

Intel (R) 845E Interactive Client Reference Design

Revision X2

Last Change : 2002-09-26

#	Schematic Page
1	COVER SHEET
2	BLOCK DIAGRAM
3	BLOCK-POWER
4	MECH-ROUTE
5	NOTES
6	CPU-P4 BUS
7	CPU-P4 POWER
8	CPU-ITP
9	MCH-SYSBUS & CLOCK
10	MCH-AGP & DDR
11	MCH-POWER
12	CLK-ICS950201
13	DDR-DIMM 0
14	DDR-DIMM 1
15	ICH4-SYSBUS & PCI
16	ICH4-LPC & IDE & USB
17	ICH4-POWER
18	GLUE LOGIC
19	SIO0-LPC47M107
20	SIO1-LPC47N227
21	CONN-COM1/COM2/LPT
22	CONN-COM3/COM4/KBC
23	AC97-AD1885
24	LAN-10/100/1000 BUS
25	LAN-10/100/1000 CONN
26	VGA-COUGAR-01
27	VGA-COUGAR-02
28	VGA-COUGAR-03
29	CONN-PCI
30	CONN-01 IDE-FLOPPY
31	USB0-USB1-LAN0
32	USB2-USB5
33	SYSTEM CONTROL
34	DDR-POWER
35	POWER

Prefix	Netobject
A_	CRITICAL ANALOG TRACES
AC_	AC97 SIGNAL
APIC_	APIC SIGNAL
AUD_	ANALOG AUDIO SIGNAL
CK_	CLOCK SIGNAL
EEn_	SERIAL EEPROM LANn
EN_	ENABLE FOR POWER SOURCES
F_	FLOPPY DISK SIGNAL
FWH_	FIRMWARE HUB SIGNAL
G_	AGP BUS SIGNAL
GND_	GND SIGNAL DERIVED
GND	GND POWER
H_	P4 HOSTBUS SIGNAL
I2C_	I2C BUS SIGNAL
IDE_	IDE SIGNAL
INT_	INTERRUPT SIGNAL
KB_	KEYBOARD SIGNAL
L_	LPC BUS SIGNAL
LANn_	LAN CONTROLLER n SIGNAL
LP_	LPT1284 SIGNAL
M_	MEMORY BUS SIGNAL
MIDI_	MIDI SIGNAL
MS_	MOUSE SIGNAL
P_	PCI BUS SIGNAL
SPn_	SERIAL PORT n SIGNAL
USB_	USB PORT SIGNAL
V_	POWER
ZV_	ZV VIDEO PORT SIGNAL

Changes from X1 to X2	
1	All BAT54A (0-0031-1261) changed to BAT54 (0-0031-1104) due to wrong polarity
2	R712 changed from 10k to 15k to adjust voltage
3	PU R756 and R757 added @ U38.15 (PG_VDDR) and U38.16 (PG_V1V5)
4	Net on pins U3.54 and U3.55 separated (BSEL[0..1]) due to naming error
5	PU R758 added at CN34.7 (SYS_RESET#)
6	PU R759 added at U39.4 (VIDPWRGD)
7	C717 changed from 4u7 to 1u
8	R607 not populated
9	R571 and R572 not populated (FWH Test Pins)
10	R585 and R586 not populated (for LVDS 18 Bit)
11	R760 and C741 added to U7.50 to generate a V_3V3SB input delay for resume reset
12	R501 and R494 not populated due to PCI config of LAN 82540
13	U36 FWH symbol changed due to wrong pinout (Pin 23, 24 and 25)
14	R496 changed to 4k7 and set to GND (PD M66EN)
15	R525 and R499 is now populated
16	R530 not populated due to wrong V_2V5LAN voltage
17	U20.G4 is now 51R Pulldown to GND
18	U20.H4 is now 33R Pullup to V_3V3LAN
19	AC97 Fixup (AC_SDIN0 -> Changed to AC_SDIN2 on ICH4)
20	Swap ICH4 Pin N20 and P21 (H_HISTB+ / H_HISTB-) due to wrong info in yellow cover
21	LAN 82540 Fixup (R519 populated with 0R, R517 changed to 2K49 and R513 changed to 330R)
22	R615 changed to 4K32 due to Cougar Bug
23	HW Rev changed to 2 at Glue Logic
24	R373 is now populated with 10M
25	CN12.4 must be isolated cause of shortcut of AUD_MIC_BIAS to GND
26	PU R761-R765 added to VID[0:4]
27	PU R766 added to U23.15, PD R767 added to U23.14 (Panellink strapping options)
28	HD-LED-power connected to V_5V0 instead of V_5V0SB
29	PD R768 added to PS_ON
30	PU R769 added to U3.28 (PGOOD408#)
31	PD R770, R771, R772 added to power enables (default off, if CPLD not configured)
32	PD R773-R776 added to serial port shut down pins
33	Splitted SMI# and PME# signals of SIO0 and SIO1 on ICH4-GPIOs
34	Removed R383, R384, R385
35	Added D25 to avoid crossvoltages from VGA Monitor
36	Added D26 to avoid crossvoltages LPT Port
37	Alternative population of L7 to L12 with resistors (0R)
38	PME# Signal of Cougar (PinB7) is set to V_3V3 via 0R
39	U29 (LP3965EMP) can be replaced by an 0R_1206 to power 3V3 on Cougar
40	Possibility to PullDown Pin D8(MD24) on Cougar to enable SDRAM
41	CN41 (JUMPER 3x1) added to connect to MPC1 Pins (TIP and RING)
42	V_5V0 input at V_DDR supply is now controlled by XILINX CPLD (Pin 25)
43	Delay of FWRGOOD# (LAN 82540EM Pin A9) to enable correct EEPROM detection

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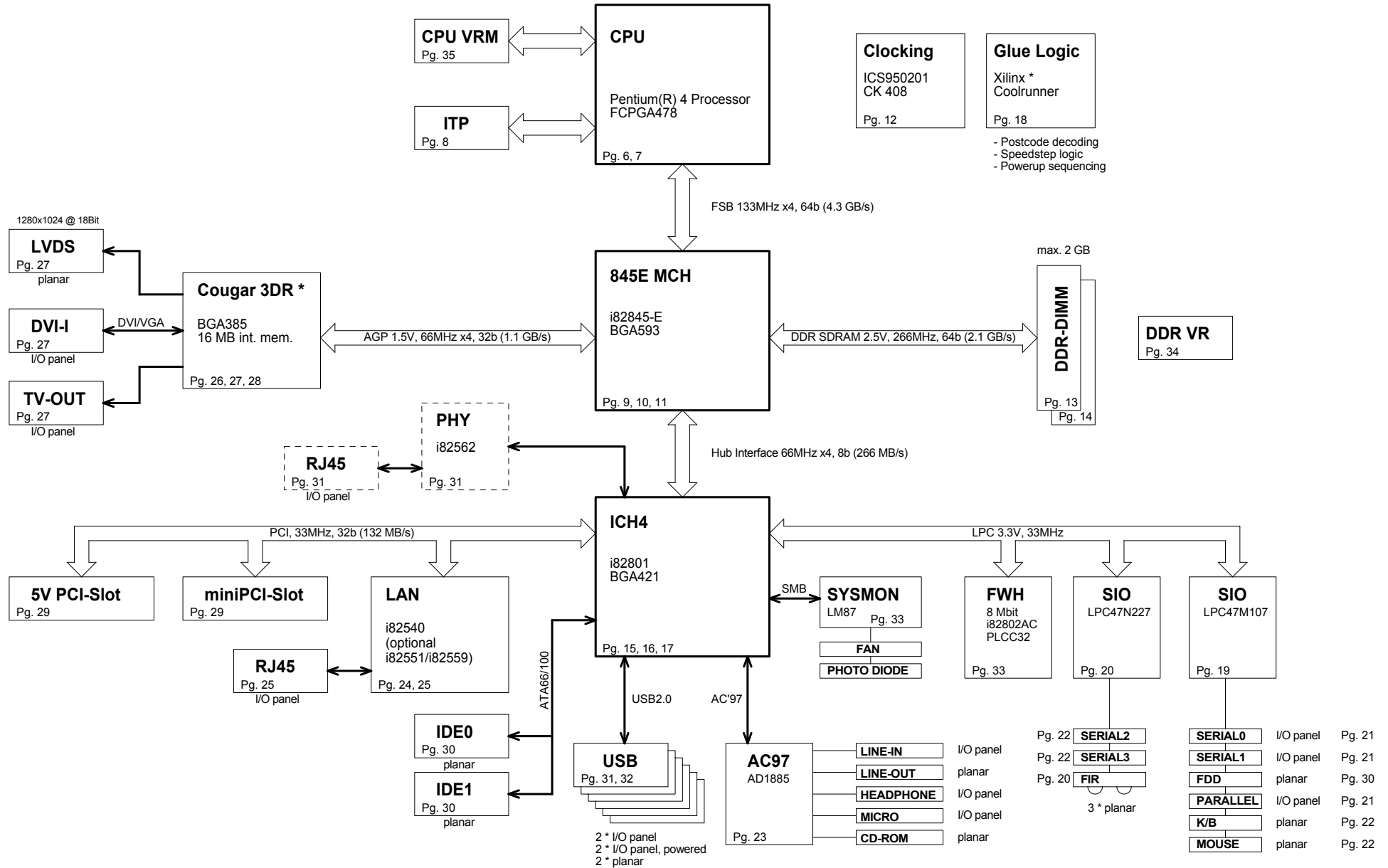
* Other names and brands may be claimed as the property of others.

General Note:

All Parts marked 'XXX1' will not be assembled in V1.
All Parts marked 'XXX2' will not be assembled in V2.

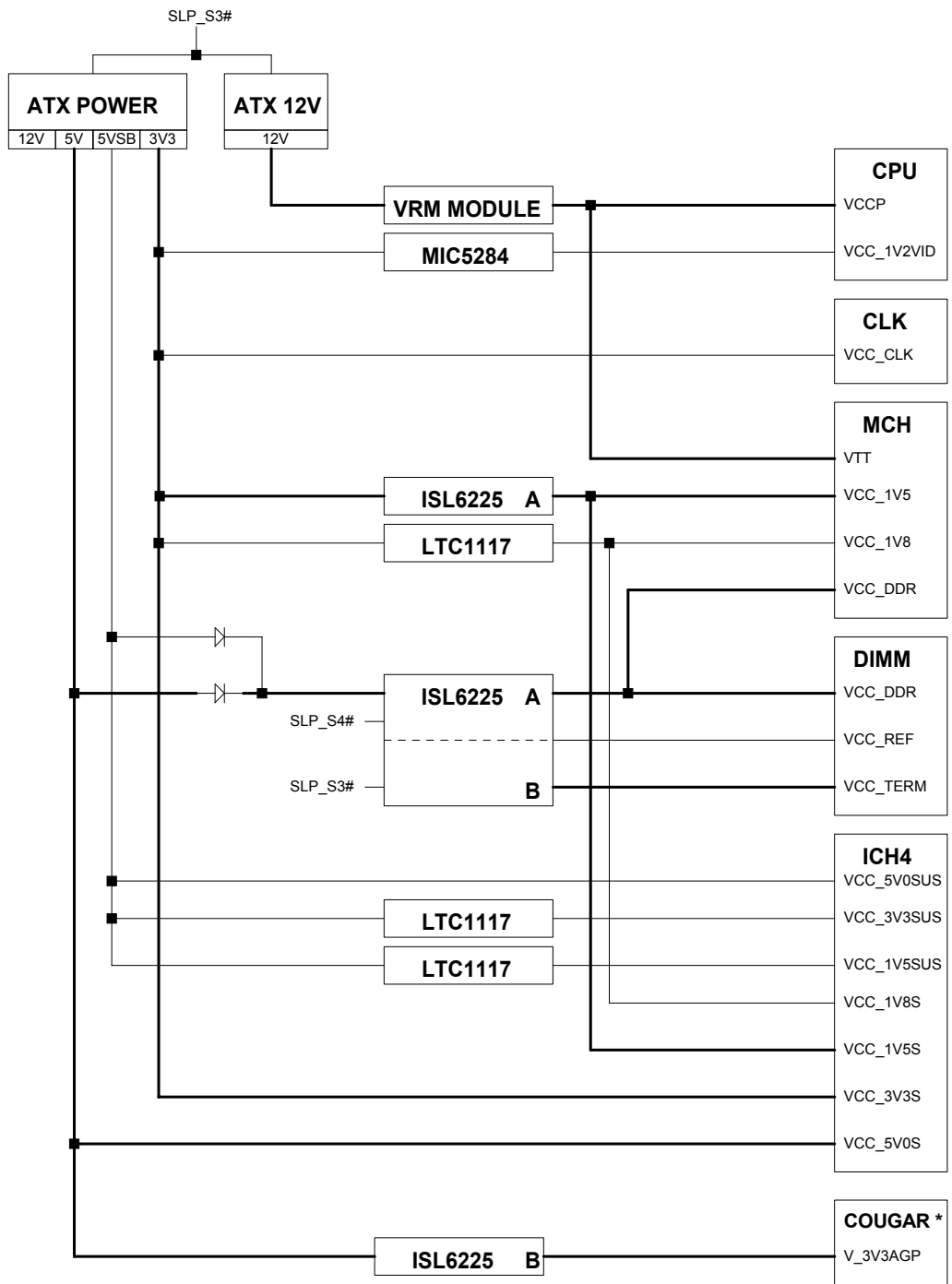
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Size C	Document Number B444B-W	Rev 2.00	
Date Friday, September 28, 2003	Sheet 1	of 35	

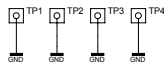
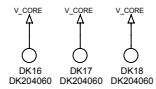
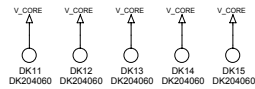
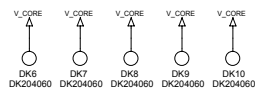
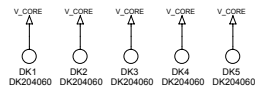
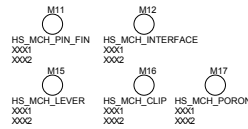
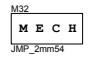
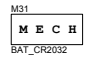
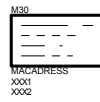
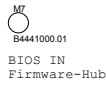
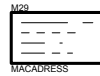
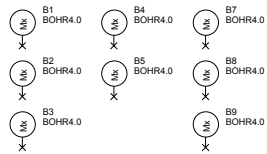
Block Diagram



Intel (R) 845E Interactive Client Reference Design

Title BLOCK-DIAGRAM		
Size C	Document Number B444B-W	Rev 2.00
Date Friday, September 26, 2003	Sheet 2	of 35





6.8.11.17.33.35 V_CORE V_CORE

Title		Intel (R) 845E Interactive Client Reference Design	
Size		MECH-ROUTE	
C	Document Number	B444B-W	Rev
			2.00
Date	Friday, September 26, 2003	Sheet	4 of 35

INPUT VOLTAGES	DERIVED VOLTAGES -->		
V_12V0VRM	V_12V0VRMF	V_CORE	V_VCCA V_VCCIOPLL
V_12V0	V_FAN1 V_12USB2 V_12VAUD V_FAN1S V_12USB2F V_AUDOUT V_FAN1SF V_12USB2S V_5VAUD V_FAN2 V_12USB3 V_BLI V_FAN2S V_12USB3F V_FAN2SF V_12USB3S		
V_5V0SB	V_3V3SB	V_3V3LAN V_3V3LAN0	V_1V5LAN V_2V5LAN
	V_1V5SB V_KB V_KBF		
	V_DDR	V_DDRREF	
V_5V0	V_USB0 V_USB0X V_DDRVTT V_USB1 V_USB1X V_USB2 V_USB2X V_USB3 V_USB3X V_USB4 V_USB4X V_USB5 V_USB5X		
	V_1V5	V_1V5A1 V_HVDD V_1V5A2 V_ICHPLL	
	V_3V3AGP	V_2V5_LVD	V_2V5_LVD1 V_PLLVDD V_LVDD1 V_2V5_LVD2 V_LVDD2 V_CVDD
		V_2V0_2V5	V_VDD1
		V_2V5_VDD	V_VDD2 V_VDD3
		V_VCC1 V_DL_CL V_AVCC1 V_DL_CLF V_PVCC1 V_AVDD V_VREF_SII V_FPVDD V_DBL V_TVDD V_VPVDD	
	V_5DVI V_5V0CF V_AMP V_PIDE V_5DVIF V_AMPIN V_SIDE V_IOLAN V_AMPINX V_FIR V_GAME V_AMPOUT V_IR V_GAMEF V_5V0REF		
V_3V3	V_1V2VID V_1V8 V_CLK		
V_3V3SB			
	V_RTC		
V_BAT	V_RTCBIAS		
V_-12V0			
V_-5V0			

