CR-1 - APPLE LTR MLB(SCH,1):PAGE1

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

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

D21 MLB - DVT (0K2FAB)

版本

LAST_MODIFICATION=Tue Jun 6 18:57:04 2017

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2	2	SYSTEM: BOM TABLES (1/2)	sync	02/24/2017
3	3	SYSTEM: BOM TABLES (2/2)	test_mlb	03/17/2017
4	4	SYSTEM:MECH COMPONENTS	sync	04/14/2017
5	5	SYSTEM: Testpoints 测试点	sync	04/14/2017
6	6	BOOTSTRAPPING 主板版本配置	sync	09/19/2016
7	10	SOC: JTAG,USB,XTAL CPU的JTAG模块、USB模块、时钟电路	sync	04/14/2017
8	11	SOC: PCIE CPU的PCIE模块	sync	04/14/2017
9	12	SOC: MIPI + ISP CPU的MIPI总线(显示和前相头）和ISP_I2C总线	sync	04/14/2017
10	13	SOC: LPDP CPU的LPDP总线（后相头）	sync	04/14/2017
11	14	SOC: SERIAL + SMC CPU的串行总线（I2C总线）	sync	04/14/2017
12	15	SOC: GPIO + UART CPU可编程引起+UART总线	sync	04/14/2017
13	16	SOC: AOP **CPU内部集成的传感器模块（(协处理器)）**	sync	04/14/2017
14	17	SOC: Power (1/3) CPU的供电	sync	04/14/2017
15	18	SOC: Power (2/3) CPU的供电	sync	04/14/2017
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17	26	NAND 硬盘	sync	04/14/2017
18	27	SYSTEM POWER: PMU Bucks (1/4) 电源芯片的PWM供电输出	sync	04/14/2017
19	28	SYSTEM POWER: PMU Bucks (2/4) 电源芯片的PWM供电输出	sync	04/14/2017
20	29	SYSTEM POWER: PMU LDOs (3/4) 电源芯片的线性供电输出	sync	04/14/2017
21	30	SYSTEM POWER: PMU (4/4) 电源芯片的控制信号部分	sync	04/14/2017
22	31	SYSTEM POWER: Boost PP_VDD_BOOST “产生电路	sync	04/14/2017
23	32	SYSTEM POWER: B2B Battery 电池接口	sync	04/14/2017
24	33	SYSTEM POWER: Charger 充电芯片	sync	04/14/2017
25	34	SYSTEM POWER: Iktara 无线充电芯片	sync	04/14/2017
26	35	SYSTEM POWER: B2B Cyclone 无线充电接收电路	sync	04/14/2017
27	36	SENSORS 传感器	sync	04/14/2017
28	37	CAMERA: PMU (1/2) 摄像头的供电芯片	sync	04/14/2017
29	38	CAMERA: PMU (2/2) 摄像头的供电芯片	sync	04/14/2017
30	39	CAMERA: B2B Wide (KY) 后置摄像头接口（广角相头）	sync	04/14/2017
31	40	CAMERA: B2B Tele (TN) 后置摄像头接口（长焦相头）	sync	04/14/2017
32	41	CAMERA: Strobe Drivers 闪光灯驱动芯片	sync	04/14/2017
33	42	CAMERA: FCAM + FOREHEAD 前置摄像头，听筒，感光感距等	sync	04/14/2017
34	43	CAMERA: B2B Strobe + Buttons 闪光灯接口、按键、麦克风	sync	04/14/2017
35	47	AUDIO: CODEC (1/2) 大音频	sync	04/14/2017
36	48	AUDIO: CODEC (2/2) 大音频	sync	04/14/2017
37	49	AUDIO: Speaker Amp Bottom 小音频(铃声功放）	sync	04/14/2017
38	50	AUDIO: Speaker Amp Top 小音频（听筒功放）	sync	04/14/2017
39	51	ARC: Driver 振动芯片	sync	04/14/2017
40	55	CG: Niki M5500复合电感（充电升压电感、铃声功放升压、背光升压电感集成块）	sync	04/14/2017
41	56	CG: PMUs 显示触摸供电芯片、背光供电芯片、指纹升压芯片	sync	04/14/2017
42	57	CG: B2B DISPLAY + TOUCH 显示触摸连接座	sync	04/14/2017
43	58	CG: B2B ORB + MESA 返回触感和指纹连接座	sync	04/14/2017
44	59	I/O: Overvoltage Cut-Off Circuit 电池过充保护芯片	sync	04/14/2017
45	61	I/O: Accessory Buck 附件供电ACC3.3V供电芯片	sync	04/14/2017

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46	62	I/O: USB PD 快充芯片	sync	04/14/2017
47	63	I/O: Hydra USB芯片	sync	04/14/2017
48	64	I/O: B2B DOCK 尾插接口	sync	10/10/2016
49	65	SYSTEM: I2C MAP I2C总线列表	sync	04/14/2017
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57	5	BB: POWER 基带CPU供电		
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59	7	BB: GPIOS & QLINK 基带芯片		
60	8	XCVR 射频		
61	9	XCVR 射频		
62	10	QPOET MODULE 功放电源		
63	11	LB PAD 低频功放		
64	12	HB PAD 高频功放		
65	13	UHB PAD 超高频功放		
66	14	2G PA 2G功放		
67	15	LB DSM 低频分集接收器		
68	16	HB DSM 高频分集接收器		
69	17	COUPLER2 耦合器		
70	18	LOWER ANTENNA 天线		
71	19	UPPER ANTENNA 天线		
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73	21	SIM, DEBUG CONN SIM卡，诊断接口		
74	22	TEST POINTS 测试点	PROBE POINTS	07/18/2016
75	1	FRONT PAGE		
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80	4	Guinness WIFI、蓝牙	WIFI	11/28/2016
81	5	WiFiANTFeeds WIFI天线		11/28/2016

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
051-02159	1	SCH,MLB,D21	SCH	?
820-00846	1	PCBF,MLB,D21	PCB	?

Sub Designs

SOURCE PROJECT	SUB-DESIGN NAME	VERSION	HARD/SOFT	SYNC_DATE/TIME
D21	RADIO_MLB	0.122.0	S	2017_06_06_17:14:31
D20	NFC_MLB	0.50.0	S	2017_05_26_07:54:42
D21	WIFI_MLB	0.20.0	S	2017_05_16_02:56:32
D21	RADIO_MLB_FF	0.35.0	S	2017_06_02_14:56:02

SYNC_MASTER=sync | TABLE OF CONTENTS | SYNC_DATE=06/19/2016

DRAWING TITLE: SCH,MLB,D21

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DRAWING NUMBER: 051-02159 | SIZE: D

REVISION: 10.0.0

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EEEE Codes

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

SOC

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

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

SIPs

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

SOFT-TERM CAP SUB BOMS

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:	
685-00152	685-00151	BOM_TABLE_ALTS	SUBBOM_CAP	SUBBOM,MLB,CAP,SOFT,D21	
138S00049	138S0831	TYPICAL_CAP	ALL	CAP,0201,2.2UF,6.3V,KYOCERA	To enable alt in SUBBOM

	PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION	
	685-00151	1	SUBBOM,MLB,SOFT-TERM,D21	SUBBOM_CAP			Default is typical
AGNES OUTPUT	138S00159	9	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C2906,C2961,C2963,C2966,C2967,C2910-C2913		SOFT_CAP	
	138S0831	9	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C2906,C2961,C2963,C2966,C2967,C2910-C2913		TYPICAL_CAP	
AGNES INPUT	138S00159	15	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C2851-C2852,C2854-C2860,C2862-C2866,C2868		SOFT_CAP	
	138S0831	15	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C2851-C2852,C2854-C2860,C2862-C2866,C2868		TYPICAL_CAP	
	138S00159	10	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C2870-C2872,C2874-C2876,C2970,C2971,C2960,C2961		SOFT_CAP	
	138S0831	10	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C2870-C2872,C2874-C2876,C2970,C2971,C2960,C2961		TYPICAL_CAP	
T2	138S00159	2	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C3351,C3352		SOFT_CAP	
	138S0831	2	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C3351,C3352		TYPICAL_CAP	
SENSORS	138S00159	3	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C3602,C3611,C3622		SOFT_CAP	
	138S0831	3	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C3602,C3611,C3622		TYPICAL_CAP	
ANSEL INPUT	138S00159	5	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C3791,C3795-C3798		SOFT_CAP	
	138S0831	5	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C3791,C3795-C3798		TYPICAL_CAP	
RCAM B2Bs	138S00159	3	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C3909,C3925,C3926		SOFT_CAP	
	138S0831	3	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C3909,C3925,C3926		TYPICAL_CAP	
FOREHEAD B2Bs	138S00159	2	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C4250,C4261		SOFT_CAP	
	138S0831	2	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C4250,C4261		TYPICAL_CAP	
STROBE B2Bs	138S00159	1	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C4303		SOFT_CAP	
	138S0831	1	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C4303		TYPICAL_CAP	
AUDIO	138S00159	5	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C4805,C4809,C4914,C4926,C4929		SOFT_CAP	
	138S0831	5	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C4805,C4809,C4914,C4926,C4929		TYPICAL_CAP	
	138S00159	5	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C5016,C5018,C5134,C5629,C5136		SOFT_CAP	
	138S0831	5	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C5016,C5018,C5134,C5629,C5136		TYPICAL_CAP	
MOJAVE	138S00159	1	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C5611		SOFT_CAP	
	138S0831	1	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C5611		TYPICAL_CAP	
DISPLAY B2Bs	138S00159	4	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C5700,C5705,C5716,C5721		SOFT_CAP	
	138S0831	4	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C5700,C5705,C5716,C5721		TYPICAL_CAP	
ORB/WLAN B2Bs	138S00159	5	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C5802-C5804,C5811,C5880		SOFT_CAP	
	138S0831	5	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C5802-C5804,C5811,C5880		TYPICAL_CAP	
MAMBA LDO	138S00159	1	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C5890		SOFT_CAP	
	138S0831	1	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C5890		TYPICAL_CAP	
ACC BUCK OUTPUT	138S00159	5	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C6320,C6321,C6322,C6323,C6324		SOFT_CAP	
	138S0831	5	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C6320,C6321,C6322,C6323,C6324		TYPICAL_CAP	
	138S00160	4	CAP,SOFT-TERM,10UF,10V,0402,MURATA	C4907,C4903,C4904,C4931		SOFT_CAP	
	138S0979	4	CAP,TYPICAL,10UF,10V,0402,MUR/KYO	C4907,C4903,C4904,C4931		TYPICAL_CAP	
CHESTNUT LDO	138S00160	5	CAP,SOFT-TERM,10UF,10V,0402,MURATA	C5600,C5602,C5603,C5702,C5703		SOFT_CAP	
	138S0979	5	CAP,TYPICAL,10UF,10V,0402,MUR/KYO	C5600,C5602,C5603,C5702,C5703		TYPICAL_CAP	
RCAM (TELE)	138S00159	2	CAP,SOFT-TERM,2.2uF,6.3V,0201,KYOCERA	C4025,C4026		SOFT_CAP	D21x Specific
	138S0831	2	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C4025,C4026		TYPICAL_CAP	D21x Specific

IKTARA DIODES SUB BOMS

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

#31526972: Update Iktara Diodes APNs

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

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NAND BOM Options

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

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
335S00284	335S00287	BOM_TABLE_ALTS	U2600	T,1z,ULTIMATE
335S00285	335S00287	BOM_TABLE_ALTS	U2600	T,BiCS3,ULTIMATE
335S00288	335S00287	BOM_TABLE_ALTS	U2600	S,BiCS3,ULTIMATE
335S00286	335S00287	BOM_TABLE_ALTS	U2600	SS,3Dv4,ULTIMATE
335S00228	335S00240	BOM_TABLE_ALTS	U2600	T,BiCS3,EXTREME
335S00247	335S00240	BOM_TABLE_ALTS	U2600	S,BiCS3,EXTREME
335S00276	335S00240	BOM_TABLE_ALTS	U2600	SS,3Dv4,EXTREME

Isolator Switch

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

Mamba LDO

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

Load Switch

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
353S00999	353S01039	BOM_TABLE_ALTS	U6100	TI,LOAD SW,TPS22915C
353S01007	353S01039	BOM_TABLE_ALTS	U6100	ONSEMI,LOAD SW,NCP333

Crystal Alts

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
197S0612	197S00118	BOM_TABLE_ALTS	Y1000	NDK,XTAL,24MHz,1.6x1.2
197S00120	197S00118	BOM_TABLE_ALTS	Y1000	EPSON,XTAL,24MHz,1.6x1.2

CRITICAL PART#	COMMENT
197S00118	XTAL, 24M, 1612, TDK
197S0612	XTAL, 24M, 1612, NDK
197S00120	XTAL, 24M, 1612, EPSON

PMID1 Zener Diode

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
371S00121	371S00030	BOM_TABLE_ALTS	DZ3300	DIODE,ZENER,20V

ZRB Caps

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
138S0683	1	1uF,25V,0402,X5R,10%	C3301	CRITICAL	COMMON

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

Global R/C Alternates

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
118S0764	118S0717	BOM_TABLE_ALTS	ALL	RES, 3.92K, 0.1%, 0201
138S0648	138S0652	BOM_TABLE_ALTS	ALL	CAP,X5R,4.7UF,6.3V,0.65MM,0402,TAIYO
138S00024	138S0986	BOM_TABLE_ALTS	ALL	CAP,CER,5UF,20%,10V,X5R,0201,MURATA
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,TAIYO
132S0436	132S0400	BOM_TABLE_ALTS	ALL	CAP,CER,X5R,0.22UF,20%,6.3V,01005
138S00133	138S00128	BOM_TABLE_ALTS	ALL	CAP,CER,X5R,0.47UF,20%,6.3V,01005
138S00148	138S00150	BOM_TABLE_ALTS	ALL	CAP,0402,15UF,4V,KYOCERA
138S00149	138S00150	BOM_TABLE_ALTS	ALL	CAP,0402,14UF,4V,MURATA
138S00151	138S00150	BOM_TABLE_ALTS	ALL	CAP,0402,15UF,4V,TAIYO
138S00144	138S00143	BOM_TABLE_ALTS	ALL	CAP,0402,26UF,4V,MURATA
138S00143	138S00144	BOM_TABLE_ALTS	ALL	CAP,0402,22UF,4V,KYOCERA
138S00139	138S00138	BOM_TABLE_ALTS	ALL	CAP,0201,4UF,4V,MURATA
138S00138	138S00139	BOM_TABLE_ALTS	ALL	CAP,0201,4.7UF,4V,KYOCERA
138S00145	138S00146	BOM_TABLE_ALTS	ALL	CAP,0402,20UF,6.3V,KYOCERA
138S00141	138S00140	BOM_TABLE_ALTS	ALL	CAP,0201,4UF,6.3V,MURATA
138S00142	138S00140	BOM_TABLE_ALTS	ALL	CAP,0201,3UF,6.3V,SAMSUNG
138S00142	138S00141	BOM_TABLE_ALTS	ALL	CAP,0201,3UF,6.3V,SAMSUNG
138S00049	138S0831	BOM_TABLE_ALTS	ALL	CAP,0201,2.2UF,6.3V,KYOCERA
138S00163	138S00143	BOM_TABLE_ALTS	ALL	CAP,0402,22UF,4V,TY
138S00164	138S00138	BOM_TABLE_ALTS	ALL	CAP,0201,4UF,4V,TY
138S00165	138S00146	BOM_TABLE_ALTS	ALL	CAP,0402,20UF,6.3V,TY
138S00166	138S00140	BOM_TABLE_ALTS	ALL	CAP,0201,4UF,6.3V,TY
138S00140	138S00141	BOM_TABLE_ALTS	ALL	CAP,0201,4UF,6.3V,KYO
138S00048	138S00003	BOM_TABLE_ALTS	ALL	CAP,Y5R,15UF,6.3V,0.85MM,0402,KYO
132S0639	132S00088	BOM_TABLE_ALTS	ALL	CAP,Y5R,0.47UF,25V,0.78MM,0201,MLR

CRITICAL PART#	COMMENT
118S0717	RES, 3.92K, 0.1%, 0201
138S0652	CAP,X5R,4.7UF,6.3V,0.65MM,0402
138S0706	CAP,CER,X5R,1UF,20%,6.3V,0201
132S0400	CAP,CER,X5R,0.22UF,20%,6.3V,01005
138S0831	CAP,CER,X5R,2.2UF,20%,6.3V,0201
138S00128	CAP,CER,X5R,0.47UF,20%,6.3V,01005

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

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

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

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

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

Global Ferrites Alternates

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
155S0581	155S00067	BOM_TABLE_ALTS	ALL	FERR, 240OHM, 0.38OHM DCR, 0201
155S00194	155S0610	BOM_TABLE_ALTS	ALL	FERR BD, 150OHM, TDK
155S00200	155S0610	BOM_TABLE_ALTS	ALL	FERR BD, 150OHM, TY
152S00558	152S00557	BOM_TABLE_ALTS	ALL	IND,0.47UH,20%,2.5A,80MO,1608,TY
152S00655	152S00656	BOM_TABLE_ALTS	ALL	IND,MLD,1.0UH,20%,3A,80MO,H=0.65,2016,TY
152S00653	152S00651	BOM_TABLE_ALTS	ALL	IND,MLD,1.2UH,2.8A,100MO
152S00654	152S00652	BOM_TABLE_ALTS	ALL	IND,MLD,1.2UH,3A,72MO,H=0.8MM,2016,CTH
155S00012	155S00168	BOM_TABLE_ALTS	ALL	FLTR, 65 OHMS, 0605
BUCK0 Slave 152S00710	152S00617	BOM_TABLE_ALTS	ALL	IND,0.1UH,29MOHM,6.1A,1608,H=.65
BUCK1 Slave 152S00711	152S00619	BOM_TABLE_ALTS	ALL	IND,0.1UH,21MOHM,7.2A,2012,H=.65
152S00713	152S00621	BOM_TABLE_ALTS	ALL	IND,0.47UH,35MOHM,3.5A,2012,H=.65
BUCK8/9/10 152S00714	152S00622	BOM_TABLE_ALTS	ALL	IND,1UH,100MOHM,2.1A,2012,H=.65
Ansel L 152S00716	152S00626	BOM_TABLE_ALTS	ALL	IND,1UH,70MOHM,2.5A,2012,H=.80
BUCK0/2/4/11 Master 152S00717	152S00631	BOM_TABLE_ALTS	ALL	IND,1UH,66MOHM,3.2A,2016,H=.80
BUCK5/7 152S00718	152S00632	BOM_TABLE_ALTS	ALL	IND,1UH,52MOHM,3.2A,2016,H=.80
BUCK1 Slave 152S00719	152S00639	BOM_TABLE_ALTS	ALL	IND,0.47UH,55MOHM,3.0A,2012,H=.65
Boost Alt 152S00720	152S00640	BOM_TABLE_ALTS	ALL	IND,0.47UH,55MOHM,3.0A,2012,H=.65
BUCK1 Master 152S00721	152S00641	BOM_TABLE_ALTS	ALL	IND,1UH,60MOHM,3.6A,2016,H=.80
155S00338	155S0661	BOM_TABLE_ALTS	ALL	FERR BD,330HM,1.5A,55MOHM DCR,0201
155S00340	155S0876	BOM_TABLE_ALTS	ALL	FERR BD,180HM,1.5A,50MOHM DCR,0100S
155S00339	155S0660	BOM_TABLE_ALTS	ALL	FERR BD,220HM,1.8A,40MOHM DCR,0201

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

CRITICAL PART#	COMMENT
152S00617	IND,MLD,0.1UH,20%,6.1A,29MOHM,H=.65,1608
152S00620	IND,MLD,0.1UH,20%,7.2A,17MOHM,H=0.8,2012
152S00621	IND,MLD,0.47UH,20%,3.5A,53MO,H=.65,2012
152S00622	IND,MLD,1.0UH,20%,2.1A,100MO,H=.65,2012
152S00626	IND,MLD,1.5UH,20%,1.1A,160MO,H=.65,2012
152S00631	IND,MLD,1.0UH,20%,2.5A,78MO,H=0.8,2012
152S00632	IND,MLD,1.0UH,20%,3.2A,60MO,H=0.8,2016
152S00640	IND,MLD,0.47UH,3.8A,55MO,H=0.65MM,2012
152S00641	IND,MLD,0.47UH,4A,48MO,H=0.8MM,2012
152S00623	IND,MLD,1UH,3.6A,60MO,H=0.8MM,2016
152S00651	IND,1.2UH, 3A, 2016, 0.65Z
152S00650	IND,0.47UH,6.6A,3225,0.8Z

Multi-Vendor Criticals

CRITICAL PART#	COMMENT
377S0106	SUPPR,TRANS,VARISTOR,12V,33PF,01005
197S0446	XTAL,24MHZ,30PPM,9.5PF,60 OHM MAX,1612
155S0576	FERR BD,10 OHM,50%,750MA,0.07 DCR,01005
155S00168	FLTR,NOISE,65 OHMZ,3.4OHM,0.7-2GHZ,0605
138S0979	CAP,CER,X5R,10UF,20%,10V,0402,H=0.65MM
138S0692	CAP,CER,X5R,1UF,20%,6.3V,0201
138S0683	CAP,CER,X5R,1UF,10%,25V,0402
138S0652	CAP,CER,X5R,4.7UF,20%,6.3V,H=0.65MM,0402
138S00070	CAP,X5R,4.7UF,20%,25V,0402
138S00014	CAP,CER,1UF,20%,16V,X5R,0201,H=0.39MM
132S0664	CAP,CER,0.047UF,10%,25V,X5R,0201
132S0663	CAP,CER,X5R,1UF,10%,25V,0402
132S0534	CAP,CER,X5R,0.1UF,10%,25V,0201
132S0436	CAP,CER,X5R,0.22UF,20%,6.3V,01005
132S0396	CAP,CER,X5R,1000PF,10%,10V,01005
132S0316	CAP,CER,X5R,0.1UF,20%,6.3V,01005
132S0304	CAP,CER,X5R,0.22UF,20%,6.3V,0201
132S0296	CAP,CER,X5R,1000PF,10%,6.3V,01005

CRITICAL PART#	COMMENT
132S0288	CAP,CER,X5R,0.1UF,10%,16V,0201
132S0275	CAP,CER,X5R,470PF,10%,10V,01005
132S0249	CAP,CER,X7R,220PF,10%,10V,01005
132S0245	CAP,CER,X5R,0.01UF,10%,6.3V,01005
132S00093	CAP,X5R,0.022UF,20%,6.3V,01005
132S00025	CAP,CER,X5R,0.047UF,20%,6.3V,01005
132S00008	CAP,CER,0.1UF,10%,50V,X7R,0402
131S0883	CAP,CER,NP0/C0G,220PF,2%,50V,0201
131S0804	CAP,CER,27PF,5%,C0G,25V,0201
131S0307	CAP,CER,NP0/C0G,100PF,5%,16V,01005
131S0225	CAP,CER,NP0/C0G,15PF,5%,16V,01005
131S0223	CAP,CER,NP0/C0G,27PF,5%,16V,01005
131S0220	CAP,CER,NP0/C0G,12PF,5%,16V,01005
131S0216	CAP,CER,NP0/C0G,47PF,5%,16V,01005
131S00053	CAP,CER,C0G,220PF,5%,10V,01005
118S00068	RES,MF,1.3 MOHM,1%,200PPM,1/20W,0201
117S0055	RES,MF,1/20W,2M OHM,5,0201,SMD
107S0257	THERMISTOR,NTC,10K OHM,1%,B=3435,01005

PAGE TITLE

SYSTEM: BOM TABLES (2/2)

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Current as of D21 MCO 056-03352 REV 42

radio_mlb_ff: AGND_RF
radio_mlb_ff: SUAT1_KF
radio_mlb_ff: SUAT2_RF

BS0407
STDOFF-2.6OD1.6ID-0.96H-TH

BS0401
STDOFF-2.6OD1.6ID-0.96H-TH

BS0402
STDOFF-2.56OD1.4ID0.99H-SM

BS0403
STDOFF-2.9OD0.81H-SM1

CHASSIS_GND_BS401
CHASSIS_GND_BS402
CHASSIS_GND_BS403

Changed to 860-00746 in P2

NORTH_SCREW_EXPOSED

#25046211

C0413 220PF 5% 10V C0G-CERM 01005
C0414 56PF 5% 25V NP0-C0G-CERM 01005
C0415 18PF 2% 16V CERM 01005
C0416 4PF +/-0.1PF 16V NP0-C0G 01005

CHASSIS_GND_BS401
C0401 220PF 5% 10V C0G-CERM 01005
C0402 220PF 5% 10V C0G-CERM 01005
C0403 100PF 5% 16V NP0-C0G 01005
C0404 56PF 5% 25V NP0-C0G-CERM 01005
C0405 18PF 2% 16V CERM 01005
C0406 4PF +/-0.1PF 16V NP0-C0G 01005

CHASSIS_GND_BS402
C0407 220PF 5% 10V C0G-CERM 01005
C0408 220PF 5% 10V C0G-CERM 01005
C0409 100PF 5% 16V NP0-C0G 01005
C0410 56PF 5% 25V NP0-C0G-CERM 01005
C0411 18PF 2% 16V CERM 01005
C0412 4PF +/-0.1PF 16V NP0-C0G 01005

CHASSIS_GND_BS403
C0417 220PF 5% 10V C0G-CERM 01005
C0418 220PF 5% 10V C0G-CERM 01005
C0419 100PF 5% 16V NP0-C0G 01005
C0420 56PF 5% 25V NP0-C0G-CERM 01005
C0421 18PF 2% 16V CERM 01005
C0422 4PF +/-0.1PF 16V NP0-C0G 01005

Front Shields

SH0401 SM
SHIELD-FRONT-UPPER-D21

SH0403 SM
SHIELD-LOWER-FRONT-D21

Back Shields

SH0400 SM
SHIELD-SOFT-UPPER-BACK-D21

SH0402 SM
SHIELD-SOFT-LOWER-BACK-D21

BS0405
STDOFF-2.57OD1.43ID-0.899H-SM

BS0404
STDOFF-2.57OD1.43ID-0.899H-SM

ZT0408
2.50R1.70-NSP

BS0406
STDOFF-2.6OD0.869H-TH

FIDUCIALS

FD0401 FID 0P5SM1P0SQ-NSP ROOM=ASSEMBLY
FD0402 FID 0P5SM1P0SQ-NSP ROOM=ASSEMBLY
FD0403 FID 0P5SM1P0SQ-NSP ROOM=ASSEMBLY
FD0404 FID 0P5SQ-SMP3SQ-NSP ROOM=ASSEMBLY
FD0405 FID 0P5SQ-SMP3SQ-NSP ROOM=ASSEMBLY
FD0406 FID 0P5SQ-SMP3SQ-NSP ROOM=ASSEMBLY
FD0407 FID 0P5SQ-SMP3SQ-NSP ROOM=ASSEMBLY
FD0408 FID 0P5SQ-SMP3SQ-NSP ROOM=ASSEMBLY
FD0409 FID 0P5SQ-SMP3SQ-NSP ROOM=ASSEMBLY
FD0412 FID 0P5SQ-SMP3SQ-NSP ROOM=ASSEMBLY
FD0410 FID 0P5SM1P0SQ-NSP ROOM=ASSEMBLY
FD0411 FID 0P5SM1P0SQ-NSP ROOM=ASSEMBLY

TOP SIDE

PAGE TITLE: SYSTEM:MECH COMPONENTS

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Test Points

POWER

- TP0520 — POWER GROUND
- PP_VBUS1_E75 — TP0521 — VBUS1
- TP0527
- 无线充电到充电芯片的充电电压
- PP_VBUS2_IKTARA — TP0541 — VBUS2
- PP_BATT_VCC — TP0515 — VBATT
- TP0522
- PP_VDD_MAIN — TP0525 — VDD_MAIN
- TP0526
- FD0500 FID 0P5SM1P0SQ-NSP
- TP0528 — LVCC TP
- OMIT XW0520 ROOM=SOC SHORT-20L-0.05MM-SM
- LVCC_CPU_GND — TP0529 — LVCC GROUND
- IKTARA_COIL1_CONN — TP0523 — CALLISTO
- IKTARA_COIL2_CONN — TP0524

DFU

- 电源和USB到CPU的强制DFU信号
- PMU_HYDRA_TO_AP_FORCE_DFU — TP0514 — FORCE DFU
- DFU_STATUS — PP0504

E75

- 90_HYDRA_DP1_CONN_P — TP0502
- 90_HYDRA_DP1_CONN_N — TP0503
- 90_HYDRA_DP2_CONN_P — TP0504
- 90_HYDRA_DP2_CONN_N — TP0505
- PP_HYDRA_ACC1_CONN — TP0506 — ACCESSORY ID AND POWER
- PP_HYDRA_ACC2_CONN — TP0507
- TP0516 — TP IS TO HELP WITH USB SI IN THE FACTORY FIXTURE.
- HYDRA_CON_DETECT_CONN_L — TP0508 — FOR DIAGS

AMUX

- PMU_AMUX_AY — TP0513 — ANALOG MUX A OUTPUT
- FD0501 FID 0P5SM1P0SQ-NSP
- PMU_AMUX_BY — ANALOG MUX B OUTPUT — Note: Fiducial used as test point

MOJAVE

- MESA_TO_BOOST_EN_CONN — TP0500
- PP16V0_MESA_CONN — TP0501

LCM

- PP_DISPLAY_BL12_CAT1_CONN — TP0530 — LCM BACKLIGHT SINK1
- PP_DISPLAY_BL12_CAT2_CONN — TP0531 — LCM BACKLIGHT SINK2
- PP_DISPLAY_BL12_ANODE_CONN — TP0532 — LCM BACKLIGHT SOURCE
- PP_DISPLAY_BL34_CAT1_CONN — TP0533 — LCM BACKLIGHT SINK3
- PP_DISPLAY_BL34_CAT2_CONN — TP0534 — LCM BACKLIGHT SINK4
- PP_DISPLAY_BL34_ANODE_CONN — TP0535 — LCM BACKLIGHT SOURCE (3/4)

SENSE TP

- OMIT XW0540 SHORT-28L-0.05MM-SM ROOM=SOC
- AP_GPU_GND_SENSE — TP0540 — GPU GROUND SENSE

Sensor SPI

- SPI_AOP_TO_IMU_SCLK — PP0540
- SPI_AOP_TO_IMU_MOSI — PP0541
- SPI_IMU_TO_AOP_MISO — PP0542
- SPI_AOP_TO_COMPASS_CS_L — PP0543
- COMPASS_TO_AOP_INT — PP0544
- PHOSPHORUS_TO_AOP_INT — PP0545

Probe Points

SOC Debug

- AP_TO_PMU_TEST_CLKOUT — PP0500
- BOARD_ID0 — PP0501
- AP_DEBUG3 — PP0503

SOC CPU/GPU

- BUCK1_FB
- Per #27963227: BUCK1 is GPU. Change to BUCK1_FB to save 1 via in layout
- OMIT XW0510 ROOM=SOC SHORT-20L-0.05MM-SM
- BUCK1_FB — PP_GPU_LVCC — TP0510
- OMIT XW0511 ROOM=SOC SHORT-20L-0.05MM-SM
- PP_CPU_PCORE — PP_CPU_PCORE_LVCC — TP0511
- AP_CPU_PCORE_SENSE — PP0512
- AP_VDD_GPU_SENSE — PP0513
- TP_SOC_SENSE — PP0514
- TP_VSS_CPU_SENSE — PP0515
- TP_VSS_SENSE — PP0516

PMU Debug

- AOP_TO_DDR_SLEEP1_READY — PP0520
- SPMI_PMU_BI_PMGR_SDATA — PP0521
- #29098531:GPU THROTTLE
- PMU_TO_AP_THROTTLE_GPU1_L — PP0522
- #29282469:SOCHOT
- AP_TO_PMU_SOCHOT_L — CPU到电源重启复位信号（温控） — PP0523
- #29162687:CODEC BCLK
- I2S_CODEC_ASP1_TO_AOP_AMPS_BCLK_R — PP0524
- #29794618:CCG2
- CCG2_TO_SMC_INT_L — 快充芯片到CPU的中断信号 — PP0525
- HYDRA
- HYDRA_TO_TIGRIS_VBUS1_VALID_L — PP0550

PCIE Refclk

- 90_PCIE_AP_TO_NAND_REFCLK_P — PP0530
- 90_PCIE_AP_TO_NAND_REFCLK_N — PP0531

SOC DDR

- TP_VDD_DCS_SENSE — PP0508
- TP_DDR_VSS_SENSE — PP0509
- TP_VDDQL_SENSE — PP0510

NAND Debug

- SWD_AP_BI_NAND_SWDIO — PP0560
- SWD_AOP_TO_MANY_SWCLK — PP0561
- SPI_S4E_TO_AP_MISO_BOOT_CONFIG2 — PP0562
- NAND_ANI1_VREF — PP0563
- NAND_ANI0_VREF — PP0564

BB UAT Debug

- PP3V0_S2 — PP0580
- PP1V8_S2 — 电源输出的1.8V供电 — PP0581
- UAT_TUNER_RFFE_CLK — PP0582
- UAT_TUNER_RFFE_DATA — PP0583

BACKLIGHT Debug

- DWI_PMGR_TO_BACKLIGHT_DATA — PP0590
- DWI_PMGR_TO_BACKLIGHT_CLK — PP0591

RF Debug

- WLAN_TO_AP_TIME_SYNC — PP0595
- AP_TO_NFC_FW_DWLD_REQ — PP0596

PAGE TITLE: SYSTEM: Testpoints

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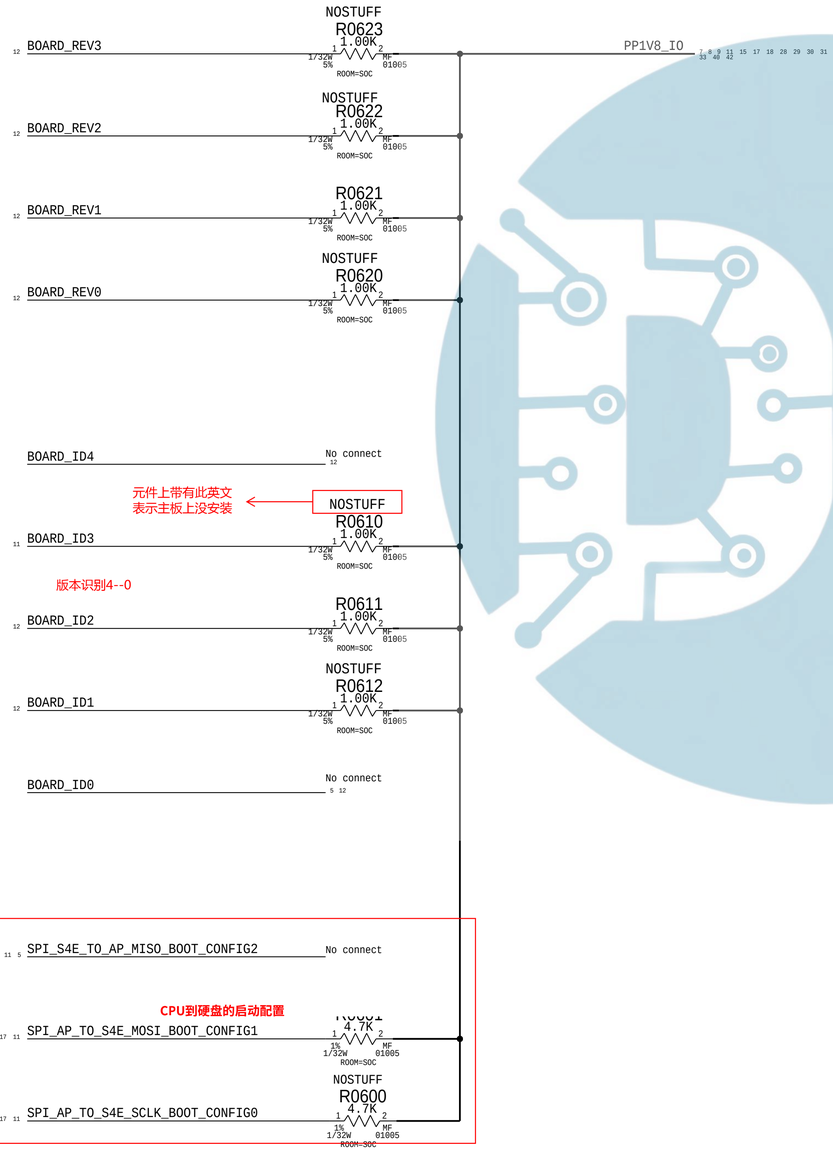
BOOTSTRAPPING:BOARD REV
BOARD ID
BOOT CONFIG



此位置上有安装的电阻不多掉件，可直连，掉件会引起自动DFU模式，型号识别不对,或识别不出型号

元件上带有此英文表示主板上没安装

版本识别4--0

CPU到硬盘的启动配置

#30903807:Nostuff R0600 to move to PoR BOOT_CONFIG

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

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

Note: Future board revs TBD

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

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

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

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

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

SYNC_MASTER=sync SYNC_DATE=09/19/2016

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SOC - USB, JTAG, XTAL

VDD18_XTAL:1.62-1.98V @ 2mA MAX
VDD18_USB: 1.62-1.98V @ 20mA MAX

PP1V8_IO 6 8 9 11 15 17 18 28 29 30 31 33 40 42
电源输出的1.8V供电
供给内部时钟模块和USB模式

C1090 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC
FL1092 2400HM-25%-0.2A-0.9OHM 01005 ROOM=SOC
PP1V8_XTAL
C1092 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC
C1093 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=SOC

3.14-3.46V @ 12mA MAX
PP3V3_USB 20
CPU内部USB模块所需的3.3V供电
C1095 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

0.765V - 0.84V @ 5mA MAX
PP0V8_SOC_FIXED_S1 8 9 10 14 15 18
CPU0.8V核心供电

U1000 TMIT78B1-C5 WLCSP SYM 1 OF 16 ROOM=SOC CRITICAL OMIT_TABLE

CPU

VDD12_UH1_HSIC0 AT7
VDD18_USB AP14
VDD18_XTAL AU28
VDD33_USB AN14
VDD_FIXED_USB AN15

NC BA4 UH1_HSIC0_DATA
NC AY4 UH1_HSIC0_STB

ANALOGMUX_OUT AT27 AP_TO_PMU_AMUX_OUT OUT 21
CPU到电源芯片模拟复用信号输出

USB_DP AY6 90_USB_AP_DATA_P BI 47
USB_DM BA6 90_USB_AP_DATA_N BI 47
USB到CPU数据线

USB_VBUS AV7 USB_VBUS_DETECT IN 24
USB插入检测

USB_ID AW6 NC

USB_REXT AU8
USB Reference
USB基准电源
AP_USB_REXT
R1000 200 1% 1/32W MF 01005 ROOM=SOC

CPU_TRIGGER0 AT22 PMU_TO_AP_THROTTLE_PCORE_L IN 21
CPU_TRIGGER1 AW21 PMU_TO_AP_THROTTLE_ECORE_L IN 21
GPU_TRIGGER0 AD2 PMU_TO_AP_THROTTLE_GPU0_L IN 21
GPU_TRIGGER1 AD3 PMU_TO_AP_THROTTLE_GPU1_L IN 5 21
PMU到CPU节能调节控制信号

SOCHOT1 A30 AP_TO_PMU_SOCHOT_L OUT CPU到电源重启复位信号（温控）
DROOP B31 PMU_TO_AP_PRE_UVLO_L IN 电源到CPU低压锁定信号
WDOG AW5 AP_TO_PMU_WDOG_RESET OUT CPU到电源看门狗信号。

XI0 BA28 XTAL_AP_24M_IN
XO0 BA27 XTAL_AP_24M_OUT
CPU 24M时钟输入

#31656746: Update 24MHz XTAL APNs
NOSTUFF R1010 511K 1% 1/32W MF 01005 ROOM=SOC
R1011 1.00K 1% 1/32W MF 01005 ROOM=SOC
SOC_24M_O
Y1000 24MHZ-30PPM-9.5PF-60OHM 1.60X1.20MM-SM CRITICAL ROOM=SOC
24M 晶振
C1010 12PF 5% 16V CERM 01005 ROOM=SOC
C1011 12PF 5% 16V CERM 01005 ROOM=SOC

MAKE_BASE=TRUE GND AT8 JTAG_SEL
NC AV6 JTAG_TRST*
NC AT9 JTAG_TDO
NC AT12 JTAG_TDI
JTAG_TMS AT10
JTAG_TCK AT13

CPU到USB的SWD总线
47 BI SWD_DOCK_BI_AP_SWDIO
47 IN SWD_DOCK_TO_AP_SWCLK

R1020 10K 5% 1/32W MF 01005 ROOM=SOC
电源发出CPU的复位信号
21 IN PMU_TO_SYSTEM_COLD_RESET_L
PMU_TO_SYSTEM_COLD_RESET_R_L CPU复位信号 AU7 COLD_RESET*
47 41 21 IN PMU_TO_AP_HYDRA_ACTIVE_READY 电源到USB准备就绪启动信号 CFSB
电源发出CPU的复位信号 AV5 CFSB_AON
CPU到电源芯片测试时钟输出 OUT AP_TO_PMU_TEST_CLKOUT V2 TST_CLKOUT
CPU发给硬盘的复位信号 OUT AP_TO_NAND_RESET_L AF34 SSD_RESET*
CPU发给硬盘的启动信号 OUT AP_TO_NAND_FW_STRAP AG38 SSD_BFH
MAKE_BASE=TRUE GND W5 HOLD_RESET
GND W4 TESTMODE

看门狗信号。在电源内部集成一个定时器，比如定时两秒钟，两秒钟内CPU会发出一个清零从头开始的信号（也就是所谓的喂狗），如果CPU运算错误死机了没发出清零信号，2秒钟后电源就会重新启动，就是一个系统崩溃后会自动重启的信号。

比如认不到上层掉电重启，I2C总线不正常掉电重启都是因为这个信号在工作。

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SOC: JTAG,USB,XTAL

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SOC - PCIE INTERFACES

VDD12_PCIE_REFBUF:1.08V - 1.26V @ 30mA MAX

CPU内部PCIE模块的基准电压

PP1V2_SOC → R1198 0.00 → PP1V2_SOC_PCIE_REFBUF

C1198 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

CPU内部PCIE模块1.8V供电

VDD18_PCIE:1.62V - 1.98V @ 81mA MAX

C1199 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=SOC → PP1V8_IO

VDD_FIXED_PCIE_xxx:0.765V - 0.84V @ 140mA MAX

CPU内部PCIE模块0.75V供电

CPU内部PCIE模块0.75V基准电压

PP0V8_SOC_FIXED_PCIE_REFBUF

VOLTAGE=0.9V

R1194 0.00 → PP0V8_SOC_FIXED_S1

C1194 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

C1193 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

C1192 1.0UF 20% 6.3V X5R 0201-1 ROOM=SOC

C1191 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=SOC

PCIe Clock Request Pull-Ups

PP1V8_IO

R1100 100K 5% 1/32W MF 01005 ROOM=SOC

R1130 100K 5% 1/32W MF 01005 ROOM=SOC

PCIE_NAND_BI_AP_CLKREQ_L

PCIE_WLAN_BI_AP_CLKREQ_L

PCIe Reset Pull-Downs

PCIE_AP_TO_WLAN_RESET_L

PCIE_AP_TO_BB_RESET_L

PCIE_AP_TO_NAND_RESET_L

R1101 100K 5% 1/32W MF 01005 ROOM=SOC

R1121 100K 5% 1/32W MF 01005 ROOM=SOC

R1131 100K 5% 1/32W MF 01005 ROOM=SOC

PCIE总线
一种高速串行传输总线。在6S以后的手机中。CPU和基带、硬盘、WIFI之间的数据传输都是使用PCIE总线
REFCLK：参考时钟，CPU送出的基准时钟频庇，为了让设备与CPU之间在相同的频率下运行
CLKREQ：请求运行时钟，也就是请求输出参考时钟
RXD： 数据接收。PCIE总线数据传输是成对的，一条后面加P是正的，后面带N是负的
TXD：数据发射，也是一正一负
RESET：复位信号，由CPU发出。

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CPU

PCIE LINK 0

耦合电容

C1100 0.22UF 20% 6.3V X5R 01005-1 ROOM=NAND

C1101 0.22UF 20% 6.3V X5R 01005-1 ROOM=NAND

C1102 0.22UF 20% 6.3V X5R 01005-1 ROOM=SOC

C1103 0.22UF 20% 6.3V X5R 01005-1 ROOM=SOC

90_PCIE_NAND_TO_AP_RXD_P / 90_PCIE_NAND_TO_AP_RXD_N

90_PCIE_AP_TO_NAND_TXD_P / 90_PCIE_AP_TO_NAND_TXD_N

CPU到硬盘的PCIE传输总线

90_PCIE_NAND_TO_AP_RXD_C_P / 90_PCIE_NAND_TO_AP_RXD_C_N

90_PCIE_AP_TO_NAND_TXD_C_P / 90_PCIE_AP_TO_NAND_TXD_C_N

PCIE_AP_TO_NAND_RESET_L

CPU到硬盘的复位信号

耦合电容：在电路中是电容的两端都是接信号数。作用是隔离滤除信号中的直流信号，避免前级后级之间互相干扰

如果耦合电容掉件了，尽量使用更换的方式，要直连的话也最好正负都直连，不要一对信号中一个直连一个耦合，

更换必须在相同位置拆的电容才能代换

PCIE_CLKREQ0* AL38 ← PCIE_NAND_BI_AP_CLKREQ_L

PCIE_REF_CLK0_P AW27 ← 90_PCIE_AP_TO_NAND_REFCLK_P

PCIE_REF_CLK0_N AV27 ← 90_PCIE_AP_TO_NAND_REFCLK_N

PCIE_TX0_P AY30 → 90_PCIE_NAND_TO_AP_RXD_C_P

PCIE_TX0_N BA30 → 90_PCIE_NAND_TO_AP_RXD_C_N

PCIE_PERST0* AJ37 → PCIE_AP_TO_NAND_RESET_L

PCIE LINK 1

PCIE_CLKREQ1* NC AL37

PCIE_REF_CLK1_P NC AW26

PCIE_REF_CLK1_N NC AY26

PCIE_RX1_P NC AV31

PCIE_RX1_N NC AW31

PCIE_TX1_P NC AY32

PCIE_TX1_N NC BA32

PCIE_PERST1* NC AK38

PCIE LINK 2

PCIE_CLKREQ3* AJ36 → PCIE_WLAN_BI_AP_CLKREQ_L

PCIE_REF_CLK3_P AY24 ← 90_PCIE_AP_TO_WLAN_REFCLK_P

PCIE_REF_CLK3_N BA24 ← 90_PCIE_AP_TO_WLAN_REFCLK_N

CPU到WIFI的PCIE通讯总线

PCIE_RX3_P BA36 ← 90_PCIE_WLAN_TO_AP_RXD_C_P

PCIE_RX3_N AY36 ← 90_PCIE_WLAN_TO_AP_RXD_C_N

PCIE_TX3_P AV35 → 90_PCIE_AP_TO_WLAN_TXD_C_P

PCIE_TX3_N AW35 → 90_PCIE_AP_TO_WLAN_TXD_C_N

PCIE_PERST3* AH36 → PCIE_AP_TO_WLAN_RESET_L

耦合电容

C1130 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

C1131 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

C1132 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

C1133 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

90_PCIE_WLAN_TO_AP_RXD_P / 90_PCIE_WLAN_TO_AP_RXD_N

90_PCIE_AP_TO_WLAN_TXD_P / 90_PCIE_AP_TO_WLAN_TXD_N

PCIE_CLKREQ2* AK37 → PCIE_BB_BI_AP_CLKREQ_L

PCIE_REF_CLK2_P AV25 ← 90_PCIE_AP_TO_BB_REFCLK_P

PCIE_REF_CLK2_N AW25 ← 90_PCIE_AP_TO_BB_REFCLK_N

CPU到基带的PCIE通讯总线

PCIE_RX2_P BA34 ← 90_PCIE_BB_TO_AP_RXD_C_P

PCIE_RX2_N AY34 ← 90_PCIE_BB_TO_AP_RXD_C_N

PCIE_TX2_P AV33 → 90_PCIE_AP_TO_BB_TXD_C_P

PCIE_TX2_N AW33 → 90_PCIE_AP_TO_BB_TXD_C_N

PCIE_PERST2* AJ38 → PCIE_AP_TO_BB_RESET_L

CPU到基带的PCIE总线复位信号

C1120 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

C1121 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

C1122 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

C1123 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

90_PCIE_BB_TO_AP_RXD_P / 90_PCIE_BB_TO_AP_RXD_N

90_PCIE_AP_TO_BB_TXD_P / 90_PCIE_AP_TO_BB_TXD_N

LINK0 LINK3 LINK1 LINK2

AU30 PCIE_EXT_REF_CLK_P

AT30 PCIE_EXT_REF_CLK_N

PCIE_REXT AU32 ← AP_PCIE_RCAL

PCIE总线外部电阻

R1150 200 1% 1/32W MF 01005 ROOM=SOC

REXT在MIPI总线和PCIE总线都存在这样的电阻，作用是来设定总线端口电流，如果此电阻掉件会引起该总线不工作。如认不到硬盘，MIPI总线的则引起不照相不显示等

