

1. ALL RESISTANCE VALUES ARE IN OHMS, 0.1 WATT +/- 5%.
2. ALL CAPACITANCE VALUES ARE IN MICROFARADS.
3. ALL CRYSTALS & OSCILLATOR VALUES ARE IN HERTZ.

X2719 MLB-C

REV	ECN	DESCRIPTION OF REVISION	CK APPD	DATE
5	0029858249	ENGINEERING RELEASED		2021-06-15

LAST MODIFICATION: Tue Jun 15 20:11:21 2021

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5	6	SOC: RESETS, CLOCKS, SMD	T585_REF_SOC_H13C_0.0.20	
6	8	SOC: GPIO, I2C, I2S, SPI, UART	T585_REF_SOC_H13C_0.0.20	
7	10	SOC: LPOF, ISP, MIPI	T585_REF_SOC_H13C_0.0.20	
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12	20	SOC: SPI NOK & SEP NOK	T585_REF_SOC_H13C_0.0.20	
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15	23	SOC: POWER (CPU, GPU)	T585_REF_SOC_H13C_0.0.20	
16	25	SOC: POWER (SRAM, DISK, DCB)	T585_REF_SOC_H13C_0.0.20	
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35	58	POWER: 3VS AON (2/2)	T585_REF_VR_ICEMAN_HP_0.28.0	
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37	76	PMU BUCK OUTPUT DESENSE CAPS	X2724	06/25/2020
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56	105	MONACO 4	T585_REF_CLVR_MONACO_0.75.0	
57	106	EMPTY (WAS VDDH DISCHARGE)	T585_REF_CLVR_MONACO_0.74.0	
58	120	MONACO PROJECT SUPPORT	T724_OTUDMAN_MLB_C_0.14.1	
59	122	POWER: 5V S2 TP862130	T585_REF_VR_VR_TP862130_0.13.0	
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62	132	I2C Connections - Other	X2724	06/25/2020
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64	136	SENSORS: HIGH-SIDE (2/2)	J314_MLB_S_5.11.0	
65	137	SENSORS: HIGH-SIDE	J314_MLB_S_5.11.0	
66	138	SENSORS: LOW-SIDE (1/3)	J314_MLB_S_5.11.0	
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68	140	SENSORS: LOW-SIDE (3/3)	J314_HUKKRATT_MLB_C_4.8.3	
69	141	SENSORS:THERMAL	T724_HUKKRATT_MLB_C_0.41.1	
70	144	SENSORS: MOTION	J314_MLB_S_5.13.0	
71	145	FAN#	X2724	06/25/2020
72	150	USB-C: High Speed ATC0	X2724	06/25/2020
73	151	USB-C: High Speed ATC1	X2724	06/25/2020
74	152	USB-C: Support 1 ATC01	J314_MLB_S_3.21.0	
75	153	USB-C: Support 2 ATC01	J314_MLB_S_3.21.0	
76	154	USB-C: Port Controller ATC0	J314_RUENJOU_MLB_C_2.6.1	
77	155	USB-C: Port Controller ATC1	J314_RUENJOU_MLB_C_2.6.1	
78	156	USB-C: Left Connectors	J314_MLB_S_3.13.0	
79	157	USB-C: HS Level Shifters	J314_MLB_S_4.8.0	
80	158	USB-C: SV Regulator	T585_REF_USBC_VR_TP862180_0.8.5	
81	159	USB-C: CC Protection	J314_RUENJOU_MLB_S_3.06.06/2021	
82	160	USB-C: High Speed ATC2	X2724	06/25/2020
83	162	USB-C: Support 1 ATC23	X2724	06/25/2020
84	163	USB-C: Support 2 ATC23	J314_MLB_S_3.13.0	
85	164	USB-C: Port Controller ATC2	J314_RUENJOU_MLB_C_2.6.1	
86	166	USB-C: Right Connector	J314_MLB_S_3.13.0	
87	167	USB-C: HS Level Shifters	J314_MLB_S_4.8.0	
88	168	USB-C: SV Regulator	T585_REF_USBC_VR_TP862180_0.8.5	
89	169	USB-C: CIO Redrivers 2/3	J314_RUENJOU_MLB_C_2.6.1	
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99	198	SDCARD POWER SUPPORT	T585_REF_SDCARD_GL9755_0.16.0	
100	200	WIFI/BT: MODULE	T585_REF_WIRELESS_TYFHOON_0.33.0	
101	201	WIFI/BT: ANTENNA and GND	T585_REF_WIRELESS_TYFHOON_0.33.0	
102	220	STORAGE: SDD0 S5E <0>	X2724	06/25/2020
103	221	STORAGE: SDD0 S5E <1>	X2724	06/25/2020
104	222	STORAGE: SDD0 S5E <2>	X2724	06/25/2020
105	223	STORAGE: SDD0 S5E <3>	X2724	06/25/2020
106	224	STORAGE: SDD0 OCARINA & HAND VCC	T585_REF_STORAGE_S5E_0.38.0	
107	225	STORAGE: SDD1 S5E <0>	X2724	06/25/2020
108	226	STORAGE: SDD1 S5E <1>	X2724	06/25/2020
109	227	STORAGE: SDD1 S5E <2>	X2724	06/25/2020
110	228	STORAGE: SDD1 S5E <3>	X2724	06/25/2020
111	229	STORAGE: SDD1 OCARINA & HAND VCC	T585_REF_STORAGE_S5E_0.38.0	
112	230	STORAGE: SSD SUPPORT	X2724	06/25/2020
113	234	CAMERA: FLEX CONNECTOR	J314_TYD3_MLB_C_1.3.1	
114	236	DISPLAY CONNECTOR	J314_HUKKRATT_MLB_S_2.34.3	
115	237	DISPLAY POWER SEQUENCER	J314_MLB_S_2.34.3	
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120	245	AUDIO DAC CODEC	T585_REF_CODEC_CASLOW_1.3.0	

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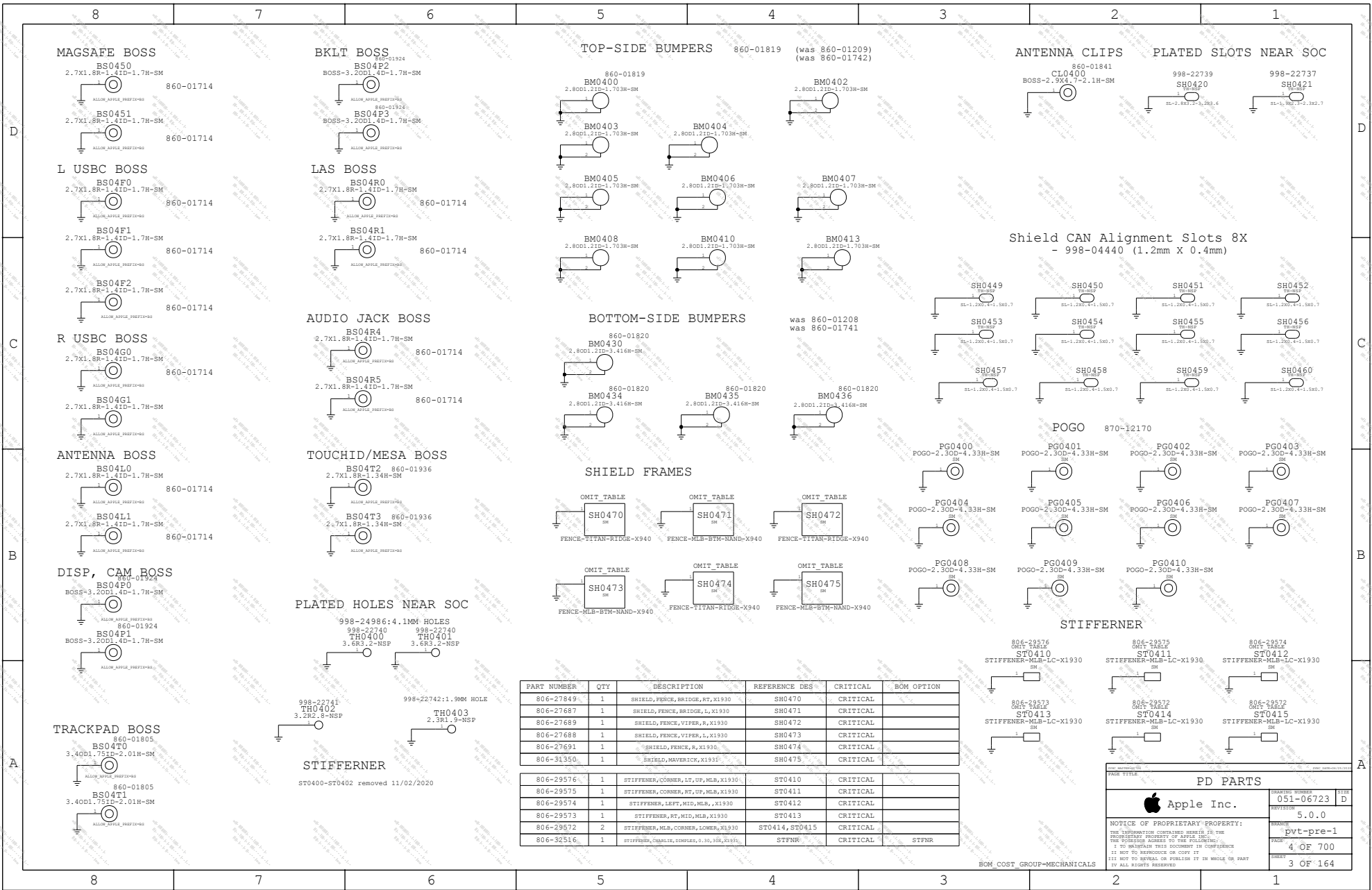
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127	252	KEYBOARD SIGNAL CONNECTOR, ESD	J314_MLB_S_2.55.0	
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150	410	SIGNAL ALIASES-7414	J314_MLB_S_3.13.0	
151	420	Signal Aliases - SGA/CSA Diffs	T728_MLB_C_0.17.0	
152	500	17.2 RULES	X2724	06/25/2020
153	501	17.2 PHYSICAL CNETS	X2724	06/25/2020
154	502	17.2 SPACING CNETS, I/O	X2724	06/25/2020
155	503	17.2 SPACING CNETS, CLASS-CLASS	X2724	06/25/2020

Schematic / PCB #'s

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
051-06723	1	SCHEM, MLB-C, X2719	SCB	CRITICAL	SCB
820-02443	1	PCBF, MLB-C, X2719	PCB	CRITICAL	PCB

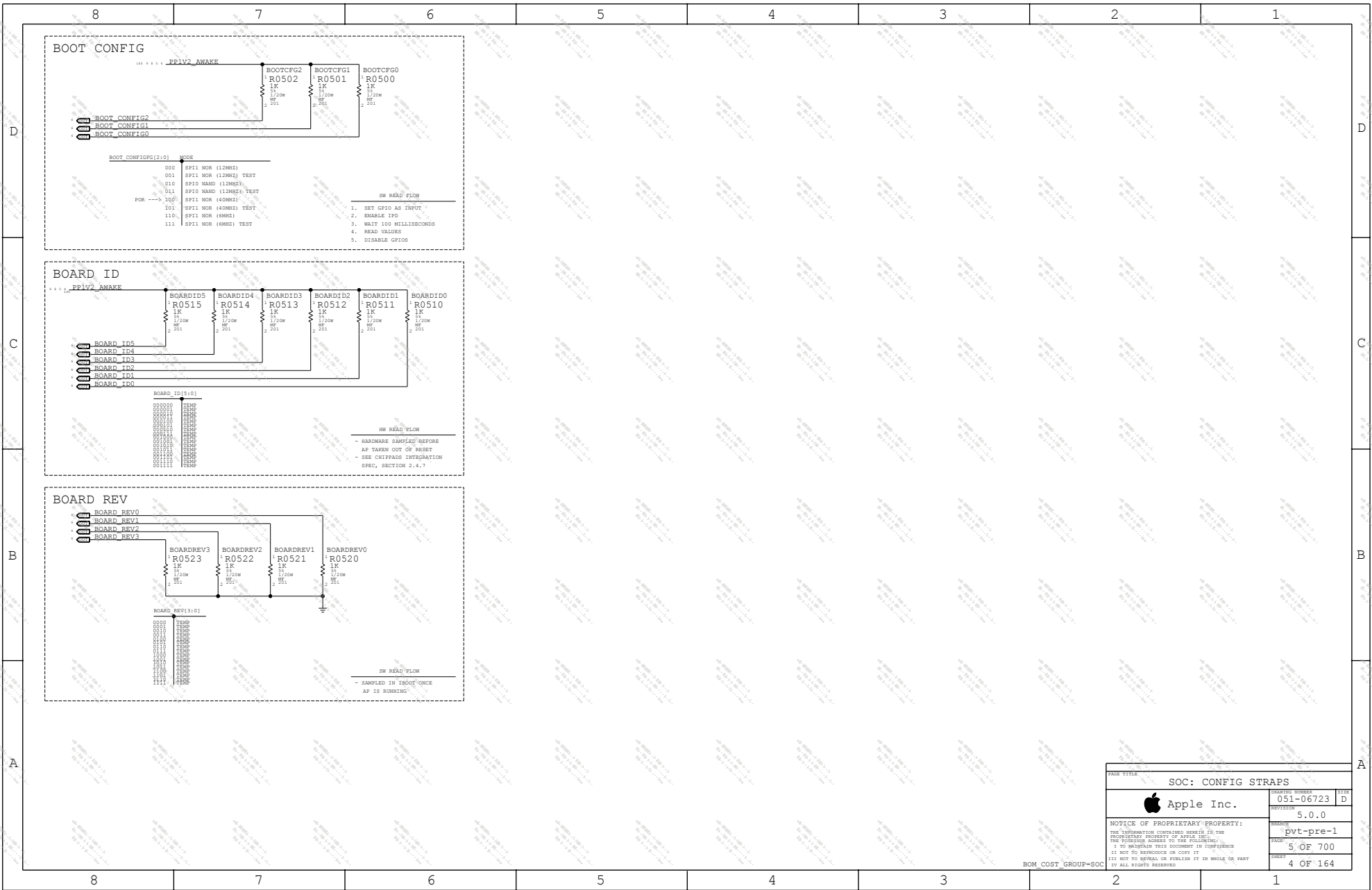
SCHEM, MLB-C

DRAWING TITLES	
SCHEM, MLB-C, X2719	
Apple Inc.	051-06723
REV	5.0.0
DATE	05/11/2021
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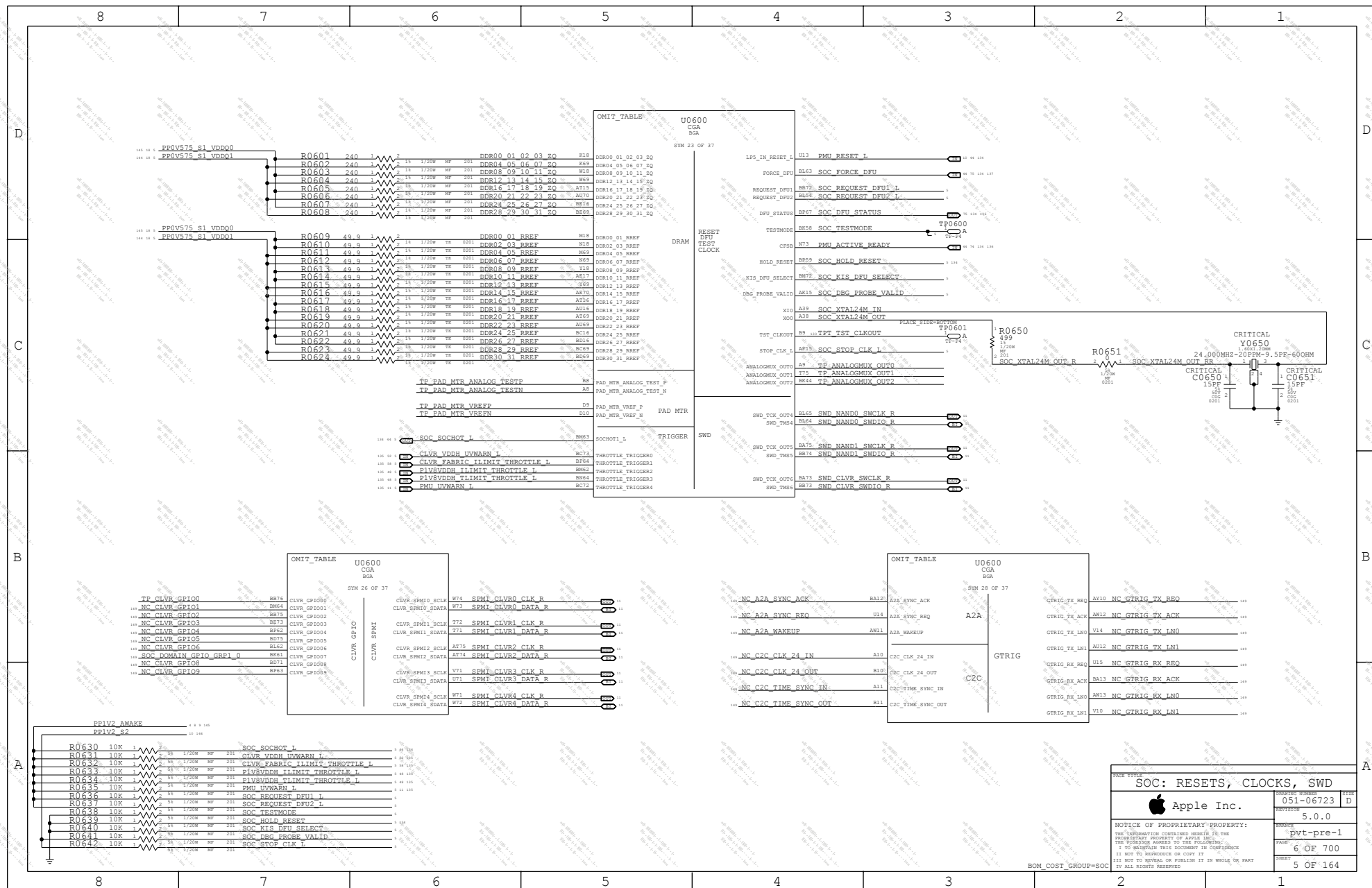


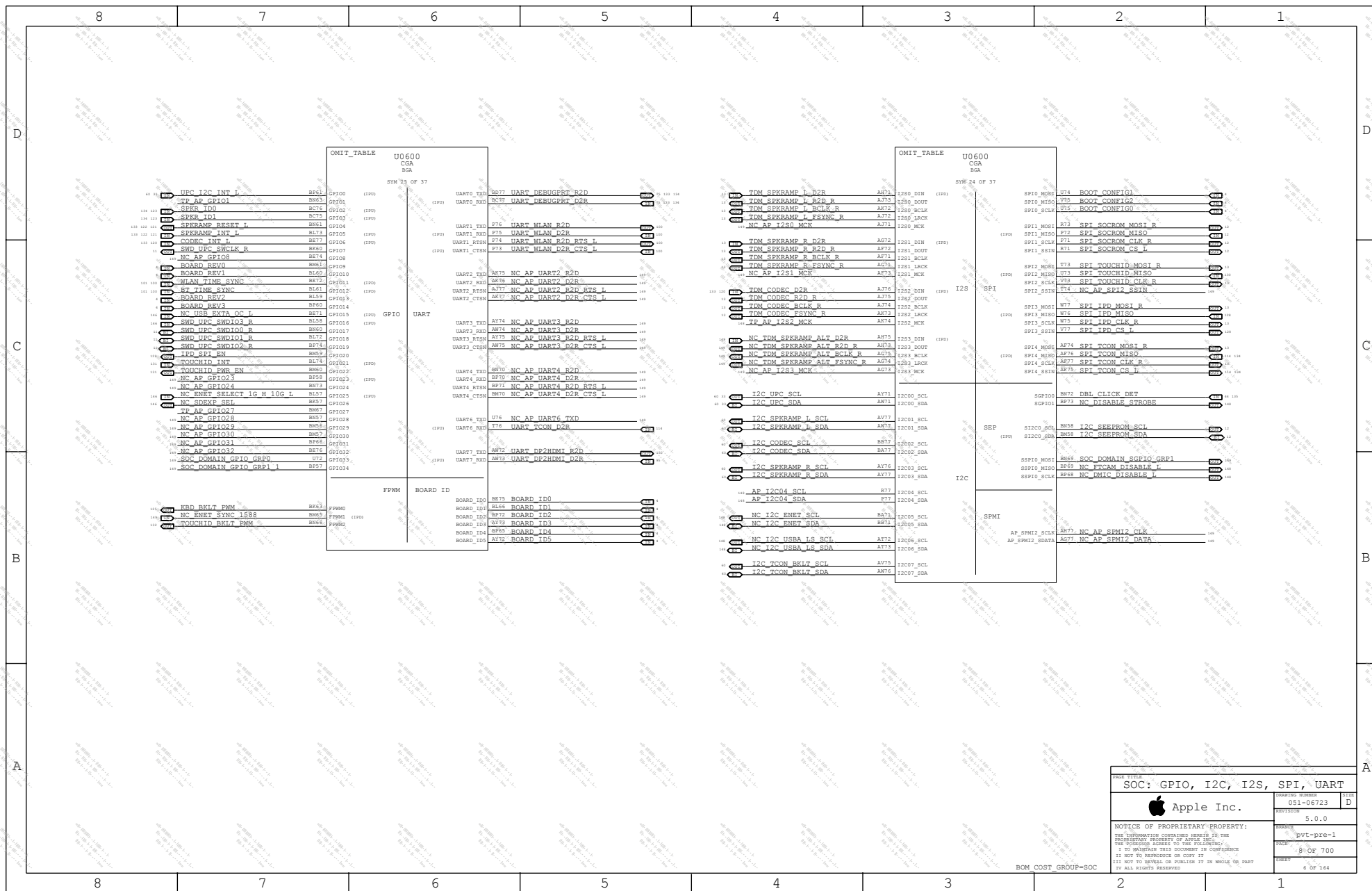
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806-27849	1	SHIELD,FENCE,BRIDGE,RT,X1930	SH0470	CRITICAL	
806-27687	1	SHIELD,FENCE,BRIDGE,L,X1930	SH0471	CRITICAL	
806-27689	1	SHIELD,FENCE,VISPER,R,X1930	SH0472	CRITICAL	
806-27688	1	SHIELD,FENCE,VISPER,L,X1930	SH0473	CRITICAL	
806-27691	1	SHIELD,FENCE,R,X1930	SH0474	CRITICAL	
806-31350	1	SHIELD,MAVERICK,X1930	SH0475	CRITICAL	
806-29576	1	STIFFENER,CORNER,L,UP,MLB,X1930	ST0410	CRITICAL	
806-29575	1	STIFFENER,CORNER,RT,UP,MLB,X1930	ST0411	CRITICAL	
806-29574	1	STIFFENER,LEFT,MID,MLB,X1930	ST0412	CRITICAL	
806-29573	1	STIFFENER,RT,MID,MLB,X1930	ST0413	CRITICAL	
806-29572	2	STIFFENER,MLB,CORNER,LOWER,X1930	ST0414,ST0415	CRITICAL	
806-32516	1	STIFFENER,CHARLIE,SIMPLES,V,30,30,2130	STFNR	CRITICAL	STFNR

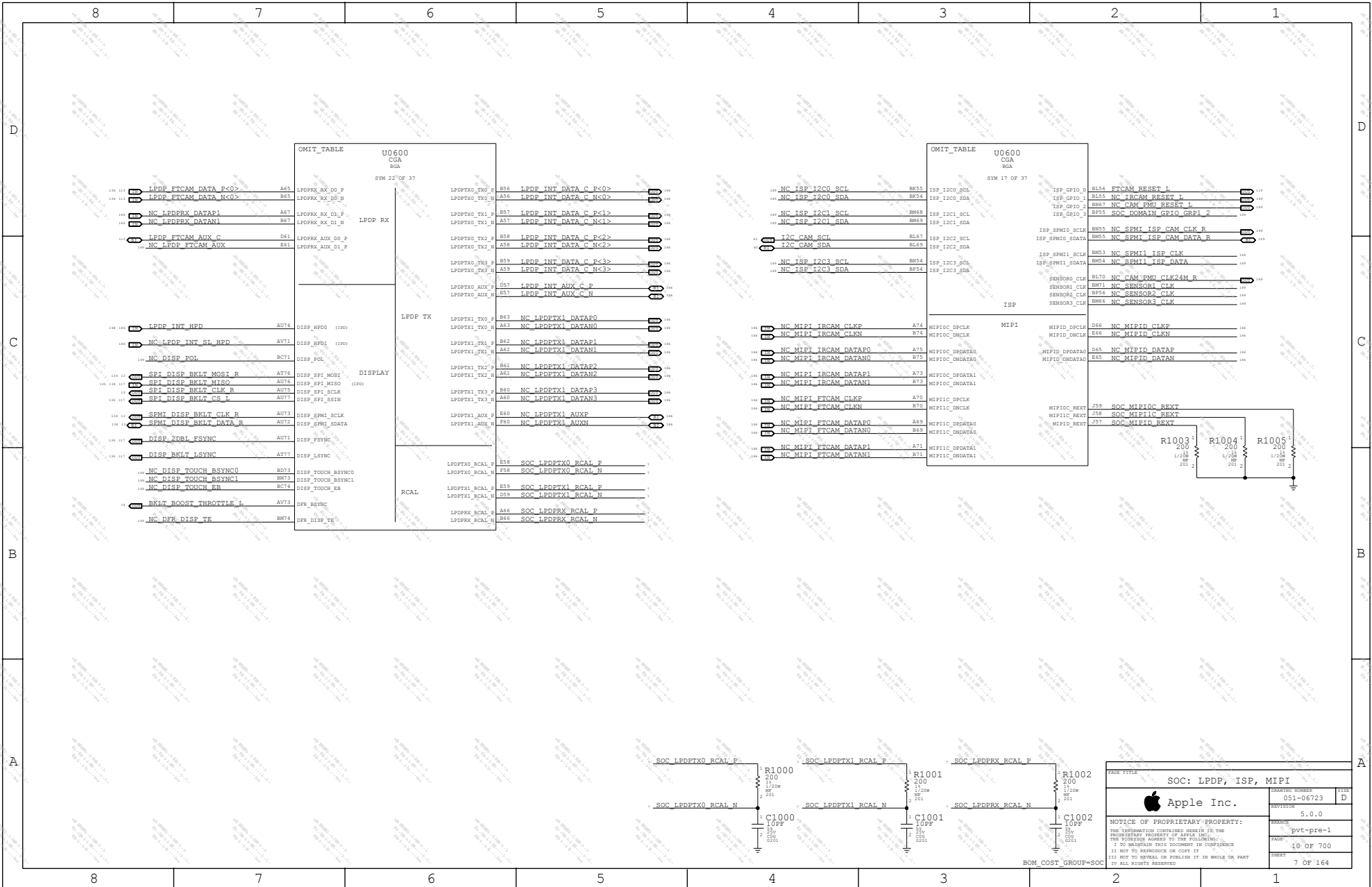
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PD PARTS	
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DATE Pvt-pre-1	SHEET 4 OF 700
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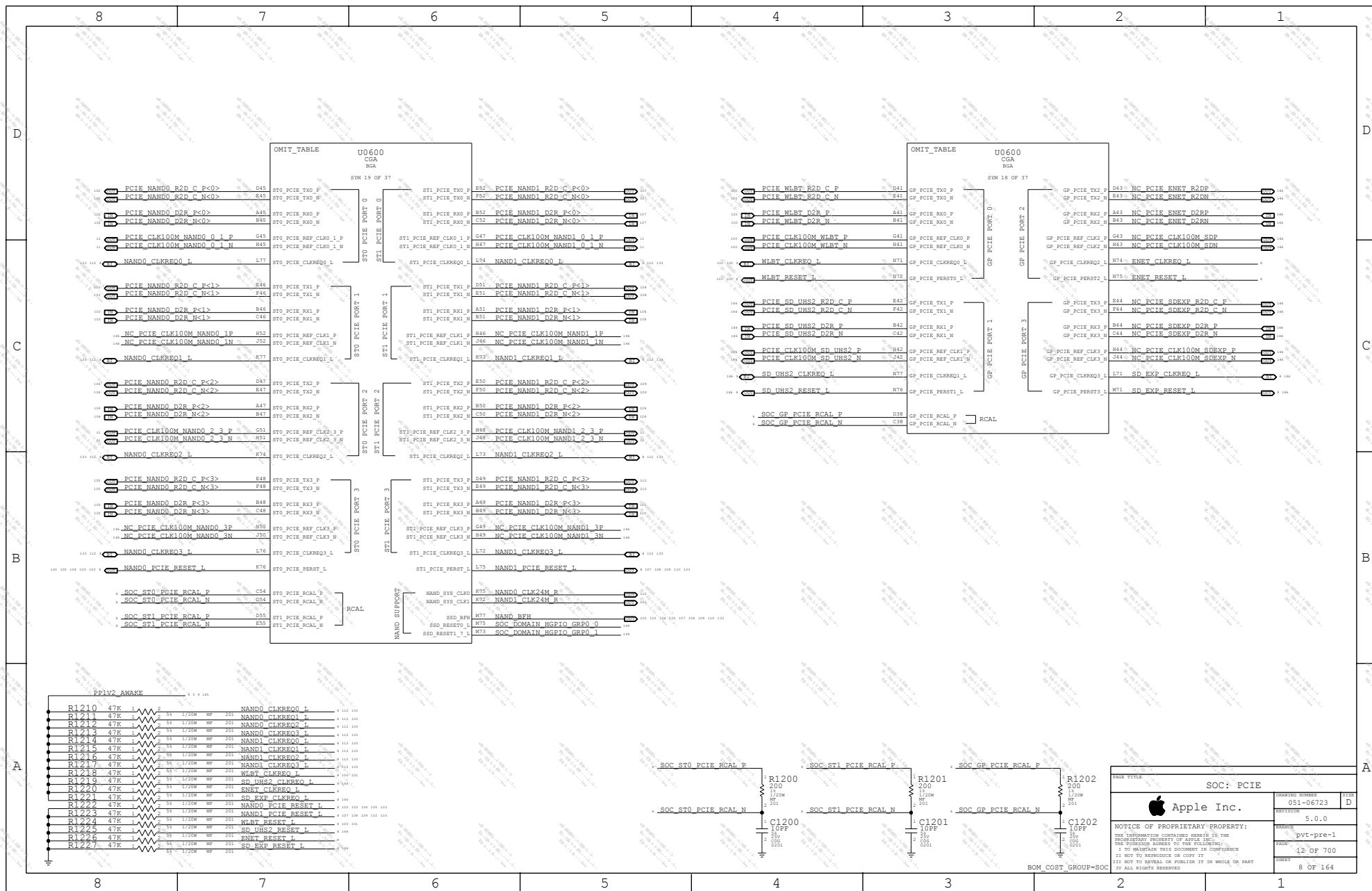
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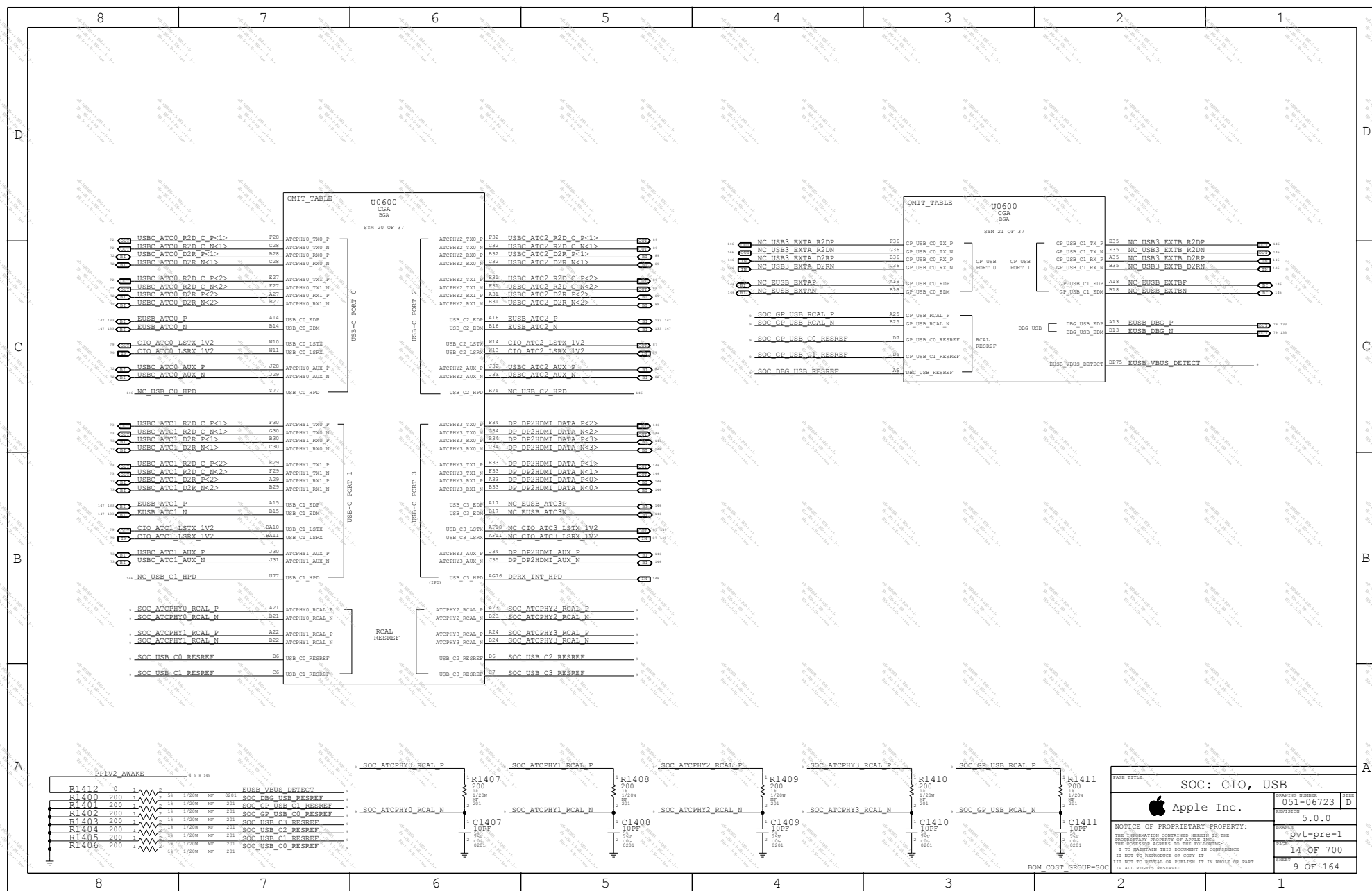


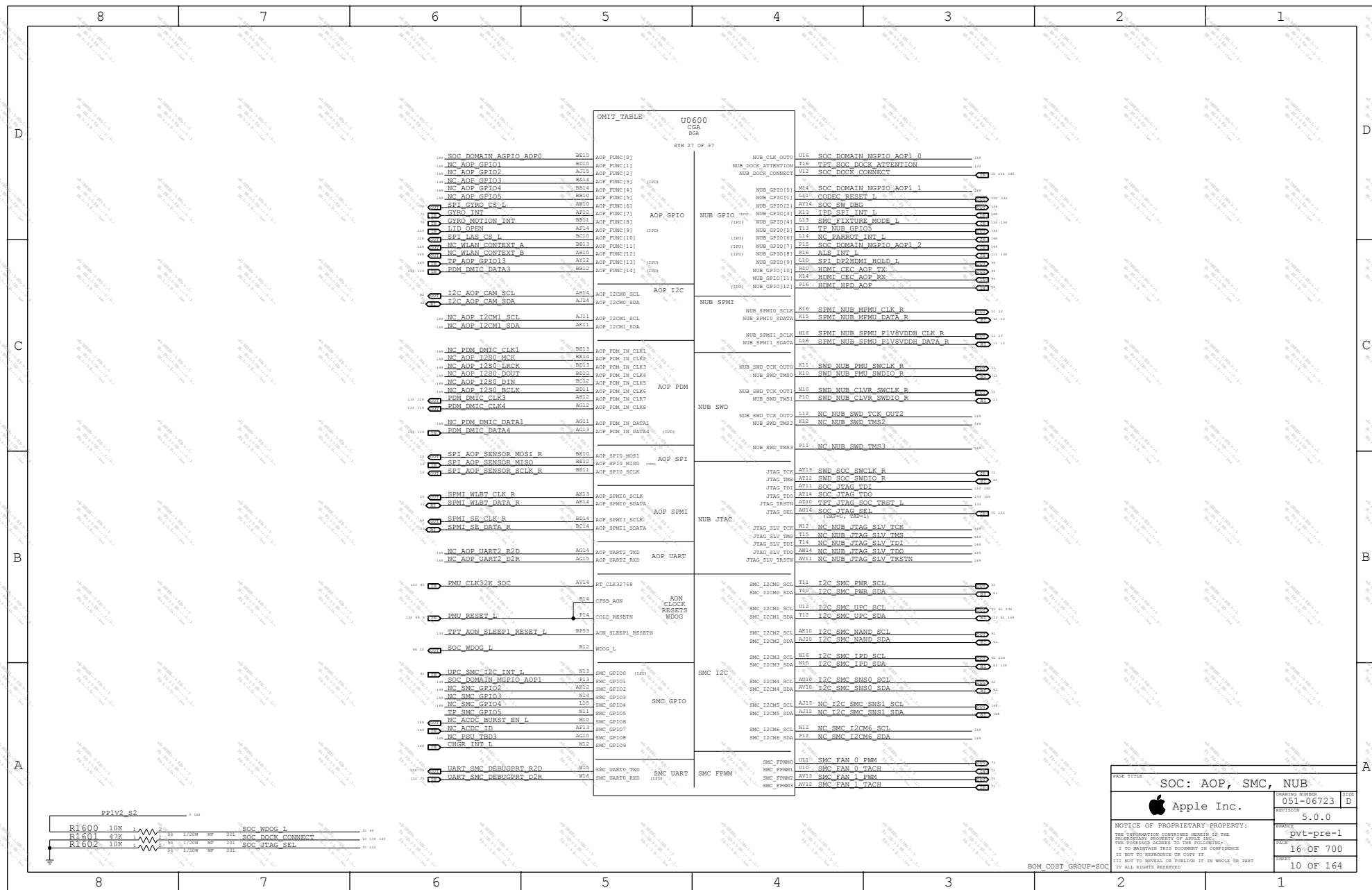




PAGE TITLE			
SOC: LPDP, ISP, MIPI			
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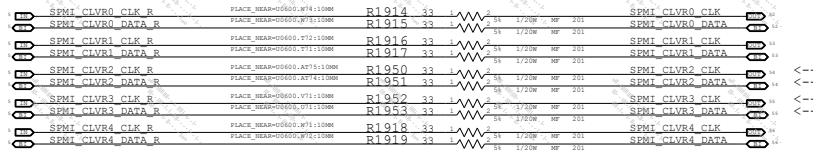




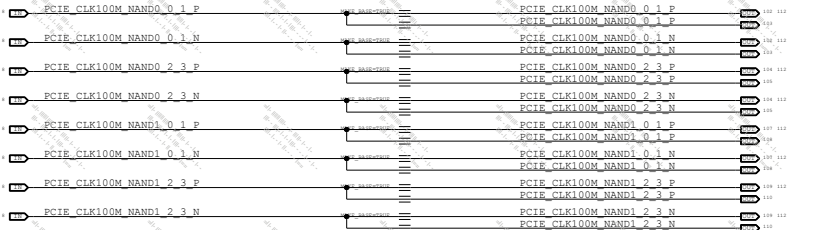


IN PROGRESS

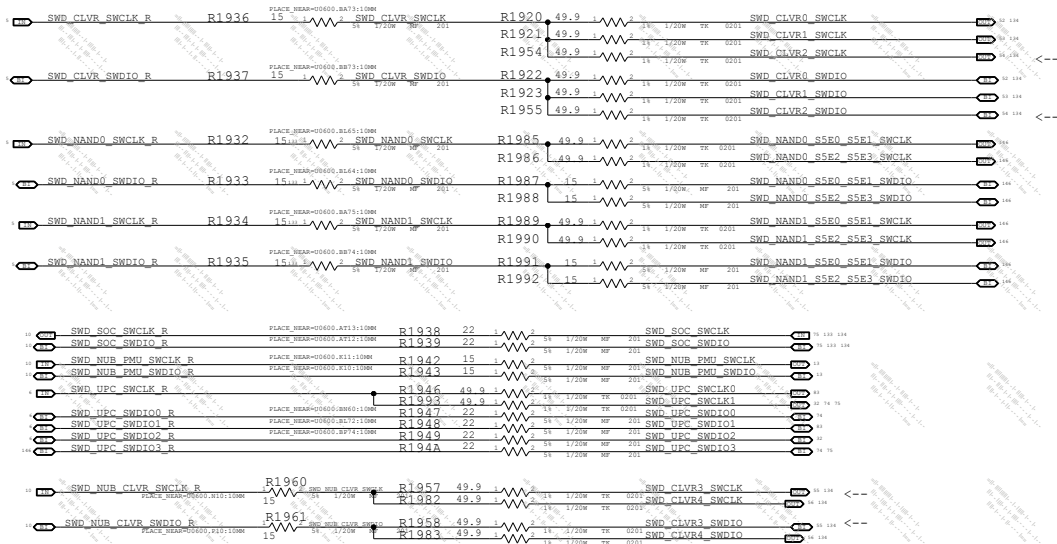
SPMI SOURCE TERMINATION



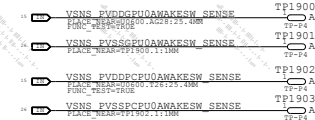
NAND PCIE CLK BRANCH RESISTORS



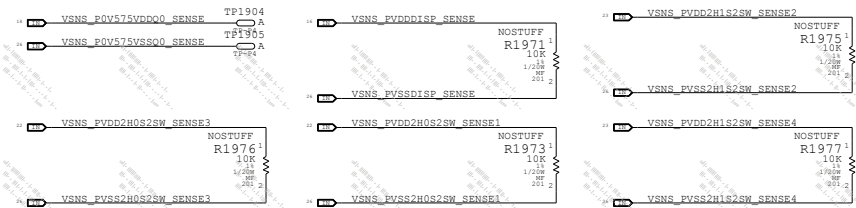
SWD SERIES RESISTORS



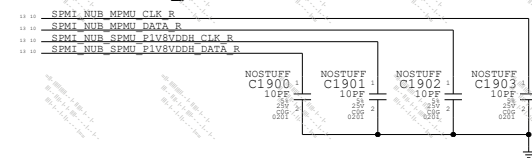
MOCACO VDD/VSS SENSE BREAKOUT PADS



MAVERICKS VDD/VSS SENSE BREAKOUT RESISTORS

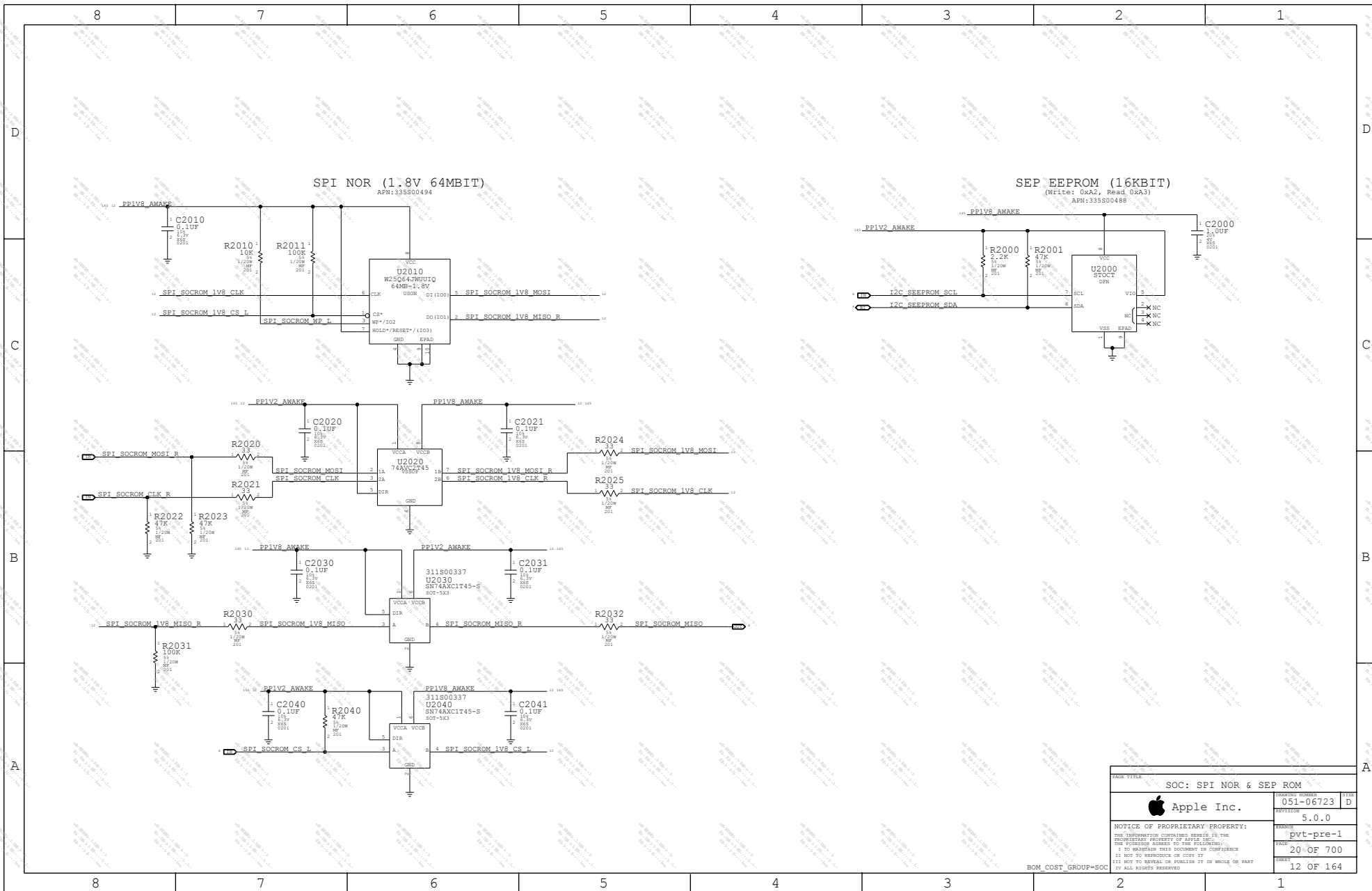


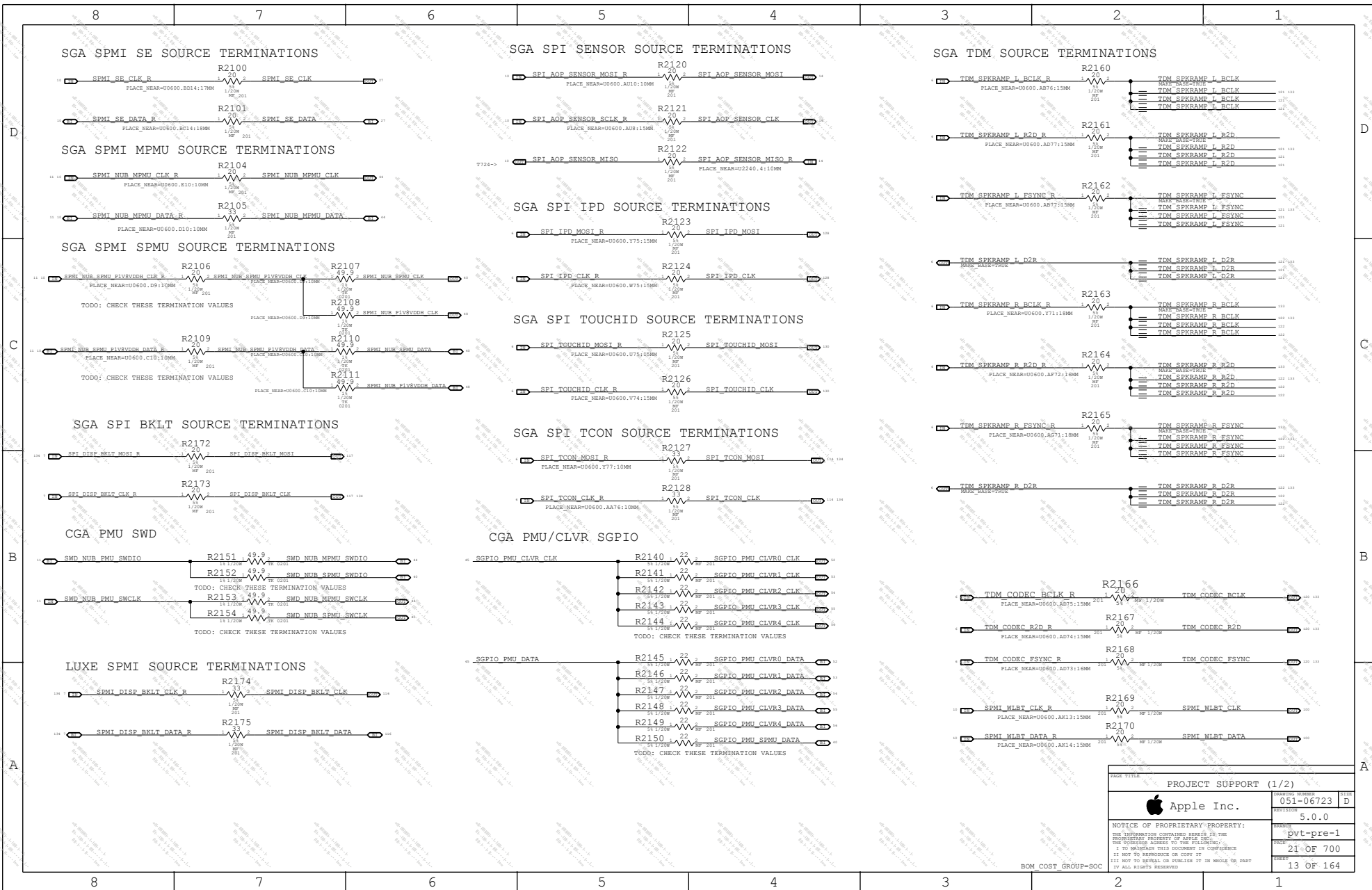
SPMI_NUB DAMPING FILTERS



SOC: SHARED SUPPORT

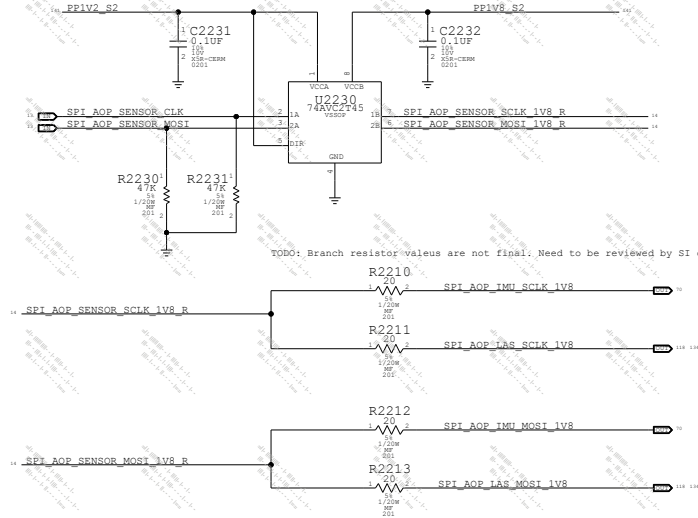
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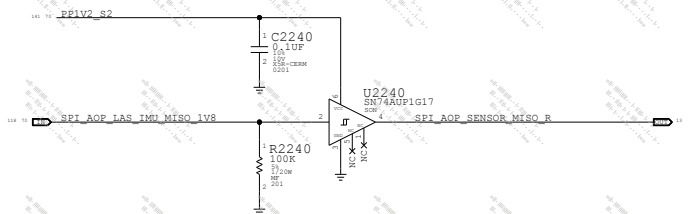


SPI AOP Sensor LS and Branch Resistors

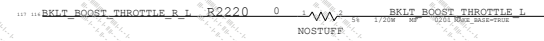
TODO: Reference designators need to be updated once layout has imported latest netlist



TODO: Branch resistor values are not final. Need to be reviewed by SI once routed.