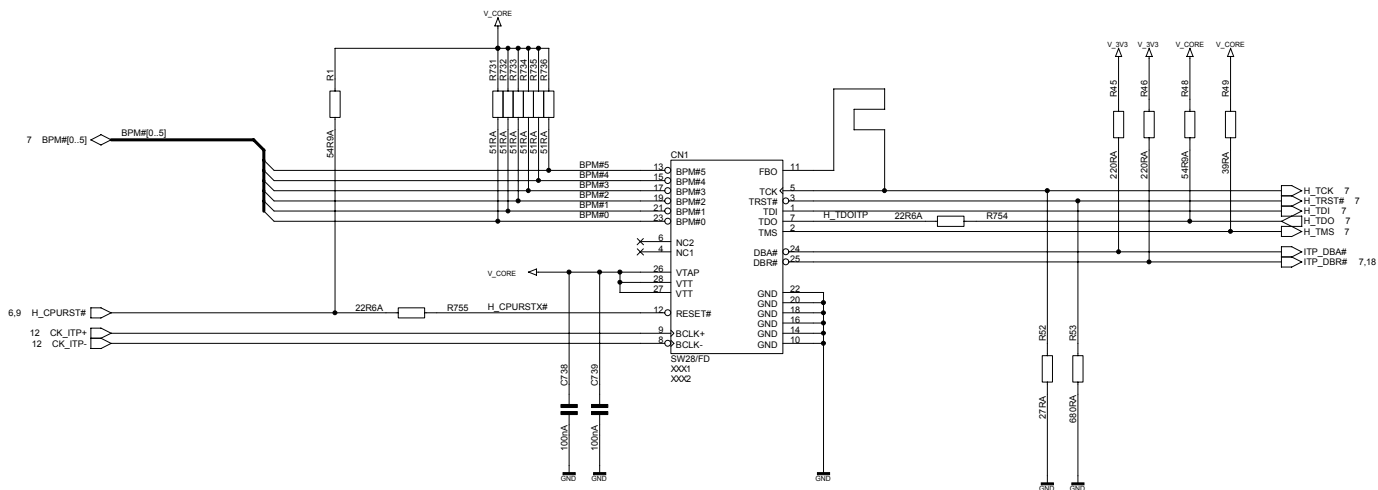
I2C DEVICES		
DEVICE	ADDRESS	BUS
CLOCK GENERATOR	1101001x	SM BUS
SO-DIMM0	1010000x	SM BUS
SO-DIMM1	1010001x	SM BUS
ICH4 SLAVE	1000100x	SM LINK
LAN CONTROLLER	N/A	SM LINK
LM87 HW MONITOR	0101110x	SM BUS

PCI/AGP DEVICES				
DEV	IDSEL	DEVICE	IRQ	REQ/GNT
00	AD16	COUGAR AGP	A	AGP
01	AD17	LAN10/100/1000T	G	4
02	AD18			
03	AD19			
04	AD20			
05	AD21			
06	AD22			
07	AD23			
08	AD24	INTERNAL LAN	N/A	N/A
09	AD25	MINI PCI SLOT	E-F	3
10	AD26	STD PCI SLOT	A-B-C-D	0
11	AD27	RISER SLOT1	B-C-D-A	0
12	AD28			
13	AD29	RISER SLOT2	C-D-A-B	1
14	AD30			
15	AD31	RISER SLOT3	D-A-B-C	2

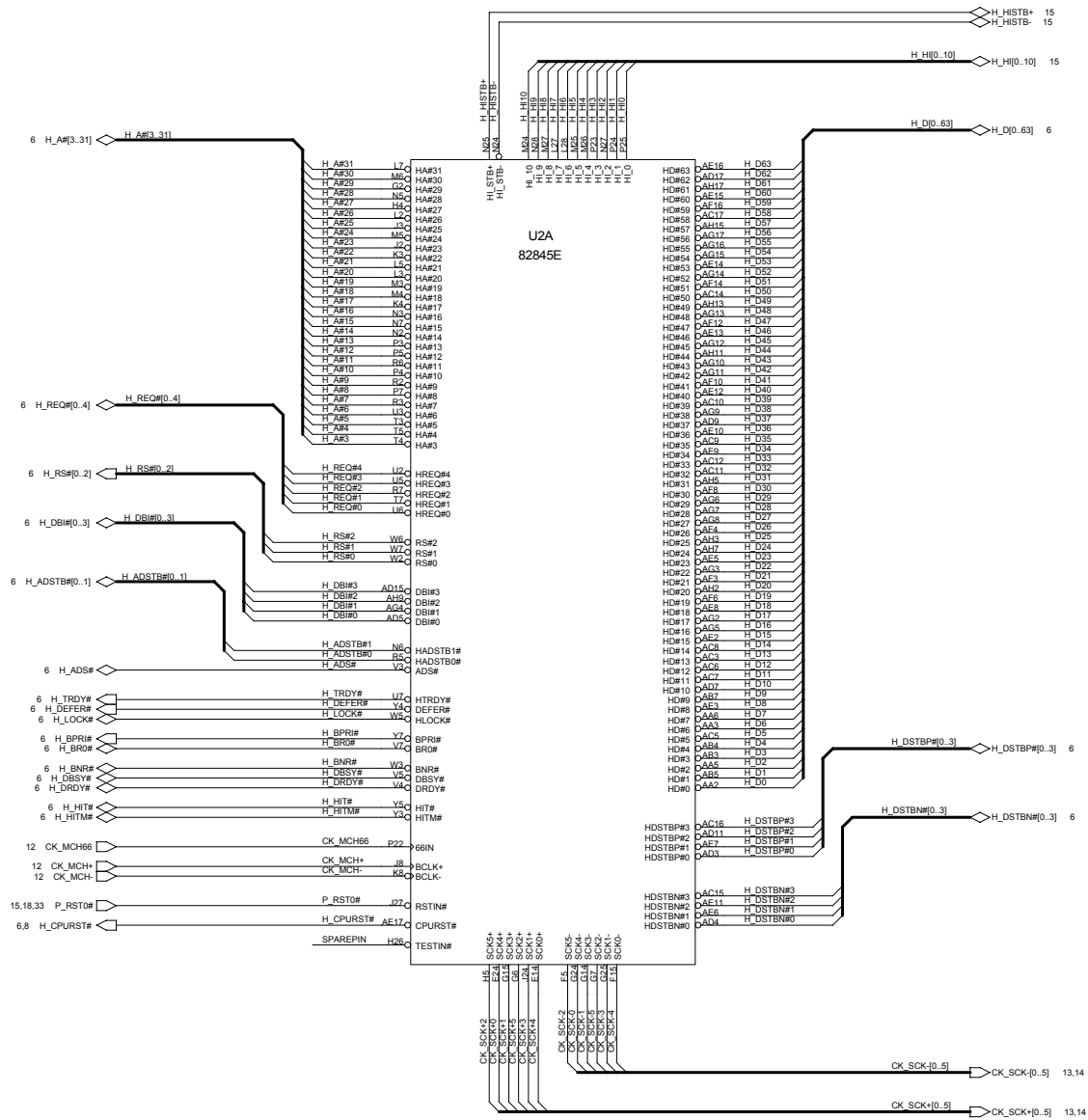
ICH4 GPIOs		
GPIO	DEVICE	SIGNAL NAME
GPI6	SUPER I/O 0	SIO0_SMI#
GPI7	SUPER I/O 1	SIO1_SMI#
GPI8	SUPER I/O 0	SIO0_PME#
GPI12	SUPER I/O 1	SIO1_PME#
GPI13	CPLD	XC_GPIO2
GPIO25	LAN0 KINNERETH	LAN0_ENA
GPIO27	MINI PCI	MPCI_ACT#
GPIO28	CPLD	XC_GPIO1
GPIO32	PRIMARY IDE	IDE_PPDIAG#
GPIO33	SECONDARY IDE	IDE_SPDIAG#
GPIO34	POWERED USB	USB_PWR2ENA#
GPIO35	POWERED USB	USB_PWR3ENA#
GPIO36	FIRMWARE HUB	FWH_WP#
GPIO37	FIRMWARE HUB	FWH_TBL#
GPIO38	PCI RISER	RISER_ID1
GPIO39	PCI RISER	RISER_ID2
GPIO40	AUDIO AMPLIFIER	AMP_SHDN
GPIO41	PCI RISER	NOGO
GPIO42	PCI SLOT	P_PRSNT1#
GPIO43	PCI SLOT	P_PRSNT2#

POWER STATES	
ON IN STATE	POWER PLANE
S5 (SOFT OFF)	V_*SB, V_KB, V_*LAN, V_USB*
S3 (SUS. TO RAM)	V_DDR, V_DDRREF
S0 (FULL ON)	OTHERS

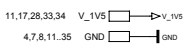
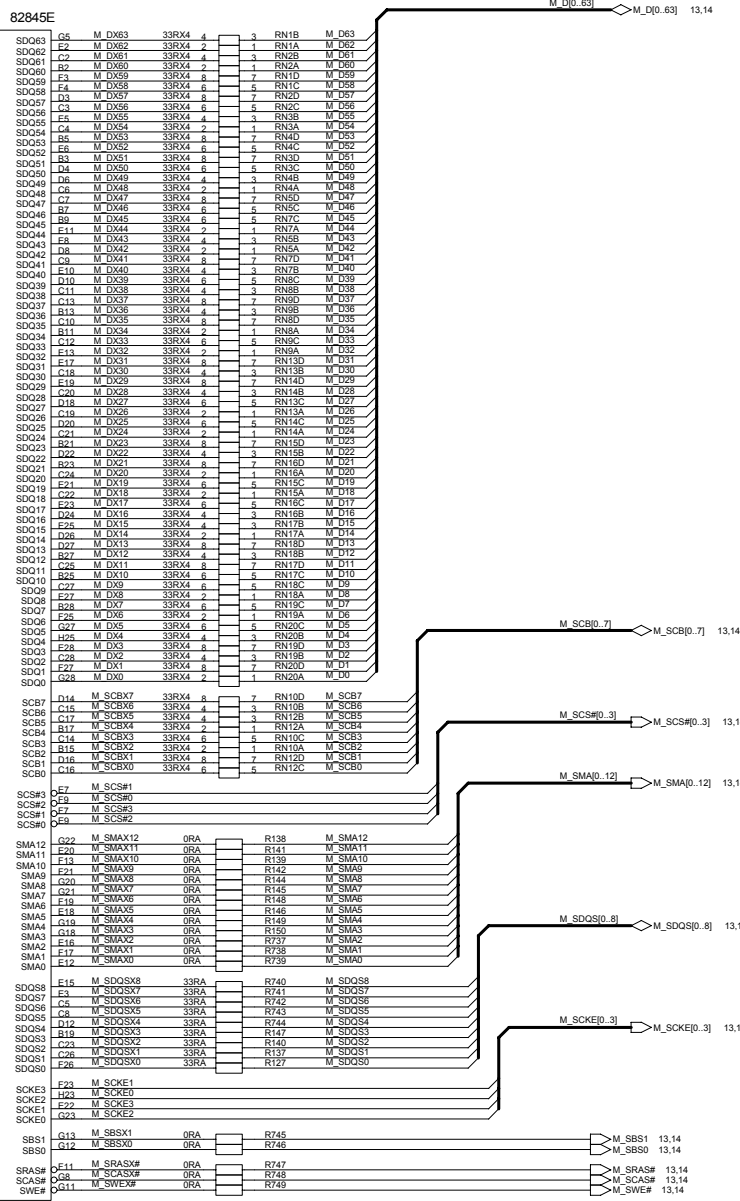
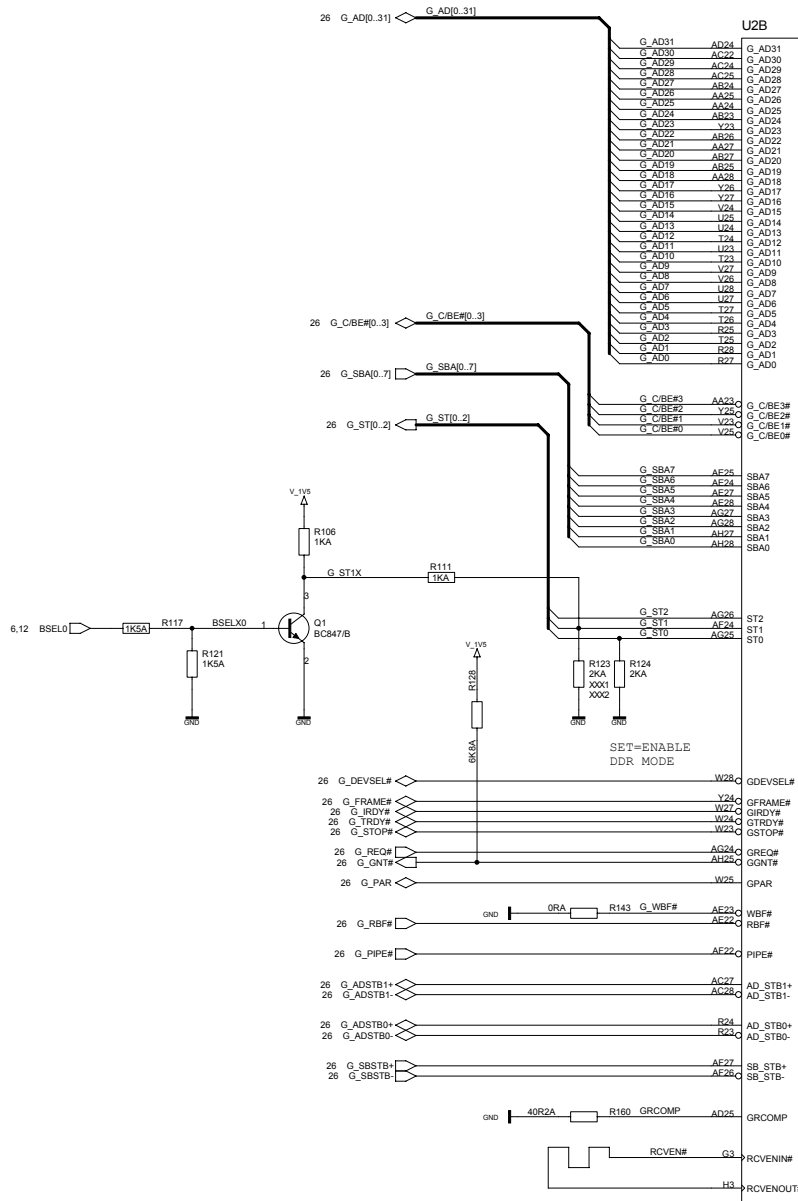
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Size	Document Number	Rev
C	B444B-W	2.00
Date	Friday, September 26, 2003	Sheet 5 of 35

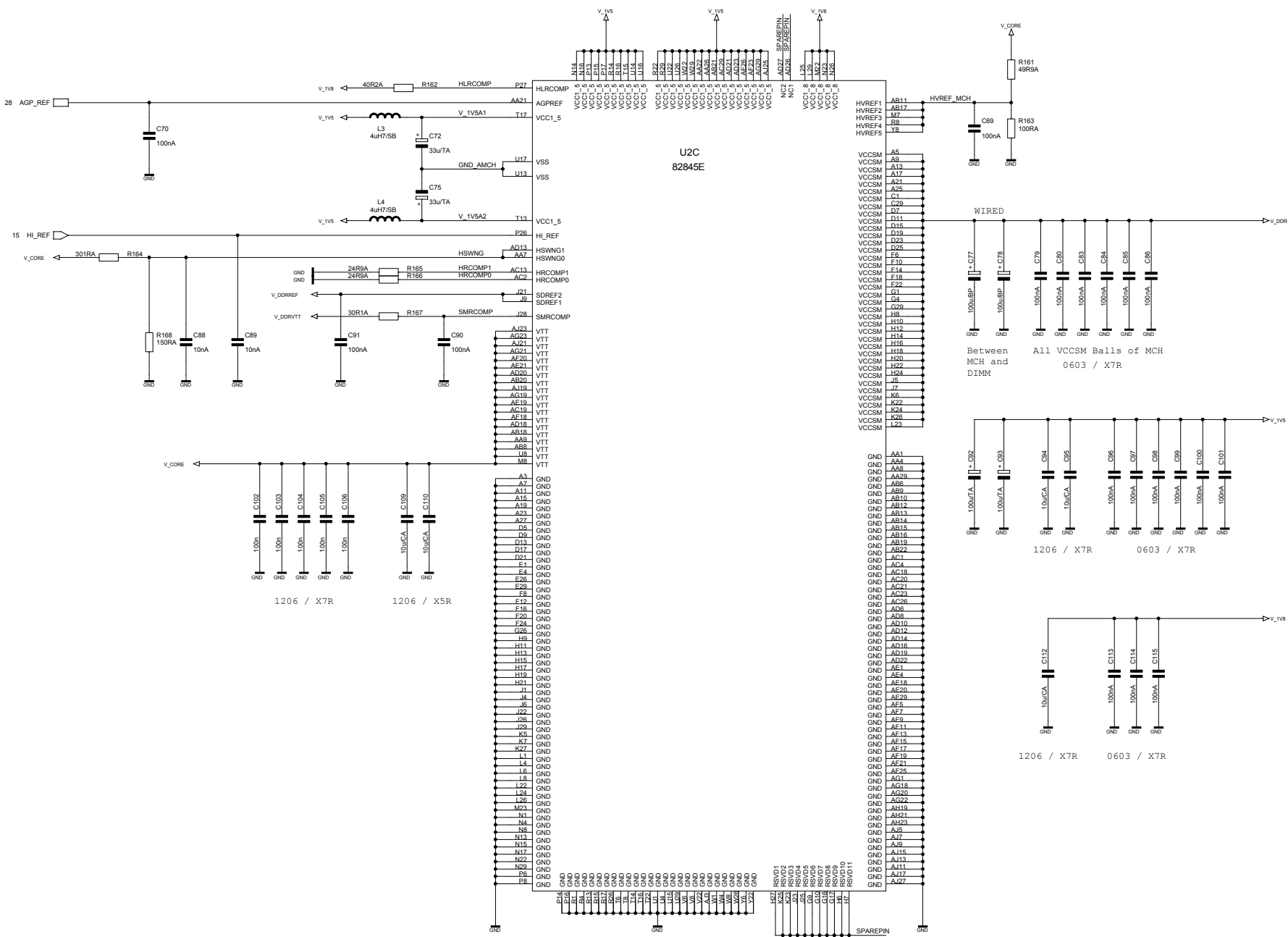


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Size	Document Number	B444B-W	Rev
C			2.00
Date	Friday, September 26, 2003	Sheet	8 of 35