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SOC - MIPI & ISP INTERFACES

VDD_FIXED_MIPI:0.765V - 0.84V @ 40mA MAX

CPU内部MIPI模块0.75V供电

PP0V8_SOC_FIXED_S1

C1290 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

C1291 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=SOC

VDD18_MIPI:1.62V - 1.98V @ 10mA MAX

CPU内部MIPI模块1.8V供电

PP1V8_IO

C1295 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=SOC

C1296 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

VDD_FIXED_MIPI

VDD18_MIPI

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CPU

CPU到前置相头MIPI总线

FCAM MIPI

90_MIPI_FCAM_TO_AP_DATA0_P / 90_MIPI_FCAM_TO_AP_DATA0_N
90_MIPI_FCAM_TO_AP_DATA1_P / 90_MIPI_FCAM_TO_AP_DATA1_N
90_MIPI_FCAM_TO_AP_CLK_P / 90_MIPI_FCAM_TO_AP_CLK_N

MIPI0C_DPDATA0 B12
MIPI0C_DNDATA0 A12
MIPI0C_DPDATA1 B14
MIPI0C_DNDATA1 A14
MIPI0C_DPCLK A13
MIPI0C_DNCLK B13
MIPI0C_REXT D12
MIPI1C_REXT D13

MIPI0C_REXT

R1250 200 1% 1/32W MF 01005 ROOM=SOC 前置相头MIPI总线外部电阻

REXT在MIPI总线和PCIE总线都存丰这样的电阻，作用是来设定总线端口电流，如果此电阻掉件会引起该总线不工作。如认不到硬盘，MIPI总线的则引起不照相不显示等

CPU到前置相头MIPI总线

Display MIPI

90_MIPI_AP_TO_DISPLAY_DATA0_P / 90_MIPI_AP_TO_DISPLAY_DATA0_N
90_MIPI_AP_TO_DISPLAY_DATA3_P / 90_MIPI_AP_TO_DISPLAY_DATA3_N
90_MIPI_AP_TO_DISPLAY_DATA2_P / 90_MIPI_AP_TO_DISPLAY_DATA2_N
90_MIPI_AP_TO_DISPLAY_DATA1_N / 90_MIPI_AP_TO_DISPLAY_DATA1_P
90_MIPI_AP_TO_DISPLAY_CLK_P / 90_MIPI_AP_TO_DISPLAY_CLK_N

MIPID_DPDATA0 A10
MIPID_DNDATA0 B10
MIPID_DPDATA1 B9
MIPID_DNDATA1 A9
MIPID_DPDATA2 A7
MIPID_DNDATA2 B7
MIPID_DPDATA3 A6
MIPID_DNDATA3 B6
MIPID_DPCLK A8
MIPID_DNCLK B8

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

显示屏MIPI总线外部电阻

MIPID_REXT D11

R1252 200 1% 1/32W MF 01005 ROOM=SOC

DISP_TOUCH_BSYNC0 AA3
DISP_TOUCH_BSYNC1 AB4
DISP_TOUCH_EB AB6
MIPID_REXT
DISP_I2C_SCL AA4
DISP_I2C_SDA AA5
DISP_POL Y4

ISP_I2C0_SCL W35 — I2C0_ISP_SCL — 后相头广角相头（主相头）I2C总线
ISP_I2C0_SDA V38 — I2C0_ISP_SDA
ISP_I2C1_SCL W36 — I2C1_ISP_SCL — 后相头长焦相头（副相头）I2C总线
ISP_I2C1_SDA Y36 — I2C1_ISP_SDA
ISP_I2C2_SCL Y34 — I2C2_ISP_SCL — 前置相头I2C总线
ISP_I2C2_SDA Y38 — I2C2_ISP_SDA
ISP_I2C3_SCL AA37 — I2C3_ISP_SCL — 照相机供电芯片I2C总线
ISP_I2C3_SDA AB38 — I2C3_ISP_SDA

SENSOR_INT AB36 NC

SENSOR0_CLK U38 — AP_TO_WIDE_CLK_R — R1240 33.2 — CPU到广角相头时钟信号 AP_TO_WIDE_CLK
SENSOR1_CLK R38 — AP_TO_TELE_CLK_R — R1241 33.2 — CPU到长焦相头时钟信号 AP_TO_TELE_CLK
SENSOR2_CLK R37 — AP_TO_FCAM_CLK_R — R1242 33.2 — CPU到长焦相头时钟信号 AP_TO_FCAM_CLK

CPU到长焦相头开启信号

SENSOR0_RST V34 NC
SENSOR1_RST U35 — ISP_TO_TELE_SHUTDOWN_L
SENSOR2_RST AB34 — ISP_TO_WIDE_SHUTDOWN_L — CPU到广角相头开启信号
SENSOR3_RST AC37 NC
SENSOR4_RST AA35 — ISP_TO_FCAM_SHUTDOWN_L — CPU到前置相头开启信号

#30699217: Change camera shutdown pins

工厂诊断测试点

SENSOR0_ISTRB V36 — AP_DEBUG3
SENSOR1_ISTRB U36 NC

SENSOR0_XSHUTDOWN U37 NC
SENSOR1_XSHUTDOWN T37 — AP_TO_MUON_BL_STROBE_EN
CPU发给背光芯片的开启信号（前置相机闪光灯，用前置后照屏幕会变全白）

ISP I2C0

相线或开头以PP、PN开头的都是供电

PP1V8_IO

R1201 1.00K 5% 1/32W MF 01005 ROOM=SOC
R1202 1.00K 5% 1/32W MF 01005 ROOM=SOC

电阻一端接供电一端接信号线的为上拉电阻，一端接信号一端接地的为下拉电阻，一般不能直连。两端都接供电的是保险限流作用，两端都接信号的为保险或隔离作用，可以直连

I2C0_ISP_SCL
I2C0_ISP_SDA

细线表示信号、数据线

ISP I2C1

PP1V8_IO

R1211 1.00K 5% 1/32W MF 01005 ROOM=SOC
R1212 1.00K 5% 1/32W MF 01005 ROOM=SOC

I2C1_ISP_SCL
I2C1_ISP_SDA

ISP I2C2

PP1V8_IO

R1221 2.2K 5% 1/32W MF 01005 ROOM=SOC
R1222 2.2K 5% 1/32W MF 01005 ROOM=SOC

#29684166: Freq change to 400K, change PU to 2.2K

I2C2_ISP_SCL
I2C2_ISP_SDA

ISP I2C3

PP1V8_IO

R1231 4.3K 1% 1/32W MF 01005 ROOM=SOC
R1232 4.3K 1% 1/32W MF 01005 ROOM=SOC

#29684166: Freq change to 400K, change PU to 4.3K

I2C3_ISP_SCL
I2C3_ISP_SDA

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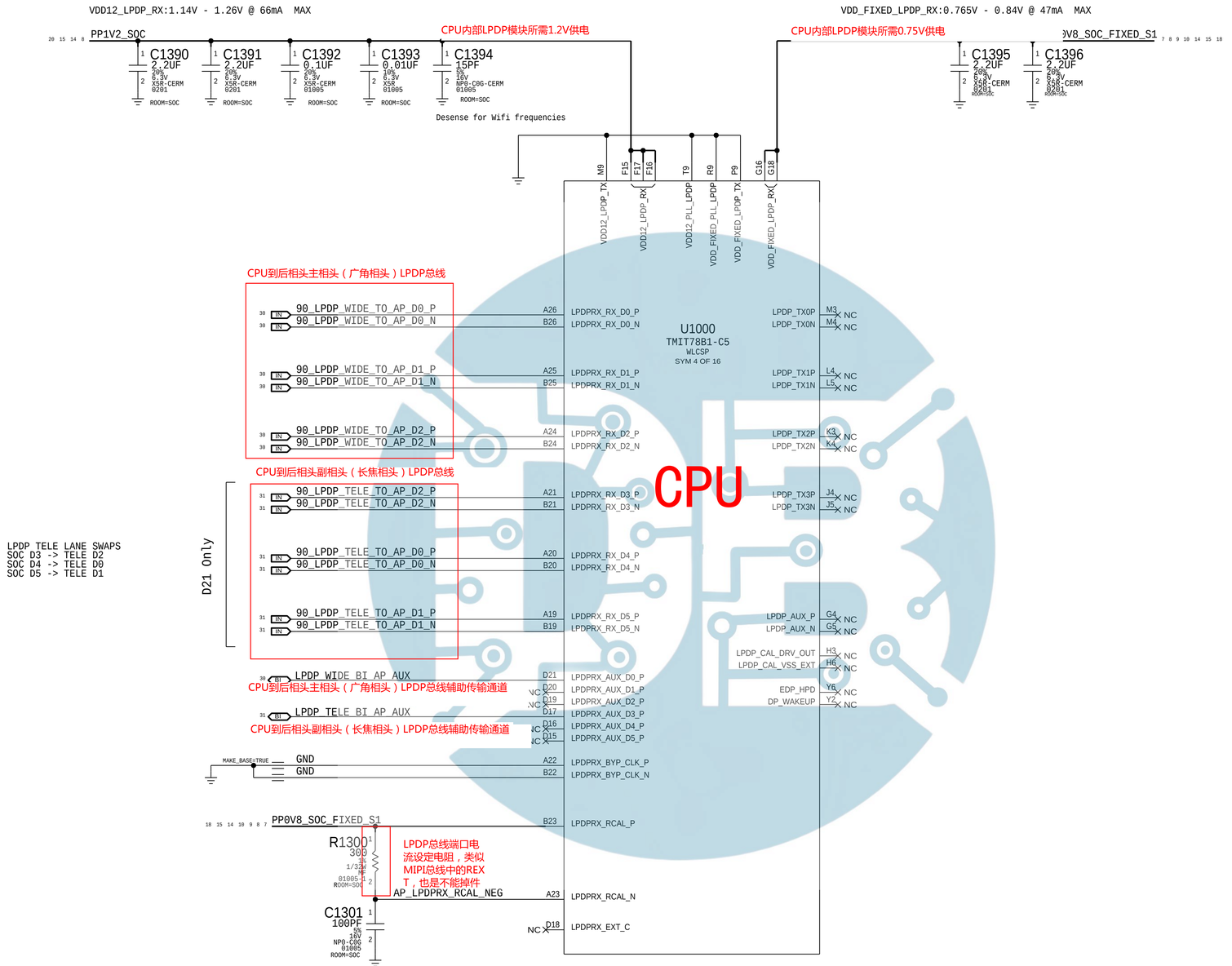
SOC - LPDP INTERFACES



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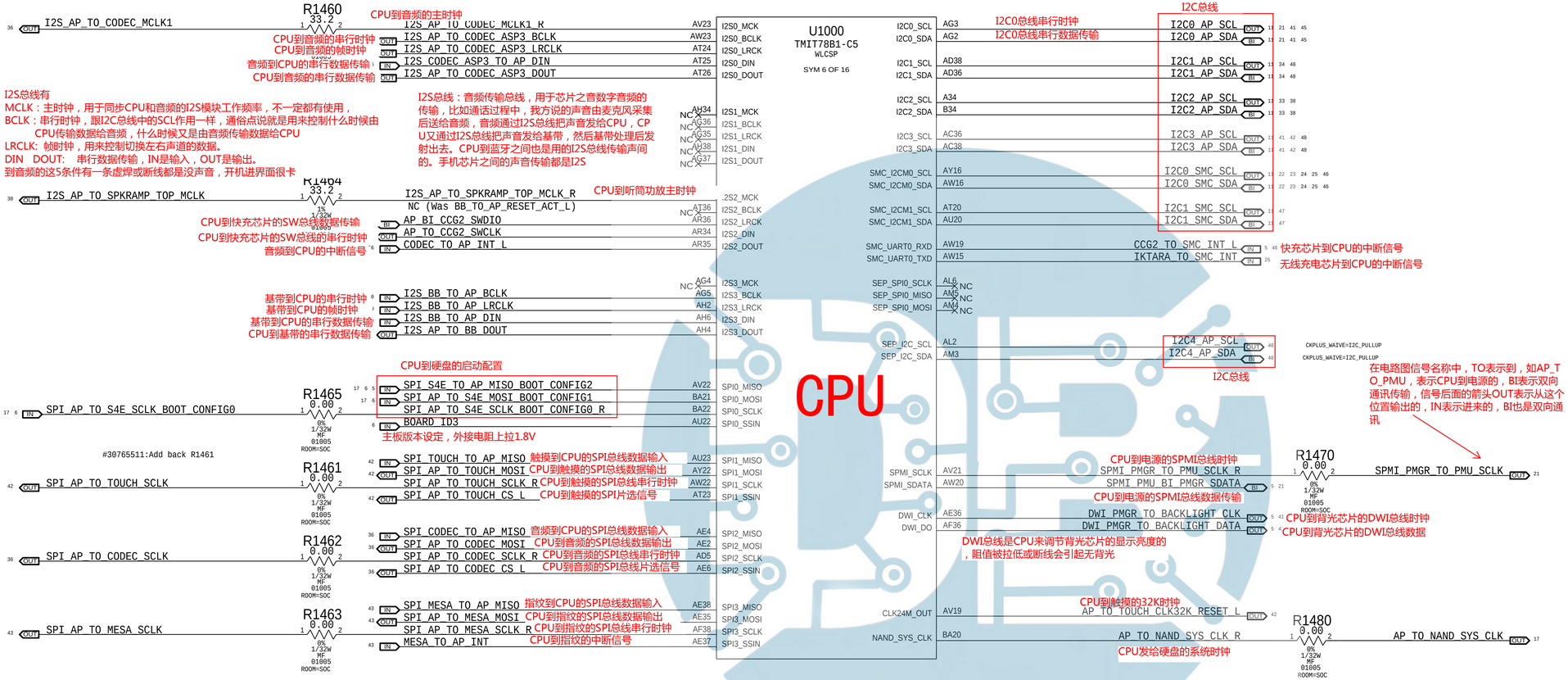
SOC - SERIAL INTERFACES



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

SPI总线：串行高速通讯总线，在手机中一般有4根信号线，
MISO：数据传输，M是主设备，I是IN输入，S是从设备，O是OUT输出，CPU是主设备，相连的芯片是从设备，就是从设备输出数据到CPU
MOSI：CPU输出数据到从设备。
SCLK：串行时钟，用来控制什么时候发送数据，什么时候接收数据，比如高电平时接收，低电平发送
CS或SS：片选信号，SPI总线上可以同时接很多从设备，只有CPU选中的设备才可以接收发送数据，手机中一般都是一组SPI总线只接一个从设备，

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SOC - GPIO INTERFACES

DISPLAY：显示屏　RESET:复位信号，后面带L 低电平时复位
也就是说这个复位信号低电平时复位显示屏，正常工作的时候为高电平，手机中所有的复位信号，正常工作时都是高电平。
（低电平一般指0V，高电平一般是1.8V）

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CPU

AP_TO_DISPLAY_RESET_L	CPU发给显示屏的复位信号	AL4	GPIO_0	EAST	
AP_TO_BB_MESA_ON	CPU到基带指纹开启信号	T35	GPIO_1		
AP_TO_CAMPMU_RESET_L	CPU发给照相机电源的复位信号	R36	GPIO_2		
AP_TO_NFC_DEV_WAKE	CPU发给NFC芯片的唤醒信号	P38	GPIO_3		
AP_TO_BB_COREDUMP	CPU发给基带的核心转储信号	R35	GPIO_4		
AP_TO_BB_RESET_L	CPU发给基带的复位信号	N37	GPIO_5		
NC		L37	GPIO_6		
AP_TO_BB_IPC_GPIO1	CPU到基带的可编程定义信号	K38	GPIO_7		
NC		K34	GPIO_8		
NC		L35	GPIO_9		
AP_TO_GNSS_WAKE	CPU发给GPS的唤醒信号 只有英特尔版本才有GNSS这个GPS芯片，高通的没	D33	GPIO_10		
NC		C34	GPIO_11		
AP_TO_BT_WAKE	CPU发给蓝牙的唤醒信号	D32	GPIO_12		
AP_TO_SPKRAMP_TOP_RESET_L	CPU发给上部小音频的复位信号（听筒功放）	D29	GPIO_13		
NC		B33	GPIO_14		
AP_TO_NFC_FW_DWLD_REQ	CPU到NFC的DWLD请求	A32	GPIO_15	NORTHEAST	
NC		P6	GPIO_16		
AP_TO_TOUCH_MAMBA_RESET_L	CPU到触摸和3D TOUCH的复位信号	P4	GPIO_17		
BOARD_ID0	主板版本识别	R4	GPIO_18		
SPKRAMP_TOP_TO_AP_INT_L	听筒功放到CPU的中断信号	R3	GPIO_19		
CAMPMU_TO_AP_IRQ_L	相机电源到CPU的中断信号	R2	GPIO_20		
AP_TO_BBPMU_RADIO_ON_L	CPU到基带电源的开启信号	T5	GPIO_21		
AP_TO_WLAN_DEVICE_WAKE	CPU到WIFI的唤醒信号	T4	GPIO_22		
NC		T3	GPIO_23		
NC		T2	GPIO_24		
BOARD_ID1	主板版本识别	U6	GPIO_25	WEST	
PMU_HYDRA_TO_AP_FORCE_DFU	电源和USB到CPU的强制DFU信号	U4	GPIO_26		
DFU_STATUS	DFU模式测试点	U2	GPIO_27		
BOARD_ID2	主板版本识别	V5	GPIO_28		
BOARD_ID4	主板版本识别	V4	GPIO_29		
AP_TO_PMU_AMUX_SYNC	CPU到电源同步信号	V3	GPIO_30		
AP_TO_BB_TIME_MARK	CPU到基带的时间标记信号	AJ3	GPIO_31		
BB_TO_AP_RESET_DETECT_L	基带CPU的复位检测信号	AJ4	GPIO_32		
TOUCH_TO_AP_INT_L	触摸到CPU的中断请求	AJ5	GPIO_33		
BOARD_REV3	主板版本识别	AJ6	GPIO_34		
BOARD_REV2		AK3	GPIO_35		
BOARD_REV1		AK4	GPIO_36		
BOARD_REV0		AK5	GPIO_37	SOUTHWEST	
PMU_TO_AP_BUTTON_POWER_KEY_L	电源到CPU的开机键信号	AB2	REQUEST_DFU1		
PMU_TO_AP_BUTTON_VOL_DOWN_L	电源到CPU的音量下按键信号	AC4	REQUEST_DFU2		

TMR32_PWM0	PMU_TO_AP_PRE_UVLO_L	D28	电源到CPU的低压关闭信号	
TMR32_PWM1	NC	C30	#29471964: Remove PWM AP Timebase Calibration Connection for Prox	
TMR32_PWM2	WLAN_TO_AP_TIME_SYNC	A28	WIFI到CPU的时间同步信号	
UART0_RXD	UART_AP_DEBUG_RXD	AF3	USB到CPU的UART总线调试信号	RX表示接收
UART0_TXD	UART_AP_DEBUG_TXD	AF2	USB到CPU的UART总线调试信号	TX表示发送
UART1_CTS*	UART_BT_TO_AP_CTS_L	P34	蓝牙到CPU的UART总线停止发送信号	
UART1_RTS*	UART_AP_TO_BT_RTS_L	L36	CPU到蓝牙的UART总线接收请求	
UART1_RXD	UART_BT_TO_AP_RXD	P36	蓝牙到CPU的UART总线接收	
UART1_TXD	UART_AP_TO_BT_TXD	M37	CPU到蓝牙UART总线发送	
UART2_CTS*	UART_GNSS_TO_AP_CTS_L	B28	GPS到CPU的UART总线停止发送信号	只有英特尔版本才有这个GNSS
UART2_RTS*	UART_AP_TO_GNSS_RTS_L	B29	CPU到GPS的UART总线接收请求	
UART2_RXD	UART_GNSS_TO_AP_RXD	C28	GPS到CPU的UART总线接收	
UART2_TXD	UART_AP_TO_GNSS_TXD	B30	CPU到GPS的UART总线发送	
UART3_CTS*	UART_NFC_TO_AP_CTS_L	D30	NFC到CPU的UART总线停止发送信号	
UART3_RTS*	UART_AP_TO_NFC_RTS_L	B32	CPU到NFC的UART总线接收请求	
UART3_RXD	UART_NFC_TO_AP_RXD	C32	NFC到CPU的UART总线接收	
UART3_TXD	UART_AP_TO_NFC_TXD	D31	CPU到NFC的UART总线发送	
UART4_CTS*	UART_WLAN_TO_AP_CTS_L	K36	WIFI到CPU的UART总线停止发送信号	
UART4_RTS*	UART_AP_TO_WLAN_RTS_L	M35	CPU到WIFI的UART总线接收请求	
UART4_RXD	UART_WLAN_TO_AP_RXD	N36	WIFI到CPU的UART总线接收	
UART4_TXD	UART_AP_TO_WLAN_TXD	N35	CPU到WIFI的UART总线发送	
UART6_RXD	UART_ACCESSORY_TO_AP_RXD	AF5	USB到CPU的UART总线接收	
UART6_TXD	UART_AP_TO_ACCESSORY_TXD	AF4	CPU到USB的UART总线发送	
UART7_RXD	NC	R5		
UART7_TXD	NC	P7		

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SOC - AOP

VDDIO18_AOP:1.8V @ 15mA MAX

PP1V8_S2 电源输出的1.8V上层供电

C1690 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=SOC

C1691 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

AP13 AP15 AP17 AP19 VDDIO18_AOP

U1000 TMIT78B1-C5 WLCSP SYM 7 OF 16

CPU

AOP_DDR_RESET* AT11

AOP_FUNC_0 AT14

AOP_FUNC_1 AU13

AOP_FUNC_2 AW10

AOP_FUNC_3 AW11

AOP_FUNC_4 16

AOP_FUNC_5 AV11

AOP_FUNC_6 AY10

AOP_FUNC_7 12

AOP_FUNC_8 AY11

AOP_FUNC_9 AV16

AOP_FUNC_10 AV16

AOP_FUNC_11 AV13

AOP_FUNC_12 AW12

AOP_FUNC_13 AV14

AOP_FUNC_14 AW13

AOP_FUNC_15 7

AOP_FUNC_16 AV15

AOP_FUNC_17 AY13

AOP_FUNC_18 BA11

AOP_FUNC_19 AV17

AOP_FUNC_20 BA10

AOP_FUNC_21 AT18

AOP_FUNC_22 AW14

AOP_FUNC_23 AV18

AOP_FUNC_24 BA12

AOP_FUNC_25 AY14

AOP_FUNC_26

AOP_SPI_MISO AW7

AOP_SPI_MOSI AU10

AOP_SPI_SCLK AV8

AOP_UART0_RXD AT14

AOP_UART0_TXD AY8

AOP_UART1_RXD BA8

AOP_UART1_TXD AW8

AOP_UART2_RXD AU11

AOP_UART2_TXD AT15

AOP_I2S0_BCLK BA14

AOP_I2S0_DIN AT19

AOP_I2S0_MCK AU19

AOP_I2S0_LRCK BA15

AOP_I2S0_DOUT BA13

AOP_PDM_CLK0 BA16 音频到CPU的可编程定义信号1 CODEC_TO_AOP_GPIO1

AOP_PDM_DATA0 AW18 音频到CPU的可编程定义信号2 CODEC_TO_AOP_GPIO2

AOP_PDM_DATA1 AW17 NC

RT_CLK32768 BA18 电源到CPU的32K时钟输入 PMU_TO_AOP_CLK32K

AOP_SWD_TCK_OUT AV20 CPU到硬盘的SWD总线时钟 SWD_AOP_TO_MANY_SWCLK

AOP_SWD_TMS0 AY17 NC

AOP_SWD_TMS1 AT21 CPU到基带的SWD总线数据 SWD_AOP_BI_BB_SWDIO

SWD_TMS2 AC5 CPU到硬盘的SWD总线数据 SWD_AP_BI_NAND_SWDIO

SWD_TMS3 AC2 NC

AOP_I2CM0_SCL BA9

AOP_I2CM0_SDA AV9

AOP_I2CM1_SCL AV10

AOP_I2CM1_SDA AW9

DOCK_ATTENTION BA17 HYDRA_TO_NUB_INT

DOCK_CONNECT AY19 HYDRA_TO_NUB_DOCK_CONNECT

AOP_TO_DDR_SLEEP1_READY CPU到上层休眠信号

SPI_AOP_TO_COMPASS_CS_L CPU到指南针的SPI总线片选信号

COMPASS_TO_AOP_INT 指南针到CPU的中断信号

ACCEL_GYRO_TO_AOP_DATARDY 螺旋仪到CPU数据数据准备就绪

SPI_AOP_TO_ACCEL_GYRO_CS_L CPU到陀螺仪的SPI片选信号

ACCEL_GYRO_TO_AOP_INT 螺旋仪到CPU中断信号

SPI_AOP_TO_PHOSPHORUS_CS_L CPU到气压传感器的片选

PHOSPHORUS_TO_AOP_INT 气压传感器到CPU的中断信号

AOP_TO_MESA_I2C_ISO_EN CPU发出开启指纹I2C总线，到U1601和U1602

MESA_TO_AOP_FDINT 指纹接口到CPU的中断信号

DISPLAY_TO_MANY_BSYNC 显示屏发出的同步信号

PMU_TO_AOP_IRQ_L 电源到CPU的中断信号

AOP_TO_SPKRAMP_BOT_ARC_RESET_L CPU到铃声功放和振动的复位信号

SPKRAMP_BOT_ARC_TO_AOP_INT_L 铃声功放和振动到CPU的中断信号

AOP_TO_CODEC_CLP_EN CPU到音频的开启信号

I2S_AOP_AMPS_TO_CODEC_ASP1_DOUT CPU到大小音频的I2S总线数据

PROX_BI_AOP_INT_L_PWM 感距到CPU的中断信号

AOP_TO_CODEC_RESET_L CPU到音频的复位信号

ALS_TO_AOP_INT_L 感光到CPU的中断信号

AOP_TO_MESA_BLANKING_EN CPU到指纹开启信号

I2S_CODEC_ASP1_TO_AOP_AMPS_BCLK_R 音频到CPU的I2S总线串行时钟信号

I2S_CODEC_ASP1_TO_AOP_AMPS_LRCLK_R 音频到CPU的I2S总线帧时钟信号

I2S_CODEC_ASP1_TO_AOP_AMPS_DIN 音频到CPU的I2S总线数据输入信号

#30638490: Route U1000/U5000 ASP1 BCLK, LRCLK with _R

IMU：惯性测量单元组，用来测量手机的姿势，角度。这个单元组包括指南针、陀螺仪，气压传感器，这些芯片都是用一组SPI总线连在一起控制的

SPI_AOP_TO_IMU_SCLK R1601 49.9 1% 1/32W MF 01005 ROOM=SOC

SPI_AOP_TO_IMU_MOSI IMU到CPU的SPI总线数据输入

SPI_AOP_TO_IMU_SCLK_R CPU到IMU的SPI总线数据输出

SPI_AOP_TO_IMU_SCLK CPU到IMU的SPI总线串行时钟

UART_BB_TO_AOP_RXD 基带到CPU的UART总线数据接收

UART_AOP_TO_BB_TXD CPU到基带的UART总线数据发射

AOP_TO_WLAN_CONTEXT_A CPU到WIFI调试总线数据输入

AOP_TO_WLAN_CONTEXT_B CPU到WIFI调试总线数据输出

TOUCH_TO_AOP_GPO 触摸到CPU的可编程定义信号

AOP_TO_TOUCH_PROX_STATE CPU到触摸的感距控制信号

I2S_AOP_TO_CODEC_MCLK2 R1602 33.2 1% 1/32W MF 01005 ROOM=SOC

I2S_AOP_TO_CODEC_ASP2_BCLK CPU到音频的I2S总线串行时钟

I2S_CODEC_ASP2_TO_AOP_DIN 音频到CPU的I2S总线数据输入

I2S_AOP_TO_CODEC_MCLK2_R CPU到音频的I2S总线主时钟

I2S_AOP_TO_CODEC_ASP2_LRCLK CPU到音频的I2S总线帧时钟

I2S_AOP_TO_CODEC_ASP2_DOUT CPU到音频的I2S总线数据输出

电源输出的1.8V上层供电 PP1V8_S2

R1620 2.2K 5% 1/32W MF 01005 ROOM=SOC

R1621 2.2K 5% 1/32W MF 01005 ROOM=SOC

I2C0_AOP_SCL

I2C0_AOP_SDA

PP1V8_S2 电源输出的1.8V供电

R1622 1.00K 5% 1/32W MF 01005 ROOM=SOC

R1623 1.00K 5% 1/32W MF 01005 ROOM=SOC

I2C0总线

I2C1_AOP_SCL

I2C1_AOP_SDA

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SOC - CPU, GPU & SOC RAILS

1.06V @ 11.0A MAX
0.8V @ 6A MAX
0.575V @ 2.7A MAX
PP_CPU_PCORE
CPU核心供电

C1702 4.7UF 20% 4V CER-X5R 0201 ROOM=SOC
C1703 4.7UF 20% 4V CER-X5R 0201 ROOM=SOC
OMIT XW1701 SHORT-20L-0.05MM
到电源的核心供电反馈信号，用来调整核心供电电压

C1704 C1705 C1706 C1707 15UF 20% 4V X5R 0402-D2X-1 ROOM=SOC
C1708 C1709 C1710 C1711 C1712 C1713 15UF 20% 4V X5R 0402-D2X-1 ROOM=SOC

CPU核心供电

U1000 TMIT78B1-C5 WLCSP SYM 8 OF 16 ROOM=SOC

VDD_CPU: AA14 AA16 AB11 AB13 AB15 AB17 AB19 AC20 AD15 AE14 AF20 AG9 AG15 AH10 AH12 AH14 AH16 AH18 AH20

在苹果电路图中，名称前面P表示供电，PP是正压，PN是负压
PP后面跟的数字表示电压值。
如PP0V7：表示正的0.7V。
PN5V7：表示负的5.7V。

1.06V @ 18.3A MAX
0.8V @ 10.6A MAX
0.575V @ 3.4A MAX
PP_GPU
CPU内部显示核心供电，电压0.8V左右此供电亮白苹果后进系统之前才会出来

C1730 C1731 4.7UF 20% 4V CER-X5R 0201 ROOM=SOC
OMIT XW1731 SHORT-20L-0.05MM-SM
送到电源的GPU供电反馈
BUCK1_FB
NO_XNET_CONNECTION

C1734 C1735 C1736 C1737 C1738 C1739 C1740 C1741 15UF 20% 4V X5R 0402-D2X-1 ROOM=SOC

VDD_GPU: F25 J16 F31 G20 G22 G24 G26 J28 H11 H15 H19 H23 H31 J12 J18 J22 J24 J26 J30 L16 K17 K29 L12 L18 L22 L28 M23 L24 N22 N24 N28

CPU

0.765V @ 4.9A MAX
0.635V @ 2.6A MAX
PP_SOC_S1
系统芯片组供电，0.8V左右

C1760 C1761 4.7UF 20% 4V CER-X5R 0201 ROOM=SOC
OMIT XW1760 SHORT-20L-0.05MM-SM NO_XNET_CONNECTION
BUCK2_FB
到电源的系统芯片组供电反馈信号，用来调整SOC供电电压。

C1762 C1763 C1764 15UF 20% 4V X5R 0402-D2X-1 ROOM=SOC

U1000 TMIT78B1-C5 WLCSP SYM 9 OF 16 ROOM=SOC

VDD_SOC: AA9 AA18 AA22 AA24 AA28 AA30 AB21 AB25 AB27 AC22 AC24 AC28 AC30 AD9 AD21 AD25 AD27 AD29 AE22 AE24 AE28 AF25 AF27 AG22 AG24 AG28 AH25 AH27 AJ16 AJ18 AJ22 AJ24 AJ28 AK13 AK15 AK19 AK21 AK25 AK27 AL12 AL16 AL18 AL22 AL24 AL28 AL30 AM13 AM25 AN12 AN22 AN24 F22

G13 J20 L19 M13 M21 N10 N12 N16 N18 N29 P13 P15 P19 P21 P25 P27 R10 R12 R16 R18 R22 R24 R28 T13 T15 T19 T21 T25 T27 U16 U18 U22 U24 U28 U30 V19 V21 V25 V27 W18 W22 W24 W28 W30 Y19 Y25 Y21 Y27 P23

CPU

VDD_SOC_SENSE
TP_SOC_SENSE
GPU电压检测信号，到PP0514测试点

0.7V @ 75mA MAX
PP0V7_VDD_LOW_S2
CPU 的 0.7v供电

C1750 4.7UF 20% 4V CER-X5R 0201 ROOM=SOC

VDD_LOW: AM15 AM17 AM19 AM21 AN16 AN18 AN20

1.01V @ 2.1A MAX
0.735V @ 0.6A MAX
PP_CPU_SRAM

C1772 C1773 15UF 20% 4V X5R 0402-D2X-1 ROOM=SOC

VDD_CPU_SRAM: AA12 AB18 AC9 AC14 AE20 AF14 U14

1.06V @ 1.1A MAX
0.80V @ 0.63A MAX
0.675V @ 0.19A MAX
AP_CPU_PCORE_SENSE

VDD_CPU_SENSE: AH21

PP_GPU_SRAM
GPU显示核心缓存供电，1V电压，也是要快进系统才出来

C1781 C1782 15UF 20% 4V X5R 0402-D2X-1 ROOM=SOC

VDD_GPU_SRAM: N26 H13 H17 H21 H25 K11 K19 K23 G30 M29

AP_VDD_GPU_SENSE
GPU电压检测信号，到电源芯片

VDD_GPU_SENSE: N23

VDD_ECPU: AA10 U10 U12 V13 V15 Y13 Y15

CPU的E核心供电

C1791 C1792 C1793 15UF 20% 4V X5R 0402-D2X-1 ROOM=SOC
C1794 4.7UF 20% 4V CER-X5R 0201 ROOM=SOC

OMIT XW1790 SHORT-20L-0.05MM-SM ROOM=SOC
送到电源 的E核心供电反馈
BUCK11_FB

1.06V @ 4.3A MAX
0.8V @ 2.8A MAX
0.575V @ 1.4A MAX
PP_CPU_ECORE

VDD_FIXED_CPU: W14
CPU0.8V供电
PP0V8_SOC_FIXED_S1
0.8V @ 6mA MAX

VDD_FIXED_PLL_GPU: K21
CPU0.8V供电
PP0V8_SOC_FIXED_S1

VDD_FIXED_PLL_SOC: L20
0.8V @ 6+10=16mA MAX

VDD12_PLL_CPU: W16
VDD12_PLL_GPU: L21
VDD12_PLL_SOC: M20
系统芯片组1.2V供电
PP1V2_SOC

C1720 C1721 C1722 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC
C1723 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=SOC

1.2V @ 7mA MAX (CPU)
1.2V @ 7mA MAX (GPU)
1.2V @ 20mA MAX (SOC)

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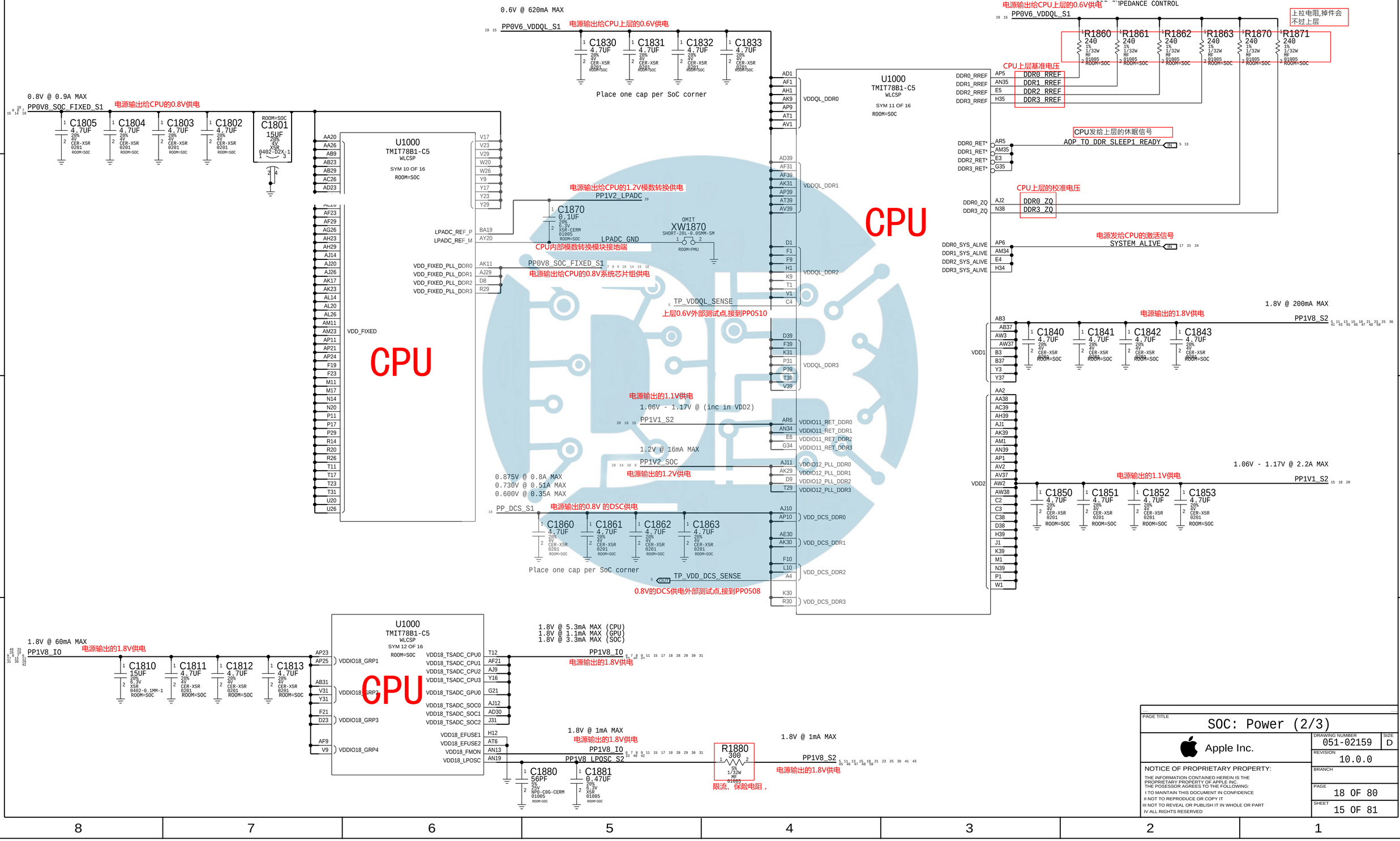
SOC - POWER SUPPLIES



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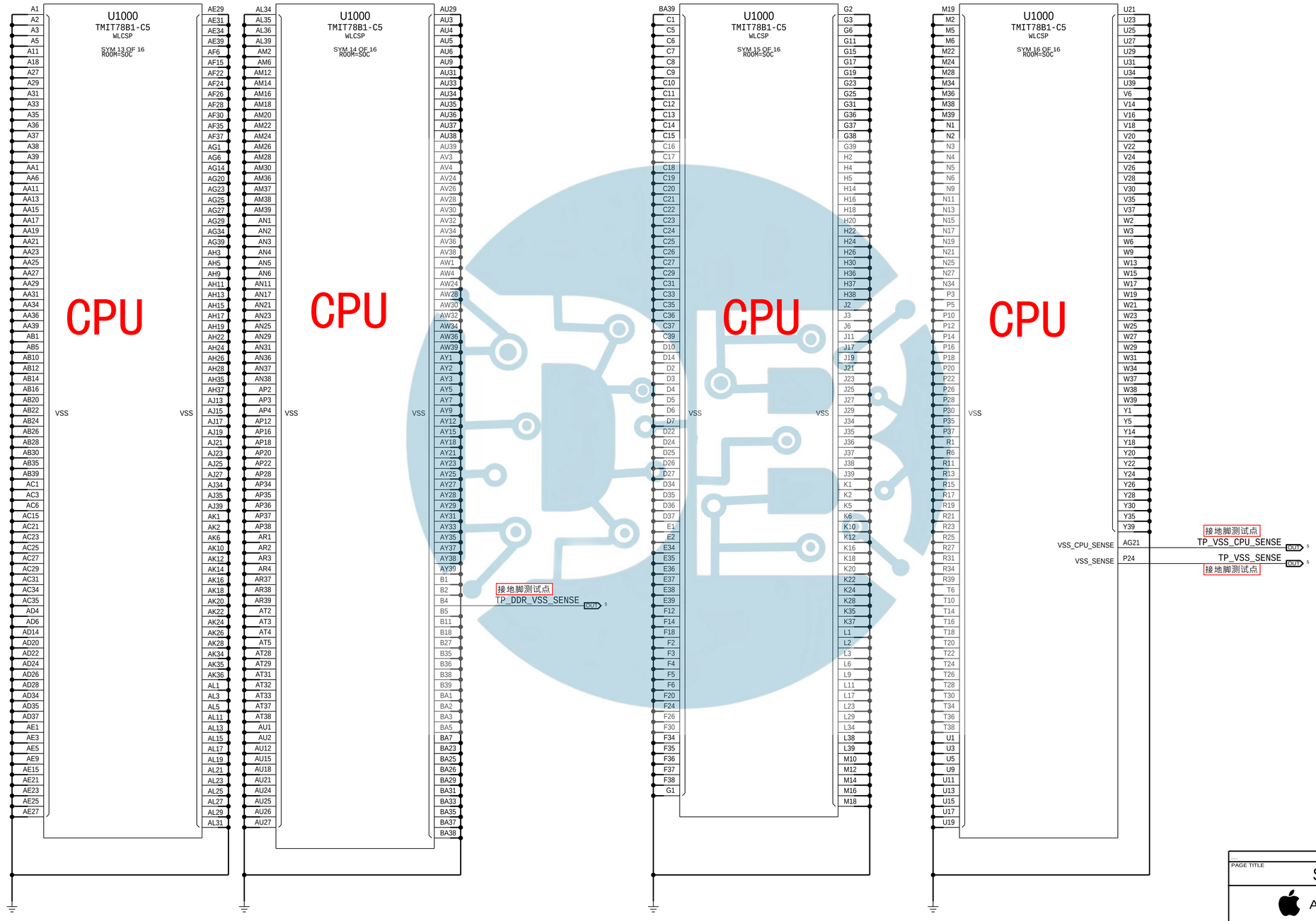
SOC - POWER SUPPLIES



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391mA MAX
PP1V8_IO
电源输出的1.8V供电

C2626 4.7UF 20% 4V CER-X5R 0201 ROOM=NAND
C2610 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=NAND
C2629 18UF 20% 6.3V CER-X5R 0402-0.1MM ROOM=NAND
C2630 18UF 20% 6.3V CER-X5R 0402-0.1MM ROOM=NAND
C2641 4.7UF 20% 4V CER-X5R 0201 ROOM=NAND
C2643 4.7UF 20% 4V CER-X5R 0201 ROOM=NAND
C2645 4.7UF 20% 4V CER-X5R 0201 ROOM=NAND
C2647 4.7UF 20% 4V CER-X5R 0201 ROOM=NAND
C2601 22PF 5% 16V CERM 01005 ROOM=NAND
C2611 39PF 5% 16V NP0-C0G 01005 ROOM=NAND
C2617 68PF 5% 16V NP0-C0G 01005 ROOM=NAND
C2623 100PF 5% 16V NP0-C0G 01005 ROOM=NAND
C2612 220PF 5% 10V C0G-CERM 01005 ROOM=NAND

932mA MAX
PP0V9_NAND

C2602 22UF 20% 4V X5R 0402-0.1MM ROOM=NAND
C2605 22UF 20% 4V X5R 0402-0.1MM ROOM=NAND
C2622 4.7UF 20% 4V CER-X5R 0201 ROOM=NAND
C2627 4.7UF 20% 4V CER-X5R 0201 ROOM=NAND
C2640 4.7UF 20% 4V CER-X5R 0201 ROOM=NAND
C2642 4.7UF 20% 4V CER-X5R 0201 ROOM=NAND
C2644 4.7UF 20% 4V CER-X5R 0201 ROOM=NAND
C2646 4.7UF 20% 4V CER-X5R 0201 ROOM=NAND
C2603 22PF 5% 16V CERM 01005 ROOM=NAND
C2606 68PF 5% 16V NP0-C0G 01005 ROOM=NAND
C2609 100PF 5% 16V NP0-C0G 01005 ROOM=NAND
C2614 47PF 5% 16V CERM 01005 ROOM=NAND
C2620 220PF 5% 10V C0G-CERM 01005 ROOM=NAND
C2628 220PF 5% 10V C0G-CERM 01005 ROOM=NAND

d dfasdf

只是硬盘输出以测试点，掉点可不补
硬盘基准电压测试点
NAND_ANI1_VREF
NAND_ANI0_VREF
硬盘基准电压测试点

1300mA MAX (1us peak power)
电源输出的硬盘3V供电
PP3V0_NAND

C2613 18UF 20% 6.3V CER-X5R 0402-0.1MM ROOM=NAND
C2616 18UF 20% 6.3V CER-X5R 0402-0.1MM ROOM=NAND
C2619 18UF 20% 6.3V CER-X5R 0402-0.1MM ROOM=NAND
C2621 18UF 20% 6.3V CER-X5R 0402-0.1MM ROOM=NAND
C2649 3.9UF 20% 6.3V CER-X5R 0201 ROOM=NAND
C2650 3.9UF 20% 6.3V CER-X5R 0201 ROOM=NAND
C2651 3.9UF 20% 6.3V CER-X5R 0201 ROOM=NAND
C2652 3.9UF 20% 6.3V CER-X5R 0201 ROOM=NAND
C2615 22PF 5% 16V CERM 01005 ROOM=NAND
C2618 39PF 5% 16V NP0-C0G 01005 ROOM=NAND
C2631 68PF 5% 16V NP0-C0G 01005 ROOM=NAND
C2632 47PF 5% 16V CERM 01005 ROOM=NAND
C2634 100PF 5% 6V NP0-C0G 01005 ROOM=NAND
C2635 220PF 5% 10V C0G-CERM 01005 ROOM=NAND
C2636 220PF 5% 10V C0G-CERM 01005 ROOM=NAND