DISPLAY BACKLIGHT



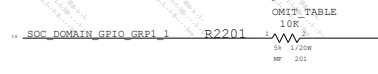
SOC GPIO33 PD

R2200 BOM OPTION (PCORE:6) STUFF PD on 6-cores
R2200 BOM NO STUFF on 8-cores



SOC GPIO34 PD

R2201 BOM OPTION (FSTP:MIN) STUFF PD on lower FSTP settings
R2201 BOM NO STUFF on max settings



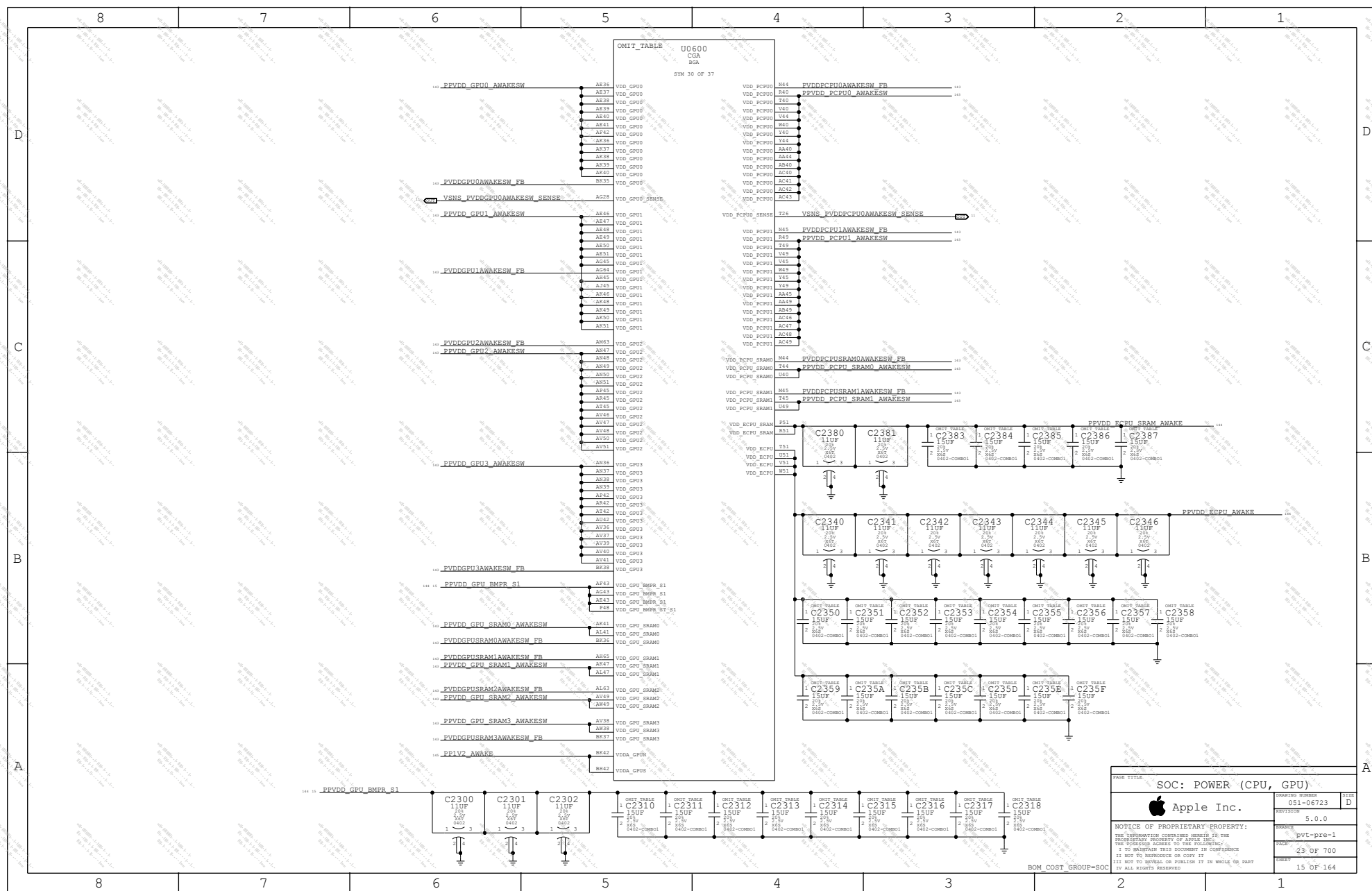
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117S0006	1	RES, MF, 1/20W, 1K ohm, 5, 0201, SMD	R2200		PCORE:6
117S0006	1	RES, MF, 1/20W, 1K ohm, 5, 0201, SMD	R2201		FSTP:MIN

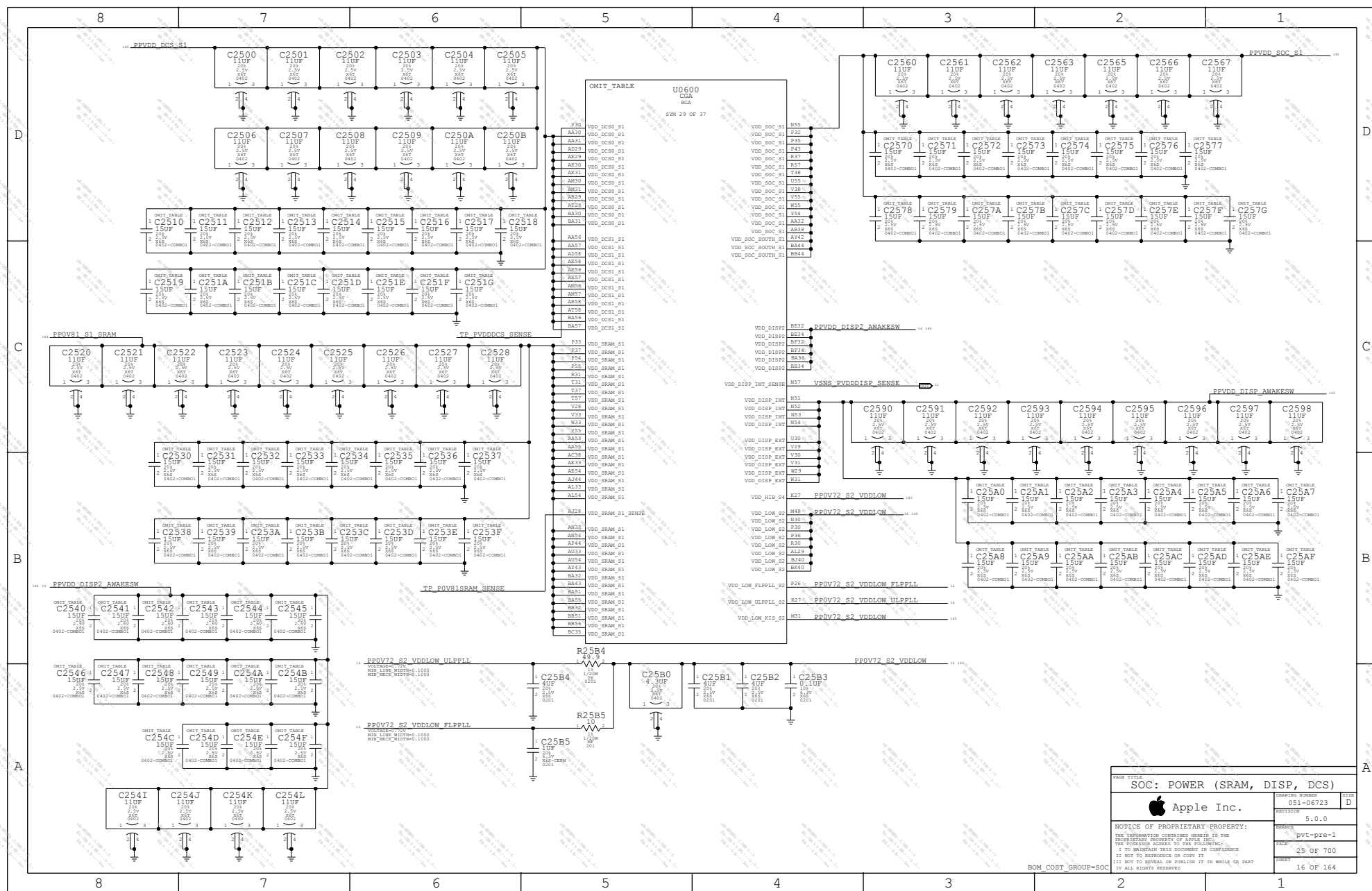
SOC GPIO33/4 ALIASING

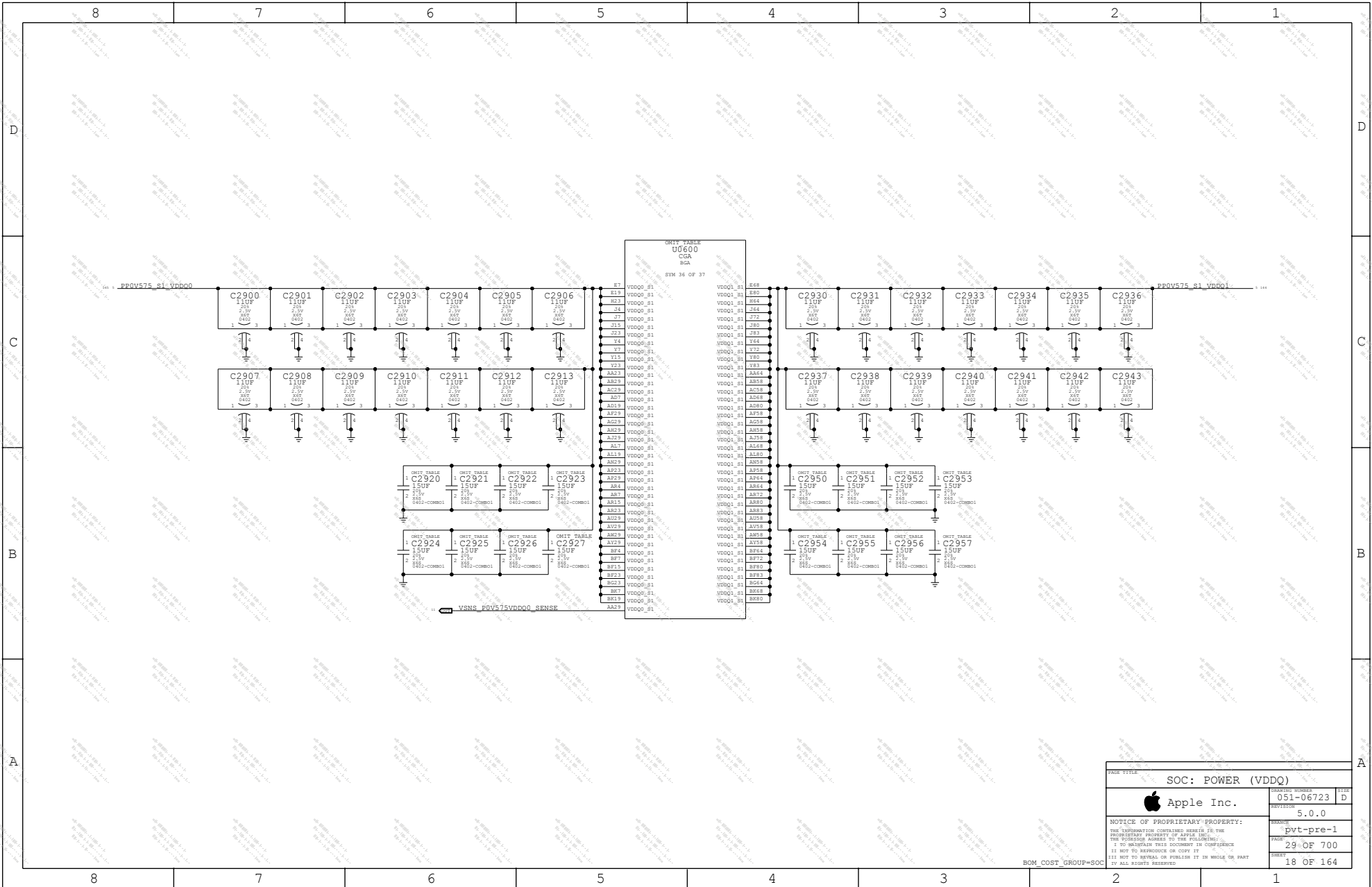



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BOM_COST_GROUP=SOC

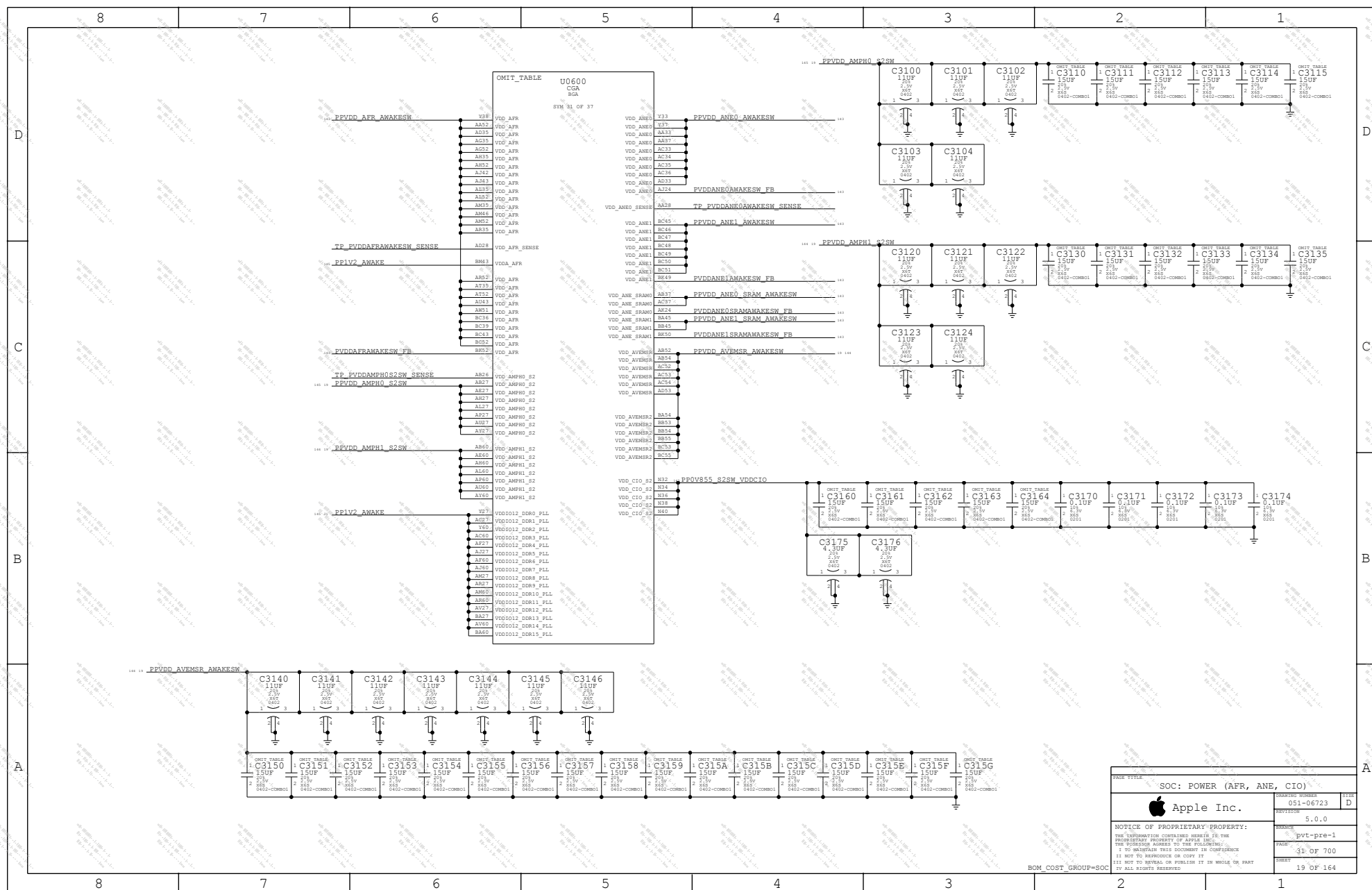


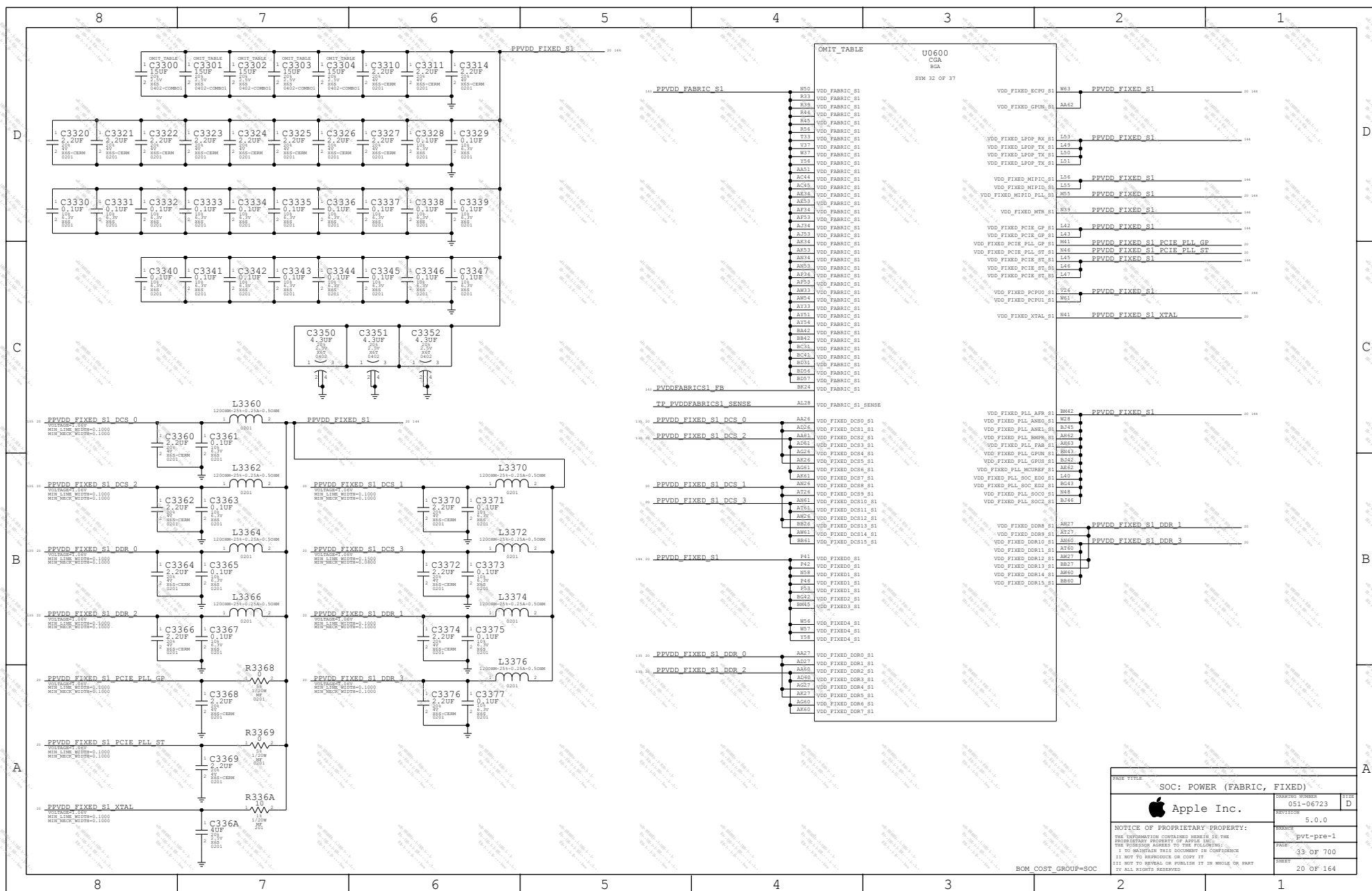


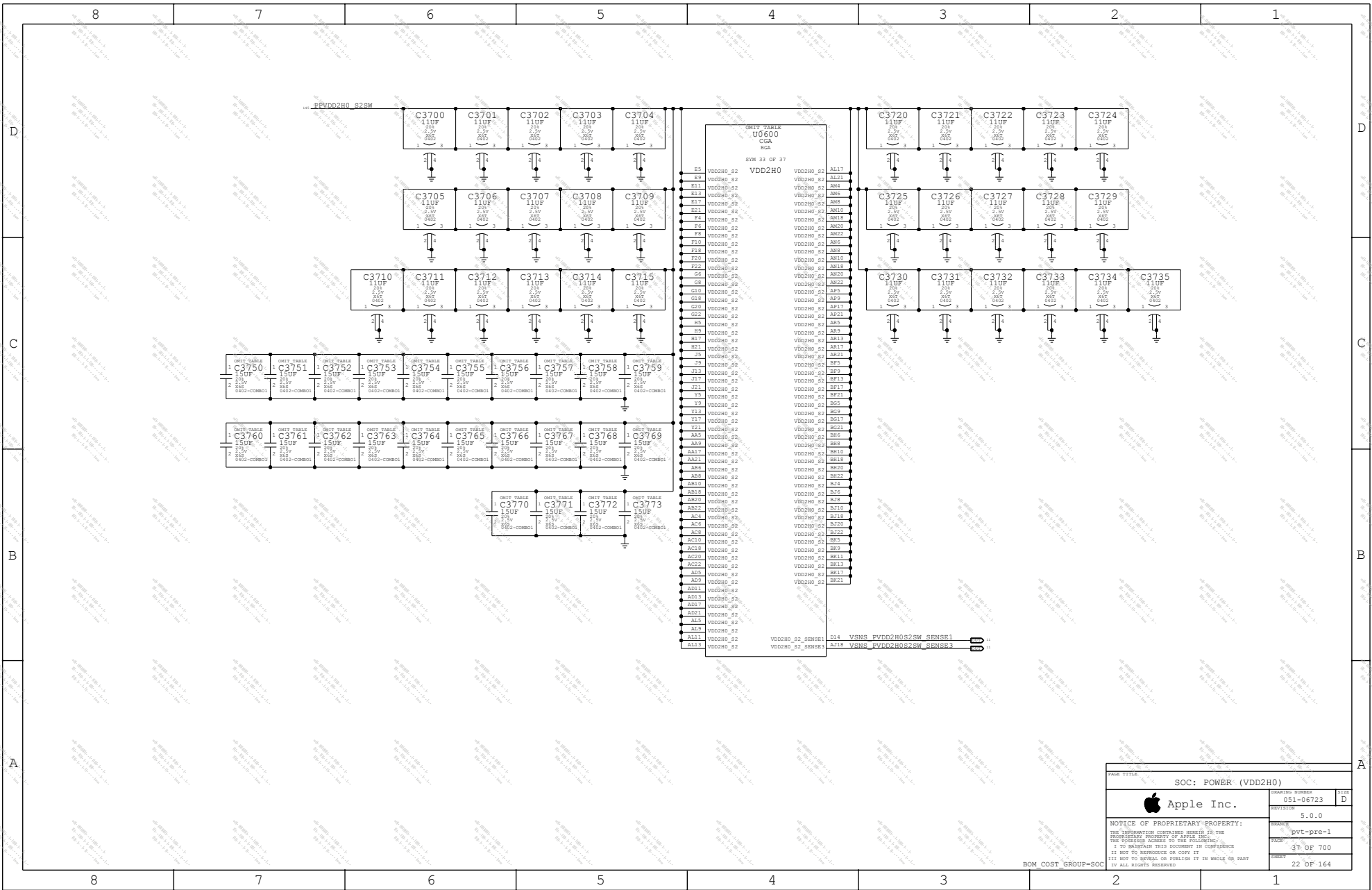


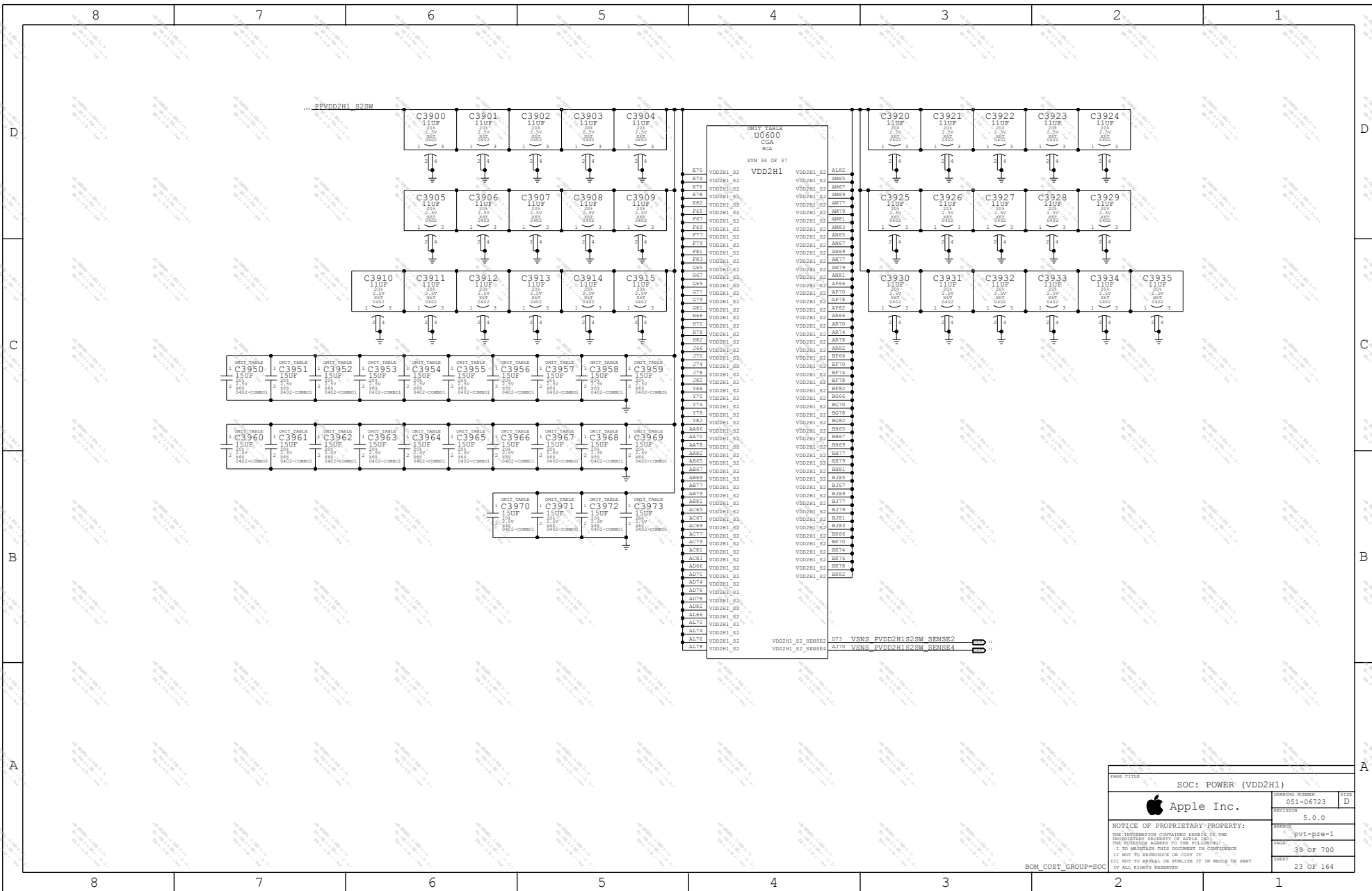
PAGE TITLE			
SOC: POWER (VDDQ)			
 Apple Inc.	DOCUMENT NUMBER	051-06723	TYPE
	REVISION	5.0.0	D
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	PAGE	29 OF 700	
	SHEET	18 OF 164	

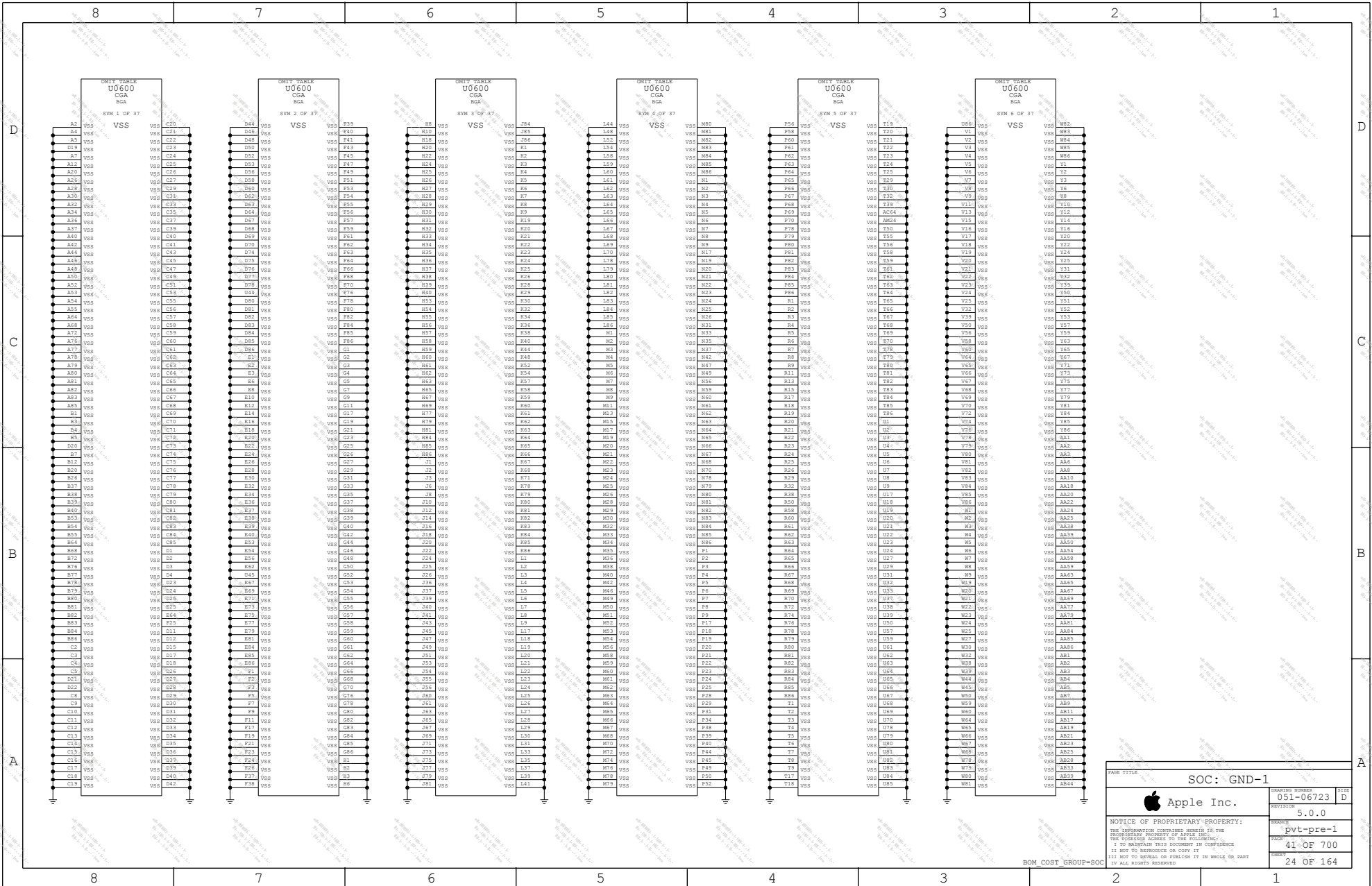
BOM_COST_GROUP=SOC











SOC: GND-1

Apple Inc.

051-06723

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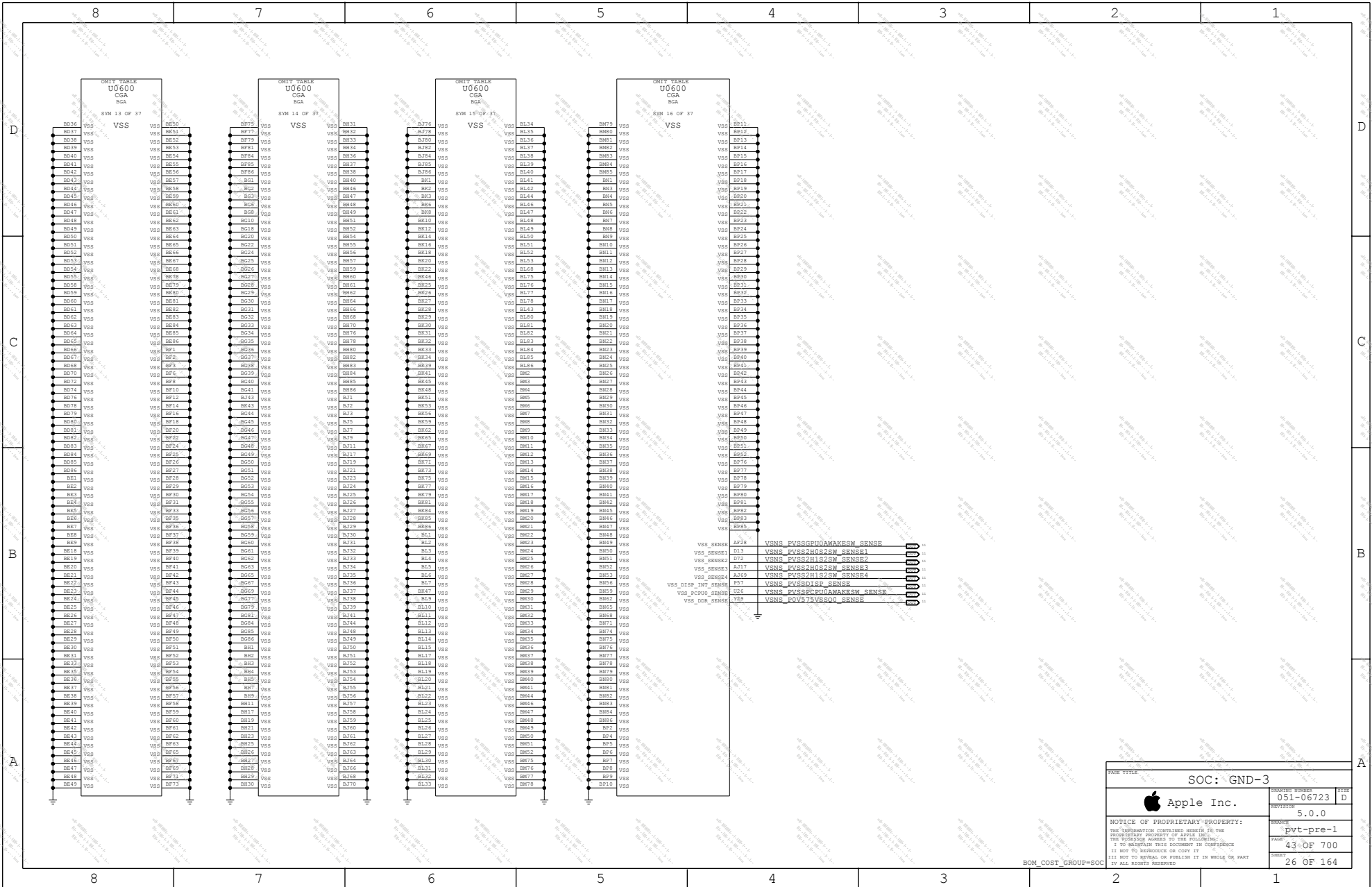
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BOM_COST_GROUP=SCC

[illegible]



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BOM_COST_GROUP=SCC


*** OK2INTEGRATE ***



Per TGA Power Block Diagram v0.3

IccMax: 100mA As per NXP preliminary estimate, final pending.

BOM_COST_GROUP=SECURE ELEMENT

DATE: 04/08/2014 11:04 AM PAGE: 1 OF 1 PAGE TITLE:		DATE: 04/08/2014 11:04 AM	
<h1>Secure Element</h1>			
		<h2>Apple Inc.</h2>	
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		SIZE D	
		REVISION 5.0.0	
		FRAME pvt-pre-1	
		PAGE 50 OF 700	
		SHEET 27 OF 164	

Battery Sub-System Debug Connector

ARKANOID CONN

BMU POWER FLEX HOTBAR TO THE MLB:

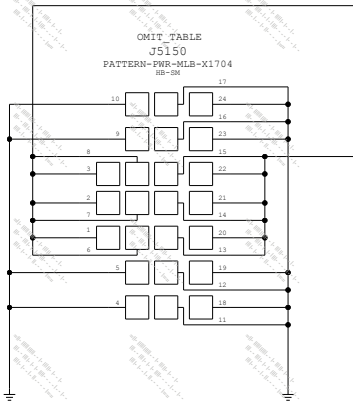
PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
632-04146	1	PCBA, FLEX, BMU-POWER, X1703	J5150	CRITICAL	

PPDCIN_AON

RATIO=PPDCIN/6.76



ARKANOID	MLB Connector / Signals	Sales
J0301 - 1	SMBUS_BATT_SCL (= I2C_SMC_PWR_SCL)	0
J0301 - 3	SMBUS_BATT_SDA (= I2C_SMC_PWR_SDA)	1
J0301 - 5	I2C_SMC_UPC_SCL	2
J0301 - 7	I2C_SMC_UPC_SDA	3
J0302 - 1	UPC_SMC_I2C_INT_L	4
J0302 - 3	CHGR_AMON	5
J0302 - 5	CHGR_BMON	6
J0302 - 7	1/6.76 * PPDCIN_AON	7
J0303 - 1	CHGR_RST_IN	8
J0303 - 3	—	9
J0303 - 5	PPVBAT_AON	10
J0303 - 7	—	11

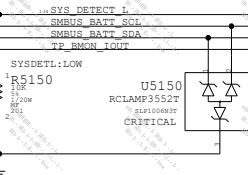


C5150
0.1uF
100
25V
0805

C5160
1uF
25V
0603

APN:518S0818

J5151
FF14A-6C-R11DL-B-3H

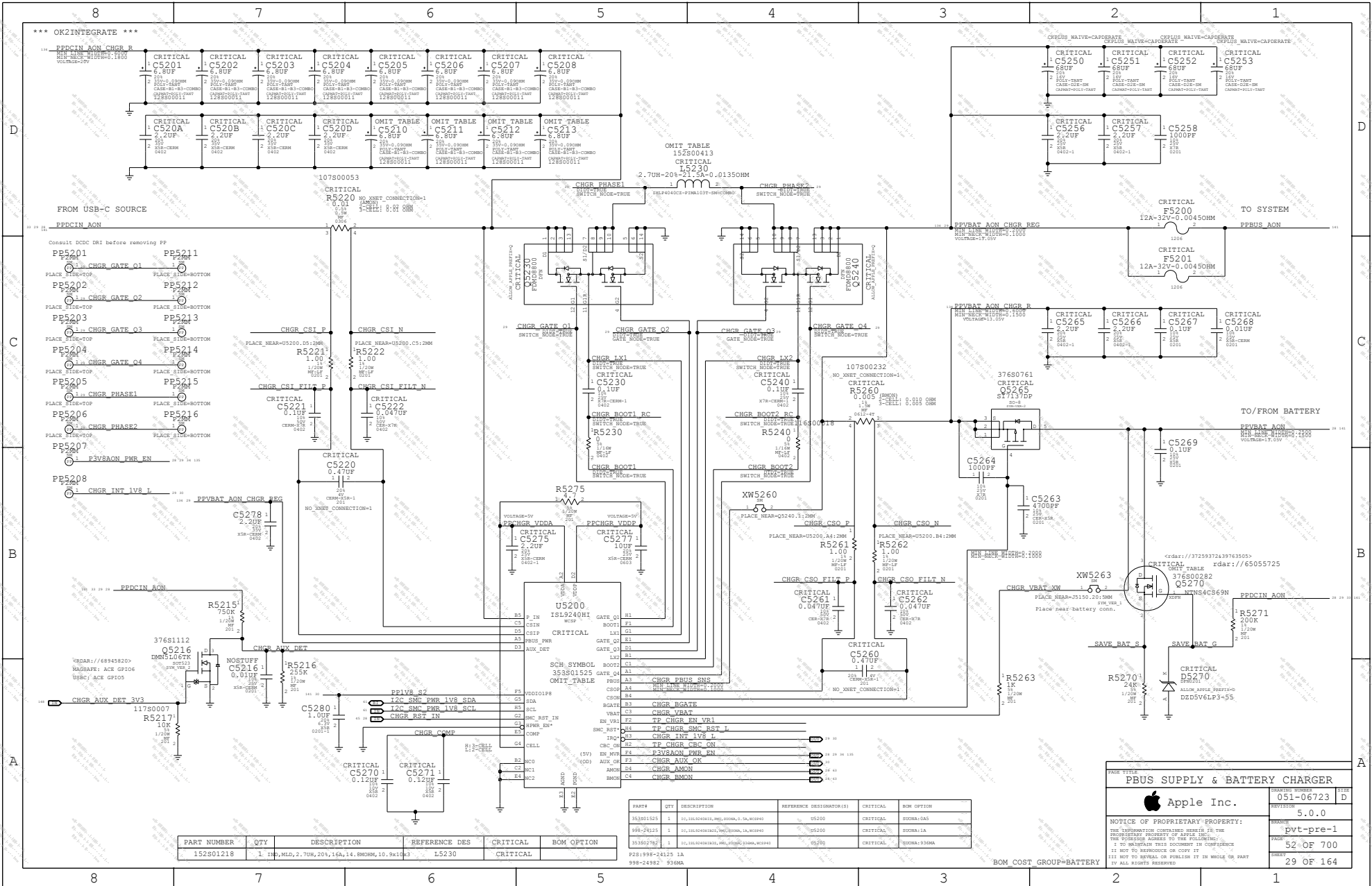


PER: (KIDAR) / (TS) (03/20) 06/15/2021

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
376S1128	3	XSTR, FET, N-CH, 30V, 300mA, 3P DFN	Q5155, Q5270, QH500	CRITICAL	

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BOM_COST_GROUP=BATTERY



PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
152S01218	1	1. 1H, 2. 70H, 20V, 16A, 14, 8.0MOM, 10. 9x10x3	L5230	CRITICAL	

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
353001521	1	1. 1H, 2. 70H, 20V, 16A, 14, 8.0MOM, 10. 9x10x3	U5230	CRITICAL	SDH0A:0A5
353001522	1	1. 1H, 2. 70H, 20V, 16A, 14, 8.0MOM, 10. 9x10x3	U5230	CRITICAL	SDH0A:1A
353001523	1	1. 1H, 2. 70H, 20V, 16A, 14, 8.0MOM, 10. 9x10x3	U5230	CRITICAL	SDH0A:300A

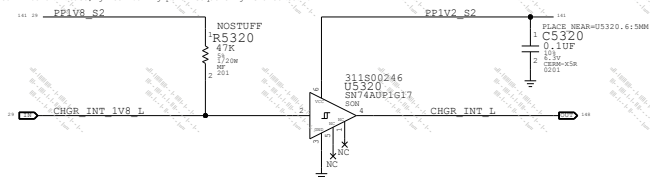
P28:308-24125 1A
938-24362 930A

PAGE TITLE	
PBUS SUPPLY & BATTERY CHARGER	
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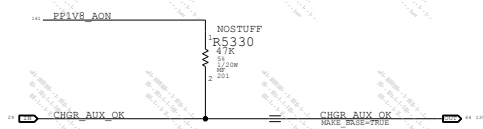
BOM COST GROUP=BATTERY


SMBUS CHGR IV8 [SCL/SDA]: Level translation circuit to be placed in project specific I2C page.

Stuff R5320 in case, glitch during power sequencing is a concern.



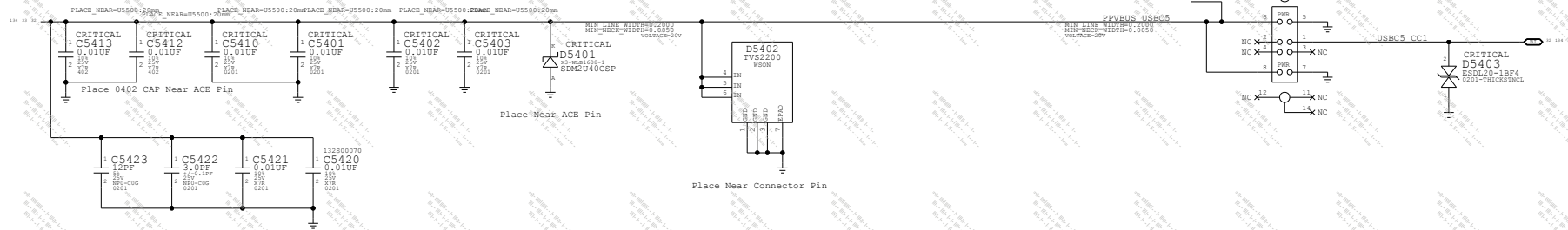
OK, to completely remove pull up, but consult PMU architecture and check OTP before that.



10-100 (Rev. 10-6-95) THIS TITLE		10-100 (Rev. 10-6-95)	
BATTERY CHARGER SUPPLY		DRAWING NUMBER 051-06723	
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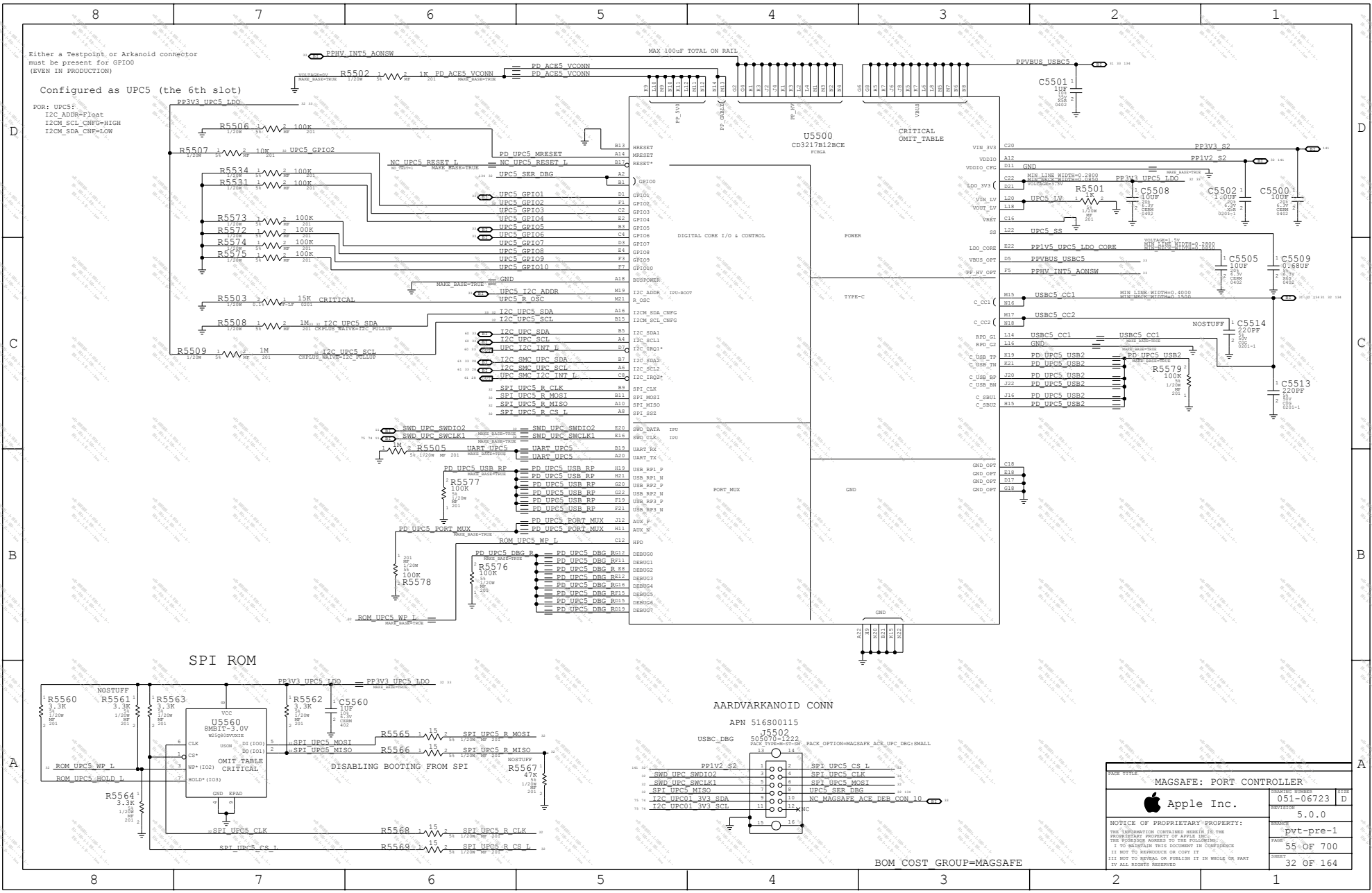
MAGSAFE connector APN:
MLB:516S00787 / Flex:516S00788

NOTE: FERRITES for proto study only
REFER TO RADAR 70006166
NOTE: FERRITES removed starting EVT
REFER TO RADAR 73518905



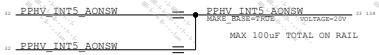
PAGE TITLE		MAGSAFE: CONNECTOR	
Apple Inc.		051-06723	051-06723
PROVISION		5.0.0	5.0.0
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BOM_COST_GROUP=MAGSAFE

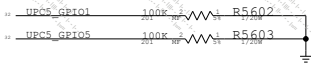


PAGE TITLE		MAGSAFE: PORT CONTROLLER	
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		SHEET	32 OF 164

POWER ALIASES



GPIOs



DEBUG PORT



POWER / FUSE FOR UPC



I2C

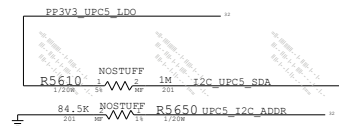


CONNECTION TO CHARGER



ACE I2C ADDRESS

P0: UPC5:
I2C_ADDR=84.5K PD
I2CM_SCL_CNFG=HIGH
I2CM_SDA_CNFG=HIGH



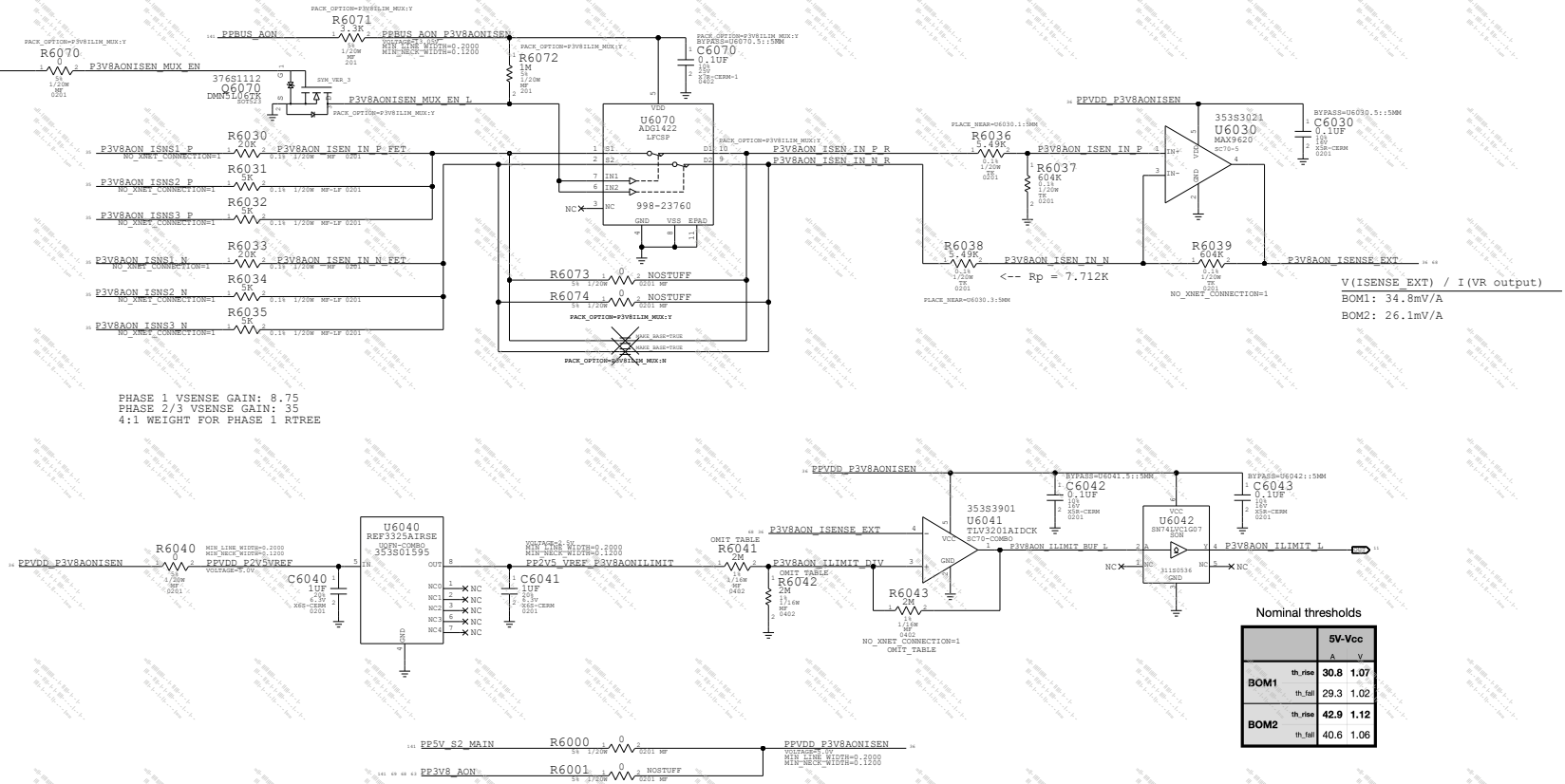
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PAGE TITLE		MAGSAFE: CONTROLLER SUPPORT	
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P3V8 LOW SIDE ISENSE AND ILIMIT (SUMMING AMP FOR 3 PHASES)

rdar://problem/69466996 Icedman Throttle Design Data

10A MAX ON PHASE 1, MAX TOTAL CURRENT SENSE @ PMU= 43.11A



Call one of these BOM GROUPs in the main BOM:

