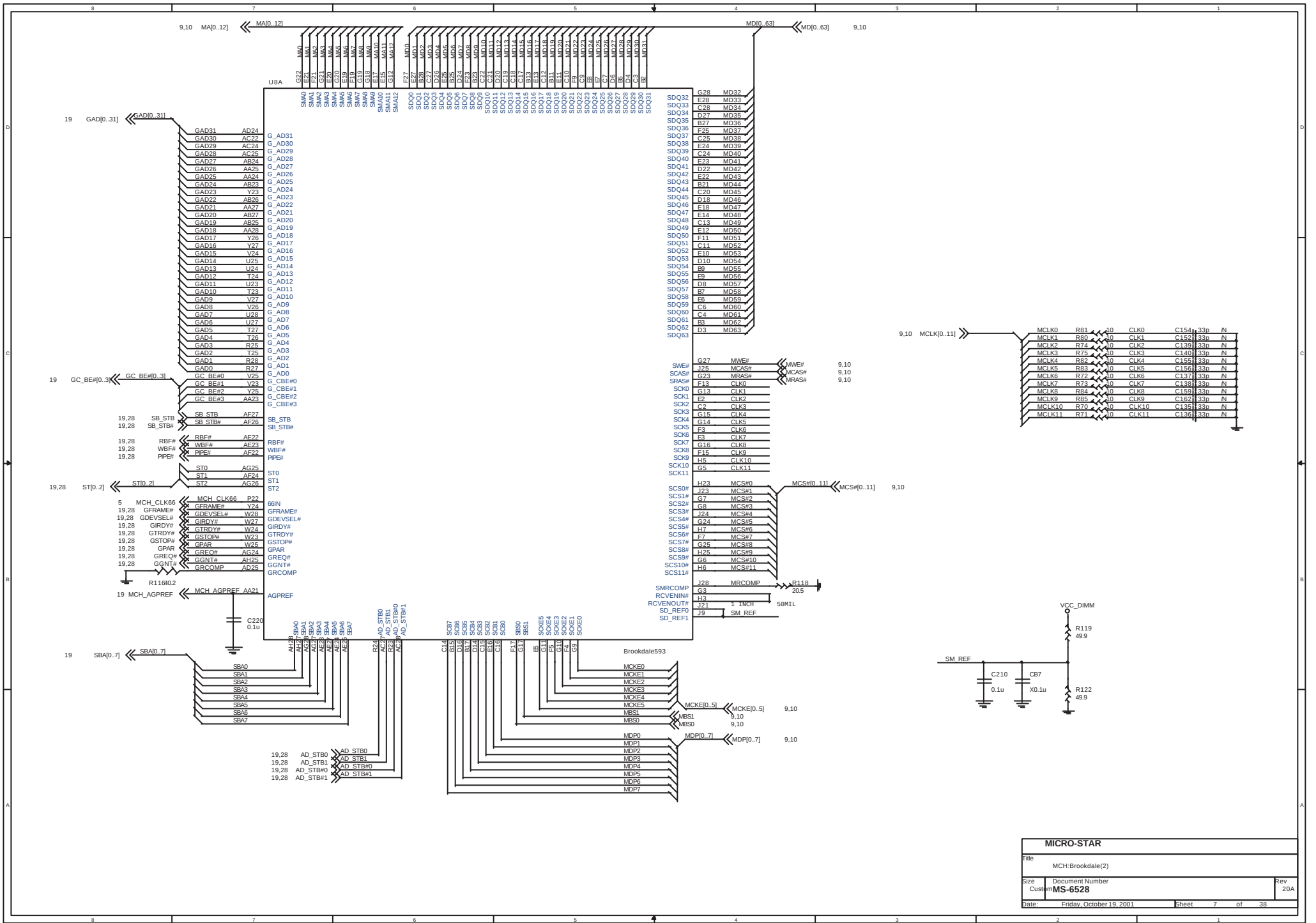




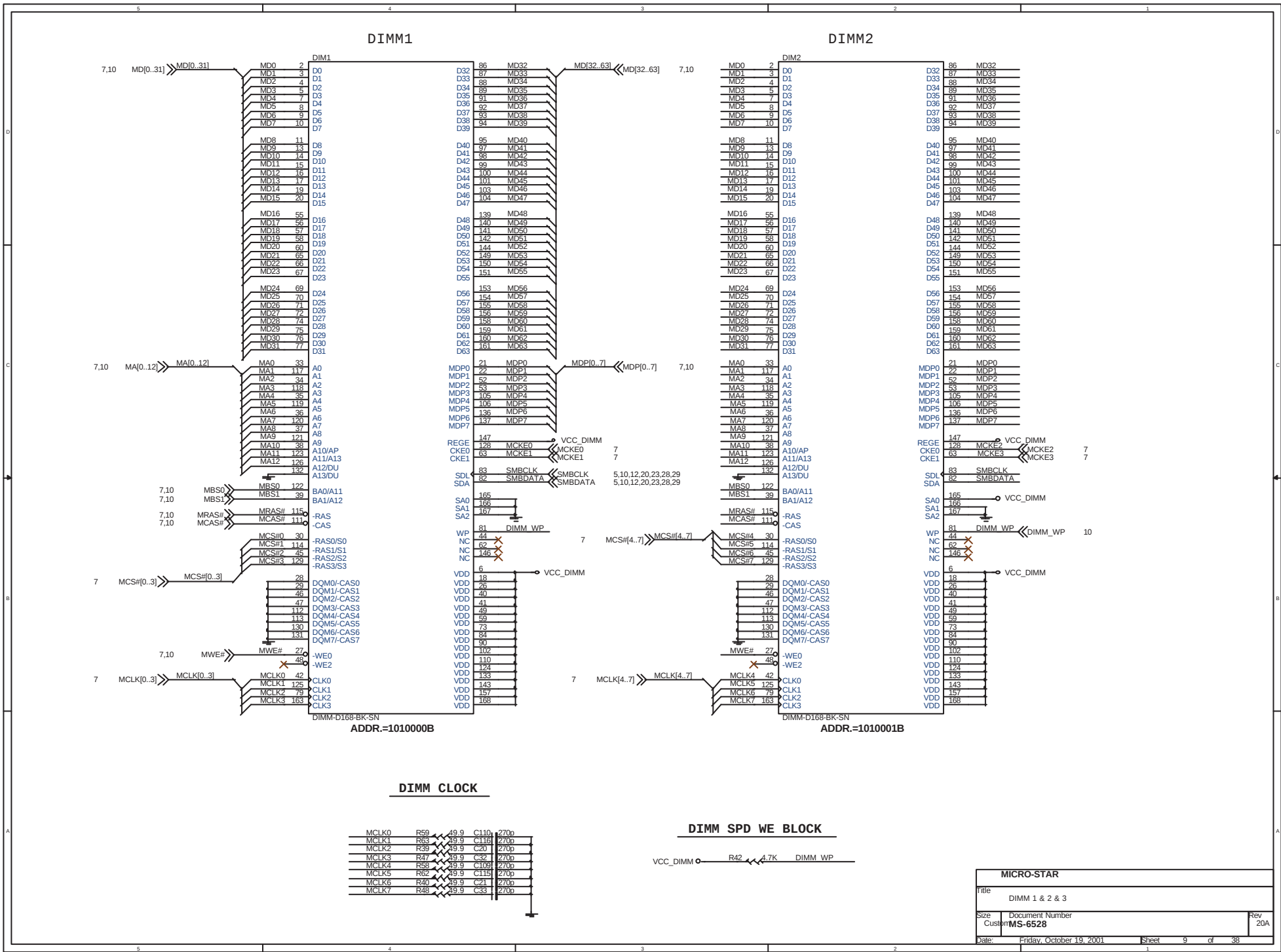
MICRO-STAR				
Title Willamette478-CPU2				
Size B	Document Number MS-6528			Rev 2
Date:	Friday, October 19, 2001		Sheet	4 of 38

