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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35	20	HB DIVERSITY RECEIVE LNA		
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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_ICE,D33	SCH	CRITICAL	?
820-01063	1	PCB,MLB_BOT_ICE,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

TABLE OF CONTENTS
SYNC_DATE=07/29/2016

DRAWING TITLE: SCH,MLB,BOT,ICE,D33

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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_JG58	CRITICAL	SSNA
825-7691	1	EEEE (MLB_BOT_ICE,SSV,ROW,639-05086)	EEEE_JG59	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:
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 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

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:
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

Global Ferrites

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
152S00558	152S00557	BOM_TABLE_ALTS	ALL	IND,MLD,0.47UH,20%,2.5A,88MO,1608
155S00194	155S0610	BOM_TABLE_ALTS	ALL	FERR BD,150 OHM,25%,200MA,0.7 DCR,01005
155S00200	155S0610	BOM_TABLE_ALTS	ALL	FERR BD,150 OHM,25%,200MA,0.7 DCR,01005
155S00338	155S0661	BOM_TABLE_ALTS	ALL	FERR BD,33 OHM,25%,1.5A,55MOHM DCR,0201

CRITICAL PART#	COMMENT
152S00557	IND,MLD,0.47UH,20%,2.5A,88MO,1608
155S0610	FERR BD,150 OHM,25%,200MA,0.7 DCR,01005
155S0661	FERR BD,33 OHM,25%,1.5A,55MOHM DCR,0201

Global R/C Alternates

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
138S0648	138S0652	BOM_TABLE_ALTS	ALL	CAP,X5R,4.7UF,6.3V,0.65MM,0402,TAIYO
138S00024	138S0986	BOM_TABLE_ALTS	ALL	CAP,CER,3-TERM,7.5UF,20%,4V,0402,TAIYO/TDK
138S0706	138S0739	BOM_TABLE_ALTS	ALL	CAP,CER,1UF,20%,10V,X5R,0201,MURATA
138S0945	138S0739	BOM_TABLE_ALTS	ALL	CAP,CER,1UF,20%,10V,X5R,0201,KYOCERA
138S0739	138S0706	BOM_TABLE_ALTS	ALL	CAP,CER,X5R,0.22UF,20%,6.3V,20%
138S00049	138S0831	BOM_TABLE_ALTS	ALL	CAP,CER,X5R,2.2UF,20%,6.3V,0201
138S00133	138S00128	BOM_TABLE_ALTS	ALL	CAP,X5R,0.47UF,20%,6.3V,MUR,01005
138S00116	138S00071	BOM_TABLE_ALTS	ALL	CAP,X5R,4UF,20%,6.3V,0201,T=0.55MM
138S00117	138S00071	BOM_TABLE_ALTS	ALL	CAP,X5R,4UF,20%,6.3V,0201,T=0.55MM
138S00048	138S00003	BOM_TABLE_ALTS	ALL	CAP,X5R,15UF,20%,6.3V,0.65MM,HRZTL,0402
131S00172	131S00164	BOM_TABLE_ALTS	ALL	CAP,CER,C0G,220PF,5%,16V,01005
131S00173	131S00164	BOM_TABLE_ALTS	ALL	CAP,CER,C0G,220PF,5%,16V,01005
131S00185	131S0316	BOM_TABLE_ALTS	ALL	CAP,CER,X5R,0.1UF,20%,6.3V,01005
138S00048	138S00003	BOM_TABLE_ALTS	ALL	CAP,CER,X5R,15UF,20%,6.3V,0402
132S00185	132S0316	BOM_TABLE_ALTS	ALL	CAP,CER,X5R,15UF,20%,6.3V,0402

CRITICAL PART#	COMMENT
138S0652	CAP,X5R,4.7UF,6.3V,0.65MM,0402,TAIYO
138S0986	CAP,CER,3-TERM,7.5UF,20%,4V,0402,TAIYO/TDK
138S0739	CAP,CER,1UF,20%,10V,X5R,0201,MURATA
138S0706	CAP,CER,X5R,0.22UF,20%,6.3V,20%
132S0400	CAP,CER,X5R,0.22UF,20%,6.3V,01005
138S0831	CAP,CER,X5R,2.2UF,20%,6.3V,0201
138S00128	CAP,X5R,0.47UF,20%,6.3V,KYO,01005
138S00071	CAP,X5R,4UF,20%,6.3V,0201,T=0.55MM
138S00003	CAP,X5R,15UF,20%,6.3V,0.65MM,HRZTL,0402
131S00164	CAP,CER,C0G,220PF,5%,16V,01005

Global Inductors

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
152S00653	152S00651	BOM_TABLE_ALTS	ALL	IND,1.2UH,3A,2016,0.65Z
152S00654	152S00652	BOM_TABLE_ALTS	ALL	IND,1.2UH,3A,2016,0.8Z

CRITICAL PART#	COMMENT
152S00651	IND,1.2UH,3A,2016,0.65Z
152S00652	IND,1.2UH,3A,2016,0.8Z

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
685-00243	685-00182	BOM_TABLE_ALTS	SUBBOM_DS	SUBBOM,MLB,BOT,DIODES,ONSEMI,X891

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	ONSEMI,SHOTTKY DIODE,30V,2A,0603	D3400,D3401,D3402,D3403	CRITICAL	ONSEMI_DS

Hall Effect Alts

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
353S01327	353S3697	BOM_TABLE_ALTS	ALL	ROHM HES

IKTARA

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
116S00002	6	RES, High Current 0 Ohm	C3461,C3462,C3463,C3464,C3465,C3466	CRITICAL	UNBALNACED CAPS
132S00186	1	CAP, 0.033uF, 10%, 100V, X6S	C3451	CRITICAL	UNBALNACED CAPS
132S00187	3	CAP, 0.047uF. 10%, 100V, X6S	C3452,C3453,C3456	CRITICAL	UNBALNACED CAPS

Multi-Vendor Criticals

CRITICAL PART#	COMMENT
138S0979	CAP,CER,X5R,10UF,20%,10V,0402,H=0.65MM
138S0683	CAP,CER,X5R,1UF,10%,25V,0402
132S0663	CAP,CER,X5R,1UF,10%,25V,0402
132S0288	CAP,CER,X5R,0.1UF,10%,16V,0201
132S0275	CAP,CER,X5R,470PF,10%,10V,01005
132S0245	CAP,CER,X5R,0.01UF,10%,6.3V,01005
138S0692	CAP,CER,X5R,1UF,20%,6.3V,0201

CRITICAL PART#	COMMENT
132S00008	CAP,CER,0.1UF,10%,50V,X7R,0402
131S0804	CAP,CER,27PF,5%,C0G,25V,0201
131S0307	CAP,CER,NP0/C0G,100PF,5%,16V,01005
131S00053	CAP,CER,C0G,220PF,5%,10V,01005
117S0055	RES,MF,1/20W,2M OHM,5,0201,SMD
107S0257	THERMISTOR,NTC,10K OHM,1%,B=3435,01005
131S00170	CAP,CER,C0G,220PF,5%,25V,01005
131S0643	CAP,CER,NP0/C0G,56PF,5%,25V,01005
131S0316	CAP,CER,X5R,0.1UF,20%,6.3V,01005

PAGE TITLE
SYSTEM:BOM Tables

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ST0403
STIFFENER-UAT-D32
SM
1

ZT401
HOL-3.0OD2.45ID-2.2NP
10 NFC_ANT 1

SB0403
STDOFF-2.6OD1.087H-TH-0.311-1.6
1

ST0402
STIFFENER-UNIBODY-D33
SM
1

SB0402
STDOFF-2.6OD1.087H-TH-0.311-1.6
1

FIDUCIALS

FIDUCIALS

Crosses

FD0401
FID
0P5SQ-CROSS-NSP
1 ROOM=ASSEMBLY

FD0402
FID
0P5SQ-CROSS-NSP
1 ROOM=ASSEMBLY

FD0403
FID
0P5SQ-CROSS-NSP
1 ROOM=ASSEMBLY

FD0404
FID
0P5SQ-CROSS-NSP
1 ROOM=ASSEMBLY

FD0405
FID
0P5SQ-CROSS-NSP
1 ROOM=ASSEMBLY

FD0410
FID
0P5SQ-SMP3SQ-NSP
1 ROOM=ASSEMBLY

FD0411
FID
0P5SQ-SMP3SQ-NSP
1 ROOM=ASSEMBLY

FD0412
FID
0P5SQ-SMP3SQ-NSP
1 ROOM=ASSEMBLY

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SYSTEM: Mechanical Components

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BOOTSTRAPPING:BOARD ID[3]

SELECTED-->

	Board ID[4:0] Float = Low PU = High				
	4	3	2	1	0
	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	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**

11 OUT BOARD_ID2
CKPLUS_NAIVE=SINGLE_NODENET

SYNCMASTER
SYNC_DATE=08/08/2017

PAGE TITLE
BOOTSTRAPPING

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Test Points

14 10 7 6 5 PP_VDD_MAIN — TP0700 VDD_MAIN; TP0701; TP0702; TP0703 (TP-P55, ROOM=TEST)

14 PP_BATT_VCC — TP0515 VBATT; TP0522 (TP-P55, ROOM=TEST)

TP0705 TP0707 TP0709 TP0706 TP0708 TP0710 (TP-P55, ROOM=TEST)

AMUX

11 PMU_AMUX_AY — TP0713 (TP-P55, ROOM=TEST) ANALOG MUX A OUTPUT

11 PMU_AMUX_BY — TP0715 (TP-P55, ROOM=TEST) ANALOG MUX B OUTPUT

DFU

11 HYDRA_TO_AP_FORCE_DFU — TP0714 (TP-P55, ROOM=TEST) FORCE DFU

LVCC

12 PP_GPU_LVCC — TP0720 (TP-P55, ROOM=TEST)

12 PP_CPU_PCORE_LVCC — TP0721 (TP-P55, ROOM=TEST)

COIL

14 6 IKTARA_COIL1 — TP0730 (TP-P55, ROOM=TEST)

14 6 IKTARA_COIL2 — TP0731 (TP-P55, ROOM=TEST)

OV COMP

11 PP_VDD_MAIN_OV_R — TP0741 (TP-P55, ROOM=TEST)

12 10 9 TOUCH_TO_MANY_FORCE_PWM — TP0757 (TP-P55, ROOM=TEST)

12 9 PMU_TO_TOUCH_CLK32K — TP0758 (TP-P55, ROOM=TEST)

11 9 AP_TO_TOUCH_SCAN_CLK — TP0759 (TP-P55, ROOM=TEST)

REL BIAS

11 9 AP_TO_RACER_RESET_L — TP0761 (TP-P55, ROOM=TEST)

12 9 UART_RACER_TO_AOP_RXD — TP0762 (TP-P55, ROOM=TEST)

15 9 RACER_TO_AOP_INT_L — TP0763 (TP-P55, ROOM=TEST)

12 9 UART_AOP_TO_RACER_TXD — TP0764 (TP-P55, ROOM=TEST)

14 6 PP_VBUS2_IKTARA — TP0765 (TP-P55, ROOM=TEST)

11 PMU_TO_SYSTEM_COLD_RESET_L — TP0772 (TP-P55, ROOM=TEST)

12 REL_BIAS_VBUS_EN — TP0773 (TP-P55, ROOM=TEST)

11 AP_TO_CAMPMU_RESET_L — TP0774 (TP-P55, ROOM=TEST)

Probe Points

Iktara Debug

15 6 PMU_TO_IKTARA_EN_EXT_1V8 — PP0700 P2MM-NSM (SM 1 PP) ROOM=TEST

6 IKTARA_ANA1 — PP0701 P2MM-NSM (SM 1 PP) ROOM=TEST

6 IKTARA_GPIO3 — PP0702 P2MM-NSM (SM 1 PP) ROOM=TEST

6 IKTARA_GPIO4 — PP0703 P2MM-NSM (SM 1 PP) ROOM=TEST

15 6 IKTARA_TO_SMC_INT — PP0704 P2MM-NSM (SM 1 PP) ROOM=TEST

VDD_MAIN TRADEOFF CAPS

10 7 6 5 14 PP_VDD_MAIN

C0701 15UF 20% 6.3V X5R 0402-0.1MM-1

C0702 15UF 20% 6.3V X5R 0402-0.1MM-1

SYNC_DATE=11/01/2017

PAGE TITLE: SYSTEM: Testpoints (Bottom)

Apple Inc.

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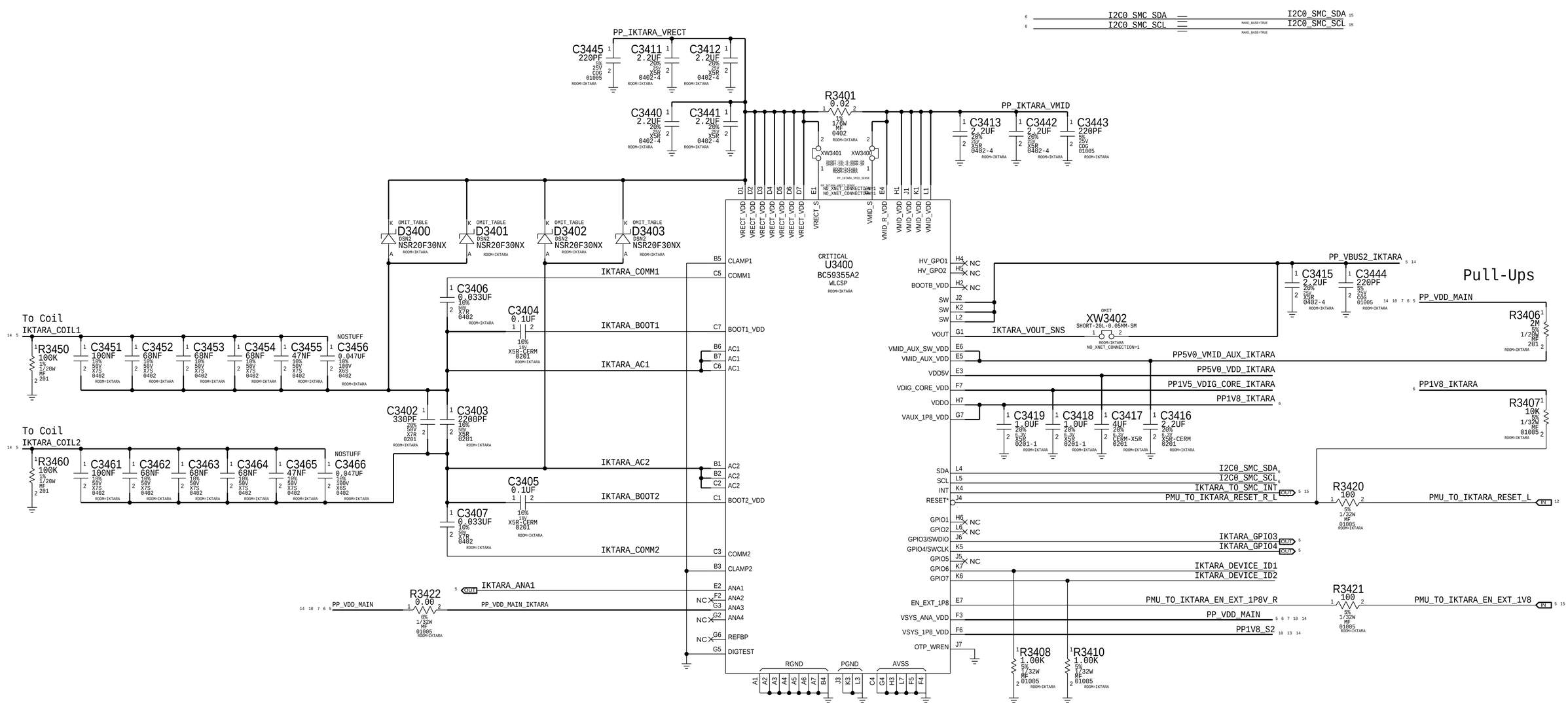
Iktara



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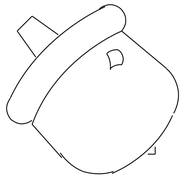
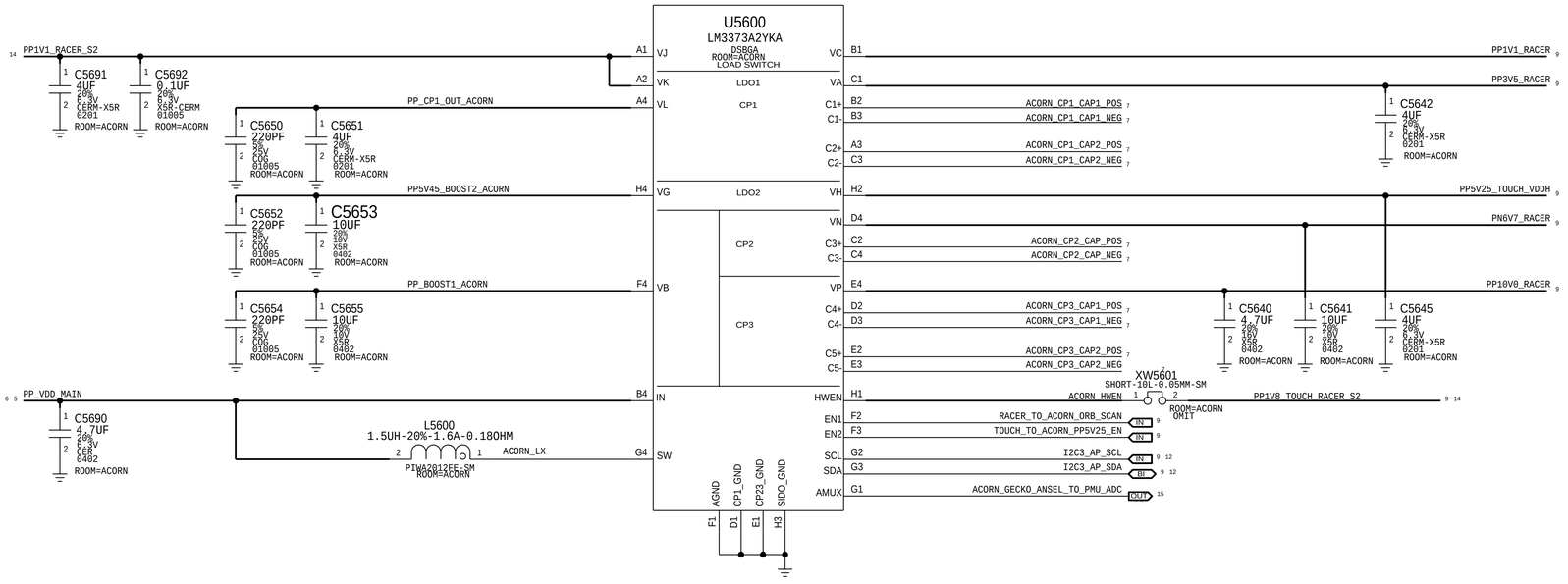
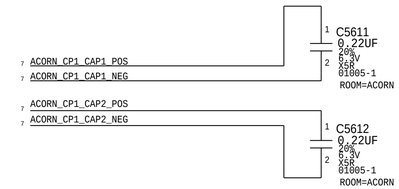
Acorn PMU

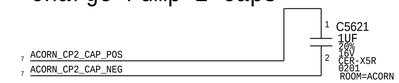




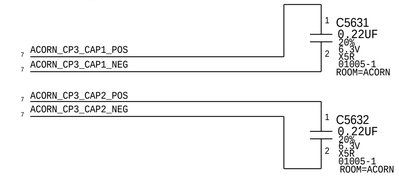
Charge Pump 1 Caps



Charge Pump 2 Caps



Charge Pump 3 Caps



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-PAD
SYM 1 OF 2
INTERPOSER-MLB-TOP-V3-D32

11	GND	1	IO1	IO95	95	AP_TO_NFC_FW_DWLD_REQ	11
11	GND	2	IO2	IO96	96	GND	11
11	GND	3	IO3	IO97	97	PMU_TO_NFC_VDD_MAIN_EN	11
11	GND	4	IO4	IO98	98	UART_AOP_TO_BB_TXD	11
11	GND	5	IO5	IO99	99	GND	11
11	GND	6	IO6	IO100	100	UART_AP_TO_GNSS_TXD	11
11	PMU_TO_SYSTEM_COLD_RESET_L	7	IO7	IO101	101	GND	11
11	GND	8	IO8	IO102	102	AP_TO_BB_COREDUMP_TRIG	11
11	AP_TO_CAMPMU_RESET_L	9	IO9	IO103	103	UART_AP_TO_NFC_TXD	11
11	GND	10	IO10	IO104	104	UART_NFC_TO_AP_RXD	11
11	BB_TO_MANY_GSM_BURST_IND	11	IO11	IO105	105	BB_TO_AP_RESET_DETECT_L	11
11	GND	12	IO12	IO106	106	GND	11
11	HALL_CASE_TO_AOP_NORTH_L	13	IO13	IO107	107	BOARD_ID2	11
11	GND	14	IO14	IO108	108	AP_TO_GNSS_TIME_MARK	11
11	AP_TO_TOUCH_SCAN_CLK	15	IO15	IO109	109	PCIE_BB_BI_AP_CLKREQ_L	11
11	GND	16	IO16	IO110	110	AP_TO_BB_PEAK_POWER_INDICATOR	11
11	I2S_BB_TO_AP_BCLK	17	IO17	IO111	111	AP_TO_BBPMU_RADIO_ON_L	11
11	GND	18	IO18	IO112	112	PP_VDD_MAIN	11
11	I2S_BB_TO_AP_DIN	19	IO19	IO113	113	PP_VDD_MAIN	11
11	GND	20	IO20	IO114	114	PP_VDD_MAIN	11
11	I2S_AP_TO_BB_DOUT	21	IO21	IO115	115	GND	11
11	GND	22	IO22	IO116	116	GND	11
11	I2S_BB_TO_AP_LRCLK	23	IO23	IO117	117	GND	11
11	GND	24	IO24	IO118	118	90_PCIE_BB_TO_AP_RXD_N	11
11	PP1V8_ALWAYS	25	IO25	IO119	119	90_PCIE_BB_TO_AP_RXD_P	11
11	GND	26	IO26	IO120	120	GND	11
11	GND	27	IO27	IO121	121	90_PCIE_AP_TO_BB_TXD_N	11
11	GND	28	IO28	IO122	122	90_PCIE_AP_TO_BB_TXD_P	11
11	GND	29	IO29	IO123	123	GND	11
11	GND	30	IO30	IO124	124	90_PCIE_AP_TO_BB_REFCLK_P	11
11	GND	31	IO31	IO125	125	90_PCIE_AP_TO_BB_REFCLK_N	11
11	GND	32	IO32	IO126	126	GND	11
11	GND	33	IO33	IO127	127	UART_BB_TO_AOP_RXD	11
11	GND	34	IO34	IO128	128	UART_GNSS_TO_AP_RXD	11
11	GND	35	IO35	IO129	129	PCIE_AP_TO_BB_PERST_L	11
11	GND	36	IO36	IO130	130	GND	11
11	GND	37	IO37	IO131	131	PMU_AMUX_BY	11
11	GND	38	IO38	IO132	132	PMU_AMUX_AY	11
11	GND	39	IO39	IO133	133	GND	11
11	GND	40	IO40	IO134	134	UART_NFC_TO_AP_CTS_L	11
11	GND	41	IO41	IO135	135	UART_AP_TO_NFC_RTS_L	11
11	GND	42	IO42	IO136	136	BB_TO_AP_PEAK_POWER_INDICATOR	11
11	GND	43	IO43	IO137	137	GND	11
11	GND	44	IO44	IO138	138	PP_VDD_MAIN	11
11	GND	45	IO45	IO139	139	PP_VDD_MAIN	11
11	GND	46	IO46	IO140	140	PP_VDD_MAIN	11
11	GND	47	IO47	IO141	141	GND	11
11	GND	48	IO48	IO142	142	GND	11
11	GND	49	IO49	IO143	143	GND	11
11	NFC_TO_ARC_RESET_L	50	IO50	IO144	144	GND	11
11	GND	51	IO51	IO145	145	GND	12
11	NFC_TO_ARC_TRIG	52	IO52	IO146	146	GND	12
11	GND	53	IO53	IO147	147	GND	12
11	GND	54	IO54	IO148	148	GND	12
11	GND	55	IO55	IO149	149	GND	12
11	GND	56	IO56	IO150	150	GND	12
11	GND	57	IO57	IO151	151	GND	12
11	GND	58	IO58	IO152	152	GND	12
11	GND	59	IO59	IO153	153	GND	12
11	GND	60	IO60	IO154	154	PP_VDD_MAIN	12
11	GND	61	IO61	IO155	155	PP_VDD_MAIN	12
11	GND	62	IO62	IO156	156	GND	12
11	GND	63	IO63	IO157	157	PP_VDD_MAIN	12
11	GND	64	IO64	IO158	158	PP_VDD_MAIN	12
11	AP_TO_BB_RESET_L	65	IO65	IO159	159	GND	12
11	GND	66	IO66	IO160	160	PMU_TO_NFC_EN	12
11	SWD_AOP_BI_BB_SWDIO	67	IO67	IO161	161	GND	12
11	GND	68	IO68	IO162	162	PMU_TO_BBPMU_RESET_L	12
11	UART_GNSS_TO_AP_CTS_L	69	IO69	IO163	163	GND	12
11	GND	70	IO70	IO164	164	PMU_TO_TOUCH_CLK32K	12
11	UART_AP_TO_GNSS_RTS_L	71	IO71	IO165	165	GND	12
11	GND	72	IO72	IO166	166	PCIE_WLAN_BI_AP_CLKREQ_L	12
11	PCIE_AP_TO_WLAN_PERST_L	73	IO73	IO167	167	GND	12
11	GND	74	IO74	IO168	168	GND	12
11	AP_TO_RACER_RESET_L	75	IO75	IO169	169	BB_TO_PMU_PCIE_HOST_WAKE_L	12
11	GND	76	IO76	IO170	170	GND	12
11	AP_TO_WLAN_TIME_SYNC	77	IO77	IO171	171	GND	12
11	GND	78	IO78	IO172	172	WLAN_TO_PMU_HOST_WAKE	12
11	GNSS_TO_AP_LOW_PWR_IND	79	IO79	IO173	173	GND	12
11	GND	80	IO80	IO174	174	PMU_TO_WLAN_CLK32K	12
11	HYDRA_TO_AP_FORCE_DFU	81	IO81	IO175	175	GND	12
11	GND	82	IO82	IO176	176	NFC_TO_AOP_HOST_WAKE	12
11	PP1V8_S2	83	IO83	IO177	177	GND	12
11	PP1V8_S2	84	IO84	IO178	178	TOUCH_TO_MANY_FORCE_PWM	12
11	GND	85	IO85	IO179	179	GND	12
11	GND	86	IO86	IO180	180	UART_AP_TO_BT_TXD	12
11	GND	87	IO87	IO181	181	GND	12
11	GND	88	IO88	IO182	182	UART_AP_TO_BT_RTS_L	12
11	GND	89	IO89	IO183	183	GND	12
11	PP_VDD_MAIN_OV_R	90	IO90	IO184	184	GND	12
11	AP_TO_BB_COEX	91	IO91	IO185	185	GND	12
11	BB_TO_AP_COEX	92	IO92	IO186	186	GND	12
11	GND	93	IO93	IO187	187	GND	12
11	AP_TO_NFC_DEV_WAKE	94	IO94	IO188	188	GND	12

