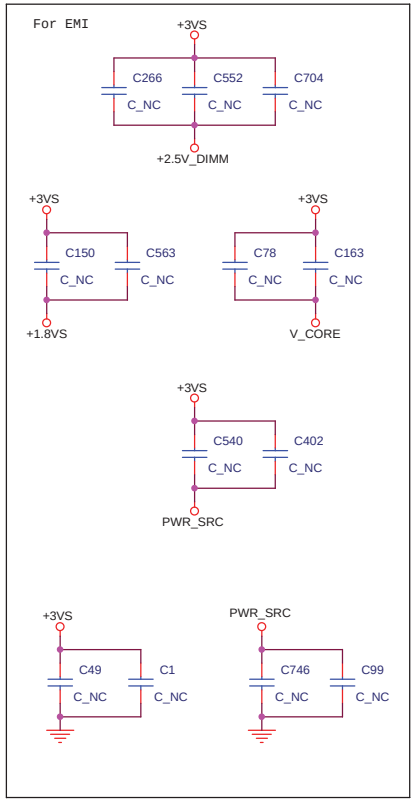
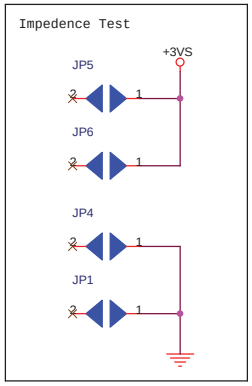
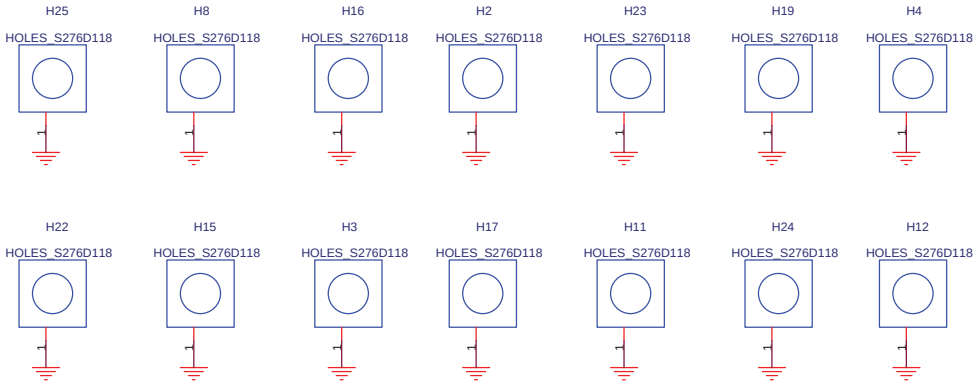
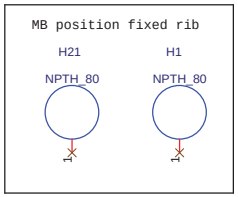
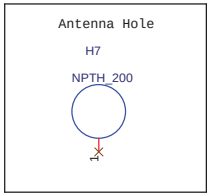
01_COVER
02_Block Diagram
03_Power Rail
04_Power on Sequency
05_AMD XP-M uPGA563 - 1
06_AMD XP-M uPGA563 - 2
07_AMD XP-M uPGA563 - 3
08_M741-1(Host/AGP)
09_M741-2 Memory
10_M741-3 MuTIOL/VGA/Others
11_M741-4 Power
12_DDR SODIMM 1
13_DDR SODIMM 2
14_DIMM Termination
15_SIS 301C
16_963L-1 PCI / IDE / MuTIOL
17_963L-2 MISC Signals
18_963L-3 USB/Others
19_963L-4 Power
20_Clock Generator
21_DDR Clock Buffer
22_KBC / EC / uP W83950D
23_Power Control
24_Power Good / Switches & LEDs
25_VID / FID
26_ENE 1410
27_Audio CODEC
28_Audio AMP & Jack
29_Mini PCI & MDC conn.
30_USB Ports / LPC BIOS
31_HDD & CDROM conn.
32_LAN PHY RTL8201
33_ES60x8_MEM&EPROM
34_EX60x8_System
35_EX60x8_Power
36_MST9131
37_MST9131_Power / LCD Inverter
38_CRT & S-Video CONN.
39_uP / LCM conn.
40_+1.5V, +1.8V
41_+2.5V, +1.25V
42_Battery Charger
43_Battery Selector
44_CPU power
45_System Power
46_Daughter Board

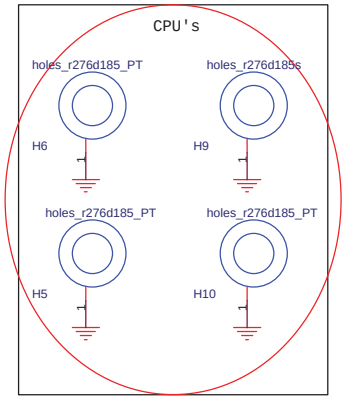




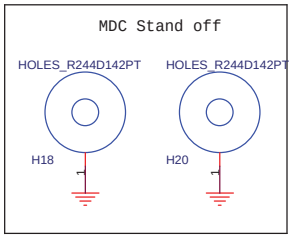


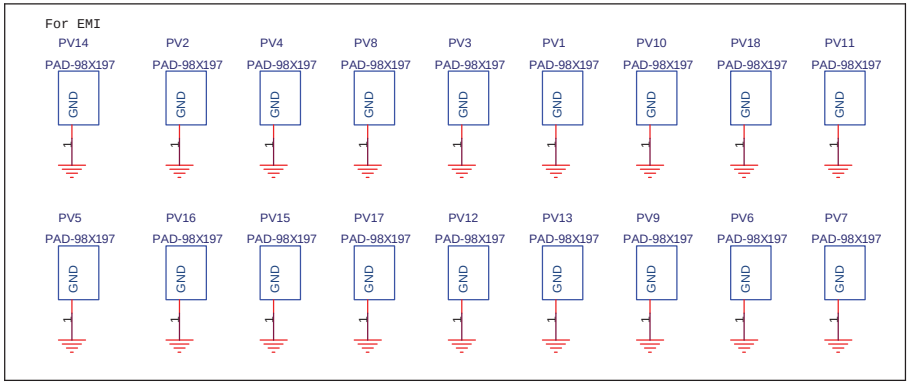


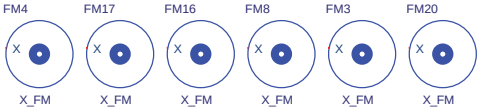


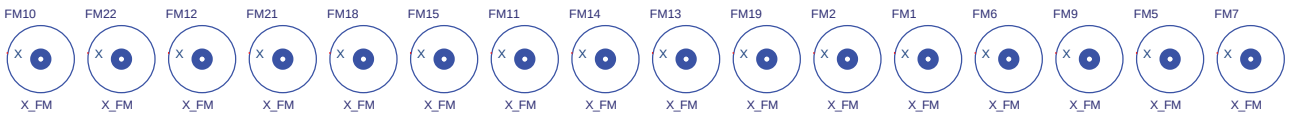


Footprint change to
PTH except H9
2/24









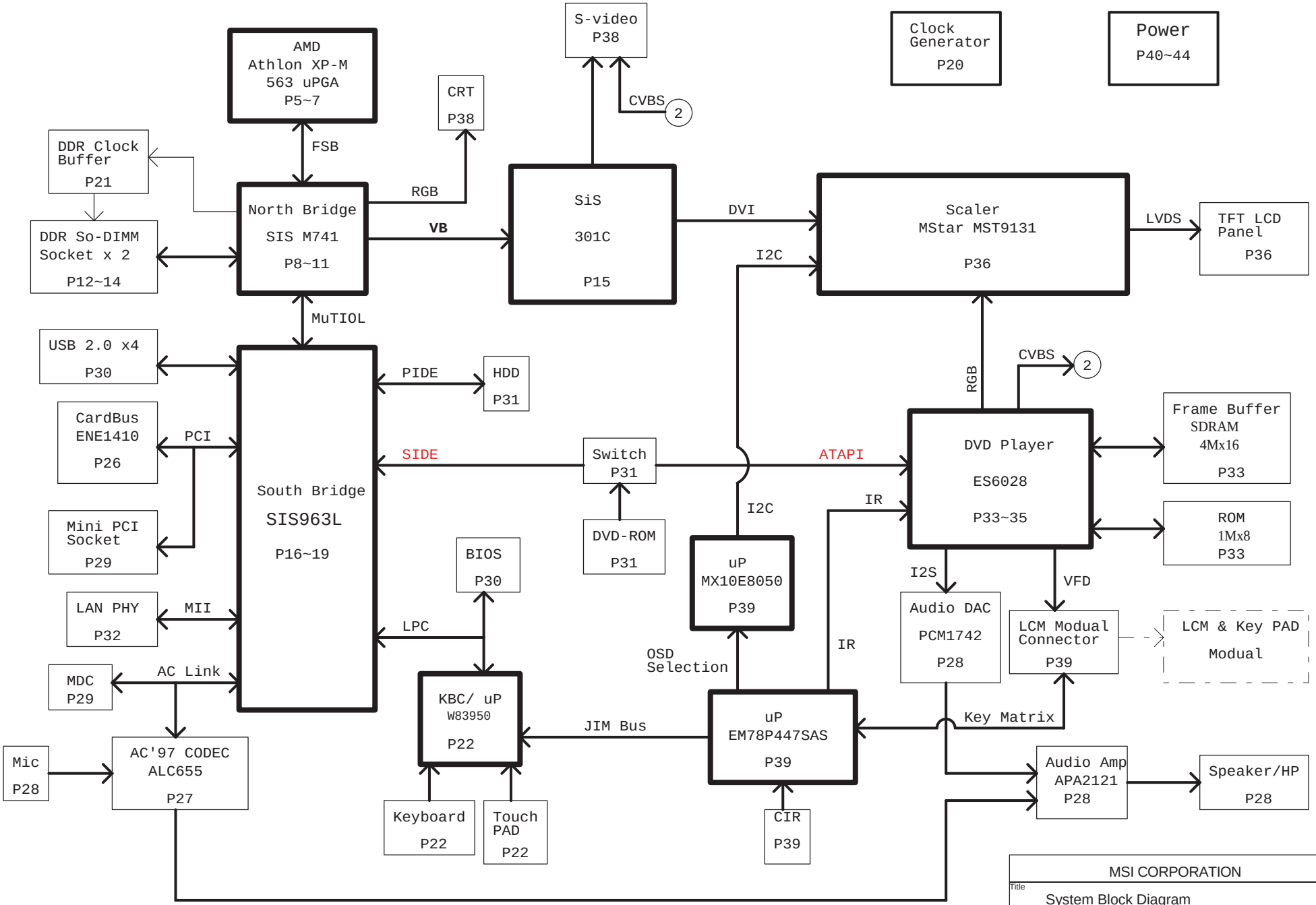
MSI CORPORATION

Title: Cover

Size: Custom | Document Number: MS-1004 | Rev: 0.A

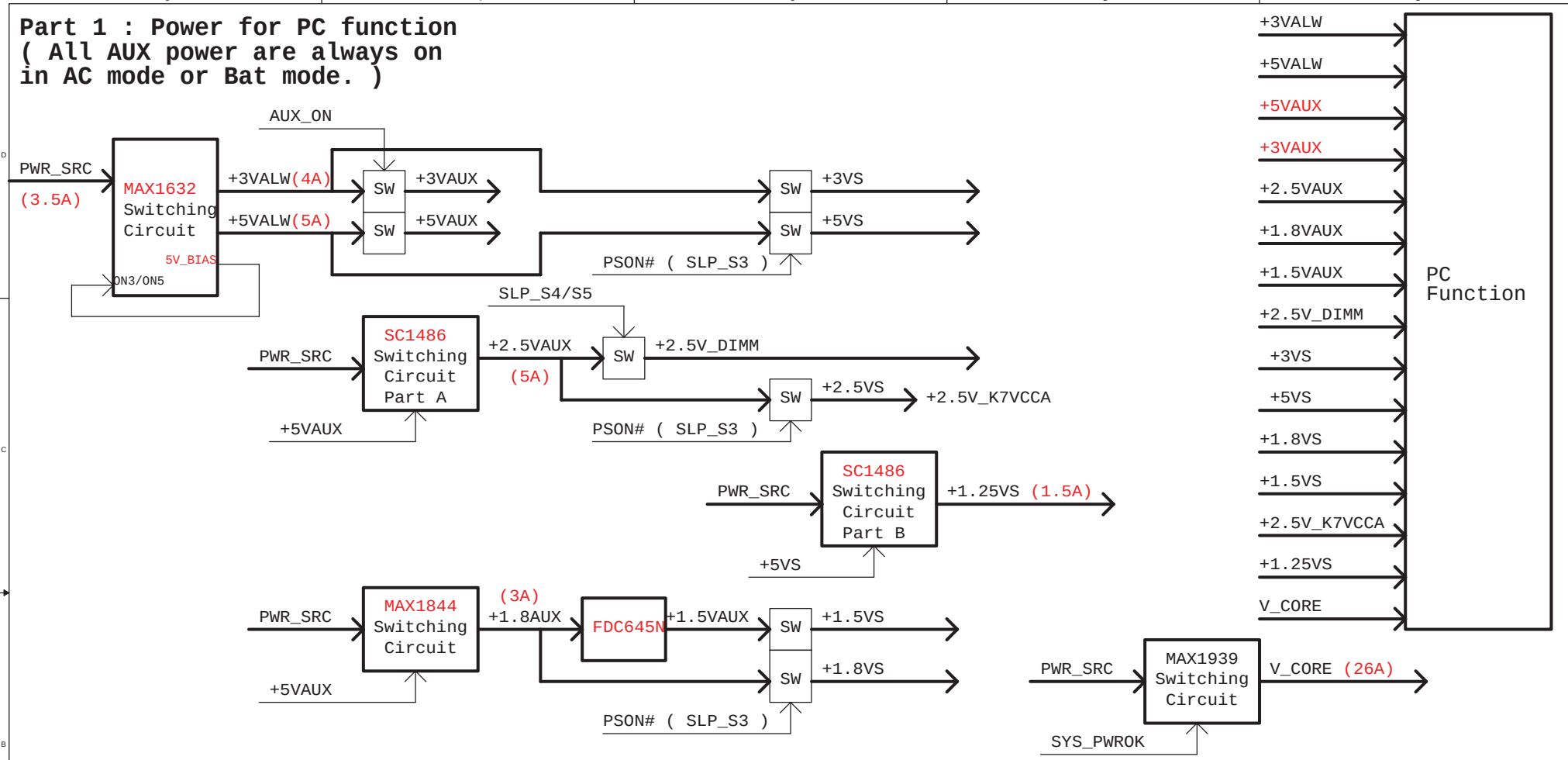
Date: Wednesday, March 10, 2004 | Sheet 1 of 46

MS-1004 System Block Diagram

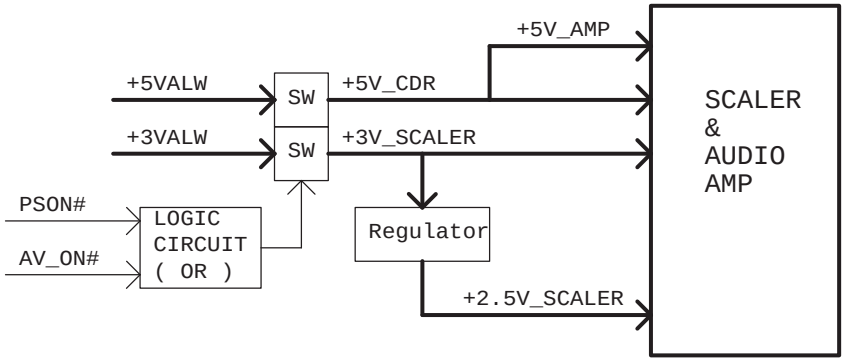


MSI CORPORATION		
Title: System Block Diagram		
Size: Custom	Document Number: MS-1004	Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 2 of 46	

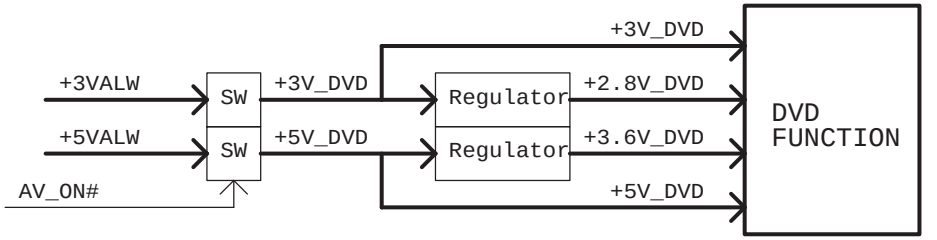
Part 1 : Power for PC function
(All AUX power are always on in AC mode or Bat mode.)



Part 2 : Power for scaler and audio amp.
(Power ON no matter PC or DVD is power on.)

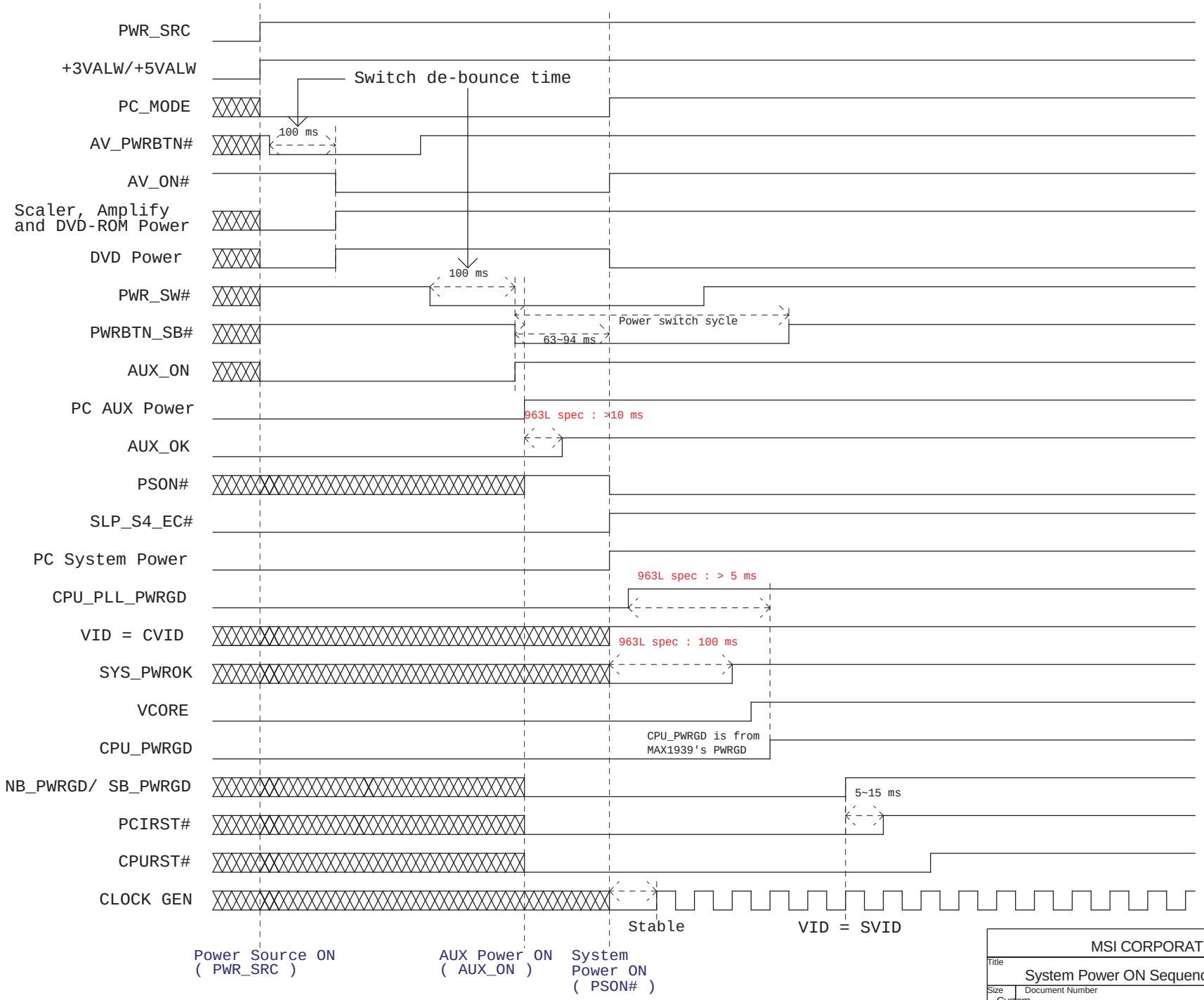


Part 3 : Power for DVD playback function

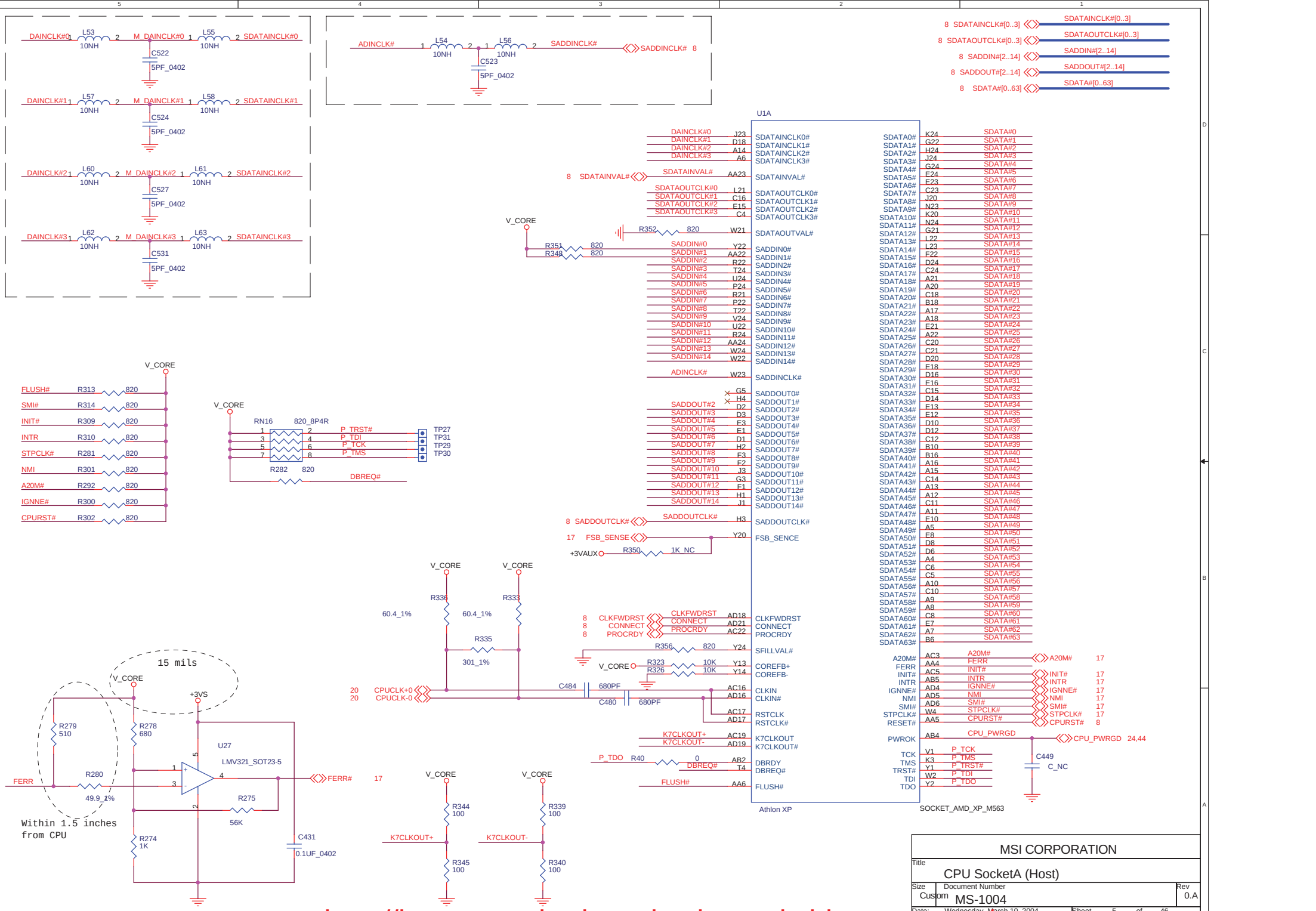


MSI CORPORATION		
Title: System Power Rail		
Size: Custom	Document Number: MS-1004	Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 3 of 46	

MS-1004 System Power on Sequency From AV Mode to PC Mode



MSI CORPORATION		
Title: System Power ON Sequency		
Size: Custom	Document Number: MS-1004	Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 4 of 46	

