

8		7		6		5		4		3		2		1						
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					
												10	0008927012	ENGINEERING RELEASED	2017-06-06					
D21 MLB - DVT (OK2FAB)																				
LAST_MODIFICATION= Tue Jun 6 18:57:04 2017																				
PAGE CSA CONTENTS					SYNC		DATE		PAGE CSA CONTENTS					SYNC		DATE				
1	1	TABLE OF CONTENTS			sync		06/19/2016		46	62	I/O: USB PD			sync		04/14/2017				
2	2	SYSTEM: BOM TABLES (1/2)			sync		02/24/2017		47	63	I/O: Hydra			sync		04/14/2017				
3	3	SYSTEM: BOM TABLES (2/2)			test_mlb		03/17/2017		48	64	I/O: B2B DOCK			sync		10/10/2016				
4	4	SYSTEM: MECH COMPONENTS			sync		04/14/2017		49	65	SYSTEM: I2C MAP			sync		04/14/2017				
5	5	SYSTEM: Testpoints			sync		04/14/2017		50	80	RADIOS			D21_MLB_DOE		07/18/2016				
6	6	BOOTSTRAPPING			sync		09/19/2016		51	1	page1									
7	10	SOC: JTAG, USB, XTAL			sync		04/14/2017		52	75	NFC									
8	11	SOC: PCIE			sync		04/14/2017		53	1	FRONT PAGE									
9	12	SOC: MIPI + ISP			sync		04/14/2017		54	2	HIERARCHY									
10	13	SOC: LPDP			sync		04/14/2017		55	3	PMIC: BUCKS & LDOS									
11	14	SOC: SERIAL + SMC			sync		04/14/2017		56	4	PMIC: CLOCKS & CONTROL									
12	15	SOC: GPIO + UART			sync		04/14/2017		57	5	BB: POWER									
13	16	SOC: AOP			sync		04/14/2017		58	6	BB: CONTROL & HS PERIPHERALS [6]									
14	17	SOC: Power (1/3)			sync		04/14/2017		59	7	BB: GPUS & QLINK									
15	18	SOC: Power (2/3)			sync		04/14/2017		60	8	XCVR									
16	19	SOC: Power (3/3)			sync		04/14/2017		61	9	XCVR									
17	26	NAND			sync		04/14/2017		62	10	OPOET MODULE									
18	27	SYSTEM POWER: PMU Bucks (1/4)			sync		04/14/2017		63	11	LB PAD									
19	28	SYSTEM POWER: PMU Bucks (2/4)			sync		04/14/2017		64	12	HB PAD									
20	29	SYSTEM POWER: PMU LDOS (3/4)			sync		04/14/2017		65	13	UHB PAD									
21	30	SYSTEM POWER: PMU (4/4)			sync		04/14/2017		66	14	2G PA									
22	31	SYSTEM POWER: Boost			sync		04/14/2017		67	15	LB DSM									
23	32	SYSTEM POWER: B2B Battery			sync		04/14/2017		68	16	HB DSM									
24	33	SYSTEM POWER: Charger			sync		04/14/2017		69	17	COUPLER2									
25	34	SYSTEM POWER: Iktara			sync		04/14/2017		70	18	LOWER ANTENNA									
26	35	SYSTEM POWER: B2B Cyclone			sync		04/14/2017		71	19	UPPER ANTENNA									
27	36	SENSORS			sync		04/14/2017		72	20	GNSS									
28	37	CAMERA: PMU (1/2)			sync		04/14/2017		73	21	SIM, DEBUG CONN									
29	38	CAMERA: PMU (2/2)			sync		04/14/2017		74	22	TEST POINTS			PROBE POINTS		07/18/2016				
30	39	CAMERA: B2B Wide (KY)			sync		04/14/2017		75	1	FRONT PAGE									
31	40	CAMERA: B2B Tele (TN)			sync		04/14/2017		76	2	METROCIRC									
32	41	CAMERA: Strobe Drivers			sync		04/14/2017		77	3	UAT MATCH AND TUNER									
33	42	CAMERA: FCAM + FOREHEAD			sync		04/14/2017		78	4	RFFE TO GPO TRANSLATOR									
34	43	CAMERA: B2B Strobe + Buttons			sync		04/14/2017		79	1	SymbolPorts									
35	47	AUDIO: CODEC (1/2)			sync		04/14/2017		80	4	Guinness			WIFI		11/28/2016				
36	48	AUDIO: CODEC (2/2)			sync		04/14/2017		81	5	WiFiANTFeeds					11/28/2016				
37	49	AUDIO: Speaker Amp Bottom			sync		04/14/2017													
38	50	AUDIO: Speaker Amp Top			sync		04/14/2017													
39	51	ARC: Driver			sync		04/14/2017													
40	55	CG: Niki			sync		04/14/2017													
41	56	CG: PMUs			sync		04/14/2017													
42	57	CG: B2B DISPLAY + TOUCH			sync		04/14/2017													
43	58	CG: B2B ORB + MESA			sync		04/14/2017													
44	59	I/O: Overvoltage Cut-Off Circuit			sync		04/14/2017													
45	61	I/O: Accessory Buck			sync		04/14/2017													
Sub Designs																				
PART#		QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION	SOURCE PROJECT		SUB-DESIGN NAME		VERSION	HARD/ SOFT	SYNC_DATE/TIME		TABLE OF CONTENTS						
051-02159		1	SCH_MLB_D21	SCH	?	D21		RADIO_MLB		0.122.0	S	2017_06_06_17:14:31		DRAWING TITLE						
820-00846		1	PCBF_MLB_D21	PCB	?	D20		NFC_MLB		0.50.0	S	2017_05_26_07:54:42		DRAWING NUMBER						
						D21		WIFI_MLB		0.20.0	S	2017_05_16_02:56:32		REVISION						
						D21		RADIO_MLB_FF		0.35.0	S	2017_06_02_14:56:02		SIZE						
												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								
												051-02159								
												REVISION								
												10.0.0								
												BRANCH								
												PAGE								
												1 OF 80								
												SHEET								
												1 OF 81								
8		7		6		5		4		3		2		1						

8

7

6

5

4

3

2

1

EEEE Codes

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION	
825-7691	1	EEEE FOR (MLB, 639-04441, JP, ULTRA)	EEEE_J08R	CRITICAL	EEEE_ULTIMATE	D21x Specific
825-7691	1	EEEE FOR (MLB, 639-03377, JP, EXTREME)	EEEE_HNV8	CRITICAL	EEEE_EXTREME	D21x Specific
825-7691	1	EEEE FOR (MLB, 639-04442, ROM, ULTRA)	EEEE_J08X	CRITICAL	EEEE_ULTIMATE_ROW	D21x Specific
825-7691	1	EEEE FOR (MLB, 639-03380, ROM, EXTREME)	EEEE_HNVF	CRITICAL	EEEE_EXTREME_ROW	D21x Specific

SOC

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION	
339S00416	1	SOC, H, 3GB 21nm T509, B1	U1000	CRITICAL	COMMON	D21x Specific

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
339S00415	339S00416	BOM_TABLE_ALTS	U1000	SoC, M, 3GB 20nm DDR, B1
339S00417	339S00416	BOM_TABLE_ALTS	U1000	SoC, S, 3GB 20nm DDR, B1
339S00418	339S00416	BOM_TABLE_ALTS	U1000	SoC, S, 3GB 1xnm DDR, B1
339S00429	339S00416	BOM_TABLE_ALTS	U1000	SoC, H, 3GB 20nm DDR, B1
339S00430	339S00416	BOM_TABLE_ALTS	U1000	SoC, M, 3GB 20nm DDR, B1
339S00431	339S00416	BOM_TABLE_ALTS	U1000	SoC, S, 3GB 20nm DDR, B1
339S00432	339S00416	BOM_TABLE_ALTS	U1000	SoC, S, 3GB 18nm DDR, B1

SIPs

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:	
339M00011	339M00010	BOM_TABLE_ALTS	M5500	NIKI, STATS SIP	D21x Specific
339M00013	339M00012	BOM_TABLE_ALTS	M4100	HUNT, STATS SIP	

SOFT-TERM CAP SUB BOMS

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
685-00152	685-00151	BOM_TABLE_ALTS	SUBBOM_CAP	SUBBOM, MLB, CAP, SOFT, D21
138S00049	138S0831	TYPICAL_CAP	ALL	CAP, 0201, 2, 20P, 6.3V, KYOCERA

To enable alt in SUBBOM

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
685-00151	1	SUBBOM, MLB, SOFT-TERM, D21	SUBBOM_CAP		Default is typical
138S00159	9	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C3601, C3601, C3601, C3601, C3601, C3601		SOFT_CAP
138S0831	9	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C3601, C3601, C3601, C3601, C3601, C3601		TYPICAL_CAP
138S00159	15	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C3601, C3602, C3604, C3602, C3602, C3604, C3604		SOFT_CAP
138S0831	15	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C3601, C3605, C3604, C3604, C3602, C3604, C3604, C3604		TYPICAL_CAP
138S00159	10	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C3602, C3604, C3604, C3601, C3601, C3601		SOFT_CAP
138S0831	10	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C3601, C3604, C3604, C3601, C3601, C3601		TYPICAL_CAP
138S00159	2	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C3351, C3352		SOFT_CAP
138S0831	2	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C3351, C3352		TYPICAL_CAP
138S00159	3	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C3602, C3611, C3622		SOFT_CAP
138S0831	3	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C3602, C3611, C3622		TYPICAL_CAP
138S00159	5	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C3791, C3795-C3798		SOFT_CAP
138S0831	5	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C3791, C3795-C3798		TYPICAL_CAP
138S00159	3	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C3909, C3925, C3926		SOFT_CAP
138S0831	3	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C3909, C3925, C3926		TYPICAL_CAP
138S00159	2	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C4250, C4261		SOFT_CAP
138S0831	2	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C4250, C4261		TYPICAL_CAP
138S00159	1	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C4303		SOFT_CAP
138S0831	1	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C4303		TYPICAL_CAP
138S00159	5	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C4805, C4809, C4804, C4805, C4809		SOFT_CAP
138S0831	5	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C4805, C4809, C4804, C4805, C4809		TYPICAL_CAP
138S00159	5	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C5016, C5016, C5034, C5029, C5136		SOFT_CAP
138S0831	5	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C5016, C5016, C5134, C5029, C5136		TYPICAL_CAP
138S00159	1	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C5611		SOFT_CAP
138S0831	1	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C5611		TYPICAL_CAP
138S00159	4	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C5700, C5705, C5716, C5721		SOFT_CAP
138S0831	4	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C5700, C5705, C5716, C5721		TYPICAL_CAP
138S00159	5	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C5802-C5804, C5811, C5880		SOFT_CAP
138S0831	5	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C5802-C5804, C5811, C5880		TYPICAL_CAP
138S00159	1	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C5890		SOFT_CAP
138S0831	1	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C5890		TYPICAL_CAP
138S00159	5	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C6320, C6321, C6322, C6323, C6324		SOFT_CAP
138S0831	5	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C6320, C6321, C6322, C6323, C6324		TYPICAL_CAP
138S00160	4	CAP, SOFT-TERM, 100P, 10V, 0402, MUR/KYO	C4907, C4903, C4904, C4931		SOFT_CAP
138S0979	4	CAP, TYPICAL, 100P, 10V, 0402, MUR/KYO	C4907, C4903, C4904, C4931		TYPICAL_CAP
138S00160	5	CAP, SOFT-TERM, 100P, 10V, 0402, MURATA	C5600, C5602, C5603, C5702, C5703		SOFT_CAP
138S0979	5	CAP, TYPICAL, 100P, 10V, 0402, MUR/KYO	C5600, C5602, C5603, C5702, C5703		TYPICAL_CAP
138S00159	2	CAP, SOFT-TERM, 2, 20P, 6.3V, 0201, KYOCERA	C4025, C4026		SOFT_CAP
138S0831	2	CAP, TYPICAL, 2, 20P, 6.3V, 0201, MURATA	C4025, C4026		TYPICAL_CAP

D21x Specific

D21x Specific


IKTARA DIODES SUB BOMS

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
685-00172	685-00171	BOM_TABLE_ALTS	SUBBOM_DS	SUBBOM, MLB, SCHOTTKY DIODES, ONSEMI, D21

#31058972: Update Iktara Diodes APNs

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
685-00171	1	SUBBOM, MLB, SCHOTTKY DIODES, DIODES, D21	SUBBOM_DS		Footprint is ONSEMI
371S00133	4	DIODES, SHOTKEY DIODE, 30V, 2A, 0603	D3400, D3401, D3402, D3403		DIODES_DS
371S00132	4	ONSEMI, SHOTKEY DIODE, 30V, 2A, 0603	D3400, D3401, D3402, D3403		ONSEMI_DS

Primary is DIODES

PAGE TITLE			SYSTEM: BOM TABLES (1/2)	
 Apple Inc.		DRAWING NUMBER	051-02159	SIZE
		REVISION	10.0.0	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 PUBLISH IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED		BRANCH		
		PAGE	2 OF 80	
		SHEET	2 OF 81	

8

7

6

5

4

3

2

1

NAND BOM Options

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
335S00287	1	NAND, H, ULTRA, TLC	U2600	CRITICAL	ULTIMATE
335S00240	1	NAND, H, EXTREME, TLC	U2600	CRITICAL	EXTREME

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
335S00284	335S00287	BOM_TABLE_ALTS	U2600	T,1z,ULTIMATE
335S00285	335S00287	BOM_TABLE_ALTS	U2600	T,B1CS3,ULTIMATE
335S00288	335S00287	BOM_TABLE_ALTS	U2600	S,B1CS3,ULTIMATE
335S00286	335S00287	BOM_TABLE_ALTS	U2600	SS,3Dv4,ULTIMATE
335S00228	335S00240	BOM_TABLE_ALTS	U2600	T,B1CS3,EXTREME
335S00247	335S00240	BOM_TABLE_ALTS	U2600	S,B1CS3,EXTREME
335S00276	335S00240	BOM_TABLE_ALTS	U2600	SS,3Dv4,EXTREME

Isolator Switch

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
311S00126	311S00114	BOM_TABLE_ALTS	ALL	SPDT,TI

Mamba LDO

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
353S00932	353S00576	BOM_TABLE_ALTS	U5890	SMICRO LDO

Load Switch

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
353S00999	353S01039	BOM_TABLE_ALTS	U6100	TLLOAD SW,T9929195C
353S01007	353S01039	BOM_TABLE_ALTS	U6100	ONOFF LOAD SW,BCF313

Crystal Alts

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:	CRITICAL PART#	COMMENT
197S0612	197S00118	BOM_TABLE_ALTS	Y1000	NDX,CYAL,24MHz,1.6x1.2	197S00118	XTAL, 24M, 1612, TOK
197S06120	197S00118	BOM_TABLE_ALTS	Y1000	EPSON,CYAL,24MHz,1.6x1.2	197S0612	XTAL, 24M, 1612, NDK
					197S00120	XTAL, 24M, 1612, EPSON

PMID1 Zener Diode

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
371S00121	371S00030	BOM_TABLE_ALTS	D23300	DIODE,ZENER,20V

ZRB Caps

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
138S0683	1	1uF,25V,0402,X5R,104	C3301	CRITICAL	COMMON

CRITICAL PART#	COMMENT
138S00185	MUR,CAP,ZRB,2.2UF,25V,0402
138S00186	MUR,CAP,ZRB,4.7UF,25V,0603

Global R/C Alternates

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
118S0764	138S0717	BOM_TABLE_ALTS	ALL	RES, 3.92K, 0.1%, 0201
138S0648	138S0652	BOM_TABLE_ALTS	ALL	CAP,XSR,4.7UF,4.7V,2.5MM,0401,25V100
138S00024	138S0986	BOM_TABLE_ALTS	ALL	CAP,CER,3.700V,1.50V,20%,4V,0402,1000000
138S0706	138S0739	BOM_TABLE_ALTS	ALL	CAP,CER,10V,20V,20%,10V,0402,1000000
138S0945	138S0739	BOM_TABLE_ALTS	ALL	CAP,CER,10V,20V,20%,10V,0402,1000000
138S0739	138S0706	BOM_TABLE_ALTS	ALL	CAP,CER,10V,20V,20%,10V,0402,1000000
132S0436	132S0400	BOM_TABLE_ALTS	ALL	CAP,CER,10V,20V,20%,10V,0402,1000000
138S00133	138S00128	BOM_TABLE_ALTS	ALL	CAP,CER,10V,20V,20%,10V,0402,1000000
138S00148	138S00150	BOM_TABLE_ALTS	ALL	CAP,0402,150V,4V,KTCC88A
138S00149	138S00150	BOM_TABLE_ALTS	ALL	CAP,0402,140V,4V,MURATA
138S00151	138S00150	BOM_TABLE_ALTS	ALL	CAP,0402,150V,4V,TAIYO
138S00144	138S00143	BOM_TABLE_ALTS	ALL	CAP,0402,160V,4V,MURATA
138S00143	138S00144	BOM_TABLE_ALTS	ALL	CAP,0402,220V,4V,KTCC88A
138S00139	138S00138	BOM_TABLE_ALTS	ALL	CAP,0201,10V,4V,MURATA
138S00138	138S00139	BOM_TABLE_ALTS	ALL	CAP,0201,4.7UF,4V,KTCC88A
138S00145	138S00146	BOM_TABLE_ALTS	ALL	CAP,0402,200V,6.3V,KTCC88A
138S00141	138S00140	BOM_TABLE_ALTS	ALL	CAP,0201,10V,4.7V,MURATA
138S00142	138S00140	BOM_TABLE_ALTS	ALL	CAP,0201,10V,4.7V,SAMSUNG
138S00142	138S00141	BOM_TABLE_ALTS	ALL	CAP,0201,10V,4.7V,SAMSUNG
138S00049	138S0831	BOM_TABLE_ALTS	ALL	CAP,0201,2.2UF,6.3V,KTCC88A
138S00163	138S00143	BOM_TABLE_ALTS	ALL	CAP,0402,220V,4V,KTCC88A
138S00164	138S00138	BOM_TABLE_ALTS	ALL	CAP,0201,10V,4V,MURATA
138S00165	138S00146	BOM_TABLE_ALTS	ALL	CAP,0402,200V,6.3V,KTCC88A
138S00166	138S00140	BOM_TABLE_ALTS	ALL	CAP,0201,10V,4.7V,TT
138S00140	138S00141	BOM_TABLE_ALTS	ALL	CAP,0201,10V,4.7V,KTCC88A
138S00048	138S00003	BOM_TABLE_ALTS	ALL	CAP,33V,150V,6.3V,2.5MM,0402,25V
132S0639	132S00088	BOM_TABLE_ALTS	ALL	CAP,33V,4.7UF,25V,2.5MM,0401,100

Global Ferrites Alternates

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
155S00581	155S00149	BOM_TABLE_ALTS	ALL	FERR, 240OHM, 0.360MM DCR, 0201
155S00194	155S00910	BOM_TABLE_ALTS	ALL	FERR BD, 150OHM, TOK
155S00200	155S0610	BOM_TABLE_ALTS	ALL	FERR BD, 150OHM, TT
152S00558	152S00957	BOM_TABLE_ALTS	ALL	IND,0.47UH,20V,2.5A,60MO,1000,2012
152S00655	152S00656	BOM_TABLE_ALTS	ALL	IND,MID,1.0UH,20V,3A,60MO,1000,2012,1000
152S00653	152S00651	BOM_TABLE_ALTS	ALL	IND,MID,1.2UH,2.8A,100MO
152S00654	152S00652	BOM_TABLE_ALTS	ALL	IND,MID,1.0UH,10V,1A,100MO,1000,2012,1000
155S00012	155S00168	BOM_TABLE_ALTS	ALL	FLTR, 65 OHMS, 0605
152S00710	152S00617	BOM_TABLE_ALTS	ALL	IND,0.1UH,290OHM,3.5A,160H,B=65
152S00711	152S00619	BOM_TABLE_ALTS	ALL	IND,0.1UH,210OHM,7.2A,2012,B=65
152S00713	152S00621	BOM_TABLE_ALTS	ALL	IND,0.47UH,160OHM,3.5A,2012,B=65
152S00714	152S00622	BOM_TABLE_ALTS	ALL	IND,1UH,100OHM,2.1A,2012,B=65
152S00716	152S00626	BOM_TABLE_ALTS	ALL	IND,1UH,780OHM,2.1A,2012,B=80
152S00717	152S00631	BOM_TABLE_ALTS	ALL	IND,1UH,400OHM,3.2A,2016,B=80
152S00718	152S00632	BOM_TABLE_ALTS	ALL	IND,1UH,520OHM,3.2A,2016,B=80
152S00719	152S00639	BOM_TABLE_ALTS	ALL	IND,0.47UH,160OHM,3.5A,2012,B=65
152S00720	152S00640	BOM_TABLE_ALTS	ALL	IND,0.47UH,400OHM,3.5A,2012,B=65
152S00721	152S00641	BOM_TABLE_ALTS	ALL	IND,1UH,400OHM,3.5A,2016,B=80
155S00338	155S0661	BOM_TABLE_ALTS	ALL	FERR BD,150OH,1.1A,500OHM DCR,0201
155S00340	155S0876	BOM_TABLE_ALTS	ALL	FERR BD,150OH,1.1A,500OHM DCR,0201
155S00339	155S0660	BOM_TABLE_ALTS	ALL	FERR BD,220OH,1.1A,400OHM DCR,0201

CRITICAL PART#	COMMENT
118S0717	RES, 3.92K, 0.1%, 0201
138S0652	CAP,XSR,4.7UF,6.3V,0.65MM,0402
138S0706	CAP,CER,XSR,1UF,20%,6.3V,0201
132S0400	CAP,CER,XSR,0.22UF,20%,6.3V,01005
138S0831	CAP,CER,XSR,2.2UF,20%,6.3V,0201
138S00128	CAP,CER,XSR,0.47UF,20%,6.3V,01005

CRITICAL PART#	COMMENT
138S00149	0402-3T,10.5uF@1V

CRITICAL PART#	COMMENT
138S00144	0402,16uF@1V

CRITICAL PART#	COMMENT
138S00140	0201,3uF@1V

CRITICAL PART#	COMMENT
138S00146	0402,5.1uF@3V


CRITICAL PART#	COMMENT
138S00141	0201,1.1uF@3V

CRITICAL PART#	COMMENT
155S0610	FERR BD, 150OHM, 01005

CRITICAL PART#	COMMENT
152S00617	IND,MID,0.1UH,20%,6.1A,290OHM,B=65,160H
152S00620	IND,MID,0.1UH,20%,7.2A,170OHM,B=0.8,2012
152S00621	IND,MID,0.47UH,20%,3.5A,53MO,B=65,2012
152S00622	IND,MID,1.0UH,20%,2.1A,100MO,B=65,2012
152S00626	IND,MID,1.5UH,20%,1.1A,160MO,B=65,2012
152S00631	IND,MID,1.0UH,20%,2.5A,78MO,B=0.6,2012
152S00632	IND,MID,1.0UH,20%,3.2A,60MO,B=0.8,2016
152S00640	IND,MID,0.47UH,3.8A,55MO,B=0.65MM,2012
152S00641	IND,MID,0.47UH,4A,48MO,B=0.8MM,2012
152S00623	IND,MID,1UH,3.8A,60MO,B=0.9MM,2016
152S00651	IND,1.2UH,3A,2016,0.65S
152S00650	IND,0.47UH,6.6A,3225,0.6S

Multi-Vendor Criticals

CRITICAL PART#	COMMENT	CRITICAL PART#	COMMENT
377S0106	SUPPR,TRANS,VARIATOR,12V,33PF,01005	132S0288	CAP,CER,XSR,0.1UF,10V,16V,0201
197S0446	XTAL,24MHz,30PPM,9.5PF,60 OHM MAX,1612	132S0275	CAP,CER,XSR,470PF,10V,10V,01005
155S0576	FERR BD,15 OHM,504,750MA,0.07 DCR,01005	132S0249	CAP,CER,XSR,220PF,10V,10V,01005
155S00168	FLTR,NOISE,65 OHM,3.40MM,0.7-20HZ,0605	132S0245	CAP,CER,XSR,0.01UF,10V,6.3V,01005
138S0979	CAP,CER,XSR,10UF,20%,10V,0402,H=0.65MM	132S00093	CAP,XSR,0.022UF,20%,6.3V,01005
138S0692	CAP,CER,XSR,1UF,20%,6.3V,0201	132S00025	CAP,CER,XSR,0.047UF,20%,6.3V,01005
138S0683	CAP,CER,XSR,1UF,10V,25V,0402	132S00008	CAP,CER,0.1UF,10V,50V,X7R,0402
138S0652	CAP,CER,XSR,4.7UF,20%,6.3V,H=0.65MM,0402	131S0883	CAP,CER,NPO/COG,220PF,2A,50V,0201
138S00070	CAP,XSR,4.7UF,20%,25V,0402	131S0804	CAP,CER,27PF,5V,COG,25V,0201
138S00014	CAP,CER,10V,20%,16V,XSR,0201,H=0.39MM	131S0307	CAP,CER,NPO/COG,100PF,5V,16V,01005
138S0664	CAP,CER,0.047UF,10V,25V,XSR,0201	131S0225	CAP,CER,NPO/COG,15PF,5V,16V,01005
132S0663	CAP,CER,XSR,1UF,10V,25V,0402	131S0223	CAP,CER,NPO/COG,27PF,5V,16V,01005
132S0534	CAP,CER,NPO/COG,12PF,5V,16V,01005	131S0220	CAP,CER,NPO/COG,12PF,5V,16V,01005
132S0436	CAP,CER,XSR,0.22UF,20%,6.3V,01005	131S0216	CAP,CER,NPO/COG,47PF,5V,16V,01005
132S0396	CAP,CER,XSR,1000PF,10V,10V,01005	131S00053	CAP,CER,COG,220PF,5V,10V,01005
132S0316	CAP,CER,XSR,0.1UF,20%,6.3V,01005	118S00068	RES,NF,0.3 MOHM,1A,200PPM,1/20W,0201
138S0304	CAP,CER,XSR,0.22UF,20%,6.3V,0201	117S0055	RES,NF,1/20W,2M OHM,5,0201,2ND
132S0296	CAP,CER,XSR,1000PF,10V,6.3V,01005	107S0257	THERMISTOR,NTC,10K OHM,1A,B=3435,01005

PAGE TITLE			SYSTEM: BOM TABLES (2/2)	
 Apple Inc.		DRAWING NUMBER	051-02159	SIZE
		REVISION	10.0.0	
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 IV ALL RIGHTS RESERVED		BRANCH		
		PAGE	3 OF 80	
		SHEET	3 OF 81	

87654321

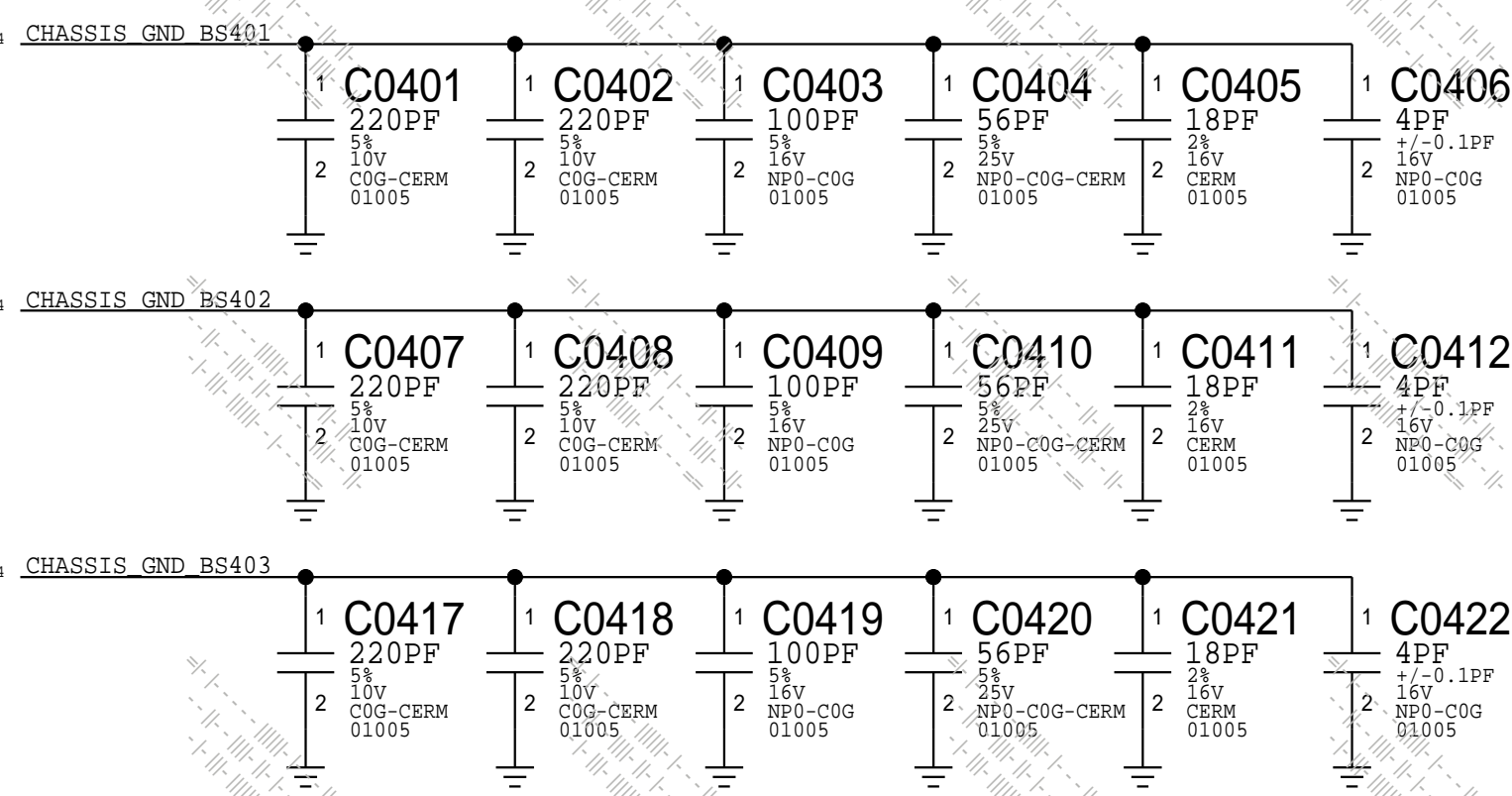
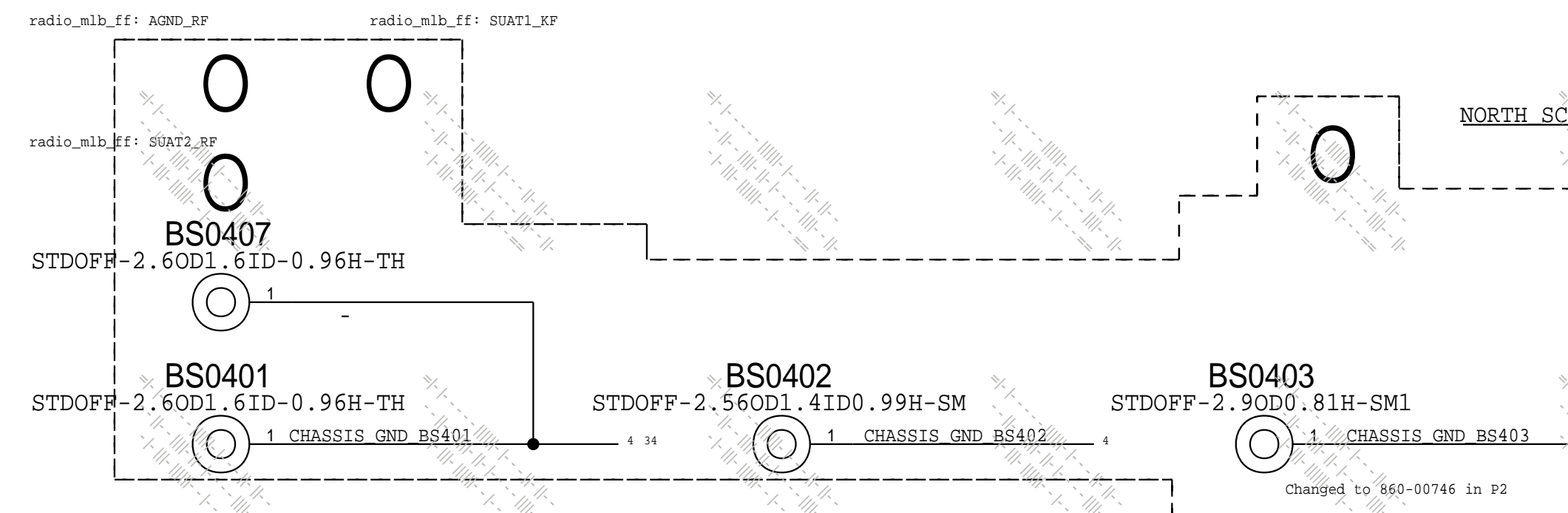
Current as of D21 MCO 056-03352 REV 42

D

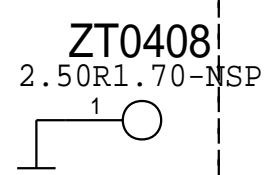
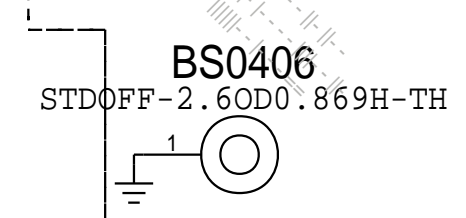
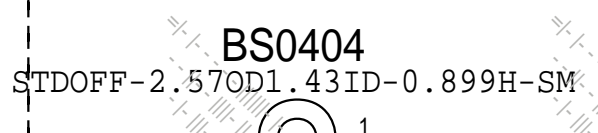
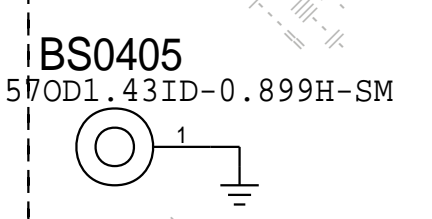
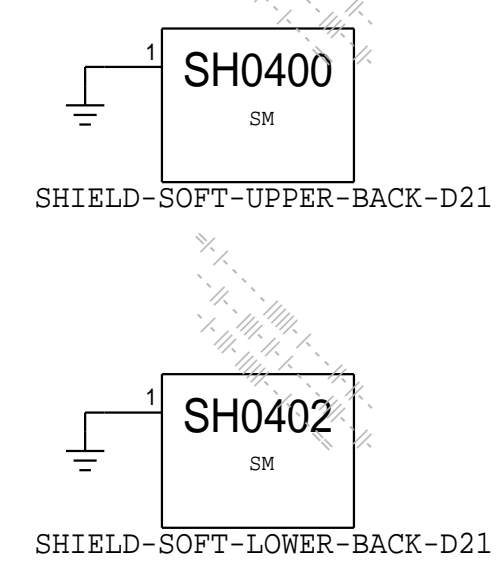
C

B

A

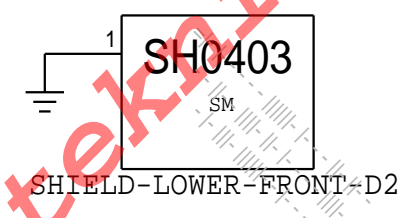
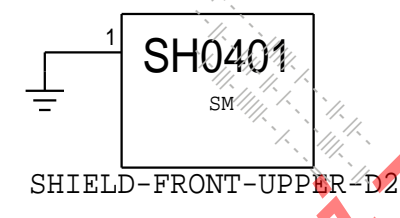


Back Shields



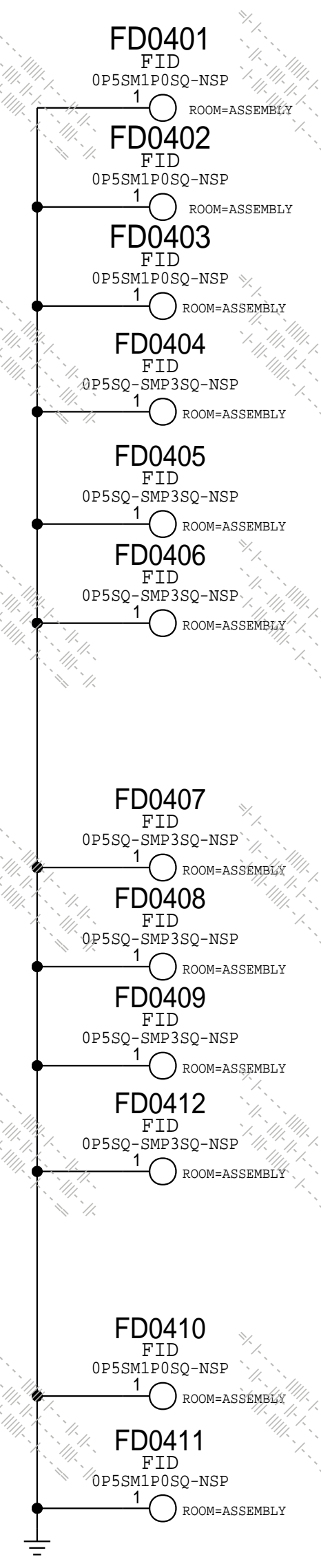
www.teknisi-indonesia.com


Front Shields



TOP SIDE

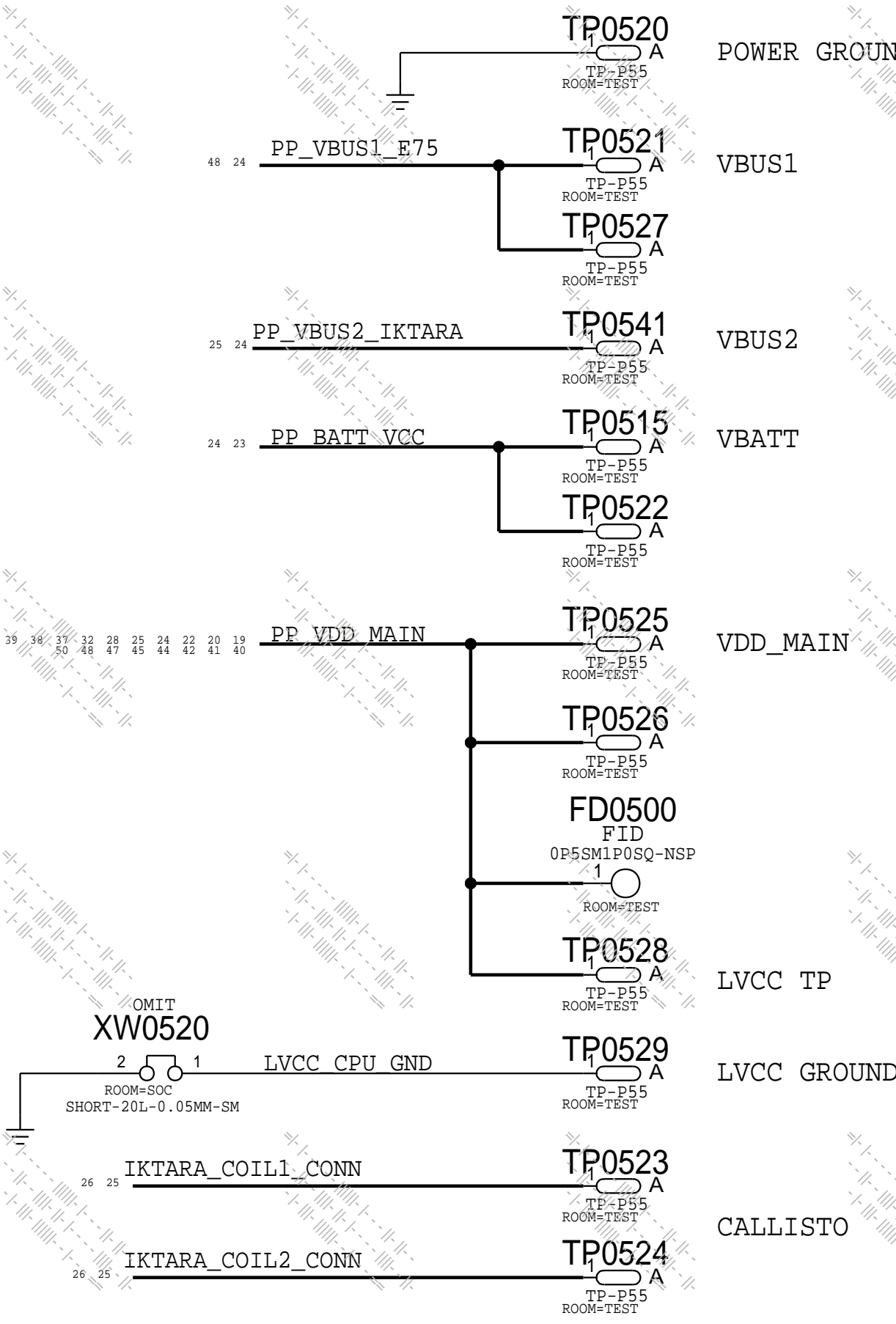
FIDUCIALS



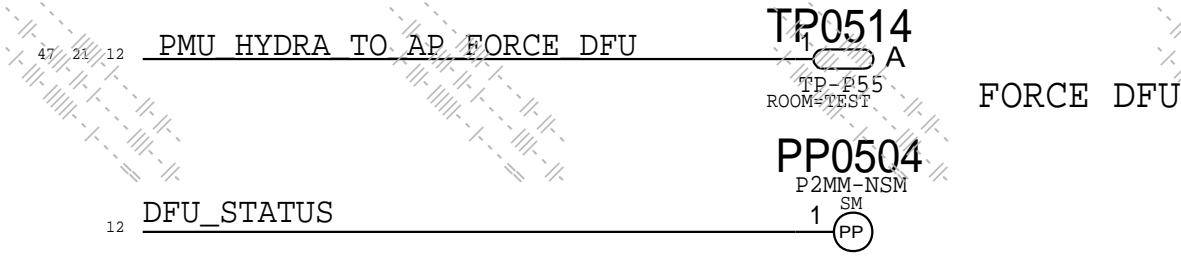
PAGE TITLE				SYSTEM:MECH COMPONENTS			
 Apple Inc.		DRAWING NUMBER		051-02159		SIZE	D
		REVISION		10.0.0			
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED		BRANCH					
		PAGE 4 OF 80					
		SHEET 4 OF 81					

Test Points

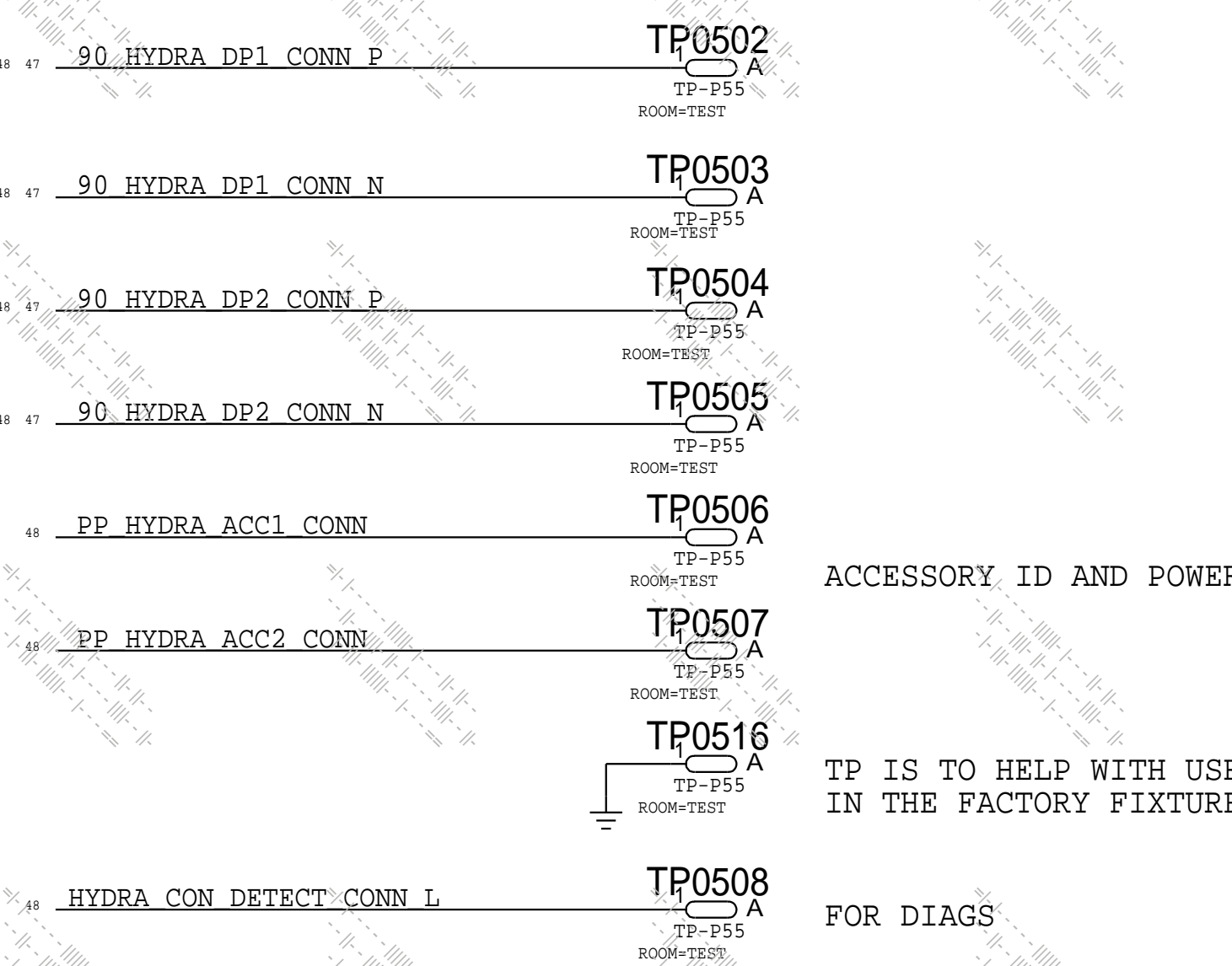
POWER



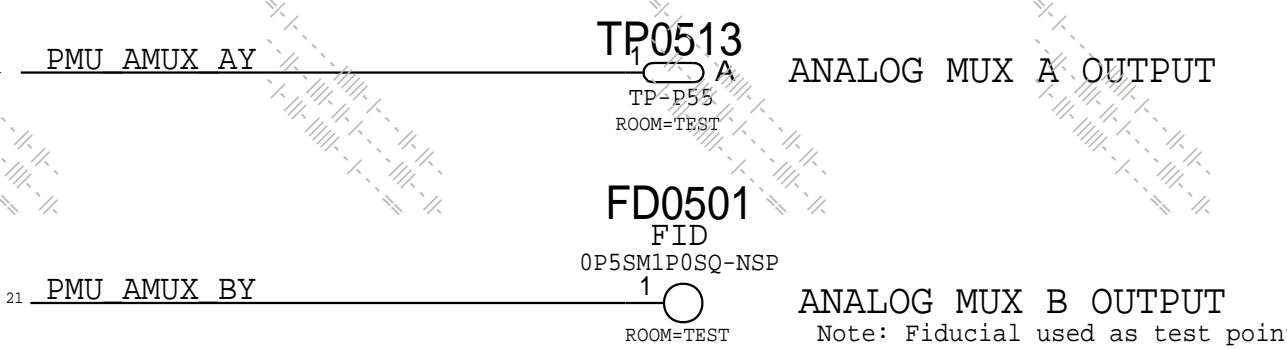
DFU



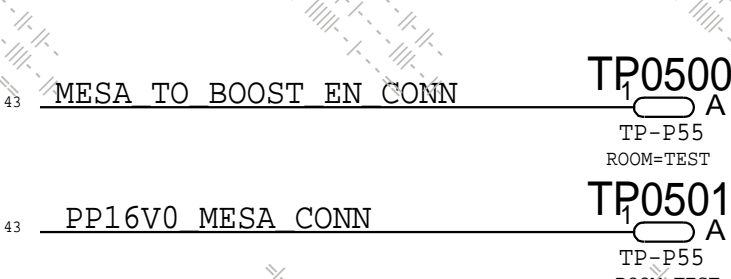
E75



AMUX



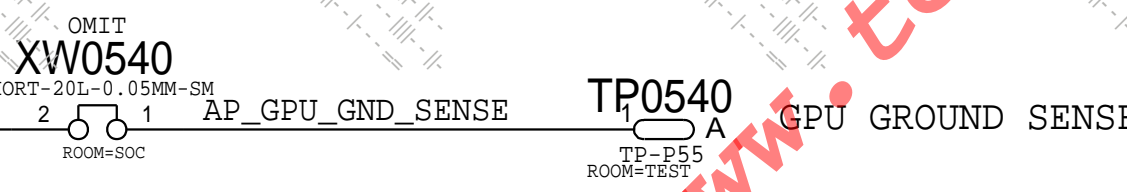
MOJAVE



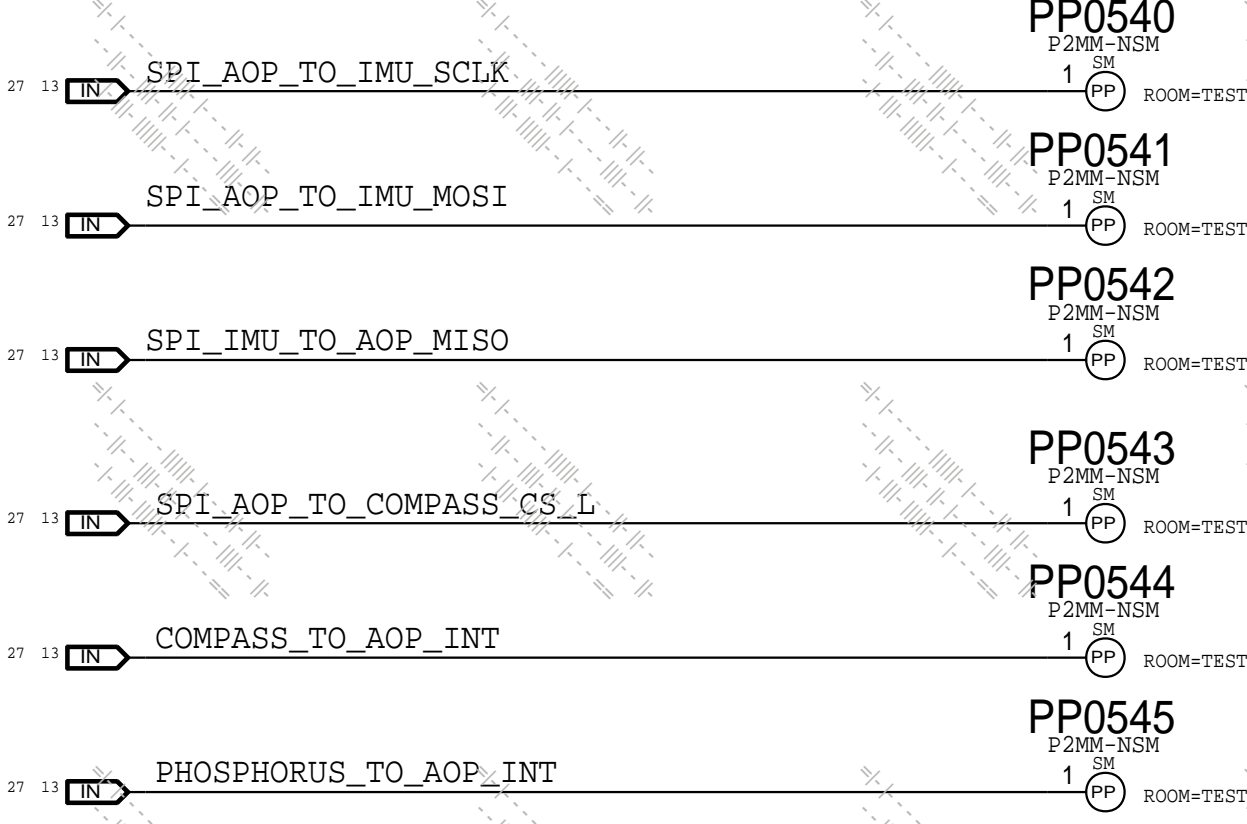
LCM



SENSE TP

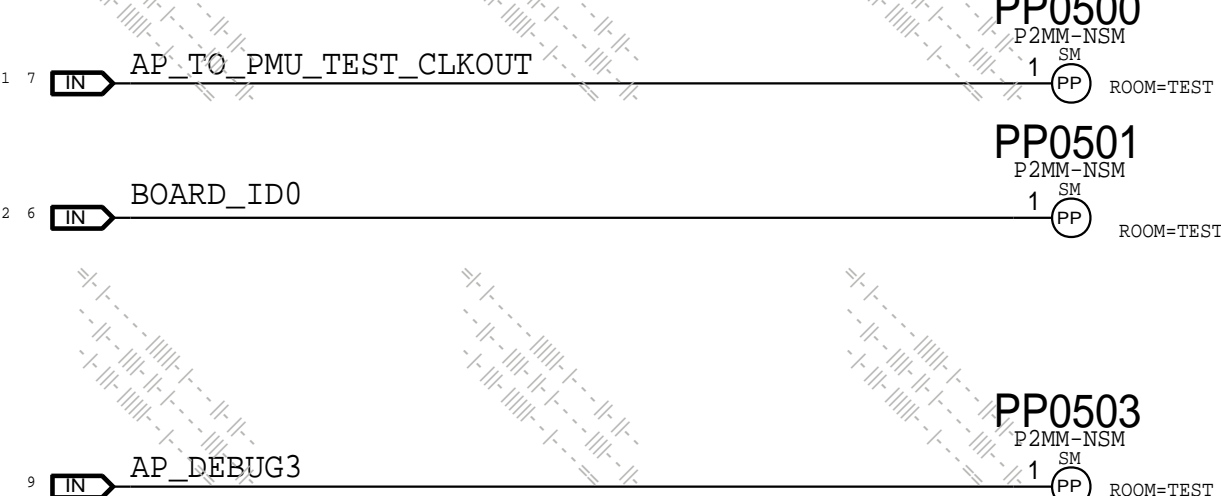


Sensor SPI

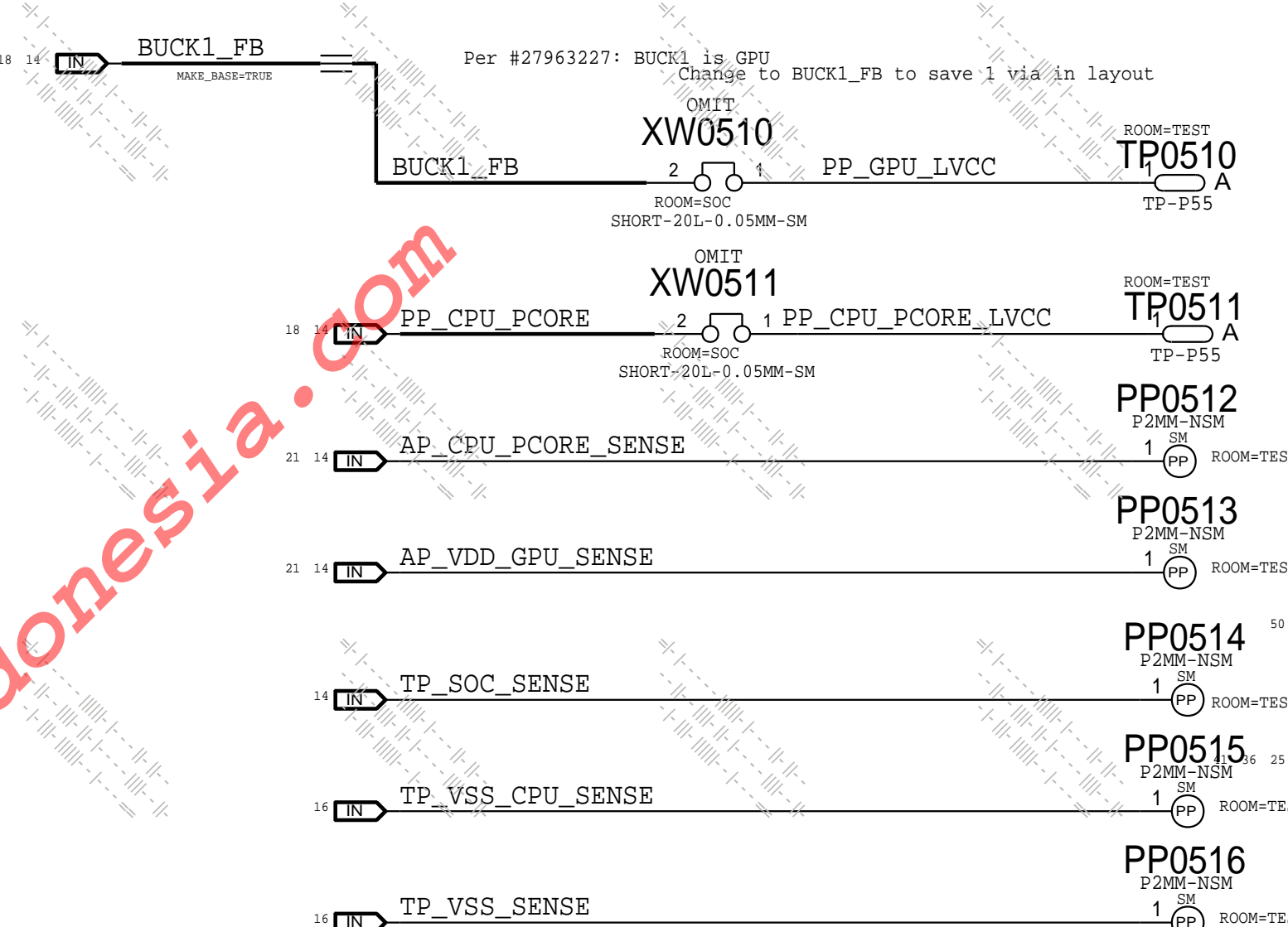


Probe Points

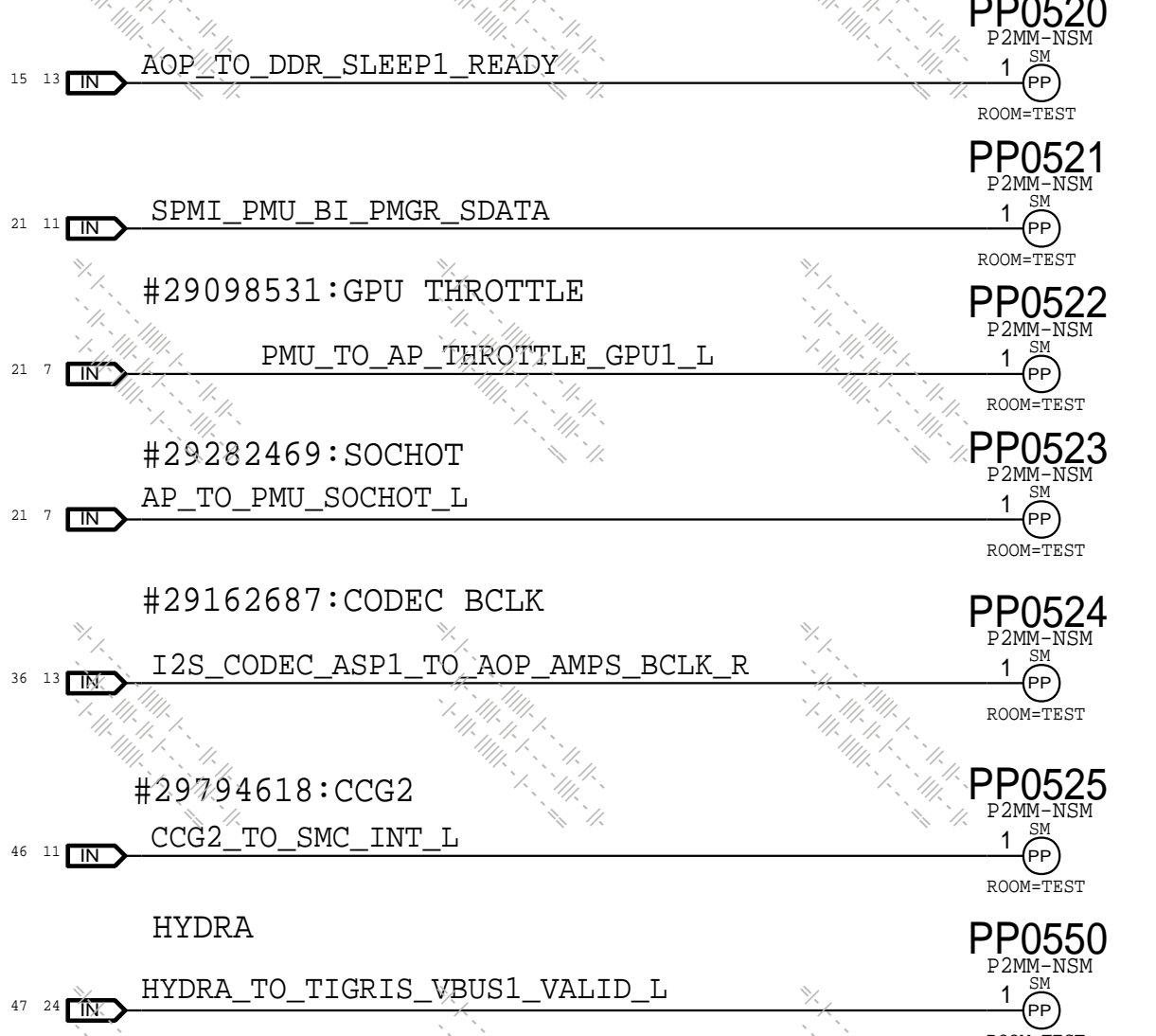
SOC Debug



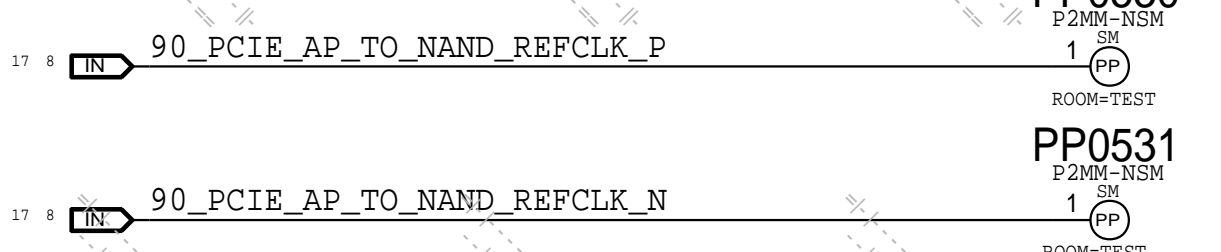
SOC CPU/GPU



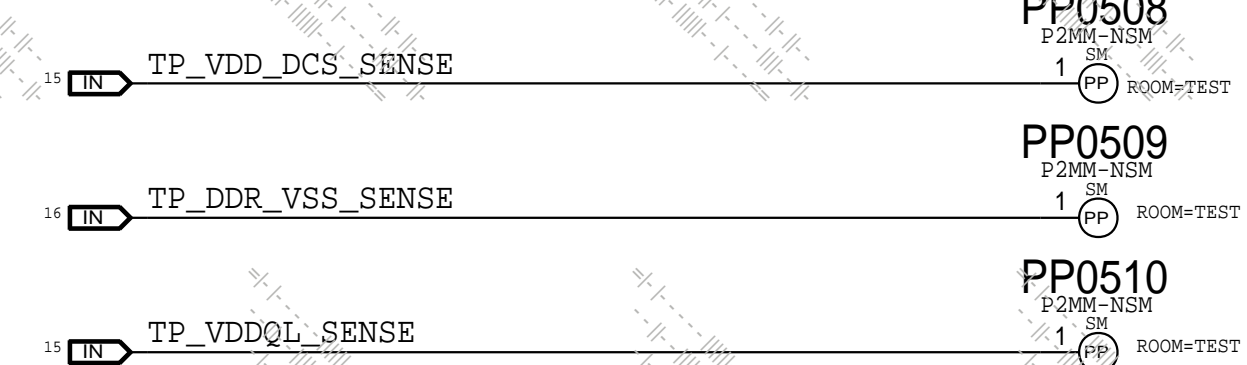
PMU Debug



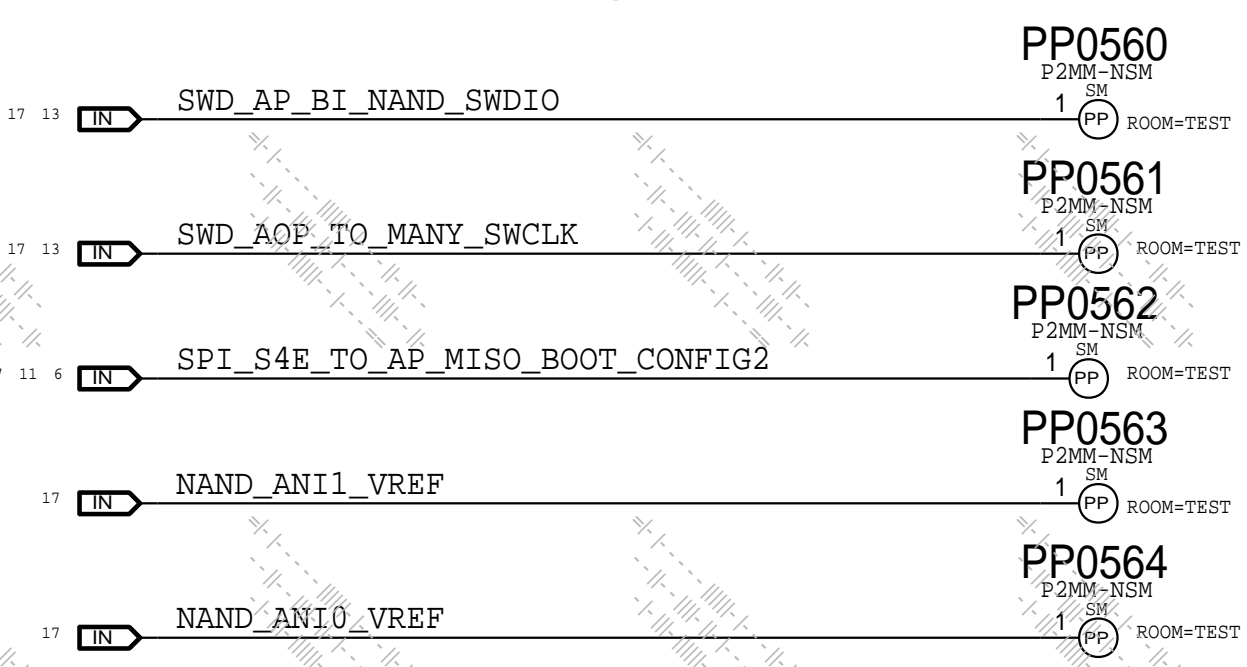
PCIE Refclk



SOC DDR



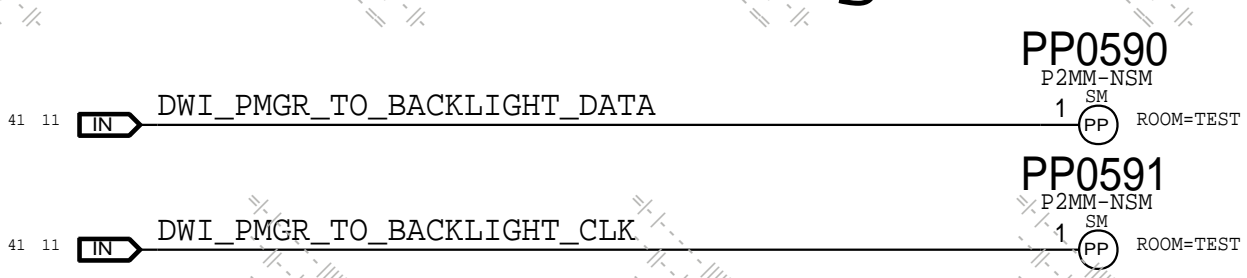
NAND Debug



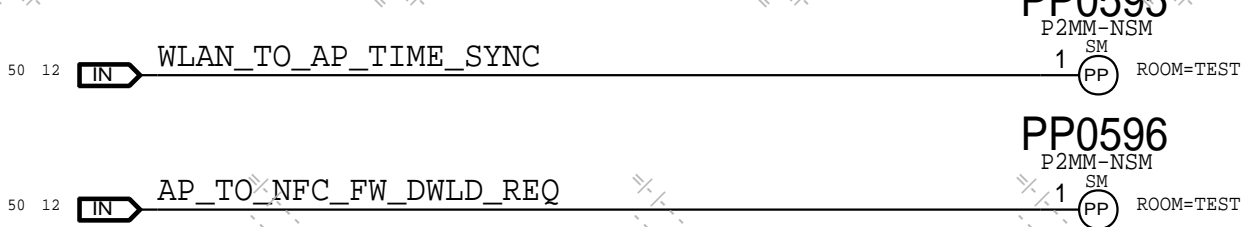
BB UAT Debug



BACKLIGHT Debug

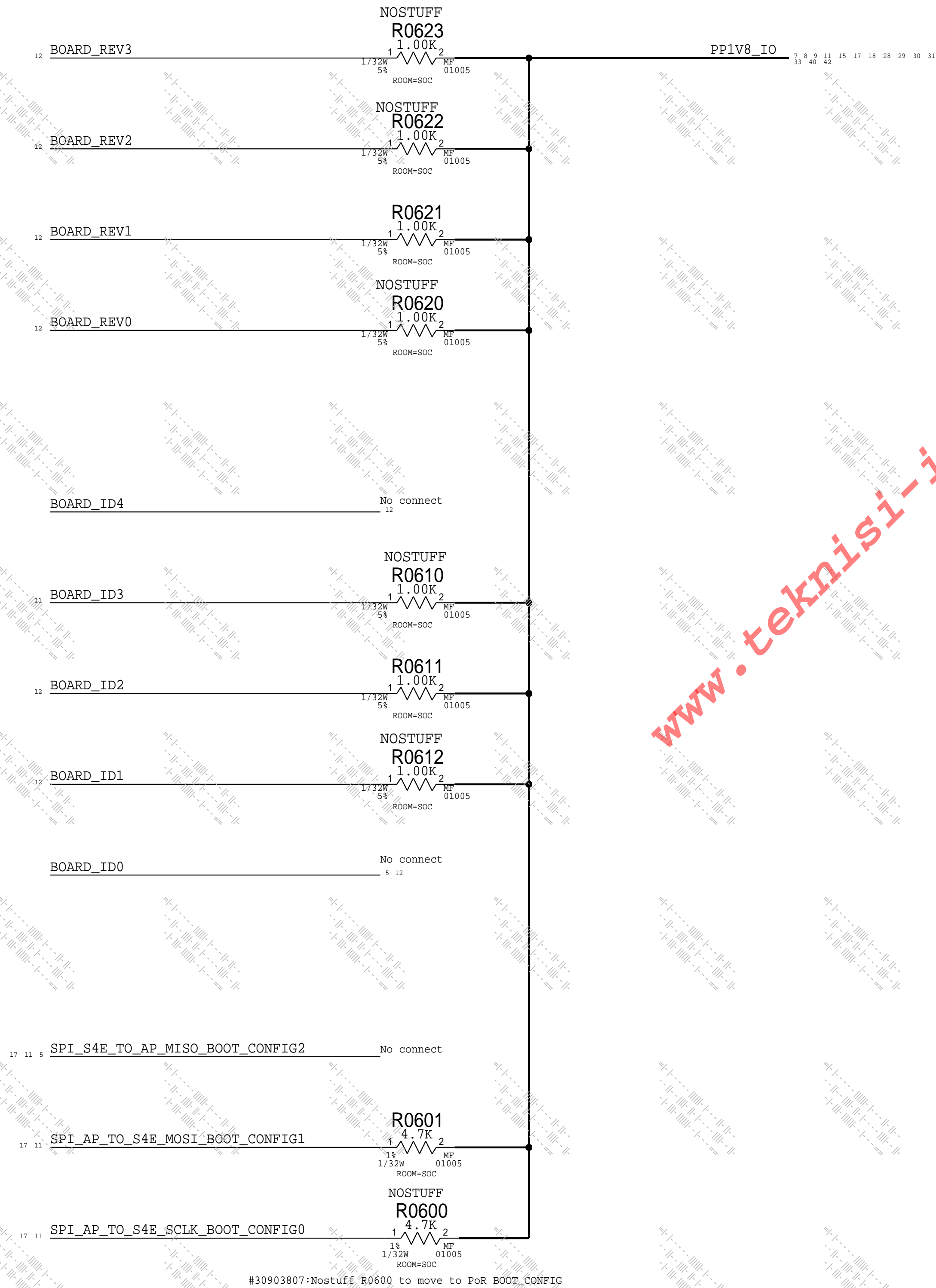


RF Debug



PAGE TITLE		
SYSTEM: Testpoints		
	DRAWING NUMBER	051-02159
	REVISION	10.0.0
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	BRANCH	
	PAGE	5 OF 80
	SHEET	5 OF 81