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12	GND	189	IO189	IO282	282	GND	12
12	GND	190	IO190	IO283	283	GND	12
12	GND	191	IO191	IO284	284	GND	12
12	GND	192	IO192	IO285	285	GND	12
12	GND	193	IO193	IO286	286	GND	15
12	GND	194	IO194	IO287	287	ACORN_GECKO_ANSEL_TO_PMU_ADC	15
12	GND	195	IO195	IO288	288	GND	15
12	PP1V8_NFC_S2	196	IO196	IO289	289	RACER_TO_AOP_INT_L	15
12	PMU_TO_GNSS_EN	197	IO197	IO290	290	GND	15
12	PMU_TO_BT_REG_ON	198	IO198	IO291	291	HALL_CASE_TO_AOP_SOUTH_L	15
12	GND	199	IO199	IO292	292	GND	15
12	90_PCIE_AP_TO_WLAN_REFCLK_N	200	IO200	IO293	293	PMU_TO_IKTARA_EN_EXT_1V8	15
12	90_PCIE_AP_TO_WLAN_REFCLK_P	201	IO201	IO294	294	GND	15
12	GND	202	IO202	IO295	295	IKTARA_TO_SMC_INT	15
12	90_PCIE_AP_TO_WLAN_TXD_P	203	IO203	IO296	296	GND	15
12	90_PCIE_AP_TO_WLAN_TXD_N	204	IO204	IO297	297	I2C0_SMC_SCL	15
12	GND	205	IO205	IO298	298	I2C0_SMC_SDA	15
12	90_PCIE_WLAN_TO_AP_RXD_N	206	IO206	IO299	299	GND	15
12	90_PCIE_WLAN_TO_AP_RXD_P	207	IO207	IO300	300	IKTARA_COIL2	15
12	GND	208	IO208	IO301	301	IKTARA_COIL2	15
12	PP3V0_S2	209	IO209	IO302	302	IKTARA_COIL2	15
12	PP1V8_TOUCH_RACER_S2	210	IO210	IO303	303	IKTARA_COIL2	15
12	PP1V8_TOUCH_RACER_S2	211	IO211	IO304	304	IKTARA_COIL1	15
12	PMU_TO_WLAN_REG_ON	212	IO212	IO305	305	IKTARA_COIL1	15
12	RADIO_PA_NTC	213	IO213	IO306	306	IKTARA_COIL1	15
12	BT_TO_AP_TIME_SYNC	214	IO214	IO307	307	IKTARA_COIL1	15
12	UART_BT_TO_AP_RXD	215	IO215	IO308	308	GND	15
12	GND	216	IO216	IO309	309	GND	15
12	GND	217	IO217	IO310	310	GND	15
12	UART_BT_TO_AP_CTS_L	218	IO218	IO311	311	GND	15
12	GND	219	IO219	IO312	312	GND	15
12	GND	220	IO220	IO313	313	GND	15
12	GND	221	IO221	IO314	314	GND	15
12	GND	222	IO222	IO315	315	GND	15
12	GND	223	IO223	IO316	316	GND	15
12	GND	224	IO224	IO317	317	GND	15
12	GND	225	IO225	IO318	318	GND	15
12	GND	226	IO226	IO319	319	GND	15
12	GND	227	IO227	IO320	320	GND	15
12	GND	228	IO228	IO321	321	GND	15
12	REL_BIAS_VBUS_EN	229	IO229	IO322	322	GND	15
12	GND	230	IO230	IO323	323	GND	15
12	PP_GPU_LVCC	231	IO231	IO324	324	GND	15
12	GND	232	IO232	IO325	325	GND	15
12	PP_CPU_PCORE_LVCC	233	IO233	IO326	326	GND	15
12	GND	234	IO234	IO327	327	GND	15
12	PP_BATT_VCC	235	IO235	IO328	328	GND	15
12	PP_BATT_VCC	236	IO236	IO329	329	GND	15
12	GND	237	IO237	IO330	330	GND	15
12	AP_TO_BT_DEVICE_WAKE	238	IO238	IO331	331	GND	15
12	AOP_TO_WLAN_CONTEXT_A	239	IO239	IO332	332	GND	15
12	UART_AOP_TO_RACER_TXD	240	IO240	IO333	333	GND	15
12	SWD_AOP_TO_MANY_SWCLK	241	IO241	IO334	334	GND	15
12	SPI_AP_TO_RACER_MOSI	242	IO242	IO335	335	GND	15
12	SPI_AP_TO_RACER_SCLK	243	IO243	IO336	336	GND	15
12	PP1V1_RACER_S2	244	IO244	IO337	337	GND	15
12	PP1V1_RACER_S2	245	IO245	IO338	338	GND	15
12	PP1V1_RACER_S2	246	IO246	IO339	339	GND	15
12	AP_TO_RACER_REF_CLK	247	IO247	IO340	340	GND	15
12	GND	248	IO248	IO341	341	GND	15
12	AOP_TO_BBPMU_COEX	249	IO249	IO342	342	GND	15
12	PP_VBUS2_IKTARA	250	IO250	IO343	343	GND	15
12	PP_VBUS2_IKTARA	251	IO251	IO344	344	GND	15
12	PP_VBUS2_IKTARA	252	IO252	IO345	345	GND	15
12	PP_VBUS2_IKTARA	253	IO253	IO346	346	GND	15
12	GND	254	IO254	IO347	347	GND	15
12	AOP_TO_WLAN_CONTEXT_B	255	IO255	IO348	348	GND	15
12	GND	256	IO256	IO349	349	GND	15
12	UART_RACER_TO_AOP_RXD	257	IO257	IO350	350	GND	15
12	GND	258	IO258	IO351	351	GND	15
12	SPI_RACER_TO_AP_MISO	259	IO259	IO352	352	GND	15
12	GND	260	IO260	IO353	353	GND	15
12	SPI_AP_TO_RACER_CS_L	261	IO261	IO354	354	GND	15
12	GND	262	IO262	IO355	355	GND	15
12	PMU_TO_IKTARA_RESET_L	263	IO263	IO356	356	GND	15
12	GND	264	IO264	IO357	357	GND	15
12	SWD_AOP_BI_RACER_SWDIO	265	IO265	IO358	358	GND	15
12	GND	266	IO266				
12	I2C3_AP_SDA	267	IO267				
12	GND	268	IO268				
12	I2C3_AP_SCL	269	IO269				
12	GND	270	IO270				
12	GND	271	IO271				
12	GND	272	IO272				
12	GND	273	IO273				
12	GND	274	IO274				
12	GND	275	IO275				
12	GND	276	IO276				
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12	GND	278	IO278				
12	GND	279	IO279				
12	GND	280	IO280				
12	GND	281	IO281				

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BOT INTERPOSER

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998-10900 ON MLB_BOT

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	1	IO1	IO75	75	
10 50_PRX_LB_PAD_LB2_SDR_IN_XCVR	2	IO2	IO76	76	
	3	IO3	IO77	77	PP1V8_TOUCH_RACER_S2 7 9 14
	4	IO4	IO78	78	
	5	IO5	IO79	79	
10 50_PRX_MB2_PAD_MB_B_SDR_IN_XCVR	6	IO6	IO80	80	PP1V8_TOUCH_RACER_S2 7 9 14
	7	IO7	IO81	81	
	8	IO8	IO82	82	PP10V0_RACER 7
	9	IO9	IO83	83	
10 50_PRX_MB1_PAD_MB_A_SDR_IN_XCVR	10	IO10	IO84	84	PN6V7_RACER 7
	11	IO11	IO85	85	
	12	IO12	IO86	86	
	13	IO13	IO87	87	
10 50_PRX_HB2_PAD_LHB_SDR_IN_XCVR	14	IO14	IO88	88	PP3V5_RACER 7
	15	IO15	IO89	89	LOFT_CANARY_2 10
	16	IO16	IO90	90	AP_TO_RACER_REF_CLK 12
	17	IO17	IO91	91	
10 50_PRX_HB1_PAD_HB_SDR_IN_XCVR	18	IO18	IO92	92	
	19	IO19	IO93	93	AP_TO_RACER_RESET_L 5 11
	20	IO20	IO94	94	RACER_TO_ACORN_ORB_SCAN 7
	21	IO21	IO95	95	AP_TO_TOUCH_SCAN_CLK 5 11
	22	IO22	IO96	96	UART_RACER_TO_AOP_RXD 5 12
	23	IO23	IO97	97	
	24	IO24	IO98	98	UART_AOP_TO_RACER_TXD 5 12
	25	IO25	IO99	99	SWD_AOP_TO_MANY_SWCLK 10 12
	26	IO26	IO100	100	SWD_AOP_BI_RACER_SWDIO 9 12
10 LOFT_CANARY_1	27	IO27	IO101	101	SPI_AP_TO_RACER_MOSI 12
	28	IO28	IO102	102	
	29	IO29	IO103	103	RACER_TO_AOP_INT_L 5 15
10 SHIELD_RFFE_RX_SDATA	30	IO30	IO104	104	SPI_AP_TO_RACER_SCLK 12
	31	IO31	IO105	105	
10 SHIELD_RFFE_RX_SCLK	32	IO32	IO106	106	SPI_RACER_TO_AP_MISO 12
	33	IO33	IO107	107	TOUCH_TO_ACORN_PP5V25_EN 7
	34	IO34	IO108	108	SPI_AP_TO_RACER_CS_L 12
	35	IO35	IO109	109	TOUCH_TO_MANY_FORCE_PWM 5 10 12
	36	IO36	IO110	110	
10 PP_1V8_VIO	37	IO37	IO111	111	I2C3_AP_SDA 7 12
	38	IO38	IO112	112	CKPLUS_WAIVE=I2C_PULLUP
10 SHIELD_RFFE_TX_SDATA	39	IO39	IO113	113	
	40	IO40	IO114	114	
10 SHIELD_RFFE_TX_SCLK	41	IO41	IO115	115	
	42	IO42	IO116	116	
	43	IO43	IO117	117	PP5V25_TOUCH_VDDH 7
	44	IO44	IO118	118	I2C3_AP_SCL 7 12
	45	IO45	IO119	119	PMU_TO_TOUCH_CLK32K 5 12
	46	IO46	IO120	120	CKPLUS_WAIVE=I2C_PULLUP
	47	IO47	IO121	121	PP1V1_RACER 7 9
	48	IO48	IO122	122	PP1V1_RACER 7 9
	49	IO49	IO123	123	
	50	IO50	IO124	124	50_LBPAD_2G_OUT_CPL2_IN_JPN 10
	51	IO51	IO125	125	
10 9 PP_ET_PA	52	IO52	IO126	126	50_HBPAD_2G_OUT_CPL2_IN_JPN 10
10 9 PP_ET_PA	53	IO53	IO127	127	
10 9 PP_ET_PA	54	IO54	IO128	128	50_PAD_ANT_HB_CPL2_IN 10
10 9 PP_ET_PA	55	IO55	IO129	129	
10 9 PP_ET_PA	56	IO56	IO130	130	50_PAD_ANT_LB_CPL2_IN 10
	57	IO57	IO131	131	
	58	IO58	IO132	132	50_TDD_PAD_ANT_HB_CPL2_IN 10
	59	IO59	IO133	133	
	60	IO60	IO134	134	PP_VBATT_PA 10
	61	IO61	IO135	135	
10 PP_1V8_VBIAS_LNA	62	IO62	IO136	136	
	63	IO63	IO137	137	
	64	IO64	IO138	138	50_TX_2G_HB_IN 10
	65	IO65	IO139	139	
	66	IO66	IO140	140	50_TX_MB1_IN 10
	67	IO67	IO141	141	
	68	IO68	IO142	142	50_TX_HB_PA_IN 10
	69	IO69	IO143	143	
	70	IO70	IO144	144	
10 50_TX_LB_PA_IN	71	IO71	IO145	145	
	72	IO72			
	73	IO73			
	74	IO74			

10 PP_1V2_VDD_LNA

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146	IO146	
147	IO147	
148	IO148	
149	IO149	
150	IO150	
151	IO151	
152	IO152	
153	IO153	
154	IO154	
155	IO155	
156	IO156	
157	IO157	
158	IO158	
159	IO159	
160	IO160	
161	IO161	
162	IO162	
163	IO163	
164	IO164	
165	IO165	
166	IO166	
167	IO167	
168	IO168	

SWD_AOP_BI_RACER_SWDIO 9 12

R7701
100K
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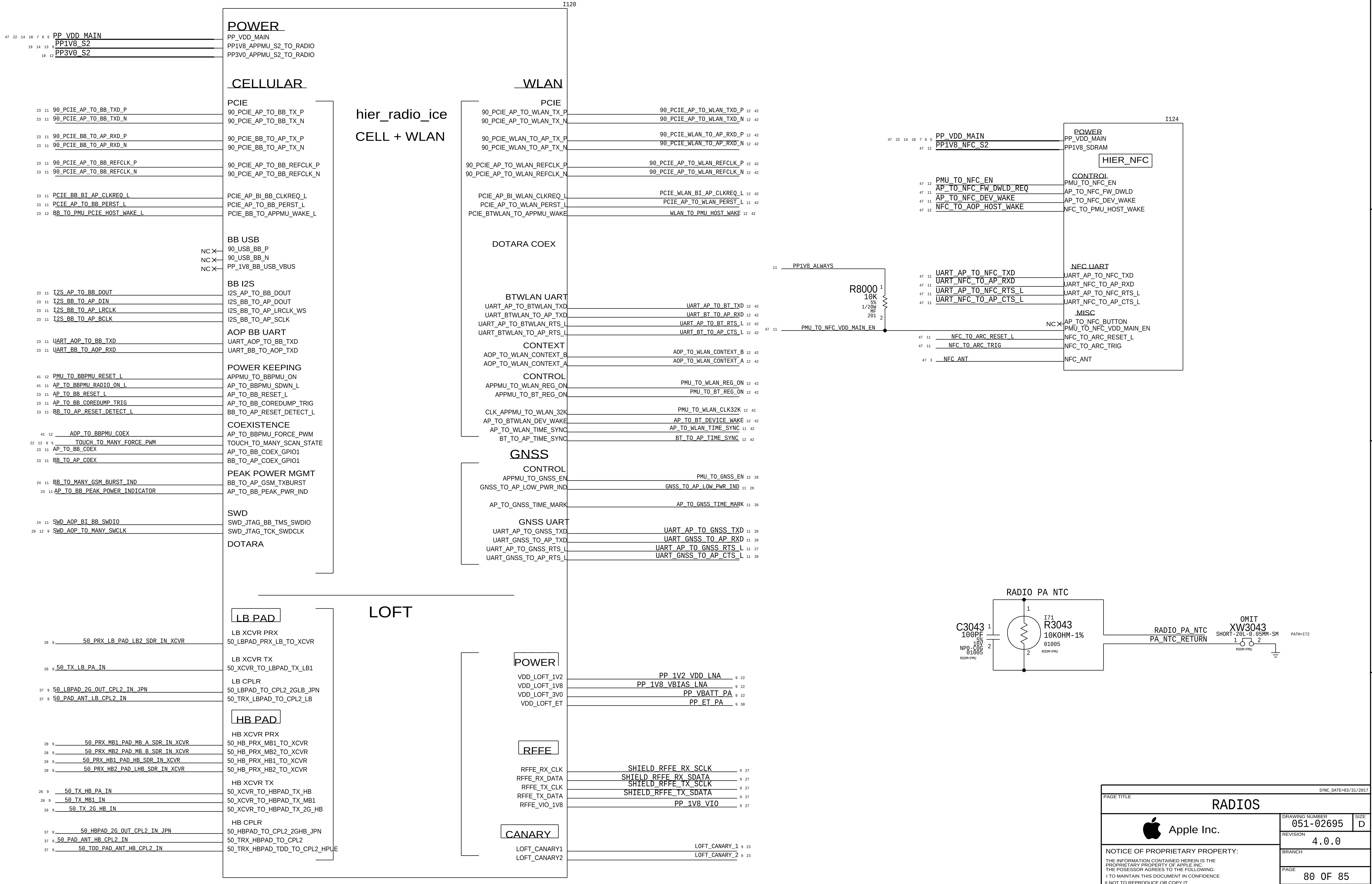
I120
POWER
PP_VDD_MAIN
PP1V8_S2
PP3V0_S2
PP_VDD_MAIN
PP1V8_APPMU_S2_TO_RADIO
PP3V0_APPMU_S2_TO_RADIO
CELLULAR
WLAN
hier_radio_ice
CELL + WLAN
PCIE
90_PCIE_AP_TO_BB_TXD_P
90_PCIE_AP_TO_BB_TXD_N
90_PCIE_BB_TO_AP_RXD_P
90_PCIE_BB_TO_AP_RXD_N
90_PCIE_AP_TO_BB_REFCLK_P
90_PCIE_AP_TO_BB_REFCLK_N
PCIE_BB_BI_AP_CLKREQ_L
PCIE_AP_TO_BB_PERST_L
BB_TO_PMU_PCIE_HOST_WAKE_L
90_PCIE_AP_TO_BB_TX_P
90_PCIE_AP_TO_BB_TX_N
90_PCIE_BB_TO_AP_TX_P
90_PCIE_BB_TO_AP_TX_N
PCIE_AP_BI_BB_CLKREQ_L
PCIE_AP_TO_BB_PERST_L
PCIE_BB_TO_APPMU_WAKE_L
BB USB
NC
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
I2S_BB_TO_AP_DOUT
I2S_BB_TO_AP_LRCLK_WS
I2S_BB_TO_AP_SCLK
AOP BB UART
UART_AOP_TO_BB_TXD
UART_BB_TO_AOP_RXD
UART_BB_TO_AOP_TXD
POWER KEEPING
PMU_TO_BBPMU_RESET_L
AP_TO_BBPMU_RADIO_ON_L
AP_TO_BB_RESET_L
AP_TO_BB_COREDUMP_TRIG
BB_TO_AP_RESET_DETECT_L
APPMU_TO_BBPMU_ON
AP_TO_BBPMU_SDWN_L
COEXISTENCE
AOP_TO_BBPMU_COEX
TOUCH_TO_MANY_FORCE_PWM
AP_TO_BB_COEX
BB_TO_AP_COEX
AP_TO_BBPMU_FORCE_PWM
TOUCH_TO_MANY_SCAN_STATE
AP_TO_BB_COEX_GPIO1
BB_TO_AP_COEX_GPIO1
PEAK POWER MGMT
BB_TO_MANY_GSM_BURST_IND
AP_TO_BB_PEAK_POWER_INDICATOR
BB_TO_AP_GSM_TXBURST
AP_TO_BB_PEAK_PWR_IND
SWD
SWD_AOP_BI_BB_SWDIO
SWD_AOP_TO_MANY_SWCLK
SWD_JTAG_BB_TMS_SWDIO
SWD_JTAG_TCK_SWDCLK
DOTARA
90_PCIE_AP_TO_WLAN_TX_P
90_PCIE_AP_TO_WLAN_TX_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_AP_BI_WLAN_CLKREQ_L
PCIE_AP_TO_WLAN_PERST_L
PCIE_BTWLAN_TO_APPMU_WAKE
90_PCIE_AP_TO_WLAN_TXD_P
90_PCIE_AP_TO_WLAN_TXD_N
90_PCIE_WLAN_TO_AP_RXD_P
90_PCIE_WLAN_TO_AP_RXD_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_AP_TO_BT_TXD
UART_BT_TO_AP_RXD
UART_AP_TO_BT_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
PMU_TO_WLAN_REG_ON
PMU_TO_BT_REG_ON
CLK_APPMU_TO_WLAN_32K
AP_TO_BTWLAN_DEV_WAKE
AP_TO_WLAN_TIME_SYNC
BT_TO_AP_TIME_SYNC
PMU_TO_WLAN_CLK32K
AP_TO_BT_DEVICE_WAKE
GNSS
APPMU_TO_GNSS_EN
GNSS_TO_AP_LOW_PWR_IND
AP_TO_GNSS_TIME_MARK
PMU_TO_GNSS_EN
GNSS UART
UART_AP_TO_GNSS_TXD
UART_GNSS_TO_AP_TXD
UART_AP_TO_GNSS_RTS_L
UART_GNSS_TO_AP_RTS_L
UART_GNSS_TO_AP_RXD
UART_GNSS_TO_AP_CTS_L
LOFT
LB PAD
LB XCVR PRX
50_PRX_LB_PAD_LB2_SDR_IN_XCVR
50_LBPAD_PRX_LB_TO_XCVR
LB XCVR TX
50_TX_LB_PA_IN
50_XCVR_TO_LBPAD_TX_LB1
LB CPLR
50_LBPAD_2G_OUT_CPL2_IN_JPN
50_PAD_ANT_LB_CPL2_IN
50_LBPAD_TO_CPL2_2GLB_JPN
50_TRX_LBPAD_TO_CPL2_LB
HB PAD
HB XCVR PRX
50_PRX_MB1_PAD_MB_A_SDR_IN_XCVR
50_PRX_MB2_PAD_MB_B_SDR_IN_XCVR
50_PRX_HB1_PAD_HB_SDR_IN_XCVR
50_PRX_HB2_PAD_LHB_SDR_IN_XCVR
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_TX_HB_PA_IN
50_TX_MB1_IN
50_TX_2G_HB_IN
50_XCVR_TO_HBPAD_TX_HB
50_XCVR_TO_HBPAD_TX_MB1
50_XCVR_TO_HBPAD_TX_2G_HB
HB CPLR
50_HBPAD_2G_OUT_CPL2_IN_JPN
50_PAD_ANT_HB_CPL2_IN
50_TDD_PAD_ANT_HB_CPL2_IN
50_HBPAD_TO_CPL2_2GHB_JPN
50_TRX_HBPAD_TO_CPL2
50_TRX_HBPAD_TDD_TO_CPL2_HPUE
VDD_LOFT_1V2
VDD_LOFT_1V8
VDD_LOFT_3V0
VDD_LOFT_ET
PP_1V2_VDD_LNA
PP_1V8_VBIAS_LNA
PP_VBATT_PA
PP_ET_PA
RFFE
RFFE_RX_CLK
RFFE_RX_DATA
RFFE_TX_CLK
RFFE_TX_DATA
RFFE_VIO_1V8
SHIELD_RFFE_RX_SCLK
SHIELD_RFFE_RX_SDATA
SHIELD_RFFE_TX_SCLK
SHIELD_RFFE_TX_SDATA
PP_1V8_VIO
CANARY
LOFT_CANARY1
LOFT_CANARY2
LOFT_CANARY_1
LOFT_CANARY_2
I124
HIER_NFC
PP_VDD_MAIN
PP1V8_NFC_S2
PP1V8_SDRAM
PMU_TO_NFC_EN
AP_TO_NFC_FW_DWLD_REQ
AP_TO_NFC_DEV_WAKE
NFC_TO_AOP_HOST_WAKE
AP_TO_NFC_FW_DWLD
NFC_TO_PMU_HOST_WAKE
NFC 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
PP1V8_ALWAYS
R8000
10K
5%
1/20W
MF
201
RADIO PA NTC
C3043
100PF
5%
16V
NP0-C0G
01005
R3043
10KOHM-1%
01005
RADIO_PA_NTC
PA_NTC_RETURN
OMIT
XW3043
SHORT-20L-0.05MM-SM
PATH=I72

SYNC_DATE=03/31/2017

PAGE TITLE

RADIOS

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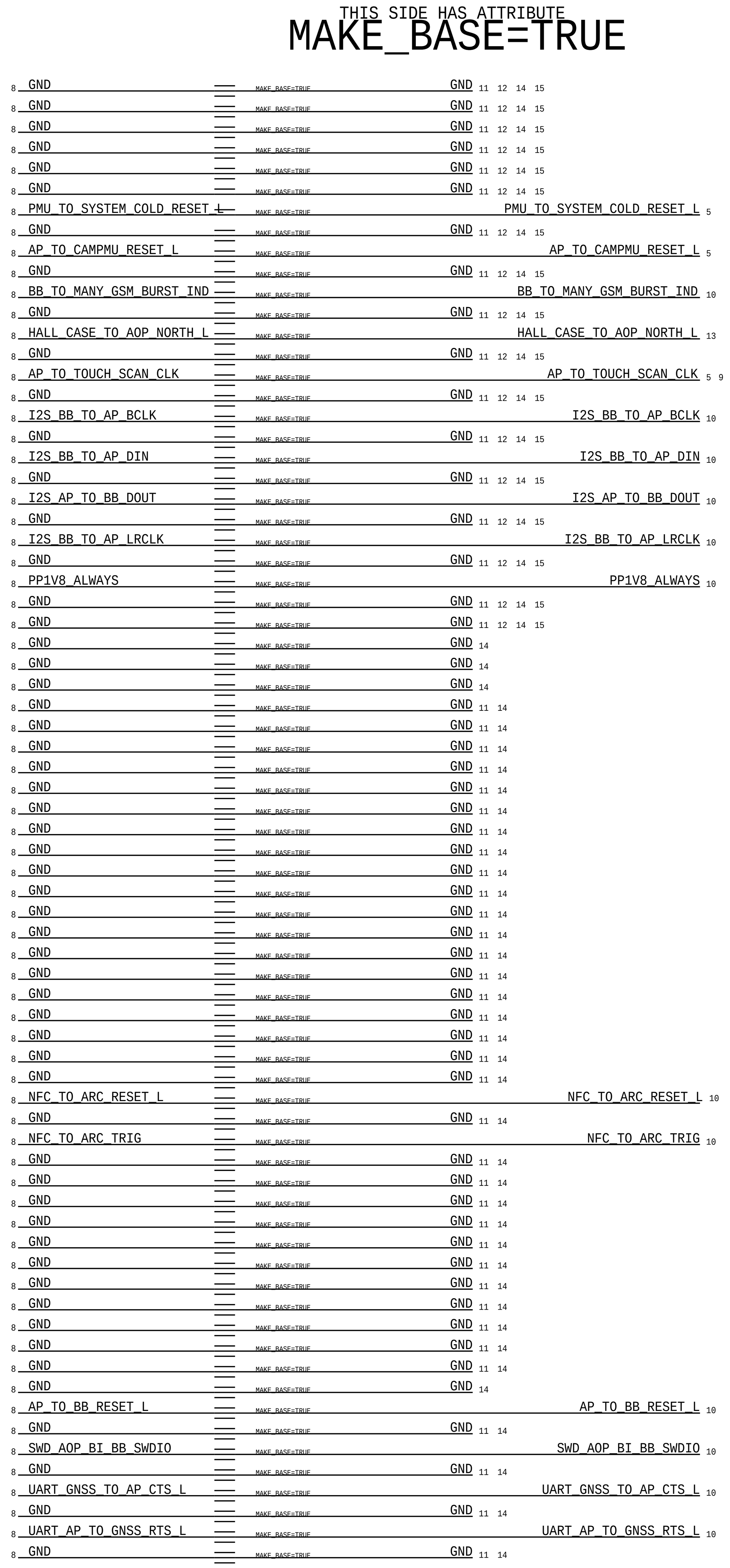
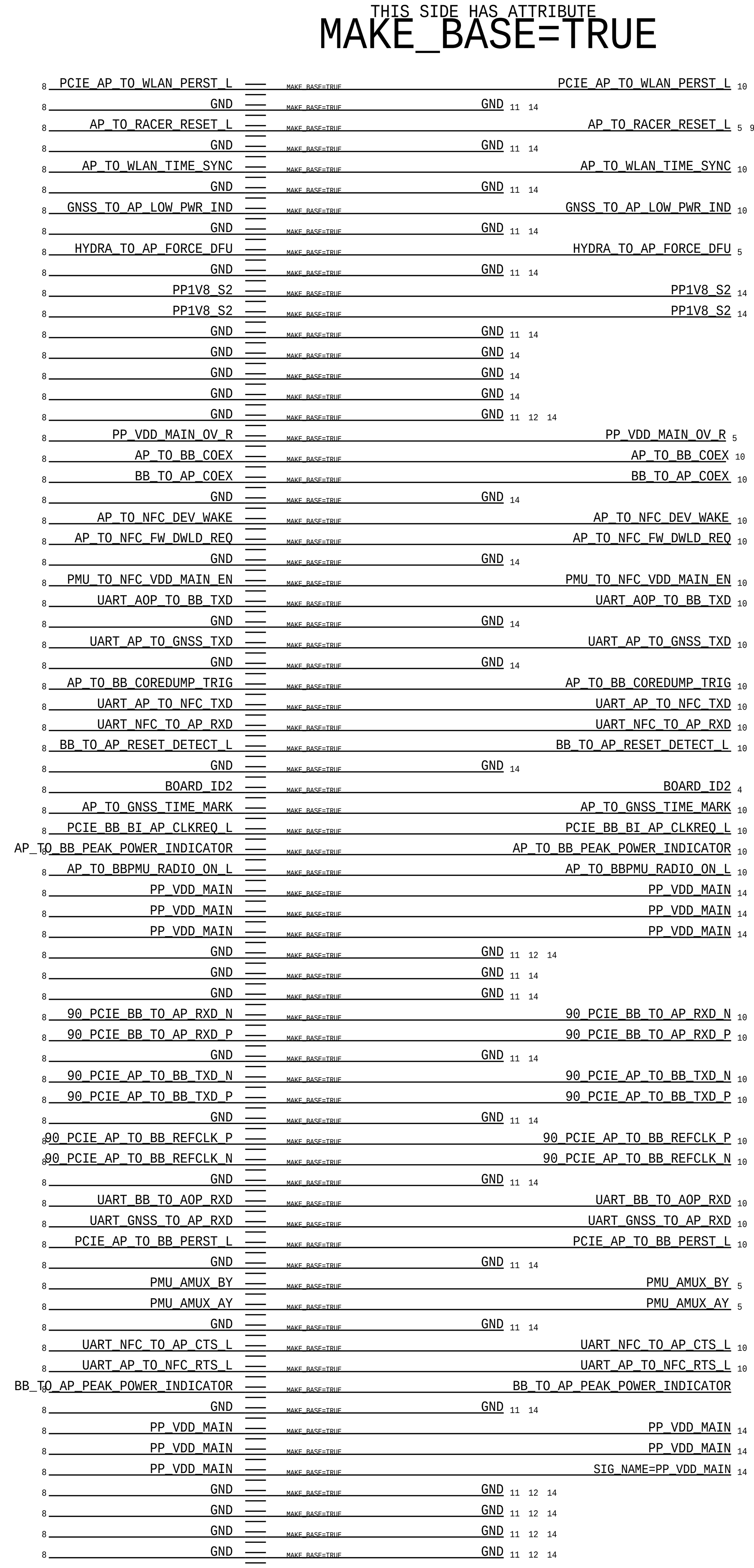
Interposer Aliases: Pins 1-144