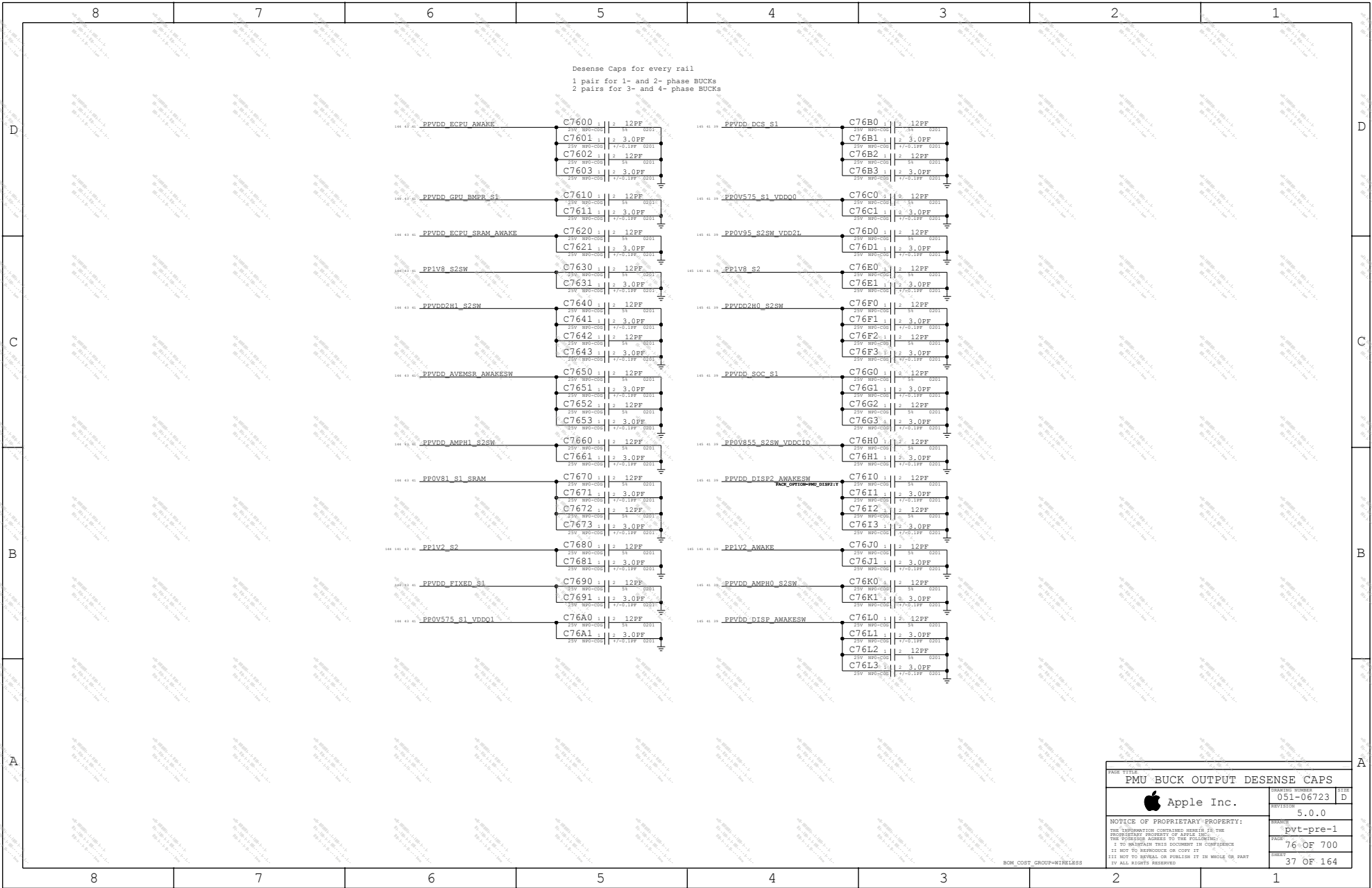
BOM GROUP	BOM OPTIONS
P3V8ILIM:BOM1_5V	P3V8ILIM_RT:22K,P3V8ILIM_RB:15K4,P3V8ILIM_RP:866K
P3V8ILIM:BOM2_5V	P3V8ILIM_RT:20K,P3V8ILIM_RB:15K,P3V8ILIM_RP:715K

Don't Call these OPTIONs directly:

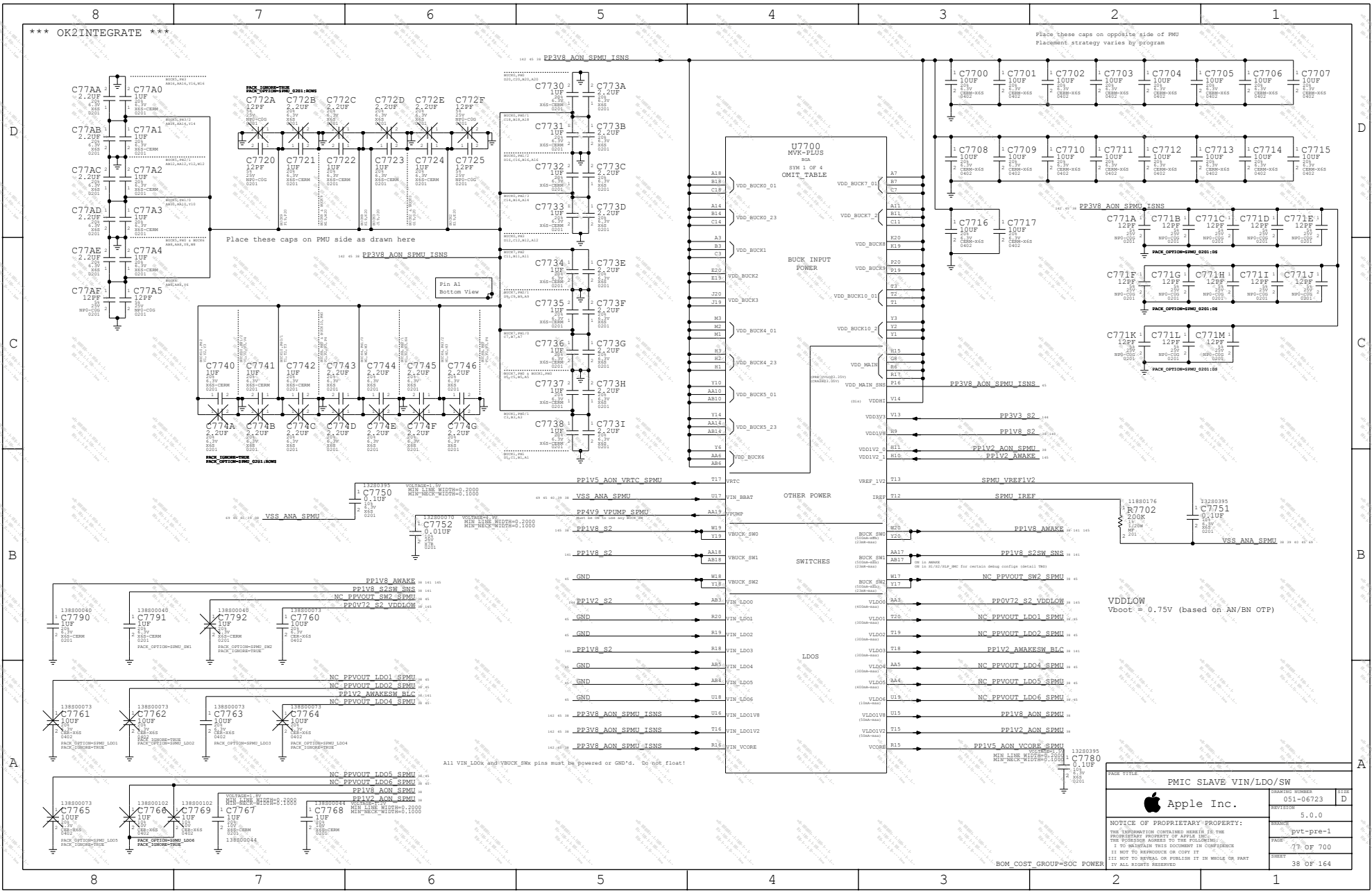
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	SOW OPTION
11480343	1	RES,0402,1K,1/16W,50V	R6041	P3V8ILIM_RT:20K
11480341	1	RES,0402,1K,1/16W,50V	R6041	P3V8ILIM_RT:20K
11480331	1	RES,0402,1K,1/16W,50V	R6042	P3V8ILIM_RB:15K
11480332	1	RES,0402,1K,1/16W,50V	R6042	P3V8ILIM_RB:15K
11480495	1	RES,0402,1K,1/16W,50V	R6043	P3V8ILIM_RP:715K
11480503	1	RES,0402,1K,1/16W,50V	R6043	P3V8ILIM_RP:866K

BOM COST GROUP=SOC POWER

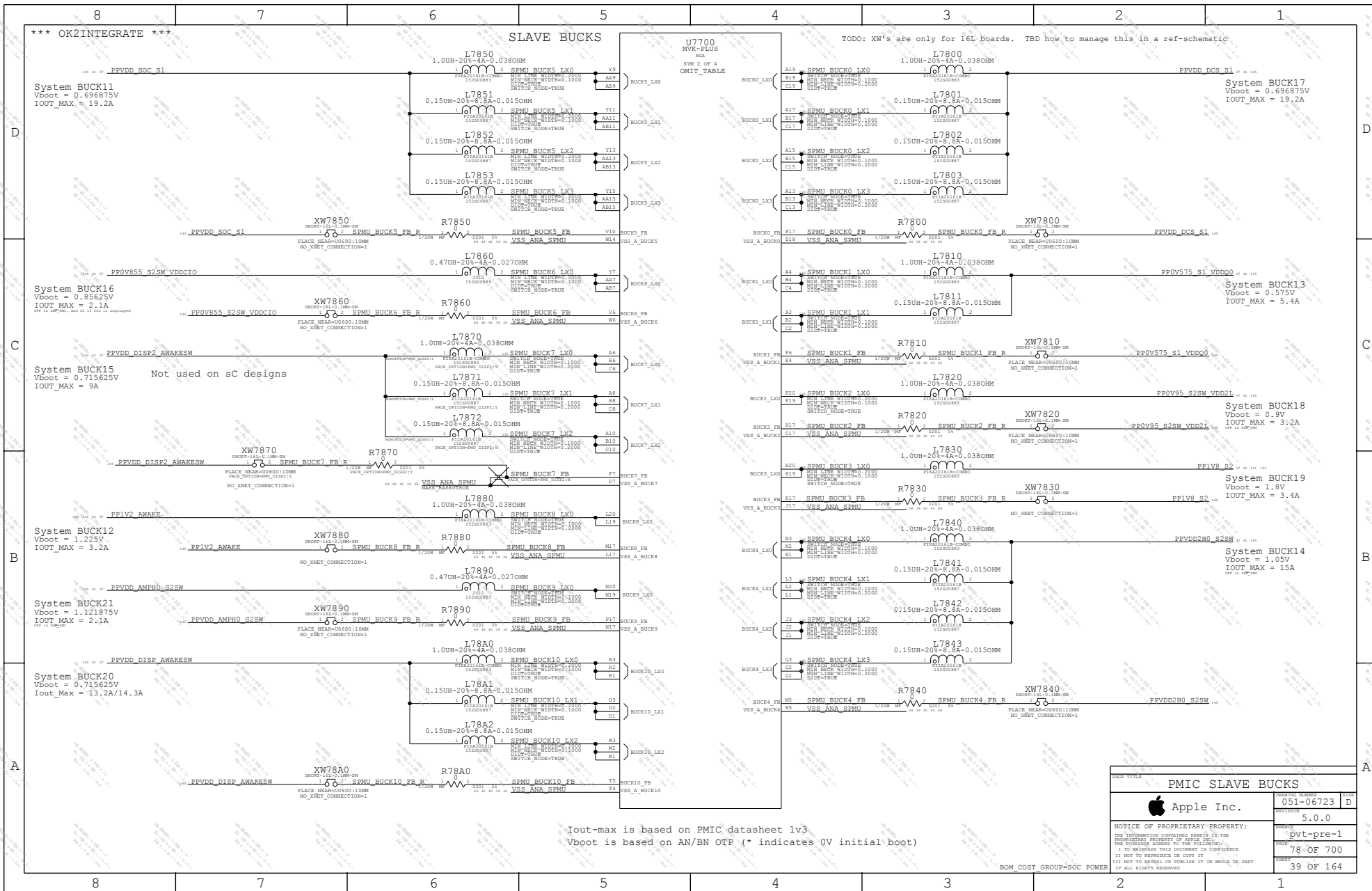
POWER: 3V8 AON OUTPUT THROTTLE	
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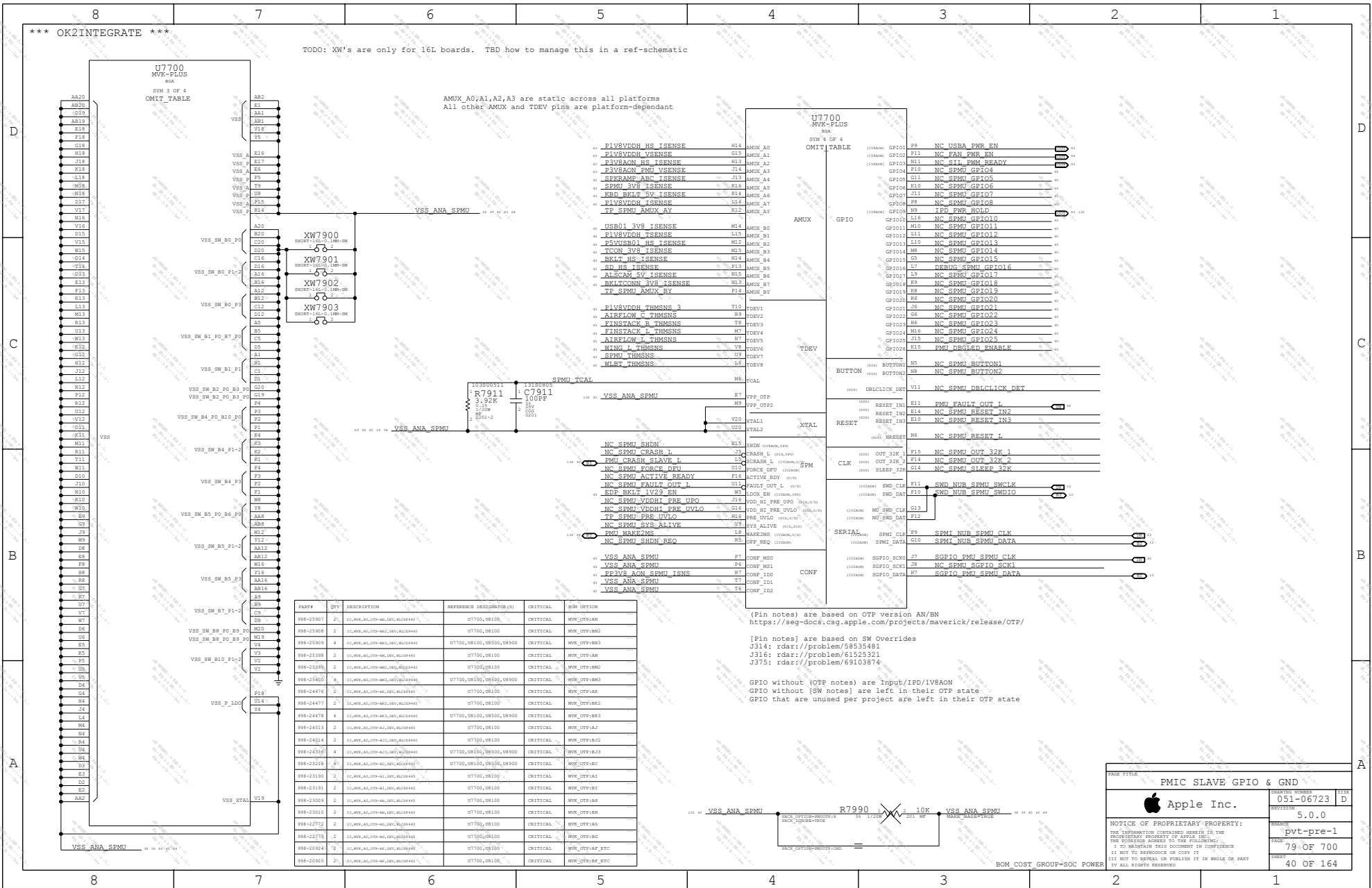
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TODO: XM's are only for 16L boards. TBD how to manage this in a ref-schematic

AMUX_A0,A1,A2,A3 are static across all platforms
All other AMUX and TDEV pins are platform-dependant

(Pin notes) are based on OTP version AN/BN
<https://seag-docs.csg.apple.com/projects/naverick/release/OTP/>

[Pin notes] are based on SW Overrides

J314: rdar://problem/56535481

J316: rdar://problem/61535321

J375: rdar://problem/69103874

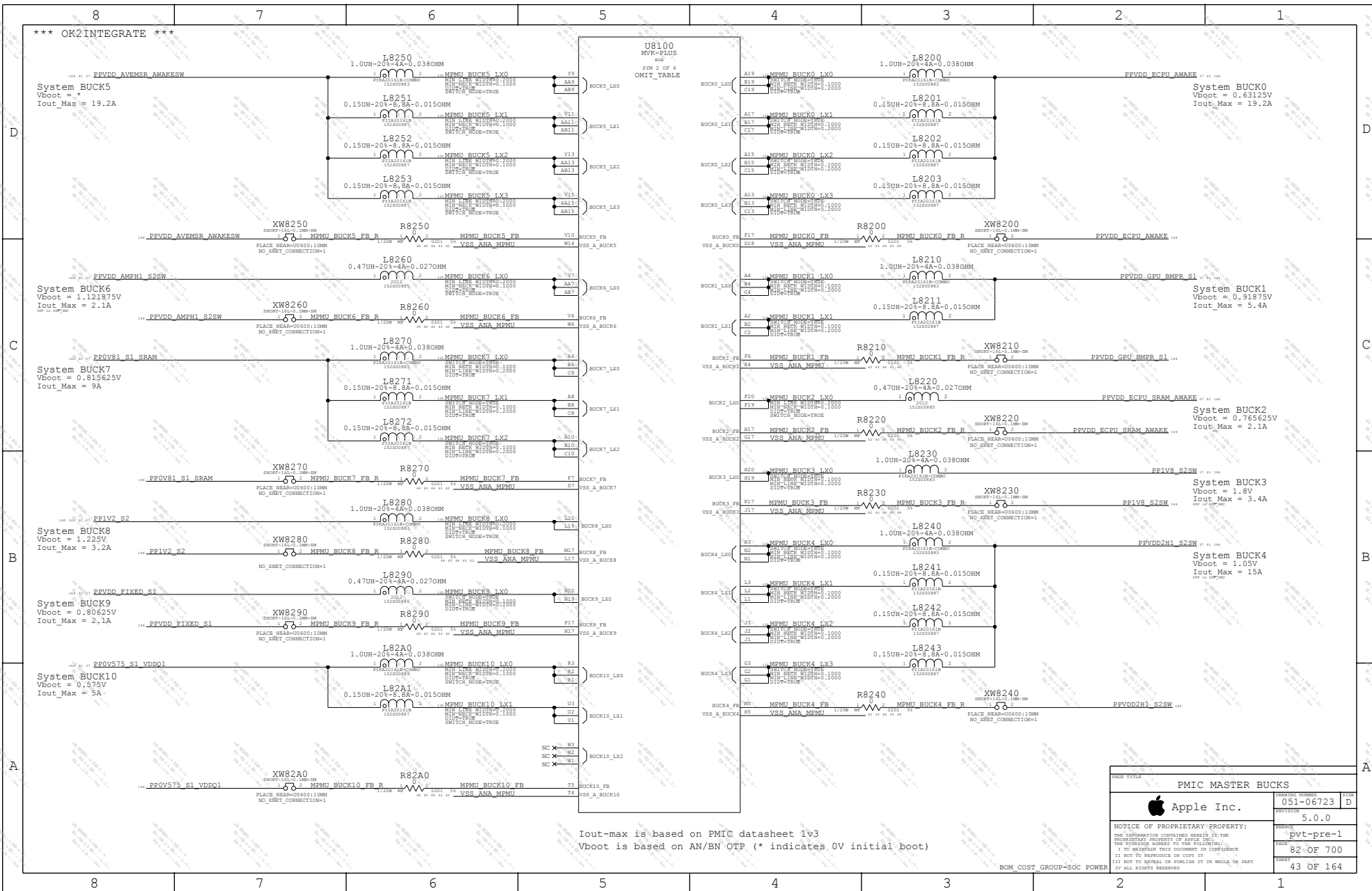
GPIO without (OTP notes) are Input/IPD/IVS/AON


GPIO without (SW notes) are left in their OTP state

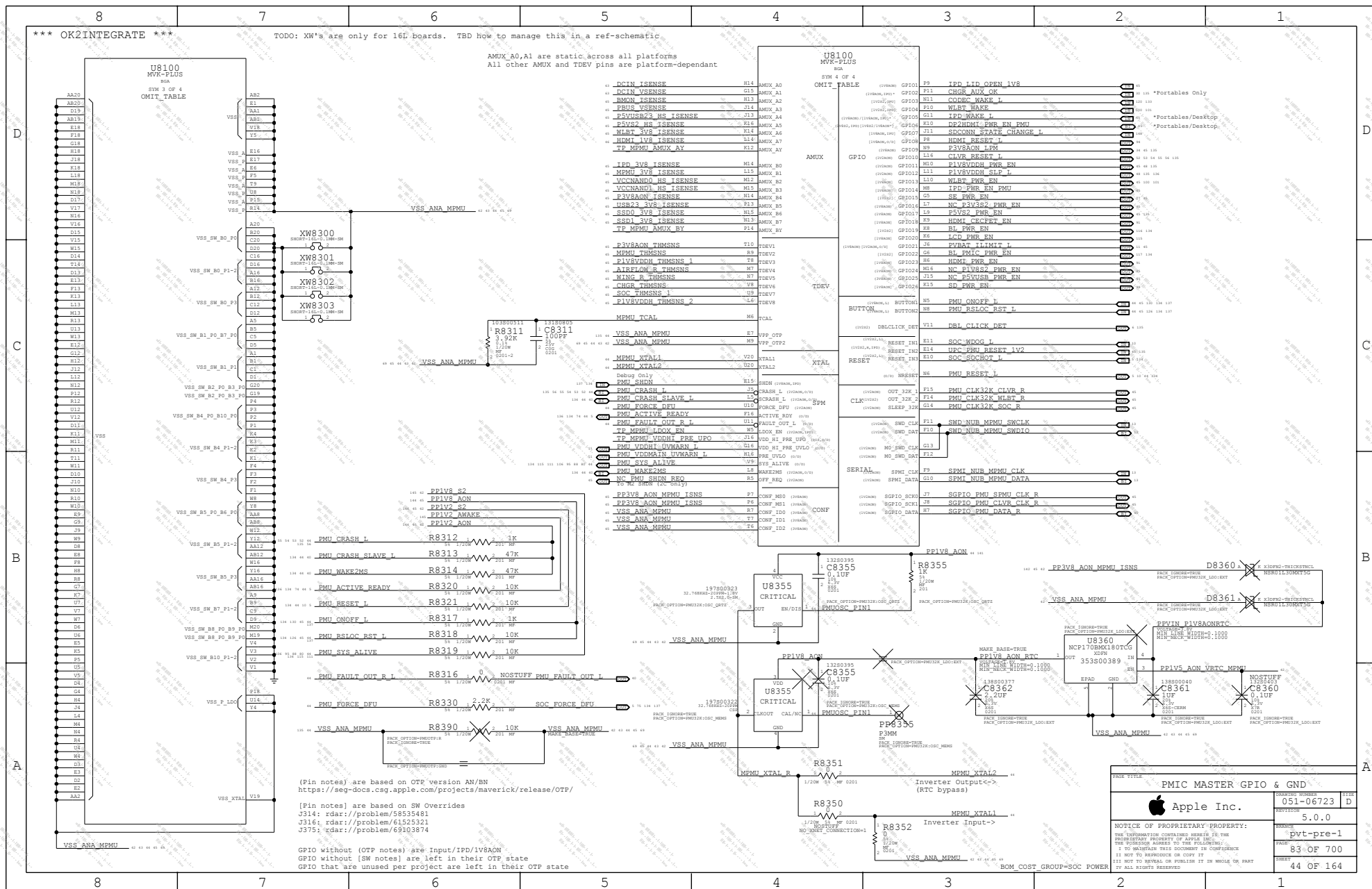
GPIO that are unused per project are left in their OTP state

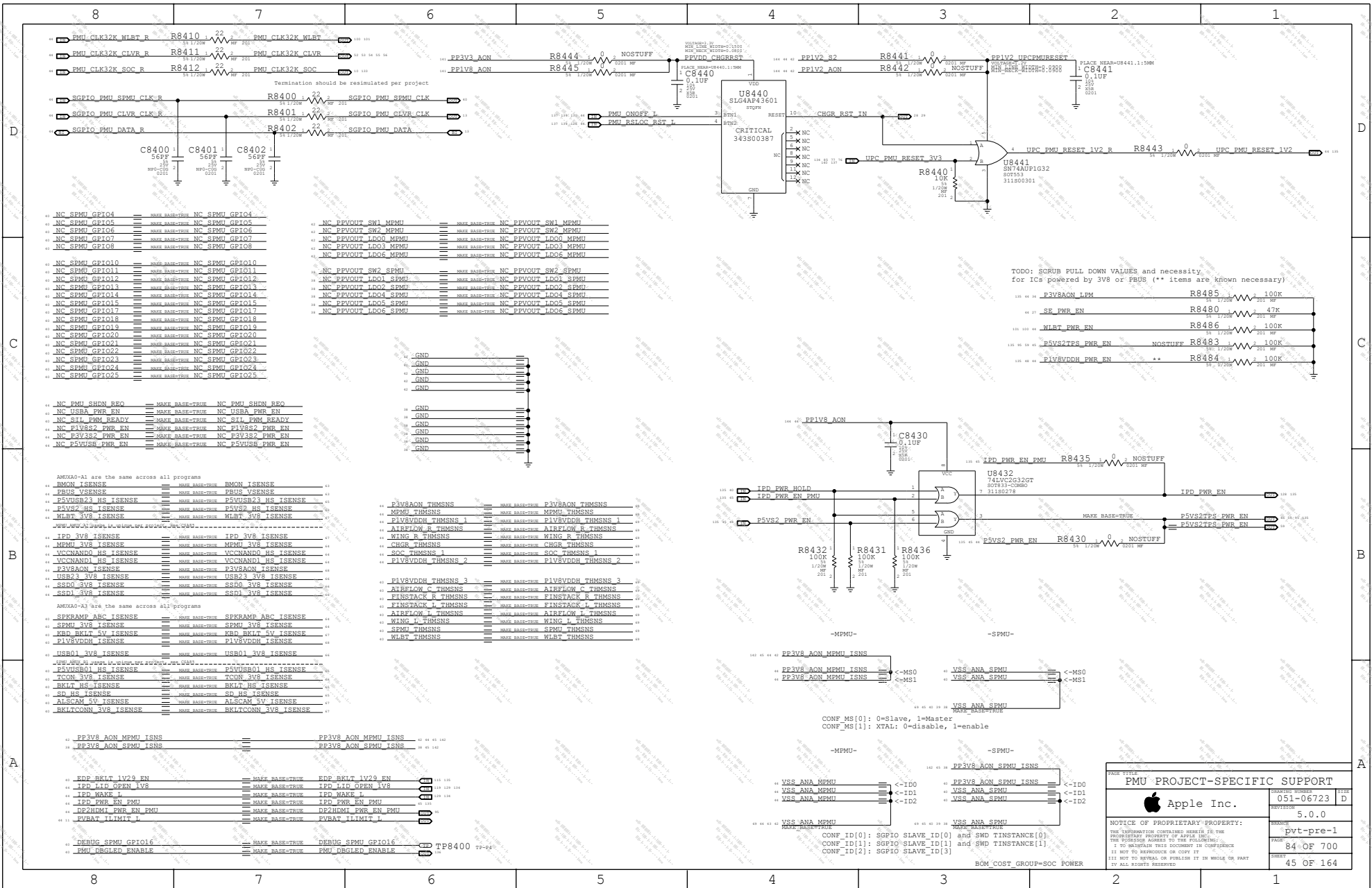
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
998-25907	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25908	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25909	4	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106, DR500, DR900	CRITICAL	NOV_OTP:AN
998-25910	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25911	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25912	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25913	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25914	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25915	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25916	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25917	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25918	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25919	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25920	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25921	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25922	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25923	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25924	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN
998-25925	2	10K, 0.1%, 0.5W, 0.5% (0.5% 0.5W)	U7700, DR106	CRITICAL	NOV_OTP:AN

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PMIC SLAVE GPIO & GND	
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D

D

C

C

B


B

A

A

	8	7	6	5	4	3	2	1	
D	<p>This page is for t724-specific PMU support</p> <div><div>.. <u>HDMI_VVS_TSENSE</u> == <u>MODE_MASK=TRUE</u> <u>HDMI_VVS_TSENSE</u> ..</div><div>.. <u>P1VSVDCH_TSENSE</u> == <u>MODE_MASK=TRUE</u> <u>P1VSVDCH_TSENSE</u> ..</div><div>.. <u>NC_FAN_PWR_EN</u> == <u>MODE_MASK=TRUE</u> <u>NC_FAN_PWR_EN</u> ..</div></div>								D
C									C
B									B
A									A
	8	7	6	5	4	3	2	1	

PMU PROJECT-SPECIFIC SUPPORT 2

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051-06723

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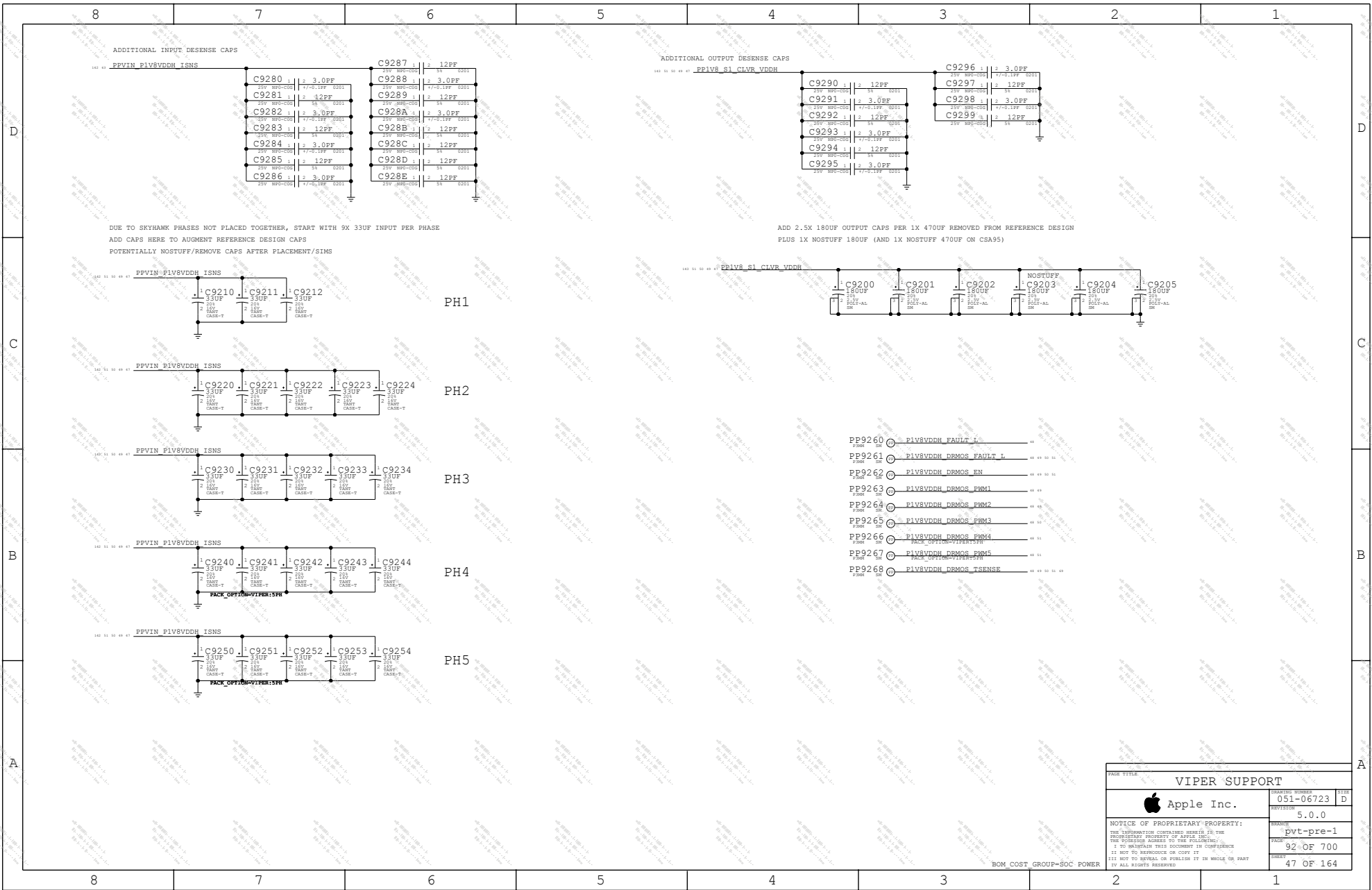
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BOM_COST_GROUP=SOC POWER

PAGE TITLE		PMU PROJECT-SPECIFIC SUPPORT 2	
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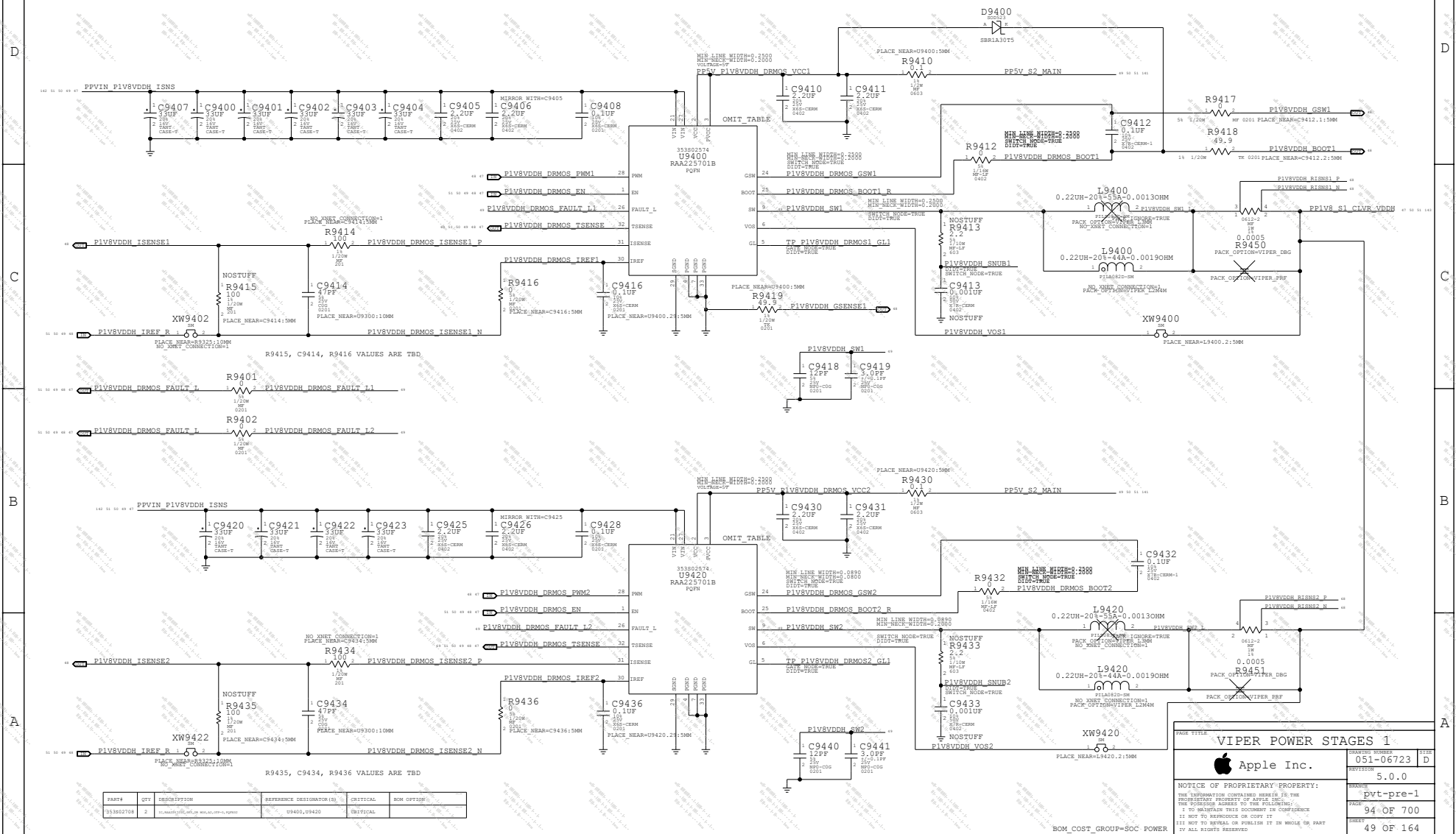
BCM_COST_GROUP-SOC POWER



PAGE TITLE		
VIPER SUPPORT		
Apple Inc.	DOCUMENT NUMBER	051-06723
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	PAGE	92 OF 700
SHEET		47 OF 164

OK2INTEGRATE

VIPER POWER STAGES 1

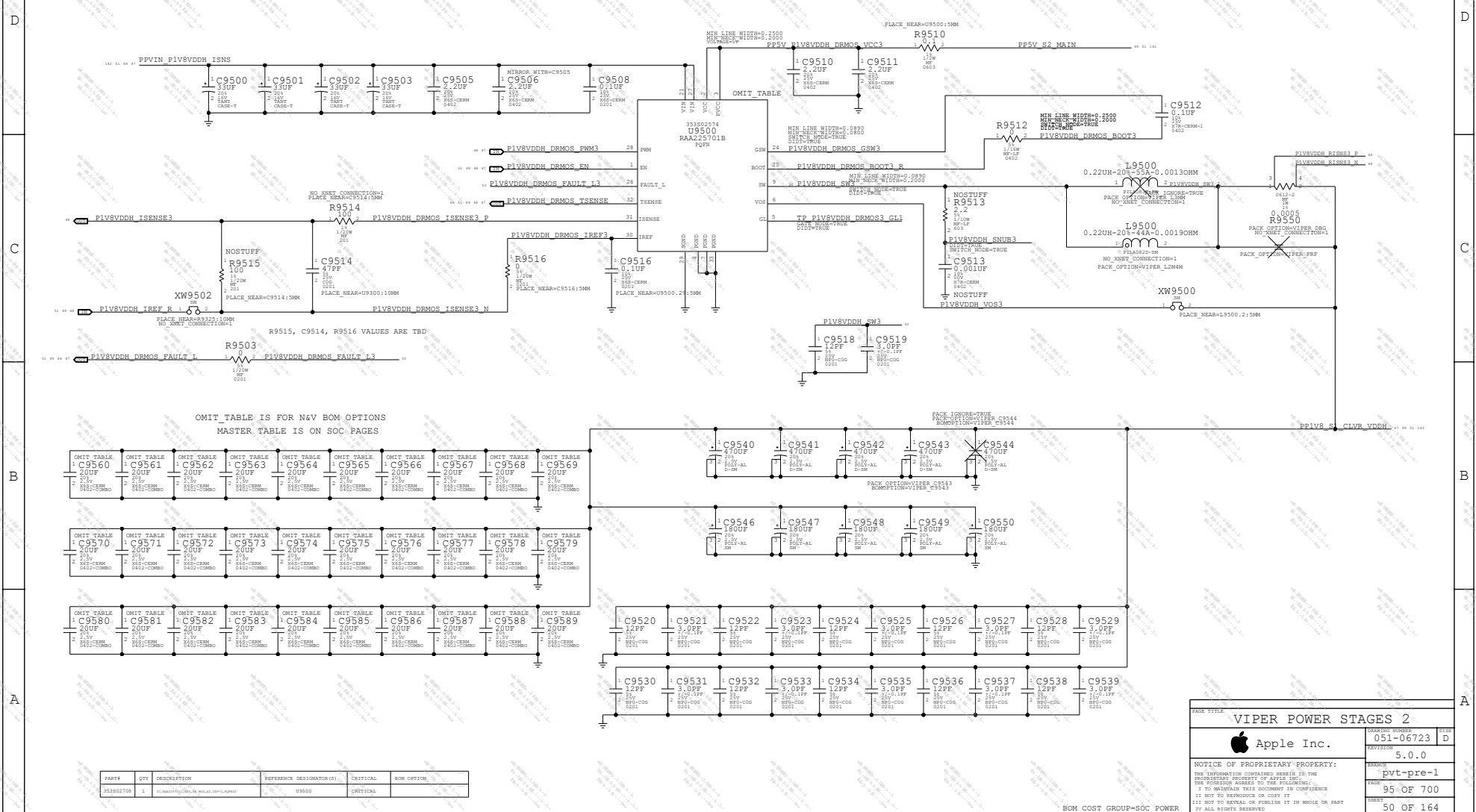


PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
33502708	2	U9400, U9401	U9400, U9401	CRITICAL	

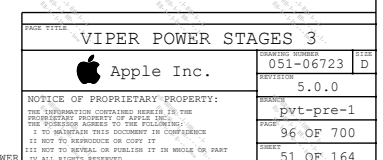
VIPER POWER STAGES 1			
Apple Inc.		051-06723	D
5.0.0		051-06723	D
Dvt-pre-1		051-06723	D
94 OF 700		051-06723	D
49 OF 164		051-06723	D

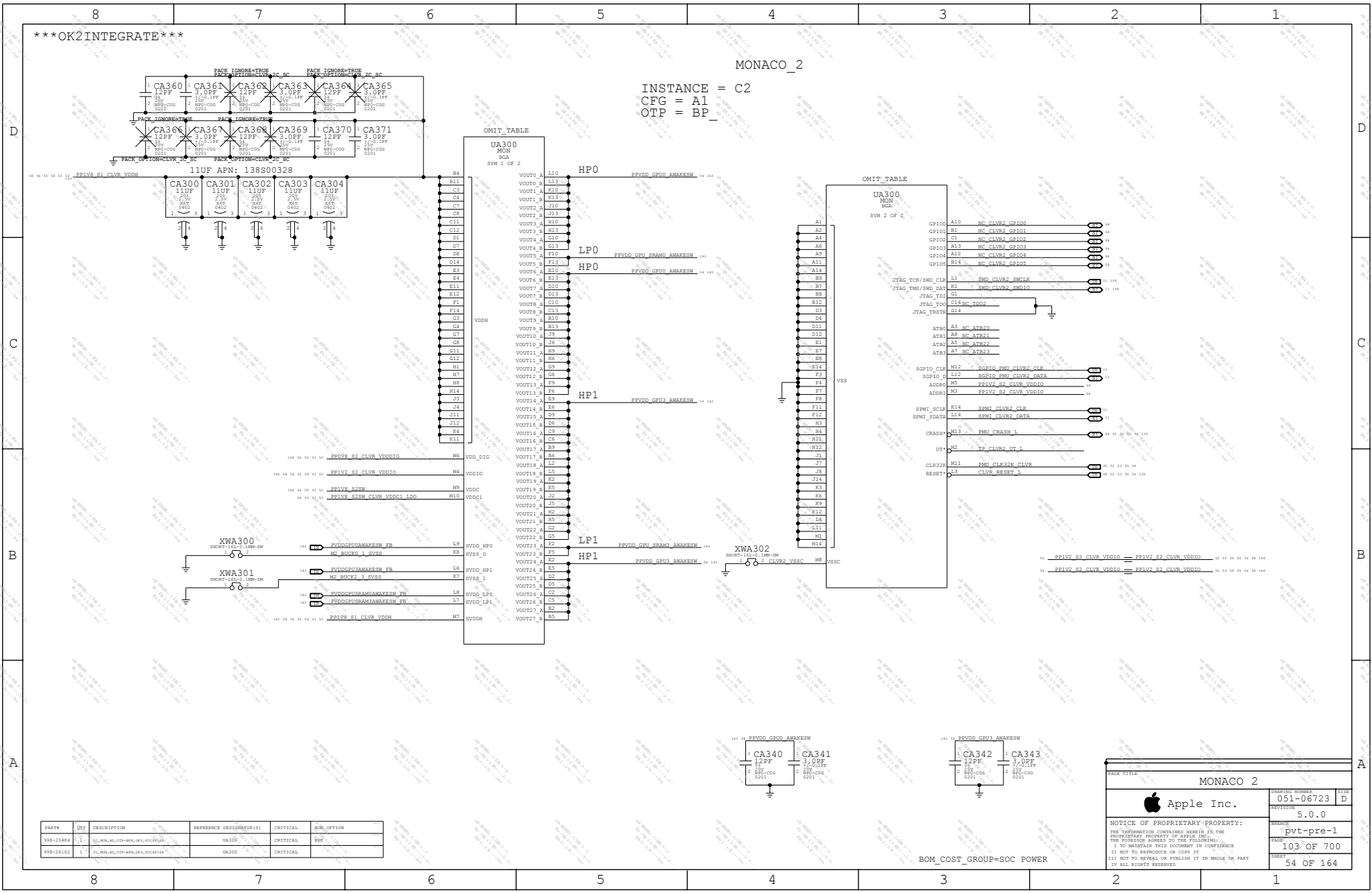
OK2INTEGRATE

VIPER POWER STAGES 2



VIPER POWER STAGES 3





PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	MR_OPTION
998-25484	1	U1,MON,MON-APP,MON,MON,MON	UA300	CRITICAL	SW
998-25482	1	U2,MON,MON-APP,MON,MON,MON	UA300	CRITICAL	

PAGE TITLE	
MONACO 2	
Apple Inc.	051-06723
PROVISION	5.0.0
STATUS	Pvt-pre-1
PAGE	103 OF 700
SHEET	54 OF 164

BOM_COST_GROUP=SOC POWER

OK2INTEGRATE

MONACO_3

INSTANCE = C3
CFG = B0
OTP = IP_

OMIT TABLE

UA400
MON
BGA
SYM 1 OF 2

OMIT TABLE

UA400
MON
BGA
SYM 2 OF 2


PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
988-25485	1	104KΩ,0.1%TOL,1%VOLT,0.5W	U400	CRITICAL	2%
988-26163	1	104KΩ,0.1%TOL,1%VOLT,0.5W	U400	CRITICAL	2%

PAGE TITLE		MONACO 3	
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		SHEET	55 OF 164

BOM_COST_GROUP=SOC POWER

	8	7	6	5	4	3	2	1
D								
C								
B								
A								
	8	7	6	5	4	3	2	1

VDDH DISCHARGE
RADAR:60167832
REMOVED per RADAR:72825553

PAGE TITLE EMPTY (WAS VDDH DISCHARGE)		DRAWING NUMBER 051-06723	TYPE D
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		PAGE 106 OF 700	
		SHEET 57 OF 164	

* OK2INTEGRATE *

5V_S2 Voltage Regulator (low power option)

SET ONE OPTION FOR PBUS CAPS

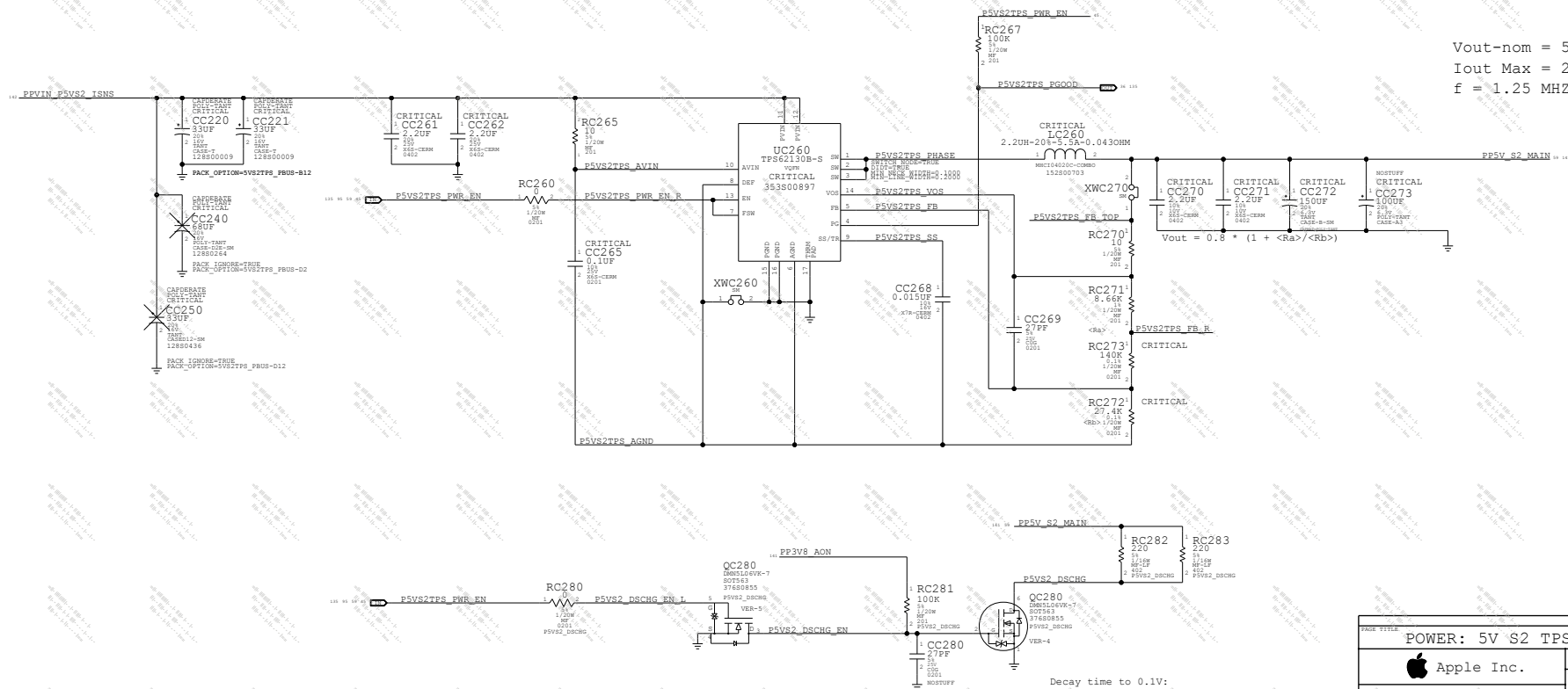
PACK_OPTION=5VS2TPS_PBUS-B12

PACK_OPTION=5VS2TPS_PBUS-D2

PACK_OPTION=5VS2TPS_PBUS-D12


START UP TIME = 4.7/7.5/10.5 MS
(min/typ/max)

Vout-nom = 5.14V
Iout Max = 2.1A
f = 1.25 MHZ



Decay time to 0.1V:
86ms-min / 114ms-typ / 148ms-max
(Vout=5.14V5%, Cout=260uF20%, R=2x220R5%)

BOM_COST_GROUP=PLATFORM POWER

PAGE TITLE	
POWER: 5V S2 TPS62130	
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PAGE	122 OF 700
SHEET	59 OF 164

AP_I2C0

DEVICE	CARD/REFDES	7-BIT	8-BIT
ACE2 - 0 (DEBUG)	USB-C 0	0x38	0x70
ACE2 - 1 (DEBUG)	USB-C 0	0x3F	0x7E
ACE2 - 2 (DEBUG)	USB-C 1	0x3B	0x76
ACE2 - 3 (DEBUG)	USB-C 1	0x3A	0x74
ACE2 - 4 (DEBUG)	USB-C 0	0x6B	0xD6

MASTER	NUMBER	SPEED	7-BIT ADDR	8-BIT ADDR (R)	DEVICE
?	?	?	?	?	?
?	?	?	?	?	?
?	?	?	?	?	?

