

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
4	0011669799	ENGINEERING RELEASED		2018-03-16

D33 MLB Bottom Ice : EVT

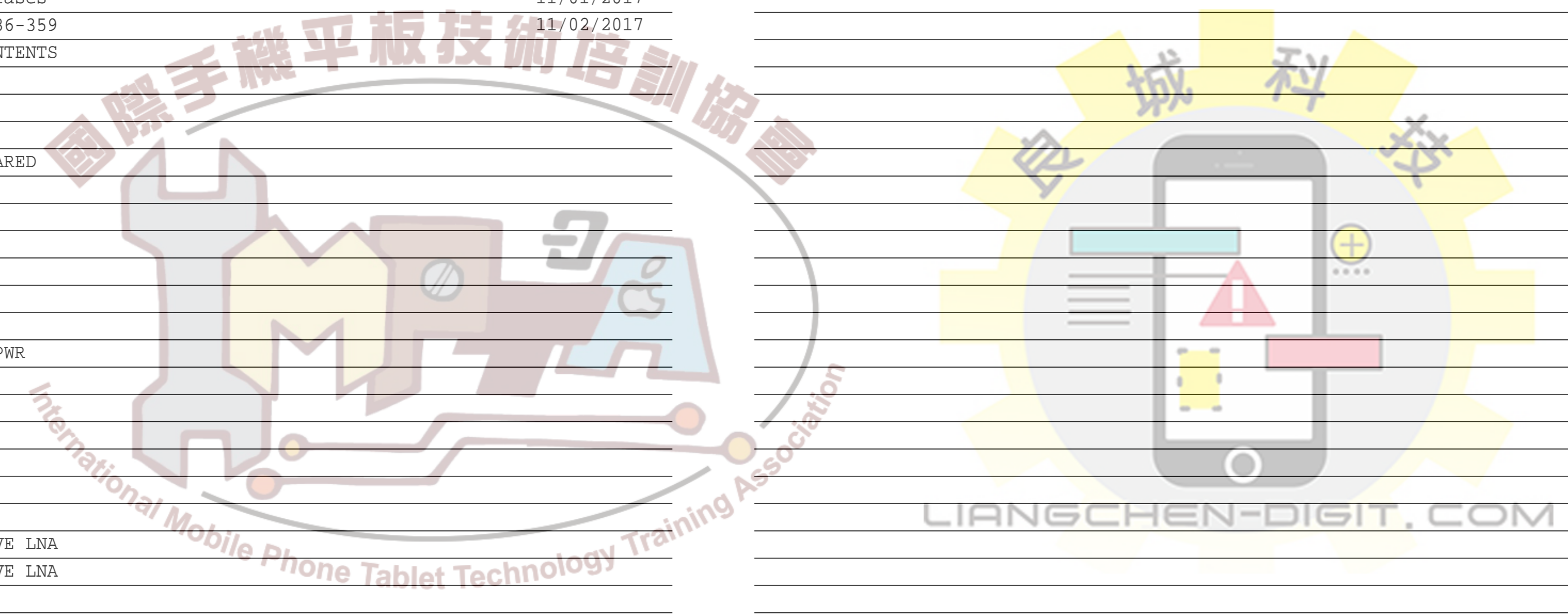
LAST_MODIFICATION=Fri Mar 16 10:21:05 2018

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MCO:056-04080
 SS ROW:639-04880
 SS JP:639-04881
 SS NA:639-05085
 SSV ROW:639-05086
 SSV JP:639-05496
 SSV NA:639-05497
 DS ROW:639-05640

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
051-02695	1	SCH_MLB_BOT_ICB,D33	SCH	CRITICAL	?
820-01063	1	PCB_MLB_BOT_ICB,D33	PCB	CRITICAL	?



Sub Designs

SOURCE PROJECT	SUB-DESIGN NAME	VERSION	HARD/ SOFT	SYNC_DATE/TIME
D32	HIER_NFC	0.43.2	S	2018_03_12_10:49:29
D33	HIER_RADIO_ICE	0.46.17	S	2018_03_12_16:55:29

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Apple Inc.	DRAWING NUMBER	051-02695
	REVISION	4.0.0
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	PAGE	1 OF 85
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EEEE Codes

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
825-7691	1	EEEE (MLB_BOT_ICE_SS_ROW_639-04880)	EEEE_J90J	CRITICAL	SSROW
825-7691	1	EEEE (MLB_BOT_ICE_SS_JP_639-04881)	EEEE_J90K	CRITICAL	SSJP
825-7691	1	EEEE (MLB_BOT_ICE_SS_NA_639-05085)	EEEE_J059	CRITICAL	SSNA
825-7691	1	EEEE (MLB_BOT_ICE_SSV_ROW_639-05086)	EEEE_J059	CRITICAL	SSVROW
825-7691	1	EEEE (MLB_BOT_ICE_SSV_JP_639-05496)	EEEE_JM18	CRITICAL	SSVJP
825-7691	1	EEEE (MLB_BOT_ICE_SSV_NA_639-05497)	EEEE_JM19	CRITICAL	SSVNA
825-7691	1	EEEE (MLB_BOT_ICE_DS_ROW_639-05640)	EEEE_JN5M	CRITICAL	DSROW

Global Capacitors

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
138S00148	138S00149	BOM_TABLE_ALTS	ALL	0402-3T,10.5uF@1V, Kyocera
138S00150	138S00149	BOM_TABLE_ALTS	ALL	0402-3T,10.5uF@1V, SEMCO
138S00151	138S00149	BOM_TABLE_ALTS	ALL	0402-3T,10.5uF@1V, TY

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

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
685-00243	685-00182	BOM_TABLE_ALTS	SUBBOM_DS	(FROM MLB_BOT_22000_00000_2001)

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
138S00143	138S00144	BOM_TABLE_ALTS	ALL	0402,16uF@1V, Kyocera
138S00163	138S00144	BOM_TABLE_ALTS	ALL	0402,16uF@1V, Taiyo

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

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
685-00242	1	SUBBOM_MLB_BOT_DIODES_DIODES_X891	SUBBOM_DS	CRITICAL	COMMON
371S00133	4	DIODES_SHOTTKY DIODE_30V_2A_0603	D3400,D3401,D3402,D3403	CRITICAL	DIODES_DS
371S00189	4	DIODES_SHOTTKY DIODE_30V_2A_0603	D3400,D3401,D3402,D3403	CRITICAL	DIODES_DS

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
138S00138	138S00139	BOM_TABLE_ALTS	ALL	0201,3uF@1V, Kyocera
138S00164	138S00139	BOM_TABLE_ALTS	ALL	0201,3uF@1V, Taiyo

CRITICAL PART#	COMMENT
138S00139	0201,3uF@1V

Hall Effect Alts

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
138S00221	138S00146	BOM_TABLE_ALTS	ALL	0402,5.1uF@3V, Kyocera

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

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
359S001327	353S3697	BOM_TABLE_ALTS	ALL	ROHM 885

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
138S00140	138S00141	BOM_TABLE_ALTS	ALL	0201,1.1uF@3V, Kyocera
138S00142	138S00141	BOM_TABLE_ALTS	ALL	0201,1.1uF@3V, SEMCO
138S00166	138S00141	BOM_TABLE_ALTS	ALL	0201,1.1uF@3V, Taiyo

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

IKTARA

Global Ferrites

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
152S00558	152S00557	BOM_TABLE_ALTS	ALL	IND_MLD,0.47UH,20A,2.5A,80MD,160H
155S00194	155S0610	BOM_TABLE_ALTS	ALL	FERR_BD,150 OHM,25A,200MA,0.7 DCR,01005
155S00200	155S0610	BOM_TABLE_ALTS	ALL	FERR_BD,150 OHM,25A,200MA,0.7 DCR,01005
155S00338	155S0661	BOM_TABLE_ALTS	ALL	FERR_BD,150 OHM,25A,200MA,0.7 DCR,01005

CRITICAL PART#	COMMENT
152S00557	IND_MLD,0.47UH,20A,2.5A,80MD,160H
155S0610	FERR_BD,150 OHM,25A,200MA,0.7 DCR,01005
155S0661	FERR_BD,150 OHM,25A,200MA,0.7 DCR,01005

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
116S00002	6	RES, High Current 0 Ohm	C1461,C1462,C1463,C1464,C1465,C1466	CRITICAL	UNBALNACED CAPS
132S00186	1	CAP, 0.033uF, 10V, 100V, 2X6S	C1461	CRITICAL	UNBALNACED CAPS
132S00187	3	CAP, 0.047uF, 10V, 100V, 2X6S	C1462,C1463,C1466	CRITICAL	UNBALNACED CAPS

Global R/C Alternates

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
138S0648	138S0652	BOM_TABLE_ALTS	ALL	CAP_XSR,4.7UF,6.3V,0.65MM,0402,TAIYO
138S00024	138S0986	BOM_TABLE_ALTS	ALL	CAP_CER,2.2UF,20V,4V,0402,TAIYO/TK
138S0706	138S0739	BOM_TABLE_ALTS	ALL	CAP_CER,1UF,20V,10V,XSR,0201,MIKATA
138S0945	138S0739	BOM_TABLE_ALTS	ALL	CAP_CER,1UF,20V,10V,XSR,0201,MIKATA
138S0739	138S0706	BOM_TABLE_ALTS	ALL	CAP_CER,2.2UF,20V,4V,0402,TAIYO/TK
138S00049	138S0831	BOM_TABLE_ALTS	ALL	CAP_CER,2.2UF,20V,4V,0402,TAIYO/TK
138S00133	138S00128	BOM_TABLE_ALTS	ALL	CAP_XSR,2.2UF,20V,6.3V,0201
138S00116	138S00071	BOM_TABLE_ALTS	ALL	CAP_XSR,4UF,20V,6.3V,KYO,01005
138S00117	138S00071	BOM_TABLE_ALTS	ALL	CAP_XSR,4UF,20V,6.3V,KYO,01005
138S00048	138S00003	BOM_TABLE_ALTS	ALL	CAP_XSR,15UF,20V,6.3V,0.65MM,MRZTL,0402
131S00172	131S00164	BOM_TABLE_ALTS	ALL	CAP_CER,COG,220PF,5A,16V,01005
131S00173	131S00164	BOM_TABLE_ALTS	ALL	CAP_CER,COG,220PF,5A,16V,01005
131S00185	131S0316	BOM_TABLE_ALTS	ALL	CAP_CER,COG,220PF,5A,16V,01005
138S00048	138S00003	BOM_TABLE_ALTS	ALL	CAP_XSR,15UF,20V,6.3V,0.65MM,MRZTL,0402
132S00185	132S0316	BOM_TABLE_ALTS	ALL	CAP_CER,COG,220PF,5A,16V,01005

CRITICAL PART#	COMMENT
138S0652	CAP_XSR,4.7UF,6.3V,0.65MM,0402,TAIYO
138S0986	CAP_CER,2.2UF,20V,4V,0402,TAIYO/TK
138S0739	CAP_CER,1UF,20V,10V,XSR,0201,MIKATA
138S0706	CAP_CER,2.2UF,20V,4V,0402,TAIYO/TK
132S0400	CAP_CER,2.2UF,20V,4V,0402,TAIYO/TK
138S0831	CAP_CER,2.2UF,20V,6.3V,0201
138S00128	CAP_XSR,2.2UF,20V,6.3V,KYO,01005
138S00071	CAP_XSR,4UF,20V,6.3V,0201,4.0,55MM
138S00003	CAP_XSR,15UF,20V,6.3V,0.65MM,MRZTL,0402
131S00164	CAP_CER,COG,220PF,5A,16V,01005


Multi-Vendor Criticals

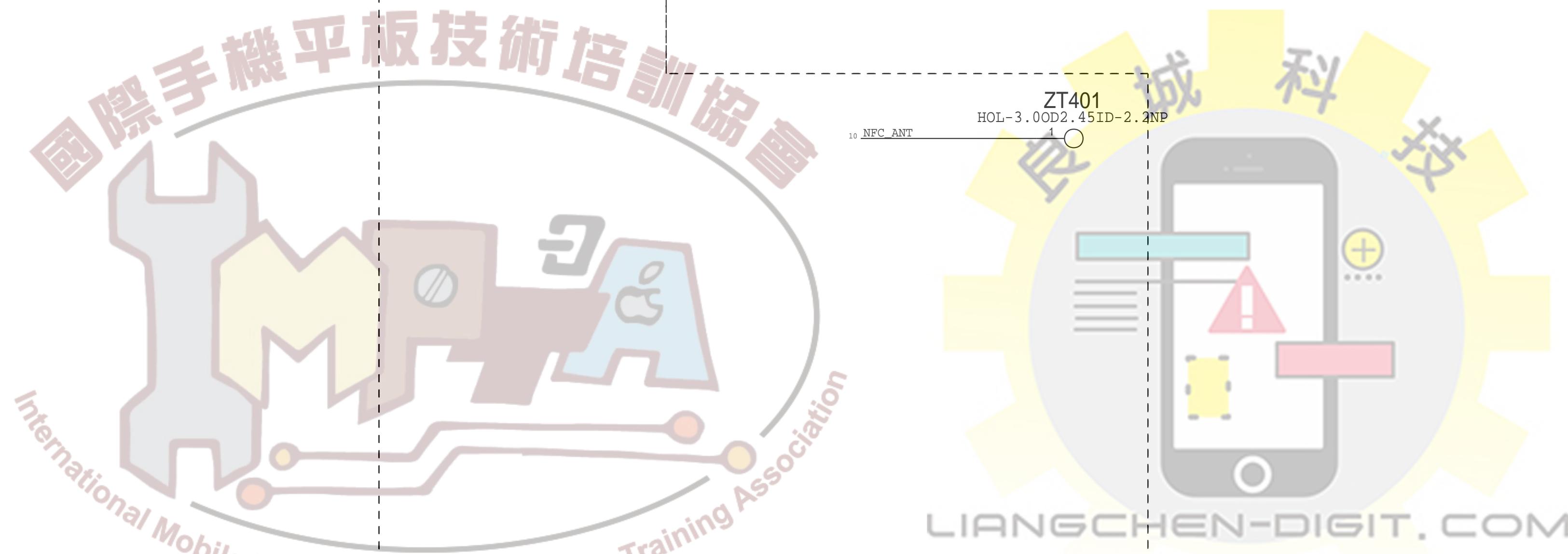
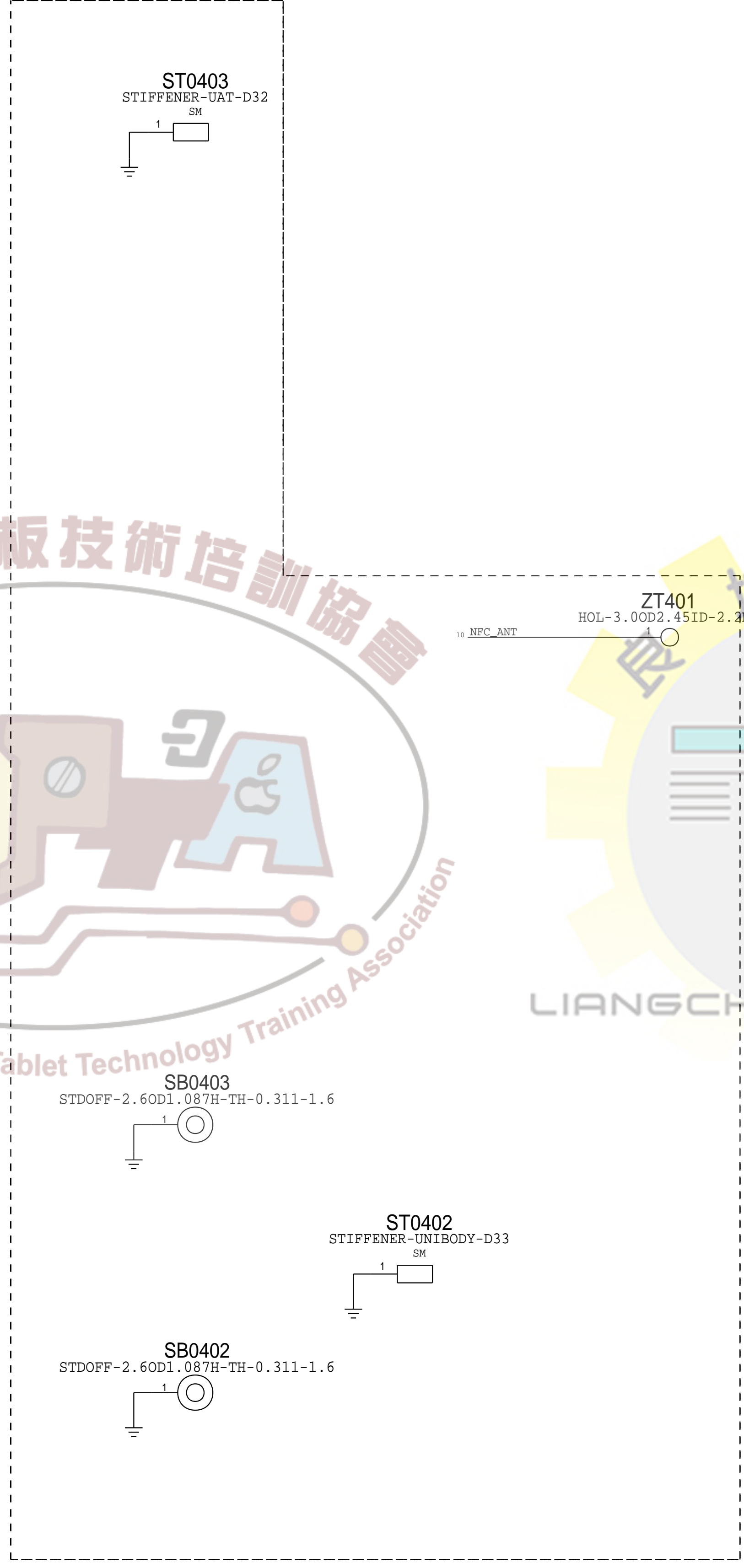
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138S0979	CAP_CER,XSR,10UF,20V,10V,0402,H=0.65MM	132S00008	CAP_CER,0.1UF,10V,50V,XTR,0402
138S0683	CAP_CER,XSR,1UF,10V,25V,0402	131S0804	CAP_CER,27PF,5A,COG,25V,0201
132S0663	CAP_CER,XSR,1UF,10V,25V,0402	131S0307	CAP_CER,NPO/COG,100PF,5A,16V,01005
132S0288	CAP_CER,XSR,0.1UF,10V,16V,0201	131S00053	CAP_CER,COG,220PF,5A,10V,01005
132S0275	CAP_CER,XSR,470PF,10V,10V,01005	117S0055	RES,MP,1/20W,2M OHM,5,0201,SMD
132S0245	CAP_CER,XSR,0.01UF,10V,6.3V,01005	107S0257	THERMISTOR,NTC,10K OHM,1A,B=3435,01005
138S0692	CAP_CER,XSR,1UF,20V,6.3V,0201	131S00170	CAP_CER,COG,220PF,5A,25V,01005
		131S0643	CAP_CER,NPO/COG,54PF,5A,25V,01005
		131S0316	CAP_CER,XSR,0.1UF,20V,6.3V,01005

Global Inductors

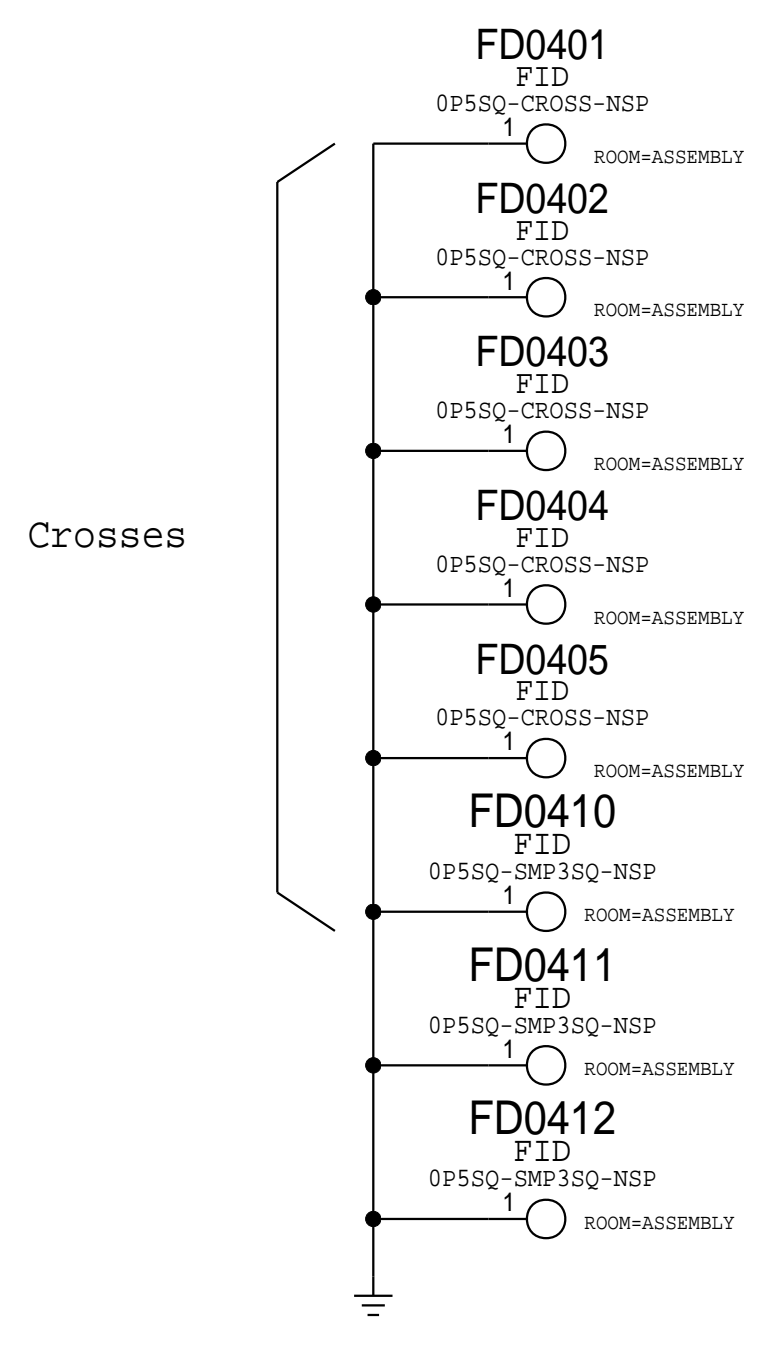
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CRITICAL PART#	COMMENT
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PAGE TITLE		SYSTEM:BOM Tables	
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FIDUCIALS FIDUCIALS



PAGE TITLE			SYSTEM: Mechanical Components		
Apple Inc.	DRAWING NUMBER	051-02695	SIZE	D	
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			SHEET	3 OF 47	

BOOTSTRAPPING:BOARD ID[3]



11 BOARD_ID2
CEPLUS_MALIVE+SINGLE_MODEM

SELECTED-->

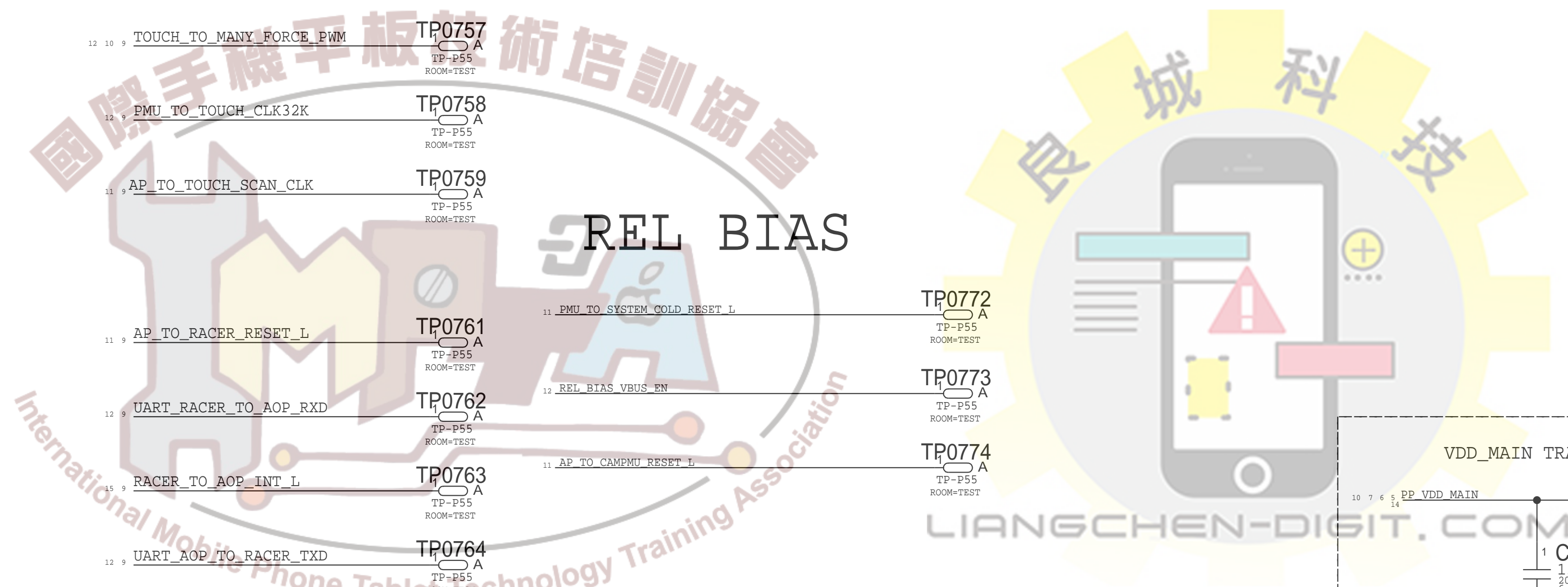
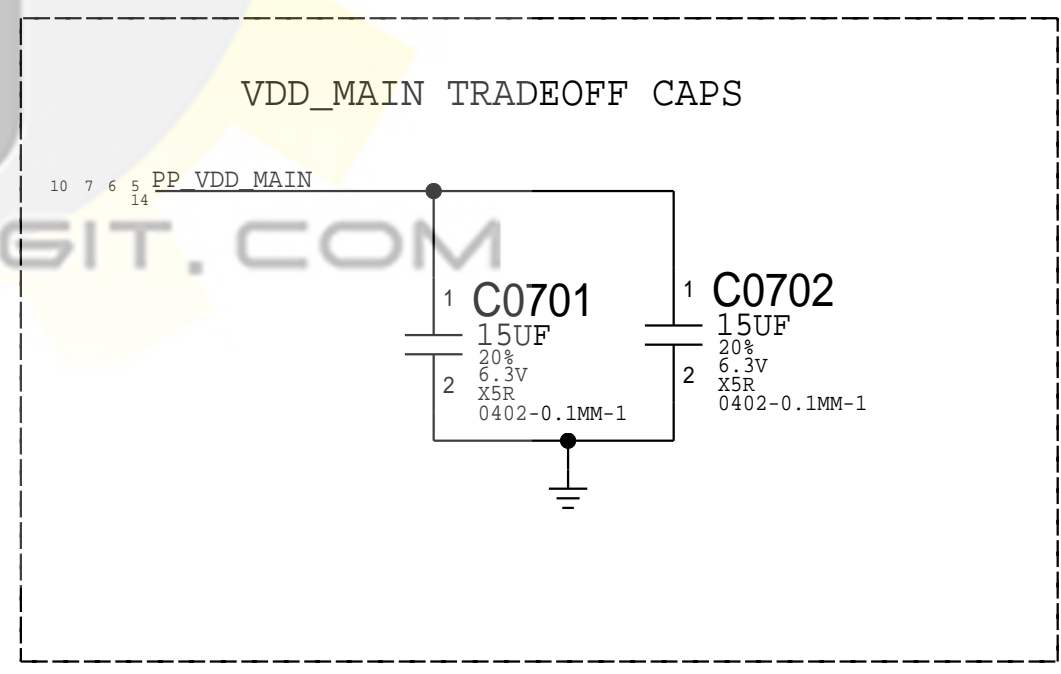
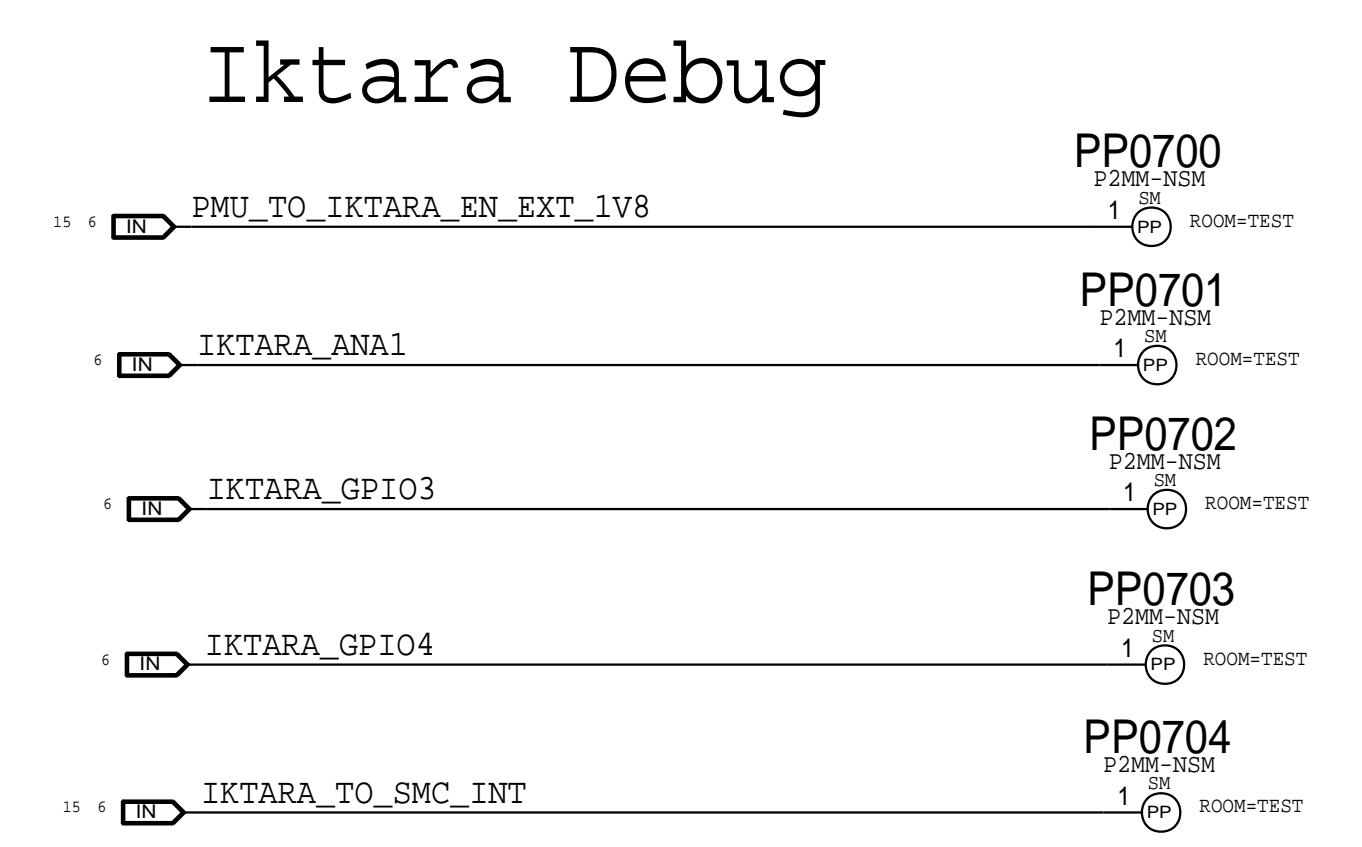
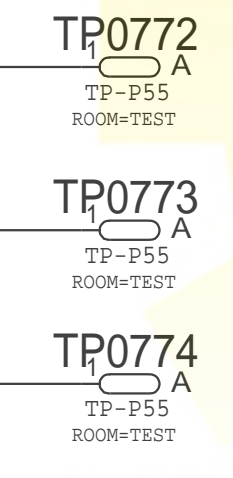
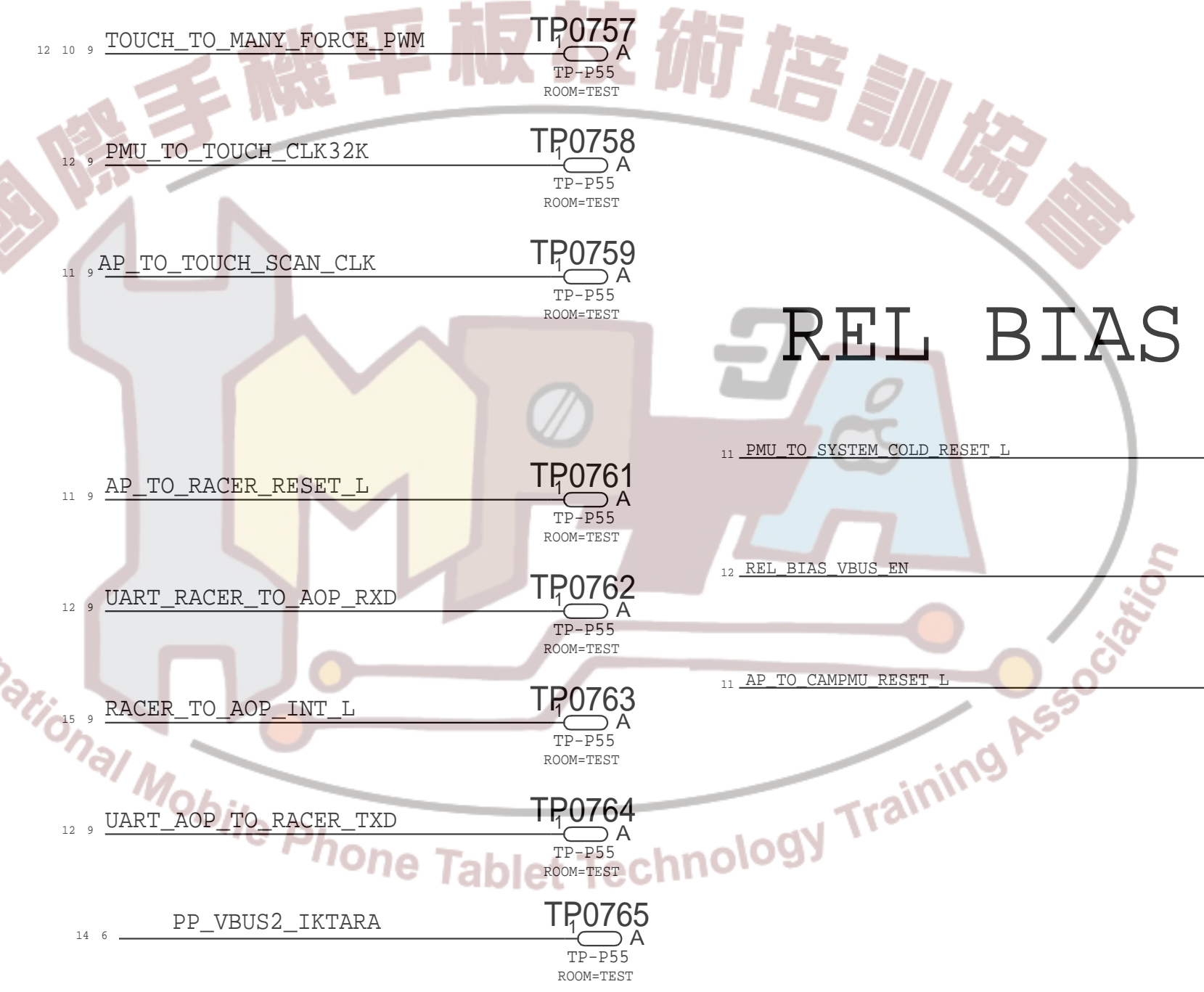
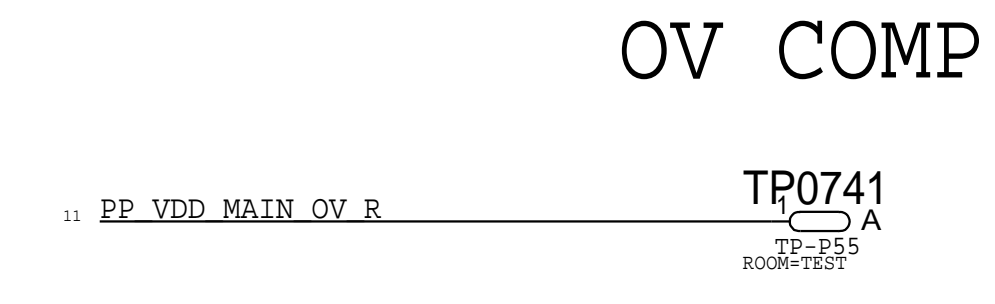
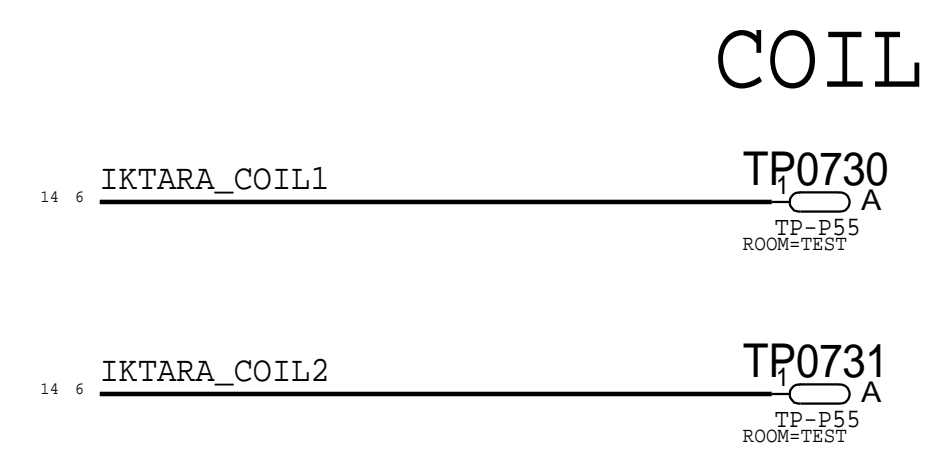
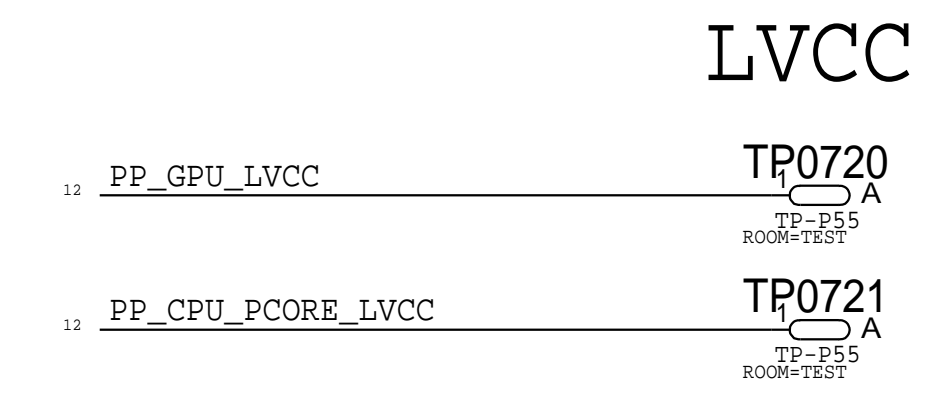
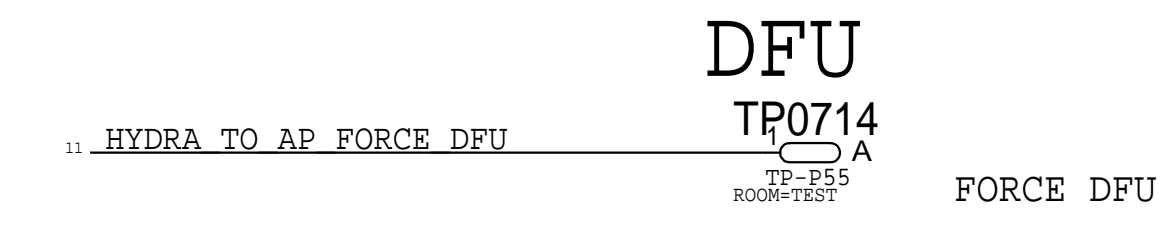
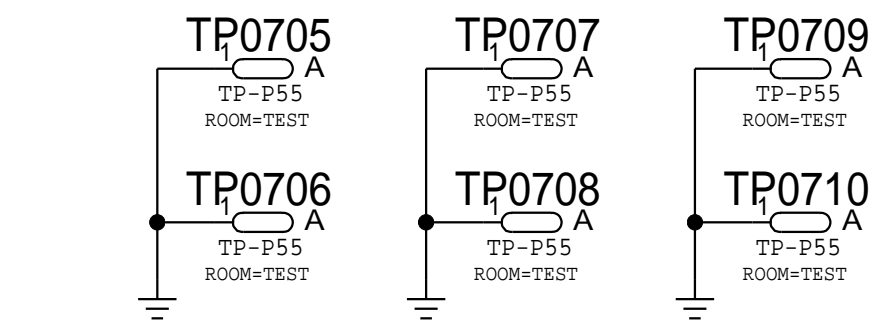
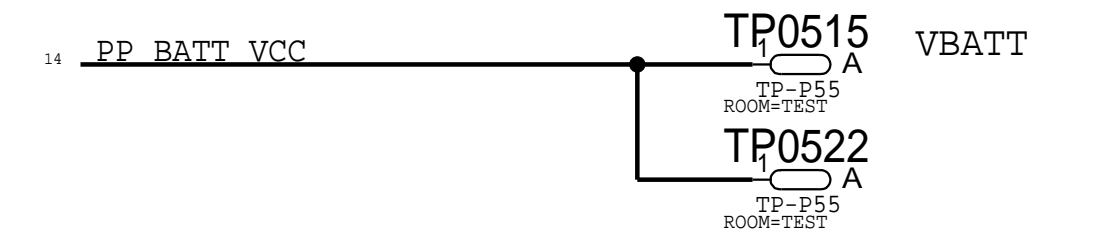
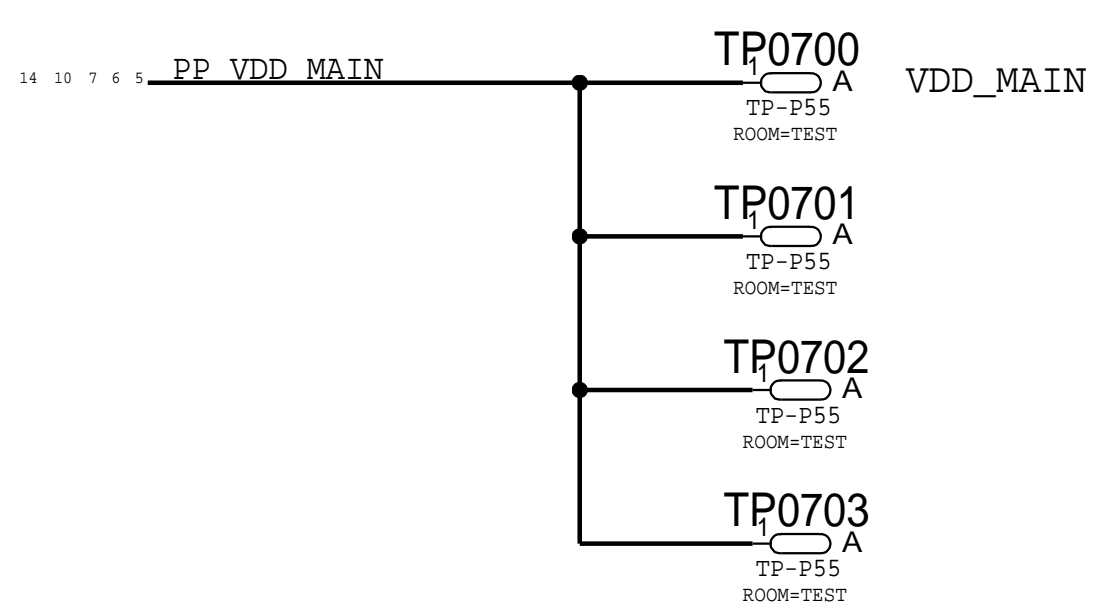
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	Denali = 0, Imola = 1	Mav = 0, Ice = 1	00=Open 01=D33 10=N84 11=D32	MLB = 0, Dev = 1	
D33 MLB Mav	0		0	1	0
D33p MLB Mav	1	0	0	1	0
D33 Dev Mav	0	0	0	1	1
D33p Dev Mav	1	0	0	1	1
D33 MLB Ice	0	1	0	1	0
D33p MLB Ice	1	1	0	1	0
D33 Dev Ice	0	1	0	1	1
D33p Dev Ice	1	1	0	1	1
D32 MLB Mav	0	0	1	1	0
D32 Dev Mav	0	0	1	1	1
D32 MLB Ice	0	1	1	1	0
D32 Dev Ice	0	1	1	1	1

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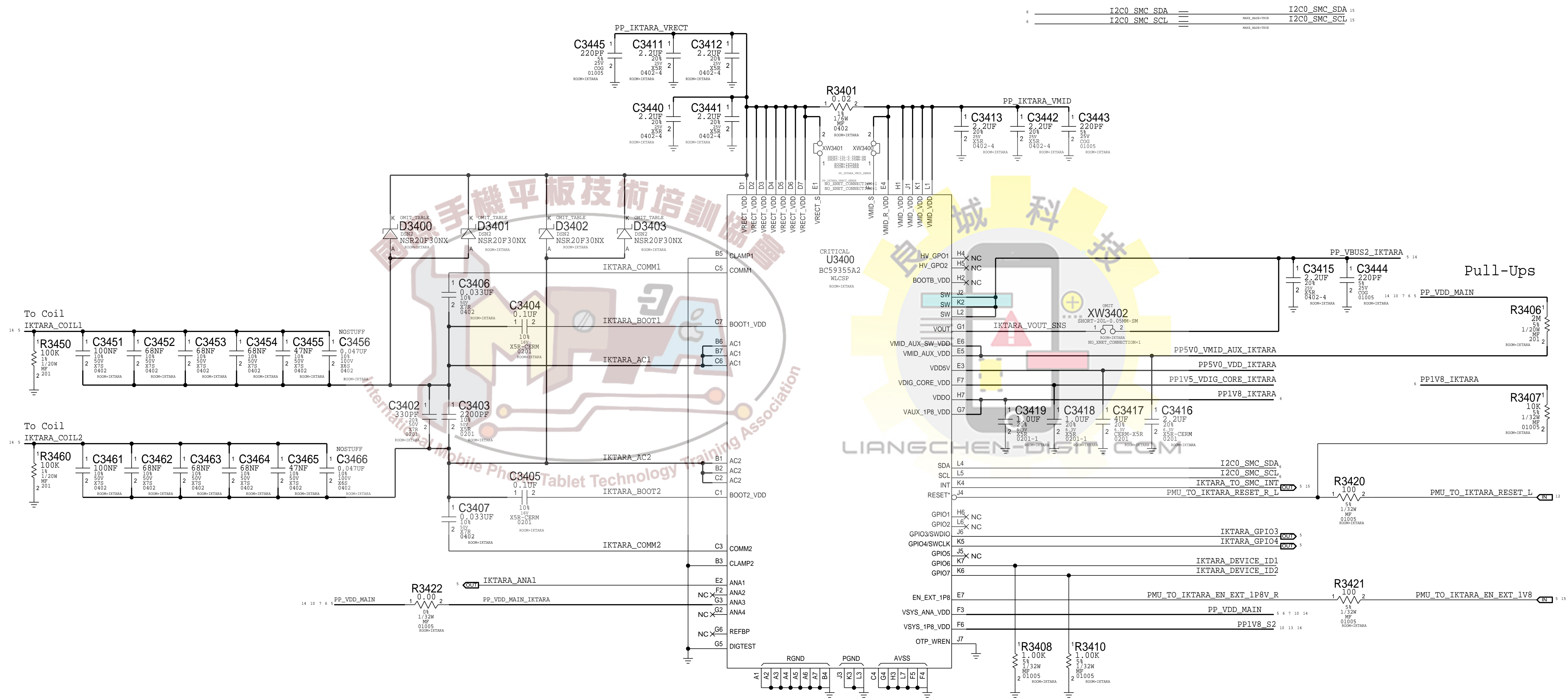
Test Points

