

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.

X2724 MLB_S

REV	ECN	DESCRIPTION OF REVISION	CK APPD	DATE
7	0029939226	ENGINEERING RELEASED		2021-06-21

LAST_MODIFICATION=Mon Jun 21 18:18:03 2021

LAST_MODIFICATION=Mon Jun 21 18:18:03 2021

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102	224	STORAGE: SDD0 OCARINA & HAND VCC	T585.REF_STORAGE.S5E.0.37.0	
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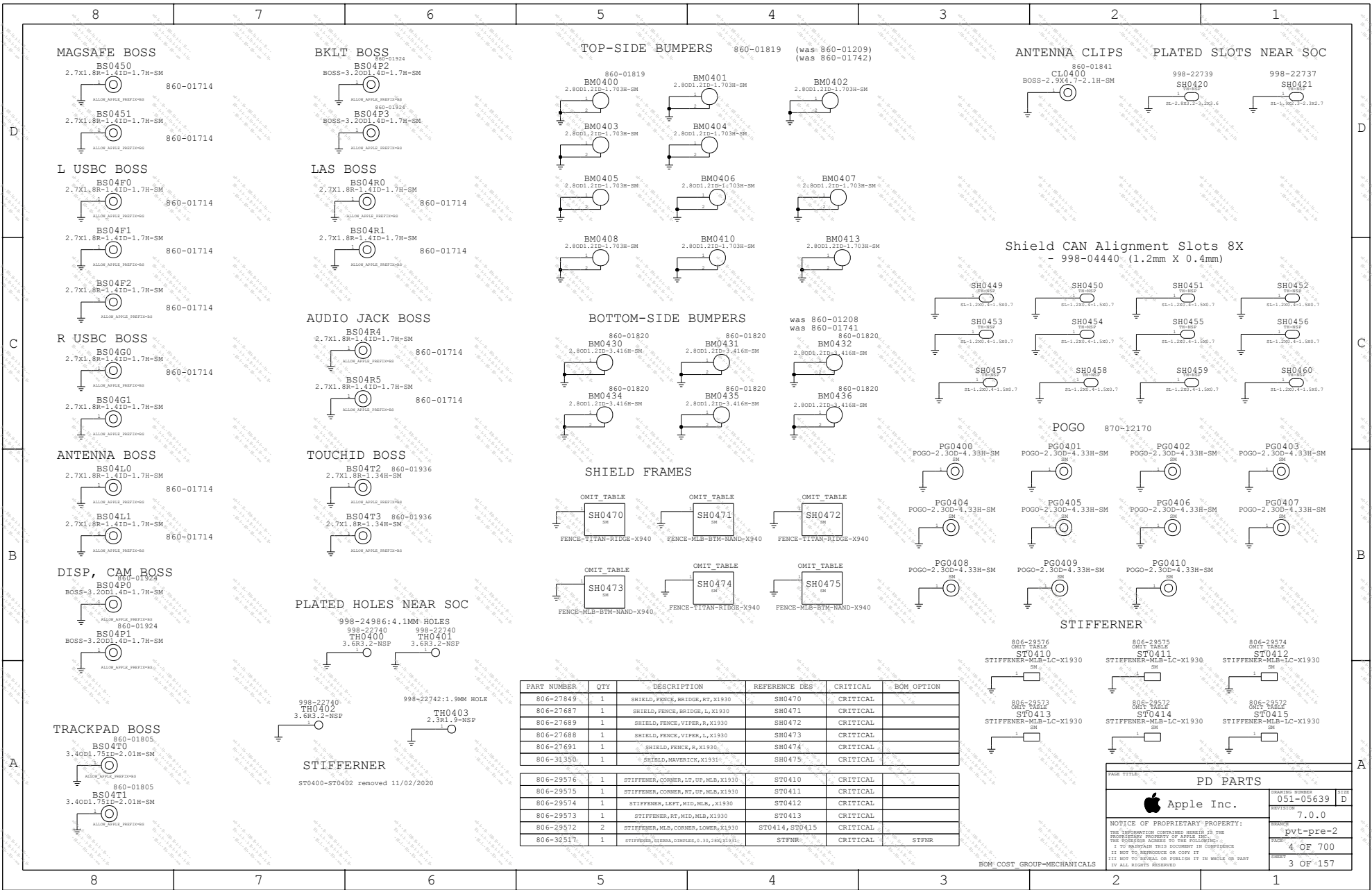
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Schematic / PCB #'s

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
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820-02098	1	PCBF,MLB-S,X2724	PCB	CRITICAL	PCB

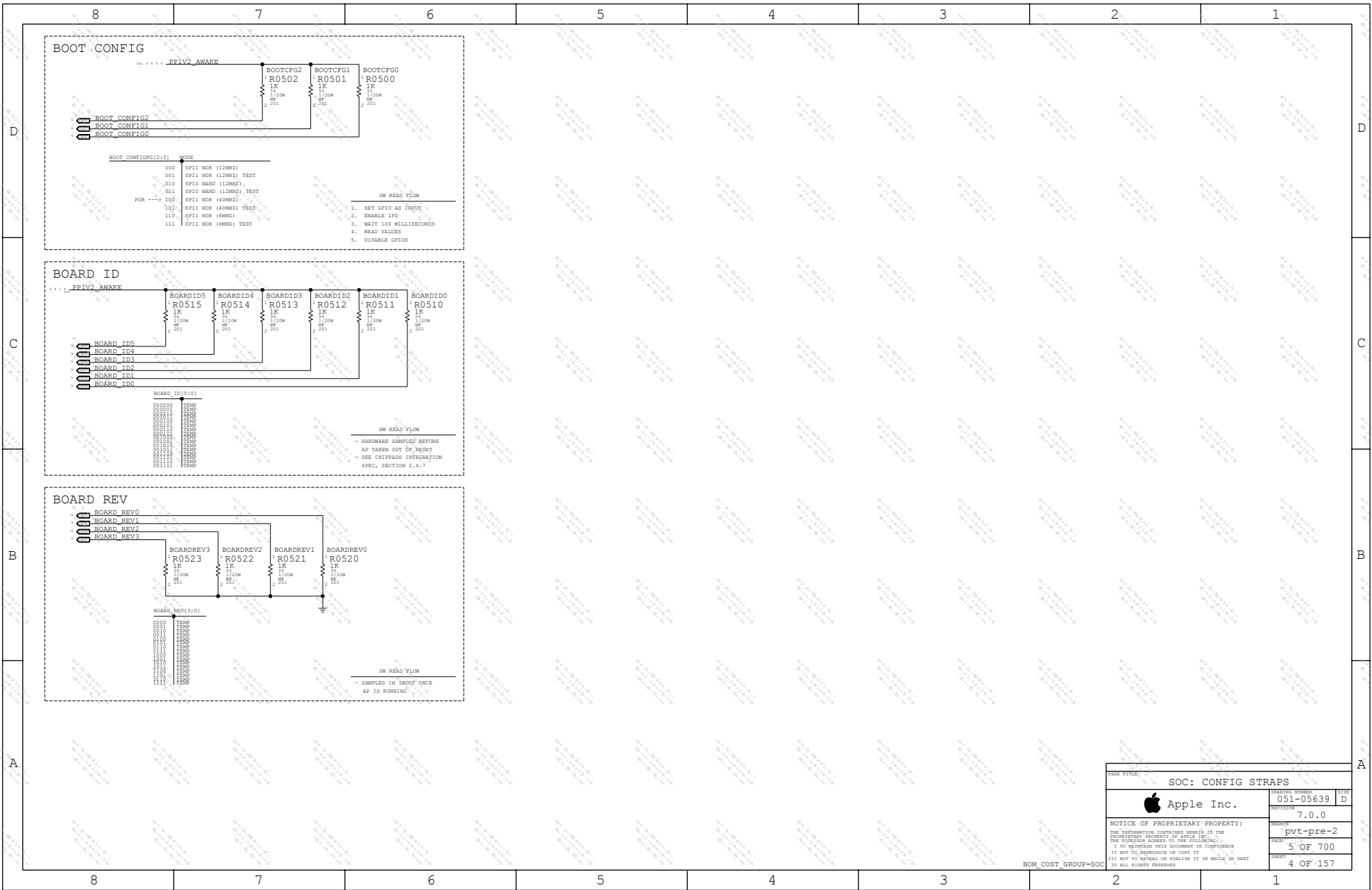
CHECKLIST RULE CONFIGURATIONS	
FORM NUMBER IS - LATEST	YES
FOR BATTERY ALIASES	YES
FORM FIELDS AND OPTIONS	YES

DRAWING TITLE:	
SCHEM,MLB-S,X2724	
Apple Inc.	
FORM NUMBER	051-05639
REVISION	7.0.0
DATE	pvt-pre-2
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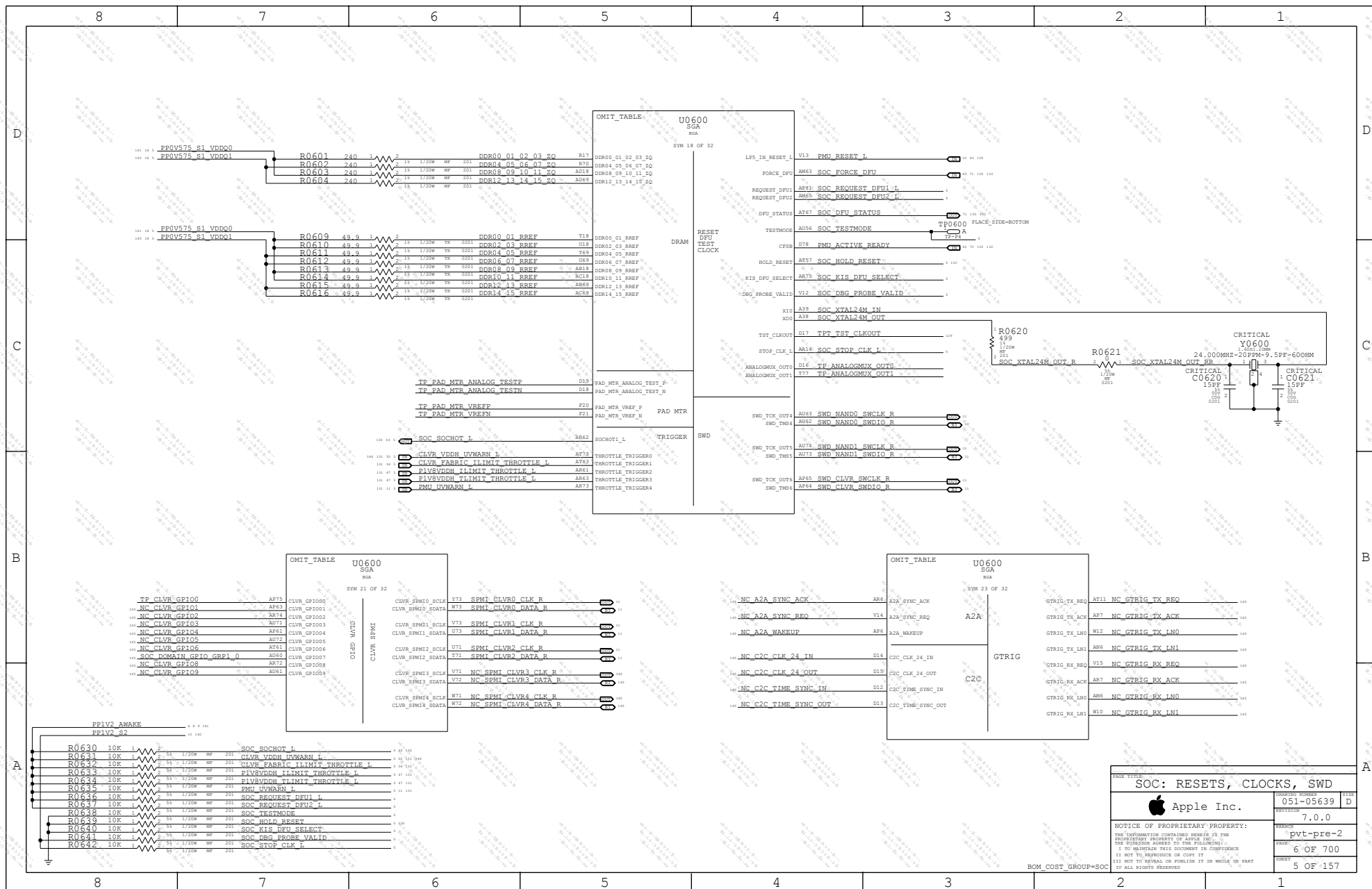


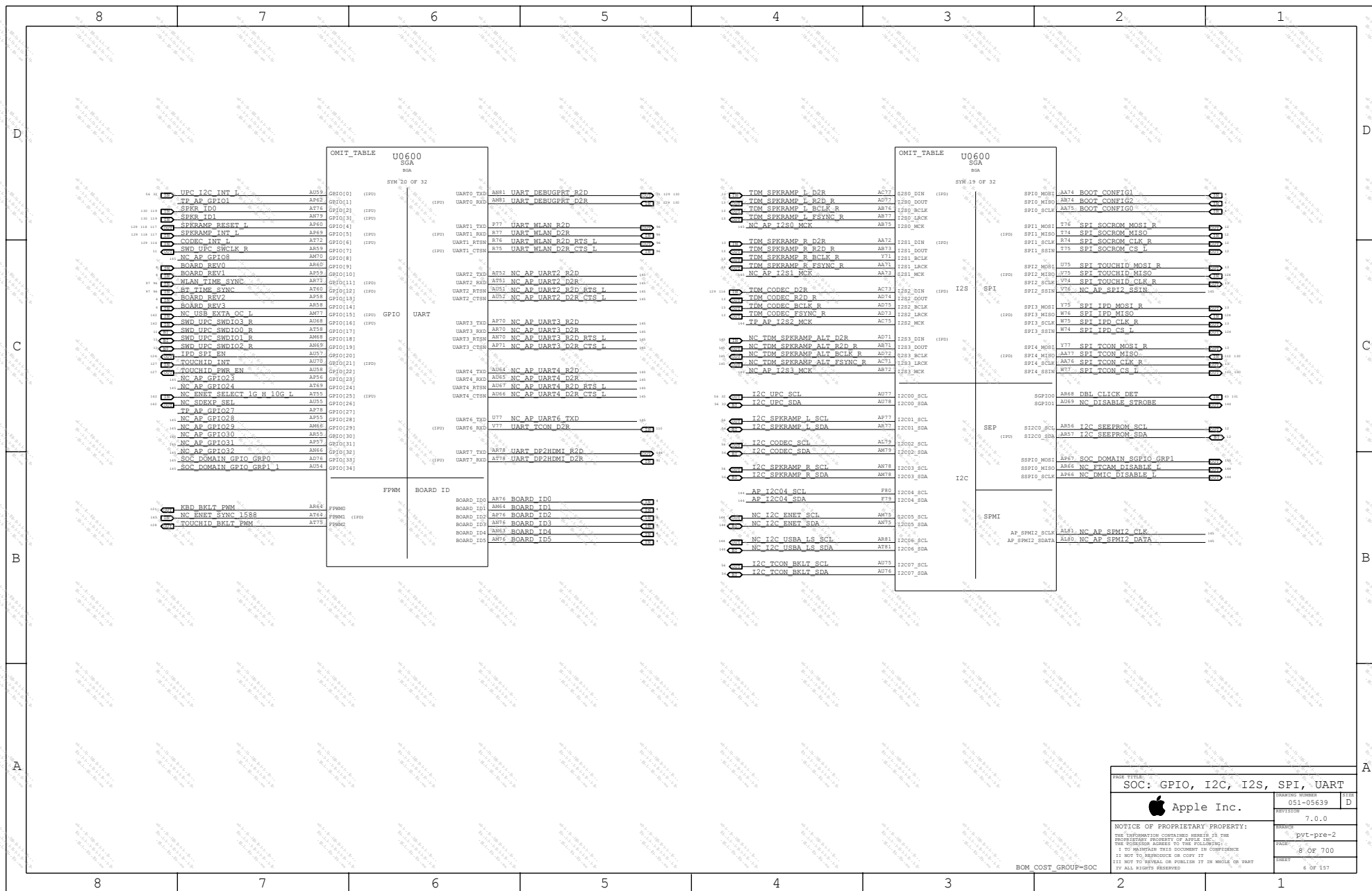
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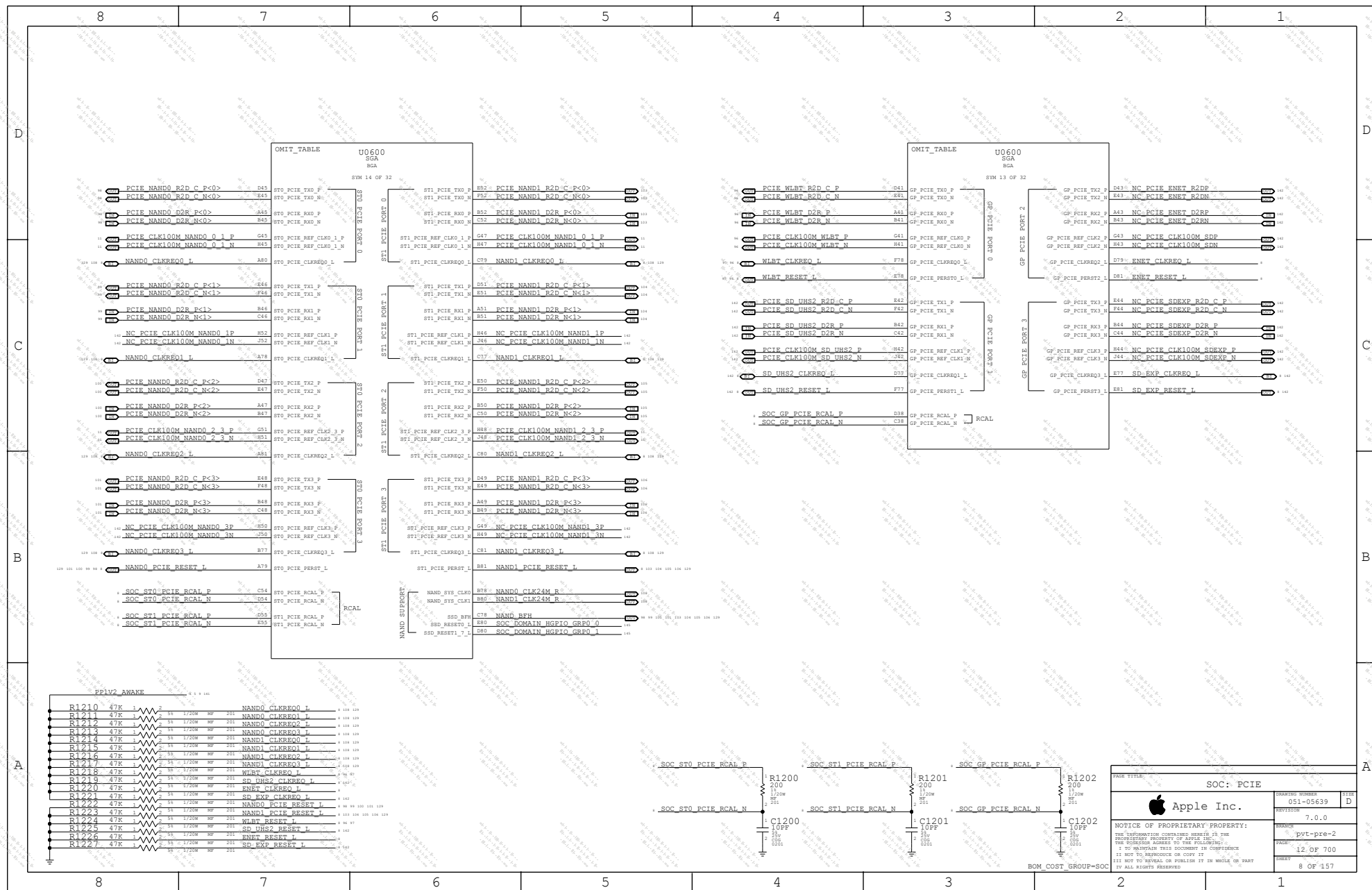
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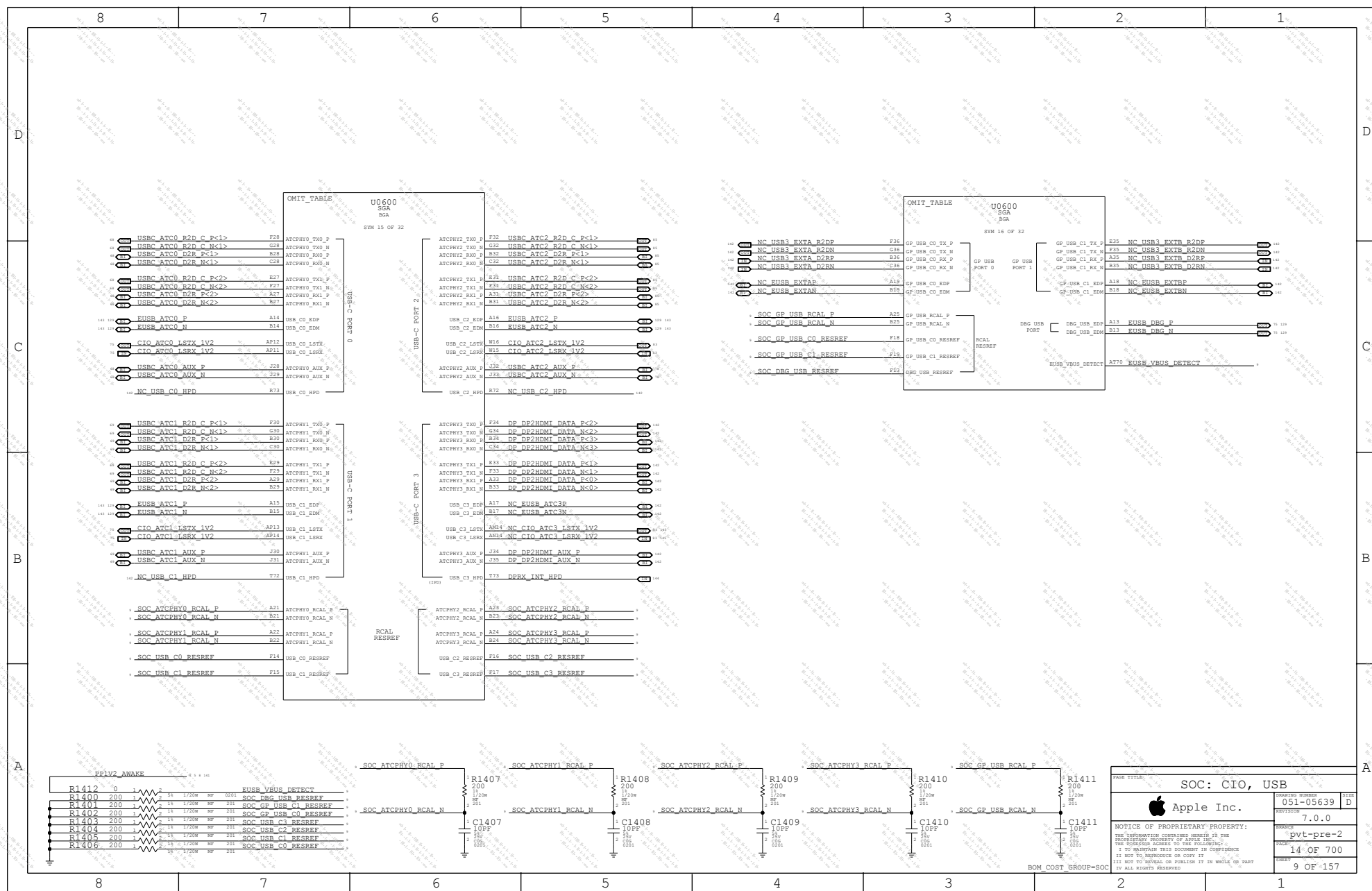


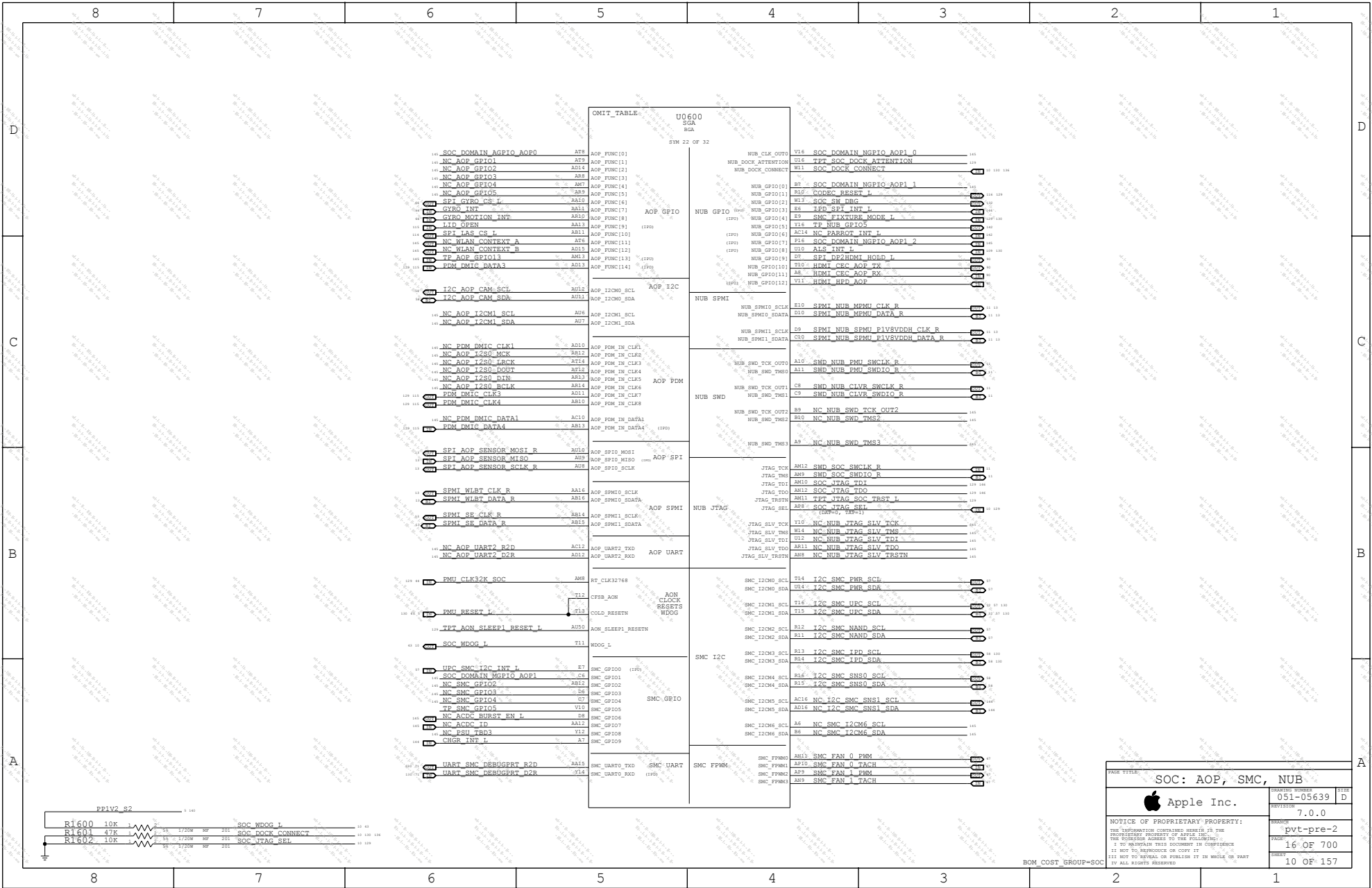
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PAGE TITLE: SOC: AOP, SMC, NUB

Apple Inc.

051-05639

7.0.0

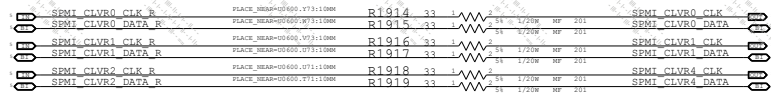
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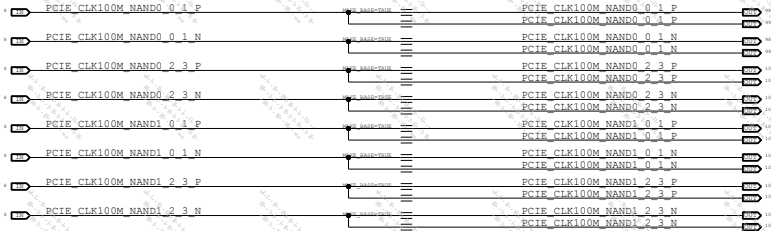
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IN PROGRESS

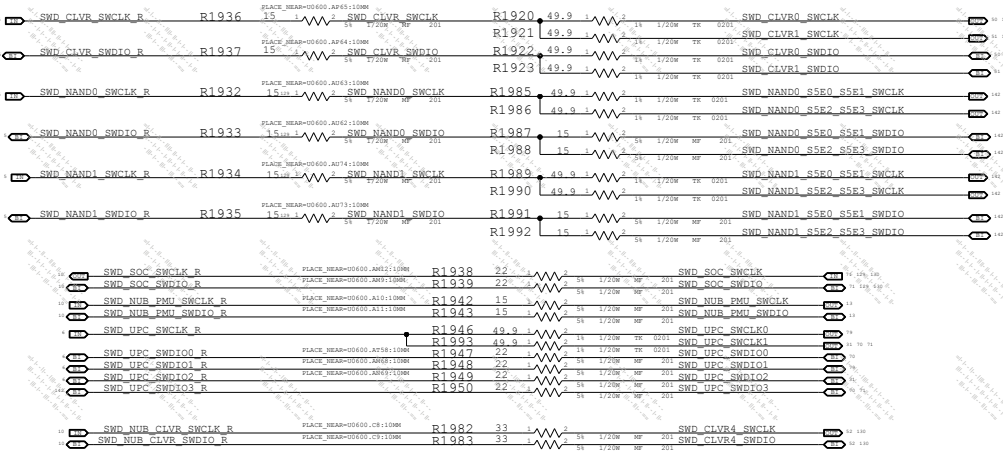
SPMI SOURCE TERMINATION



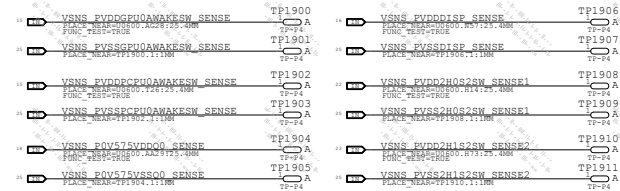
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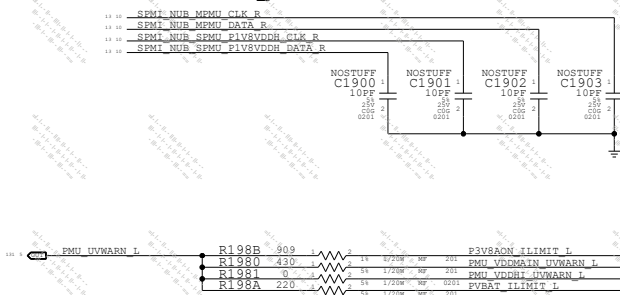
SWD SERIES RESISTORS



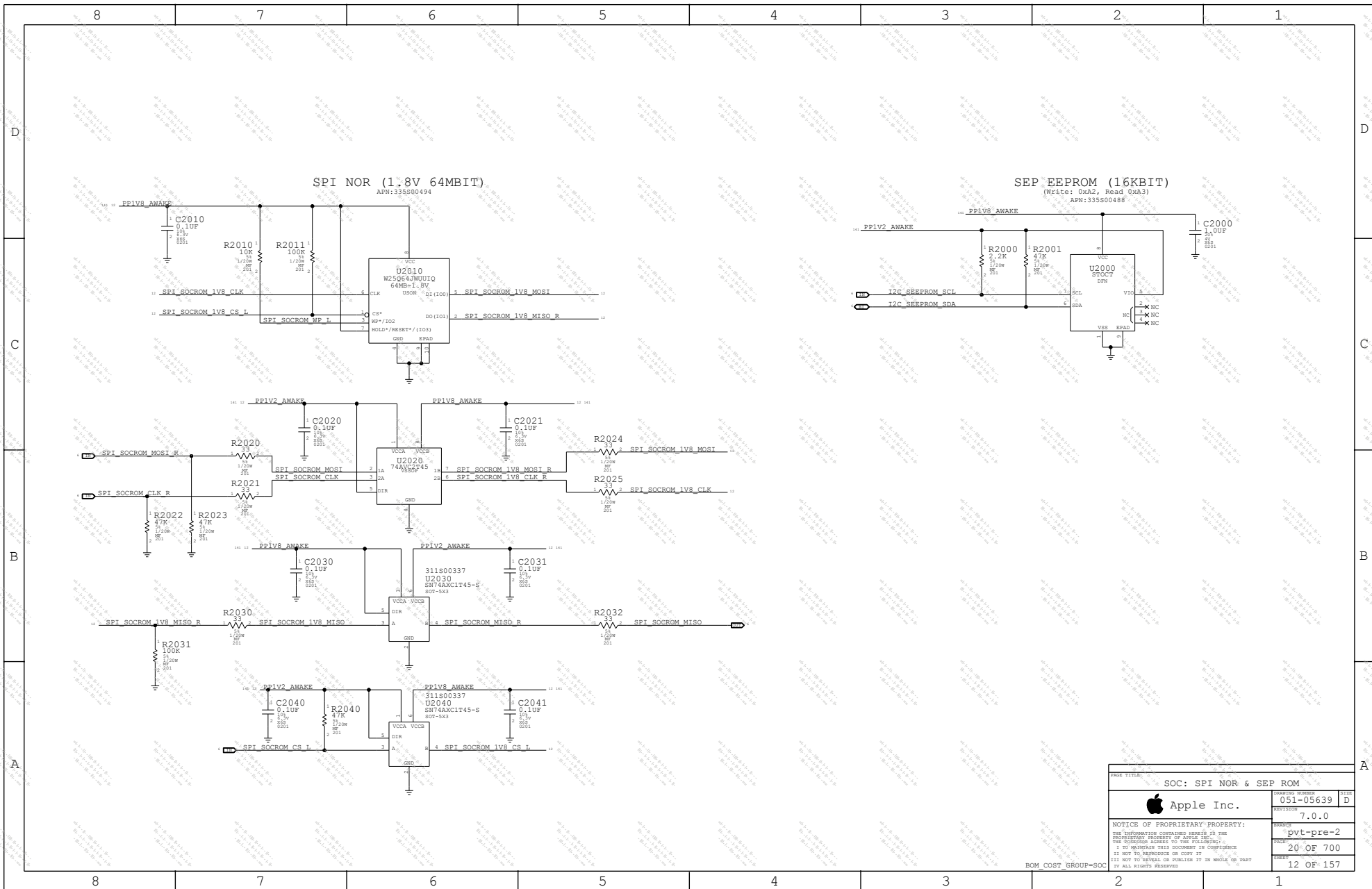
VDD/VSS SENSE BREAKOUT PADS

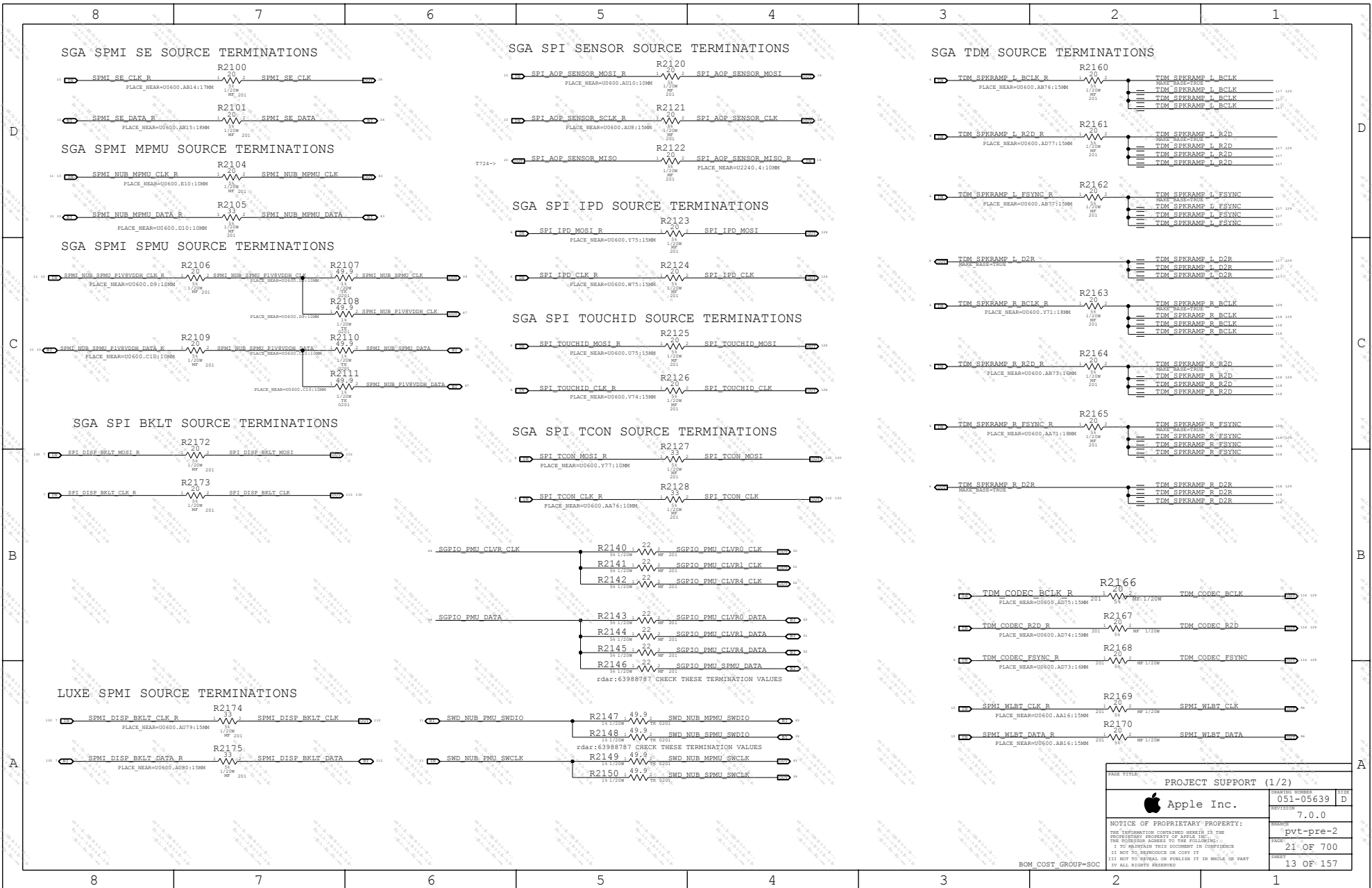


SPMI NUB DAMPING FILTERS



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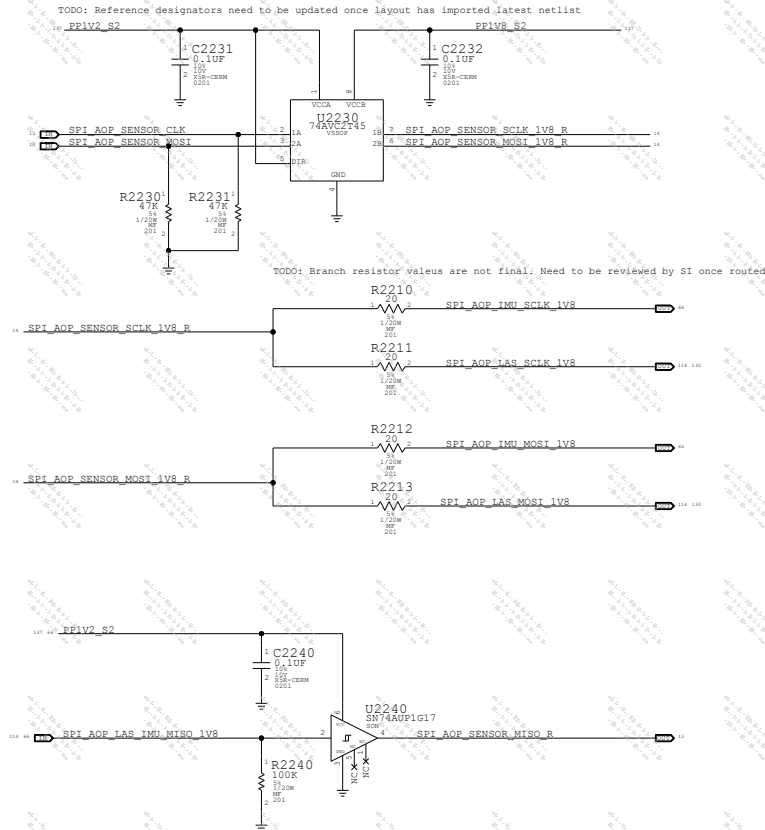




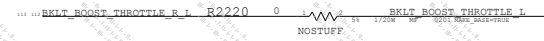
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BCM_COST_GROUP=SOC

SPI AOP Sensor LS and Branch Resistors

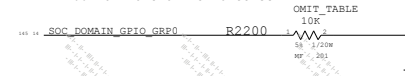


DISPLAY BACKLIGHT



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



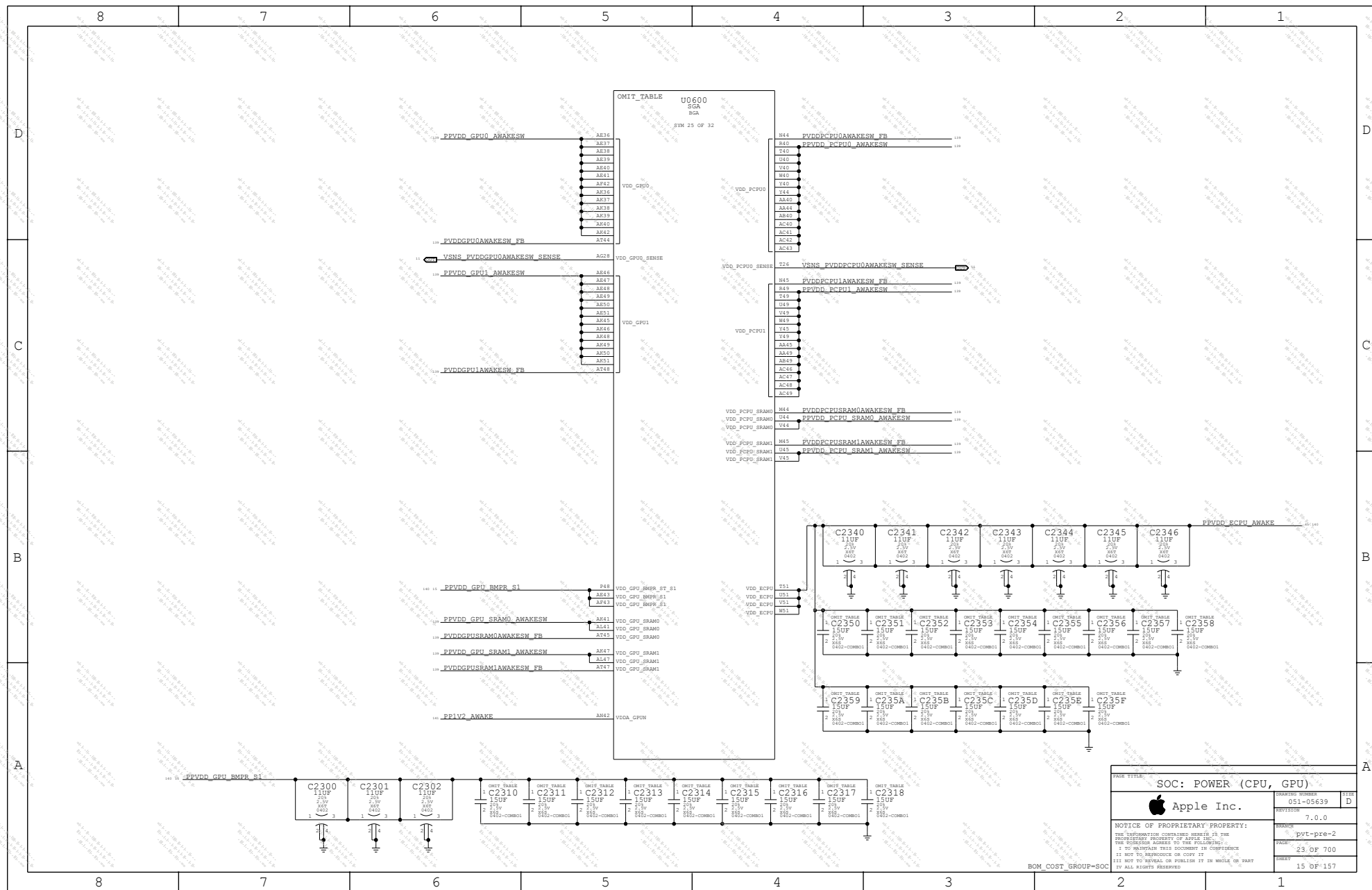
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11780006	1	RES,MP,1/20W,1K ohm,5,0201,SMD	R2201		FSTP:MIN

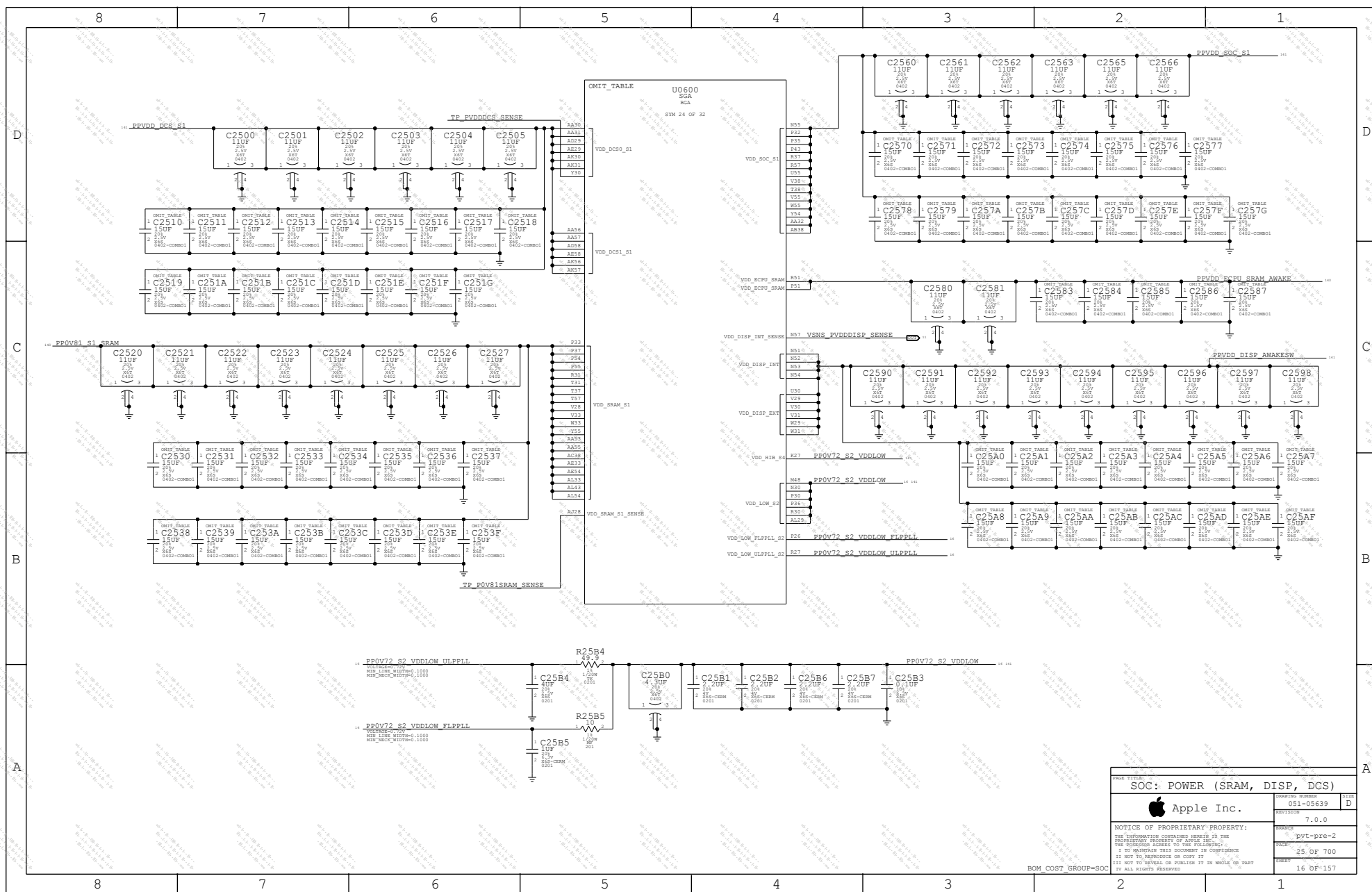
SOC GPIO33/4 ALIASING

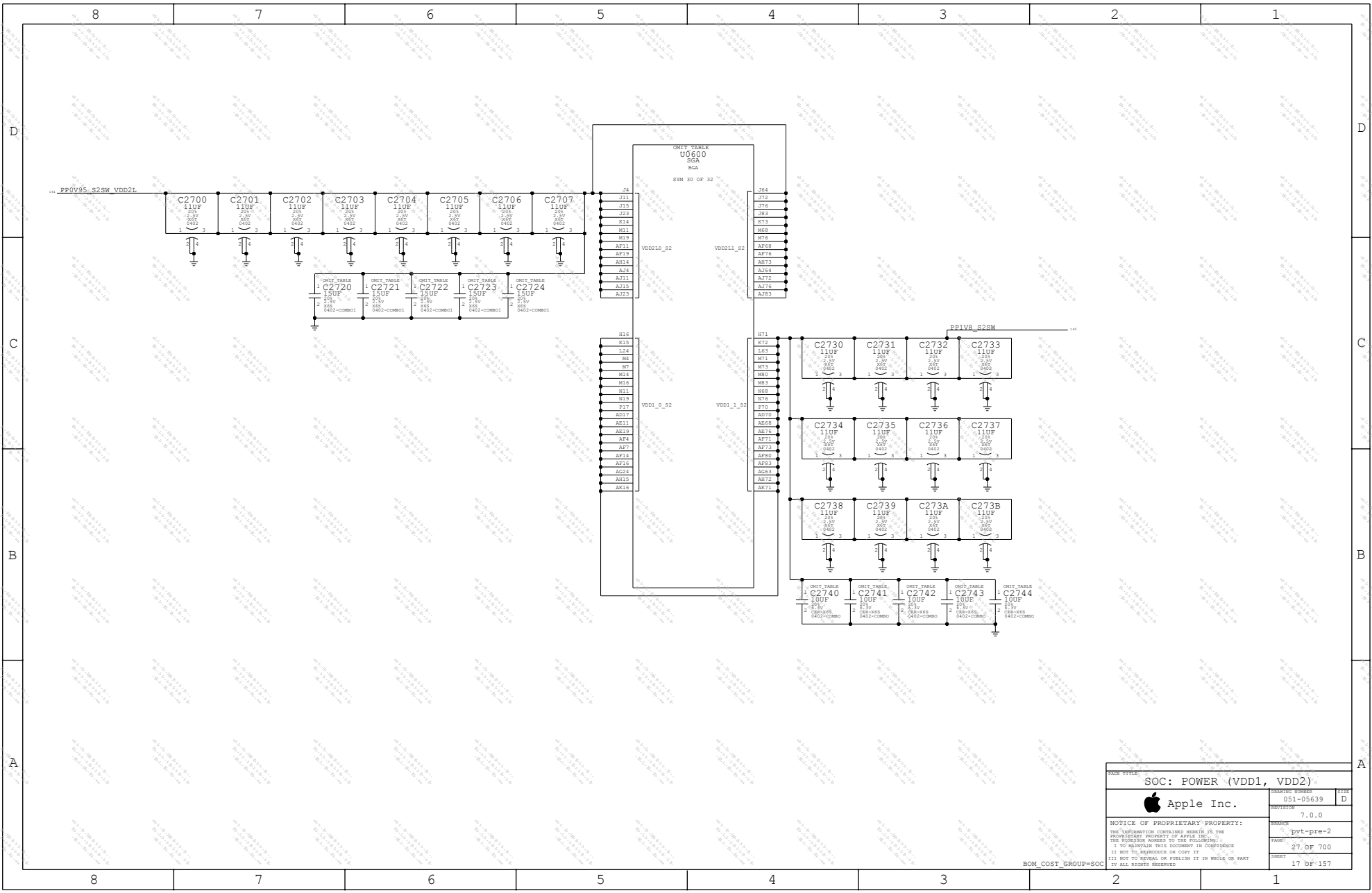


BOM_COST_GROUP=SOC

PAGE TITLE: PROJECT SUPPORT (2/2)			
Apple Inc.		051-05639	051-05639
		7.0.0	
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		14 OF 157	