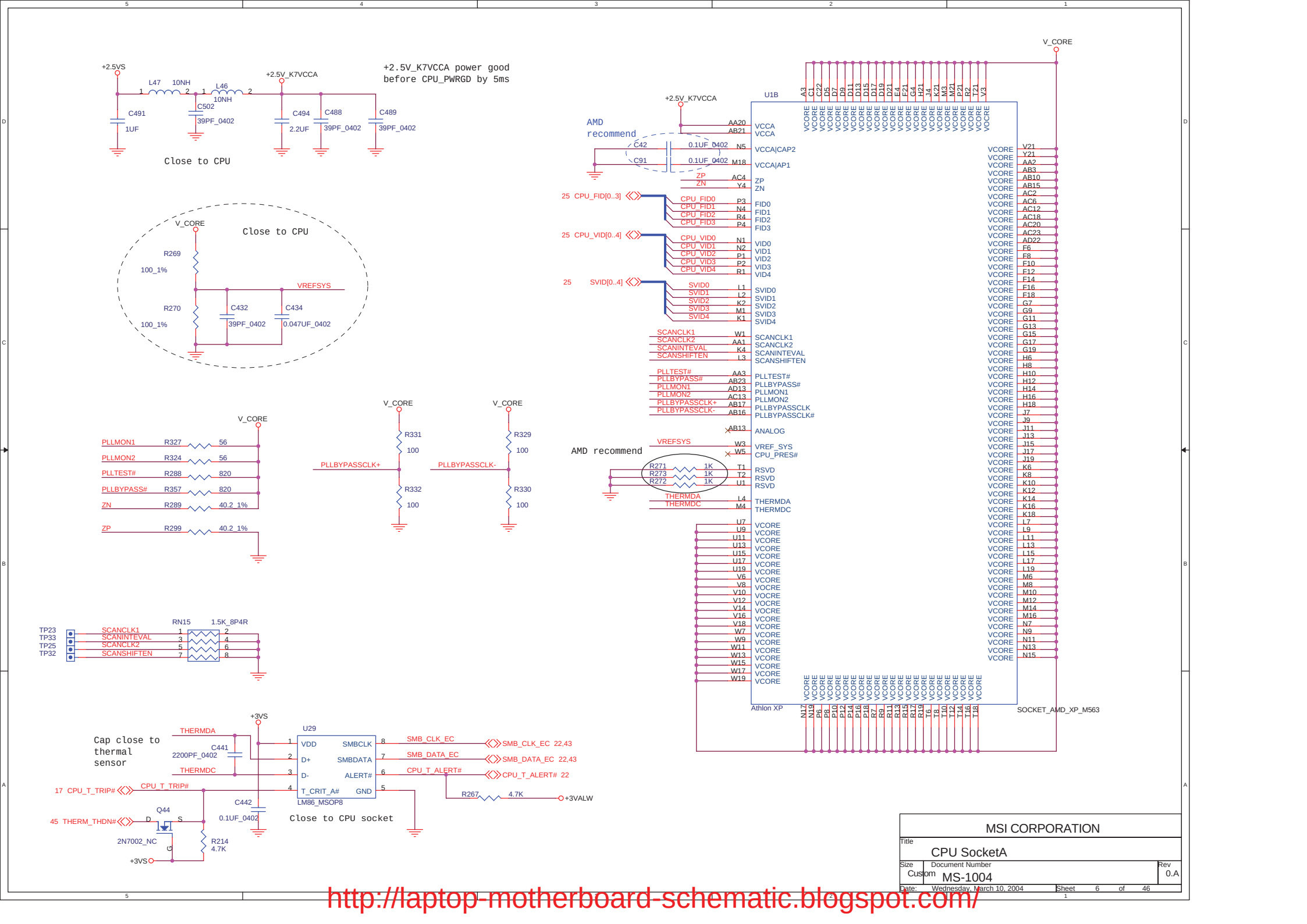


MSI CORPORATION

Title: CPU SocketA (Host)

Size: Custom | Document Number: MS-1004 | Rev: 0.A

Date: Wednesday, March 10, 2004 | Sheet 5 of 46



MSI CORPORATION	
Title	CPU SocketA
Size: Custom	Document Number: MS-1004
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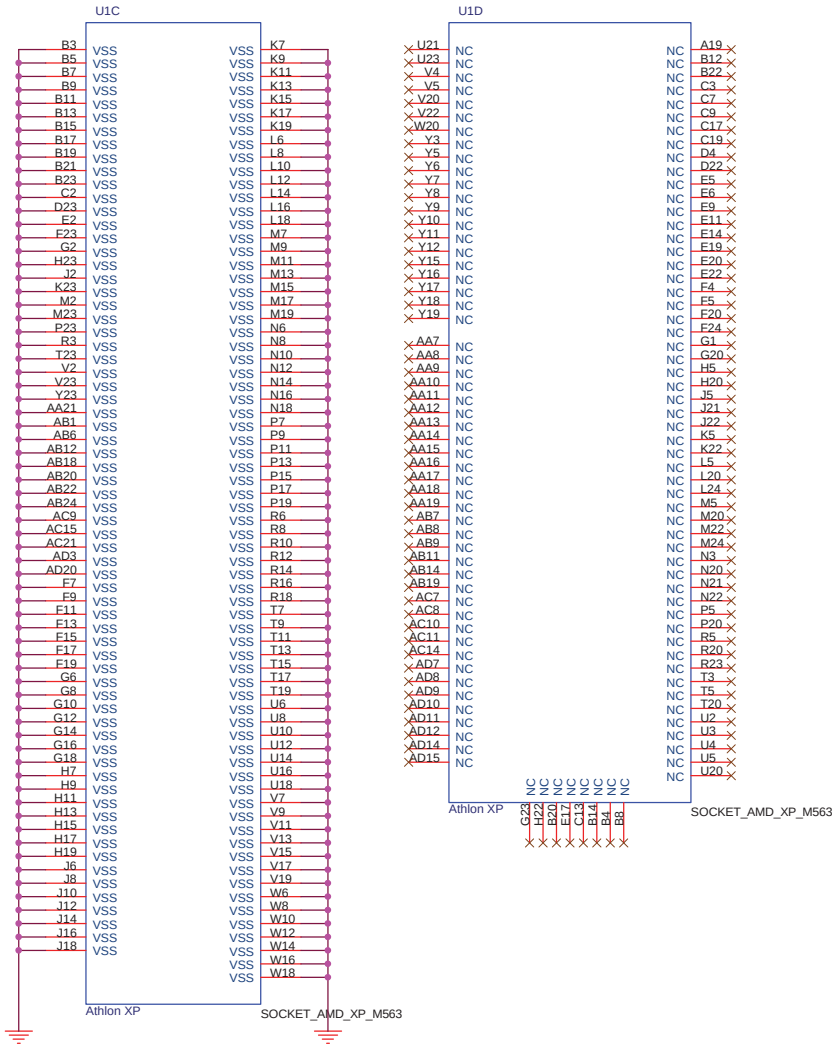
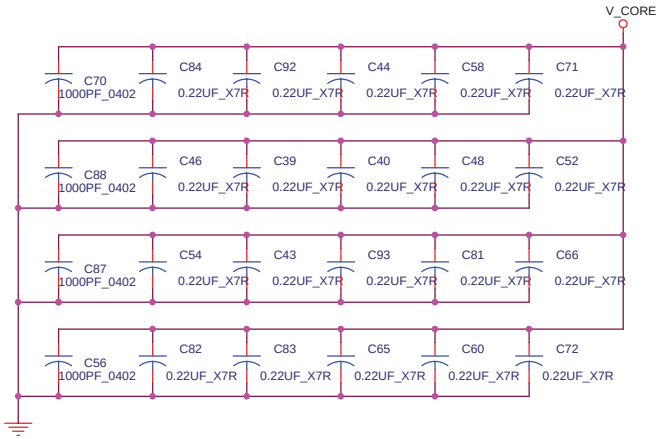
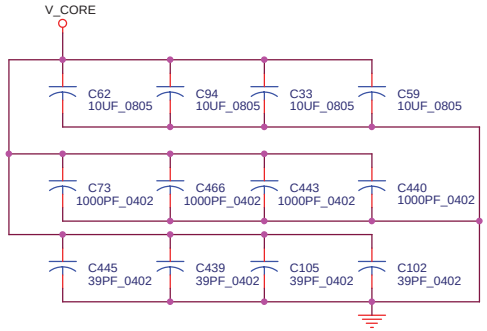
Date: Wednesday, March 10, 2004	Sheet 6 of 46





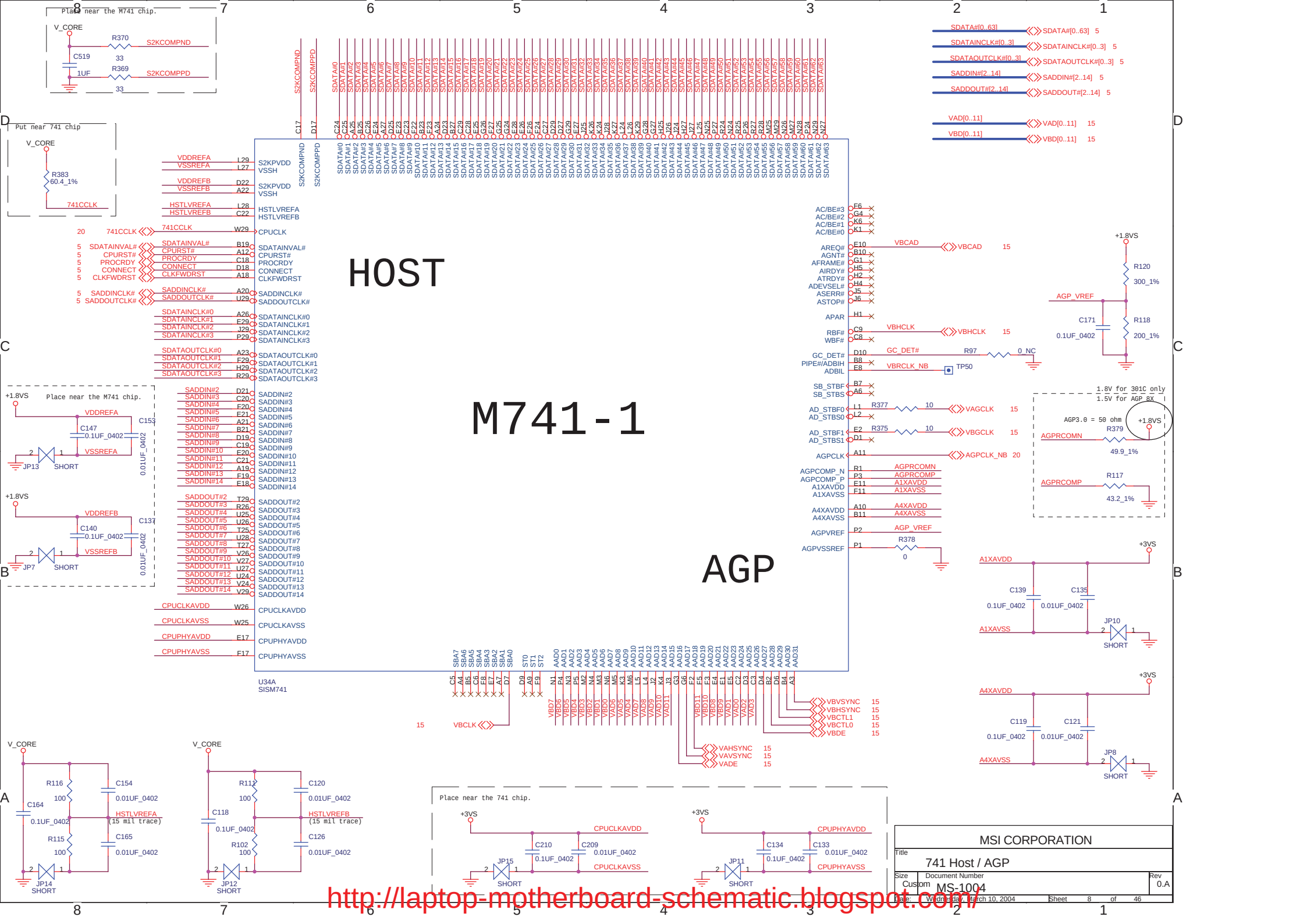
Place under uPGA socket

Place at Vcore boundary with other power plane



Place at four conner of CPU Socket

MSI CORPORATION		
Title: CPU SocketA		
Size: Custom	Document Number: MS-1004	Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 7 of 46	


HOST
M741-1
AGP
U34A
SISM741
Place near the M741 chip.
Put near 741 chip
Place near the 741 chip.
V_CORE
+1.8VS
+3VS
R370
S2KCOMPND
C519
33
1UF
R369
S2KCOMPPD
R383
60.4_1%
741CCLK
VDDREFA
VSSREFA
VDDREFB
VSSREFB
HSTLVREFA
HSTLVREFB
SDATAINVAL#
CPURST#
PROCRDY
CONNECT
CLKFWDRST
SADDINCLK#
SADDOUTCLK#
SDATAINCLK#0
SDATAINCLK#1
SDATAINCLK#2
SDATAINCLK#3
SDATAOUTCLK#0
SDATAOUTCLK#1
SDATAOUTCLK#2
SDATAOUTCLK#3
CPUCLKAVDD
CPUCLKAVSS
CPUPHYAVDD
CPUPHYAVSS
VBCLK
VAHSYNC
VAVSYNC
VADE
VBVSYNC
VBHSYNC
VBCTL1
VBCTL0
VBDE
SDATA#[0..63]
SDATAINCLK#[0..3]
SDATAOUTCLK#[0..3]
SADDIN#[2..14]
SADDOUT#[2..14]
VAD[0..11]
VBD[0..11]
AC/BE#3
AC/BE#2
AC/BE#1
AC/BE#0
AREQ#
AGNT#
AFRAME#
AIRDY#
ATRDY#
ADEVSEL#
ASERR#
ASTOP#
APAR
RBF#
WBF#
GC_DET#
PIPE#/ADBIH
ADBIL
SB_STBF
SB_STBS
AD_STBF0
AD_STBS0
AD_STBF1
AD_STBS1
AGPCLK
AGPCOMP_N
AGPCOMP_P
A1XAVDD
A1XAVSS
A4XAVDD
A4XAVSS
AGPVREF
AGPVSSREF
VBCAD
VBHCLK
VAGCLK
VBGCLK
AGPCLK_NB
AGPRCOMN
AGPRCOMP
AGP_VREF
TP50
R120
300_1%
R118
200_1%
C171
0.1UF_0402
R379
49.9_1%
R117
43.2_1%
1.8V for 301C only
1.5V for AGP 8X
AGP3.0 = 50 ohm
JP13
JP7
JP10
JP8
JP14
JP12
JP15
JP11
SHORT
C147
C140
C153
C137
C139
C135
C119
C121
C164
C154
C165
C118
C120
C126
C210
C209
C134
C133
R116
R115
R112
R102
R97
0_NC
R378
0
MSI CORPORATION
741 Host / AGP
MS-1004
0.A
Wednesday, March 10, 2004
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/RMD[0..63] /RMD[0..63] 12,13,14
/RDQM[0..7] /RDQM[0..7] 12,13,14
/RDQS[0..7] /RDQS[0..7] 12,13,14
/RMAA[0..15] /RMAA[0..15] 12,13,14
/RRAM_CS#[0..5] /RRAM_CS#[0..5] 12,13,14

U34B

M741-2

SISM741

10 mil wire

Put near 741 chip.

For M741

+2.5V_DIMM

+3VS

DDRVREFA
(10-mil trace)
25-mil clearance
or shielded by
VSS trace and
VDD trace

DDRVREFB
(10-mil trace)
25-mil clearance
or shielded by
VSS trace and
VDD trace

SHORT

MSI CORPORATION

Title: 741 Memory

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		Enable	Disable
RSYNC	VGA(INTA#)	1	0
LSYNC	panel link	1	0
CSYNC	VB	1	0

NB Hardware Trap Table

SW1 Pin		Description	ON/1	OFF/0	Default
S1	CPUDLLENN	CPUCLK SDCLK PLL/DLL Circuit Enable	DISABLE	ENABLE	OFF
S2	TMODE0	TV Type Select	NYSC	PAL	OFF
S3	TMODE1	MuTIOL (ASL) Initialize Mode	DISABLE	ENABLE	OFF
S4	TMODE2	P741 Debug Mode Selection	ENABLE	DISABLE	OFF
S5	TRAP4	MuTIOL Type (Verision 1 , 2)	Ver. 1	Ver. 2	OFF

Check !!

NB Hardware Trap has internal pull-low in SiS746/746FX chip for DRAM_SEL,CPUDLLENN,TMODE0,TMODE1,TMODE2 signals.

M741-3

MuTIOL

The differences between the traces of MuTIOL Strobes and Data should be smaller than 0.05"

Should not change layer

Place near 741 chip.

150 Ohm for MuTIOL 1.0/66MHz 49.9 Ohm for MuTIOL 2.0/133Mhz

Put any where(Near South Bridge) , Don't effect wire layout placement

Put TP on the top layer

Title	741 MuTIOL / VGA / Others
Company	MSI CORPORATION
Size	Custom
Document Number	MS-1004
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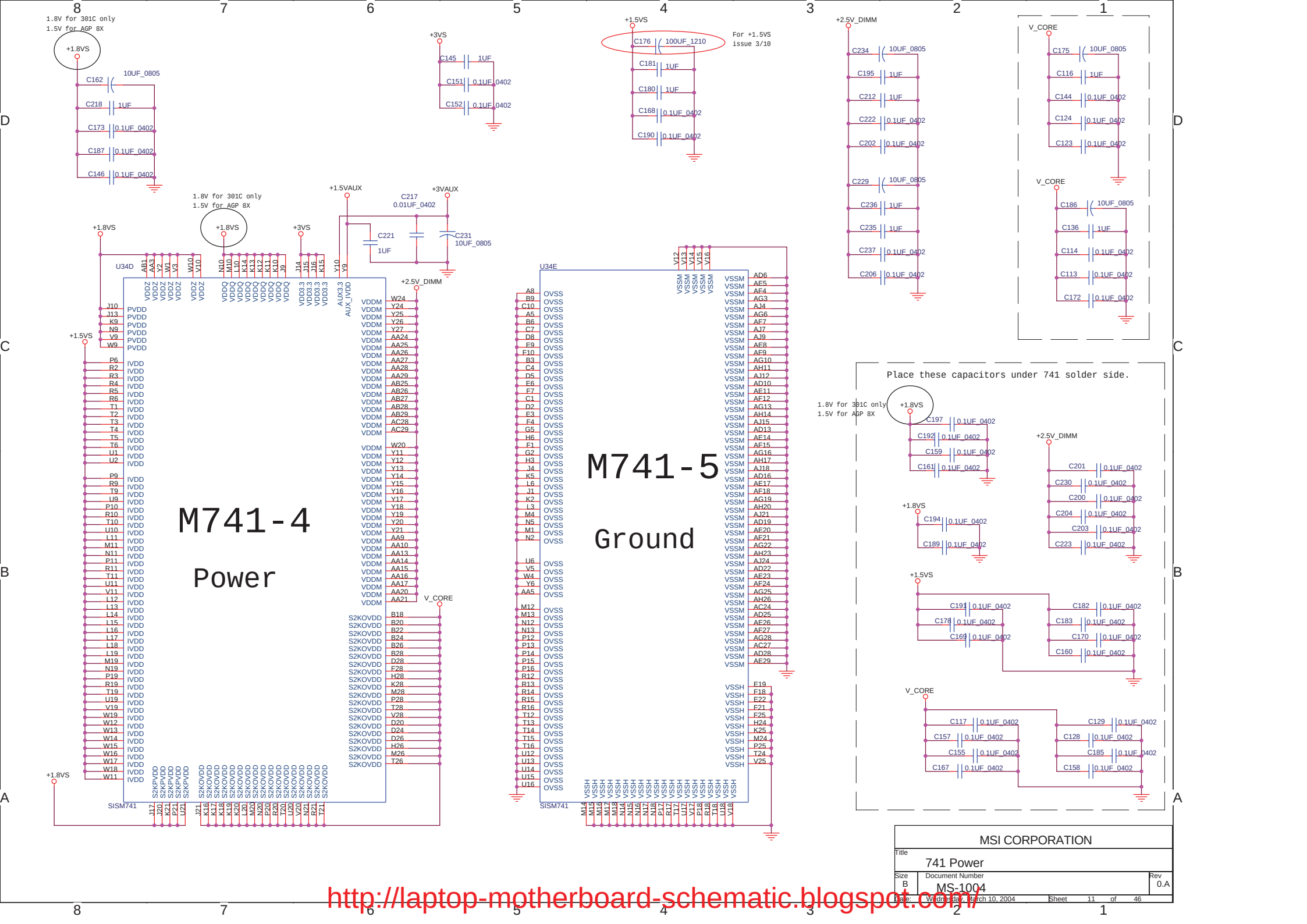
M741-4
Power
M741-5
Ground
Place these capacitors under 741 solder side.
1.8V for 301C only
1.5V for AGP 8X
+1.8VS
+1.5VS
+3VS
+3VAUX
+1.5VAUX
+2.5V_DIMM
V_CORE
U34D
U34E
SISM741
For +1.5VS issue 3/10
MSI CORPORATION
741 Power
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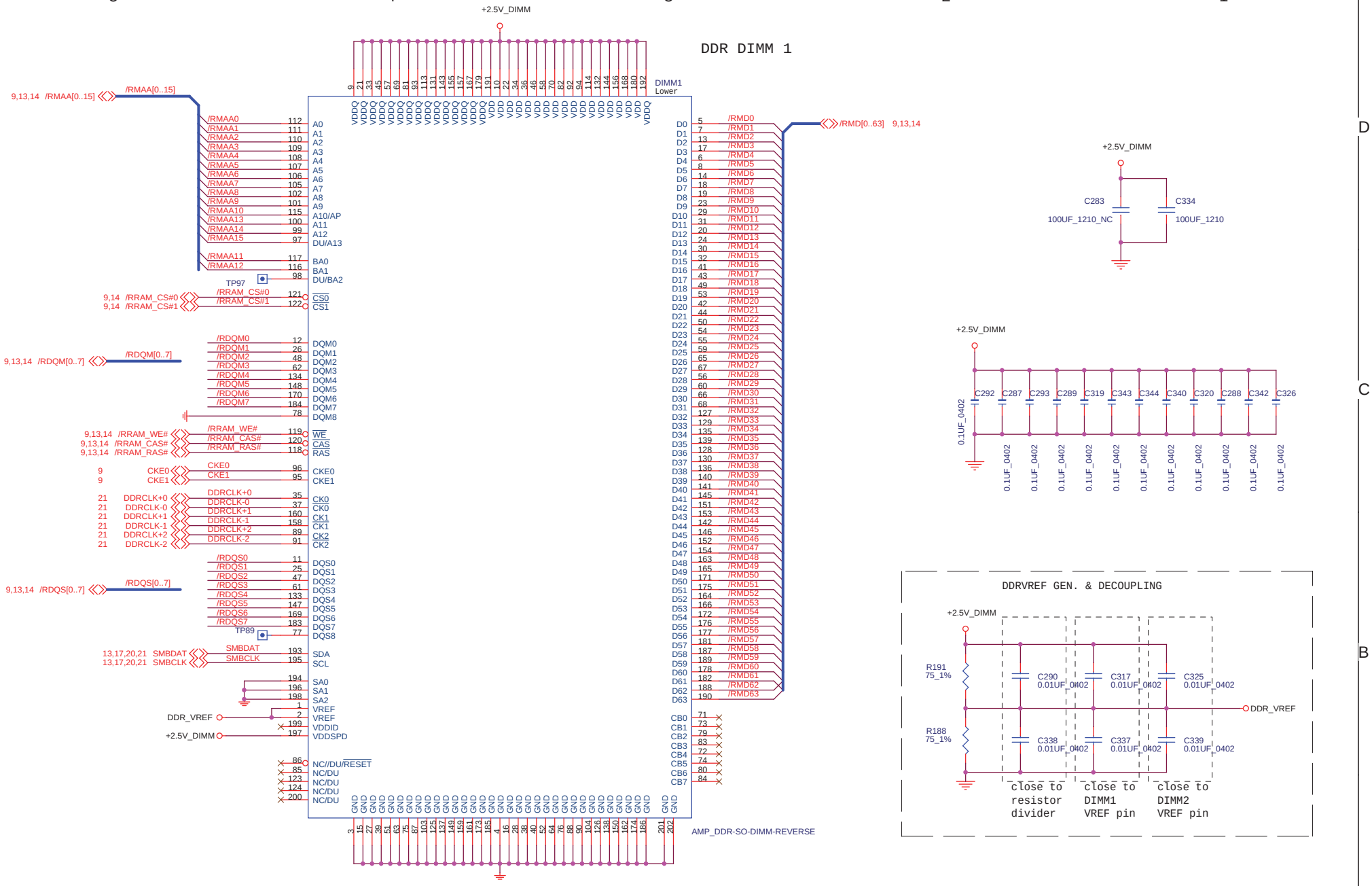
http://laptop-motherboard-schematic.blogspot.com/