U2600
H23Q2T8QK6MES-BC
LGA
BOMOPTION=OMIT_TABLE
CRITICAL

PCI_AVDD_CLK_1 N6
PCI_AVDD_CLK_2 M9
PCI_AVDD_H J6
PCI_VDD_1 N8
PCI_VDD_2 J8
AVDD18_PLL L2
ANI0_VREF G12
ANI1_VREF J4
G6
G8
VDD L6
L8
R6
R8
E2
E10
VDDIO J2
K9
N2
T5
P9
D3
E12
VCC G4
L12
R2
VDD_PLL R4
VPP F3
NC

CPU发给硬盘的系统时钟
AP_TO_NAND_SYS_CLK → CLK_IN M3

CPU到硬盘的PCIE总线参考时钟正端
90_PCIE_AP_TO_NAND_REFCLK_P → PCIE_REFCLK_P K11
CPU到硬盘的PCIE总线参考时钟负端
90_PCIE_AP_TO_NAND_REFCLK_N → PCIE_REFCLK_M J12

硬盘到CPU的PCIE总线请求运行时钟信号
PCIE_NAND_BI_AP_CLKREQ_L → PCIE_CLKREQ_N P5

PCIE总线电流设定端
PCIE_NAND_RESREF → PCI_RESREF H7
R2604 3.01K 1% 1/32W MF 01005 ROOM=NAND
这个电阻不能掉件，腐蚀掉件只能原值或原位置代换

CPU到硬盘的PCIE总线数据发射正端
90_PCIE_AP_TO_NAND_TXD_P → PCIE_RX0_P M11
CPU到硬盘的PCIE总线数据发射负端
90_PCIE_AP_TO_NAND_TXD_N → PCIE_RX0_M N12

硬盘到CPU的PCIE总线数据接收正端
90_PCIE_NAND_TO_AP_RXD_P → PCIE_TX0_P R12
硬盘到CPU的PCIE总线数据接收负端
90_PCIE_NAND_TO_AP_RXD_N → PCIE_TX0_M T11

CPU到硬盘的PCIE总线复位信号
AP_TO_NAND_RESET_L → RESET* L4

TRST* G10

外接电阻校准 信号
NAND_ZQ_C → ZQ_C K3
NAND_ZQ_N → ZQ_N C10
MISS_P_DIFFPAIR
R2600 100 0.1% 1/32W MF 01005 ROOM=NAND
R2601 300 0.1% 1/32 MF 01005 ROOM=NAND
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硬盘

电源到硬盘的电池低电压启动模式
PMU_TO_NAND_LOW_BATT_BOOT_L → EXT_D0/BOOT0 B3
CPU发给硬盘的启动信号
AP_TO_NAND_FW_STRAP → EXT_D1/BOOT1 C4
EXT_D2/BOOT2/SPINAND_SCLK B5
EXT_D3/SWD_UID0/SPINAND_MISO C6
CPU到硬盘的启动配置
SPI_AP_TO_S4E_SCLK_BOOT_CONFIG0 → EXT_D4/UART_RX B7
SPI_S4E_TO_AP_MISO_BOOT_CONFIG2 → EXT_D5/SWD_UID1/SPINAND_MOSI C8
SPI_AP_TO_S4E_MOSI_BOOT_CONFIG1 → EXT_D6/UART_TX B9
EXT_D7/SPI B11
NC
SYSTEM_ALIVE → 电源发给CPU和硬盘的激活信号
PCIE_AP_TO_NAND_RESET_L → EXT_NCE/PERST* E8 CPU到硬盘的PCIE总线复位信号
SWD_AP_BI_NAND_SWDIO → EXT_NRE/JTAG_TMS D7 CPU到硬盘的SWD总线数据
SWD_AOP_TO_MANY_SWCLK → EXT_NWE/JTAG_TCK E6 CPU到硬盘的SWD总线时钟
EXT_RNB/JTAG_TDO E4
EXT_CLE/JTAG_TDI D5
EXT_ALE/JTAG_SEL D9
DROOP_N T3
WP_N G2

电源输出的1.8V供电
PP1V8_IO → PP1V8_IO
MAKE_BASE=TRUE

VSS
A2 A4 A6 A8 A10 A12 B1 B13 C2 C12 D1 D11 D13 F1 F5 F7 F9 F11 F13 H1 H3 H5 H9 H11 H13 J10 K1 K5 K7 K13 L10 M1 M5 M7 M13 N4 N10 P1 P3 P7 P11 P13 R10 T1 T7 T9 T13 U2 U4 U6 U8 U10 U12

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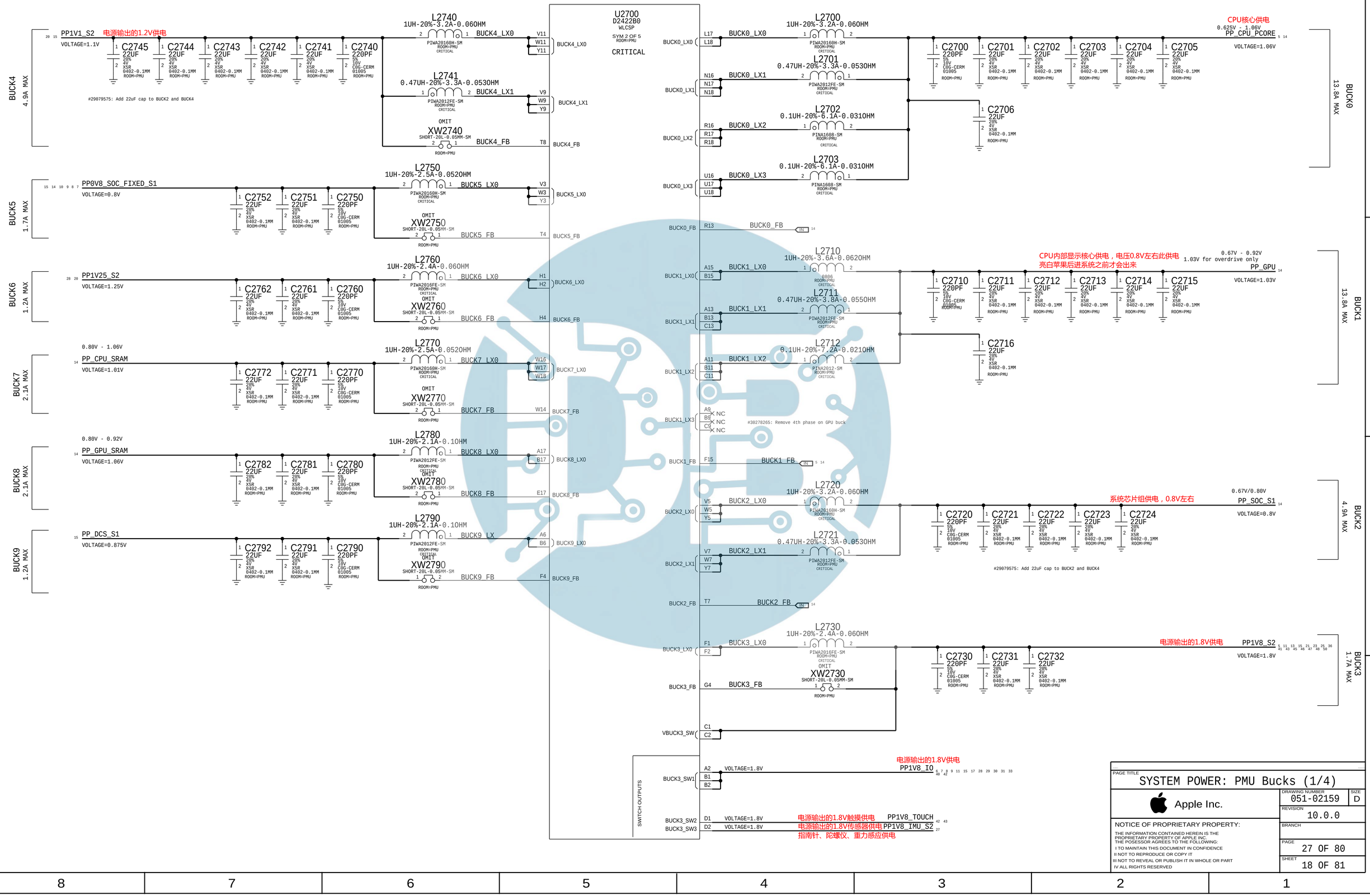
BUCK4
4.9A MAX
PP1V1_S2
电源输出的1.2V供电
VOLTAGE=1.1V
C2745 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2744 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2743 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2742 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2741 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2740 220PF 5% 10V C0G-CERM 01005 ROOM=PMU
#29079575: Add 22uF cap to BUCK2 and BUCK4
L2740 1UH-20%-3.2A-0.06OHM PIWA2016H-SM ROOM=PMU CRITICAL
BUCK4_LX0
V11 W11 Y11
BUCK4_LX0
L2741 0.47UH-20%-3.3A-0.053OHM PIWA2012FE-SM ROOM=PMU CRITICAL
BUCK4_LX1
V9 W9 Y9
BUCK4_LX1
OMIT
XW2740 SHORT-20L-0.05MM-SM ROOM=PMU
BUCK4_FB
T8
BUCK4_FB
BUCK5
1.7A MAX
PP0V8_SOC_FIXED_S1
VOLTAGE=0.8V
C2752 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2751 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2750 220PF 5% 10V C0G-CERM 01005 ROOM=PMU
L2750 1UH-20%-2.5A-0.052OHM PIWA2016H-SM ROOM=PMU CRITICAL
BUCK5_LX0
V3 W3 Y3
BUCK5_LX0
OMIT
XW2750 SHORT-20L-0.05MM-SM ROOM=PMU
BUCK5_FB
T4
BUCK5_FB
BUCK6
1.2A MAX
PP1V25_S2
VOLTAGE=1.25V
C2762 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2761 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2760 220PF 5% 10V C0G-CERM 01005 ROOM=PMU
L2760 1UH-20%-2.4A-0.06OHM PIWA2016FE-SM ROOM=PMU CRITICAL
BUCK6_LX0
H1 H2
BUCK6_LX0
OMIT
XW2760 SHORT-20L-0.05MM-SM ROOM=PMU
BUCK6_FB
H4
BUCK6_FB
BUCK7
2.1A MAX
0.80V - 1.06V
PP_CPU_SRAM
VOLTAGE=1.01V
C2772 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2771 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2770 220PF 5% 10V C0G-CERM 01005 ROOM=PMU
L2770 1UH-20%-2.5A-0.052OHM PIWA2016H-SM ROOM=PMU CRITICAL
BUCK7_LX0
W16 W17 W18
BUCK7_LX0
OMIT
XW2770 SHORT-20L-0.05MM-SM ROOM=PMU
BUCK7_FB
W14
BUCK7_FB
BUCK8
2.1A MAX
0.80V - 0.92V
PP_GPU_SRAM
VOLTAGE=1.06V
C2782 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2781 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2780 220PF 5% 10V C0G-CERM 01005 ROOM=PMU
L2780 1UH-20%-2.1A-0.10HM PIWA2012FE-SM ROOM=PMU CRITICAL
BUCK8_LX0
A17 B17
BUCK8_LX0
OMIT
XW2780 SHORT-20L-0.05MM-SM ROOM=PMU
BUCK8_FB
E17
BUCK8_FB
BUCK9
1.2A MAX
PP_DCS_S1
VOLTAGE=0.875V
C2792 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2791 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2790 220PF 5% 10V C0G-CERM 01005 ROOM=PMU
L2790 1UH-20%-2.1A-0.10HM PIWA2012FE-SM ROOM=PMU CRITICAL
BUCK9_LX
A6 B6
BUCK9_LX0
OMIT
XW2790 SHORT-20L-0.05MM-SM ROOM=PMU
BUCK9_FB
F4
BUCK9_FB
U2700
D2422B0
WLCSP
SYM 2 OF 5
ROOM=PMU
CRITICAL
BUCK0_LX0
L17 L18
BUCK0_LX0
L2700 1UH-20%-3.2A-0.06OHM PIWA2016H-SM ROOM=PMU CRITICAL
BUCK0_LX1
N16 N17 N18
BUCK0_LX1
L2701 0.47UH-20%-3.3A-0.053OHM PIWA2012FE-SM ROOM=PMU CRITICAL
BUCK0_LX2
R16 R17 R18
BUCK0_LX2
L2702 0.1UH-20%-6.1A-0.031OHM PINA1608-SM ROOM=PMU CRITICAL
BUCK0_LX3
U16 U17 U18
BUCK0_LX3
L2703 0.1UH-20%-6.1A-0.031OHM PINA1608-SM ROOM=PMU CRITICAL
C2700 220PF 5% 10V C0G-CERM 01005 ROOM=PMU
C2701 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2702 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2703 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2704 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2705 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2706 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
CPU核心供电
0.625V - 1.06V
PP_CPU_PCORE
VOLTAGE=1.06V
BUCK0
13.8A MAX
BUCK0_FB
R13
BUCK0_FB
IN
BUCK1_LX0
A15 B15
BUCK1_LX0
L2710 1UH-20%-3.6A-0.062OHM 0806 ROOM=PMU CRITICAL
BUCK1_LX1
A13 B13 C13
BUCK1_LX1
L2711 0.47UH-20%-3.8A-0.055OHM PIWA2012FE-SM ROOM=PMU CRITICAL
BUCK1_LX2
A11 B11 C11
BUCK1_LX2
L2712 0.1UH-20%-7.2A-0.021OHM PINA2012-SM ROOM=PMU CRITICAL
BUCK1_LX3
A9 NC
B9 NC
C9 NC
#30278265: Remove 4th phase on GPU buck
BUCK1_FB
F15
BUCK1_FB
IN
C2710 220PF 5% 10V C0G-CERM 01005 ROOM=PMU
C2711 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2712 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2713 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2714 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2715 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2716 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
CPU内部显示核心供电，电压0.8V左右此供电
亮白苹果后进系统之前才会出来
0.67V - 0.92V
1.03V for overdrive only
PP_GPU
VOLTAGE=1.03V
BUCK1
13.8A MAX
BUCK2_LX0
V5 W5 Y5
BUCK2_LX0
L2720 1UH-20%-3.2A-0.06OHM PIWA2016H-SM ROOM=PMU CRITICAL
BUCK2_LX1
V7 W7 Y7
BUCK2_LX1
L2721 0.47UH-20%-3.3A-0.053OHM PIWA2012FE-SM ROOM=PMU CRITICAL
BUCK2_FB
T7
BUCK2_FB
IN
C2720 220PF 5% 10V C0G-CERM 01005 ROOM=PMU
C2721 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2722 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2723 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2724 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
系统芯片组供电，0.8V左右
0.67V/0.80V
PP_SOC_S1
VOLTAGE=0.8V
#29079575: Add 22uF cap to BUCK2 and BUCK4
BUCK2
4.9A MAX
BUCK3_LX0
F1 F2
BUCK3_LX0
L2730 1UH-20%-2.4A-0.06OHM PIWA2016FE-SM ROOM=PMU CRITICAL
BUCK3_FB
G4
BUCK3_FB
OMIT
XW2730 SHORT-20L-0.05MM-SM ROOM=PMU
VBUCK3_SW
C1 C2
C2730 220PF 5% 10V C0G-CERM 01005 ROOM=PMU
C2731 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
C2732 22UF 20% 4V X5R 0402-0.1MM ROOM=PMU
电源输出的1.8V供电
PP1V8_S2
VOLTAGE=1.8V
BUCK3
1.7A MAX
SWITCH OUTPUTS
BUCK3_SW1
A2 B1 B2
VOLTAGE=1.8V
电源输出的1.8V供电
PP1V8_IO
BUCK3_SW2
D1
VOLTAGE=1.8V
电源输出的1.8V触摸供电
PP1V8_TOUCH
BUCK3_SW3
D2
VOLTAGE=1.8V
电源输出的1.8V传感器供电
PP1V8_IMU_S2
指南针、陀螺仪、重力感应供电
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SYSTEM POWER: PMU Bucks (1/4)
Apple Inc.
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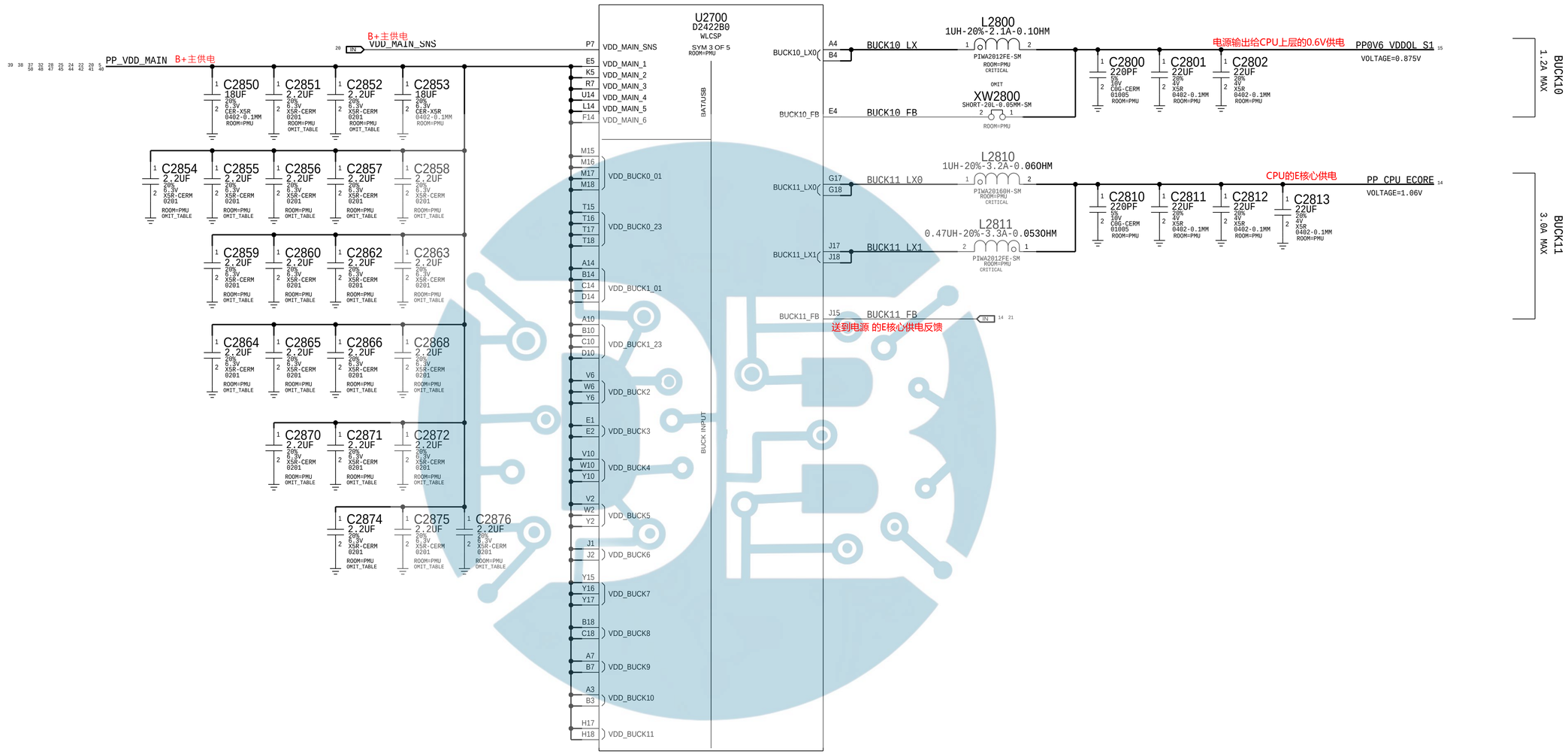

PAGE TITLE
SYSTEM POWER: PMU Bucks (2/4)

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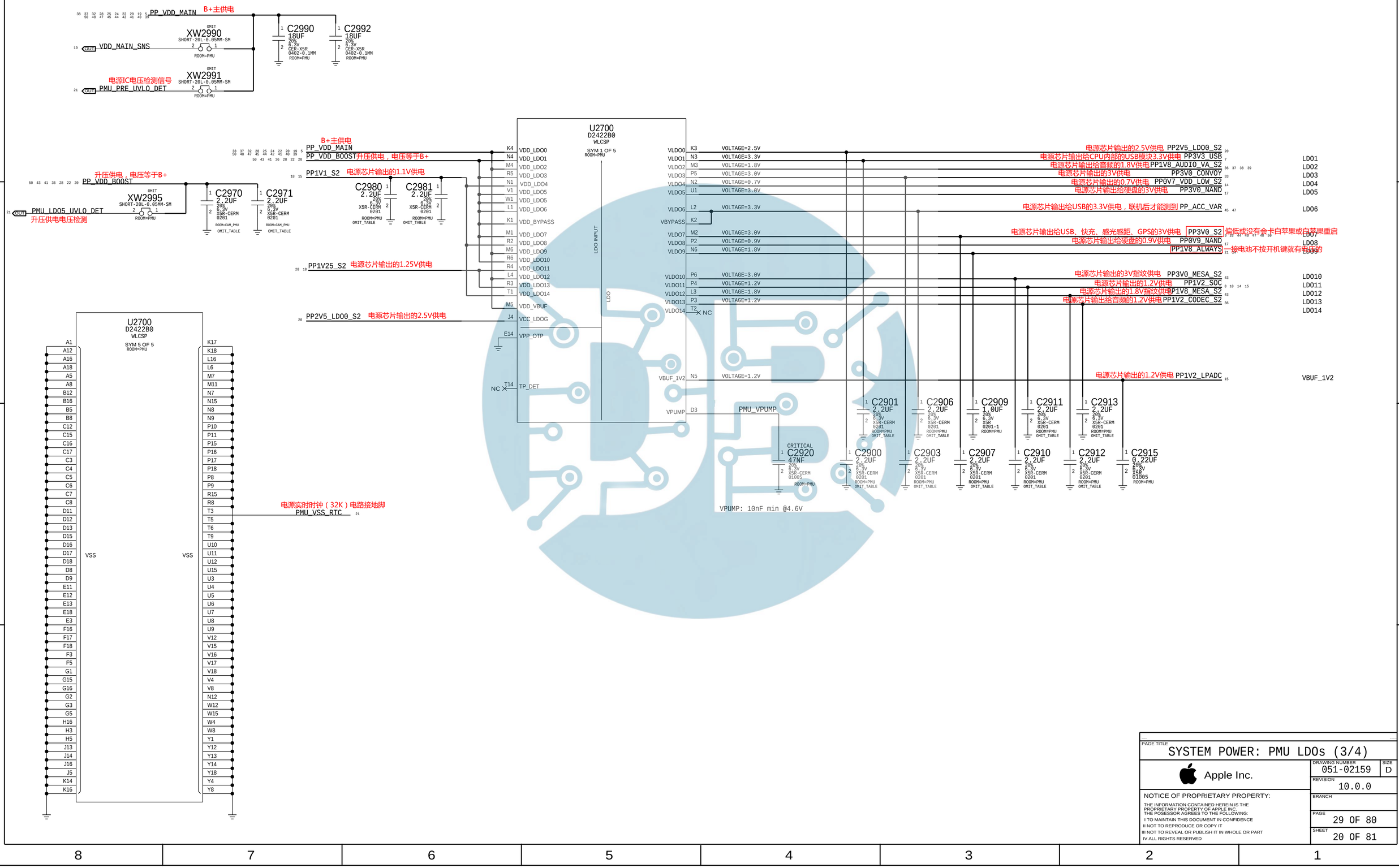

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SYSTEM POWER: PMU LDOs (3/4)

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COLD_RESET & SYSTEM_ALIVE

电源芯片输出的1.8V供电

PP1V8_S2

R3061 100K 5% 1/32W MF 01005 ROOM=PMU

R3062 100K 5% 1/32W MF 01005 ROOM=PMU

SYSTEM_ALIVE 电源发给CPU、硬盘和USB的激活

PMU_TO_SYSTEM_COLD_RESET_L 电源发出CPU的复位信号

#28476673:1000PF CAP ON ANSEL AMUX

Chestnut / Ansel AMUX

CHESTNUT_TO_PMU_AMUX 显示电源到大电源的模拟多用信号

CAMPMU_TO_PMU_AMUX 相机电源到大电源的模拟多用信号

C3070 1000PF 10% 10V X5S 01005 ROOM=PMU

C3071 1000PF 10% 10V X5S 01005 ROOM=PMU

温度检测

NTCs

FOREHEAD NTC

C3041 100PF 5% 16V NP0-C0G 01005 ROOM=PMU

R3041 10KOHM-1% 01005 ROOM=NEO

主板前部温度检测

FOREHEAD_NTC

FOREHEAD_NTC_RETURN

XW3041 OMIT SHORT-20L-0.05MM-SM ROOM=PMU

REAR CAMERA NTC 后置温度检测

C3042 100PF 5% 16V NP0-C0G 01005 ROOM=PMU

R3042 10KOHM-1% 01005 ROOM=B2B_WIDE_RCAM

REAR_CAMERA_NTC

RCAM_NTC_RETURN

XW3042 OMIT SHORT-20L-0.05MM-SM ROOM=PMU

RADIO PA NTC

C3043 100PF 5% 16V NP0-C0G 01005 ROOM=PMU

R3043 10KOHM-1% 01005 ROOM=RADIO_PAD

RADIO_PA_NTC

PA_NTC_RETURN

XW3043 OMIT SHORT-20L-0.05MM-SM ROOM=PMU

AP NTC CPU温度检测

C3044 100PF 5% 16V NP0-C0G 01005 ROOM=PMU

R3044 10KOHM-1% 01005 ROOM=SOC

AP_NTC

AP_NTC_RETURN

XW3044 OMIT SHORT-20L-0.05MM-SM ROOM=PMU

CHARGER NTC (IN SIP)

To Senna

CHARGER_NTC

CHARGER_NTC_RETURN

XW3045 OMIT SHORT-20L-0.05SMM-SM ROOM=PMU

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

#29404057:Damping R for ACTIVE_RDY

电源到USB准备就绪启动信号

PMU_TO_AP_HYDRA_ACTIVE_READY

R3009 100 5% 1/32W MF 01005 ROOM=PMU

#29300440:Connect PMU crash to SoC

#27852679:No SDA R, PoR is SPMI

#25244799:200K pull-down

#25244799:CHESTNUT AMUX AND PWR_EN ON SAME CHANNEL

#28748132:CHESTNUT AMUX AND PWR_EN SWAP BETWEEN A6/B6

#25244799:OTP-AJ Connects XTAL1 to GND

32K晶振到电源的输入脚 PMU_XTAL2

C3020 100PF 5% 16V NP0-C0G 01005 ROOM=PMU

R3020 3.92K 1% 1/20W MF 0201 ROOM=PMU

电源实时时钟电路

PMU_VDD_RTC

C3030 0.22UF 20% 6.3V X5R 0201 ROOM=PMU

C3031 1.0UF 20% 6.3V X5R 0201-1 ROOM=PMU

电源芯片基准供电

PMU_VDD_REF

R3000 0.00 5% 1/32W MF 01005 ROOM=PMU

32K晶振1.8V供电

PP1V8_ALWAYS

PMU_VDD_TCXO

C3000 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=PMU

Y3000 32.768KHZ-10PPM 32K晶振 CRITICAL ROOM=PMU

PMU_VSS_RTC

XW3000 OMIT SHORT-20L-0.05MM-SM ROOM=PMU

#29312542:REPLACE PMU XTAL WITH XO

U2700 D2422B0 WLCSP SYM 4 OF 5 ROOM=PMU

RESETS

AP_TO_PMU_WDOG_RESET	CPU到电源看门狗信号。	P13 RESET_IN1
HYDRA_TO_PMU_HOST_RESET	USB到电源主机复位信号	P12 RESET_IN2
AP_TO_PMU_SOCHOT_L	CPU到电源重启复位信号（温控）	N13 RESET_IN3
PMU_TO_SYSTEM_COLD_RESET_L		R12 RESET*
		H15 SHDN

REFS

IREF R10 PMU_IREF 电源芯片基准参考电流

R3010 200K 1% 1/20W MF 0201 ROOM=PMU

VREF R9 PMU_VREF

C3010 0.22UF 20% 6.3V X5R 0201 ROOM=PMU

COMPARATOR

PMU_TO_AP_HYDRA_ACTIVE_READY_R	电源到USB准备就绪启动信号	M12 ACTIVE_RDY
PMU_TO_AOP_CLK32K	电源到CPU的32K时钟信号	G6 SLEEP_32K
PMU_TO_WLAN_CLK32K	电源到WIFI的32K时钟信号	H6 OUT_32K
SYSTEM_ALIVE	电源发给CPU、硬盘和USB的激活信号	K13 SYS_ALIVE
DISPLAY_TO_MANY_BSYNC	显示屏发出的同步信号	M13 FORCE_SYNC
#29300440:Connection Not Needed		L12 DBL_CLICK_DET
PMU_TO_AOP_IRQ_L	电源到CPU的中断信号	N14 IRQ*
I2C0_AP_SCL	I2C0总线	M8 SCL
I2C0_AP_SDA		L8 SDA
SPMI_PMGR_TO_PMU_SCLK	CPU到电源的SPMI总线时钟	K7 SCLK
SPMI_PMU_BI_PMGR_SDATA	CPU到电源的SPMI总线数据	L7 SDATA

ADC

AP_TO_PMU_AMUX_OUT	CPU到电源芯片模拟复用信号输出	D4 AMUX_A0
PMU_ADC_IN	电源芯片模数转换输入	D5 AMUX_A1
CAMPMU_TO_PMU_AMUX	相机电源到大电源的模拟多用信号	D6 AMUX_A2
AP_TO_PMU_AMUX_SYNC	CPU到电源同步信号	D7 AMUX_A3
		F9 AMUX_A4
HYDRA_TO_PMU_USB_BRICK_ID		F10 AMUX_A5
DISPLAY_TO_CHESTNUT_PWR_EN	显示屏到显示电源的开启信号	E6 AMUX_A6
ACC_BUCK_TO_PMU_AMUX	附件供电芯片到大电源的模拟多用信号	E7 AMUX_A7
PMU_AMUX_AY	电源的模拟多用信号外部测试点	E8 AMUX_AY
IKTARA_TO_PMU_OVP	无线充电芯片到电源过压保护信号	F6 AMUX_B0
		G7 AMUX_B1
AP_TO_PMU_TEST_CLKOUT	CPU到电源芯片测试时钟输出	G8 AMUX_B2
PMU_TO_WLAN_CLK32K	电源到WIFI的32K时钟信号	F7 AMUX_B3
CHESTNUT_TO_PMU_AMUX	显示电源到大电源的模拟多用信号	E9 AMUX_B4
		E10 AMUX_B5
PMU_AMUX_BY	电源的模拟多用信号外部测试点	F8 AMUX_B6
		H7 AMUX_B7
		H8 AMUX_BY

AMUX BUTTONS

NTC

FOREHEAD_NTC	主板前部温度检测	T12 TDEV1
REAR_CAMERA_NTC	后置温度检测	T13 TDEV2
RADIO_PA_NTC	射频、功放温度检测	U13 TDEV3
AP_NTC	CPU温度检测	V13 TDEV4
CHARGER_NTC		W13 TDEV5
PMU_TCAL		V14 TCAL

XTAL

R1 XTAL1

P1 XTAL2

GPIO

PRE_UVLO	PMU_TO_AP_PRE_UVLO_L	M14
VDROOP0	PMU_TO_AP_THROTTLE_PCORE_L	P14
VDROOP1	PMU_TO_AP_THROTTLE_GPU0_L	E16
VDROOP11	PMU_TO_AP_THROTTLE_ECORE_L	L15
VDROOP0_DET	AP_CPU_PCORE_SENSE	R14
VDROOP1_DET	AP_VDD_GPU_SENSE	E15
VDROOP11_DET	BUCK11_FB	K15
PRE_UVLO_DET	PMU_PRE_UVLO_DET	L13
LDO5_UVLO_DET	PMU_LDO5_UVLO_DET	U2
IBAT	NC	T11
VBAT	NC	T10
BRICK_ID1	HYDRA_TO_PMU_USB_BRICK_ID	N11
BRICK_ID2	NC	N10
ADC_IN	PMU_ADC_IN 电源芯片模数转换输入	R11
BUTTON1	BUTTON_VOL_DOWN_L 音量下按键	G14
BUTTON2	BUTTON_POWER_KEY_L	H14
BUTTON3	BUTTON_VOL_UP_L 音量上按键	F13
BUTTON4	BUTTON_RINGER_A 静音按键	G13
BUTTON1	PMU_TO_AP_BUTTON_VOL_DOWN_L	K6
BUTTON2	PMU_TO_AP_BUTTON_POWER_KEY_L	J7
BUTTON3	NC	J6
GPIO1	PMU_TO_NFC_EN 电源到NFC开启信号	F11
GPIO2	PMU_TO_AP_THROTTLE_GPU1_L	F12
GPIO3	TIGRIS_TO_PMU_INT_L	G9
GPIO4	WLAN_TO_PMU_HOST_WAKE	G10
GPIO5	NFC_TO_PMU_HOST_WAKE	G11
GPIO6	NC 电源到GPS开启信号，只有英特尔版本才有	G12
GPIO7	PMU_TO_GNSS_EN	H9
GPIO8	NC	H10
GPIO9	PMU_TO_BT_REG_ON 电源到蓝牙开启信号	H11
GPIO10	BT_TO_PMU_HOST_WAKE	H12
GPIO11	CODEC_TO_PMU_WAKE_L	J8
GPIO12	NC	J9
GPIO13	NC	J10
GPIO14	PMU_TO_WLAN_REG_ON 电源到WIFI开启信号	J11
GPIO15	PMU_TO_BB_USB_VBUS_DETECT	J12
GPIO16	NC	K8
GPIO17	PMU_TO_AP_FORCE_DFU_R	K9
GPIO18	PMU_TO_CCG2_RESET_L	K10
GPIO19	PMU_TO_BBPMU_RESET_R_L	K11
GPIO20	PMU_TO_NAND_LOW_BATT_BOOT_L	K12
GPIO21	BB_TO_PMU_PCIE_HOST_WAKE_L	L9
GPIO22	PMU_TO_IKTARA_EN_EXT_1P8V	L10
GPIO23	PMU_TO_BOOST_EN	L11
GPIO24	PMU_TO_DISPLAY_PANICB	M9
GPIO25	I2C0_AP_SCL	M10
FAULT_OUT*	PMU_TO_IKTARA_RESET_L	H13

PMU到CPU节能调节控制信号

GPU到电源芯片的PCORE核心供电检测

GPU到电源芯片的GPU供电检测

送到电源 的E核心供电反馈

电池供电电压检测信号

升压电压PP_VDD_BOOST检测

USB到电源的附件ID检测信号

R3071 20.0K 1% 1/32W MF 01005 ROOM=PMU

R3070 100K 1% 1/32W MF 01005 ROOM=PMU

PMU_HYDRA_TO_AP_FORCE_DFU

PMU_TO_BBPMU_RESET_L

电源到CPU音量上信号	
电源到CPU开机信号	
电源到CPU节能调节控制信号	
USB到电源芯片中断信号	
WIFI到电源主机唤醒信号	
NFC到电源主机唤醒信号	
蓝牙到电源主机唤醒信号	
音频到电源唤醒信号	
电源到WIFI开启信号	
电源到基带USB供电信号	
电源和USB到CPU的强制DFU信号	
电源到快充芯片的复位信号	
电源到基带电源的复位信号	
基带到电源芯片的备唤醒信号	
电源到无线充电5V、6V开启信号	
电源到升压供电5V的开启信号	
I2C0总线时钟信号	
电源到无线充电的复位信号	

PAGE TITLE	SYSTEM POWER: PMU (4/4)
Apple Inc.	DRAWING NUMBER 051-02159
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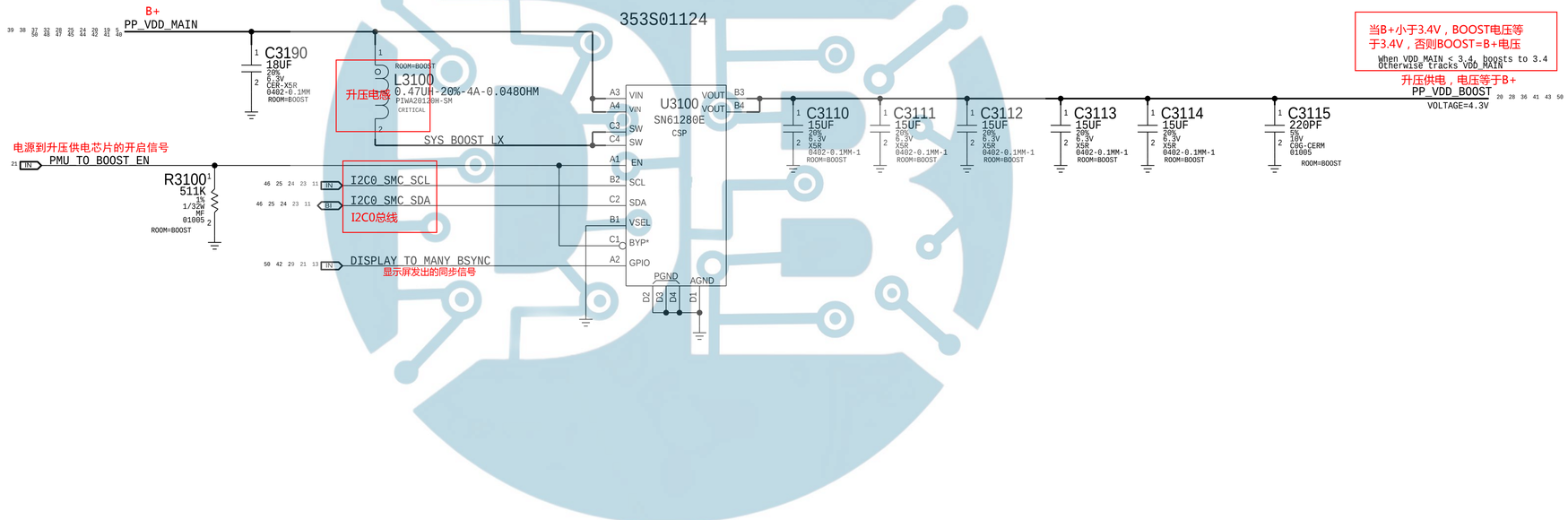
升压供电芯片

BOOST

353S01124



PAGE TITLE	SYSTEM POWER: Boost
Apple Inc.	DRAWING NUMBER 051-02159 SIZE D
	REVISION 10.0.0
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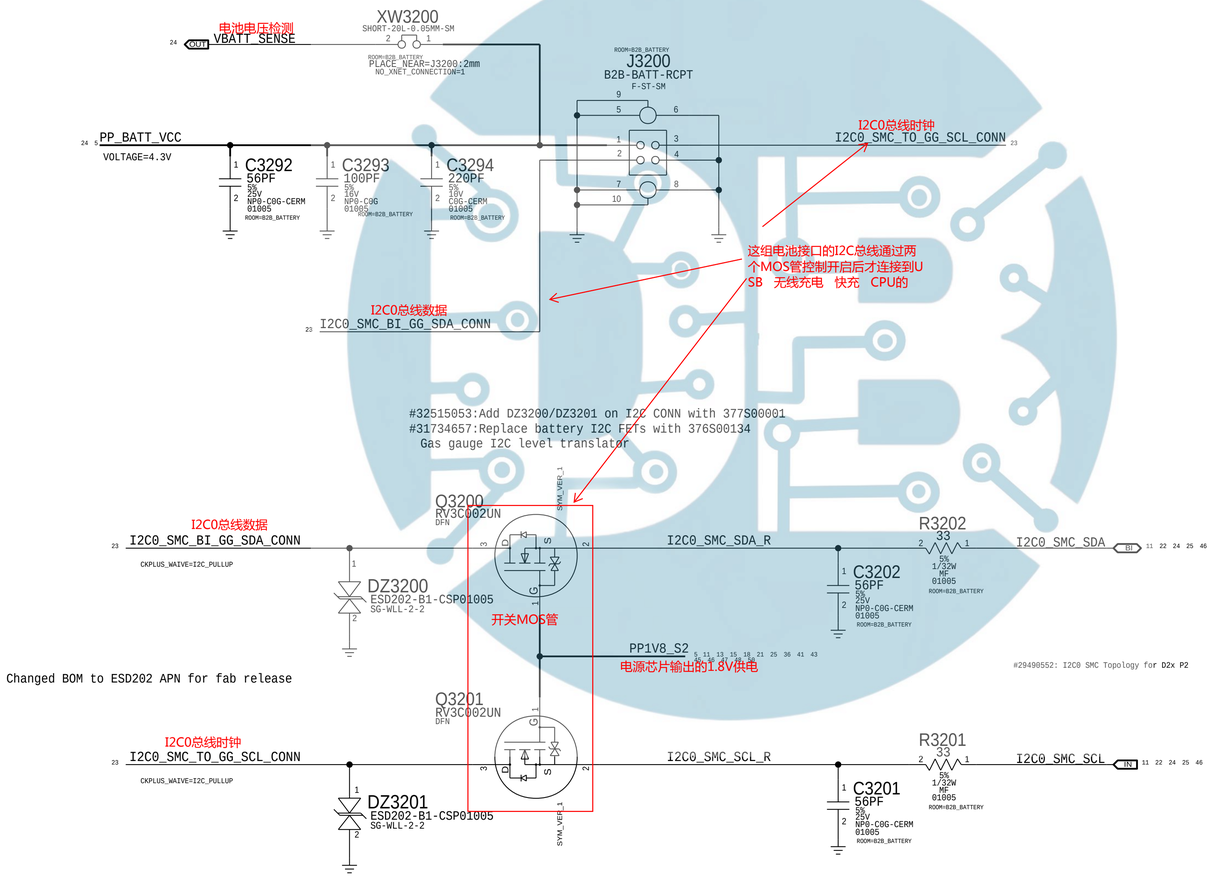
电池接口

Battery Connector

THIS ONE ON MLB ---> 516S00232



PAGE TITLE	SYSTEM POWER: B2B Battery
	Apple Inc.
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Tigris 2

APN:343S00170

#29546692:Move DZ3300 to PMID1
Additional Cap for D21/D211 MLB
C3318 is only on D21x

TIGRIS_PMID1 充电芯片自身降压产生电路外部滤波

DZ3300 BZT52C20LP DFN10062
C3318 2.2UF 20% 25V X5R 0402-4
C3310 4.7UF 20% 25V X5R 0603
C3315 220PF 5% 25V C0G 01005
C3316 220PF 5% 25V C0G 01005
NOSTUFF C3317 220PF 5% 25V C0G 01005

#29277790:Nostuff C3317/C3327
#26845160:Charge Sharing on PMID caps
#31097491:Charge C3310/C3320 to ZRB

R3311 50K 1% 1/32W MF 01005
C3311 4.7UF 20% 16V X5R 0402
C3312 4.7UF 20% 16V X5R 0402
C3313 4.7UF 20% 16V X5R 0402

TIGRIS_PMID2 充电芯片自身降压产生电路外部滤波

C3320 4.7UF 20% 25V X5R 0603
C3325 220PF 5% 25V C0G 01005
C3326 220PF 5% 25V C0G 01005
NOSTUFF C3327 220PF 5% 25V C0G 01005

PP_VBUS1_E75 尾插到充电芯片的充电电压

#31097491:Change C3301/C3420 to ZRB

C3301 2.2UF 20% 25V X5R 0402-4 OMIT_TABLE
C3302 220PF 5% 25V C0G 01005
C3303 220PF 5% 25V C0G 01005

PP_VBUS2_IKTARA 无线充电到充电芯片的充电电压

C3305 1UF 10% 25V X5R 402
C3306 220PF 5% 25V C0G 01005

PP1V8_ALWAYS

R3330 100K 5% 1/32W MF 01005

I2C0_SMC_SDA I2C0总线
I2C0_SMC_SCL
SYSTEM_ALIVE 电源发给CPU和充电芯片的激活信号
HYDRA_TO_TIGRIS_VBUS1_VALID_L
USB到充电芯片的过流检测（开启信号）

TIGRIS_TO_PMU_INT_L
R3331 100 1% 1/32W MF 01005
TIGRIS_TO_PMU_INT_R_L 充电芯片到电源的中断信号

USB_VBUS_DETECT
R3332 30.1K 1% 1/32W MF 01005
TIGRIS_VBUS_DETECT USB插入检测脚

BATTERY_NTC

U3300 SN2501A1 WCSP CRITICAL 充电芯片

PMID1 PMID1 PMID1 PMID1 PMID1
PMID2 PMID2 PMID2
VBUS1 VBUS1 VBUS1 VBUS1 VBUS1
VBUS2 VBUS2 VBUS2
SDA SCL SYS_ALIVE VBUS1_VALID* VBUS2_VALID* INT* VBUS1_DET TEST NTC
LDO BOOT BUCK_SW BUCK_SW BUCK_SW BUCK_SW BUCK_SW BUCK_SW BUCK_SW BUCK_SW
BATT BATT BATT BATT BATT
BATT_SNS ACT_DIODE HDQ_HOST HDQ_GAUGE AUX1 NC0 NC1 NC2 NC3
GND AGND

#29745777:Conn VDD_MAIN5 to PP_VDD_MAIN

C3390 15UF 20% 6.3V CERM 0402-0.1MM ROOM=CHARGER
C3391 15UF 20% 6.3V CERM 0402-0.1MM ROOM=CHARGER

充电芯片自身降压产生电路外部滤波

TIGRIS_LDO
C3360 220PF 5% 16V C0G-CERM 01005
C3361 3.9UF 20% 6.3V CER-X5R 0201

C3340 0.047UF 10% 16V X5R 0201

TIGRIS_BOOT
NO_XNET_CONNECTION
TIGRIS_LX

APN:152S00683 (0.47UH-20%-7.2A-0.028OHM)
Inductor in Niki SIP
升压电感
集成在M5500里面

C3341 220PF 5% 16V C0G-CERM 01005
C3342 220PF 5% 16V C0G-CERM 01005
C3343 330PF 10% 16V CER-X7R 01005

电池供电
VBATT_SENSE 电池电压检测
TIGRIS_ACTIVE_DIODE 充电管开关信号

#29536366:10ohm between AUX1 and P_IN

R3335 10 5% 1/32W MF 01005
PP_VAR_USB_RVP_TIGRIS_R
USB3V供电
PP_VAR_USB_RVP

Grounded for thermals

138S00140/138S00141/138S00142 are alts
#29536225:4UF for Better Derating
#30208688:Update C3342/C3360/C3294 to 131S00053

B+ PP_VDD_MAIN

CRITICAL Q3350 CSD68841W BGA
充电管

PP_BATT_VCC

C3353 220PF 5% 16V C0G-CERM 01005
C3350 330PF 10% 16V CER-X7R 01005
C3351 2.2UF 20% 6.3V X5R-CERM 0201 OMIT_TABLE
C3352 2.2UF 20% 6.3V X5R-CERM 0201 OMIT_TABLE

NOSTUFF R3350 100K 5% 1/32W MF 01005

BATTERY NTC
C3370 220PF 5% 16V C0G-CERM 01005
电池温控热敏电阻
R3370 10KOHM-1% 01005
BATTERY_NTC
BATTERY_NTC_RETURN
OMIT XW3370 SHORT-20L-0.05MM-SM

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Iktara

Iktara Debug
PP3403
IKTARA_GPIO3
PP3404
IKTARA_GPIO4
PP3405
IKTARA_TO_SMC_INT
无线充电芯片到CPU的中断信号
ROOM=TEST
整流后的直流充电电压
PP_IKTARA_VRECT
PP_IKTARA_VMID
VOLTAGE=19V
CRITICAL
R3410
0.02
C3410
C3411
C3412
C3413
C3414
C3415
C3416
C3417
2.2UF
220PF
XW3401
XW3400
D3400
D3401
D3402
D3403
OMIT_TABLE
SNSR20F30WCNX
整流二极管
U3400
BC59355A2
WLCSP
CRITICAL
无线充电芯片
#29235539: D21x EVT updates for resonant caps
#31871684: Per Kieran/Pratik, Updating Low Dk Caps for Iktara in Carrier
To Coil
IKTARA_COIL1_CONN
无线充电接口送来的交流充电电压
R3450
C3451
C3452
C3453
C3454
C3455
C3456
To Coil
IKTARA_COIL2_CONN
R3460
C3461
C3462
C3463
C3464
C3465
C3466
C3402
C3403
C3404
C3405
C3406
C3407
IKTARA_COMM1
IKTARA_BOOT1
IKTARA_AC1
IKTARA_AC2
IKTARA_BOOT2
IKTARA_COMM2
CLAMP1
COMM1
BOOT1_VDD
AC1
AC2
BOOT2_VDD
COMM2
CLAMP2
ANA1
ANA2
ANA3
ANA4
REFBP
DIGTEST
RGND
PGND
AVSS
HV_GPO1
HV_GPO2
BOOTB_VDD
SW
VOUT
VMID_AUX_SW_VDD
VMID_AUX_VDD
VDD5V
VDIG_CORE_VDD
VDDO
VAUX_1P8_VDD
SDA
SCL
INT
RESET*
GPIO1
GPIO2
GPIO3/SWDIO
GPIO4/SWCLK
GPIO5
GPIO6
GPIO7
EN_EXT_1P8
VSYS_ANA_VDD
VSYS_1P8_VDD
OTP_WREN
NC
无线充电到充电芯片的充电电压
PP_VBUS2_IKTARA
VOLTAGE=16V
C3420
C3421
XW3402
IKTARA_VOUT_SNS
PP5V0_VMID_AUX_IKTARA
PP5V0_VDD_IKTARA
PP1V5_VDIG_CORE_IKTARA
无线充电自身产生的供电
PP1V8_IKTARA
C3422
C3423
C3424
C3425
#30624018: Update C3425 to 2.2UF
Pull-Ups
PP_VDD_MAIN
R3420
R3421
#30188057: Add 0201 PU to VDD_MAIN
PP1V8_IKTARA
I2C0总线
I2C0_SMC_SDA
I2C0_SMC_SCL
IKTARA_TO_SMC_INT
无线充电芯片到CPU的中断信号
PMU_TO_IKTARA_RESET_R_L
电源到无线充电的复位信号
NOTE: PU only at RESET* not GPIO2
R3422
PMU_TO_IKTARA_RESET_L
#29302816: Remove reset connection to Iktara GPIO
IKTARA_TO_PMU_OVP
无线充电到电源芯片过压保护信号
#29706561: Add connection from Iktara GPIO to PMU
无线充电诊断测试点
IKTARA_GPIO3
IKTARA_GPIO4
NC_IKTARA_PRODUCT_ID_0
IKTARA_PRODUCT_ID_1
NC_IKTARA_PRODUCT_ID_2
无线充电附件检测信号
R3424
#30823904: Add 1kohm to GPIO6 for product ID
#29223315: Add series R to EN_EXT_1P8 and RESET*
R3423
电源到无线充电的1.8V开启信号
PMU_TO_IKTARA_EN_EXT_1P8V_R
PMU_TO_IKTARA_EN_EXT_1P8V
B+
PP_VDD_MAIN
电源芯片输出的1.8V供电
PP1V8_S2
R3430
PP_VDD_MAIN_IKTARA
#30023781: Connect ANA3 to VDD_MAIN
Note: Iktara GPIOs 5-7 reserved for product ID
110 RESERVED FOR OTHER PROGRAMS
101 <- SELECTED (D21x)
011 RESERVED FOR OTHER PROGRAMS

PAGE TITLE

SYSTEM POWER: Iktara

Apple Inc.