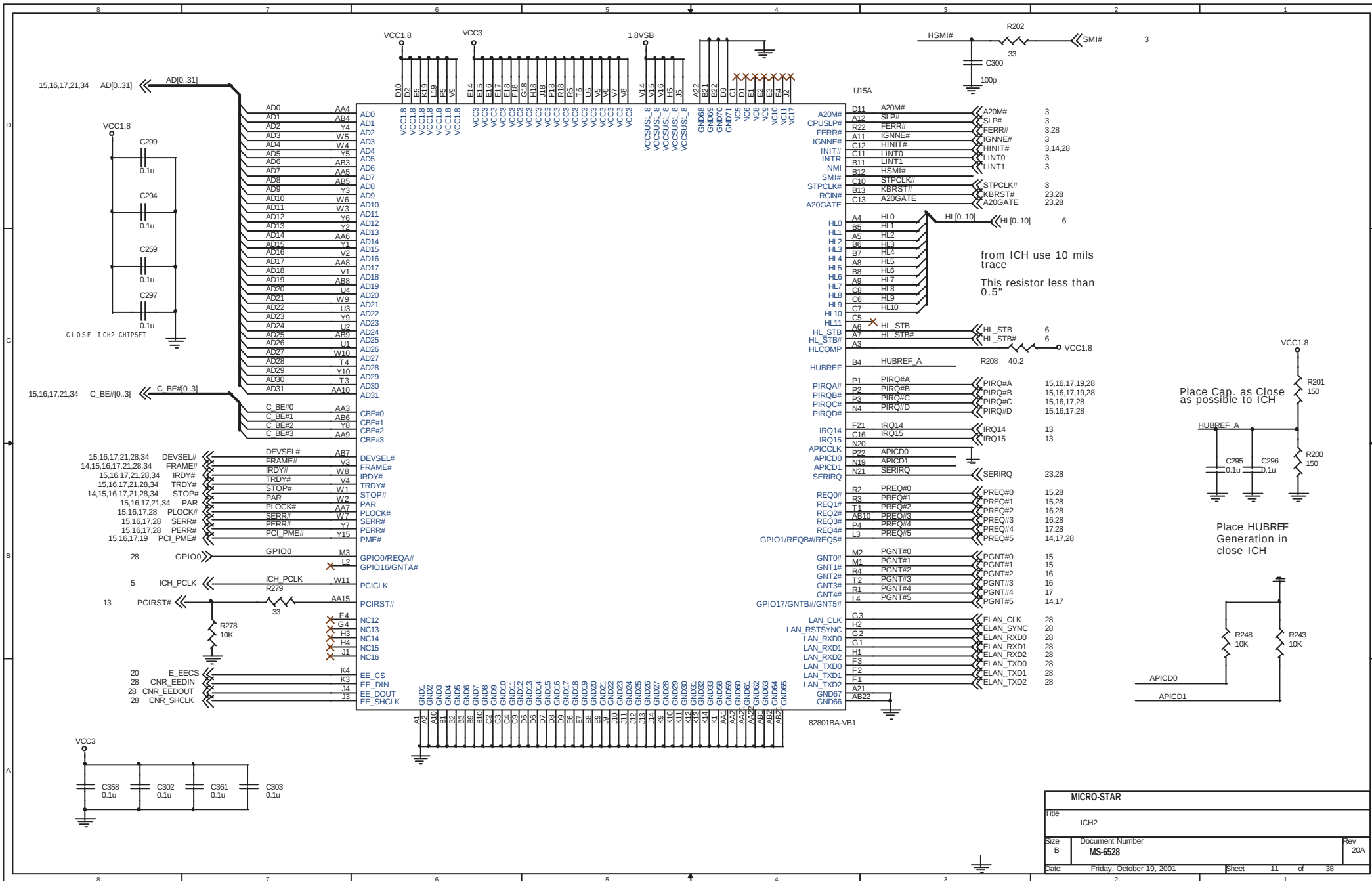




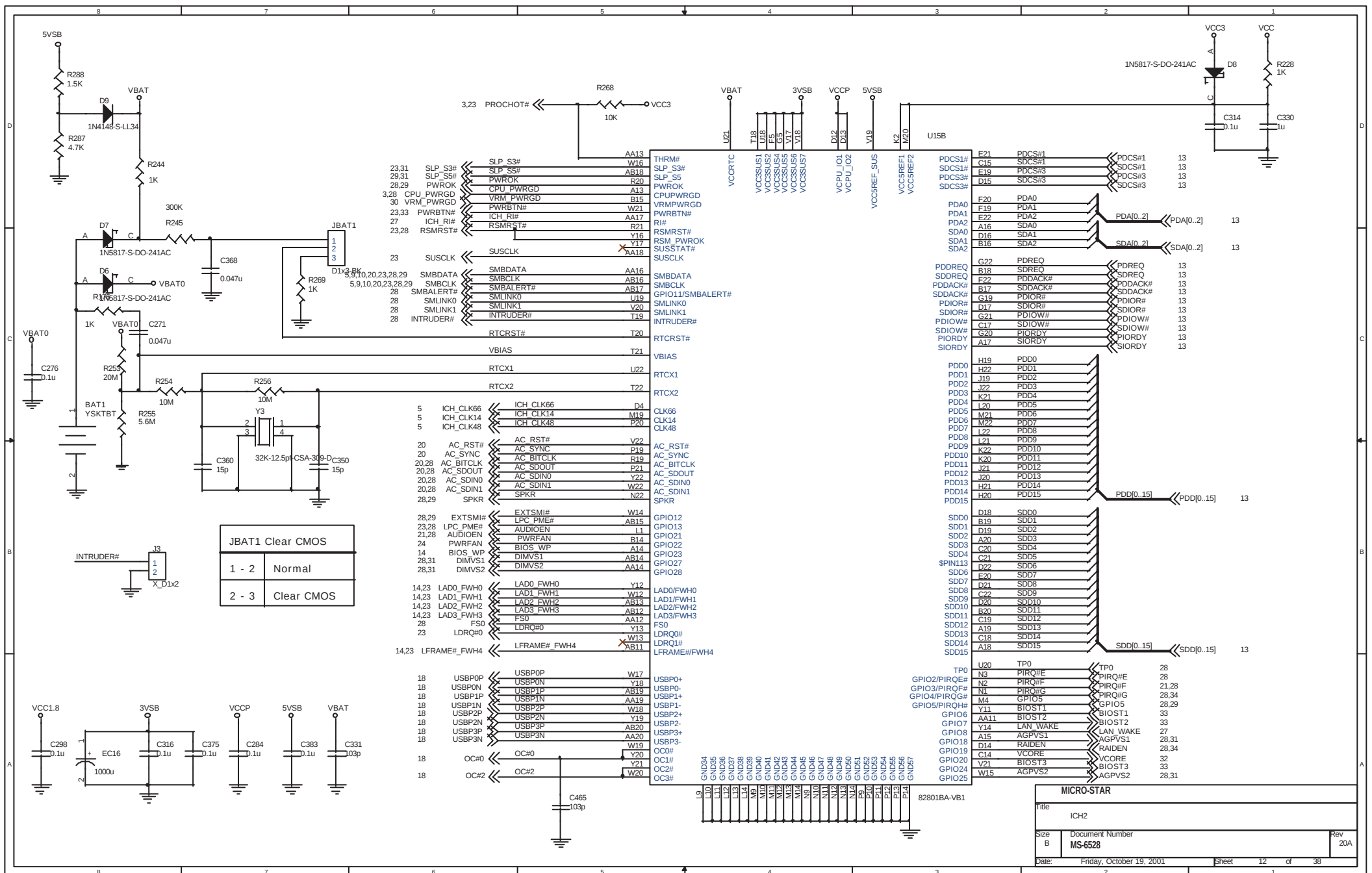


MICRO-STAR			
Title			
MCH:Brookdale(2)			
Size	Document Number	Rev	
Custom	MS-6528	20A	
Date	Friday, October 19, 2001	Sheet	7 of 38



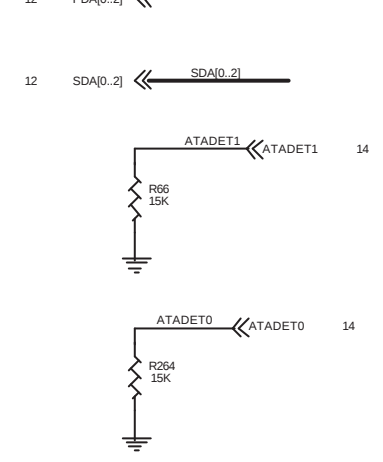
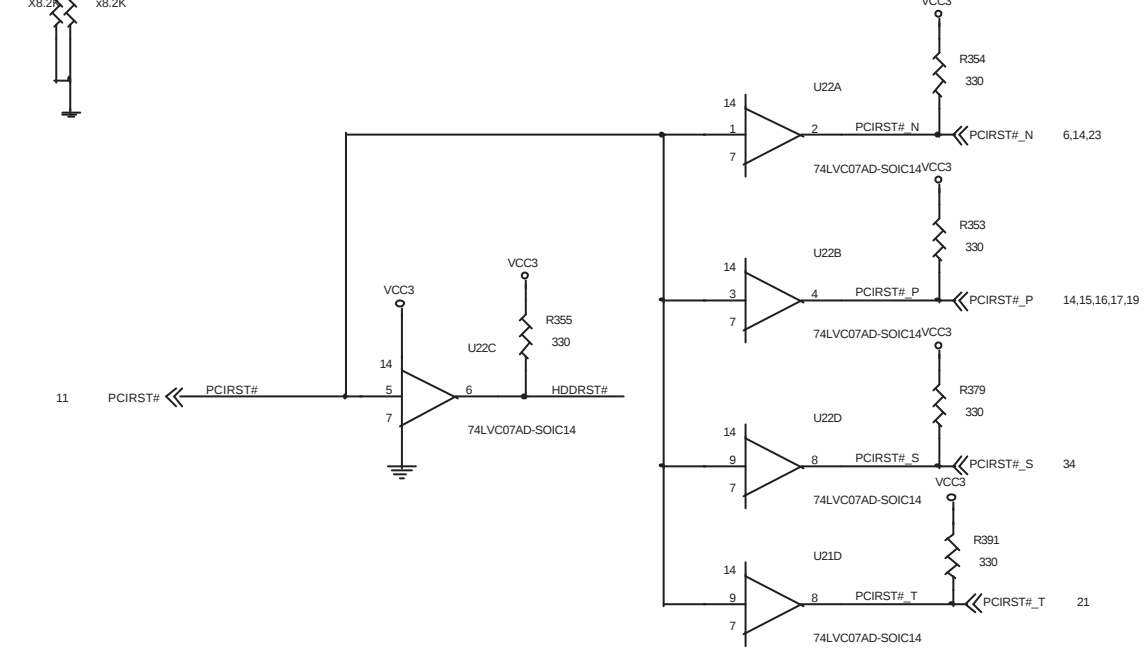
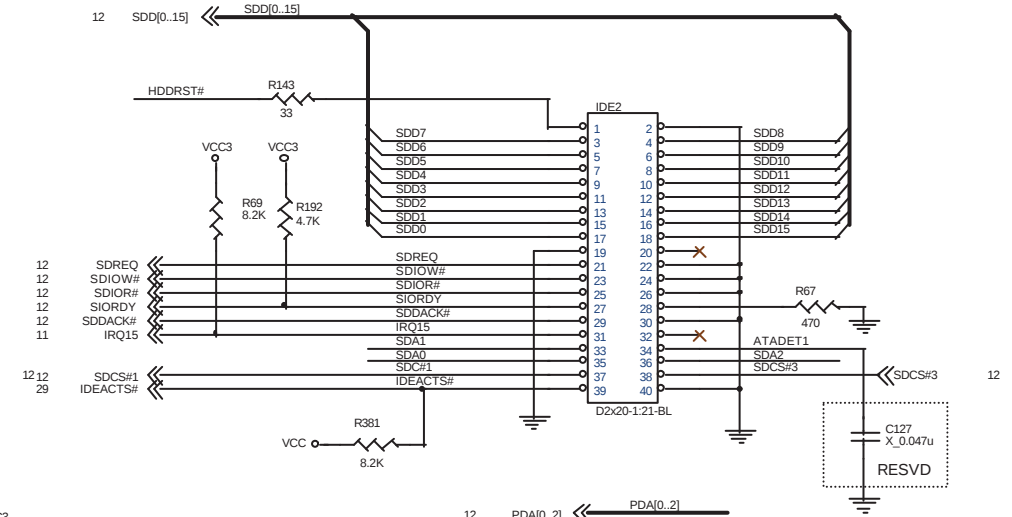
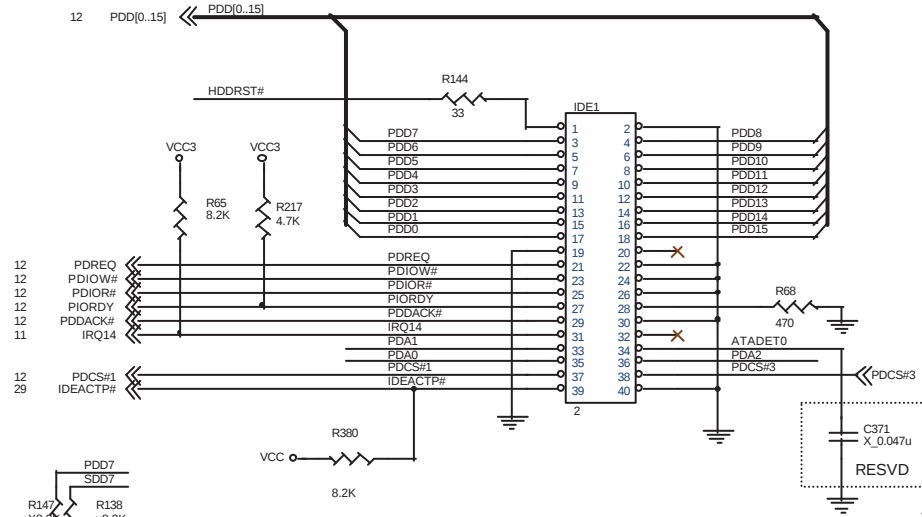


MICRO-STAR		
Title ICH2		
Size B	Document Number MS-6528	Rev 20A
Date: Friday, October 19, 2001	Sheet 11	of 38

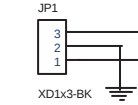
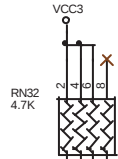
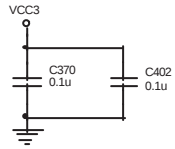


PRIMARY IDE CONN.

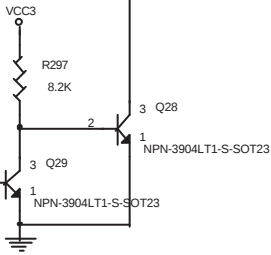
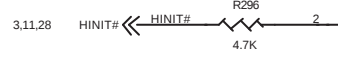
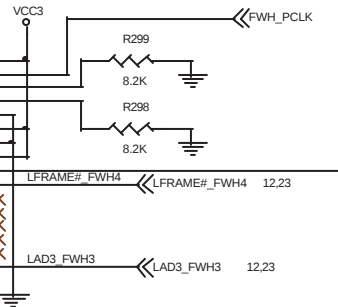
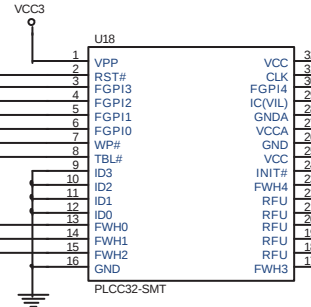
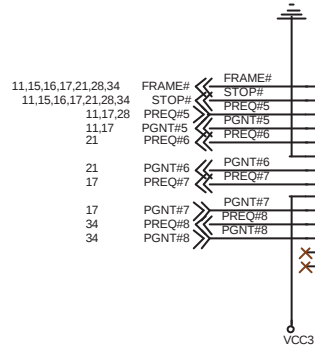
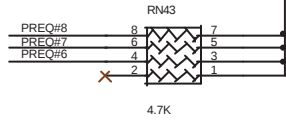
SECONDARY IDE CONN.



MICRO-STAR		
Title	IDE	
Size B	Document Number MS-6528	Rev 20A
Date:	Friday, October 19, 2001	Sheet 13 of 38