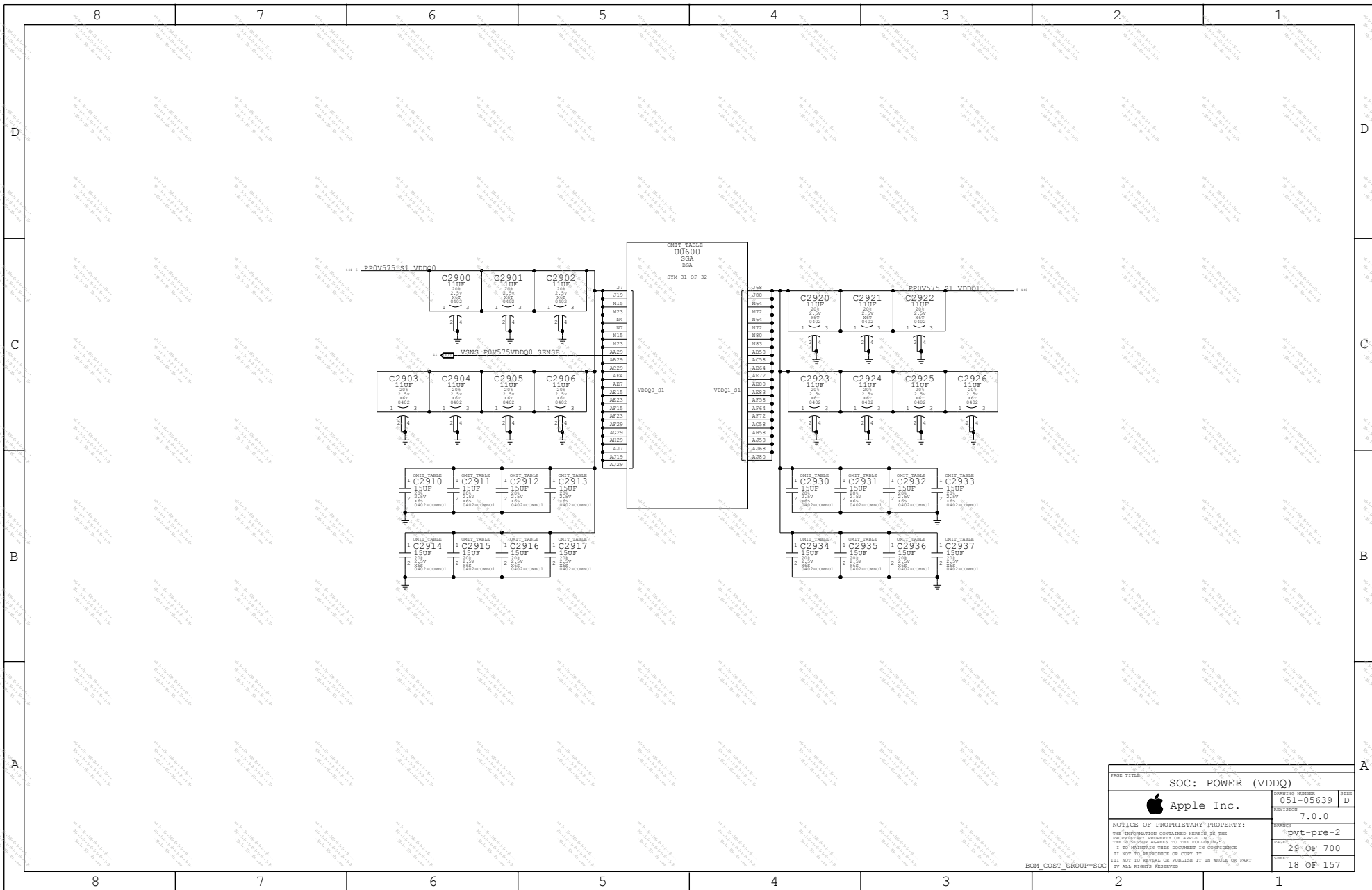




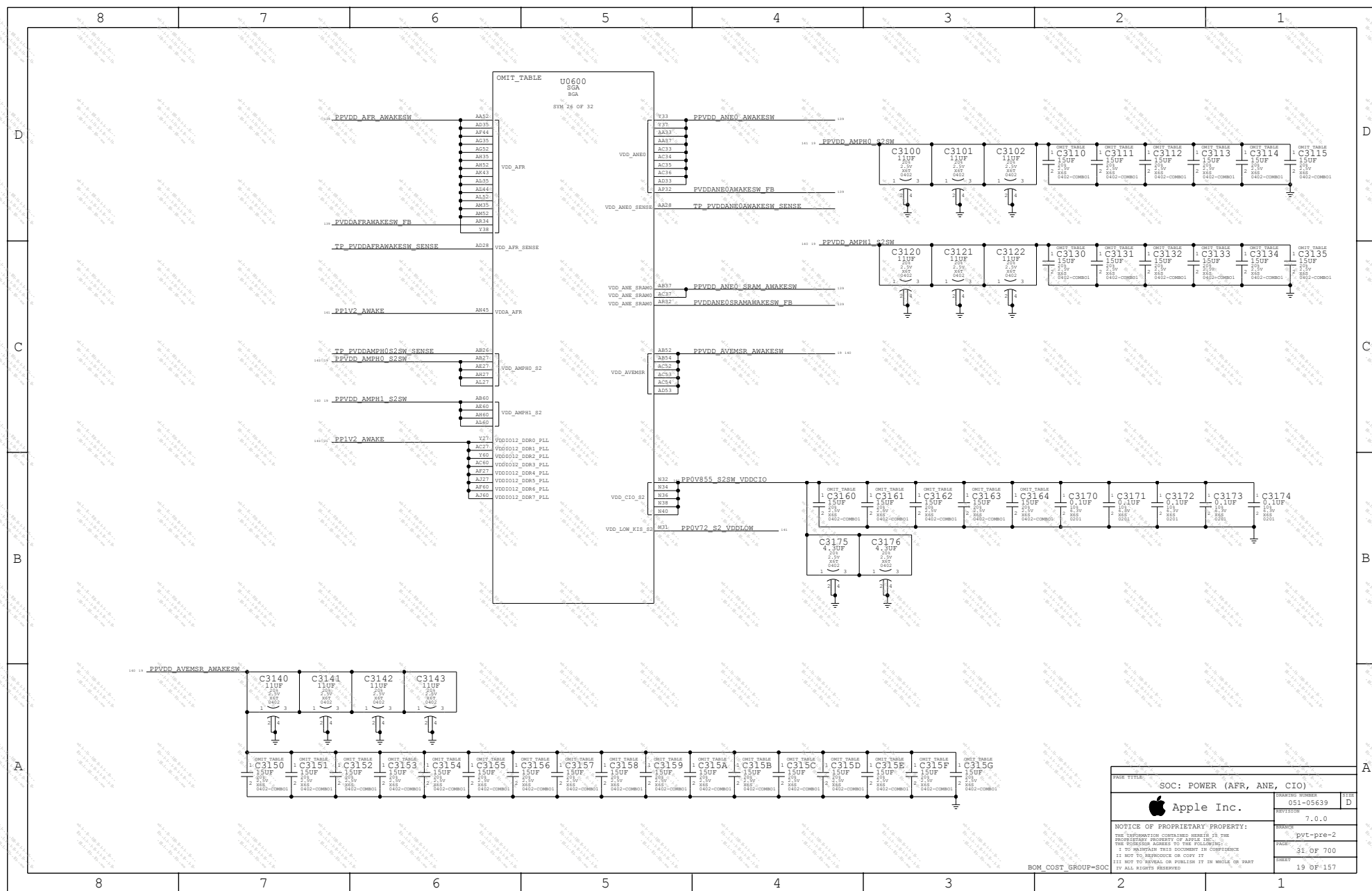



PAGE TITLE: SOC: POWER (VDD1, VDD2)			
Apple Inc.		DRAWING NUMBER: 051-05639	TYPE: D
		REVISION: 7.0.0	
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		PAGE: 27 OF 700	
		SHEET: 17 OF 157	

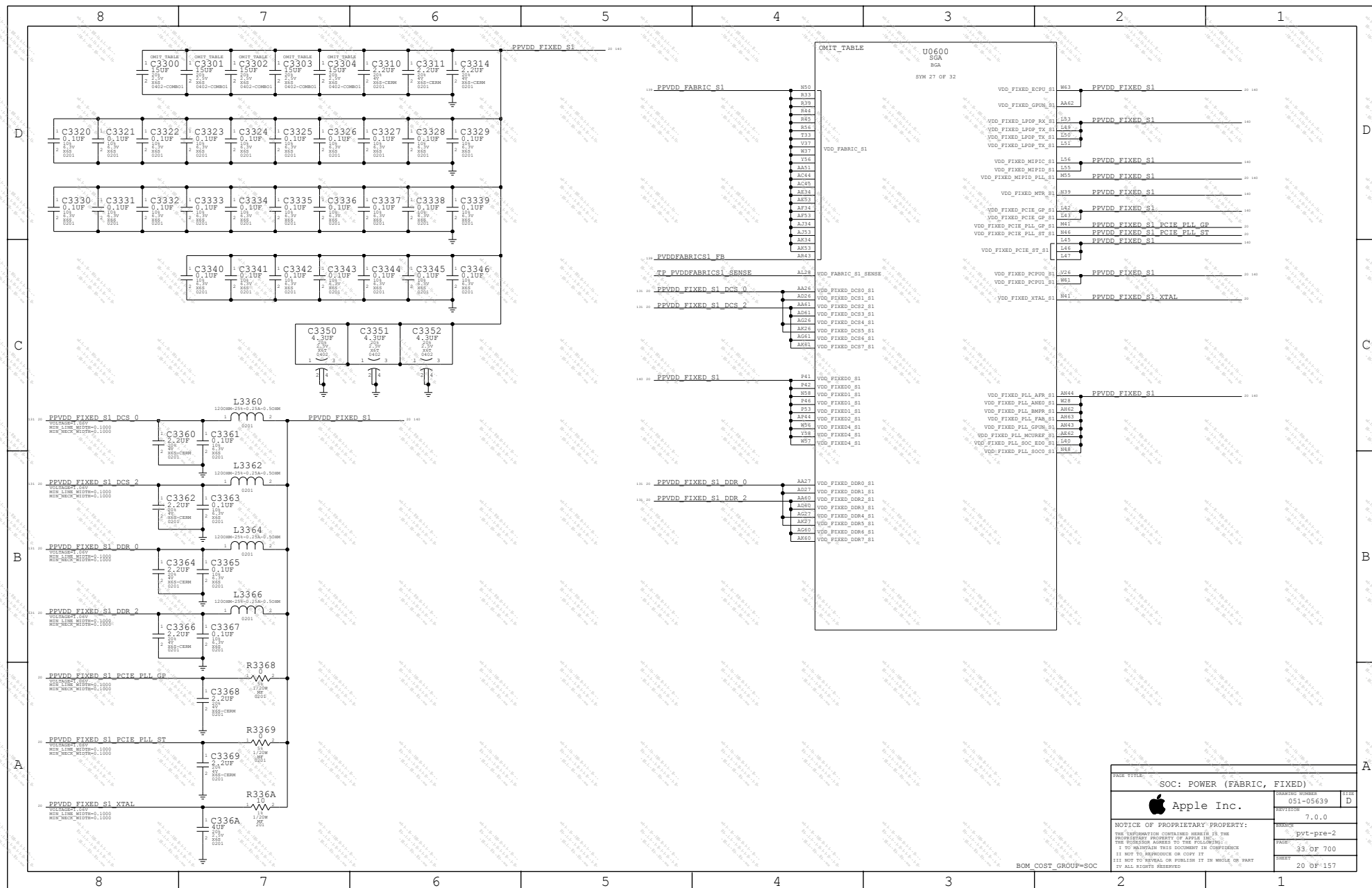
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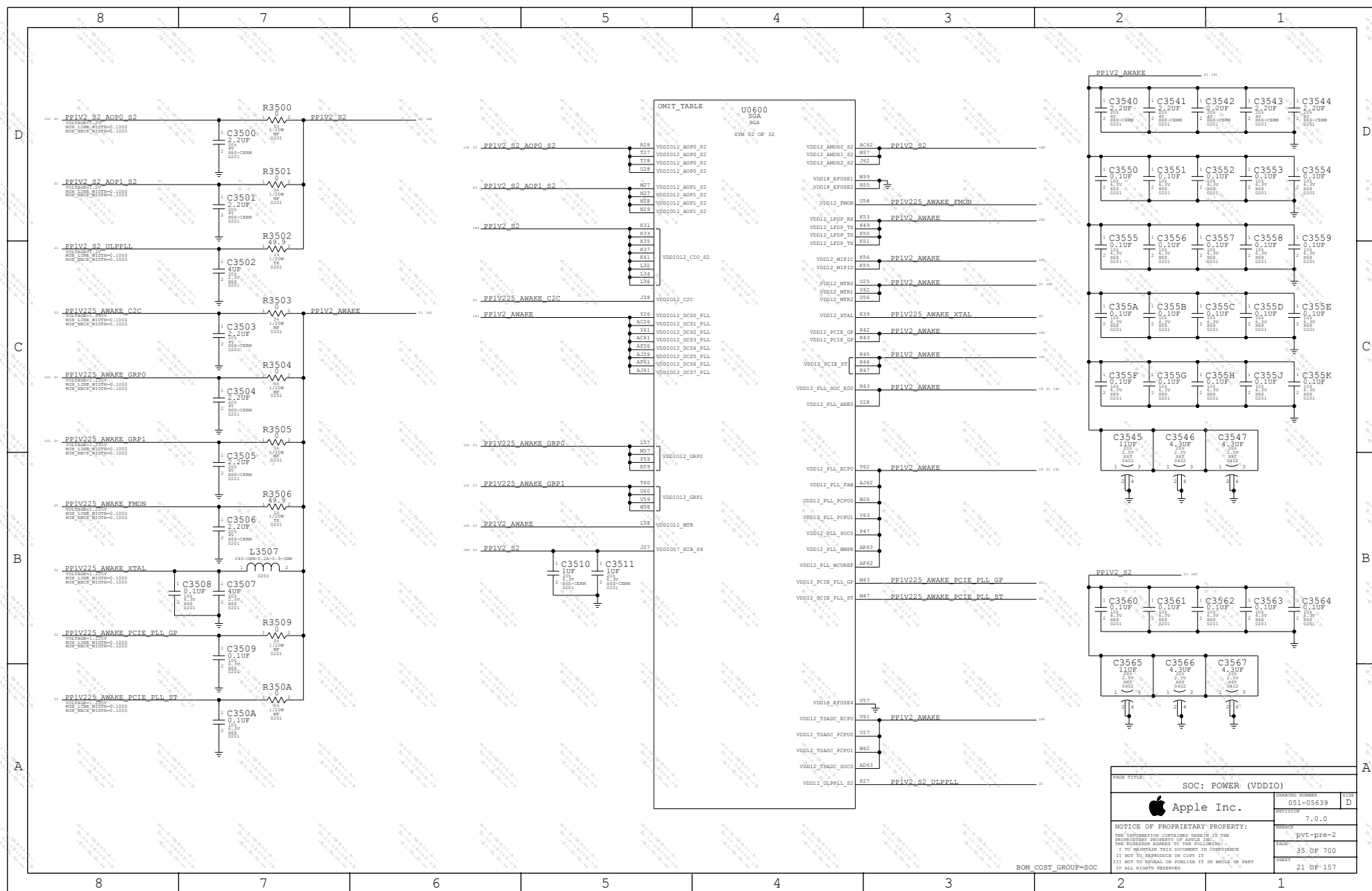


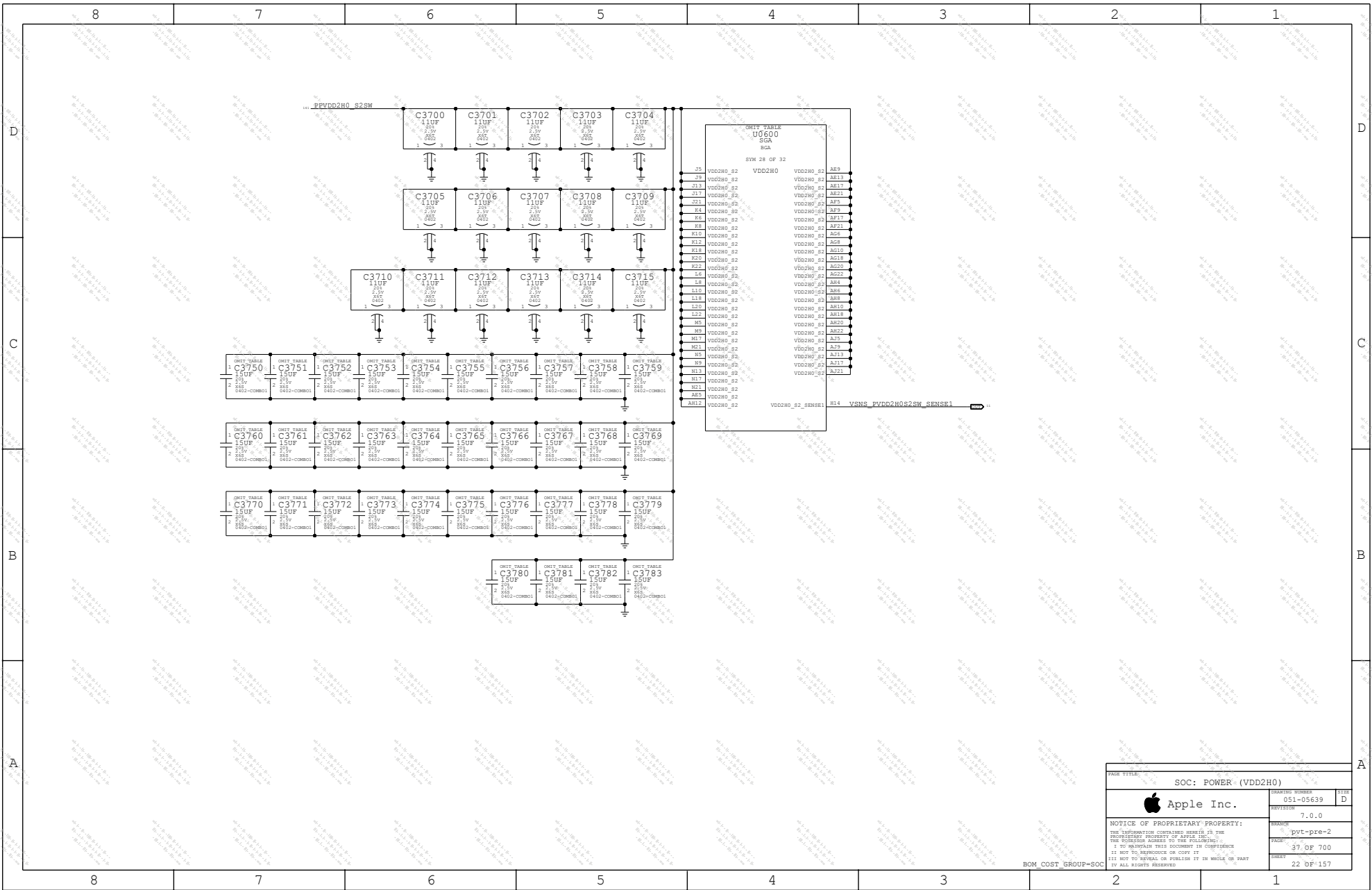
PAGE TITLE: SOC: POWER (VDDQ)		
Apple Inc.	051-05639	051-05639
	7.0.0	7.0.0
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PAGE: 29 OF 700		
SHEET: 18 OF 157		




PAGE TITLE:		SOC: POWER (AFR, ANE, CIO)	
	Apple Inc.	BRANCH NUMBER	051-05639
		REVISION	7.0.0
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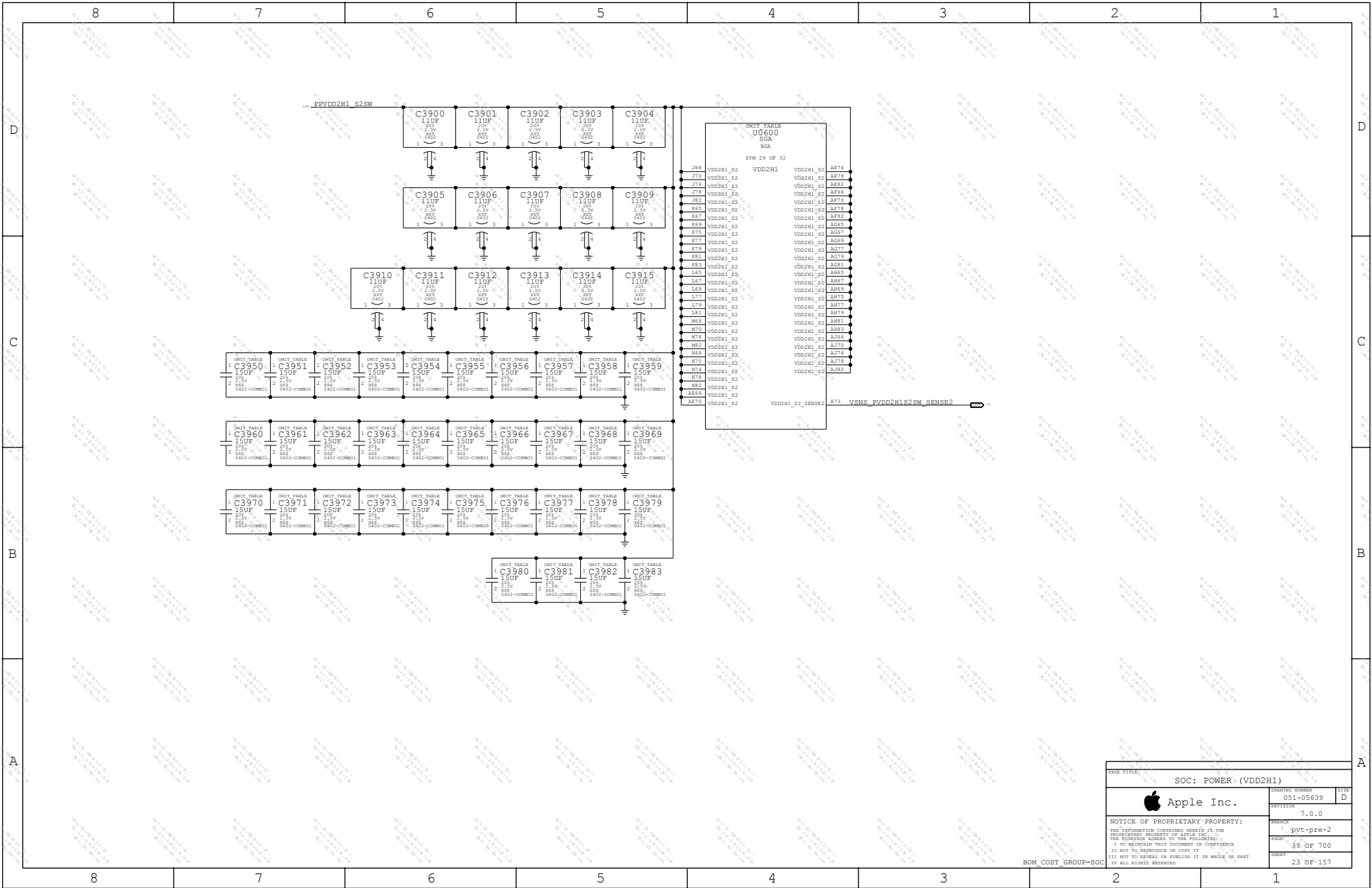







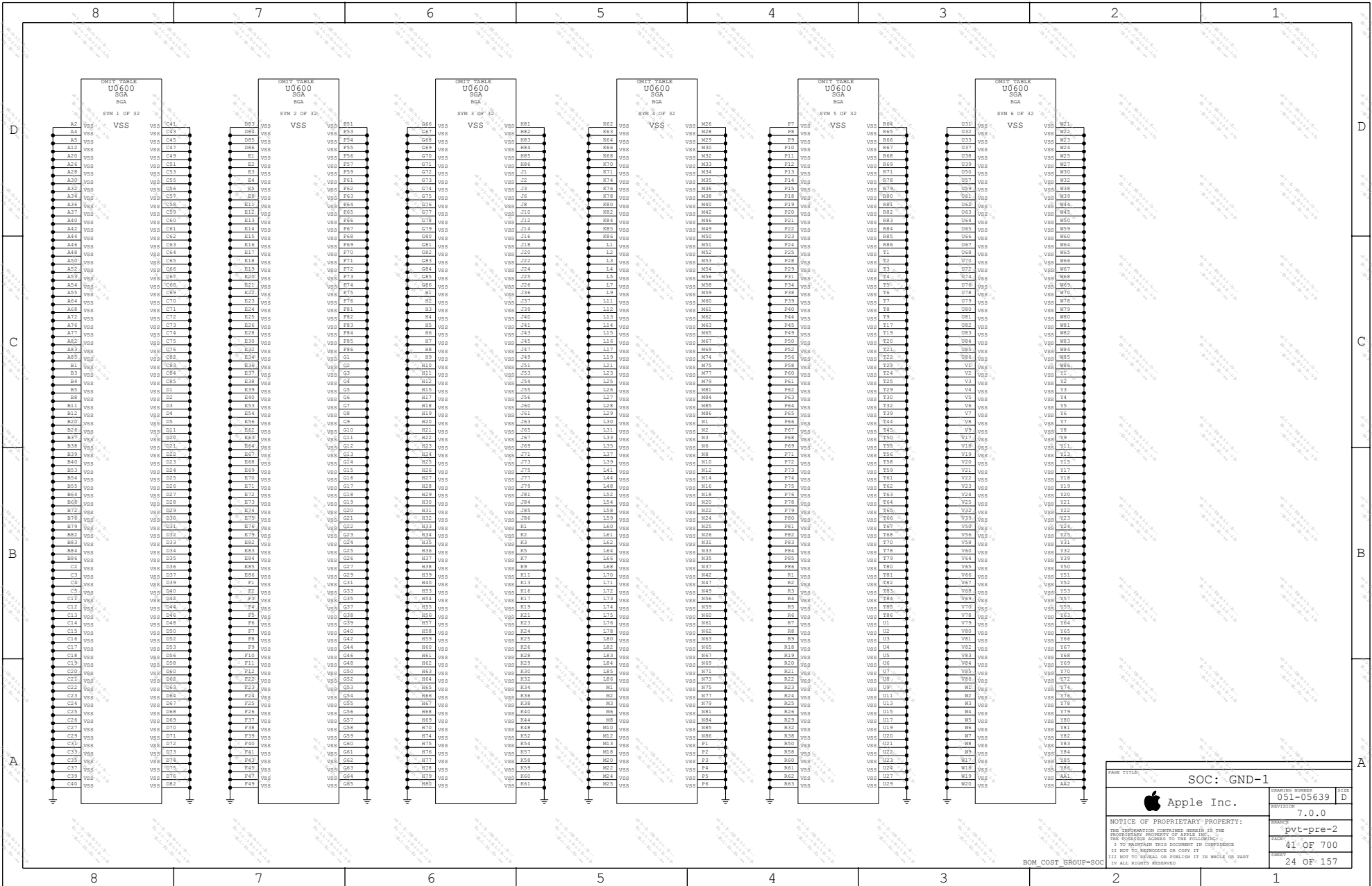
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	REVISION:	7.0.0
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	PAGE:	37 OF 700
	SHEET:	22 OF 157

BOM_COST_GROUP=SOC



PAGE TITLE:		
SOC: POWER (VDD2H1)		
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	REVISION	7.0.0
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	PAGE	39 OF 700
	SHEET	23 OF 157

BOM_COST_GROUP=SOC



SOC: GND-1

Apple Inc.

051-05639

7.0.0

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41 OF 700

24 OF 157

BOM_COST_GROUP=SSC

*** OK2INTEGRATE ***




Per TGA Power Block Diagram v0.3

SE only: 10mA ¹³⁷ Based on SPMI only use case

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

BOM COST GROUP=SECURE ELEMENT

PAGE TITLE:			
<h1>Secure Element</h1>			
	Apple Inc.		
	DRAWING NUMBER 051-05639		SIZE D
	REVISION 7.0.0		
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		PAGE 50	TOTAL 700
		SHEET 26	TOTAL 157

Battery Sub-System Debug Connector

ARKANOID CONN

BMU POWER FLEX HOTBAR'd TO THE MLB:

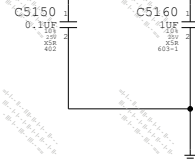
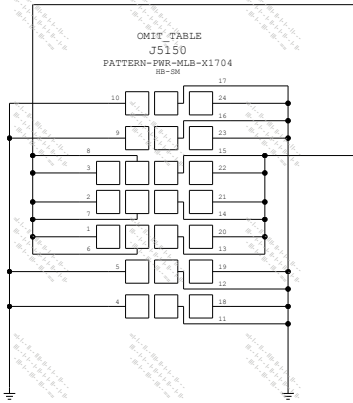
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PPDCIN_AON

RATIO=PPDCIN/6.76

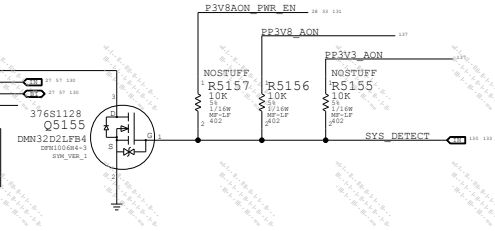
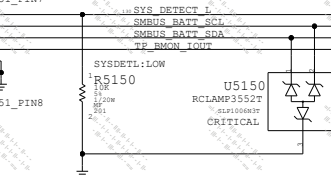
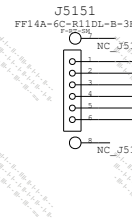


ARKANOID	MLB Connector / Signals	Sales
J0301 - 1	6 SMBUS_BATT_SCL (= I2C_SMC_PWR_SCL)	0
J0301 - 3	4 SMBUS_BATT_SDA (= I2C_SMC_PWR_SDA)	1
J0301 - 5	2 I2C_SMC_UPC_SCL	2
J0301 - 7	1 I2C_SMC_UPC_SDA	3
J0302 - 1	3 UPC_SMC_I2C_INT_L	4
J0302 - 3	5 CHGR_AMON	5
J0302 - 5	7 CHGR_BMON	6
J0302 - 7	9 1/6.76 * PPDCIN_AON	7
J0303 - 1	11 CHGR_RST_IN	8
J0303 - 3	12 -	9
J0303 - 5	10 PPVBAT_AON	10
J0303 - 7	8 -	11



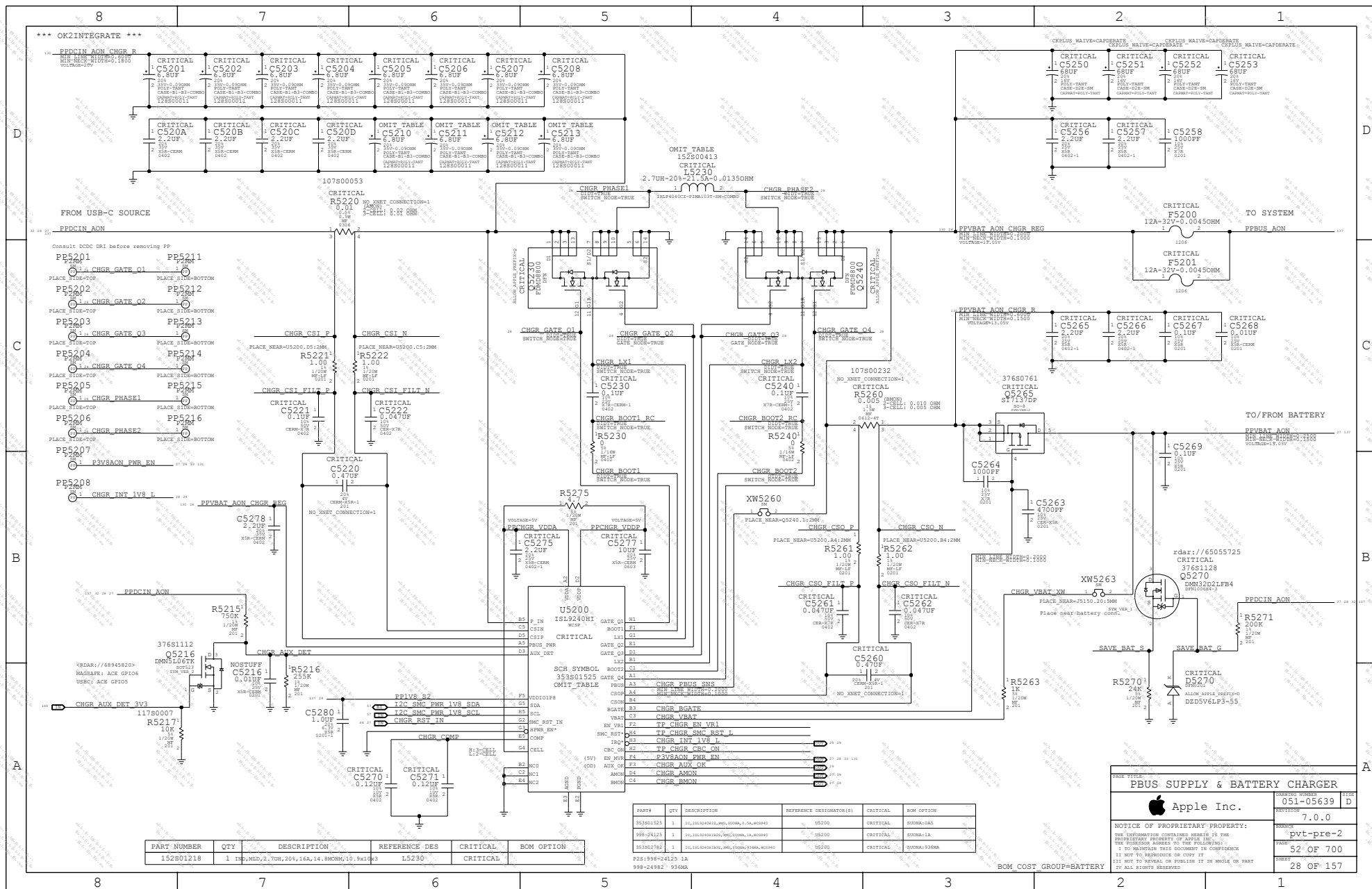
PPVBAT_AON

APN:518S0818



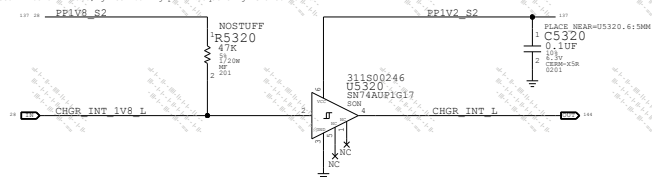
PAGE TITLE:		BATTERY CONN	
Apple Inc.		051-05639	518
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BOM_COST_GROUP=BATTERY

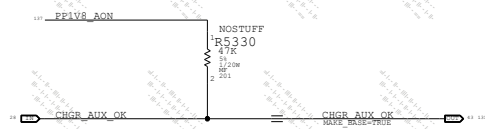



SMBUS CHGR IV8 [SCL/SDA]: Level translation circuit to be placed in project specific I2C page.

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.

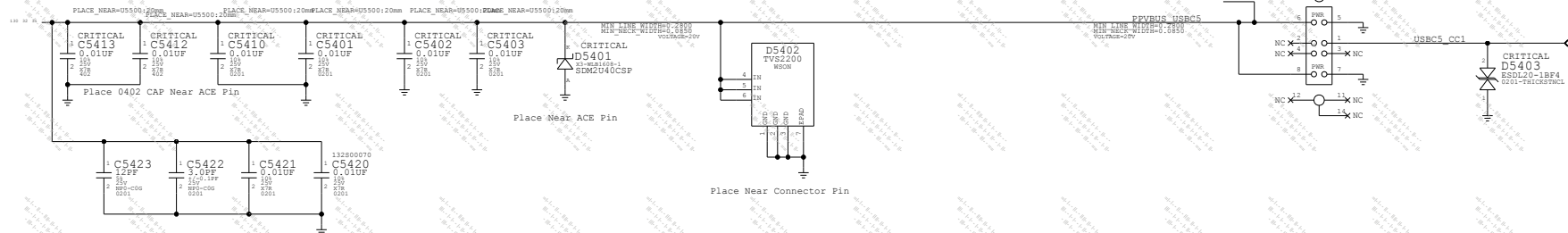


PAGE TITLE:		BATTERY CHARGER SUPPORT	
 Apple Inc.	DRAWING NUMBER		051-05639
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		SHEET	29 OF 157

BOM COST GROUP=BATTERY

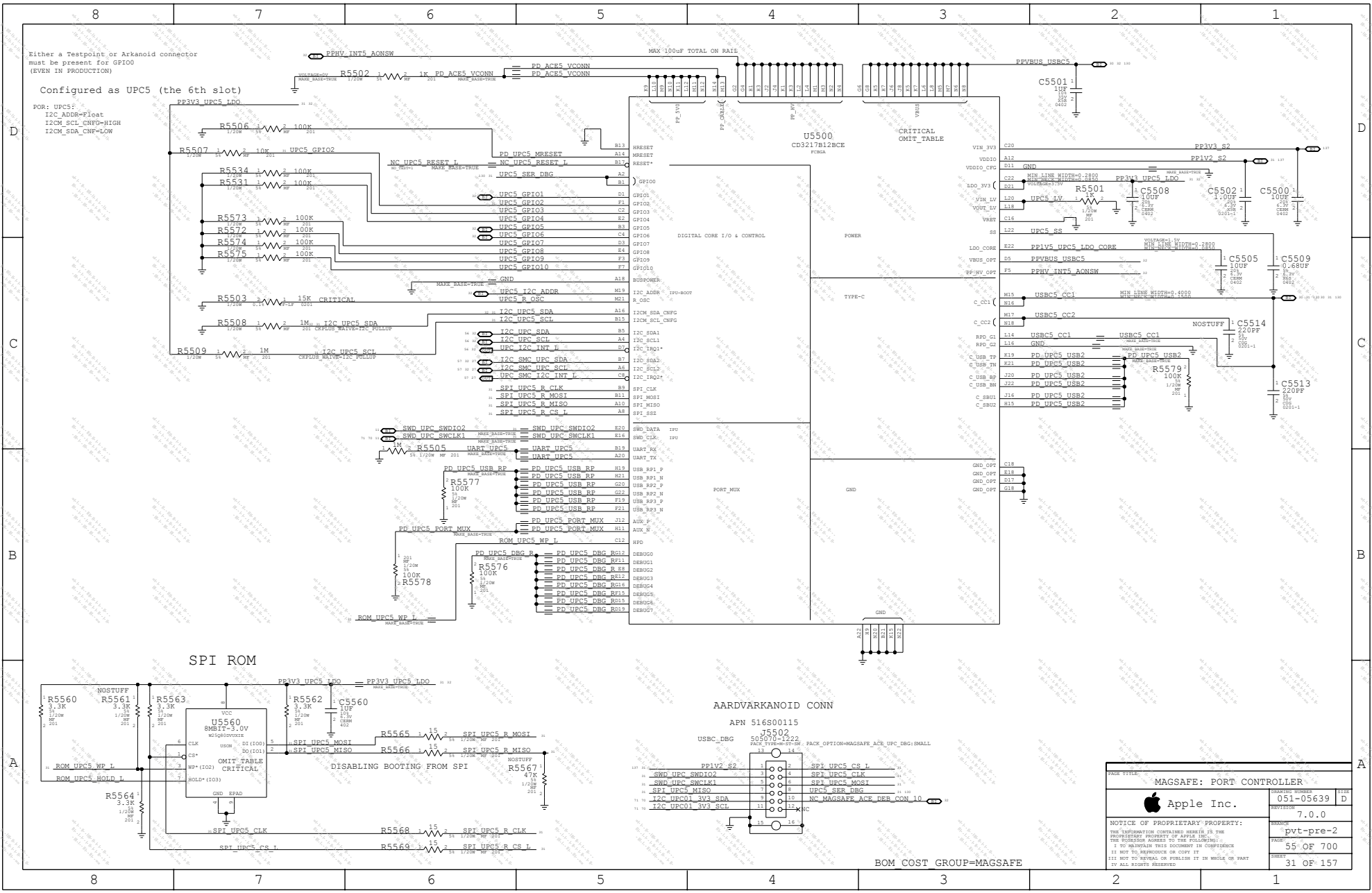
MAGSAFE connector APN:
MLB:516S00787 / Flex:516S00788

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



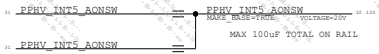
PAGE TITLE:		MAGSAFE: CONNECTOR	
Apple Inc.		051-05639	051-05639
NOTICE OF PROPRIETARY PROPERTY:		7.0.0	7.0.0
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PAGE:		54 OF 700	54 OF 700
SHEET:		30 OF 157	30 OF 157

BOM_COST_GROUP=MAGSAFE

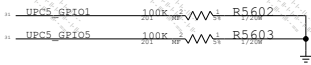


PAGE TITLE:		MAGSAFE: PORT CONTROLLER	
Apple Inc.		051-05639	D
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REASON FOR DECLASSIFICATION			
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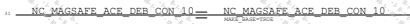
POWER ALIASES



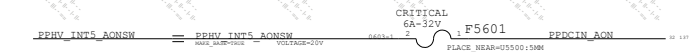
GPIOs



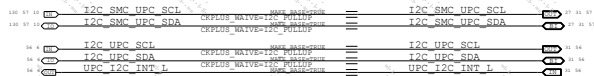
DEBUG PORT



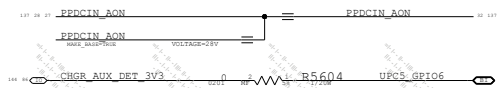
POWER / FUSE FOR UPC



I2C

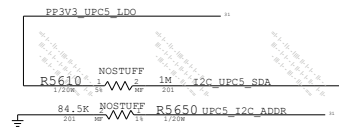


CONNECTION TO CHARGER



ACE I2C ADDRESS

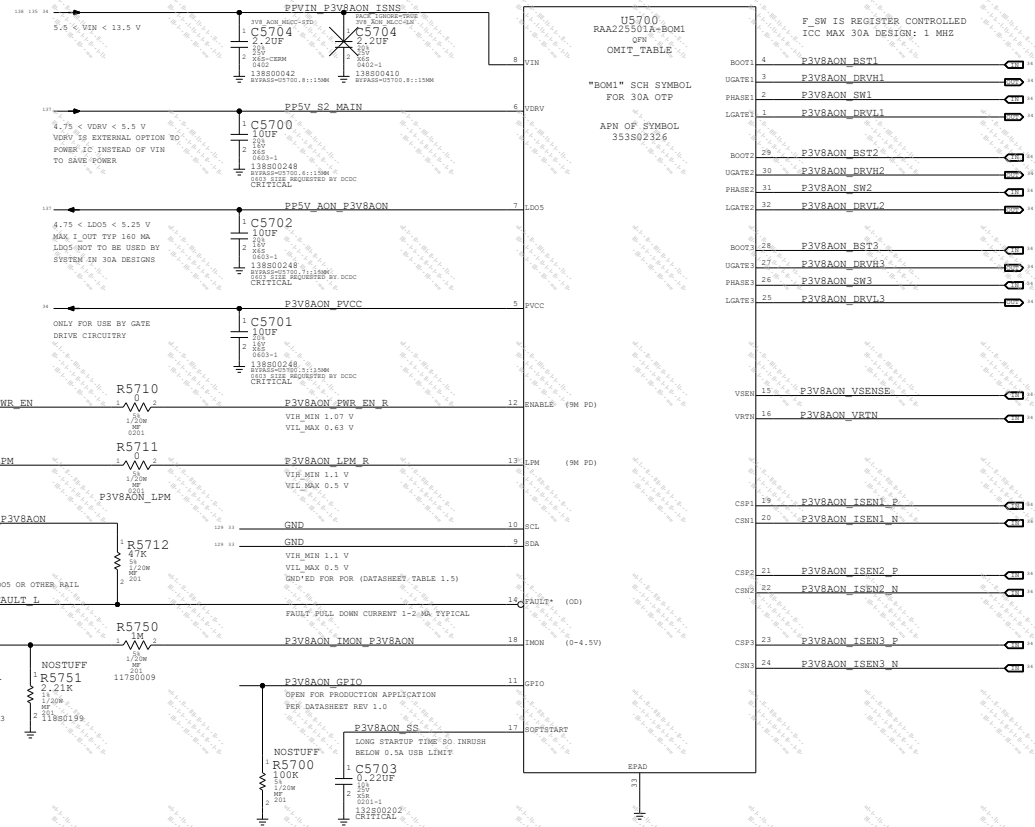
P0: UPC5:
I2C_ADDR=84.5K PD
I2CM_SCL_CNFG=HIGH
I2CM_SDA_CNFG=HIGH



BOM_COST_GROUP=MAGSAFE

PAGE TITLE: MAGSAFE: CONTROLLER SUPPORT		
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PAGE: 56 OF 700		SHEET: 32 OF 157

3V8 AON CONTROLLER 30A ICC MAX



30A OTP CHANGES DOCUMENTED IN <RDAR://6151950>

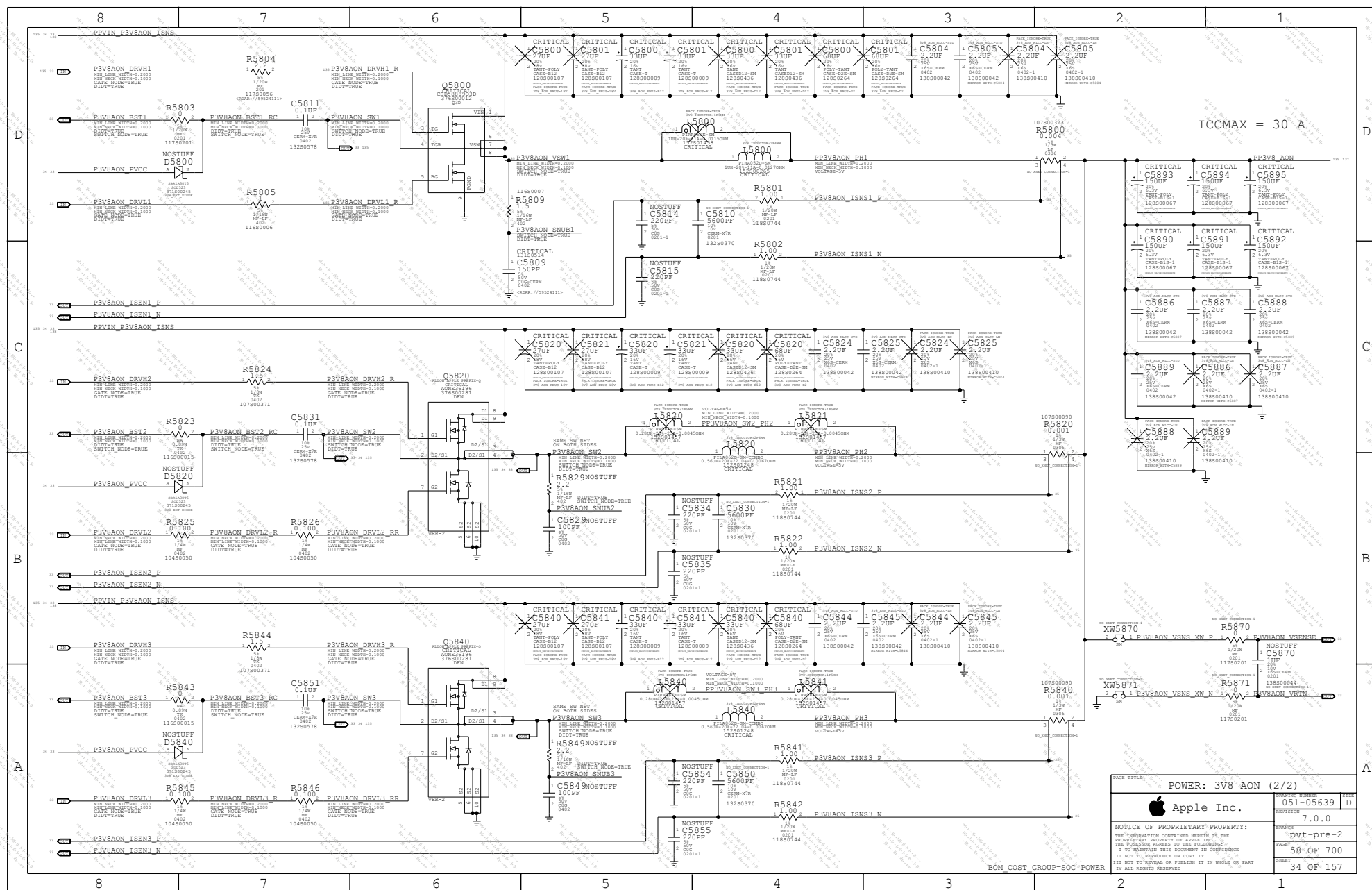
BOM1 IS A CONTINUATION OF BOM1 SINCE BOM1 IS PROGEN FOR TGA PROGRAMS

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
35380328	1	IC:AA225501A-1-10V VOLT REGULATOR	U5700	CRITICAL	P3V8AON_IC1A0
353802472	1	IC:AA225501A-1-10V VOLT REGULATOR	U5700	CRITICAL	P3V8AON_IC1A1_B0B0
353802544	1	IC:AA225501A-1-10V VOLT REGULATOR	U5700	CRITICAL	P3V8AON_IC1A1_B0B1
353802540	1	IC:AA225501A-1-10V VOLT REGULATOR	U5700	CRITICAL	P3V8AON_IC1A1_B0B2
353802574	1	IC:AA225501A-1-10V VOLT REGULATOR	U5700	CRITICAL	P3V8AON_IC1A1_B0B3
353802594	1	IC:AA225501A-1-10V VOLT REGULATOR	U5700	CRITICAL	P3V8AON_IC1A2_B0B0
353802448	1	IC:AA225501A-1-10V VOLT REGULATOR	U5700	CRITICAL	P3V8AON_IC1A2_B0B1

<- 30A BOM1 OPT TGA PROGRAMS ARE GOING TO RAMP WITH
<- NEW BOM5 OPT FOR FUTURE PROGRAMS

PAGE TITLE:		POWER: 3V8 AON (1/2)	
Apple Inc.		DESIGN NUMBER	051-05639
		REVISION	7.0.0
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		SHEET	33 OF 157

