

Module Parts

CPU

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
337S00592	1	CPU,AMS-Y,QQQF,PQS,1.6,1.15,BGA1515	U0500	CRITICAL	CPU_AMLY:QQQE
337S00593	1	CPU,AMS-Y,QQQF,PQS,1.6,1.15,BGA1515	U0500	CRITICAL	CPU_AMLY:QQQF
337S00594	1	CPU,AMS-Y,QQQF,PQS,1.6,1.15,BGA1515	U0500	CRITICAL	CPU_AMLY:QQQG
337S00613	1	CPU,AMS-Y,QQQF,PQS,HS,1.6,7W,1.15,B1515	U0500	CRITICAL	CPU_AMLY:QQQM
337S00614	1	CPU,AMS-Y,QQQF,PQS,HS,1.6,7W,1.1,BA1515	U0500	CRITICAL	CPU_AMLY:QQQN
337S00615	1	CPU,AMS-Y,QQQF,PQS,HS,1.6,7W,1.15,B1515	U0500	CRITICAL	CPU_AMLY:QQQP
337S00621	1	CPU,AMS-Y,QQQF,PQS,HS,1.6,7W,1.15,B1515	U0500	CRITICAL	CPU_AMLY:QQQQ
337S00622	1	CPU,AMS-Y,QQQF,PQS,HS,1.6,7W,1.1,BA1515	U0500	CRITICAL	CPU_AMLY:QQQR
337S00623	1	CPU,AMS-Y,QQQF,PQS,HS,1.6,7W,1.15,B1515	U0500	CRITICAL	CPU_AMLY:QQQS
337S00624	1	CPU,AMS-Y,SREKQ,FRQ,1.6,7W,1.1,BA1515	U0500	CRITICAL	CPU_AMLY:SREKN
337S00625	1	CPU,AMS-Y,SREKQ,FRQ,1.6,7W,1.1,BA1515	U0500	CRITICAL	CPU_AMLY:SREKP
337S00626	1	CPU,AMS-Y,SREKQ,FRQ,1.6,7W,1.15,BGA1515	U0500	CRITICAL	CPU_AMLY:SREKQ
998-15364	1	INTERPOSER,VMTT ADAPTER,ASC-Y,BGA1515	U0500	CRITICAL	CPU_AMLY:INTERPOSER

TBT Titan Ridge

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
338S00305	1	IC,TBT,TITAN RIDGE,QTIE,P,ES,A0,CBP337	U2800	CRITICAL	TBT_TR:A0
338S00356	1	IC,TBT,TITAN RIDGE DP,QTIE,B02,B0,CBP337	U2800	CRITICAL	TBT_TR:B0
338S00399	1	IC,TBT,TITAN RIDGE DP,QTIE,B02,C0,CBP337	U2800	CRITICAL	TBT_TR:C0
338S00408	1	IC,TBT,TITAN RIDGE DP,Q0AK,Q0,C1,CBP337	U2800	CRITICAL	TBT_TR:C1
338S00441	1	IC,TBT,TITANRIDGE DP,B0AB0,FRQ,C1,CBP337	U2800	CRITICAL	TBT_TR:FRQ

Ace

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
335S00961	2	IC,CD3215,ACE,C30,DSB PWR SW,BLAW,BGA96	U3100,U3200	CRITICAL	ACE:C0_BGA
335S01442	2	IC,CD3215,ACE,C30,DSB PWRSW,BLAW,MTSGA96	U3100,U3200	CRITICAL	ACE:C0_NFRGA

Wireless

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
339S00448	1	MODULE,WIFI,T88100 CD886,T,88A,9,UGA160	U3700	CRITICAL	WIRELESS:USI
PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:	
339S00446	339S00448		ALL	Murata Module	

SOC

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
339S00370	1	POP,GLOBALTA+108 208M,M,B0,SCY,C3P1406	U3900	CRITICAL	SOC:B0_1G
PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:	
339S00371	339S00370	SOC:B0_1G	ALL	Hynix 1GB SCK	
339S00375	339S00370	SOC:B0_1G	ALL	Micron 1GB SCK	
339S00376	339S00370	SOC:B0_1G	ALL	Hynix 1GB ATK	
339S00372	1	POP,GLOBALTA+108 208M,M,B0,SCY,C3P1406	U3900	CRITICAL	SOC:B0_2G
PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:	
339S00373	339S00372	SOC:B0_2G	ALL	Hynix 2GB SCK	
339S00377	339S00372	SOC:B0_2G	ALL	Micron 2GB ATK	
339S00378	339S00372	SOC:B0_2G	ALL	Hynix 2GB ATK	

PMU

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
338S00267	1	IC,PMU,CA9P,1024980,OTF-A1,CBP324,6,4P	U7800	CRITICAL	PMU:A0_A

DRAM

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
333S00052	2	IC,SDRAM,LFPD03-1866,32GBIT,208M,BGA253	U2300,U2500	CRITICAL	DRAM:SAMSUNG_8GB
333S00130	2	IC,LFPD03-1866,64GBIT,188M,S,BGA253	U2300,U2500	CRITICAL	DRAM:SAMSUNG_16GB
333S00110	2	IC,LFPD03-1866,32GBIT,218M,BGA253	U2300,U2500	CRITICAL	DRAM:HYNIX_8GB
333S00111	2	IC,LFPD03-1866,64GBIT,218M,BGA253	U2300,U2500	CRITICAL	DRAM:HYNIX_16GB
333S00082	2	IC,LFPD03-1866,32GBIT,208M,BGA253	U2300,U2500	CRITICAL	DRAM:MICRON_8GB_1866
333S00113	2	IC,LFPD03-1866,64GBIT,208M,M,BGA253	U2300,U2500	CRITICAL	DRAM:MICRON_16GB
333S00199	2	IC,LFPD03-2133,32GBIT,208M,BGA253	U2300,U2500	CRITICAL	DRAM:MICRON_8GB

NAND

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
335S00273	2	NAND,1E,128GBM,64E,128G,SD,HPM1,UGA110	U8600,U8700	CRITICAL	NAND:HPM1_256G_ZL
335S00289	3	NAND,3DV3,42GBP,XXX,64E,1700,T,UGA110	U8600,U8700,U8800	CRITICAL	NAND:PMLC_128G_TO
335S00301	3	NAND,3DV3,42GBP,XXX,64E,1700,SD,UGA110	U8600,U8700,U8800	CRITICAL	NAND:PMLC_128G_SD
335S00290	3	NAND,3DV3,65GBP,XXX,64E,1700,T,UGA110	U8600,U8700,U8800	CRITICAL	NAND:PMLC_256G_TO
335S00302	3	NAND,3DV3,65GBP,XXX,64E,1700,SD,UGA110	U8600,U8700,U8800	CRITICAL	NAND:PMLC_256G_SD
335S00292	3	NAND,3DV3,170GBP,XXX,64E,1700,T,UGA110	U8600,U8700,U8800	CRITICAL	NAND:PMLC_512G_TO
335S00304	3	NAND,3DV3,170GBP,XXX,64E,1700,SD,UGA110	U8600,U8700,U8800	CRITICAL	NAND:PMLC_512G_SD
998-12416	3	NAND,3DV3,42GBP,64E,1700,T,SDM,X,UGA110	U8600,U8700,U8800	CRITICAL	NAND:PMLC_128G_TO_NM
PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:	
998-12417	998-12416	NAND:PMLC_128G_TO_NM	ALL	TO 128G Substrate 2	
335S00323	3	NAND,3DV3,42GBP,XXX,64E,1700,SD,UGA110	U8600,U8700,U8800	CRITICAL	NAND:PMLC_128G_SD_NM
998-12418	3	NAND,3DV3,65GBP,64E,1700,T,SDM,X,UGA110	U8600,U8700,U8800	CRITICAL	NAND:PMLC_256G_TO_NM
PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:	
998-12419	998-12418	NAND:PMLC_256G_TO_NM	ALL	TO 256G Substrate 2	
335S00324	3	NAND,3DV3,65GBP,XXX,64E,1700,SD,UGA110	U8600,U8700,U8800	CRITICAL	NAND:PMLC_256G_SD_NM
998-12422	3	NAND,3DV3,170GBP,64E,1700,T,SDM,X,UGA110	U8600,U8700,U8800	CRITICAL	NAND:PMLC_512G_TO_NM
PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:	
998-12423	998-12422	NAND:PMLC_512G_TO_NM	ALL	TO 512G Substrate 2	
335S00326	3	NAND,3DV3,170GBP,XXX,64E,1700,SD,UGA110	U8600,U8700,U8800	CRITICAL	NAND:PMLC_512G_SD_NM
335S00322	3	NAND,3DV4,512GBP,XXX,256E,SS,UGA110	U8600,U8700,U8800	CRITICAL	NAND:3DV4_1P5T_SS
335S00373	3	NAND,3DV4,512GBP,XXX,256E,M03,SS,UGA110	U8600,U8700,U8800	CRITICAL	NAND:3DV4_1P5T_SS_MG3

Programmables

TBT ROM

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
335S00133	1	IC,EFI SERIAL FLASH,MB15T,3,0V,UGM8	U2890	CRITICAL	TBT_ROM:BLANK
341S00905	1	IC,NVM (V5,T) PHOTO-0,X1032	U2890	CRITICAL	TBT_ROM:P0
341S00922	1	IC,NVM (V1,1) NVM,PHOTO-0,X1032	U2890	CRITICAL	TBT_ROM:P0_B0
341S00942	1	IC,NVM (V5,1) PHOTO-1,X1032	U2890	CRITICAL	TBT_ROM:P1
341S00982	1	IC,NVM (VXXX) PHOTO-2,X1032	U2890	CRITICAL	TBT_ROM:P2
341S01046	1	IC,NVM (VXXX) EVT,X1032	U2890	CRITICAL	TBT_ROM:EVT
341S01150	1	IC,NVM (VXXX) PHOTO-3,X1032	U2890	CRITICAL	TBT_ROM:P3
341S01177	1	IC,NVM (VXXX) EVT-2,X1032	U2890	CRITICAL	TBT_ROM:EVT2

BT ROM

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
335S00256	1	IC,BT SERIAL FLASH,MB15T,1,0V,DPH8	U3770	CRITICAL	BT_ROM:BLANK
341S00745	1	IC,BT ROM (V4) PHOTO-0,X1032	U3770	CRITICAL	BT_ROM:P0
341S00939	1	BT SPLASH ROM (V22,33,40) PHOTO-1,X1032	U3770	CRITICAL	BT_ROM:P1
341S00983	1	BT SPLASH ROM (VXXX) PHOTO-1,X1032	U3770	CRITICAL	BT_ROM:P2
341S01042	1	BT SPLASH ROM (VXXX) EVT,X1032	U3770	CRITICAL	BT_ROM:EVT
341S01176	1	BT SPLASH ROM (VXXX) EVT-2,X1032	U3770	CRITICAL	BT_ROM:EVT2
PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:	
335S00248	335S00256	BT_ROM:BLANK	ALL	Macronix	
335S00255	335S00256	BT_ROM:BLANK	ALL	Adesto	

Wifi ROM


PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
335S00145	1	IC,EEPROM,4KBIT,1,0V,SELECT ONO,DPH8	U3780	CRITICAL	WIFI_ROM:BLANK
341S00744	1	WIFI ROM (P101) PHOTO-0,M01,X1032	U3780	CRITICAL	WIFI_ROM:P0
PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:	
335S00236	335S00145	WIFI_ROM:BLANK	ALL	Rohm	

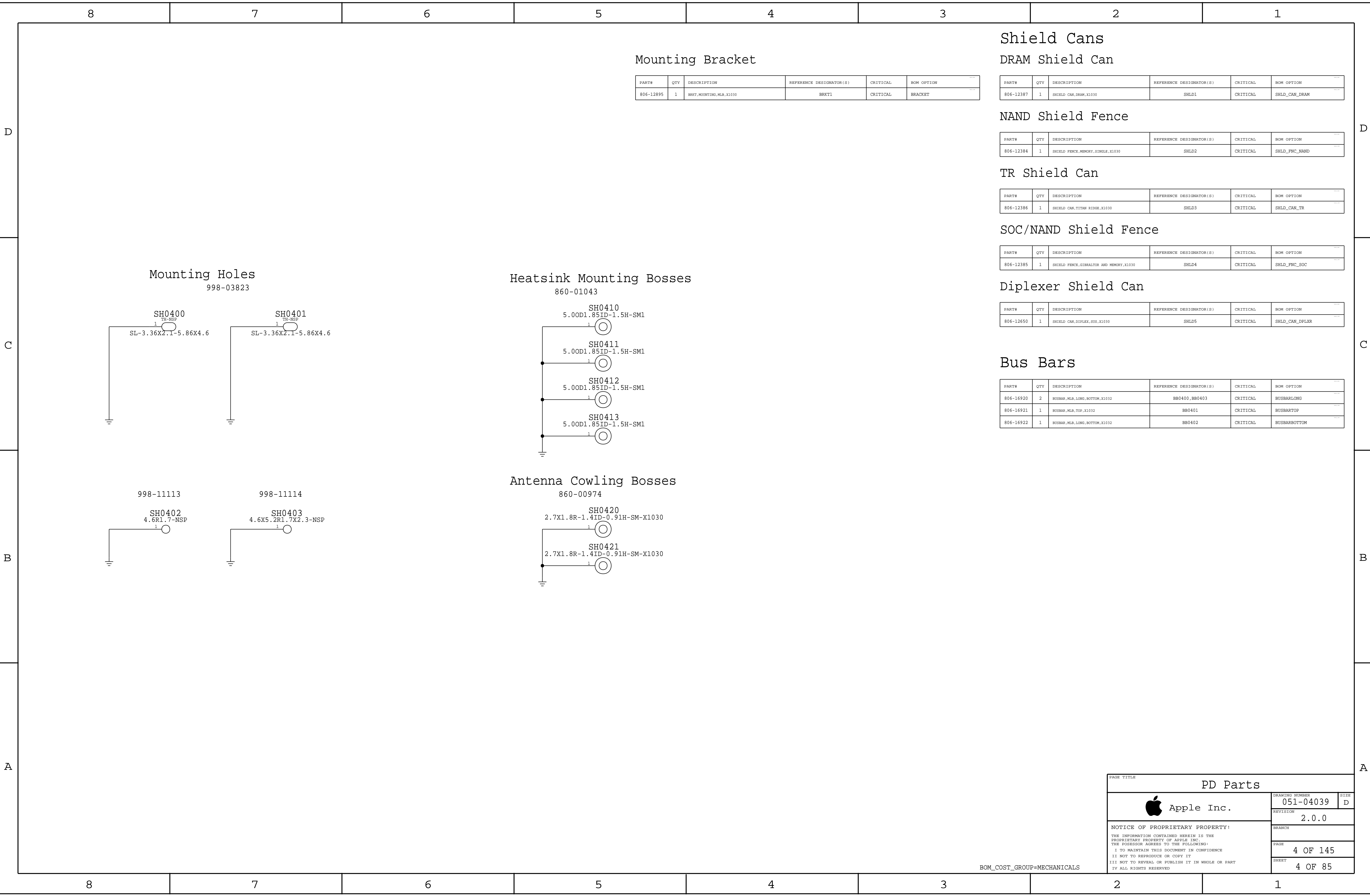
SOC ROM

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
335S00203	1	IC,FLASH,SERIAL,8PT,40KX1,1,0V,4X1MM,DPH8	U4770	CRITICAL	SOC_ROM:BLANK

EFI ROM

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
335S00371	1	IC,SERIAL FLASH,128MBIT,1,0V,6W1,MOH8	U2100	CRITICAL	EFI_ROM:BLANK
PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:	
335S00370	335S00371		ALL	Macronix	
335S00376	335S00371		ALL	Adesto	

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BOM Configuration		
 Apple Inc.	DRAWING NUMBER	051-04039
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	PAGE	2 OF 145
	SHEET	2 OF 85



PD Parts

Apple Inc.

051-04039

2.0.0

4 OF 145

4 OF 85

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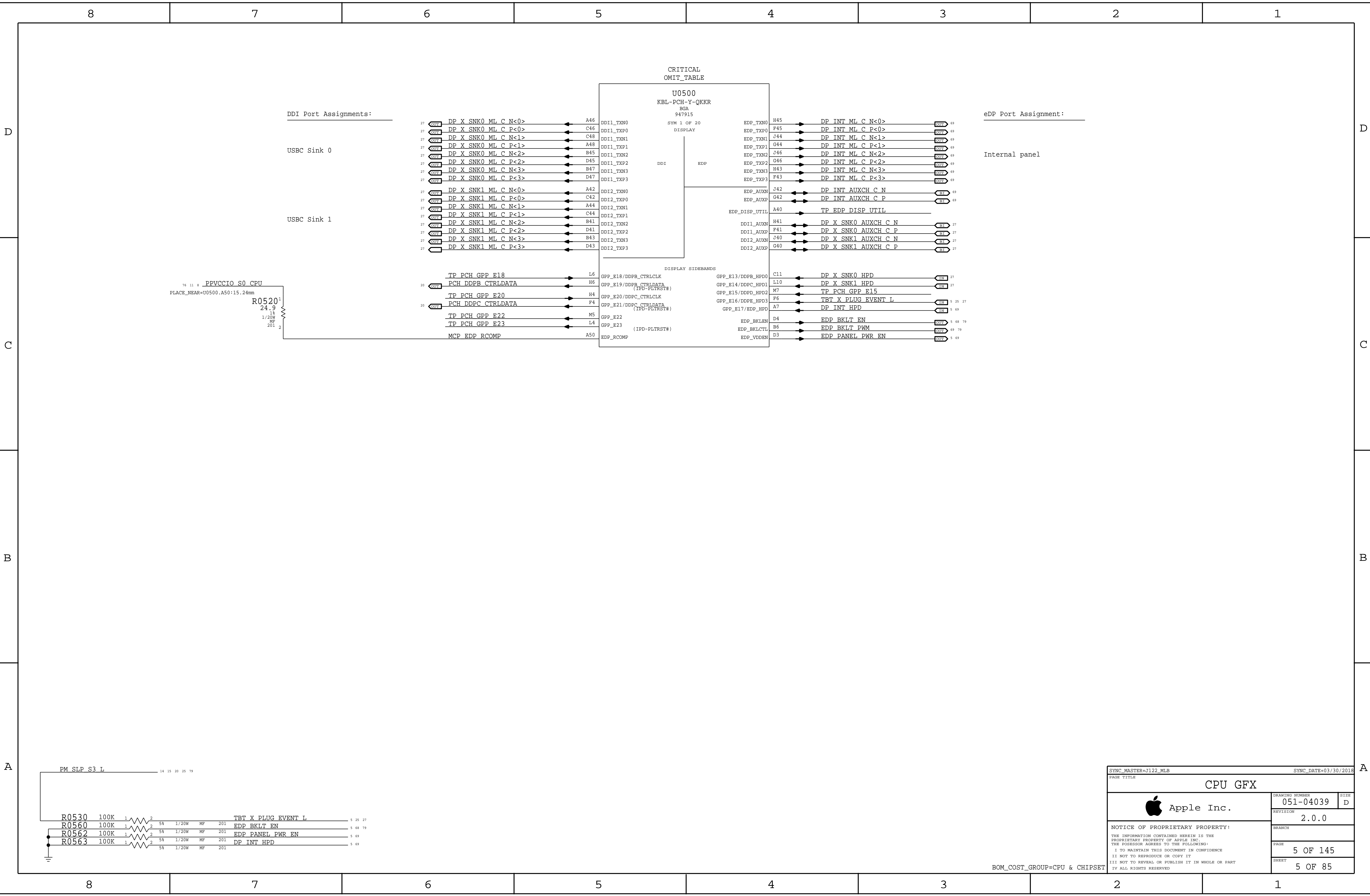
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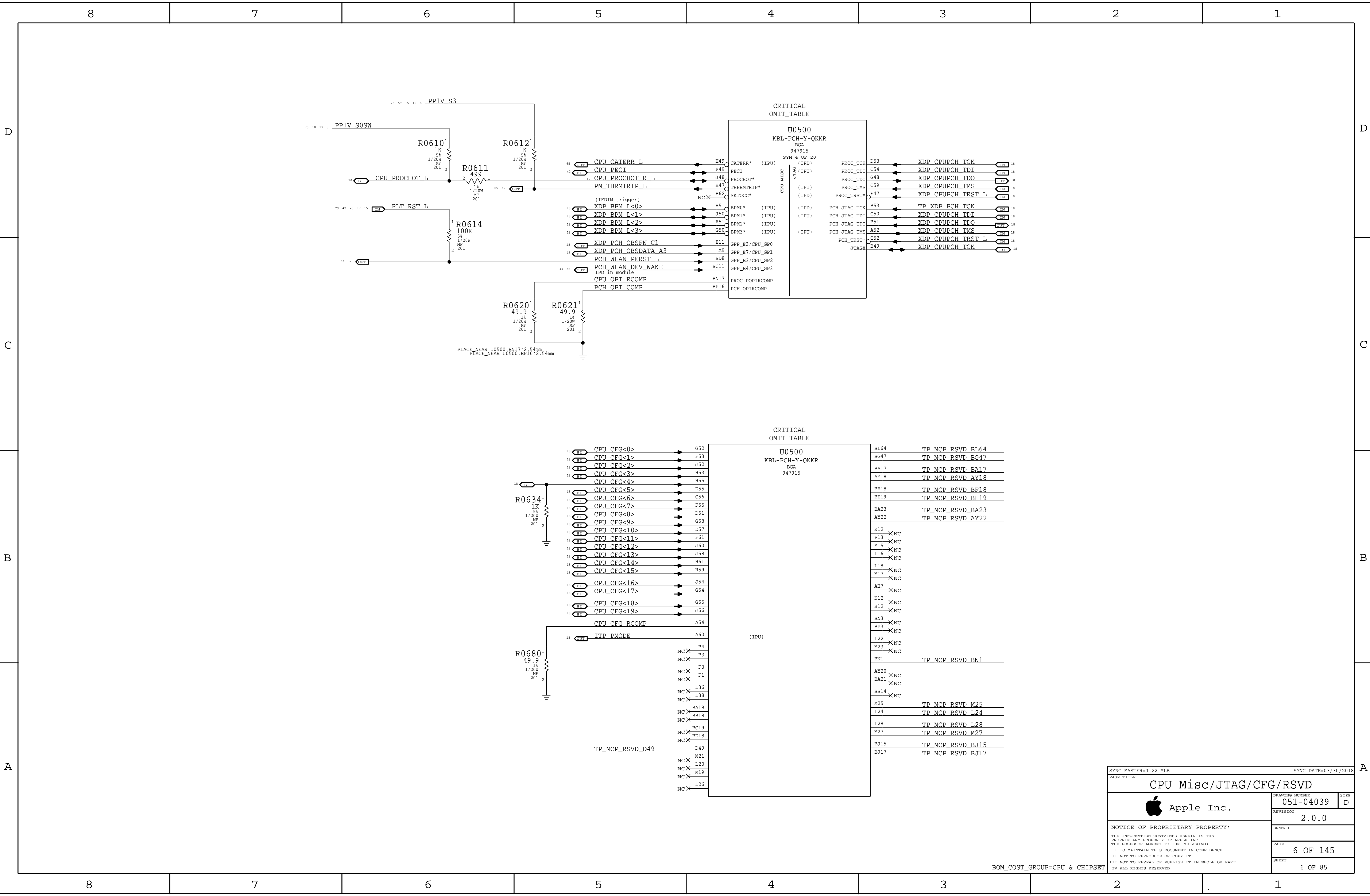
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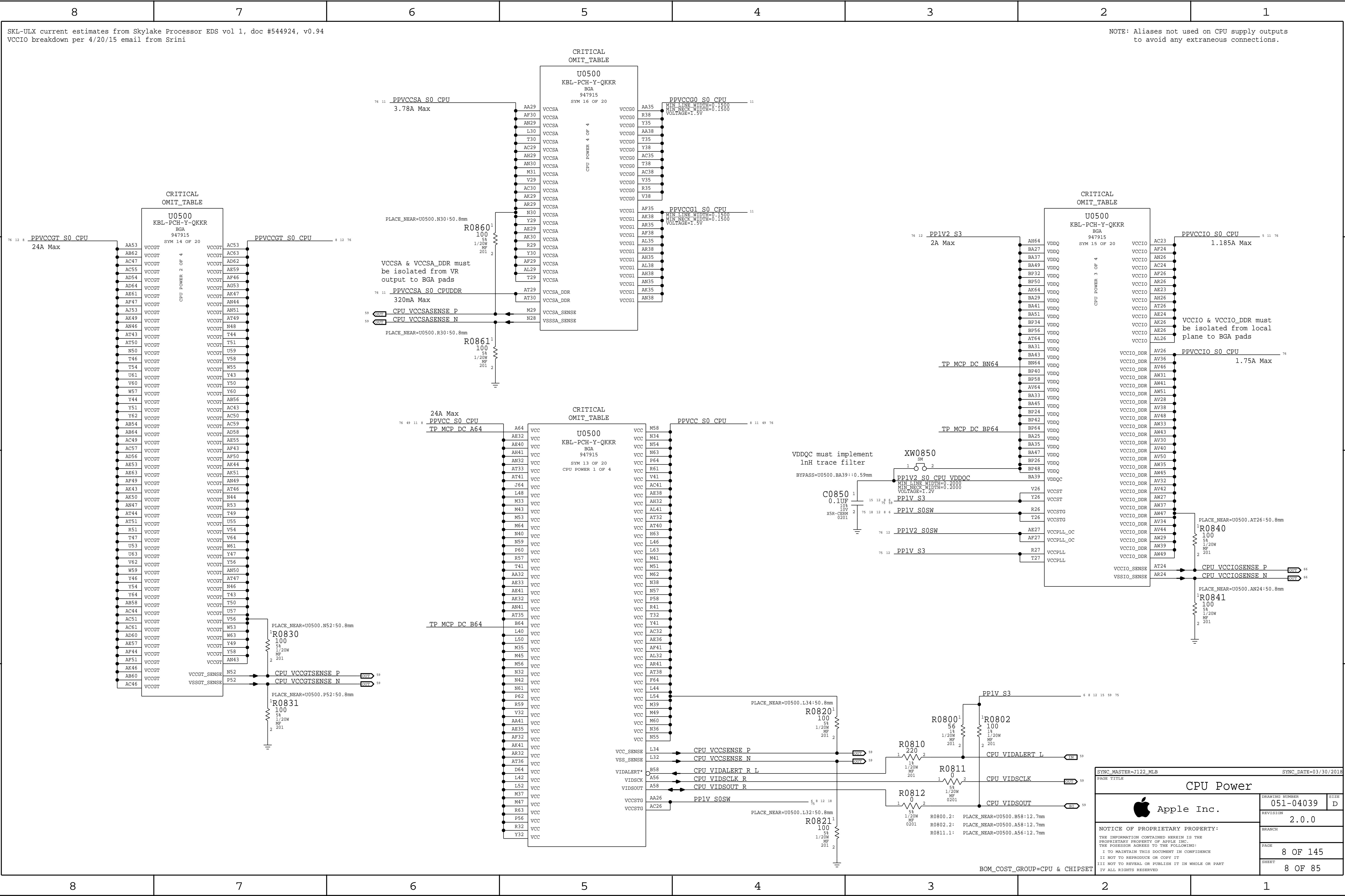
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	BRANCH		
	PAGE		
	5 OF 145		
	SHEET		
	5 OF 85		

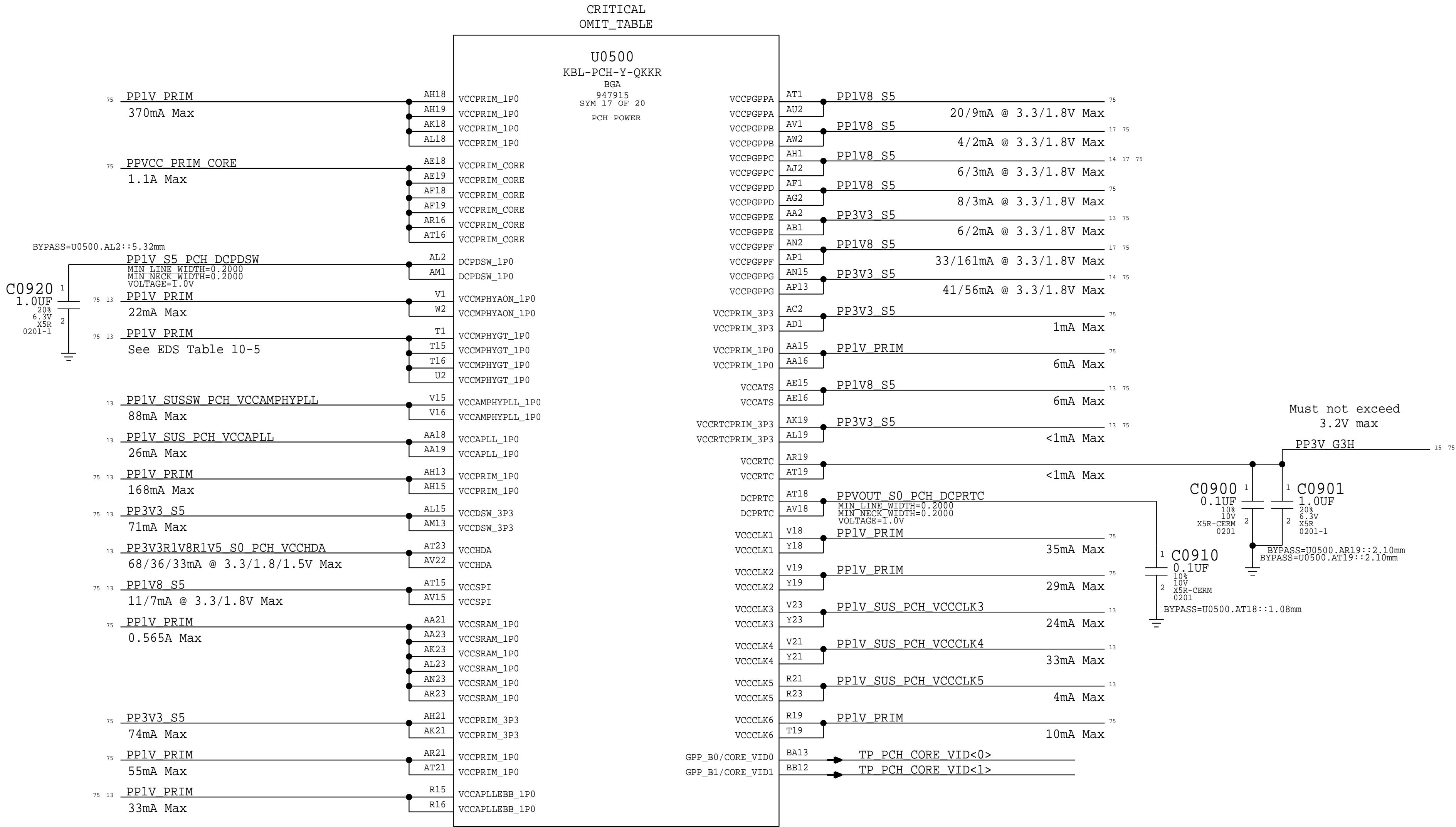
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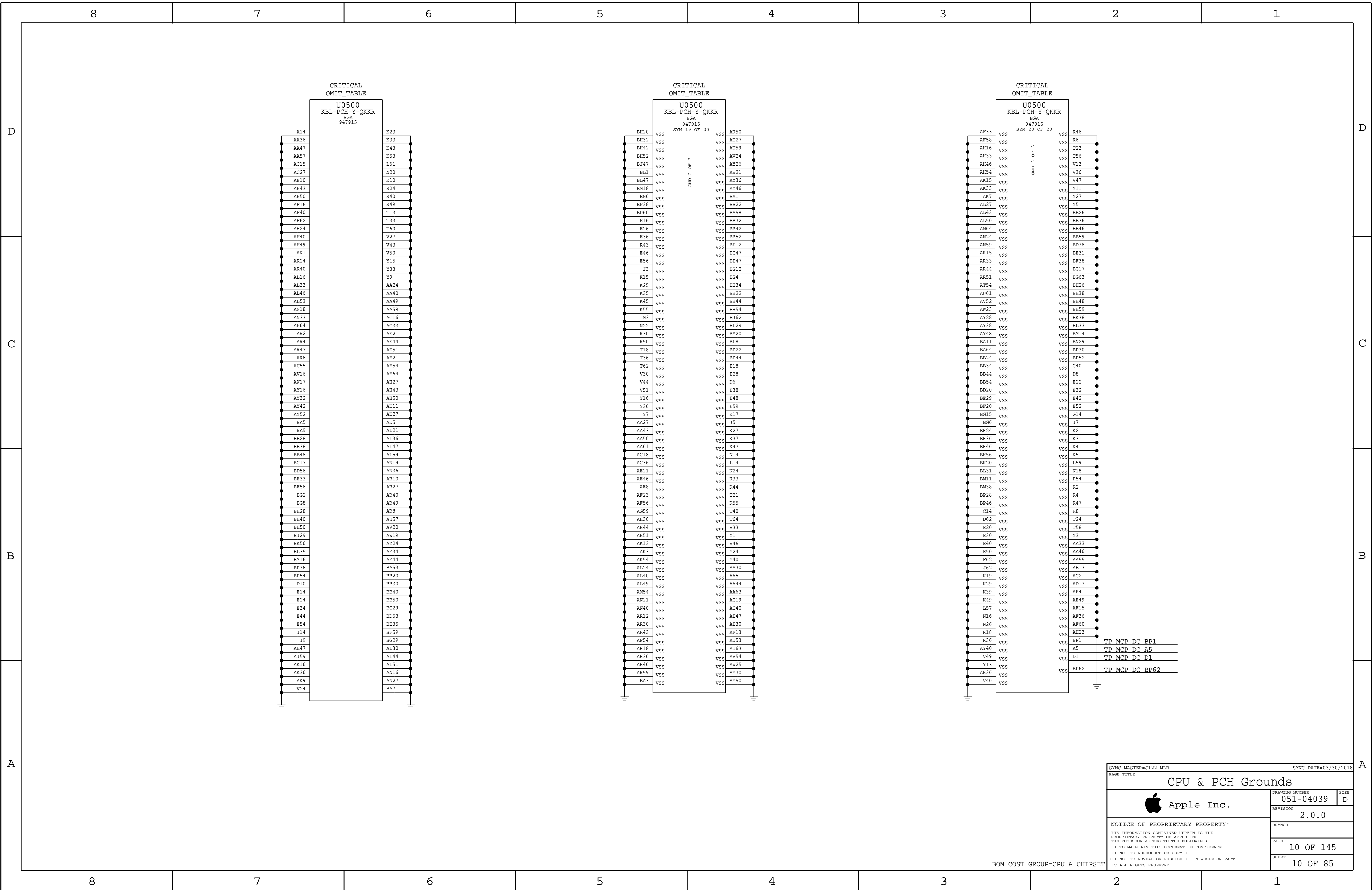




SPT-LP current estimates from Sunrise Point-LP PCH EDS vol 1, doc #545659, vl.2.
VCCAMPHYPLL_1P0 and VCCPRIM_1P0 / VCCPRIM_3P3 breakdowns from Srimi email 4/13/15

NOTE: Aliases not used on CPU supply outputs
to avoid any extraneous connections.





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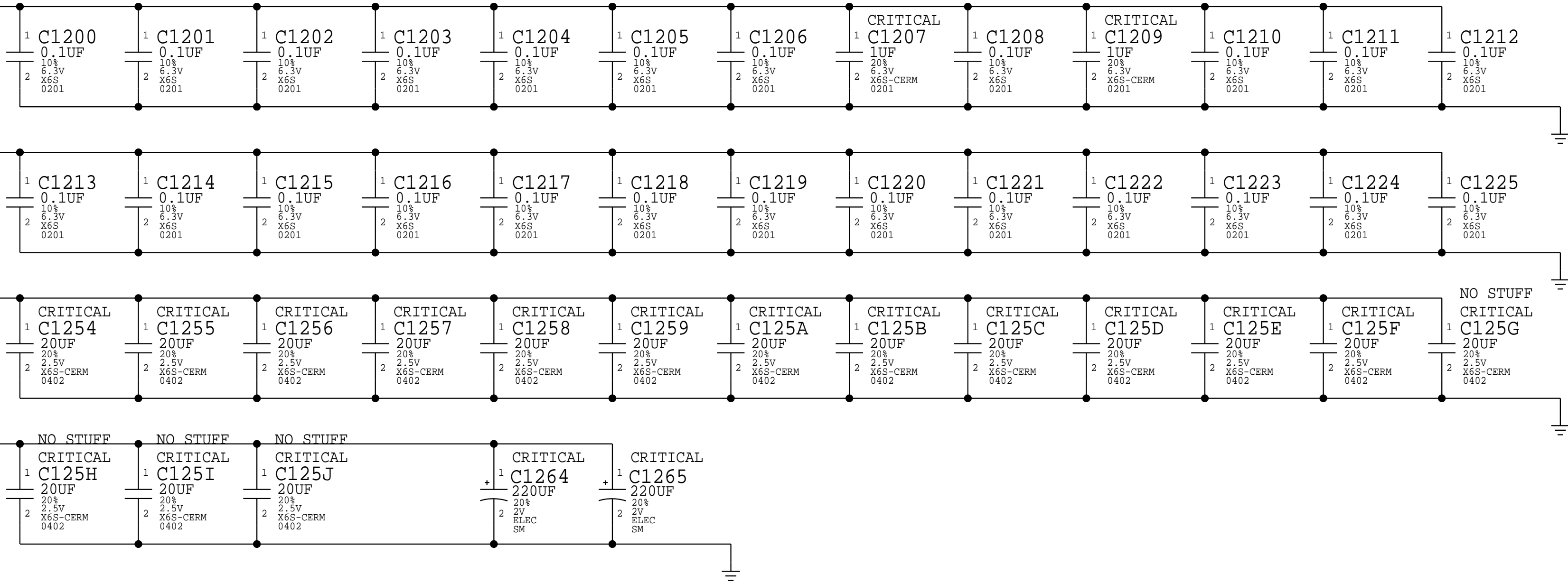
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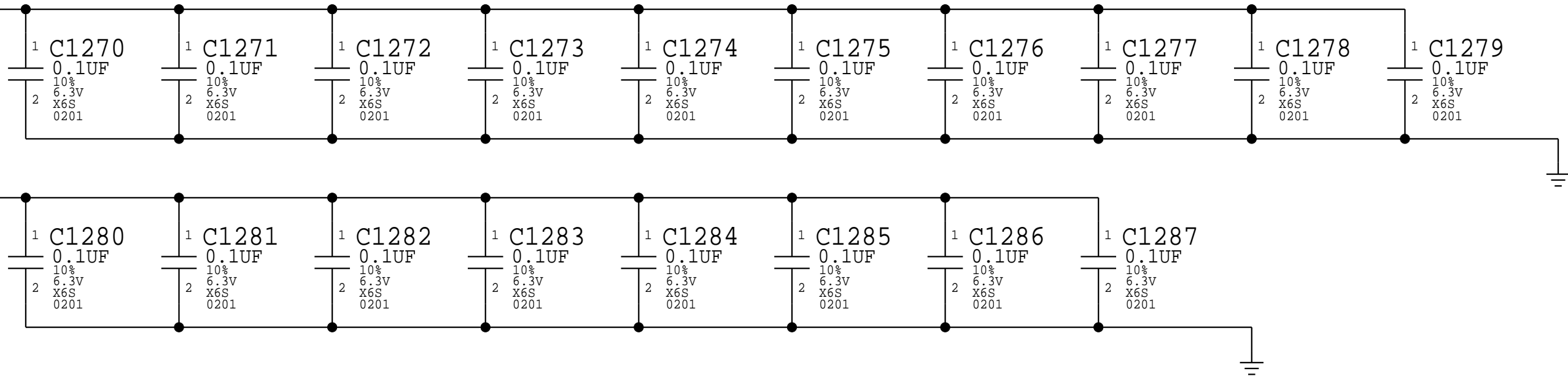
CPU GT Decoupling

Intel implementation (#561280, Table 49-2): 12x 0.1uF 0201, 2x 1uF 0402, 9x 47uF 0805
Apple implementation: 24x 0.1uF 0201, 2x 1uF 0201, 10x 20uF 0402 STUFF (6x NOSTUFF), 2x 220uF D1 STUFF

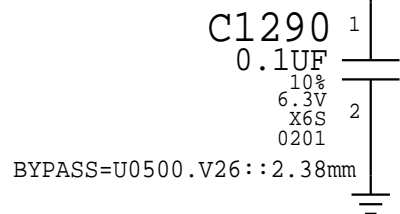


CPU VDDQ DECOUPLING

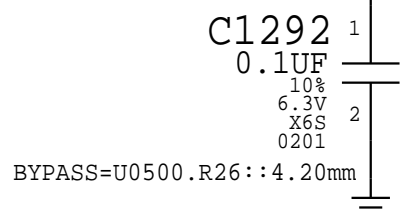
Intel implementation (#561280, Table 49-2): 18x 0.1uF 0201
Apple implementation: 18x 0.1uF 0201



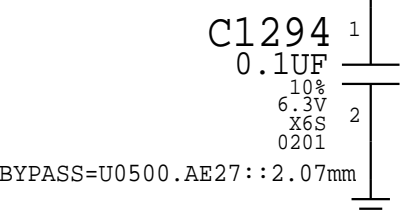
CPU VCCST BYPASS
(CPU 1.0V SUSTAIN PWR)
PP1V_S3



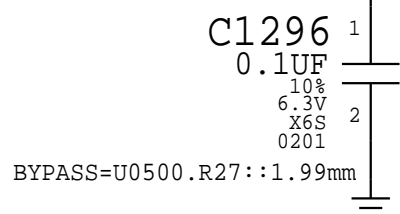
CPU VCCSTG BYPASS
(CPU 1.0V SUSTAIN GATED PWR)
PP1V_S0SW




CPU VCCPLL_OC BYPASS
(CPU 1.2V PLL PWR)
PP1V2_S0SW



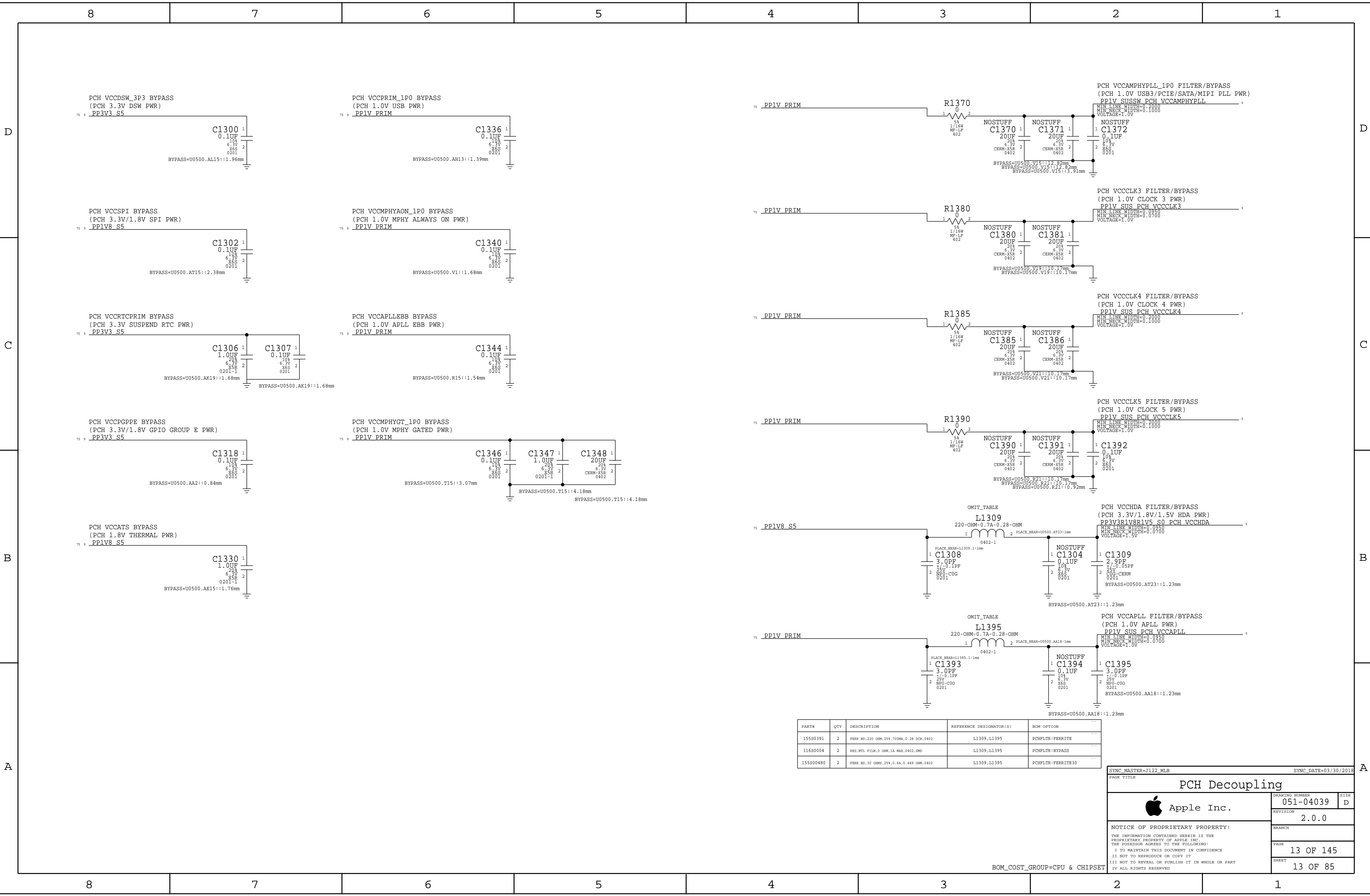
CPU VCCPLL BYPASS
(CPU 1.0V DIGITAL PLL PWR)
PP1V_S3



NOTE: Bypass calcs based on 0.1mm trace width with worst case stackup and 500pH added for power/ground via pair.