Probe Points



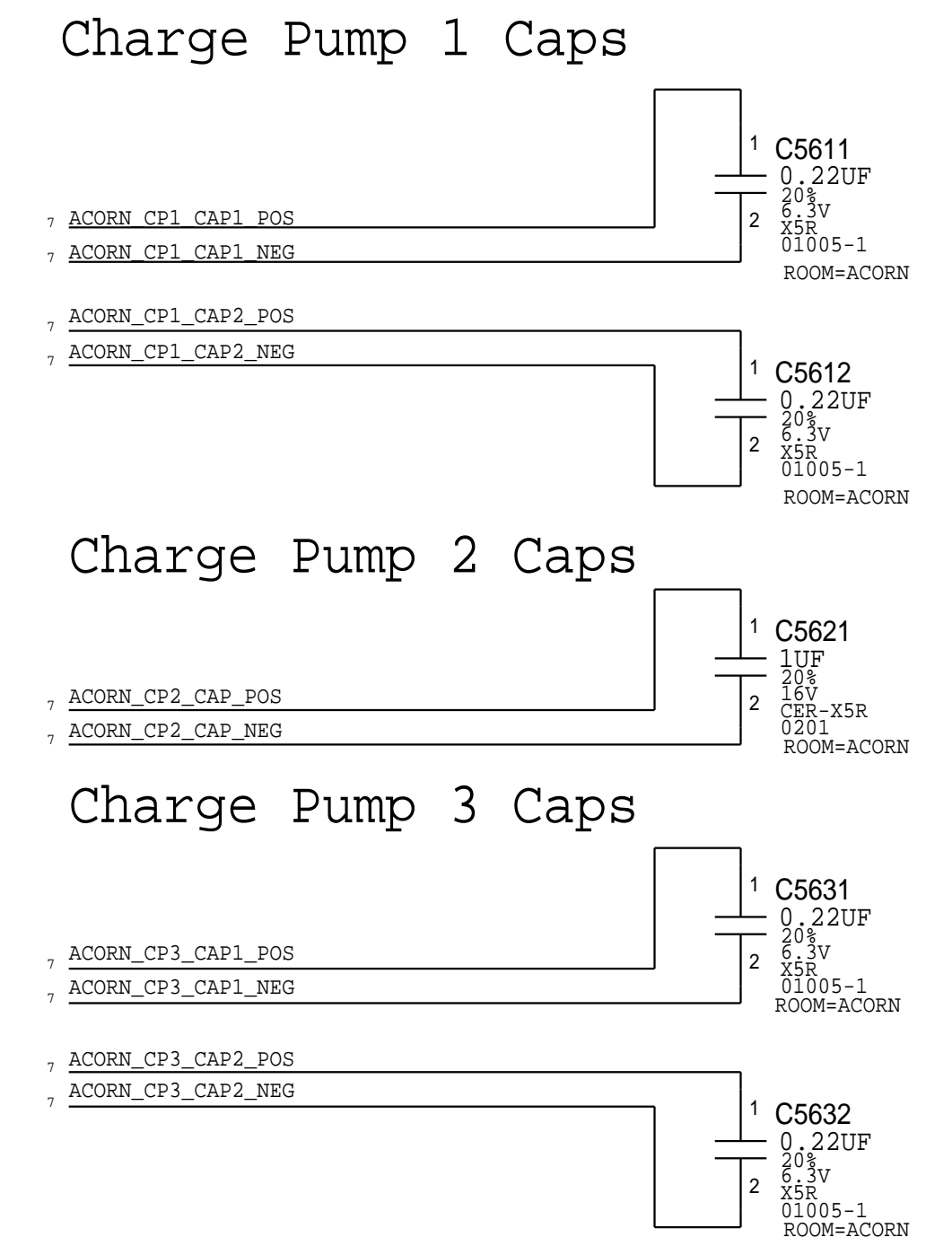
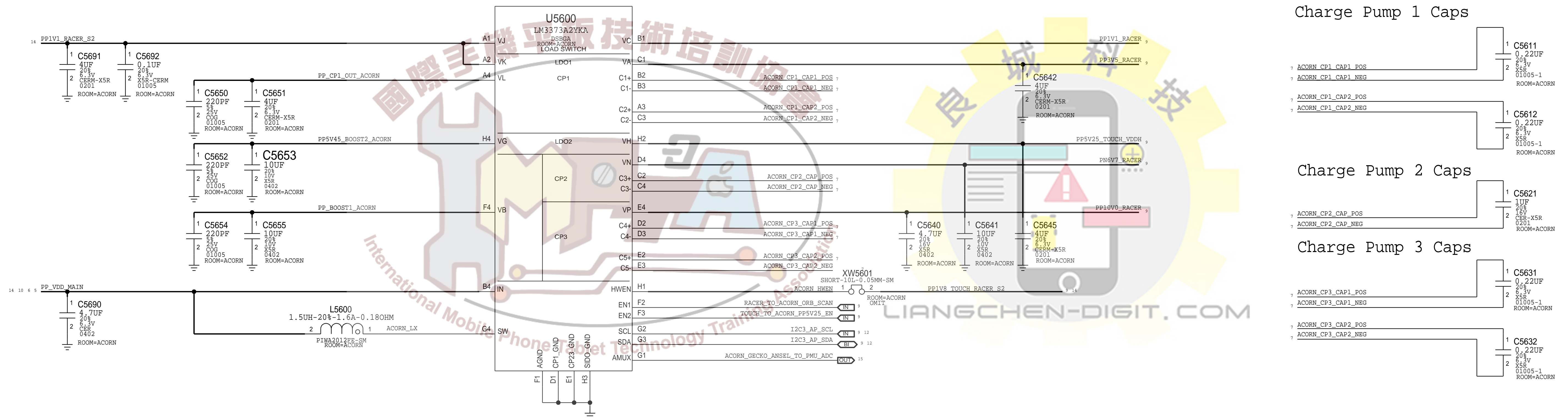
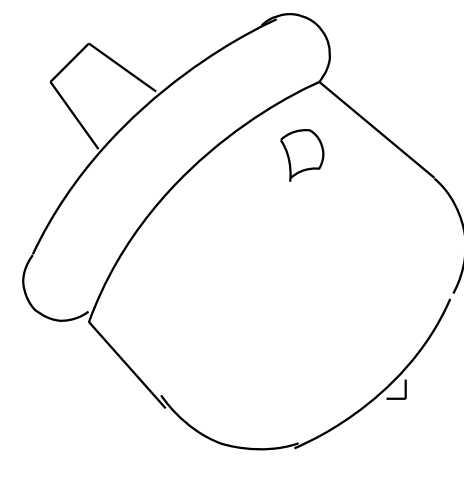
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Iktara



PAGE TITLE		
SYSTEM POWER: Iktara		
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Acorn PMU



PAGE TITLE CG: Power Supplies - Touch & Display		
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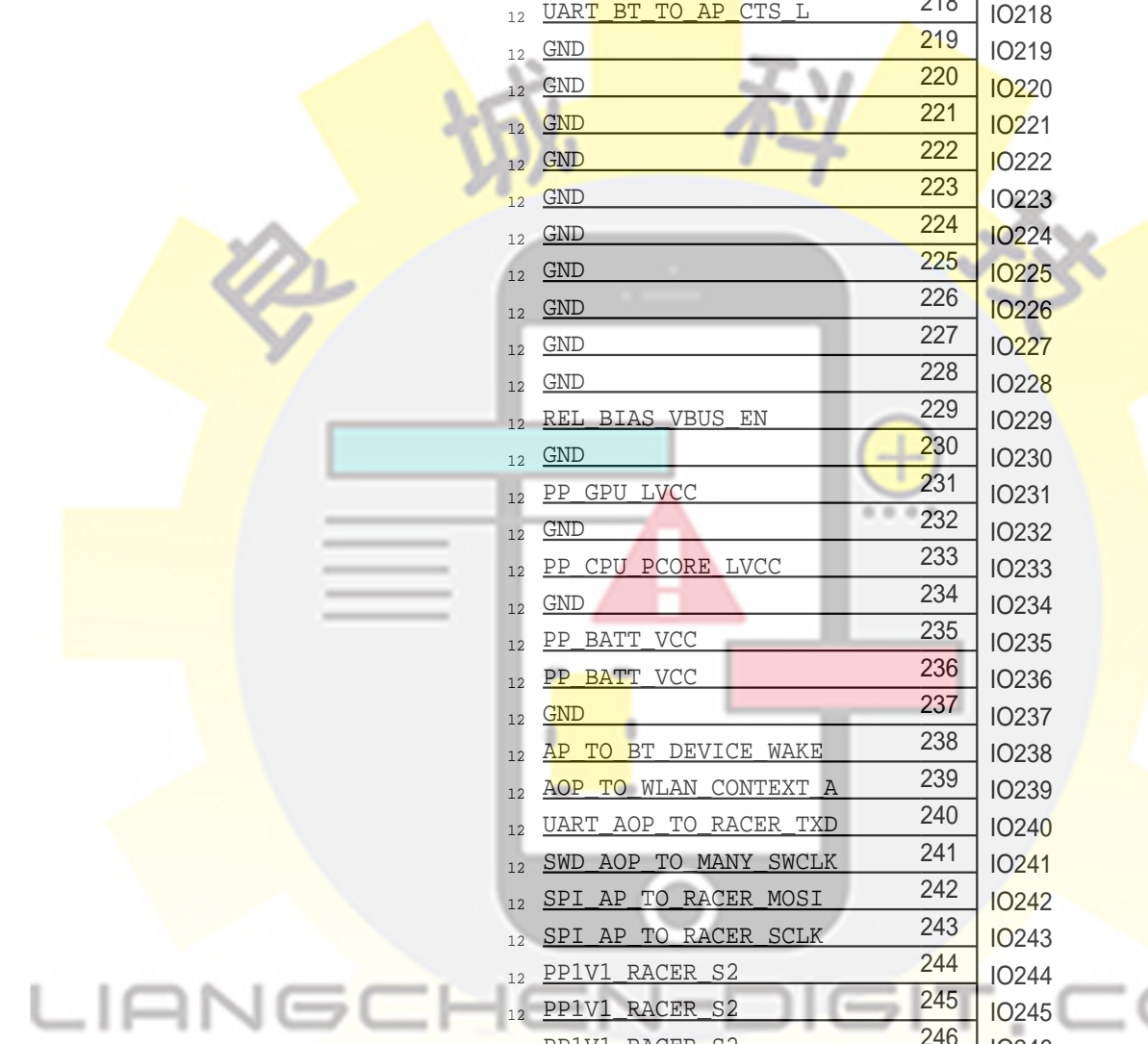
Top Board Interposer APN:998-12513
 Bot Board Interposer APN:998-12514 <--- Stuffed

J_INT_TOP
 SMT-FAD
 SYM 1 OF 2

1	IO1	95	AP TO NFC FW DMLD REQ
2	IO2	96	GND
3	IO3	97	PMU TO NFC VDD MAIN EN
4	IO4	98	UART AOP TO BB_TXD
5	IO5	99	GND
6	IO6	100	UART AP TO GNSS_TXD
7	IO7	101	GND
8	IO8	102	AP TO BB COREDUMP TRIG
9	IO9	103	UART AP TO NFC_TXD
10	IO10	104	UART NFC TO AP_RXD
11	IO11	105	BB TO AP RESET DETECT L
12	IO12	106	GND
13	IO13	107	BOARD ID2
14	IO14	108	AP TO GNSS TIME MARK
15	IO15	109	PCIE_BB_BI_AP_CLKREQ L
16	IO16	110	AP TO BB PEAK POWER INDICATOR
17	IO17	111	AP TO BBPMU RADIO ON L
18	IO18	112	PP_VDD_MAIN
19	IO19	113	PP_VDD_MAIN
20	IO20	114	PP_VDD_MAIN
21	IO21	115	GND
22	IO22	116	GND
23	IO23	117	GND
24	IO24	118	90_PCIE_BB_TO_AP_RXD N
25	IO25	119	90_PCIE_BB_TO_AP_RXD P
26	IO26	120	GND
27	IO27	121	90_PCIE_AP_TO_BB_TXD N
28	IO28	122	90_PCIE_AP_TO_BB_TXD P
29	IO29	123	GND
30	IO30	124	90_PCIE_AP_TO_BB_REFCLK P
31	IO31	125	90_PCIE_AP_TO_BB_REFCLK N
32	IO32	126	GND
33	IO33	127	UART_BB_TO_AOP_RXD
34	IO34	128	UART_GNSS_TO_AP_RXD L
35	IO35	129	PCIE AP TO BB PERST L
36	IO36	130	GND
37	IO37	131	PMU_AMUX_BY
38	IO38	132	PMU_AMUX_AY
39	IO39	133	GND
40	IO40	134	UART_NFC_TO_AP_CTS L
41	IO41	135	UART_AP_TO_NFC_RTS L
42	IO42	136	AP TO BB PEAK POWER INDICATOR
43	IO43	137	GND
44	IO44	138	PP_VDD_MAIN
45	IO45	139	PP_VDD_MAIN
46	IO46	140	PP_VDD_MAIN
47	IO47	141	GND
48	IO48	142	GND
49	IO49	143	GND
50	IO50	144	GND
51	IO51	145	GND
52	IO52	146	GND
53	IO53	147	GND
54	IO54	148	GND
55	IO55	149	GND
56	IO56	150	GND
57	IO57	151	GND
58	IO58	152	GND
59	IO59	153	GND
60	IO60	154	PP_VDD_MAIN
61	IO61	155	PP_VDD_MAIN
62	IO62	156	PP_VDD_MAIN
63	IO63	157	PP_VDD_MAIN
64	IO64	158	PP_VDD_MAIN
65	IO65	159	GND
66	IO66	160	PMU TO NFC_EN
67	IO67	161	GND
68	IO68	162	PMU TO BBPMU RESET L
69	IO69	163	GND
70	IO70	164	PMU TO TOUCH CLK32K
71	IO71	165	GND
72	IO72	166	PCIE WLAN BI AP_CLKREQ L
73	IO73	167	GND
74	IO74	168	GND
75	IO75	169	BB TO PMU_PCIE_HOST_WAKE L
76	IO76	170	GND
77	IO77	171	GND
78	IO78	172	WLAN TO PMU_HOST_WAKE
79	IO79	173	GND
80	IO80	174	PMU TO WLAN CLK32K
81	IO81	175	GND
82	IO82	176	NFC TO AOP_HOST_WAKE
83	IO83	177	GND
84	IO84	178	TOUCH TO MANY_FORCE_PWM
85	IO85	179	GND
86	IO86	180	UART AP TO BT_TXD
87	IO87	181	GND
88	IO88	182	UART AP TO BT_RTS L
89	IO89	183	GND
90	IO90	184	GND
91	IO91	185	GND
92	IO92	186	GND
93	IO93	187	GND
94	IO94	188	GND

J_INT_TOP
 SMT-FAD
 SYM 2 OF 2

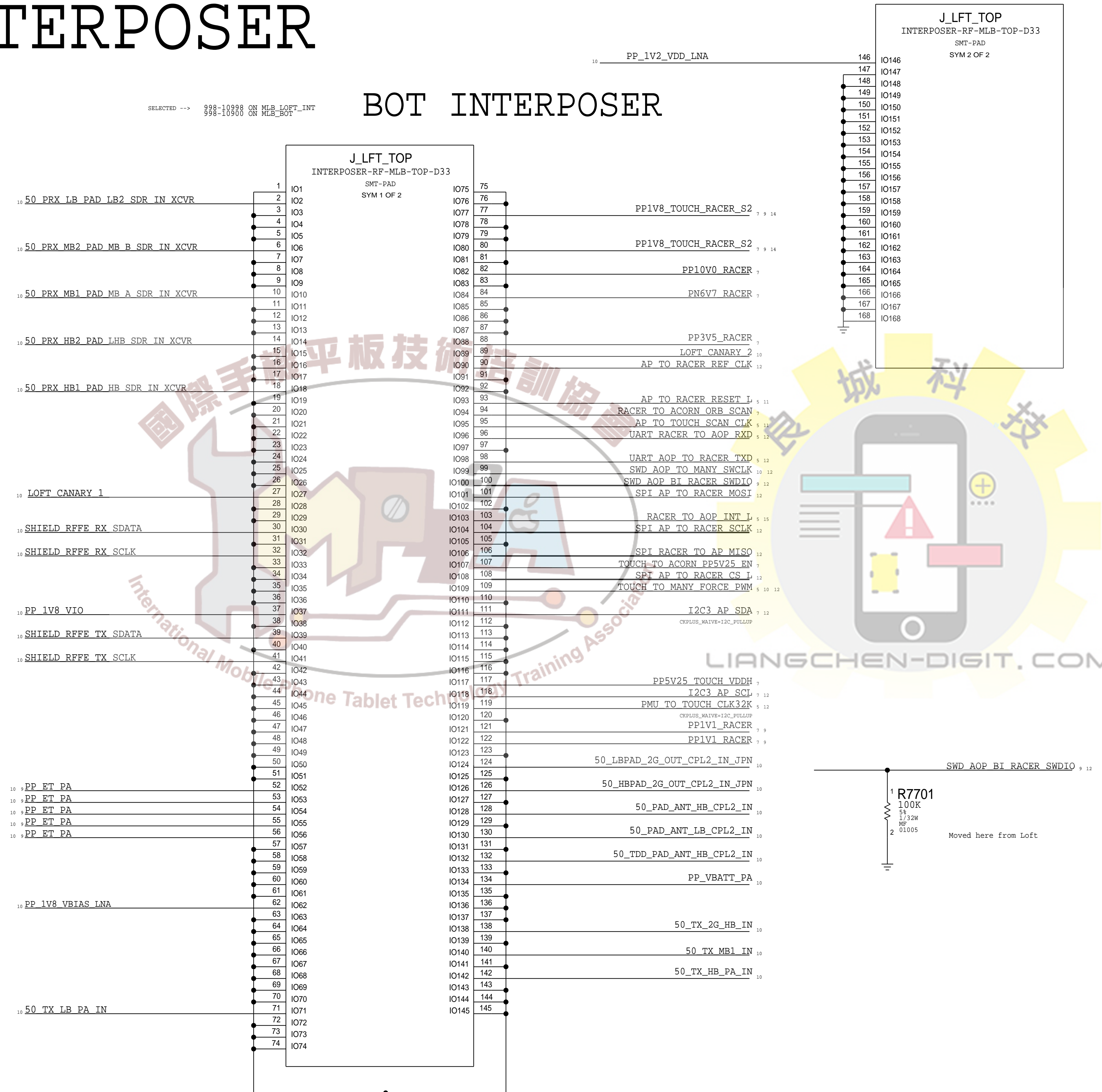
189	IO189	282	GND
190	IO190	283	GND
191	IO191	284	GND
192	IO192	285	GND
193	IO193	286	GND
194	IO194	287	PERN_GECKO_ANSRL_TO_PMU_ADC
195	IO195	288	GND
196	IO196	289	RACER_TO_AOP_INT L
197	IO197	290	GND
198	IO198	291	HALL_CASE_TO_AOP_SOUTH L
199	IO199	292	GND
200	IO200	293	PMU_TO_IKTARA_EN_EXT_LV8
201	IO201	294	GND
202	IO202	295	IKTARA_TO_SMC_INT
203	IO203	296	GND
204	IO204	297	I2C0_SMC_SCL
205	IO205	298	I2C0_SMC_SDA
206	IO206	299	GND
207	IO207	300	IKTARA_COIL2
208	IO208	301	IKTARA_COIL2
209	IO209	302	IKTARA_COIL2
210	IO210	303	IKTARA_COIL2
211	IO211	304	IKTARA_COIL1
212	IO212	305	IKTARA_COIL1
213	IO213	306	IKTARA_COIL1
214	IO214	307	IKTARA_COIL1
215	IO215	308	GND
216	IO216	309	GND
217	IO217	310	GND
218	IO218	311	GND
219	IO219	312	GND
220	IO220	313	GND
221	IO221	314	GND
222	IO222	315	GND
223	IO223	316	GND
224	IO224	317	GND
225	IO225	318	GND
226	IO226	319	GND
227	IO227	320	GND
228	IO228	321	GND
229	IO229	322	GND
230	IO230	323	GND
231	IO231	324	GND
232	IO232	325	GND
233	IO233	326	GND
234	IO234	327	GND
235	IO235	328	GND
236	IO236	329	GND
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238	IO238	331	GND
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240	IO240	333	GND
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250	IO250	343	GND
251	IO251	344	GND
252	IO252	345	GND
253	IO253	346	GND
254	IO254	347	GND
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260	IO260	353	GND
261	IO261	354	GND
262	IO262	355	GND
263	IO263	356	GND
264	IO264	357	GND
265	IO265	358	GND
266	IO266		
267	IO267		
268	IO268		
269	IO269		
270	IO270		
271	IO271		
272	IO272		
273	IO273		
274	IO274		
275	IO275		
276	IO276		
277	IO277		
278	IO278		
279	IO279		
280	IO280		
281	IO281		



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LOFT INTERPOSER

BOT INTERPOSER



PAGE TITLE B2B: Interposer Loft		
	DRAWING NUMBER 051-02695	SIZE D
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BRANCH	PAGE 77 OF 85	SHEET 9 OF 47

D

C

B

A

D

C

B

A

POWER

PP_VDD_MAIN
PP1V8_APPMU_S2_TO_RADIO
PP3V0_APPMU_S2_TO_RADIO

CELLULAR

PCIE
90_PCIE_AP_TO_BB_TX_P
90_PCIE_AP_TO_BB_TX_N
90_PCIE_BB_TO_AP_RXD_P
90_PCIE_BB_TO_AP_RXD_N
90_PCIE_AP_TO_BB_REFCLK_P
90_PCIE_AP_TO_BB_REFCLK_N
PCIE_BB_BI_AP_CLKREQ_L
PCIE_AP_TO_BB_PERST_L
BB_TO_PMU_PCIE_HOST_WAKE_L
PCIE_AP_BI_BB_CLKREQ_L
PCIE_AP_TO_BB_PERST_L
PCIE_BB_TO_APPMU_WAKE_L

BB USB
90_USB_BB_P
90_USB_BB_N
PP_1V8_BB_USB_VBUS

BB I2S
I2S_AP_TO_BB_DOUT
I2S_BB_TO_AP_DIN
I2S_BB_TO_AP_LRCLK
I2S_BB_TO_AP_BCLK

AOP BB UART
UART_AOP_TO_BB_TXD
UART_BB_TO_AOP_RXD

POWER KEEPING
APPMU_TO_BBPMU_ON
AP_TO_BBPMU_SDWN_L
AP_TO_BB_RESET_L
AP_TO_BB_COREDUMP_TRIG
BB_TO_AP_RESET_DETECT_L

COEXISTENCE
AP_TO_BBPMU_FORCE_PWM
TOUCH_TO_MANY_SCAN_STATE
AP_TO_BB_COEX
BB_TO_AP_COEX

PEAK POWER MGMT
BB_TO_MANY_GSM_BURST_IND
AP_TO_BB_PEAK_POWER_INDICATOR

SWD
SWD_JTAG_BB_TMS_SWIDIO
SWD_JTAG_TCK_SWIDIO

DOTARA

LB PAD
LB_XCVR_PRX
50_LBPAD_PRX_LB_TO_XCVR
LB_XCVR_TX
50_XCVR_TO_LBPAD_TX_LB1
LB_CPLR
50_LBPAD_2G_OUT_CPL2_IN_JPN
50_TRX_LBPAD_TO_CPL2_LB

HB PAD
HB_XCVR_PRX
50_HB_PRX_MB1_TO_XCVR
50_HB_PRX_MB2_TO_XCVR
50_HB_PRX_HB1_TO_XCVR
50_HB_PRX_HB2_TO_XCVR
HB_XCVR_TX
50_XCVR_TO_HBPAID_TX_HB
50_XCVR_TO_HBPAID_TX_MB1
50_XCVR_TO_HBPAID_TX_2G_HB
HB_CPLR
50_HBPAID_2G_OUT_CPL2_IN_JPN
50_TRX_HBPAID_TO_CPL2
50_TDD_PAD_ANT_HB_CPL2_IN

CANARY
LOFT_CANARY1
LOFT_CANARY2

hier_radio_ice
CELL + WLAN

WLAN

PCIE
90_PCIE_AP_TO_WLAN_TXD_P
90_PCIE_AP_TO_WLAN_TXD_N
90_PCIE_WLAN_TO_AP_TX_P
90_PCIE_WLAN_TO_AP_TX_N
90_PCIE_AP_TO_WLAN_REFCLK_P
90_PCIE_AP_TO_WLAN_REFCLK_N
PCIE_WLAN_BI_AP_CLKREQ_L
PCIE_AP_TO_WLAN_PERST_L
WLAN_TO_PMU_HOST_WAKE

DOTARA COEX

BTWLAN UART
UART_AP_TO_BTWLAN_TXD
UART_BTWLAN_TO_AP_TXD
UART_AP_TO_BTWLAN_RTS_L
UART_BTWLAN_TO_AP_RTS_L
UART_BT_TO_AP_CTS_L

CONTEXT
AOP_TO_WLAN_CONTEXT_B
AOP_TO_WLAN_CONTEXT_A

CONTROL
APPMU_TO_WLAN_REG_ON
APPMU_TO_BT_REG_ON

CLK_APPMU_TO_WLAN_32K
AP_TO_BTWLAN_DEV_WAKE
AP_TO_WLAN_TIME_SYNC
BT_TO_AP_TIME_SYNC

GNSS

CONTROL
APPMU_TO_GNSS_EN
GNSS_TO_AP_LOW_PWR_IND

AP_TO_GNSS_TIME_MARK
GNSS UART
UART_AP_TO_GNSS_TXD
UART_GNSS_TO_AP_TXD
UART_AP_TO_GNSS_RTS_L
UART_GNSS_TO_AP_RTS_L

POWER

VDD_LOFT_1V2
VDD_LOFT_1V8
VDD_LOFT_3V0
VDD_LOFT_ET

RFFE

RFFE_RX_CLK
RFFE_RX_DATA
RFFE_TX_CLK
RFFE_TX_DATA
RFFE_VIO_1V8

CANARY

LOFT_CANARY1
LOFT_CANARY2

1120

1124

POWER

PP_VDD_MAIN
PP1V8_NFC_S2

HIER_NFC

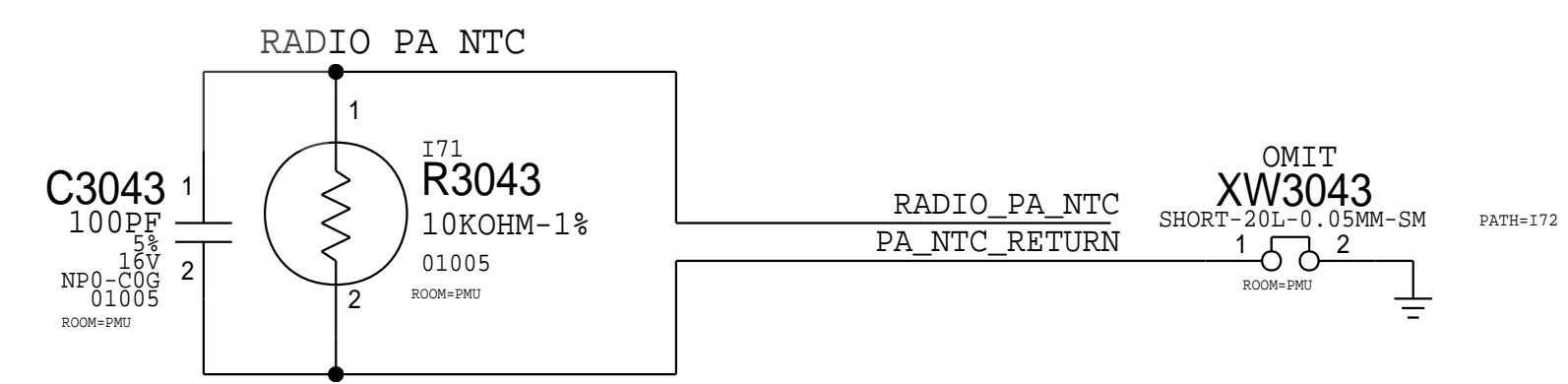
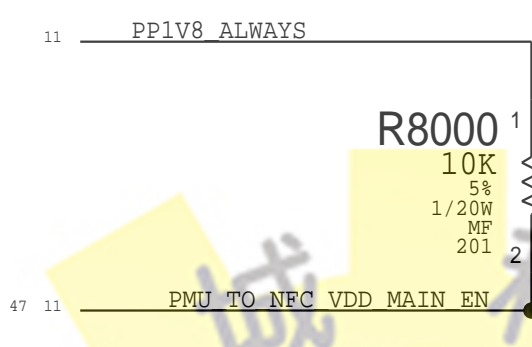
CONTROL
PMU_TO_NFC_EN
AP_TO_NFC_FW_DWLD_REQ
AP_TO_NFC_DEV_WAKE
NFC_TO_AOP_HOST_WAKE
PMU_TO_NFC_EN
AP_TO_NFC_FW_DWLD
AP_TO_NFC_DEV_WAKE
NFC_TO_PMU_HOST_WAKE

NEC UART

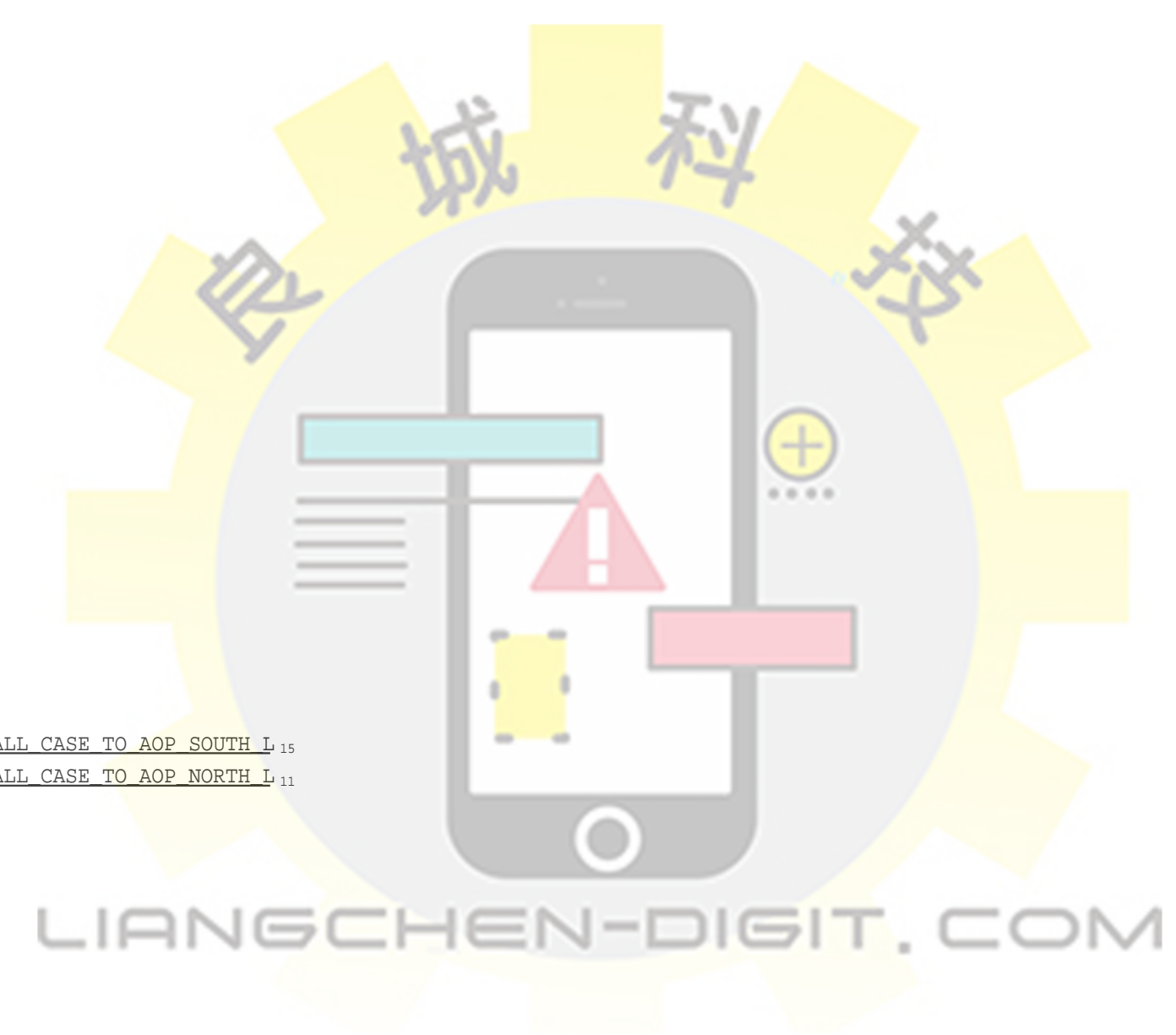
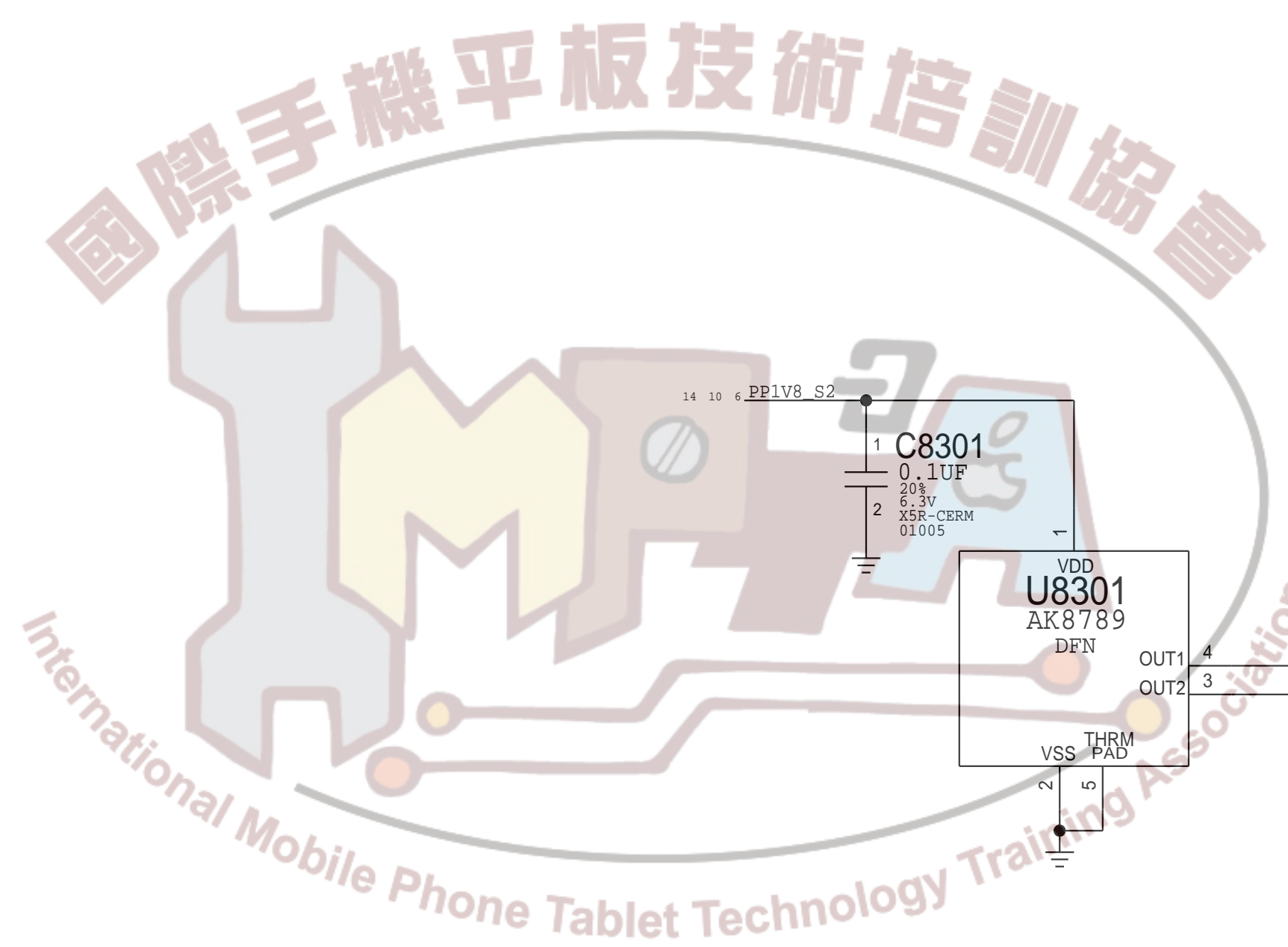
UART_AP_TO_NFC_TXD
UART_NFC_TO_AP_RXD
UART_AP_TO_NFC_RTS_L
UART_NFC_TO_AP_CTS_L

MISC

AP_TO_NFC_BUTTON
PMU_TO_NFC_VDD_MAIN_EN
NFC_TO_ARC_RESET_L
NFC_TO_ARC_TRIG
NFC_ANT



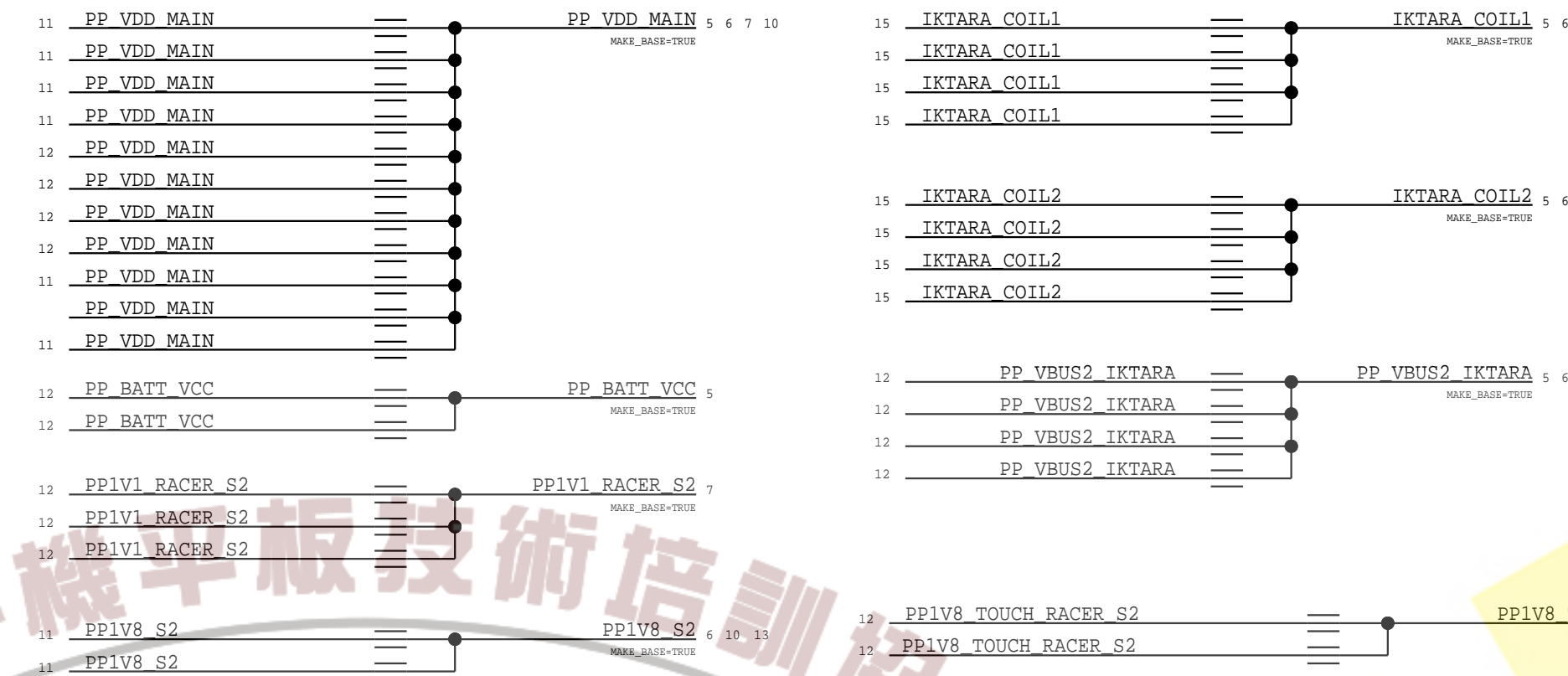
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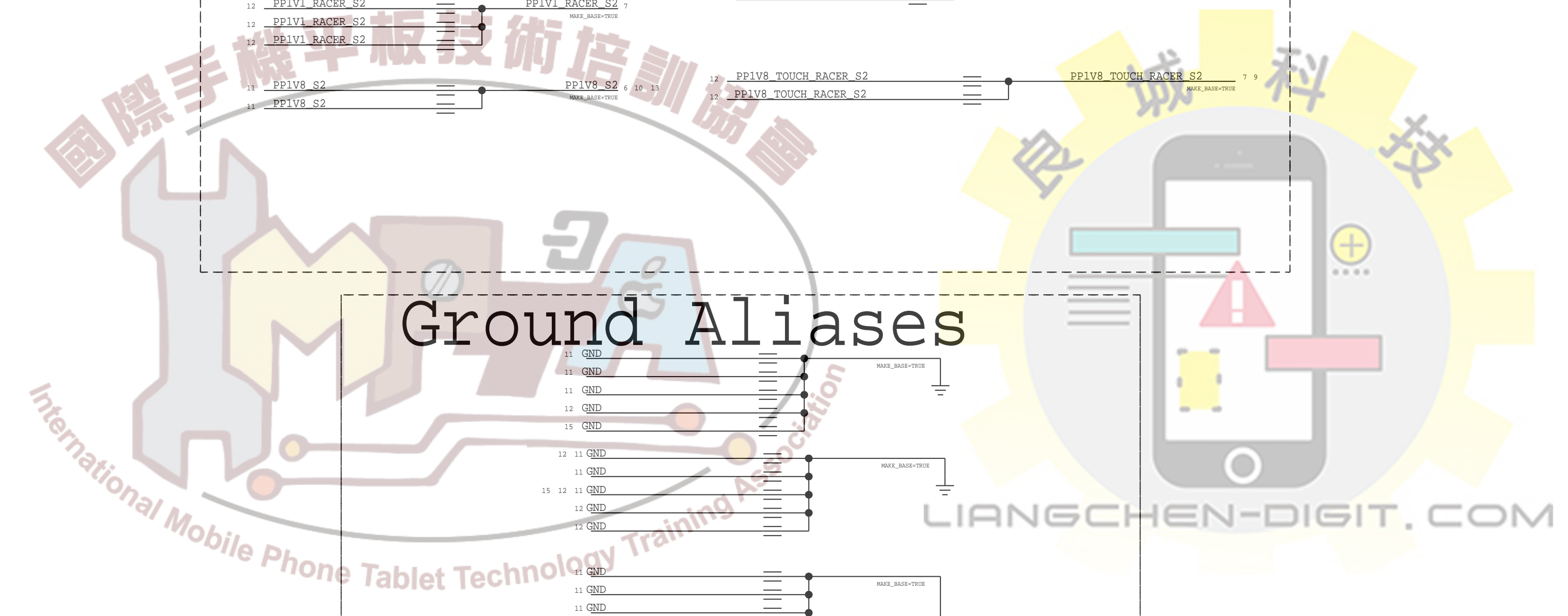
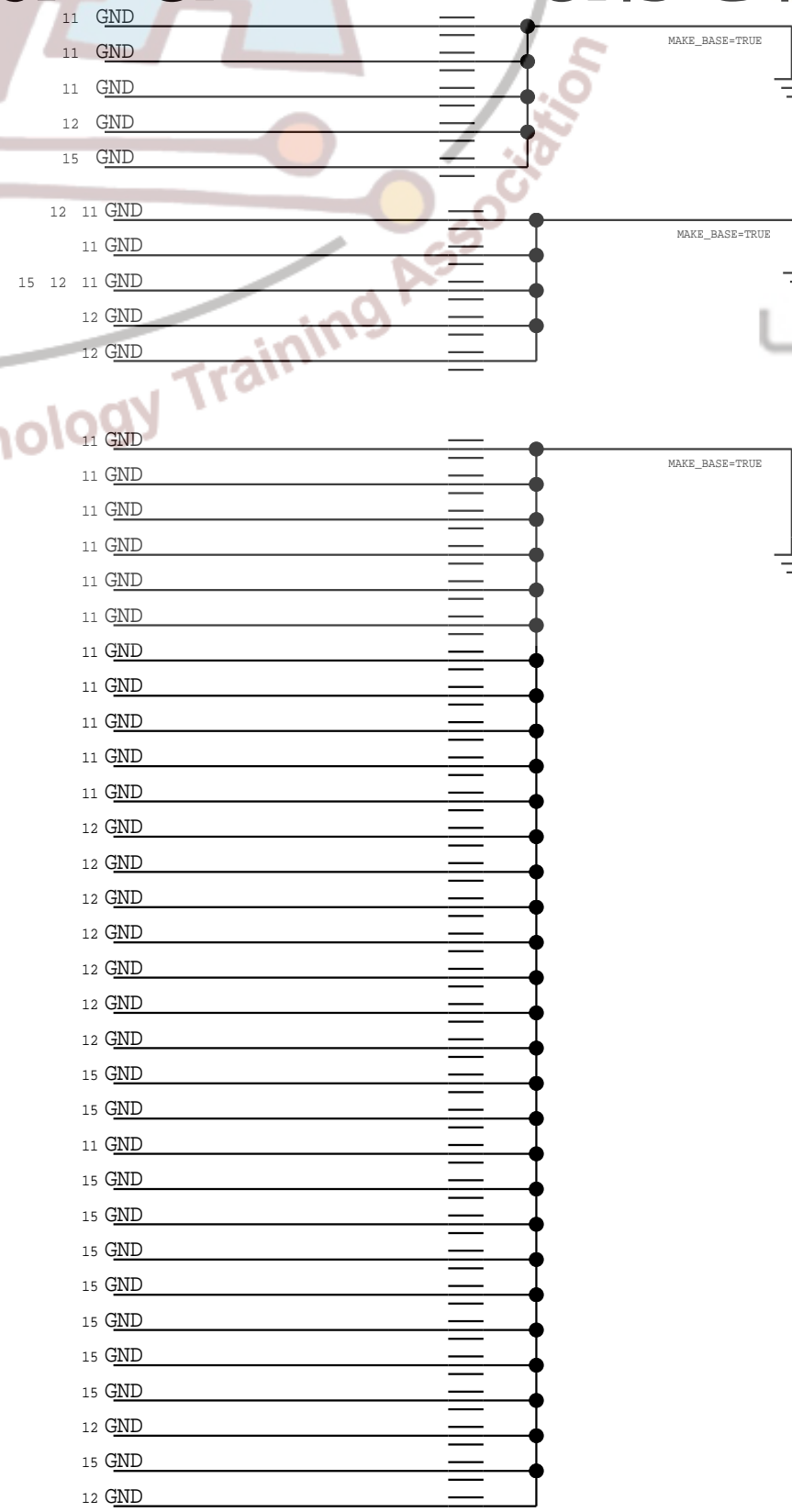
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Interposer Top Level Aliases

