

Intel (R) 845E Interactive Client Reference Design

Revision X2

Last Change : 2002-09-26

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Prefix	Netobject
A_	CRITICAL ANALOG TRACES
AC_	AC97 SIGNAL
APIC_	APIC SIGNAL
AUD_	ANALOG AUDIO SIGNAL
CK_	CLOCK SIGNAL
EEp_	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 MPCPI Pins (TIP and RING)
42	V_5V0 input at V_DDDR supply is now controlled by XILINX CPLD (Pin 25)
43	Delay of PWRGOOD# (LAN 82540EM Pin A9) to enable correct EEPROM detection

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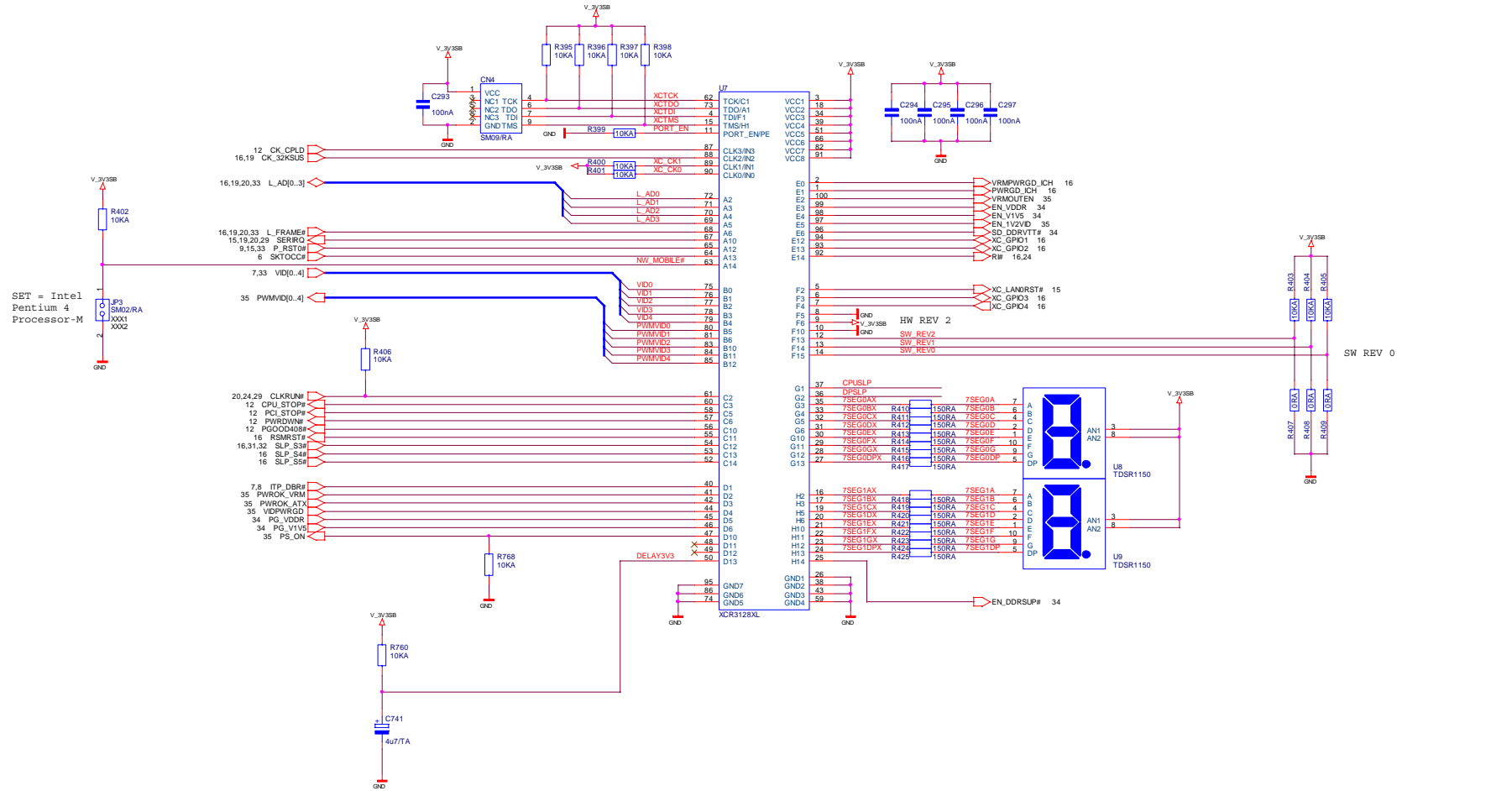
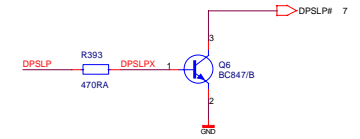
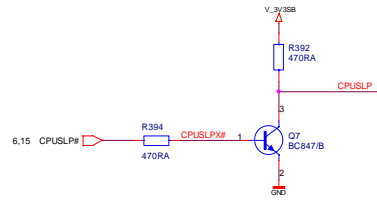
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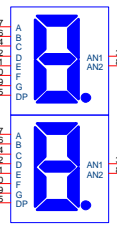
General Note:
 All Parts marked 'XXX1' will not be assembled in V1.
 All Parts marked 'XXX2' will not be assembled in V2.

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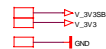


SET = Intel Pentium 4 Processor-M

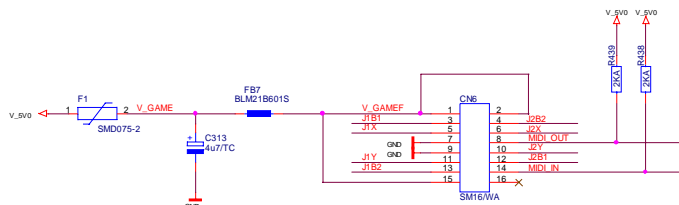
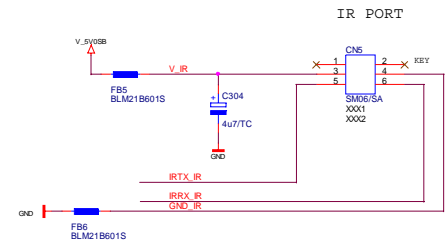
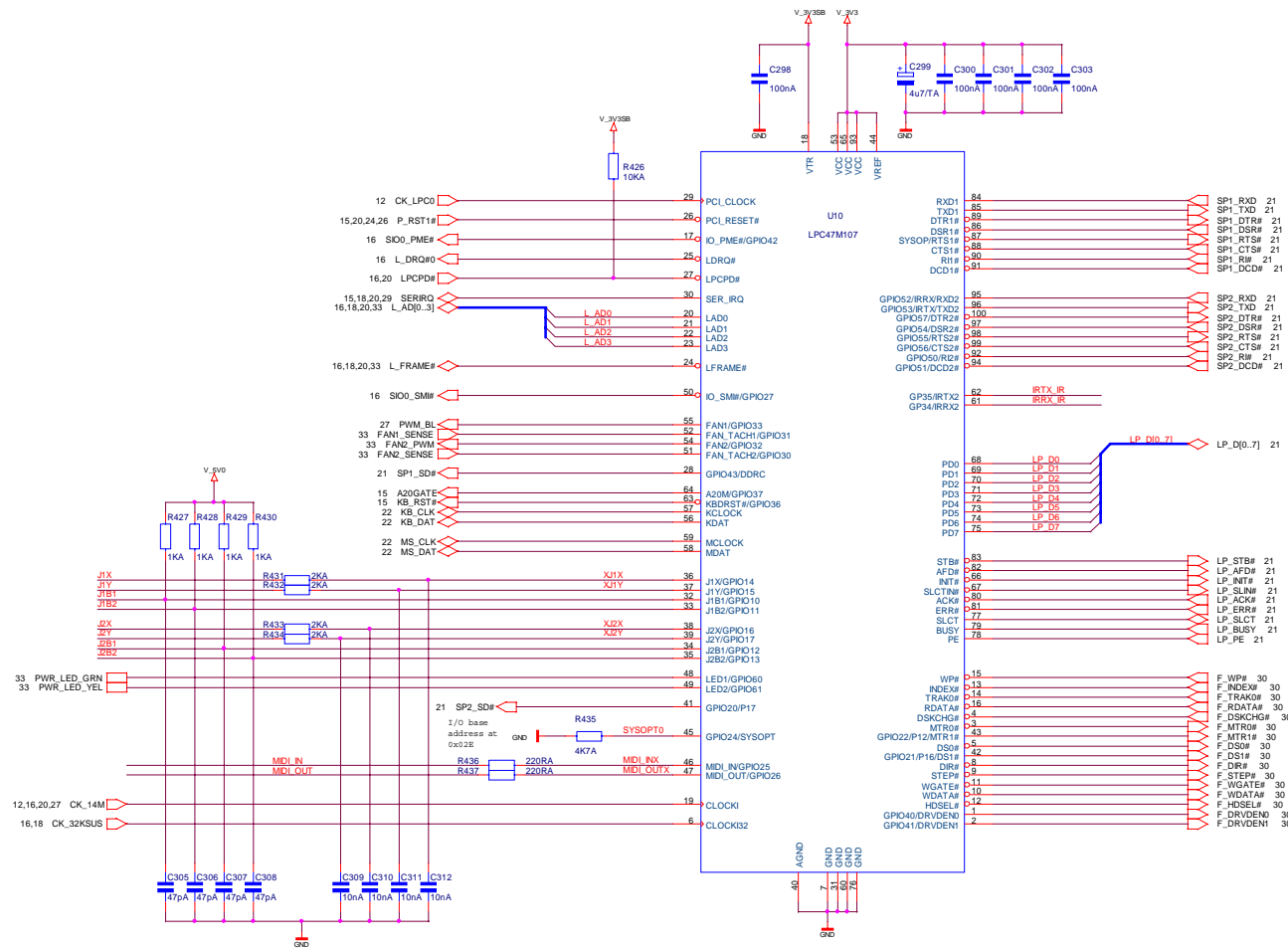
HW REV 2
SW REV 2
SW REV 1
SW REV 0



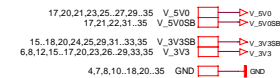
15, 17, 19, 20, 24, 25, 29, 31, 33, 35 V_3V3SB
6, 8, 12, 15, 17, 19, 20, 23, 26, 29, 33, 35 V_3V3
4, 7, 8, 10, 17, 19, 35 GND



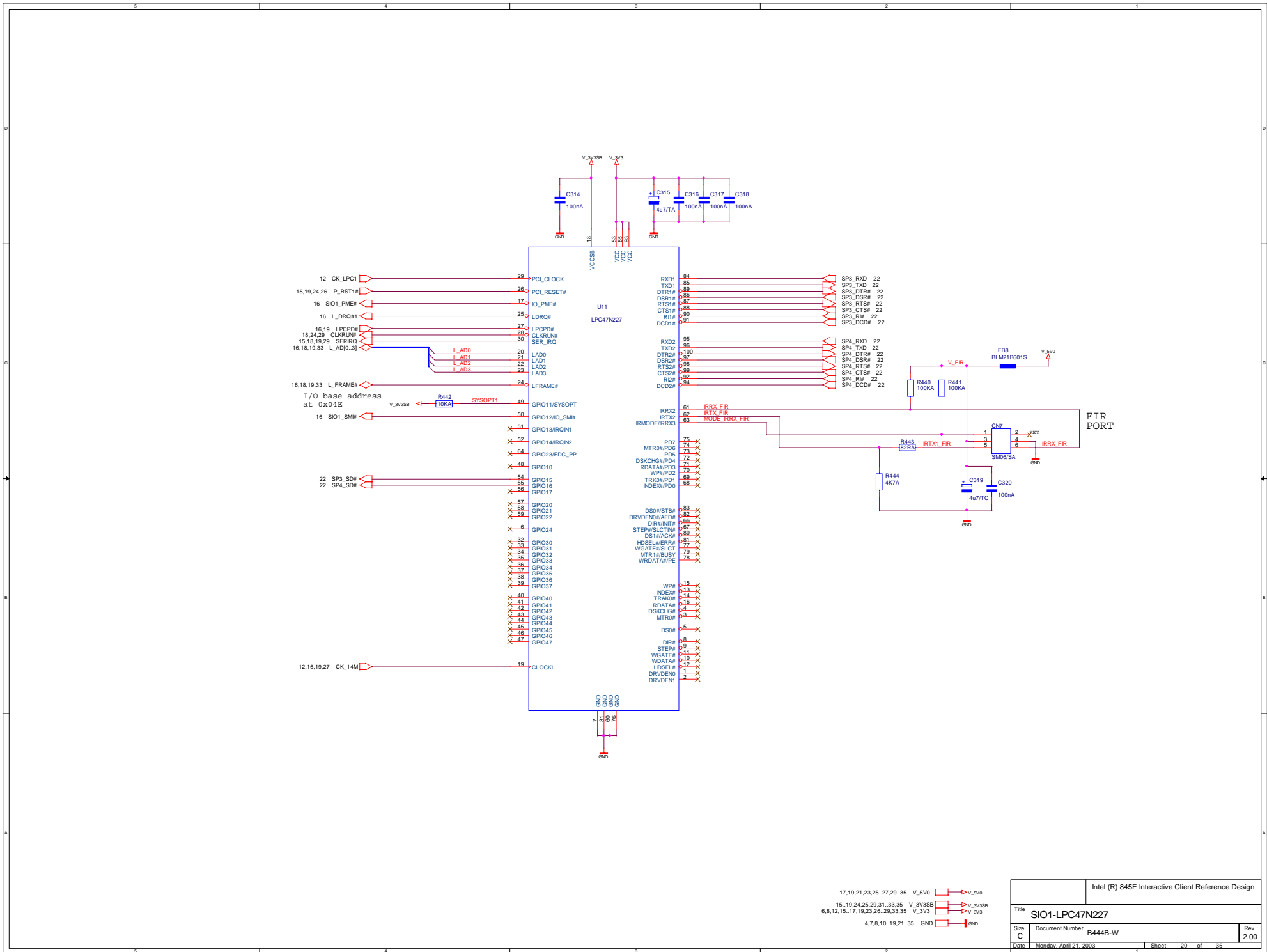
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GAME PORT/MIDI