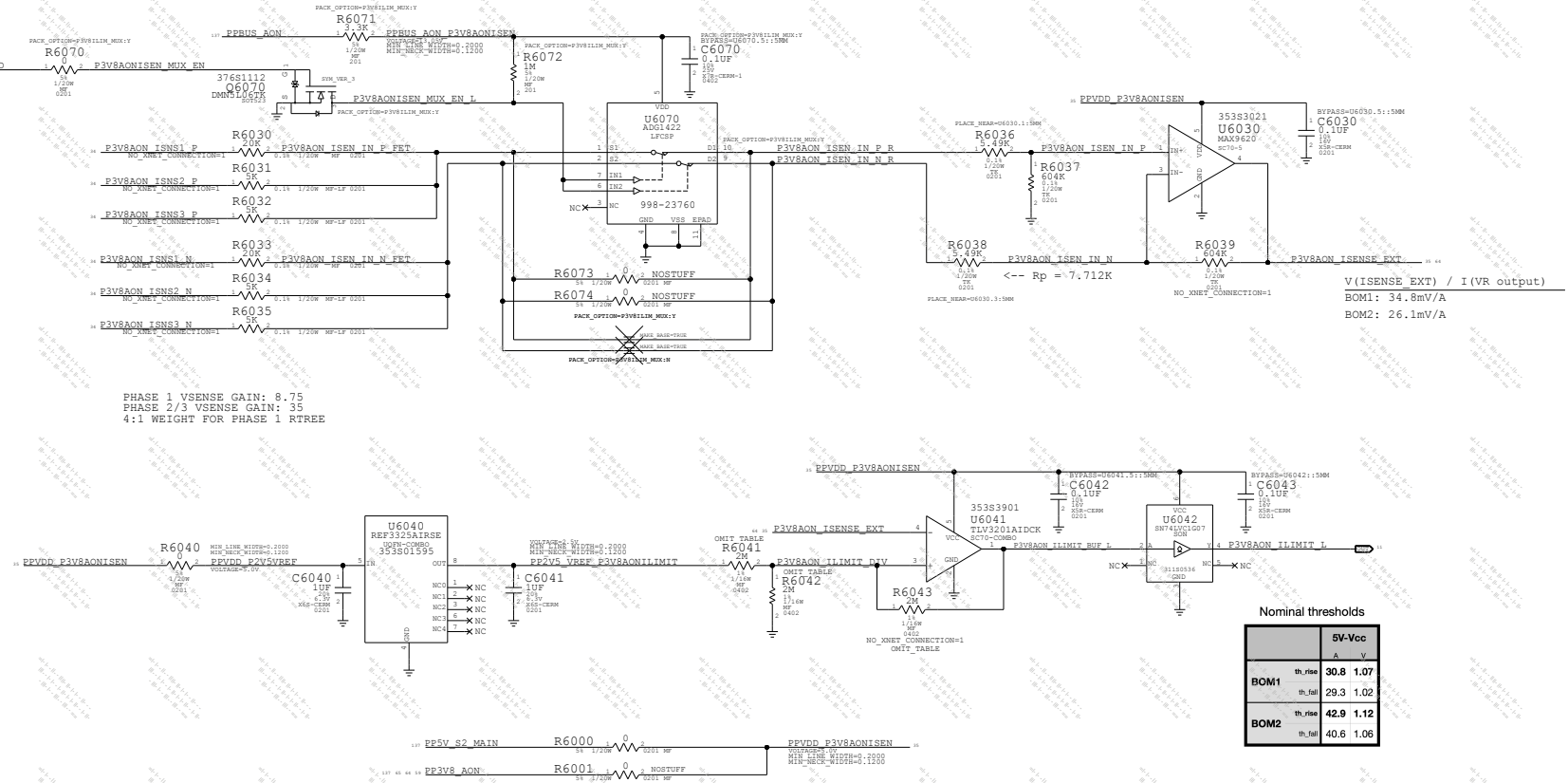
BOM_COST_GROUP=SOC POWER



P3V8 LOW SIDE ISENSE AND ILIMIT (SUMMING AMP FOR 3 PHASES)

rdar://problem/69466996 Iceman 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:

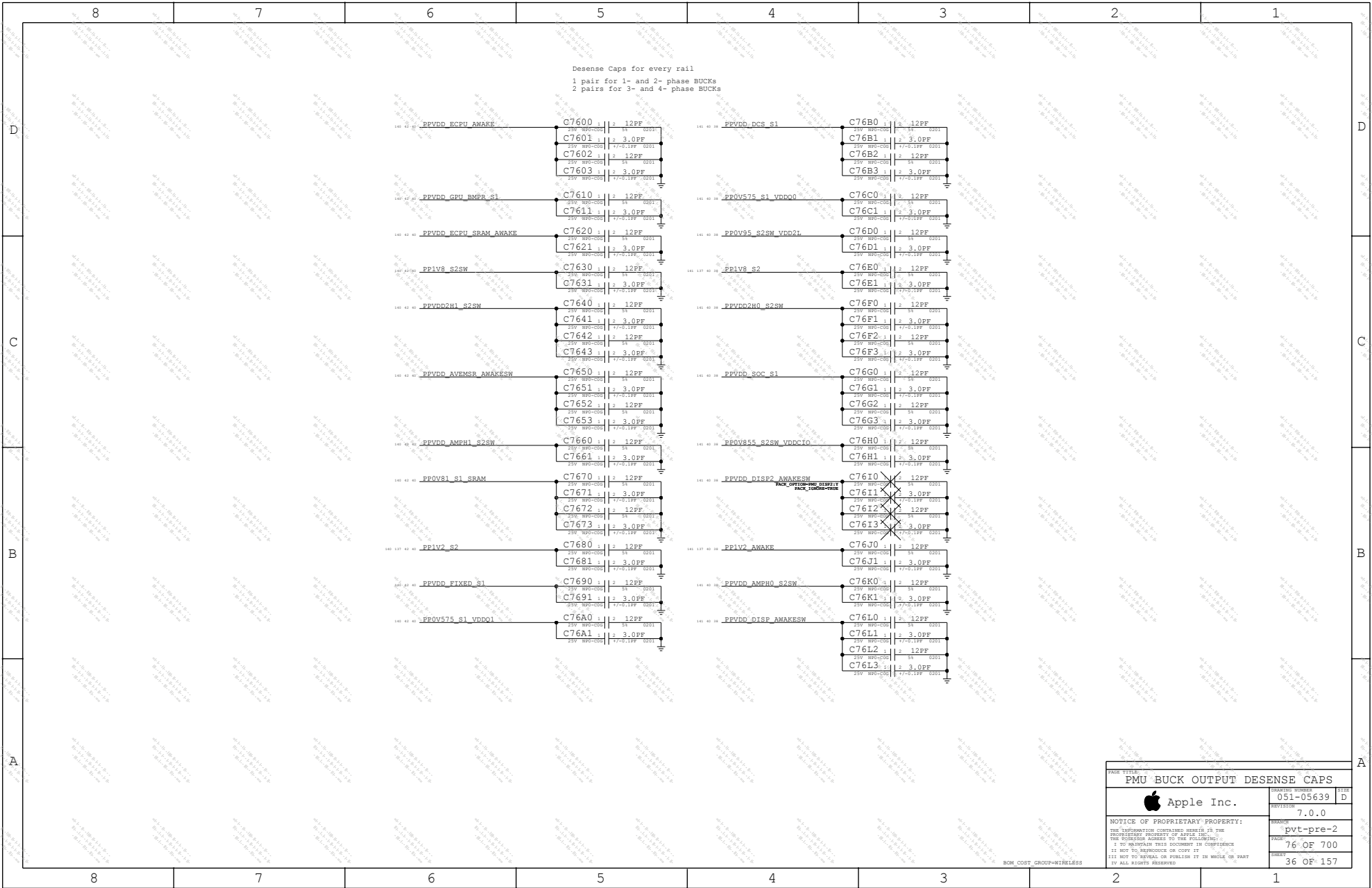
BOM GROUP	BOM OPTIONS
P3V8ILIM:BOM1_5V	P3V8ILIM_RT:22K,P3V8ILIM_RB:15K4,P3V8ILIM_RE:966K
P3V8ILIM:BOM2_5V	P3V8ILIM_RT:20K,P3V8ILIM_RB:15K,P3V8ILIM_RE:715K

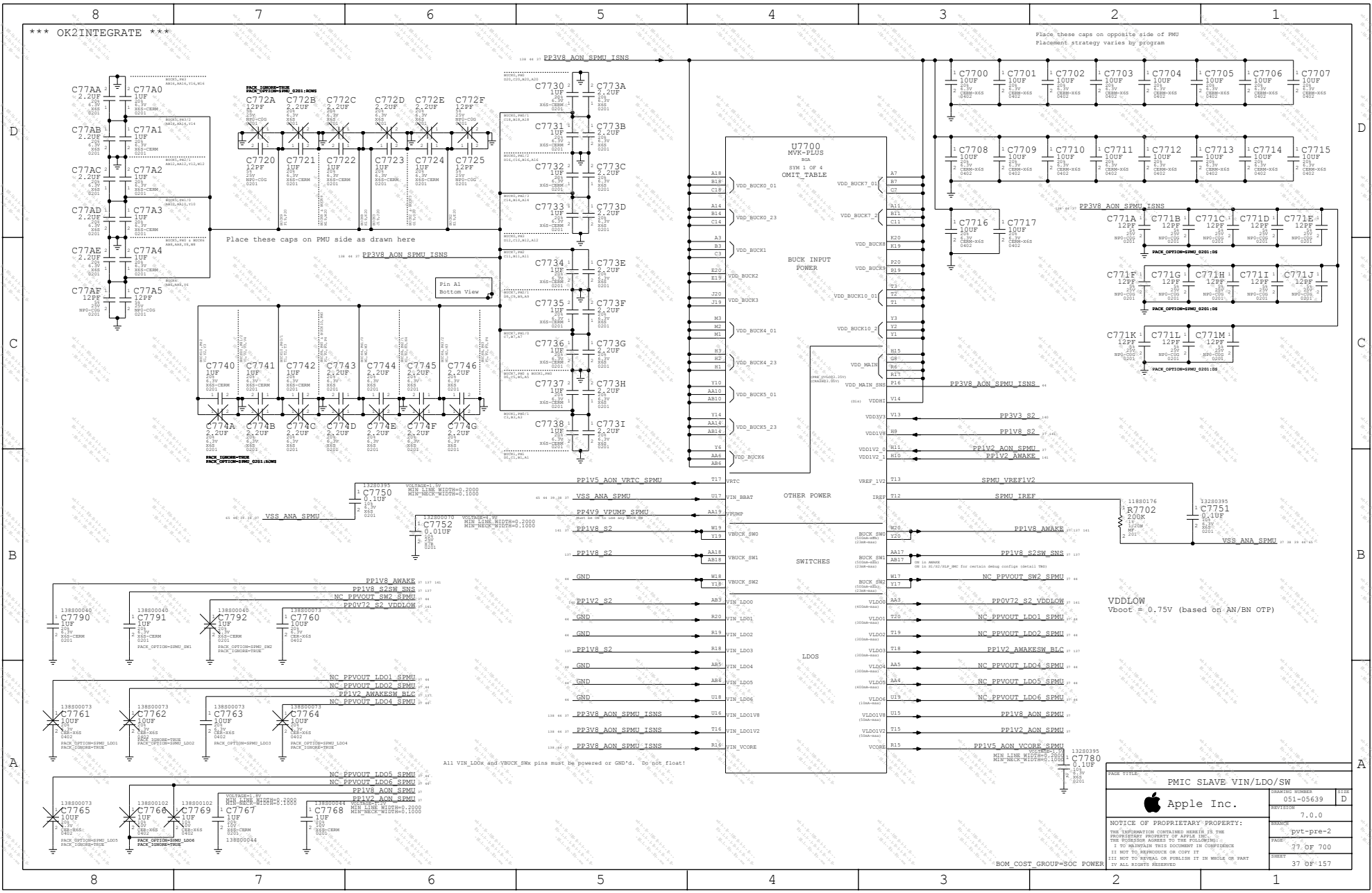
Don't Call these OPTIONS directly:


PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	SNV OPTION
1480343	1	RES,0402,1K,1/16W,20K	R6041	P3V8ILIM_RT:20K
14800141	1	RES,0402,1K,1/16W,20K	R6041	P3V8ILIM_RT:20K
14800331	1	RES,0402,1K,1/16W,20K	R6042	P3V8ILIM_RB:15K
14800332	1	RES,0402,1K,1/16W,20K	R6042	P3V8ILIM_RB:15K
14800495	1	RES,0402,1K,1/16W,20K	R6043	P3V8ILIM_RE:715K
14800503	1	RES,0402,1K,1/16W,20K	R6043	P3V8ILIM_RE:715K

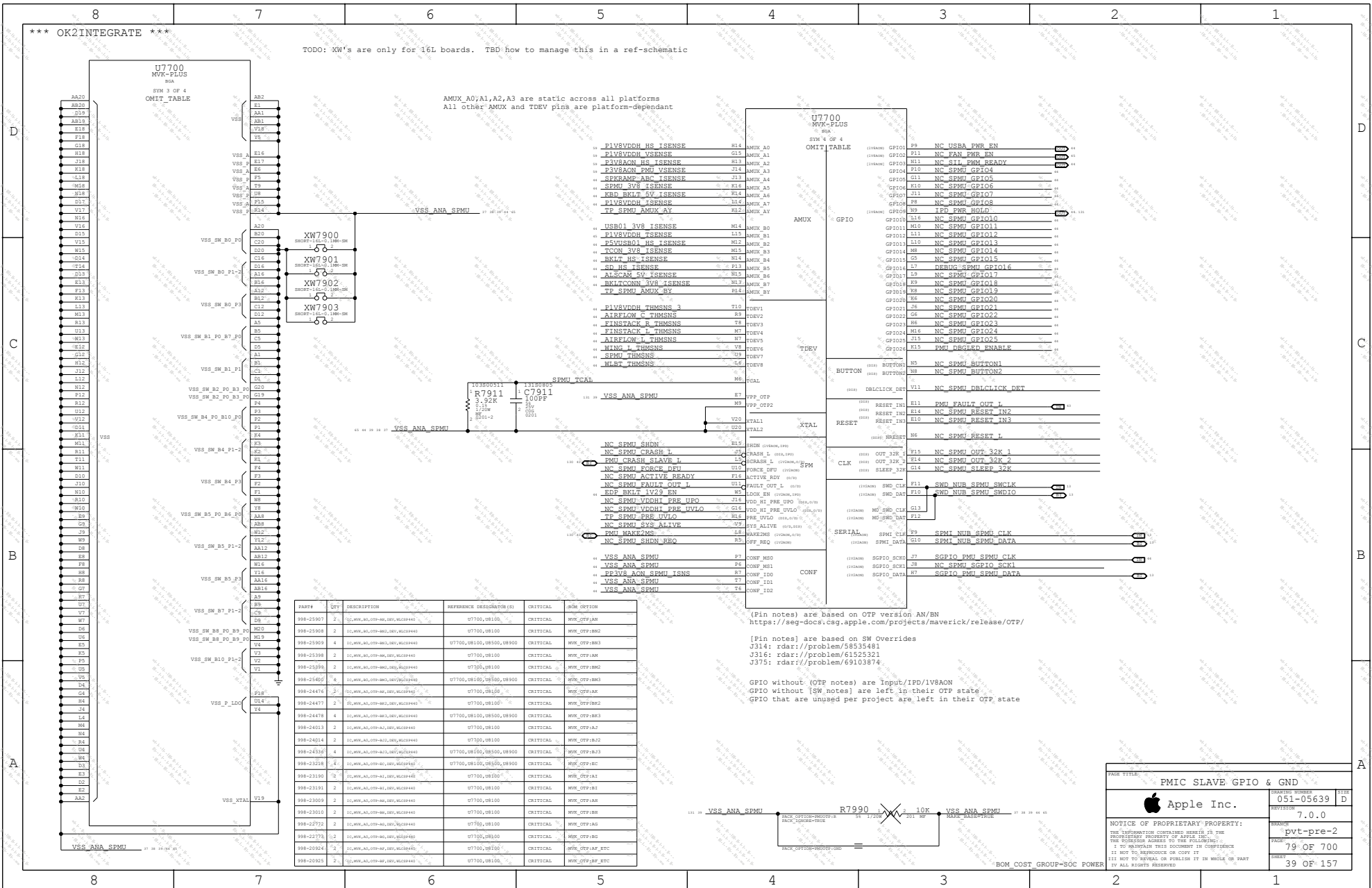
BOM COST GROUP=SDC POWER

PAGE TITLE:	
POWER: 3V8 AON OUTPUT THROTTLE	
Apple Inc.	051-05639
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35 OF 157	

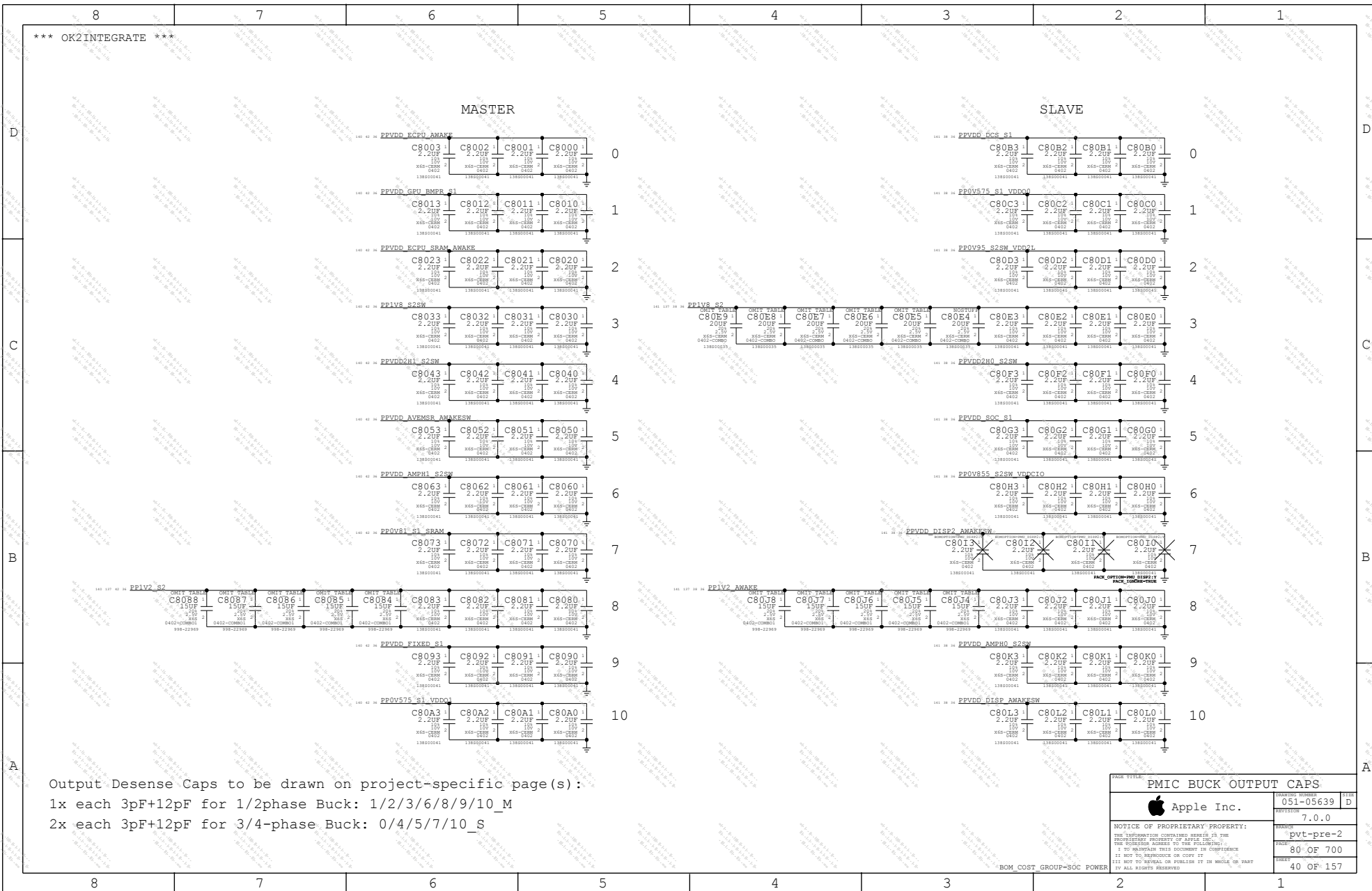


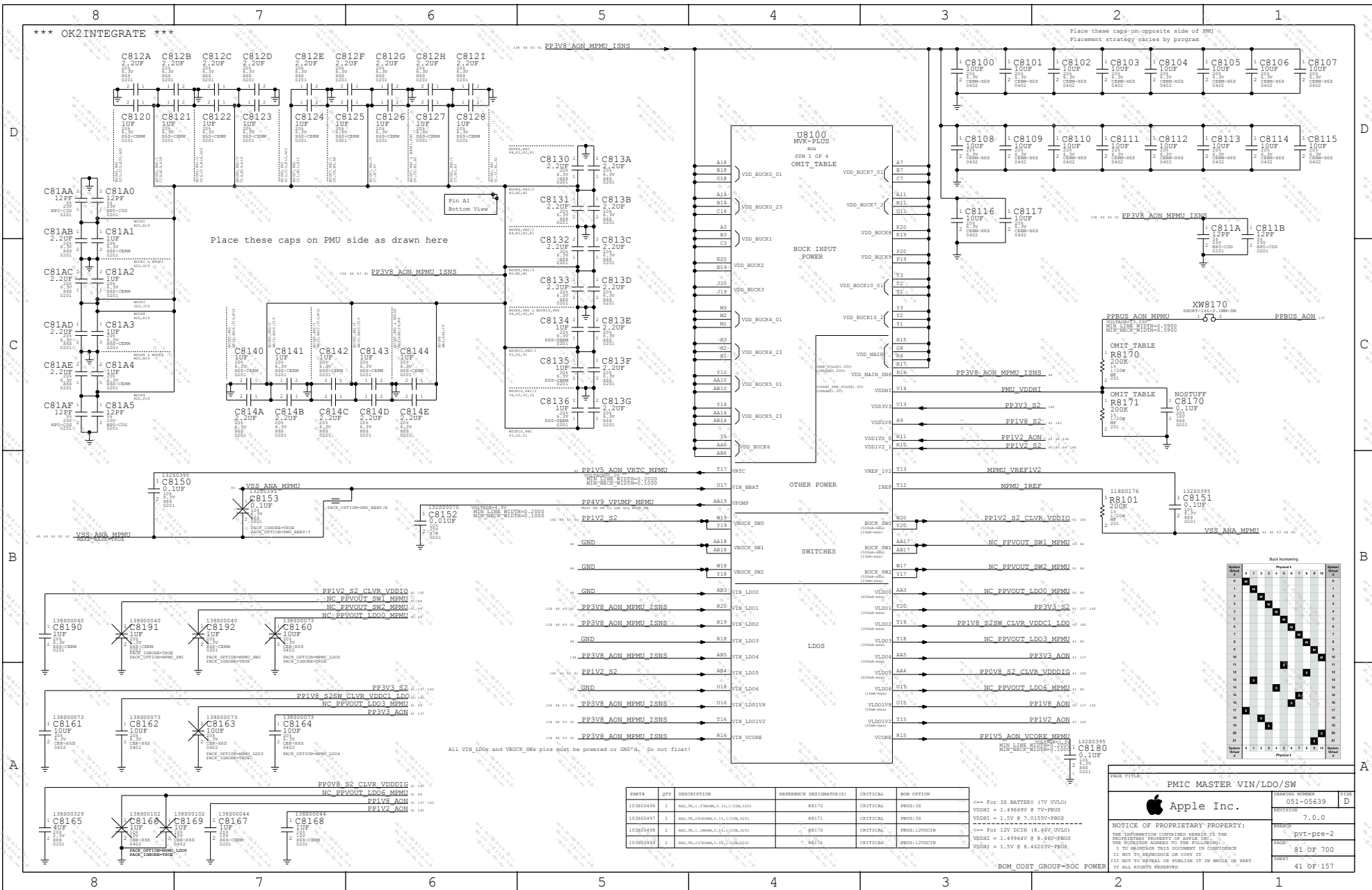


PAGE TITLE:		PMIC SLAVE VIN/LDO/SW	
 Apple Inc.		DRAWING NUMBER:	051-05639
		REVISION:	D
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		BRANCH:	pvt-pre-2
		PAGE:	37 OF 700
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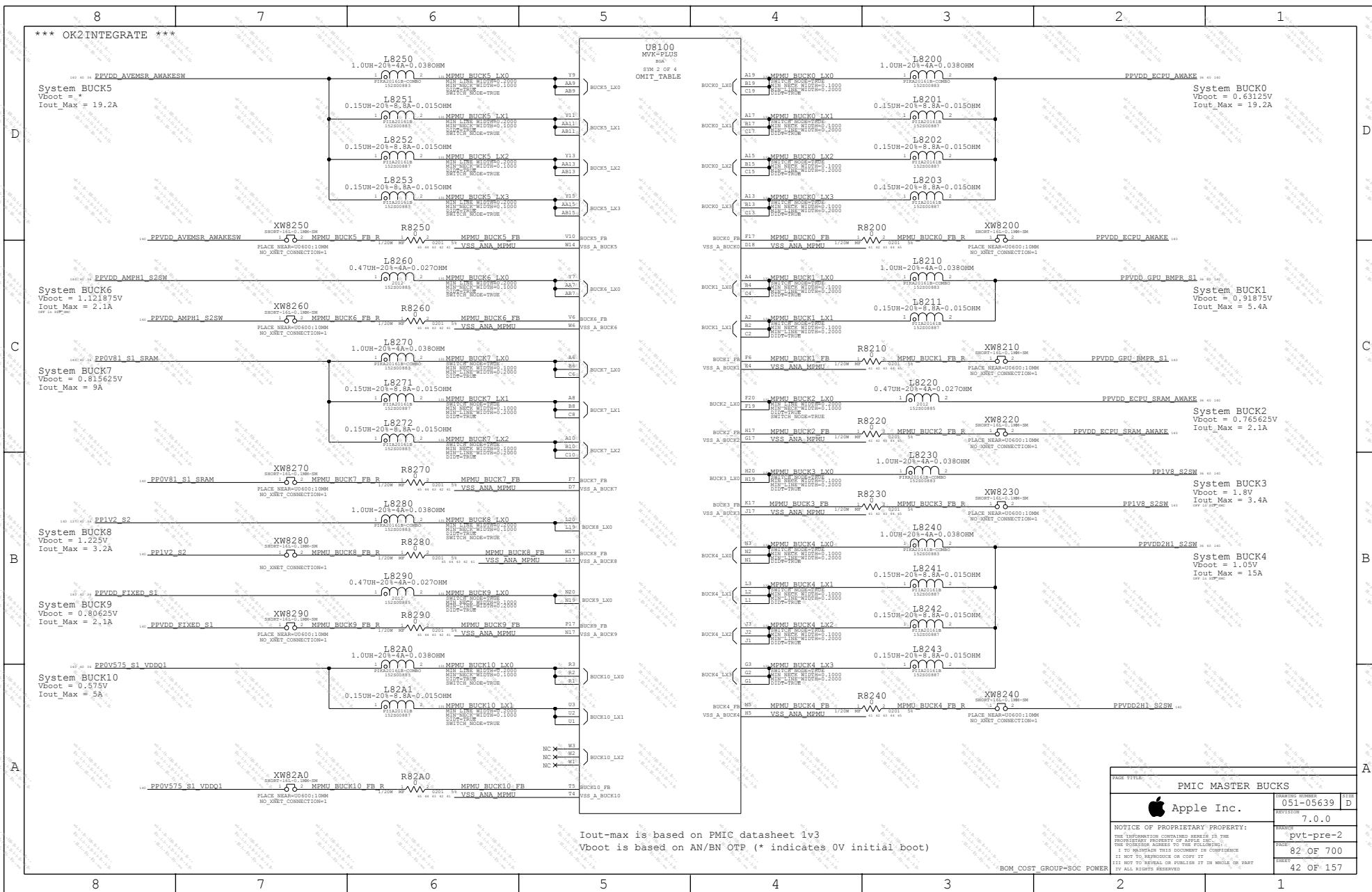


PAGE TITLE:	
PMIC SLAVE GPIO & GND	
Apple Inc.	
051-05639	051-05639
7.0.0	7.0.0
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PAGE: 79 OF 700	
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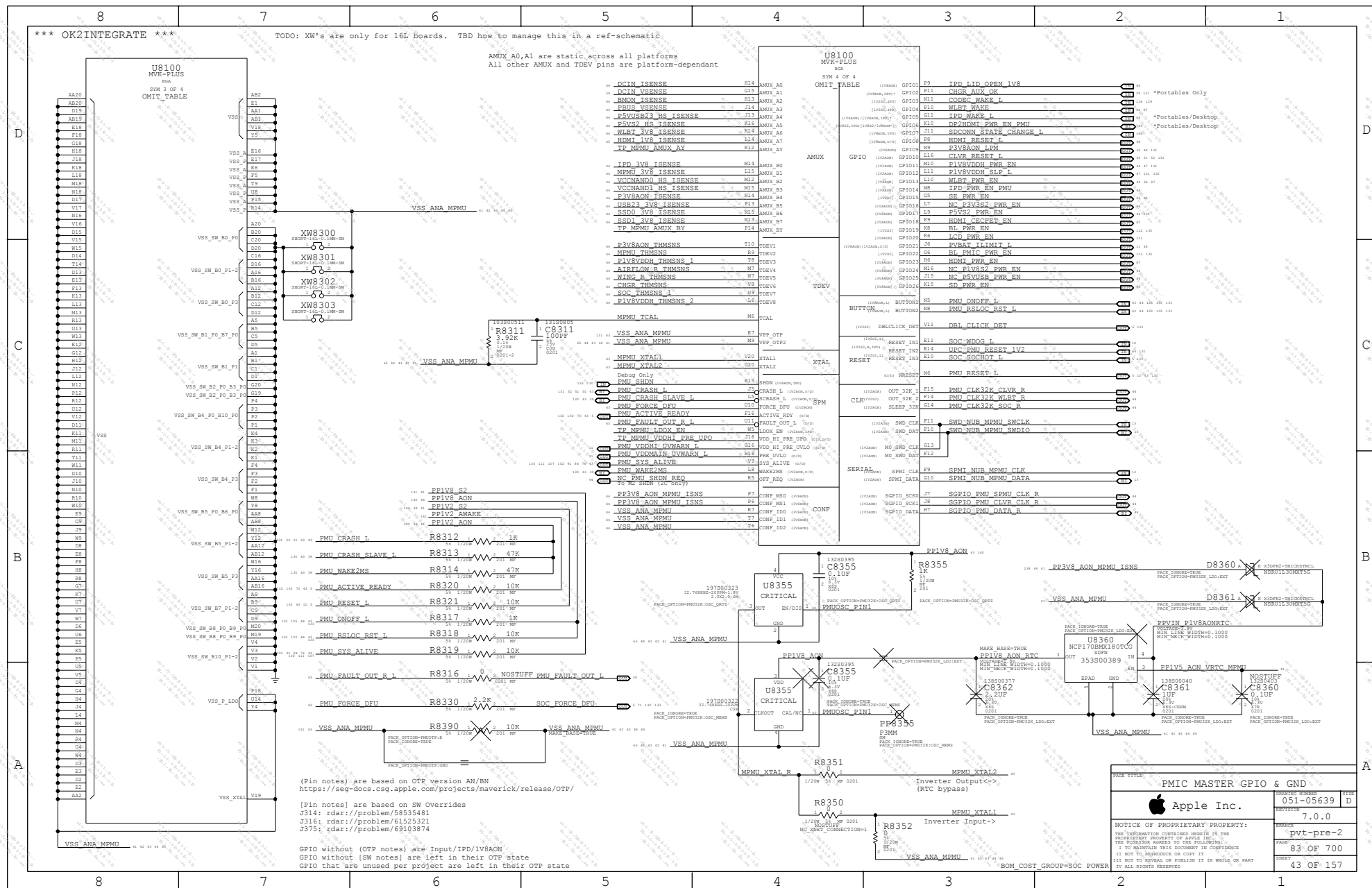


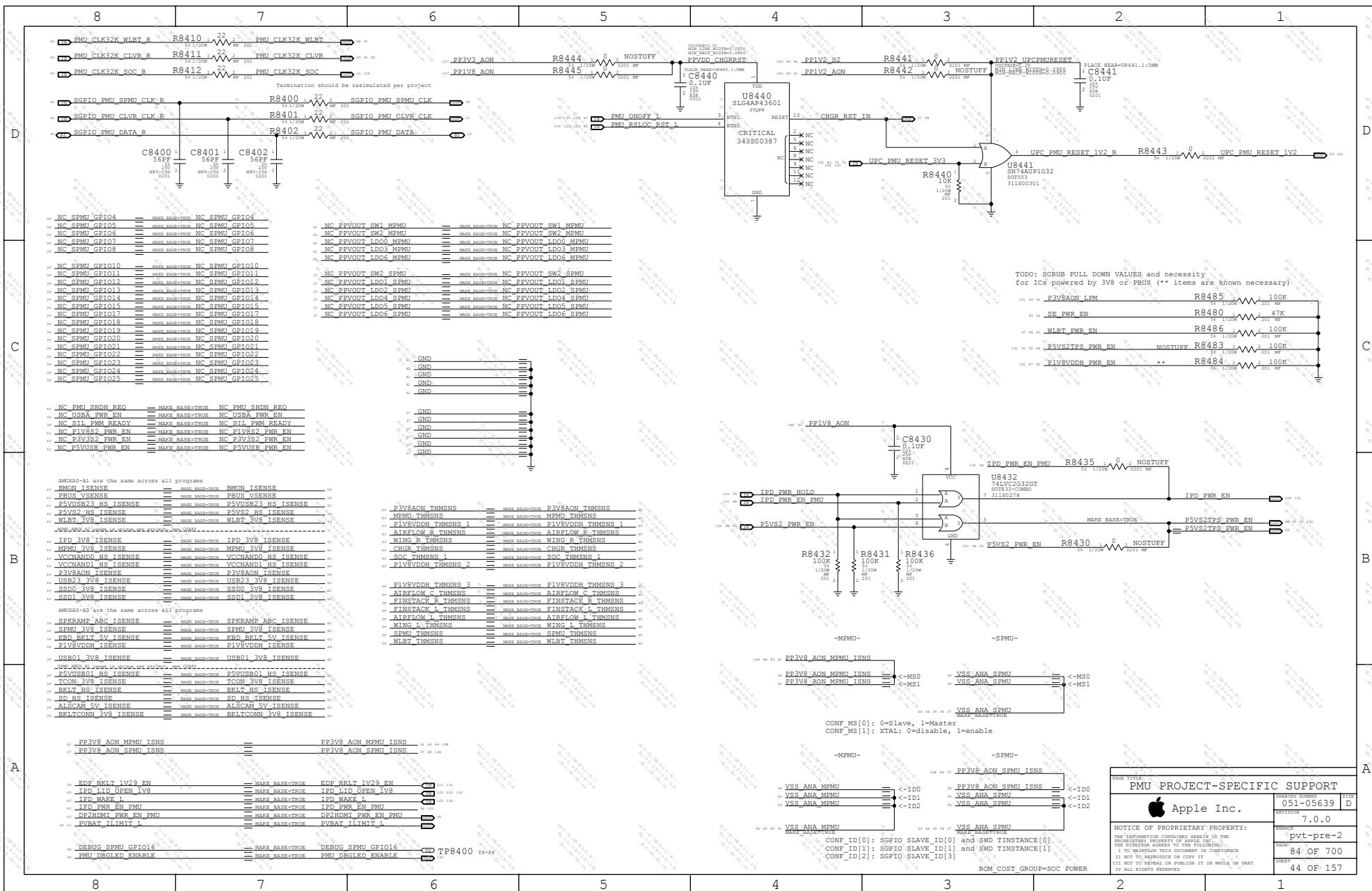


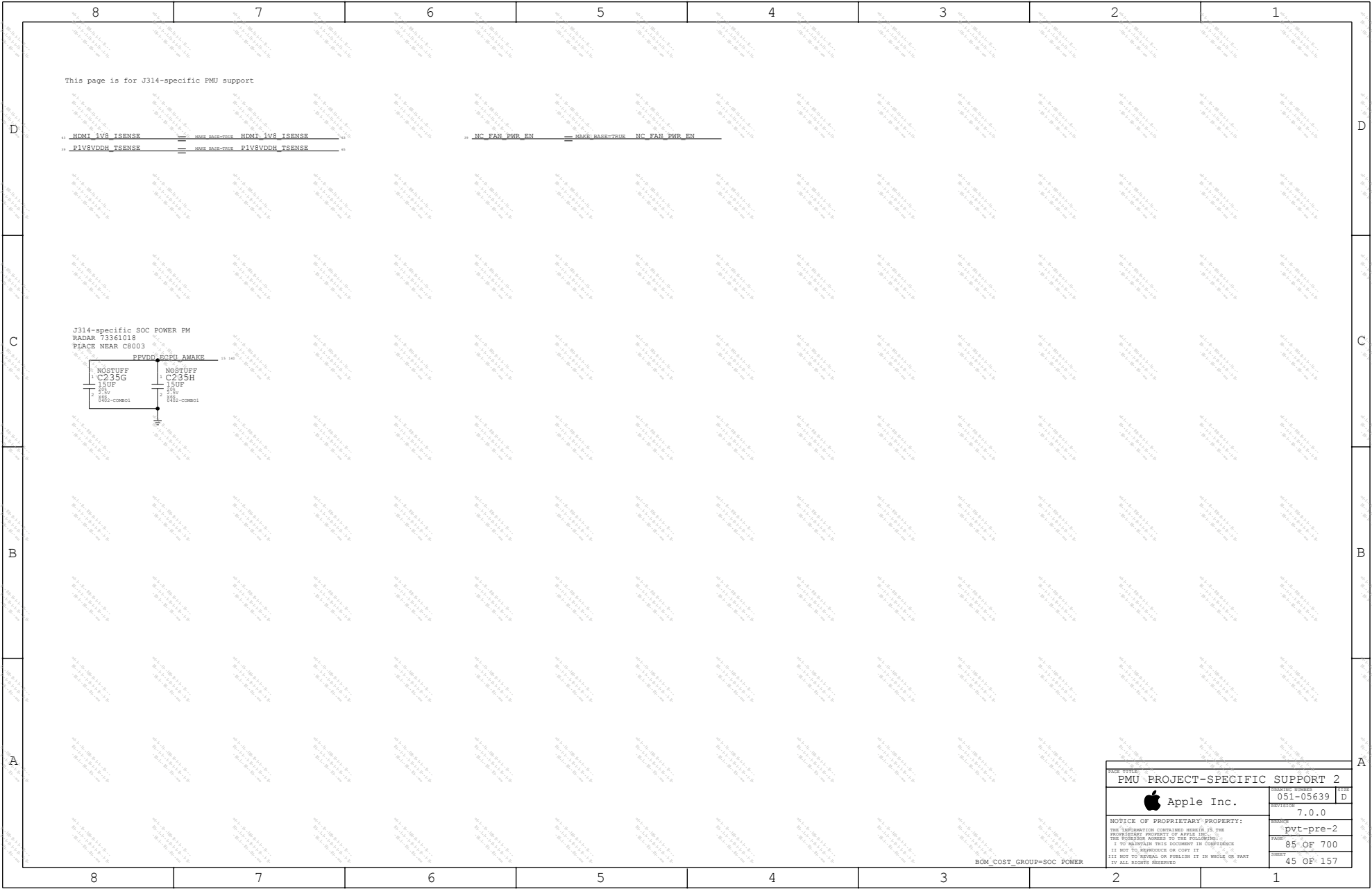
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
103800496	1	888, 7V, 1.270000, 0.15, 1.2700, 0.001	#8170	CRITICAL	PROD:35
103800497	1	888, 7V, 1.270000, 0.15, 1.2700, 0.001	#8171	CRITICAL	PROD:35
103800498	1	888, 7V, 1.270000, 0.15, 1.2700, 0.001	#8170	CRITICAL	PROD:12VDCIN
103800499	1	888, 7V, 1.270000, 0.15, 1.2700, 0.001	#8171	CRITICAL	PROD:12VDCIN



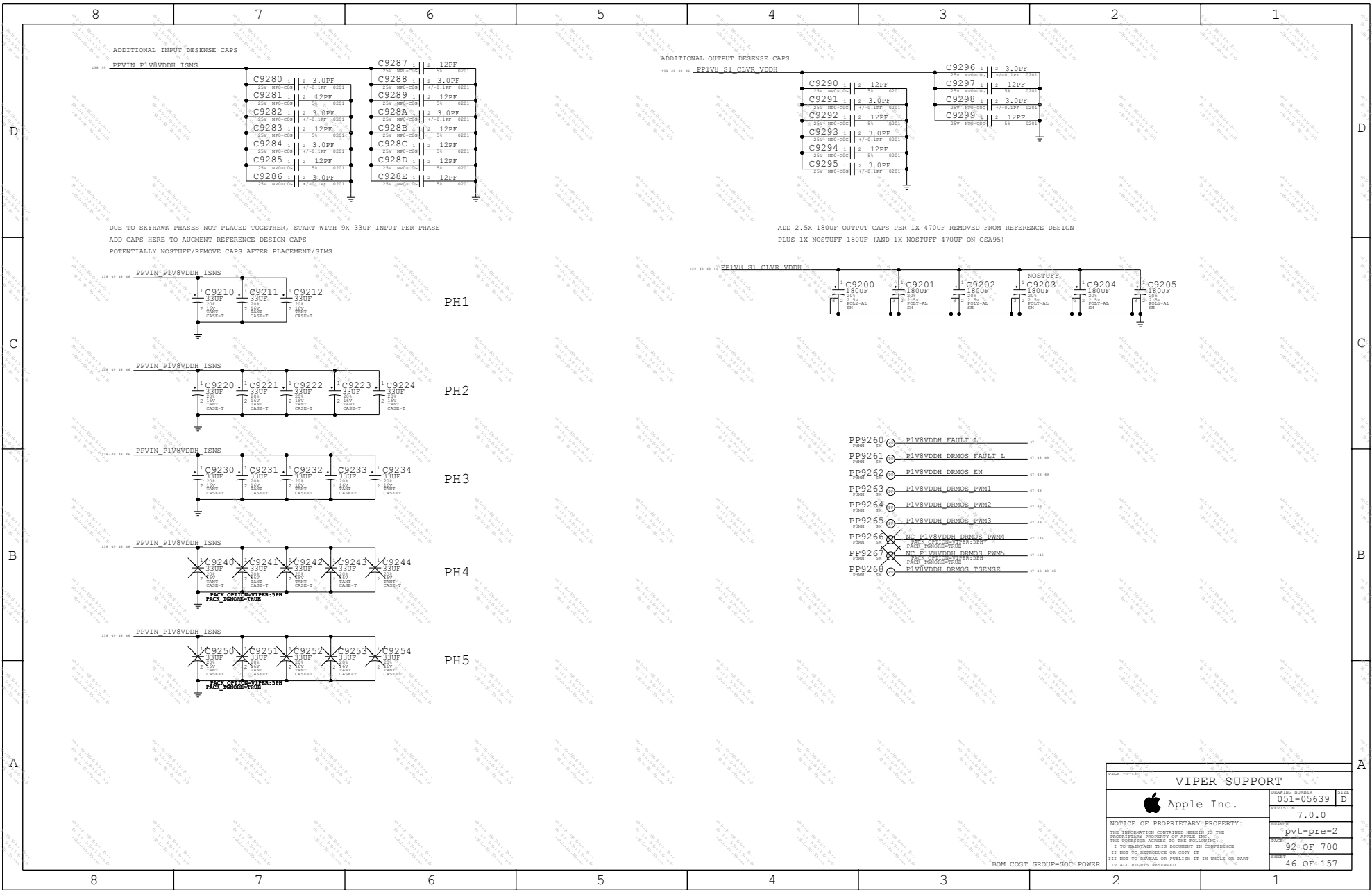
PAGE TITLE:		
PMIC MASTER BUCKS		
Apple Inc.		
051-05639	051-05639	051-05639
7.0.0	7.0.0	7.0.0
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SHEET:		
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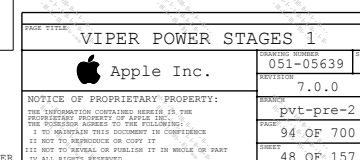


PAGE TITLE: PMU PROJECT-SPECIFIC SUPPORT 2		051-05639	8
Apple Inc.		7.0.0	
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		85 OF 700	
		45 OF 157	



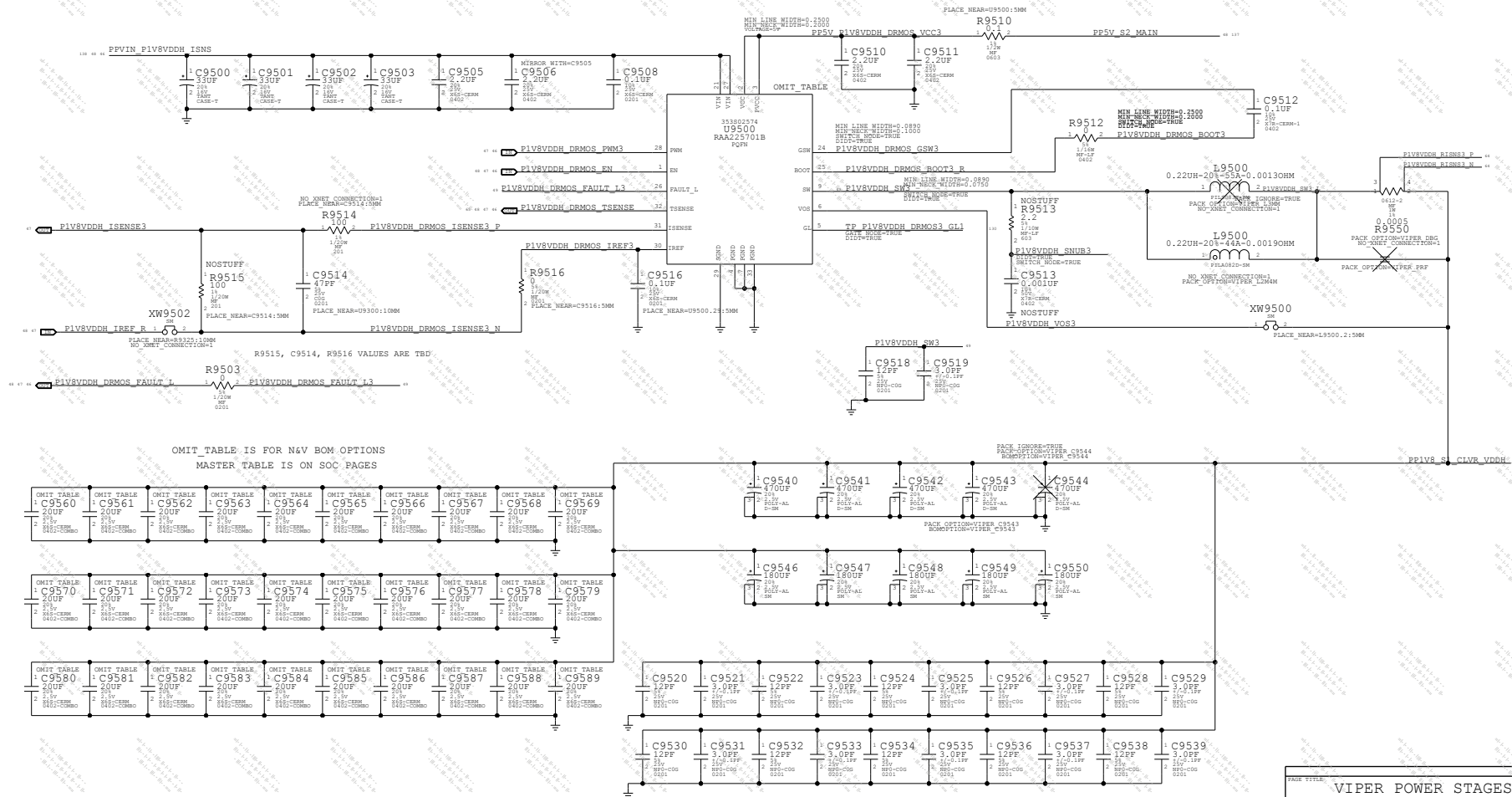
PAGE TITLE: VIPER SUPPORT		
Apple Inc.	051-05639	051-05639
	7.0.0	7.0.0
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PAGE: 92 OF 700		
SHEET: 46 OF 157		

VIPER POWER STAGES 1




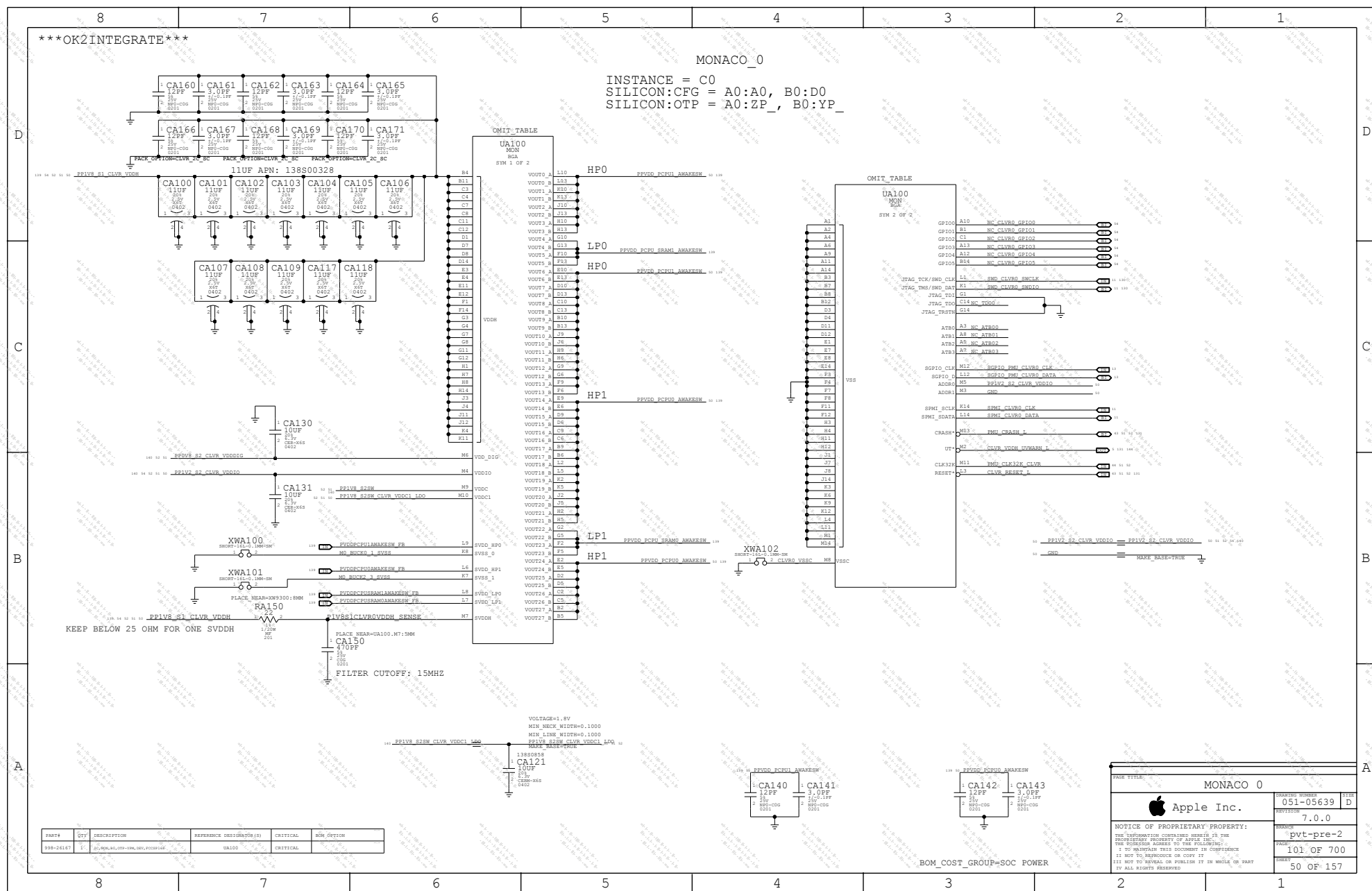
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
953502708	2	IC,AA3267010,EN,SR NOR,A2,07P-0,PQ9632	U9400,U9420	CRITICAL	

VIPER POWER STAGES 2



PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
353502708	1	IC, MAX232SPIC, EPF, 18, 804, 42, 07F-0, PQP832	U9500	CRITICAL	

PAGE TITLE:		VIPER POWER STAGES 2		PAGE NO:	
 Apple Inc.		BRANCH NUMBER:		PAGE D	
		051-05639			
		REVISION:		7.0.0	
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OK2INTEGRATE