AP_I2C1

DEVICE	CARD/REFDES	7-BIT	8-BIT
SPKRAMP TAWANG A	SPKRAMP	0x38	0x70
SPKRAMP TAWANG B	SPKRAMP	0x39	0x72
SPKRAMP TAWANG C	SPKRAMP	0x3A	0x74

AP_I2C2

DEVICE	CARD/REFDES	7-BIT	8-BIT
CODEC - CLIFDEN	DMIC & CODEC	0x48	0x90
CODEC - CARLOW	DMIC & CODEC	0x4B	0x95

AP_I2C3

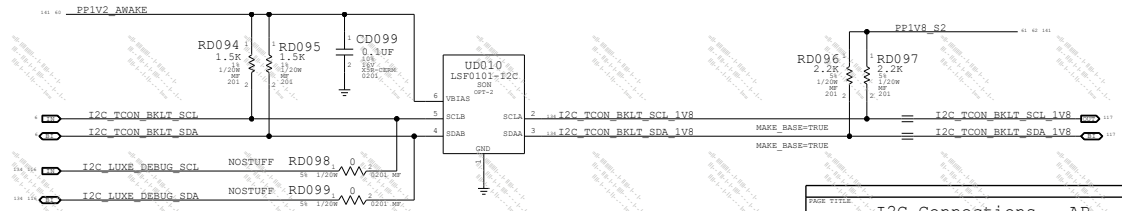
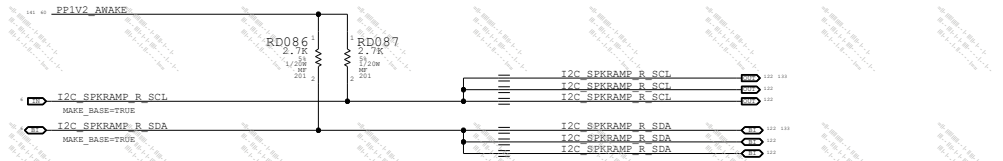
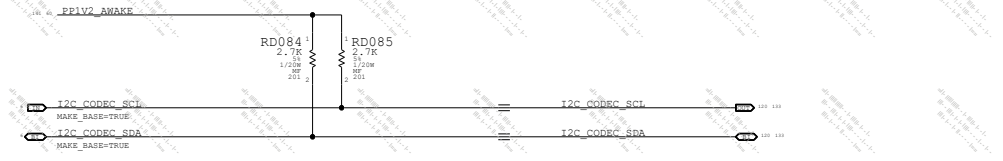
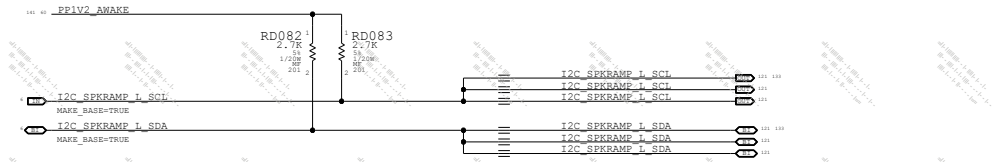
DEVICE	CARD/REFDES	7-BIT	8-BIT
SPKRAMP TAWANG D	SPKRAMP	0x3B	0x76
SPKRAMP TAWANG E	SPKRAMP	0x3C	0x78
SPKRAMP TAWANG F	SPKRAMP	0x3D	0x7A

AP_I2C7

DEVICE	CARD/REFDES	7-BIT	8-BIT
Avellino PMIC	Display	0XX	0XX

UNUSED:

AOP_I2C1
ISP_I2C0
ISP_I2C1
ISP_I2C3



PAGE TITLE		I2C Connections - AP	
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SMC_I2C3

DEVICE	CARD/REFDES	7-BIT	8-BIT
Palm Rest Temp	IPD	0x4C	0x98

SMC_I2C4

DEVICE	CARD/REFDES	7-BIT	8-BIT
Temp Sensors	Uxxxx	0x48	0x90

AOP_I2C0

DEVICE	CARD/REFDES	7-BIT	8-BIT
ALS	Camera	0x29	0x52
ALS Temp	Camera	0x24	0x48

ISP_I2C2

DEVICE	CARD/REFDES	7-BIT	8-BIT
FHSI+	Camera	0x10	0x20
Camera Sensor	Camera	0x6C	0xD8

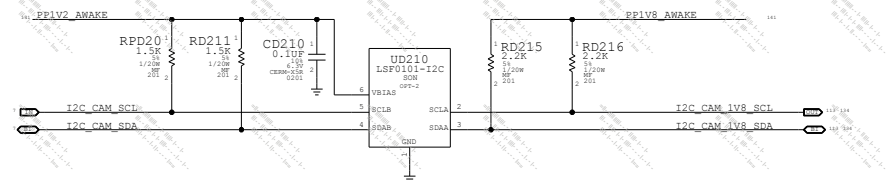
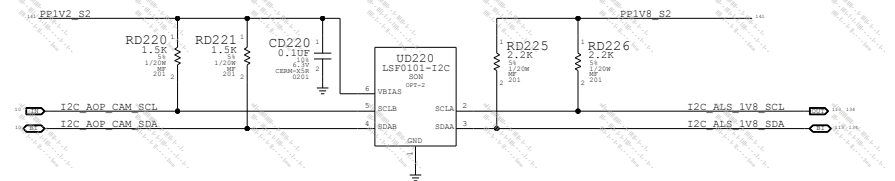
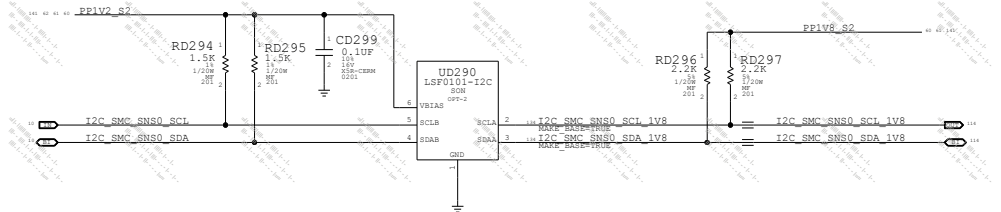
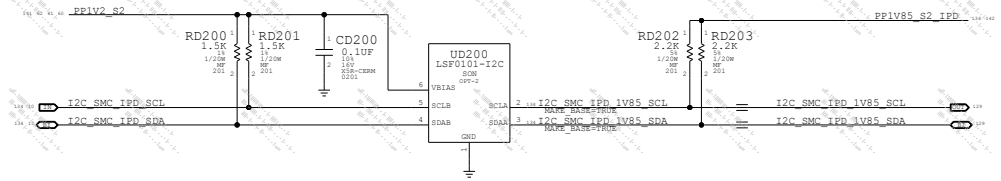
UNUSED and already aliased
ISP_I2C0 SMC_I2C6
ISP_I2C1
ISP_I2C3
AOP_I2C1

SI2C

DEVICE	CARD/REFDES	7-BIT	8-BIT
SEP EEPROM	U0500	0XXX	0XX

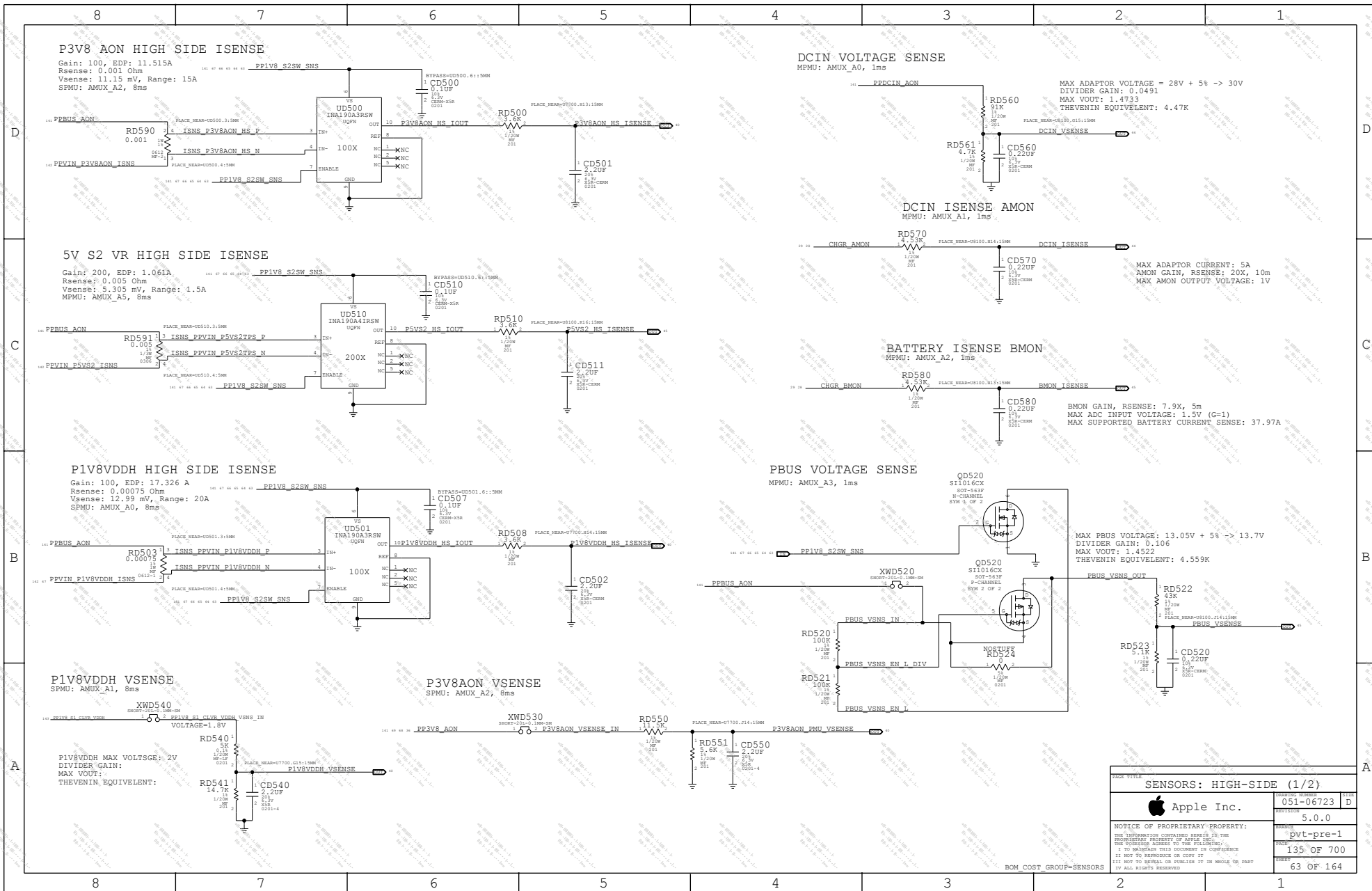
Need to confirm if this needs/has pull-ups

MISSING WLAN/BT, Rf, CELL - VENDOR CARDS



I2C Connections - Other			
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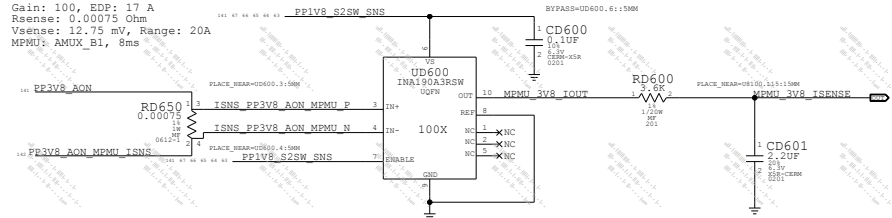
BOM_COST_GROUP=SOC



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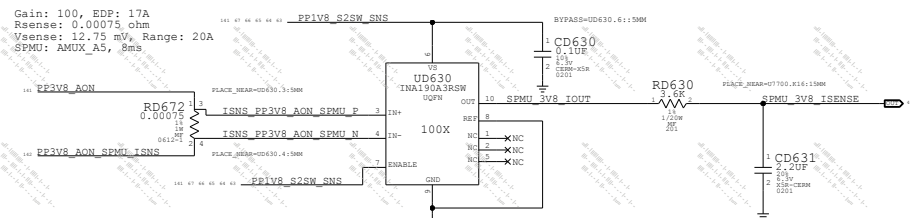
MASTER PMU HIGH SIDE 3V8 ISENSE

Gain: 100, EDP: 17 A
Rsense: 0.00075 Ohm
Vsense: 12.75 mV, Range: 20A
MPMU: AMUX_B1, 8ms



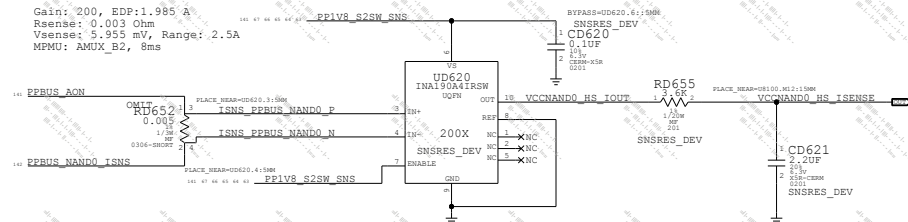
SLAVE PMU HIGH SIDE 3V8 ISENSE

Gain: 100, EDP: 17A
Rsense: 0.00075 ohm
Vsense: 12.75 mV, Range: 20A
SPMU: AMUX_A5, 8ms



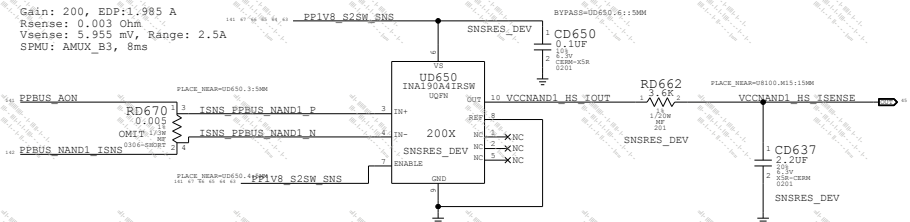
NAND 0 PBUS ISENSE

Gain: 200, EDP: 1.985 A
Rsense: 0.003 Ohm
Vsense: 5.955 mV, Range: 2.5A
MPMU: AMUX_B2, 8ms



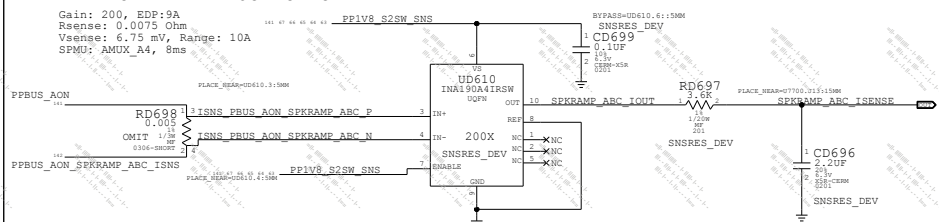
NAND 1 PBUS ISENSE

Gain: 200, EDP: 1.985 A
Rsense: 0.003 Ohm
Vsense: 5.955 mV, Range: 2.5A
SPMU: AMUX_B3, 8ms



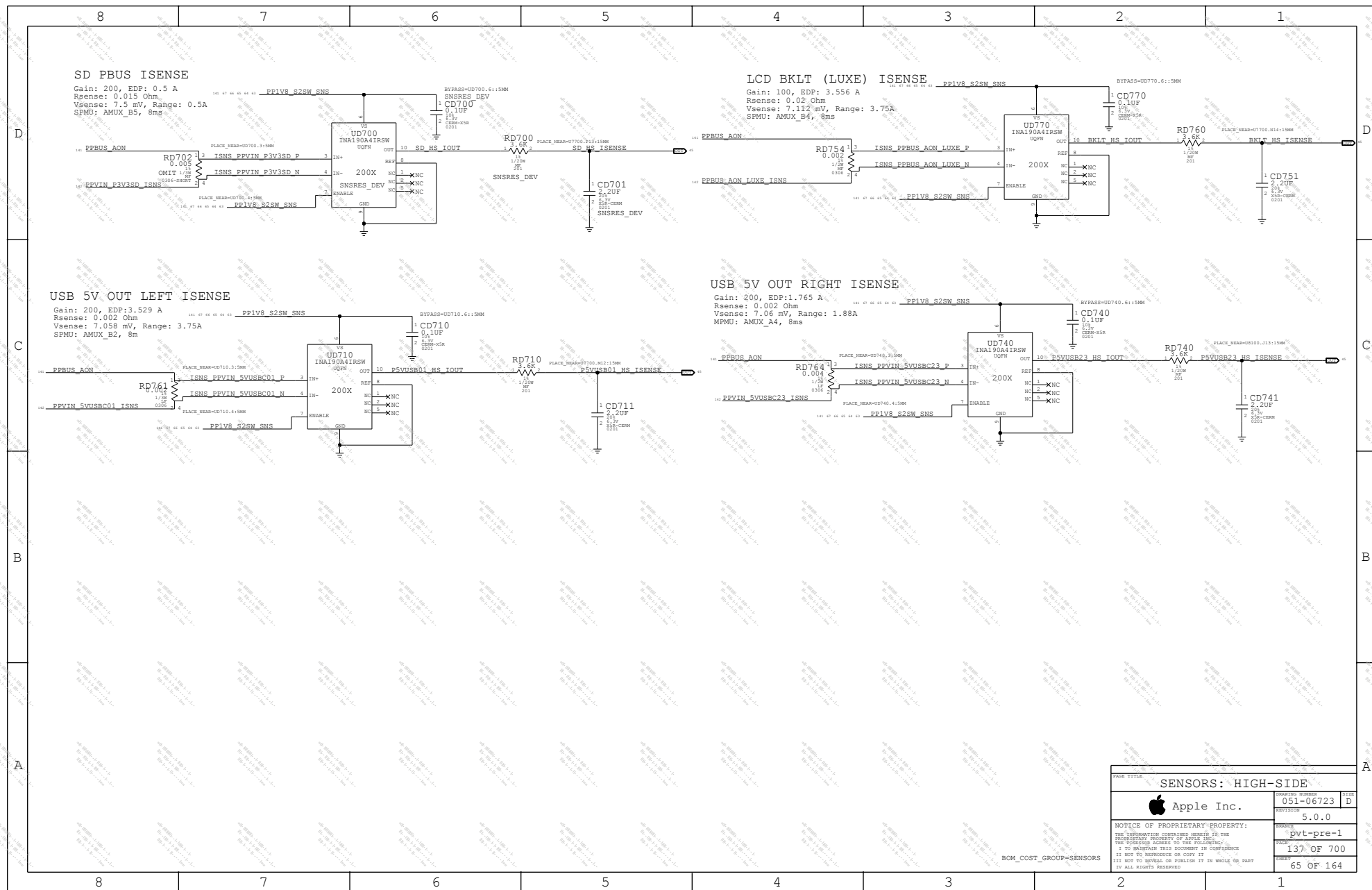
LEFT SPKRAMP PBUS ISENSE

Gain: 200, EDP: 9A
Rsense: 0.0075 Ohm
Vsense: 6.75 mV, Range: 10A
SPMU: AMUX_A4, 8ms



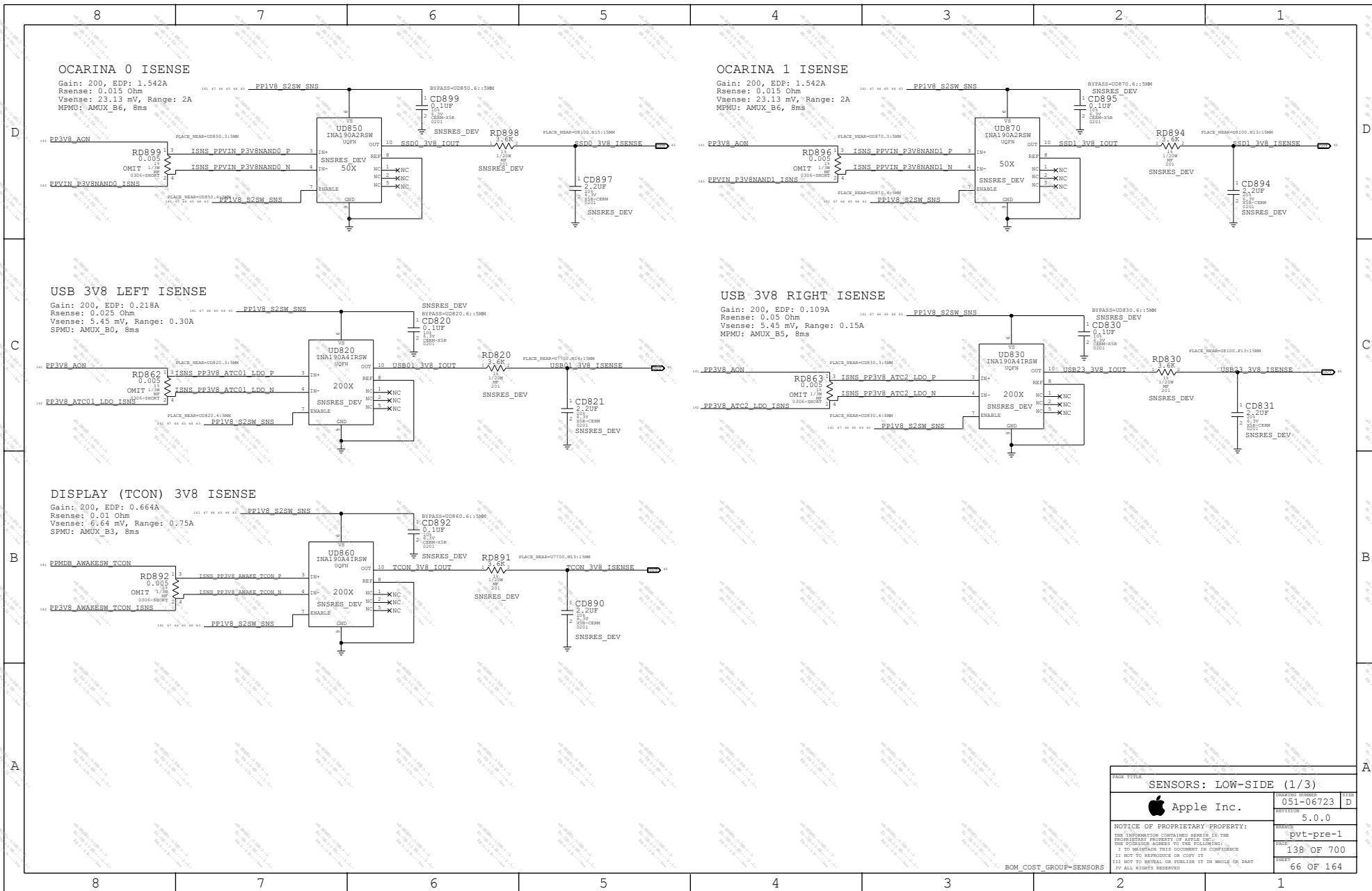
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BCM_COST_GROUP-SENSORS



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BCM_COST_GROUP=SENSORS

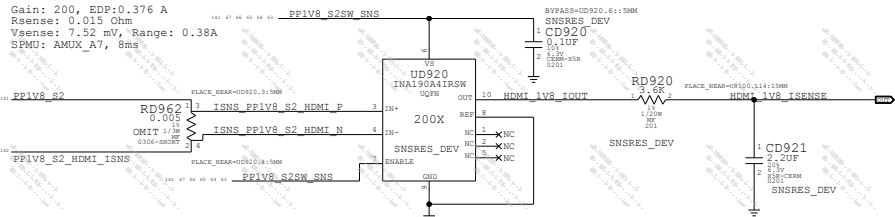


PAGE TITLE		SENSORS: LOW-SIDE (1/3)	
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DRAWING		5.0.0	
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BCM_COST_GROUP-SENSORS

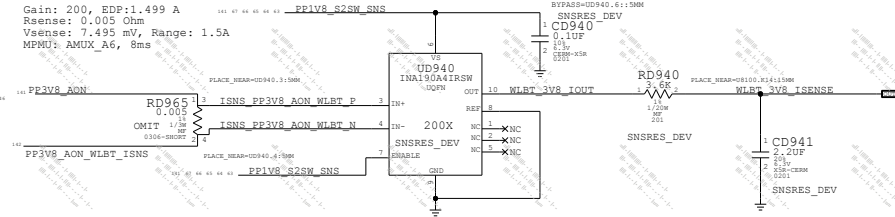
HDMI 1V8 ISENSE

Gain: 200, EDP: 0.376 A
Rsense: 0.015 Ohm
Vsense: 7.52 mV, Range: 0.38A
SPMU: AMUX_A7, 8ms



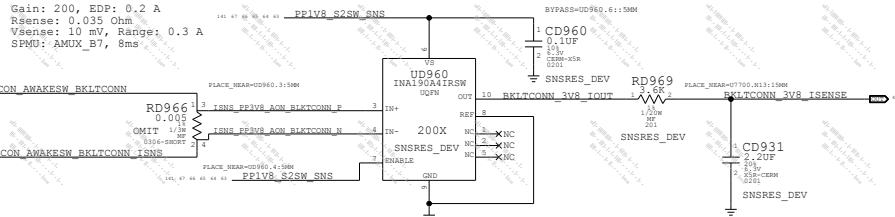
WLAN BT 3V8 ISENSE

Gain: 200, EDP: 1.499 A
Rsense: 0.005 Ohm
Vsense: 7.495 mV, Range: 1.5A
MPMU: AMUX_A6, 8ms



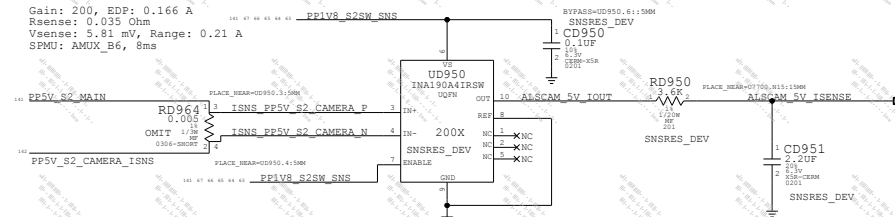
DISPLAY BACKLIGHT 3V8 ISENSE

Gain: 200, EDP: 0.2 A
Rsense: 0.035 Ohm
Vsense: 10 mV, Range: 0.3 A
SPMU: AMUX_B7, 8ms



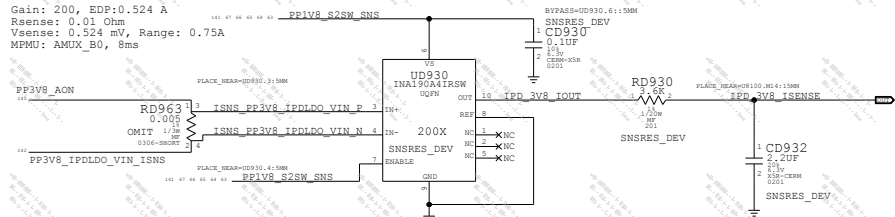
CAMERA 5V ISENSE

Gain: 200, EDP: 0.166 A
Rsense: 0.035 Ohm
Vsense: 5.81 mV, Range: 0.21 A
SPMU: AMUX_B6, 8ms



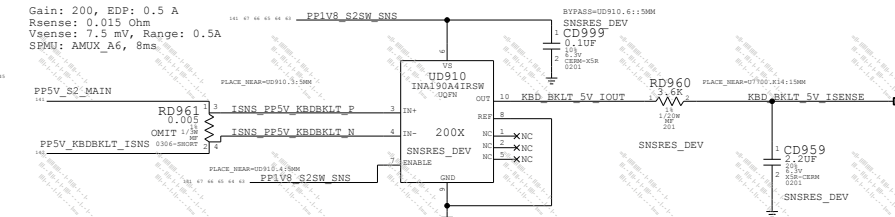
IPD 3V8 ISENSE

Gain: 200, EDP: 0.524 A
Rsense: 0.01 Ohm
Vsense: 0.524 mV, Range: 0.75A
MPMU: AMUX_B0, 8ms



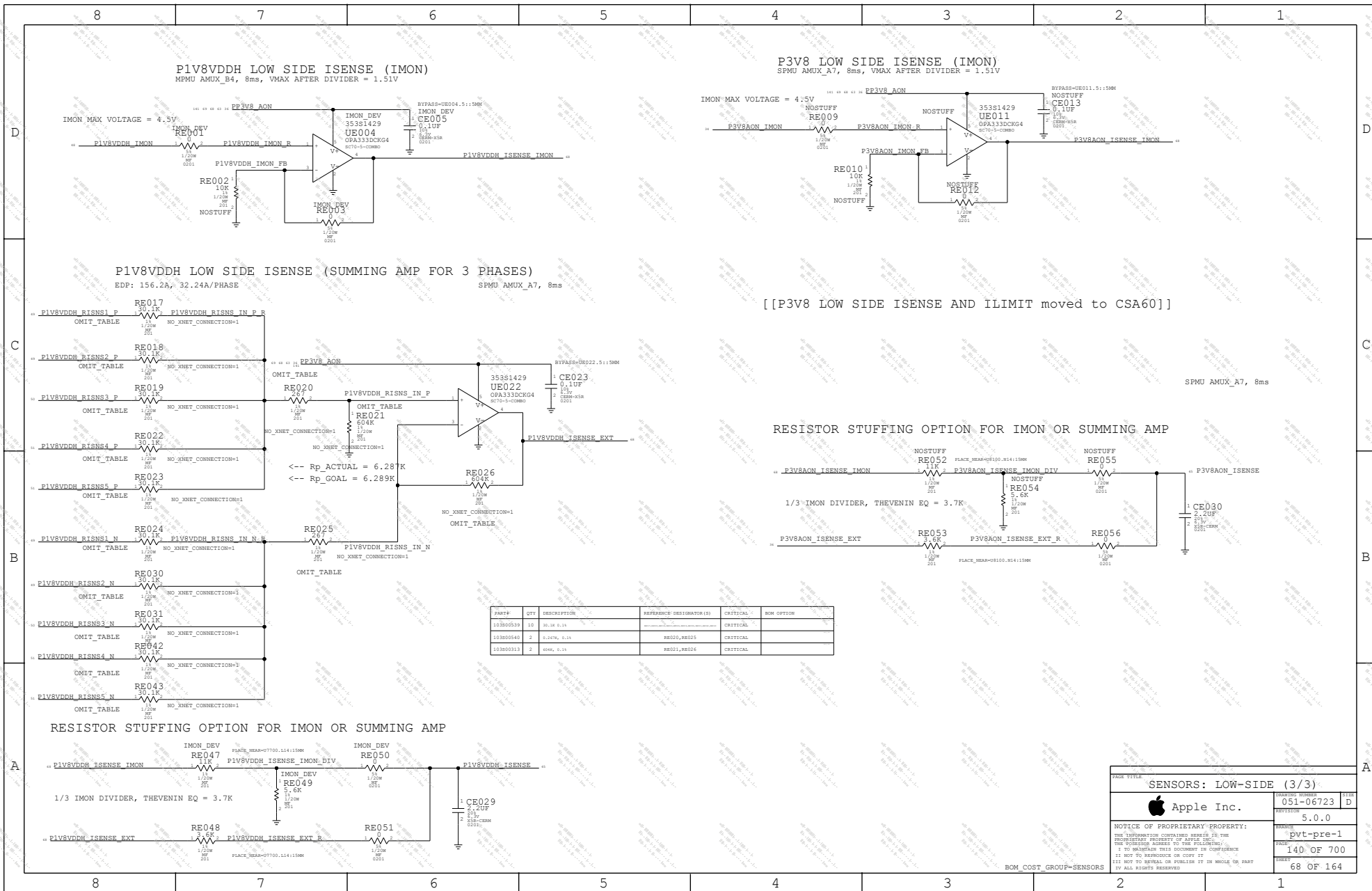
KBD BACKLIGHT ISENSE

Gain: 200, EDP: 0.5 A
Rsense: 0.015 Ohm
Vsense: 7.5 mV, Range: 0.5A
SPMU: AMUX_A6, 8ms

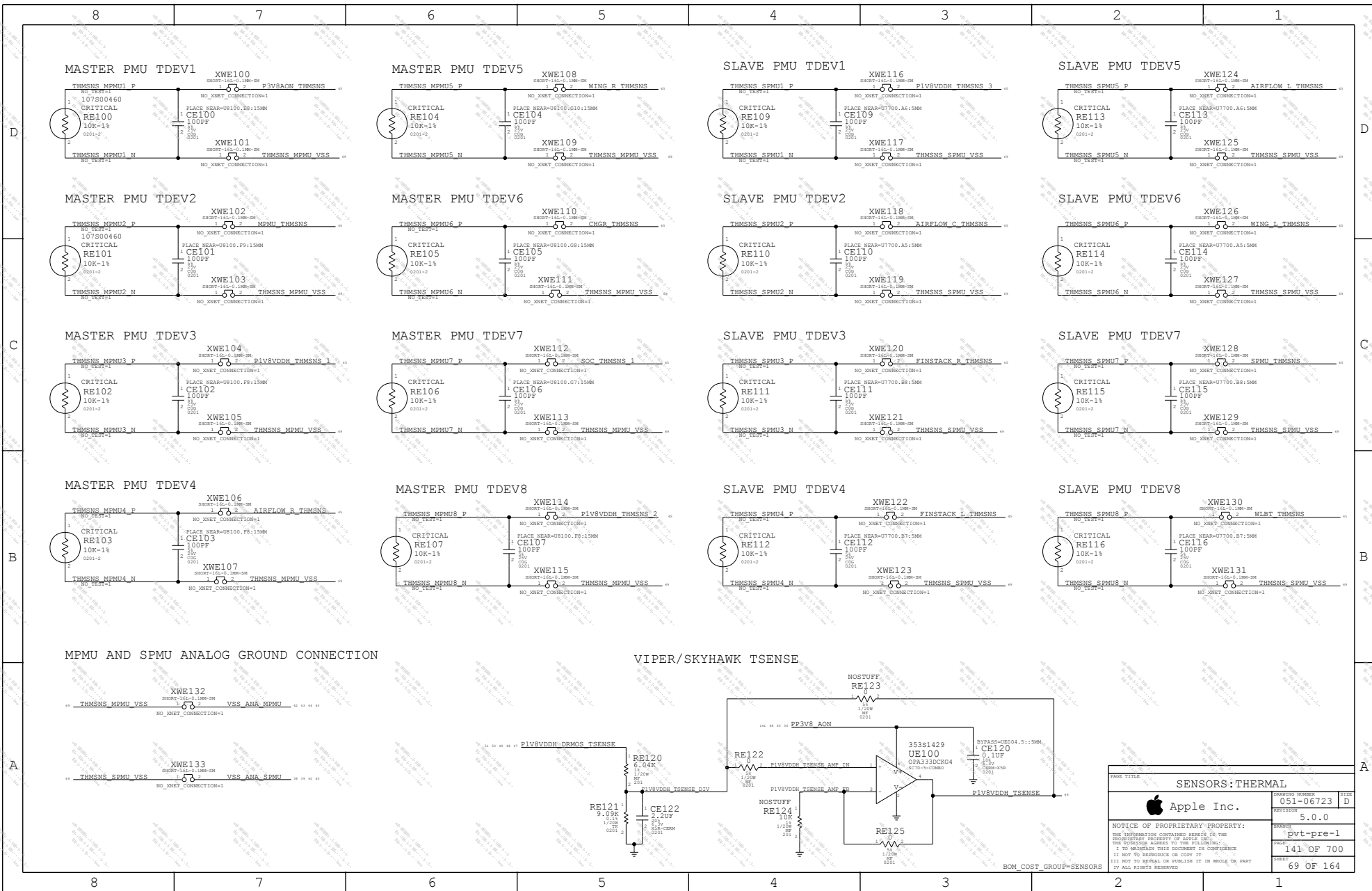


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		SHEET	67 OF 164

BCM_COST_GROUP-SENSORS



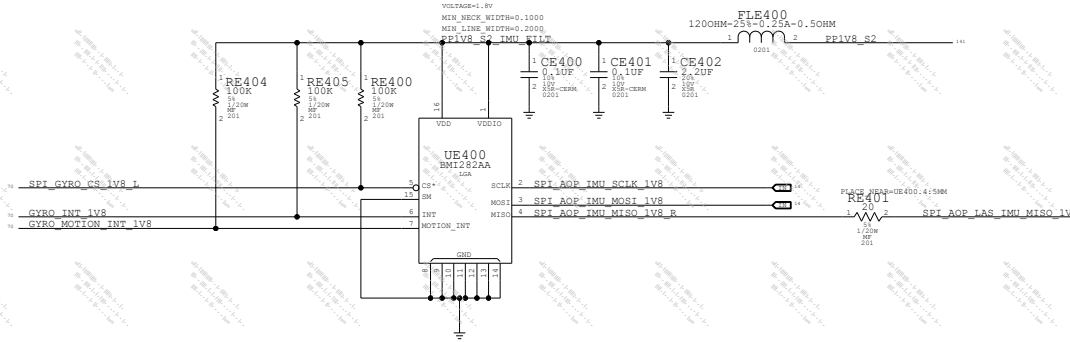
PAGE TITLE		
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	PAGE	140 OF 700
	SHEET	68 OF 164



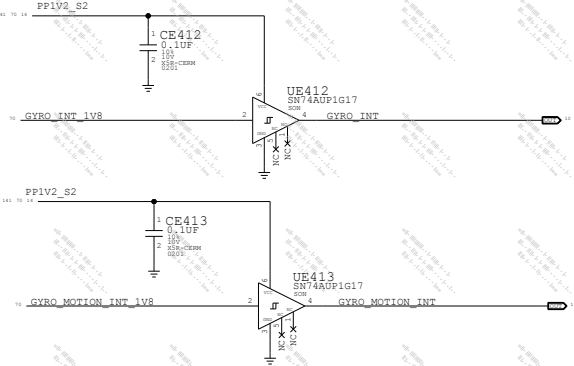
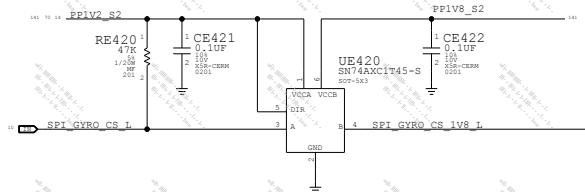
PAGE TITLE		
SENSORS:THERMAL		
Apple Inc.	SHOOTING NUMBER	051-06723
	REVISION	5.0.0
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	PAGE	141 OF 700
SHEET		69 OF 164

KOBOL: ACCEL & GYRO

FERRITE IS PLACEHOLDER ONLY
J417 USES 1555S0686 (01005)
MUST FIND PROPER PART, IF ONE IS NEEDED AT ALL



SPI LEVEL TRANSLATION

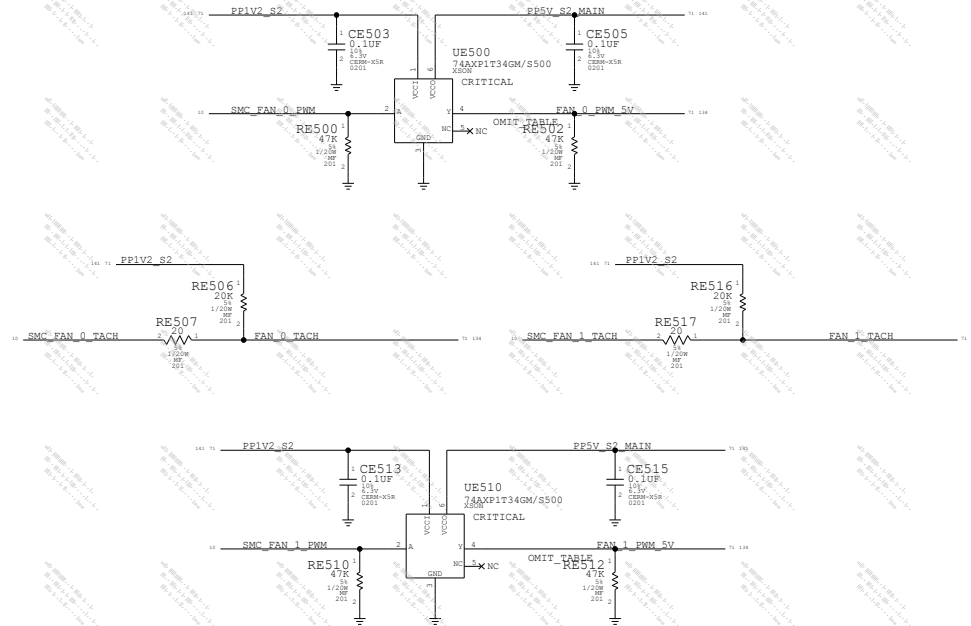


PAGE TITLE			
SENSORS: MOTION			
Apple Inc.	051-06723	5.0.0	1
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70	OF	164	1

BCM_COST_GROUP-SENSORS

FAN CONTROLLERS

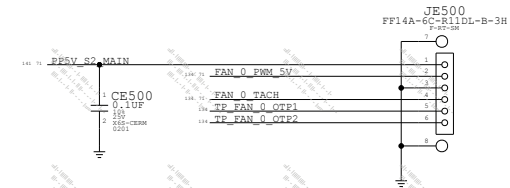
FAN PWM LEVEL SHIFTER



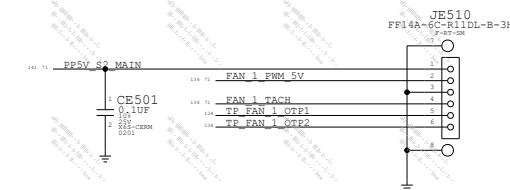
PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
11780104	2	RES,MP,1/20W,4.7K OHM,5,0201,SMC	RE502,RE512		

*DUMMY FAN TO PLUG INTO EITHER POR FAN CONNECTORS JE500 OR JE510

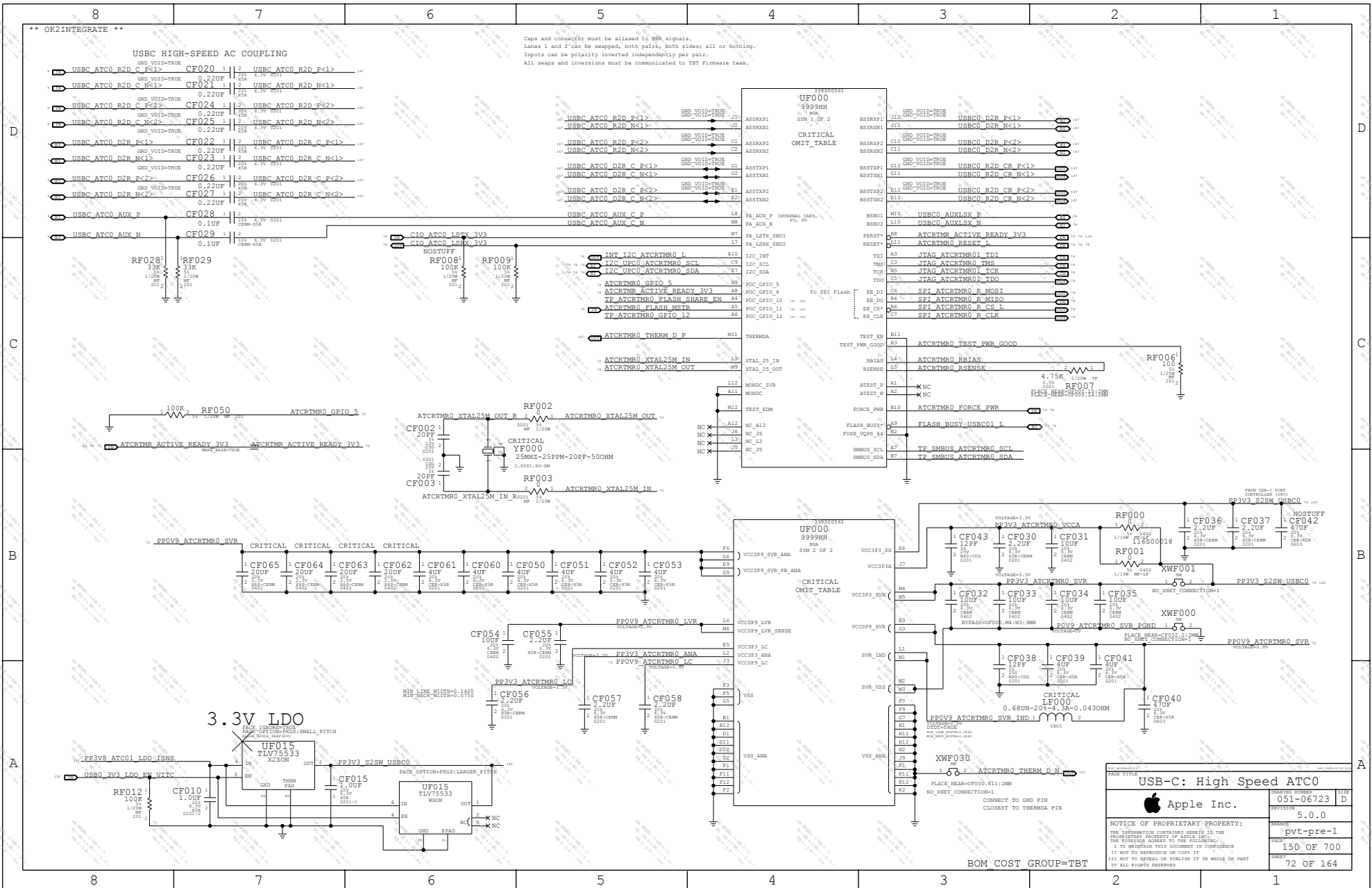
PWM FAN0 (LEFT) CONNECTOR



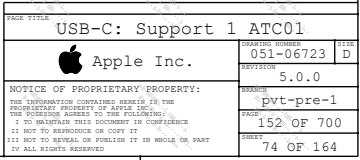
PWM FAN1 (RIGHT) CONNECTOR

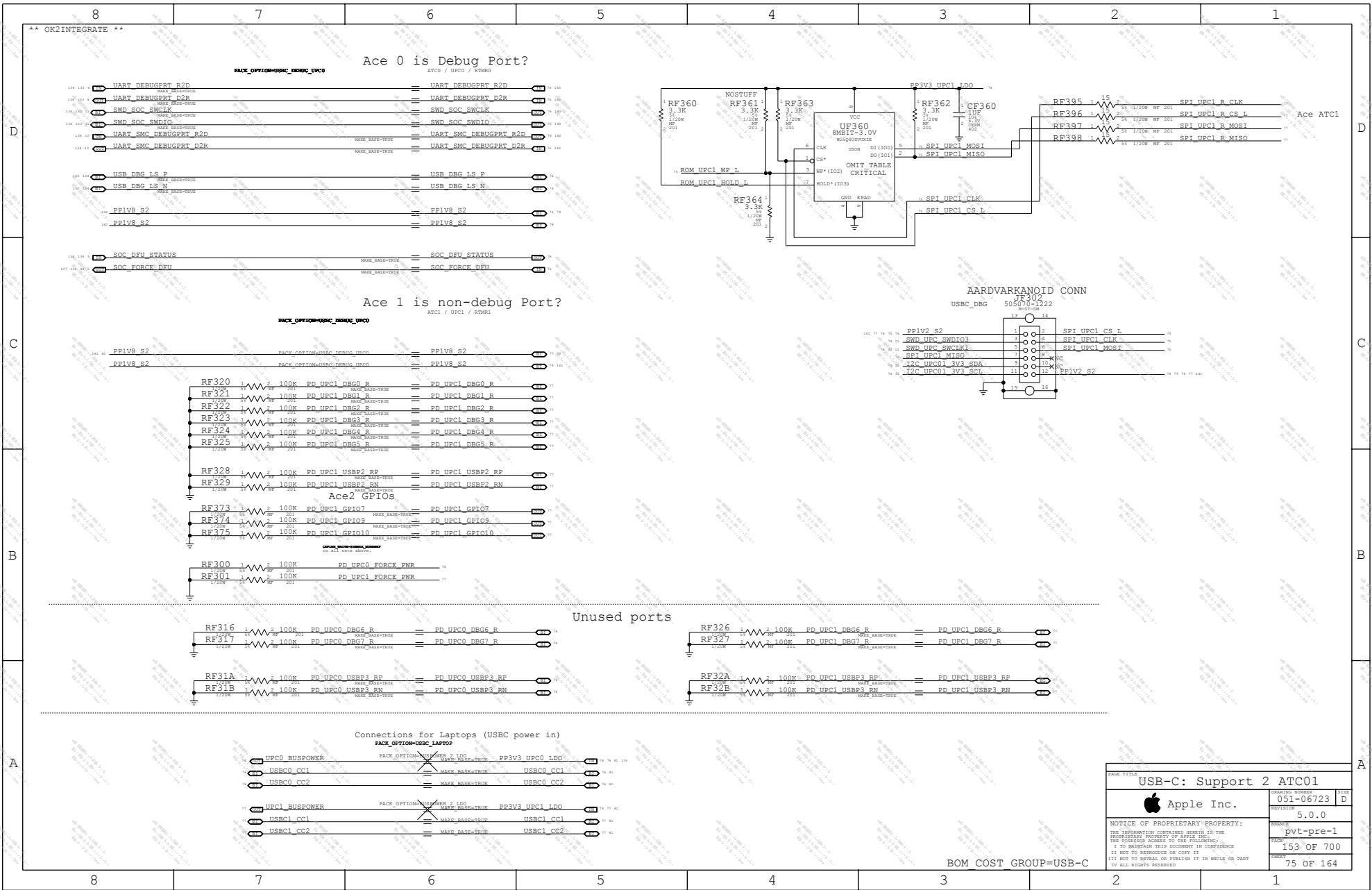


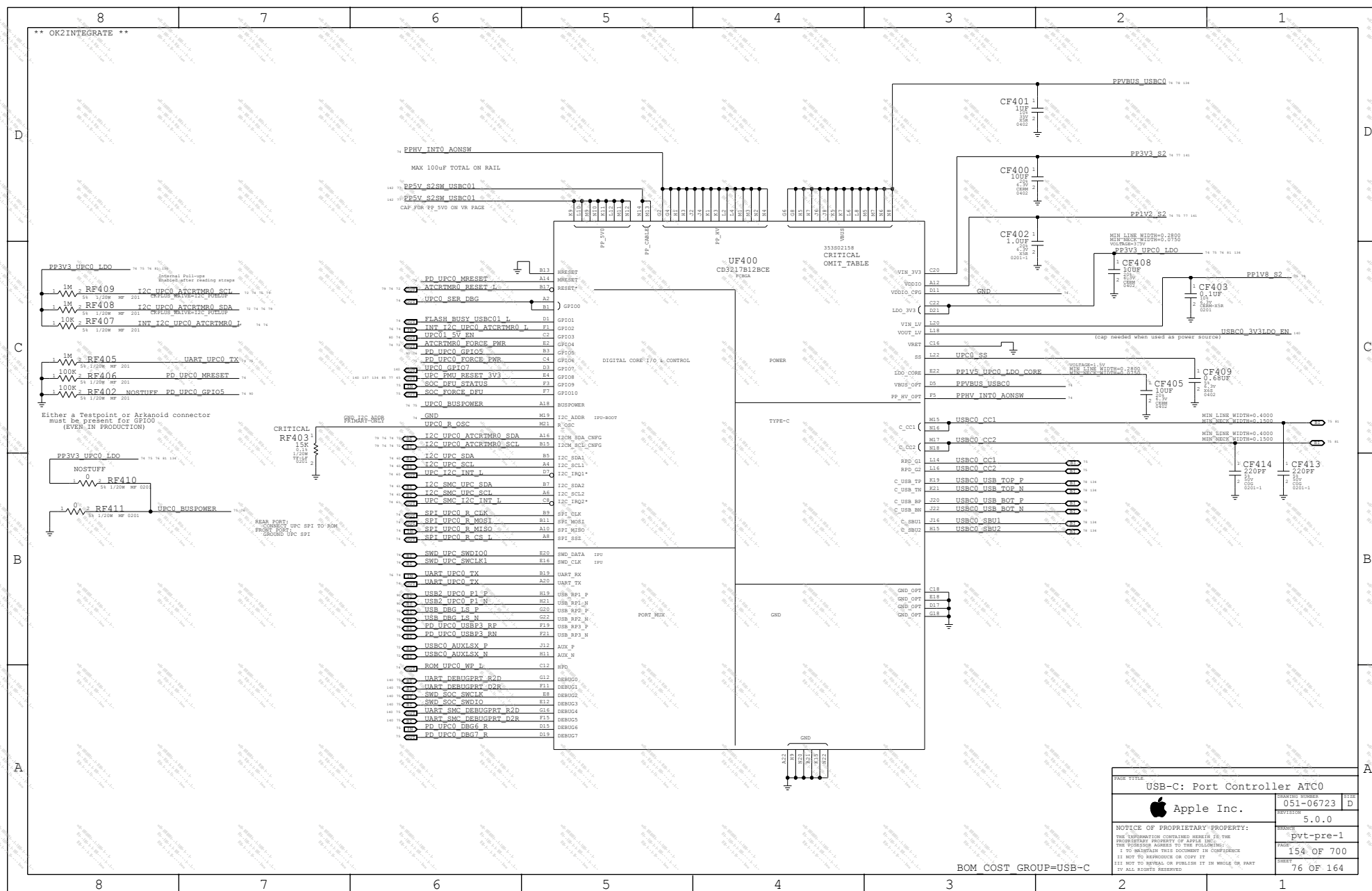
FANS			
Apple Inc.	051-06723	051-06723	051-06723
	5.0.0	5.0.0	5.0.0
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BOM_COST_GROUP=FANS		71 OF 164	