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	PAGE		
	12 OF 145		
	SHEET		
	12 OF 85		

BOM_COST_GROUP=CPU & CHIPSET




PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
155S0391	2	FERR RD,220 OHM,254,700MA,0.28 DCR,0402	L1309,L1395	PCHFLTR:FERRITE
116S0004	2	RES,MTL FILM,0 OHM,1A MAX,0402,SMD	L1309,L1395	PCHFLTR:BYPASS
155S00480	2	FERR RD,30 OHM2,254,0.6A,0.449 OHM,0402	L1309,L1395	PCHFLTR:FERRITE30

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PAGE TITLE

PCH Decoupling

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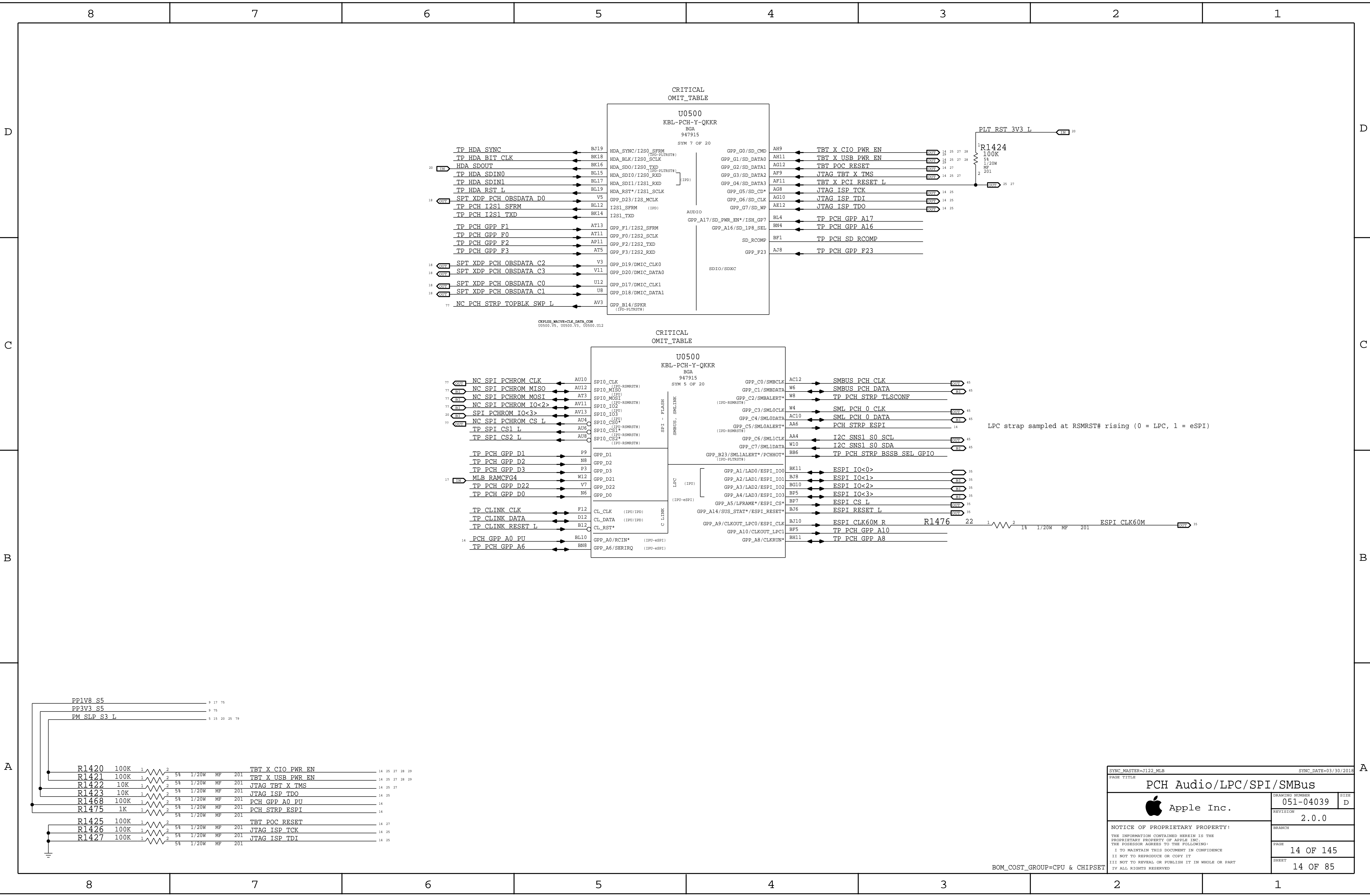
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13 OF 145

SHEET

13 OF 85

BOM_COST_GROUP=CPU & CHIPSET



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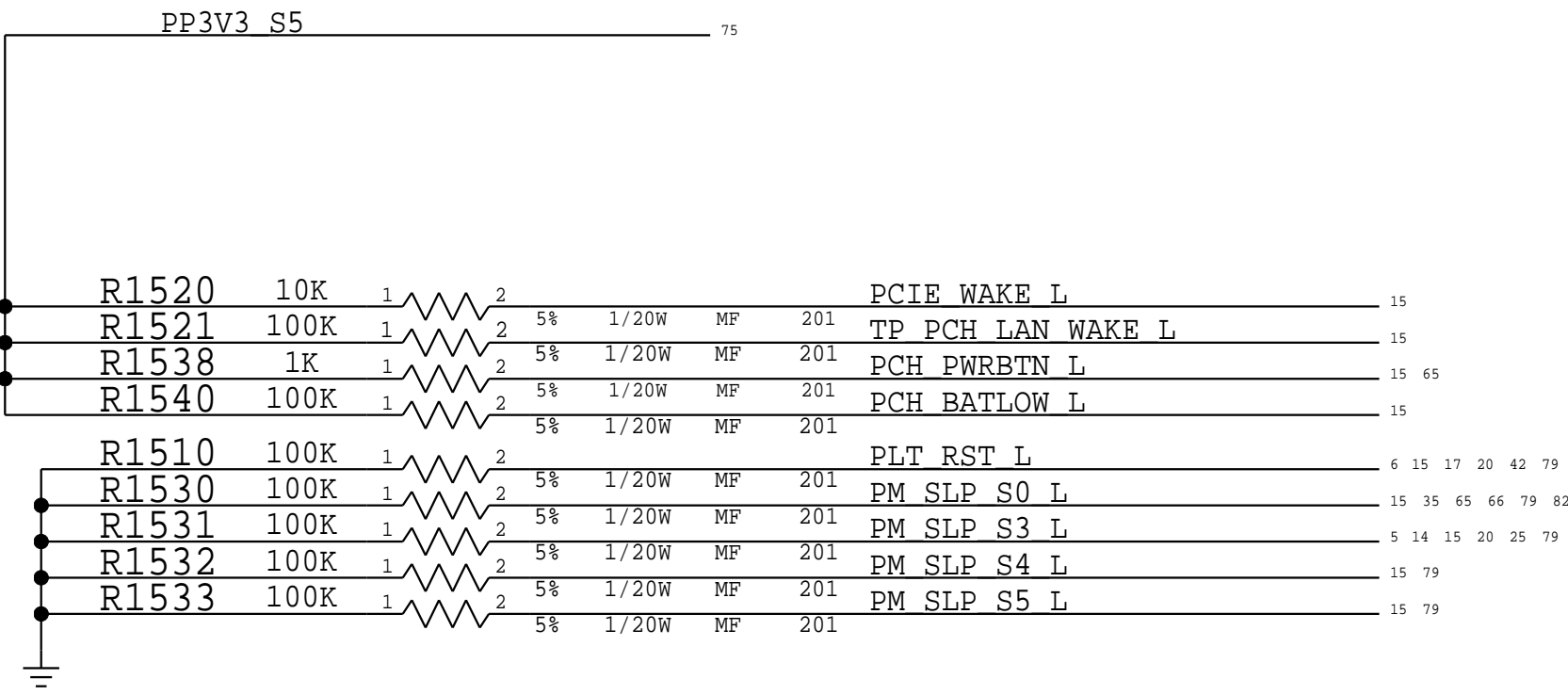
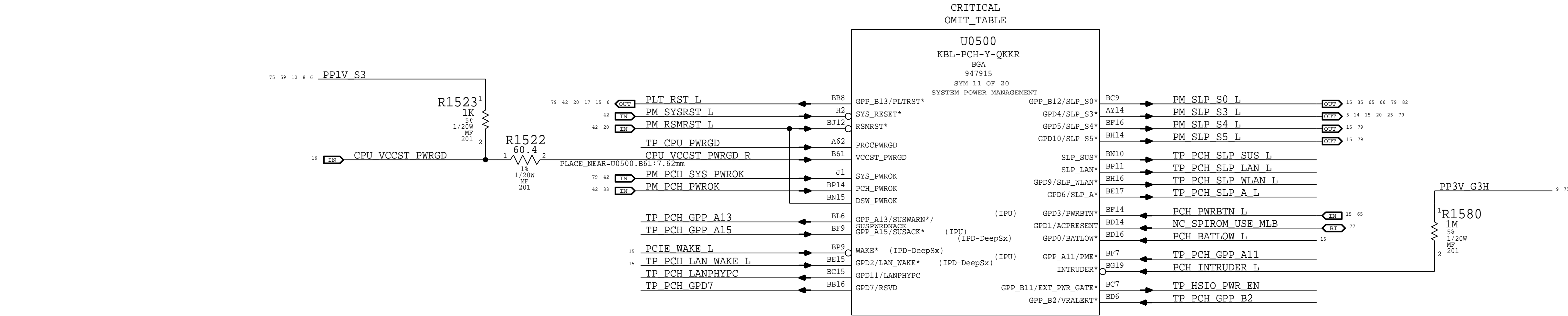
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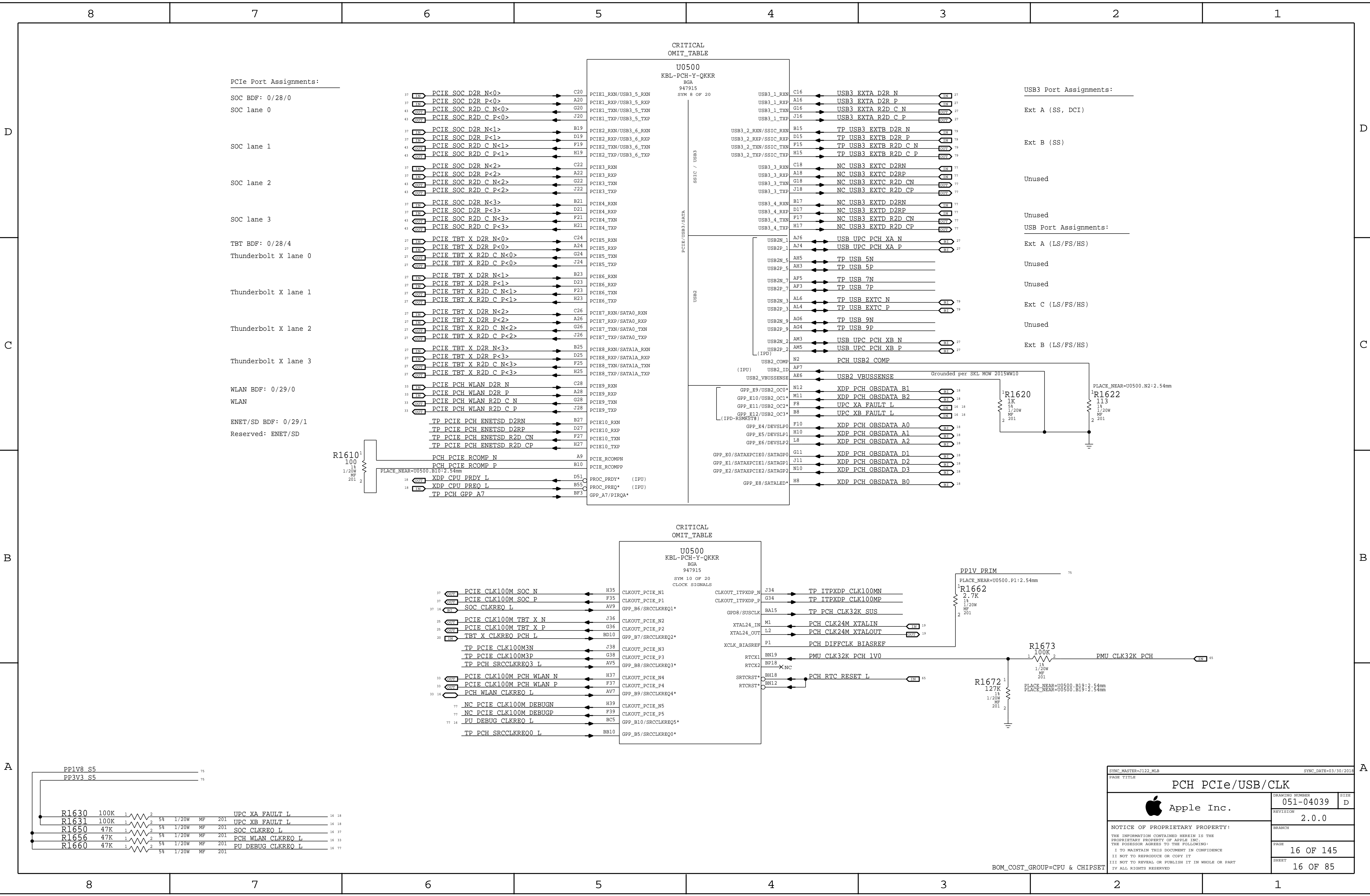
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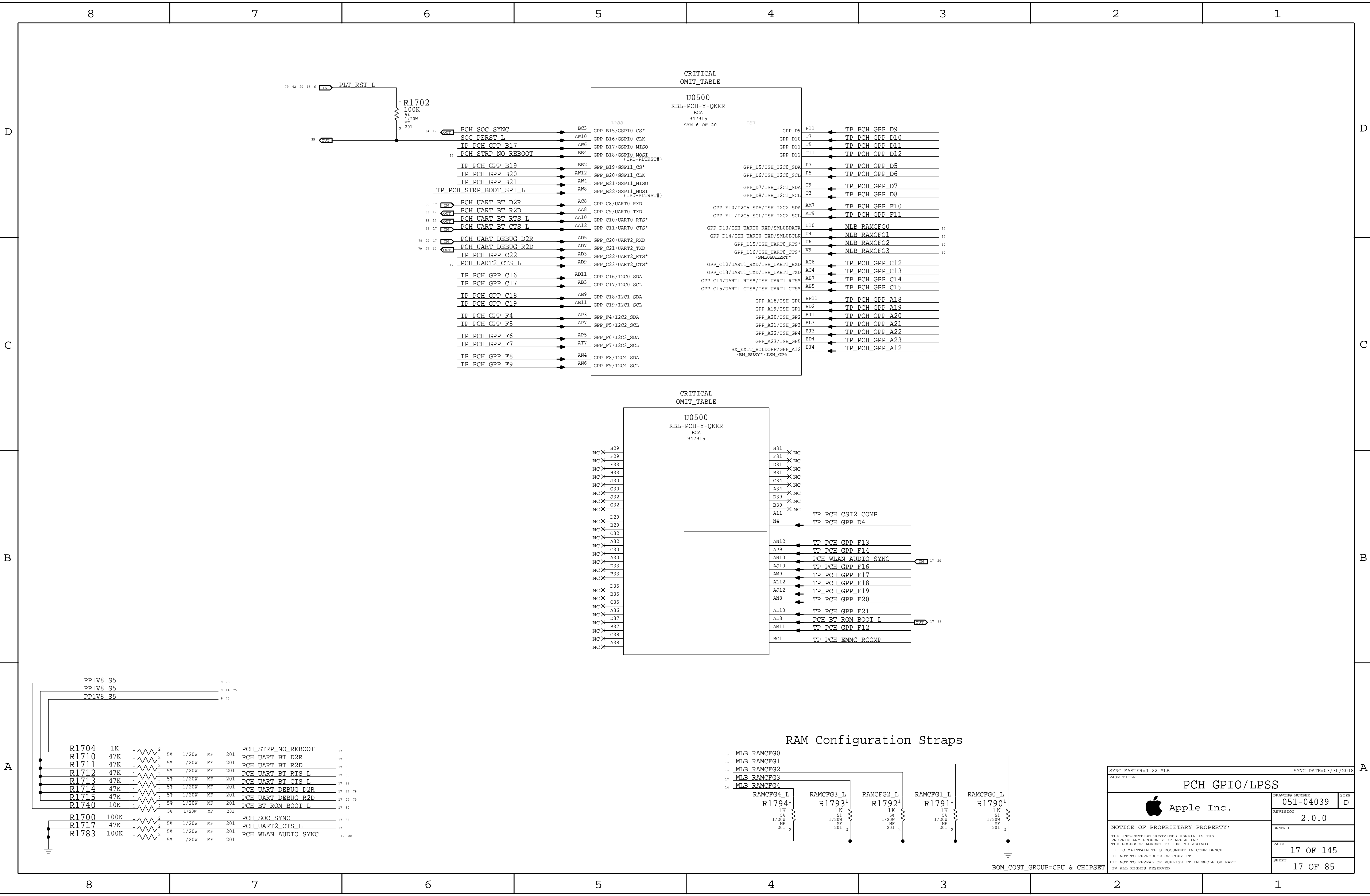
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	PAGE	15 OF 145	
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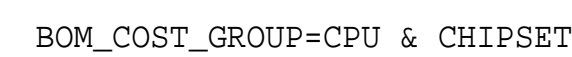
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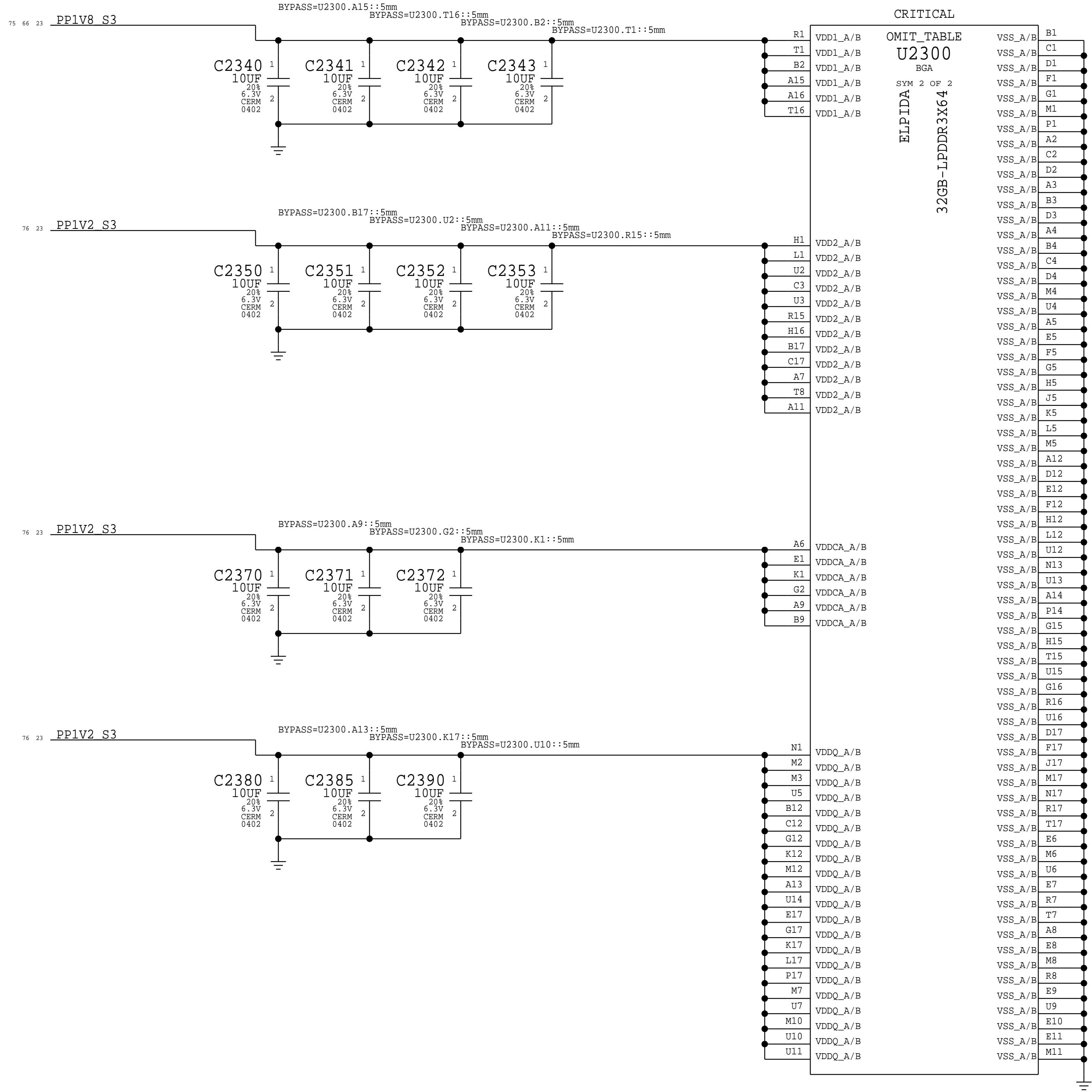
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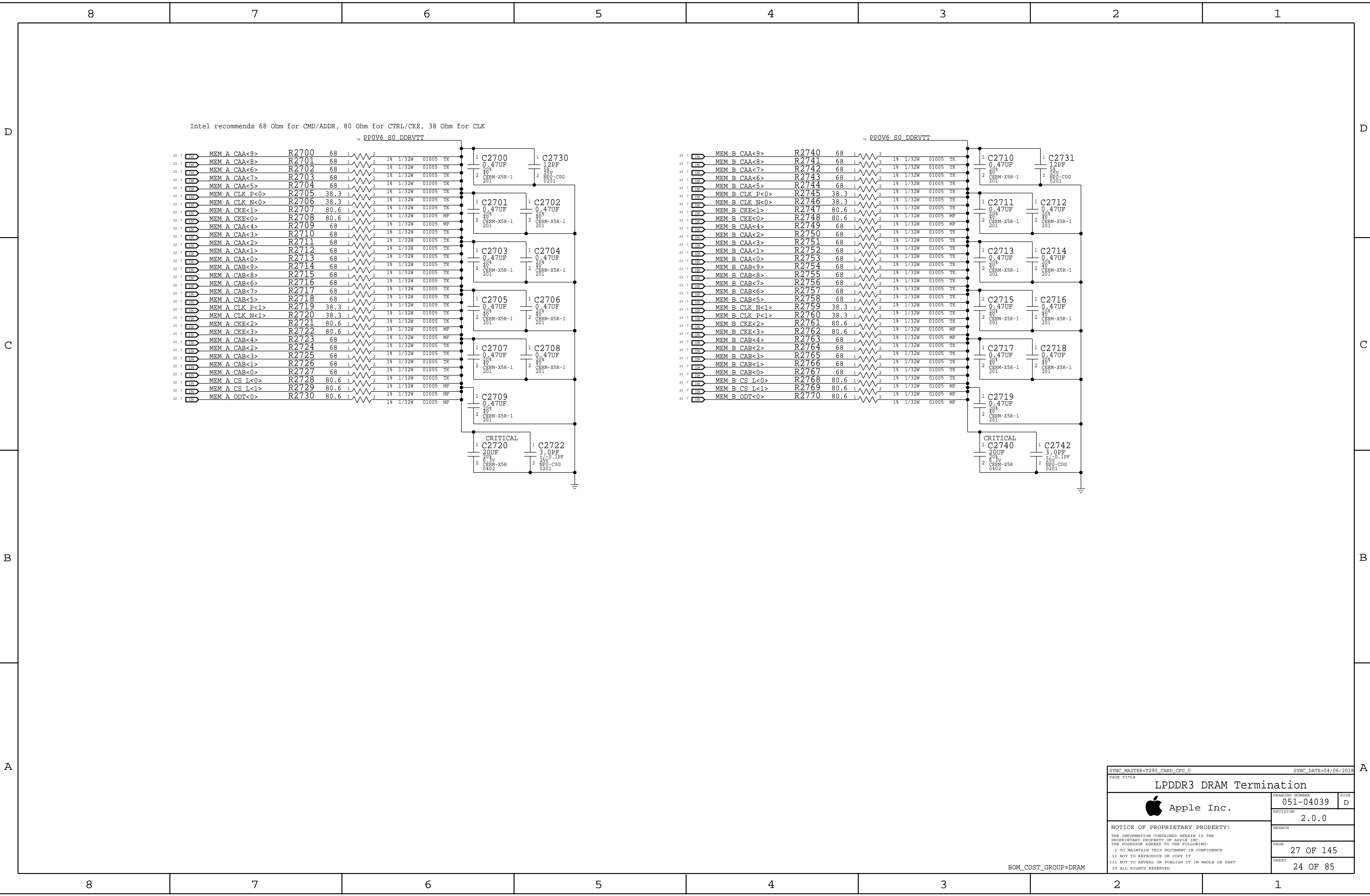
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		SHEET	
		20 OF 85	


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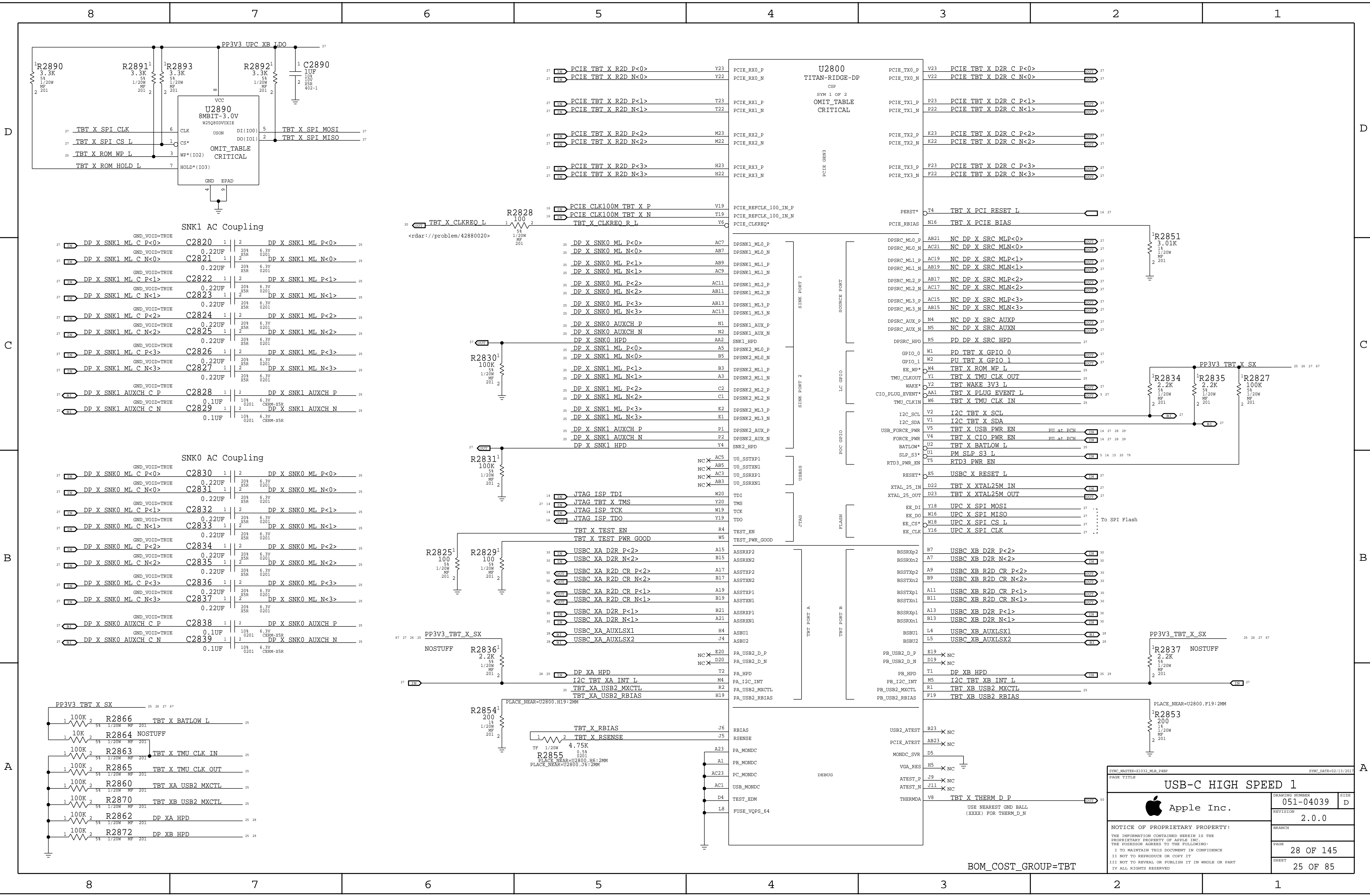
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LPDDR3 DRAM Channel A (0-63)			
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	051-04039		D
REVISION		2.0.0	
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		23 OF 145	
		SHEET	
		22 OF 85	



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LPDDR3 DRAM Termination			
 Apple Inc.	DRAWING NUMBER		SIZE
	051-04039		D
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	2.0.0		
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	PAGE		
	27 OF 145		
	SHEET		
	24 OF 85		




SYNC_MASTER=K1032_MLB_P4BP

SYNC_DATE=02/13/2017

PAGE TITLE

USB-C HIGH SPEED 1

 Apple Inc.

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DRAWING NUMBER

051-04039

REVISION

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PAGE

28 OF 145

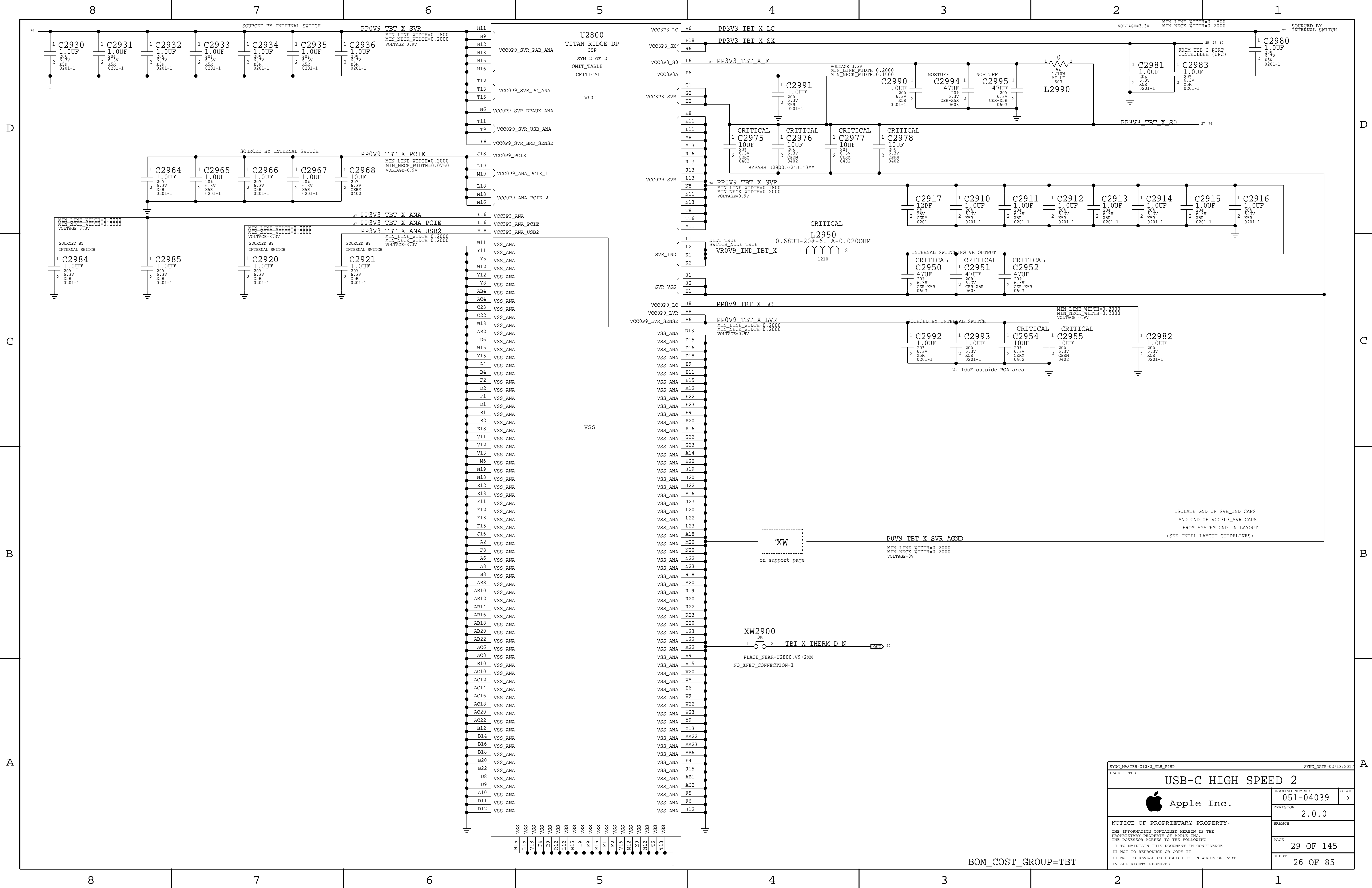
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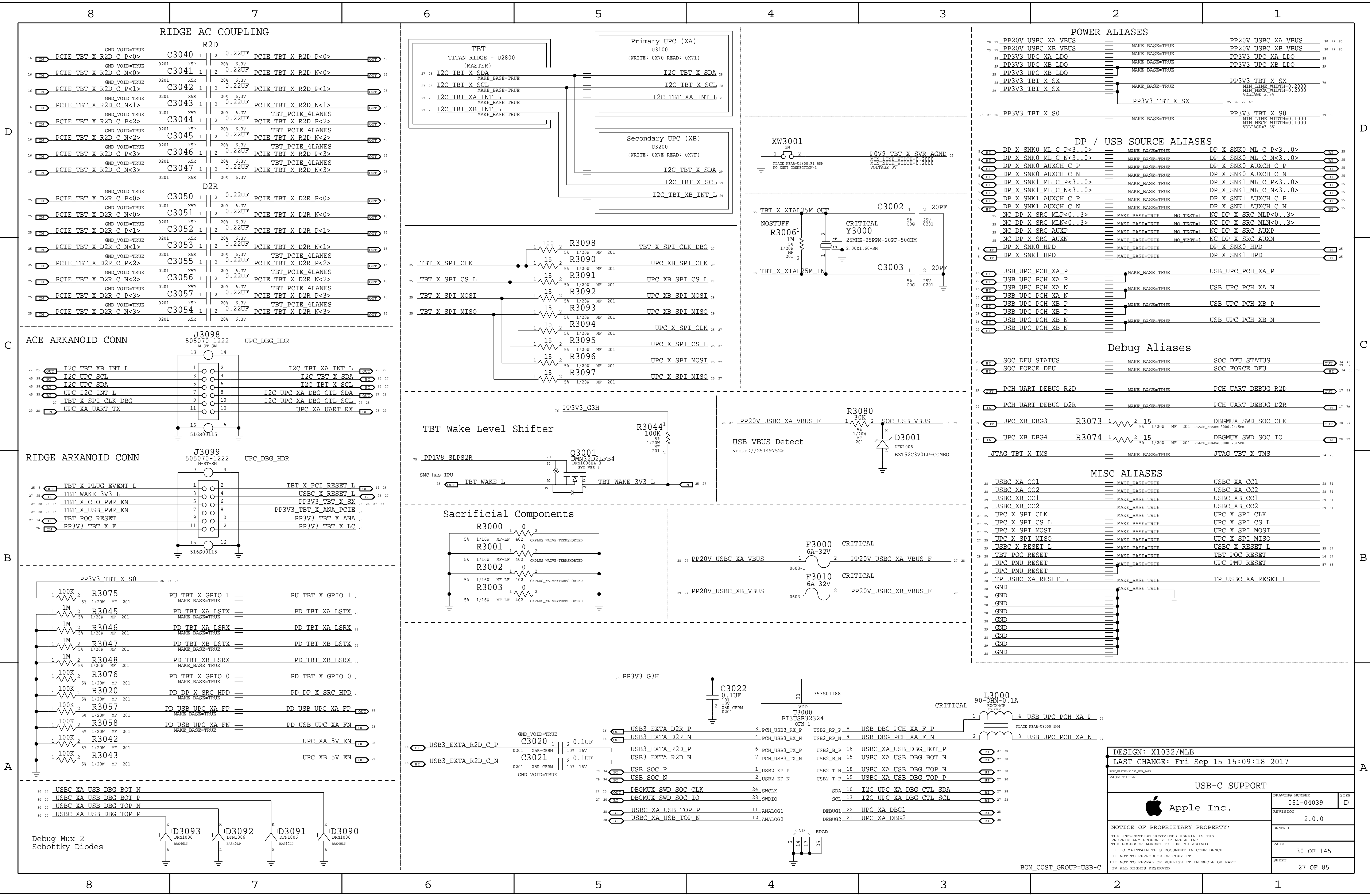
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SIZE

D

BOM_COST_GROUP=TBT





D



B


A

D

C

B

A

SWC_NUMBER=01012_MSR_F486		SWC_DATE=02/12/2013	
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 Apple Inc.	DRAWING NUMBER 051-04039		SIZE D
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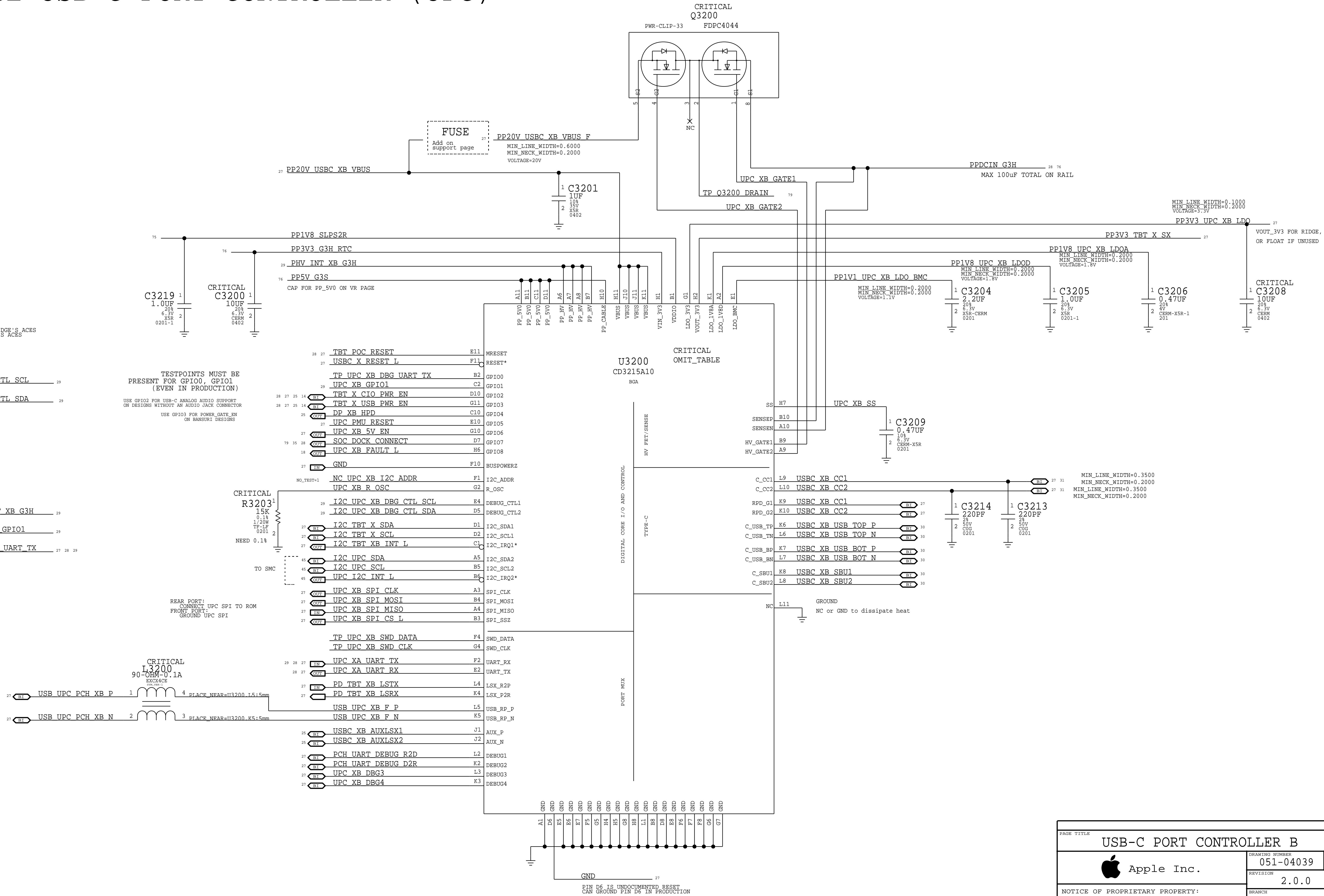
SECONDARY ACE USB-C PORT CONTROLLER (UPC)

D

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D

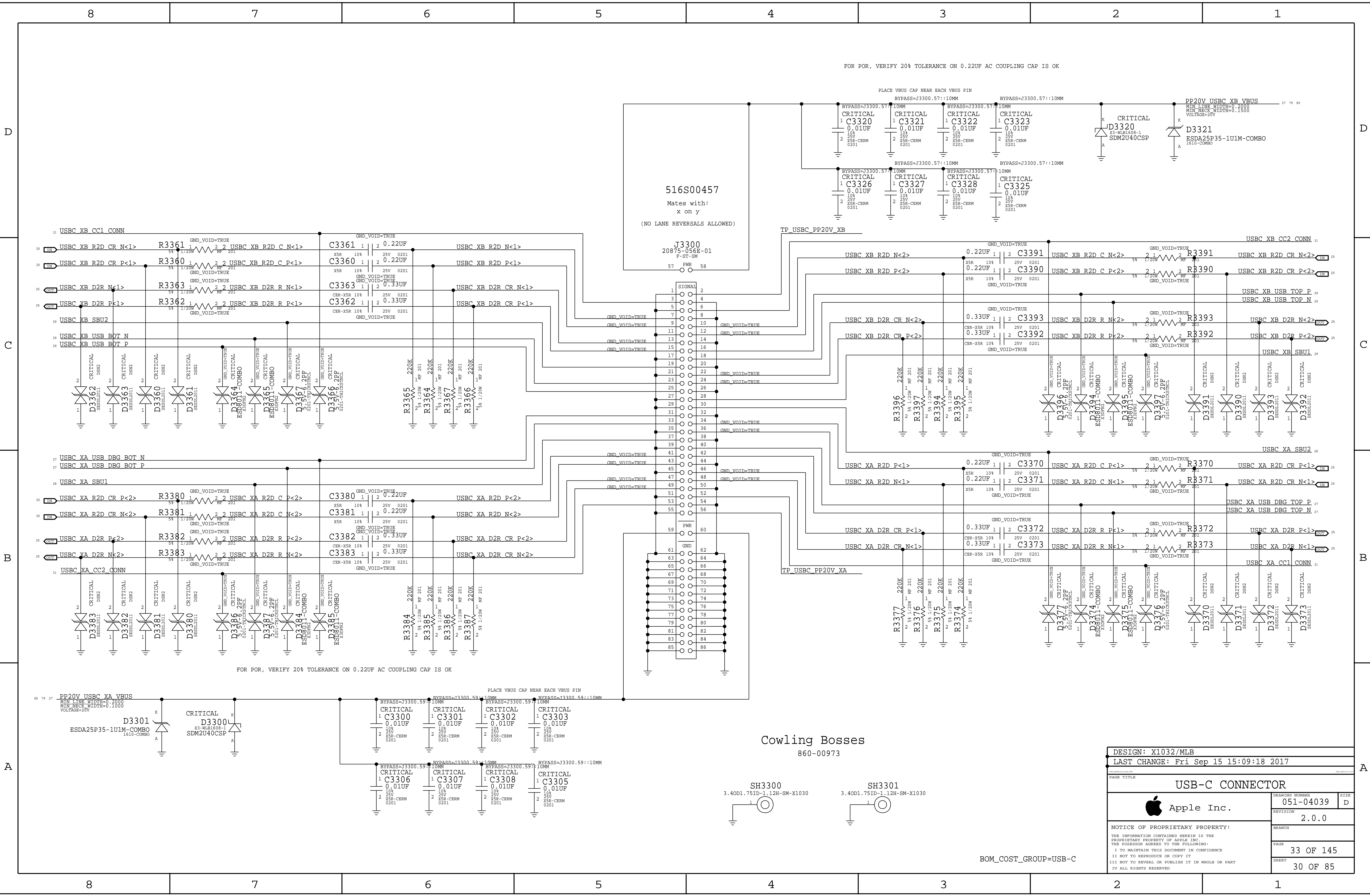
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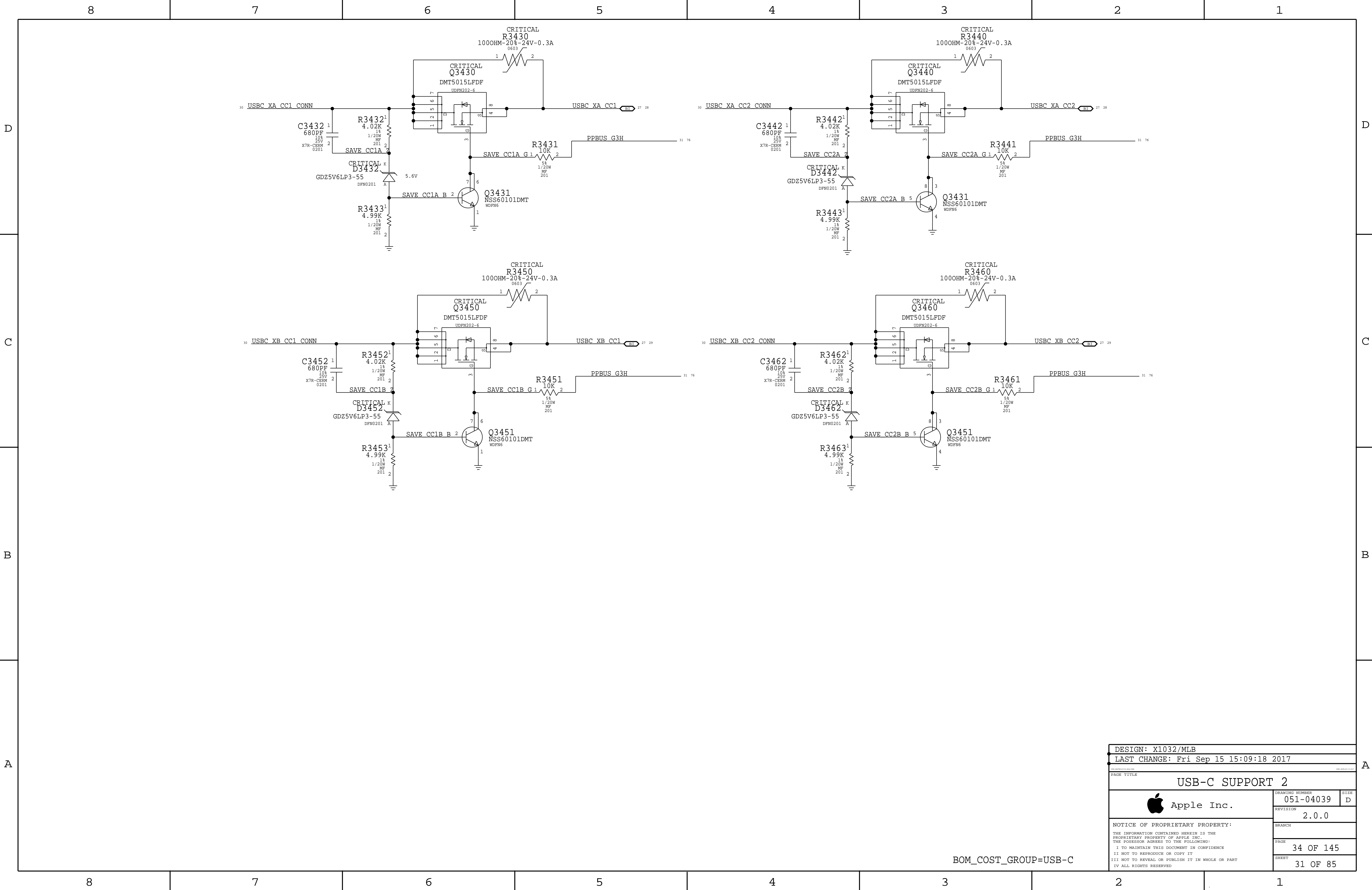
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 Apple Inc.	DRAWING NUMBER	051-04039
	REVISION	2.0.0
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	SHEET	29 OF 85



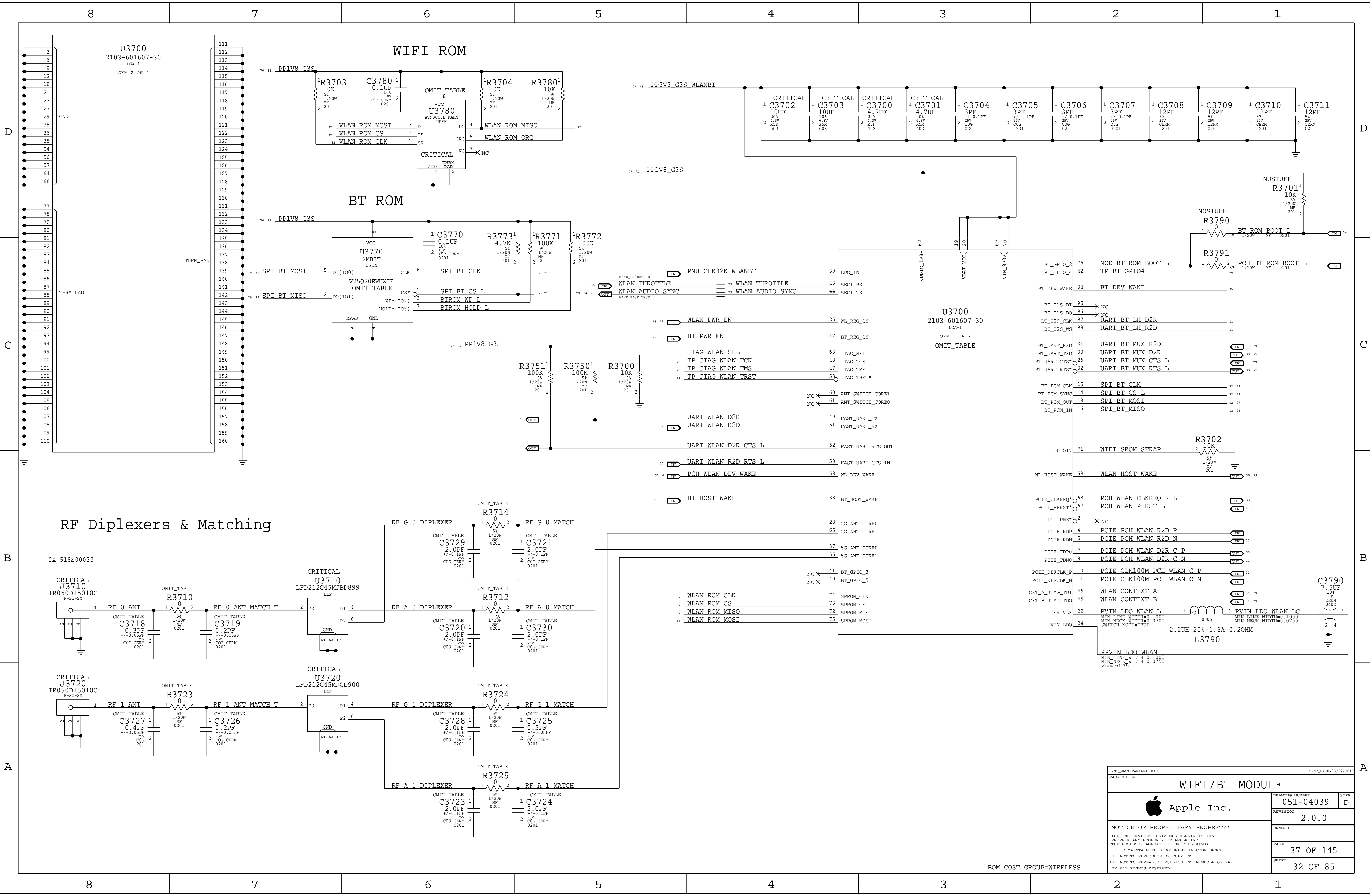
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LAST CHANGE: Fri Sep 15 15:09:18 2017		
PAGE TITLE		
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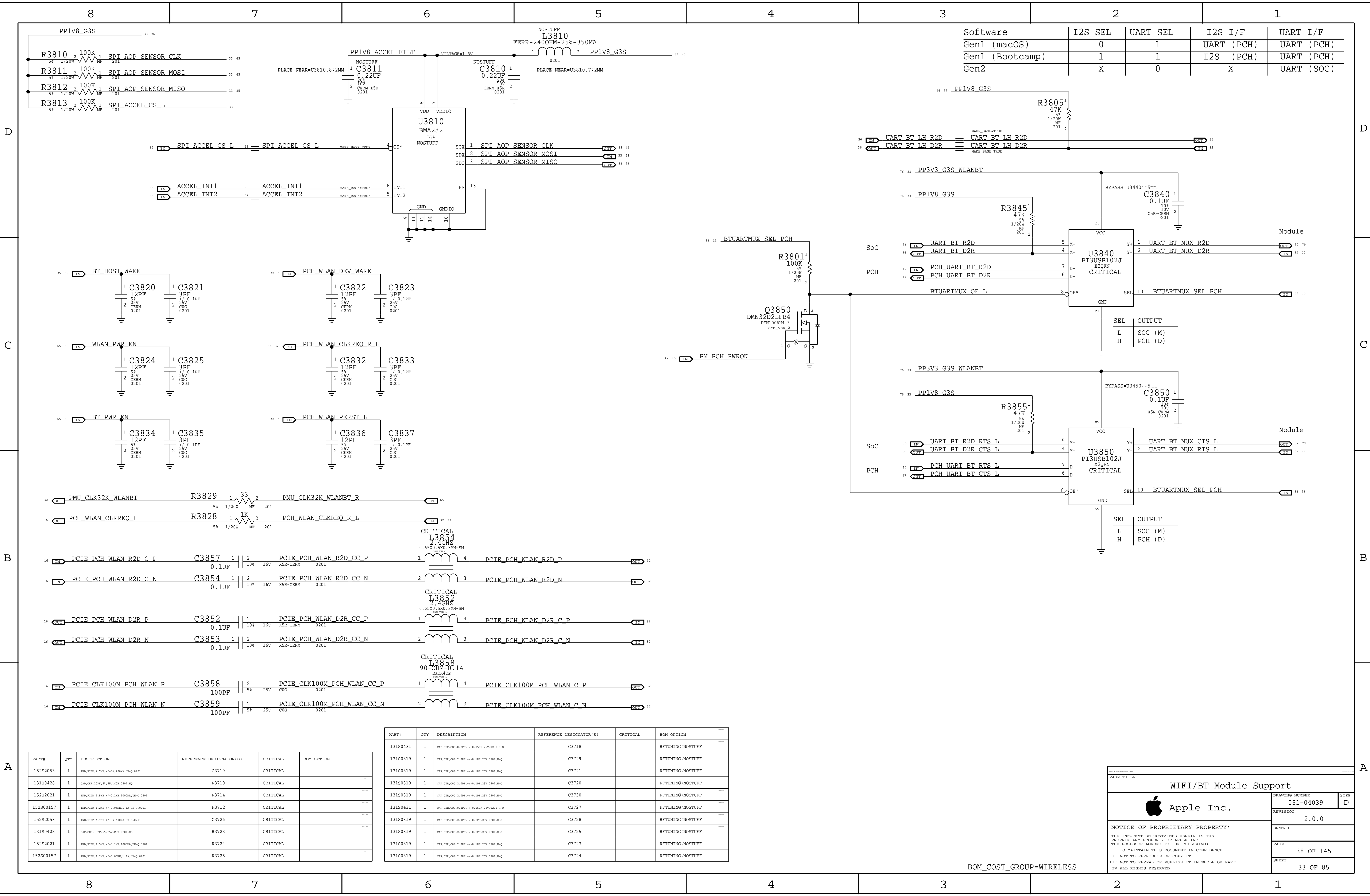
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	PAGE	34 OF 145
	SHEET	31 OF 85