DDR DIMM 1



-CS/-RAS/-CAS/-WE
R - 0101
W - 0100

PC2100 - CL2 = 15 to Data 2-2-2/2.5-3-3
CL2.5 = 18.75 to Data

DDR266 256MB 4Bks Pmax = 8W
Ptyp = 7W

64MB/128MB/256MB - 500MB/s - 1.0W
- 1000MB/s - 1.65W
- 1500MB/s - 2.5W
- 2000MB/s - 3.2W

MSI CORPORATION			
Title: DDR SODIMM 1			
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DDR DIMM 2 footprint is different from DIMM 1

DDR DIMM 2

+2.5V_DIMM

DIMM2
Lower

9,12,14 /RMAA[0..15] /RMAA[0..15]

/RMAA0 112 A0
/RMAA1 111 A1
/RMAA2 110 A2
/RMAA3 109 A3
/RMAA4 108 A4
/RMAA5 107 A5
/RMAA6 106 A6
/RMAA7 105 A7
/RMAA8 102 A8
/RMAA9 101 A9
/RMAA10 115 A10/AP
/RMAA13 100 A11
/RMAA14 99 A12
/RMAA15 97 DU/A13

/RMAA11 117 BA0
/RMAA12 116 BA1
98 DU/BA2

TP99

9,14 /RRAM_CS#2 /RRAM_CS#2 121 CS0
9,14 /RRAM_CS#3 /RRAM_CS#3 122 CS1

9,12,14 /RDQM[0..7] /RDQM[0..7]

/RDQM0 12 DQM0
/RDQM1 26 DQM1
/RDQM2 48 DQM2
/RDQM3 62 DQM3
/RDQM4 134 DQM4
/RDQM5 148 DQM5
/RDQM6 170 DQM6
/RDQM7 184 DQM7
78 DQM8

9,12,14 /RRAM_WE# /RRAM_WE# 119 WE
9,12,14 /RRAM_CAS# /RRAM_CAS# 120 CAS
9,12,14 /RRAM_RAS# /RRAM_RAS# 118 RAS

9 CKE2 CKE2 96 CKE0
9 CKE3 CKE3 95 CKE1

21 DDRCLK+3 DDRCLK+3 35 CK0
21 DDRCLK-3 DDRCLK-3 37 CK0
21 DDRCLK+4 DDRCLK+4 160 CK1
21 DDRCLK-4 DDRCLK-4 158 CK1
21 DDRCLK+5 DDRCLK+5 89 CK2
21 DDRCLK-5 DDRCLK-5 91 CK2

9,12,14 /RDQS[0..7] /RDQS[0..7]

/RDQS0 11 DQS0
/RDQS1 25 DQS1
/RDQS2 47 DQS2
/RDQS3 61 DQS3
/RDQS4 133 DQS4
/RDQS5 147 DQS5
/RDQS6 169 DQS6
/RDQS7 183 DQS7
TP98 77 DQS8

12,17,20,21 SMBDAT SMBDAT 193 SDA
12,17,20,21 SMBCLK SMBCLK 195 SCL

+2.5V_DIMM 194 SA0
196 SA1
198 SA2

DDR_VREF 1 VREF
2 VREF
+2.5V_DIMM 199 VDDID
197 VDDSPD

86 NC//DU/RESET
85 NC/DU
123 NC/DU
124 NC/DU
200 NC/DU

/RMD[0..63] 9,12,14

D0 5 /RMD0
D1 7 /RMD1
D2 13 /RMD2
D3 17 /RMD3
D4 6 /RMD4
D5 8 /RMD5
D6 14 /RMD6
D7 18 /RMD7
D8 19 /RMD8
D9 23 /RMD9
D10 29 /RMD10
D11 31 /RMD11
D12 20 /RMD12
D13 24 /RMD13
D14 30 /RMD14
D15 32 /RMD15
D16 41 /RMD16
D17 43 /RMD17
D18 49 /RMD18
D19 53 /RMD19
D20 42 /RMD20
D21 44 /RMD21
D22 50 /RMD22
D23 54 /RMD23
D24 55 /RMD24
D25 59 /RMD25
D26 65 /RMD26
D27 67 /RMD27
D28 56 /RMD28
D29 60 /RMD29
D30 66 /RMD30
D31 68 /RMD31
D32 127 /RMD32
D33 129 /RMD33
D34 135 /RMD34
D35 139 /RMD35
D36 128 /RMD36
D37 130 /RMD37
D38 136 /RMD38
D39 140 /RMD39
D40 141 /RMD40
D41 145 /RMD41
D42 151 /RMD42
D43 153 /RMD43
D44 142 /RMD44
D45 146 /RMD45
D46 152 /RMD46
D47 154 /RMD47
D48 163 /RMD48
D49 165 /RMD49
D50 171 /RMD50
D51 175 /RMD51
D52 164 /RMD52
D53 166 /RMD53
D54 172 /RMD54
D55 176 /RMD55
D56 177 /RMD56
D57 181 /RMD57
D58 187 /RMD58
D59 189 /RMD59
D60 178 /RMD60
D61 182 /RMD61
D62 188 /RMD62
D63 190 /RMD63

CB0 71
CB1 73
CB2 79
CB3 83
CB4 72
CB5 74
CB6 80
CB7 84

AMP_DDR-SO-DIMM-STANDARD
Outsight

+2.5V_DIMM

C368 100UF_1210_NC
C274 100UF_1210

+2.5V_DIMM

C316 C205 C341 C327 C324 C322 C294 C291 C295 C315 C346 C257
0.1UF_0402
0.1UF_0402 0.1UF_0402 0.1UF_0402 0.1UF_0402 0.1UF_0402 0.1UF_0402 0.1UF_0402 0.1UF_0402 0.1UF_0402 0.1UF_0402 0.1UF_0402

-CS/-RAS/-CAS/-WE
R - 0101
W - 0100

PC2100 - CL2 = 15 to Data 2-2-2/2.5-3-3
CL2.5 = 18.75 to Data

DDR266 256MB 4Bks Pmax = 8W
Ptyp = 7W

64MB/128MB/256MB - 500MB/s - 1.0W
- 1000MB/s - 1.65W
- 1500MB/s - 2.5W
- 2000MB/s - 3.2W

MSI CORPORATION

Title: DDR SODIMM 2		
Size: Custom	Document Number: MS-1004	Rev: 0.A
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SSTL-2 Termination Resistors

(Note: The termination resistors are only for DDR application)

	DDR	Rs	Rtt
MD/DQM(/DQS)	SSTL-2	10/0	33/47
MA/Control	SSTL-2	10/0	22/33
CS	SSTL-2	10/0	22/33
CKE	LV-CMOS/OD 2.5V		

/RMD[0..63] /RMD[0..63] 9,12,13
/RDQM[0..7] /RDQM[0..7] 9,12,13
/RDQS[0..7] /RDQS[0..7] 9,12,13

/RMAA[0..15] /RMAA[0..15] 9,12,13
/RRAM_CS#[0..5] /RRAM_CS#[0..5] 9,12,13
/RRAM_RAS# /RRAM_RAS# 9,12,13
/RRAM_WE# /RRAM_WE# 9,12,13
/RRAM_CAS# /RRAM_CAS# 9,12,13

Pullup resistance can reswap by layout result.

+1.25VS

/RMD4	RN66	1	2	33_8P4R_0402	/RMD30	RN59	1	2	33_8P4R_0402
/RMD2		3	4		/RMD31		3	4	
/RMD1		5	6		/RMD26		5	6	
/RMD0		7	8		/RMD27		7	8	
/RMD5	RN65	1	2	33_8P4R_0402	/RMD32	RN52	1	2	33_8P4R_0402
/RDQS0		3	4		/RMD33		3	4	
/RDQM0		5	6		/RMD36		5	6	
/RMD3		7	8		/RMD37		7	8	
/RMD6	RN64	1	2	33_8P4R_0402	/RMD39	RN57	1	2	33_8P4R_0402
/RMD7		3	4		/RMD34		3	4	
/RMD12		5	6		/RMD44		5	6	
/RMD8		7	8		/RMD45		7	8	
/RMD9	RN68	1	2	33_8P4R_0402	/RDQS4	RN58	1	2	33_8P4R_0402
/RMD13		3	4		/RDQM4		3	4	
/RDQS1		5	6		/RMD38		5	6	
/RDQM1		7	8		/RMD35		7	8	
/RMD14	RN67	1	2	33_8P4R_0402	/RDQS5	RN55	1	2	33_8P4R_0402
/RMD15		3	4		/RMD47		3	4	
/RMD11		5	6		/RMD42		5	6	
/RMD10		7	8		/RMD43		7	8	
/RMD17	RN63	1	2	33_8P4R_0402	/RMD40	RN56	1	2	33_8P4R_0402
/RMD16		3	4		/RDQM5		3	4	
/RMD18		5	6		/RMD46		5	6	
/RDQS2		7	8		/RMD41		7	8	
/RMD19	RN62	1	2	33_8P4R_0402	/RMD52	RN54	1	2	33_8P4R_0402
/RMD20		3	4		/RMD53		3	4	
/RMD21		5	6		/RDQM6		5	6	
/RDQM2		7	8		/RMD48		7	8	
/RDQM3	RN60	1	2	33_8P4R_0402	/RMD50	RN69	1	2	33_8P4R_0402
/RMD24		3	4		/RMD51		3	4	
/RDQS3		5	6		/RMD60		5	6	
/RMD25		7	8		/RMD61		7	8	
/RMD22	RN61	1	2	33_8P4R_0402	/RMD54	RN53	1	2	33_8P4R_0402
/RMD23		3	4		/RMD49		3	4	
/RMD28		5	6		/RMD55		5	6	
/RMD29		7	8		/RDQS6		7	8	

DECOUPLING CAPACITOR FOR SSTL-2 END TERMIANTION VTT ISLAND
0402 Package placed within 350mils of VTT Termination R-packs

+1.25VS

C670	C672	C673	C674
0.1UF_0402	0.1UF_0402	0.1UF_0402	0.1UF_0402
C675	C676	C677	C657
0.1UF_0402	0.1UF_0402	0.1UF_0402	0.1UF_0402
C678	C679	C671	C664
0.1UF_0402	0.1UF_0402	0.1UF_0402	0.1UF_0402
C648	C649	C650	C651
0.1UF_0402	0.1UF_0402	0.1UF_0402	0.1UF_0402
C652	C653	C663	C655
0.1UF_0402	0.1UF_0402	0.1UF_0402	0.1UF_0402
C656	C658	C659	C666
0.1UF_0402	0.1UF_0402	0.1UF_0402	0.1UF_0402
C661	C662	C667	C668
0.1UF_0402	0.1UF_0402	0.1UF_0402	0.1UF_0402
C665	C669	C654	C660
0.1UF_0402	0.1UF_0402	0.1UF_0402	0.1UF_0402
C355			
10UF_0805			
C360			
10UF_0805			

Pullup resistance can reswap by layout result.

+1.25VS

/RMD56	RN71	1	2	33_8P4R_0402	/RMD59	RN70	1	2	33_8P4R_0402
/RDQM7		3	4		/RMD58		3	4	
/RMD62		5	6		/RDQS7		5	6	
/RMD63		7	8		/RMD57		7	8	
/RRAM_CS#5	RN11	1	2	47_8P4R_0402	/RRAM_CS#0	R206			47_0402
/RRAM_CS#4		3	4		/RRAM_CS#1	R196			47_0402
/RRAM_CS#3		5	6						
/RRAM_CS#2		7	8						

+1.25VS

/RMAA15	R199	33_0402
/RMAA14	R197	33_0402
/RMAA13	R445	33_0402
/RMAA9	R198	33_0402
/RMAA7	R200	33_0402
/RMAA8	R444	33_0402
/RMAA5	R201	33_0402
/RMAA6	R452	33_0402
/RMAA4	R451	33_0402
/RMAA3	R202	33_0402
/RMAA2	R450	33_0402
/RMAA1	R203	33_0402
/RMAA0	R449	33_0402
/RMAA10	R204	33_0402
/RMAA12	R448	33_0402
/RMAA11	R205	33_0402
/RRAM_RAS#	R447	33_0402
/RRAM_WE#	R207	33_0402
/RRAM_CAS#	R446	33_0402

MSI CORPORATION

Title: DIMM Termination

Size: B | Document Number: MS-1004 | Rev: 0.A

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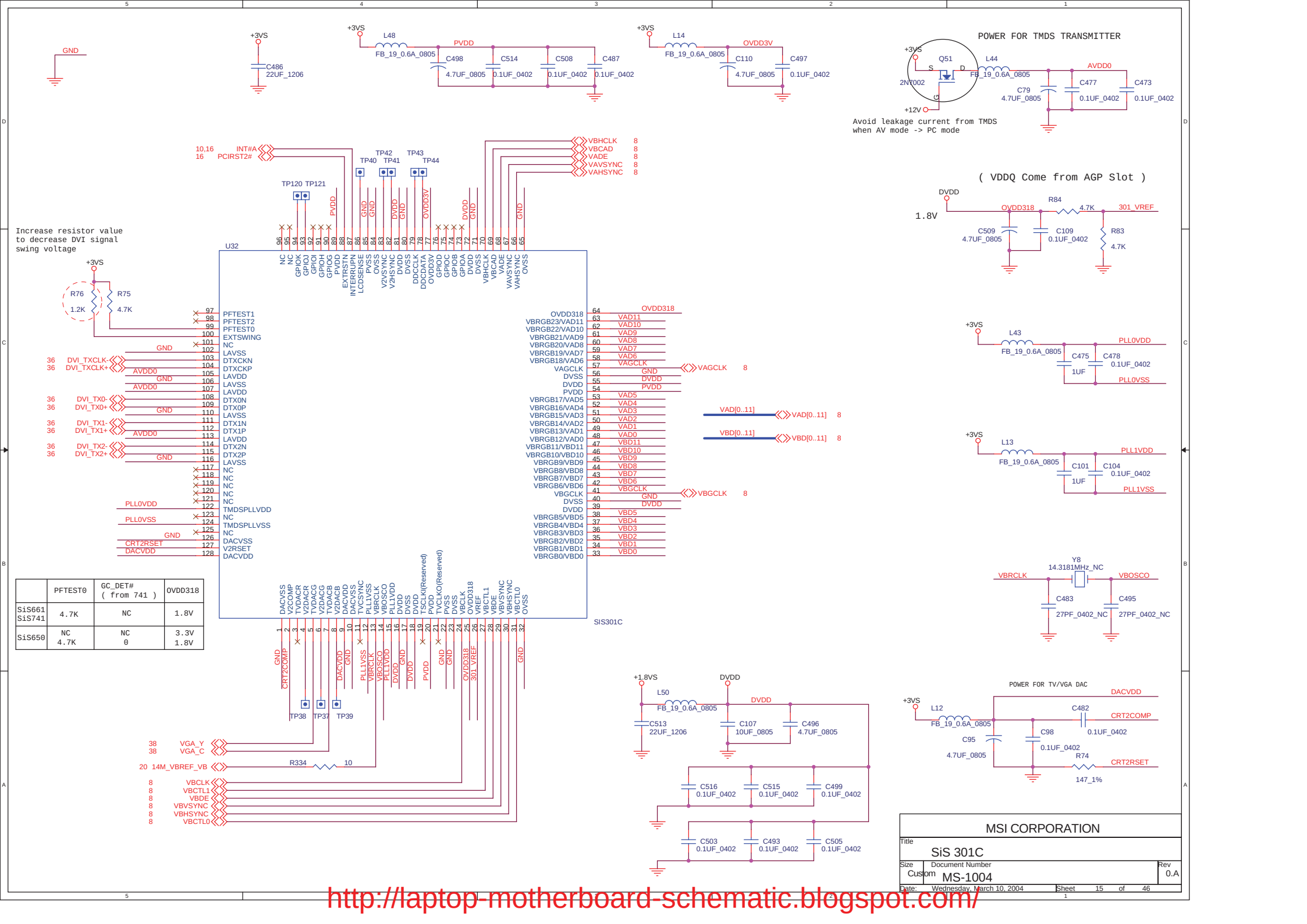
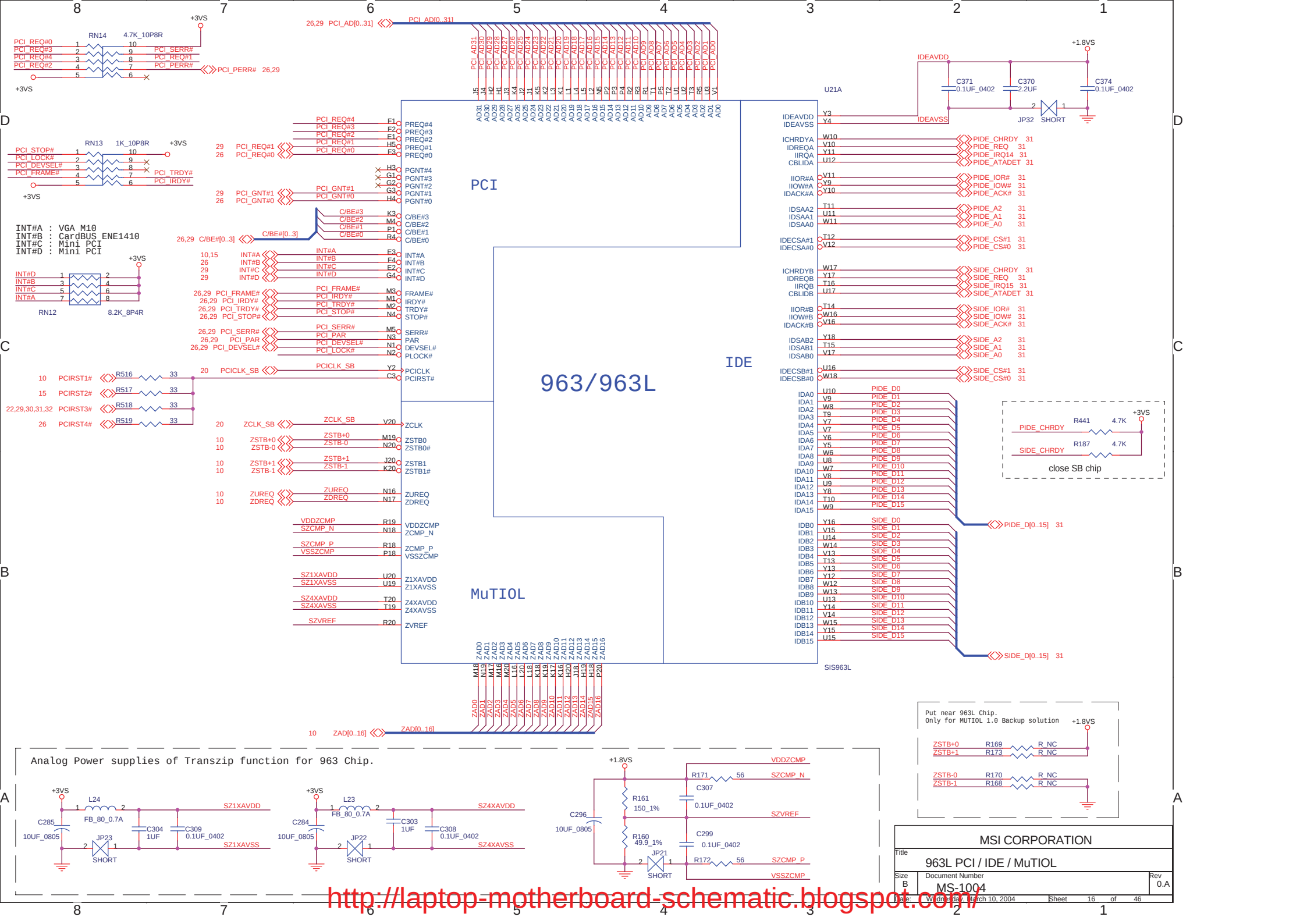
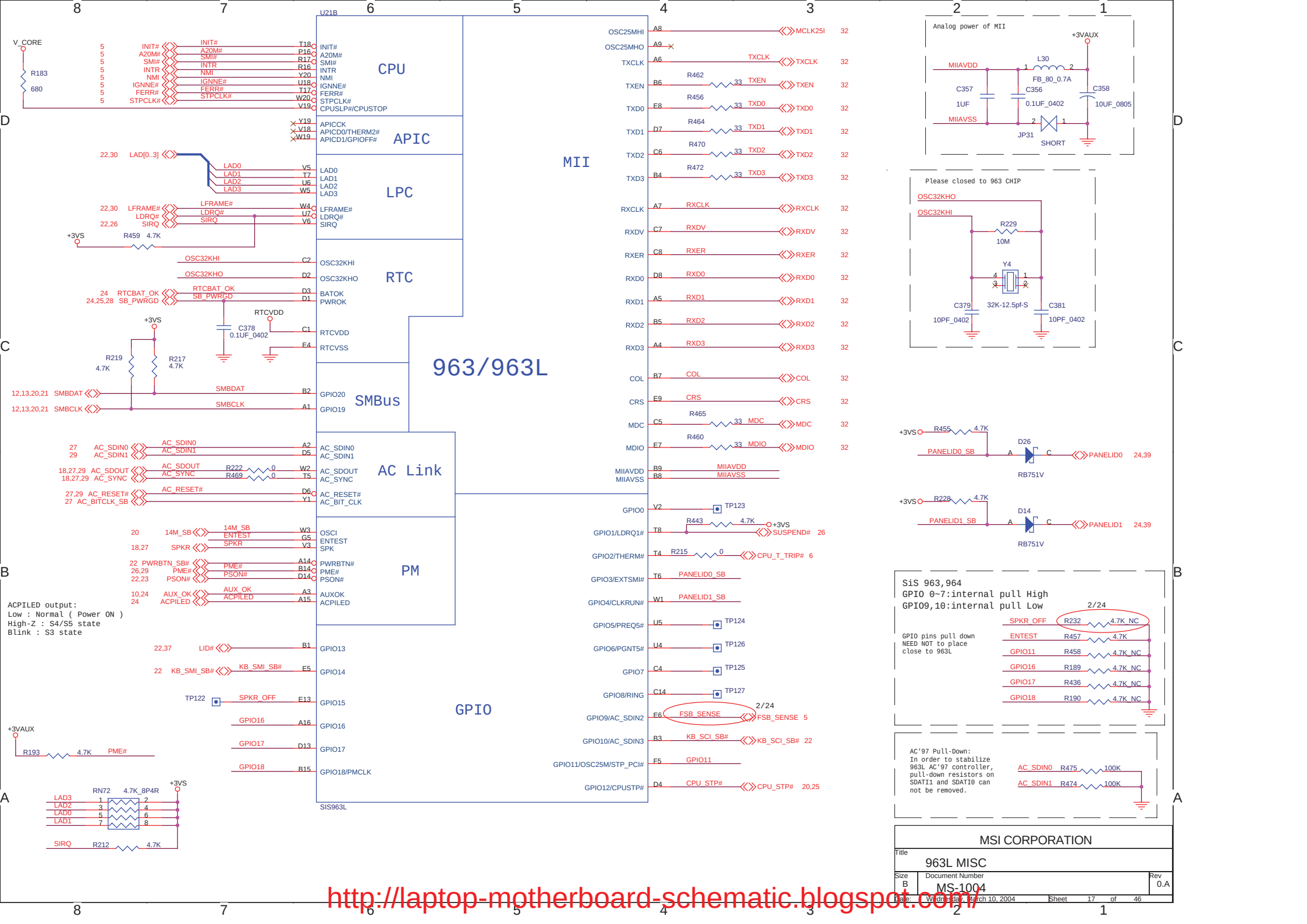
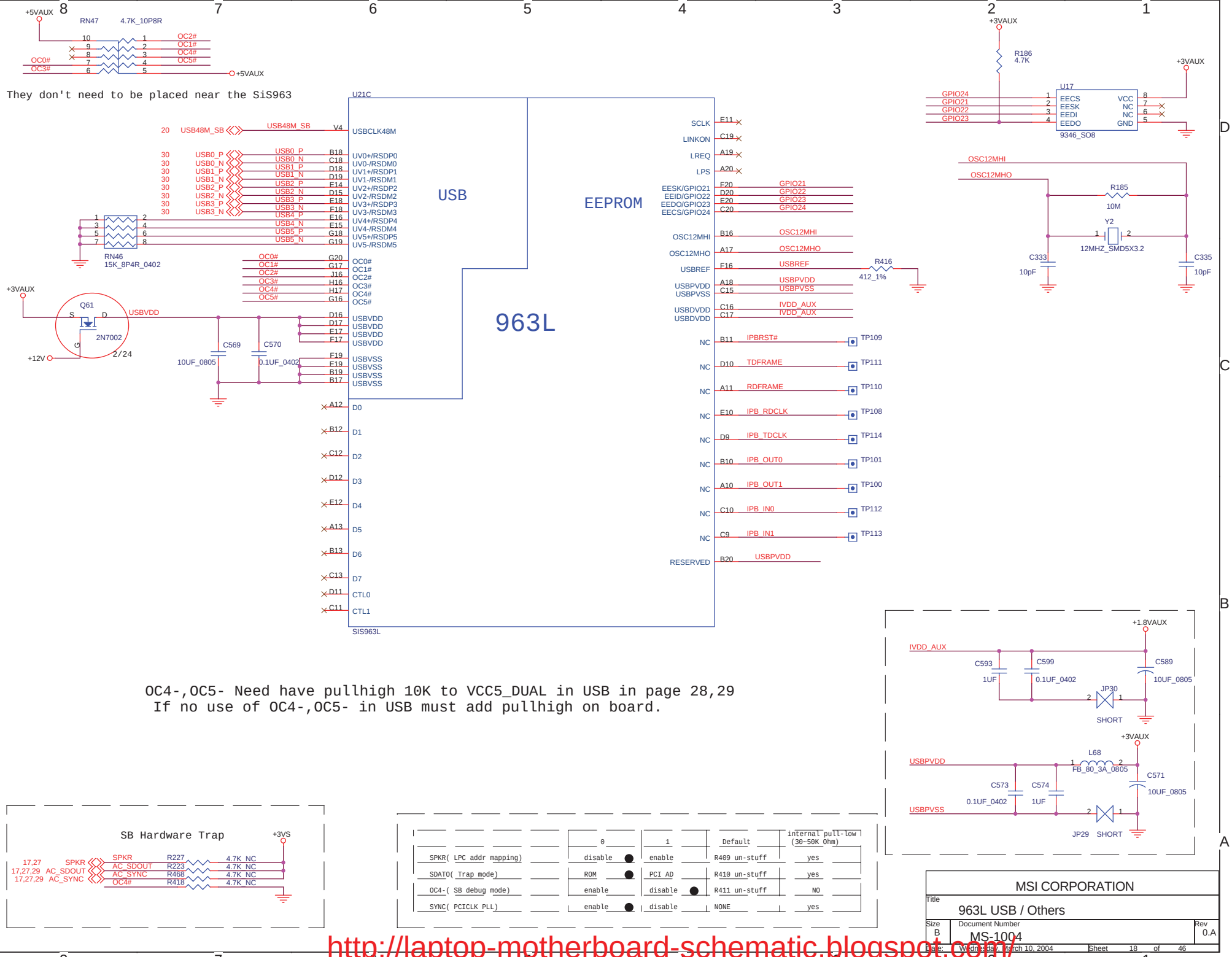