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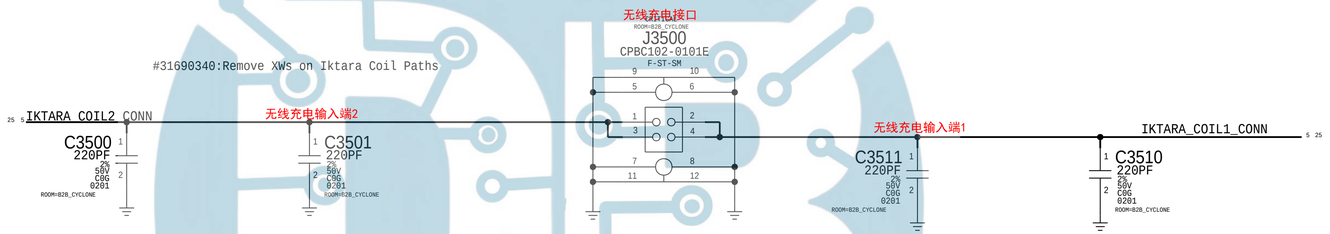
Cyclone connector

THIS ONE ON MLB ---> 516S00311

#31690340:Remove XWs on Iktara Coil Paths



PAGE TITLE

SYSTEM POWER: B2B Cyclone

Apple Inc.

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REVISION 10.0.0

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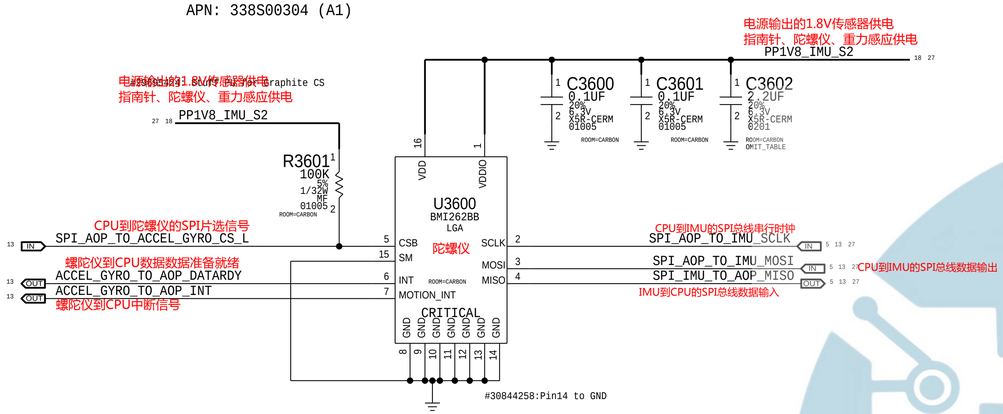
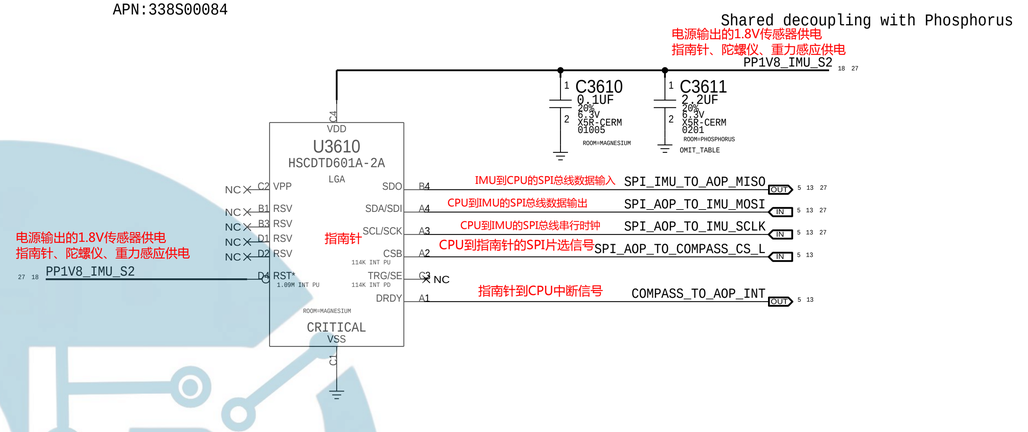
Graphite - Accel & Gyro

APN: 338S00304 (A1)

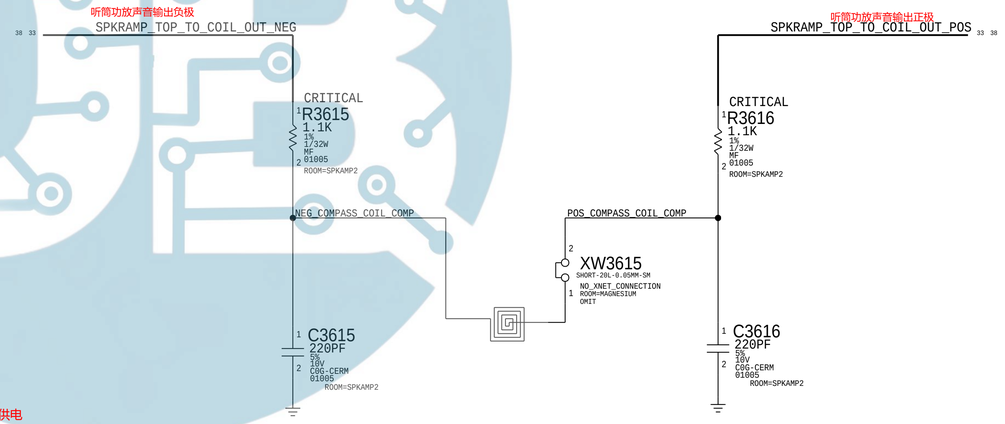


Magnesium - Compass

APN:338S00084

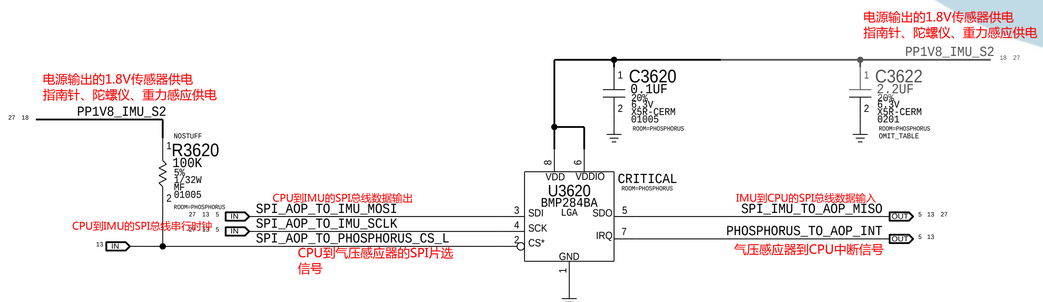


North Speaker Compass Compensation Coil



Phosphorus

APN:338S00334



PAGE TITLE: SENSORS

Apple Inc.

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REVISION: 10.0.0

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Camera PMU

相机电源

PP_VDD_MAIN
B+
C3790 18UF 20% 6.3V CER-X5R 0402-0.1MM ROOM=CAM_PMU
C3791 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=CAM_PMU OMIT_TABLE
LAYOUT: C3790 shared with NFC BOOST

U3700 D2462-AVAE WLCSP SYM 1 OF 4 ROOM=CAM_PMU CRITICAL
VCC MAIN BUCKS
J7 VDD_BUCK9
J8 VDD_BUCK9
C5 VDD_MAIN
E2 VDD_MAIN
G4 VDD_MAIN
BUCK9_LX0 H7
BUCK9_LX0 H8
BUCK9_FB H5

D20:152S00626
D21:152S00622 (Lower)
L3700 1UH-20%-2.1A-0.10HM PIWA2012FE-SM ROOM=CAM_PMU
CAMPMU_BUCK_LX0
给广角相头接口的2.85V
PP2V85_VAR_CAM_VCM_PVDD
C3700 18UF 20% 6.3V CER-X5R 0402-0.1MM ROOM=CAM_PMU
C3701 18UF 20% 6.3V CER-X5R 0402-0.1MM ROOM=CAM_PMU
C3702 330PF 10% 16V CER-X7R 01005 ROOM=CAM_PMU
VOLTAGE=2.85V
XW3700 SHORT-20L-0.05MM-SM ROOM=B2B_WIDE_RCAM
CAMPMU_BUCK_FB
OMIT

PP_VDD_BOOST
升压电压输入
C3795 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=CAM_PMU OMIT_TABLE
C3796 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=CAM_PMU OMIT_TABLE
PP1V25_S2
电源芯片输出的1.25V
C3797 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=CAM_PMU OMIT_TABLE
C3798 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=CAM_PMU OMIT_TABLE

U3700 D2462-AVAE WLCSP SYM 2 OF 4
LDO INPUT LDO OUTPUT
A1 VDD_LDO4_17
H2 VDD_LDO9
B6 VDD_LDO10
B5 VDD_LDO15
A2 VDD_LDO4_17
B4 VDD_LDO18
B3 VDD_LDO19
A7 VDD_LDO20_21
A8 VDD_LDO20_21
H1 VDD_LDO22
VLDO4 B2 VOLTAGE=2.85V
VLDO9 J2 VOLTAGE=2.6V /1.95V
VLDO10 A6 VOLTAGE=1.15V
VLDO15 A5 VOLTAGE=1.15V
VLDO17 B1 VOLTAGE=2.85V
VLDO18 A4 VOLTAGE=1.15V
VLDO19 A3 VOLTAGE=1.8V
VLDO20 B8 VOLTAGE=2.85V
VLDO21 B7 VOLTAGE=3.3V
VLDO22 G1 VOLTAGE=2.6V /1.95V

#31766720:Add 0402 Footprint Connector
#31710713:C3704 to 4UF to mitigate RnR
给前相头接口的2.85V
PP2V85_FCAM_AVDD
给广角相头接口的2V
PP_CAM_WIDE_ADC
C3704 3.9UF 20% 6.3V CER-X5R 0201 ROOM=CAM_PMU
C3703 18UF 20% 6.3V CER-X5R 0402-0.1MM ROOM=CAM_PMU
C3709 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=CAM_PMU
给长焦相头接口的1.1V
PP1V1_CAM_TELE_DVDD
给前相头接口的1.1V
PP1V1_FCAM_DVDD
C3710 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=CAM_PMU
C3711 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=CAM_PMU
C3715 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=CAM_PMU
给长焦相头接口的2.85V
PP2V85_CAM_TELE_AVDD
给广角相头接口的1.1V
PP1V1_CAM_WIDE_DVDD
C3717 3.9UF 20% 6.3V CER-X5R 0201 ROOM=CAM_PMU
C3718 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=CAM_PMU
PP1V8_HAWKING
给广角相头接口的2V
PP2V85_CAM_WIDE_AVDD
C3719 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=CAM_PMU
C3720 3.9UF 20% 6.3V CER-X5R 0201 ROOM=CAM_PMU
所有相机共用3.3V
PP3V3_SVDD
给长焦相头接口的2V
PP_CAM_TELE_ADC
C3721 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=CAM_PMU
C3722 3.9UF 20% 6.3V CER-X5R 0201 ROOM=CAM_PMU
#32596057:Increase C3722 to 3.9UF to Help RCAM ONZ

C LDO4: 300mA max
CX LDO9: 390mA max
Ga LDO10: 1300mA max
D LDO15: 400mA max
Actual Load: 390mA
C LDO17: 300mA max
D LDO18: 400mA max
C LDO19: 300mA max
C LDO20: 300mA max
C LDO21: 300mA max
Cx LDO22: 390mA max

For GPIO pullups only
电源输出的1.8V供电
PP1V8_IO
VBUCK3 H3
SW INPUT SW OUTPUT
BUCK3_SW1 J3 NC
NC J4 VPUMP
ON_BUF F2 CAMPMU_ON_BUF
C3750 0.22UF 20% 6.3V X5R 01005 ROOM=CAM_PMU

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#29220631: Connect Neon to other side of R3802 and change to 49.9 ohms

I2C3_ISP_SDA_R

I2C3_ISP_SDA

R3802 49.9 1% 1/32W MF 01005 ROOM=CAM_PMU

I2C3_ISP_SCL

相机电源到CPU中断信号

CAMPMU_TO_AP_IRQ_L

PU on AP GPIO

AP_TO_CAMPMU_RESET_L

CPU发给照相机电源的复位信号

R3801 100K 5% 1/32W MF 01005 ROOM=CAM_PMU

CAMPMU_VREF 相机电源基准电压

CAMPMU_IREF 相机电源基准电流

CAMPMU_VRTC

C3800 0.22UF 20% 6.3V X5R 01005 ROOM=CAM_PMU

R3800 200K 1% 1/32W MF 01005 ROOM=CAM_PMU

C3810 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=CAM_PMU

#30505664:Remove Ansel TDEV Routing

U3700
D2462-AVAE
WLCSP
SYM 3 OF 4

I2C 相机电源

RESET

REFERENCE

GPIO

TEMPERATURE

SCL E8
SDA F8
IRQ* D8
CRASH* D6
RESET_IN F5
VREF C1
IREF D1
VRTC E1
TDEV1 J5
TDEV2 G5
TCAL C6

GPIO1 F6 相机电源到闪光灯驱动芯片开启信号 CAMPMU_TO_STROBE_DRIVER_HWEN_R
GPIO2 E6 NC
GPIO3 D7 NC
GPIO4 E4 NC
GPIO5 D4 NC
GPIO6 D3 NC
GPIO9 F7 电源输出的1.8V供电 PP1V8_IO
GPIO10 F3 DISPLAY_TO_MANY_BSYNC 显示屏发出的同步信号
GPIO11 G3 NC
GPIO12 G2 NC
GPIO15 E3 NC

AMUX_AY C8 相机电源到大电源的模拟多用信号 CAMPMU_TO_PMU_AMUX
ATM E7

R3840 100 5% 1/32W MF 01005 ROOM=B2B_FOREHEAD
CAMPMU_TO_STROBE_DRIVER_HWEN

PP1V8_IO MAKE_BASE=TRUE

U3700
D2462-AVAE
WLCSP
SYM 4 OF 4

VSS C2 C3 C4 C7 D2 D5 E5 F1
VSS G6 G7 G8 H4 H6 J1 J6 F4

PAGE TITLE
CAMERA: PMU (2/2)

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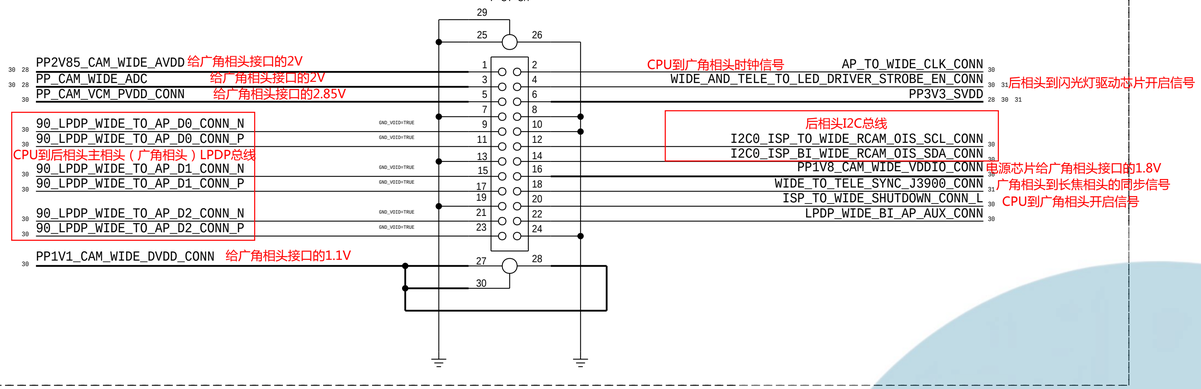
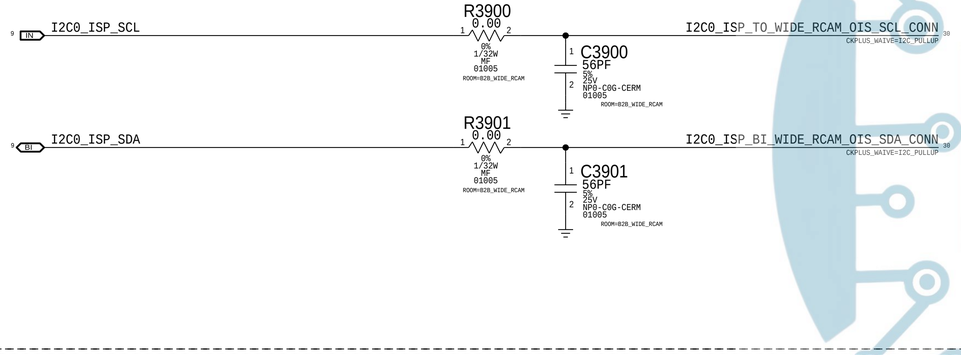
Wide Camera Connector

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

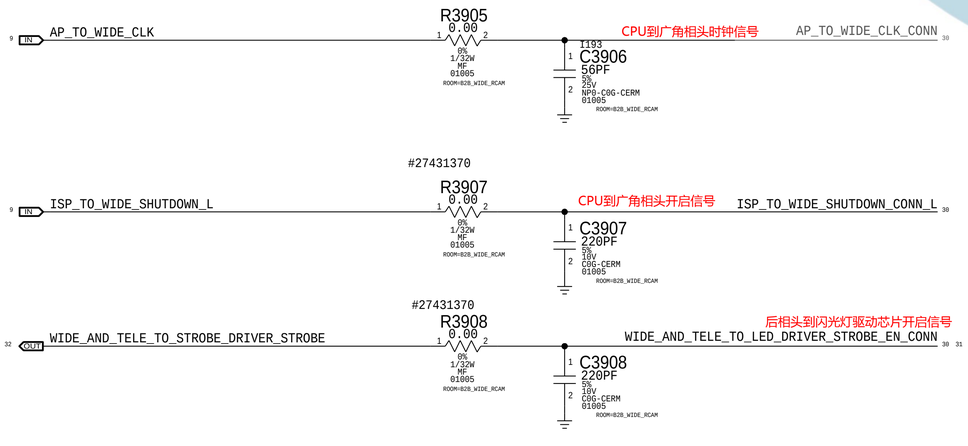
J3900
AA27DK-S024VA1
F-ST-SM



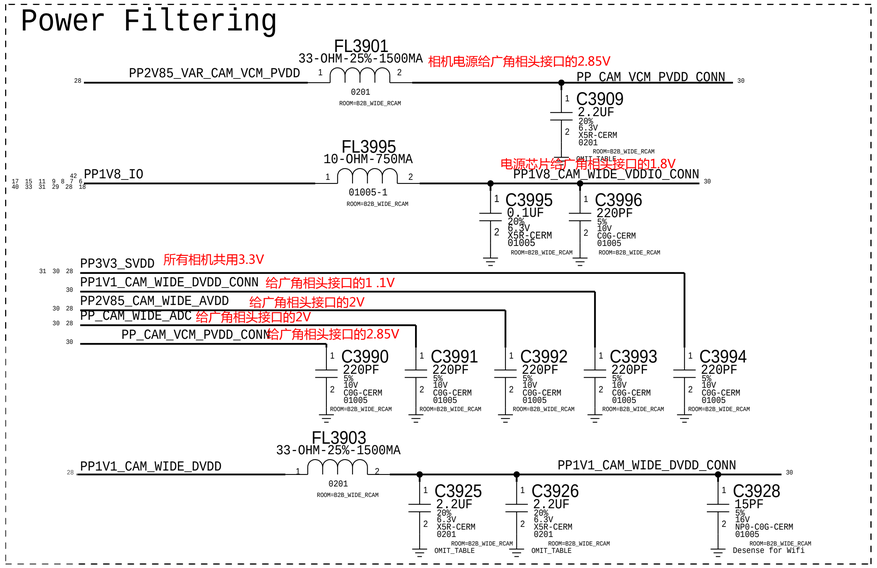
ISP I2C



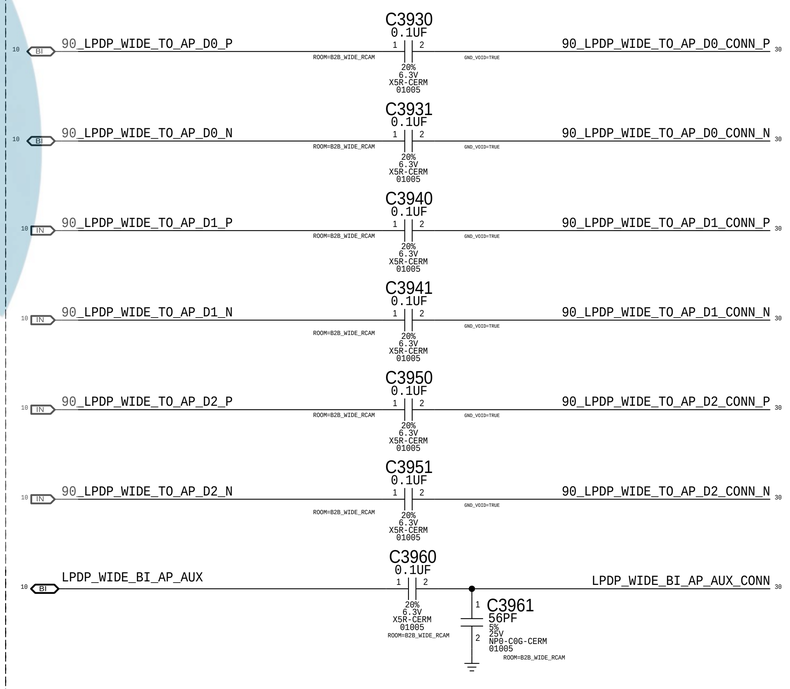
IO Filters



Power Filtering



LPDP Filters



PAGE TITLE
CAMERA: B2B Wide (KY)

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Tele Camera Connector

长焦相头

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

CPU到后相头副相头（长焦相头）LPDP总线

J4000
AA27DK-S024VA1
F-ST-SM

90_LPDP_TELE_TO_AP_D2_CONN_N		90_LPDP_TELE_TO_AP_D1_CONN_P
90_LPDP_TELE_TO_AP_D2_CONN_P		90_LPDP_TELE_TO_AP_D1_CONN_N
90_LPDP_TELE_TO_AP_D0_CONN_N	I2C总线	I2C1_ISP_TO_TELE_SCL_CONN
90_LPDP_TELE_TO_AP_D0_CONN_P		I2C1_ISP_BI_TELE_SDA_CONN
		WIDE_AND_TELE_TO_LED_DRIVER_STROBE_EN_CONN 后相头到闪光灯驱动芯片开启信号
AP_TO_TELE_CLK_CONN CPU到长焦相头时钟信号		所有相机共用3.3V PP3V3_SVDD
		PP1V8_CAM_TELE_VDDIO_CONN 电源芯片给长焦相头接口的1.8V
PP2V85_CAM_TELE_AVDD 给长焦相头接口的2.85V		WIDE_TO_TELE_SYNC_J4000_CONN 广角相头到长焦相头的同步信号
PP_CAM_TELE_ADC 给长焦相头接口的2.V		ISP_TO_TELE_SHUTDOWN_CONN_L CPU到长焦相头开启信号
PP1V8_CAM_TELE_VDDIO_CONN 电源芯片给长焦相头接口的1.8V		LPDP_TELE_BI_AP_AUX_CONN
PP1V1_CAM_TELE_DVDD_CONN 给长焦相头接口的1.1V		

ISP I2C

I2C1_ISP_SCL (IN) — R4000 0.00 (0% 1/32W MF 01005) — C4000 56PF (5% 25V NP0-C0G-CERM 01005) — I2C1_ISP_TO_TELE_SCL_CONN (CKPLUS_WAIVE=I2C_PULLUP)

I2C1_ISP_SDA (BI) — R4001 0.00 (0% 1/32W MF 01005) — C4001 56PF (5% 25V NP0-C0G-CERM 01005) — I2C1_ISP_BI_TELE_SDA_CONN (CKPLUS_WAIVE=I2C_PULLUP)

IO Filters

#29487888
AP_TO_TELE_CLK (IN) — R4005 0.00 (0% 1/32W MF 01005) — C4006 56PF (5% 25V NP0-C0G-CERM 01005) — AP_TO_TELE_CLK_CONN
CPU到长焦相头时钟信号

#27431370
ISP_TO_TELE_SHUTDOWN_L (IN) — R4007 0.00 (0% 1/32W MF 01005) — C4007 220PF (5% 10V C0G-CERM 01005) — ISP_TO_TELE_SHUTDOWN_CONN_L
CPU到长焦相头开启信号

WIDE_AND_TELE_TO_LED_DRIVER_STROBE_EN_CONN (BI) — C4008 220PF (5% 10V C0G-CERM 01005)
CPU到长焦相头开启信号

#27431370
WIDE_TO_TELE_SYNC_J3900_CONN (IN) — R4010 0.00 (0% 1/32W MF 01005) — NOSTUFF C4010 220PF (5% 10V C0G-CERM 01005) — WIDE_TO_TELE_SYNC_J4000_CONN
广角相头到长焦相头的同步信号

Power Filtering

FL4095
33-OHM-25%-1500MA
0201

PP1V8_IO — PP1V8_CAM_TELE_VDDIO_CONN
C4095 1.0UF (20% 6.3V X6S 0201-1)
C4096 220PF (5% 10V C0G-CERM 01005)

PP3V3_SVDD 所有相机共用3.3V
PP2V85_CAM_TELE_AVDD 给长焦相头接口的2.85V
PP_CAM_TELE_ADC 给长焦相头接口的2.V
C4091 220PF (5% 10V C0G-CERM 01005)
C4092 220PF (5% 10V C0G-CERM 01005)
C4094 220PF (5% 10V C0G-CERM 01005)

FL4003
33-OHM-25%-1500MA
0201

PP1V1_CAM_TELE_DVDD — PP1V1_CAM_TELE_DVDD_CONN
C4025 2.2UF (20% 6.3V X5R-CERM 0201) OMIT_TABLE
C4026 2.2UF (20% 6.3V X5R-CERM 0201) OMIT_TABLE
C4093 220PF (5% 10V C0G-CERM 01005) ROOM=B2B_PEARL
C4028 15PF (5% 10V NP0-C0G-CERM 01005)
Desense for Wifi frequencies

LPDP

90_LPDP_TELE_TO_AP_D0_P	C4030 0.1UF	90_LPDP_TELE_TO_AP_D0_CONN_P
90_LPDP_TELE_TO_AP_D0_N	C4031 0.1UF	90_LPDP_TELE_TO_AP_D0_CONN_N
90_LPDP_TELE_TO_AP_D1_P	C4040 0.1UF	90_LPDP_TELE_TO_AP_D1_CONN_P
90_LPDP_TELE_TO_AP_D1_N	C4041 0.1UF	90_LPDP_TELE_TO_AP_D1_CONN_N
90_LPDP_TELE_TO_AP_D2_P	C4050 0.1UF	90_LPDP_TELE_TO_AP_D2_CONN_P
90_LPDP_TELE_TO_AP_D2_N	C4051 0.1UF	90_LPDP_TELE_TO_AP_D2_CONN_N
LPDP_TELE_BI_AP_AUX	C4060 0.1UF	LPDP_TELE_BI_AP_AUX_CONN

(20% 6.3V X5R-CERM 01005; GND_VOID=TRUE; C4061 56PF (5% 25V NP0-C0G-CERM 01005))

PAGE TITLE: CAMERA: B2B Tele (TN)

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LED STROBE DRIVERS (NEON)

闪光灯驱动芯片

NEON1
APN:353S00558
I2C ADDRESS: 0x63

B+
PP_VDD_MAIN
C4190 10UF 20% 6.3V CERM-X5R 0402-0.1MM ROOM=STROBE
C4191 10UF 20% 6.3V CERM-X5R 0402-0.1MM ROOM=STROBE
C4192 220PF 5% 10V C0G-CERM 01005 ROOM=STROBE

M4100 HUNT-A SIP SYM 1 OF 3

B8 VDD
D2 VDD
D3 VDD

后相头到闪光灯驱动芯片开启信号 → CAMPMU_TO_STROBE_DRIVER_HWEN → C9 HWEN1 (INT 300K PD) 复合电感 集成闪光灯驱动和升压电感
后相头到闪光灯驱动芯片开启信号 → WIDE_AND_TELE_TO_STROBE_DRIVER_STROBE → C8 STB1 (INT 300K PD)
基带到闪光灯的来电闪烁开启信号 → BB_TO_STROBE_DRIVER_GSM_BURST_IND → D8 GSM1 (INT 300K PD)
I2C3_ISP_SDA_R (BI) → B9 SDA1
I2C3_ISP_SCL → B10 SCL1
I2C总线

LED1 D9, D10 → 闪光灯供电输出1 PP_STROBE_DRIVER1_COOL_LED
LED2 D6, D7 → 闪光灯供电输出1 PP_STROBE_DRIVER1_WARM_LED
NTC C10 → 闪光灯温度检测 STROBE_MODULE_NTC

#29230367: Change net names for Capella strobe module

NEON2
APN:353S00868
I2C ADDRESS: 0x67

B+
PP_VDD_MAIN
C4195 10UF 20% 6.3V CERM-X5R 0402-0.1MM ROOM=STROBE2
C4196 10UF 20% 6.3V CERM-X5R 0402-0.1MM ROOM=STROBE2
C4197 220PF 5% 10V C0G-CERM 01005 ROOM=STROBE

M4100 HUNT-A SIP SYM 2 OF 3

B18 VDD
B19 VDD
D13 VDD

后相头到闪光灯驱动芯片开启信号 → CAMPMU_TO_STROBE_DRIVER_HWEN → C12 HWEN0 (INT 300K PD) 复合电感 集成闪光灯驱动和升压电感
后相头到闪光灯驱动芯片开启信号 → WIDE_AND_TELE_TO_STROBE_DRIVER_STROBE → C13 STB0 (INT 300K PD)
基带到闪光灯的来电闪烁开启信号 → BB_TO_STROBE_DRIVER_GSM_BURST_IND → B13 GSM0 (INT 300K PD)
I2C3_ISP_SDA_R (BI) → D12 SDA2
I2C3_ISP_SCL → D11 SCL2
I2C总线

LED1 B11, B12 → 闪光灯供电输出2 PP_STROBE_DRIVER2_COOL_LED
LED2 B14, B15 → 闪光灯供电输出2 PP_STROBE_DRIVER2_WARM_LED
NTC C11 → 闪光灯温度检测 STROBE_MODULE_NTC

M4100 HUNT-A SIP SYM 3 OF 3

A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19 A20 B2 B3 B4 B5 B6 B7 B16 B17 B20 C1 C2 C3 C4 C5 C6 C7 GND
C14 C15 C16 C17 C18 C19 C20 D1 D4 D5 D14 D15 D16 D17 D18 D19 E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17 E18 E19 GND
A1 GND1, B1 GND1S, E20 GND2, D20 GND2S

PAGE TITLE
CAMERA: Strobe Drivers

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FCAM POWER

FL4200
1500HM-25%-200MA-0.7DCR
PP1V8_IO → PP1V8_FCAM_IO_CONN
C4200 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=B2B_FOREHEAD
C4201 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_FOREHEAD

给前相头接口的1.1V
FL4210
33-OHM-25%-1500MA
PP1V1_FCAM_DVDD → PP1V1_FCAM_DVDD_CONN
C4210 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=B2B_FOREHEAD
C4211 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_FOREHEAD

FL4220
10-OHM-750MA
PP2V85_FCAM_AVDD → PP2V85_FCAM_AVDD_CONN
C4220 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=B2B_FOREHEAD
C4221 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_FOREHEAD

FCAM I/O

#29487888
AP_TO_FCAM_CLK → AP_TO_FCAM_CLK_CONN
R4230 0.00 0% 1/32W MF 01005 ROOM=B2B_FOREHEAD
C4230 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_FOREHEAD
CPU到长焦相头时钟信号

#27431370
ISP_TO_FCAM_SHUTDOWN_L → ISP_TO_FCAM_SHUTDOWN_CONN_L
R4232 0.00 0% 1/32W MF 01005 ROOM=B2B_FOREHEAD
C4232 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_FOREHEAD
CPU到前置相头开启信号

I2C2_ISP_SCL → I2C2_ISP_TO_FCAM_SCL_CONN (CKPLUS_WAIVE=I2C_PULLUP)
R4234 0.00 0% 1/32W MF 01005 ROOM=B2B_FOREHEAD
C4234 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_FOREHEAD

I2C2_ISP_SDA → I2C2_ISP_BI_FCAM_SDA_CONN (CKPLUS_WAIVE=I2C_PULLUP)
R4236 0.00 0% 1/32W MF 01005 ROOM=B2B_FOREHEAD
C4236 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_FOREHEAD

CONVOY I/O

PDM_SPKRAMP_TOP_TO_CONVOY_CLK → PDM_SPKRAMP_TOP_TO_CONVOY_CLK_CONN
R4270 100 5% 1/32W MF 01005 ROOM=B2B_FOREHEAD
C4270 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_FOREHEAD

FL4271
1500HM-25%-200MA-0.7DCR
PDM_CONVOY_TO_SPKRAMP_TOP_DATA → PDM_CONVOY_TO_SPKRAMP_TOP_DATA_CONN
C4271 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_FOREHEAD

I2C2_AP_SCL → I2C2_AP_TO_CONVOY_SCL_CONN
R4272 0.00 0% 1/32W MF 01005 ROOM=B2B_FOREHEAD
C4272 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_FOREHEAD

I2C2_AP_SDA → I2C2_AP_BI_CONVOY_SDA_CONN
R4273 0.00 0% 1/32W MF 01005 ROOM=B2B_FOREHEAD
C4273 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_FOREHEAD

PROX + ALS + CONVOY POWER

FL4250
1500HM-25%-200MA-0.7DCR
PP3V0_CONVOY → PP3V0_CONVOY_CONN
C4250 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=B2B_FOREHEAD OMIT_TABLE
C4251 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_FOREHEAD

FL4260
10-OHM-750MA
PP3V0_S2 → PP3V0_PROX_ALS_CONN
C4261 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=B2B_FOREHEAD OMIT_TABLE
C4262 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_FOREHEAD
#28225348: Change FL4260 to low-DCR part

NORTH SPEAKER

SPKRAMP_TOP_TO_COIL_OUT_POS
C4284 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_FOREHEAD
SPKRAMP_TOP_TO_COIL_OUT_NEG
C4285 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_FOREHEAD
C4286 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_FOREHEAD

COIL_TO_SPKRAMP_TOP_VSENSE_P → COIL_TO_SPKRAMP_TOP_VSENSE_CONN_P
R4287 100 5% 1/32W MF 01005 ROOM=B2B_FOREHEAD
C4287 100PF 5% 16V NP0-C0G 01005 ROOM=B2B_FOREHEAD
R4287/R4288 to 100ohm to reduce Xtalk
#30299013:Stuff 100pF at C4287/C4288

COIL_TO_SPKRAMP_TOP_VSENSE_N → COIL_TO_SPKRAMP_TOP_VSENSE_CONN_N
R4288 100 5% 1/32W MF 01005 ROOM=B2B_FOREHEAD
C4288 100PF 5% 16V NP0-C0G 01005 ROOM=B2B_FOREHEAD

MIC3

PP_CODEC_TO_FRONTMIC3_BIAS → PP_CODEC_TO_FRONTMIC3_BIAS_CONN
FL4280 1500HM-25%-200MA-0.7DCR 01005 ROOM=B2B_FOREHEAD
DZ4280 6.8V-100PF 01005 ROOM=B2B_FOREHEAD

FRONTMIC3_TO_CODEC_AIN3_N → FRONTMIC3_TO_CODEC_AIN3_CONN_N
FL4281 1500HM-25%-200MA-0.7DCR 01005 ROOM=B2B_FOREHEAD
DZ4281 6.8V-100PF NO_XNET_CONNECTION=1 01005 ROOM=B2B_FOREHEAD

FRONTMIC3_TO_CODEC_AIN3_P → FRONTMIC3_TO_CODEC_AIN3_CONN_P
FL4282 1500HM-25%-200MA-0.7DCR 01005 ROOM=B2B_FOREHEAD
DZ4282 6.8V-100PF NO_XNET_CONNECTION=1 01005 ROOM=B2B_FOREHEAD

FOREHEAD CONNECTOR

APN: 516S00146
前置相头接口
ROOM=B2B_FOREHEAD
CRITICAL
J4200
245858036201829
F-ST-SM

PP2V85_FCAM_AVDD_CONN 相机电源给前相头接口的2.85V
PP1V8_FCAM_IO_CONN
ISP_TO_FCAM_SHUTDOWN_CONN_L CPU到前置相头开启信号
AP_TO_FCAM_CLK_CONN CPU到长焦相头时钟信号
I2C2_ISP_TO_FCAM_SCL_CONN
I2C2_AP_BI_CONVOY_SDA_CONN
I2C总线
PDM_SPKRAMP_TOP_TO_CONVOY_CLK_CONN
PDM_CONVOY_TO_SPKRAMP_TOP_DATA_CONN
PROX_BI_AOP_INT_PWM_CONN_L
COIL_TO_SPKRAMP_TOP_VSENSE_CONN_P
COIL_TO_SPKRAMP_TOP_VSENSE_CONN_N
SPKRAMP_TOP_TO_COIL_OUT_NEG
I2C0_AOP_TO_PROX_ALS_SCL_CONN
PP_CODEC_TO_FRONTMIC3_BIAS_CONN
FRONTMIC3_TO_CODEC_AIN3_CONN_P
感距到CPU的中断信号
听筒功放到听筒的驱动电压检测
听筒功放到听筒的驱动信号负极
CPU到感光感距的I2C总线
前置麦克风偏压
前置麦克风信号

90_MIPI_FCAM_TO_AP_DATA0_P
90_MIPI_FCAM_TO_AP_DATA0_N
90_MIPI_FCAM_TO_AP_CLK_P
90_MIPI_FCAM_TO_AP_CLK_N
前相头到CPU的MIPI总线
90_MIPI_FCAM_TO_AP_DATA1_P
90_MIPI_FCAM_TO_AP_DATA1_N
给前相头接口的1.1V PP1V1_FCAM_DVDD_CONN
I2C2_ISP_BI_FCAM_SDA_CONN
I2C总线 I2C2_AP_TO_CONVOY_SCL_CONN
3V供电 PP3V0_CONVOY_CONN
CPU到感光感距的I2C总线 I2C0_AOP_BI_PROX_ALS_SDA_CONN
听筒功放到听筒的驱动信号正极 SPKRAMP_TOP_TO_COIL_OUT_POS
感光到CPU的中断信号 ALS_TO_AOP_INT_CONN_L
电源到感光感距的3V供电 PP3V0_PROX_ALS_CONN
前置麦克风信号 FRONTMIC3_TO_CODEC_AIN3_CONN_N

前置麦克风偏压 FRONTMIC3_TO_CODEC_BIAS_FILT_RET
XW4200 SMT ROOM=B2B_FOREHEAD SHORT-20L-0.05MM-SM

PROX + ALS I/O

感距到CPU的中断信号
FL4274
1500HM-25%-200MA-0.7DCR
PROX_BI_AOP_INT_L_PWM → PROX_BI_AOP_INT_PWM_CONN_L
C4274 18PF 5% 16V CERM 01005 ROOM=B2B_FOREHEAD
#30299013:Change C4274 to 18pF to reduce FCAM coupling

ALS_TO_AOP_INT_L 感光到CPU的中断信号 → ALS_TO_AOP_INT_CONN_L
R4275 0.00 0% 1/32W MF 01005 ROOM=B2B_FOREHEAD
C4275 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_FOREHEAD

I2C0_AOP_SCL → I2C0_AOP_TO_PROX_ALS_SCL_CONN (CKPLUS_WAIVE=I2C_PULLUP)
R4240 0.00 0% 1/32W MF 01005 ROOM=B2B_FOREHEAD
C4240 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_FOREHEAD

I2C0_AOP_SDA → I2C0_AOP_BI_PROX_ALS_SDA_CONN (CKPLUS_WAIVE=I2C_PULLUP)
R4242 0.00 0% 1/32W MF 01005 ROOM=B2B_FOREHEAD
C4242 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_FOREHEAD

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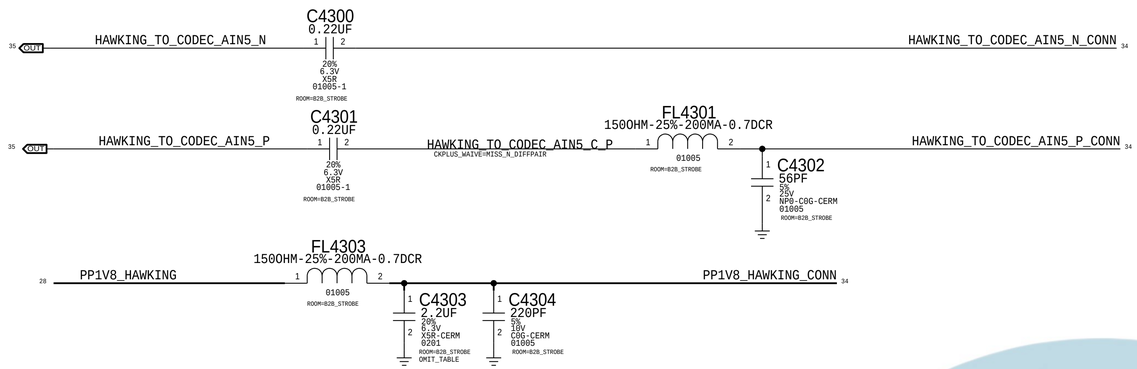
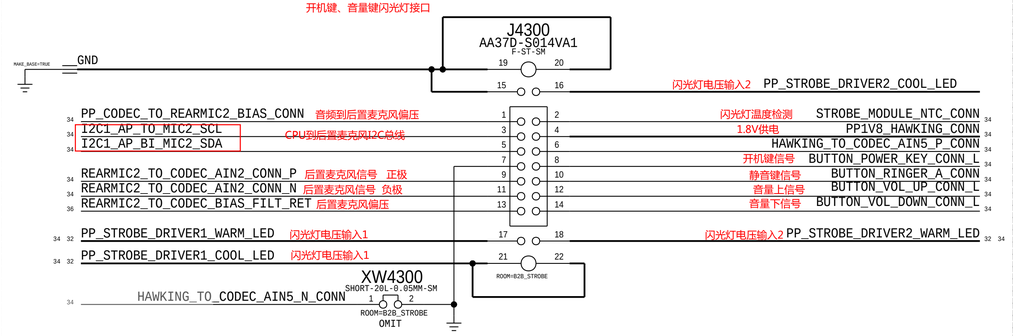
HAWKING