MONACO_1


INSTANCE = C1

CFG = A1

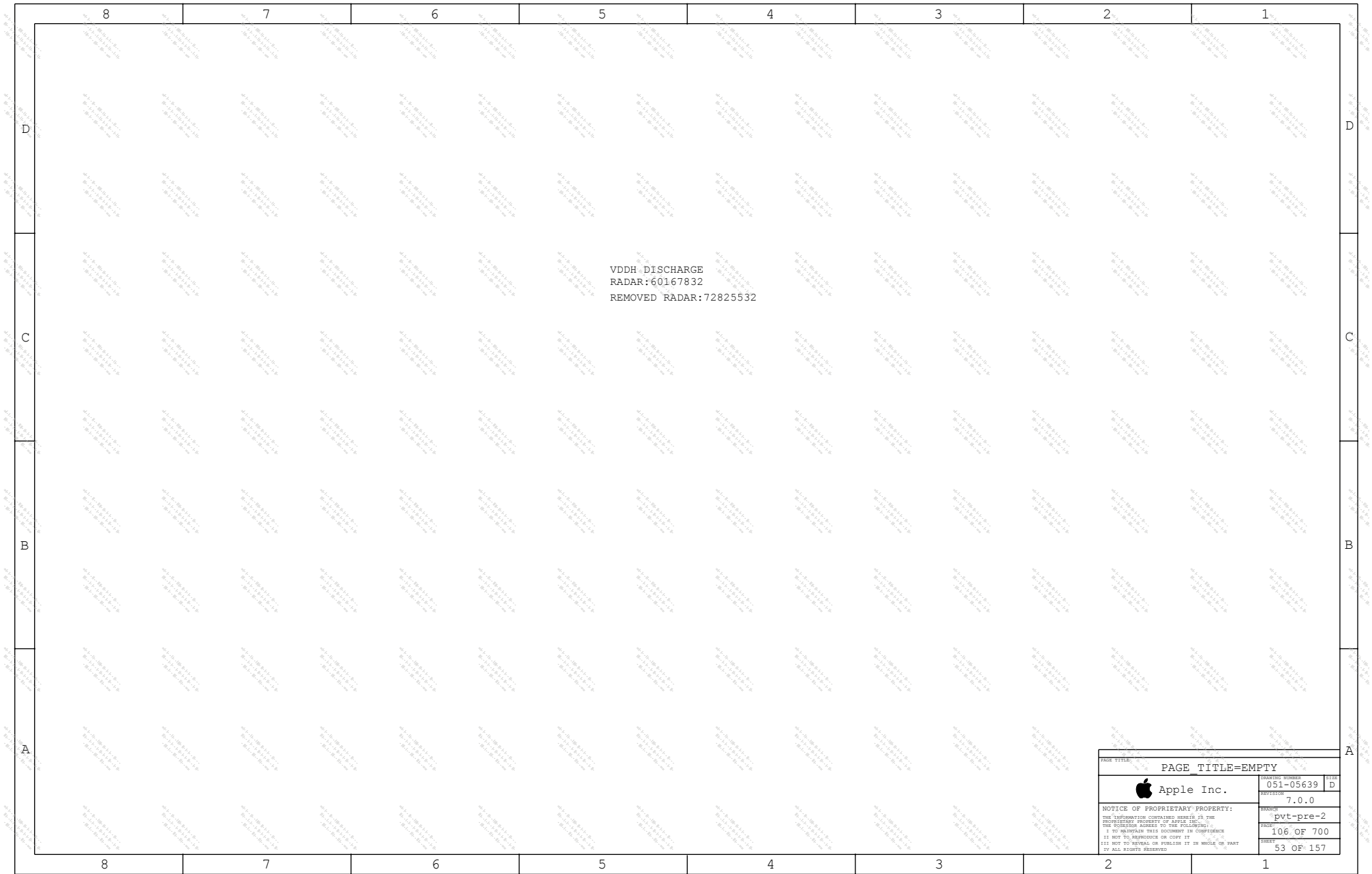
OTP = BP_

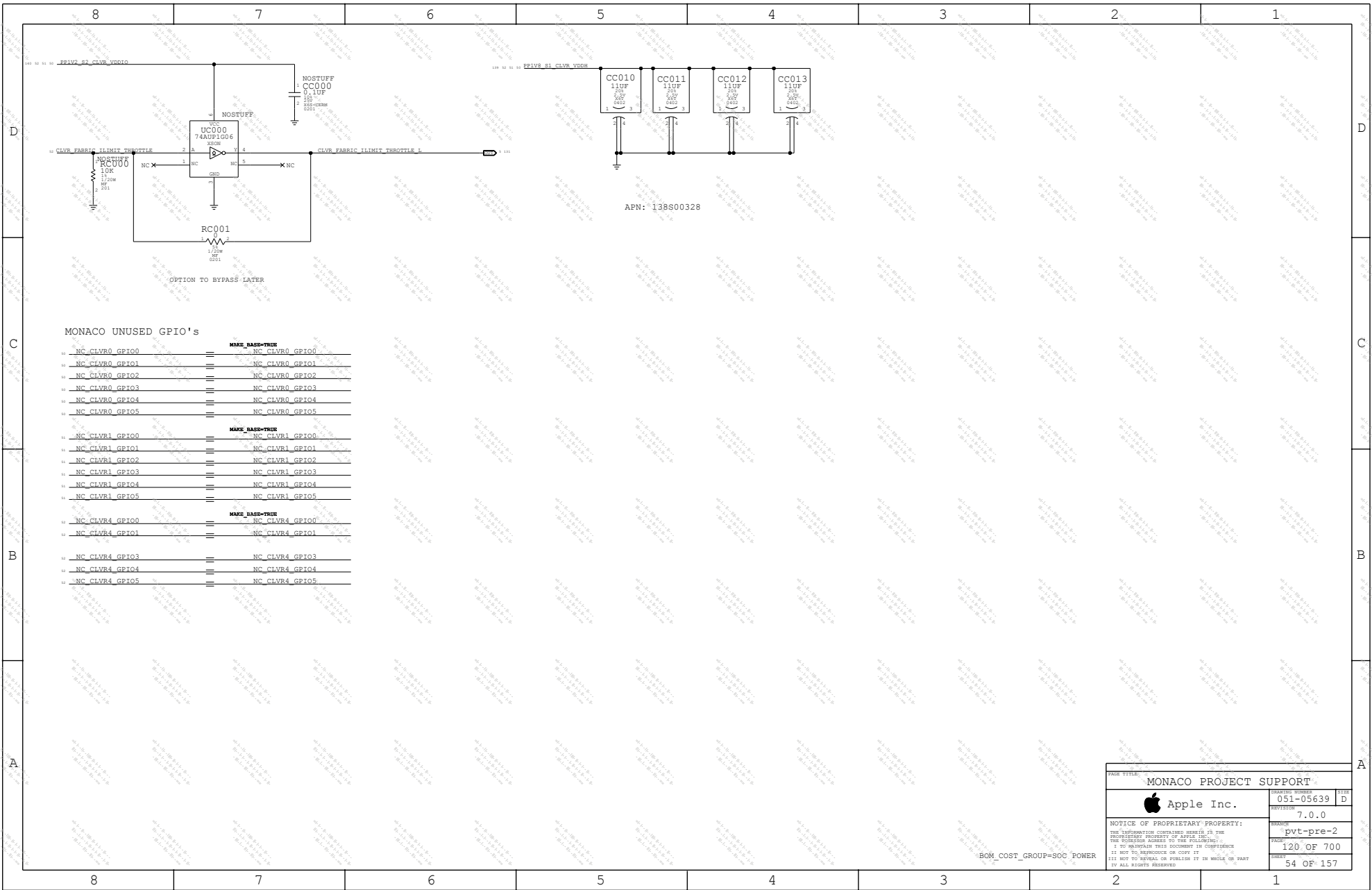
OMIT TABLE
UA200
MON
RGA
SYM 1 OF 2

OMIT TABLE
UA200
MON
RGA
SYM 2 OF 2

PAGE TITLE:		
MONACO 1		
 Apple Inc.		
051-05639	051-05639	051-05639
7.0.0	7.0.0	7.0.0
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102 OF 700	102 OF 700	102 OF 700
51 OF 157	51 OF 157	51 OF 157

BCM_COST GROUP=SOC POWER





PAGE TITLE: MONACO PROJECT SUPPORT			
Apple Inc.	DESIGN NUMBER	051-05639	TYPE
	REVISION	7.0.0	D
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	PAGE	120 OF 700	
	SHEET	54 OF 157	

BOM_COST_GROUP=SOC POWER

* OK2INTEGRATE *

5V_S2 Voltage Regulator (low power option)

SET ONE OPTION FOR PBUS CAPS

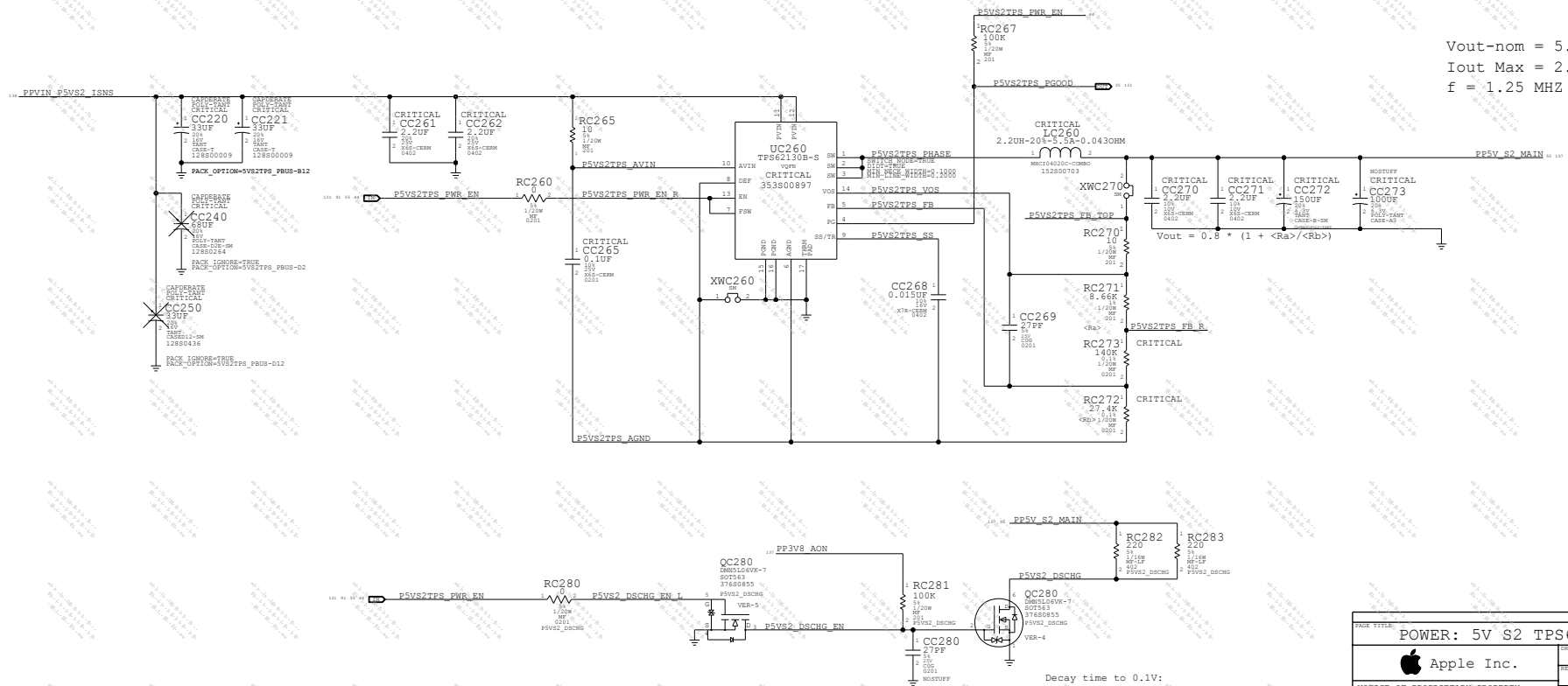
PACK_OPTION=5VS2TPS_PBUS-B12

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



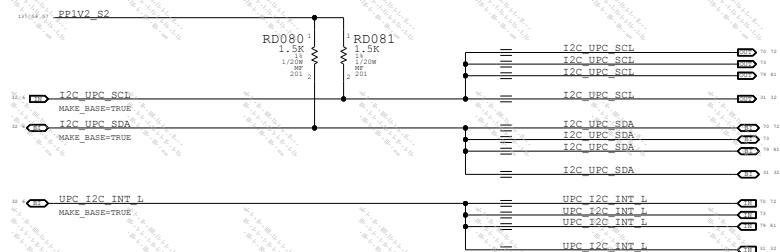
Decay time to 0.1V:
86ms-min / 114ms-typ / 148ms-max
(Vout=5.14V5%, Cout=260uF20%, R=2x220R5%)

BOB_COST_GROUP=PLATFORM POWER

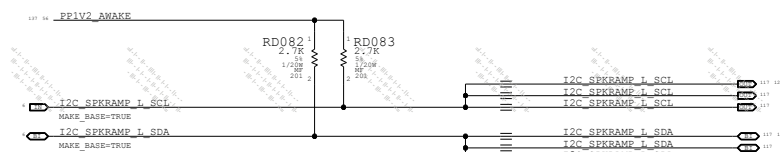
PAGE TITLE: POWER: 5V S2 TPS62130		
 Apple Inc.		
DESIGN NUMBER 051-05639	REV D	
REVISION 7.0.0	BRANCH pvt-pre-2	
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PAGE 122 OF 700	SHEET 55 OF 157	

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	0xb6

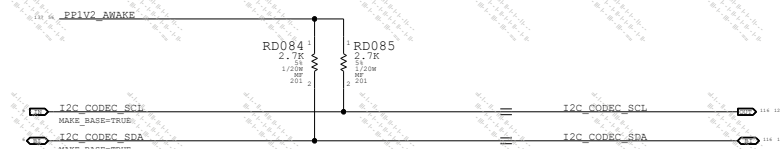
MASTER	NUMBER	SPEED	7-BIT ADDR	8-BIT ADDR (R)	DEVICE
?	?	?	?	?	?
?	?	?	?	?	?
?	?	?	?	?	?



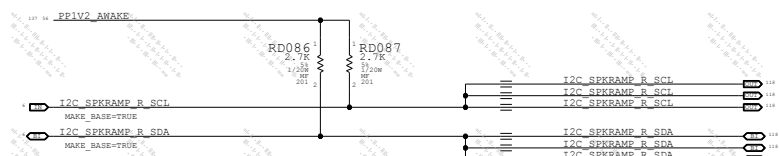
DEVICE	CARD/REFDES	7-BIT	8-BIT
SPKRAMP TAWANG A	SPKRAMP	0x38	0x70
SPKRAMP TAWANG B	SPKRAMP	0x39	0x72
SPKRAMP TAWANG C	SPKRAMP	0x3A	0x74



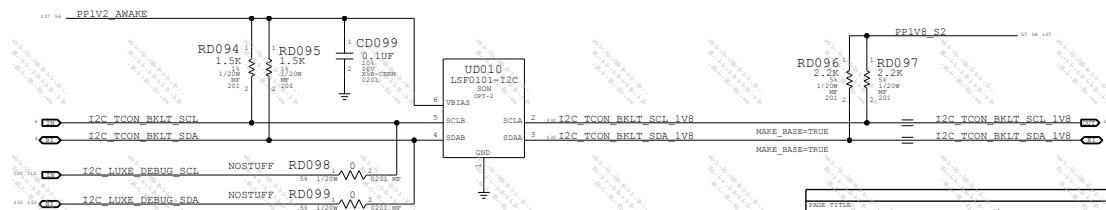
DEVICE	CARD/REFDES	7-BIT	8-BIT
CODEC - CLIFDEN	DMIC & CODEC	0x48	0x90
CODEC - CARLOW	DMIC & CODEC	0x4B	0x95




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



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



```
AOP_I2C1
ISP_I2C0
ISP_I2C1
ISP_I2C3
```

PAGE TITLE:		I2C Connections - AP	
 Apple Inc.	DRAWING NUMBER		051-05639
	REVISION		7.0.0
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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

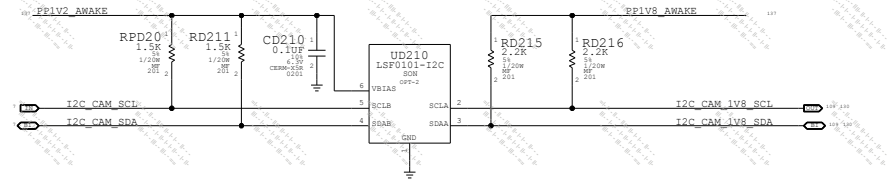
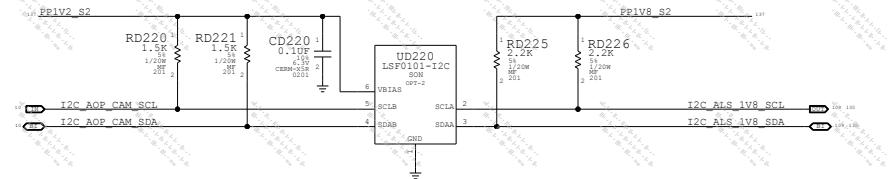
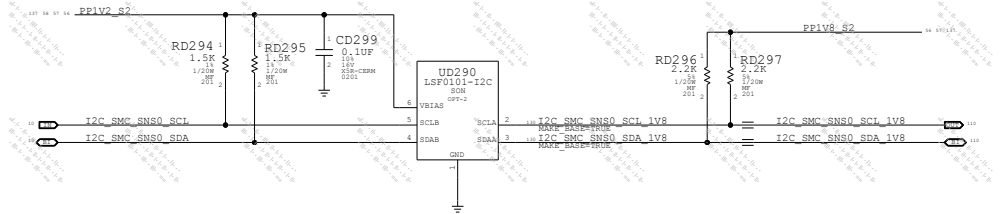
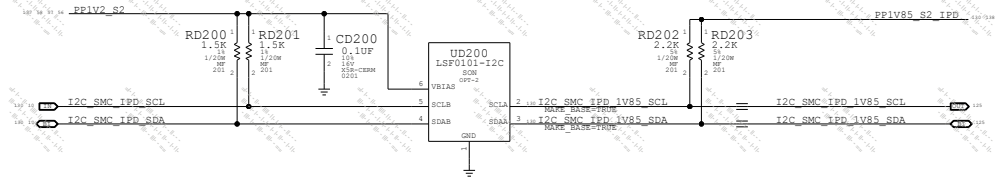
ISP_I2C2

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

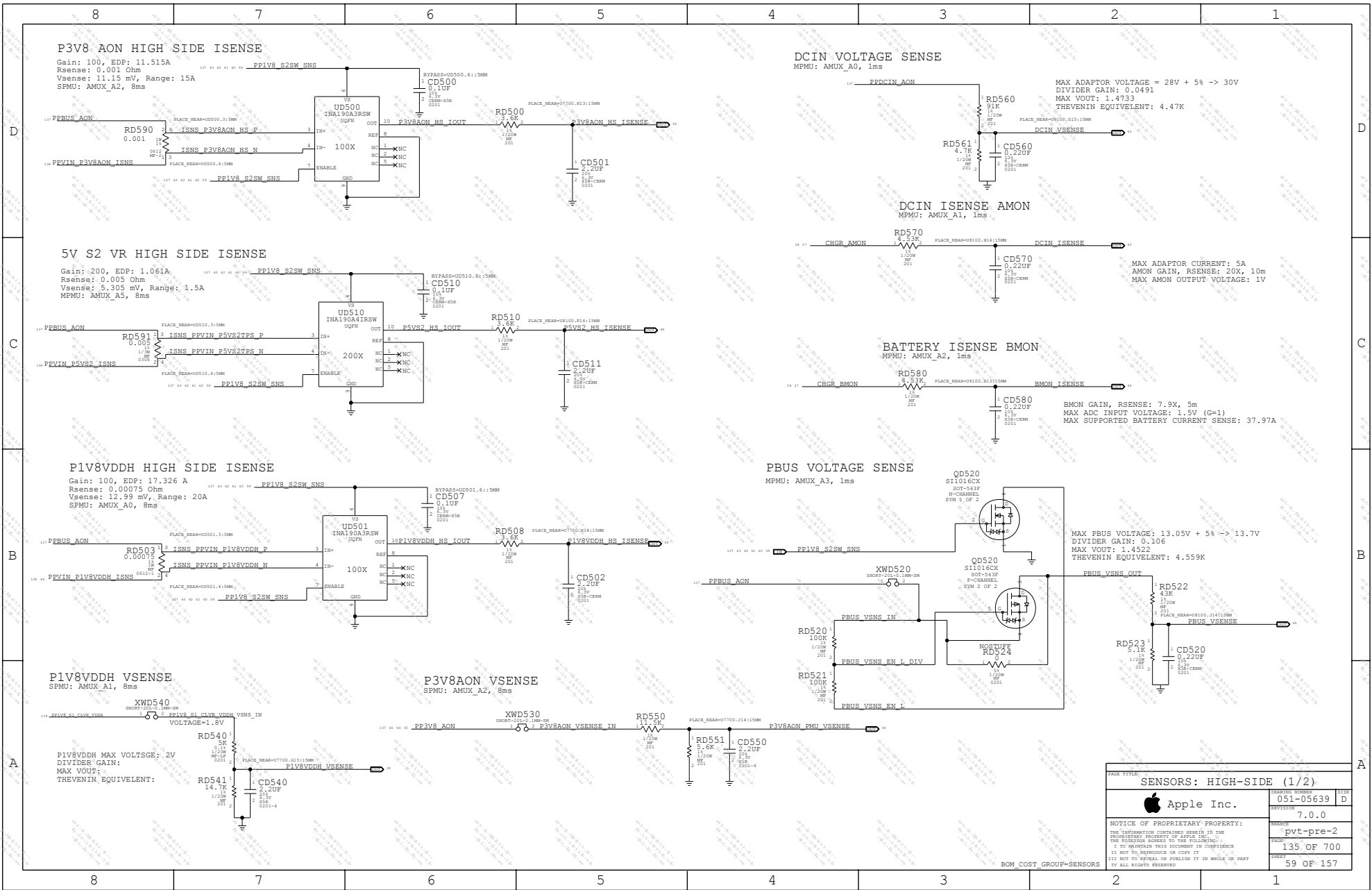
SI2C


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

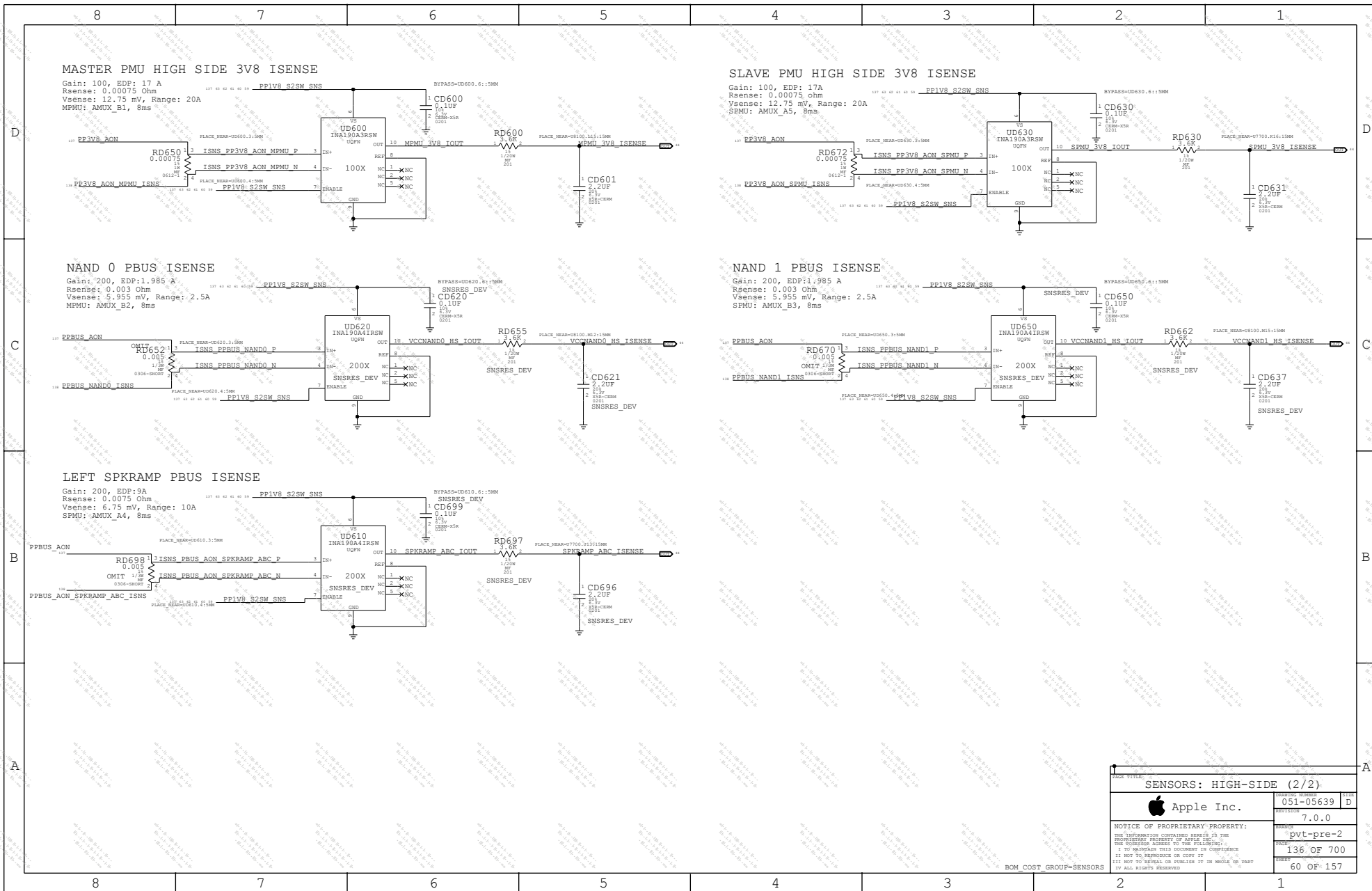


PAGE TITLE			
I2C Connections - Other			
Apple Inc.		DESIGN NUMBER	051-05639
		REVISION	D
		VERSION	7.0.0
		BRANCH	Pvt-pre-2
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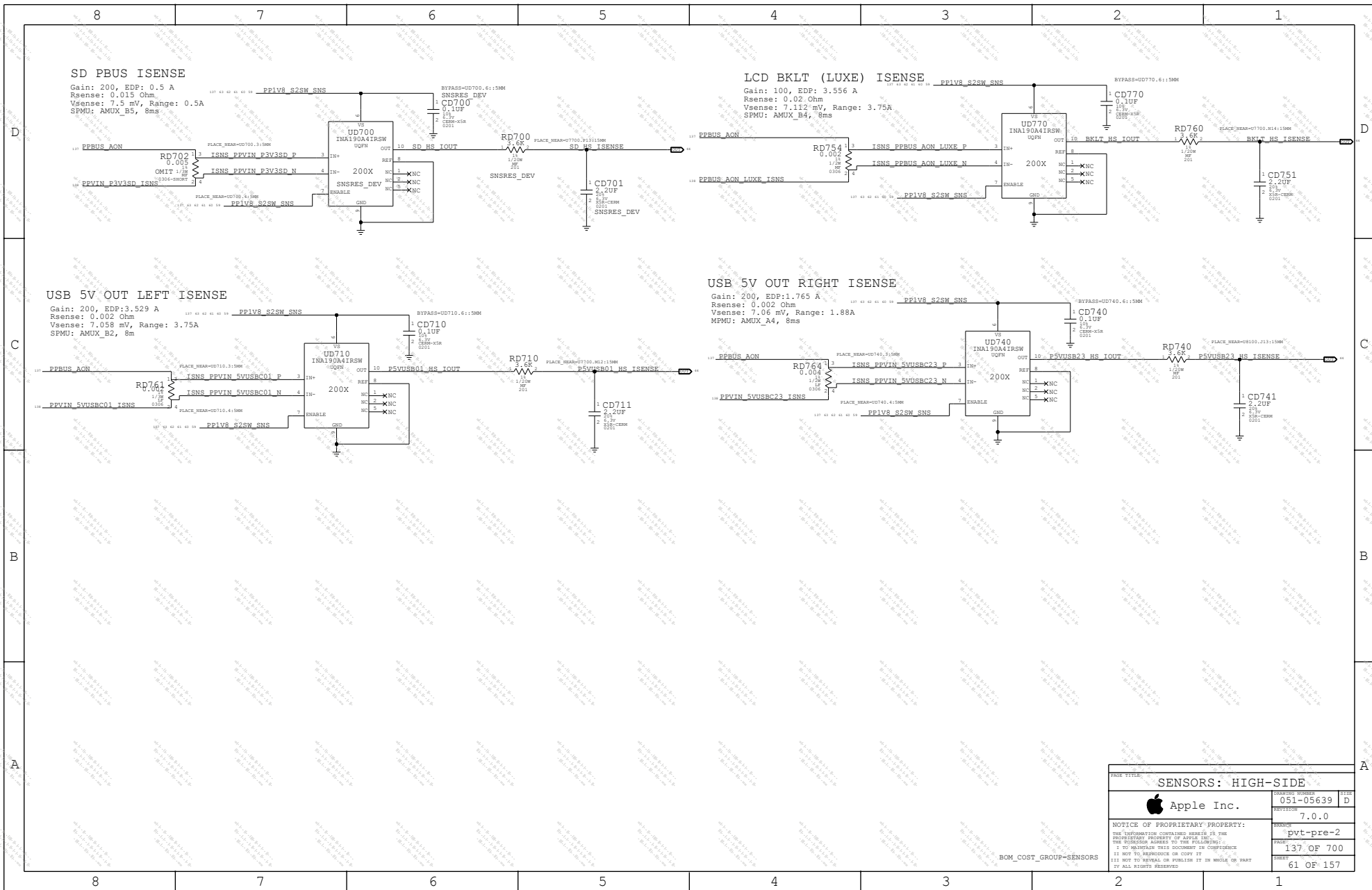
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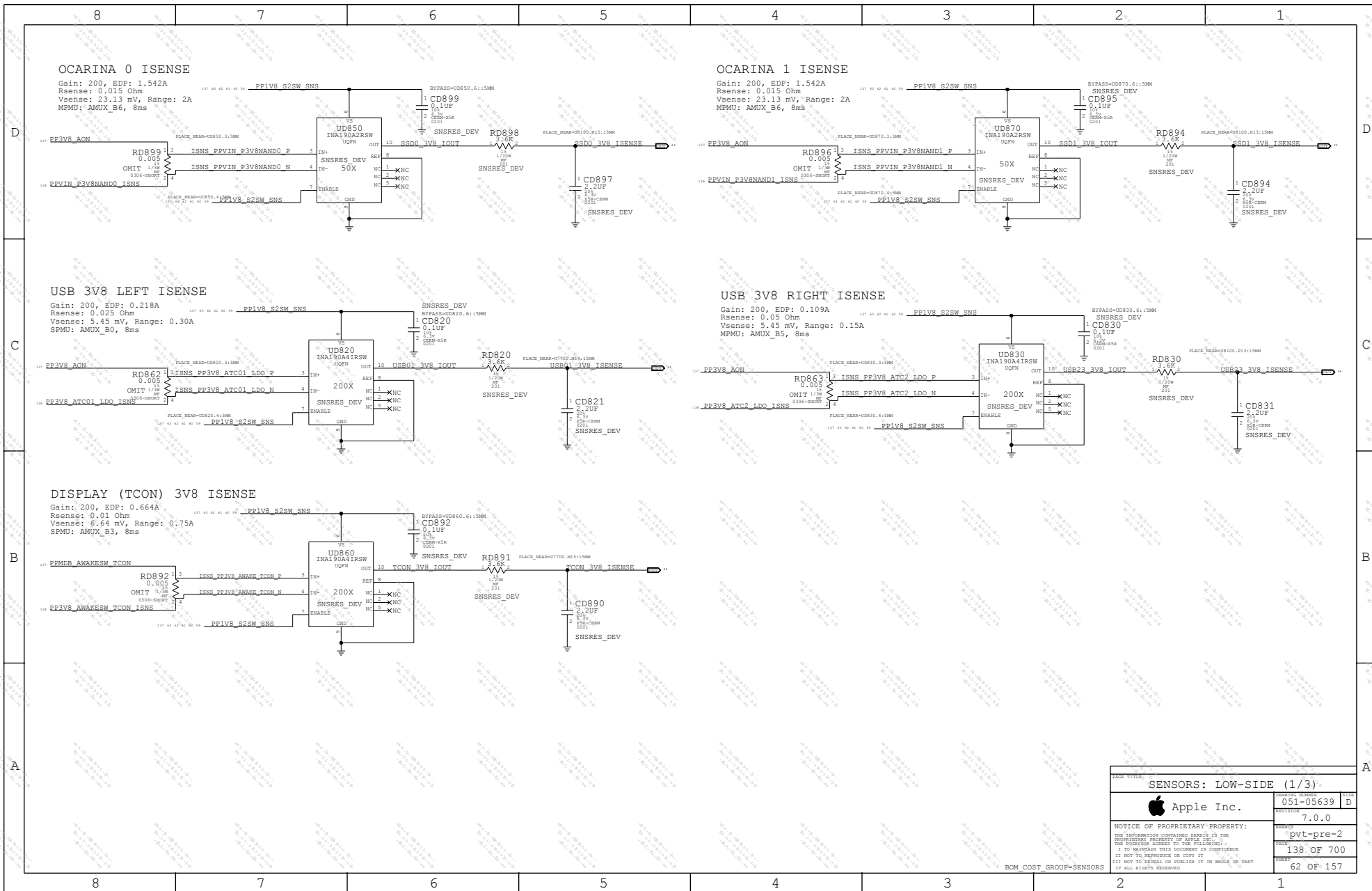
PAGE TITLE: SENSORS: HIGH-SIDE (1/2)		
 Apple Inc.	DESIGN NUMBER	051-05639
	REVISION	7.0.0
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	PAGE	135 OF 700
	SHEET	59 OF 157



PAGE TITLE: SENSORS: HIGH-SIDE (2/2)		
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	SHEET: 60 OF 157	
	BCM_COST_GROUP-SENSORS	



PAGE TITLE: SENSORS: HIGH-SIDE		
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Pvt-pre-2		137 OF 700
PAGE		61 OF 157
SHEET		61 OF 157

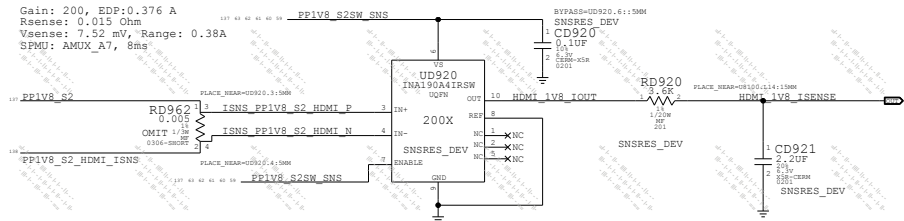


PAGE TITLE: SENSORS: LOW-SIDE (1/3)			
Apple Inc.		DESIGN NUMBER: 051-05639	ITER: D
		REVISION: 7.0.0	
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		PAGE: 138 OF 700	
		SHEET: 62 OF 157	

BCM_COST_GROUP-SENSORS

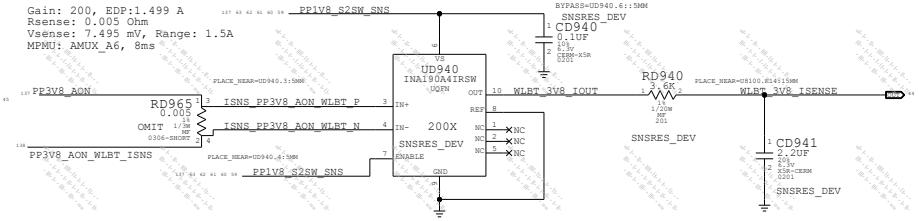
HDMI 1V8 ISENSE

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



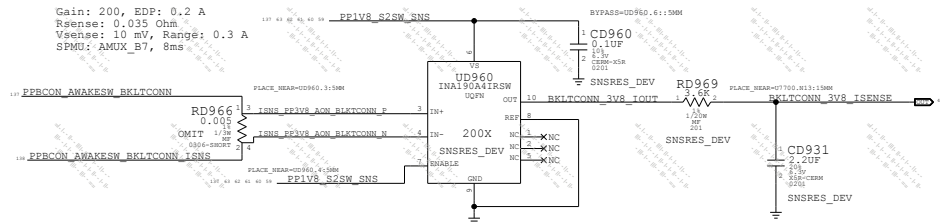
WLAN BT 3V8 ISENSE

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



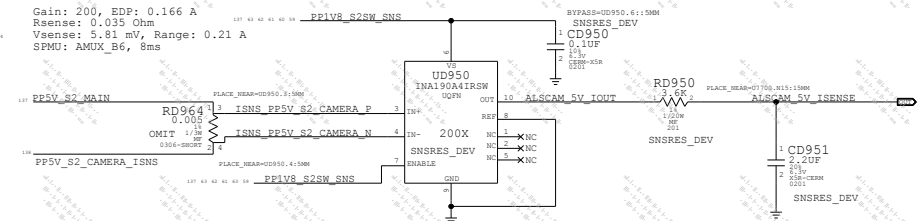
DISPLAY BACKLIGHT 3V8 ISENSE

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



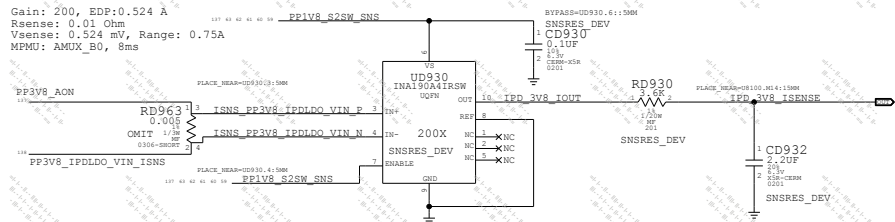
CAMERA 5V ISENSE

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



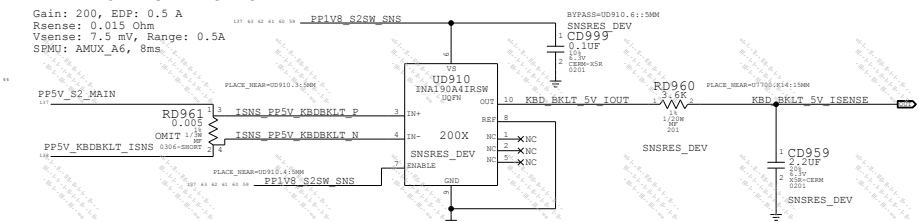
IPD 3V8 ISENSE

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



KBD BACKLIGHT ISENSE

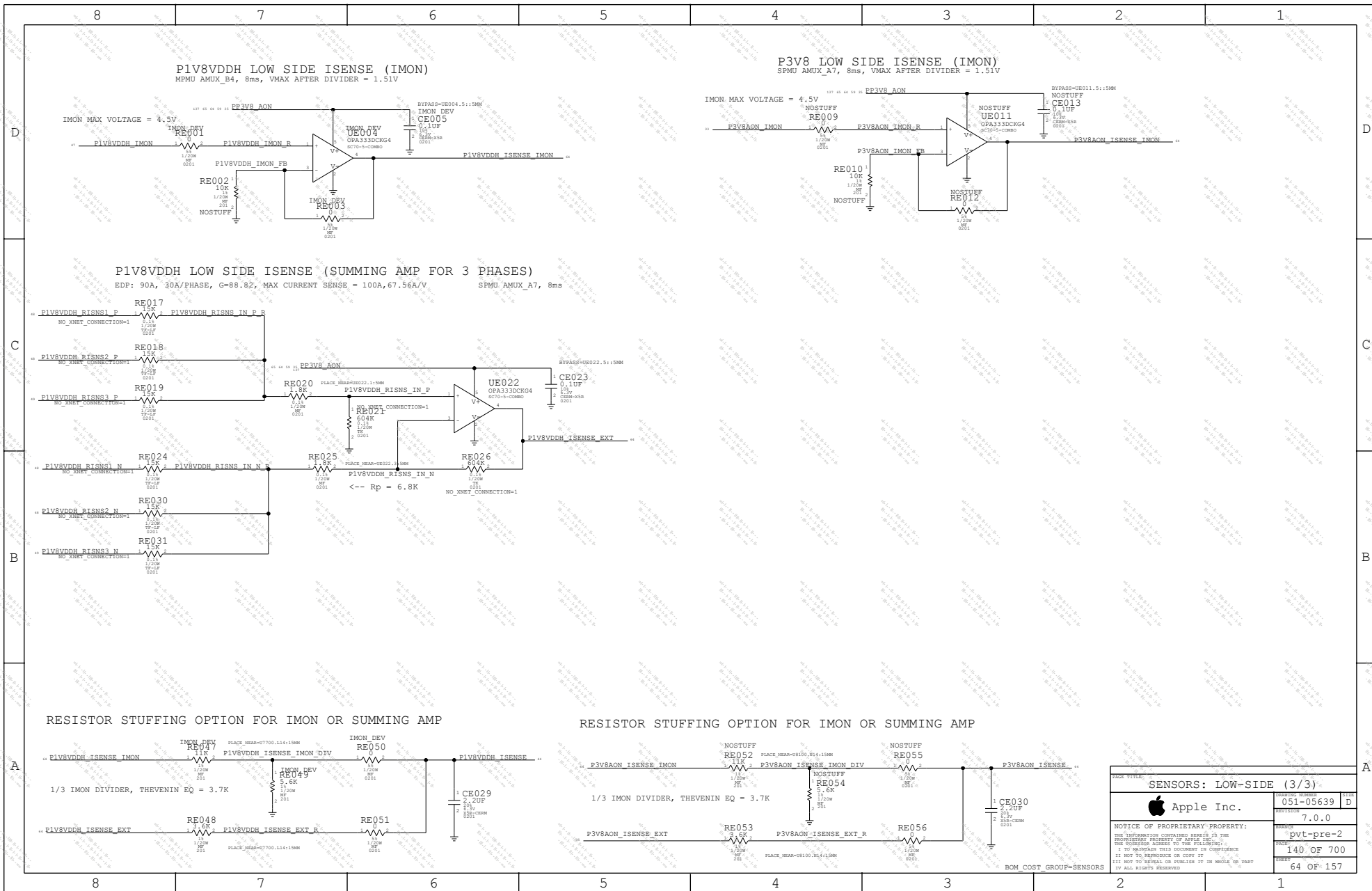
Gain: 200, EDP: 0.5 A
Rsense: 0.015 Ohm
Vsense: 7.5 mV, Range: 0.5A
SPMU: AMUX_A6, 8ms



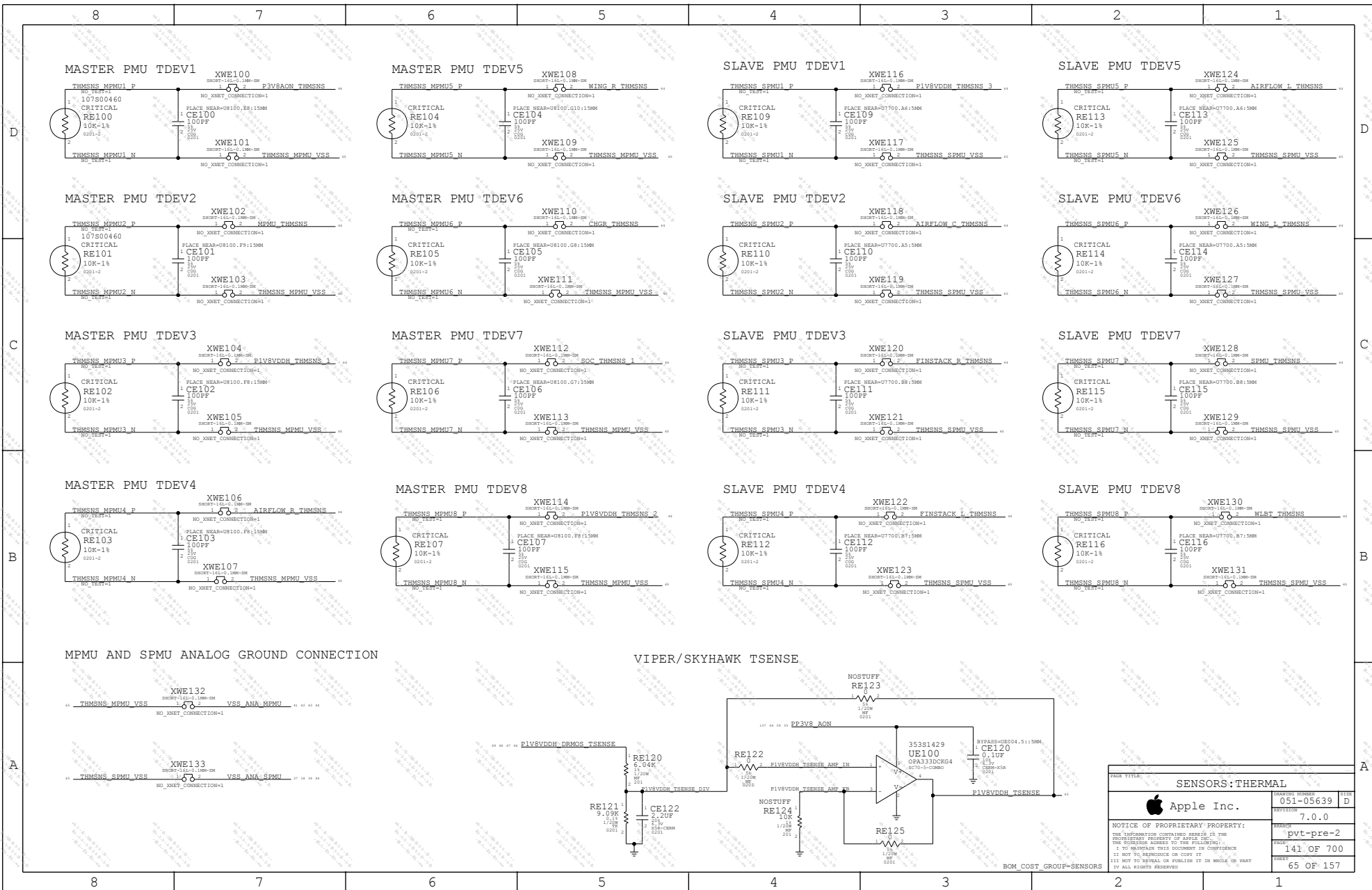
SENSORS: LOW-SIDE (2/3)

Apple Inc.	051-05639	Rev B
7.0.0		
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BCM_COST_GROUP-SENSORS

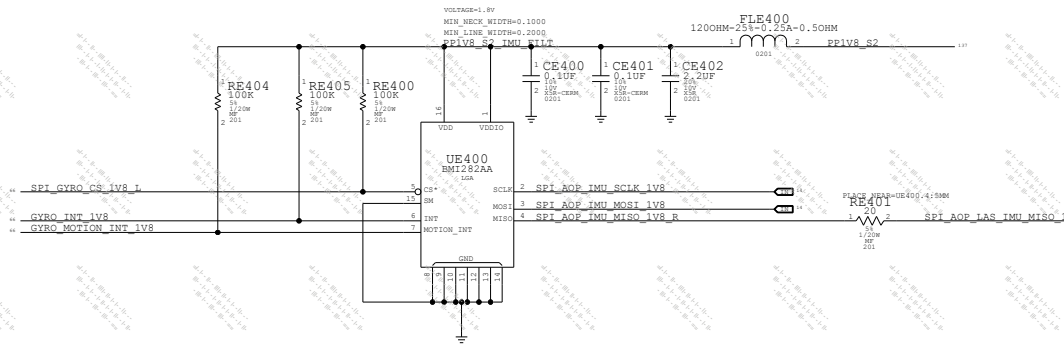


PAGE TITLE: SENSORS: LOW-SIDE (3/3)		
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	PAGE	140 OF 700
	SHEET	64 OF 157

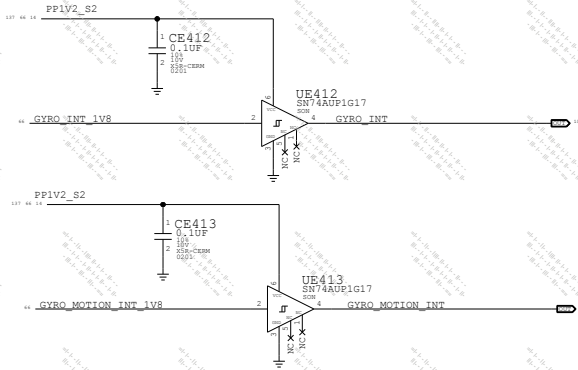
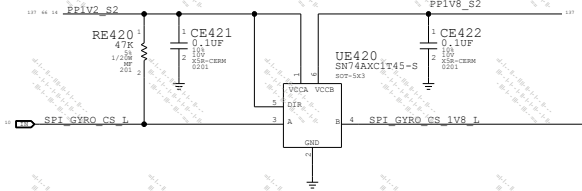


KOBOL: ACCEL & GYRO

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



SPI LEVEL TRANSLATION

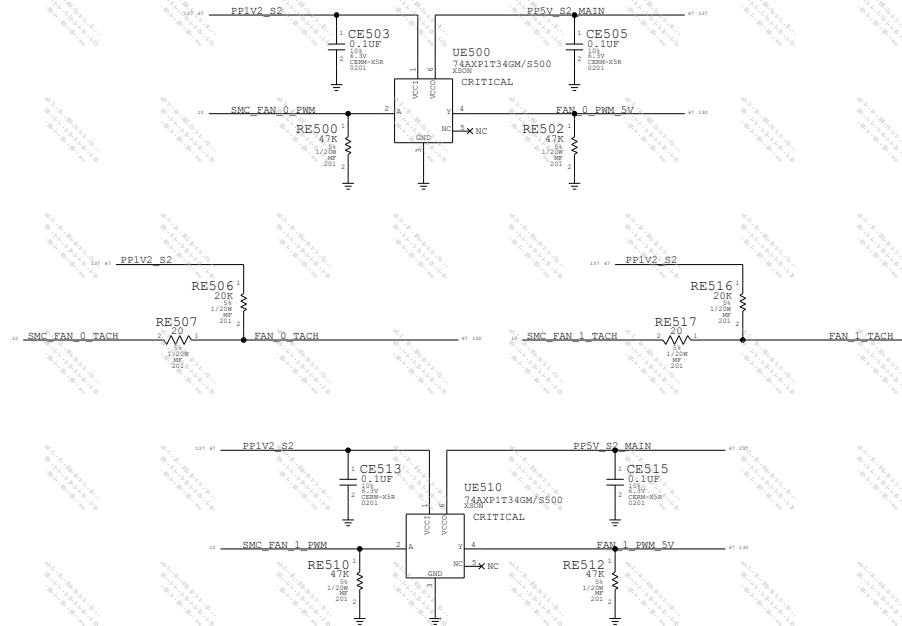


PAGE TITLE: SENSORS: MOTION			
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NOTICE OF PROPRIETARY PROPERTY:		STATUS	pvt-pre-2
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BCM_COST_GROUP=SENSORS