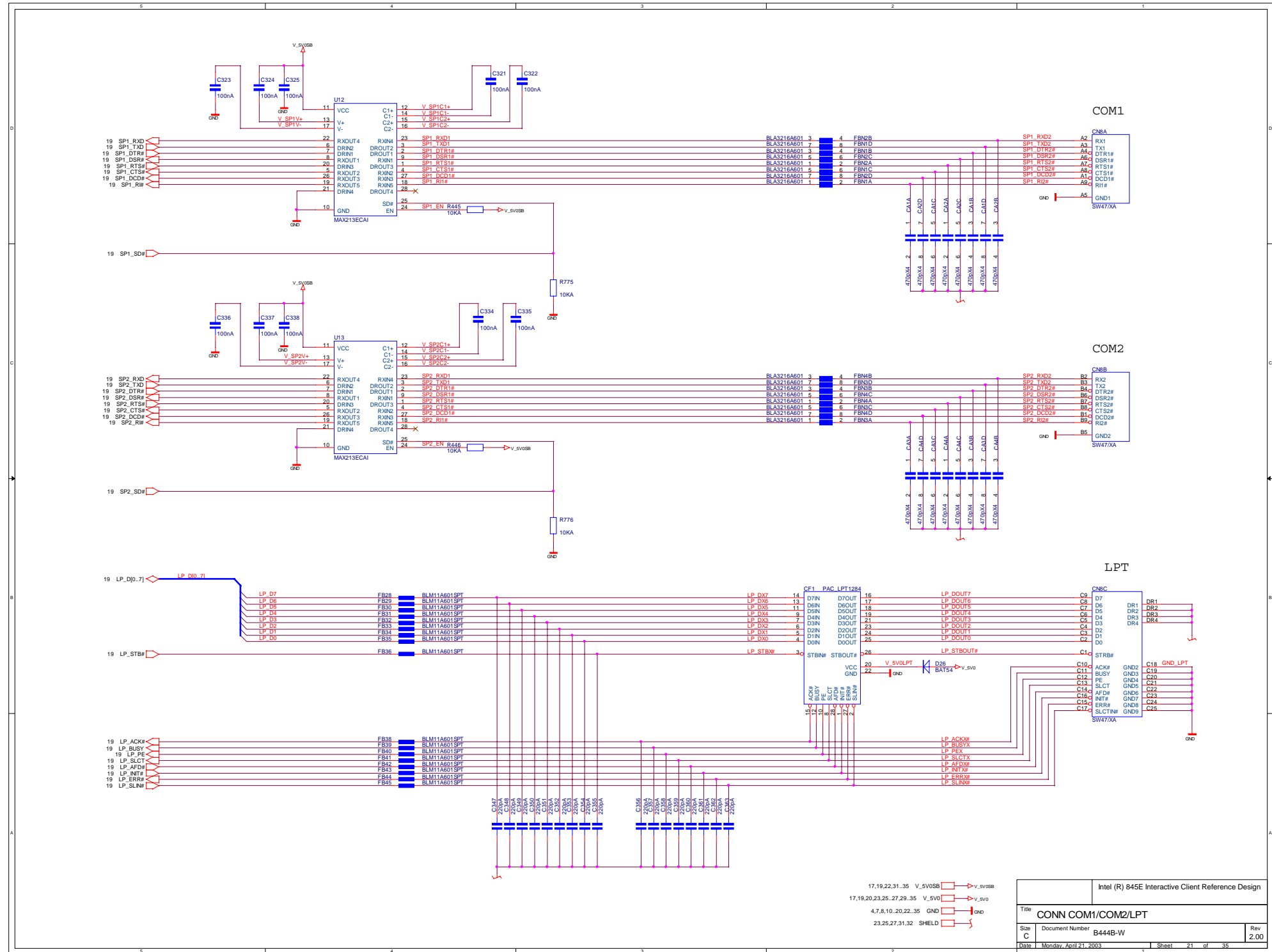


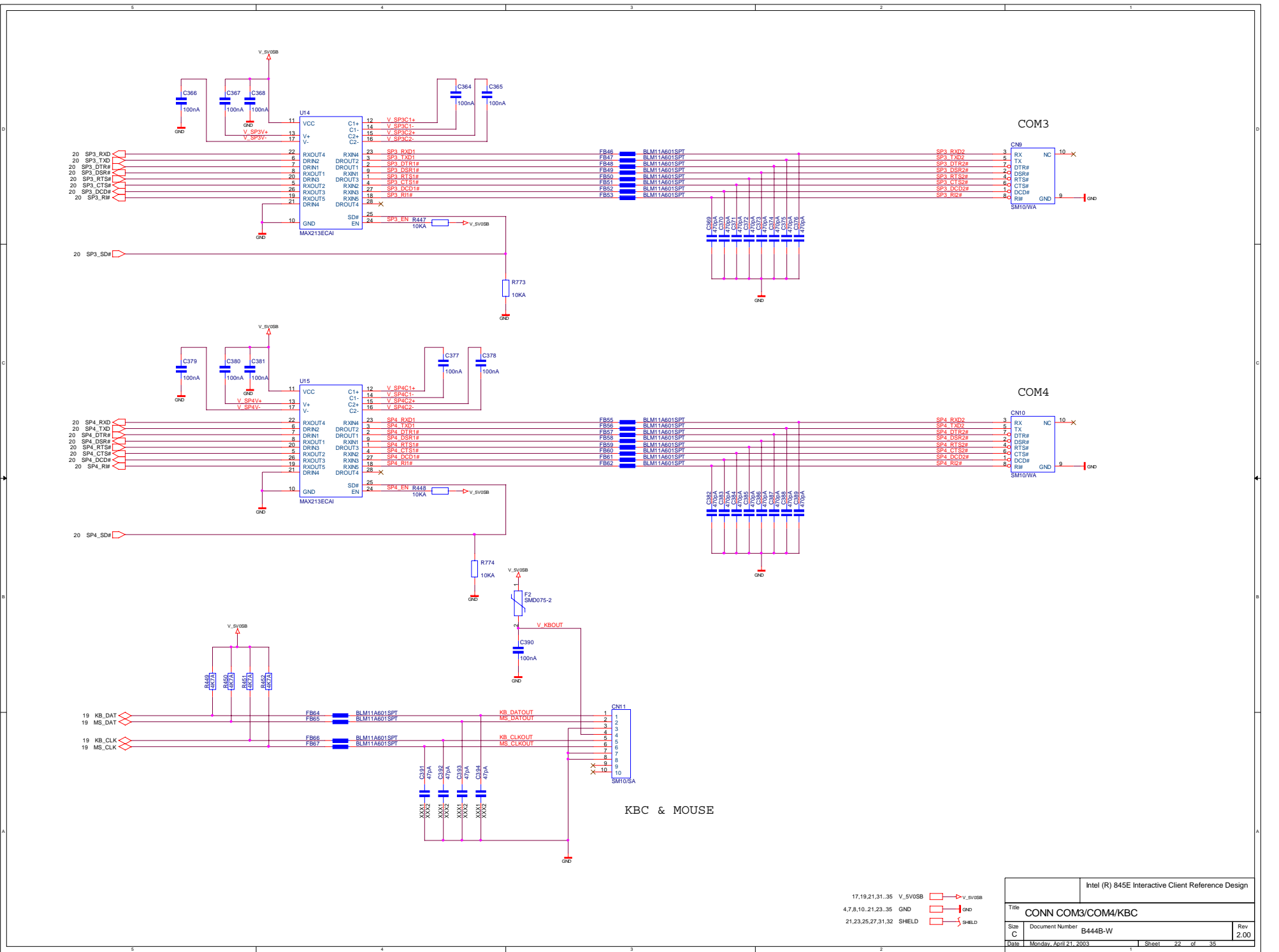
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- 17,19,21,23,25,27,29,35 V_5V0 ■
- 15,18,24,25,29,31,33,35 V_3V3SB ■
- 6,8,12,15,17,19,23,26,28,33,35 V_3V3 ■
- 4,7,8,10,19,21,35 GND ■

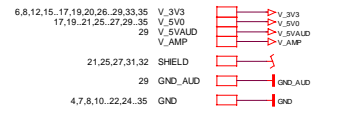
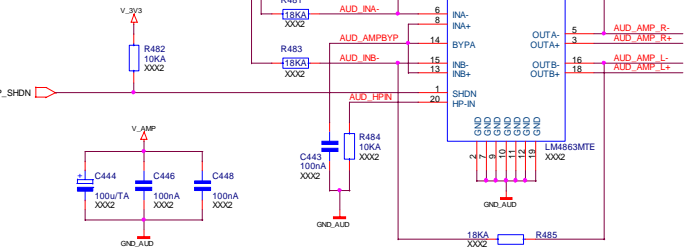
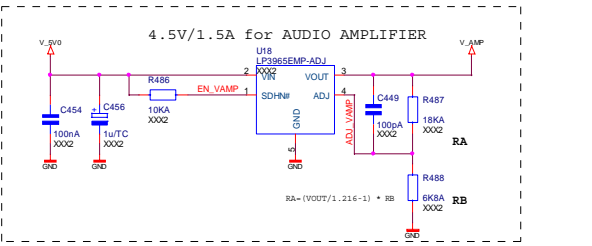
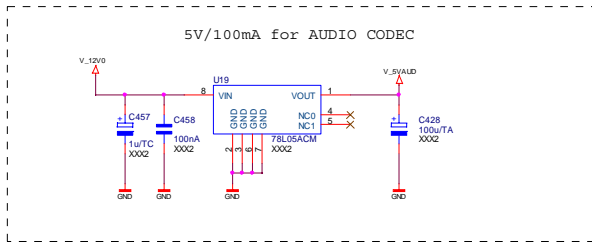
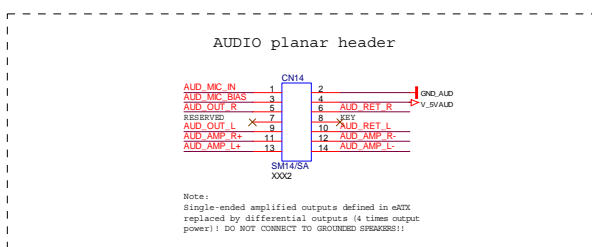
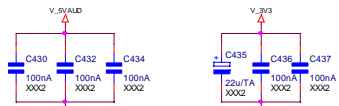
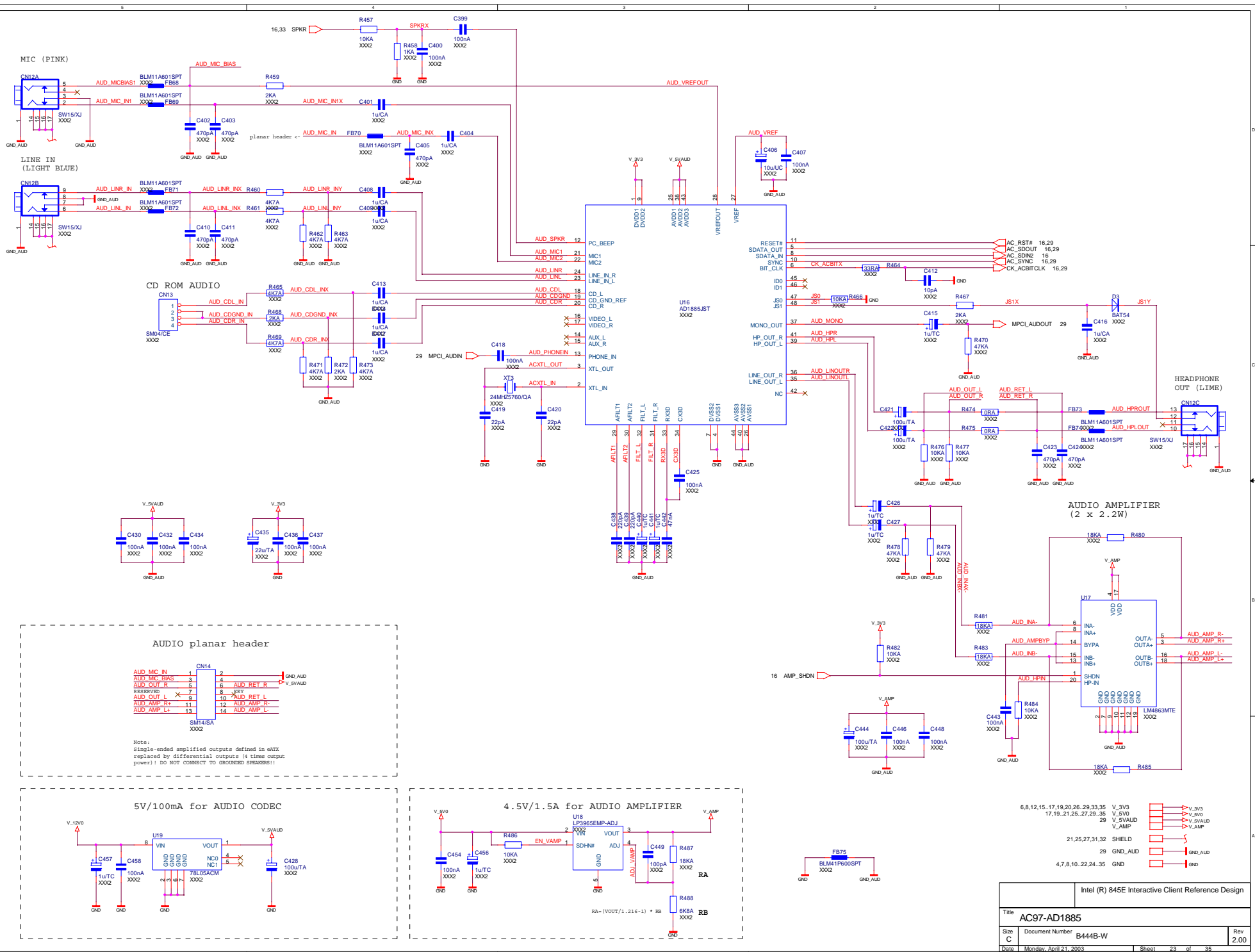
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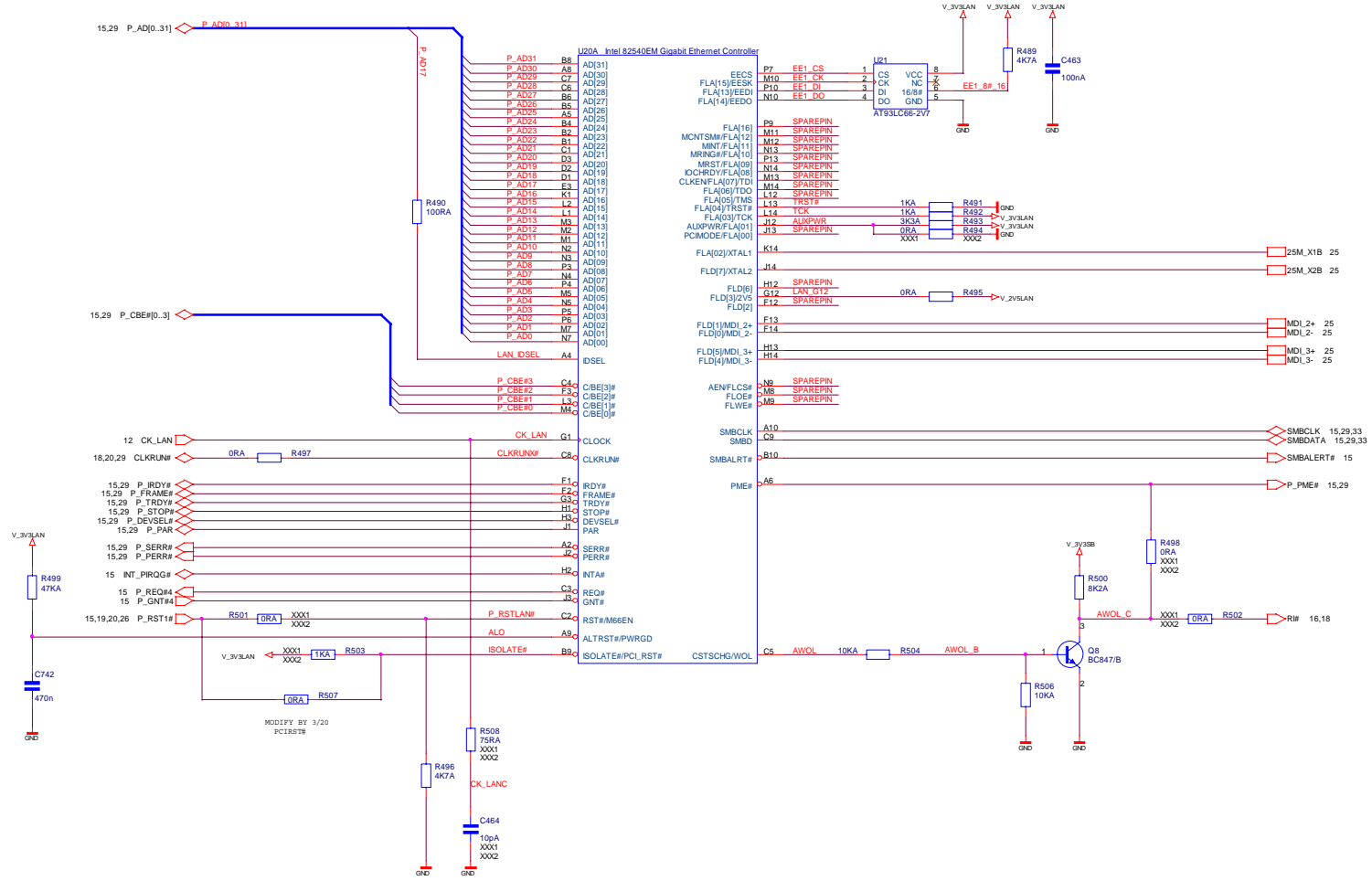


17,19,21,31..35 V_SV05B
 4,7,8,10,21,23,35 GND
 21,23,25,27,31,32 SHIELD

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Title	CONN COM3/COM4/KBC
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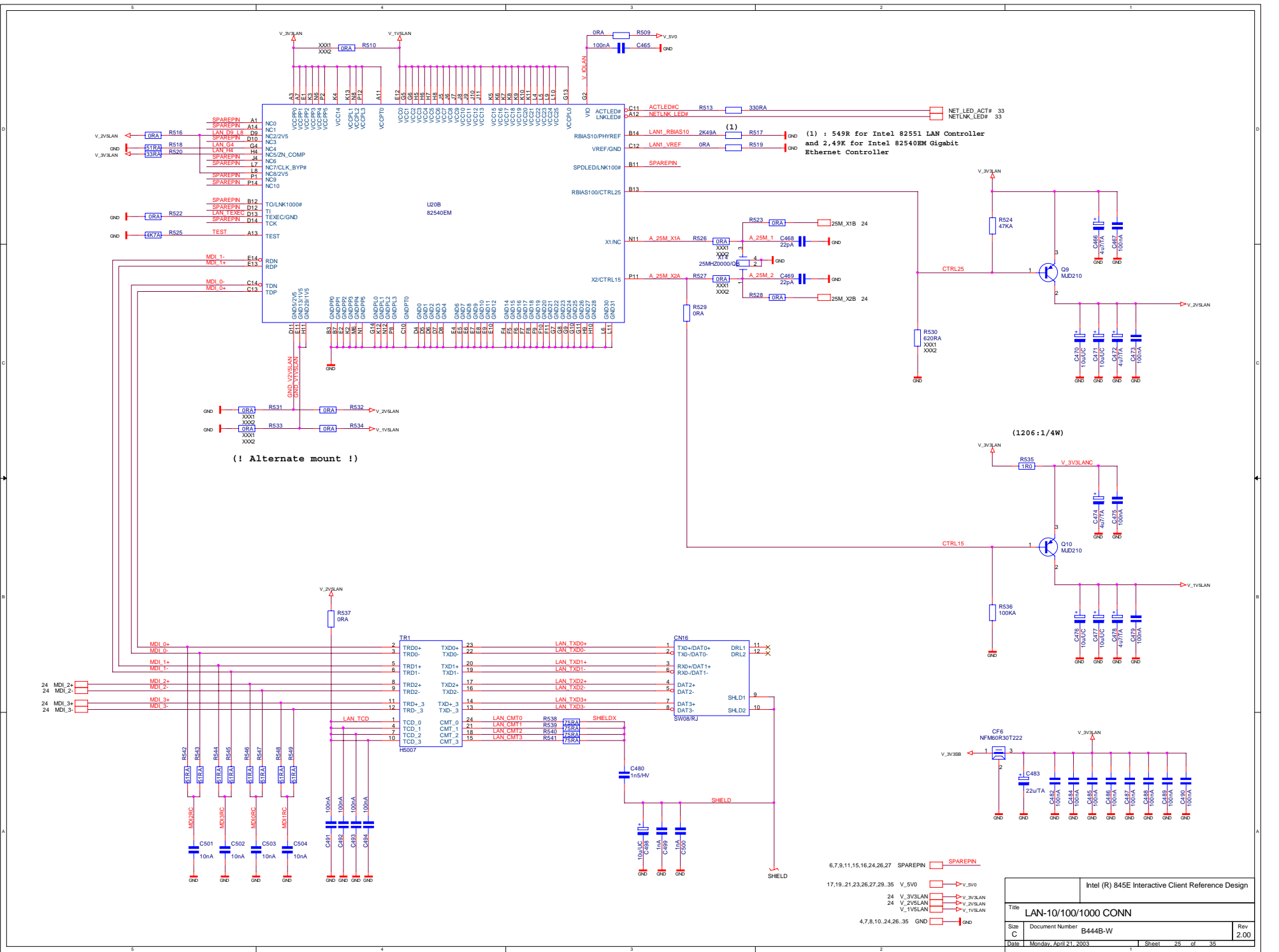