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Interposer: Pins 1-144

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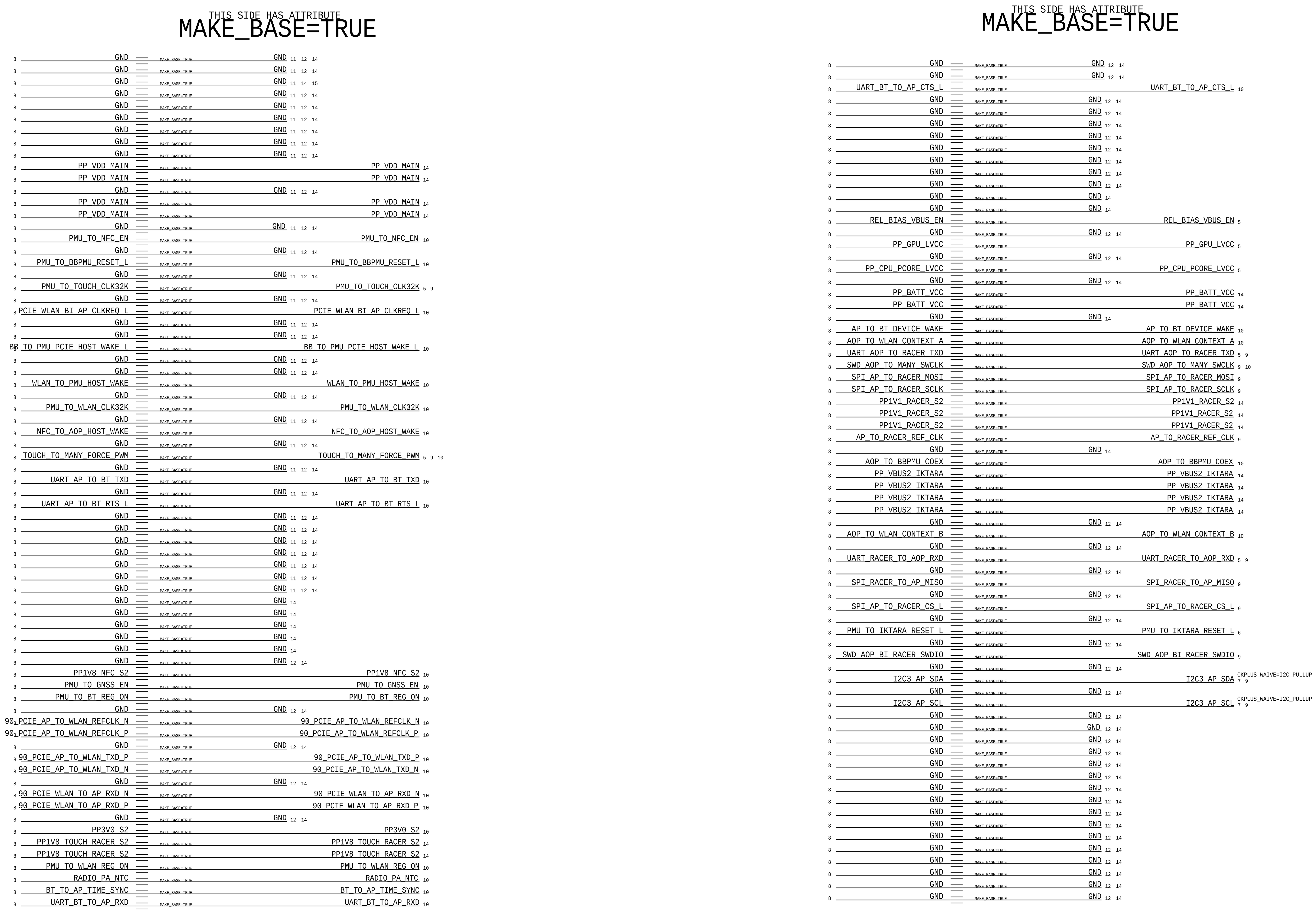
Interposer Aliases: Pins 145-285



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Interposer: Pins 145-285

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Hall

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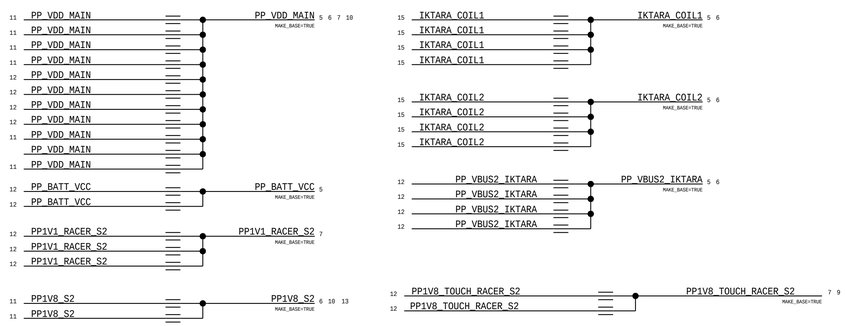
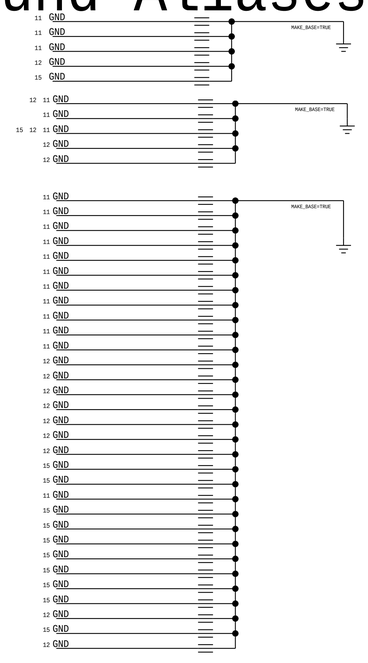
CDS_LIB=apple

Interposer Top Level Aliases

Power Aliases



Ground Aliases



SYNC_DATE=11/01/2017

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CDS_LIB=apple

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

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21	6	BBPMU: CONTROL		
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25	10	BB: DIGITAL PWR		
26	11	XCVR: TX & GNSS		
27	12	XCVR: INTERFACE & PWR		
28	13	XCVR: PRX DRX		
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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	41 37 33 30 27 SHIELD_RFFE_TX_SCLK-10[I120]	
37	22	COUPLER + LOWER ANTENNA	41 37 33 30 27 SHIELD_RFFE_TX_SDATA-10[I120]	
38	23	UPPER ANTENNA FEEDS	27 SHIELD_RFFE_RX_SDATA-10[I120]	
39	24	SIM: ESIM	27 SHIELD_RFFE_RX_SCLK-10[I120]	
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		

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

LOFT ALIASES

22 PP_1V2_VDD_LNA-10[I120] — PP_1V2_VDD_LNA 16
MAKE_BASE=TRUE

PP_1V8_VBIAS_LNA — PP_1V8_VBIAS_LNA 16
MAKE_BASE=TRUE

33 37 PP_VBATT_PA-10[I120] — PP_VBATT_PA 16
MAKE_BASE=TRUE

30 PP_ET_PA-10[I120] — PP_ET_PA 16
33
MAKE_BASE=TRUE

33 30 27 41 36 35 PP_1V8_VIO-10[I120] — PP_1V8_VIO 16
MAKE_BASE=TRUE

SHIELD_RFFE_TX_SCLK — SHIELD_RFFE_TX_SCLK 16
MAKE_BASE=TRUE

SHIELD_RFFE_TX_SDATA — SHIELD_RFFE_TX_SDATA 16
MAKE_BASE=TRUE

SHIELD_RFFE_RX_SDATA — SHIELD_RFFE_RX_SDATA 16
MAKE_BASE=TRUE

SHIELD_RFFE_RX_SCLK — SHIELD_RFFE_RX_SCLK 16
MAKE_BASE=TRUE

LOFT

PMIC:POWER & I/O

16 IN PP_1V2_VDD_LNA
16 IN PP_1V8_VBIAS_LNA
16 IN PP_VBATT_PA
16 IN PP_ET_PA

BB:RFFE

16 IN PP_1V8_VIO
16 IN SHIELD_RFFE_TX_SCLK
16 IN SHIELD_RFFE_TX_SDATA
16 IN SHIELD_RFFE_RX_SDATA
16 IN SHIELD_RFFE_RX_SCLK

XCVR

LB PAD
26 18 IN 50_TX_LB_PA_IN
18 20 IN 50_PRX_LB_PAD_LB2_SDR_IN_XCVR

CPLR

37 18 IN 50_LBPAD_2G_OUT_CPL2_IN_JPN
18 37 IN 50_PAD_ANT_LB_CPL2_IN

XCVR

HB PAD
26 18 IN 50_TX_HB_PA_IN
26 18 IN 50_TX_MB1_IN
26 18 IN 50_TX_2G_HB_IN
18 20 IN 50_PRX_MB1_PAD_MB_A_SDR_IN_XCVR
28 18 IN 50_PRX_MB2_PAD_MB_B_SDR_IN_XCVR
28 18 IN 50_PRX_HB1_PAD_HB_SDR_IN_XCVR
28 18 IN 50_PRX_HB2_PAD_LHB_SDR_IN_XCVR

CPLR

37 18 IN 50_HBPAD_2G_OUT_CPL2_IN_JPN
18 37 IN 50_PAD_ANT_HB_CPL2_IN
37 18 IN 50_TDD_PAD_ANT_HB_CPL2_IN

CNRY

41 26 21 IN LOFT_CANARY_1
41 23 18 IN LOFT_CANARY_2

SYSTEM POWER

POWER

30 22 19 42 41 IO PP_VDD_MAIN
41 19 18 42 IO PP1V8_S2
41 19 18 IO PP3V0_S2

WLAN INTERPOSER

CONTROL

42 10 IO PMU_TO_WLAN_REG_ON
42 10 IO PMU_TO_BT_REG_ON
42 10 IO AP_TO_BT_DEVICE_WAKE

CLOCKS

42 10 IO PMU_TO_WLAN_CLK32K
42 10 IO AP_TO_WLAN_TIME_SYNC
42 10 IO BT_TO_AP_TIME_SYNC

WLAN PCIE

42 10 IO 90_PCIE_AP_TO_WLAN_REFCLK_P
42 10 IO 90_PCIE_AP_TO_WLAN_REFCLK_N
42 10 IO 90_PCIE_AP_TO_WLAN_TXD_P
42 10 IO 90_PCIE_AP_TO_WLAN_TXD_N
42 10 IO 90_PCIE_WLAN_TO_AP_RXD_P
42 10 IO 90_PCIE_WLAN_TO_AP_RXD_N
42 10 IO PCIE_AP_TO_WLAN_PERST_L
42 10 IO PCIE_WLAN_BI_AP_CLKREQ_L
42 10 IO WLAN_TO_PMU_HOST_WAKE

BLWLAN UART

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

AOP

42 10 IO AOP_TO_WLAN_CONTEXT_A
42 10 IO AOP_TO_WLAN_CONTEXT_B

CELLULAR INTERPOSER

POWER-KEEPING

41 21 10 IO PMU_TO_BBPMU_RESET_L
41 23 10 IO AP_TO_BB_RESET_L
41 23 10 IO AP_TO_BBPMU_RADIO_ON_L
41 21 10 IO AP_TO_BB_COREDUMP_TRIG
41 23 10 IO BB_TO_AP_RESET_DETECT_L

PCIE

41 23 10 IO BB_TO_PMU_PCIE_HOST_WAKE_L
41 23 10 IO PCIE_AP_TO_BB_PERST_L
41 29 23 10 IO PCIE_BB_BI_AP_CLKREQ_L
41 23 10 IO 90_PCIE_BB_TO_AP_RXD_P
23 10 IO 90_PCIE_BB_TO_AP_RXD_N
23 10 IO 90_PCIE_AP_TO_BB_TXD_P
41 23 10 IO 90_PCIE_AP_TO_BB_TXD_N
41 23 10 IO 90_PCIE_AP_TO_BB_REFCLK_P
41 23 10 IO 90_PCIE_AP_TO_BB_REFCLK_N

I2S

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

AOP UART

41 23 10 IO UART_BB_TO_AOP_RXD
41 23 10 IO UART_AOP_TO_BB_TXD

JTAG-SWD

29 10 IO SWD_AOP_TO_MANY_SWCLK
41 24 10 IO SWD_AOP_BI_BB_SWDIO

DEBUG USB

41 23 IO 90_USB_BB_P
41 23 IO 90_USB_BB_N
41 23 IO PP_1V8_BB_USB_VBUS

SYSTEM COEX

41 22 10 IO TOUCH_TO_MANY_FORCE_PWM
41 21 10 IO AOP_TO_BBPMU_COEX
41 23 10 IO AP_TO_BB_COEX
41 23 10 IO BB_TO_AP_COEX

PEAK POWER MANAGEMENT

41 24 10 IO BB_TO_MANY_GSM_BURST_IND
41 23 10 IO AP_TO_BB_PEAK_POWER_INDICATOR

GNSS

41 26 10 IO UART_AP_TO_GNSS_TXD
41 26 10 IO UART_GNSS_TO_AP_RXD
41 27 10 IO UART_AP_TO_GNSS_RTS_L
41 26 10 IO UART_GNSS_TO_AP_CTS_L
41 26 21 10 IO PMU_TO_GNSS_EN
41 26 10 IO AP_TO_GNSS_TIME_MARK
41 26 10 IO GNSS_TO_AP_LOW_PWR_IND

RADIO: TABLE OF CONTENTS

DRAWING TITLE: SCH,MLB,BOT,ICE,D33

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BOM TABLES

RF SKU

ROW SKU

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
118S0724	1	RES,MF,0.0 OHM,1/20W,0201,HIGH FREQ	R2003_K	ROW
118S0724	1	RES,MF,0.0 OHM,1/20W,0201,HIGH,FREQ	R2015_K	ROW
118S00072	1	RES,MF,8.2K OHM,1/32W,01005	R312_K	ROW
197S00155	1	XTL,THERM,38.4MHZ,12PPM,6PF,1612	Y301_K	ROW
353S01647	1	2GPA, SKYWORKS, 7820B, 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,MF,0.0 OHM,1/20W,0201,HIGH FREQ	R2002_K	JP
118S0724	1	RES,MF,0.0 OHM,1/20W,0201,HIGH,FREQ	R1403_K	JP
118S00120	1	RES,MF,6.8K OHM,1/32W,01005	R312_K	JP
197S00179	1	XTL,THERM,38.4MHZ,12PPM,6PF,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,MF,0.0 OHM,1/20W,0201,HIGH FREQ	R2003_K	NA
118S0724	1	RES,MF,0.0 OHM,1/20W,0201,HIGH,FREQ	R2015_K	NA
118S00073	1	RES,MF,56K OHM,1/32W,01005	R312_K	NA
197S00156	1	XTL,THERM,38.4MHZ,12PPM,6PF,1612	Y301_K	NA
353S01647	1	2GPA, SKYWORKS, 7820B, REV13	PA_UHB_K	NA
353S01472	1	SKYWORKS, LB DSM, 13785, 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,MF,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,MF,0.0 OHM,1/32W,01005	R31_SIM	DUAL
117S0166	1	RES,MF,100 OHM,1/32W,01005	R27_SIM	DUAL
117S0185	1	RES,MF,47 OHM,1/32W,01005	R26_SIM	DUAL
117S0166	1	RES,MF,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,NI0,BIRCH 4.0	U_SIM	VINYL
117S0158	1	RES,MF,100K OHM,1/32W,01005	R10_SIM	VINYL
118S0636	1	RES,MF,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, 240OHM
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

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
335S00013	335S0894	BOM_TABLE_ALTS	EEPROM_K	EEPROM,8KBIT,I2C

RULER_RULE_SET=MSAP_2017 — MANUFACTURING CONFIGURATION — TABLE_REV_NUMBER=6

DIELECTRIC BASED SPACING RULES					DEFAULT SPACING MULTIPLES	VOID SPACE RATIO
MULTIPLES		SMDPIN MAX(UM)	MVIA MAX(UM)	SMDPIN2SMDPIN MAX(UM)		
1	1.65,2,2D,3.2D,4D		120	120	100	2	

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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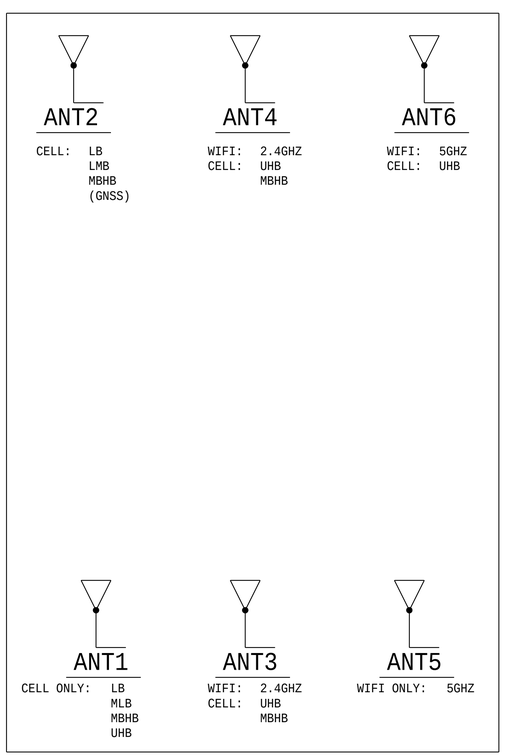
RADIO ANTENNAS



UAT

LAT

PAGE TITLE: ANTENNA DIAGRAM

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ANTENNA B2BS

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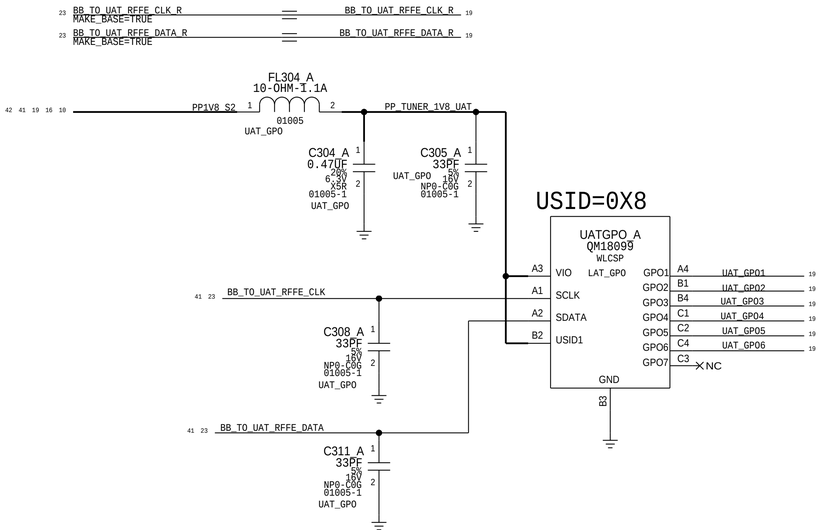
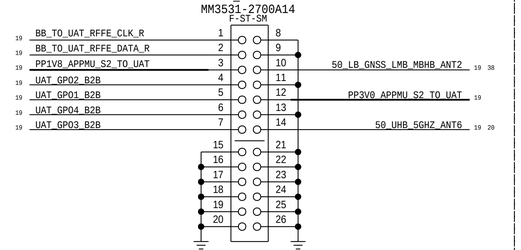
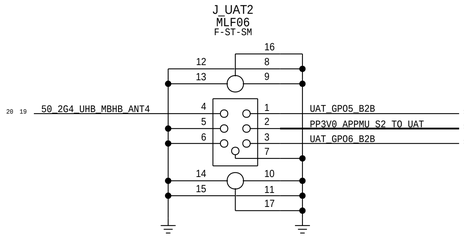


UAT B2BS

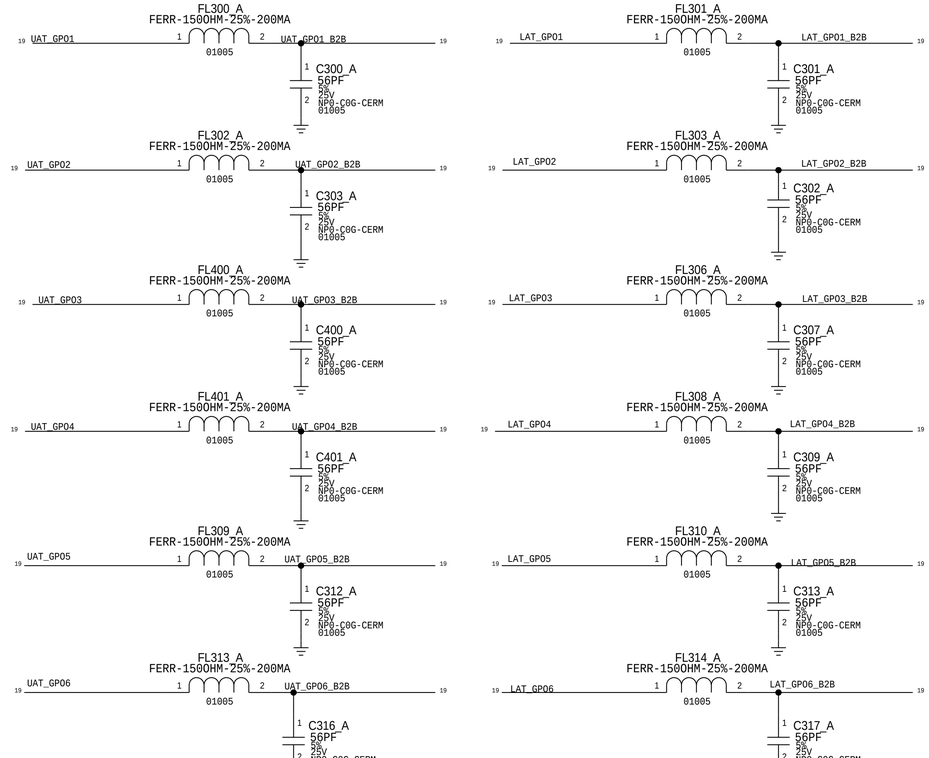
RCPT ON MLB_BOT (518S00167)
PLUG ON FLEX (518S00166)



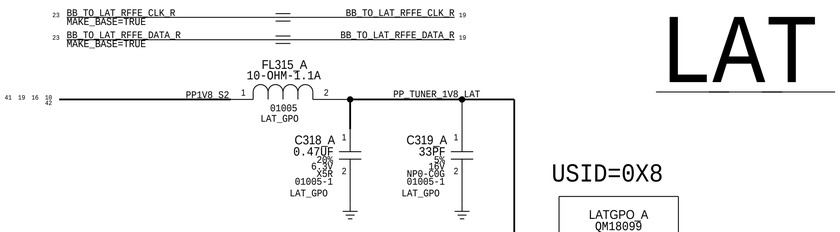
RCPT ON MLB_BOT (516S00434)
PLUG ON FLEX (516S00435)



GPO FILTERS

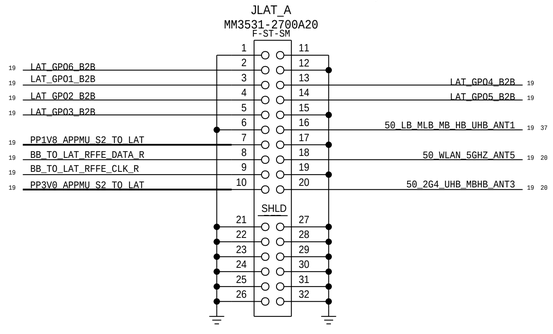


LAT

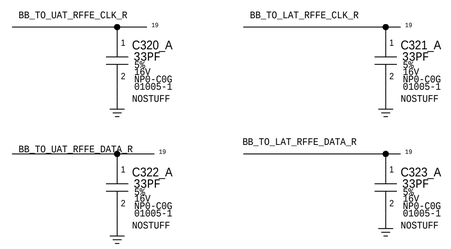


LAT B2B

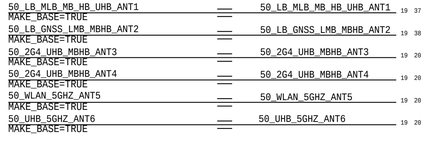
RCPT ON MLB_BOT (518S00149)
PLUG ON FLEX (518S00150)



RFFE FILTERS



ANTENNA CONNECTIONS



PAGE TITLE
ANTENNA: B2BS

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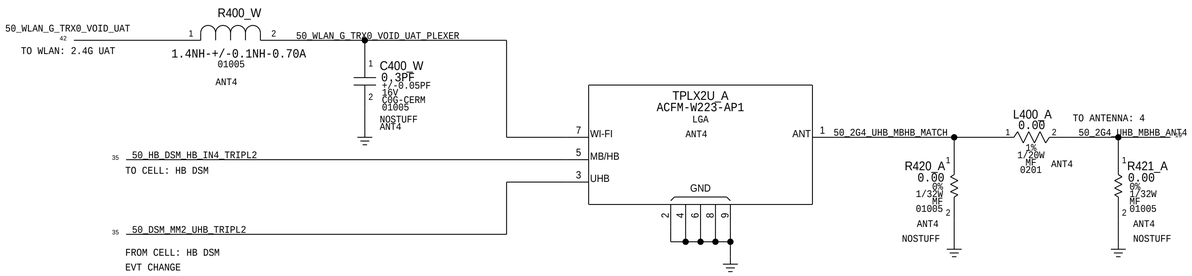
SHARED N-PLEXERS