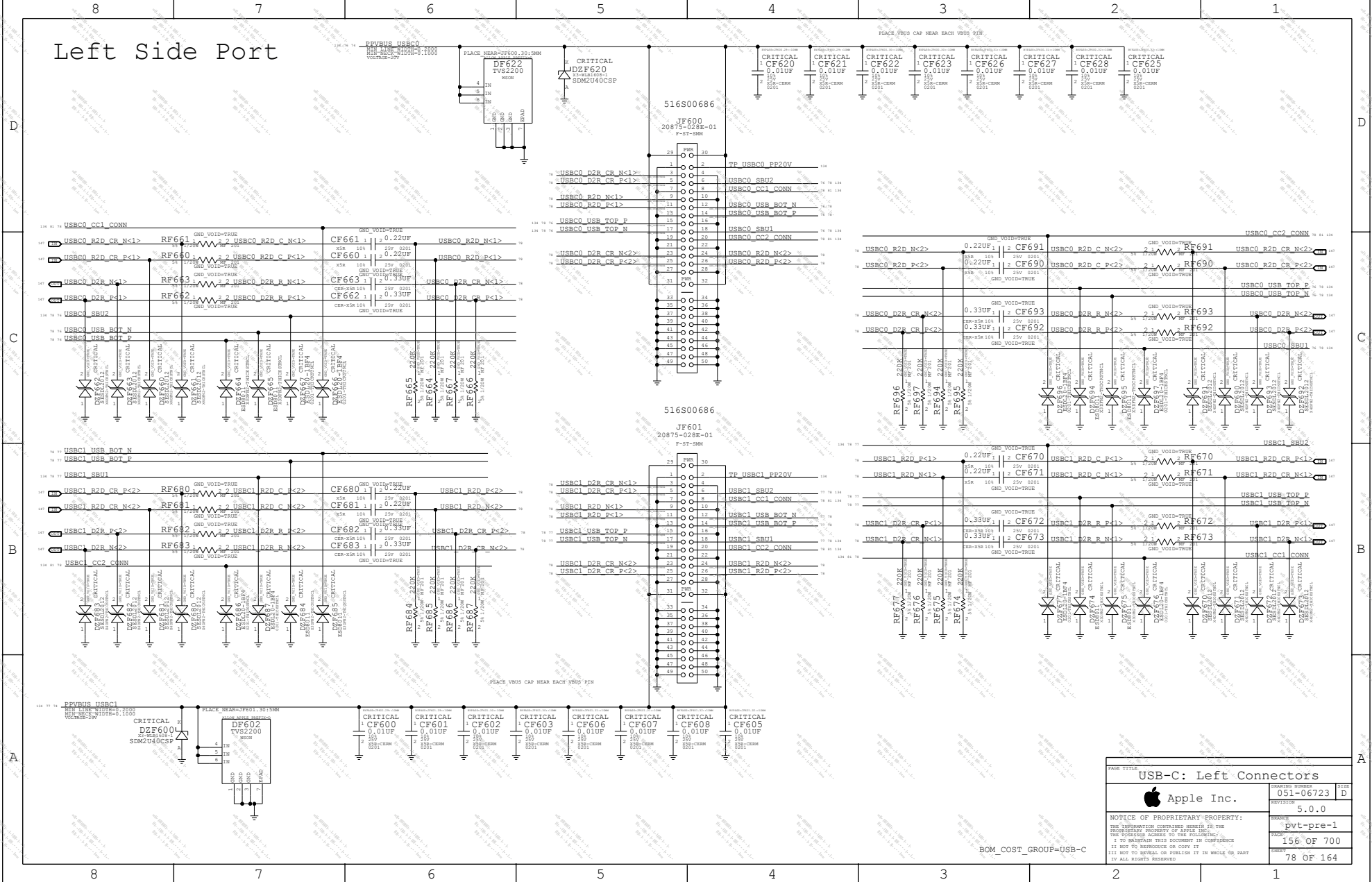
USB-C: High Speed ATC0		
Apple Inc.		
051-06723	5.0.0	
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150 OF 700		
72 OF 164		







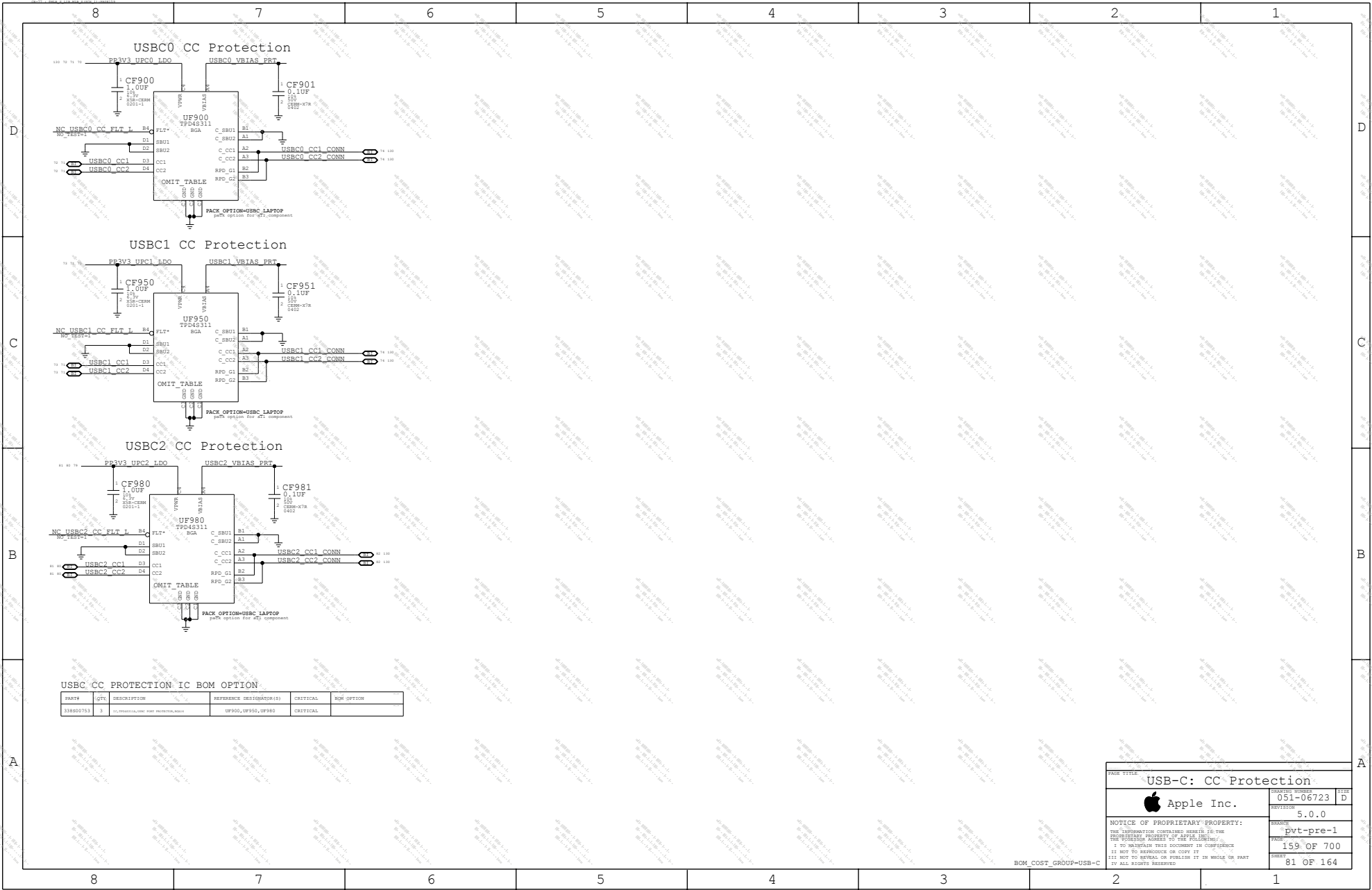
Left Side Port



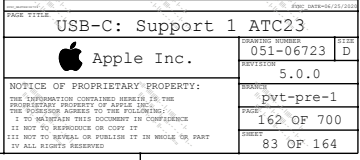
PAGE TITLE			
USB-C: Left Connectors			
Apple Inc.		REVISED NUMBER	051-06723
		REVISION	5.0.0
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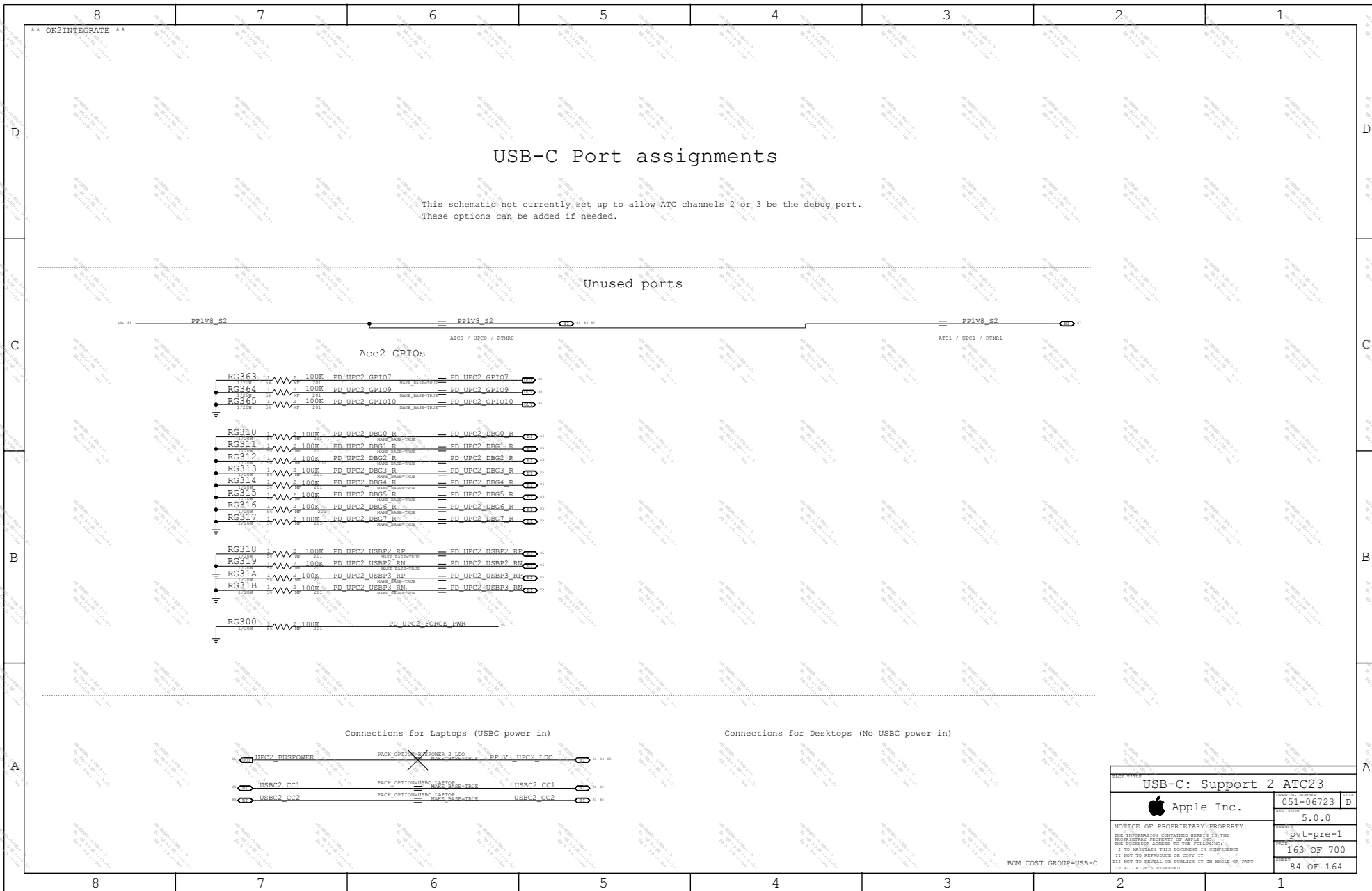
BOM_COST_GROUP=USB-C

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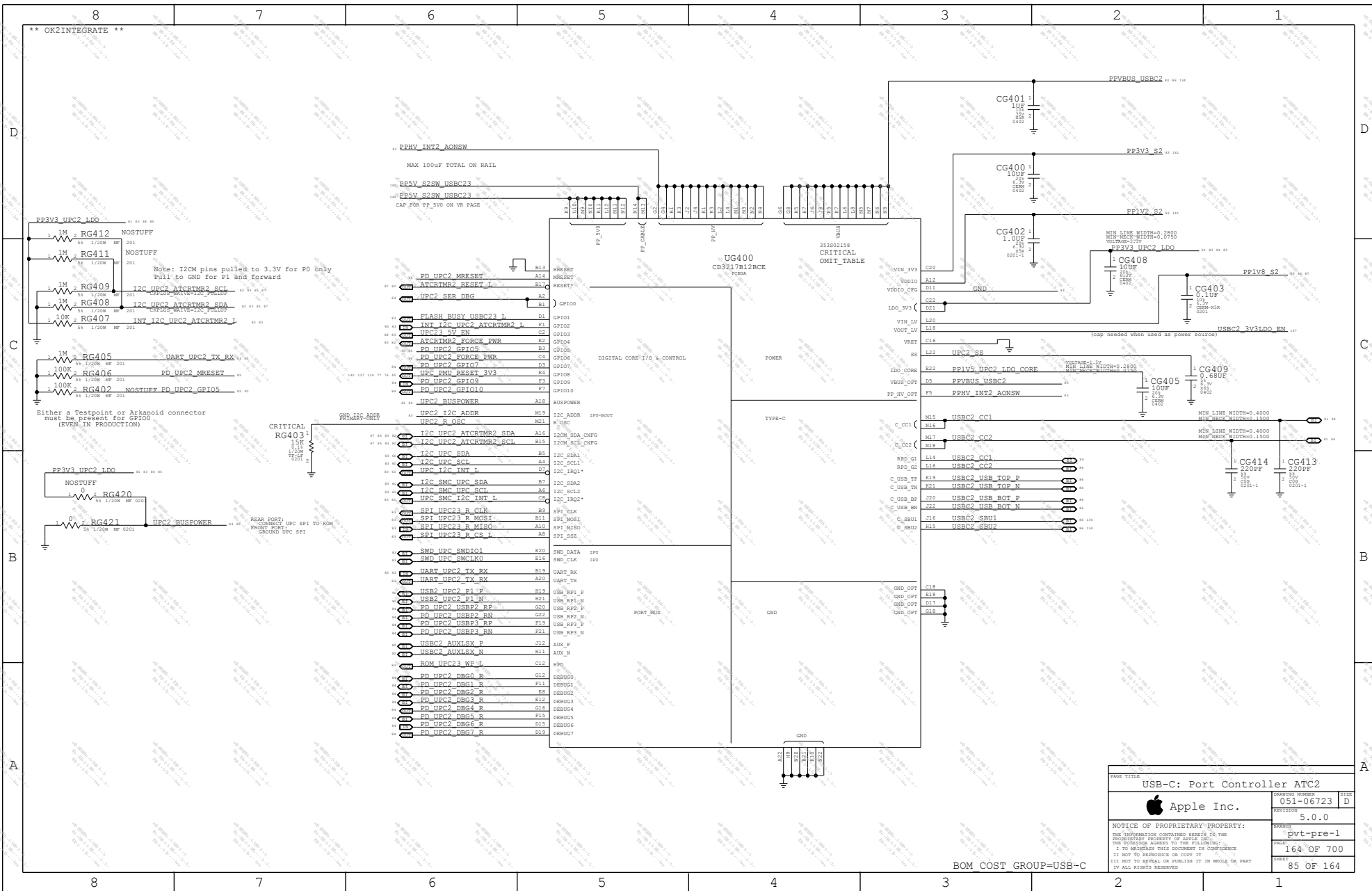


PAGE TITLE		USB-C: CC Protection	
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PAGE		159 OF 700	
PAGE		81 OF 164	





PAGE TITLE		USB-C: Support 2 ATC23
Apple Inc.		051-06723
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PAGE TITLE		051-06723	5.0.0
USB-C: Port Controller ATC2		164 OF 700	85 OF 164
Apple Inc.		164 OF 700	85 OF 164
NOTICE OF PROPRIETARY PROPERTY:		164 OF 700	85 OF 164
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IN ANY MANNER WITHOUT THE WRITTEN		164 OF 700	85 OF 164
CONSENT OF APPLE INC.		164 OF 700	85 OF 164
IT IS NOT TO BE REPRODUCED OR COPIED		164 OF 700	85 OF 164
IN ANY MANNER WITHOUT THE WRITTEN		164 OF 700	85 OF 164
CONSENT OF APPLE INC.		164 OF 700	85 OF 164

Right Side Port

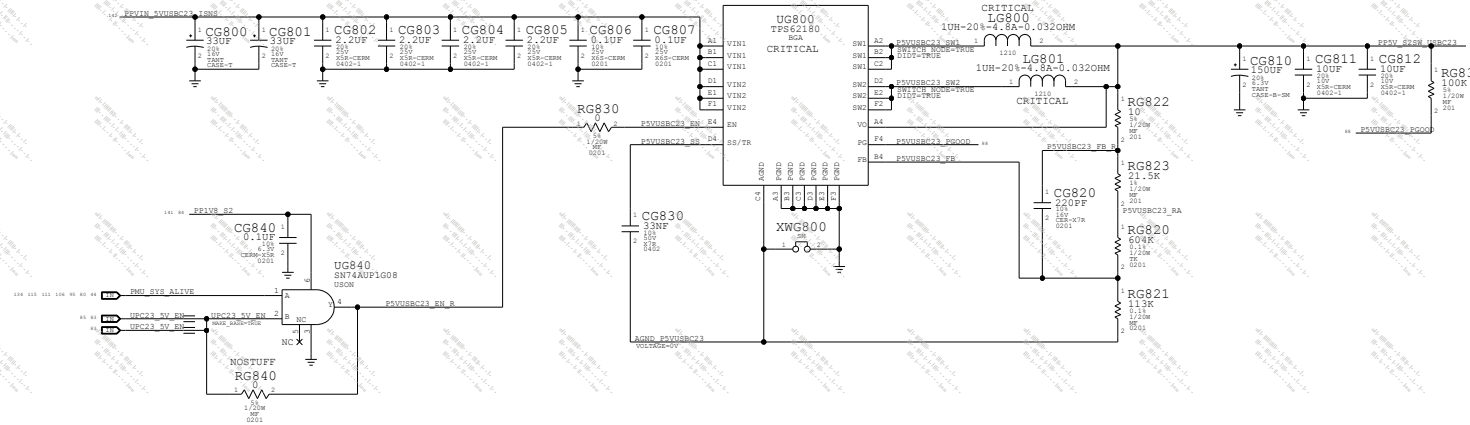
USB-C: Right Connector

BOM

Part	Description	Quantity
516S00686	USB-C Controller	1
CG620	Capacitor	1
CG621	Capacitor	1
CG622	Capacitor	1
CG623	Capacitor	1
CG626	Capacitor	1
CG627	Capacitor	1
CG625	Capacitor	1
RG661	Resistor	1
RG660	Resistor	1
RG663	Resistor	1
RG662	Resistor	1
RG665	Resistor	1
RG664	Resistor	1
RG667	Resistor	1
RG666	Resistor	1

*** OK2 INTEGRATE ***

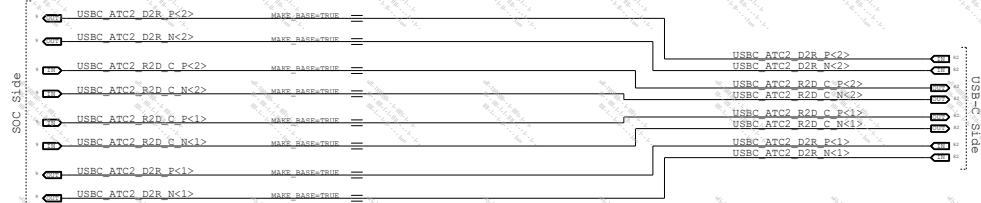
Vout = 5.23V
Freq = 1.9-2.0MHz
OCP Max = 9A
OCP Nom = 7A
OCP Min = 4A
Icc Max = 3.3A



PAGE TITLE		
USB-C: 5V Regulator		
Apple Inc.		051-06723
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PAGE		88 OF 164
SHEET		

BOM_COST_GROUP=USB-C

*** In Progress ***

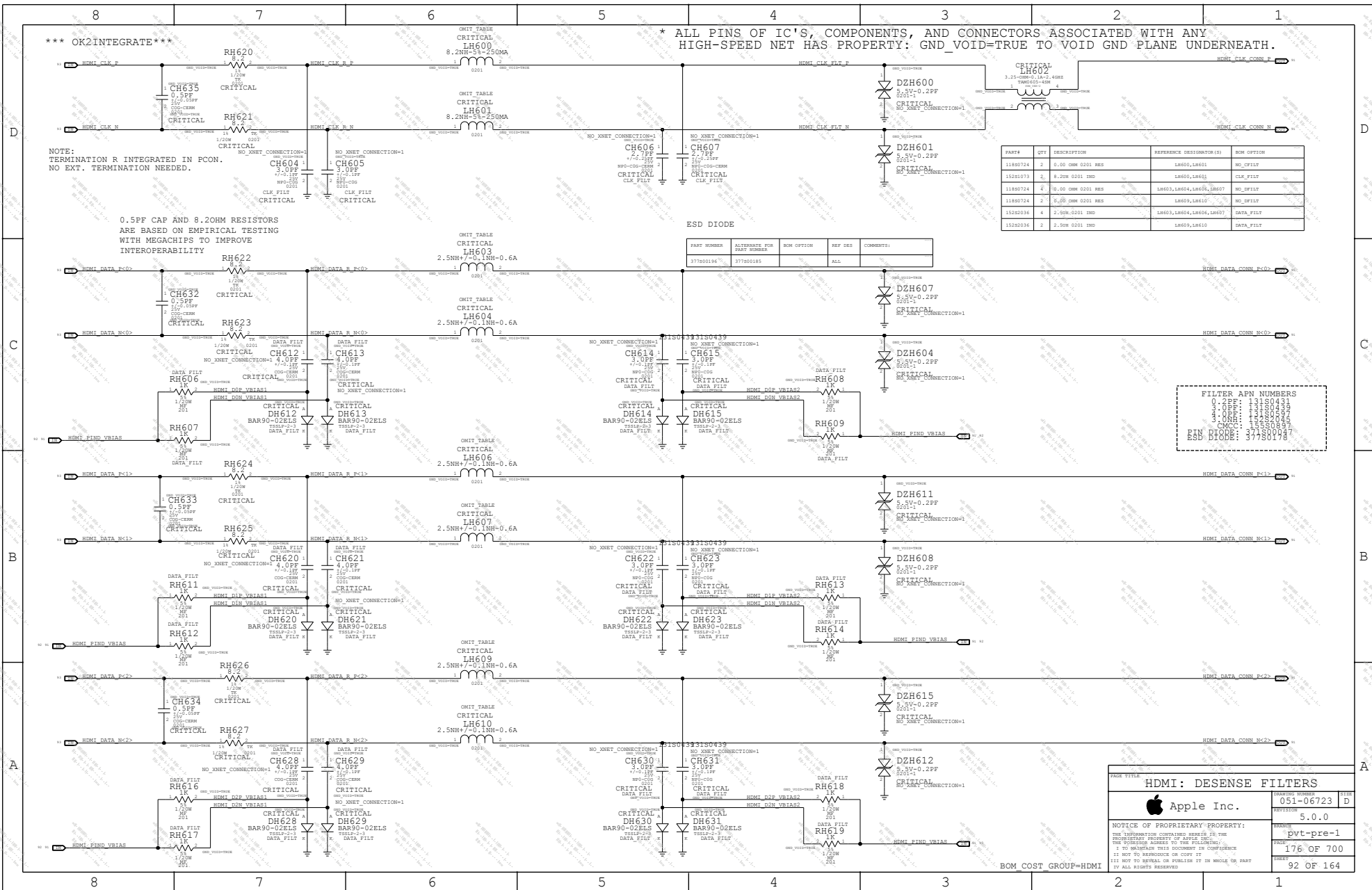


ATC3 Redriver still in progress
Circuit will be identical to that of ATC2

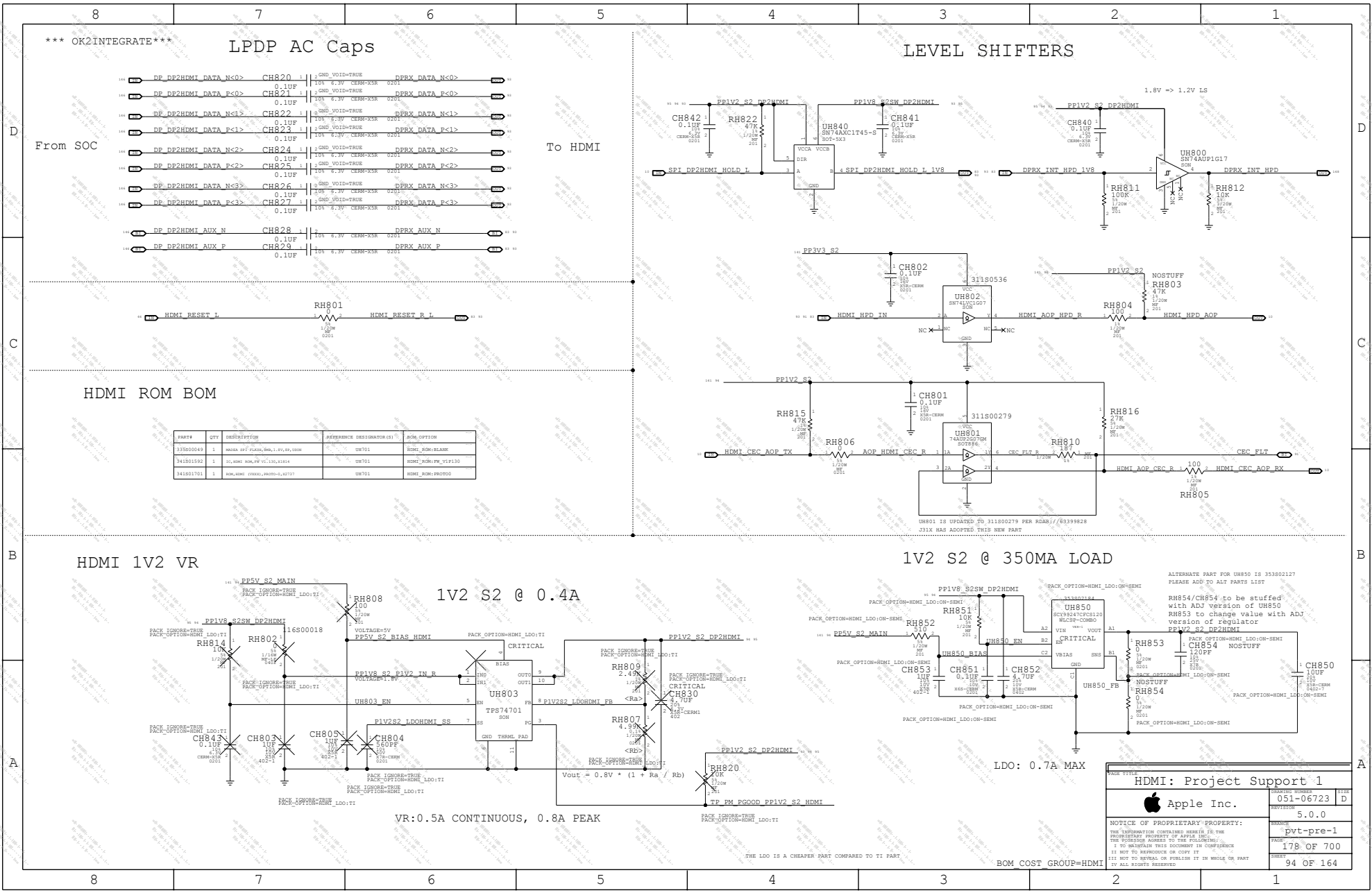
USB-C: CIO Redrivers 2/3

PAGE TITLE		051-06723	5.0.0
Apple Inc.		PROVISION	D
NOTICE OF PROPRIETARY PROPERTY:		REVISION	Dvt-pre-1
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BCM_COST_GROUP=USB-C



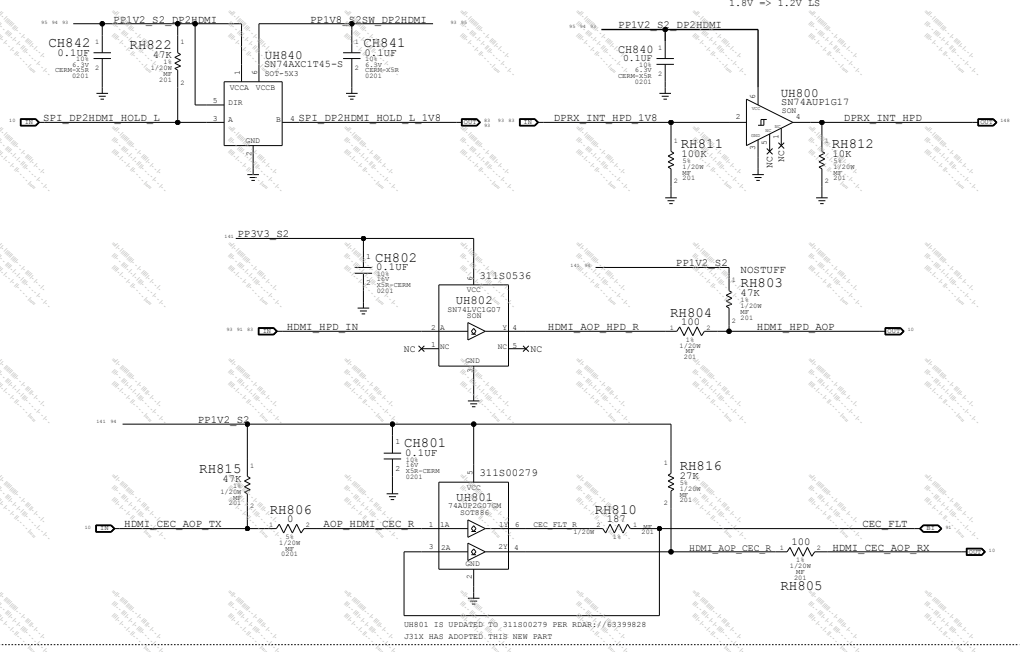
PAGE TITLE		
HDMI: DESENSE FILTERS		
Apple Inc.		
SHOOTING NUMBER	051-06723	FILE D
REVISION	5.0.0	
BRANCH	Dvt-pre-1	
PAGE	176 OF 700	
SHEET	92 OF 164	



LPDP AC Caps

DP_DP2HDMI_DATA_N<0>	CH820	1	10K 5.0V CER&P-XSR 0201	DP2HDMI_DATA_N<0>	CH820	1	10K 5.0V CER&P-XSR 0201
DP_DP2HDMI_DATA_P<0>	CH821	1	10K 5.0V CER&P-XSR 0201	DP2HDMI_DATA_P<0>	CH821	1	10K 5.0V CER&P-XSR 0201
DP_DP2HDMI_DATA_N<1>	CH822	1	10K 5.0V CER&P-XSR 0201	DP2HDMI_DATA_N<1>	CH822	1	10K 5.0V CER&P-XSR 0201
DP_DP2HDMI_DATA_P<1>	CH823	1	10K 5.0V CER&P-XSR 0201	DP2HDMI_DATA_P<1>	CH823	1	10K 5.0V CER&P-XSR 0201
DP_DP2HDMI_DATA_N<2>	CH824	1	10K 5.0V CER&P-XSR 0201	DP2HDMI_DATA_N<2>	CH824	1	10K 5.0V CER&P-XSR 0201
DP_DP2HDMI_DATA_P<2>	CH825	1	10K 5.0V CER&P-XSR 0201	DP2HDMI_DATA_P<2>	CH825	1	10K 5.0V CER&P-XSR 0201
DP_DP2HDMI_DATA_N<3>	CH826	1	10K 5.0V CER&P-XSR 0201	DP2HDMI_DATA_N<3>	CH826	1	10K 5.0V CER&P-XSR 0201
DP_DP2HDMI_DATA_P<3>	CH827	1	10K 5.0V CER&P-XSR 0201	DP2HDMI_DATA_P<3>	CH827	1	10K 5.0V CER&P-XSR 0201
DP_DP2HDMI_AUX_N	CH828	1	10K 5.0V CER&P-XSR 0201	DP2HDMI_AUX_N	CH828	1	10K 5.0V CER&P-XSR 0201
DP_DP2HDMI_AUX_P	CH829	1	10K 5.0V CER&P-XSR 0201	DP2HDMI_AUX_P	CH829	1	10K 5.0V CER&P-XSR 0201

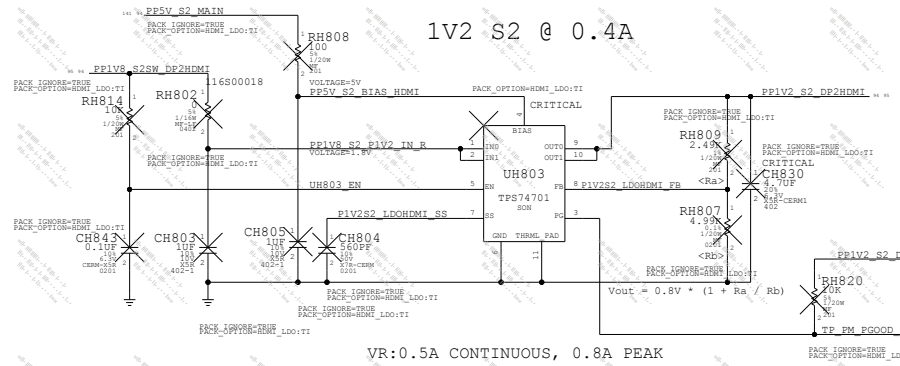
LEVEL SHIFTERS



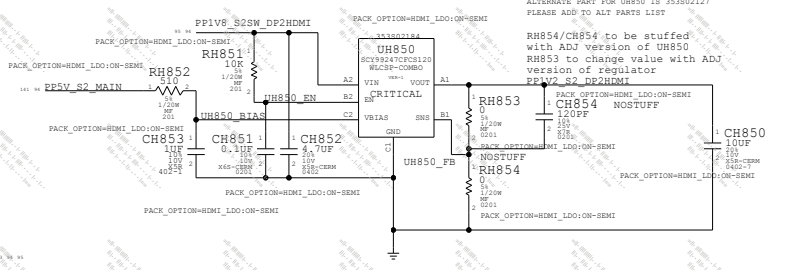
HDMI ROM BOM

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	ROM_OPTION
33500049	1	ROM, 4K, 1.5V, 1.5V, 1.5V, 1.5V	UH801	ROM_OPTION=BLANK
34150152	1	UH801 ROM, FW V1.130, X1314	UH801	HDMI_ROM_FW_V1P130
341501701	1	ROM, ROM (FW), FW V1.130, X1314	UH801	HDMI_ROM_FW_V1P130

HDMI 1V2 VR



1V2 S2 @ 350MA LOAD



Apple Inc.

Apple logo

HDMI: Project Support 1

051-06723

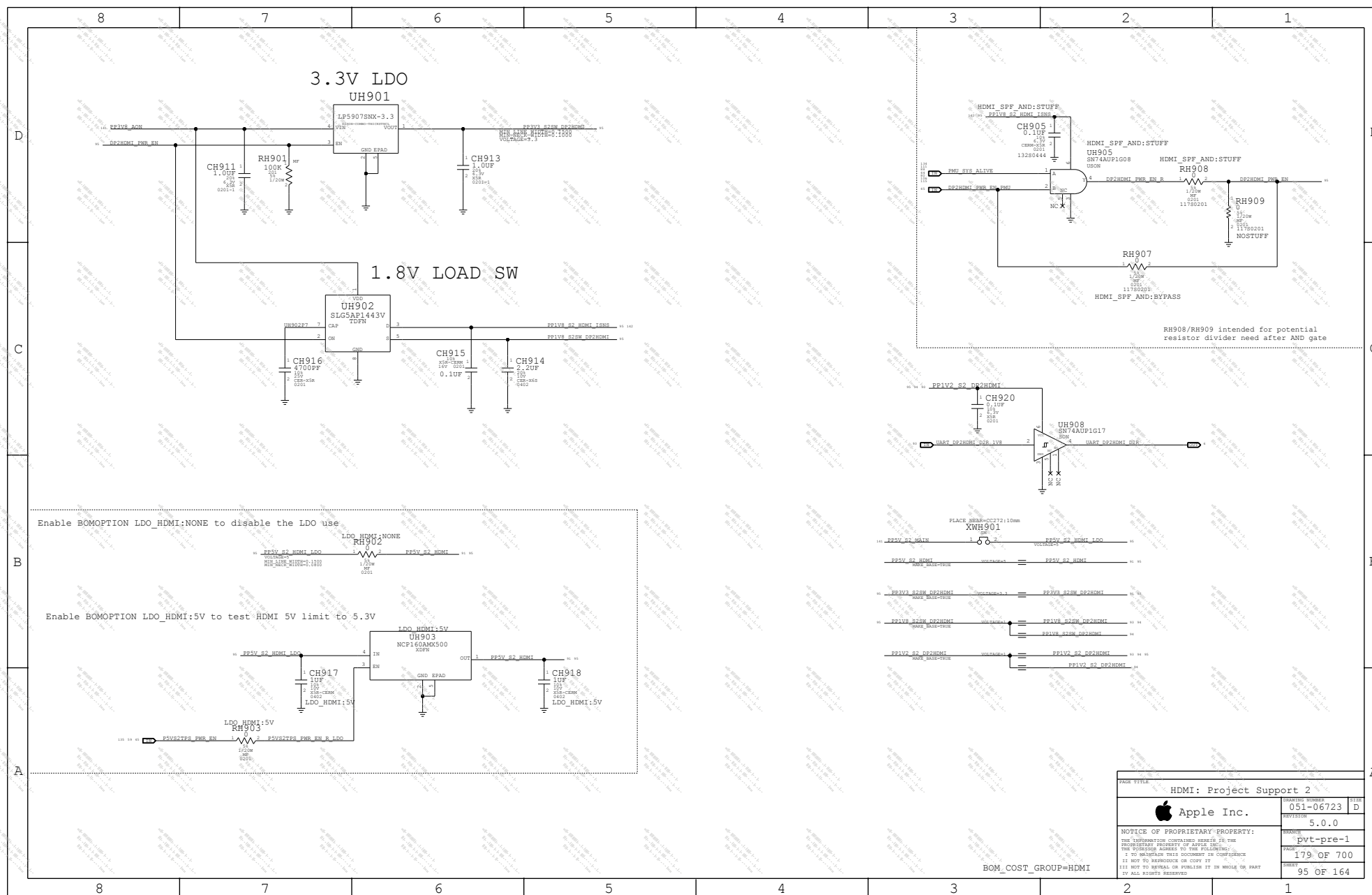
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178 OF 700

94 OF 164

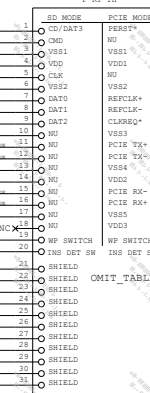
THE LDO IS A CHEAPER PART COMPARED TO TI PART

BOM COST GROUP=HDMI

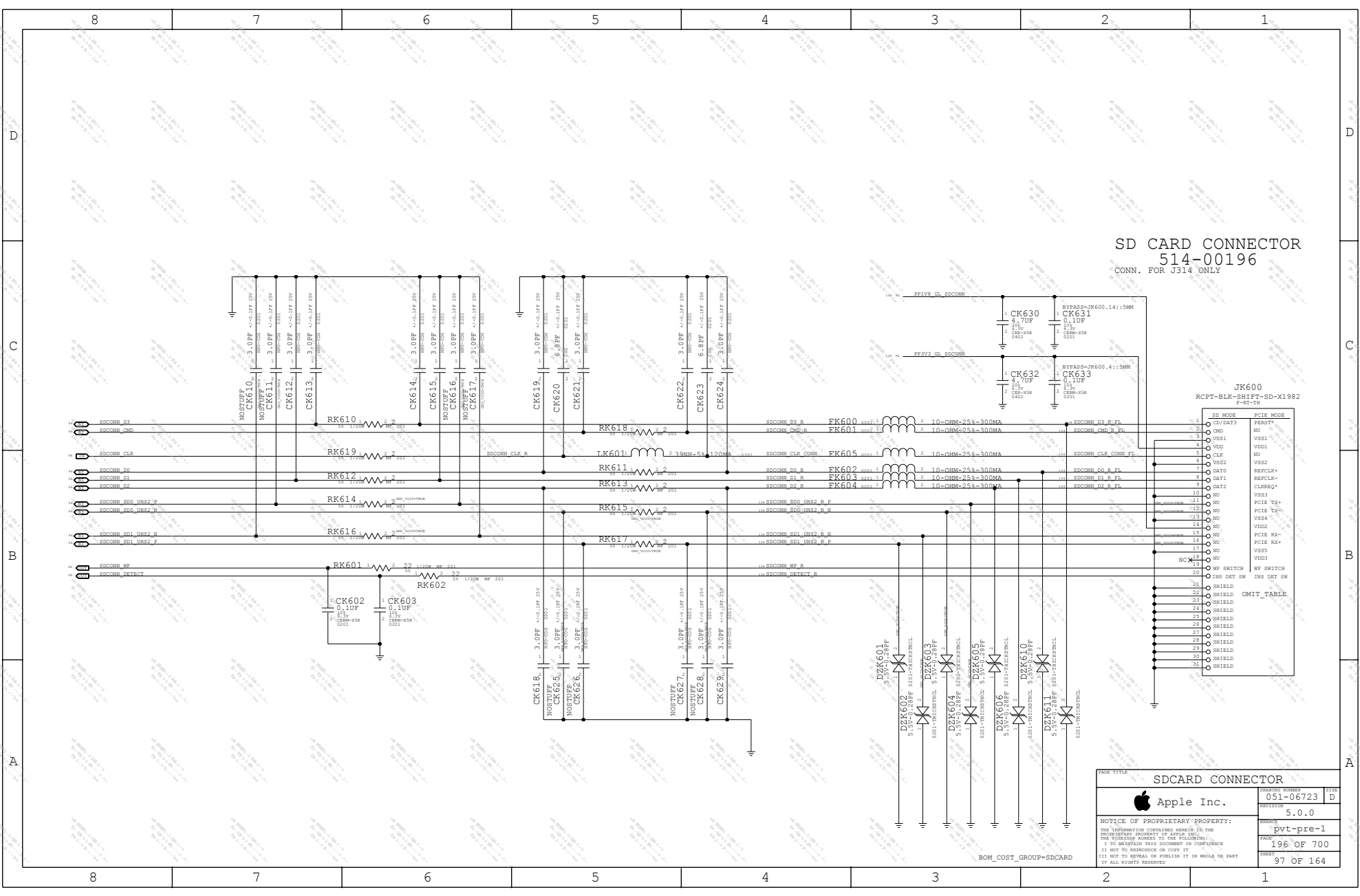


SD CARD CONNECTOR
514-00196
CONN. FOR J314 ONLY

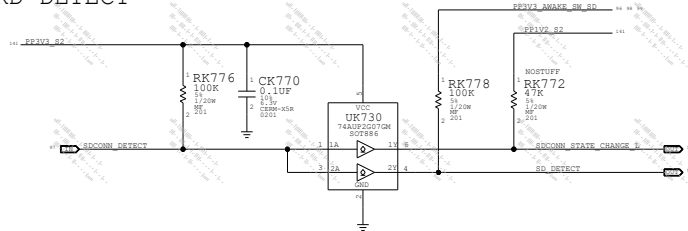
JK600
RCPT-BLK-SHIFT-SD-X1982
F-07-78



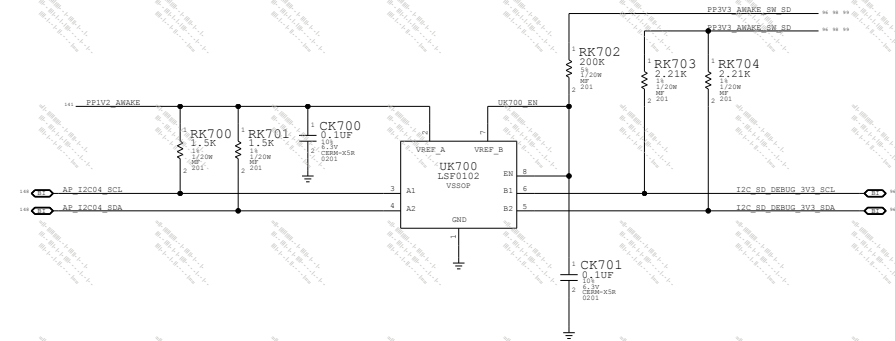
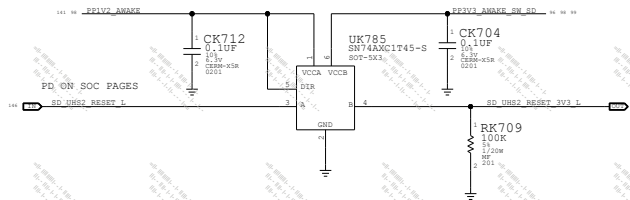
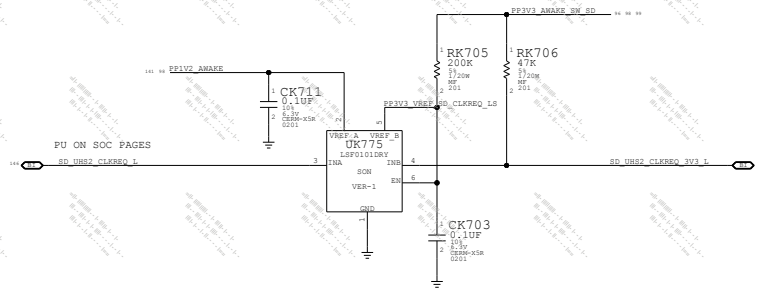
PAGE TITLE		
SDCARD CONNECTOR		
Apple Inc.	REVISED NUMBER	051-06723
	REVISION	5.0.0
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	PAGE	196 OF 700
SHEET		
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CARD DETECT

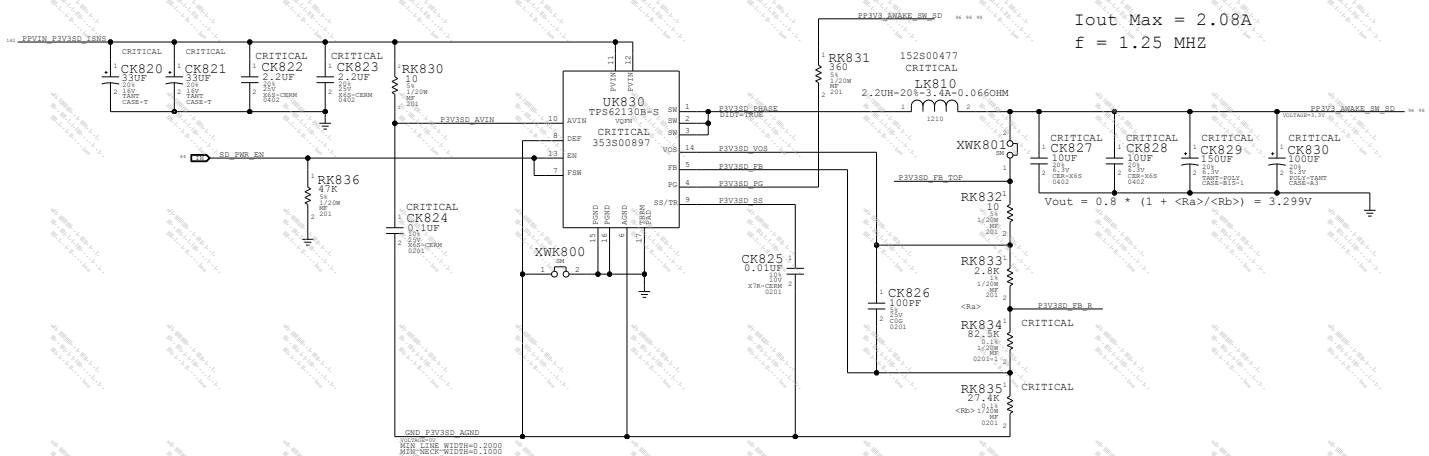


CONTROLLER IO



PAGE TITLE			
SDCARD IO LS/BUF SUPPORT			
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PAGE		197 OF 700	
SHEET		98 OF 164	

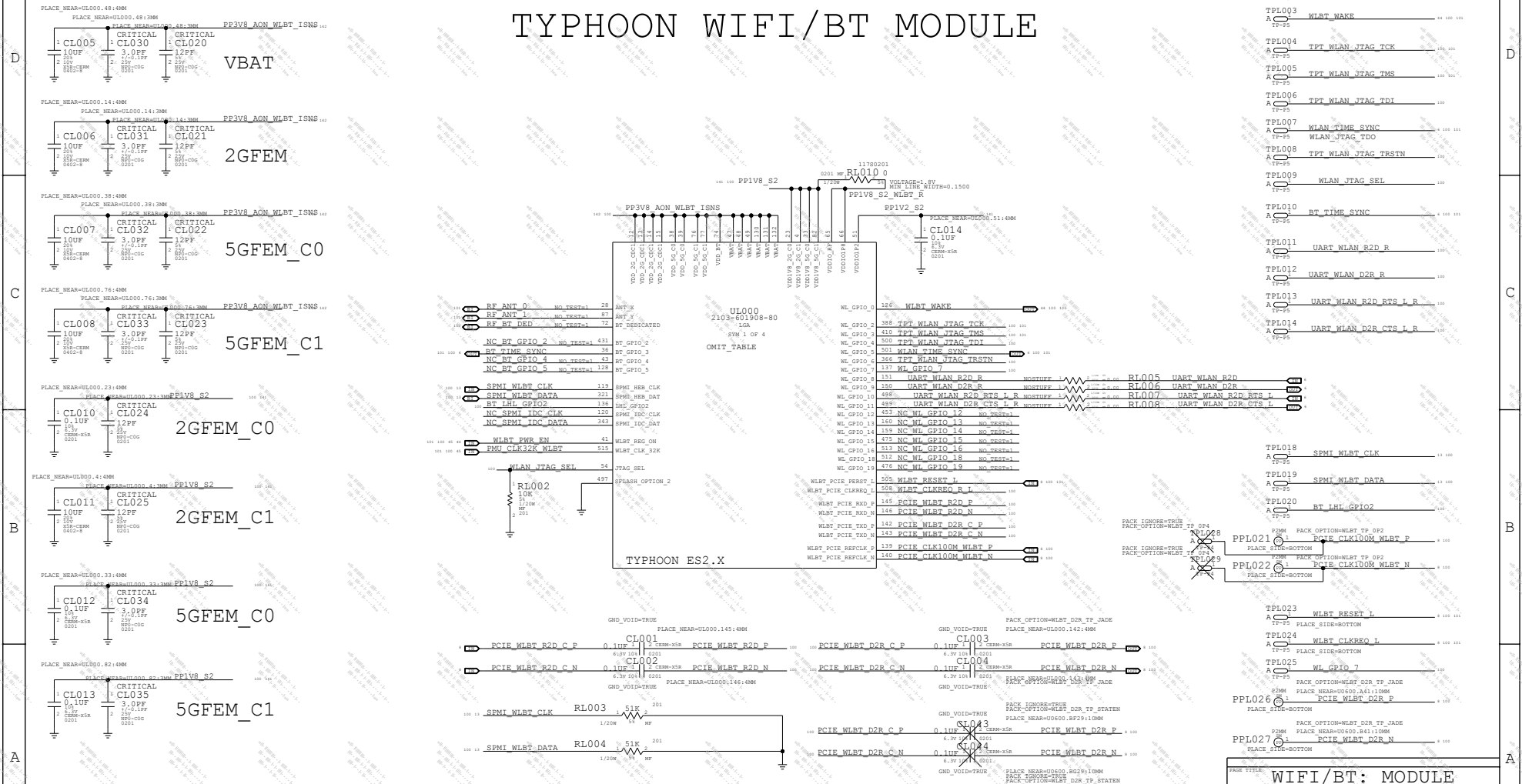
BOM_COST_GROUP=SDCARD



PAGE TITLE			
SDCARD POWER SUPPORT			
Apple Inc.		051-06723	5.0.0
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TYPHOON WIFI/BT MODULE

FOR SYSTEM INTEGRATION INFORMATION REFER TO
RDAR://PROBLEM/59047597




TYPHOON BOM TABLE:

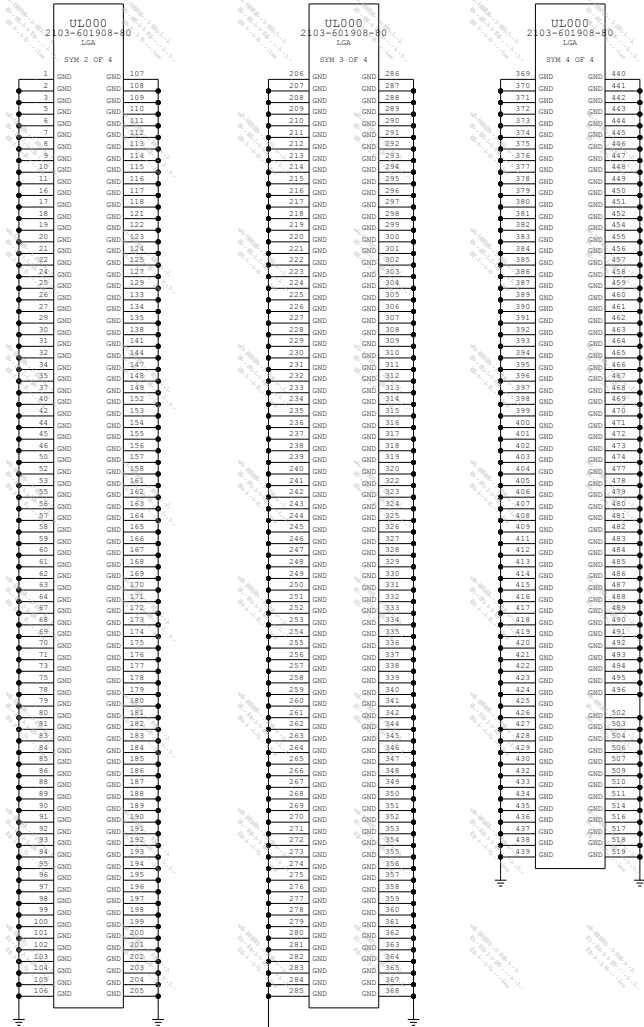
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
339500912	1	MODULE, WLAN/WT, TYPHOON, K84.70	UL000	CRITICAL	

NOTE:

- 1) TYPHOON ALTERNATE BOM:
REMOVED per Mete 04/05 email
- 2) RL005~RL008 are kept per Mete 04/06 email