BOOTSTRAPPING:BOARD REV
BOARD ID
BOOT CONFIG



BOARD_REV[3:0]
FLOAT=LOW, PULLUP=HIGH

1111	Pre-Proto (Placeholder)
1110	PROTO1
1101	SPARE
1100	PROTO2
1011	PROTO2 (HALOGEN DOE)
1001	PROTO2v5
xxxx	SPARES
1000	EVT
xxxx	SPARES
0100	CARRIER
xxxx	SPARE
0010	DVT
xxxx	SPARE
0000	PVT

Note: Future board revs TBD


BOARD_ID[4:0]
FLOAT=LOW, PULLUP=HIGH

00010	D20 MLB
00011	D20 DEV
00100	D21 MLB
00101	D21 DEV
01010	D201 MLB
01011	D201 DEV
01100	D211 MLB
01101	D211 DEV

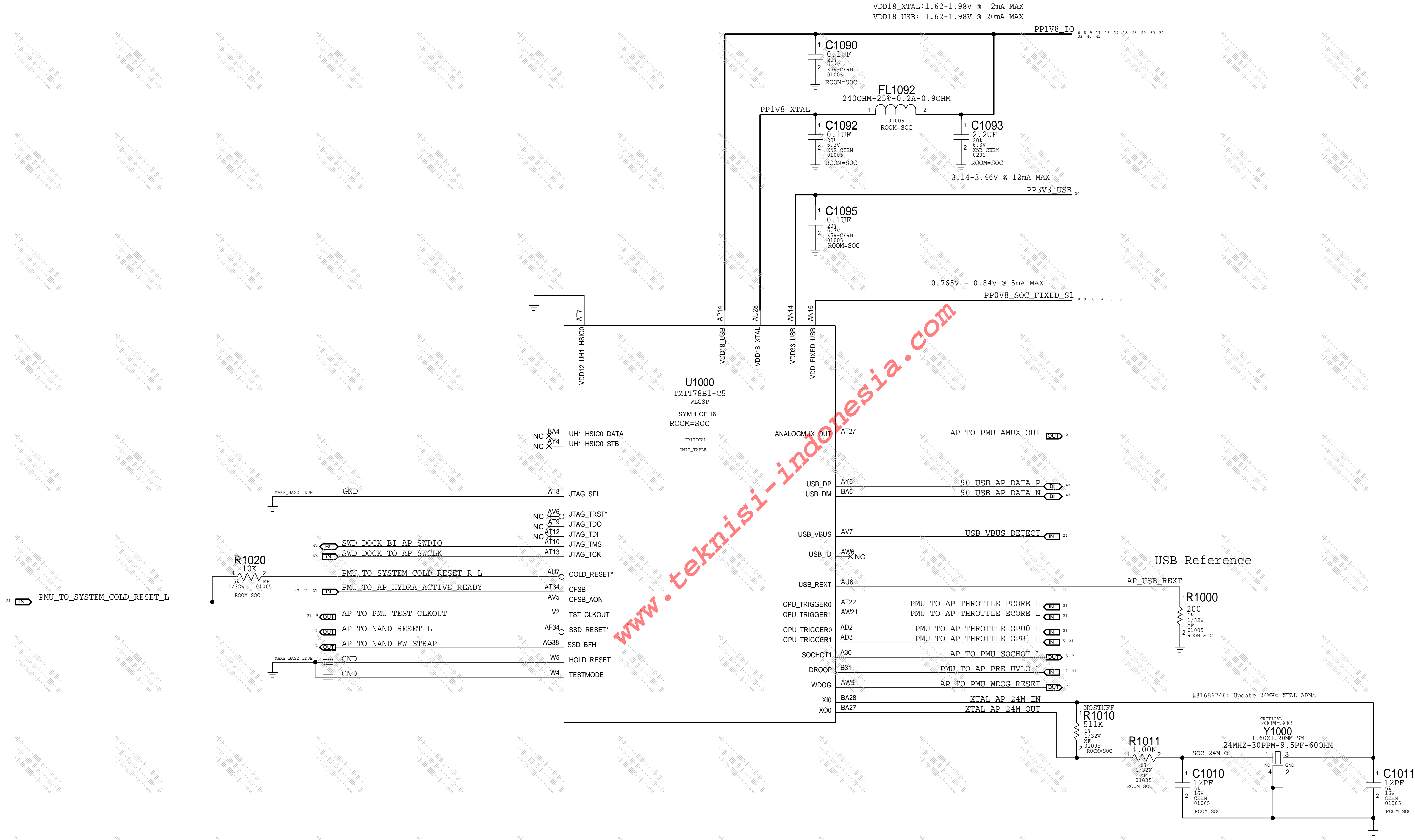
0=MLB, 1=DEV
01=D20x, 10=D21x
0=EUREKA, 1=KAROO

BOOT_CONFIG[2:0]
FLOAT=LOW, PULLUP=HIGH

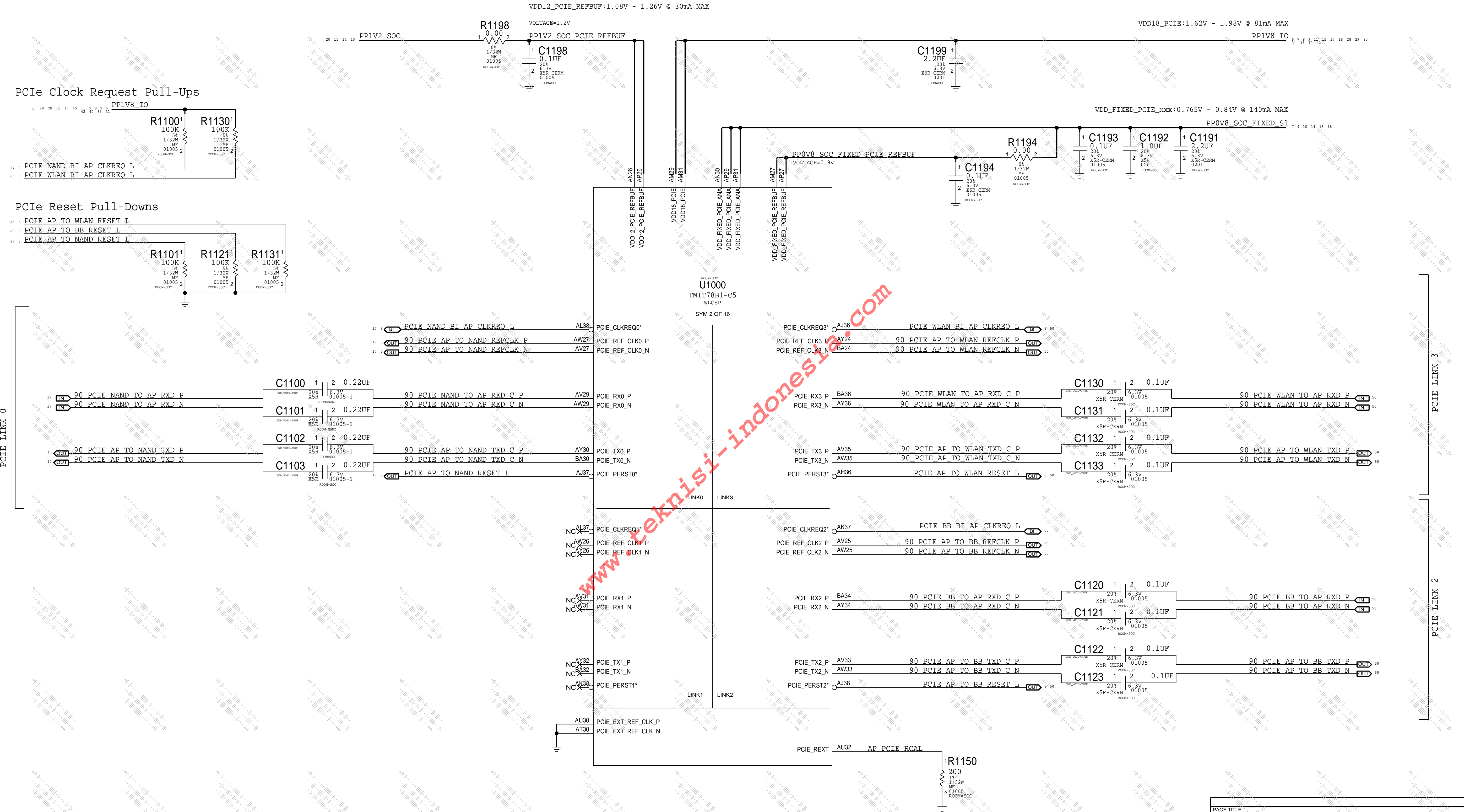
000	SPI0
001	SPI0 TEST MODE
010	SPI0 NAND
011	SPI0 NAND TEST
100	n/a
101	n/a
110	SLOW SPI0 TEST
111	FAST SPI0 TEST

PAGE TITLE			BOOTSTRAPPING		
 Apple Inc.		DRAWING NUMBER		SIZE	
		051-02159		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		REVISION		10.0.0	
		BRANCH			
		PAGE		6 OF 80	
		SHEET		6 OF 81	

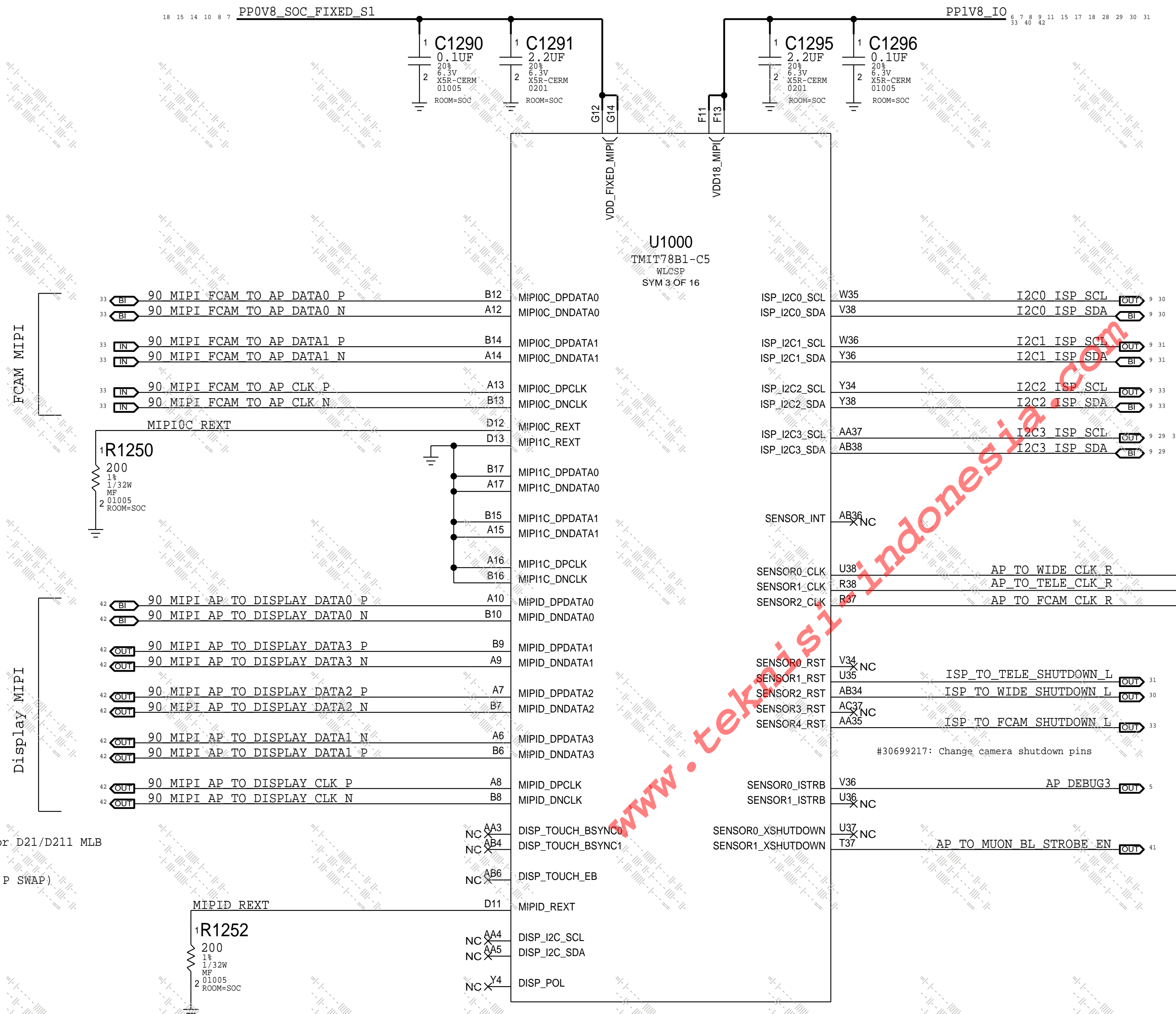
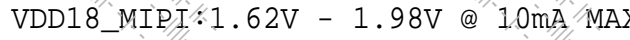
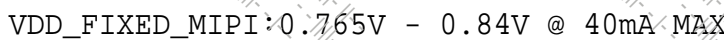
SOC - USB, JTAG, XTAL



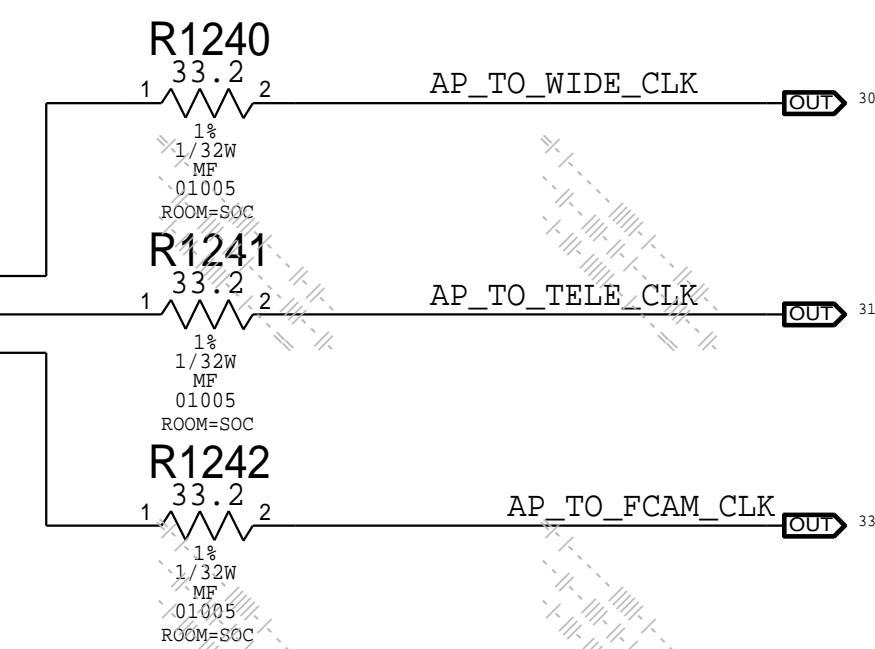
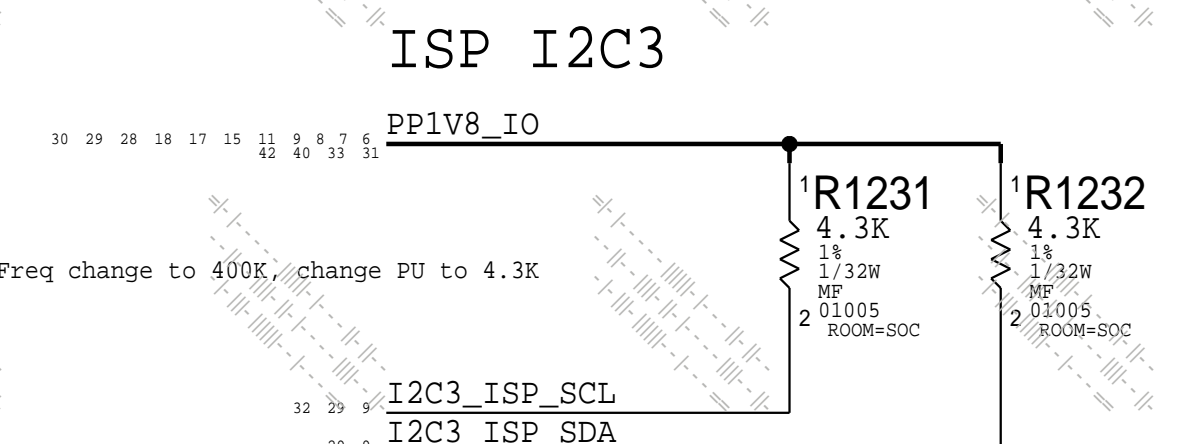
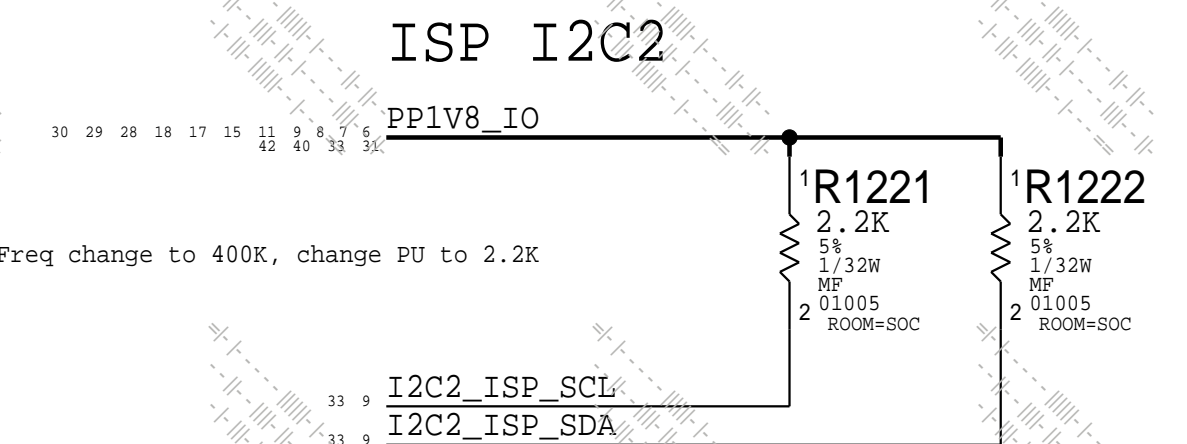
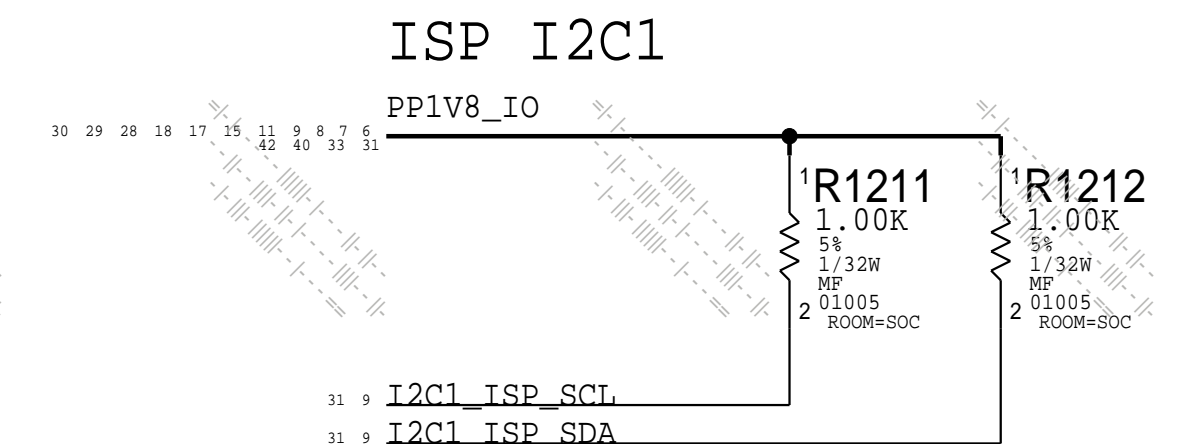
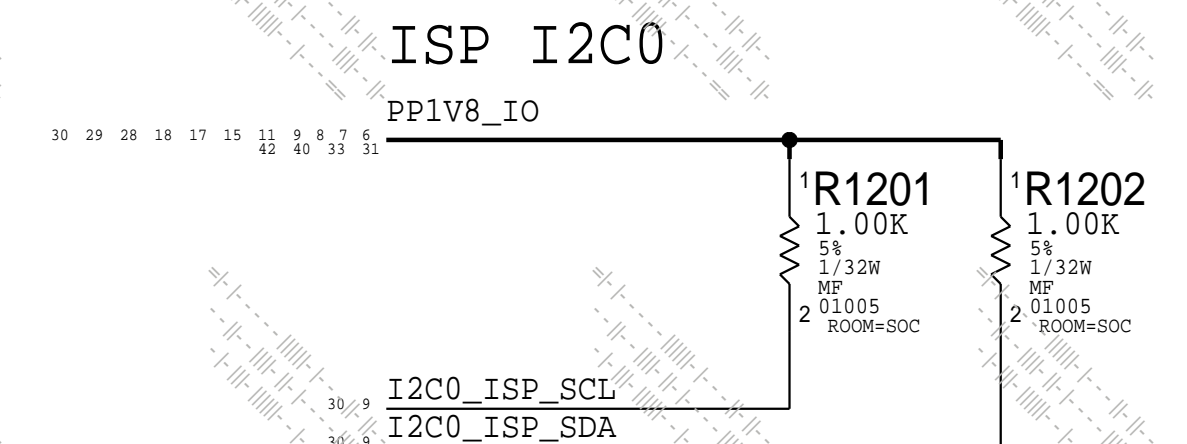
SOC - PCIE INTERFACES



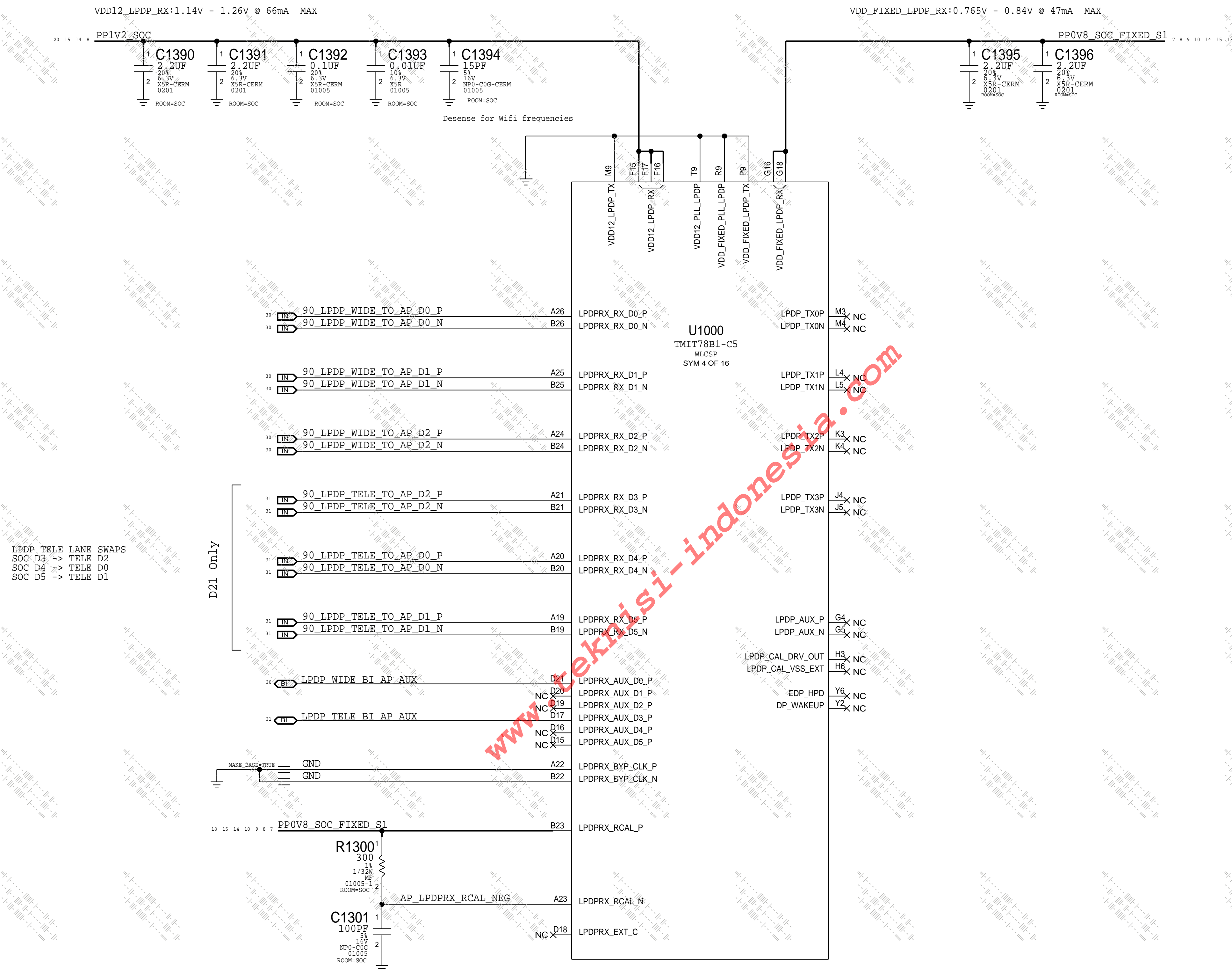
SOC – MIPI & ISP INTERFACES



```
Pin assignment optimized for D21/D211 ML
DISPLAY MIPI LANE SWAPS
SOC D1 -> DISPLAY D3
SOC D3 -> DISPLAY D1 (N & P SWAP)
```




SOC – LPDP INTERFACES

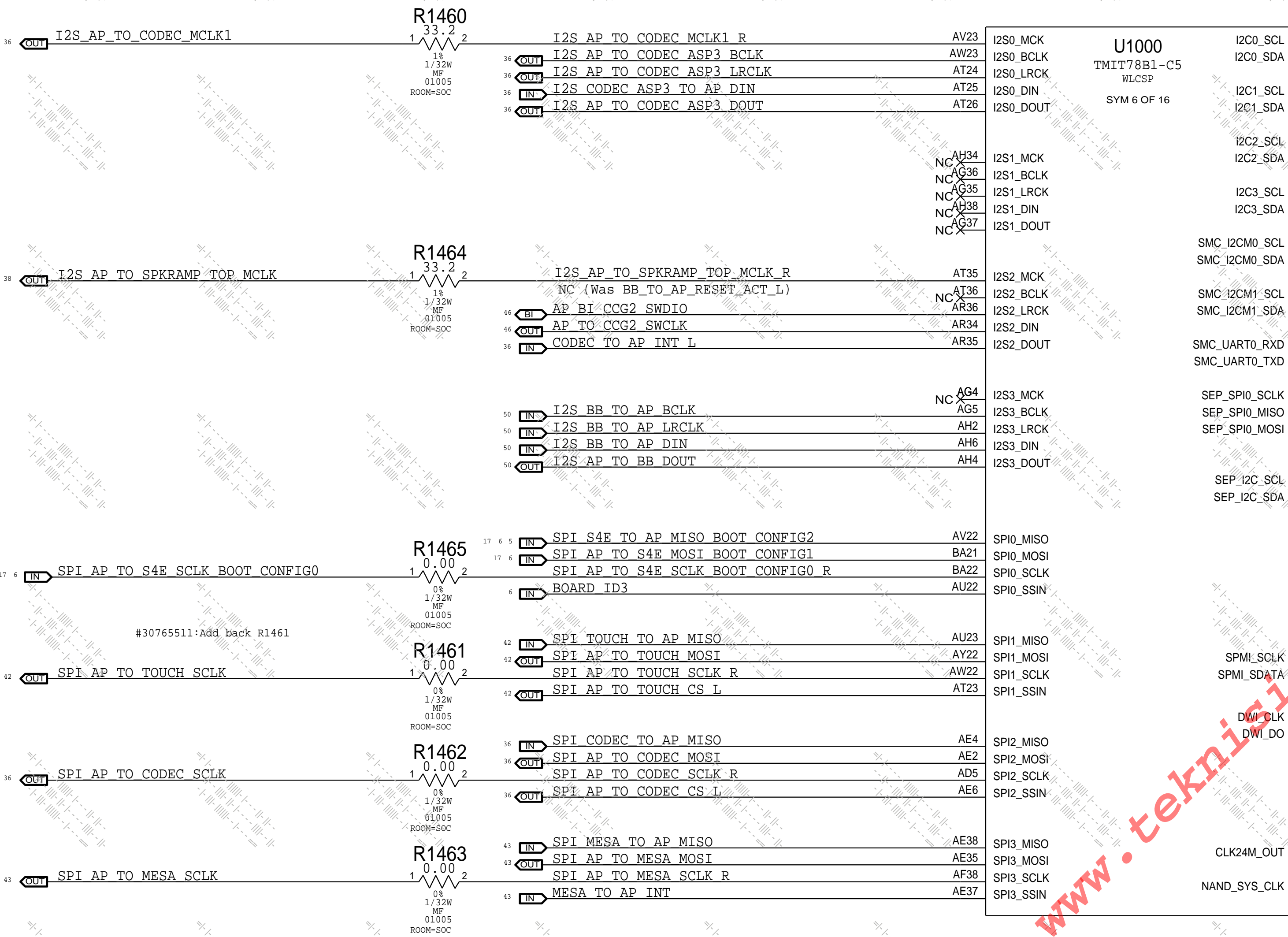


```
LPDP TELE LANE SWAPS
SOC D3 -> TELE D2
SOC D4 -> TELE D0
SOC D5 -> TELE D1
```

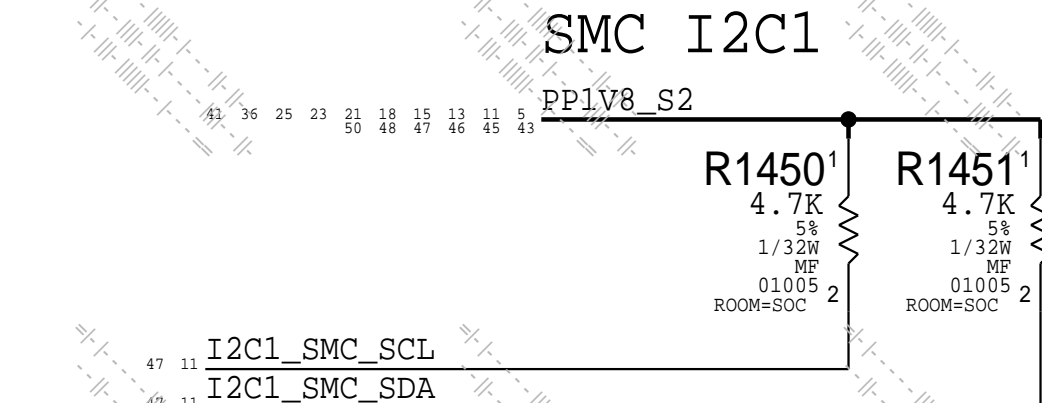
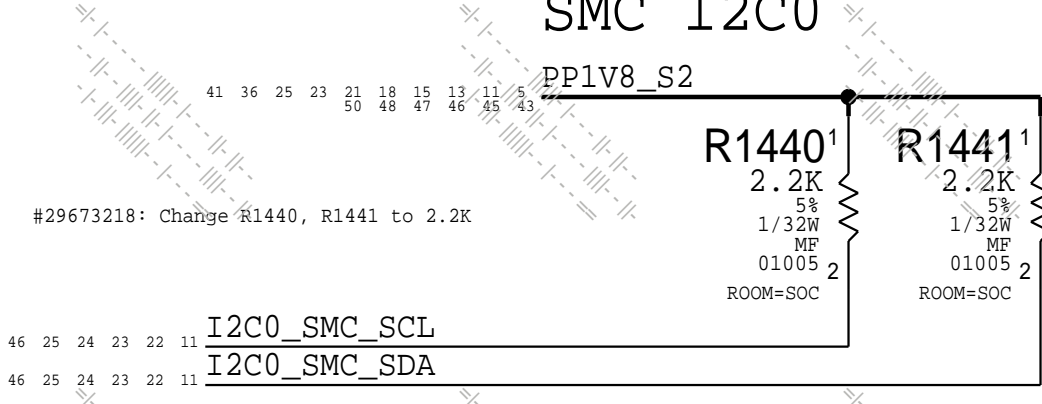
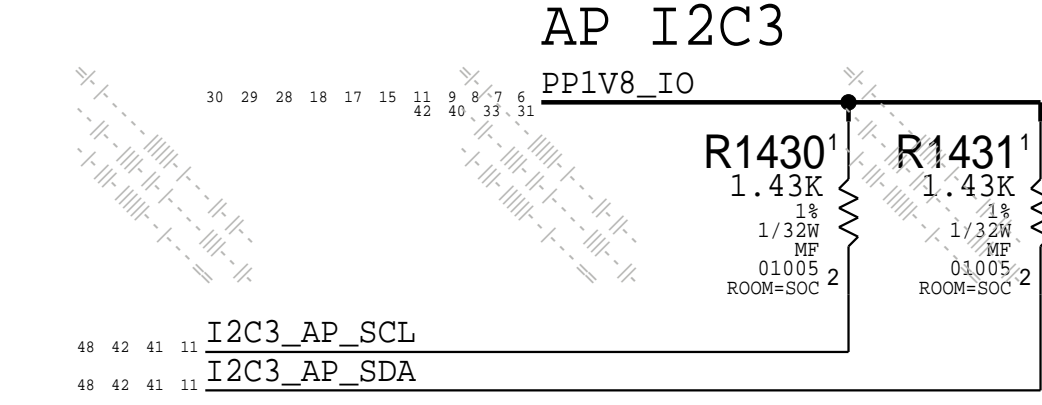
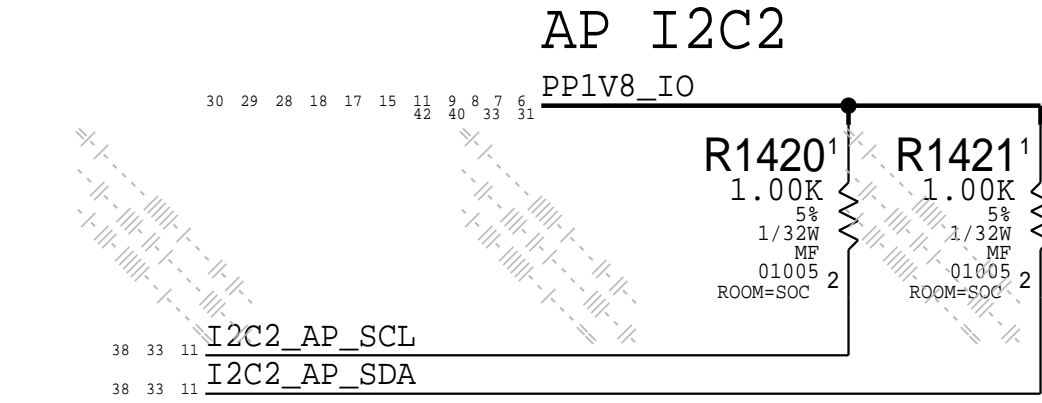
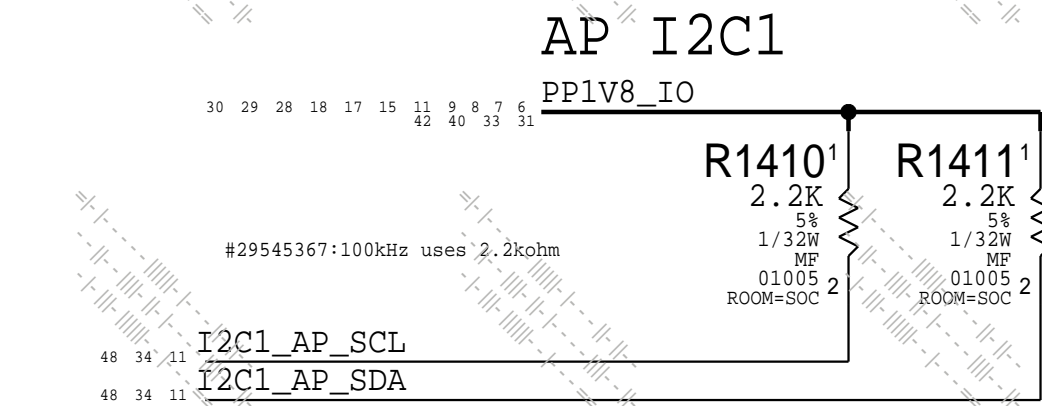
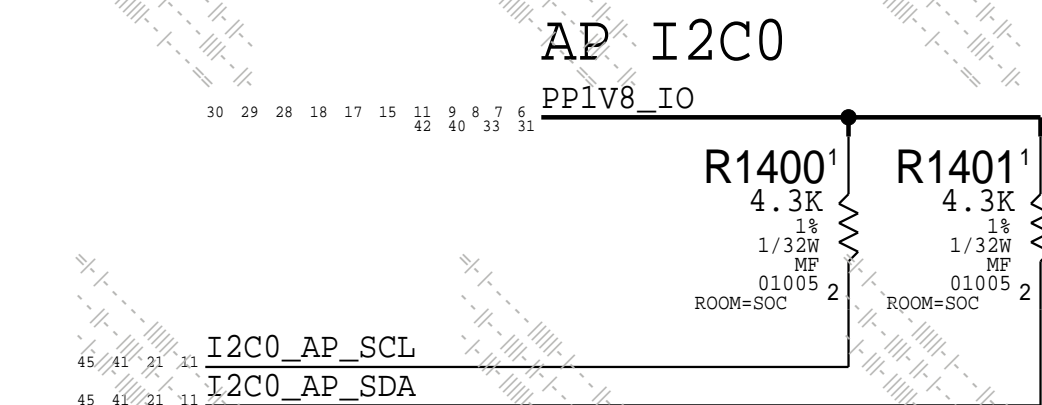
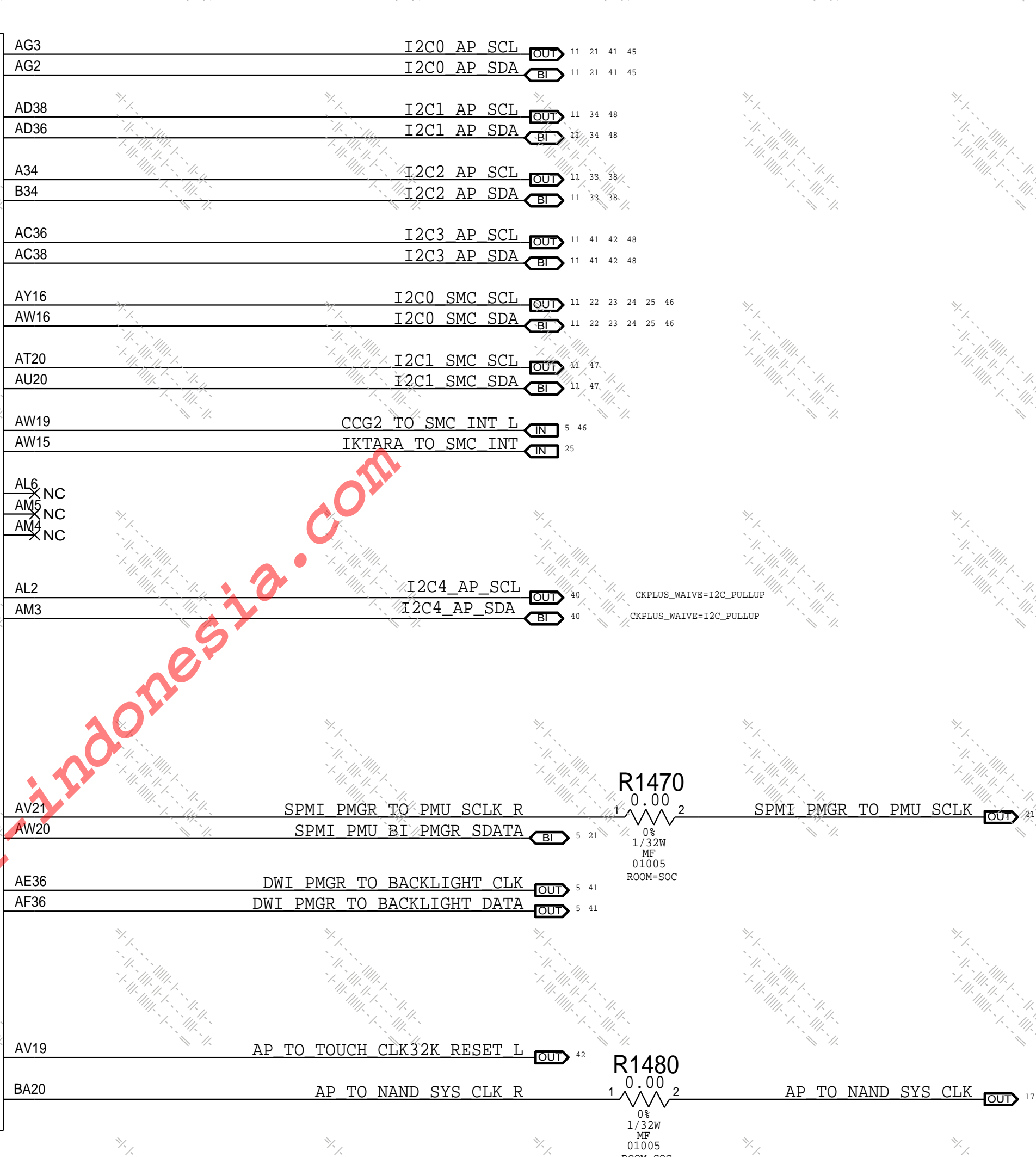
D21 Only

PAGE TITLE		
SOC: LPDP		
 Apple Inc.	DRAWING NUMBER	SIZE
	051-02159	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	REVISION	
	10.0.0	
	BRANCH	
	PAGE	13 OF 80
	SHEET	10 OF 81

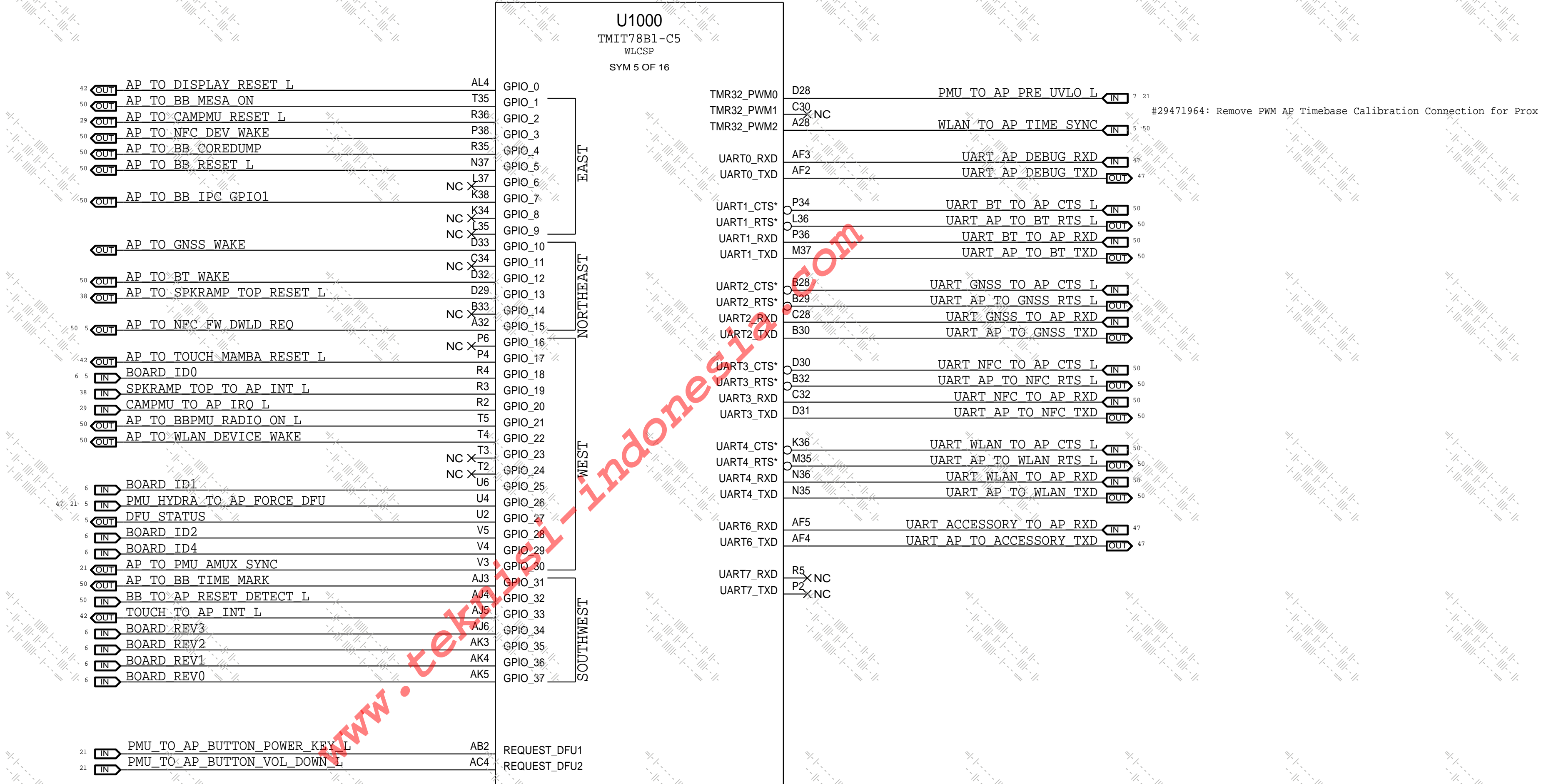
SOC - SERIAL INTERFACES



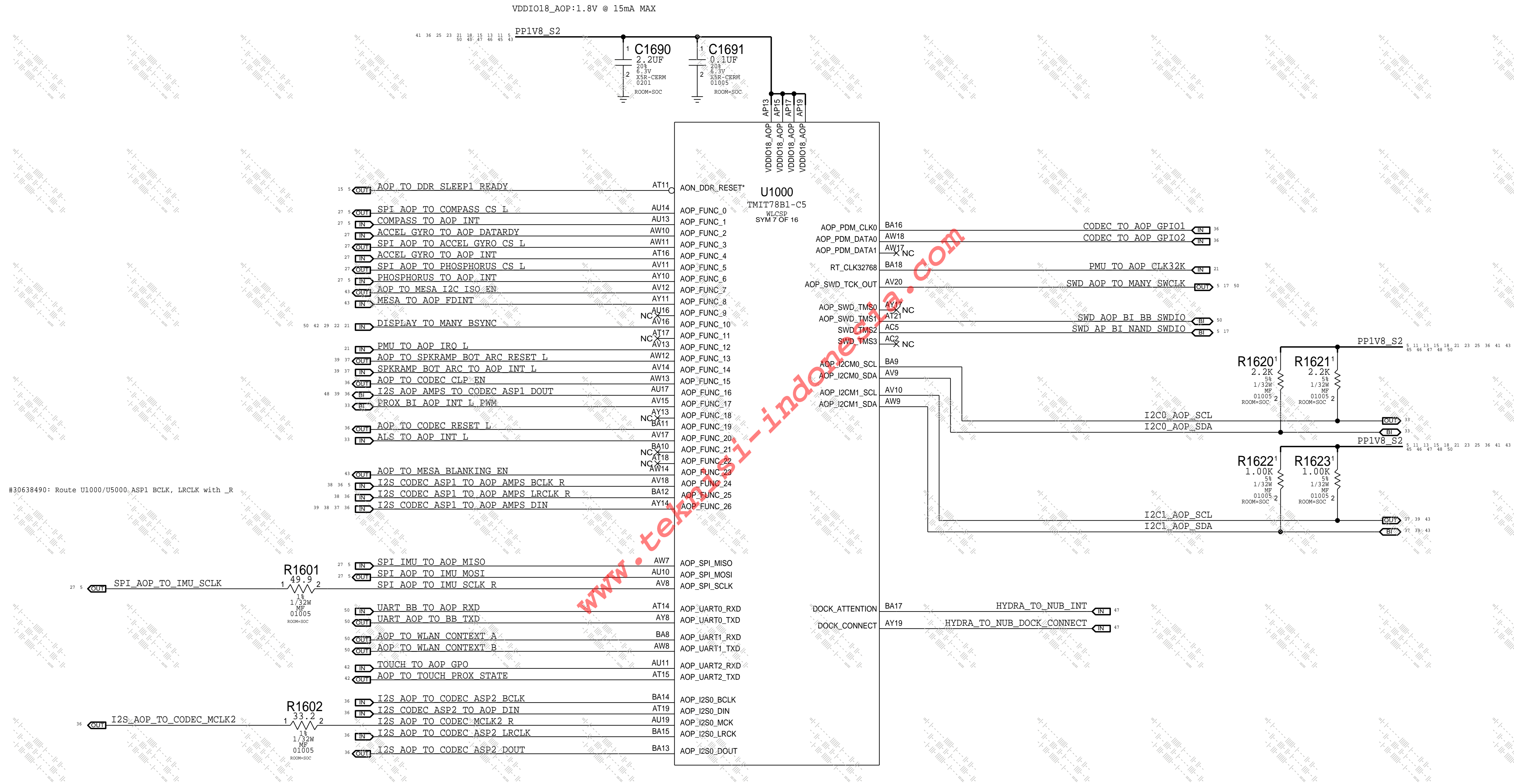
SPI: Route as Daisy-Chain (No T's Allowed)