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6.7,8,11,15,16,25,27 SPAREPIN SPAREPIN
 15,20,25,29,31,33,35 V_3V3SSB V_3V3SSB
 25 V_3V3LAN V_3V3LAN
 25 V_2V5LAN V_2V5LAN
 4.7,8,10,23,25,35 GND GND

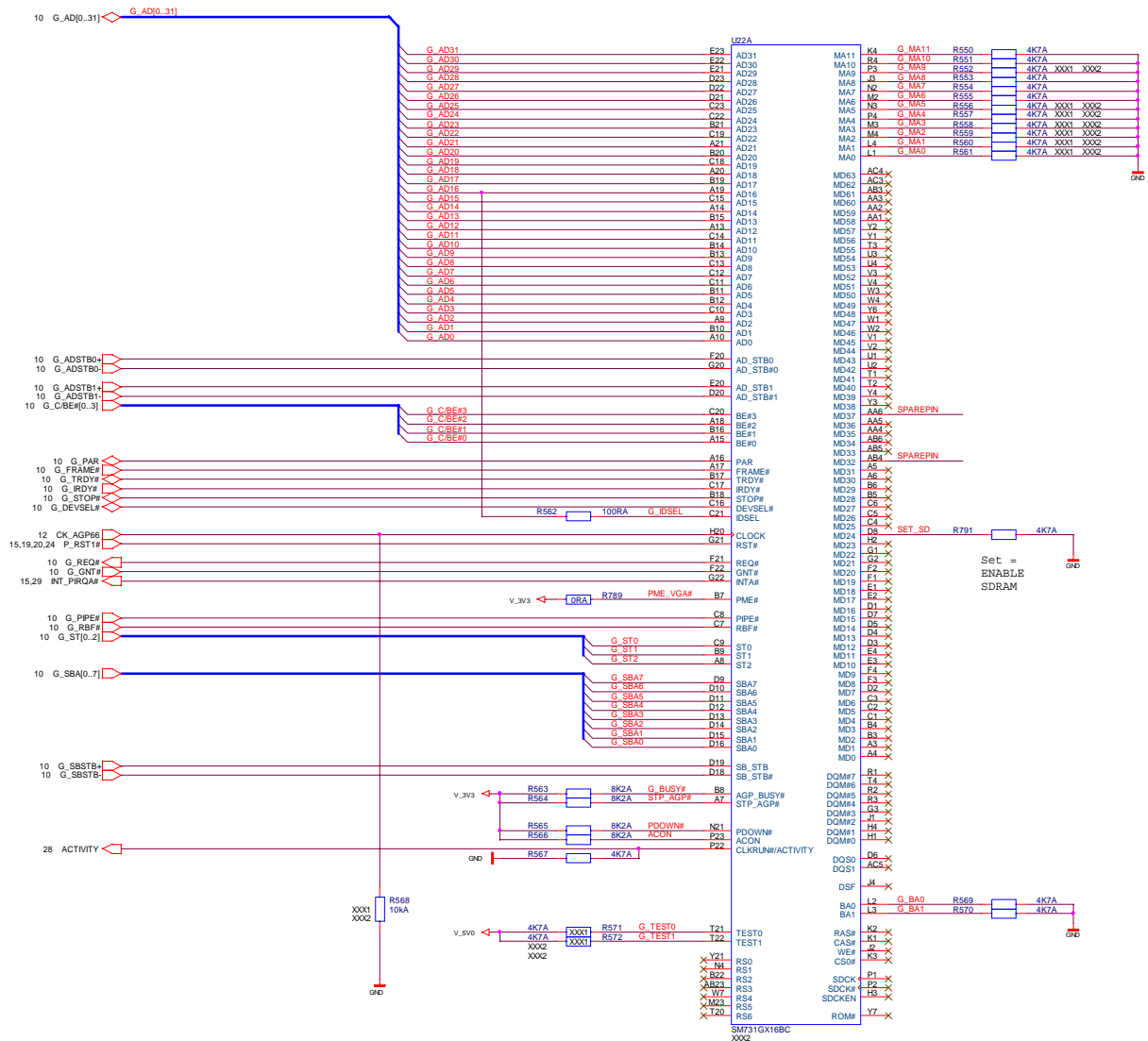
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(! Alternate mount !)

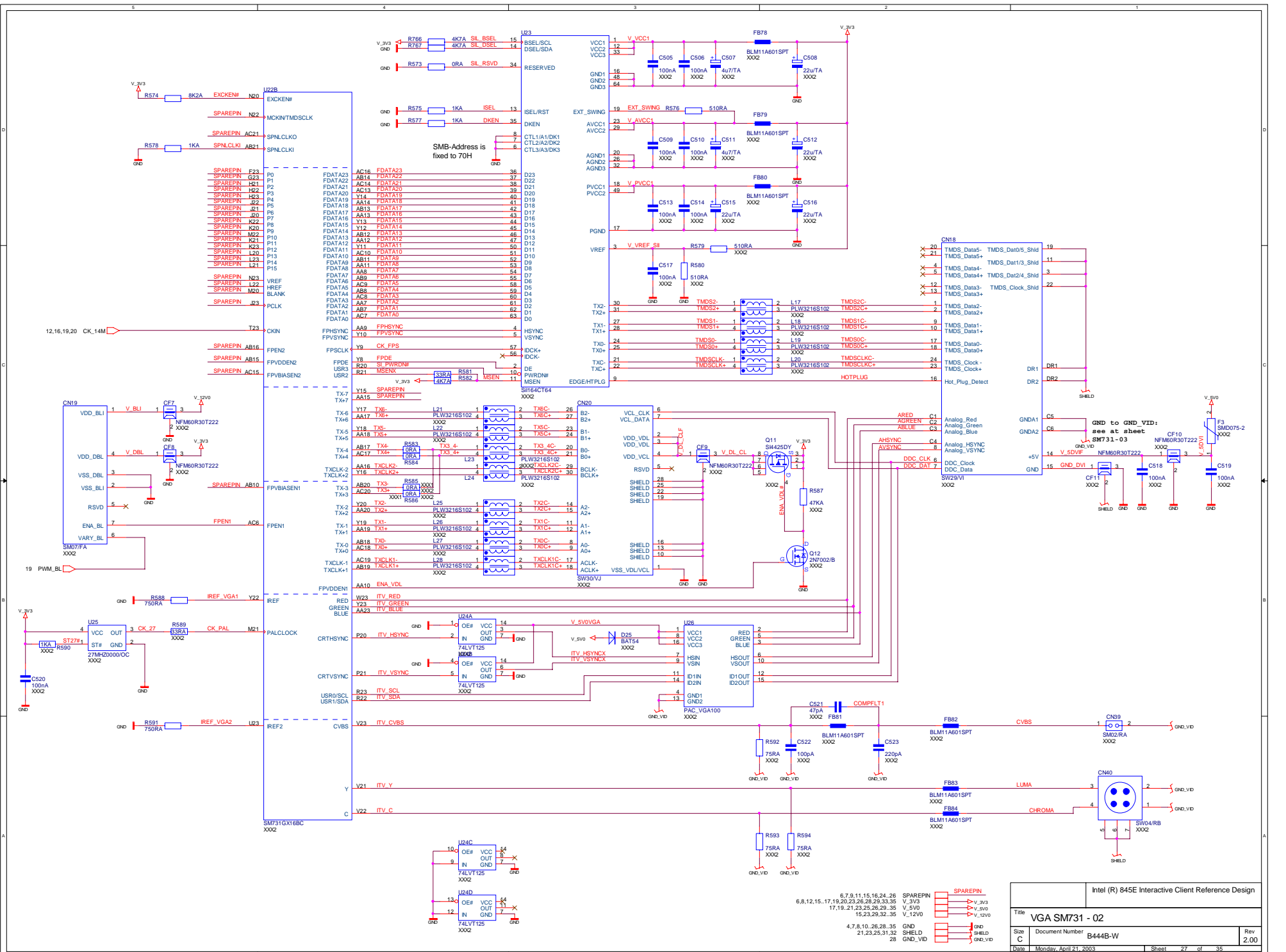
- 6,7,9,11,15,16,24,26,27 SPAREPIN SPAREPIN
- 17,19,21,23,26,27,29...35 V_5V0 V_5V0
- 24 V_3V3LAN V_3V3LAN
- 24 V_2V5LAN V_2V5LAN
- 24 V_1V5LAN V_1V5LAN
- 4,7,8,10,24,26...35 GND GND

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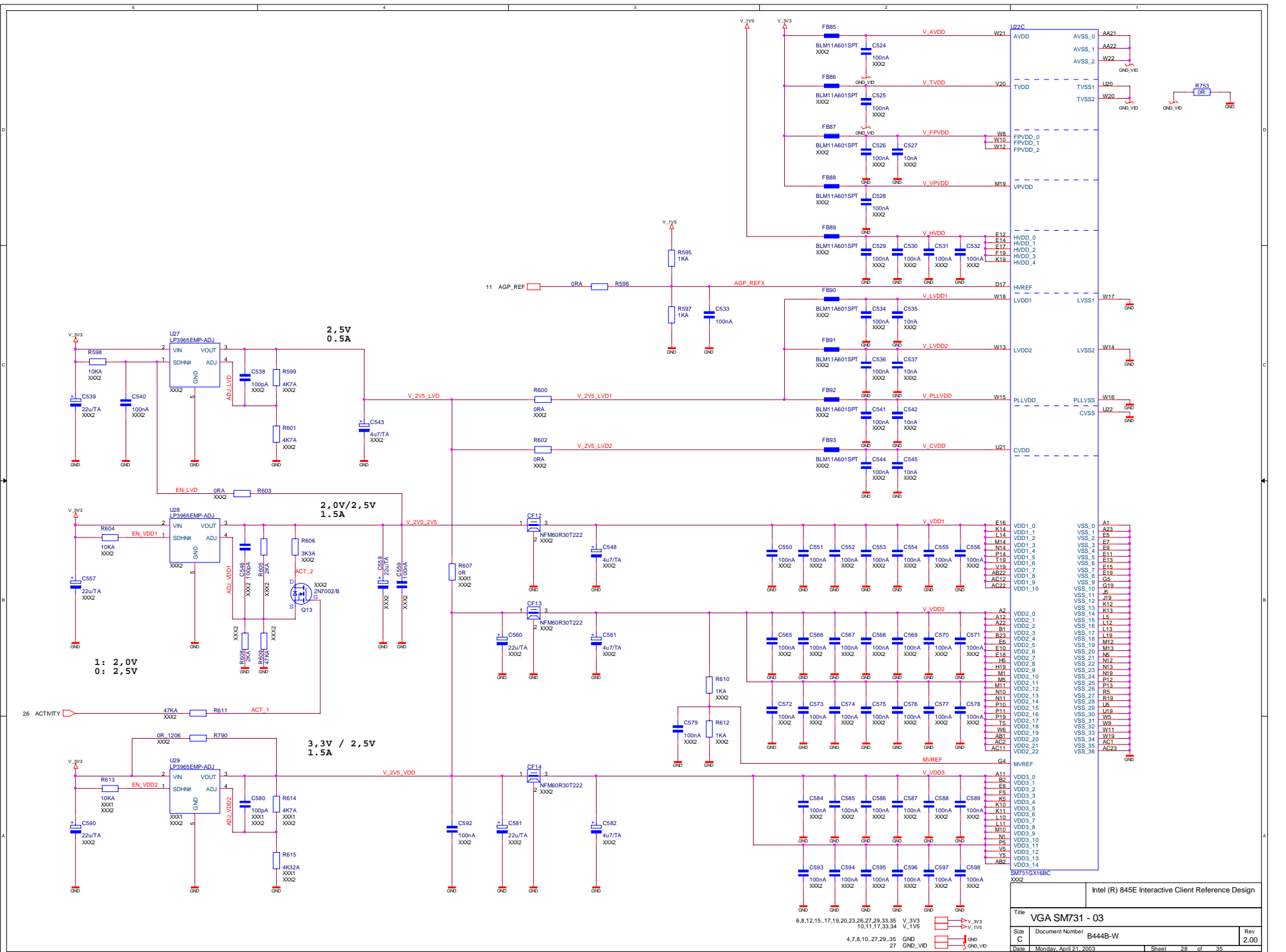
- 6,7,9,11,15,16,24,25,27 SPAREPIN □ SPAREPIN
- 17,19,21,23,25,27,29,35 V_5V0 □ V_5V0
- 6,8,12,15,17,19,20,23,27,29,33,35 V_3V3 □ V_3V3
- 10,11,17,28,33,34 V_1V5 □ V_1V5
- 4,7,8,10,25,27,35 GND □ GND

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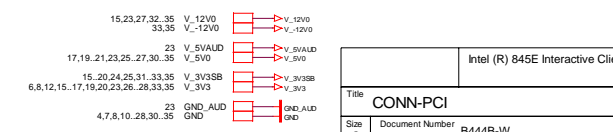
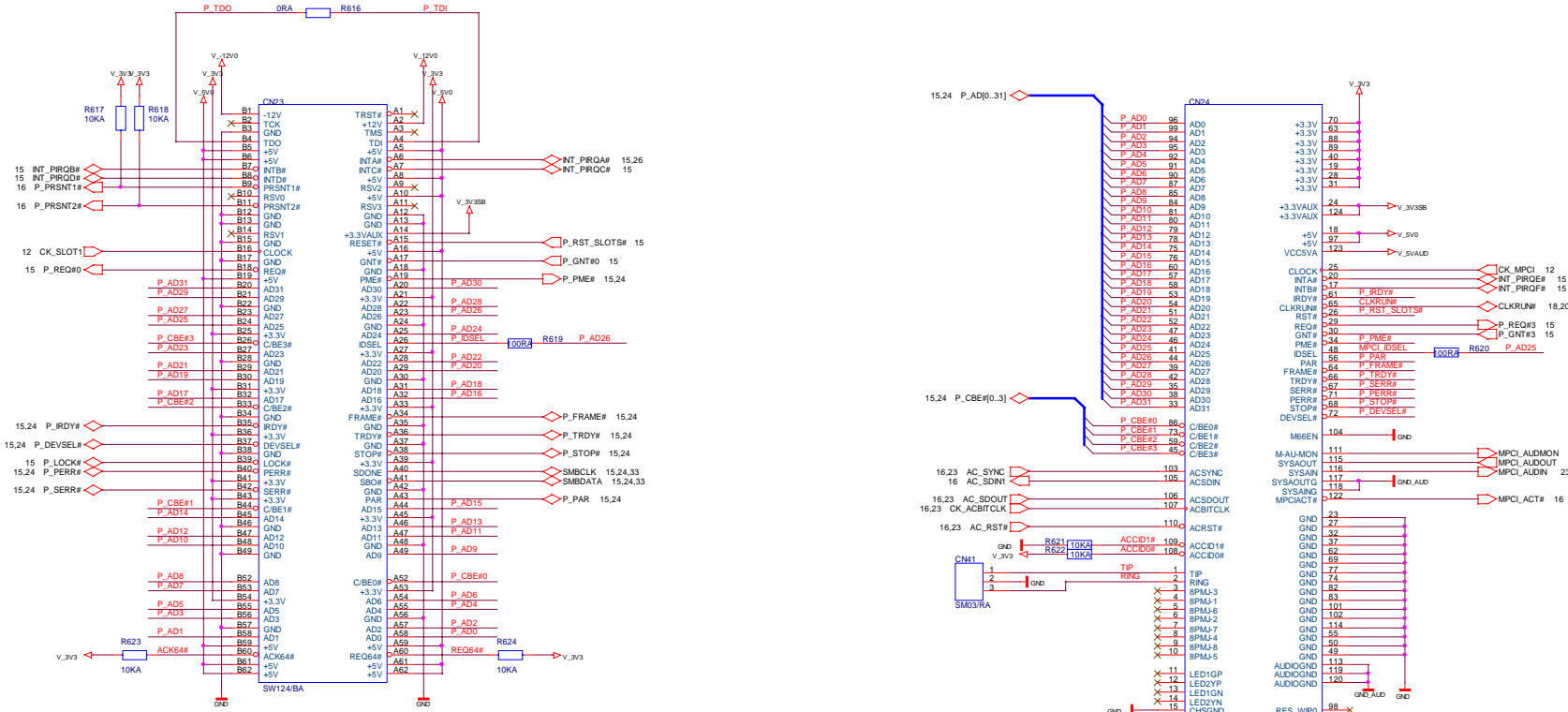
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 6.7, 8, 11, 15, 16, 24, 26 SPAREPIN
 6.8, 12, 15, 17, 19, 20, 23, 26, 28, 29, 33, 35 V_V3V3
 17, 19, 21, 23, 25, 26, 29, 35 V_V10
 15, 23, 29, 32, 35 V_V12V0
 4.7, 8, 10, 26, 28, 35 GND
 21, 23, 25, 31, 32 SHIELD
 28 GND_VID