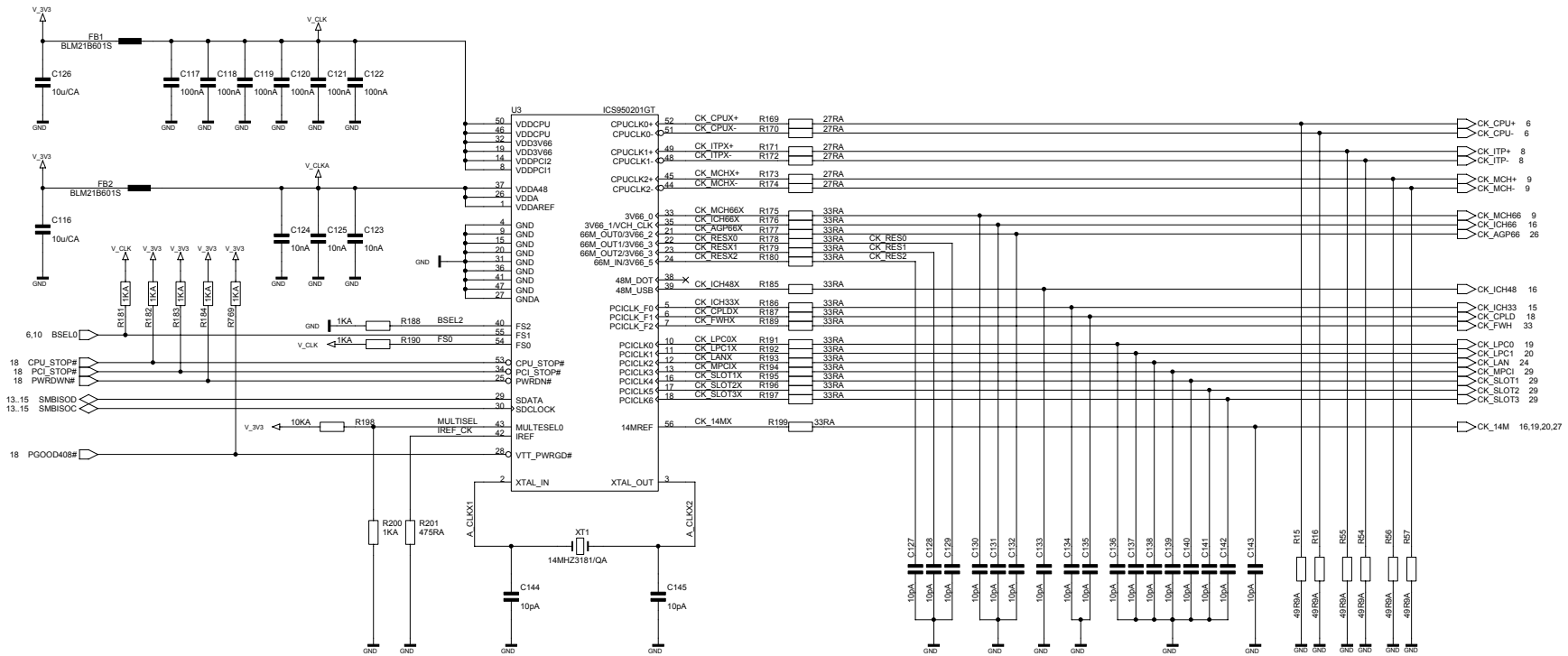
6,7,11,15,16,24,27 SPAREPIN SPAREPIN
 4,7,8,10,35 GND GND





- 6,7,9,15,16,24,27 SPAREPIN SPAREPIN
- 13,14,33,34 V_DDR V_DDR
- 13,14,34 V_DDRREF V_DDRREF
- 14,34 V_DDRVTT V_DDRVTT
- 4,6,8,17,33,35 V_CORE V_CORE
- 15,17,33,35 V_1V8 V_1V8
- 10,17,28,33,34 V_1V5 V_1V5
- 4,7,8,10,12,35 GND GND

Intel (R) 845E Interactive Client Reference Design	
Title MCH-POWER	
Size C	Document Number B444B-W
Date Friday, September 28, 2003	Rev 2.00
Sheet 11	of 35

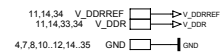
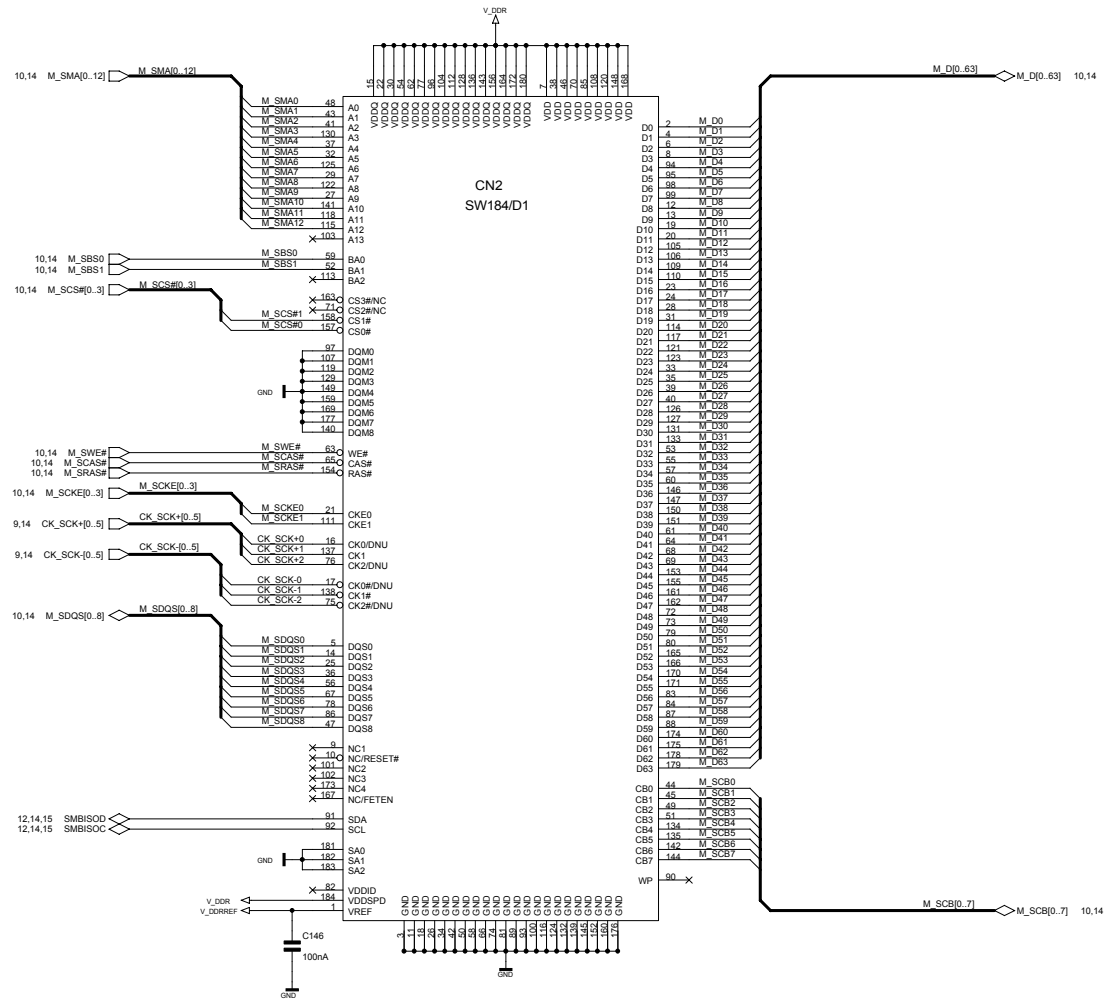


6, 8, 15, 17, 19, 20, 23, 26, 29, 33, 35
 4, 7, 8, 10, 11, 13, 35



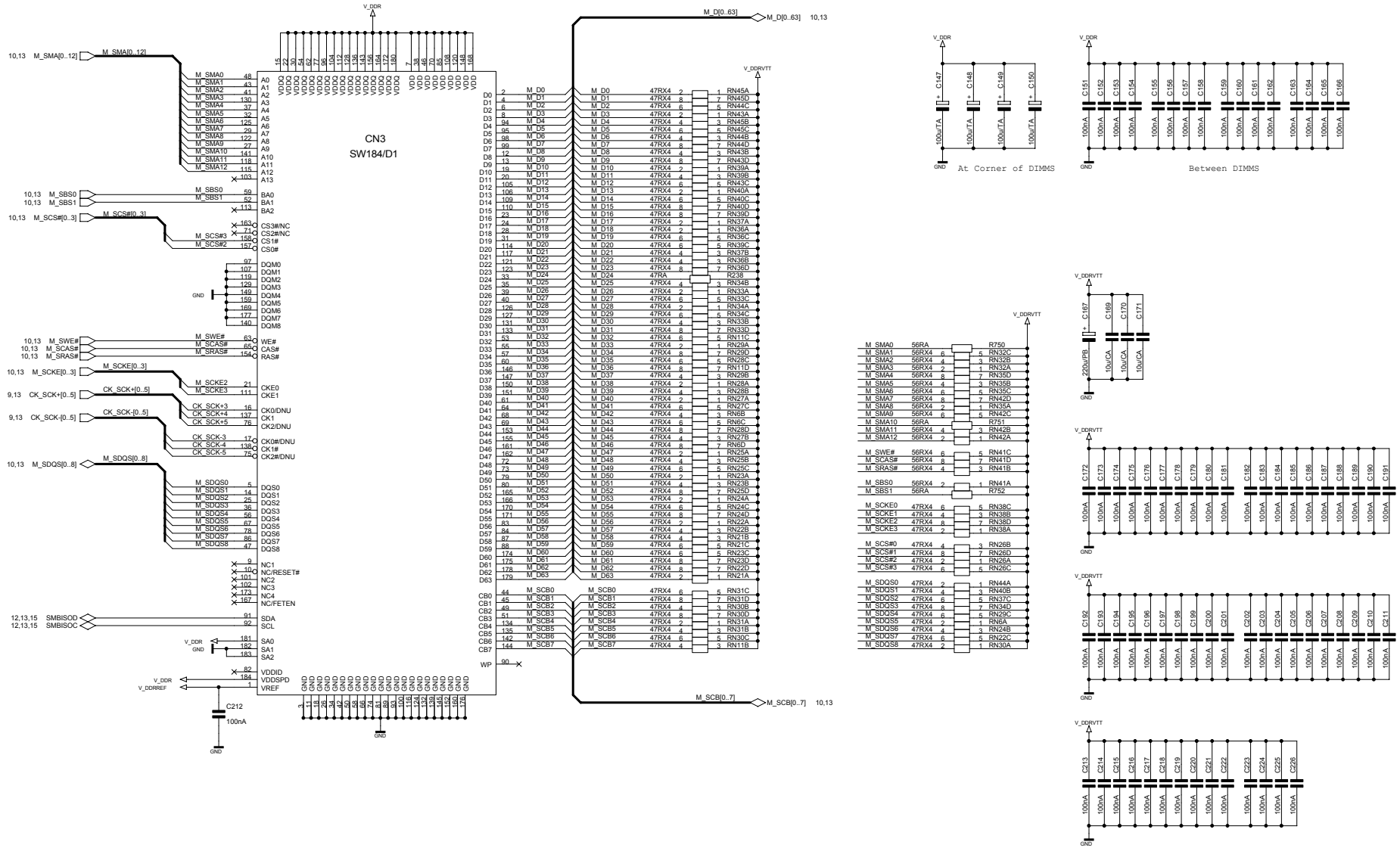
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Size	Document Number B444B-W
C	Rev 2.00
Date	Friday, September 26, 2003
Sheet	12 of 35

DIMM 0

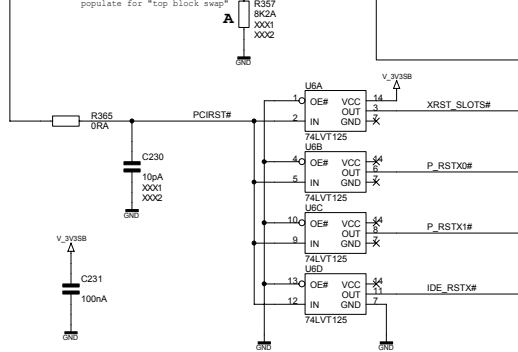
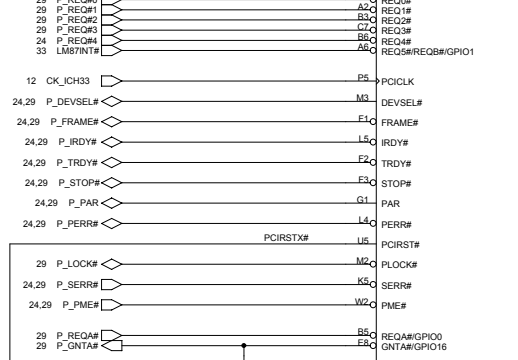
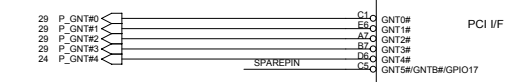
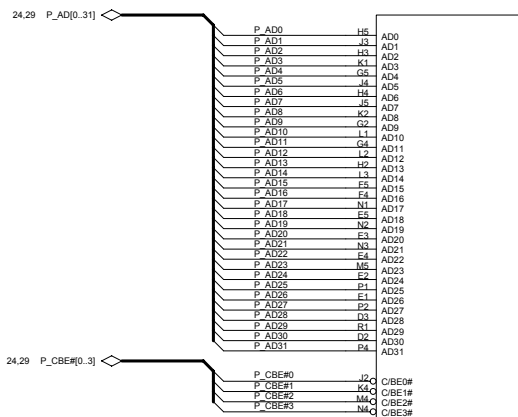


Intel (R) 845E Interactive Client Reference Design	
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Size: C	Document Number: B444B-W
Date: Friday, September 28, 2003	Rev: 2.00
Sheet: 13	of 35

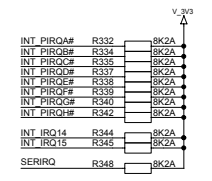
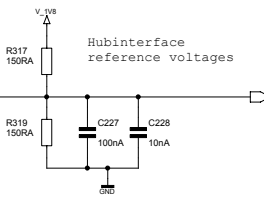
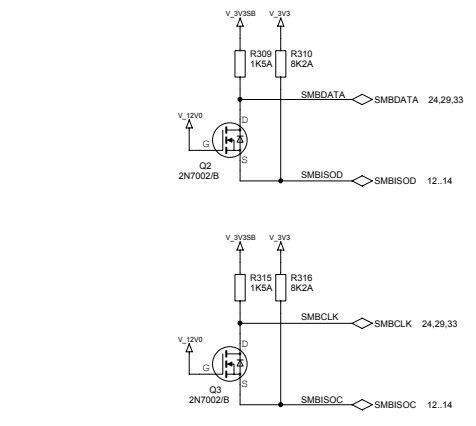
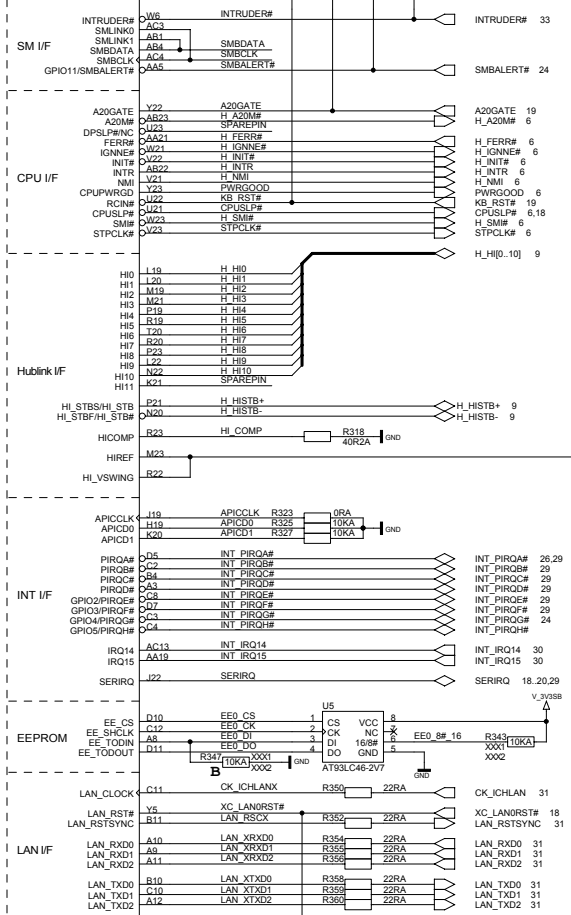
DIMM 1