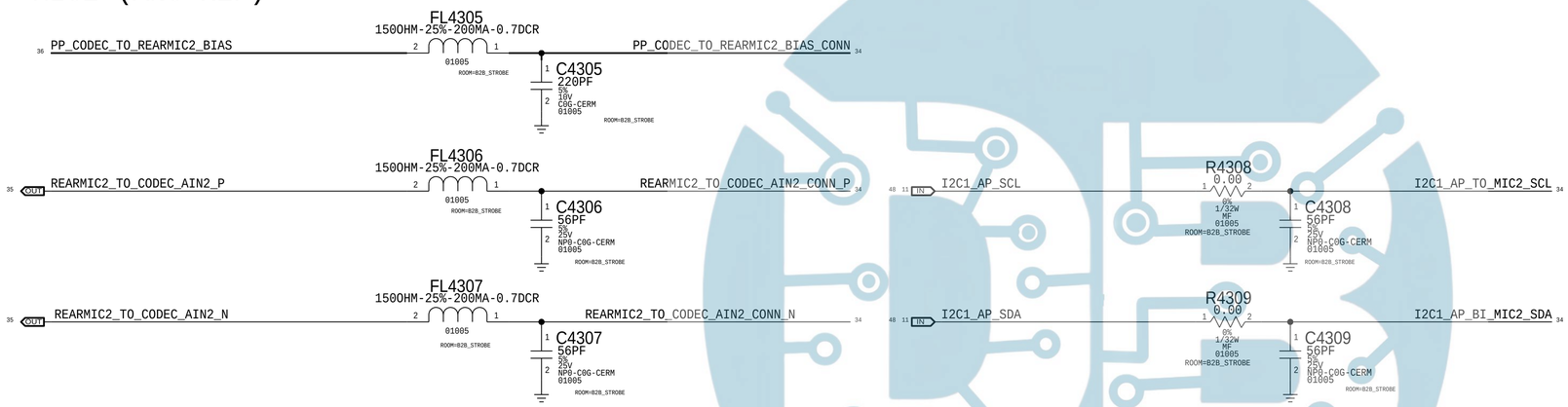


Strobe Connector

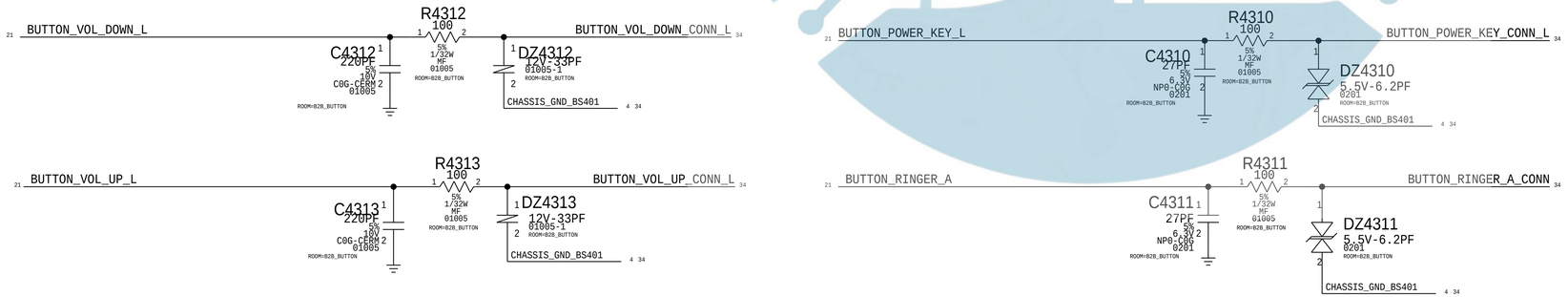
开机键、音量键闪光灯接口



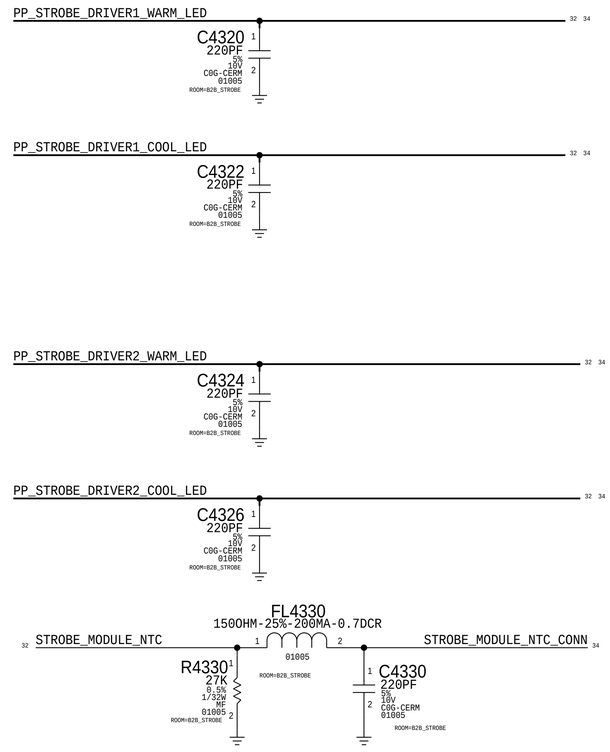
MIC2 (ANC REF)



BUTTON



Strobe Filtering



PAGE TITLE
CAMERA: B2B Strobe + Buttons

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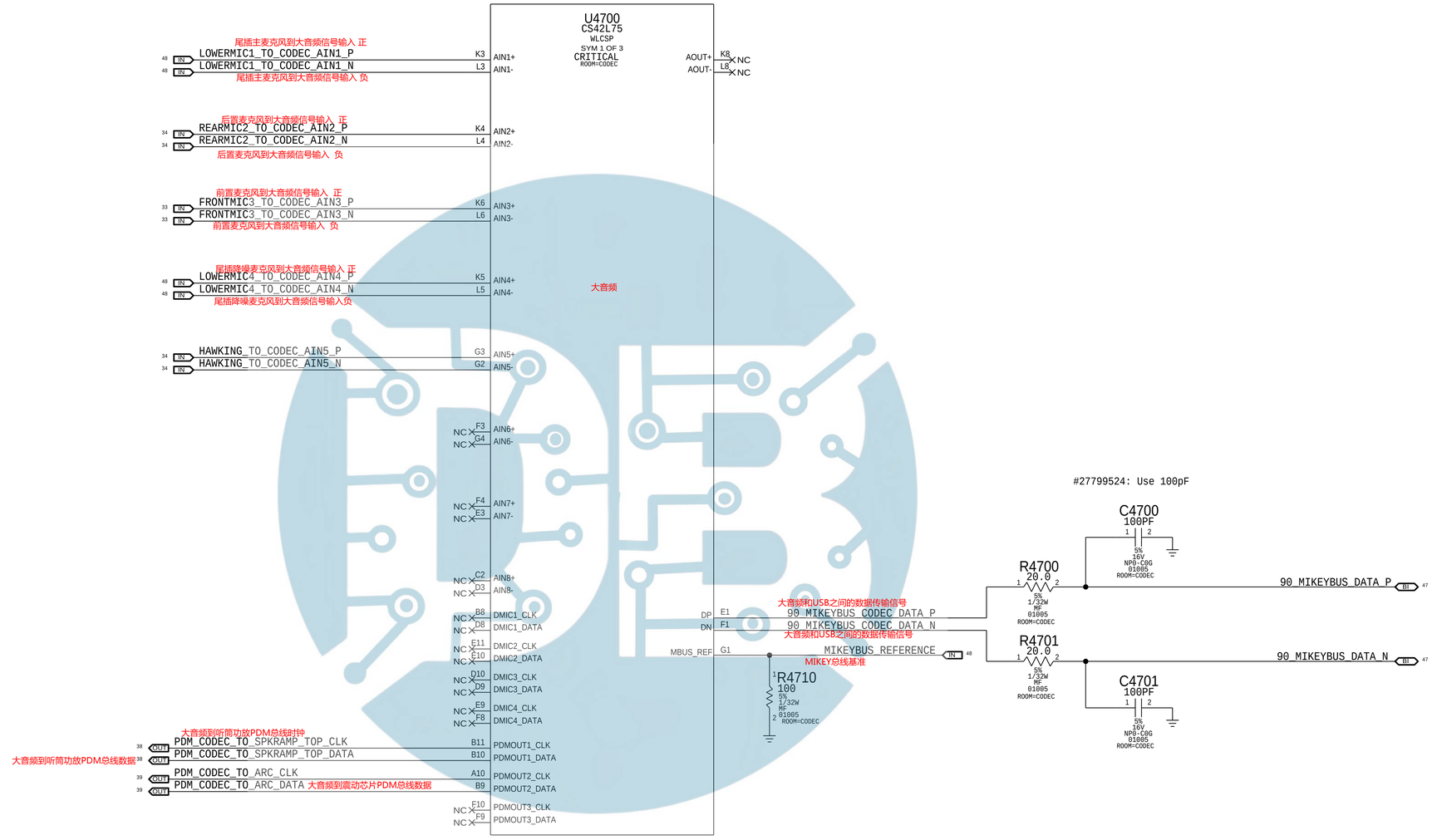
CALLAN AUDIO CODEC (ANALOG INPUTS & OUTPUTS)



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CALLAN AUDIO CODEC (POWER & I/O)

PP1V8_AUDIO_VA_S2 电源芯片输出给音频的1.8V供电
C4809 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=CODEC OMIT_TABLE
CODEC_AGND

PP_VDD_BOOST 升压供电电压
C4812 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=CODEC
C4814 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=CODEC
C4805 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=CODEC OMIT_TABLE

PP1V8_S2 电源输出的1.8V供电
C4811 15UF 20% 6.3V CERM 0402-0.1MM ROOM=CODEC
C4813 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=CODEC
C4815 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=CODEC

电源输出的1.2V供电
PP1V2_CODEC_S2
C4817 1.0UF 20% 6.3V X5R 0201-1 ROOM=CODEC
C4821 1.0UF 20% 6.3V X5R 0201-1 ROOM=CODEC

VL_SW A2 | VD C1 | VD_FILT B1 | VD_FILT G11 | VL A9 | VP L9 | VA J1 | VA J2 | VA K2 | VP_MBUS F2

LOWERMIC1_TO_CODEC_BIAS_FILT_RET
C4803 4.7UF 20% 6.3V X5R-CERM1 402 ROOM=CODEC
VOLTAGE=2.86V
PP_CODEC_TO_LOWERMIC1_BIAS
LOWERMIC1_BIAS_FILT_IN 尾插主麦克风偏压
MIC1_BIAS K11 | MIC1_BIAS_FILT K10

REARMIC2_TO_CODEC_BIAS_FILT_RET
C4804 4.7UF 20% 6.3V X5R-CERM1 402 ROOM=CODEC
VOLTAGE=2.86V
PP_CODEC_TO_REARMIC2_BIAS 后置麦克风偏压
REARMIC2_BIAS_FILT_IN 后置麦克风偏压
MIC2_BIAS J11 | MIC2_BIAS_FILT J10

FRONTMIC3_TO_CODEC_BIAS_FILT_RET
C4801 4.7UF 20% 6.3V X5R-CERM1 402 ROOM=CODEC
VOLTAGE=2.86V
PP_CODEC_TO_FRONTMIC3_BIAS 前置麦克风偏压
FRONTMIC3_BIAS_FILT_IN 前置麦克风偏压
MIC3_BIAS K9 | MIC3_BIAS_FILT J9

LOWERMIC4_TO_CODEC_BIAS_FILT_RET
C4802 4.7UF 20% 6.3V X5R-CERM1 402 ROOM=CODEC
VOLTAGE=2.86V
PP_CODEC_TO_LOWERMIC4_BIAS 尾插副麦克风偏压
LOWERMIC4_BIAS_FILT_IN 尾插副麦克风偏压
MIC4_BIAS H9 | MIC4_BIAS_FILT H8

C4823 1.0UF 20% 6.3V X5R 0201-1 ROOM=CODEC
C4824 1.0UF 20% 6.3V X5R 0201-1 ROOM=CODEC
C4822 1.0UF 20% 6.3V X5R 0201-1 ROOM=CODEC
C4825 1.0UF 20% 6.3V X5R 0201-1 ROOM=CODEC

MIC5_BIAS H11 | MIC5_BIAS_FILT H10
MIC6_BIAS G8 | MIC6_BIAS_FILT G9

大音频

CRITICAL ROOM=CODEC U4700 CS42L75 WLCSP SYM 2 OF 3

GNDD A1 A8 A11 E2 F11 K7
GNDP L1 L7 L10 L11

LP_FILT+ D1 CODEC_LP_FILTP
LP_FILT- D2 CODEC_LP_FILTN
C4820 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=CODEC

FILT+ K1 CODEC_FILTP
FILT- L2
C4808 10UF 20% 6.3V CERM-X5R 0402-0.1MM ROOM=CODEC

XW4802 SHORT-10L-0.1MM-SM ROOM=CODEC

大音频到铃声功放的主时钟
CODEC_TO_SPKRAMP_BOT_ARC_MCLK
R4830 33.2 1% 1/32W MF 01005 ROOM=CODEC
CODEC_TO_SPKRAMP_BOT_ARC_MCLK_R

I2S_CODEC_ASP1_TO_AOP_AMPS_BCLK
R4801 20.0 5% 1/32W MF 01005 ROOM=CODEC
I2S_CODEC_ASP1_TO_AOP_AMPS_BCLK_R

I2S_CODEC_ASP1_TO_AOP_AMPS_LRCLK
R4802 20.0 5% 1/32W MF 01005 ROOM=CODEC
I2S_CODEC_ASP1_TO_AOP_AMPS_LRCLK_R

#29527815: Series R on ASP1 BCLK, LRCLK
#30638490: Route U1000/U5000 ASP1 BCLK, LRCLK with _R

PP1V8_S2 电源输出的1.8V供电
#28287605: [P2] Add PU and connect to AOP
R4800 100K 5% 1/32W MF 01005 ROOM=CODEC

CPU到音频的复位信号
AOP_TO_CODEC_RESET_L

U4700 CS42L75 WLCSP SYM 3 OF 3 ROOM=CODEC CRITICAL

CODEC_TO_PMU_WAKE_L 音频到电源唤醒信号
CODEC_TO_AP_INT_L 音频到CPU的中断信号
CPU到音频的SPI总线
SPI_AP_TO_CODEC_CS_L
SPI_AP_TO_CODEC_SCLK
SPI_AP_TO_CODEC_MOSI
SPI_CODEC_TO_AP_MISO
音频到CPU的I2S声音传输总线
I2S_AP_TO_CODEC_MCLK1
I2S_AOP_TO_CODEC_MCLK2
大音频到铃声功放的主时钟
CODEC_TO_SPKRAMP_BOT_ARC_MCLK_R
I2S_CODEC_ASP1_TO_AOP_AMPS_BCLK_R
I2S_CODEC_ASP1_TO_AOP_AMPS_LRCLK_R
I2S_AOP_AMPS_TO_CODEC_ASP1_DOUT
I2S_CODEC_ASP1_TO_AOP_AMPS_DIN
音频到CPU的I2S声音传输总线
I2S_AOP_TO_CODEC_ASP2_BCLK
I2S_AOP_TO_CODEC_ASP2_LRCLK
I2S_AOP_TO_CODEC_ASP2_DOUT
I2S_CODEC_ASP2_TO_AOP_DIN
I2S_AP_TO_CODEC_ASP3_BCLK
I2S_AP_TO_CODEC_ASP3_LRCLK
I2S_AP_TO_CODEC_ASP3_DOUT
I2S_CODEC_ASP3_TO_AP_DIN
DIGLDO_PULLDN
DIGLDO_EN
SW1_CLK
SW1_SD
SW2_CLK
SW2_SD
CODEC_TO_AOP_GPIO1 音频到CPU的可编程定义信号1
CODEC_TO_AOP_GPIO2 音频到CPU的可编程定义信号2
AOP_TO_CODEC_CLP_EN CPU到音频的开启信号
RESET* WAKE* INT* CS* CCLK MOSI MISO MCLK1_IN MCLK2_IN MCLK_OUT ASP1_SCLK ASP1_LRCK/FSYNC ASP1_SDIN ASP1_SDOUT ASP2_SCLK ASP2_LRCK/FSYNC ASP2_SDIN ASP2_SDOUT ASP3_SCLK ASP3_LRCK/FSYNC ASP3_SDIN ASP3_SDOUT DIGLDO_PULLDN DIGLDO_EN SW1_CLK SW1_SD SW2_CLK SW2_SD GPIO1 GPIO2 CLP_EN
JTAG_TMS JTAG_TCK JTAG_TDI JTAG_TDO NC
TSTI J3 J5
GNDA F5 G5 G6 G7 H1 H2 H6 H7 J6 J7 J8 E4

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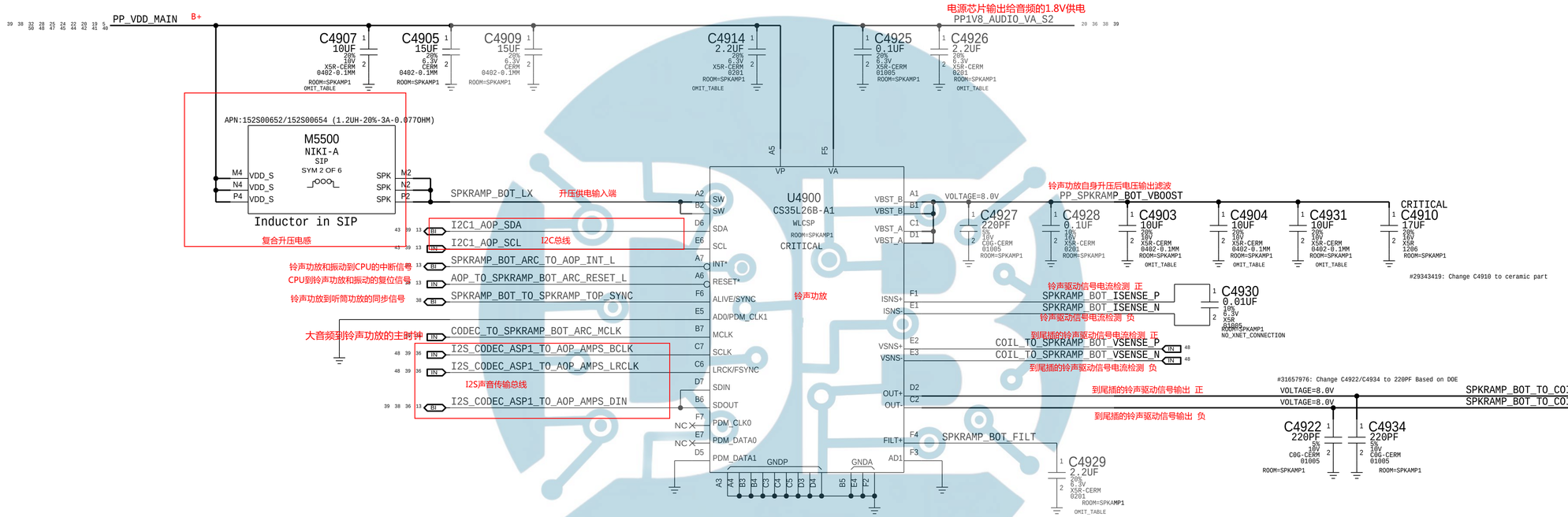
South Speaker Amplifier

APN: 338S00143

I2C ADDRESS: 1000 000x
0x80



PAGE TITLE	AUDIO: Speaker Amp Bottom
	Apple Inc.
DRAWING NUMBER	051-02159
SIZE	D
REVISION	10.0.0
BRANCH	
PAGE	49 OF 80
SHEET	37 OF 81

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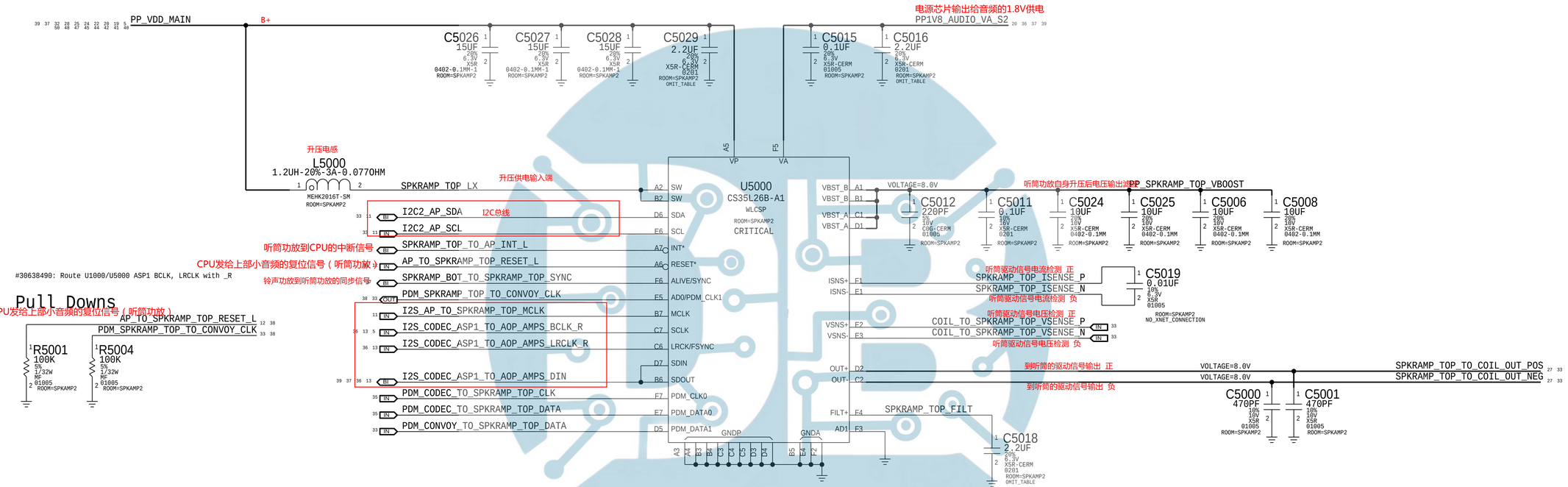
North Speaker Amplifier

APN: 338S00295

I2C ADDRESS: 1000 000x (0x80)



PAGE TITLE

AUDIO: Speaker Amp Top

Apple Inc.

DRAWING NUMBER 051-02159

SIZE D

REVISION 10.0.0

BRANCH

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SHEET 38 OF 81

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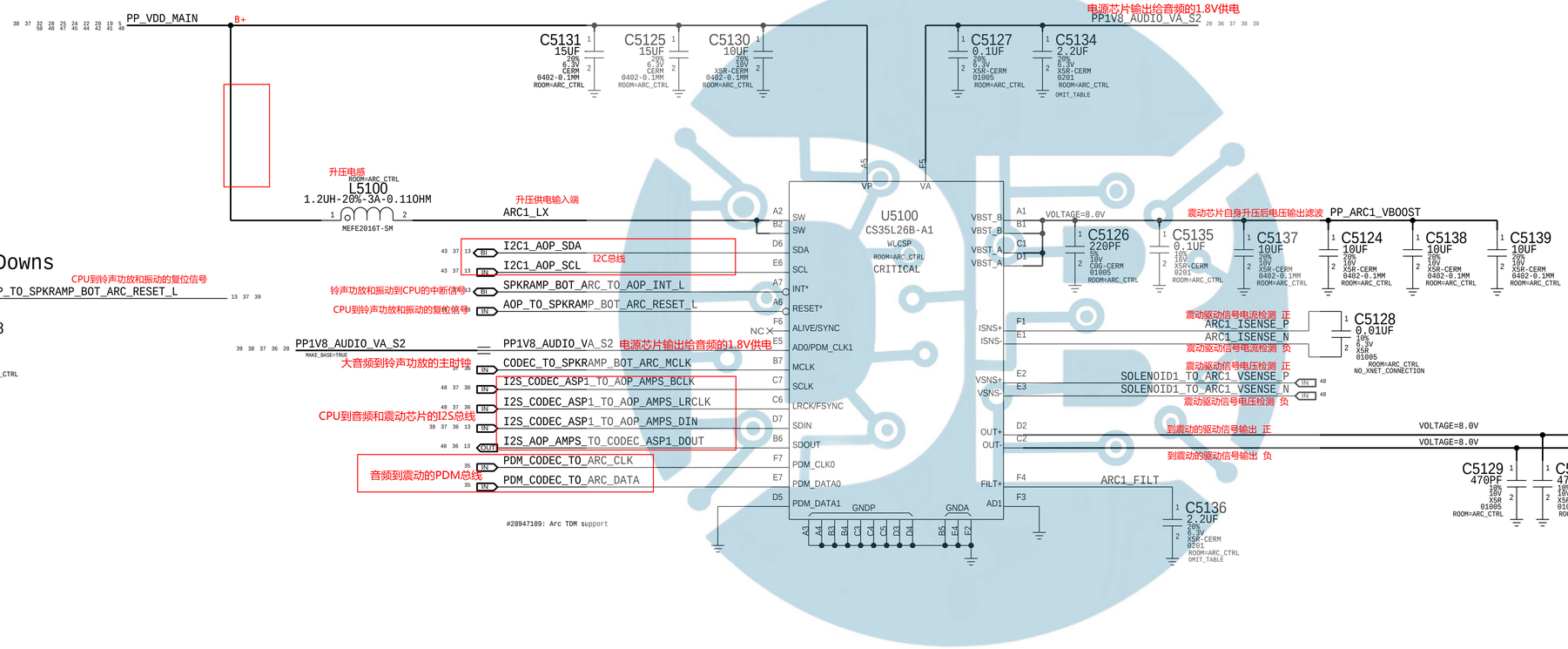
振动驱动芯片

ARC DRIVER

APN: 338S00295

I2C ADDRESS: 1000 001x (0x82)



PAGE TITLE

ARC: Driver

Apple Inc.

DRAWING NUMBER 051-02159

SIZE D

REVISION 10.0.0

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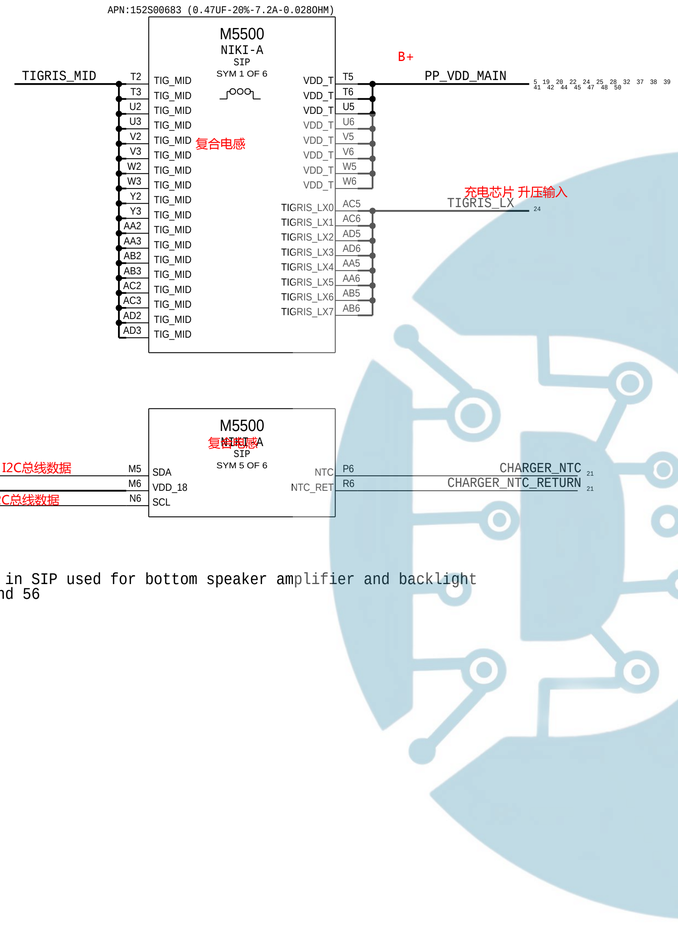
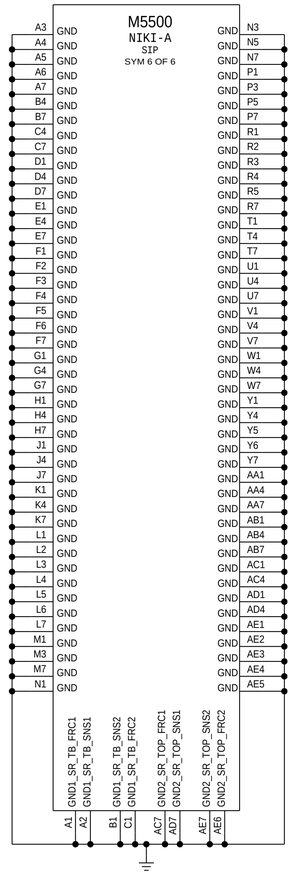
Niki SIP

音频到震动的PDM总线





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

PAGE TITLE
CG: Niki

Apple Inc.

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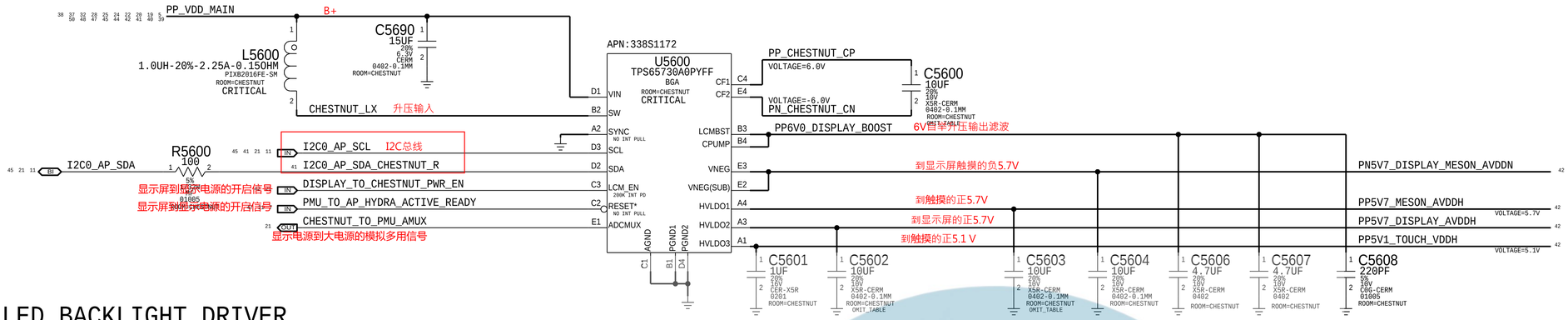
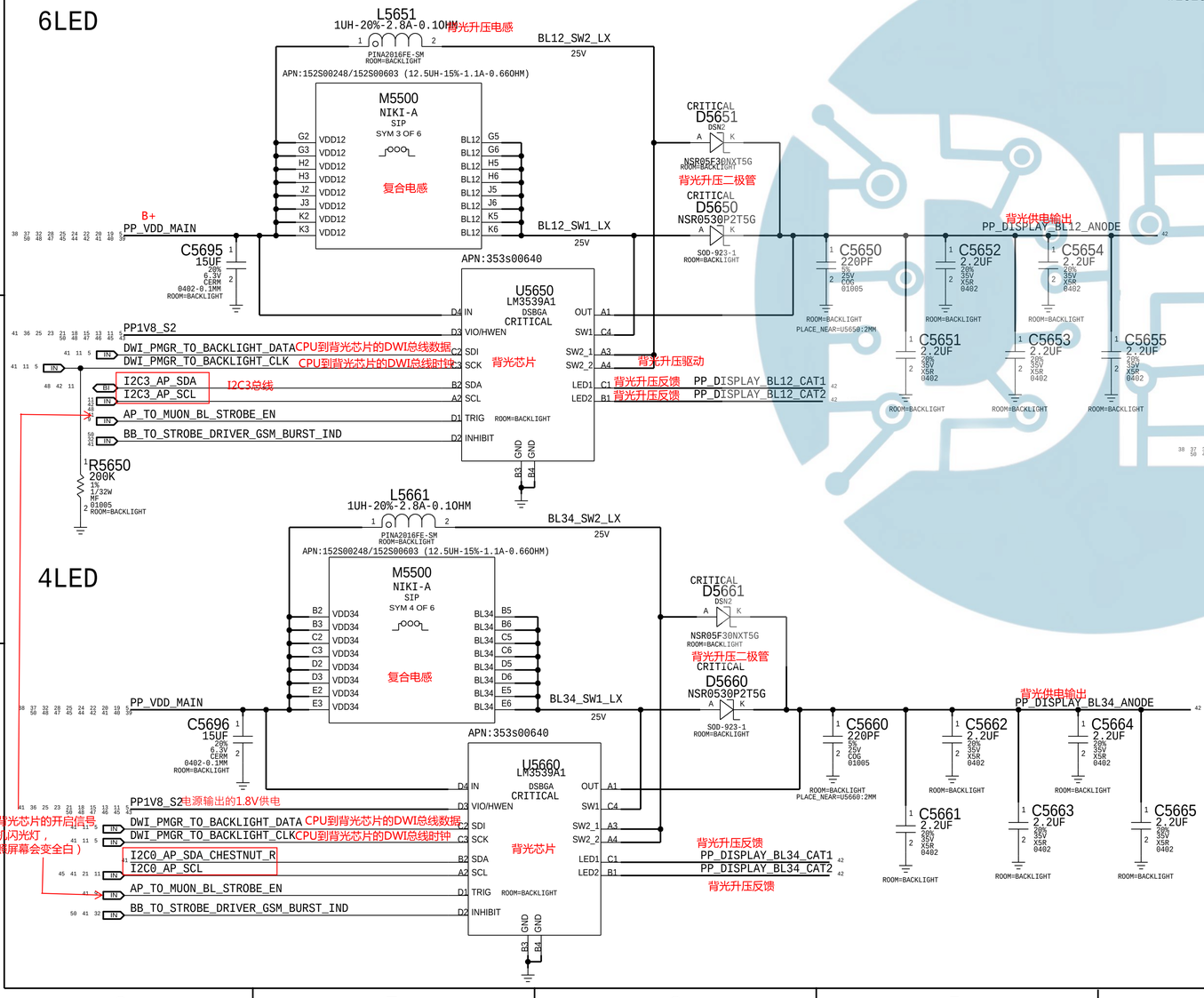
CHESTNUT DISPLAY PMU



#28282573: Update C5606/C5607 to match D1x

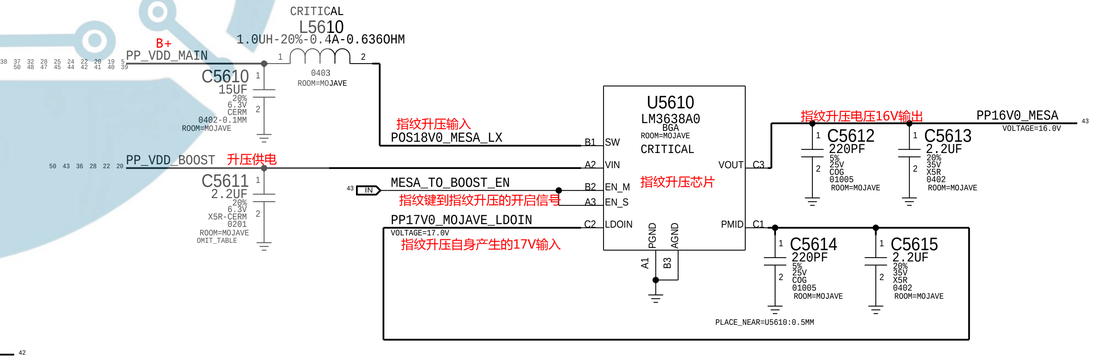
LED BACKLIGHT DRIVER

6LED



MOJAVE MESA BOOST

APN:353S00671



PAGE TITLE	CG: PMUs
Apple Inc.	DRAWING NUMBER 051-02159 · SIZE D
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DISPLAY POWER

FL5700 240-OHM-25%-0.42A-0.31DCR
PP5V7_DISPLAY_AVDDH → PP5V7_DISPLAY_AVDDH_CONN
C5702 10UF 20% 10V X5R-CERM 0402-0.1MM ROOM=B2B_DISPLAY OMIT_TABLE
C5703 1UF 20% 10V XSR-CERM 0402-0.1MM ROOM=B2B_DISPLAY OMIT_TABLE
C5700 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=B2B_DISPLAY OMIT_TABLE
C5701 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY

FL5705 240-OHM-25%-0.42A-0.31DCR
PP1V8_IO → PP1V8_DISPLAY_CONN
C5705 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=B2B_DISPLAY OMIT_TABLE
C5706 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY

FL5710 240OHM-25%-0.2A-0.9OHM
PN5V7_DISPLAY_MESON_AVDDN → PN5V7_DISPLAY_MESON_AVDDN_CONN
C5710 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY

FL5715 240-OHM-25%-0.42A-0.31DCR
PP5V7_MESON_AVDDH → PP5V7_MESON_AVDDH_CONN
C5715 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY
C5716 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=B2B_DISPLAY OMIT_TABLE

DISPLAY CONTROL SIGNALS

FL5750 150OHM-25%-200MA-0.7DCR
DISPLAY_TO_CHESTNUT_PWR_EN → DISPLAY_TO_CHESTNUT_PWR_EN_CONN 显示屏到显示电源的开启信号
C5750 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY

FL5752 150OHM-25%-200MA-0.7DCR
AP_TO_DISPLAY_RESET_L → AP_TO_DISPLAY_RESET_CONN_L
R5753 100K 5% 1/32W MF 01005 ROOM=B2B_DISPLAY
C5752 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY
C5751 1000PF 10% 16V X5R 01005 ROOM=B2B_DISPLAY NOSTUFF

R5754 10 5% 1/32W MF 01005 ROOM=B2B_DISPLAY
PMU_TO_DISPLAY_PANICB → PMU_TO_DISPLAY_PANICB_CONN
C5754 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY

R5755 0.00 0% 1/32W MF 01005 ROOM=B2B_DISPLAY
I2C3_AP_SCL → I2C_DISP_EEPROM_SCL_CONN CKPLUS_WAIVE=I2C_PULLUP

R5756 0.00 0% 1/32W MF 01005 ROOM=B2B_DISPLAY
I2C3_AP_SDA → I2C_DISP_EEPROM_SDA_CONN CKPLUS_WAIVE=I2C_PULLUP
C5756 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DISPLAY
C5755 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DISPLAY

BACKLIGHT

#32464647:C5730 to 56PF to Improve GPS L1 Desense

R5730 0.00 1% 1/20W ME 0201 ROOM=B2B_DISPLAY
PP_DISPLAY_BL12_ANODE → PP_DISPLAY_BL12_ANODE_CONN
C5730 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DISPLAY

R5731 0.00 1% 1/20W ME 0201 ROOM=B2B_DISPLAY
PP_DISPLAY_BL12_CAT1 → PP_DISPLAY_BL12_CAT1_CONN
C5731 220PF 5% 25V C0G 01005 ROOM=B2B_DISPLAY

R5732 0.00 1% 1/20W ME 0201 ROOM=B2B_DISPLAY
PP_DISPLAY_BL12_CAT2 → PP_DISPLAY_BL12_CAT2_CONN
C5732 220PF 5% 25V C0G 01005 ROOM=B2B_DISPLAY

R5733 0.00 1% 1/20W ME 0201 ROOM=B2B_DISPLAY
PP_DISPLAY_BL34_ANODE → PP_DISPLAY_BL34_ANODE_CONN
C5733 220PF 5% 25V C0G 01005 ROOM=B2B_DISPLAY

R5734 0.00 1% 1/20W ME 0201 ROOM=B2B_DISPLAY
PP_DISPLAY_BL34_CAT1 → PP_DISPLAY_BL34_CAT1_CONN
C5734 220PF 5% 25V C0G 01005 ROOM=B2B_DISPLAY

R5735 0.00 1% 1/20W ME 0201 ROOM=B2B_DISPLAY
PP_DISPLAY_BL34_CAT2 → PP_DISPLAY_BL34_CAT2_CONN
C5735 220PF 5% 25V C0G 01005 ROOM=B2B_DISPLAY
28463617: Update to 25V Tolerant Cap

TOUCH POWER

FL5720 33-OHM-25%-1500MA
PP1V8_TOUCH → PP1V8_TOUCH_CONN
C5721 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=B2B_DISPLAY OMIT_TABLE
C5720 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY

FL5725 240-OHM-25%-0.42A-0.31DCR
PP5V1_TOUCH_VDDH → PP5V1_TOUCH_VDDH_CONN
C5725 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY

AOP/TOUCH INTERFACE

FL5760 150OHM-25%-200MA-0.7DCR
DISPLAY_TO_MANY_BSYNC 显示屏发出的同步信号 → DISPLAY_TO_MANY_BSYNC_CONN
C5760 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DISPLAY

FL5762 150OHM-25%-200MA-0.7DCR
TOUCH_TO_AOP_GPO → TOUCH_TO_AOP_GPO_CONN 触摸到CPU的可编程定义信号
C5762 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DISPLAY

FL5764 150OHM-25%-200MA-0.7DCR
AOP_TO_TOUCH_PROX_STATE → AOP_TO_TOUCH_PROX_STATE_CONN
C5764 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DISPLAY

FL5766 150OHM-25%-200MA-0.7DCR
TOUCH_TO_AP_INT_L → TOUCH_TO_AP_INT_CONN_L
C5766 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY

CPU到触摸的32K时钟
R5768 33.2 1% 1/32W MF 01005 ROOM=B2B_DISPLAY
AP_TO_TOUCH_CLK32K_RESET_L → AP_TO_TOUCH_CLK32K_RESET_CONN_L
C5768 100PF 5% 16V NP0-C0G 01005 ROOM=B2B_DISPLAY
Per #27955644:Use 100pF to match D1x

AP/TOUCH INTERFACE

FL5770 1500HM-25%-200MA-0.7DCR
SPI_AP_TO_TOUCH_CS_L → SPI_AP_TO_TOUCH_CS_CONN_L
C5770 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DISPLAY

R5772 0.00 0% 1/32W MF 01005 ROOM=B2B_DISPLAY
SPI_AP_TO_TOUCH_SCLK → SPI_AP_TO_TOUCH_SCLK_CONN
C5772 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DISPLAY

FL5774 1500HM-25%-200MA-0.7DCR
SPI_AP_TO_TOUCH_MOSI → SPI_AP_TO_TOUCH_MOSI_CONN
C5774 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DISPLAY

FL5776 1500HM-25%-200MA-0.7DCR
SPI_TOUCH_TO_AP_MISO → SPI_TOUCH_TO_AP_MISO_CONN
C5776 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DISPLAY

FL5778 1500HM-25%-200MA-0.7DCR
AP_TO_TOUCH_MAMBA_RESET_L → AP_TO_TOUCH_MAMBA_RESET_CONN_L CPU到触摸和3D TOUCH的复位信号
C5778 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY
C5779 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY ROOM=B2B_MAMBA_MESA

ORB/TOUCH INTERFACE

PP1V8_TOUCH
R5785 10K 5% 1/32W MF 01005 ROOM=B2B_MAMBA_MESA
R5786 10K 5% 1/32W MF 01005 ROOM=B2B_MAMBA_MESA BOMOPTION=NOSTUFF
Stuff 10k PU with 200k to meet spec
I2C_TOUCH_TO_MAMBA_SCL_R
I2C_TOUCH_BI_MAMBA_SDA
To J5700 DISP/TOUCH B2B
R5787 200 1% 1/32W MF 01005 ROOM=B2B_DISPLAY
I2C_TOUCH_TO_MAMBA_SCL
C5788 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DISPLAY
C5787 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_MAMBA_MESA
#28227044:Have cap on each side of R5787

DISPLAY + TOUCH CONNECTOR

MLB: 516S00168

J5700 BB35C-RA48-3A F-ST-SM ROOM=B2B_DISPLAY

MAMBA_TO_DISPLAY_MDRIVE	1	2	CPU到显示屏的I2C总线 I2C_DISP_EEPROM_SCL_CONN
I2C_DISP_EEPROM_SDA_CONN	3	4	触摸屏到指纹的I2C总线 I2C_TOUCH_BI_MAMBA_SDA
I2C_TOUCH_TO_MAMBA_SCL_R 触摸屏到指纹的I2C总线	5	6	触摸到CPU的SPI总线 SPI_AP_TO_TOUCH_MOSI_CONN
SPI_TOUCH_TO_AP_MISO_CONN	7	8	触摸到CPU的中断信号 TOUCH_TO_AP_INT_CONN_L
SPI_AP_TO_TOUCH_CS_CONN_L 触摸到CPU的SPI总线	9	10	AP_TO_TOUCH_MAMBA_RESET_CONN_L
AP_TO_TOUCH_CLK32K_RESET_CONN_L CPU到触摸的32K时钟	11	12	#27428158:Ground J5700.12 CPU到触摸和3D TOUCH的复位信号
SPI_AP_TO_TOUCH_SCLK_CONN CPU到触摸的SPI总线	13	14	CPU到触摸的感距控制信号 AOP_TO_TOUCH_PROX_STATE_CONN
TOUCH_TO_AOP_GPO_CONN 触摸到CPU的可编程定义信号	15	16	PMU_TO_DISPLAY_PANICB_CONN
AP_TO_DISPLAY_RESET_CONN_L CPU到显示屏的复位	17	18	显示屏1.8V供电 PP1V8_DISPLAY_CONN
PP5V1_TOUCH_VDDH_CONN 触摸5.1V供电	19	20	显示屏的正5.7V PP5V7_DISPLAY_AVDDH_CONN
PP1V8_TOUCH_CONN 触摸1.8V供电	21	22	显示屏到显示电源的开启信号 DISPLAY_TO_CHESTNUT_PWR_EN_CONN
PN5V7_DISPLAY_MESON_AVDDN_CONN 显示触摸-5.7V供电	23	24	显示屏发出的同步信号 DISPLAY_TO_MANY_BSYNC_CONN
PP5V7_MESON_AVDDH_CONN 触摸5.7V供电	25	26	GND_VOID=TRUE
DISPLAY_TO_MAMBA_MSYNC_CONN 显示屏到3D TOUCH的同步信号	27	28	90_MIPI_AP_TO_DISPLAY_DATA0_CONN_P
TP_GALILEO_PHOTON_PIFA_CONN	29	30	90_MIPI_AP_TO_DISPLAY_DATA0_CONN_N
90_MIPI_AP_TO_DISPLAY_CLK_CONN_P CPU到显示屏的MIPI总线	31	32	GND_VOID=TRUE
90_MIPI_AP_TO_DISPLAY_CLK_CONN_N	33	34	90_MIPI_AP_TO_DISPLAY_DATA1_CONN_P
	35	36	90_MIPI_AP_TO_DISPLAY_DATA1_CONN_N
PP_DISPLAY_BL12_CAT1_CONN 背光供电反馈信号	37	38	GND_VOID=TRUE
PP_DISPLAY_BL12_ANODE_CONN 背光供电	39	40	90_MIPI_AP_TO_DISPLAY_DATA2_CONN_P
PP_DISPLAY_BL12_CAT2_CONN 背光供电反馈信号	41	42	90_MIPI_AP_TO_DISPLAY_DATA2_CONN_N
PP_DISPLAY_BL34_CAT1_CONN 背光供电反馈信号	43	44	GND_VOID=TRUE
PP_DISPLAY_BL34_ANODE_CONN 背光供电	45	46	90_MIPI_AP_TO_DISPLAY_DATA3_CONN_P
PP_DISPLAY_BL34_CAT2_CONN 背光供电反馈信号	47	48	90_MIPI_AP_TO_DISPLAY_DATA3_CONN_N
	49	50	
	51	52	
	53	54	