Power Aliases



Ground Aliases



PAGE TITLE Interposer: Top Aliases		
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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
4	0011669799	ENGINEERING RELEASED		2018-03-16

D33 HIER_RADIO_ICE - EVT

LAST_MODIFICATION=Fri Mar 16 10:21:01 2018

PAGE	CSA	CONTENTS	SYNC	DATE
16	1	RADIO: TABLE OF CONTENTS		
17	2	BOM TABLES		
18	3	ANTENNA DIAGRAM		
19	4	ANTENNA: B2BS		
20	5	ANTENNA: N-PLEX SHARED		
21	6	BBPMU: CONTROL		
22	7	BBPMU: RAILS		
23	8	BB: INTERFACE		
24	9	BB: DDR PWR & JTAG		
25	10	BB: DIGITAL PWR		
26	11	XCVR: TX & GNSS		
27	12	XCVR: INTERFACE & PWR		
28	13	XCVR: PRX DRX		
29	14	HW CONFIG OPTIONS		
30	15	ET		
31	16	LB SPAD		
32	17	HB SPAD		
33	18	UHB LMB SPAD		
34	19	LB DIVERSITY RECEIVE LNA		
35	20	HB DIVERSITY RECEIVE LNA		
36	21	MIMO RECEIVE LNAs		
37	22	COUPLER + LOWER ANTENNA		
38	23	UPPER ANTENNA FEEDS		
39	24	SIM: ESIM		
40	25	SIM: PSIM		
41	26	TEST POINTS		
42	27	SYMBOL: WIFI		
43	1	WIFI: TABLE OF CONTENTS		
44	2	DIETCOKE		
45	3	FEM MODULES		

SYSTEM POWER

30	22	41	PP_VDD_MAIN
41	19	43	PP1V8_S2
41	19	10	PP3V0_S2

WLAN INTERPOSER

CONTROL

42	10	PMU_TO_WLAN_REG_ON
42	10	PMU_TO_BT_REG_ON
42	10	AP_TO_BT_DEVICE_WAKE

CLOCKS

42	10	PMU_TO_WLAN_CLK32K
42	10	AP_TO_WLAN_TIME_SYNC
42	10	BT_TO_AP_TIME_SYNC

WLAN PCIE

42	10	90_PCIE_AP_TO_WLAN_REFCLK_P
42	10	90_PCIE_AP_TO_WLAN_REFCLK_N
42	10	90_PCIE_AP_TO_WLAN_TXD_P
42	10	90_PCIE_WLAN_TO_AP_RXD_P
42	10	90_PCIE_WLAN_TO_AP_RXD_N
42	10	PCIE_AP_TO_WLAN_PERSIST_L
42	10	PCIE_WLAN_BI_AP_CLKREQ_L
42	10	WLAN_TO_PMU_HOST_WAKE

BLWLAN UART

42	10	UART_AP_TO_BT_TXD
42	10	UART_BT_TO_AP_RXD
42	10	UART_AP_TO_BT_RTS_L
42	10	UART_BT_TO_AP_CTS_L

AOP

42	10	AOP_TO_WLAN_CONTEXT_A
42	10	AOP_TO_WLAN_CONTEXT_B

CELLULAR INTERPOSER

POWER-KEEPING

41	23	10	PMU_TO_BBPMU_RESET_L
41	23	10	AP_TO_BB_RESET_L
41	23	10	AP_TO_BBPMU_RADIO_ON_L
41	23	10	AP_TO_BB_COREDUMP_TRIG
41	23	10	BB_TO_AP_RESET_DETECT_L

PCIE

41	23	10	BB_TO_PMU_PCIE_HOST_WAKE_L
41	23	10	PCIE_AP_TO_BB_PERSIST_L
41	23	10	PCIE_BB_BI_AP_CLKREQ_L
41	23	10	90_PCIE_BB_TO_AP_RXD_P
41	23	10	90_PCIE_BB_TO_AP_RXD_N
41	23	10	90_PCIE_AP_TO_BB_TXD_P
41	23	10	90_PCIE_AP_TO_BB_TXD_N
41	23	10	90_PCIE_AP_TO_BB_REFCLK_P
41	23	10	90_PCIE_AP_TO_BB_REFCLK_N

I2S

41	23	10	I2S_BB_TO_AP_BCLK
41	23	10	I2S_BB_TO_AP_LRCLK
41	23	10	I2S_AP_TO_BB_DOUT
41	23	10	I2S_BB_TO_AP_DIN

AOP UART

41	23	10	UART_BB_TO_AOP_RXD
41	23	10	UART_AOP_TO_BB_TXD

JTAG-SWD

29	10	SWD_AOP_TO_MANY_SWCLK	
41	24	10	SWD_AOP_BI_BB_SWDIO

DEBUG USB

41	23	10	90_USB_BB_P
41	23	10	90_USB_BB_N
41	23	10	PP_1V8_BB_USB_VBUS

SYSTEM COEX

41	23	10	TOUCH_TO_MANY_FORCE_PWM
41	21	10	AOP_TO_BBPMU_COEX
41	23	10	AP_TO_BB_COEX
41	23	10	BB_TO_AP_COEX

PEAK POWER MANAGEMENT

41	24	10	BB_TO_MANY_GSM_BURST_IND
41	23	10	AP_TO_BB_PEAK_POWER_INDICATOR

GNSS

41	26	10	UART_AP_TO_GNSS_TXD
41	26	10	UART_GNSS_TO_AP_RXD
41	27	10	UART_AP_TO_GNSS_RTS_L
41	26	10	UART_GNSS_TO_AP_CTS_L
41	26	10	PMU_TO_GNSS_EN
41	26	10	AP_TO_GNSS_TIME_MARK
41	26	10	GNSS_TO_AP_LOW_PWR_IND

LOFT ALIASES

22	PP_1V2_VDD_LNA	16	PP_1V2_VDD_LNA
33	PP_1V8_VBIAS_LNA	16	PP_1V8_VBIAS_LNA
33	PP_VBATT_PA	16	PP_VBATT_PA
30	PP_BT_PA	16	PP_BT_PA
33	PP_1V8_VIO	16	PP_1V8_VIO
41	SHIELD_RFFE_TX_SCLK	16	SHIELD_RFFE_TX_SCLK
41	SHIELD_RFFE_TX_SDATA	16	SHIELD_RFFE_TX_SDATA
41	SHIELD_RFFE_RX_SDATA	16	SHIELD_RFFE_RX_SDATA
41	SHIELD_RFFE_RX_SCLK	16	SHIELD_RFFE_RX_SCLK

LOFT

PMIC:POWER & I/O

16	PP_1V2_VDD_LNA
16	PP_1V8_VBIAS_LNA
16	PP_VBATT_PA
16	PP_BT_PA

BB:RFFE

16	PP_1V8_VIO
16	SHIELD_RFFE_TX_SCLK
16	SHIELD_RFFE_TX_SDATA
16	SHIELD_RFFE_RX_SDATA
16	SHIELD_RFFE_RX_SCLK

LB PAD

26	50_TX_LB_PA_IN
26	50_PRX_LB_PAD_LB2_SDR_IN_XCVR

CPLR

37	50_LB_PAD_2G_OUT_CPL2_IN_JFN
37	50_PAD_ANT_LB_CPL2_IN

HB PAD

26	50_TX_HB_PA_IN
26	50_TX_MB1_IN
26	50_TX_2G_HB_IN
26	50_PRX_MB1_PAD_MB_A_SDR_IN_XCVR
26	50_PRX_MB2_PAD_MB_B_SDR_IN_XCVR
26	50_PRX_HB1_PAD_HB_SDR_IN_XCVR
26	50_PRX_HB2_PAD_LHB_SDR_IN_XCVR

CPLR

37	50_HB_PAD_2G_OUT_CPL2_IN_JFN
37	50_PAD_ANT_HB_CPL2_IN
37	50_TDD_PAD_ANT_HB_CPL2_IN

CNRY

41	LOFT_CANARY_1
41	LOFT_CANARY_2

SOURCE PROJECT	SUB-DESIGN NAME	VERSION	HARD/ SOFT	SYNC_DATE/TIME
D32	HIER_WIFI	0.52.0	S	2018_03_07_13:05:02

SCH: 951-04720
PCB: 920-03588

RADIO: TABLE OF CONTENTS

DRAWING TITLE		DRAWING NUMBER	SIZE
SCH, MLB, BOT, ICE, D33		051-02695	D
Apple Inc.		REVISION	
		4.0.0	
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BOM TABLES

RF SKU

ROW SKU

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
118S0724	1	RES,MP,0.0 OHM,1/20W,0201,HIGH FREQ	R2003_K	ROW
118S0724	1	RES,MP,0.0 OHM,1/20W,0201,HIGH FREQ	R2015_K	ROW
118S00072	1	RES,MP,8.2K OHM,1/32W,01005	R312_K	ROW
197S00155	1	XTL,THEEM,38.4MHZ,12PFM,EPF,1612	Y301_K	ROW
353S01647	1	30PA, SKYWORKS, 78208, REV13	PA_UHB_K	ROW
353S01301	1	SKYWORKS, LB DSM, 13765, REV16	DSM_LB_K	ROW

JP SKU

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
118S0724	1	RES,MP,0.0 OHM,1/20W,0201,HIGH FREQ	R2002_K	JP
118S0724	1	RES,MP,0.0 OHM,1/20W,0201,HIGH FREQ	R1403_K	JP
118S00120	1	RES,MP,6.8K OHM,1/32W,01005	R312_K	JP
197S00179	1	XTL,THEEM,38.4MHZ,12PFM,EPF,1612	Y301_K	JP
353S01662	1	SKYWORKS, UHB PA, REV13	PA_UHB_K	JP
353S01301	1	SKYWORKS, LB DSM, 13765, REV16	DSM_LB_K	JP

NA SKU

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
118S0724	1	RES,MP,0.0 OHM,1/20W,0201,HIGH FREQ	R2003_K	NA
118S0724	1	RES,MP,0.0 OHM,1/20W,0201,HIGH FREQ	R2015_K	NA
118S00073	1	RES,MP,8.2K OHM,1/32W,01005	R312_K	NA
197S00156	1	XTL,THEEM,38.4MHZ,12PFM,EPF,1612	Y301_K	NA
353S01647	1	30PA, SKYWORKS, 78208, REV13	PA_UHB_K	NA
353S01472	1	SKYWORKS, LB DSM, 13765, REV13	DSM_LB_K	NA

SIM SKU

SINGLE 4FF SKU

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
512S00038	1	SIM,TALL,PTH,4X3,D33	J_SIM	SINGLE
117S0158	1	RES,MP,100K OHM,1/32W,01005	R11_SIM	SINGLE

DUAL 4FF SKU

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
512S00039	1	SIM,DUAL,BUNK,PTH,4X3,D33	J_SIM	DUAL
117S0161	1	RES,MP,0.0 OHM,1/32W,01005	R31_SIM	DUAL
117S0166	1	RES,MP,100 OHM,1/32W,01005	R27_SIM	DUAL
117S0185	1	RES,MP,47 OHM,1/32W,01005	R26_SIM	DUAL
117S0166	1	RES,MP,100 OHM,1/32W,01005	R29_SIM	DUAL

SINGLE 4FF + VINYL SKU

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
512S00038	1	SIM,TALL,PTH,4X3,D33	J_SIM	VINYL
998-12938	1	VINYL,N10,BIRCH 4.0	U_SIM	VINYL
117S0158	1	RES,MP,100K OHM,1/32W,01005	R10_SIM	VINYL
118S0636	1	RES,MP,4.7K OHM,1/32W,01005	R12_SIM	VINYL

FERRITE ALTERNATES

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
155S00131	155S00341	BOM_TABLE_ALTS	FL900_K	FERR BD, 2400HM
155S00414	155S0876	BOM_TABLE_ALTS	ALL	FERR BD, 100HM
155S00200	155S00400	BOM_TABLE_ALTS	ALL	FERR BD, 1500HM
155S00194	155S00400	BOM_TABLE_ALTS	ALL	FERR BD, 1500HM

ETIC CAP ALTERNATES

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
138S00237	138S00167	BOM_TABLE_ALTS	C1204_K	CAP, 2.2UF
138S00237	138S00167	BOM_TABLE_ALTS	C1205_K	CAP, 2.2UF
138S00237	138S00167	BOM_TABLE_ALTS	C1206_K	CAP, 2.2UF

CAP ALTERNATES

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
138S00086	138S0884	BOM_TABLE_ALTS	ALL	CAP, 20UF
138S0719	138S1103	BOM_TABLE_ALTS	ALL	CAP, 4.7UF
138S00128	138S00133	BOM_TABLE_ALTS	ALL	CAP, 0.47UF

VARISTOR ALTERNATES

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
377S00130	377S0106	BOM_TABLE_ALTS	ALL	VARISTOR, 12V, 33PF

EEPROM ALTERNATES

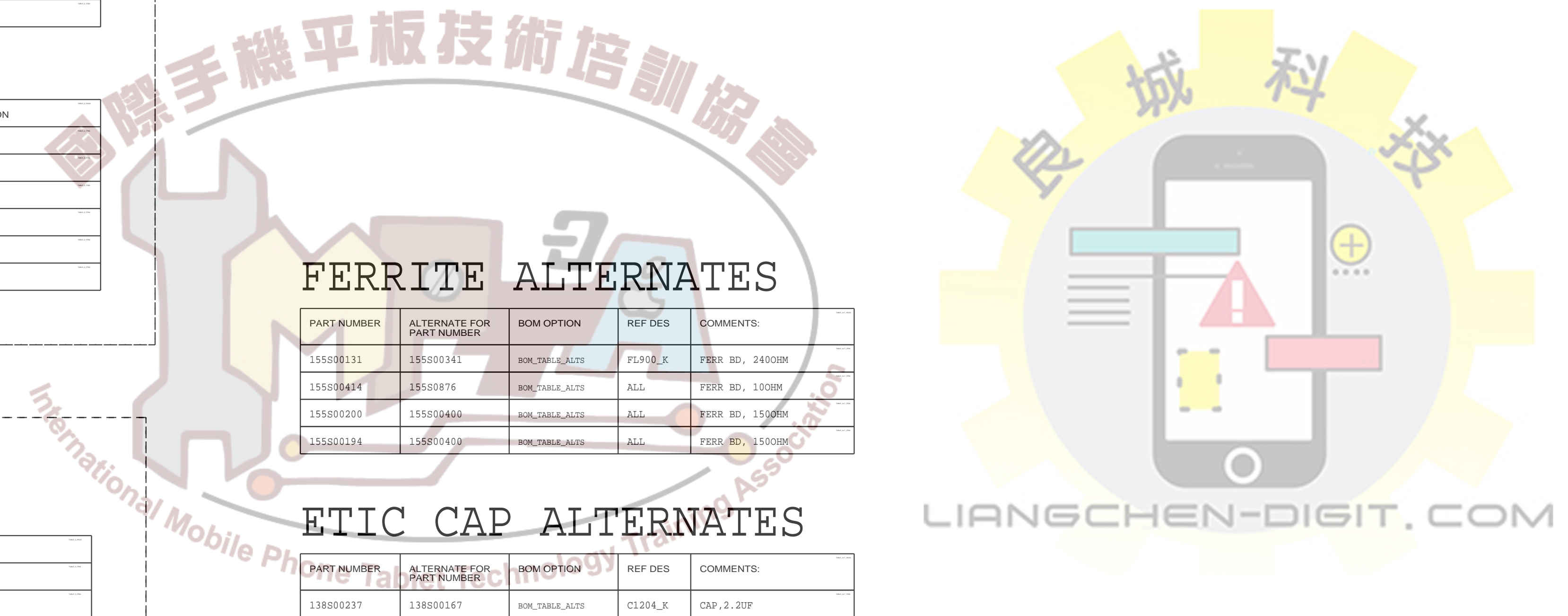
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335S00013	335S0894	BOM_TABLE_ALTS	EEPROM_K	EEPROM, 8KBIT, I2C

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MULTIPLES		DIELECTRIC BASED SPACING RULES		DEFAULT SPACING MULTIPLES		VOID SPACE RATIO
1		SMDPIN MAX(UM)	MVIA MAX(UM)	SMOPIN2SMDPIN MAX(UM)	2	
		1.65, 2, 2D, 3, 2D, 4D	120	120	100	
LAYERS			MINIMUM CU WIDTH RATIO	MINIMUM CU SPACING RATIO	MINIMUM TO DEFAULT RATIO	
TOP, BOTTOM, ISL4, ISL5			1.0	1.0	1.0	
ISL2, ISL3, ISL6, ISL7			1.0	1.0	1.0	

POWER RULE DEFINITIONS			
LOAD CURRENT(MA)	CURRENT DENSITY(A/SQMM)	MIN NECK WIDTH(MM)	MAX NECK LENGTH(MM)
50	50	0.08	10
100	50	0.08	10
200	50	0.08	10
300	50	0.08	10
500	50	0.08	10
1000	50	0.08	10
3000	50	0.08	10

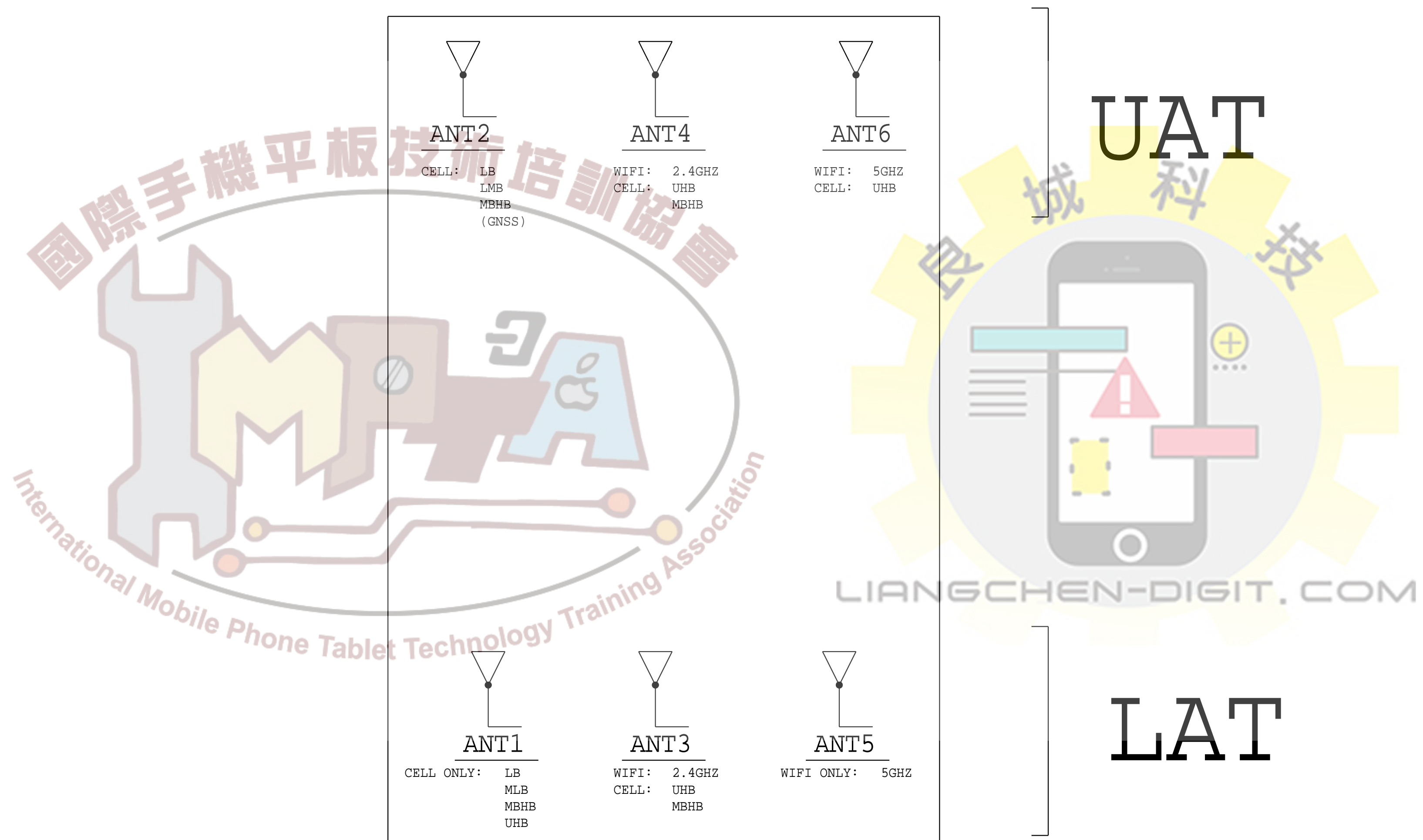
TABLE_IMPEDANCE_HYBRID=50_HYBRID	
LAYERS	IMPEDANCE RULE
TOP	50_OHM_SE
ISL3	50_OHM_SE
ISL6	50_OHM_SE_6R4R8
ISL7	50_OHM_SE
ISL5	50_OHM_SE

TABLE_IMPEDANCE_HYBRID=50_HYBRID_WIDE	
LAYERS	IMPEDANCE RULE
TOP	50_OHM_SE_1R3
ISL3	50_OHM_SE
ISL6	50_OHM_SE_6R4R8
ISL7	50_OHM_SE
ISL5	50_OHM_SE



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RADIO ANTENNAS



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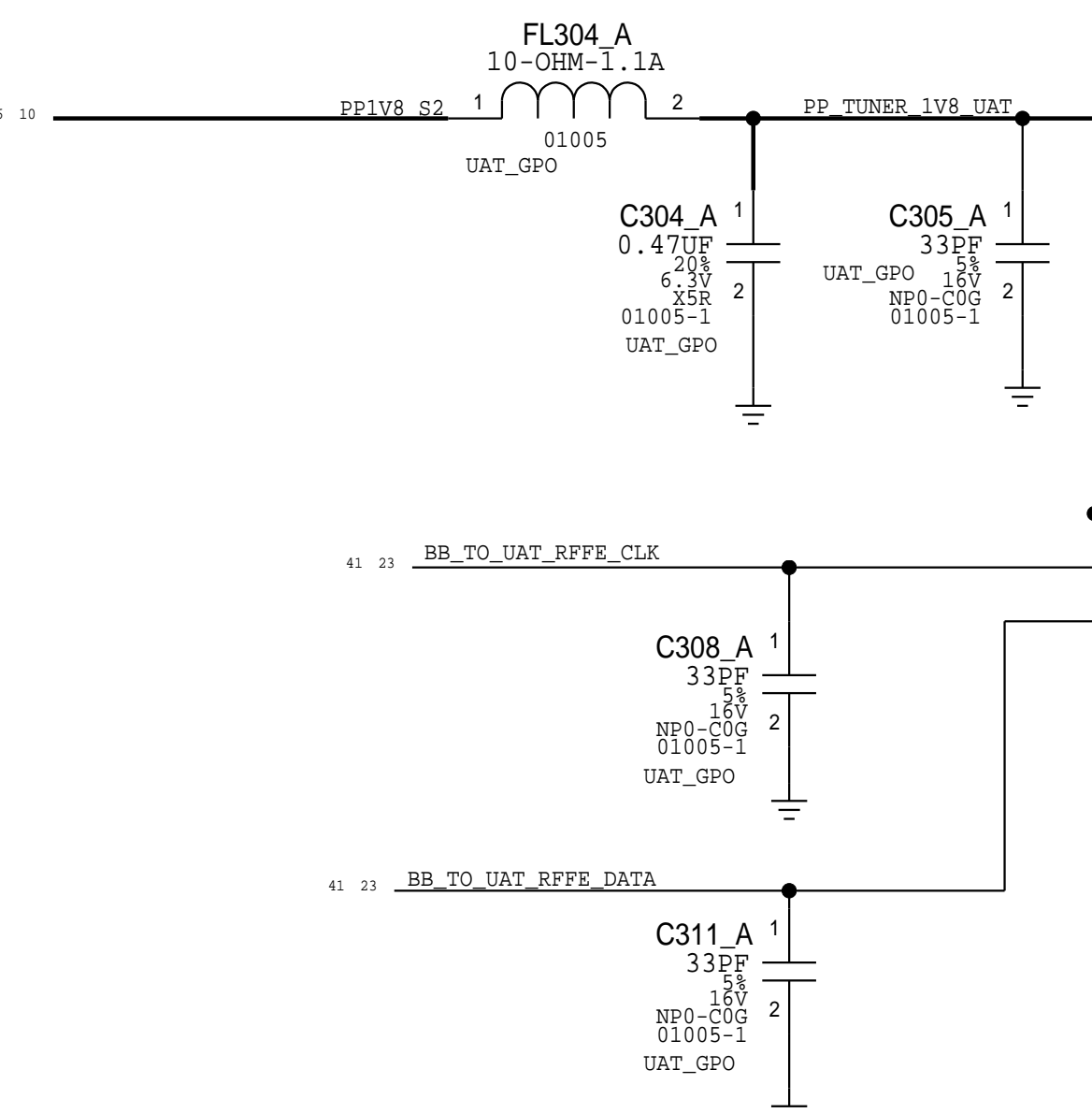
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UAT

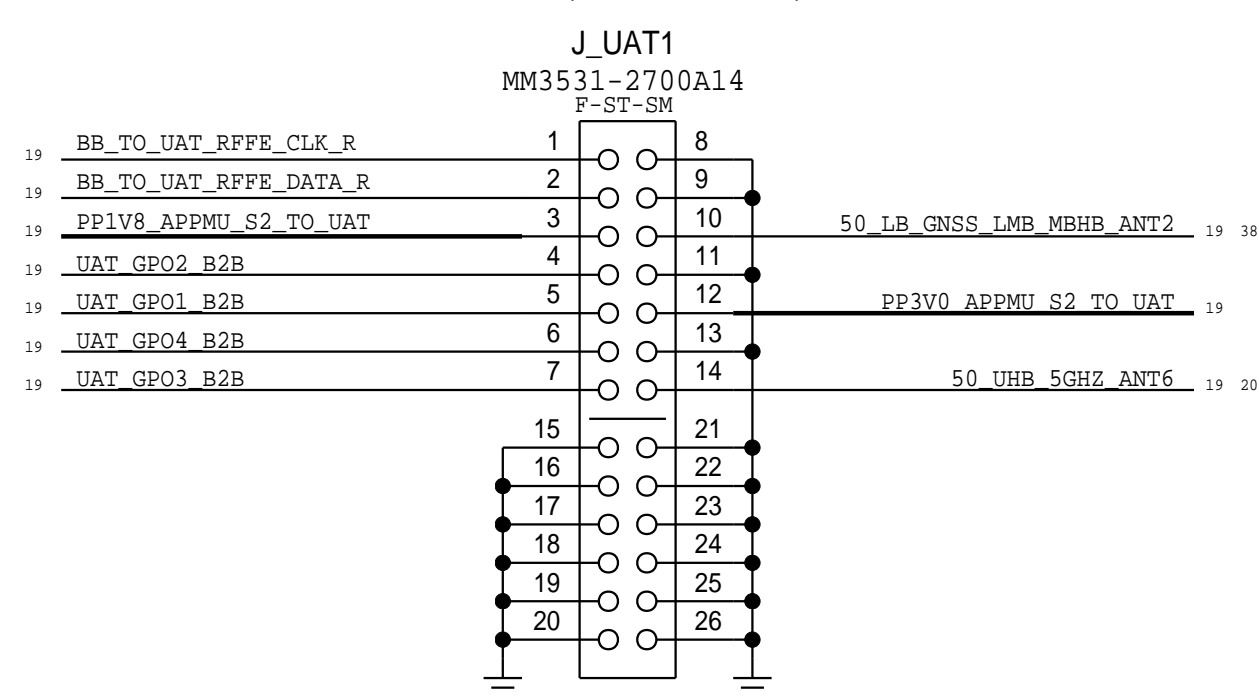
UAT B2BS

GPO FILTERS

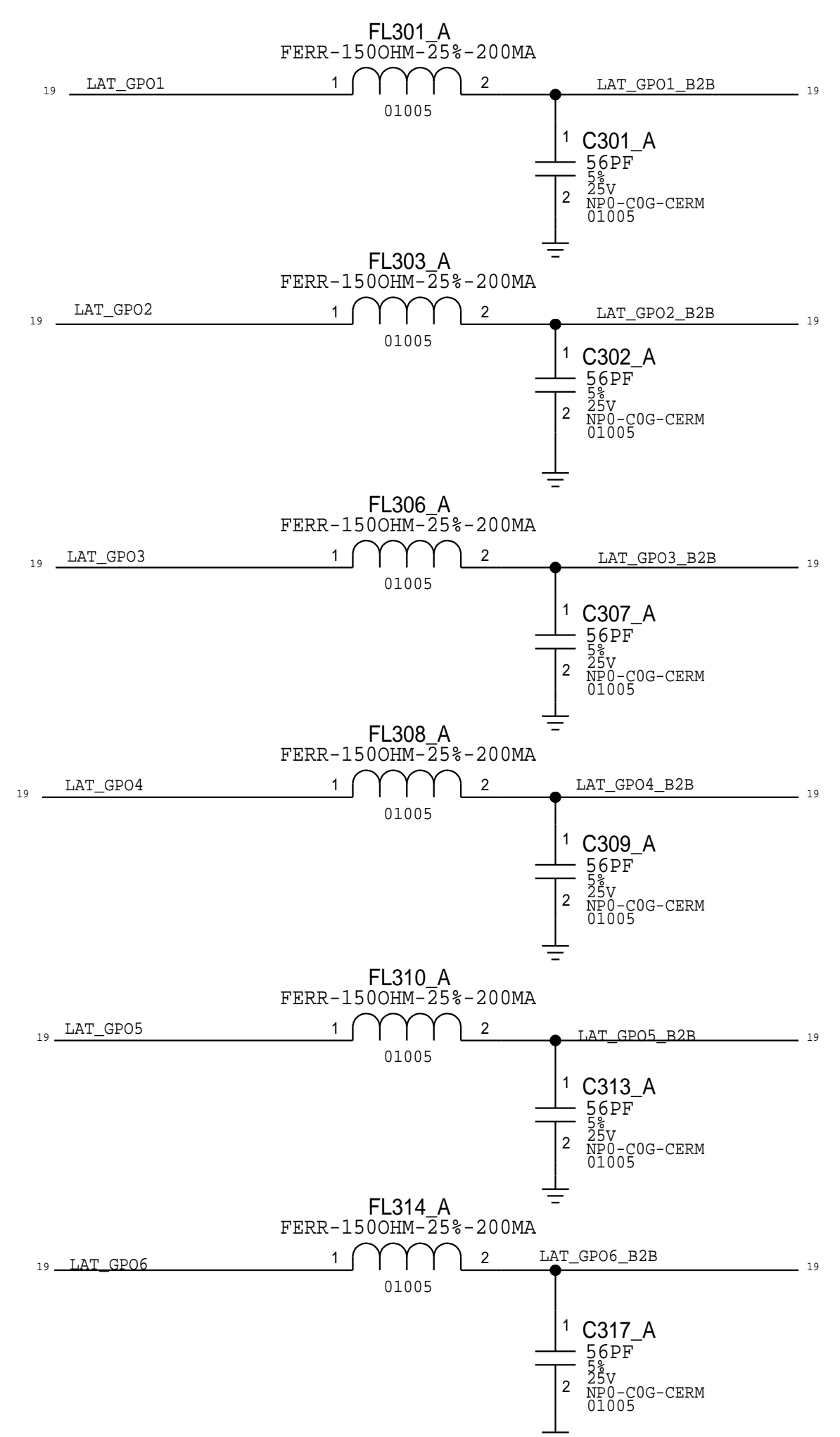
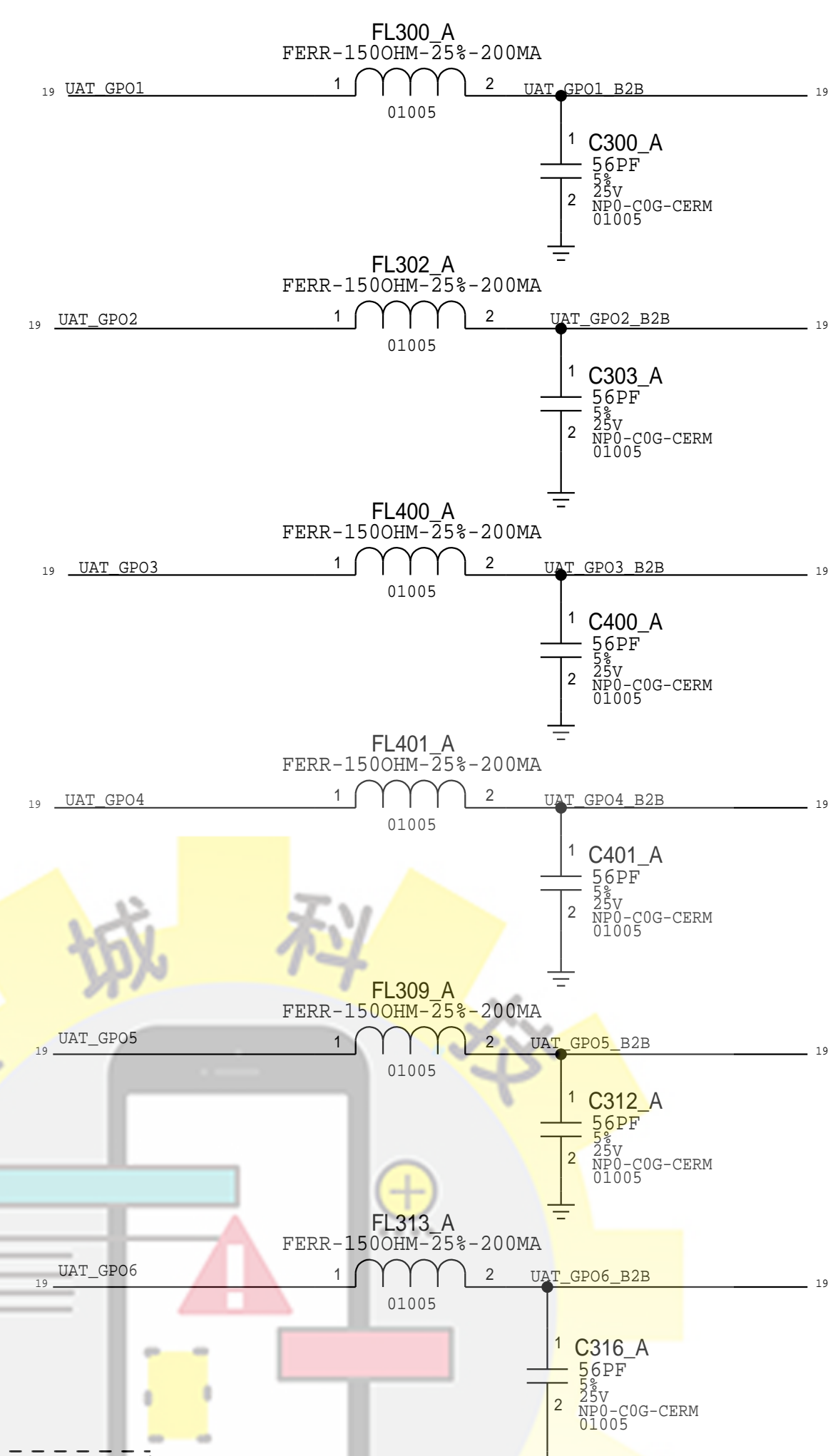
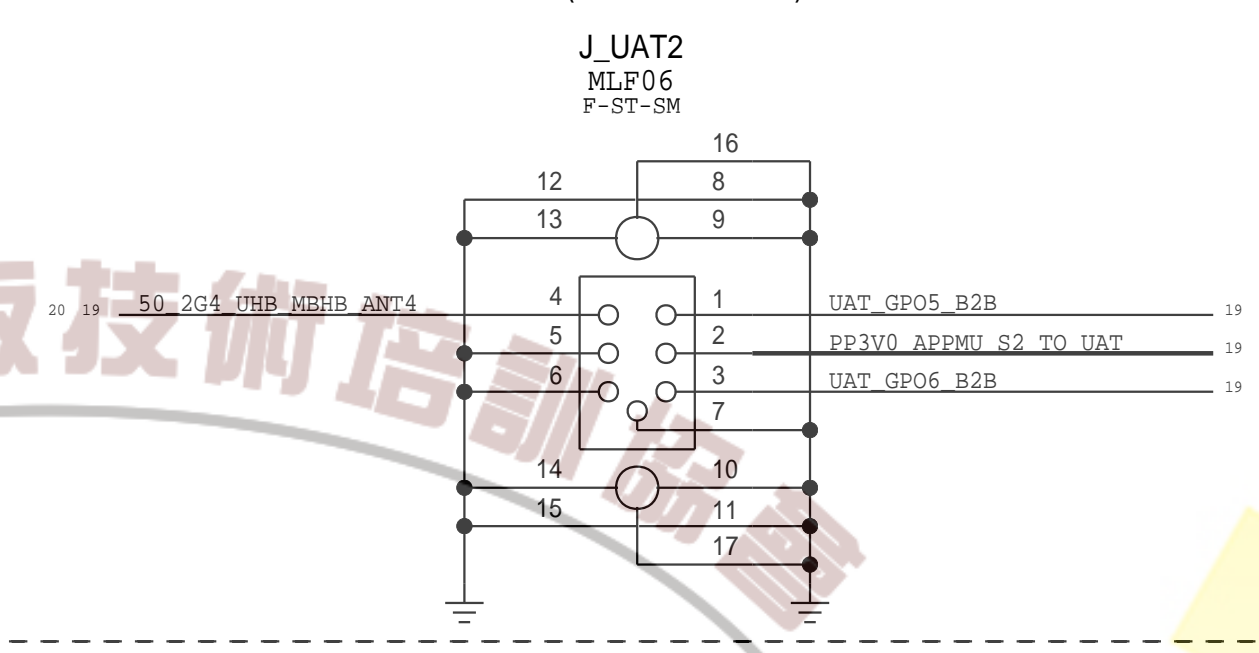
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 MAKE_BASE=TRUE



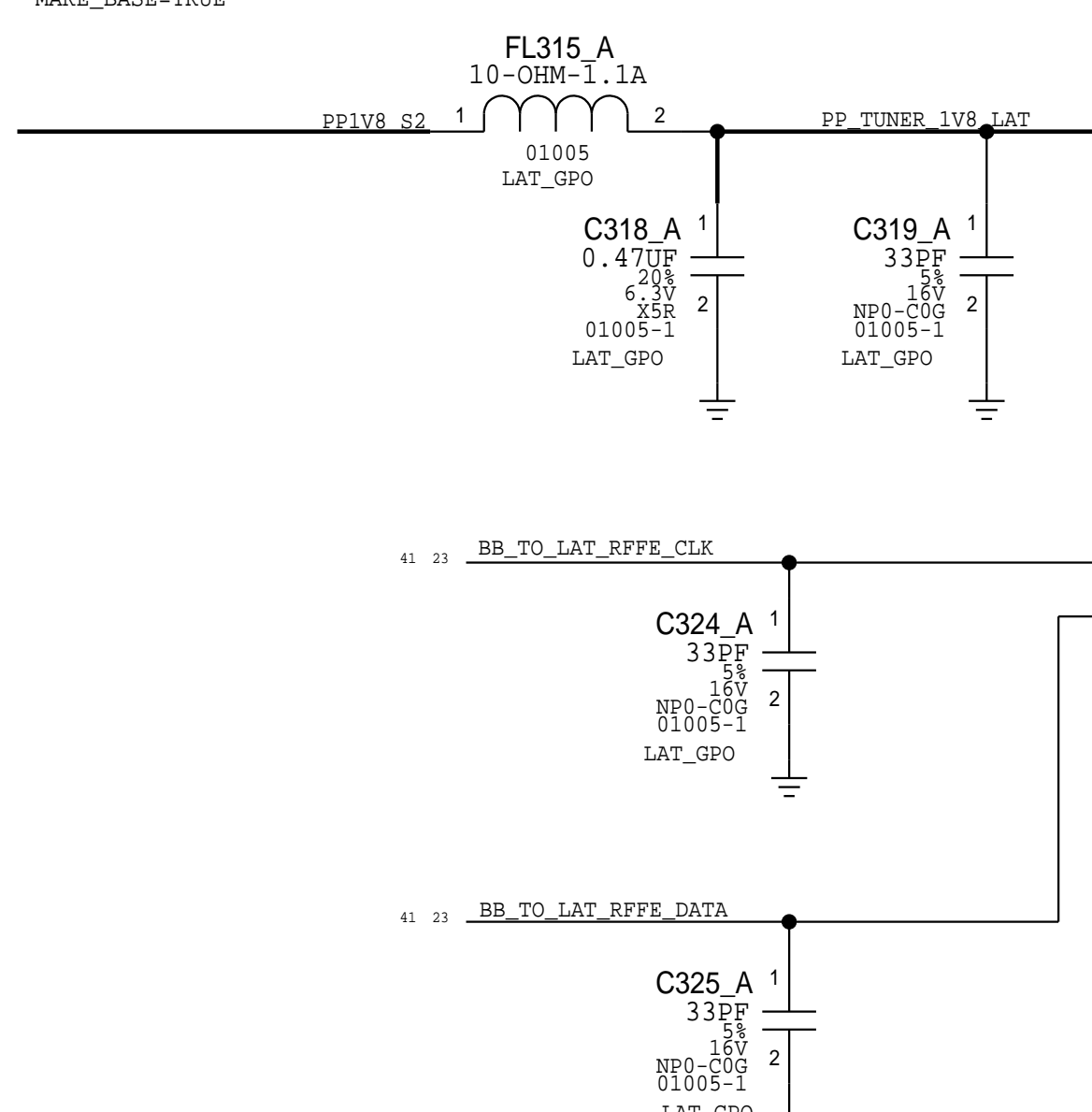
RCPT ON MLB_BOT (518S00167)
 PLUG ON FLEX (518S00166)



RCPT ON MLB_BOT (516S00434)
 PLUG ON FLEX (516S00435)



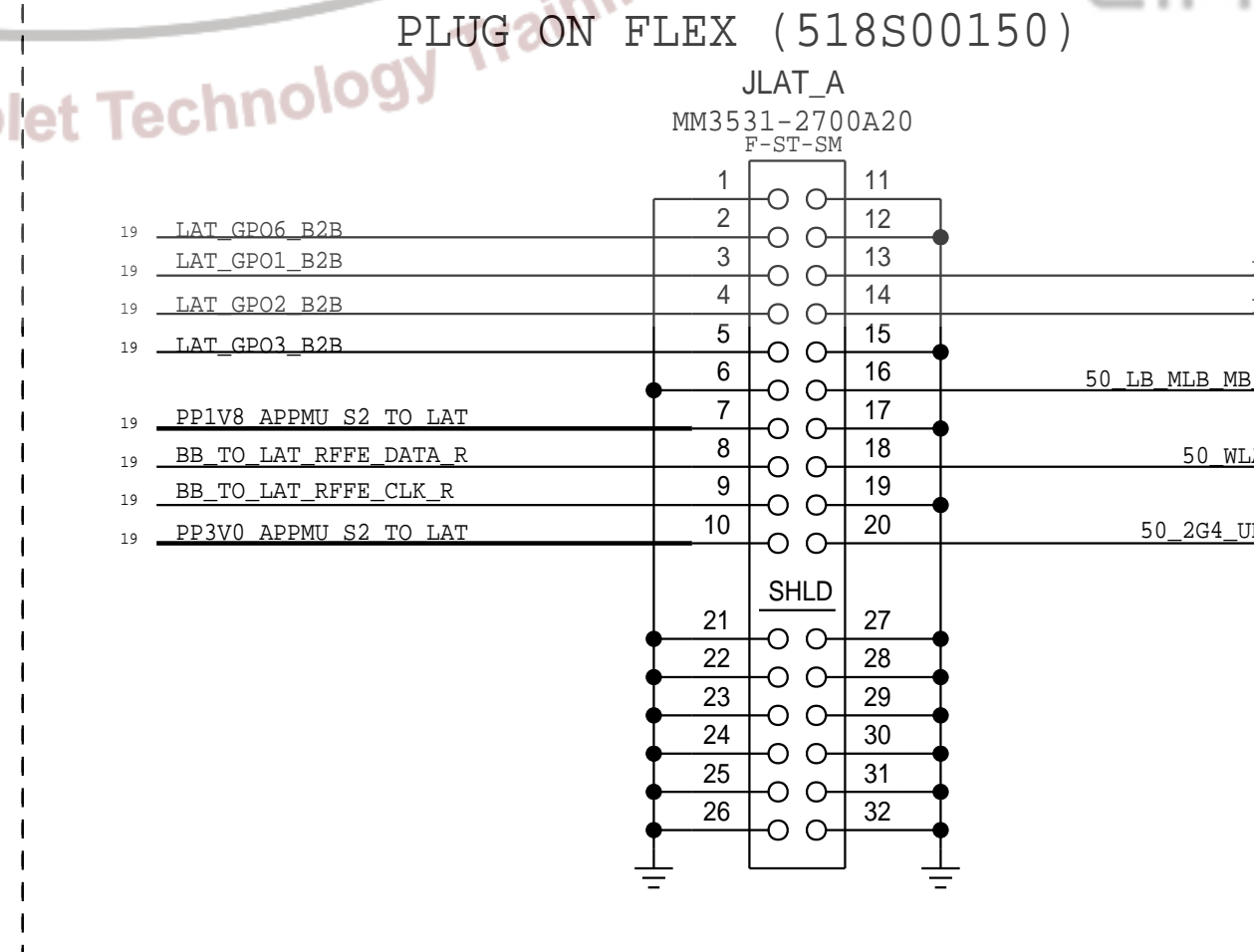
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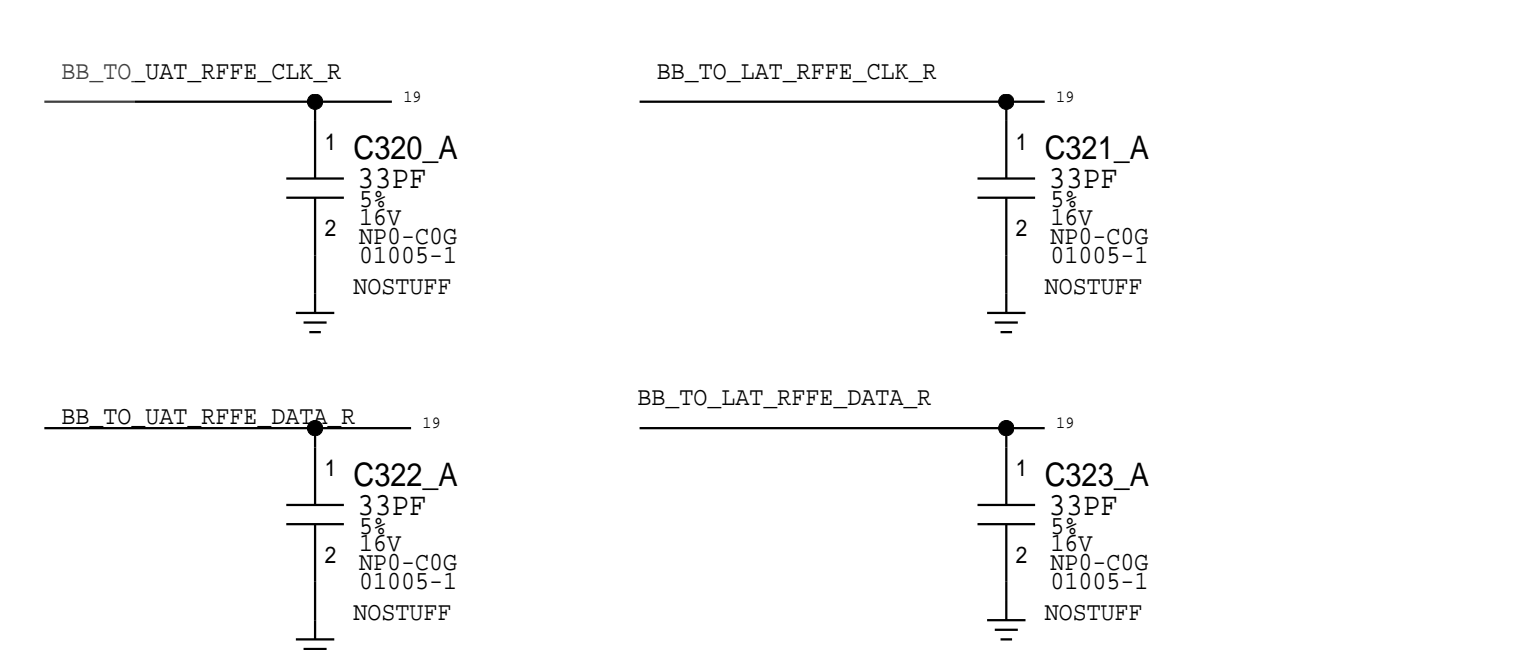
LAT