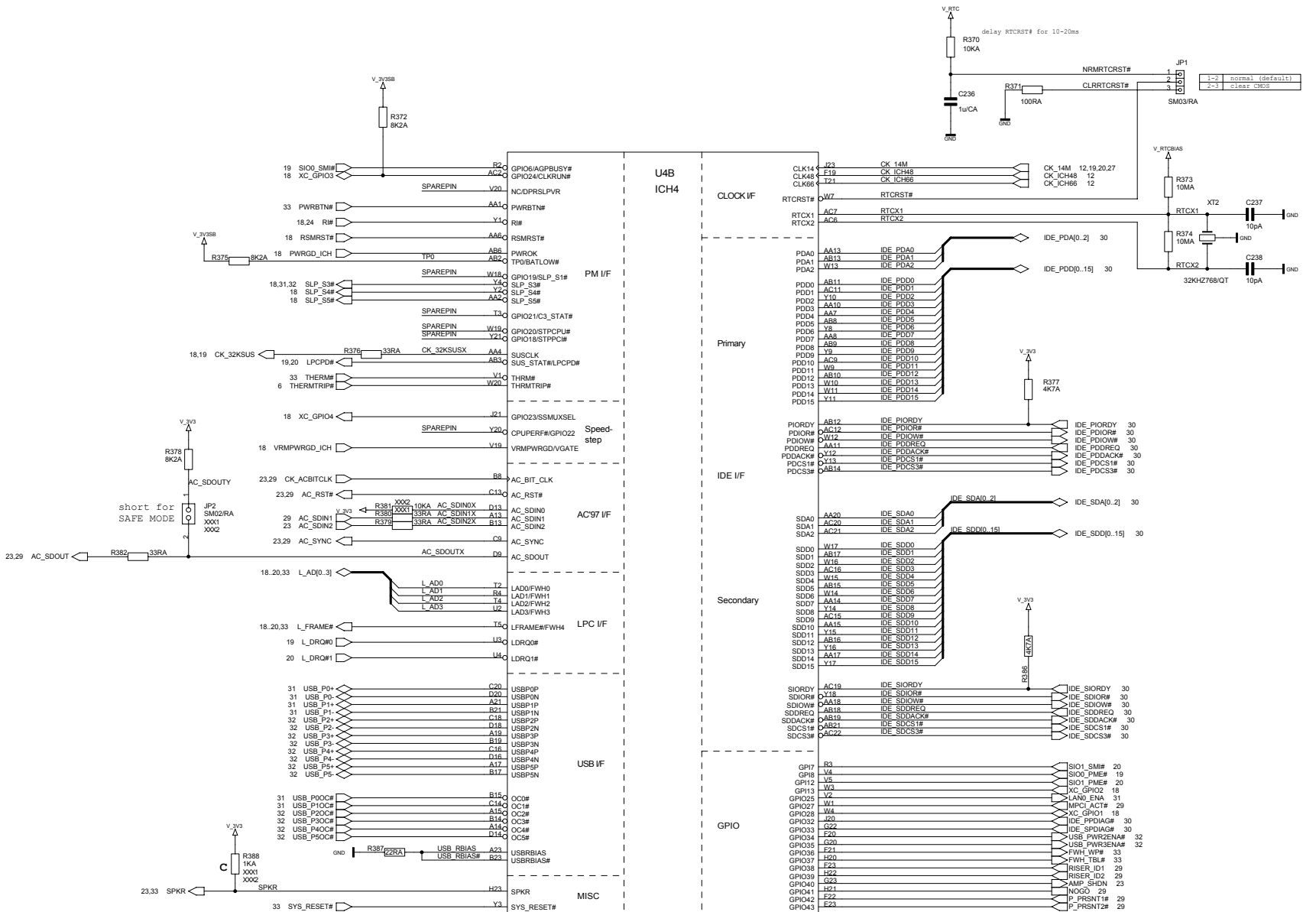
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Size		DDR DIMM 1	
Document Number		B444B-W	
Date	Friday, September 28, 2003	Sheet	14 of 35
Rev	2.00		



**U4A
ICH4**



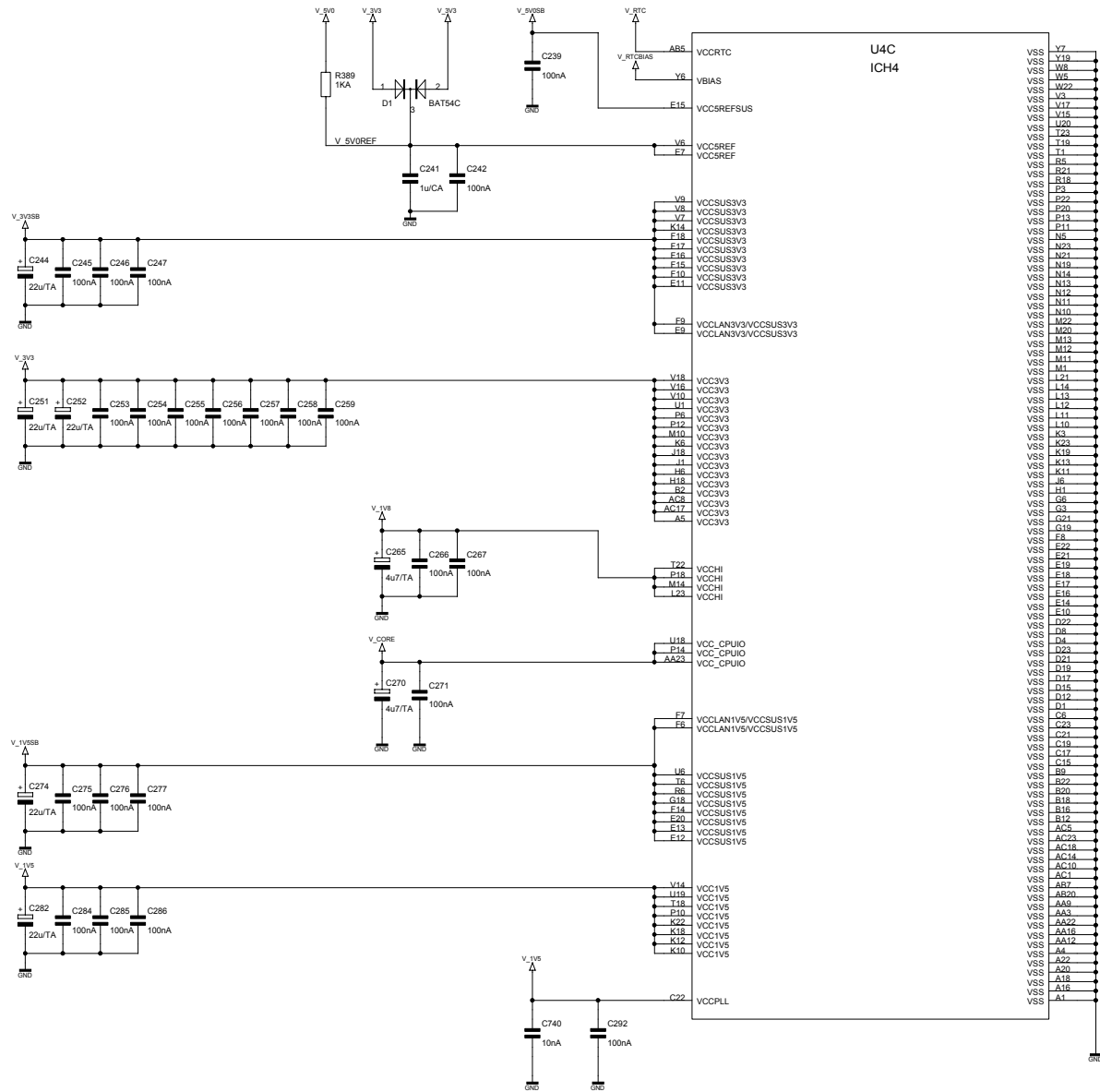
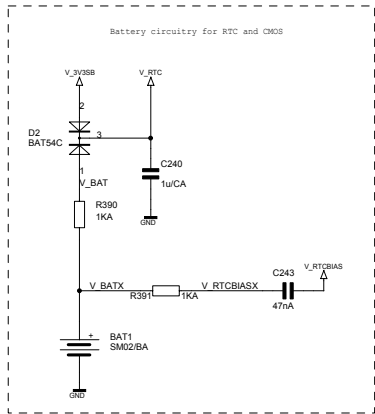
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- 11,17,33,35 V_1V8 V_1V8
- 6.8,12,16,17,19,20,23,26,29,33,35 V_3V3 V_3V3
- 16,20,24,25,29,31,33,35 V_3VSSB V_3VSSB
- 16,17 V_RTC V_RTC
- 23,27,29,32,35 V_12V0 V_12V0
- 4,7,8,10,14,16,35 GND GND



R	Signal	Function	Default
A	P_GNTA#	top block swap	NO STUFF
B	EE_DOUT	reserved	NO STUFF
C	SPKR	no reboot mode	NO STUFF
JP	AC_SDOUTX	safe mode	OPEN

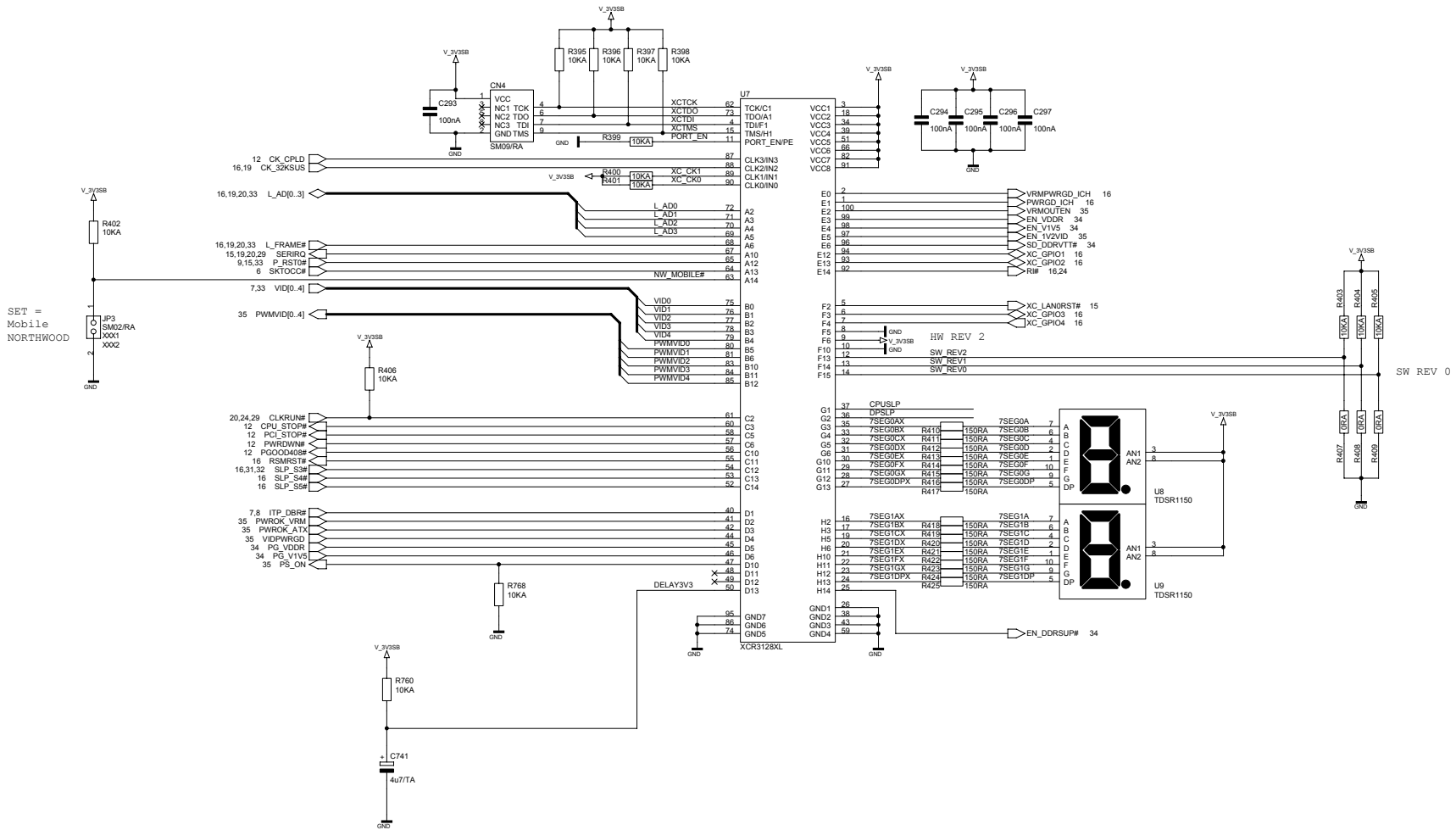
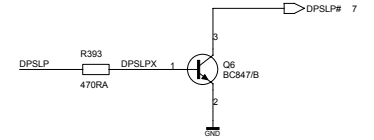
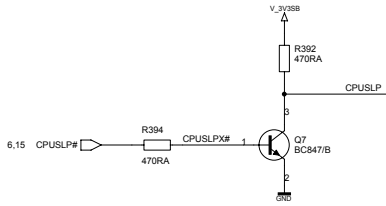
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- 6.8.12.15.17.19.20.23.26.29.33.35 V_3V3
- 15.17.20.24.25.29.31.33.35 V_3V3SB
- 15.17 V_RTC
- 17 V_RTCBIAS
- 4.7.8.10.15.17.35 GND

Title		Intel (R) 845E Interactive Client Reference Design	
Size		B444B-W	
C		Document Number	Rev 2.00
Date	Friday, September 26, 2003	Sheet	16 of 35

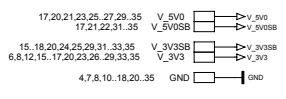
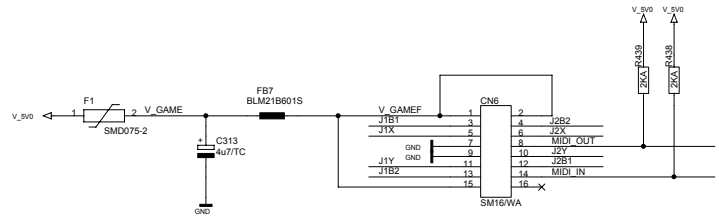
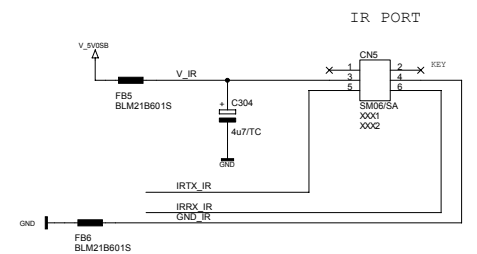
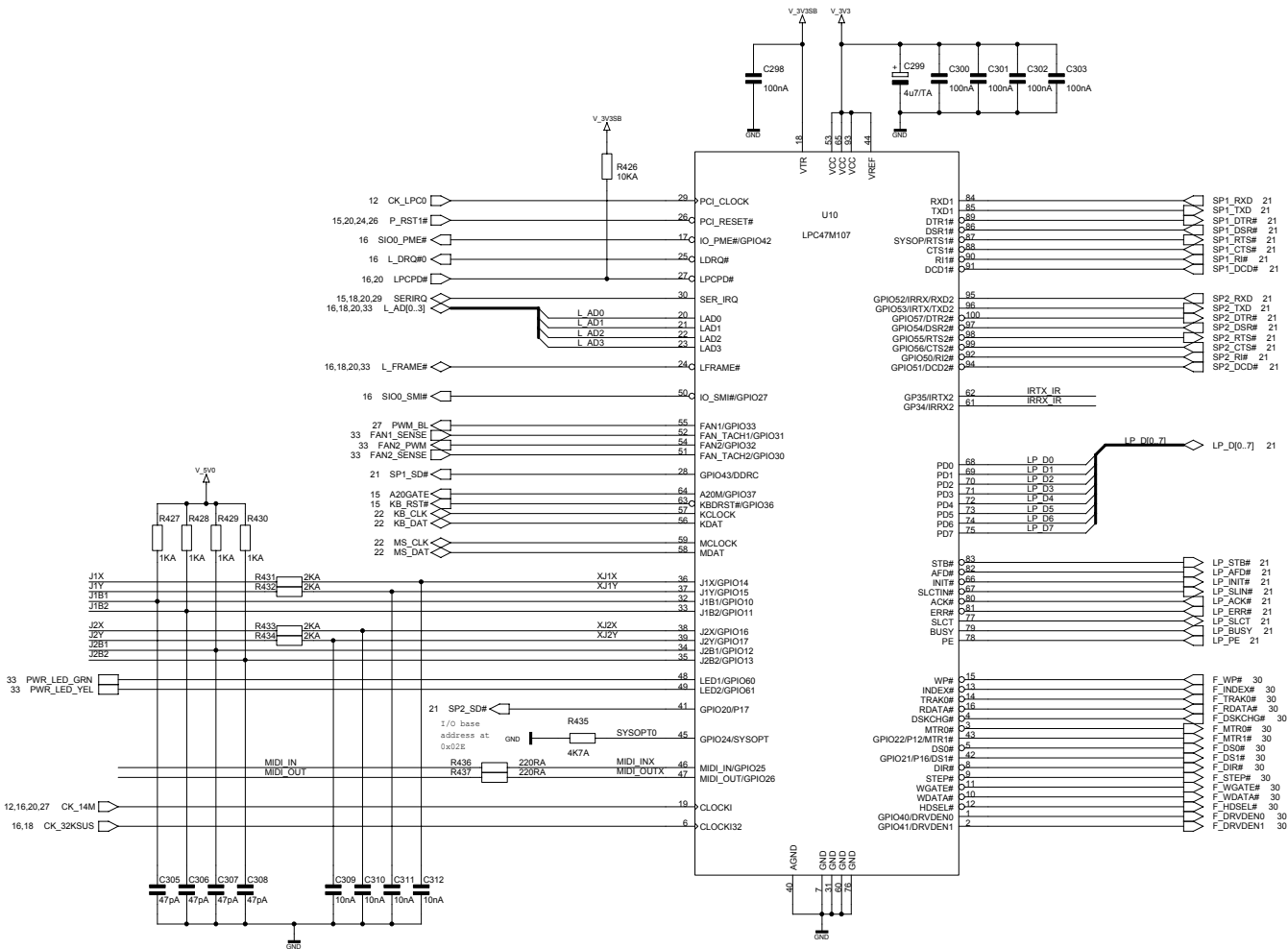


35	V_1V5SB	→ V_1V5SB
10,11,28,33,34	V_1V5	→ V_1V5
11,15,33,35	V_1V8	→ V_1V8
15,16,18,20,24,25,29,31,33,35	V_3V3SB	→ V_3V3SB
6,8,12,15,16,19,20,23,26,29,33,35	V_3V3	→ V_3V3
19,21,22,31,35	V_5V0SB	→ V_5V0SB
19,21,23,25,27,29,35	V_5V0	→ V_5V0
4,6,8,11,33,35	V_CORE	→ V_CORE
15,16	V_RTC	→ V_RTC
16	V_RTCBIAS	→ V_RTCBIAS
4,7,8,10,16,18,35	GND	→ GND