BOM_COST_GROUP=USB-C





D

C

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A

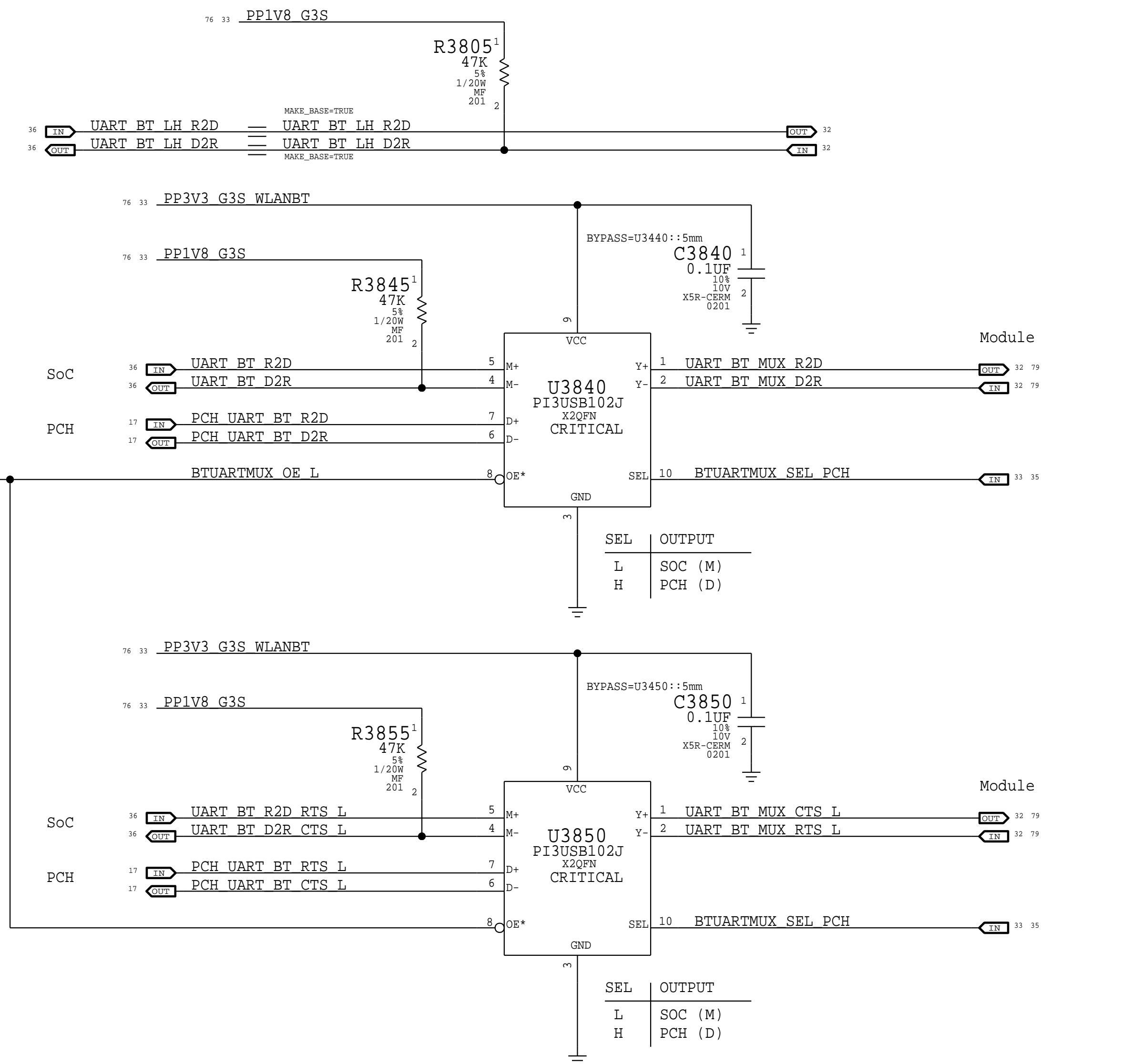
D

C

B

A

Software	I2S_SEL	UART_SEL	I2S I/F	UART I/F
Gen1 (macOS)	0	1	UART (PCH)	UART (PCH)
Gen1 (Bootcamp)	1	1	I2S (PCH)	UART (PCH)
Gen2	X	0	X	UART (SOC)

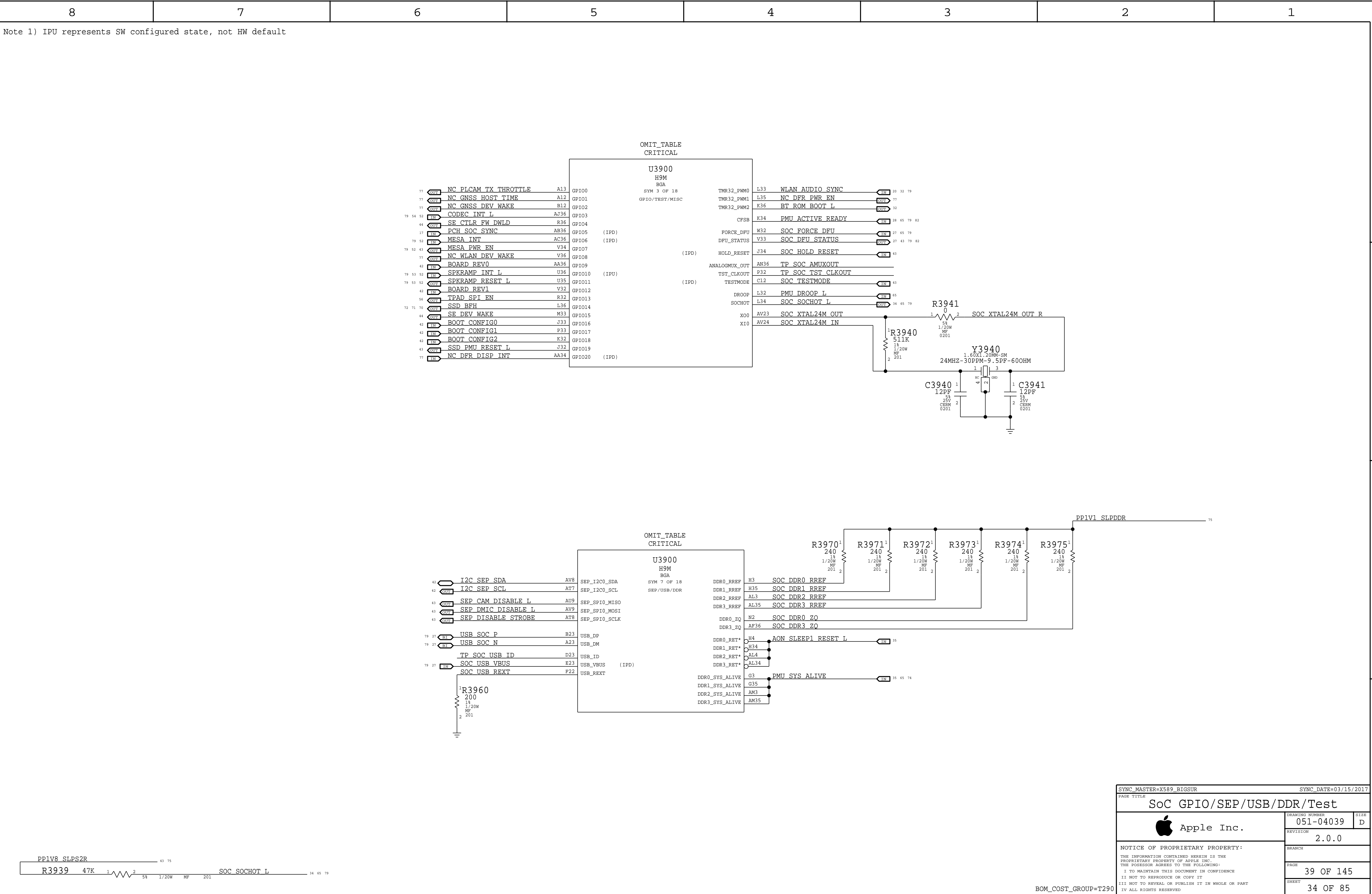


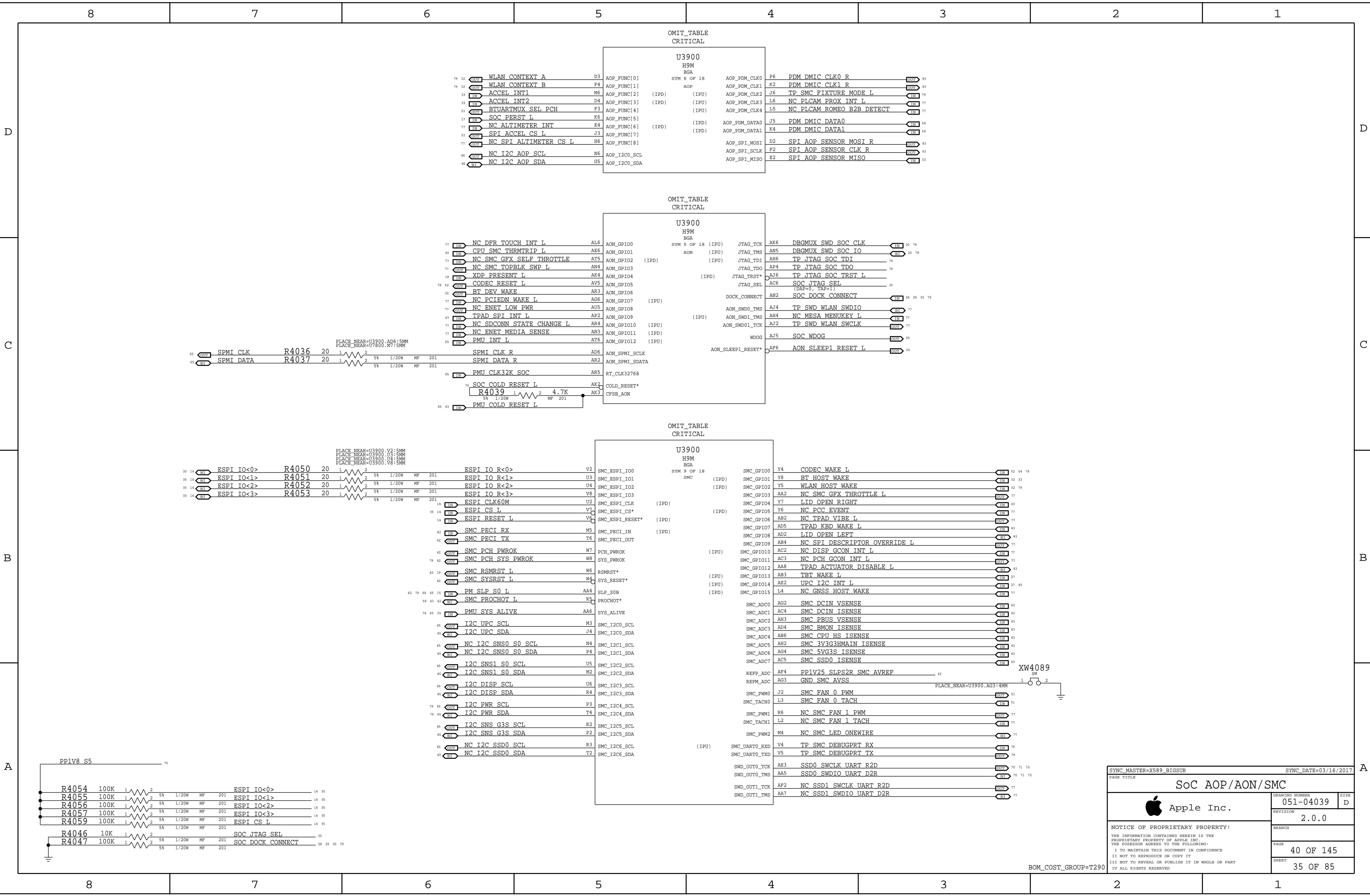
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
131S0431	1	CAP,CER,C0G,0.22UF,+/-0.05PP,25V,0201,0-Q	C3718		RFTUNING:NOSTUFF
131S0319	1	CAP,CER,C0G,2.0UF,+/-0.1PP,25V,0201,0-Q	C3729		RFTUNING:NOSTUFF
131S0319	1	CAP,CER,C0G,2.0UF,+/-0.1PP,25V,0201,0-Q	C3721		RFTUNING:NOSTUFF
131S0319	1	CAP,CER,C0G,2.0UF,+/-0.1PP,25V,0201,0-Q	C3720		RFTUNING:NOSTUFF
131S0319	1	CAP,CER,C0G,2.0UF,+/-0.1PP,25V,0201,0-Q	C3730		RFTUNING:NOSTUFF
131S0431	1	CAP,CER,C0G,0.22UF,+/-0.05PP,25V,0201,0-Q	C3727		RFTUNING:NOSTUFF
131S0319	1	CAP,CER,C0G,2.0UF,+/-0.1PP,25V,0201,0-Q	C3728		RFTUNING:NOSTUFF
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131S0319	1	CAP,CER,C0G,2.0UF,+/-0.1PP,25V,0201,0-Q	C3723		RFTUNING:NOSTUFF
131S0319	1	CAP,CER,C0G,2.0UF,+/-0.1PP,25V,0201,0-Q	C3724		RFTUNING:NOSTUFF

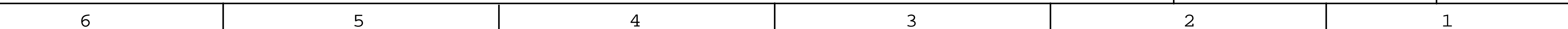
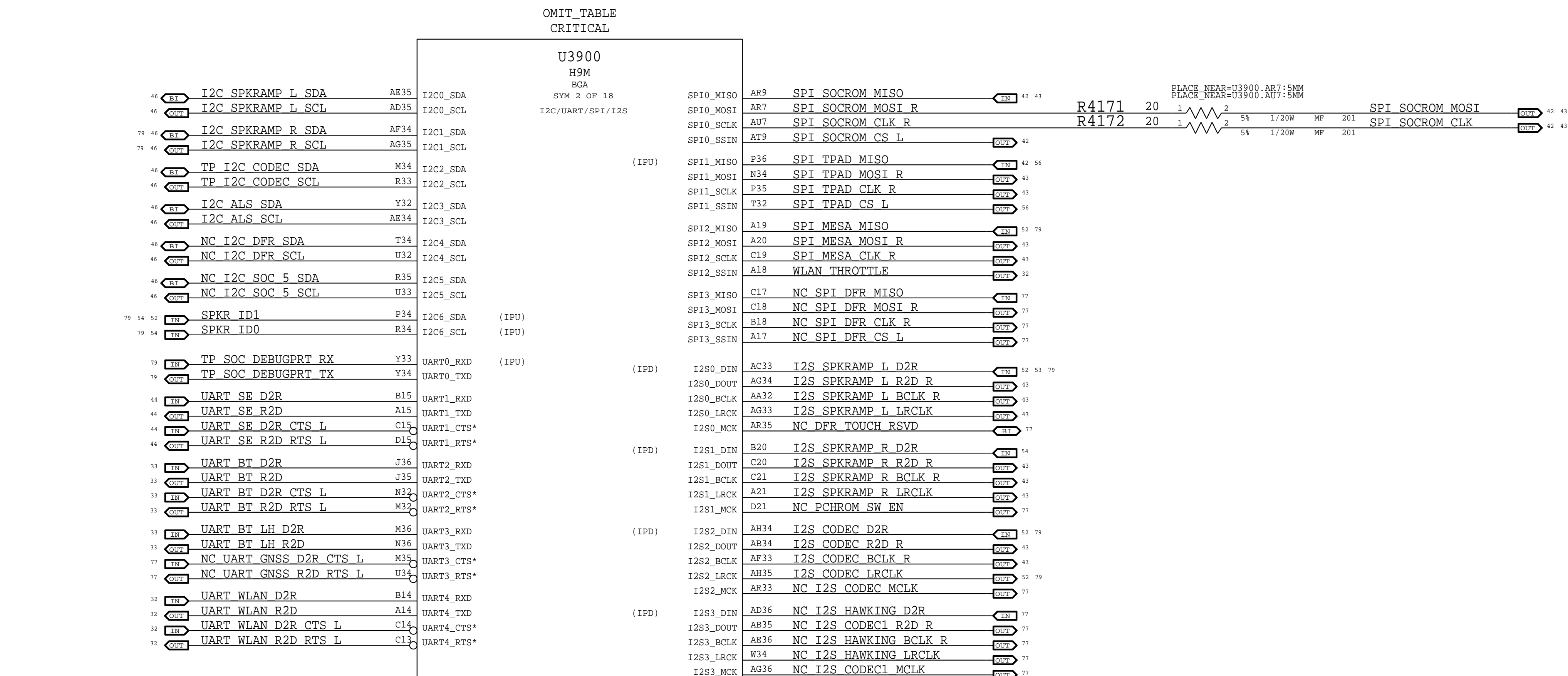
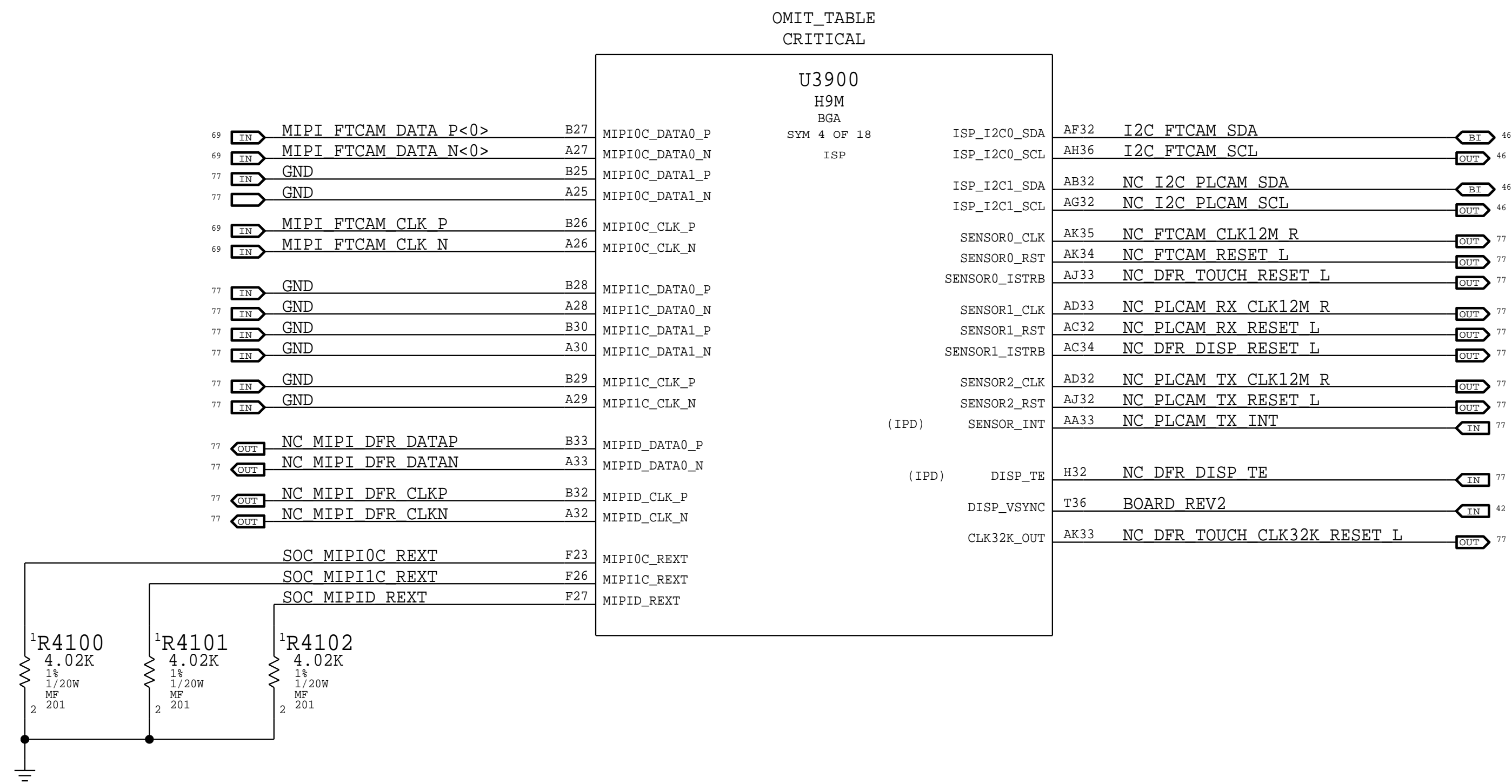
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
152S2053	1	IND,FILM,4.7MH,+/-1%,400MA,10-Q,0201	C3719	CRITICAL	
131S0428	1	CAP,CER,10PP,5V,25V,C0G,0201,0-Q	R3710	CRITICAL	
152S2021	1	IND,FILM,1.5MH,+/-0.1%,1000MA,10-Q,0201	R3714	CRITICAL	
152S00157	1	IND,FILM,1.2MH,+/-0.05%,1.1A,10-Q,0201	R3712	CRITICAL	
152S2053	1	IND,FILM,4.7MH,+/-1%,400MA,10-Q,0201	C3726	CRITICAL	
131S0428	1	CAP,CER,10PP,5V,25V,C0G,0201,0-Q	R3723	CRITICAL	
152S2021	1	IND,FILM,1.5MH,+/-0.1%,1000MA,10-Q,0201	R3724	CRITICAL	
152S00157	1	IND,FILM,1.2MH,+/-0.05%,1.1A,10-Q,0201	R3725	CRITICAL	

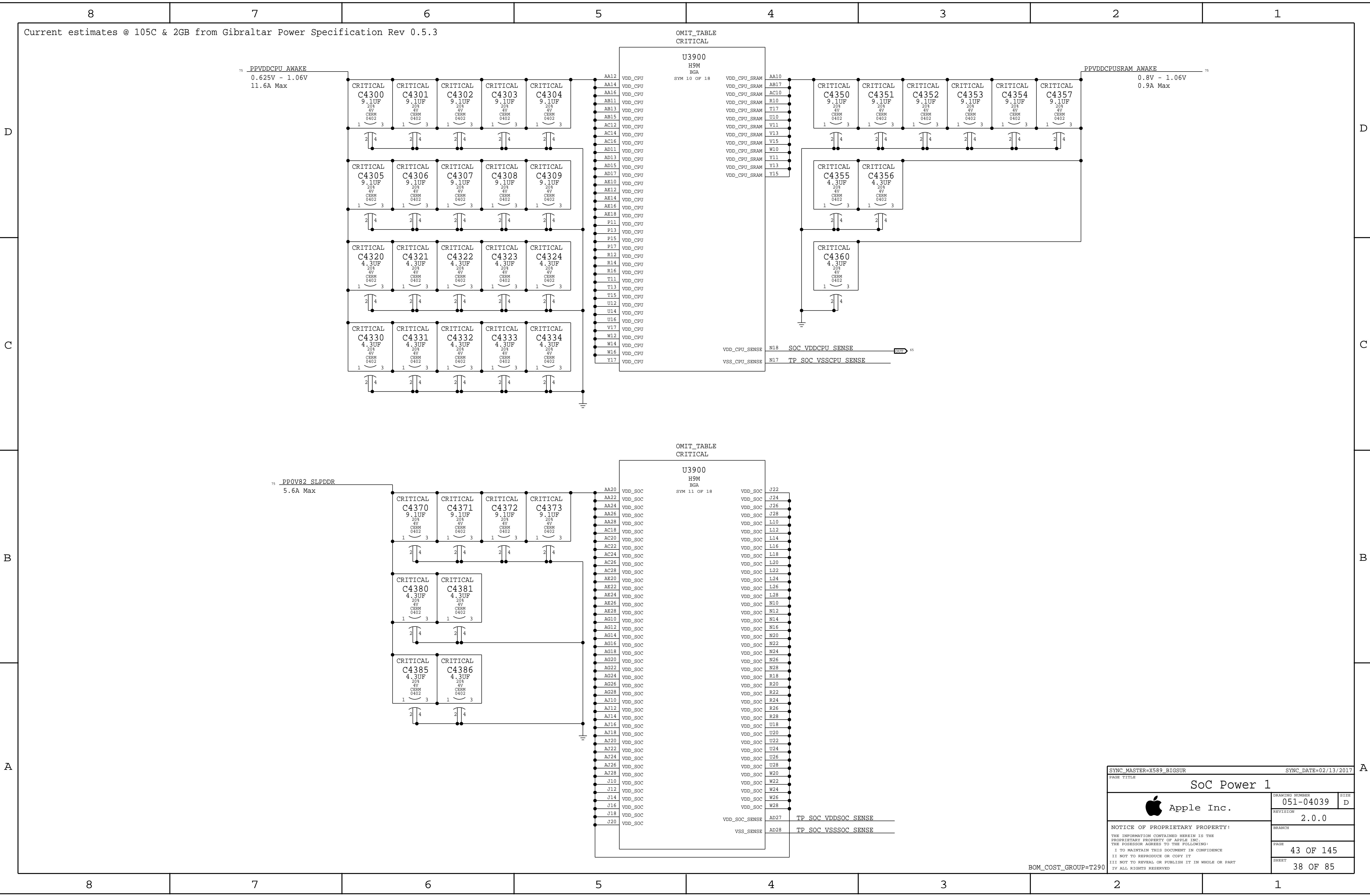
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	SHEET	33 OF 85





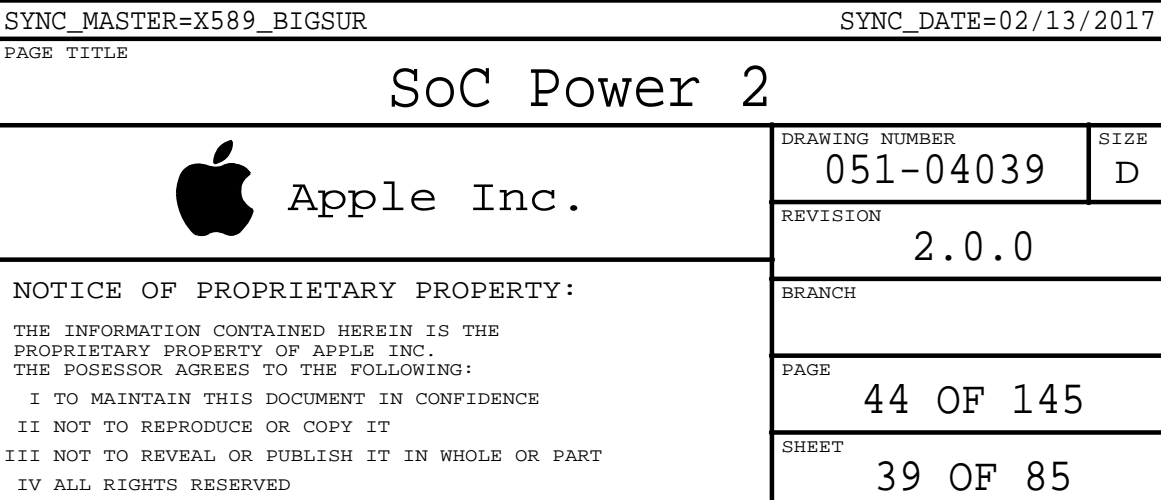




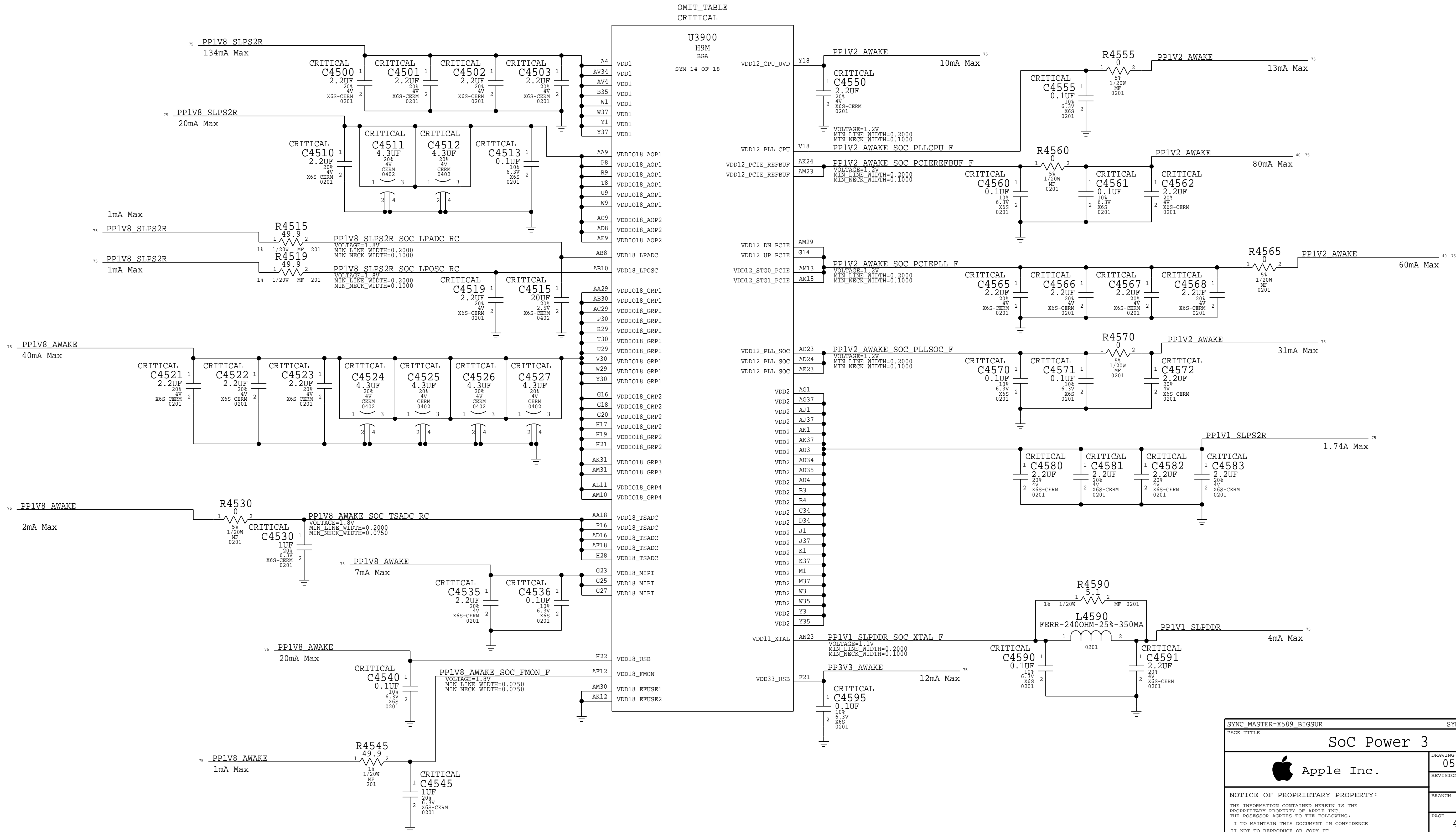
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BOM_COST_GROUP=T290


BOM_COST_GROUP=T290

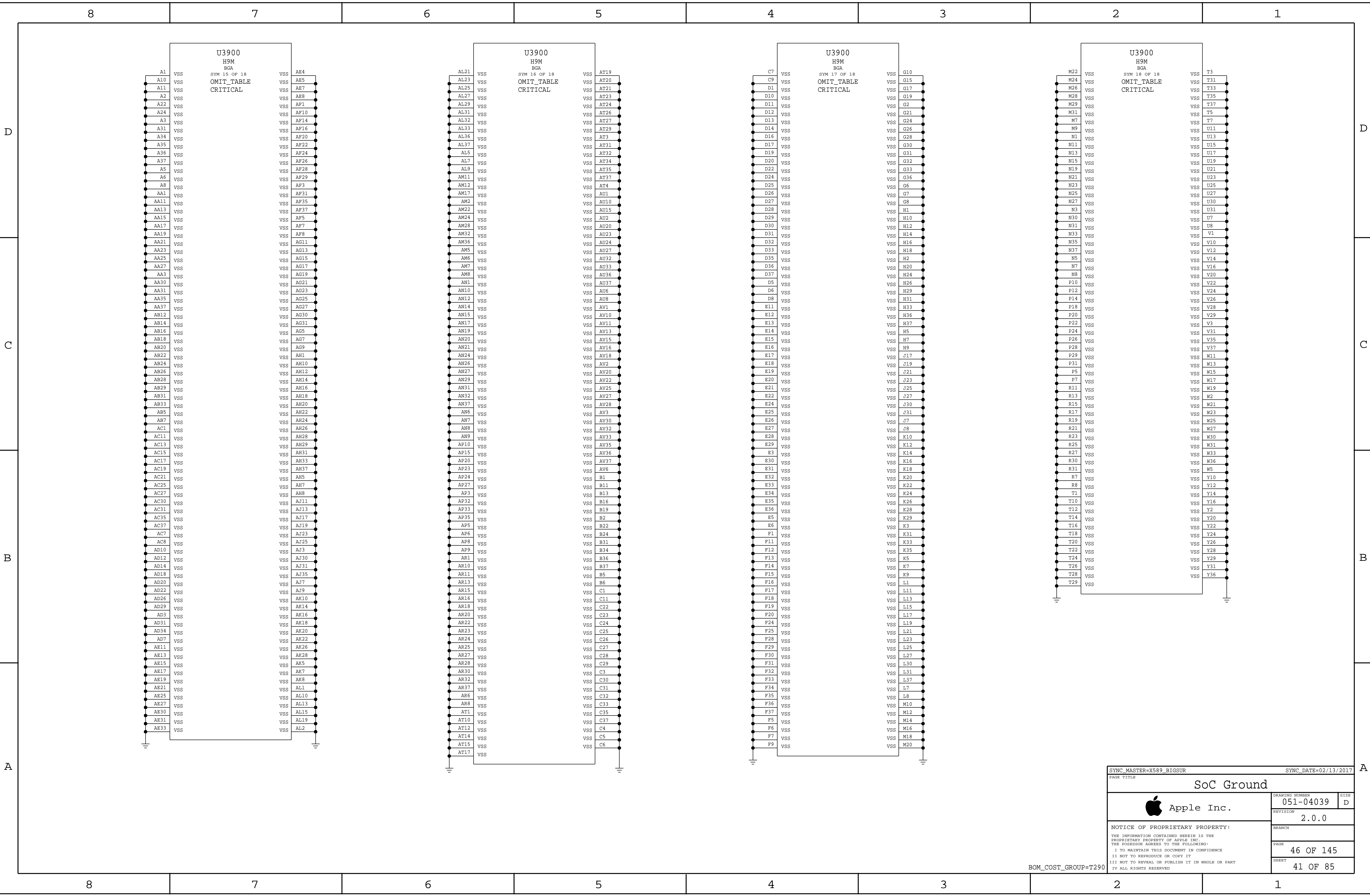


Current estimates @ 105C & 2GB from Gibraltar Power Specification Rev 0.5.3



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SYNC_MASTER=X589_BIGSUR

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SoC Ground

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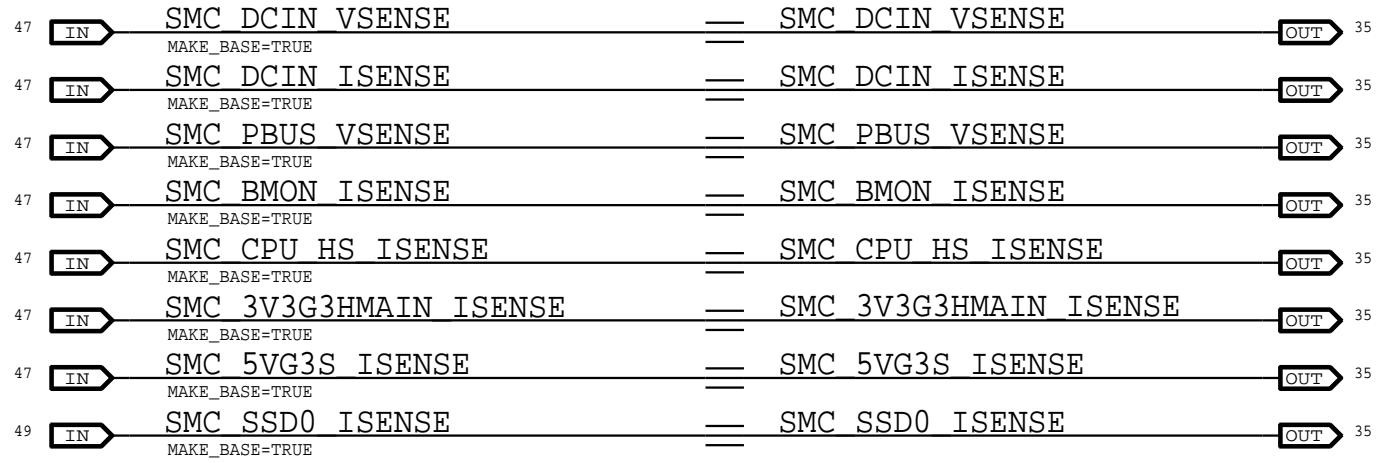
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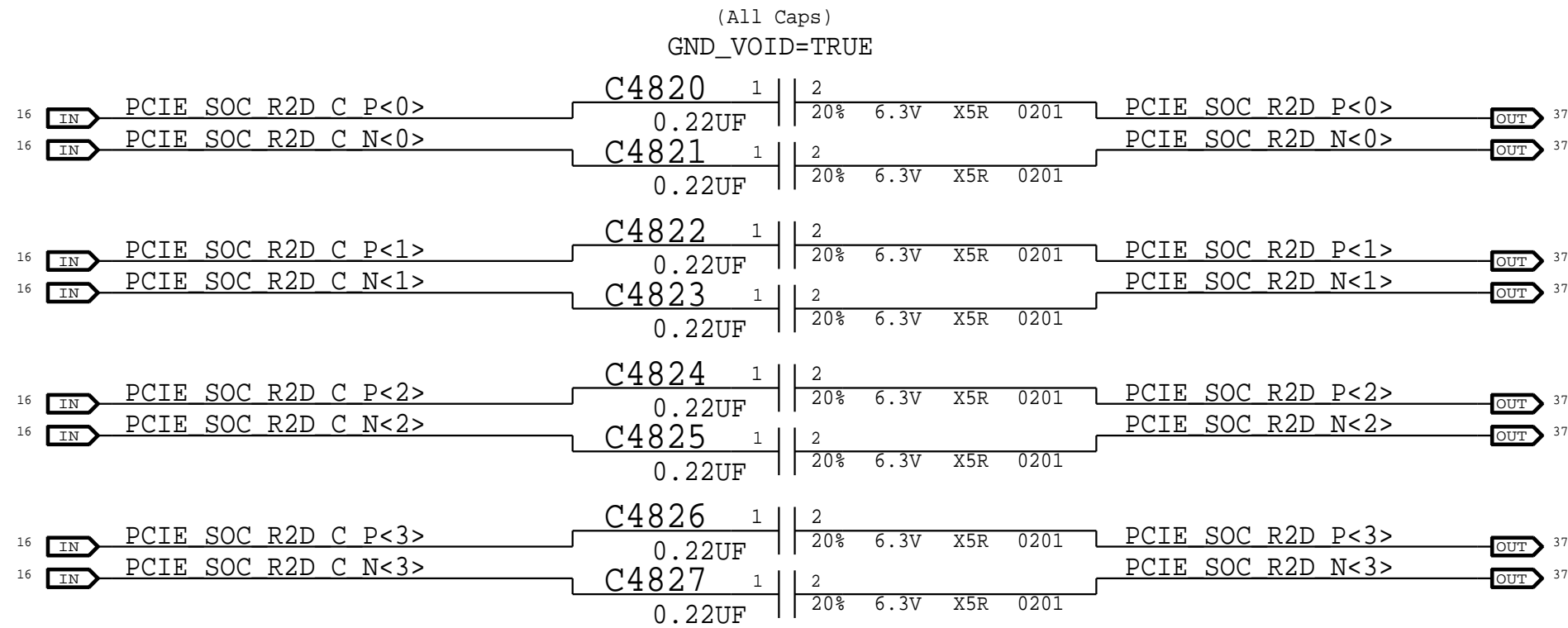
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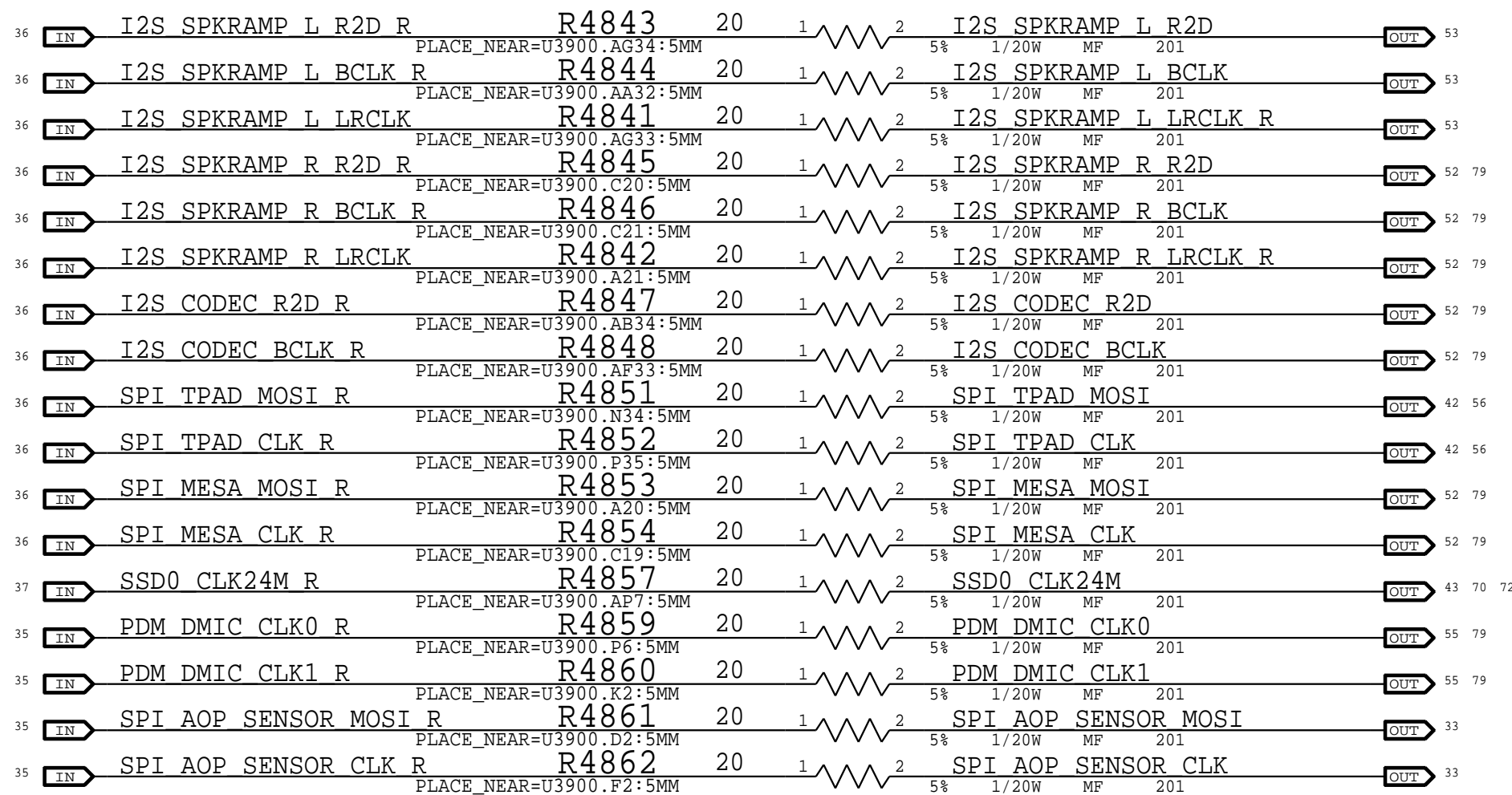
SMC ADC Assignments



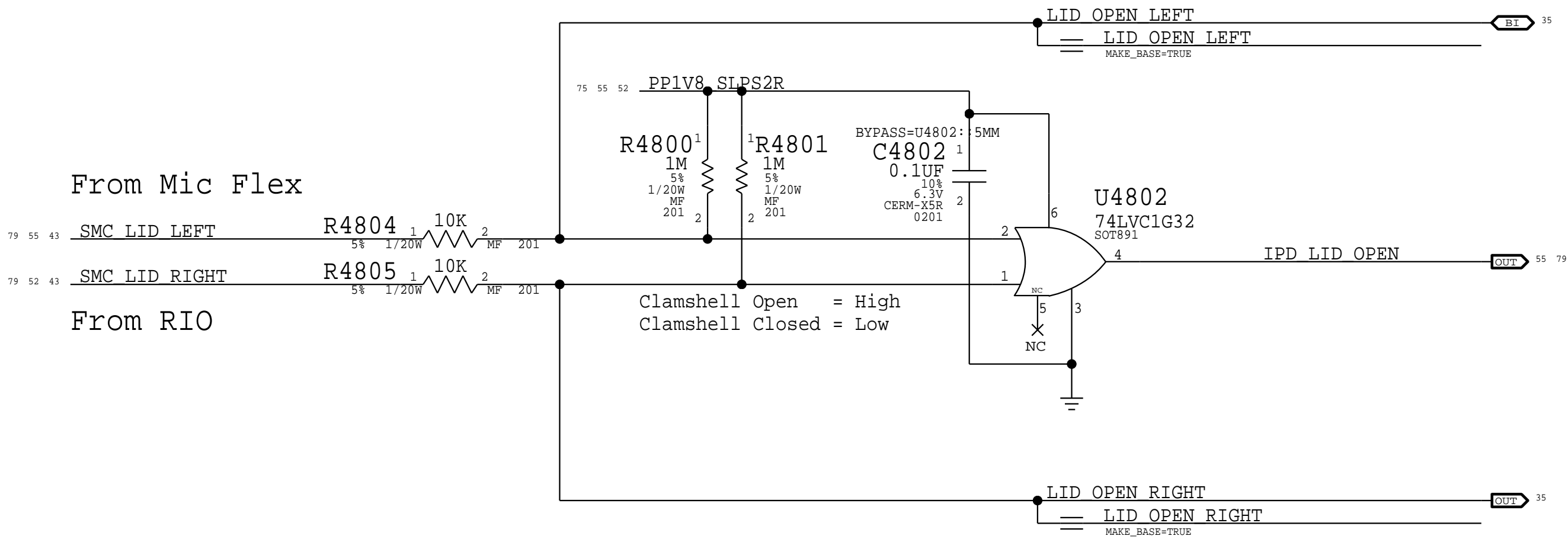
PCIe Up R2D AC Caps



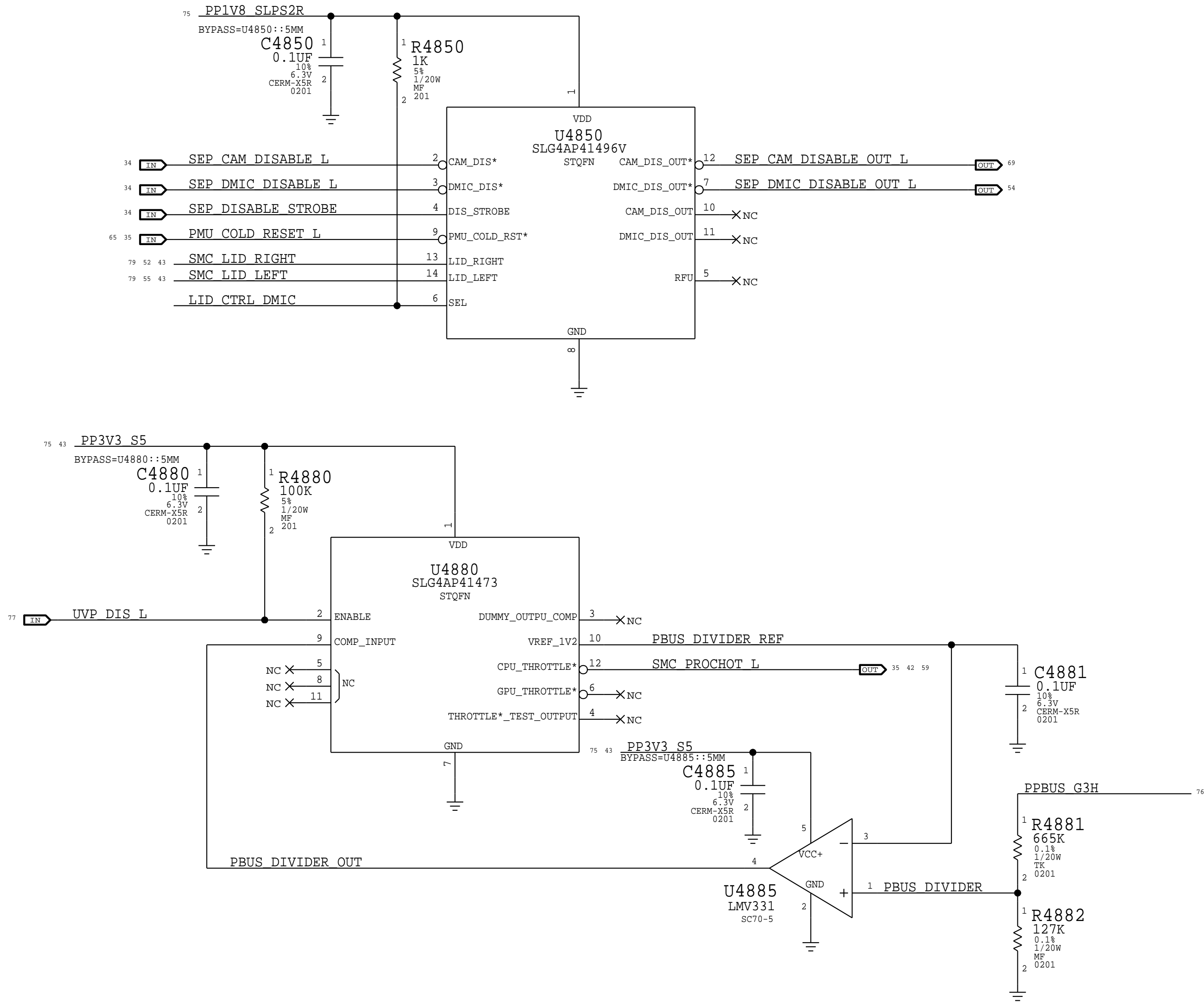
GPIO Source Termination



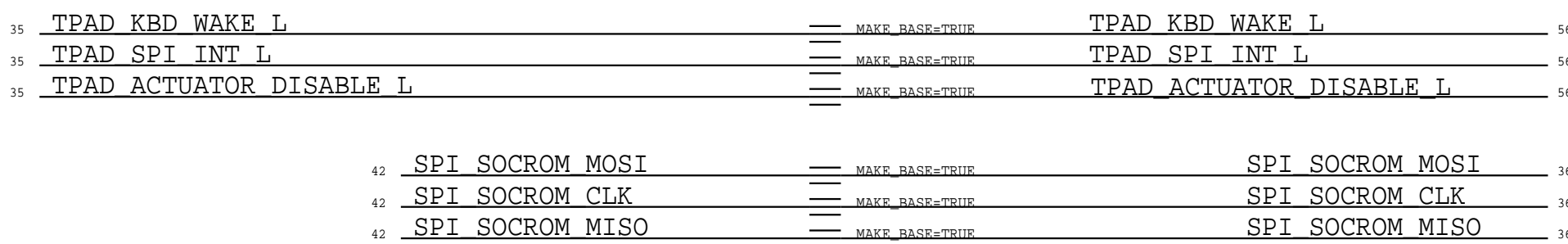
Lid Detect Logic



Secure Disable



Overloaded GPIOs



SYNC_MASTER=X589_BIGSUR

SYNC_DATE=02/13/2017

SoC Project Support

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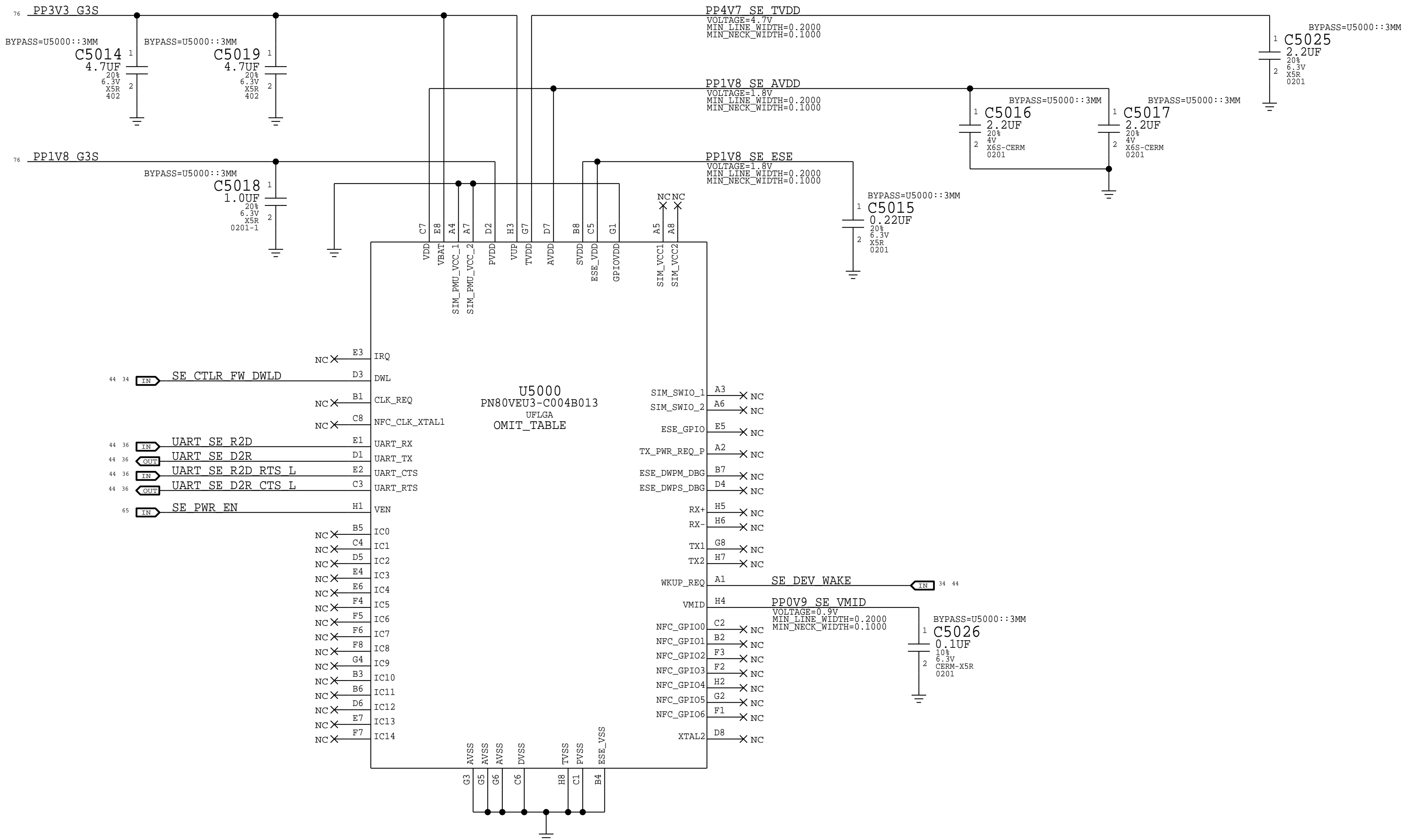
48 OF 145