PAGE TITLE: WIFI/BT: MODULE			
 Apple Inc.	DRAWING NUMBER 051-06723		SIZE D
	REVISION		5.0.0
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TYPHOON WIFI/BT MODULE GND



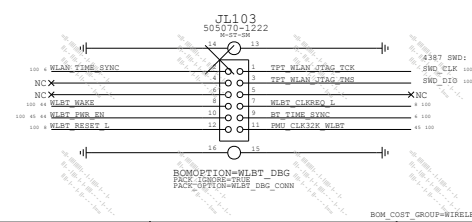
ANTENNA CONNECTORS

2G_C0
5G_C0
BT_C0

2G_C1
5G_C1
BT_C1

BT_C1_DED

WLBT DEBUG CONNECTOR



WIFI/BT: ANTENNA and GND	
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NAND0 S5E0

D

D

C

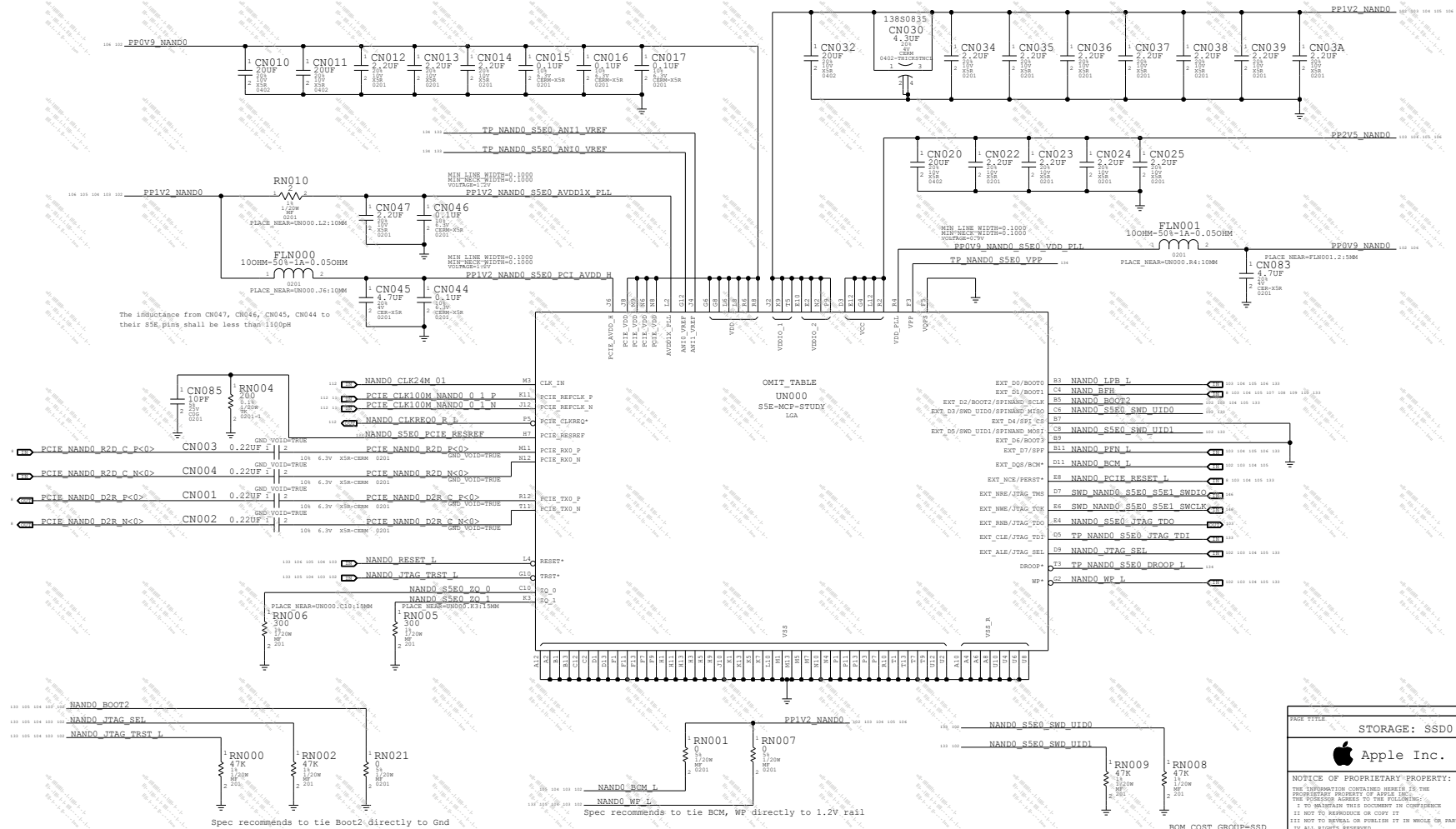
C

B

B

A

A



PAGE TITLE		DATE=08/23/2011
STORAGE: SSD0 S5E <0>		
Apple Inc.	051-06723	5.0.0
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NAND1 S5E0

D

D

C

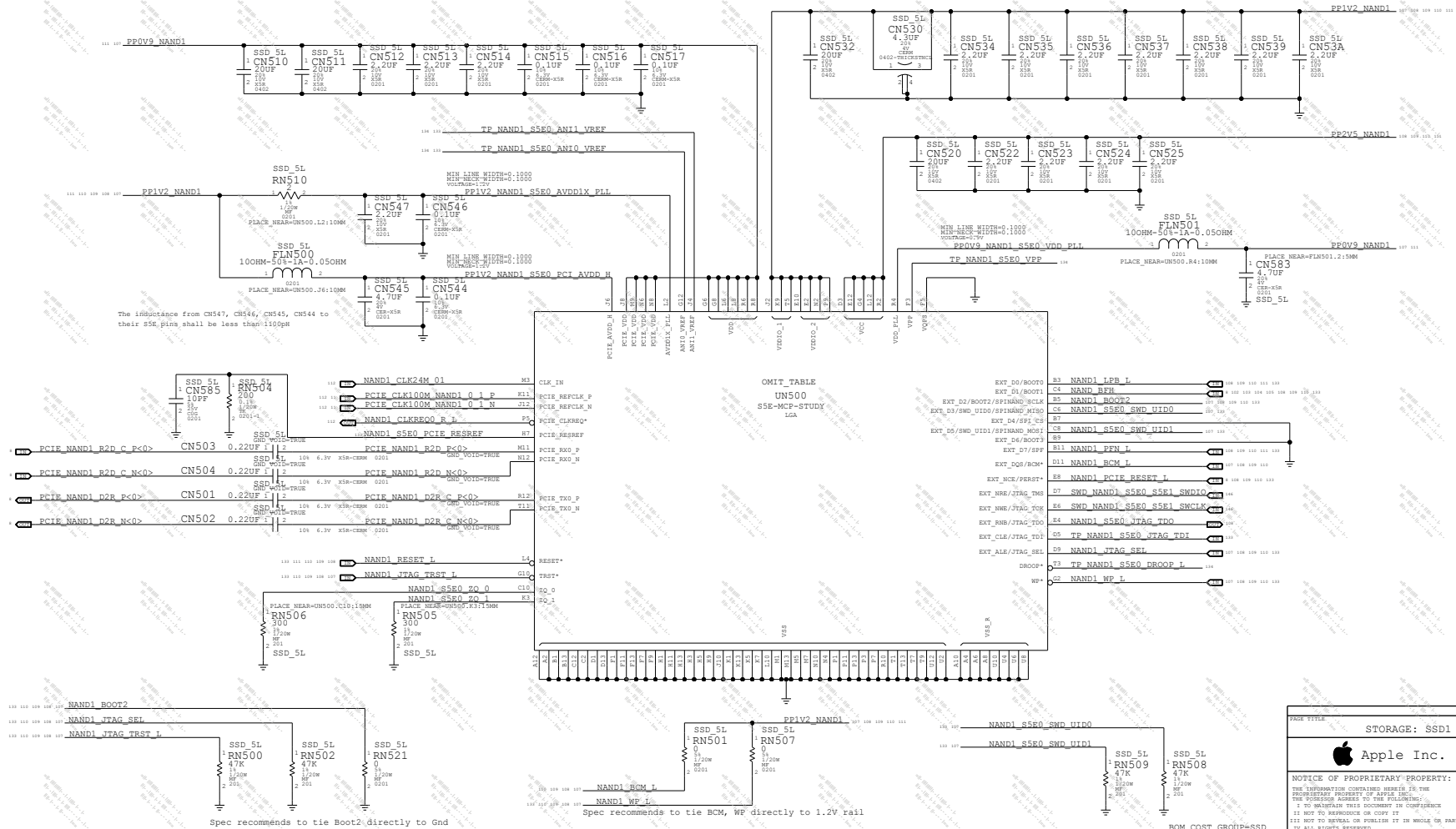
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B

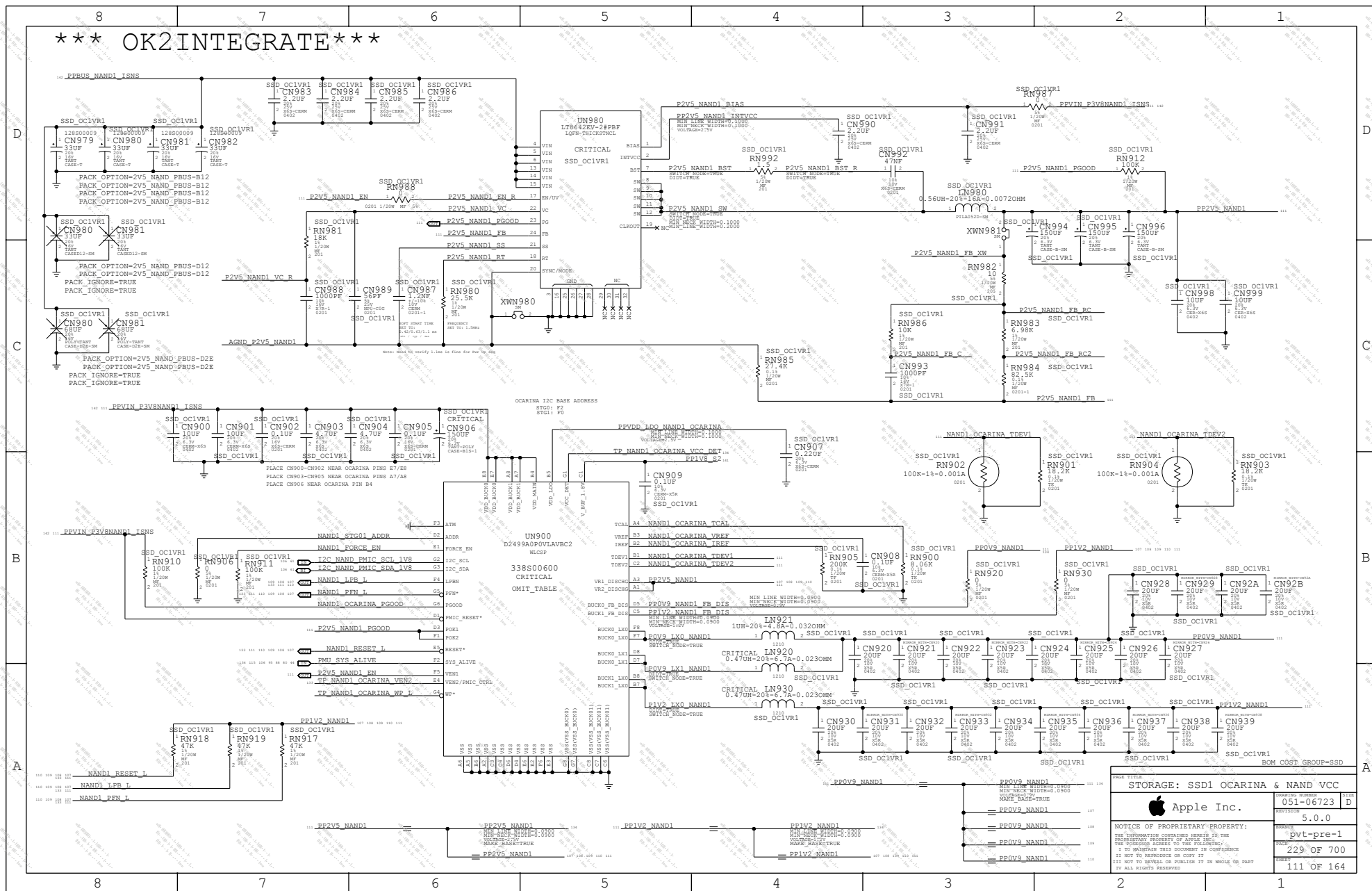
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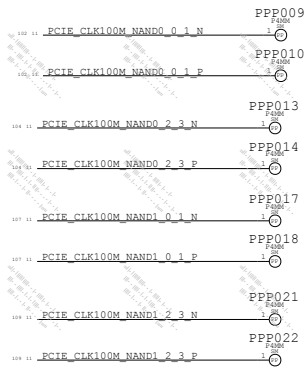
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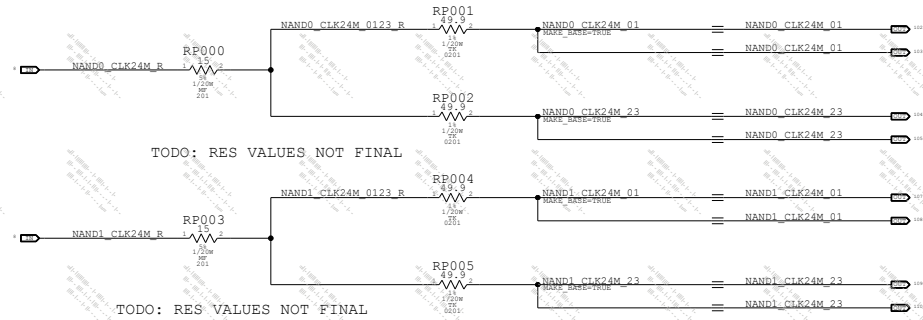
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NAND CLK TEST POINTS

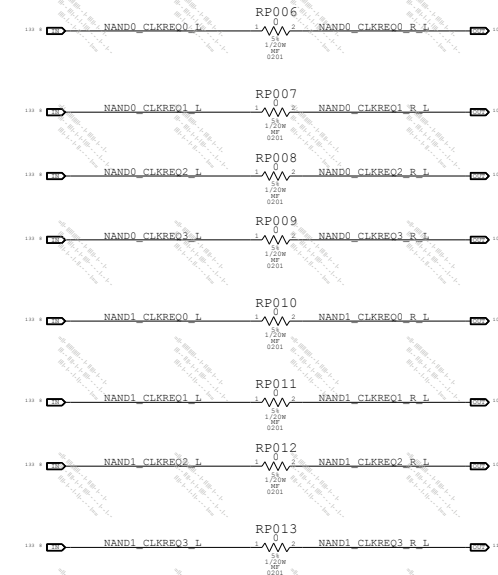


SSD 24M CLOCK TERMINATIONS



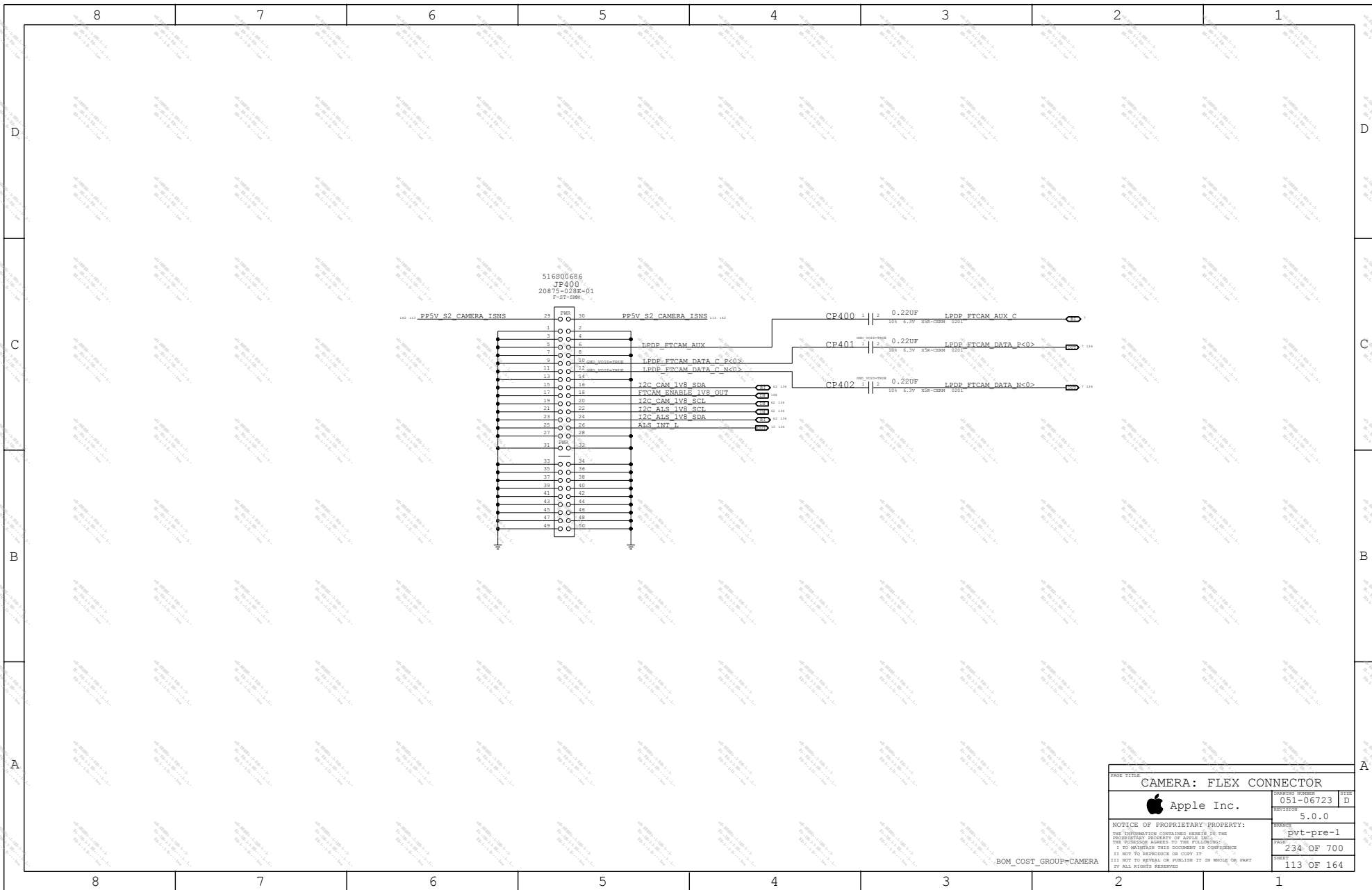
NAND CLKREQ SERIES RESISTORS

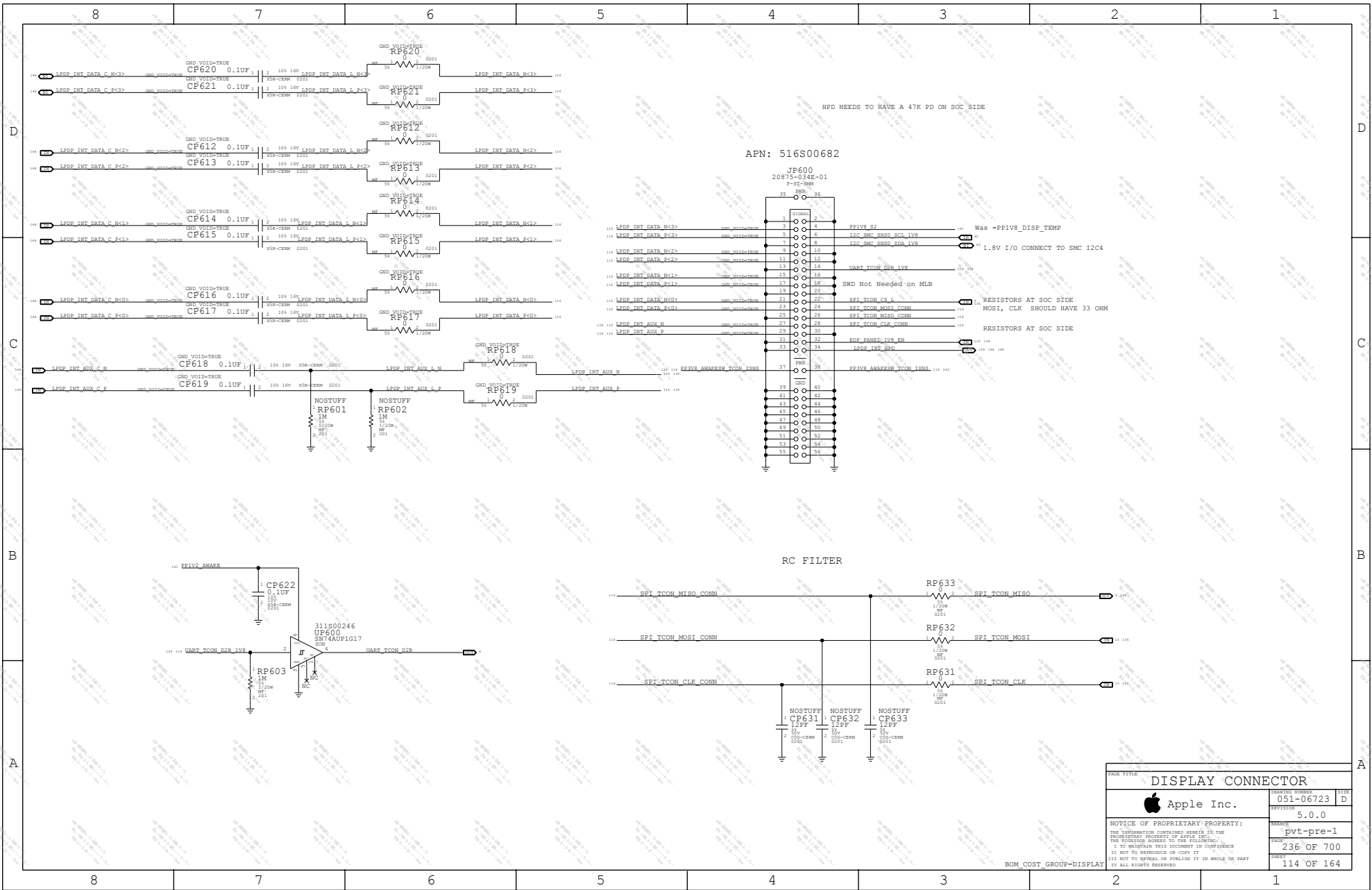
TODO: RES VALUES NOT FINAL



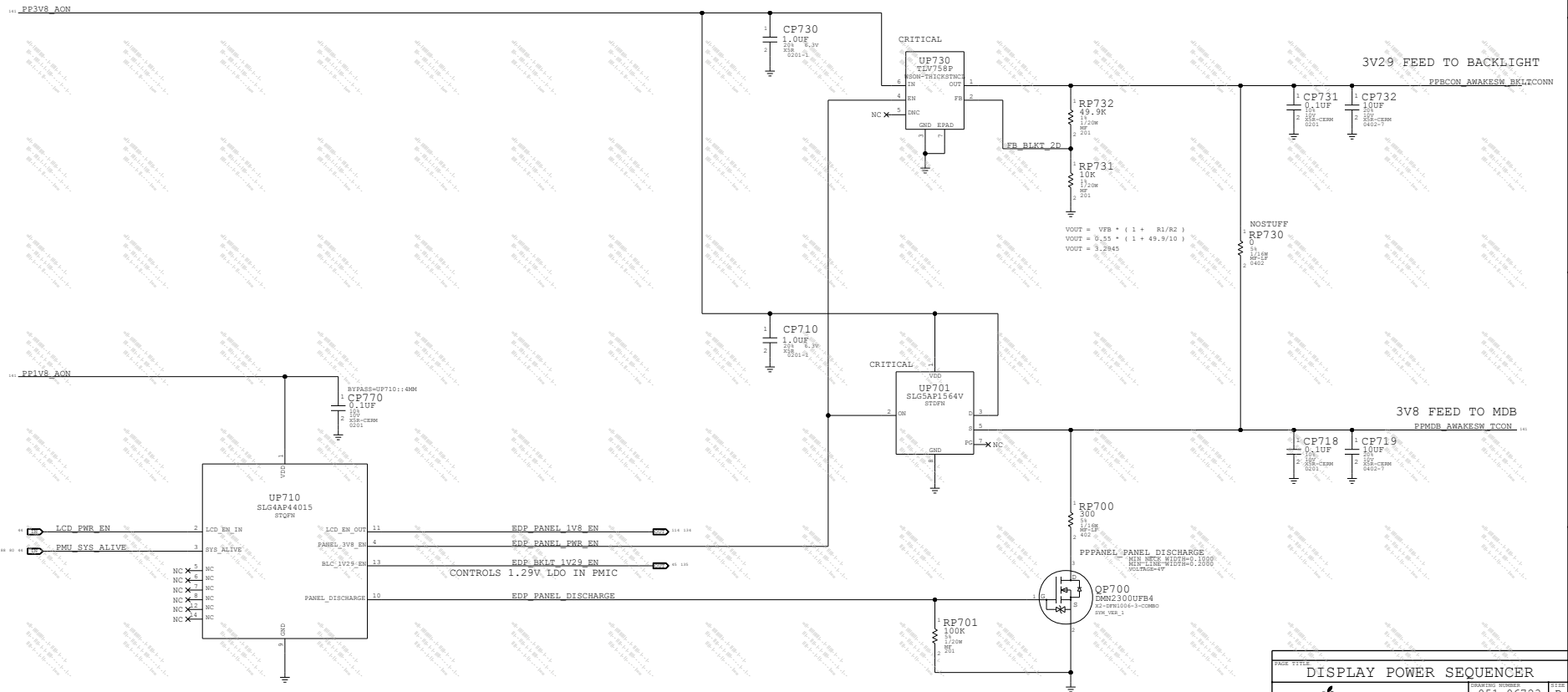
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Apple Inc.		DOCUMENT NUMBER	051-06723
		REVISION	5.0.0
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BOM_COST_GROUP=SSD



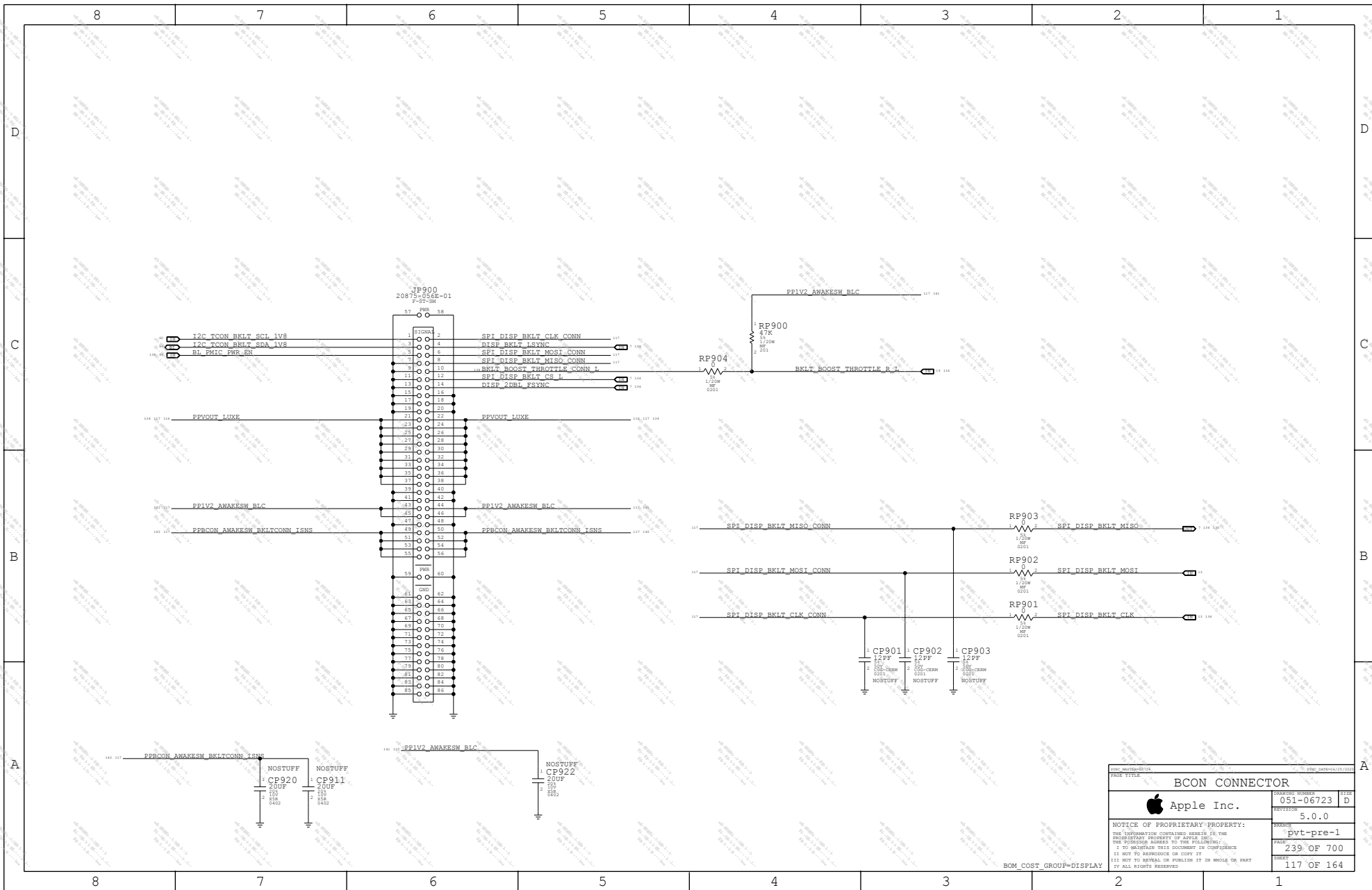



*** OK2INTEGRATE ***



PAGE TITLE			
DISPLAY POWER SEQUENCER			
 Apple Inc.		DESIGN NUMBER	051-06723
		PROVISION	5.0.0
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		PAGE	237 OF 700
		SHEET	115 OF 164

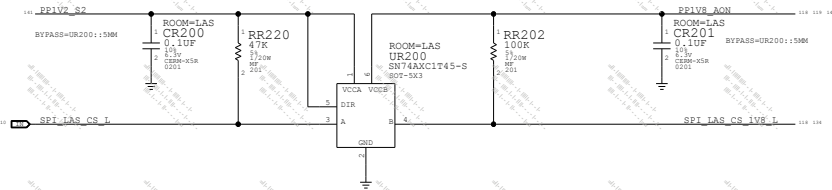
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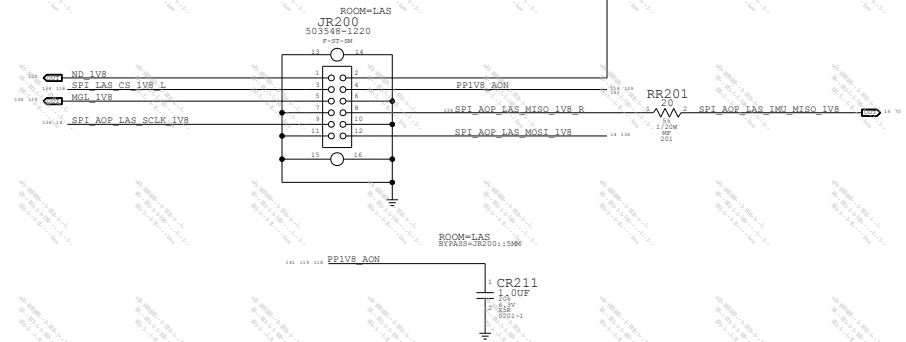
BCON CONNECTOR			
 Apple Inc.	SHOOTING NUMBER	051-06723	TYPE
	PROVISION	5.0.0	D
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REVISION	Pvt-pre-1		
PAGE	239 OF 700		
SHEET	117 OF 164		

*** OK2INTEGRATE ***

LEVEL TRANSLATION



APN: 516S0873



CURRENT PER RAIL

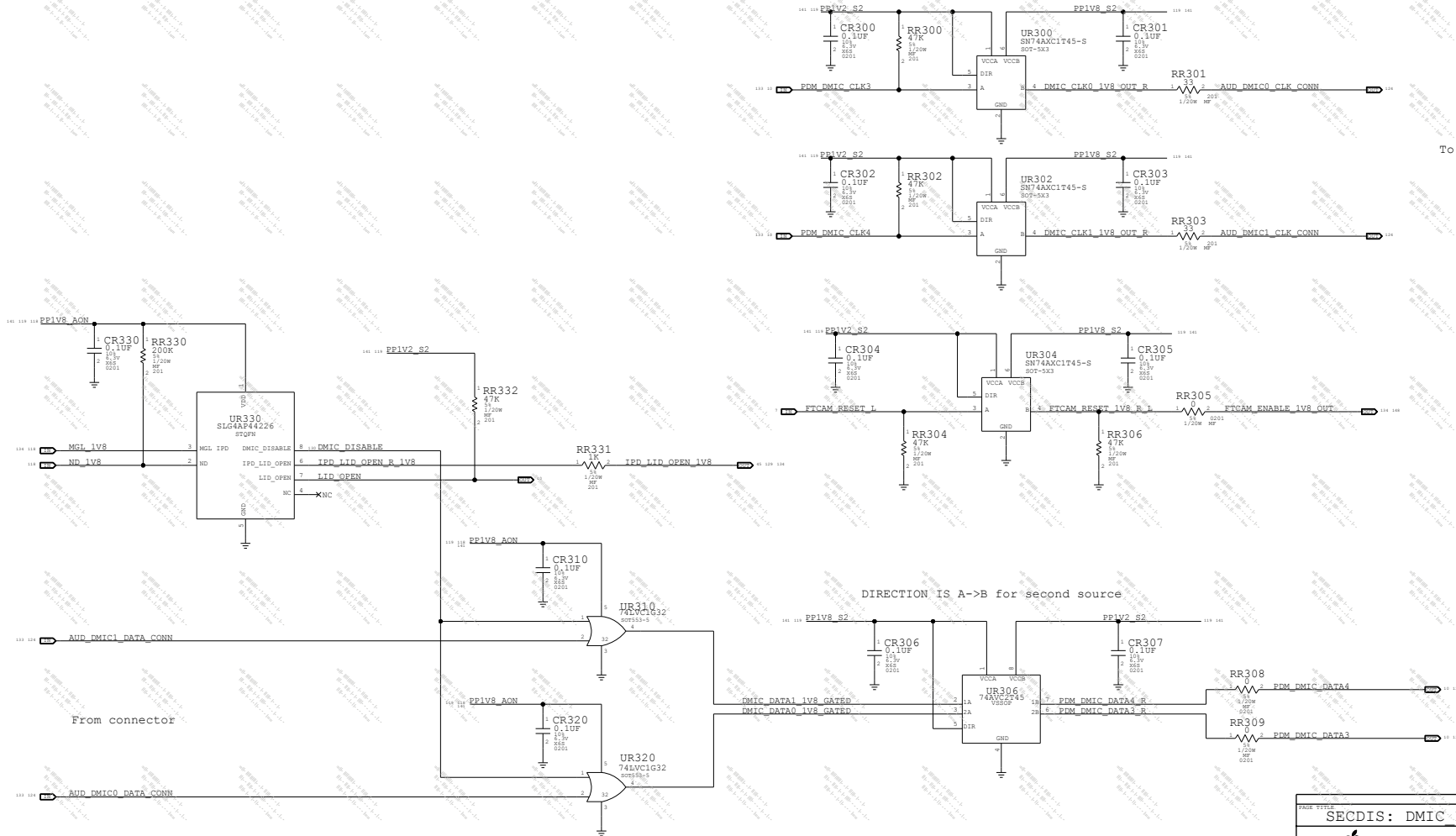
RAIL	TYPICAL	PEAK
1.2 S2	22UA	1.2MA
1.8 AON	30UA	8 MA
3.3 AON	1UA	10 MA

PAGE TITLE	
SECDIS: LID ANGLE SENSOR	
Apple Inc.	051-06723
PROVISION	
5.0.0	
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118 OF 164	

ROOM_COST_GROUP=SOC

*** OK2INTEGRATE ***

Level Shifter - DMIC & FTCAM



DIRECTION IS A->B for second source

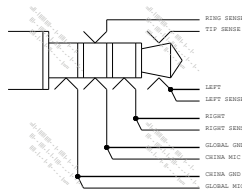
PAGE TITLE		
SECDIS: DMIC LID CONTROL		
DRAWING NUMBER		051-06723
REVISION		D
PROVISION		5.0.0
STATUS		Pvt-pre-1
PAGE		243 OF 700
SHEET		119 OF 164

BOM_COST_GROUP=SCC

*** OK2INTEGRATE ***

CARLOW CODEC I2C ADDRESS	
ADDR FIN	ADDRESS
0R TO GND	0X48
100K TO GND	0X49
100K TO VDDIO	0X4A
0R TO VDDIO	0X4B <--

AUDIO JACK PINOUT



AUDIO JACK LEFT OUT
AUDIO JACK RIGHT OUT
SEE NOTE

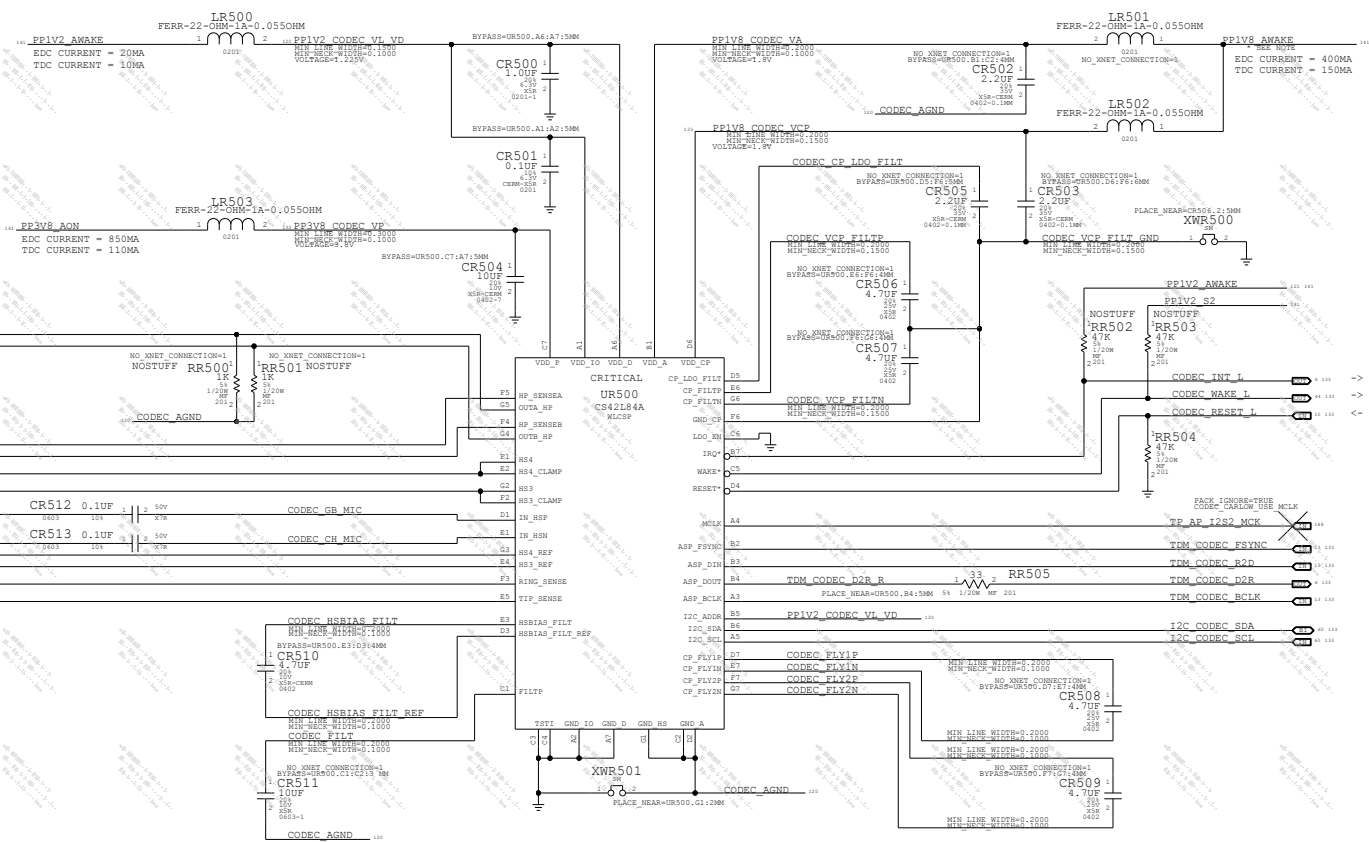
AUDIO JACK LEFT SNS
AUDIO JACK RIGHT SNS
AUDIO JACK CH_GND
AUDIO JACK GB_GND
AUDIO JACK GB_MIC
AUDIO JACK CH_MIC
SEE NOTE

AUDIO JACK RING SNS
AUDIO JACK TIP SNS

TO / FROM
AUDIO JACK
CONNECTOR

NOTES:

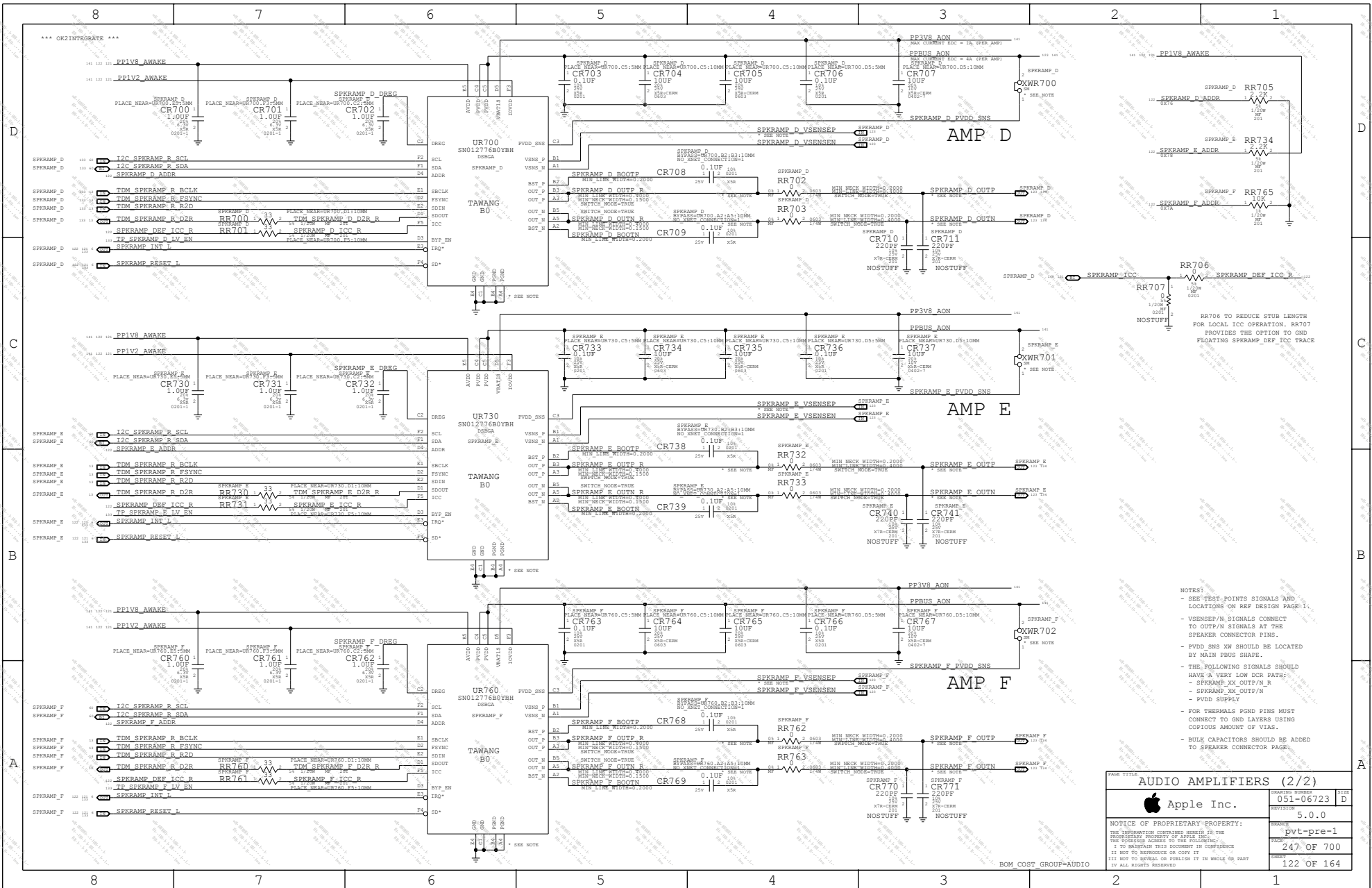
- SEE TEST POINT SIGNALS & LOCATIONS ON REF DESIGN PAGE 1
- THE FOLLOWING SIGNALS SHOULD HAVE A LOW DCR PATH:
 - VP SUPPLY
 - VCP SUPPLY
 - AUDIO JACK LEFT/RIGHT OUT
 - AUDIO JACK_GB/CH_GND
- GB_MIC SIGNAL CONNECTS TO CH_GND AT A/J CONNECTOR.
CH_MIC SIGNAL CONNECTS TO GB_GND AT A/J CONNECTOR.
- VP SUPPLY RAIL ACCEPTS 3.0V TO 5.25V AND NEEDS TO COME UP FIRST AND TURN OFF LAST (NEED TO STAY UP WHEN THE OTHER RAILS GO DOWN)
VP CURRENT CONSUMPTION WITH PART IN LOWEST POWER STATE:
3.10A (1V8 OFF, RST# LOW)
750A (1V8 ON, RST# LOW)
370A (1V8 OFF, RST# HIGH)



CARLOW B0 SILICON

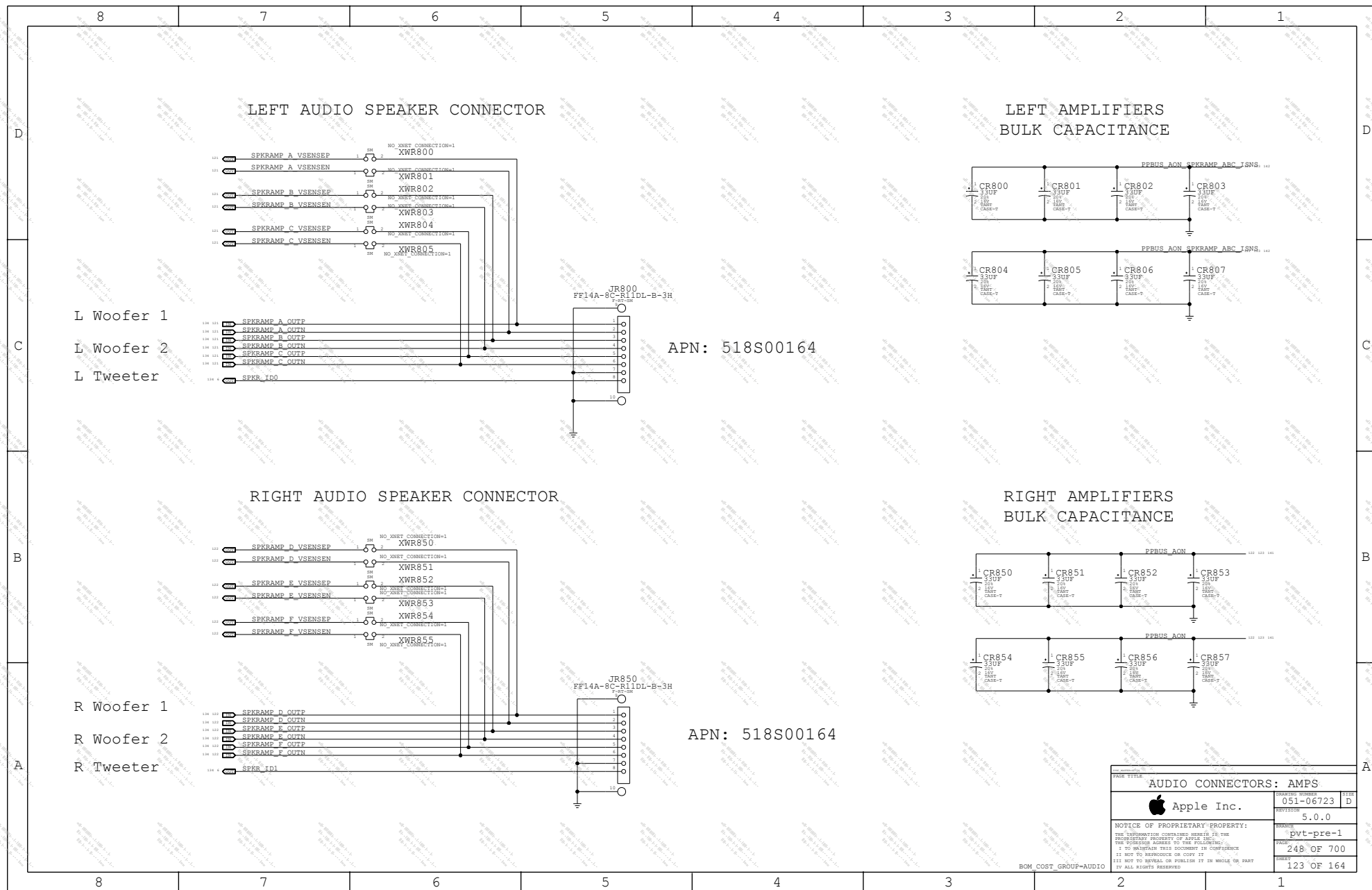
BOM_COST_GROUP-AUDIO

PAGE TITLE	
AUDIO JACK CODEC	
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1 TO MAINTAIN THIS DOCUMENT IN CONFIDENCE	245 OF 700
2 TO NOT REPRODUCE OR COPY IT	120 OF 164
3 TO NOT REVEAL OR PUBLISH IT IN WHOLE OR PART	
4 TO NOT REPRODUCE OR COPY IT	



- NOTES:
- SEE TEST-POINTS SIGNALS AND LOCATIONS ON REF DESIGN PAGE 1.
 - VSENSE/N SIGNALS CONNECT TO OUTP/N SIGNALS AT THE SPEAKER CONNECTOR PINS.
 - PVD_SNS XN SHOULD BE LOCATED BY MAIN PBUS SHAPE.
 - THE FOLLOWING SIGNALS SHOULD HAVE A VERY LOW DCR PATH:
 - SPKRAMP_XX_OUTP/N
 - SPKRAMP_XX_OUTP/N
 - PVD_SUPPLY
 - FOR THERMALS: PGND PINS MUST CONNECT TO GND LAYERS USING COPIOUS AMOUNT OF VIAS.
 - BULK CAPACITORS SHOULD BE ADDED TO SPEAKER CONNECTOR PAGE.