SOC – GPIO INTERFACES



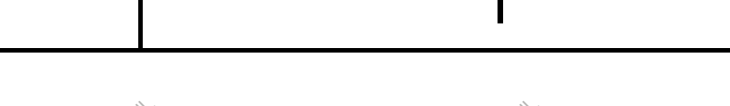
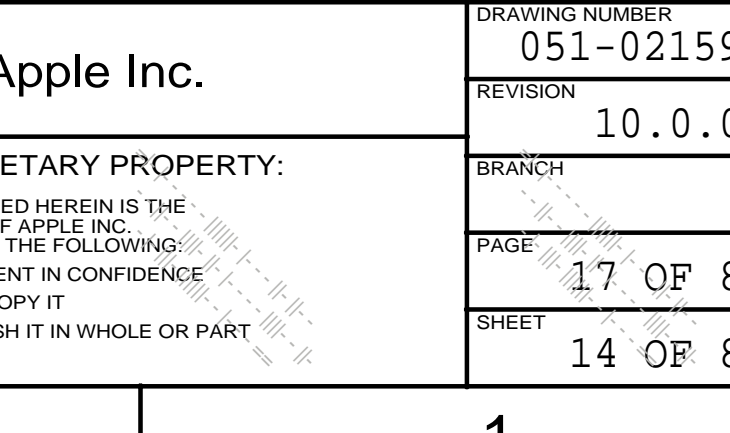
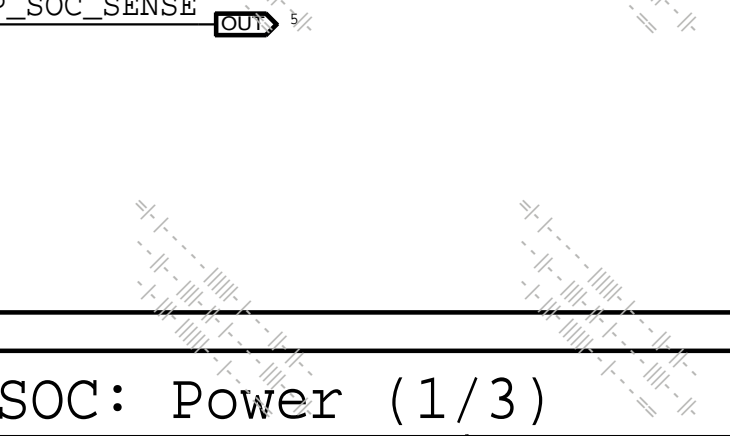
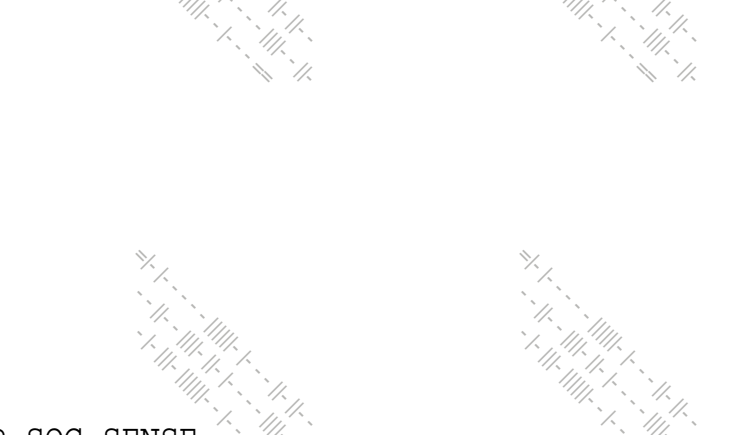
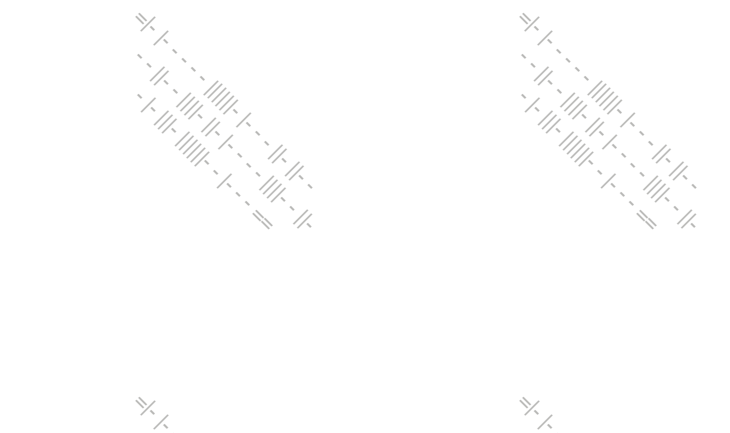
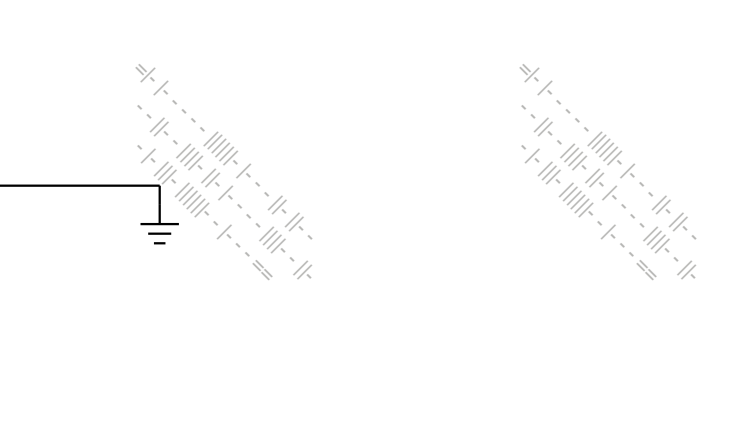
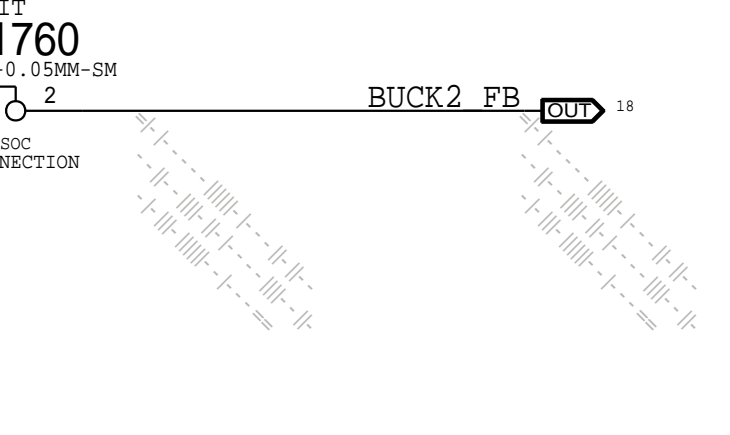
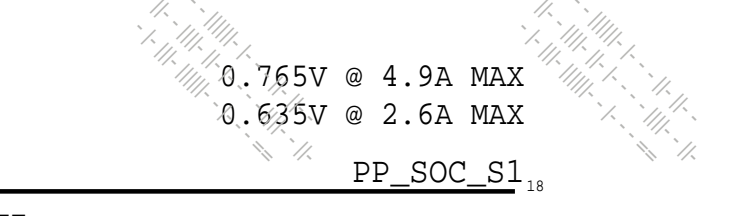
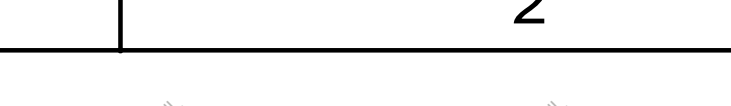
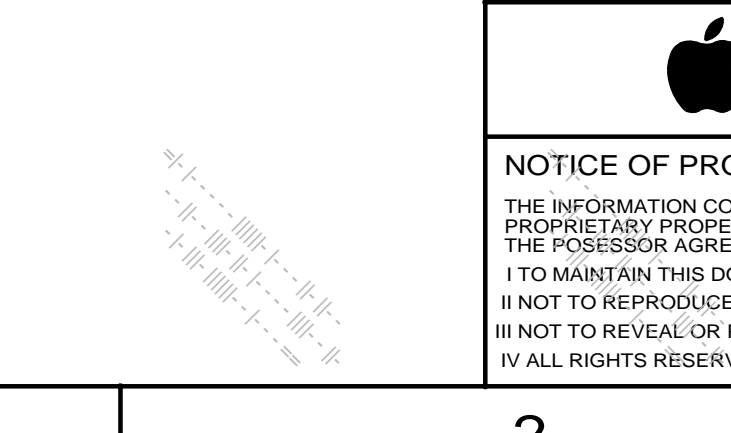
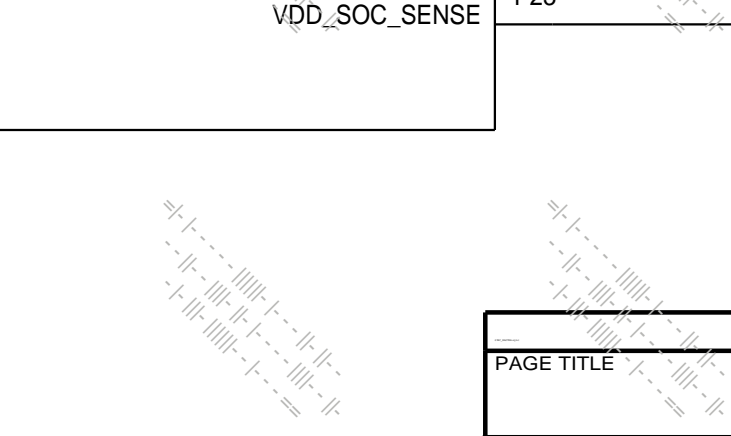
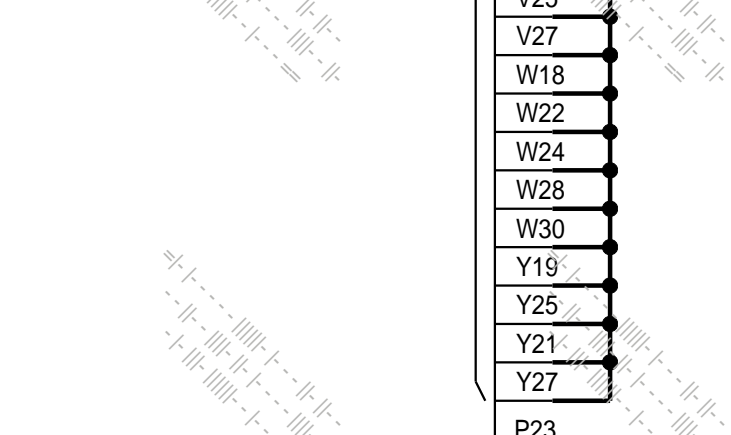
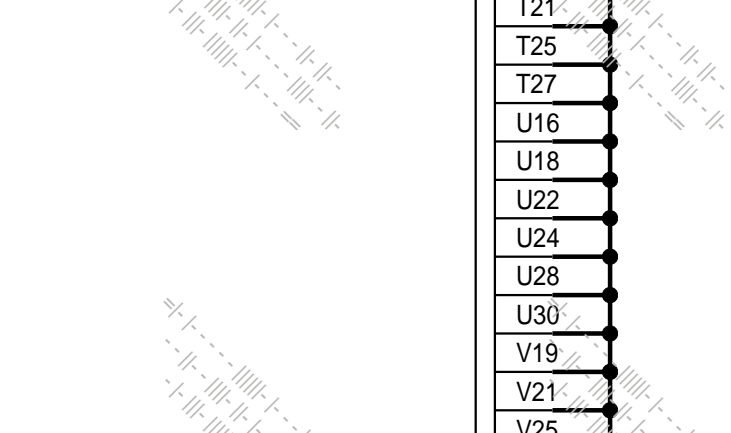
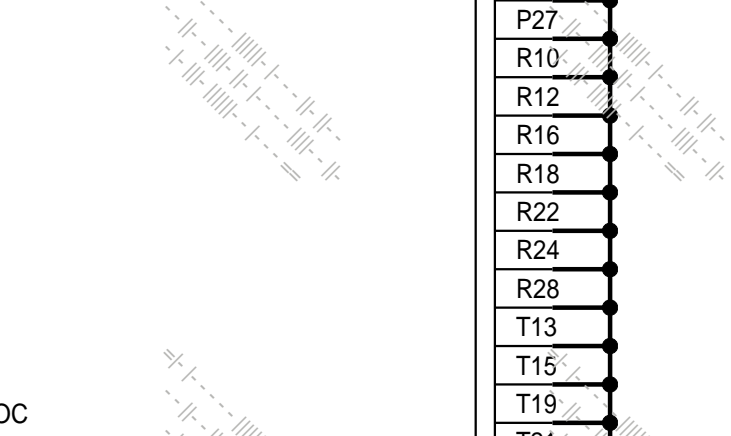
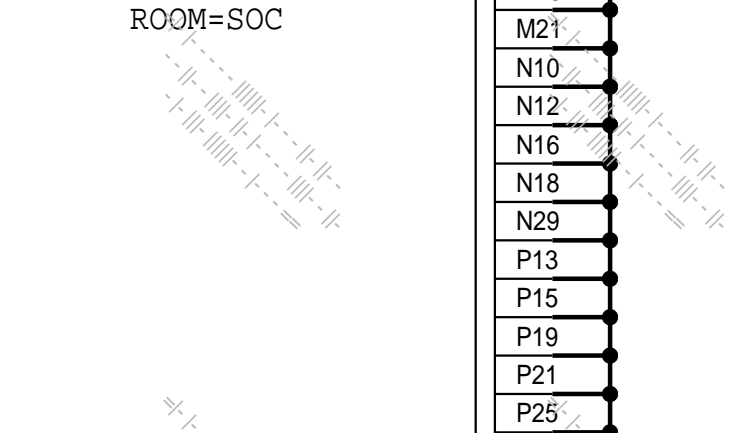
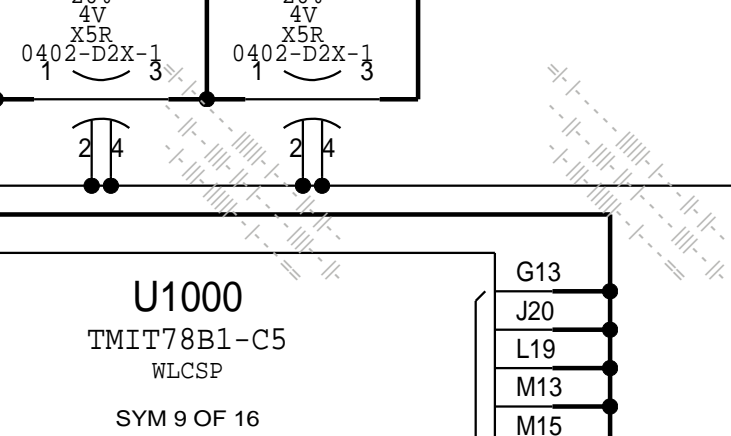
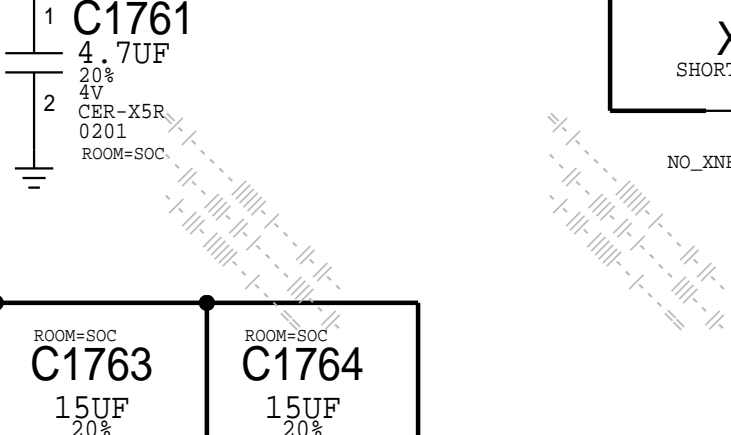
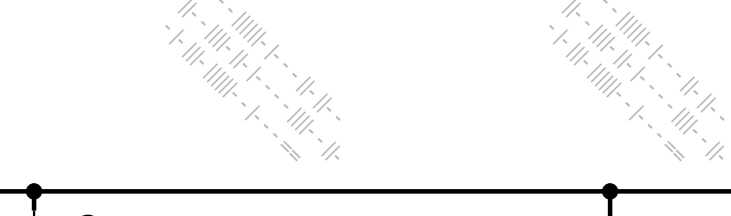
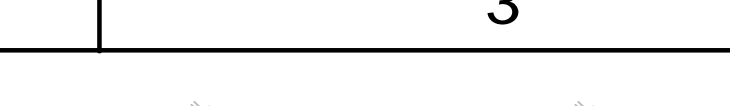
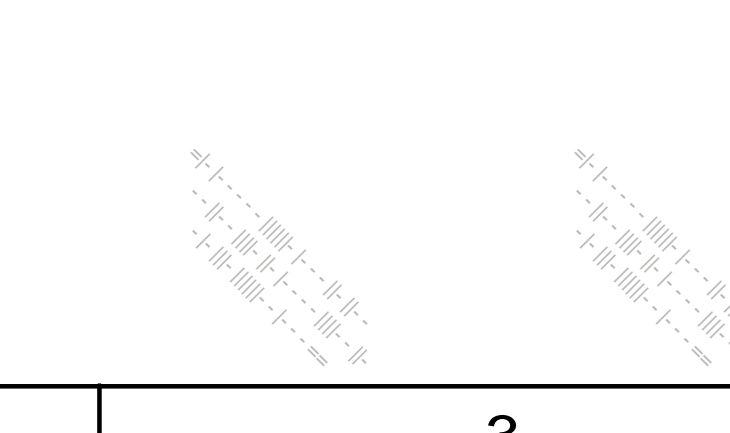
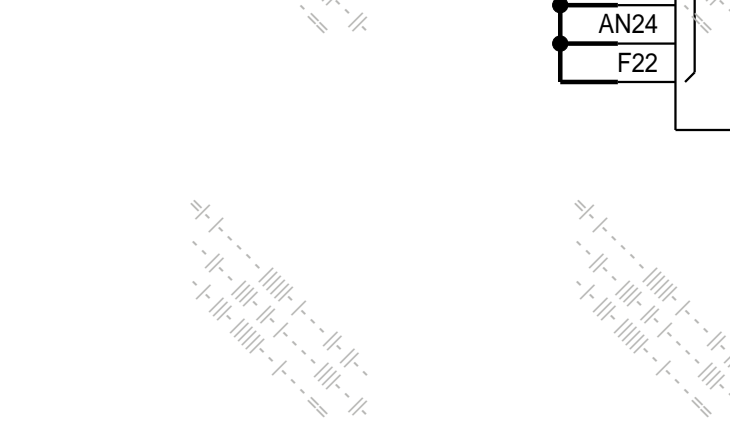
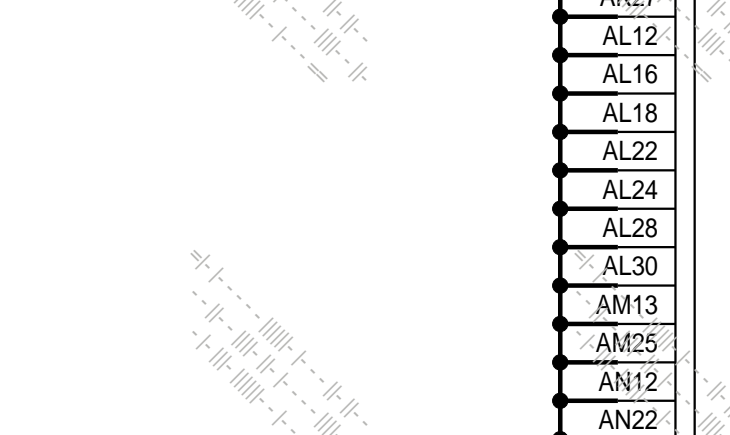
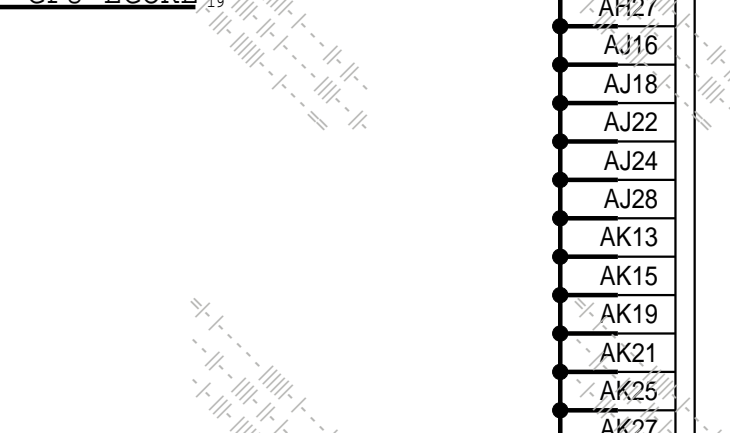
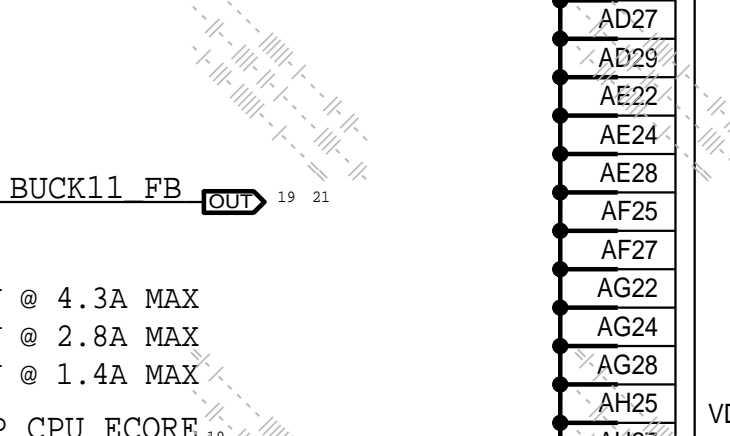
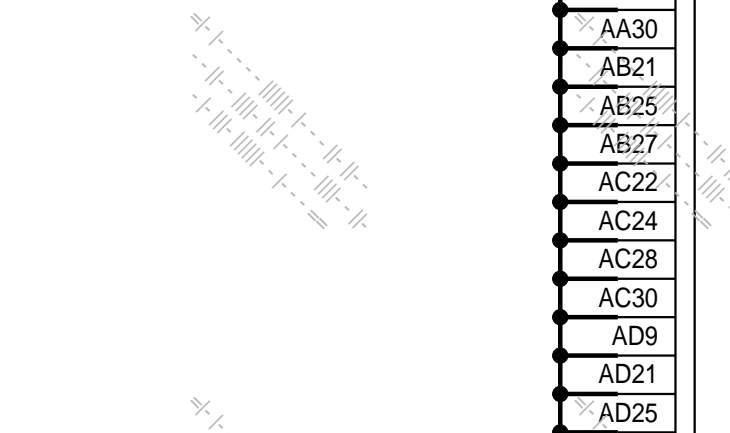
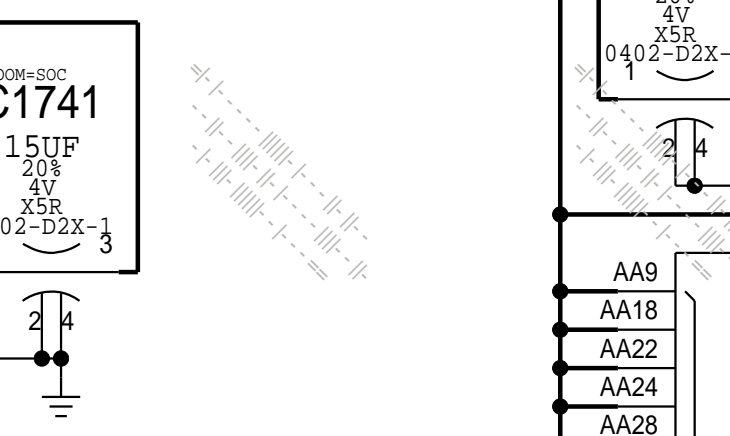
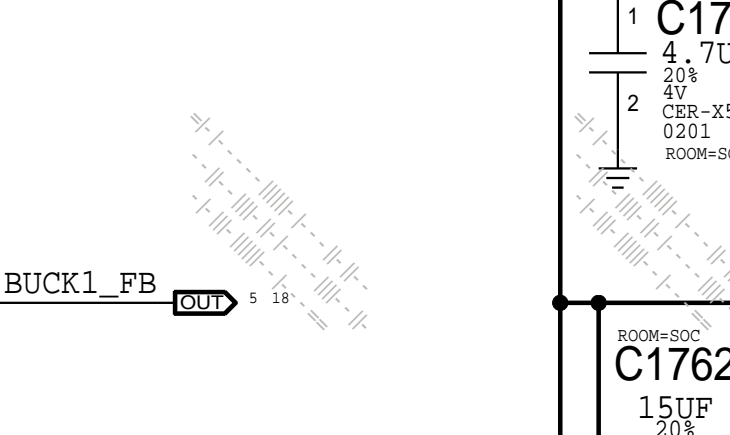
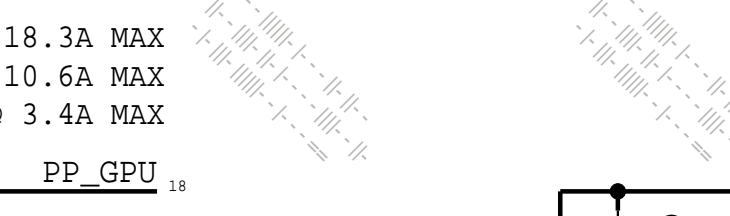
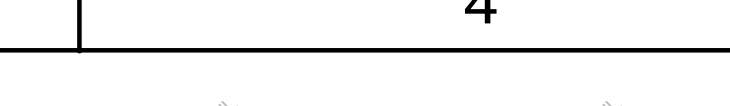
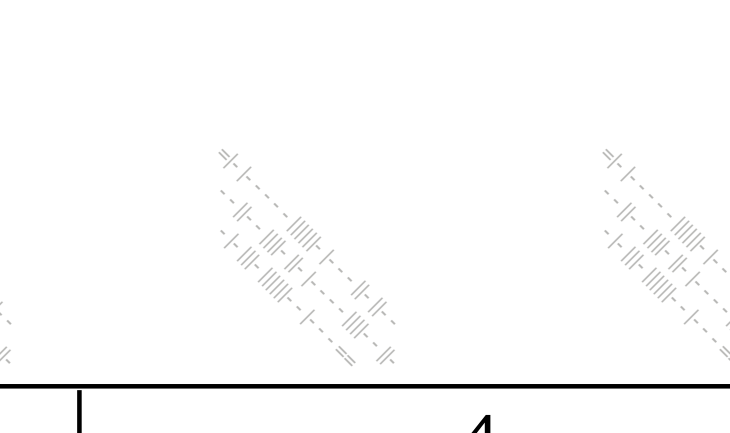
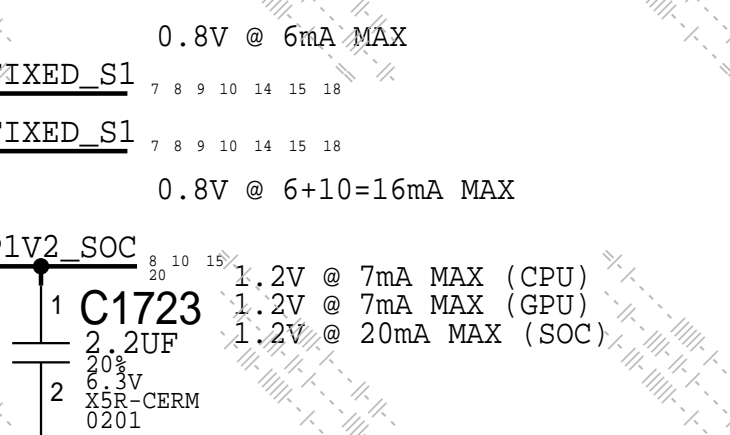
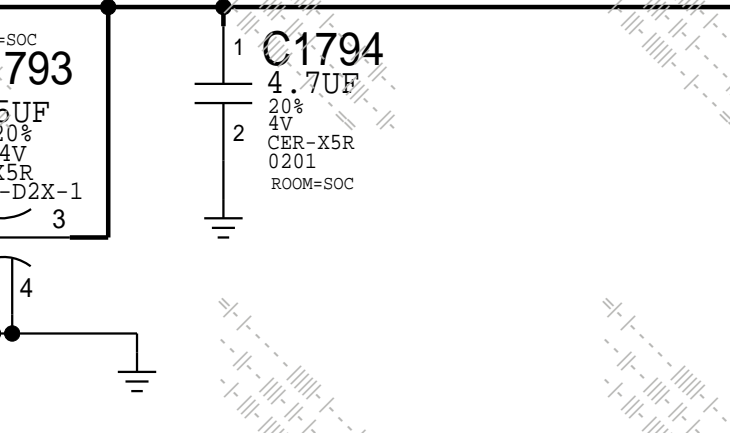
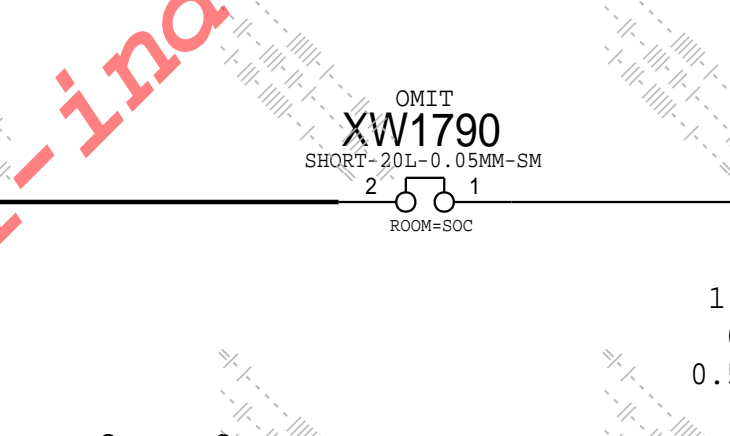
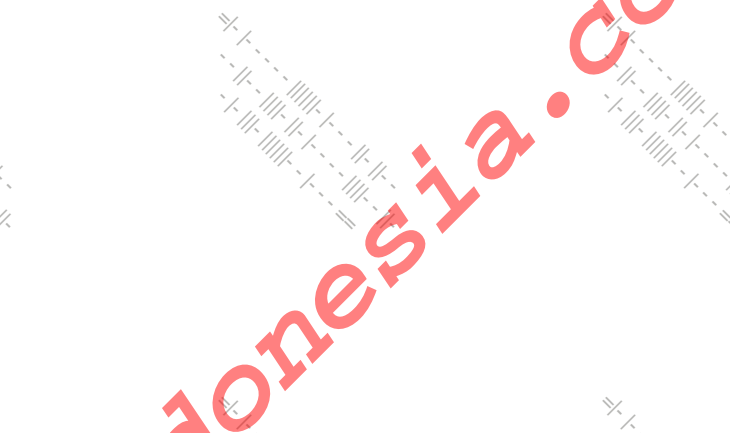
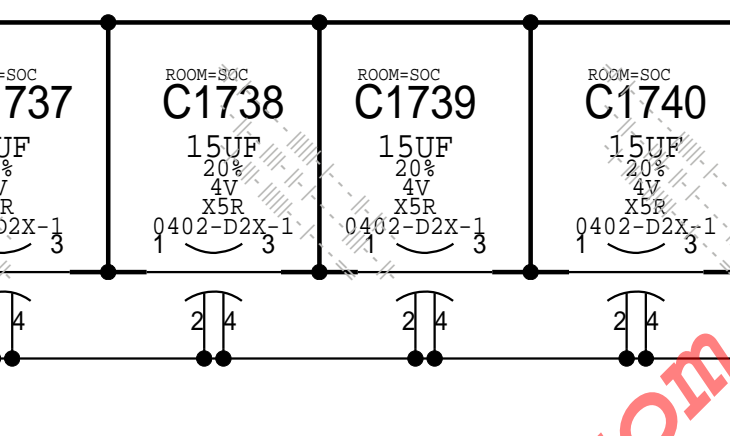
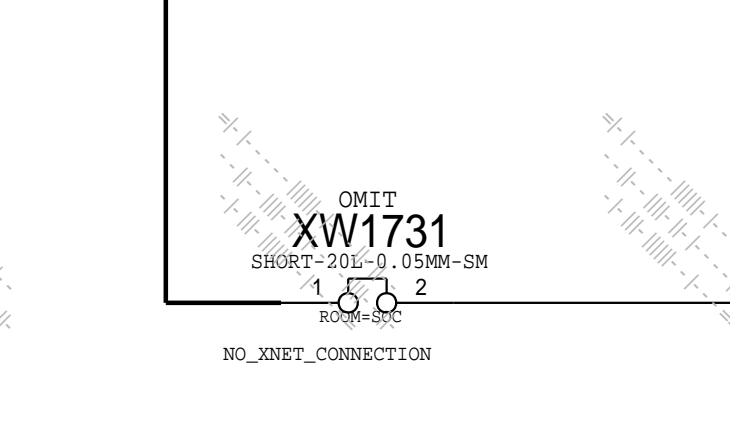
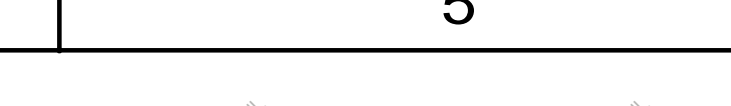
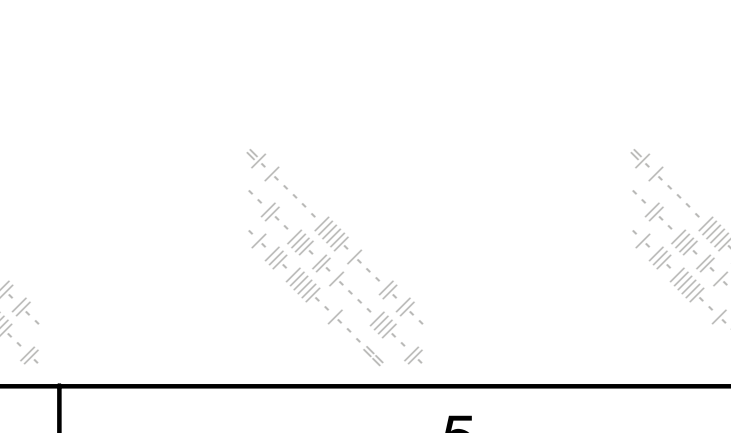
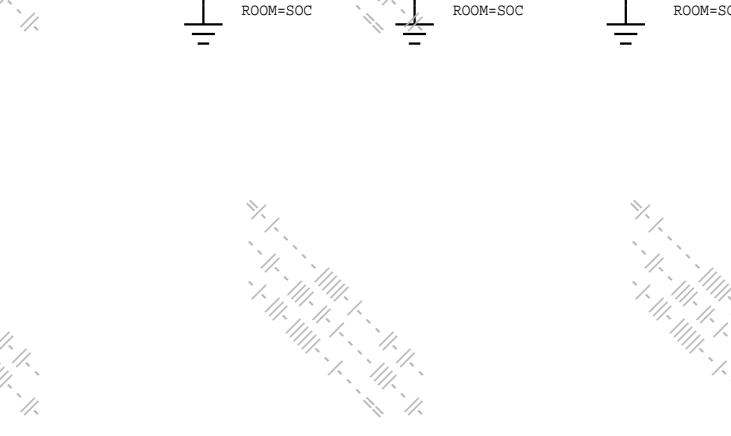
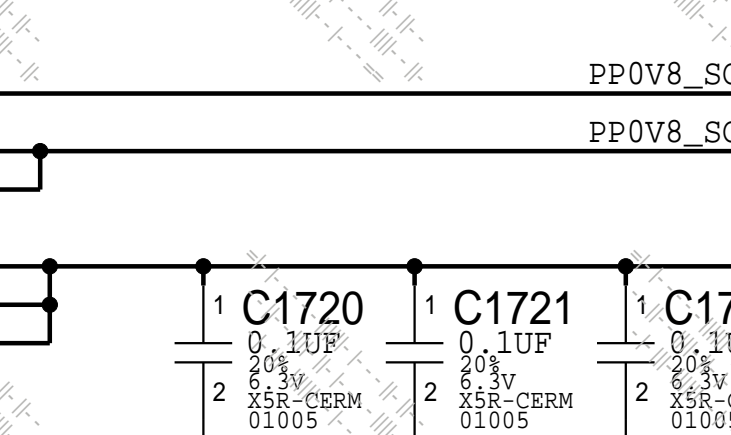
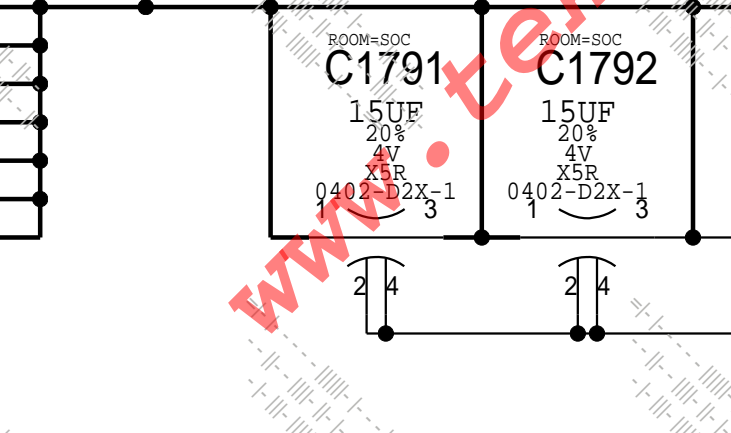
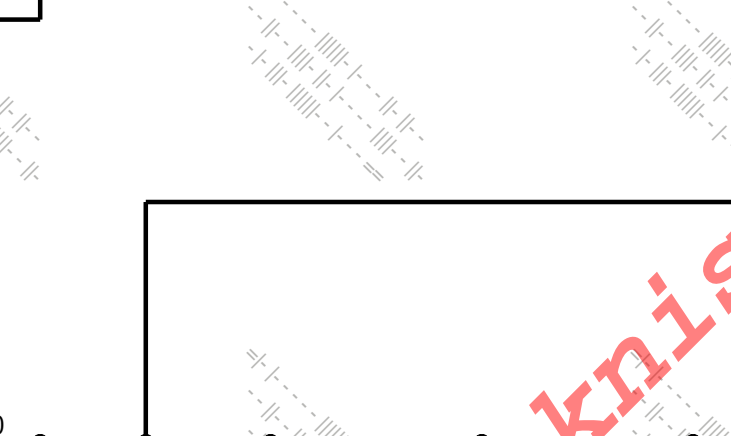
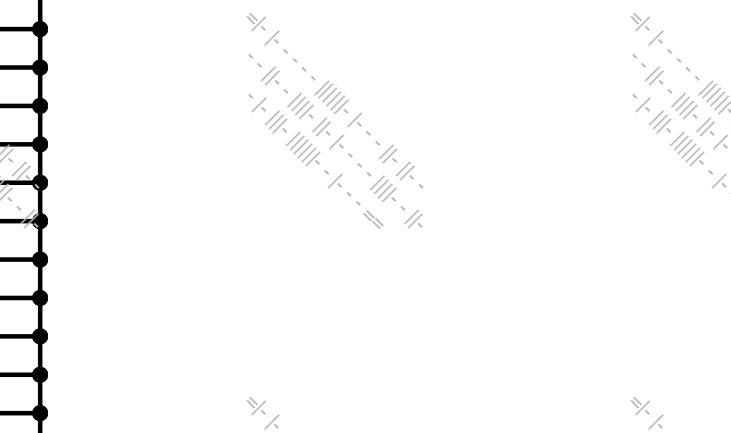
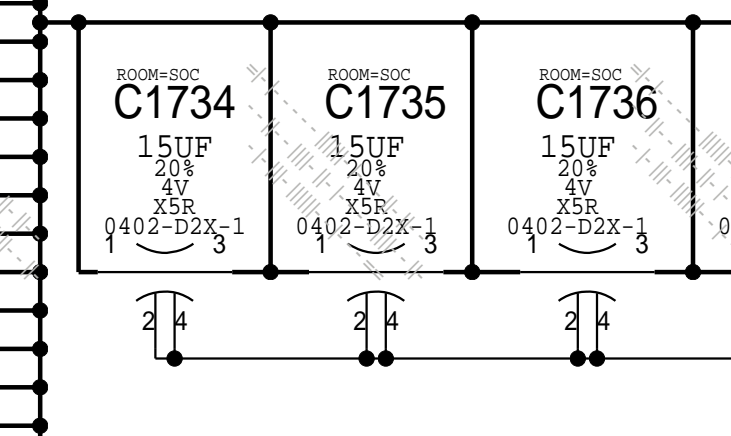
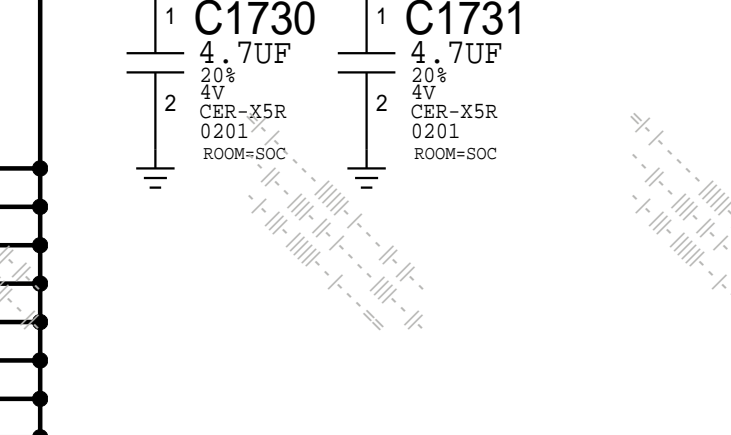
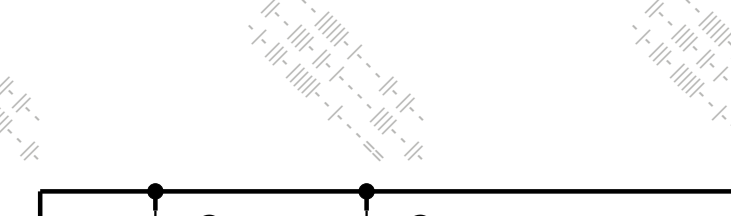
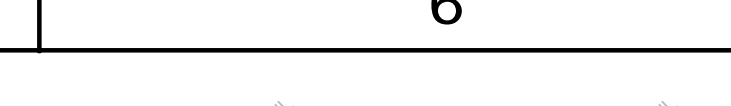
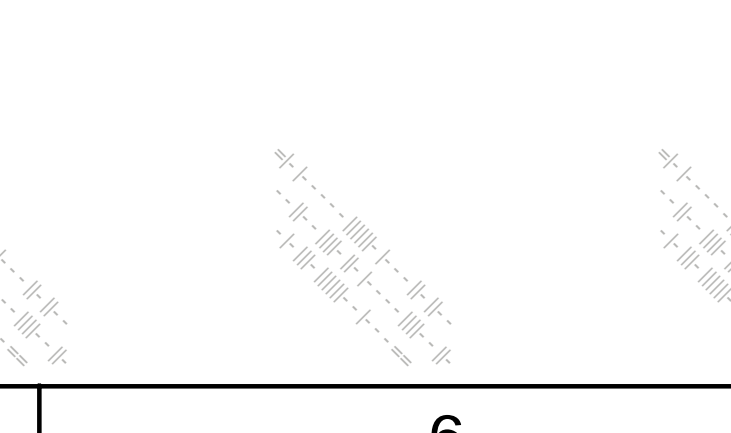
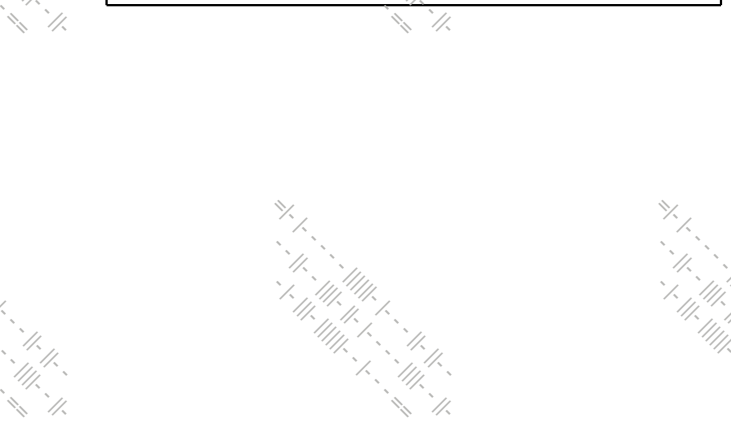
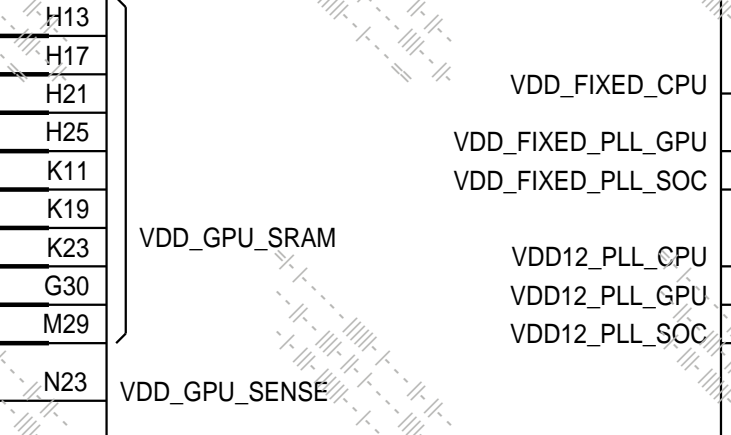
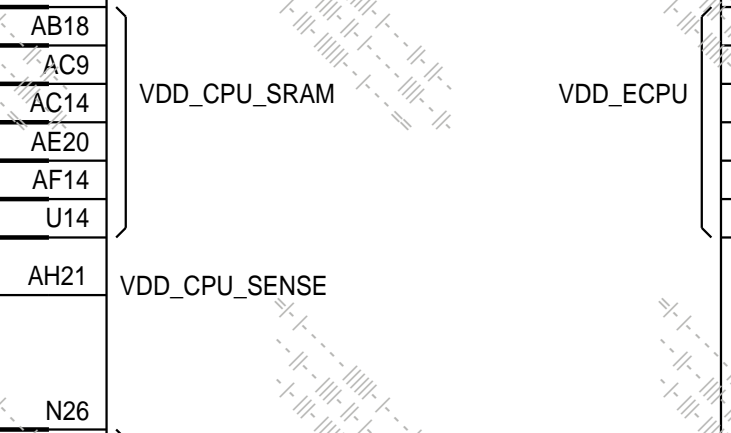
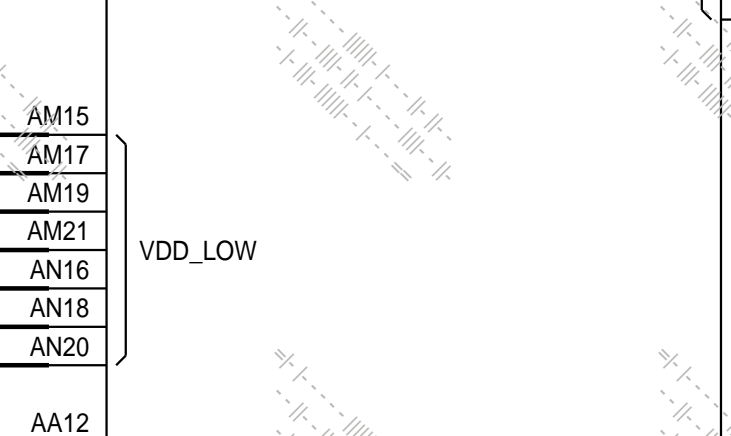
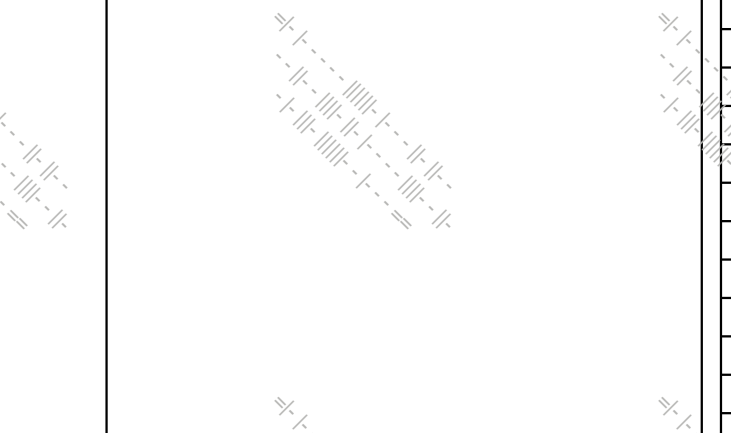
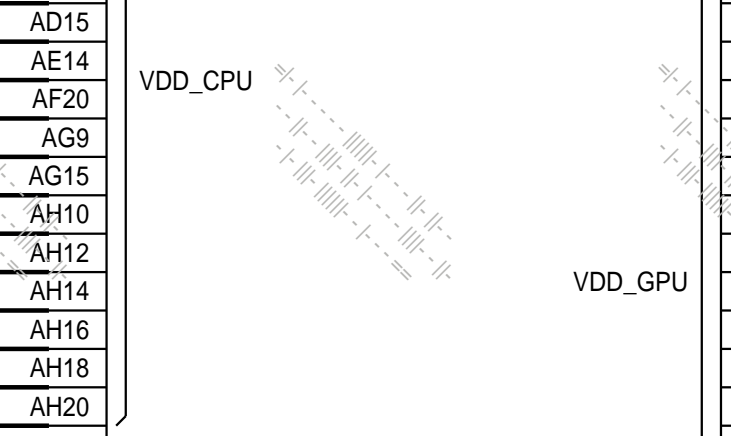
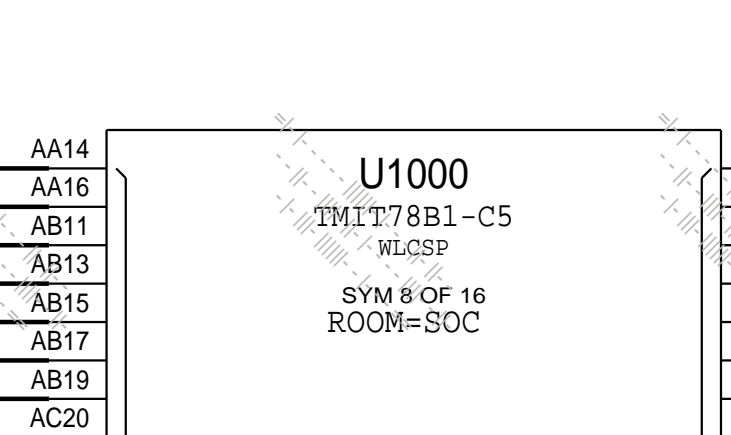
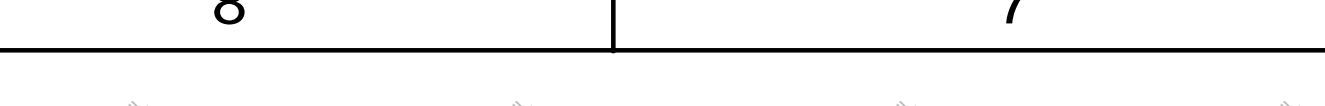
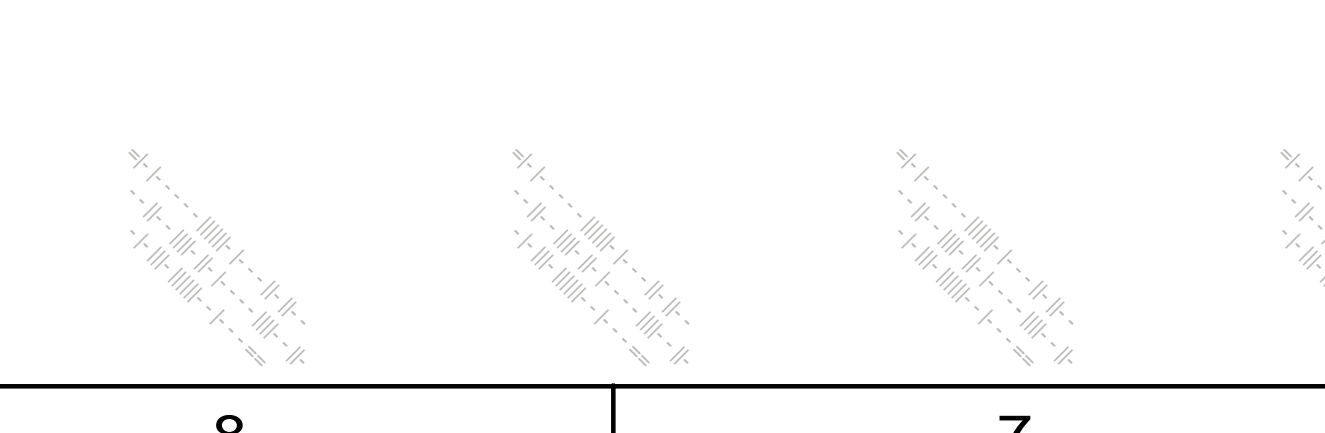
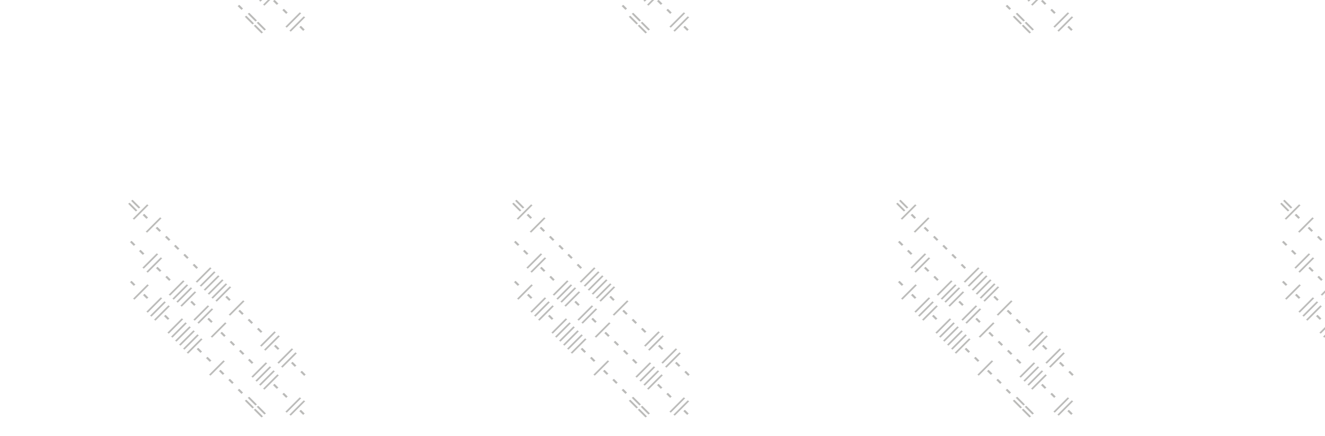
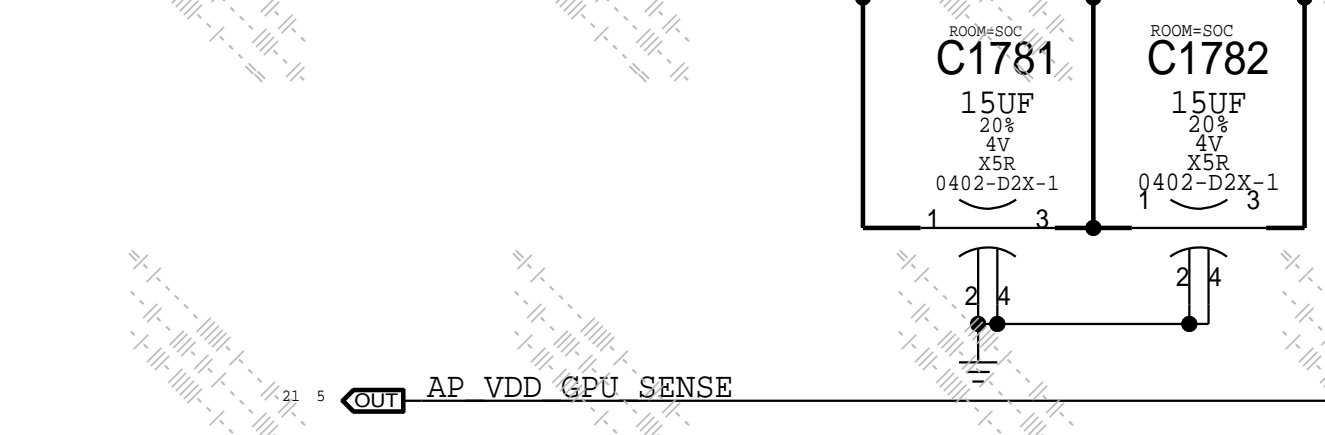
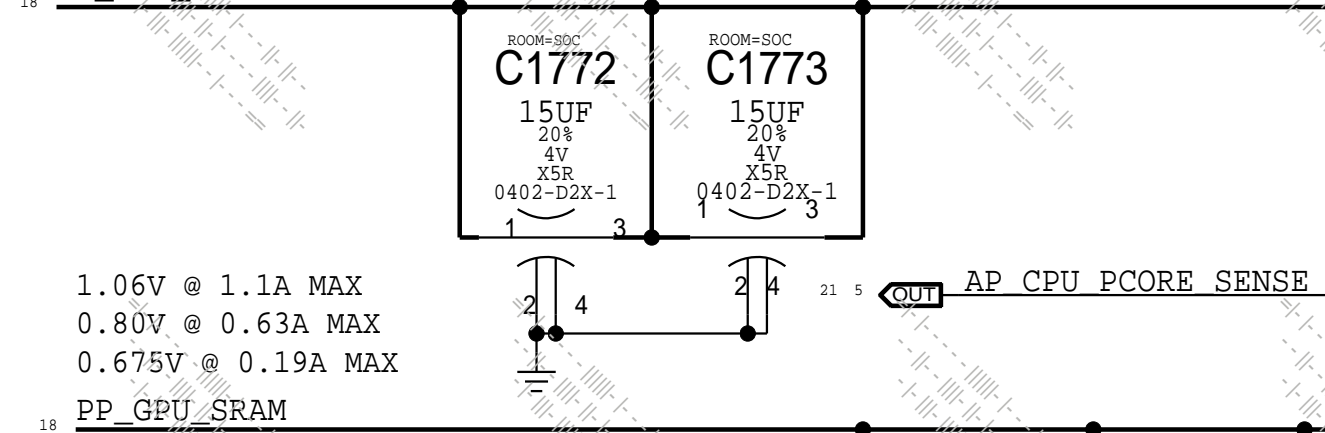
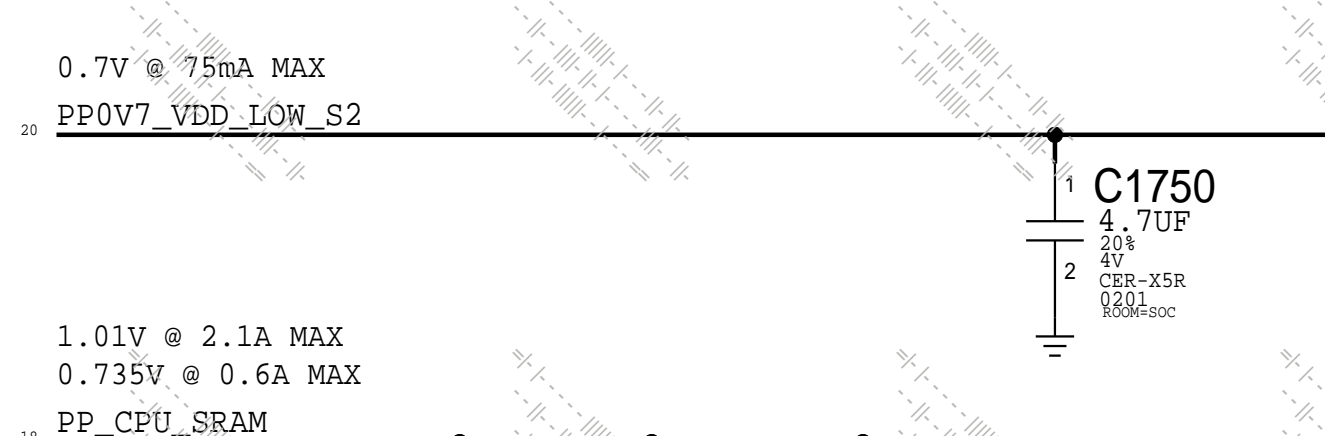
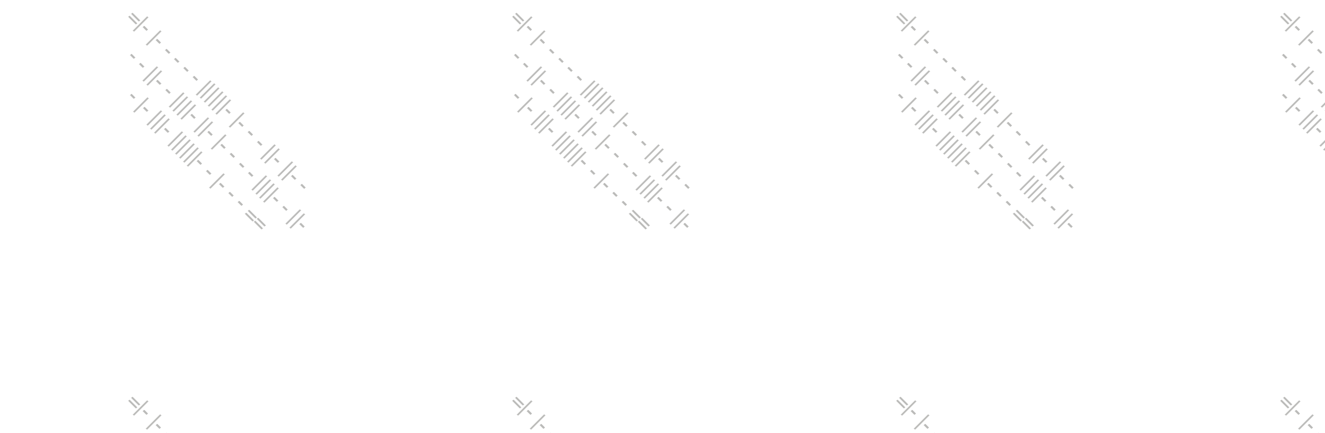
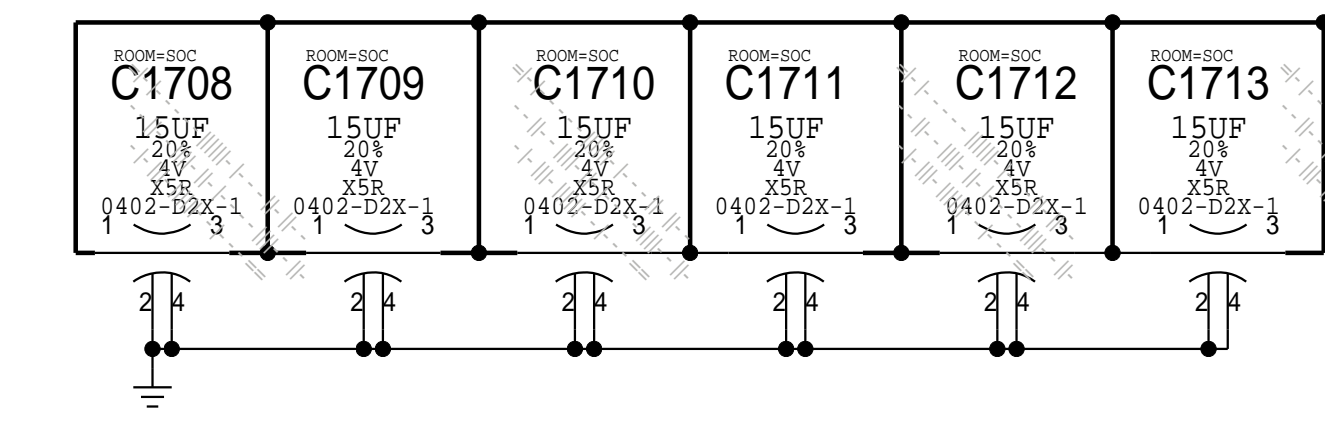
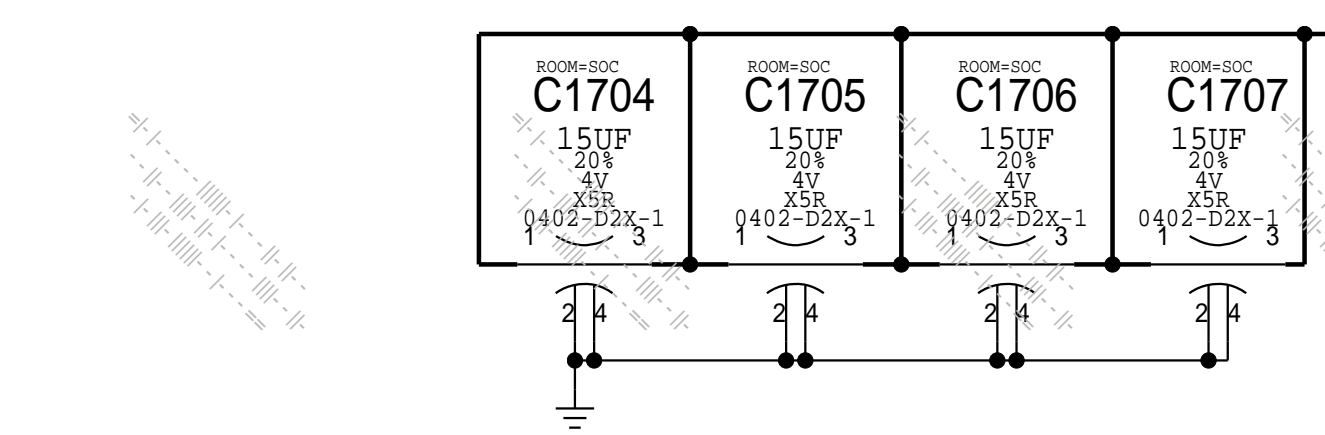
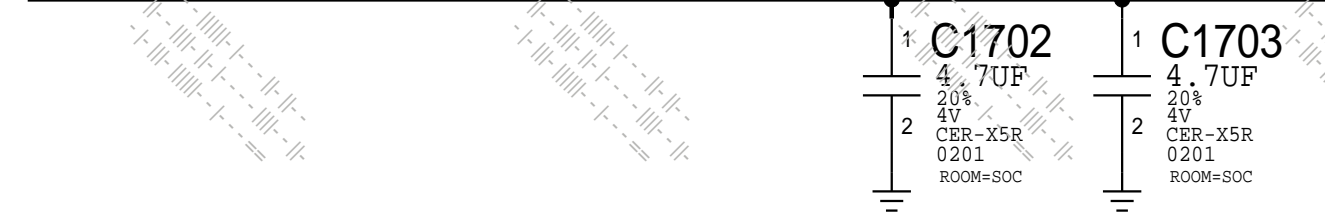
SOC - AOP



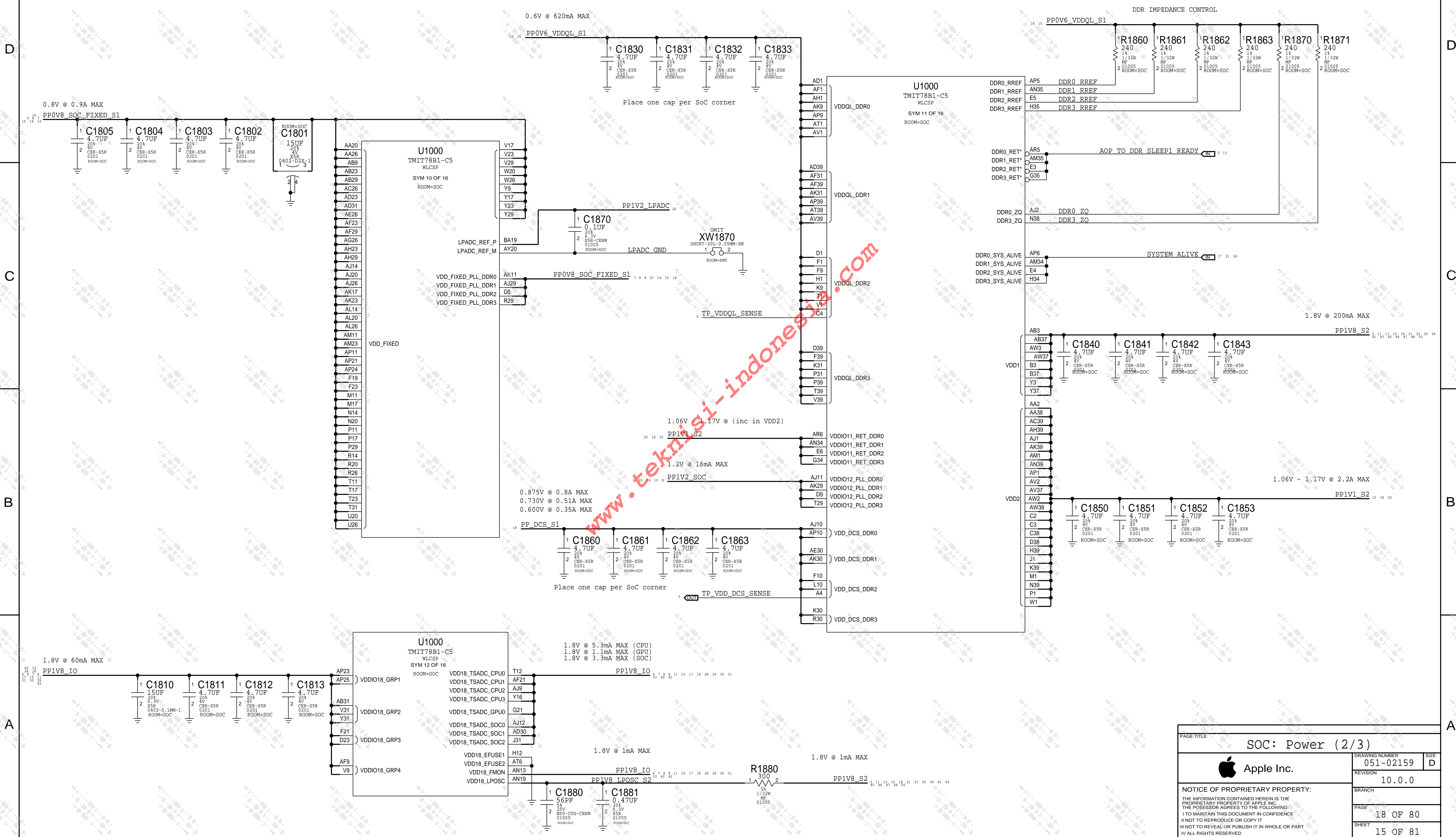
SOC - CPU, GPU & SOC RAILS

1.06V @ 11.0A MAX
0.8V @ 6A MAX
0.575V @ 2.7A MAX

PP_CPU_PCORE



SOC - POWER SUPPLIES



SOC – POWER SUPPLIES

D

C

B

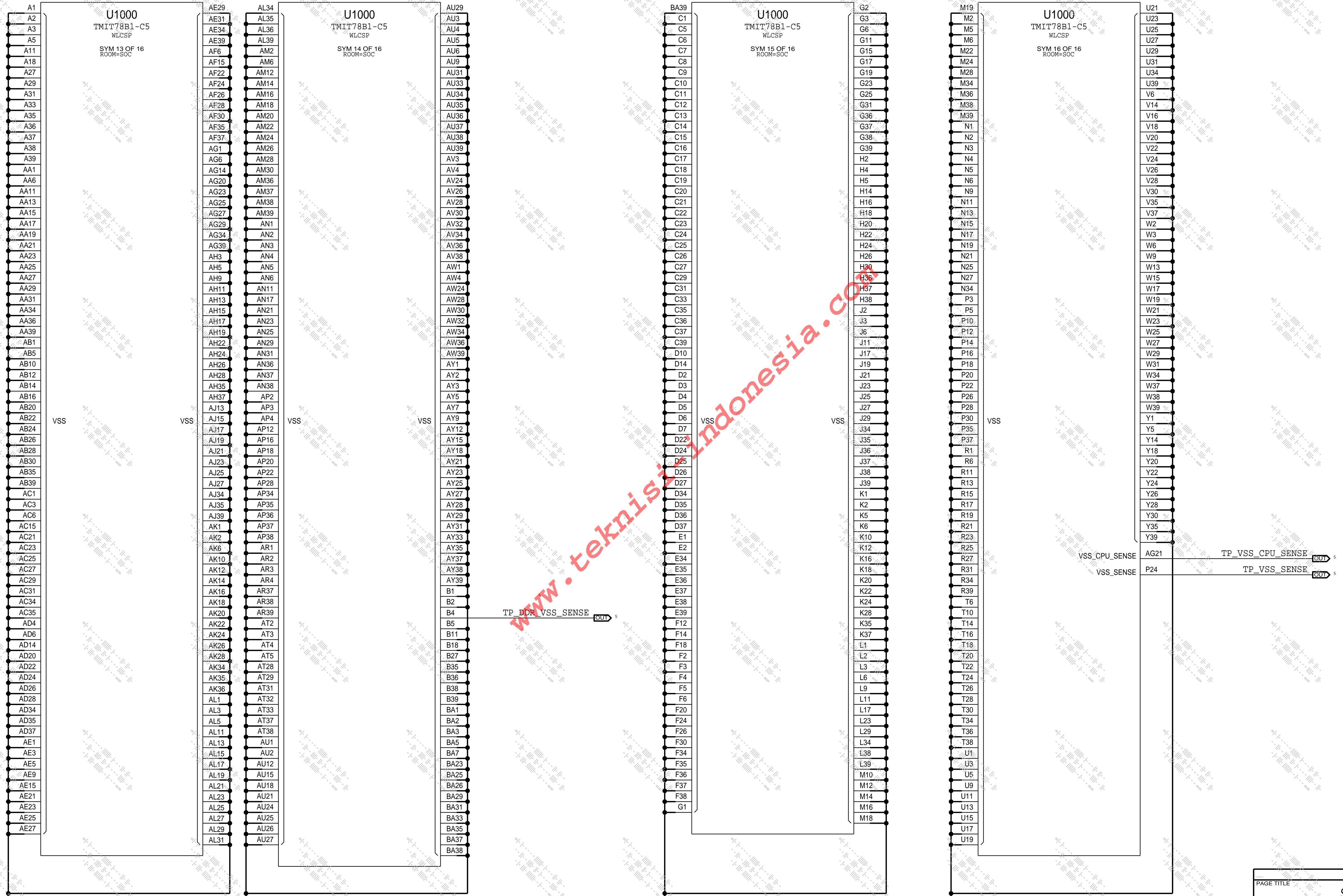
A

D

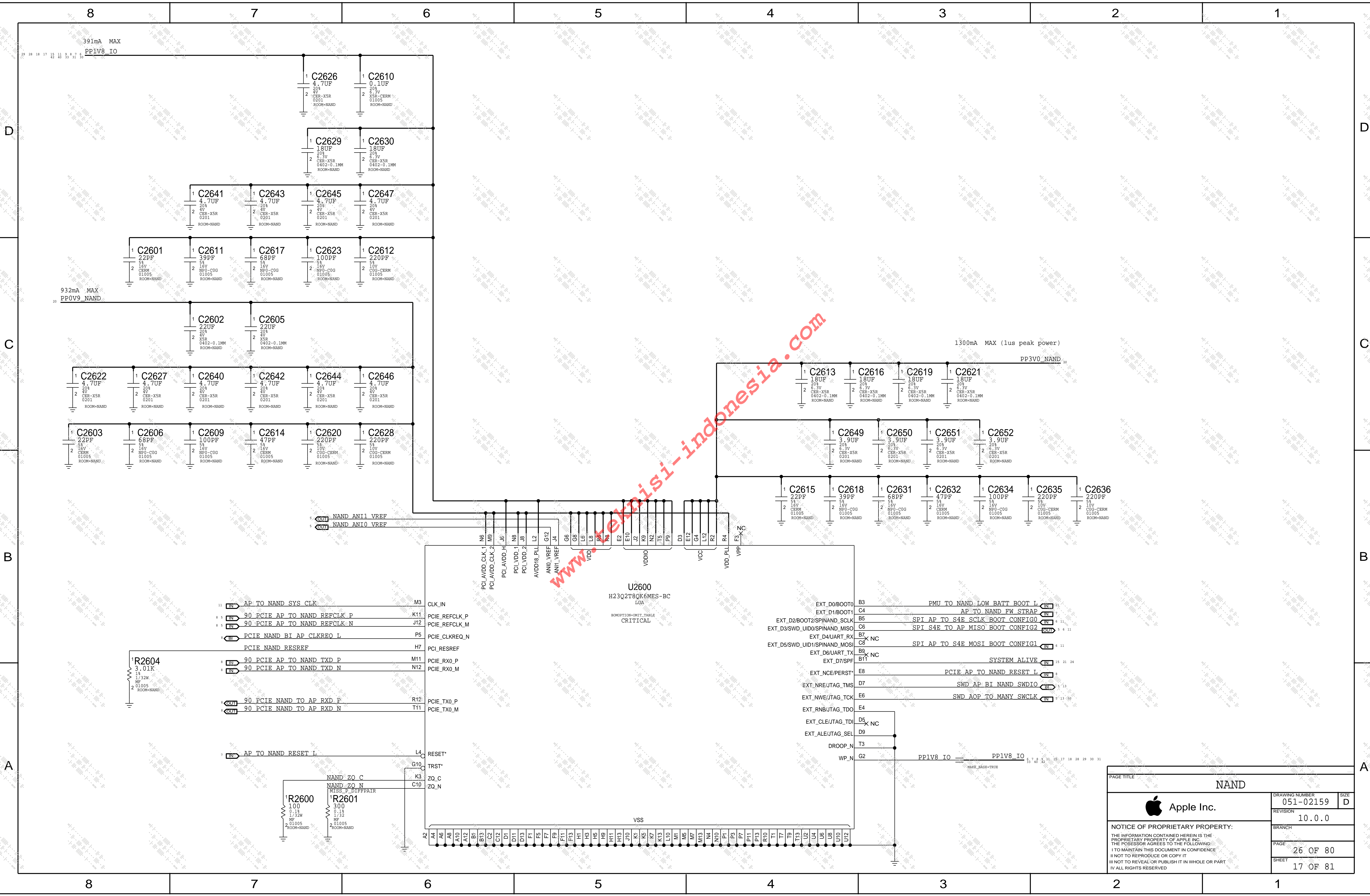
C

B

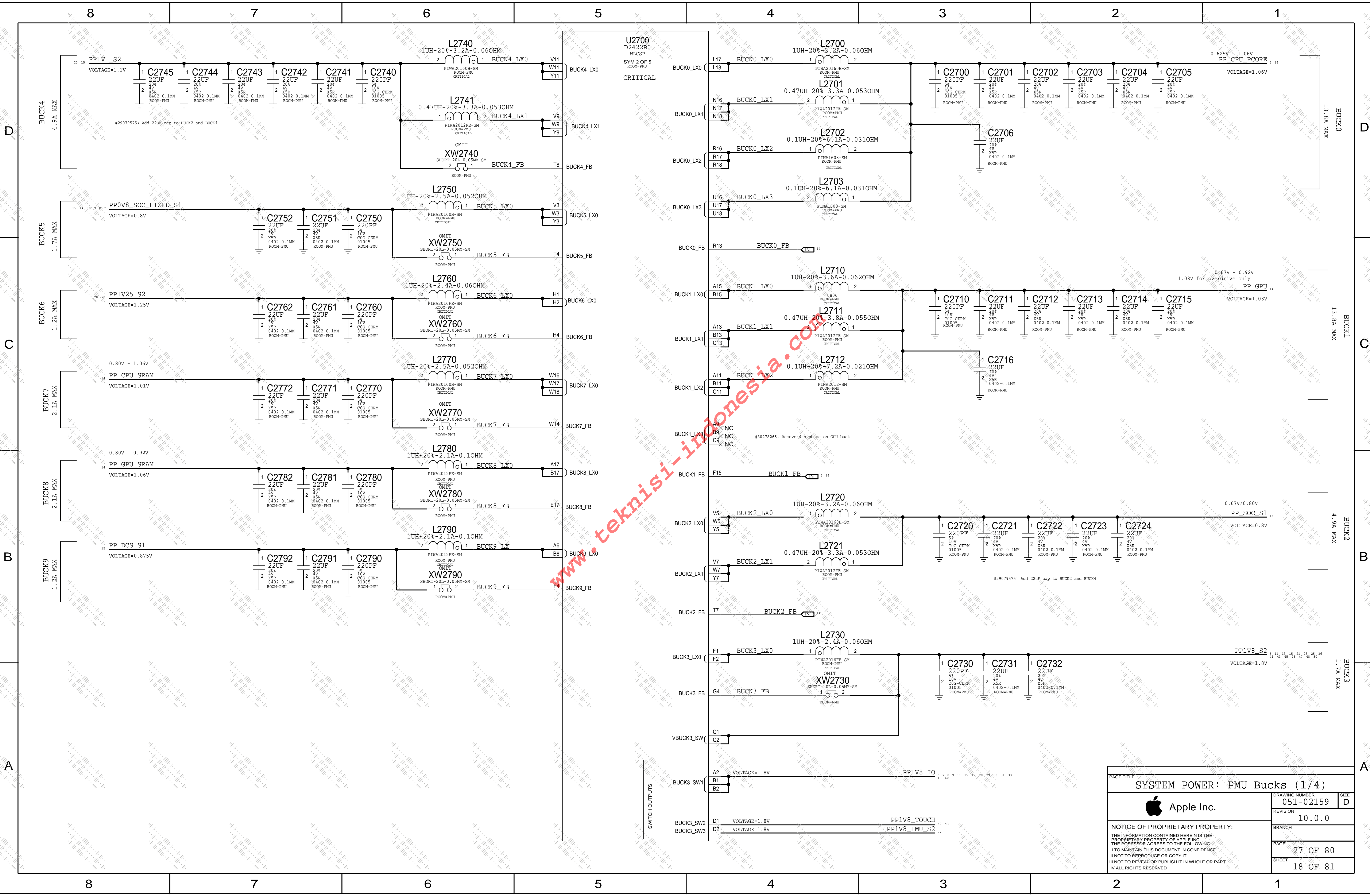
A

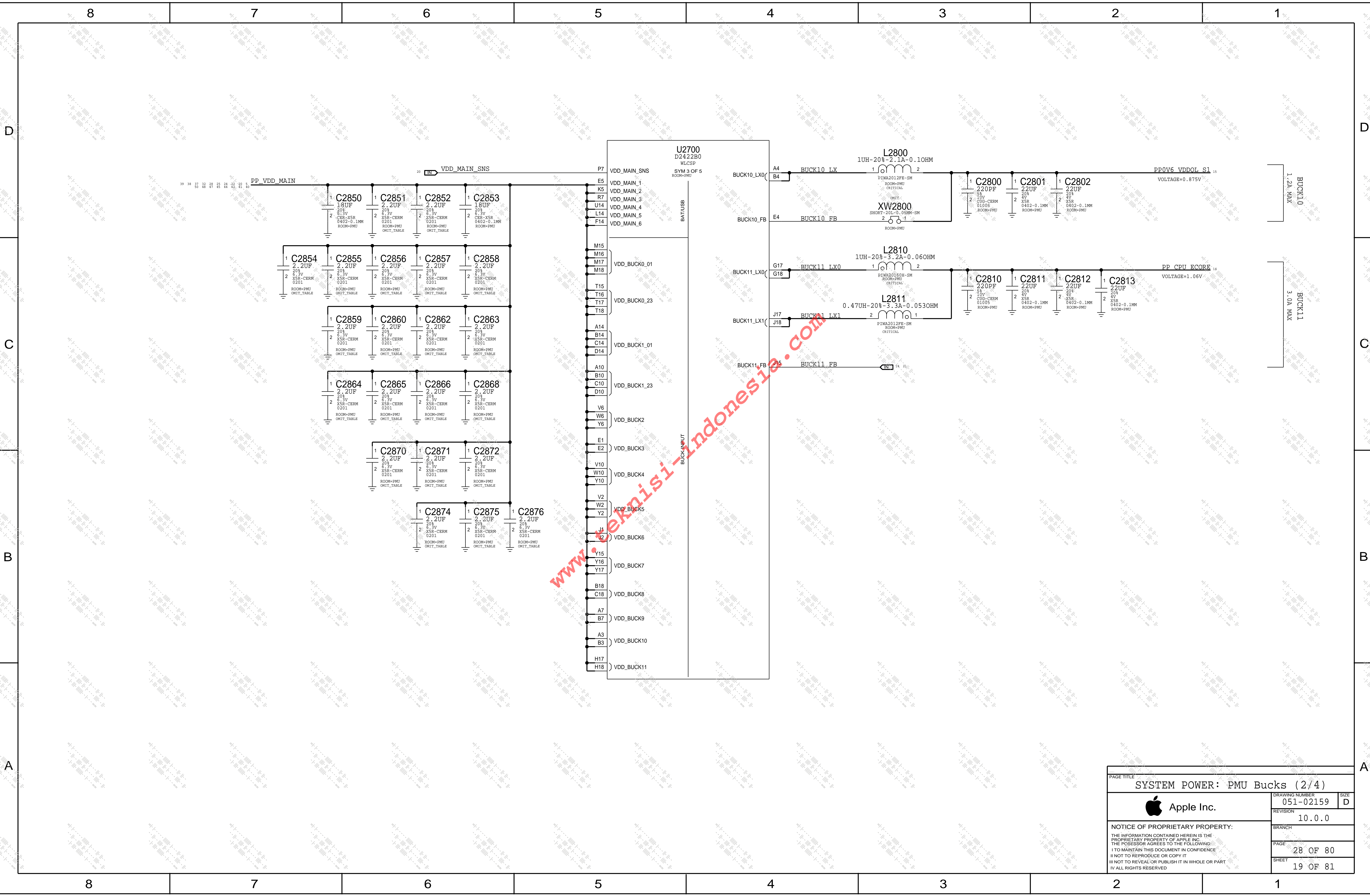


PAGE TITLE			SOC: Power (3/3)		
		DRAWING NUMBER		SIZE	
		051-02159		D	
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED		REVISION		10.0.0	
		BRANCH			
		PAGE		19 OF 80	
		SHEET		16 OF 81	

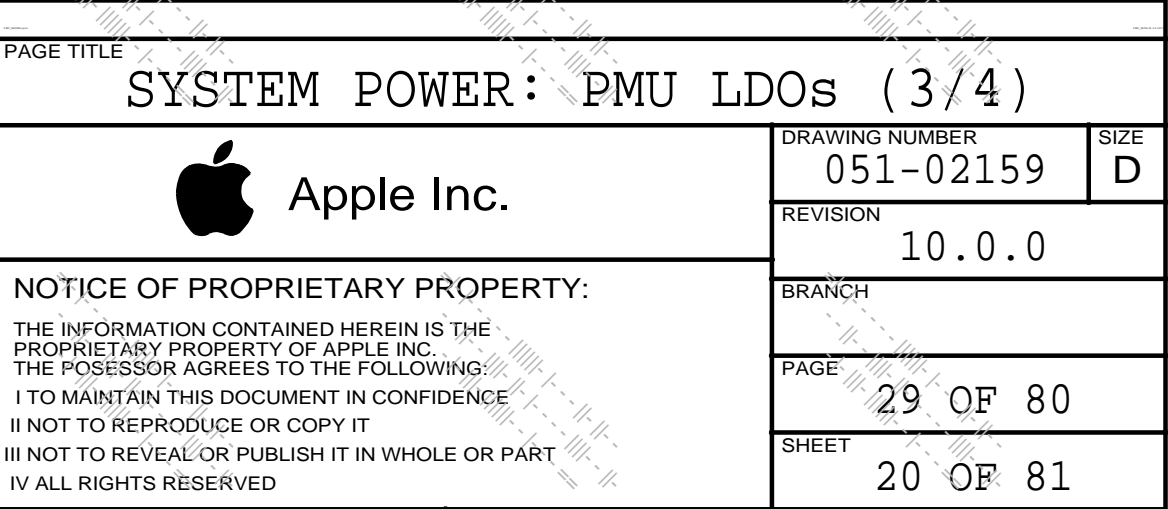


PAGE TITLE			NAND		
		DRAWING NUMBER		SIZE	
		051-02159		D	
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED		REVISION		10.0.0	
		BRANCH			
		PAGE		26 OF 80	
		SHEET		17 OF 81	

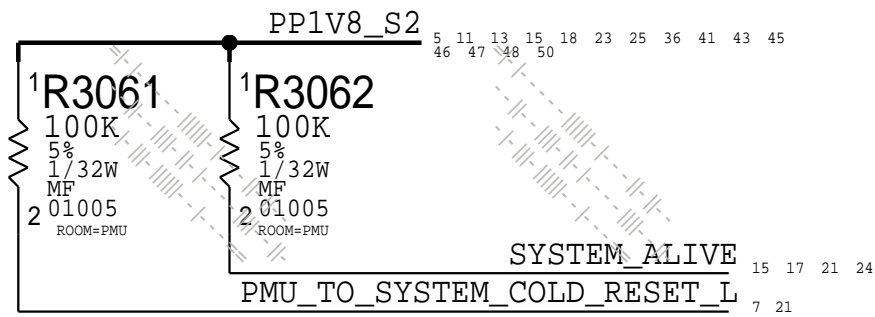




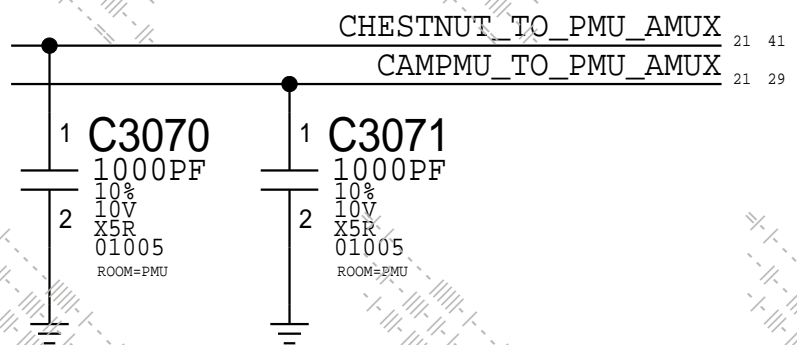
PAGE TITLE		
SYSTEM POWER: PMU Bucks (2/4)		
	DRAWING NUMBER	051-02159
	REVISION	10.0.0
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED	BRANCH	
	PAGE	28 OF 80
	SHEET	19 OF 81



COLD_RESET & SYSTEM_ALIVE

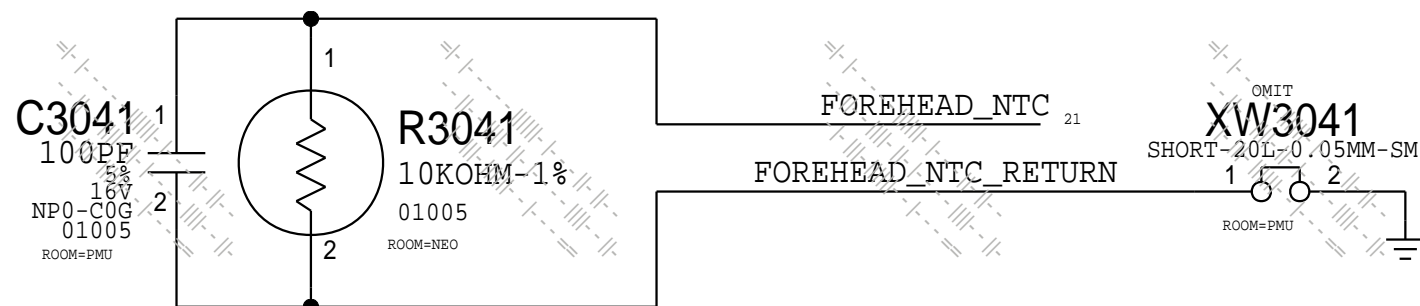


#28476673:1000PF CAP ON ANSEL AMUX
Chestnut / Ansel AMUX

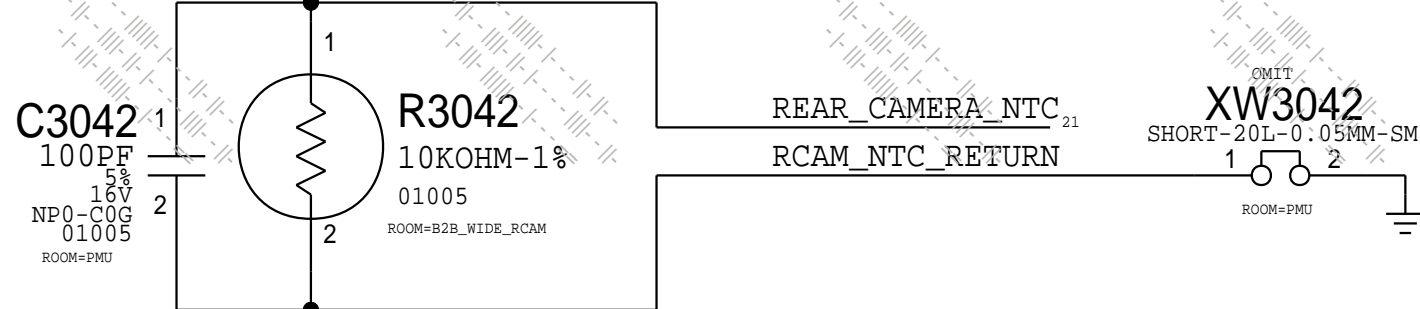


NTCs

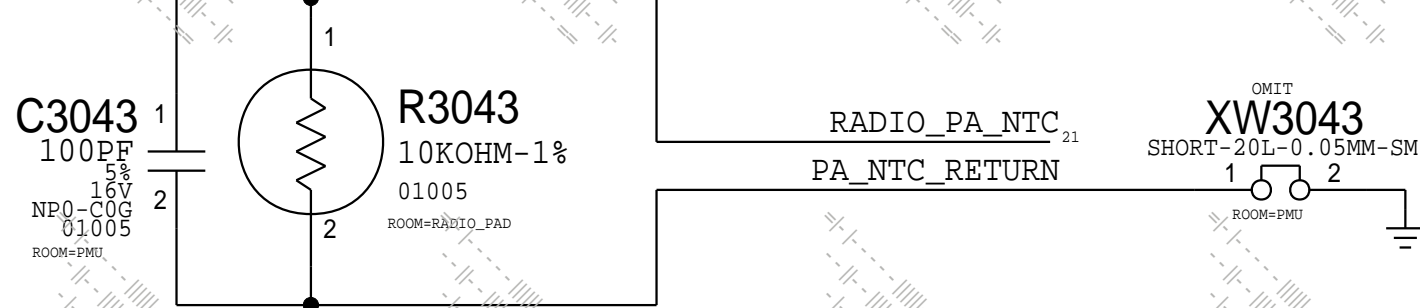
FOREHEAD NTC



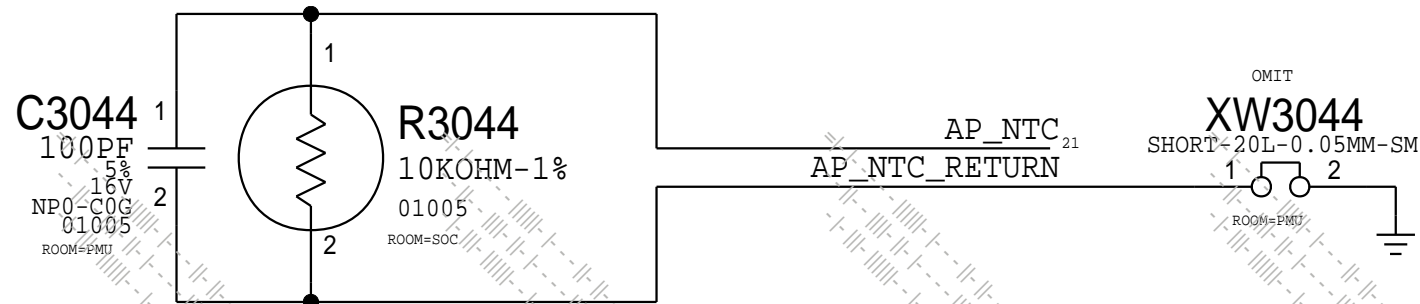
REAR CAMERA NTC



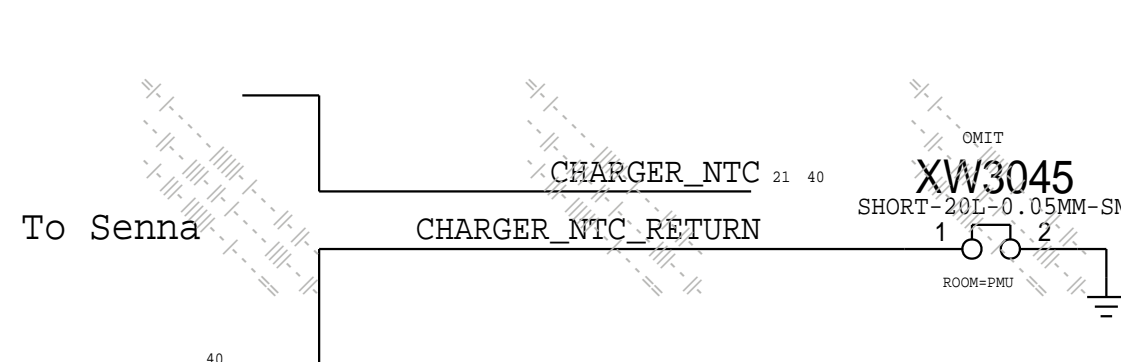
RADIO PA NTC



AP NTC



CHARGER NTC (IN SIP)