BIOS_WP << BIOS_WP



JP1 Gateway	
1 - 2	Flash from FDD
2 - 3	Boot auto clear CMOS

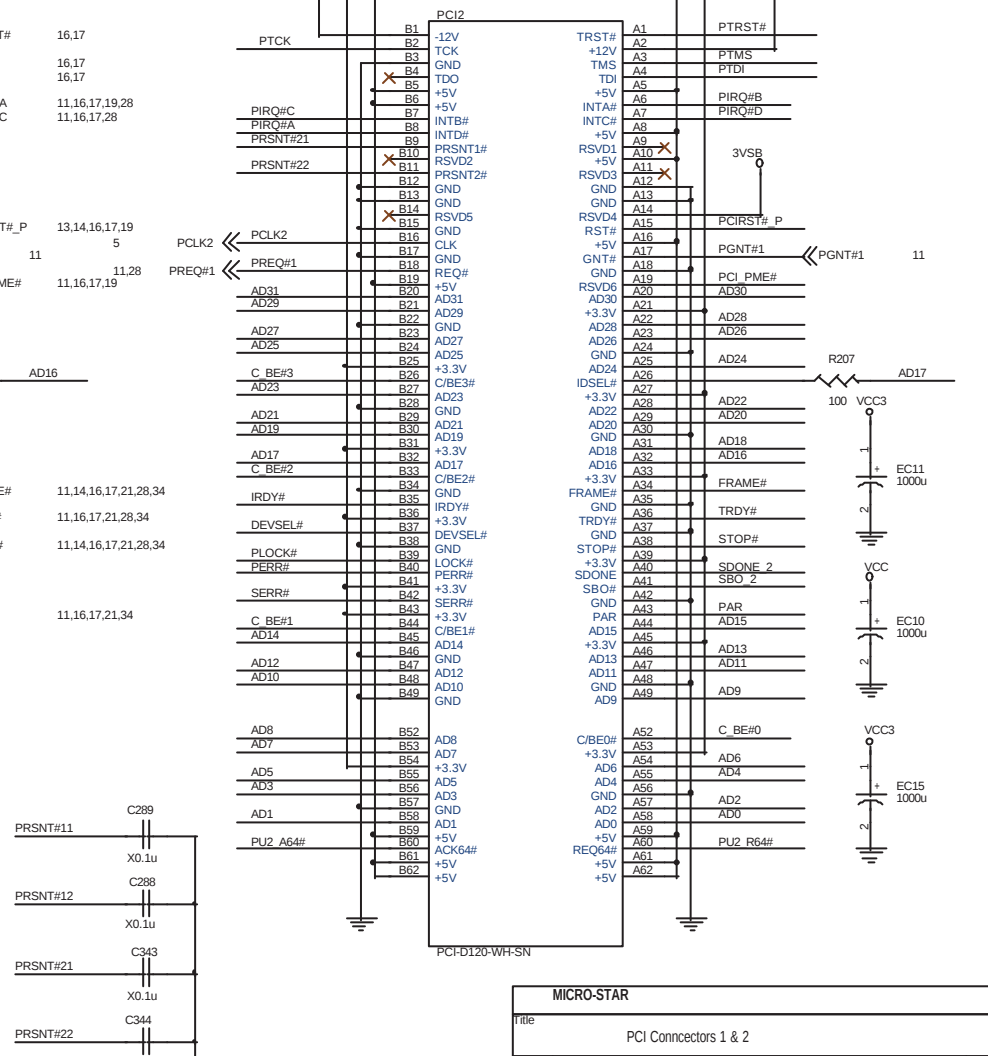
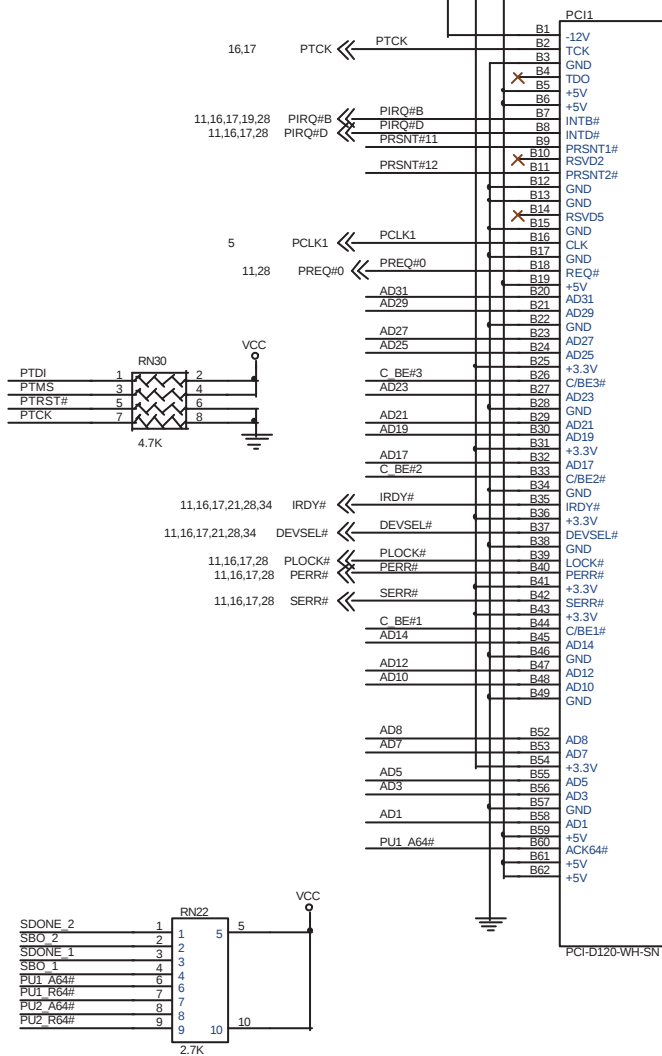
J6 BIOS PROTECT	
SHORT	Locked
OPEN	Unlocked

*

MICRO-STAR		
Title	FWH	
Size B	Document Number	Rev
	MS-6528	20A
Date:	Friday, October 19, 2001	Sheet 14 of 38

32/33 PCI Connector 1 & 2

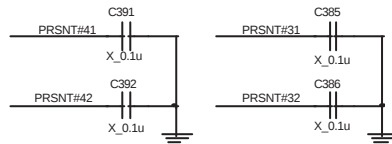
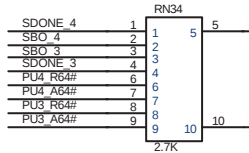
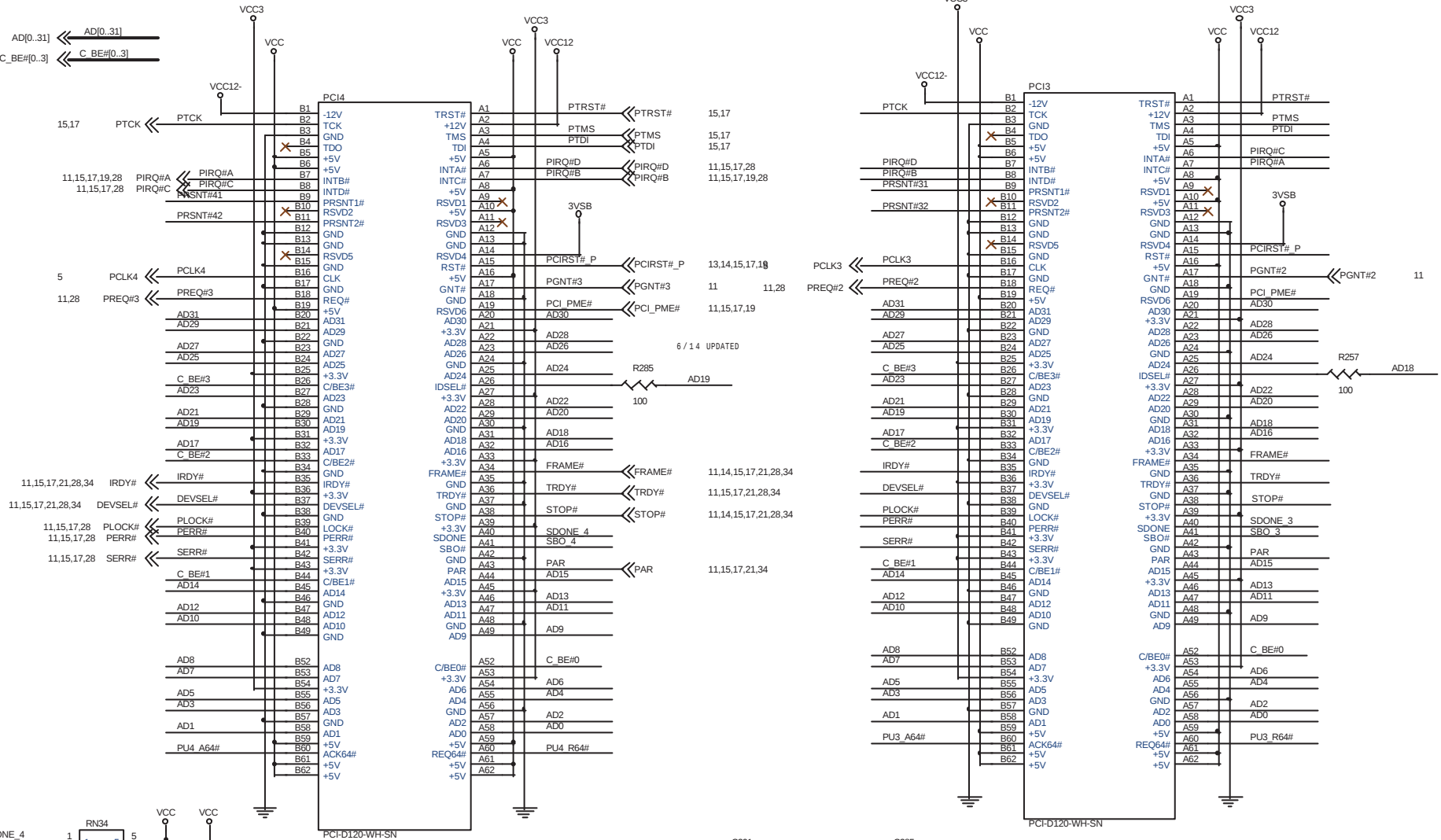
11,16,17,21,34 AD[0..31] << AD[0..31]
11,16,17,21,34 C_BE#[0..3] << C_BE#[0..3]



MICRO-STAR		
Title		
PCI Connectors 1 & 2		
Size	Document Number	Rev
B	MS-6528	20A
Date:	Friday, October 19, 2001	Sheet 15 of 38