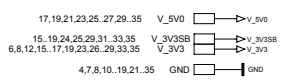
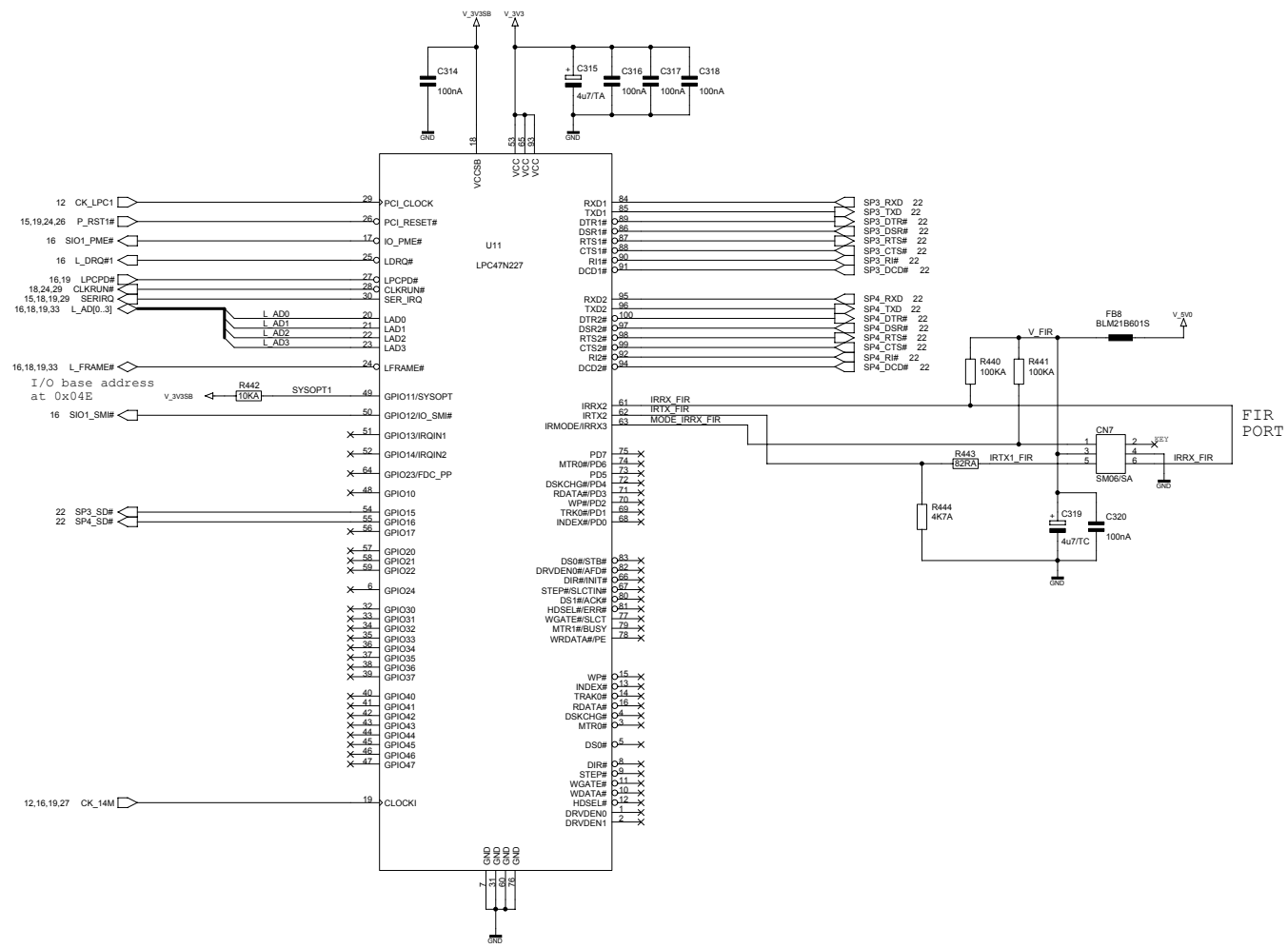
Intel (R) 845E Interactive Client Reference Design	
Title	INTEL ICH4 - 03
Size	Document Number B444B-W
Date	Friday, September 26, 2003
Rev	2.00
Sheet	17 of 35



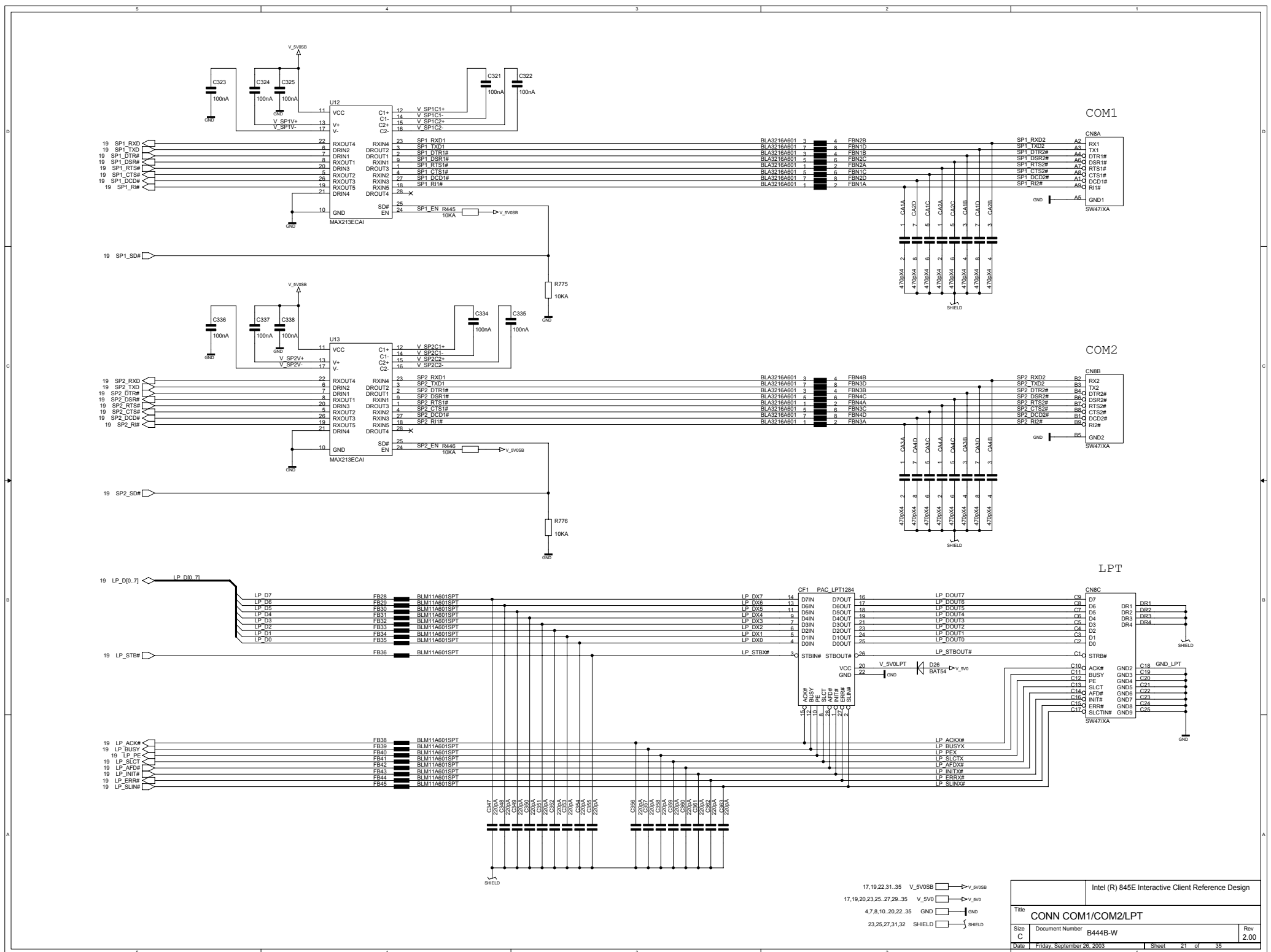
Intel (R) 845E Interactive Client Reference Design	
Title	GLUE LOGIC
Size	Document Number B444B-W
Date	Friday, September 28, 2003
Sheet	18 of 35
Rev	2.00



Intel (R) 845E Interactive Client Reference Design	
Title SIO0-LPC47M107	
Size C	Document Number B444B-W
Date Friday, September 26, 2003	Sheet 19 of 35
Rev 2.00	

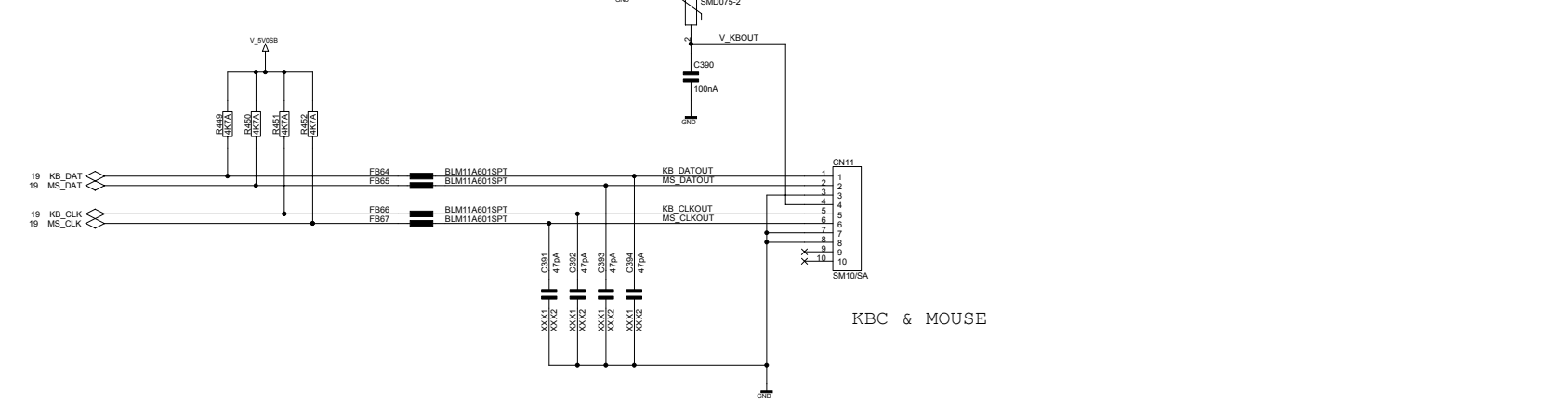
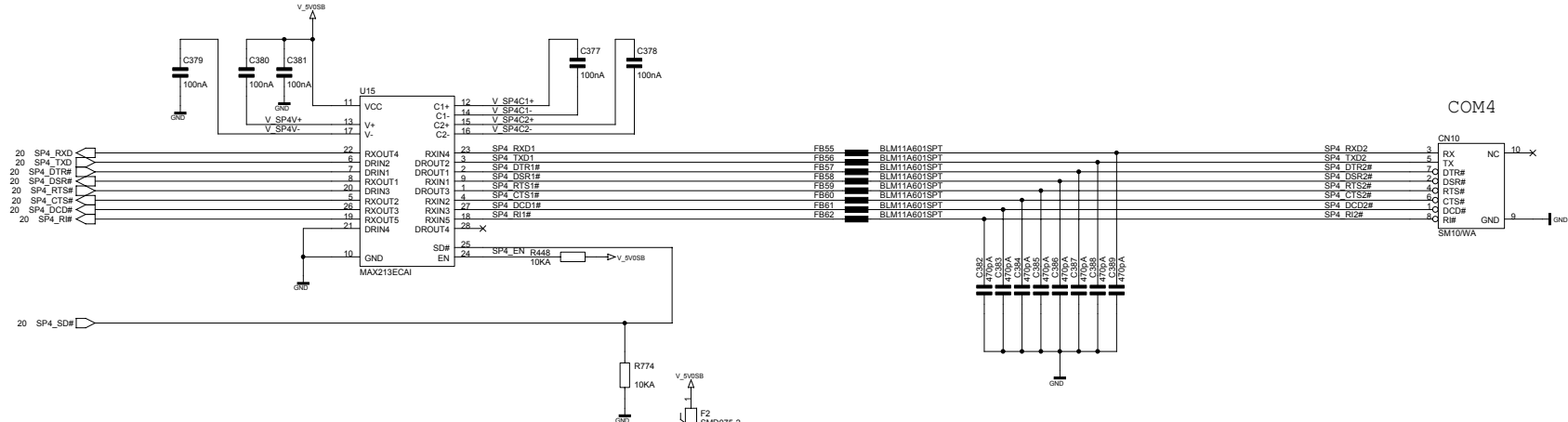
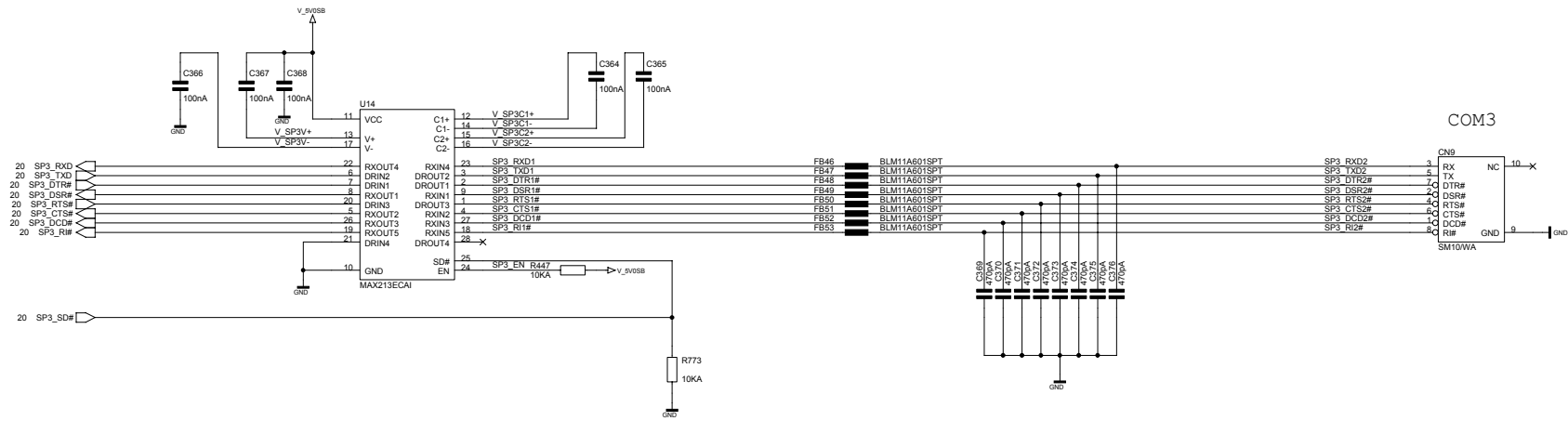


Intel (R) 845E Interactive Client Reference Design	
Title	SIO1-LPC47N227
Size	Document Number B444B-W
C	Rev 2.00
Date	Friday, September 26, 2003
Sheet	20 of 35



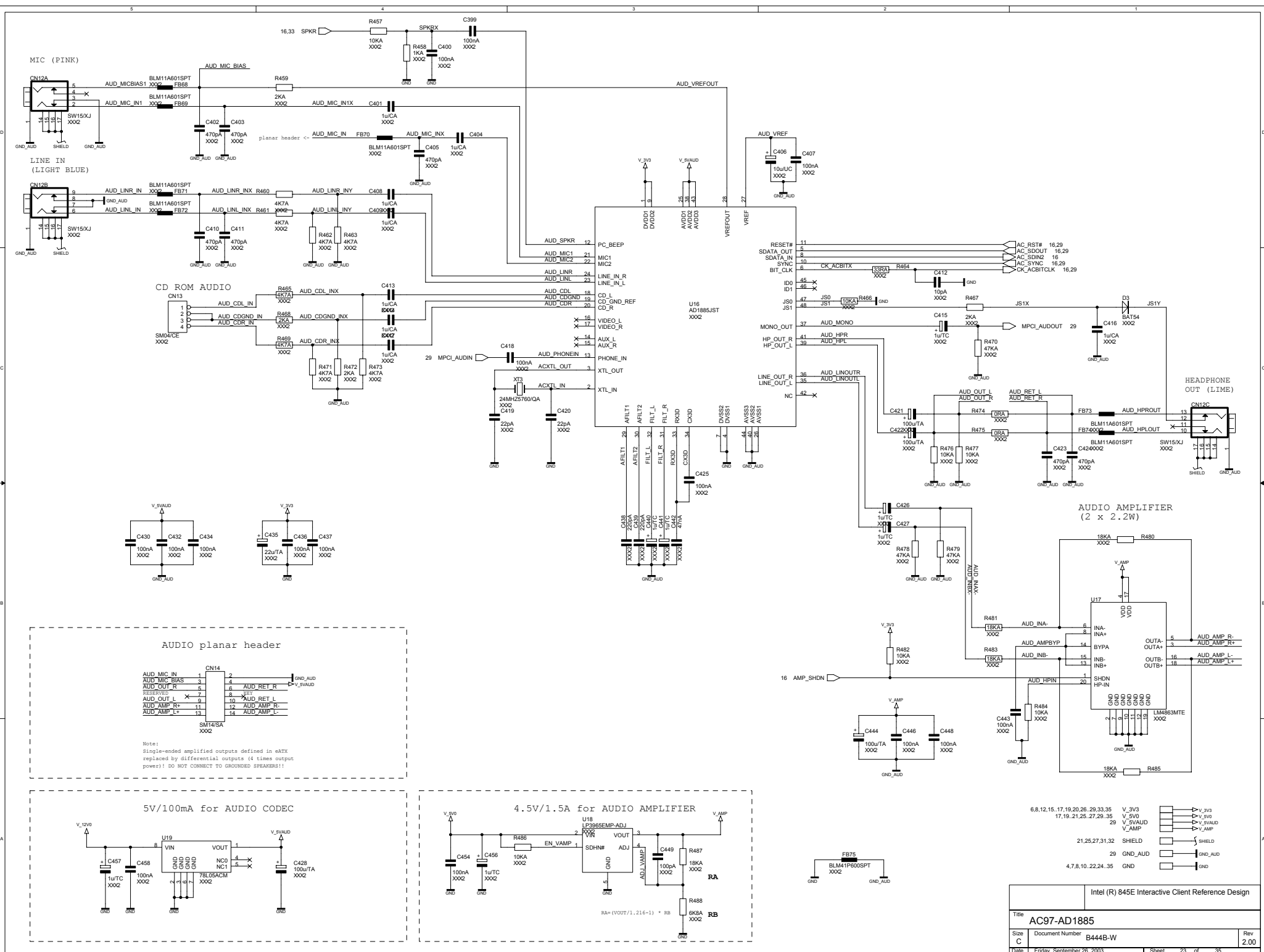
- 17.19.22.31.35 V_5V0SB → V_5V0SB
- 17.19.20.23.25.27.29.35 V_5V0 → V_5V0
- 4.7.8.10.20.22.35 GND → GND
- 23.25.27.31.32 SHIELD → SHIELD