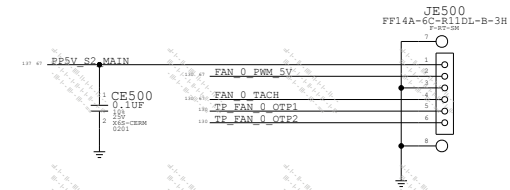
FAN CONTROLLERS

FAN PWM LEVEL SHIFTER

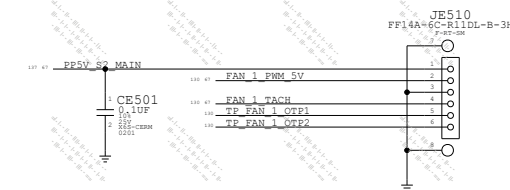


*DUMMY FAN TO PLUG INTO EITHER POR FAN CONNECTORS JE500 OR JE510

PWM FAN0 (LEFT) CONNECTOR

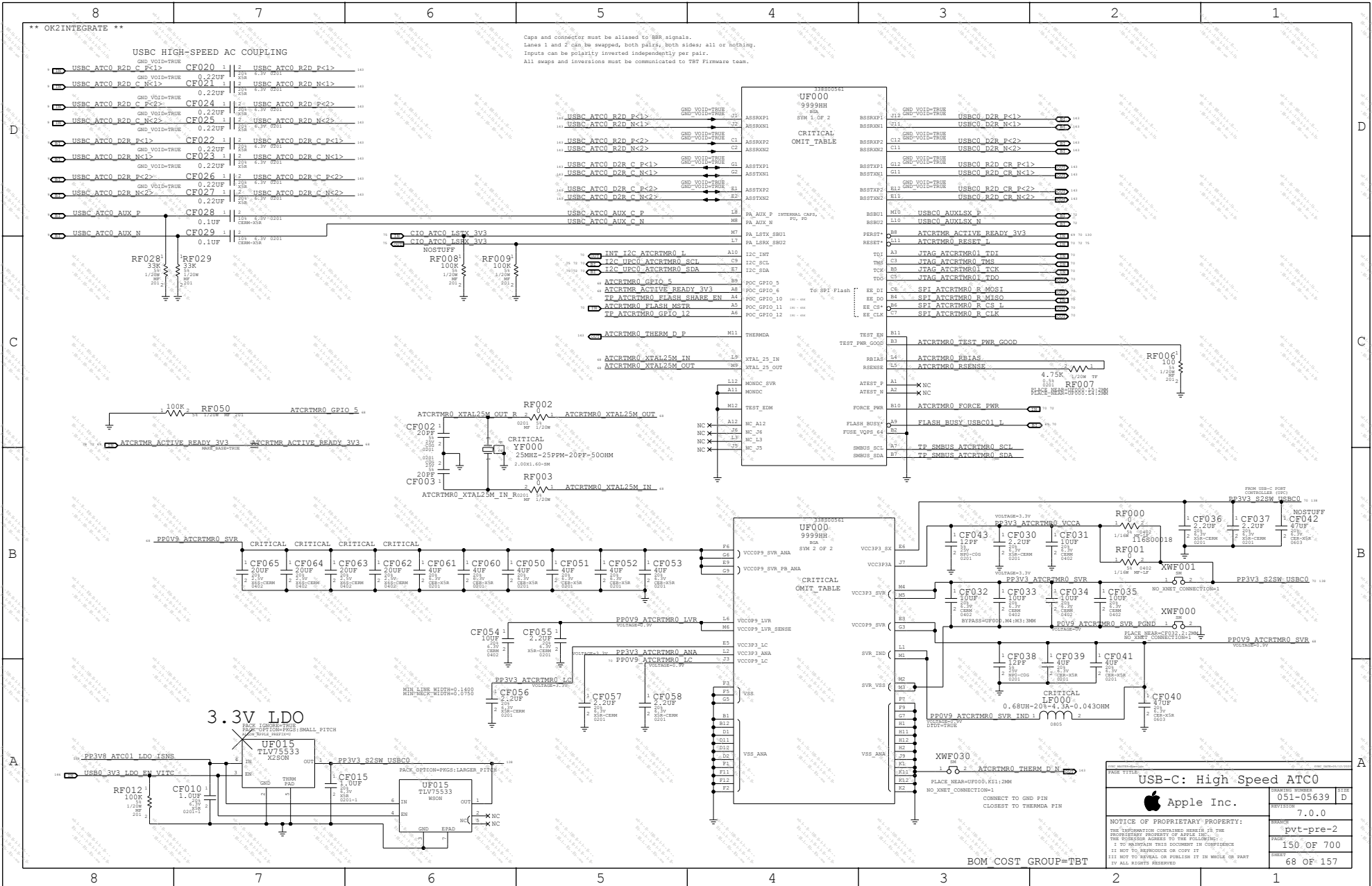


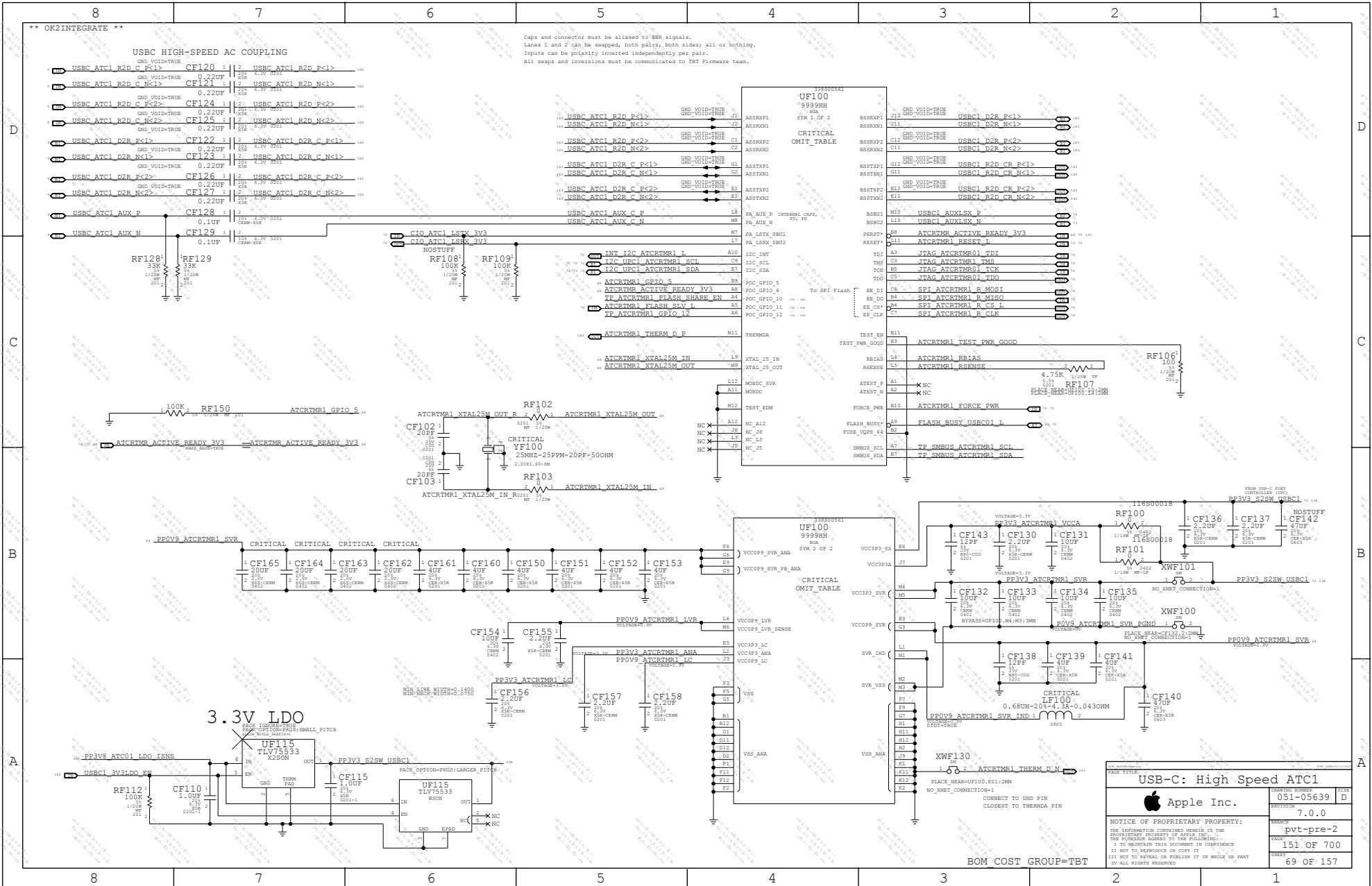
PWM FAN1 (RIGHT) CONNECTOR

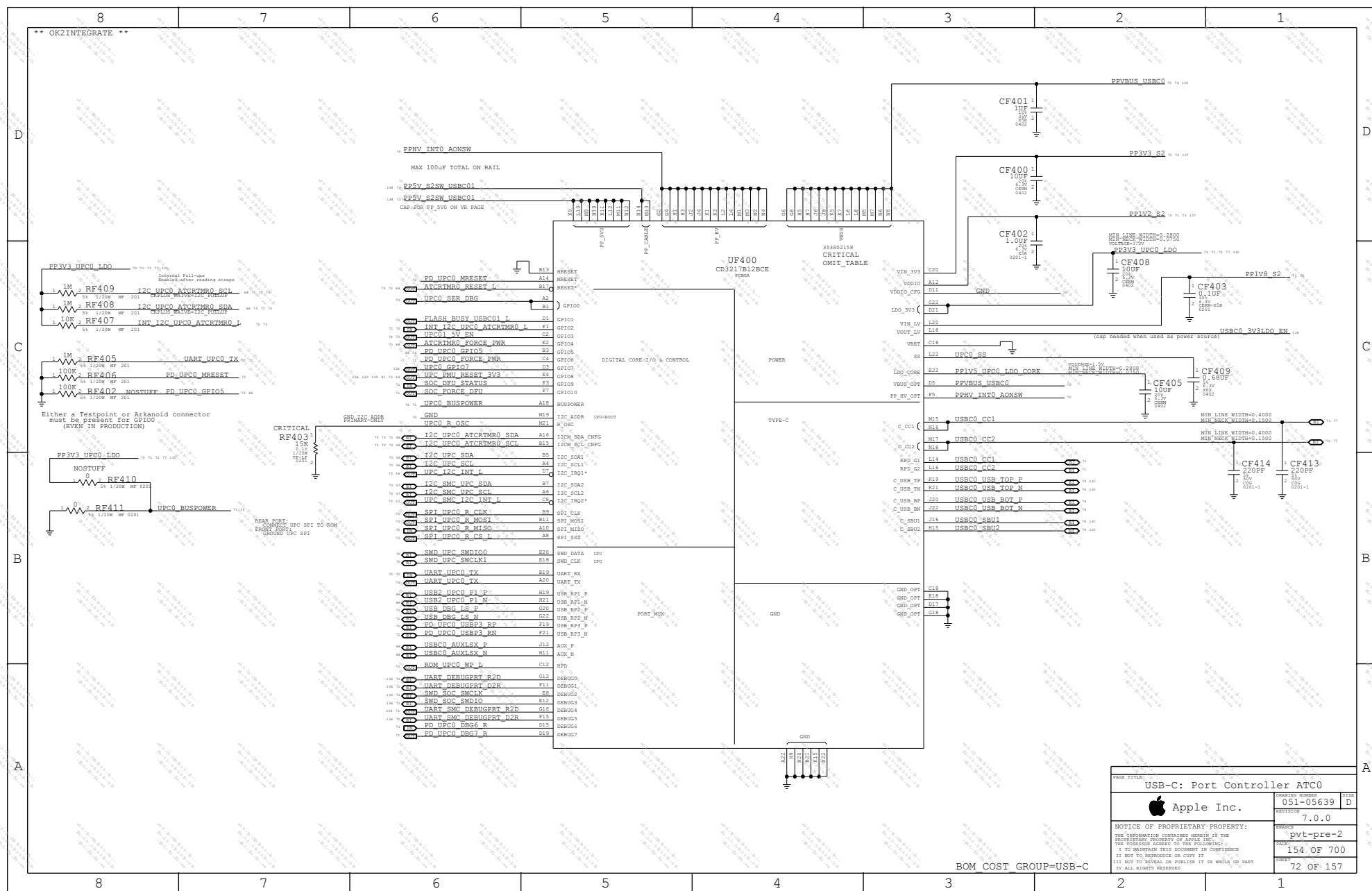


FANS			
Apple Inc.	051-05639	051-05639	051-05639
	051-05639	051-05639	051-05639
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PAGE 145 OF 700		67 OF 157	

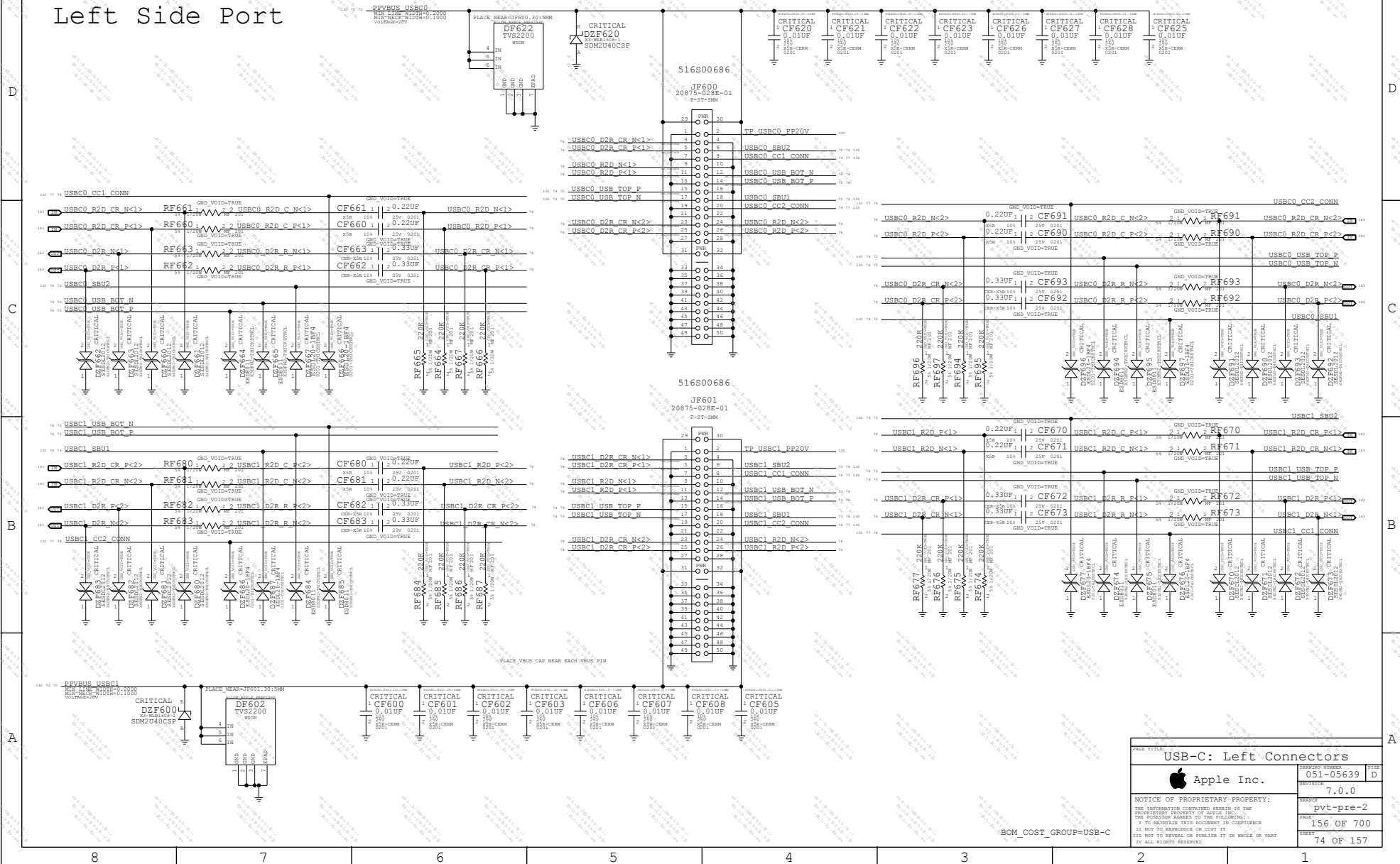
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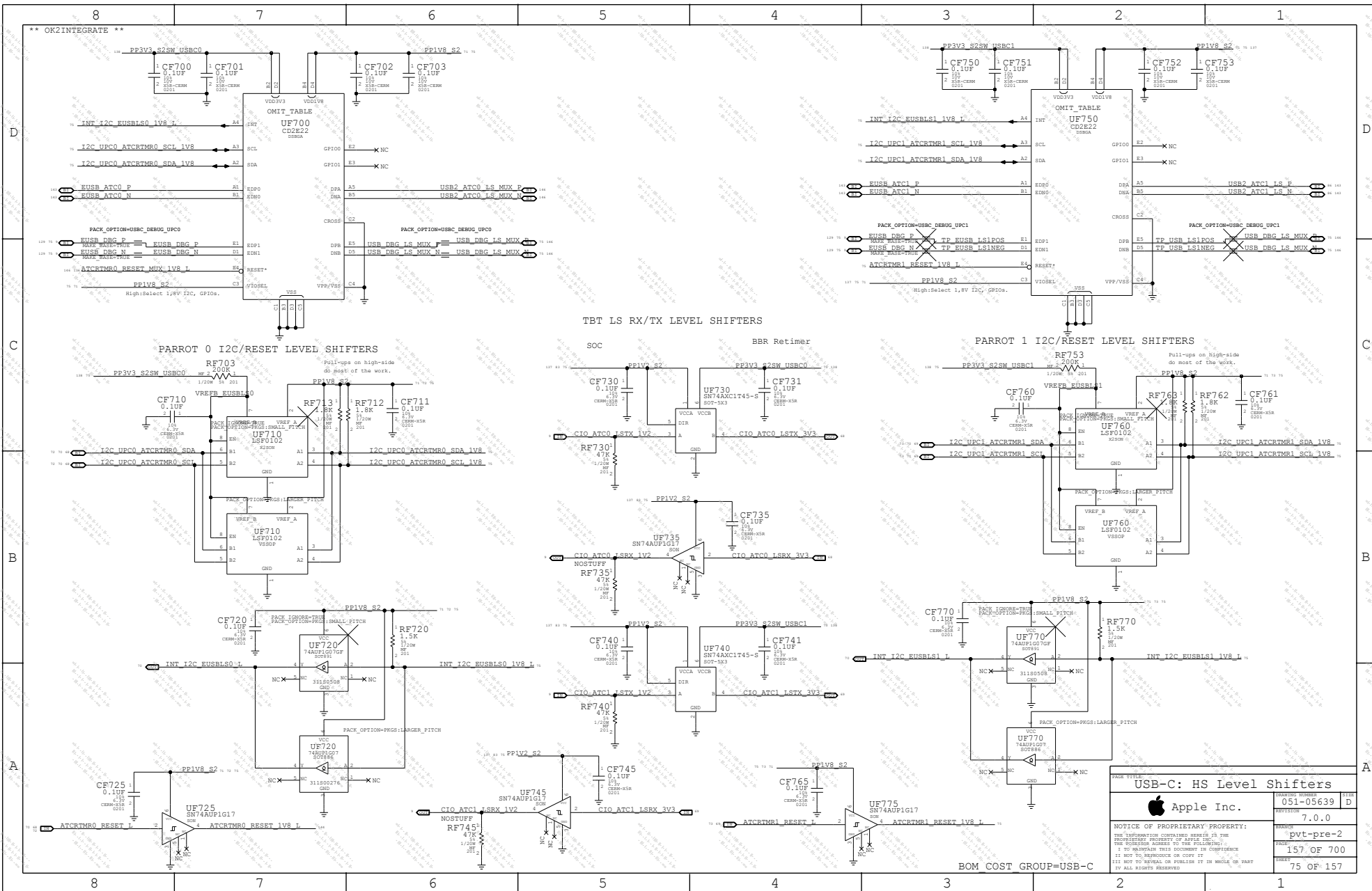




Left Side Port



PAGE TITLE:		
USB-C: Left Connectors		
Apple Inc.		
DESIGN NUMBER	051-05639	ITER D
REVISION	7.0.0	
BRANCH		
DATE		
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BOM_COST_GROUP=USB-C		
	156 OF 700	
	74 OF 157	



*** OK2INTEGRATE ***

D

C

B

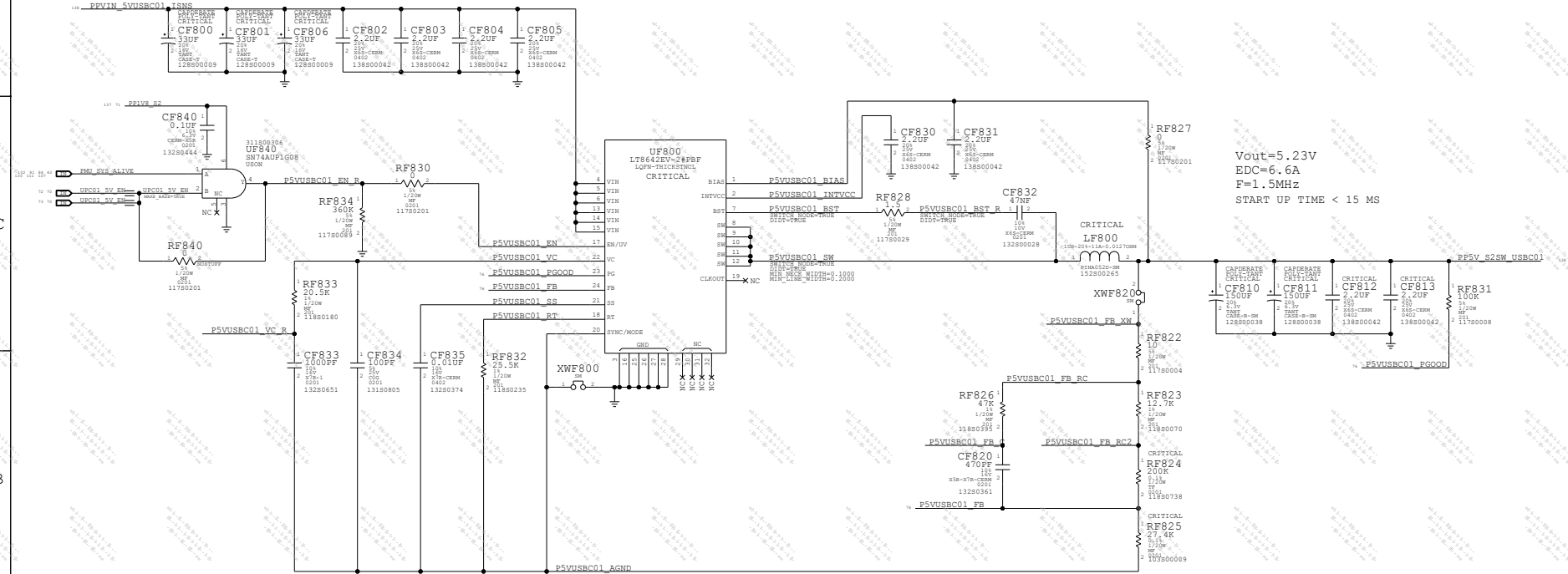
A

D

C

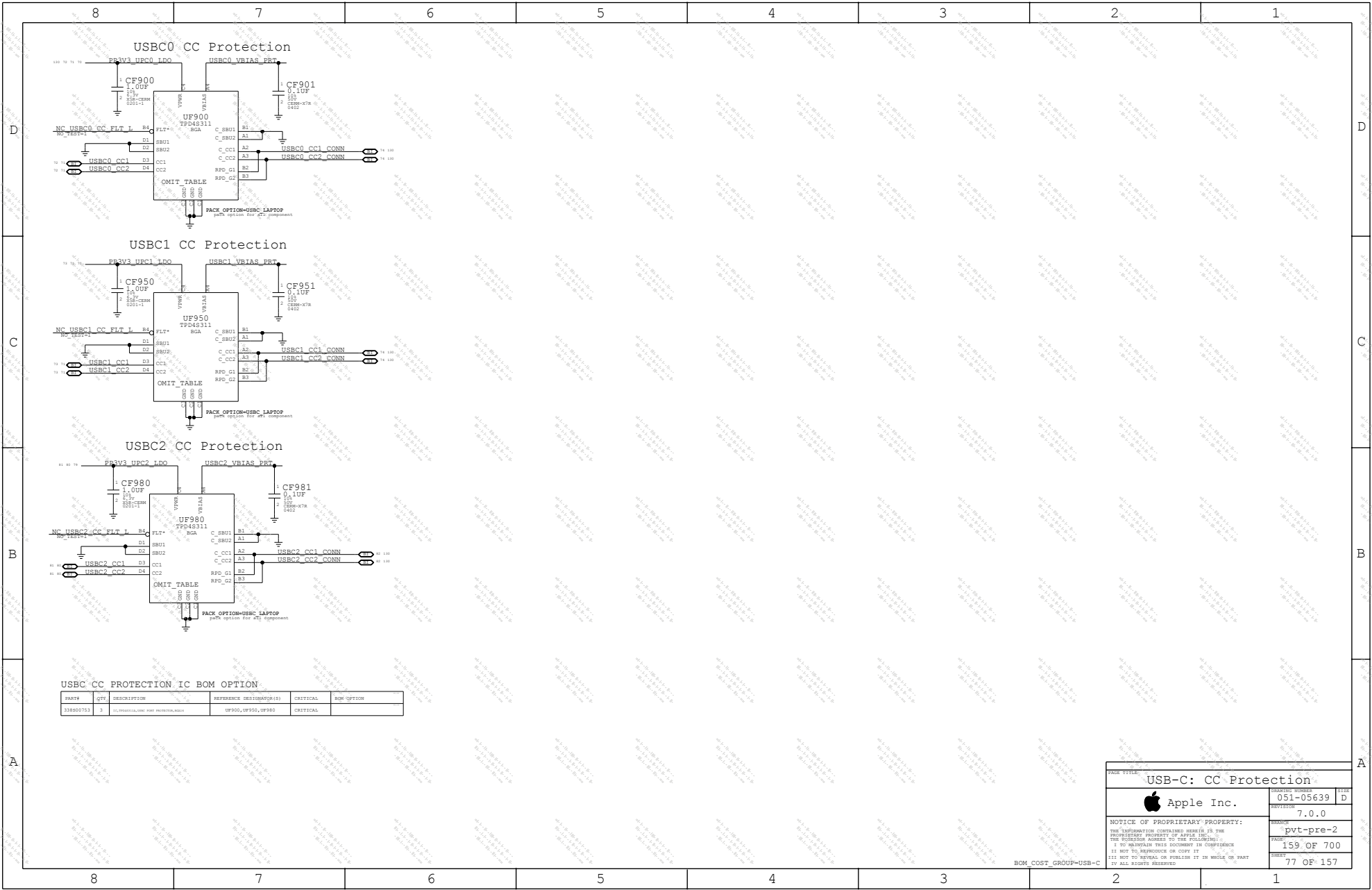
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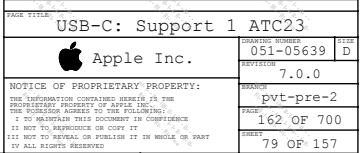


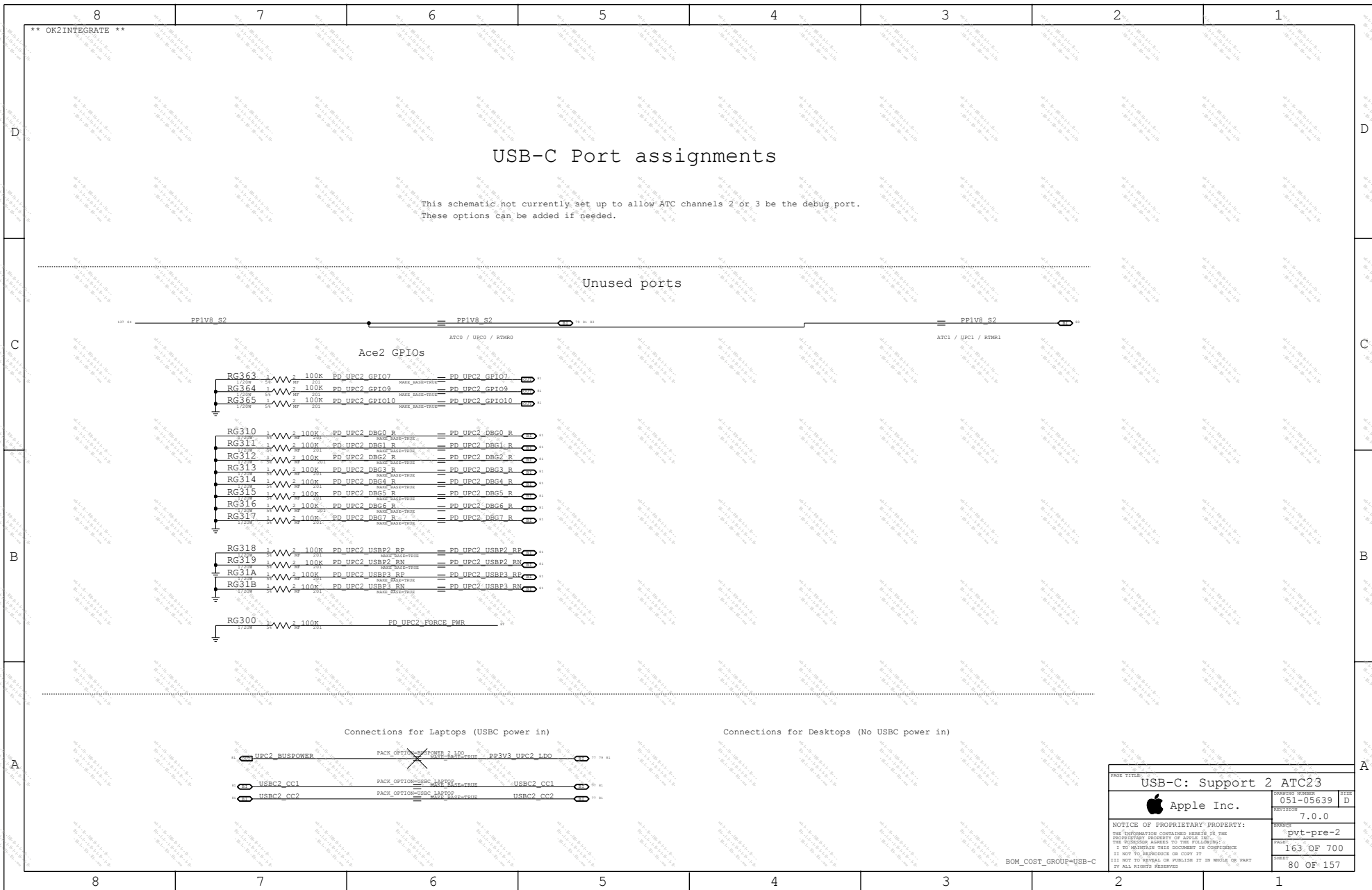
PAGE TITLE: USB-C: 5V Regulator		
DRAWING NUMBER: 051-05639		REV: D
DRAWING TITLE: Apple Inc.		PROVISION: 7.0.0
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE RECIPIENT AGREES TO THE FOLLOWING: 1. TO MAINTAIN THIS DOCUMENT IN CONFIDENCE 2. NOT TO REPRODUCE OR COPY IT 3. NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART 4. ALL RIGHTS RESERVED		REVISION: Pvt-pre-2
PAGE: 158 OF 700		SHEET: 76 OF 157


BCM_COST_GROUP=USB-C

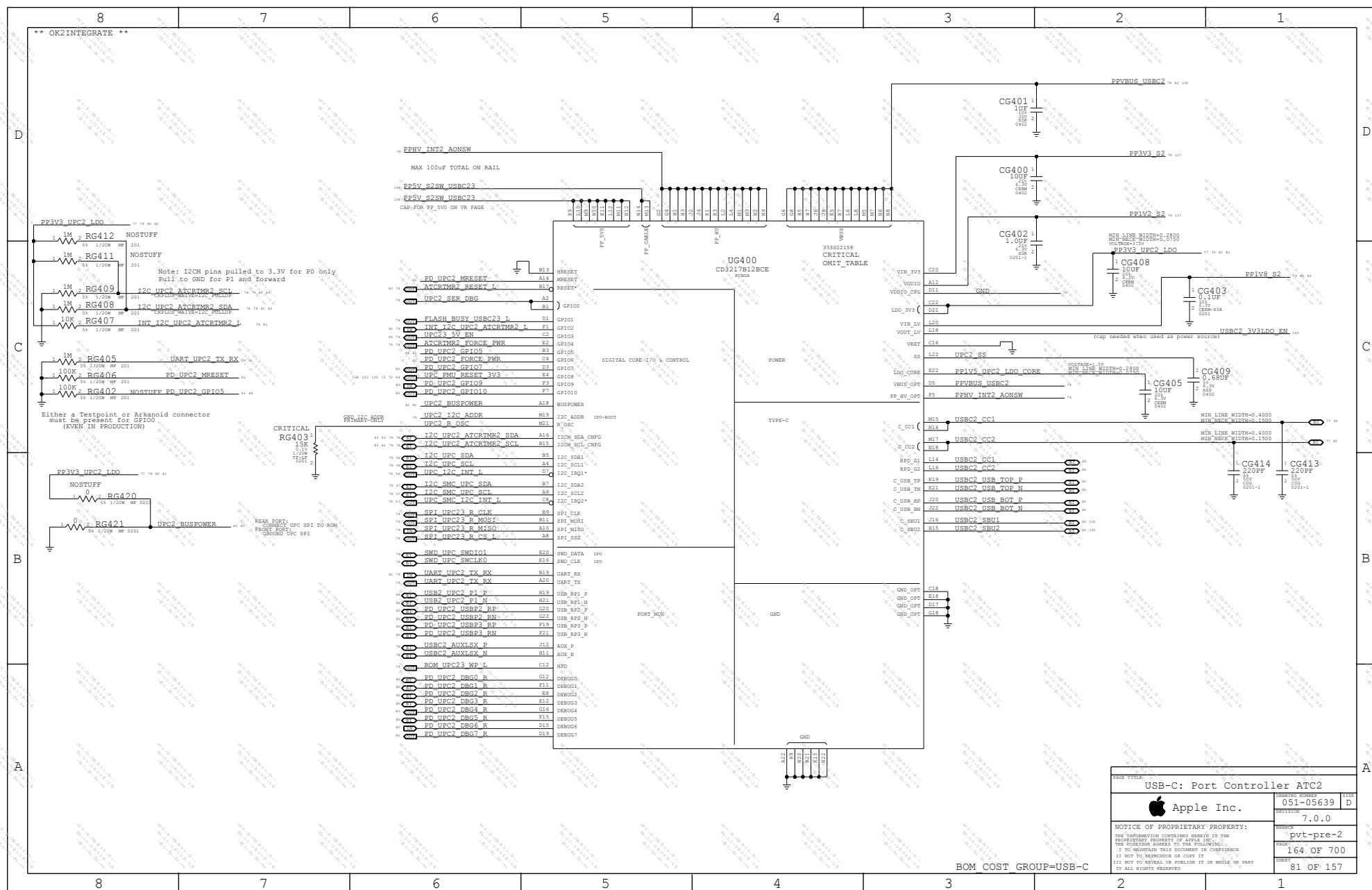


PAGE TITLE: USB-C: CC Protection	
Apple Inc.	051-05639
PROVISION	7.0.0
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PROVISION	pvt-pre-2
PAGE	159 OF 700
SHEET	77 OF 157

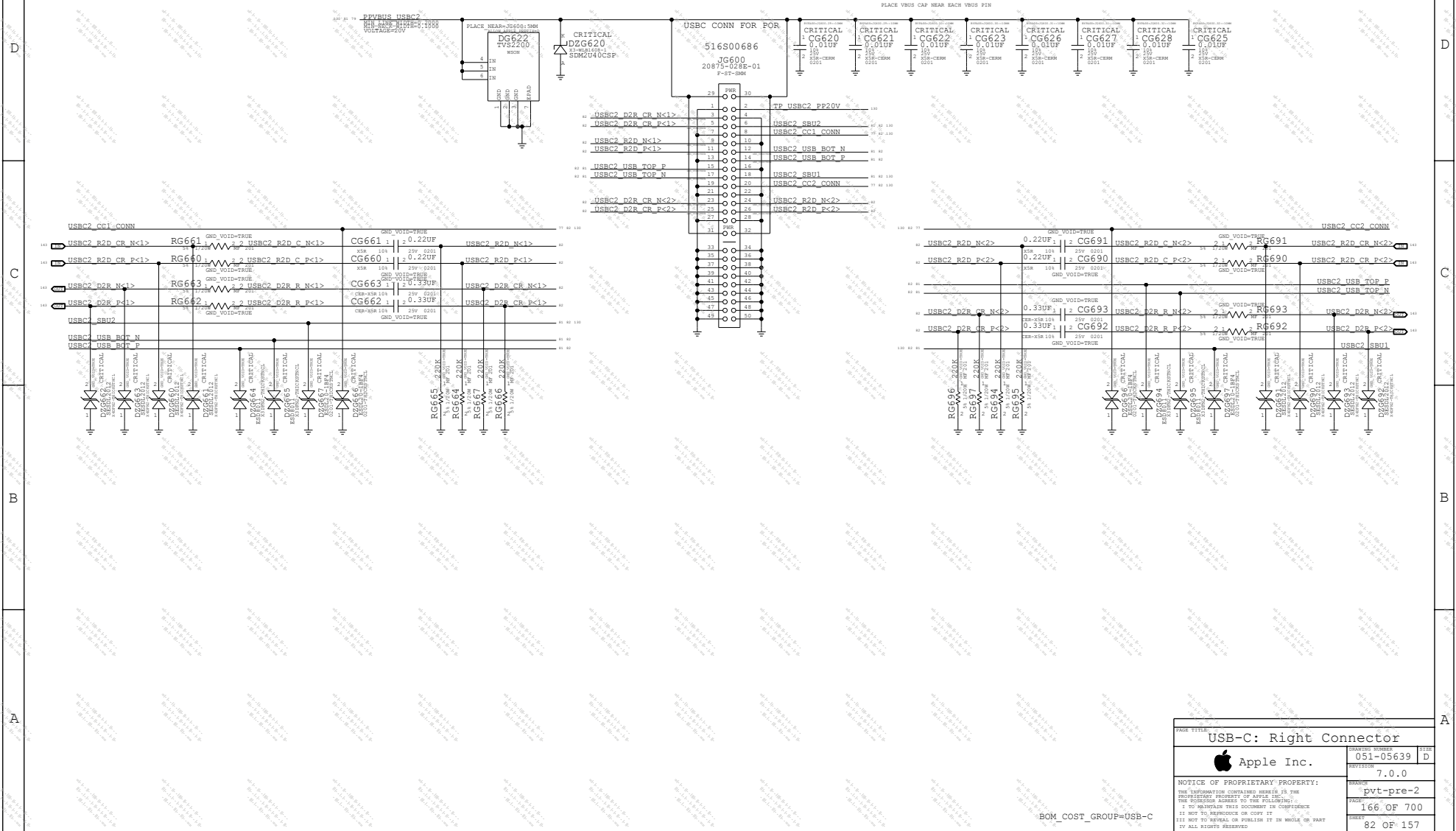




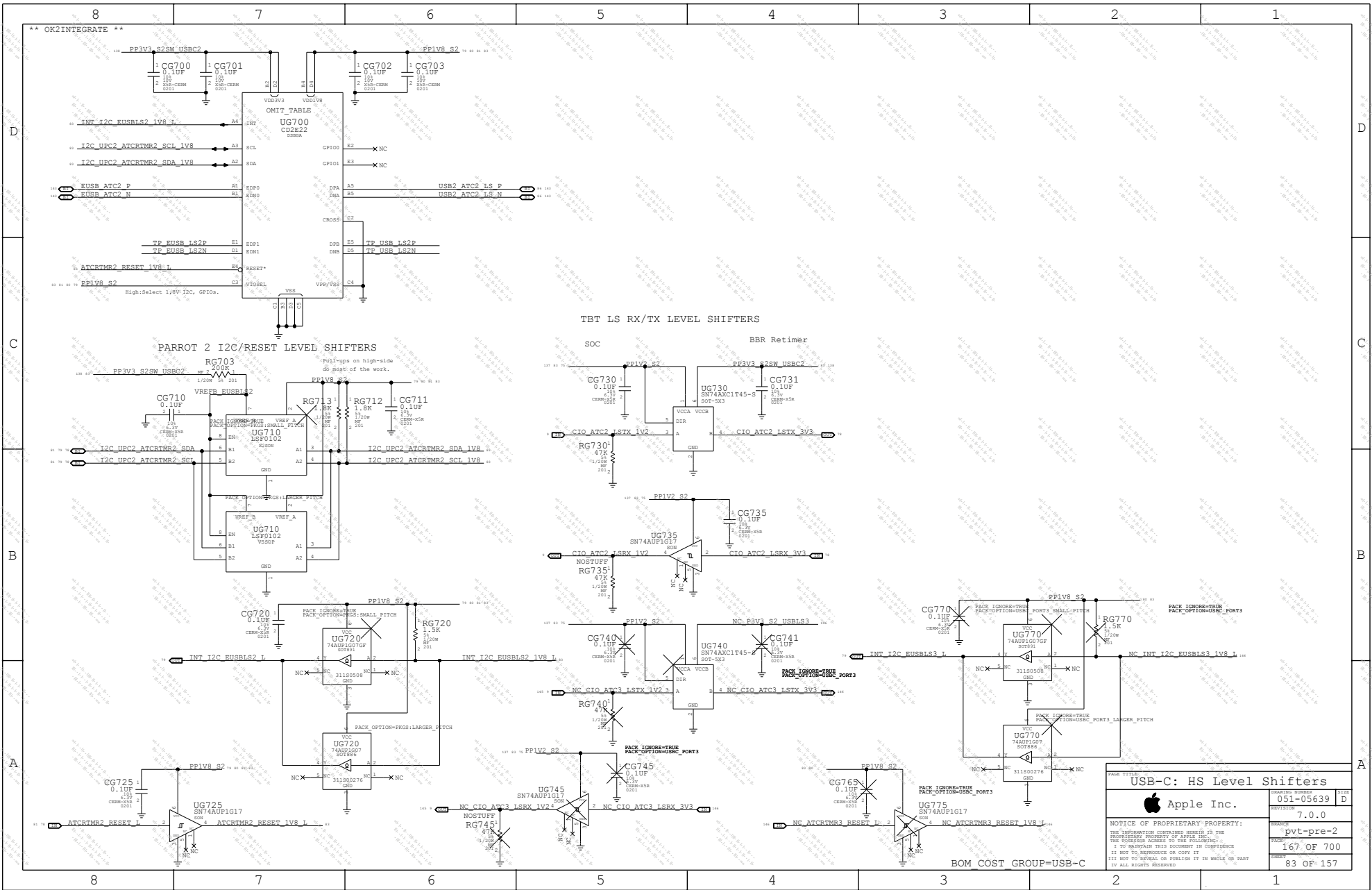
PAGE TITLE: USB-C: Support 2 ATC23		
 Apple Inc.	DOCUMENT NUMBER: 051-05639	PAGE D
	REVISION: 7.0.0	
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PAGE: 163 OF 700		SHEET: 80 OF 157



Right Side Port



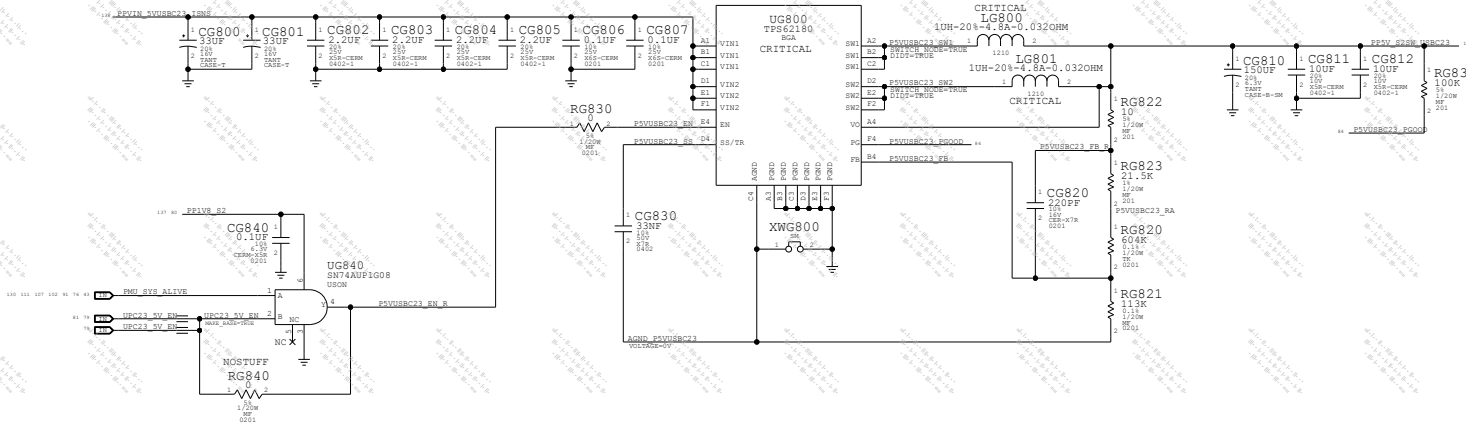
BOM_COST_GROUP=USB-C



PAGE TITLE: USB-C: HS Level Shifters		
Apple Inc.		
DOCUMENT NUMBER: 051-05639	REVISION: 7.0.0	SHEET: 167 OF 700
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*** OK2 INTEGRATE ***

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



USB-C: 5V Regulator



DRAWING NUMBER	051-05639	SIZE	D
REVISION	7.0.0		

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BRANCH	pvt-pre-2
PAGE	168 OF 700
SHEET	84 OF 157

BOM COST GROUP=USB-C

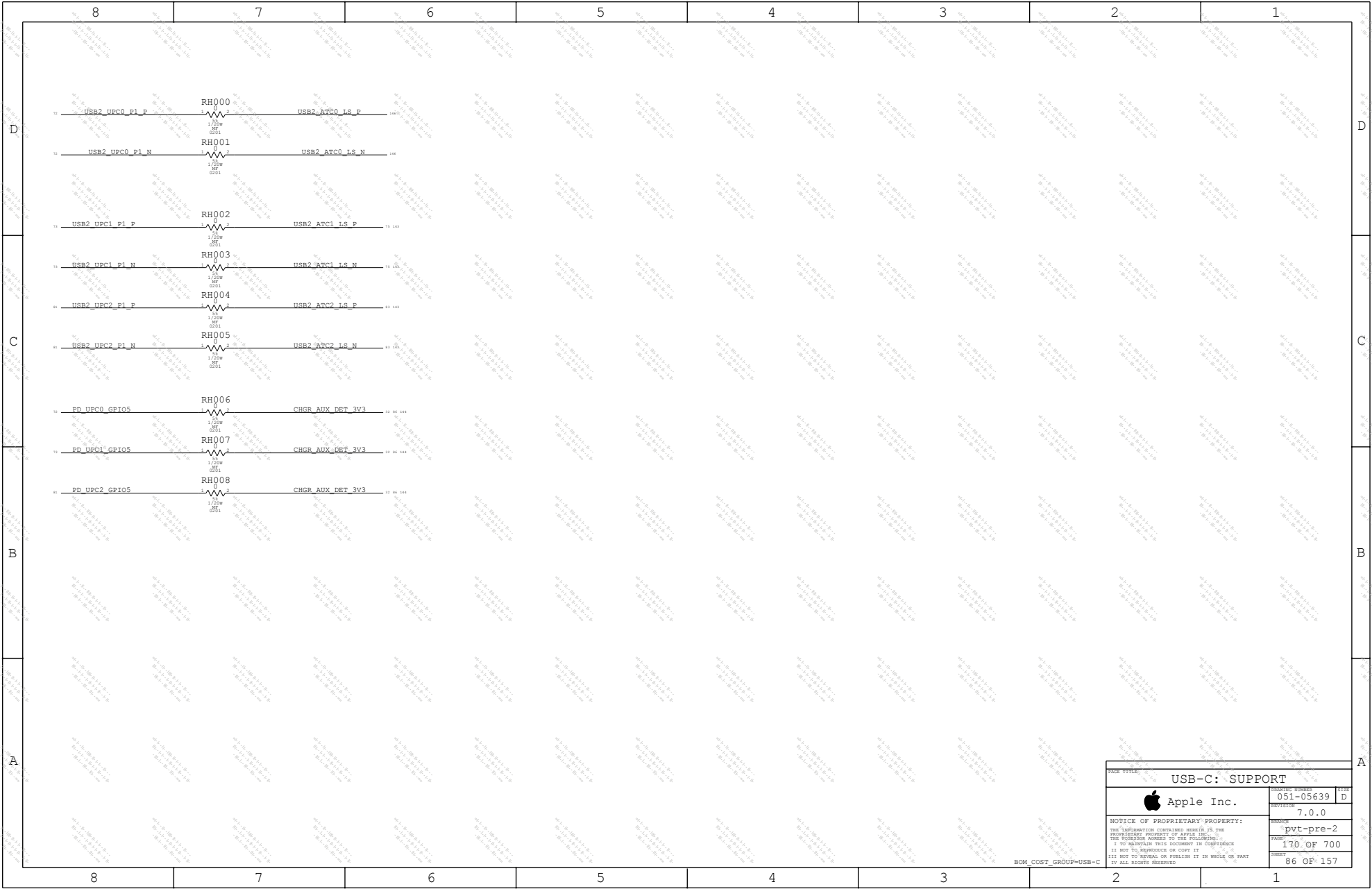
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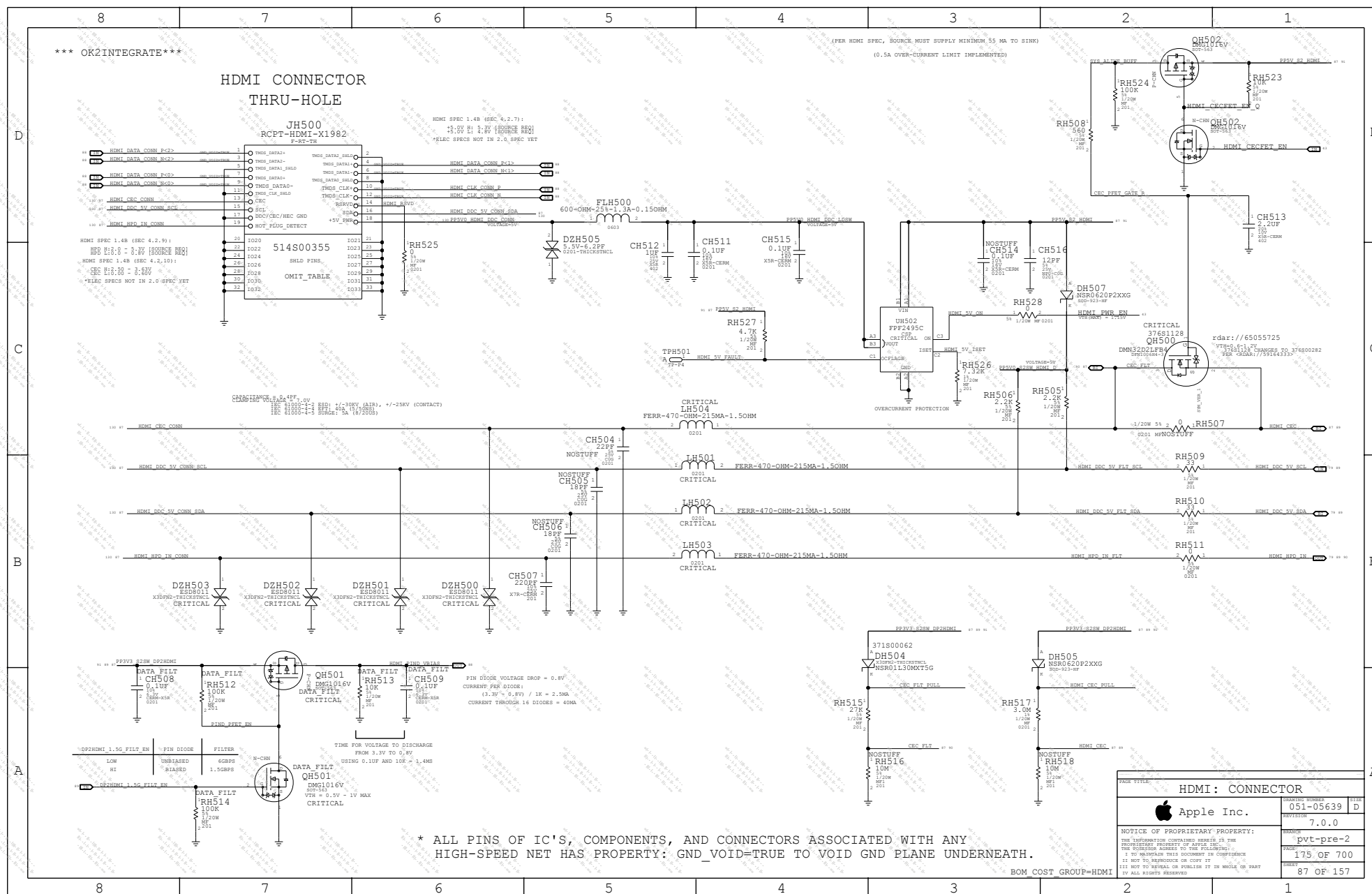
ATC3 Redriver removed