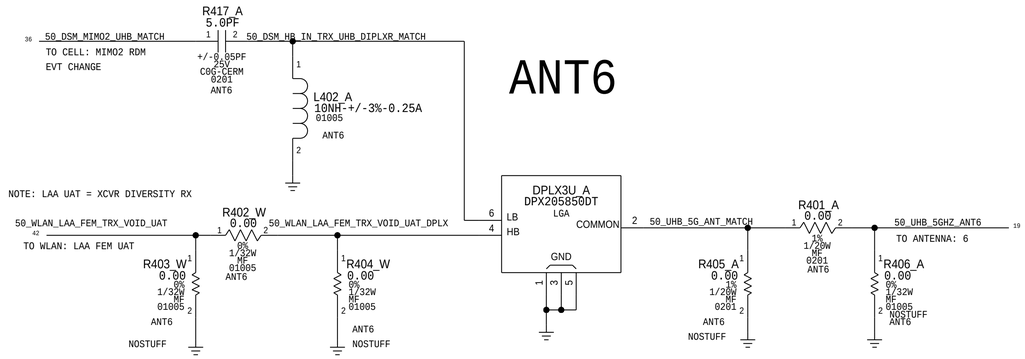
UAT

ANT4



MHB-UHB/2.4G WLAN TRIPLEXER2

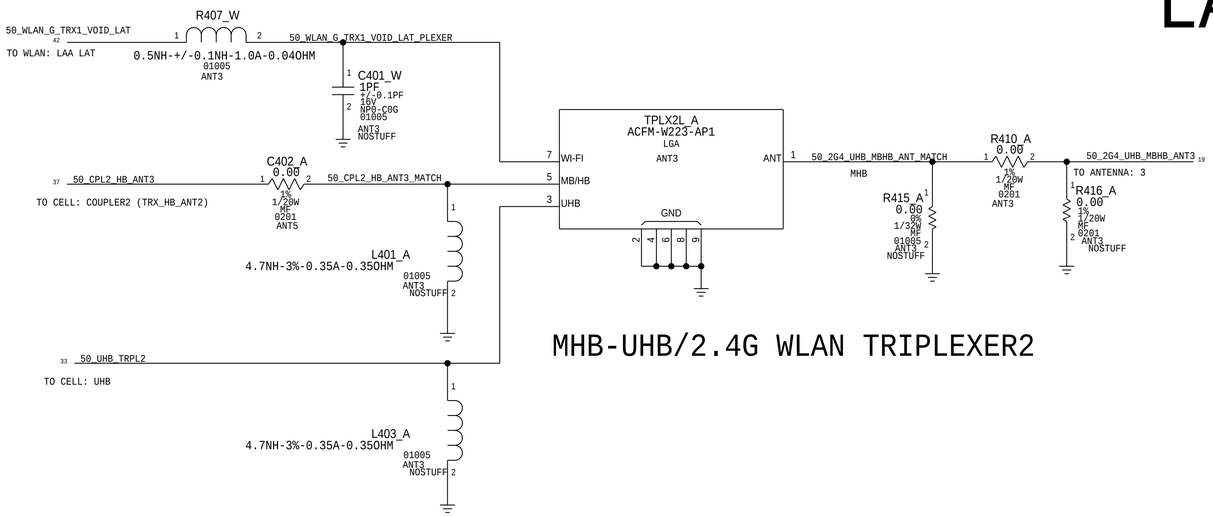
ANT6



UHB-5G WLAN DIPLEXER3

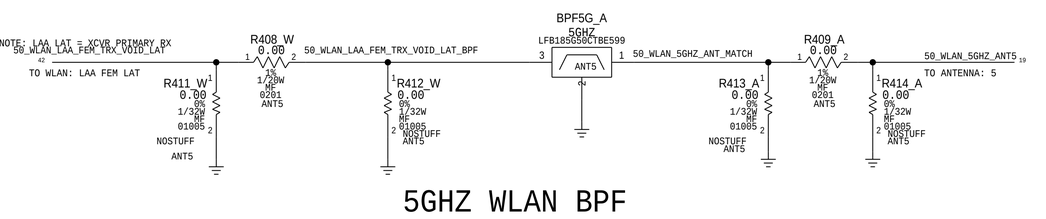
LAT

ANT3



MHB-UHB/2.4G WLAN TRIPLEXER2

ANT5



5GHZ WLAN BPF

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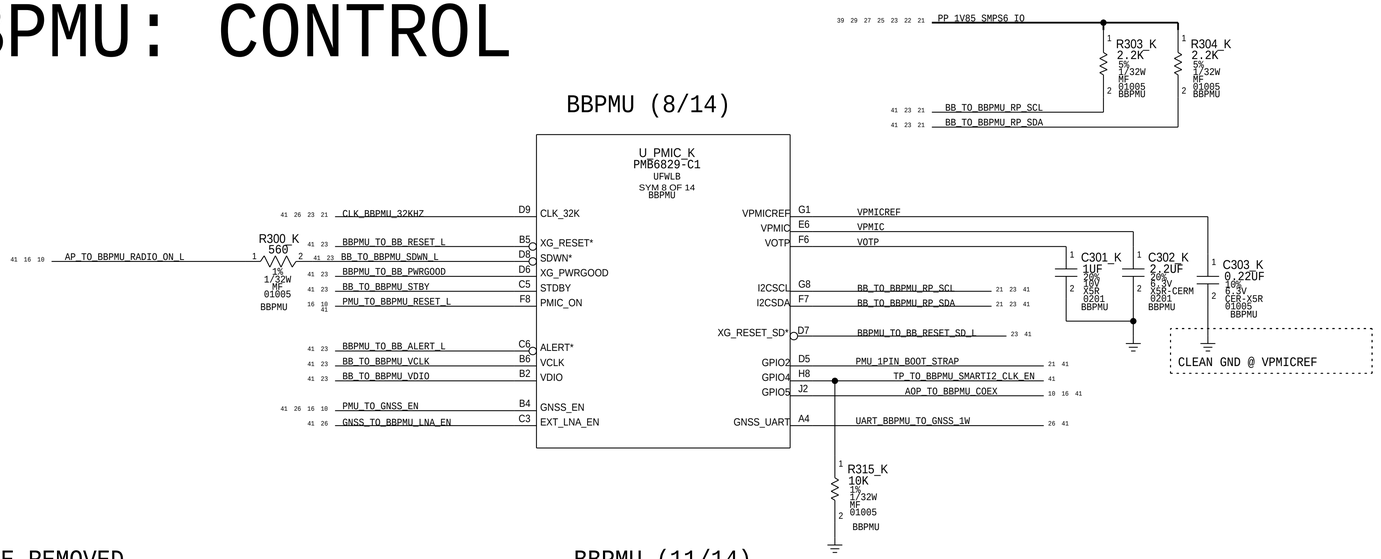
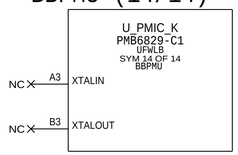
BBPMU: CONTROL

BBPMU (8/14)

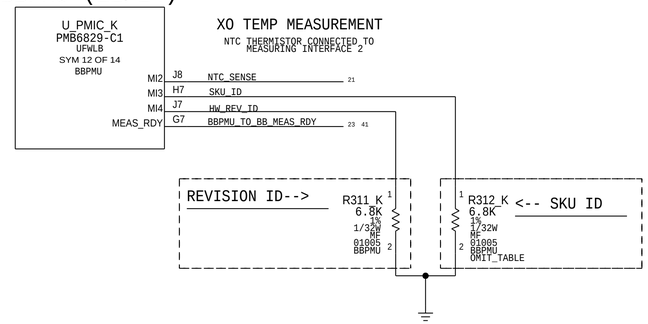


BBPMU (14/14)

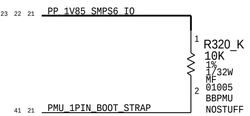


POR: 32K CLK GENERATED INTERNALLY
OPTIONAL PINS FOR EXTERNAL OSC

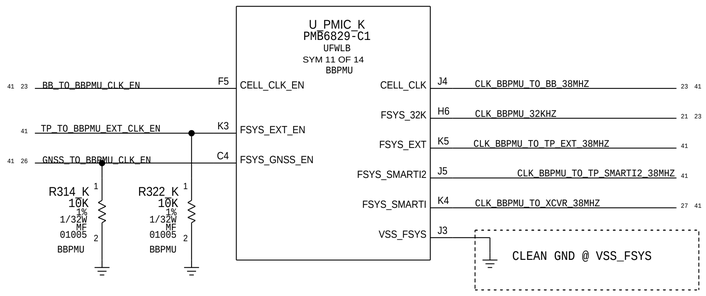
BBPMU (12/14)



CAN BE REMOVED WITH XPMU C0



BBPMU (11/14)



REVISION

R311_K	REVISION MLB	REVISION 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

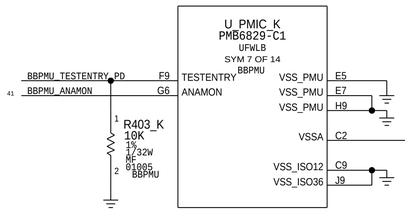
R312_K	HW REVISION	X-CODE
0.0	RFDEV JP	
1.2K	ICE 18.0 JP	X1344 (ICE 18.0)
2.2K	ICE 18.0 ROW	
3.3K	ICE 18.1 JP	X1049 (ICE 18.1)
4.7K	ICE 18.1 ROW	
6.8K	ICE 18.2 JP	X1210 (ICE 18.2)
8.2K	ICE 18.2 ROW	
10K	RFDEV ROW	
12K	ICE 18.5 JP	X1170
15K	ICE 18.6 JP	X1176
18K		
22K	ICE 18.5 US	X1170
27K	ICE 18.6 US	X1176
33K	ICE 18.0 NA	X1344
39K	RFDEV NA	
47K	ICE 18.1 NA	X1049
56K	ICE 18.2 NA	X1210
68K		
82K	KAROO INTERNAL	
100K	KAROO INTERNAL	
120K	KAROO INTERNAL	
150K		

NTC TS-XO

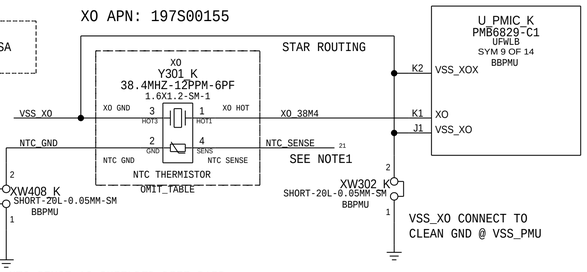
(RESISTANCE DECREASES AS TEMPERATURE INCREASES)

NEGATIVE TEMPERATURE COEFFICIENT
THERMAL SENSING CRYSTAL OSCILLATOR

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

HWID TABLE RDAR://32880011
ADC TABLE RDAR://27081897

BBPMU ADC TABLES

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BBPMU: RAILS

PROGRAMMABLE LDOS

BBPMU (10/14)

U_PMIC_K
PMB6829-C1
UFWLB BBPMU
SYM 10 OF 14

PP_1V85_SMPS6_IO	G2	VIN_1V8_EXT	
	H4	V1V8_XO	
PP_3V3_CHP	F4	VIN_3V3	
PP_VDD_MAIN	H3	VSYS	
PP_1V3_SMPS3_XCVR_ANA	J6	VIN_1V1	
PP_1V85_SMPS6_IO	F3	VIN_ANA	
PP_1V85_SMPS6_IO	D4	VDD_IO	
	F2	VSIM1	PP_VDD_SIM1
	F1	VSIM2	PP_VDD_SIM2
	A5	VREFCP_GPIO3	TOUCH TO MANY FORCE_PWM
	G5	VPROG1	PP_VBATT_PA
	G3	VPROG2	PP_1V8_VBIAS_LNA
	H5	VPROG3_GPIO1	FOR USB OR FORCE_PWM PMU B0 ONLY / PP_3V3_LDO3_USB_HS
	H2	VPROG4	VMOD_6 SWITCH / PP_1V8_LDO4_BB_MEM
	H1	VPROG5	PP_1V24_LDO5_USB_SS
	K7	VPROG6	PP_1V1_LDO6_BB_IO
	K6	VPROG7	NOT USED / PP_1V1_LDO7_NO_LOAD
	E3	VPROG8	PP_1V2_VDD_LNA
	G4	VPROG9	PP_1V8_LDO9_GNSS
	E4	VPROG10	PP_1V8_LDO10_XCVR_HI

PMU-C0: GPIO3 IS MUXABLE WITH FORCE_PWM1

C427_K 0.47UF 20% 6.3V X5R 01005-1 BBPMU
C428_K 0.47UF 20% 6.3V X5R 01005-1 BBPMU
C411_K 4UF 20% 6.3V CERM-X5R 0201 BBPMU
C407_K 4UF 20% 6.3V CERM-X5R 0201 BBPMU
C408_K 1UF 20% 10V X5R 0201 BBPMU
C409_K 1UF 20% 10V X5R 0201 BBPMU
C410_K 10UF 20% 6.3V CERM-X5R 0402-0.1MM
C412_K 10UF 20% 6.3V CERM-X5R 0402-0.1MM
C414_K 4UF 20% 6.3V CERM-X5R 0201 BBPMU
C415_K 4UF 20% 6.3V CERM-X5R 0201 BBPMU
C416_K 4.7UF 20% 10V X5R 0402-1 BBPMU
C405_K 15UF 20% 6.3V X5R 0402-1 BBPMU
C425_K 100PF 5% 25V C0G-CERM 01005 BBPMU
C426_K 27PF 5% 16V NP0-C0G 01005-1 BBPMU

CHARGE PUMP

BBPMU (6/14)

U_PMIC_K
PMB6829-C1
UFWLB
SYM 6 OF 14
BBPMU

PP_1V85_SMPS6_IO	D3	VDD_CHP	
	D2	VSS_CHP	
	D1	VCHP	PP_3V3_CHP
	E1	VCHP_BSTP	VDD_CHP_BST_E1
	E2	VCHP_BSTN	VDD_CHP_BST_E2

C421_K 1UF 20% 10V X5R 0201 BBPMU
C422_K 4.7UF 20% 10V X5R 0402-1 BBPMU

PP400_K P2MM-NSM OMIT_SM PP — PP_VBATT_PA — PP_VBATT_PA-10[I120]
PP401_K P2MM-NSM OMIT_SM PP — PP_1V8_VBIAS_LNA — PP_1V8_VBIAS_LNA-10[I120]
PP2480_K P2MM-NSM OMIT_SM PP — PP_3V3_LDO3_USB_HS
PP2481_K P2MM-NSM OMIT_SM PP — PP_1V8_LDO4_BB_MEM
PP2482_K P2MM-NSM OMIT_SM PP — PP_1V24_LDO5_USB_SS
PP2490_K P2MM-NSM OMIT_SM PP — PP_1V1_LDO6_BB_IO
PP403_K P2MM-NSM OMIT_SM PP — PP_1V1_LDO7_NO_LOAD
PP404_K P2MM-NSM OMIT_SM PP — PP_1V2_VDD_LNA — PP_1V2_VDD_LNA-10[I120]
PP405_K P2MM-NSM OMIT_SM PP — PP_1V8_LDO9_GNSS
PP406_K P2MM-NSM OMIT_SM PP — PP_1V8_LDO10_XCVR_HI

SWITCHERS

BBPMU (1/14)

U_PMIC_K
PMB6829-C1
UFWLB
SYM 1 OF 14
BBPMU

PP_VDD_MAIN	A7	VDD_VMOD1	VMOD1LX B7
	A8	VDD_VMOD1	VMOD1LX B8
VMOD1_FB	A6	VMOD1SENSE	
	C7	VSS_VMOD1	
	C8	VSS_VMOD1	

C471_K 2.2UF 20% 6.3V X5R-CERM 0201
C402_K 15UF 20% 6.3V X5R 0402-1 BBPMU

APN:152S00539
Z=0.8MM
L401_K 0.47UH-20%-3.8A-0.037OHM 0805 BBPMU
XW401_K SHORT-20L-0.05MM-SM
XW410_K SHORT-20L-0.05MM-SM — VDD_SMPS1_0V9_COEX
PP_0V9_SMPS1_BB_SRAM
C400_K 20UF 20% 6.3V CERM-X5R 0402 BBPMU
C401_K 20UF 20% 6.3V CERM-X5R 0402 BBPMU
C480_K 220PF 5% 25V C0G 01005

BBPMU (2/14)

U_PMIC_K
PMB6829-C1
UFWLB
SYM 2 OF 14
BBPMU

PP_VDD_MAIN	A10	VDD_VMOD2	VMOD2LX B9
			VMOD2LX B10
VMOD2_FB	A9	VMOD2SENSE	
	C10	VSS_VMOD2	

C473_K 2.2UF 20% 6.3V X5R-CERM 0201

APN:152S00436
Z=0.8MM
L402_K 1UH-20%-3.6A-0.0350HM 2016 BBPMU
XW403_K SHORT-20L-0.05MM-SM
XW416_K SHORT-20L-0.05MM-SM — VDD_SMPS2_0V8_COEX
PP_0V8_SMPS2_BB_DIG
C481_K 220PF 5% 25V C0G 01005
C404_K 20UF 20% 6.3V CERM-X5R 0402 BBPMU

BBPMU (3/14)

U_PMIC_K
PMB6829-C1
UFWLB
SYM 3 OF 14
BBPMU

PP_VDD_MAIN	H10	VDD_VMOD3	VMOD3LX G10
VMOD3_FB	G9	VMOD3SENSE	
	F10	VSS_VMOD3	

APN:152S00666
Z=0.7MM
L403_K 2.2UH-20%-1.4A-0.210HM 0805 BBPMU
XW405_K SHORT-20L-0.05MM-SM
XW412_K SHORT-20L-0.05MM-SM — VDD_SMPS3_1V3_COEX
PP_1V3_SMPS3_XCVR_ANA
C482_K 220PF 5% 25V C0G 01005
C406_K 20UF 20% 6.3V CERM-X5R 0402 BBPMU

BBPMU (4/14)

U_PMIC_K
PMB6829-C1
UFWLB
SYM 4 OF 14
BBPMU

PP_VDD_MAIN	A1	VDD_VMOD4	VMOD4LX B1
VMOD4_FB	A2	VMOD4SENSE	
	C1	VSS_VMOD4	

C474_K 2.2UF 20% 6.3V X5R-CERM 0201
C417_K 15UF 20% 6.3V X5R 0402-1 BBPMU

APN:152S00630
Z=0.65MM
L404_K 1UH-20%-2.4A-0.060HM PIWA2016FE-SM BBPMU
XW407_K SHORT-20L-0.05MM-SM
XW413_K SHORT-20L-0.05MM-SM — VDD_SMPS4_0V77_COEX
PP_0V77_SMPS4_BB_CORE
C483_K 220PF 5% 25V C0G 01005
C418_K 20UF 20% 6.3V CERM-X5R 0402 BBPMU

BBPMU (5/14)

U_PMIC_K
PMB6829-C1
UFWLB
SYM 5 OF 14
BBPMU

PP_VDD_MAIN	E10	VDD_VMOD5	VMOD5LX E9
VMOD5_FB	D10	VMOD5SENSE	
	E8	VSS_VMOD5	

C472_K 2.2UF 20% 6.3V X5R-CERM 0201
C419_K 15UF 20% 6.3V X5R 0402-1 BBPMU

APN:152S00630
Z=0.65MM
L405_K 1UH-20%-2.4A-0.060HM PIWA2016FE-SM BBPMU
XW409_K SHORT-20L-0.05MM-SM
XW414_K SHORT-20L-0.05MM-SM — VDD_SMPS5_1V0_COEX
PP_1V0_SMPS5_XCVR_CORE
C484_K 220PF 5% 25V C0G 01005
C420_K 20UF 20% 6.3V CERM-X5R 0402 BBPMU

BBPMU (13/14)

U_PMIC_K
PMB6829-C1
UFWLB
SYM 13 OF 14
BBPMU

PP_VDD_MAIN	K10	VDD_VMOD6	VMOD6LX K9
VMOD6_FB	J10	VMOD6SENSE	
	K8	VSS_VMOD6	

C423_K 15UF 20% 6.3V X5R 0402-1 BBPMU

APN:152S00630
Z=0.65MM
L406_K 1UH-20%-2.4A-0.060HM PIWA2016FE-SM BBPMU
XW411_K SHORT-20L-0.05MM-SM
XW415_K SHORT-20L-0.05MM-SM — VDD_SMPS6_1V85_COEX
PP_1V85_SMPS6_IO
C485_K 220PF 5% 25V C0G 01005
C424_K 20UF 20% 6.3V CERM-X5R 0402 BBPMU

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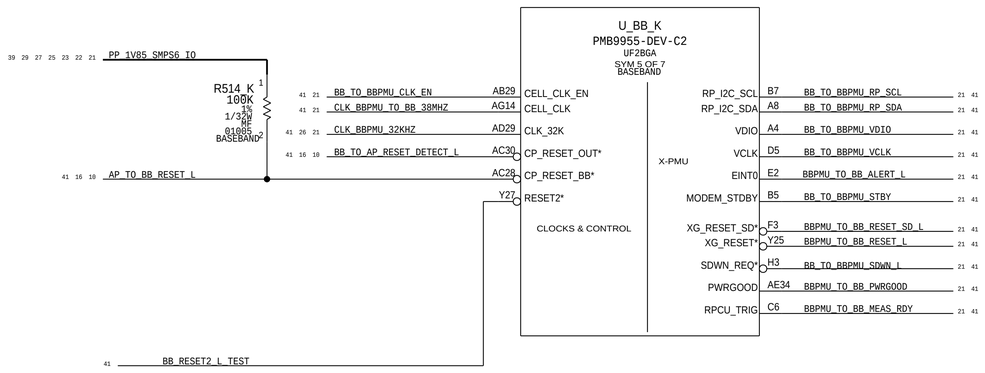
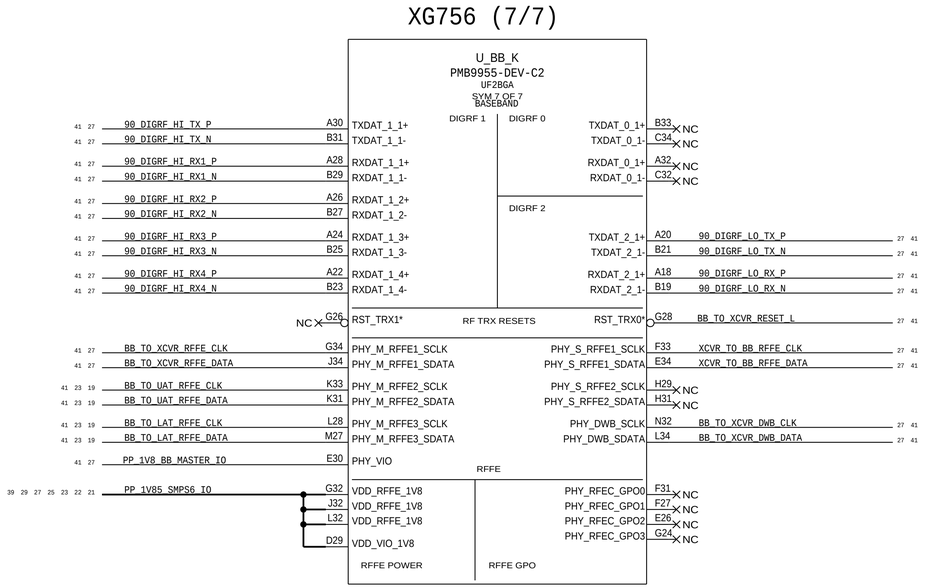
BB: INTERFACE

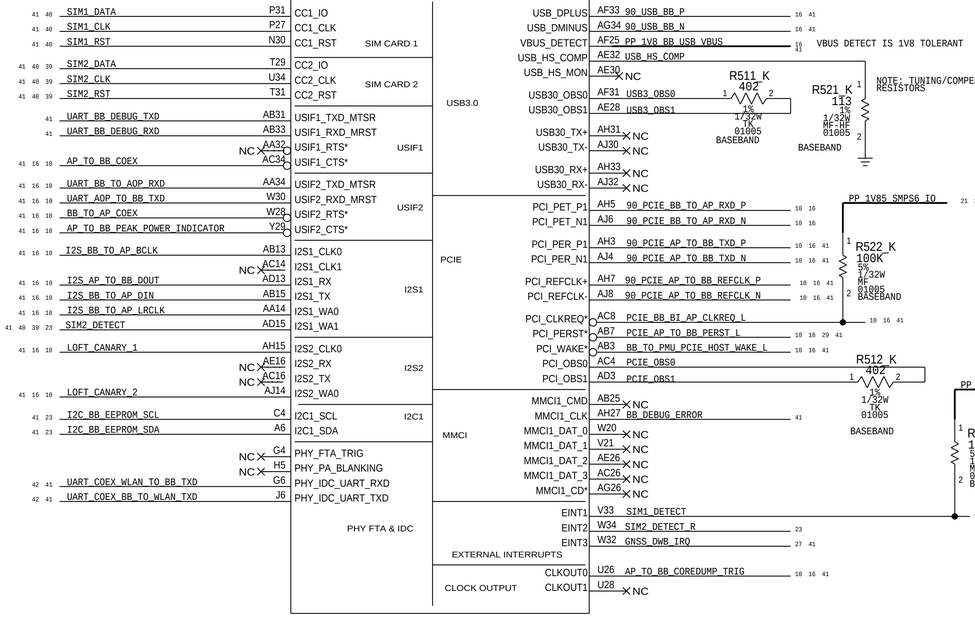
XG756 (5/7)



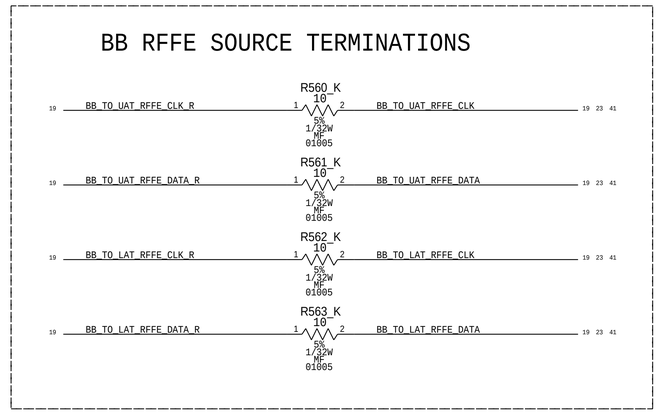
XG756 (7/7)



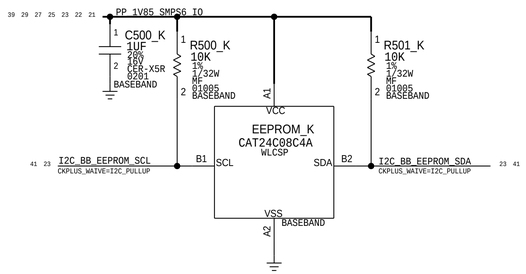
XG756 (1/7)