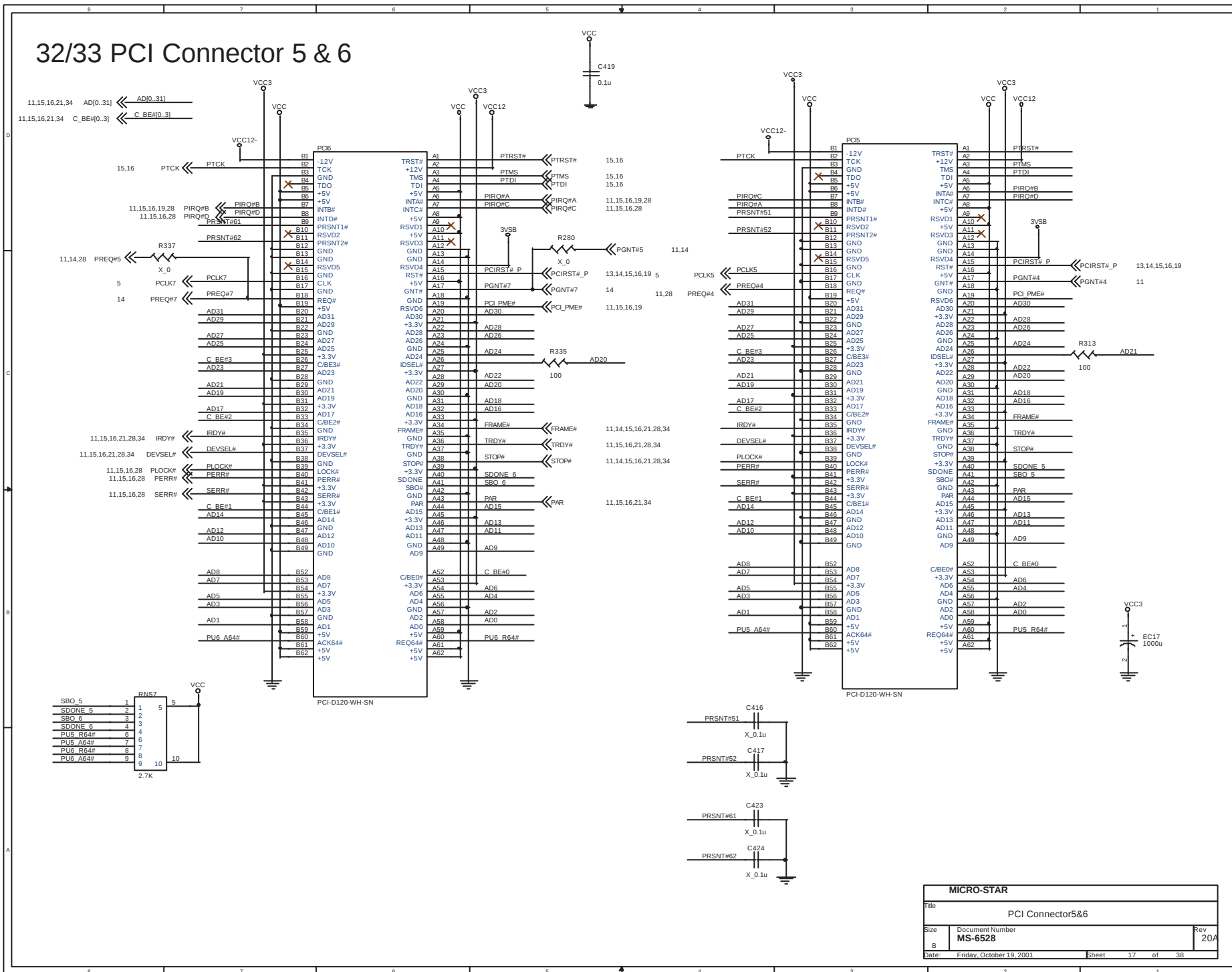
32/33 PCI Connector 3 & 4

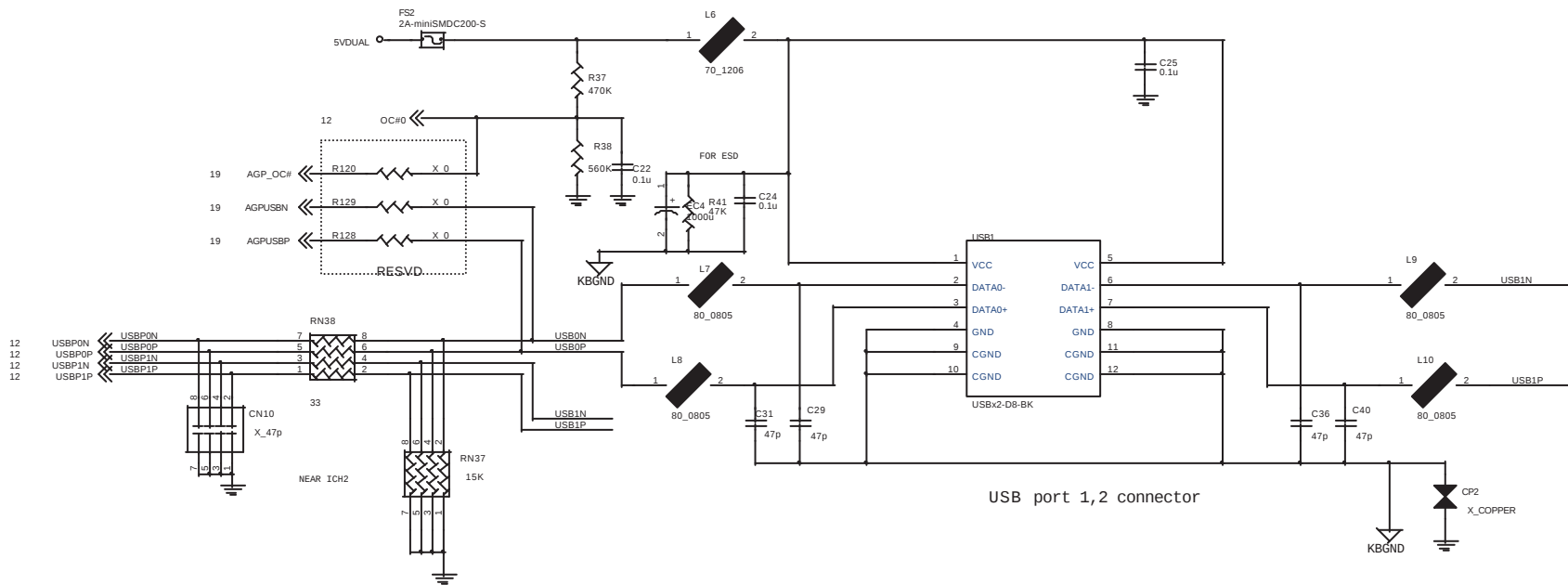
11,15,17,21,34 AD[0..31] << AD[0..31]
11,15,17,21,34 C_BE#[0..3] << C_BE#[0..3]



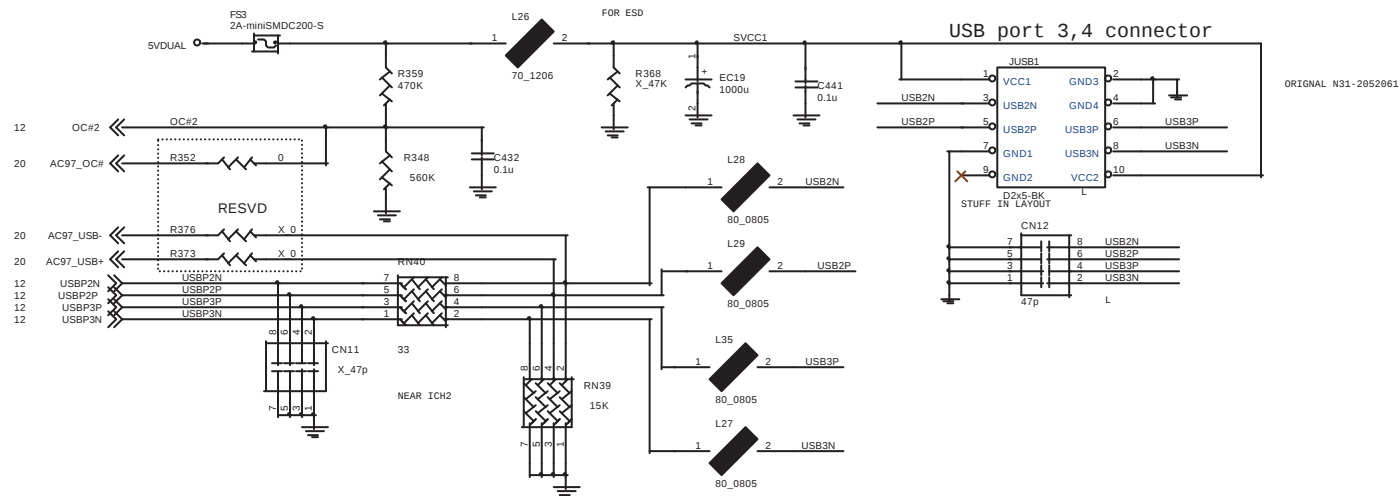
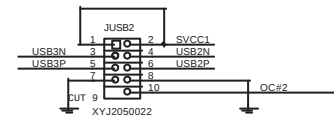
MICRO-STAR		
Title		
PCI Connector 3 & 4		
Size	Document Number	Rev
B	MS-6528	20A
Date	Friday, October 19, 2001	Sheet 16 of 38

32/33 PCI Connector 5 & 6

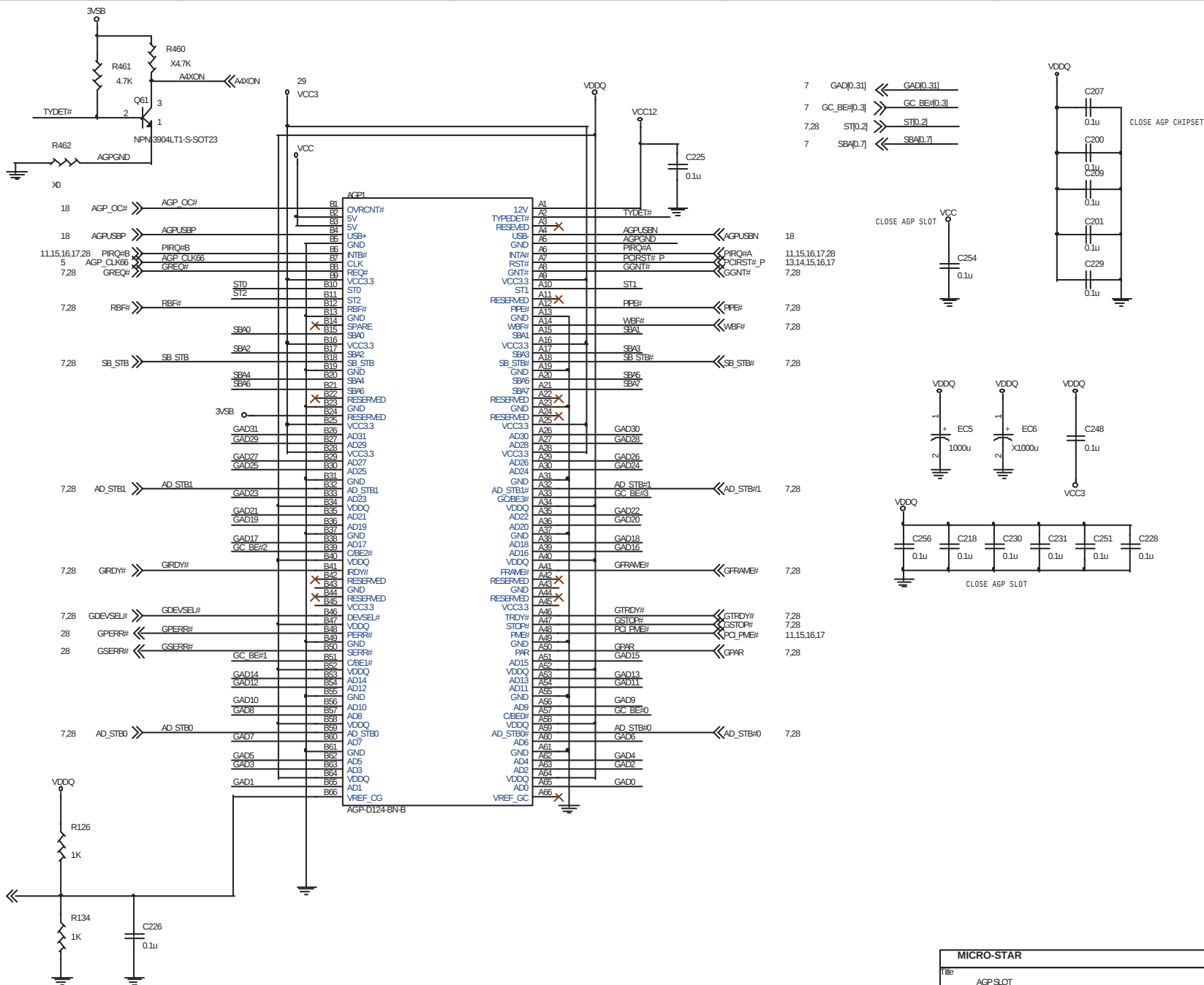




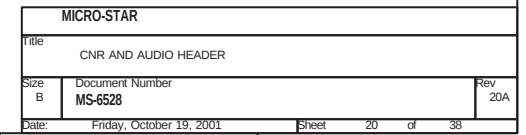
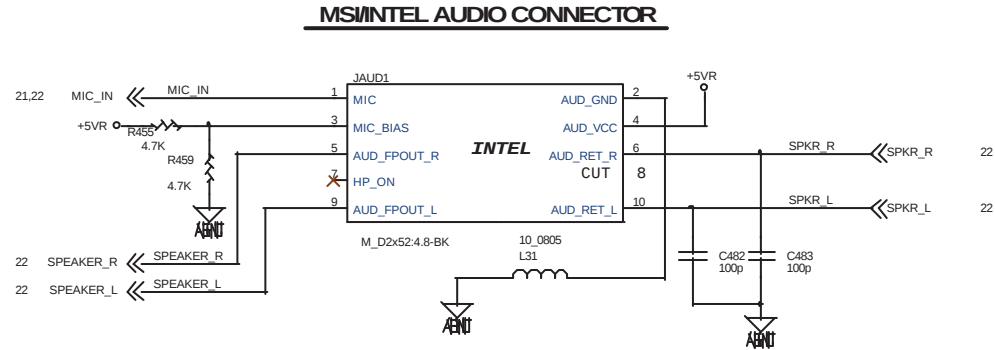
INTEL