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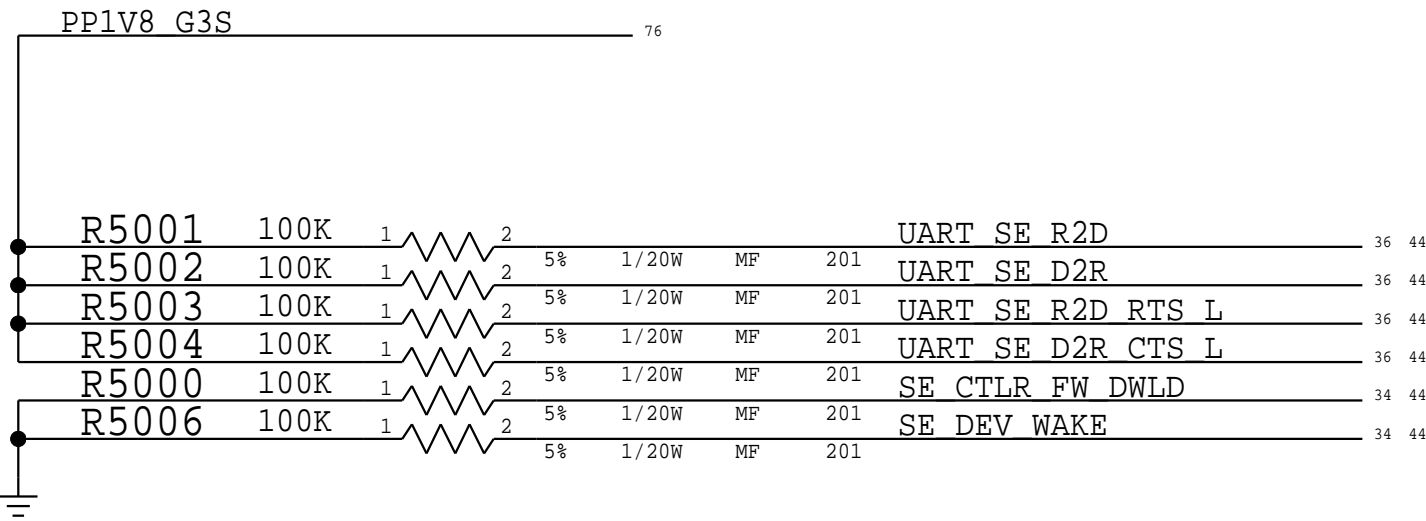
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BOM_COST_GROUP=T290

STOCKHOLM 2017

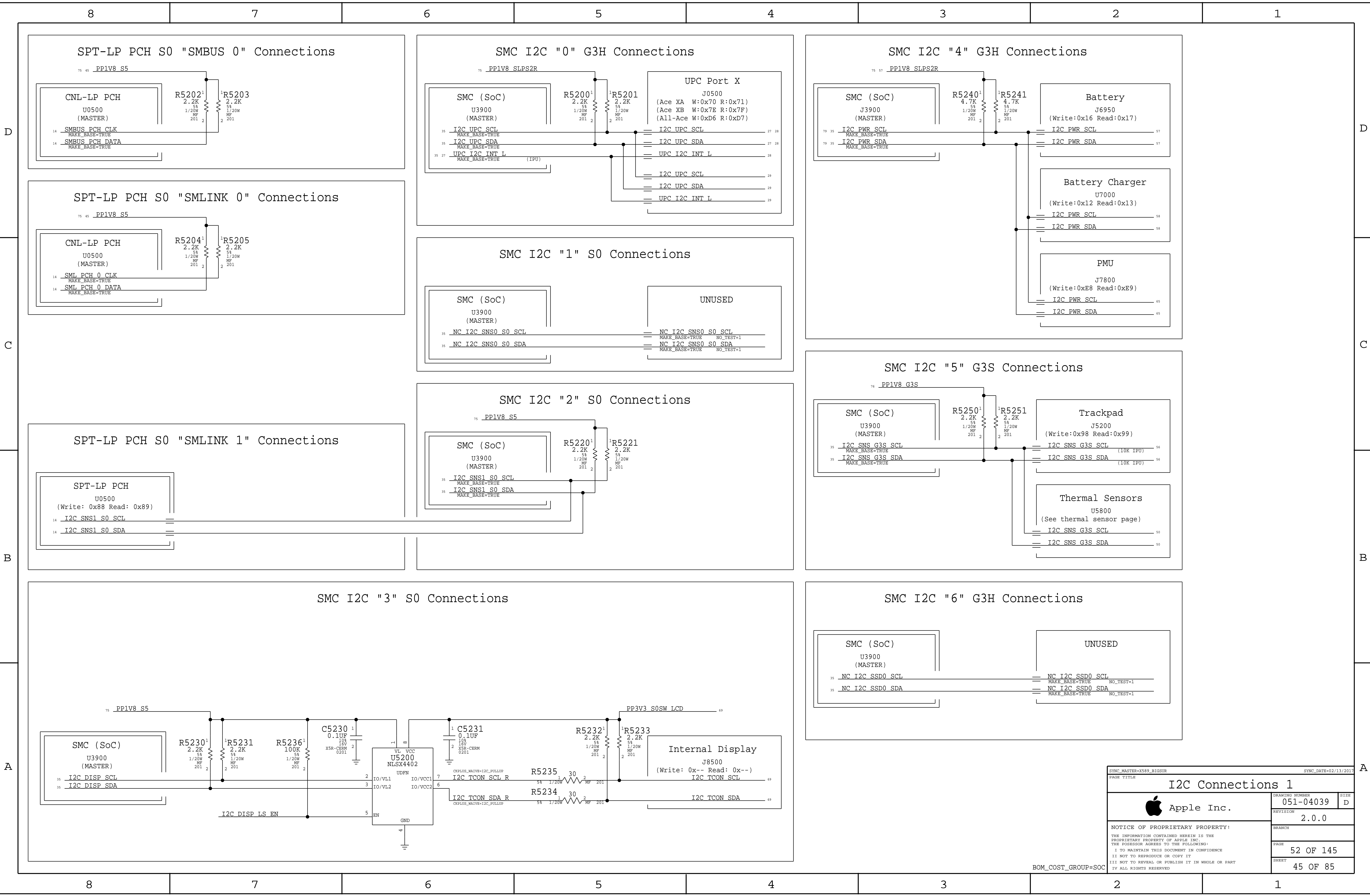


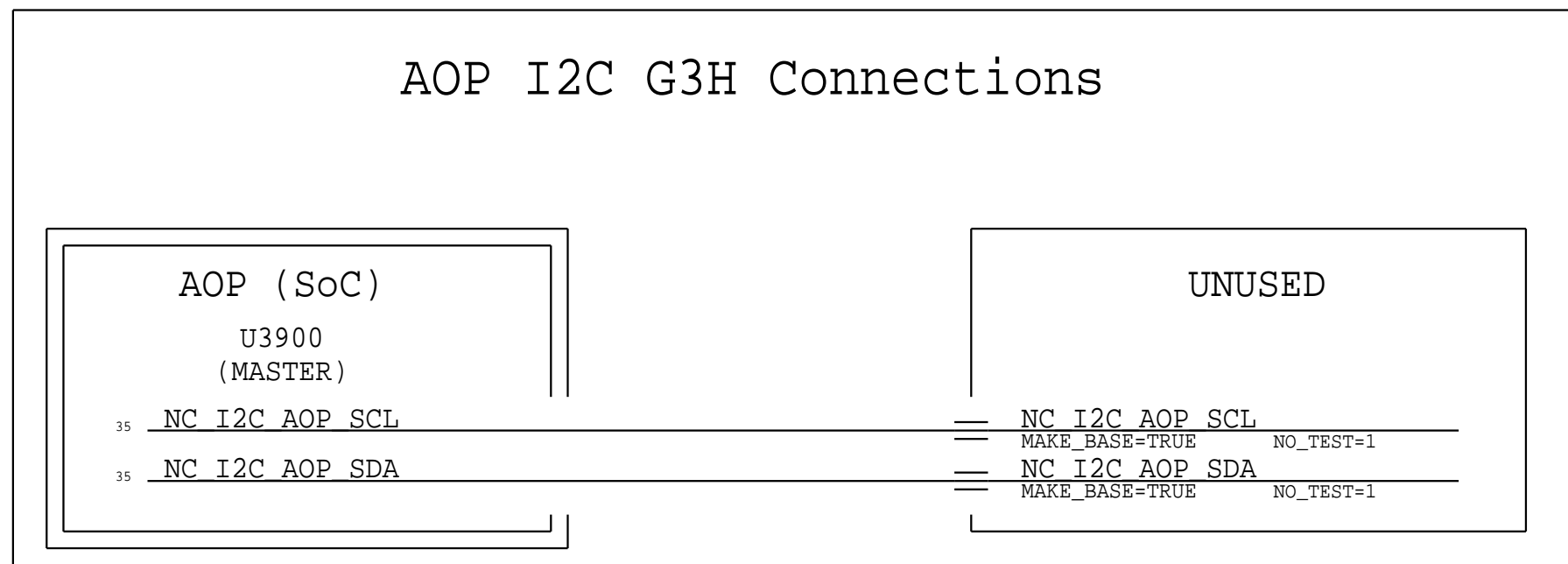
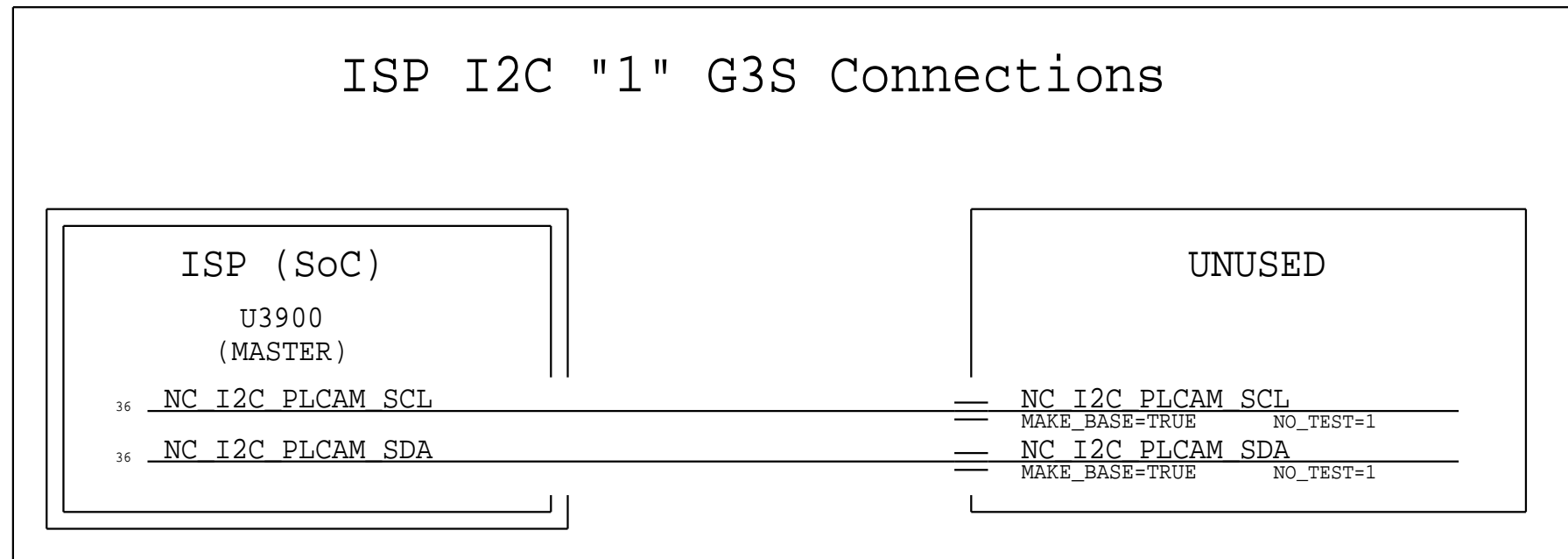
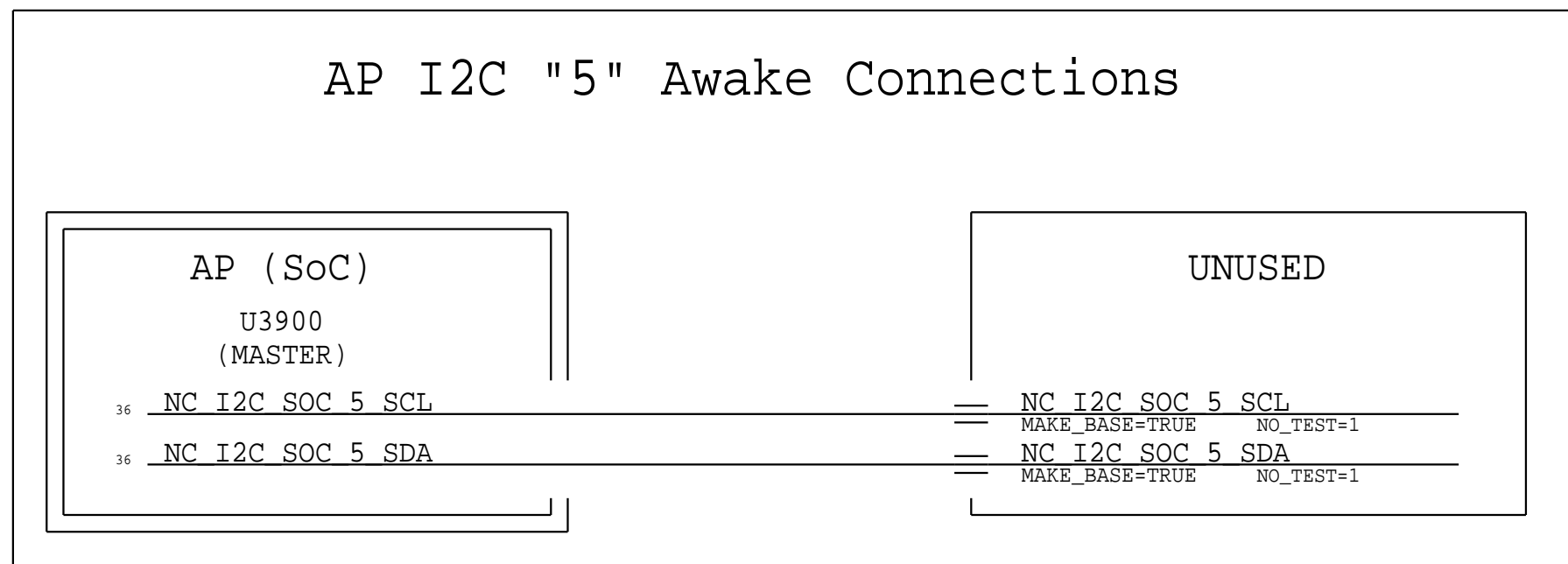
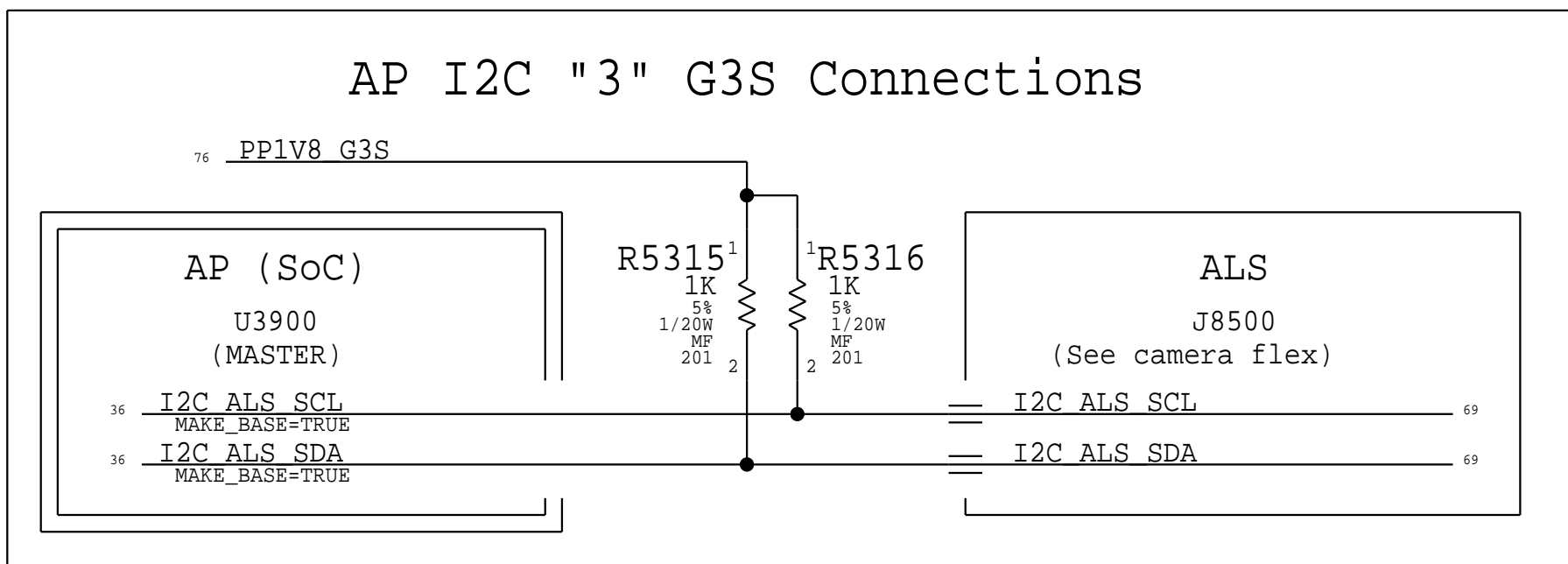
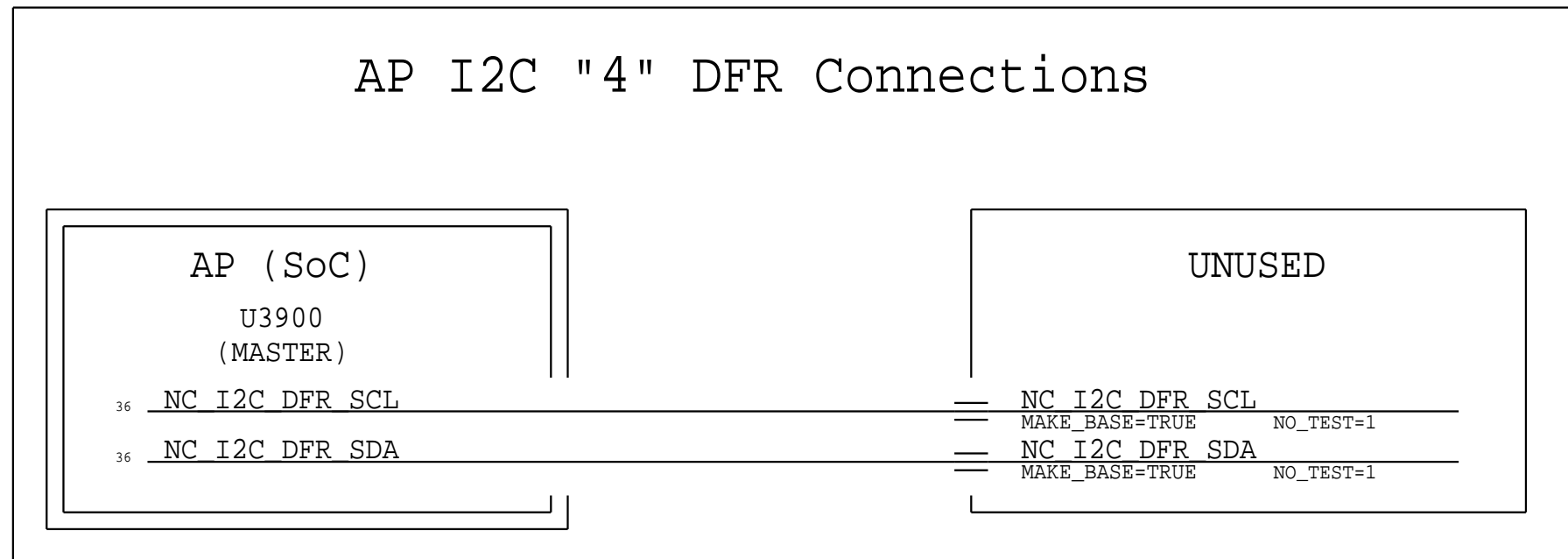
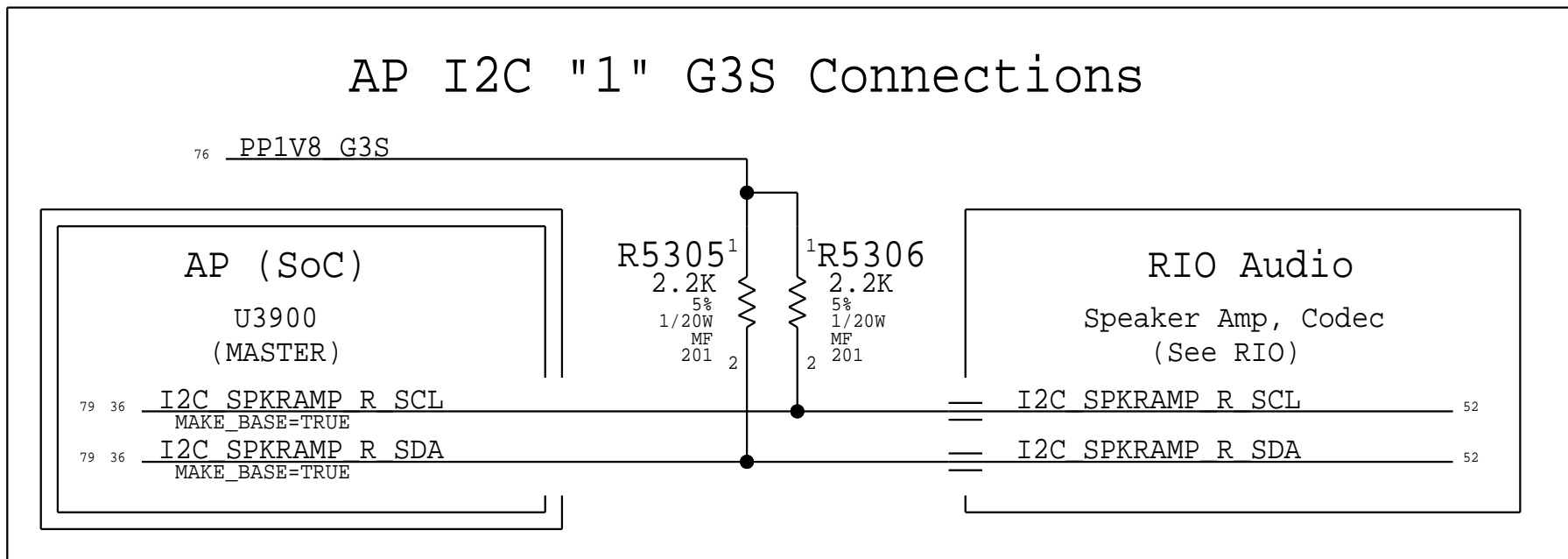
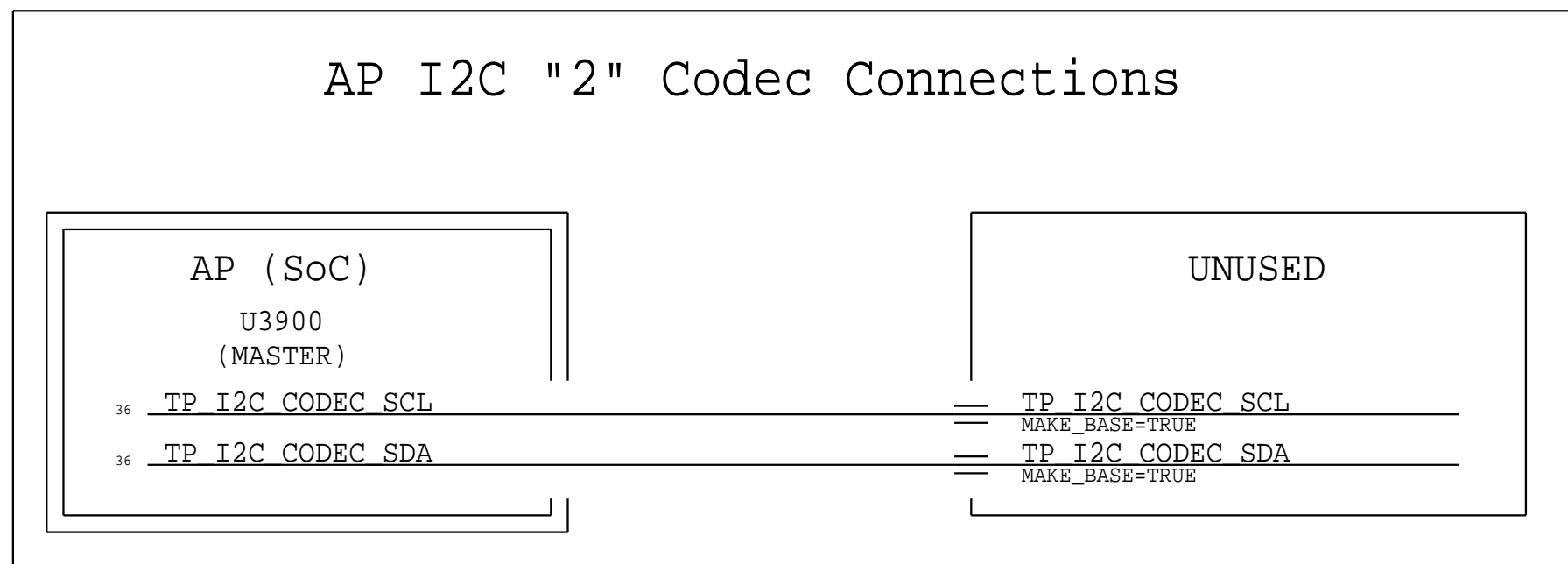
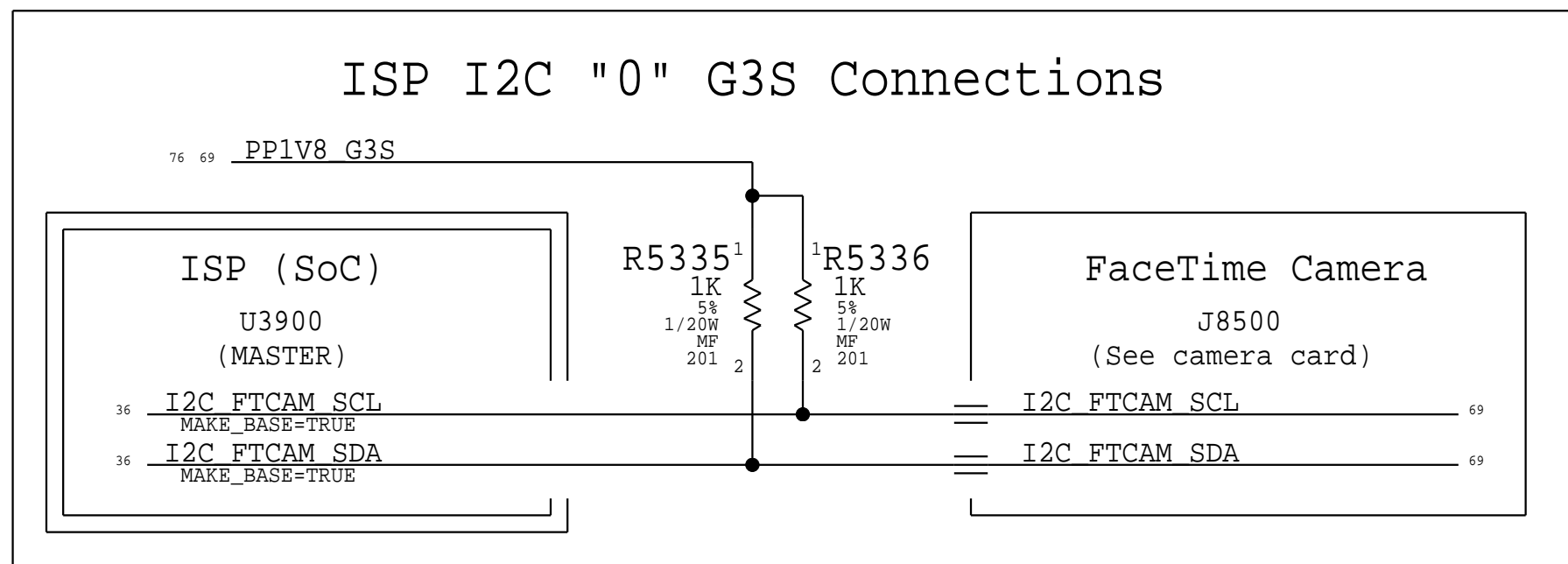
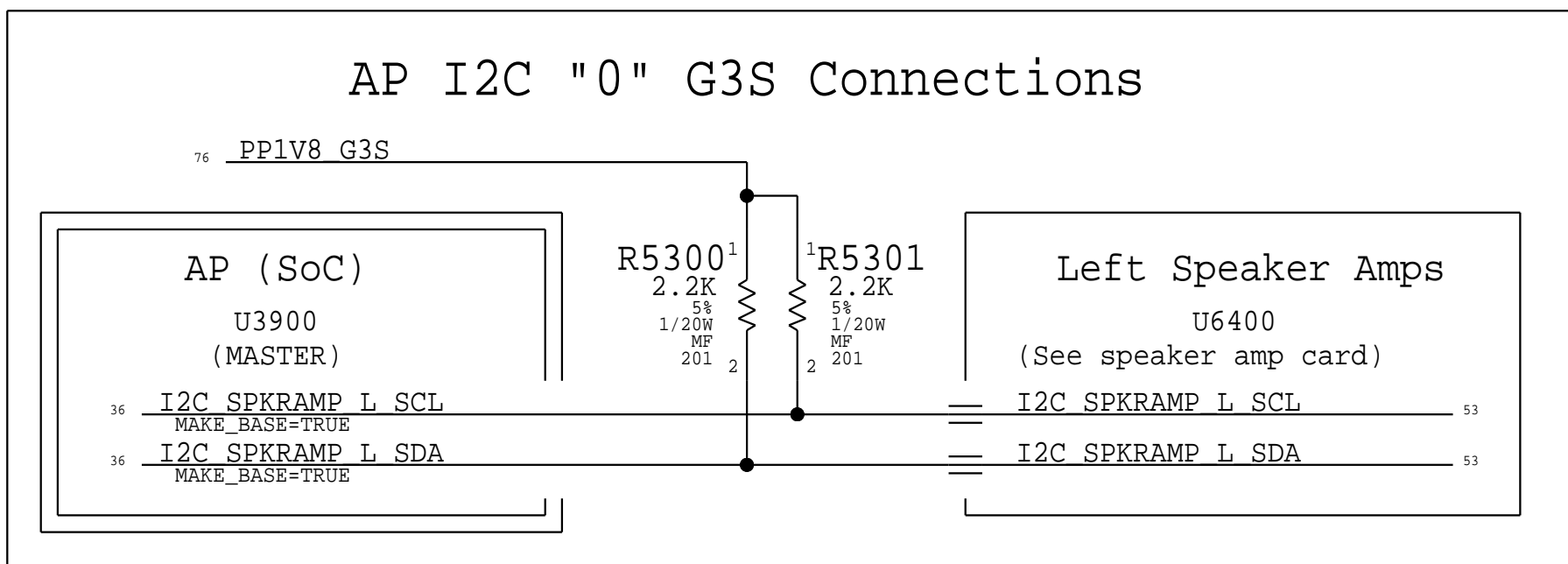
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998-11132	1	IC,RTM4,ES2.1.1,PN80V,DEV_KY,S/W-M,UFLGA64	U5000	CRITICAL	SE:DEV_2017
338S00253	1	MODULE,NFC,NXP,LGA64	U5000	CRITICAL	SE:PROD_2017



SYNC_MASTER=X941_MLB		SYNC_DATE=03/10/2017	
PAGE TITLE			
Secure Element		Drawing	
	Apple Inc.	DRAWING NUMBER	SIZE
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		REVISION	2.0.0
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BOM_COST_GROUP=T151



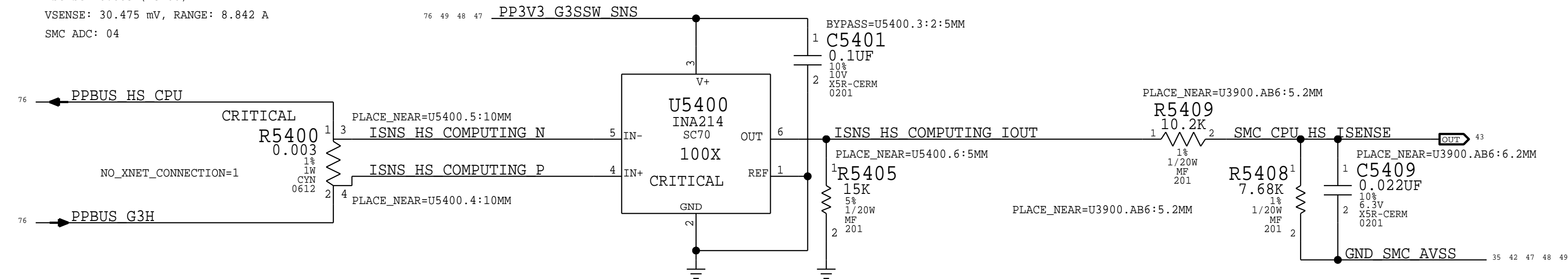


8

INA21X PARTS HAVE MINOR LEAKAGE PATH FROM INPUTS TO OUTPUT WHEN UNPOWERED.
PULL-DOWN RESISTORS ON INA OUTPUTS BLEED OFF THE LEAKAGE CURRENT TO PREVENT
SIGNAL PUMP-UP.

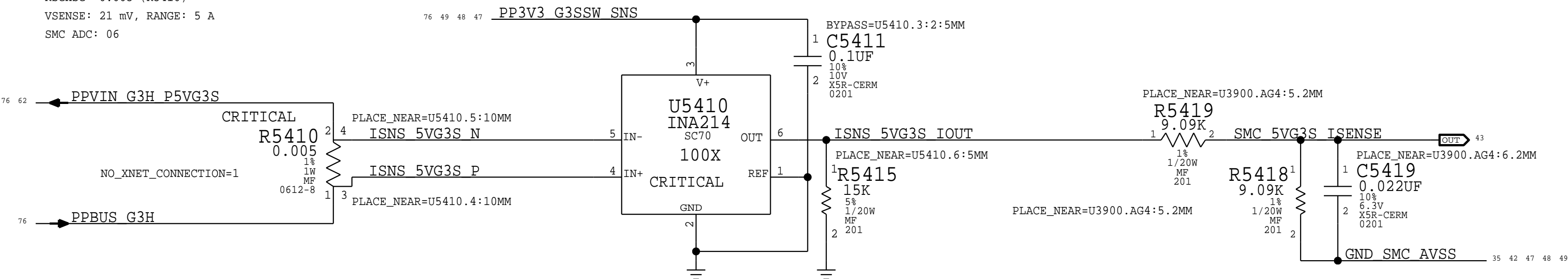
CPU High Side Current Sense (IC0R)

GAIN: 100X, EDP: 10.16 A
Rsense: 0.003 (R5400)
VSENSE: 30.475 mV, RANGE: 8.842 A
SMC ADC: 04



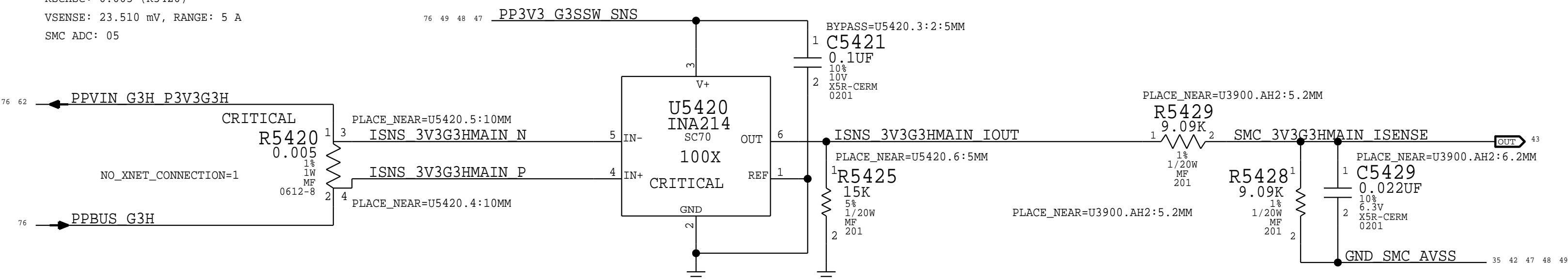
5V G3S (I05R)

```
GAIN: 100X, EDP: 4.2 A
Rsense: 0.005 (R5410)
VSENSE: 21 mV, RANGE: 5 A
SMC ADC: 06
```



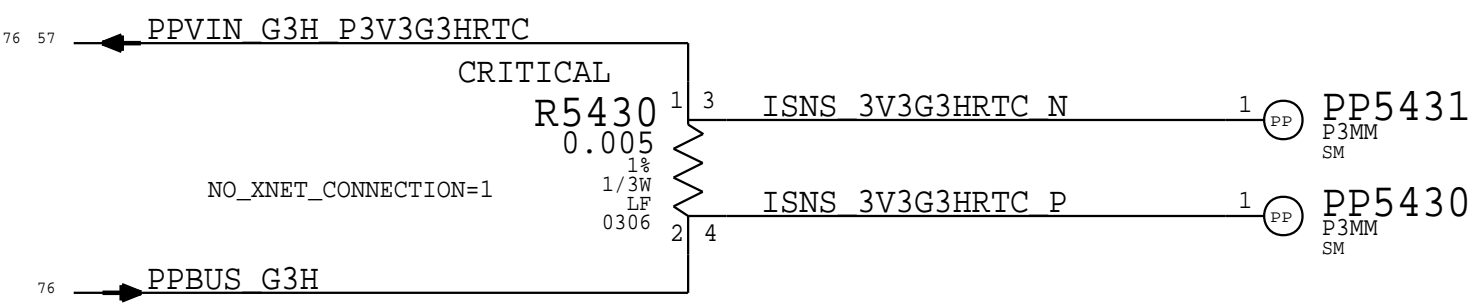
3V3 G3H MAIN (IO3R)

```
GAIN: 100X, EDP: 4.702 A
Rsense: 0.005 (R5420)
VSENSE: 23.510 mV, RANGE: 5 A
SMC ADC: 05
```



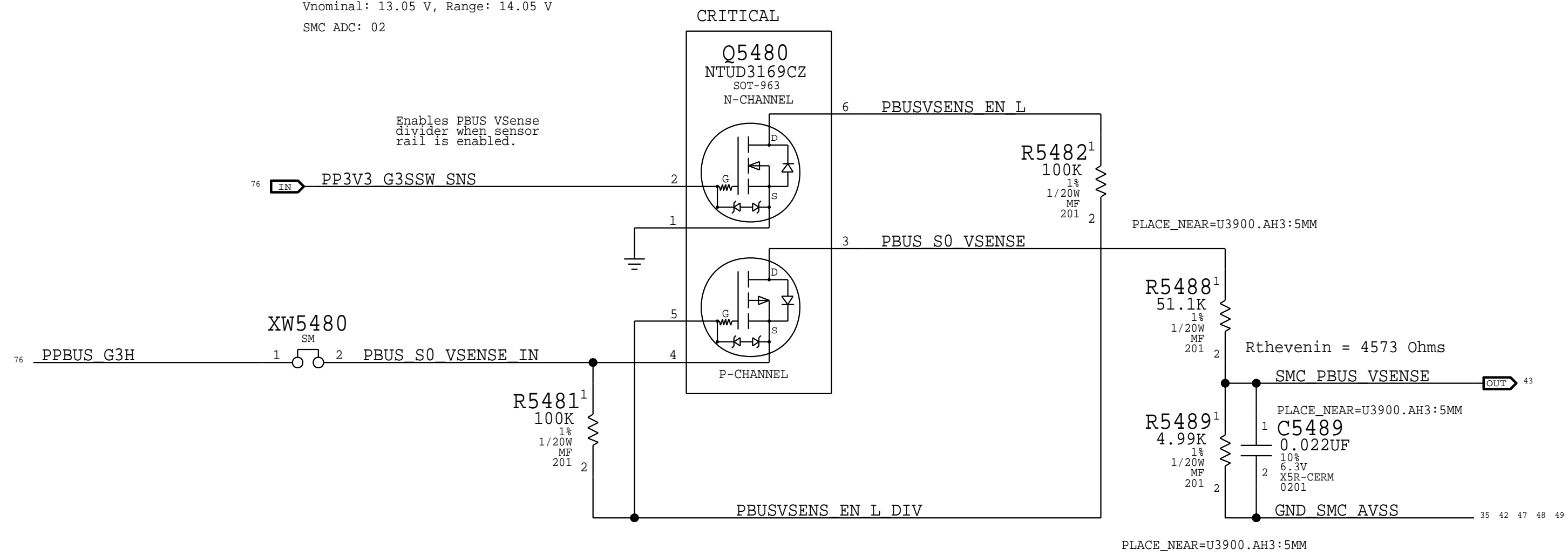
3V3 G3H RTC (xxxx)

```
GAIN: X, EDP: 0.753 A
Rsense: 0.005 (R5430)
VSENSE: 3.767 mV, RANGE: 0.756 A
PMU AMUX: x
```



PBUS Voltage Sense & Enable (VP0R)

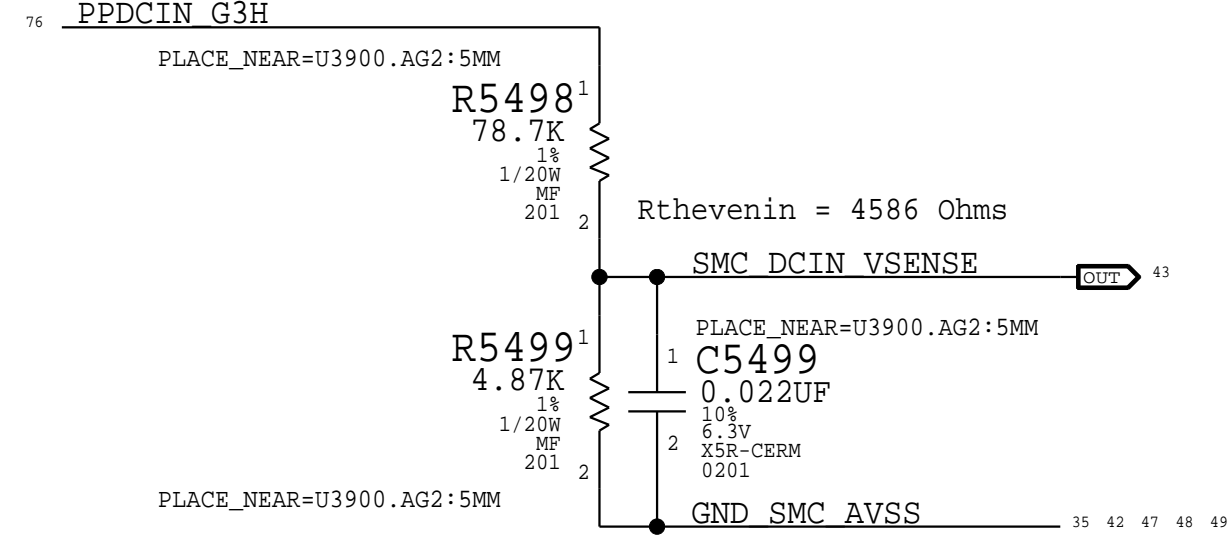
Gain: 0.089x
Vnominal: 13.05 V, Range: 14.05 V
SMC ADC: 02



DC In Voltage Sense & Enable (VD0R)

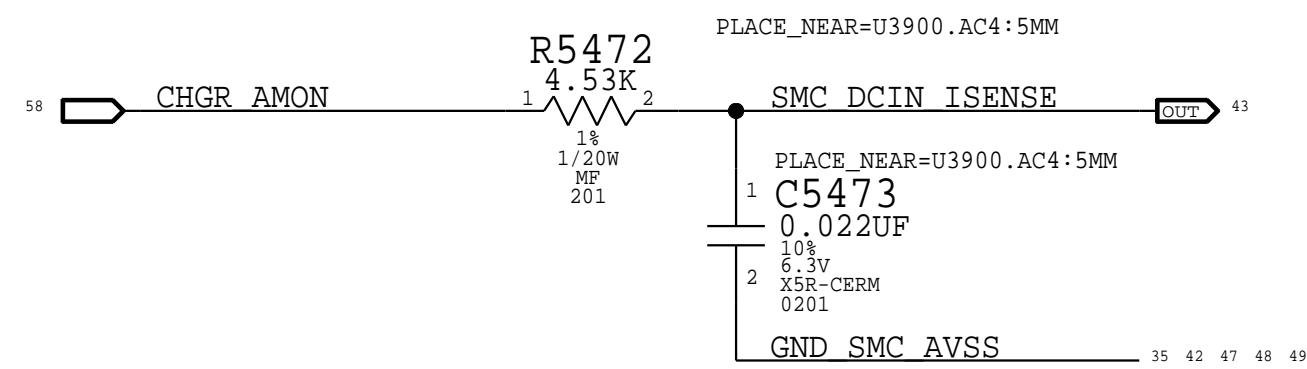
Gain: 0.148x
Vnominal: 16.5 V, Range: 22.29 V
SMC ADC: 00

```
DCIN sensing no longer gated.
FETs removed to avoid power
draw on PU on CHGR_AUX_OK.
```



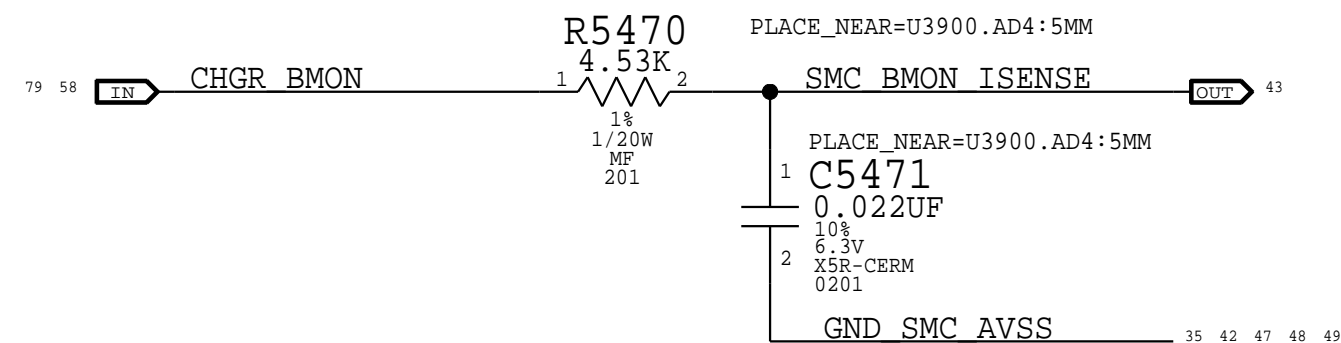
DC-IN (AMON) Current Sense (ID0R)

Charger Gain: 20x, EDP: 3.0 A
RSENSE: 0.010 (R7020)
SMC ADC: 01



Charger (BMON) Current Sense (IPBR)

Charger Gain: 7.9x, EDP: 6.5 A
RSENSE: 0.005 (R7060)
SMC ADC: 03



BOM_COST_GROUP=SENSORS

DESIGN: X1032/MLB

LAST CHANGE: Fri Sep 15 15:09:18 2017

PAGE TITLE

Power Sensors High Side

Apple Inc.

