

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.	REV	ECN	DESCRIPTION OF REVISION	CK APPD DATE
	2	0032865190	ENGINEERING RELEASED	2021-12-15

X2143 KBD DAUGHTER BOARD

LAST_MODIFICATION=Thu Sep 30 18:25:26 2021

PAGE	CSA CONTENTS	SYNC	DATE
1	<CSA_PAGE1> TABLE OF CONTENTS	<SYNC_MASTER1>	<SYNC_DATE1>
2	<CSA_PAGE2> BLOCK DIAGRAM	<SYNC_MASTER2>	<SYNC_DATE2>
3	<CSA_PAGE3> MLB B2B CONNECTOR	<SYNC_MASTER3>	<SYNC_DATE3>
4	<CSA_PAGE4> TOUCHID CONN	<SYNC_MASTER4>	<SYNC_DATE4>
5	<CSA_PAGE5> TOUCHID POWER	<SYNC_MASTER5>	<SYNC_DATE5>
6	<CSA_PAGE6> LAS BYPASS	<SYNC_MASTER6>	<SYNC_DATE6>
7	<CSA_PAGE7> KEYBOARD IOXP/RSLOC KEYS	<SYNC_MASTER7>	<SYNC_DATE7>
8	<CSA_PAGE8> KEYBOARD CONNECTOR & ESD	<SYNC_MASTER8>	<SYNC_DATE8>
9	<CSA_PAGE9> BEN: KEYBD BKLT	<SYNC_MASTER9>	<SYNC_DATE9>
10	<CSA_PAGE10> LED CONNECTORS	<SYNC_MASTER10>	<SYNC_DATE10>
11	<CSA_PAGE11> AUDIO JACK CODEC	<SYNC_MASTER11>	<SYNC_DATE11>
12	<CSA_PAGE12> Audio Jack Flex Connector	<SYNC_MASTER12>	<SYNC_DATE12>
13	<CSA_PAGE13> CONSTRAINS & TEST POINTS	<SYNC_MASTER13>	<SYNC_DATE13>
	<CSA_PAGE14>	<SYNC_MASTER14>	<SYNC_DATE14>
	<CSA_PAGE15>	<SYNC_MASTER15>	<SYNC_DATE15>

SCHEMATIC: 051-08064

PCBF: 820-02862

PCBA: 639-16101


SCHEMATIC & PCB

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
051-08064	1	SCH, KBDB CODEC,X2143	SCH	CRITICAL	
820-02862	1	PCBF,KBDB CODEC,X2143	PCB	CRITICAL	
806-35241	1	SHIELD CAN,KBDB CODEC,X2147	SHIELD	CRITICAL	


BOM VARIANTS


BOM NUMBER	BOM NAME	BOM OPTIONS
639-16101	PCBA,KBDB CODEC,X2143	COMMON,ALTERNATE,BLC_5V_R_0,BLC_5V_C_1

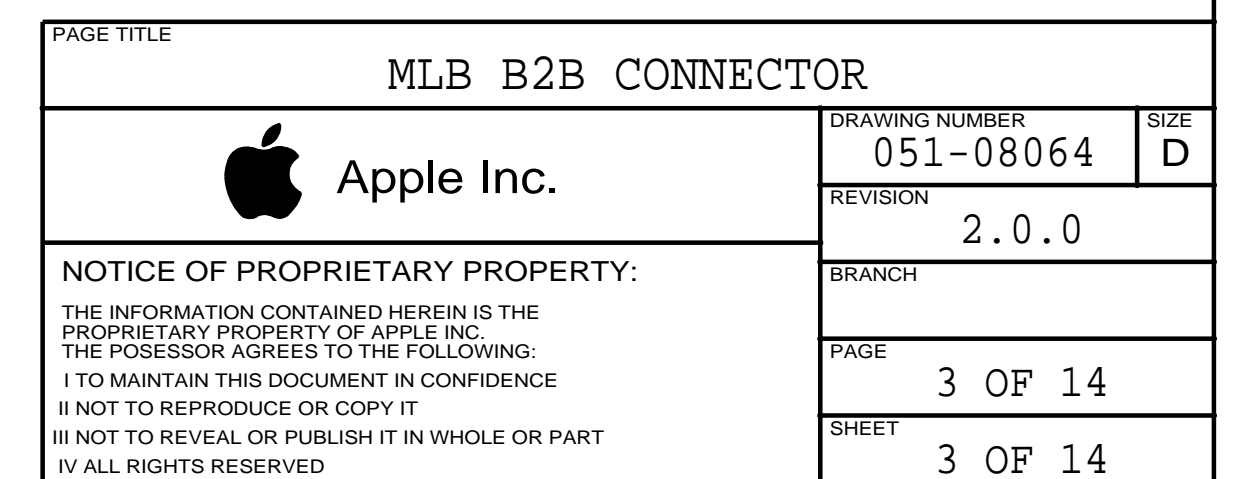
FAB#F0196

DRAWING TITLE SCHEM,KBD-DAUGHTER,CODEC,X2203		
 Apple Inc.	DRAWING NUMBER 051-08064	SIZE D
	REVISION 2.0.0	BRANCH
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED	PAGE 1 OF 14	SHEET 1 OF 14

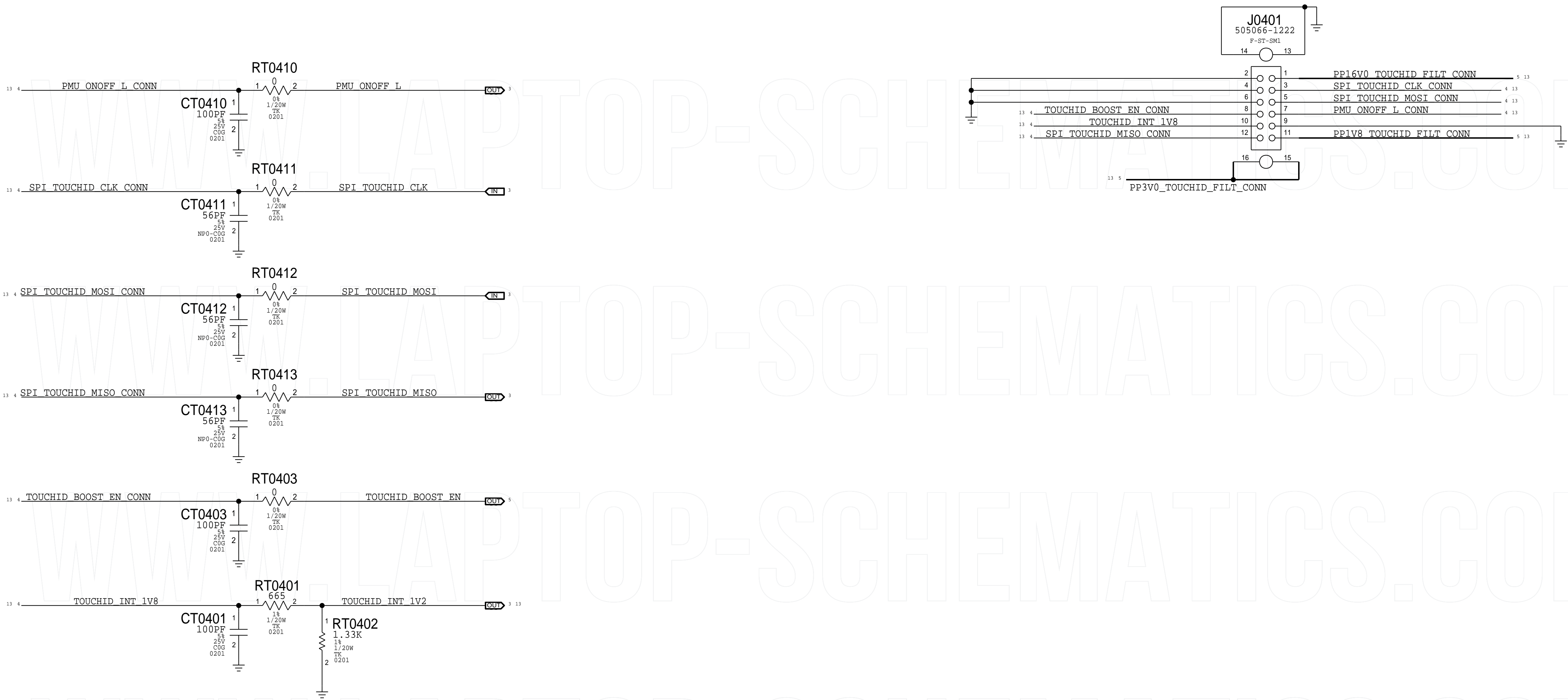
8		7		6		5		4		3		2		1		
																D
																C
																B
																A
8		7		6		5		4		3		2		1		

PAGE TITLE			BLOCK DIAGRAM		
 Apple Inc.		DRAWING NUMBER		051-08064	
		REVISION		2.0.0	
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED		BRANCH			
		PAGE		2 OF 14	
		SHEET		2 OF 14	

PAGE TITLE			BLOCK DIAGRAM		
 Apple Inc.			DRAWING NUMBER	051-08064	SIZE
			REVISION	2.0.0	D
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED			BRANCH		
			PAGE		
			2 OF 14		
			SHEET		
			2 OF 14		



ISOLATE FROM OTHER COMPONENTS / NETS AS MUCH AS POSSIBLE



PAGE TITLE		
TOUCHID_CONN		
	DRAWING NUMBER	051-08064
	REVISION	2.0.0
NOTICE OF PROPRIETARY PROPERTY:		
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING:		
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE		
I NOT TO REPRODUCE OR COPY IT		
I NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART		
I ALL RIGHTS RESERVED		

BOM_COST_GROUP=TOUCHID

D

C

B

A

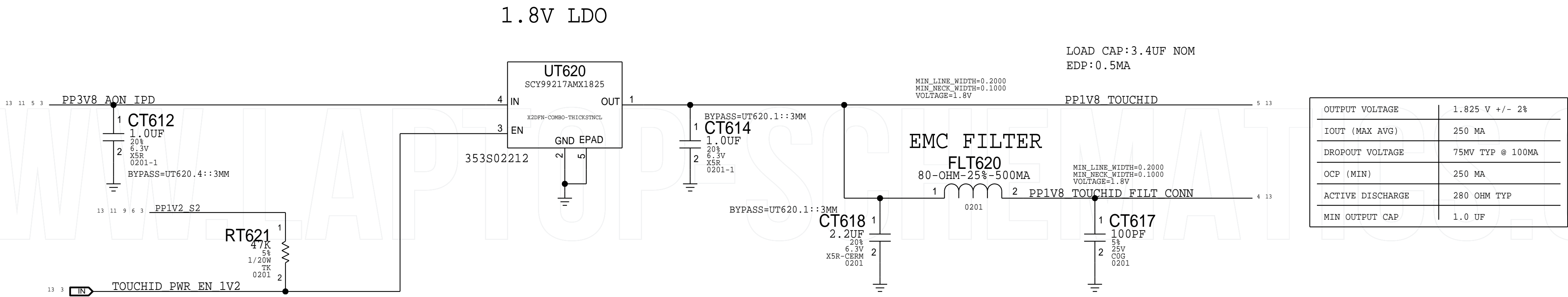
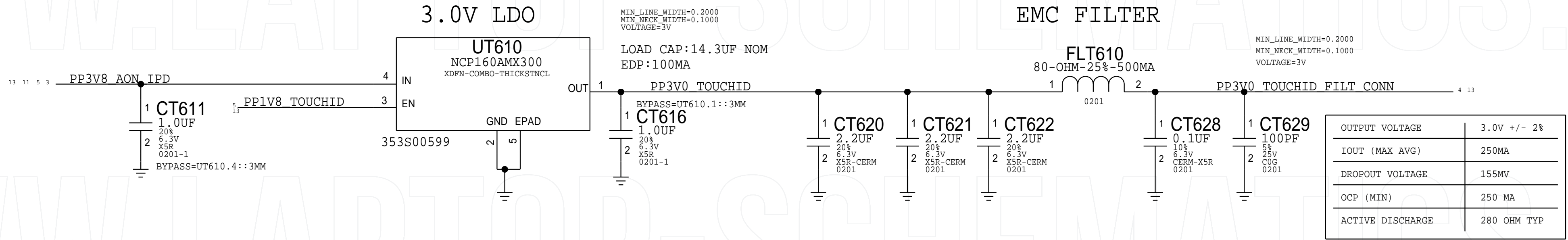
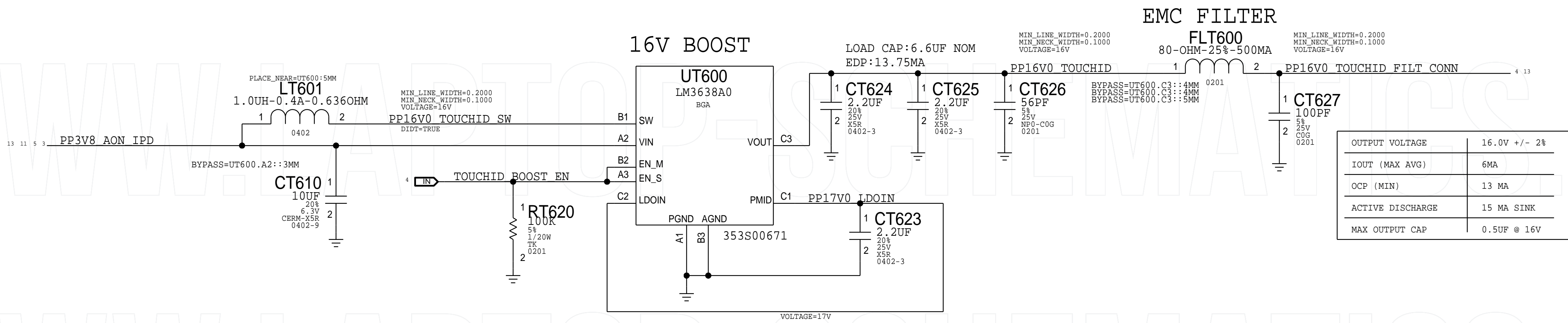
D