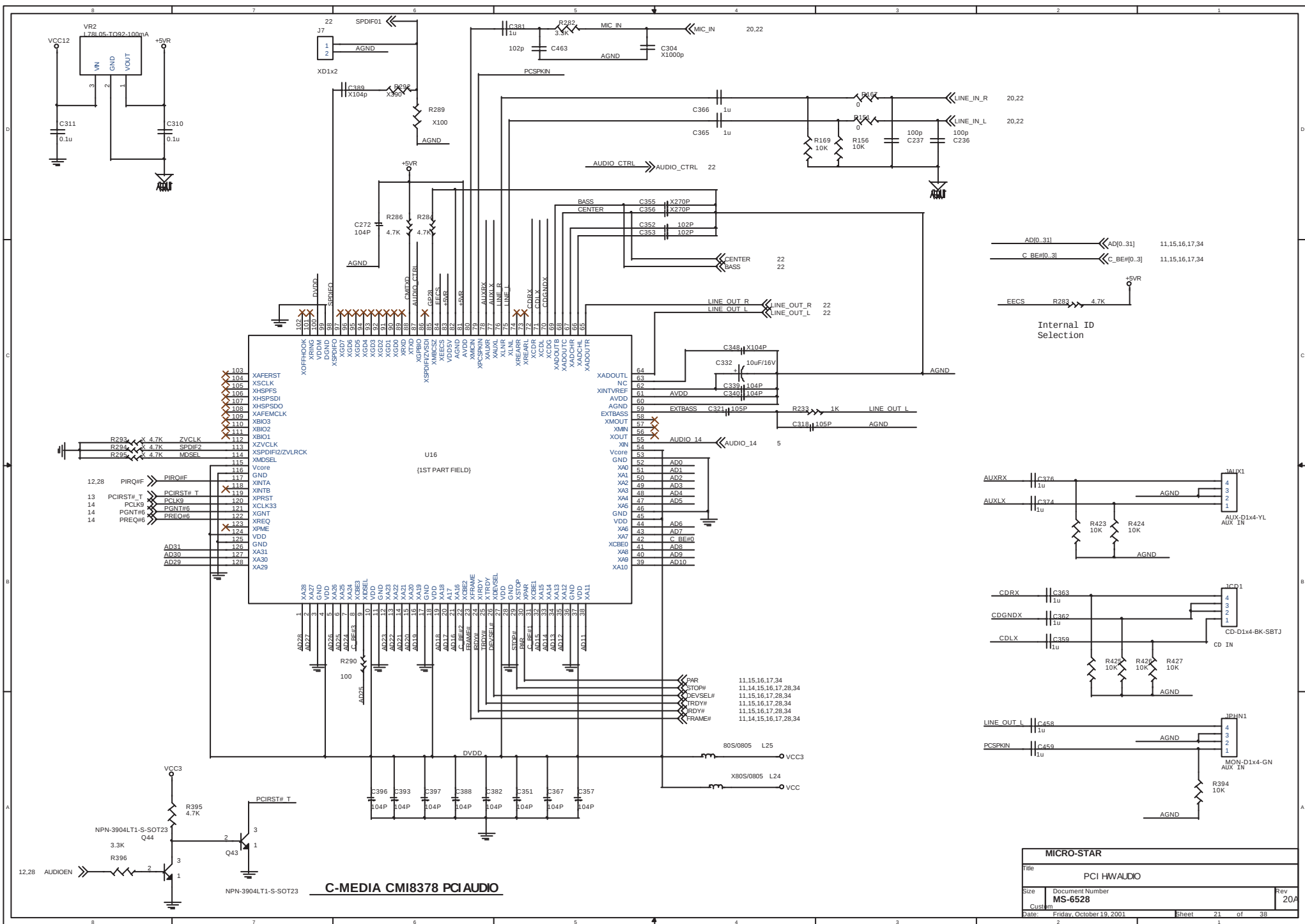


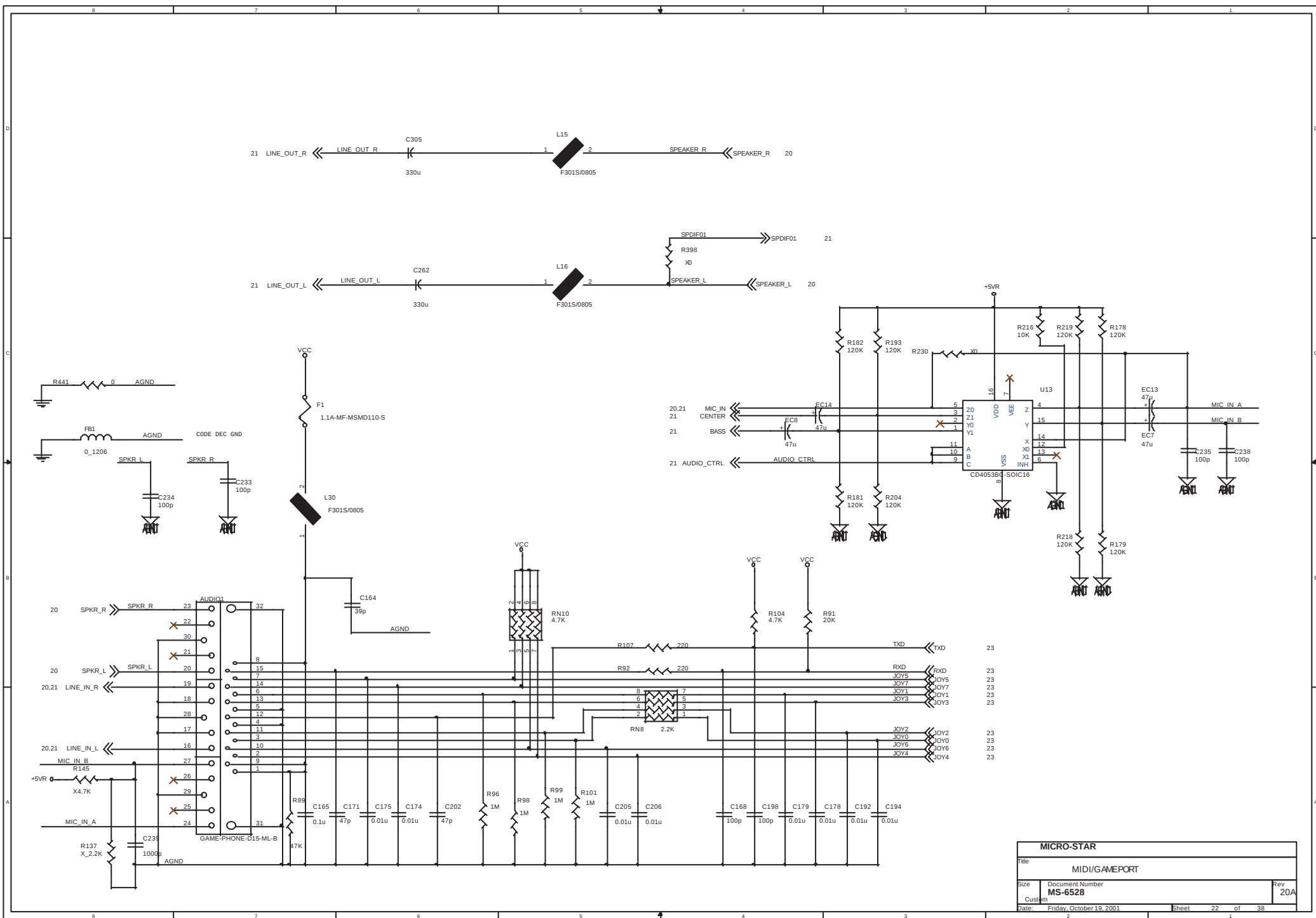
MICRO-STAR			
Title	USB		
Size	Document Number	Rev	
Cust	MS-6528	20A	
Date	Friday, October 19, 2001	Sheet	18 of 38



MICRO-STAR			
Title			
AGP SLOT			
Size	Document Number	Rev	
Custom	MS-6528	20A	
Date:	Friday, October 19, 2001	Sheet	19 of 38







FLOPPY DISK HEADER

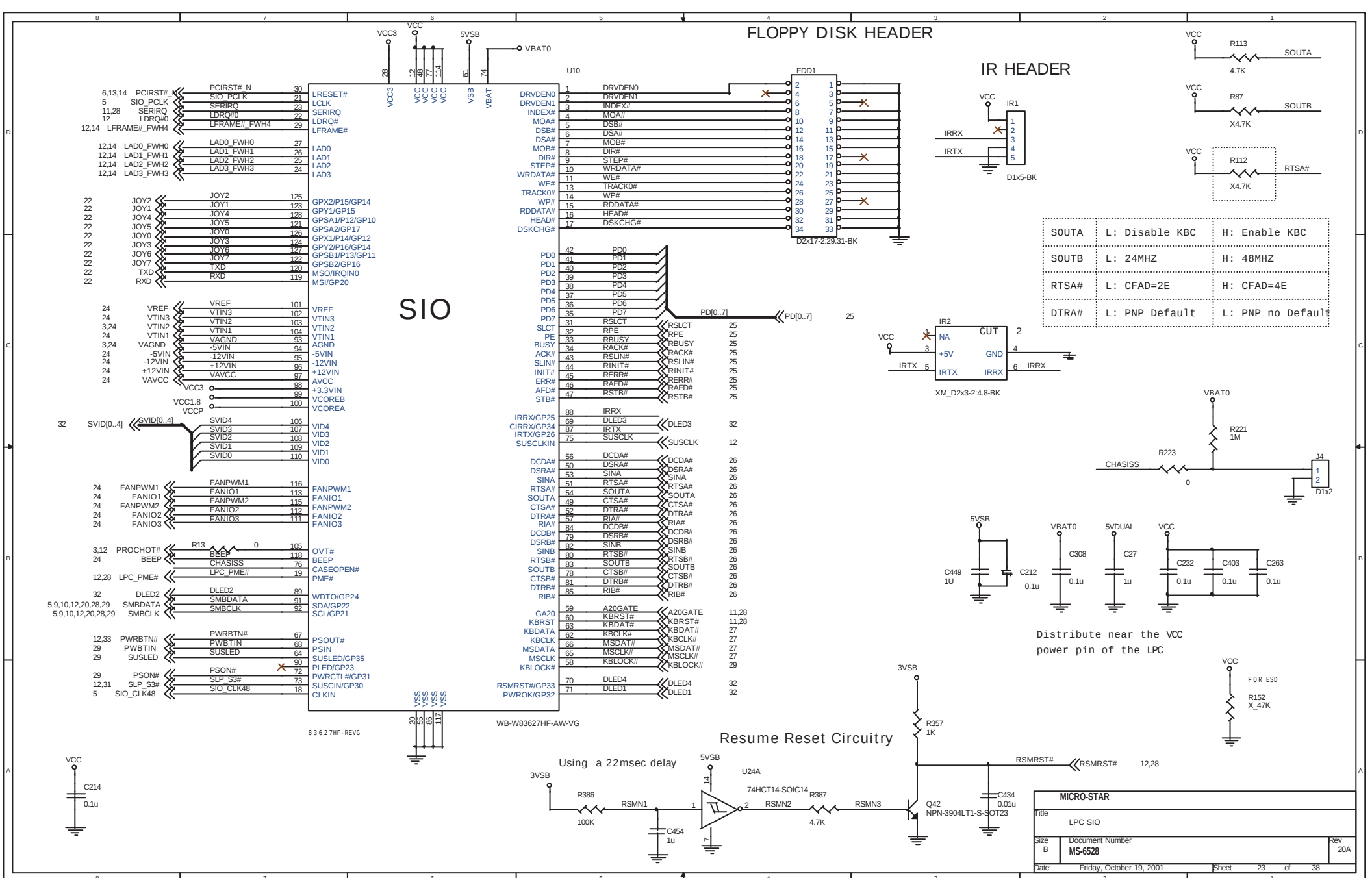
IR HEADER

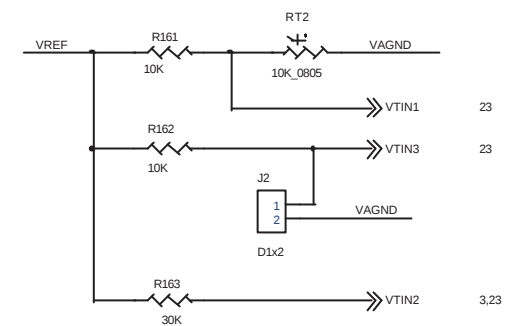
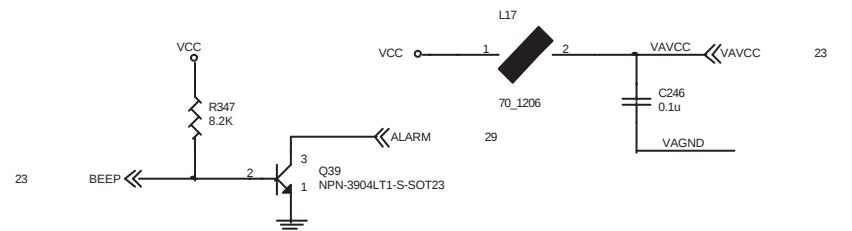
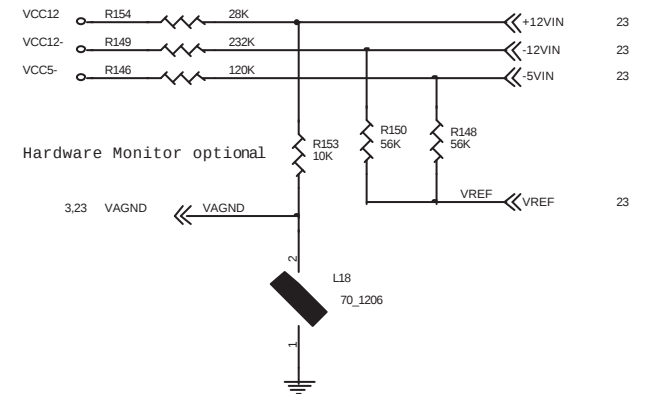
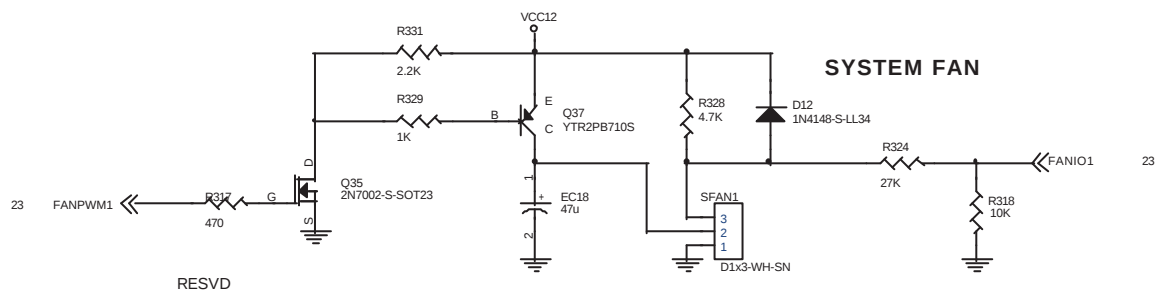
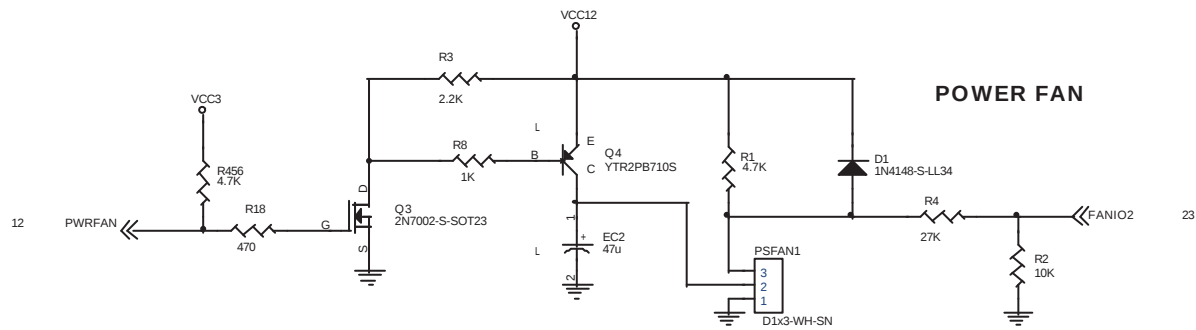
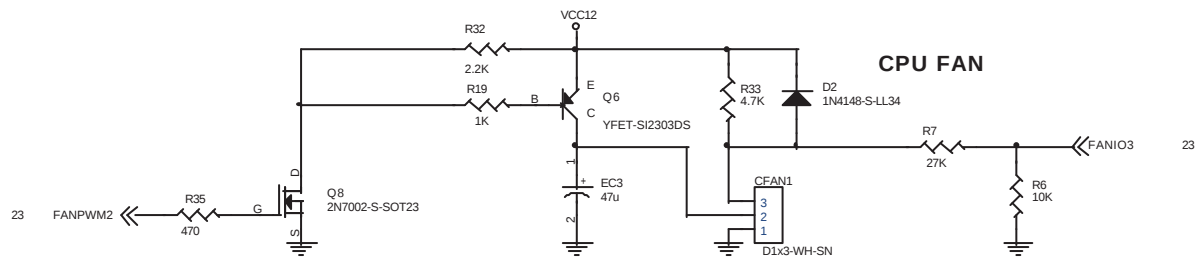
SOUTA	L: Disable KBC	H: Enable KBC
SOUTB	L: 24MHZ	H: 48MHZ
RTSA#	L: CFAD=2E	H: CFAD=4E
DTRA#	L: PNP Default	L: PNP no Default