	PFTEST0	GC_DET# (from 741)	OVDD318
SiS661 SiS741	4.7K	NC	1.8V
SiS650	NC 4.7K	NC 0	3.3V 1.8V


963/963L
PCI
IDE
MuTIOL
SIS963L
U21A
INT#A : VGA M10
INT#B : CardBUS_ENE1410
INT#C : Mini PCI
INT#D : Mini PCI
close SB chip
Put near 963L Chip.
Only for MUTIOL 1.0 Backup solution
Analog Power supplies of Transzip function for 963 Chip.
MSI CORPORATION
963L PCI / IDE / MuTIOL
MS-1004
Wednesday, March 10, 2004
http://laptop-motherboard-schematic.blogspot.com/




They don't need to be placed near the SiS963
963L
USB
EEPROM
U21C
SIS963L
RN47 4.7K_10P8R
RN46 15K_8P4R_0402
Q61 2N7002
R186 4.7K
U17 9346_SO8
R185 10M
Y2 12MHZ_SMD5X3.2
C333 10pF
C335 10pF
R416 412_1%
C569 10UF_0805
C570 0.1UF_0402
C593 1UF
C599 0.1UF_0402
C589 10UF_0805
JP30 SHORT
L68 FB_80_3A_0805
C571 10UF_0805
C573 0.1UF_0402
C574 1UF
JP29 SHORT
OC4-,OC5- Need have pullhigh 10K to VCC5_DUAL in USB in page 28,29
If no use of OC4-,OC5- in USB must add pullhigh on board.
SB Hardware Trap
MSI CORPORATION
963L USB / Others
MS-1004
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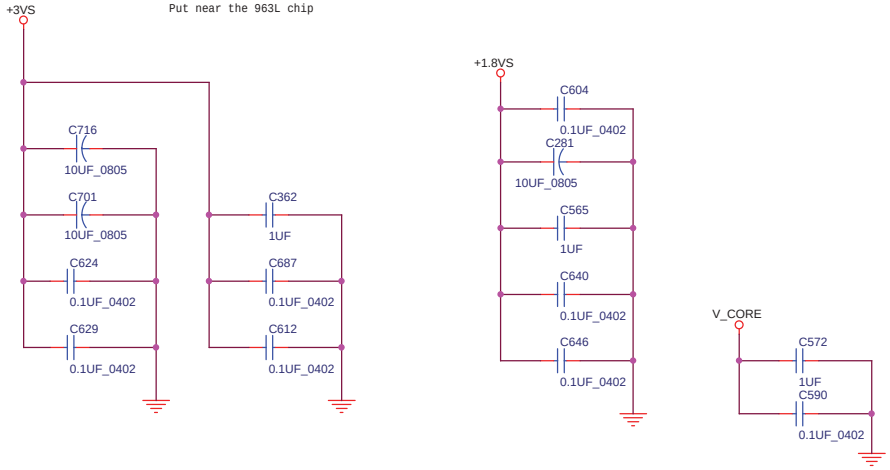
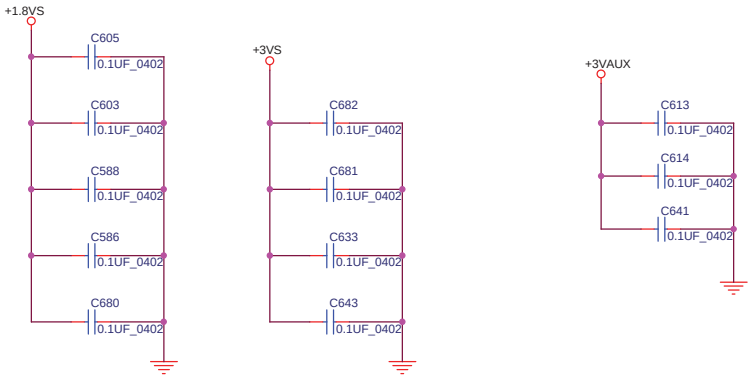
963L chip POWER capacitors

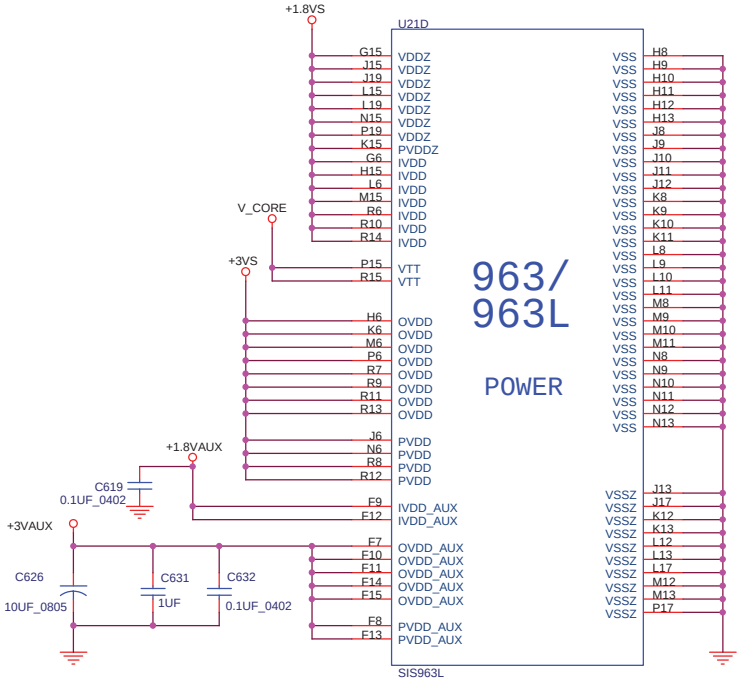
Put near the 963L chip



963L chip Power capacitors

Put in the solder of 963L chip





MSI CORPORATION		
Title: 963L Power		
Size: B	Document Number: MS-1004	Rev: 0.A
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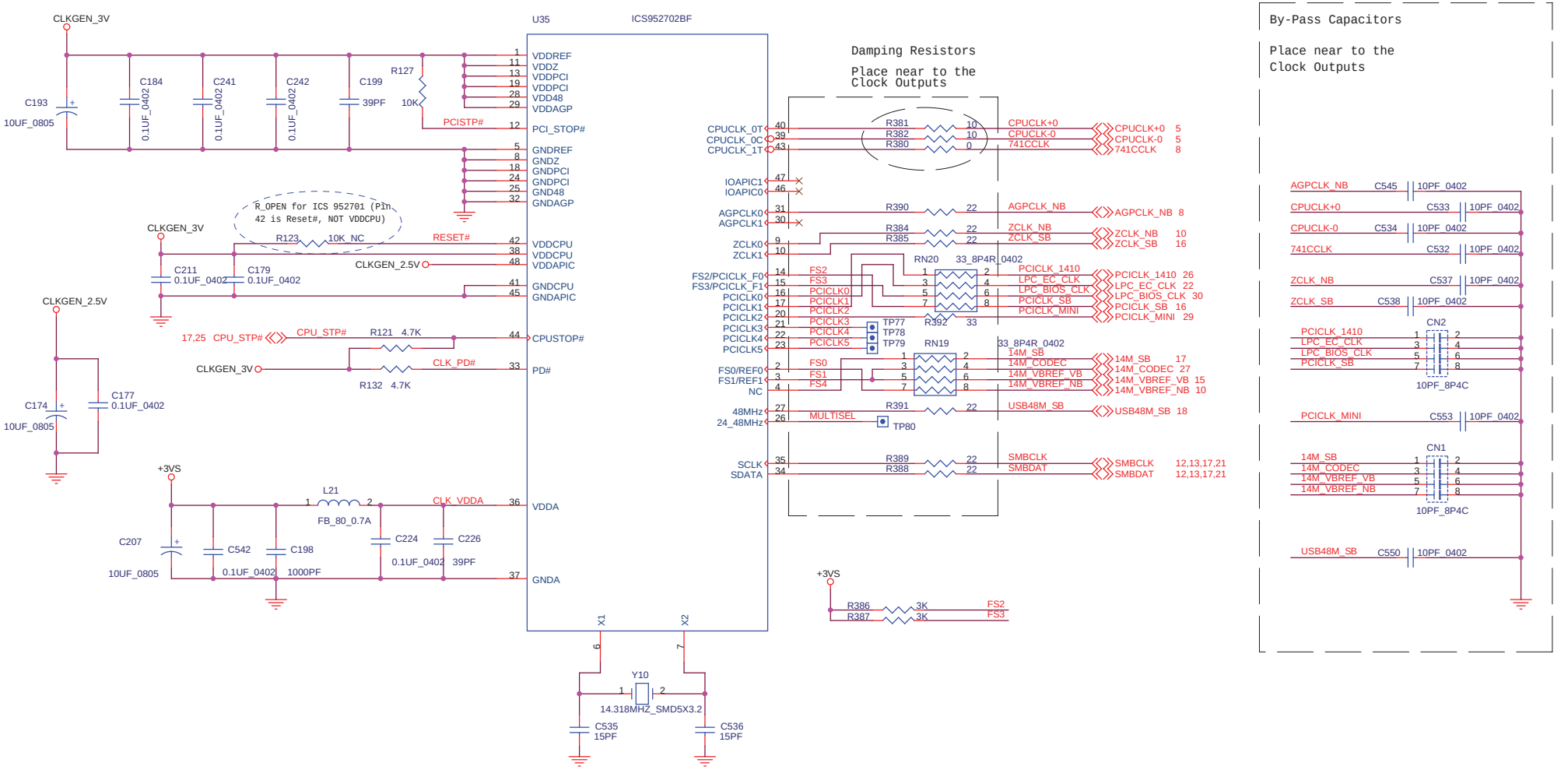
Main Clock Generator



Different clock generator with different frequency define table

SiS 746/746FX CLOCK

(FS4)	(FS3)	(FS2)	(FS1)	(FS0)	CPU (MHz)	ZCLK (MHz)	AGPCLK (MHz)	PCI (MHz)	VCO (MHz)
0	0	0	0	0	133.33	66.66	66.66	33.33	400
0	0	0	0	1	133.33	66.66	50	33.33	400
0	0	0	1	0	133.33	100	66.66	33.33	400
0	0	0	1	1	133.33	100	50	33.33	400
0	0	1	0	0	133.33	133.33	66.66	33.33	400
0	0	1	0	1	133.33	133.33	50	33.33	400
0	0	1	1	0	133.4	166.75	66.7	33.35	667
0	0	1	1	1	133.4	166.75	55.58	33.35	667
0	1	0	0	0	100	66.66	66.66	33.33	400
0	1	0	0	1	100	66.66	50	33.33	400
0	1	0	1	0	100	100	66.66	33.33	400
0	1	0	1	1	100	100	50	33.33	400
default 0	1	1	0	0	100	133.33	66.66	33.33	400
0	1	1	0	1	100	133.33	50	33.33	400
0	1	1	1	0	111	166.75	66.7	33.35	667
0	1	1	1	1	111	166.75	55.58	33.35	667

SiS 746/746FX CLOCK

(FS4)	(FS3)	(FS2)	(FS1)	(FS0)	CPU (MHz)	ZCLK (MHz)	AGPCLK (MHz)	PCI (MHz)	VCO (MHz)
1	0	0	0	0	114.28	100	66.66	33.33	800
1	0	0	0	1	120	100	66.66	33.33	600
1	0	0	1	0	133.4	83.38	66.7	33.35	667
1	0	0	1	1	133.4	111	74.1	33.35	667
1	0	1	0	0	133.4	133.4	83.38	33.35	667
1	0	1	0	1	144.5	123.85	66.69	33.34	867
1	0	1	1	0	150	100	66.66	33.33	600
1	0	1	1	1	166.75	111	66.7	33.35	667
1	1	0	0	0	111	133.4	66.7	33.35	667
1	1	0	0	1	138.83	138.83	64.07	32.03	833
1	1	0	1	0	144.5	144.5	66.69	33.34	867
1	1	0	1	1	150	150	64.28	32.14	900
1	1	1	0	0	155.5	133.28	66.64	33.32	933
1	1	1	0	1	166.75	133.4	66.7	33.35	667
1	1	1	1	0	180	150	69.23	34.61	900
1	1	1	1	1	200	133.33	66.66	33.33	800

NOTE: PCICLK<34.5MHz

Major Different circuit setting between 5 clock gen. vendor

	Cypress CY28372	ICS 952701	Hitachi TS404	Phaseink 205-107	Realtek RTM360-741
VDDCPU	**2.5V**	3.3V	**2.5V**	3.3V	3.3V
Pin 42	VDDCPU	Reset#	VDDCPU	VDDCPU	VDDCPU
Freq. Sel. latch (FSx)	0~3	0~4	0~3	0~4	0~5
Pin 4	Ref2	Ref2/FS4	NC	Ref2/FS4	Ref2/FS4

MSI CORPORATION			
Title: Clock Generator			
Size: Custom	Document Number: MS-1004		Rev: 0.A
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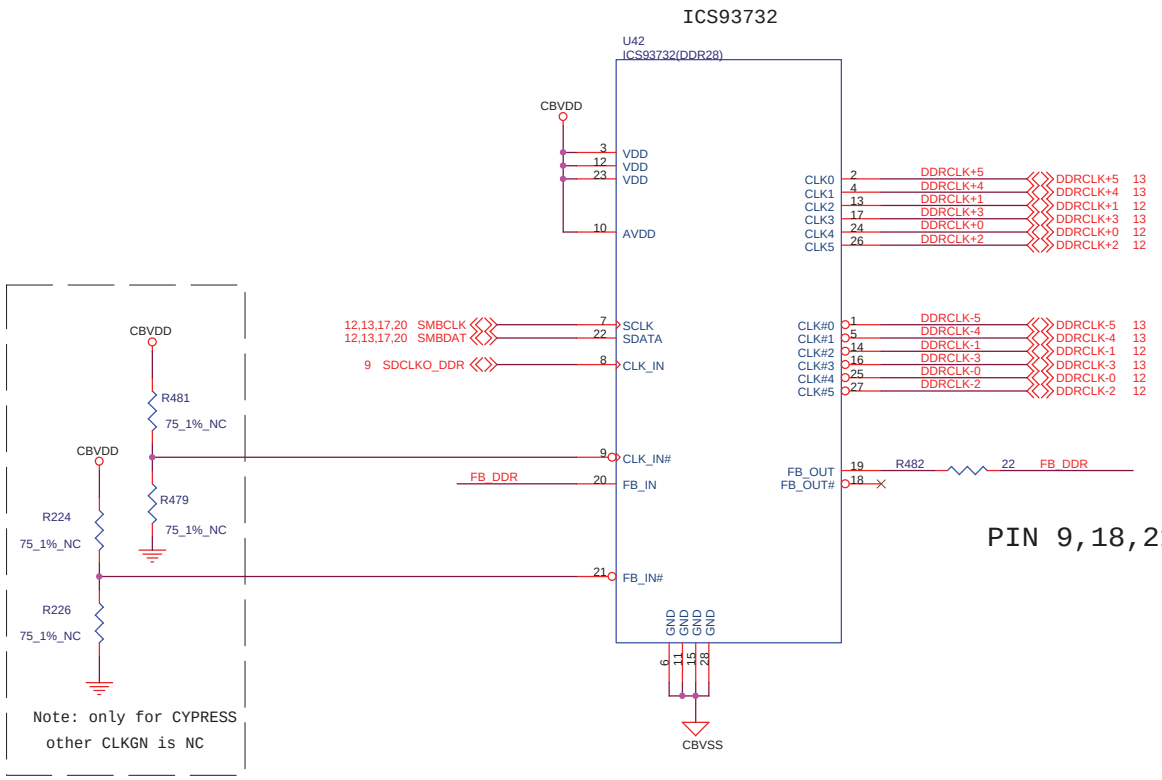
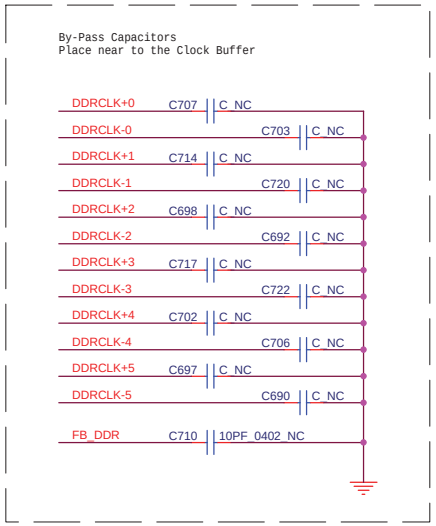
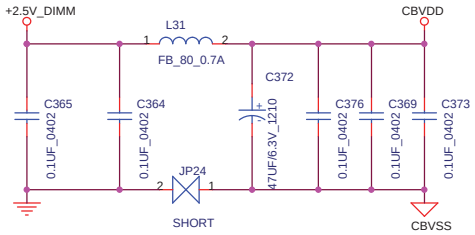
Clock Buffer (FOR 2 DDR SDRAM DIMMS)



PIN 9,18,21 NC





MSI CORPORATION		
Title: DDR Clock Buffer		
Size: Custom	Document Number: MS-1004	Rev: 0.A
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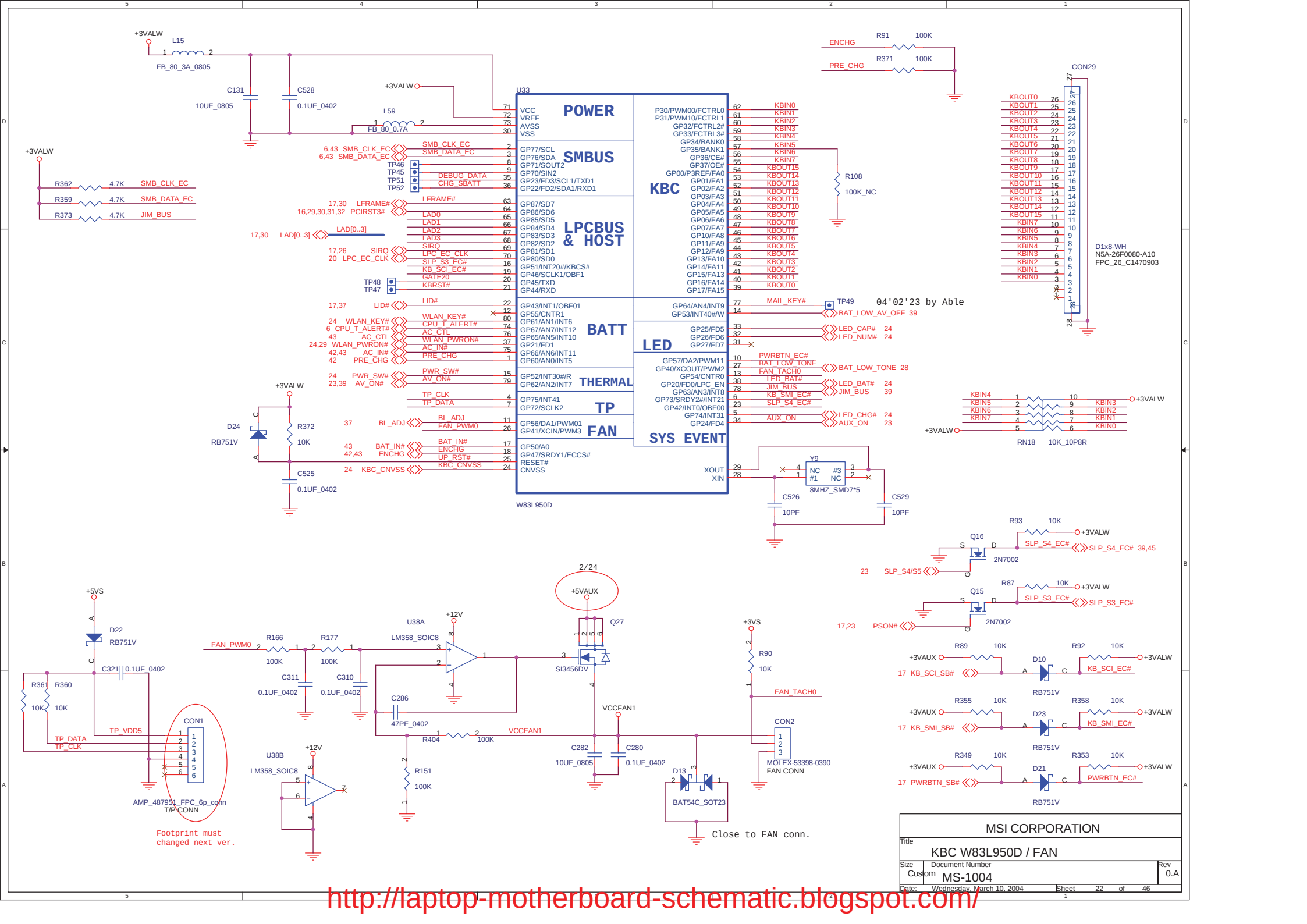
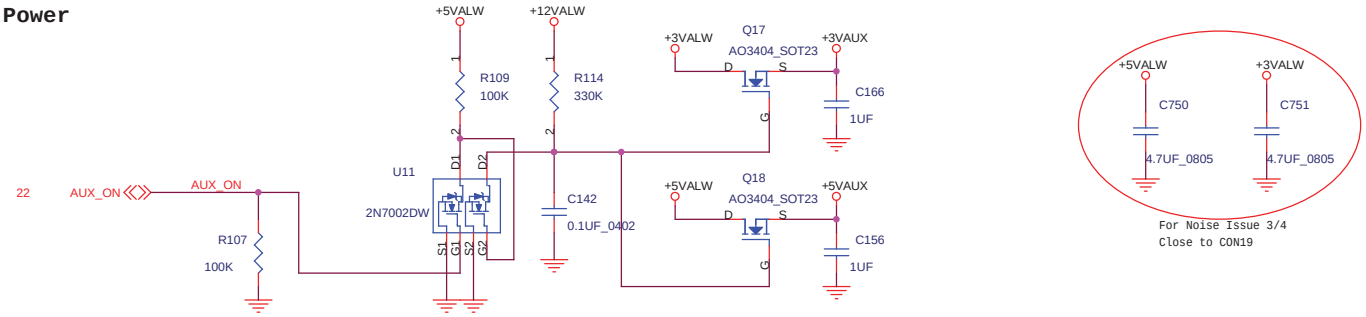
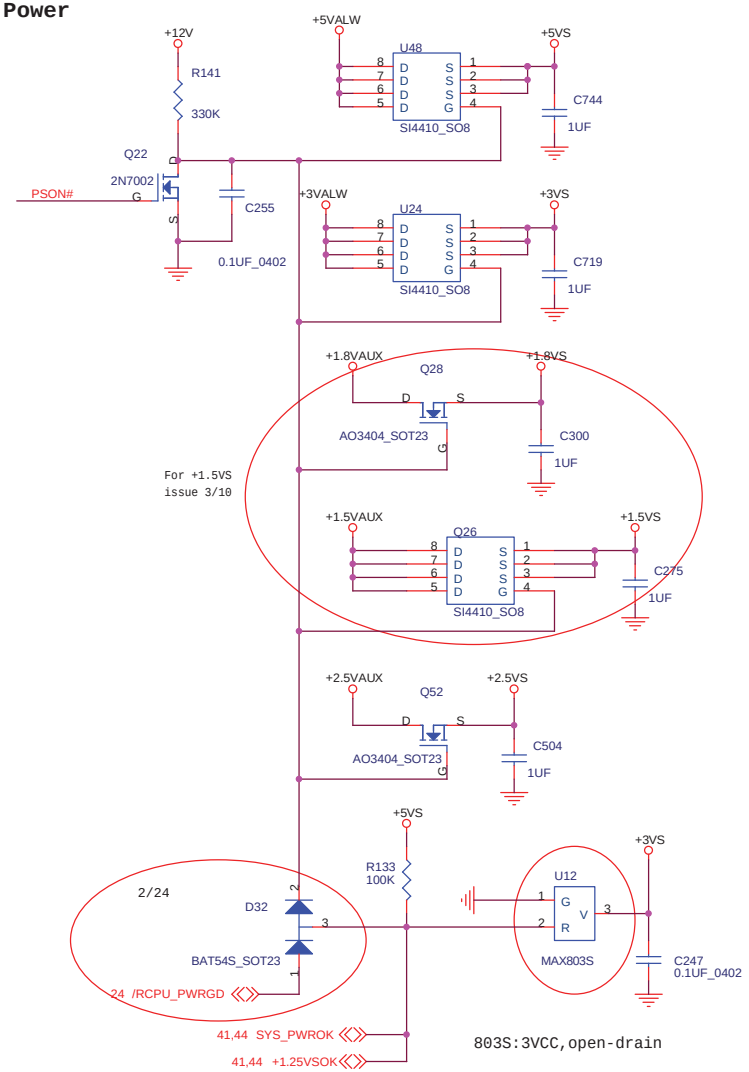