C

B


A

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



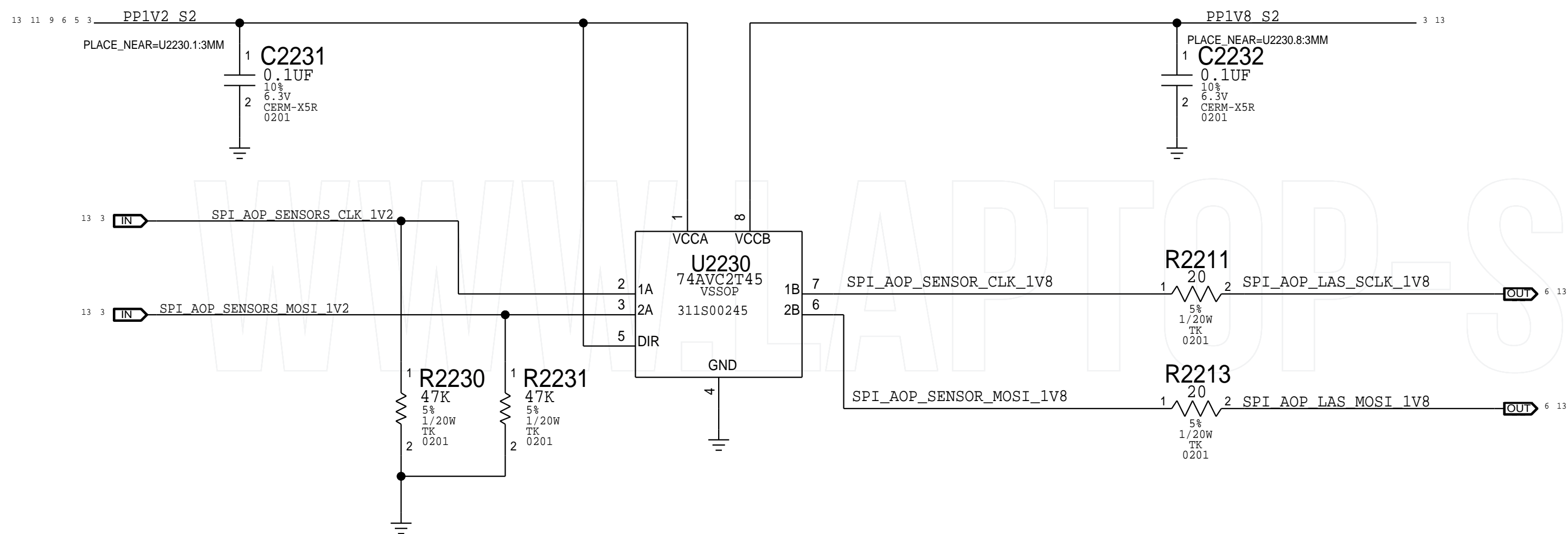
UT620 CHANGED FROM 353S00754 TO 353S02212 FOR 1.2V EN SIGNAL SUPPORT.
N.B.: TOUCHID_PWR_EN REQUIRES 47K PULL-UP TO PP1V25_S2 AT THE SOC

BOM_COST_GROUP=TOUCHID

TOUCHID POWER		
 Apple Inc.	DRAWING NUMBER	051-08064
	REVISION	2.0.0
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED	BRANCH	
	PAGE	5 OF 14
	SHEET	5 OF 14

D

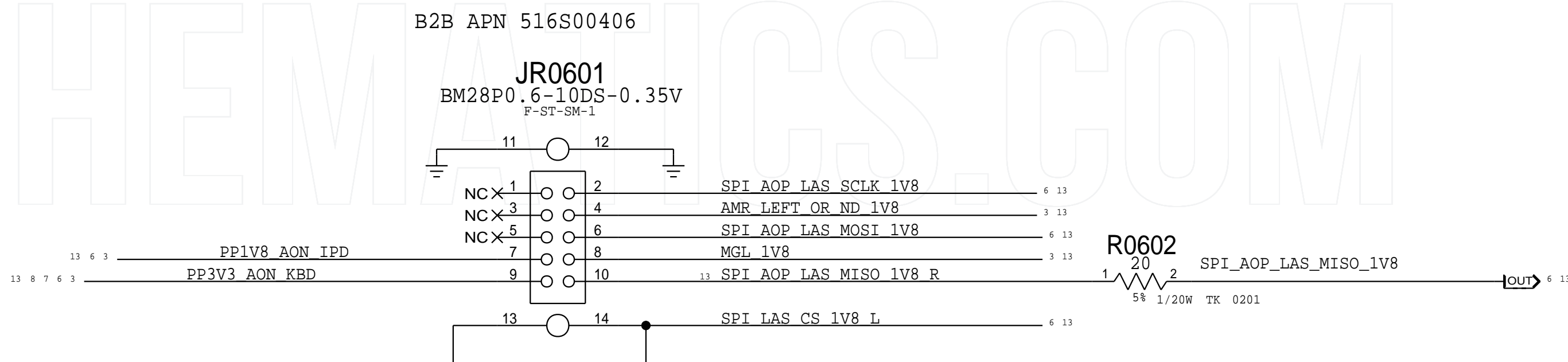
D



C

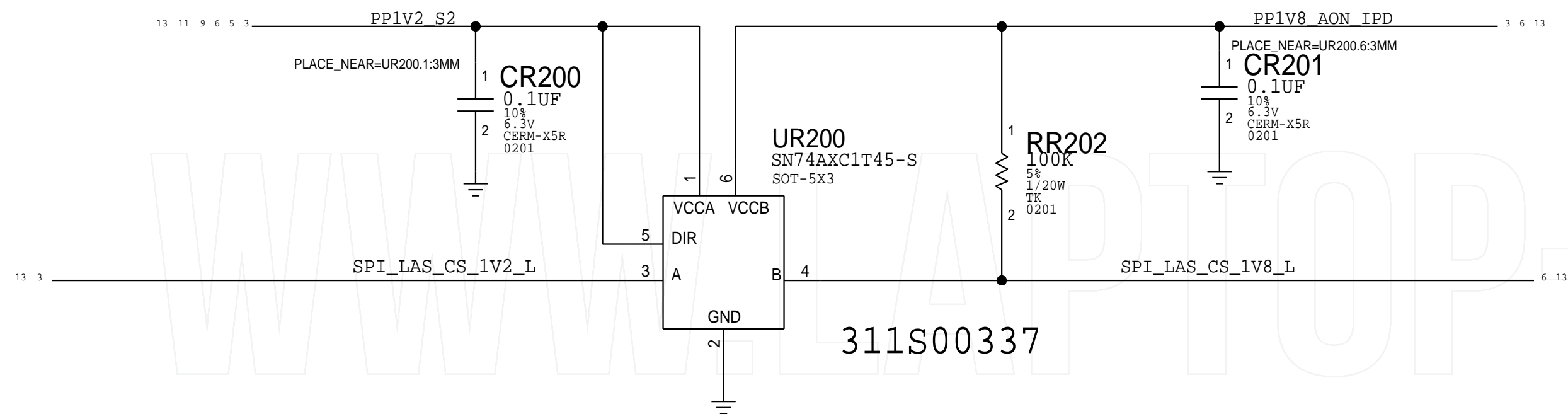
C

LAS FLEX B2B CONNECTOR



B

B



CURRENT PER RAIL

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

A

A

LAS BYPASS		
	DRAWING NUMBER	051-08064
	REVISION	2.0.0
NOTICE OF PROPRIETARY PROPERTY:		
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING:		
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE		
I NOT TO REPRODUCE OR COPY IT		
I NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART		
I ALL RIGHTS RESERVED		
BOM_COST_GROUP=SOC		