LAT B2B

RCPT ON MLB_BOT (518S00149)
 PLUG ON FLEX (518S00150)



RFFE FILTERS



ANTENNA CONNECTIONS

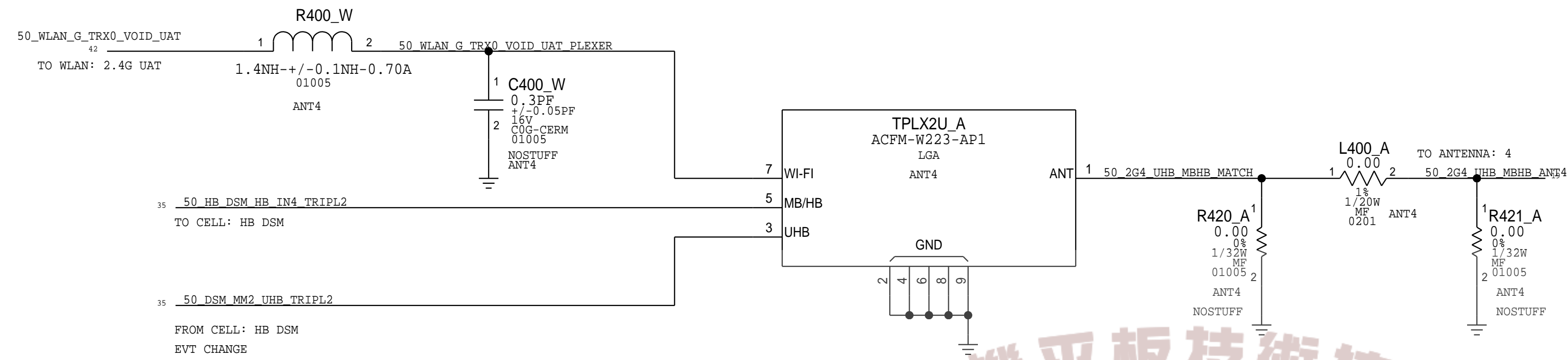
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MAKE_BASE=TRUE			
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50_UHB_5GHZ_ANT6	==	50_UHB_5GHZ_ANT6	20
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SHARED N-PLEXERS

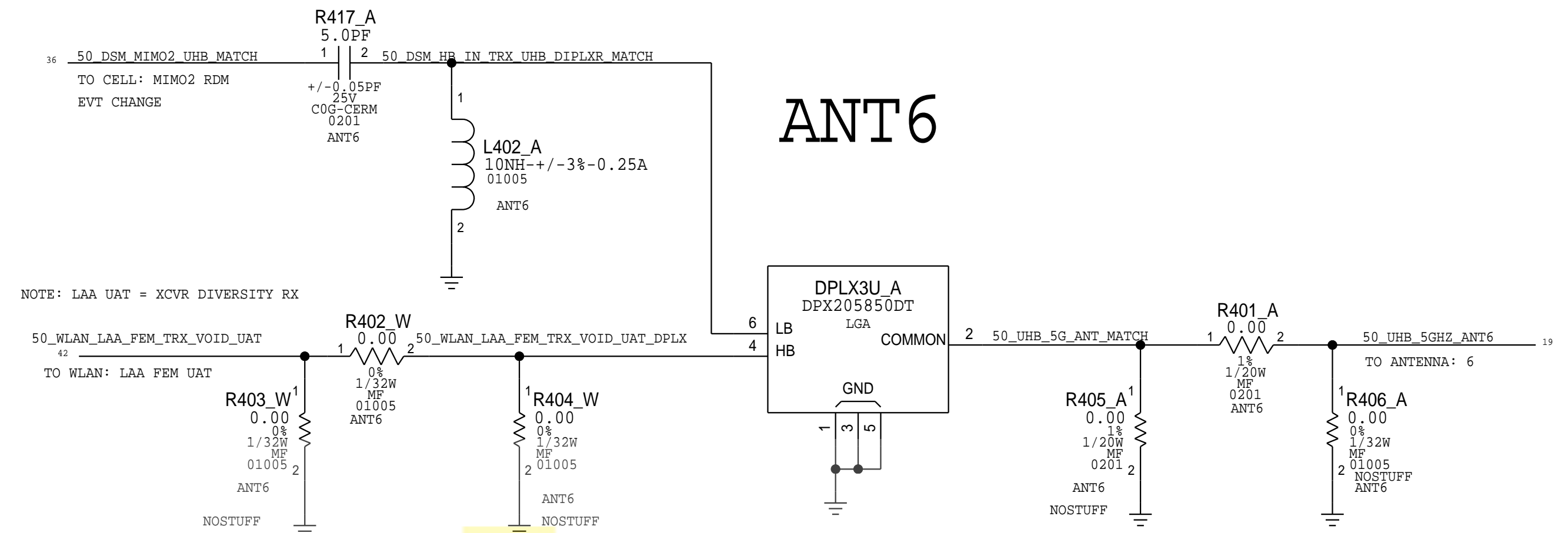
UAT

ANT4



MHB-UHB/2.4G WLAN TRIPLEXER2

ANT6

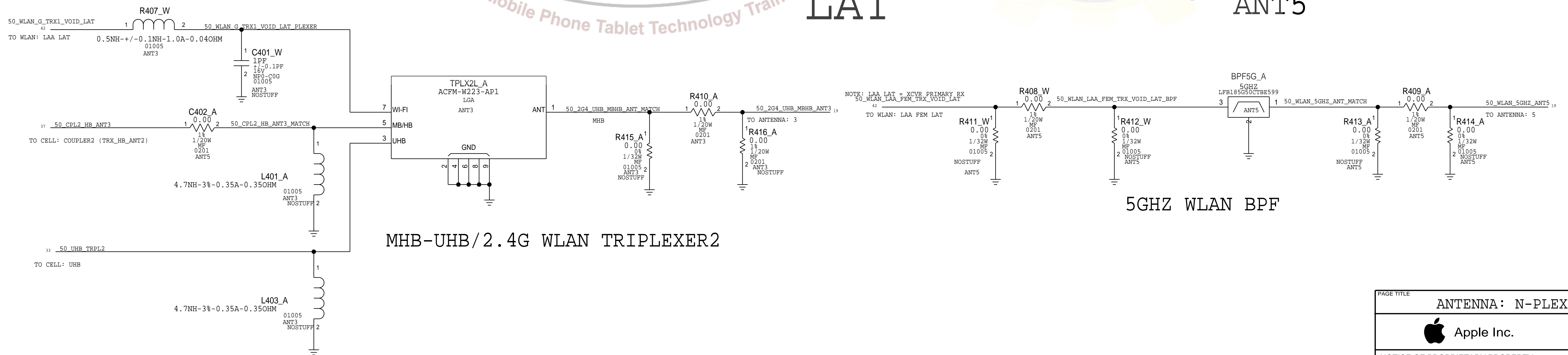


UHB-5G WLAN DIPLXER3

ANT3

LAT

ANT5



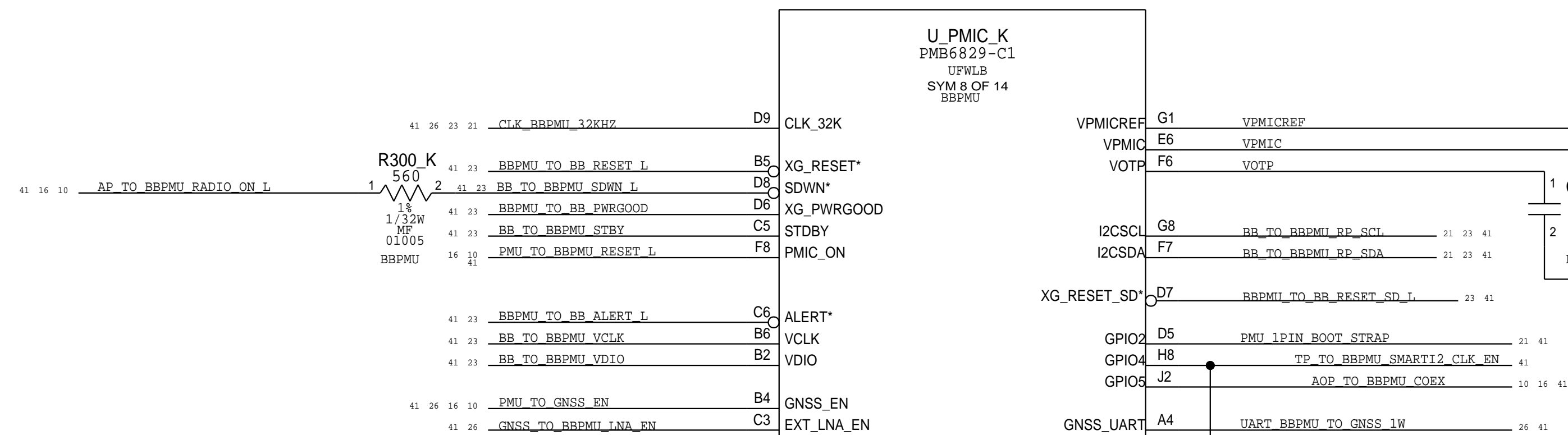
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5GHZ WLAN BPF

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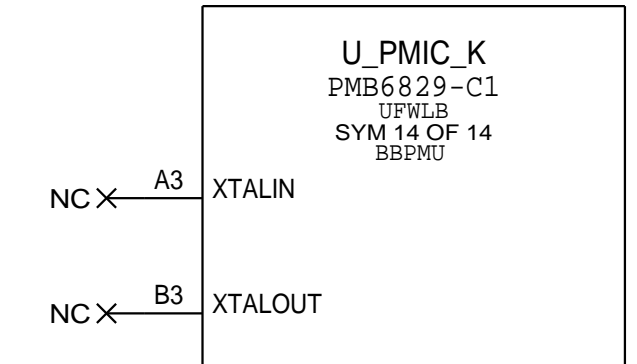
BBPMU: CONTROL

BBPMU (8/14)

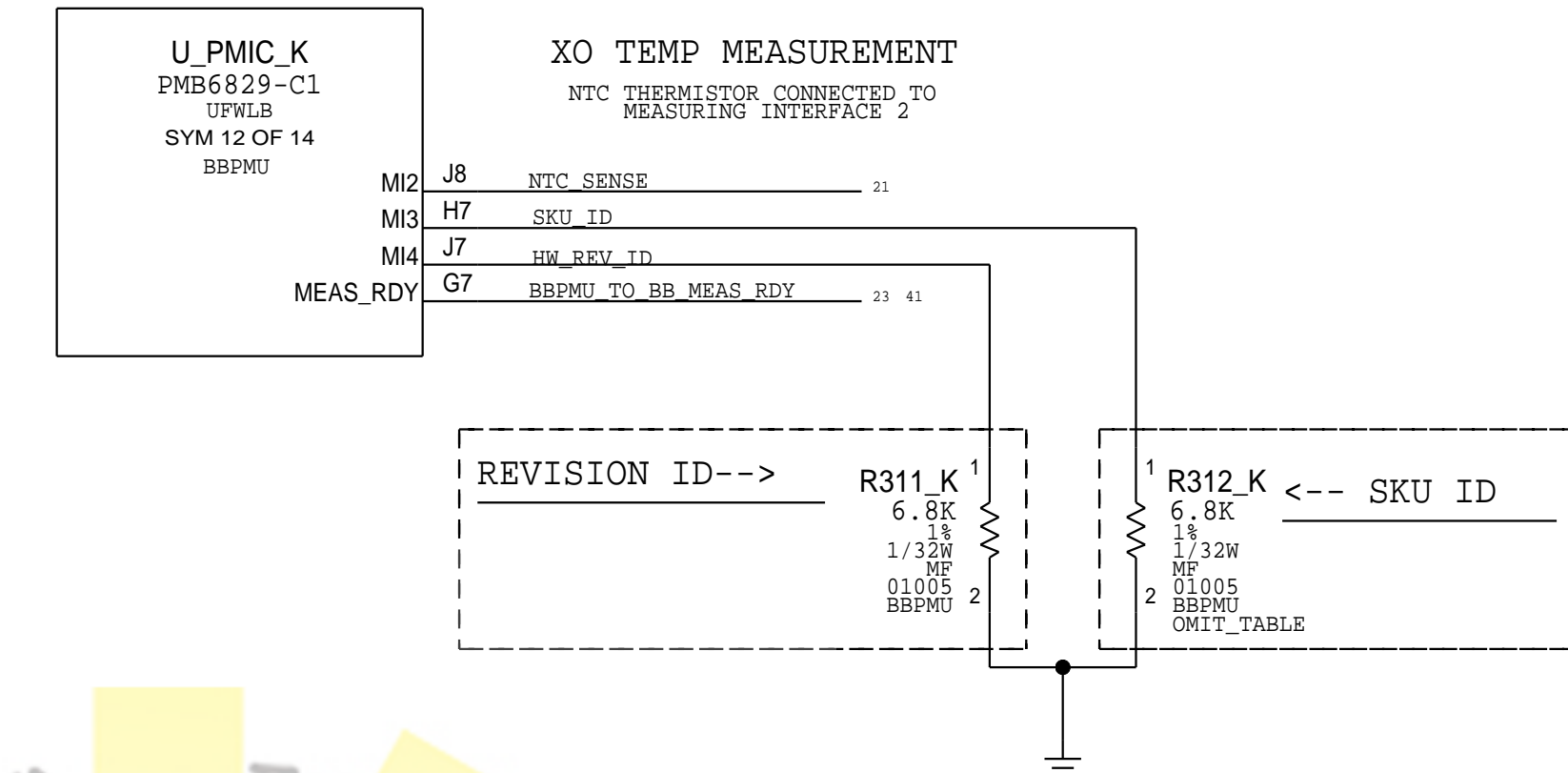


POR: 32K CLK GENERATED INTERNALLY
OPTIONAL PINS FOR EXTERNAL OSC

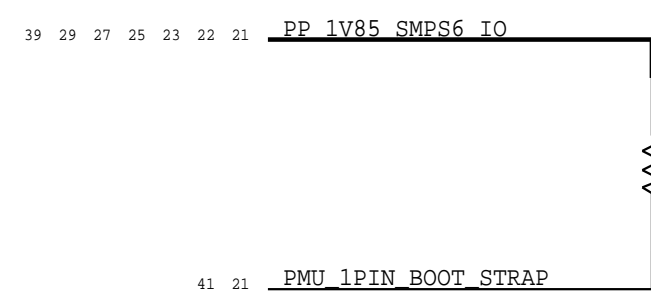
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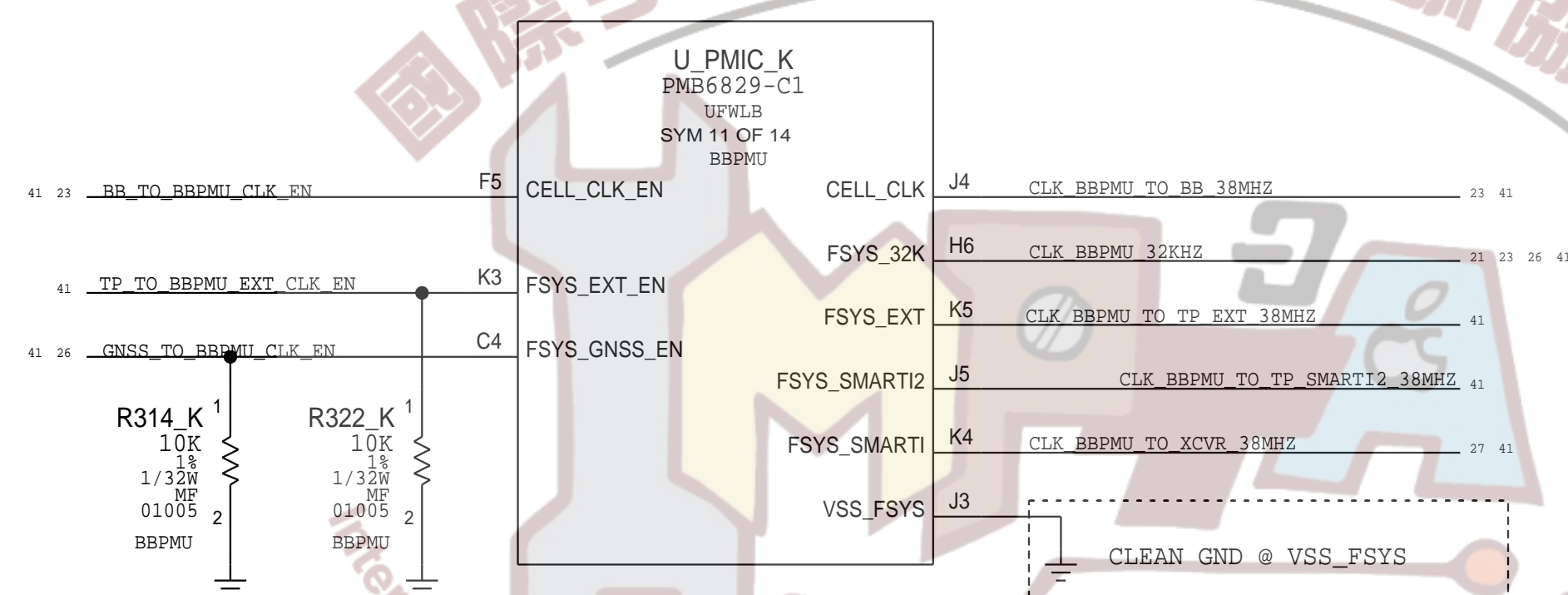
BBPMU (12/14)



CAN BE REMOVED
WITH XPMU C0



BBPMU (11/14)



REVISION

R311_K	MLB	RF DEV
0.0	T/POC/PRE-PROTO0	1.0
1.2K	P0	1.1
2.2K	P1	2.0
3.3K	P2	2.1
4.7K		3.0
6.8K	EVT	
8.2K	EVT 1.5	4.0
10K	CARRIER	
12K	DVT	5.0
15K	PVT	5.1
18K		
22K		
27K		6.0
33K		6.0
39K		
47K		
56K	DARWIN	
68K	JP_SKWS	
82K		
100K	P1 DOE2, TXC	
120K	P1 DOE1, S7 B1	
150K		

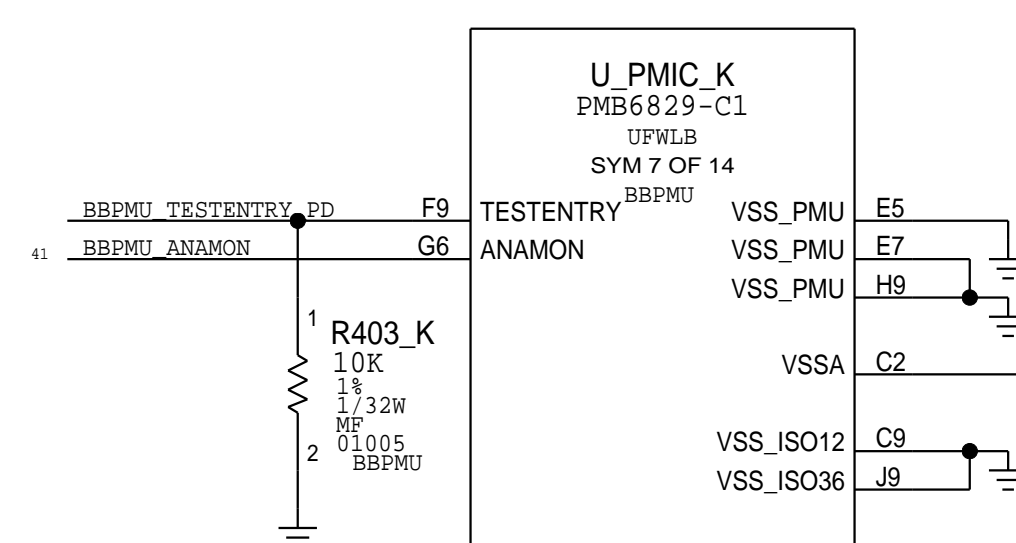
SKU/CATEGORY

R312_K	HW REVISION	X-CODE
0.0	RFDEV JP	
1.2K	ICE 18.0 JP	X1344
2.2K	ICE 18.0 ROW	(ICE 18.0)
3.3K	ICE 18.1 JP	X1049
4.7K	ICE 18.1 ROW	(ICE 18.1)
6.8K	ICE 18.2 JP	X1210
8.2K	ICE 18.2 ROW	(ICE 18.2)
10K	RFDEV ROW	
12K	ICE 18.5 JP	X1170
15K	ICE 18.6 JP	X1176
18K		
22K	ICE 18.5 US	X1170
27K	ICE 18.6 US	X1176
33K	ICE 18.0 NA	X1344
39K	RFDEV NA	
47K	ICE 18.1 NA	X1049
56K	ICE 18.2 NA	X1210
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82K	KAROO INTERNAL	
100K	KAROO INTERNAL	
120K	KAROO INTERNAL	
150K		

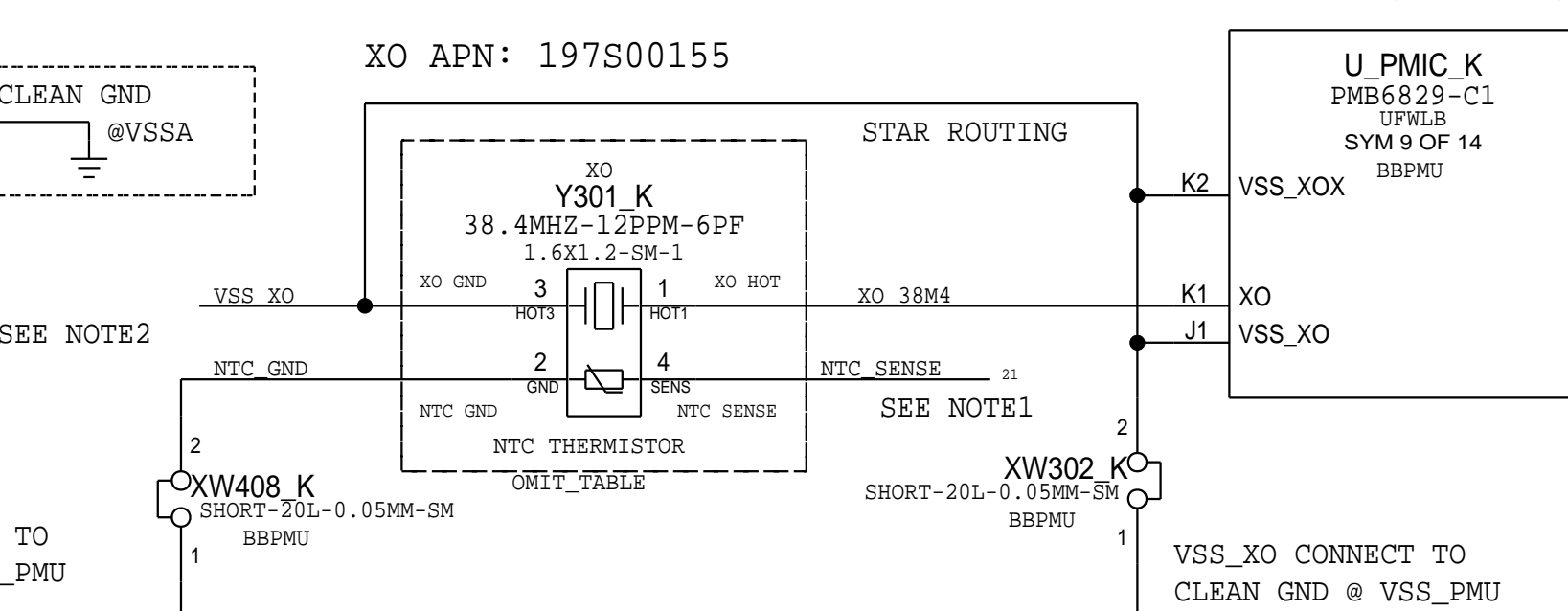
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ADC TABLE RDAR://27081897

BBPMU ADC TABLES

BBPMU (7/14)



BBPMU (9/14)



NOTE1: ROUTE NTC_GND AND NTC_SENSE AS SHIELDED DIFF PAIR
NOTE2: VSS_XO AND NTC_GND SHOULD CONNECT TOGETHER WITH LOW IMPEDANCE ON CLEAN GND

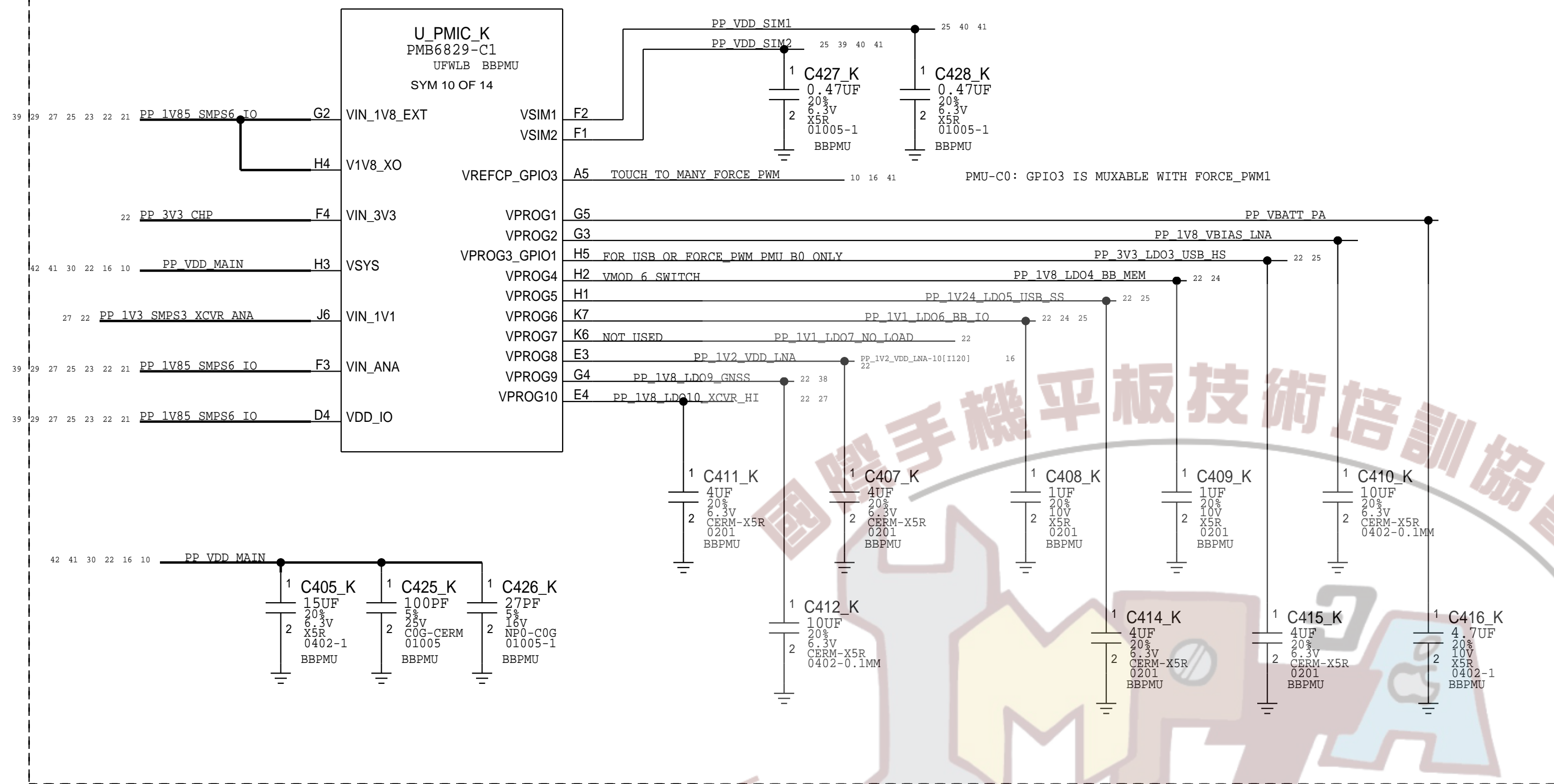
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BBPMU: RAILS

SWITCHERS

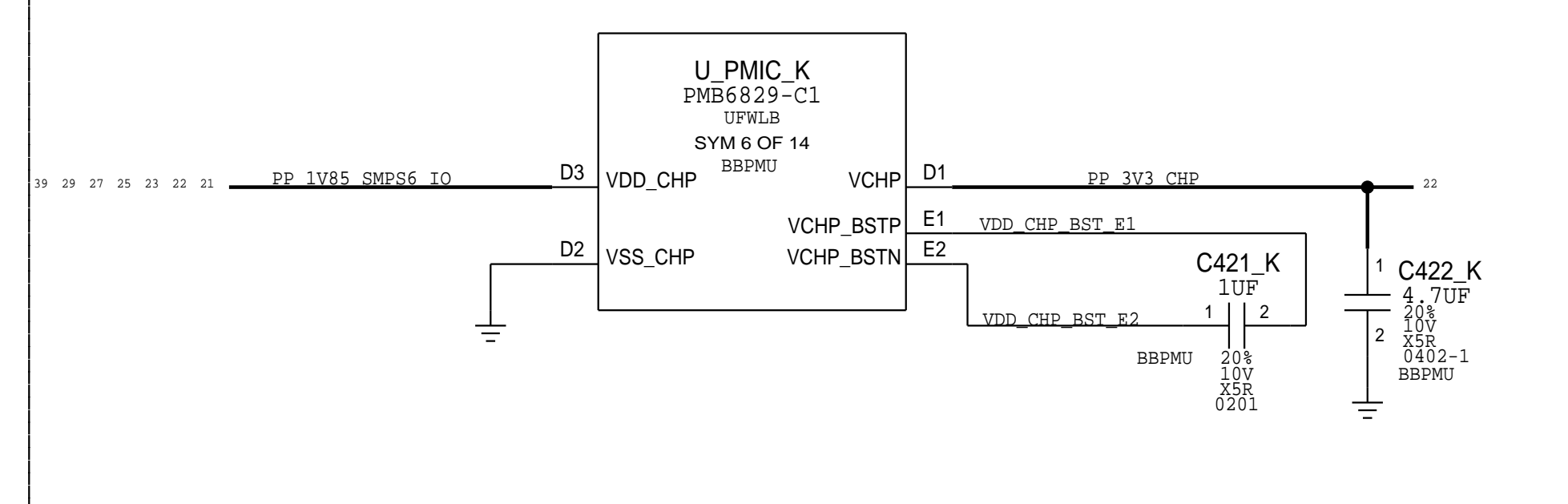
PROGRAMMABLE LDOS

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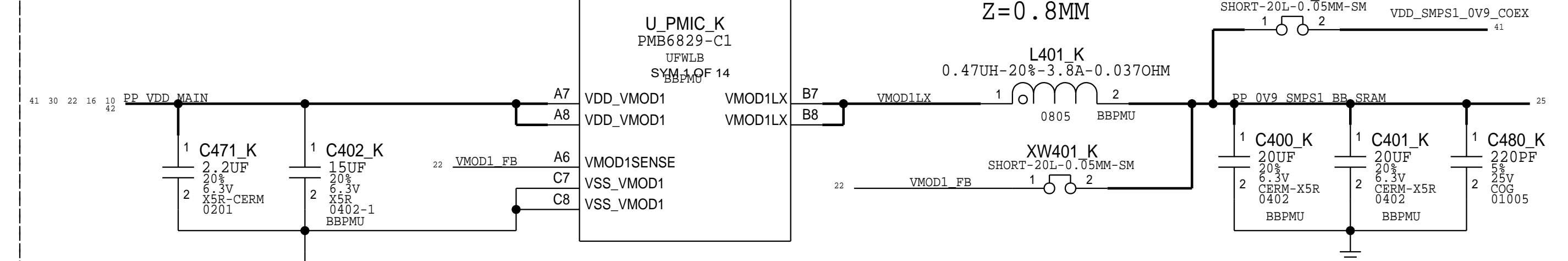


CHARGE PUMP

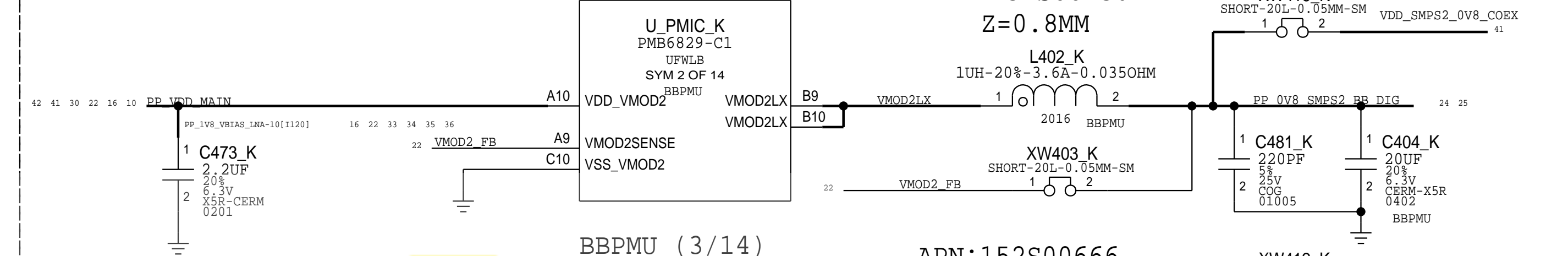
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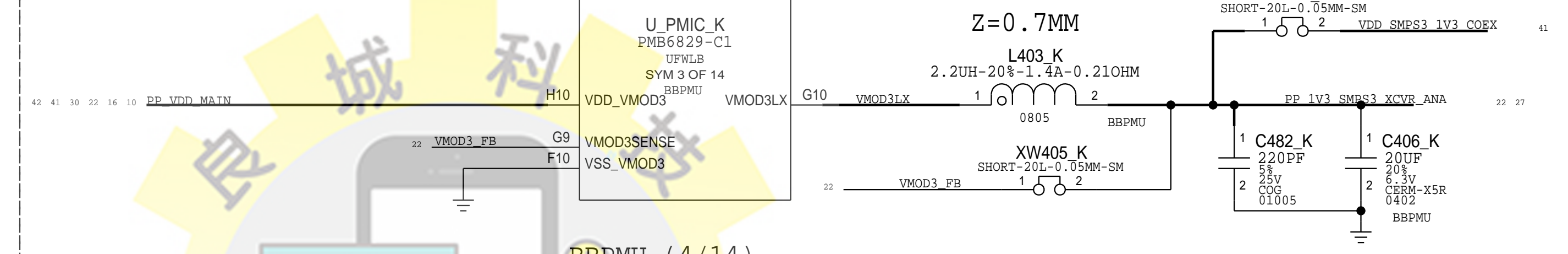
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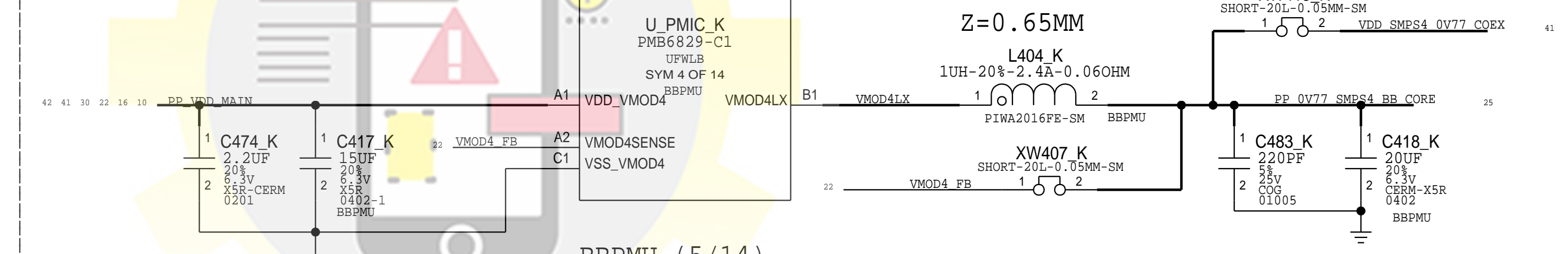
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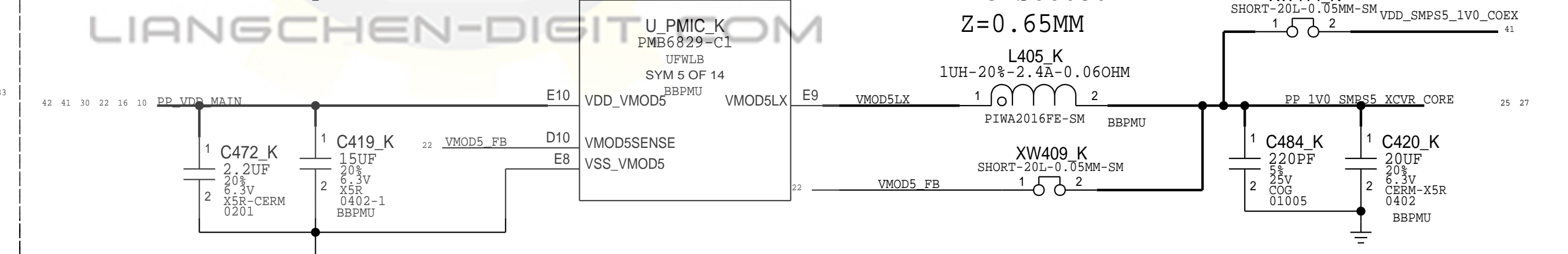
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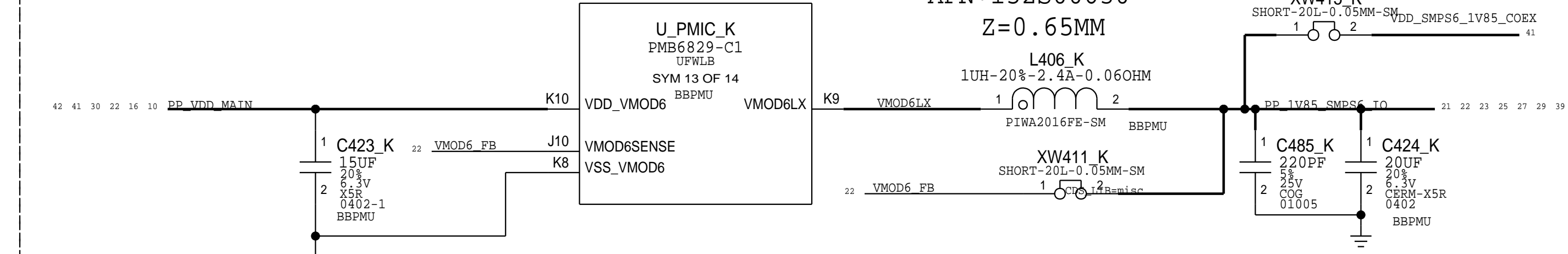
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BBPMU (5/14)



BBPMU (13/14)

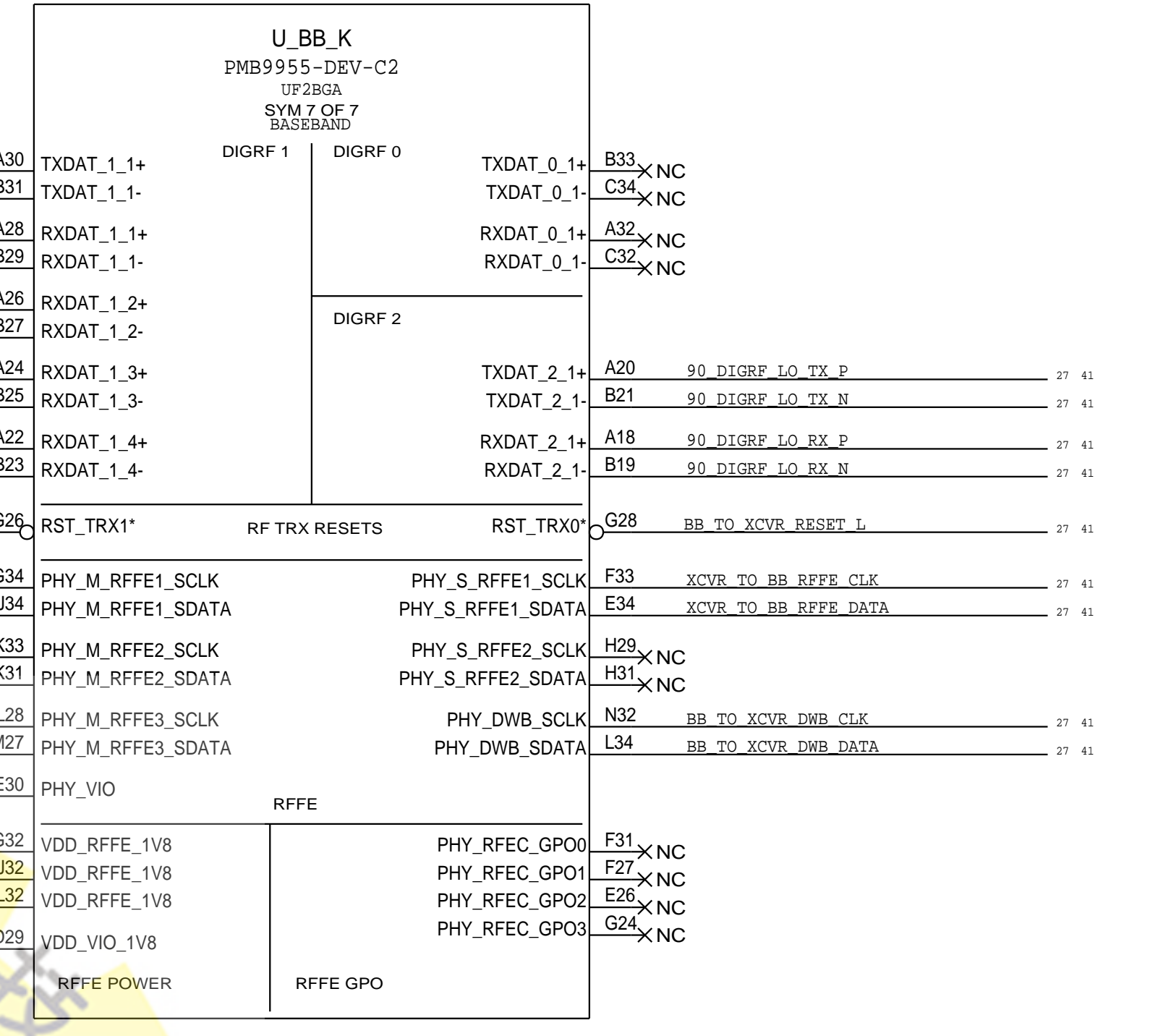
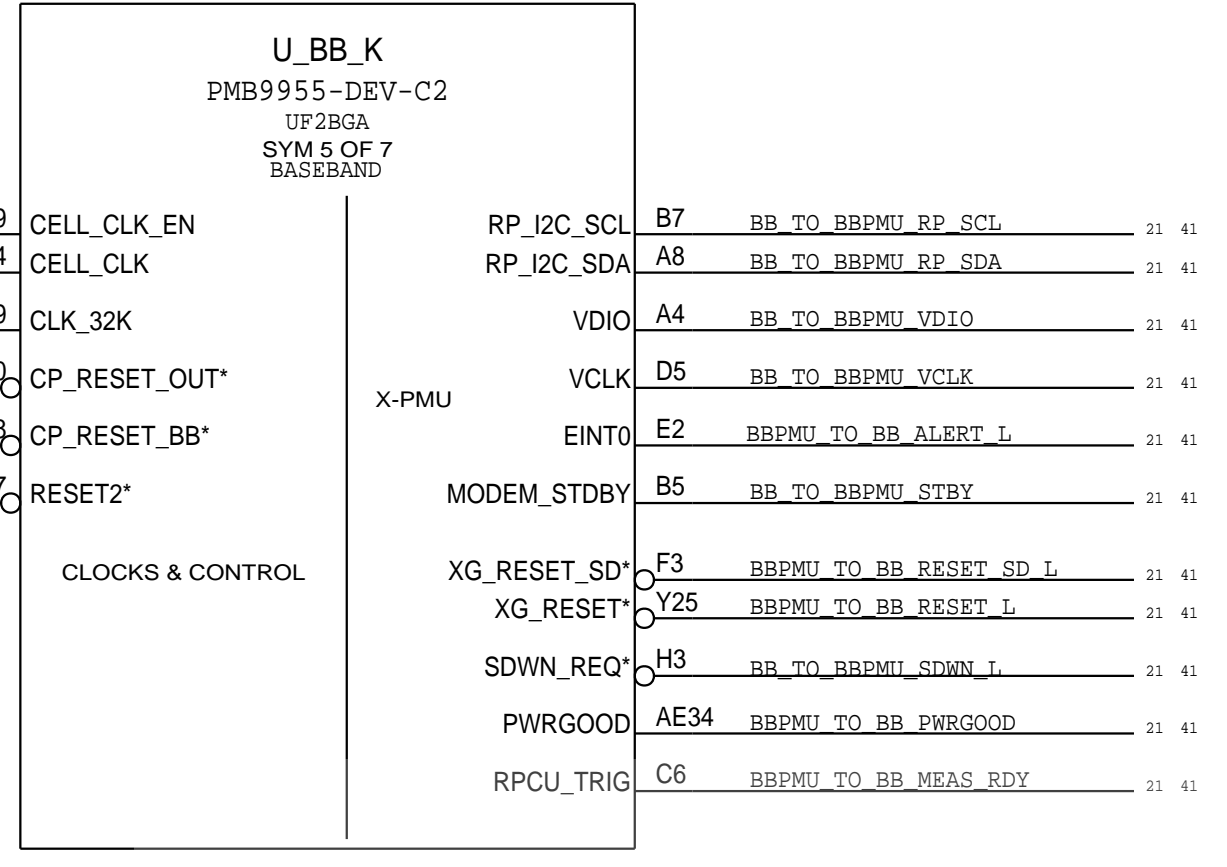