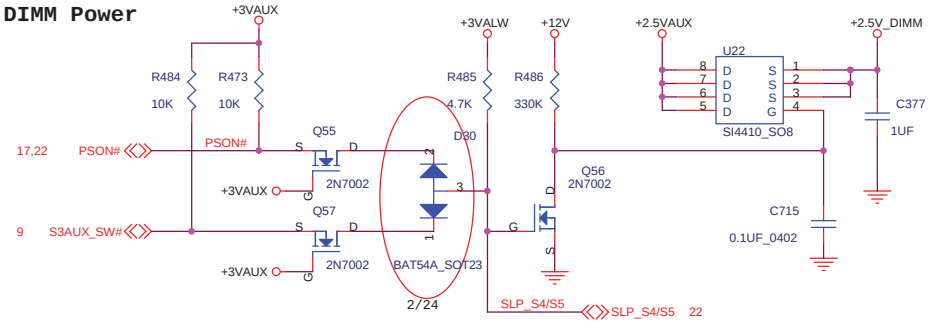
AUX Power



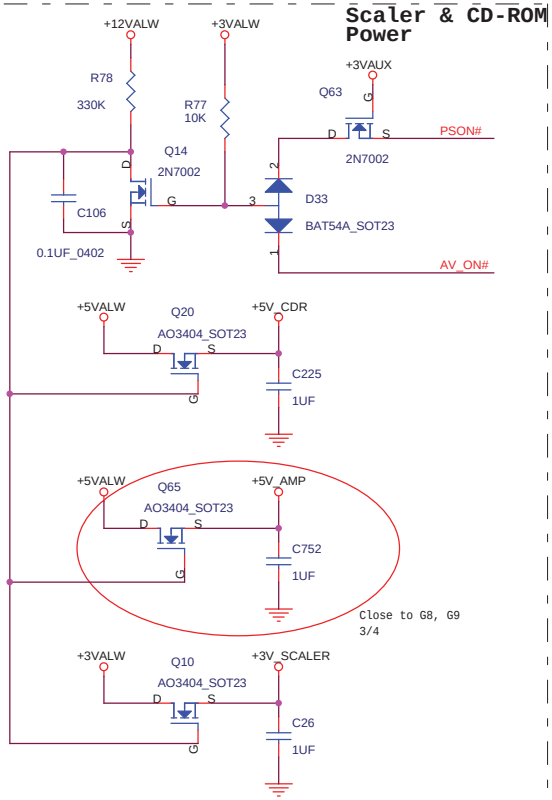
System Power



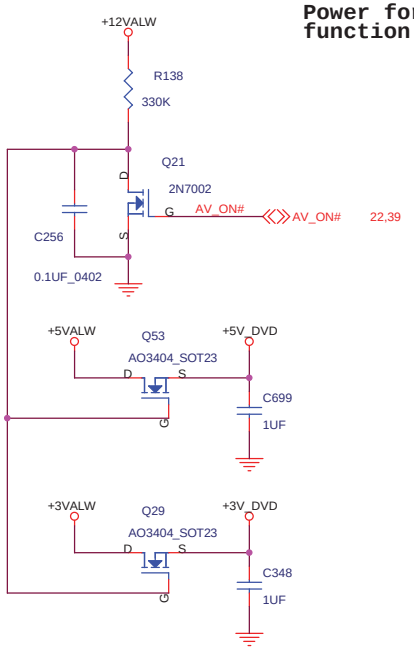
DIMM Power



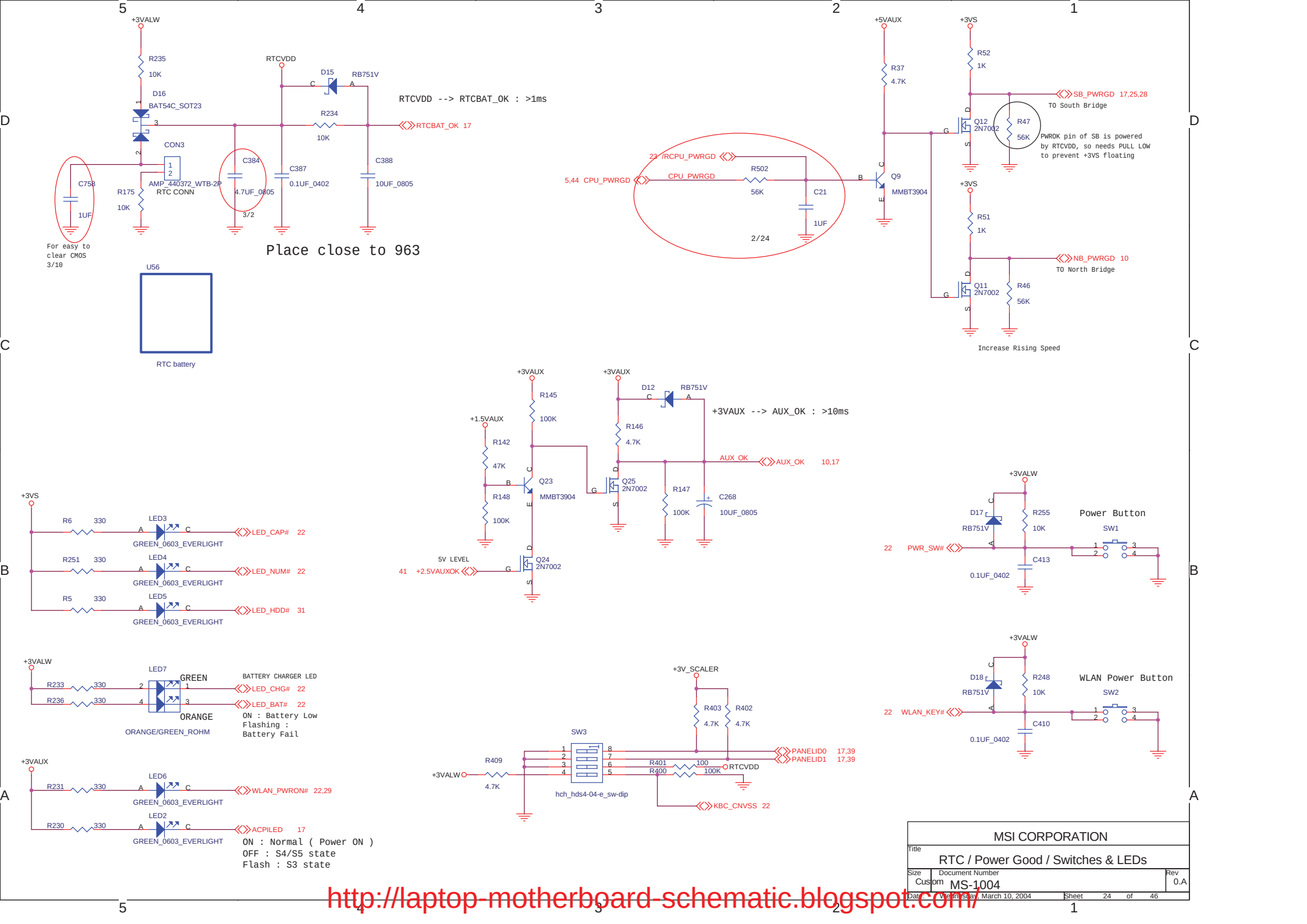
Scaler & CD-ROM Power



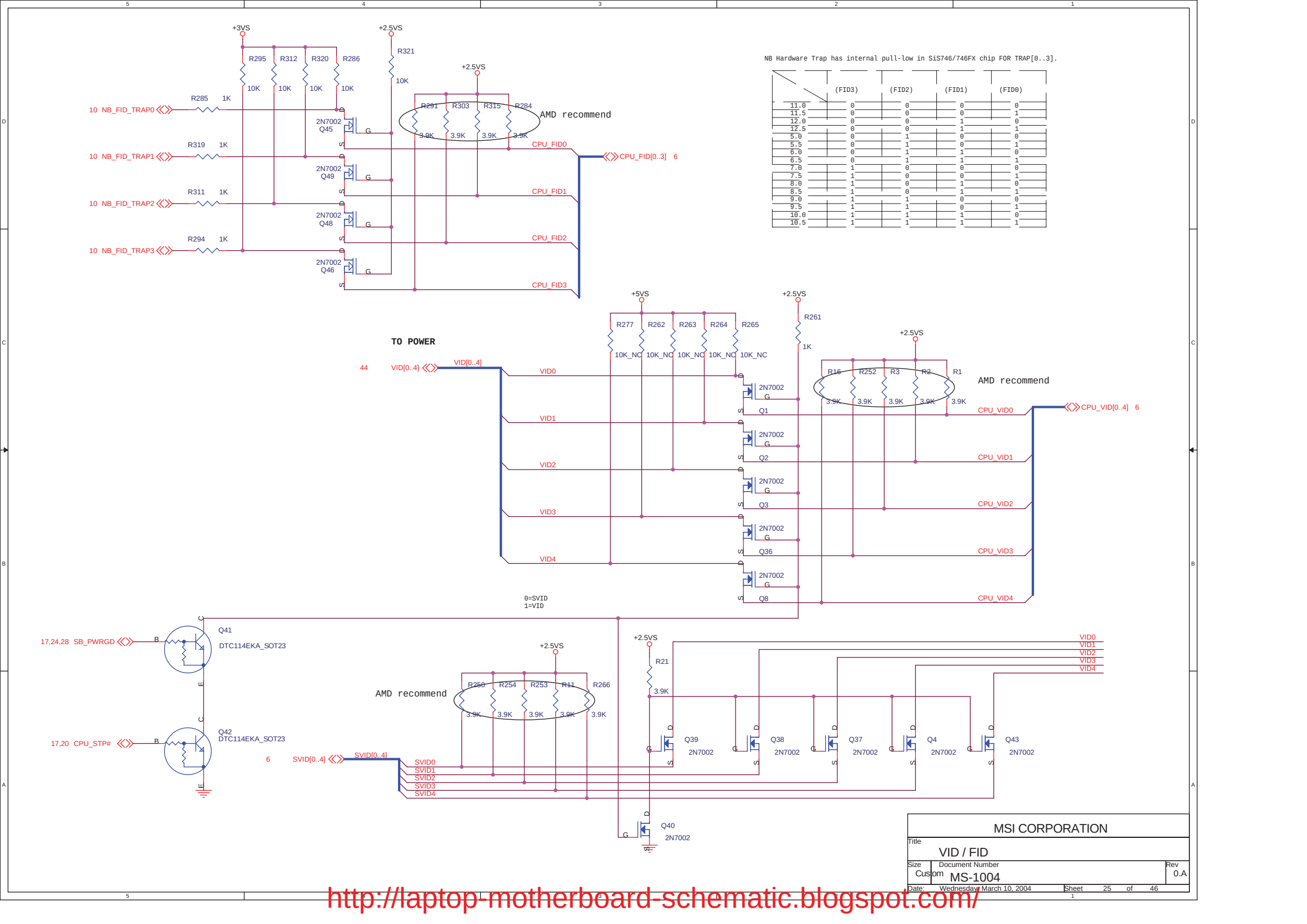
Power for DVD function

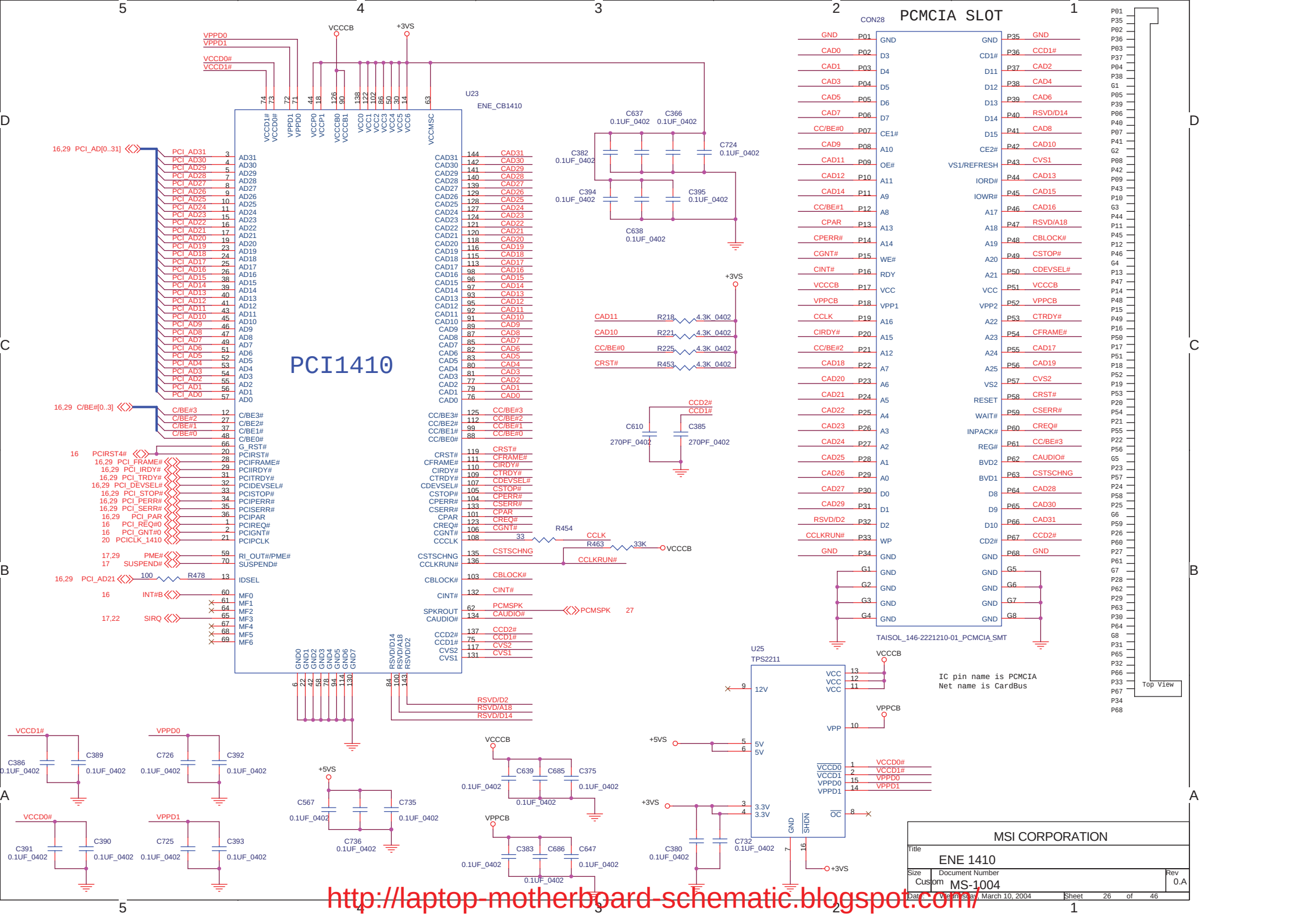


MSI CORPORATION		
Title: System Power Control		
Size: Custom	Document Number: MS-1004	Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 23 of 46	



MSI CORPORATION	
Title	RTC / Power Good / Switches & LEDs
Size: Custom	Document Number: MS-1004
Rev	0.A
Date: Wednesday, March 10, 2004	Sheet 24 of 46




PCI1410
U23
ENE_CB1410
PCMCIA SLOT
CON28
TAISOL_146-2221210-01_PCMCIA_SMT
U25
TPS2211
IC pin name is PCMCIA
Net name is CardBus
Top View
MSI CORPORATION
Title
ENE 1410
Size
Custom
Document Number
MS-1004
Rev
0.A
Date: Wednesday, March 10, 2004
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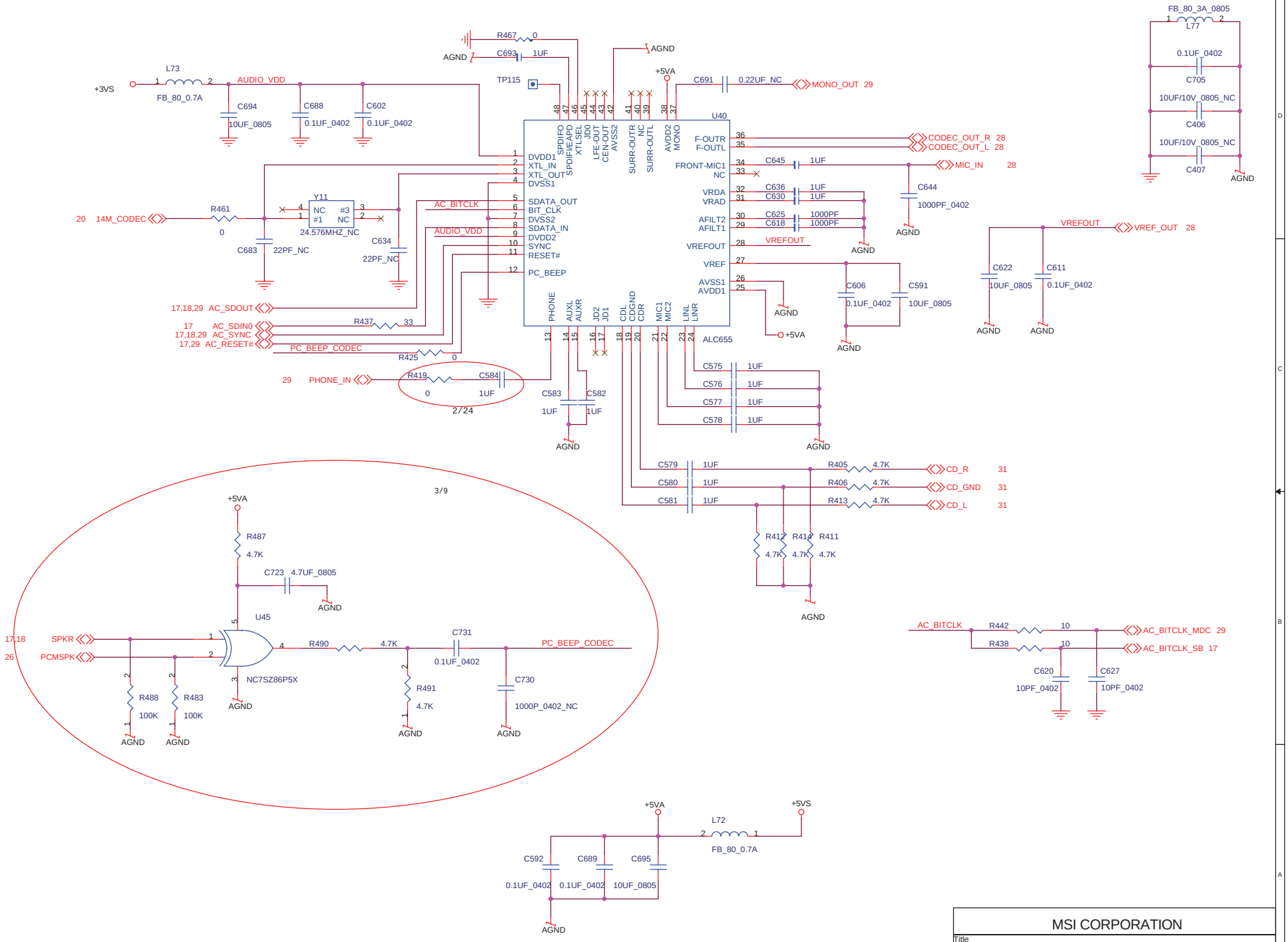
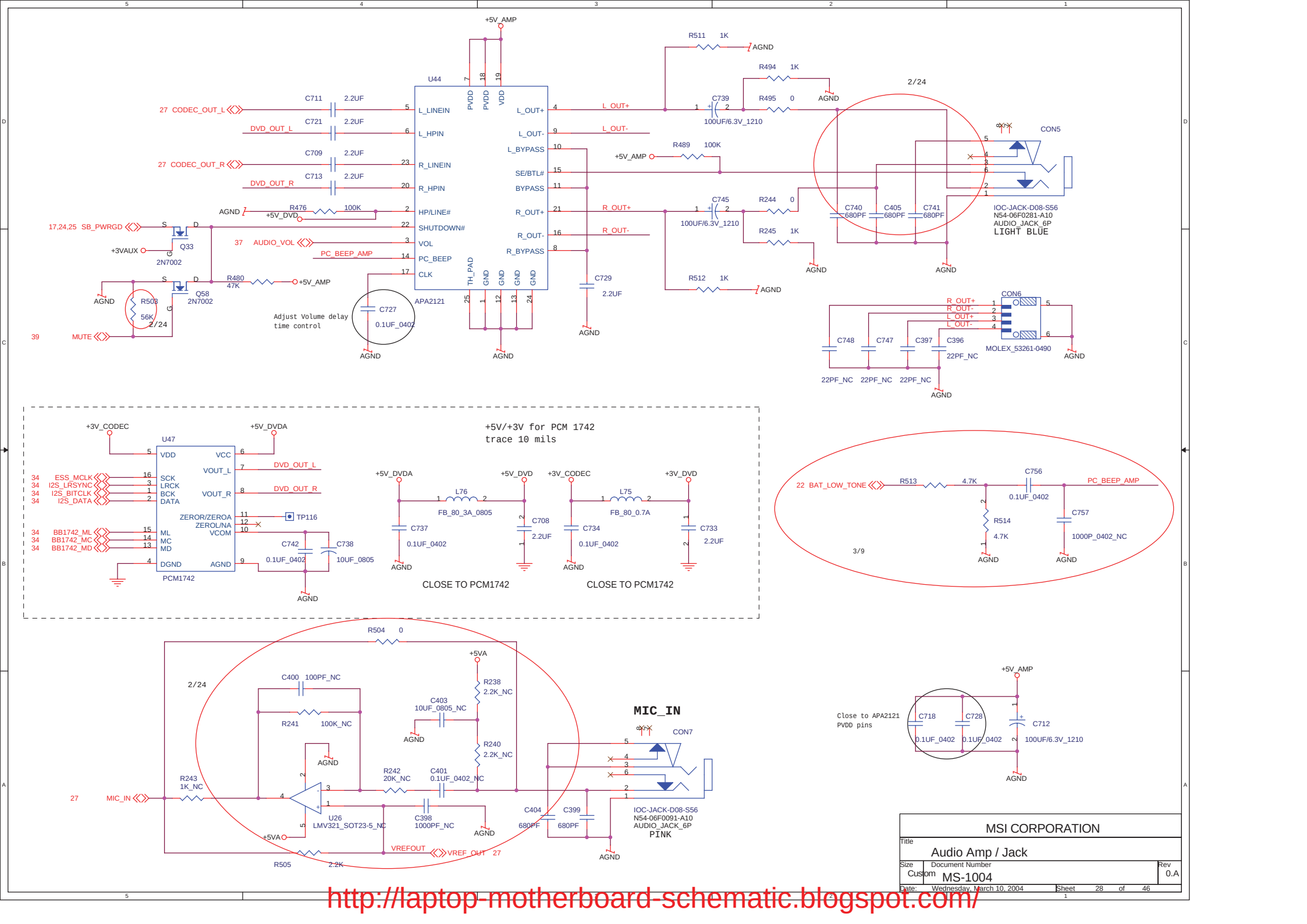