BOM_COST_GROUP=SOC

D

C

B

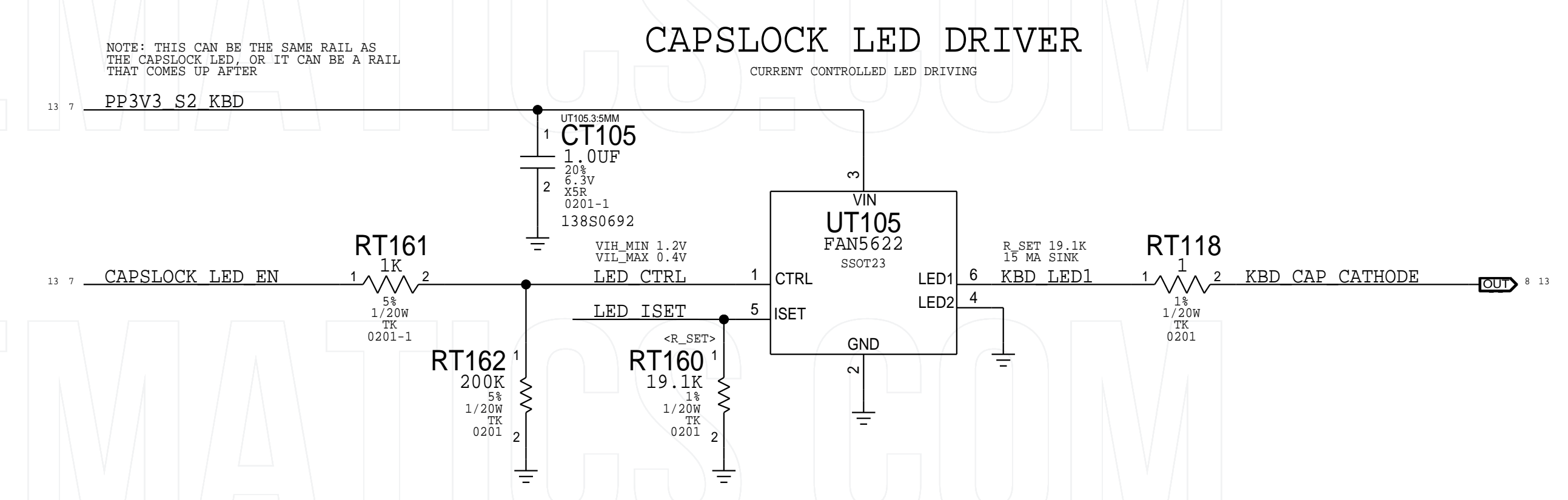
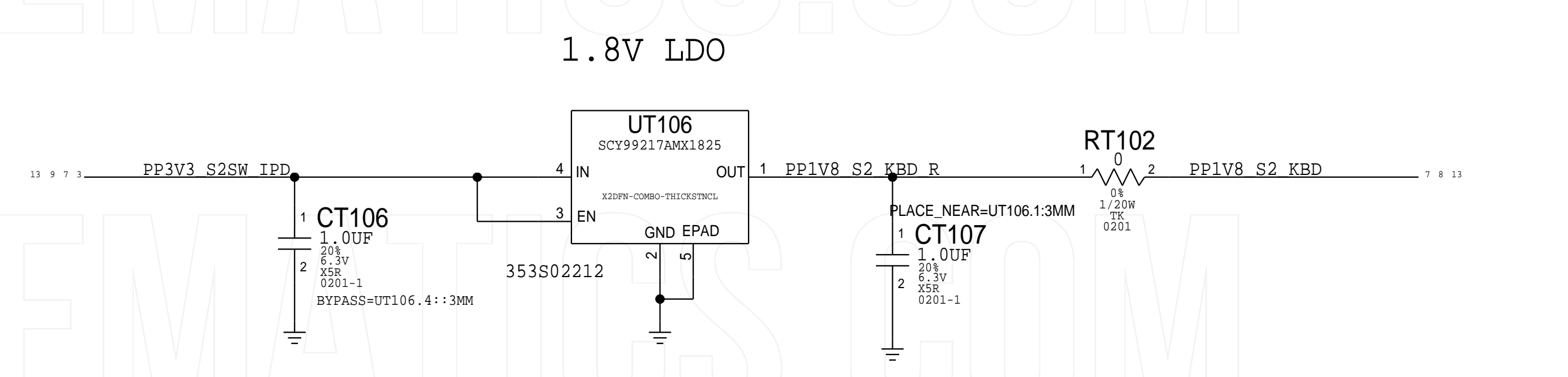
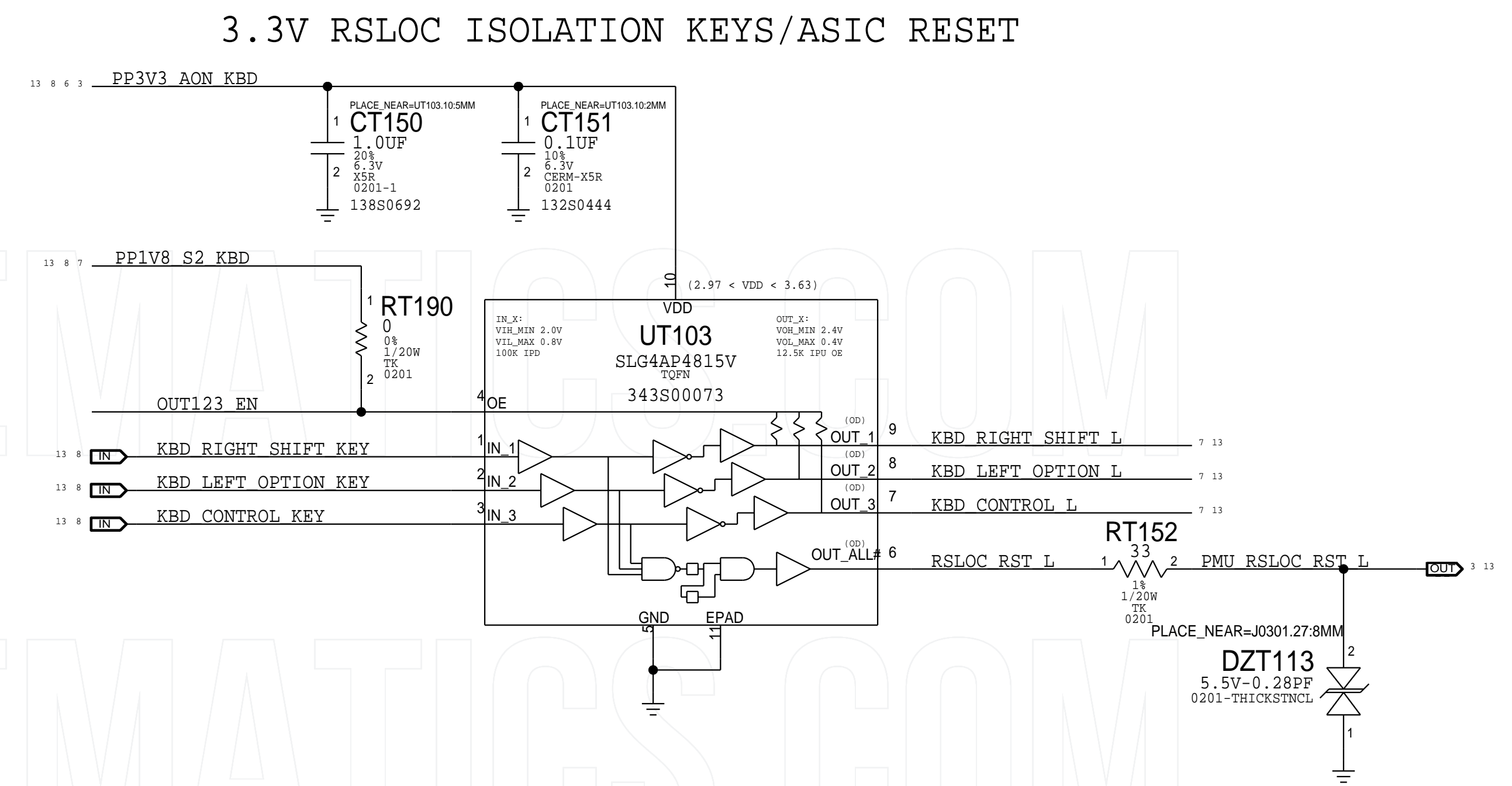
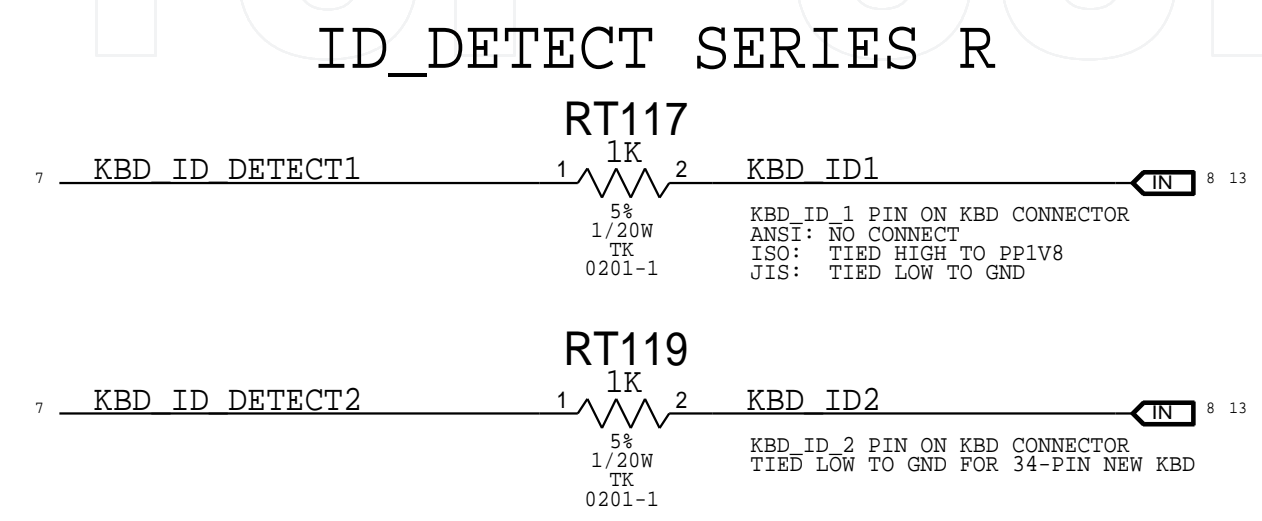
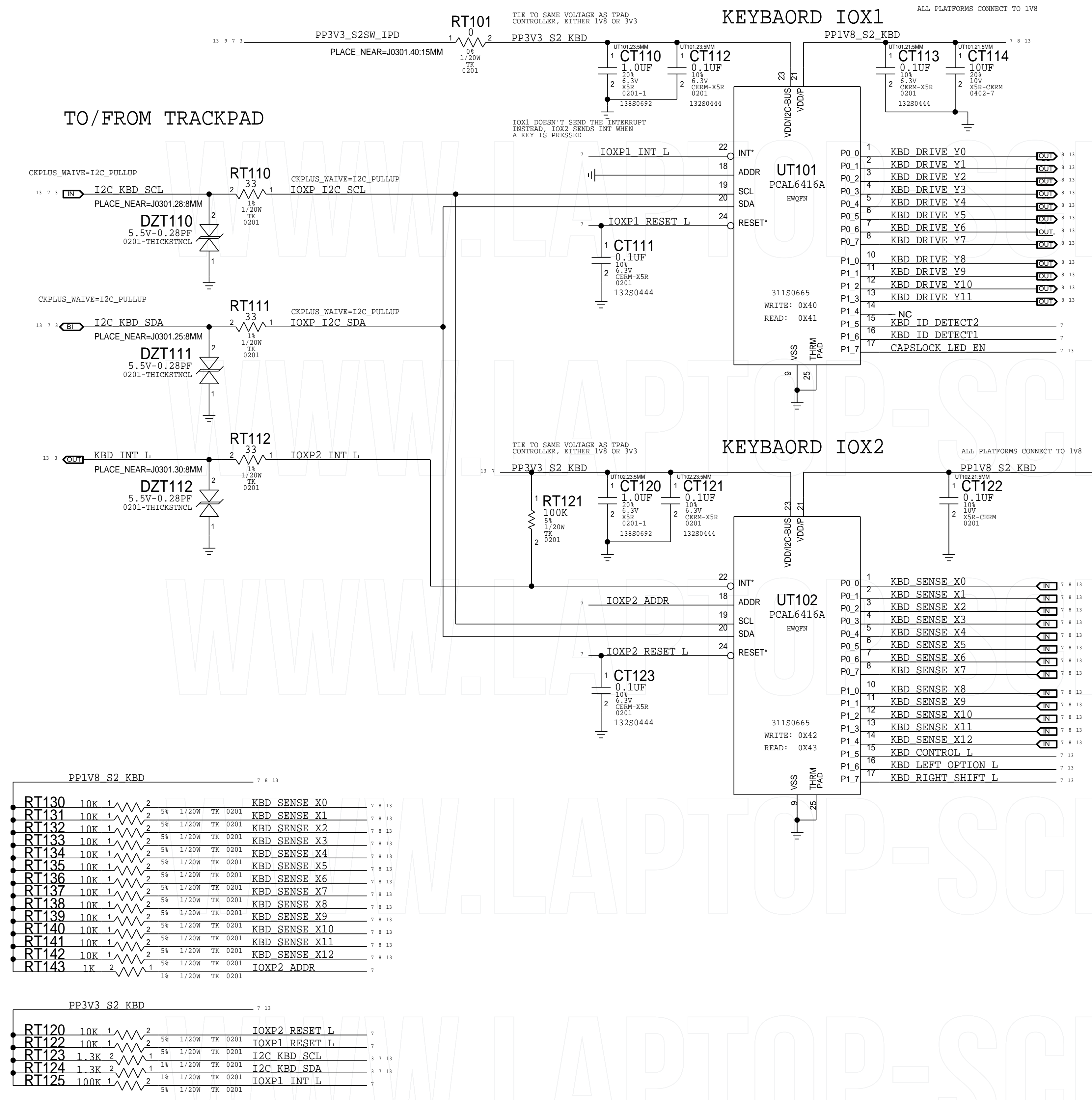
A