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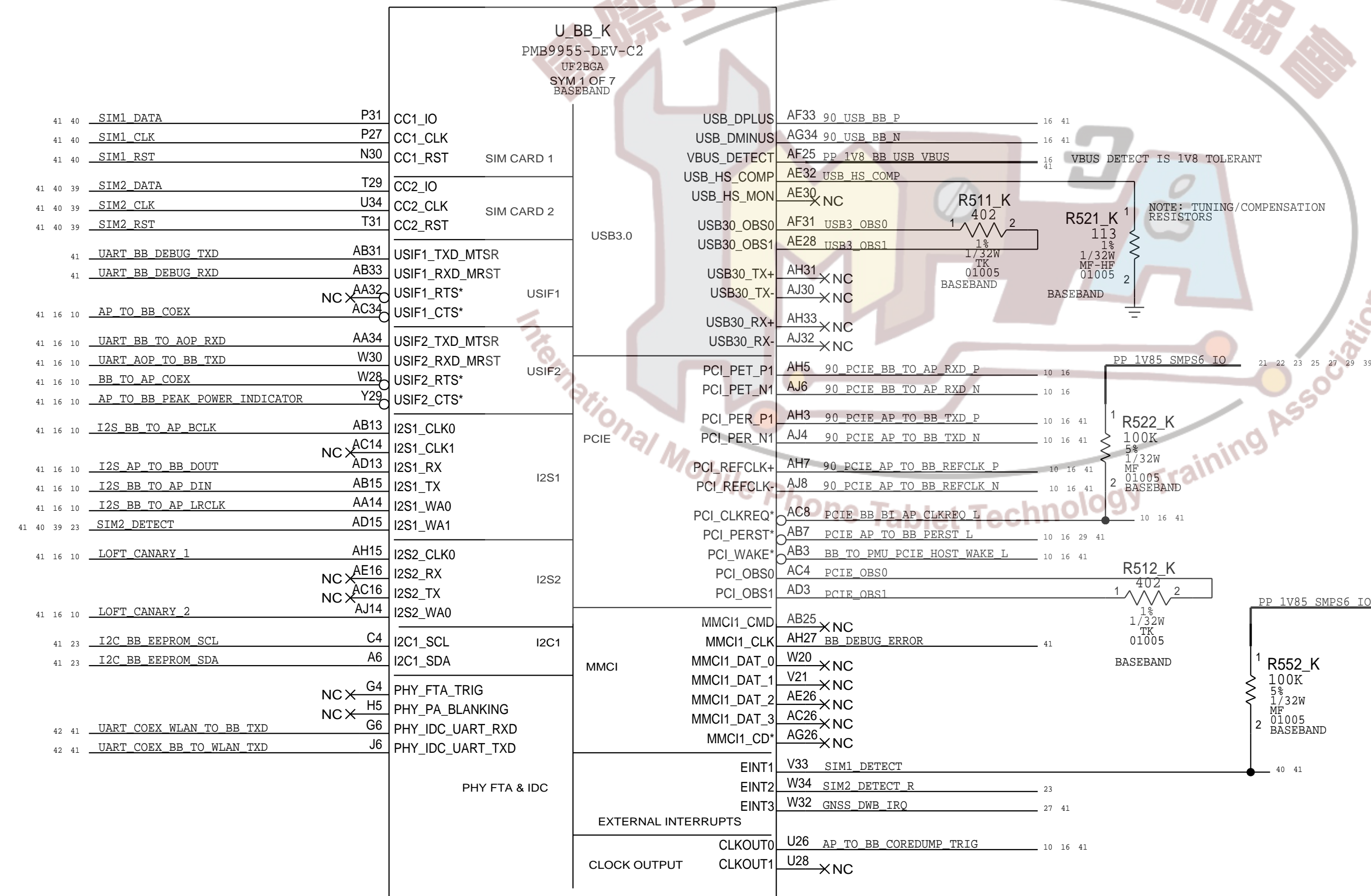
BB: INTERFACE

XG756 (7/7)

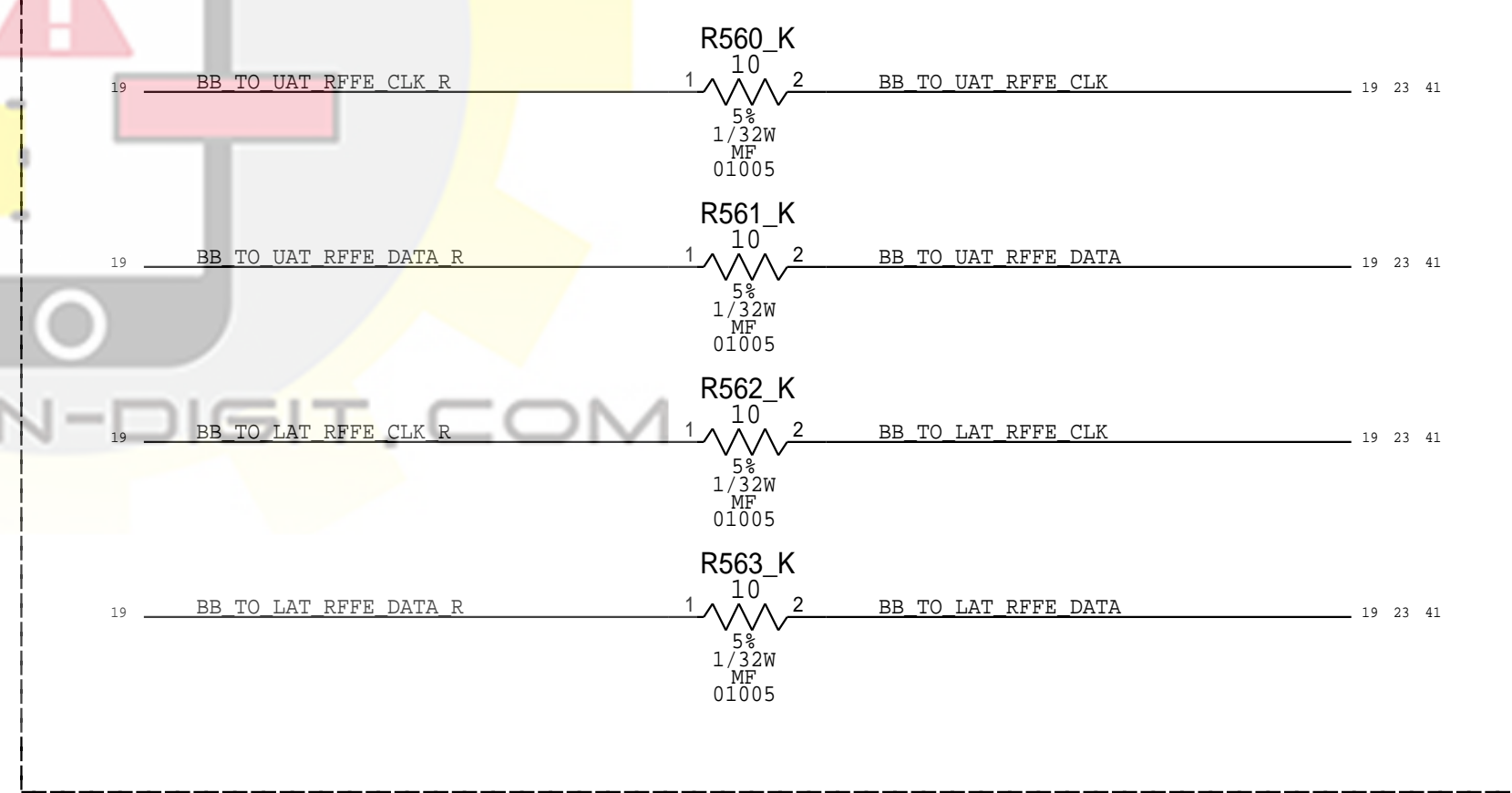
XG756 (5/7)



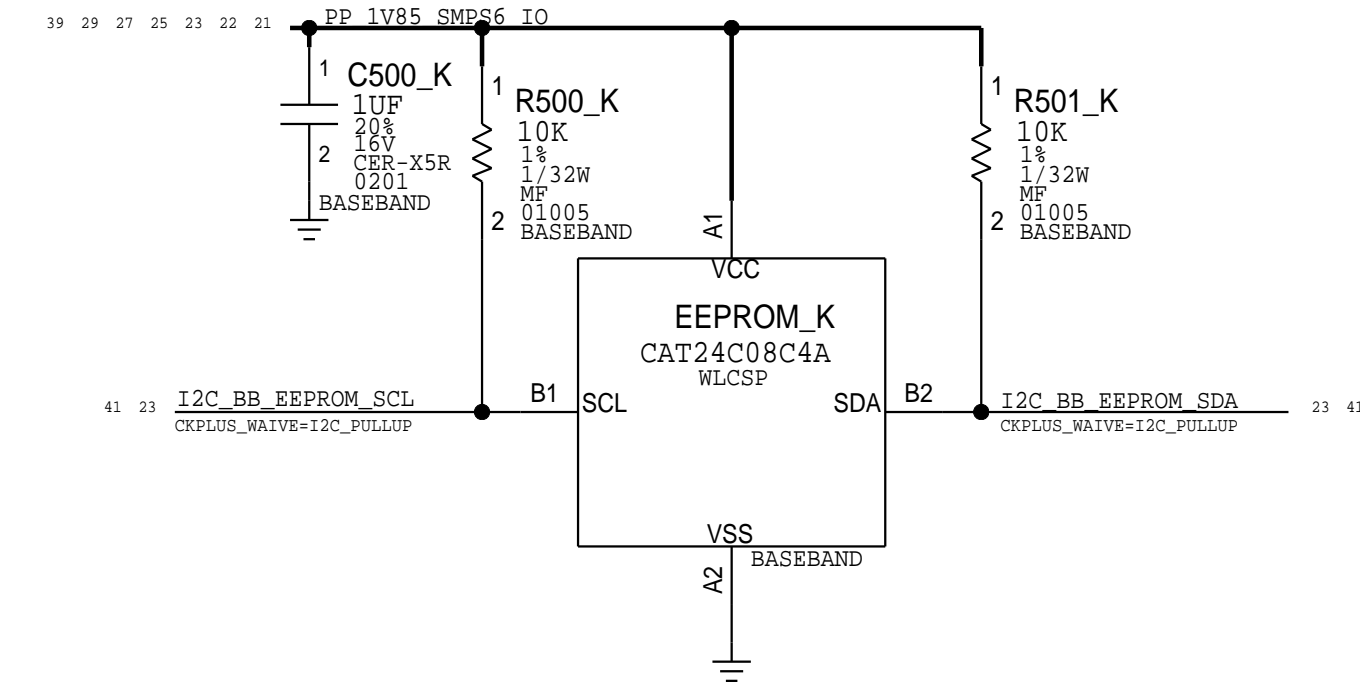
XG756 (1/7)



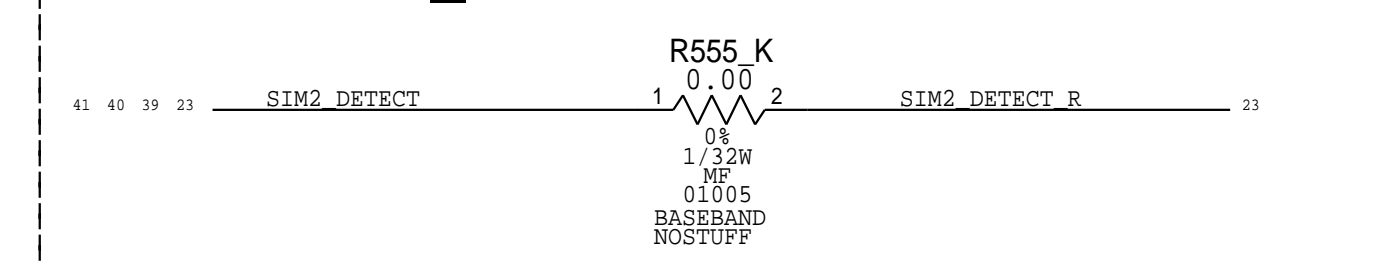
BB RFFE SOURCE TERMINATIONS



BB EEPROM



SIM2_DETECT TO EINT2

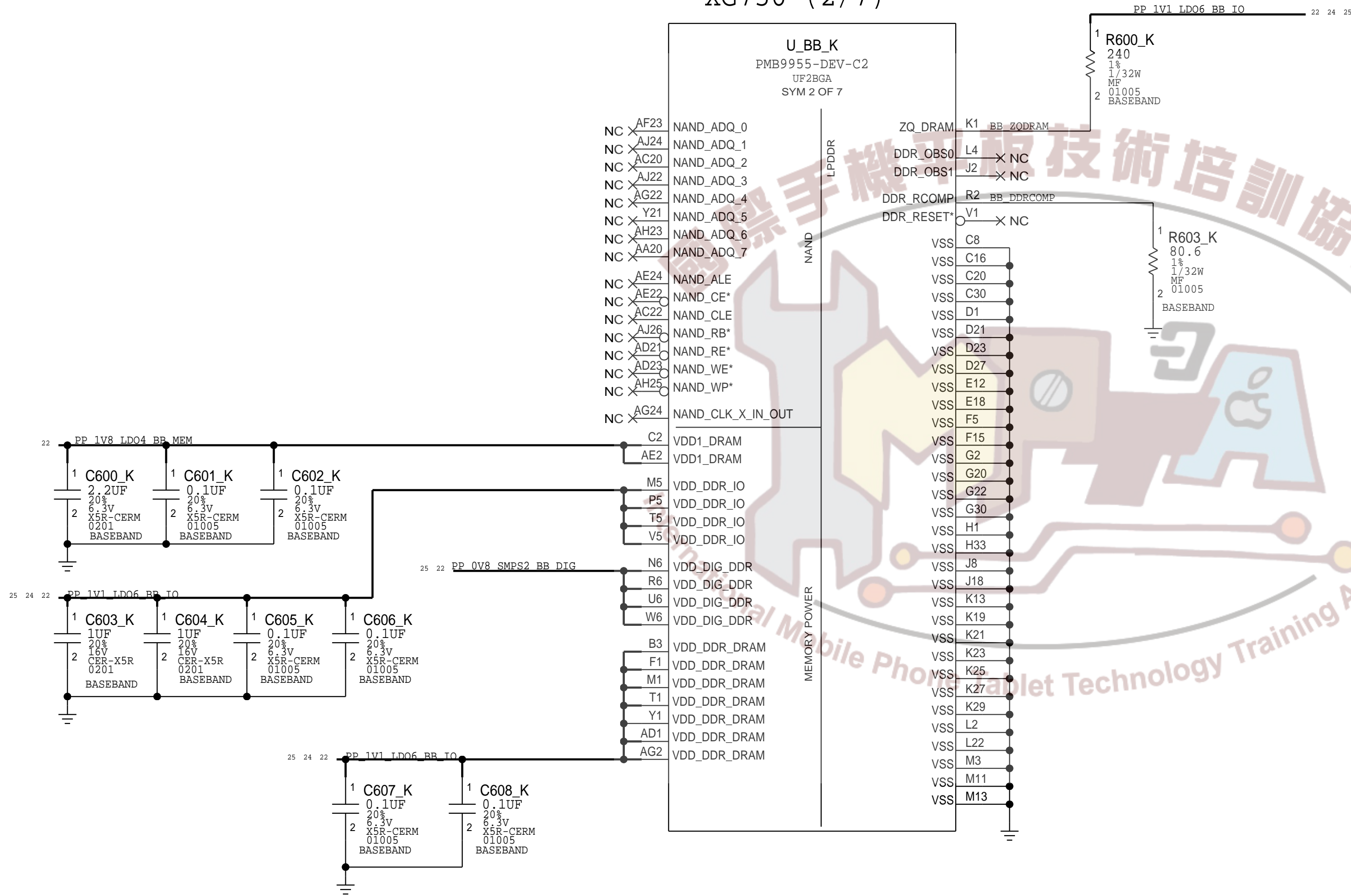


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BRANCH		PAGE 8 OF 27
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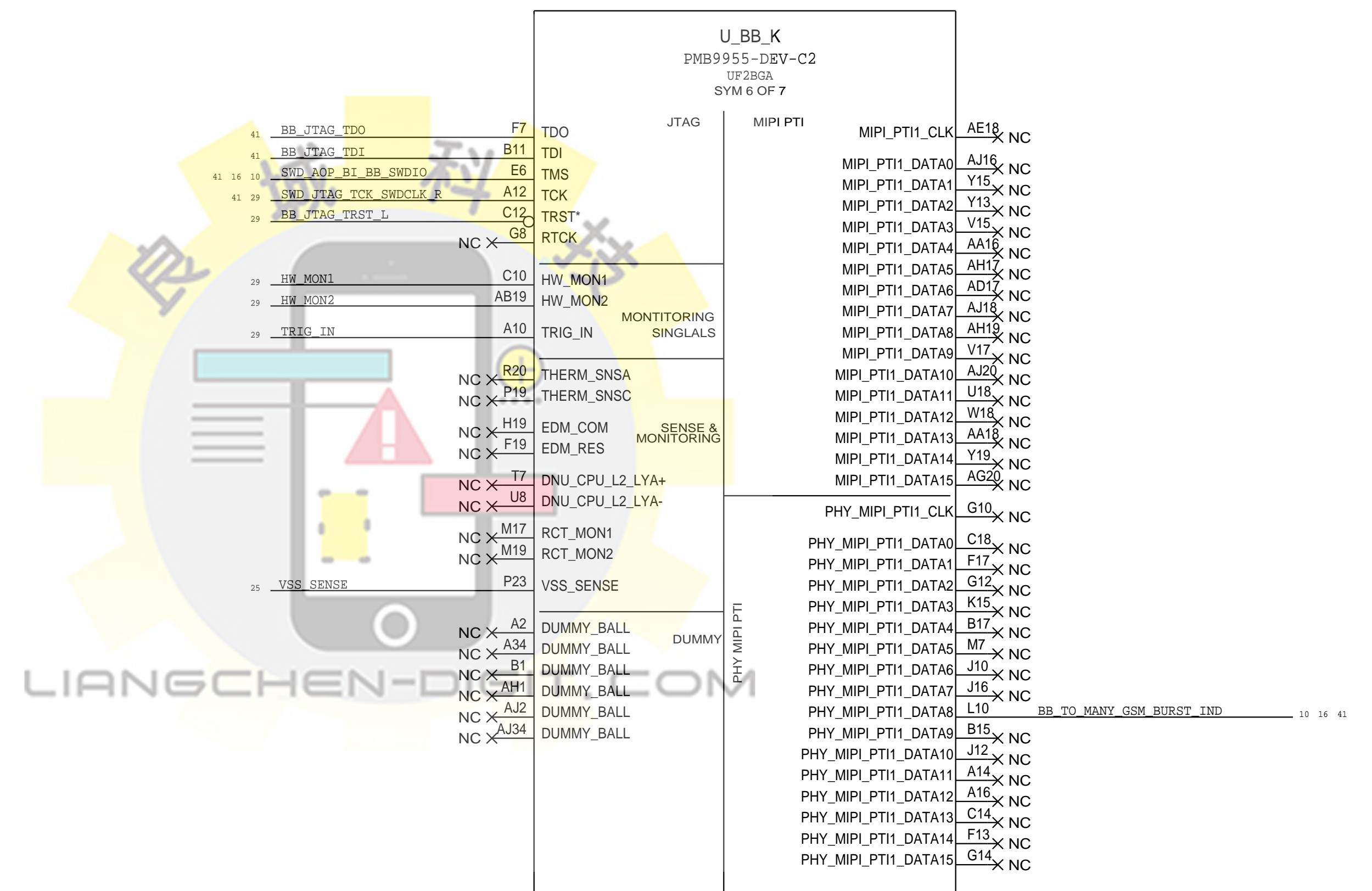
BB: DDR PWR & JTAG

HOOKS FOR DDR4 TESTING/CAL

XG756 (2/7)



XG756 (6/7)

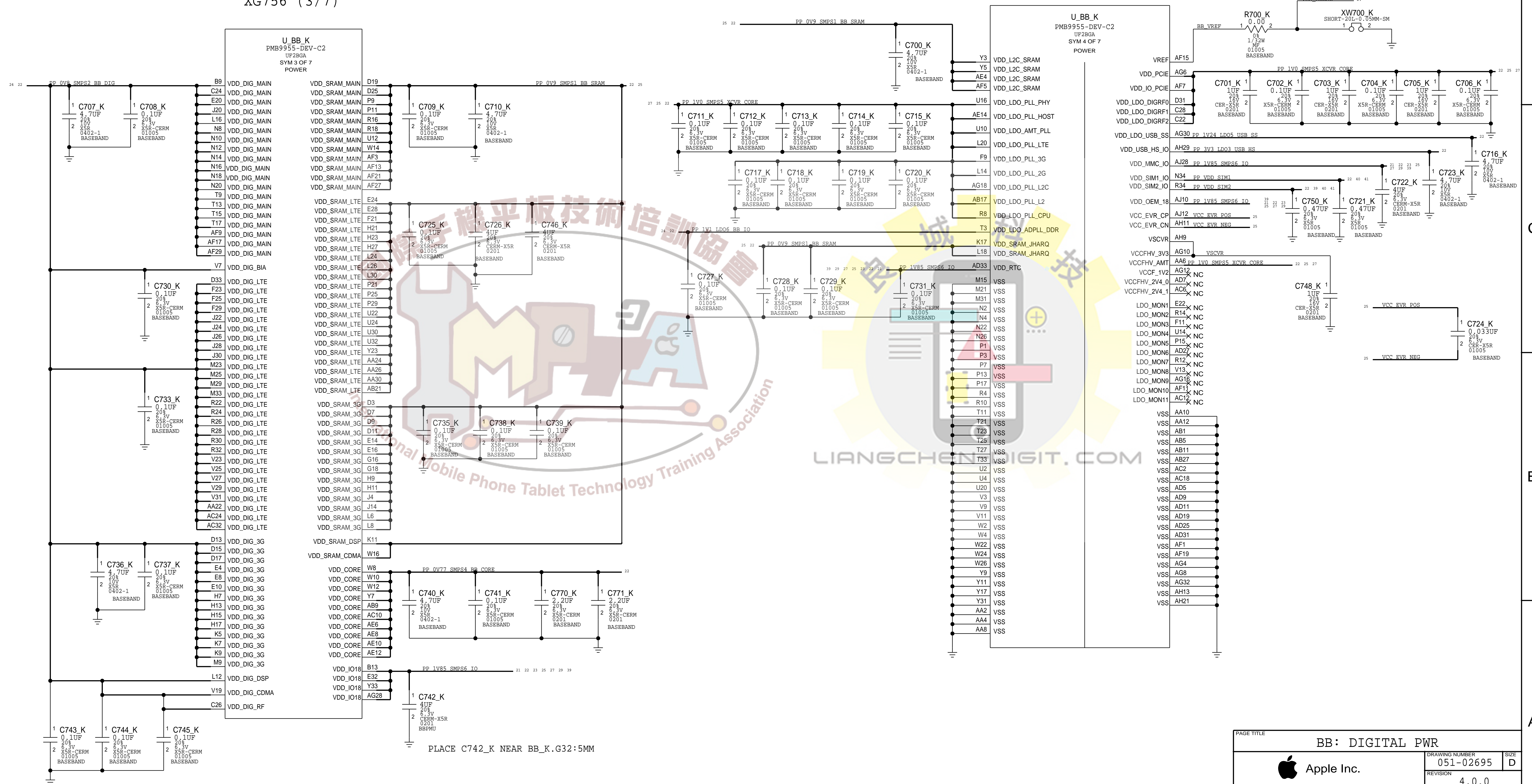


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BB: DIGITAL PWR

XG756 (3/7)

XG756 (4/7)

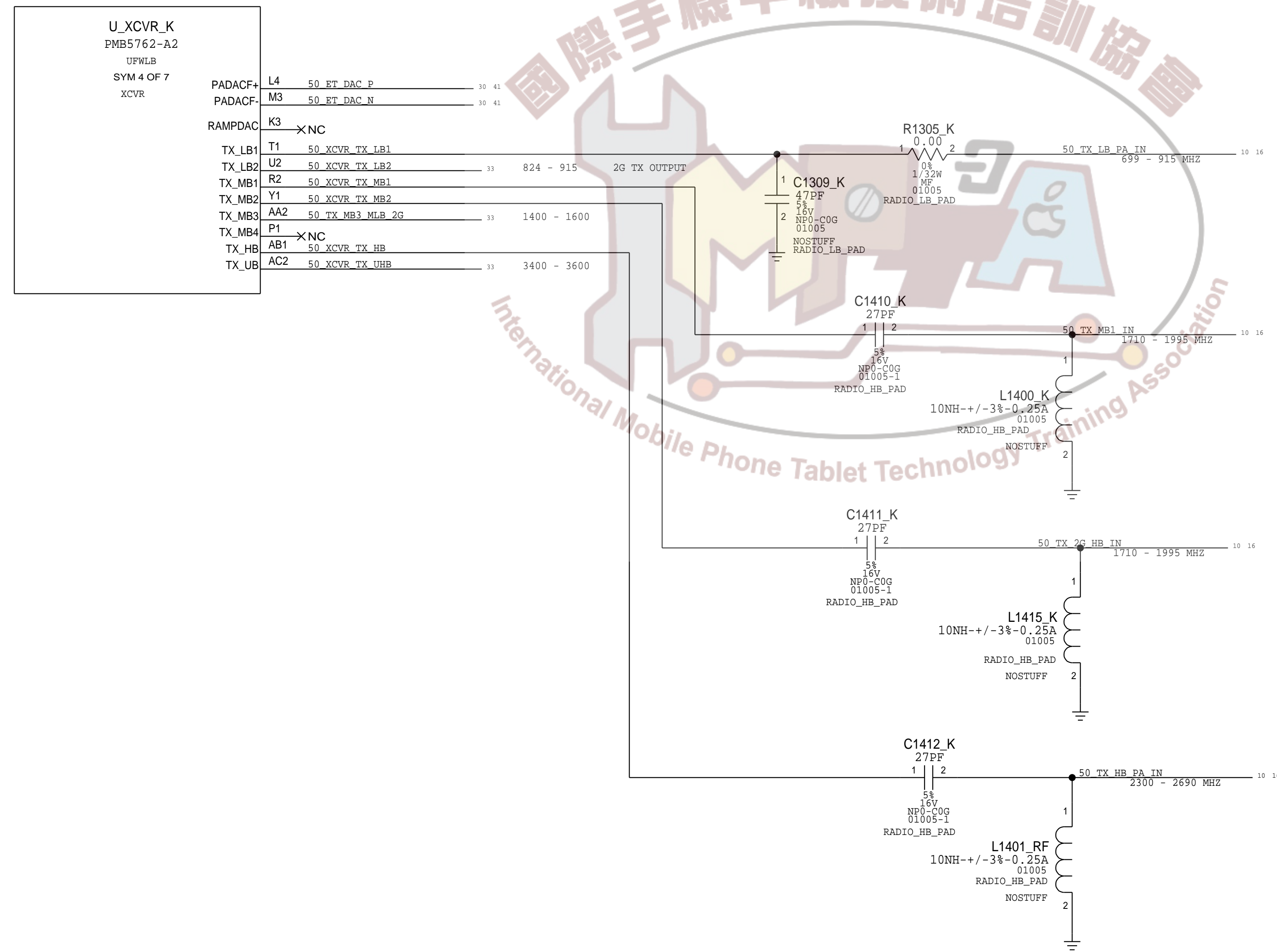


PAGE TITLE		BB: DIGITAL PWR	
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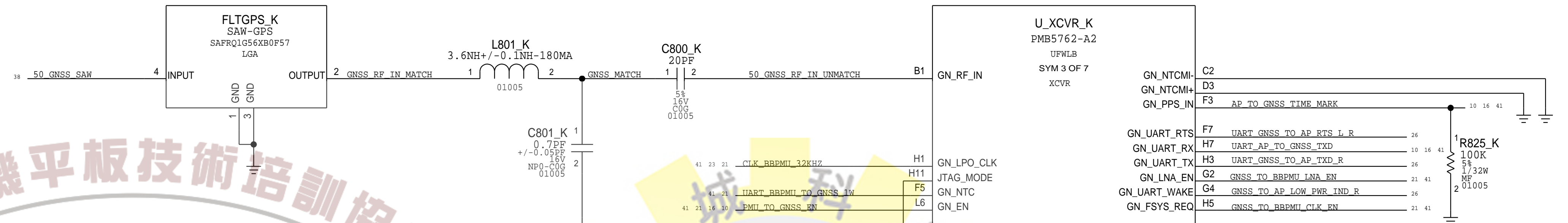
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XCVR: TRANSMIT & GNSS

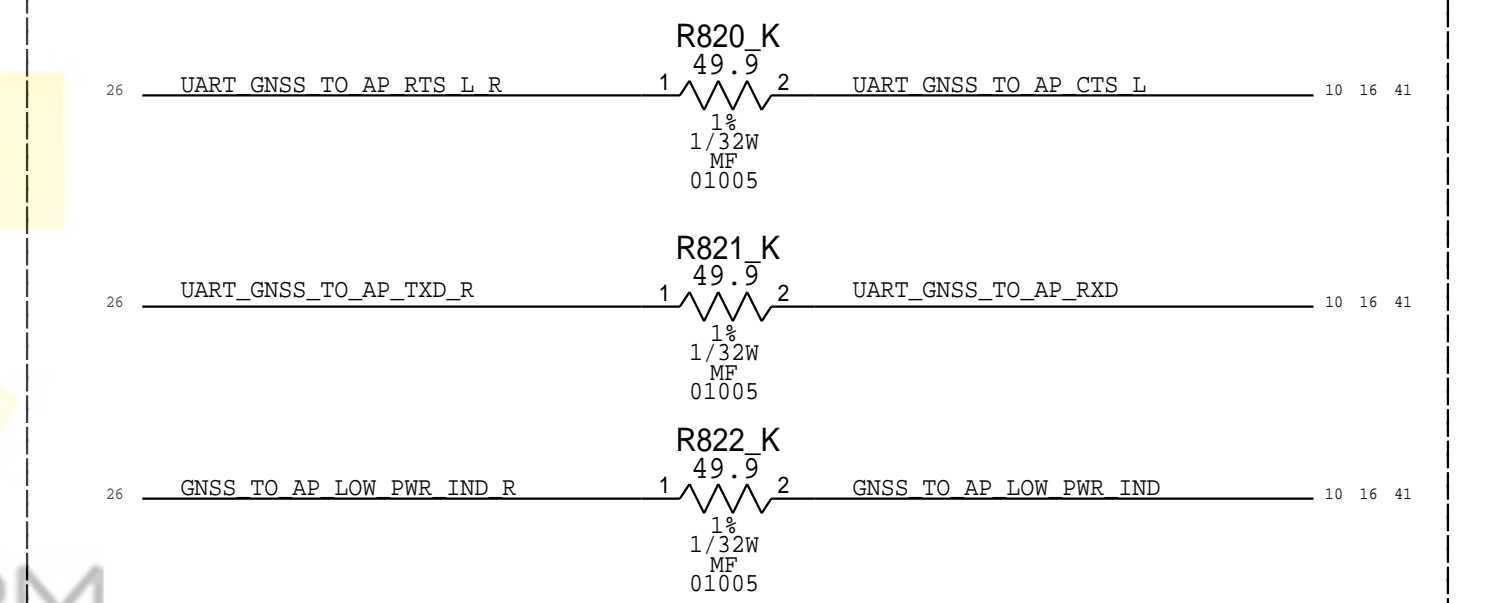
SMARTI7 (4/7)



SMARTI7 (3/7)



GNSS DAMPING RESISTORS



PAGE TITLE		
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XCVR: INTERFACE & PWR

(LAYOUT: MAX DCR 850MHM)

27 25 22 PP 1V0 SMPS5 XCVR CORE

(LAYOUT: STAR ROUTE)

27 22 PP 1V3 SMPS3 XCVR ANA

27 22 PP 1V3 SMPS3 XCVR ANA

STAR ROUTE

SMARTI7 (1/7)

U_XCVR_K
PMB5762-A2

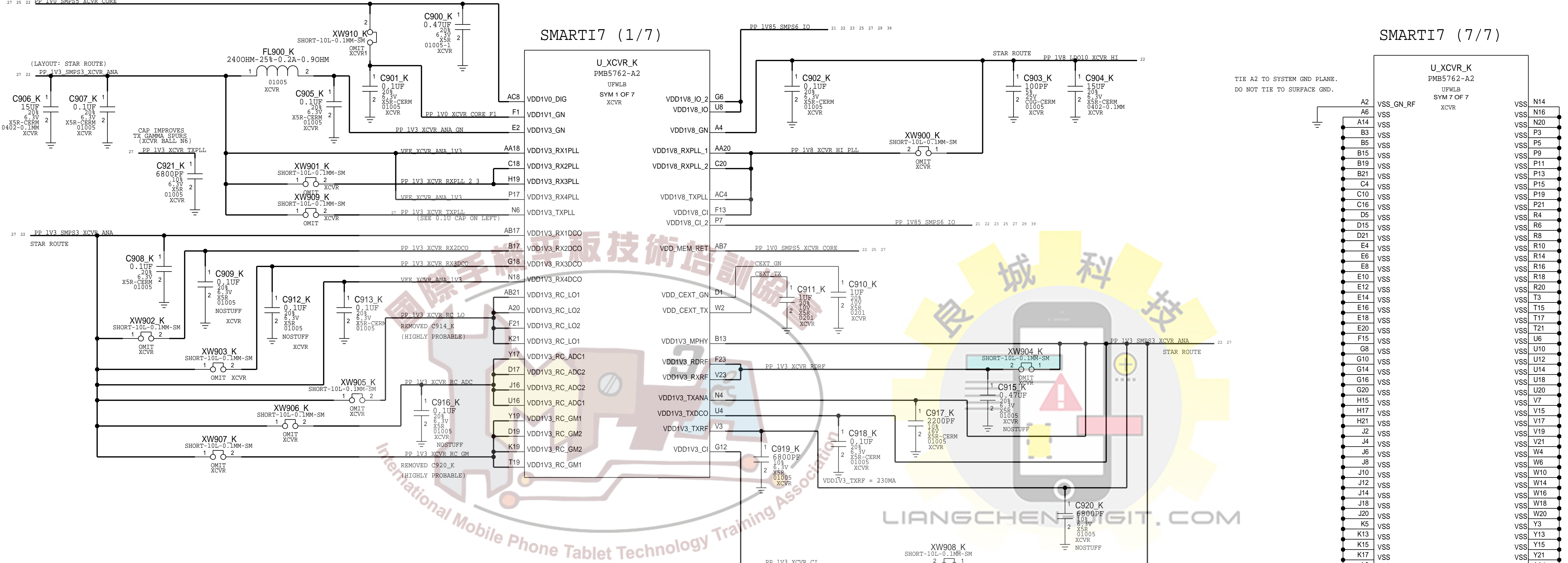
UFWLB
SYM 1 OF 7
XCVR

SMARTI7 (7/7)

U_XCVR_K
PMB5762-A2

UFWLB
SYM 7 OF 7
XCVR

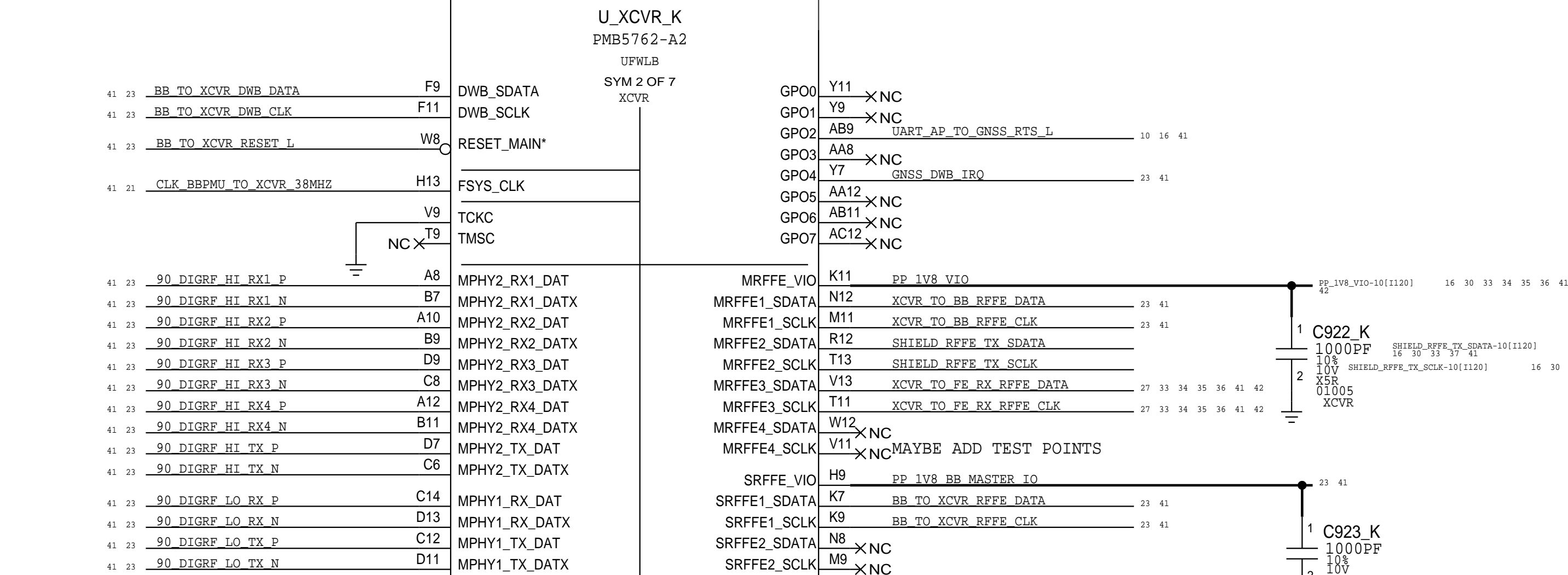
TIE A2 TO SYSTEM GND PLANE.
DO NOT TIE TO SURFACE GND.



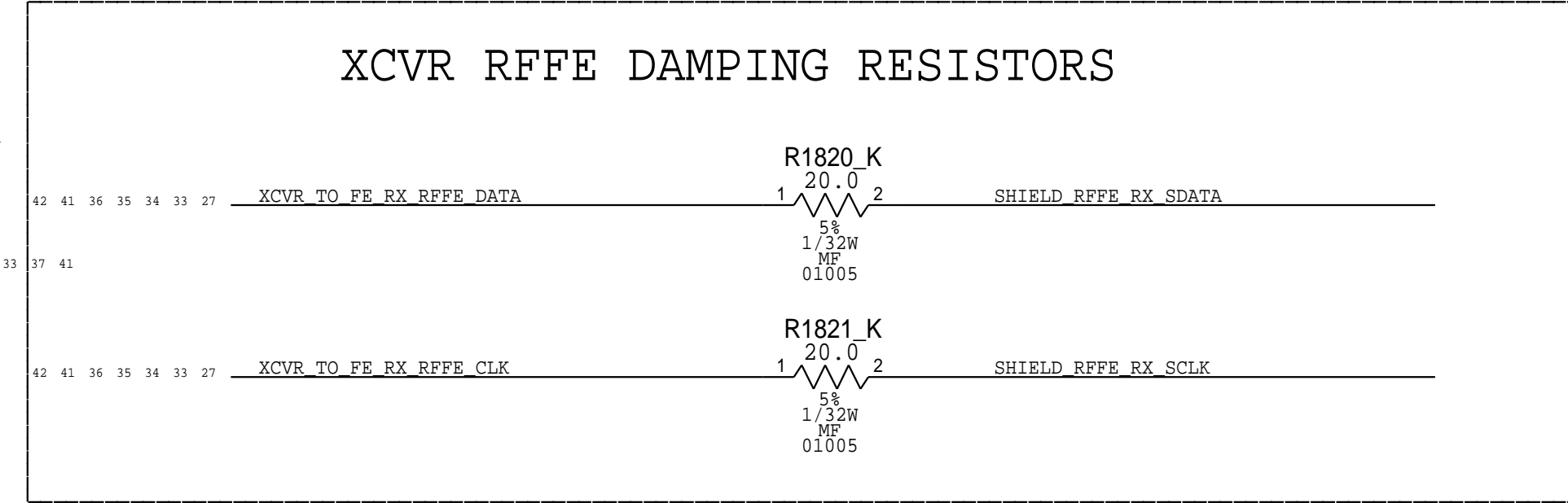
SMARTI7 (2/7)