NOTE:100PF CAPS ARE THE SAMPLING CAPS FOR PMU ADC

#29404057:Damping R for ACTIVE_RDY

#29300440:Connect PMU crash to SoC

#27852679:No SDA R, PoR is SPMI

#25244799:200K pull-down

#25244799:CHESTNUT AMUX AND PWR_EN ON SAME CHANNEL
#28748132:CHESTNUT AMUX AND PWR_EN SWAP BETWEEN A6/B6

#25244799:OTP-AJ Connects XTAL1 to GND

#29312542:REPLACE PMU XTAL WITH XO

AP TO PMU WDOG RESET
HYDRA TO PMU HOST RESET
AP TO PMU SOCHOT L
PMU TO SYSTEM_COLD_RESET L

PMU TO AP HYDRA ACTIVE READY
PMU TO AOP CLK32K
PMU TO WLAN CLK32K
SYSTEM ALIVE
DISPLAY TO MANY_BSYNCR
PMU TO AOP IRQ L
I2C0 AP_SCL
I2C0 AP_SDA
SPMI PMGR TO PMU_SCLK
SPMI PMU BI PMGR_SDATA

AP TO PMU AMUX_OUT
PMU_ADC_IN
CAMPMU TO PMU_AMUX
AP TO PMU_AMUX_SYNC

HYDRA TO PMU USB BRICK ID
DISPLAY TO CHESTNUT_PWR_EN
ACC_BUCK TO PMU_AMUX
IKTARA TO PMU_OVP

AP TO PMU TEST_CLKOUT
PMU TO WLAN_CLK32K
CHESTNUT TO PMU_AMUX
PMU_AMUX_BY

FOREHEAD_NTC
REAR_CAMERA_NTC
RADIO_PA_NTC
AP_NTC
CHARGER_NTC
PMU_TCAL

#25244799:OTP-AJ Connects XTAL1 to GND

PMU_VDD_RTC
PMU_VDD_REF

PMU_VDD_TCXO

PMU_VSS_RTC

Y3000
32.768KHZ-10PPM
CSP
CRITICAL
CLKOUT

XW3000
SHORT-20L-0.05MM-SM
OMIT
ROHM-FRG

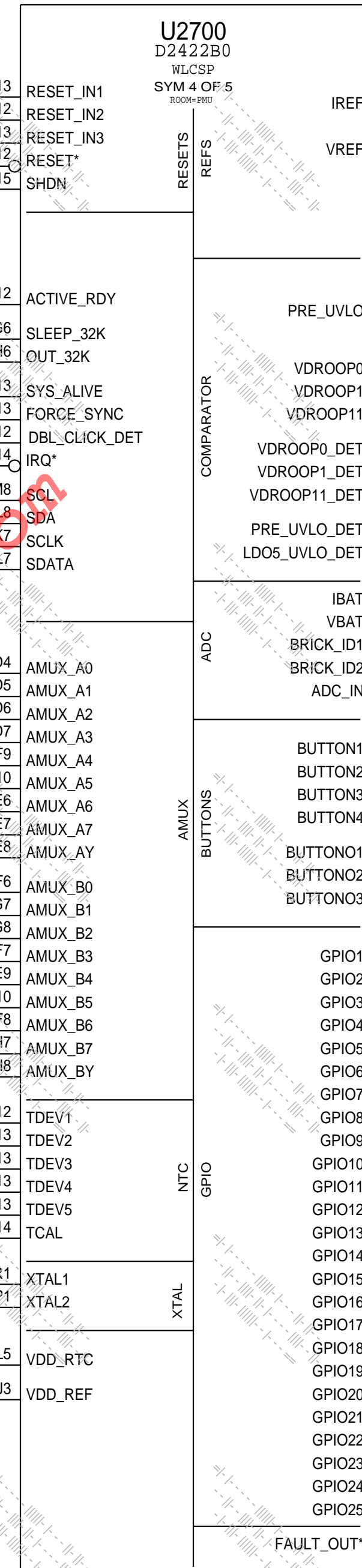
XW3000
SHORT-20L-0.05MM-SM
OMIT
ROHM-FRG

XW3000
SHORT-20L-0.05MM-SM
OMIT
ROHM-FRG

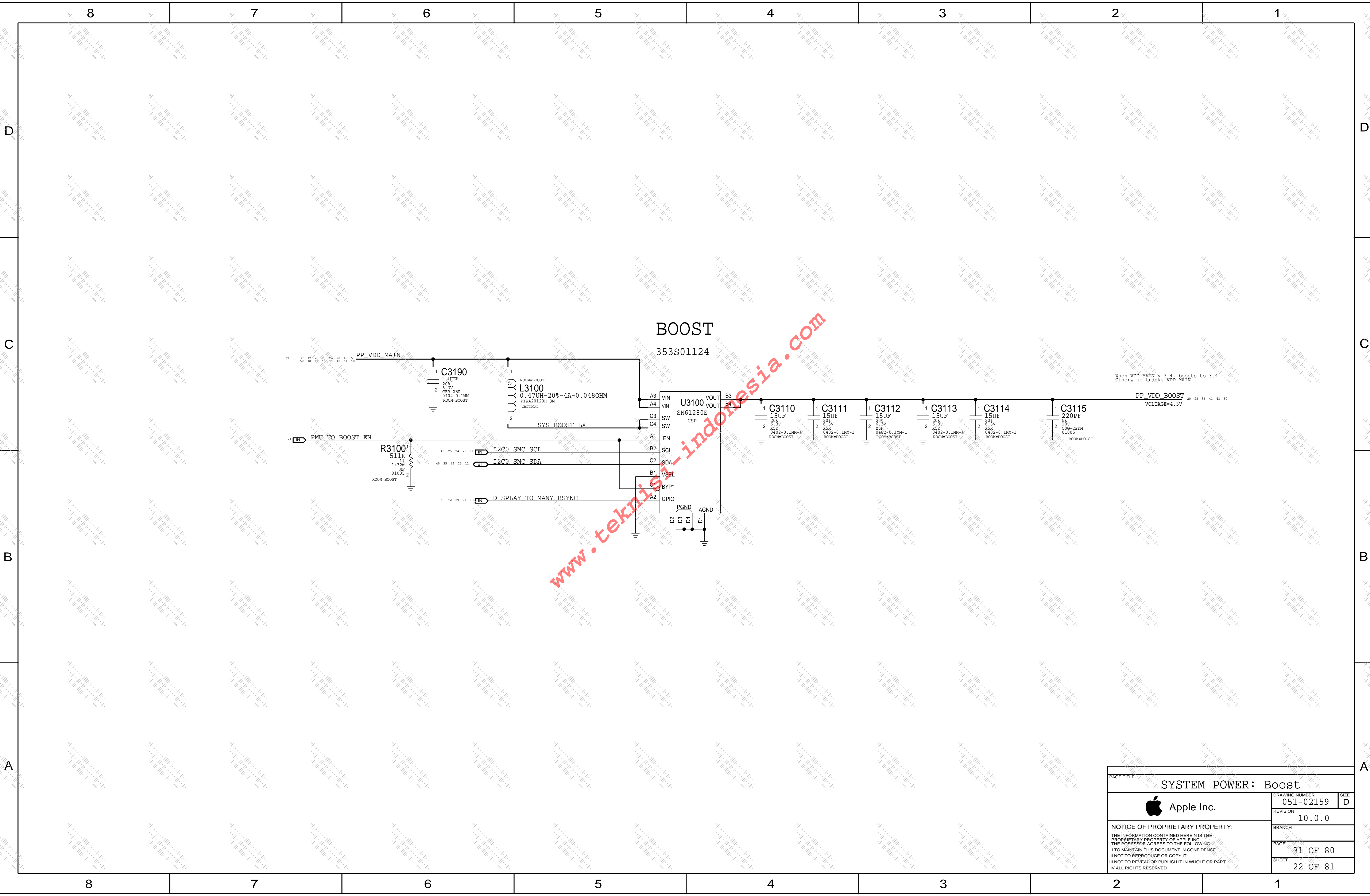
XW3000
SHORT-20L-0.05MM-SM
OMIT
ROHM-FRG


XW3000
SHORT-20L-0.05MM-SM
OMIT
ROHM-FRG

XW3000
SHORT-20L-0.05MM-SM
OMIT
ROHM-FRG



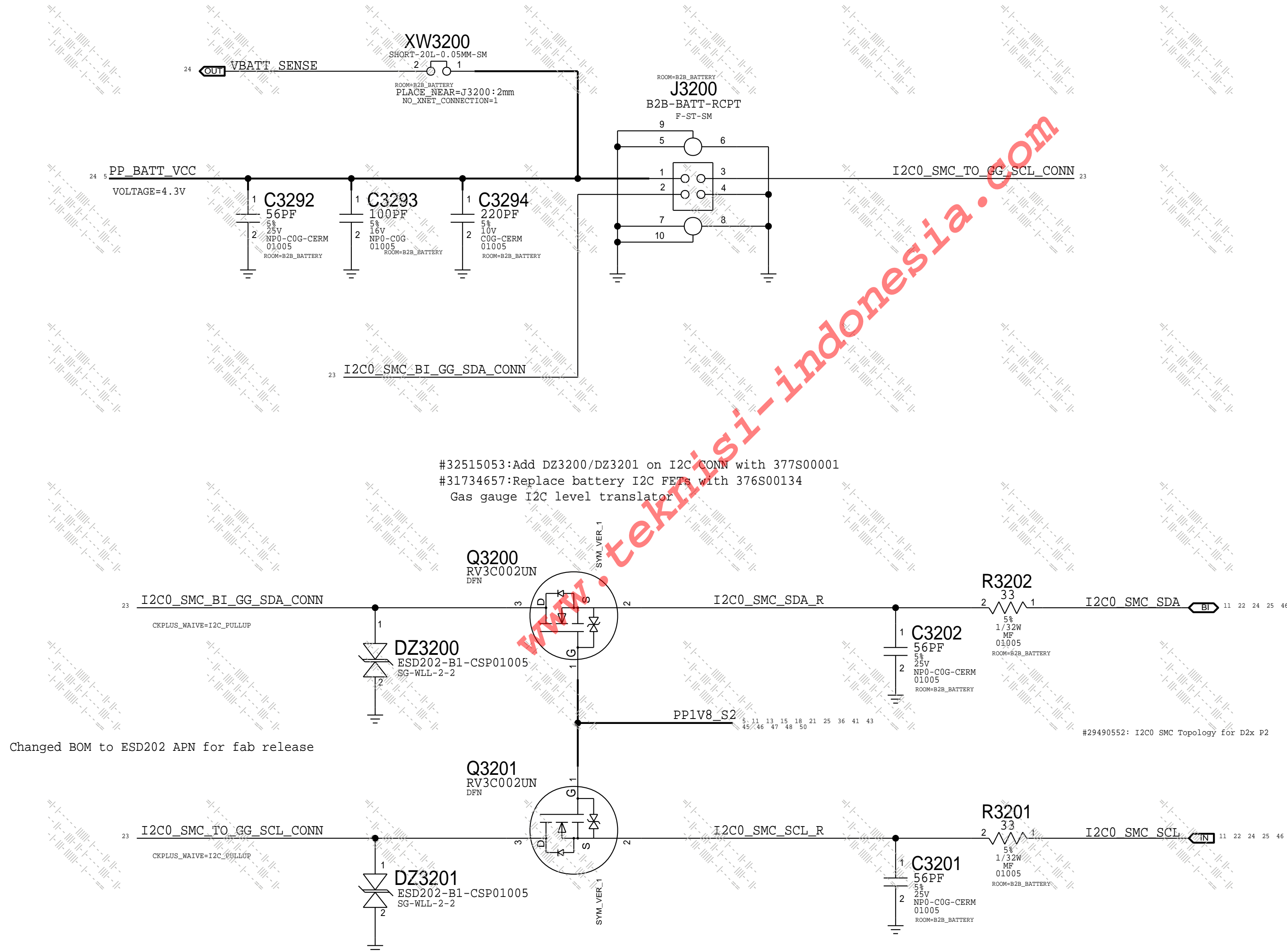
PAGE TITLE		
SYSTEM POWER: PMU (4/4)		
Apple Inc.	DRAWING NUMBER	051-02159
	REVISION	10.0.0
NOTICE OF PROPRIETARY PROPERTY:		BRANCH
THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING:		PAGE
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE		30 OF 80
I NOT TO REPRODUCE OR PUBLISH IT IN WHOLE OR PART		SHEET
I NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART		21 OF 81
I NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART		



PAGE TITLE		
SYSTEM POWER: Boost		
 Apple Inc.	DRAWING NUMBER	051-02159
	REVISION	10.0.0
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 PUBLISH IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED	BRANCH	
	PAGE	31 OF 80
	SHEET	22 OF 81

Battery Connector

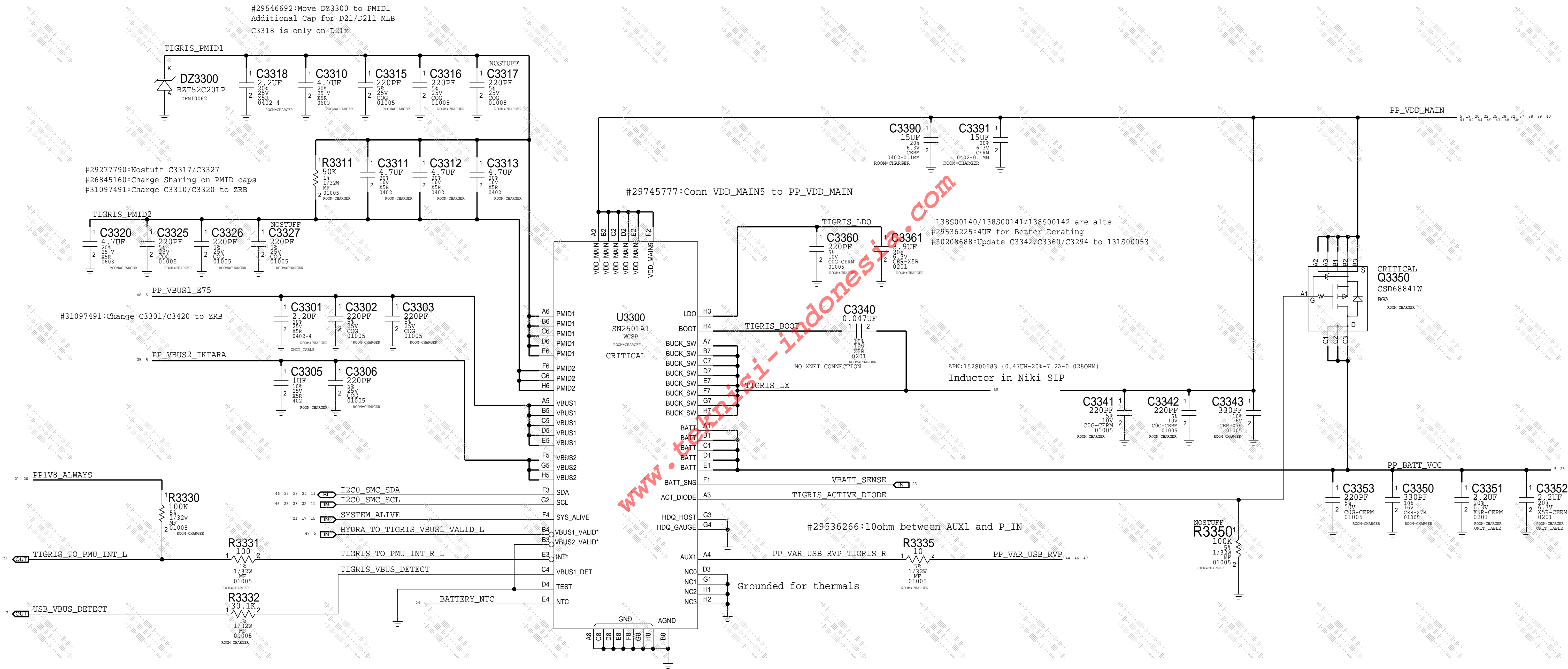
THIS ONE ON MLB ----> 516S00232




PAGE TITLE		
SYSTEM POWER: B2B Battery		
	DRAWING NUMBER	051-02159
	REVISION	10.0.0
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	32 OF 80
	SHEET	23 OF 81

Tigris 2

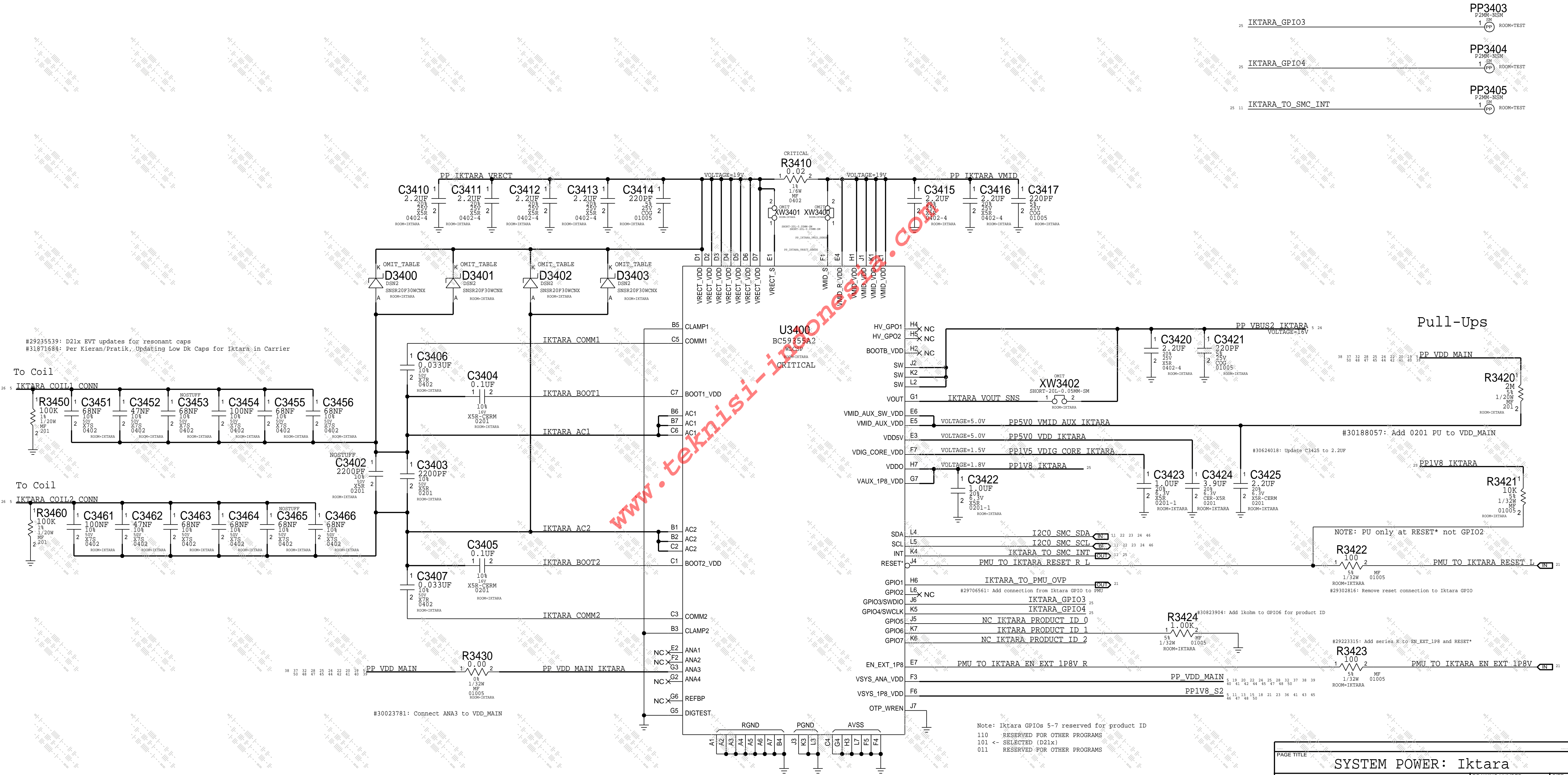
APN:343S00170




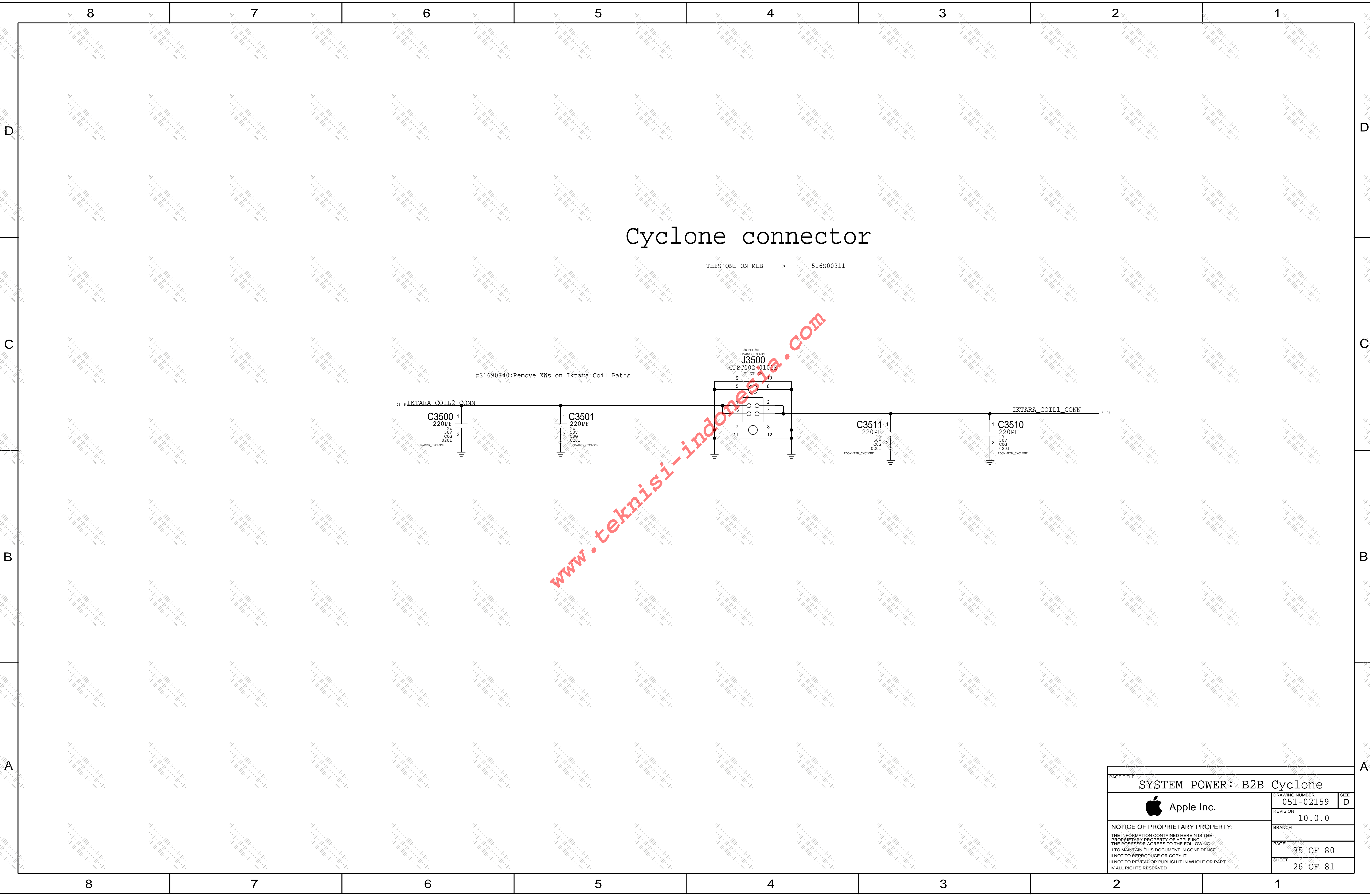
PAGE TITLE			SYSTEM POWER: Charger		
 Apple Inc.		DRAWING NUMBER	051-02159	SIZE	D
		REVISION	10.0.0	BRANCH	
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED			PAGE	33 OF 80	
			SHEET	24 OF 81	

Iktara

Iktara Debug

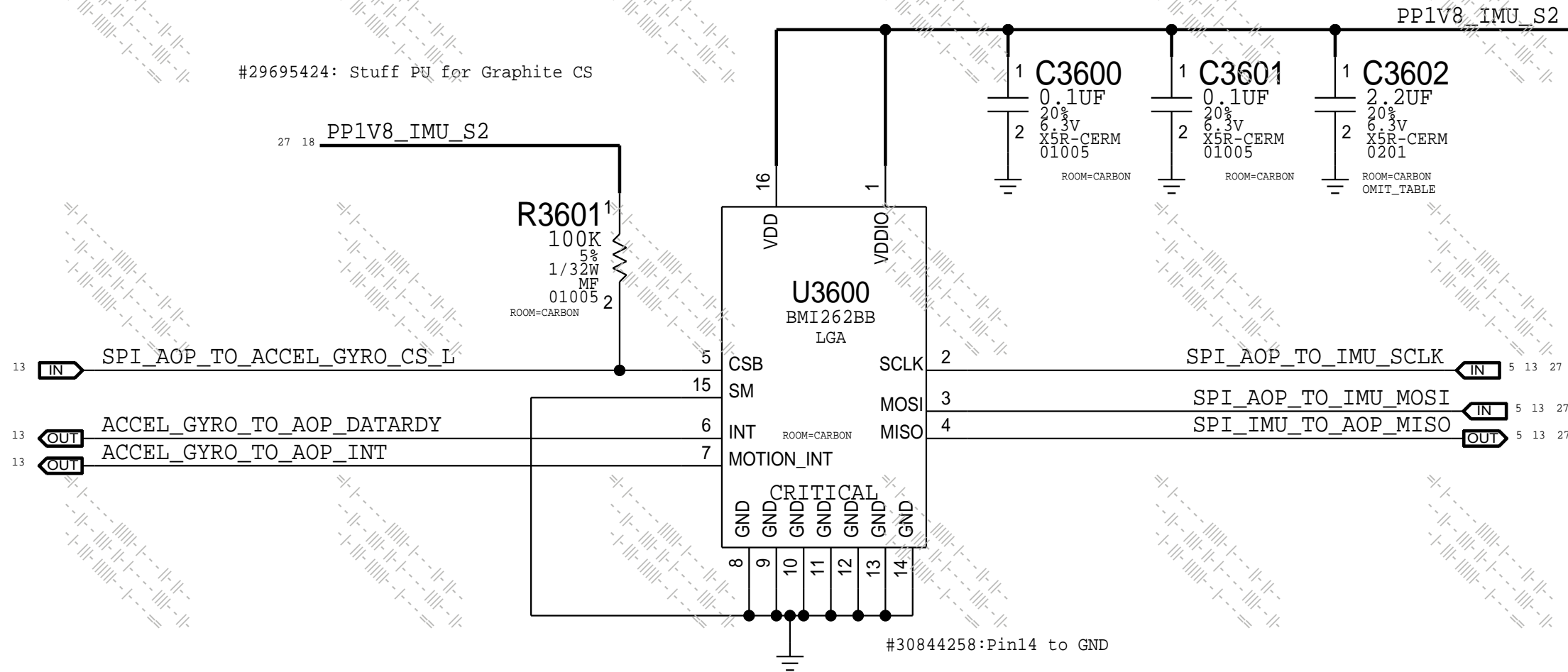


PAGE TITLE		
SYSTEM POWER: Iktara		
 Apple Inc.	DRAWING NUMBER	051-02159
	REVISION	10.0.0
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE I NOT TO REPRODUCE OR COPY IT I NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED	BRANCH	
	PAGE	34 OF 80
	SHEET	25 OF 81



Graphite - Accel & Gyro

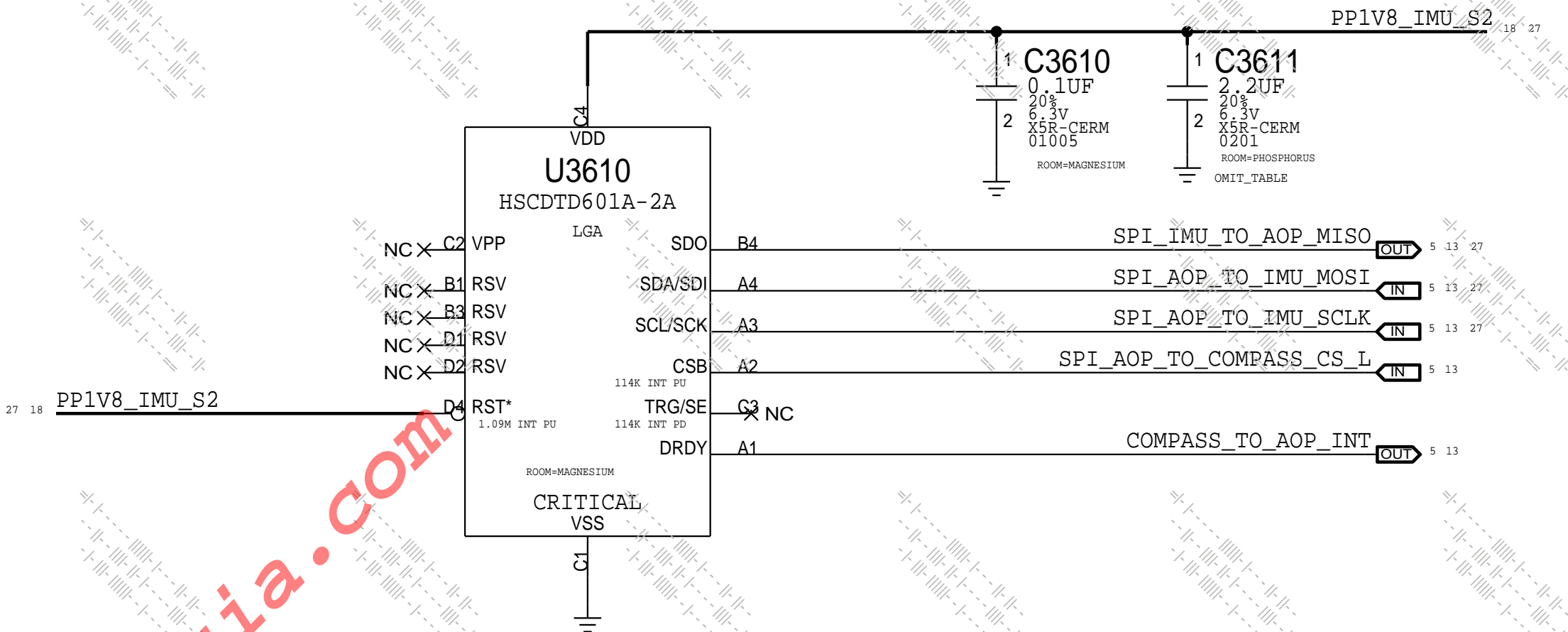
APN: 338S00304 (A1)



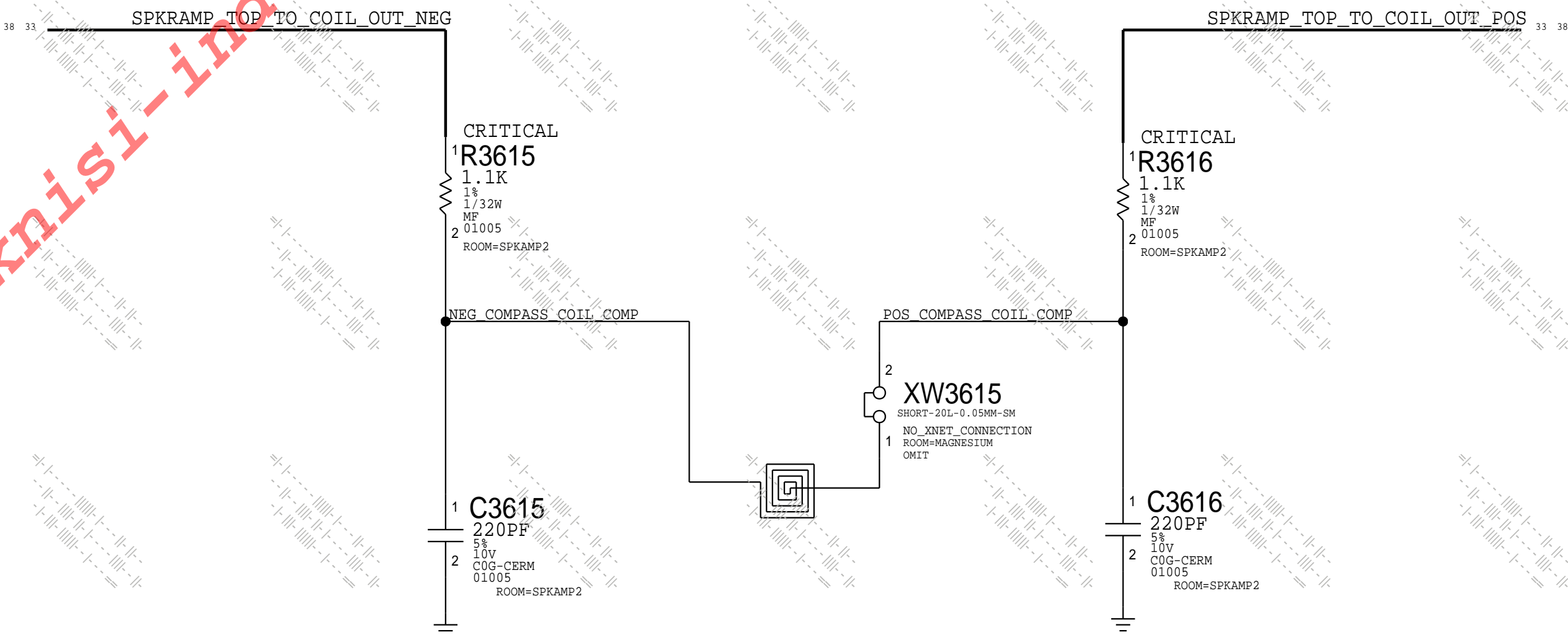
Magnesium - Compass

APN:338S00084

Shared decoupling with Phosphorus

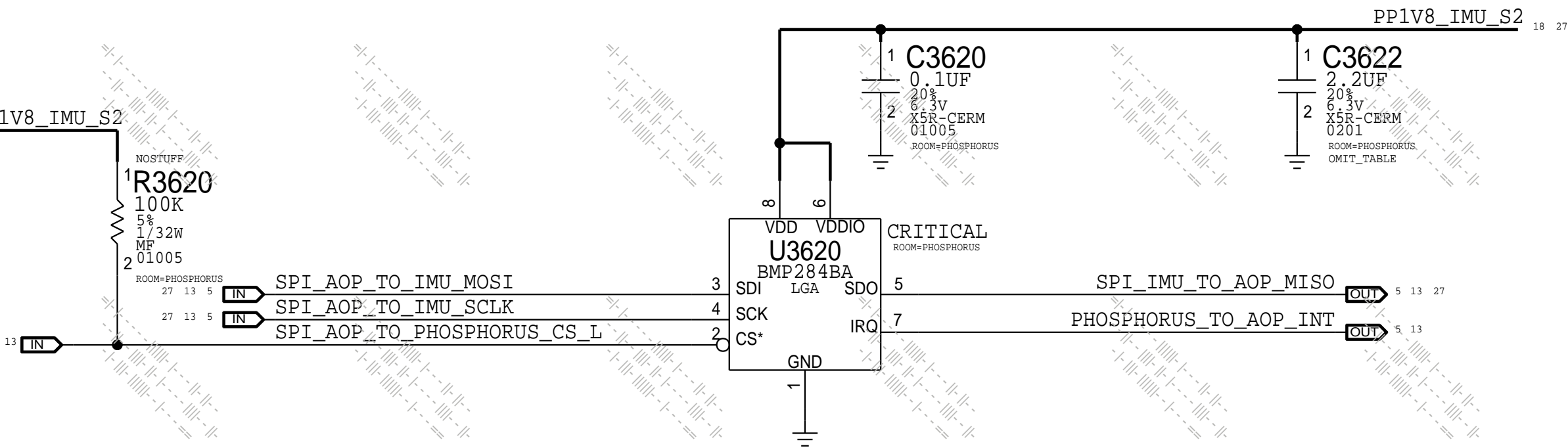


North Speaker Compass Compensation Coil



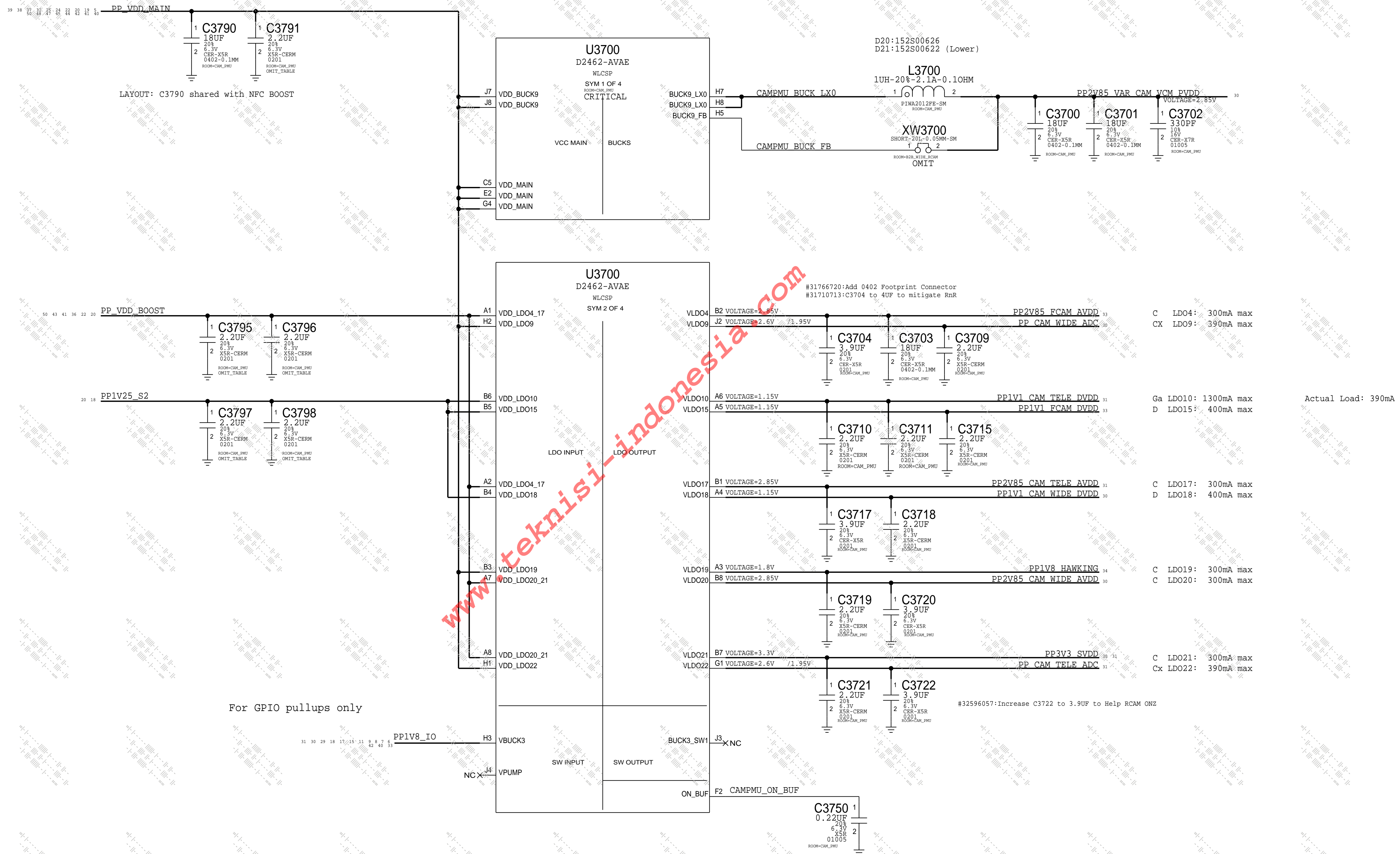
Phosphorus


APN: 338S00334

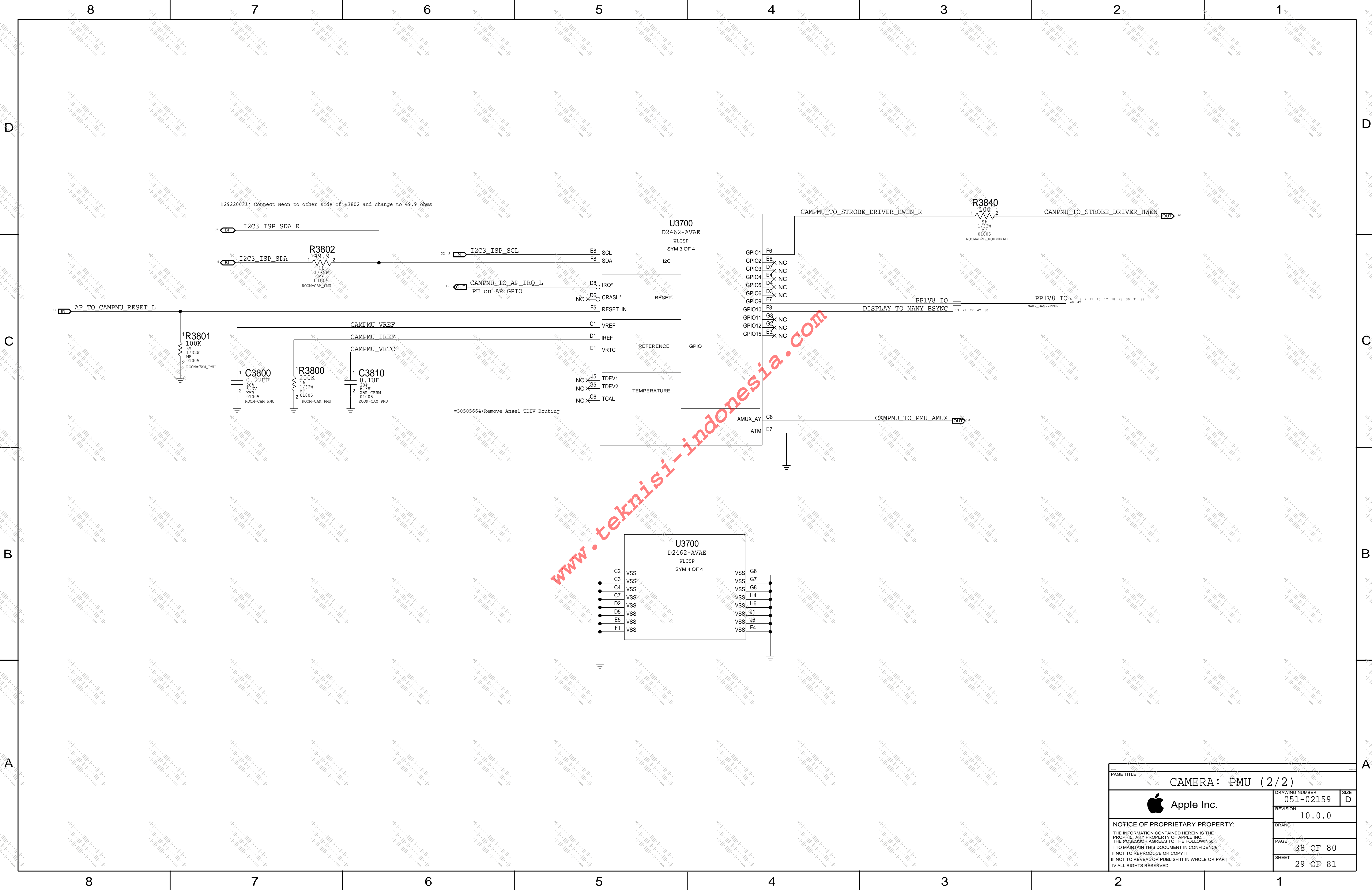



PAGE TITLE		
SENSORS		
	DRAWING NUMBER	051-02159
	REVISION	10.0.0
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE I NOT TO REPRODUCE OR COPY IT I NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED	BRANCH	
	PAGE	36 OF 80
	SHEET	27 OF 81

Camera PMU



PAGE TITLE			CAMERA: PMU (1/2)		
 Apple Inc.	DRAWING NUMBER		051-02159		SIZE
	REVISION		10.0.0		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		37 OF 80			
SHEET		28 OF 81			



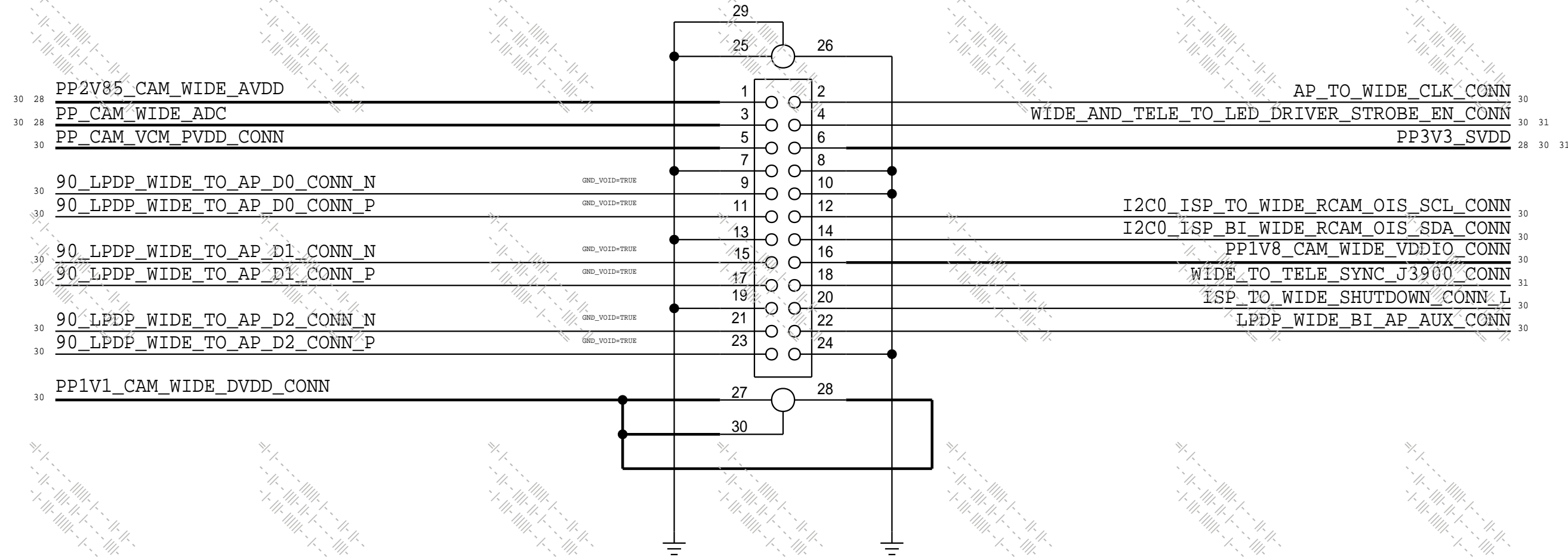
PAGE TITLE			CAMERA: PMU (2/2)		
 Apple Inc.		DRAWING NUMBER		SIZE	
		051-02159		D	
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED		REVISION		10.0.0	
		BRANCH			
		PAGE		38 OF 80	
		SHEET		29 OF 81	

Wide Camera Connector

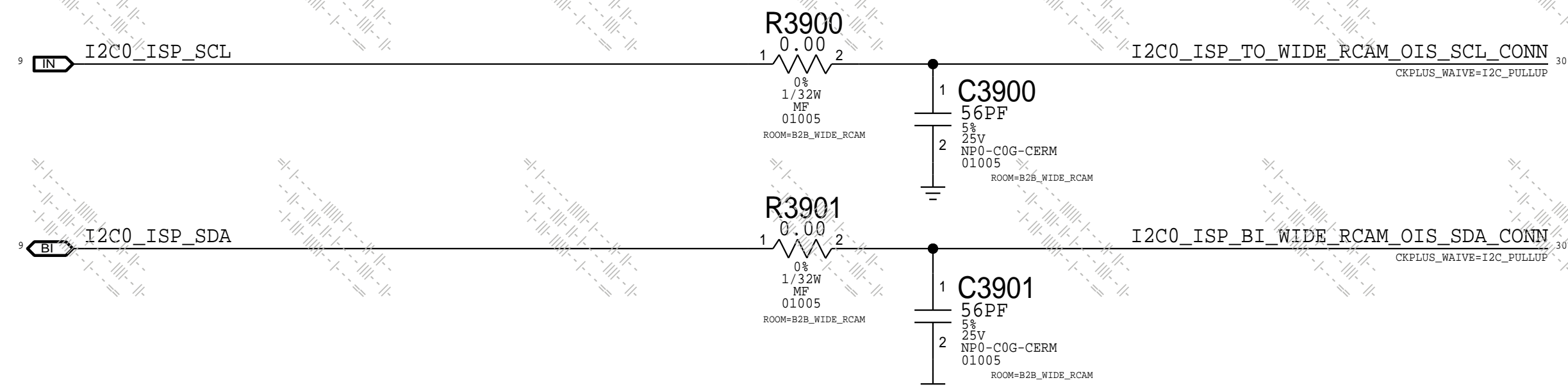
THIS ONE ---->

516S00310/P2 RCPT (USED ON MLB)
516S00309/P2 PLUG (USED ON FLEX)

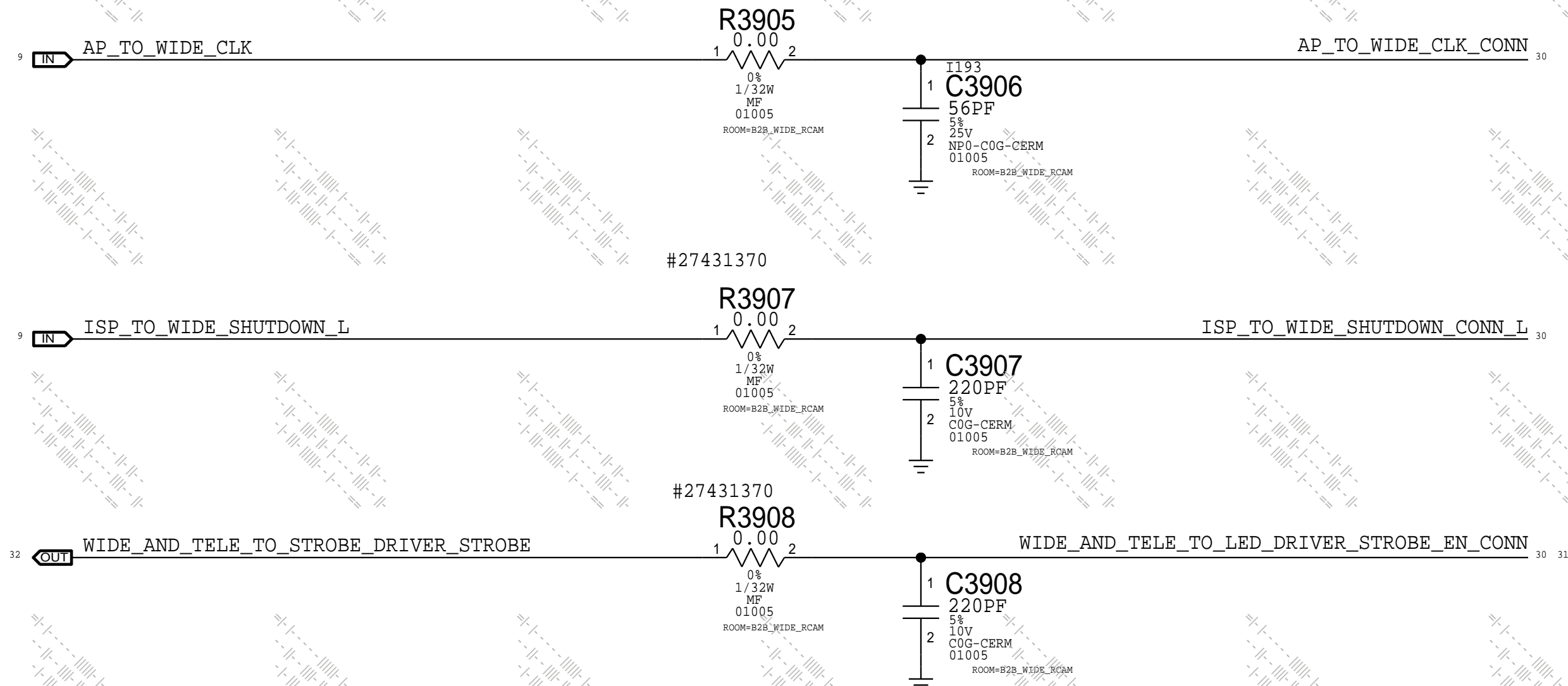
J3900
AA27DK-S024VA1
P-ST-SM



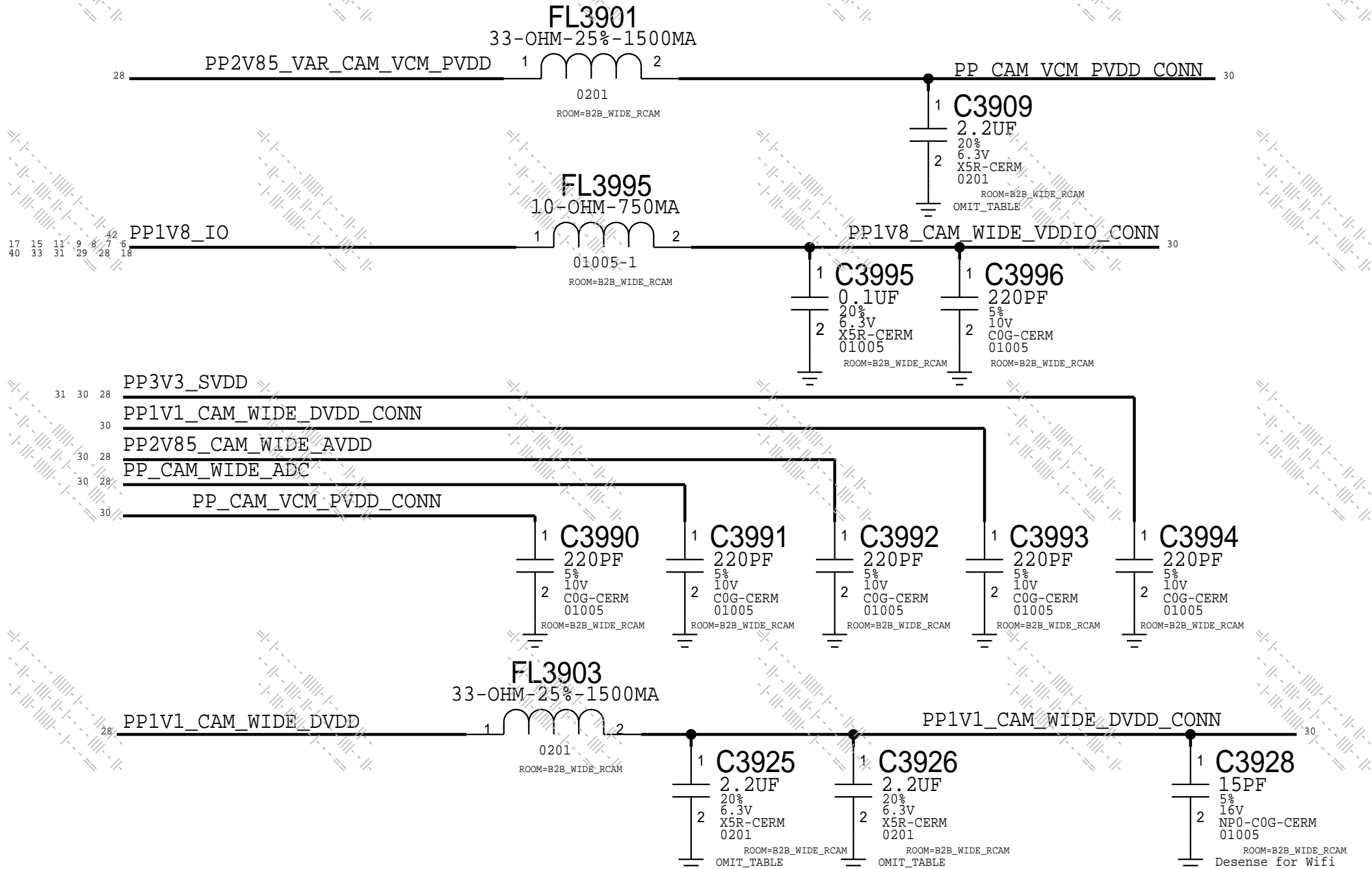
ISP I2C



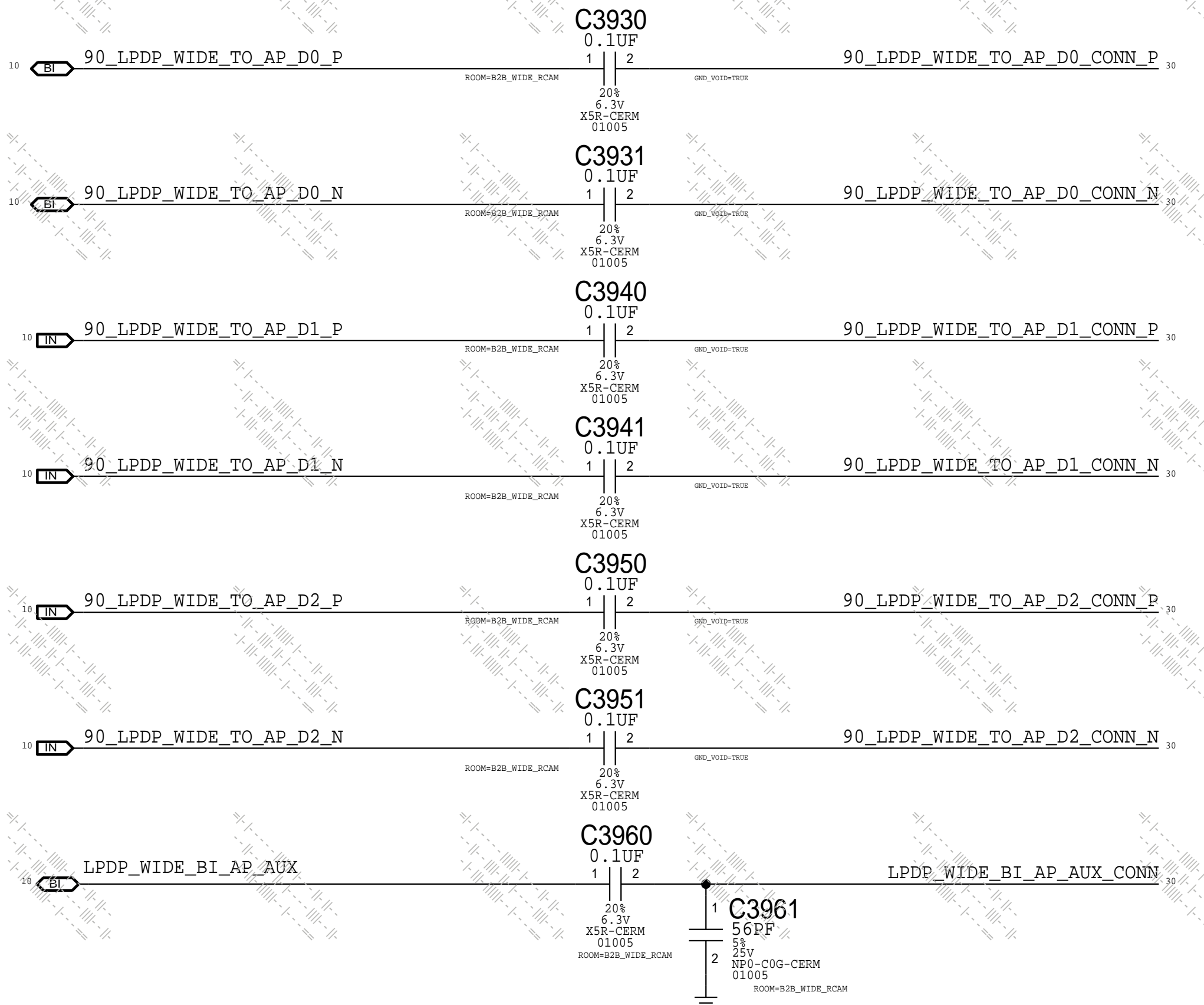
IO Filters



Power Filtering



LPDP Filters



PAGE TITLE
CAMERA: B2B Wide (KY)



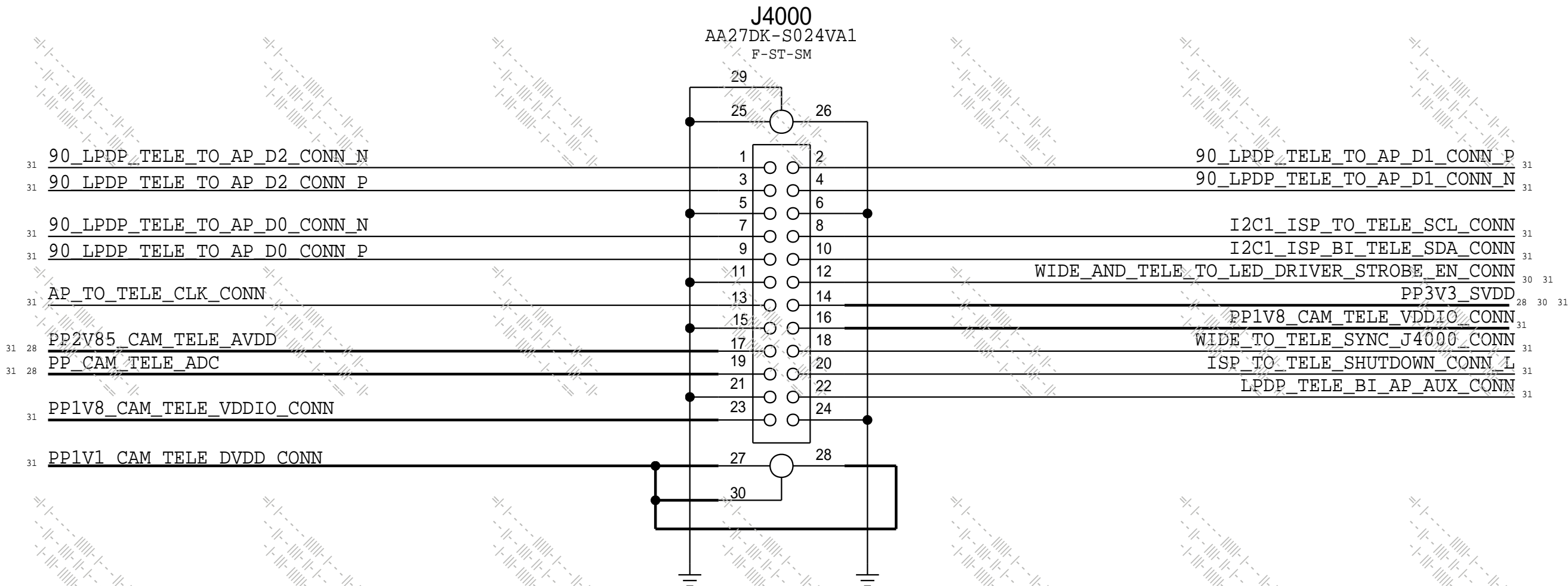
Apple Inc.