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PAGE 54 OF 145

47 OF 85

D

C

B

A

D

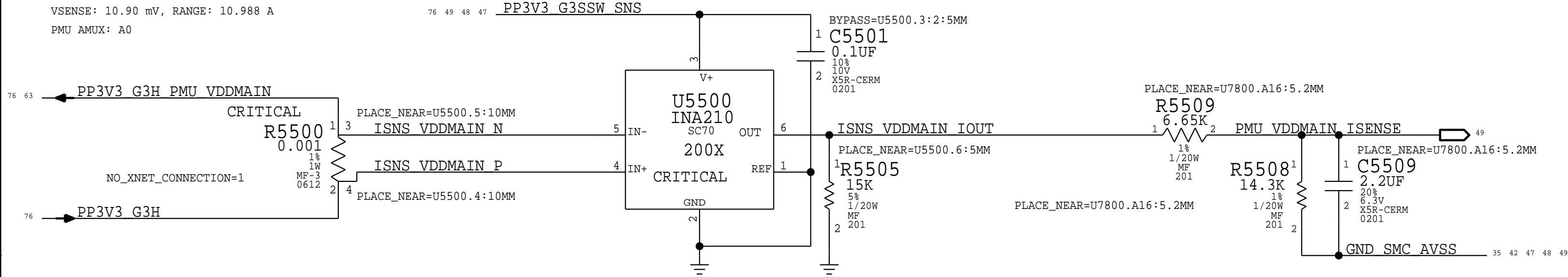
C

B

A

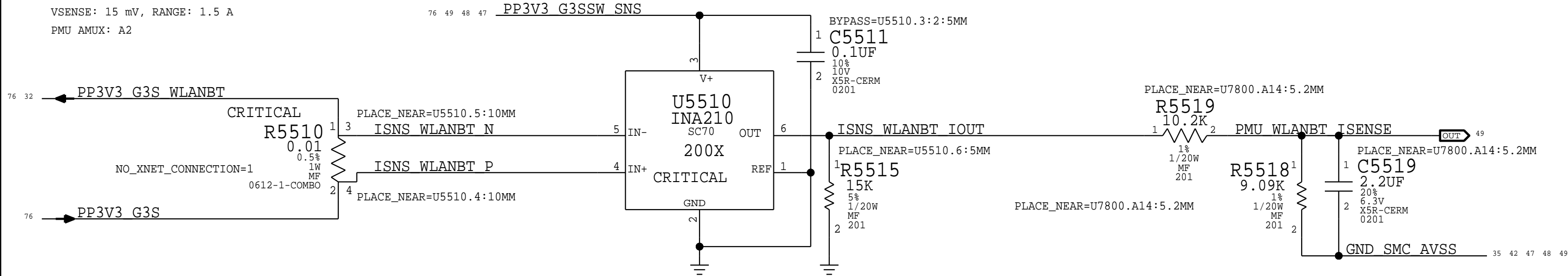
VDDMAIN (ISLC)


GAIN: 200X, EDP: 10.90 A
Rsense: 0.001 (R5500)
VSENSE: 10.90 mV, RANGE: 10.988 A
PMU AMUX: A0



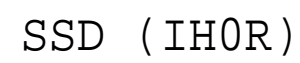
Wireless (IAPC)

GAIN: 200X, EDP: 1.5 A
Rsense: 0.010 (R5510)
VSENSE: 15 mV, RANGE: 1.5 A
PMU AMUX: A2

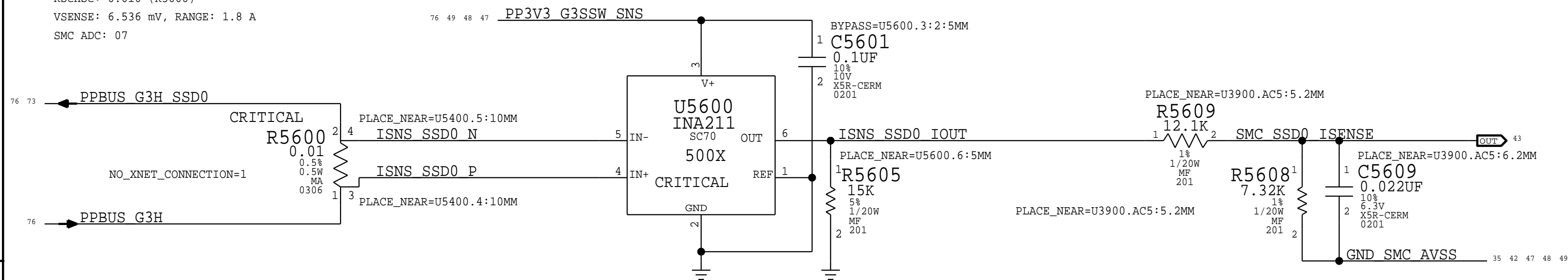


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Power Sensors Load Side		
 Apple Inc.	DRAWING NUMBER	051-04039
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	SHEET	48 OF 85

BOM_COST_GROUP=SENSORS

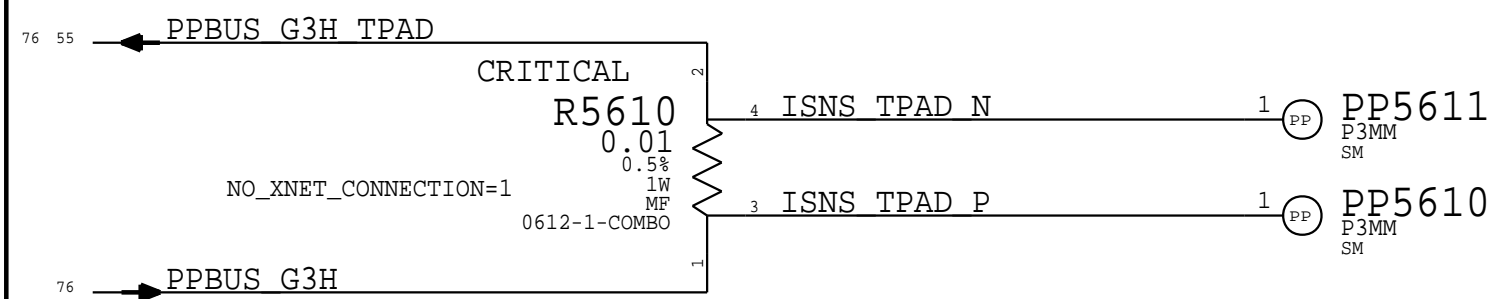


```
GAIN: 500X, EDP: 0.654 A
Rsense: 0.010 (R5600)
VSENSE: 6.536 mV, RANGE: 1.8 A
SMC ADC: 07
```



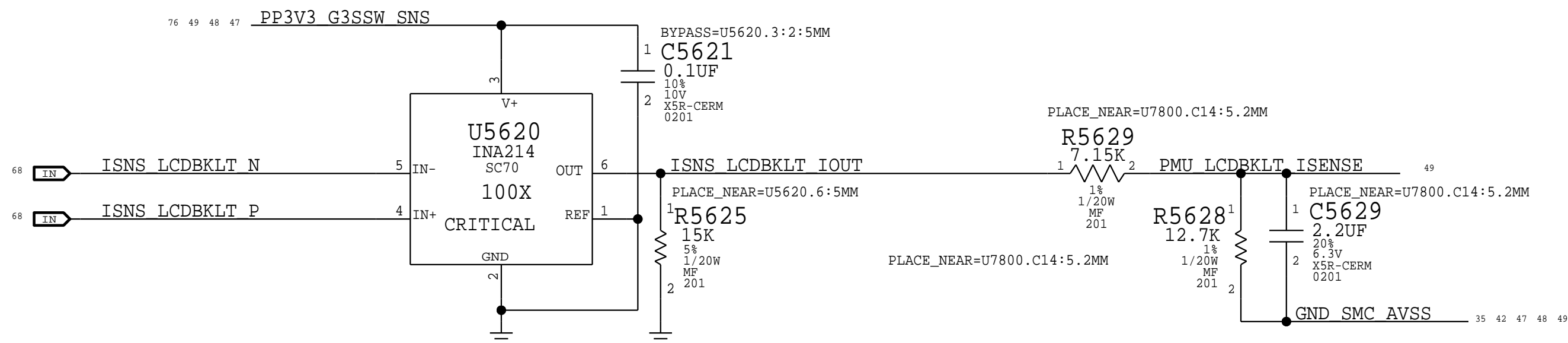
Trackpad (xxxx)

```
GAIN: x, EDP: 2.3 A
Rsense: 0.010 (R5610)
VSENSE: 23 mV, RANGE: 2.344 A
PMU AMUX: x
```



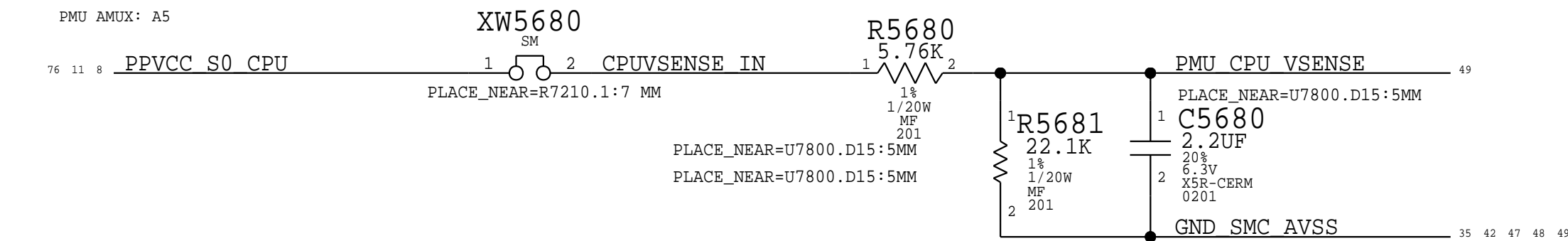
LCD Backlight (IBLR)

```
GAIN: 100X, EDP: 0.902 A
Rsense: 0.025 (R8400)
VSENSE: 22.549 mV, RANGE: 0.902 A
PMU AMUX: A4
```



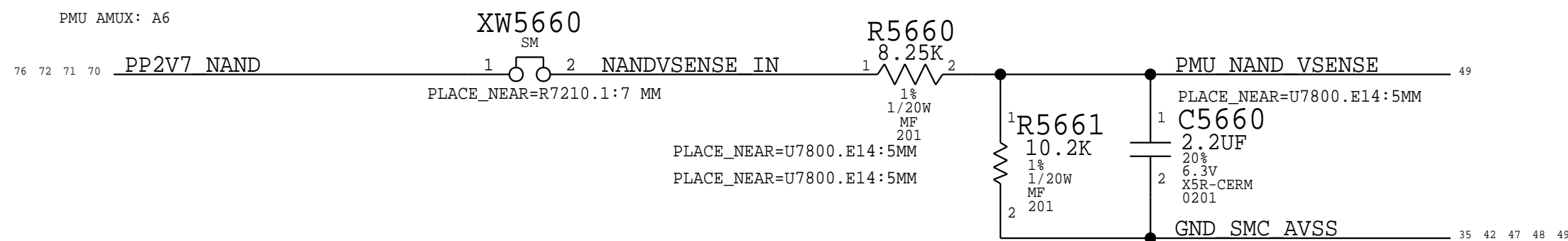
CPU CORE VOLTAGE SENSE (VCAC)

PMU AMUX: A#



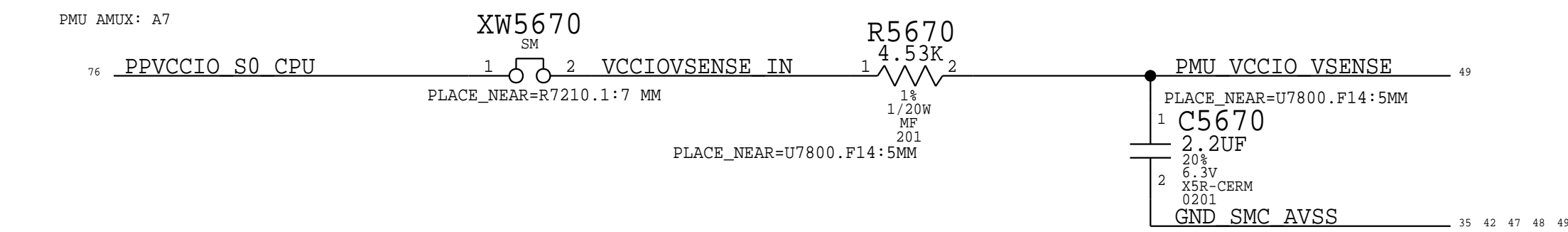
NAND 2V7 VOLTAGE SENSE (VHNC)

PMU AMUX: AC



VCCIO VOLTAGE SENSE (VCIC)

PMU AMUX: A'

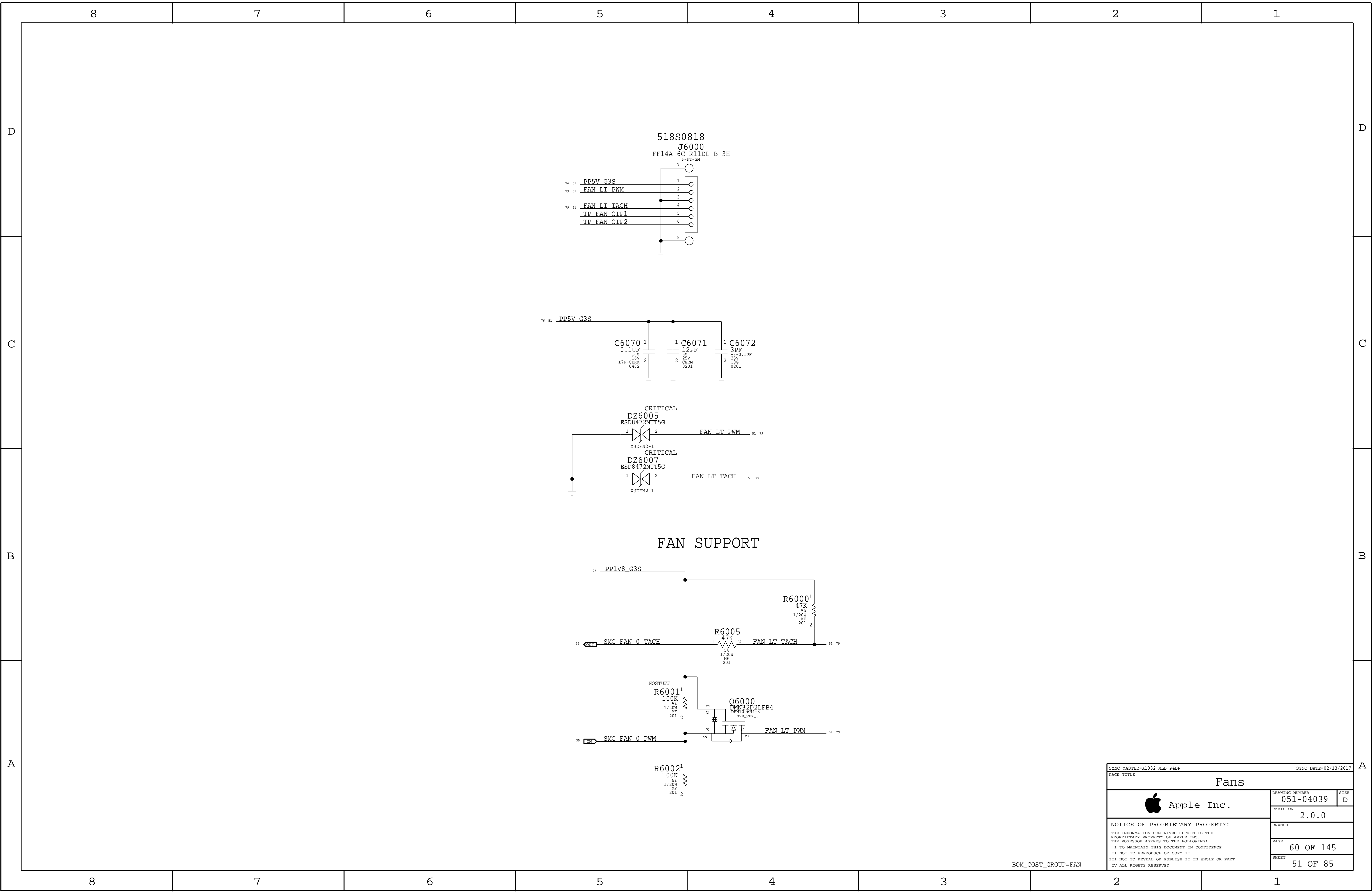


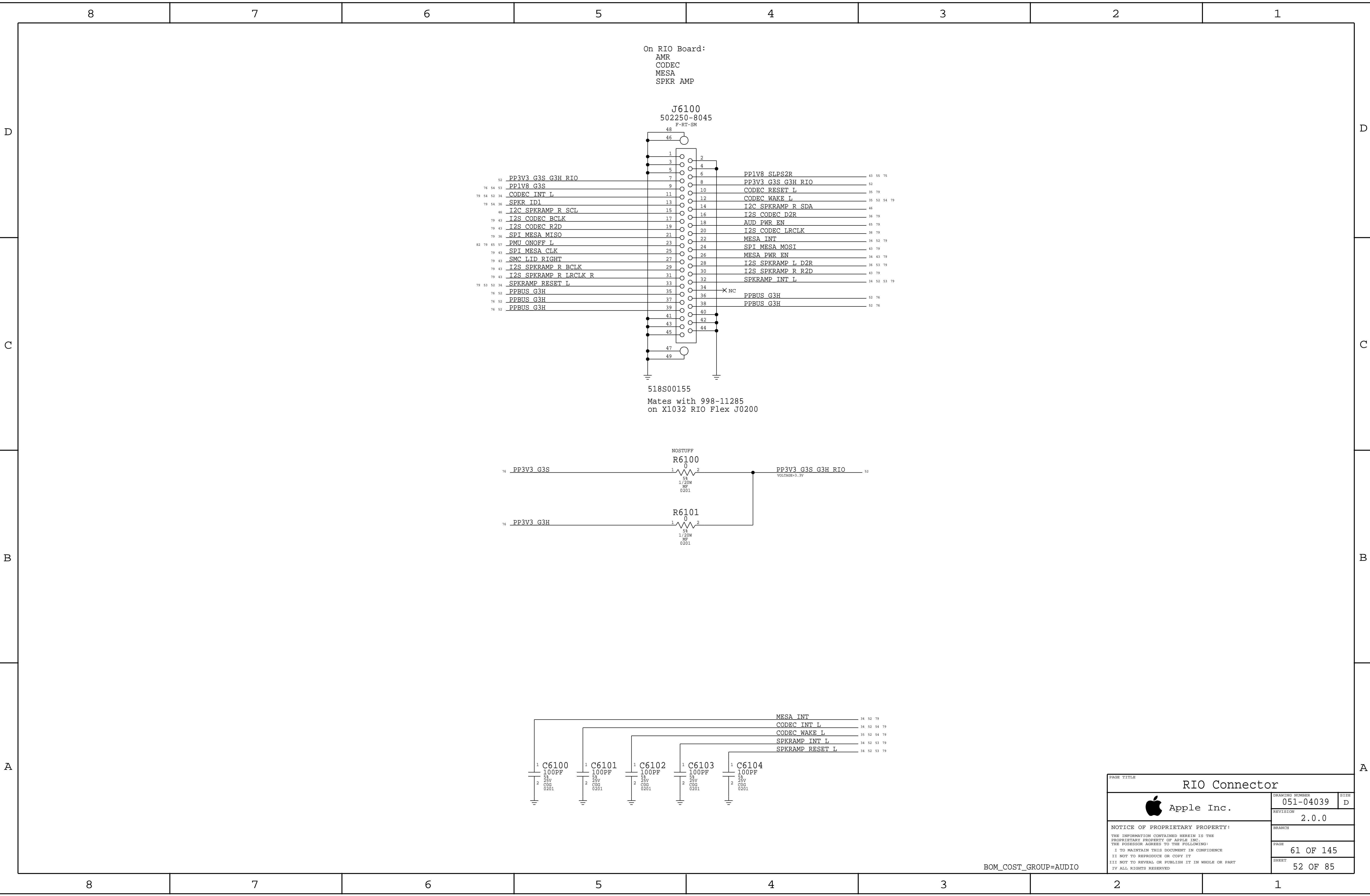
PMU ADC Assignments

48	PMU VDDMAIN ISENSE	—	PMU VDDMAIN ISENSE	65
	MAKE_BASE=TRUE			
	NC PMU AMUX A1	—	NC PMU AMUX A1	65
	MAKE_BASE=TRUE NO_TEST=1			
48	PMU WLANBT ISENSE	—	PMU WLANBT ISENSE	65
	MAKE_BASE=TRUE			
	NC PMU AMUX A3	—	NC PMU AMUX A3	65
	MAKE_BASE=TRUE NO_TEST=1			
49	PMU LCDBKLT ISENSE	—	PMU LCDBKLT ISENSE	65
	MAKE_BASE=TRUE			
	PMU CPU VSENSE	—	PMU CPU VSENSE	65
	MAKE_BASE=TRUE			
49	PMU NAND VSENSE	—	PMU NAND VSENSE	65
	MAKE_BASE=TRUE			
49	PMU VCCIO VSENSE	—	PMU VCCIO VSENSE	65
	MAKE_BASE=TRUE			

BOM_COST_GROUP=SENSORS

DESIGN: X1032/MLB			
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Power Sources Extended			
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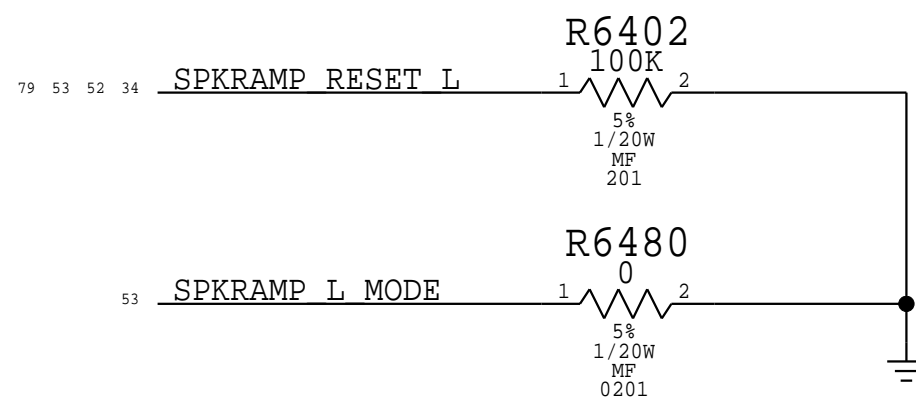
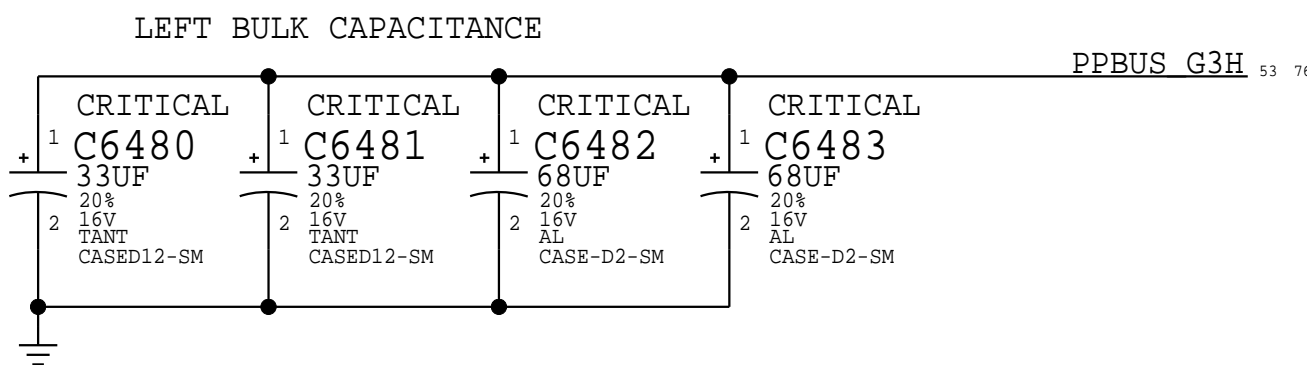
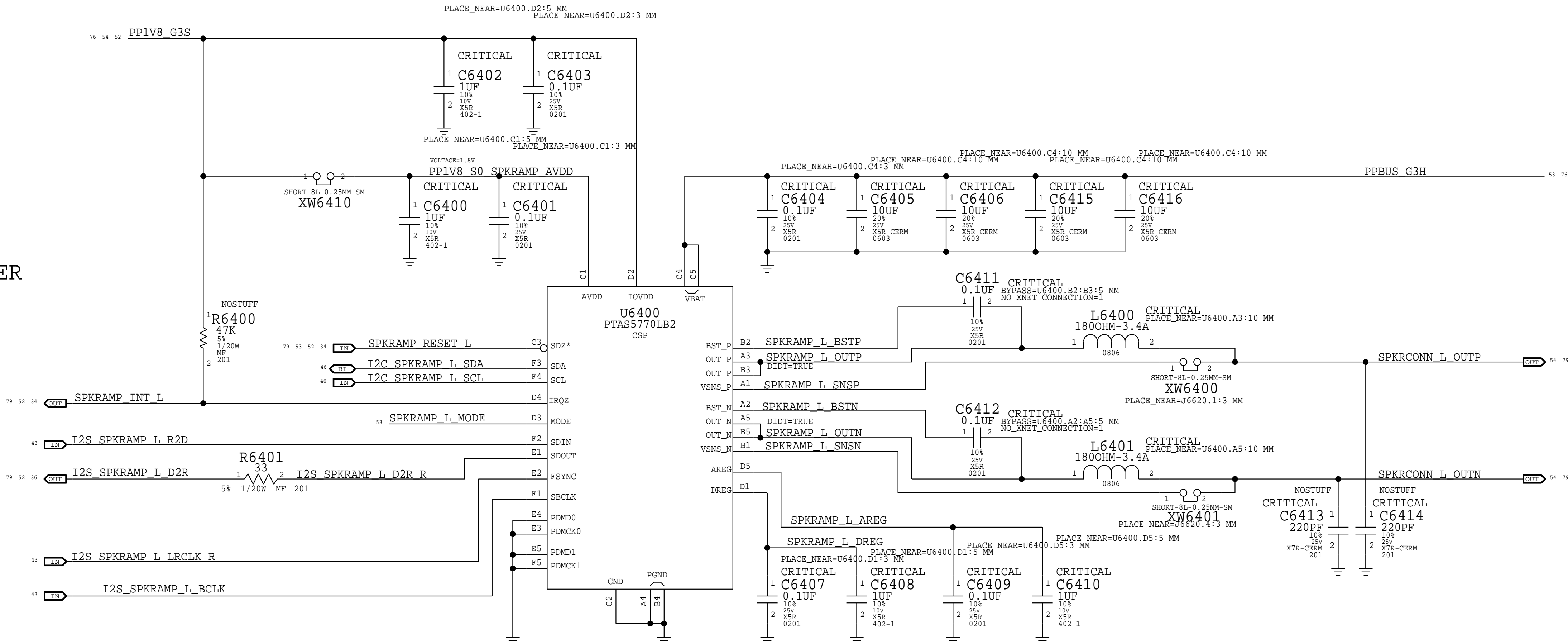




1X MONO SPEAKER AMPLIFIER


APN: 353S01629
GAIN: 0DBFS = 6.31 VRMS

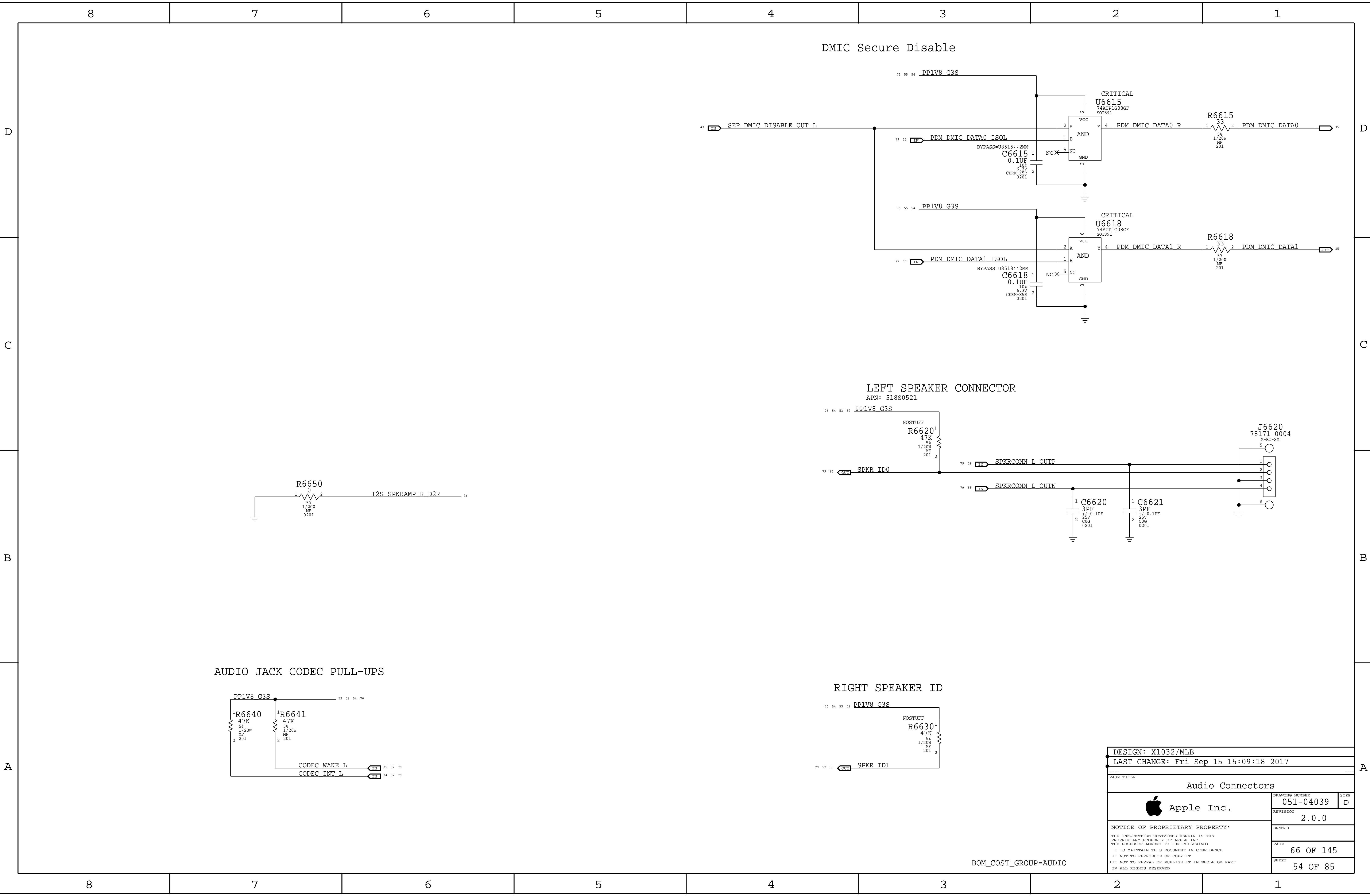
LEFT AMPLIFIER




MODE	PIN	I2C ADDR	CHANNEL
GND		0x31	LEFT
470 to GND		0x32	
470 to IOVDD		0x33	
2k2 to GND		0x34	
2k2 to IOVDD		0x35	
10k to GND		0x36	
10k to IOVDD		0x37	
47k to IOVDD		0x38	RIGHT

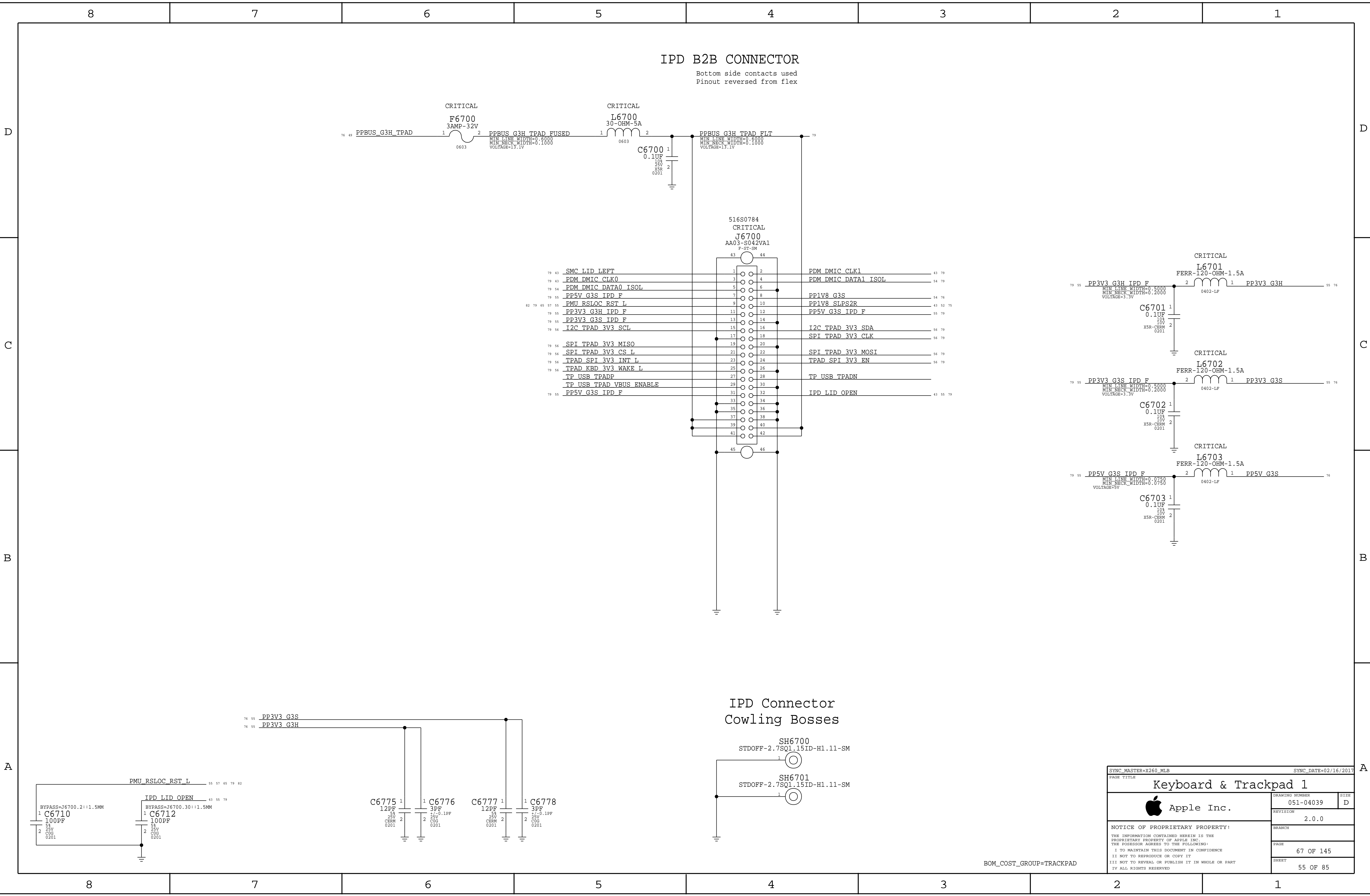
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Audio Speaker Amplifiers		
 Apple Inc.	DRAWING NUMBER	051-04039
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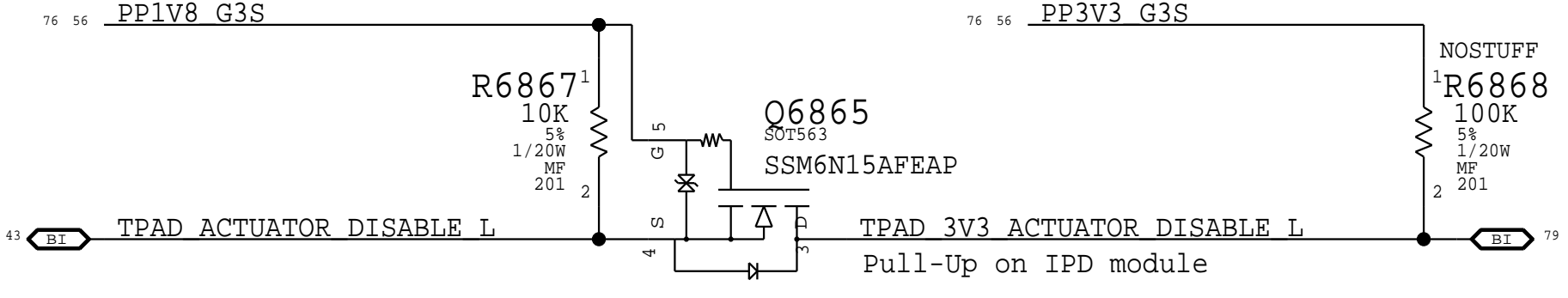
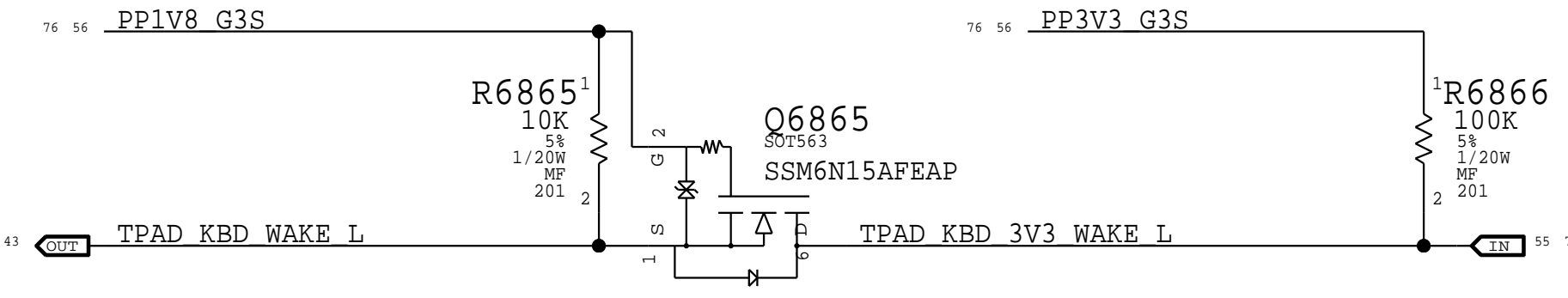
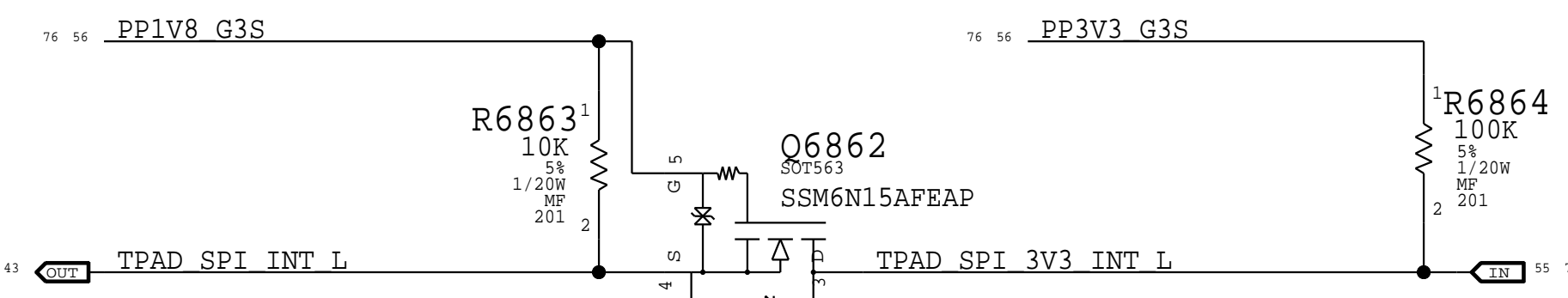
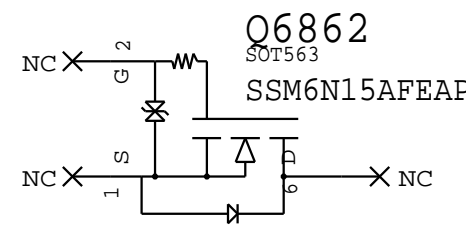
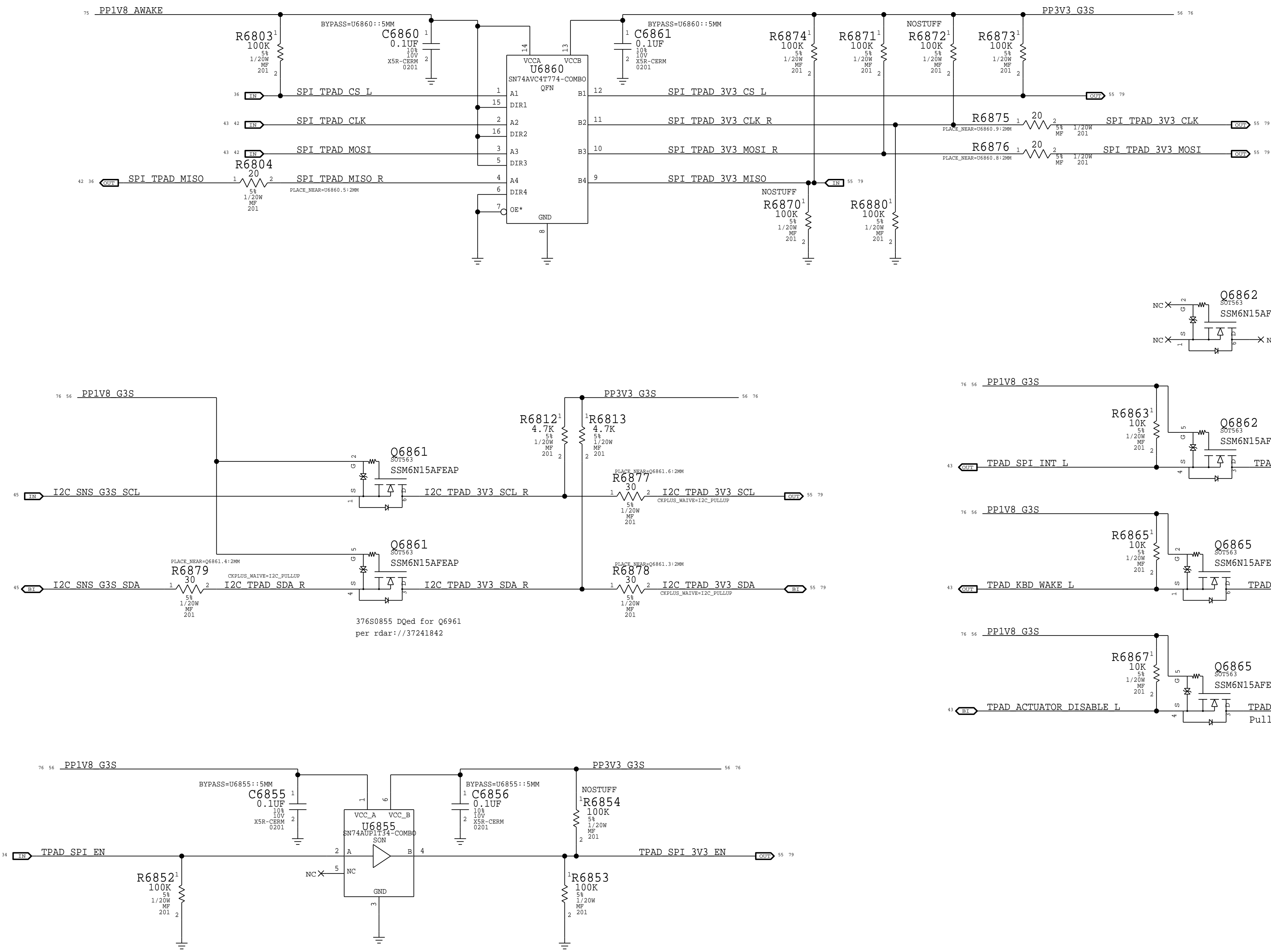
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Audio Connectors		
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	SHEET	54 OF 85



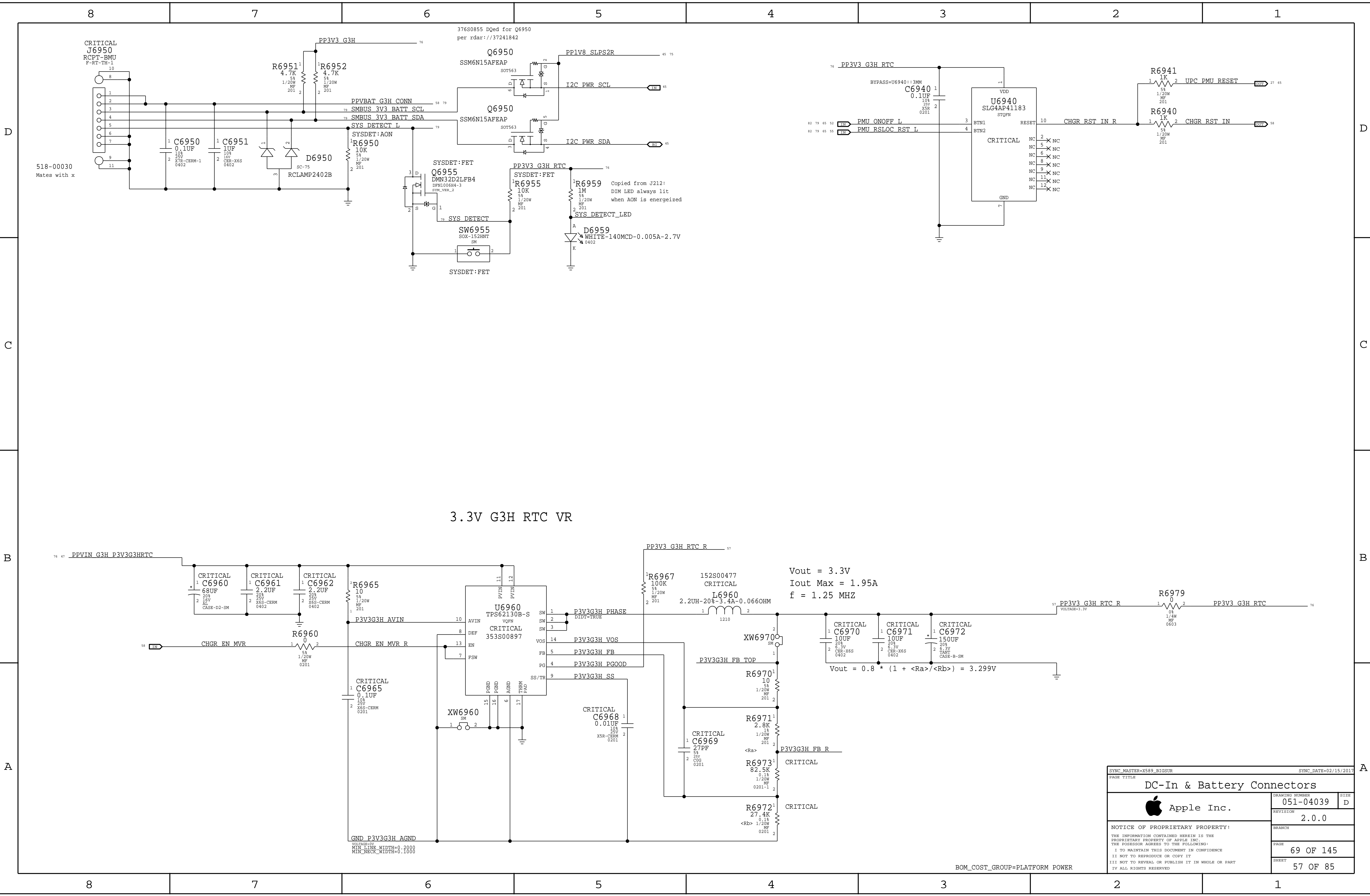
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PAGE TITLE			
Keyboard & Trackpad 1			
 Apple Inc.	DRAWING NUMBER		SIZE
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		67 OF 145	
		SHEET	
		55 OF 85	

Trackpad Level Shifting




SYNC_MASTER=X589_CARD_IPD		SYNC_DATE=02/16/2017	
PAGE TITLE			
Keyboard & Trackpad 2			
 Apple Inc.	DRAWING NUMBER	051-04039	SIZE D
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		SHEET 56 OF 85	

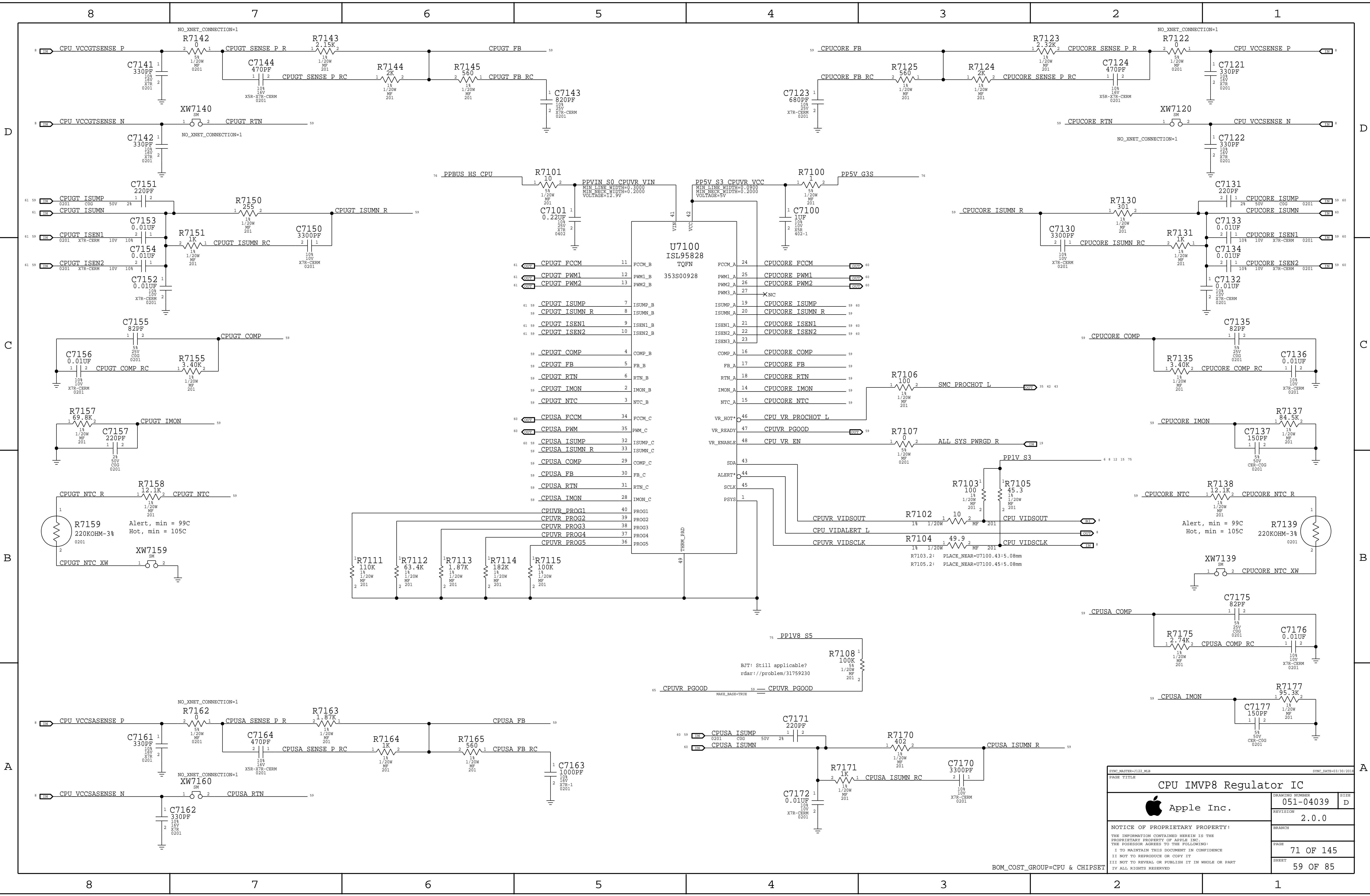
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3.3V G3H RTC VR