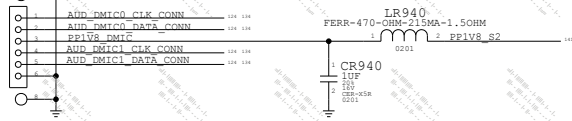
PAGE TITLE		051-06723	D
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BOM_COST_GROUP=AUDIO		122 OF 164	



Digital Mic Flex Connector

APN: 518S0818
JR940
FF14A-6C-H1DL-B-3H

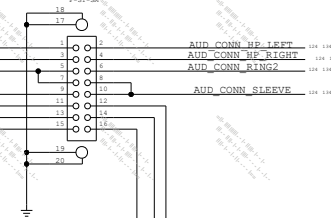
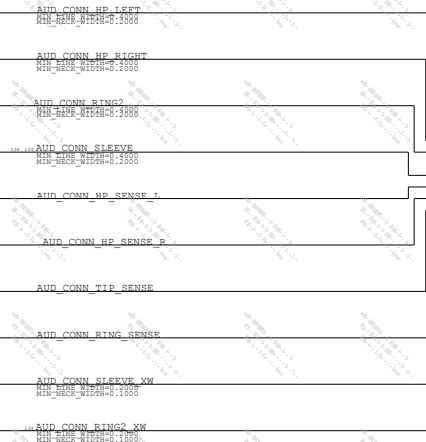
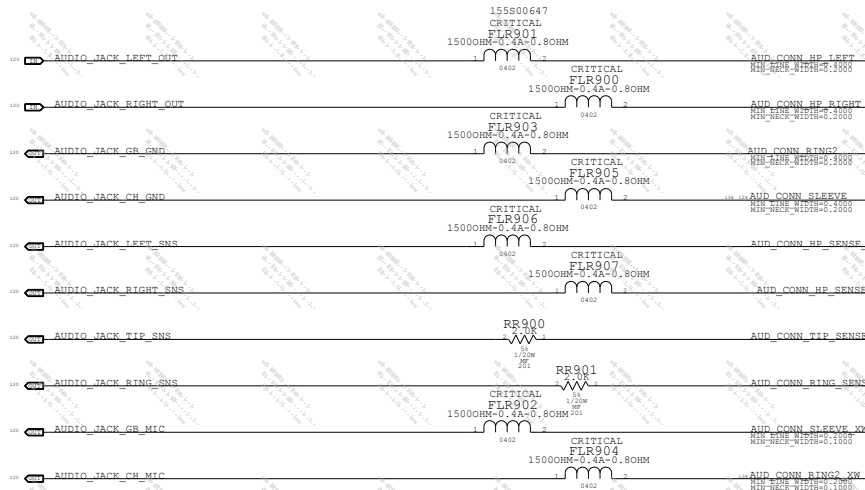
PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
155S0694	1	FERR	LR940		



Audio Jack Flex Connector

PART_NUMBER=516S1181
JR900
AA252-S01EVA1
7-25-08

APN: 516S1181 ,MATINGM PLUG APN:516S1180
SAME AS J214

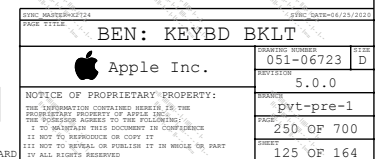


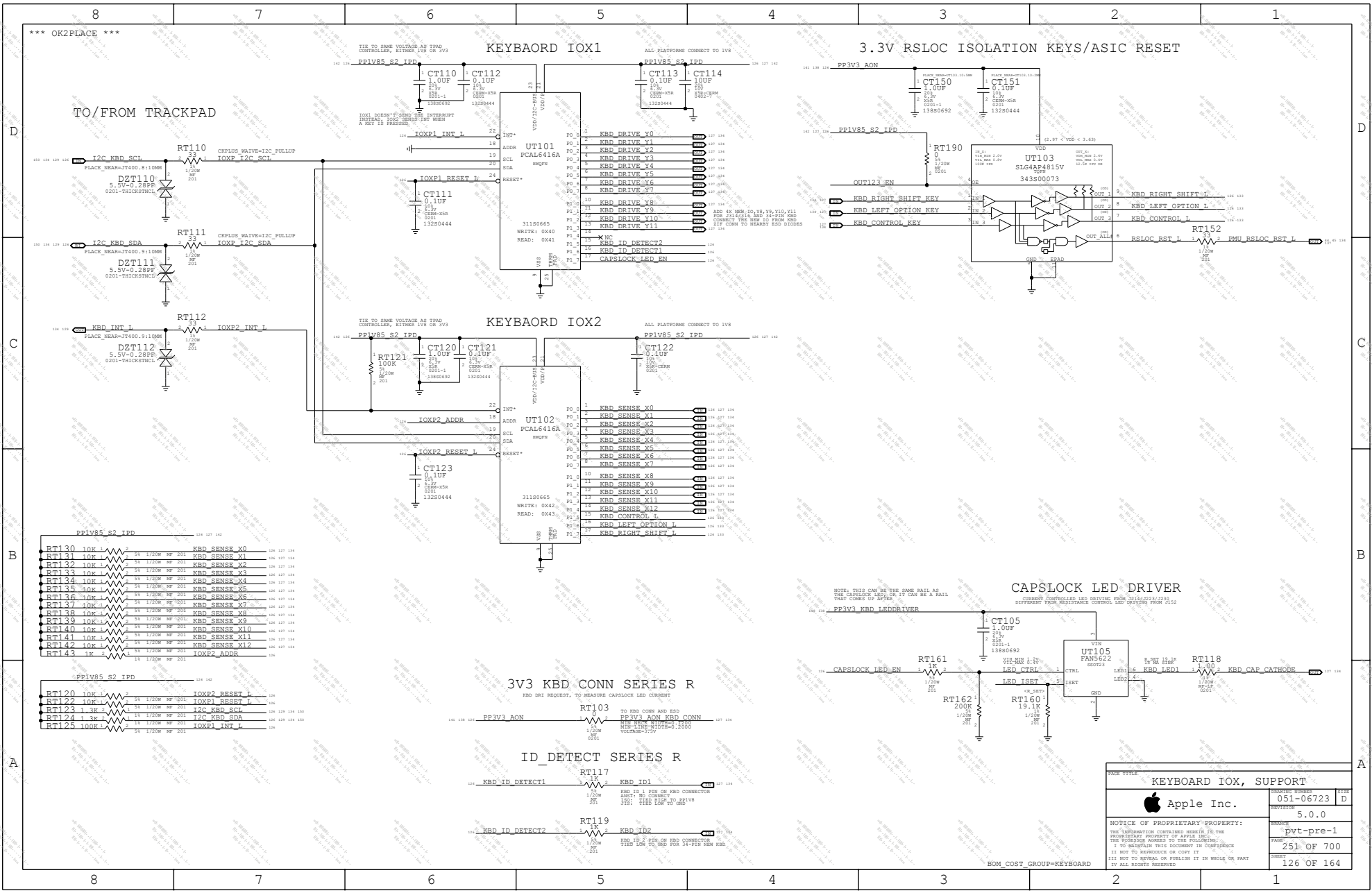
BOM_COST_GROUP=AUDIO

LAST CHANGE: Wed Feb 18 17:12:24 2015

PAGE TITLE			
Audio Flex Connectors			
Apple Inc.		051-06723	5.0.0
NOTICE OF PROPRIETARY PROPERTY:		Dvt-pre-1	
THE INFORMATION CONTAINED HEREIN IS THE		249 OF 700	
PROPRIETARY PROPERTY OF APPLE INC.		124 OF 164	
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BEN IC: KEYBOARD LED DRIVER

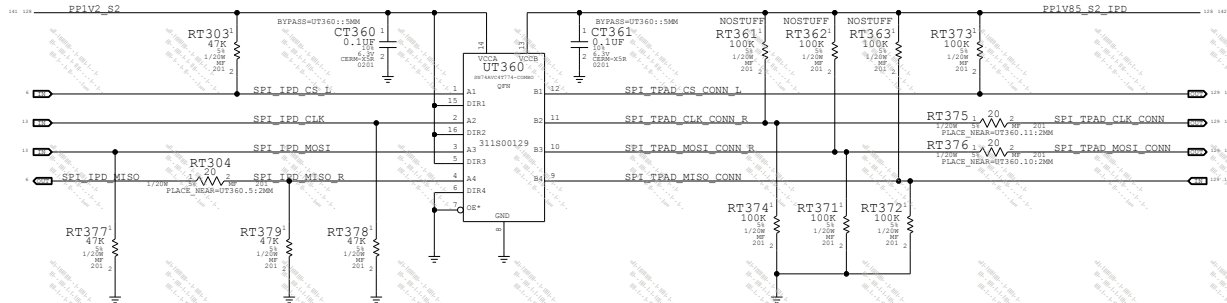




PAGE TITLE		KEYBOARD IOX, SUPPORT	
Apple Inc.		DESIGN NUMBER	051-06723
		REVISION	5.0.0
NOTICE OF PROPRIETARY PROPERTY:		STATUS	Pvt-pre-1
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		SHEET	126 OF 164

BOM_COST_GROUP=KEYBOARD

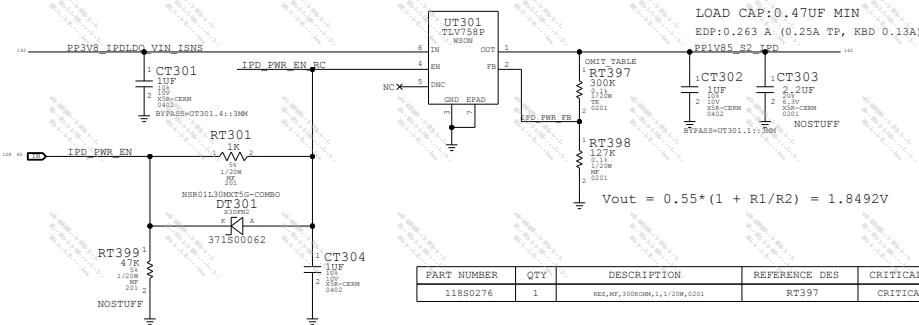
TRACKPAD SPI BUS LEVEL SHIFTER (+1.2V TO +1.8V)



SN74AVC4T774 Truth Table

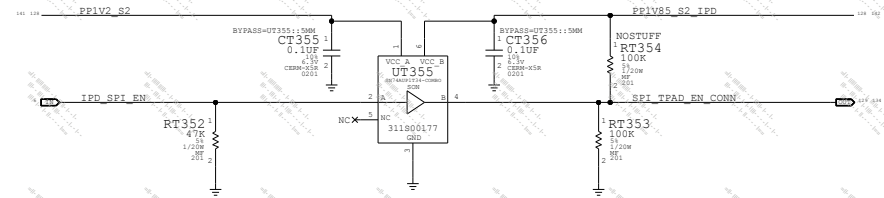
CTRL INPUTS		OUTPUT CIRCUITS		OPERATION
/OE	DIR	A PORT	B PORT	
L	L	Enabled	Hi-Z	B data to A data
L	H	Hi-Z	Enabled	A data to B data
H	X	Hi-Z	Hi-Z	Isolation

IPD LDO 1.85 V FOR TRACKPAD AND KEYBOARD IOX

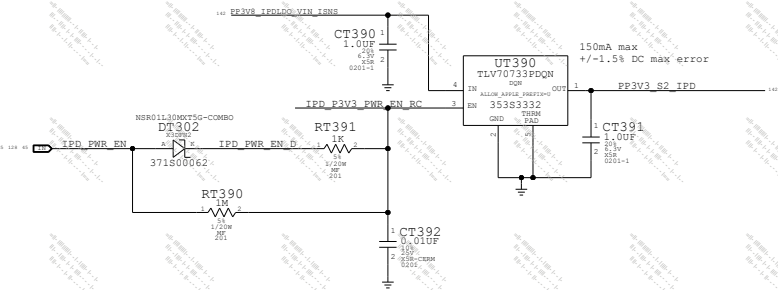


PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
11880276	1	RES, 10K, 1/20W, 0.25A	RT397	CRITICAL	

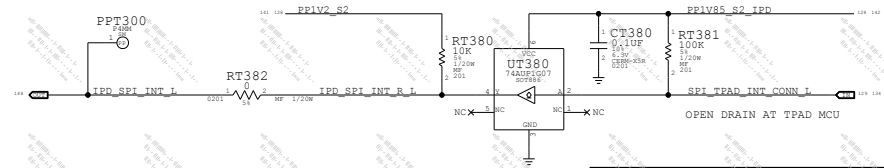
TRACKPAD SPI ENABLE LEVEL SHIFTER



3.3V S2 LDO FOR TPAD



IPD SPI INTERRUPT LEVEL SHIFTER

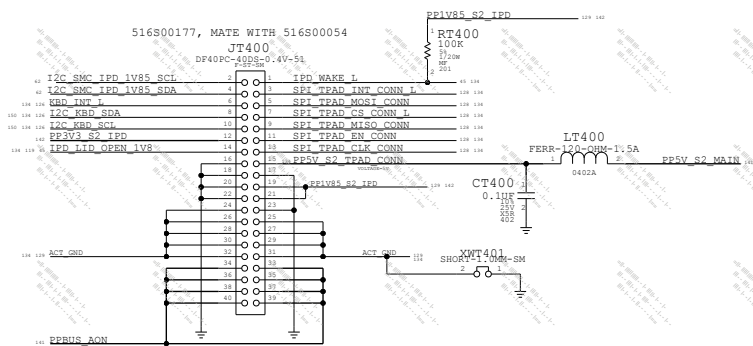



TRACKPAD SUPPORT

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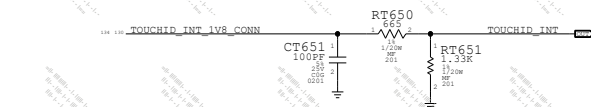
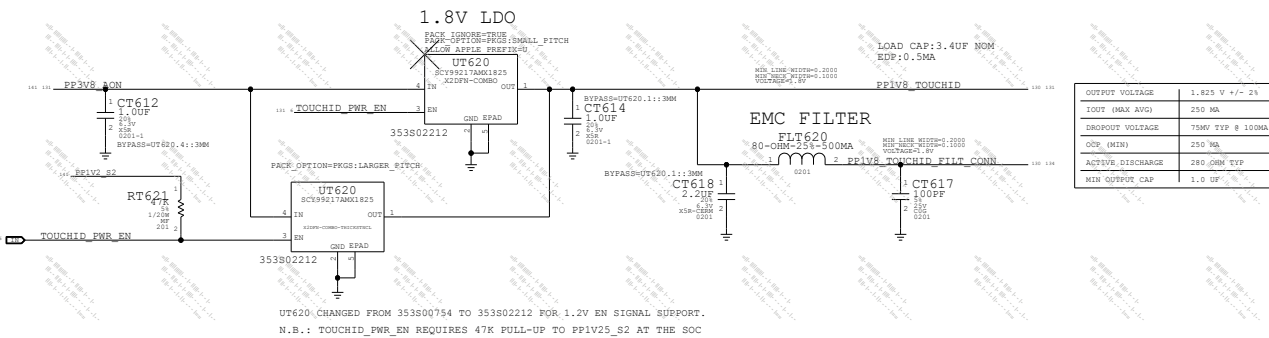
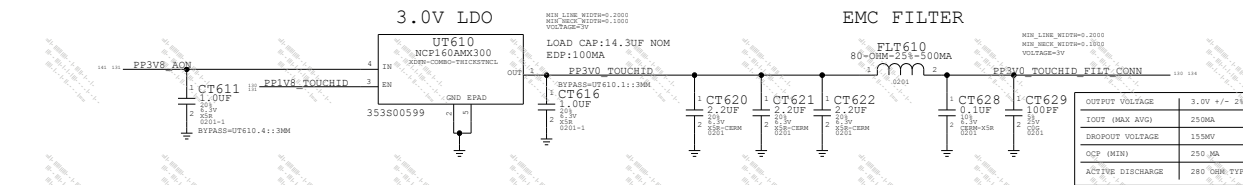
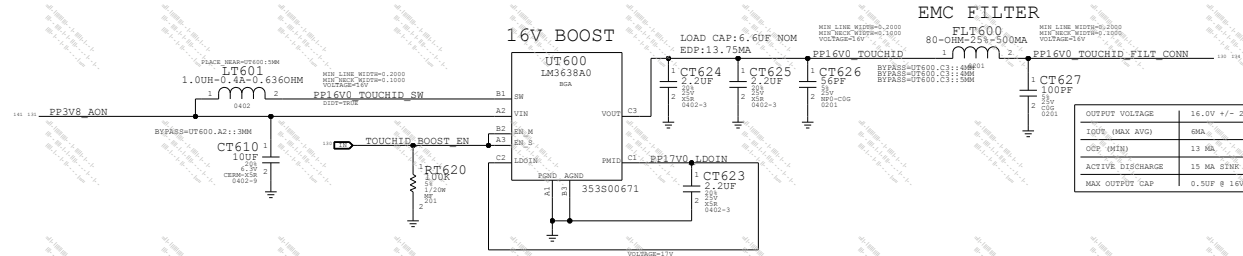
BOM COST GROUP=TRACKPAD



PAGE TITLE			
TRACKPAD CONNECTOR			
 Apple Inc.	DRAWING NUMBER		SIZE
	051-06723		D
	REVISION		
		5.0.0	
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FRAME		pvt-pre-1	
PAGE		254 OF 700	
SHEET		129 OF 164	

*** OK2INTEGRATE ***

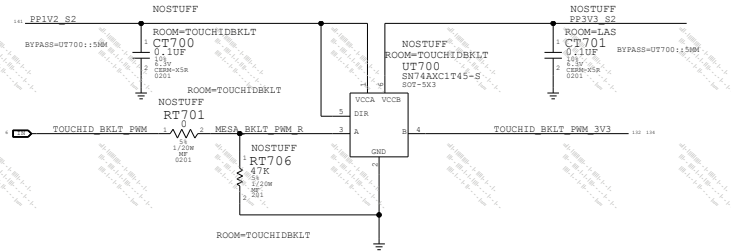
TOUCHID POWER SEQUENCING REQUIREMENTS POWER ON: 1V8 -> 3V3 -> 16V0



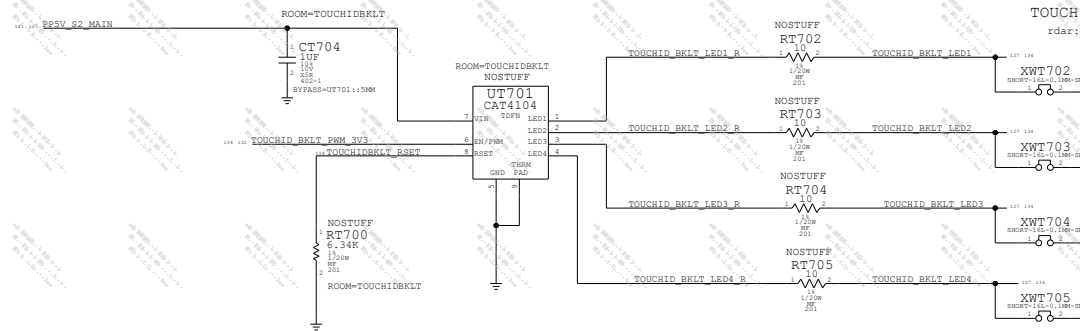
TOUCHID SUPPORT	
Apple Inc.	051-06723
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DATE	256 OF 700
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*** OK2INTEGRATE ***

TOUCHID BKLT PWM LEVEL SHIFTER



TOUCHID BKLT LED DRIVER



TOUCHID BKLT FEATURE IS REMOVED IN PREPVT
rdar://79155272 (J314, Pre-FV7c, removing Mega Back light)
XW70x is added to make no floating copper

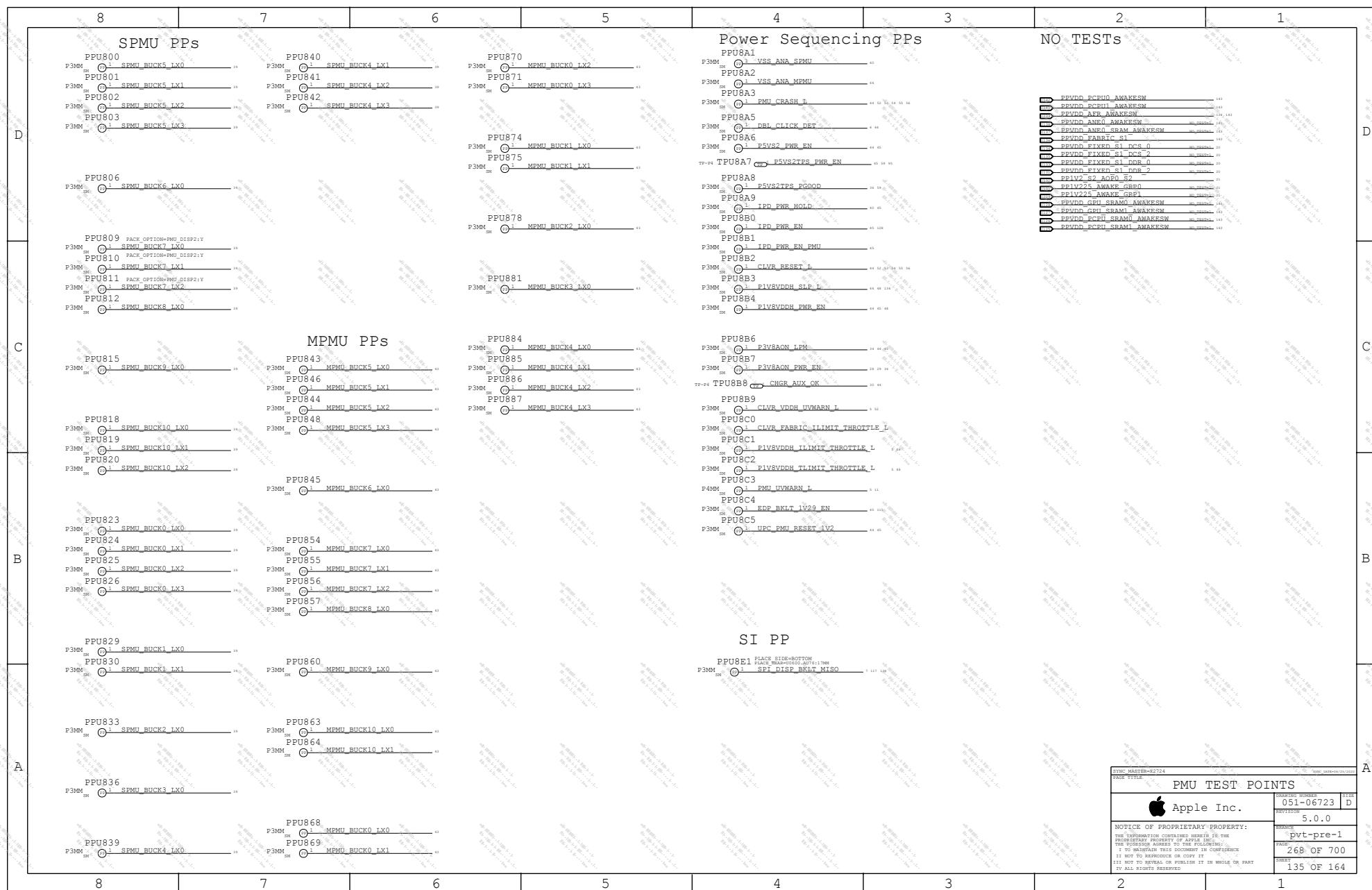
CURRENT PER RAIL

RAIL	TYPICAL	PEAK
1.2 S2	10UA	1.2MA
3 AON	10UA	8 MA
5V S2	80MA	80 MA

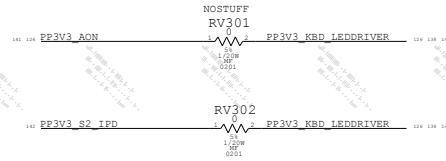
4X LEDS, 20MA EACH LED

BCM_COST_GROUP=SOC

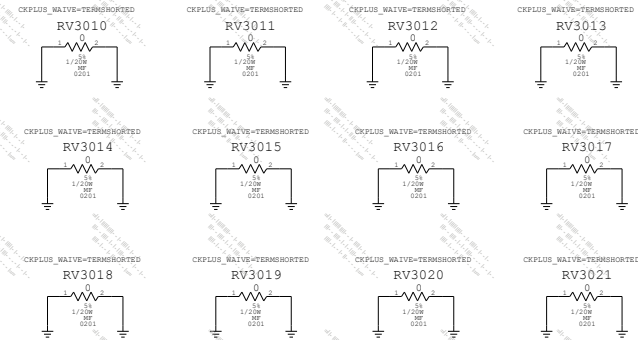
PAGE TITLE		
TOUCHID BACKLIGHT		
Apple Inc.	SHOOTING NUMBER	051-06723
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	PAGE	257 OF 700
	SHEET	132 OF 164



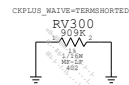
FOR UT105 POWR RAIL OPTION



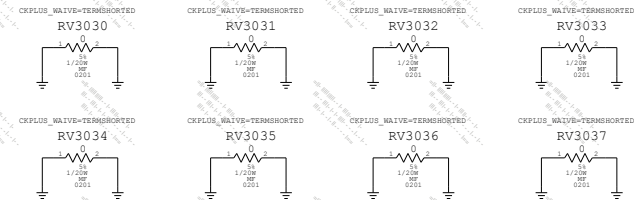
NAND ASSEMBLY PROTECTION PURPOSES



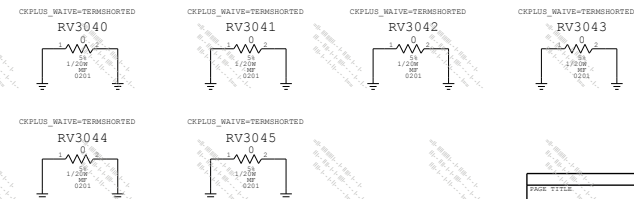
FOR ASSEMBLY PROTECTION PURPOSES ONLY



U8100 ASSEMBLY PROTECTION PURPOSES

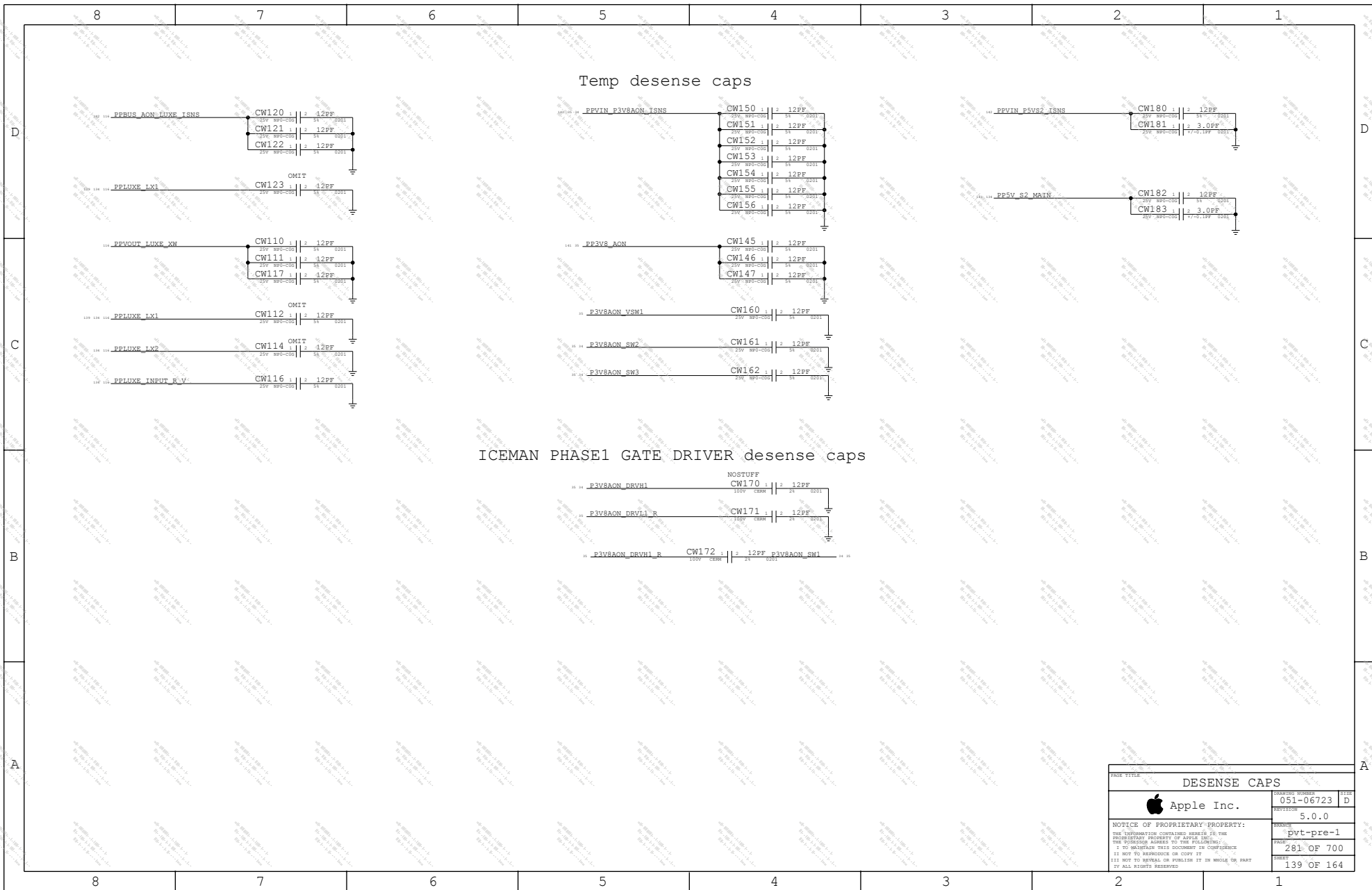


U7700 ASSEMBLY PROTECTION PURPOSES

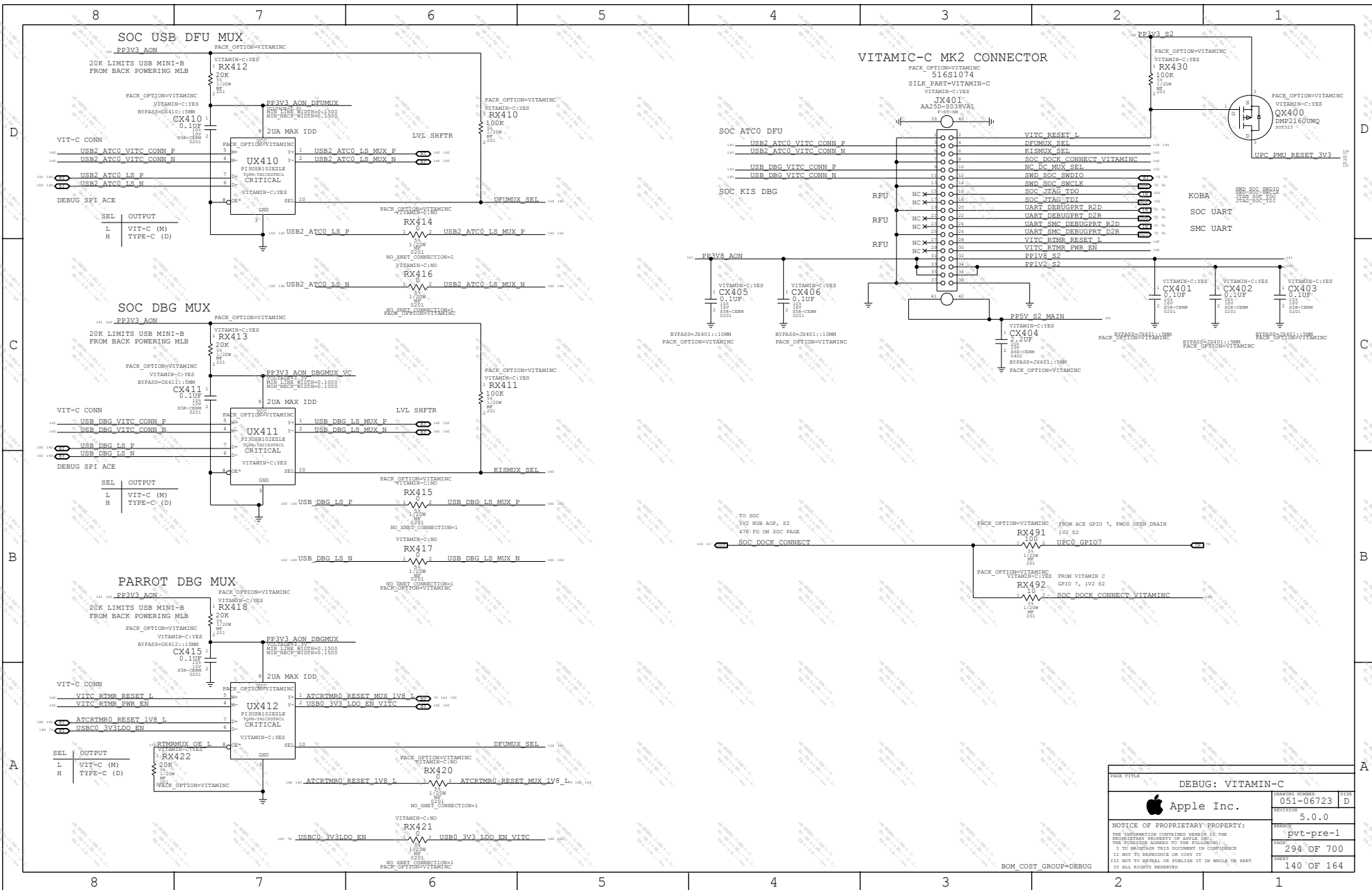


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		REVISION	5.0.0
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		PAGE	273 OF 700
		SHEET	138 OF 164

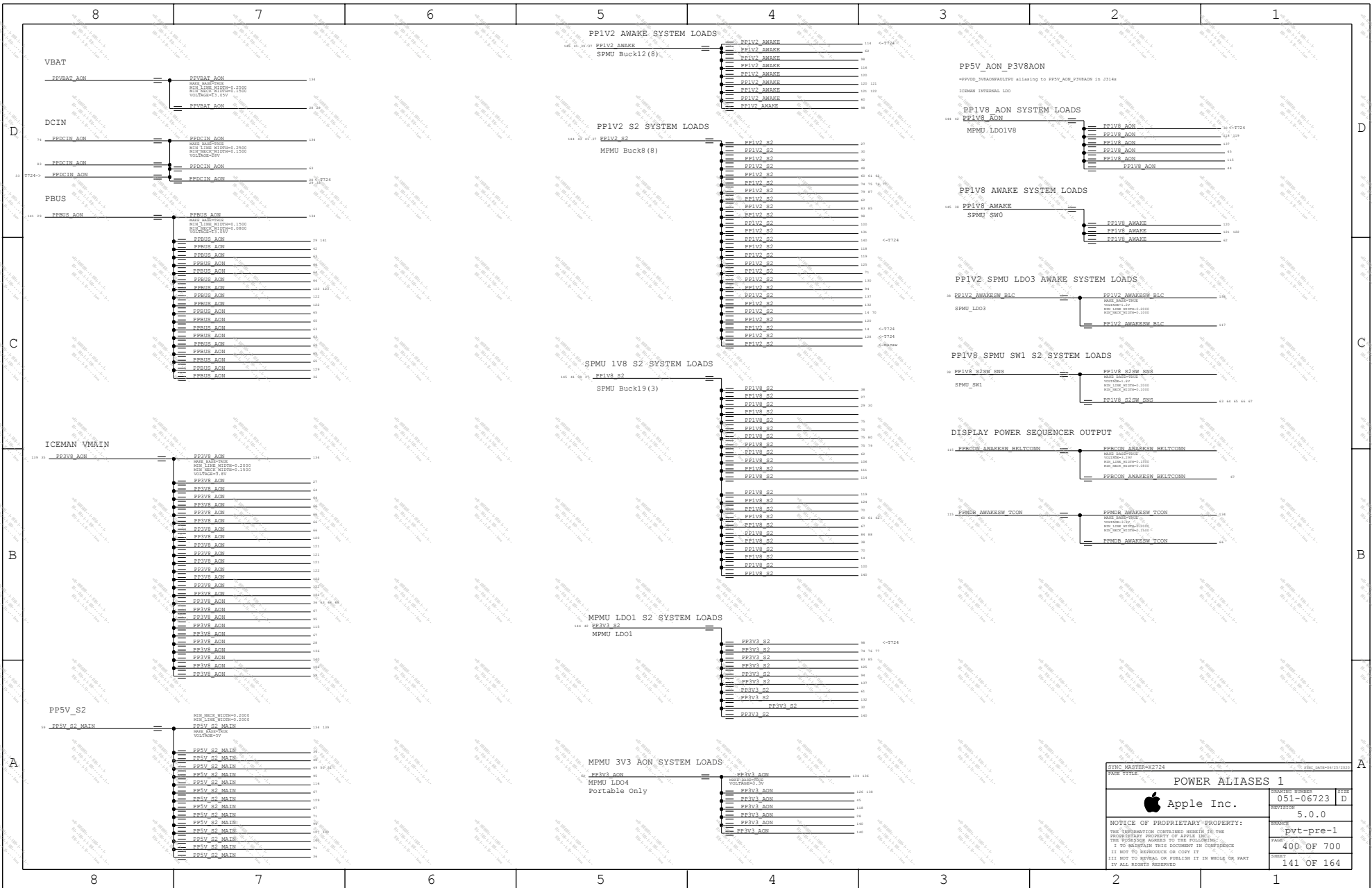
BOM COST GROUP=DEBUG



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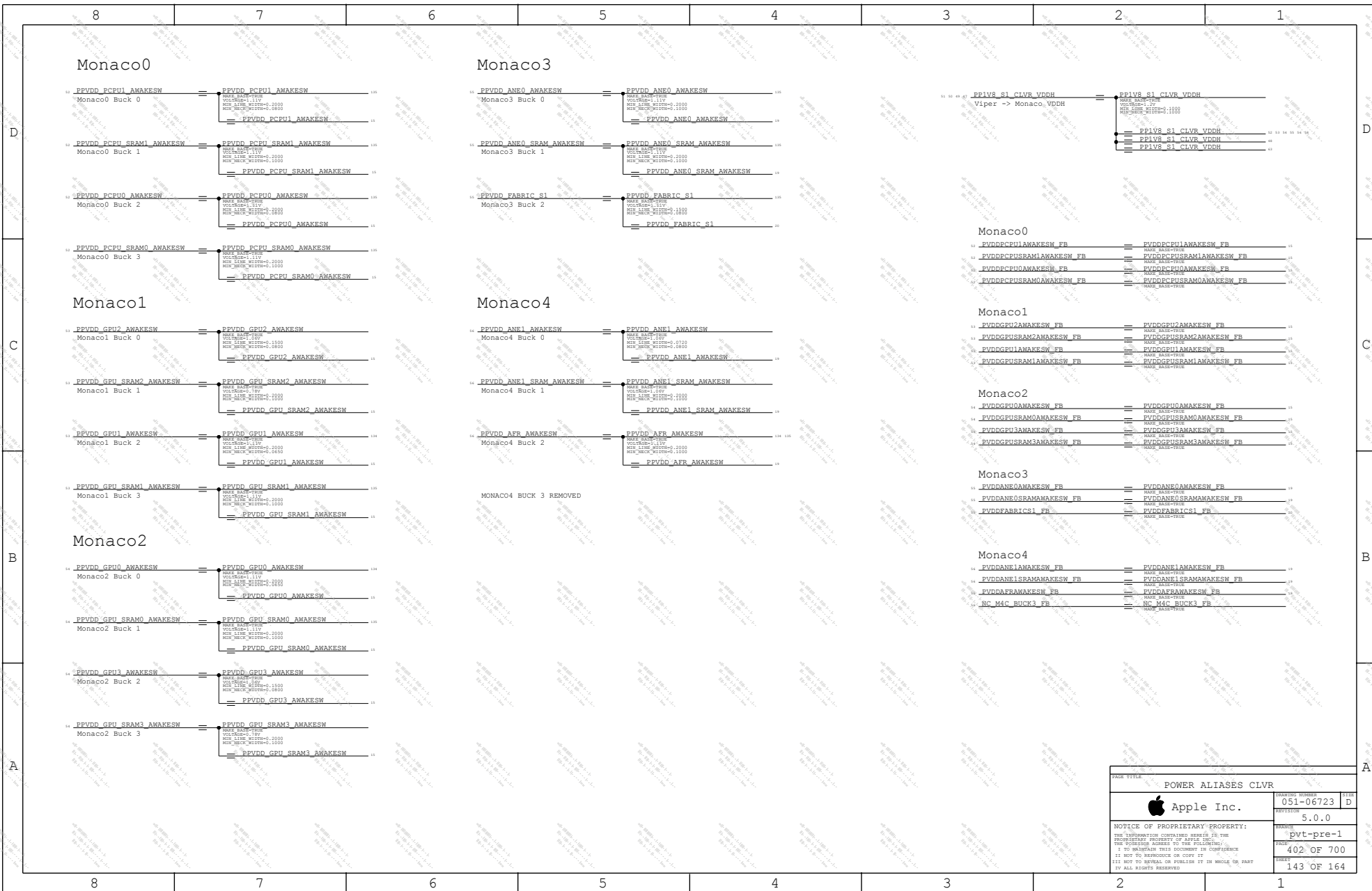


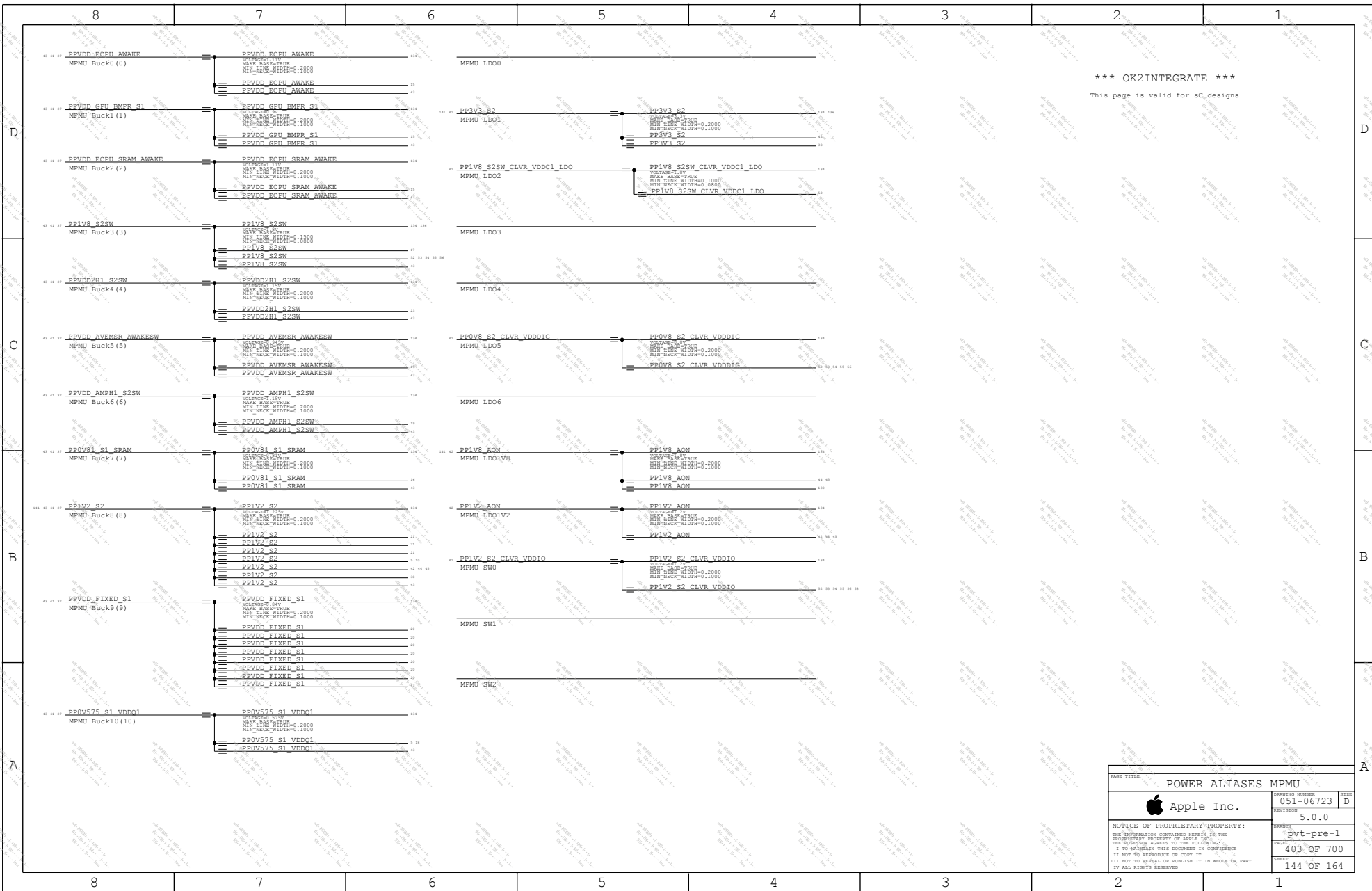
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	PAGE	294 OF 700
	SHEET	140 OF 164

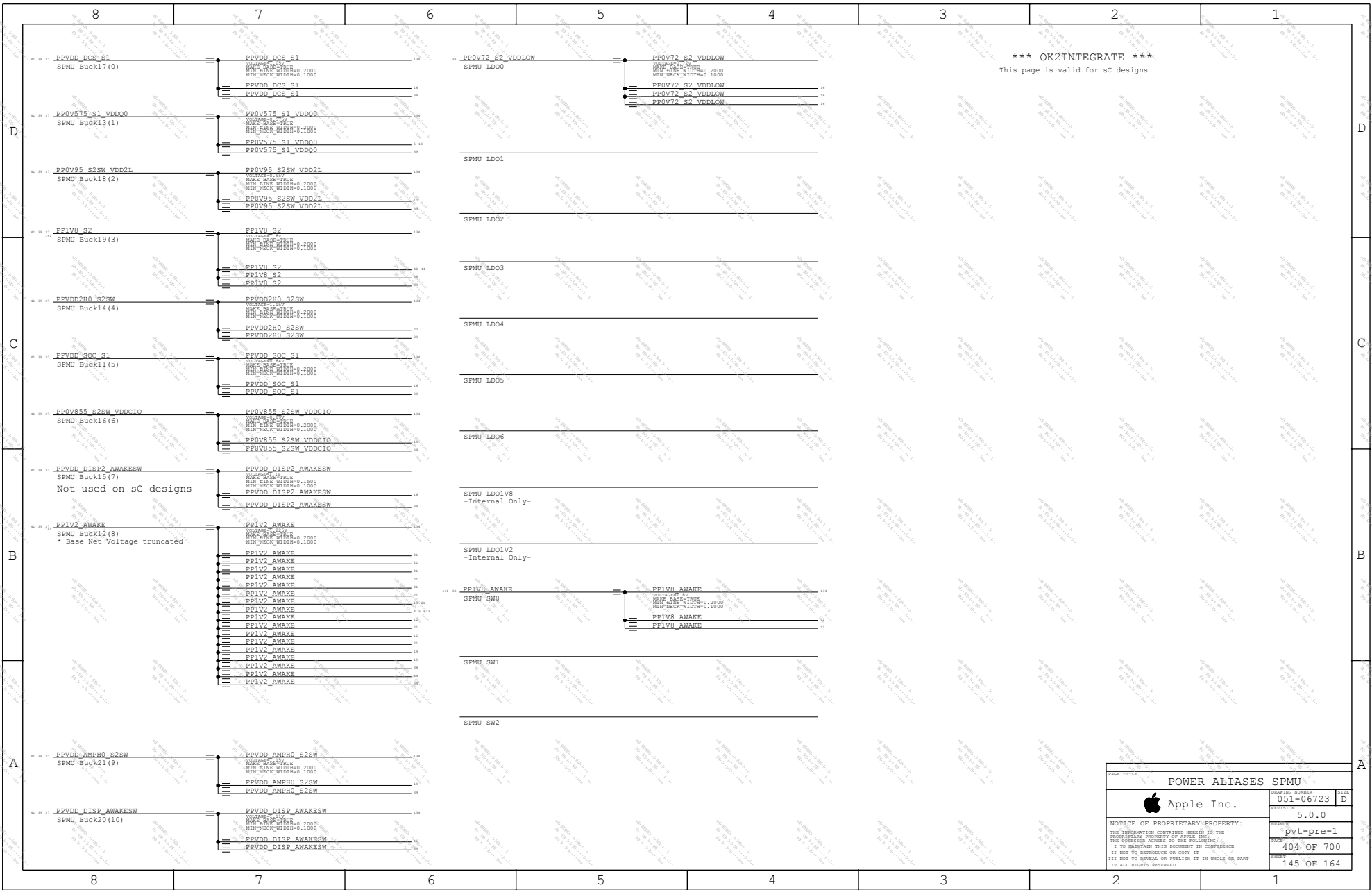


POWER ALIASES 1			
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PAGE		400 OF 700	
SHEET		141 OF 164	

[illegible]