#27978784:Add GND_VOID=TRUE to MIPI pins

PP5700 P2MM-NSM ROOM=TEST

DISPLAY MIPI

L5754 CRITICAL 650HM-0.7-2GHZ-3.40HM TAM0605 SYM_VER=2 ROOM=B2B_DISPLAY
90_MIPI_AP_TO_DISPLAY_CLK_N → 90_MIPI_AP_TO_DISPLAY_CLK_CONN_N
90_MIPI_AP_TO_DISPLAY_CLK_P → 90_MIPI_AP_TO_DISPLAY_CLK_CONN_P

L5750 CRITICAL 650HM-0.7-2GHZ-3.40HM TAM0605 SYM_VER=2 ROOM=B2B_DISPLAY
90_MIPI_AP_TO_DISPLAY_DATA0_P → 90_MIPI_AP_TO_DISPLAY_DATA0_CONN_P
90_MIPI_AP_TO_DISPLAY_DATA0_N → 90_MIPI_AP_TO_DISPLAY_DATA0_CONN_N

L5751 CRITICAL 650HM-0.7-2GHZ-3.40HM TAM0605 SYM_VER=2 ROOM=B2B_DISPLAY
90_MIPI_AP_TO_DISPLAY_DATA1_P → 90_MIPI_AP_TO_DISPLAY_DATA1_CONN_P
90_MIPI_AP_TO_DISPLAY_DATA1_N → 90_MIPI_AP_TO_DISPLAY_DATA1_CONN_N

L5752 CRITICAL 650HM-0.7-2GHZ-3.40HM TAM0605 SYM_VER=2 ROOM=B2B_DISPLAY
90_MIPI_AP_TO_DISPLAY_DATA2_P → 90_MIPI_AP_TO_DISPLAY_DATA2_CONN_P
90_MIPI_AP_TO_DISPLAY_DATA2_N → 90_MIPI_AP_TO_DISPLAY_DATA2_CONN_N

L5753 CRITICAL 650HM-0.7-2GHZ-3.40HM TAM0605 SYM_VER=2 ROOM=B2B_DISPLAY
90_MIPI_AP_TO_DISPLAY_DATA3_P → 90_MIPI_AP_TO_DISPLAY_DATA3_CONN_P
90_MIPI_AP_TO_DISPLAY_DATA3_N → 90_MIPI_AP_TO_DISPLAY_DATA3_CONN_N

PP_VDD_MAIN

C5742 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY
C5744 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY
C5746 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY
C5748 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY
C5790 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY
C5741 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY
C5743 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY
C5745 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY
C5747 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY
C5749 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY
C5791 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DISPLAY

AC return path (LCM MIPI):GND/VDD_MAIN reference

PAGE TITLE: CG: B2B DISPLAY + TOUCH
Apple Inc.
DRAWING NUMBER: 051-02159
SIZE: D
REVISION: 10.0.0
BRANCH:
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MESA POWER

#30272427: Change FL5800 to 155S00067

FL5800
240-OHM-25%-0.42A-0.31DCR
0201
ROOM=B2B_MAMBA_MESA

PP3V0_MESA_S2 → PP3V0_MESA_CONN

C5802 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=B2B_MAMBA_MESA OMIT_TABLE
C5803 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=B2B_MAMBA_MESA OMIT_TABLE
C5804 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=B2B_MAMBA_MESA OMIT_TABLE
C5800 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=B2B_MAMBA_MESA
C5801 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_MAMBA_MESA

FL5810
150OHM-25%-200MA-0.7DCR
01005
ROOM=B2B_MAMBA_MESA

PP1V8_MESA_S2 → PP1V8_MESA_CONN

C5811 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=B2B_MAMBA_MESA OMIT_TABLE
C5810 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_MAMBA_MESA

FL5820
150OHM-25%-200MA-0.7DCR
01005
ROOM=B2B_MAMBA_MESA

PP16V0_MESA → PP16V0_MESA_CONN

C5820 220PF 5% 25V C0G 01005 ROOM=B2B_MAMBA_MESA

MAMBA AND MESA CONNECTOR

MLB: 516S00273

J5800
BB35K-RB24-3A
F-ST-SM
ROOM=B2B_MAMBA_MESA

PP1V8_MESA_CONN 指纹1.8V供电
MESA_TO_AOP_FDINT_CONN 指纹接口到CPU的中断信号
I2C1_AOP_BI_MESA_TURTLE_SDA_CONN I2C总线
I2C1_AOP_TO_MESA_TURTLE_SCL_CONN
MESA_TO_BOOST_EN_CONN 指纹键到指纹开压的开启信号
MESA_TO_AP_INT_CONN CPU到指纹的中断信号
SPI_AP_TO_MESA_SCLK_CONN 指纹到CPU SPI总线
SPI_AP_TO_MESA_MOSI_CONN
AOP_TO_MESA_BLANKING_EN_CONN CPU到指纹开启信号
SPI_MESA_TO_AP_MISO_CONN 指纹到CPU SPI总线
PP2V75_MAMBA_CONN 2.75V 3D TOUCH供电

PP3V0_MESA_CONN
指纹升压输出的16V供电
PP16V0_MESA_CONN
GUARD
MAMBA_TO_DISPLAY_MDRIVE_CONN
DISPLAY_TO_MAMBA_MSYNC_CONN 显示屏到3D TOUCH的同步信号
AP_TO_TOUCH_MAMBA_RESET_CONN_L CPU到触摸芯片3D TOUCH的复位信号
TP_MAMBA_HINT_L 3D TOUCH中断信号测试点
I2C_TOUCH_BI_MAMBA_SDA
I2C_TOUCH_TO_MAMBA_SCL
3D TOUCH中断信号测试点
PP1V8_TOUCH_TO_MAMBA_CONN 1.8V触摸供电

PP5800
SM
ROOM=TEST

MESA DIGITAL I/O

FL5840
150OHM-25%-200MA-0.7DCR
01005
ROOM=B2B_MAMBA_MESA

SPI_AP_TO_MESA_MOSI → SPI_AP_TO_MESA_MOSI_CONN

R5841 511K 1% 1/32W MF 01005 ROOM=B2B_MAMBA_MESA
C5840 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_MAMBA_MESA

SPI_AP_TO_MESA_SCLK → SPI_AP_TO_MESA_SCLK_CONN

R5842 49.9 1% 1/32W MF 01005 ROOM=B2B_MAMBA_MESA
#31201019: Change R5842 to 50 ohms
R5843 511K 1% 1/32W MF 01005 ROOM=B2B_MAMBA_MESA
C5842 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_MAMBA_MESA

SPI_MESA_TO_AP_MISO → SPI_MESA_TO_AP_MISO_CONN

R5844 33.2 1% 1/32W MF 01005 ROOM=B2B_MAMBA_MESA
C5844 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_MAMBA_MESA

PP1V8_S2 电源输出的1.8V供电

C5870 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

U1601
74LVC1G3157GX
X2SON6
VCC GND S Z Y0 Y1 NC
ROOM=SOC
CRITICAL

R1633 511K 1% 1/32W MF 01005 ROOM=SOC

PP1V8_MESA_S2

R1631 1.00K 5% 1/32W MF 01005 ROOM=MAMBA_MESA
R1632 1.00K 5% 1/32W MF 01005 ROOM=MAMBA_MESA

I2C1_AOP_SCL → I2C1_AOP_TO_MESA_TURTLE_SCL → I2C1_AOP_TO_MESA_TURTLE_SCL_CONN
AOP_TO_MESA_I2C_ISO_EN

R5852 0.00 0% 1/32W MF 01005 ROOM=B2B_MAMBA_MESA
C5852 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_MAMBA_MESA

PP1V8_S2

C5872 0.1UF 20% 6.3V X5R-CERM 01005 ROOM=SOC

U1602
74LVC1G3157GX
X2SON6
VCC GND S Z Y0 Y1 NC
ROOM=SOC
CRITICAL

I2C1_AOP_SDA → I2C1_AOP_TO_MESA_TURTLE_SDA → I2C1_AOP_BI_MESA_TURTLE_SDA_CONN

R5854 0.00 0% 1/32W MF 01005 ROOM=B2B_MAMBA_MESA
C5854 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_MAMBA_MESA

MESA_TO_AP_INT → MESA_TO_AP_INT_CONN
CPU到指纹的中断信号

R5846 681 1% 1/32W MF 01005 ROOM=B2B_MAMBA_MESA
C5846 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_MAMBA_MESA

指纹键到指纹开压的开启信号
MESA_TO_BOOST_EN → MESA_TO_BOOST_EN_CONN

R5848 681 1% 1/32W MF 01005 ROOM=B2B_MAMBA_MESA
C5848 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_MAMBA_MESA

FL5850
150OHM-25%-200MA-0.7DCR
01005
ROOM=B2B_MAMBA_MESA

AOP_TO_MESA_BLANKING_EN → AOP_TO_MESA_BLANKING_EN_CONN
CPU到指纹开启信号

C5850 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_MAMBA_MESA

CPU到指纹开启信号

MAMBA POWER

PP_VDD_BOOST

C5890 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=B2B_MAMBA_MESA OMIT_TABLE

NOTE: OUTPUT IMPEDANCE MUST BE >0.005-OHM
IN ORDER TO MEET CAP ESR REQUIREMENT PER LDO SPEC.
VENDOR ALSO RECOMMENDS CIN = COUT FOR STABILITY

U5890
LP5907SNX-2.75
X2SON
VIN VOUT EN GND EPAD
ROOM=B2B_MAMBA_MESA
CRITICAL

VOLTAGE=2.75V
PP2V75_MAMBA_CONN

C5895 10UF 20% 6.3V X5R-CERM 0402-0.1MM ROOM=B2B_MAMBA_MESA
C5896 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_MAMBA_MESA

PP1V8_TOUCH → XW5890 SHORT-20L-0.05MM-SM ROOM=PMU OMIT → MAMBA_LDO_EN

R5880 0.00 0% 1/32W MF 01005 ROOM=B2B_MAMBA_MESA

PP1V8_TOUCH → PP1V8_TOUCH_TO_MAMBA_CONN

C5880 2.2UF 20% 6.3V X5R-CERM 0201 ROOM=B2B_MAMBA_MESA OMIT_TABLE
C5881 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_MAMBA_MESA

MAMBA DIGITAL I/O

#29189177: Move C5785 to other side of resistor

I2C_TOUCH_TO_MAMBA_SCL_R → I2C_TOUCH_BI_MAMBA_SDA → TO J5800 MAMBA/MESA B2B

C5785 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DISPLAY NOSTUFF
C5786 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_MAMBA_MESA NOSTUFF

#27956171: Stuff only 1 set to meet rise time spec
Stuff C5787/C5788 or C5785/C5786

FL5860
150OHM-25%-200MA-0.7DCR
01005
ROOM=B2B_MAMBA_MESA

MAMBA_TO_DISPLAY_MDRIVE → MAMBA_TO_DISPLAY_MDRIVE_CONN

C5861 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_MAMBA_MESA
C5860 NOSTUFF 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_MAMBA_MESA

DISPLAY_TO_MAMBA_MSYNC_CONN

C5863 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DISPLAY
C5862 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_MAMBA_MESA

FL5864
150OHM-25%-200MA-0.7DCR
01005
ROOM=B2B_MAMBA_MESA

MESA_TO_AOP_FDINT → MESA_TO_AOP_FDINT_CONN
指纹接口到CPU的中断信号

C5864 220PF 5% 10V C0G-CERM 01005 ROOM=B2B_MAMBA_MESA

CPU到指纹开启信号

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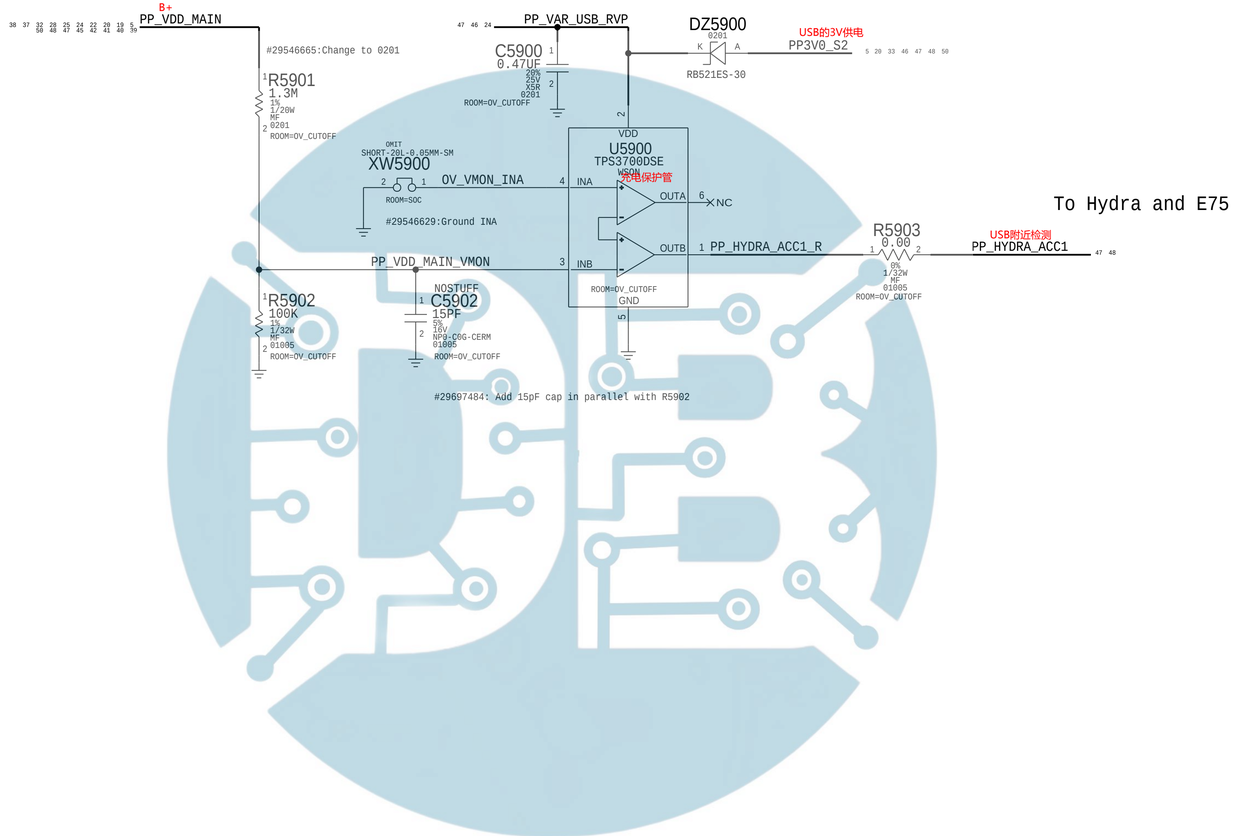
VDD_MAIN OV CUT-OFF CIRCUIT



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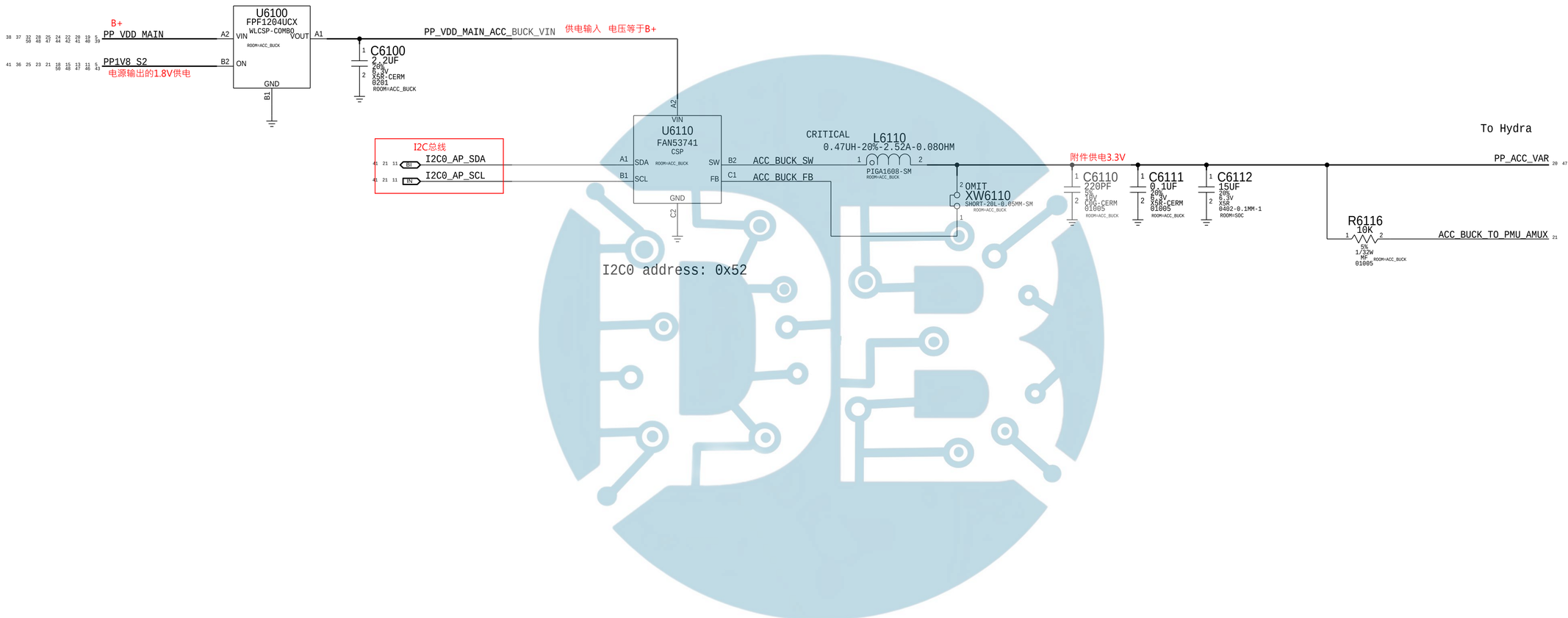
ACCESSORY BUCK



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USB-PD

#29590414: Update CCG2 resistor divider values
#30199192: R6210 change to 0201 to prevent Dendrite

PP_VAR_USB_RVP
R6210 499K 1% 1/20W MF 201 ROOM=USB_PD
R6211 50K 1% 1/32W MF 01005 ROOM=USB_PD
C6211 22NF 20% 6.3V X5R-CERM 01005 ROOM=USB_PD

PP1V8_S2 电源输出的1.8V供电
PP3V0_S2 电源输出的3V供电
C6290 1.00UF 20% 6.3V X5R 0201-1 ROOM=USBPD
C6291 1.00UF 20% 6.3V X5R 0201-1 ROOM=USBPD
PP1V8_VCCD_CCG2
C6292 1.00UF 20% 6.3V X5R 0201-1 ROOM=USBPD

CCG2_TO_SMC_INT_L 快充芯片到CPU的中断信号
PP5V0_USB_RVP_R
I2C0_SMC_SDA
R6200 43.2 1% 1/32W MF 01005 ROOM=USB_PD
I2C0_SMC_SCL
I2C0_SMC_SDA_CCG2_R
I2C总线
AP_BI_CCG2_SWDIO CPU到快充芯片的SW总线数据传输
AP_TO_CCG2_SWCLK CPU到快充芯片的SW总线时钟

U6200 CSP 快充芯片 CG8740AAT CRITICAL ROOM=USBPD
VDDD VCCD VDDIO VCONN2 VCONN1
GPIO_C3 GPIO_D3 GPIO_C2 GPIO_D2 GPIO_B2
I2C_0_SCL I2C_0_SDA SWD_IO SWD_CLK
CC1 CC2 RD1 XRES
VSS VSS

CCG2_TO_HYDRA_CC
C6200 220PF 5% 10V C0G-CERM 01005 ROOM=USBPD
电源到快充芯片的复位信号
PMU_TO_CCG2_RESET_L

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HYDRA

12C ADDRESS: 0011010X

PP3V0_S2
C6390 1.0UF 20% 6.3V X5R 0201-1
C6391 0.1UF 20% 6.3V X5R-CERM 01005
VOLTAGE=3.0V 电源输出的3V供电

PP1V8_S2电源输出的1.8V供电
C6395 0.01UF 10% 6.3V X5R 01005

附件供电3.3V
PP_ACC_VAR
C6320 2.2UF 20% 6.3V X5R-CERM 0201
C6321 2.2UF 20% 6.3V X5R-CERM 0201
C6322 2.2UF 20% 6.3V X5R-CERM 0201
C6323 2.2UF 20% 6.3V X5R-CERM 0201
C6324 2.2UF 20% 6.3V X5R-CERM 0201

HYDRA_TO_PMU_USB_BRICK_ID
R6300 6.34K 1% 1/32W MF 01005
C6300 0.01UF 10% 6.3V X5R 01005

L6300 15NH-250MA 0201
90_USB_AP_DATA_P
L6301 15NH-250MA 0201
90_USB_AP_DATA_N

90_MIKEYBUS_DATA_P 大音频和USB之间的数据传输信号
90_MIKEYBUS_DATA_N 大音频和USB之间的数据传输信号
90_USB_BB_DATA_P 基带到USB芯片的USB总线
90_USB_BB_DATA_N 基带到USB芯片的USB总线
HYDRA_TO_PMU_USB_BRICK_ID_R USB到电源的附件ID检测信号
90_USB_AP_DATA_L_P
90_USB_AP_DATA_L_N CPU到USB芯片的USB总线
UART_AP_TO_ACCESSORY_TXD CPU到USB的UART总线发送
UART_ACCESSORY_TO_AP_RXD CPU到USB的UART总线发送
UART_AP_DEBUG_TXD USB到CPU的UART总线调试信号
UART_AP_DEBUG_RXD USB到CPU的UART总线调试信号

PP6300 P2MM-NSM 3W
#29289485: Add PP to HYDRA_TO_NUB_DOCK_CONN 电源和USB到CPU的强制DFU信号
HYDRA_TO_NUB_DOCK_CONNECT

SWD_DOCK_TO_AP_SWCLK
SWD_DOCK_BI_AP_SWDIO CPU到USB的SWD总线
PMU_HYDRA_TO_AP_FORCE_DFU
CCG2_TO_HYDRA_CC
HYDRA_CC1
R6301 100K 1% 1/32W MF 01005

U6300 CBTL1612A1 WLCSP

USB
DIG_DP
DIG_DN
USB1_DP
USB1_DN
USB0_DP
USB0_DN
UART1_TX
UART1_RX
UART2_TX
UART2_RX
JTAG_CLK
JTAG_DIO
FORCE_DFU
EXT_SW_EN
DOCK_CONNECT
CC0
CC1

P_IN
ACC1
ACC2
DP1
DN1
DP2
DN2
CON_DET_L
POW_GATE_EN*
SWITCH_EN
HOST_RESET
SDA
SCL
INT
BYPASS
HYDRA_BYPASS

尾插送来的充电电压
PP_VAR_USB_RVP
C6311 0.47UF 20% 25V X5R 0201
C6312 0.47UF 20% 25V X5R 0201
PP_HYDRA_ACC1 VOLTAGE=4.3V
PP_HYDRA_ACC2 VOLTAGE=4.3V

90_HYDRA_DP1_CONN_P
90_HYDRA_DP1_CONN_N
90_HYDRA_DP2_CONN_P
90_HYDRA_DP2_CONN_N
到尾插的USB信号
HYDRA_CON_DETECT_L 尾插插入检测
HYDRA_TO_TIGRIS_VBUS1_VALID_L USB到充电芯片的过流检测（开启信号）
PMU_TO_AP_HYDRA_ACTIVE_READY 电源到USB准备就绪启动信号
HYDRA_TO_PMU_HOST_RESET USB到电源主机复位信号
I2C1_SMC_SDA
I2C1_SMC_SCL
I2C总线
HYDRA_TO_NUB_INT USB到CPU的中断信号

C6330 1.0UF 20% 6.3V X5R 0201-1

DVSS
DVSS1

UART TX/RX pin names on Hydra match signal names (i.e. TX pin is input and connects to TX signal)

D20x Stiching AC Cap:
PP_VDD_MAIN
AP USBx7
C6301 220PF 5% 10V C0G-CERM 01005
C6331 220PF 5% 10V C0G-CERM 01005
C6332 220PF 5% 10V C0G-CERM 01005
C6333 220PF 5% 10V C0G-CERM 01005
C6334 220PF 5% 10V C0G-CERM 01005
C6335 220PF 5% 10V C0G-CERM 01005
C6336 220PF 5% 10V C0G-CERM 01005

BB USB
C6302 220PF 5% 10V C0G-CERM 01005 ROOM=BASEBAND

MIKEYBUS
C6303 220PF 5% 10V C0G-CERM 01005 ROOM=CODEC

MIPI
C6304 220PF 5% 10V C0G-CERM 01005 ROOM=CAM_PMU

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ANTENNA

PP3V0_S2 → FL6430 (1500HM-25%-200MA-0.7DCR, 01005, ROOM=B2B_DOCK) → PP3V0_LAT_CONN
- C6430 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DOCK

PP1V8_S2 电源输出的1.8V供电 → FL6432 (1500HM-25%-200MA-0.7DCR, 01005, ROOM=B2B_DOCK) → PP1V8_LAT_ARC_CONN
- C6432 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DOCK

LAT_TUNER_RFFE1_CLK → R6434 0.00 0% 1/32W MF 01005 ROOM=B2B_DOCK → LAT_TUNER_RFFE1_CLK_CONN
- C6434 33PF 5% 16V NP0-C0G-CERM 01005 ROOM=B2B_DOCK

#31609563: Update C6434/C6436 to 33pF (D21)

LAT_TUNER_RFFE1_DATA → R6436 0.00 0% 1/32W MF 01005 ROOM=B2B_DOCK → LAT_TUNER_RFFE1_DATA_CONN
- C6436 33PF 5% 16V NP0-C0G-CERM 01005 ROOM=B2B_DOCK

BB_TO_LAT_GPO1 → FL6438 (1500HM-25%-200MA-0.7DCR, 01005, ROOM=B2B_DOCK) → BB_TO_LAT_GPO1_CONN
- C6438 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DOCK

BB_TO_LAT_GPO2 → FL6440 (1500HM-25%-200MA-0.7DCR, 01005, ROOM=B2B_DOCK) → BB_TO_LAT_GPO2_CONN
- C6440 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DOCK

BB_TO_LAT_GPO3 → FL6442 (1500HM-25%-200MA-0.7DCR, 01005, ROOM=B2B_DOCK) → BB_TO_LAT_GPO3_CONN
- C6442 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DOCK

BB_TO_LAT_GPO4 → FL6444 (1500HM-25%-200MA-0.7DCR, 01005, ROOM=B2B_DOCK) → BB_TO_LAT_GPO4_CONN
- C6444 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DOCK

HYDRA

PP_VDD_MAIN
- C6415 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DOCK
- C6416 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DOCK

AC return path (USB):GND/VDD_MAIN reference

HYDRA_CON_DETECT_L 尾插插入检测 → R6410 100 1% 1/32W MF 01005 ROOM=B2B_DOCK → HYDRA_CON_DETECT_CONN_L
- C6410 27PF 5% 16V NP0-C0G 01005 ROOM=B2B_DOCK

PP_HYDRA_ACC1 → FL6411 (10-OHM-1.1A, 01005, ROOM=B2B_DOCK) → PP_HYDRA_ACC1_CONN
- C6411 100PF 5% 16V NP0-C0G 01005 ROOM=B2B_DOCK
  NOTE:Another 100pF on dock flex [P1.5] Use 16V Part

PP_HYDRA_ACC2 → FL6413 (22-OHM-25%-1800MA, 0201, ROOM=B2B_DOCK) → PP_HYDRA_ACC2_CONN
- C6413 220PF 5% 25V C0G 01005 ROOM=B2B_DOCK
  #28565582:[P2] Reduce to 100pF [P1.5] Use 16V Part #31347215: [CRB] Revert to 220pF

ARC

I2C3_AP_SCL → R6422 0.00 0% 1/32W MF 01005 ROOM=B2B_DOCK → I2C3_AP_TO_SAKONNET_SCL_CONN
- C6422 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DOCK

I2C3_AP_SDA → R6424 0.00 0% 1/32W MF 01005 ROOM=B2B_DOCK → I2C3_AP_BI_SAKONNET_SDA_CONN
- C6424 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DOCK

ARC1_TO_SOLENOID1_OUT_POS 到震动的驱动信号输出
ARC1_TO_SOLENOID1_OUT_NEG
- C6471 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DOCK
- C6470 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DOCK

I2S_CODEC_ASP1_TO_AOP_AMPS_BCLK (IN) → R6419 100 1% 1/32W MF 01005 ROOM=B2B_DOCK → I2S_CODEC_ASP1_TO_AOP_AMPS_BCLK_CONN
- C6419 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DOCK (NOSTUFF)

I2S_CODEC_ASP1_TO_AOP_AMPS_LRCLK (IN) → R6420 100 1% 1/32W MF 01005 ROOM=B2B_DOCK → I2S_CODEC_ASP1_TO_AOP_AMPS_LRCLK_CONN
- C6420 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DOCK (NOSTUFF)

I2S_AOP_AMPS_TO_CODEC_ASP1_DOUT (OUT) → R6421 100 1% 1/32W MF 01005 ROOM=B2B_DOCK → I2S_AOP_AMPS_TO_CODEC_ASP1_DOUT_CONN
- C6421 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DOCK (NOSTUFF)

MICS

LOWERMIC1_TO_CODEC_AIN1_P → FL6450 (1500HM-25%-200MA-0.7DCR, 01005, ROOM=B2B_DOCK) → LOWERMIC1_TO_CODEC_AIN1_CONN_P 尾插主麦克风到大音频信号输入 正
- C6450 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DOCK

LOWERMIC1_TO_CODEC_AIN1_N 尾插主麦克风到大音频信号输入 负 → FL6452 (1500HM-25%-200MA-0.7DCR, 01005, ROOM=B2B_DOCK) → LOWERMIC1_TO_CODEC_AIN1_CONN_N
- C6452 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DOCK

PP_CODEC_TO_LOWERMIC1_BIAS → FL6454 (1500HM-25%-200MA-0.7DCR, 01005, ROOM=B2B_DOCK) → PP_CODEC_TO_LOWERMIC1_BIAS_CONN
- C6454 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DOCK

LOWERMIC4_TO_CODEC_AIN4_P → FL6460 (1500HM-25%-200MA-0.7DCR, 01005, ROOM=B2B_DOCK) → LOWERMIC4_TO_CODEC_AIN4_CONN_P 尾插降噪麦克风到大音频信号输入 正
- C6460 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DOCK

LOWERMIC4_TO_CODEC_AIN4_N → FL6462 (1500HM-25%-200MA-0.7DCR, 01005, ROOM=B2B_DOCK) → LOWERMIC4_TO_CODEC_AIN4_CONN_N
- C6462 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DOCK

PP_CODEC_TO_LOWERMIC4_BIAS → FL6464 (1500HM-25%-200MA-0.7DCR, 01005, ROOM=B2B_DOCK) → PP_CODEC_TO_LOWERMIC4_BIAS_CONN
- C6464 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DOCK

I2C1_AP_SCL → R6456 0.00 0% 1/32W MF 01005 ROOM=B2B_DOCK → I2C1_AP_TO_MIC1_SCL_CONN
- C6456 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DOCK

I2C1_AP_SDA → R6466 0.00 0% 1/32W MF 01005 ROOM=B2B_DOCK → I2C1_AP_BI_MIC1_SDA_CONN
- C6466 56PF 5% 25V NP0-C0G-CERM 01005 ROOM=B2B_DOCK

DOCK FLEX CONNECTOR

APN: 516S00276

ROOM=B2B_DOCK
CRITICAL
J6400
BB35L-RA50-3A
F-ST-SM

PP3V0_LAT_CONN	3V供电	SPKRAMP_BOT_TO_COIL_OUT_NEG 到尾插的铃声驱动信号输出 负
LOWERMIC4_TO_CODEC_BIAS_FILT_RET	尾插副麦克风偏压	COIL_TO_SPKRAMP_BOT_VSENSE_CONN_N 到尾插的铃声驱动信号电流检测 负
LOWERMIC1_TO_CODEC_AIN1_CONN_N	尾插主麦克风到大音频信号输入 负	BB_TO_LAT_GPO1_CONN
LOWERMIC1_TO_CODEC_AIN1_CONN_P	尾插主麦克风到大音频信号输入 正	BB_TO_LAT_GPO2_CONN
PP_CODEC_TO_LOWERMIC1_BIAS_CONN	尾插副麦克风偏压	PP_CODEC_TO_LOWERMIC4_BIAS_CONN 尾插副麦克风偏压
I2C1_AP_TO_MIC1_SCL_CONN	I2C总线	LOWERMIC4_TO_CODEC_AIN4_CONN_P 尾插降噪麦克风到大音频信号输入 正
I2C1_AP_BI_MIC1_SDA_CONN		LOWERMIC4_TO_CODEC_AIN4_CONN_N 尾插降噪麦克风到大音频信号输入 负
		LOWERMIC1_TO_CODEC_BIAS_FILT_RET 尾插副麦克风偏压
		MIKEYBUS_REFERENCE MIKEY总线基准
90_HYDRA_DP2_CONN_P	尾插到USB的数据线	BB_TO_LAT_GPO4_CONN
90_HYDRA_DP2_CONN_N		BB_TO_LAT_GPO3_CONN
90_HYDRA_DP1_CONN_P		HYDRA_CON_DETECT_CONN_L 尾插插入检测
90_HYDRA_DP1_CONN_N		LAT_TUNER_RFFE1_DATA_CONN 到基带的RFFE总线
PP_HYDRA_ACC1_CONN	附件检测	LAT_TUNER_RFFE1_CLK_CONN
PP_HYDRA_ACC2_CONN	附件检测	PP1V8_LAT_ARC_CONN 1.8V供电
ARC1_TO_SOLENOID1_OUT_NEG	到震动的驱动信号输出 负	SOLENOID1_TO_ARC1_VSENSE_N 震动驱动信号电压检测 负
ARC1_TO_SOLENOID1_OUT_POS	到震动的驱动信号输出 正	SOLENOID1_TO_ARC1_VSENSE_P 震动驱动信号电压检测 正
I2S_CODEC_ASP1_TO_AOP_AMPS_LRCLK_CONN	音频到CPU的I2S总线数据输入信号	I2C3_AP_BI_SAKONNET_SDA_CONN I2C总线
I2S_CODEC_ASP1_TO_AOP_AMPS_BCLK_CONN		I2C3_AP_TO_SAKONNET_SCL_CONN
		I2S_AOP_AMPS_TO_CODEC_ASP1_DOUT_CONN 音频到CPU的I2S总线数据输入信号
		COIL_TO_SPKRAMP_BOT_VSENSE_CONN_P 到尾插的铃声驱动信号电流检测 正
		SPKRAMP_BOT_TO_COIL_OUT_POS
		到尾插的铃声驱动信号输出 正

PP_VBUS1_F75 充电电压输入 VOLTAGE=16.0V
- C6490 0.1UF 10% 25V X5R 0201 ROOM=CHARGER
- C6491 0.1UF 10% 25V X5R 0201 ROOM=CHARGER
- C6492 0.1UF 10% 25V X5R 0201 ROOM=B2B_DOCK
- C6493 220PF 5% 25V C0G 01005 ROOM=B2B_DOCK
- C6494 0.1UF 10% 25V X5R 0201 ROOM=B2B_DOCK
- C6496 0.1UF 10% 25V X5R 0201 ROOM=B2B_DOCK

#30797674: Update C6496/C6494 per EMC/Desense feedback
#30657902: Update C6494 to 0.1UF per EMC/Densence

SOUTH SPEAKER

COIL_TO_SPKRAMP_BOT_VSENSE_P → FL6480 (1500HM-25%-200MA-0.7DCR, 01005, ROOM=B2B_DOCK) → COIL_TO_SPKRAMP_BOT_VSENSE_CONN_P
- C6480 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DOCK (NOSTUFF)

COIL_TO_SPKRAMP_BOT_VSENSE_N → FL6482 (1500HM-25%-200MA-0.7DCR, 01005, ROOM=B2B_DOCK) → COIL_TO_SPKRAMP_BOT_VSENSE_CONN_N
- C6482 220PF 5% 16V C0G-CERM 01005 ROOM=B2B_DOCK (NOSTUFF)

#29332151: No-stuff C6480 and C6482

SPKRAMP_BOT_TO_COIL_OUT_POS
SPKRAMP_BOT_TO_COIL_OUT_NEG
- C6488 1000PF 10% 16V X5R 01005 ROOM=B2B_DOCK
- C6489 1000PF 10% 16V X5R 01005 ROOM=B2B_DOCK

PAGE TITLE: I/O: B2B DOCK
DRAWING NUMBER: 051-02159
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REVISION: 1.0.0
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迅维职业技能培训中心 400-800-9990

I2C MAP

(see #28857723 updates)

Diags ID	Bus	Device	7-Bit Address	8-Bit Address	Device Max Speed	Operating Speed	Net Name
0	AP I2C0	**Agnes** (System PMU)	0x74	0xE8	400 Kbps	400 Kbps	I2C0_AP
		Chestnut (Display PMU)	0x27	0x4E	400 Kbps		
		AccessoryBuck	0x52	0xA4	400 Kbps		
		Muon (Backlight Controller 2)	0x62	0xC4	1 Mbps		
1	AP I2C1	**MIC1 Temp Sensor** (South)	0x54	0xA8	1 Mbps	100 Kbps	I2C1_AP
		MIC2 Temp Sensor (North Rear)	0x56	0xAC	1 Mbps		
2	AP I2C2	**Adare** (Top Speaker Amp)	0x40	0x80	1 Mbps	1 Mbps	I2C2_AP
		Convoy (Top Speaker Cap Sense)	0x21	0x42	1 Mbps		
3	AP I2C3	**EEPROM**	0x51	0xA2	400 Kbps	400 Kbps	I2C3_AP
		Muon (Backlight Controller 1)	0x62	0xC4	400 Kbps		
		Sakonnet (Arc: Hall Effect Sensor)	0x08	0x10	1 Mbps		
		EEPROM	0x50	0xA0	400 Kbps		
	ISP I2C0	**Casper** (Rear Wide Camera)	0x10	0x20	1 Mbps	1 Mbps	I2C0_ISP
		Grunberg+ (AF/OIS Wide Camera)	0x3C	0x78	1 Mbps		
	ISP I2C1	**Billings** (Rear Tele Camera)	0x20	0x40	1 Mbps	1 Mbps	I2C1_ISP
		Edwin (AF Tele Camera)	0x0D	0x1A	1 Mbps		
	ISP I2C2	**Concord** (Front Camera)	0x10	0x20	1 Mbps	400 Kbps	I2C2_ISP
	ISP I2C3	**Neon** (Strobe - CW : LM3566)	0x63	0xC6	1 Mbps	400 Kbps	I2C3_ISP
		Ansel (Camera PMU)	0x40	0x80	1 Mbps		
		Neon (Strobe - AM : LM3562)	0x67	0xCE	1 Mbps		
	SEP I2C	**EEPROM**	0x51	0xA2	400 Kbps	400 Kbps	I2C4_AP
4	AOP I2C0	**Doppler** (Prox Sensor)	0x58	0xB0	1 Mbps	400 Kbps	I2C0_AOP
		CT709 (ALS : Firefish)	0x29	0x52	400 Kbps		
5	AOP I2C1	**Adare** (Bottom Speaker Amp)	0x40	0x80	1 Mbps	1 Mbps	I2C1_AOP
		Adare (Arc : Driver)	0x41	0x82	1 Mbps		
		Apache3 (Mesa Power Supply)	0x61	0xC2	1 Mbps		I2C1_AOP_ISO
		Turtle	0x2C	0x58	1 Mbps		
6	SMC I2C0	**Tigris2** (Charger)	0x71	0xE2	400 Kbps	400 Kbps	I2C0_SMC
		TPS61280 (VDD Boost)	0x75	0xEA	400 Kbps		
		CCG2 (USB PD)	0x12 (0x08)	0x24 (0x10)	1 Mbps		
		Iktara	0x39	0x72	400 Kbps		
		SN45546 (Gas Gauge)	0x55	0xAA	400 Kbps		
7	SMC I2C1	**Hydra**	0x1A	0x34	400 Kbps	400 Kbps	I2C1_SMC

SYNC_MASTER=sync SYNC_DATE=04/14/2017

PAGE TITLE

SYSTEM: I2C MAP

Apple Inc.