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
I NOT TO REPRODUCE OR COPY IT
I NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

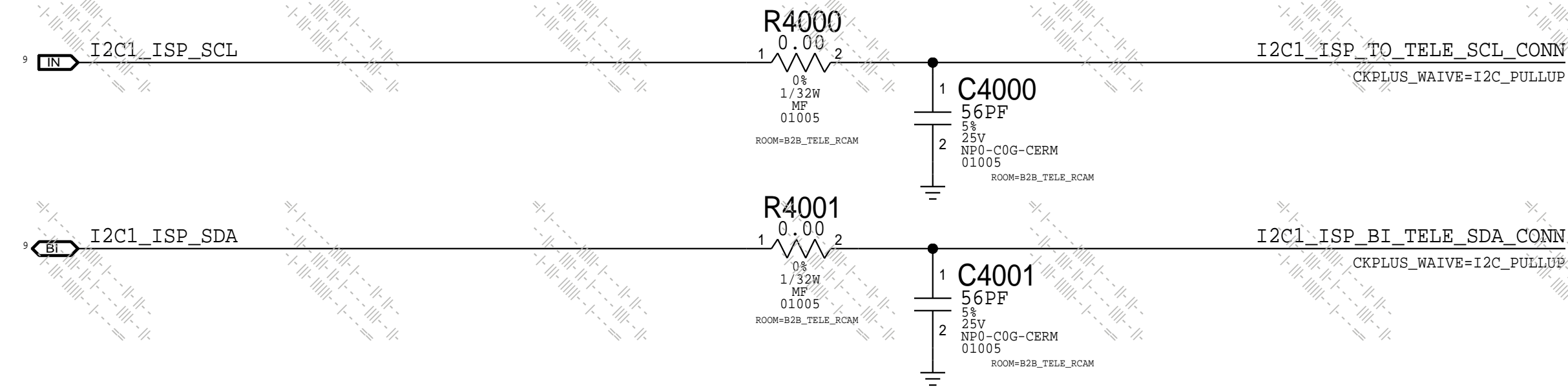
DRAWING NUMBER	051-02159	SIZE	D
REVISION	10.0.0	BRANCH	
PAGE	39 OF 80	SHEET	30 OF 81

Tele Camera Connector

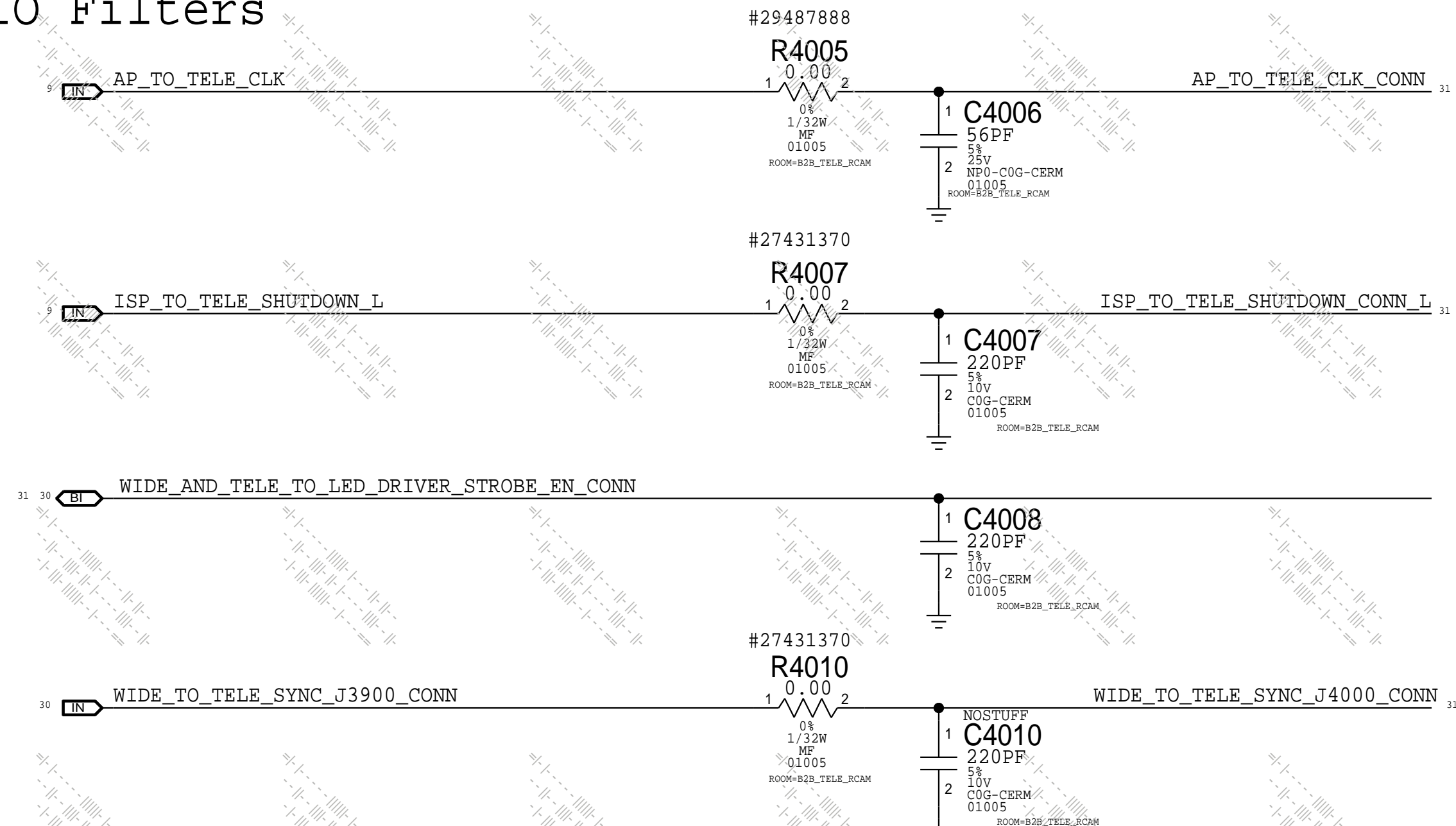
THIS ONE ----> 516S00310/P2 RCPT (USED ON MLB)
516S00309/P2 PLUG (USED ON FLEX)



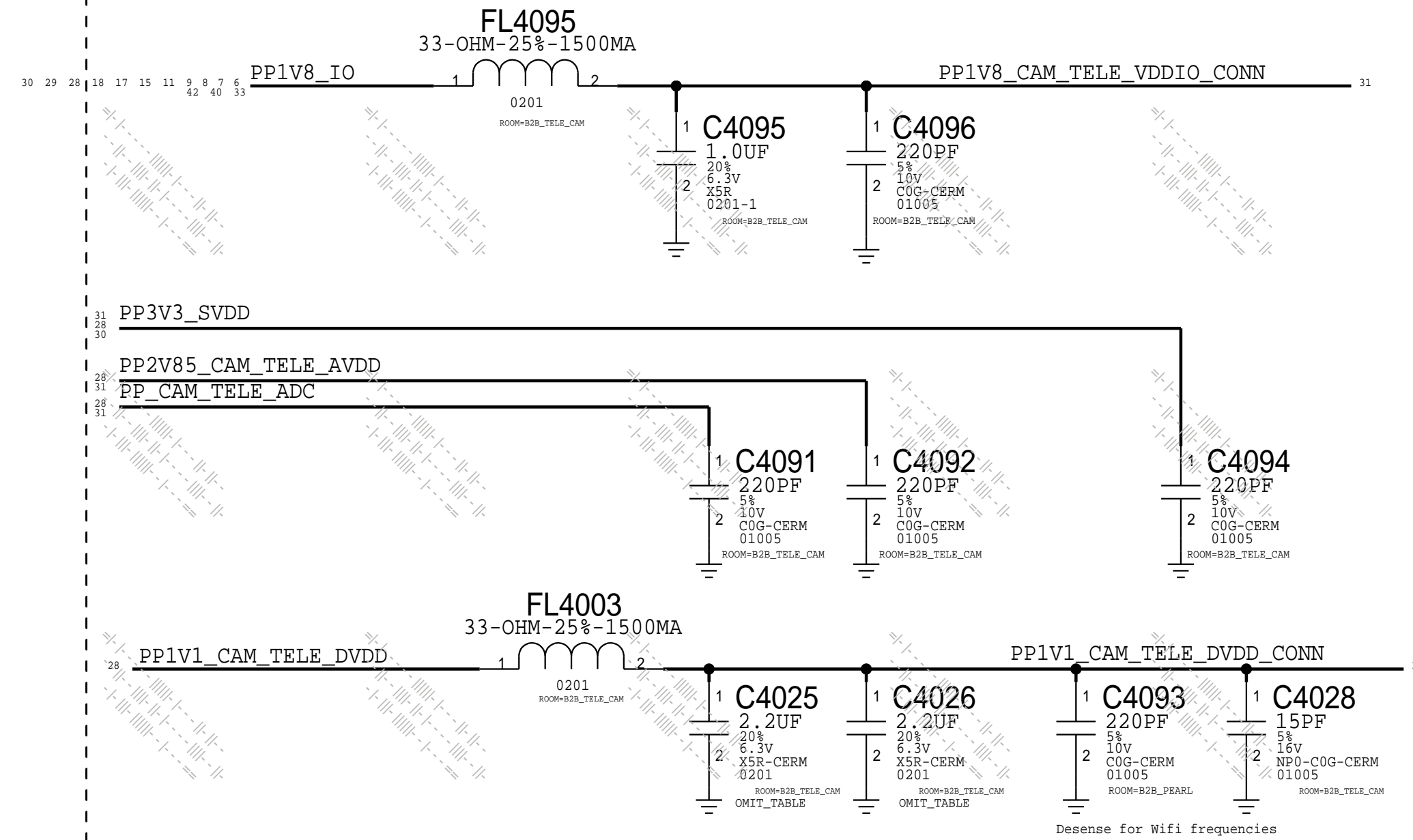
ISP I2C



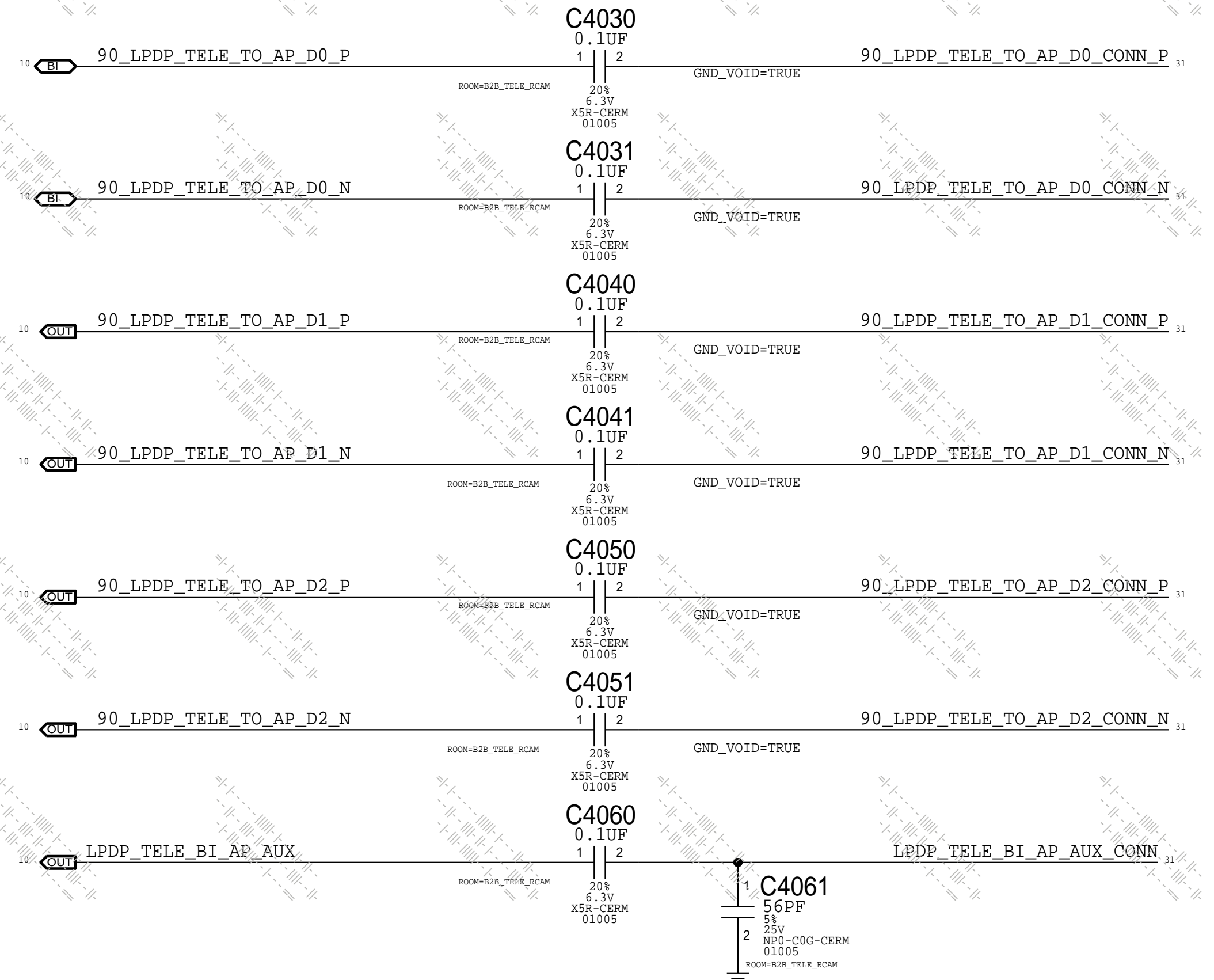
IO Filters



Power Filtering



LPDP



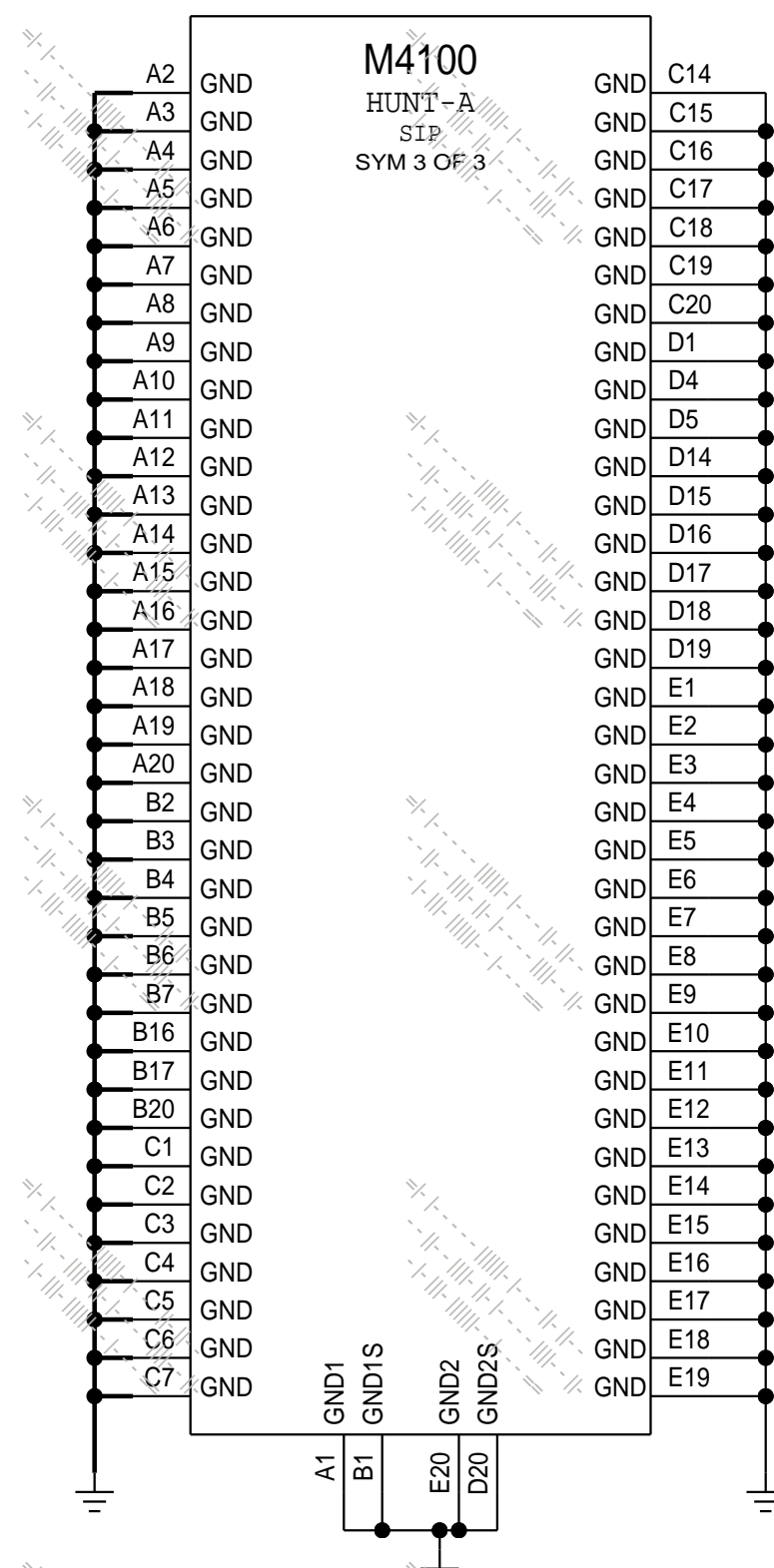
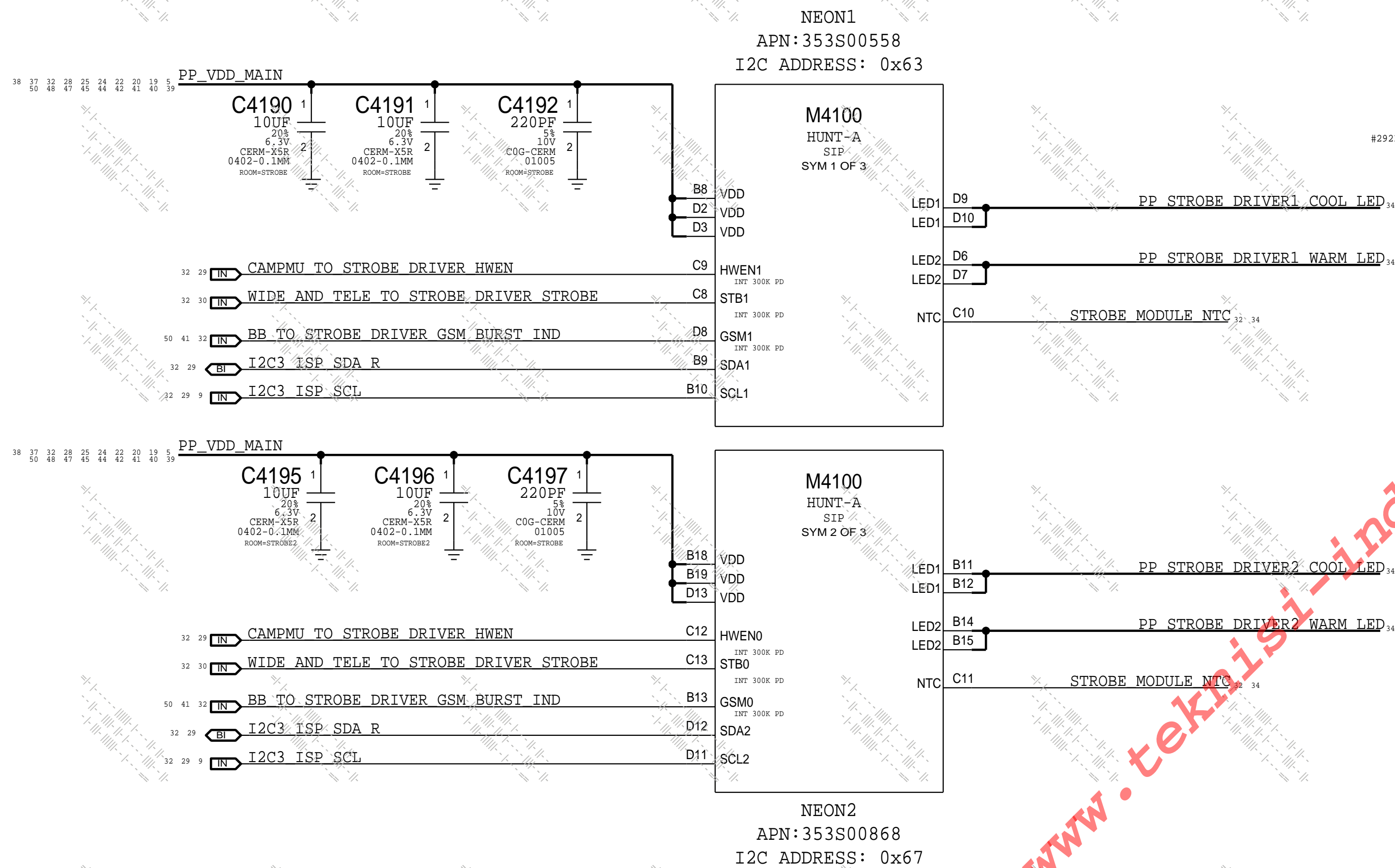
CAMERA: B2B Tele (TN)

Apple Inc.

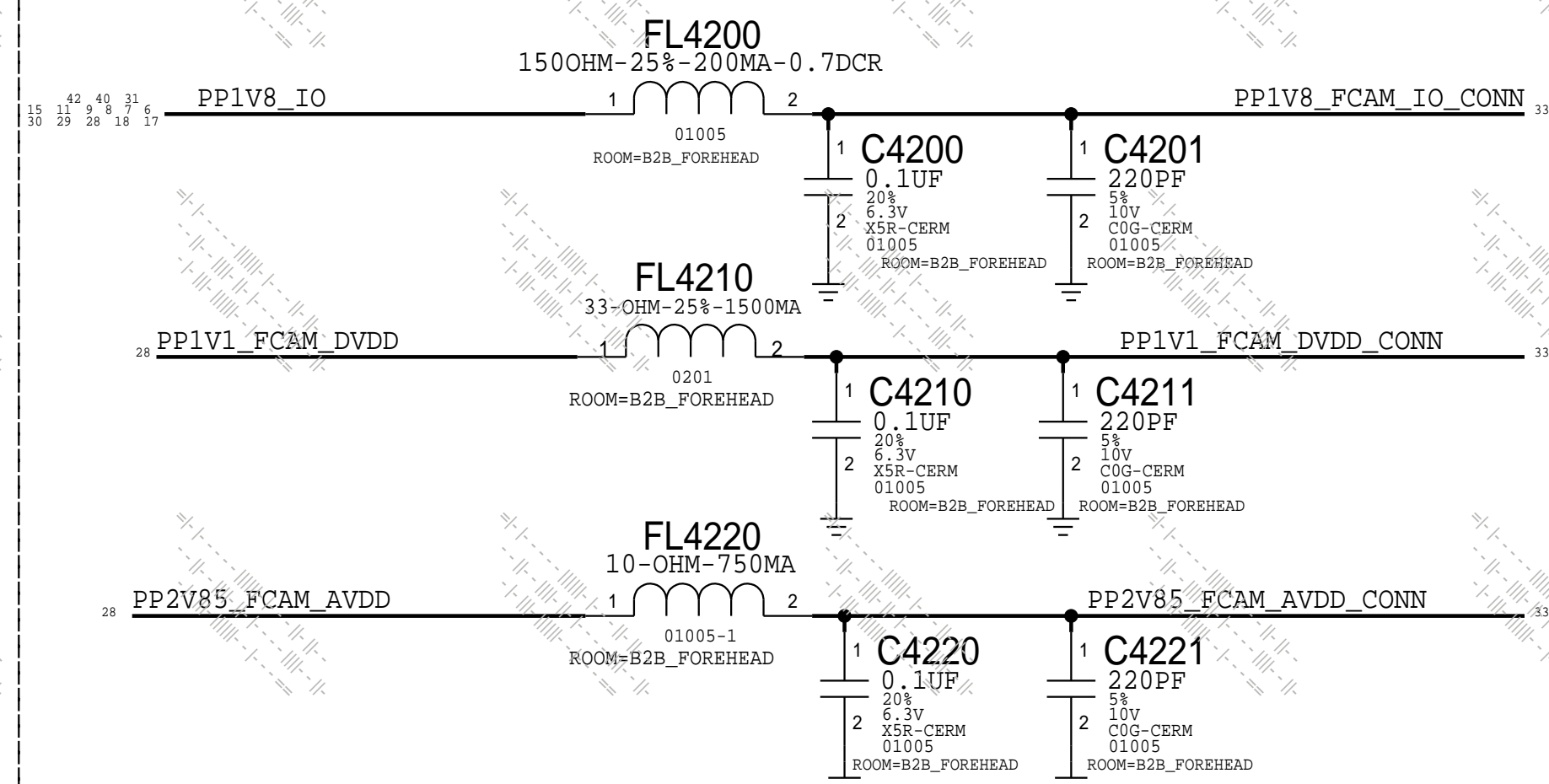
NOTICE OF PROPRIETARY PROPERTY:
THE INFORMATION CONTAINED HEREIN IS THE
PROPRIETARY PROPERTY OF APPLE INC.
THE POSSESSOR AGREES TO THE FOLLOWING:
I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE
I NOT TO REPRODUCE OR COPY IT
I NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART
IV ALL RIGHTS RESERVED

DRAWING NUMBER	051-02159	SIZE	D
REVISION	10.0.0	BRANCH	
PAGE	40 OF 80	SHEET	31 OF 81

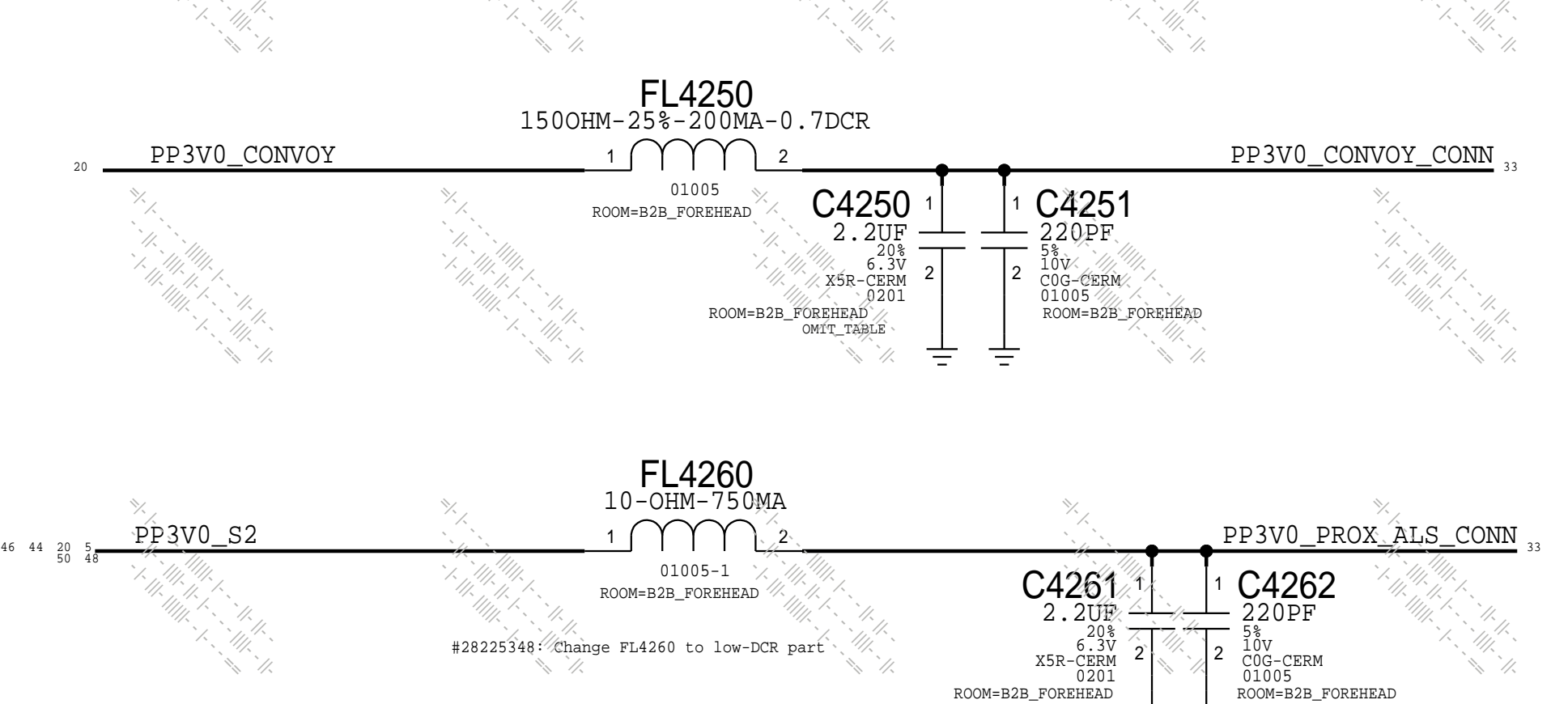
LED STROBE DRIVERS (NEON)



FCAM POWER

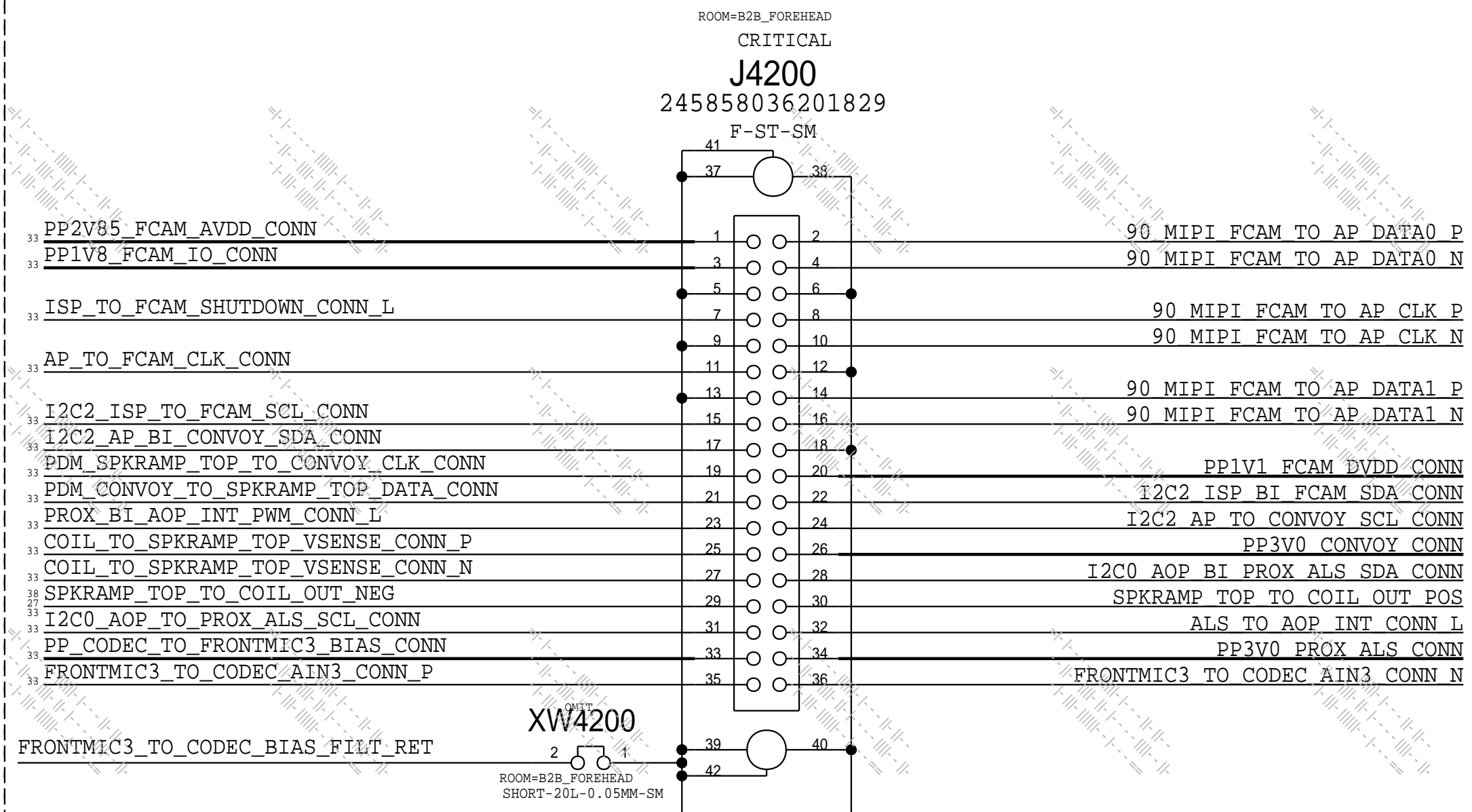


PROX + ALS + CONVOY POWER

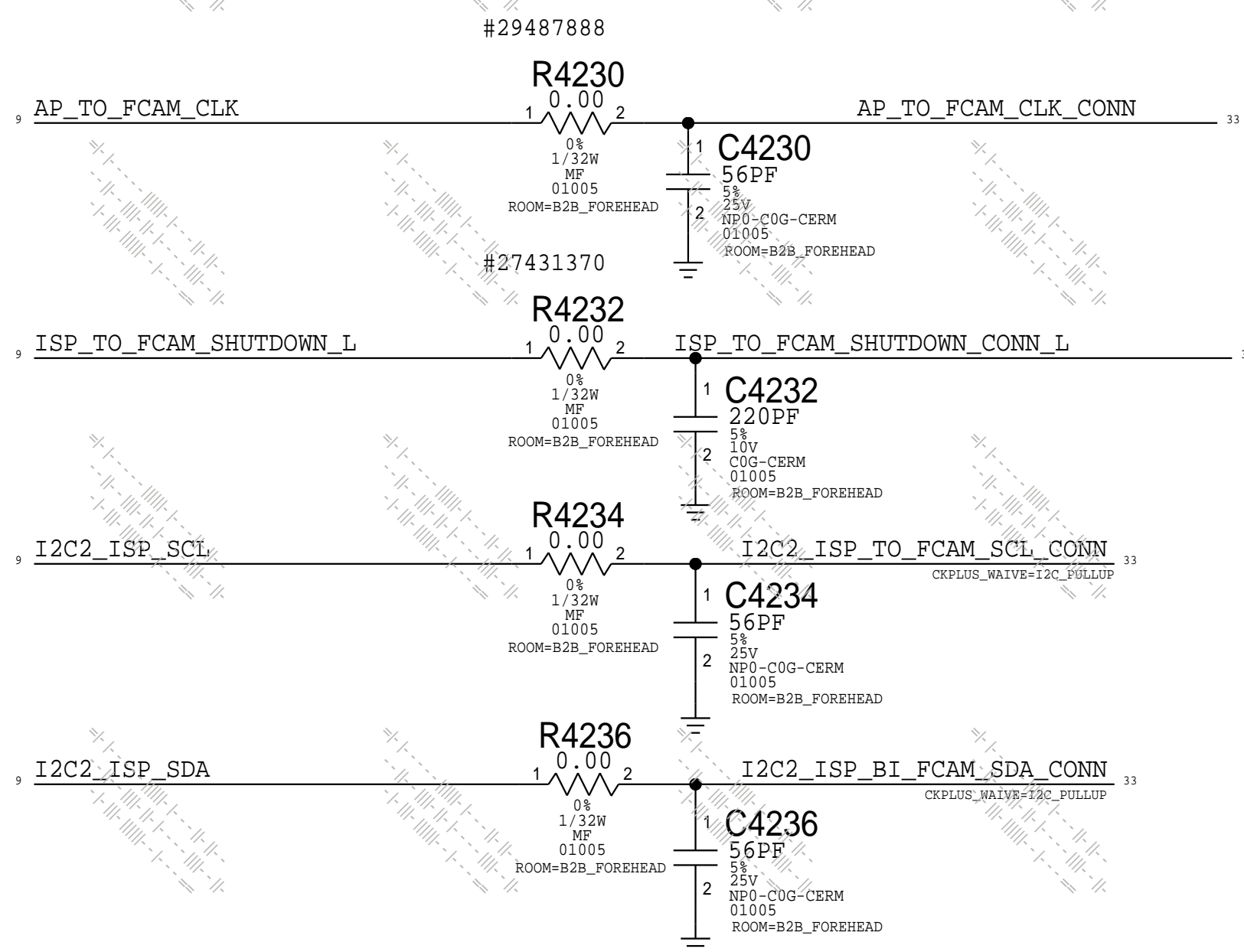


FOREHEAD CONNECTOR

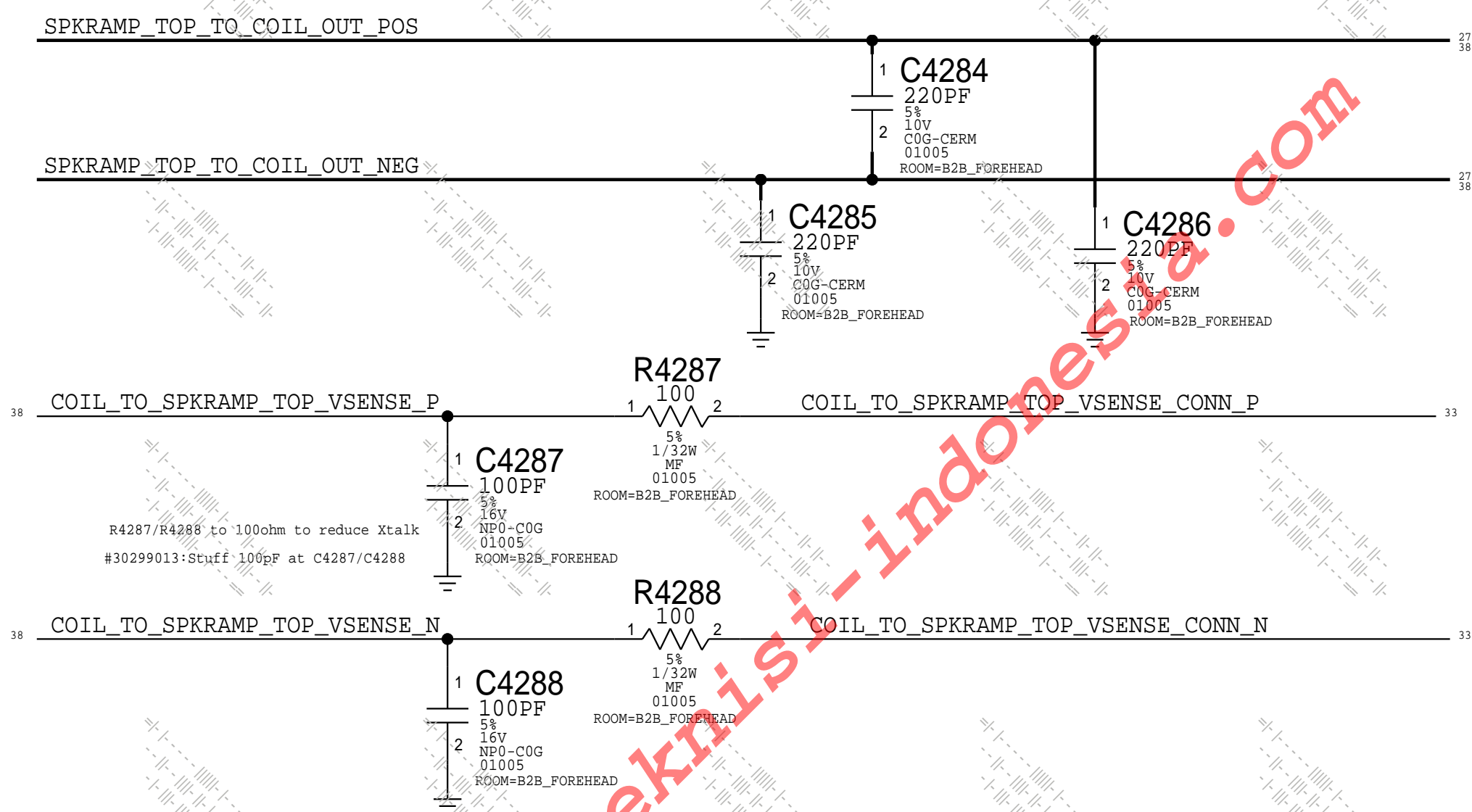
APN: 516S00146



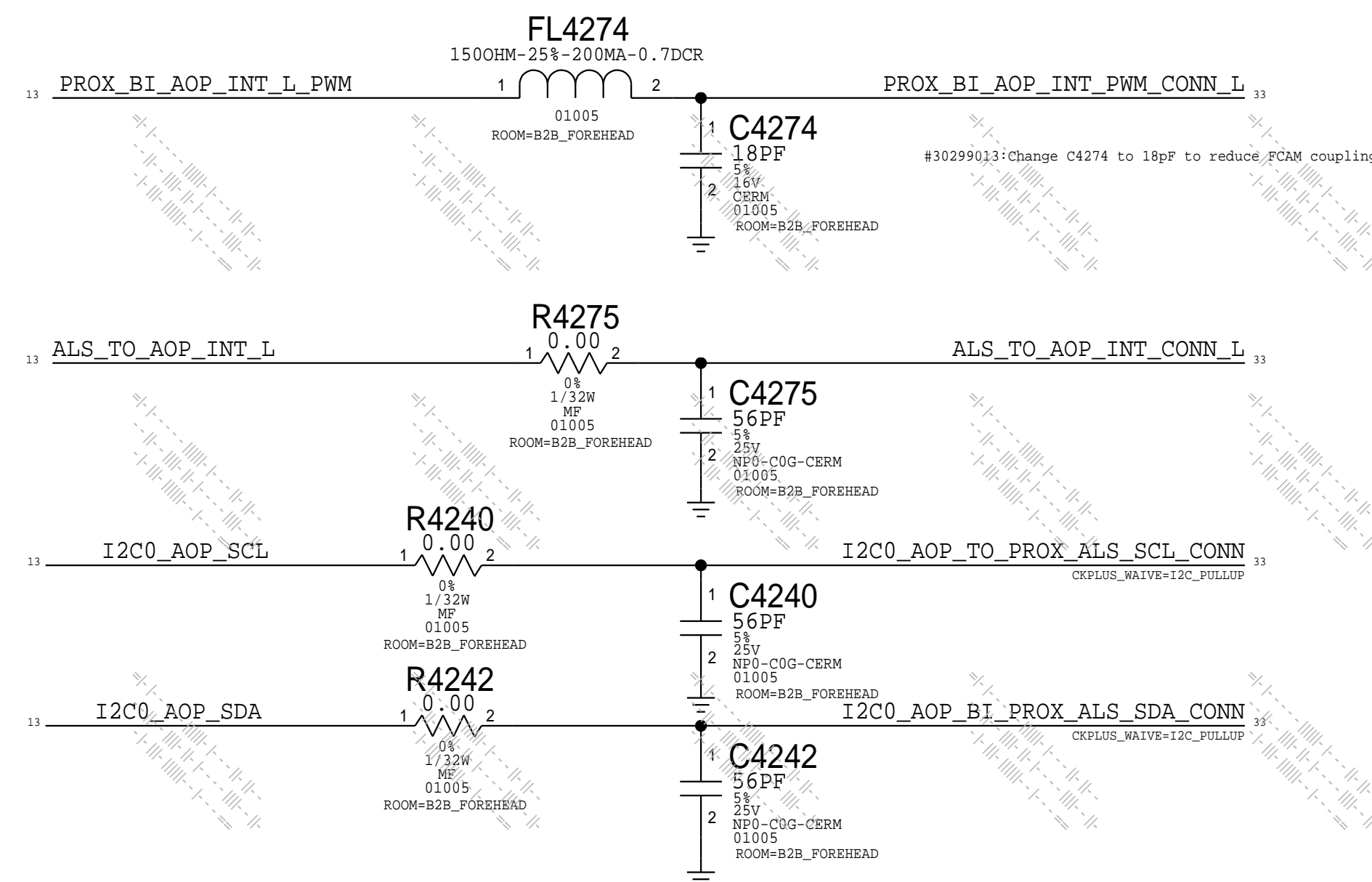
FCAM I/O



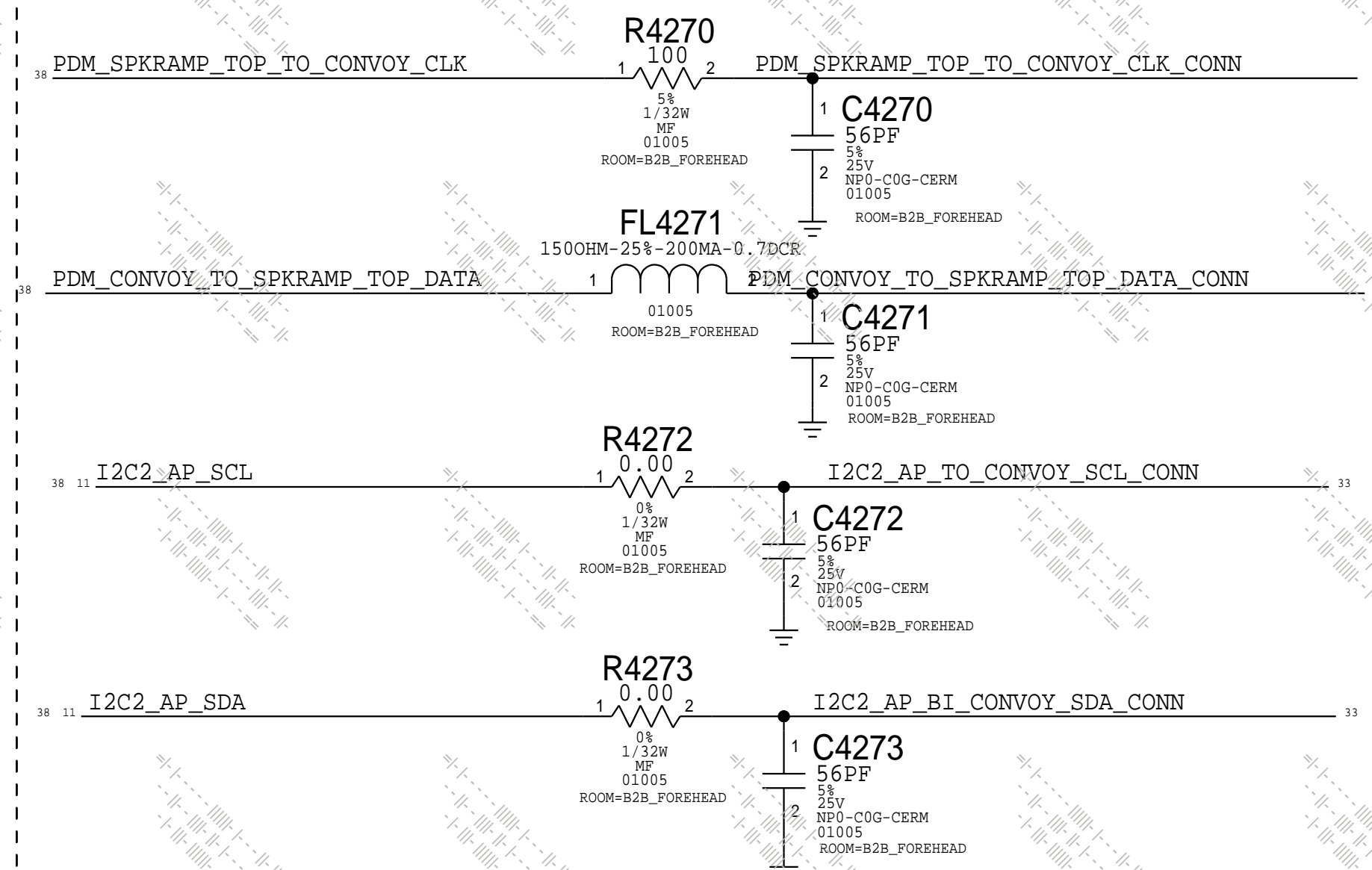
NORTH SPEAKER



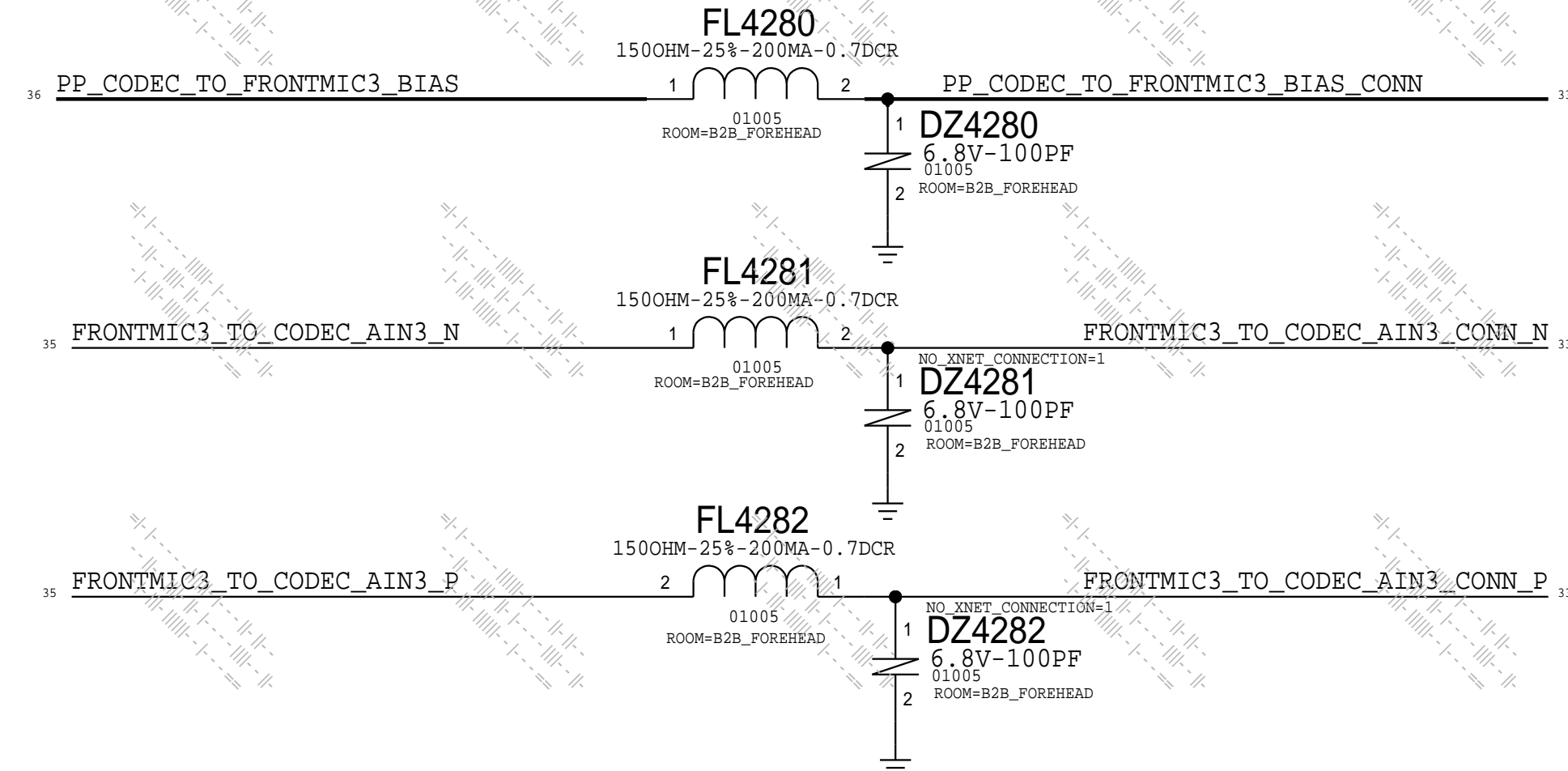
PROX + ALS I/O




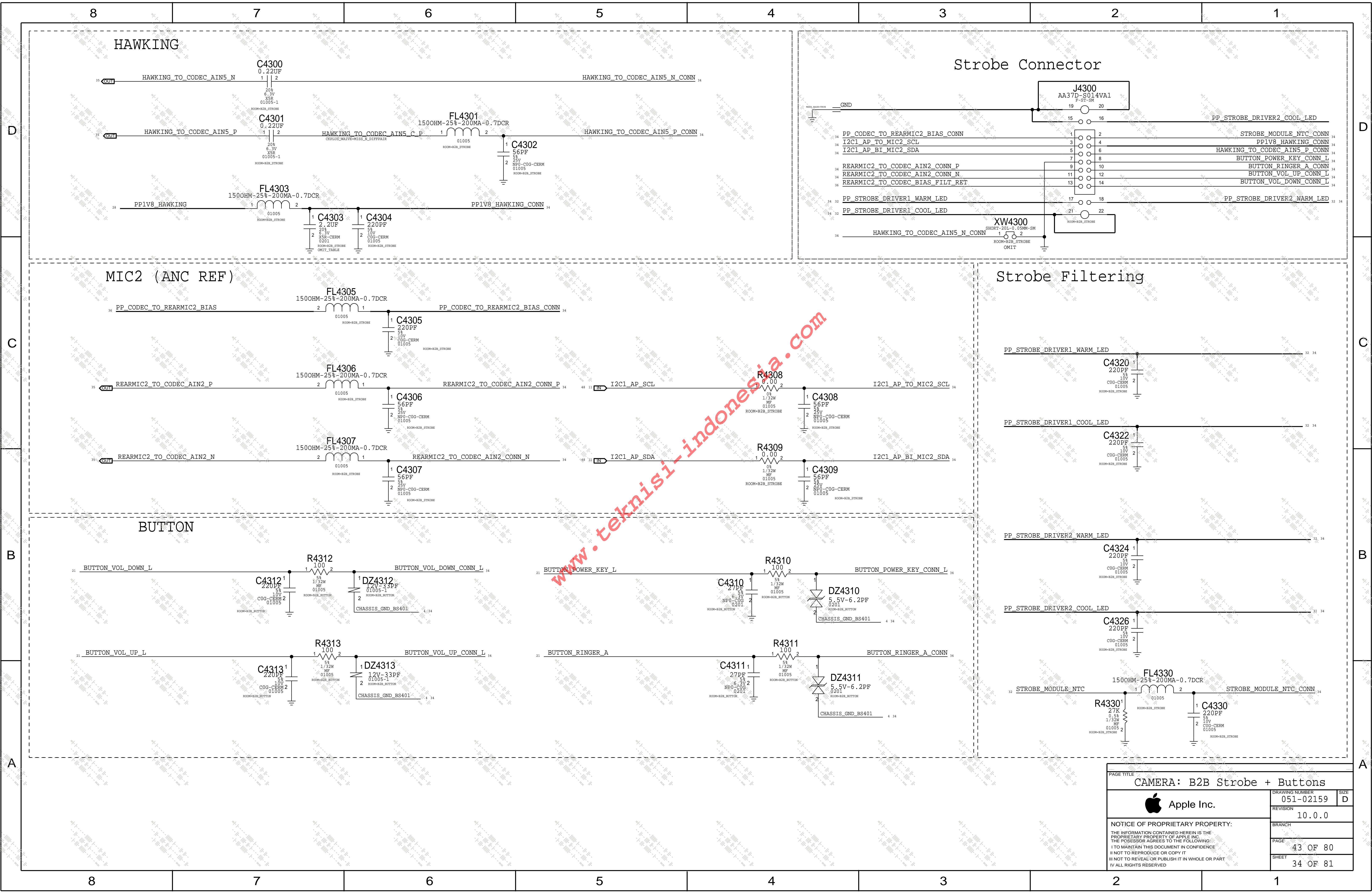
CONVOY I/O




MIC3

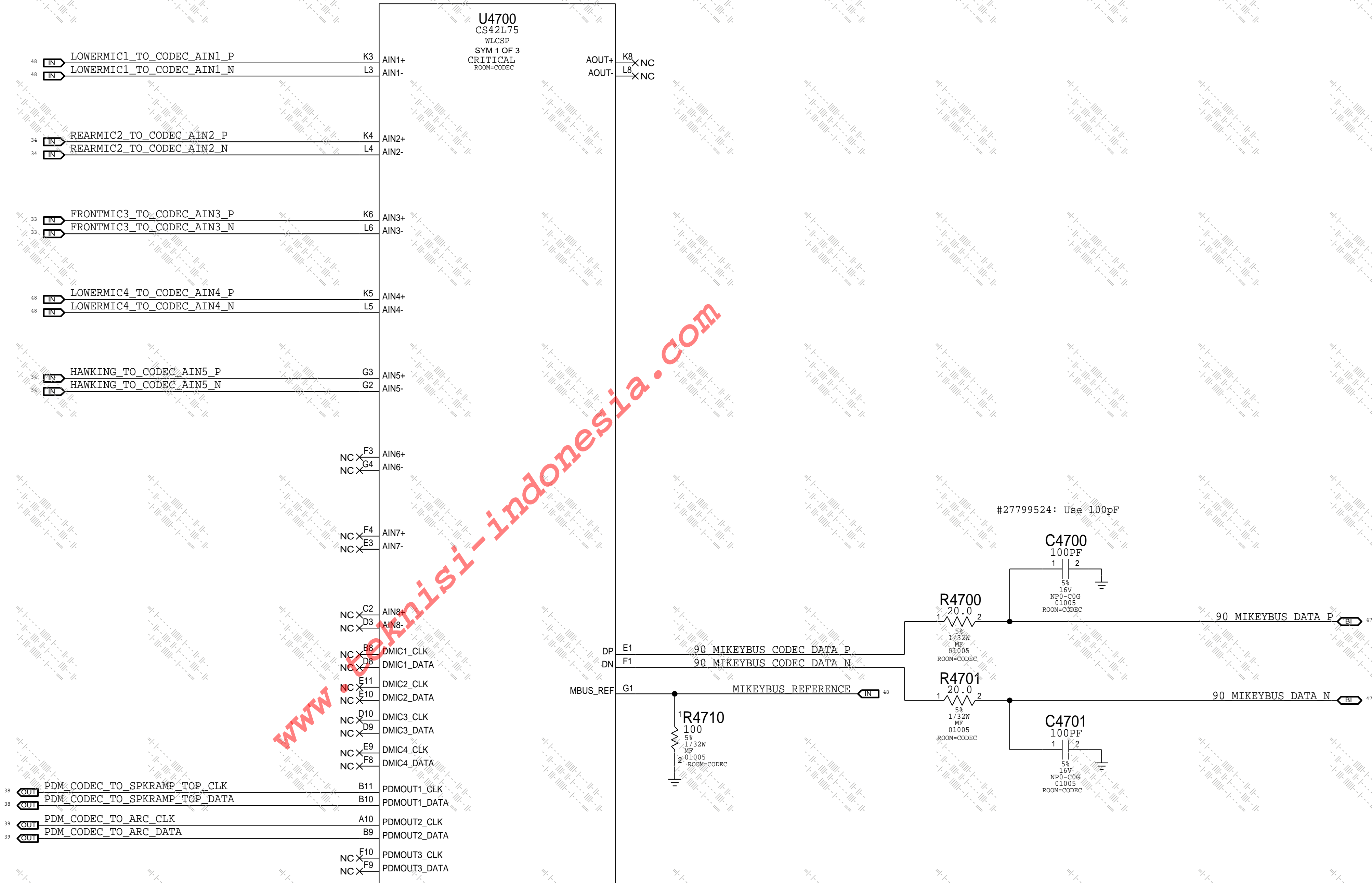


PAGE TITLE		
CAMERA: FCAM + FOREHEAD		
 Apple Inc.	DRAWING NUMBER	051-02159
	REVISION	10.0.0
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE I NOT TO REPRODUCE OR COPY IT I NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART I ALL RIGHTS RESERVED	BRANCH	
	PAGE	42 OF 80
	SHEET	33 OF 81

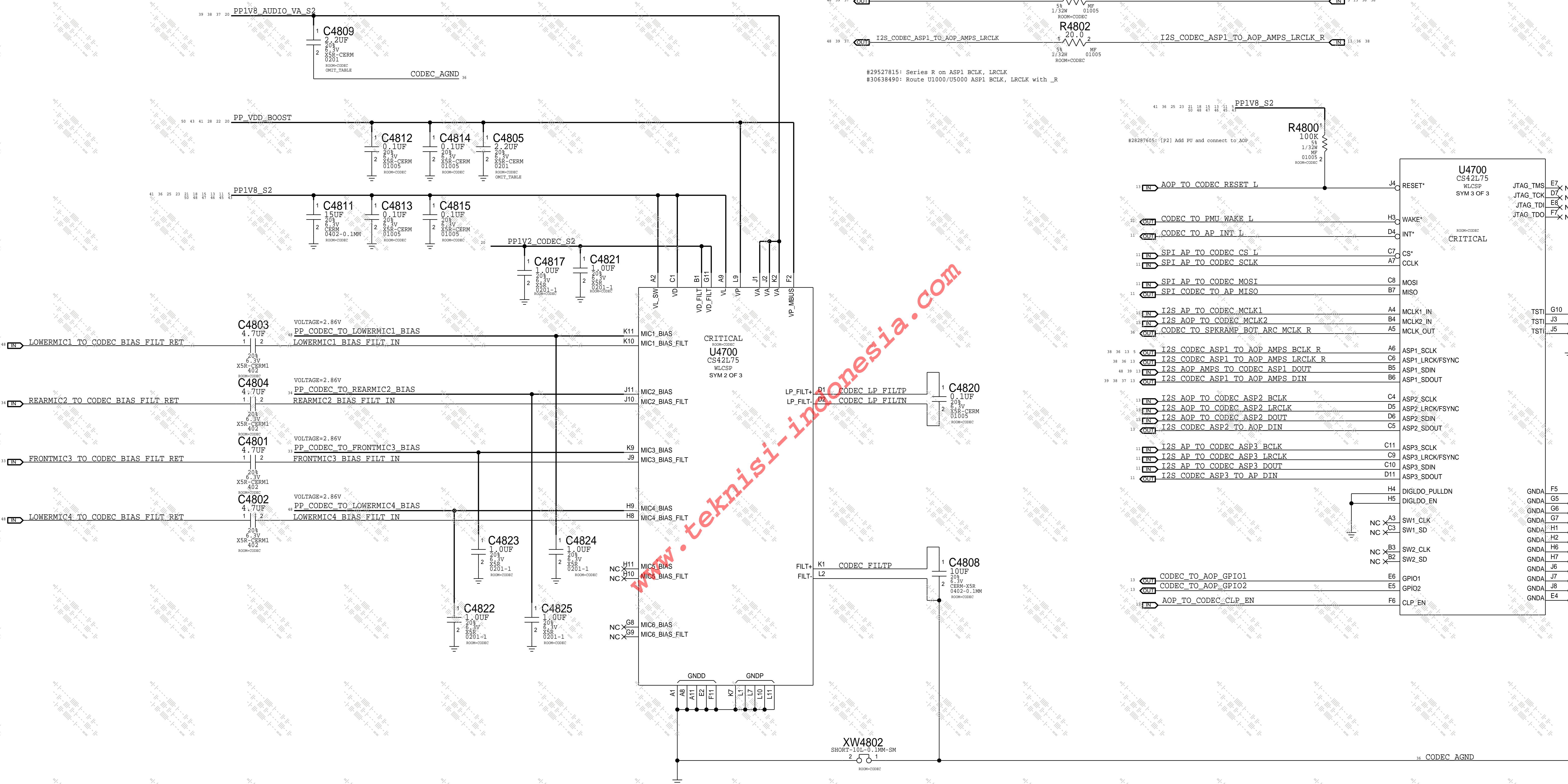



PAGE TITLE		
CAMERA: B2B Strobe + Buttons		
 Apple Inc.	DRAWING NUMBER	051-02159
	REVISION	10.0.0
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE I NOT TO REPRODUCE OR COPY IT I NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED	BRANCH	
	PAGE	43 OF 80
	SHEET	34 OF 81

CALLAN AUDIO CODEC (ANALOG INPUTS & OUTPUTS)

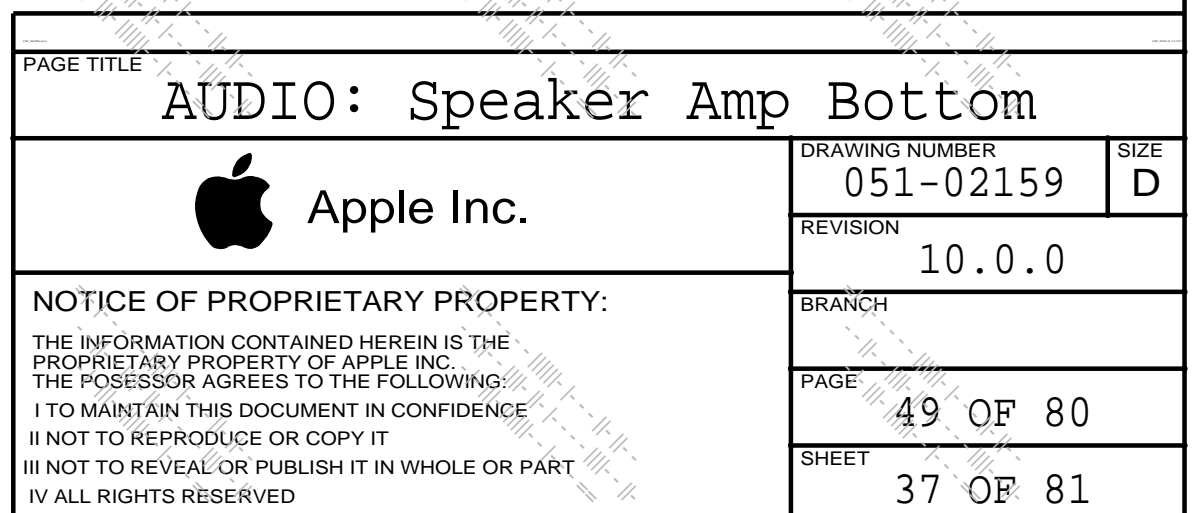


CALLAN AUDIO CODEC (POWER & I/O)



PAGE TITLE		AUDIO: CODEC (2/2)	
 Apple Inc.	DRAWING NUMBER		SIZ
	051-02159		D
	REVISION		
		10.0.0	
NOTICE OF PROPRIETARY PROPERTY:		BRANCH	
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		PAGE	
		48 OF 80	
		SHEET	
		36 OF 81	

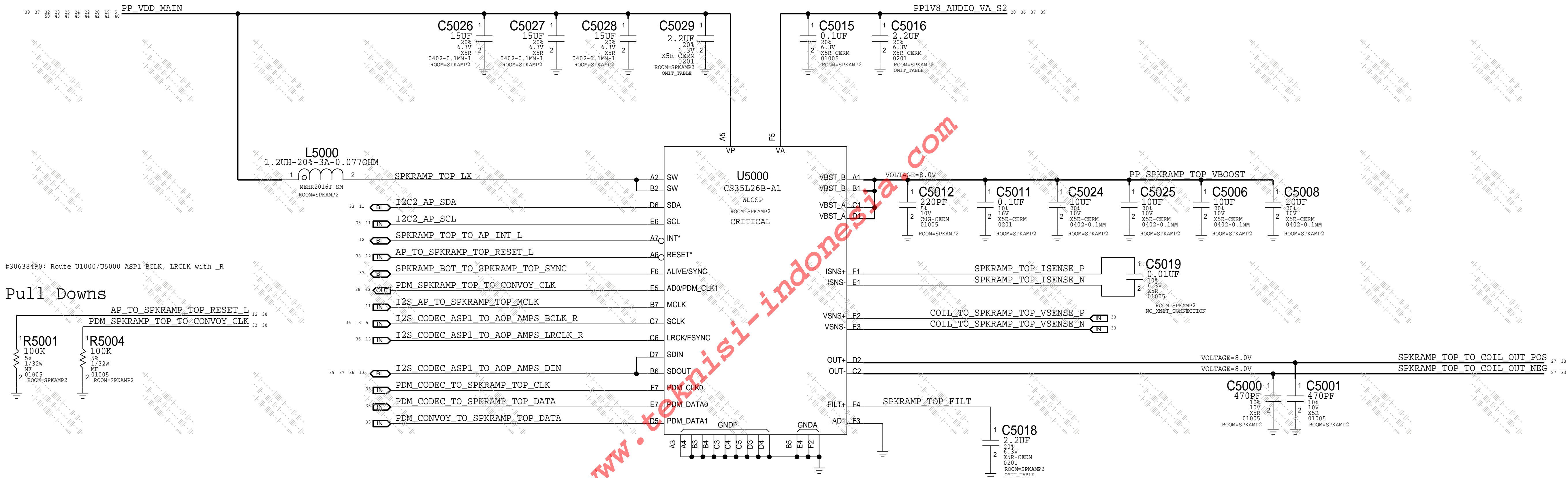
APN: 338S00143
I2C ADDRESS: 1000 000x
0x80




North Speaker Amplifier

APN: 338S00295

I2C ADDRESS: 1000 000x (0x80)

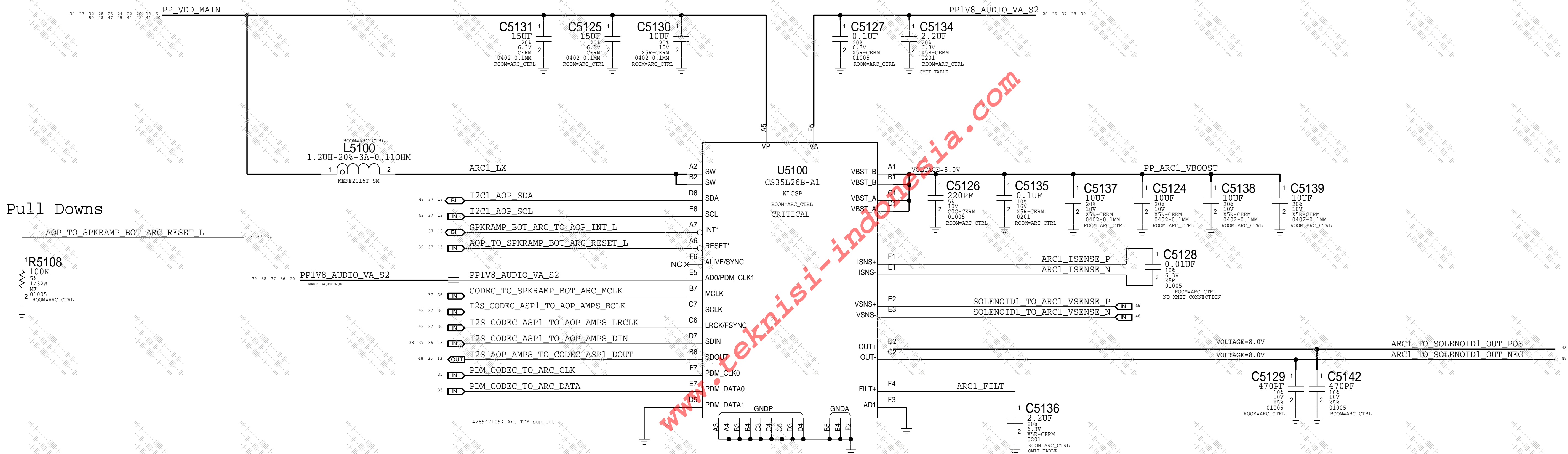



PAGE TITLE		
AUDIO: Speaker Amp Top		
 Apple Inc.	DRAWING NUMBER	051-02159
	REVISION	10.0.0
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED	BRANCH	
	PAGE	50 OF 80
	SHEET	38 OF 81

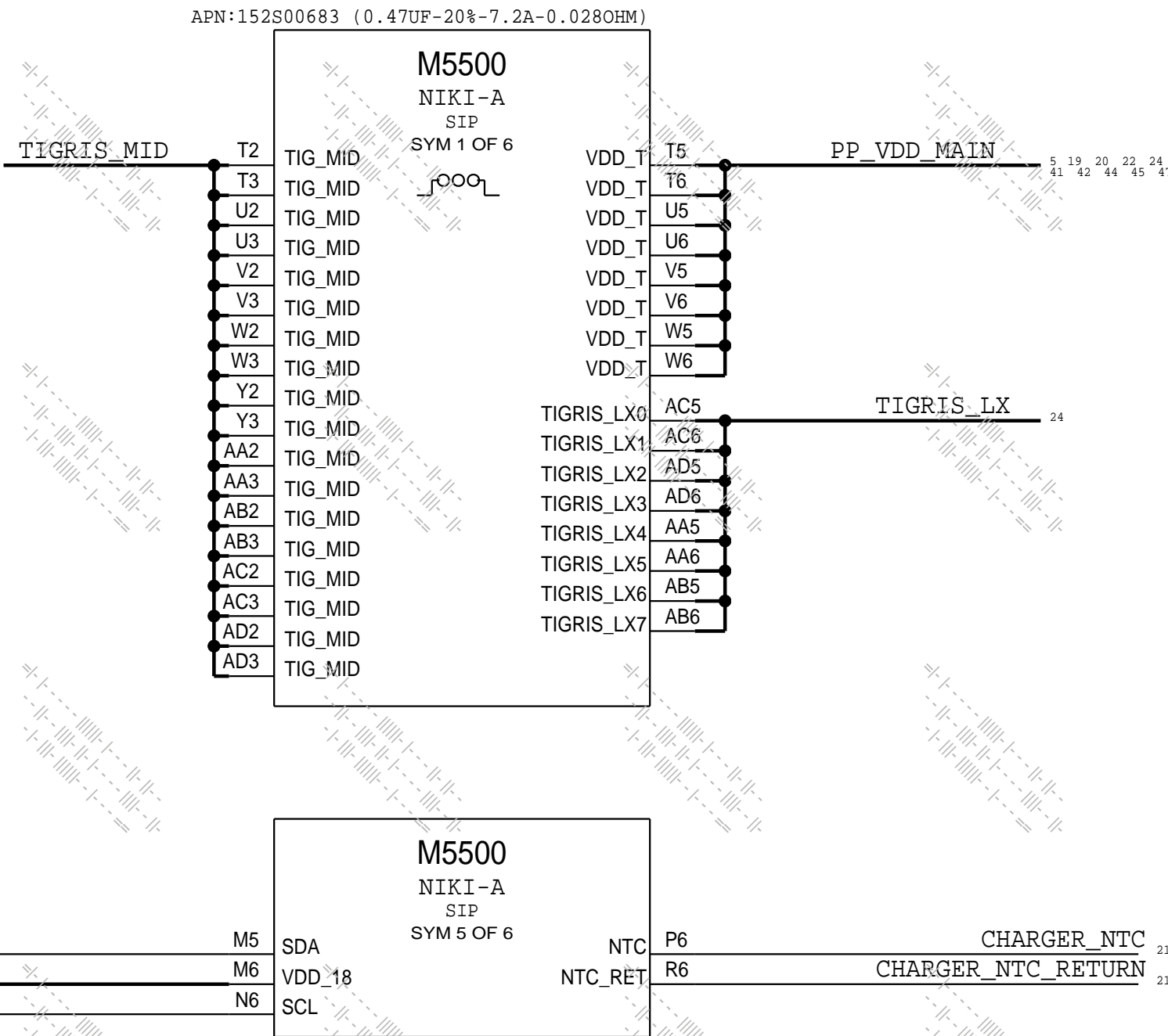
ARC DRIVER

APN: 338S00295

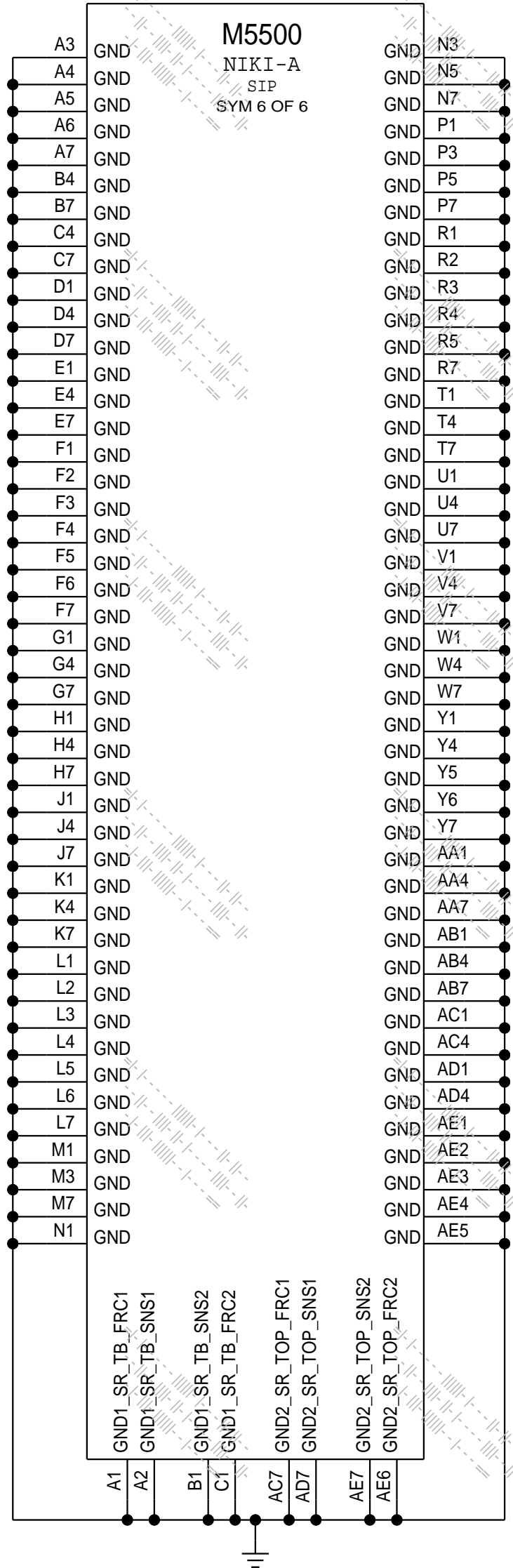
I2C ADDRESS: 1000 001x (0x82)



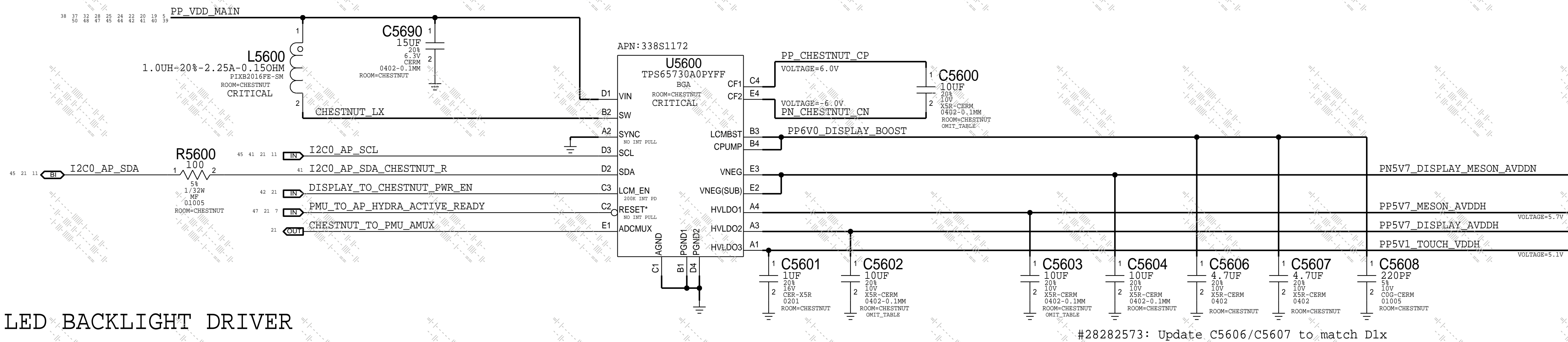
PAGE TITLE		
ARC: Driver		
 Apple Inc.	DRAWING NUMBER	051-02159
	REVISION	10.0.0
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED	BRANCH	
	PAGE	51 OF 80
	SHEET	39 OF 81



Note: inductors in SIP used for bottom speaker amplifier and backlight
See pages 49, and 56