D

C

B

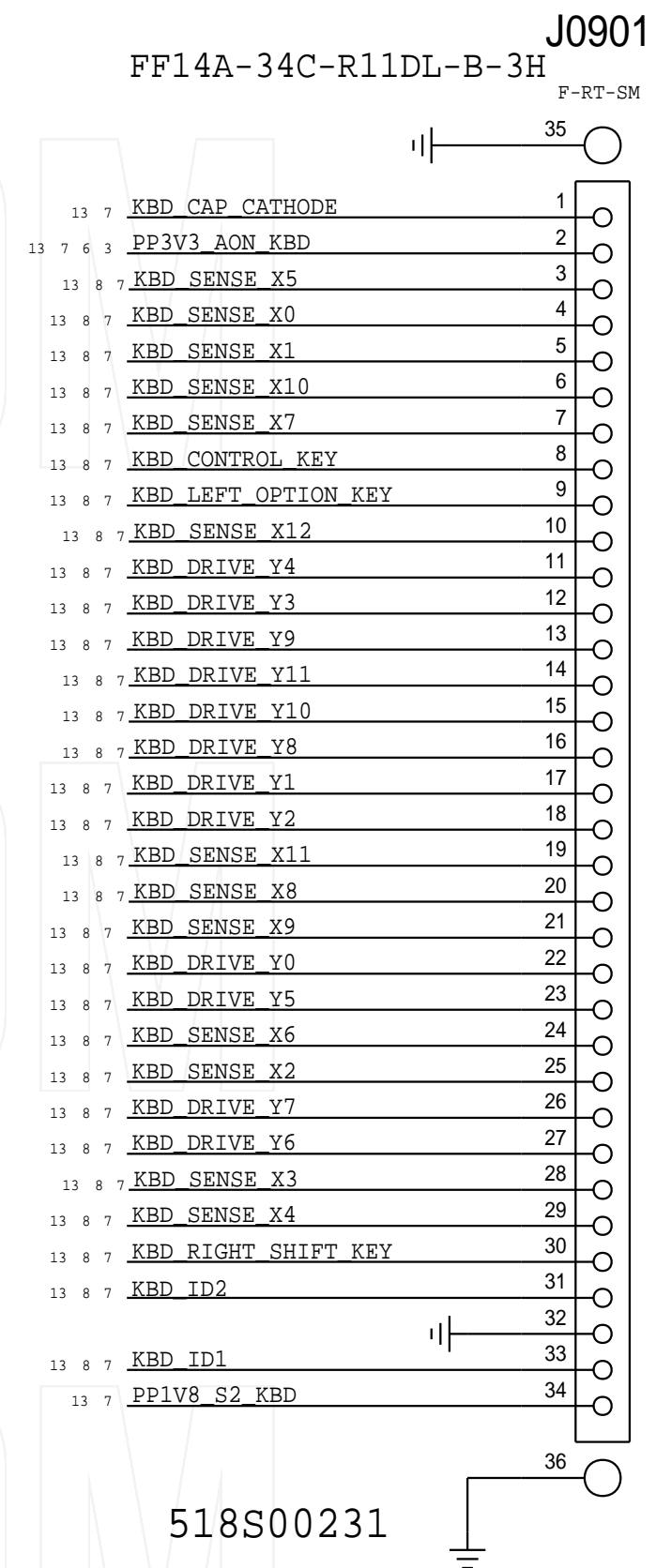
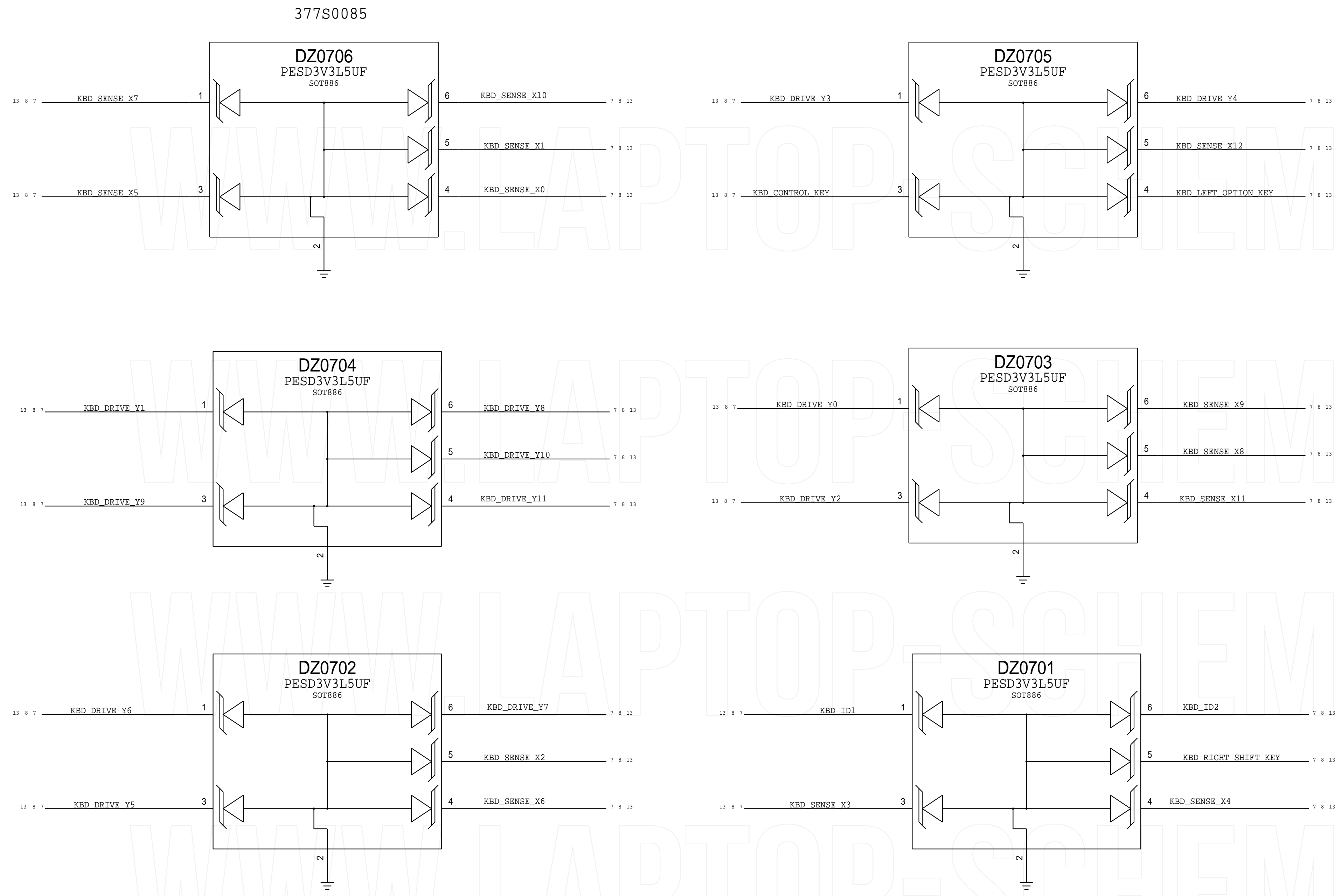
A




SYNC_MASTER=J314_MLB		SYNC_DATE=10/27/2020	
PAGE TITLE			
KEYBOARD IOXP/RSLOC KEYS			
 Apple Inc.		DRAWING NUMBER	051-08064
		REVISION	2.0.0
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE I NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED		BRANCH	
		PAGE	7 OF 14
		SHEET	7 OF 14

BOM_COST_GROUP=KEYBOARD

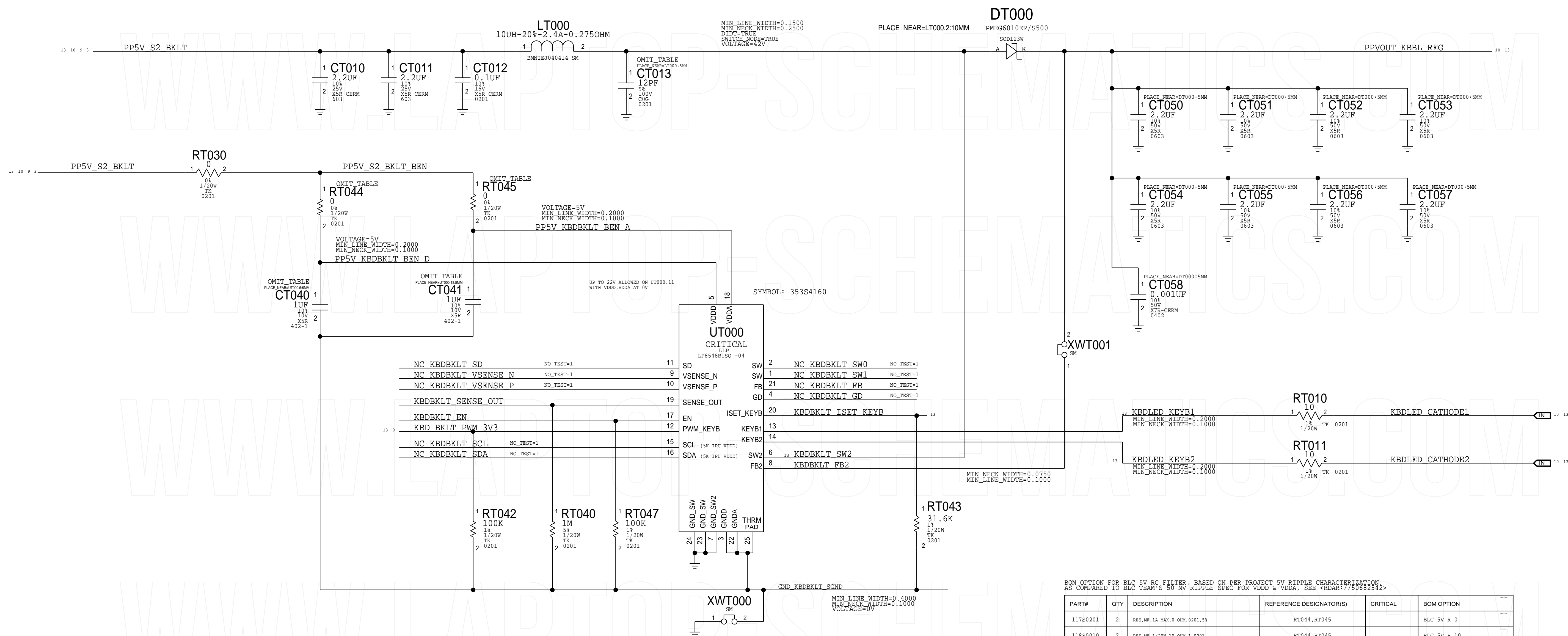
X2143 KEYBOARD CONNECTOR
BOTTOM CONTACT



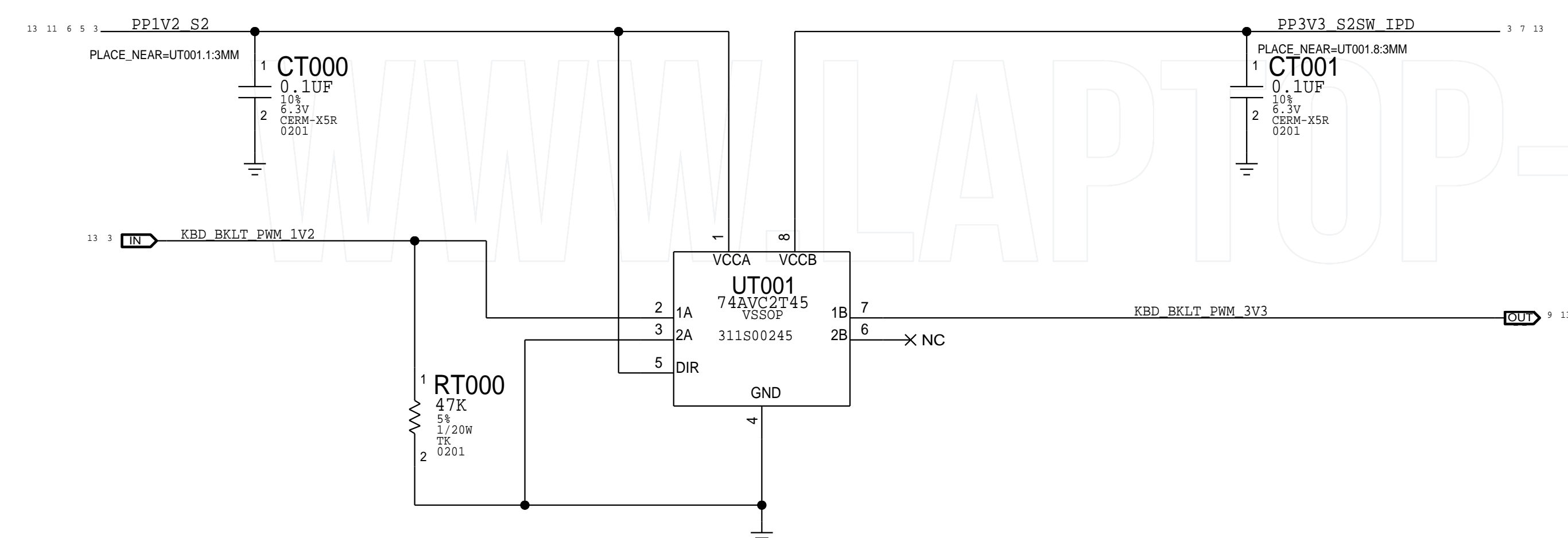
ESD DIODES

PAGE TITLE			10/27/2020 KBD_IPD	
KEYBOARD CONNECTOR & ESD				
 Apple Inc.	DRAWING NUMBER 051-08064		SIZE D	
	REVISION 2.0.0		BRANCH	
	PAGE 8 OF 14			
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED				
SHEET 8 OF 14				