SYNC_MASTER=X589_BIGSUR			SYNC_DATE=02/15/2017		
PAGE TITLE			DC-In & Battery Connectors		
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			PAGE	69 OF 145	
			SHEET	57 OF 85	

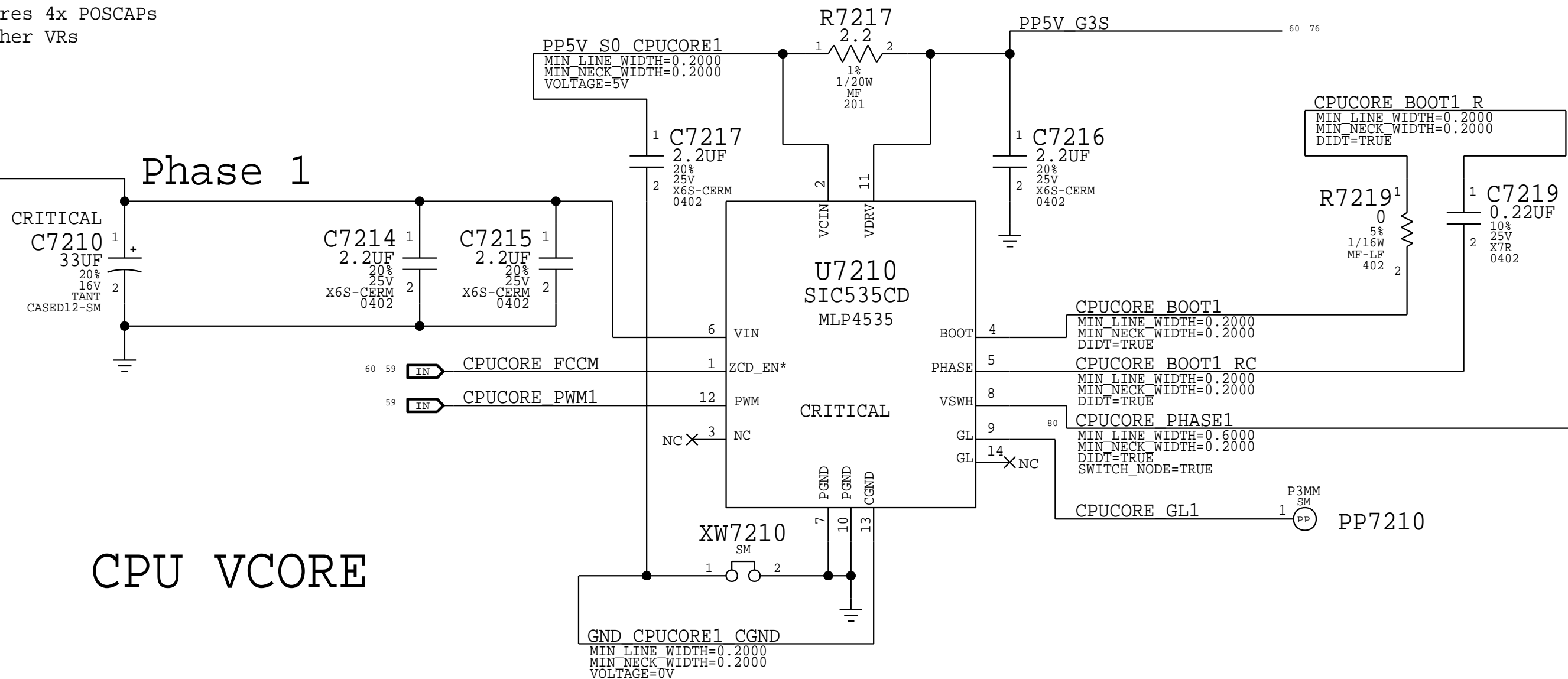
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SYNC_MASTER=3122_MLB		SYNC_DATE=03/10/2018	
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CPU IMVP8 Regulator IC			
 Apple Inc.	DRAWING NUMBER	051-04039	SIZE D
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PAGE		71 OF 145	
SHEET		59 OF 85	

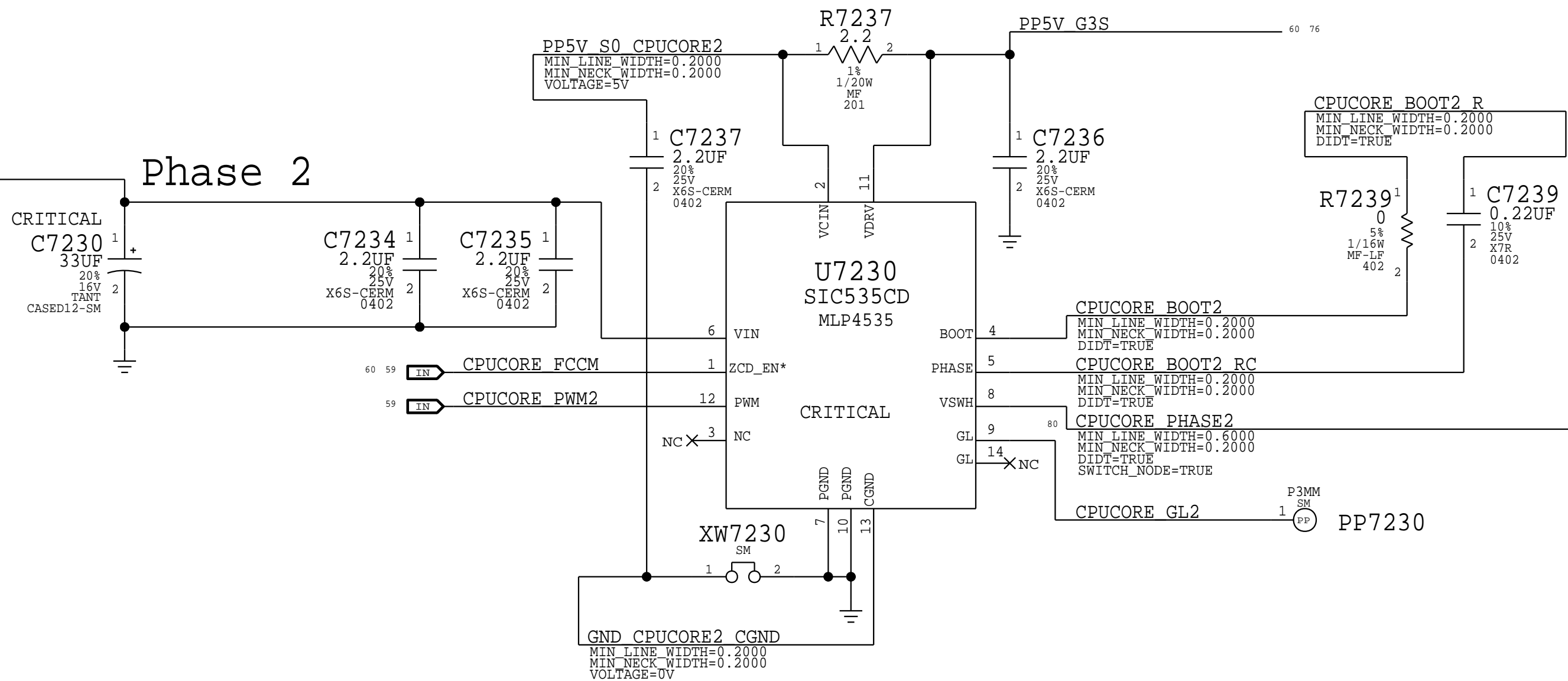
Note:Vcore design requires 4x POSCAPs
3x shared from other VRs

Phase 1

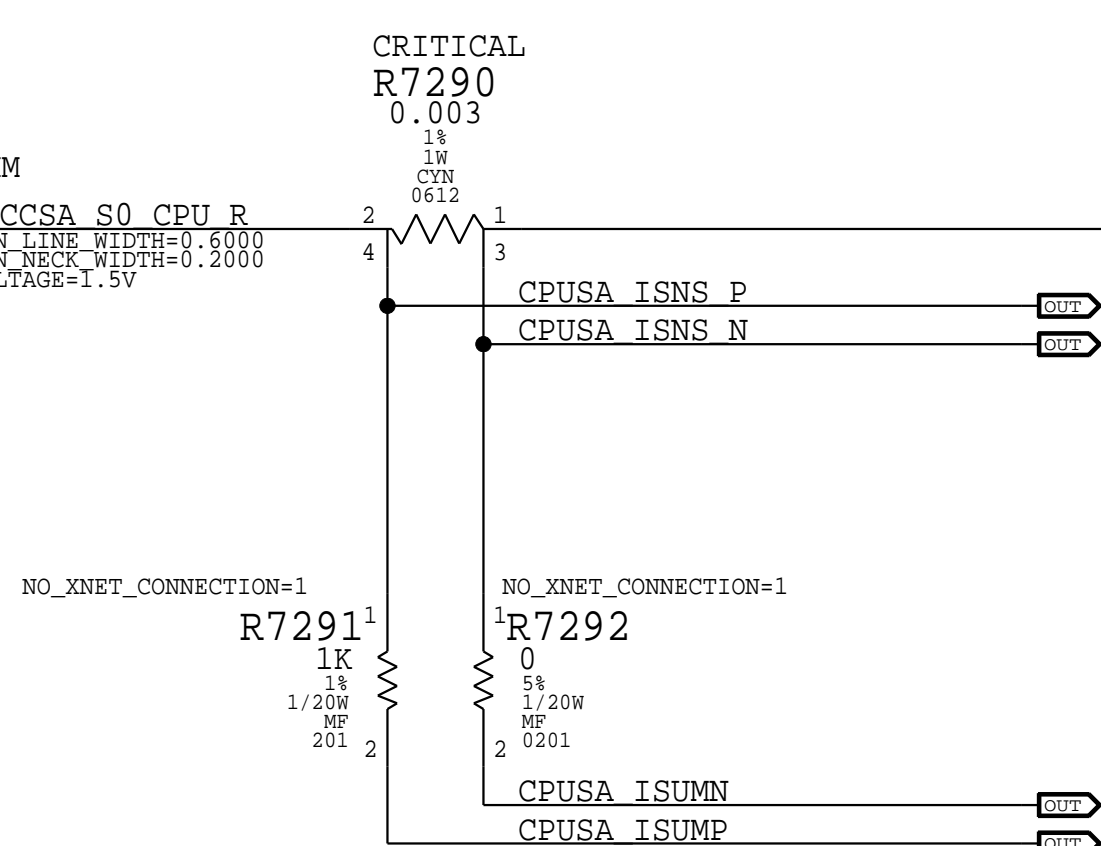
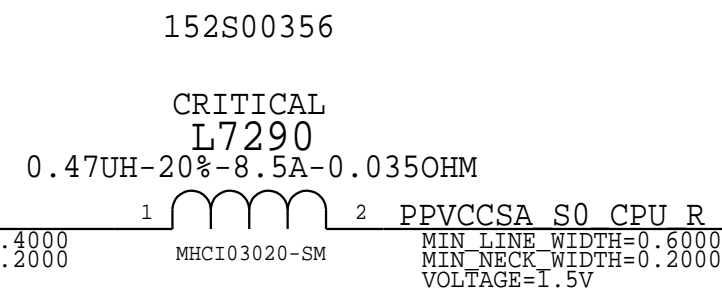
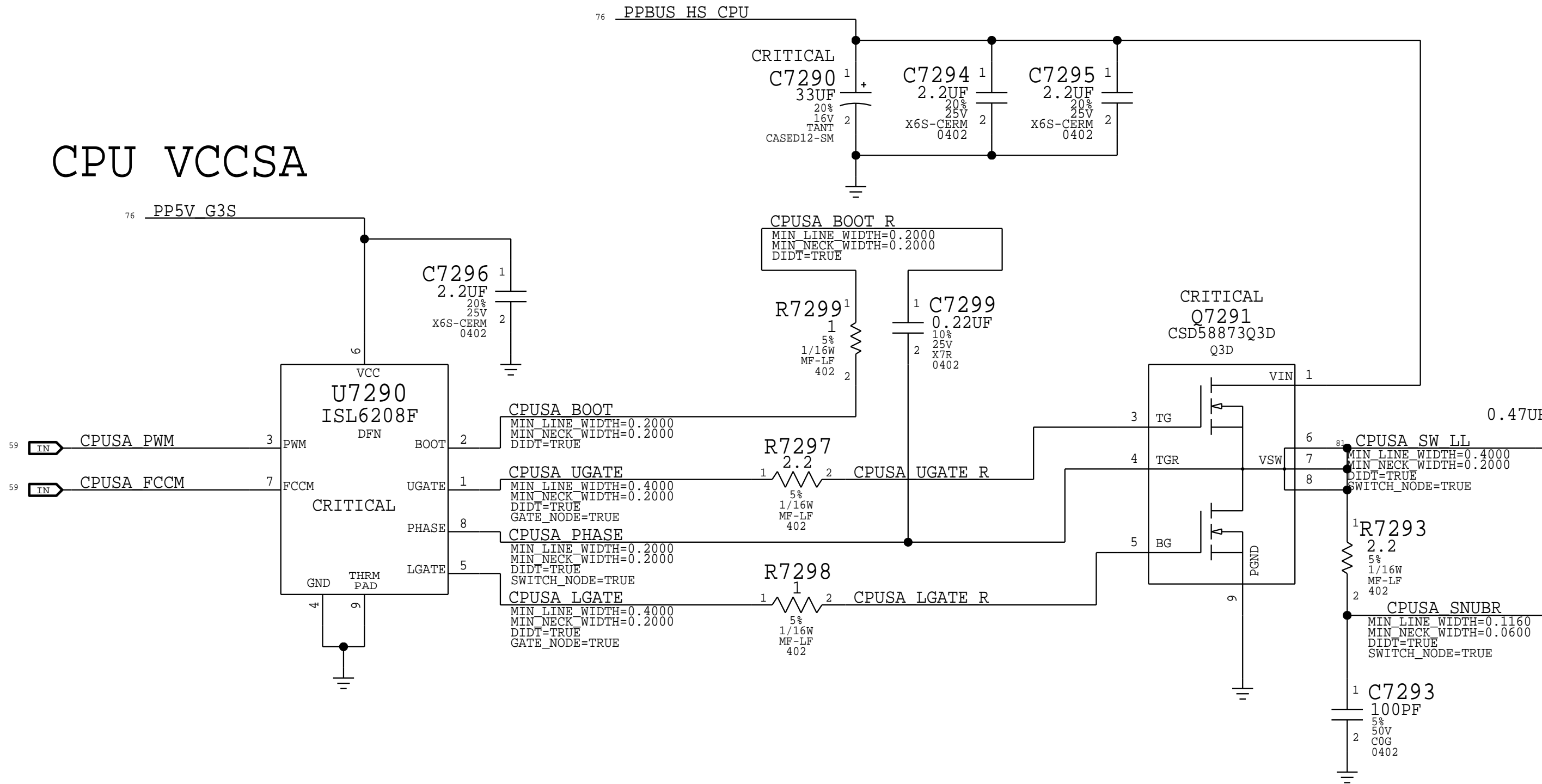


CPU VCore

Phase 2



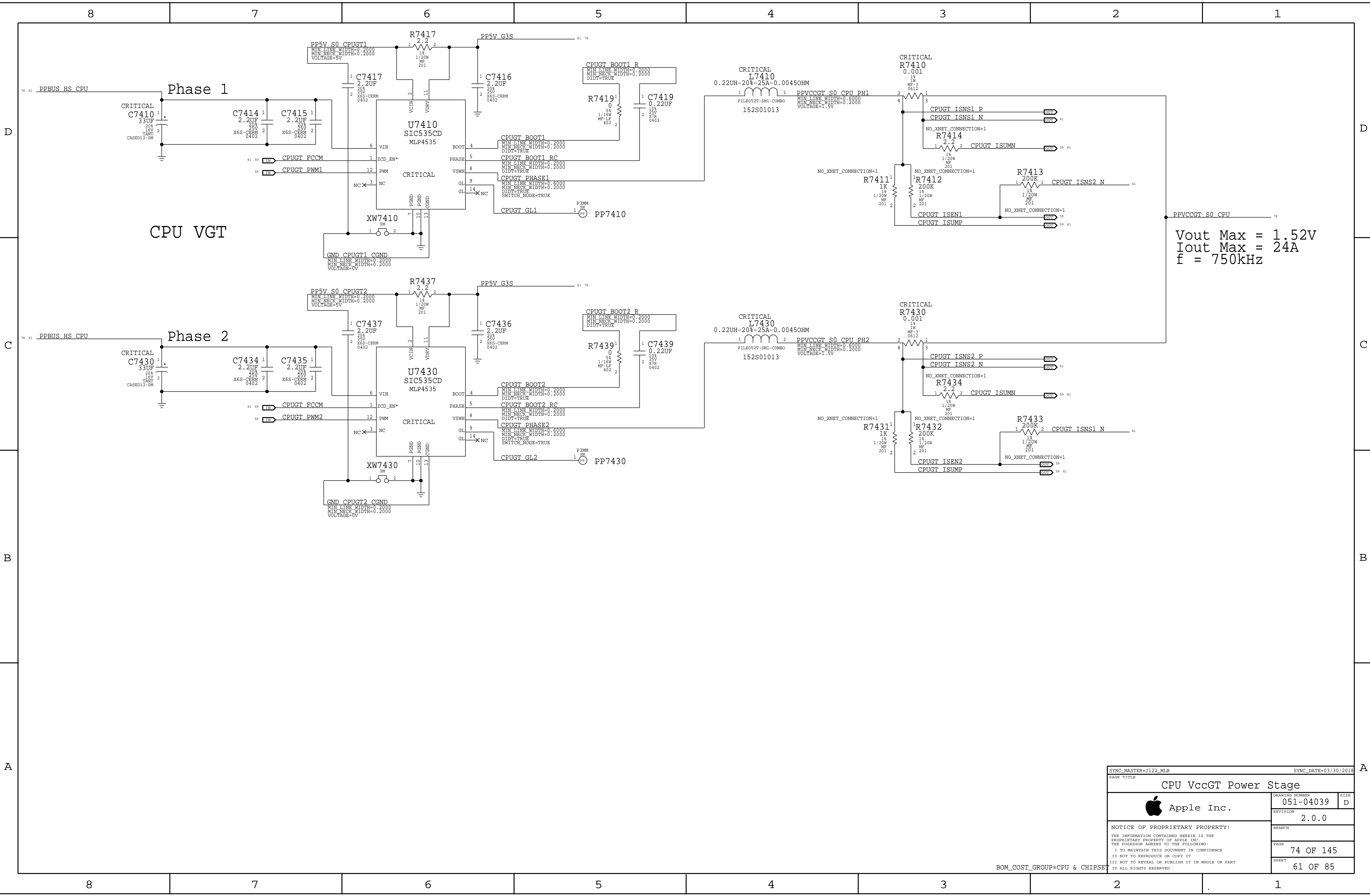
CPU VCCSA




Vout Max = 1.52V
Iout Max = 4.1A
f = 750kHz

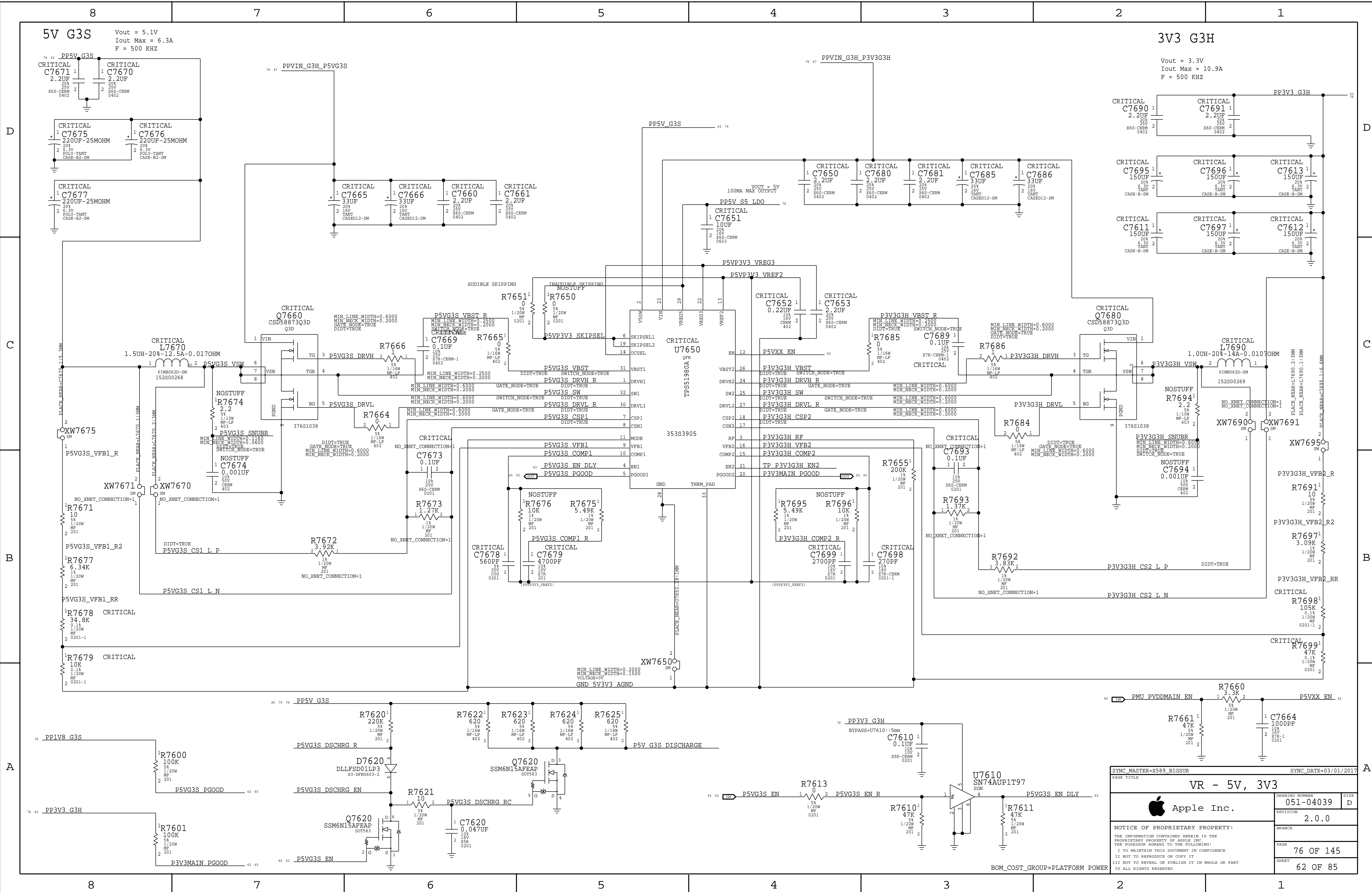
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			SHEET	60 OF 85	

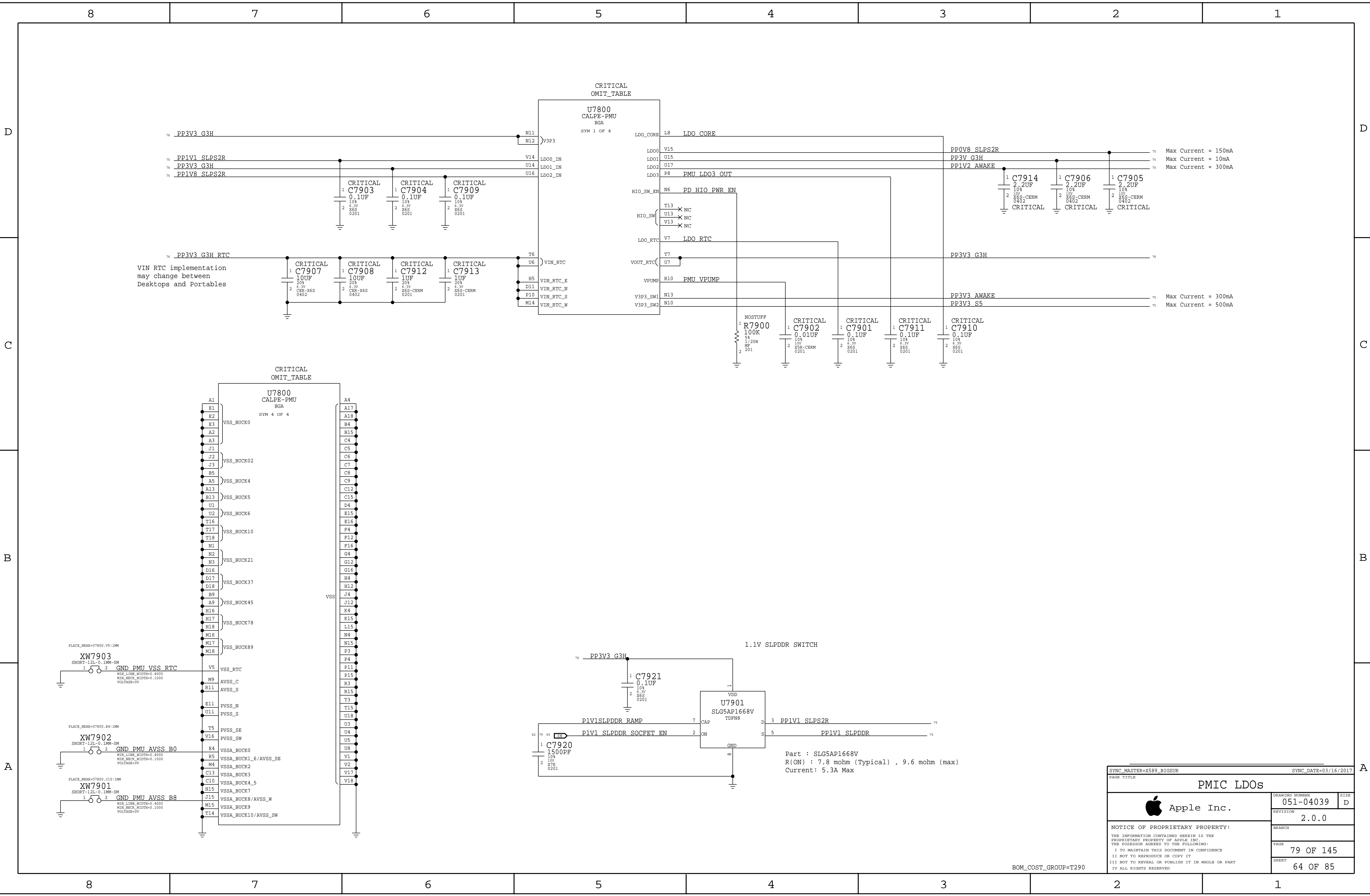
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SYNC_MASTER=J122_MLB		SYNC_DATE=03/30/2018	
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CPU VccGT Power Stage			
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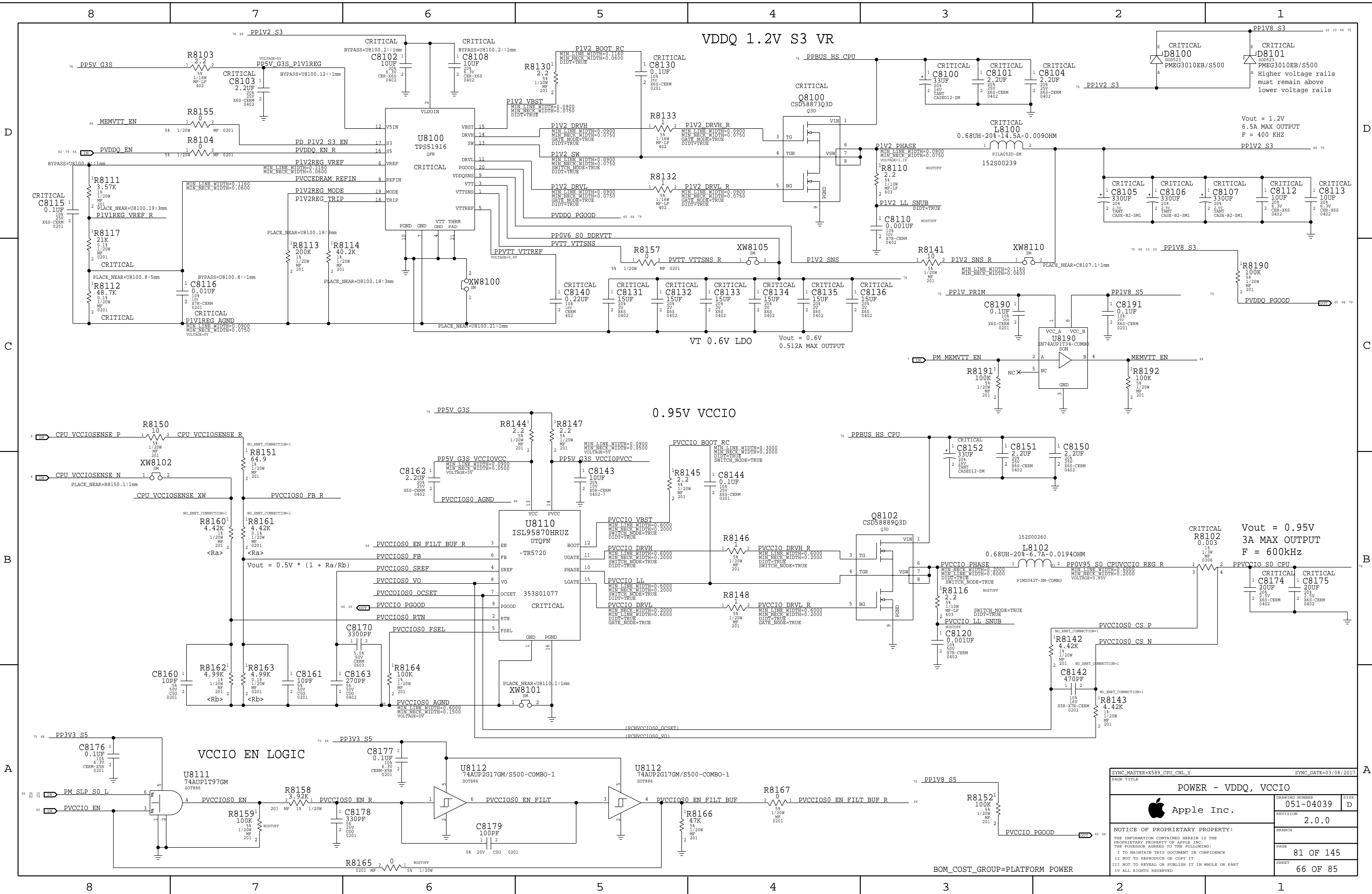
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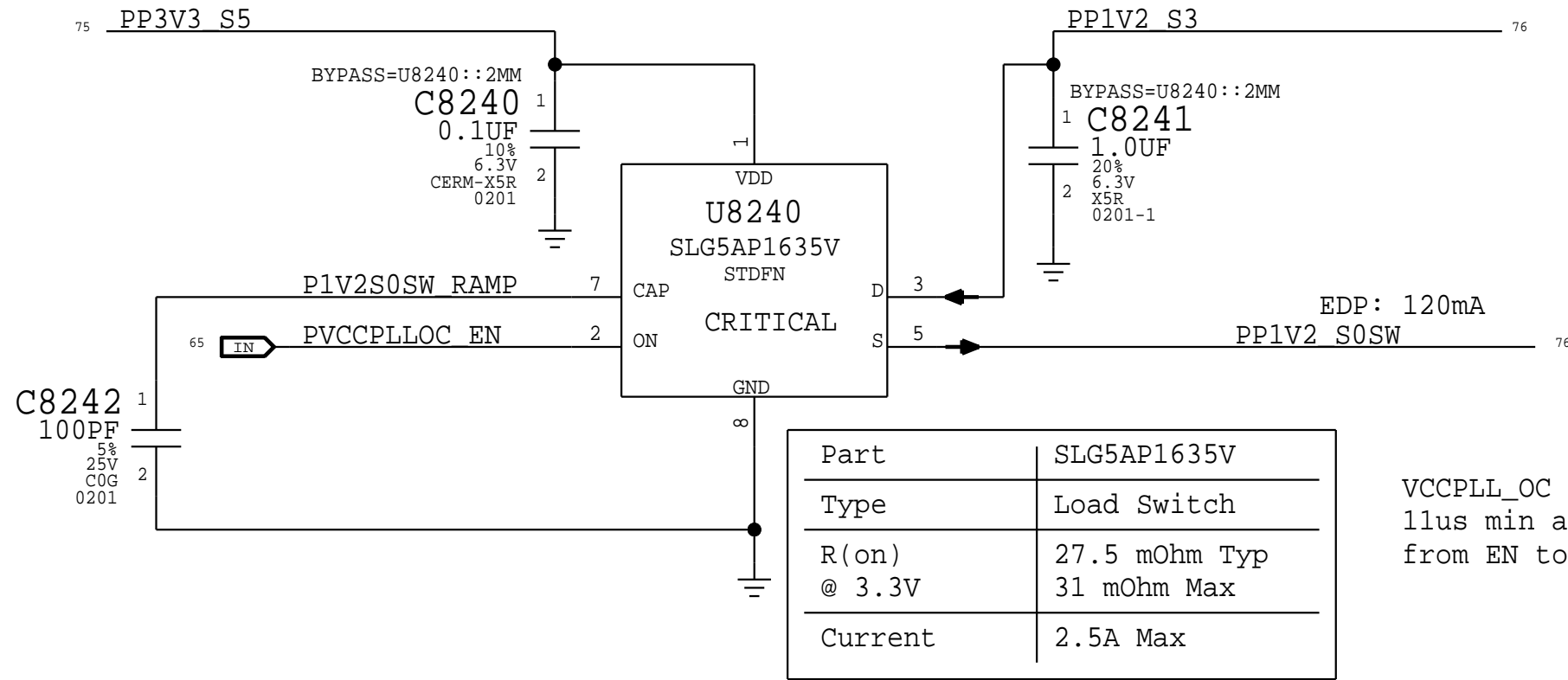


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PMIC LDOs			
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		PAGE	79 OF 145
		SHEET	64 OF 85

BOM_COST_GROUP=T290

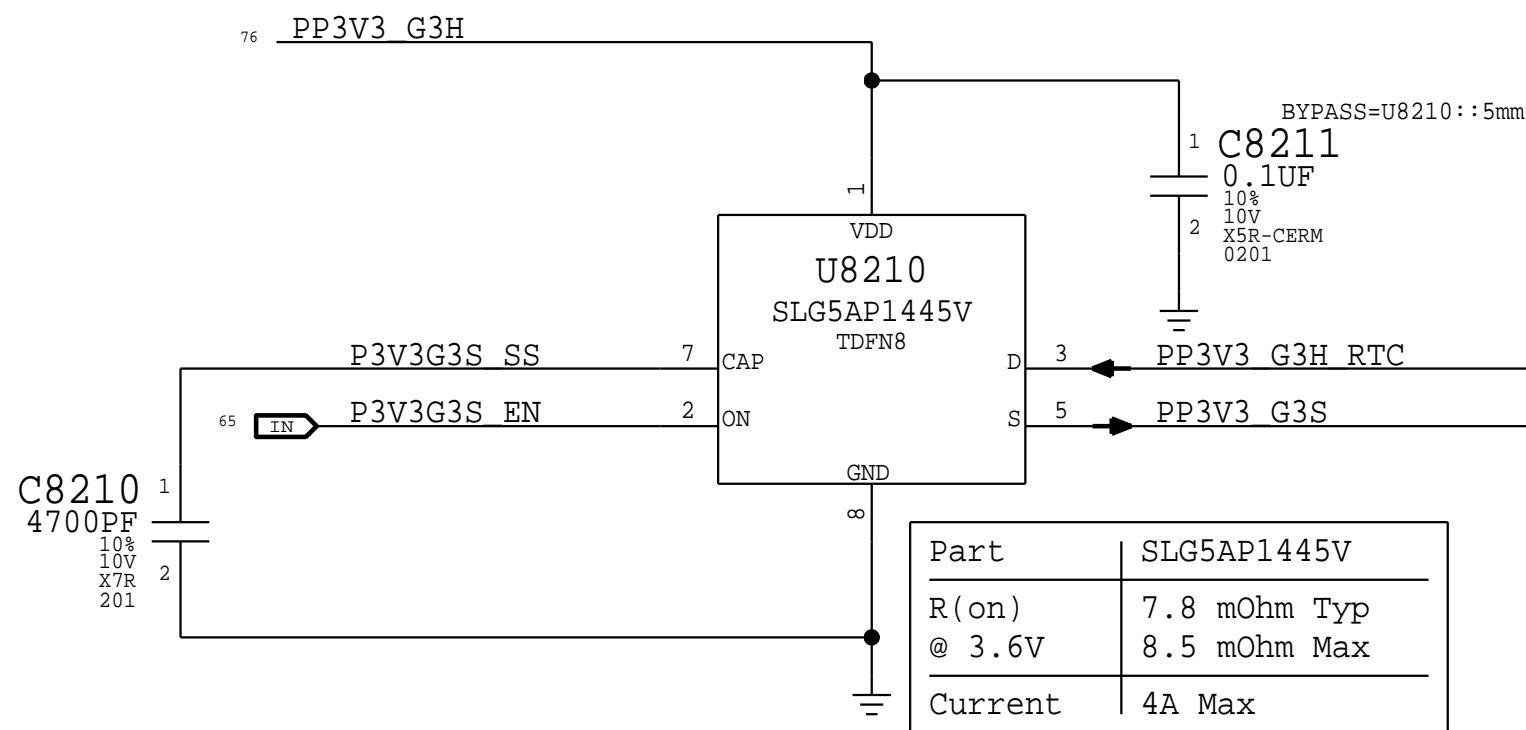


1.2V S0SW VCCPLL_OC Switch



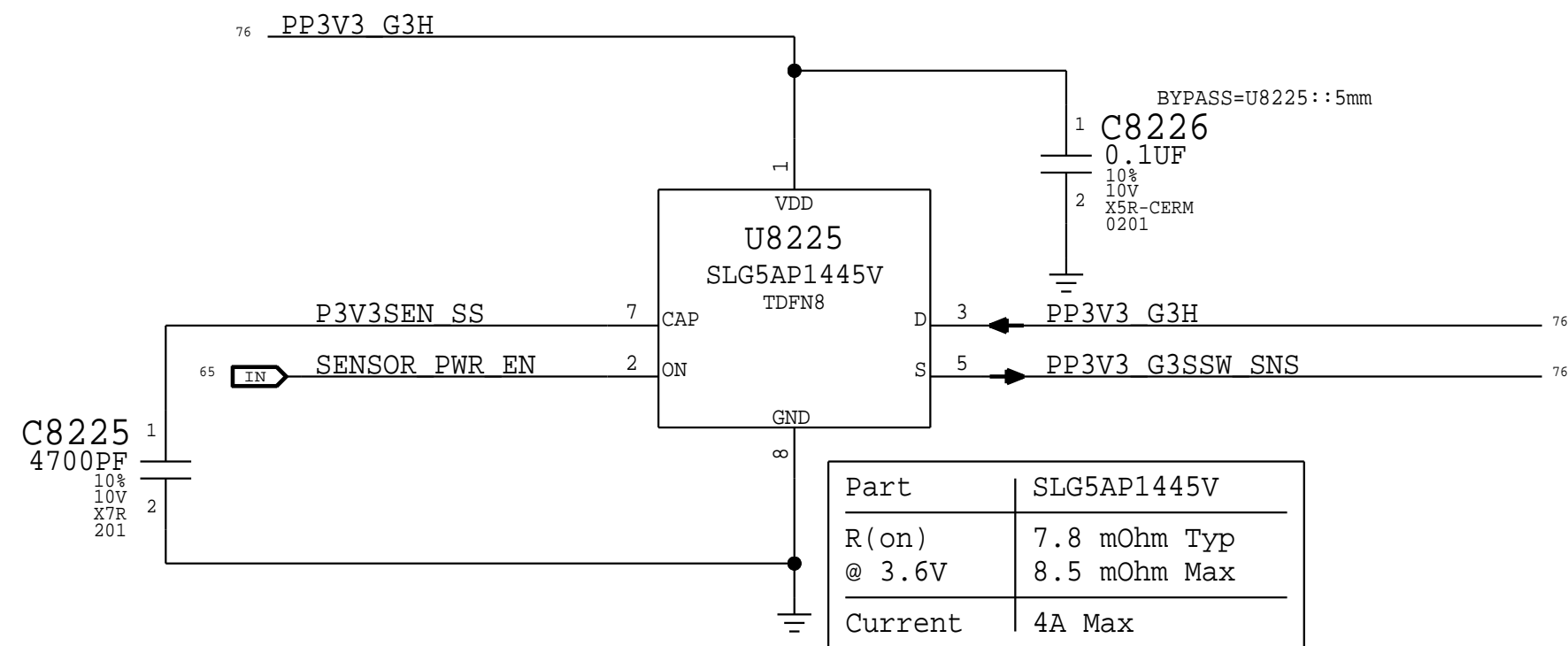
VCCPLL_OC had turn-on requirement of 11us min and 240us max from EN to 1.2V

3.3V G3 Standby Switch



EG: Check load current & shrink switch?

3.3V Sensors Switch

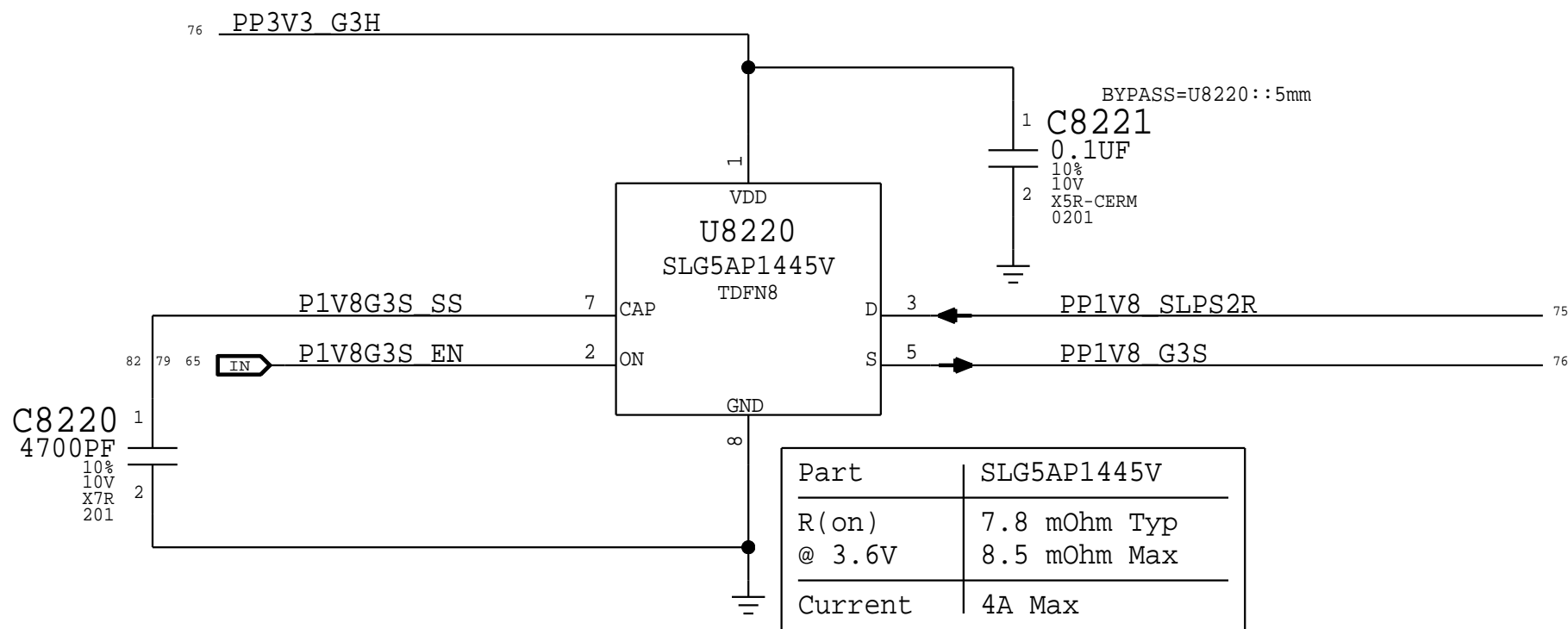


System Power States

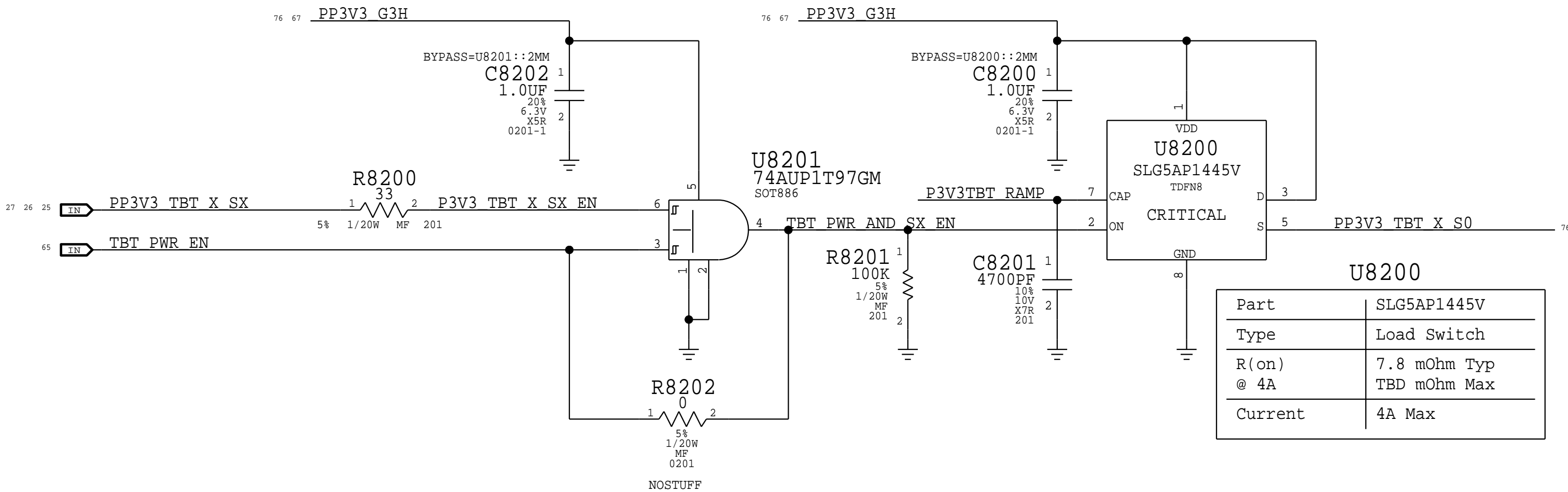
System State:	Shutdown (G3H)		Standby (G3S)		Standby (S4)		Sleep (S0i/S3)		Run (S0)	
	CPU/PCH State:		Off (RTC Only)		Standby		Sleep		Run	
Rails	SoC State:		S2R	Awake	S2R	Awake	S2R	Awake	S2R	Awake
PP*_S2R (0.8,1.1,1.8V)	On	On	On	On	On	On	On	On	On	On
PP*_DDR (0.8,0.9,1.1V)	Off	On	Off	On	Off	On	Off	On	On	On
PP*_AWAKE (CPU,SRAM,1.2,1.8,3.3V)	Off	On	Off	On	Off	On	Off	On	On	On
PP3V3_G3H (VR1)	On	On	On	On	On	On	On	On	On	On
PP1S_G3H	On	On	On	On	On	On	On	On	On	On
PP*_G3S (1.8,3.3,5V)	Off	On	On	On	On	On	On	On	On	On
PP*_S5 (1.8,3.3V)	Off	Off	Off	Off	On	On	On	On	On	On
CPU/PCH VRs	Off	Off	Off	Off	Off/On	Off/On	Off/On	Off/On	On	On


* System: Shutdown Awake is a transition state only.
* SoC: SLP_DDR is a transition state only.
* CPU/PCH: S4 is only used by desktops for USB wakes.
* CPU/PCH: S5 is a transition state. May also be used for RTC wakes.