MSI CORPORATION		
Title: Audio CODEC		
Size: Custom	Document Number: MS-1004	Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 27 of 46	



MSI CORPORATION

Title	Audio Amp / Jack		
Size	Custom	Document Number MS-1004	Rev 0.A
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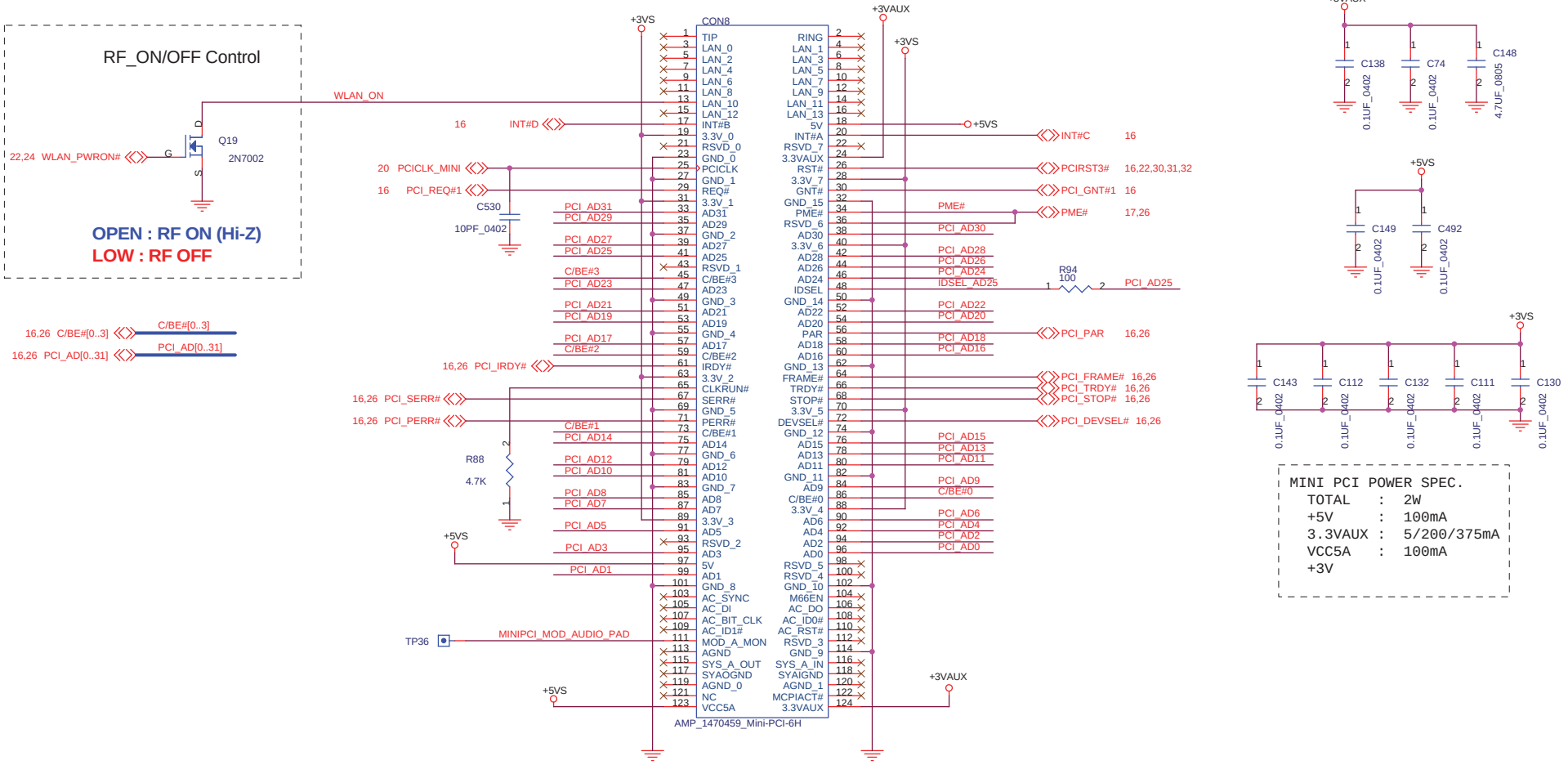
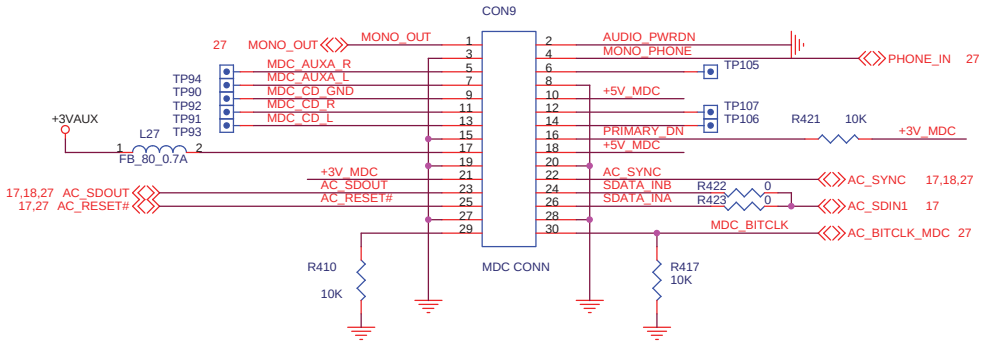
MINI PCI SOCKET

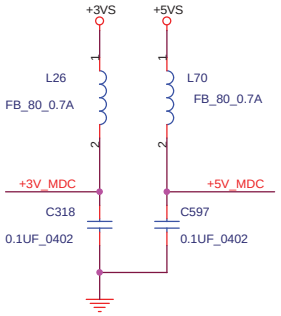


MINI PCI POWER SPEC.

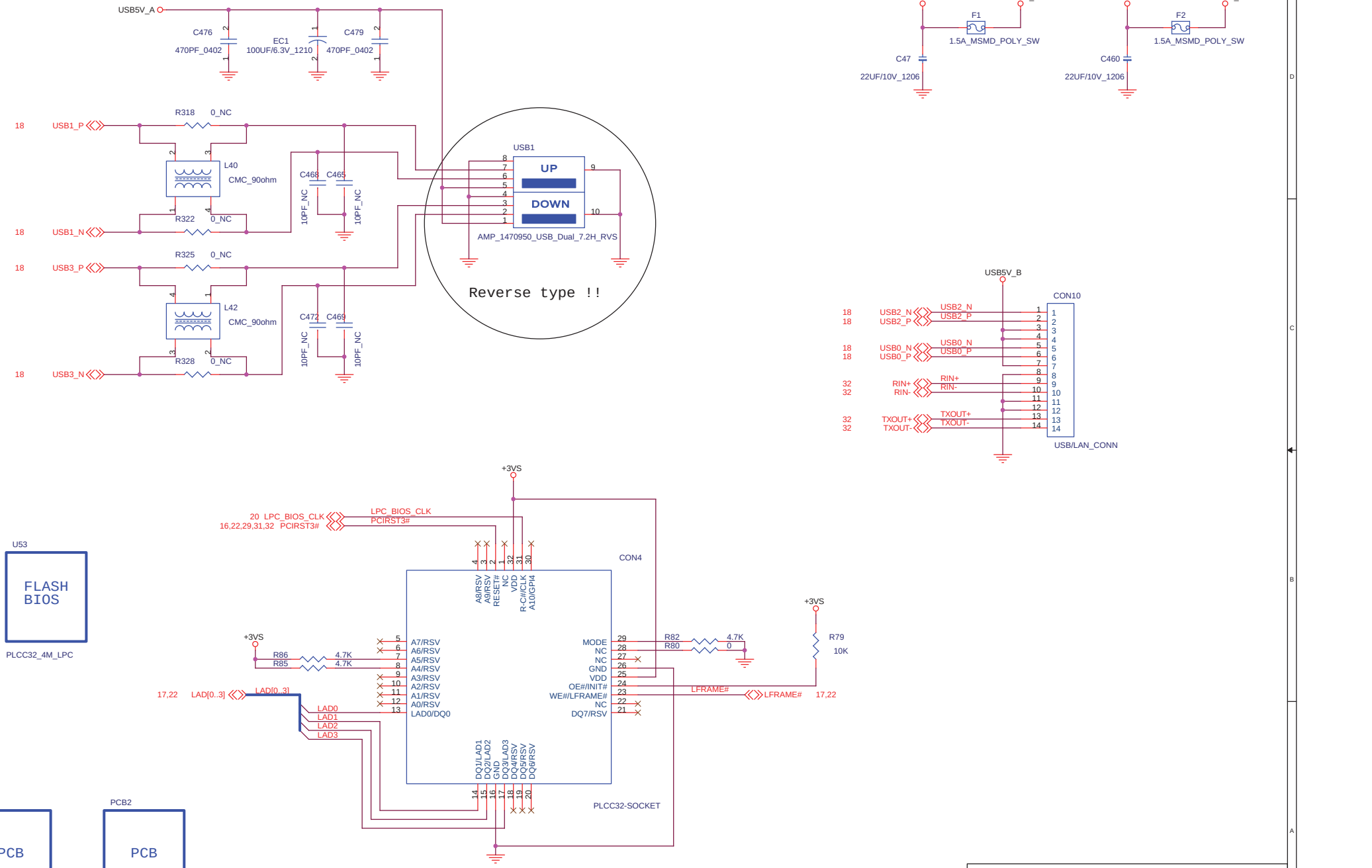
TOTAL	:	2W
+5V	:	100mA
3.3VAUX	:	5/200/375mA
VCC5A	:	100mA
+3V		

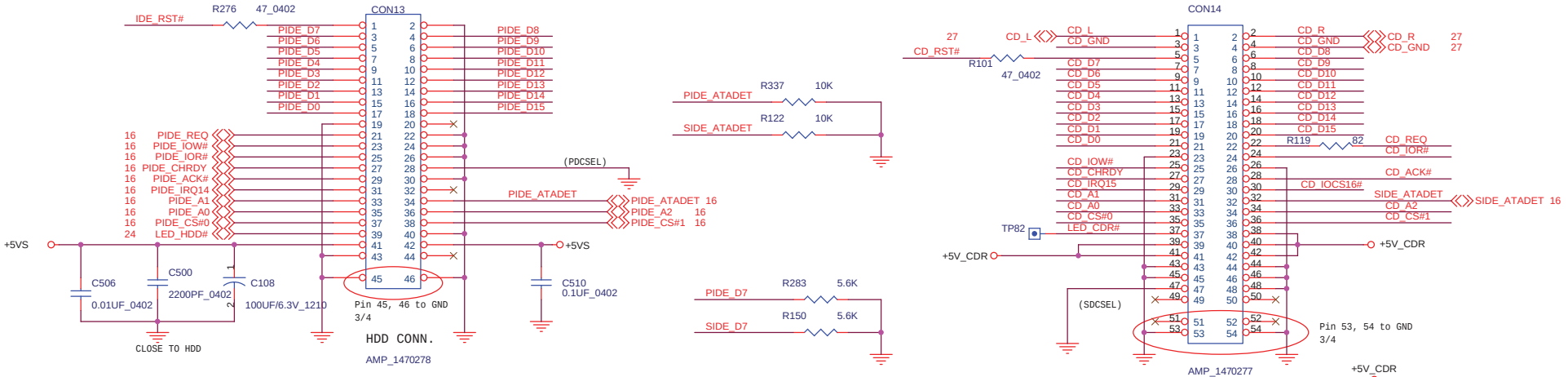
MDC





MSI CORPORATION			
Title: Mini PCI / MDC connector			
Size: Custom	Document Number: MS-1004		Rev: 0.A
Date: Wednesday, March 10, 2004		Sheet 29 of 46	



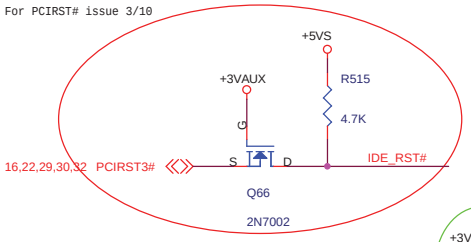


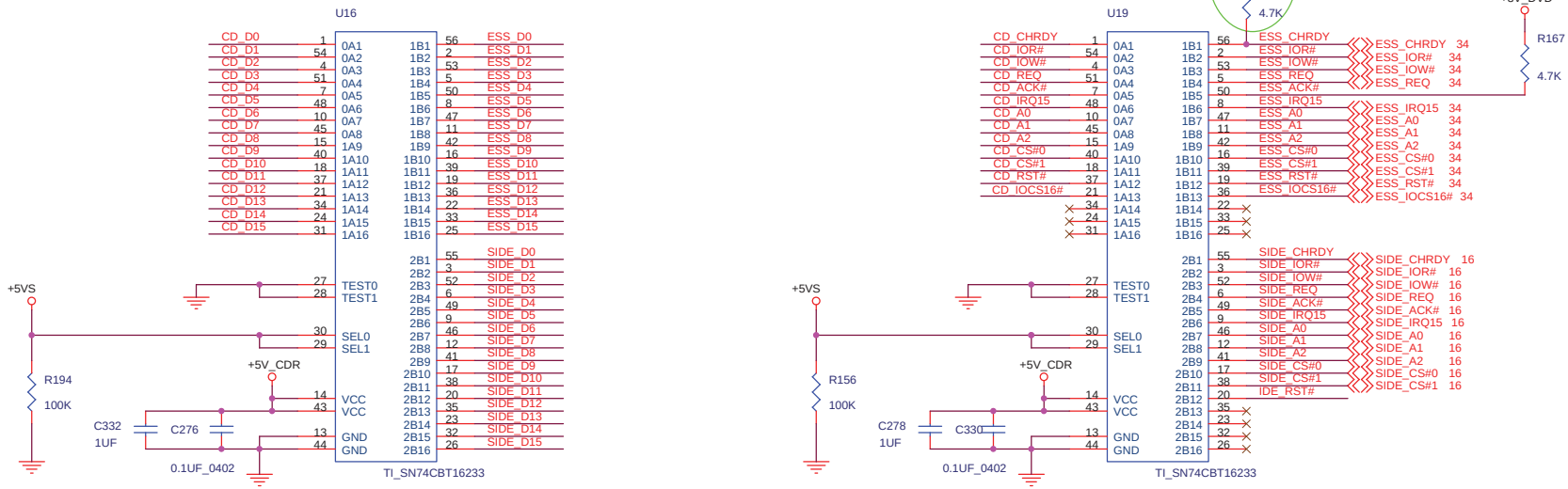
PIDE_D[0..15] PIDE_D[0..15] 16

SIDE_D[0..15] SIDE_D[0..15] 16

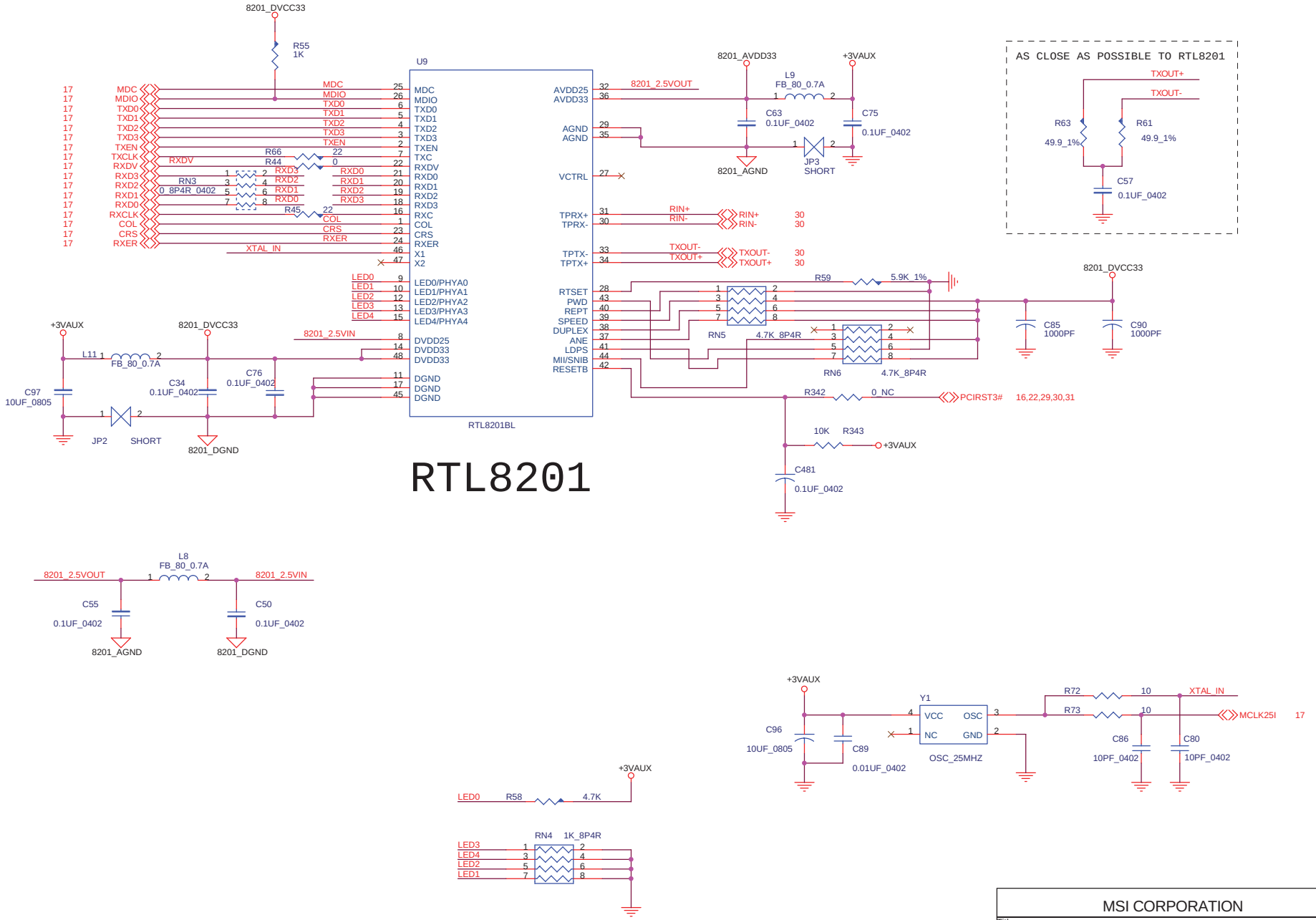
ESS_D[0..15] ESS_D[0..15] 34

SEL0	TEST0	Description
L	L	0A to 1B
H	L	0A to 2B
X	H	0A to 1B and 2B
SEL1	**TEST1**	**Description**
L	L	1A to 1B
H	L	1A to 2B
X	H	1A to 1B and 2B

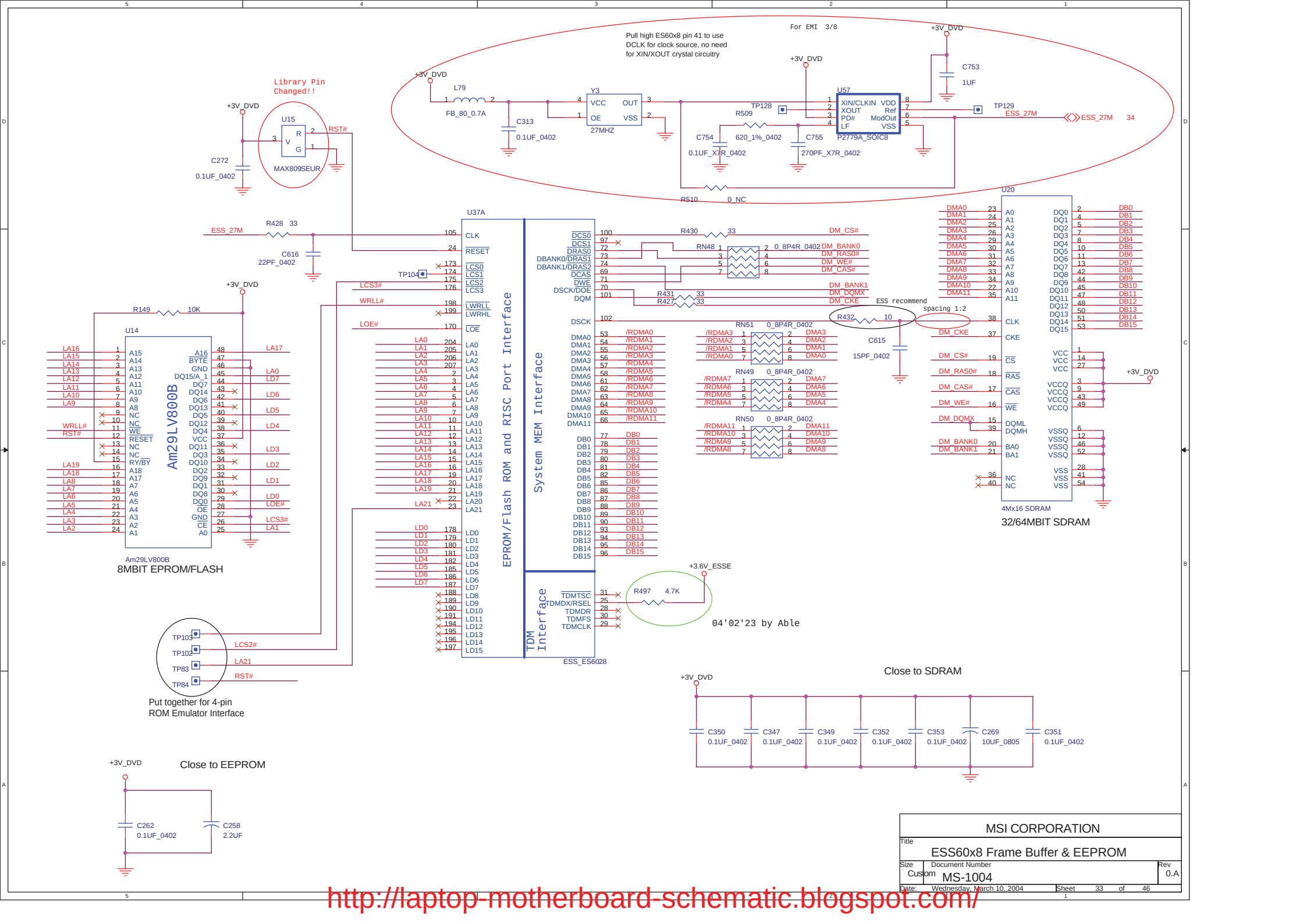




MSI CORPORATION		
Title: HDD / CD-ROM connector		
Size: Custom	Document Number: MS-1004	Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 31 of 46	



MSI CORPORATION		
Title: LAN PHY RTL8201		
Size: Custom	Document Number: MS-1004	Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 32 of 46	



PLL3(pin41)	CLK SOURCE
1	DCLK INPUT
0	CRSTAL OSC

PLL2(pin32)	PLL1(pin36)	PLL0(pin33)	MULTI	Frequency
0	0	0	4.25	114.75
0	0	1	reserved	NA
0	1	0	bypass	27
0	1	1	3.75	101.25
1	0	0	4.5	121.5
1	0	1	reserved	NA
1	1	0	3.5	94.5
1	1	1	4	108

CHIP	FREQ SOURCE	R184	DCLKINPUT	MULTI	FREQ	CRYSTALOSC
ES6008	DCLKINPUT OR CRYSTALOSC	INSTALL	NA	X4	108.0MHz	27MHZ
ES6018	DCLKINPUT OR CRYSTALOSC	INSTALL	NA	X4	108.0MHz	27MHZ
ES6028	DCLKINPUT OR CRYSTALOSC	INSTALL	NA	X4	108.0MHz	27MHZ
ES6038	DCLKINPUT AND CRYSTALOSC	REMOVE	33.3MHz	X3.5	116.7MHz	27MHZ
ES6028-T	DCLKINPUT OR CRYSTALOSC	INSTALL	NA	X4.25	114.75MHz	27MHZ