BEN IC: KEYBOARD LED DRIVER




KEYBOARD AND MESA BKLT PWM LEVEL-SHIFTER



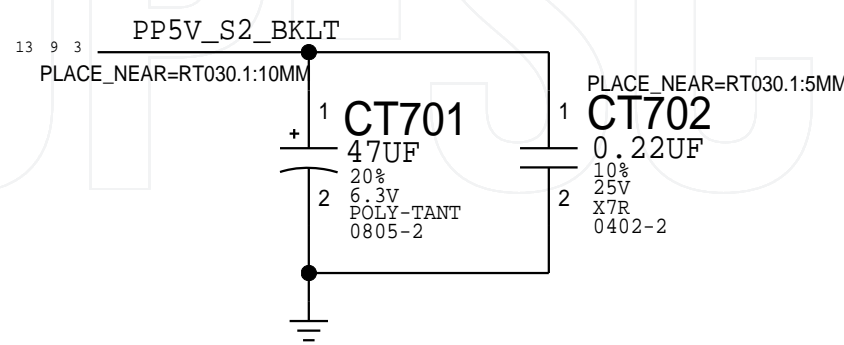
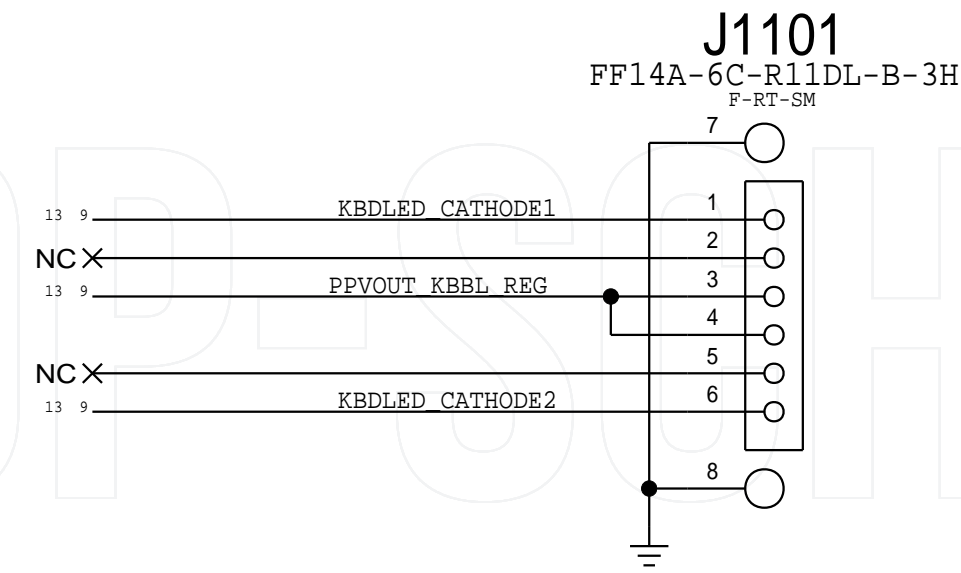
KEYBOARD SWITCH NODE DESENSE OPTION

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
131S00141	1	CAP,C0G,12PF,54,100V,0201	CT013		BLC_KBD_SW_DESENSE

BOM_COST_GROUP=KEYBOARD

SYNCHOSTTYPE=7724_BEN		SYNCHDATE=12/11/2020	
PAGE TITLE			
BEN: KEYBD BKL7			
 Apple Inc.	DRAWING NUMBER		SIZE
	051-08064		D
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE I II NOT TO REPRODUCE OR COPY IT I III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART I IV ALL RIGHTS RESERVED	REVISION		
	2.0.0		
	BRANCH		
	PAGE		
			9 OF 14
SHEET			
			9 OF 14

KBD BKLT CONNECTOR
APN:518S0818

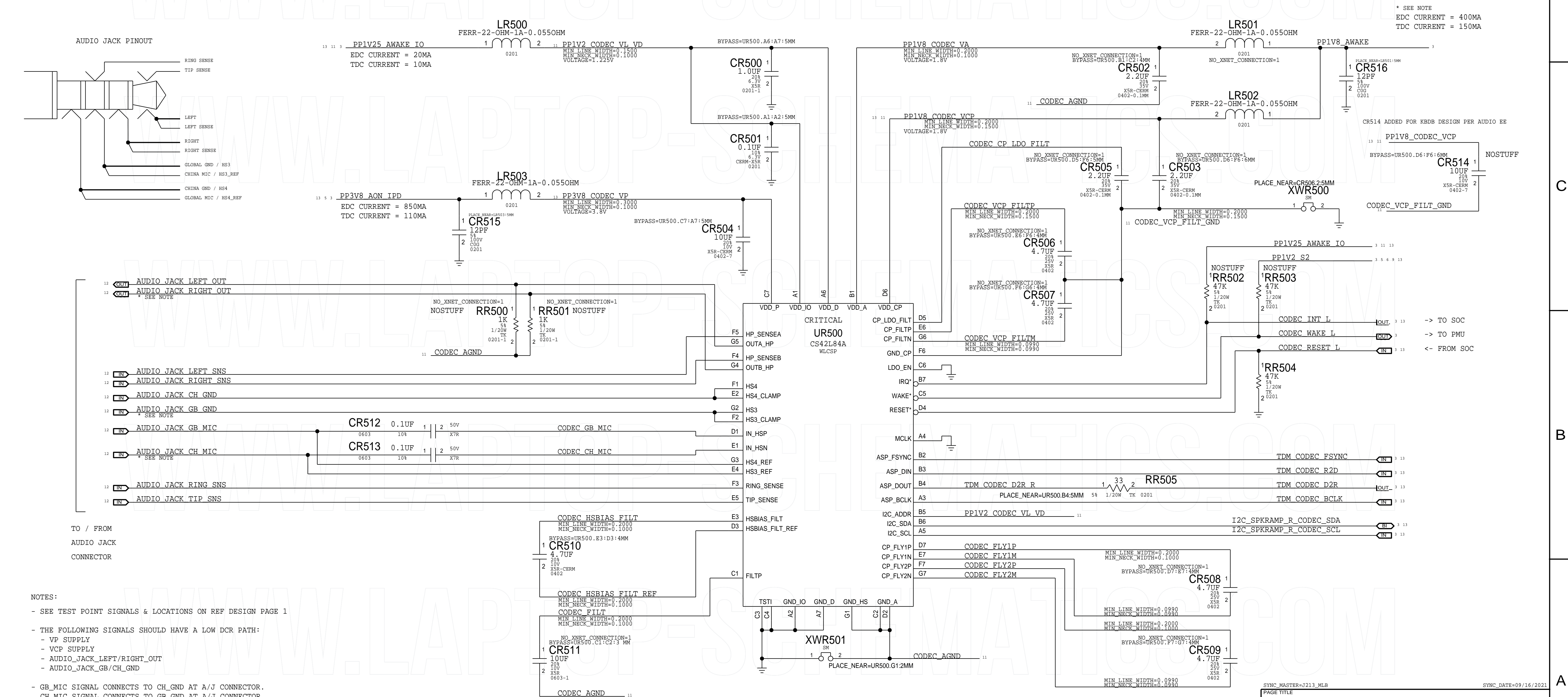


PAGE TITLE		
LED CONNECTORS		
	DRAWING NUMBER	051-08064
	REVISION	2.0.0
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED		
BRANCH		
PAGE		
10 OF 14		
SHEET		
10 OF 14		

BOM_COST_GROUP=TOUCHID

*** OK2INTEGRATE ***

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

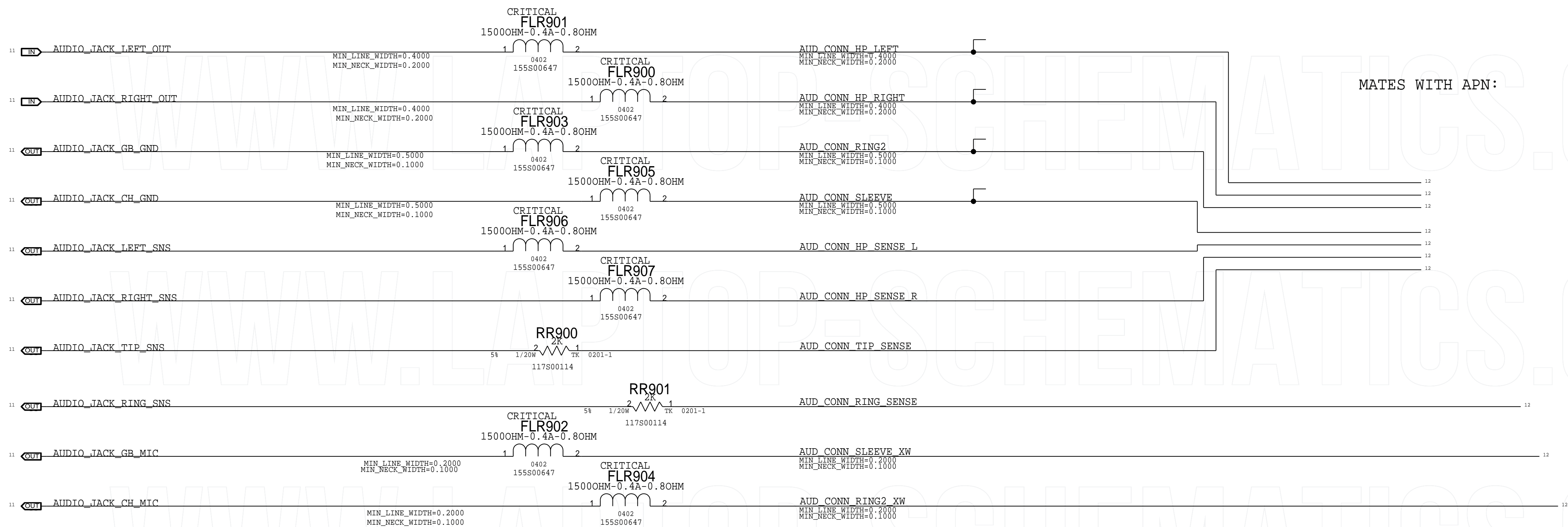


CARLOW B0 SILICON

PAGE TITLE		DRAWING NUMBER		SIZE	
AUDIO JACK CODEC		051-08064		D	
REVISION		2.0.0		BRANCH	
NOTICE OF PROPRIETARY PROPERTY:		PAGE		11 OF 14	
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING:		SHEET		11 OF 14	
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE					
I NOT TO REPRODUCE OR COPY IT					
I NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART					
I V ALL RIGHTS RESERVED					

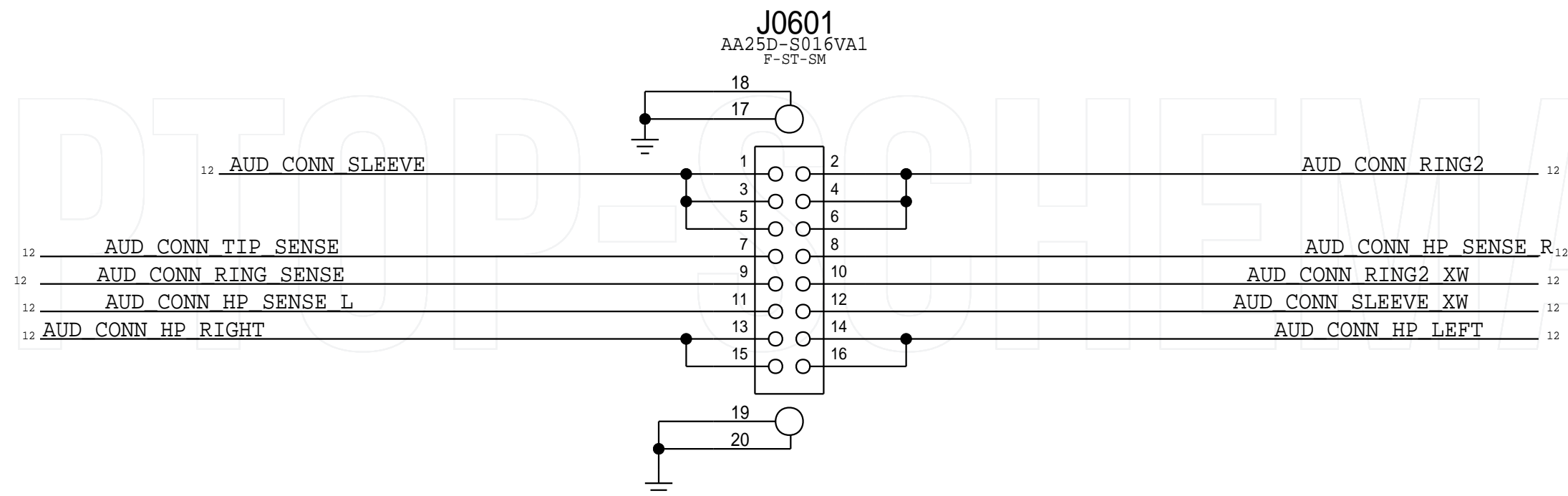
BOM_COST_GROUP=AUDIO

A AUDIO JACK FLEX CONNECTOR



MATES WITH APN:

APN:516S1181
(MATING RECEPTACLE: 516S1180)



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

PAGE TITLE		
Audio Jack Flex Connector		
Apple Inc.	DRAWING NUMBER	051-08064
	REVISION	2.0.0
NOTICE OF PROPRIETARY PROPERTY:		
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING:		
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE		
II NOT TO REPRODUCE OR COPY IT		
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART		
IV ALL RIGHTS RESERVED		
PAGE		12 OF 14
SHEET		12 OF 14

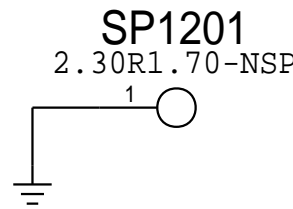
BOM_COST_GROUP=AUDIO

DEFAULT SPACING & PHYSICAL CONSTRAINTS

BOARD LAYERS			BOARD AREAS		BOARD UNITS (MIL or MM)	ALLEGRO VERSION
TOP, ISL2, IS3L, BOTTOM			NO_TYPE		MM	16.2

PHYSICAL_RULE_SET	LAYER	ALLOW ROUTE ON LAYER?	MINIMUM LINE WIDTH	MINIMUM NECK WIDTH	MAXIMUM NECK LENGTH	DIFFPAIR PRIMARY GAP	DIFFPAIR NECK GAP
DEFAULT	*	Y	0.075 MM	0.05 MM	10 MM	0.075 MM	0.070 MM
STANDARD	*	Y	=DEFAULT	=DEFAULT	=DEFAULT	=DEFAULT	=DEFAULT

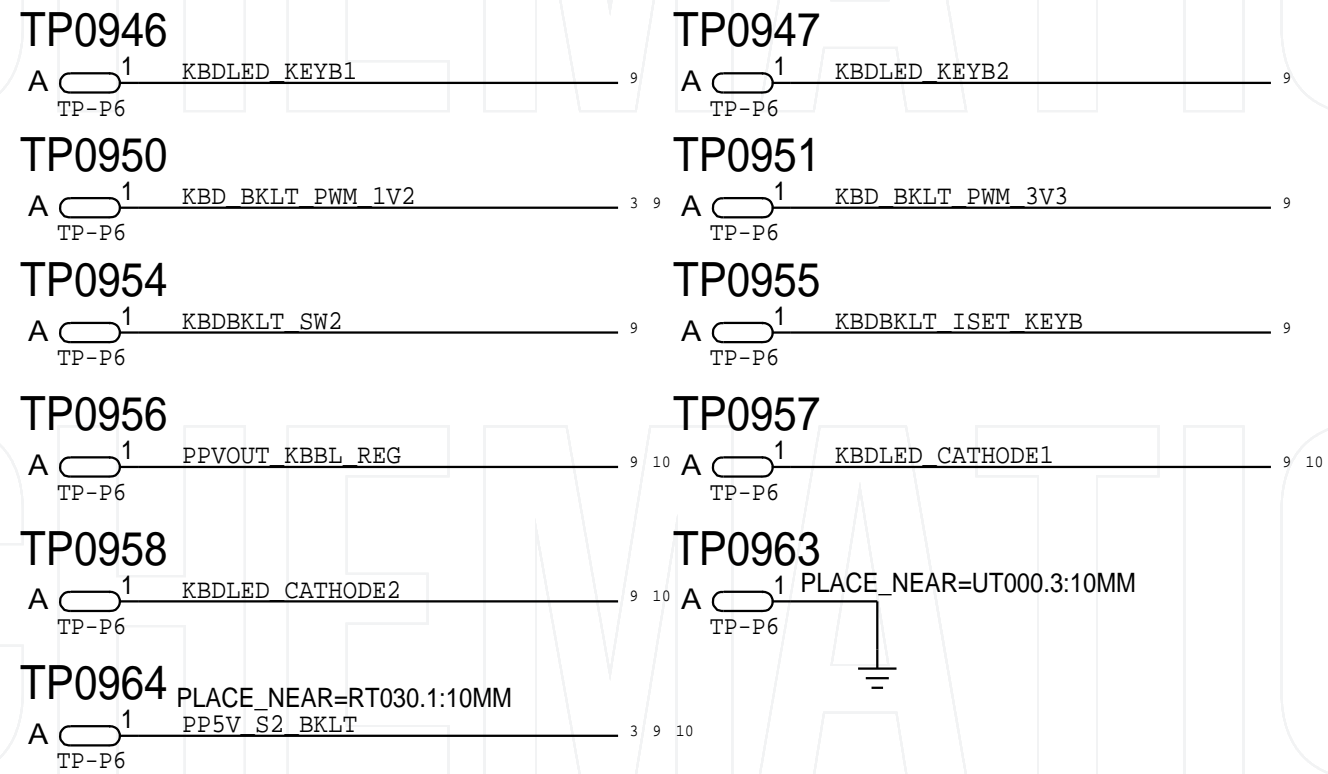
PLATED THROUGH HOLE



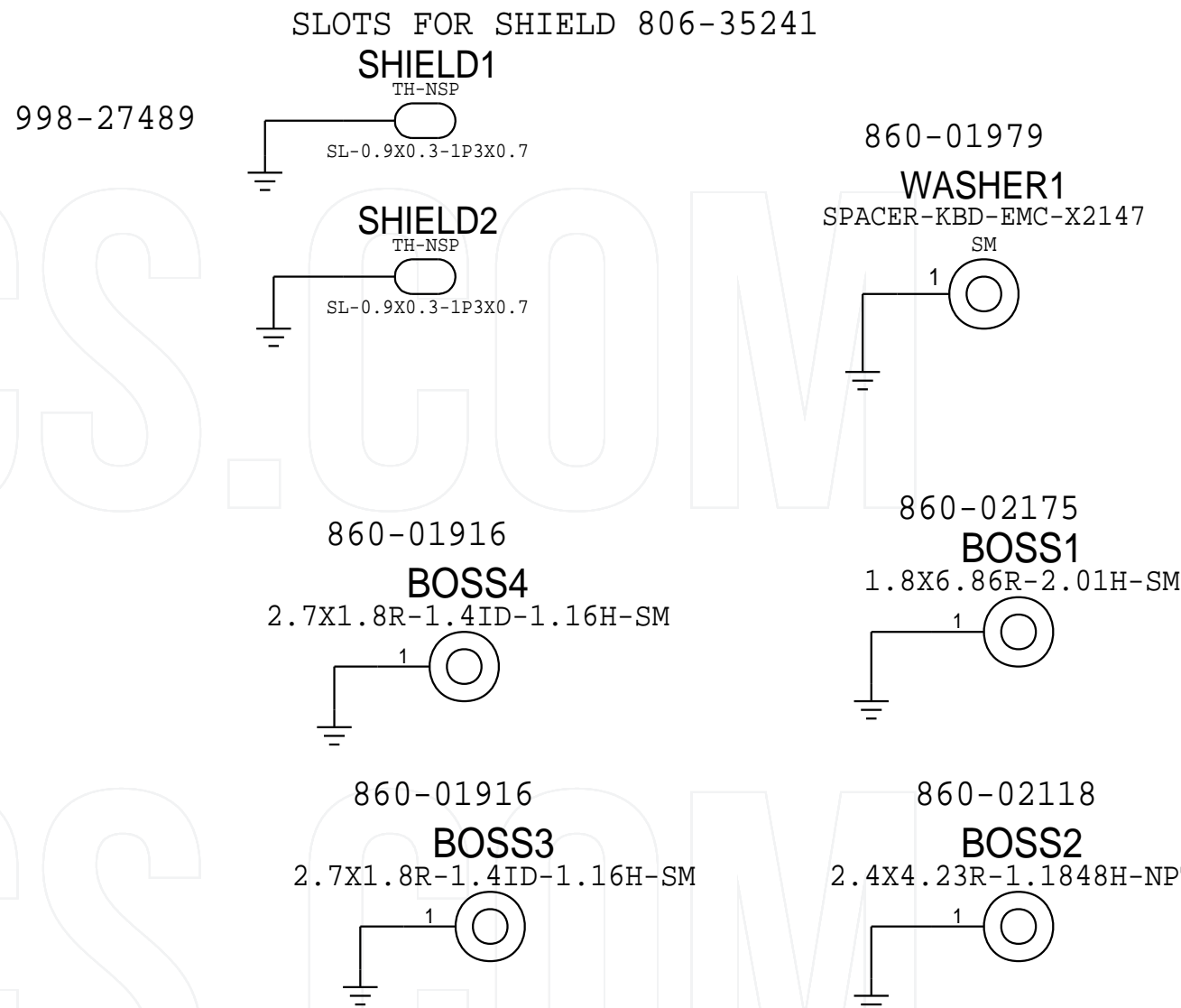
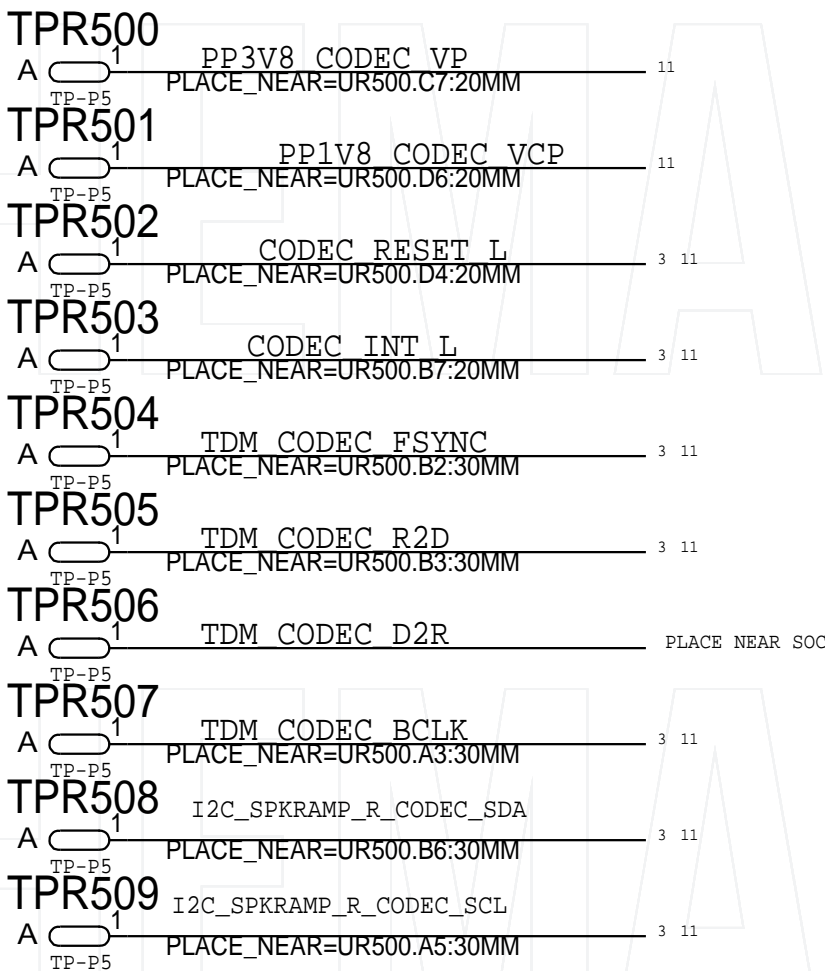
ALTERNATE PARTS