U_XCVR_K
PMB5762-A2

UFWLB
SYM 2 OF 7
XCVR

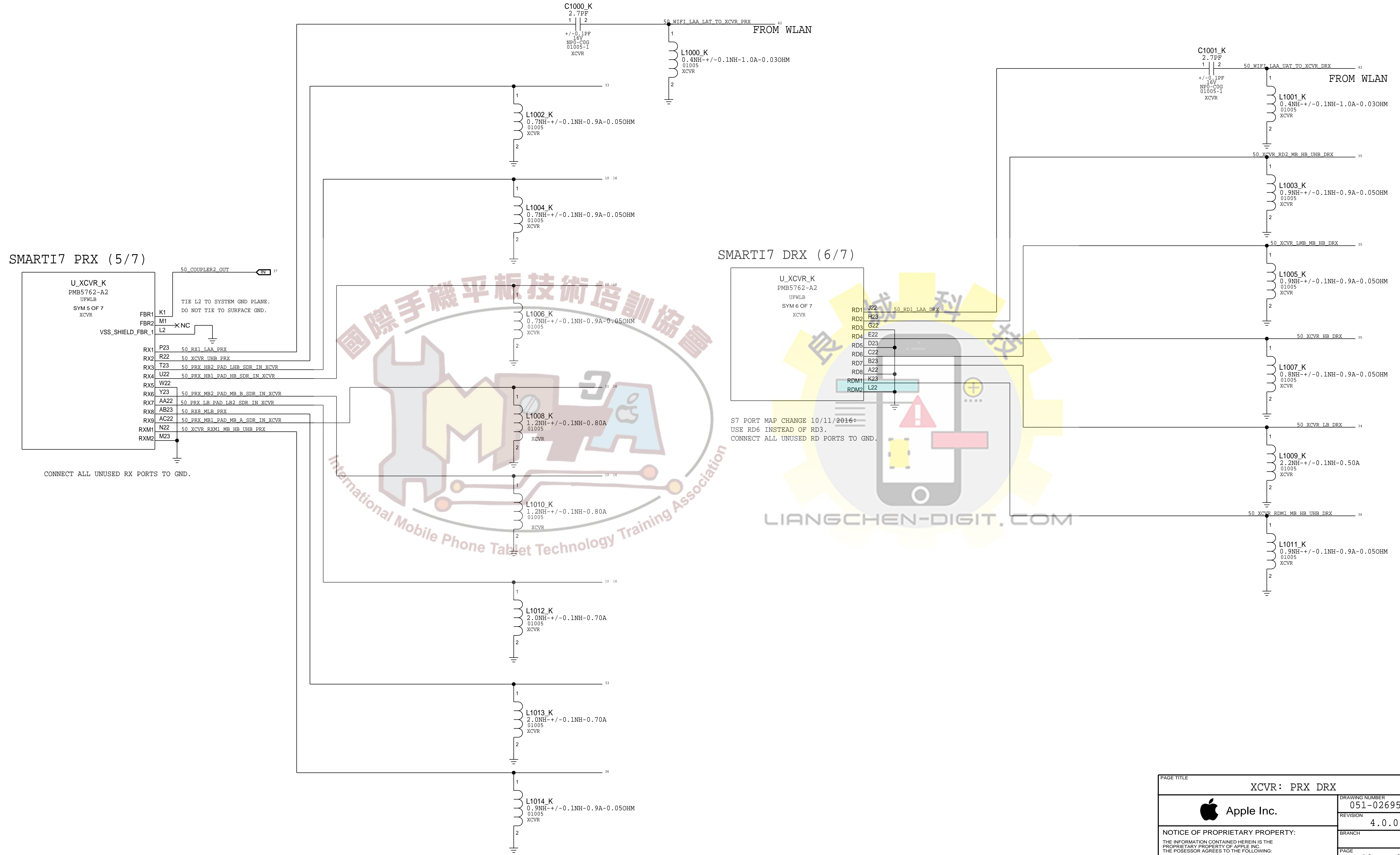


XCVR RFFE DAMPING RESISTORS



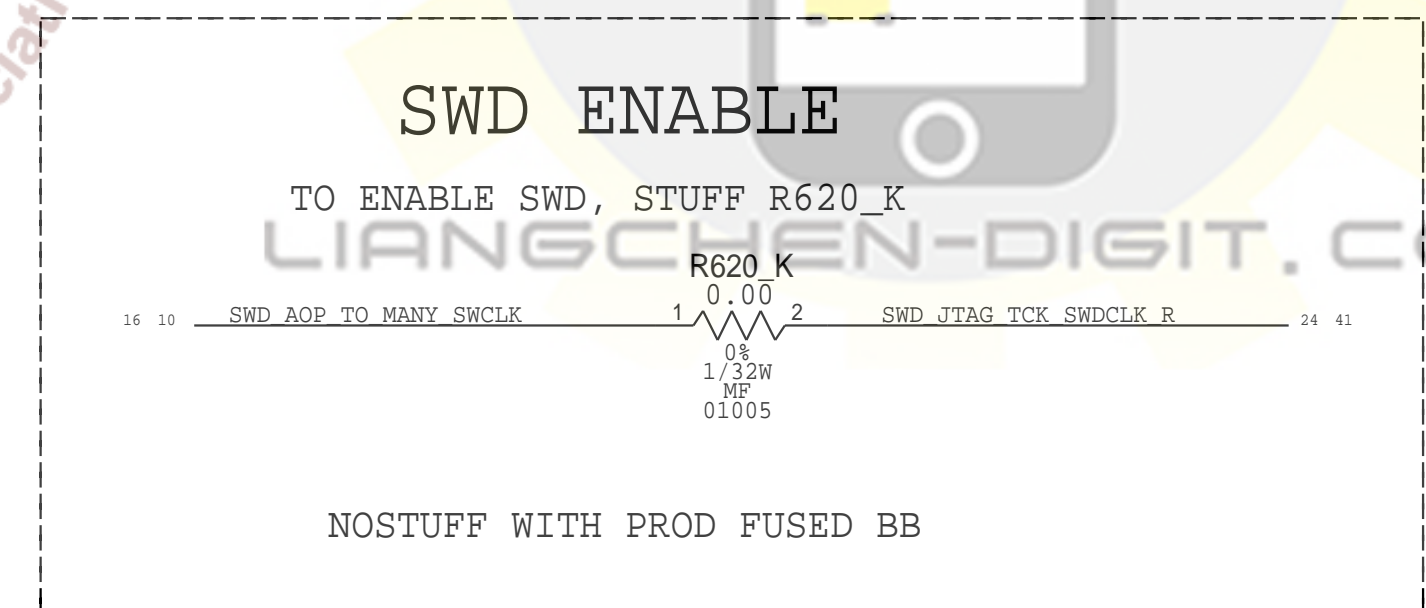
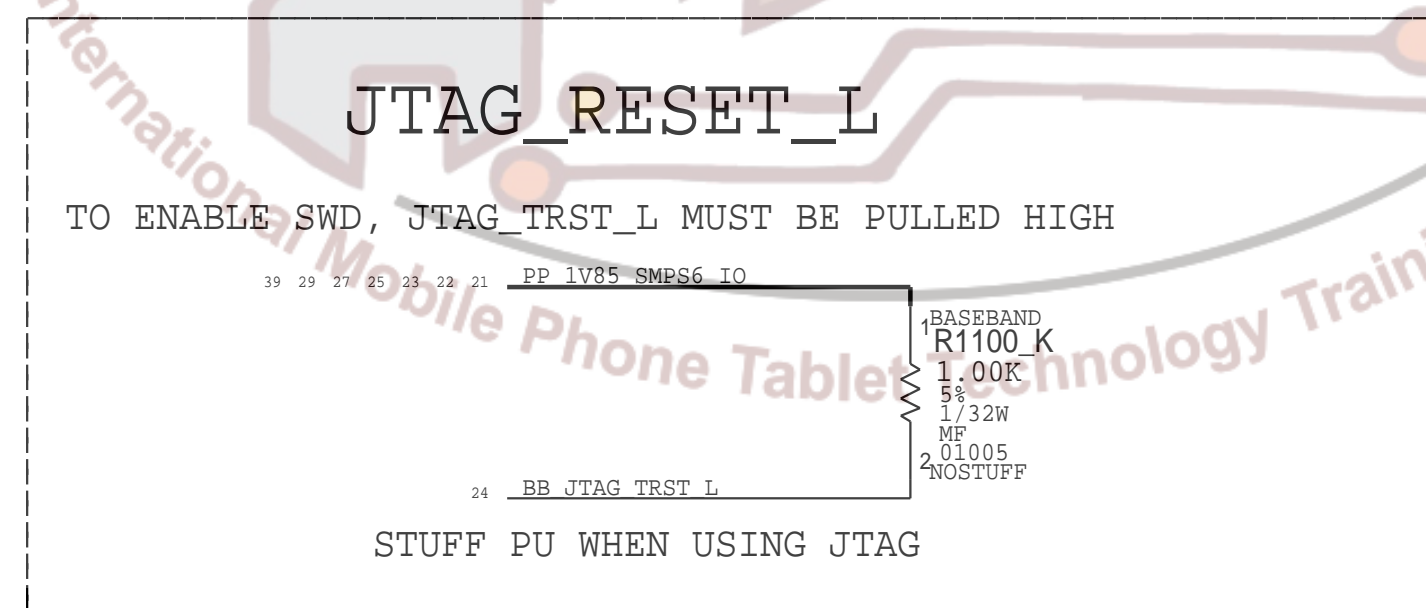
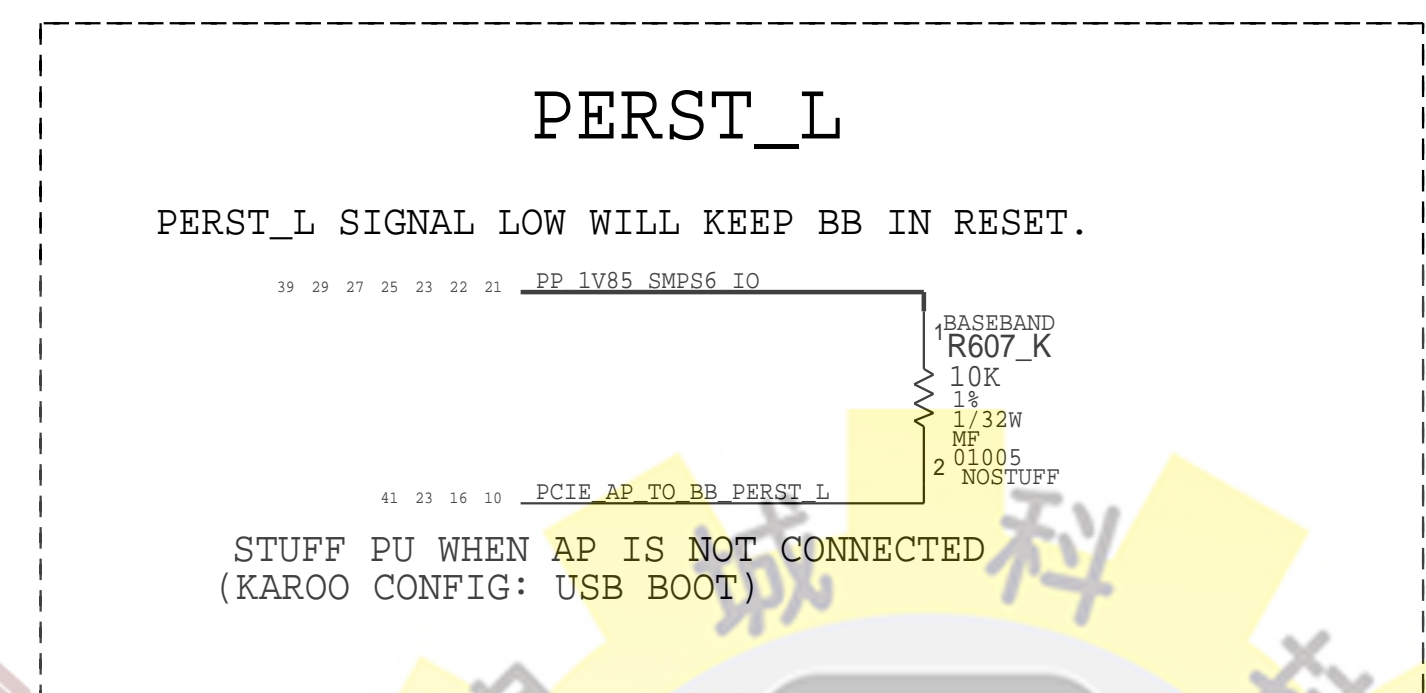
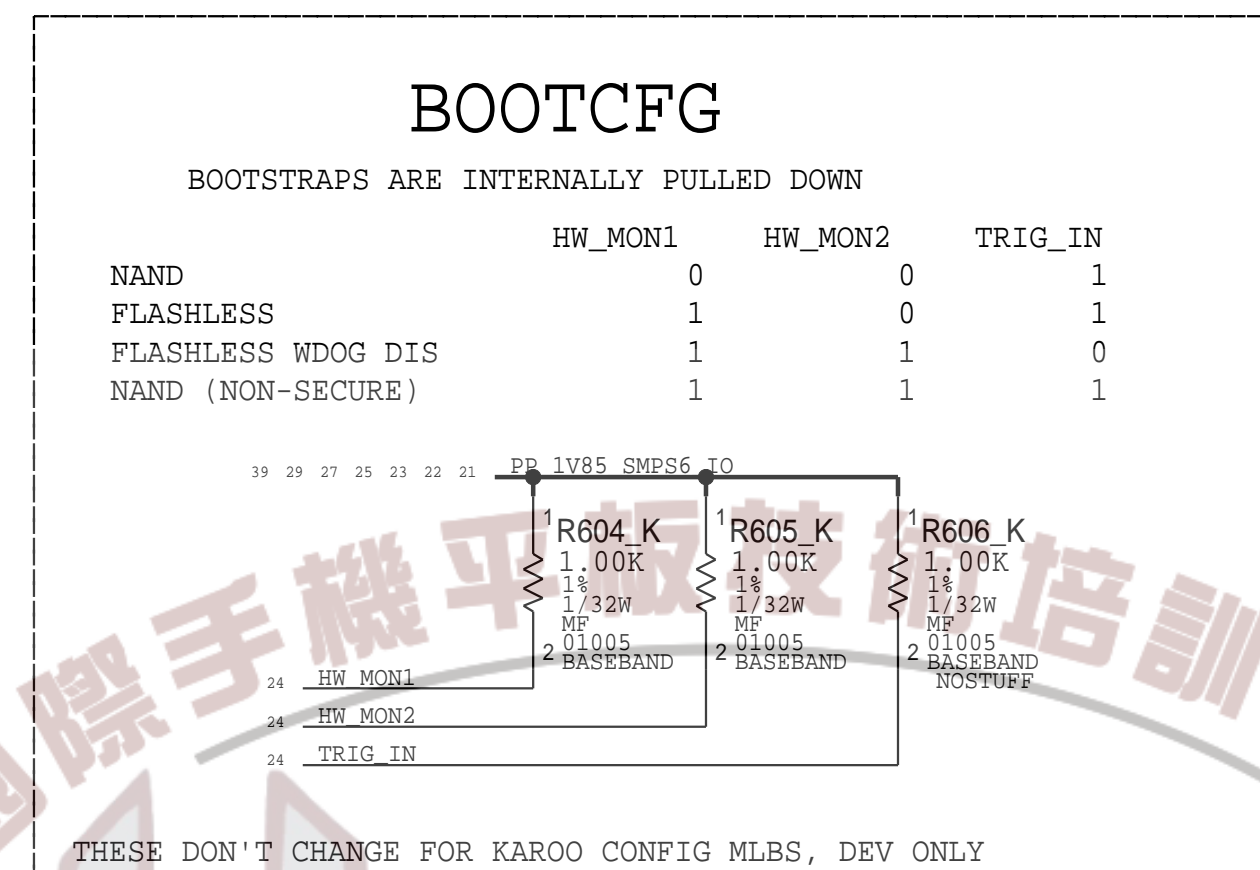
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		DRAWING NUMBER	051-02695
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XCVR: PRIMARY/DIVERSITY RX



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XCVR: PRX DRX		
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KAROO CONFIG



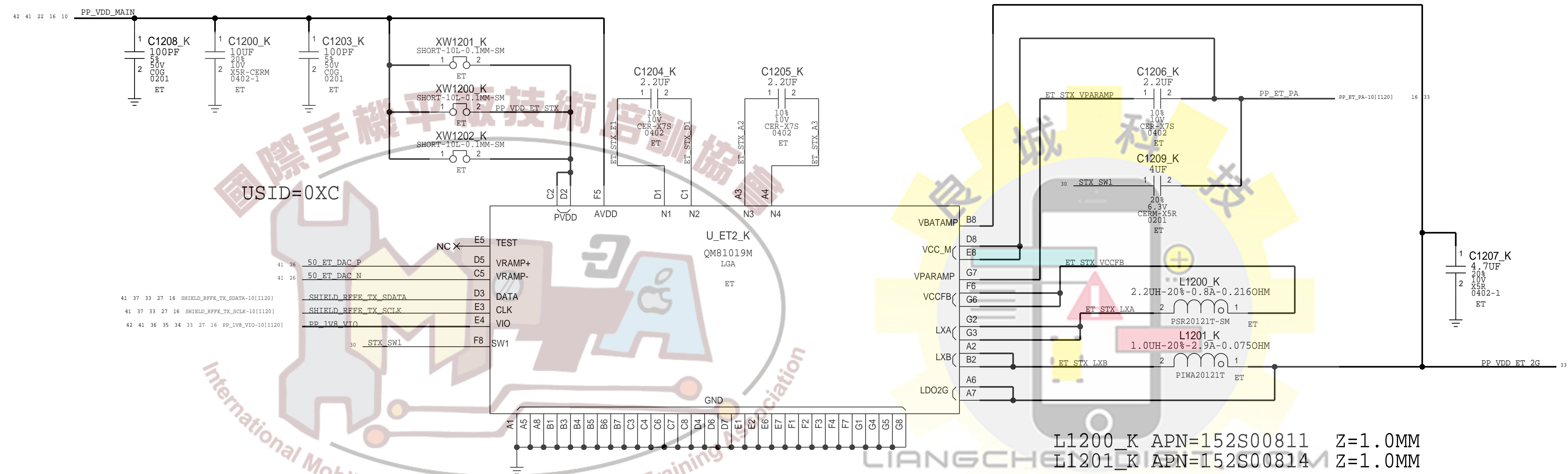
HW BUG IN BASEBAND A/B SILICON, FIXED IN C SILICON
NOSTUFF, STARTING AT EVT

DEFAULTS SET TO AP/FLASHLESS BOOT

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HW CONFIG OPTIONS		
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ET MODULATOR

ALPES STX QM81019 E1.0.1 MODULE



STUFFED: C1204_K, C1205_K, C1206_K: KYOCERA APN=138S00167
 ALTERNATE: C1204_K, C1205_K, C1206_K: MURATA APN=138S00237

PAGE TITLE		
ET		
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BRANCH		
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8

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LB SPAD

D

D

C

C

B

B

A

A



8

7

6

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4

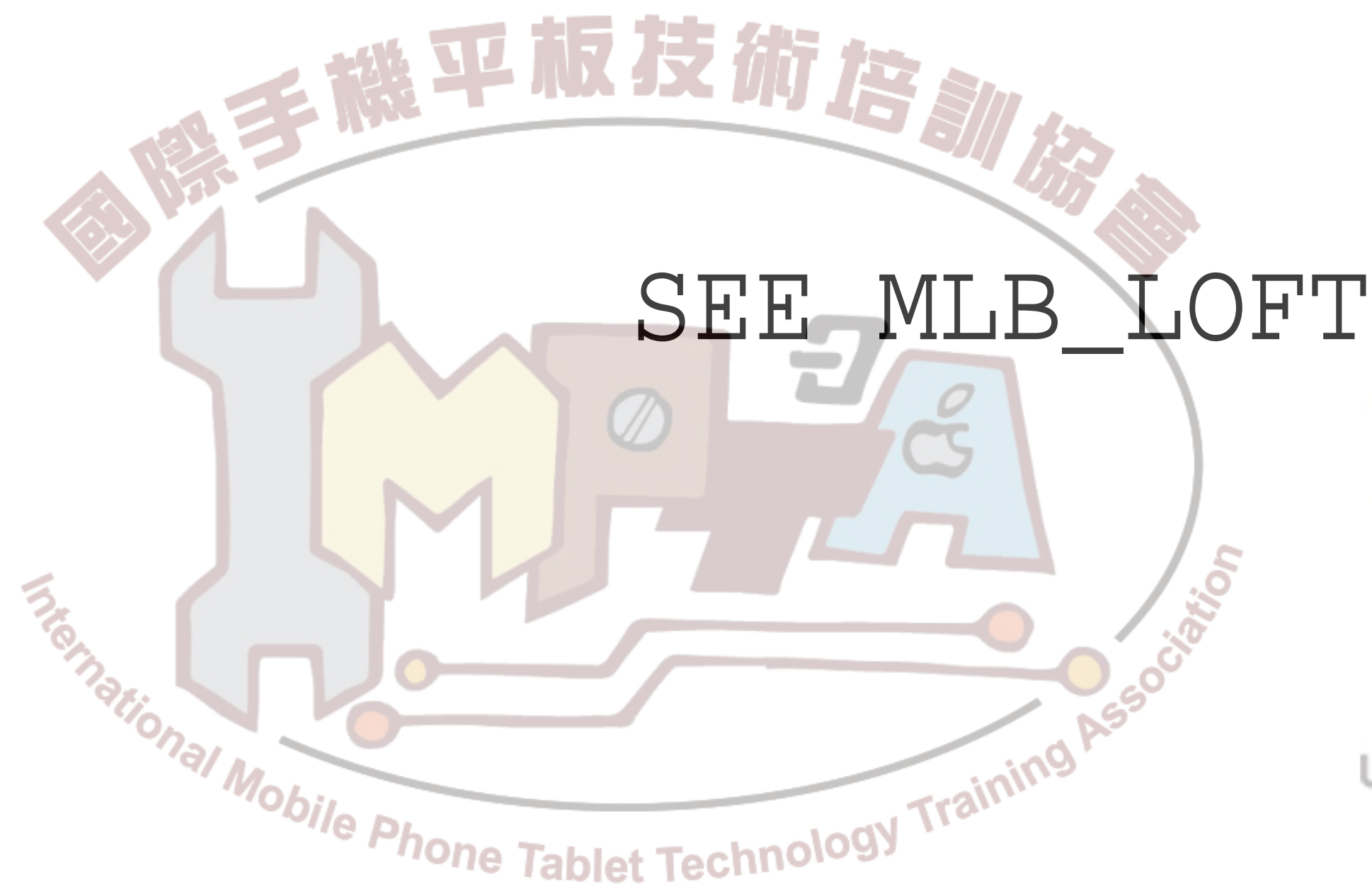
3

2

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PAGE TITLE LB SPAD		
Apple Inc.	DRAWING NUMBER 051-02695	SIZE D
	REVISION 4.0.0	
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HB SPAD



PAGE TITLE HB SPAD		
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UHB LMB SPAD

D

C

B

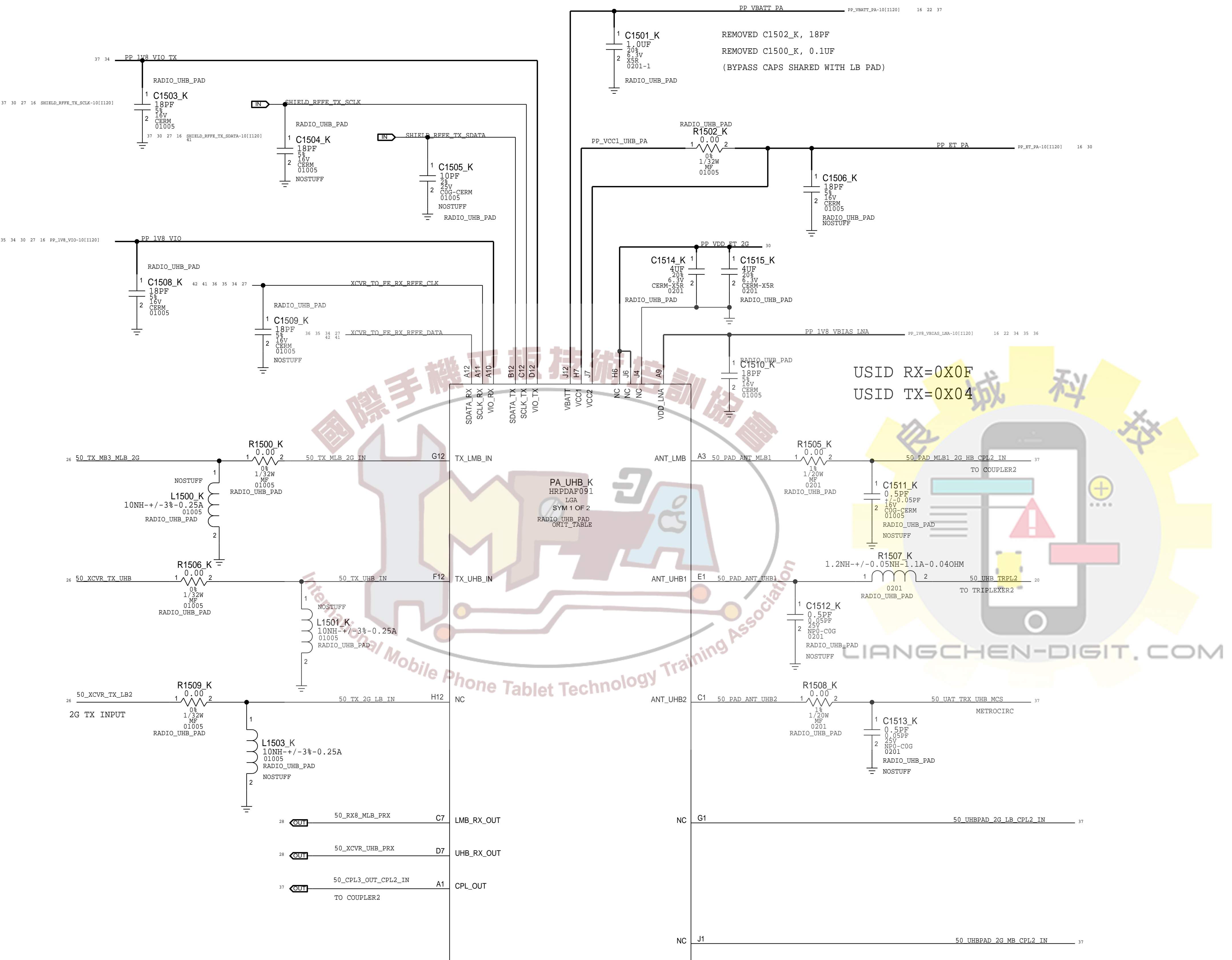
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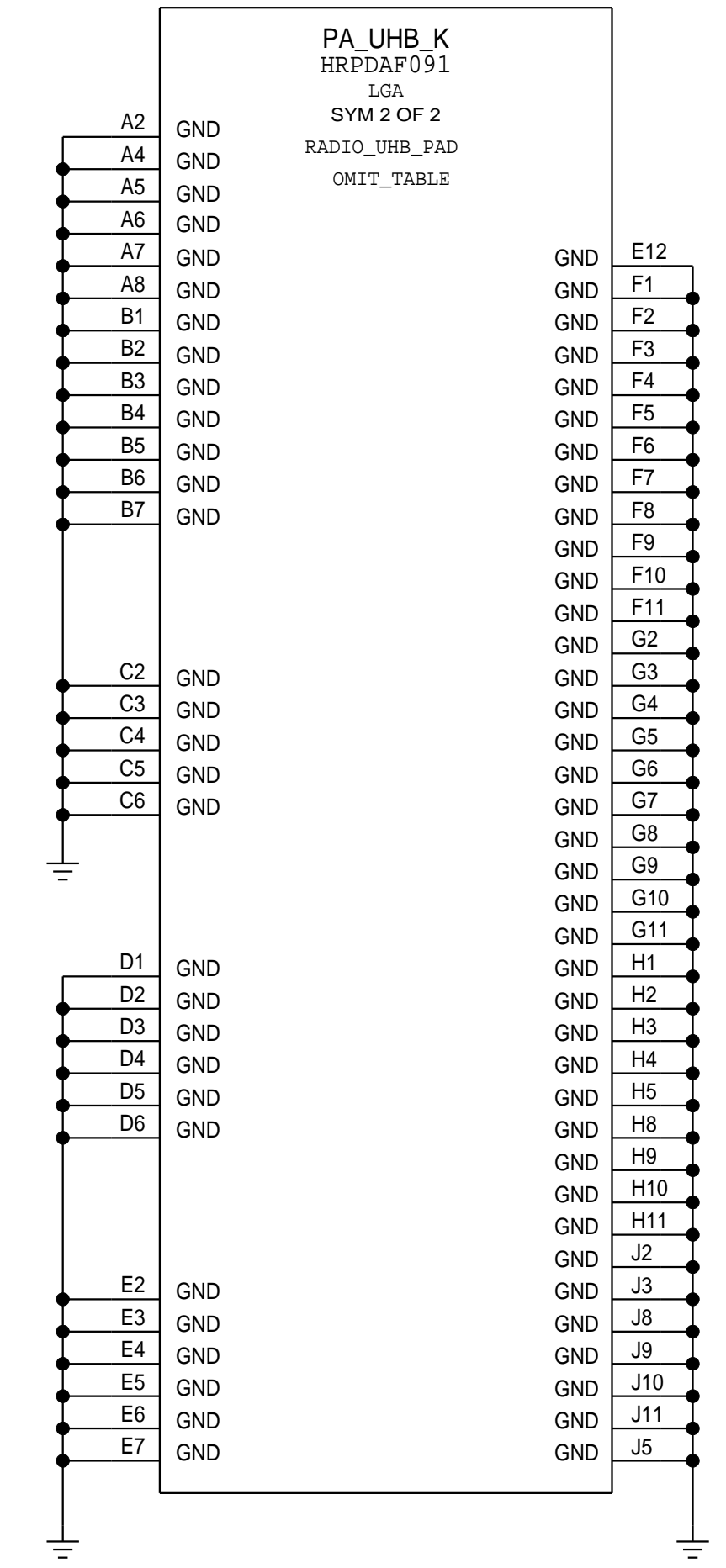
C

B

A



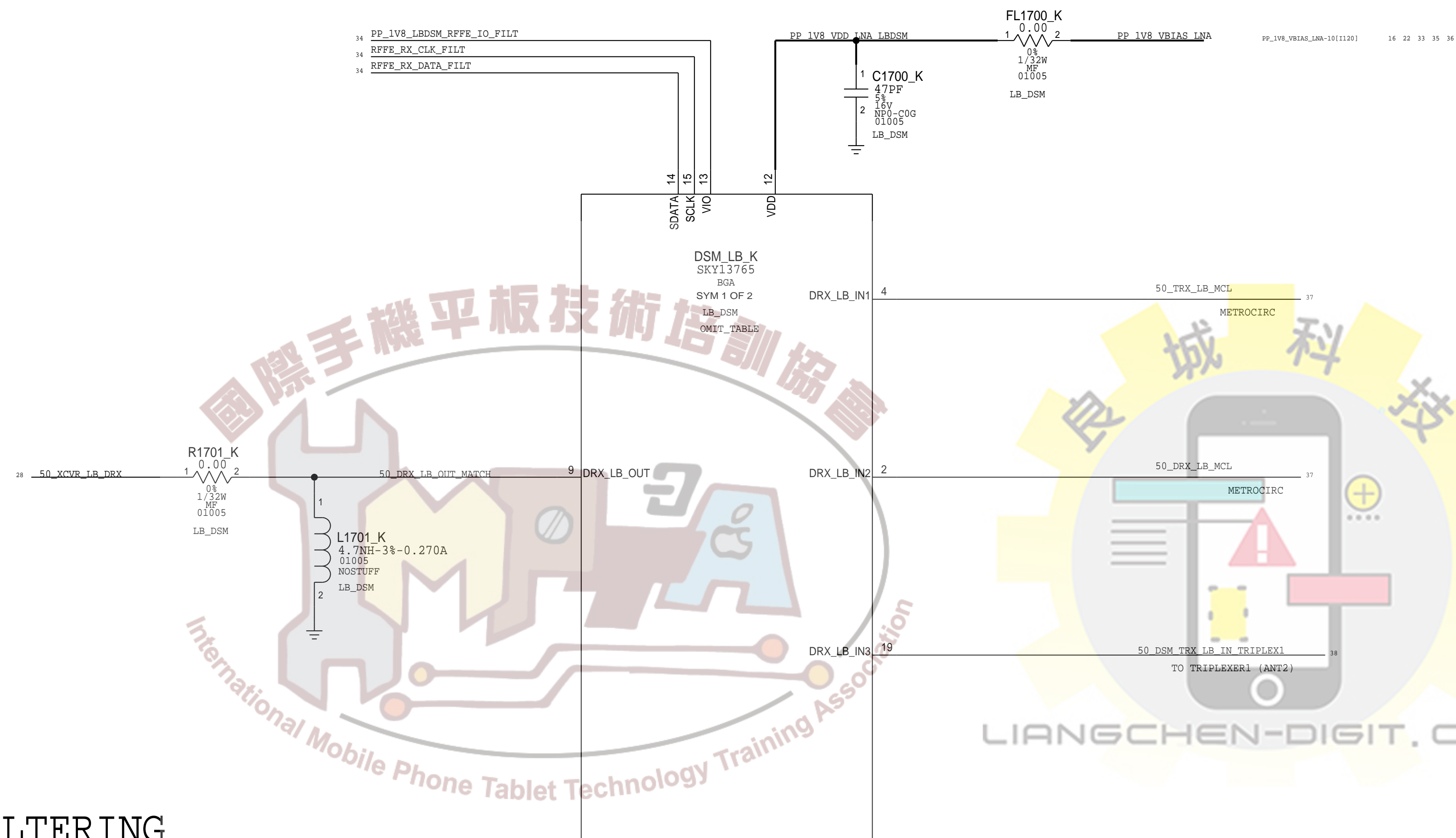
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USID TX=0X04



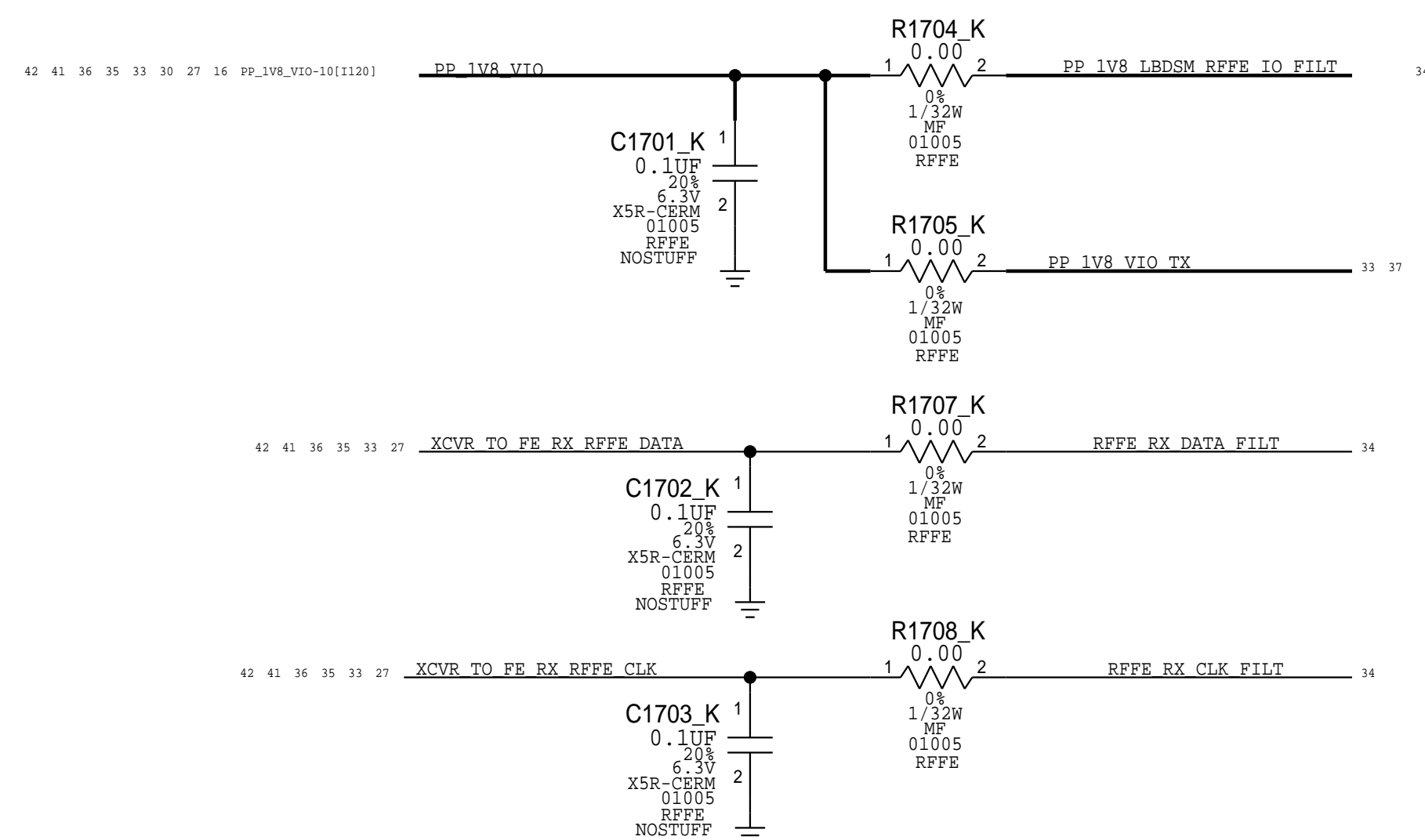
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LB DIVERSITY RECEIVE LNA

USID RX=0X09



RFFE FILTERING

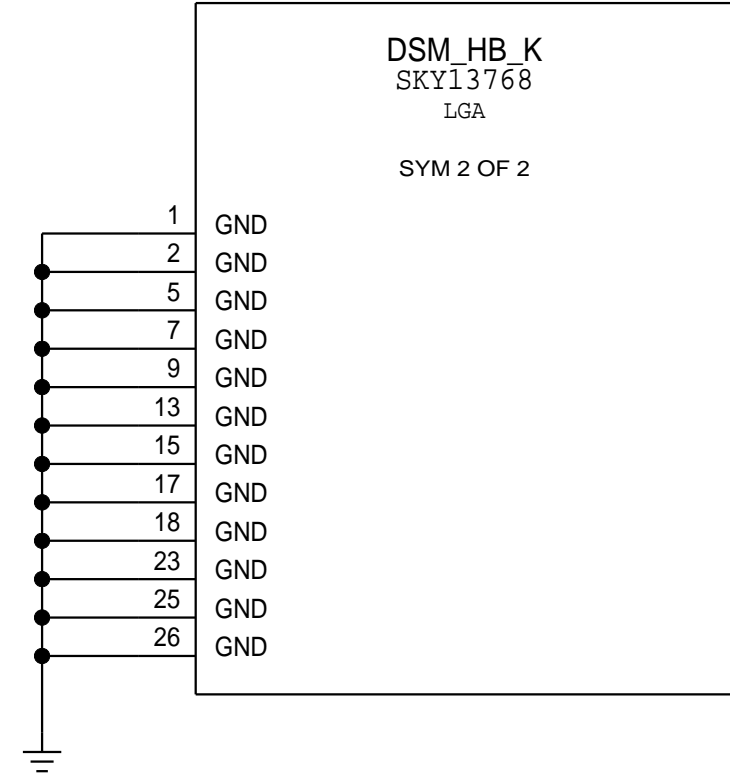
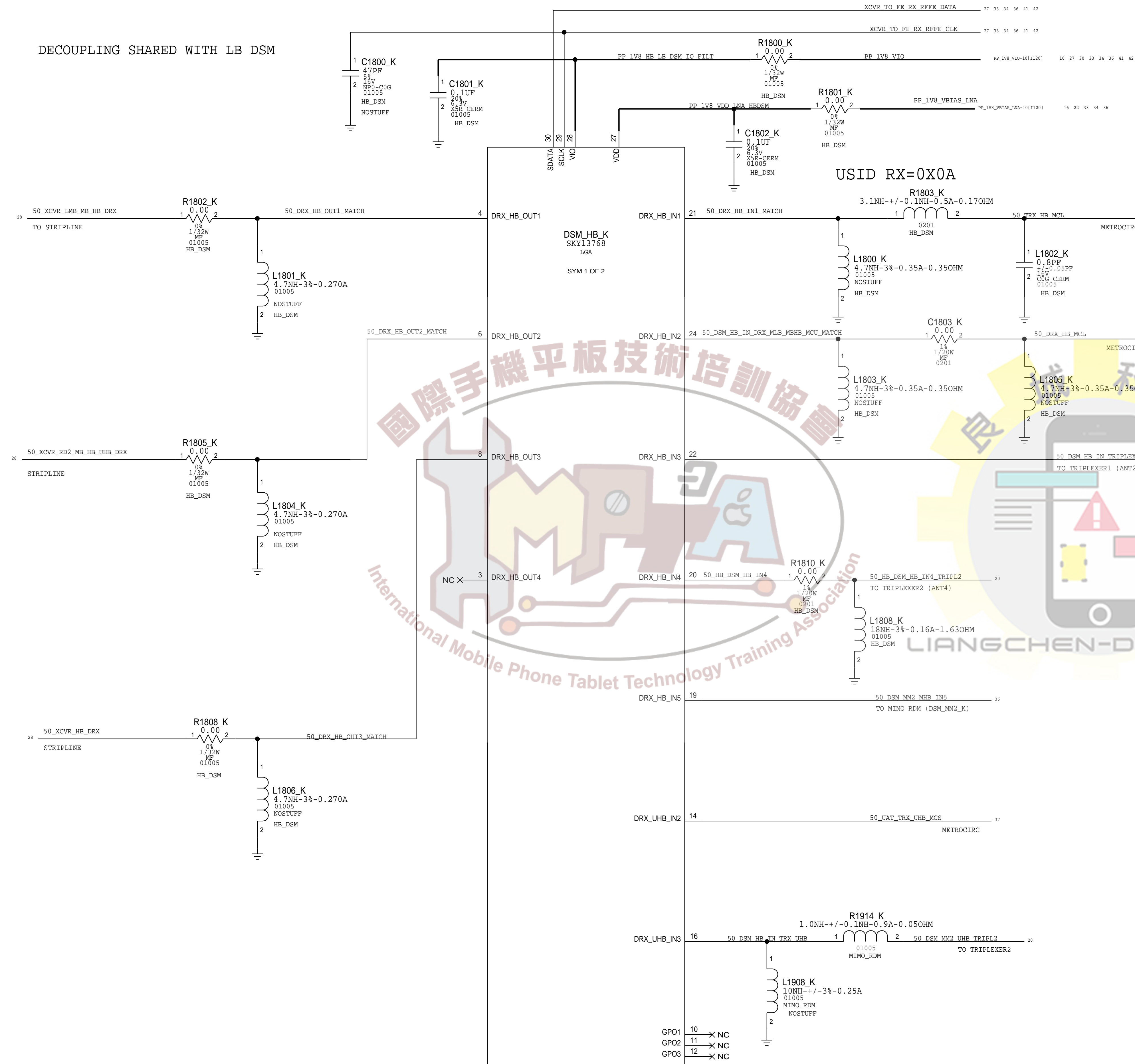


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PAGE TITLE		
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HB DIVERSITY RECEIVE LNA

DECOUPLING SHARED WITH LB DSM



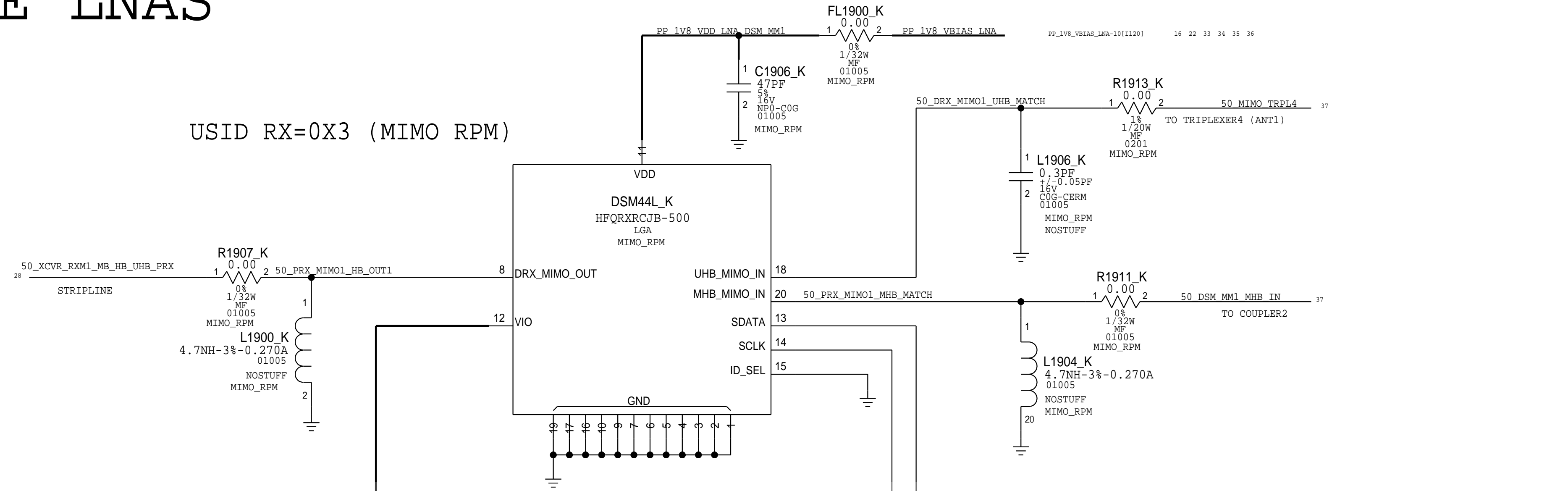
GPO1 10 X NC
GPO2 11 X NC
GPO3 12 X NC

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PAGE TITLE HB DIVERSITY RECEIVE LNA		
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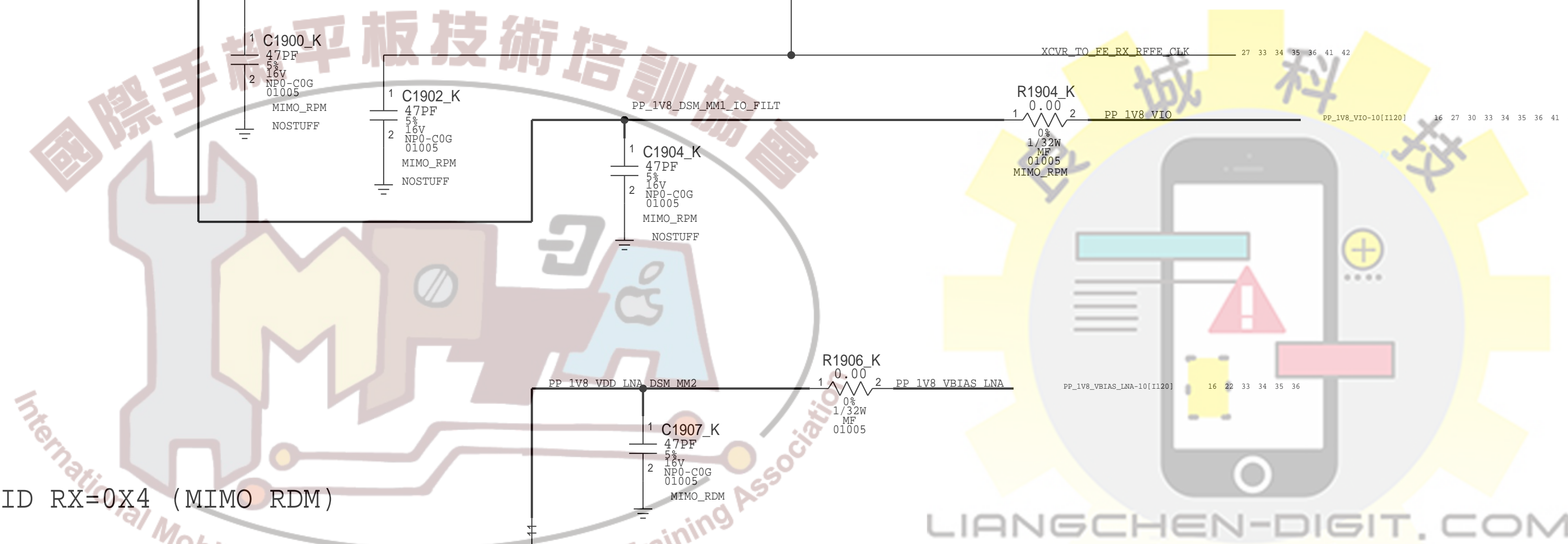
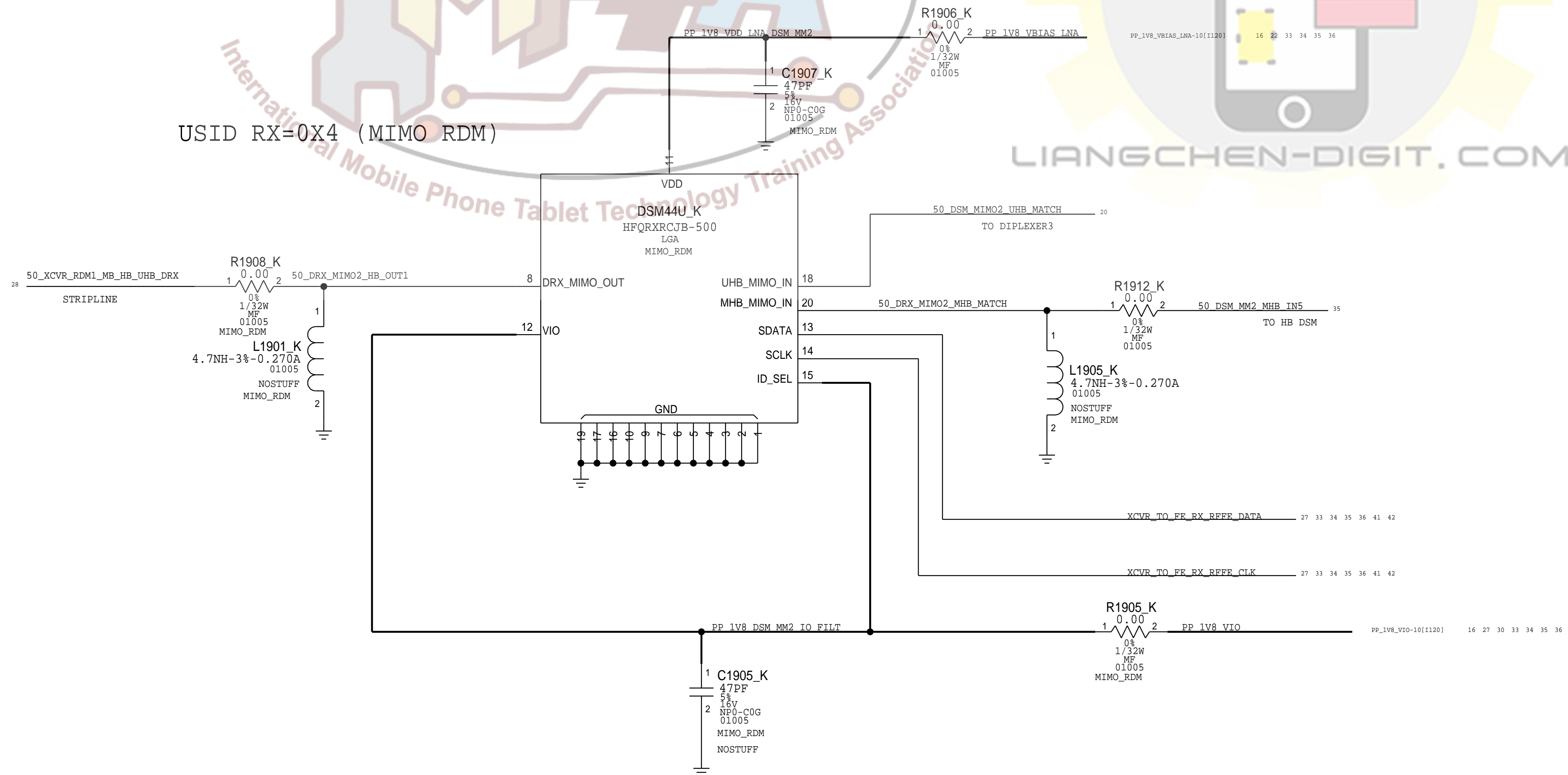
MIMO RECEIVE LNAS