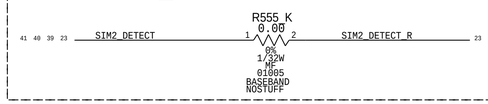
BB RFFE SOURCE TERMINATIONS



BB EEPROM



SIM2_DETECT TO EINT2



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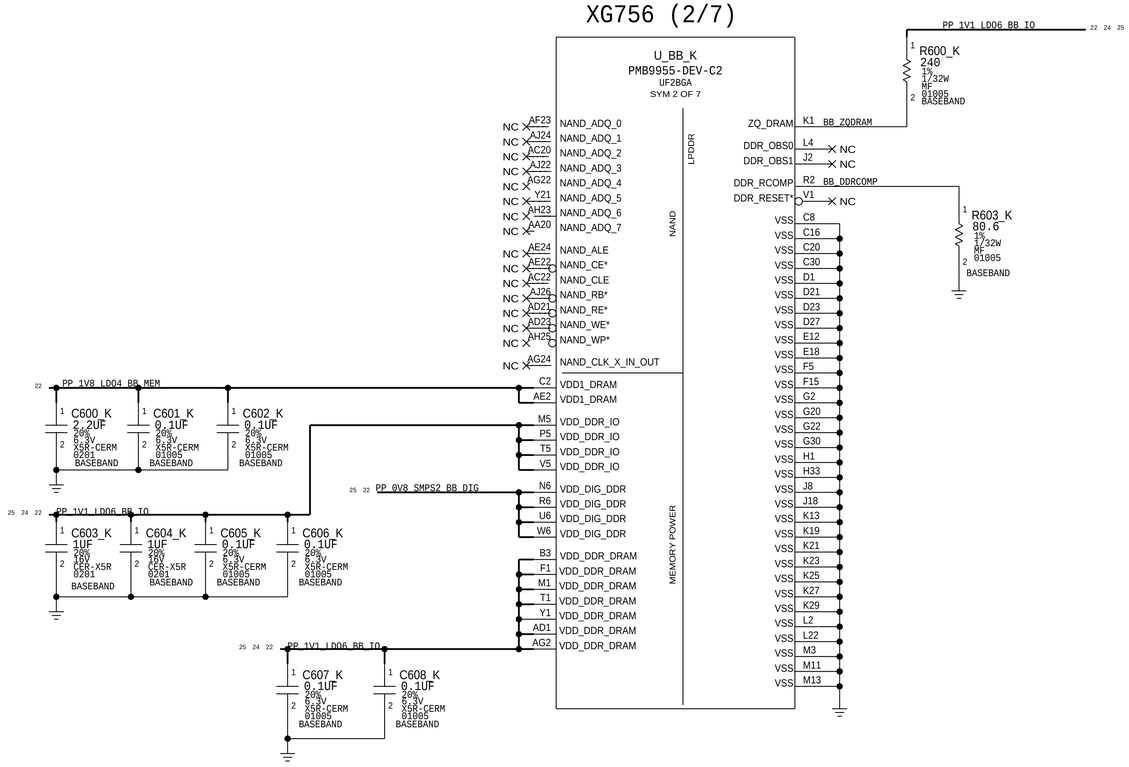
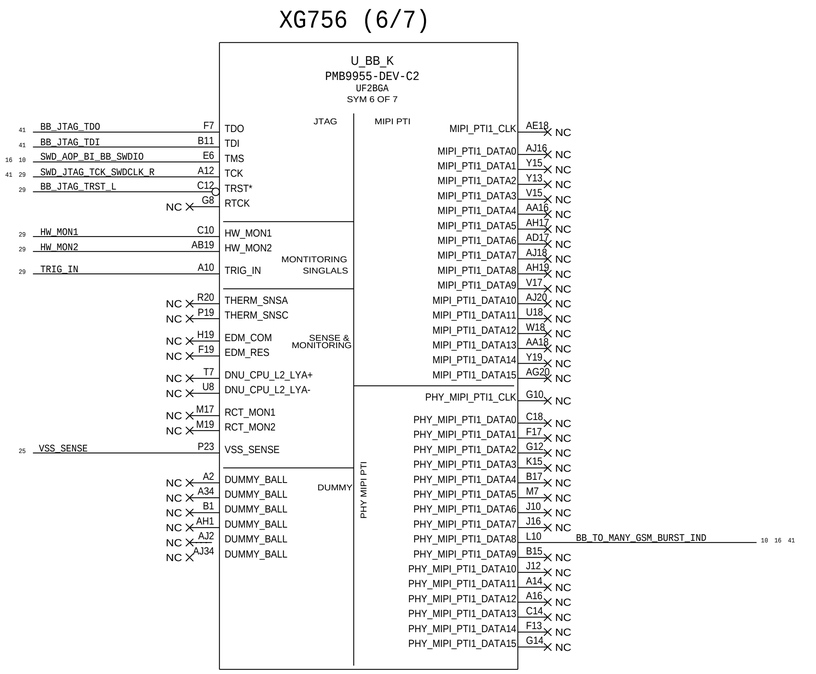
BB: DDR PWR & JTAG

HOOKS FOR DDR4 TESTING/CAL

XG756 (2/7)



XG756 (6/7)



PAGE TITLE	BB: DDR PWR & JTAG
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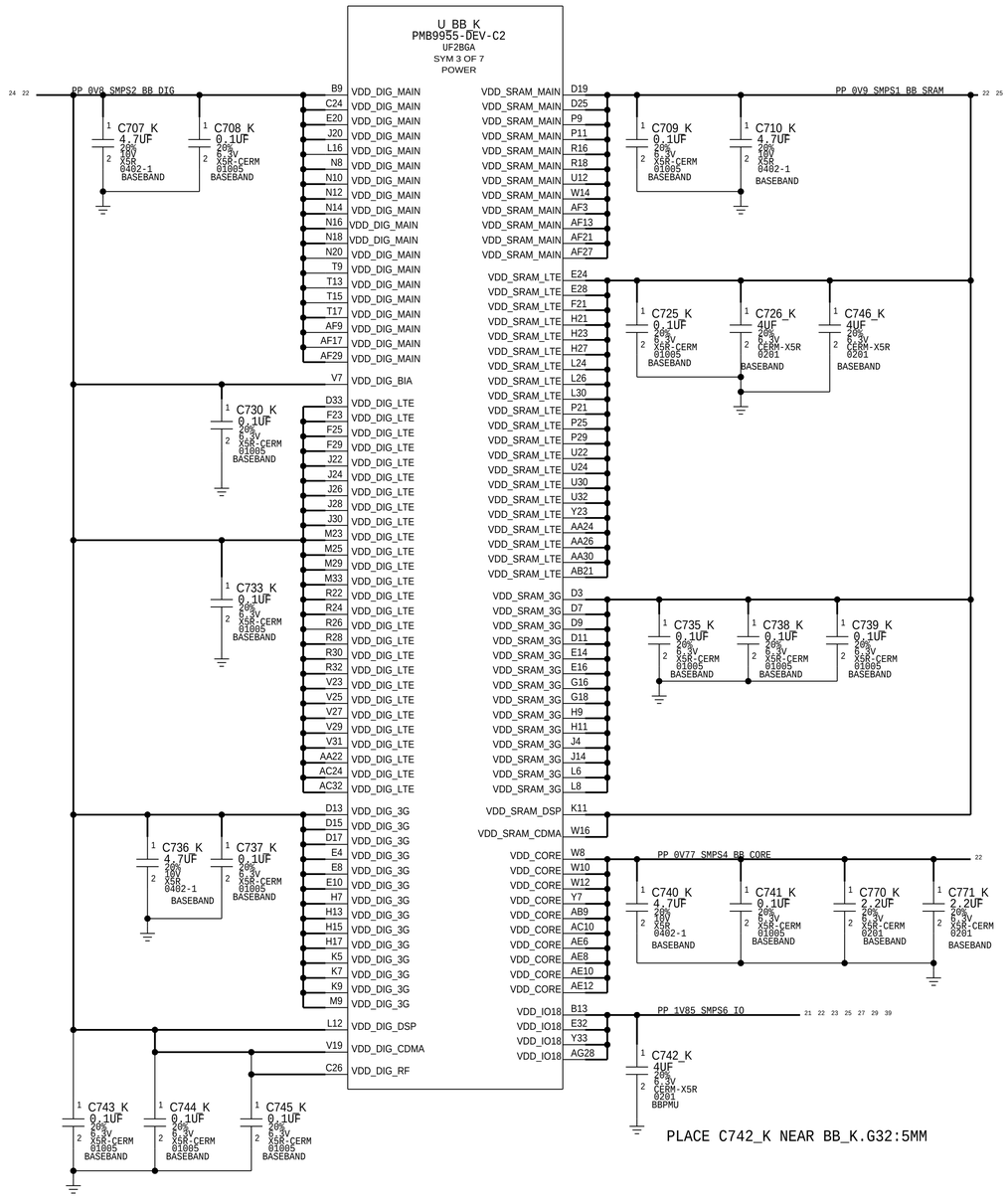
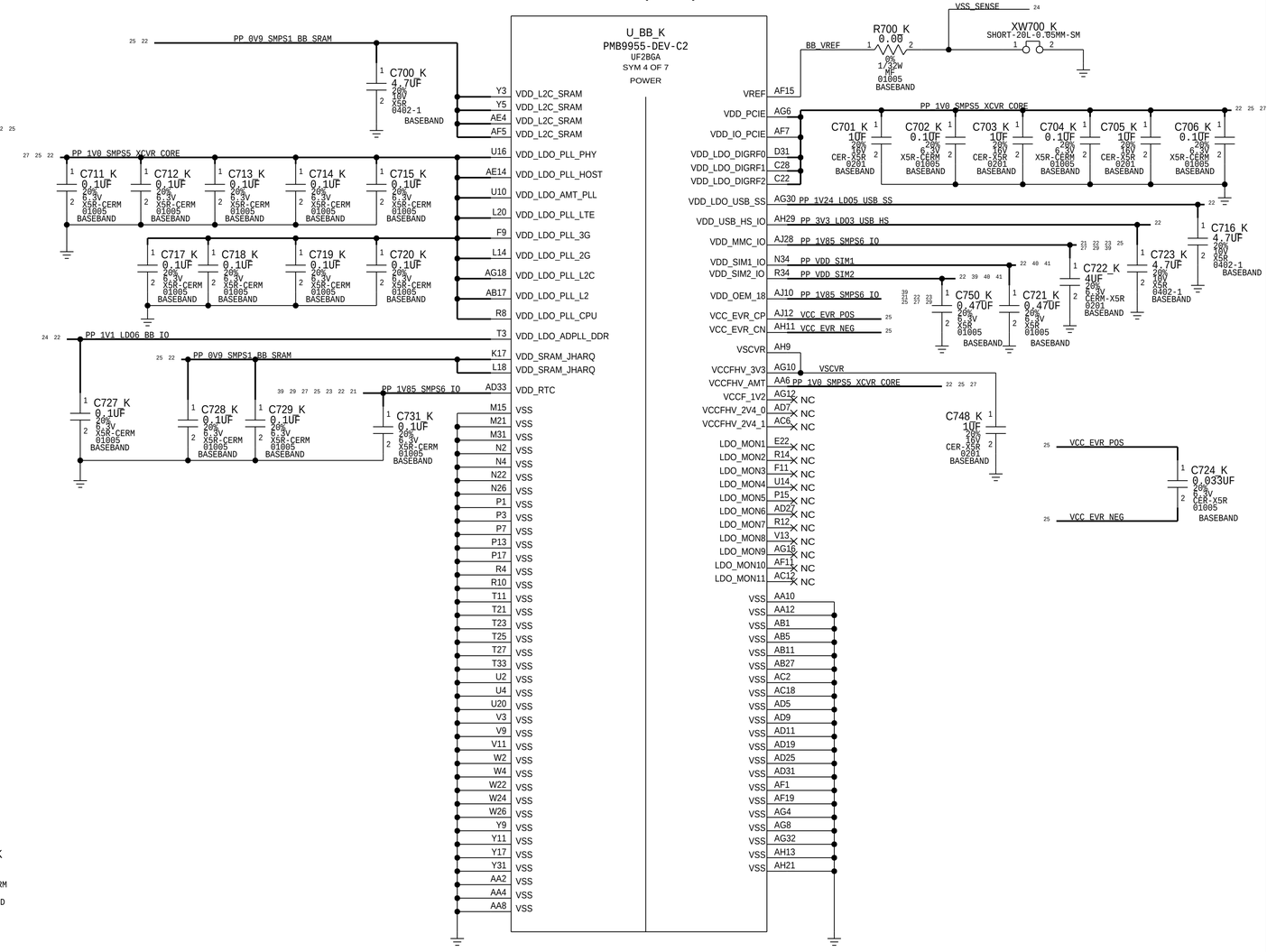
BB: DIGITAL PWR

XG756 (3/7)



XG756 (4/7)



PAGE TITLE	BB: DIGITAL PWR
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XCVR: TRANSMIT & GNSS

SMARTI7 (4/7)

U_XCVR_K
PMB5762-A2
UFWLB
SYM 4 OF 7
XCVR

PADACF+ L4 50_ET_DAC_P 30 41
PADACF- M3 50_ET_DAC_N 30 41
RAMPDAC K3 NC
TX_LB1 T1 50_XCVR_TX_LB1
TX_LB2 U2 50_XCVR_TX_LB2 33 824 - 915 2G TX OUTPUT
TX_MB1 R2 50_XCVR_TX_MB1
TX_MB2 Y1 50_XCVR_TX_MB2
TX_MB3 AA2 50_TX_MB3_MLB_2G 33 1400 - 1600
TX_MB4 P1 NC
TX_HB AB1 50_XCVR_TX_HB
TX_UB AC2 50_XCVR_TX_UB 33 3400 - 3600

R1305_K 0.00 1 2 5% 1/32W MF 01005 RADIO_LB_PAD
50_TX_LB_PA_IN 699 - 915 MHZ 10 16

C1309_K 47PF 1 2 5% 16V NP0-C0G 01005 NOSTUFF RADIO_LB_PAD

C1410_K 27PF 1 2 5% 16V NP0-C0G 01005-1 RADIO_HB_PAD
50_TX_MB1_IN 1710 - 1995 MHZ 10 16
L1400_K 10NH-+/-3%-0.25A 01005 RADIO_HB_PAD NOSTUFF 1 2

C1411_K 27PF 1 2 5% 16V NP0-C0G 01005-1 RADIO_HB_PAD
50_TX_2G_HB_IN 1710 - 1995 MHZ 10 16
L1415_K 10NH-+/-3%-0.25A 01005 RADIO_HB_PAD NOSTUFF 1 2

C1412_K 27PF 1 2 5% 16V NP0-C0G 01005-1 RADIO_HB_PAD
50_TX_HB_PA_IN 2300 - 2690 MHZ 10 16
L1401_RF 10NH-+/-3%-0.25A 01005 RADIO_HB_PAD NOSTUFF 1 2

FLTGPS_K
SAW-GPS
SAFRQ1G56XB0F57
LGA

38 50_GNSS_SAW 4 INPUT OUTPUT 2 GNSS_RF_IN_MATCH
GND 1 GND 3

L801_K 3.6NH+/-0.1NH-180MA 01005 1 2 GNSS_MATCH
C801_K 0.7PF +/-0.05PF 16V NP0-C0G 01005 1 2
C800_K 20PF 1 2 5% 16V C0G 01005 50_GNSS_RF_IN_UNMATCH

SMARTI7 (3/7)

U_XCVR_K
PMB5762-A2
UFWLB
SYM 3 OF 7
XCVR

B1 GN_RF_IN
41 23 21 CLK_BBPMU_32KHZ H1 GN_LPO_CLK
H11 JTAG_MODE
41 21 UART_BBPMU_TO_GNSS_1W F5 GN_NTC
41 21 16 10 PMU_TO_GNSS_EN L6 GN_EN

GN_NTCMI- C2
GN_NTCMI+ D3
GN_PPS_IN F3 AP_TO_GNSS_TIME_MARK 10 16 41
GN_UART_RTS F7 UART_GNSS_TO_AP_RTS_L_R 26
GN_UART_RX H7 UART_AP_TO_GNSS_TXD 10 16 41
GN_UART_TX H3 UART_GNSS_TO_AP_TXD_R 26
GN_LNA_EN G2 GNSS_TO_BBPMU_LNA_EN 21 41
GN_UART_WAKE G4 GNSS_TO_AP_LOW_PWR_IND_R 26
GN_FSYS_REQ H5 GNSS_TO_BBPMU_CLK_EN 21 41

R825_K 100K 5% 1/32W MF 01005 1 2 10 16 41

GNSS DAMPING RESISTORS

R820_K 49.9 1% 1/32W MF 01005 1 2
26 UART_GNSS_TO_AP_RTS_L_R
UART_GNSS_TO_AP_CTS_L 10 16 41

R821_K 49.9 1% 1/32W MF 01005 1 2
26 UART_GNSS_TO_AP_TXD_R
UART_GNSS_TO_AP_RXD 10 16 41

R822_K 49.9 1% 1/32W MF 01005 1 2
26 GNSS_TO_AP_LOW_PWR_IND_R
GNSS_TO_AP_LOW_PWR_IND 10 16 41

PAGE TITLE: XCVR: TX & GNSS

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XCVR: INTERFACE & PWR

SMARTI7 (1/7)

U_XCVR_K
PMB5762-A2
UFWLB
SYM 1 OF 7
XCVR

(LAYOUT: MAX DCR 85MOHM)
27 25 22 PP_1V0_SMPS5_XCVR_CORE

(LAYOUT: STAR ROUTE)
27 22 PP_1V3_SMPS3_XCVR_ANA

C906_K 15UF 20% 6.3V X5R-CERM 0402-0.1MM XCVR
C907_K 0.1UF 20% 6.3V X5R-CERM 01005 XCVR

FL900_K 2400HM-25%-0.2A-0.90HM 01005 XCVR

XW910_K SHORT-10L-0.1MM-SM OMIT XCVR1

C900_K 0.47UF 20% 6.3V X5R 01005-1 XCVR

C901_K 0.1UF 20% 6.3V X5R-CERM 01005 XCVR

C905_K 0.1UF 20% 6.3V X5R-CERM 01005 XCVR

CAP IMPROVES TX GAMMA SPURS (XCVR BALL N6)
27 PP_1V3_XCVR_TXPLL

C921_K 6800PF 10% 6.3V X5R 01005 XCVR

XW901_K SHORT-10L-0.1MM-SM OMIT XCVR
XW909_K SHORT-10L-0.1MM-SM OMIT XCVR

27 22 PP_1V3_SMPS3_XCVR_ANA
STAR ROUTE

C908_K 0.1UF 20% 6.3V X5R-CERM 01005
C909_K 0.1UF 20% 6.3V X5R 01005 NOSTUFF XCVR
C912_K 0.1UF 20% 6.3V X5R 01005 NOSTUFF XCVR
C913_K 0.1UF 20% 6.3V X5R-CERM 01005

XW902_K SHORT-10L-0.1MM-SM OMIT XCVR
XW903_K SHORT-10L-0.1MM-SM OMIT XCVR
XW905_K SHORT-10L-0.1MM-SM OMIT XCVR
XW906_K SHORT-10L-0.1MM-SM OMIT XCVR
XW907_K SHORT-10L-0.1MM-SM OMIT XCVR

PP_1V3_XCVR_RC_ADC
C916_K 0.1UF 20% 6.3V X5R 01005 XCVR NOSTUFF
PP_1V3_XCVR_RC_GM
REMOVED C920_K (HIGHLY PROBABLE)

AC8	VDD1V0_DIG	PP_1V0_XCVR_CORE_F1
F1	VDD1V1_GN	
E2	VDD1V3_GN	PP_1V3_XCVR_ANA_GN
AA18	VDD1V3_RX1PLL	VFE_XCVR_ANA_1V3
C18	VDD1V3_RX2PLL	
H19	VDD1V3_RX3PLL	PP_1V3_XCVR_RXPLL_2_3
P17	VDD1V3_RX4PLL	VFE_XCVR_ANA_1V3
N6	VDD1V3_TXPLL	27 PP_1V3_XCVR_TXPLL (SEE 0.1U CAP ON LEFT)
AB17	VDD1V3_RX1DCO	
B17	VDD1V3_RX2DCO	PP_1V3_XCVR_RX2DCO
G18	VDD1V3_RX3DCO	PP_1V3_XCVR_RX3DCO
N18	VDD1V3_RX4DCO	VFE_XCVR_ANA_1V3
AB21	VDD1V3_RC_LO1	
A20	VDD1V3_RC_LO2	PP_1V3_XCVR_RC_LO
F21	VDD1V3_RC_LO2	REMOVED C914_K (HIGHLY PROBABLE)
K21	VDD1V3_RC_LO1	
Y17	VDD1V3_RC_ADC1	
D17	VDD1V3_RC_ADC2	
J16	VDD1V3_RC_ADC2	
U16	VDD1V3_RC_ADC1	
Y19	VDD1V3_RC_GM1	
D19	VDD1V3_RC_GM2	
K19	VDD1V3_RC_GM2	
T19	VDD1V3_RC_GM1	

PP_1V85_SMPS6_IO
21 22 23 25 27 29 39

G6	VDD1V8_IO_2	C902_K 0.1UF 20% 6.3V X5R-CERM 01005 XCVR
U8	VDD1V8_IO	
A4	VDD1V8_GN	
AA20	VDD1V8_RXPLL_1	PP_1V8_XCVR_HI_PLL
C20	VDD1V8_RXPLL_2	
AC4	VDD1V8_TXPLL	
F13	VDD1V8_CI	
P7	VDD1V8_CI_2	PP_1V85_SMPS6_IO (21 22 23 25 27 29 39)
AB7	VDD_MEM_RET	PP_1V0_SMPS5_XCVR_CORE (22 25 27)
D1	VDD_CEXT_GN	CEXT_GN
W2	VDD_CEXT_TX	CEXT_TX; C911_K 1UF 20% 10V X5R 0201 XCVR; C910_K 1UF 20% 10V X5R 0201 XCVR
B13	VDD1V3_MPHY	
F23	VDD1V3_RDRF	
V23	VDD1V3_RXRF	PP_1V3_XCVR_RDRF
N4	VDD1V3_TXANA	
U4	VDD1V3_TXDCO	
V3	VDD1V3_TXRF	
G12	VDD1V3_CI	

STAR ROUTE
PP_1V8_LDO10_XCVR_HI 22

C903_K 100PF 5% 25V C0G-CERM 01005 XCVR
C904_K 15UF 20% 6.3V X5R-CERM 0402-0.1MM XCVR

XW900_K SHORT-10L-0.1MM-SM OMIT XCVR

XW904_K SHORT-10L-0.1MM-SM OMIT XCVR
C915_K 0.47UF 20% 6.3V X5R 01005 XCVR NOSTUFF

PP_1V3_SMPS3_XCVR_ANA 22 27
STAR ROUTE

C917_K 2200PF 10% 16V X5R-CERM 01005 XCVR
C918_K 0.1UF 20% 6.3V X5R-CERM 01005 XCVR
C919_K 6800PF 10% 6.3V X5R 01005 XCVR
VDD1V3_TXRF = 230MA

C920_K 6800PF 10% 6.3V X5R 01005 XCVR NOSTUFF

XW908_K SHORT-10L-0.1MM-SM OMIT XCVR
PP_1V3_XCVR_CI

SMARTI7 (2/7)

U_XCVR_K
PMB5762-A2
UFWLB
SYM 2 OF 7
XCVR

41 23 BB_TO_XCVR_DWB_DATA	F9	DWB_SDATA	GPO0 Y11	NC
41 23 BB_TO_XCVR_DWB_CLK	F11	DWB_SCLK	GPO1 Y9	NC
41 23 BB_TO_XCVR_RESET_L	W8	RESET_MAIN*	GPO2 AB9	UART_AP_TO_GNSS_RTS_L (10 16 41)
			GPO3 AA8	NC
41 21 CLK_BBPMU_TO_XCVR_38MHZ	H13	FSYS_CLK	GPO4 Y7	GNSS_DWB_IRQ (23 41)
	V9	TCKC	GPO5 AA12	NC
NC	T9	TMSC	GPO6 AB11	NC
			GPO7 AC12	NC
41 23 90_DIGRF_HI_RX1_P	A8	MPHY2_RX1_DAT	MRFFE_VIO K11	PP_1V8_VIO
41 23 90_DIGRF_HI_RX1_N	B7	MPHY2_RX1_DATX	MRFFE1_SDATA N12	XCVR_TO_BB_RFFE_DATA (23 41)
41 23 90_DIGRF_HI_RX2_P	A10	MPHY2_RX2_DAT	MRFFE1_SCLK M11	XCVR_TO_BB_RFFE_CLK (23 41)
41 23 90_DIGRF_HI_RX2_N	B9	MPHY2_RX2_DATX	MRFFE2_SDATA R12	SHIELD_RFFE_TX_SDATA
41 23 90_DIGRF_HI_RX3_P	D9	MPHY2_RX3_DAT	MRFFE2_SCLK T13	SHIELD_RFFE_TX_SCLK
41 23 90_DIGRF_HI_RX3_N	C8	MPHY2_RX3_DATX	MRFFE3_SDATA V13	XCVR_TO_FE_RX_RFFE_DATA (27 33 34 35 36 41 42)
41 23 90_DIGRF_HI_RX4_P	A12	MPHY2_RX4_DAT	MRFFE3_SCLK T11	XCVR_TO_FE_RX_RFFE_CLK (27 33 34 35 36 41 42)
41 23 90_DIGRF_HI_RX4_N	B11	MPHY2_RX4_DATX	MRFFE4_SDATA W12	NC
41 23 90_DIGRF_HI_TX_P	D7	MPHY2_TX_DAT	MRFFE4_SCLK V11	NC MAYBE ADD TEST POINTS
41 23 90_DIGRF_HI_TX_N	C6	MPHY2_TX_DATX	SRFFE_VIO H9	PP_1V8_BB_MASTER_IO
41 23 90_DIGRF_LO_RX_P	C14	MPHY1_RX_DAT	SRFFE1_SDATA K7	BB_TO_XCVR_RFFE_DATA (23 41)
41 23 90_DIGRF_LO_RX_N	D13	MPHY1_RX_DATX	SRFFE1_SCLK K9	BB_TO_XCVR_RFFE_CLK (23 41)
41 23 90_DIGRF_LO_TX_P	C12	MPHY1_TX_DAT	SRFFE2_SDATA N8	NC
41 23 90_DIGRF_LO_TX_N	D11	MPHY1_TX_DATX	SRFFE2_SCLK M9	NC

PP_1V8_VIO-10[I120] 42 16 30 33 34 35 36 41
C922_K 1000PF 10% 10V X5R 01005 XCVR
SHIELD_RFFE_TX_SDATA-10[I120] 16 30 33 37 41
SHIELD_RFFE_TX_SCLK-10[I120] 16 30 33 37 41

C923_K 1000PF 10% 10V X5R 01005 XCVR
23 41

XCVR RFFE DAMPING RESISTORS

42 41 36 35 34 33 27 XCVR_TO_FE_RX_RFFE_DATA — R1820_K 20.0 5% 1/32W MF 01005 — SHIELD_RFFE_RX_SDATA — SHIELD_RFFE_RX_SDATA-10[I120] 16

42 41 36 35 34 33 27 XCVR_TO_FE_RX_RFFE_CLK — R1821_K 20.0 5% 1/32W MF 01005 — SHIELD_RFFE_RX_SCLK — SHIELD_RFFE_RX_SCLK-10[I120] 16

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.