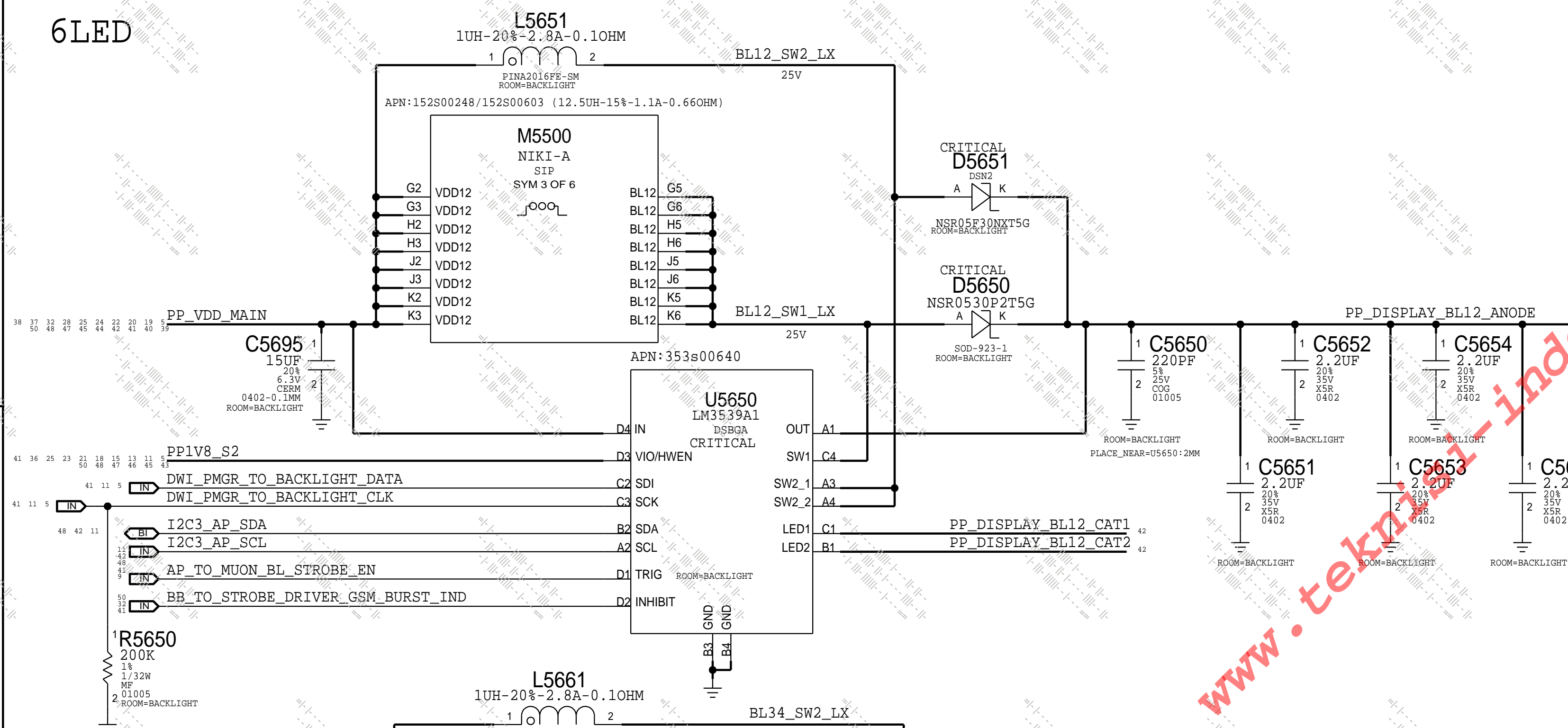


CHESTNUT DISPLAY PMU

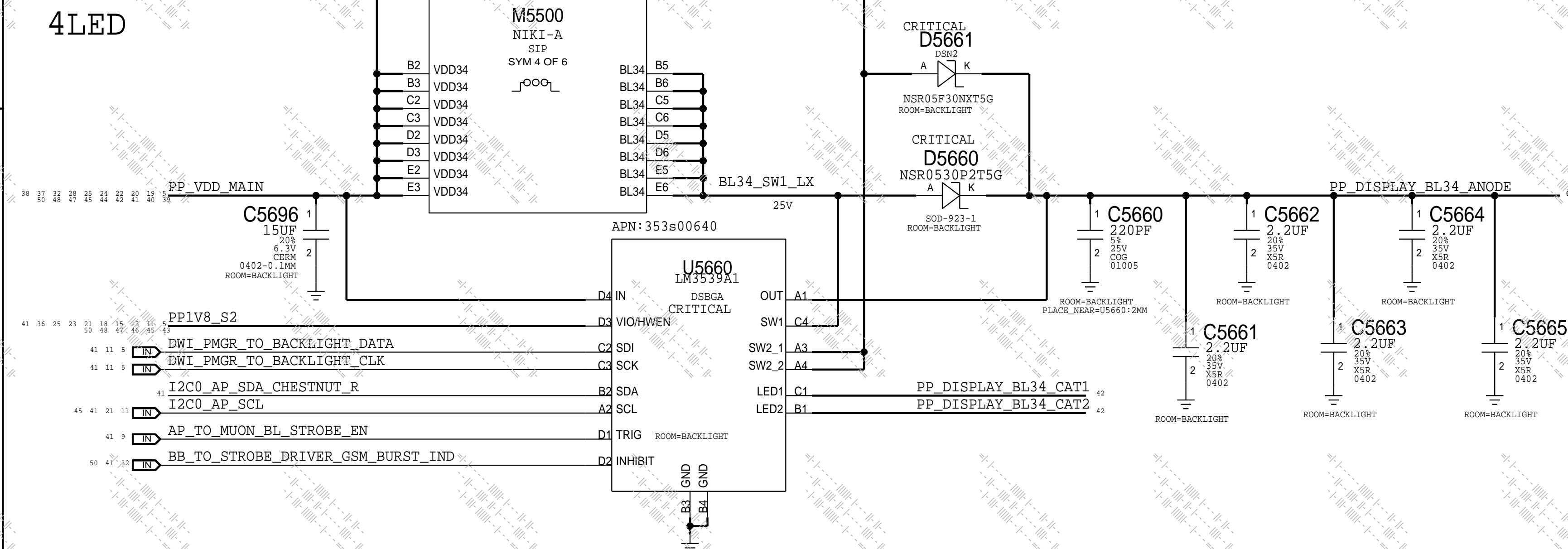


LED BACKLIGHT DRIVER

6LED

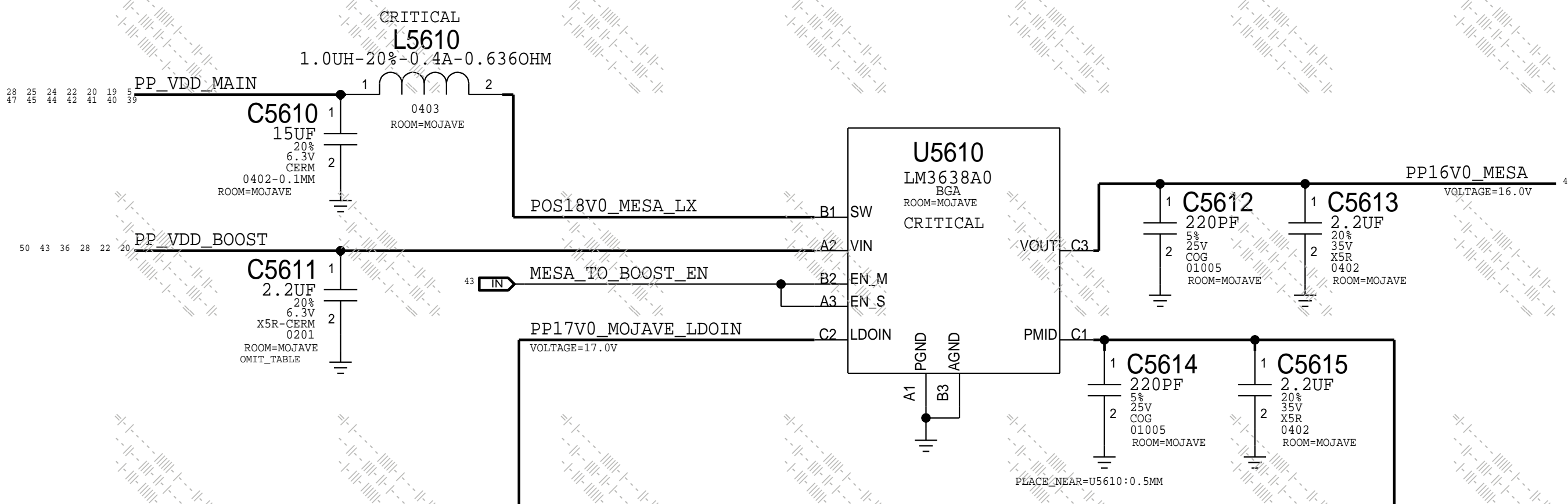



4LED

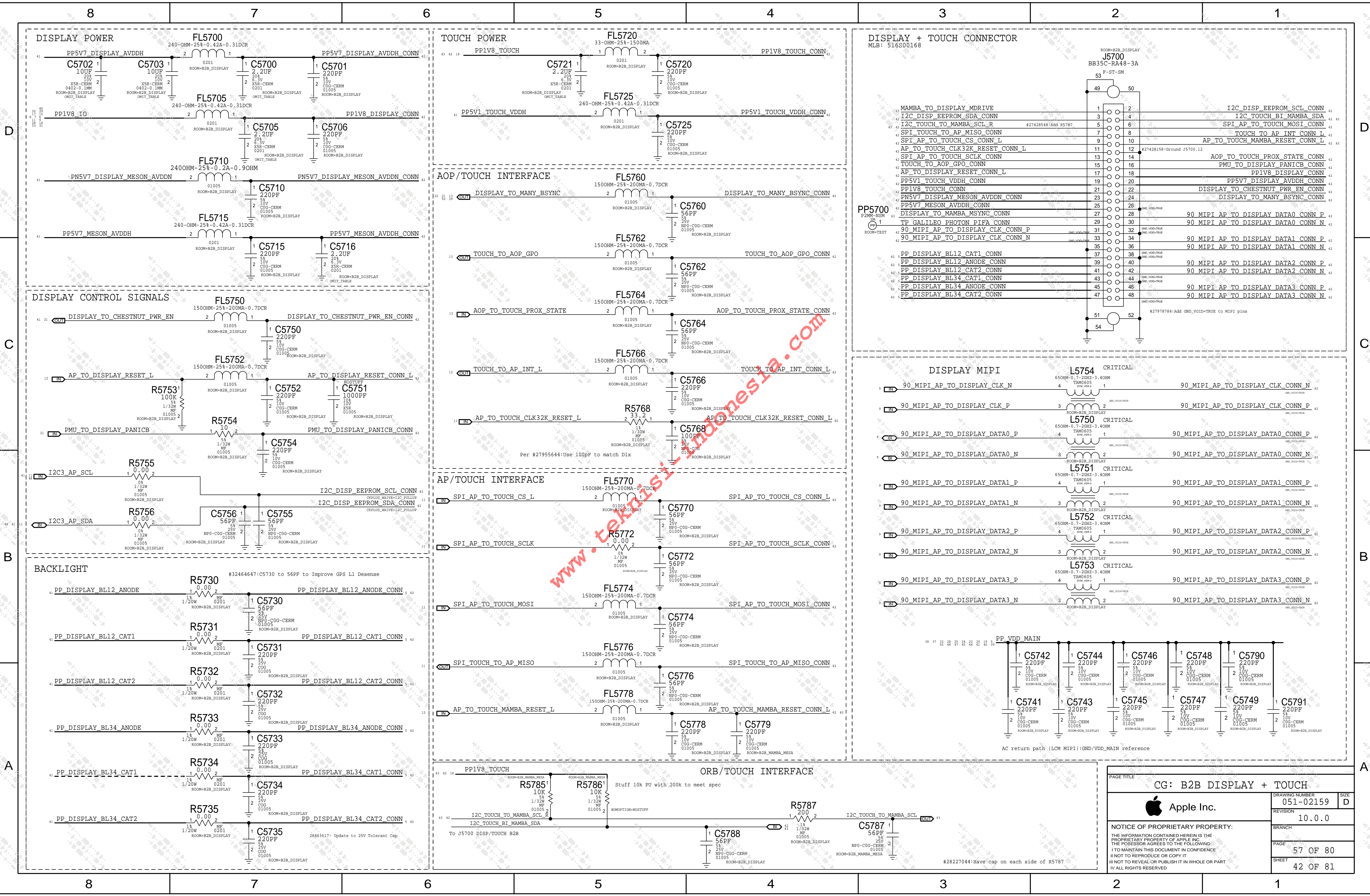


MOJAVE MESA BOOST

APN:353S00671



PAGE TITLE			
CG: PMUs			
 Apple Inc.	DRAWING NUMBER	051-02159	SIZE
	REVISION	10.0.0	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 I NOT TO REPRODUCE OR COPY IT I NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED			
BRANCH		PAGE	
		56 OF 80	
SHEET		41 OF 81	



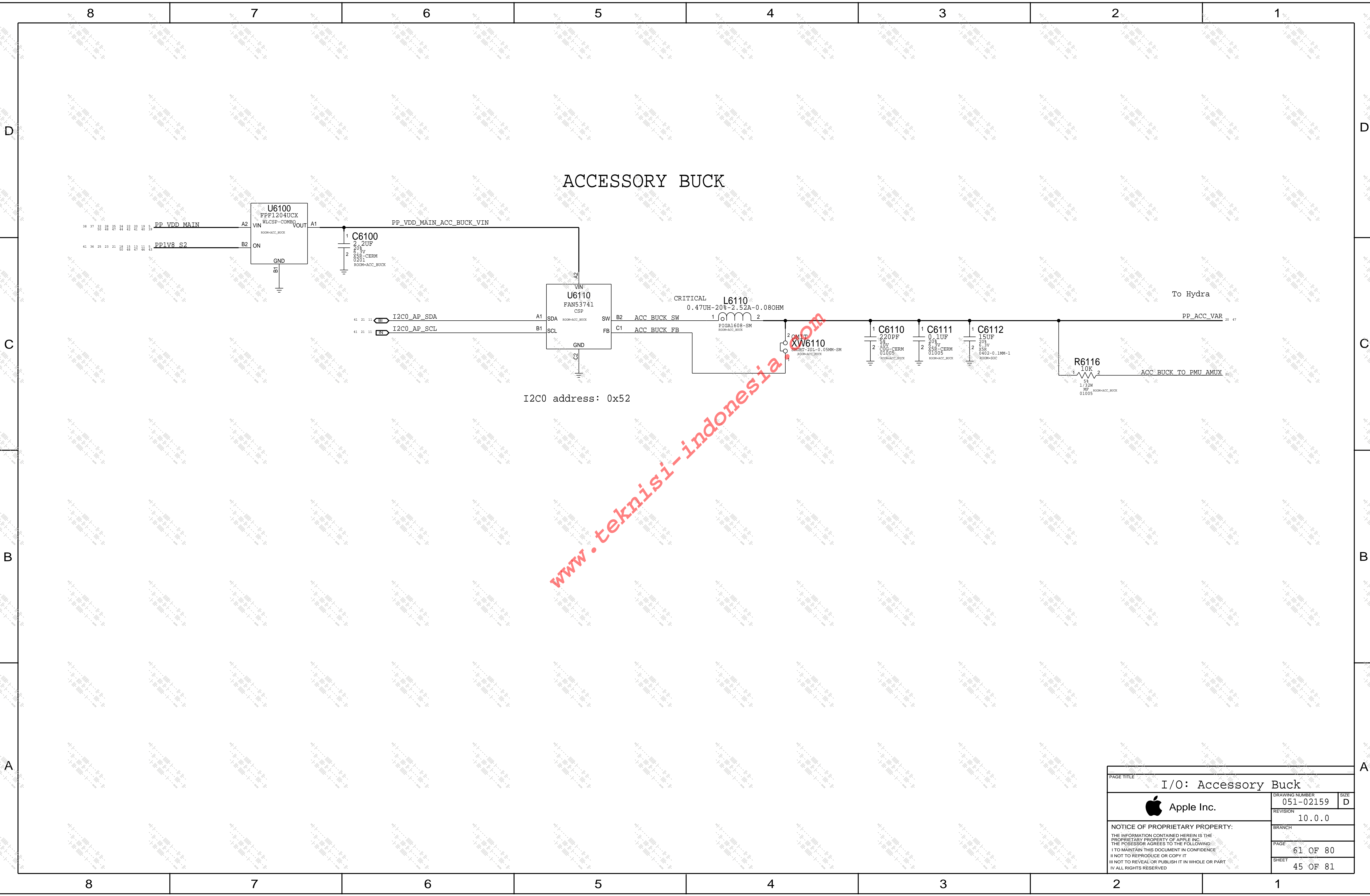
D

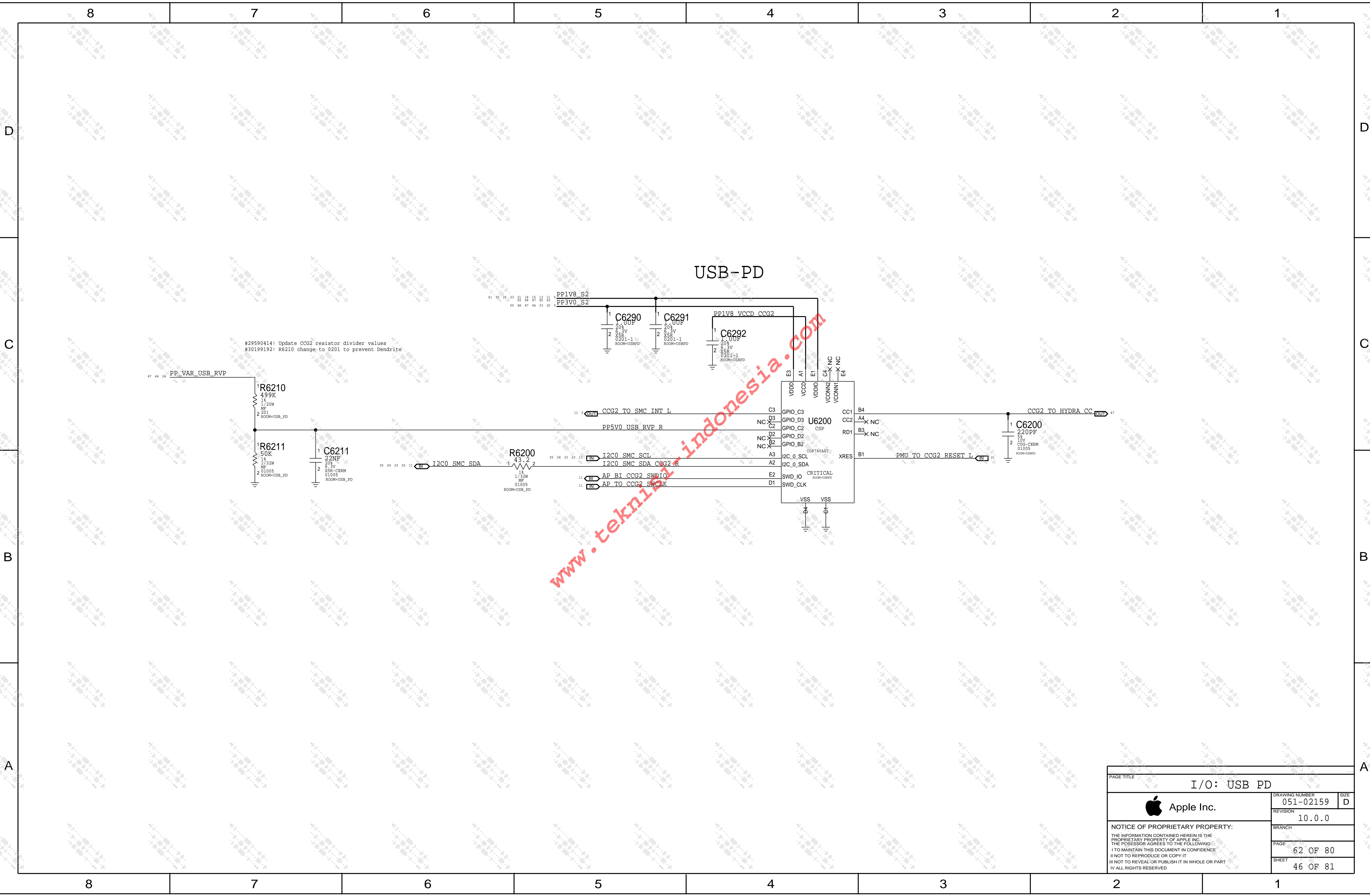


B

A

A






I2C MAP

(see #28857723 updates)

Diags ID	Bus	Device	7-Bit Address	8-Bit Address	Device Max Speed	Operating Speed	Net Name
0	AP I2C0	Agnes (System PMU)	0x74	0xE8	400 Kbps	400 Kbps	I2C0_AP
		Chestnut (Display PMU)	0x27	0x4E	400 Kbps		
		AccessoryBuck	0x52	0xA4	400 Kbps		
		Muon (Backlight Controller 2)	0x62	0xC4	1 Mbps		
1	AP I2C1	MIC1 Temp Sensor (South)	0x54	0xA8	1 Mbps	100 Kbps	I2C1_AP
		MIC2 Temp Sensor (North Rear)	0x56	0xAC	1 Mbps		
2	AP I2C2	Adare (Top Speaker Amp)	0x40	0x80	1 Mbps	1 Mbps	I2C2_AP
		Convoy (Top Speaker Cap Sense)	0x21	0x42	1 Mbps		
3	AP I2C3	EEPROM	0x51	0xA2	400 Kbps	400 Kbps	I2C3_AP
		Muon (Backlight Controller 1)	0x62	0xC4	400 Kbps		
		Sakonnet (Arc: Hall Effect Sensor)	0x08	0x10	1 Mbps		
		EEPROM	0x50	0xA0	400 Kbps		
	ISP I2C0	Casper (Rear Wide Camera)	0x10	0x20	1 Mbps	1 Mbps	I2C0_ISP
		Grunberg+ (AF/OIS Wide Camera)	0x3C	0x78	1 Mbps		
	ISP I2C1	Billings (Rear Tele Camera)	0x20	0x40	1 Mbps	1 Mbps	I2C1_ISP
		Edwin (AF Tele Camera)	0x0D	0x1A	1 Mbps		
	ISP I2C2	Concord (Front Camera)	0x10	0x20	1 Mbps	400 Kbps	I2C2_ISP
	ISP I2C3	Neon (Strobe - CW : LM3566)	0x63	0xC6	1 Mbps	400 Kbps	I2C3_ISP
		Ansel (Camera PMU)	0x40	0x80	1 Mbps		
		Neon (Strobe - AM : LM3566)	0x67	0xCE	1 Mbps		
	SEP I2C	EEPROM	0x51	0xA2	400 Kbps	400 Kbps	I2C4_AP
4	AOP I2C0	Doppler (Prox Sensor)	0x58	0xB0	1 Mbps	400 Kbps	I2C0_AOP
		CT709 (ALS : Flash)	0x29	0x52	400 Kbps		
5	AOP I2C1	Adare (Bottom Speaker Amp)	0x40	0x80	1 Mbps	1 Mbps	I2C1_AOP
		Adare (Arc: Driver)	0x41	0x82	1 Mbps		
		Apache3 (Mesa Power Supply)	0x61	0xC2	1 Mbps		I2C1_AOP_ISO
		Turtle	0x2C	0x58	1 Mbps		
6	SMC I2C0	Tigris2 (Charger)	0x71	0xE2	400 Kbps	400 Kbps	I2C0_SMC
		TPS61280 (VDD Boost)	0x75	0xEA	400 Kbps		
		CCG2 (USB PD)	0x12 (0x08)	0x24 (0x10)	1 Mbps		
		Iktara	0x39	0x72	400 Kbps		
		SN45546 (Gas Gauge)	0x55	0xAA	400 Kbps		
7	SMC I2C1	Hydra	0x1A	0x34	400 Kbps	400 Kbps	I2C1_SMC

SYSTEM: I2C MAP

 Apple Inc.

DRAWING NUMBER

051-02159

SIZE

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

65 OF 80

SHEET

49 OF 81

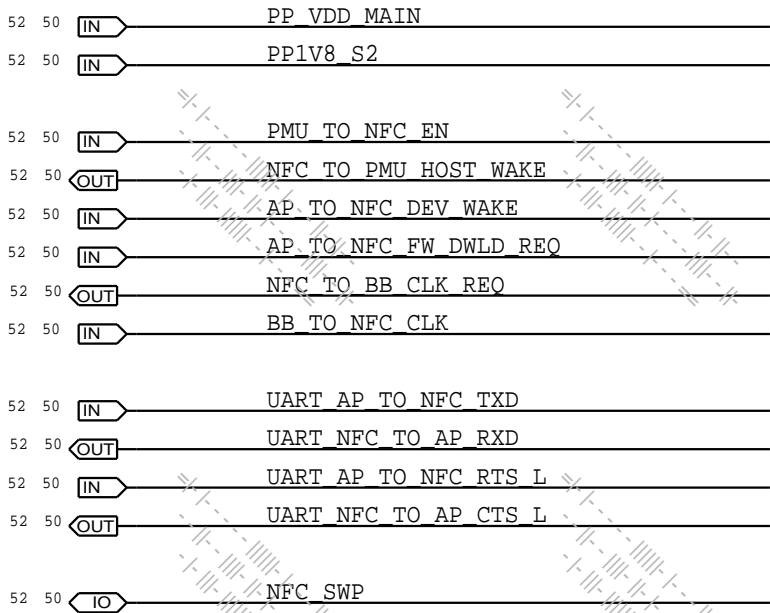
1. ALL RESISTANCE VALUES ARE IN OHMS, 0.1 WATT +/- 5%.
2. ALL CAPACITANCE VALUES ARE IN MICROFARADS.
3. ALL CRYSTALS & OSCILLATOR VALUES ARE IN HERTZ.

REV	ECN	DESCRIPTION OF REVISION	CK APPD	DATE
10	0008927012	ENGINEERING RELEASED		2017-06-06

NFC_MLB D20/D21

MAY 15, 2017

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
138S00159	3	CAP,SOFT TERM,2.2UF,6.3V,0201	C7500_S,C7502_S, C7505_S	CRITICAL	SOFT_CAP
138S0831	3	CAP,TYPICAL,2.2UF,6.3V,0201	C7500_S,C7502_S,C7505_S	CRITICAL	TYPICAL_CAP



PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
131S0882	1	390PF, 0201, 2%, 25V	C7514_S	D20_JPN
131S00026	1	820PF, 0201, 2%, 25V	C7515_S	D20_JPN
131S00033	1	680PF, 0201, 2%, 25V	C7516_S	D20_JPN
131S0883	1	220PF, 0201, 2%, 50V	C7518_S	D20_JPN
131S00025	1	1000PF, 0201, 2%, 25V	C7510_S	D20_JPN
131S00025	1	1000PF, 0201, 2%, 25V	C7513_S	D20_JPN
157S00022	1	TDK, BALUN, 11T	T7500_S	D20_JPN

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
131S00138	1	39PF, 0201, 2%, 50V	C7512_S	D20_ROW
131S00016	1	470PF, 0201, 2%, 25V	C7514_S	D20_ROW
131S00025	1	1000PF, 0201, 2%, 25V	C7515_S	D20_ROW
131S0825	1	680PF, 0201, 2%, 25V	C7516_S	D20_ROW
131S0883	1	220PF, 0201, 2%, 50V	C7518_S	D20_ROW
131S00025	1	820PF, 0201, 2%, 25V	C7510_S	D20_ROW
131S00026	1	820PF, 0201, 2%, 25V	C7513_S	D20_ROW
157S00022	1	TDK, BALUN, 11T	T7500_S	D20_ROW


PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
131S00138	1	39PF, 0201, 2%, 50V	C7512_S	D201
131S00016	1	470PF, 0201, 2%, 25V	C7514_S	D201
131S00025	1	1000PF, 0201, 2%, 25V	C7515_S	D201
131S0825	1	680PF, 0201, 2%, 25V	C7516_S	D201
131S0883	1	220PF, 0201, 2%, 50V	C7518_S	D201
131S00026	1	820PF, 0201, 2%, 25V	C7510_S	D201
131S00026	1	820PF, 0201, 2%, 25V	C7513_S	D201
157S00022	1	TDK, BALUN, 11T	T7500_S	D201

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
131S00138	1	39PF, 0201, 2%, 50V	C7512_S	D21_JPN
131S00081	1	270PF, 0201, 2%, 25V	C7514_S	D21_JPN
131S00025	1	1000PF, 0201, 2%, 25V	C7515_S	D21_JPN
131S00033	1	680PF, 0201, 2%, 25V	C7516_S	D21_JPN
131S00019	1	150PF, 0201, 2%, 50V	C7518_S	D21_JPN
131S00033	1	680PF, 0201, 2%, 25V	C7510_S	D21_JPN
131S00033	1	680PF, 0201, 2%, 25V	C7513_S	D21_JPN
157S00023	1	MURATA, BALUN, 11T	T7500_S	D21_JPN

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
131S00138	1	39PF, 0201, 2%, 50V	C7512_S	D21_ROW
131S00081	1	270PF, 0201, 2%, 25V	C7514_S	D21_ROW
131S00025	1	1000PF, 0201, 2%, 25V	C7515_S	D21_ROW
131S00033	1	680PF, 0201, 2%, 25V	C7516_S	D21_ROW
131S00019	1	150PF, 0201, 2%, 50V	C7518_S	D21_ROW
131S00033	1	680PF, 0201, 2%, 25V	C7510_S	D21_ROW
131S00033	1	680PF, 0201, 2%, 25V	C7513_S	D21_ROW
157S00023	1	MURATA, BALUN, 11T	T7500_S	D21_ROW

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
131S00138	1	39PF, 0201, 2%, 50V	C7512_S	D211
131S00081	1	270PF, 0201, 2%, 25V	C7514_S	D211
131S00025	1	1000PF, 0201, 2%, 25V	C7515_S	D211
131S00033	1	680PF, 0201, 2%, 25V	C7516_S	D211
131S00019	1	150PF, 0201, 2%, 50V	C7518_S	D211
131S00033	1	680PF, 0201, 2%, 25V	C7510_S	D211
131S00033	1	680PF, 0201, 2%, 25V	C7513_S	D211
157S00023	1	MURATA, BALUN, 11T	T7500_S	D211

page1

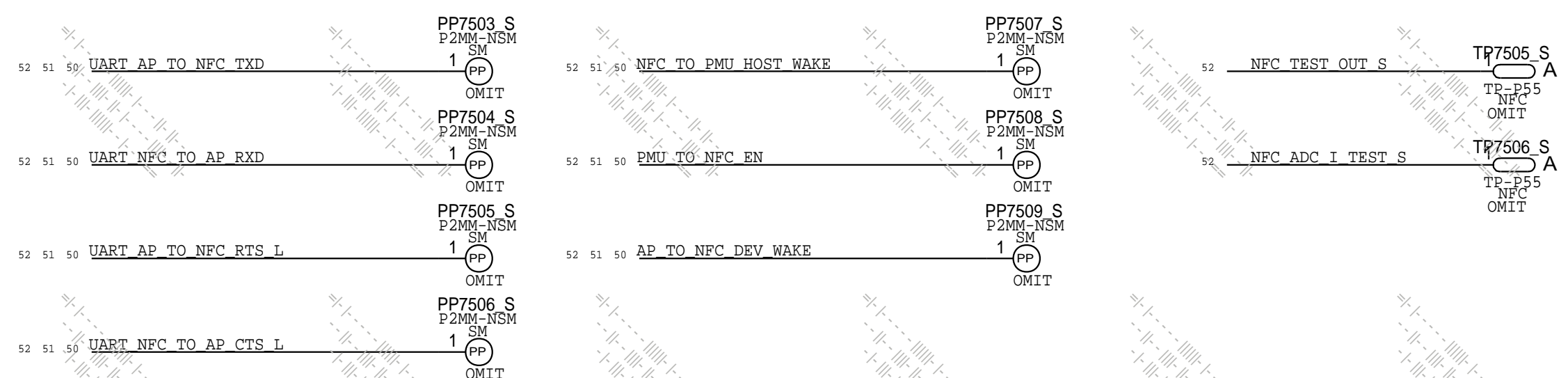
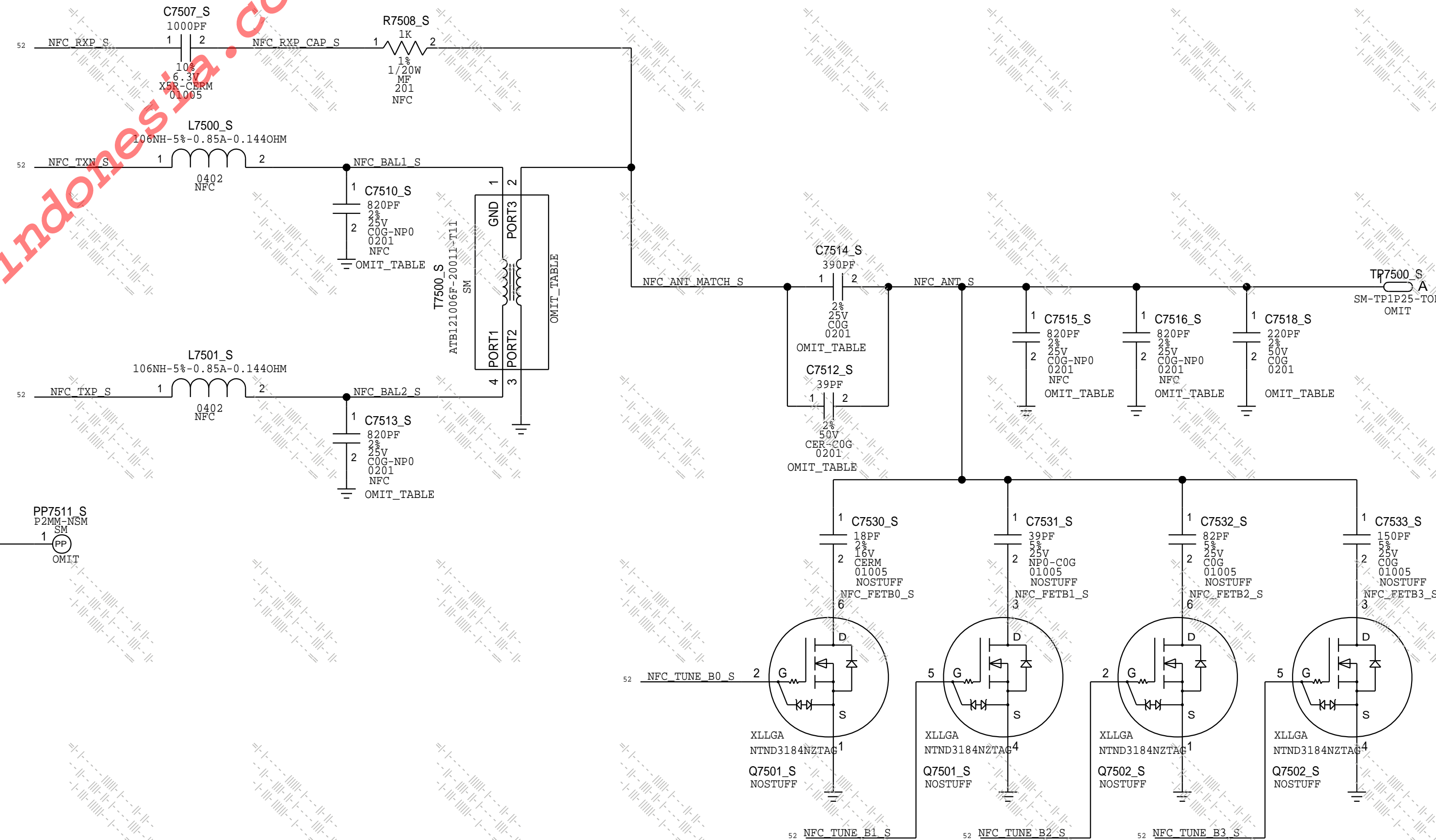
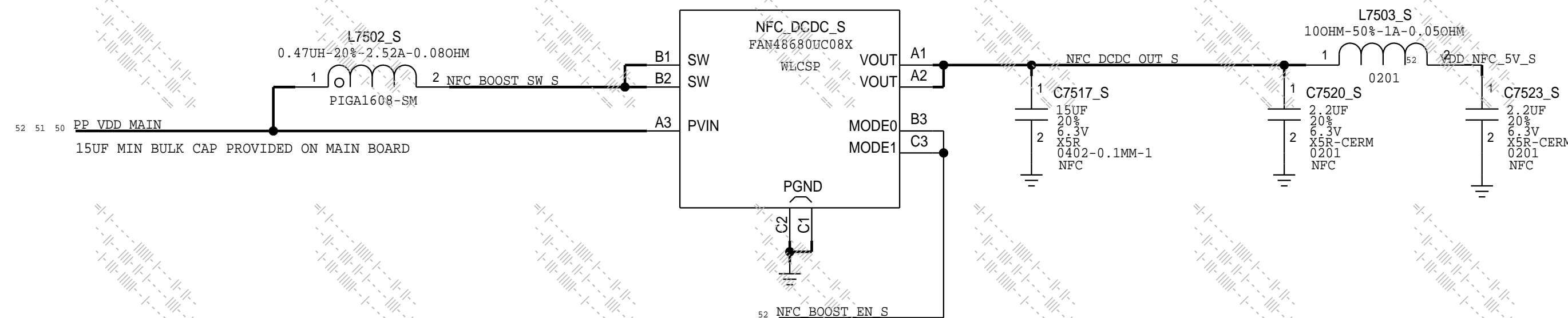
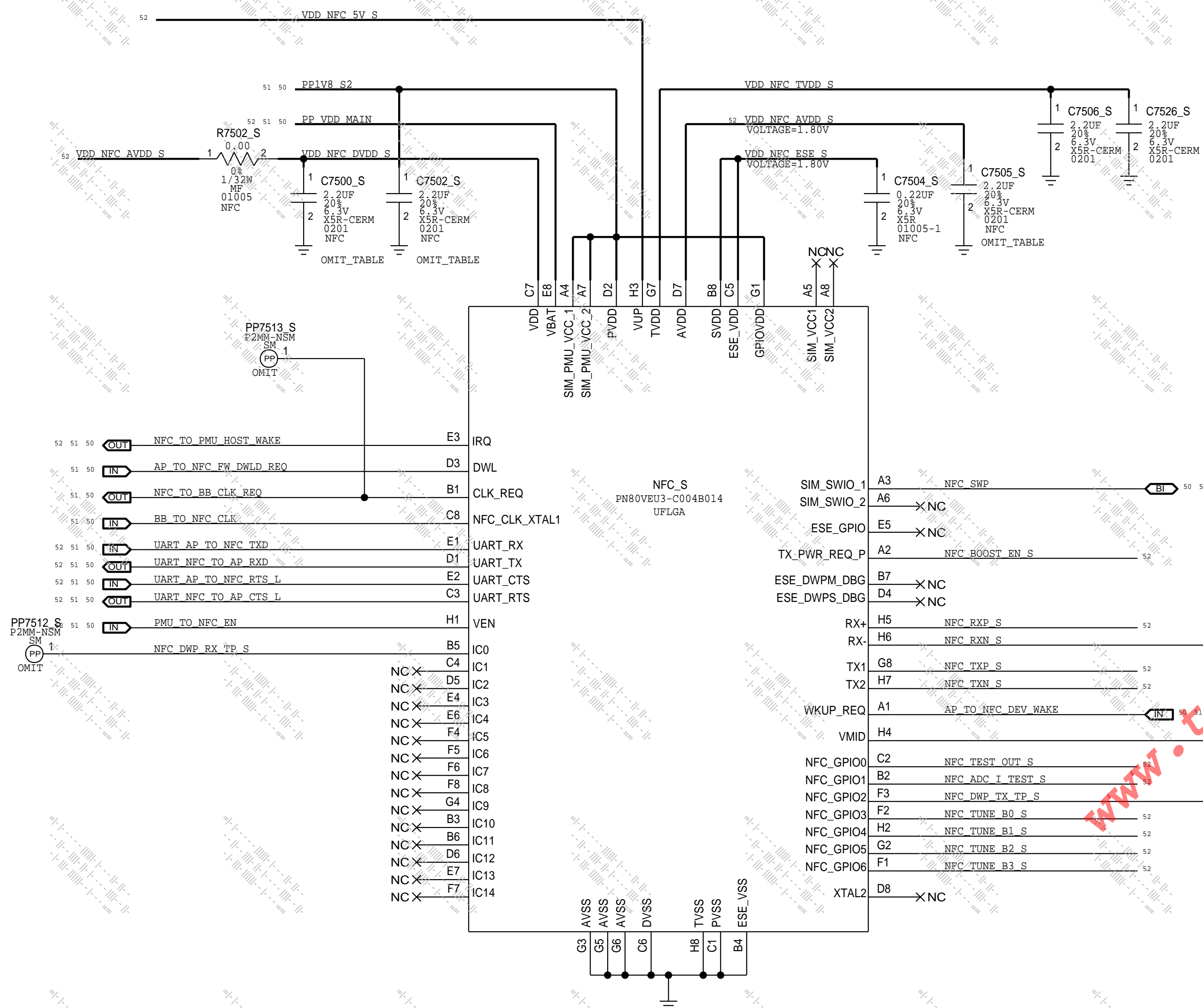
DRAWING TITLE			
SCH,MLB,D21			
 Apple Inc.	DRAWING NUMBER		SIZE
	051-02159		D
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED	REVISION		
	10.0.0		
	BRANCH		
	PAGE		
	1 OF 75		
	SHEET		
	51 OF 81		

STOCKHOLM


NFC CONTROLLER

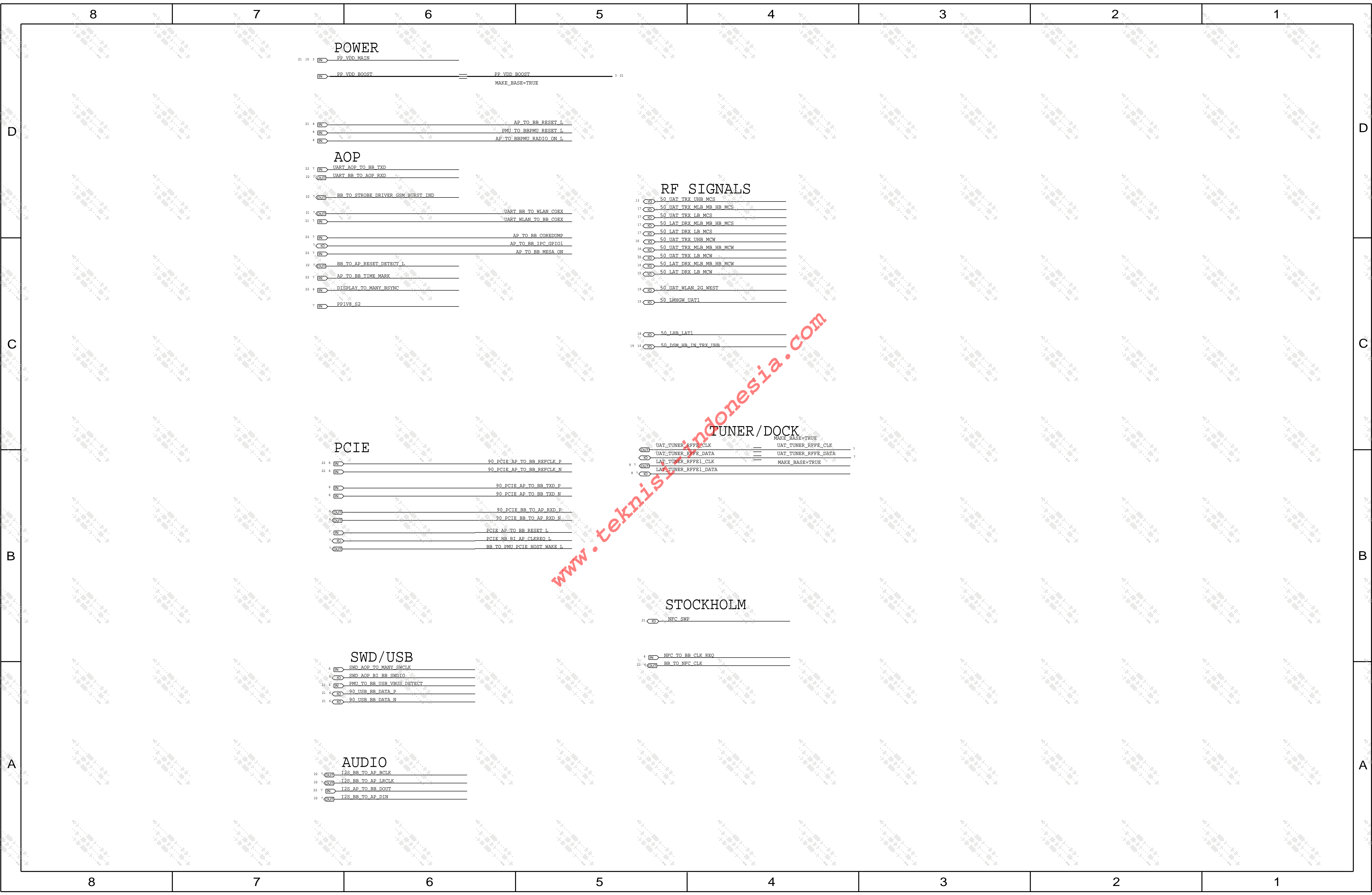
5V BOOSTER

NFC FRONT END



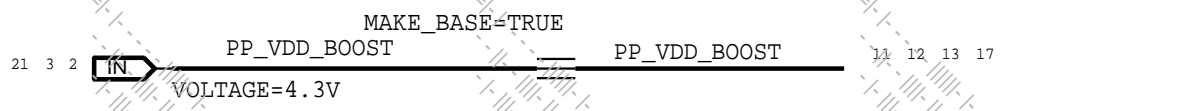
PAGE TITLE			NFC		
			DRAWING NUMBER		051-02159
			REVISION		10.0.0
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE I NOT TO REPRODUCE OR COPY IT I NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART I ALL RIGHTS RESERVED			BRANCH		
			PAGE		75 OF 75
			SHEET		52 OF 81

8		7		6		5		4		3		2		1																																																																																																																																													
CONFIDENTIAL AND PROPRIETARY APPLE SYSTEM DESIGN. FOR REFERENCE ONLY - NOT A CHANGE REQUEST												REV	ECN	DESCRIPTION OF REVISION	CK APPD DATE																																																																																																																																												
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.												10	0008927012	ENGINEERING RELEASED	2017-06-06																																																																																																																																												
<div>(MAV17.2/3)</div> <div>D21 RADIO_MLB</div> <div>06/06/2017</div> <div>0.122.0</div> <div>LAST_MODIFICATION=</div> <div>Tue Jun 6 18:57:01 2017</div> <table><thead><tr><th>PAGE</th><th>CSA</th><th>CONTENTS</th><th>SYNC</th><th>DATE</th></tr></thead><tbody><tr><td>53</td><td>1</td><td>FRONT PAGE</td><td></td><td></td></tr><tr><td>54</td><td>2</td><td>HIERARCHY</td><td></td><td></td></tr><tr><td>55</td><td>3</td><td>PMIC: BUCKS & LDOS</td><td></td><td></td></tr><tr><td>56</td><td>4</td><td>PMIC: CLOCKS & CONTROL</td><td></td><td></td></tr><tr><td>57</td><td>5</td><td>BB: POWER</td><td></td><td></td></tr><tr><td>58</td><td>6</td><td>BB: CONTROL & HS PERIPHERALS [6]</td><td></td><td></td></tr><tr><td>59</td><td>7</td><td>BB: GPIOS & QLINK</td><td></td><td></td></tr><tr><td>60</td><td>8</td><td>XCVR</td><td></td><td></td></tr><tr><td>61</td><td>9</td><td>XCVR</td><td></td><td></td></tr><tr><td>62</td><td>10</td><td>QPOET MODULE</td><td></td><td></td></tr><tr><td>63</td><td>11</td><td>LB PAD</td><td></td><td></td></tr><tr><td>64</td><td>12</td><td>HB PAD</td><td></td><td></td></tr><tr><td>65</td><td>13</td><td>UHB PAD</td><td></td><td></td></tr><tr><td>66</td><td>14</td><td>2G PA</td><td></td><td></td></tr><tr><td>67</td><td>15</td><td>LB DSM</td><td></td><td></td></tr><tr><td>68</td><td>16</td><td>HB DSM</td><td></td><td></td></tr><tr><td>69</td><td>17</td><td>COUPLER2</td><td></td><td></td></tr><tr><td>70</td><td>18</td><td>LOWER ANTENNA</td><td></td><td></td></tr><tr><td>71</td><td>19</td><td>UPPER ANTENNA</td><td></td><td></td></tr><tr><td>72</td><td>20</td><td>GNSS</td><td></td><td></td></tr><tr><td>73</td><td>21</td><td>SIM, DEBUG CONN</td><td></td><td></td></tr><tr><td>74</td><td>22</td><td>TEST POINTS</td><td>PROBE POINTS</td><td>07/18/2016</td></tr></tbody></table> <div>SCH # : 951-03059 PCB # : 920-02293 BOM # : 939-02493</div> <div>ALTERNATES<table><thead><tr><th>PART NUMBER</th><th>ALTERNATE FOR PART NUMBER</th><th>REFERENCE DESIGNATOR(S)</th><th>DESCRIPTION</th><th>BOM OPTION</th></tr></thead><tbody><tr><td>335S00013</td><td>335S0894</td><td>U_EEPROM_E</td><td>IC, EEPROM</td><td>BOM_TABLE_ALTS</td></tr><tr><td>197S00093</td><td>197S00065</td><td>Y401_E</td><td>XTAL, 38P4MHZ</td><td>BOM_TABLE_ALTS</td></tr><tr><td>197S00067</td><td>197S00065</td><td>Y401_E</td><td>XTAL, 38P4MHZ</td><td>BOM_TABLE_ALTS</td></tr><tr><td>353S01287</td><td>353S01109</td><td>U_QET_E</td><td>ET MODULE, QPOET</td><td>BOM_TABLE_ALTS</td></tr></tbody></table><div>FRONT PAGE</div><div><div>DRAWING TITLE</div><div>SCH,MLB,D21</div><div><div> Apple Inc.</div><div><div>DRAWING NUMBER</div><div>051-02159</div><div>SIZE</div><div>D</div></div><div><div>REVISION</div><div>10.0.0</div></div><div><div>BRANCH</div></div><div><div>PAGE</div><div>1 OF 22</div></div><div><div>SHEET</div><div>53 OF 81</div></div></div><div>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</div></div></div>																PAGE	CSA	CONTENTS	SYNC	DATE	53	1	FRONT PAGE			54	2	HIERARCHY			55	3	PMIC: BUCKS & LDOS			56	4	PMIC: CLOCKS & CONTROL			57	5	BB: POWER			58	6	BB: CONTROL & HS PERIPHERALS [6]			59	7	BB: GPIOS & QLINK			60	8	XCVR			61	9	XCVR			62	10	QPOET MODULE			63	11	LB PAD			64	12	HB PAD			65	13	UHB PAD			66	14	2G PA			67	15	LB DSM			68	16	HB DSM			69	17	COUPLER2			70	18	LOWER ANTENNA			71	19	UPPER ANTENNA			72	20	GNSS			73	21	SIM, DEBUG CONN			74	22	TEST POINTS	PROBE POINTS	07/18/2016	PART NUMBER	ALTERNATE FOR PART NUMBER	REFERENCE DESIGNATOR(S)	DESCRIPTION	BOM OPTION	335S00013	335S0894	U_EEPROM_E	IC, EEPROM	BOM_TABLE_ALTS	197S00093	197S00065	Y401_E	XTAL, 38P4MHZ	BOM_TABLE_ALTS	197S00067	197S00065	Y401_E	XTAL, 38P4MHZ	BOM_TABLE_ALTS	353S01287	353S01109	U_QET_E	ET MODULE, QPOET	BOM_TABLE_ALTS
PAGE	CSA	CONTENTS	SYNC	DATE																																																																																																																																																							
53	1	FRONT PAGE																																																																																																																																																									
54	2	HIERARCHY																																																																																																																																																									
55	3	PMIC: BUCKS & LDOS																																																																																																																																																									
56	4	PMIC: CLOCKS & CONTROL																																																																																																																																																									
57	5	BB: POWER																																																																																																																																																									
58	6	BB: CONTROL & HS PERIPHERALS [6]																																																																																																																																																									
59	7	BB: GPIOS & QLINK																																																																																																																																																									
60	8	XCVR																																																																																																																																																									
61	9	XCVR																																																																																																																																																									
62	10	QPOET MODULE																																																																																																																																																									
63	11	LB PAD																																																																																																																																																									
64	12	HB PAD																																																																																																																																																									
65	13	UHB PAD																																																																																																																																																									
66	14	2G PA																																																																																																																																																									
67	15	LB DSM																																																																																																																																																									
68	16	HB DSM																																																																																																																																																									
69	17	COUPLER2																																																																																																																																																									
70	18	LOWER ANTENNA																																																																																																																																																									
71	19	UPPER ANTENNA																																																																																																																																																									
72	20	GNSS																																																																																																																																																									
73	21	SIM, DEBUG CONN																																																																																																																																																									
74	22	TEST POINTS	PROBE POINTS	07/18/2016																																																																																																																																																							
PART NUMBER	ALTERNATE FOR PART NUMBER	REFERENCE DESIGNATOR(S)	DESCRIPTION	BOM OPTION																																																																																																																																																							
335S00013	335S0894	U_EEPROM_E	IC, EEPROM	BOM_TABLE_ALTS																																																																																																																																																							
197S00093	197S00065	Y401_E	XTAL, 38P4MHZ	BOM_TABLE_ALTS																																																																																																																																																							
197S00067	197S00065	Y401_E	XTAL, 38P4MHZ	BOM_TABLE_ALTS																																																																																																																																																							
353S01287	353S01109	U_QET_E	ET MODULE, QPOET	BOM_TABLE_ALTS																																																																																																																																																							

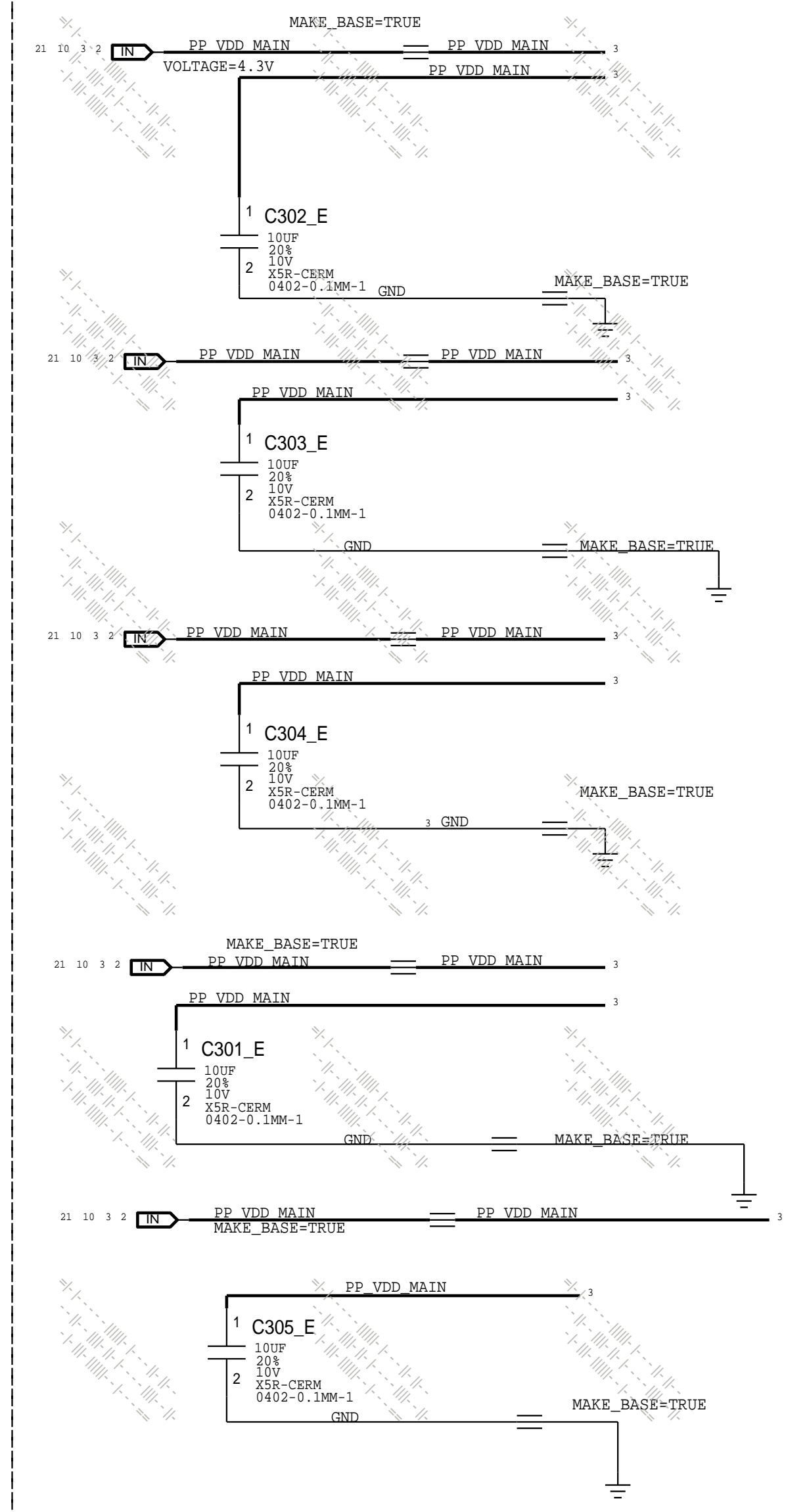


D

D



SWITCHERS BULK CAPS



C

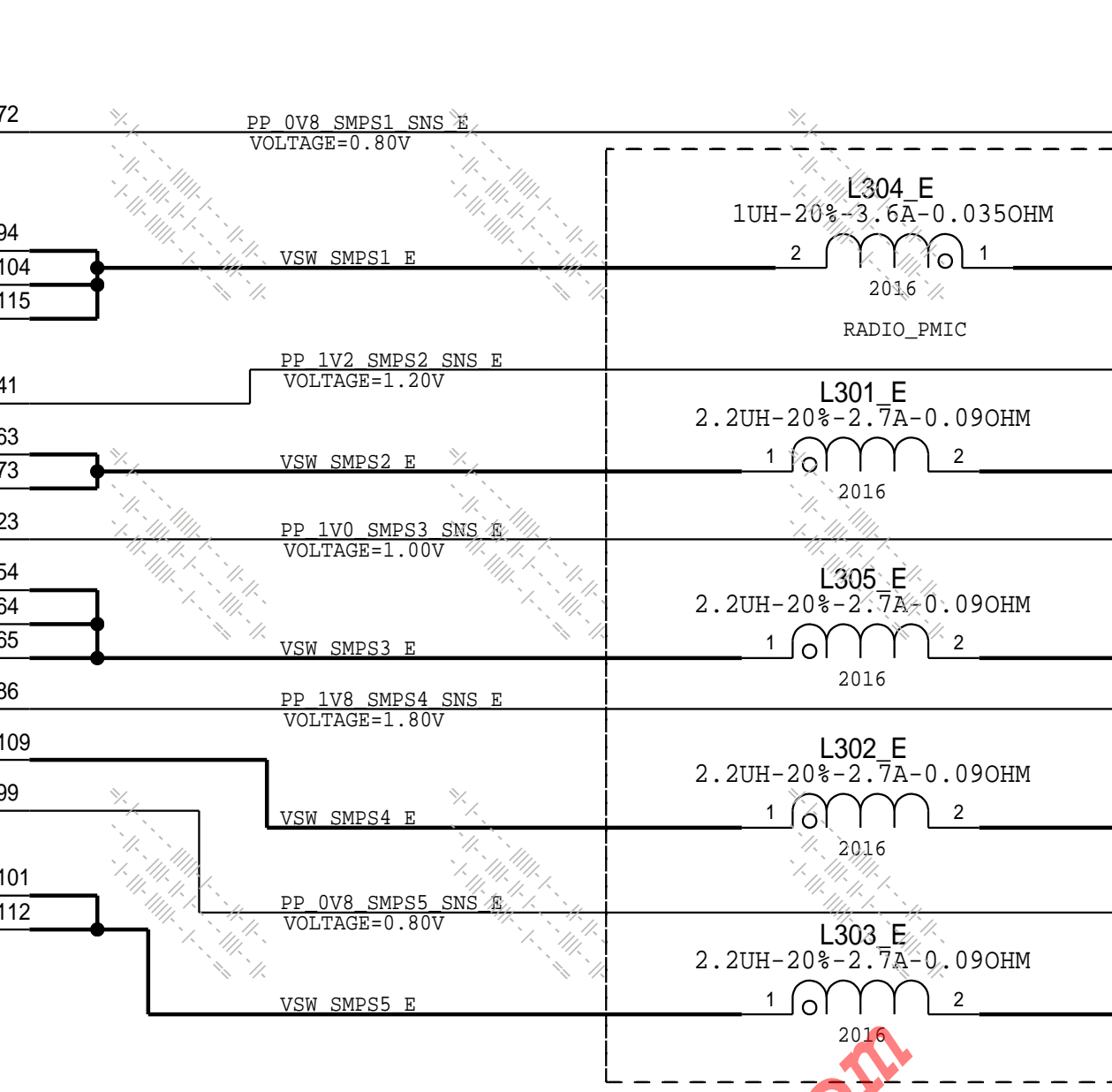
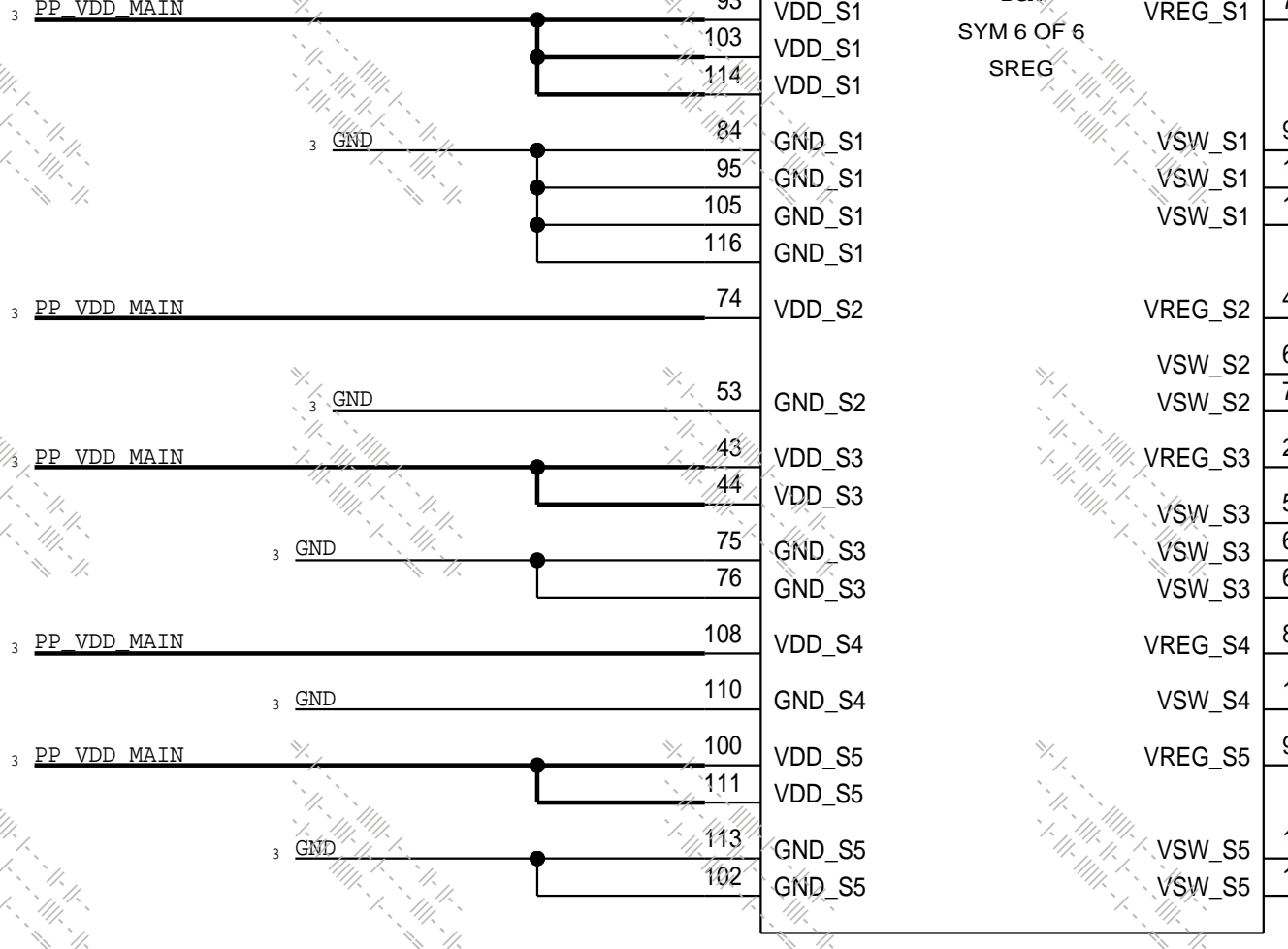
C

B

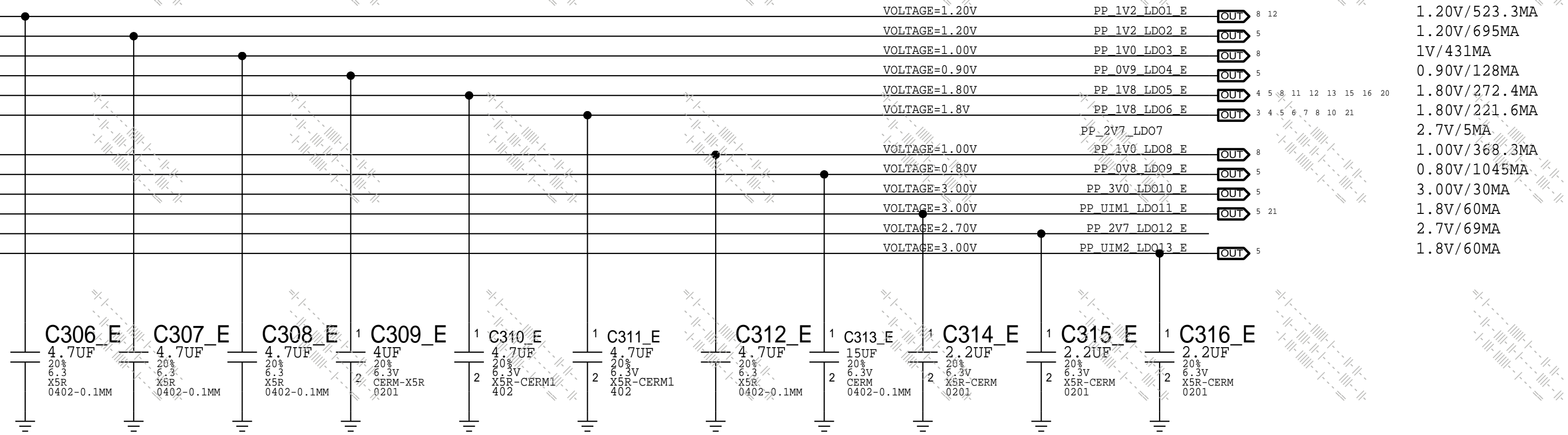
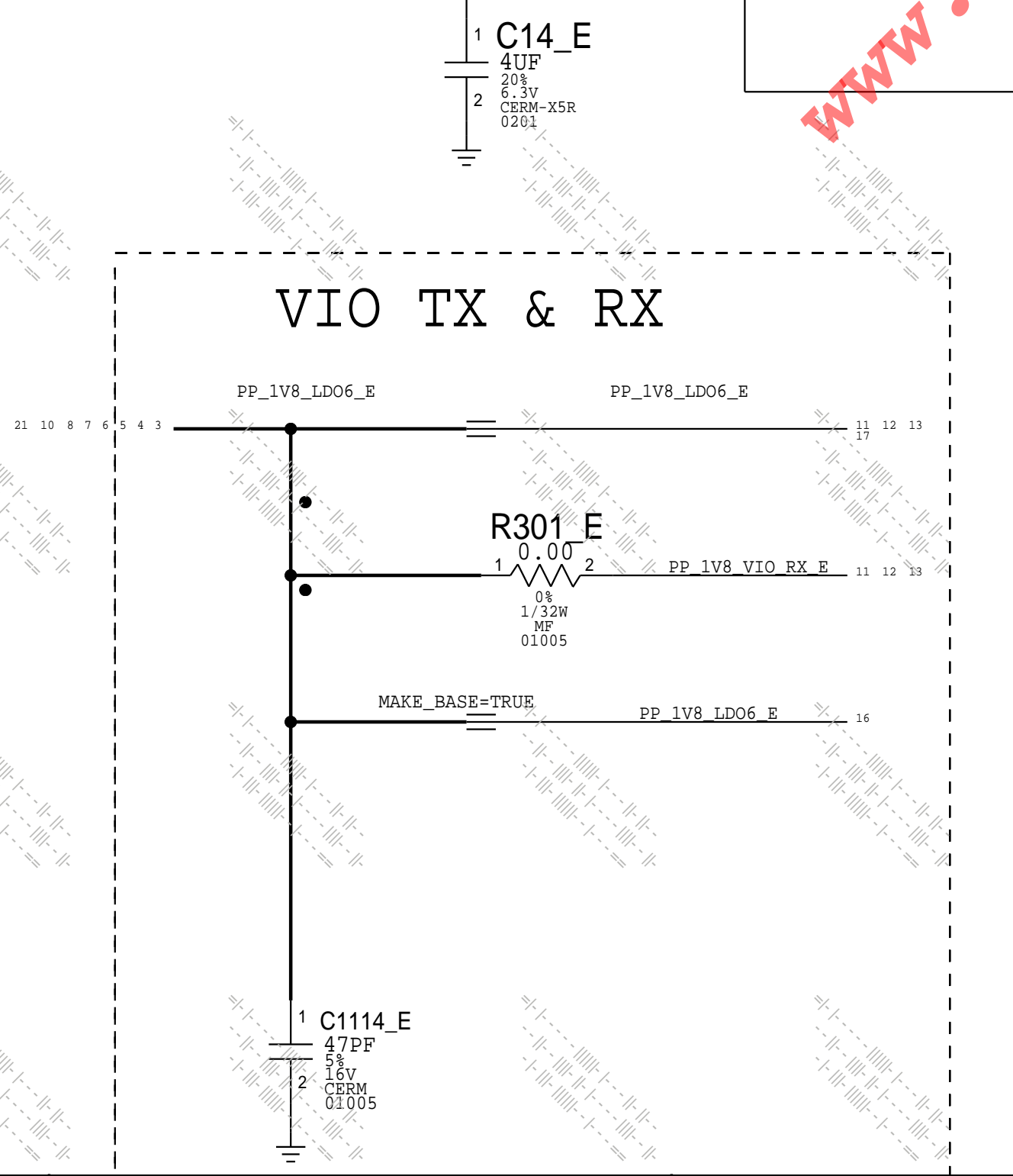
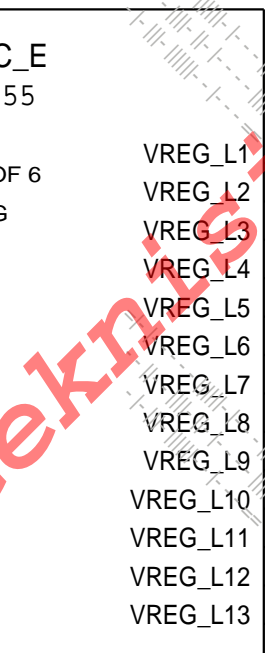
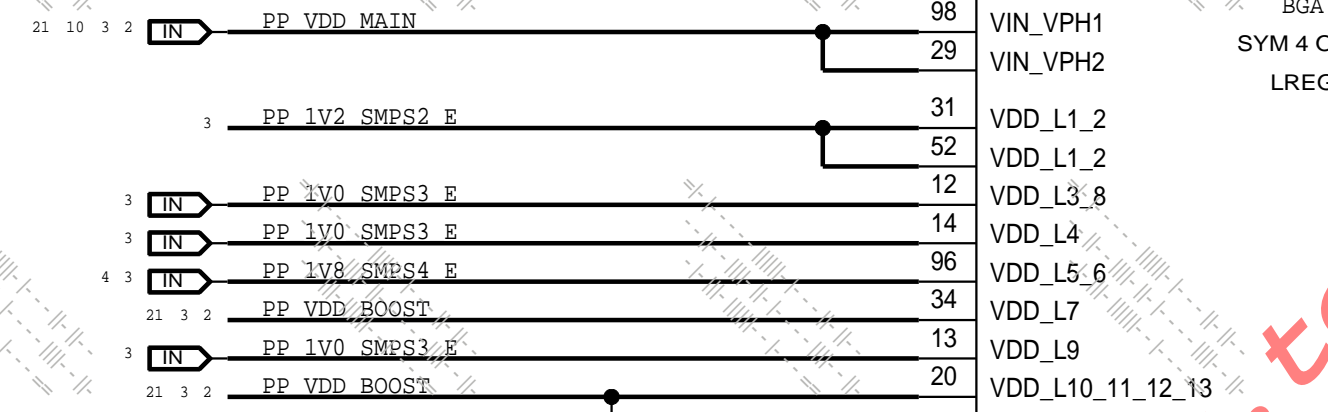
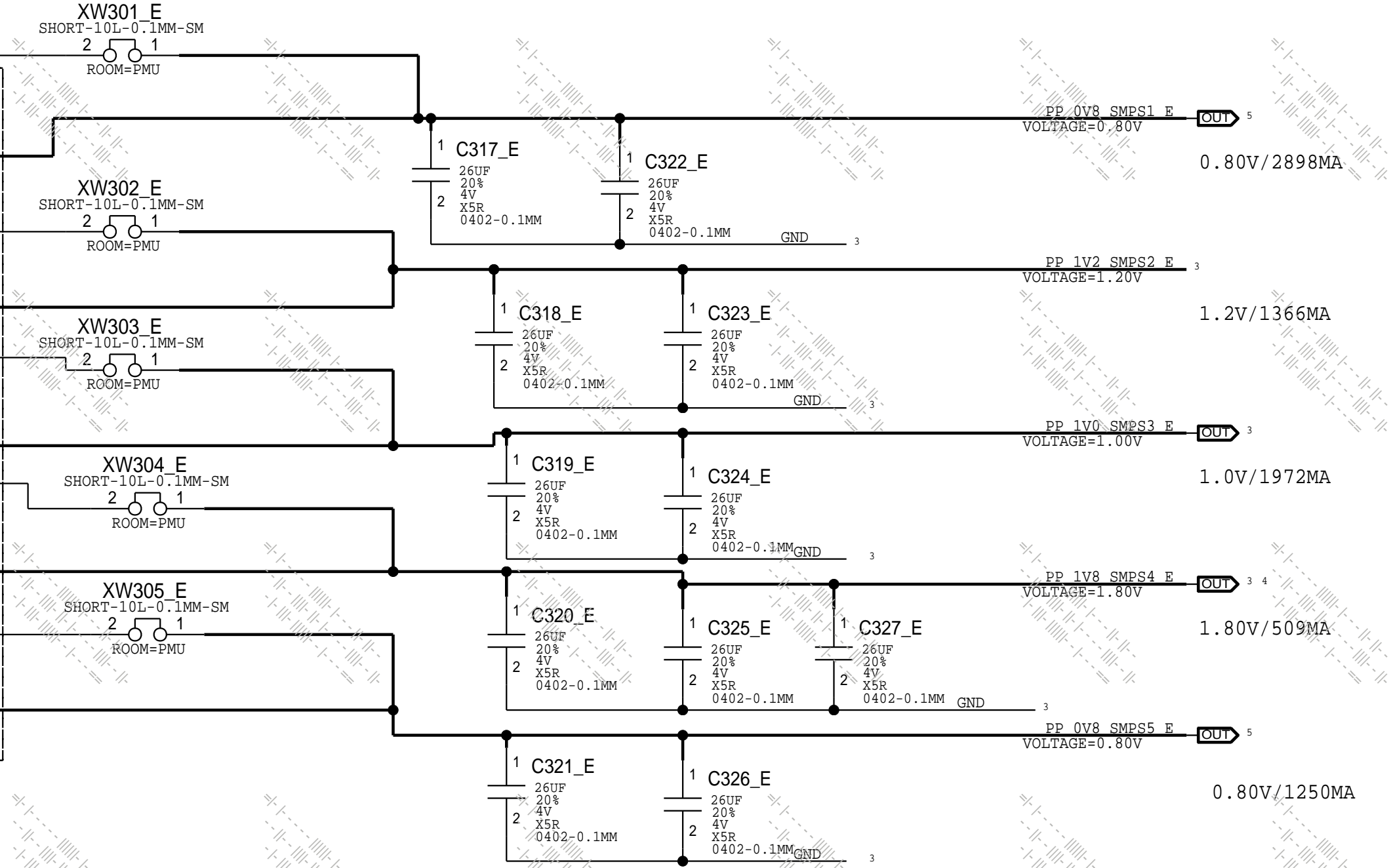
B