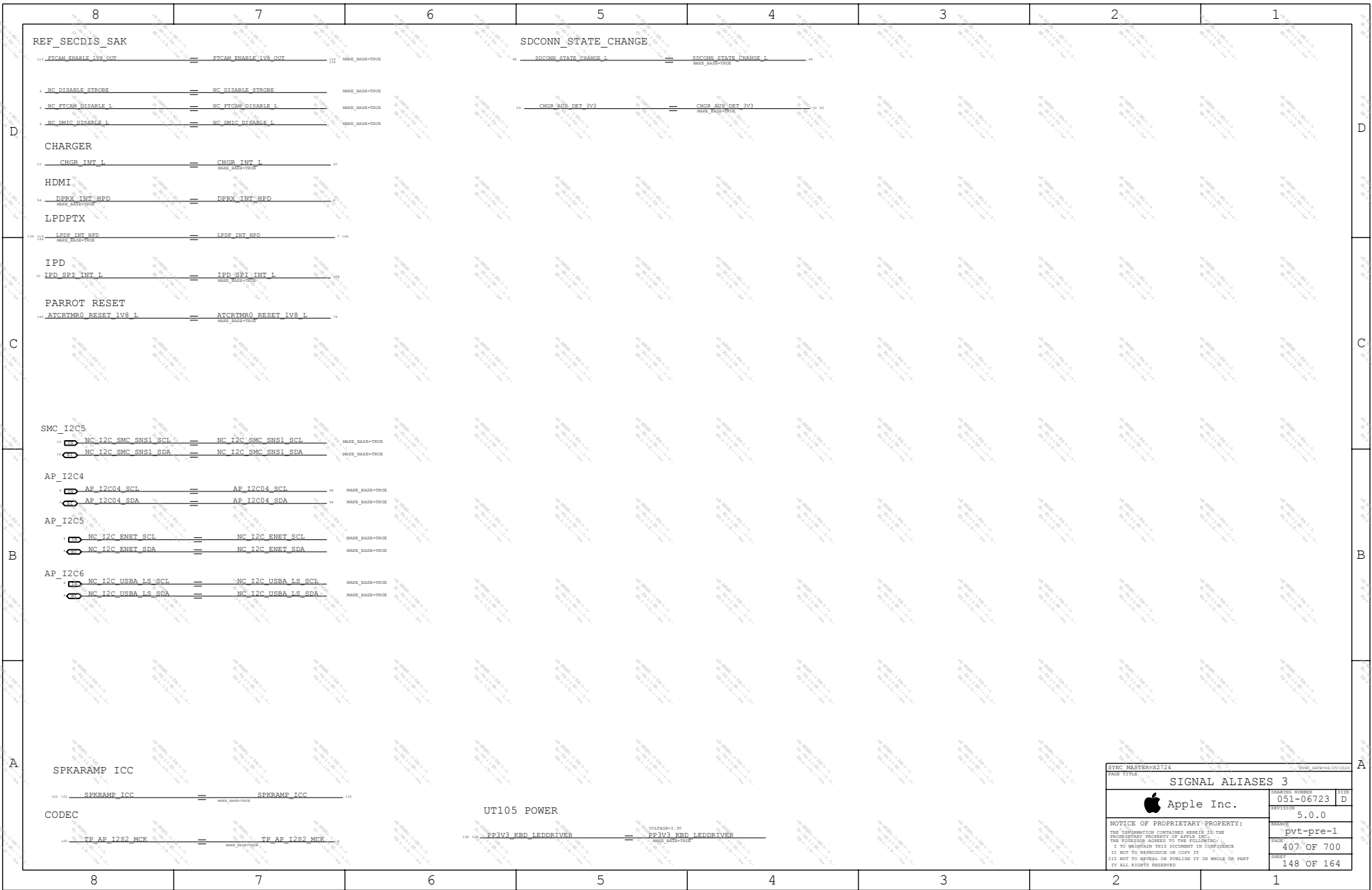







	8	7	6	5	4	3	2	1					
D	LPDPTX		MIPI		ENET				D				
	LPDP_INT_DATA_C_P<0>	MAKE_BASE=TRUE LPDP_INT_DATA_C_P<0>	NC_MIPI0_DATAP	MAKE_BASE=TRUE NC_MIPI0_DATAP	NC_PCIE_ENET_R2DP	NC_PCIE_ENET_R2DP	MAKE_BASE=TRUE						
	LPDP_INT_DATA_C_N<0>	LPDP_INT_DATA_C_N<0>	NC_MIPI0_DATAN	NC_MIPI0_DATAN	NC_PCIE_ENET_R2DN	NC_PCIE_ENET_R2DN	MAKE_BASE=TRUE						
	LPDP_INT_DATA_C_P<1>	LPDP_INT_DATA_C_P<1>	NC_MIPI0_CLKP	NC_MIPI0_CLKP	NC_PCIE_ENET_D2RP	NC_PCIE_ENET_D2RP	MAKE_BASE=TRUE						
	LPDP_INT_DATA_C_N<1>	LPDP_INT_DATA_C_N<1>	NC_MIPI0_CLKN	NC_MIPI0_CLKN	NC_PCIE_ENET_D2RN	NC_PCIE_ENET_D2RN	MAKE_BASE=TRUE						
	LPDP_INT_DATA_C_P<2>	LPDP_INT_DATA_C_P<2>	MAKE_BASE=TRUE NC_MIPI1_FTCAM_DATAP0	NC_MIPI1_FTCAM_DATAP0	NC_PCIE_CLK100M_SDP	NC_PCIE_CLK100M_SDP	MAKE_BASE=TRUE						
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	LPDP_INT_AUX_C_P	LPDP_INT_AUX_C_P											
C	LPDP_INT_AUX_C_N	LPDP_INT_AUX_C_N	USB3		SD				C				
	LPDP_INT_HPD	LPDP_INT_HPD	NC_USB3_EXTN_R2DP	MAKE_BASE=TRUE NC_USB3_EXTN_R2DP	PCIE_SD_UHS2_R2D_C_P	PCIE_SD_UHS2_R2D_C_P	MAKE_BASE=TRUE						
	NC_LPDPCTX1_DATAP0	MAKE_BASE=TRUE NC_LPDPCTX1_DATAP0	NC_USB3_EXTN_R2DN	NC_USB3_EXTN_R2DN	PCIE_SD_UHS2_R2D_C_N	PCIE_SD_UHS2_R2D_C_N	MAKE_BASE=TRUE						
	NC_LPDPCTX1_DATAN0	NC_LPDPCTX1_DATAN0	NC_USB3_EXTN_D2RP	NC_USB3_EXTN_D2RP	PCIE_SD_UHS2_D2R_P	PCIE_SD_UHS2_D2R_P	MAKE_BASE=TRUE						
	NC_LPDPCTX1_DATAP1	NC_LPDPCTX1_DATAP1	NC_USB3_EXTN_D2RN	NC_USB3_EXTN_D2RN	PCIE_SD_UHS2_D2R_N	PCIE_SD_UHS2_D2R_N	MAKE_BASE=TRUE						
	NC_LPDPCTX1_DATAN1	NC_LPDPCTX1_DATAN1	NC_USB3_EXTN_P	NC_USB3_EXTN_P	PCIE_CLK100M_SD_UHS2_P	PCIE_CLK100M_SD_UHS2_P	MAKE_BASE=TRUE						
	NC_LPDPCTX1_DATAP2	NC_LPDPCTX1_DATAP2	NC_USB3_EXTN_D2RP	NC_USB3_EXTN_D2RP	PCIE_CLK100M_SD_UHS2_N	PCIE_CLK100M_SD_UHS2_N	MAKE_BASE=TRUE						
	NC_LPDPCTX1_DATAN2	NC_LPDPCTX1_DATAN2	NC_USB3_EXTN_D2RN	NC_USB3_EXTN_D2RN	SD_UHS2_RESET_L	SD_UHS2_RESET_L	MAKE_BASE=TRUE						
	NC_LPDPCTX1_DATAP3	NC_LPDPCTX1_DATAP3	NC_USB3_EXTN_D2RN	NC_USB3_EXTN_D2RN	SD_UHS2_CLKREQ_L	SD_UHS2_CLKREQ_L	MAKE_BASE=TRUE						
	NC_LPDPCTX1_DATAN3	NC_LPDPCTX1_DATAN3	NC_EUSB_EXTAP	NC_EUSB_EXTAP									
B	NC_LPDPCTX1_AUXP	NC_LPDPCTX1_AUXP	NC_EUSB_EXTAN	NC_EUSB_EXTAN	NC_PCIE_SDEXP_R2D_C_P	NC_PCIE_SDEXP_R2D_C_P	MAKE_BASE=TRUE		B				
	NC_LPDPCTX1_AUXN	NC_LPDPCTX1_AUXN	NC_EUSB_EXTBP	NC_EUSB_EXTBP	NC_PCIE_SDEXP_R2D_C_N	NC_PCIE_SDEXP_R2D_C_N	MAKE_BASE=TRUE						
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	LPDPRX		NC_EUSB_EXTBN	NC_EUSB_EXTBN	NC_PCIE_SDEXP_D2R_N	NC_PCIE_SDEXP_D2R_N	MAKE_BASE=TRUE						
	NC_LPDPCTX1_AUXP	NC_LPDPCTX1_AUXP	NC_EUSB_EXTBN	NC_EUSB_EXTBN	NC_PCIE_CLK100M_SDEXP_P	NC_PCIE_CLK100M_SDEXP_P	MAKE_BASE=TRUE						
	NC_LPDPCTX1_AUXN	NC_LPDPCTX1_AUXN	NC_EUSB_EXTBN	NC_EUSB_EXTBN	NC_PCIE_CLK100M_SDEXP_N	NC_PCIE_CLK100M_SDEXP_N	MAKE_BASE=TRUE						
	NC_LPDPCTX1_AUXN	NC_LPDPCTX1_AUXN	NC_EUSB_EXTBN	NC_EUSB_EXTBN	SD_EXP_RESET_L	SD_EXP_RESET_L	MAKE_BASE=TRUE						
	NC_LPDPCTX1_AUXN	NC_LPDPCTX1_AUXN	NC_EUSB_EXTBN	NC_EUSB_EXTBN	SD_EXP_CLKREQ_L	SD_EXP_CLKREQ_L	MAKE_BASE=TRUE						
	NC_LPDPCTX1_AUXN	NC_LPDPCTX1_AUXN	NC_EUSB_EXTBN	NC_EUSB_EXTBN	NC_SDEXP_SEL	NC_SDEXP_SEL	MAKE_BASE=TRUE						
	NC_LPDPCTX1_AUXN	NC_LPDPCTX1_AUXN	NC_EUSB_EXTBN	NC_EUSB_EXTBN									
A	NAND		ATC3 - HDMI						A				
	NC_PCIE_CLK100M_NAND0_1P	NC_PCIE_CLK100M_NAND0_1P	DP_DP2HDMI_DATA_P<2>	DP_DP2HDMI_DATA_P<2>									
	NC_PCIE_CLK100M_NAND0_1N	NC_PCIE_CLK100M_NAND0_1N	DP_DP2HDMI_DATA_P<2>	DP_DP2HDMI_DATA_P<2>									
	NC_PCIE_CLK100M_NAND0_3P	NC_PCIE_CLK100M_NAND0_3P	DP_DP2HDMI_DATA_N<2>	DP_DP2HDMI_DATA_N<2>									
	NC_PCIE_CLK100M_NAND0_3N	NC_PCIE_CLK100M_NAND0_3N	DP_DP2HDMI_DATA_P<3>	DP_DP2HDMI_DATA_P<3>									
	NC_PCIE_CLK100M_NAND1_1P	NC_PCIE_CLK100M_NAND1_1P	DP_DP2HDMI_DATA_P<3>	DP_DP2HDMI_DATA_P<3>									
	NC_PCIE_CLK100M_NAND1_1N	NC_PCIE_CLK100M_NAND1_1N	DP_DP2HDMI_DATA_N<3>	DP_DP2HDMI_DATA_N<3>									
	NC_PCIE_CLK100M_NAND1_3P	NC_PCIE_CLK100M_NAND1_3P	DP_DP2HDMI_DATA_P<1>	DP_DP2HDMI_DATA_P<1>									
	NC_PCIE_CLK100M_NAND1_3N	NC_PCIE_CLK100M_NAND1_3N	DP_DP2HDMI_DATA_P<1>	DP_DP2HDMI_DATA_P<1>									
	SWD_NAND0_S5E0_S5E1_SWCLK	SWD_NAND0_S5E0_S5E1_SWCLK	DP_DP2HDMI_DATA_N<1>	DP_DP2HDMI_DATA_N<1>									
	SWD_NAND0_S5E0_S5E1_SWCLK	SWD_NAND0_S5E0_S5E1_SWCLK	DP_DP2HDMI_DATA_P<0>	DP_DP2HDMI_DATA_P<0>									
	SWD_NAND0_S5E2_S5E3_SWCLK	SWD_NAND0_S5E2_S5E3_SWCLK	DP_DP2HDMI_DATA_P<0>	DP_DP2HDMI_DATA_P<0>									
	SWD_NAND0_S5E2_S5E3_SWCLK	SWD_NAND0_S5E2_S5E3_SWCLK	DP_DP2HDMI_DATA_N<0>	DP_DP2HDMI_DATA_N<0>									
	SWD_NAND0_S5E2_S5E3_SWCLK	SWD_NAND0_S5E2_S5E3_SWCLK	DP_DP2HDMI_DATA_P<1>	DP_DP2HDMI_DATA_P<1>									
	SWD_NAND0_S5E0_S5E1_SWDIO	SWD_NAND0_S5E0_S5E1_SWDIO	DP_DP2HDMI_DATA_P<1>	DP_DP2HDMI_DATA_P<1>									
	SWD_NAND0_S5E0_S5E1_SWDIO	SWD_NAND0_S5E0_S5E1_SWDIO	DP_DP2HDMI_DATA_N<1>	DP_DP2HDMI_DATA_N<1>									
	SWD_NAND0_S5E2_S5E3_SWDIO	SWD_NAND0_S5E2_S5E3_SWDIO	DP_DP2HDMI_DATA_P<0>	DP_DP2HDMI_DATA_P<0>									
	SWD_NAND0_S5E2_S5E3_SWDIO	SWD_NAND0_S5E2_S5E3_SWDIO	DP_DP2HDMI_DATA_N<0>	DP_DP2HDMI_DATA_N<0>									
	SWD_NAND1_S5E0_S5E1_SWCLK	SWD_NAND1_S5E0_S5E1_SWCLK	DP_DP2HDMI_AUX_P	DP_DP2HDMI_AUX_P									
	SWD_NAND1_S5E0_S5E1_SWCLK	SWD_NAND1_S5E0_S5E1_SWCLK	DP_DP2HDMI_AUX_P	DP_DP2HDMI_AUX_P									
	SWD_NAND1_S5E2_S5E3_SWCLK	SWD_NAND1_S5E2_S5E3_SWCLK	DP_DP2HDMI_AUX_N	DP_DP2HDMI_AUX_N									
	SWD_NAND1_S5E2_S5E3_SWCLK	SWD_NAND1_S5E2_S5E3_SWCLK	DP_DP2HDMI_AUX_N	DP_DP2HDMI_AUX_N									
	SWD_NAND1_S5E0_S5E1_SWDIO	SWD_NAND1_S5E0_S5E1_SWDIO	USBC		NC_EUSB_ATC3P	NC_EUSB_ATC3P	MAKE_BASE=TRUE						
	SWD_NAND1_S5E0_S5E1_SWDIO	SWD_NAND1_S5E0_S5E1_SWDIO	NC_USB_C0_HPD	NC_USB_C0_HPD	NC_EUSB_ATC3N	NC_EUSB_ATC3N	MAKE_BASE=TRUE						
	SWD_NAND1_S5E2_S5E3_SWDIO	SWD_NAND1_S5E2_S5E3_SWDIO	NC_USB_C1_HPD	NC_USB_C1_HPD									
	SWD_NAND1_S5E2_S5E3_SWDIO	SWD_NAND1_S5E2_S5E3_SWDIO	NC_USB_C2_HPD	NC_USB_C2_HPD									
	SWD_NAND1_S5E2_S5E3_SWDIO	SWD_NAND1_S5E2_S5E3_SWDIO											
	SWD_NAND1_S5E2_S5E3_SWDIO	SWD_NAND1_S5E2_S5E3_SWDIO											
	SWD_NAND1_S5E2_S5E3_SWDIO	SWD_NAND1_S5E2_S5E3_SWDIO											
	SWD_NAND1_S5E2_S5E3_SWDIO	SWD_NAND1_S5E2_S5E3_SWDIO											

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D	ISP GPIO		D2D IO		NC SPN's				
	NC_IRQAM_RESET_L	NC_IRQAM_RESET_L	NC_A2A_SYNC_ACK	NC_A2A_SYNC_ACK	NC_DISP_TOUCH_BSYNCO	NC_DISP_TOUCH_BSYNCO			
	NC_CAM_PMU_RESET_L	NC_CAM_PMU_RESET_L	NC_A2A_SYNC_REQ	NC_A2A_SYNC_REQ	NC_DISP_TOUCH_BSYNC1	NC_DISP_TOUCH_BSYNC1			
			NC_A2A_WAKEUP	NC_A2A_WAKEUP	NC_DISP_TOUCH_FB	NC_DISP_TOUCH_FB			
			NC_C2C_CLK_24_IN	NC_C2C_CLK_24_IN	NC_DFR_DISP_FB	NC_DFR_DISP_FB			
			NC_C2C_CLK_24_OUT	NC_C2C_CLK_24_OUT					
			NC_C2C_TIME_SYNC_IN	NC_C2C_TIME_SYNC_IN					
			NC_C2C_TIME_SYNC_OUT	NC_C2C_TIME_SYNC_OUT					
			NC_GTRIG_TX_REQ	NC_GTRIG_TX_REQ					
			NC_GTRIG_TX_ACK	NC_GTRIG_TX_ACK					
	AOP IO		NAND		NC SPN's				
	TP_AOP_GPIO13	TP_AOP_GPIO13	SOC_DOMAIN_HGPIO_GRP0_0	SOC_DOMAIN_HGPIO_GRP0_0	NC_CAM_PMU_CLK24M_R	NC_CAM_PMU_CLK24M_R			
	NC_AOP_GPIO1	NC_AOP_GPIO1	SOC_DOMAIN_HGPIO_GRP0_1	SOC_DOMAIN_HGPIO_GRP0_1	NC_SENSOR1_CLK	NC_SENSOR1_CLK			
	NC_AOP_GPIO5	NC_AOP_GPIO5			NC_SENSOR2_CLK	NC_SENSOR2_CLK			
	NC_AOP_I2C0_SCL	NC_AOP_I2C0_SCL			NC_SENSOR3_CLK	NC_SENSOR3_CLK			
	NC_AOP_I2C0_SDA	NC_AOP_I2C0_SDA							
	NC_PDM_HMIC_CLK1	NC_PDM_HMIC_CLK1							
	NC_AOP_I2S0_MCK	NC_AOP_I2S0_MCK							
	NC_AOP_I2S0_LRCK	NC_AOP_I2S0_LRCK							
	NC_AOP_I2S0_DOUT	NC_AOP_I2S0_DOUT							
	CLVR GPIO		CLVR SPMI						
	NC_AOP_I2S0_DIN	NC_AOP_I2S0_DIN	NC_I2C_SE_SCL	NC_I2C_SE_SCL					
	NC_AOP_I2S0_RCLK	NC_AOP_I2S0_RCLK	NC_I2C_SE_SDA	NC_I2C_SE_SDA					
	NC_PDM_HMIC_DATA1	NC_PDM_HMIC_DATA1							
	NC_AOP_UART2_R2D	NC_AOP_UART2_R2D							
	NC_AOP_UART2_D2R	NC_AOP_UART2_D2R							
	SOC_DOMAIN_AGPIO_AOP0	SOC_DOMAIN_AGPIO_AOP0							
	NC_AOP_GPIO2	NC_AOP_GPIO2							
	NC_AOP_GPIO3	NC_AOP_GPIO3							
	NC_AOP_GPIO4	NC_AOP_GPIO4							
C	CLVR GPIO		ISP SPMI						
	NC_CLVR_GPIO1	NC_CLVR_GPIO1	NC_SPMI_I2C0_SCL	NC_SPMI_I2C0_SCL	NC_AP_UART2_R2D	NC_AP_UART2_R2D			
	NC_CLVR_GPIO2	NC_CLVR_GPIO2	NC_SPMI_I2C0_SDA	NC_SPMI_I2C0_SDA	NC_AP_UART2_D2R	NC_AP_UART2_D2R			
	NC_CLVR_GPIO3	NC_CLVR_GPIO3	NC_SPMI_I2C0_SCL	NC_SPMI_I2C0_SCL	NC_AP_UART2_D2R_RTS_L	NC_AP_UART2_D2R_RTS_L			
	NC_CLVR_GPIO4	NC_CLVR_GPIO4	NC_SPMI_I2C0_SDA	NC_SPMI_I2C0_SDA	NC_AP_UART2_D2R_CTS_L	NC_AP_UART2_D2R_CTS_L			
	NC_CLVR_GPIO5	NC_CLVR_GPIO5	NC_SPMI_I2C0_SCL	NC_SPMI_I2C0_SCL	NC_AP_UART2_D2R_CTS_L	NC_AP_UART2_D2R_CTS_L			
	SOC_DOMAIN_GPIO_GRP1_0	SOC_DOMAIN_GPIO_GRP1_0	NC_SPMI_I2C0_SDA	NC_SPMI_I2C0_SDA	NC_AP_UART2_D2R_CTS_L	NC_AP_UART2_D2R_CTS_L			
	NC_CLVR_GPIO8	NC_CLVR_GPIO8	NC_SPMI_I2C0_SCL	NC_SPMI_I2C0_SCL	NC_AP_UART2_D2R_CTS_L	NC_AP_UART2_D2R_CTS_L			
	NC_CLVR_GPIO9	NC_CLVR_GPIO9	NC_SPMI_I2C0_SDA	NC_SPMI_I2C0_SDA	NC_AP_UART2_D2R_CTS_L	NC_AP_UART2_D2R_CTS_L			
			SOC_DOMAIN_GPIO_GRP1_2	SOC_DOMAIN_GPIO_GRP1_2	NC_AP_UART2_TXD	NC_AP_UART2_TXD			
	SMC GPIO		VIPER PWM						
	NC_ACDC_BURST_EN_L	NC_ACDC_BURST_EN_L	NC_SPMI1_I2C0_SCL	NC_SPMI1_I2C0_SCL	NC_AP_SPI2_SSIN	NC_AP_SPI2_SSIN			
	NC_ACDC_ID	NC_ACDC_ID	NC_SPMI1_I2C0_SDA	NC_SPMI1_I2C0_SDA	NC_AP_SPI2_DATA	NC_AP_SPI2_DATA			
	NC_PBU_TBD1	NC_PBU_TBD1	NC_SPMI1_I2C0_SCL	NC_SPMI1_I2C0_SCL	NC_AP_SPI2_CLK	NC_AP_SPI2_CLK			
	SOC_DOMAIN_WGPIO_AOP1	SOC_DOMAIN_WGPIO_AOP1	NC_SPMI1_I2C0_SDA	NC_SPMI1_I2C0_SDA	NC_LEDP_FTICAM_AUX	NC_LEDP_FTICAM_AUX			
	NC_SMC_GPIO2	NC_SMC_GPIO2	NC_SPMI1_I2C0_SCL	NC_SPMI1_I2C0_SCL	NC_DISP_FOL	NC_DISP_FOL			
	NC_SMC_GPIO3	NC_SMC_GPIO3	NC_SPMI1_I2C0_SDA	NC_SPMI1_I2C0_SDA					
	NC_SMC_GPIO4	NC_SMC_GPIO4							
	NC_SMC_I2CM6_SCL	NC_SMC_I2CM6_SCL							
	NC_SMC_I2CM6_SDA	NC_SMC_I2CM6_SDA							
	NUB GPIO		NC SPN's		SOC GPIO TPs BY DOMAIN				
	SOC_DOMAIN_HGPIO_AOP1_2	SOC_DOMAIN_HGPIO_AOP1_2	NC_TDM_SPKRAMP_ALT_BCLK_R	NC_TDM_SPKRAMP_ALT_BCLK_R	Nonused SOC pins pulled out by functional/power domains				
	SOC_DOMAIN_HGPIO_AOP1_0	SOC_DOMAIN_HGPIO_AOP1_0	NC_TDM_SPKRAMP_ALT_D2R	NC_TDM_SPKRAMP_ALT_D2R					
	SOC_DOMAIN_HGPIO_AOP1_1	SOC_DOMAIN_HGPIO_AOP1_1	NC_TDM_SPKRAMP_ALT_FSYNC_R	NC_TDM_SPKRAMP_ALT_FSYNC_R					
	NC_NUB_SWD_TMS3	NC_NUB_SWD_TMS3	NC_TDM_SPKRAMP_ALT_R2D_R	NC_TDM_SPKRAMP_ALT_R2D_R					
			NC_AP_I2S3_MCK	NC_AP_I2S3_MCK					
			NC_AP_I2S0_MCK	NC_AP_I2S0_MCK					
			NC_AP_I2S1_MCK	NC_AP_I2S1_MCK					
			NC_AP_GPIO23	NC_AP_GPIO23					
			NC_AP_GPIO24	NC_AP_GPIO24					
B	SEP		NC SPN's		SOC GPIO TPs BY DOMAIN				
	SOC_DOMAIN_SGPIO_GRP1	SOC_DOMAIN_SGPIO_GRP1	NC_AP_GPIO28	NC_AP_GPIO28	PPZZ01		PPZZ02		
			NC_AP_GPIO29	NC_AP_GPIO29	PPZZ03		PPZZ04		
			NC_AP_GPIO30	NC_AP_GPIO30	PPZZ05		PPZZ06		
			NC_AP_GPIO31	NC_AP_GPIO31	PPZZ07		PPZZ08		
			NC_AP_GPIO32	NC_AP_GPIO32	PPZZ09		PPZZ10		
			NC_AP_GPIO33	NC_AP_GPIO33	PPZZ11		PPZZ12		
			NC_AP_GPIO34	NC_AP_GPIO34					
			NC_CIO_ATC3_LSTX_I_V2	NC_CIO_ATC3_LSTX_I_V2					
			NC_CIO_ATC3_LSRX_I_V2	NC_CIO_ATC3_LSRX_I_V2					
A	ENET GPIO		NC SPN's		SOC GPIO TPs BY DOMAIN				
	NC_ENET_SYNC_1588	NC_ENET_SYNC_1588	NC_WLAN_CONTEXT_A	NC_WLAN_CONTEXT_A	PPZZ01		PPZZ02		
			NC_WLAN_CONTEXT_B	NC_WLAN_CONTEXT_B	PPZZ03		PPZZ04		
			SOC_DOMAIN_GPIO_GRP0	SOC_DOMAIN_GPIO_GRP0	PPZZ05		PPZZ06		
			SOC_DOMAIN_GPIO_GRP1	SOC_DOMAIN_GPIO_GRP1	PPZZ07		PPZZ08		
					PPZZ09		PPZZ10		
					PPZZ11		PPZZ12		

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	SPACING CONSTRAINT SET ASSIGNMENT, CLASS-CLASS			SPACING CONSTRAINT SET ASSIGNMENT, CLASS-CLASS			SPACING CONSTRAINT SET ASSIGNMENT, CLASS-CLASS		
D	CLASS TO CLASS SPACING			CLASS TO CLASS SPACING			CLASS TO CLASS SPACING		
	CLASS NAME	CLASS NAME	CONSTRAINT SET	CLASS NAME	CLASS NAME	CONSTRAINT SET	CLASS NAME	CLASS NAME	CONSTRAINT SET
	IIC	GROUND	DEFAULT	IIC	POWER	DEFAULT	USBC SOC BB80 D2R 1	USBC SOC BB80 D2R 2	A DIELECTRIC 5X
	UPT	GROUND	DEFAULT	UPT	POWER	DEFAULT	USBC SOC BB80 R2D 1	USBC SOC BB80 R2D 2	A DIELECTRIC 5X
	SPMI	GROUND	DEFAULT	SPMI	POWER	DEFAULT	USBC BB80 CONN D2R 1	USBC BB80 CONN D2R 2	A DIELECTRIC 5X
	SWD	GROUND	DEFAULT	SWD	POWER	DEFAULT	USBC BB80 CONN R2D 1	USBC BB80 CONN R2D 2	A DIELECTRIC 5X
	STAO	GROUND	DEFAULT	STAO	POWER	DEFAULT	USBC SOC BB81 D2R 1	USBC SOC BB81 D2R 2	A DIELECTRIC 5X
	CLOCK 24M	GROUND	DEFAULT	CLOCK 24M	POWER	DEFAULT	USBC SOC BB81 R2D 1	USBC SOC BB81 R2D 2	A DIELECTRIC 5X
	CLOCK 32K	GROUND	DEFAULT	CLOCK 32K	POWER	DEFAULT	USBC BB81 CONN D2R 1	USBC BB81 CONN D2R 2	A DIELECTRIC 5X
	TDM LEFT	GROUND	DEFAULT	TDM LEFT	POWER	DEFAULT	USBC BB81 CONN R2D 1	USBC BB81 CONN R2D 2	A DIELECTRIC 5X
C	TDM RIGHT	GROUND	DEFAULT	TDM RIGHT	POWER	DEFAULT	PANEL LFPD DATA	PANEL LFPD DATA	A DIELECTRIC 5X
	TDM CODEC	GROUND	DEFAULT	TDM CODEC	POWER	DEFAULT	SOC XTAL 24M IN	SOC XTAL 24M OUT	A DIELECTRIC 2X
	SPKR 10C	GROUND	DEFAULT	SPKR 10C	POWER	DEFAULT			
	UART	GROUND	DEFAULT	UART	POWER	DEFAULT			
	RSRSTS	GROUND	DEFAULT	RSRSTS	POWER	DEFAULT			
	WDOG	GROUND	DEFAULT	WDOG	POWER	DEFAULT			
	SOCROT	GROUND	DEFAULT	SOCROT	POWER	DEFAULT			
	POWER BUTTON	GROUND	DEFAULT	POWER BUTTON	POWER	DEFAULT			
	FAULT	GROUND	DEFAULT	FAULT	POWER	DEFAULT			
	DMIC PDM	GROUND	DEFAULT	DMIC PDM	POWER	DEFAULT			
B	FAN CTRL	GROUND	DEFAULT	FAN CTRL	POWER	DEFAULT			
	USBC SOC BB80 D2R 1	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC SOC BB80 D2R 2	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC SOC BB80 D2R 2	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC SOC BB80 R2D 1	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC SOC BB80 R2D 1	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC SOC BB80 R2D 2	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC SOC BB80 AUX	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC SOC BB80 LEX	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC SOC BB80 LEX	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC BB80 CONN D2R 1	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC BB80 CONN D2R 1	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC BB80 CONN D2R 2	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC BB80 CONN R2D 1	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC BB80 CONN R2D 2	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC BB80 CONN AUXLEX	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC BB80 CONN AUXLFX	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC UPC0 CONN TOP	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC UPC0 CONN BOT	POWER	DEFAULT WITH 5X LINE2SHAPE			
A	USBC UPC0 CONN BOT	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC UPC0 CONN CC	POWER	DEFAULT			
	USBC UPC0 CONN CC	GROUND	DEFAULT	USBC UPC0 CONN SBU	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC SOC RTMR0 USB2	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC SOC RTMR0 USB2	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC RTMR0 MIX USB2	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC MIX UPC0 USB2	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC MIX UPC0 USB2	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC MIX VITC USB2	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC SOC BB81 D2R 1	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC SOC BB81 D2R 2	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC SOC BB81 D2R 2	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC SOC BB81 R2D 1	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC SOC BB81 R2D 1	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC SOC BB81 R2D 2	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC SOC BB81 AUX	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC SOC BB81 LEX	POWER	DEFAULT WITH 5X LINE2SHAPE			
	USBC BB81 CONN D2R 1	GROUND	DEFAULT WITH 5X LINE2SHAPE	USBC BB81 CONN D2R 2	POWER	DEFAULT WITH 5X LINE2SHAPE			

17.2 SPACING CSETS, CLASS-CLASS

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PAGE TITLE		BOM VARIANT TABLES	
 Apple Inc.		DOCUMENT NUMBER	051-06723
		REVISION	5.0.0
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SOC

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
998-16917	1	SOC_S0A_DEV	U0600	CRITICAL	SOC:DEV
939-10299	1	FCBFB,BA100A,02737	U0600	CRITICAL	SOC:SOCKET
998-26570	1	SOC_S0A,B1+100,17,RC,32PST,LP,AG,B,04103	U0600	CRITICAL	
998-26571	1	SOC_S0A,B1+100,17,RC,32PST,LP,AG,B,04102	U0600	CRITICAL	
998-26585	1	SOC_S0A,B1+100,17,RC,32PST,LP,AG,B,04105	U0600	CRITICAL	
998-26586	1	SOC_S0A,B1+100,17,RC,32PST,LP,AG,B,04107	U0600	CRITICAL	

SOC ALT

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS
998-26572	998-26570	SOC:RC_32PSTP_320	U0600	Samsung
998-26573	998-26570	SOC:RC_32PSTP_320	U0600	Microon
998-26574	998-26571	SOC:RC_32PSTP_320	U0600	Microon
998-26587	998-26585	SOC:RC_32PSTP_320	U0600	Samsung
998-26589	998-26585	SOC:RC_32PSTP_320	U0600	Microon
998-26590	998-26586	SOC:RC_32PSTP_320	U0600	Microon

BBR IC

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
998-13316	3	IC_4008BITER,8100A,008/76,8100A,00A103	UF000,UF100,U0600	CRITICAL	ATCTMR:DEV
338500561	3	IC_1987,005,01007,FQ0,A1,00A103	UF000,UF100,U0600	CRITICAL	BBR:A1_PRQ

ACE/UPC/MAGSAFE

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
353502977	4	IC_00101,ACE,B2,008 PWR SW B/W,00A103	U5500,UF400,UF500,U0600	CRITICAL	ACE2:B2

Programmable parts: BBR/ACE ROMs

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
341501862	1	ROM_BBR/ACE-01 (V2000) EVT_02704	UF360	CRITICAL	BBR_1 ROM:EVT
341501861	1	ROM_BBR/ACE-01 (V2000) EVT_02704	UF260	CRITICAL	BBR_0 ROM:EVT
341501863	1	ROM_BBR/ACE-01 (V2000) EVT_02704	UG260	CRITICAL	BBR_2 ROM:EVT
341501864	1	ROM_ACE-01 (V2000) EVT_02704	U5560	CRITICAL	ACE0 ROM:EVT

<-LEFT
<-RIGHT
<-MAGSAFE

BBR BOM ALT parts

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS
355000232	355000129		ALT	

SD CARD CONNECTOR

SD CARD CONNECTOR BOM OPTIONS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
514-00196	1	CONN,RCPT,BLK,SD,X1982	JK600	CRITICAL	CONN:BLK
514-00203	1	CONN,RCPT,MI,SD,X1982	JK600	CRITICAL	CONN:GRY

SD CARD CONTROLLER BOM OPTION(CSA155)

SD CARD CONN BLACK ALT

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS
514-00210	514-00196	CONN:BLK	JK600	TWO BLACK CONN APNS

EUSB LEVEL SHIFTER PARROT in CSA157 and CSA167

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
338500429	2	IC_PPMHVT_000220A,00A01,0704,CV05	UP700,UP700,UP700	CRITICAL	CONN_LB:PARROT

SUONA APN IN CSA52

OCARINA 0/1

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
338500600	1	IC_P00,OCARINA,01490A0,0PT-0C,0UC056	UN400	CRITICAL	OCARINA:AO_OTPBC
338500600	1	IC_P00,OCARINA,01490A0,0PT-0C,0UC056	UN900	CRITICAL	OCARINA:AO_OTPBC

HDMI MADEA

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
338500347	1	IC_HDMI_P00A01,0C02020,0A,0A0117	UH700	CRITICAL	

HMDI CONNECTOR BOM OPTIONS:

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
514500360	1	CONN,RCPT,BLK,HDMI,X1982	JH500	CRITICAL	CONN:BLK
514500360	1	CONN,RCPT,GRY,HDMI,X1982	JH500	CRITICAL	CONN:GRY


514500355 GREY HDMI CONN is removed in EVT. KEEP CONN:GRY for 639 structure

PBUS CAPS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
128500011	1	CAP,TANT,POLY,6-RPF,20V,33V,SMD00A,B1.2	C5210	CRITICAL	

SE CERES

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
338500630	1	IC_010010V,B1,CERES,PROD,000-00,0UC056	U5000	CRITICAL	SE:PROD_SW_MU
998-21255	1	IC_010010V,B1,CERES,DEV,000-00,0UC056	U5000	CRITICAL	SE:DEV_SW_H3
338500629	1	IC_010010V,B1,CERES,DEV,000-00,0UC056	U5000	CRITICAL	SE:DEV_SW_LN

ITEM: MASTER-02724		REV: 0475-06/25/2021	
PAGE TITLE:		BOM OPTION TABLES	
 Apple Inc.		ROUTING NUMBER	051-06723
		REVISION	5.0.0
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D	COMMON BOM GROUPS								D																															
	<table><tr><th>BOM GROUP</th><th>BOM OPTIONS</th></tr><tr><td>X2719_COMMON</td><td>SOB, PCB, COMMON, ALT_OEM, ALTERNATE, X2719_COMMON, X2719_PROGPARTS, X2719_USBC, X2719_HDMI, X2719_PWR, X2719_BLC</td></tr><tr><td>X2719_COMMON1</td><td>BOARD_ID, BOARD_REV:0110, BOOTCFG2</td></tr><tr><td>X2719_COMMON2</td><td>SE:DEV_SW_LH, RND_12C:1V8, RF-COMM, SD:REV4, BTW_GATE:80, STFWB, VITAMIN-C:NO</td></tr><tr><td>X2719_PROGPARTS</td><td>BBR_0_ROM:EVT, BBR_1_ROM:EVT, BBR_2_ROM:EVT, ACES_ROM:EVT, HDMI_ROM:FW_V1P130</td></tr><tr><td>X2719_USBC</td><td>BBR:AI_FRO, ACB2:82, EUSB_L8:PARROT, UPC_ATTACHM_INT, UPC_RJ45LS_INT</td></tr><tr><td>X2719_HDMI</td><td>DATA_FILT7, CLK_FILT7, LDO_ROM1:5V, HDMI_SFF_AND:STUFF</td></tr><tr><td>X2719_BLC</td><td>BLC_BEN_IC:V4, BLC_5V_SERIES:10_OHM, BLC_5V_CAP:497_UF</td></tr><tr><td>X2719_PWR</td><td>X2719_MONACO, X2719_ICEMAN_HP, X2719_VIPER, X2719_MAVERICKS, CAPS_ENOISE, PSVS2_DSCHG, BUONA:936MA</td></tr><tr><td>CAPS_ENOISE</td><td>ENOISE_VDCH_200F:HSTL, ENOISE_GRP1:150F_HSTL, ENOISE_GRP2:150F_HSTL, ENOISE_GRP3:150F_HSTL, ENOISE_1V8_100F:HSTL, ENOISE_1V8_200F:HSTL</td></tr><tr><td>X2719_MAVERICKS</td><td>PMU_OSPF2:1V, MUX_OTP:AN, PSUS:35</td></tr><tr><td>X2719_ICEMAN_HP</td><td>SYNAPS_IC:AD_ROM2_S0C1, SYNAPS_L8B, SW_ROM2_C0A4A, SW_ROM2_C0A4B, SW0ELN-ROM2_SW</td></tr><tr><td>X2719_VIPER</td><td>VIPER:SPH</td></tr><tr><td>X2719_MONACO</td><td>MONACO_IC</td></tr></table>									BOM GROUP	BOM OPTIONS	X2719_COMMON	SOB, PCB, COMMON, ALT_OEM, ALTERNATE, X2719_COMMON, X2719_PROGPARTS, X2719_USBC, X2719_HDMI, X2719_PWR, X2719_BLC	X2719_COMMON1	BOARD_ID, BOARD_REV:0110, BOOTCFG2	X2719_COMMON2	SE:DEV_SW_LH, RND_12C:1V8, RF-COMM, SD:REV4, BTW_GATE:80, STFWB, VITAMIN-C:NO	X2719_PROGPARTS	BBR_0_ROM:EVT, BBR_1_ROM:EVT, BBR_2_ROM:EVT, ACES_ROM:EVT, HDMI_ROM:FW_V1P130	X2719_USBC	BBR:AI_FRO, ACB2:82, EUSB_L8:PARROT, UPC_ATTACHM_INT, UPC_RJ45LS_INT	X2719_HDMI	DATA_FILT7, CLK_FILT7, LDO_ROM1:5V, HDMI_SFF_AND:STUFF	X2719_BLC	BLC_BEN_IC:V4, BLC_5V_SERIES:10_OHM, BLC_5V_CAP:497_UF	X2719_PWR	X2719_MONACO, X2719_ICEMAN_HP, X2719_VIPER, X2719_MAVERICKS, CAPS_ENOISE, PSVS2_DSCHG, BUONA:936MA	CAPS_ENOISE	ENOISE_VDCH_200F:HSTL, ENOISE_GRP1:150F_HSTL, ENOISE_GRP2:150F_HSTL, ENOISE_GRP3:150F_HSTL, ENOISE_1V8_100F:HSTL, ENOISE_1V8_200F:HSTL	X2719_MAVERICKS	PMU_OSPF2:1V, MUX_OTP:AN, PSUS:35	X2719_ICEMAN_HP	SYNAPS_IC:AD_ROM2_S0C1, SYNAPS_L8B, SW_ROM2_C0A4A, SW_ROM2_C0A4B, SW0ELN-ROM2_SW	X2719_VIPER	VIPER:SPH	X2719_MONACO	MONACO_IC			
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Variable BOM Groups/Development/Base BOMs																																								
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P0 rev #:BOARD_REV:0000 P1c rev #:BOARD_REV:0010//rdar:70159986 EVTc rev #:BOARD_REV:0100//rdar:73904349																																								
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	<table><tr><th>BOM NUMBER</th><th>BOM NAME</th><th>BOM OPTIONS</th></tr><tr><td>685-00415</td><td>SSD_4_LAND, MLB-S, X2719</td><td>ALT_OEM, ALTERNATE, SSD_SUPPORT:L1-L4</td></tr><tr><td>685-00416</td><td>SSD_5_LAND, MLB-S, X2719</td><td>ALT_OEM, ALTERNATE, SSD_SUPPORT:L5</td></tr><tr><td>685-00417</td><td>SSD_8_LAND, MLB-S, X2719</td><td>ALT_OEM, ALTERNATE, SSD_SUPPORT:L8</td></tr></table>									BOM NUMBER	BOM NAME	BOM OPTIONS	685-00415	SSD_4_LAND, MLB-S, X2719	ALT_OEM, ALTERNATE, SSD_SUPPORT:L1-L4	685-00416	SSD_5_LAND, MLB-S, X2719	ALT_OEM, ALTERNATE, SSD_SUPPORT:L5	685-00417	SSD_8_LAND, MLB-S, X2719	ALT_OEM, ALTERNATE, SSD_SUPPORT:L8																			
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685-00417	SSD_8_LAND, MLB-S, X2719	ALT_OEM, ALTERNATE, SSD_SUPPORT:L8																																						
SSD Variable BOM Groups/Development																																								
<table><tr><th>PART NUMBER</th><th>QTY</th><th>DESCRIPTION</th><th>REFERENCE DES</th><th>CRITICAL</th><th>BOM OPTION</th></tr><tr><td>685-00415</td><td>1</td><td>SSD 685FS, SSD_4_LAND, MLB-S, X2719</td><td>SSD</td><td>CRITICAL</td><td>LND_4_BOM</td></tr><tr><td>685-00416</td><td>1</td><td>SSD 685FS, SSD_5_LAND, MLB-S, X2719</td><td>SSD</td><td>CRITICAL</td><td>LND_5_BOM</td></tr><tr><td>685-00417</td><td>1</td><td>SSD 685FS, SSD_8_LAND, MLB-S, X2719</td><td>SSD</td><td>CRITICAL</td><td>LND_8_BOM</td></tr></table>									PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION	685-00415	1	SSD 685FS, SSD_4_LAND, MLB-S, X2719	SSD	CRITICAL	LND_4_BOM	685-00416	1	SSD 685FS, SSD_5_LAND, MLB-S, X2719	SSD	CRITICAL	LND_5_BOM	685-00417	1	SSD 685FS, SSD_8_LAND, MLB-S, X2719	SSD	CRITICAL	LND_8_BOM								
PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION																																			
685-00415	1	SSD 685FS, SSD_4_LAND, MLB-S, X2719	SSD	CRITICAL	LND_4_BOM																																			
685-00416	1	SSD 685FS, SSD_5_LAND, MLB-S, X2719	SSD	CRITICAL	LND_5_BOM																																			
685-00417	1	SSD 685FS, SSD_8_LAND, MLB-S, X2719	SSD	CRITICAL	LND_8_BOM																																			
SSD Support BOM Groups																																								
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SSD_SUPPORT:L1-L4	Common BOM	ALTERNATE, SSD_2L, SSD_4L																																						
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<table><tr><td colspan="2">FORM NUMBER: X2719</td><td colspan="2">FORM DATE: 09/11/2021</td></tr><tr><td colspan="4">PAGE TITLE</td></tr><tr><td colspan="2">BOM GROUPS</td><td>ISSUES NUMBER</td><td>ISSUES DATE</td></tr><tr><td colspan="2">Apple Inc.</td><td>051-06723</td><td>05/11/2021</td></tr><tr><td colspan="2">NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. AND IS NOT TO BE REPRODUCED OR COPIED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF APPLE INC. 1 TO MAINTAIN THIS DOCUMENT IN CONFIDENCE 2 NOT TO REPRODUCE OR COPIY IT 3 NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART 4 ALL RIGHTS RESERVED</td><td>REVISION</td><td>5.0.0</td></tr><tr><td colspan="2"></td><td>ISSUES</td><td>Pvt-pre-1</td></tr><tr><td colspan="2"></td><td>PAGE</td><td>602 OF 700</td></tr><tr><td colspan="2"></td><td>SHEET</td><td>159 OF 164</td></tr></table>									FORM NUMBER: X2719		FORM DATE: 09/11/2021		PAGE TITLE				BOM GROUPS		ISSUES NUMBER	ISSUES DATE	Apple Inc.		051-06723	05/11/2021	NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. AND IS NOT TO BE REPRODUCED OR COPIED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF APPLE INC. 1 TO MAINTAIN THIS DOCUMENT IN CONFIDENCE 2 NOT TO REPRODUCE OR COPIY IT 3 NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART 4 ALL RIGHTS RESERVED		REVISION	5.0.0			ISSUES	Pvt-pre-1			PAGE	602 OF 700			SHEET	159 OF 164
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		PAGE	602 OF 700																																					
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8	7	6	5	4	3	2	1																																	

NANDO S5E0

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
998-18368	1	IC,NANDO,S5E MCP ROUTING STUDY,LSA110	UN000	CRITICAL	NANDO_S5E_STUDY
998-21934	1	IC,NANDO,S5E MCP ROUTING STUDY,LSA110	UN000	CRITICAL	NANDO_S5E_STUDY_2TB
335800480	1	NAND, 10V4, 128MBT, 40X, 474, 512G, 8, S5EA110	UN000	CRITICAL	NANDO_S5E0:512GB_KX
335800437	1	NAND, 10V4, 128MBT, 40X, 474, 512G, 8, S5EA110	UN000	CRITICAL	NANDO_S5E0:512GB_HY
335800489	1	NAND, 10V4, 180MBT, 40X, 474, 256G, 8, S5EA110	UN000	CRITICAL	NANDO_S5E0:512GB_WD
335800464	1	NAND, 10V4, 128MBT, 40X, 474, 256G, 8, S5EA110	UN000	CRITICAL	NANDO_S5E0:1TB_KX
335800472	1	NAND, 10V4, 256MBT, 40X, 474, 256G, 8, S5EA110	UN000	CRITICAL	NANDO_S5E0:1TB_WD
335800438	1	NAND, 10V4, 256MBT, 40X, 474, 512G, 8, S5EA110	UN000	CRITICAL	NANDO_S5E0:1TB_HY
335800466	1	NAND, 10V4, 512MBT, 40X, 474, 256G, 8, S5EA110	UN000	CRITICAL	NANDO_S5E0:1TB_KX
335800439	1	NAND, 10V4, 512MBT, 40X, 474, 512G, 8, S5EA110	UN000	CRITICAL	NANDO_S5E0:1TB_HY
335800474	1	NAND, 10V4, 512MBT, 40X, 474, 256G, 8, S5EA110	UN000	CRITICAL	NANDO_S5E0:2TB_WD
335800466	1	NAND, 10V4, 512MBT, 40X, 474, 256G, 8, S5EA110	UN000	CRITICAL	NANDO_S5E0:4TB_KX
335800439	1	NAND, 10V4, 512MBT, 40X, 474, 512G, 8, S5EA110	UN000	CRITICAL	NANDO_S5E0:4TB_HY
335800474	1	NAND, 10V4, 512MBT, 40X, 474, 256G, 8, S5EA110	UN000	CRITICAL	NANDO_S5E0:4TB_WD
335800458	1	NAND, 10V4, 1024MBT, 40X, 474, 512G, 8, S5EA110	UN000	CRITICAL	NANDO_S5E0:8TB_HY
335800468	1	NAND, 10V4, 178T, 40X, 474, 512G, 8, S5EA110	UN000	CRITICAL	NANDO_S5E0:8TB_KX
335800535	1	NAND, 81C05T, 178T, 40X, 474, 512G, 8, LSA110	UN000	CRITICAL	NANDO_S5E0:8TB_WD

NANDO S5E123

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
998-18368	3	IC,NANDO,S5E MCP ROUTING STUDY,LSA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E_STUDY
998-21934	3	IC,NANDO,S5E MCP ROUTING STUDY,LSA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E_STUDY_2TB
335800462	3	NAND, 10V4, 128MBT, 40X, 474, 256G, 8, S5EA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E123:512GB_KX
335800437	3	NAND, 10V4, 128MBT, 40X, 474, 512G, 8, S5EA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E123:512GB_HY
335800470	3	NAND, 10V4, 128MBT, 40X, 474, 512G, 8, S5EA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E123:512GB_WD
335800464	3	NAND, 10V4, 256MBT, 40X, 474, 256G, 8, S5EA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E123:1TB_KX
335800472	3	NAND, 10V4, 256MBT, 40X, 474, 256G, 8, S5EA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E123:1TB_WD
335800438	3	NAND, 10V4, 256MBT, 40X, 474, 512G, 8, S5EA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E123:1TB_HY
335800466	3	NAND, 10V4, 512MBT, 40X, 474, 256G, 8, S5EA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E123:2TB_KX
335800439	3	NAND, 10V4, 512MBT, 40X, 474, 512G, 8, S5EA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E123:2TB_HY
335800474	3	NAND, 10V4, 512MBT, 40X, 474, 256G, 8, S5EA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E123:2TB_WD
335800466	3	NAND, 10V4, 512MBT, 40X, 474, 256G, 8, S5EA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E123:4TB_KX
335800439	3	NAND, 10V4, 512MBT, 40X, 474, 512G, 8, S5EA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E123:4TB_HY
335800474	3	NAND, 10V4, 512MBT, 40X, 474, 256G, 8, S5EA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E123:4TB_WD
335800458	3	NAND, 10V4, 1024MBT, 40X, 474, 512G, 8, S5EA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E123:8TB_HY
335800468	3	NAND, 10V4, 178T, 40X, 474, 512G, 8, S5EA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E123:8TB_KX
335800535	3	NAND, 81C05T, 178T, 40X, 474, 512G, 8, LSA110	UN100,UN200,UN300	CRITICAL	NANDO_S5E123:8TB_WD

NAND SOCKET


PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
939-08815	2	PCB,NANDSOCKET	UN000,UN400	CRITICAL	NAND_SOCKET

NAND1 S5E0

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
998-18368	1	IC,NANDO,S5E MCP ROUTING STUDY,LSA110	UN500	CRITICAL	NANDO_S5E_STUDY
998-21934	1	IC,NANDO,S5E MCP ROUTING STUDY,LSA110	UN500	CRITICAL	NANDO_S5E_STUDY_2TB
335800436	1	NAND, 10V4, 640MBT, 40X, 474, 512G, 8, S5EA110	UN500	CRITICAL	NANDO_S5E0:512GB_HY
335800436	1	NAND, 10V4, 640MBT, 40X, 474, 512G, 8, S5EA110	UN500	CRITICAL	NANDO_S5E0:1TB_HY
335800466	1	NAND, 10V4, 512MBT, 40X, 474, 256G, 8, S5EA110	UN500	CRITICAL	NANDO_S5E0:4TB_KX
335800439	1	NAND, 10V4, 512MBT, 40X, 474, 512G, 8, S5EA110	UN500	CRITICAL	NANDO_S5E0:4TB_HY
335800474	1	NAND, 10V4, 512MBT, 40X, 474, 256G, 8, S5EA110	UN500	CRITICAL	NANDO_S5E0:4TB_WD
335800458	1	NAND, 10V4, 1024MBT, 40X, 474, 512G, 8, S5EA110	UN500	CRITICAL	NANDO_S5E0:8TB_HY
335800468	1	NAND, 10V4, 178T, 40X, 474, 512G, 8, S5EA110	UN500	CRITICAL	NANDO_S5E0:8TB_KX
335800535	1	NAND, 81C05T, 178T, 40X, 474, 512G, 8, LSA110	UN500	CRITICAL	NANDO_S5E0:8TB_WD

NAND1 S5E123

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
998-18368	3	IC,NANDO,S5E MCP ROUTING STUDY,LSA110	UN400,UN700,UN800	CRITICAL	NANDO_S5E_STUDY
998-21934	3	IC,NANDO,S5E MCP ROUTING STUDY,LSA110	UN400,UN700,UN800	CRITICAL	NANDO_S5E_STUDY_2TB
335800466	3	NAND, 10V4, 512MBT, 40X, 474, 256G, 8, S5EA110	UN400,UN700,UN800	CRITICAL	NANDO_S5E123:4TB_KX
335800439	3	NAND, 10V4, 512MBT, 40X, 474, 512G, 8, S5EA110	UN400,UN700,UN800	CRITICAL	NANDO_S5E123:4TB_HY
335800474	3	NAND, 10V4, 512MBT, 40X, 474, 256G, 8, S5EA110	UN400,UN700,UN800	CRITICAL	NANDO_S5E123:4TB_WD
335800458	3	NAND, 10V4, 1024MBT, 40X, 474, 512G, 8, S5EA110	UN400,UN700,UN800	CRITICAL	NANDO_S5E123:8TB_HY
335800468	3	NAND, 10V4, 178T, 40X, 474, 512G, 8, S5EA110	UN400,UN700,UN800	CRITICAL	NANDO_S5E123:8TB_KX
335800535	3	NAND, 81C05T, 178T, 40X, 474, 512G, 8, LSA110	UN400,UN700,UN800	CRITICAL	NANDO_S5E123:8TB_WD

PAGE TITLE			
NAND BOM OPTION TABLES			
 Apple Inc.	DESIGN NUMBER	051-06723	SHEET
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REF_CLKV_MONACO

PACK OPTIONS TO INCLUDE IN NETLIST

CLVR_1C_2C

REF_VR_ICEMAN_HP

PACK OPTIONS TO INCLUDE IN NETLIST

1V8_AON_12C-POR

2V8B3LIN_M0K1Y

REF_USBC_ACE2

PACK OPTIONS TO INCLUDE IN NETLIST

USBC_LAPTOP

USBC_RPI_UPC0

USBC_RPI_UPC2

USBC_DEBUG_UPC0

PM03_LARGER_FITCH

REF_STORAGE_536

PACK OPTIONS TO INCLUDE IN NETLIST

2V8_BAND_PBUS-R12

REF_SEC016_BAK

PACK OPTIONS TO INCLUDE IN NETLIST

PROD_SEC016

STAG_SEC016V06

PROD_SEC016_W0N0P1

PROTO_FULDOWN_SEC016

REF_SPERAMP_0N012776

PACK OPTIONS TO INCLUDE IN NETLIST

SPERAMP_A

SPERAMP_B

SPERAMP_C

SPERAMP_D

SPERAMP_E

SPERAMP_F

SPERAMP_F0C_0B

7

REF_WIRELESS_TYPHOON

PACK OPTIONS TO INCLUDE IN NETLIST

SINWAY

BY_ANTENNA

WLBT_02R_TP_JADE

WLBT_TP_0F2

REF_PMC_MAVERICKS

PACK OPTIONS TO INCLUDE IN NETLIST

PM01_L004

PM01_W0T1

PM01F1_00N0

PM01F1_00N2

PM01F1_00N3

PM01F1_00N4

PM01F1_00N5

PM01F1_00N6

PM01F1_00N7

PM01F1_00N8

PM01F1_00N9

PM01F1_00N0

REF_HDMI_MADEA

PACK OPTIONS TO INCLUDE IN NETLIST

H0M1_L001_0N0-S0M1

6

REF_SOC_M13C

PACK OPTIONS TO INCLUDE IN NETLIST

LP0PXX_M4

LP0PXX_M1

ENET_NC

AT03_H0M1

W0M0_RX

SDCARD

SPM1_E

REF_MAGSAFE_ACE2_12V

PACK OPTIONS TO INCLUDE IN NETLIST

M0G0SAFE_ACE2_UPC_0N01_0N0M0LL

5

T724_MLB_FOR_DEBUG

PACK OPTIONS TO INCLUDE IN NETLIST

VITAMINIC

4

3

ENOISE_CAP_SELECTION

1V8_CAPS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
138S00037	5	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402	C2740-C2744	CRITICAL	ENOISE_V18_200P_000
138S00073	5	CAP,C08,100P,20V,2.7V,800,LOW NOISE,0402	C2740-C2744	CRITICAL	ENOISE_V18_100P_000
138S00036	5	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402	C8065-C8069	CRITICAL	ENOISE_V18_200P_000
138S00035	5	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402	C8065-C8069	CRITICAL	ENOISE_V18_200P_000
998-22077	5	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402	C8065-C8069	CRITICAL	ENOISE_V18_200P_000

VDDH_CAPS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
138S00036	40	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_VDDH_200P_000
138S00035	40	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_VDDH_200P_000
998-22077	40	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_VDDH_200P_000

20UF_ZRB_SOC_CAPS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
138S00036	16	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_20UF_000
138S00036	21	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_20UF_000
138S00036	18	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_20UF_000
138S00036	16	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_20UF_000
138S00036	17	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_20UF_000
138S00036	16	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_20UF_000
138S00036	24	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_20UF_000
138S00036	65	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_20UF_000
138S00036	27	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_20UF_000
138S00036	10	CAP,C08,200P,20V,2.7V,800,LOW NOISE,0402	C8064-C8069,C8074-C8078	CRITICAL	ENOISE_00P1_20UF_000

15UF_ZRX_SOC_CAPS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
998-22815	16	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
998-22815	21	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
998-22815	18	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
998-22815	16	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
998-22815	17	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
998-22815	16	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
998-22815	24	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
998-22815	65	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
998-22815	27	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
998-22815	10	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402	C8064-C8069,C8074-C8078	CRITICAL	ENOISE_00P1_15UF_000

15UF_HZTL_SOC_CAPS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
138S00392	16	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
138S00392	21	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
138S00392	18	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
138S00392	16	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
138S00392	17	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
138S00392	16	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
138S00392	24	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
138S00392	65	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
138S00392	27	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402		CRITICAL	ENOISE_00P1_15UF_000
138S00392	10	CAP,C08,150P,20V,2.7V,800,LOW NOISE,0402	C8064-C8069,C8074-C8078	CRITICAL	ENOISE_00P1_15UF_000

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Pin Delay

pin delay file is imported by APPLEx

pin delay table has to be removed as it caused fatal errors in cPlus

SYNCH MASTER

PACK TITLE

051-06723

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