Intel (R) 845E Interactive Client Reference Design	
Title	CONN COM1/COM2/LPT
Size	C
Document Number	B444B-W
Date	Friday, September 26, 2003
Sheet	21 of 35
Rev	2.00



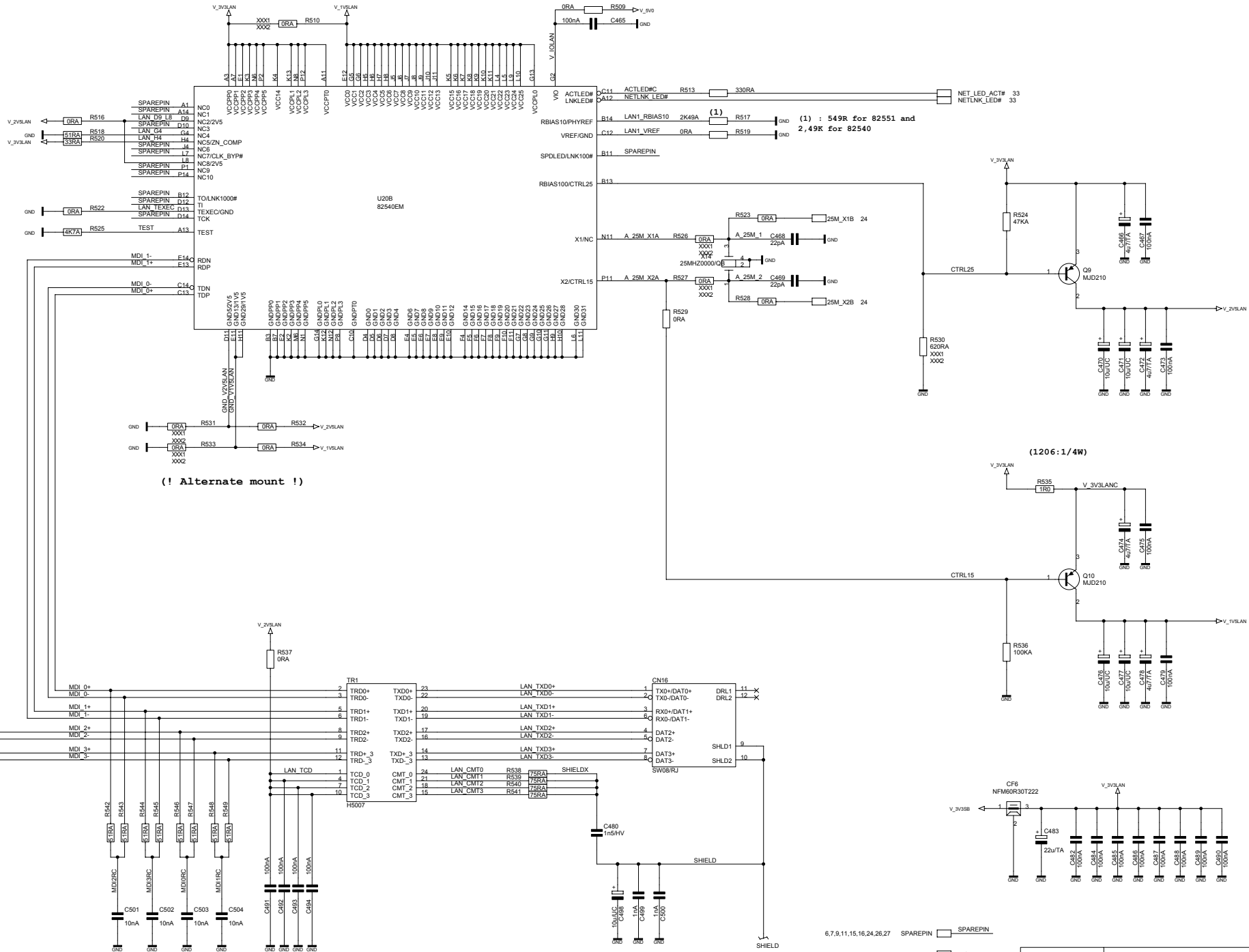
- 17,19,21,31,35 V_5V0SB
- 4,7,8,10,21,23,35 GND
- 21,23,25,27,31,32 SHIELD

Intel (R) 845E Interactive Client Reference Design	
Title CONN COM3/COM4/KBC	
Size C	Document Number B444B-W
Date Friday, September 28, 2003	Rev 2.00
Sheet 22 of 35	



Note:
 Single-ended amplified outputs defined in eATX
 replaced by differential outputs (4 times output
 power)! DO NOT CONNECT TO GROUNDED SPEAKERS!!

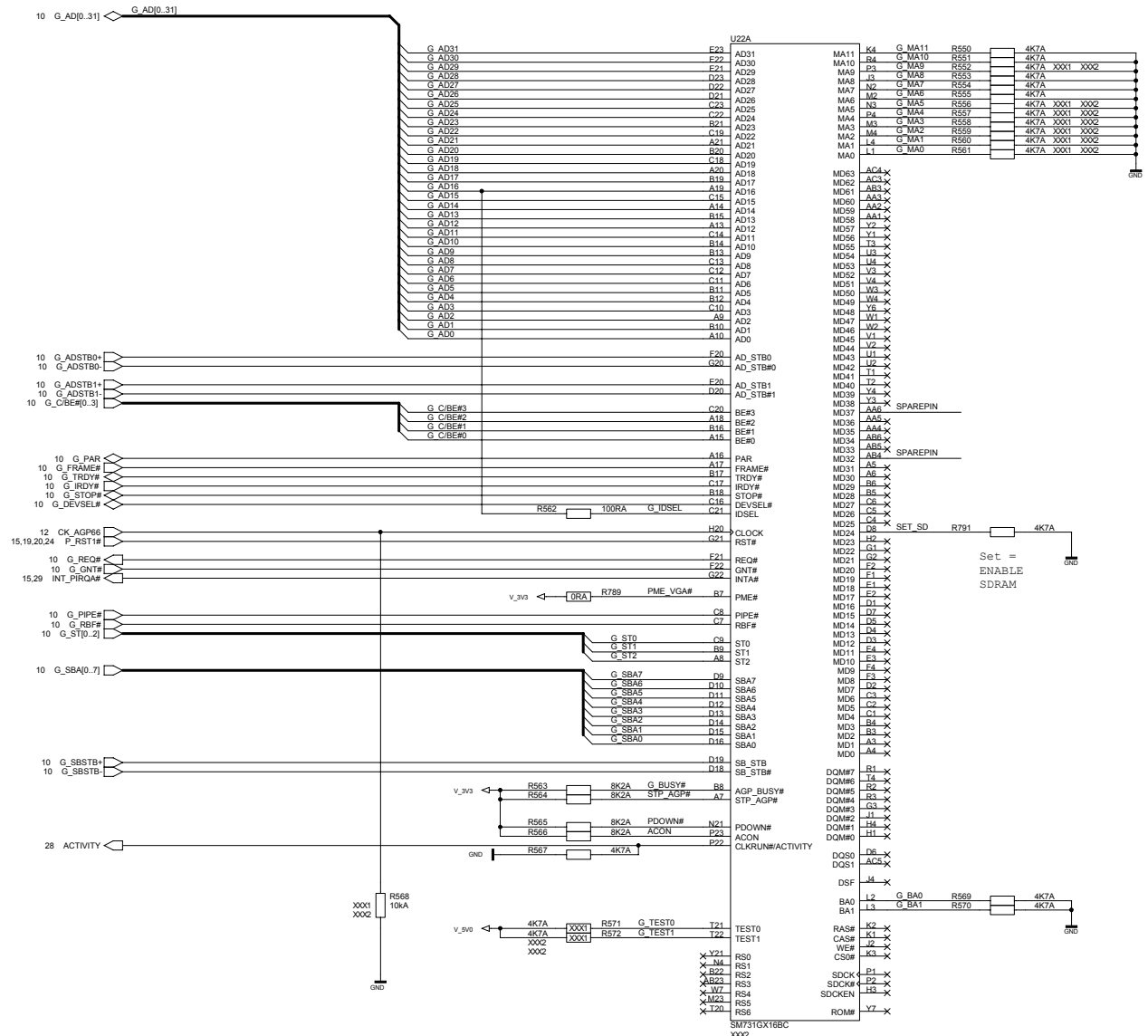
6,8,12,15,17,19,20,26,29,33,35	V_3V3		V_3V3
17,19,21,25,27,29,35	V_5V0		V_5V0
29	V_5V0AUD		V_5V0AUD
	V_AMP		V_AMP
21,25,27,31,32	SHIELD		SHIELD
29	GND_AUD		GND_AUD
4,7,8,10,22,24,35	GND		GND



(! Alternate mount !)

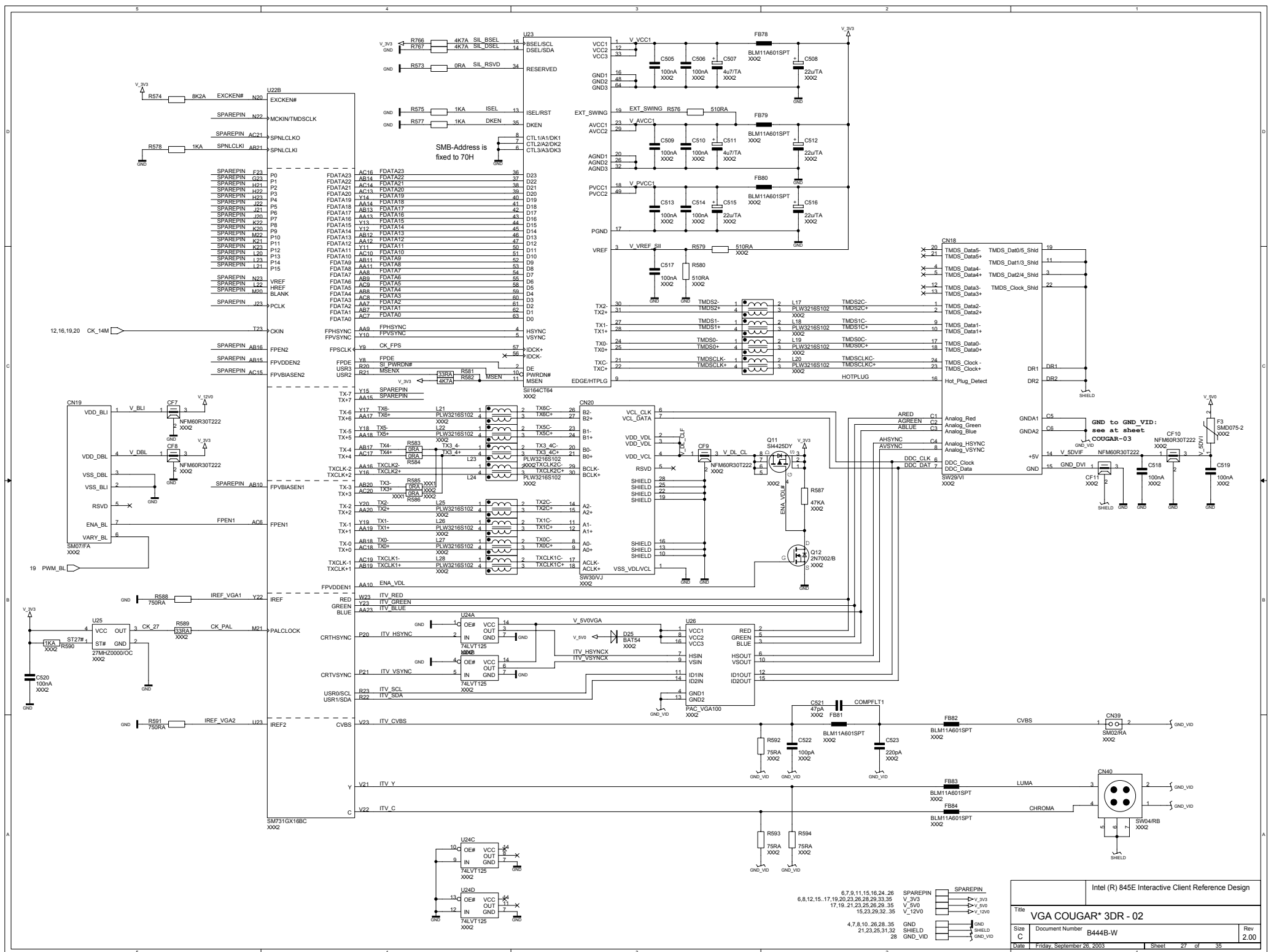
- 6.7,9,11,15,16,24,26,27 SPAREPIN SPAREPIN
- 17,19,21,23,26,27,29,35 V_5V0 V_5V0
- 24 V_3V3LAN V_3V3LAN
- 24 V_2V5LAN V_2V5LAN
- 24 V_1V5LAN V_1V5LAN
- 4,7,8,10,24,26,35 GND GND

Intel (R) 845E Interactive Client Reference Design	
Title LAN-10/100/1000 CONN	
Size C	Document Number B444B-W
Date Friday, September 26, 2003	Sheet 25 of 35
Rev 2.00	

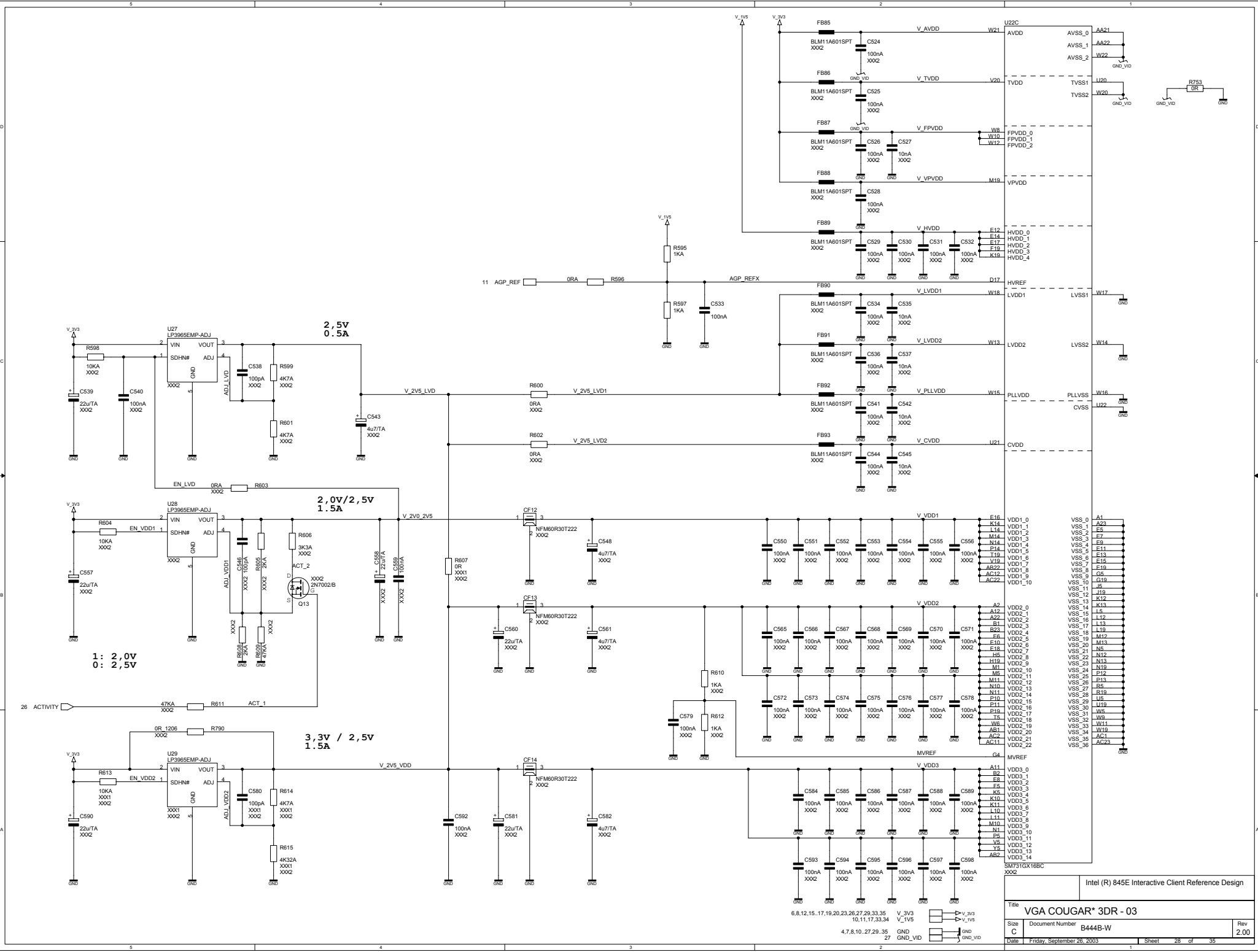


- 6,7,9,11,15,16,24,25,27 SPAREPIN SPAREPIN
- 17,19,21,23,25,27,29,35 V_5V0 V_5V0
- 6,8,12,15,17,19,20,23,27,29,33,35 V_3V3 V_3V3
- 10,11,17,28,33,34 V_1V5 V_1V5
- 4,7,8,10,25,27,35 GND GND