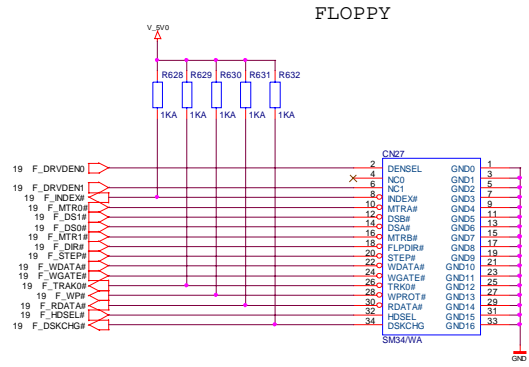
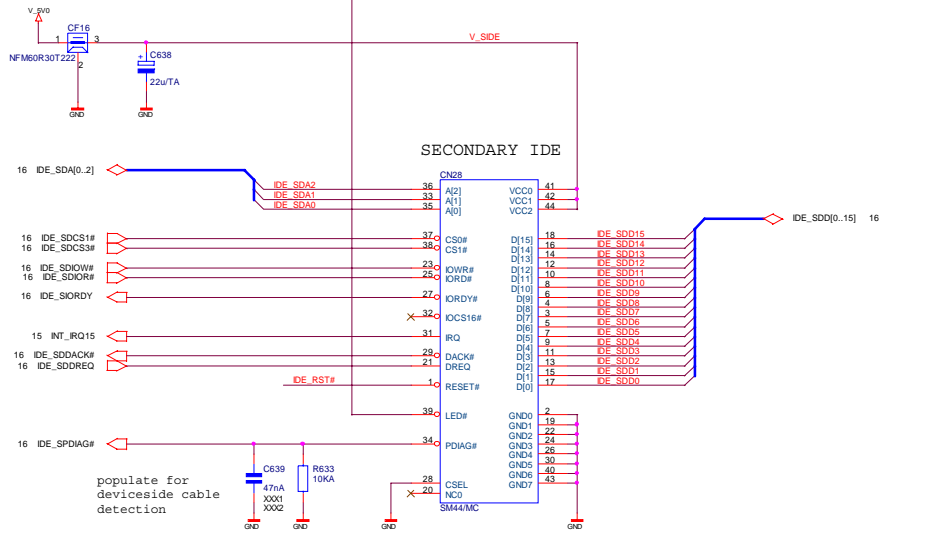
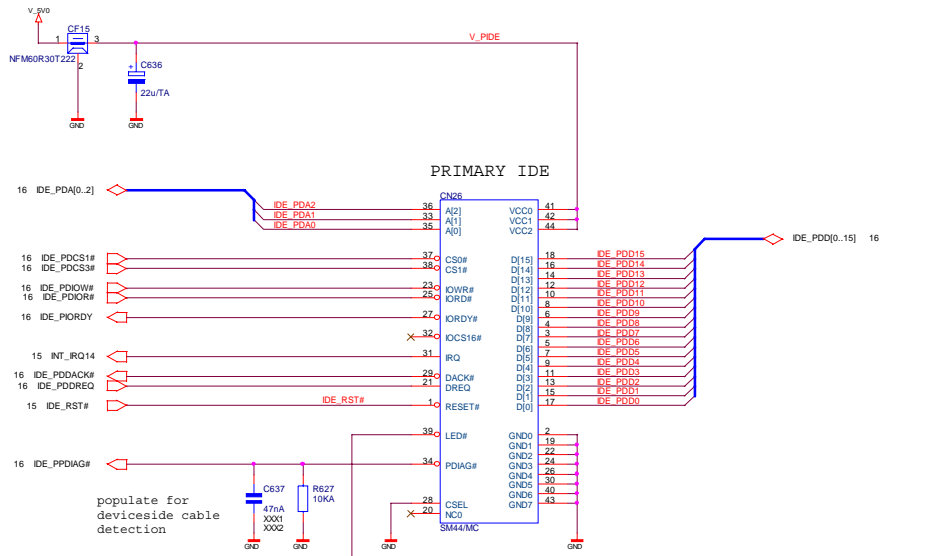
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 10,11,17,33,34 V_1V5
 4,7,8,10,27,29,35 GND
 27 GND_VID

VSS_0	A1
VSS_1	AA2
VSS_2	AA3
VSS_3	AA4
VSS_4	AA5
VSS_5	AA6
VSS_6	AA7
VSS_7	AA8
VSS_8	AA9
VSS_9	AA10
VSS_10	AA11
VSS_11	AA12
VSS_12	AA13
VSS_13	AA14
VSS_14	AA15
VSS_15	AA16
VSS_16	AA17
VSS_17	AA18
VSS_18	AA19
VSS_19	AA20
VSS_20	AA21
VSS_21	AA22
VSS_22	AA23
VSS_23	AA24
VSS_24	AA25
VSS_25	AA26
VSS_26	AA27
VSS_27	AA28
VSS_28	AA29
VSS_29	AA30
VSS_30	AA31
VSS_31	AA32
VSS_32	AA33
VSS_33	AA34
VSS_34	AA35
VSS_35	AA36
VSS_36	AA37

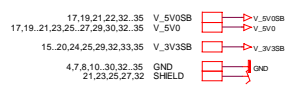
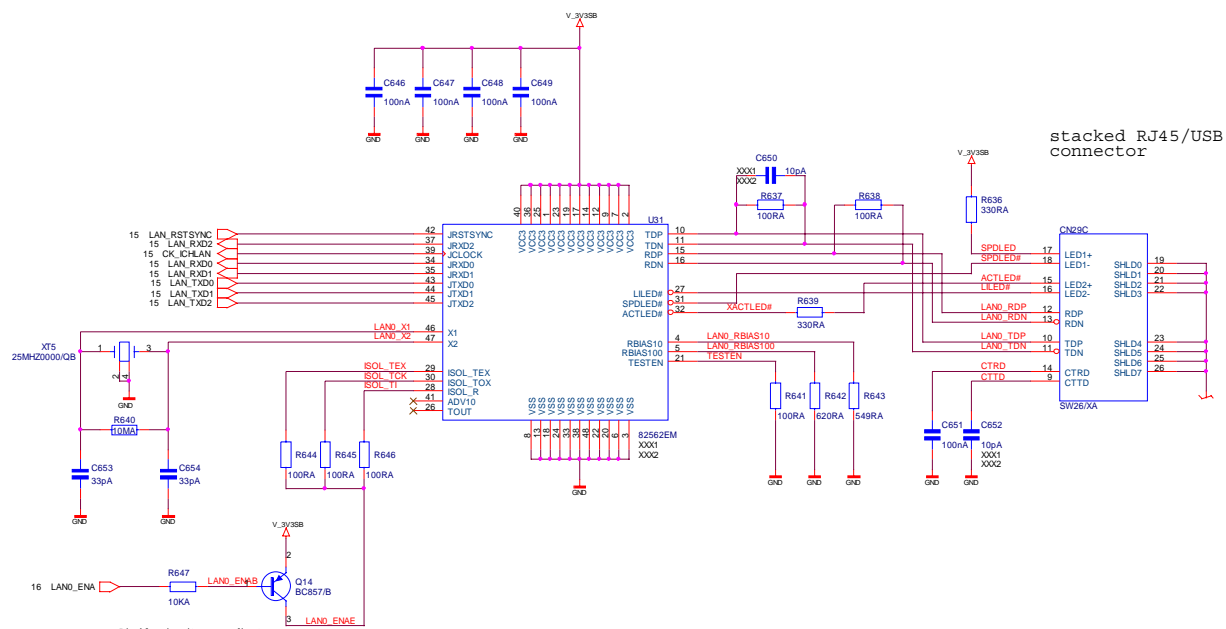
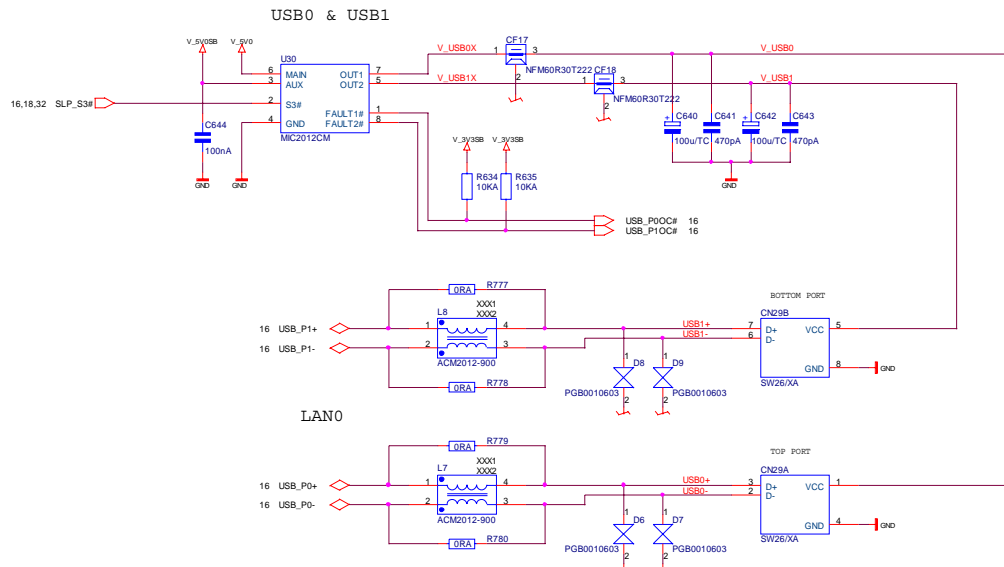


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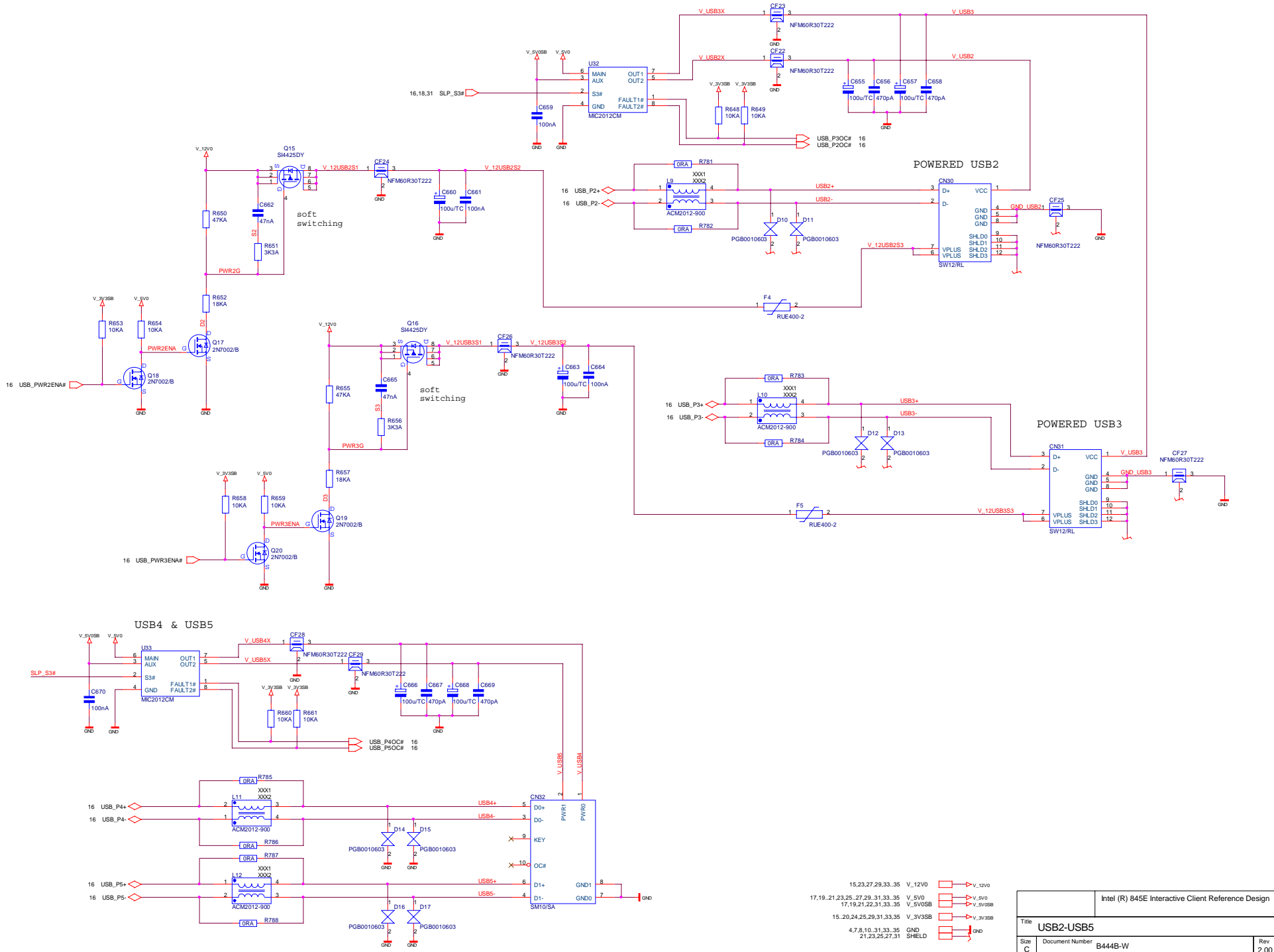


17,19,21,23,25,27,29,31,35 V_5V0 v_5v0
 17,19,21,22,31,35 V_5V0SB v_5v0sb
 4,7,8,10,29,31,35 GND gnd

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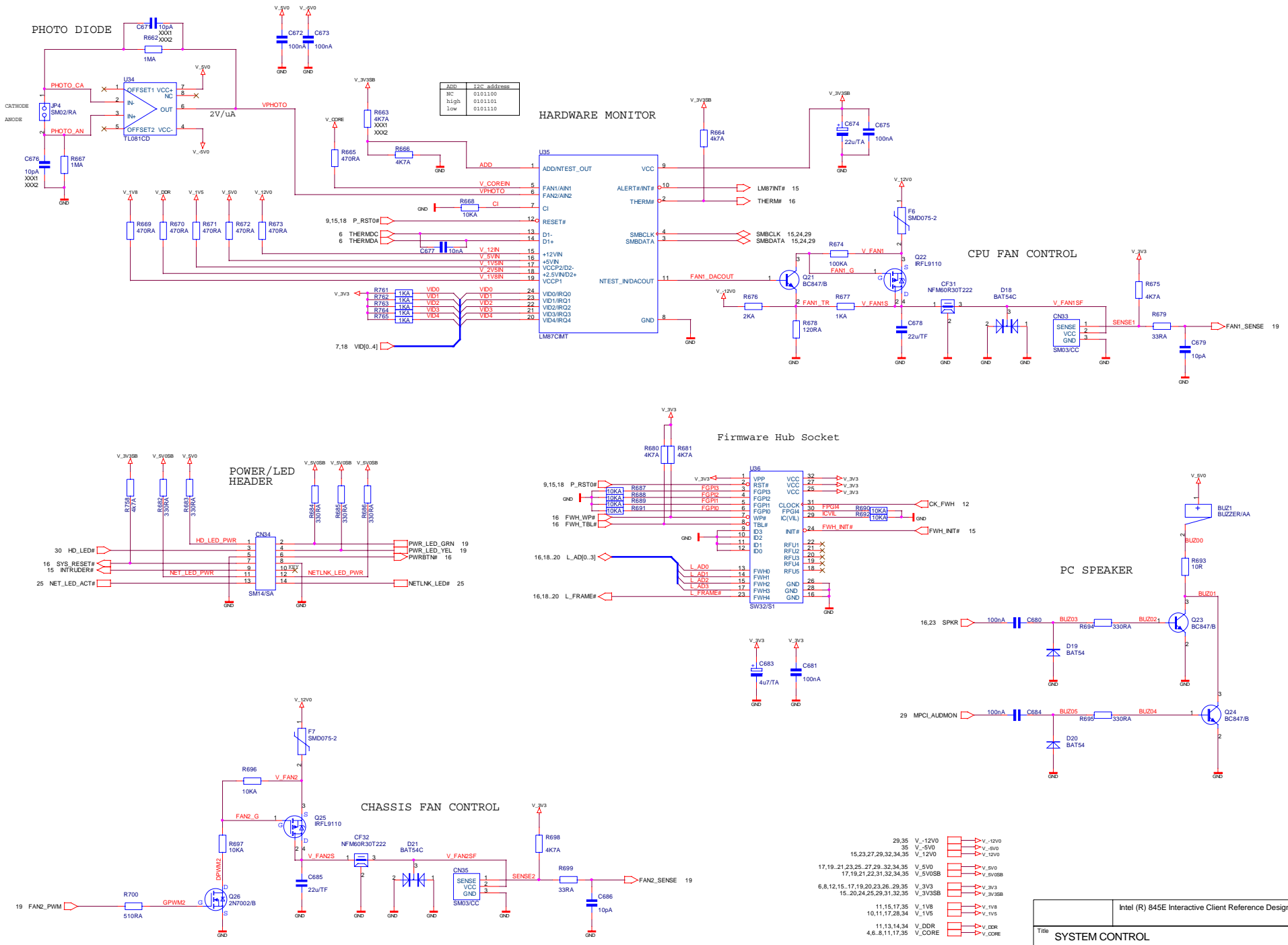