Resume Reset Circuitry

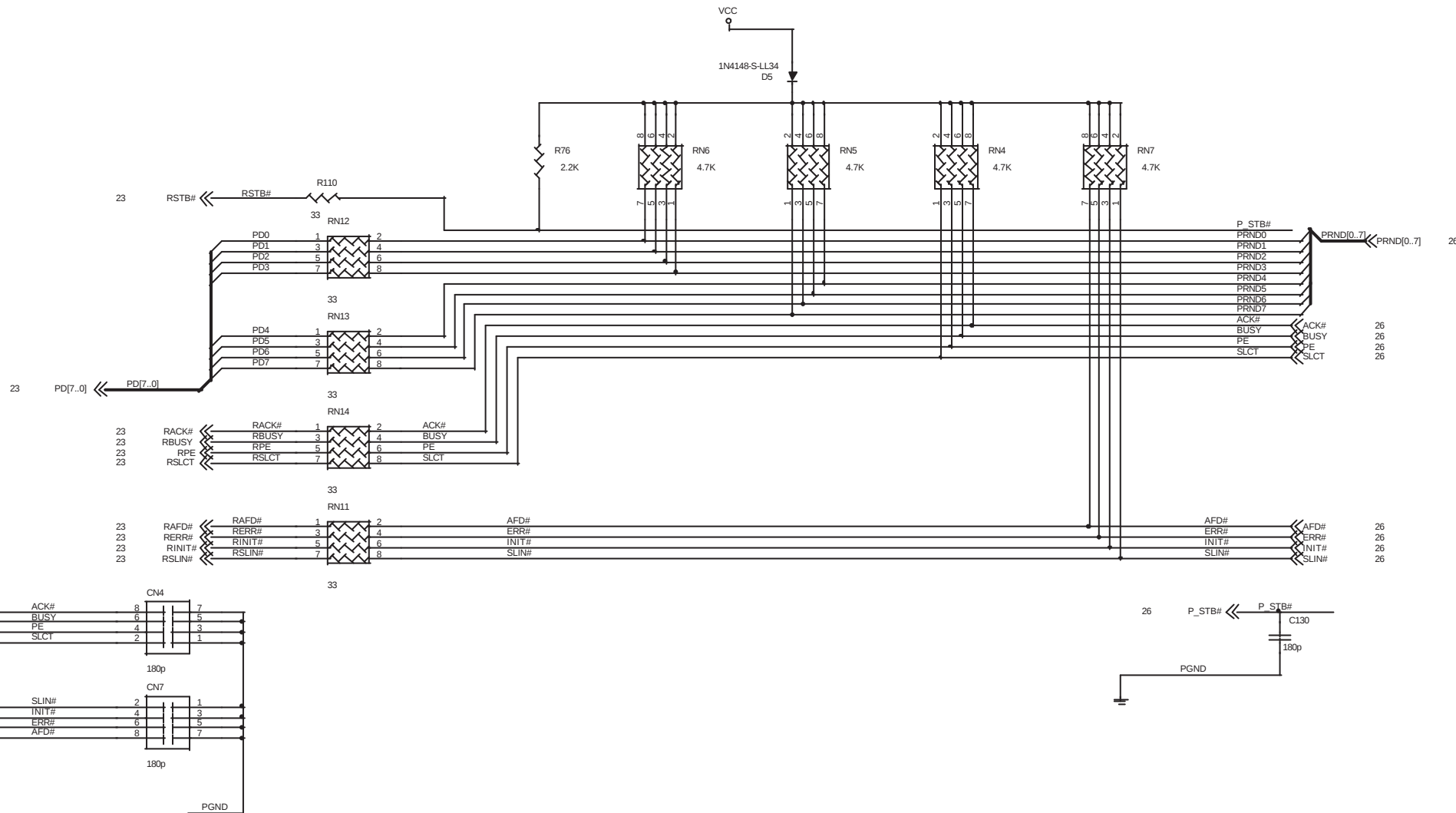
Distribute near the VCC power pin of the LPC

MICRO-STAR		
File	LPC SIO	
Size B	Document Number	Rev
	MS-6528	20A
Date:	Friday, October 19, 2001	Sheet 23 of 38



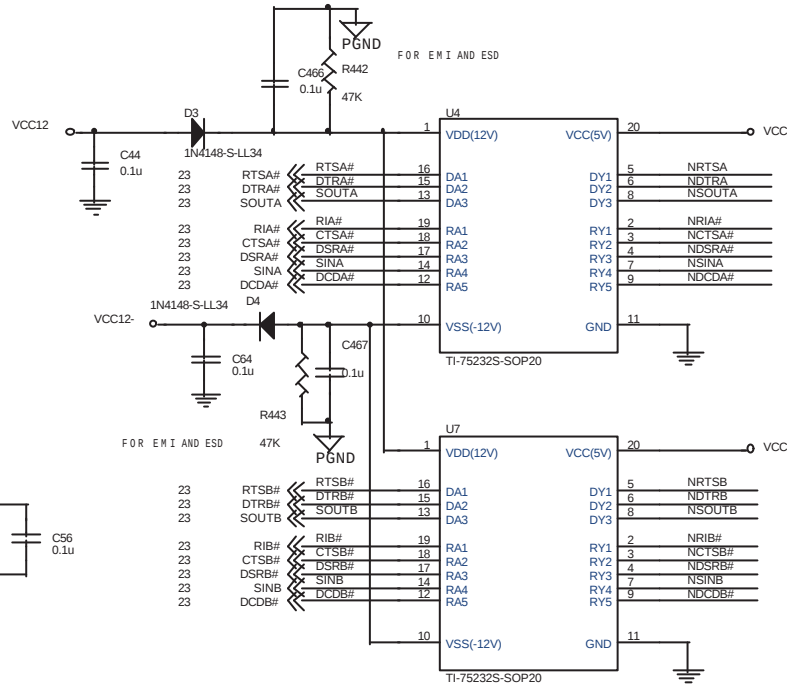
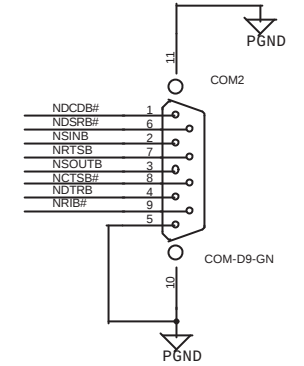
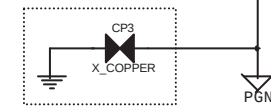
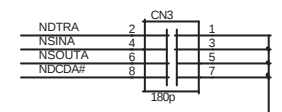
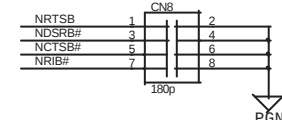
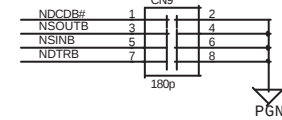
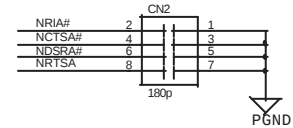
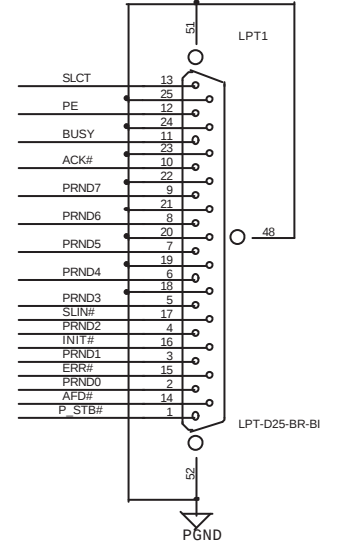
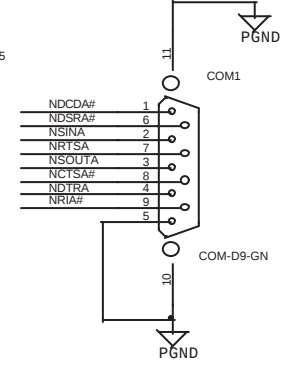
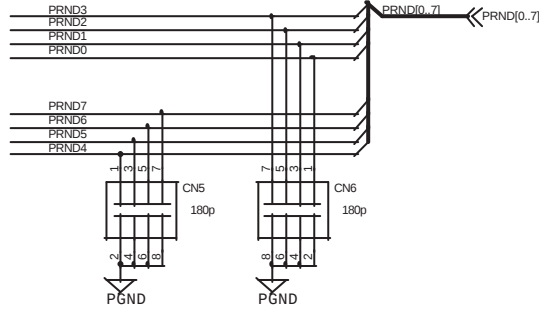


MICRO-STAR		
Title		
Hardware Monitor		
Size B	Document Number	Rev
	MS-6528	20A
Date:	Friday, October 19, 2001	Sheet 24 of 38

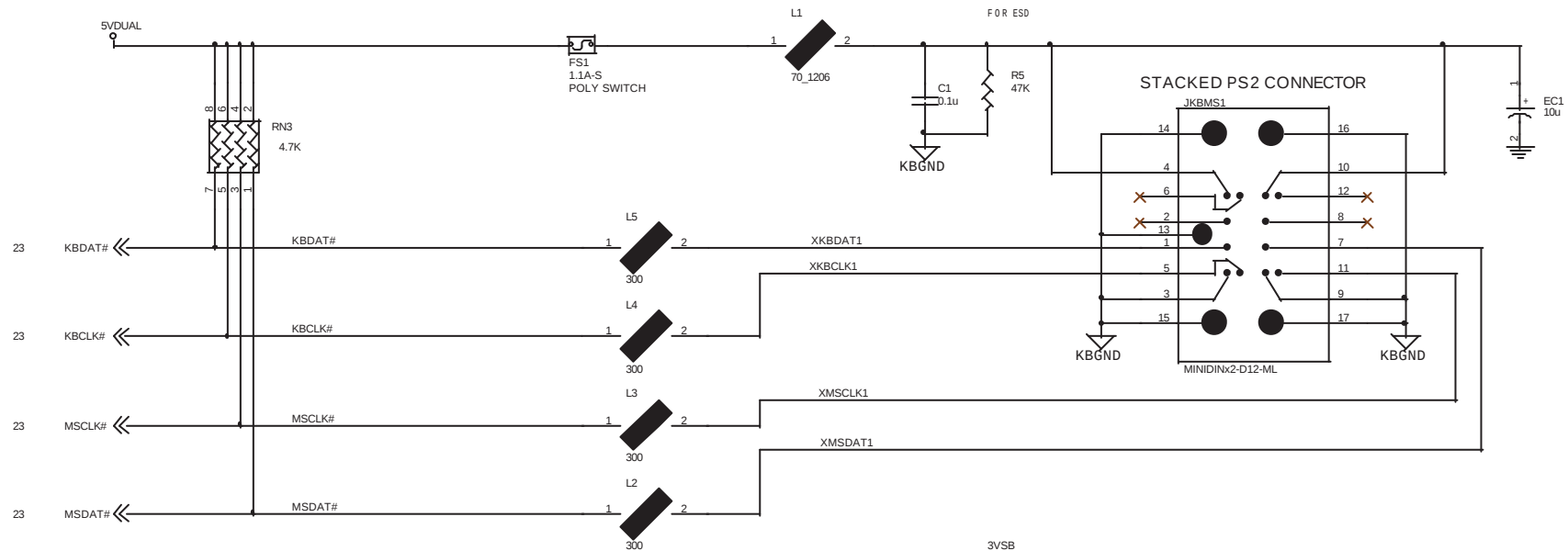


MICRO-STAR		
Title		
PARALLEL PORT TEREATION		
Size	Document Number	Rev
B	MS-6528	20A
Date:	Friday, October 19, 2001	Sheet 25 of 38