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
138S0786	138S0847	?	ALL	ALT:SAMSUNG
377S0155	377S0184	?	ALL	ALT:ONSEMI
311S00230	311S00212	?	ALL	ALT:TI
371S000217	371S00079	?	ALL	ALT:ROHM
353S00078	353S00599	?	ALL	ALT:TI
311S00268	311S00246	?	ALL	ALT:NEXPERIA
311S00254	311S00245	?	ALL	ALT:TI
152S00434	152S1829	?	ALL	ALT:CYNTEC
138S00087	138S1086	?	ALL	ALT:TAIYO
138S00104	138S0978	?	ALL	ALT:TAIYO
138S00049	138S0831	?	ALL	ALT:KYOCERA
152S00114	152S01543	?	ALL	ALT:CYNTEC
155S00097	155S0664	?	ALL	ALT:TDK
128S0487	128S00012	?	ALL	ALT:NBC/KEMET
155S0660	155S0513	?	ALL	ALT:MURATA
353S02407	353S02212	?	ALL	ALT:TI

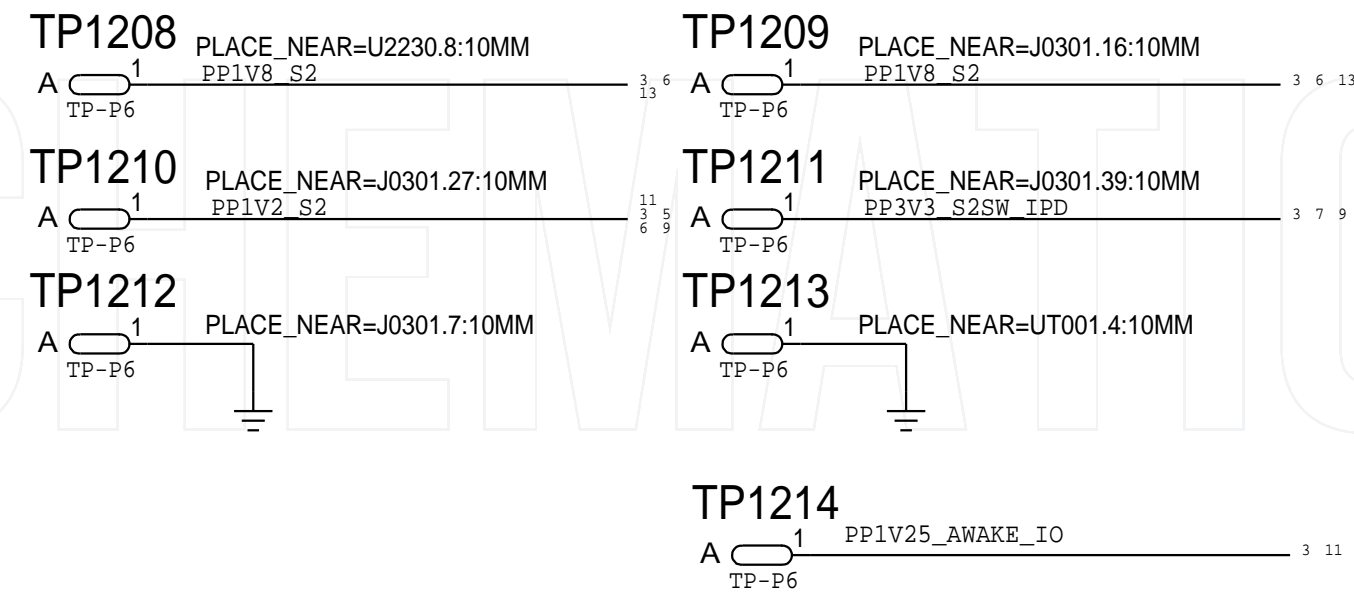
BACKLIGHT TEST POINTS



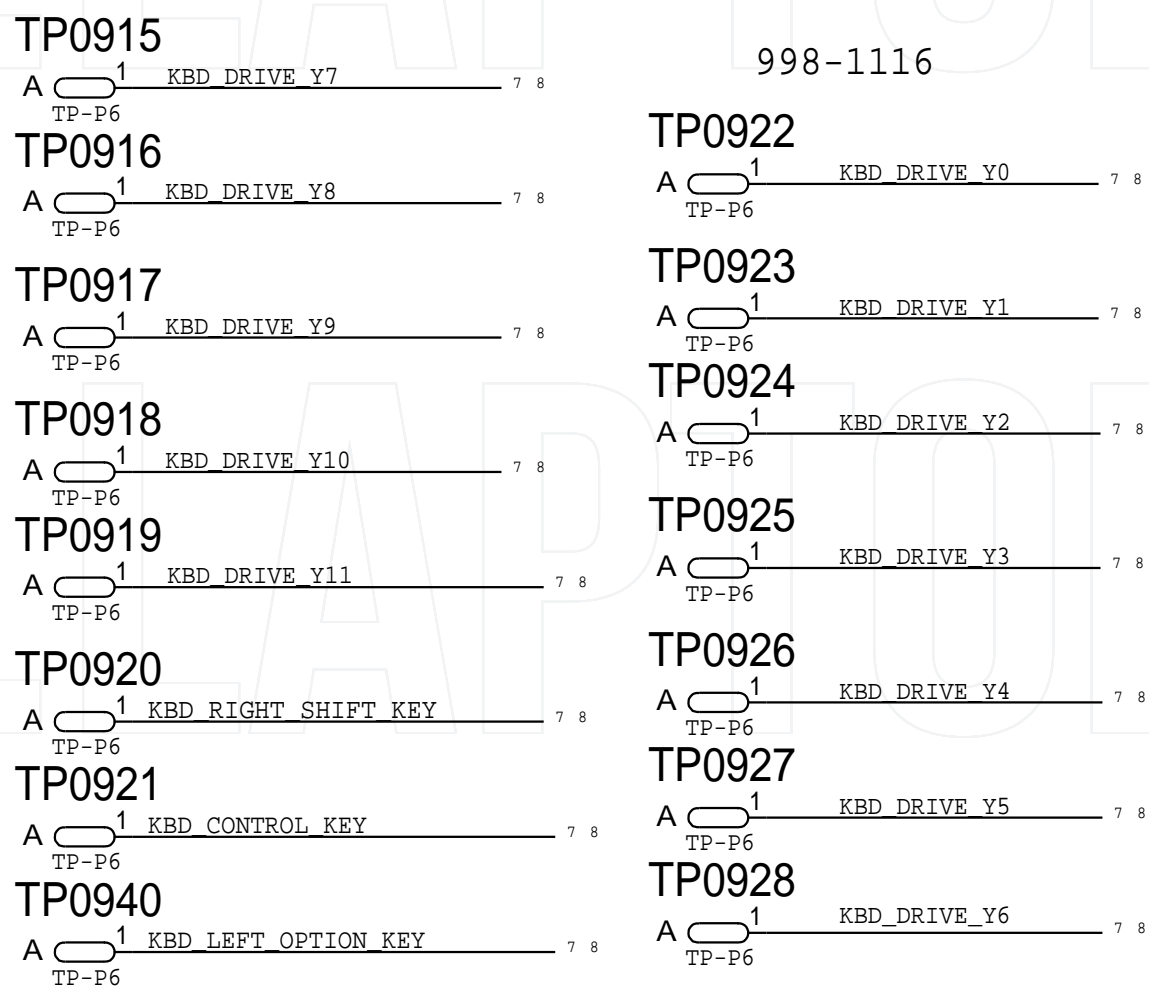
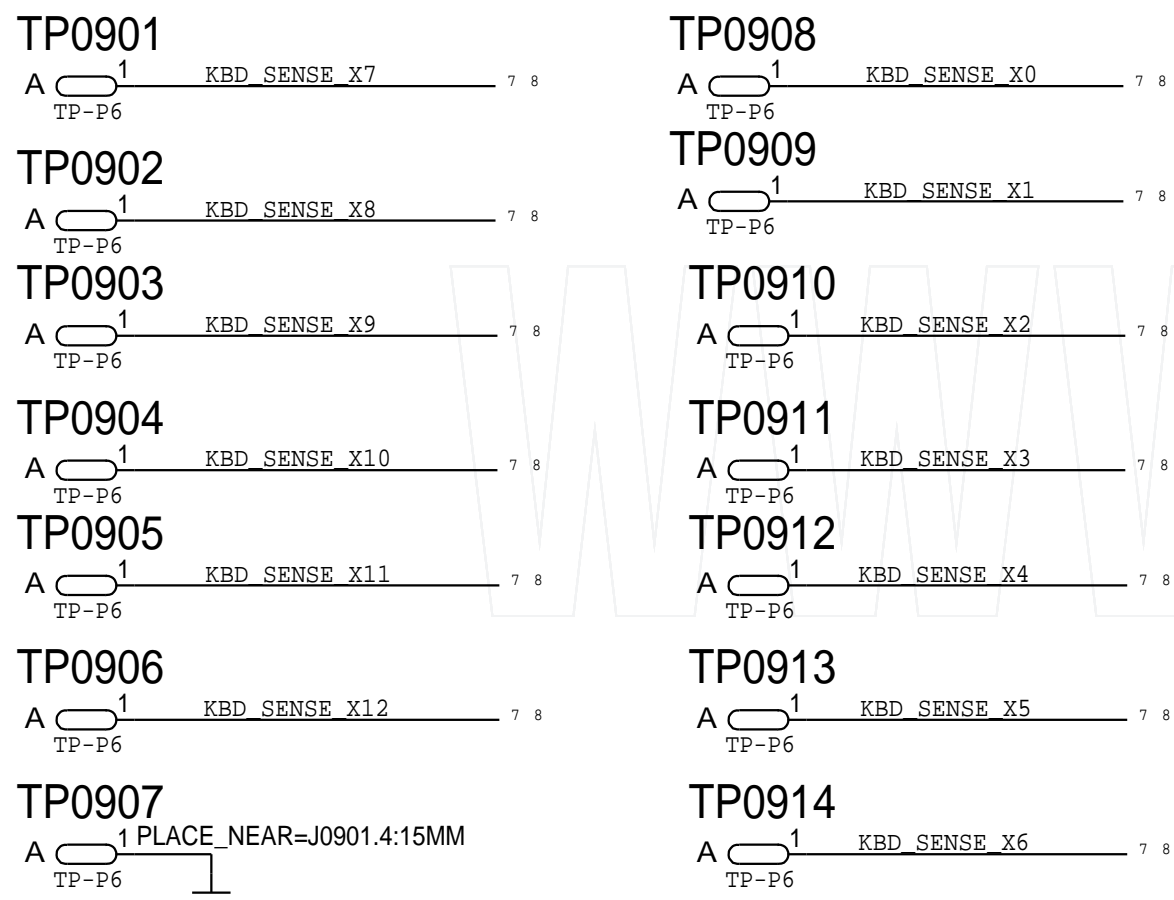
CODEC TEST POINTS