A2	VSS_GN_RF	VSS	N14
A6	VSS	VSS	N16
A14	VSS	VSS	N20
B3	VSS	VSS	P3
B5	VSS	VSS	P5
B15	VSS	VSS	P9
B19	VSS	VSS	P11
B21	VSS	VSS	P13
C4	VSS	VSS	P15
C10	VSS	VSS	P19
C16	VSS	VSS	P21
D5	VSS	VSS	R4
D15	VSS	VSS	R6
D21	VSS	VSS	R8
E4	VSS	VSS	R10
E6	VSS	VSS	R14
E8	VSS	VSS	R16
E10	VSS	VSS	R18
E12	VSS	VSS	R20
E14	VSS	VSS	T3
E16	VSS	VSS	T15
E18	VSS	VSS	T17
E20	VSS	VSS	T21
F15	VSS	VSS	U6
G8	VSS	VSS	U10
G10	VSS	VSS	U12
G14	VSS	VSS	U14
G16	VSS	VSS	U18
G20	VSS	VSS	U20
H15	VSS	VSS	V7
H17	VSS	VSS	V15
H21	VSS	VSS	V17
J2	VSS	VSS	V19
J4	VSS	VSS	V21
J6	VSS	VSS	W4
J8	VSS	VSS	W6
J10	VSS	VSS	W10
J12	VSS	VSS	W14
J14	VSS	VSS	W16
J18	VSS	VSS	W18
J20	VSS	VSS	W20
K5	VSS	VSS	Y3
K13	VSS	VSS	Y13
K15	VSS	VSS	Y15
K17	VSS	VSS	Y21
L8	VSS	VSS	AA4
L10	VSS	VSS	AA6
L12	VSS	VSS	AA10
L14	VSS	VSS	AA14
L16	VSS	VSS	AA16
L18	VSS	VSS	AB3
L20	VSS	VSS	AB13
M5	VSS	VSS	AB15
M7	VSS	VSS	AB19
M13	VSS	VSS	AC6
M21	VSS	VSS	AC10
N2	VSS	VSS	AC14
N10	VSS	VSS	AC20

PAGE TITLE: XCVR: INTERFACE & PWR

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XCVR: PRIMARY/DIVERSITY RX

C1000_K
2.7PF
+/-0.1PF
16V
NP0-C0G
01005-1
XCVR

50_WIFI_LAA_LAT_TO_XCVR_PRX 42

FROM WLAN

L1000_K
0.4NH-+/-0.1NH-1.0A-0.03OHM
01005
XCVR

SMARTI7 PRX (5/7)

U_XCVR_K
PMB5762-A2
UFWLB
SYM 5 OF 7
XCVR

50_COUPLER2_OUT IN 37

TIE L2 TO SYSTEM GND PLANE.
DO NOT TIE TO SURFACE GND.

FBR1	K1	
FBR2	M1	NC
VSS_SHIELD_FBR_1	L2	
RX1	P23	50_RX1_LAA_PRX
RX2	R22	50_XCVR_UHB_PRX
RX3	T23	50_PRX_HB2_PAD_LHB_SDR_IN_XCVR
RX4	U22	50_PRX_HB1_PAD_HB_SDR_IN_XCVR
RX5	W22	
RX6	Y23	50_PRX_MB2_PAD_MB_B_SDR_IN_XCVR
RX7	AA22	50_PRX_LB_PAD_LB2_SDR_IN_XCVR
RX8	AB23	50_RX8_MLB_PRX
RX9	AC22	50_PRX_MB1_PAD_MB_A_SDR_IN_XCVR
RXM1	N22	50_XCVR_RXM1_MB_HB_UHB_PRX
RXM2	M23	

CONNECT ALL UNUSED RX PORTS TO GND.

L1002_K
0.7NH-+/-0.1NH-0.9A-0.05OHM
01005
XCVR

L1004_K
0.7NH-+/-0.1NH-0.9A-0.05OHM
01005
XCVR

L1006_K
0.7NH-+/-0.1NH-0.9A-0.05OHM
01005
XCVR

L1008_K
1.2NH-+/-0.1NH-0.80A
01005
XCVR

L1010_K
1.2NH-+/-0.1NH-0.80A
01005
XCVR

L1012_K
2.0NH-+/-0.1NH-0.70A
01005
XCVR

L1013_K
2.0NH-+/-0.1NH-0.70A
01005
XCVR

L1014_K
0.9NH-+/-0.1NH-0.9A-0.05OHM
01005
XCVR

SMARTI7 DRX (6/7)

U_XCVR_K
PMB5762-A2
UFWLB
SYM 6 OF 7
XCVR

RD1	J22	50_RD1_LAA_DRX
RD2	H23	
RD3	G22	
RD4	E22	
RD5	D23	
RD6	C22	
RD7	B23	
RD8	A22	
RDM1	K23	
RDM2	L22	

S7 PORT MAP CHANGE 10/11/2016:
USE RD6 INSTEAD OF RD3.
CONNECT ALL UNUSED RD PORTS TO GND.

C1001_K
2.7PF
+/-0.1PF
16V
NP0-C0G
01005-1
XCVR

50_WIFI_LAA_UAT_TO_XCVR_DRX 42

FROM WLAN

L1001_K
0.4NH-+/-0.1NH-1.0A-0.03OHM
01005
XCVR

50_XCVR_RD2_MB_HB_UHB_DRX 35

L1003_K
0.9NH-+/-0.1NH-0.9A-0.05OHM
01005
XCVR

50_XCVR_LMB_MB_HB_DRX 35

L1005_K
0.9NH-+/-0.1NH-0.9A-0.05OHM
01005
XCVR

50_XCVR_HB_DRX 35

L1007_K
0.8NH-+/-0.1NH-0.9A-0.05OHM
01005
XCVR

50_XCVR_LB_DRX 34

L1009_K
2.2NH-+/-0.1NH-0.50A
01005
XCVR

50_XCVR_RDM1_MB_HB_UHB_DRX 36

L1011_K
0.9NH-+/-0.1NH-0.9A-0.05OHM
01005
XCVR

PAGE TITLE: XCVR: PRX DRX

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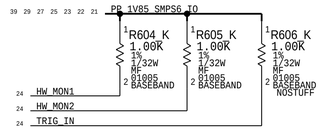
KAROO CONFIG

BOOTCFG

BOOTSTRAPS ARE INTERNALLY PULLED DOWN

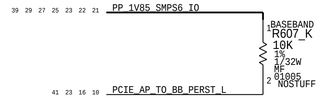
	HW_MON1	HW_MON2	TRIG_IN
NAND	0	0	1
FLASHLESS	1	0	1
FLASHLESS WDOG DIS	1	1	0
NAND (NON-SECURE)	1	1	1



THESE DON'T CHANGE FOR KAROO CONFIG MLBS, DEV ONLY

PERST_L

PERST_L SIGNAL LOW WILL KEEP BB IN RESET.

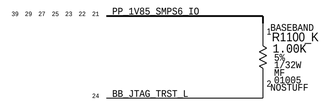


STUFF PU WHEN AP IS NOT CONNECTED
(KAROO CONFIG: USB BOOT)

DEFAULTS SET TO AP/FLASHLESS BOOT

JTAG_RESET_L

TO ENABLE SWD, JTAG_TRST_L MUST BE PULLED HIGH



STUFF PU WHEN USING JTAG

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

SWD ENABLE

TO ENABLE SWD, STUFF R620_K

NOSTUFF WITH PROD FUSED BB

PAGE TITLE: HW CONFIG OPTIONS

Apple Inc.

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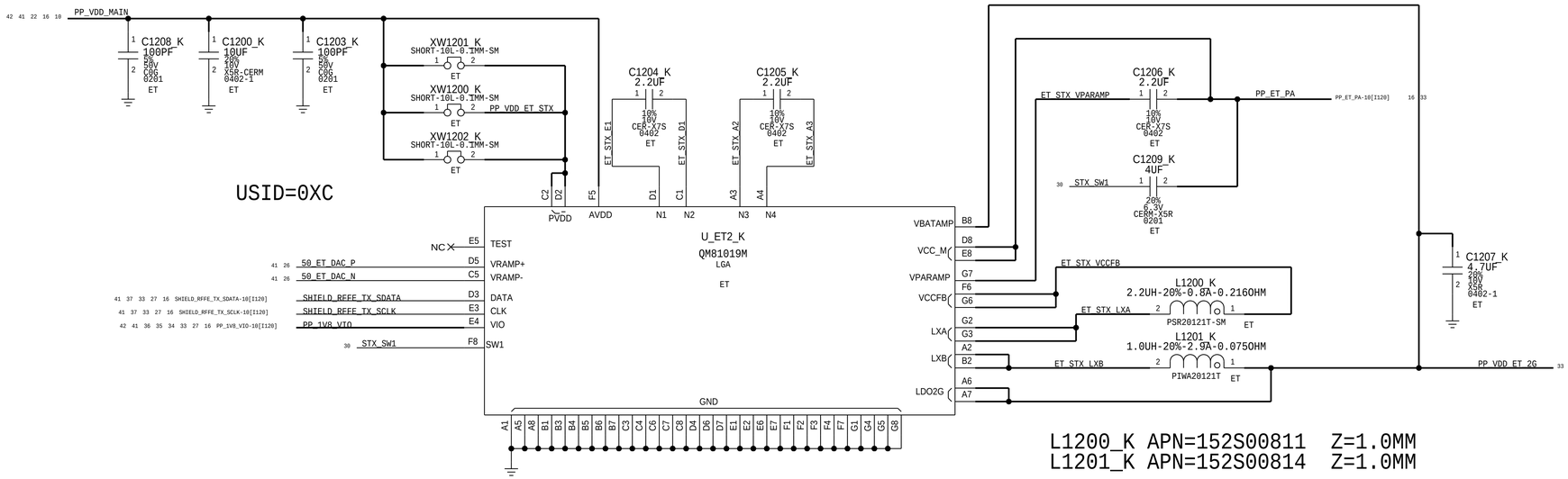
ET MODULATOR

ALPES STX QM81019 E1.0.1 MODULE



L1200_K APN=152S00811 Z=1.0MM
L1201_K APN=152S00814 Z=1.0MM

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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LB SPAD

SEE MLB_LOFT

PAGE TITLE: LB SPAD

Apple Inc.

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HB SPAD

SEE MLB_LOFT

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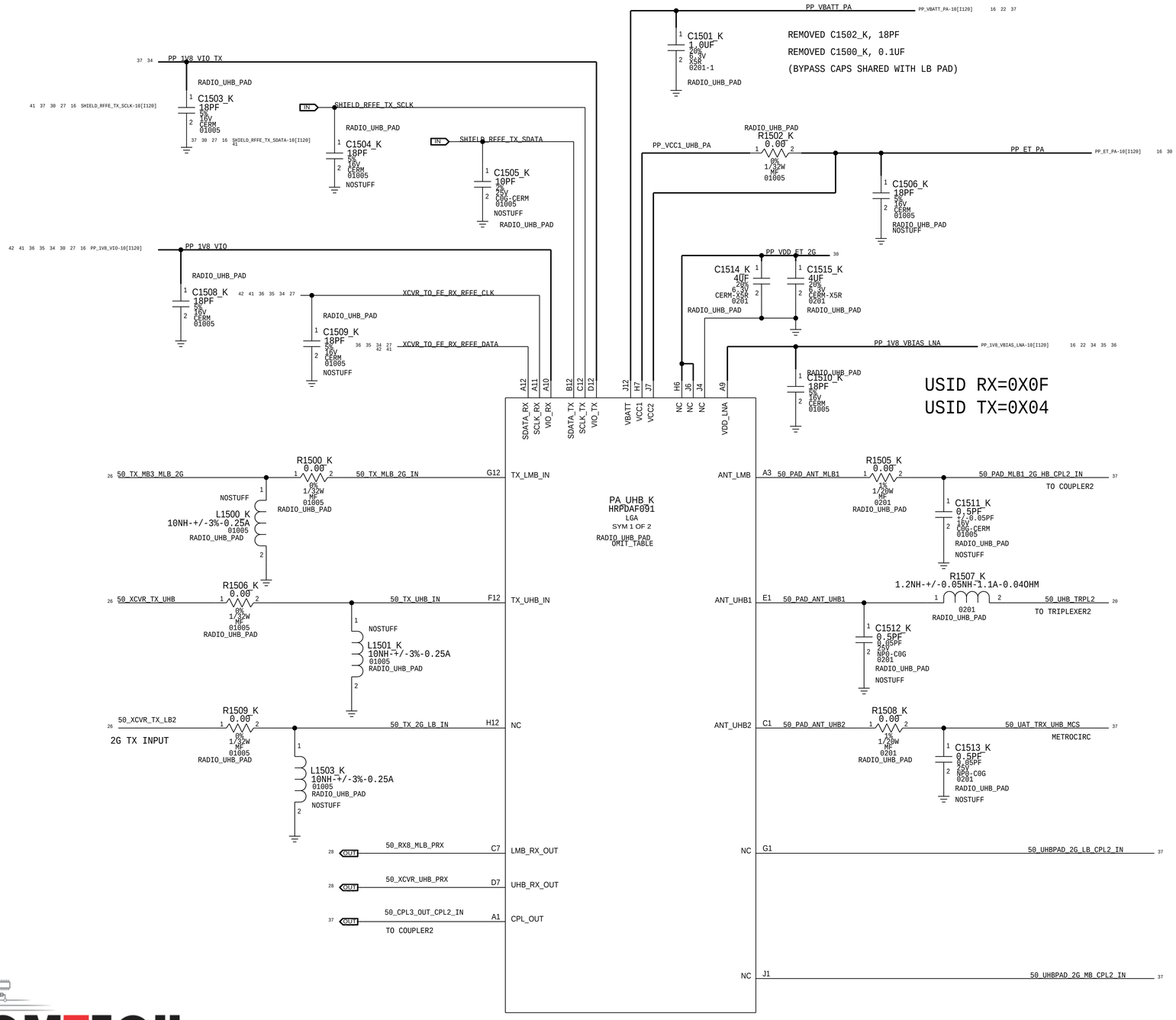
UHB LMB SPAD



PAGE TITLE: UHB LMB SPAD

Apple Inc.

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REVISION: 4.0.0

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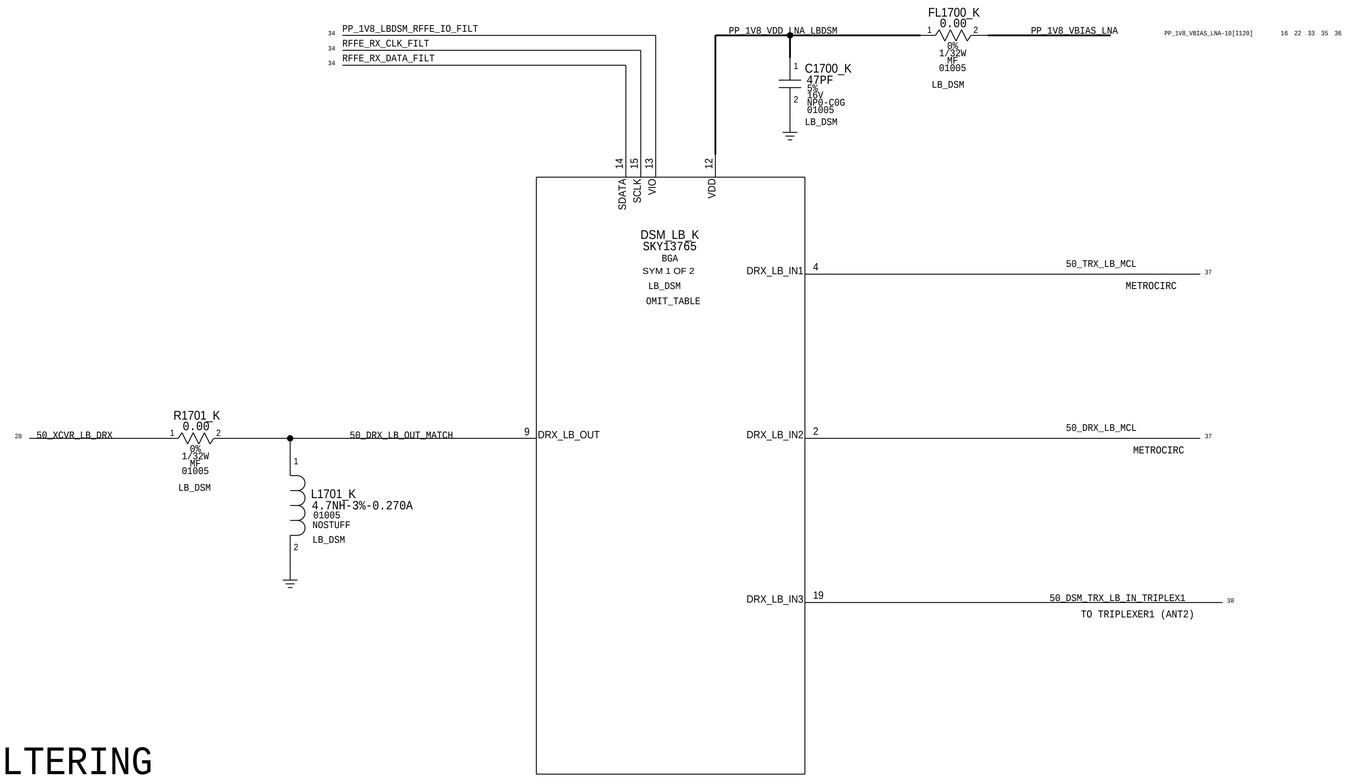
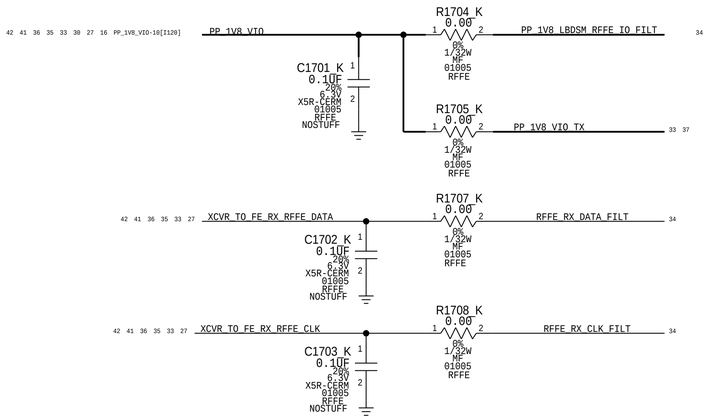
LB DIVERSITY RECEIVE LNA

USID RX=0X09



RFFE FILTERING



PAGE TITLE: LB DIVERSITY RECEIVE LNA

Apple Inc.

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HB DIVERSITY RECEIVE LNA

DECOUPLING SHARED WITH LB DSM

C1800_K 47PF 5% 16V NP0_C0G 01005 HB_DSM NOSTUFF

C1801_K 0.1UF 20% 6.3V X5R-CERM 01005 HB_DSM

R1800_K 0.00 0% 1/32W MF 01005 HB_DSM

PP_1V8_HB_LB_DSM_IO_FILT

PP_1V8_VIO

PP_1V8_VIO-10[I120] 16 27 30 33 34 36 41 42

XCVR_TO_FE_RX_RFFE_DATA 27 33 34 36 41 42

XCVR_TO_FE_RX_RFFE_CLK 27 33 34 36 41 42

R1801_K 0.00 0% 1/32W MF 01005 HB_DSM

PP_1V8_VDD_LNA_HBDSM

PP_1V8_VBIAS_LNA

PP_1V8_VBIAS_LNA-10[I120] 16 22 33 34 36

C1802_K 0.1UF 20% 6.3V X5R-CERM 01005 HB_DSM

SDATA 30 SCLK 29 VIO 28 VDD 27

USID RX=0X0A

DSM_HB_K SKYI3768 LGA SYM 1 OF 2

50_XCVR_LMB_MB_HB_DRX 28 — TO STRIPLINE

R1802_K 0.00 0% 1/32W MF 01005 HB_DSM

50_DRX_HB_OUT1_MATCH 4 — DRX_HB_OUT1

L1801_K 4.7NH-3%-0.270A 01005 NOSTUFF HB_DSM

50_DRX_HB_OUT2_MATCH 6 — DRX_HB_OUT2

50_XCVR_RD2_MB_HB_UHB_DRX 28 — STRIPLINE

R1805_K 0.00 0% 1/32W MF 01005 HB_DSM

8 — DRX_HB_OUT3

L1804_K 4.7NH-3%-0.270A 01005 NOSTUFF HB_DSM

NC — 3 — DRX_HB_OUT4

50_XCVR_HB_DRX 28 — STRIPLINE

R1808_K 0.00 0% 1/32W MF 01005 HB_DSM

50_DRX_HB_OUT3_MATCH

L1806_K 4.7NH-3%-0.270A 01005 NOSTUFF HB_DSM

DRX_HB_IN1 21 — 50_DRX_HB_IN1_MATCH

R1803_K 3.1NH-+/-0.1NH-0.5A-0.17OHM 0201 HB_DSM

50_TRX_HB_MCL 37 — METROCIRC

L1800_K 4.7NH-3%-0.35A-0.35OHM 01005 NOSTUFF HB_DSM

L1802_K 0.8PF +/-0.05PF 16V C0G-CERM 01005 HB_DSM

DRX_HB_IN2 24 — 50_DSM_HB_IN_DRX_MLB_MBHB_MCU_MATCH

C1803_K 0.00 1% 1/20W MF 0201

50_DRX_HB_MCL 37 — METROCIRC

L1803_K 4.7NH-3%-0.35A-0.35OHM 01005 NOSTUFF HB_DSM

L1805_K 4.7NH-3%-0.35A-0.35OHM 01005 NOSTUFF HB_DSM

DRX_HB_IN3 22 — 50_DSM_HB_IN_TRIPLEX1 38 — TO TRIPLEXER1 (ANT2)

DRX_HB_IN4 20 — 50_HB_DSM_HB_IN4

R1810_K 0.00 1% 1/20W MF 0201 HB_DSM

50_HB_DSM_HB_IN4_TRIPL2 20 — TO TRIPLEXER2 (ANT4)

L1808_K 10NH-3%-0.16A-1.63OHM 01005 HB_DSM

DRX_HB_IN5 19 — 50_DSM_MM2_MHB_IN5 36 — TO MIMO RDM (DSM_MM2_K)

DRX_UHB_IN2 14 — 50_UAT_TRX_UHB_MCS 37 — METROCIRC

DRX_UHB_IN3 16 — 50_DSM_HB_IN_TRX_UHB

R1914_K 1.0NH-+/-0.1NH-0.9A-0.05OHM 01005 MIMO_RDM

50_DSM_MM2_UHB_TRIPL2 20 — TO TRIPLEXER2

L1908_K 10NH-+/-3%-0.25A 01005 MIMO_RDM NOSTUFF

GPO1 10 — NC

GPO2 11 — NC

GPO3 12 — NC

DSM_HB_K SKYI3768 LGA SYM 2 OF 2

GND 1, 2, 5, 7, 9, 13, 15, 17, 18, 23, 25, 26

PAGE TITLE: HB DIVERSITY RECEIVE LNA

Apple Inc.

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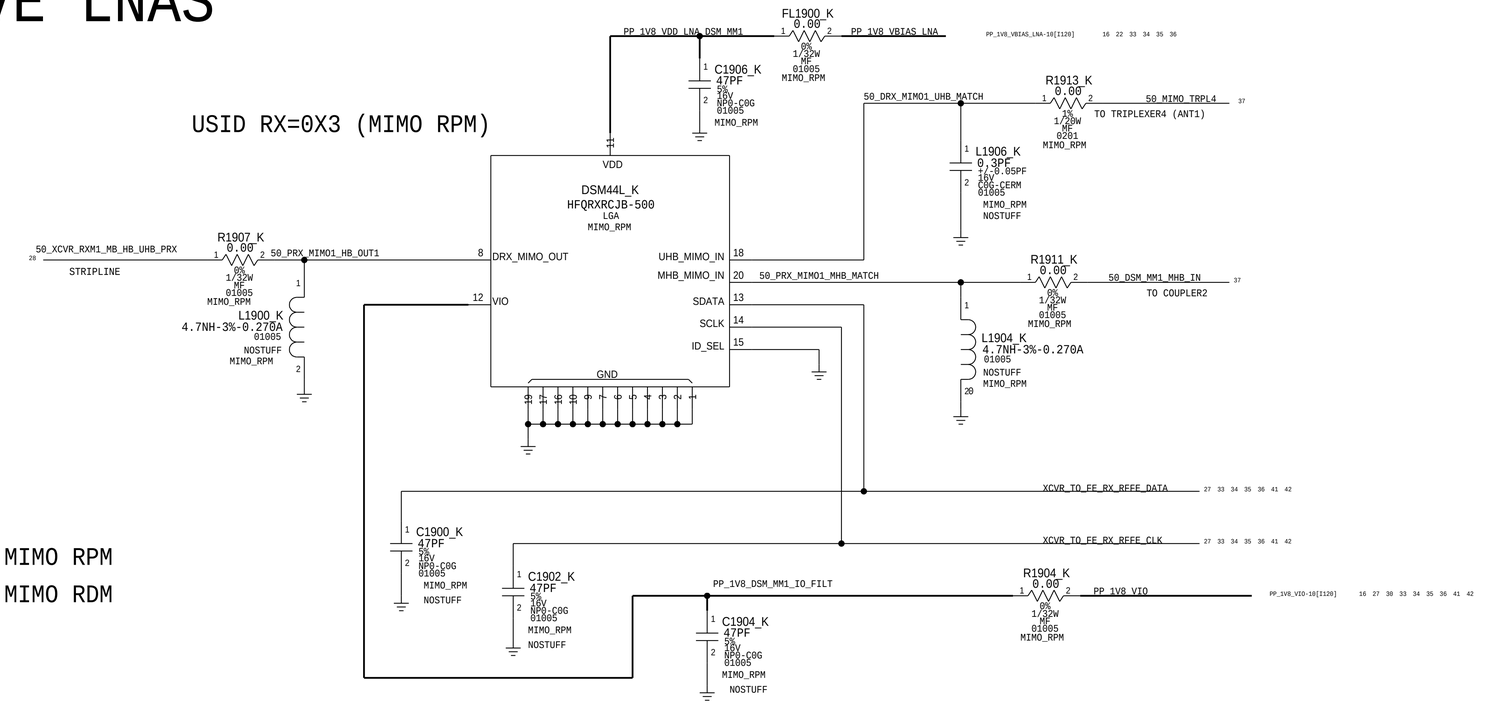
MIMO RECEIVE LNAS