	CVBS and S-VIDEO	CVBS and COLOR DIFFERENCE	R,G,B
VDAC	CV	CV	
YDAC	Y	Y	G
CDAC	C	PB	R
UDAC		PR	B

04'02'23 by Able

+3.6V_ESS +3.6V_ESS +3.6V_ESS

R164 4.7K_NC R162 4.7K_NC R157 4.7K_NC

R176 4.7K R163 4.7K R158 4.7K

C302 15PF_NC C306 22PF_NC

RN10 33_8P4R_0402

I2S_LRSYNC 28 I2S_DATA 28 ESS_MCLK 28 I2S_BITCLK 28

31 ESS_D[0..15] ESS_D[0..15]

31 ESS_A[0..2] ESS_A[0..2]

U37B

Host / ATAPI Interface

31 ESS_RST# 145 HRST/EAUX3[5]
31 ESS_IOR# 150 HRD/DCI_ACK/EAUX4[6]
31 ESS_IOW# 149 HWR/DCI_CLK/EAUX4[5]
28 BB1742_MD R398 33 143 HRDQ/EAUX4[0]
31 ESS_REQ 142 HWRQ/DCI_REQ/EAUX4[1]
31 ESS_CHRDY 146 HIORDY/EAUX3[3]
31 ESS_IOCS16# 151 HIOCS16/CAMPCLK/EAUX3[4]
31 ESS_CS#0 152 HCS1FX/EAUX3[7]
31 ESS_CS#1 153 HCS3FX/EAUX3[6]
31 ESS_IRQ15 144 HIRQ/DCI_ERR/EAUX4[7]

ESS_A0 154 HA0/EAUX4[2]
ESS_A1 155 HA1/EAUX4[3]
ESS_A2 158 HA2/EAUX4[4]

ESS_D8 122 HD0/DCI[0]/EAUX1[0]
ESS_D9 123 HD1/DCI[1]/EAUX1[1]
ESS_D10 124 HD2/DCI[2]/EAUX1[2]
ESS_D11 125 HD3/DCI[3]/EAUX1[3]
ESS_D12 126 HD4/DCI[4]/EAUX1[4]
ESS_D13 127 HD5/DCI[5]/EAUX1[5]
ESS_D14 128 HD6/DCI[6]/EAUX1[6]
ESS_D15 131 HD7/DCI[7]/EAUX1[7]
ESS_D0 132 HD8/DCI_FDS/EAUX2[0]
ESS_D1 133 HD9/EAUX2[1]
ESS_D2 134 HD10/EAUX2[2]
ESS_D3 135 HD11/EAUX2[3]
ESS_D4 136 HD12/EAUX2[4]
ESS_D5 137 HD13/EAUX2[5]
ESS_D6 140 HD14/EAUX2[6]
ESS_D7 141 HD15/EAUX2[7]

Audio Port Interface

MCLK 39
TBCK 40
TWS/SEL_PLL2 32
TSD0/SEL_PLL0 33
TSD1/SEL_PLL1 36
TSD2 37
TSD3 38
TP88 TP85
R165 4.7K_NC For 61X8
RBCK 47
RWS 46
RSD 45
TP86 TP87 TP96
SPDIF OUT
SPDIF/SEL_PLL3 41 SPDIF R174 33_NC
TP95 ESS_HSYNC 36 ESS_VSYNC 36
MENU_ESS 39

Display Interface

PCLK2XSCN/CAMYUV4 116
PCLKQSCN/CAMYUV5/AUX3[2] 117
HSSCN/CAMYUV7/EAUX3[0] 119
VSSCN/CAMYUV6/EAUX3[1] 118
YUV0/CAMYUV2 106
YUV1/VREF 107 ESS_VREF
YUV2/CDAC 108
YUV3/COMP 109
YUV4/RSET 110
YUV5/YDAC 113
YUV6/VDAC 114
YUV7CAMYUV3 115

+3.6V_ESSE
C312 0.1UF_0402
C595 0.1UF_0402
R415 270
GNDV

Auxiliary Port Interface

RN21 0_8P4R_0402

AUX0 160 BB1742_ML 28
AUX1 161 VFD_DATA 39
AUX2 162
AUX3 165
AUX4 166 VFD_CLK 39
AUX5 167 VFD_CS# 39
AUX6 168 BB1742_MC 28
AUX7 169 CIR_OUT 39

ESS_ES6028

RN22 0_8P4R_0402

+3V_DVD
R143 1K R144 1K

U13
VCC S0
WC S1
SCL S2
SDA GND
24C01A

Clock

33 ESS_27M R184 33 49 XIN
50 XOUT
C328 22PF_0402

2-CHANNEL AUDIO OUT
BurrBrown 2-CHANNEL AUDIODAC

VFD+REMOTE INTERFACE

CVBS OUT

L69 2.2UH_1206
CVBS ESS_CVBS 38
YDAC ESS_G 36
CDAC ESS_R 36
UDAC ESS_B 36
R420 75 C585 470PF C587 470PF
GNDV GNDV GNDV
Close to ES60x8 side

VIDEO OUT

L67 2.2UH_1206
R408 75 C568 470PF C562 470PF
GNDV GNDV GNDV
Close to ES60x8 side

L66 2.2UH_1206_NC
R407 75 C566 470PF_NC C561 470PF_NC
GNDV GNDV GNDV
Close to ES60x8 side

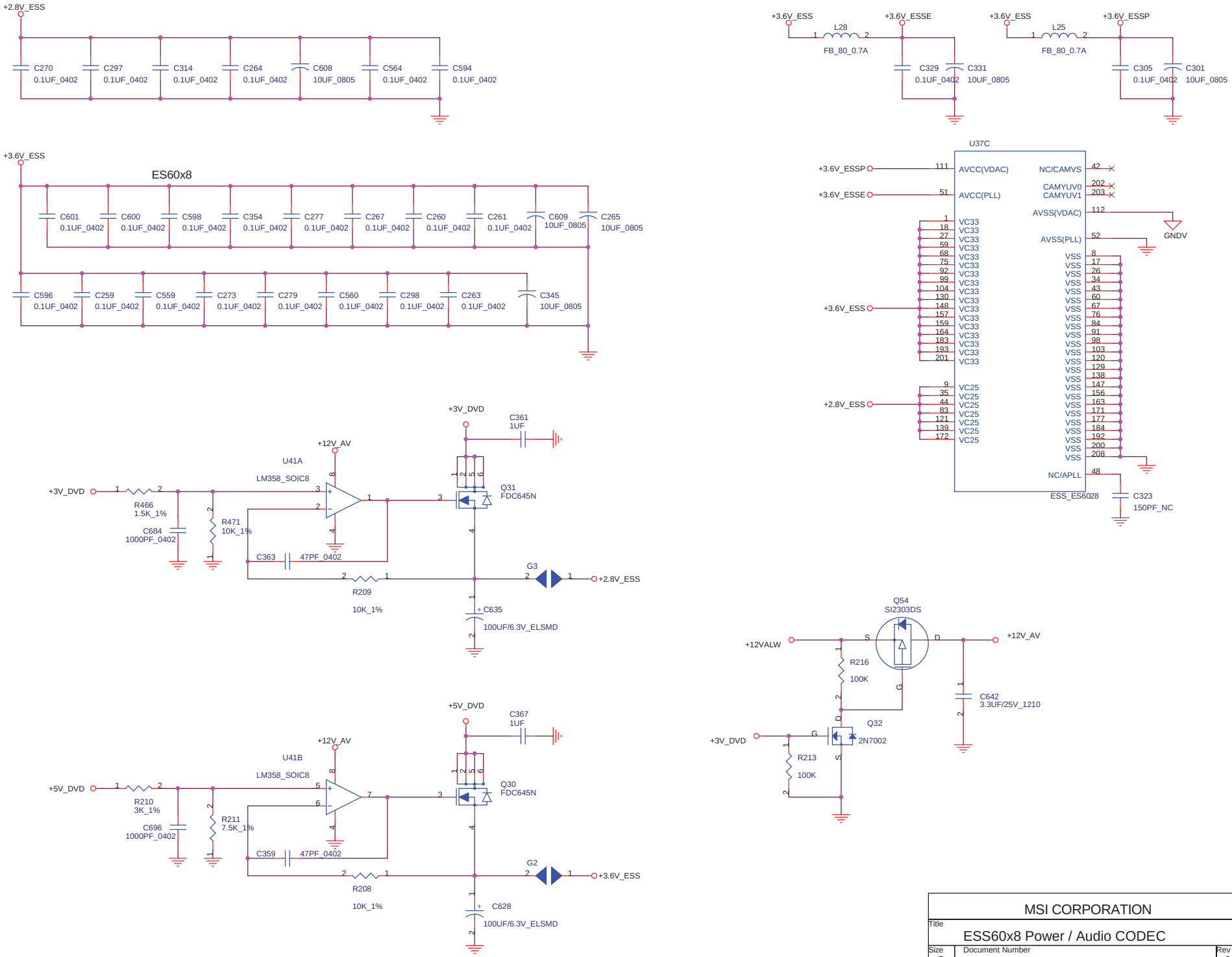
L71 2.2UH_1206
R433 75 C617 470PF C607 470PF
GNDV GNDV GNDV
Close to ES60x8 side

R399 0 GNDV

2 Ground are connected at board layout thru a thick trace

+3V_DVD
C271 0.1UF_0402
Close to 24C01

MSI CORPORATION		
Title: ESS60x8 System & Output		
Size: Custom	Document Number: MS-1004	Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 34 of 46	



MSI CORPORATION		
Title: ESS60x8 Power / Audio CODEC		
Size: Custom	Document Number: MS-1004	Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 35 of 46	

By pass CAP place attention

AVDD<-->AVSS
AVDDPLL<-->AVSSPLL
AVDDDVI<-->AVSSDVI
VDDP<-->GNDP
VDDC<-->GNDC

U28

MST9131/9151

75 Ohm and 20PF Close to MST9131 side

Remove R25
04'02'23 by Able

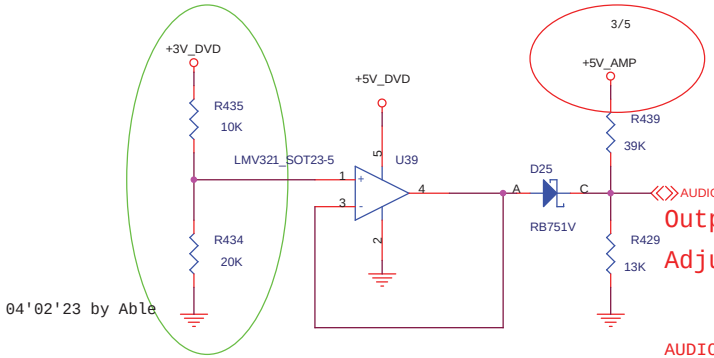
04'02'23 by Able

04'02'23 by Able

Close to +3.3V pins

Footprint Change 3/3

MSI CORPORATION	
Title	MST9131
Size	Custom
Document Number	MS-1004
Rev	0.A
Date:	Wednesday, March 10, 2004
Sheet	36 of 46



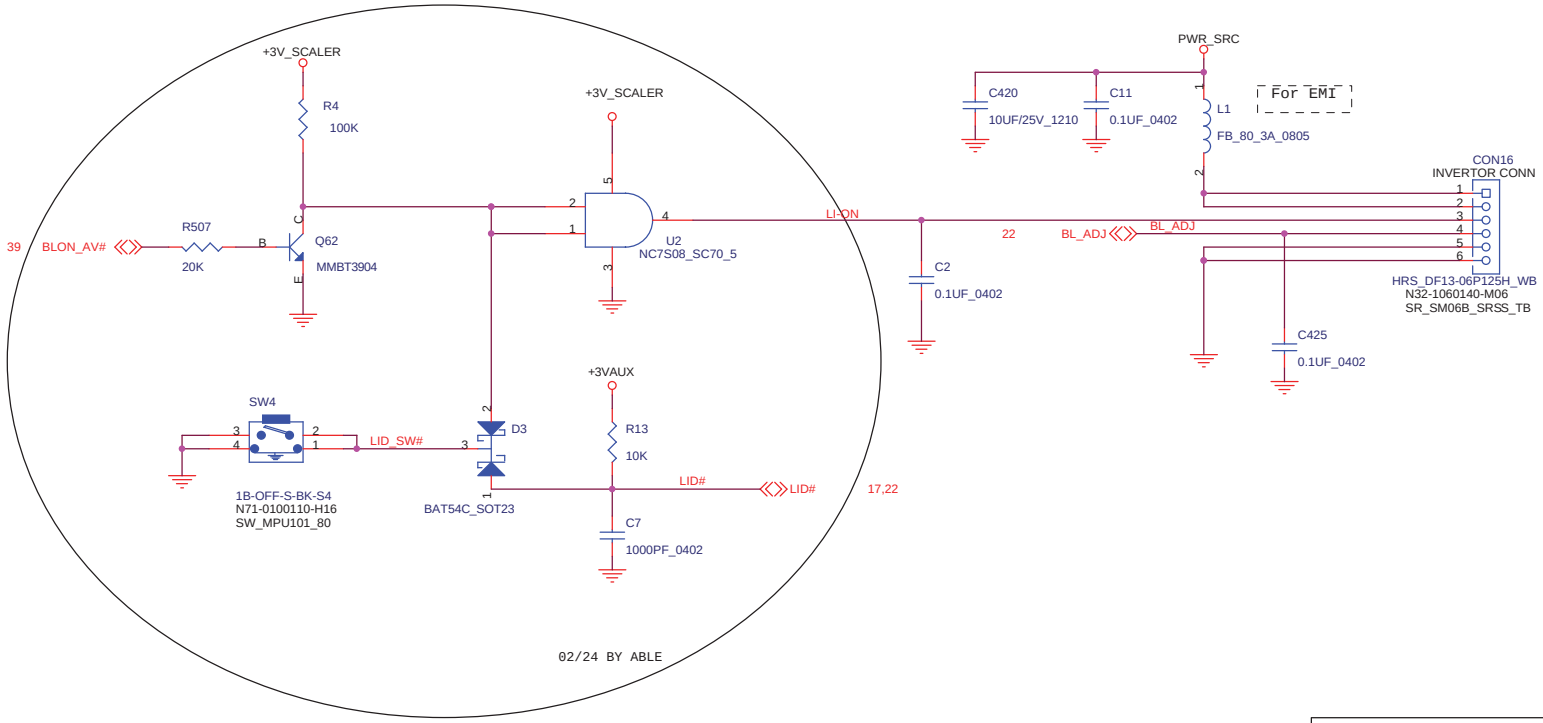
04'02'23 by Able

Output range from 1.25V to 4-0.2 V=3.8V

Adjust volume range from 0dB to -40dB .

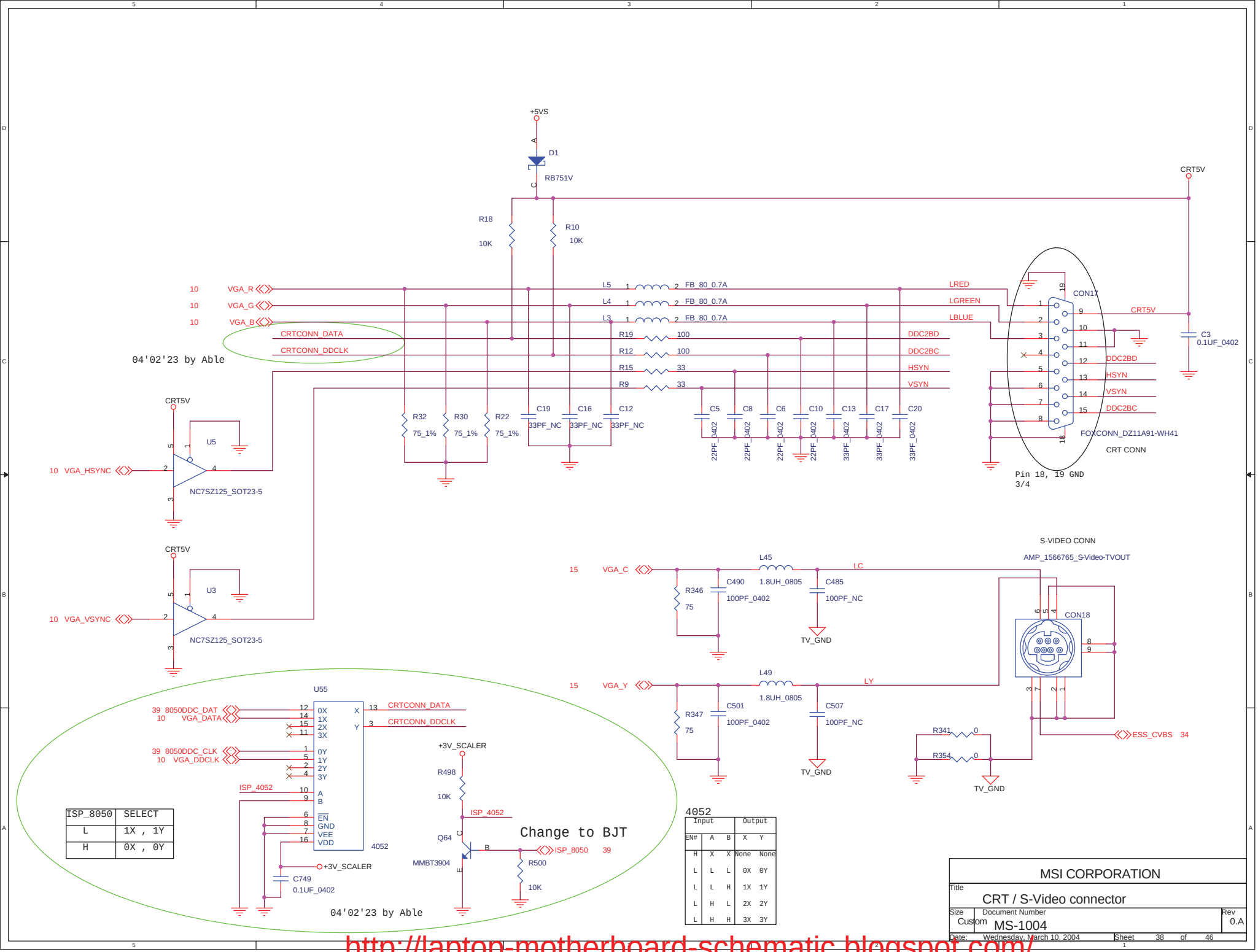
AUDIO_VOL=5x(13/(39+13))=1.25V in PC mode .

1.25V equal to 0db



02/24 BY ABLE

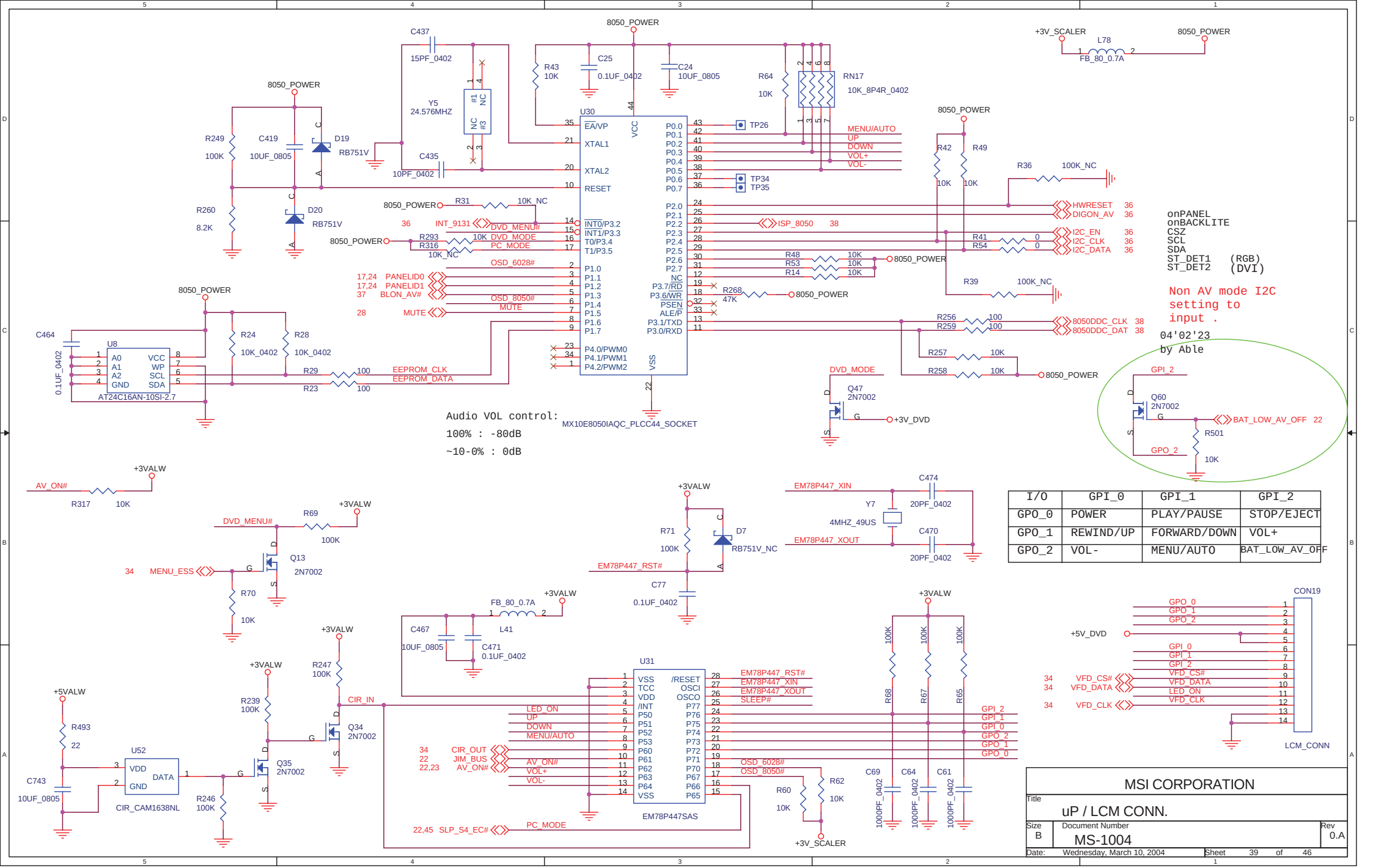
MSI CORPORATION			
Title: Volume Adjust / LCD Inverter			
Size: Custom	Document Number: MS-1004		Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 37 of 46		



ISP_8050	SELECT
L	1X , 1Y
H	0X , 0Y

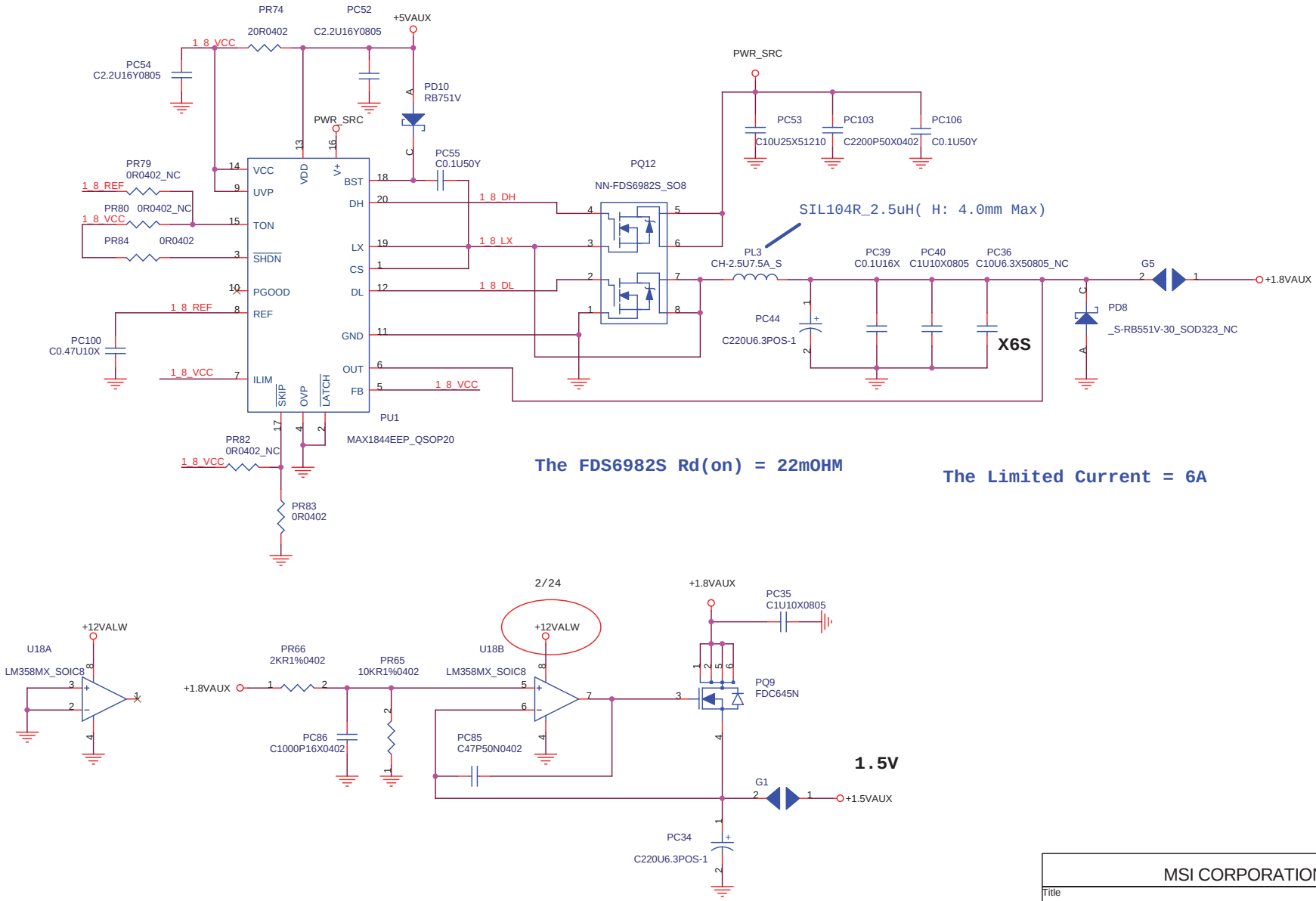
4052

Input			Output	
EN#	A	B	X	Y
H	X	X	None	None
L	L	L	0X	0Y
L	L	H	1X	1Y
L	H	L	2X	2Y
L	H	H	3X	3Y