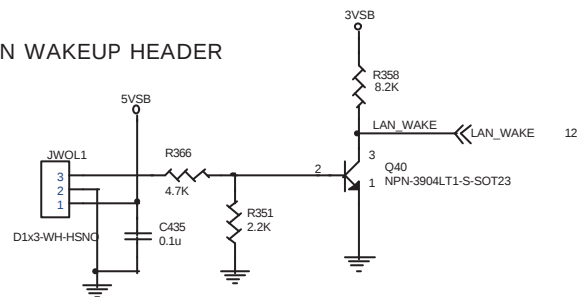
ACK# <> ACK# 25
 BUSY <> BUSY 25
 PE <> PE 25
 SLCT <> SLCT 25
 AFD# <> AFD# 25
 ERR# <> ERR# 25
 INIT# <> INIT# 25
 SLIN# <> SLIN# 25
 P_STB# <> P_STB# 25



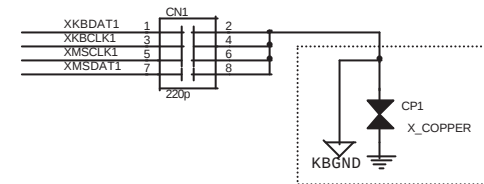
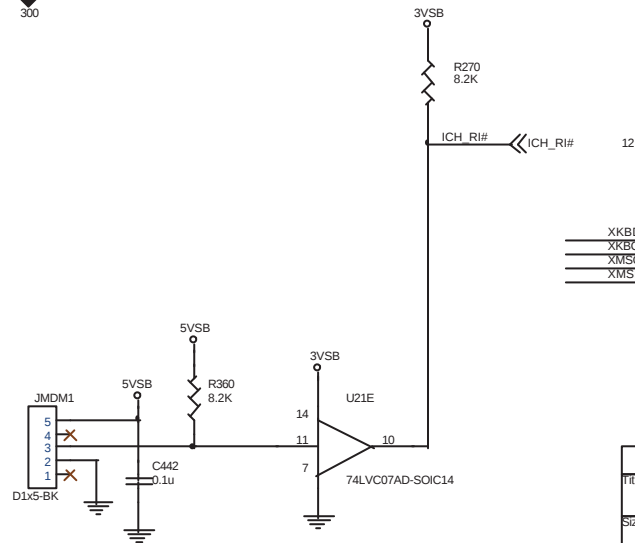
MICRO-STAR		
File	LPT/COM Port	
Size	Document Number	Rev
B	MS-6528	20A
Date:	Friday, October 19, 2001	Sheet 28 of 38



LAN WAKEUP HEADER

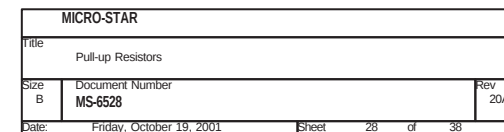


INTERNAL MODEM WAKEUP HEADER

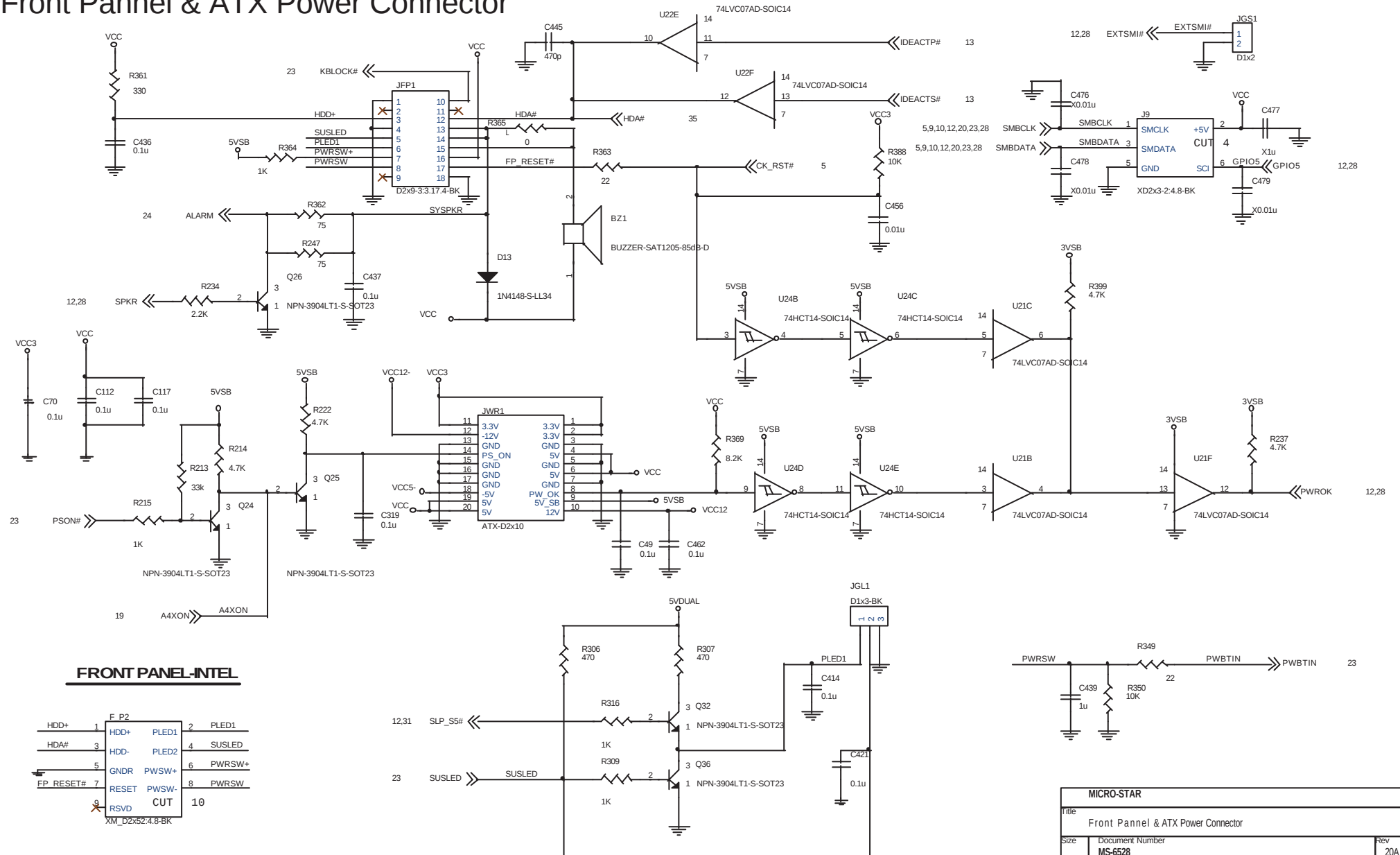


MICRO-STAR		
File	Keyboard/Mouse	
Size	Document Number	Rev
B	MS-6528	20A
Date:	Friday, October 19, 2001	Sheet 27 of 38

AGP



Front Panel & ATX Power Connector



SOT-223

AGP 4X SLOT 1.5V POWER TRANSLATOR

R619 1K --> DRV2=2.5V
R619 10K --> DRV2=3.3V

REGULATORS OUTPUT DECOUPLING CAPACITORS

DIMMVCC	DIMVS1	DIMVS2
3.3V	1	1
3.4V	0	1
3.5V	1	0
3.6V	0	0

1.8V STANDBY POWER TRANSLATOR
(30mils trace / 15 mils space)

Power	S0	S3	S6
VCC3_SB	Main	Standby	Standby
VCC5_STR	Main	Standby	Standby
VCC_DIMM	Main	Standby	Standby

1.8V POWER TRANSLATOR
(50mils trace / 15 mils space)