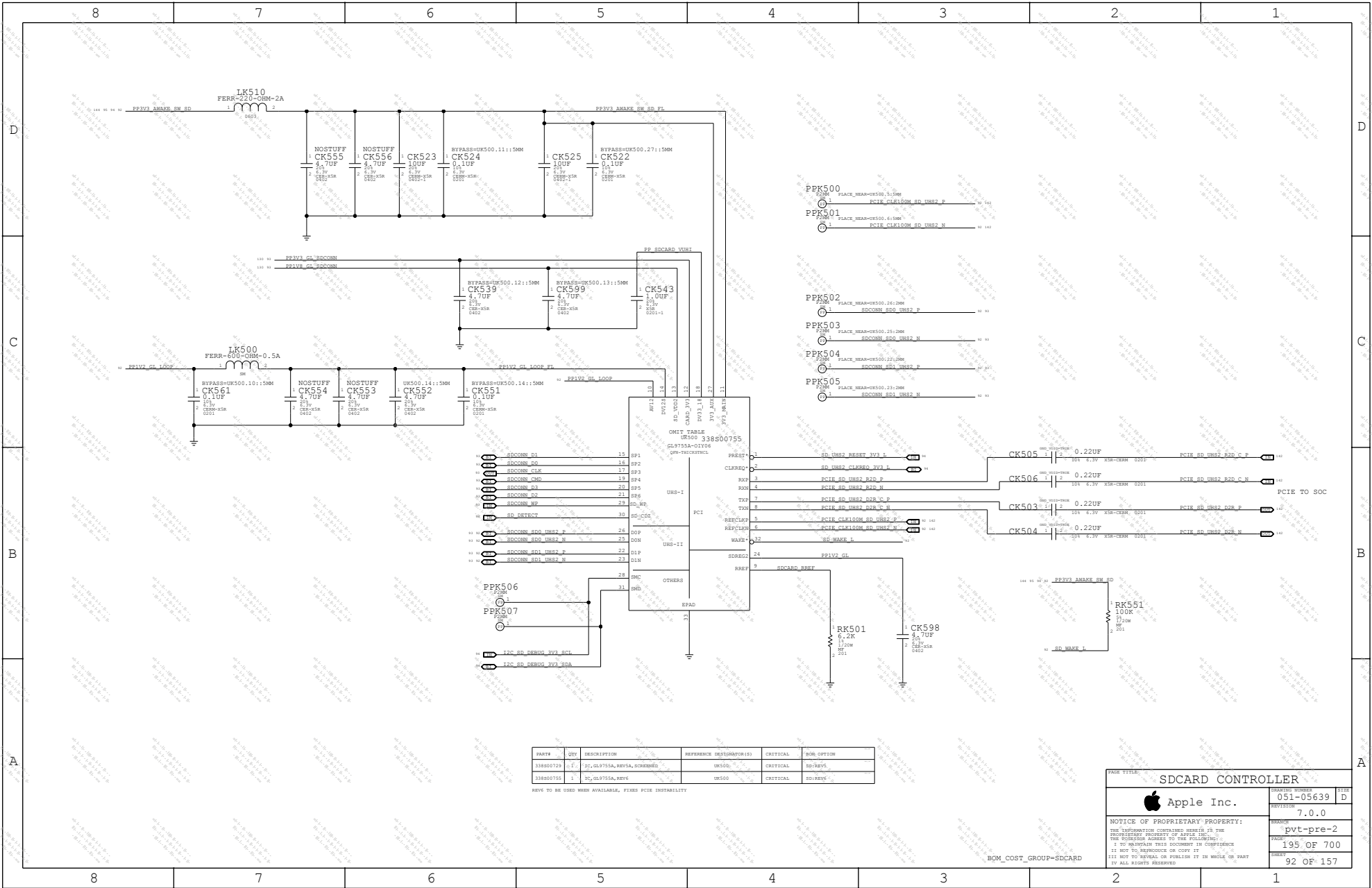
PAGE TITLE: USB-C: CIO Redrivers 2/3		
Apple Inc.	DESIGN NUMBER 051-05639	DATE D
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BCM_COST_GROUP=USB-C



PAGE TITLE: USB-C: SUPPORT		
 Apple Inc.	REVISION: 051-05639	SHEET: D
	PROVISION: 7.0.0	
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PART	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
338S00755	1	U500 338S00755, SDCARD CONTROLLER	U500	CRITICAL	SD:REV0
338S00755	1	U500 338S00755, SDCARD CONTROLLER	U500	CRITICAL	SD:REV0

REV0 TO BE USED WHEN AVAILABLE, FIXES PCIE INSTABILITY

PAGE TITLE: SDCARD CONTROLLER		
Apple Inc.		051-05639
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PAGE: 92 OF 157		157

SD CARD CONNECTOR
514-00196
CONN. FOR J314 ONLY

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

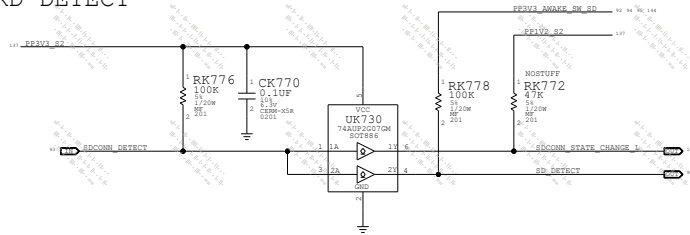
SD MODE	PCIE MODE
1	CD/DAT3
2	PERST*
3	NU
4	VSS1
5	VDD1
6	YD0
7	NU
8	CLK
9	VSS2
10	REFCLK+
11	REFCLK-
12	CLKREQ*
13	VSS3
14	PCIE TX+
15	PCIE TX-
16	VSS4
17	VDD2
18	PCIE RX+
19	PCIE RX-
20	VSS5
21	VDD3
22	WP SWITCH
23	INS DET SW
24	INS DET SW
25	SHIELD
26	SHIELD
27	SHIELD
28	SHIELD
29	SHIELD
30	SHIELD
31	SHIELD

PAGE TITLE: SDCARD CONNECTOR		
Apple Inc.		
051-05639	REV	D
7.0.0		
Pvt-pre-2		
196 OF 700		
93 OF 157		

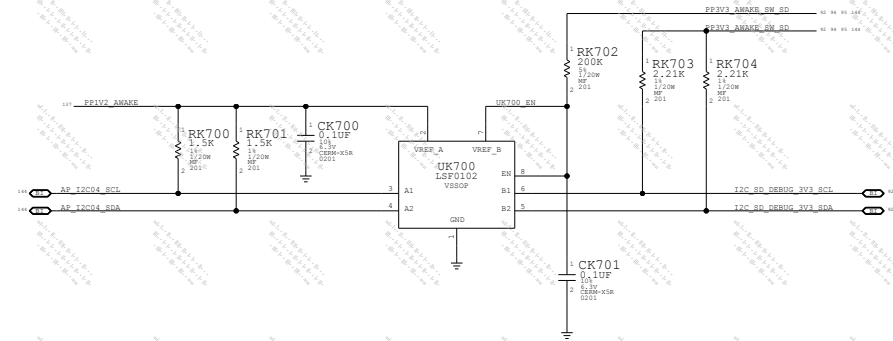
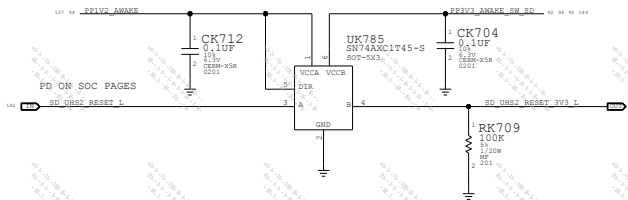
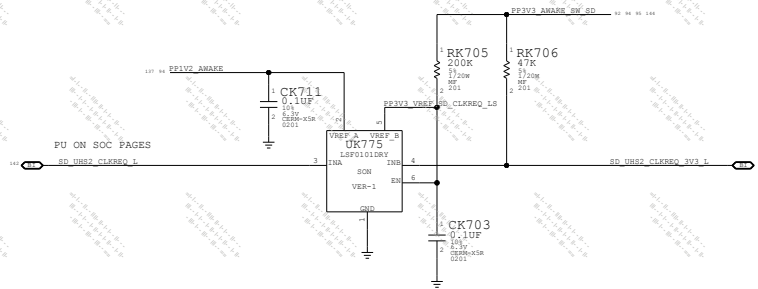
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BOM_COST_GROUP=SDCARD

CARD DETECT



CONTROLLER IO



PAGE TITLE:			
SDCARD IO LS/BUF SUPPORT			
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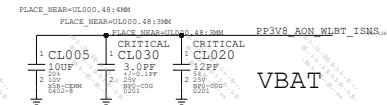
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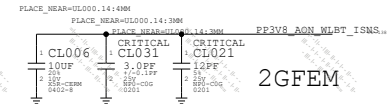
FOR SYSTEM INTEGRATION INFORMATION REFER TO
RDAR://PROBLEM/59047597

TYPHOON WIFI/BT MODULE

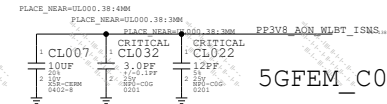
TPLO01	PMU CLK32K WLBT
TPLO02	WLBT_PWR_EN
TPLO03	WLBT_WAKE
TPLO04	TPT WLAN JTAG TCK
TPLO05	TPT WLAN JTAG TMS
TPLO06	TPT WLAN JTAG TDI
TPLO07	WLAN_TIME_SYNC
TPLO08	TPT WLAN JTAG TRSTN
TPLO09	WLAN JTAG_SEL
TPLO10	BT TIME SYNC
TPLO11	UART WLAN R2D_R
TPLO12	UART WLAN D2R_R
TPLO13	UART WLAN R2D_RTS_L_R
TPLO14	UART WLAN D2R_CTS_L_R



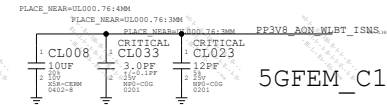
VBAT



2GFEM



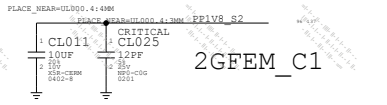
5GFEM_C0



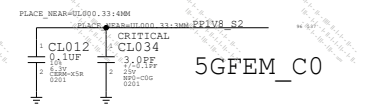
5GFEM_C1



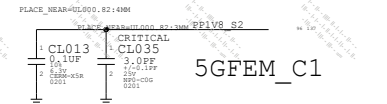
2GFEM_C0



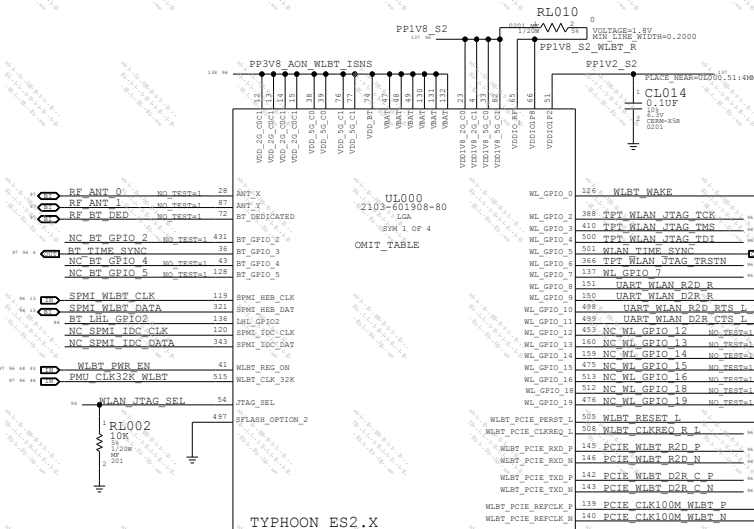
2GFEM_C1



5GFEM_C0



5GFEM_C1



TYPHOON ALTERNATE BOM:
REMOVED per Mete 04/05 email

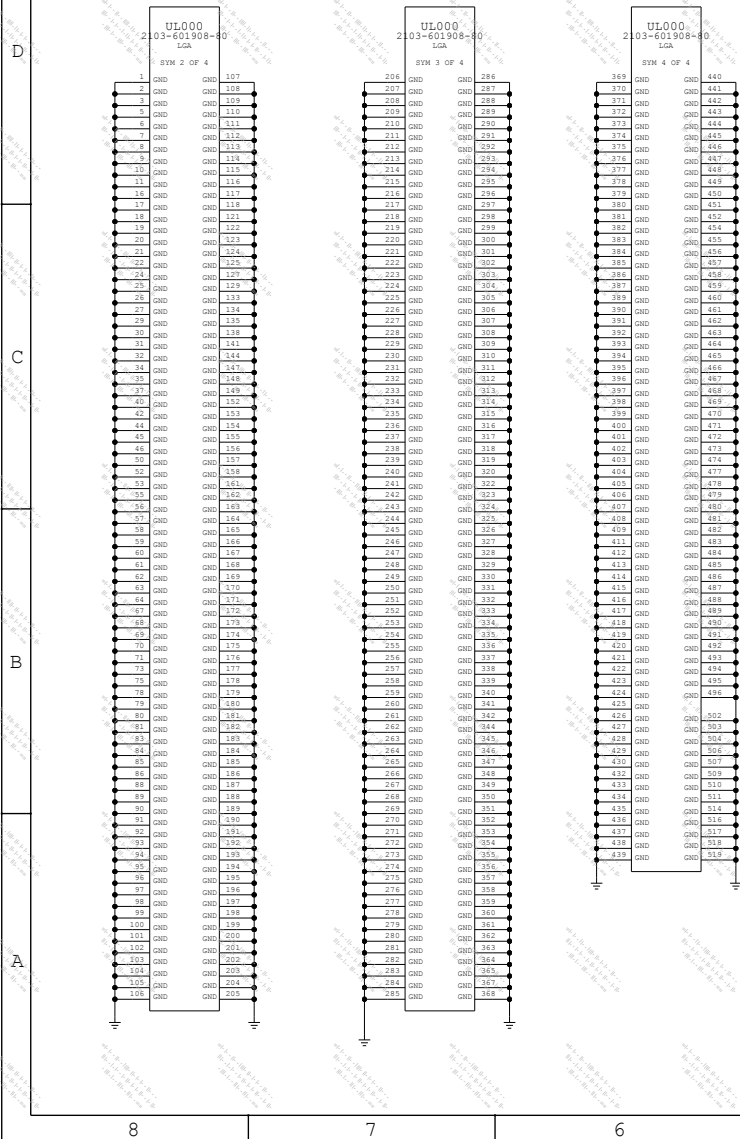
TYPHOON BOM TABLE:

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	ROW OPTION
23950912	5	WIFI/BT MODULE, 23950912, 23950912	UL000	CRITICAL	NO

PAGE TITLE		WIFI/BT: MODULE	
Apple Inc.		051-05639	D
7.0.0		pvt-pre-2	
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*** IN PROGRESS ***

TYPHOON WIFI/BT MODULE GND



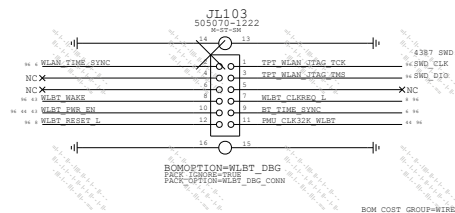
ANTENNA CONNECTORS

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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*** OK2INTEGRATE ***

NAND0 S5E0

D

D

C

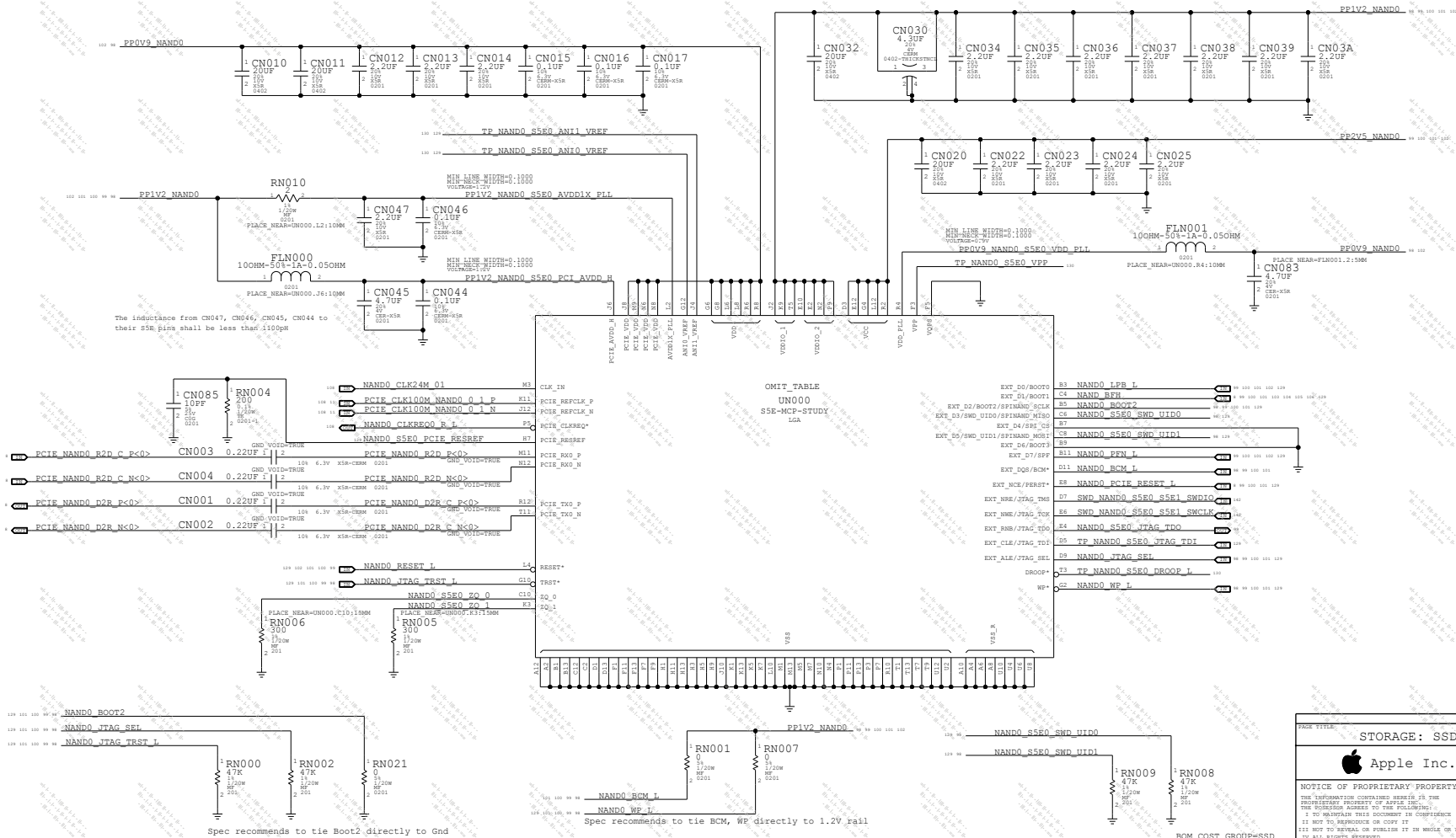
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B

B

A

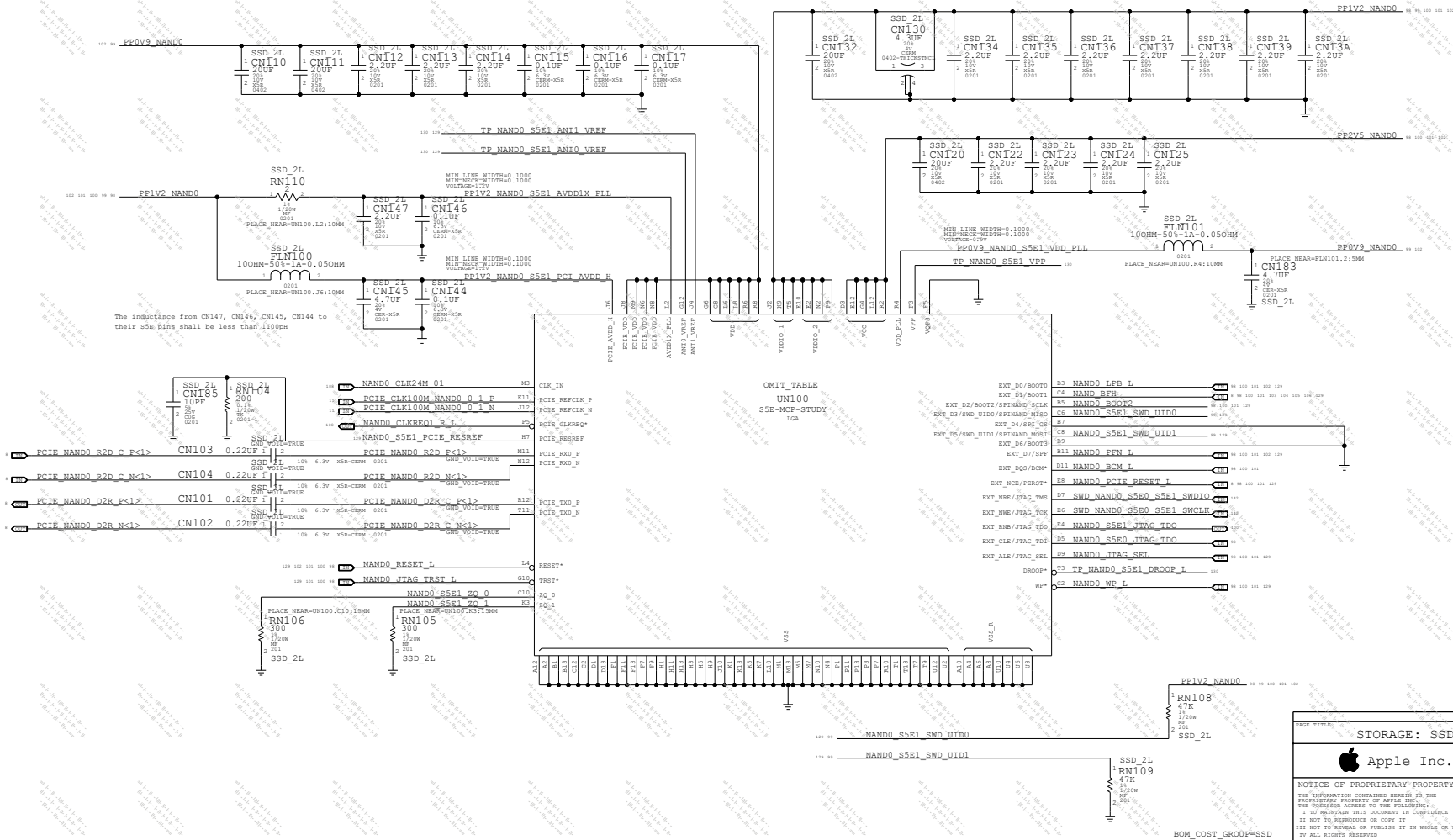
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PAGE TITLE:	
STORAGE: SSD0 S5E <0>	
Apple Inc.	051-05639
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pvt-pre-2	
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98 OF 157	

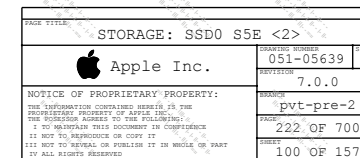
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NAND0 S5E1

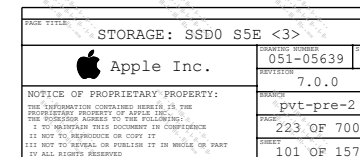


PAGE TITLE:	
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NAND0	S5E2
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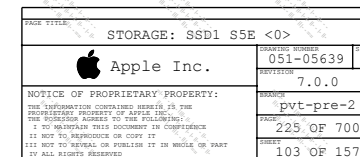


NAND0	S5E3
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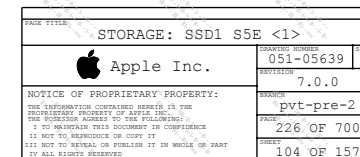


BOM COST GROUP=SSF

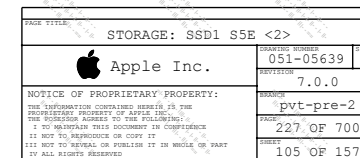
NAND1	S5E0
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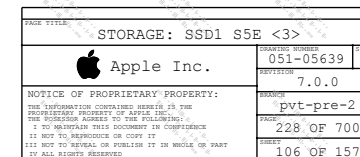
NAND1	S5E1
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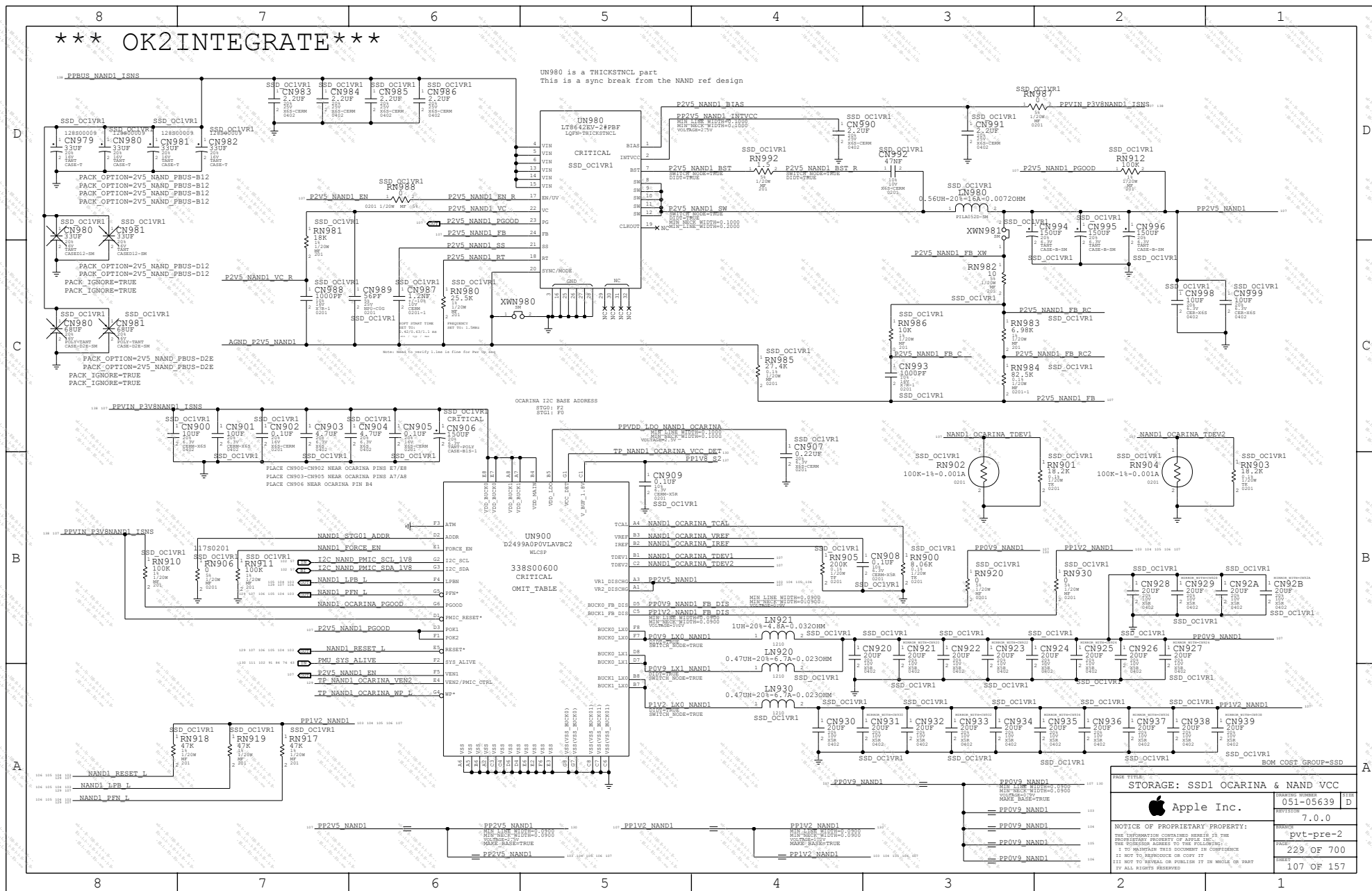
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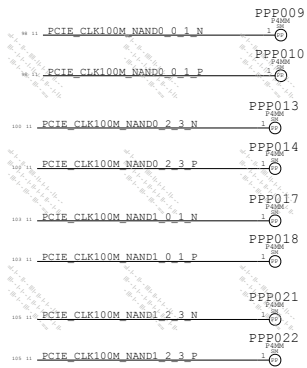
NAND1	S5E3
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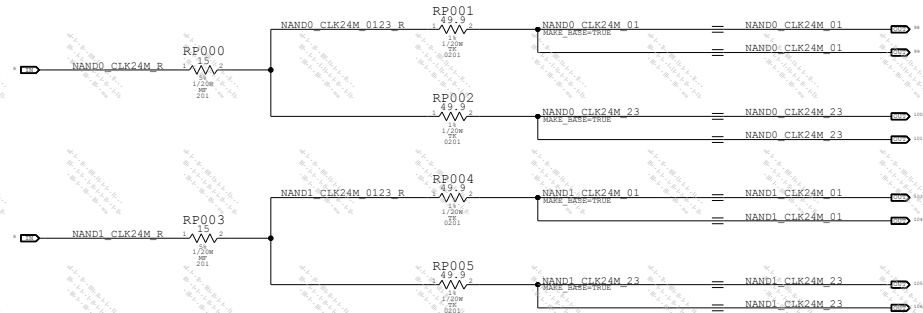
BOM COST GROUP=SS



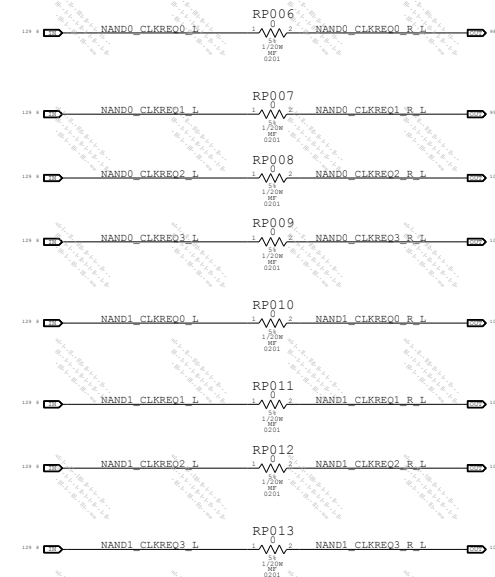
NAND CLK TEST POINTS



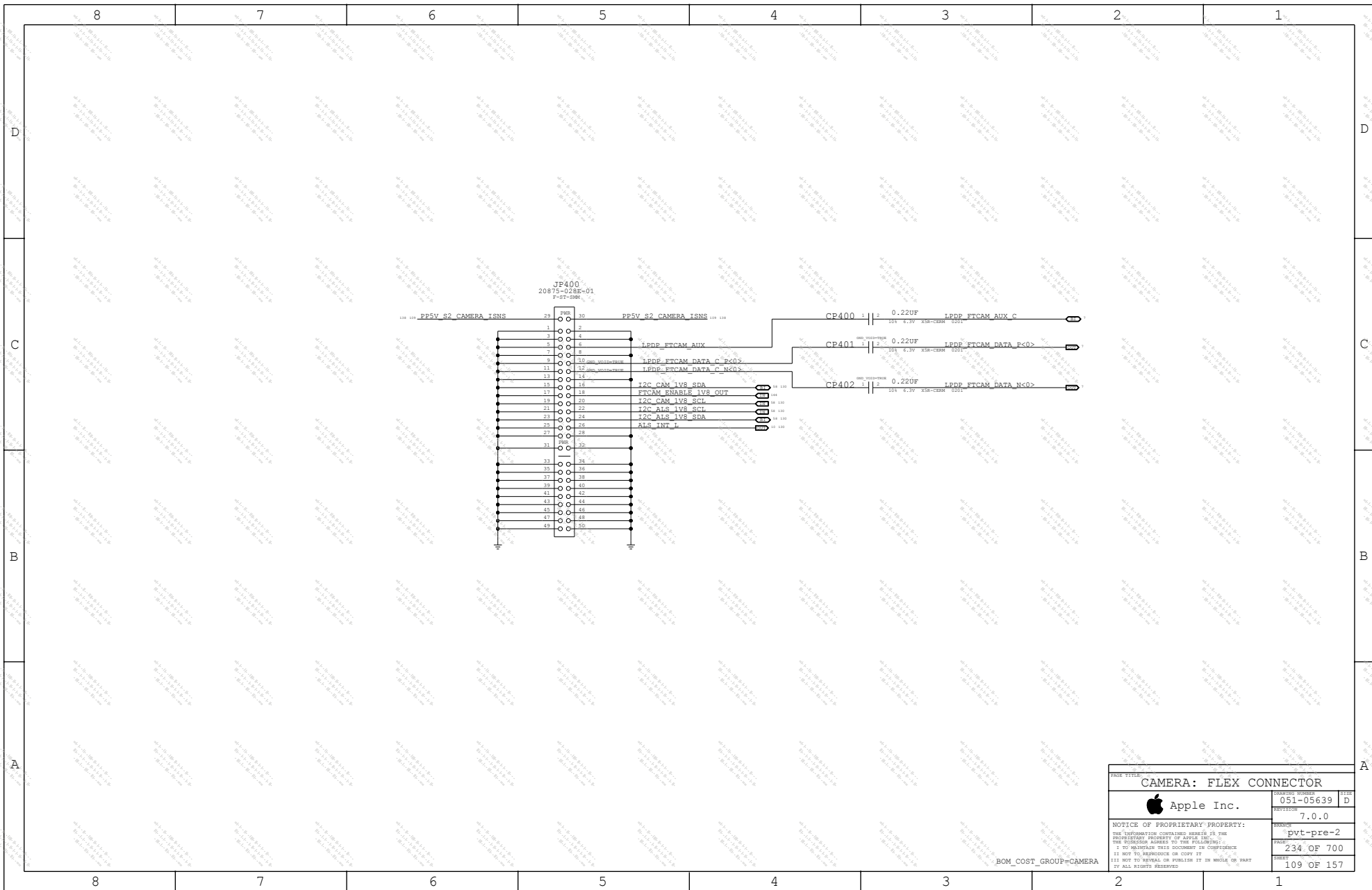
SSD 24M CLOCK TERMINATIONS




NAND CLKREQ SERIES RESISTORS



PAGE TITLE: STORAGE: SSD SUPPORT		
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BOM_COST_GROUP=SSD		Pvt-pre-2
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PAGE TITLE: CAMERA: FLEX CONNECTOR			
 Apple Inc.	DESIGN NUMBER	051-05639	TYPE
	REVISION	7.0.0	D
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	PAGE	234 OF 700	
	SHEET	109 OF 157	

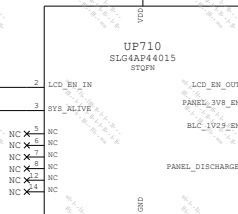
BOM_COST_GROUP=CAMERA

*** OK2INTEGRATE ***

PP3V8_AON

PP1V8_AON

LCD_PWR_EN
PMU_SYS_ALIVE

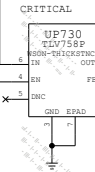


CP770
0.1UF
100
200-CERM
0402

BYPASS=CP710:1.40K

EDP_PANEL_1V8_EN
EDP_PANEL_PWR_EN
EDP_BKLT_1V29_EN
CONTROLS 1.29V LDO IN PMIC
EDP_PANEL_DISCHARGE

CP730
1.0UF
100
200-CERM
0402



RP732
49.9K
17.0W
201

RP731
10K
17.0W
201

$V_{OUT} = V_{FB} \cdot (1 + R1/R2)$
 $V_{OUT} = 0.55 \cdot (1 + 49.9/10)$
 $V_{OUT} = 3.2945$

NOSTUFF
RP730
0.1UF
100
200-CERM
0402

3V29 FEED TO BACKLIGHT
PPCON_AWAKESW_BKLTCON

CP718
0.1UF
100
200-CERM
0402

CP719
0.1UF
100
200-CERM
0402

3V8 FEED TO MDB
PFMDB_AWAKESW_TCON

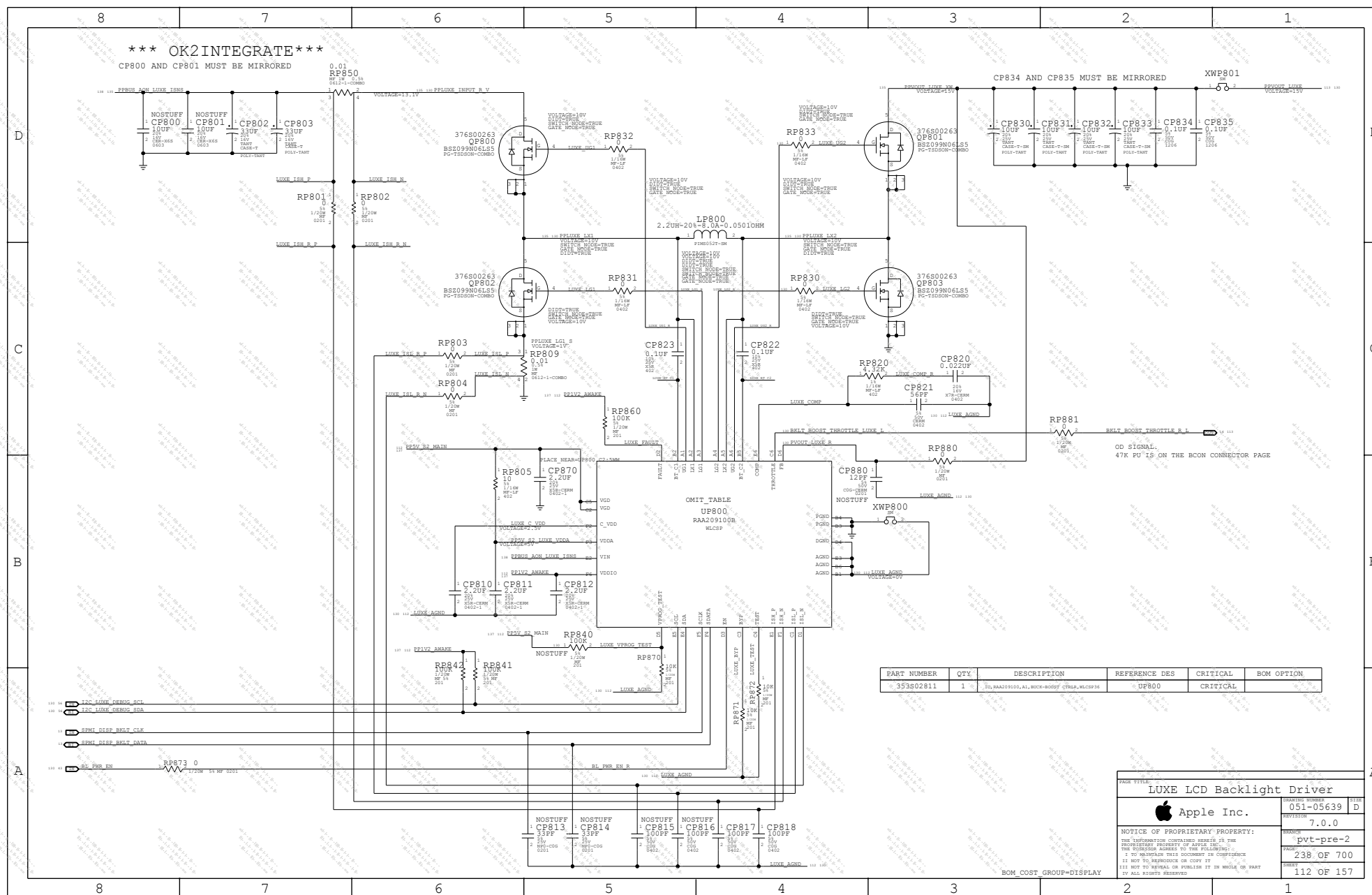
RP700
300
17.0W
201

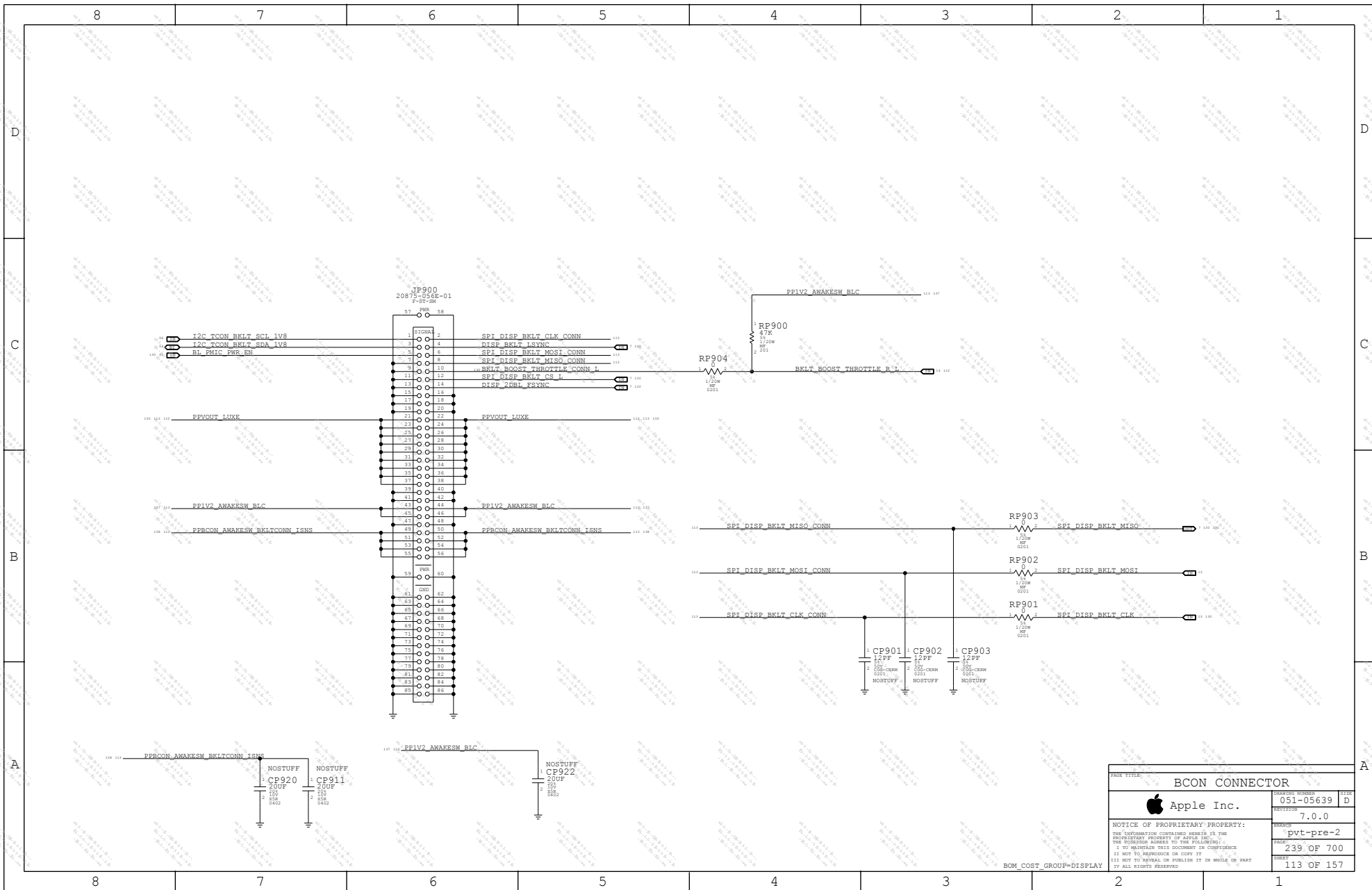



RP701
100K
17.0W
201

DISPLAY POWER SEQUENCER			
Apple Inc.		051-05639	D
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BOM_COST_GROUP=DISPLAY

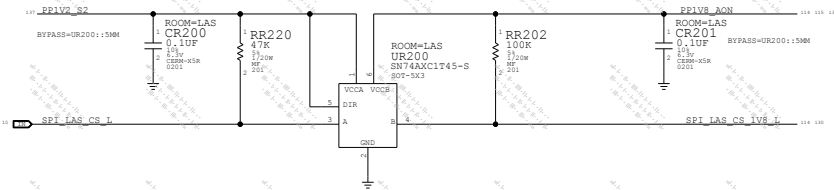




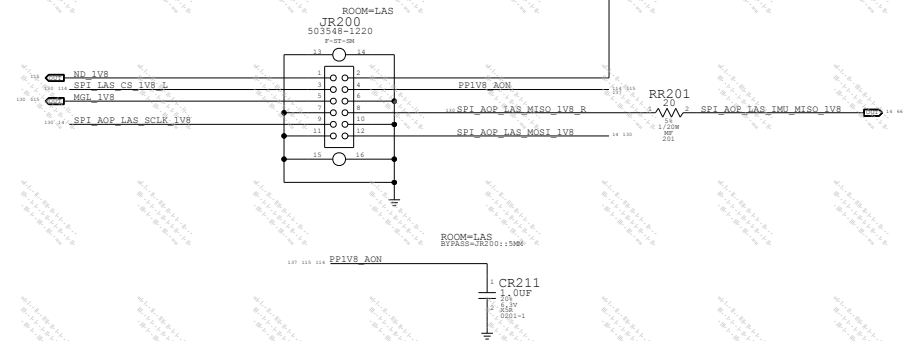
PAGE TITLE: BCON CONNECTOR		
 Apple Inc.	ISSUING NUMBER: 051-05639	FILE D
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*** OK2INTEGRATE ***

LEVEL TRANSLATION



APN: 516S0873



CURRENT PER RAIL

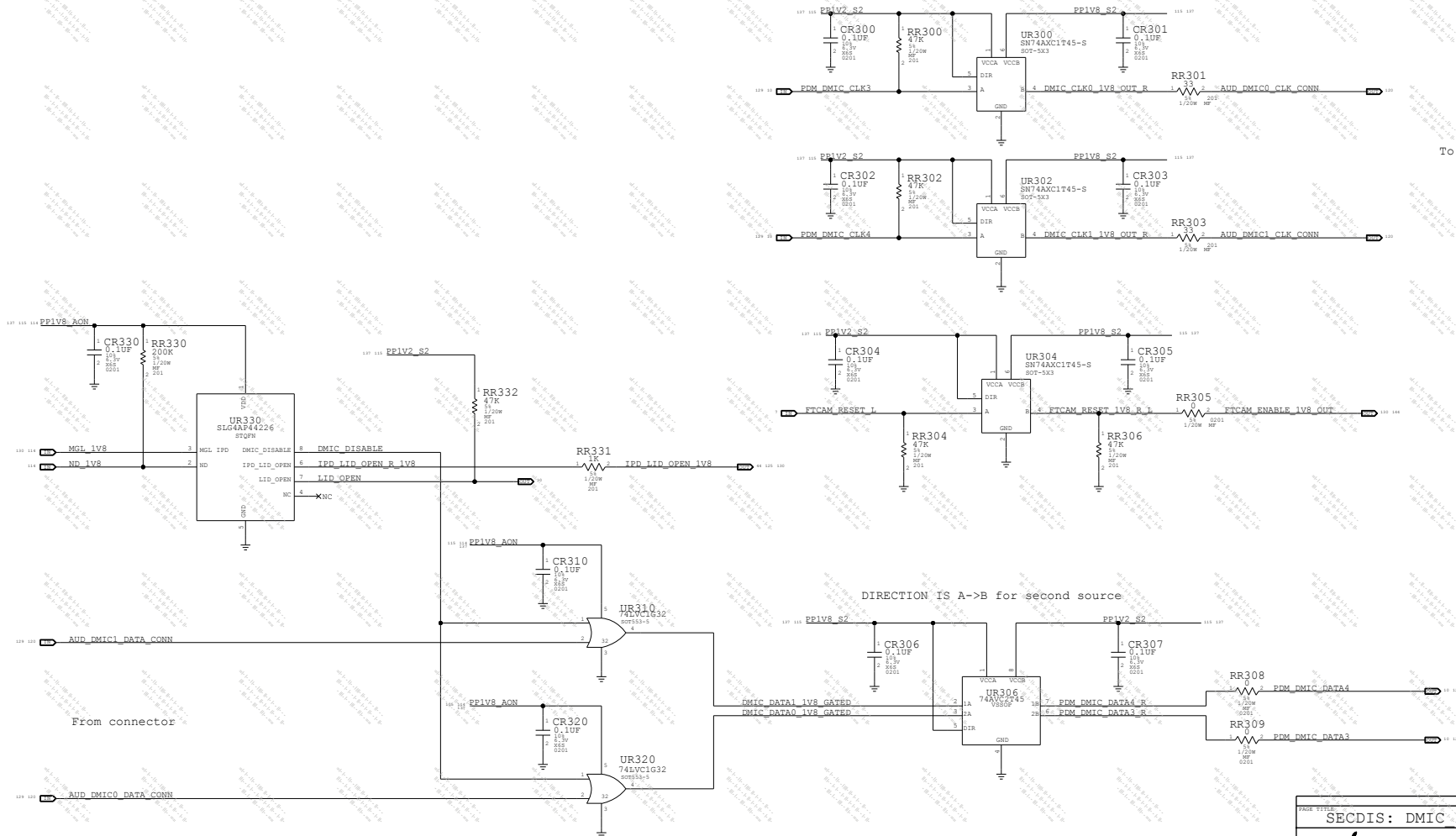
RAIL	TYPICAL	PEAK
1.2 S2	22UA	1.2MA
1.8 AON	30UA	8 MA
3.3 AON	1UA	10 MA

ROOM_COST_GROUP=SOC

PAGE TITLE: SECDIS: LID ANGLE SENSOR		
Apple Inc.		051-05639
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Pvt-pre-2		242 OF 700
114 OF 157		