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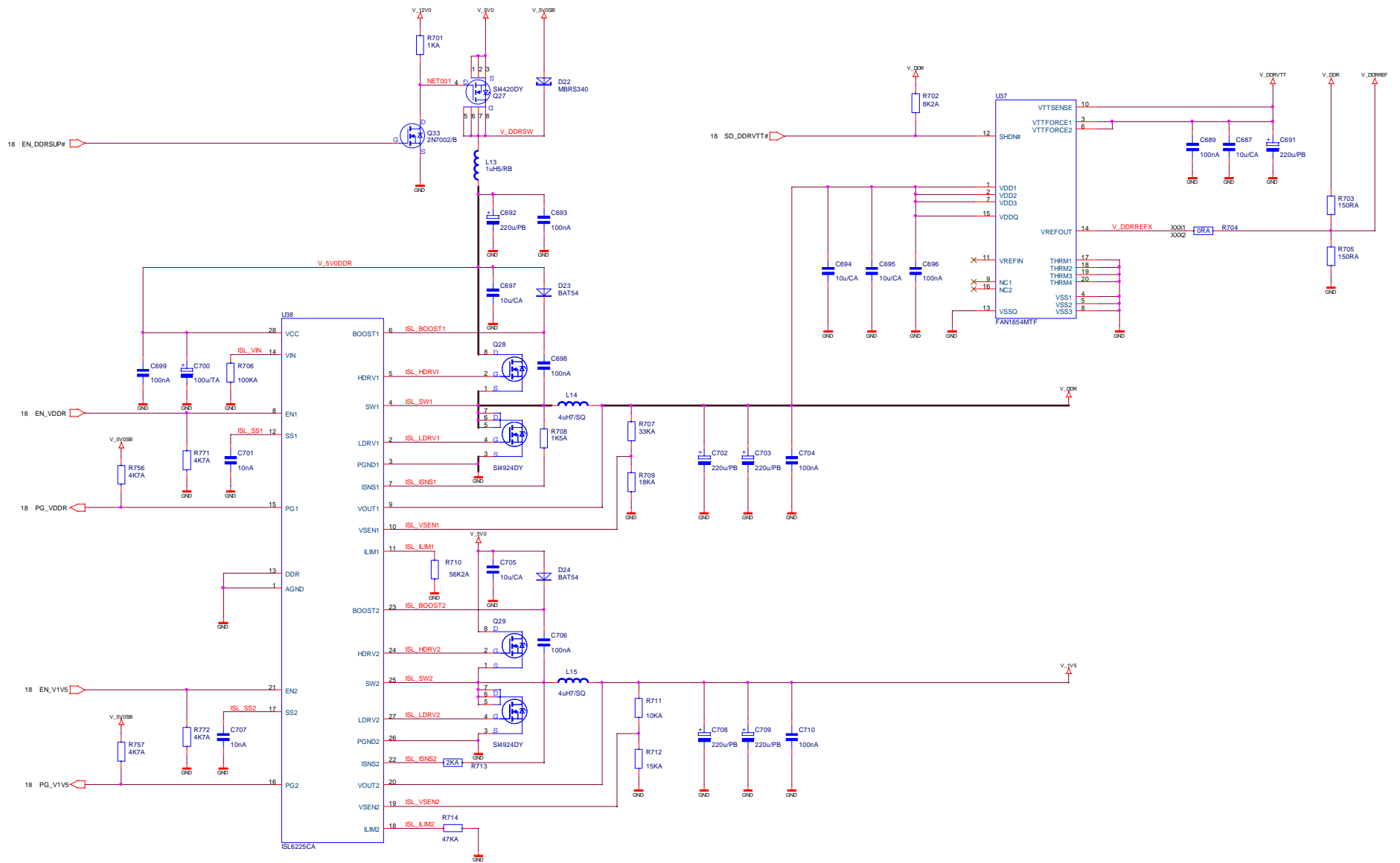


- 15,23,27,29,33,35 V_12V0
- 17,19,21,23,25,27,29,31,33,35 V_5V0
- 17,19,21,23,31,33,35 V_5V0SB
- 15,20,24,25,29,31,33,35 V_3V3SB
- 4,7,8,10,31,33,35 GND
- 21,23,25,27,31 SHIELD

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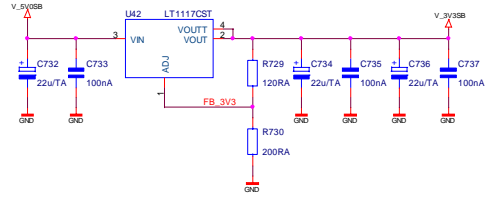
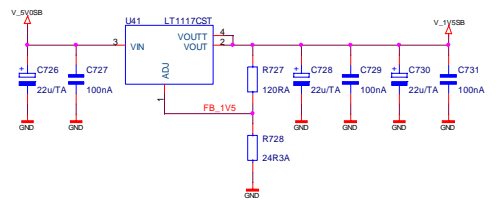
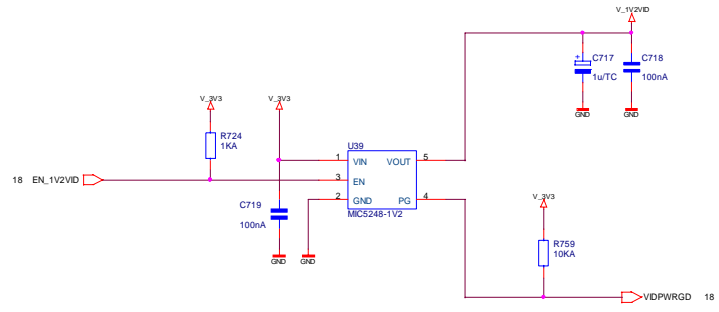
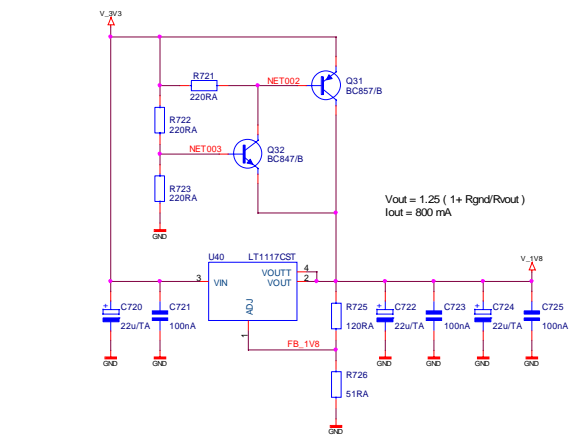
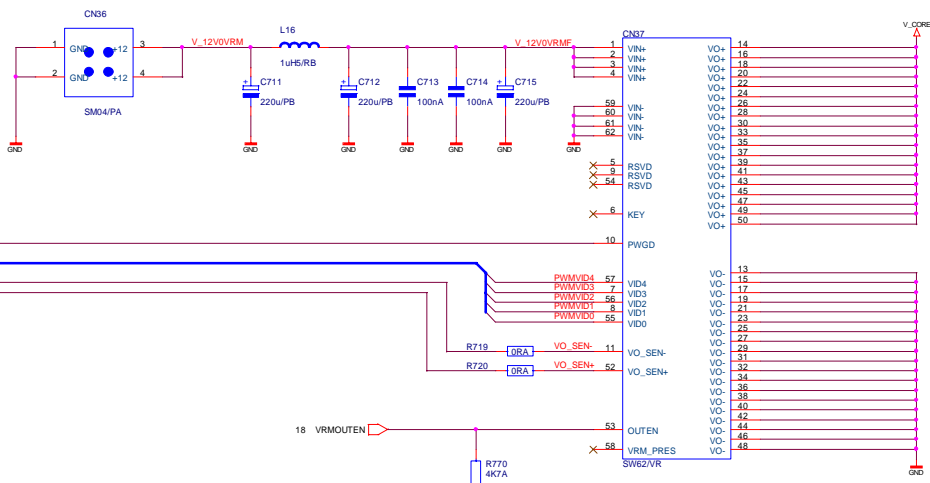
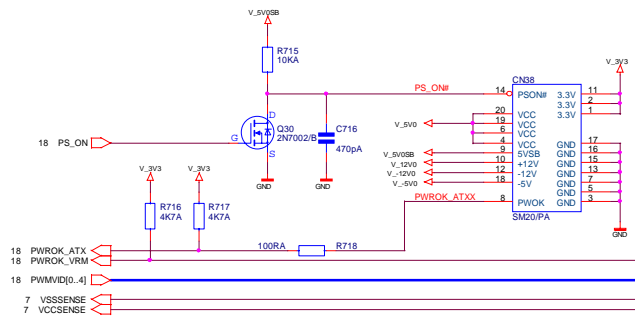


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- 15,23,27,29,32,33,35 V_12V0
- 17,19,21,23,25,27,29,33,35 V_5V0
- 17,19,21,22,31,33,35 V_5V0SB
- 10,11,17,29,33 V_1V5
- 11,13,14,33 V_DDR
- 11,14 V_DDRVTT
- 11,13,14 V_DDRREF
- 4,7,8,10,33,35 GND

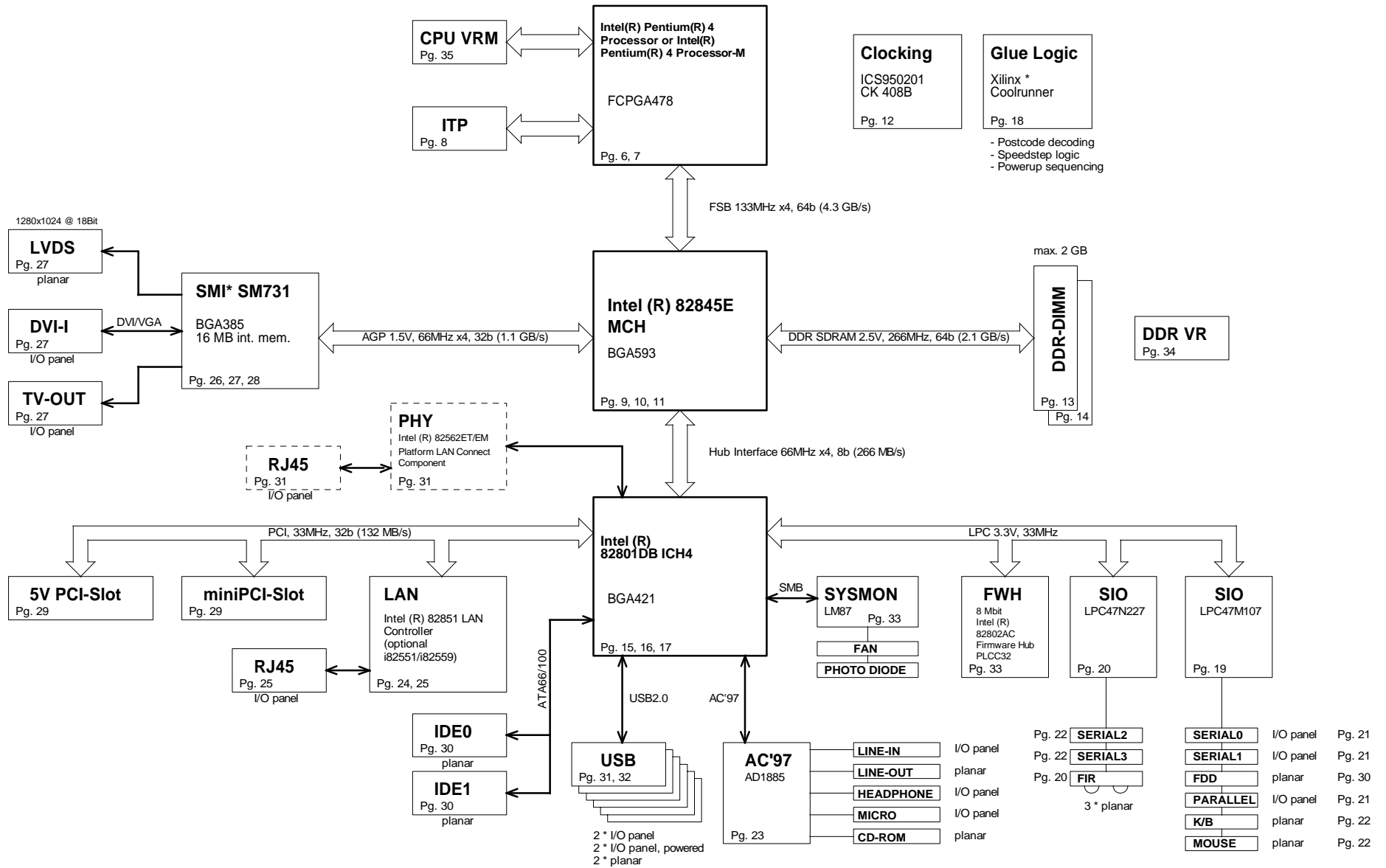
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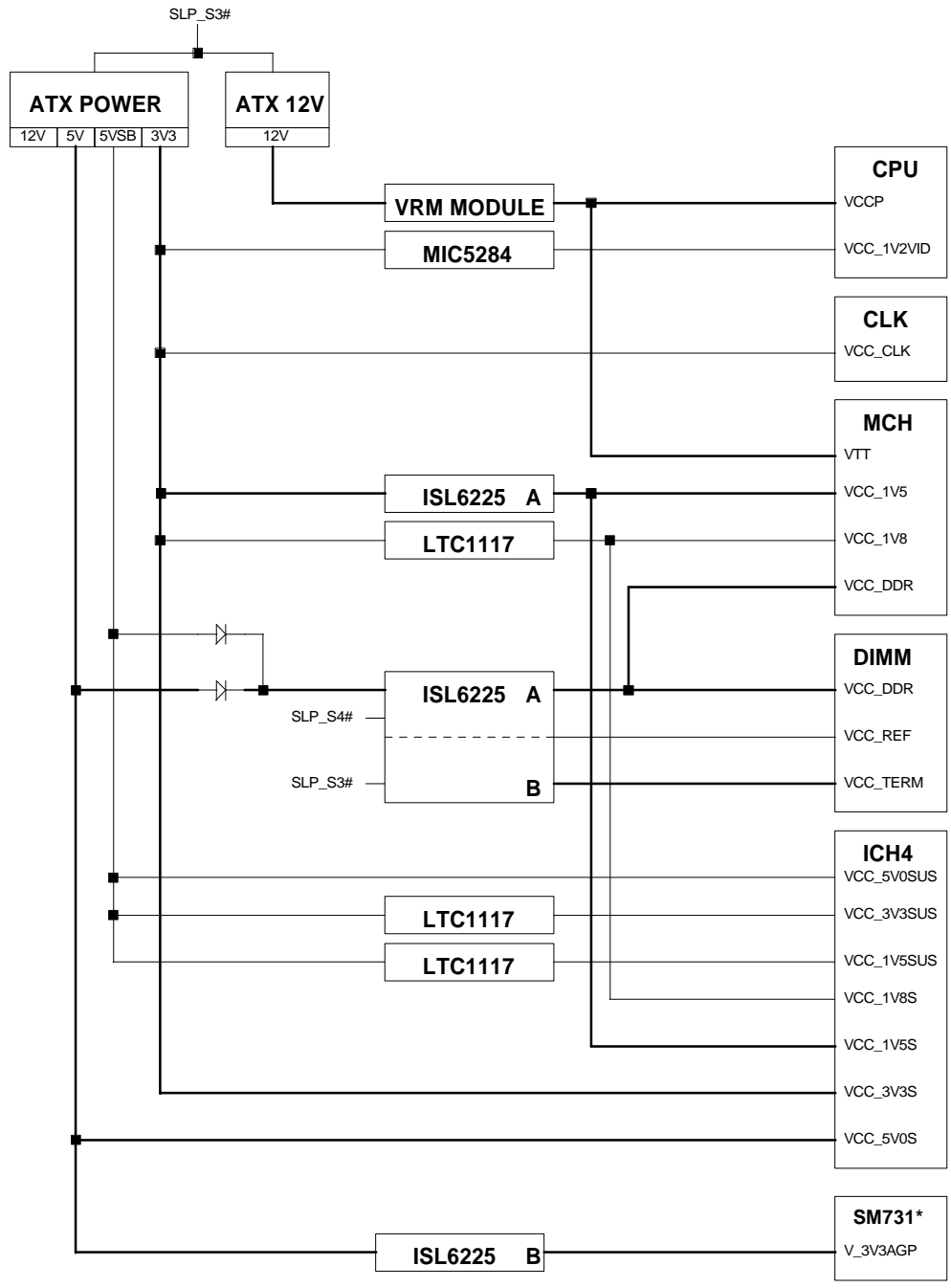
- 4,6,8,11,17,33 V_CORE
- 7 V_1V2VID
- 17 V_1V5SSB
- 11,15,17,33 V_1V8
- 6,8,12,15,17,19,20,23,26,29,33 V_3V3
- 15,20,24,25,29,31,33 V_5V0SB
- 17,19,21,22,31,34 V_5V0
- 15,23,27,29,32,34 V_12V0
- 29,33 V_-12V0
- 4,7,8,10,34 GND