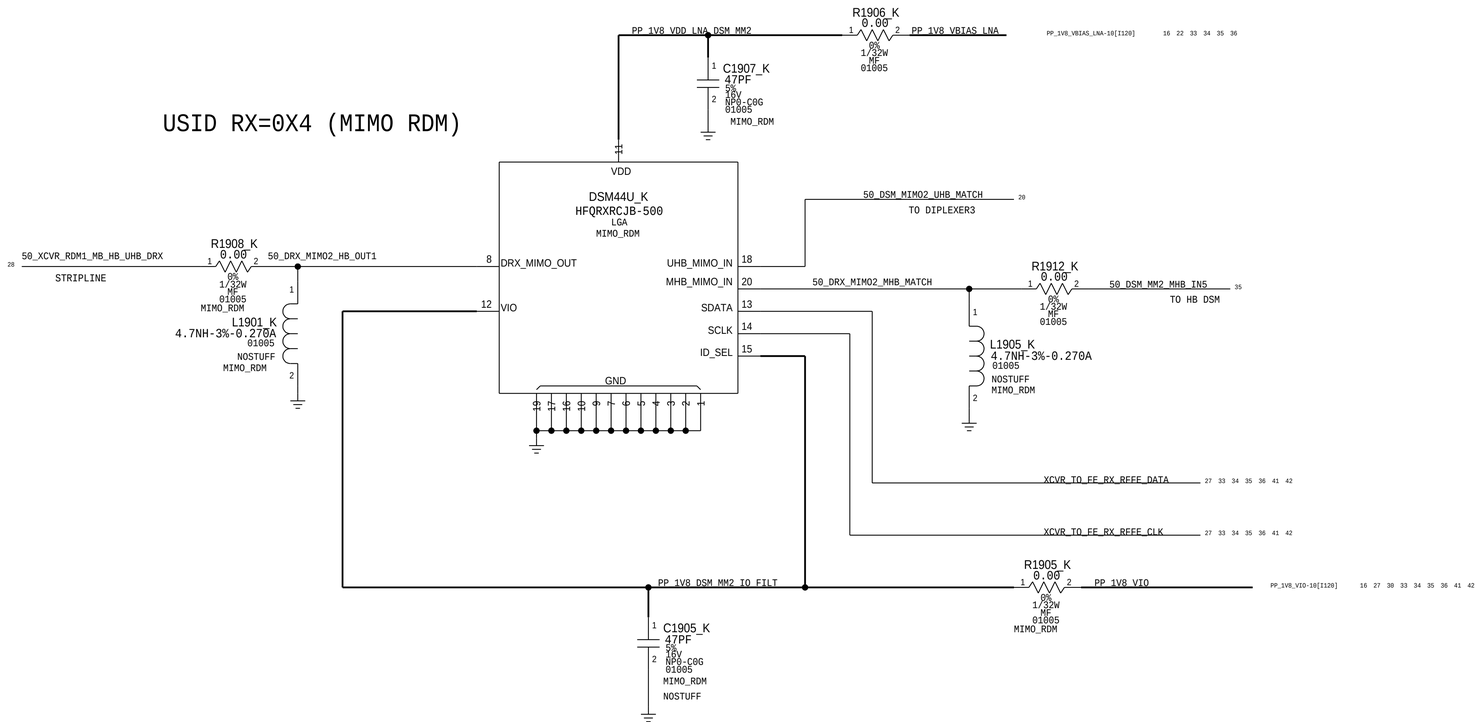
USID RX=0X3 (MIMO RPM)



ID_SEL = 0, MIMO RPM

ID_SEL = 1, MIMO RDM

USID RX=0X4 (MIMO RDM)



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COUPLER & LOWER ANTENNA

R2020_K
10-OHM-1.1A
01005

PP_1V8_VIO_TX → PP_1V8_VIO_CPLR

C2001_K 47PF 5% 16V NP0-C0G 01005 RADIO_CPL2

SHIELD_RFFE_TX_SCLK

C2003_K 47PF 5% 16V NP0-C0G 01005 NOSTUFF RADIO_CPL2

SHIELD_RFFE_TX_SDATA

C2004_K 47PF 5% 16V NP0-C0G 01005 NOSTUFF RADIO_CPL2

RFFE_DAT, RFFE_CLK, VIO, VDD

USID TX=0X06

PP_VBATT_PA

C2002_K 0.1UF 20% 6.3V X5R-CERM 01005 RADIO_CPL2

C2000_K 47PF 5% 16V NP0-C0G 01005 RADIO_CPL2

R2000_K 0.00 0% 1/32W MF 01005 RADIO_CPL2

C2005_K 1.3PF +/-0.05PF 16V C0G 01005 RADIO_CPL2 NOSTUFF

DRX_LB_OUT ← 50_CPL2_DRX_LB → 50_DRX_LB_MCL (METROCIRC)

TRX_LB_UAT → 50_TRX_LB_MCL (METROCIRC)

50_PAD_ANT_LB_CPL2_IN → TRX_LB_IN

CPL_K SKY13775 LGA SYM 1 OF 2

R2002_K 0.00 1% 1/20W MF 0201 RADIO_CLP2 OMIT_TABLE

50_LBPAD_2G_OUT_CPL2_IN_JPN

R2003_K 0.00 1% 1/20W MF 0201 RADIO_CLP2 OMIT_TABLE

50_UHBPAD_2G_LB_CPL2_IN → 50_CPL2_2GLB

R2016_K 0.00 1% 1/20W MF 0201 RADIO_CLP2

250_CPL2_TX_2GLB → TX_2GLB

L1300_K 10NH-3%-250MA 0201 RADIO_CLP2 NOSTUFF

50_PAD_ANT_HB_CPL2_IN → TRX_HB1_IN

R2015_K 0.00 1% 1/20W MF 0201 RADIO_CLP2 OMIT_TABLE

50_UHBPAD_2G_MB_CPL2_IN

R2017_K 1.0NH-+/-0.05NH-1.1A-0.040HM 0201 RADIO_CPL2

R1403_K 0.00 1% 1/20W MF 0201 RADIO_CLP2 OMIT_TABLE

50_HBPAD_2G_OUT_CPL2_IN_JPN → 50_CPL2_2GHB_MATCH → 50_CPL2_2GHB → TX_2GHB

L2100_K 10NH-3%-0.170A 01005 RADIO_CPL2 NOTCH

L2101_K 6.8NH-3%-0.3A-0.40HM 01005 RADIO_CPL2

C1609_K 0.3PF +/-0.05PF 16V C0G-CERM 01005 RADIO_CLP2

50_PAD_MLB1_2G_HB_CPL2_IN → TRX_LMB_IN

50_TDD_PAD_ANT_HB_CPL2_IN → TRX_HPUE_IN

R2006_K 1.3NH+/-0.1NH-1.1A 0201

TRX_HB_LAT ← 50_TRX_HB_LAT

L2004_K 10NH-3%-0.170A 01005 NOSTUFF RADIO_CPL2

C2009_K 1.3PF +/-0.05PF 16V C0G 01005 RADIO_CPL2 NOSTUFF

50_TRX_HB_LAT_DIPLEXER_IN

TRX_HB_UAT → 50_TRX_HB_MCL (METROCIRC)

DRX_HB_OUT → 50_DRX_HB_MCL (METROCIRC)

TRX_HB_ANT2 → 50_CPL2_HB_ANT3 TO DIPLEXER2

TRX_LB_LAT → 50_TRX_LB_LAT_DIPLEXER_IN

RX_HB_IN → 50_DSM_MM1_MHB_IN

R2011_K 0.00 0% 1/32W MF 01005 RADIO_CPL2

50_CPL3_OUT_CPL2_IN → 50_CPL3_IN → CPL_IN

50_COUPLER2_OUT → CPL_OUT1

METROCIRC REPLACEMENT

(CPL2 END)	(DSM END)
50_DRX_LB_MCL	50_DRX_LB_MCL
50_DRX_HB_MCL	50_DRX_HB_MCL
50_UAT_TRX_UHB_MCS	50_UAT_TRX_UHB_MCS
50_TRX_HB_MCL	50_TRX_HB_MCL
50_TRX_LB_MCL	50_TRX_LB_MCL

CPL_K SKY13775 LGA SYM 2 OF 2

4, 6, 9, 10, 11, 12, 14, 15, 16, 17, 19, 20, 25, 26, 28, 29, 30, 32, 34, 37, 40, 42, GND

LB-MHB-UHB TRIPLEXER4 (ANT1)

ANT1

TPLX4_K TPX253600MT-7039C1SJ TRIPLEXER LGA RADIO_CPL2

LB, LMB/MB/HB, UHB, LMB/MB/HB, GND, ANT

50_MIMO_TRPL4 MIMO

50_LB_MLB_MB_HB_UHB_MATCH → R2005_K 0.00 1% 1/20W MF 0201 RADIO_CLP2 → 50_LB_MLB_MB_HB_UHB_ANT1

L2003_K 10NH-3%-0.170A 01005 RADIO_CPL2 NOSTUFF

C2008_K 1.3PF +/-0.05PF 16V C0G 01005 RADIO_CPL2 NOSTUFF

50_LB_MLB_MB_HB_UHB_MATCH (MAKE_BASE=TRUE) = 50_LB_MLB_MB_HB_UHB_MATCH

ALIAS FOR LAYOUT PURPOSES

PAGE TITLE: COUPLER + LOWER ANTENNA

Apple Inc.

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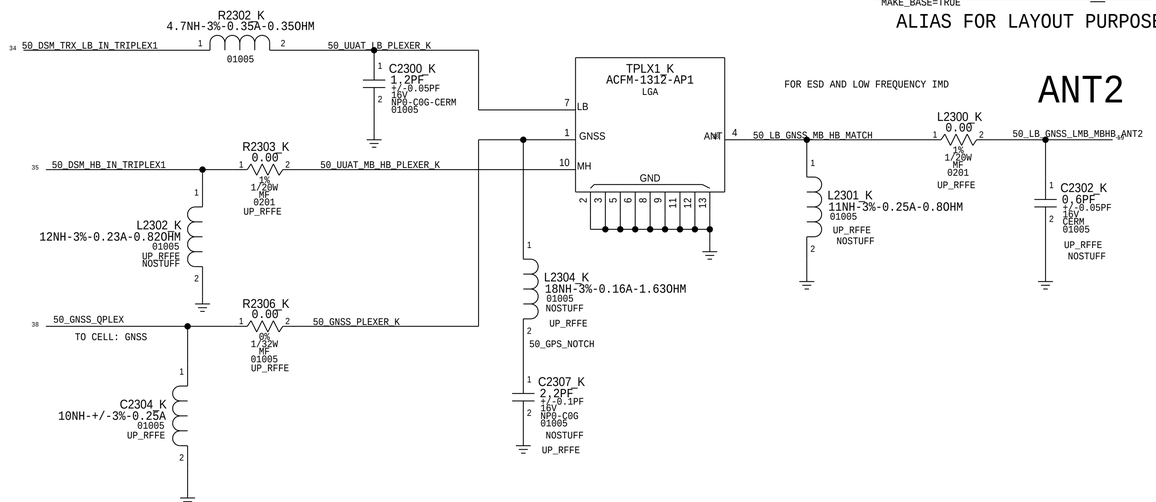
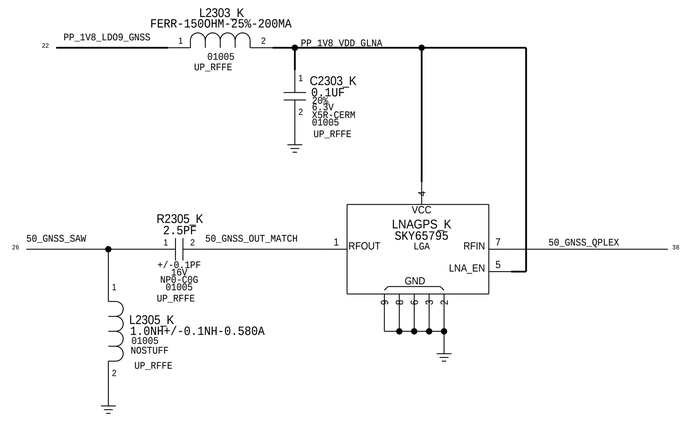
UPPER ANTENNA FEEDS

LB/MHB/GPS TRIPLEXER1





PAGE TITLE	UPPER ANTENNA FEEDS
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ESIM

41 40 23 SIM2_CLK — MAKE_BASE=TRUE — SIM2_CLK 39

41 40 23 SIM2_DATA — MAKE_BASE=TRUE — SIM2_DATA 39

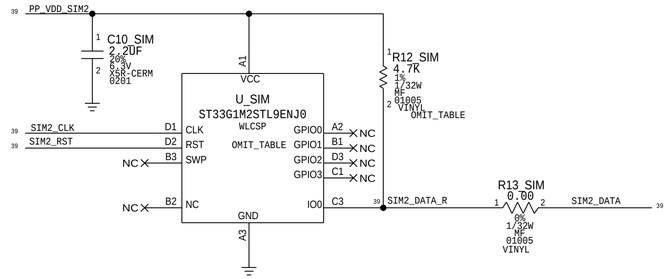
41 40 23 SIM2_RST — MAKE_BASE=TRUE — SIM2_RST 39

41 40 23 SIM2_DETECT — MAKE_BASE=TRUE — SIM2_DETECT 39

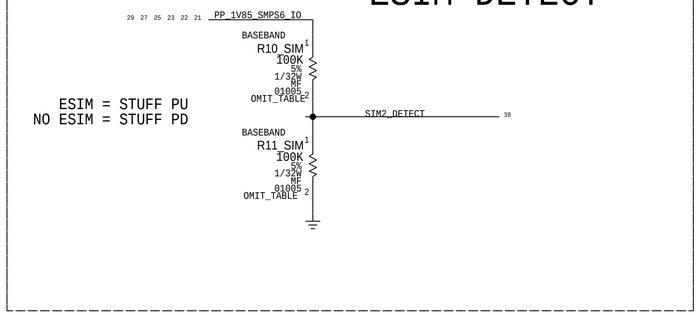
41 40 25 22 PP_VDD_SIM2 — MAKE_BASE=TRUE — PP_VDD_SIM2 39

41 SIM2_DATA_R — MAKE_BASE=TRUE — SIM2_DATA_R 39

VINYL
APN: 998-14441
NJ0, BIRCH 4.0 DEV 2



ESIM DETECT



PAGE TITLE
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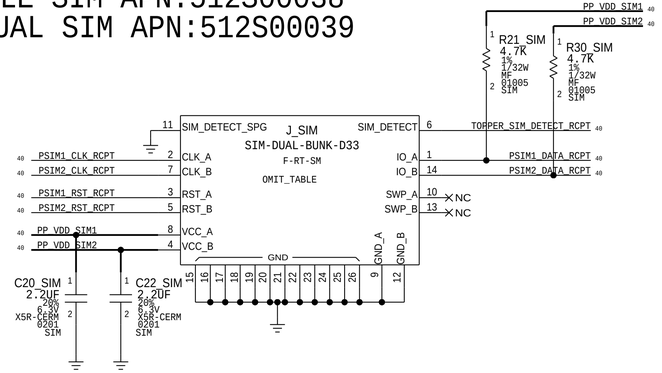
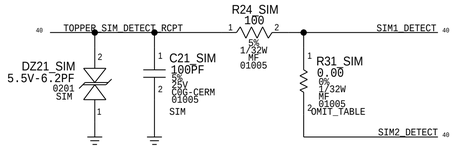
PSIM

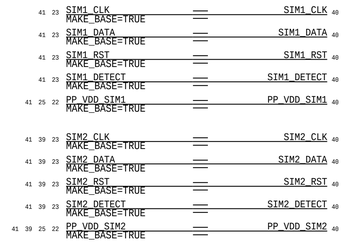
ICE18.2 DUAL PHYSICAL SIM

SINGLE SIM APN:512S00038
DUAL SIM APN:512S00039

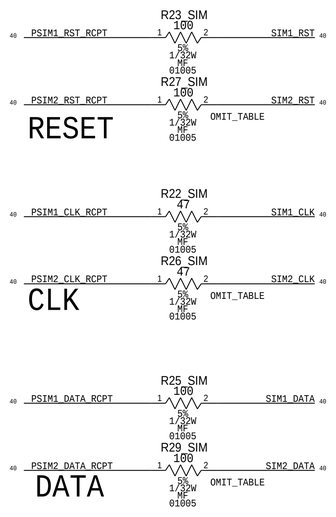


DUAL SIM DETECT

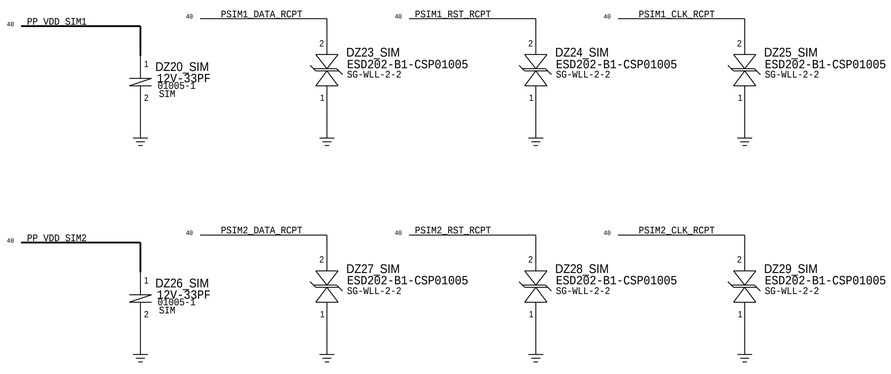




EOS RESISTORS



ESD DIODES



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DEBUG: TEST POINTS

DEBUG

PP2450_K P2MM-NSM OMIT_SM PP 1 — BB_DEBUG_ERROR — 23 41

PP24C0_K P2MM-NSM OMIT_SM PP 1 — BB_JTAG_TDO — 24

PP24C1_K P2MM-NSM OMIT_SM PP 1 — BB_JTAG_TDI — 24

PP2401_K P2MM-NSM OMIT_SM PP 1 — BBPMU_TO_BB_MEAS_RDY — 21 23

POWER-KEEPING

PP2497_K P2MM-NSM OMIT_SM PP 1 — AP_TO_BBPMU_RADIO_ON_L — 10 16 21

PP2410_K P2MM-NSM OMIT_SM PP 1 — BB_TO_XCVR_RESET_L — 23 27

PP24A9_K P2MM-NSM OMIT_SM PP 1 — BB_TO_BBPMU_SDWN_L — 21 23

PP2425_K P2MM-NSM OMIT_SM PP 1 — BBPMU_TO_BB_RESET_L — 21 23

PP24H7_K P2MM-NSM OMIT_SM PP 1 — BB_TO_AP_RESET_DETECT_L — 10 16 23

COEXISTENCE

PP24A5_K P2MM-NSM OMIT_SM PP 1 — BB_TO_MANY_GSM_BURST_IND — 10 16 24

PP24L0_K P2MM-NSM OMIT_SM PP 1 — AOP_TO_BBPMU_COEX — 10 16 21

PP24J7_K P2MM-NSM OMIT_SM PP 1 — TOUCH_TO_MANY_FORCE_PWM — 10 16 22

PEAK-POWER

PP2494_K P2MM-NSM OMIT_SM PP 1 — AP_TO_BB_PEAK_POWER_INDICATOR — 10 16 23

ET

PP2434_K P2MM-NSM OMIT_SM PP 1 — 50_ET_DAC_P — 26 30

PP2435_K P2MM-NSM OMIT_SM PP 1 — 50_ET_DAC_N — 26 30

BBPMU RP

PP24G0_K P2MM-NSM OMIT_SM PP 1 — BB_TO_BBPMU_RP_SCL — 21 23

PP24G1_K P2MM-NSM OMIT_SM PP 1 — BB_TO_BBPMU_RP_SDA — 21 23

I2C

PP24E2_K P2MM-NSM OMIT_SM PP 1 — I2C_BB_EEPROM_SDA — 23

PP24E3_K P2MM-NSM OMIT_SM PP 1 — I2C_BB_EEPROM_SCL — 23

I2S

PP24A1_K P2MM-NSM OMIT_SM PP 1 — I2S_BB_TO_AP_BCLK — 10 16 23

PP24A2_K P2MM-NSM OMIT_SM PP 1 — I2S_BB_TO_AP_LRCLK — 10 16 23

PP24A3_K P2MM-NSM OMIT_SM PP 1 — I2S_AP_TO_BB_DOUT — 10 16 23

PP24A4_K P2MM-NSM OMIT_SM PP 1 — I2S_BB_TO_AP_DIN — 10 16 23

BB RFFE

PP2486_K P2MM-NSM OMIT_SM PP 1 — BB_TO_UAT_RFFE_DATA — 19 23

PP2487_K P2MM-NSM OMIT_SM PP 1 — BB_TO_UAT_RFFE_CLK — 19 23

PP2488_K P2MM-NSM OMIT_SM PP 1 — BB_TO_LAT_RFFE_CLK — 19 23

PP2489_K P2MM-NSM OMIT_SM PP 1 — BB_TO_LAT_RFFE_DATA — 19 23

PP24A7_K P2MM-NSM OMIT_SM PP 1 — BB_TO_XCVR_DWB_CLK — 23 27

PP24A8_K P2MM-NSM OMIT_SM PP 1 — BB_TO_XCVR_DWB_DATA — 23 27

PP24E0_K P2MM-NSM OMIT_SM PP 1 — PP_1V8_BB_MASTER_IO — 23 27

CLKS

PP2427_K P2MM-NSM OMIT_SM PP 1 — TP_TO_BBPMU_EXT_CLK_EN — 21

PP2483_K P2MM-NSM OMIT_SM PP 1 — CLK_BBPMU_TO_TP_EXT_38MHZ — 21

PP24F0_K P2MM-NSM OMIT_SM PP 1 — TP_TO_BBPMU_SMARTI2_CLK_EN — 21

PP24F1_K P2MM-NSM OMIT_SM PP 1 — CLK_BBPMU_TO_TP_SMARTI2_38MHZ — 21

PP24G9_K P2MM-NSM OMIT_SM PP 1 — BB_TO_BBPMU_CLK_EN — 21 23

PP2429_K P2MM-NSM OMIT_SM PP 1 — CLK_BBPMU_TO_BB_38MHZ — 21 23

PP24H0_K P2MM-NSM OMIT_SM PP 1 — GNSS_TO_BBPMU_CLK_EN — 21 26

PP2485_K P2MM-NSM OMIT_SM PP 1 — CLK_BBPMU_TO_XCVR_38MHZ — 21 27

PP24G7_K P2MM-NSM OMIT_SM PP 1 — CLK_BBPMU_32KHZ — 21 23 26

AP COEX

PP2492_K P2MM-NSM OMIT_SM PP 1 — AP_TO_BB_COEX — 10 16 23

PP2495_K P2MM-NSM OMIT_SM PP 1 — BB_TO_AP_COEX — 10 16 23
NO_TEST=1

LOFT CANARY

PP24J5_K P2MM-NSM OMIT_SM PP 1 — LOFT_CANARY_1 — 10 16 23

PP24J6_K P2MM-NSM OMIT_SM PP 1 — LOFT_CANARY_2 — 10 16 23

VDIO

PP24E7_K P2MM-NSM OMIT_SM PP 1 — BBPMU_ANAMON — 21

PP2411_K P2MM-NSM OMIT_SM PP 1 — BB_TO_BBPMU_VDIO — 21 23

PP2422_K P2MM-NSM OMIT_SM PP 1 — BB_TO_BBPMU_VCLK — 21 23

PP2409_K P2MM-NSM OMIT_SM PP 1 — BBPMU_TO_BB_ALERT_L — 21 23

AOP UART

PP24E5_K P2MM-NSM OMIT_SM PP 1 — UART_BB_TO_AOP_RXD — 10 16 23

PP24E6_K P2MM-NSM OMIT_SM PP 1 — UART_AOP_TO_BB_TXD — 10 16 23

XCVR RFFE

PP24E8_K P2MM-NSM OMIT_SM PP 1 — PP_1V8_VIO — PP_1V8_VIO-10[I120] 16 27 30 33 34 35 36 41 42

PP2467_K P2MM-NSM OMIT_SM PP 1 — BB_TO_XCVR_RFFE_DATA — 23 27

PP2468_K P2MM-NSM OMIT_SM PP 1 — BB_TO_XCVR_RFFE_CLK — 23 27

PP2469_K P2MM-NSM OMIT_SM PP 1 — XCVR_TO_BB_RFFE_DATA — 23 27

PP2470_K P2MM-NSM OMIT_SM PP 1 — XCVR_TO_BB_RFFE_CLK — 23 27

PP2471_K P2MM-NSM OMIT_SM PP 1 — SHIELD_RFFE_TX_SDATA

PP2472_K P2MM-NSM OMIT_SM PP 1 — SHIELD_RFFE_TX_SCLK

PP2473_K P2MM-NSM OMIT_SM PP 1 — XCVR_TO_FE_RX_RFFE_DATA — 27 33 34 35 36 41 42

PP2474_K P2MM-NSM OMIT_SM PP 1 — XCVR_TO_FE_RX_RFFE_CLK — 27 33 34 35 36 41 42

PP24K0_K P2MM-NSM OMIT_SM PP 1 — SHIELD_RFFE_TX_SDATA

PP24K1_K P2MM-NSM OMIT_SM PP 1 — SHIELD_RFFE_TX_SCLK

PP24K2_K P2MM-NSM OMIT_SM PP 1 — SHIELD_RFFE_TX_SDATA

PP24K3_K P2MM-NSM OMIT_SM PP 1 — SHIELD_RFFE_TX_SCLK

PCIE

PP2442_K P2MM-NSM OMIT_SM PP 1 — 90_PCIE_AP_TO_BB_TXD_P — 10 16 23

PP2443_K P2MM-NSM OMIT_SM PP 1 — 90_PCIE_AP_TO_BB_TXD_N — 10 16 23

PP2444_K P2MM-NSM OMIT_SM PP 1 — 90_PCIE_AP_TO_BB_REFCLK_P — 10 16 23

PP2445_K P2MM-NSM OMIT_SM PP 1 — 90_PCIE_AP_TO_BB_REFCLK_N — 10 16 23

PP24G2_K P2MM-NSM OMIT_SM PP 1 — BB_TO_PMU_PCIE_HOST_WAKE_L — 10 16 23

PP24G5_K P2MM-NSM OMIT_SM PP 1 — PCIE_BB_BI_AP_CLKREQ_L — 10 16 23

DIGRF

PP24B0_K P2MM-NSM OMIT_SM PP 1 — 90_DIGRF_LO_TX_P — 23 27

PP24B1_K P2MM-NSM OMIT_SM PP 1 — 90_DIGRF_LO_TX_N — 23 27

PP24B2_K P2MM-NSM OMIT_SM PP 1 — 90_DIGRF_LO_RX_P — 23 27

PP24B3_K P2MM-NSM OMIT_SM PP 1 — 90_DIGRF_LO_RX_N — 23 27

PP24B4_K P2MM-NSM OMIT_SM PP 1 — 90_DIGRF_HI_TX_P — 23 27

PP24B5_K P2MM-NSM OMIT_SM PP 1 — 90_DIGRF_HI_TX_N — 23 27

PP24B6_K P2MM-NSM OMIT_SM PP 1 — 90_DIGRF_HI_RX1_P — 23 27

PP24B7_K P2MM-NSM OMIT_SM PP 1 — 90_DIGRF_HI_RX1_N — 23 27

PP24D0_K P2MM-NSM OMIT_SM PP 1 — 90_DIGRF_HI_RX2_P — 23 27

PP24D1_K P2MM-NSM OMIT_SM PP 1 — 90_DIGRF_HI_RX2_N — 23 27

PP24D2_K P2MM-NSM OMIT_SM PP 1 — 90_DIGRF_HI_RX3_P — 23 27

PP24D3_K P2MM-NSM OMIT_SM PP 1 — 90_DIGRF_HI_RX3_N — 23 27

PP24D5_K P2MM-NSM OMIT_SM PP 1 — 90_DIGRF_HI_RX4_P — 23 27
SHIELD_RFFE_TX_SDATA-10[I120] 16 27 30 33 37 41

PP24D6_K P2MM-NSM OMIT_SM PP 1 — 90_DIGRF_HI_RX4_N — 23 27
SHIELD_RFFE_TX_SCLK-10[I120] 16 27 30 33 37 41

LO

HI

SMPS

PP24H1_K P2MM-NSM OMIT_SM PP 1 — VDD_SMPS1_0V9_COEX — 22

PP24H2_K P2MM-NSM OMIT_SM PP 1 — VDD_SMPS2_0V8_COEX — 22

PP24J3_K P2MM-NSM OMIT_SM PP 1 — VDD_SMPS3_1V3_COEX — 22

PP24H4_K P2MM-NSM OMIT_SM PP 1 — VDD_SMPS4_0V77_COEX — 22

PP24H5_K P2MM-NSM OMIT_SM PP 1 — VDD_SMPS5_1V0_COEX — 22

PP24H6_K P2MM-NSM OMIT_SM PP 1 — VDD_SMPS6_1V85_COEX — 22

GNSS

PP24E9_K P2MM-NSM OMIT_SM PP 1 — UART_BBPMU_TO_GNSS_1W — 21 26

PP24E4_K P2MM-NSM OMIT_SM PP 1 — GNSS_DWB_IRQ — 23 27

PP24A6_K P2MM-NSM OMIT_SM PP 1 — AP_TO_GNSS_TIME_MARK — 10 16 26

PP2419_K P2MM-NSM OMIT_SM PP 1 — GNSS_TO_BBPMU_LNA_EN — 21 26

BBPMU

PP24G6_K P2MM-NSM OMIT_SM PP 1 — BBPMU_TO_BB_PWRGOOD — 21 23

PP24G8_K P2MM-NSM OMIT_SM PP 1 — BBPMU_TO_BB_RESET_SD_L — 21 23

PP24F2_K P2MM-NSM OMIT_SM PP 1 — PMU_1PIN_BOOT_STRAP — 21

BB GPIOS

PP24C3_K P2MM-NSM OMIT_SM PP 1 — AP_TO_BB_COREDUMP_TRIG — 10 16 23

PP24F5_K P2MM-NSM OMIT_SM PP 1 — BB_RESET2_L_TEST — 23

PP24G4_K P2MM-NSM OMIT_SM PP 1 — BB_TO_BBPMU_STBY — 21 23

PP24H8_K P2MM-NSM OMIT_SM PP 1 — BB_DEBUG_ERROR — 23 41

AP PMU RAILS

PP2413_K P2MM-NSM OMIT_SM PP 1 — PP1V8_S2 — 10 16 19 41 42

PP2414_K P2MM-NSM OMIT_SM PP 1 — PP3V0_S2 — 10 16 19

DEBUG CONNECTOR

FLEX: 516S00037
MLB_BOT: 516S00038

NOSTUFF

J_DEBUG
BM28P0.6-44DS-0.35V
F-ST-SM

16 10 20	UART_GNSS_TO_AP_RXD	1	2	90_USB_BB_P	16 23
	NC	3	4	90_USB_BB_N	16 23
23 16	PP_1V8_BB_USB_VBUS	5	6	NC	
	NC	7	8	SIM1_RST	23 40
29 23 16 10	PCIE_AP_TO_BB_PERST_L	9	10	SIM2_CLK	23 39 40
21 16 10	PMU_TO_BBPMU_RESET_L	11	12	SIM1_DATA	23 40
26 16 10	UART_AP_TO_GNSS_TXD	13	14	NC	
41 23 16 10	AP_TO_BB_RESET_L	15	16	SIM1_DETECT	23 40
	NC	17	18	PP_VDD_SIM1	22 25 40
	ICE_DETECT_L	19	20	PP_VDD_SIM2	22 25 39 40
24 16 10	SWD_AOP_BI_BB_SWDIO	21	22	SIM2_DATA	23 39 40
	NC	23	24	SIM2_RST	23 39 40
41 23 16 10	AP_TO_BB_RESET_L	25	26	SIM2_DATA_R	39
26 16 10	UART_GNSS_TO_AP_CTS_L	27	28	NC	
27 16 10	UART_AP_TO_GNSS_RTS_L	29	30	UART_BB_DEBUG_TXD	23
	NC	31	32	SWD_JTAG_TCK_SWDCLK_R	24 29
42 41 19 16 10	PP1V8_S2	33	34	SIM2_DETECT	23 39 40
40 23	SIM1_CLK	35	36	UART_BB_DEBUG_RXD	23
26 21 16 10	PMU_TO_GNSS_EN	37	38	UART_COEX_WLAN_TO_BB_TXD	23 42
26 16 10	GNSS_TO_AP_LOW_PWR_IND	39	40	UART_COEX_BB_TO_WLAN_TXD	23 42
		41	42	NC	
	NC	43	44	NC	
42 30 22 16 10	PP_VDD_MAIN	47	48		