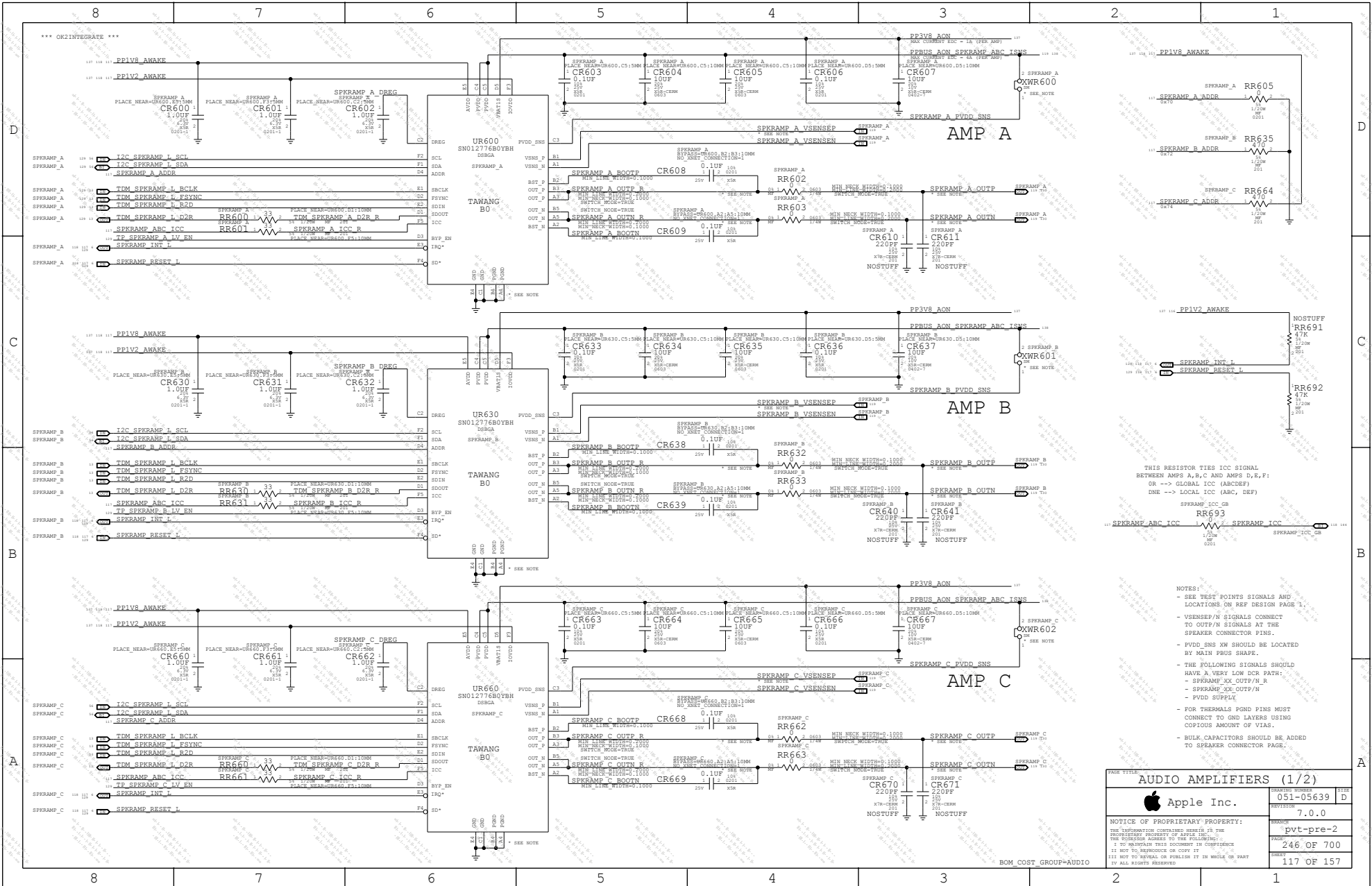
*** OK2INTEGRATE ***

Level Shifter - DMIC & FTCAM

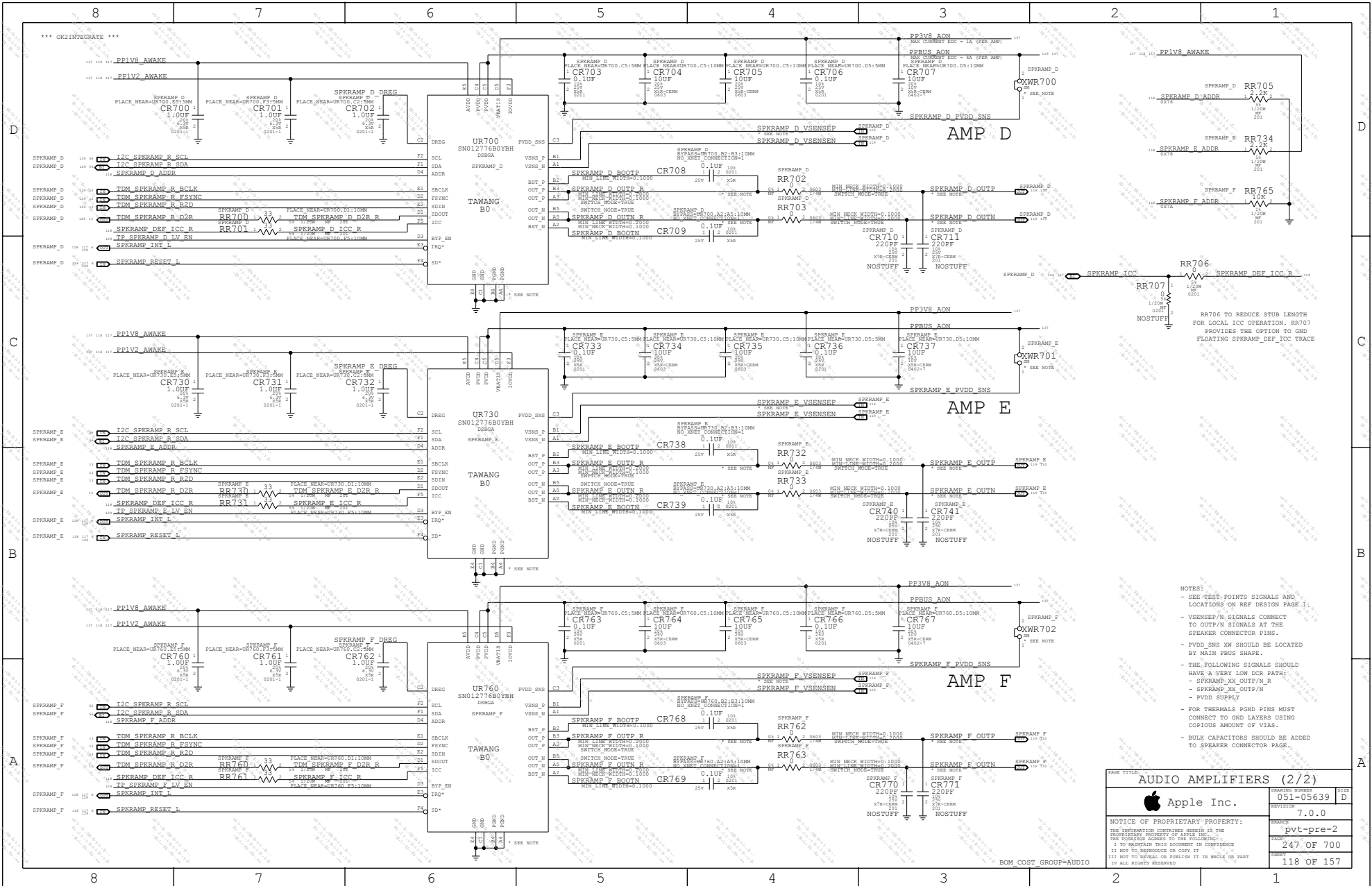


PAGE TITLE:		SECDIS: DMIC LID CONTROL	
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BOM_COST_GROUP=SCC

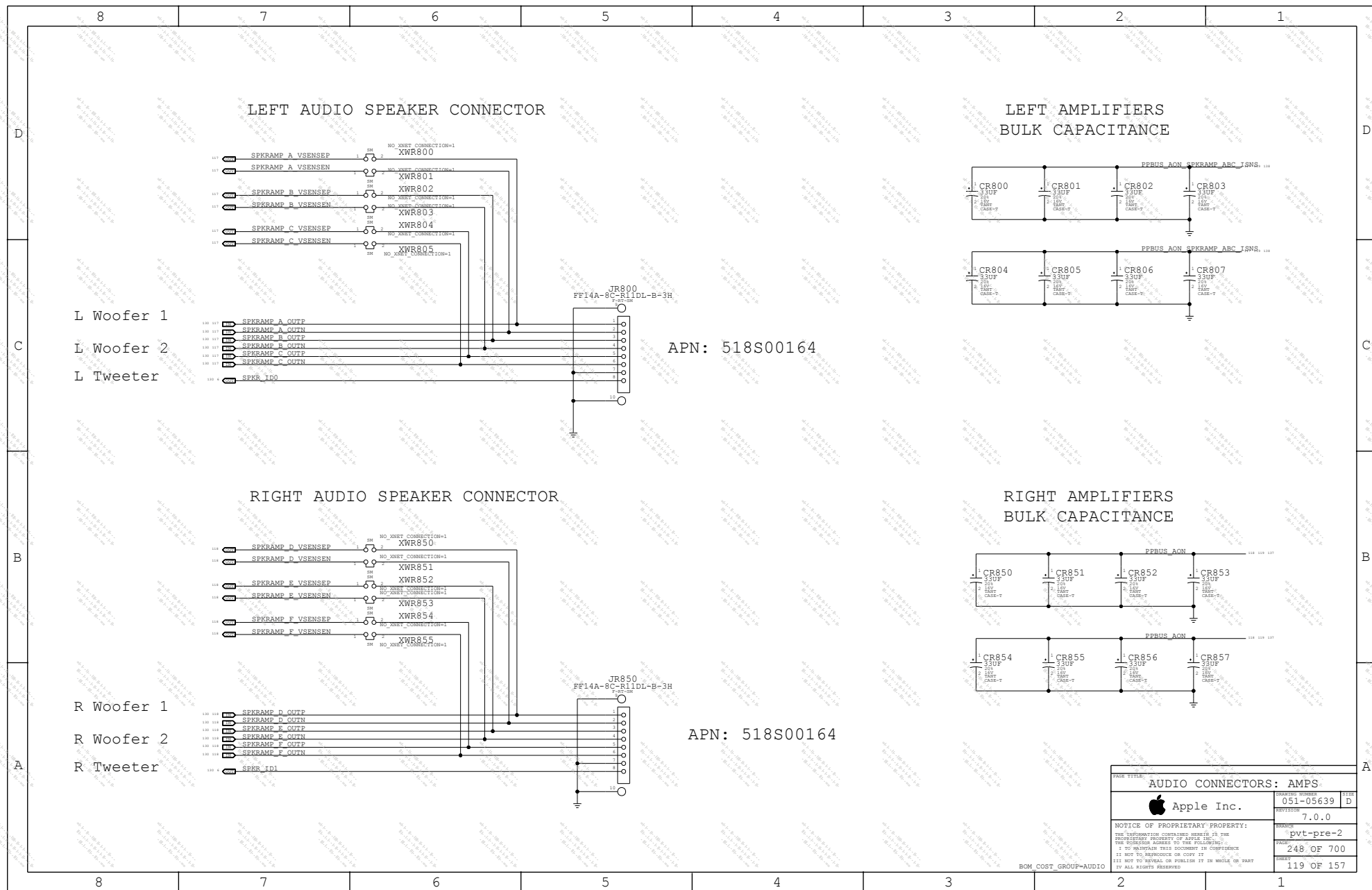


PAGE TITLE:	
AUDIO AMPLIFIERS (1/2)	
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PAGE: 246 OF 700	
SHEET: 117 OF 157	



- 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.
 - PVDV_SNS XN SHOULD BE LOCATED BY MAIN PBUS SHAPE.
 - THE FOLLOWING SIGNALS SHOULD HAVE A VERY LOW INR PATH:
 - SPCRAMP_XN_OUTP/N
 - SPCRAMP_XN_OUTN/N
 - PVDV_SUPPLY
 - FOR THERMALS PCHD PINS MUST CONNECT TO GND LAYERS USING COPIOUS AMOUNT OF VIAS.
 - BULK CAPACITORS SHOULD BE ADDED TO SPEAKER CONNECTOR PAGE.

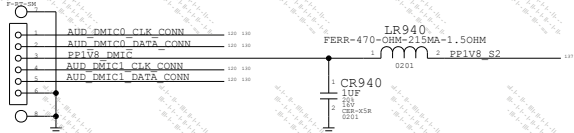
PAGE TITLE:		AUDIO AMPLIFIERS (2/2)	
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		SHEET	118 OF 157



PAGE TITLE:		
AUDIO CONNECTORS: AMPS		
Apple Inc.	DESIGN NUMBER	051-05639
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SHEET		119 OF 157

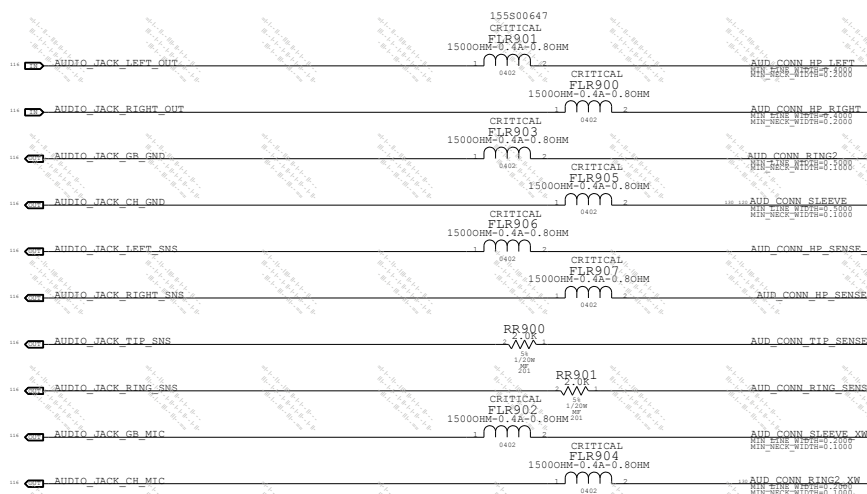
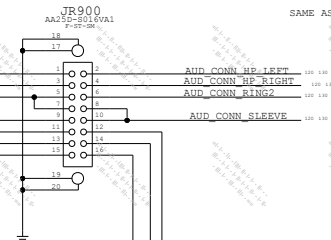
BOM_COST_GROUP-AUDIO

APN: 518S0818
JR940
FF14A-6C-R11DL-B-3H




PART NUMBER=516S1181

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

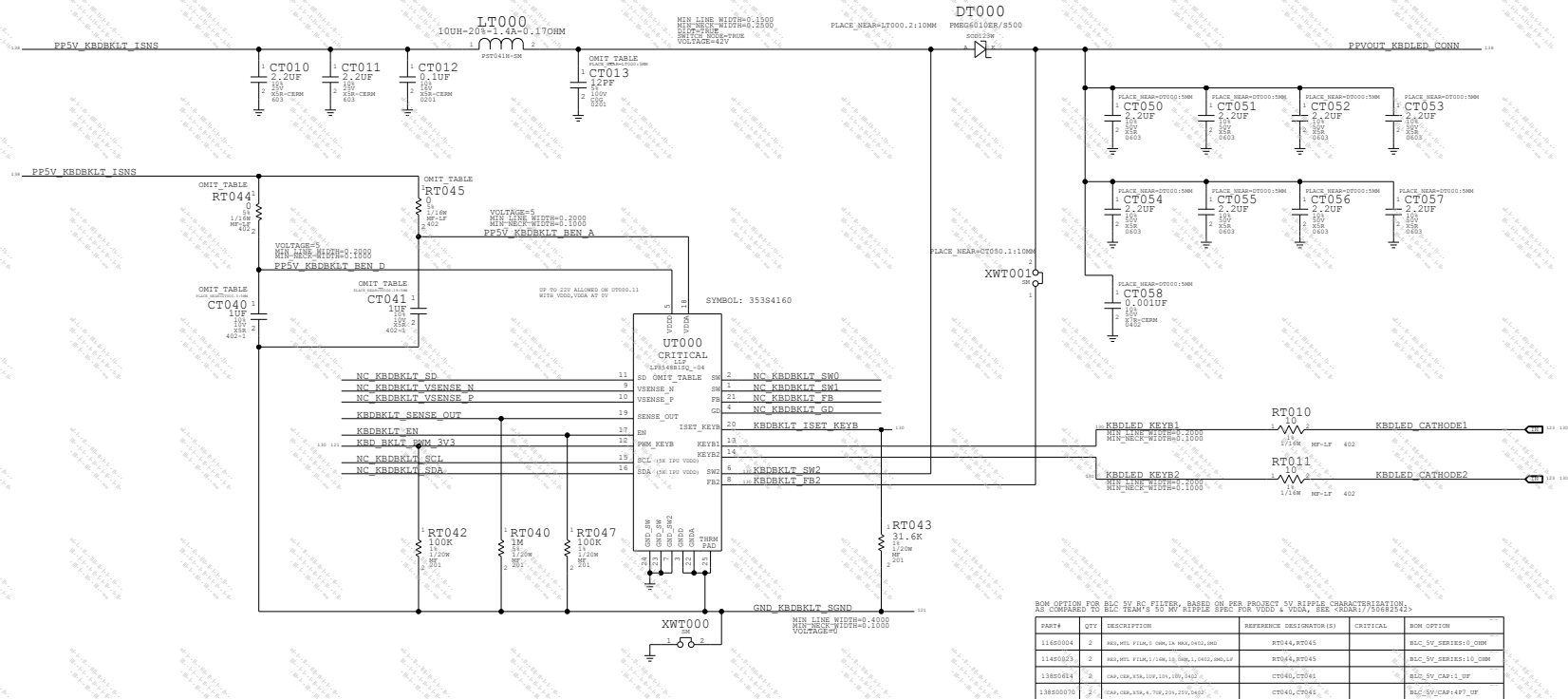


BOM COST GROUP=AUDIO

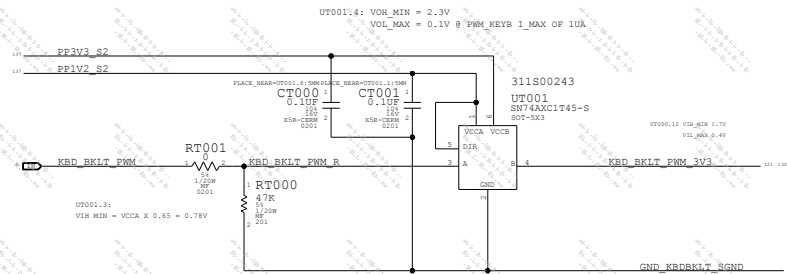
LAST CHANGE: Wed Feb 18 17:12:24 2015	
PAGE TITLE: Audio Flex Connectors	
 Apple Inc.	CRAWLING NUMBER 051-05639
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	PART NUMBER pvt-pre-2
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PAGE 129 OF 700	
PAGE 240 OF 157	

*** OK2INTEGRATE ***

BEN IC: KEYBOARD LED DRIVER



KEYBOARD BKLK PWM LEVEL-SHIFTER



BOM OPTION FOR BLC SV AC FILTER, BASED ON PER PROJECT SV RIPPLE CHARACTERIZATION, AS COMPARED TO BLC TEAM'S 50 MVRIPPLE SPEC FOR VDD0 & VDDA, SEE <RDRM17506252>

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
11600004	2	RES,MTL FILM,0.08W,1A,MAX,0.02,0.02	RT044,RT045		BLC_SV_SERIES:0_0.08W
11400023	2	RES,MTL FILM,1/4W,10M,1,0.02,0.02,0.02	RT044,RT045		BLC_SV_SERIES:10_0.02W
13800034	2	CAP,CER,X5R,10V,100,100,0.02	CT040,CT041		BLC_SV_CAP:10_0.02W
13800070	2	CAP,CER,X5R,1.7V,100,100,0.02	CT040,CT041		BLC_SV_CAP:1.7V_0.02W

BEN IC VERSION 4 Y3 6 DEPENDS ON WHICH VERSION OF JERRY IC IS ON THE PANEL

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
33301623	1	IC,CMOS,6400,1.8V,1.8V,1.8V,1.8V	UT000		BLC_BEN_IC:V4
33301685	1	IC,CMOS,6400,1.8V,1.8V,1.8V,1.8V	UT000		BLC_BEN_IC:V6

ALTERNATE PART# FOR BEN IC VERSION 4

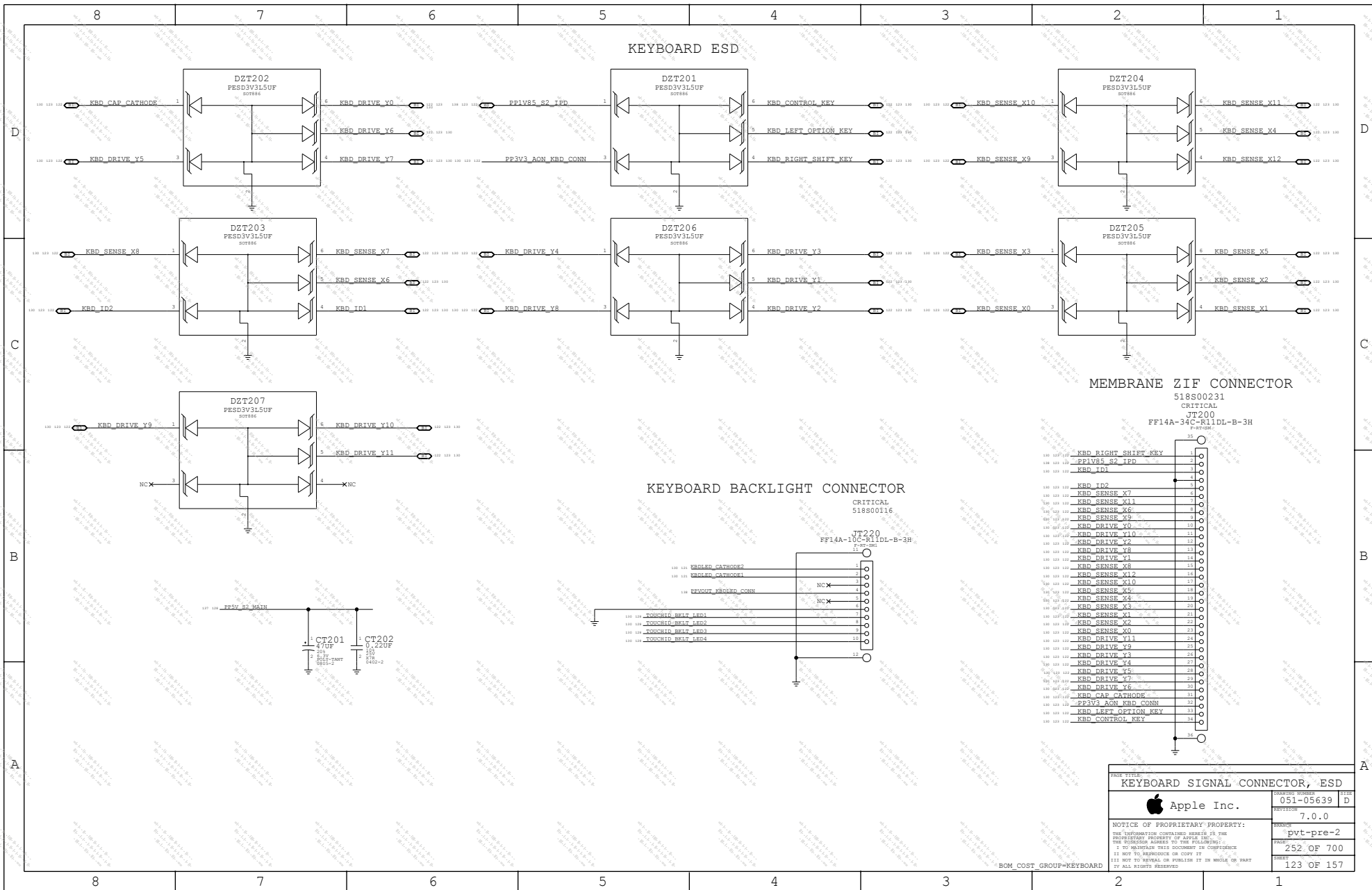
PART NUMBER	ALTERNATE FOR	BOM OPTION	REF DES	COMMENTS
33301610	33302015	BLC_BEN_IC:V4	ANY	RECOMMENDED BY LUTSAP

KEYBOARD SWITCH NODE SENSE OPTION

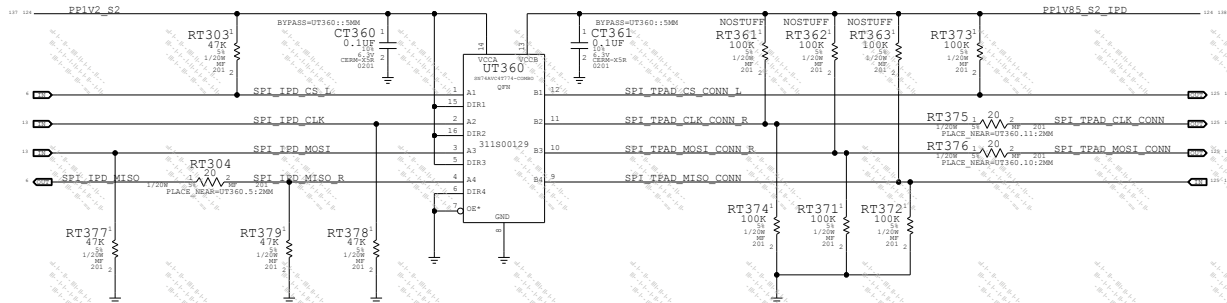
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
13100141	1	IC,CMOS,12V,1.8V,1.8V,1.8V	CT013		BLC_BEN_IC:SWITCH

BOM_COST_GROUP=KEYBOARD

PAGE TITLE:	
BEN: KEYBD BKLK	
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PAGE 250 OF 700	
SHEET 121 OF 157	



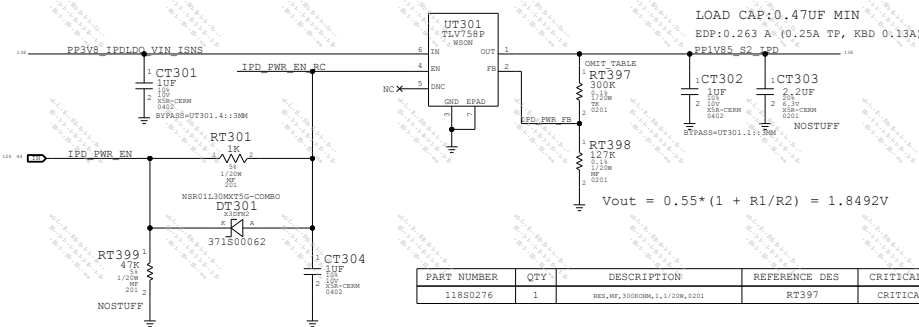
TRACKPAD SPI BUS LEVEL SHIFTER (+1.2V TO +1.8V)



SN74AVC4T774 Truth Table

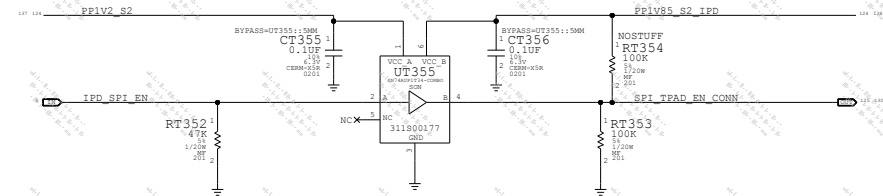
CTRL INPUTS		OUTPUT CIRCUITS		OPERATION
/OE	DIR	A PORT	B PORT	
L	L	Enabled	Hi-Z	B data to A data
L	H	Hi-Z	Enabled	A data to B data
H	X	Hi-Z	Hi-Z	Isolation

IPD LDO 1.85 V FOR TRACKPAD AND KEYBOARD IOX

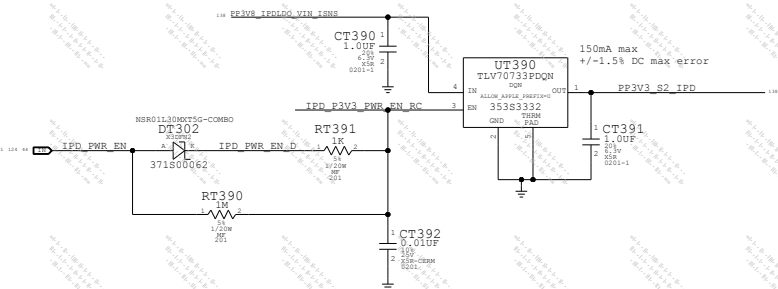


PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
11880276	1	REG,MP,300KOHM,1,1/20W,G201	RT397	CRITICAL	

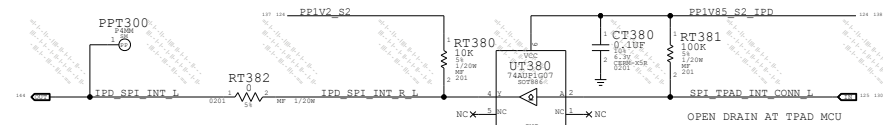
TRACKPAD SPI ENABLE LEVEL SHIFTER



3.3V S2 LDO FOR TPAD



IPD SPI INTERRUPT LEVEL SHIFTER



BOM_COST_GROUP=TRACKPAD

TRACKPAD SUPPORT

Apple Inc.	051-05639	D
PROVISION	7.0.0	

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STATUS

Pvt-pre-2

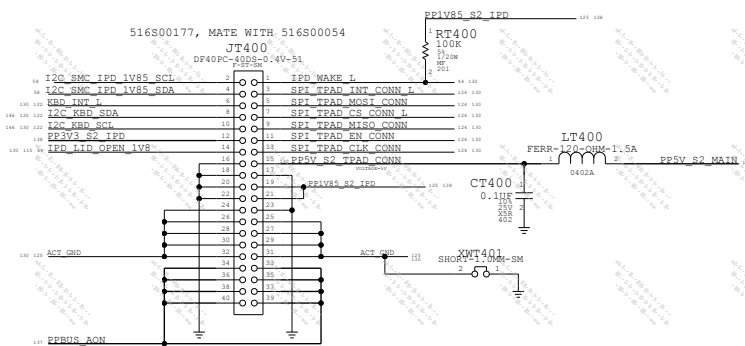
PAGE

253 OF 700

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TPAD CONNECTOR



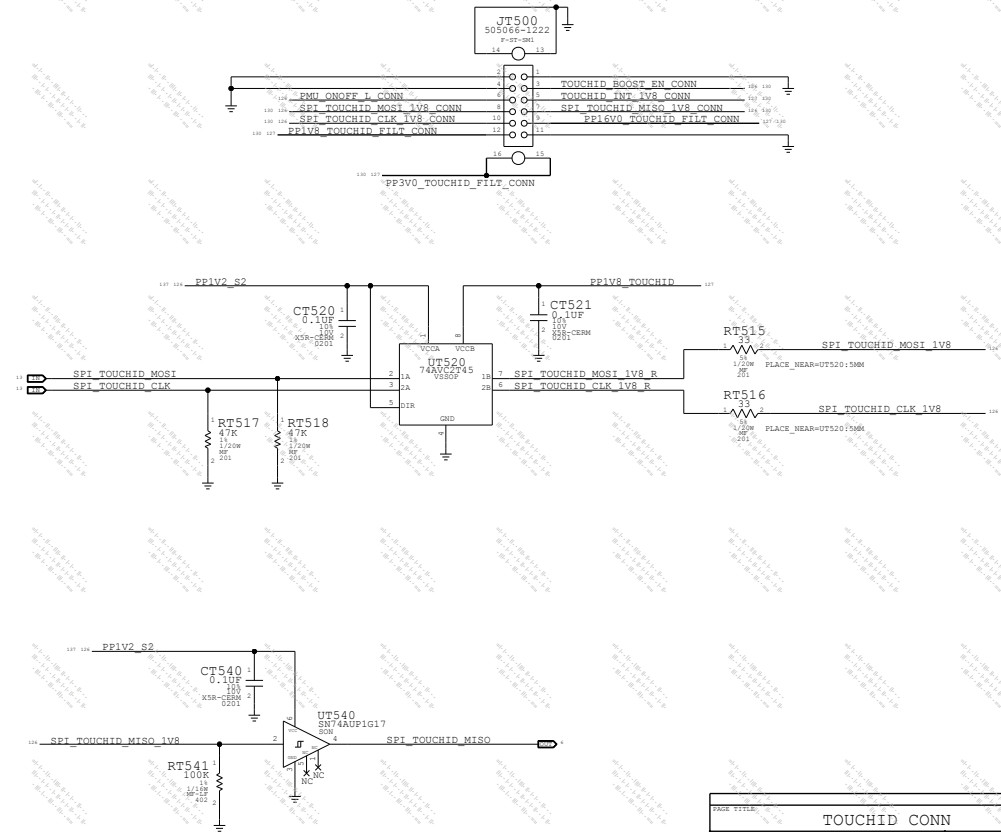
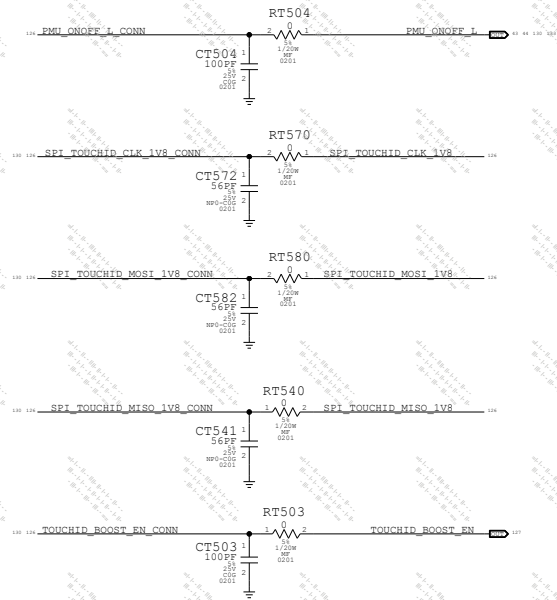
TRACKPAD CONNECTOR			
Apple Inc.	DESIGN NUMBER	051-05639	REV D
	REVISION	7.0.0	
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	PAGE	254 OF 700	
	SHEET	125 OF 157	


BCM_COST_GROUP=TRACKPAD

*** OK2INTEGRATE ***

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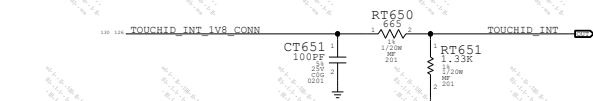
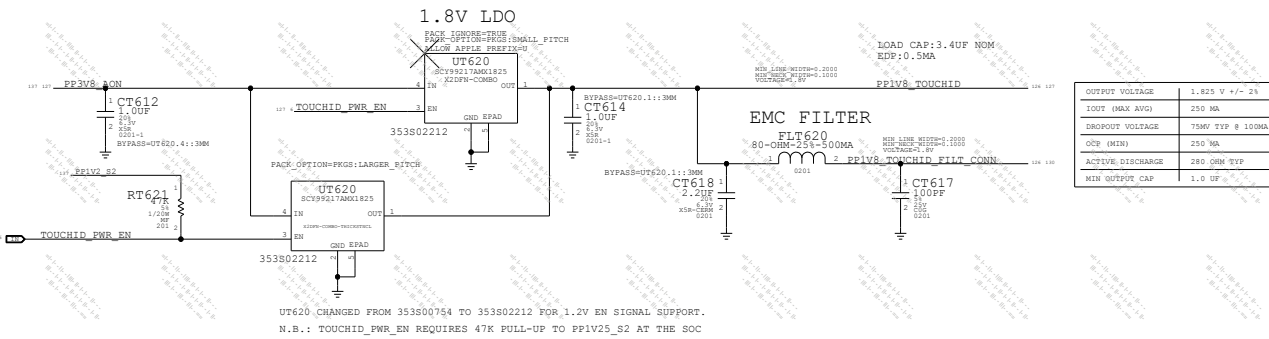
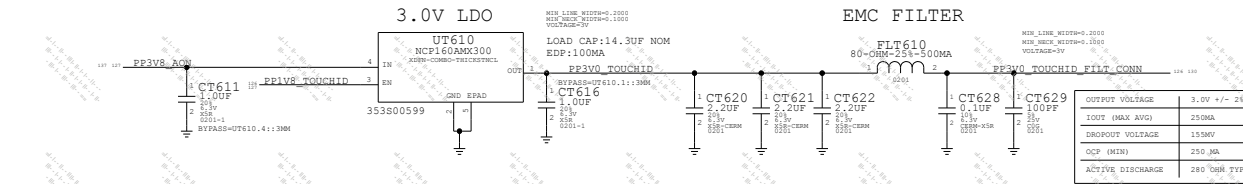
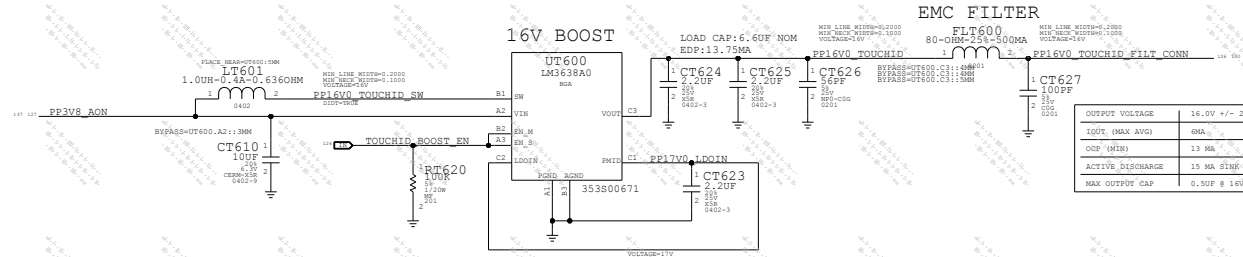


TOUCHID_CONN			
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	PAGE	255 OF 700	
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BOM_COST_GROUP=TOUCHID

*** OK2INTEGRATE ***

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

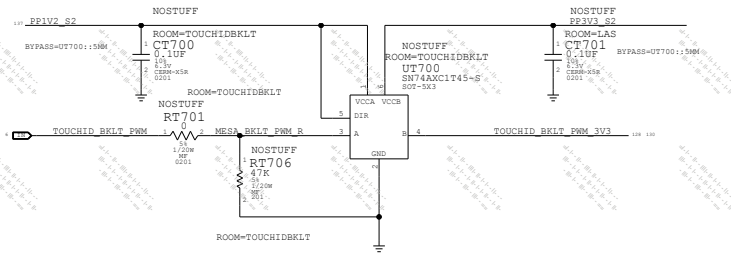


BOM_COST_GROUP=TOUCHID

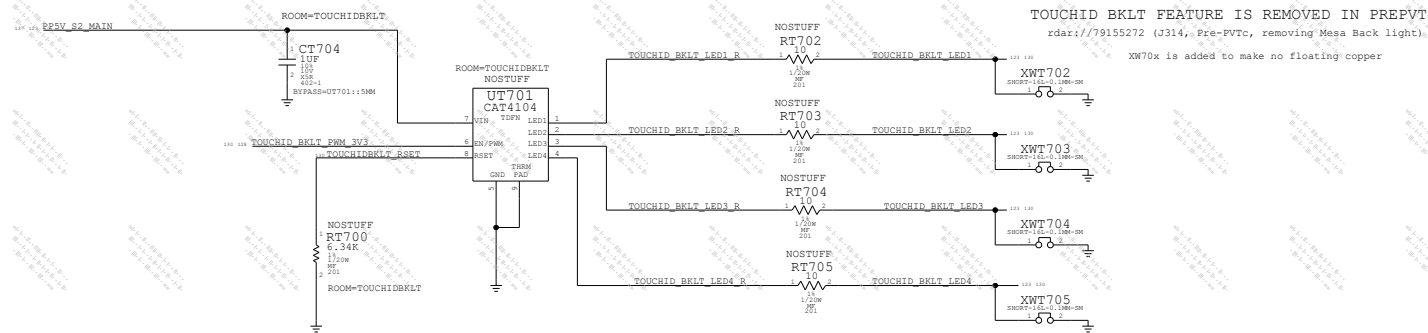
PAGE TITLE: TOUCHID SUPPORT		
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	SHEET: 127 OF 157	

*** OK2INTEGRATE ***

TOUCHID BKLT PWM LEVEL SHIFTER



TOUCHID BKLT LED DRIVER



CURRENT PER RAIL

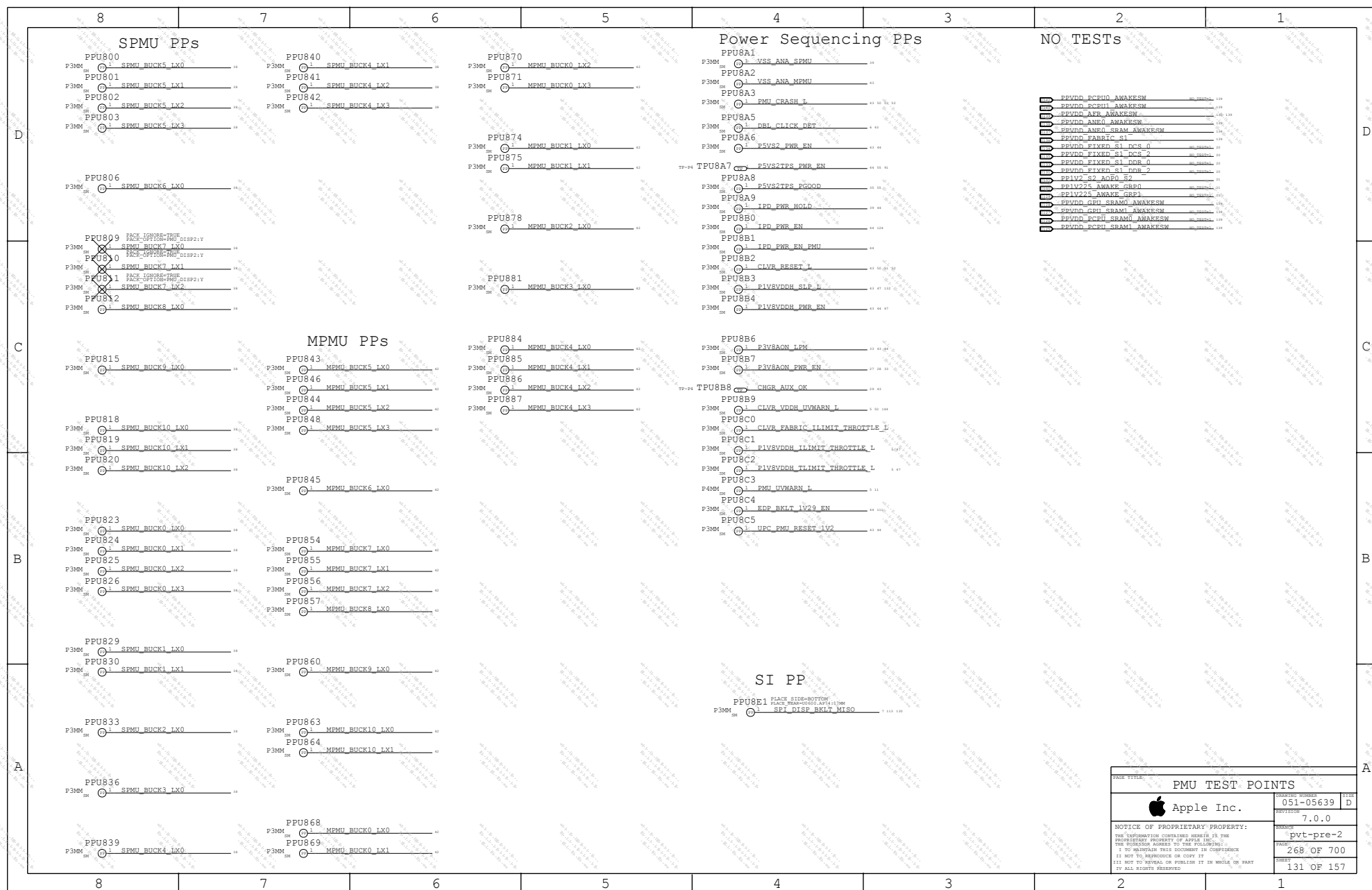
RAIL	TYPICAL	PEAK
1.2 S2	10UA	1.2MA
3 AON	10UA	8 MA
5V S2	80MA	80 MA

4X LEDS, 20MA EACH LED

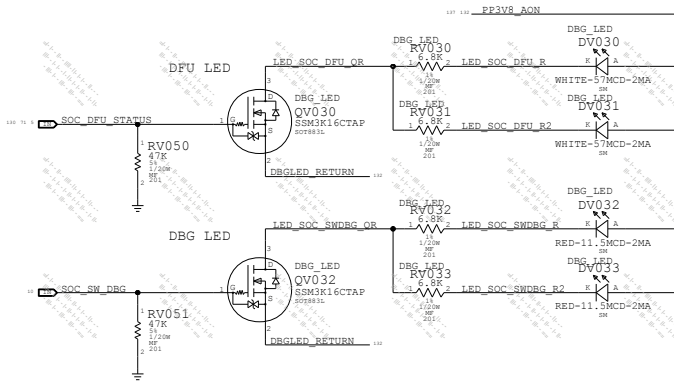
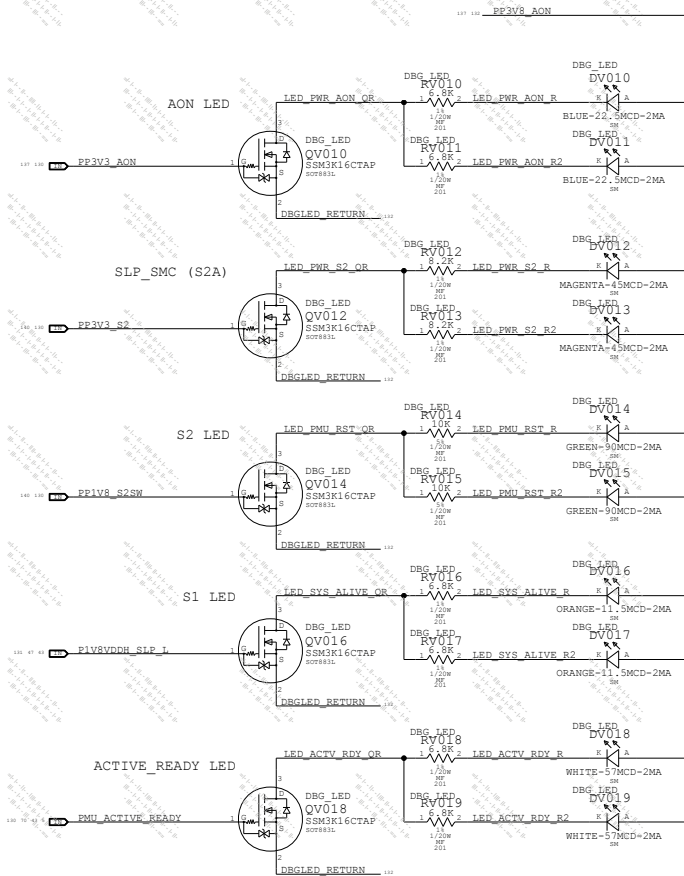
BCM_COST_GROUP=SOC

PAGE TITLE: TOUCHID BACKLIGHT		
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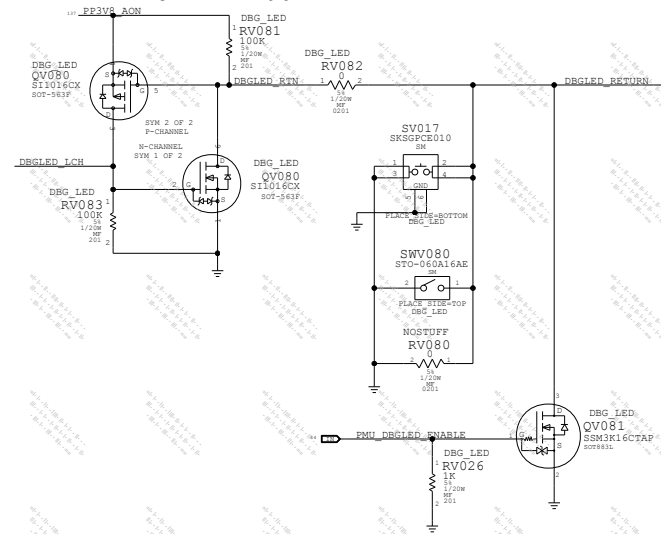


Debug LEDs



Debug LED Latch
Press button once to engage.
Remove power to disengage.

Debug LED Enable

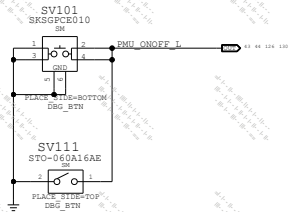


PAGE TITLE: Debug: LEDs, Koba		
Apple Inc.	051-05639	1
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BOM_COST_GROUP=DEBUG	7.0.0	8

POWER BUTTON

Imitate a user-facing Power Button press, many functions:

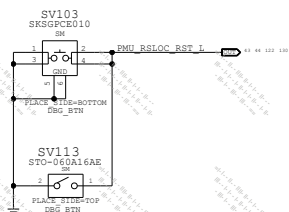
- Press to Wake from any state
- Combine with RSLOC (see RSLOC)
- Hold for 8sec to trigger "one-finger reset"
- Similar to PMU RESET, except SW gets a warning to initiate panic-flow



RSLOC BUTTON

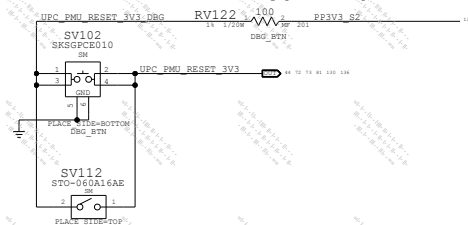
Imitate a user-facing key combo Right-Shift + Left-Option + Control:

- Hold RSLOC 4sec, then press Power Button to initiate PMU RESET
- Hold RSLOC 4sec, then hold Power Button 4sec to power-cycle P3V8AON VR
- Hold Power Button 1sec, then hold RSLOC 10sec to trigger PMU RESET into DFU (continue holding first button when second button is added)



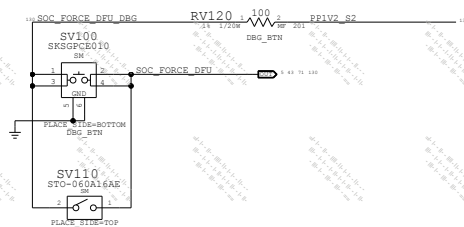
PMU RESET

PMU transitions to OFF and automatically proceeds up to AWAKE



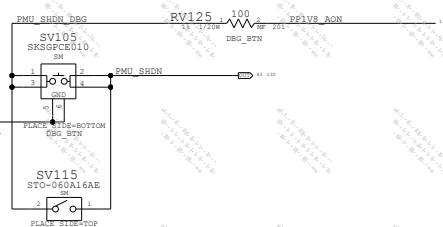
FORCE DFU

Hold during OFF->AWAKE transition to enter SOC's "Debug Firmware Update" mode



PMU SHUTDOWN

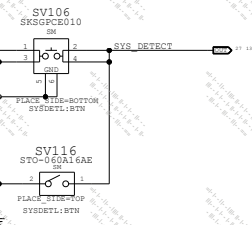
PMU transitions to OFF state and waits for a WAKE source*



SYS_DETECT (Battery Disconnect)

Imitate unplugging the battery signal flex, to disconnect MLB from Battery power

- Disconnect all DCIN sources, then hold SYS_DETECT for 2sec. MLB will completely power down.