USID RX=0X3 (MIMO RPM)



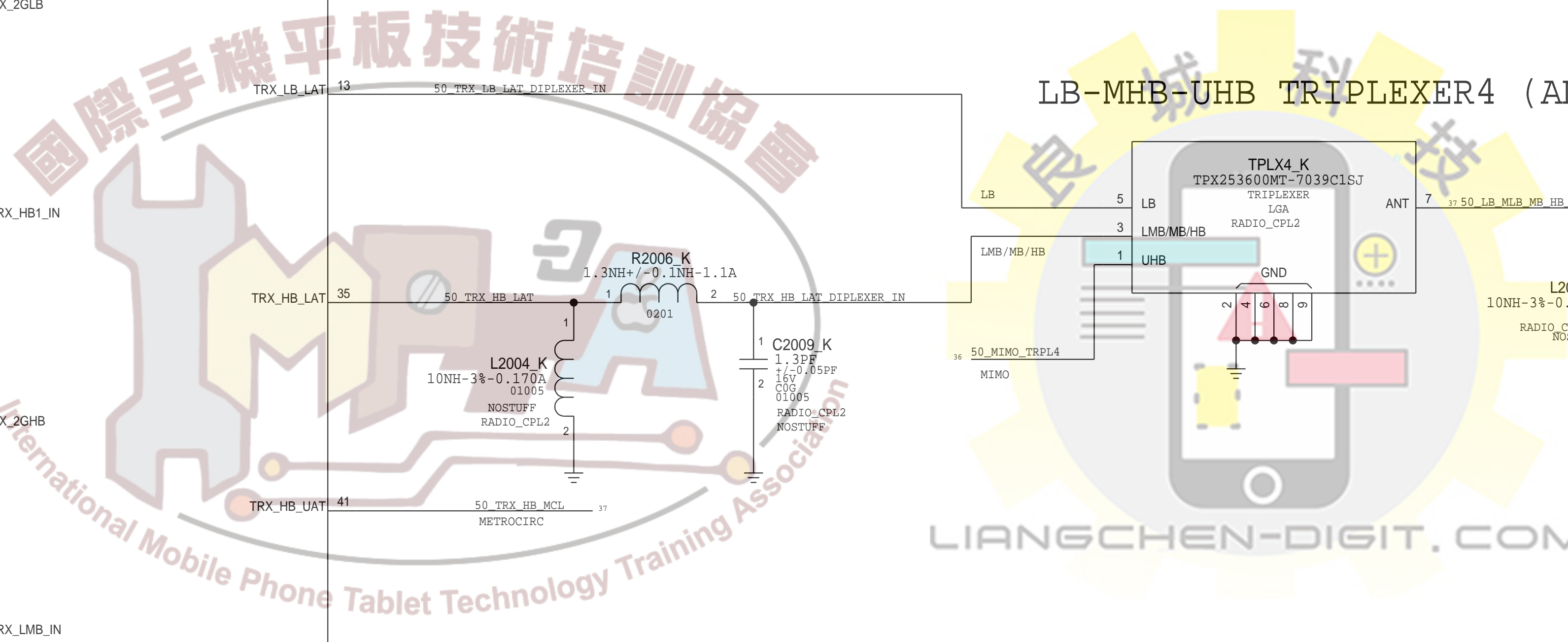
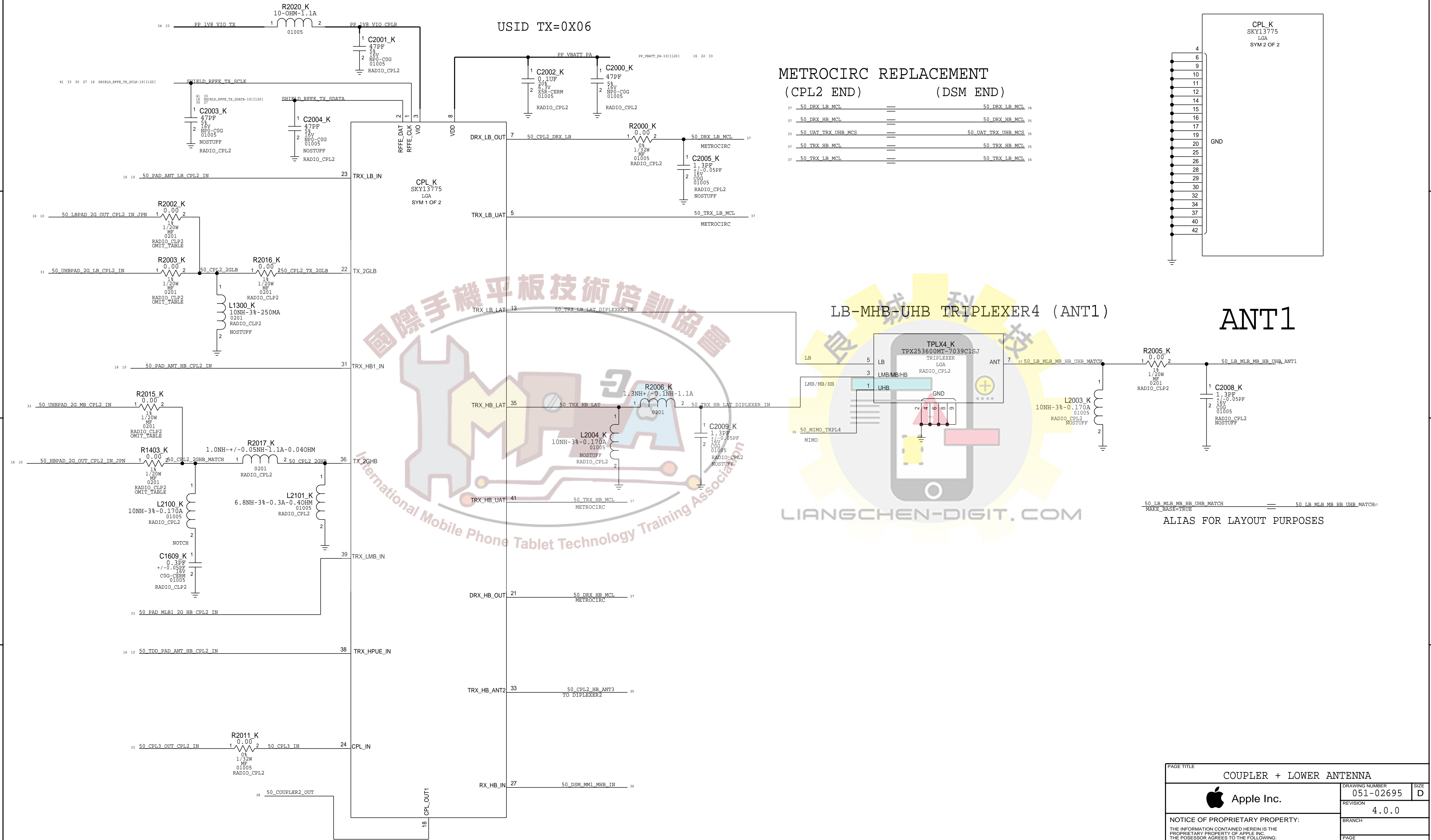
ID_SEL = 0, MIMO RPM
ID_SEL = 1, MIMO RDM

USID RX=0X4 (MIMO RDM)



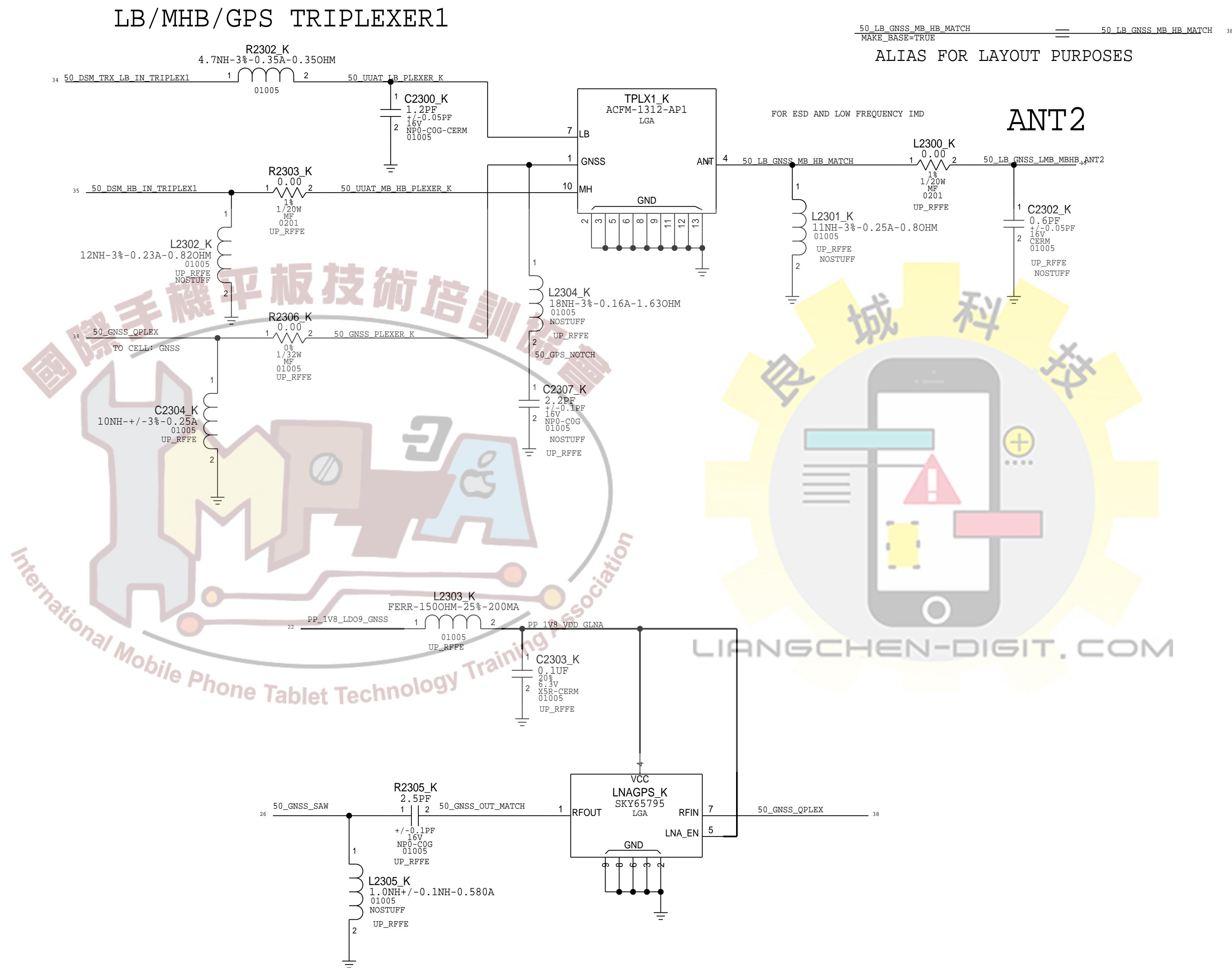
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MIMO RECEIVE LNAS		
	DRAWING NUMBER	051-02695
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COUPLER & LOWER ANTENNA