A

A



NEED 0.8MM PARTS STILL



- 1.20V/523.3MA
- 1.20V/695MA
- 1V/431MA
- 0.90V/128MA
- 1.80V/272.4MA
- 1.80V/221.6MA
- 2.7V/5MA
- 1.00V/368.3MA
- 0.80V/1045MA
- 3.00V/30MA
- 1.8V/60MA
- 2.7V/69MA
- 1.8V/60MA

RF PMIC: XTAL, CLOCKS AND MISCELLANEOUS

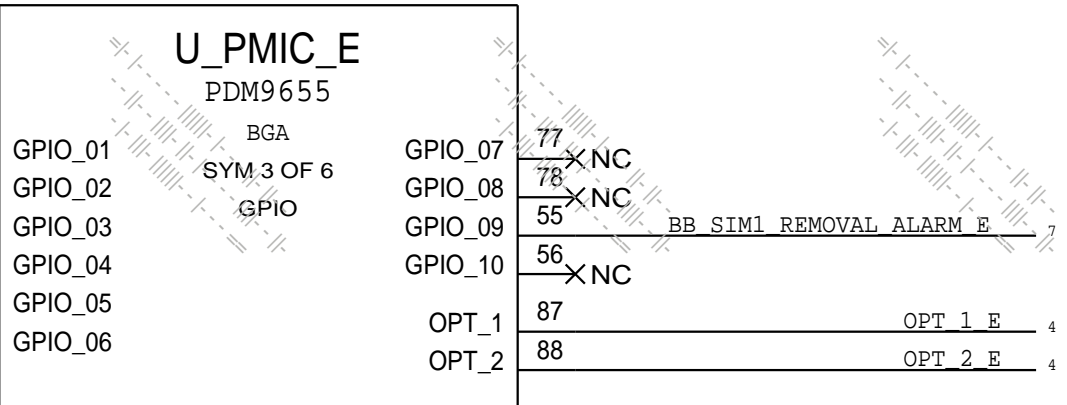
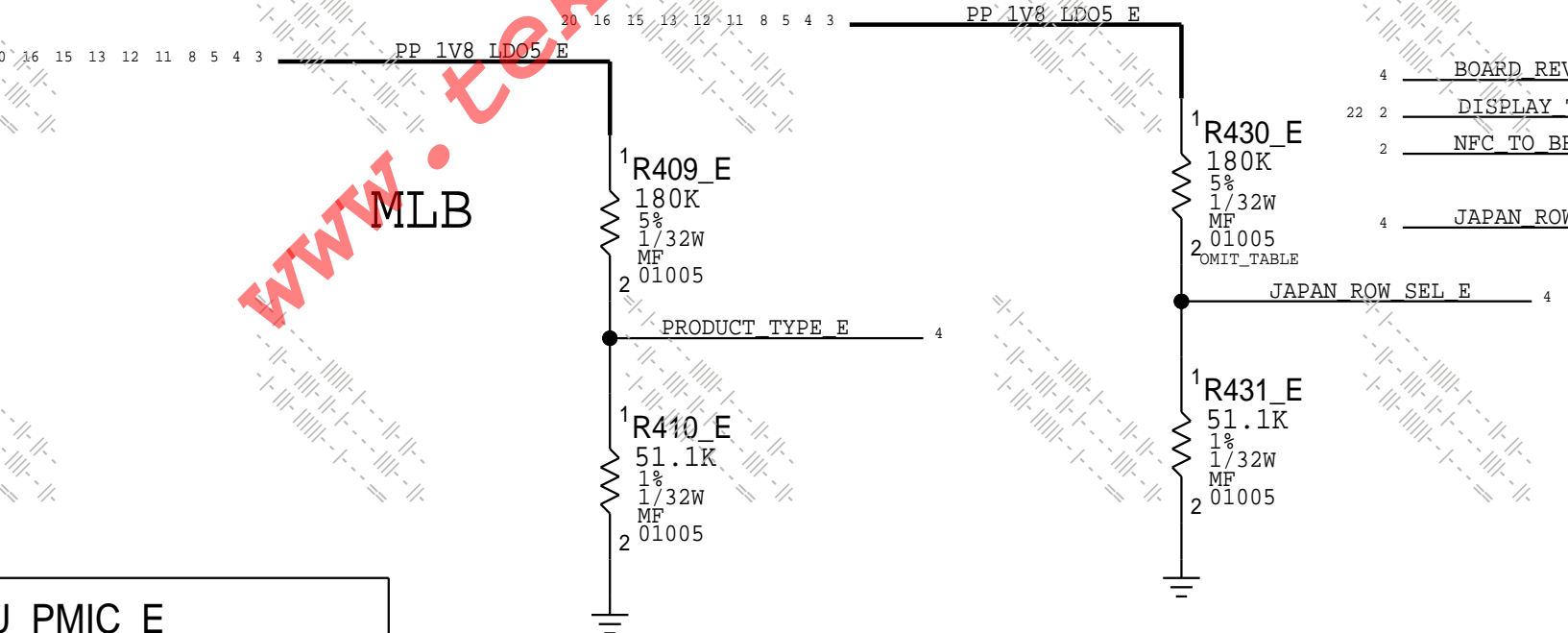
HW_REV_ID	R407	R408	MLB/RADIO_DEV
<0.10V	NOSTUFF	51.1K	T500/DEV1
0.15V-0.25V	422K	51.1K	PROTO1.5
0.35V-0.45V	180K	51.1K	PROTO2.5/DEV2
0.55V-0.65V	105K	51.1K	PROTO1/DEV3
0.75V-0.85V	66.5K	51.1K	PROTO2/DEV4
0.95V-1.05V	44.2K	51.1K	EVT
1.15V-1.25V	28K	51.1K	CARRIER/DEV5
1.35V-1.45V	16.5K	51.1K	DVT/DEV6
1.55V-1.65V	7.87K	51.1K	PVT/DEV7
1.75V-1.85V	10K	NOSTUFF	SPARE

NOTE XTAL SYMBOL MIRRORED
COMPARED TO PREVIOUS SCH

PA_THERM2	R409	R410	PRODUCT TYPE	Y
0.00V-0.10V	NOSTUFF	51.1K	RADIO DEV	1
0.15V-0.25V	422K	51.1K	3RD TYPE	2
0.35V-0.45V	180K	51.1K	POR MLB (FF)	3
0.55V-0.65V	105K	51.1K	SPARE	4
0.75V-0.85V	66.5K	51.1K	SPARE	5
0.95V-1.05V	44.2K	51.1K	SPARE	6
1.15V-1.25V	28K	51.1K	SPARE	7
1.35V-1.45V	16.5K	51.1K	SPARE	8
1.55V-1.65V	7.87K	51.1K	SPARE	9
1.75V-1.85V	10K	NOSTUFF	SPARE	A

JPN_ROW_SEL	R430	R431	MAV PLATFORM	Y	SKU
<0.10V	NOSTUFF	51.1K	MAV17.0	0	ROW
0.15V-0.25V	422K	51.1K	MAV17.1	1	JPN
0.35V-0.45V	180K	51.1K	MAV17.2	2	ROW
0.55V-0.65V	105K	51.1K	MAV17.3	3	JPN
0.75V-0.85V	66.5K	51.1K	MAV17.4	4	ROW
0.95V-1.05V	44.2K	51.1K	MAV17.5	5	JPN
1.15V-1.25V	28K	51.1K	MAV17.6	6	ROW
1.35V-1.45V	16.5K	51.1K	MAV17.7	7	JPN
1.55V-1.65V	7.87K	51.1K	MAV17.8	8	ROW
1.75V-1.85V	10K	NOSTUFF	MAV17.9	9	JPN

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
118S0686	1	RESISTOR, 01005, 105K OHMS	R430_E	CRITICAL	JPN
117S0197	1	RESISTOR, 01005, 180K OHMS	R430_E	CRITICAL	ROW



PAGE TITLE

PMIC: CLOCKS & CONTROL

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

051-02159

REVISION

10.0.0

BRANCH

PAGE

4 OF 22

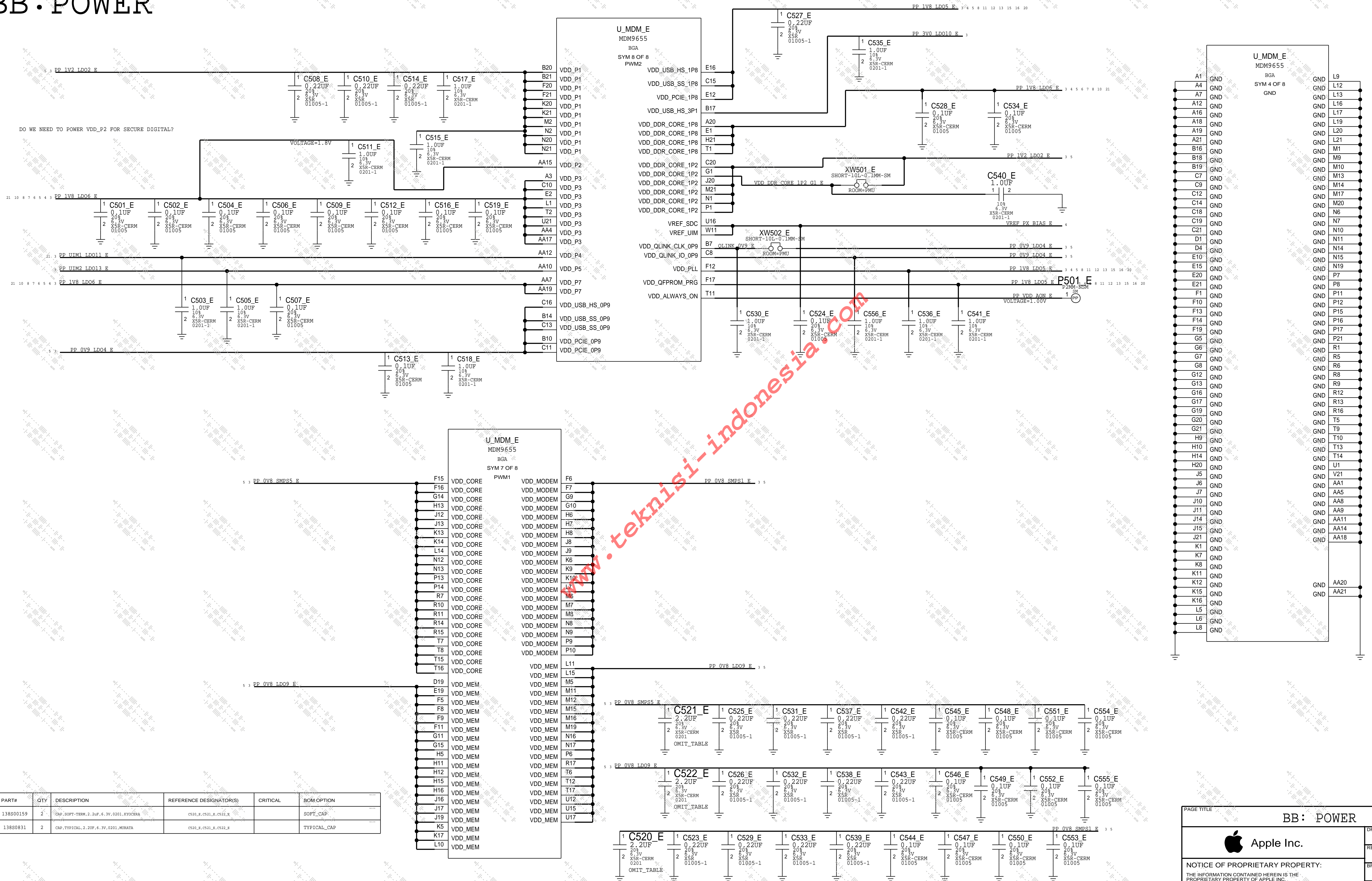
SHEET

56 OF 81

SIZE

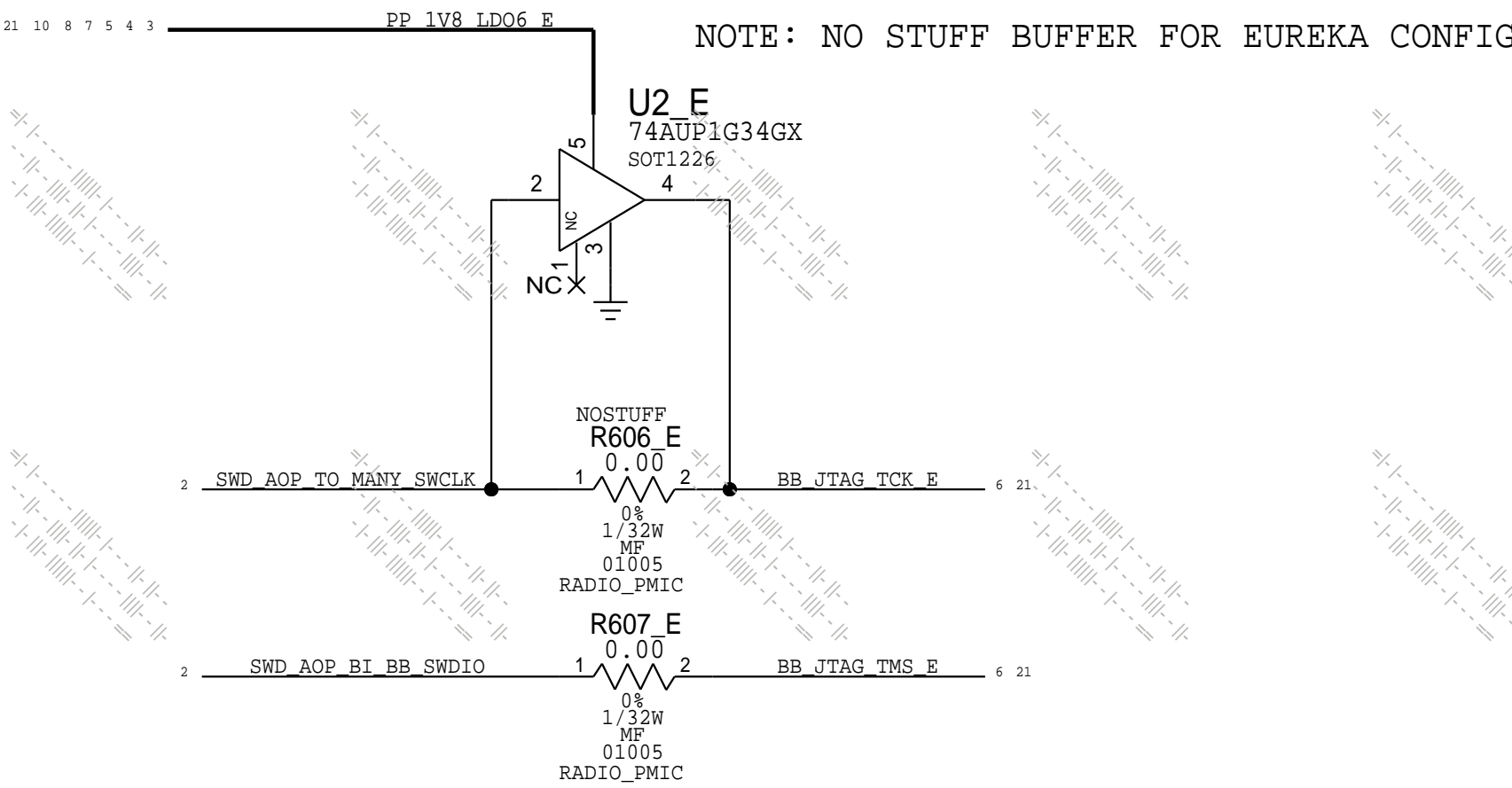
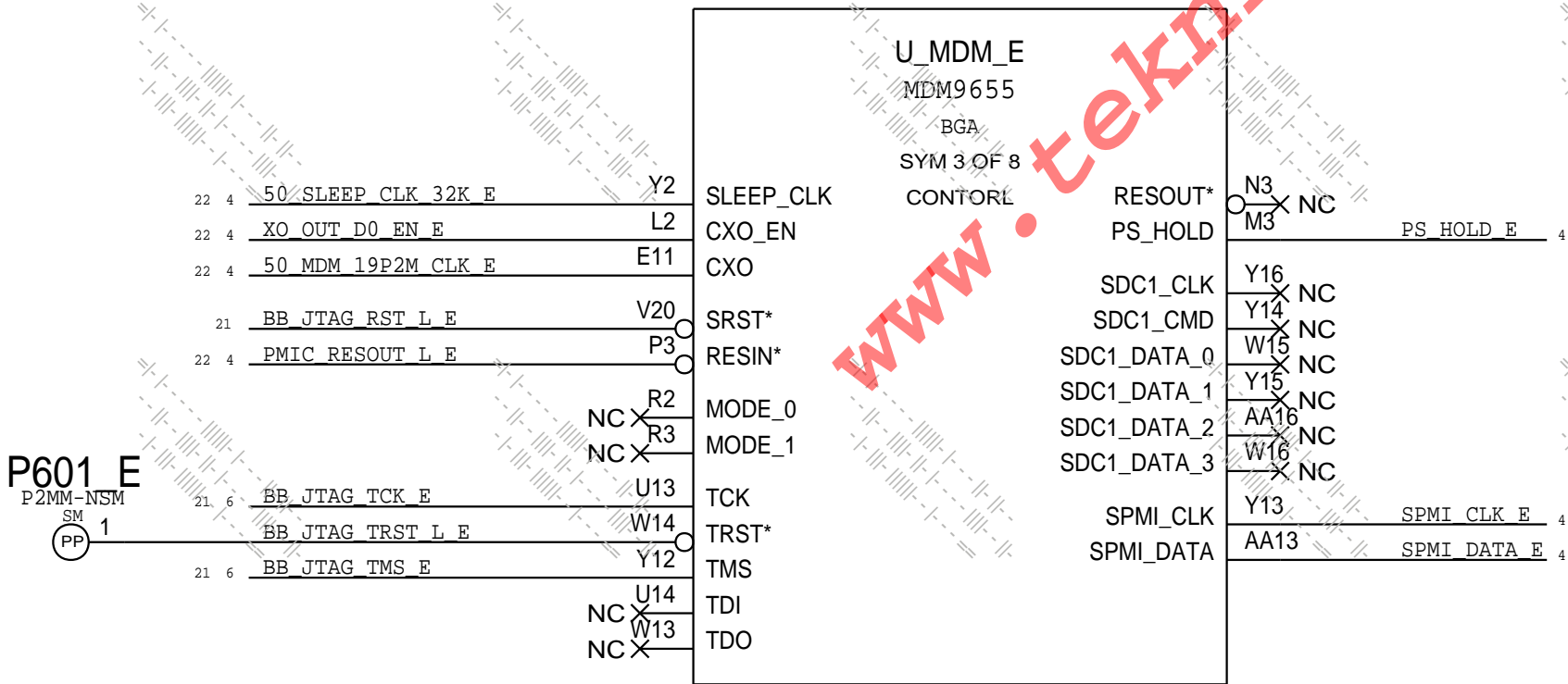
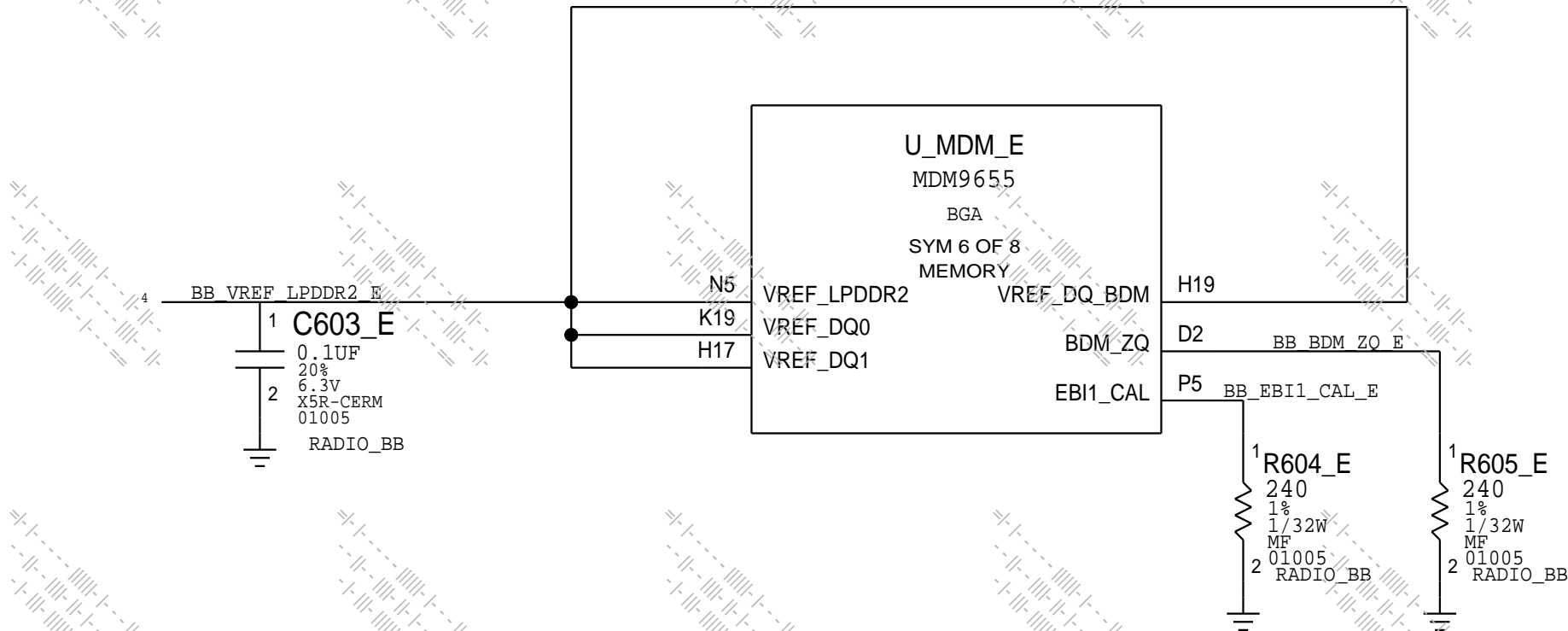
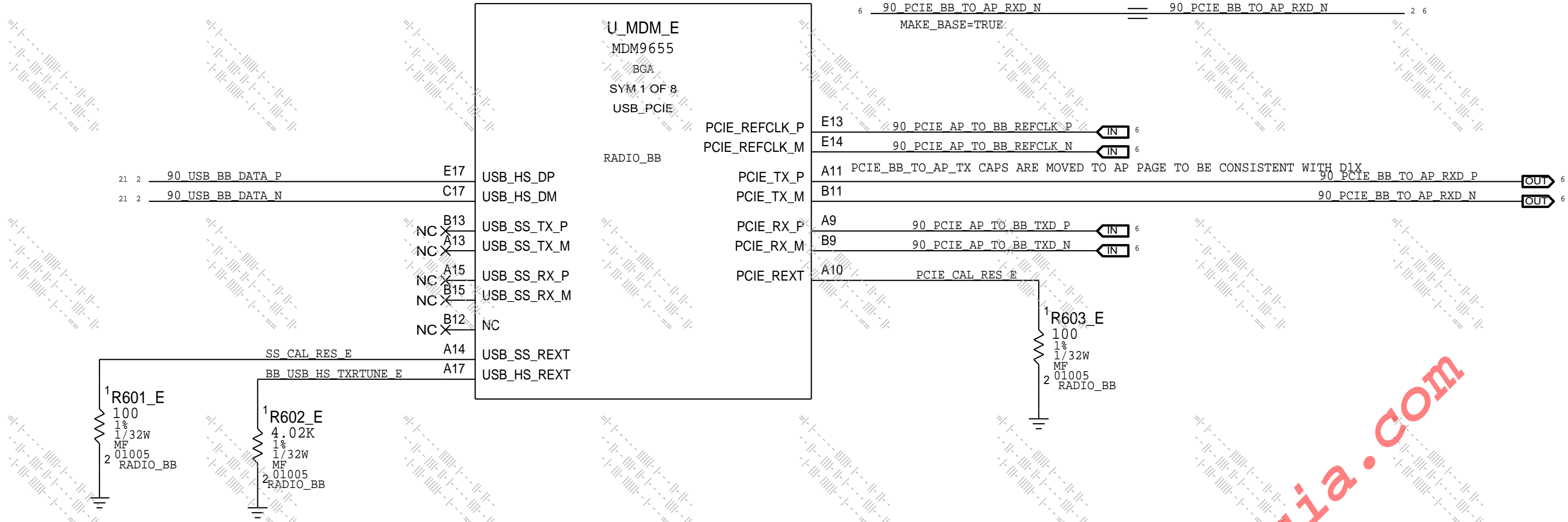
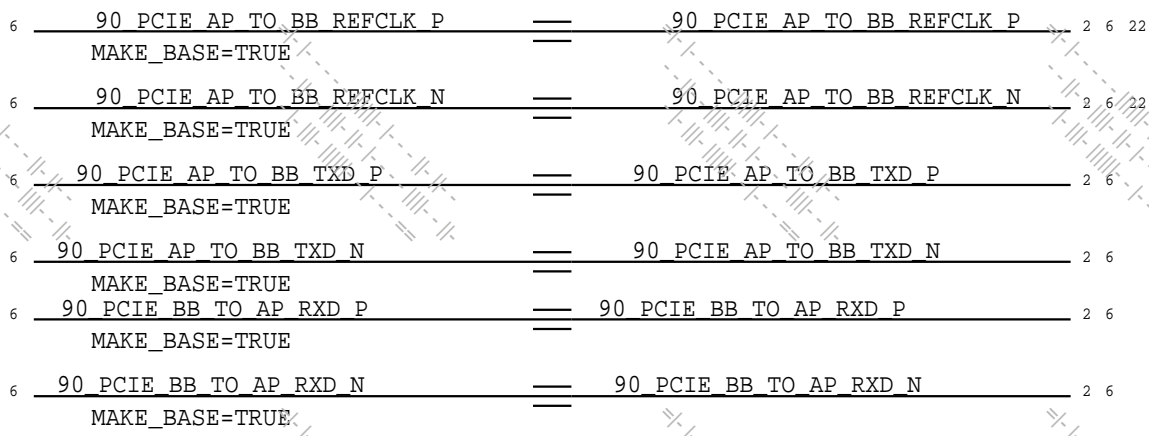
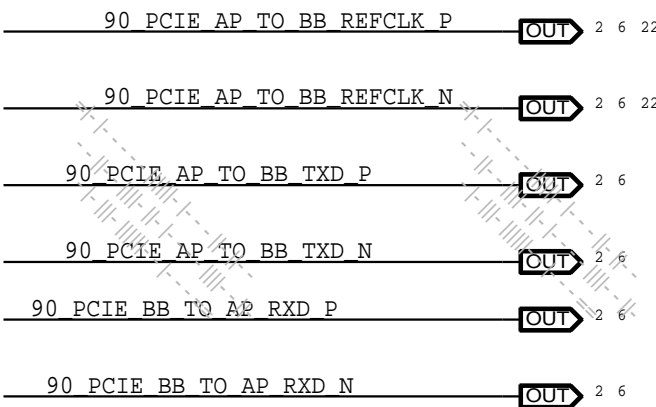
D

BB : POWER



PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
138S00159	2	CAP,SOFT-TERM,2.2UF,6.3V,0201,KYOCERA	C520_S,C521_S,C522_S		SOFT_CAP
138S0831	2	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C520_S,C521_S,C522_S		TYPICAL_CAP

BB: CONTROL & HS PERIPHERALS



BB:GPIOS & QLINK

CONFIDENTIAL AND PROPRIETARY APPLE SYSTEM DESIGN. FOR REFERENCE ONLY - NOT A CHANGE REQUEST

D

D

C

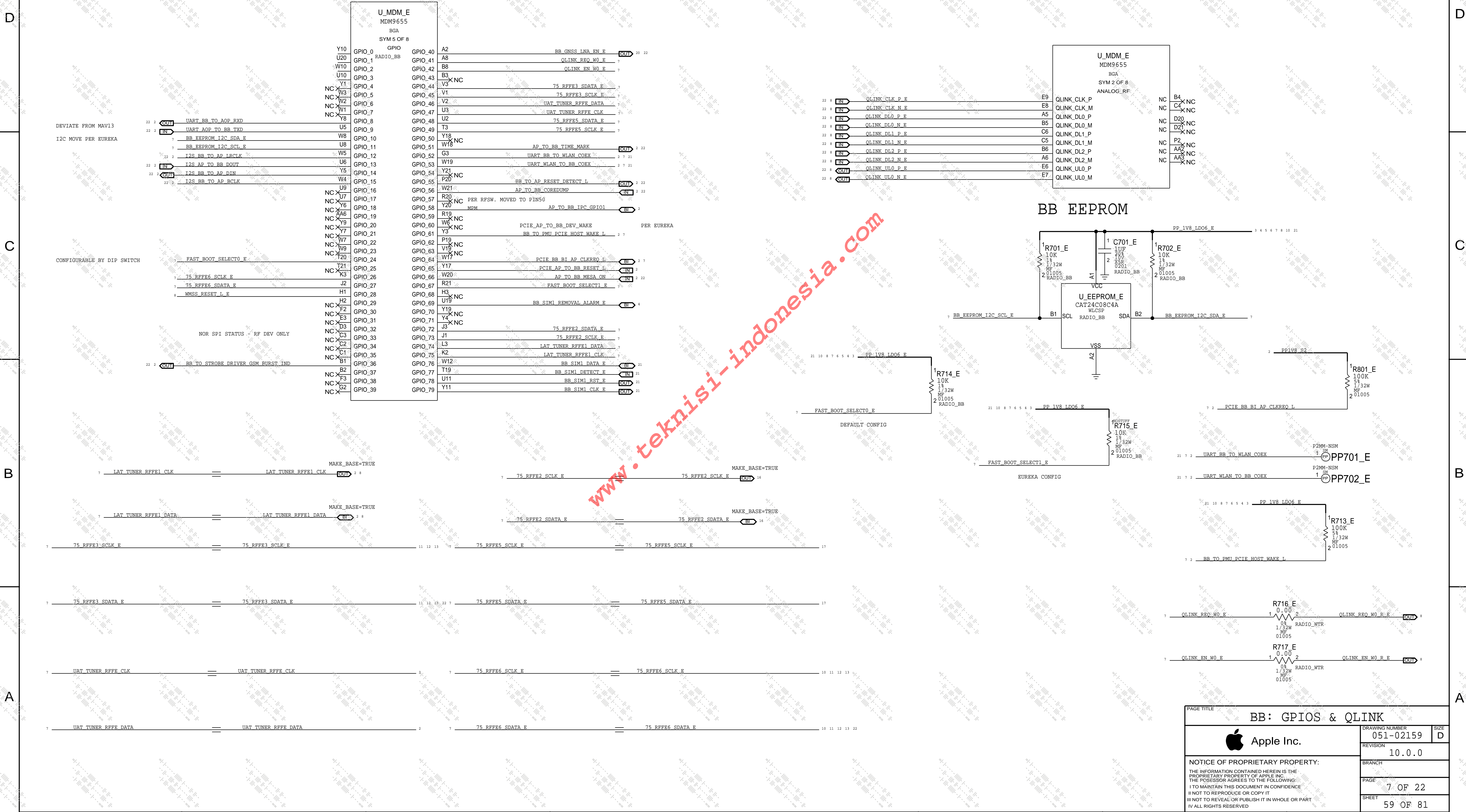
C

B

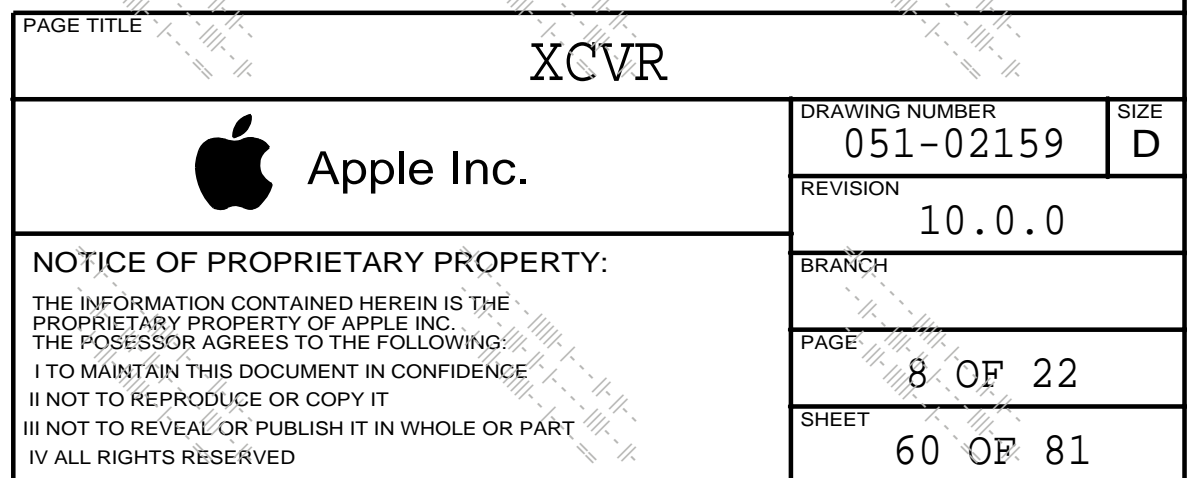
B

A

A



CONFIDENTIAL AND PROPRIETARY APPLE SYSTEM DESIGN. FOR REFERENCE ONLY - NOT A CHANGE REQUEST

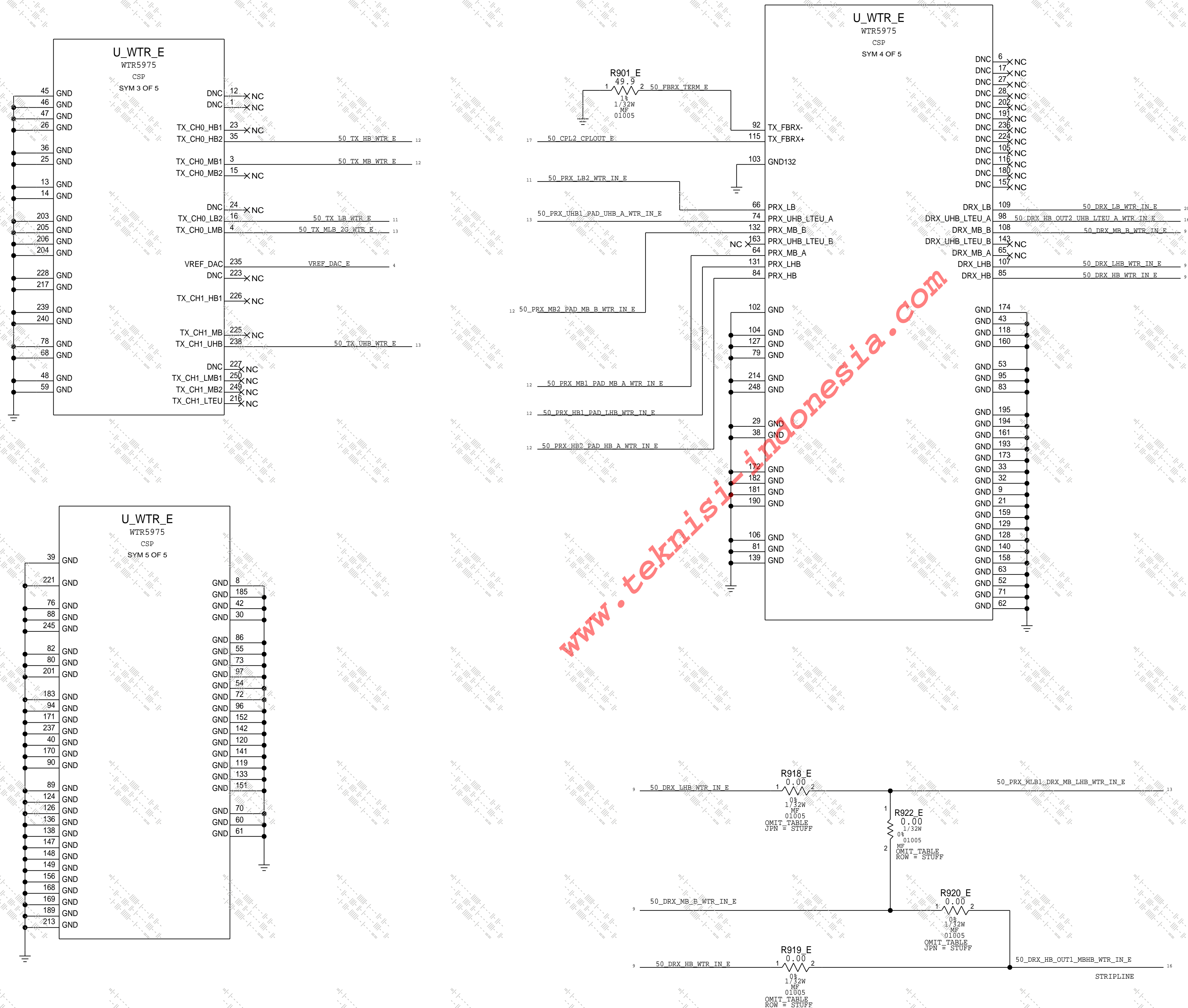



TRANSCIVER: TX & RX

CONFIDENTIAL AND PROPRIETARY APPLE SYSTEM DESIGN. FOR REFERENCE ONLY - NOT A CHANGE REQUEST

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
117S0161	1	01005 OR	R919_B	CRITICAL	ROW
117S0161	1	01005 OR	R922_B	CRITICAL	ROW

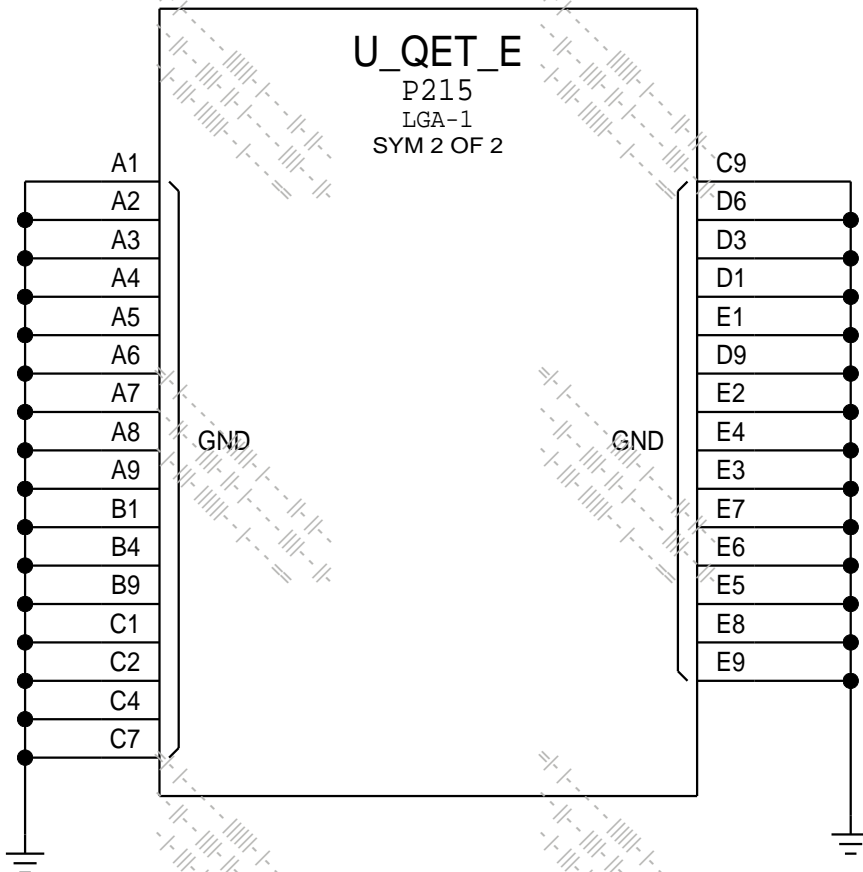
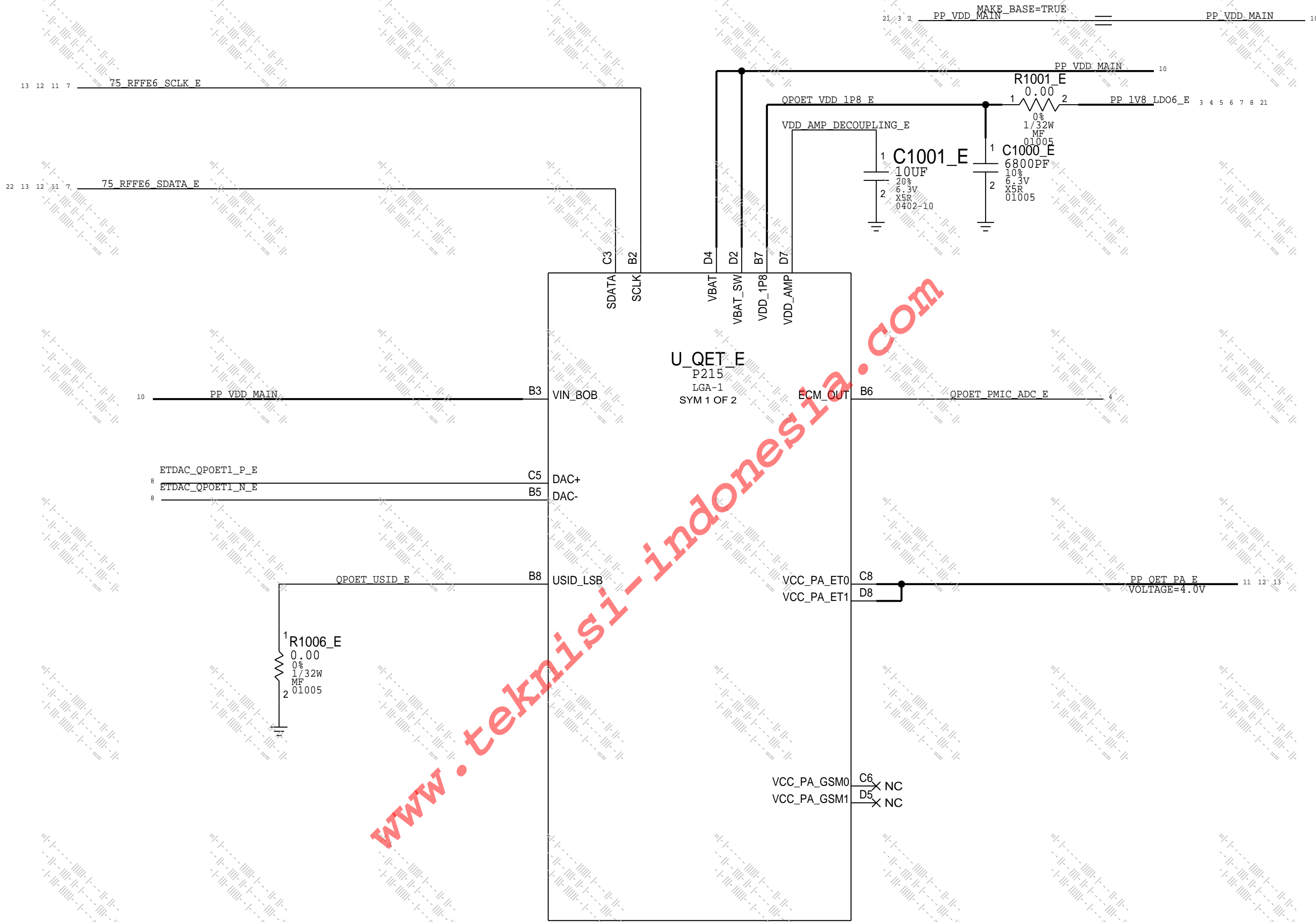
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
11780161	1	01005_0R	R918_E	CRITICAL	JPN
11780161	1	01005_0R	R920_E	CRITICAL	JPN



PAGE TITLE		XCVR	
 Apple Inc.	DRAWING NUMBER	051-02159	SIZE D
	REVISION	10.0.0	
	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 THE 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		9 OF 22	
SHEET		61 OF 81	

QET:MODULE

CONFIDENTIAL AND PROPRIETARY APPLE SYSTEM DESIGN. FOR REFERENCE ONLY - NOT A CHANGE REQUEST



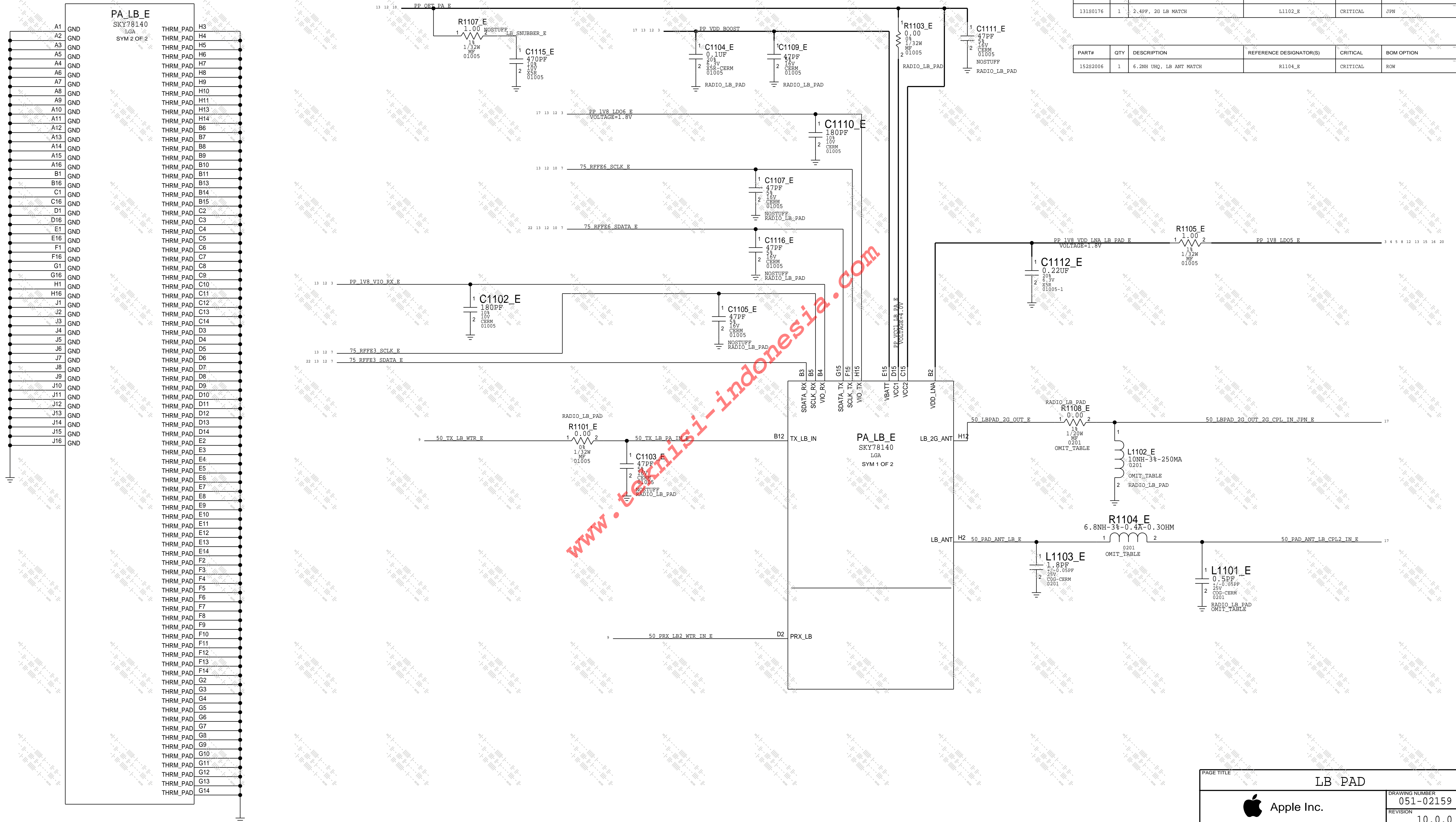
PAGE TITLE			QPOET_MODULE		
		DRAWING NUMBER		SIZE	
		051-02159		D	
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED		REVISION		10.0.0	
		BRANCH			
		PAGE		10 OF 22	
		SHEET		62 OF 81	


LB PAD

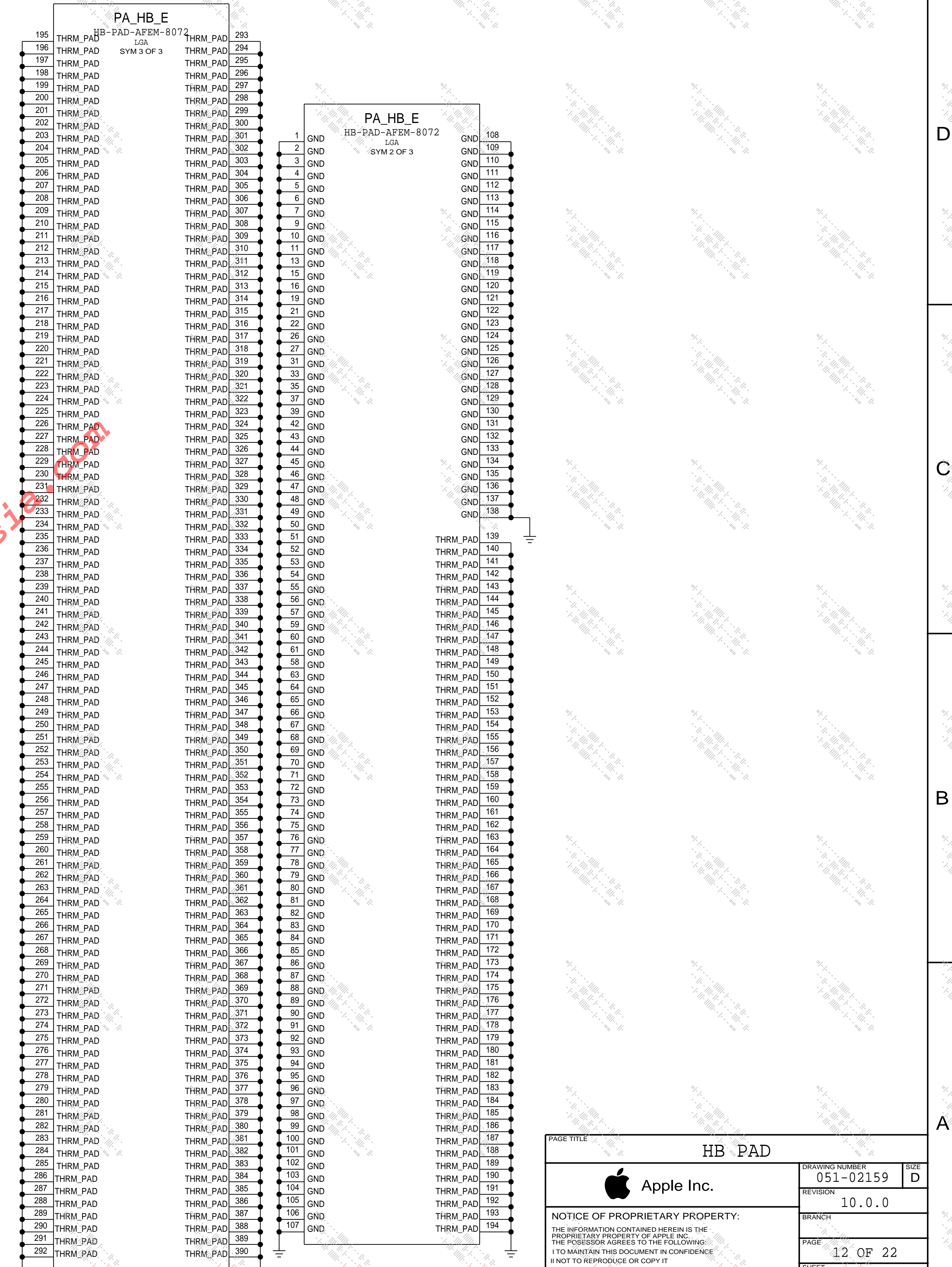
CONFIDENTIAL AND PROPRIETARY APPLE SYSTEM DESIGN. FOR REFERENCE ONLY - NOT A CHANGE REQUEST

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
11880724	1	2G LB MATCH, 0 OHMS	R108_E	CRITICAL	JPN
152800021	1	6.8NH UHQ, LB ANT MATCH	R104_E	CRITICAL	JPN
13180555	1	1PF, LB ANT MATCH	L101_E	CRITICAL	JPN
13180176	1	2.4PF, 2G LB MATCH	L102_E	CRITICAL	JPN

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
152S2006	1	6.2NH UHQ, LB ANT MATCH	R1104_E	CRITICAL	ROW



PAGE TITLE				LB PAD							
 Apple Inc.				DRAWING NUMBER		051-02159		SIZE		D	
				REVISION		10.0.0					
				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 I NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED				PAGE		11 OF 22					
				SHEET		63 OF 81					

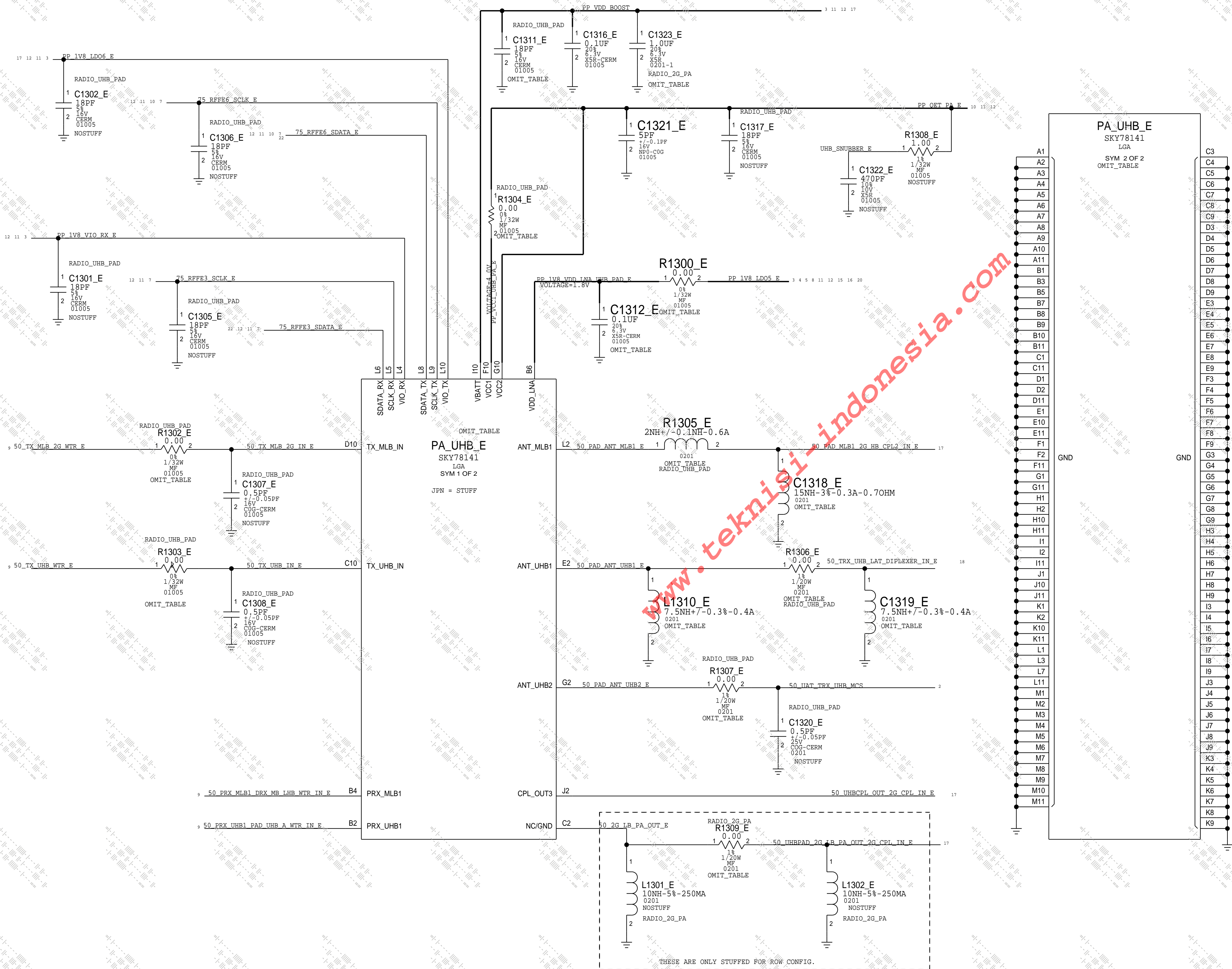


PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
15282023	1	3.2NH UHQ, 2G HB-PAD MATCH	R1209_E	CRITICAL	JPN
152800153	1	1NH UHQ, 2G HB PAD MATCH	R1211_E	CRITICAL	JPN
13180425	1	0.5FP, HB ANT MATCH	C1209_E	CRITICAL	JPN
15282042	1	1.8NH UHQ, HB ANT MATCH	R1210_E	CRITICAL	JPN

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
131S0329	1	0.4PF, HB ANT MATCH	C1209_B	CRITICAL	ROW
152S2000	1	2.0NH UHQ, HB ANT MATCH	R1210_B	CRITICAL	ROW

UHB/2G PAD -JPN

CONFIDENTIAL AND PROPRIETARY APPLE SYSTEM DESIGN. FOR REFERENCE ONLY - NOT A CHANGE REQUEST



PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
393801243	1	UHB PAD	PA_UHB_E	CRITICAL	JPN
11780161	1	MLB/2GTX IN MCH2, 0 OHMS	R1302_E	CRITICAL	JPN
11780161	1	UHB INPUT MCH1, 0 OHMS	R1303_E	CRITICAL	JPN
11780002	1	MLB/2G MB OUT MCH1, 0 OHMS	R1305_E	CRITICAL	JPN
13180552	1	2.7PF UHQ, UHB1 ANT MATCH	R1306_E	CRITICAL	JPN
11780002	1	0 OHMS UHB2 OUT/DRX BP MCH1	R1307_E	CRITICAL	JPN
13280316	1	UHB LNA DECOUPLING, 0.1UF	C1312_E	CRITICAL	JPN
11780161	1	UHB LNA SUPPLY FILTER, 0OHMS	R1300_E	CRITICAL	JPN
13180214	1	VBAT DECOUPLING,18PF	C1311_E	CRITICAL	JPN
13880692	1	VBAT DECOUPLING, 1UF	C1323_E	CRITICAL	JPN
11780161	1	VCC2/VCC1 RESISTOR OPTION, 0 OHM	R1304_E	CRITICAL	JPN
15281999	1	22NH, MLB1 ANT MATCH	C1318_E	CRITICAL	JPN
15281688	1	3.5NH, UHB1 ANT MATCH	L1310_E	CRITICAL	JPN
13180431	1	0.2PF, UHB TO METROCIRC	C1320_E	CRITICAL	JPN

PAGE TITLE		
UHB PAD		
	DRAWING NUMBER	051-02159
	REVISION	10.0.0
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	BRANCH	
	PAGE	13 OF 22
	SHEET	65 OF 81


87654321

2G PA - ROW

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
353801247	1	2G PA	PA_UHB_E	CRITICAL	ROW
11780161	1	MLB/2GTX IN MCH2, 0 OHMS	R1302_E	CRITICAL	ROW
11780161	1	UHB INPUT MCH1, 0 OHMS	R1303_E	CRITICAL	ROW
11880724	1	MLB/2G MB OUT MCH1, 0 OHMS	R1305_E	CRITICAL	ROW
11880724	1	UHB2 OUT/DRX BP MCH1, 0 OHMS	R1307_E	CRITICAL	ROW
15282053	1	4.7NH UHQ, 2G LB OUTPUT MCH2	R1309_E	CRITICAL	ROW
13180214	1	VBAT DECOUPLING,18PF	C1311_E	CRITICAL	ROW
13880692	1	VBAT DECOUPLING, 1UF	C1323_E	CRITICAL	ROW
11780161	1	VCC2/VCC1 RESISTOR OPTION, 0 OHM	R1304_E	CRITICAL	ROW
103800089	1	50 OHM TERMINATION FOR ROW ONLY	C1319_E	CRITICAL	ROW

PAGE TITLE

2G PA

 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
051-02159

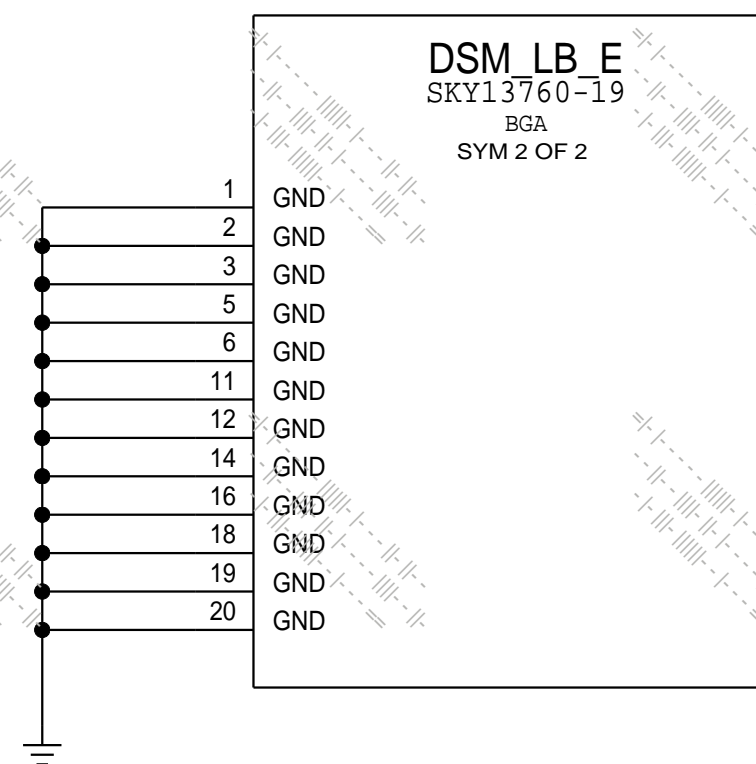
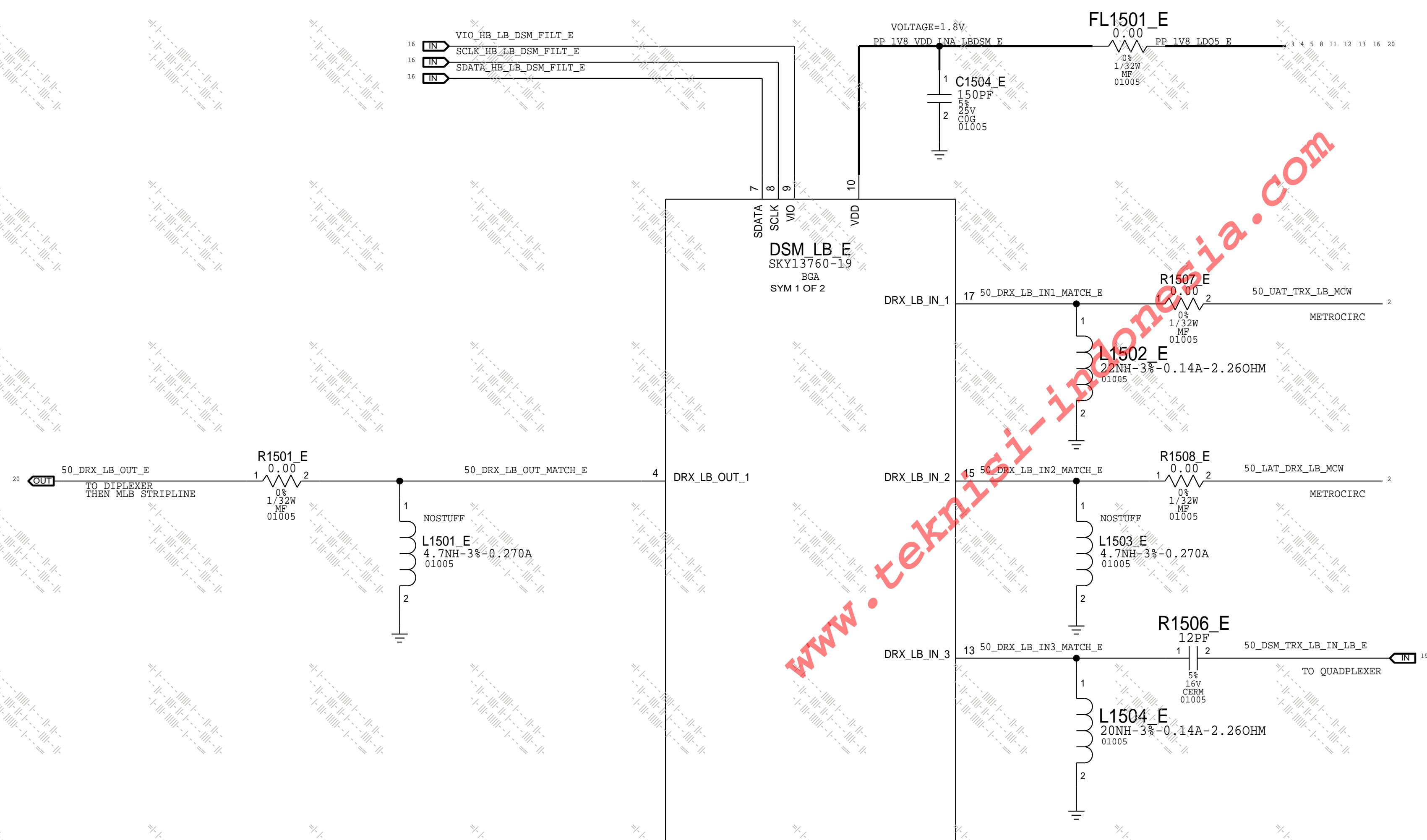
REVISION
10.0.0

BRANCH

PAGE
14 OF 22

SHEET
66 OF 81

SIZE
D

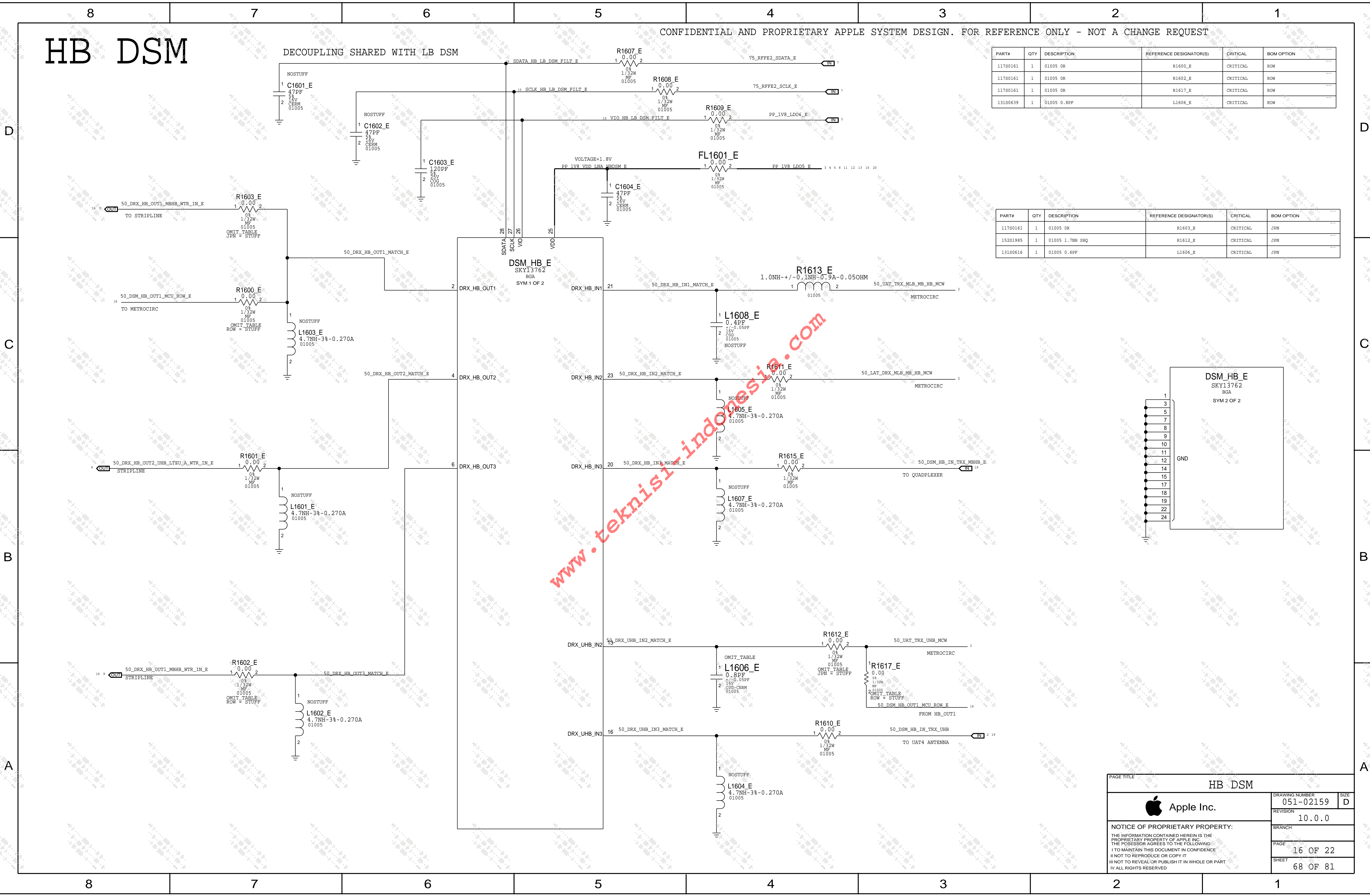



HB DSM

CONFIDENTIAL AND PROPRIETARY APPLE SYSTEM DESIGN. FOR REFERENCE ONLY - NOT A CHANGE REQUEST

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
117S0161	1	01005 0R	R1600_E	CRITICAL	ROW
117S0161	1	01005 0R	R1602_E	CRITICAL	ROW
117S0161	1	01005 0R	R1617_E	CRITICAL	ROW
131S0639	1	01005 0.8PF	L1606_E	CRITICAL	ROW