1.8V G3 Standby Switch

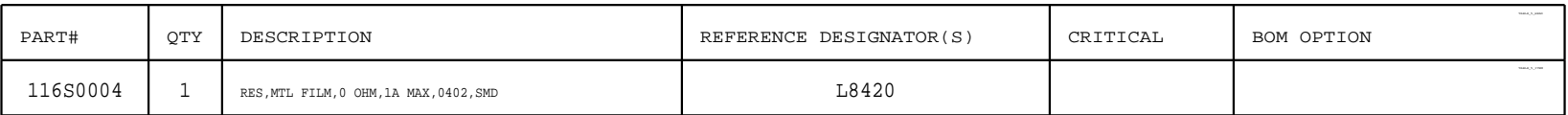










3.3V S0SW TBT Switch




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	SHEET	67 OF 85

BOM_COST_GROUP=PLATFORM POWER



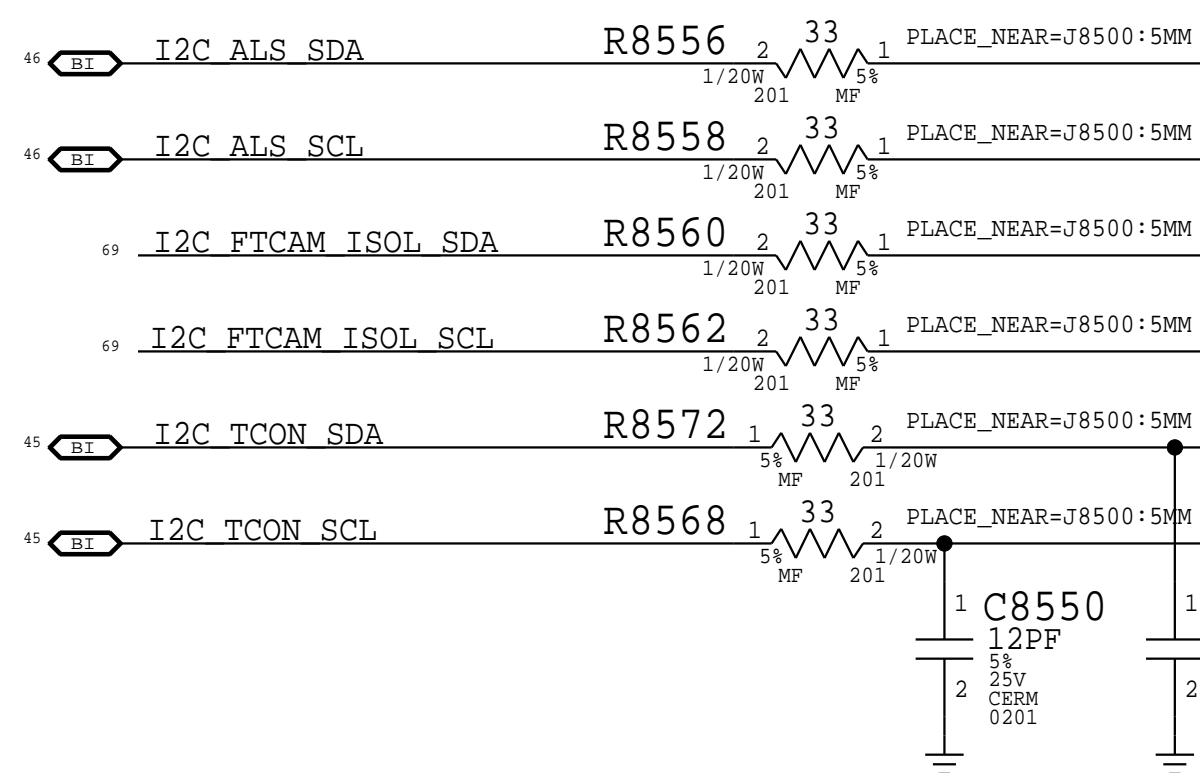
LINE WIDTHS		PBUS LINE WIDTHS		LCD BKLT LINE WIDTHS			
 PP5V_S0_BKLT_A MIN LINE WIDTH=2.0000 MIN NECK_WIDTH=0.2000 VOLTAGE=5V	68	 PPVIN_S0SW_LCDBKLT_F MIN LINE WIDTH=2.0000 MIN NECK_WIDTH=0.2000 VOLTAGE=12.9V	68	 LCDCKBLT_FET_DRV MIN LINE WIDTH=0.6000 MIN NECK_WIDTH=0.2000 VOLTAGE=5V GATE_NODE=TRUE D1D7=TRUE	68	 PPVIN_SW_LCDBKLT_SW MIN LINE WIDTH=2.0000 MIN NECK_WIDTH=0.1200 VOLTAGE=55V SWITCH_NODE=TRUE D1D7=TRUE	68
 PP5V_S0_BKLT_D MIN LINE WIDTH=2.0000 MIN NECK_WIDTH=0.2000 VOLTAGE=5V	68	 PPVIN_S0SW_LCDBKLT_R MIN LINE WIDTH=2.0000 MIN NECK_WIDTH=0.2000 VOLTAGE=14.9V	68 79	 PPVOUIT_S0_LCDCKBLT MIN LINE WIDTH=0.1900 MIN NECK_WIDTH=0.1500 VOLTAGE=55V	68 69 79	 PPVOUIT_S0_LCDBKLT_F MIN LINE WIDTH=2.0000 MIN NECK_WIDTH=0.1500	68

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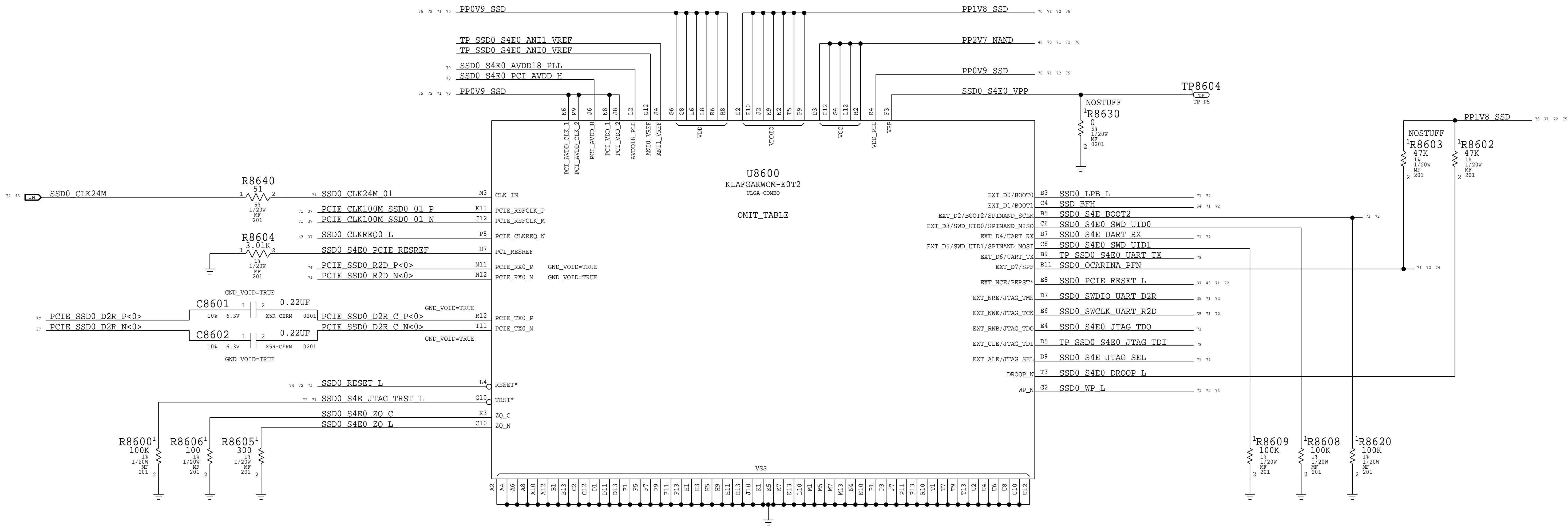
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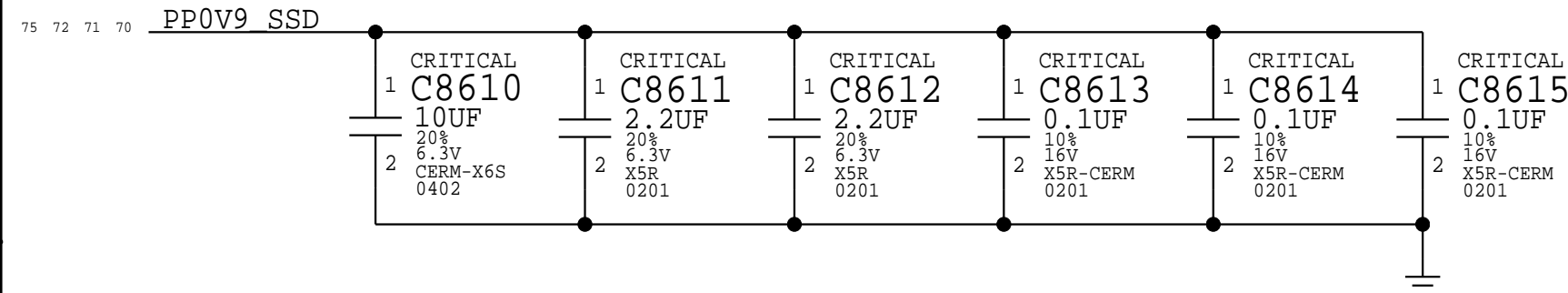
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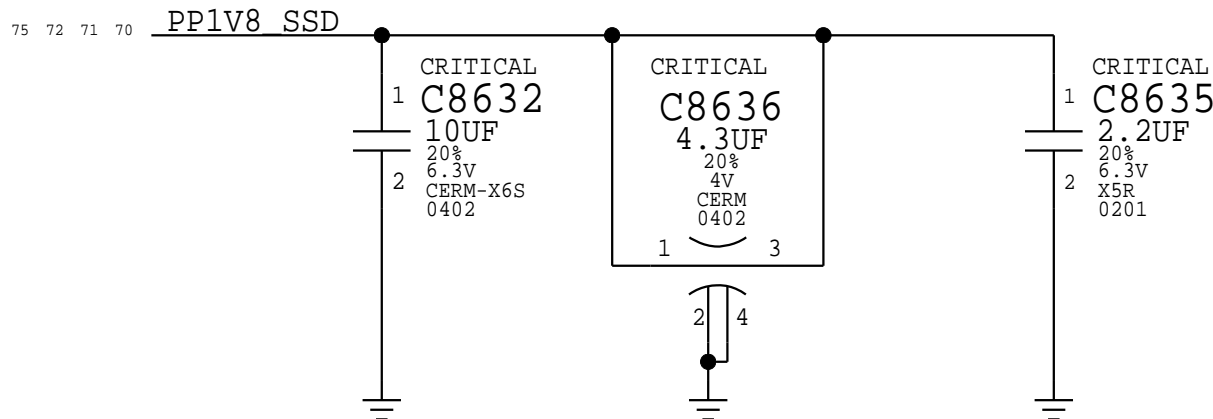
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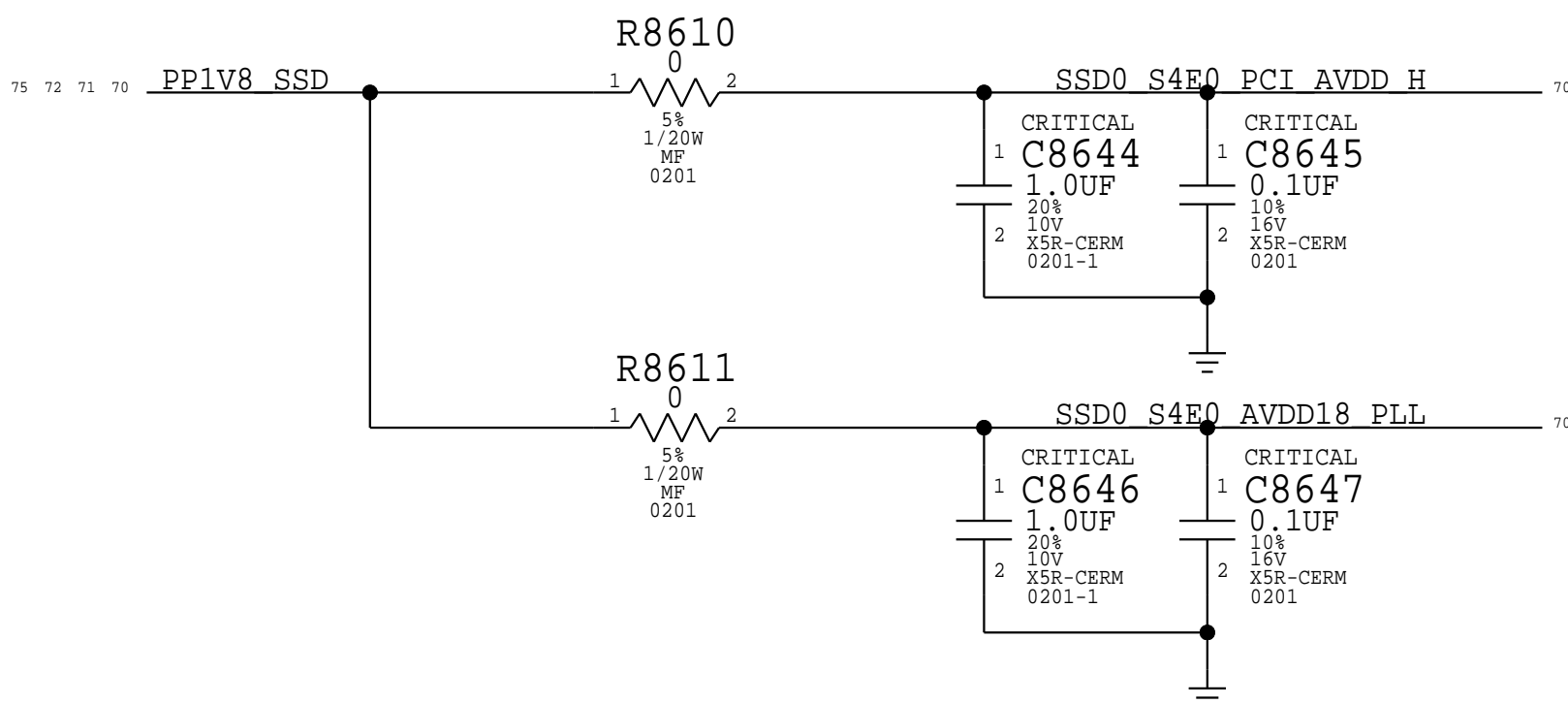
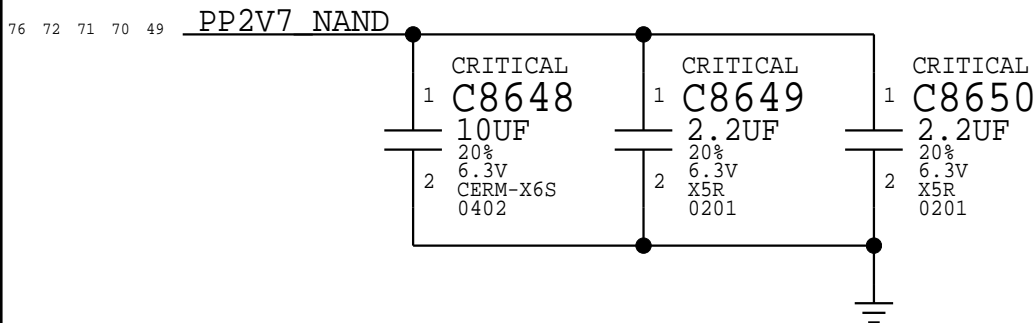
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S4E VDDIO



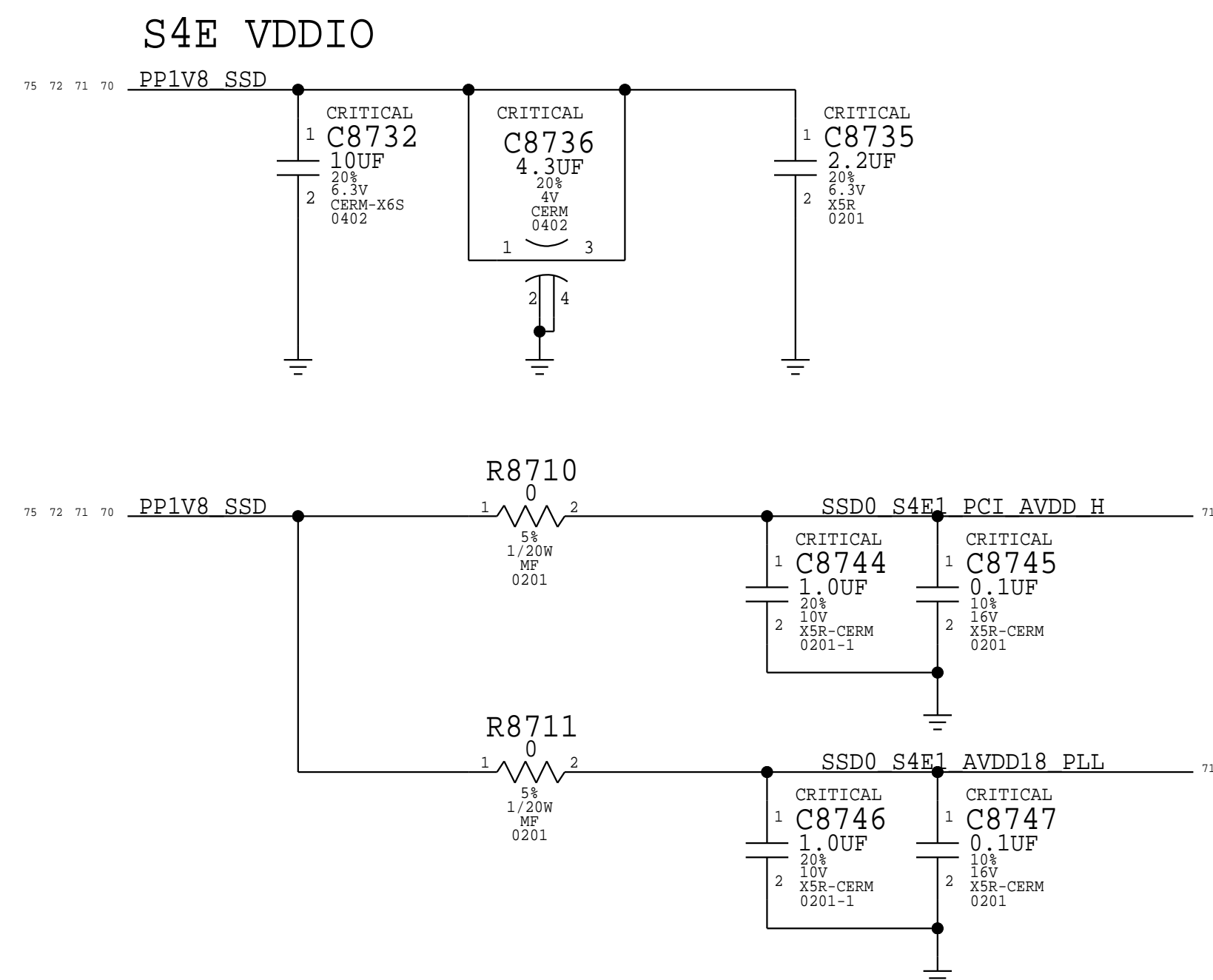
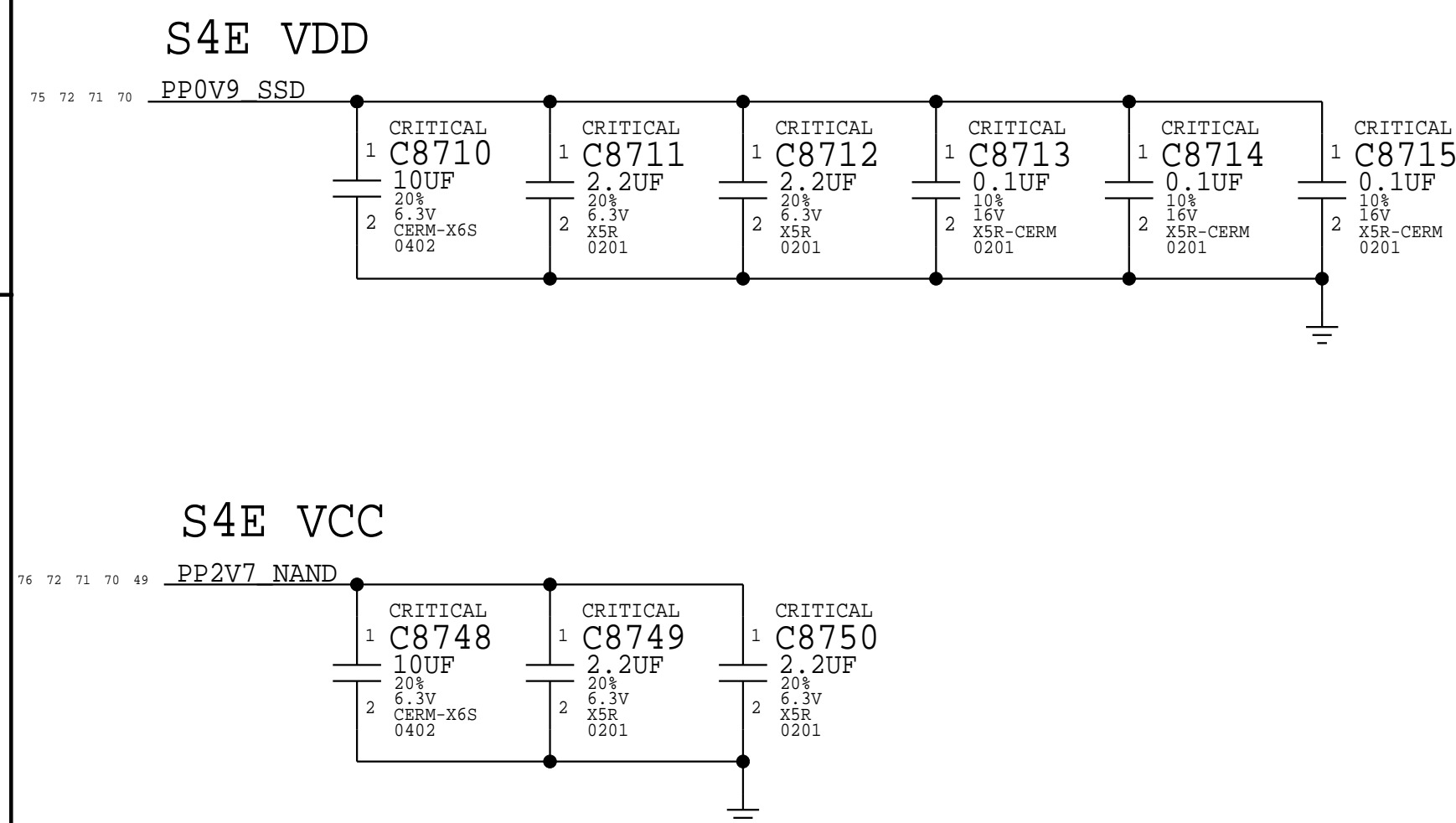
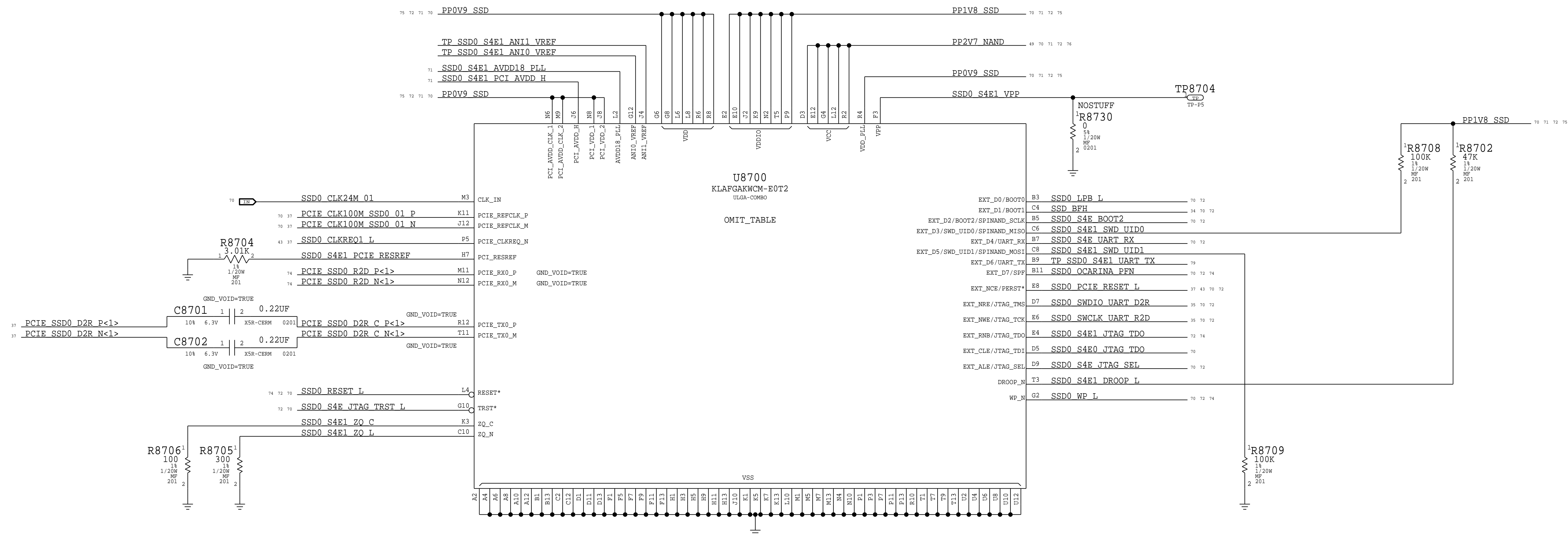
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		PAGE	86 OF 145
		SHEET	70 OF 85

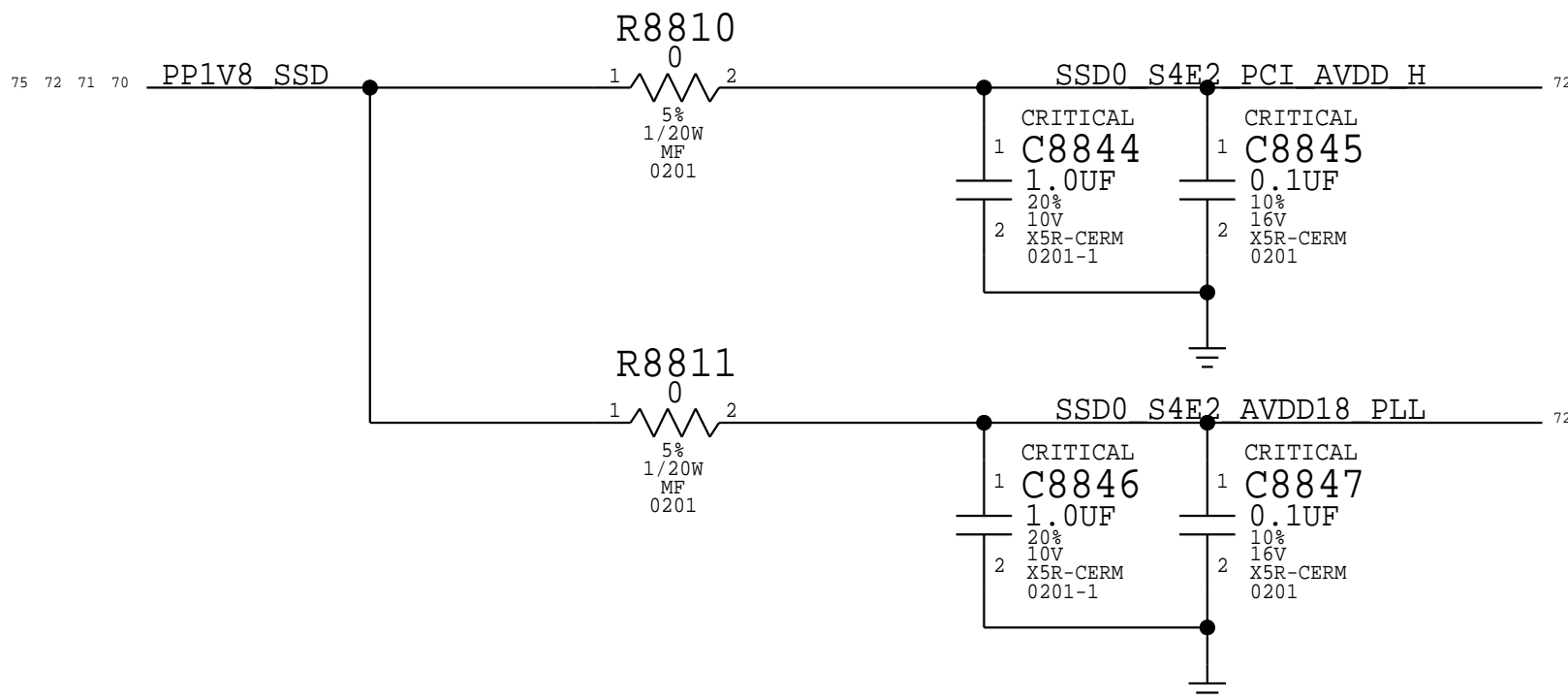
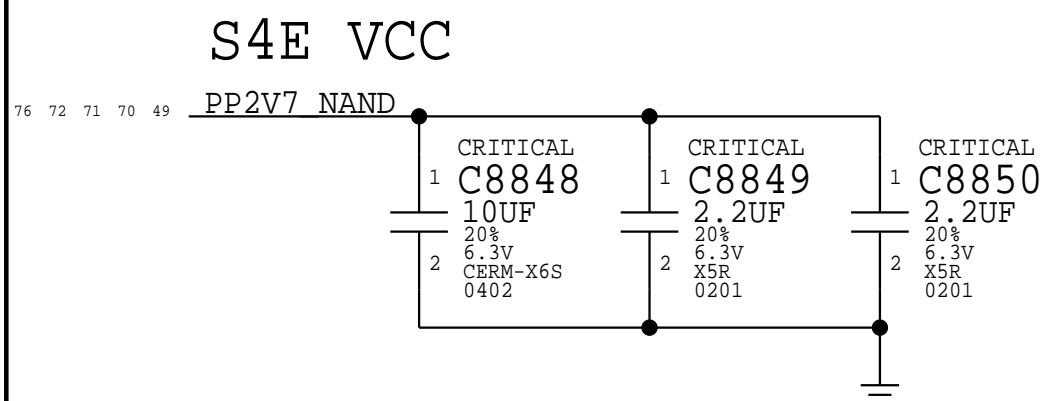
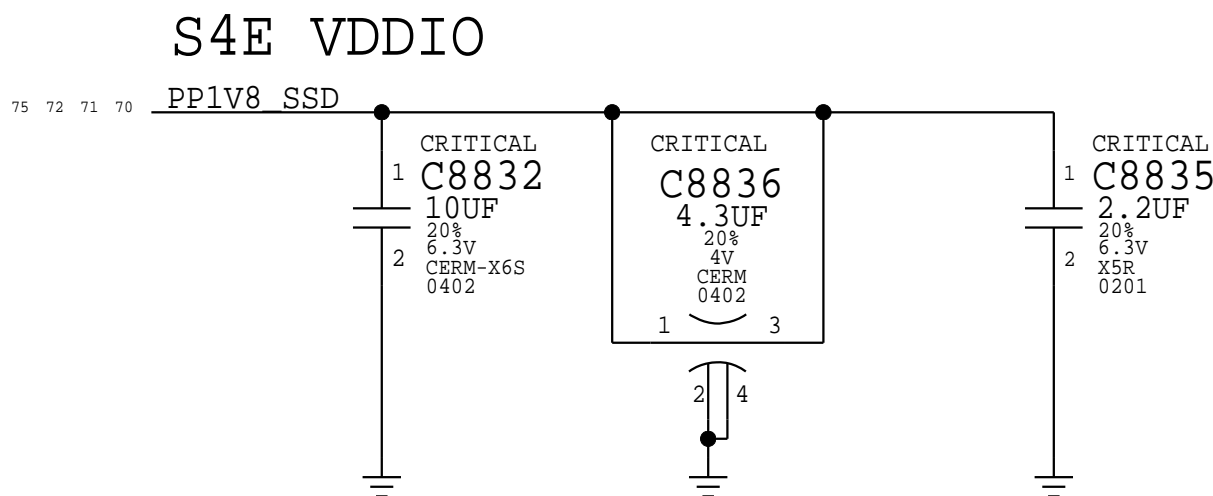
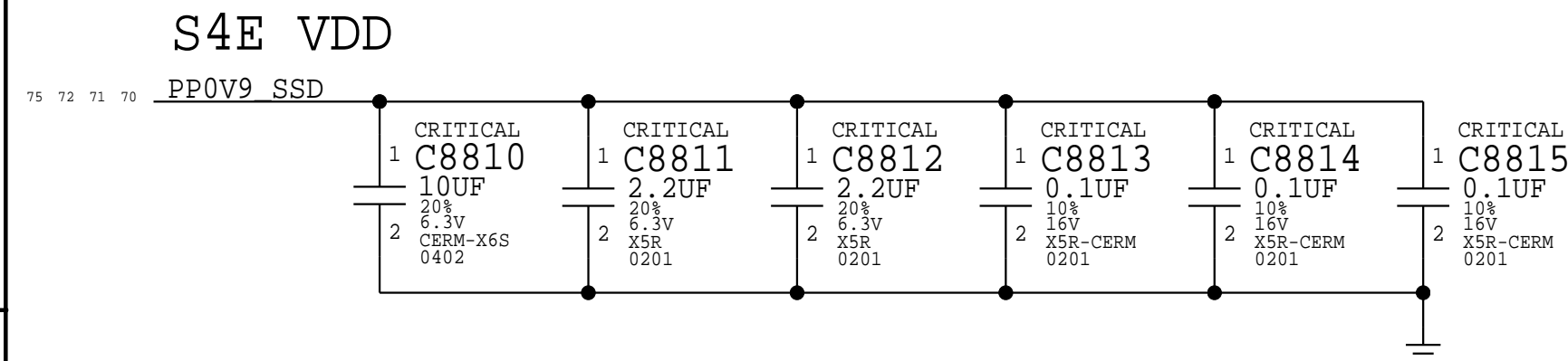
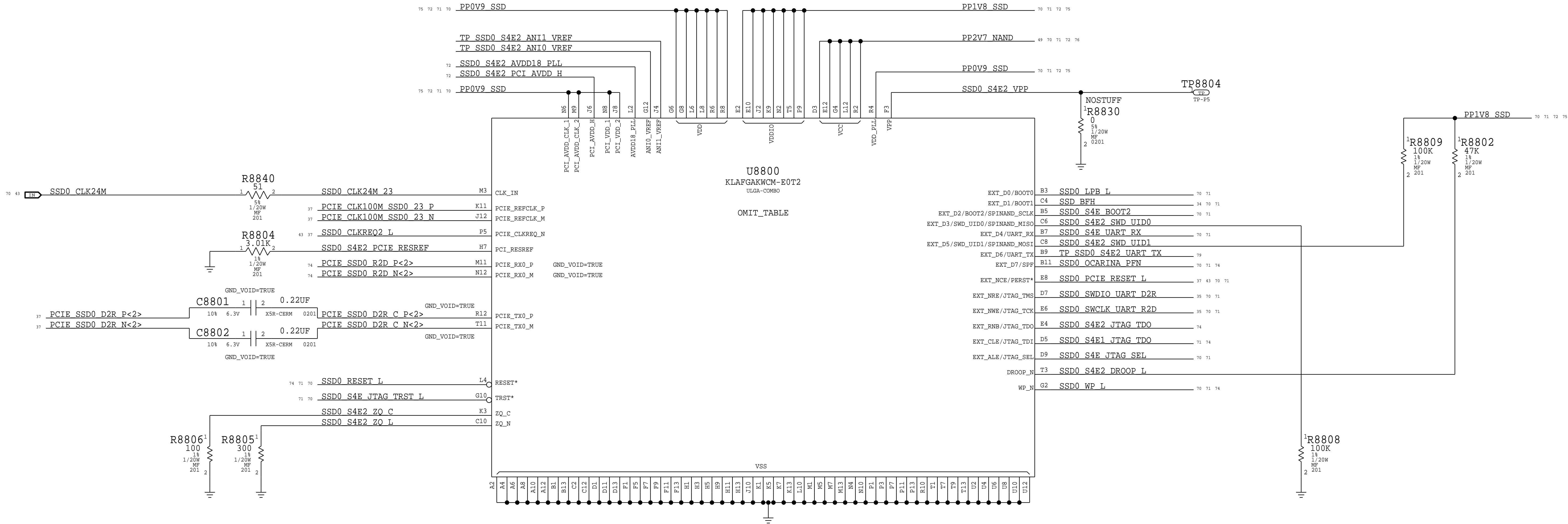
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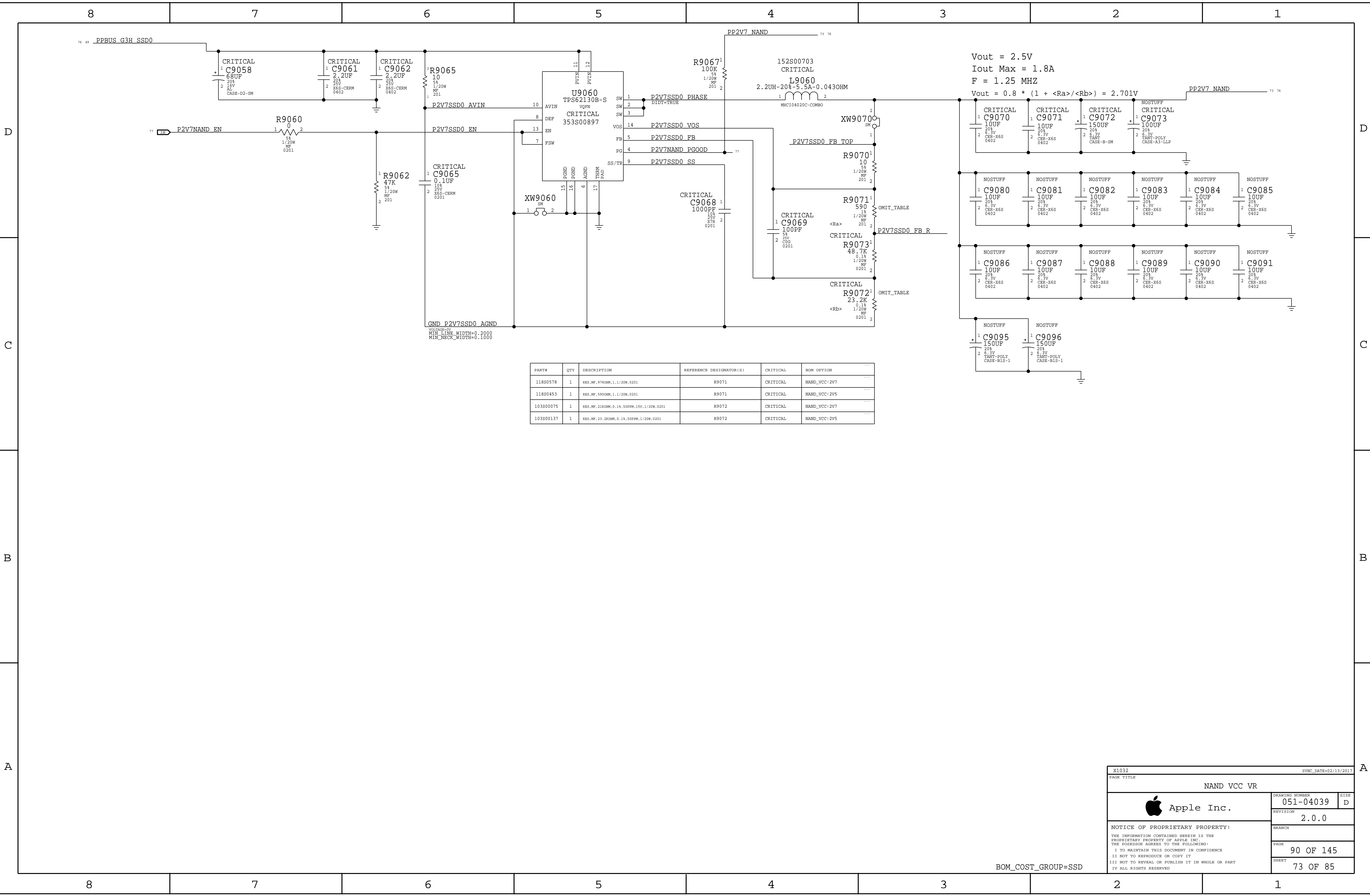
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	051-04039		D
	REVISION		
	2.0.0		
	BRANCH		
PAGE		87 OF 145	
SHEET		71 OF 85	

S4E2




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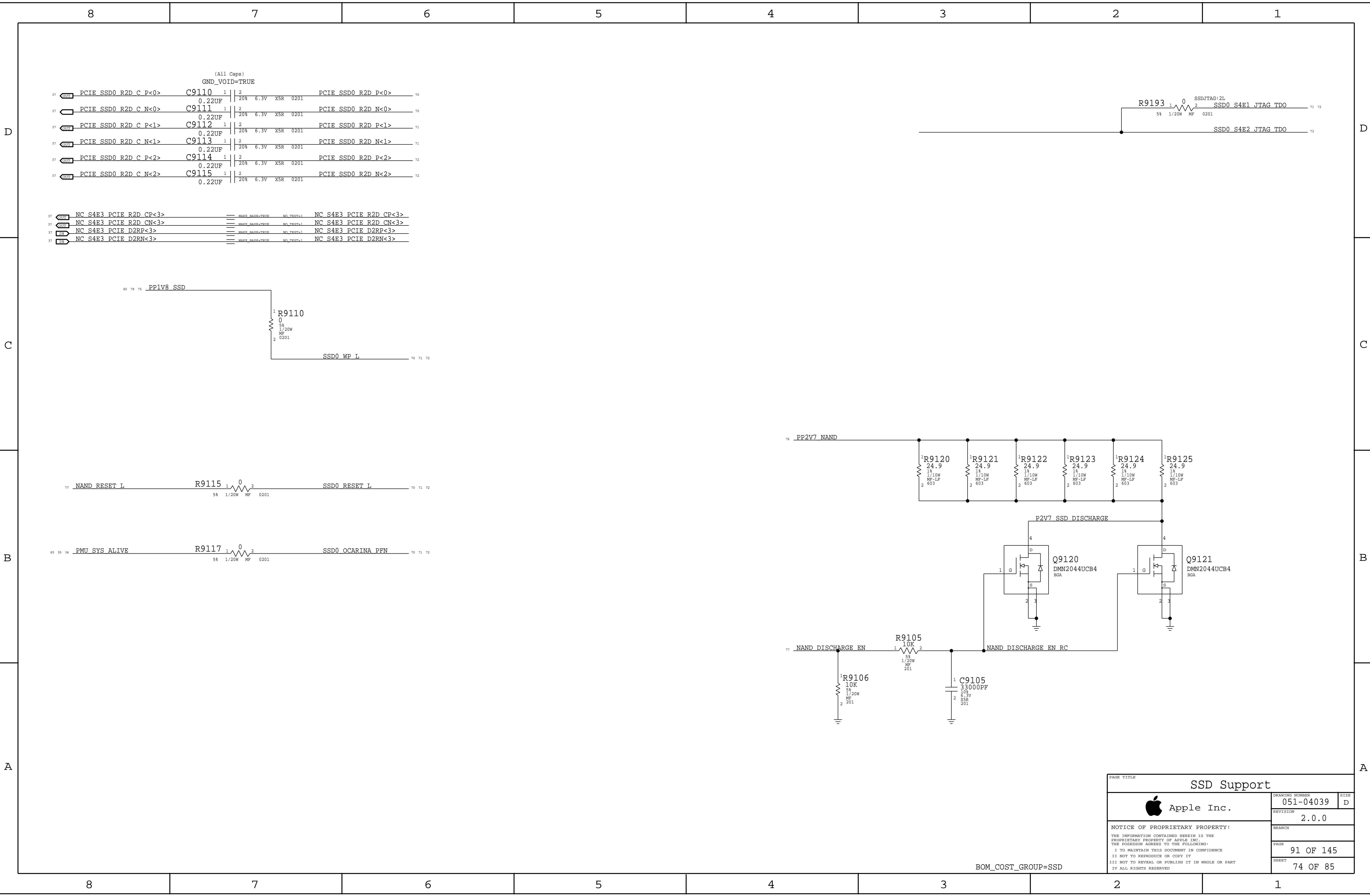
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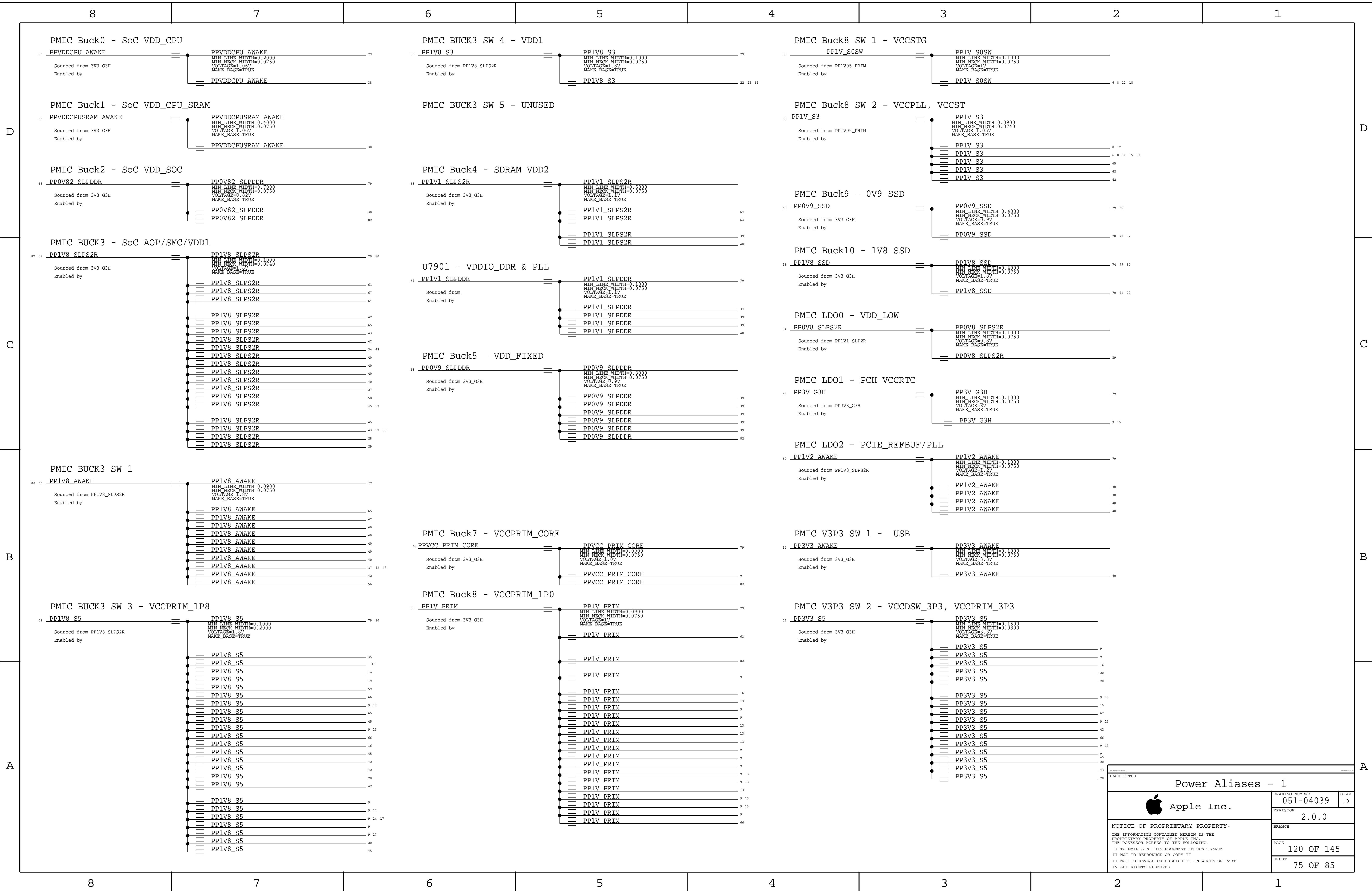


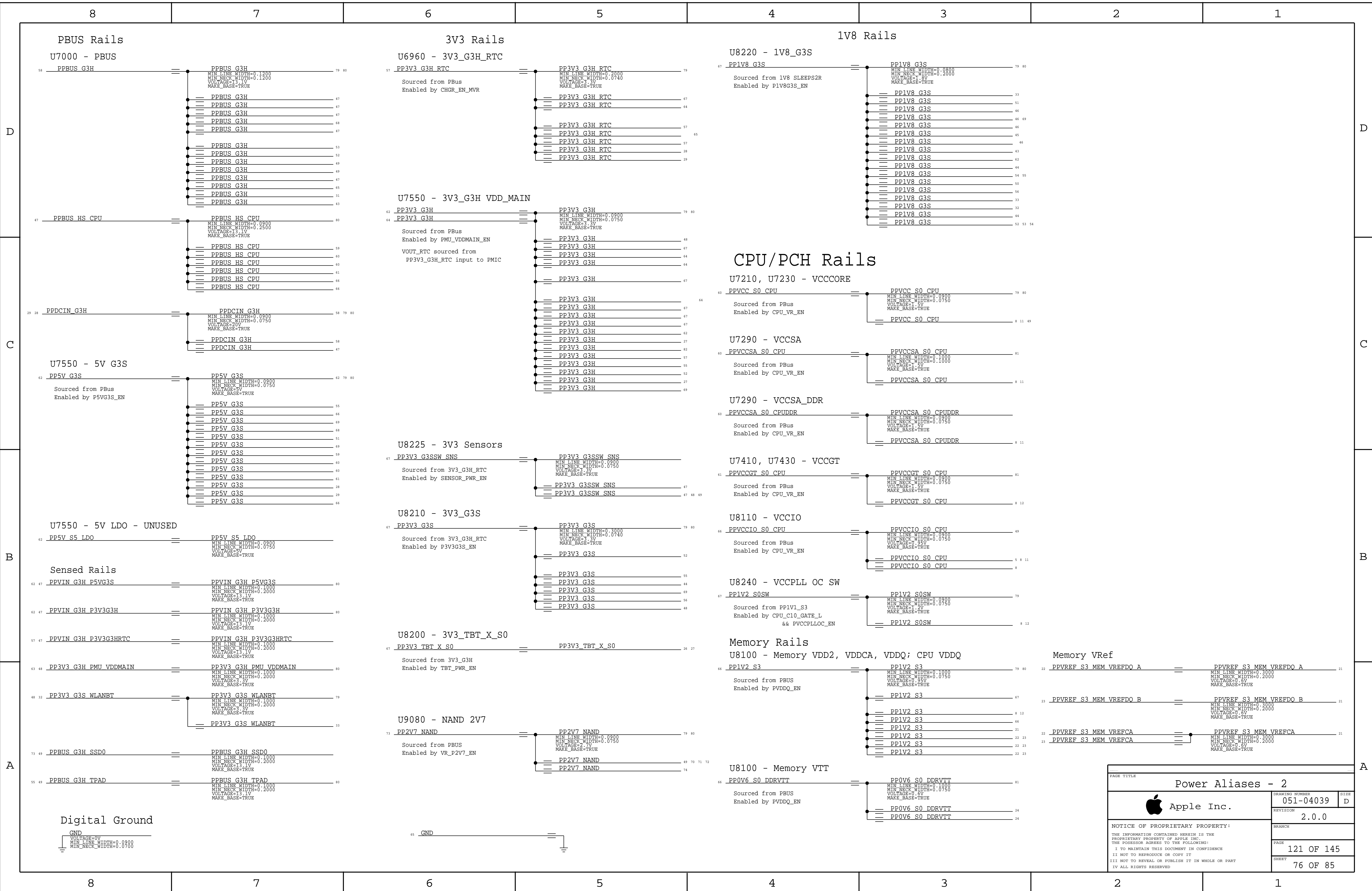
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118S0578	1	RES,MF,976OHM,1.1/20W,0201	R9071	CRITICAL	NAND_VCC:2V7
118S0453	1	RES,MF,590OHM,1.1/20W,0201	R9071	CRITICAL	NAND_VCC:2V5
103S00075	1	RES,MF,21KOHM,0.1%,50PPM,15V,1/20W,0201	R9072	CRITICAL	NAND_VCC:2V7
103S00137	1	RES,MF,23.2KOHM,0.1%,50PPM,1/20W,0201	R9072	CRITICAL	NAND_VCC:2V5