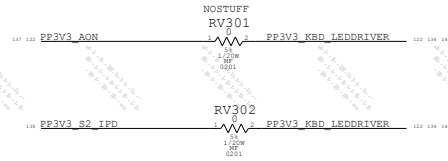


*WAKE sources in OFF:
CHGR_AUX_OK (DCIN present)
IPD_LID_OPEN_LV8 (Lid is open)
PMU_ONOFF_L (User Power Button)

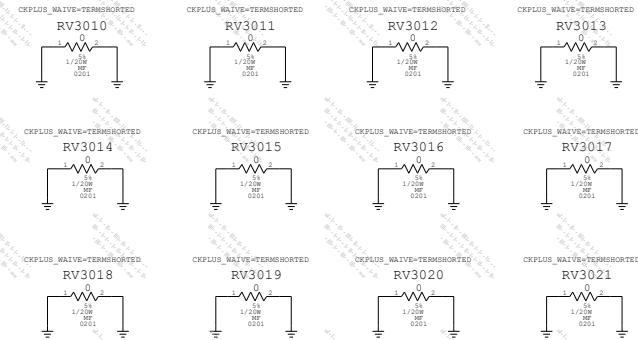
PAGE TITLE: Debug: Buttons			
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		SHEET	133 OF 157

BOM_COST GROUP=DEBUG

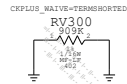
FOR UT105 POWR RAIL OPTION



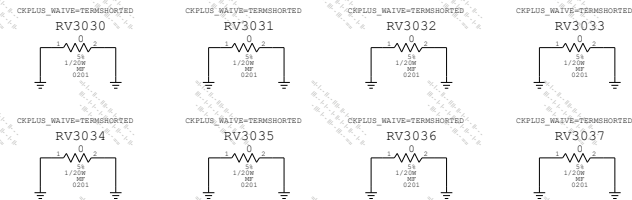
NAND ASSEMBLY PROTECTION PURPOSES



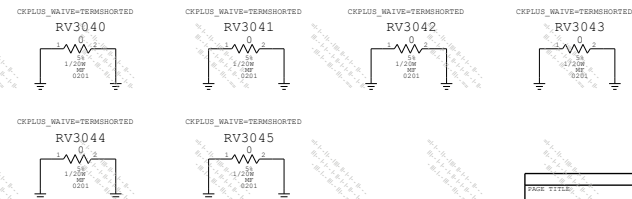
FOR ASSEMBLY PROTECTION PURPOSES ONLY



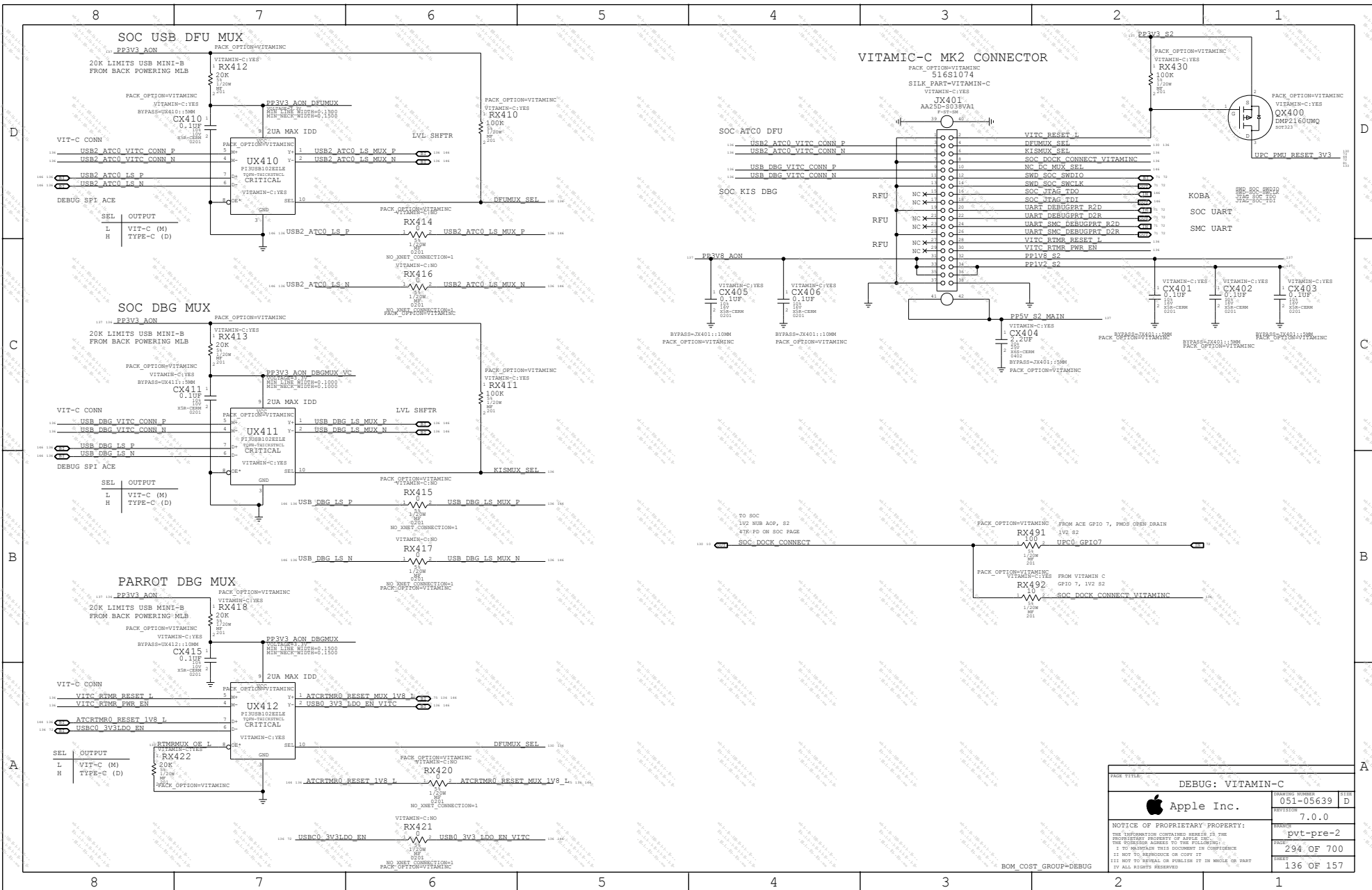
U8100 ASSEMBLY PROTECTION PURPOSES



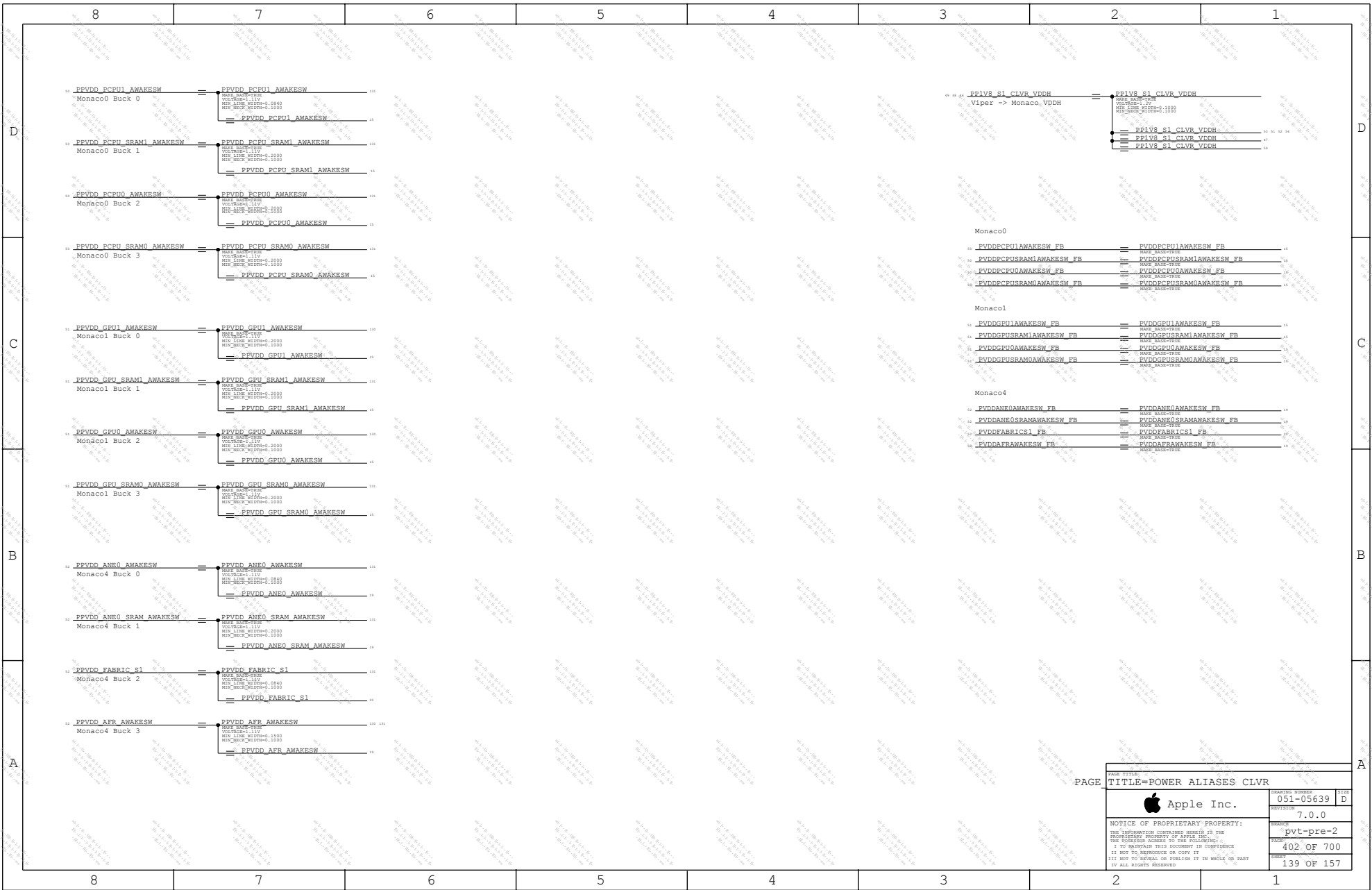
U7700 ASSEMBLY PROTECTION PURPOSES

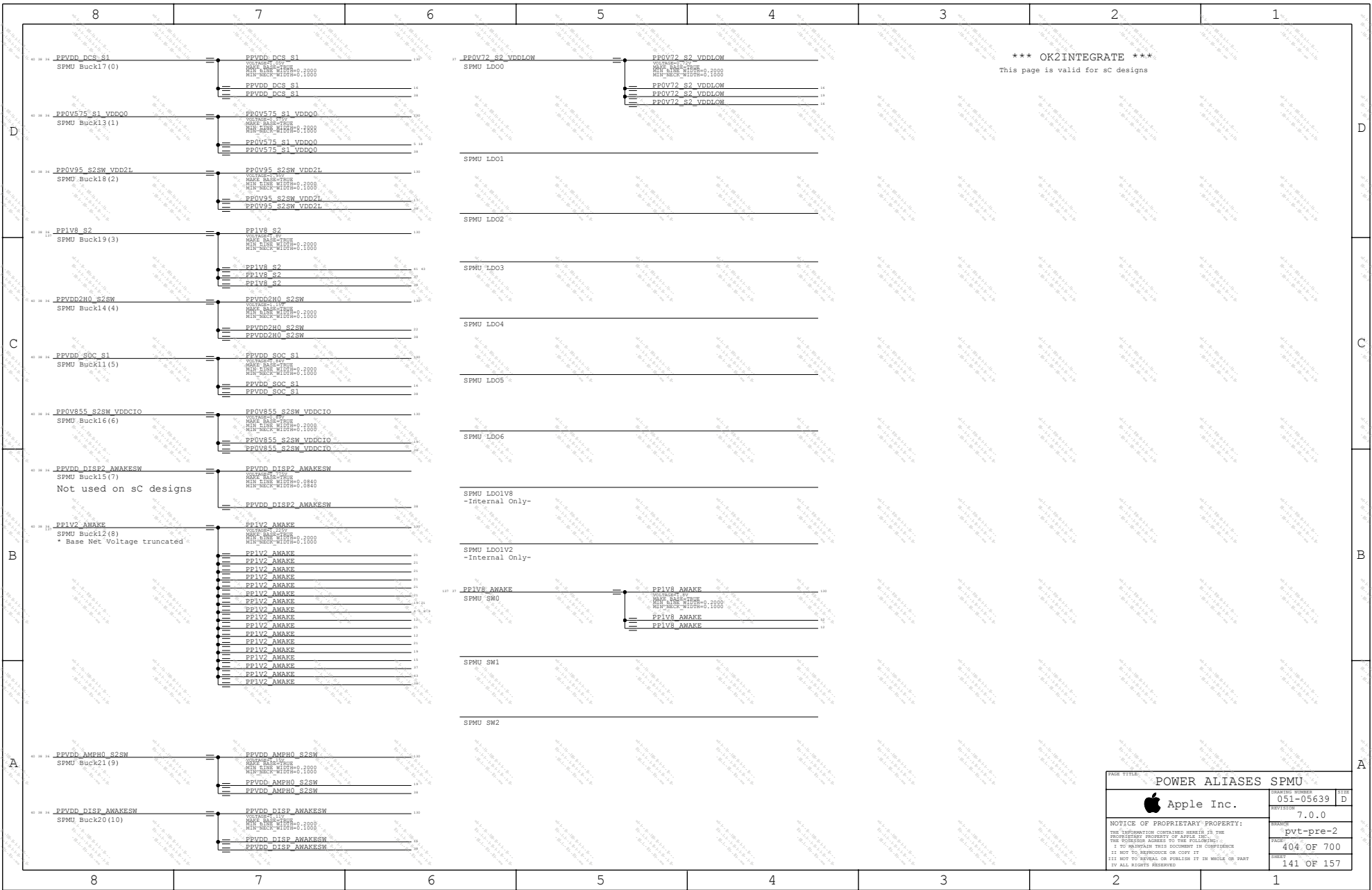


SUPPORT		
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BOM COST GROUP=DEBUG		
PAGE 134 OF 157		



[illegible]





	8	7	6	5	4	3	2	1	
D	LPDPTX		MIPI		ENET				D
	LPDP_INT_DATA_C_P<0>	==	NC_MIPID_DATAP	==	NC_PCIE_ENET_R2DP	==	NC_PCIE_ENET_R2DP	MAKE_BASE=TRUE	
	LPDP_INT_DATA_C_N<0>	==	NC_MIPID_DATAN	==	NC_PCIE_ENET_R2DN	==	NC_PCIE_ENET_R2DN	MAKE_BASE=TRUE	
	LPDP_INT_DATA_C_P<1>	==	NC_MIPID_CLKP	==	NC_PCIE_ENET_D2RP	==	NC_PCIE_ENET_D2RP	MAKE_BASE=TRUE	
	LPDP_INT_DATA_C_N<1>	==	NC_MIPID_CLKN	==	NC_PCIE_ENET_D2RN	==	NC_PCIE_ENET_D2RN	MAKE_BASE=TRUE	
	LPDP_INT_DATA_C_P<2>	==	NC_MIPI_FTCAM_DATAP0	==	NC_PCIE_CLK100M_SDP	==	NC_PCIE_CLK100M_SDP	MAKE_BASE=TRUE	
	LPDP_INT_DATA_C_N<2>	==	NC_MIPI_FTCAM_DATAN0	==	NC_PCIE_CLK100M_SDN	==	NC_PCIE_CLK100M_SDN	MAKE_BASE=TRUE	
	LPDP_INT_DATA_C_P<3>	==	NC_MIPI_FTCAM_DATAP1	==	NC_ENET_SELECT_1G_H_10G_L	==	NC_ENET_SELECT_1G_H_10G_L	MAKE_BASE=TRUE	
	LPDP_INT_DATA_C_N<3>	==	NC_MIPI_FTCAM_DATAN1	==					
	LPDP_INT_AUX_C_P	==	NC_MIPI_FTCAM_CLKP	==					
C	LPDP_INT_AUX_C_N	==	NC_MIPI_FTCAM_CLKN	==					
	LPDP_INT_HPD	==	NC_MIPI_IRCAM_DATAP0	==					
	NC_LPDP_TX1_DATA0	==	NC_MIPI_IRCAM_DATAN0	==					
	NC_LPDP_TX1_DATA0	==	NC_MIPI_IRCAM_DATAP1	==					
	NC_LPDP_TX1_DATA1	==	NC_MIPI_IRCAM_DATAN1	==					
	NC_LPDP_TX1_DATA1	==	NC_MIPI_IRCAM_CLKP	==					
	NC_LPDP_TX1_DATA2	==	NC_MIPI_IRCAM_CLKN	==					
	NC_LPDP_TX1_DATA2	==							
	NC_LPDP_TX1_DATA3	==							
	NC_LPDP_TX1_AUXP	==							
B	LPDPRX		USB3						
	NC_LPDP_TX1_AUXN	==	NC_USB3_EXTN_R2DP	==					
	NC_LPDP_INT_SL_HPD	==	NC_USB3_EXTN_R2DN	==					
	NC_LPDP_TX1_AUXP	==	NC_USB3_EXTN_D2RP	==					
	NC_LPDP_TX1_AUXN	==	NC_USB3_EXTN_D2RN	==					
	NC_LPDP_TX1_AUXP	==	NC_USB3_EXTN_D2RP	==					
	NC_LPDP_TX1_AUXN	==	NC_USB3_EXTN_D2RN	==					
	NC_LPDP_TX1_AUXP	==	NC_USB3_EXTN_D2RP	==					
	NC_LPDP_TX1_AUXN	==	NC_USB3_EXTN_D2RN	==					
	NC_LPDP_TX1_AUXP	==	NC_USB3_EXTN_D2RP	==					
A	NAND		ATC3 - HDMI						
	NC_PCIE_CLK100M_NAND0_1P	==	NC_PCIE_CLK100M_NAND0_1P	MAKE_BASE=TRUE					
	NC_PCIE_CLK100M_NAND0_1N	==	NC_PCIE_CLK100M_NAND0_1N	MAKE_BASE=TRUE					
	NC_PCIE_CLK100M_NAND0_3P	==	NC_PCIE_CLK100M_NAND0_3P	MAKE_BASE=TRUE					
	NC_PCIE_CLK100M_NAND0_3N	==	NC_PCIE_CLK100M_NAND0_3N	MAKE_BASE=TRUE					
	NC_PCIE_CLK100M_NAND1_1P	==	NC_PCIE_CLK100M_NAND1_1P	MAKE_BASE=TRUE					
	NC_PCIE_CLK100M_NAND1_1N	==	NC_PCIE_CLK100M_NAND1_1N	MAKE_BASE=TRUE					
	NC_PCIE_CLK100M_NAND1_3P	==	NC_PCIE_CLK100M_NAND1_3P	MAKE_BASE=TRUE					
	NC_PCIE_CLK100M_NAND1_3N	==	NC_PCIE_CLK100M_NAND1_3N	MAKE_BASE=TRUE					
	SWD_NAND0_55E0_55E1_SWCLK	==	SWD_NAND0_55E0_55E1_SWCLK	MAKE_BASE=TRUE					
SWD_NAND0_55E0_55E1_SWCLK	==	SWD_NAND0_55E0_55E1_SWCLK	MAKE_BASE=TRUE						
SWD_NAND0_55E2_55E3_SWCLK	==	SWD_NAND0_55E2_55E3_SWCLK	MAKE_BASE=TRUE						
SWD_NAND0_55E2_55E3_SWCLK	==	SWD_NAND0_55E2_55E3_SWCLK	MAKE_BASE=TRUE						
SWD_NAND0_55E0_55E1_SWIO	==	SWD_NAND0_55E0_55E1_SWIO	MAKE_BASE=TRUE						
SWD_NAND0_55E0_55E1_SWIO	==	SWD_NAND0_55E0_55E1_SWIO	MAKE_BASE=TRUE						
SWD_NAND0_55E2_55E3_SWIO	==	SWD_NAND0_55E2_55E3_SWIO	MAKE_BASE=TRUE						
SWD_NAND0_55E2_55E3_SWIO	==	SWD_NAND0_55E2_55E3_SWIO	MAKE_BASE=TRUE						
SWD_NAND1_55E0_55E1_SWCLK	==	SWD_NAND1_55E0_55E1_SWCLK	MAKE_BASE=TRUE						
SWD_NAND1_55E0_55E1_SWCLK	==	SWD_NAND1_55E0_55E1_SWCLK	MAKE_BASE=TRUE						
SWD_NAND1_55E2_55E3_SWCLK	==	SWD_NAND1_55E2_55E3_SWCLK	MAKE_BASE=TRUE						
SWD_NAND1_55E2_55E3_SWCLK	==	SWD_NAND1_55E2_55E3_SWCLK	MAKE_BASE=TRUE						
SWD_NAND1_55E0_55E1_SWIO	==	SWD_NAND1_55E0_55E1_SWIO	MAKE_BASE=TRUE						
SWD_NAND1_55E0_55E1_SWIO	==	SWD_NAND1_55E0_55E1_SWIO	MAKE_BASE=TRUE						
SWD_NAND1_55E2_55E3_SWIO	==	SWD_NAND1_55E2_55E3_SWIO	MAKE_BASE=TRUE						
SWD_NAND1_55E2_55E3_SWIO	==	SWD_NAND1_55E2_55E3_SWIO	MAKE_BASE=TRUE						
		USBC							
		NC_USB_C0_HPD	==	NC_USB_C0_HPD	MAKE_BASE=TRUE				
		NC_USB_C1_HPD	==	NC_USB_C1_HPD	MAKE_BASE=TRUE				
		NC_USB_C2_HPD	==	NC_USB_C2_HPD	MAKE_BASE=TRUE				

Internal signal aliases - Must be configured on project pages per notes below.

Internal signal aliases - Copied or debug circuitry added between.

SOC, series caps

BBR A side

BBR B side

Connector

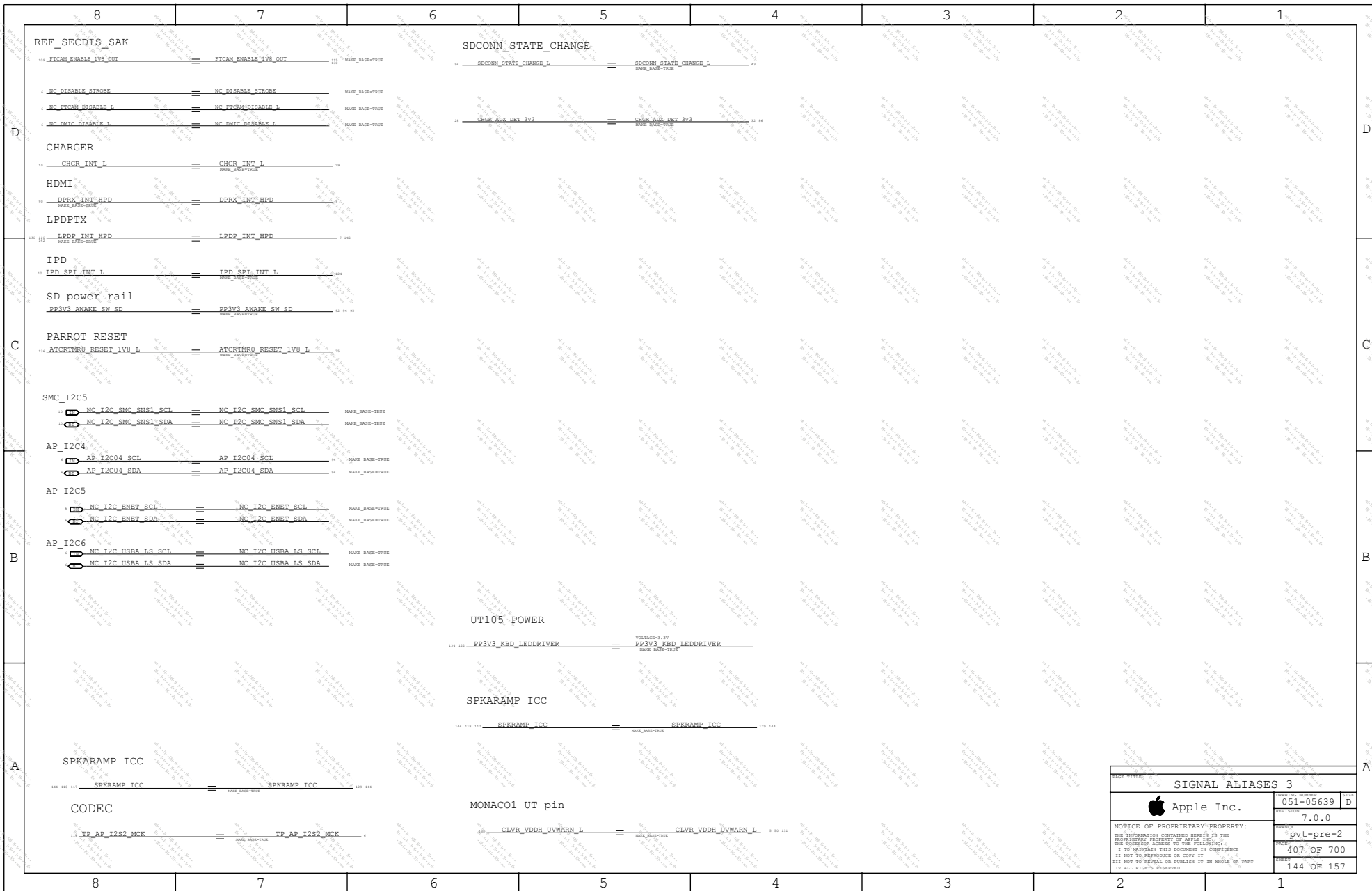
USBC0_ATOC_R2D_P<1>	USBC0_ATOC_R2D_P<1>	USBC0_R2D_CR_P<1>	USBC0_R2D_CR_P<1>
USBC0_ATOC_R2D_N<1>	USBC0_ATOC_R2D_N<1>	USBC0_R2D_CR_N<1>	USBC0_R2D_CR_N<1>
USBC0_ATOC_R2D_P<2>	USBC0_ATOC_R2D_P<2>	USBC0_R2D_CR_P<2>	USBC0_R2D_CR_P<2>
USBC0_ATOC_R2D_N<2>	USBC0_ATOC_R2D_N<2>	USBC0_R2D_CR_N<2>	USBC0_R2D_CR_N<2>
USBC0_ATOC_D2R_C_P<1>	USBC0_ATOC_D2R_C_P<1>	USBC0_D2R_P<1>	USBC0_D2R_P<1>
USBC0_ATOC_D2R_C_N<1>	USBC0_ATOC_D2R_C_N<1>	USBC0_D2R_N<1>	USBC0_D2R_N<1>
USBC0_ATOC_D2R_C_P<2>	USBC0_ATOC_D2R_C_P<2>	USBC0_D2R_P<2>	USBC0_D2R_P<2>
USBC0_ATOC_D2R_C_N<2>	USBC0_ATOC_D2R_C_N<2>	USBC0_D2R_N<2>	USBC0_D2R_N<2>
USBC1_ATOC_R2D_P<1>	USBC1_ATOC_R2D_P<1>	USBC1_R2D_CR_P<1>	USBC1_R2D_CR_P<1>
USBC1_ATOC_R2D_N<1>	USBC1_ATOC_R2D_N<1>	USBC1_R2D_CR_N<1>	USBC1_R2D_CR_N<1>
USBC1_ATOC_R2D_P<2>	USBC1_ATOC_R2D_P<2>	USBC1_R2D_CR_P<2>	USBC1_R2D_CR_P<2>
USBC1_ATOC_R2D_N<2>	USBC1_ATOC_R2D_N<2>	USBC1_R2D_CR_N<2>	USBC1_R2D_CR_N<2>
USBC1_ATOC_D2R_C_P<1>	USBC1_ATOC_D2R_C_P<1>	USBC1_D2R_P<1>	USBC1_D2R_P<1>
USBC1_ATOC_D2R_C_N<1>	USBC1_ATOC_D2R_C_N<1>	USBC1_D2R_N<1>	USBC1_D2R_N<1>
USBC1_ATOC_D2R_C_P<2>	USBC1_ATOC_D2R_C_P<2>	USBC1_D2R_P<2>	USBC1_D2R_P<2>
USBC1_ATOC_D2R_C_N<2>	USBC1_ATOC_D2R_C_N<2>	USBC1_D2R_N<2>	USBC1_D2R_N<2>
USBC2_R2D_CR_P<1>	USBC2_R2D_CR_P<1>	USBC2_R2D_CR_P<1>	USBC2_R2D_CR_P<1>
USBC2_R2D_CR_N<1>	USBC2_R2D_CR_N<1>	USBC2_R2D_CR_N<1>	USBC2_R2D_CR_N<1>
USBC2_R2D_CR_P<2>	USBC2_R2D_CR_P<2>	USBC2_R2D_CR_P<2>	USBC2_R2D_CR_P<2>
USBC2_R2D_CR_N<2>	USBC2_R2D_CR_N<2>	USBC2_R2D_CR_N<2>	USBC2_R2D_CR_N<2>
USBC2_D2R_P<1>	USBC2_D2R_P<1>	USBC2_D2R_P<1>	USBC2_D2R_P<1>
USBC2_D2R_N<1>	USBC2_D2R_N<1>	USBC2_D2R_N<1>	USBC2_D2R_N<1>
USBC2_D2R_P<2>	USBC2_D2R_P<2>	USBC2_D2R_P<2>	USBC2_D2R_P<2>
USBC2_D2R_N<2>	USBC2_D2R_N<2>	USBC2_D2R_N<2>	USBC2_D2R_N<2>

Caps and connector must be aliased to BBR signals.
BBR lanes 1 and 2 can be swapped, both pairs, both sides - all or nothing.
BBR inputs can be polarity inverted independently per pair.
All swaps and inversions must be communicated to TBT Firmware team.

USB2_ATC1_LS_P	USB2_ATC1_LS_P	HAUSE_BAISE-TRUE
USB2_ATC1_LS_N	USB2_ATC1_LS_N	HAUSE_BAISE-TRUE
USB2_ATC2_LS_P	USB2_ATC2_LS_P	HAUSE_BAISE-TRUE
USB2_ATC2_LS_N	USB2_ATC2_LS_N	HAUSE_BAISE-TRUE
EUSB_ATC0_P	EUSB_ATC0_P	
EUSB_ATC0_N	EUSB_ATC0_N	
EUSB_ATC1_P	EUSB_ATC1_P	
EUSB_ATC1_N	EUSB_ATC1_N	
EUSB_ATC2_P	EUSB_ATC2_P	
EUSB_ATC2_N	EUSB_ATC2_N	
USBC1_3V3LDO_EN	USBC1_3V3LDO_EN	
USBC2_3V3LDO_EN	USBC2_3V3LDO_EN	

ATC0TMR0_THERM_D_P	TP-P5	TPE100
ATC0TMR0_THERM_D_N	TP-P5	TPE101
ATC0TMR1_THERM_D_P	TP-P5	TPE102
ATC0TMR1_THERM_D_N	TP-P5	TPE103
ATC0TMR2_THERM_D_P	TP-P5	TPE104
ATC0TMR2_THERM_D_N	TP-P5	TPE105

SYNC MASTER=t728Integrator		DATE=01/31/2011
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	8	7	6	5	4	3	2	1
	D2D IO				NC SPN's			
D	ISP GPIO		AOP IO		NAND		CLVR SPMI	
	NC_IRQCAM_RESET_L	NC_IRQCAM_RESET_L	TP_AOP_GPIO13	TP_AOP_GPIO1	SOC_DOMAIN_HGPI0_GRP0_0	SOC_DOMAIN_HGPI0_GRP0_0	NC_I2C_SE_SCL	NC_I2C_SE_SDA
	NC_CAM_PMU_RESET_L	NC_CAM_PMU_RESET_L	NC_AOP_GPIO1	NC_AOP_GPIO1	SOC_DOMAIN_HGPI0_GRP0_1	SOC_DOMAIN_HGPI0_GRP0_1	NC_AP_UART2_R2D	NC_AP_UART2_D2R
			NC_AOP_GPIO5	NC_AOP_GPIO5			NC_AP_UART2_R2D_RTS_L	NC_AP_UART2_D2R_CTS_L
			NC_AOP_I2CM1_SCL	NC_AOP_I2CM1_SCL			NC_AP_UART2_D2R_CTS_L	NC_AP_UART3_R2D
			NC_AOP_I2CM1_SDA	NC_AOP_I2CM1_SDA			NC_AP_UART3_R2D_RTS_L	NC_AP_UART3_D2R
			NC_FPM_DMIC_CLK1	NC_FPM_DMIC_CLK1			NC_AP_UART3_D2R_CTS_L	NC_AP_UART4_R2D
			NC_AOP_I2S0_MCK	NC_AOP_I2S0_MCK			NC_AP_UART4_R2D_RTS_L	NC_AP_UART4_D2R
			NC_AOP_I2S0_LRCK	NC_AOP_I2S0_LRCK			NC_AP_UART4_D2R_CTS_L	NC_AP_UART4_R2D_RTS_L
			NC_AOP_I2S0_DOUT	NC_AOP_I2S0_DOUT			NC_AP_UART4_D2R_CTS_L	NC_AP_UART4_R2D_CTS_L
C	CLVR GPIO		CLVR SPMI		ISP SPMI		VIPER PWM	
	NC_CLVR_GPIO1	NC_CLVR_GPIO1	NC_SPMI_CLVR3_CLK_R	NC_SPMI_CLVR3_CLK_R	NC_SPMI_ISP_CAM_CLK_R	NC_SPMI_ISP_CAM_CLK_R	SOC_DOMAIN_GPIO_GRP1_2	NC_SPM11_ISP_CLK
	NC_CLVR_GPIO2	NC_CLVR_GPIO2	NC_SPMI_CLVR3_DATA_R	NC_SPMI_CLVR3_DATA_R	NC_SPMI_ISP_CAM_DATA_R	NC_SPMI_ISP_CAM_DATA_R	NC_SPM11_ISP_DATA	NC_SPM11_ISP_DATA
	NC_CLVR_GPIO3	NC_CLVR_GPIO3	NC_SPMI_CLVR4_CLK_R	NC_SPMI_CLVR4_CLK_R	NC_ISP_I2C0_SCL	NC_ISP_I2C0_SCL		
	NC_CLVR_GPIO4	NC_CLVR_GPIO4	NC_SPMI_CLVR4_DATA_R	NC_SPMI_CLVR4_DATA_R	NC_ISP_I2C0_SDA	NC_ISP_I2C0_SDA		
	NC_CLVR_GPIO5	NC_CLVR_GPIO5			NC_ISP_I2C1_SCL	NC_ISP_I2C1_SCL		
	NC_CLVR_GPIO6	NC_CLVR_GPIO6			NC_ISP_I2C1_SDA	NC_ISP_I2C1_SDA		
	SOC_DOMAIN_GPIO_GRP1_0	SOC_DOMAIN_GPIO_GRP1_0			NC_ISP_I2C3_SCL	NC_ISP_I2C3_SCL		
	NC_CLVR_GPIO8	NC_CLVR_GPIO8			NC_ISP_I2C3_SDA	NC_ISP_I2C3_SDA		
	NC_CLVR_GPIO9	NC_CLVR_GPIO9						
B	SMC GPIO		NC SPN's		SOC GPIO TPs BY DOMAIN		NUB SWD	
	NC_ACDC_BURST_EN_L	NC_ACDC_BURST_EN_L	NC_TDM_SPKRAMP_ALT_BCLK_R	NC_TDM_SPKRAMP_ALT_BCLK_R	Nonused SOC pins pulled out by functional/power domains			
	NC_ACDC_ID	NC_ACDC_ID	NC_TDM_SPKRAMP_ALT_D2R	NC_TDM_SPKRAMP_ALT_D2R				
	NC_PSH_TBD3	NC_PSH_TBD3	NC_TDM_SPKRAMP_ALT_FSYNC_R	NC_TDM_SPKRAMP_ALT_FSYNC_R				
	SOC_DOMAIN_HGPI0_AOP1	SOC_DOMAIN_HGPI0_AOP1	NC_TDM_SPKRAMP_ALT_R2D_R	NC_TDM_SPKRAMP_ALT_R2D_R				
	NC_SMC_GPIO2	NC_SMC_GPIO2	NC_AP_I2S3_MCK	NC_AP_I2S3_MCK				
	NC_SMC_GPIO3	NC_SMC_GPIO3	NC_AP_I2S0_MCK	NC_AP_I2S0_MCK				
	NC_SMC_GPIO4	NC_SMC_GPIO4	NC_AP_I2S1_MCK	NC_AP_I2S1_MCK				
	NC_SMC_I2CM6_SCL	NC_SMC_I2CM6_SCL						
	NC_SMC_I2CM6_SDA	NC_SMC_I2CM6_SDA						
A	NUB GPIO		NC SPN's		SOC GPIO TPs BY DOMAIN		SEP	
	SOC_DOMAIN_HGPI0_AOP1_2	SOC_DOMAIN_HGPI0_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_HGPI0_AOP1_0	SOC_DOMAIN_HGPI0_AOP1_0	NC_TDM_SPKRAMP_ALT_D2R	NC_TDM_SPKRAMP_ALT_D2R				
	SOC_DOMAIN_HGPI0_AOP1_1	SOC_DOMAIN_HGPI0_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				
A	SECDIS		NC SPN's		SOC GPIO TPs BY DOMAIN		ENET GPIO	
	SOC_DOMAIN_HGPI0_GRP1	SOC_DOMAIN_HGPI0_GRP1	NC_TDM_SPKRAMP_ALT_BCLK_R	NC_TDM_SPKRAMP_ALT_BCLK_R	Nonused SOC pins pulled out by functional/power domains			
			NC_TDM_SPKRAMP_ALT_D2R	NC_TDM_SPKRAMP_ALT_D2R				
			NC_TDM_SPKRAMP_ALT_FSYNC_R	NC_TDM_SPKRAMP_ALT_FSYNC_R				
			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				

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3X				Y	EPD0 20C	S	A DIELECTRIC 3X				Y	UART	S	A DIELECTRIC 2X				Y	RESETS	S	A DIELECTRIC 2X				Y	WDOG	S	A DIELECTRIC 3X				Y	SDIOCH07	S	A DIELECTRIC 3X				Y	POWER_BUTTON	S	A DIELECTRIC 3X				Y	FAULT	S	A DIELECTRIC 3X				Y	UPD0 FEM	S	A DIELECTRIC 3X				Y	FAN CTRL	S	A DIELECTRIC 2X				Y	<table><tr><th colspan="2">CLASS DEFINITIONS</th><th colspan="2">CONSTRAINT SET</th><th colspan="2">COMMA SEPARATED WITH WILDCARD SUPPORT; NET NAMES EX: D0R* DP NAMES EX: DP:DP_AA*,DP_BB* (LINE STARTS WITH FLAG DP:)</th><th>---</th></tr><tr><th>CLASS NAME</th><th></th><th></th><th></th><th></th><th></th><th>V/M</th></tr><tr><td>USBC SOC BSB2 D2R 1</td><td>S</td><td>A DIELECTRIC 7X</td><td></td><td></td><td></td><td>Y</td></tr><tr><td>USBC SOC BSB2 D2R 2</td><td>S</td><td>A DIELECTRIC 7X</td><td></td><td></td><td></td><td>Y</td></tr><tr><td>USBC SOC BSB2 R2D 1</td><td>S</td><td>A DIELECTRIC 7X</td><td></td><td></td><td></td><td>Y</td></tr><tr><td>USBC SOC BSB2 R2D 2</td><td>S</td><td>A DIELECTRIC 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35300744	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300754	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300764	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300774	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300784	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300794	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300804	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300814	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300824	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300834	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300844	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300854	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300864	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300874	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300884	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300894	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300904	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300914	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300924	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300934	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300944	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300954	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300964	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300974	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300984	35300440	ALT_CNN	ALL	<CENAR//5642490>																																																																																																																																																																																																																																																																																																																			
35300994	35300440	ALT_CNN	ALL	<																																																																																																																																																																																																																																																																																																																			

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,S5E4,120MBT,K0X,S5E,256G,H,S5EA110	UN000	CRITICAL	NANDO_S5E0:512GB_KX
335800437	1	NAND,S5E4,120MBT,K0X,S5E,512G,H,S5EA110	UN000	CRITICAL	NANDO_S5E0:512GB_HY
335800489	1	NAND,S5E4,180MBT,K0X,S5E,256G,H,S5EA110	UN000	CRITICAL	NANDO_S5E0:512GB_WD
335800464	1	NAND,S5E4,120MBT,K0X,S5E,256G,H,S5EA110	UN000	CRITICAL	NANDO_S5E0:1TB_KX
335800572	1	NAND,S5E4,256MBT,K0X,S5E,256G,H,S5EA110	UN000	CRITICAL	NANDO_S5E0:1TB_WD
335800438	1	NAND,S5E4,256MBT,K0X,S5E,512G,H,S5EA110	UN000	CRITICAL	NANDO_S5E0:1TB_HY
335800466	1	NAND,S5E4,512MBT,K0X,S5E,256G,H,S5EA110	UN000	CRITICAL	NANDO_S5E0:1TB_KX
335800439	1	NAND,S5E4,512MBT,K0X,S5E,512G,H,S5EA110	UN000	CRITICAL	NANDO_S5E0:1TB_HY
335800474	1	NAND,S5E4,512MBT,K0X,S5E,256G,H,S5EA110	UN000	CRITICAL	NANDO_S5E0:2TB_WD
335800466	1	NAND,S5E4,512MBT,K0X,S5E,256G,H,S5EA110	UN000	CRITICAL	NANDO_S5E0:4TB_KX
335800439	1	NAND,S5E4,512MBT,K0X,S5E,512G,H,S5EA110	UN000	CRITICAL	NANDO_S5E0:4TB_HY
335800474	1	NAND,S5E4,512MBT,K0X,S5E,256G,H,S5EA110	UN000	CRITICAL	NANDO_S5E0:4TB_WD
335800458	1	NAND,S5E4,1024MBT,K0X,S5E,512G,H,S5EA110	UN000	CRITICAL	NANDO_S5E0:8TB_HY
335800468	1	NAND,S5E4,1787,K0X,S5E,512G,H,S5EA110	UN000	CRITICAL	NANDO_S5E0:8TB_KX
335800535	1	NAND,B10297,1787,K0X,S5E,512G,H,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	UN000,UN200,UN300	CRITICAL	NANDO_S5E_STUDY
998-21934	3	IC,NANDO,S5E MCP ROUTING STUDY,LSA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E_STUDY_2TB
335800462	3	NAND,S5E4,120MBT,K0X,S5E,256G,H,S5EA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E123:512GB_KX
335800437	3	NAND,S5E4,120MBT,K0X,S5E,512G,H,S5EA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E123:512GB_HY
335800470	3	NAND,S5E4,120MBT,K0X,S5E,512G,H,S5EA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E123:512GB_WD
335800464	3	NAND,S5E4,256MBT,K0X,S5E,256G,H,S5EA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E123:1TB_KX
335800572	3	NAND,S5E4,256MBT,K0X,S5E,256G,H,S5EA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E123:1TB_WD
335800438	3	NAND,S5E4,256MBT,K0X,S5E,512G,H,S5EA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E123:1TB_HY
335800466	3	NAND,S5E4,512MBT,K0X,S5E,256G,H,S5EA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E123:2TB_KX
335800439	3	NAND,S5E4,512MBT,K0X,S5E,512G,H,S5EA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E123:2TB_HY
335800474	3	NAND,S5E4,512MBT,K0X,S5E,256G,H,S5EA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E123:2TB_WD
335800466	3	NAND,S5E4,512MBT,K0X,S5E,256G,H,S5EA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E123:4TB_KX
335800439	3	NAND,S5E4,512MBT,K0X,S5E,512G,H,S5EA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E123:4TB_HY
335800474	3	NAND,S5E4,512MBT,K0X,S5E,256G,H,S5EA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E123:4TB_WD
335800458	3	NAND,S5E4,1024MBT,K0X,S5E,512G,H,S5EA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E123:8TB_HY
335800468	3	NAND,S5E4,1787,K0X,S5E,512G,H,S5EA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E123:8TB_KX
335800535	3	NAND,B10297,1787,K0X,S5E,512G,H,LSA110	UN000,UN200,UN300	CRITICAL	NANDO_S5E123:8TB_WD

NAND SOCKET

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
939-08815	2	PCB,NANDSOCKET,V121	UN000,UN600	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,S5E4,640MBT,K0X,S5E,512G,H,S5EA110	UN500	CRITICAL	NANDO_S5E0:512GB_HY
335800436	1	NAND,S5E4,640MBT,K0X,S5E,512G,H,S5EA110	UN500	CRITICAL	NANDO_S5E0:1TB_HY
335800466	1	NAND,S5E4,512MBT,K0X,S5E,256G,H,S5EA110	UN500	CRITICAL	NANDO_S5E0:4TB_KX
335800439	1	NAND,S5E4,512MBT,K0X,S5E,512G,H,S5EA110	UN500	CRITICAL	NANDO_S5E0:4TB_HY
335800474	1	NAND,S5E4,512MBT,K0X,S5E,256G,H,S5EA110	UN500	CRITICAL	NANDO_S5E0:4TB_WD
335800458	1	NAND,S5E4,1024MBT,K0X,S5E,512G,H,S5EA110	UN500	CRITICAL	NANDO_S5E0:8TB_HY
335800468	1	NAND,S5E4,1787,K0X,S5E,512G,H,S5EA110	UN500	CRITICAL	NANDO_S5E0:8TB_KX
335800535	1	NAND,B10297,1787,K0X,S5E,512G,H,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	UN600,UN700,UN800	CRITICAL	NANDO_S5E_STUDY
998-21934	3	IC,NANDO,S5E MCP ROUTING STUDY,LSA110	UN600,UN700,UN800	CRITICAL	NANDO_S5E_STUDY_2TB
335800466	3	NAND,S5E4,120MBT,K0X,S5E,256G,H,S5EA110	UN600,UN700,UN800	CRITICAL	NANDO_S5E123:4TB_KX
335800439	3	NAND,S5E4,512MBT,K0X,S5E,512G,H,S5EA110	UN600,UN700,UN800	CRITICAL	NANDO_S5E123:4TB_HY
335800474	3	NAND,S5E4,512MBT,K0X,S5E,256G,H,S5EA110	UN600,UN700,UN800	CRITICAL	NANDO_S5E123:4TB_WD
335800458	3	NAND,S5E4,1024MBT,K0X,S5E,512G,H,S5EA110	UN600,UN700,UN800	CRITICAL	NANDO_S5E123:8TB_HY
335800468	3	NAND,S5E4,1787,K0X,S5E,512G,H,S5EA110	UN600,UN700,UN800	CRITICAL	NANDO_S5E123:8TB_KX
335800535	3	NAND,B10297,1787,K0X,S5E,512G,H,LSA110	UN600,UN700,UN800	CRITICAL	NANDO_S5E123:8TB_WD

NAND BOM OPTION TABLES			
Apple Inc.		DOCUMENT NUMBER	051-05639
		REVISION	7.0.0
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		SHEET	156 OF 157

REF_CLVR_MONACO

PACK OPTIONS TO INCLUDE IN NETLIST

CLVR C-CHOP

CLVR LC NC

REF_VR_ICEMAN

PACK OPTIONS TO INCLUDE IN NETLIST

VR5 AOM PHUS-B12

VR5 AOM L20-POR

VR5 EXT DIODE

FRV311M MUX1Y

VR5 INDUCTOR12F4MM

VR5 AOM MISC-RYS

REF_VR_VIPER

PACK OPTIONS TO INCLUDE IN NETLIST

VIPER13ER

VIPER DRG

VIPER L2MMH

VIPER C5543

REF_VR_SV_TF62130

PACK OPTIONS TO INCLUDE IN NETLIST

SUBSTRS PHUS-B12

REF_USBC_ACE2

PACK OPTIONS TO INCLUDE IN NETLIST

USBC LAPTOP

USBC SPI UPIC

USBC SPI UPIC2

USBC CHRGD UPIC

PRGS1 LARGER PITCH

REF_STWINGP_S16

PACK OPTIONS TO INCLUDE IN NETLIST

ZVS HAND PHUS-B12

REF_SECDIS_BAK

PACK OPTIONS TO INCLUDE IN NETLIST

PRGD SECDIS

JTAG SECDIS:YES

PRGD_SECDIS:NOTMIF1

PRGD_BULLDOWN SECDIS

JTAG SECDIS:CONN

REF_SPEERAMP_SB02176

PACK OPTIONS TO INCLUDE IN NETLIST

SPEERAMP A

SPEERAMP B

SPEERAMP C

SPEERAMP D

SPEERAMP E

SPEERAMP F

SPEERAMP TIC GB

REF_WIRELESS_TYPHOON

PACK OPTIONS TO INCLUDE IN NETLIST

SINWAY

SV ANTENNA

WLBT D2B TP JADE

WLBT TP OF2

REF_PMIC_MAVERICKS

PACK OPTIONS TO INCLUDE IN NETLIST

MEMU L504

SPMU EM1

SPMU L503

PMOUTF12ND

PMU D5SP21N

PMU BRAN1N

PMU32P1205_002E

SPMU U50110B

REF_HDMI_MADREA

PACK OPTIONS TO INCLUDE IN NETLIST

HDMI L5010M-SHMI

HDMI10MM133FIN

HDMI CHC-NO

HDMI20C-TATC3

REF_SOC_N136

PACK OPTIONS TO INCLUDE IN NETLIST

EEPROM DEV

LP0PTX X4

LP0PTX X1

MIFID DEV

MIFID NC

ENET NC

ATC3 HDMI

HAND K1C

ECOCARD

SPMI R

GPFC1B3 DEV

X2724 MLB for P0

PACK OPTIONS TO INCLUDE IN NETLIST

VITAMINC

PO/POR

SPER_P0/SPER_POR

BATT_P0/BATT_POR

<-BOM

<-BOM

20U SOC ECPU CAPS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
138800036	6	CAP,CER,100F,20V,1.5V,660,LOW NOISE,0402	ENR018_ECPU_20UF_30V	CRITICAL	
138800035	6	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_ECPU_20UF_30V	CRITICAL	
998-22077	6	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_ECPU_20UF_30V	CRITICAL	

20U SOC ECPU CAPS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
138800036	6	CAP,CER,100F,20V,1.5V,660,LOW NOISE,0402	ENR018_ECPU_20UF_30V	CRITICAL	
138800035	6	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_ECPU_20UF_30V	CRITICAL	
998-22077	6	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_ECPU_20UF_30V	CRITICAL	

20U SOC ECPU CAPS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
138800036	6	CAP,CER,100F,20V,1.5V,660,LOW NOISE,0402	ENR018_ECPU_20UF_30V	CRITICAL	
138800035	6	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_ECPU_20UF_30V	CRITICAL	
998-22077	6	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_ECPU_20UF_30V	CRITICAL	

ENOISE CAP SELECTION

1V8 CAPS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
138800037	5	CAP,CER,100F,20V,4V,6402,LOW NOISE	C2740-C2744	CRITICAL	ENR018_1V8_10UF_30V
138800073	5	CAP,CER,100F,20V,4V,3V,6402,LOW NOISE,0402	C2740-C2744	CRITICAL	ENR018_1V8_10UF_30V
138800036	5	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	C2685-C2689	CRITICAL	ENR018_1V8_10UF_30V
138800035	5	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	C2685-C2689	CRITICAL	ENR018_1V8_10UF_30V
998-22077	5	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	C2685-C2689	CRITICAL	ENR018_1V8_10UF_30V

VDDH CAPS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
138800036	30	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_VDDH_10UF_30V	CRITICAL	ENR018_VDDH_10UF_30V
138800035	30	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_VDDH_10UF_30V	CRITICAL	ENR018_VDDH_10UF_30V
998-22077	30	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_VDDH_10UF_30V	CRITICAL	ENR018_VDDH_10UF_30V

20UF 2VB SOC CAPS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
138800036	27	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP1120UF_30V	CRITICAL	ENR018_SBP1120UF_30V
138800036	22	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP1120UF_30V	CRITICAL	ENR018_SBP1120UF_30V
138800036	33	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP1120UF_30V	CRITICAL	ENR018_SBP1120UF_30V
138800036	25	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP1120UF_30V	CRITICAL	ENR018_SBP1120UF_30V
138800036	84	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP1120UF_30V	CRITICAL	ENR018_SBP1120UF_30V
138800036	22	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP1120UF_30V	CRITICAL	ENR018_SBP1120UF_30V
138800036	15	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP1120UF_30V	CRITICAL	ENR018_SBP1120UF_30V

150UF ZRX SOC CAPS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
998-22815	27	CAP,CER,150F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP11150UF_30V	CRITICAL	ENR018_SBP11150UF_30V
998-22815	22	CAP,CER,150F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP11150UF_30V	CRITICAL	ENR018_SBP11150UF_30V
998-22815	33	CAP,CER,150F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP11150UF_30V	CRITICAL	ENR018_SBP11150UF_30V
998-22815	25	CAP,CER,150F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP11150UF_30V	CRITICAL	ENR018_SBP11150UF_30V
998-22815	84	CAP,CER,150F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP11150UF_30V	CRITICAL	ENR018_SBP11150UF_30V
998-22815	22	CAP,CER,150F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP11150UF_30V	CRITICAL	ENR018_SBP11150UF_30V
998-22815	15	CAP,CER,150F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP11150UF_30V	CRITICAL	ENR018_SBP11150UF_30V

150UF H2TL SOC CAPS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
138800392	27	CAP,CER,150F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP11150UF_30V	CRITICAL	ENR018_SBP11150UF_30V
138800392	22	CAP,CER,150F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP11150UF_30V	CRITICAL	ENR018_SBP11150UF_30V
138800392	33	CAP,CER,150F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP11150UF_30V	CRITICAL	ENR018_SBP11150UF_30V
138800392	25	CAP,CER,150F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP11150UF_30V	CRITICAL	ENR018_SBP11150UF_30V
138800392	84	CAP,CER,150F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP11150UF_30V	CRITICAL	ENR018_SBP11150UF_30V
138800392	22	CAP,CER,150F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP11150UF_30V	CRITICAL	ENR018_SBP11150UF_30V
138800392	15	CAP,CER,150F,20V,2.5V,660,LOW NOISE,0402	ENR018_SBP11150UF_30V	CRITICAL	ENR018_SBP11150UF_30V

20U SOC ECPU CAPS

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
138800036	6	CAP,CER,100F,20V,1.5V,660,LOW NOISE,0402	ENR018_ECPU_20UF_30V	CRITICAL	
138800035	6	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_ECPU_20UF_30V	CRITICAL	
998-22077	6	CAP,CER,200F,20V,2.5V,660,LOW NOISE,0402	ENR018_ECPU_20UF_30V	CRITICAL	

Pin Delay

PIN DELAY MAPPING #FILE

REFERENCE DES	FILE NAME
00606	SCA_PINDELAY_2020_01_08.CAV

SYNC MASTER=t28Integrator

DATE=2020/01/08/2021

PACK TITLE

PACK OPTIONS

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