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
117S0161	1	01005 0R	R1603_E	CRITICAL	JPN
152S1985	1	01005 1.7NH SHQ	R1612_E	CRITICAL	JPN
131S0616	1	01005 0.6FF	L1606_E	CRITICAL	JPN



PAGE TITLE		
HB DSM		
 Apple Inc.	DRAWING NUMBER	SIZE
	051-02159	D
	10.0.0	
	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		16 OF 22
SHEET		68 OF 81

COUPLER2

CONFIDENTIAL AND PROPRIETARY APPLE SYSTEM DESIGN. FOR REFERENCE ONLY - NOT A CHANGE REQUEST

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
118S0724	1	0201 0R	R1810_E	CRITICAL	ROW
131S00142	1	150PF, DC BLOCK FOR GSM	R1813_E	CRITICAL	ROW
118S0724	1	0201 0R	R1814_E	CRITICAL	ROW
131S00001	1	0.1PF, CPLR HB LAT MATCH	L1801_E	CRITICAL	ROW
152S2044	1	2.2NH, CPLR HB LAT MATCH	R1807_E	CRITICAL	ROW

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
118S0724	1	0201 0R	R1809_E	CRITICAL	JPN
152S2007	1	8.2NH 2G LB MATCH	R1812_E	CRITICAL	JPN
131S0431	1	0.2PF, CPLR HB LAT MATCH	L1801_E	CRITICAL	JPN
152S00055	1	2.6NH, CPLR HB LAT MATCH	R1807_E	CRITICAL	JPN
131S0249	1	2.2PF, 2G LB MATCH	C1810_E	CRITICAL	JPN

D

D

C

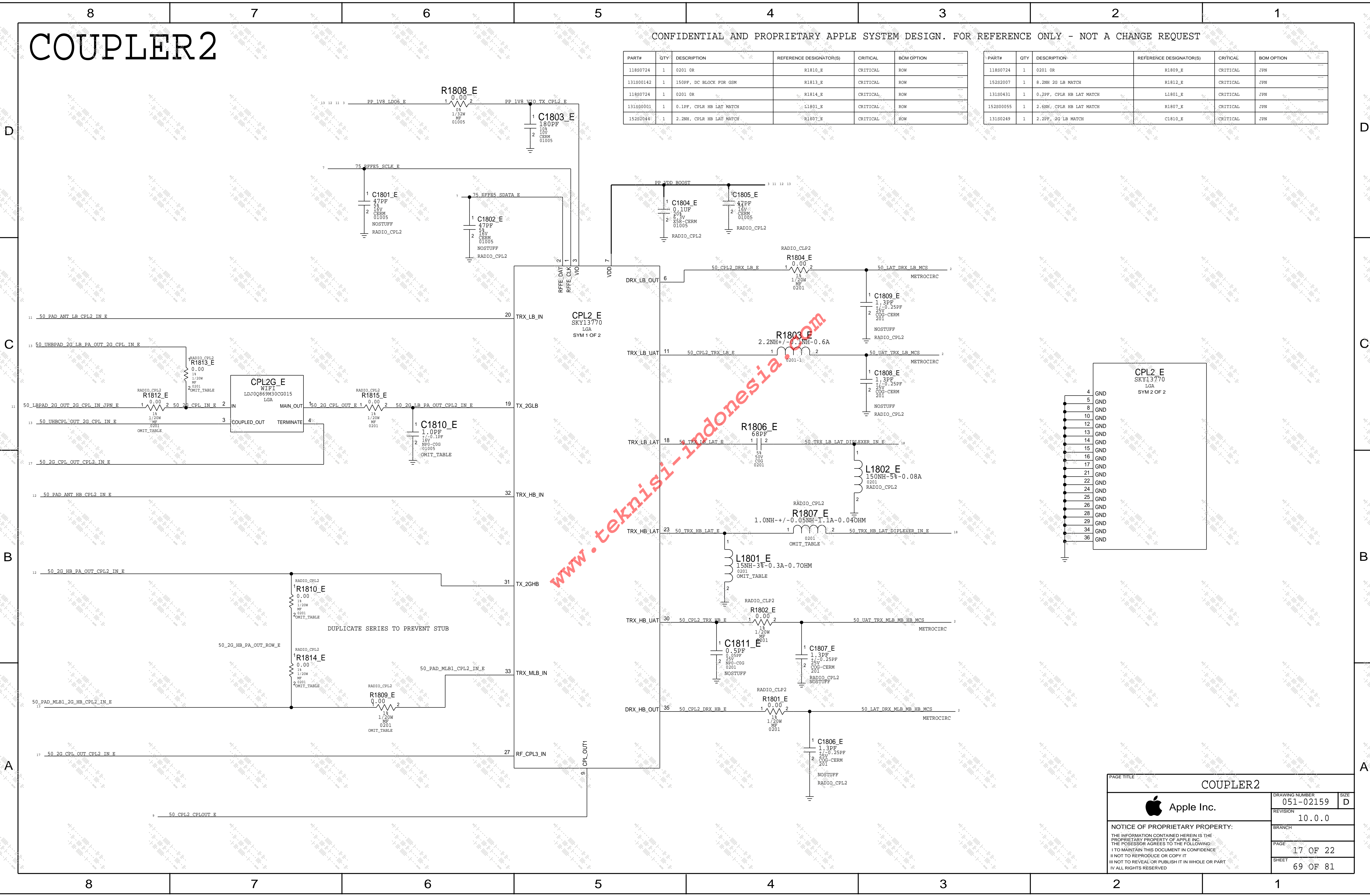
C

B

B

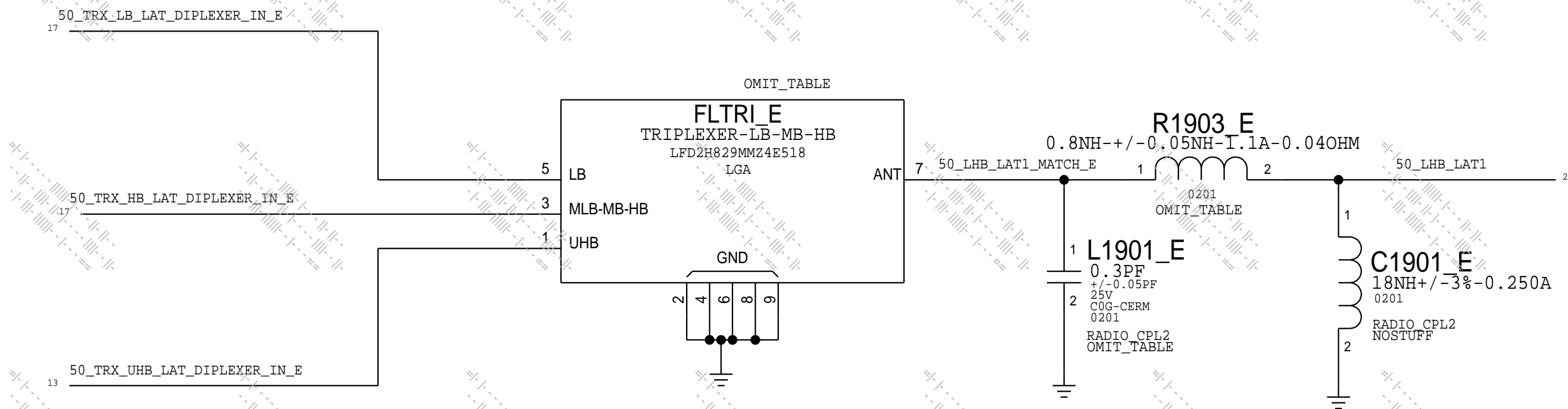
A

A



LOWER ANTENNA

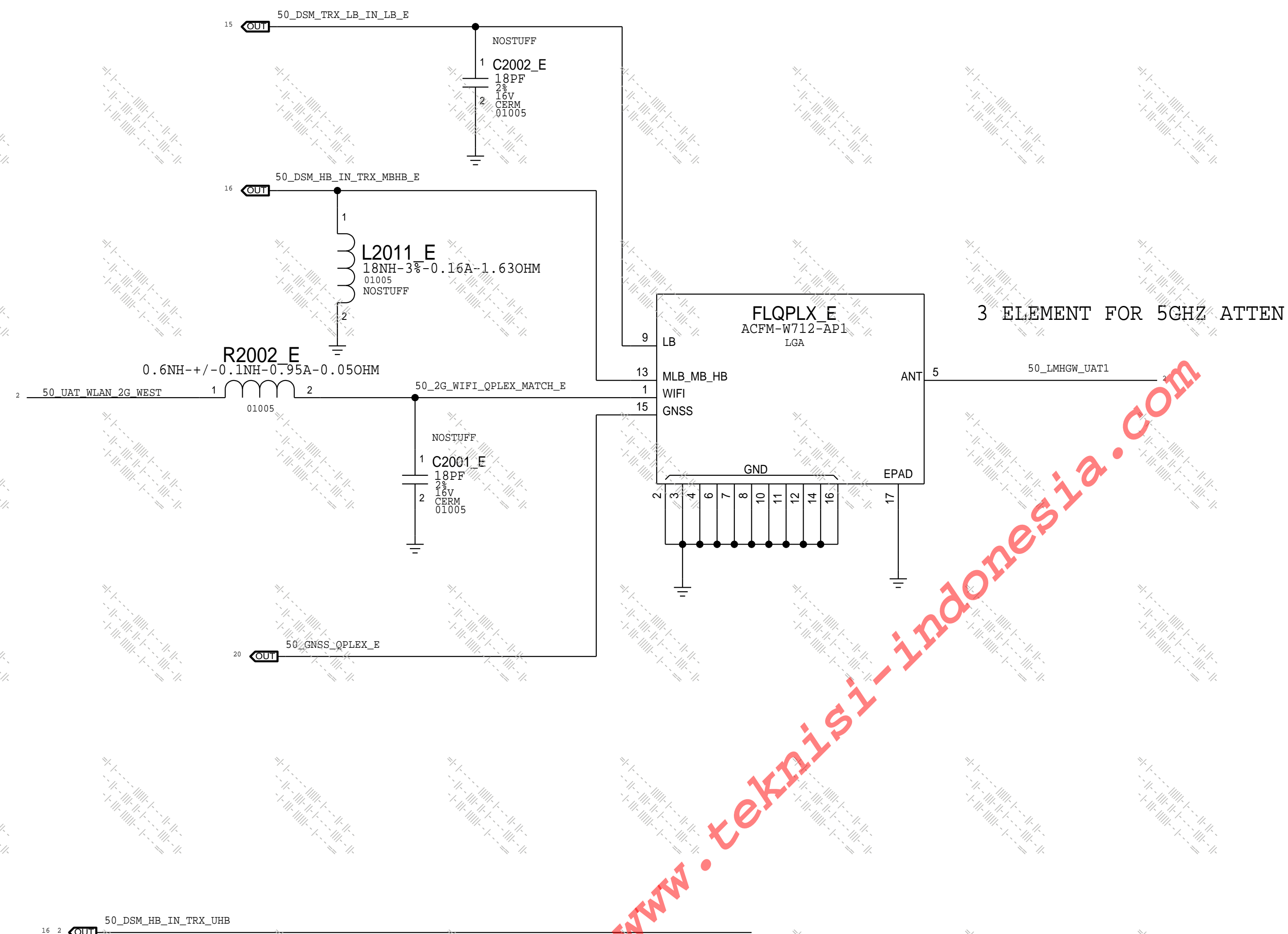
CONFIDENTIAL AND PROPRIETARY APPLE SYSTEM DESIGN. FOR REFERENCE ONLY - NOT A CHANGE REQUEST




PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
155S00298	1	TRIPLEXER, L+MLBMB+UHB	FLTRI_E	CRITICAL	JPN
155S00297	1	DIPLEXER, L+MLBMB	FLTRI_E	CRITICAL	ROW
152S00147	1	0.6NH UHQ, TRI ANT MATCH	R1903_E	CRITICAL	JPN
152S00151	1	0.8NH UHQ, TRI ANT MATCH	R1903_E	CRITICAL	ROW
131S00001	1	0.1PF, TRI ANT MATCH	L1901_E	CRITICAL	ROW

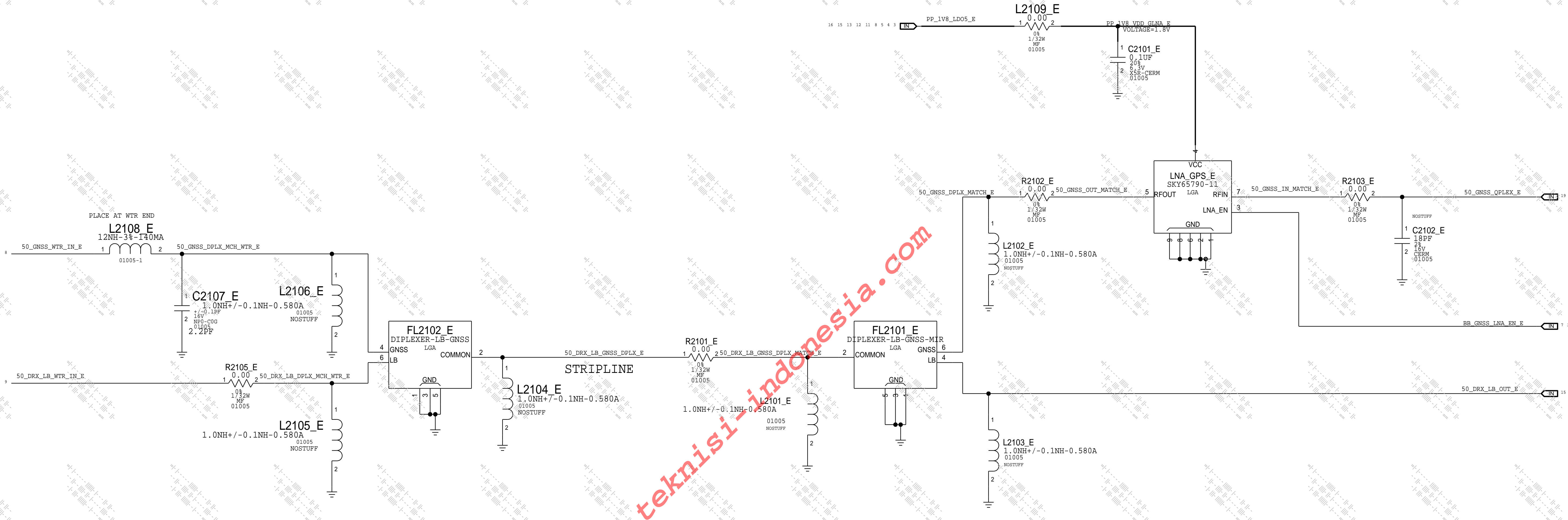
UAT & LB/UHB DIPLEXER

CONFIDENTIAL AND PROPRIETARY APPLE SYSTEM DESIGN. FOR REFERENCE ONLY - NOT A CHANGE REQUEST



PAGE TITLE		UPPER ANTENNA	
 Apple Inc.	DRAWING NUMBER	051-02159	SIZE D
	REVISION 10.0.0		
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		
	19 OF 22		
SHEET			71 OF 81

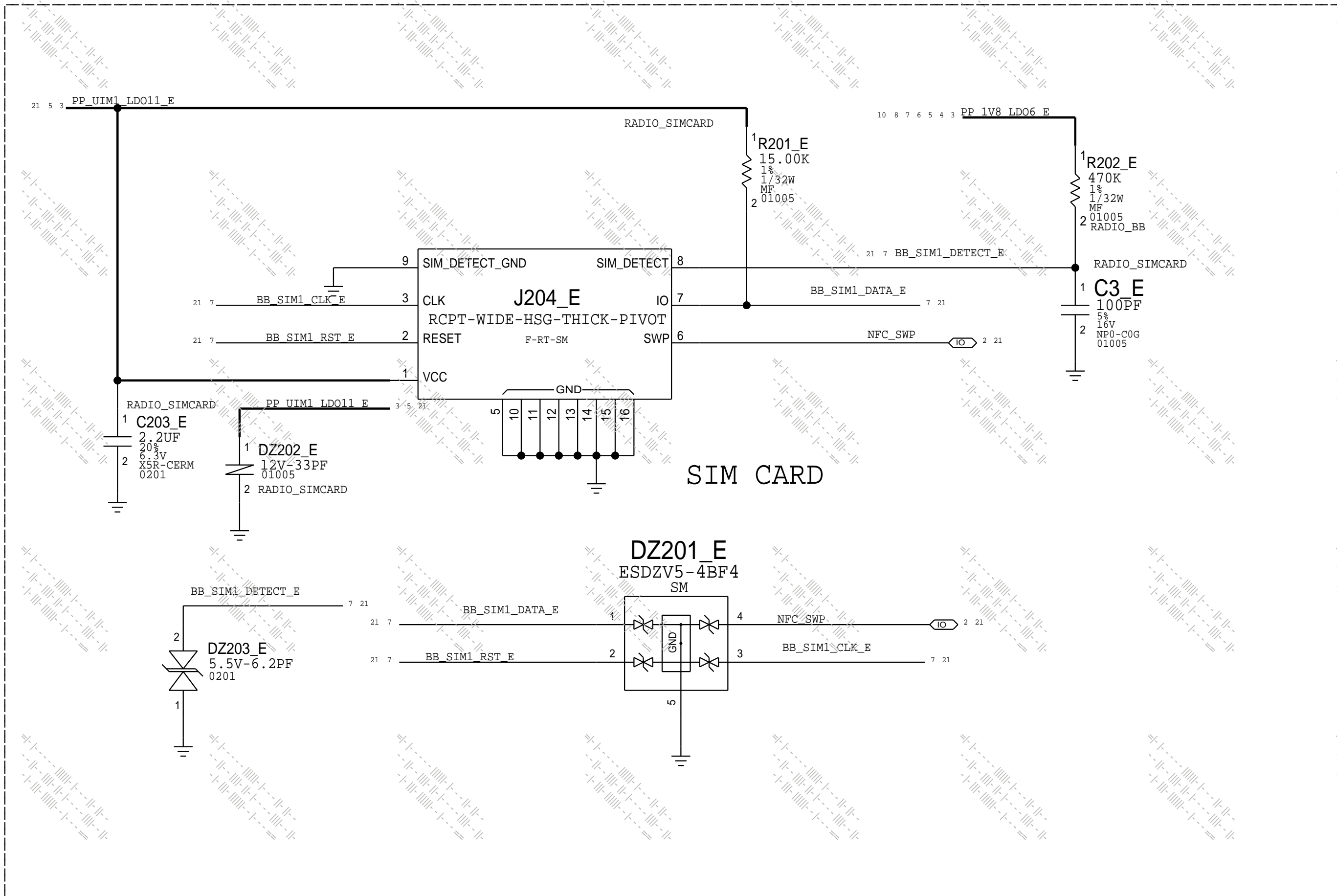
GPS & GPS/LB DIPLEXER



PAGE TITLE		
GNSS		
	DRAWING NUMBER	051-02159
	REVISION	10.0.0
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	20 OF 22
	SHEET	72 OF 81

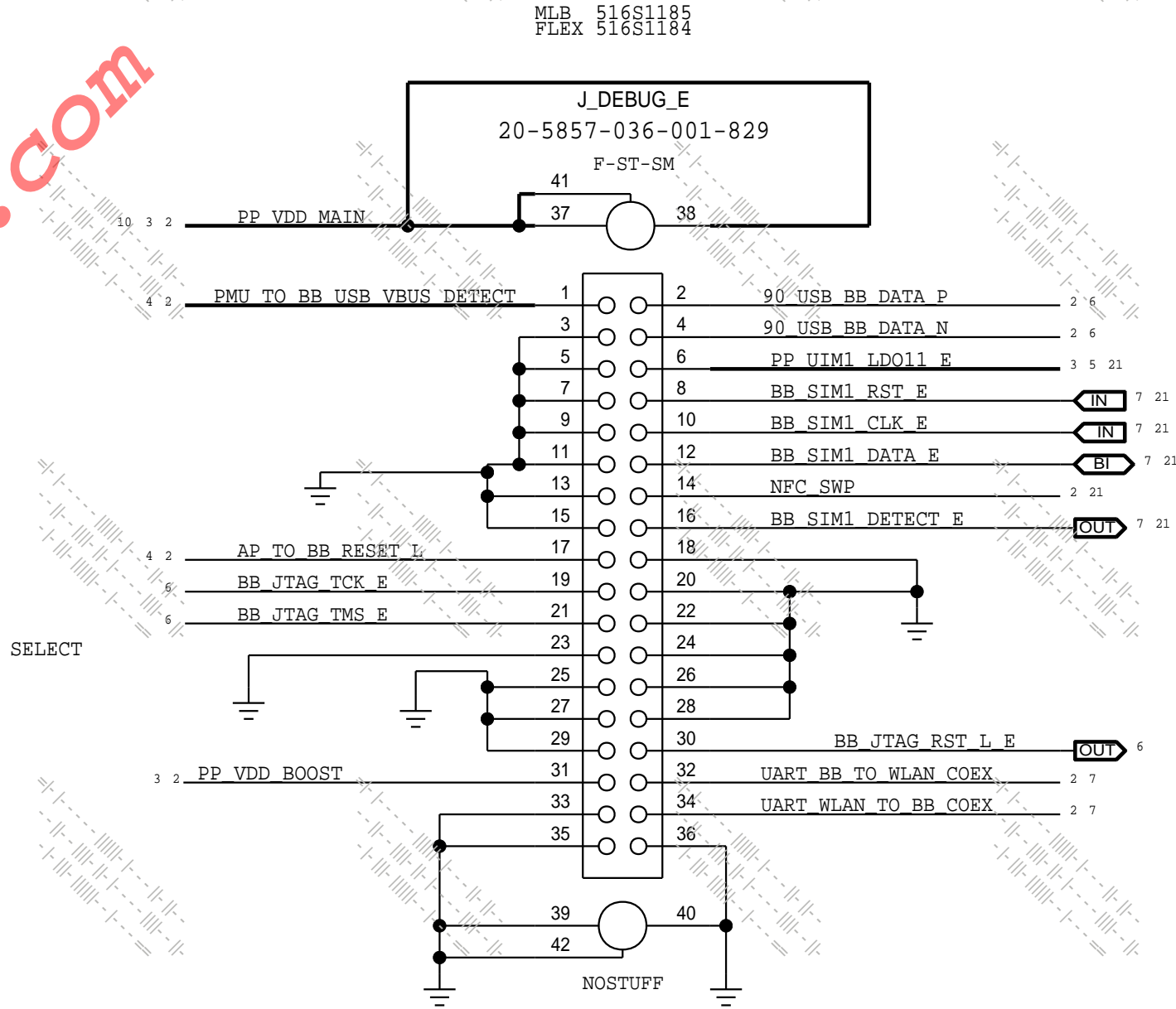
SIM CARD: CONNECTOR

CONFIDENTIAL AND PROPRIETARY APPLE SYSTEM DESIGN. FOR REFERENCE ONLY - NOT A CHANGE REQUEST



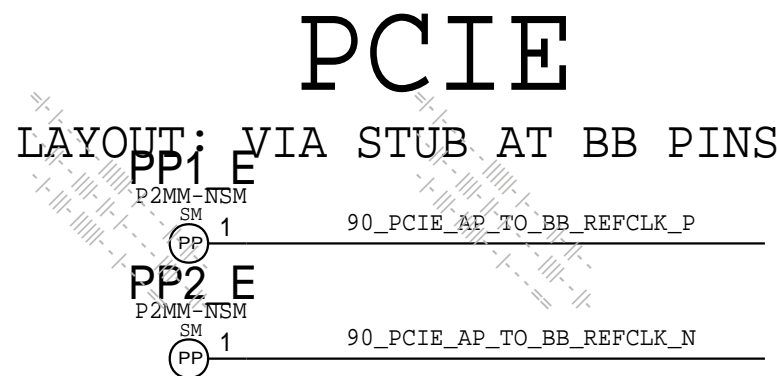
PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS
512S00026	512S00017	BOM_TABLE_ALTS	2204_E	SINCRD, KYOCERA

DEBUG CONNECTOR

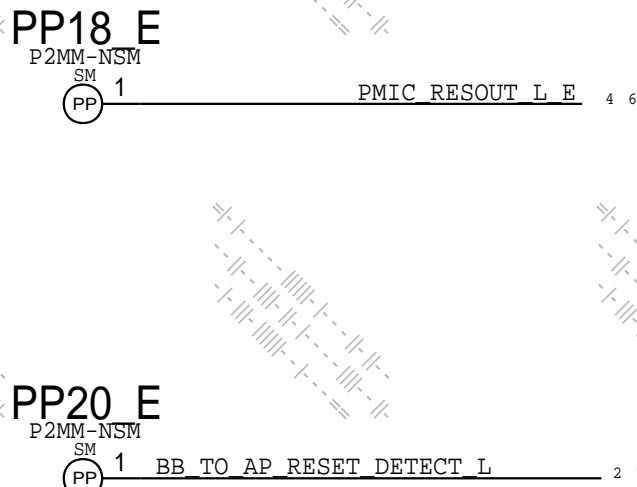


PAGE TITLE		
SIM, DEBUG CONN		
	DRAWING NUMBER	051-02159
	REVISION	10.0.0
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED		BRANCH
		PAGE
		SHEET
		21 OF 22
		73 OF 81

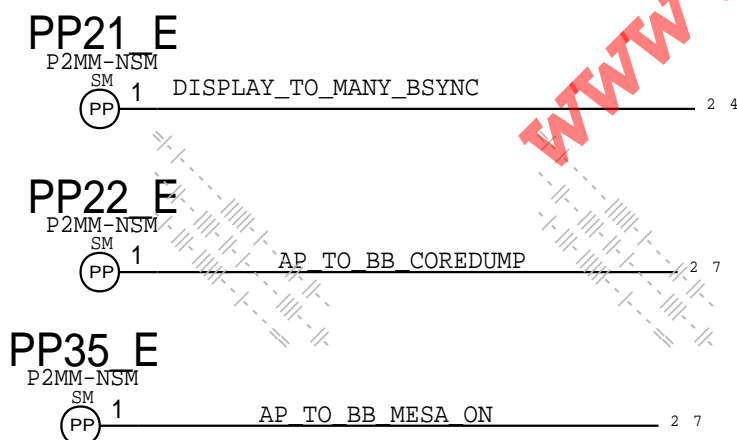
BB PROBE POINTS



PWR SEQ

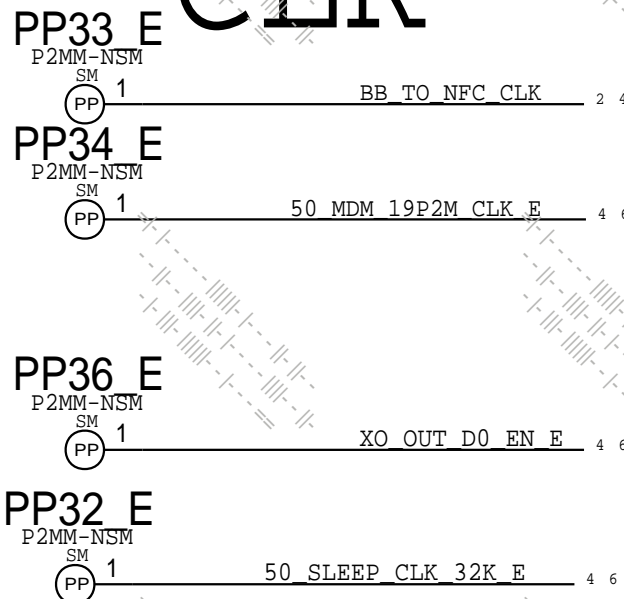


OTHERS

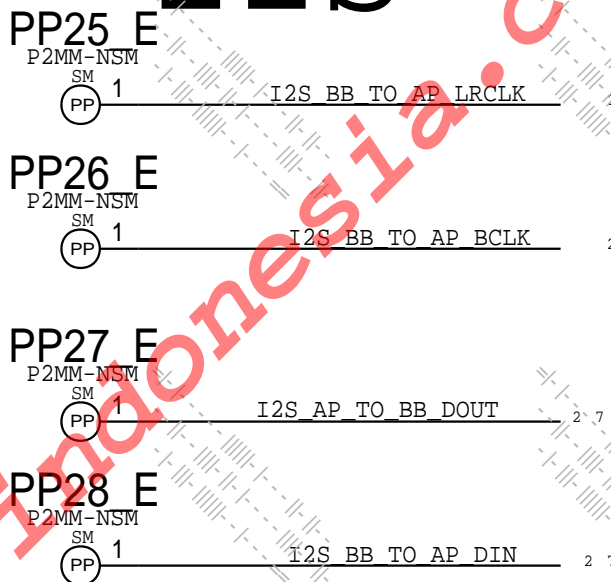


BASEBAND

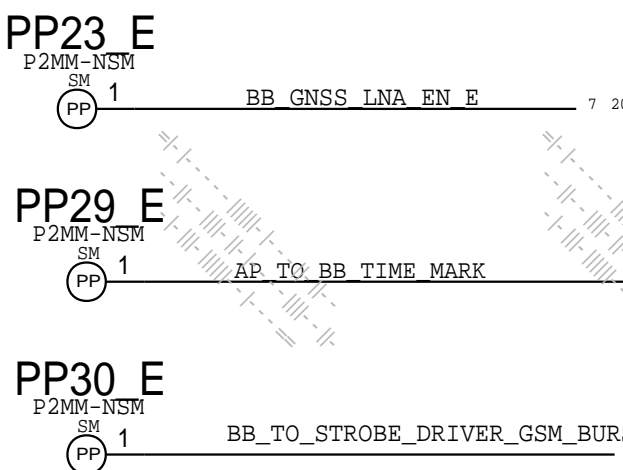
CLK



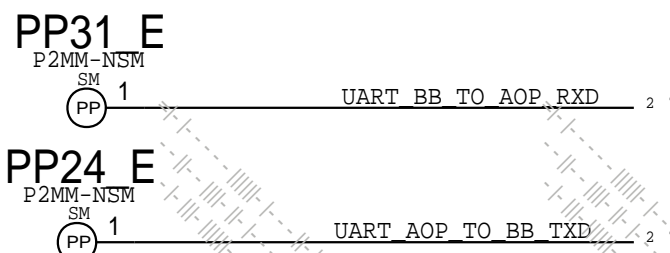
I2S



CTRL

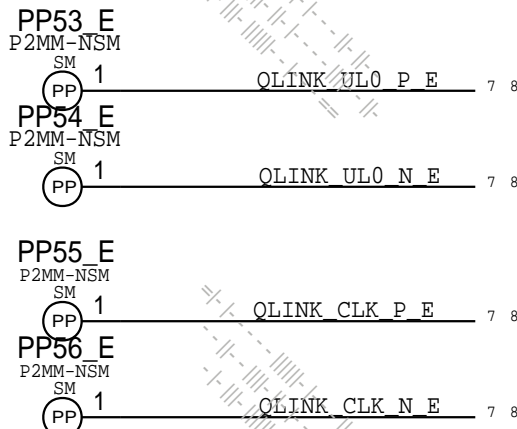


UART

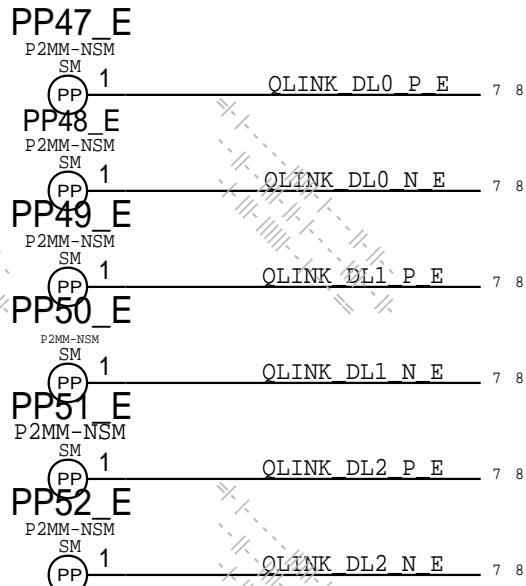


QLINK

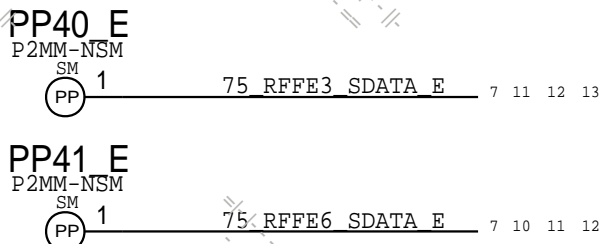
LAYOUT: VIA STUB AT WTR PINS



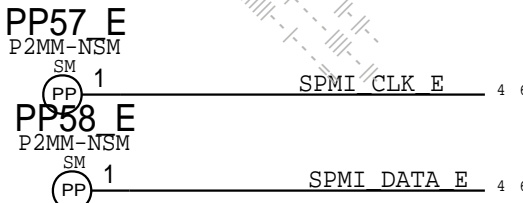
LAYOUT: VIA STUB AT BB PINS




RFFE



SPMI



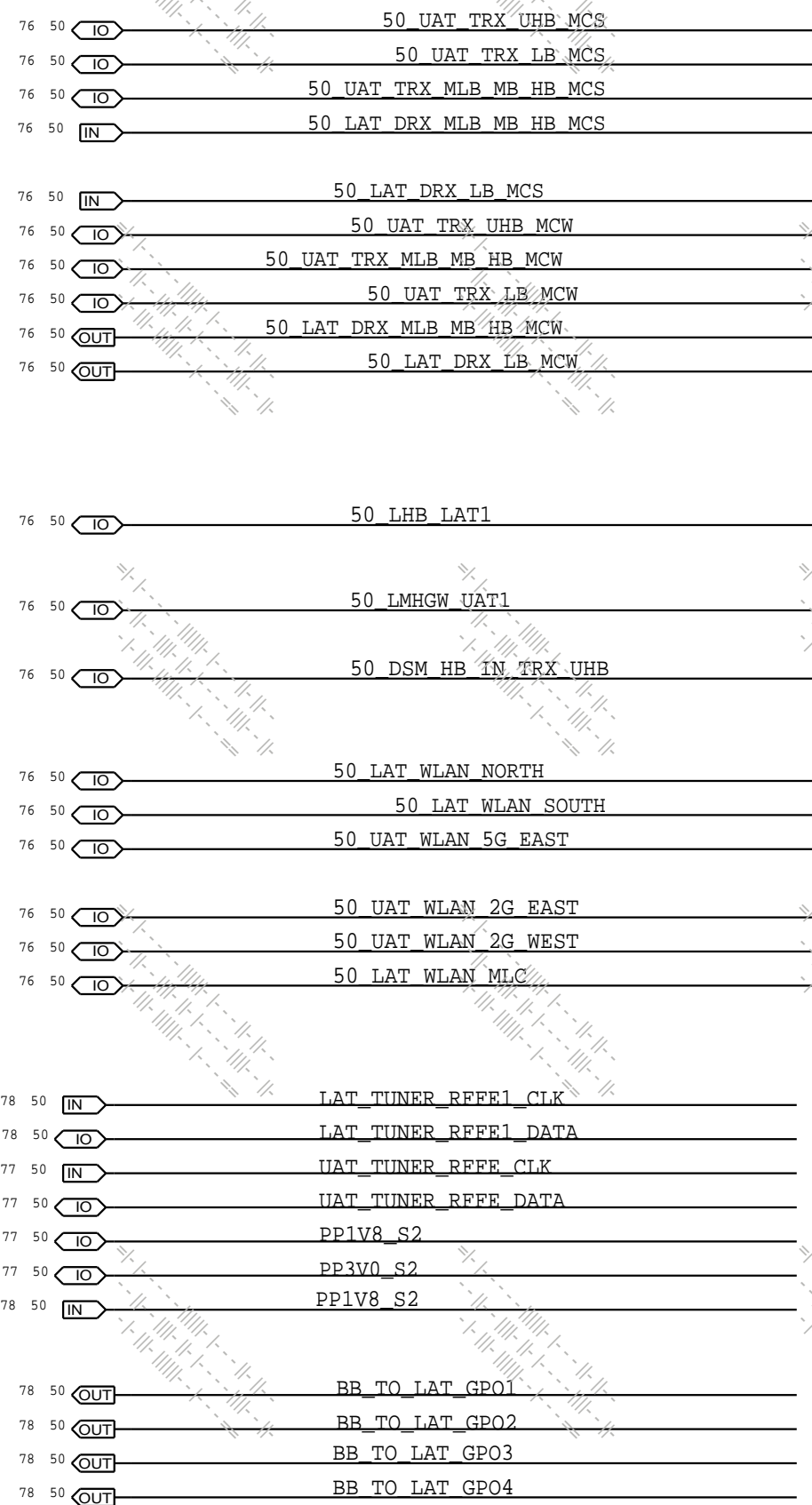
SYNC_MASTER=PROBE_POINTS		SYNC_DATE=07/18/2016		
PAGE TITLE				
TEST POINTS				
	DRAWING NUMBER		SIZE	
	051-02159		D	
<p>Apple Inc.</p> <p>NOTICE OF PROPRIETARY PROPERTY:</p> <p>THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING:</p> <p>I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE</p> <p>II NOT TO REPRODUCE OR COPY IT</p> <p>III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART</p> <p>IV ALL RIGHTS RESERVED</p>	REVISION		10.0.0	
	BRANCH			
	PAGE		22 OF 22	
	SHEET		74 OF 81	


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
10	0008927012	ENGINEERING RELEASED		2017-06-06

D21 RADIO_MLB_FF

5/22/2017

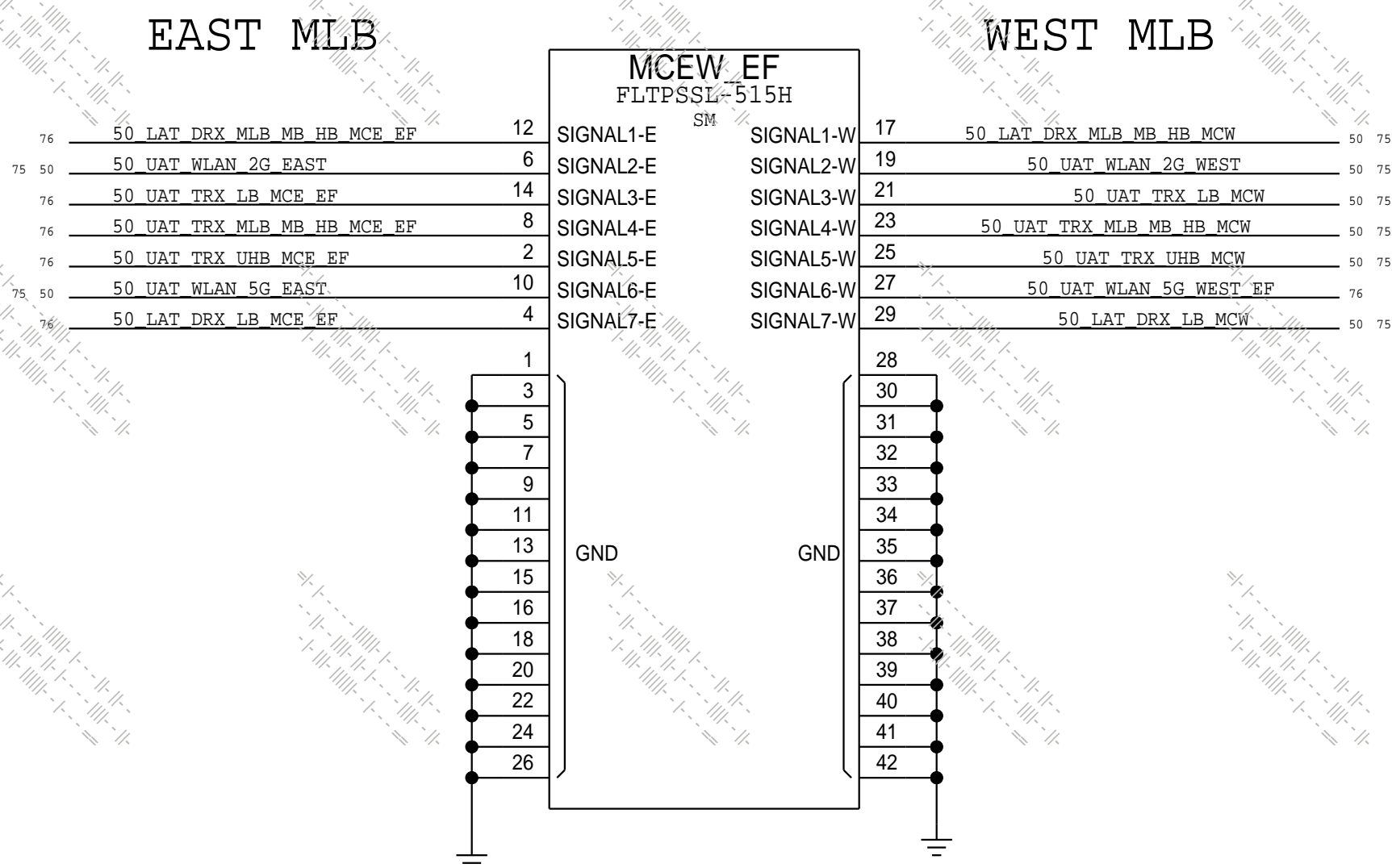
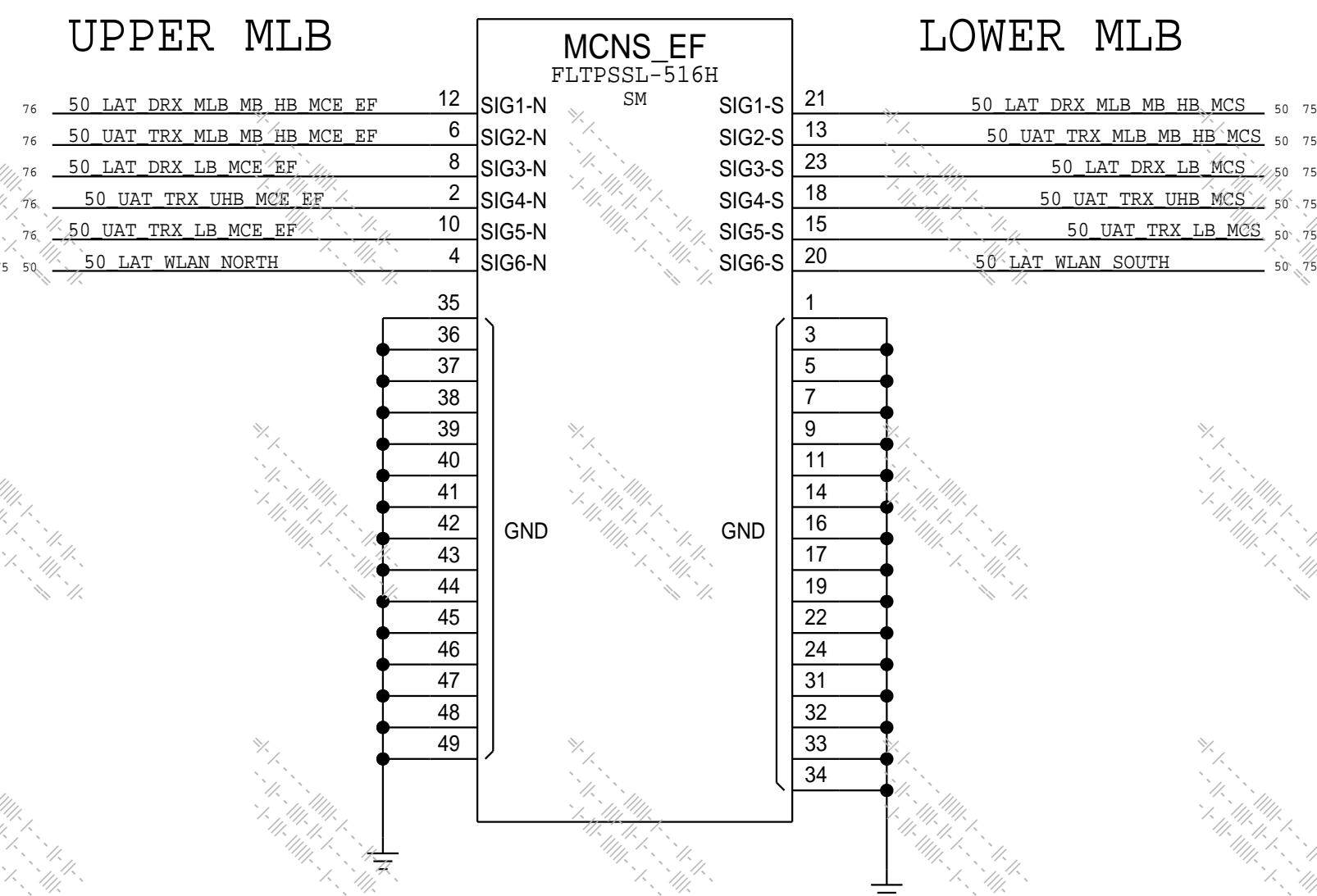


FRONT PAGE			
DRAWING TITLE		SCH, MLB, D21	
 Apple Inc.	DRAWING NUMBER		051-02159
	REVISION		10.0.0
	BRANCH		
	PAGE		1 OF 4
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED		SHEET	
		75 OF 81	

METROCIRC

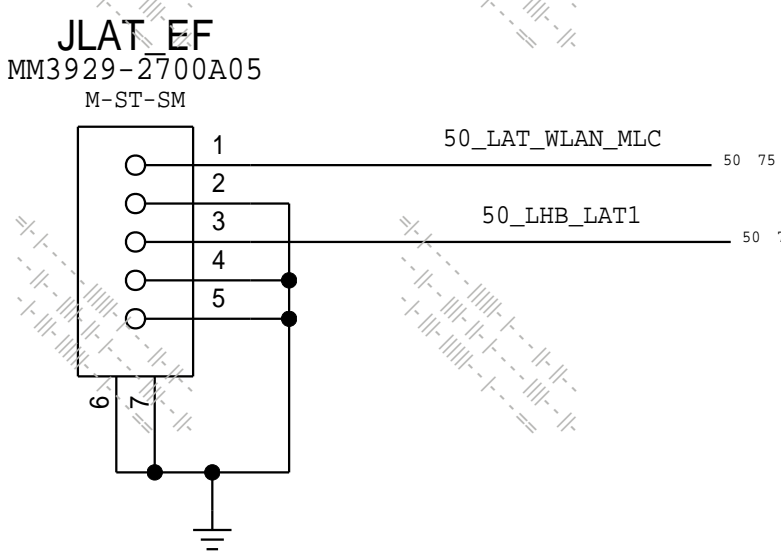
NORTH-SOUTH METROCIRC
339S00297

EAST-WEST METROCIRC
339S00296

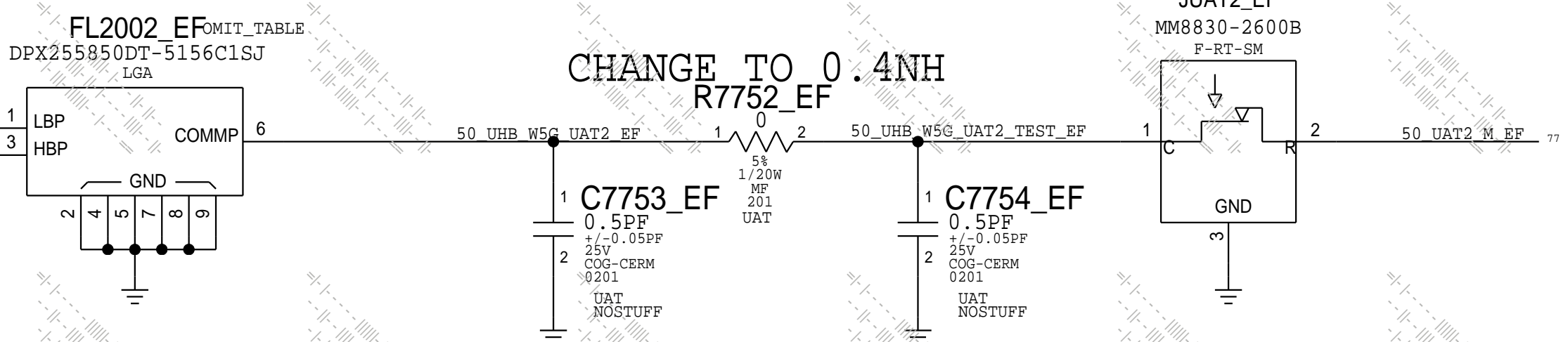
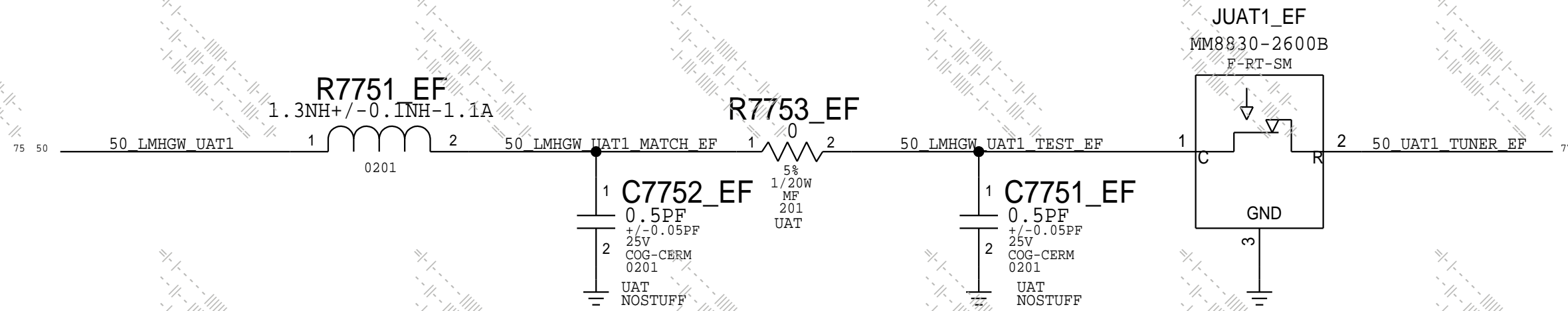


UHB/WIFI 5GHZ TEST

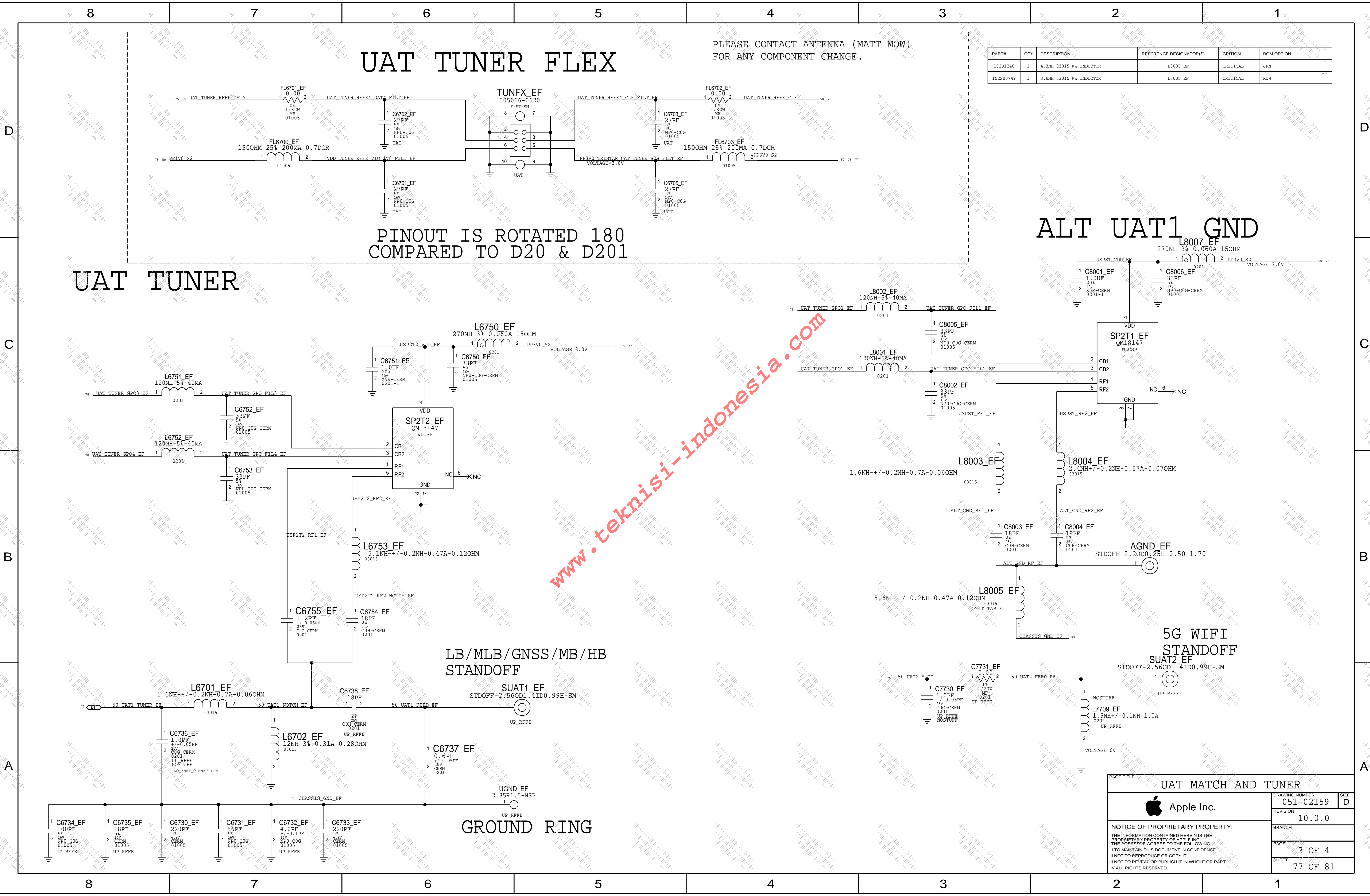
LAT MLC

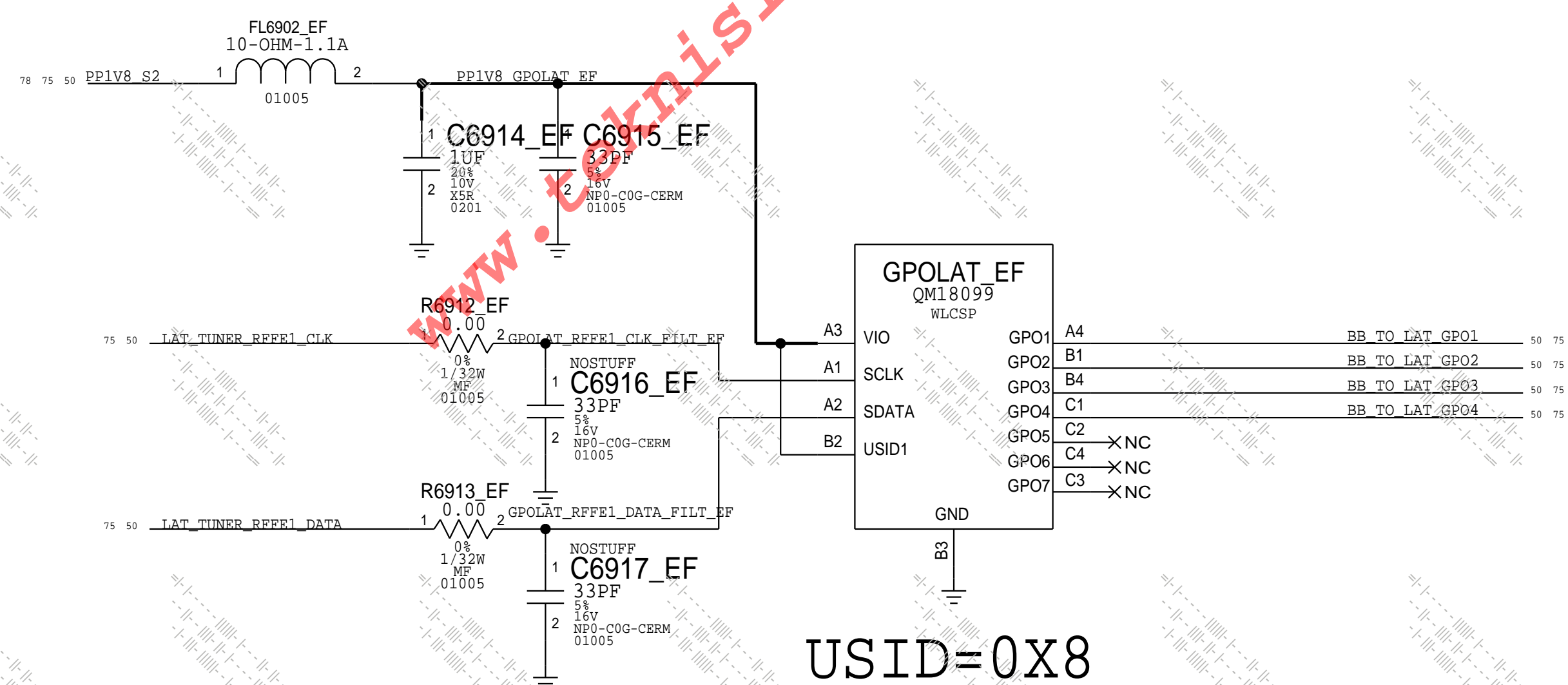
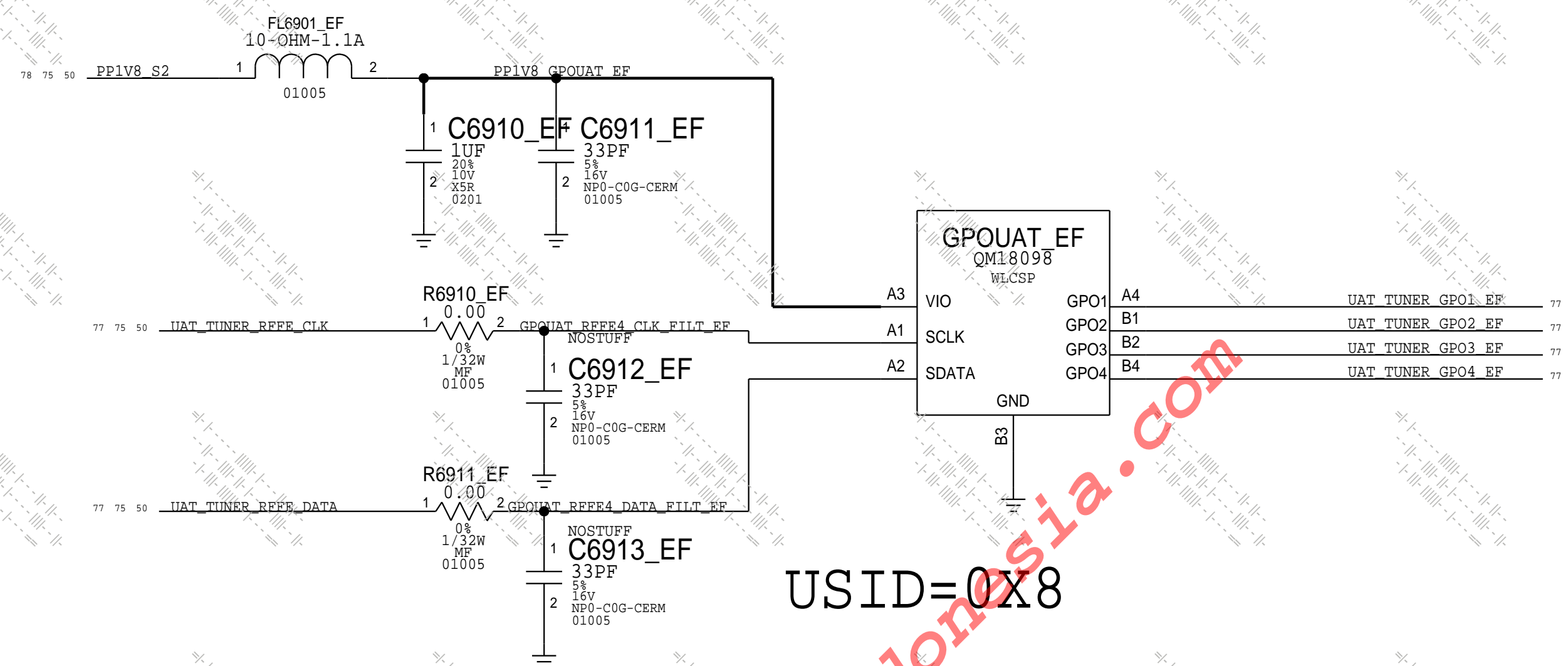


LB/MLB/MB/HB
WIFI 2.4GHZ TEST



PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
155800274	1	B42/5G DIPLEXER	FL2002_EF	CRITICAL	JPN
155800275	1	5G PASSTHROUGH	FL2002_EF	CRITICAL	ROW
131S0598	1	B42/5G DIPLEXER 5G_IN MATCH	L7751_EF	CRITICAL	JPN
131S0385	1	5G PASSTHROUGH INPUT MATCH	L7751_EF	CRITICAL	ROW





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.

D21X WIFI_MLB (GUINNESS)

NOV 28, 2016

PDF PAGE	CSA PAGE	CONTENTS
2	76	GUINNESS
3	77	WIFI FRONT-END

REV	ECN	DESCRIPTION OF REVISION	CK APPD	DATE
10	0008927012	ENGINEERING RELEASED		2017-06-06

POWER

80	50	IN	PP_VDD_MAIN
80	50	IN	PP1V8_S2

CLOCKS

80	50	IN	PMU_TO_WLAN_CLK32K
80	50	OUT	WLAN_TO_AP_TIME_SYNC

CONTROL

80	50	IN	PMU_TO_WLAN_REG_ON
80	50	IN	PMU_TO_BT_REG_ON
80	50	OUT	BT_TO_PMU_HOST_WAKE
80	50	IN	AP_TO_BT_WAKE

WLAN PCIE

80	50	IN	90_PCIE_AP_TO_WLAN_REFCLK_P
80	50	IN	90_PCIE_AP_TO_WLAN_REFCLK_N
80	50	IN	90_PCIE_AP_TO_WLAN_TXD_P
80	50	IN	90_PCIE_AP_TO_WLAN_TXD_N
80	50	OUT	90_PCIE_WLAN_TO_AP_RXD_P
80	50	OUT	90_PCIE_WLAN_TO_AP_RXD_N
80	50	IN	PCIE_AP_TO_WLAN_RESET_L
80	50	IN	PCIE_WLAN_B1_AP_CLKREQ_L
80	50	OUT	WLAN_TO_PMU_HOST_WAKE
80	50	IN	AP_TO_WLAN_DEVICE_WAKE

WLAN UART

80	50	OUT	UART_WLAN_TO_AP_RXD
80	50	IN	UART_AP_TO_WLAN_TXD
80	50	OUT	UART_WLAN_TO_AP_CTS_L
80	50	IN	UART_AP_TO_WLAN_RTS_L

BLUETOOTH UART

80	50	IN	UART_AP_TO_BT_TXD
80	50	OUT	UART_BT_TO_AP_RXD
80	50	IN	UART_AP_TO_BT_RTS_L
80	50	OUT	UART_BT_TO_AP_CTS_L

AOP

80	50	IN	AOP_TO_WLAN_CONTEXT_A
80	50	IN	AOP_TO_WLAN_CONTEXT_B


COEX

80	50	IN	UART_BB_TO_WLAN_COEX
80	50	OUT	UART_WLAN_TO_BB_COEX

ANTENNA

81	50	IN	50_UAT_WLAN_2G_EAST
81	50	IN	50_UAT_WLAN_5G_EAST
81	50	IN	50_LAT_WLAN_NORTH
81	50	IN	50_LAT_WLAN_SOUTH
81	50	IN	50_LAT_WLAN_MLC

SymbolPorts

DRAWING TITLE			
SCH, MLB, D21			
 Apple Inc.	DRAWING NUMBER	051-02159	SIZE D
	REVISION	10.0.0	
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	1 OF 5	
	SHEET	79 OF 81	

WIFI/BT

D

C

B

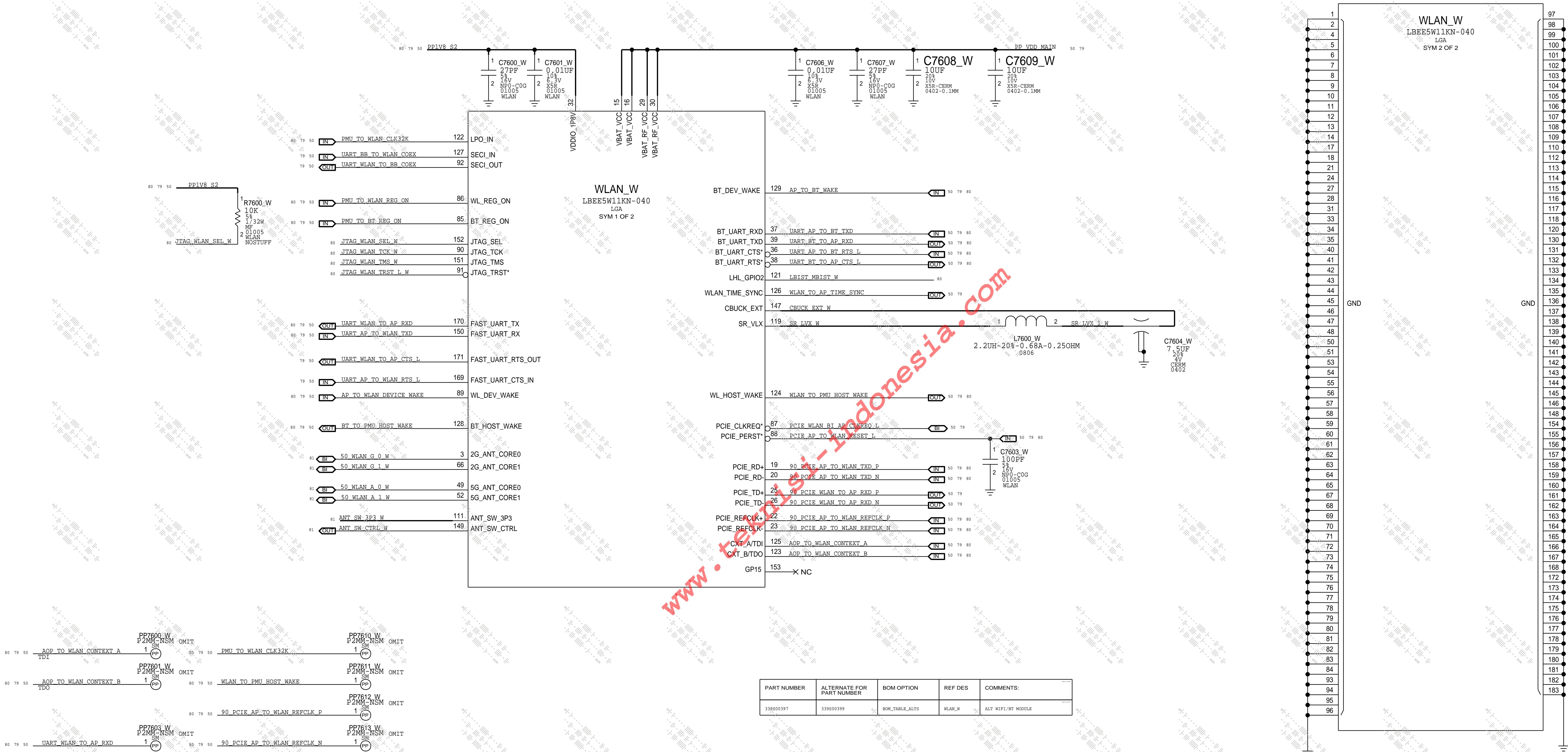
A

D

C

B

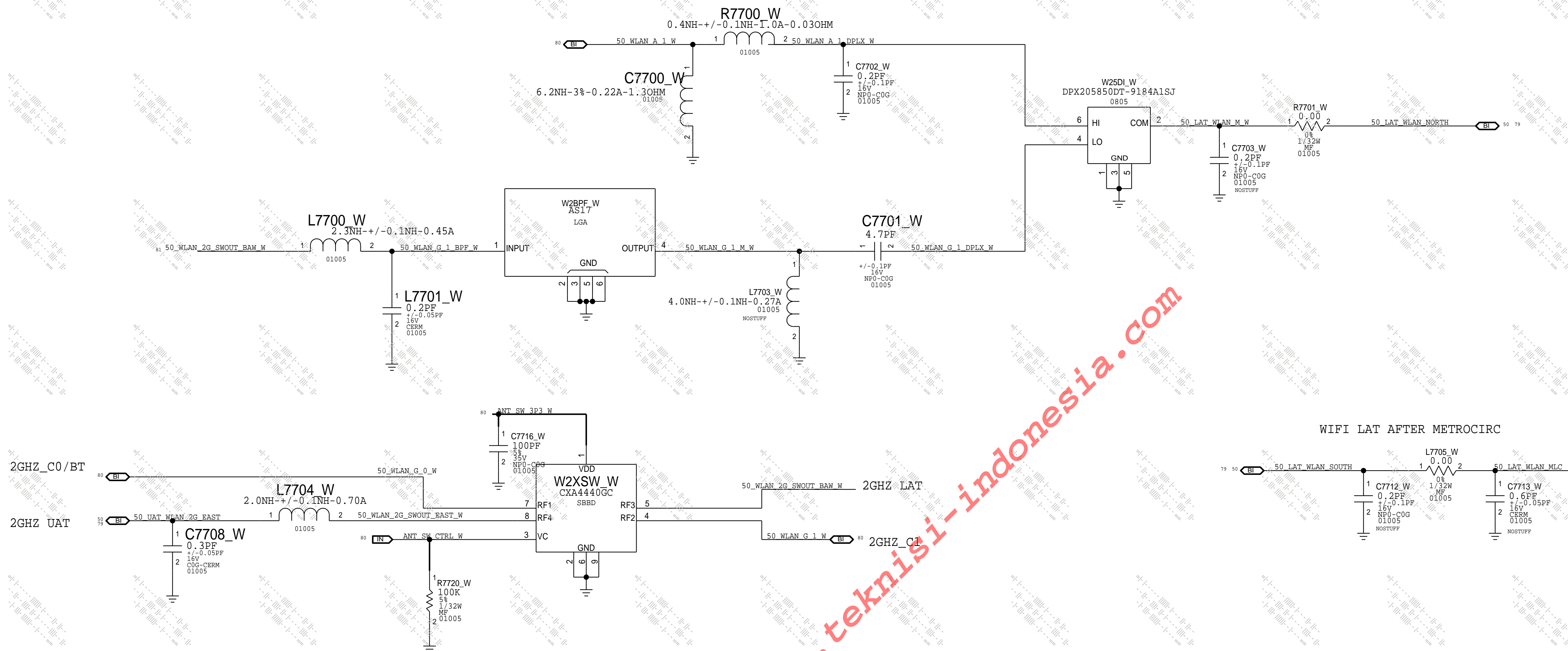
A



PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
339800397	339800399	BOM_TABLE_ALTS	WLAN_W	ALT WIFI/BT MODULE

SYNC_MASTER=WIFI		SYNC_DATE=11/28/2016	
PAGE TITLE		Guinness	
		DRAWING NUMBER	051-02159
		REVISION	10.0.0
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	4 OF 5
		SHEET	80 OF 81

WIFI LOWER ANTENNA FEED



WIFI UPPER ANTENNA FEED

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
152S00498	1	5G CORE0 BPF MATCH	R7711_W	CRITICAL	D211
117S0161	1	5G CORE0 BPF MATCH	R7711_W	CRITICAL	JFN
117S0161	1	5G CORE0 BPF MATCH	R7711_W	CRITICAL	ROW