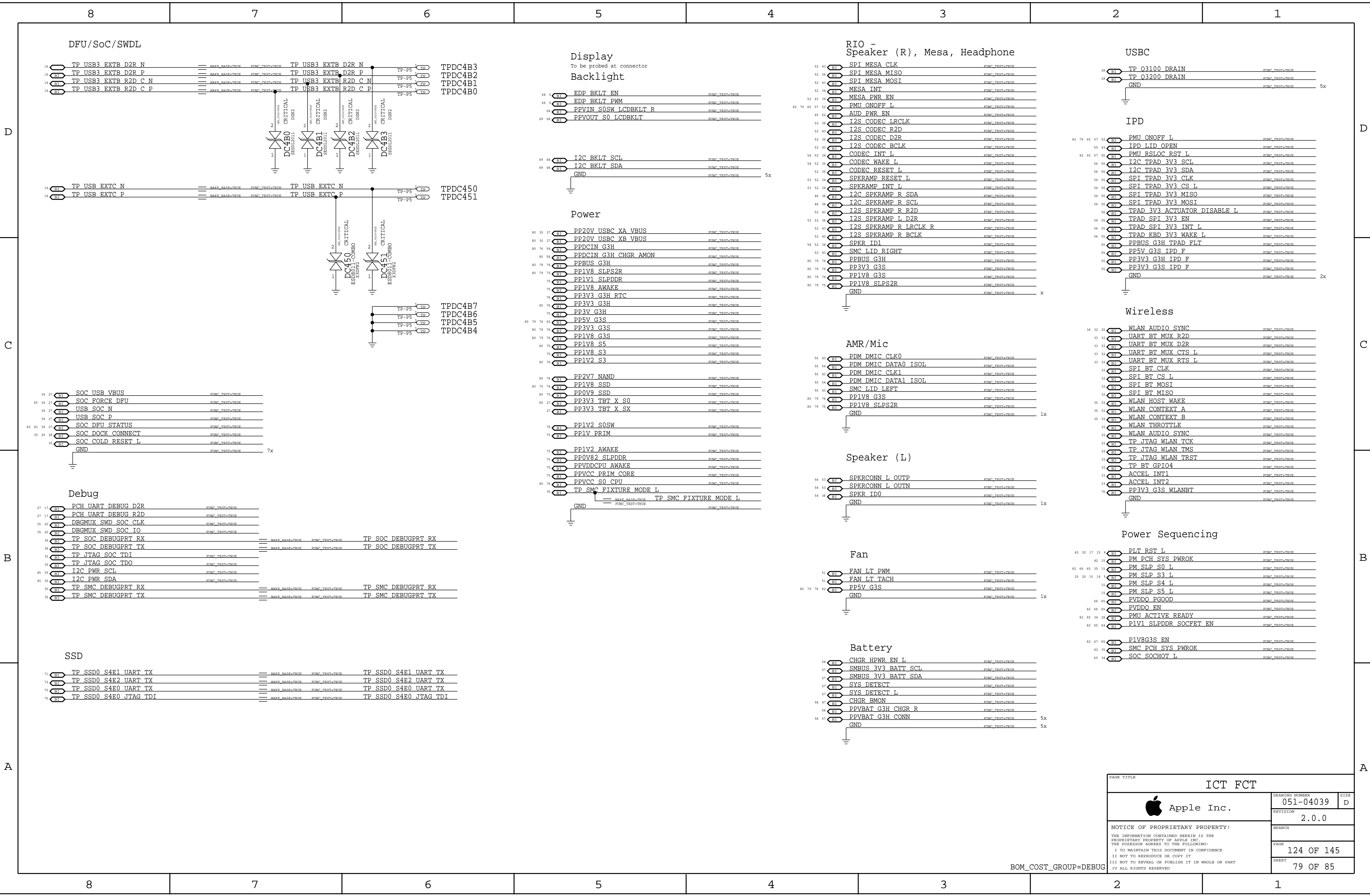
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	90 OF 145		
	SHEET		
73 OF 85			

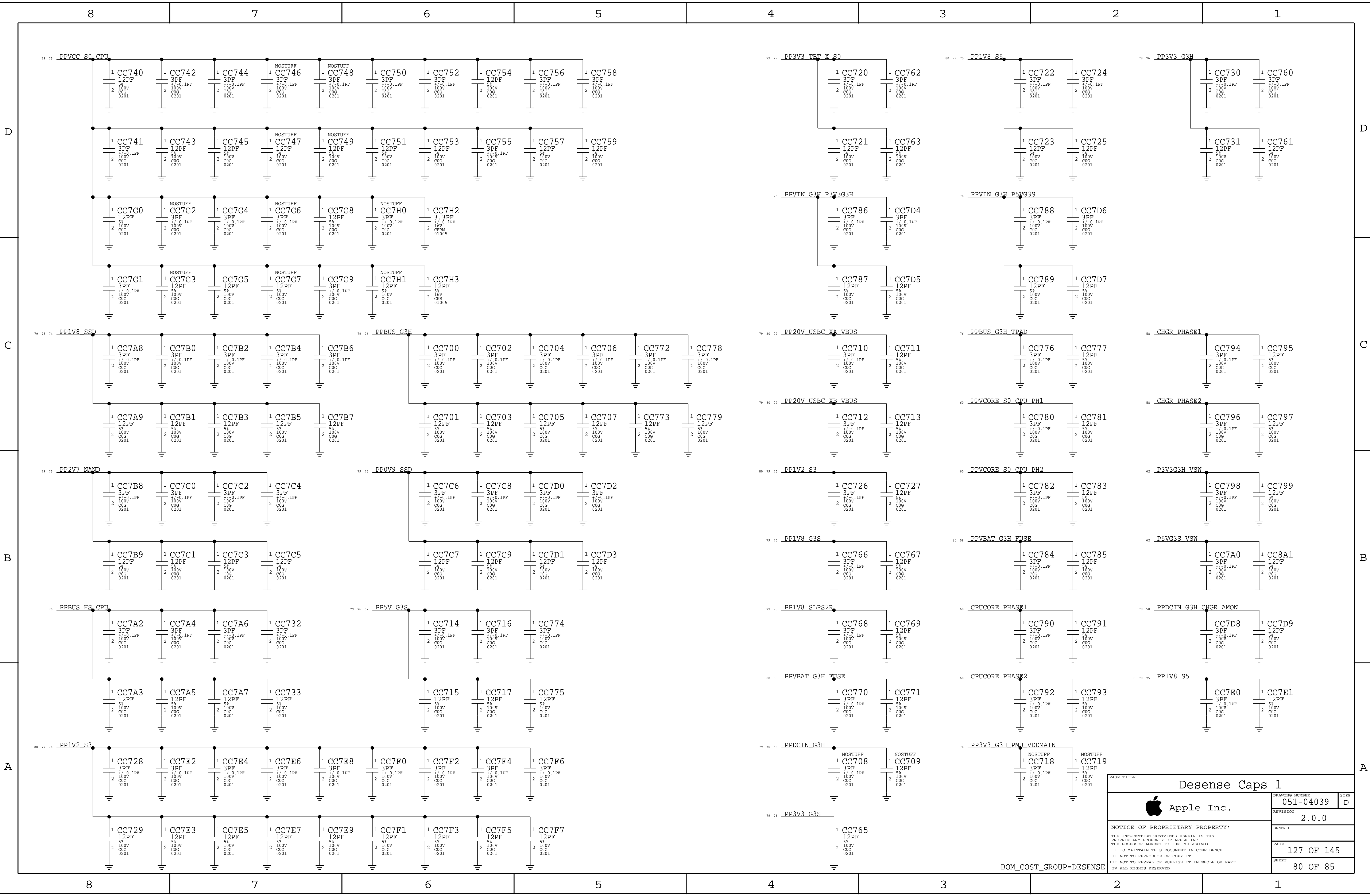
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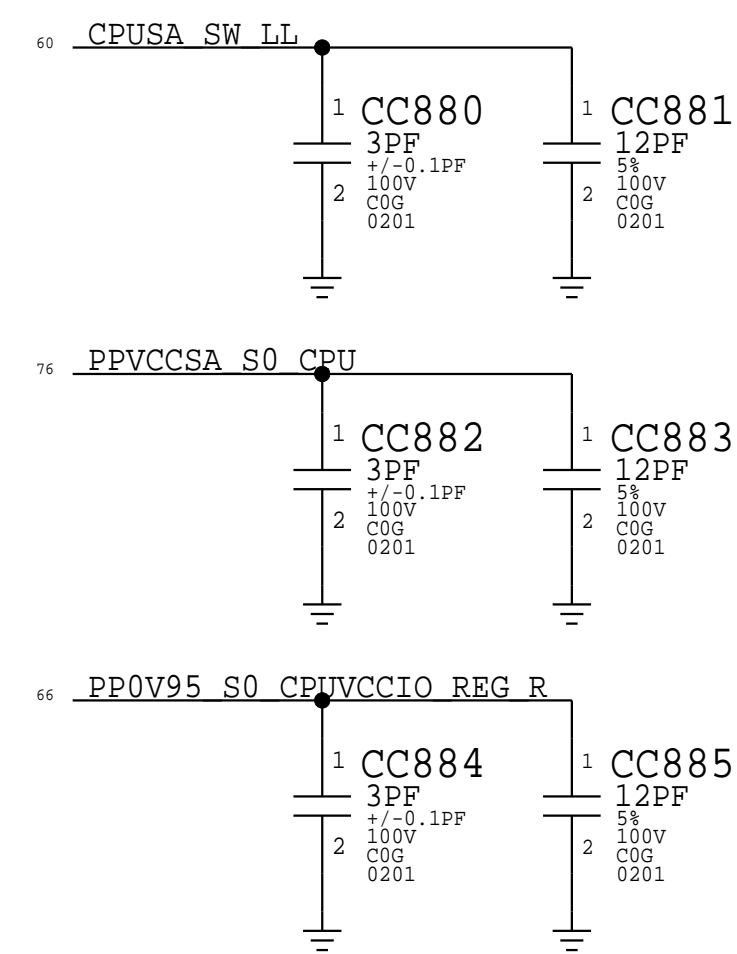
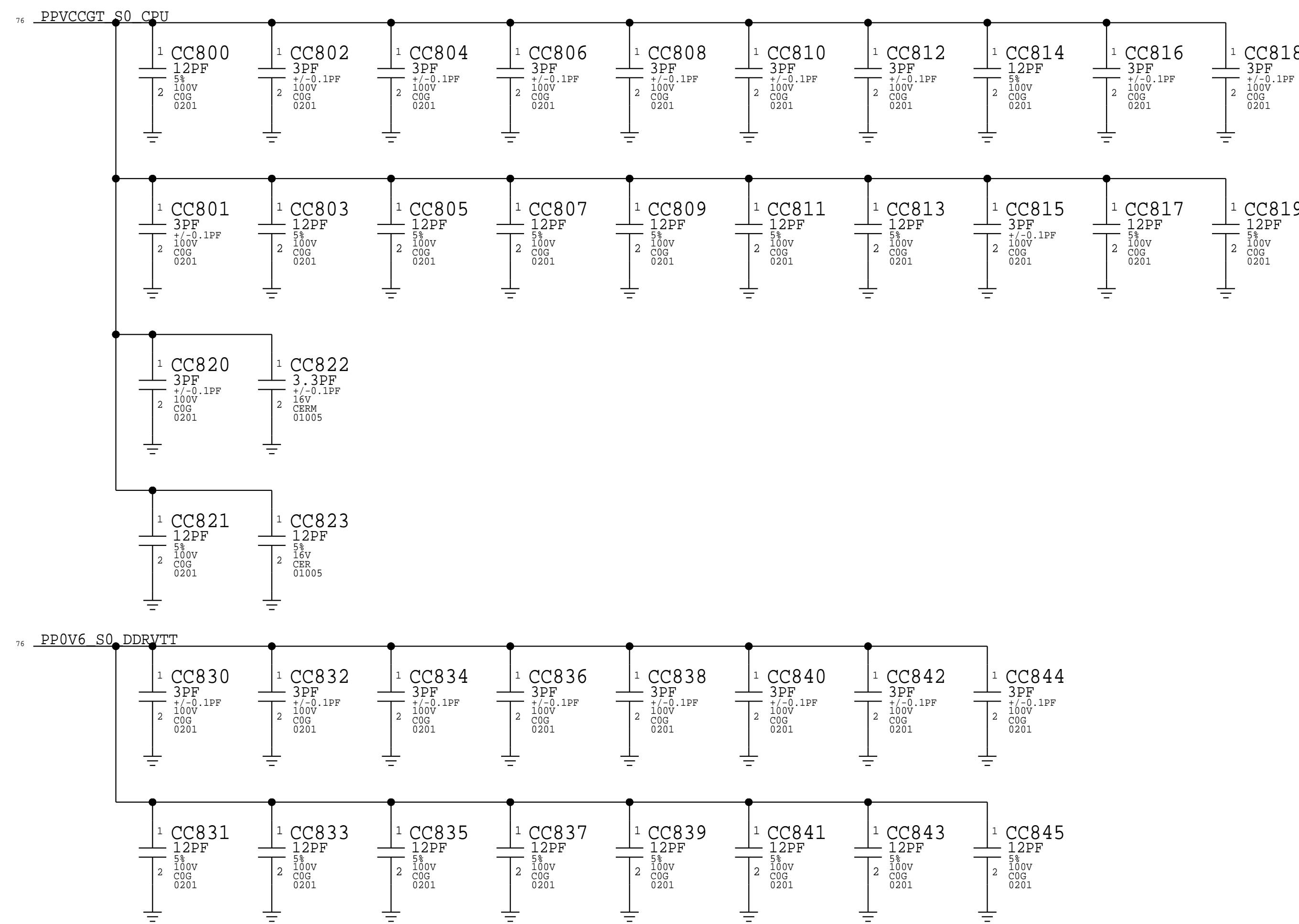









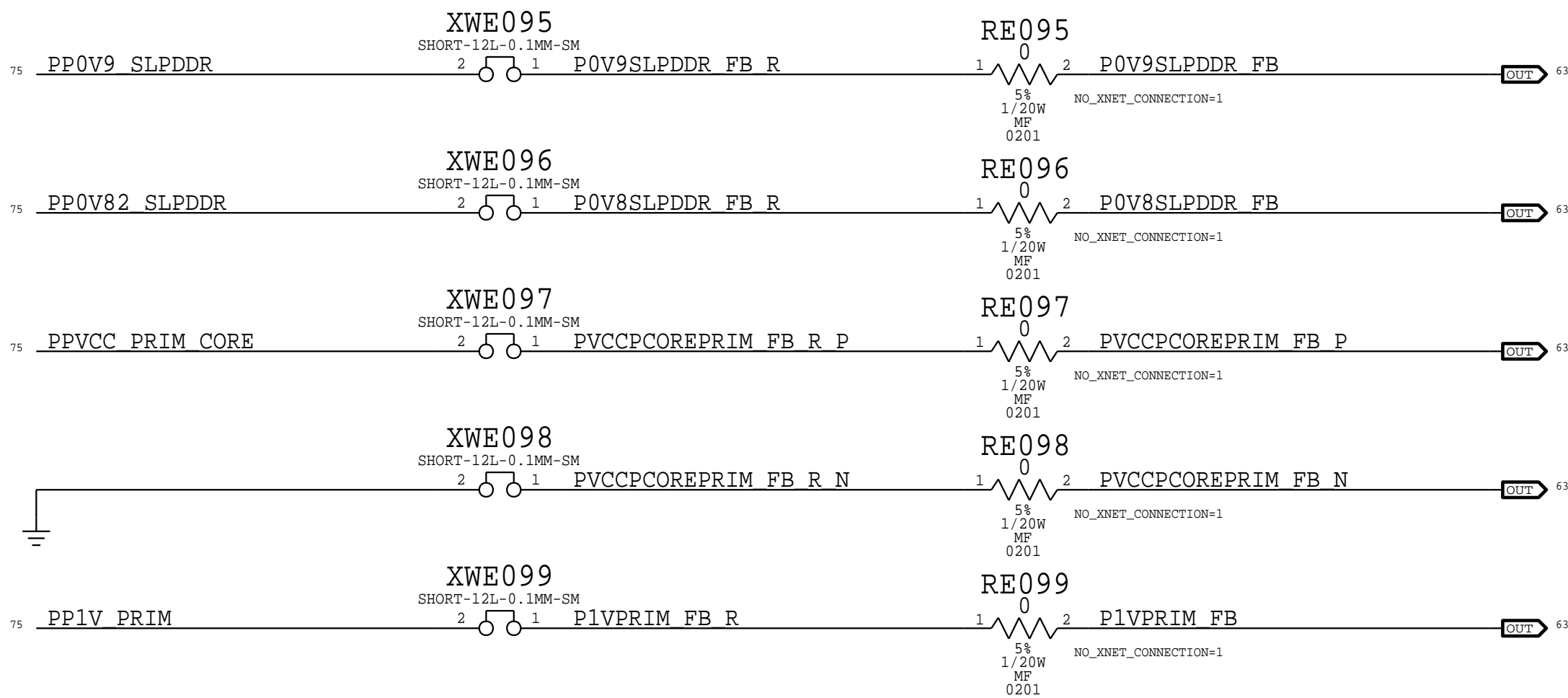
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	PAGE	127 OF 145
	SHEET	80 OF 85



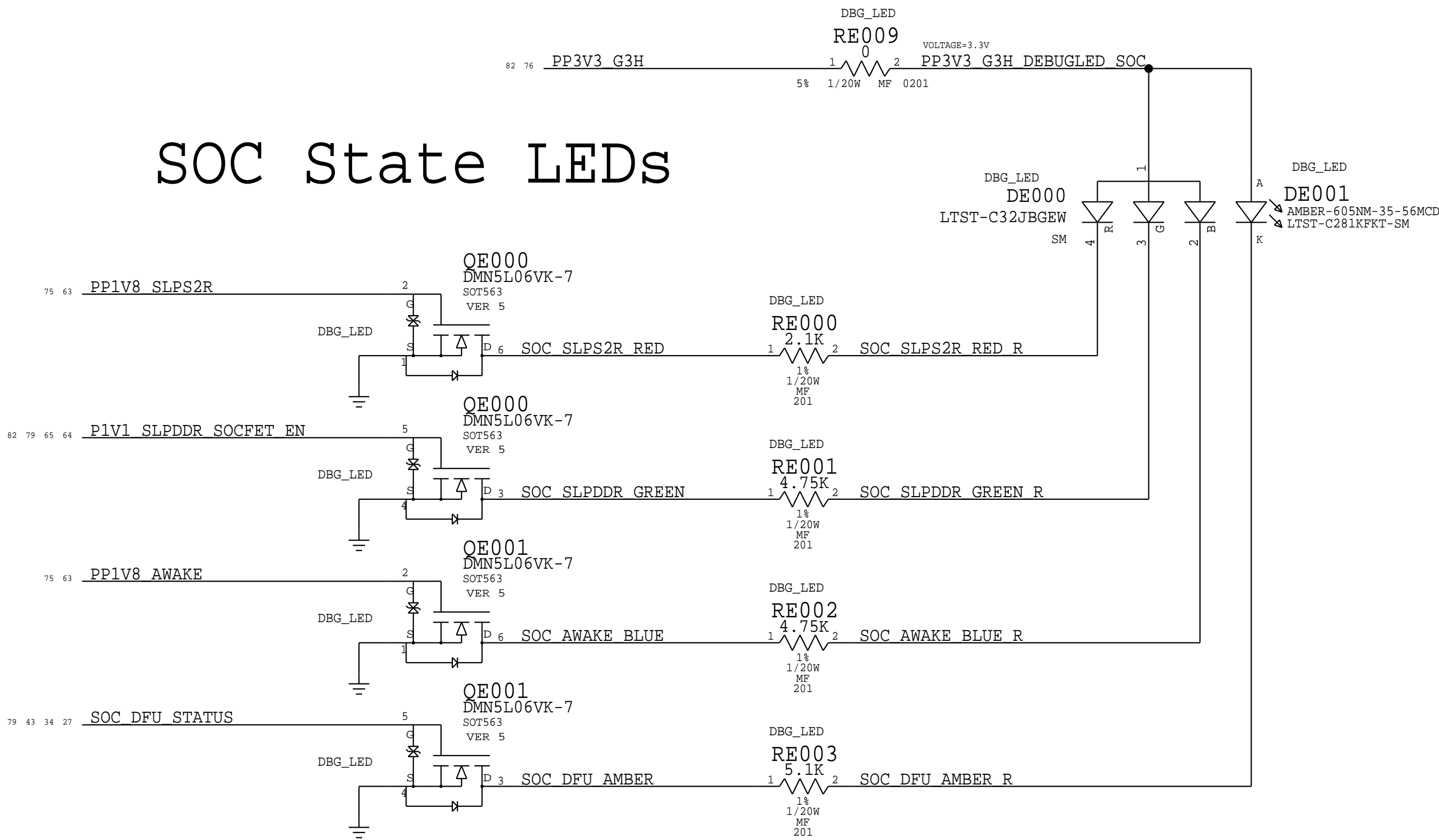
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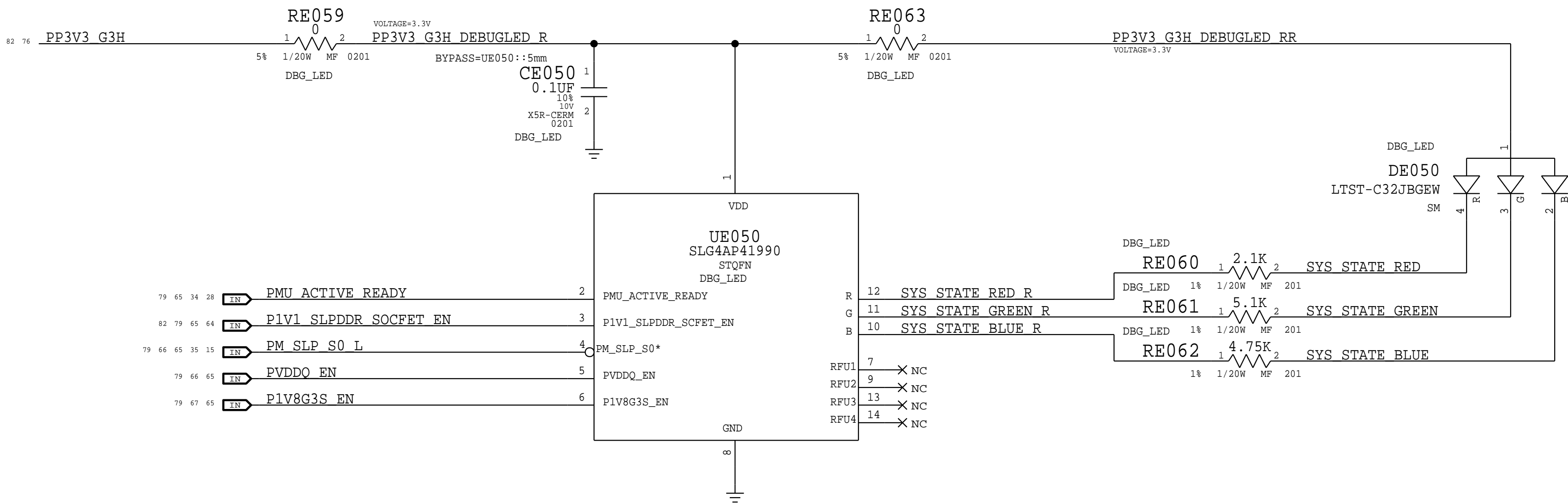
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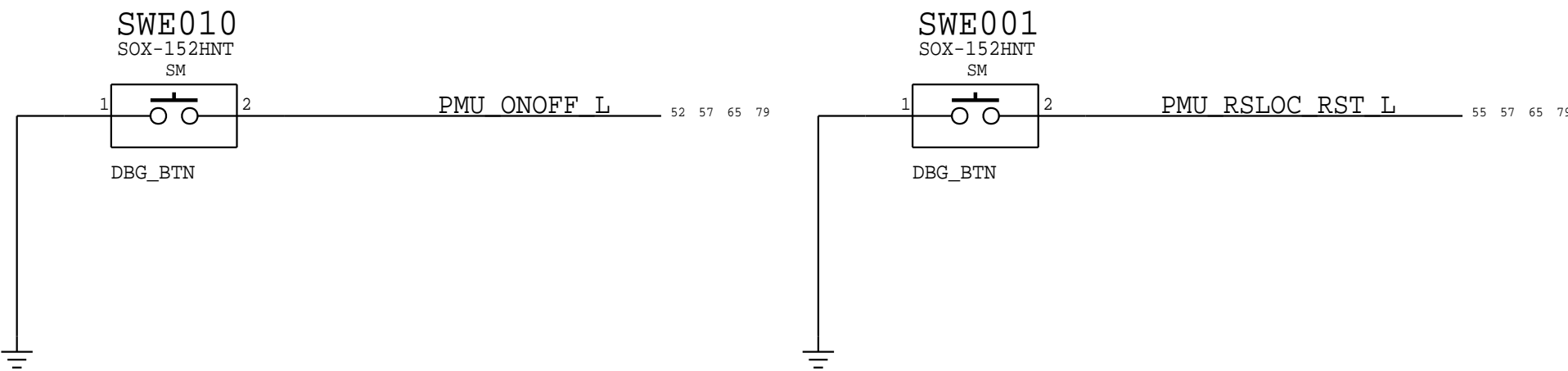
SOC State LEDs



System State LED




Dev Buttons



Inputs					Outputs			Color		State		
PMU ACT RDY	P1V1_SLPDDR SOC FET EN	PM_SLP S0_L	PVDDQ EN	P1V8G3S EN	R	G	B			System	SoC	CPU
0	0	0	0	0	BLINK	OFF	OFF	Blinking	Red	Shutdown (G3H)	OFF	OFF
0	0	0	0	1	ON	OFF	OFF	Red		Standby (G3S)	SLPS2R	OFF
1	1	0	0	1	ON	ON	OFF	Yellow		Standby (G3S)	AWAKE	OFF
0	0	0	1	1	ON	ON	ON	White		Sleep	SLPS2R	S01
1	1	0	1	1	OFF	OFF	ON	Blue		Sleep	AWAKE	S01
1	1	1	1	1	OFF	ON	OFF	Green		Run	AWAKE	S0
1	1	0	0	0	BLINK	ON	OFF	Blinking	Yellow & Green			

All other states are magenta

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Dev Support			
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NOTICE OF PROPRIETARY PROPERTY:			
BRANCH			
PAGE			
140 OF 145			
SHEET			
82 OF 85			

BOM_COST_GROUP=DEBUG

BOM Variants

BOM NUMBER	BOM NAME	BOM OPTIONS
685-00251	COMMON PARTS,MLB_BTTF,X1032	MLB_COMMON
985-00733	DEV PARTS,MLB_BTTF,X1032	DBG_BTN,DBG_LED,UPC_DBG_HDR
939-06596	PCBA,MLB-BTTF,DCDC,X1032	ALTERNATE_COMMON,DEV_PARTS_BOM,SCHEM_PCBF_CPU_ANGLY:INTERPOSER,MLB_POWER,MLB_MISC,MLB_MECH1,FREEMV2

D

EEEE	BOM NUMBER	BOM NAME	BOM OPTIONS
K6GN	639-06259	PCBA,MLB,BEST,HY-8G,SD-128G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:WYTX1_8GB,NANDCFG:PM1C_128G_SD
KLTM	639-06561	PCBA,MLB,BEST,HY-8G,TO-128G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:WYTX1_8GB,NANDCFG:PM1C_128G_TO
KLVO	639-06562	PCBA,MLB,BEST,MI-8G,SD-128G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:MICRON_8GB,NANDCFG:PM1C_128G_SD
KLVD	639-06563	PCBA,MLB,BEST,MI-8G,TO-128G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:MICRON_8GB,NANDCFG:PM1C_128G_TO
KLVV	639-06564	PCBA,MLB,BEST,SS-8G,SD-128G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:SAMSUNG_8GB,NANDCFG:PM1C_128G_SD
KLW7	639-06565	PCBA,MLB,BEST,SS-8G,TO-128G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:SAMSUNG_8GB,NANDCFG:PM1C_128G_TO
KLWL	639-06566	PCBA,MLB,BEST,HY-16G,SD-128G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:WYTX1_16GB,NANDCFG:PM1C_128G_SD
KLWY	639-06567	PCBA,MLB,BEST,HY-16G,TO-128G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:WYTX1_16GB,NANDCFG:PM1C_128G_TO
KLX9	639-06568	PCBA,MLB,BEST,MI-16G,SD-128G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:MICRON_16GB,NANDCFG:PM1C_128G_SD
KLXN	639-06569	PCBA,MLB,BEST,MI-16G,TO-128G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:MICRON_16GB,NANDCFG:PM1C_128G_TO
KLyl	639-06570	PCBA,MLB,BEST,SS-16G,SD-128G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:SAMSUNG_16GB,NANDCFG:PM1C_128G_SD
KLYD	639-06571	PCBA,MLB,BEST,SS-16G,TO-128G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:SAMSUNG_16GB,NANDCFG:PM1C_128G_TO
KLYQ	639-06572	PCBA,MLB,BEST,HY-8G,SD-256G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:WYTX1_8GB,NANDCFG:PM1C_256G_SD
KM04	639-06573	PCBA,MLB,BEST,HY-8G,TO-256G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:WYTX1_8GB,NANDCFG:PM1C_256G_TO
KM0L	639-06574	PCBA,MLB,BEST,MI-8G,SD-256G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:MICRON_8GB,NANDCFG:PM1C_256G_SD
KM10	639-06575	PCBA,MLB,BEST,MI-8G,TO-256G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:MICRON_8GB,NANDCFG:PM1C_256G_TO
KM1F	639-06576	PCBA,MLB,BEST,SS-8G,SD-256G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:SAMSUNG_8GB,NANDCFG:PM1C_256G_SD
KM1R	639-06577	PCBA,MLB,BEST,SS-8G,TO-256G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:SAMSUNG_8GB,NANDCFG:PM1C_256G_TO
KM24	639-06578	PCBA,MLB,BEST,HY-16G,SD-256G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:WYTX1_16GB,NANDCFG:PM1C_256G_SD
KM2H	639-06579	PCBA,MLB,BEST,HY-16G,TO-256G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:WYTX1_16GB,NANDCFG:PM1C_256G_TO
KM2V	639-06580	PCBA,MLB,BEST,MI-16G,SD-256G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:MICRON_16GB,NANDCFG:PM1C_256G_SD
KM39	639-06581	PCBA,MLB,BEST,MI-16G,TO-256G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:MICRON_16GB,NANDCFG:PM1C_256G_TO
KM3Q	639-06582	PCBA,MLB,BEST,SS-16G,SD-256G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:SAMSUNG_16GB,NANDCFG:PM1C_256G_SD
KM47	639-06583	PCBA,MLB,BEST,SS-16G,TO-256G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:SAMSUNG_16GB,NANDCFG:PM1C_256G_TO
KM4Q	639-06584	PCBA,MLB,BEST,HY-8G,SD-512G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:WYTX1_8GB,NANDCFG:PM1C_512G_SD
KM55	639-06585	PCBA,MLB,BEST,HY-8G,TO-512G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:WYTX1_8GB,NANDCFG:PM1C_512G_TO
KM5J	639-06586	PCBA,MLB,BEST,MI-8G,SD-512G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:MICRON_8GB,NANDCFG:PM1C_512G_SD
KM5W	639-06587	PCBA,MLB,BEST,MI-8G,TO-512G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:MICRON_8GB,NANDCFG:PM1C_512G_TO
KM67	639-06588	PCBA,MLB,BEST,SS-8G,SD-512G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:SAMSUNG_8GB,NANDCFG:PM1C_512G_SD
KM6L	639-06589	PCBA,MLB,BEST,SS-8G,TO-512G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:SAMSUNG_8GB,NANDCFG:PM1C_512G_TO
KM6Y	639-06590	PCBA,MLB,BEST,HY-16G,SD-512G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:WYTX1_16GB,NANDCFG:PM1C_512G_SD
KM79	639-06591	PCBA,MLB,BEST,HY-16G,TO-512G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:WYTX1_16GB,NANDCFG:PM1C_512G_TO
KM7N	639-06592	PCBA,MLB,BEST,MI-16G,SD-512G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:MICRON_16GB,NANDCFG:PM1C_512G_SD
KM81	639-06593	PCBA,MLB,BEST,MI-16G,TO-512G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:MICRON_16GB,NANDCFG:PM1C_512G_TO
KM8D	639-06594	PCBA,MLB,BEST,SS-16G,SD-512G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:SAMSUNG_16GB,NANDCFG:PM1C_512G_SD
KM8Q	639-06595	PCBA,MLB,BEST,SS-16G,TO-512G,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:SAMSUNG_16GB,NANDCFG:PM1C_512G_TO
KM93	639-06596	PCBA,MLB,BEST,HY-8G,SS-1.5T,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:WYTX1_8GB,NANDCFG:3DV4_1P5T_SS
KM9G	639-06597	PCBA,MLB,BEST,MI-8G,SS-1.5T,X1032	CNR_PARTS_BOM,DEV_PARTS_BOM,ALTERNATE,CPU_AMLY:8REXN,DRAMCFG:MICRON_8GB

A


EEEE	BOM NUMBER	BOM NAME	BOM OPTIONS
KMD7	639-06602	PCBA,MLB,BTTR,HY-8G,SD-128G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:HYNIX_8GB,NANDCFG:PMLC_128G_SD
KMDL	639-06603	PCBA,MLB,BTTR,HY-8G,TO-128G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:HYNIX_8GB,NANDCFG:PMLC_128G_TO
KMDY	639-06604	PCBA,MLB,BTTR,MI-8G,SD-128G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:MICRON_8GB,NANDCFG:PMLC_128G_SD
KMF9	639-06605	PCBA,MLB,BTTR,MI-8G,TO-128G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:MICRON_8GB,NANDCFG:PMLC_128G_TO
KMFN	639-06606	PCBA,MLB,BTTR,SS-8G,SD-128G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:SAMSUNG_8GB,NANDCFG:PMLC_128G_SD
KMG1	639-06607	PCBA,MLB,BTTR,SS-8G,TO-128G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:SAMSUNG_8GB,NANDCFG:PMLC_128G_TO
KMGD	639-06608	PCBA,MLB,BTTR,HY-16G,SD-128G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:HYNIX_16GB,NANDCFG:PMLC_128G_SD
KMGQ	639-06609	PCBA,MLB,BTTR,HY-16G,TO-128G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:HYNIX_16GB,NANDCFG:PMLC_128G_TO
KMH3	639-06610	PCBA,MLB,BTTR,MI-16G,SD-128G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:MICRON_16GB,NANDCFG:PMLC_128G_SD
KMHG	639-06611	PCBA,MLB,BTTR,MI-16G,TO-128G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:MICRON_16GB,NANDCFG:PMLC_128G_TO
KMIT	639-06612	PCBA,MLB,BTTR,SS-16G,SD-128G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:SAMSUNG_16GB,NANDCFG:PMLC_128G_SD
KMJ5	639-06613	PCBA,MLB,BTTR,SS-16G,TO-128G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:SAMSUNG_16GB,NANDCFG:PMLC_128G_TO
KMJK	639-06614	PCBA,MLB,BTTR,HY-8G,SD-256G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:HYNIX_8GB,NANDCFG:PMLC_256G_SD
KMJX	639-06615	PCBA,MLB,BTTR,HY-8G,TO-256G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:HYNIX_8GB,NANDCFG:PMLC_256G_TO
KMK8	639-06616	PCBA,MLB,BTTR,MI-8G,SD-256G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:MICRON_8GB,NANDCFG:PMLC_256G_SD
KMKM	639-06617	PCBA,MLB,BTTR,MI-8G,TO-256G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:MICRON_8GB,NANDCFG:PMLC_256G_TO
KML0	639-06618	PCBA,MLB,BTTR,SS-8G,SD-256G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:SAMSUNG_8GB,NANDCFG:PMLC_256G_SD
KMLC	639-06619	PCBA,MLB,BTTR,SS-8G,TO-256G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:SAMSUNG_8GB,NANDCFG:PMLC_256G_TO
KMLP	639-06620	PCBA,MLB,BTTR,HY-16G,SD-256G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:HYNIX_16GB,NANDCFG:PMLC_256G_SD
KMM2	639-06621	PCBA,MLB,BTTR,HY-16G,TO-256G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:HYNIX_16GB,NANDCFG:PMLC_256G_TO
KMMF	639-06622	PCBA,MLB,BTTR,MI-16G,SD-256G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:MICRON_16GB,NANDCFG:PMLC_256G_SD
KMMR	639-06623	PCBA,MLB,BTTR,MI-16G,TO-256G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:MICRON_16GB,NANDCFG:PMLC_256G_TO
KMN4	639-06624	PCBA,MLB,BTTR,SS-16G,SD-256G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:SAMSUNG_16GB,NANDCFG:PMLC_256G_SD
KMNH	639-06625	PCBA,MLB,BTTR,SS-16G,TO-256G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:SAMSUNG_16GB,NANDCFG:PMLC_256G_TO
KMNV	639-06626	PCBA,MLB,BTTR,HY-8G,SD-512G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:HYNIX_8GB,NANDCFG:PMLC_512G_SD
KMP6	639-06627	PCBA,MLB,BTTR,HY-8G,TO-512G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:HYNIX_8GB,NANDCFG:PMLC_512G_TO
KMPK	639-06628	PCBA,MLB,BTTR,MI-8G,SD-512G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:MICRON_8GB,NANDCFG:PMLC_512G_SD
KMPX	639-06629	PCBA,MLB,BTTR,MI-8G,TO-512G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:MICRON_8GB,NANDCFG:PMLC_512G_TO
KMQ8	639-06630	PCBA,MLB,BTTR,SS-8G,SD-512G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:SAMSUNG_8GB,NANDCFG:PMLC_512G_SD
KMQM	639-06631	PCBA,MLB,BTTR,SS-8G,TO-512G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:SAMSUNG_8GB,NANDCFG:PMLC_512G_TO
KMR0	639-06632	PCBA,MLB,BTTR,HY-16G,SD-512G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:HYNIX_16GB,NANDCFG:PMLC_512G_SD
KMRC	639-06633	PCBA,MLB,BTTR,HY-16G,TO-512G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:HYNIX_16GB,NANDCFG:PMLC_512G_TO
KMRP	639-06634	PCBA,MLB,BTTR,MI-16G,SD-512G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:MICRON_16GB,NANDCFG:PMLC_512G_SD
KMT2	639-06635	PCBA,MLB,BTTR,MI-16G,TO-512G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:MICRON_16GB,NANDCFG:PMLC_512G_TO
KMTF	639-06636	PCBA,MLB,BTTR,SS-16G,SD-512G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:SAMSUNG_16GB,NANDCFG:PMLC_512G_SD
KMTR	639-06637	PCBA,MLB,BTTR,SS-16G,TO-512G,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:SAMSUNG_16GB,NANDCFG:PMLC_512G_TO
KMV4	639-06638	PCBA,MLB,BTTR,HY-8G,SS-1.5T,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:HYNIX_8GB,NANDCFG:3DVA_1P95T_SS
KMVL	639-06639	PCBA,MLB,BTTR,MI-8G,SS-1.5T,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:MICRON_8GB,NANDCFG:3DVA_1P95T_SS
KMVY	639-06640	PCBA,MLB,BTTR,SS-8G,SS-1.5T,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:SAMSUNG_8GB,NANDCFG:3DVA_1P95T_SS
KMN9	639-06641	PCBA,MLB,BTTR,HY-16G,SS-1.5T,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:HYNIX_16GB,NANDCFG:3DVA_1P95T_SS
KMWN	639-06642	PCBA,MLB,BTTR,MI-16G,SS-1.5T,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:MICRON_16GB,NANDCFG:3DVA_1P95T_SS
KMX1	639-06643	PCBA,MLB,BTTR,SS-16G,SS-1.5T,X1032	CML_PARTS_BOM.DEV_PARTS_BOM.ALTERNATE,CPU_AMLY:SREXP,DRAMCFG:SAMSUNG_16GB,NANDCFG:3DVA_1P95T_SS

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PAGE TITLE			
BOM Variants 1			
 Apple Inc.	DRAWING NUMBER		SIZE
	051-04039		D
	REVISION 2.0.0		
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		SHEET	83 OF 85

Alternates

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
107S00033	107S00034		ALL	rdar://problem/31026933
107S00076	107S00044		ALL	rdar://problem/31026474
107S00070	107S00085		ALL	rdar://problem/31026832
107S00139	107S0178		ALL	rdar://problem/31026896
107S0248	107S0250		ALL	rdar://problem/31026938
128S00087	128S00011		ALL	rdar://problem/31104542
128S00026	128S00011		ALL	rdar://problem/31104542
128S00031	128S00011		ALL	rdar://problem/31104542
197S00120	197S00118		ALL	rdar://problem/32474316
152S00368	152S00269		ALL	rdar://problem/32986687
152S00708	152S00265		ALL	rdar://problem/32986857
152S00786	152S00344		ALL	rdar://problem/32988704
152S00785	152S00477		ALL	rdar://problem/32988930
152S00182	152S00703		ALL	rdar://problem/32989310
128S0264	128S00081		ALL	rdar://problem/32981497
128S0364	128S00081		ALL	rdar://problem/32981497
128S00069	128S00067		ALL	rdar://problem/31160233
128S00062	128S00067		ALL	rdar://problem/31160233
128S00065	128S00067		ALL	rdar://problem/31160233
128S00039	128S00038		ALL	rdar://problem/32984088
128S0302	128S00038		ALL	rdar://problem/32984088
128S0631	128S0352		ALL	rdar://problem/32984967
152S00807	152S00837		ALL	rdar://problem/33018005
152S00734	152S00730		ALL	rdar://problem/32986265
376S00303	376S00012		ALL	Per Peter H
107S00015	107S00011		ALL	rdar://problem/33006397
107S00029	107S00087		ALL	rdar://problem/33006830
376S00302	376S1038		ALL	rdar://problem/33008171
376S00227	376S00203		ALL	rdar://problem/32990227
376S00204	376S00203		ALL	rdar://problem/32990227
376S00226	376S00203		ALL	rdar://problem/32990227
152S00800	152S00268		ALL	rdar://problem/32986455
128S0445	128S0436		ALL	rdar://problem/32981936
128S0392	128S0436		ALL	rdar://problem/32981936
128S00042	128S0311		ALL	rdar://problem/32982452
128S00043	128S0311		ALL	rdar://problem/32982452
128S0329	128S0311		ALL	rdar://problem/32982452
128S00058	128S00018		ALL	rdar://problem/32983704
376S00007	376S1179		ALL	rdar://problem/33006121
376S00228	376S1179		ALL	rdar://problem/33006121
138S00047	138S00073		ALL	rdar://problem/31227780
138S00084	138S00060		ALL	rdar://problem/31227858
138S0703	138S0648		ALL	rdar://problem/31228419
353S00497	353S00796		ALL	rdar://problem/31285876
197S00047	197S00036		ALL	rdar://problem/31509365
197S00048	197S00036		ALL	rdar://problem/31509365
197S00046	197S00036		ALL	rdar://problem/31509365
311S00060	311S0273		ALL	rdar://problem/31512477
138S1101	138S0738		ALL	rdar://problem/31491081
371S00180	371S00077		ALL	rdar://problem/31927114
138S00049	138S0831		ALL	rdar://problem/31284882
138S00086	138S0884		ALL	rdar://problem/31285557


Alternate Vendor	Primary Vendor
TFT	Cyntec
Yageo	Cyntec
TDK	Murata
Panasonic	Murata
TFT	Cyntec
Panasonic	Kemet
NEC	Kemet
Rohm	Kemet
Epson	TXC
NEC	Cyntec
Chilisin	Cyntec
Cyntec	Murata
Chilisin	Murata
Cyntec	Chilisin
Panasonic	Panasonic
Kemet	Panasonic
Rohm	Panasonic
NEC	Panasonic
Kemet	Panasonic
NEC	Kemet
Panasonic	Kemet
NEC	Panasonic
Cyntec	NEC
Chilisin	Cyntec
Diodes	TI
TFT	Cyntec
TFT	Yageo
Diodes	TI
Fairchild	Vishay
Diodes	Vishay
Vishay	Vishay
NEC	Cyntec
Panasonic	Kemet
Panasonic	Panasonic
Kemet	NEC
Panasonic	NEC
Panasonic	NEC
Rohm	NEC
AOS	Vishay
Fairchild	Vishay
Taiyo	Murata
Taiyo	Murata
Murata	Taiyo
Vishay	Fairchild
Kyocera	TXC
Murata	TXC
Epson	TXC
Diodes	Philips
Murata	Samsung
Diodes	NXP
Kyocera	Murata
Taiyo	Murata

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
138S00077	138S00035		ALL	rdar://problem/31167038
138S00093	138S00035		ALL	rdar://problem/31167038
132S00012	132S0401		ALL	rdar://problem/31180314
138S00015	138S0777		ALL	rdar://problem/31254330
138S0786	138S0847		ALL	rdar://problem/31257109
152S00398	152S00204		ALL	rdar://problem/33011314
152S00724	152S00311		ALL	rdar://problem/33011211
152S00726	152S00592		ALL	rdar://problem/33011437
152S00725	152S00590		ALL	rdar://problem/33011526
371S00089	371S00085		ALL	rdar://problem/31927389
155S00190	155S0914		ALL	rdar://problem/32364855
155S00007	155S0667		ALL	rdar://problem/32415629
155S00203	155S0894		ALL	rdar://problem/32435328
376S00219	376S00079		ALL	rdar://problem/32435733
311S00013	311S0508		ALL	rdar://problem/32476985
740S00033	740S00002		ALL	rdar://problem/32477535
740S0118	740S00028		ALL	rdar://problem/32477706
138S00024	138S0986		ALL	rdar://problem/31410587
155S00067	155S00401		ALL	Per CE
155S0741	155S0361		ALL	rdar://problem/32406745
155S00166	155S0391		ALL	rdar://problem/32407096
311S00121	311S0398		ALL	rdar://problem/32474809
371S00127	371S00182		ALL	rdar://problem/36111626
138S00056	138S1100		ALL	rdar://problem/31411109
311S00104	311S00091		ALL	rdar://problem/31509861
353S01041	353S01042		ALL	rdar://problem/31816775
311S00156	311S00129		ALL	rdar://problem/31941459
107S00056	107S00086		ALL	rdar://problem/39511087
138S0775	138S0860		ALL	Per Peter Hanucha
138S0846	138S0811		ALL	rdar://problem/30812097
376S1053	376S0604		ALL	rdar://problem/30812097
152S00359	152S00253		ALL	rdar://problem/30812097
740S00041	740S0159		ALL	rdar://problem/30812097
376S1106	376S0678		ALL	rdar://problem/30812097
371S00074	371S0692		ALL	rdar://problem/33675478
132S00176	132S0640		ALL	rdar://problem/33924830
311S0426	311S00007		ALL	
138S0739	138S0706		ALL	rdar://problem/31253813
138S0945	138S0706		ALL	rdar://problem/31253813
155S0665	155S00232		ALL	rdar://problem/32364084
311S00138	311S0436		ALL	rdar://problem/32474939
335S00270	335S00203		ALL	rdar://problem/33516617
311S00175	311S00029		ALL	rdar://problem/33857884
335S00213	335S0888		ALL	rdar://problem/33927828
378S00029	378S00002		ALL	rdar://problem/33932183
197S00053	197S00050		ALL	rdar://problem/33931383
197S00054	197S00050		ALL	rdar://problem/33931383
197S00055	197S00050		ALL	rdar://problem/33931383
311S00178	311S00177		ALL	rdar://problem/39513462
138S0754	138S0942		ALL	Per Peter H
132S0238	132S00181		ALL	rdar://problem/34016553

Alternate Vendor	Primary Vendor
Taiyo	Murata
Kyocera	Murata
Murata/TDK	Taiyo
Samsung/Taiyo	Murata
Samsung	Murata/Taiyo
Taiyo	Cyntec
Chilisin	Cyntec
Chilisin	Cyntec
Chilisin	Cyntec
Diodes	ON Semi
Taiyo	Panasonic
Taiyo	Panasonic
Taiyo	Murata
TI	Fairchild
Diodes	NXP/Nexperia
Thinking	Murata
Polytronics	Bussman
Taiyo/TDK	Murata
TDK	Murata
Murata	TDK
TDK	Murata
Diodes	NXP/Nexperia
Nexperia	Diodes
Taiyo/TDK	Murata
TI	ON Semi
ST	TI
Nexperia	TI
Cyntec	TFT
Samsung	Murata
Samsung	Murata
Diodes	Fairchild
Chilisin	Cyntec
Bourns	Littlefuse
Fairchild	Vishay
Infineon	NXP
Yageo	Murata
NXP	Diodes
Samsung	Murata
Kyocera	Murata
Murata	TDK
Nexperia	TI
Adesto	Macronix
Nexperia	Diodes
On Semi	STMicro
Lite-On	Everlight
Kyocera	TXC
NDK	TXC
Murata	TXC
On Semi	TI
Samsung	Murata
Murata	Yageo

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
138S00073	138S0942		ALL	rdar://problem/34812612
138S00047	138S0942		ALL	rdar://problem/34812612
152S00403	152S00322		ALL	rdar://problem/34319209
372S00016	372S00015		ALL	rdar://problem/34320842
376S1080	376S0820		ALL	rdar://problem/34320959
376S00074	376S0855		ALL	rdar://problem/34321106
353S01320	353S01346		ALL	rdar://problem/33903814
107S0240	107S0255		ALL	rdar://problem/33930580
152S00765	152S00239		ALL	Per Peter H
377S00123	377S00031		ALL	rdar://problem/35399083
377S0077	377S0183		ALL	rdar://problem/35403837
377S0184	377S0155		ALL	rdar://problem/35404095
740S00005	740S00190		ALL	rdar://problem/35404496
376S1137	376S00019		ALL	rdar://problem/33955940
155S0706	155S0302		ALL	rdar://problem/32364222
311S0596	311S0593		ALL	rdar://problem/35040623
131S00134	131S00041		ALL	rdar://problem/36353852
353S00711	353S2073		ALL	rdar://problem/36563522
353S00712	353S2216		ALL	rdar://problem/36563854
371S0689	371S00197		ALL	rdar://problem/33930952
132S00202	132S00175		ALL	rdar://problem/36674713
138S00109	138S0914		ALL	rdar://problem/36484938
311S0372	311S0562		ALL	rdar://problem/35404697
376S00282	376S1128		ALL	rdar://problem/33904000
131S00142	132S0312		ALL	rdar://problem/36993892
152S00735	152S01013		ALL	Email per Peter H
152S00731	152S01013		ALL	Email per Peter H
152S00348	152S01013		ALL	Email per Peter H
152S00280	152S00356		ALL	Email per Peter H
152S00394	152S00260		ALL	rdar://problem/39510566
131S00308	131S00037		ALL	Email per Peter H
353S00525	353S4471		ALL	rdar://problem/39513670
353S00832	353S4471		ALL	rdar://problem/39513670
311S00193	311S00192		ALL	rdar://problem/39512882
103S0321	103S0276		ALL	Email per Peter H
371S00193	371S00015		ALL	Email per CE
138S0863	138S0853		ALL	rdar://problem/40634165
107S00053	107S00071		ALL	rdar://problem/40145084
107S00005	107S00101		ALL	rdar://problem/40145309
311S00004	311S0370		ALL	rdar://problem/40179470
376S00146	376S1061		ALL	rdar://problem/40315007
371S00085	371S00190		ALL	rdar://problem/40314867
138S00111	138S00036		ALL	Per Peter H
377S00079	377S00077		ALL	
376S00309	376S00074		ALL	rdar://problem/40181869
138S00022	138S0801		ALL	rdar://problem/40667960
353S01824	353S2208		ALL	rdar://problem/40468973
376S00343	376S00161		ALL	rdar://problem/42347938
376S00344	376S00161		ALL	Per Eric Lee

Alternate Vendor	Primary Vendor
Murata	Murata
Taiyo	Murata
Chilisin	Murata
Diodes	On Semi
Diodes	On Semi
Toshiba	Diodes
NXP	On Semi
TFT	Cyntec
Chilisin	Cyntec
Semtech	ON Semi
ST	Infineon
Infineon	ON Semi
Littelfuse	Wayon
Vishay	Diodes
Taiyo	Murata
TI	NXP/Nexperia
Murata	Taiyo
ON Semi	TI
ON Semi	TI
NXP	Diodes
Murata/Taiyo	Kyocera/Samsung
Kyocera	Murata
NXP/Nexperia	TI
Nexperia	Diodes
Samsung	Murata
Chilisin	Cyntec
Cyntec	Cyntec
Vishay	Cyntec
Cyntec	Chilisin
Vishay	Cyntec
Yageo	Murata
Vishay	Vishay
Fairchild	Vishay
TI	NXP
Yageo	Cyntec
Rohm	Toshiba
Taiyo	Murata
Cyntec	Yageo
Cyntec	Yageo
ON Semi	NXP/Nexperia
Rohm	Diodes
ON Semi	Diodes
Taiyo	Murata
Diodes	ST Micro
Diodes	Toshiba
Taiyo	Murata, Samsung
On Semi	TI
On Semi	Diodes
Alpha Omega	Diodes

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	PAGE	145 OF 145