Intel (R) 845E Interactive Client Reference Design	
Title VGA COUGAR* 3DR - 01	
Size C	Document Number B444B-W
Date Friday, September 25, 2003	Sheet 26 of 35
Rev 2.00	



Intel (R) 845E Interactive Client Reference Design	
Title VGA COUGAR* 3DR - 02	
Size C	Document Number B444B-W
Date Friday, September 26, 2003	Sheet 27 of 35
Rev 2.00	

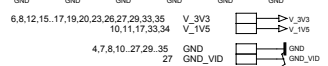


2,5V
0,5A

2,0V/2,5V
1,5A

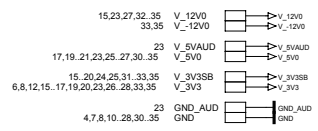
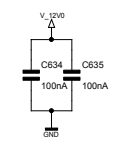
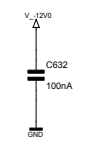
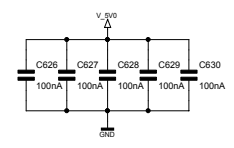
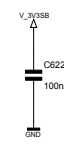
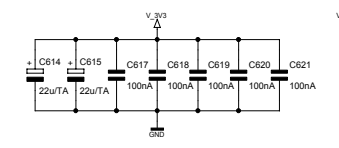
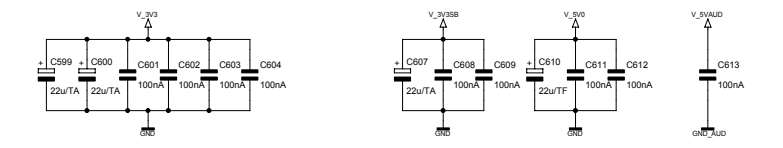
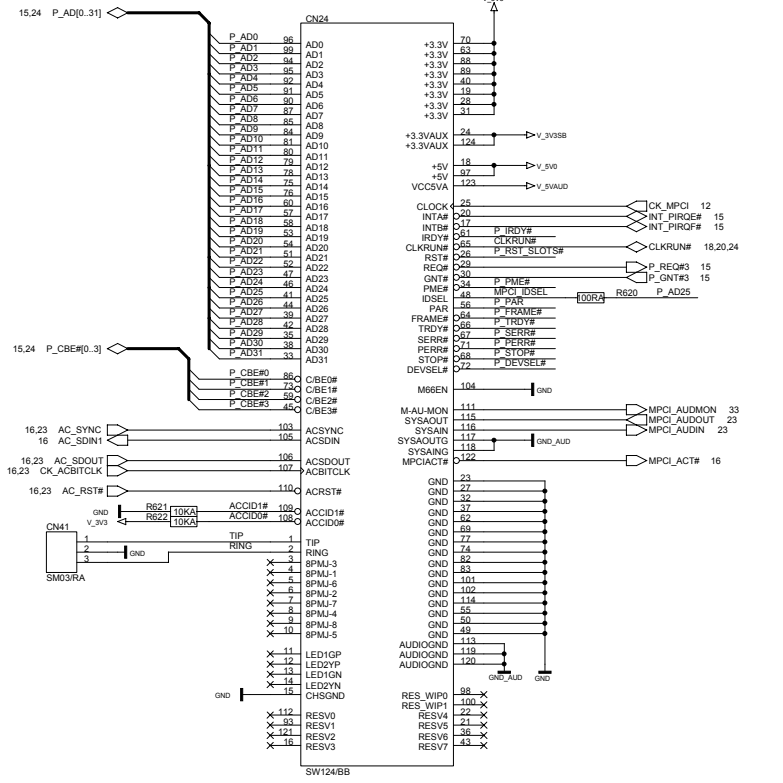
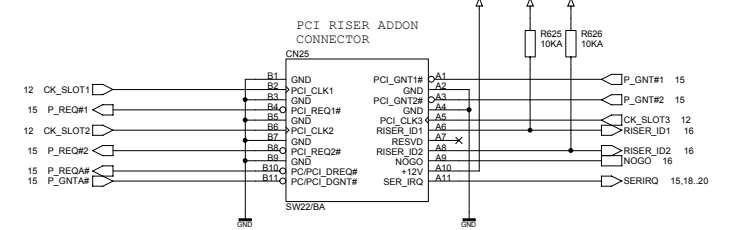
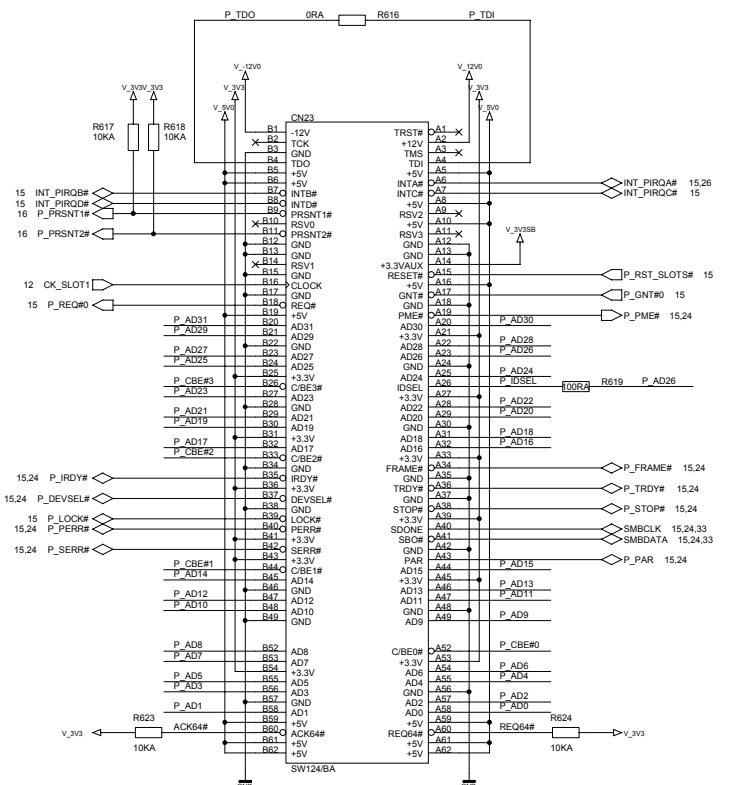
3,3V / 2,5V
1,5A

1: 2,0V
0: 2,5V

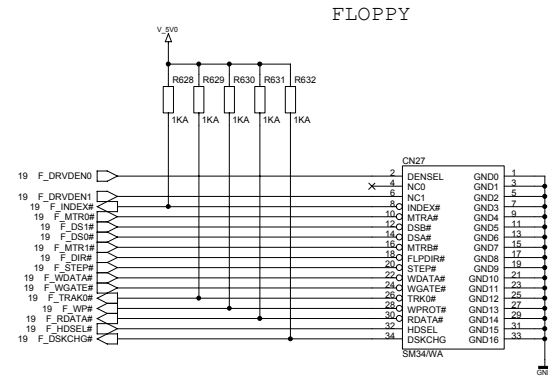
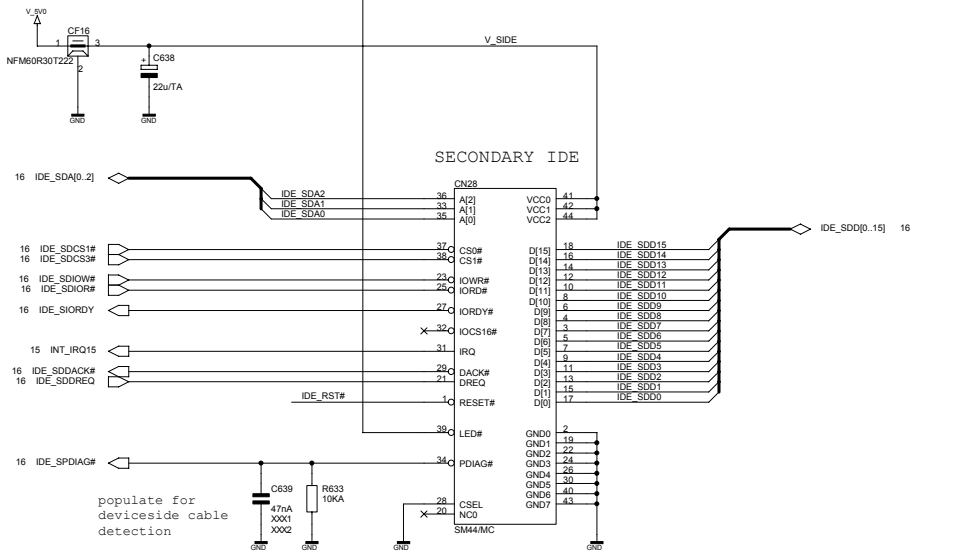
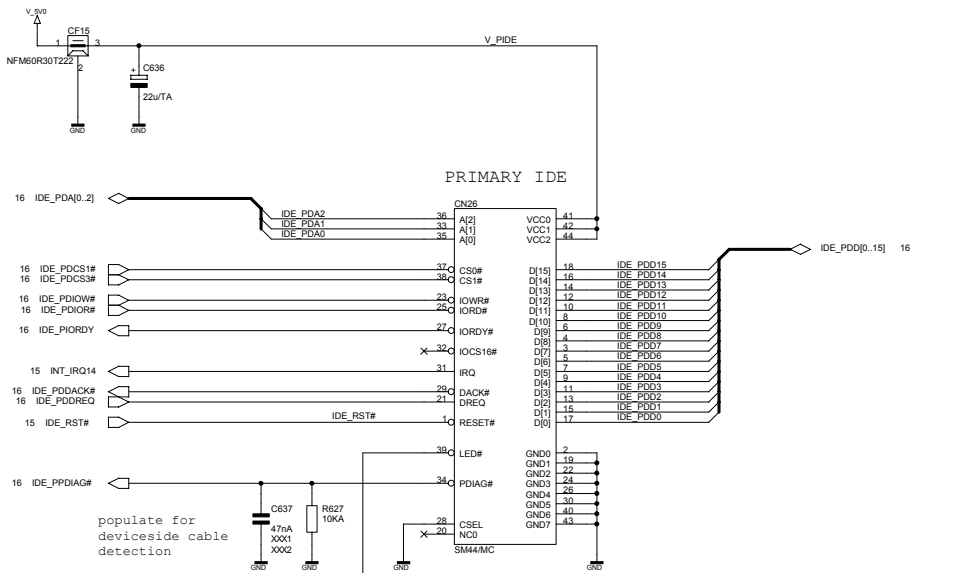


Title		VGA COUGAR* 3DR - 03	
Size	Document Number	B444B-W	
C	Date	Friday, September 26, 2003	Sheet 28 of 35

Intel (R) 845E Interactive Client Reference Design



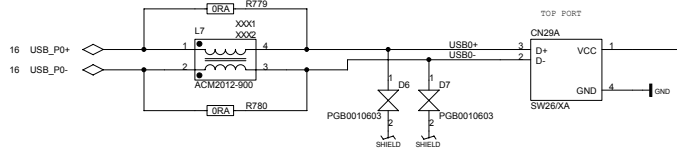
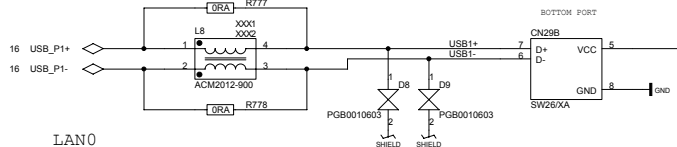
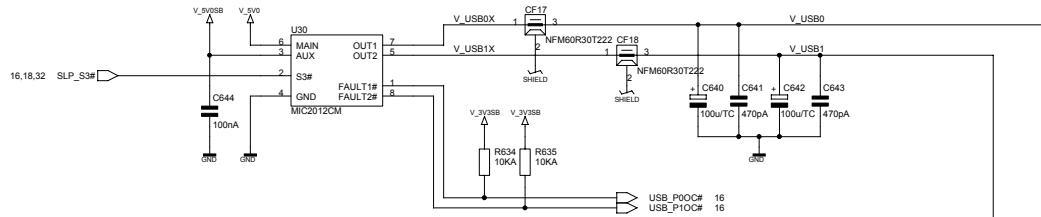
Intel (R) 845E Interactive Client Reference Design	
Title: CONN-PCI	
Size: C	Document Number: B444B-W
Date: Friday, September 26, 2003	Rev: 2.00
Sheet: 29	of 35



17,19,21,23,25,27,29,31,35 V_SVDD \square \rightarrow V_SVDD
 17,19,21,22,31,35 V_SVDSB \square \rightarrow V_SVDSB
 4,7,8,10,29,31,35 GND \square \rightarrow GND

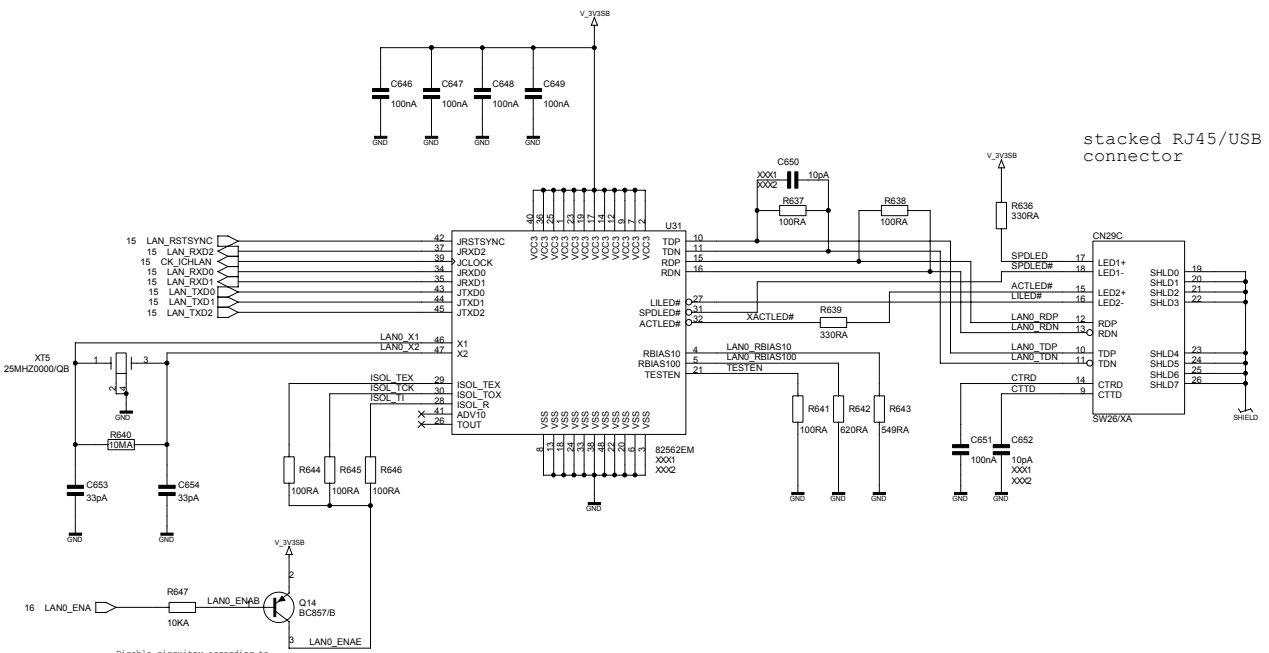
Title		Intel (R) 845E Interactive Client Reference Design	
Size		CONN-01 IDE-FLOPPY	
Date		Document Number	B444B-W
Date		Rev	2.00
Date		Friday, September 26, 2003	Sheet 30 of 35