DRAWING NUMBER 051-02159 SIZE D

REVISION 10.0.0

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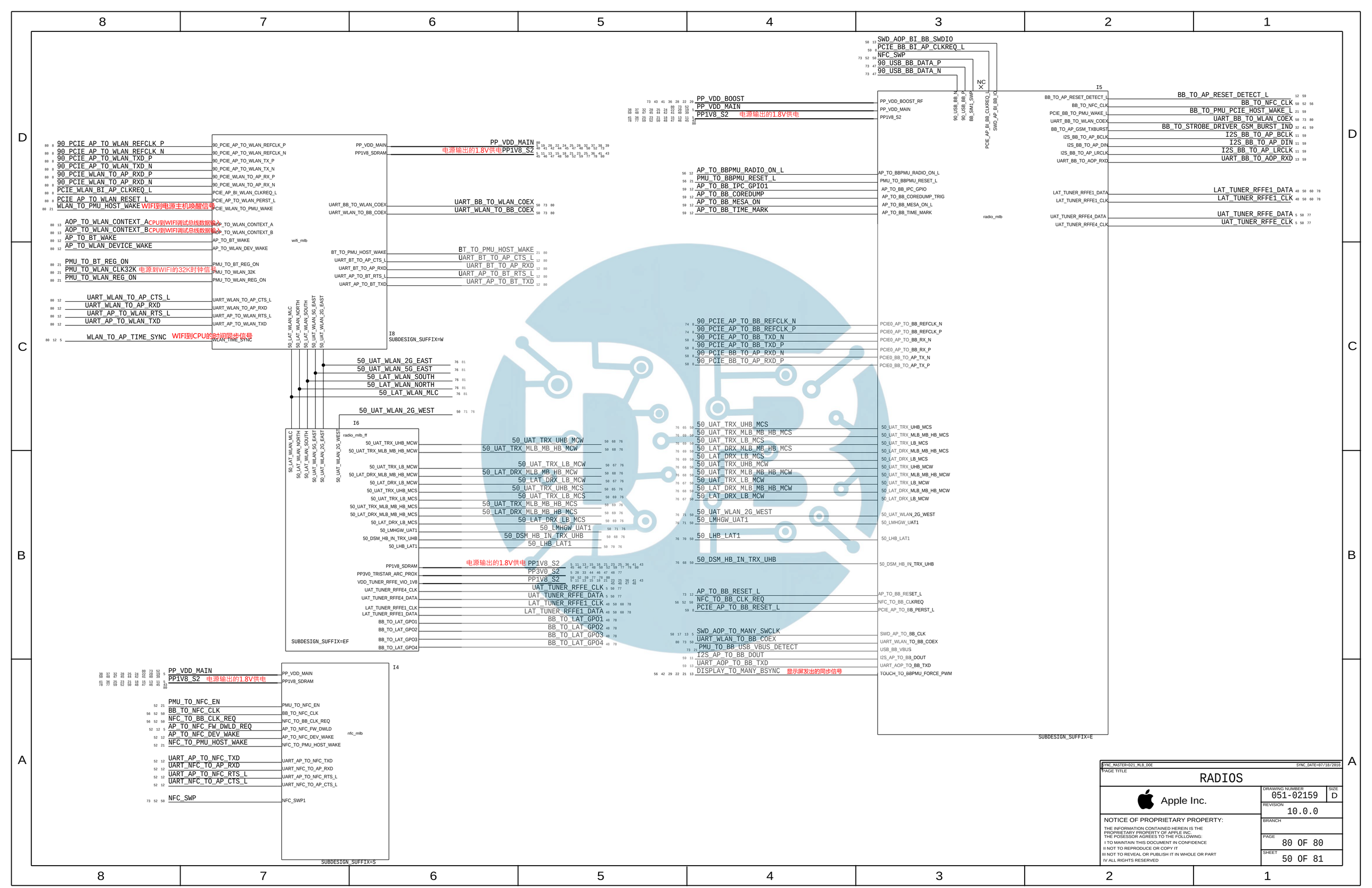
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90_PCIE_AP_TO_WLAN_REFCLK_N
90_PCIE_AP_TO_WLAN_TXD_P
90_PCIE_AP_TO_WLAN_TXD_N
90_PCIE_WLAN_TO_AP_RXD_P
90_PCIE_WLAN_TO_AP_RXD_N
PCIE_AP_BI_WLAN_CLKREQ_L
PCIE_AP_TO_WLAN_PERST_L
WLAN_TO_PMU_HOST_WAKE
WIFI到电源主机唤醒信号
PCIE_WLAN_TO_PMU_WAKE
AOP_TO_WLAN_CONTEXT_A
CPU到WIFI调试总线数据输入
AOP_TO_WLAN_CONTEXT_B
CPU到WIFI调试总线数据输入
AP_TO_BT_WAKE
AP_TO_WLAN_DEVICE_WAKE
wifi_mlb
PMU_TO_BT_REG_ON
PMU_TO_WLAN_CLK32K
电源到WIFI的32K时钟信号
PMU_TO_WLAN_REG_ON
UART_WLAN_TO_AP_CTS_L
UART_WLAN_TO_AP_RXD
UART_AP_TO_WLAN_RTS_L
UART_AP_TO_WLAN_TXD
WLAN_TO_AP_TIME_SYNC
WIFI到CPU的时间同步信号
WLAN_TIME_SYNC
I8
SUBDESIGN_SUFFIX=W
PP_VDD_MAIN
PP1V8_SDRAM
电源输出的1.8V供电
UART_BB_TO_WLAN_COEX
UART_WLAN_TO_BB_COEX
BT_TO_PMU_HOST_WAKE
UART_BT_TO_AP_CTS_L
UART_BT_TO_AP_RXD
UART_AP_TO_BT_RTS_L
UART_AP_TO_BT_TXD
50_LAT_WLAN_MLC
50_LAT_WLAN_NORTH
50_LAT_WLAN_SOUTH
50_LAT_WLAN_5G_EAST
50_UAT_WLAN_2G_EAST
50_UAT_WLAN_5G_EAST
50_UAT_WLAN_2G_WEST
I6
radio_mlb_ff
50_UAT_TRX_UHB_MCW
50_UAT_TRX_MLB_MB_HB_MCW
50_UAT_TRX_LB_MCW
50_LAT_DRX_MLB_MB_HB_MCW
50_LAT_DRX_LB_MCW
50_UAT_TRX_UHB_MCS
50_UAT_TRX_LB_MCS
50_UAT_TRX_MLB_MB_HB_MCS
50_LAT_DRX_MLB_MB_HB_MCS
50_LAT_DRX_LB_MCS
50_LMHGW_UAT1
50_DSM_HB_IN_TRX_UHB
50_LHB_LAT1
PP1V8_SDRAM
PP3V0_TRISTAR_ARC_PROX
VDD_TUNER_RFFE_VIO_1V8
UAT_TUNER_RFFE4_CLK
UAT_TUNER_RFFE4_DATA
LAT_TUNER_RFFE1_CLK
LAT_TUNER_RFFE1_DATA
BB_TO_LAT_GPO1
BB_TO_LAT_GPO2
BB_TO_LAT_GPO3
BB_TO_LAT_GPO4
SUBDESIGN_SUFFIX=EF
PP_VDD_BOOST
PP_VDD_MAIN
PP1V8_S2
电源输出的1.8V供电
AP_TO_BBPMU_RADIO_ON_L
PMU_TO_BBPMU_RESET_L
AP_TO_BB_IPC_GPIO1
AP_TO_BB_COREDUMP
AP_TO_BB_MESA_ON
AP_TO_BB_TIME_MARK
SWD_AOP_BI_BB_SWDIO
PCIE_BB_BI_AP_CLKREQ_L
NFC_SWP
90_USB_BB_DATA_P
90_USB_BB_DATA_N
NC
PP_VDD_BOOST_RF
PP_VDD_MAIN
PP1V8_S2
90_USB_BB_N
90_USB_BB_P
BB_SIM1_SWP
PCIE_AP_BI_BB_CLKREQ_L
SWD_AP_BI_BB_IO
AP_TO_BBPMU_RADIO_ON_L
PMU_TO_BBPMU_RESET_L
AP_TO_BB_IPC_GPIO
AP_TO_BB_COREDUMP_TRIG
AP_TO_BB_MESA_ON_L
AP_TO_BB_TIME_MARK
radio_mlb
I5
BB_TO_AP_RESET_DETECT_L
BB_TO_NFC_CLK
PCIE_BB_TO_PMU_WAKE_L
UART_BB_TO_WLAN_COEX
BB_TO_AP_GSM_TXBURST
I2S_BB_TO_AP_BCLK
I2S_BB_TO_AP_DIN
I2S_BB_TO_AP_LRCLK
UART_BB_TO_AOP_RXD
BB_TO_AP_RESET_DETECT_L
BB_TO_NFC_CLK
BB_TO_PMU_PCIE_HOST_WAKE_L
UART_BB_TO_WLAN_COEX
BB_TO_STROBE_DRIVER_GSM_BURST_IND
I2S_BB_TO_AP_BCLK
I2S_BB_TO_AP_DIN
I2S_BB_TO_AP_LRCLK
UART_BB_TO_AOP_RXD
LAT_TUNER_RFFE1_DATA
LAT_TUNER_RFFE1_CLK
UAT_TUNER_RFFE4_DATA
UAT_TUNER_RFFE4_CLK
90_PCIE_AP_TO_BB_REFCLK_N
90_PCIE_AP_TO_BB_REFCLK_P
90_PCIE_AP_TO_BB_TXD_N
90_PCIE_AP_TO_BB_TXD_P
90_PCIE_BB_TO_AP_RXD_N
90_PCIE_BB_TO_AP_RXD_P
PCIE0_AP_TO_BB_REFCLK_N
PCIE0_AP_TO_BB_REFCLK_P
PCIE0_AP_TO_BB_RX_N
PCIE0_AP_TO_BB_RX_P
PCIE0_BB_TO_AP_TX_N
PCIE0_BB_TO_AP_TX_P
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50_LAT_DRX_LB_MCS
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50_LAT_DRX_LB_MCW
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50_LMHGW_UAT1
50_LHB_LAT1
50_DSM_HB_IN_TRX_UHB
AP_TO_BB_RESET_L
NFC_TO_BB_CLK_REQ
PCIE_AP_TO_BB_RESET_L
SWD_AP_TO_BB_CLK
UART_WLAN_TO_BB_COEX
USB_BB_VBUS
I2S_AP_TO_BB_DOUT
UART_AOP_TO_BB_TXD
DISPLAY_TO_MANY_BSYNC
显示屏发出的同步信号
TOUCH_TO_BBPMU_FORCE_PWM
SUBDESIGN_SUFFIX=E
PP_VDD_MAIN
PP1V8_S2
电源输出的1.8V供电
PMU_TO_NFC_EN
BB_TO_NFC_CLK
NFC_TO_BB_CLK_REQ
AP_TO_NFC_FW_DWLD_REQ
AP_TO_NFC_DEV_WAKE
NFC_TO_PMU_HOST_WAKE
UART_AP_TO_NFC_TXD
UART_NFC_TO_AP_RXD
UART_AP_TO_NFC_RTS_L
UART_NFC_TO_AP_CTS_L
NFC_SWP
I4
nfc_mlb
PP_VDD_MAIN
PP1V8_SDRAM
PMU_TO_NFC_EN
BB_TO_NFC_CLK
NFC_TO_BB_CLK_REQ
AP_TO_NFC_FW_DWLD
AP_TO_NFC_DEV_WAKE
NFC_TO_PMU_HOST_WAKE
UART_AP_TO_NFC_TXD
UART_NFC_TO_AP_RXD
UART_AP_TO_NFC_RTS_L
UART_NFC_TO_AP_CTS_L
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SUBDESIGN_SUFFIX=S
SYNC_MASTER=D21_MLB_DOE
SYNC_DATE=07/18/2016
PAGE TITLE
RADIOS
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REV	ECN	DESCRIPTION OF REVISION	CK APPD / DATE
10	0008927012	ENGINEERING RELEASED	2017-06-06

NFC_MLB D20/D21
MAY 15, 2017

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

52 56 IN PP_VDD_MAIN
52 56 IN PP1V8_S2 电源输出的1.8V供电

52 56 IN PMU_TO_NFC_EN 电源到NFC开启信号
52 56 OUT NFC_TO_PMU_HOST_WAKE NFC到电源主机唤醒信号
52 56 IN AP_TO_NFC_DEV_WAKE CPU发给NFC芯片的唤醒信号
52 56 IN AP_TO_NFC_FW_DWLD_REQ CPU到NFC的DWLD请求
52 56 OUT NFC_TO_BB_CLK_REQ NFC到基带时钟中断
52 56 IN BB_TO_NFC_CLK

52 56 IN UART_AP_TO_NFC_TXD
52 56 OUT UART_NFC_TO_AP_RXD
52 56 IN UART_AP_TO_NFC_RTS_L
52 56 OUT UART_NFC_TO_AP_CTS_L

52 56 IO NFC_SWP

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

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

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
131S00138	1	39PF, 0201, 2%, 50V	C7512_S	D20_ROW
131S00016	1	470PF, 0201, 2%, 25V	C7514_S	D20_ROW
131S00025	1	1000PF, 0201, 2%, 25V	C7515_S	D20_ROW
131S0825	1	560PF, 0201, 2%, 25V	C7516_S	D20_ROW
131S0883	1	220PF, 0201, 2%, 50V	C7518_S	D20_ROW
131S00026	1	820PF, 0201, 2%, 25V	C7510_S	D20_ROW
131S00026	1	820PF, 0201, 2%, 25V	C7513_S	D20_ROW
157S00022	1	TDK, BALUN, 11T	T7500_S	D20_ROW

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

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
131S00138	1	39PF, 0201, 2%, 50V	C7512_S	D201
131S00016	1	470PF, 0201, 2%, 25V	C7514_S	D201
131S00025	1	1000PF, 0201, 2%, 25V	C7515_S	D201
131S0825	1	560PF, 0201, 2%, 25V	C7516_S	D201
131S0883	1	220PF, 0201, 2%, 50V	C7518_S	D201
131S00026	1	820PF, 0201, 2%, 25V	C7510_S	D201
131S00026	1	820PF, 0201, 2%, 25V	C7513_S	D201
157S00022	1	TDK, BALUN, 11T	T7500_S	D201

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

page1

DRAWING TITLE: SCH,MLB,D21

Apple Inc.

DRAWING NUMBER: 051-02159
SIZE: D
REVISION: 10.0.0
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PAGE: 1 OF 75
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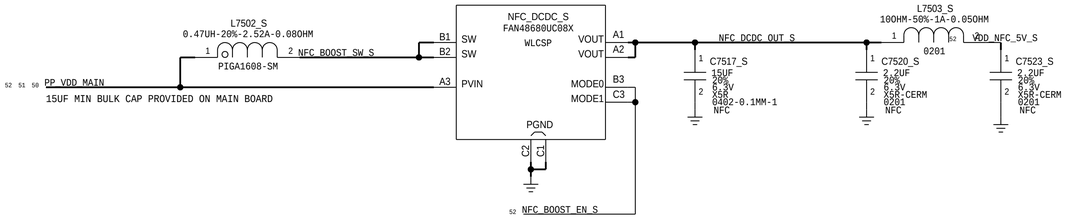
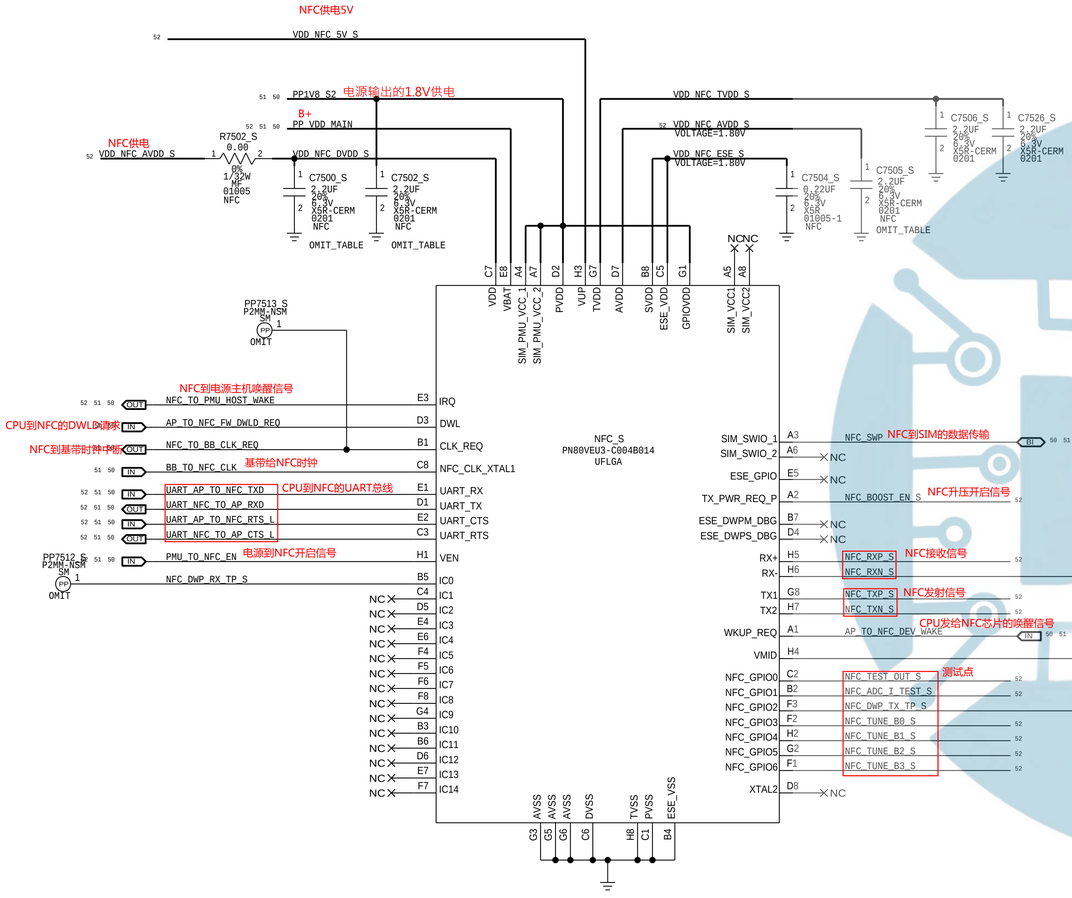
STOCKHOLM

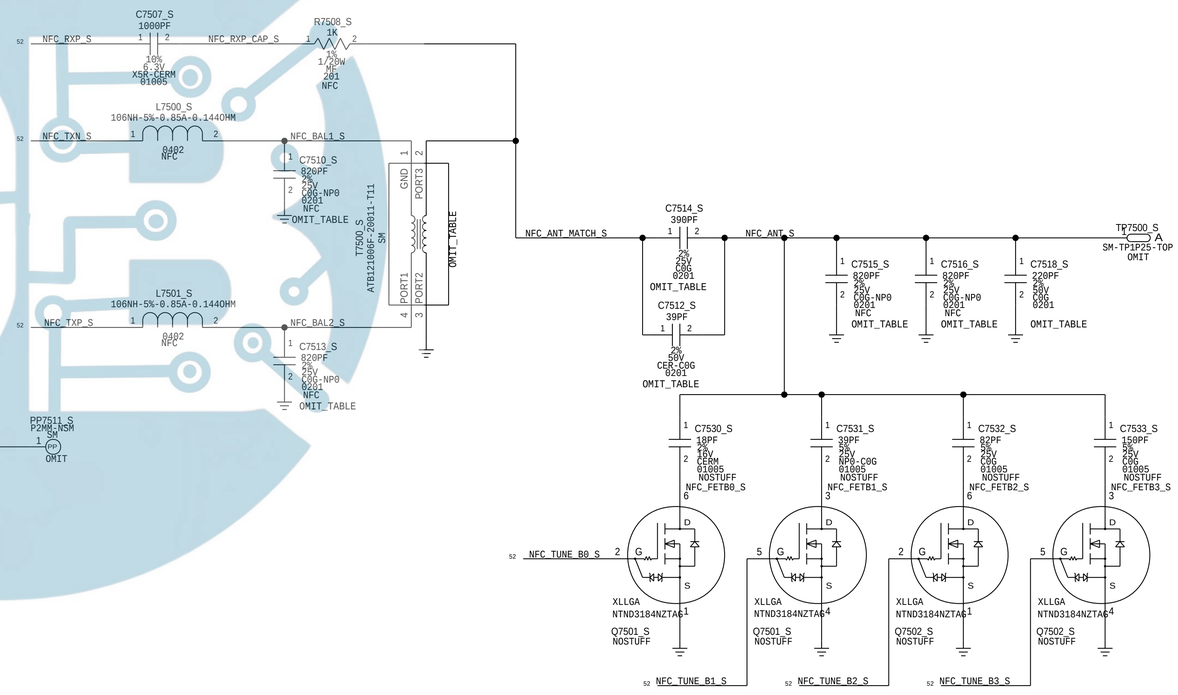
5V BOOSTER

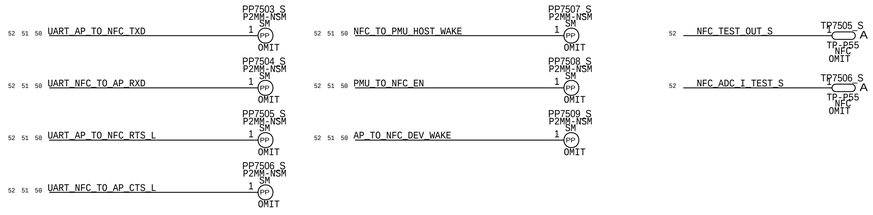


NFC CONTROLLER



NFC FRONT END





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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
10	0008927012	ENGINEERING RELEASED	2017-06-06

(MAV17.2/3)

D21 RADIO_MLB

06/06/2017

0.122.0

LAST_MODIFICATION=Tue Jun 6 18:57:01 2017

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57	5	BB: POWER 基带CPU供电部分		
58	6	BB: CONTROL & HS PERIPHERALS [6] 基带芯片		
59	7	BB: GPIOS & QLINK 基带芯片		
60	8	XCVR 射频芯片		
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63	11	LB PAD 低频功放		
64	12	HB PAD 高频功放		
65	13	UHB PAD 超高频功放		
66	14	2G PA 2G功放		
67	15	LB DSM 低频分集接收器		
68	16	HB DSM 高频分集接收器		
69	17	COUPLER2 耦合器		
70	18	LOWER ANTENNA 天线		
71	19	UPPER ANTENNA		
72	20	GNSS GPS		
73	21	SIM, DEBUG CONN SIM卡，诊断接口		
74	22	TEST POINTS 测试点	PROBE POINTS	07/18/2016

ALTERNATES

PART NUMBER	ALTERNATE FOR PART NUMBER	REFERENCE DESIGNATOR(S)	DESCRIPTION	BOM OPTION
335S00013	335S0894	U_EEPROM_E	IC, EEPROM	BOM_TABLE_ALTS
197S00093	197S00065	Y401_E	XTAL, 38P4MHZ	BOM_TABLE_ALTS
197S00067	197S00065	Y401_E	XTAL, 38P4MHZ	BOM_TABLE_ALTS
353S01287	353S01109	U_QET_E	ET MODULE, QPOET	BOM_TABLE_ALTS

SCH #: 951-03059
PCB #: 920-02293
BOM #: 939-02493

FRONT PAGE

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POWER

21 10 3 IN PP_VDD_MAIN

IN PP_VDD_BOOST = PP_VDD_BOOST 3 21
MAKE_BASE=TRUE

21 4 IN AP_TO_BB_RESET_L
4 IN PMU_TO_BBPMU_RESET_L
4 IN AP_TO_BBPMU_RADIO_ON_L

AOP

22 7 IN UART_AOP_TO_BB_TXD
22 7 OUT UART_BB_TO_AOP_RXD

22 7 OUT BB_TO_STROBE_DRIVER_GSM_BURST_IND

21 7 OUT UART_BB_TO_WLAN_COEX
21 7 IN UART_WLAN_TO_BB_COEX

22 7 IN AP_TO_BB_COREDUMP
7 IO AP_TO_BB_IPC_GPIO1
22 7 IN AP_TO_BB_MESA_ON

22 7 OUT BB_TO_AP_RESET_DETECT_L

22 7 IN AP_TO_BB_TIME_MARK

22 4 IN DISPLAY_TO_MANY_BSYNC 显示屏发出的同步信号

7 IN PP1V8_S2 电源输出的1.8V供电

RF SIGNALS

13 IO 50_UAT_TRX_UHB_MCS
17 IO 50_UAT_TRX_MLB_MB_HB_MCS
17 IO 50_UAT_TRX_LB_MCS
17 IO 50_LAT_DRX_MLB_MB_HB_MCS
17 IO 50_LAT_DRX_LB_MCS
16 IO 50_UAT_TRX_UHB_MCW
16 IO 50_UAT_TRX_MLB_MB_HB_MCW
15 IO 50_UAT_TRX_LB_MCW
16 IO 50_LAT_DRX_MLB_MB_HB_MCW
15 IO 50_LAT_DRX_LB_MCW

19 IO 50_UAT_WLAN_2G_WEST
19 IO 50_LMHGW_UAT1

18 IO 50_LHB_LAT1
19 16 IO 50_DSM_HB_IN_TRX_UHB

TUNER/DOCK

MAKE_BASE=TRUE

OUT UAT_TUNER_RFFE_CLK = UAT_TUNER_RFFE_CLK 7
IO UAT_TUNER_RFFE_DATA = UAT_TUNER_RFFE_DATA 7
8 7 OUT LAT_TUNER_RFFE1_CLK = MAKE_BASE=TRUE
8 7 IO LAT_TUNER_RFFE1_DATA

PCIE

22 6 IN 90_PCIE_AP_TO_BB_REFCLK_P
22 6 IN 90_PCIE_AP_TO_BB_REFCLK_N

6 IN 90_PCIE_AP_TO_BB_TXD_P
6 IN 90_PCIE_AP_TO_BB_TXD_N

6 OUT 90_PCIE_BB_TO_AP_RXD_P
6 OUT 90_PCIE_BB_TO_AP_RXD_N

7 IN PCIE_AP_TO_BB_RESET_L
7 IO PCIE_BB_BI_AP_CLKREQ_L
7 OUT BB_TO_PMU_PCIE_HOST_WAKE_L

STOCKHOLM

21 IO NFC_SWP

4 IN NFC_TO_BB_CLK_REQ
22 4 OUT BB_TO_NFC_CLK

SWD/USB

6 IN SWD_AOP_TO_MANY_SWCLK
6 IO SWD_AOP_BI_BB_SWDIO
21 4 IN PMU_TO_BB_USB_VBUS_DETECT
21 6 IO 90_USB_BB_DATA_P
21 6 IO 90_USB_BB_DATA_N

AUDIO

22 7 OUT I2S_BB_TO_AP_BCLK
22 7 OUT I2S_BB_TO_AP_LRCLK
22 7 IN I2S_AP_TO_BB_DOUT
22 7 OUT I2S_BB_TO_AP_DIN

RF PMIC: SWITCHERS & LDOS

MAKE_BASE=TRUE
PP_VDD_BOOST — PP_VDD_BOOST
VOLTAGE=4.3V

SWITCHERS BULK CAPS

B+ PP_VDD_MAIN — MAKE_BASE=TRUE
VOLTAGE=4.3V
C302_E 10UF 20% 10V X5R-CERM 0402-0.1MM-1 GND
B+ PP_VDD_MAIN — PP_VDD_MAIN
C303_E 10UF 20% 10V X5R-CERM 0402-0.1MM-1 GND
B+ PP_VDD_MAIN — PP_VDD_MAIN
C304_E 10UF 20% 10V X5R-CERM 0402-0.1MM-1 GND
MAKE_BASE=TRUE PP_VDD_MAIN
C301_E 10UF 20% 10V X5R-CERM 0402-0.1MM-1 GND
B+ PP_VDD_MAIN — PP_VDD_MAIN
MAKE_BASE=TRUE
C305_E 10UF 20% 10V X5R-CERM 0402-0.1MM-1 GND

U_PMIC_E
PDM9655
BGA
SYM 6 OF 6
SREG

B+ PP_VDD_MAIN	93	VDD_S1	VREG_S1 72
	103	VDD_S1	
	114	VDD_S1	
GND	84	GND_S1	VSW_S1 94
	95	GND_S1	104
	105	GND_S1	115
	116	GND_S1	
B+ PP_VDD_MAIN	74	VDD_S2	VREG_S2 41
GND	53	GND_S2	VSW_S2 63
			73
B+ PP_VDD_MAIN	43	VDD_S3	VREG_S3 23
	44	VDD_S3	VSW_S3 54
GND	75	GND_S3	64
	76	GND_S3	65
B+ PP_VDD_MAIN	108	VDD_S4	VREG_S4 86
GND	110	GND_S4	VSW_S4 109
B+ PP_VDD_MAIN	100	VDD_S5	VREG_S5 99
	111	VDD_S5	
GND	113	GND_S5	VSW_S5 101
	102	GND_S5	112

PP_0V8_SMPS1_SNS_E VOLTAGE=0.80V
VSW_SMPS1_E
PP_1V2_SMPS2_SNS_E VOLTAGE=1.20V
VSW_SMPS2_E
PP_1V0_SMPS3_SNS_E VOLTAGE=1.00V
VSW_SMPS3_E
PP_1V8_SMPS4_SNS_E VOLTAGE=1.80V
VSW_SMPS4_E
PP_0V8_SMPS5_SNS_E VOLTAGE=0.80V
VSW_SMPS5_E

L304_E 1UH-20%-3.6A-0.035OHM 2016 RADIO_PMIC
L301_E 2.2UH-20%-2.7A-0.09OHM 2016
L305_E 2.2UH-20%-2.7A-0.09OHM 2016
L302_E 2.2UH-20%-2.7A-0.09OHM 2016
L303_E 2.2UH-20%-2.7A-0.09OHM 2016

NEED 0.8MM PARTS STILL

XW301_E SHORT-10L-0.1MM-SM ROOM=PMU
XW302_E SHORT-10L-0.1MM-SM ROOM=PMU
XW303_E SHORT-10L-0.1MM-SM ROOM=PMU
XW304_E SHORT-10L-0.1MM-SM ROOM=PMU
XW305_E SHORT-10L-0.1MM-SM ROOM=PMU

C317_E, C322_E 26UF 20% 4V X5R 0402-0.1MM — GND
C318_E, C323_E 26UF 20% 4V X5R 0402-0.1MM — GND
C319_E, C324_E 26UF 20% 4V X5R 0402-0.1MM — GND
C320_E, C325_E, C327_E 26UF 20% 4V X5R 0402-0.1MM — GND
C321_E, C326_E 26UF 20% 4V X5R 0402-0.1MM — GND

S1电压0.8V PP_0V8_SMPS1_E VOLTAGE=0.80V OUT — 0.80V/2898MA
S2电压1.2V PP_1V2_SMPS2_E VOLTAGE=1.20V — 1.2V/1366MA
S3电压1.0V PP_1V0_SMPS3_E VOLTAGE=1.00V — 1.0V/1972MA
S4电压1.8V PP_1V8_SMPS4_E VOLTAGE=1.80V — 1.80V/509MA
S5电压0.8V PP_0V8_SMPS5_E VOLTAGE=0.80V — 0.80V/1250MA

U_PMIC_E
PDM9655
BGA
SYM 4 OF 6
LREG

B+ PP_VDD_MAIN	98	VIN_VPH1	VREG_L1 42
	29	VIN_VPH2	VREG_L2 32
S2电压1.2V PP_1V2_SMPS2_E	31	VDD_L1_2	VREG_L3 2
	52	VDD_L1_2	VREG_L4 4
S3电压1.0V PP_1V0_SMPS3_E	12	VDD_L3_8	VREG_L5 85
S3电压1.0V PP_1V0_SMPS3_E	14	VDD_L4	VREG_L6 107
S4电压1.8V PP_1V8_SMPS4_E	96	VDD_L5_6	VREG_L7 33
升压供电 PP_VDD_BOOST	34	VDD_L7	VREG_L8 22
S3电压1.0V PP_1V0_SMPS3_E	13	VDD_L9	VREG_L9 3
升压供电 PP_VDD_BOOST	20	VDD_L10_11_12_13	VREG_L10 19
			VREG_L11 9
			VREG_L12 21
			VREG_L13 10

C14_E 4UF 20% 6.3V CERM-X5R 0201

VOLTAGE=1.20V LDO1的1.2V电压	PP_1V2_LDO1_E	1.20V/523.3MA
VOLTAGE=1.20V LDO2的1.2V电压	PP_1V2_LDO2_E	1.20V/695MA
VOLTAGE=1.00V LDO3的1.0V电压	PP_1V0_LDO3_E	1V/431MA
VOLTAGE=0.90V LDO4的0.9V电压	PP_0V9_LDO4_E	0.90V/128MA
VOLTAGE=1.80V LDO5的1.8V电压	PP_1V8_LDO5_E	1.80V/272.4MA
VOLTAGE=1.8V LDO6的1.8V电压	PP_1V8_LDO6_E	1.80V/221.6MA
	PP_2V7_LDO7	2.7V/5MA
VOLTAGE=1.00V LDO8的1.0V电压	PP_1V0_LDO8_E	1.00V/368.3MA
VOLTAGE=0.80V LDO9的0.8V电压	PP_0V8_LDO9_E	0.80V/1045MA
VOLTAGE=3.00V LDO10的3V电压	PP_3V0_LDO10_E	3.00V/30MA
VOLTAGE=3.00V	PP_UIM1_LDO11_E UIM1卡供电1.8V	1.8V/60MA
VOLTAGE=2.70V 2.7V电压LDO12	PP_2V7_LDO12_E	2.7V/69MA
VOLTAGE=3.00V	PP_UIM2_LDO13_E UIM2卡供电1.8V	1.8V/60MA

C306_E, C307_E, C308_E, C309_E, C310_E 4.7UF 20% 6.3V X5R 0402-0.1MM
C311_E 4.7UF 20% 6.3V X5R-CERM1 402
C312_E 4.7UF 20% 6.3V X5R 0402-0.1MM
C313_E 15UF 20% 6.3V CERM 0402-0.1MM
C314_E 2.2UF 20% 6.3V X5R-CERM 0201
C315_E 2.2UF 20% 6.3V X5R-CERM 0201
C316_E 2.2UF 20% 6.3V X5R-CERM 0201

VIO TX & RX

PP_1V8_LDO6_E — PP_1V8_LDO6_E
R301_E 0.00 0% 1/32W MF 01005 — PP_1V8_VIO_RX_E
MAKE_BASE=TRUE — PP_1V8_LDO6_E
C1114_E 47PF 5% 16V CERM 01005

PAGE TITLE	PMIC: BUCKS & LDOS
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RF PMIC: XTAL, CLOCKS AND MISCELLANEOUS

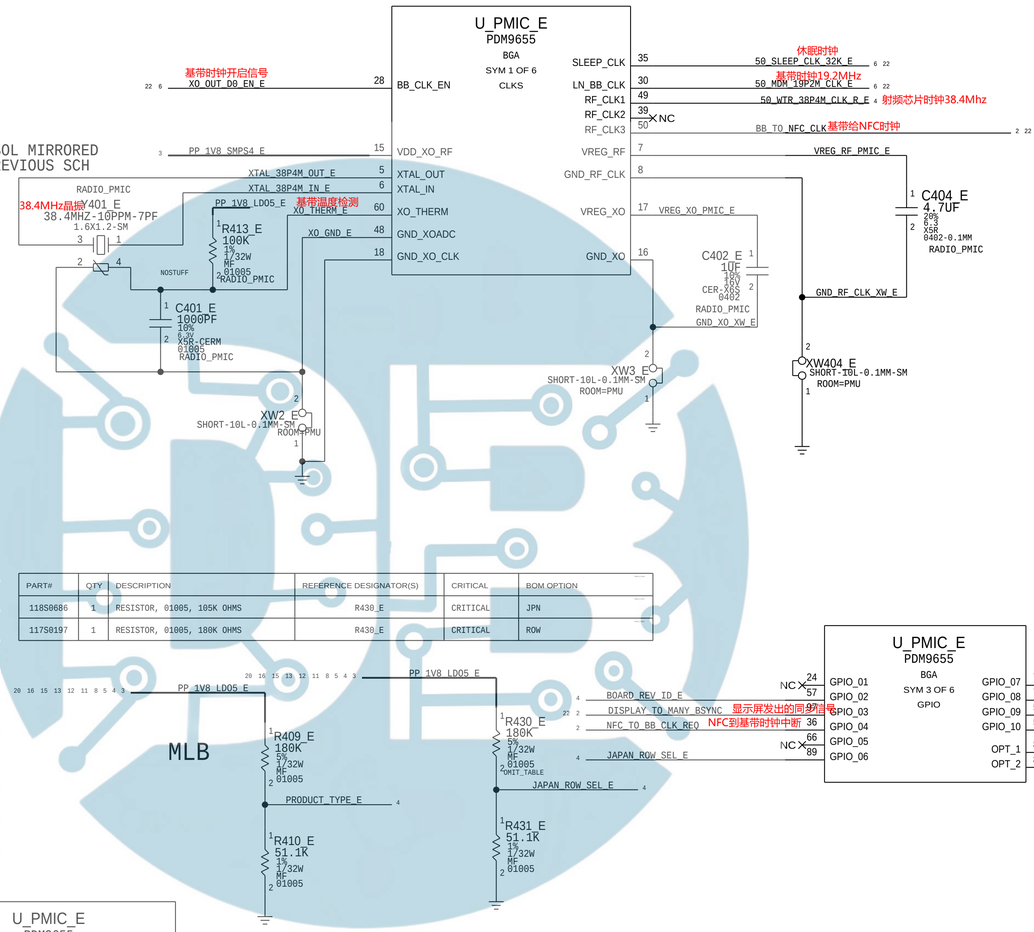
HW_REV_ID	R407	R408	MLB/RADIO_DEV
<0.10V	NOSTUFF	51.1K	T500/DEV1
0.15V-0.25V	422K	51.1K	PROTO1.5
0.35V-0.45V	180K	51.1K	PROTO2.5/DEV2
0.55V-0.65V	105K	51.1K	PROTO1/DEV3
0.75V-0.85V	66.5K	51.1K	PROTO2/DEV4
0.95V-1.05V	44.2K	51.1K	EVT
1.15V-1.25V	28K	51.1K	CARRIER/DEV5
1.35V-1.45V	16.5K	51.1K	DVT/DEV6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

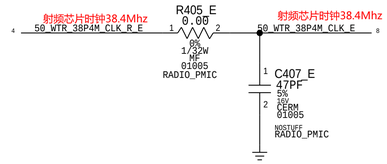
NOTE XTAL SYMBOL MIRRORED COMPARED TO PREVIOUS SCH

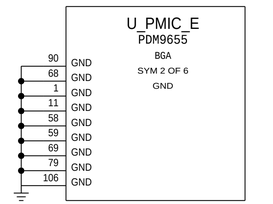
PA_THERM2	R409	R410	PRODUCT TYPE	Y
0.00V-0.10V	NOSTUFF	51.1K	RADIO DEV	1
0.15V-0.25V	422K	51.1K	3RD TYPE	2
0.35V-0.45V	180K	51.1K	POR MLB (FF)	3
0.55V-0.65V	105K	51.1K	SPARE	4
0.75V-0.85V	66.5K	51.1K	SPARE	5
0.95V-1.05V	44.2K	51.1K	SPARE	6
1.15V-1.25V	28K	51.1K	SPARE	7
1.35V-1.45V	16.5K	51.1K	SPARE	8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

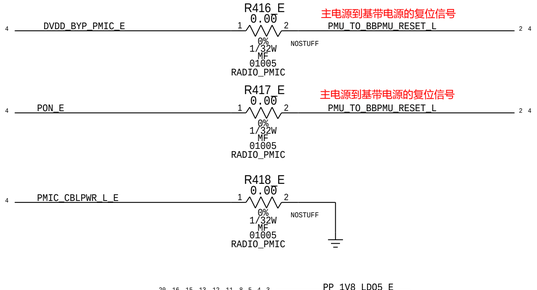
JPN_ROW_SEL	R430	R431	MAV PLATFORM	Y	SKU
<0.10V	NOSTUFF	51.1K	MAV17.0	0	ROW
0.15V-0.25V	422K	51.1K	MAV17.1	1	JPN
0.35V-0.45V	180K	51.1K	MAV17.2	2	ROW
0.55V-0.65V	105K	51.1K	MAV17.3	3	JPN
0.75V-0.85V	66.5K	51.1K	MAV17.4	4	ROW
0.95V-1.05V	44.2K	51.1K	MAV17.5	5	JPN
1.15V-1.25V	28K	51.1K	MAV17.6	6	ROW
1.35V-1.45V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

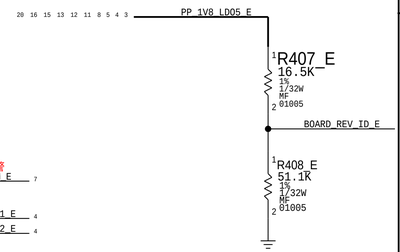
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
118S0686	1	RESISTOR, 01005, 105K OHMS	R430_E	CRITICAL	JPN
117S0197	1	RESISTOR, 01005, 180K OHMS	R430_E	CRITICAL	ROW

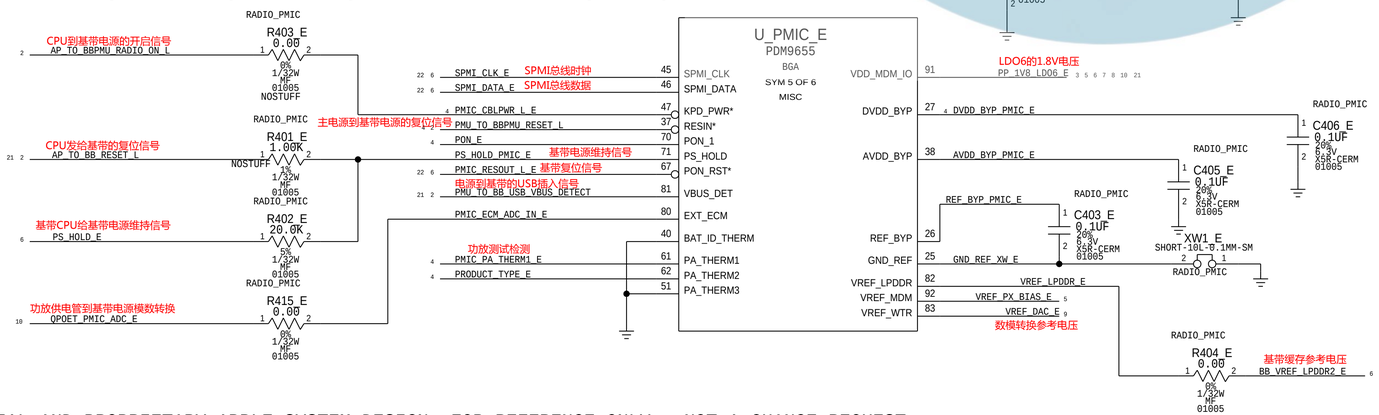


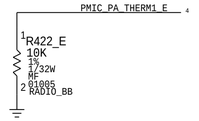


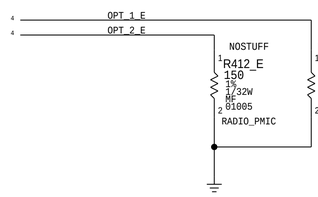












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PAGE TITLE
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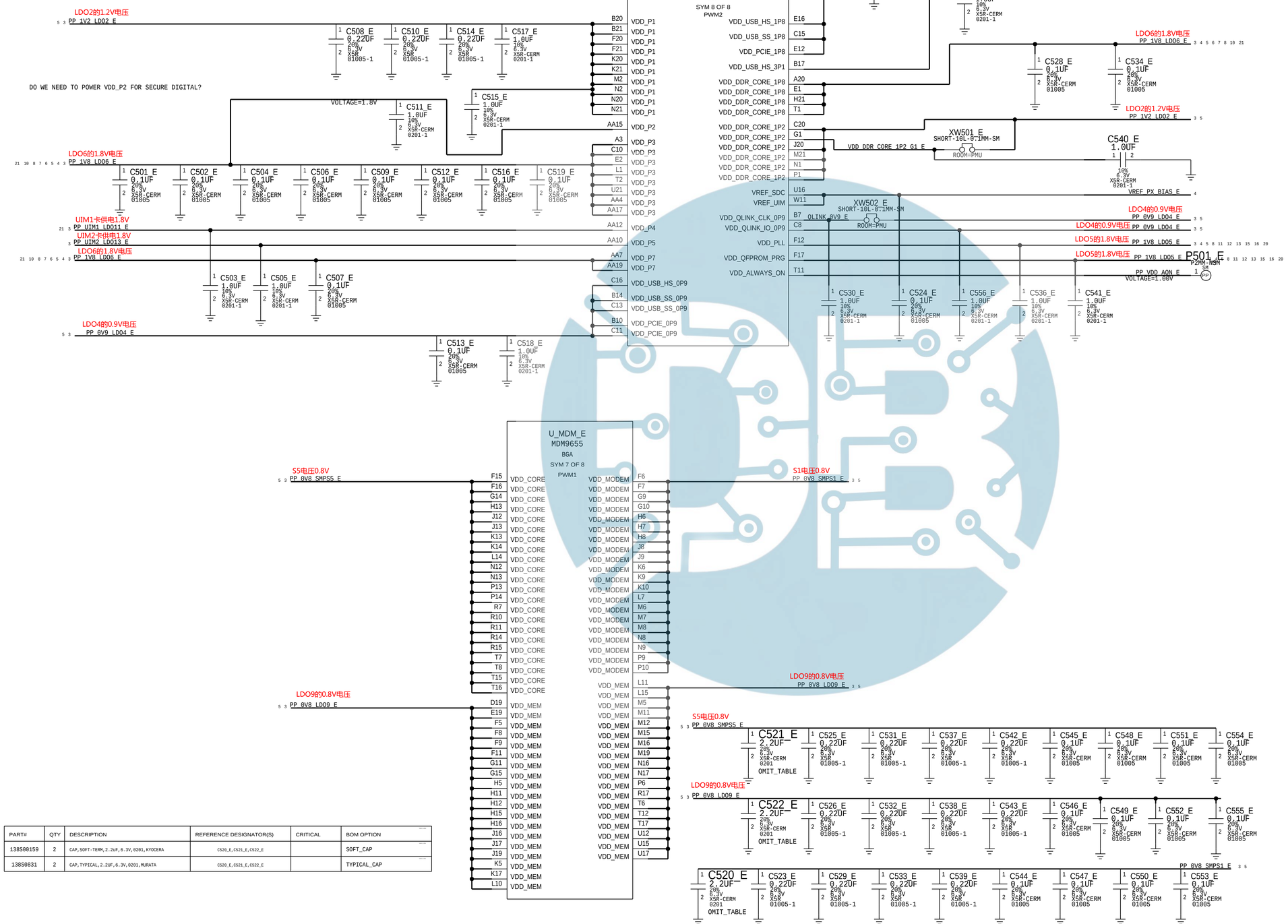

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
138S00159	2	CAP,SOFT-TERM,2.2UF,6.3V,0201,KYOCERA	C520_E,C521_E,C522_E		SOFT_CAP
138S0831	2	CAP,TYPICAL,2.2UF,6.3V,0201,MURATA	C520_E,C521_E,C522_E		TYPICAL_CAP

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BB: CONTROL & HS PERIPHERALS

90_PCIE_AP_TO_BB_REFCLK_P OUT 2 6 22
90_PCIE_AP_TO_BB_REFCLK_N OUT 2 6 22
90_PCIE_AP_TO_BB_TXD_P OUT 2 6
90_PCIE_AP_TO_BB_TXD_N OUT 2 6
90_PCIE_BB_TO_AP_RXD_P OUT 2 6
90_PCIE_BB_TO_AP_RXD_N OUT 2 6

CPU到基带PCIE总线参考时钟

6 90_PCIE_AP_TO_BB_REFCLK_P MAKE_BASE=TRUE — 90_PCIE_AP_TO_BB_REFCLK_P 2 6 22
6 90_PCIE_AP_TO_BB_REFCLK_N MAKE_BASE=TRUE — 90_PCIE_AP_TO_BB_REFCLK_N 2 6 22
6 90_PCIE_AP_TO_BB_TXD_P MAKE_BASE=TRUE — 90_PCIE_AP_TO_BB_TXD_P 2 6
6 90_PCIE_AP_TO_BB_TXD_N MAKE_BASE=TRUE — 90_PCIE_AP_TO_BB_TXD_N 2 6
6 90_PCIE_BB_TO_AP_RXD_P MAKE_BASE=TRUE — 90_PCIE_BB_TO_AP_RXD_P 2 6
6 90_PCIE_BB_TO_AP_RXD_N MAKE_BASE=TRUE — 90_PCIE_BB_TO_AP_RXD_N 2 6

基带到CPU的PCIE通信总线

基带到USB芯片的USB总线

U_MDM_E
MDM9655
BGA
SYM 1 OF 8
USB_PCIE

21 2 90_USB_BB_DATA_P — E17 USB_HS_DP
21 2 90_USB_BB_DATA_N — C17 USB_HS_DM
NC B13 USB_SS_TX_P
NC A13 USB_SS_TX_M
NC A15 USB_SS_RX_P
NC B15 USB_SS_RX_M
NC B12 NC
SS_CAL_RES_E — A14 USB_SS_REXT
BB_USB_HS_TXRTUNE_E — A17 USB_HS_REXT

RADIO_BB

PCIE_REFCLK_P E13 ← 90_PCIE_AP_TO_BB_REFCLK_P IN 6
PCIE_REFCLK_M E14 ← 90_PCIE_AP_TO_BB_REFCLK_N IN 6
PCIE_TX_P A11 PCIE_BB_TO_AP_TX CAPS ARE MOVED TO AP PAGE TO BE CONSISTENT WITH M1X → 90_PCIE_BB_TO_AP_RXD_P OUT 6
PCIE_TX_M B11 → 90_PCIE_BB_TO_AP_RXD_N OUT 6
PCIE_RX_P A9 ← 90_PCIE_AP_TO_BB_TXD_P IN 6
PCIE_RX_M B9 ← 90_PCIE_AP_TO_BB_TXD_N IN 6
PCIE_REXT A10 — PCIE_CAL_RES_E

R601_E 100 1% 1/32W MF 01005 RADIO_BB
R602_E 4.02K 1% 1/32W MF 01005 RADIO_BB
R603_E 100 1% 1/32W MF 01005 RADIO_BB

基带缓存参考电压
BB_VREF_LPDDR2_E — C603_E 0.1UF 20% 6.3V X5R-CERM 01005 RADIO_BB

U_MDM_E
MDM9655
BGA
SYM 6 OF 8
MEMORY

N5 VREF_LPDDR2
K19 VREF_DQ0
H17 VREF_DQ1
VREF_DQ_BDM H19
BDM_ZQ D2 — BB_BDM_ZQ_E
EBI1_CAL P5 — BB_EBI1_CAL_E

R604_E 240 1% 1/32W MF 01005 RADIO_BB
R605_E 240 1% 1/32W MF 01005 RADIO_BB

LDO的1.8V电压
PP_1V8_LDO6_E 21 10 8 7 5 4 3

NOTE: NO STUFF BUFFER FOR EUREKA CONFIG

U2_E
74AUP1G34GX
SOT1226

5 VCC
2
4
3 GND
NC

NOSTUFF
R606_E 0.00 5% 1/32W MF 01005 RADIO_PMIC
SWD_AOP_TO_MANY_SWCLK — BB_JTAG_TCK_E 6 21

NOSTUFF
R607_E 0.00 5% 1/32W MF 01005 RADIO_PMIC
SWD_AOP_BI_BB_SWDIO — BB_JTAG_TMS_E 6 21

仓鼠时钟
基带时钟开启信号
基带时钟19.2MHz

U_MDM_E
MDM9655
BGA
SYM 3 OF 8
CONTORL

22 4 50_SLEEP_CLK_32K_E — Y2 SLEEP_CLK
22 4 XO_OUT_D0_EN_E — L2 CXO_EN
22 4 50_MDM_19P2M_CLK_E — E11 CXO
21 BB_JTAG_RST_L_E — V20 SRST*
22 4 PMIC_RESOUT_L_E — P3 RESIN*
基带复位信号
NC R2 MODE_0
NC R3 MODE_1

P601_E
P2MM-TSM
SM
PP 1
21 6 BB_JTAG_TCK_E — U13 TCK
BB_JTAG_TRST_L_E — W14 TRST*
21 6 BB_JTAG_TMS_E — Y12 TMS
NC U14 TDI
NC U13 TDO

RESOUT* N3 NC
PS_HOLD M3 NC ← PS_HOLD_E 4
基带CPU给基带电源维持信号
SDC1_CLK Y16 NC
SDC1_CMD Y14 NC
SDC1_DATA_0 W15 NC
SDC1_DATA_1 Y15 NC
SDC1_DATA_2 AA16 NC
SDC1_DATA_3 W16 NC
SPMI_CLK Y13 → SPMI_CLK_E 4 22
SPMI_DATA AA13 → SPMI_DATA_E 4 22
SPMI总线时钟
SPMI总数据

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BB:GPIOS & QLINK

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U_MDM_E
MDM9655
BGA
SYM 5 OF 8
GPIO
RADIO_BB