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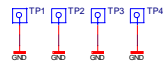
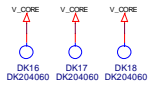
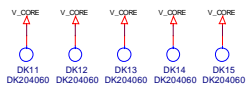
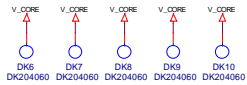
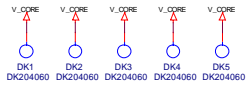
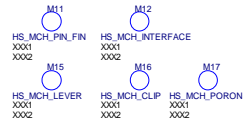
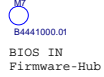
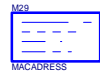
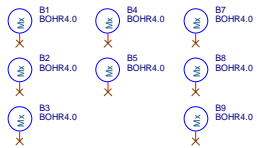
Block Diagram



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6.8,11,17,33,35 V_CORE V_CORE

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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_AMPPOUT 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			

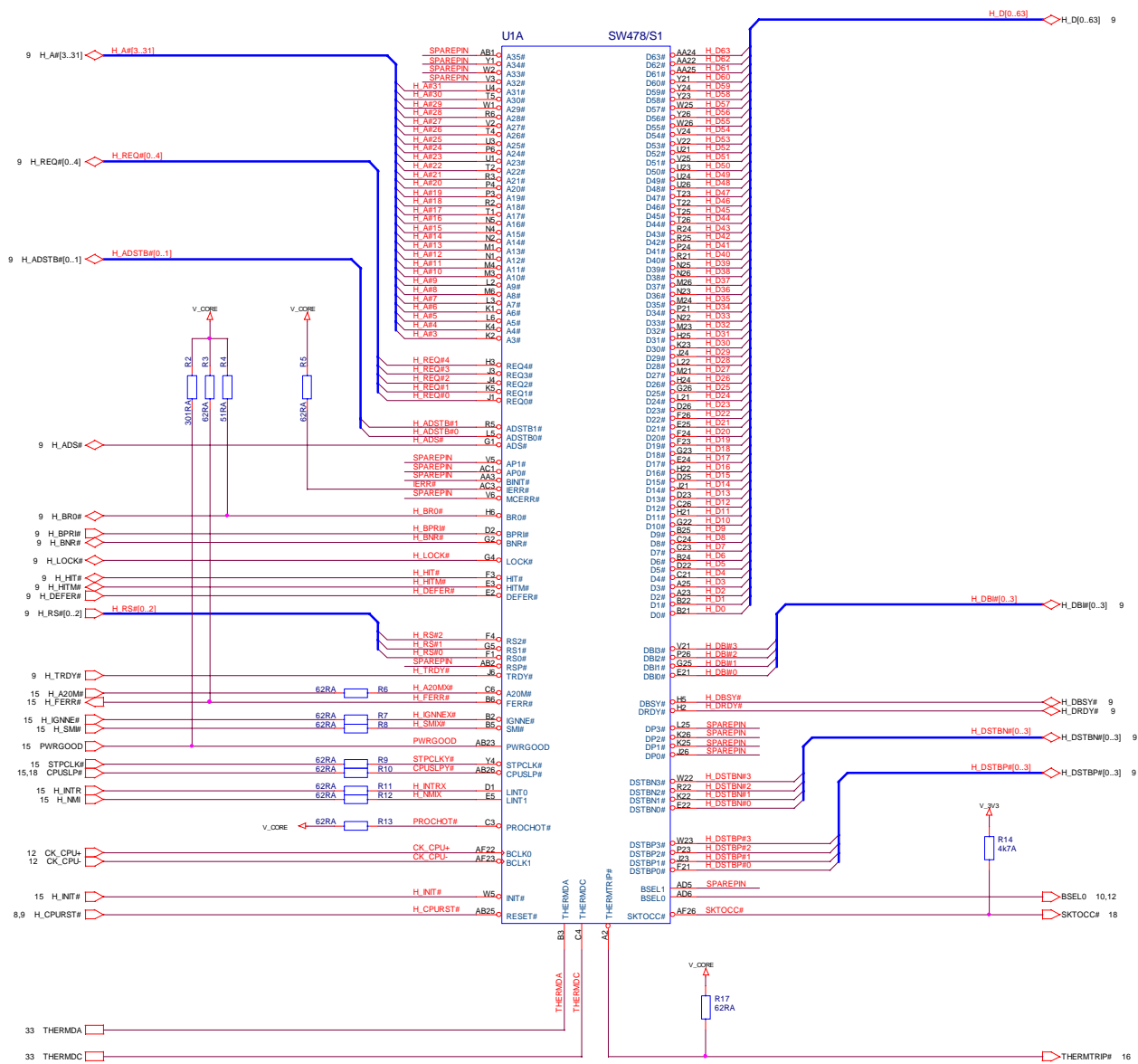
I2C DEVICES		
DEVICE	ADDRESS	BUS
CLOCK GENERATOR	1101001x	SM BUS
SO-DIMM0	1010000x	SM BUS
SO-DIMM1	1010001x	SM BUS
ICH4 SLAVE	1000100x	SM LINK
LAN CONTROLLER	N/A	SM LINK
LM87 HW MONITOR	0101110x	SM BUS

PCI/AGP DEVICES				
DEV	IDSEL	DEVICE	IRQ	REQ/GNT
00	AD16	SM731 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
GPIO16	SUPER I/O 0	SI00_SMI#
GPIO17	SUPER I/O 1	SI01_SMI#
GPIO18	SUPER I/O 0	SI00_PME#
GPIO112	SUPER I/O 1	SI01_PME#
GPIO113	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	NOG0
GPIO42	PCI SLOT	P_PRSNT1#
GPIO43	PCI SLOT	P_PRSNT2#

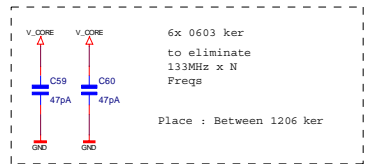
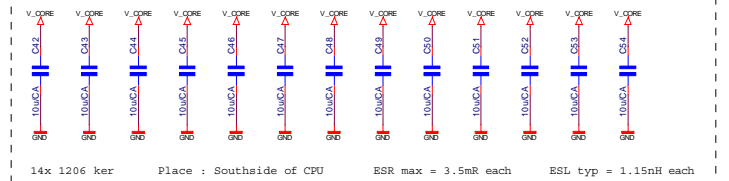
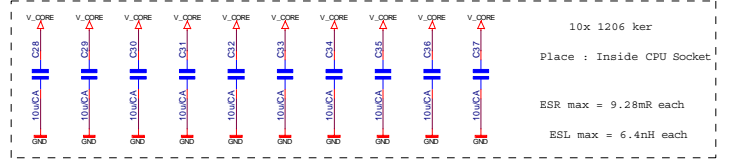
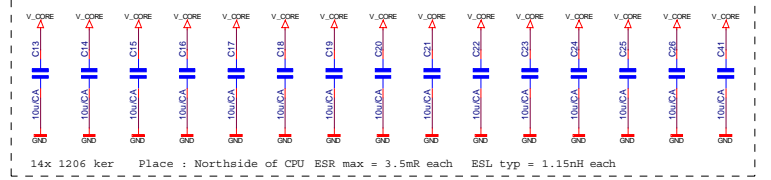
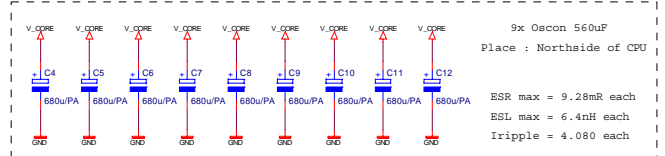
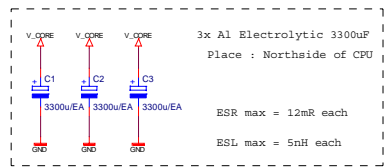
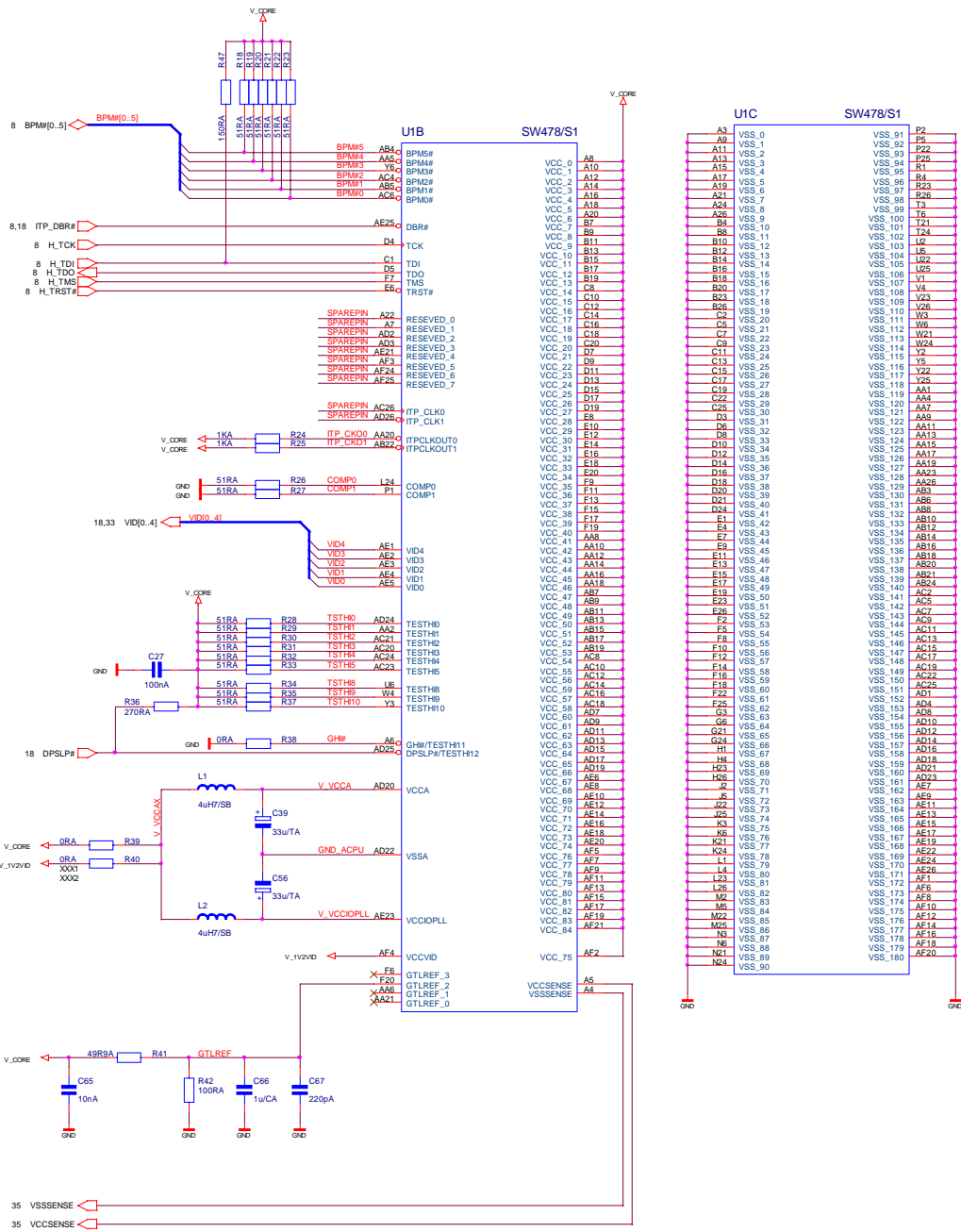
POWER STATES	
ON IN STATE	POWER PLANE
S5 (SOFT OFF)	V_*SB, V_KB, V_*LAN, V_USB*
S3 (SUS. TO RAM)	V_DDR, V_DDRREF
S0 (FULL ON)	OTHERS

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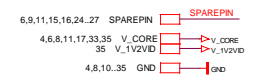


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 8,12,15,17,19,20,23,26,29,33,35 V_3V3 V_3V3
 4,7,8,11,17,33,35 V_CORE V_CORE
 4,7,8,10,35 GND GND