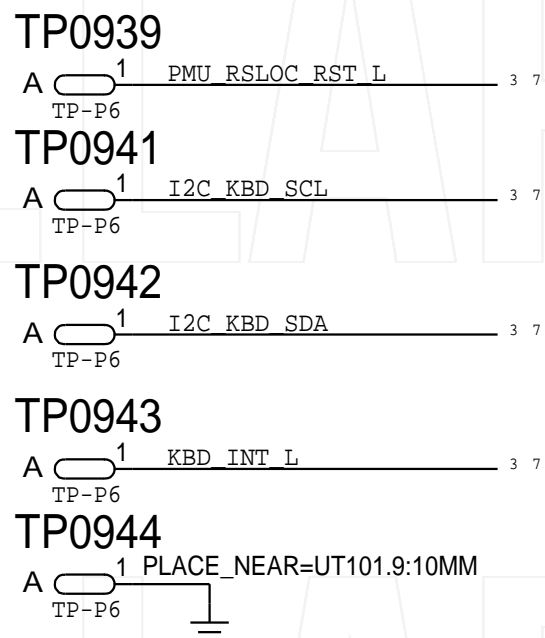
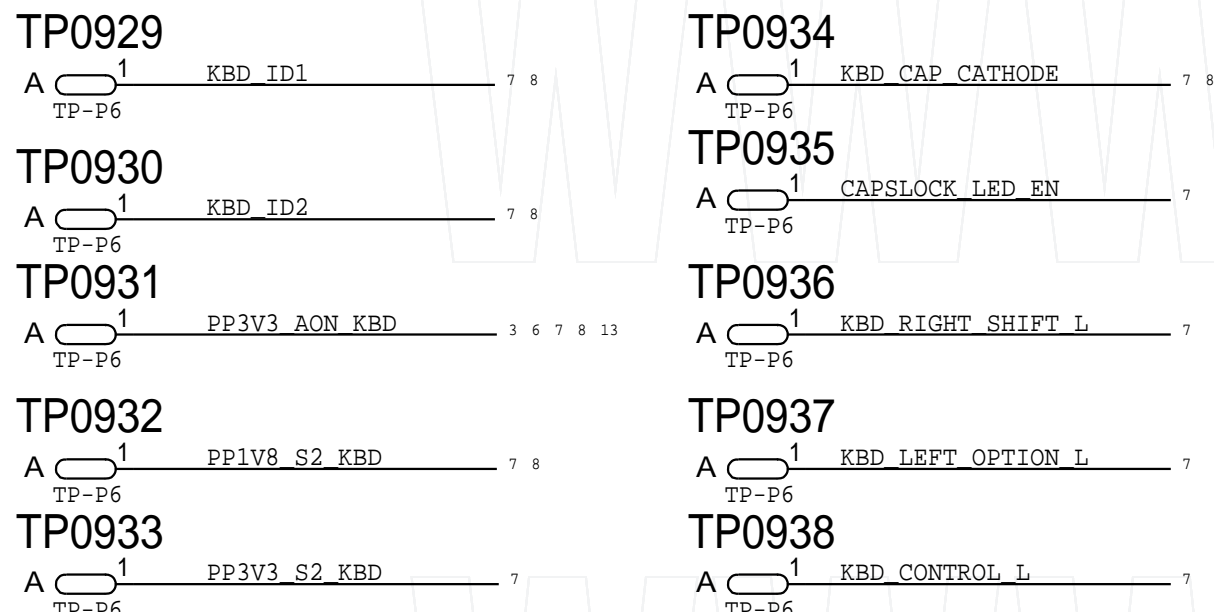
POWER TEST POINTS



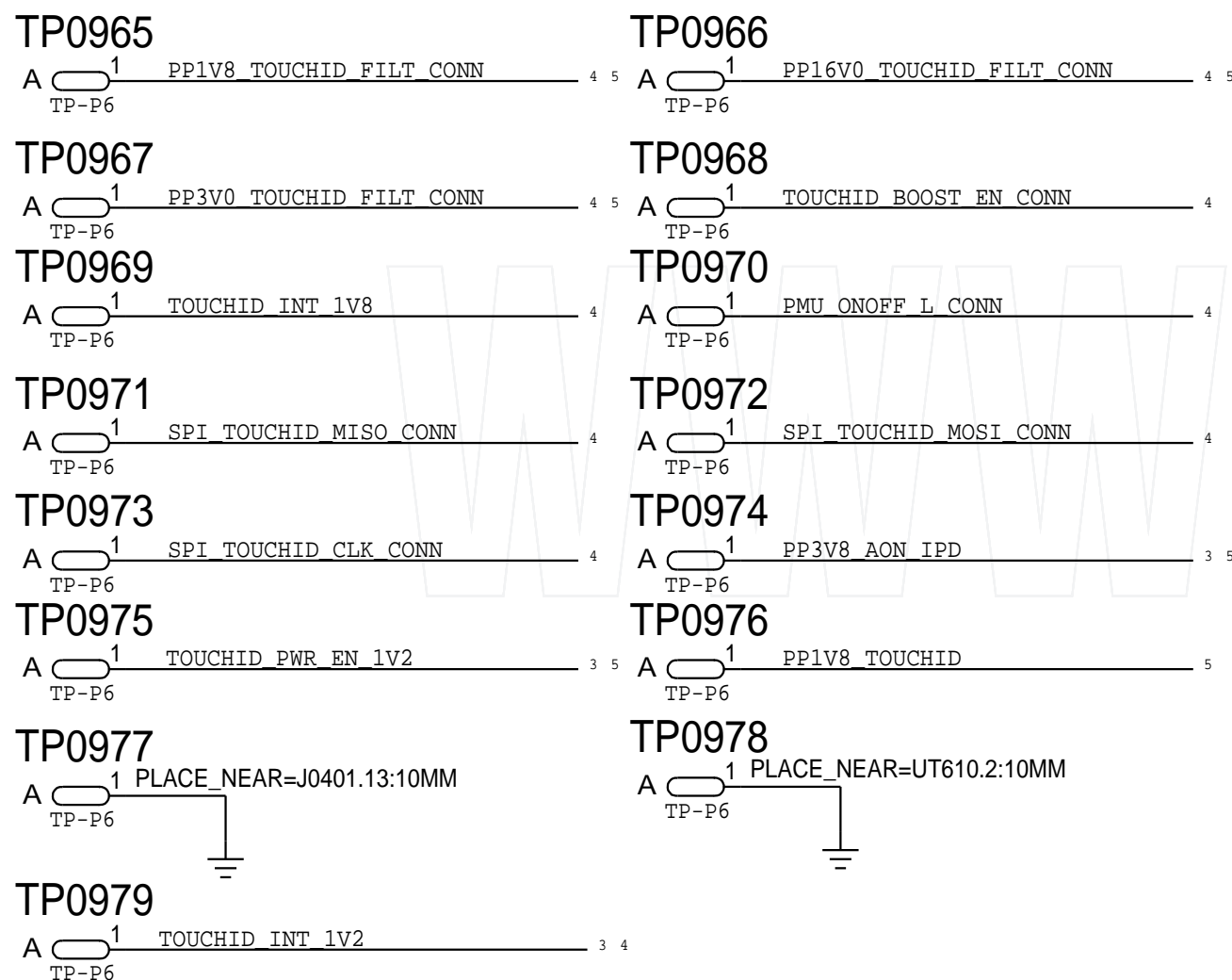
KEYS MATRIX TEST POINTS



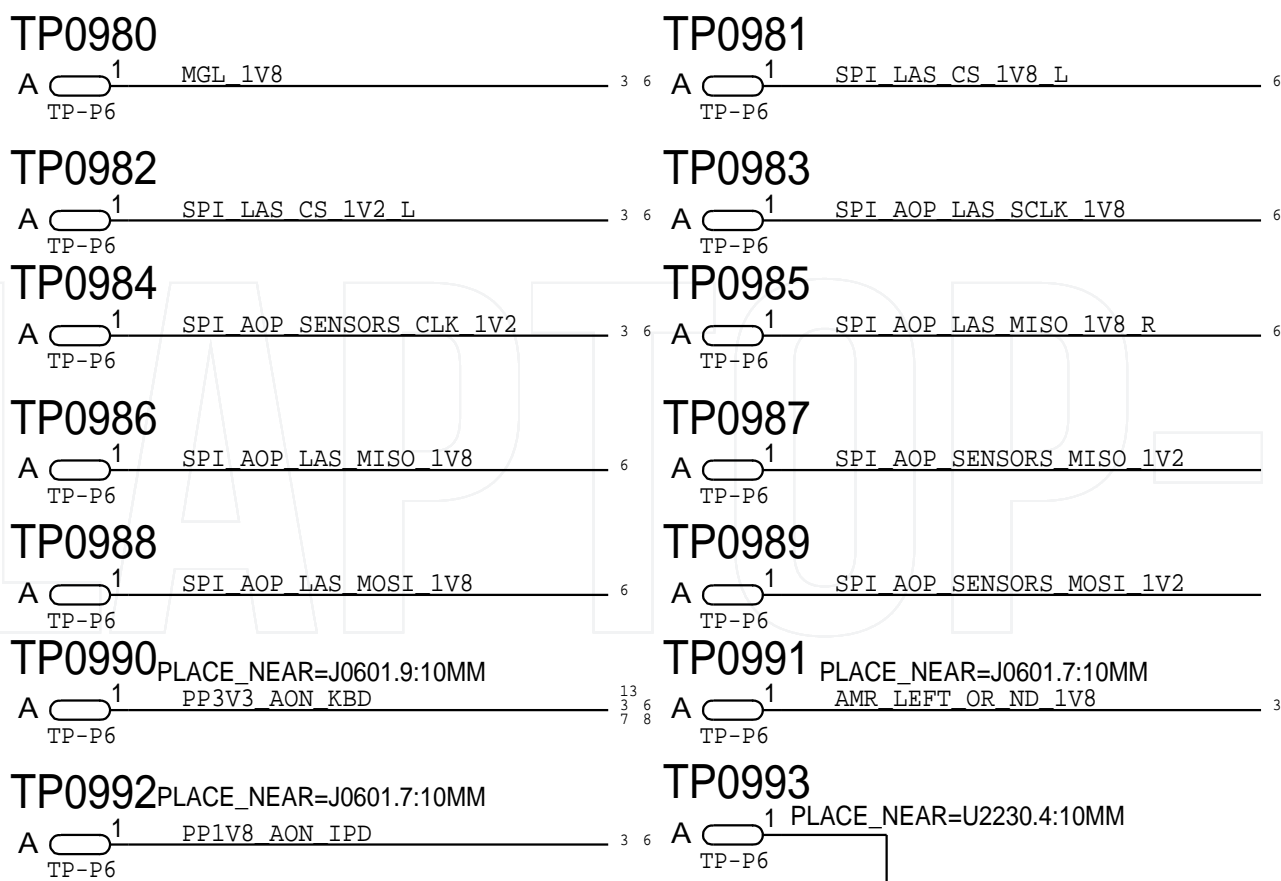
OTHER KBD SIGNALS



TOUCHID TEST POINTS



LAS TEST POINTS




PAGE TITLE			
CONSTRAINS & TEST POINTS			
	DRAWING NUMBER	051-08064	SIZE
	REVISION	2.0.0	D
	BRANCH		
NOTICE OF PROPRIETARY PROPERTY:		PAGE	13 OF 14
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING:		SHEET	13 OF 14
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE			
II NOT TO REPRODUCE OR COPY IT			
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART			
IV ALL RIGHTS RESERVED			

HISTORY

REV	EDITED BY	DATE	DESCRIPTION
0.1	SHAN WU	10/06/2020	INITIAL RELEASE
0.6		02/01/2021	ADD TEST POINTS
0.7		02/02/2021	ADD DESENSE CAPS FOR TOUCHID
2.0		03/01/2021	PROTO 0 RELEASE
2.1	SHAN WU	03/13/2021	REMOVE LAS AND KBD BKLT CONNECTOR ADD 1.8V LDO FOR IO EXP GPIO VDD CHANGE TOUCHID BKLT CONNETOR TO 21 PIN ZIF
2.2	THAI LA	04/12/2021	ADD ALTERNATE PART TABLE, REPLACE UR200 TO 311S00212
2.3	THAI LA	04/16/2021	ADD WASHER & BOSS
3.0	THAI LA	04/22/2021	RELEASE FOR P1 OK2FAB
3.1	SHAN WU	06/22/2021	REMOVE MESA BACKLIGHT MODULE REPLACE MESA BKLT CONNECTOR WITH KBD BKLT CONNECTOR J1101 ADD LAS CONNECTOR J0601 REMOVE REAR MIC CONNECTOR ADD BOSS2 REPLACE MLB CONNECTOR WITH 516S00359 B2B PLUG CHANGE INDUCTOR LT000 FOOTPRINT TO 152S01543
3.2	THAI LA	07/01/2021	UPDATE BOSS2 SYMBOL
3.4	THAI LA	07/01/2021	REPLACE 6X OPSOLETED ESD DIODES (DZ0701-DZ0706) FROM 377S0186 TO 377S00221
3.5			
3.6			
3.7	THAI LA	07/07/2021	UPDATE BOSS1 SYMBOL AND REPLACE ESD DIODES DZ0701-0706 377S00221 WITH 377S0085
3.8			REPLACE UR200 WITH 311S00337

PAGE TITLE

HISTORY

 Apple Inc.

NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC.
THE POSSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

DRAWING NUMBER
051-08064

REVISION
2.0.0

BRANCH

PAGE
14 OF 14

SHEET
14 OF 14

SIZE
D