PAGE TITLE		
COUPLER + LOWER ANTENNA		
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UPPER ANTENNA FEEDS

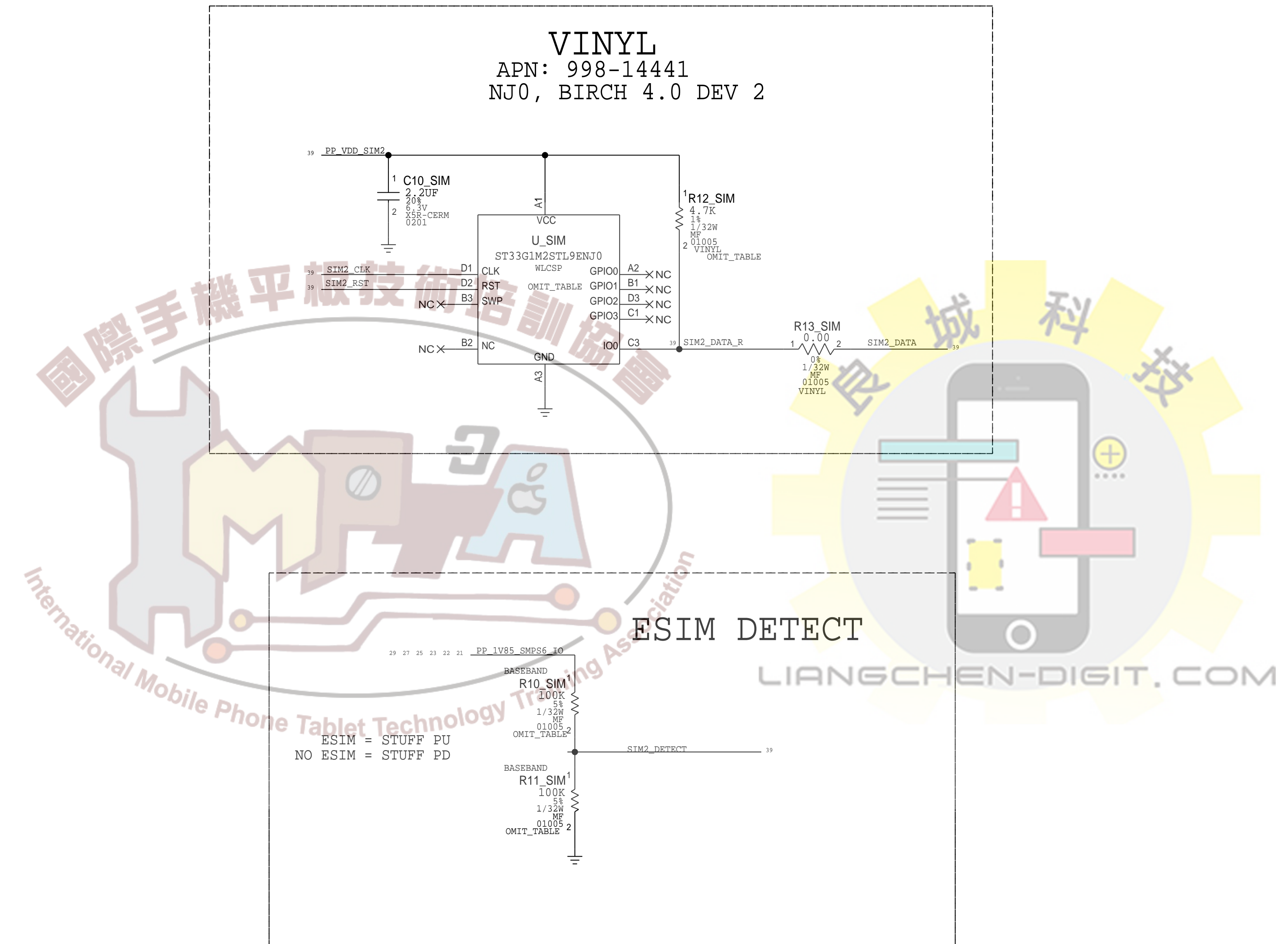


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ESIM

```

41 40 23 SIM2_CLK == SIM2_CLK 39
41 40 23 MAKE_BASE=TRUE == SIM2_DATA 39
41 40 23 SIM2_DATA == SIM2_DATA 39
41 40 23 MAKE_BASE=TRUE == SIM2_RST 39
41 40 23 SIM2_RST == SIM2_RST 39
41 40 23 MAKE_BASE=TRUE == SIM2_DETECT 39
41 40 23 SIM2_DETECT == SIM2_DETECT 39
41 40 23 MAKE_BASE=TRUE == PP_VDD_SIM2 39
41 40 23 PP_VDD_SIM2 == PP_VDD_SIM2 39
41 40 23 MAKE_BASE=TRUE == SIM2_DATA_R 39
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41 40 23 SIM2_DATA_R == SIM2_DATA_R 39
  
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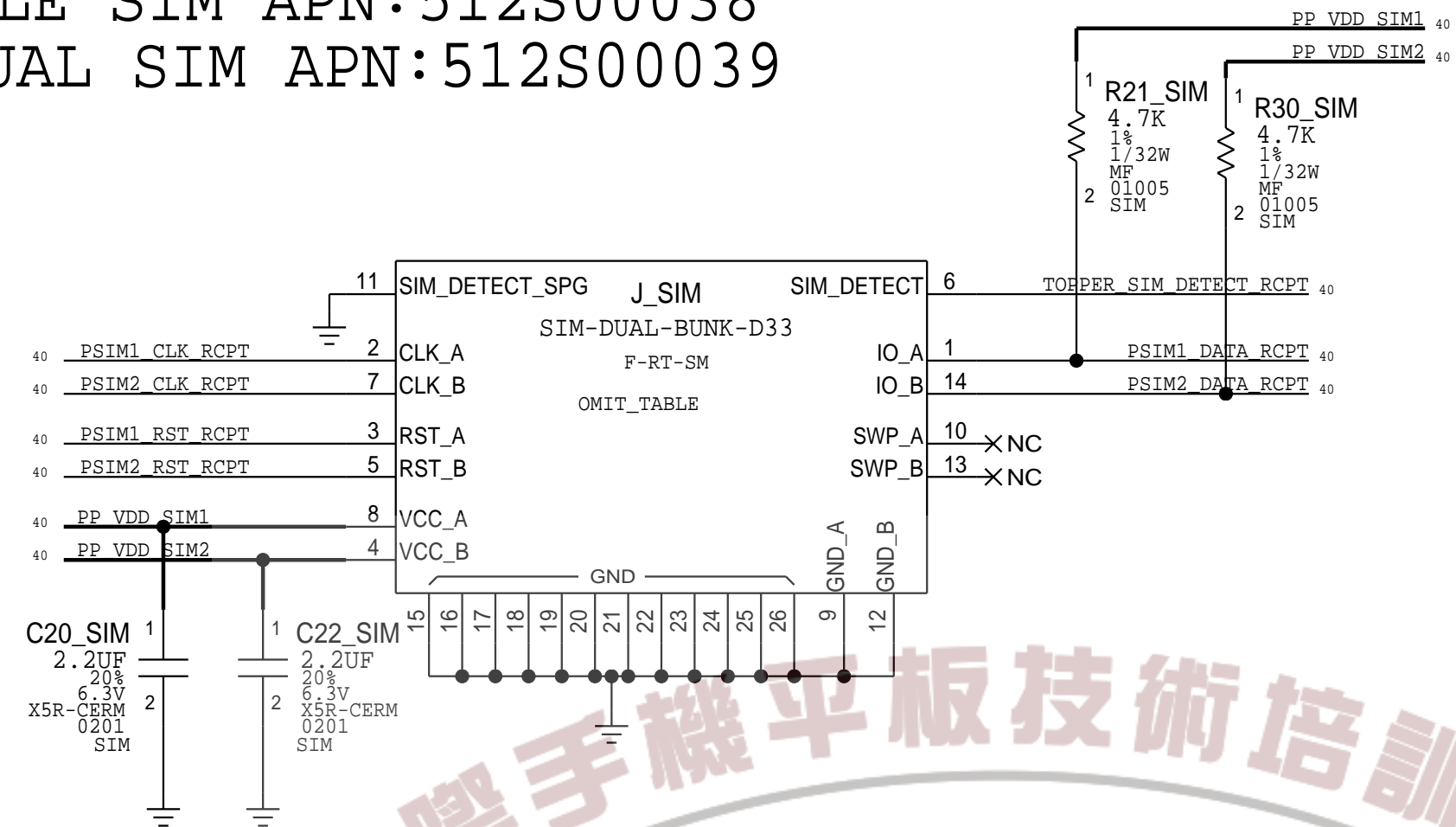
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PSIM

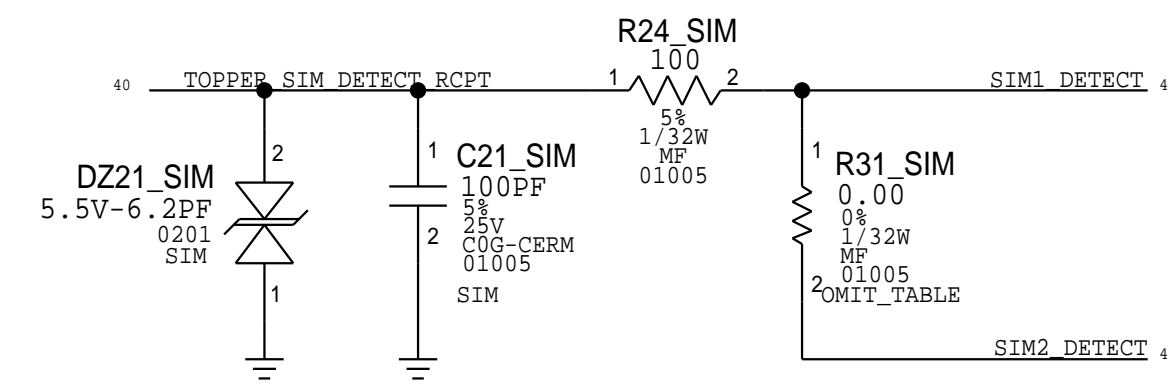
ICE18.2 DUAL PHYSICAL SIM

SINGLE SIM APN:512S00038

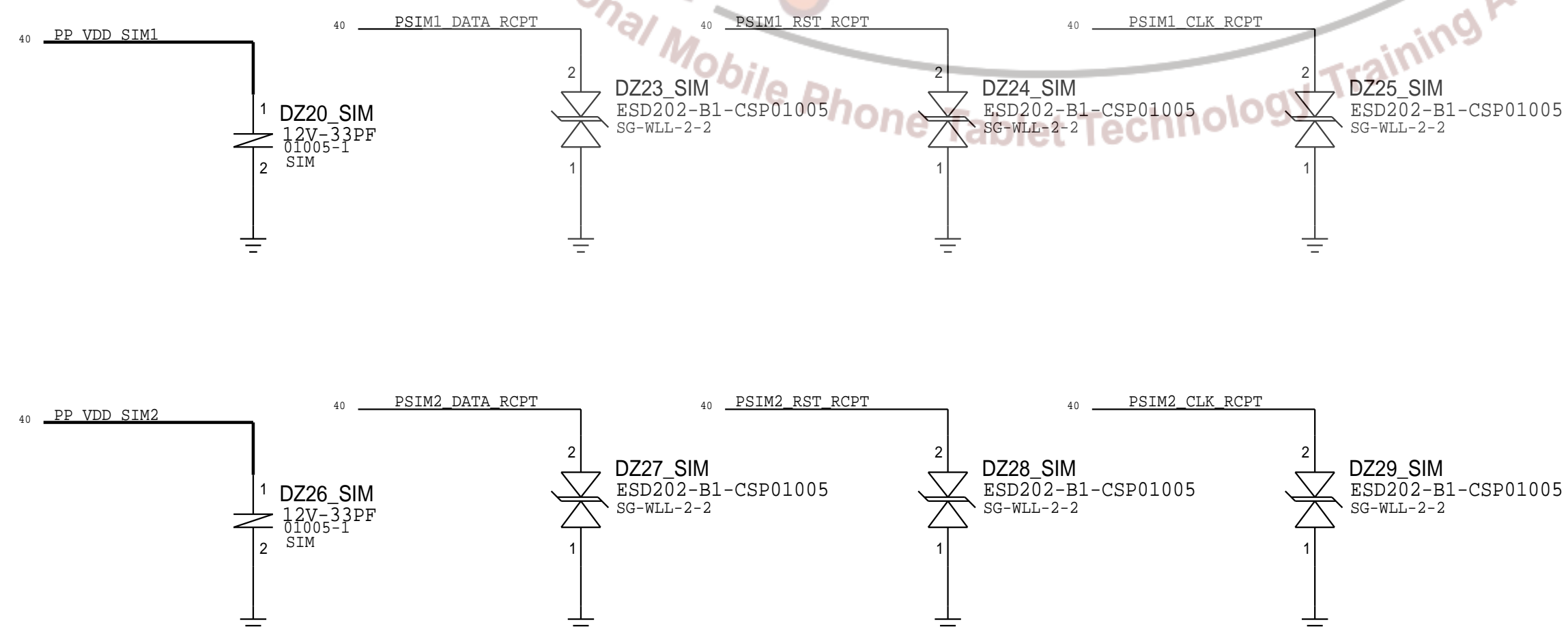
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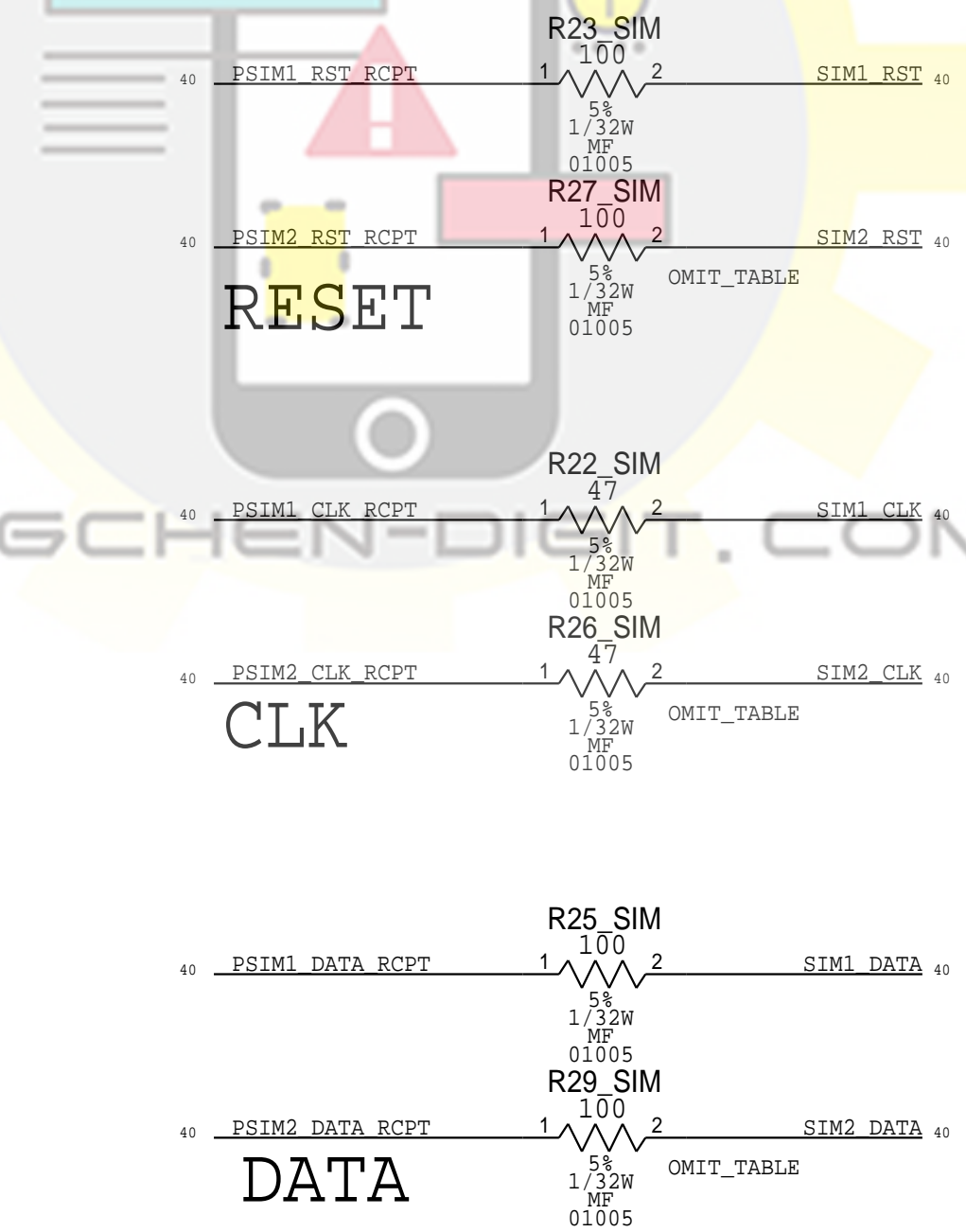
DUAL SIM DETECT



ESD DIODES



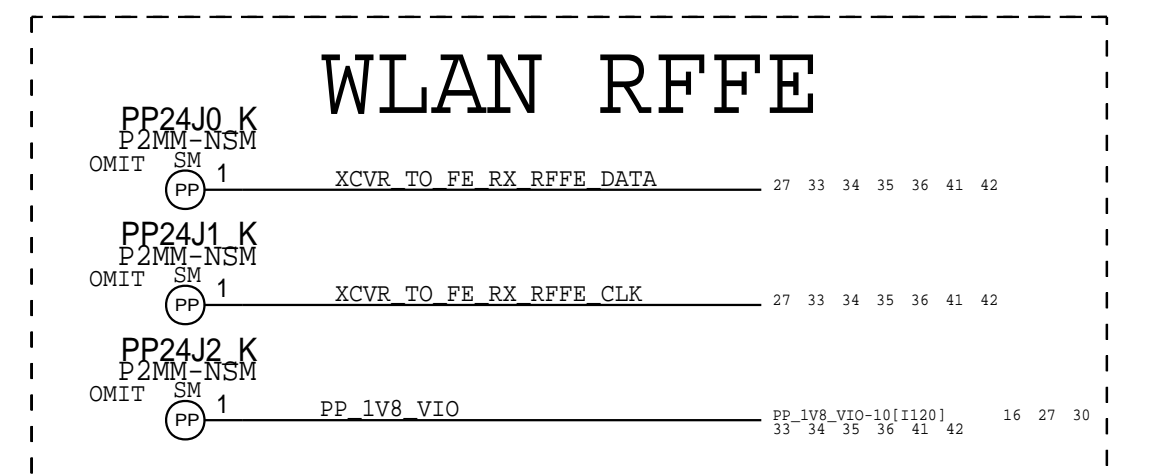
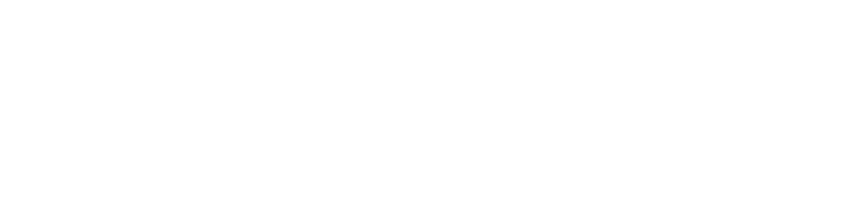
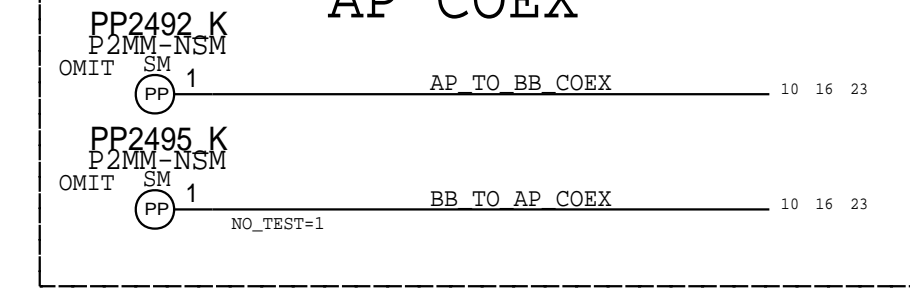
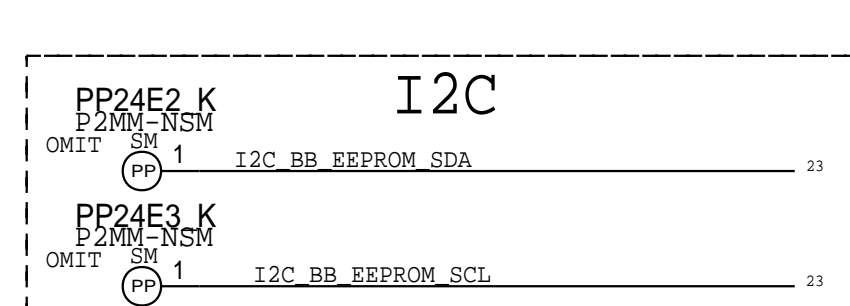
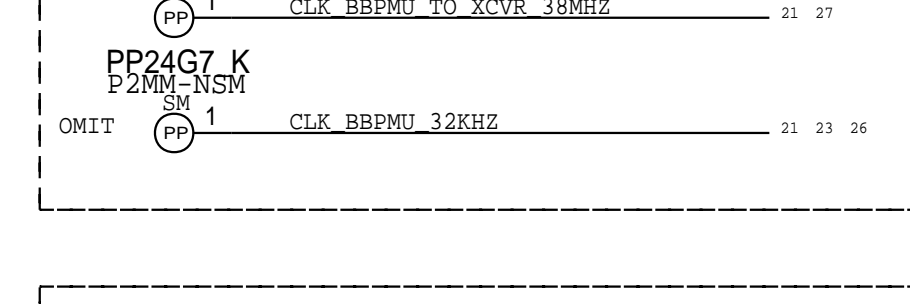
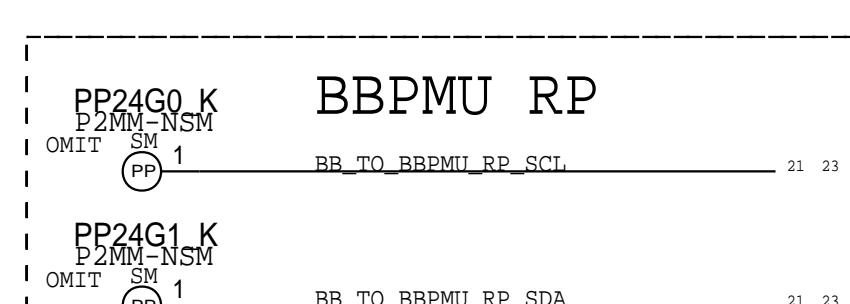
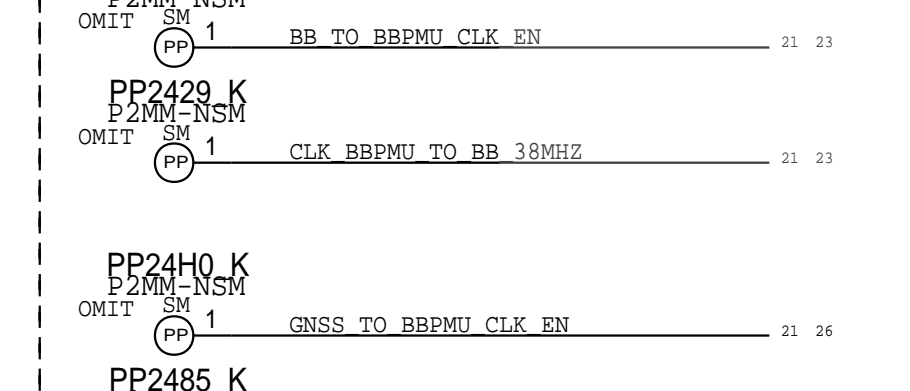
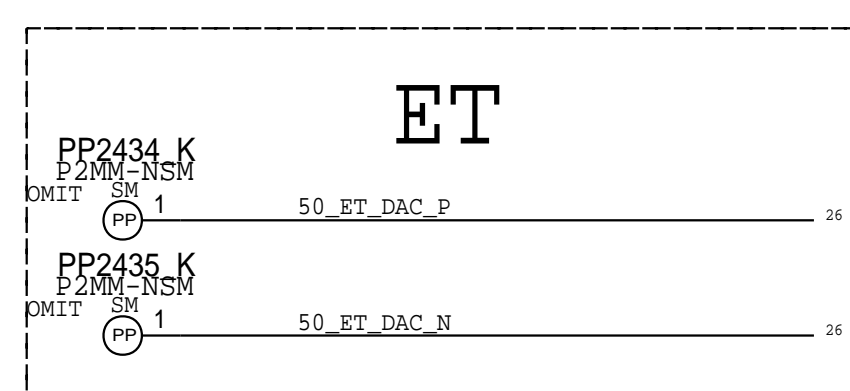
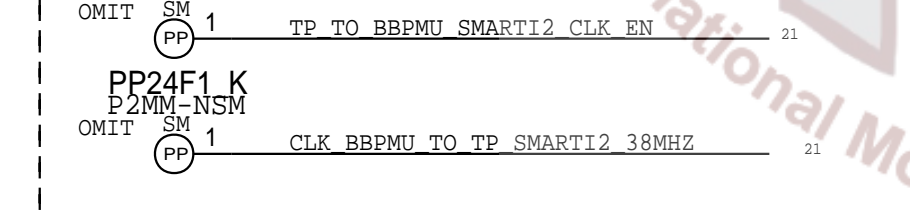
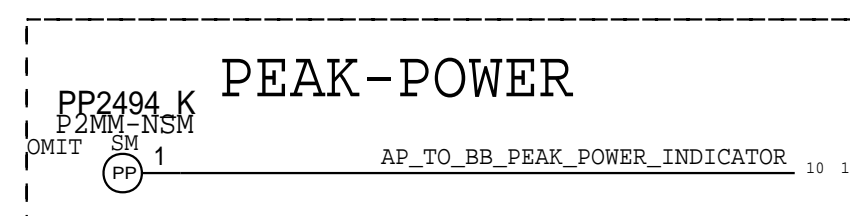
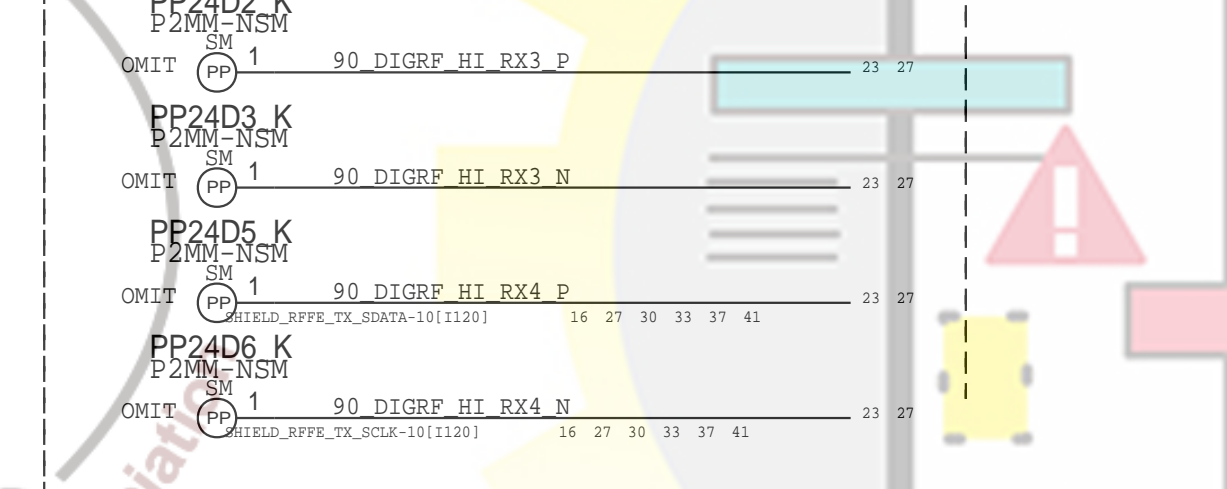
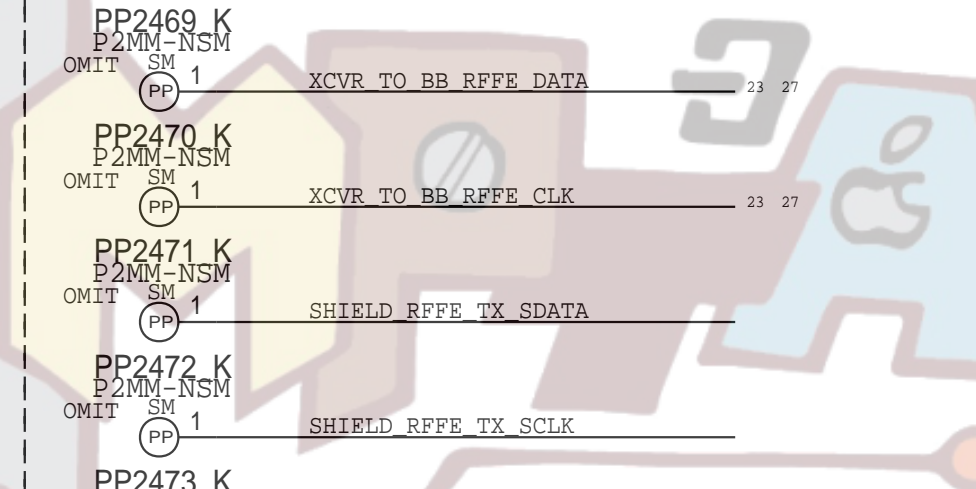
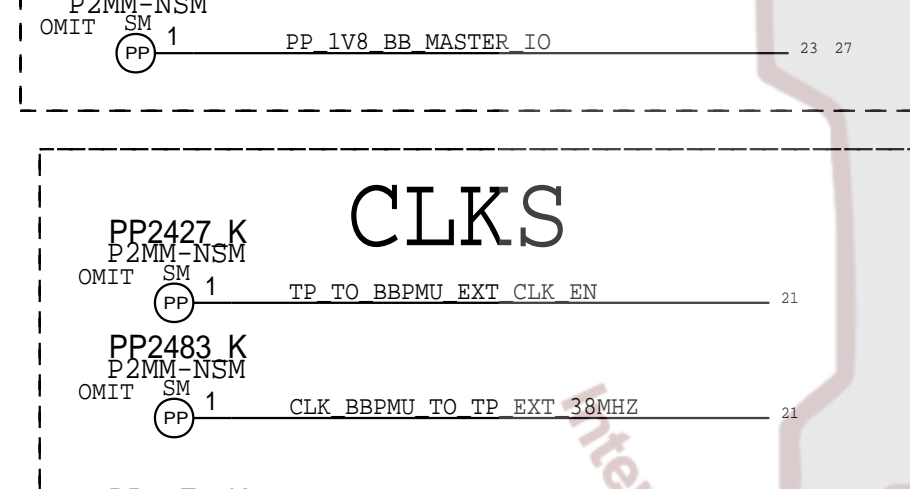
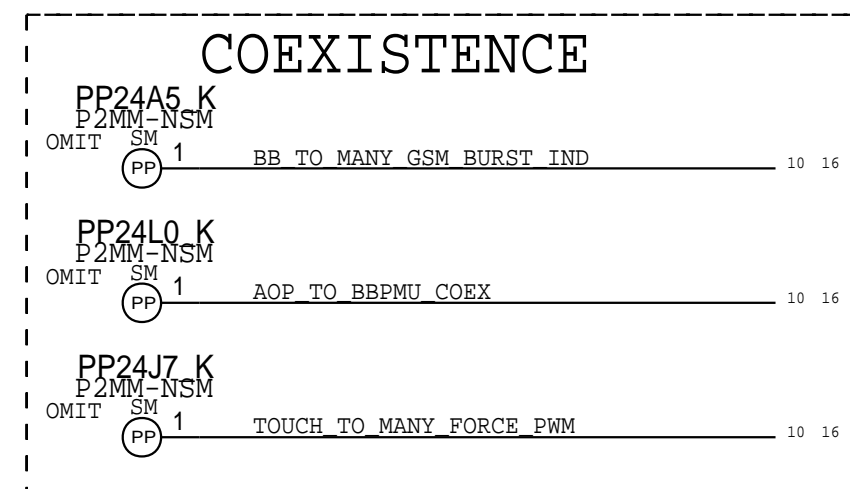
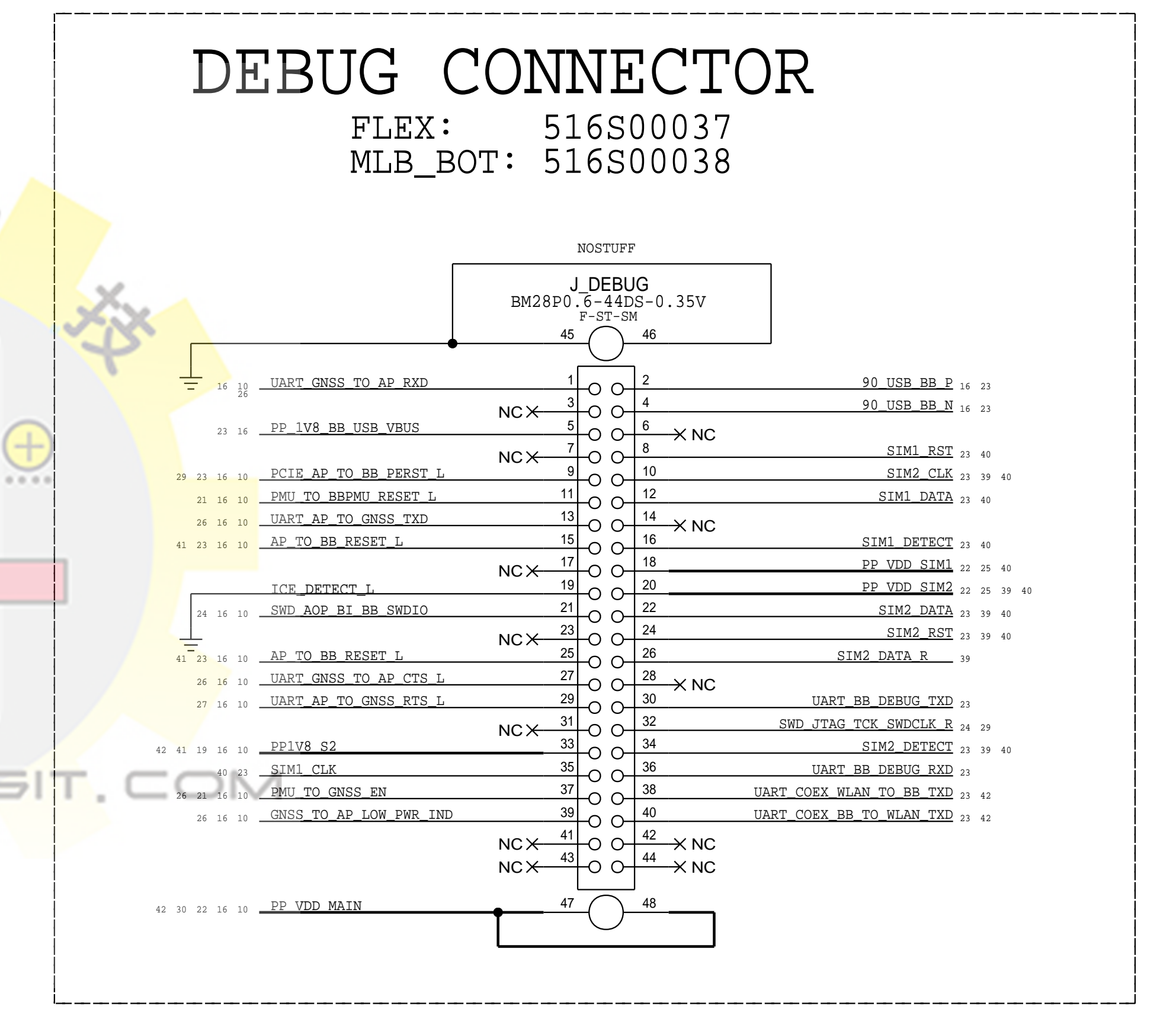
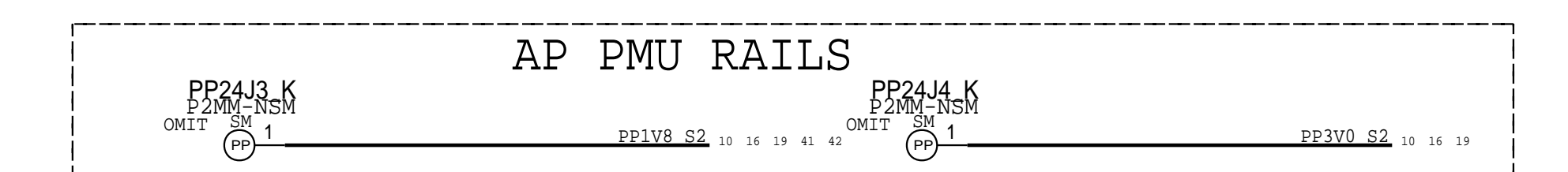
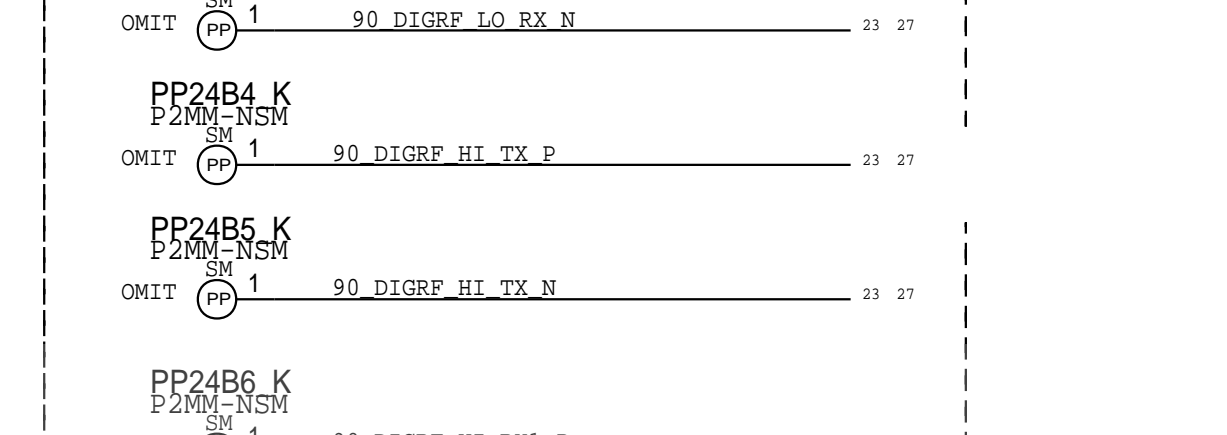
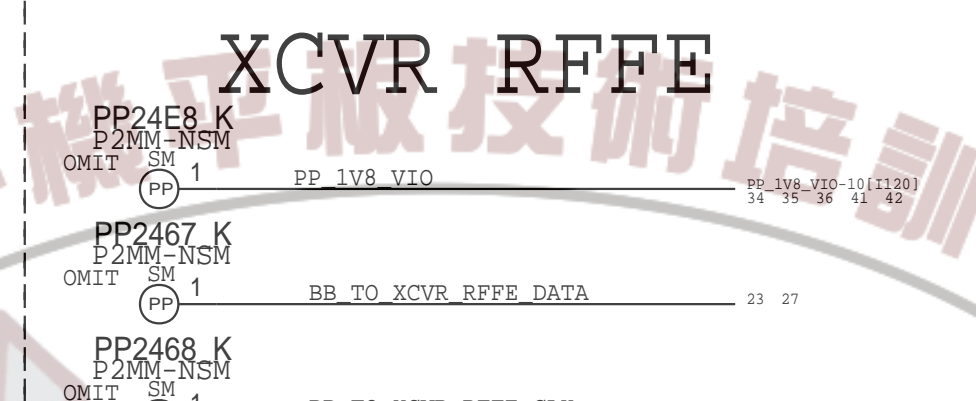
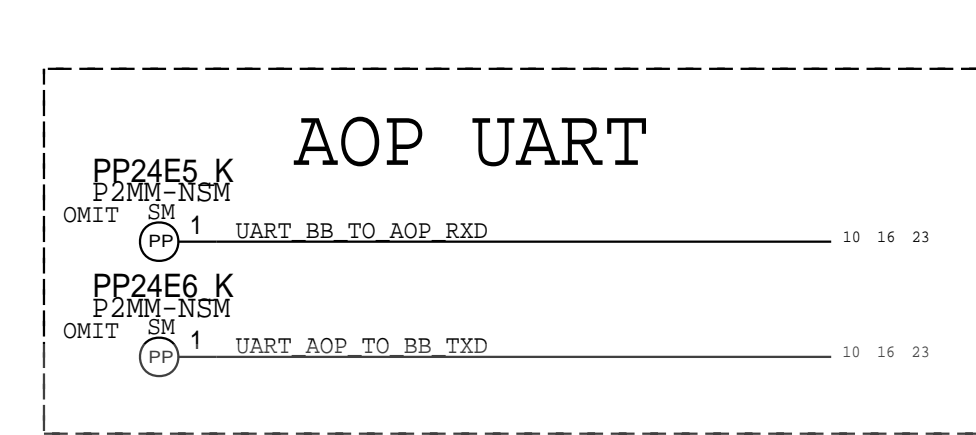
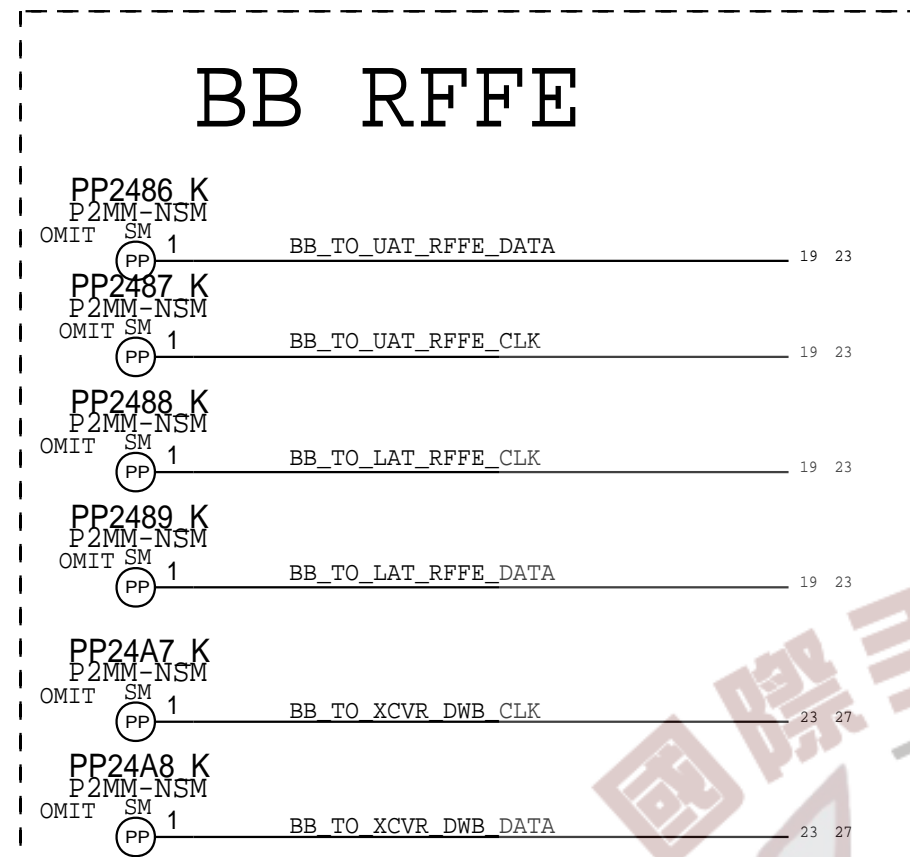
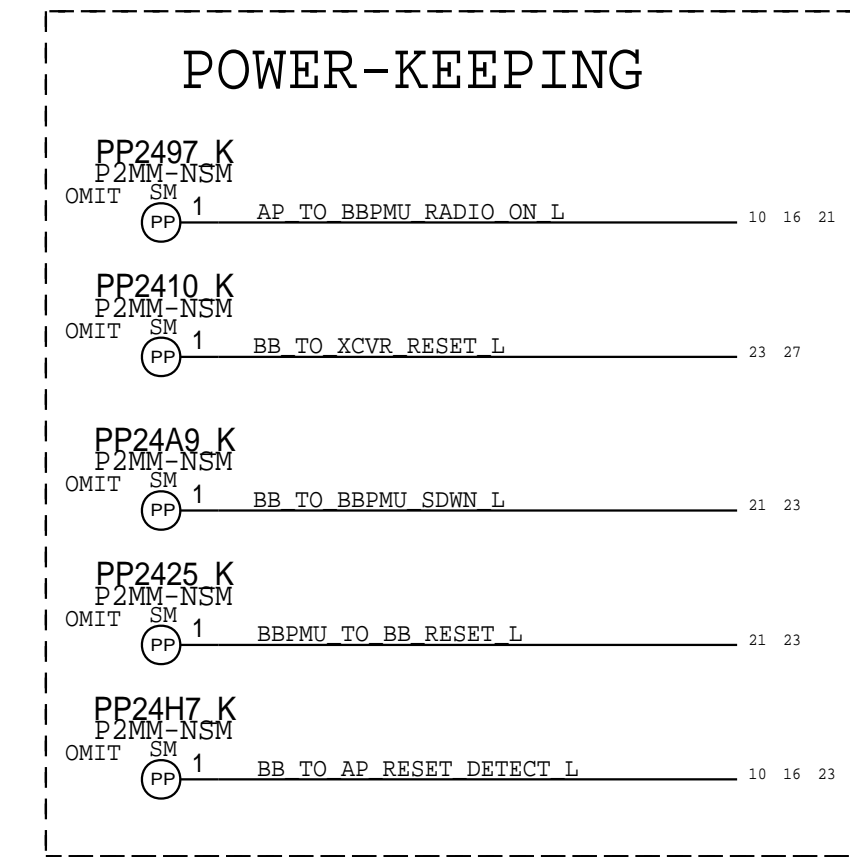
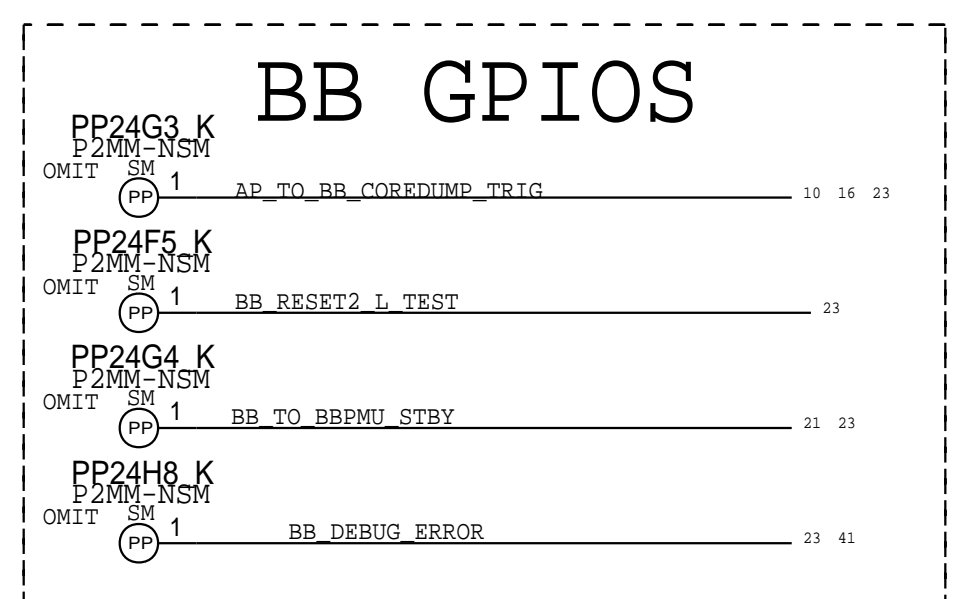
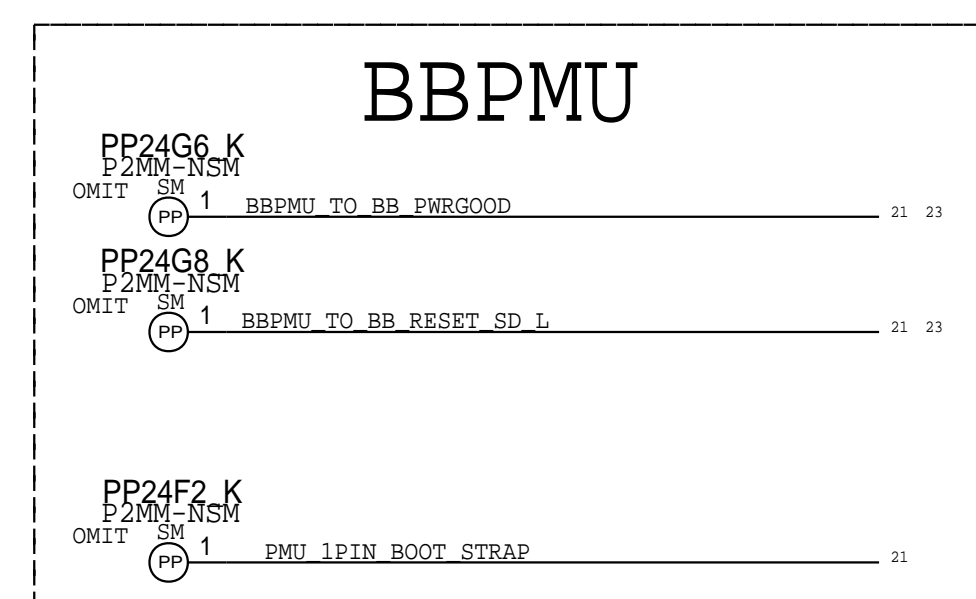
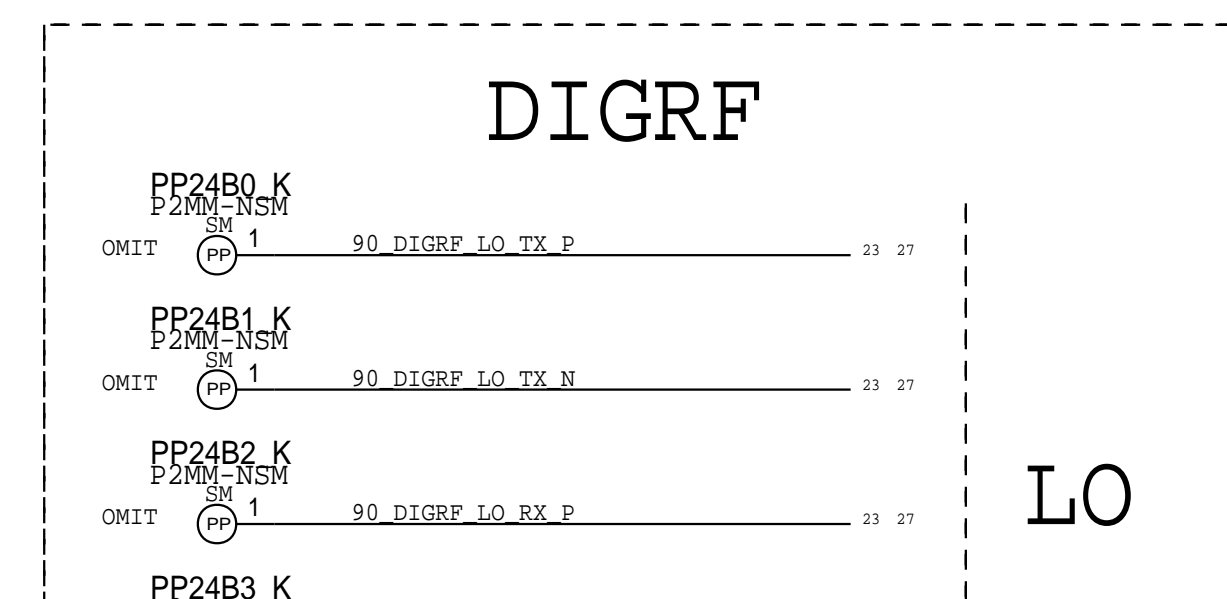
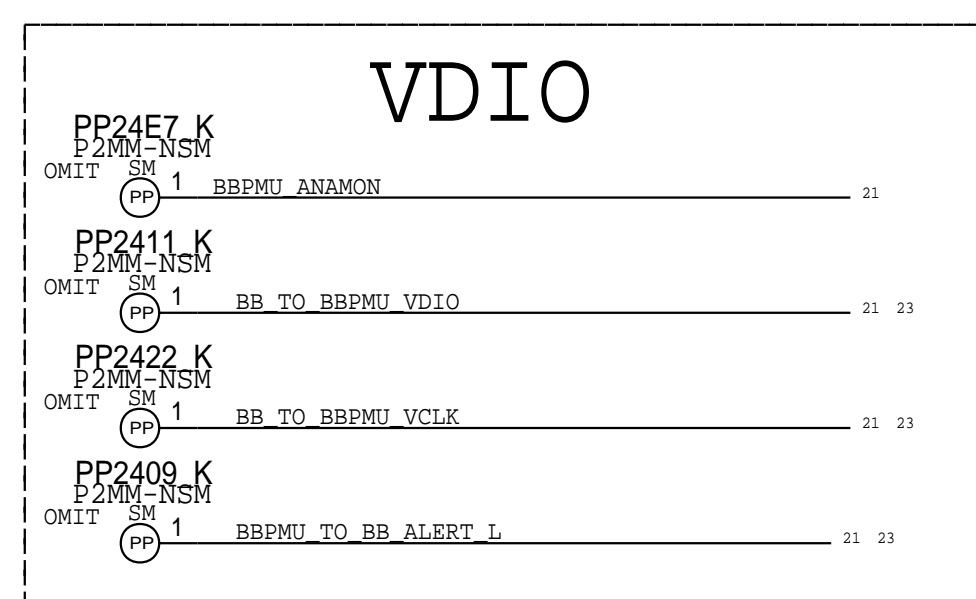
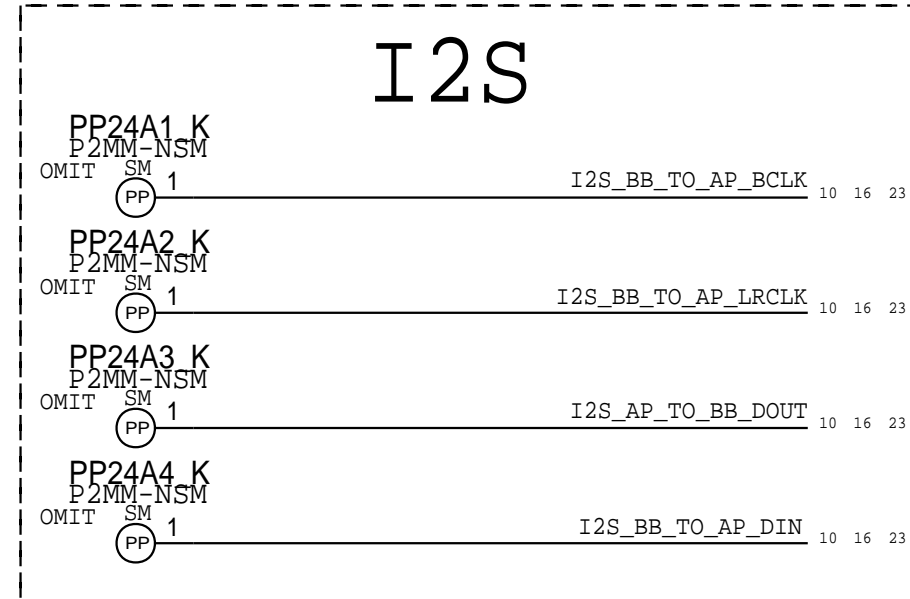
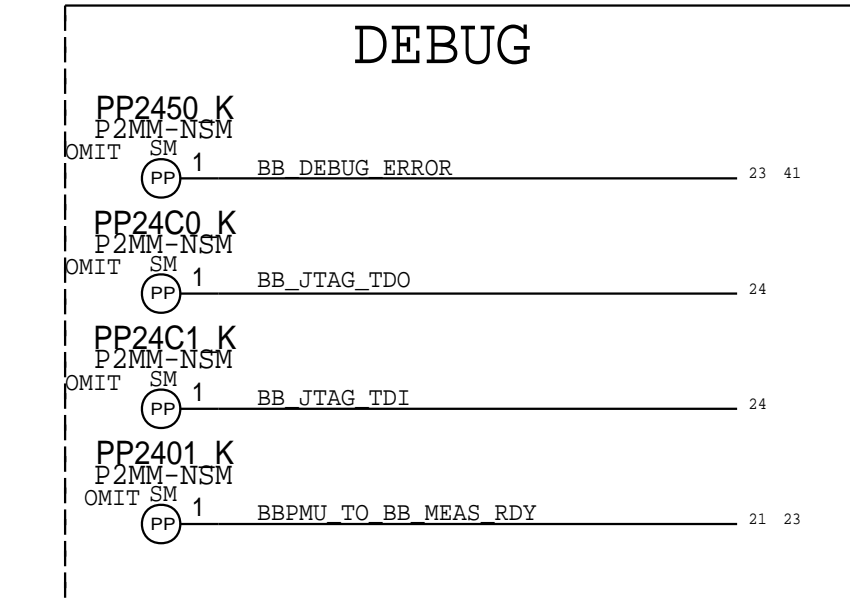
EOS RESISTORS



41	23	SIM1_CLK	==	SIM1_CLK	40
41	23	MAKE_BASE=TRUE	==		
41	23	SIM1_DATA	==	SIM1_DATA	40
41	23	MAKE_BASE=TRUE	==		
41	23	SIM1_RST	==	SIM1_RST	40
41	23	MAKE_BASE=TRUE	==		
41	23	SIM1_DETECT	==	SIM1_DETECT	40
41	23	MAKE_BASE=TRUE	==		
41	25	PP_VDD_SIM1	==	PP_VDD_SIM1	40
41	25	MAKE_BASE=TRUE	==		
41	23	SIM2_CLK	==	SIM2_CLK	40
41	23	MAKE_BASE=TRUE	==		
41	23	SIM2_DATA	==	SIM2_DATA	40
41	23	MAKE_BASE=TRUE	==		
41	23	SIM2_RST	==	SIM2_RST	40
41	23	MAKE_BASE=TRUE	==		
41	23	SIM2_DETECT	==	SIM2_DETECT	40
41	23	MAKE_BASE=TRUE	==		
41	25	PP_VDD_SIM2	==	PP_VDD_SIM2	40
41	25	MAKE_BASE=TRUE	==		

PAGE TITLE		
SIM: PSIM		
	DRAWING NUMBER	051-02695
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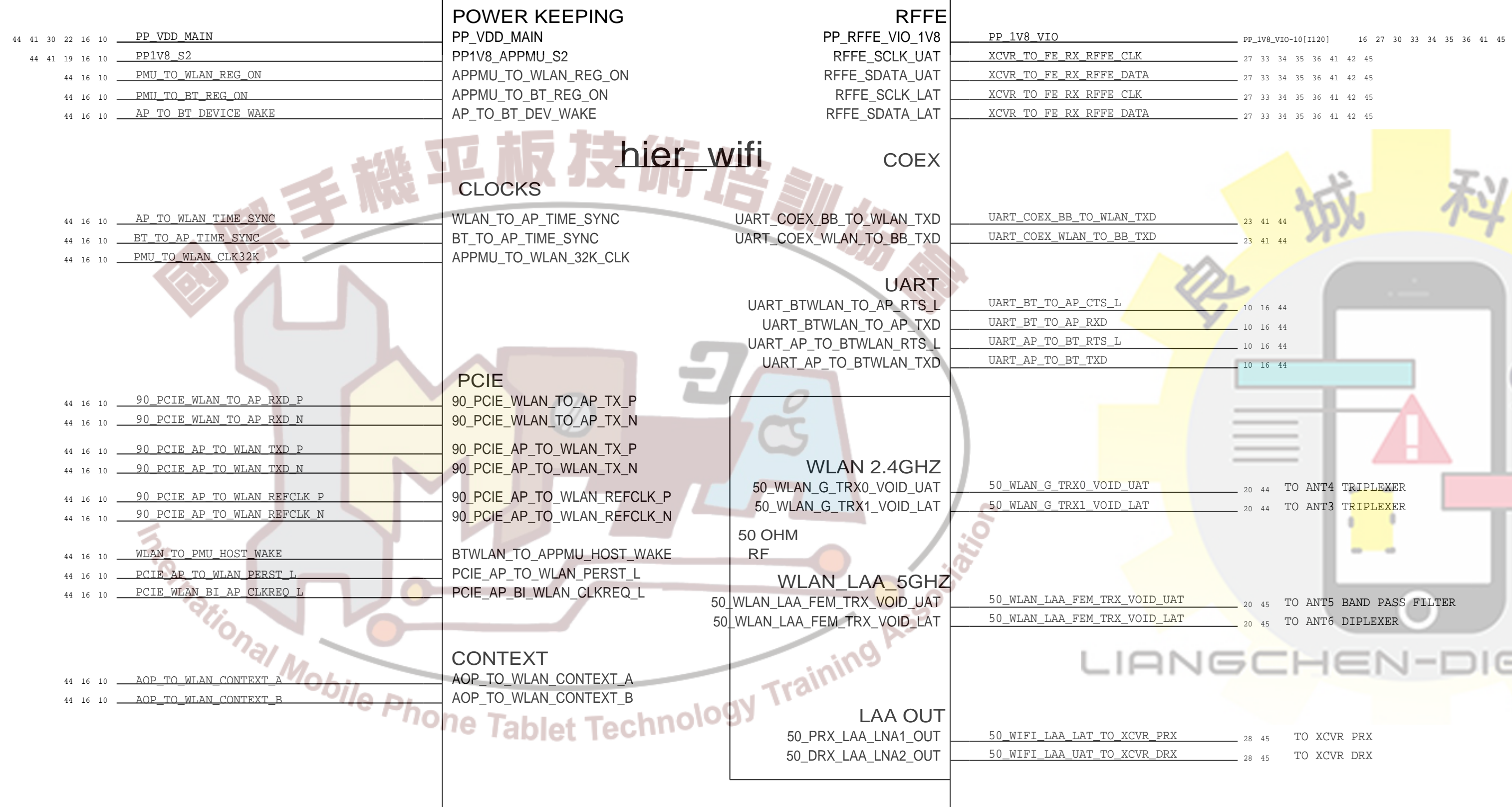
DEBUG: TEST POINTS



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	DRAWING NUMBER	051-02695	SIZE
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SYMBOL: WIFI
 HIERARCHICAL SYMBOL FOR HIER_WIFI

DIETCOKE
 HIER WIFI



PAGE TITLE			SYMBOL: WIFI		
Apple Inc.	DRAWING NUMBER	051-02695	SIZE	D	
	REVISION	4.0.0			
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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
4	0011669799	ENGINEERING RELEASED		2018-03-16

X1049 HIER_WIFI (DIETCOKE)

LAST_MODIFICATION=Fri Mar 16 10:21:00 2018

PAGE	CSA	CONTENTS	SYNC	DATE
43	1	WIFI: TABLE OF CONTENTS		
44	2	DIETCOKE		
45	3	FEM MODULES		

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WLAN SYMBOL IO PORTS

POWER

45 42 IO PP_VDD_MAIN
 VOLTAGE=3.8
 45 42 IO PP1V8_S2
 VOLTAGE=1.8

CONTROL

44 42 IO PMU_TO_WLAN_REG_ON
 44 42 IO PMU_TO_BT_REG_ON
 44 42 IO AP_TO_BT_DEVICE_WAKE

CLOCKS

44 42 IO PMU_TO_WLAN_CLK32K
 44 42 IO AP_TO_WLAN_TIME_SYNC
 44 42 IO BT_TO_AP_TIME_SYNC

WLAN PCIE

44 42 IO 90_PCIE_AP_TO_WLAN_REFCLK_P
 44 42 IO 90_PCIE_AP_TO_WLAN_REFCLK_N
 44 42 IO 90_PCIE_AP_TO_WLAN_TXD_P
 44 42 IO 90_PCIE_AP_TO_WLAN_TXD_N
 44 42 IO 90_PCIE_WLAN_TO_AP_RXD_P
 44 42 IO 90_PCIE_WLAN_TO_AP_RXD_N
 44 42 IO PCIE_AP_TO_WLAN_PERRST_L
 44 42 IO PCIE_WLAN_BI_AP_CLKREQ_L
 44 42 IO WLAN_TO_PMU_HOST_WAKE

BLWLAN UART

44 42 IO UART_AP_TO_BT_TXD
 44 42 IO UART_BT_TO_AP_RXD
 44 42 IO UART_AP_TO_BT_RTS_L
 44 42 IO UART_BT_TO_AP_CTS_L

AOP

44 42 IO AOP_TO_WLAN_CONTEXT_A
 44 42 IO AOP_TO_WLAN_CONTEXT_B

COEX

44 42 IO UART_COEX_BB_TO_WLAN_TXD
 44 42 IO UART_COEX_WLAN_TO_BB_TXD

ANTENNA

44 42 IO 50_WLAN_G_TRX0_VOID_UART
 44 42 IO 50_WLAN_G_TRX1_VOID_UART
 44 42 IO 50_WLAN_LAA_FEM_TRX_VOID_UART
 44 42 IO 50_WLAN_LAA_FEM_TRX_VOID_LAT

RF

44 42 IO 50_WIFI_LAA_LAT_TO_XCVR_PRX
 44 42 IO 50_WIFI_LAA_UART_TO_XCVR_DRX

RFFE

44 42 IO PP_1V8_VIO
 44 42 IO XCVR_TO_FB_RX_RFFE_CLK
 44 42 IO XCVR_TO_FB_RX_RFFE_DATA
 44 42 IO XCVR_TO_FB_RX_RFFE_CLK
 44 42 IO XCVR_TO_FB_RX_RFFE_DATA

SCHEMATIC APN: 051-02623

U_WLAN_W ALTERNATES

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
998-14250	998-14229	BOM_TABLE_ALTS	U_WLAN_W	WIFI/BT MODULE

DRAWING TITLE		DRAWING NUMBER	SIZE
SCH, MLB, BOT, ICE, D33		051-02695	D
Apple Inc.		REVISION	4.0.0
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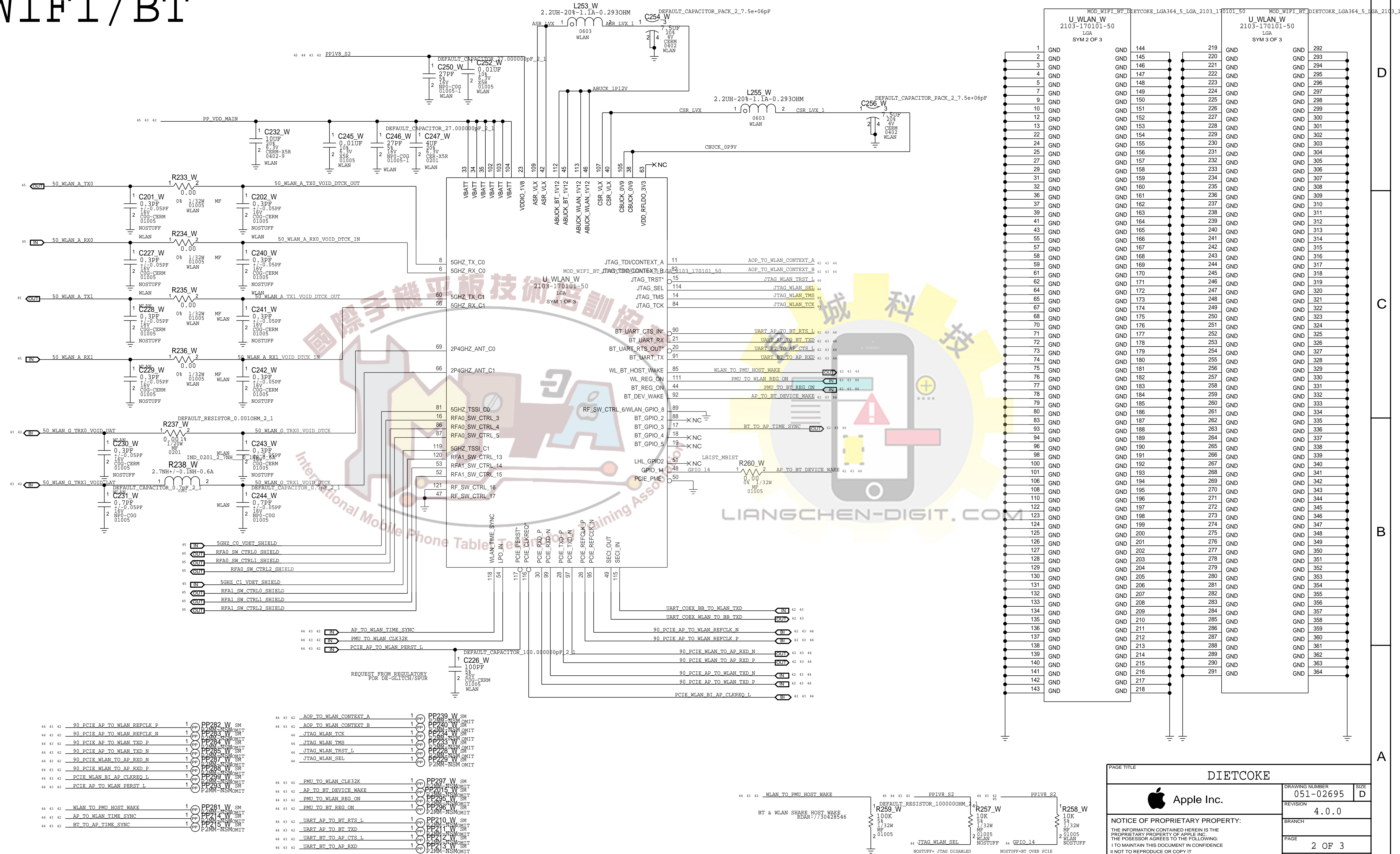
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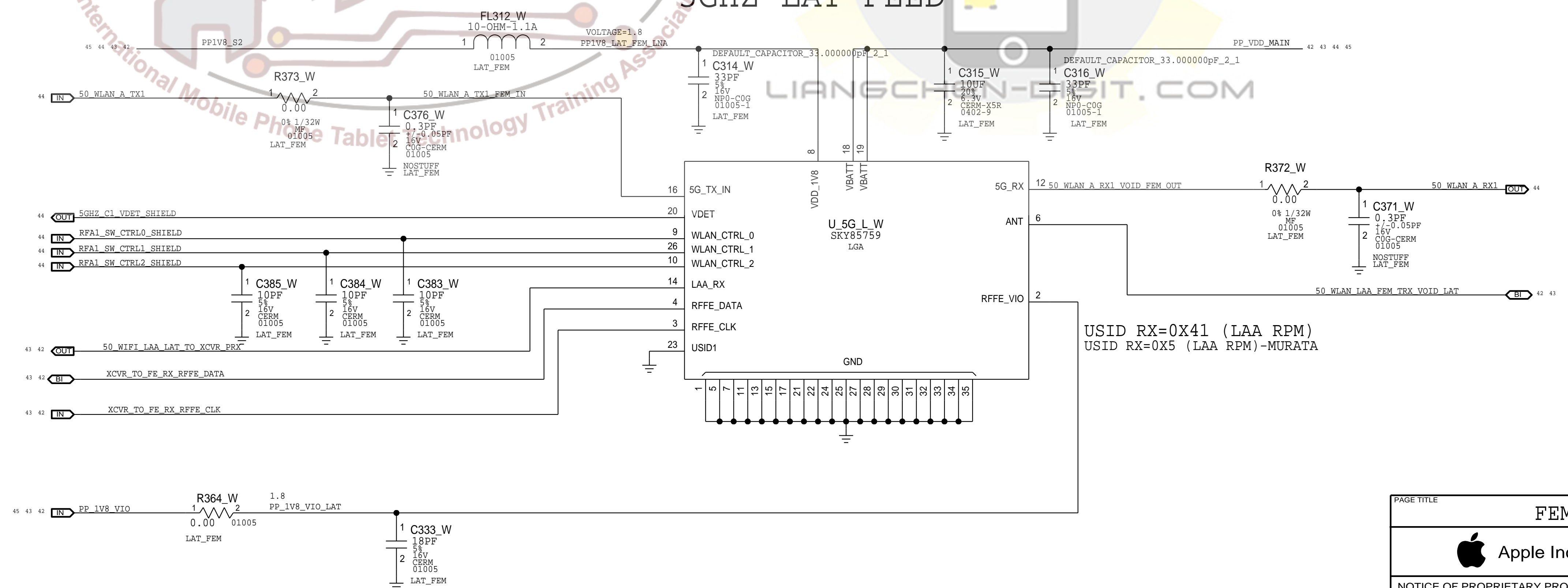
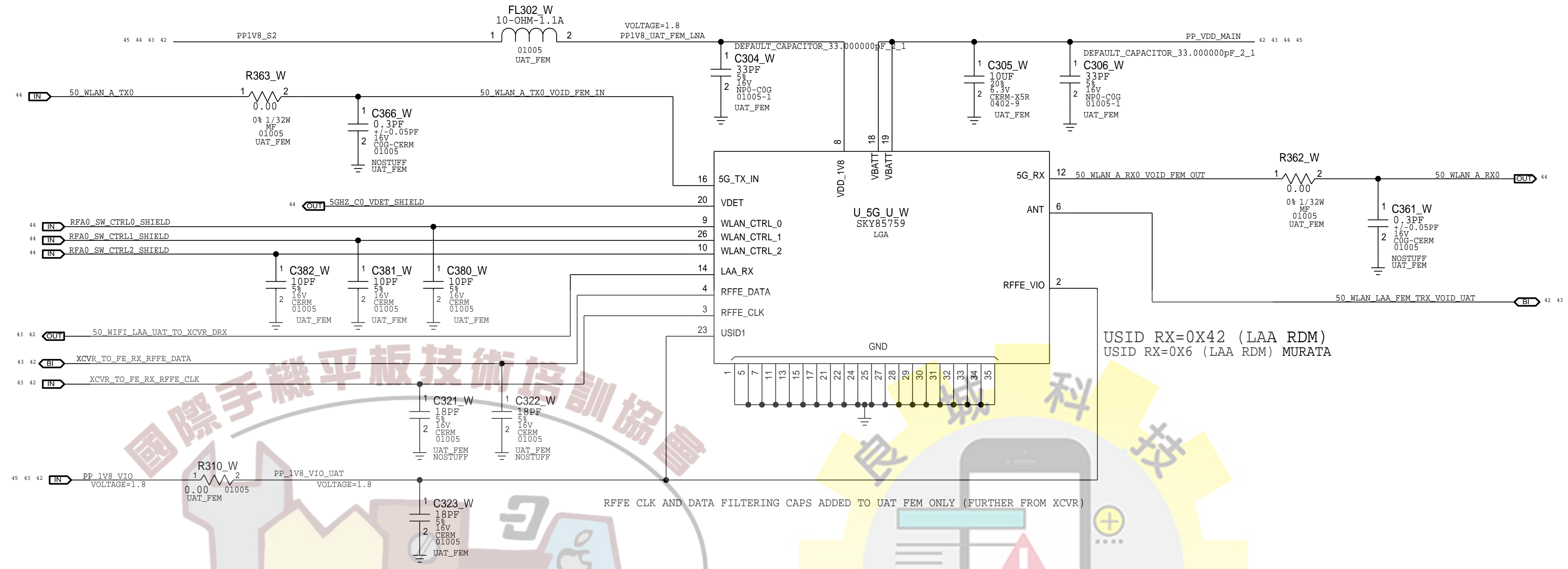
WIFI/BT



PAGE TITLE		DIETCOKE	
		DRAWING NUMBER	051-02695
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FEM MODULES

5GHZ UAT FEED



PAGE TITLE		FEM MODULES	
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1

1. ALL RESISTANCE VALUES ARE IN OHMS, 0.1 WATT +/- 5%.
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REV	ECN	DESCRIPTION OF REVISION	CK APPD	DATE
4	0011669799	ENGINEERING RELEASED		2018-03-16

HIER_NFC

LAST_MODIFICATION=Fri Mar 16 10:21:01 2018

PAGE	CSA	CONTENTS	SYNC	DATE
46	1	NFC: TABLE OF CONTENTS		
47	75	NFC		

46 1 NFC: TABLE OF CONTENTS
 47 75 NFC

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47 10 IN PP_VDD_MAIN
 VOLTAGE=3.8

47 10 IN P1V8_NFC_S2
 VOLTAGE=1.8

47 10 IN PMU_TO_NFC_EN
 47 10 OUT NFC_TO_AOP_HOST_WAKE
 47 10 IN AP_TO_NFC_DEV_WAKE
 47 10 IN AP_TO_NFC_FW_DWLD_REQ

47 10 IN UART_AP_TO_NFC_TXD
 47 10 OUT UART_NFC_TO_AP_RXD
 47 10 IN UART_AP_TO_NFC_RTS_L
 47 10 OUT UART_NFC_TO_AP_CTS_L

47 10 IN AP_TO_NFC_BUTTON
 47 10 IN PMU_TO_NFC_VDD_MAIN_EN
 47 10 OUT NFC_TO_ARC_RESET_L
 47 10 OUT NFC_TO_ARC_TRIG

47 10 OUT NFC_ANT

NFC: TABLE OF CONTENTS

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS
197800076	197800060	BOM_TABLE_ALTS	Y7500_S	XTAL, 27P12 MHZ
197800077	197800060	BOM_TABLE_ALTS	Y7500_S	XTAL, 27P12 MHZ

DRAWING TITLE		DRAWING NUMBER	SIZE
SCH, MLB, BOT, ICE, D33		051-02695	D
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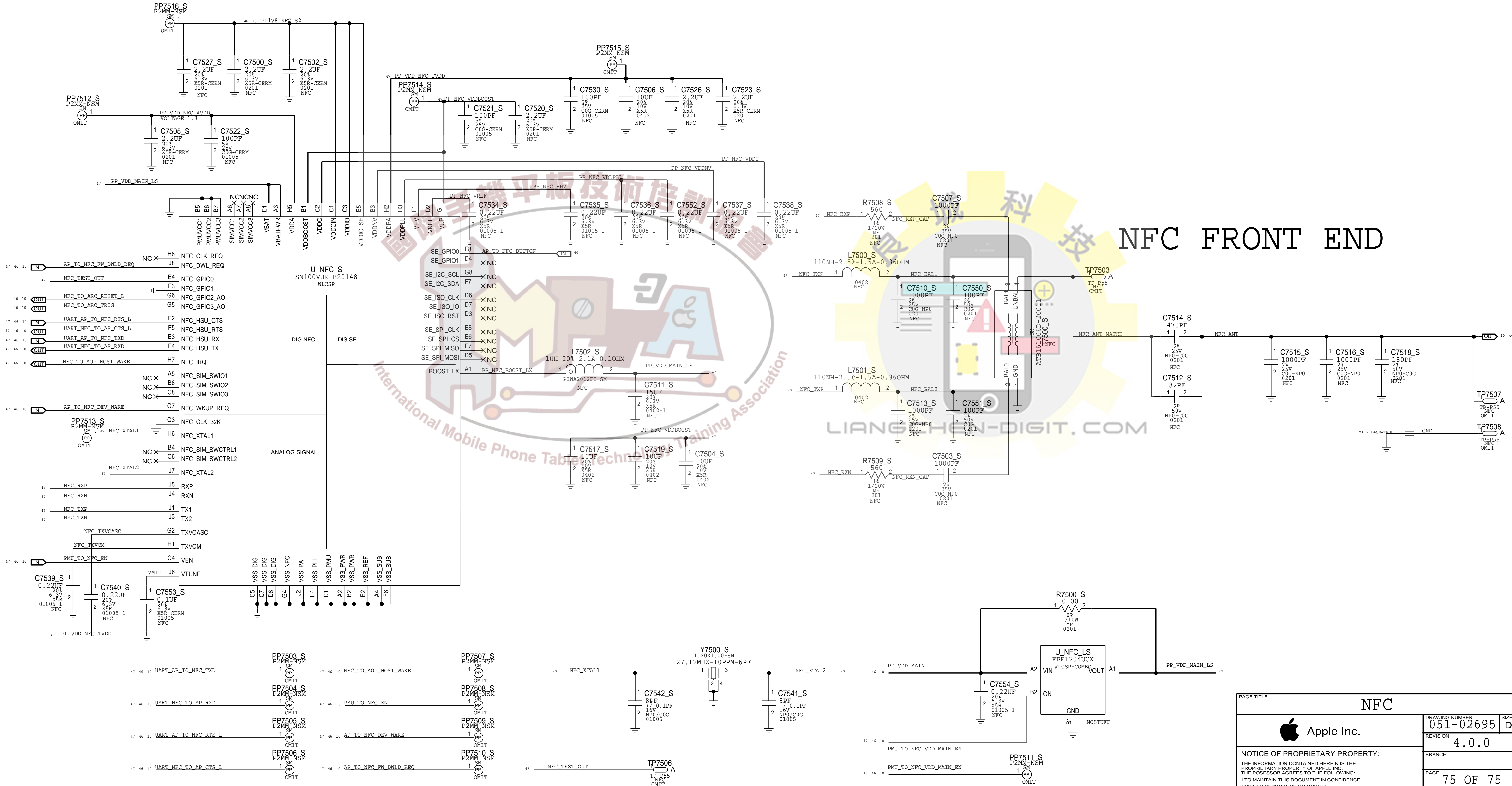
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1

STOCKHOLM

NFC CONTROLLER



NFC FRONT END

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		DRAWING NUMBER	051-02695
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