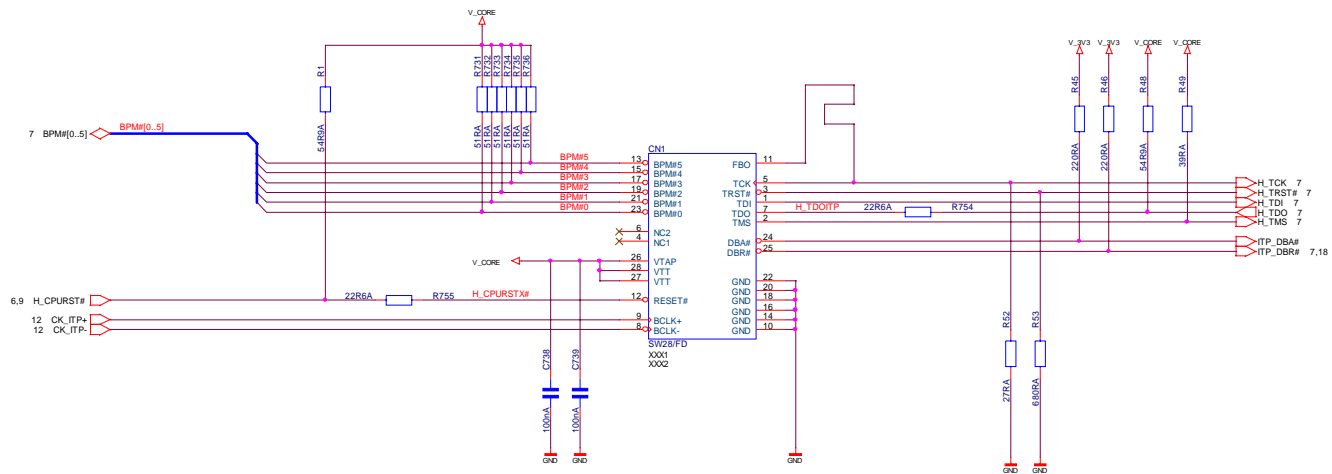
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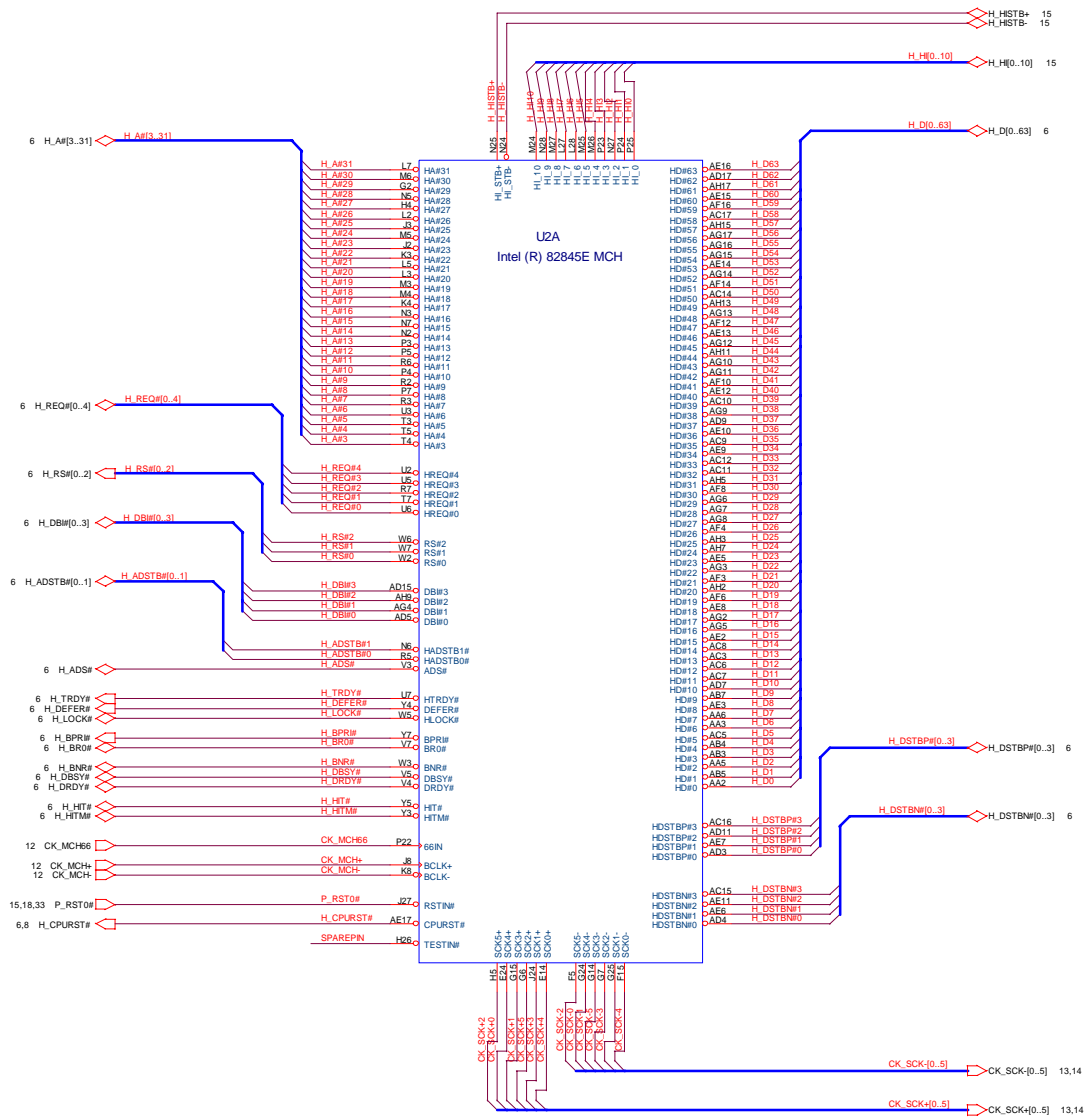
U1C		SW478/S1	
A3	VSS_0	P2	VSS_91
A6	VSS_1	P5	VSS_92
A11	VSS_2	P22	VSS_93
A13	VSS_3	P25	VSS_94
A15	VSS_4	R1	VSS_95
A17	VSS_5	R4	VSS_96
A19	VSS_6	R23	VSS_97
A21	VSS_7	R26	VSS_98
A24	VSS_8	T3	VSS_99
A26	VSS_9	T6	VSS_100
B4	VSS_10	T21	VSS_101
B8	VSS_11	T24	VSS_102
B10	VSS_12	L2	VSS_103
B12	VSS_13	L5	VSS_104
B14	VSS_14	L22	VSS_105
B16	VSS_15	L25	VSS_106
B20	VSS_16	V1	VSS_107
B22	VSS_17	V3	VSS_108
C2	VSS_18	V4	VSS_109
C5	VSS_19	V26	VSS_110
C7	VSS_20	V6	VSS_111
C9	VSS_21	V21	VSS_112
C11	VSS_22	V24	VSS_113
C13	VSS_23	V54	VSS_114
C15	VSS_24	Y5	VSS_115
C17	VSS_25	Y22	VSS_116
C19	VSS_26	Y25	VSS_117
C21	VSS_27	V18	VSS_118
C22	VSS_28	AA1	VSS_119
C23	VSS_29	AA4	VSS_120
C24	VSS_30	AA7	VSS_121
C25	VSS_31	AA9	VSS_122
C26	VSS_32	AA11	VSS_123
C27	VSS_33	AA13	VSS_124
C28	VSS_34	AA15	VSS_125
C29	VSS_35	AA17	VSS_126
C30	VSS_36	AA19	VSS_127
C31	VSS_37	AA23	VSS_128
C32	VSS_38	AA6	VSS_129
C33	VSS_39	AB3	VSS_130
C34	VSS_40	AB6	VSS_131
C35	VSS_41	AB2	VSS_132
C36	VSS_42	AB10	VSS_133
C37	VSS_43	AB12	VSS_134
C38	VSS_44	AB14	VSS_135
C39	VSS_45	AB16	VSS_136
C40	VSS_46	AB18	VSS_137
C41	VSS_47	AB20	VSS_138
C42	VSS_48	AB24	VSS_139
C43	VSS_49	AC5	VSS_140
C44	VSS_50	AC2	VSS_141
C45	VSS_51	AC5	VSS_142
C46	VSS_52	AC6	VSS_143
C47	VSS_53	AC9	VSS_144
C48	VSS_54	AC11	VSS_145
C49	VSS_55	AC13	VSS_146
C50	VSS_56	AC15	VSS_147
C51	VSS_57	AC17	VSS_148
C52	VSS_58	AC19	VSS_149
C53	VSS_59	AC22	VSS_150
C54	VSS_60	AC25	VSS_151
C55	VSS_61	AD1	VSS_152
C56	VSS_62	AD4	VSS_153
C57	VSS_63	AD8	VSS_154
C58	VSS_64	AD10	VSS_155
C59	VSS_65	AD12	VSS_156
C60	VSS_66	AD14	VSS_157
C61	VSS_67	AD16	VSS_158
C62	VSS_68	AD18	VSS_159
C63	VSS_69	AD21	VSS_160
C64	VSS_70	AD23	VSS_161
C65	VSS_71	AE7	VSS_162
C66	VSS_72	AE9	VSS_163
C67	VSS_73	AE11	VSS_164
C68	VSS_74	AE13	VSS_165
C69	VSS_75	AE15	VSS_166
C70	VSS_76	AE17	VSS_167
C71	VSS_77	AE19	VSS_168
C72	VSS_78	AE22	VSS_169
C73	VSS_79	AF6	VSS_170
C74	VSS_80	AF9	VSS_171
C75	VSS_81	AF11	VSS_172
C76	VSS_82	AF13	VSS_173
C77	VSS_83	AF15	VSS_174
C78	VSS_84	AF17	VSS_175
C79	VSS_85	AF19	VSS_176
C80	VSS_86	AF21	VSS_177
C81	VSS_87	AF16	VSS_178
C82	VSS_88	AF18	VSS_179
C83	VSS_89	AF20	VSS_180
C84	VSS_90		



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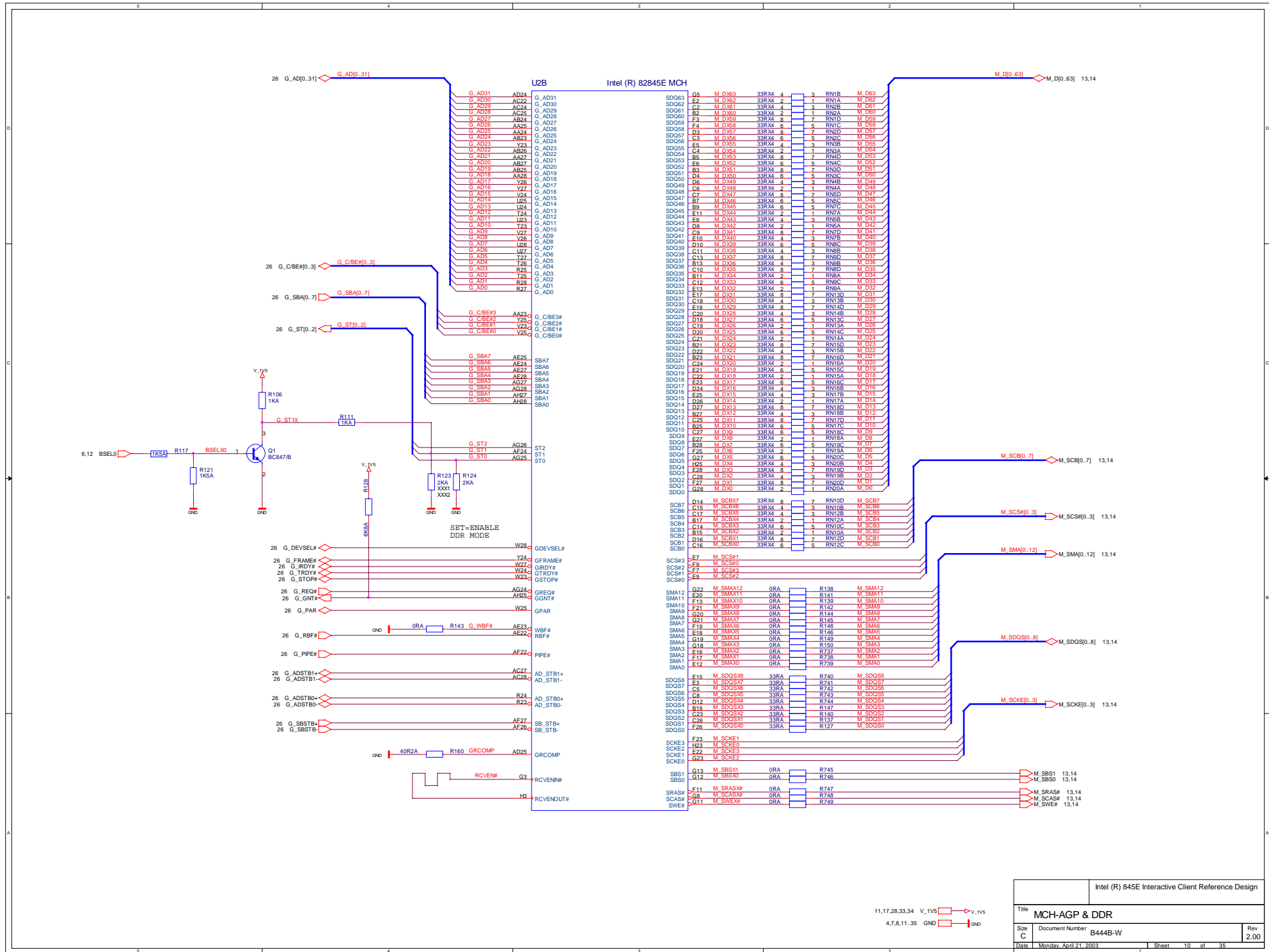


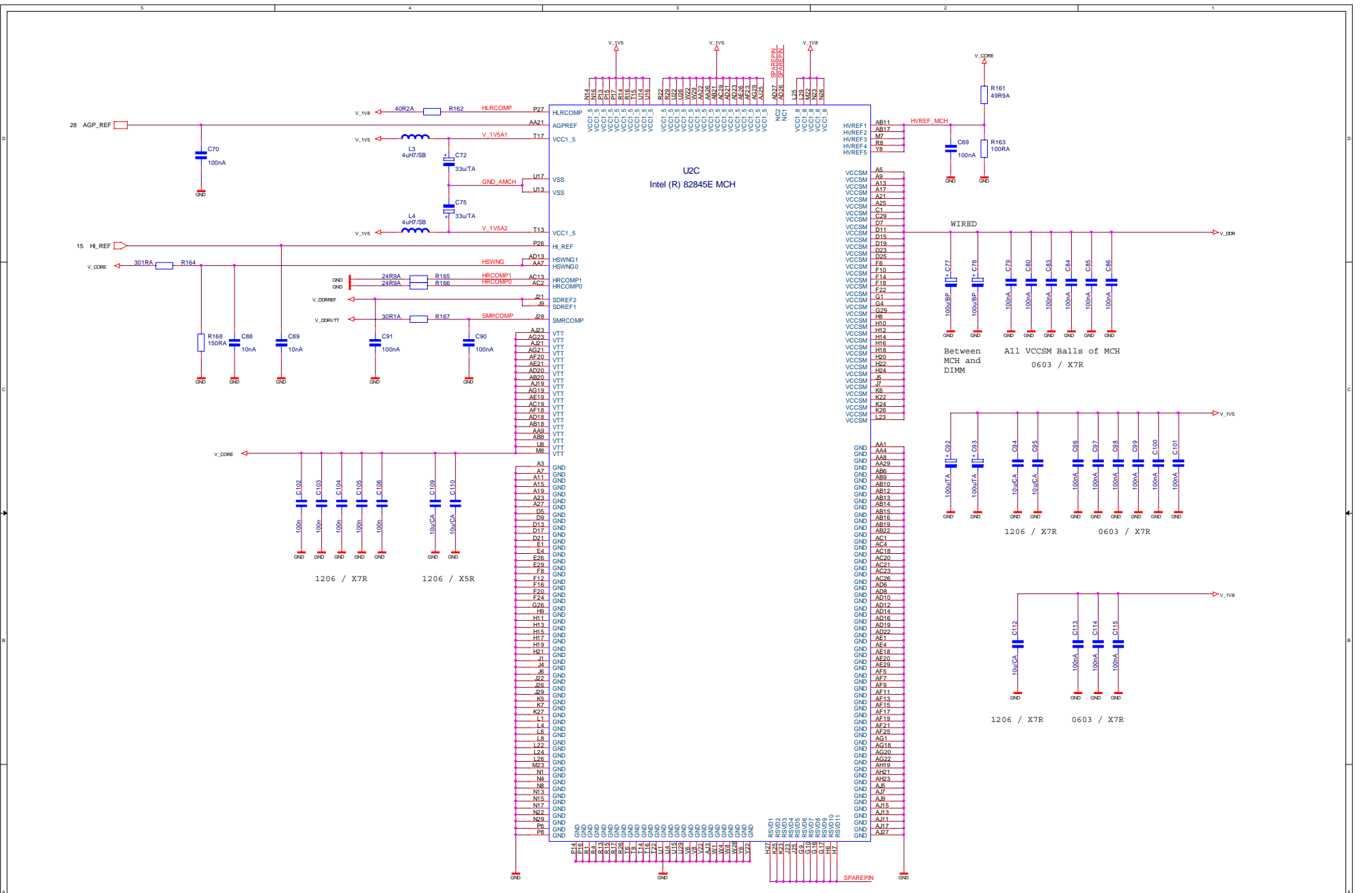
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6.7,11,15,16,24..27 SPAREPN SPAREPN
 4.7,8,10,35 GND GND

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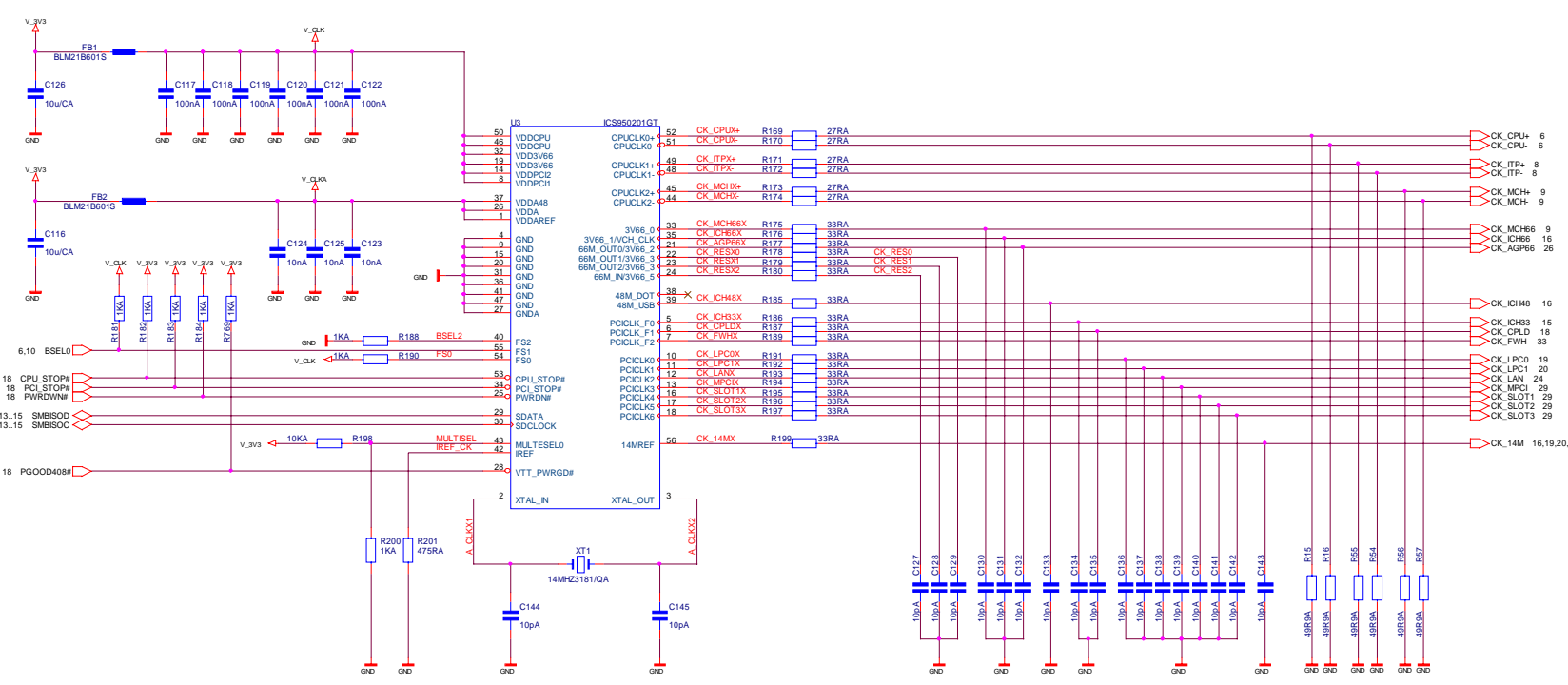