VDDQ	AGPVS1	AGPVS2
1.5V	1	1
1.55V	0	1
1.6V	1	0
1.65V	0	0

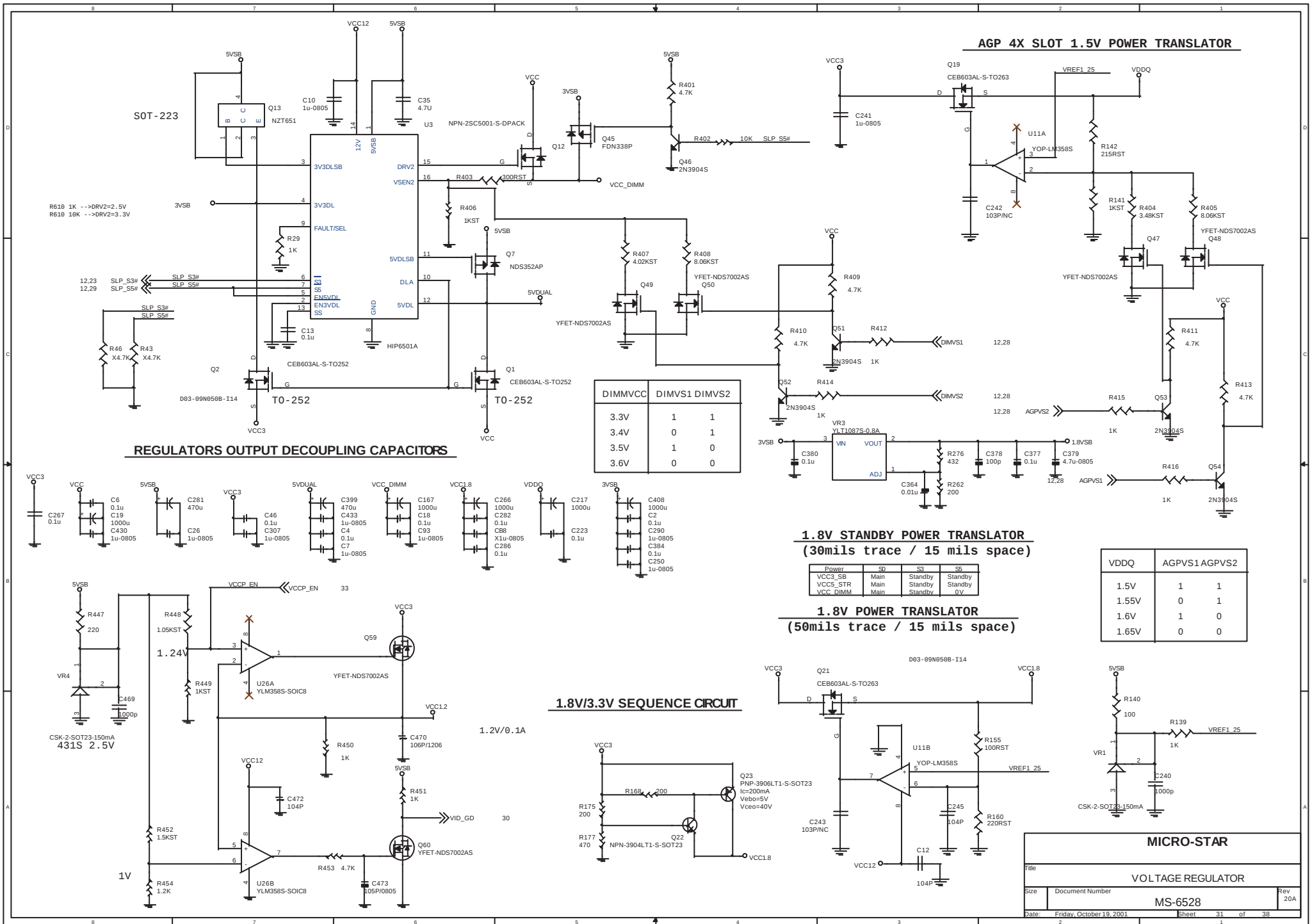
1.8V/3.3V SEQUENCE CIRCUIT

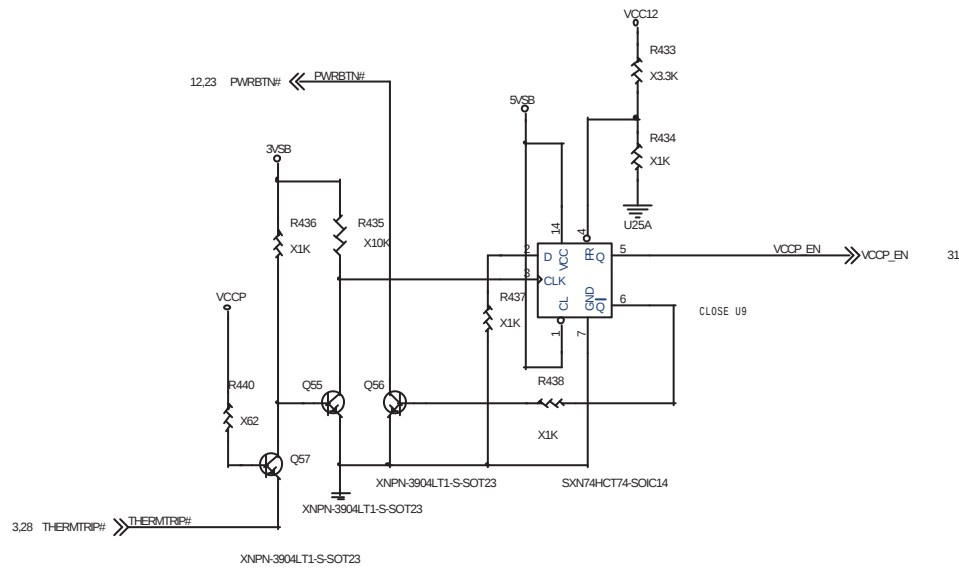
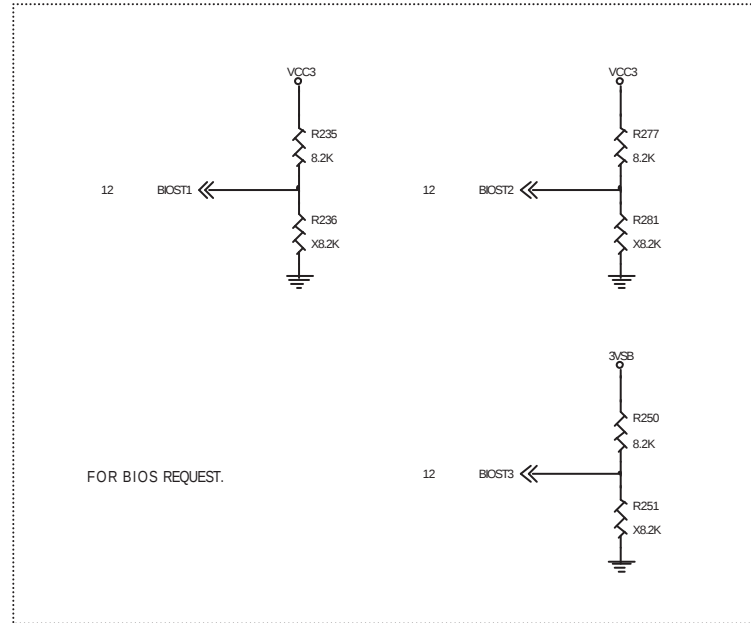
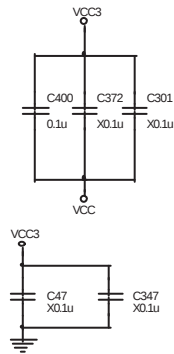
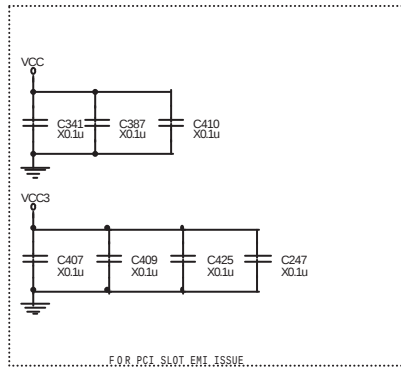
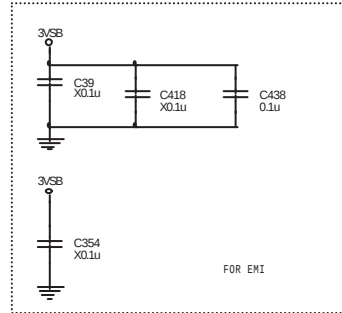
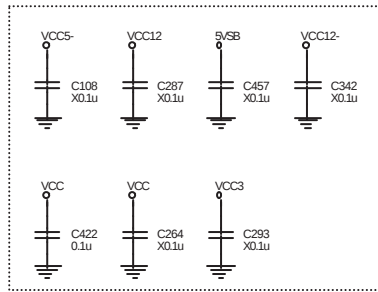
MICRO-STAR

VOLTAGE REGULATOR

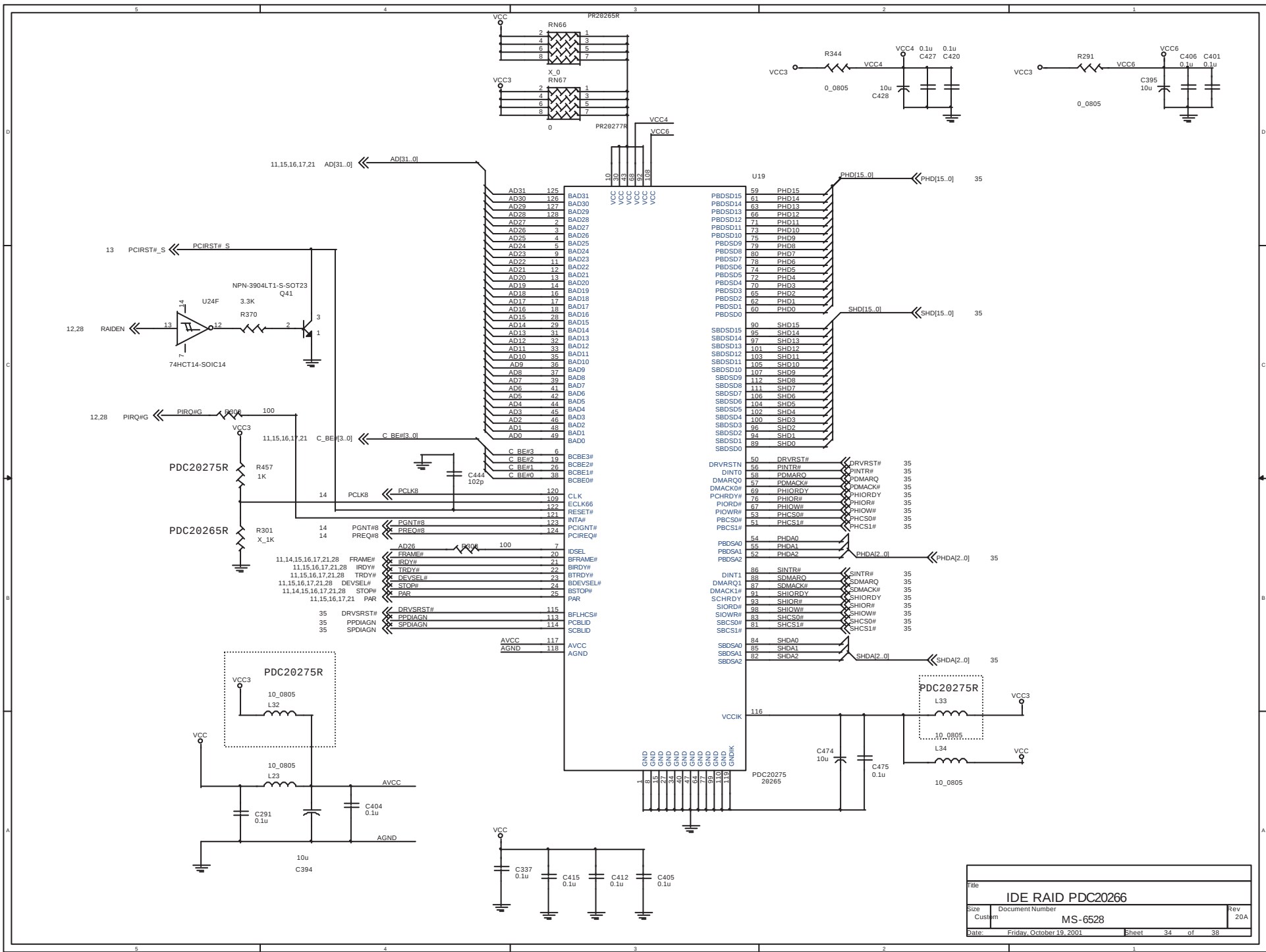
MS-6528

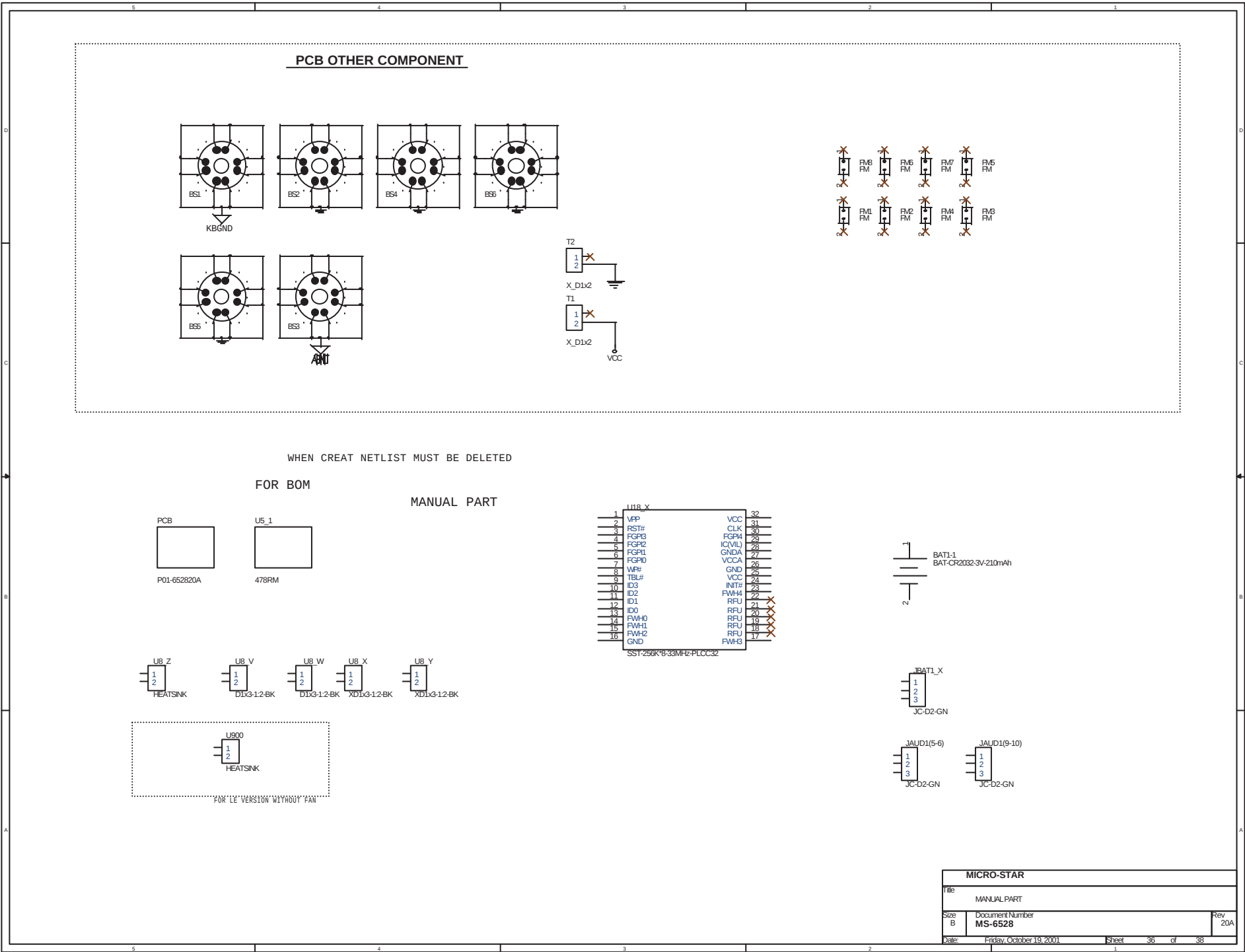
Date Friday, October 19, 2001 Sheet 31 of 38





MICRO-STAR		
Title MSC		
Size B	Document Number MS-6528	Rev 20A
Date: Friday, October 19, 2001	Sheet 33 of 38	





D

C

4

B

A

1

1

1

1

1

1

1

4

B

A

1

1

1

1

1

4

B

A

1

1

1

A

MICRO-STAR			
Title			
Revision History			
Size	Document Number		
Customer	MS-6528		
			Rev 20A
Date:	Friday, October 19, 2001	Sheet	37 of 38

General Purpose I/O Spec.

ICH2

GPIO Pin	Type	Function
GPIO 0	I	PULL UP VCC3.8.2K
GPIO 1	I	REQ#5
GPIO 2~4	I	PIRQE~F#
GPIO 5	I	PIRQH#
GPIO 6	I	BIOST1
GPIO 7	I	BIOST2
GPIO 8	I	LAN Wake Up
GPIO 9	I	AC'97 Serial Data1 In
GPIO 10	I	Not Implemented
GPIO 11	I	SMBALTER#
GPIO 12	I	External SMI
GPIO 13	I	LPC PME
GPIO 14~15	I	Not Implemented
GPIO 16	O	Non Connect
GPIO 17	O	GNT5#
GPIO 18	O	AGPVS1
GPIO 19	O	RAIDEN
GPIO 20	O	VCORE
GPIO 21	O	AUDIOEN
GPIO 22	OD	PWRFAN
GPIO 23	O	BIOS WP
GPIO 24	O	BIOST3
GPIO 25	O	AGPVS2
GPIO 26	O	Not Implemented
GPIO 27	I/O	DIMVS1
GPIO 28	I/O	DIMVS2
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-Super I/O

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#	AD 16	PREQ0# PGNT0# PCLK1
PCI Slot 2	INTB# INTC# INTD# INTA#	AD 17	PREQ1# PGNT1# PCLK2
PCI Slot 3	INTC# INTD# INTA# INTB#	AD 18	PREQ2# PGNT2# PCLK3
PCI Slot 4	INTD# INTA# INTB# INTC#	AD 19	PREQ3# PGNT3# PCLK4
PCI Slot 5	INTB# INTC# INTD# INTA#	AD 21	PREQ4# PGNT4# PCLK5
PCI Slot6	INTA# INTB# INTC# INTD#	AD 20	PREQ7# PGNT7# PCLK7
PCI H/W AUDIO	INTF#	AD 25	PREQ6# PGNT6# PCLK6
PCI RAID	INTG#	AD 26	PREQ8# PGNT8# PCLK8

MICRO-STAR			
Title			
GPIO SPEC			
Size	Document Number		
Custom	MS-6528		
Date:	Friday, October 19, 2001	Sheet	38 of 38
			Rev 20A