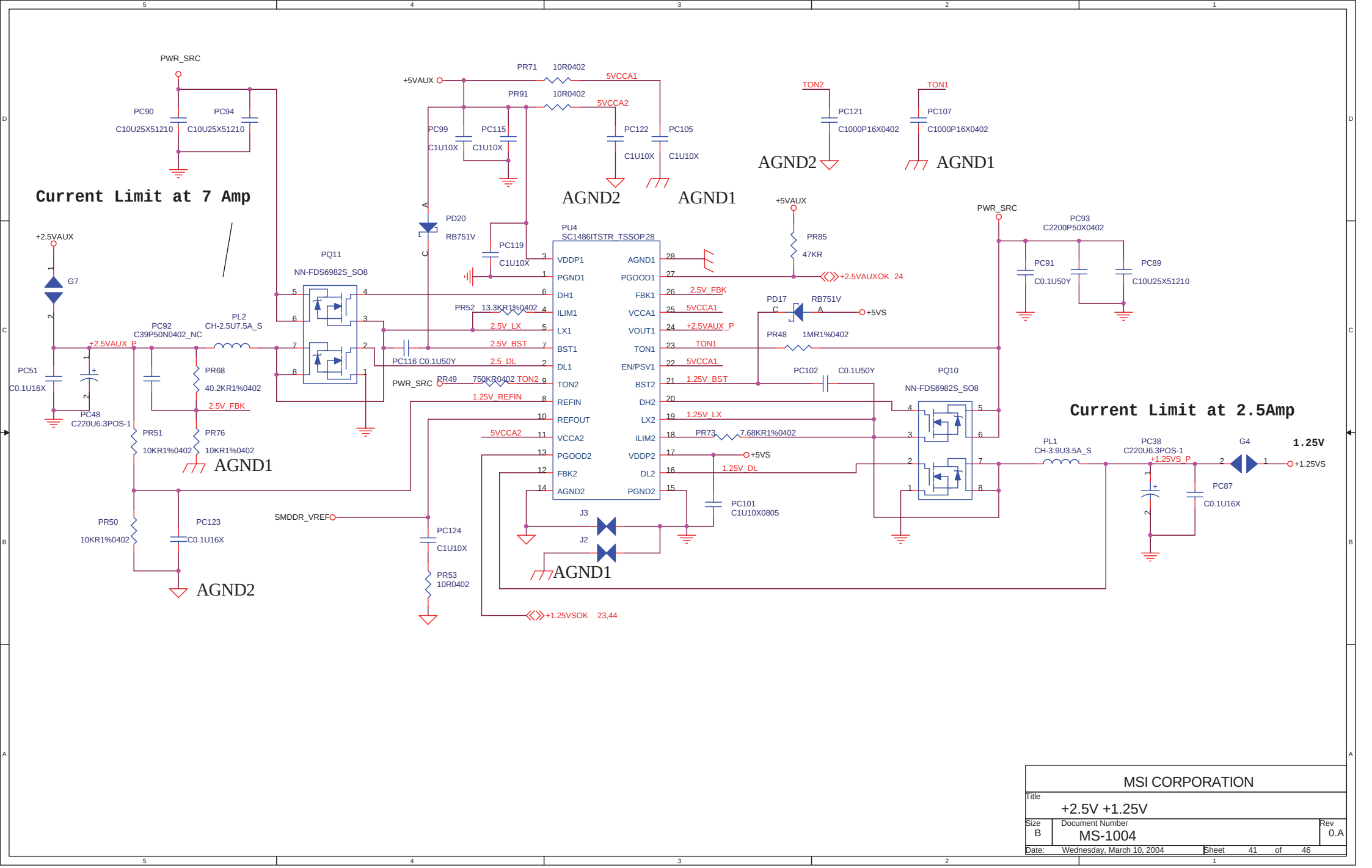


I/O	GPI_0	GPI_1	GPI_2
GPO_0	POWER	PLAY/PAUSE	STOP/EJECT
GPO_1	REWIND/UP	FORWARD/DOWN	VOL+
GPO_2	VOL-	MENU/AUTO	BAT_LOW_AV_OFF

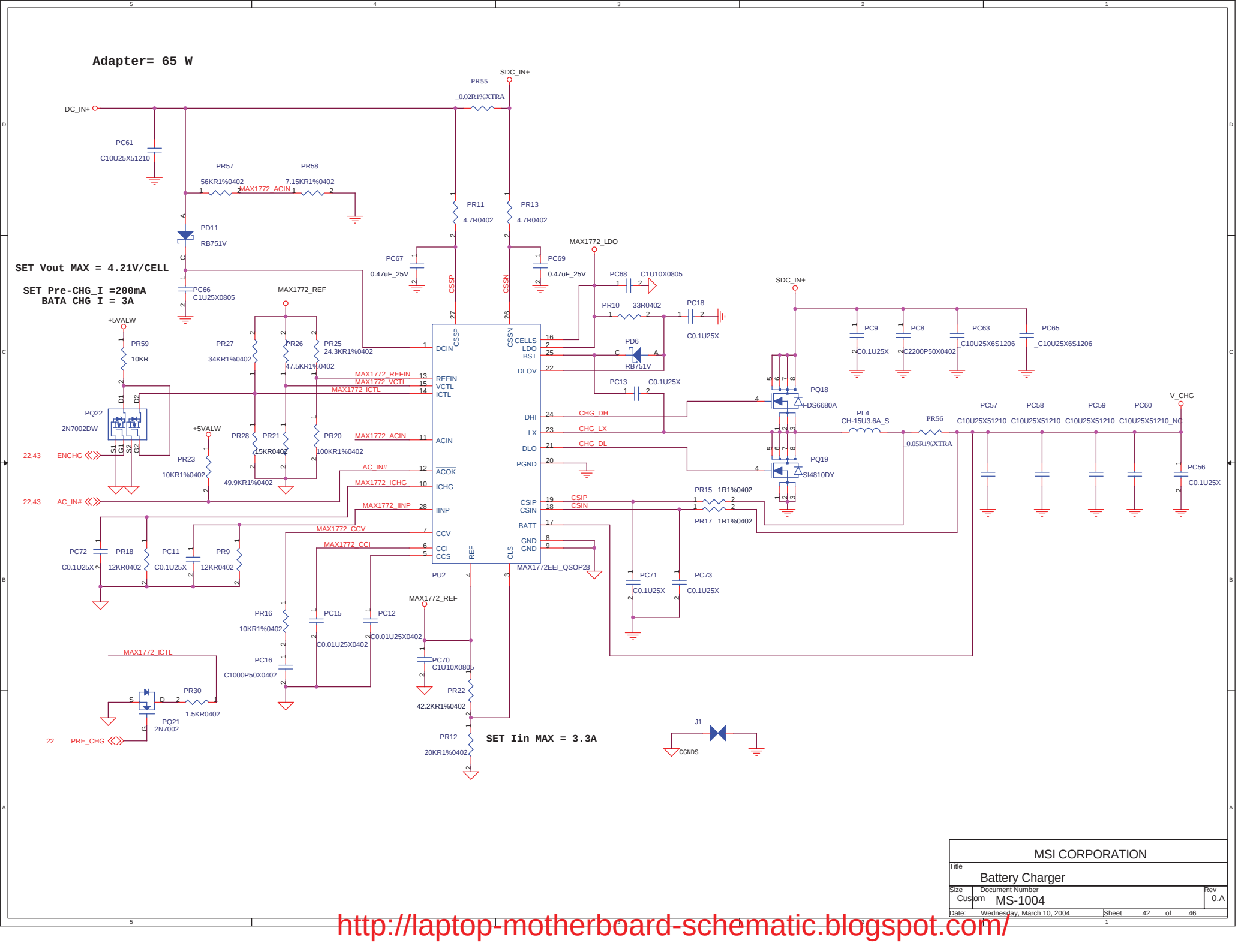
MSI CORPORATION			
Title: uP / LCM CONN.			
Size: B	Document Number: MS-1004		Rev: 0.A
Date: Wednesday, March 10, 2004		Sheet 39 of 46	

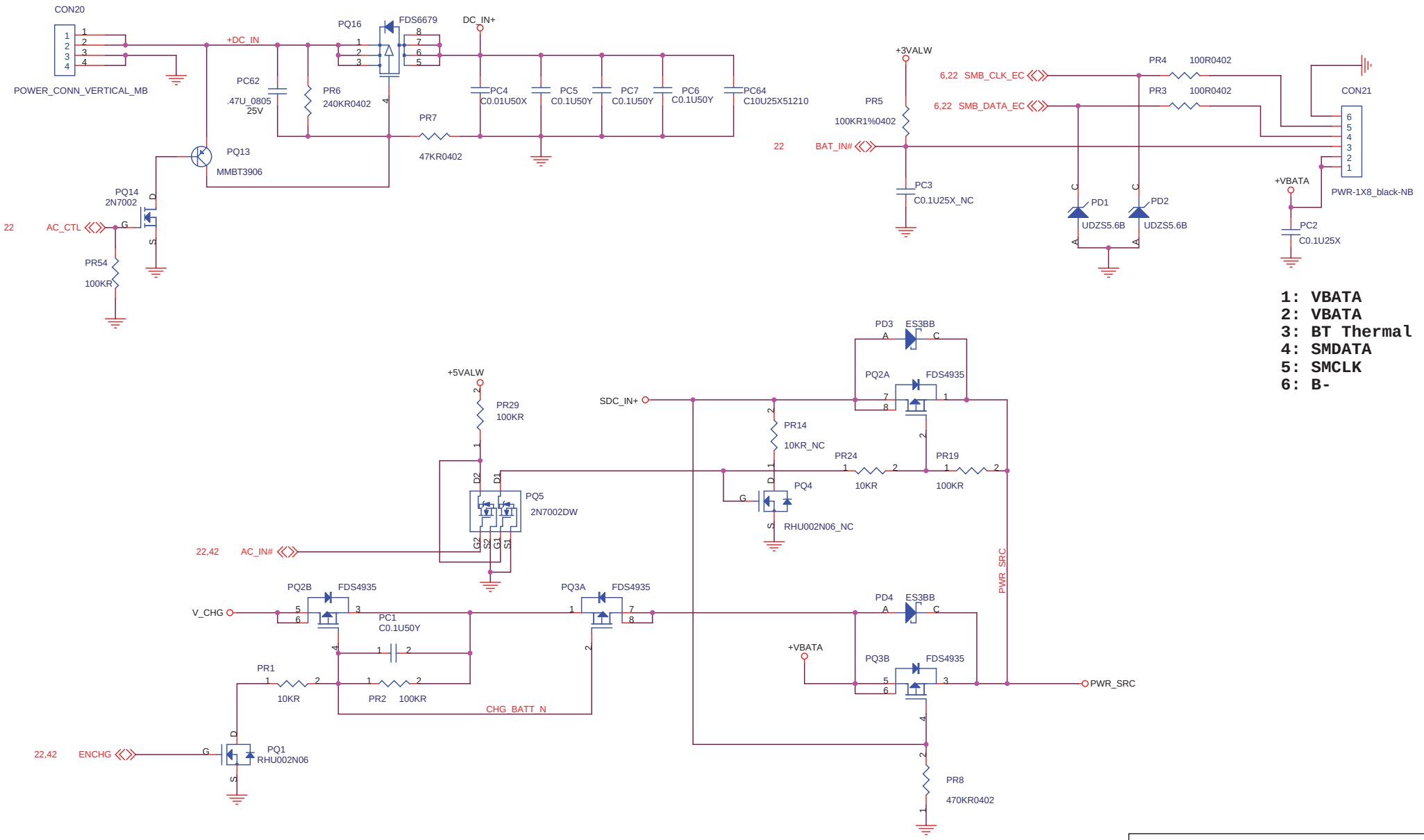


MSI CORPORATION		
Title: +1.5V & +1.8V		
Size: B	Document Number: MS-1004	Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 40 of 46	

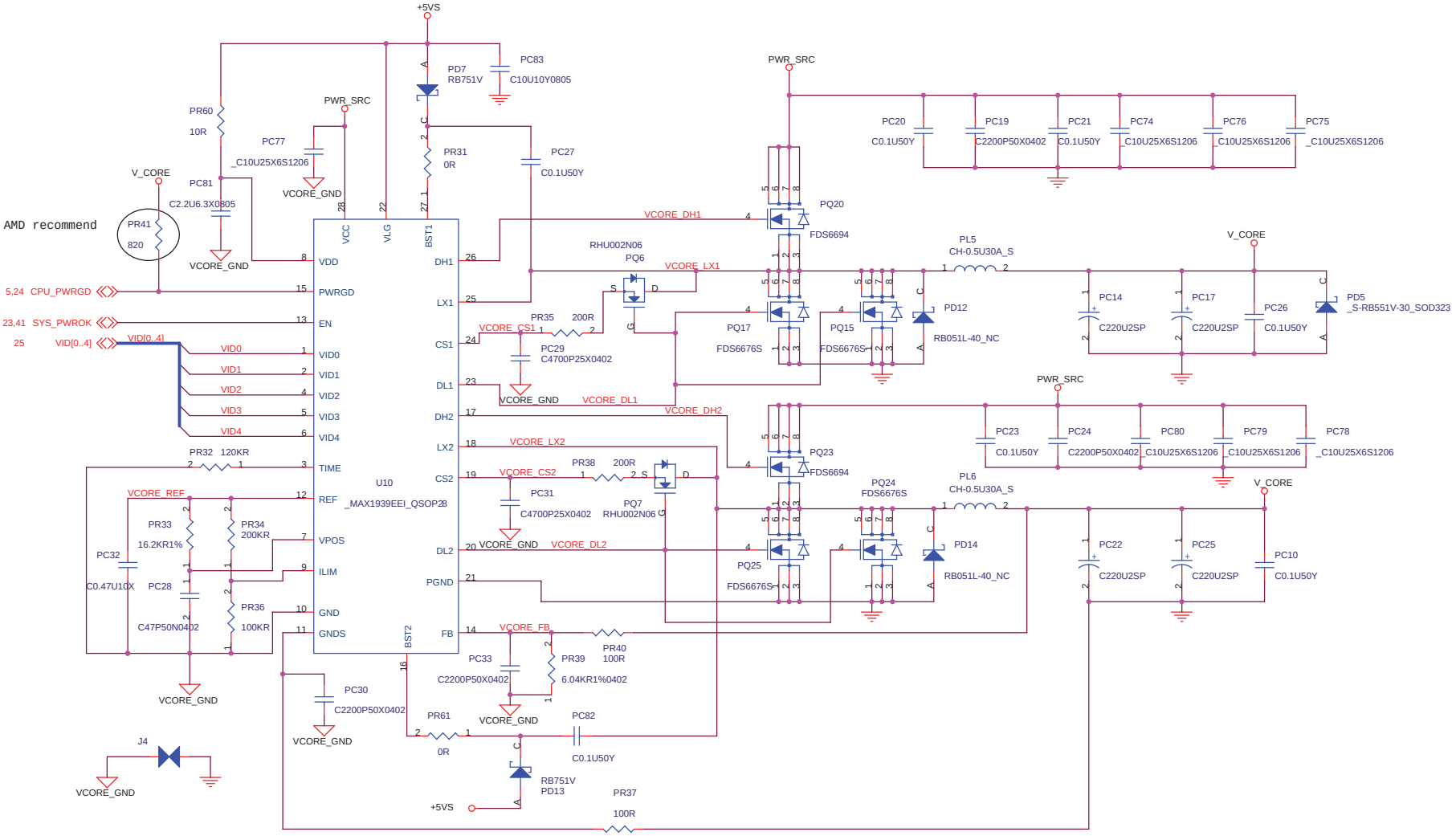


MSI CORPORATION		
Title: +2.5V +1.25V		
Size: B	Document Number: MS-1004	Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 41 of 46	

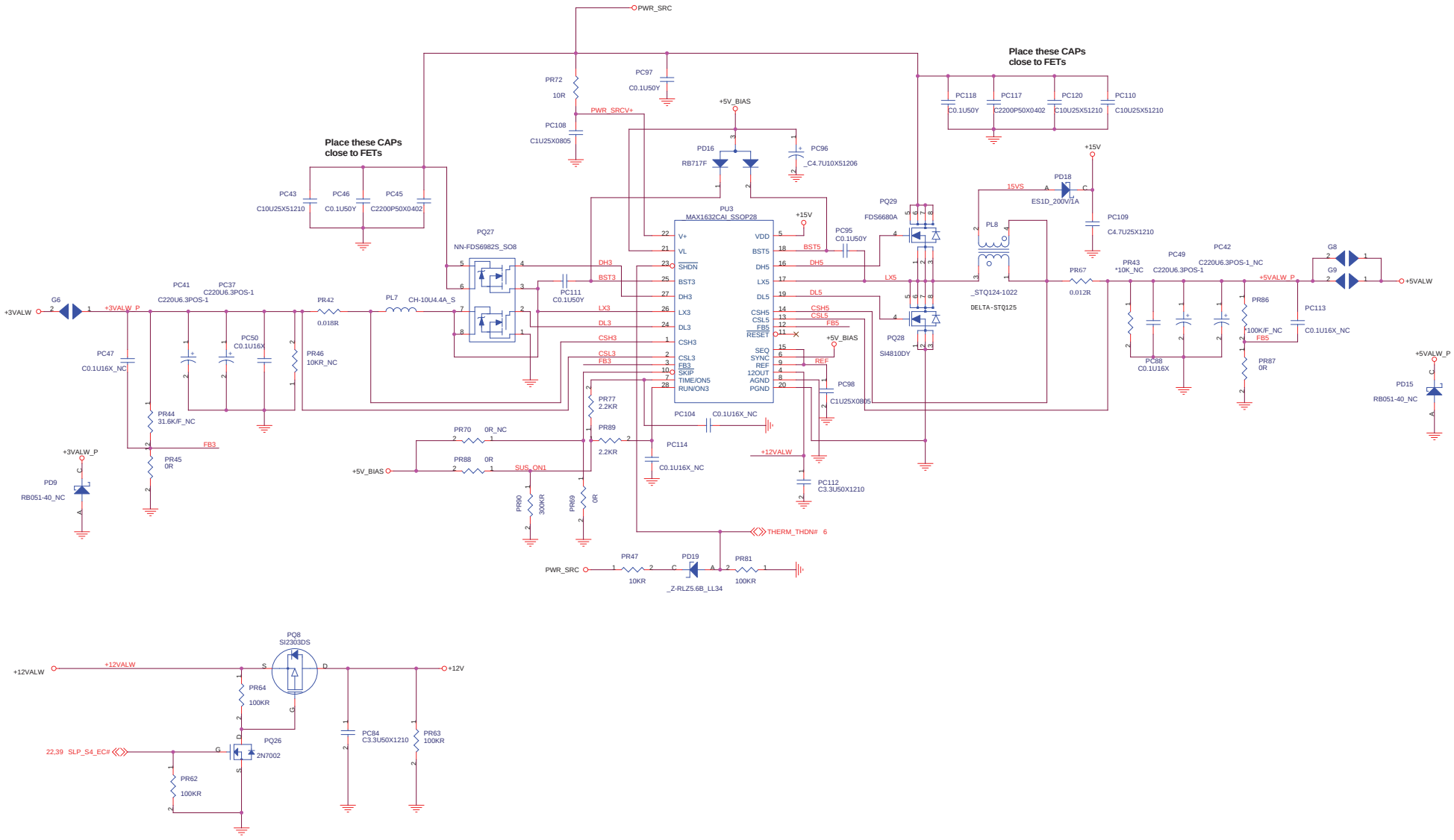




MSI CORPORATION		
Title: Battery Selector		
Size: B	Document Number: MS-1004	Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 43 of 46	



MSI CORPORATION		
Title: CPU Power		
Size: Custom	Document Number: MS-1004	Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 44 of 46	

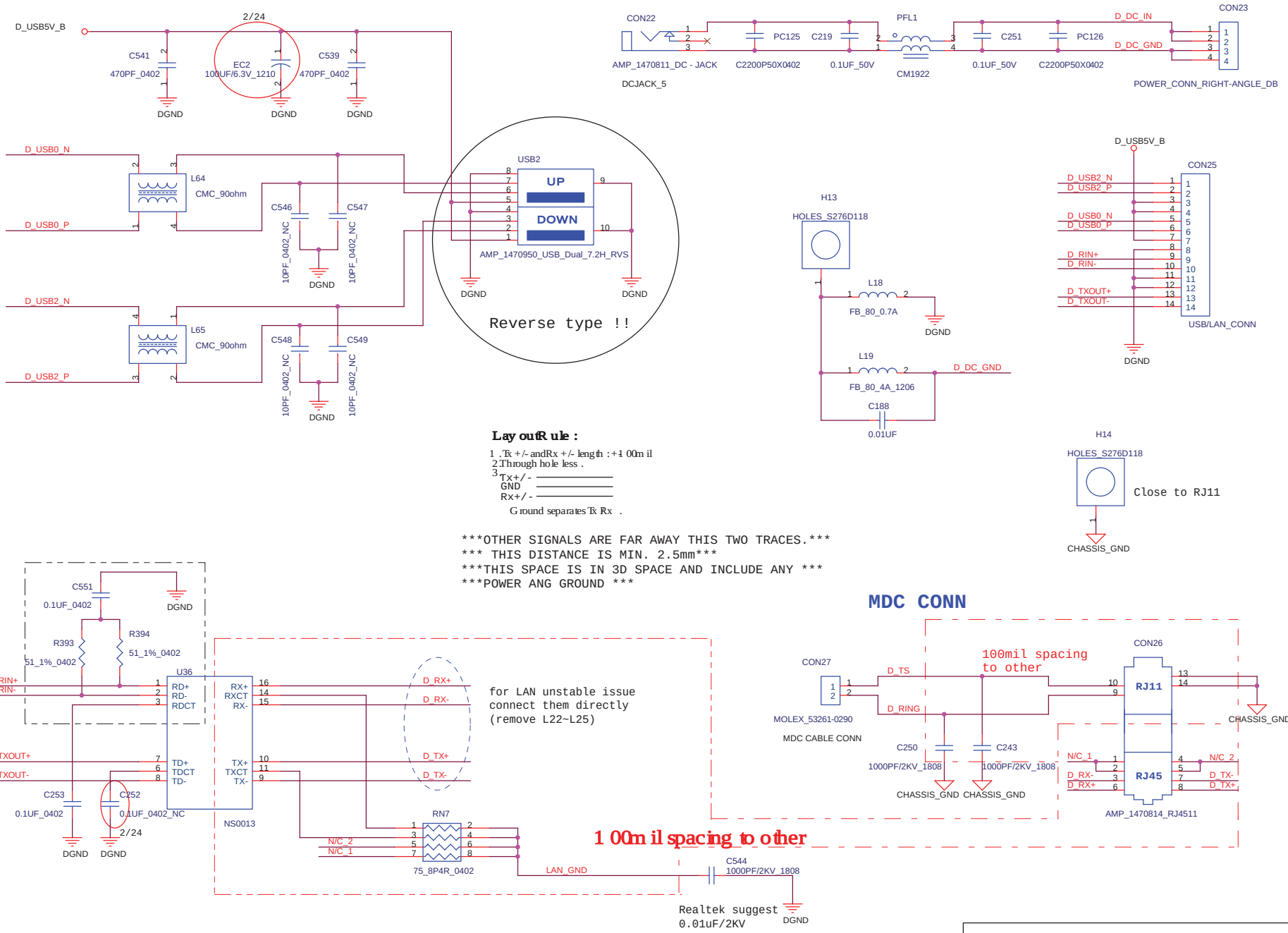


MSI CORPORATION

Title: System power

Size: C | Document Number: MS-1004 | Rev: 0.A

Date: Wednesday, March 10, 2004 | Sheet 45 of 46



MSI CORPORATION			
Title: MS-1004 USB/RJ11/RJ45/DC Jack Board			
Size: Custom	Document Number: MS-10042		Rev: 0.A
Date: Wednesday, March 10, 2004	Sheet 46 of 46		