WLAN RFFE

PP24J0_K P2MM-NSM OMIT_SM PP 1 — XCVR_TO_FE_RX_RFFE_DATA — 27 33 34 35 36 41 42

PP24J1_K P2MM-NSM OMIT_SM PP 1 — XCVR_TO_FE_RX_RFFE_CLK — 27 33 34 35 36 41 42

PP24J2_K P2MM-NSM OMIT_SM PP 1 — PP_1V8_VIO — PP_1V8_VIO-10[I120] 16 27 30 33 34 35 36 41 42

PAGE TITLE: TEST POINTS

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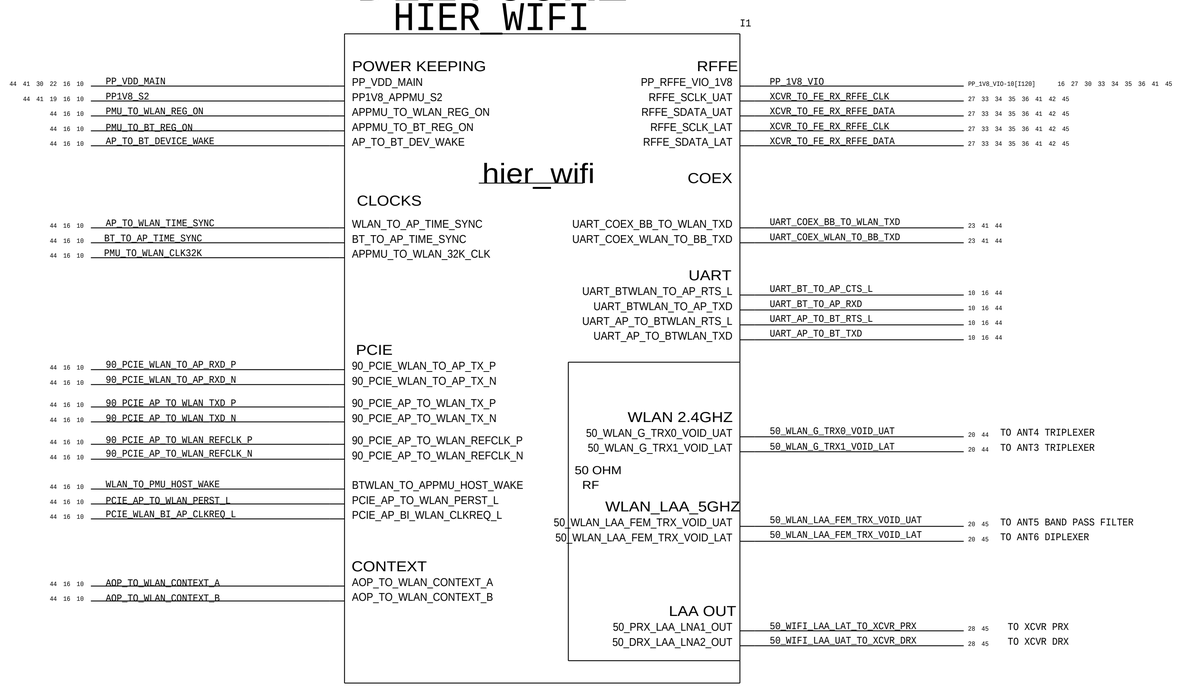
SYMBOL: WIFI

HIERARCHICAL SYMBOL FOR HIER_WIFI



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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

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44	2	DIETCOKE		
45	3	FEM MODULES		

WLAN SYMBOL IO PORTS

POWER
- 45 44 42 IO — PP_VDD_MAIN — VOLTAGE=3.8
- 45 44 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_PERST_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_UAT
- 44 42 IO — 50_WLAN_G_TRX1_VOID_LAT
- 45 42 IO — 50_WLAN_LAA_FEM_TRX_VOID_UAT
- 45 42 IO — 50_WLAN_LAA_FEM_TRX_VOID_LAT

RF
- 45 42 IO — 50_WIFI_LAA_LAT_TO_XCVR_PRX
- 45 42 IO — 50_WIFI_LAA_UAT_TO_XCVR_DRX

RFFE
- 45 42 IO — PP_1V8_VIO
- 45 42 IO — XCVR_TO_FE_RX_RFFE_CLK
- 45 42 IO — XCVR_TO_FE_RX_RFFE_DATA
- 45 42 IO — XCVR_TO_FE_RX_RFFE_CLK
- 45 42 IO — XCVR_TO_FE_RX_RFFE_DATA

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

SCHEMATIC APN: 051-02623

DRAWING TITLE: SCH,MLB,BOT,ICE,D33

Apple Inc.

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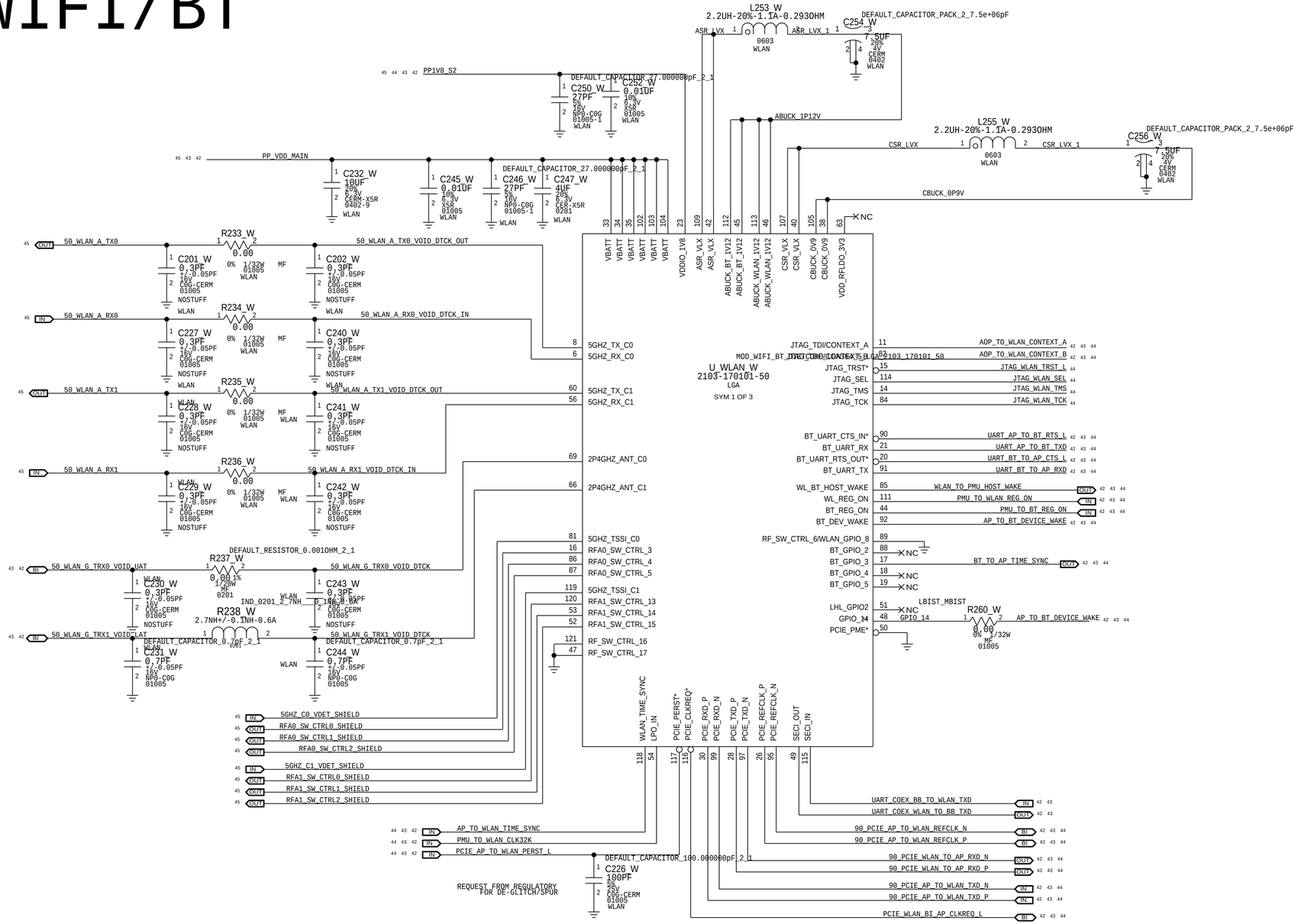
WIFI/BT



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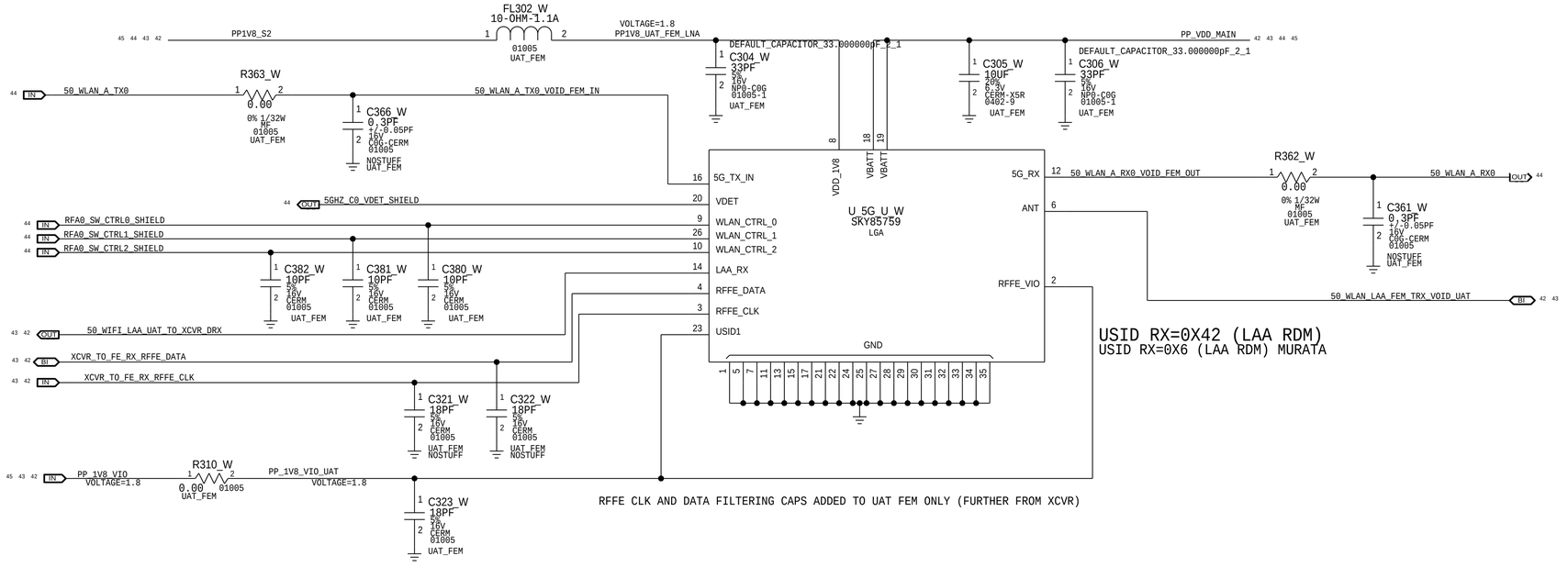
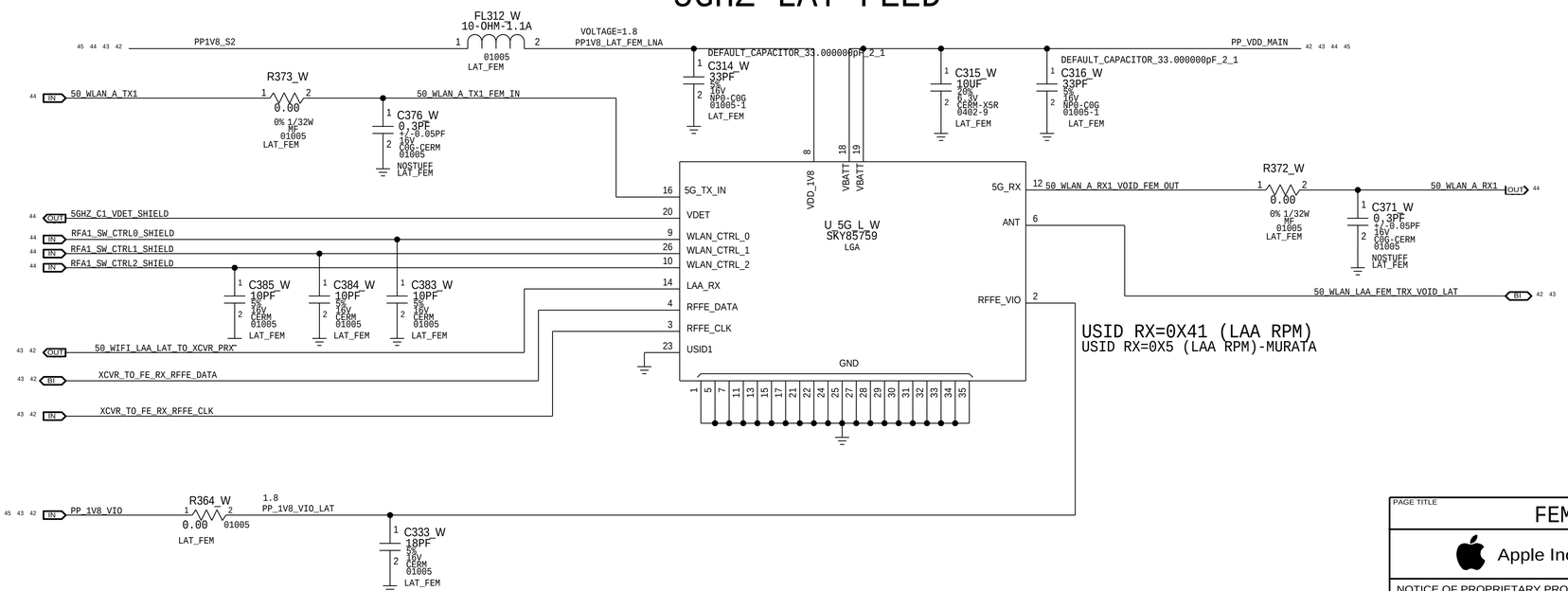
FEM MODULES

5GHZ UAT FEED



5GHZ LAT FEED



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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

HIER_NFC

LAST_MODIFICATION=Fri Mar 16 10:21:01 2018

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47	75	NFC		

47 10 IN PP_VDD_MAIN VOLTAGE=3.8
47 10 IN PP1V8_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 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

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
197S00076	197S00060	BOM_TABLE_ALTS	Y7500_S	XTAL,27P12 MHZ
197S00077	197S00060	BOM_TABLE_ALTS	Y7500_S	XTAL,27P12 MHZ

NFC: TABLE OF CONTENTS

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STOCKHOLM

NFC CONTROLLER

NFC FRONT END

PP7516_S P2MM-NSM SM 1 OMIT
46 10 PP1V8_NFC_S2
C7527_S 2.2UF 20% 6.3V X5R-CERM 0201 NFC
C7500_S 2.2UF 20% 6.3V X5R-CERM 0201 NFC
C7502_S 2.2UF 20% 6.3V X5R-CERM 0201 NFC

PP7512_S P2MM-NSM SM 1 OMIT
PP_VDD_NFC_AVDD VOLTAGE=1.8
C7505_S 2.2UF 20% 6.3V X5R-CERM 0201 NFC
C7522_S 100PF 5% 25V C0G-CERM 01005 NFC

PP7515_S P2MM-NSM SM 1 OMIT
47 PP_VDD_NFC_TVDD
PP7514_S P2MM-NSM SM 1 OMIT
47 PP_NFC_VDDBOOST
C7530_S 100PF 5% 25V C0G-CERM 01005 NFC
C7506_S 10UF 20% 10V X5R 0402 NFC
C7526_S 2.2UF 20% 6.3V X5R-CERM 0201 NFC
C7523_S 2.2UF 20% 6.3V X5R-CERM 0201 NFC
C7521_S 100PF 5% 25V C0G-CERM 01005 NFC
C7520_S 2.2UF 20% 6.3V X5R-CERM 0201 NFC

47 PP_VDD_MAIN_LS
PP_NFC_VDDC
PP_NFC_VDDNV
PP_NFC_VDDPLL
PP_NFC_VHV
PP_NFC_VREF
C7534_S 0.22UF 20% 6.3V X6S 01005-1 NFC
C7535_S 0.22UF 20% 6.3V X6S 01005-1 NFC
C7536_S 0.22UF 20% 6.3V X6S 01005-1 NFC
C7552_S 0.22UF 20% 6.3V X6S 01005-1 NFC
C7537_S 0.22UF 20% 6.3V X6S 01005-1 NFC
C7538_S 0.22UF 20% 6.3V X6S 01005-1 NFC

NC NC NC
B5 B6 B7 A6 A7 A8 E1 A3 H5 B1 C2 C1 C3 E5 B3 H2 H3 F1 H2 D2 G1
PMUVCC1 PMUVCC2 PMUVCC3 SMVCC1 SMVCC2 SMVCC3 VBAT VBATPWR VDDA VDDBOOST VDDC VDDCIN VDDIO VDDIO_SE VDDNV VDDPA VDDPLL VHV VREF VUP

U_NFC_S SN100VUK-B20148 WLCSP

	H8	NFC_CLK_REQ
47 46 10 IN	J8	NFC_DWL_REQ
47	E4	NFC_GPIO0
	F3	NFC_GPIO1
46 10 OUT	G6	NFC_GPIO2_AO
46 10 OUT	G5	NFC_GPIO3_AO
47 46 10 IN	F2	NFC_HSU_CTS
47 46 10 OUT	F5	NFC_HSU_RTS
47 46 10 IN	E3	NFC_HSU_RX
47 46 10 OUT	F4	NFC_HSU_TX
47 46 10 OUT	H7	NFC_IRQ
NC	A5	NFC_SIM_SWIO1
NC	B8	NFC_SIM_SWIO2
NC	C8	NFC_SIM_SWIO3
47 46 10 IN	G7	NFC_WKUP_REQ
	G3	NFC_CLK_32K
	H6	NFC_XTAL1
NC	B4	NFC_SIM_SWCTRL1
NC	C6	NFC_SIM_SWCTRL2
	J7	NFC_XTAL2
47	J5	RXP
47	J4	RXN
47	J1	TX1
47	J3	TX2
	G2	TXVCASC
	H1	TXVCM
47 46 10 IN	C4	VEN
	J6	VTUNE

DIG NFC | DIS SE | ANALOG SIGNAL

SE_GPIO0 F8 AP_TO_NFC_BUTTON IN 46
SE_GPIO1 D4 NC
SE_I2C_SCL G8 NC
SE_I2C_SDA F7 NC
SE_ISO_CLK D6 NC
SE_ISO_IO D7 NC
SE_ISO_RST D3 NC
SE_SPI_CLK E8 NC
SE_SPI_CS E6 NC
SE_SPI_MISO E7 NC
SE_SPI_MOSI D5 NC
BOOST_LX A1 PP_NFC_BOOST_LX

L7502_S 1UH-20%-2.1A-0.10HM PIWA2012FE-SM NFC
PP_VDD_MAIN_LS
C7511_S 15UF 20% 6.3V X5R 0402-1 NFC
PP_NFC_VDDBOOST
C7517_S 10UF 20% 10V X5R 0402 NFC
C7519_S 10UF 20% 10V X5R 0402 NFC
C7504_S 10UF 20% 10V X5R 0402 NFC

VSS_DIG VSS_DIG VSS_DIG VSS_NFC VSS_PA VSS_PLL VSS_PMU VSS_PWR VSS_PWR VSS_REF VSS_SUB VSS_SUB
C5 C7 D8 G4 J2 H4 D1 A2 B2 E2 A4 F6

C7539_S 0.22UF 20% 6.3V X5R 01005-1 NFC
C7540_S 0.22UF 20% 6.3V X5R 01005-1 NFC
C7553_S 0.1UF 20% 6.3V X5R-CERM 01005 NFC
47 PP_VDD_NFC_TVDD

47 NFC_RXP
R7508_S 560 1% 1/20W MF 201 NFC
NFC_RXP_CAP
C7507_S 1000PF 2% 25V C0G-NP0 0201 NFC

47 NFC_TXN
L7500_S 110NH-2.5%-1.5A-0.36OHM 0402 NFC
NFC_BAL1
C7510_S 1000PF 2% 25V C0G-NP0 0201 NFC
C7550_S 100PF 2% 50V C0G 0201 NFC

BAL1 3
UNBAL 4
BAL2 2
GND 1
SM ATB161006D-2001 L7500_S NFC

TP7503 TP-P55 NFC OMIT
C7514_S 470PF 2% 25V NP0-C0G 0201 NFC
NFC_ANT_MATCH
NFC_ANT
C7515_S 1000PF 2% 25V C0G-NP0 0201 NFC
C7516_S 1000PF 2% 25V C0G-NP0 0201 NFC
C7518_S 180PF 2% 50V NP0-C0G 0201 NFC
OUT 10 46
C7512_S 82PF 2% 50V NP0-C0G 0201 NFC
TP7507 TP-P55 NFC OMIT
MAKE_BASE=TRUE GND
TP7508 TP-P55 NFC OMIT

47 NFC_TXP
L7501_S 110NH-2.5%-1.5A-0.36OHM 0402 NFC
NFC_BAL2
C7513_S 1000PF 2% 25V C0G-NP0 0201 NFC
C7551_S 100PF 2% 50V C0G 0201 NFC

47 NFC_RXN
R7509_S 560 1% 1/20W MF 201 NFC
NFC_RXN_CAP
C7503_S 1000PF 2% 25V C0G-NP0 0201 NFC

PP7503_S P2MM-NSM SM 1 OMIT
47 46 10 UART_AP_TO_NFC_TXD
PP7504_S P2MM-NSM SM 1 OMIT
47 46 10 UART_NFC_TO_AP_RXD
PP7505_S P2MM-NSM SM 1 OMIT
47 46 10 UART_AP_TO_NFC_RTS_L
PP7506_S P2MM-NSM SM 1 OMIT
47 46 10 UART_NFC_TO_AP_CTS_L

PP7507_S P2MM-NSM SM 1 OMIT
47 46 10 NFC_TO_AOP_HOST_WAKE
PP7508_S P2MM-NSM SM 1 OMIT
47 46 10 PMU_TO_NFC_EN
PP7509_S P2MM-NSM SM 1 OMIT
47 46 10 AP_TO_NFC_DEV_WAKE
PP7510_S P2MM-NSM SM 1 OMIT
47 46 10 AP_TO_NFC_FW_DWLD_REQ

47 NFC_XTAL1
Y7500_S 1.20X1.00-SM 27.12MHZ-10PPM-6PF
47 NFC_XTAL2
C7542_S 8PF +/-0.1PF 16V NP0/C0G 01005
C7541_S 8PF +/-0.1PF 16V NP0/C0G 01005

47 NFC_TEST_OUT
TP7506 TP-P55 NFC OMIT

R7500_S 0.00 5% 1/10W MF 0201
46 10 PP_VDD_MAIN
U_NFC_LS FPF1204UCX WLCSP-COMBO
A2 VIN VOUT A1
B2 ON
GND B1
NOSTUFF
PP_VDD_MAIN_LS 47
C7554_S 0.22UF 20% 6.3V X5R 01005-1 NFC
47 46 10 PMU_TO_NFC_VDD_MAIN_EN
47 46 10 PMU_TO_NFC_VDD_MAIN_EN
PP7511_S P2MM-NSM SM 1 OMIT

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