USB0 & USB1



LAN0

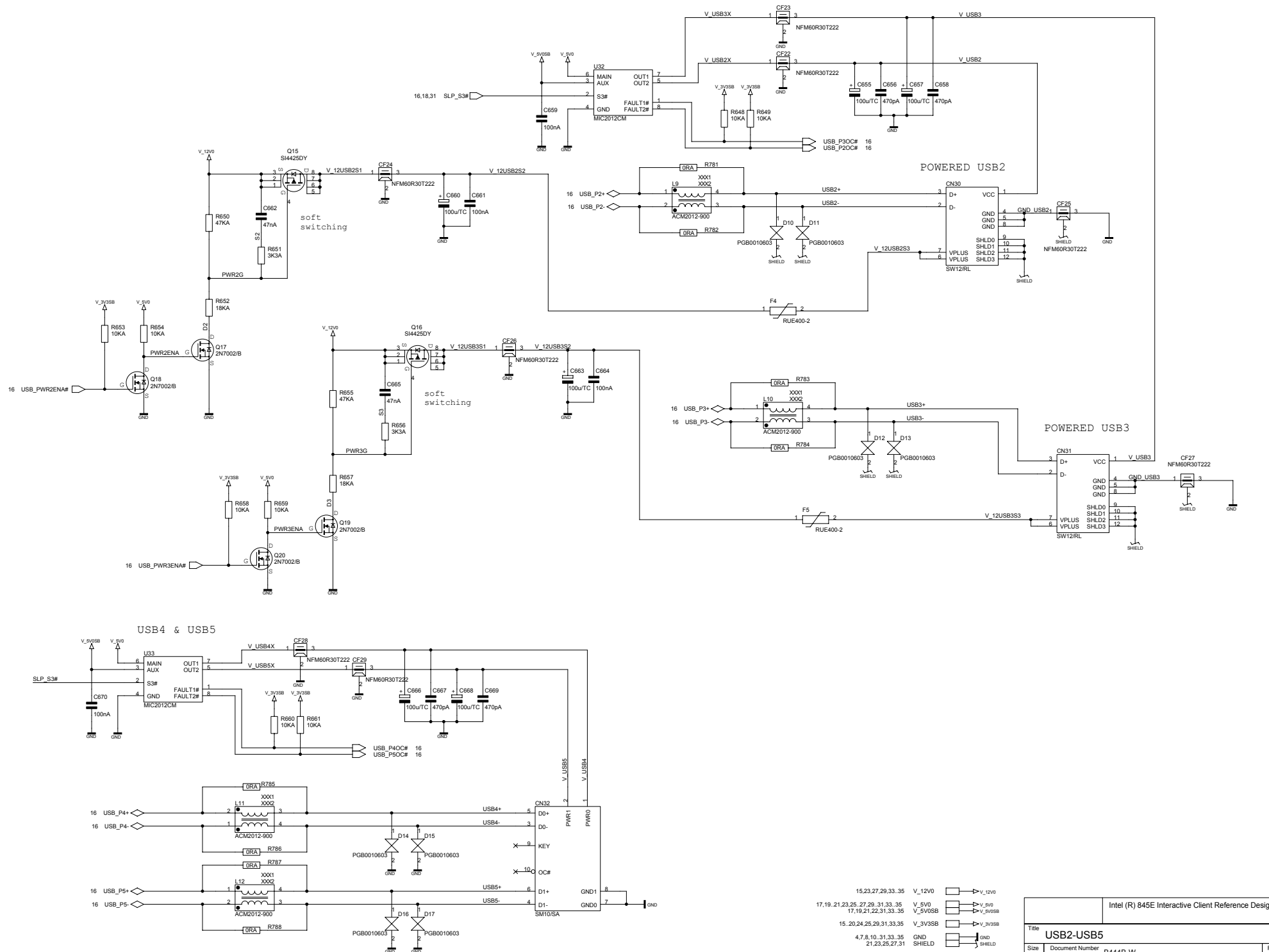
stacked RJ45/USB connector



Disable circuitry according to Brookdale-B Design Guide Rev.0.7 p. 181

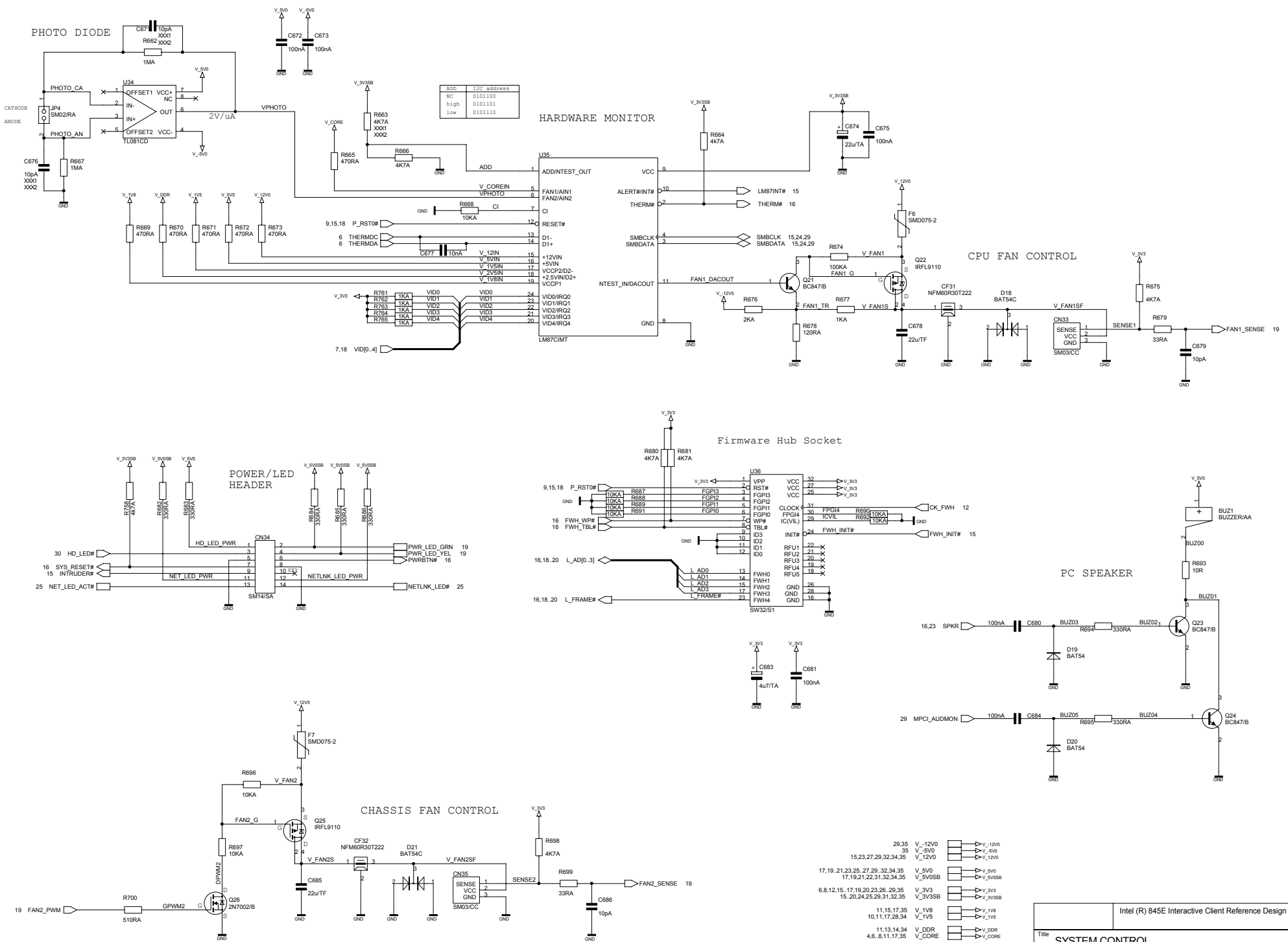
- 17,19,21,23,32,35 V_5V0SB
- 17,19,21,23,25,27,29,30,32,35 V_5V0
- 15,20,24,25,29,32,33,35 V_3V3SB
- 4,7,8,10,30,32,35 GND
- 21,23,27,32 SHIELD

Intel (R) 845E Interactive Client Reference Design	
Title USB0/USB1/LAN0	
Size C	Document Number B444B-W
Date Friday, September 26, 2003	Rev 2.00
Sheet 31 of 35	



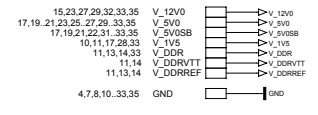
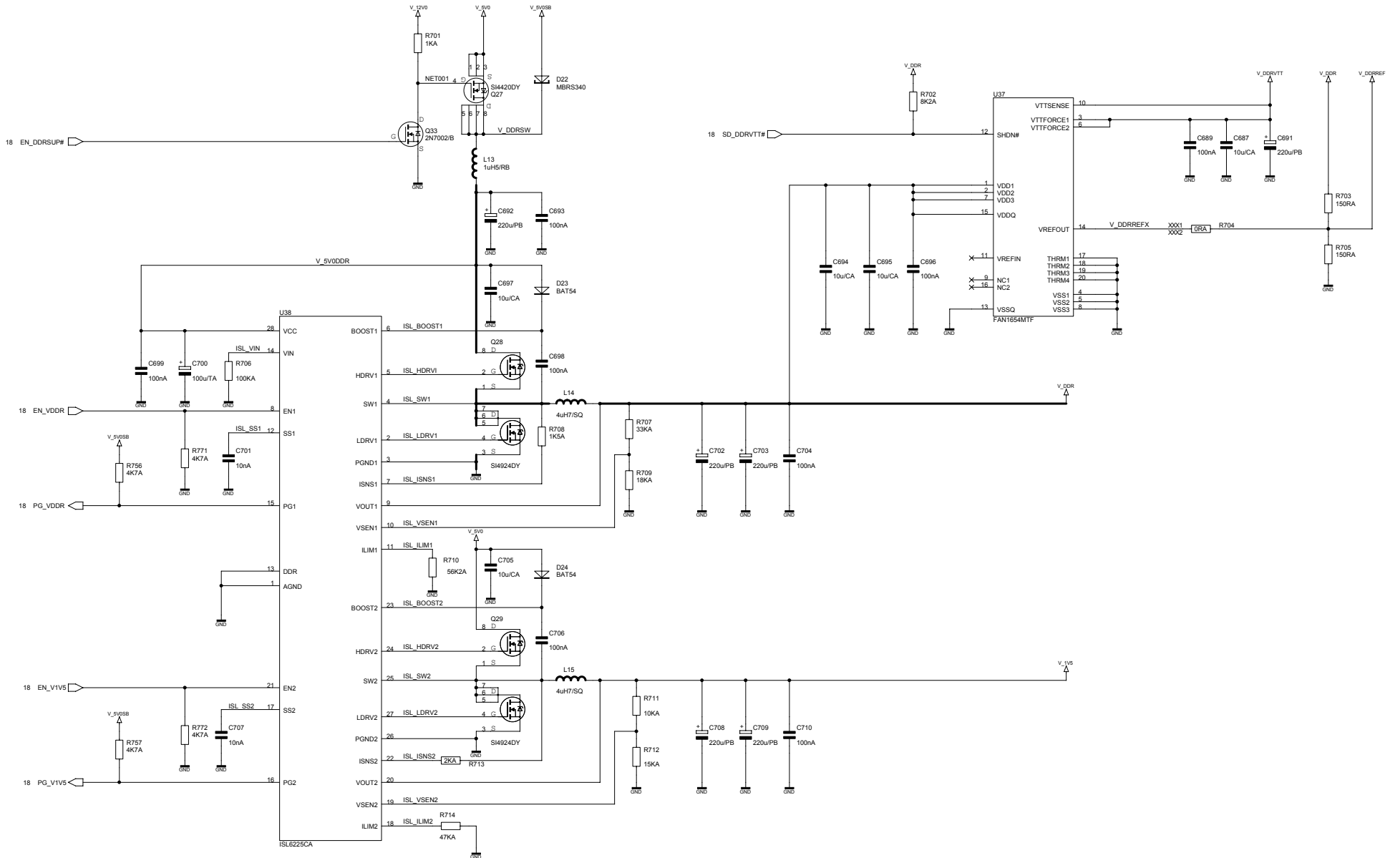
- 15.23.27.29.33.35 V_12V0
- 17.19.21.23.25.27.29.31.33.35 V_5V0
- 17.19.21.22.31.33.35 V_5V0SB
- 15.20.24.25.29.31.33.35 V_3V3SB
- 4.7.8.10.31.33.35 GND
- 21.23.25.27.31 SHIELD

Title		Intel (R) 845E Interactive Client Reference Design	
Size		USB2-USB5	
C		Document Number B444B-W	
Date	Friday, September 26, 2003	Sheet	32 of 35
Rev	2.00		

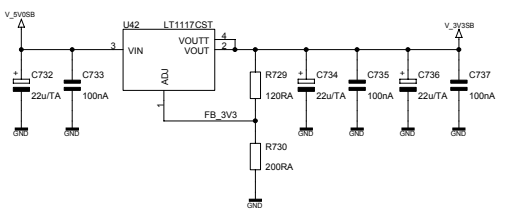
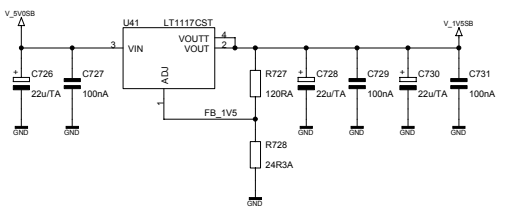
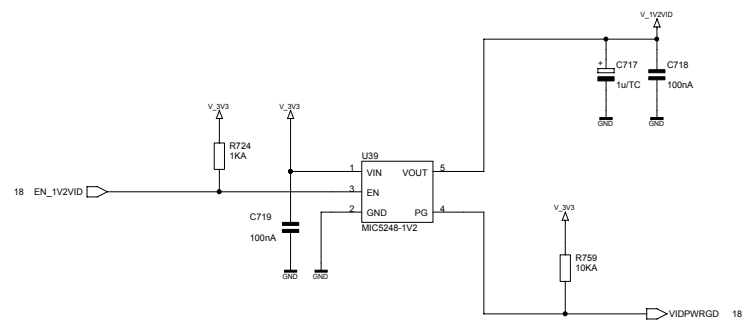
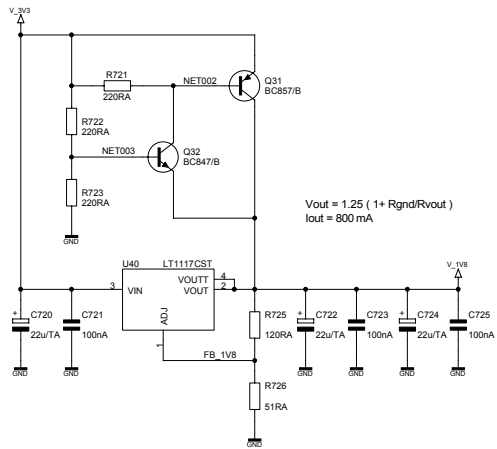
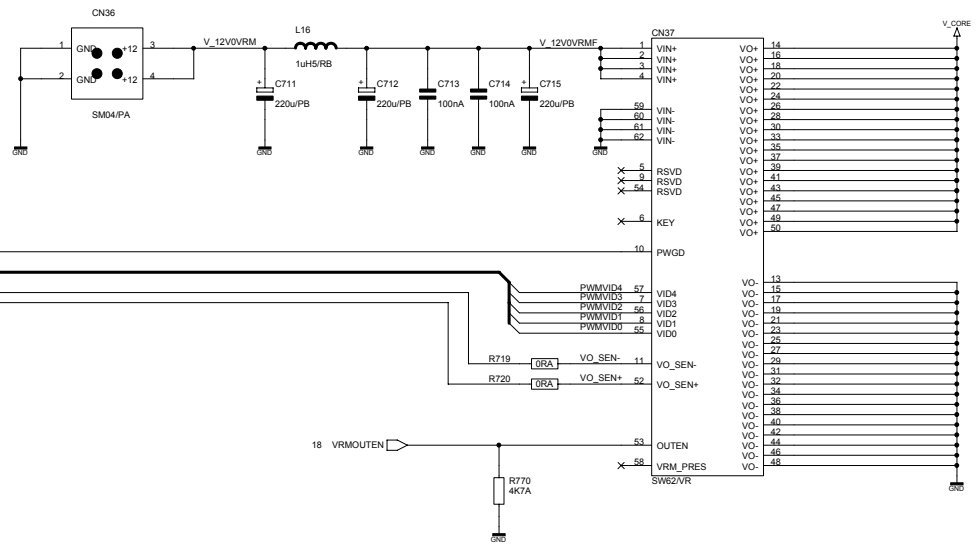
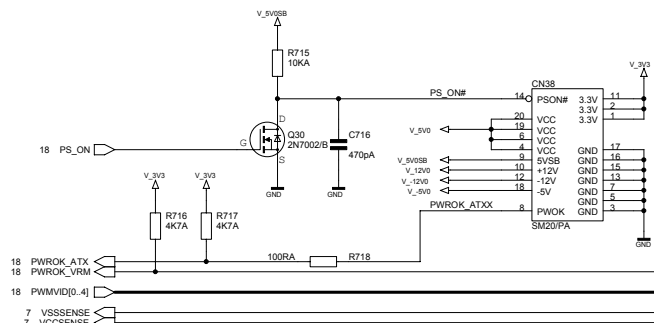


Intel (R) 845E Interactive Client Reference Design	
Title: SYSTEM CONTROL	
Size: C	Document Number: B444B-W
Date: Friday, September 26, 2003	Sheet: 33 of 35

- 29,35 V_{-12V0} → V_{-12V0}
- 35 V_{-5V0} → V_{-5V0}
- 15,23,27,29,32,34,35 V_{-12V0} → V_{-12V0}
- 17,19,21,23,25,27,29,32,34,35 V_{-5V0} → V_{-5V0}
- 17,19,21,22,31,32,34,35 V_{-5V0SB} → V_{-5V0SB}
- 6,8,12,15,17,19,20,23,26,29,35 V_{-3V3} → V_{-3V3}
- 15,20,24,25,29,31,32,35 V_{-3V3SB} → V_{-3V3SB}
- 11,15,17,35 V_{-1V8} → V_{-1V8}
- 10,11,17,28,34 V_{-1V5} → V_{-1V5}
- 11,13,14,34 V_{-DDR} → V_{-DDR}
- 4,6,8,11,17,35 V_{-CORE} → V_{-CORE}
- 4,7,8,10,32,34,35 GND → GND



Intel (R) 845E Interactive Client Reference Design	
Title DDR POWER	
Size C	Document Number B444B-W
Date Friday, September 26, 2003	Rev 2.00
Sheet 34	of 35



4.6, 8.11, 17.33	V_ CORE		V_ CORE
7	V_1V2VID		V_1V2VID
17	V_1V5SSB		V_1V5SSB
11, 15, 17, 33	V_1V8		V_1V8
6.8, 12, 15, 17, 19, 20, 23, 25, 29, 33	V_3V3		V_3V3
15, 20, 24, 25, 29, 31, 33	V_3V3SB		V_3V3SB
17, 19, 21, 23, 25, 27, 29, 34	V_5V0		V_5V0
17, 19, 21, 22, 31, 34	V_5V0SSB		V_5V0SSB
15, 23, 27, 29, 32, 34	V_12V0		V_12V0
29, 33	V_12V0		V_12V0
4, 7, 8, 10, 34	GND		GND