U2C
Intel (R) 82845E MCH

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

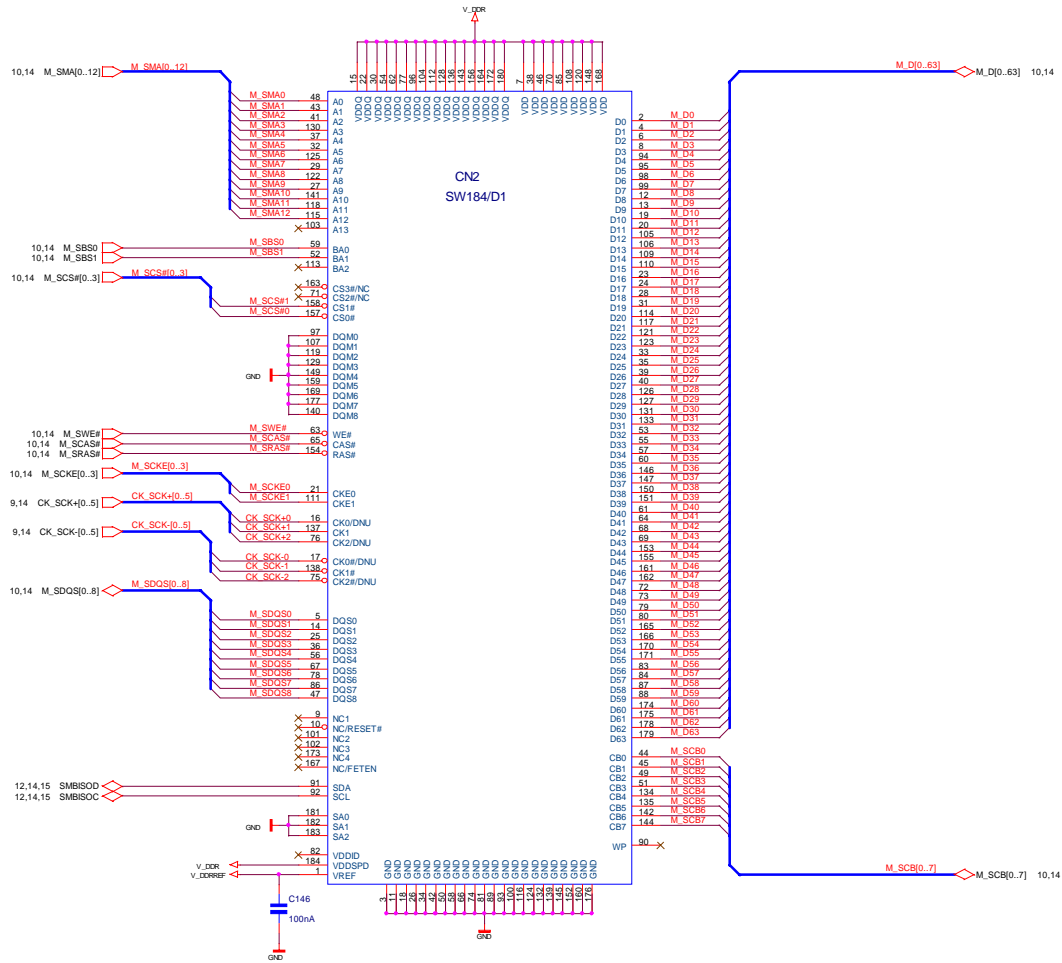
Intel (R) 845E Interactive Client Reference Design	
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V_CLK V_CLK
 V_3V3 V_3V3
 GND GND

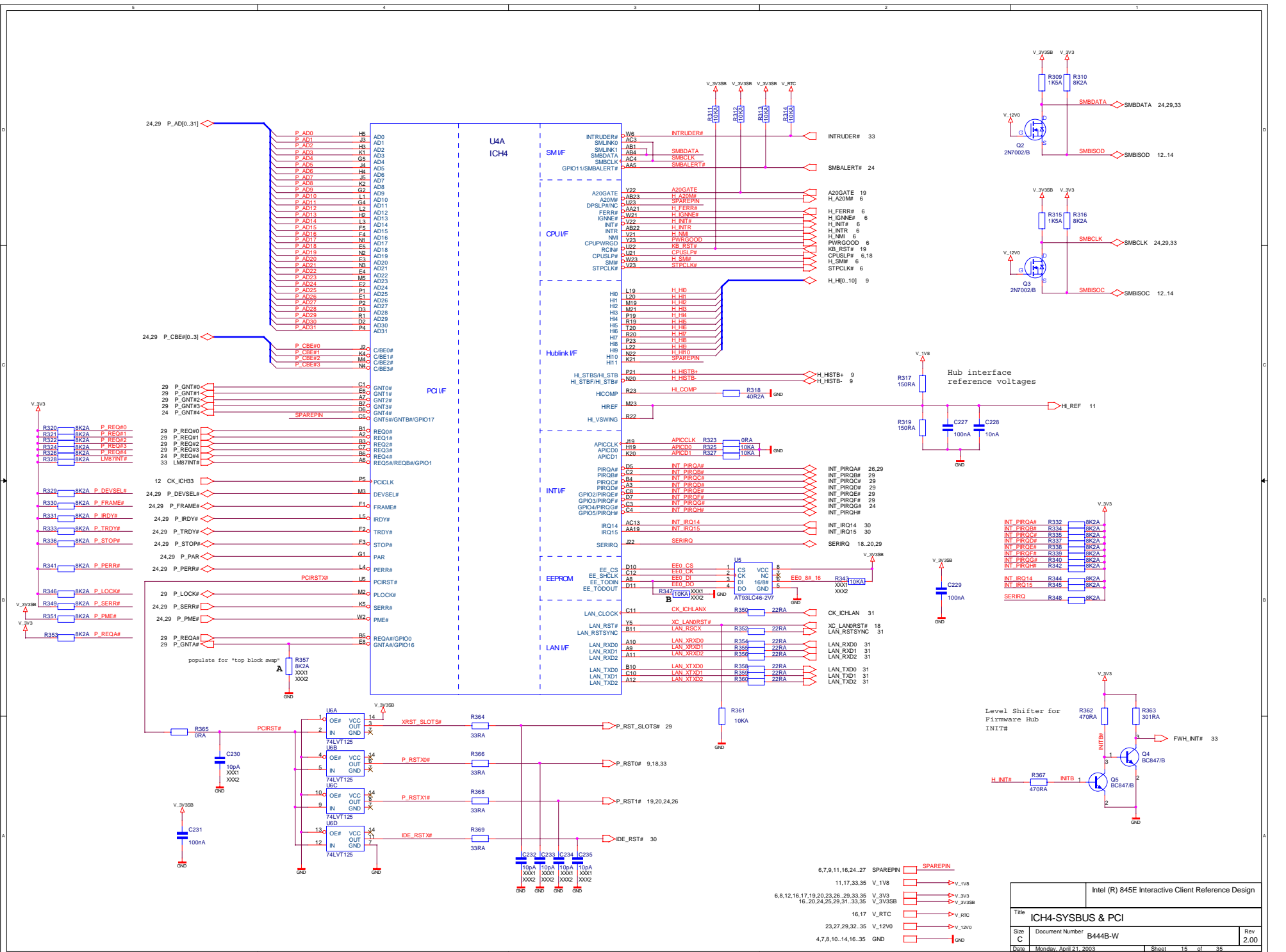
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DIMM 0



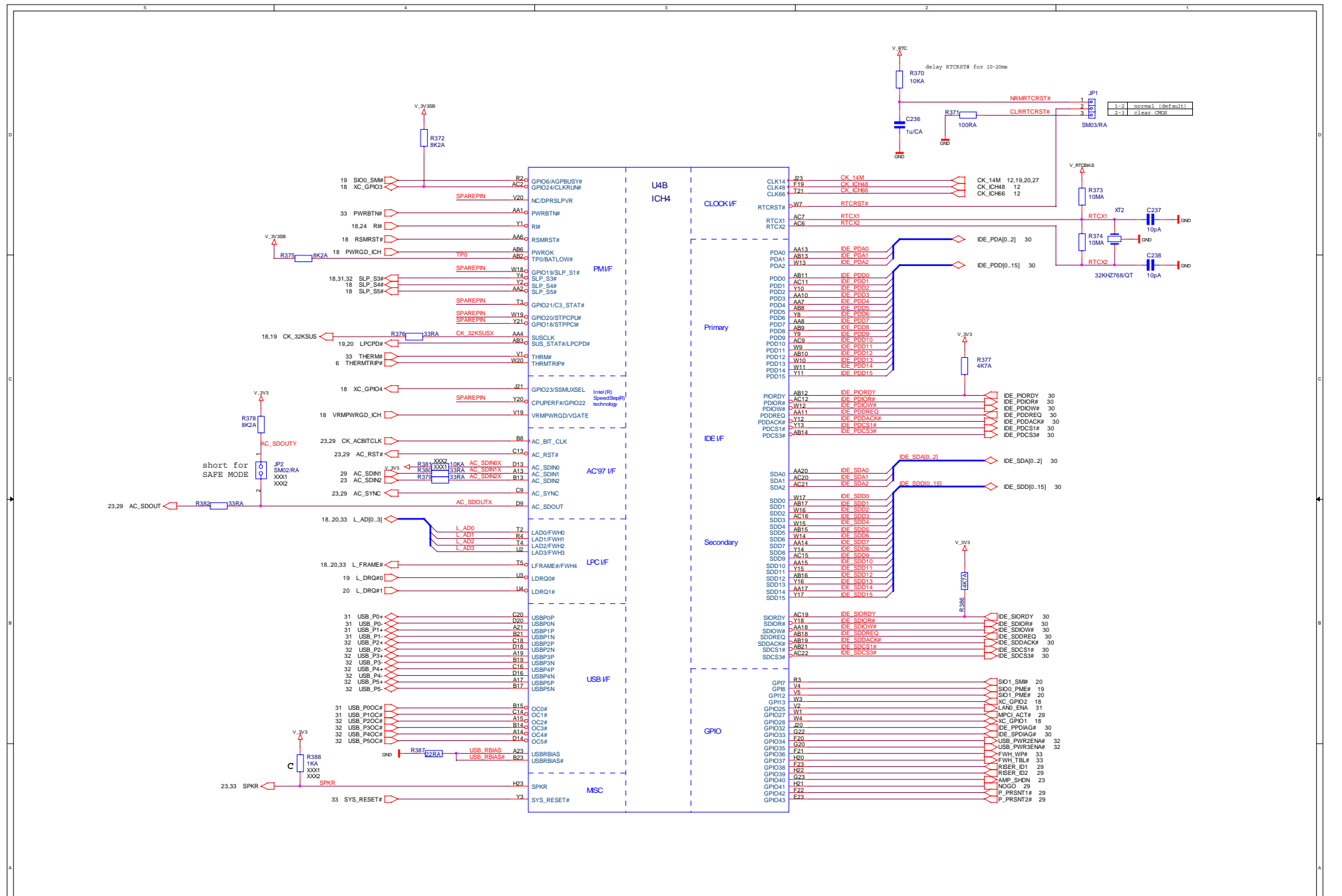
11,14,34 V_DDRREF V_DDRREF
 11,14,33,34 V_DDR V_DDR
 4,7,8,10,12,14,35 GND GND

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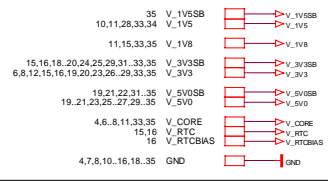
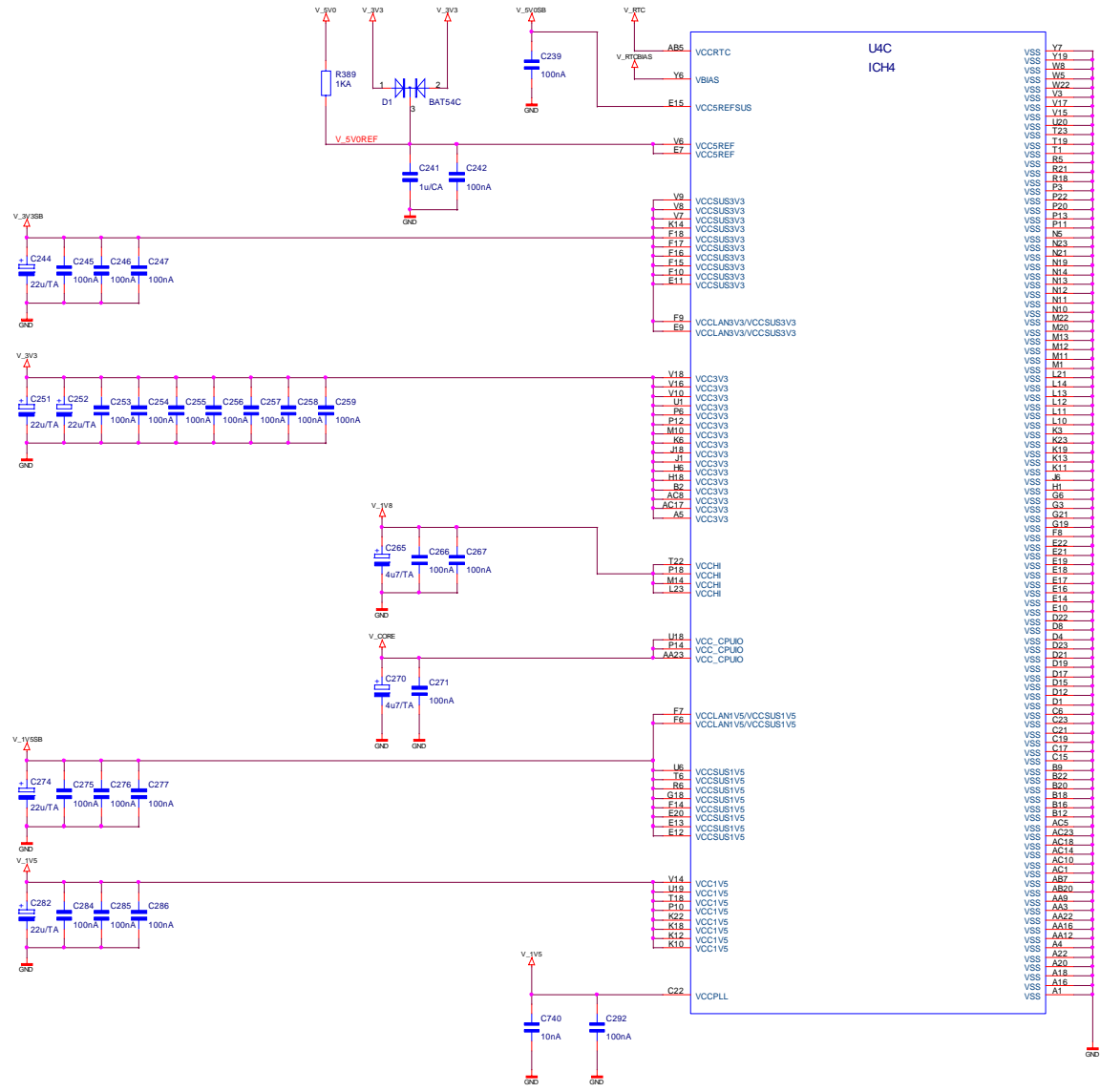
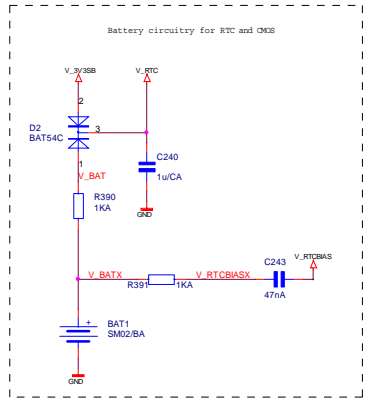
- 6,7,8,11,16,24,27 SPAREPIN# SPAREPIN
- 11,17,33,35 V_1V8
- 6,8,12,16,17,19,20,23,26,29,33,35 V_3V3
- 16,20,24,25,29,31,33,35 V_3V3SB
- 16,17 V_RTC
- 23,27,29,32,35 V_12V0
- 4,7,8,10,14,16,35 GND



ICH4 Strapping Options			
R	Signal	Function	Default
A	P_GNTA#	top block swap	NO STUPF
B	BE_DOUT	reserved	NO STUPF
C	SPKR	no reboot mode	NO STUPF
JP	AC_SDOUTX	safe mode	OPEN

- 6,7,9,11,15,24,27 SPAREPIN □ SPAREPIN
- 6,8,12,15,17,19,20,23,26,29,33,35 V_3V3 □ → V_3V3
- 15,17,20,24,25,29,31,33,35 V_3V3SB □ → V_3V3SB
- 15,17 V_RTC □ → V_RTC
- 17 V_RTCBIAS □ → V_RTCBIAS
- 4,7,8,10,15,17,35 GND □ → GND

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