	Y10	GPIO_0	GPIO_40	A2	GPS信号接收开关信号 BB_GNSS_LNA_EN_E → OUT 20 22
	U20	GPIO_1	GPIO_41	A8	QLINK总线中断 QLINK_REQ_W0_E → 7
	W10	GPIO_2	GPIO_42	B8	QLINK总线开启 QLINK_EN_W0_E → 7
	U10	GPIO_3	GPIO_43	B3	NC
NC	Y1	GPIO_4	GPIO_44	V3	75_RFFE3_SDATA_E → 7
NC	W3	GPIO_5	GPIO_45	V1	75_RFFE3_SCLK_E → 7 RFFE3总线
NC	W2	GPIO_6	GPIO_46	V2	UAT_TUNER_RFFE_DATA → 7
NC	W1	GPIO_7	GPIO_47	U3	UAT_TUNER_RFFE_CLK → 7 RFFE总线
	Y8	GPIO_8	GPIO_48	U2	75_RFFE5_SDATA_E → 7
	U9	GPIO_9	GPIO_49	T3	75_RFFE5_SCLK_E → 7 RFFE5总线
	Y18	GPIO_10	GPIO_50	W18	NC
	W8	GPIO_11	GPIO_51	G3	CPU到基带的时间标记信号 AP_TO_BB_TIME_MARK → OUT 2 22
	U8	GPIO_12	GPIO_52	W19	UART_BB_TO_WLAN_COEX → 2 7 21
	W5	GPIO_13	GPIO_53	Y21	UART_WLAN_TO_BB_COEX → 2 7 21 基带到WiFi的UART总线
	U6	GPIO_14	GPIO_54	P20	NC
	Y5	GPIO_15	GPIO_55	W21	基带到CPU的复位检测信号 BB_TO_AP_RESET_DETECT_L → OUT 2 22
	W4	GPIO_16	GPIO_56	R20	AP_TO_BB_COREDUMP → IN 2 CPU发给基带的核心转储信号
NC	U9	GPIO_17	GPIO_57	Y20	NC PER RFSW. MOVED TO PIN50
NC	U7	GPIO_18	GPIO_58	R19	MPM CPU到基带的可编程定义信号 AP_TO_BB_TPC_GPIO1 → BI 2
NC	Y6	GPIO_19	GPIO_59	W6	NC
NC	AA6	GPIO_20	GPIO_60	Y3	NC PCIE_AP_TO_BB_DEV_WAKE PER EUREKA
NC	Y9	GPIO_21	GPIO_61	P19	BB_TO_PMU_PCIE_HOST_WAKE_L → 2 7
NC	Y7	GPIO_22	GPIO_62	V19	NC 基带到电源芯片的PCIE设备唤醒信号
NC	W7	GPIO_23	GPIO_63	W17	NC 基带和CPU的PCI总线时钟中断
NC	W9	GPIO_24	GPIO_64	Y17	CPU到基带的PCIE总线复位信号 PCIE_BB_BI_AP_CLKREQ_L → BI 2 7
NC	Y20	GPIO_25	GPIO_65	W20	CPU到基带指纹开启信号 PCIE_AP_TO_BB_RESET_L → IN 2
	T21	GPIO_26	GPIO_66	R21	AP_TO_BB_MESA_ON → IN 2 22
	K3	GPIO_27	GPIO_67	H3	FAST_BOOT_SELECT1_E → 7
	J2	GPIO_28	GPIO_68	U19	NC 基带的SIM1卡插拔报警
	H1	GPIO_29	GPIO_69	Y19	BB_SIM1_REMOVAL_ALARM_E → BI 4
	H2	GPIO_30	GPIO_70	Y4	NC
NC	F2	GPIO_31	GPIO_71	J3	NC
NC	E3	GPIO_32	GPIO_72	J1	75_RFFE2_SDATA_E → 7
NC	D3	GPIO_33	GPIO_73	L3	75_RFFE2_SCLK_E → 7 RFFE2总线
NC	C3	GPIO_34	GPIO_74	K2	UAT_TUNER_RFFE1_DATA → 7
NC	C2	GPIO_35	GPIO_75	W12	UAT_TUNER_RFFE1_CLK → 7 RFFE1总线
NC	C1	GPIO_36	GPIO_76	T19	SIM1卡数据 BB_SIM1_DATA_E → BI 21
	B1	GPIO_37	GPIO_77	U11	SIM1卡检测 BB_SIM1_DETECT_E → IN 21
	B2	GPIO_38	GPIO_78	Y11	SIM1卡复位 BB_SIM1_RST_E → OUT 21
NC	F3	GPIO_39	GPIO_79		SIM1卡时钟 BB_SIM1_CLK_E → OUT 21
NC	G2				

DEVIATE FROM MAV13
I2C MOVE PER EUREKA
CONFIGURABLE BY DIP SWITCH
NOR SPI STATUS - RF DEV ONLY

- 22 2 OUT UART_BB_TO_AOP_RXD 基带到CPU的UART总线数据接收
- 22 2 IN UART_AOP_TO_BB_TXD CPU到基带的UART总线数据发射 U5
- 7 BB_EEPROM_I2C_SDA_E
- 7 BB_EEPROM_I2C_SCL_E 基带码片I2C总线 U8
- 22 2 I2S_BB_TO_AP_LRCLK 基带到CPU的帧时钟 W5
- 22 2 IN I2S_AP_TO_BB_DOUT CPU到基带的串行数据传输 U6
- 22 2 OUT I2S_BB_TO_AP_DIN 基带到CPU的串行数据传输 Y5
- 22 2 I2S_BB_TO_AP_BCLK 基带到CPU的串行时钟 W4
- 7 FAST_BOOT_SELECT0_E 快速启动设置
- 7 75_RFFE6_SCLK_E RFFE6总线
- 7 75_RFFE6_SDATA_E
- 8 WMSS_RESET_L_E 射频芯片复位信号
- 22 2 OUT BB_TO_STROBE_DRIVER_GSM_BURST_IND 基带到闪光灯的来电闪烁开启信号

U_MDM_E
MDM9655
BGA
SYM 2 OF 8
ANALOG_RF

22 8 IN	QLINK_CLK_P_E	E9	QLINK_CLK_P	NC B4 NC
22 8 IN	QLINK_CLK_N_E	E8	QLINK_CLK_M	NC C4 NC
22 8 IN	QLINK_DL0_P_E	A5	QLINK_DL0_P	NC D20 NC
22 8 IN	QLINK_DL0_N_E	B5	QLINK_DL0_M	NC D21 NC
22 8 IN	QLINK_DL1_P_E	C6	QLINK_DL1_P	NC P2 NC
22 8 IN	QLINK_DL1_N_E	C5	QLINK_DL1_M	NC AA2 NC
22 8 IN	QLINK_DL2_P_E	B6	QLINK_DL2_P	NC AA3 NC
22 8 IN	QLINK_DL2_N_E	A6	QLINK_DL2_M	
22 8 OUT	QLINK_UL0_P_E	E6	QLINK_UL0_P	
22 8 OUT	QLINK_UL0_N_E	E7	QLINK_UL0_M	

射频芯片到基带的QLINK通信总线

BB EEPROM

- R701_E 10K 1% 1/32W MF 01005 RADIO_BB
- C701_E 1UF 20% 10V X5R 0201 RADIO_BB
- R702_E 10K 1% 1/32W MF 01005 RADIO_BB
- PP_1V8_LDO6_E
- VCC
- U_EEPROM_E CAT24C08C4A WLCSP RADIO_BB 基带码片
- 7 BB_EEPROM_I2C_SCL_E ↔ B1 SCL
- SDA B2 ↔ BB_EEPROM_I2C_SDA_E 7
- A1, A2, VSS

- 21 10 8 7 6 5 4 3 PP_1V8_LDO6_E
- R714_E 10K 1% 1/32W MF 01005 RADIO_BB
- 7 FAST_BOOT_SELECT0_E
- DEFAULT CONFIG
- 21 10 8 7 6 5 4 3 PP_1V8_LDO6_E
- R715_E 10K 1% 1/32W MF 01005 RADIO_BB (MOSTUFF)
- 7 FAST_BOOT_SELECT1_E
- EUREKA CONFIG
- 2 PP1V8_S2
- R801_E 100K 5% 1/32W MF 01005
- 7 2 PCIE_BB_BI_AP_CLKREQ_L
- 21 7 2 UART_BB_TO_WLAN_COEX → P2MM-NSM SM 1 PP PP701_E
- 21 7 2 UART_WLAN_TO_BB_COEX → P2MM-NSM SM 1 PP PP702_E
- 21 10 8 7 6 5 4 3 PP_1V8_LDO6_E
- R713_E 100K 5% 1/32W MF 01005
- 7 2 BB_TO_PMU_PCIE_HOST_WAKE_L

- 7 QLINK_REQ_W0_E QLINK总线中断 → R716_E 0.00 1/32W MF 01005 RADIO_WTR → QLINK_REQ_W0_R_E OUT 8
- 7 QLINK_EN_W0_E QLINK总线开启 → R717_E 0.00 1/32W MF 01005 RADIO_WTR → QLINK_EN_W0_R_E OUT 8

- 7 LAT_TUNER_RFFE1_CLK = LAT_TUNER_RFFE1_CLK OUT 2 8 MAKE_BASE=TRUE
- 7 LAT_TUNER_RFFE1_DATA = LAT_TUNER_RFFE1_DATA BI 2 8 MAKE_BASE=TRUE
- 7 75_RFFE2_SCLK_E = 75_RFFE2_SCLK_E OUT 16 MAKE_BASE=TRUE
- 7 75_RFFE2_SDATA_E = 75_RFFE2_SDATA_E BI 16 MAKE_BASE=TRUE
- 7 75_RFFE3_SCLK_E = 75_RFFE3_SCLK_E 11 12 13
- 7 75_RFFE5_SCLK_E = 75_RFFE5_SCLK_E 17
- 7 75_RFFE3_SDATA_E = 75_RFFE3_SDATA_E 11 12 13 22
- 7 75_RFFE5_SDATA_E = 75_RFFE5_SDATA_E 17
- 7 UAT_TUNER_RFFE_CLK = UAT_TUNER_RFFE_CLK 2
- 7 75_RFFE6_SCLK_E = 75_RFFE6_SCLK_E 10 11 12 13
- 7 UAT_TUNER_RFFE_DATA = UAT_TUNER_RFFE_DATA 2
- 7 75_RFFE6_SDATA_E = 75_RFFE6_SDATA_E 10 11 12 13 22

PAGE TITLE	BB: GPIOS & QLINK
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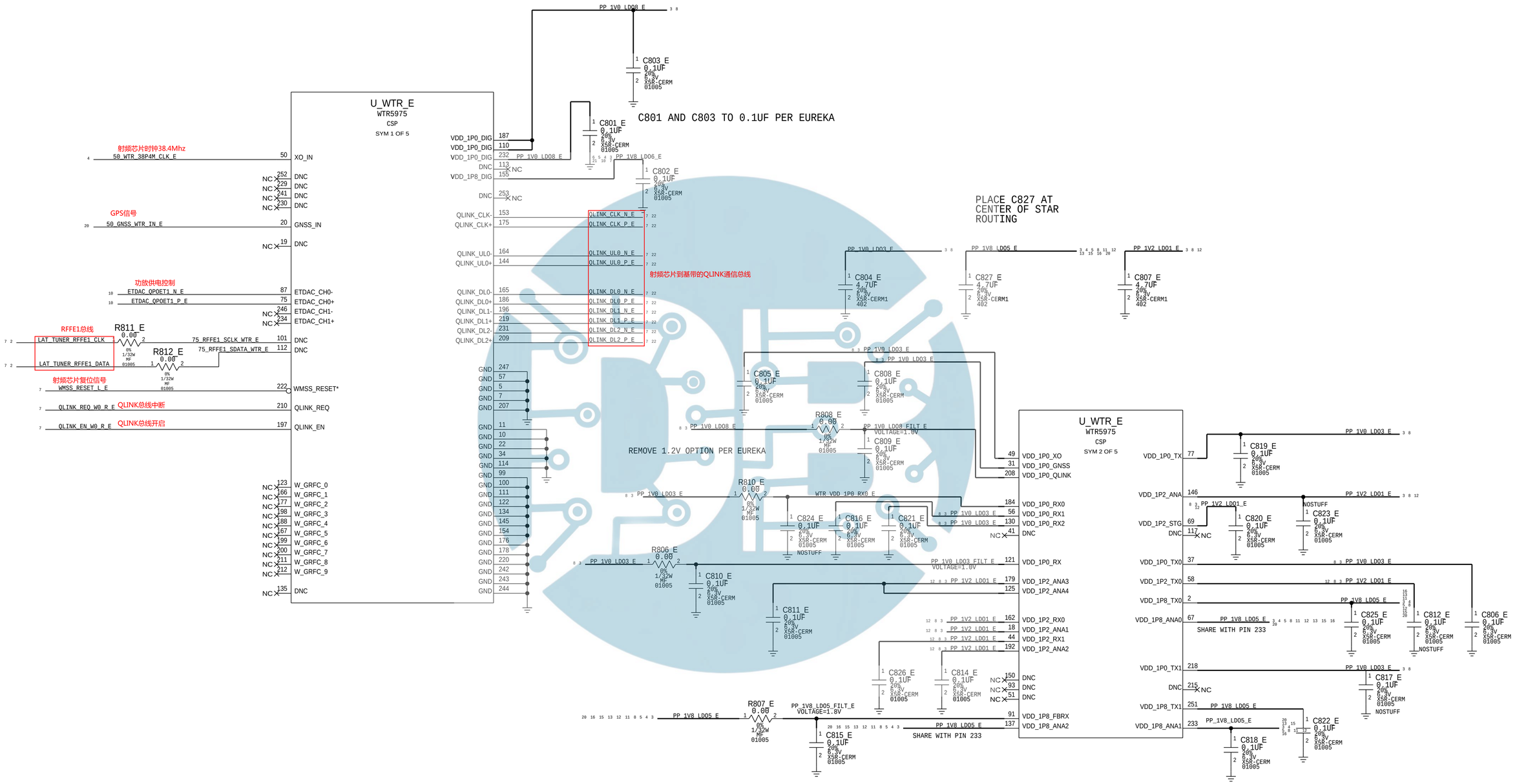

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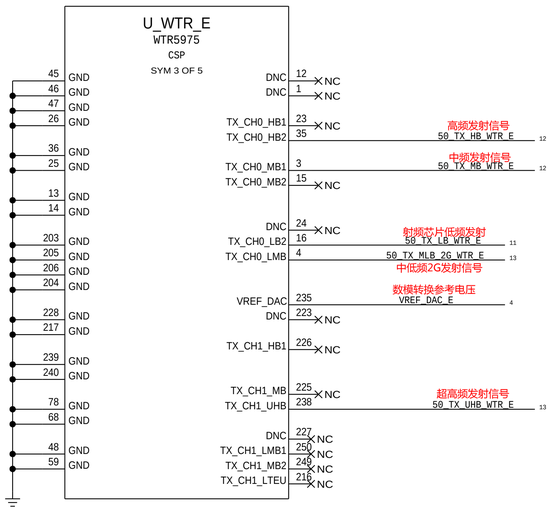
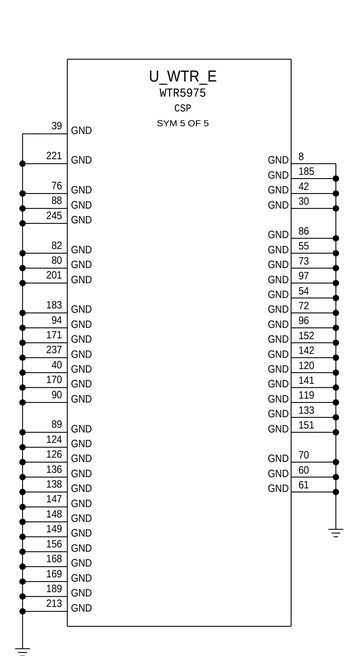
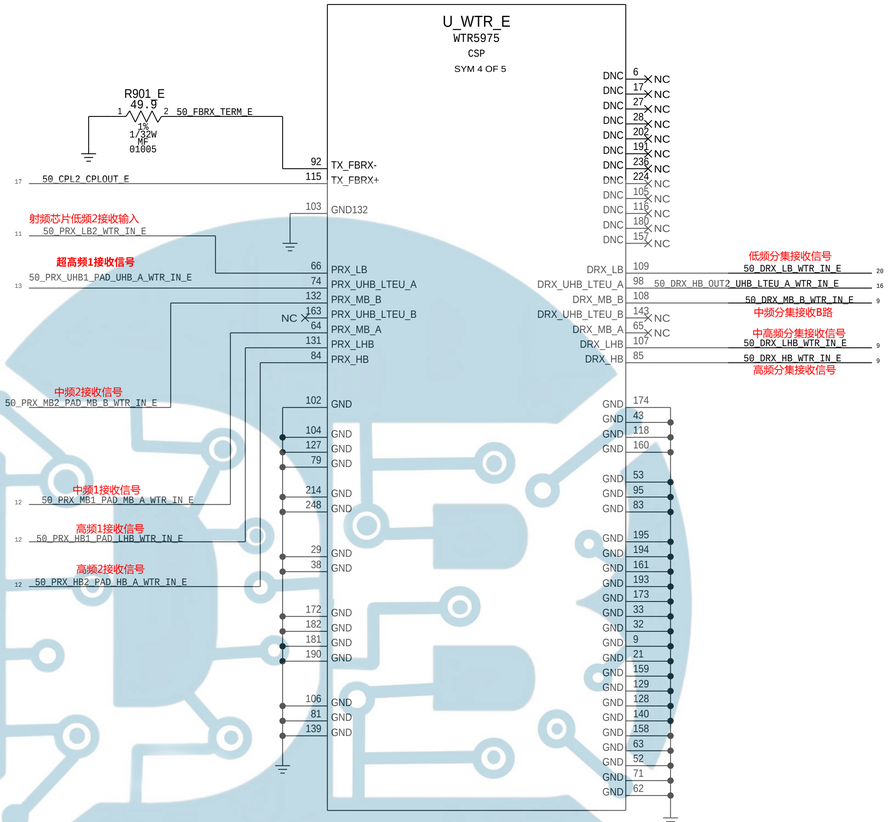
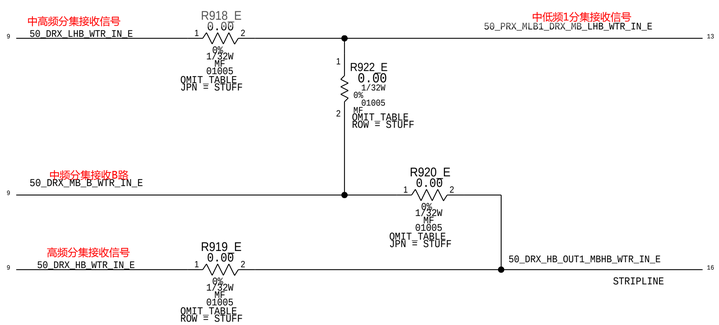
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
117S0161	1	01005 OR	R919_E	CRITICAL	ROW
117S0161	1	01005 OR	R922_E	CRITICAL	ROW

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
117S0161	1	01005 OR	R918_E	CRITICAL	JPN
117S0161	1	01005 OR	R920_E	CRITICAL	JPN









PAGE TITLE: XCVR

Apple Inc.

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QET:MODULE

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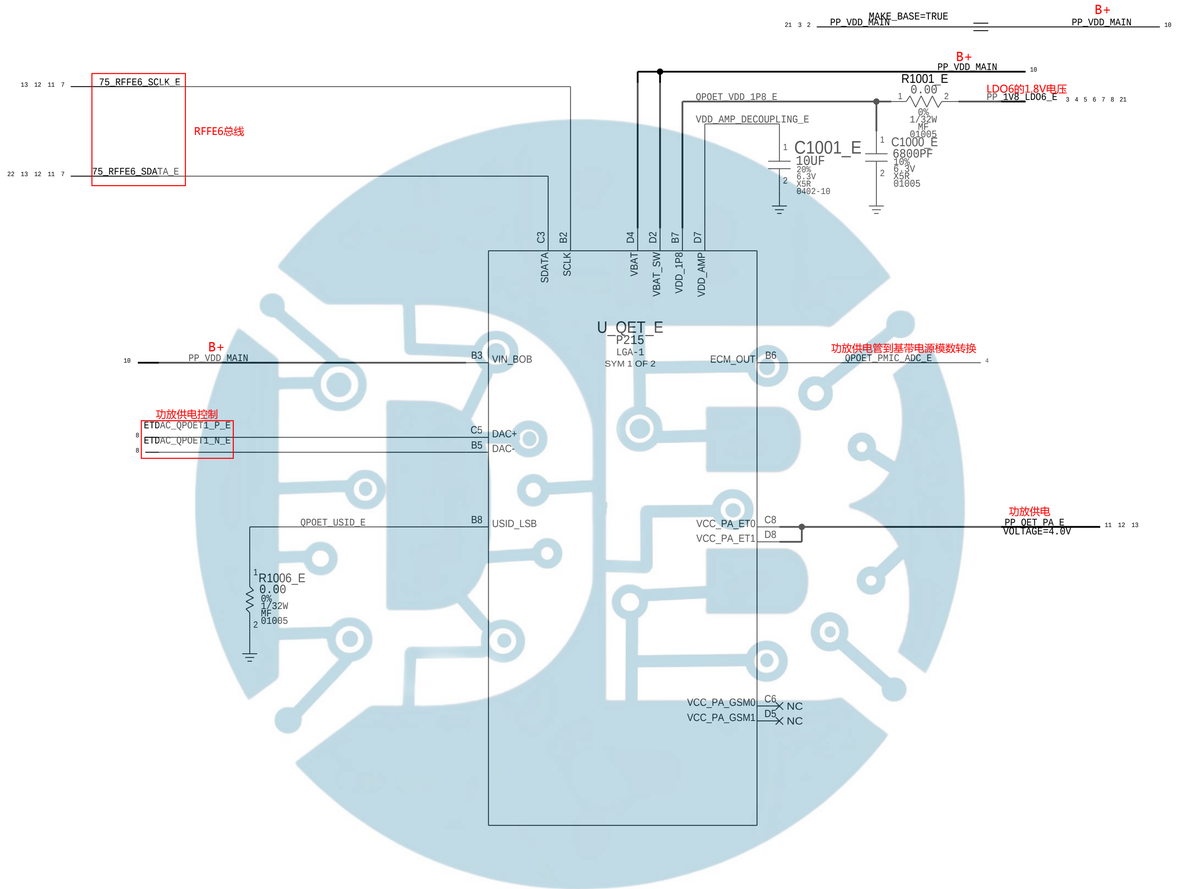

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LB PAD

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PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
118S0724	1	2G LB MATCH, 0 OHMS	R1108_E	CRITICAL	JPN
152S00021	1	6.8NH UHQ, LB ANT MATCH	R1104_E	CRITICAL	JPN
131S0555	1	1PF, LB ANT MATCH	L1101_E	CRITICAL	JPN
131S0176	1	2.4PF, 2G LB MATCH	L1102_E	CRITICAL	JPN

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

PA_LB_E
SKY78140
LGA
SYM 2 OF 2

A1	GND	THRM_PAD	H3
A2	GND	THRM_PAD	H4
A3	GND	THRM_PAD	H5
A5	GND	THRM_PAD	H6
A4	GND	THRM_PAD	H7
A6	GND	THRM_PAD	H8
A7	GND	THRM_PAD	H9
A8	GND	THRM_PAD	H10
A9	GND	THRM_PAD	H11
A10	GND	THRM_PAD	H13
A11	GND	THRM_PAD	H14
A12	GND	THRM_PAD	B6
A13	GND	THRM_PAD	B7
A14	GND	THRM_PAD	B8
A15	GND	THRM_PAD	B9
A16	GND	THRM_PAD	B10
B1	GND	THRM_PAD	B11
B16	GND	THRM_PAD	B13
C1	GND	THRM_PAD	B14
C16	GND	THRM_PAD	B15
D1	GND	THRM_PAD	C2
D16	GND	THRM_PAD	C3
E1	GND	THRM_PAD	C4
E16	GND	THRM_PAD	C5
F1	GND	THRM_PAD	C6
F16	GND	THRM_PAD	C7
G1	GND	THRM_PAD	C8
G16	GND	THRM_PAD	C9
H1	GND	THRM_PAD	C10
H16	GND	THRM_PAD	C11
J1	GND	THRM_PAD	C12
J2	GND	THRM_PAD	C13
J3	GND	THRM_PAD	C14
J4	GND	THRM_PAD	D3
J5	GND	THRM_PAD	D4
J6	GND	THRM_PAD	D5
J7	GND	THRM_PAD	D6
J8	GND	THRM_PAD	D7
J9	GND	THRM_PAD	D8
J10	GND	THRM_PAD	D9
J11	GND	THRM_PAD	D10
J12	GND	THRM_PAD	D11
J13	GND	THRM_PAD	D12
J14	GND	THRM_PAD	D13
J15	GND	THRM_PAD	D14
J16	GND	THRM_PAD	E2
		THRM_PAD	E3
		THRM_PAD	E4
		THRM_PAD	E5
		THRM_PAD	E6
		THRM_PAD	E7
		THRM_PAD	E8
		THRM_PAD	E9
		THRM_PAD	E10
		THRM_PAD	E11
		THRM_PAD	E12
		THRM_PAD	E13
		THRM_PAD	E14
		THRM_PAD	F2
		THRM_PAD	F3
		THRM_PAD	F4
		THRM_PAD	F5
		THRM_PAD	F6
		THRM_PAD	F7
		THRM_PAD	F8
		THRM_PAD	F9
		THRM_PAD	F10
		THRM_PAD	F11
		THRM_PAD	F12
		THRM_PAD	F13
		THRM_PAD	F14
		THRM_PAD	G2
		THRM_PAD	G3
		THRM_PAD	G4
		THRM_PAD	G5
		THRM_PAD	G6
		THRM_PAD	G7
		THRM_PAD	G8
		THRM_PAD	G9
		THRM_PAD	G10
		THRM_PAD	G11
		THRM_PAD	G12
		THRM_PAD	G13
		THRM_PAD	G14

功放供电
PP_QET_PA_E
R1107_E 1.00 1% 1/32W MF 01005 NOSTUFF LB_SNUBBER_E
C1115_E 470PF 10% 16V X5R 01005

升压供电
PP_VDD_BOOST
C1104_E 0.1UF 20% 6.3V X5R-CERM 01005 RADIO_LB_PAD
C1109_E 47PF 5% 16V C0G-CERM 01005 RADIO_LB_PAD

R1103_E 0.00 0% 1/32W MF 01005 RADIO_LB_PAD
C1111_E 47PF 5% 16V C0G-CERM 01005 NOSTUFF RADIO_LB_PAD

LDO6的1.8V电压
PP_1V8_LDO6_E
VOLTAGE=1.8V
C1110_E 180PF 10% 16V CERM 01005

RFFE6总线
75_RFFE6_SCLK_E
75_RFFE6_SDATA_E
C1107_E 47PF 5% 16V C0G-CERM 01005 NOSTUFF RADIO_LB_PAD
C1116_E 47PF 5% 16V C0G-CERM 01005 NOSTUFF RADIO_LB_PAD

接收供电1.8V
PP_1V8_VIO_RX_E
C1102_E 180PF 10% 16V CERM 01005
C1105_E 47PF 5% 16V C0G-CERM 01005 NOSTUFF RADIO_LB_PAD
75_RFFE3_SCLK_E
75_RFFE3_SDATA_E

PP_1V8_VDD_LNA_LB_PAD_E
VOLTAGE=1.8V
C1112_E 0.22UF 20% 6.3V X5R 01005-1
R1105_E 1.00 1% 1/32W MF 01005
PP_1V8_LDO5_E
LDO5的1.8V电压

PA_LB_E
SKY78140
LGA
SYM 1 OF 2

B3	SDATA_RX	VBATT	E15
B5	SCLK_RX	VCC1	D15
B4	VIO_RX	VCC2	C15
G15	SDATA_TX		B2
F15	SCLK_TX	VDD_LNA	
H15	VIO_TX		

PP_VCC1_LB_PA_E
VOLTAGE=4.0V

低频发射信号
50_TX_LB_WTR_E
RADIO_LB_PAD
R1101_E 0.00 5% 1/32W MF 01005
50_TX_LB_PA_IN_E
C1103_E 47PF 5% 16V C0G-CERM 01005 NOSTUFF RADIO_LB_PAD
TX_LB_IN

低频2接收信号
50_PRX_LB2_WTR_IN_E
PRX_LB

LB_2G_ANT
50_LBPAD_2G_OUT_E
RADIO_LB_PAD
R1108_E 0.00 1% 1/32W MF 0201 0MIT_TABLE
低频功放2G天线
50_LBPAD_2G_OUT_2G_CPL_IN_JPN_E
L1102_E 10NH-3%-250MA 0201 OMIT_TABLE RADIO_LB_PAD

LB_ANT
50_PAD_ANT_LB_E
R1104_E 6.8NH-3%-0.4A-0.30HM 0201 OMIT_TABLE
低频功放天线
50_PAD_ANT_LB_CPL2_IN_E
L1103_E 1.8PF +/-0.05PF 25V C0G-CERM 0201
L1101_E 0.5PF +/-0.05PF 25V C0G-CERM 0201 RADIO_LB_PAD 0MIT_TABLE

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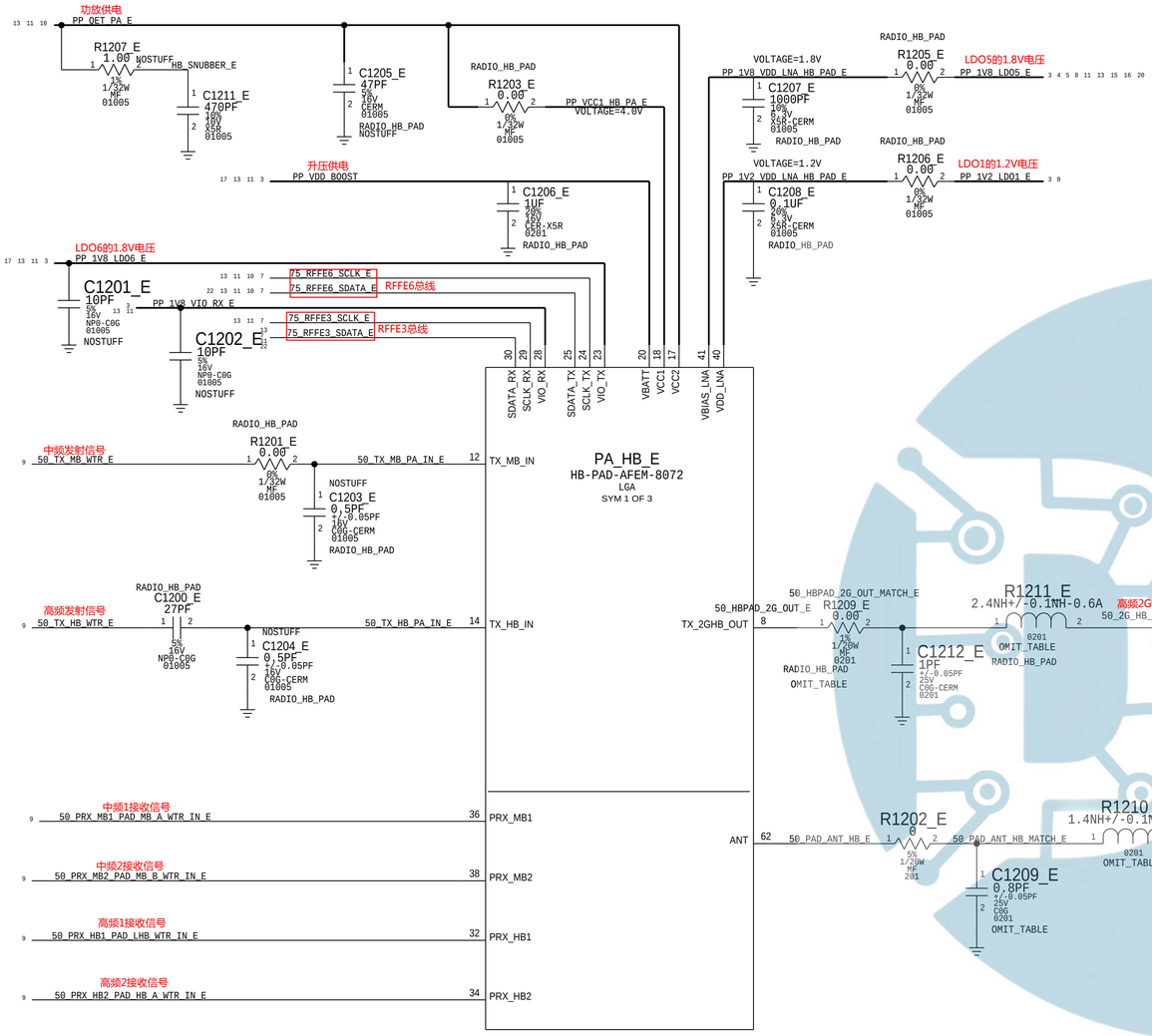
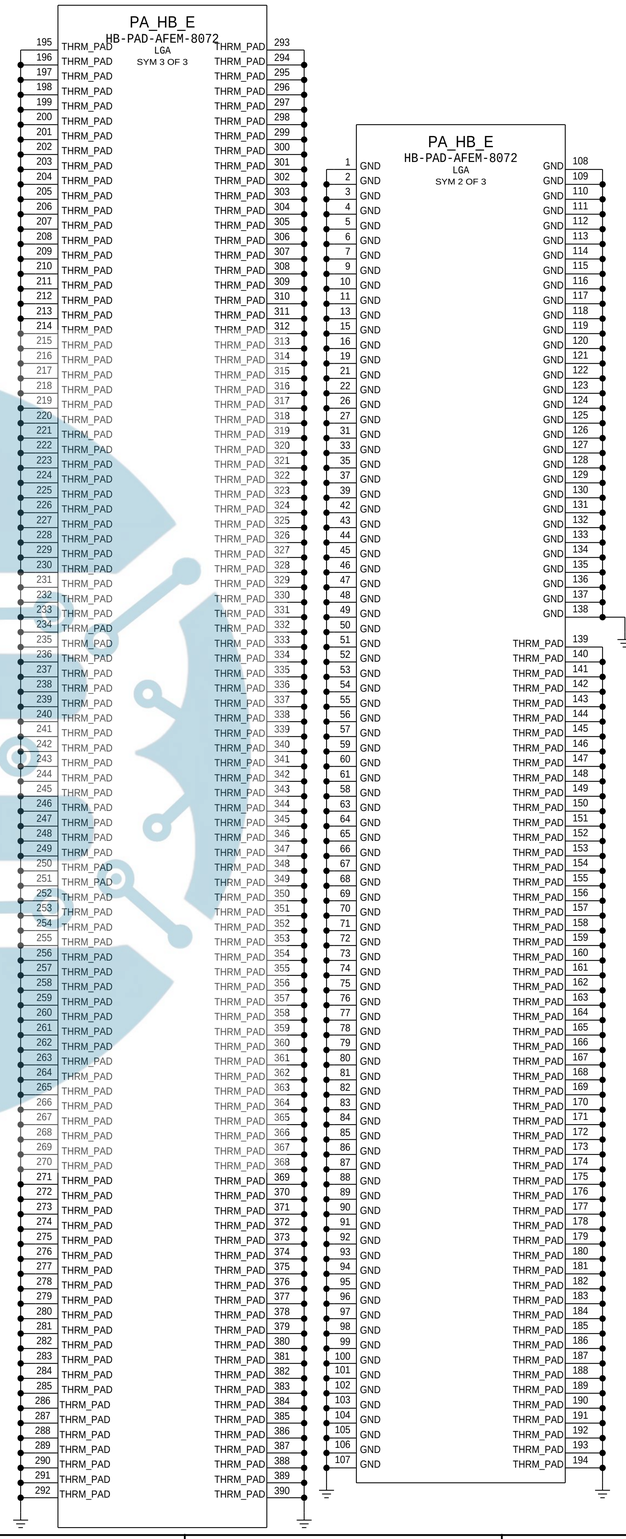
HB PAD





PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
152S2023	1	3.2NH UHQ, 2G HB PAD MATCH	R1209_E	CRITICAL	JPN
152S00153	1	1NH UHQ, 2G HB PAD MATCH	R1211_E	CRITICAL	JPN
131S0425	1	0.5PF, HB ANT MATCH	C1209_E	CRITICAL	JPN
152S2042	1	1.8NH UHQ, HB ANT MATCH	R1210_E	CRITICAL	JPN

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
131S0329	1	0.4PF, HB ANT MATCH	C1209_E	CRITICAL	ROW
152S2000	1	2.0NH UHQ, HB ANT MATCH	R1210_E	CRITICAL	ROW

PAGE TITLE: HB PAD

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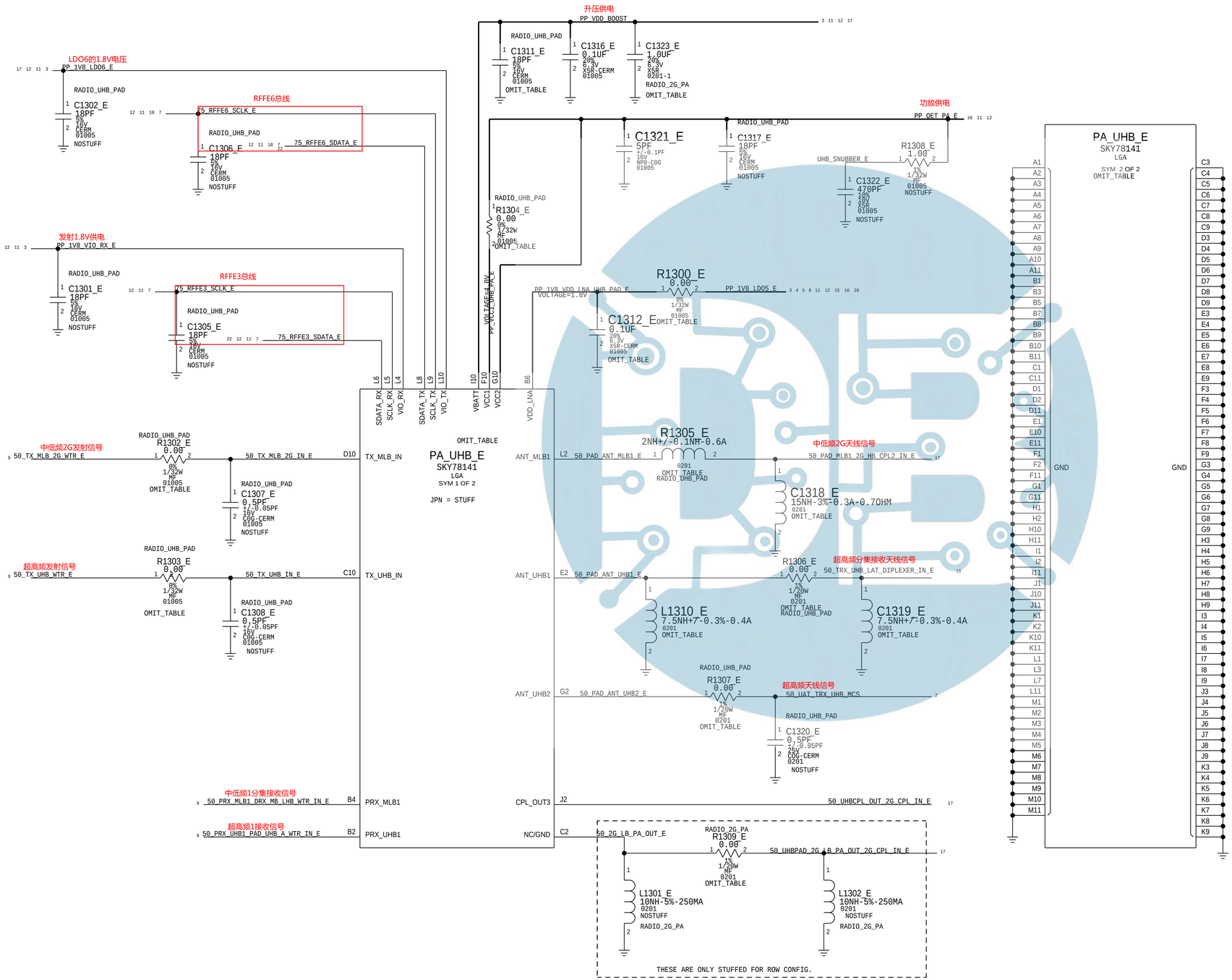
UHB/2G PAD -JPN

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
353S01243	1	UHB PAD	PA_UHB_E	CRITICAL	JPN
117S0161	1	MLB/2GTX IN MCH2, 0 OHMS	R1302_E	CRITICAL	JPN
117S0161	1	UHB INPUT MCH1, 0 OHMS	R1303_E	CRITICAL	JPN
117S0002	1	MLB/2G MB OUT MCH1, 0 OHMS	R1305_E	CRITICAL	JPN
131S0552	1	2.7PF UHQ, UHB1 ANT MATCH	R1306_E	CRITICAL	JPN
117S0002	1	0 OHMS UHB2 OUT/DRX BP MCH1	R1307_E	CRITICAL	JPN
132S0316	1	UHB LNA DECOUPLING, 0.1UF	C1312_E	CRITICAL	JPN
117S0161	1	UHB LNA SUPPLY FILTER, 00HMS	R1300_E	CRITICAL	JPN
131S0214	1	VBAT DECOUPLING,18PF	C1311_E	CRITICAL	JPN
138S0692	1	VBAT DECOUPLING, 1UF	C1323_E	CRITICAL	JPN
117S0161	1	VCC2/VCC1 RESISTOR OPTION, 0 OHM	R1304_E	CRITICAL	JPN
152S1999	1	22NH, MLB1 ANT MATCH	C1318_E	CRITICAL	JPN
152S1688	1	3.5NH, UHB1 ANT MATCH	L1310_E	CRITICAL	JPN
131S0431	1	0.2PF, UHB TO METROCIRC	C1320_E	CRITICAL	JPN



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2G PA - ROW

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
353S01247	1	2G PA	PA_UHB_E	CRITICAL	ROW
117S0161	1	MLB/2GTX IN MCH2, 0 OHMS	R1302_E	CRITICAL	ROW
117S0161	1	UHB INPUT MCH1, 0 OHMS	R1303_E	CRITICAL	ROW
118S0724	1	MLB/2G MB OUT MCH1, 0 OHMS	R1305_E	CRITICAL	ROW
118S0724	1	UHB2 OUT/DRX BP MCH1, 0 OHMS	R1307_E	CRITICAL	ROW
152S2053	1	4.7NH UHQ, 2G LB OUTPUT MCH2	R1309_E	CRITICAL	ROW
131S0214	1	VBAT DECOUPLING,18PF	C1311_E	CRITICAL	ROW
138S0692	1	VBAT DECOUPLING, 1UF	C1323_E	CRITICAL	ROW
117S0161	1	VCC2/VCC1 RESISTOR OPTION, 0 OHM	R1304_E	CRITICAL	ROW
103S00089	1	50 OHM TERMINATION FOR ROW ONLY	C1319_E	CRITICAL	ROW

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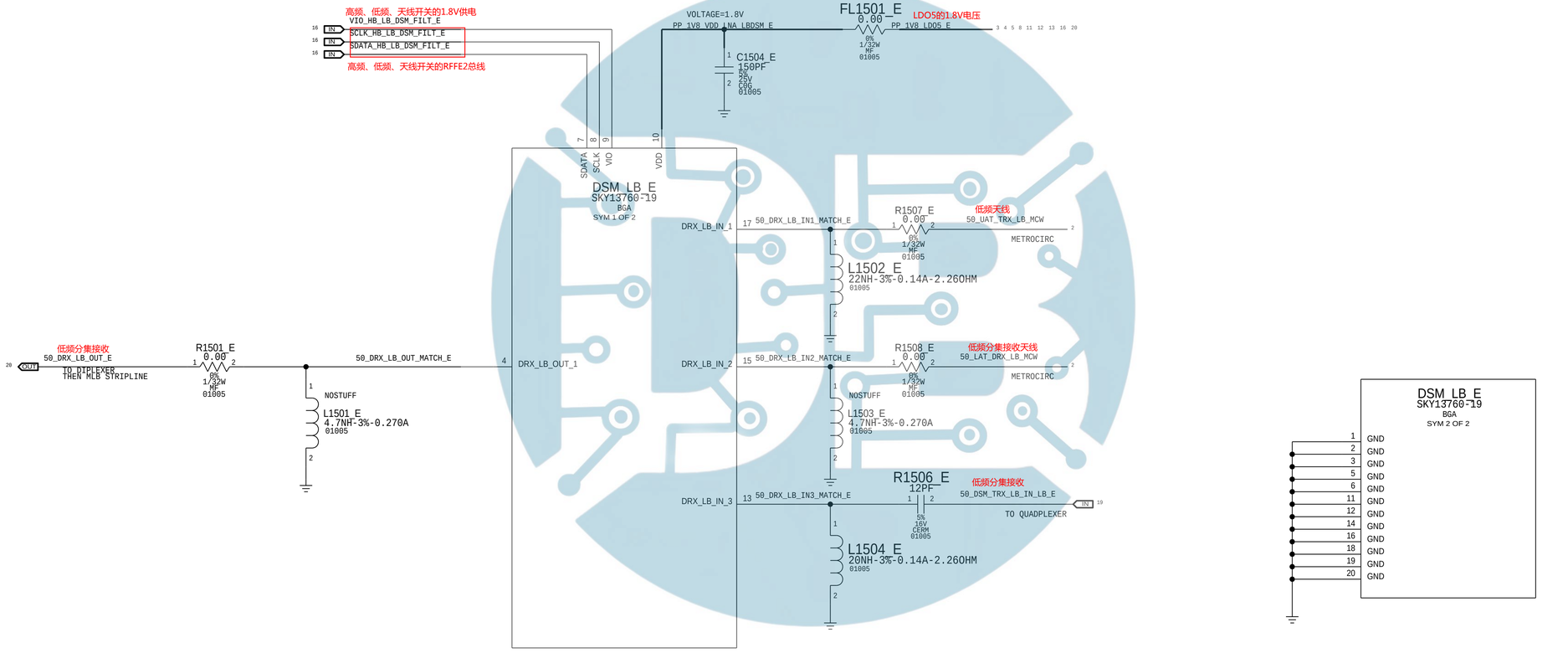
LB DSM



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HB DSM

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DECOUPLING SHARED WITH LB DSM

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

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

高频分集信号到射频输入

DSM_HB_E
SKY13762
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DSM_HB_E
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COUPLER2

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

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

R1808_E 0.00 0% 1/32W MF 01005
PP_1V8_LDO6_E
PP_1V8_VIO_TX_CPL2_E
C1803_E 180PF 10% 10V CERM 01005
75_RFFE5_SCLK_E
C1801_E 47PF 5% 16V CERM 01005 NOSTUFF RADIO_CPL2
75_RFFE5_SDATA_E
C1802_E 47PF 5% 16V CERM 01005 NOSTUFF RADIO_CPL2
PP_VDD_BOOST
C1804_E 0.1UF 10% 6.3V X5R-CERM 01005 RADIO_CPL2
C1805_E 47PF 5% 16V CERM 01005 RADIO_CPL2
RFFE_DAT
RFFE_CLK
VIO
VDD
DRX_LB_OUT
50_CPL2_DRX_LB_E
RADIO_CLP2
R1804_E 0.00 1% 1/20W MF 0201
上天线的低频 分集信号接收发射
50_LAT_DRX_LB_MCS
METROCIRC
C1809_E 1.3PF +/-0.25PF 25V C0G-CERM 201 NOSTUFF RADIO_CPL2
50_PAD_ANT_LB_CPL2_IN_E
TRX_LB_IN
CPL2_E SKY13770 LGA SYM 1 OF 2
超高频功放到CPL2G滤波器的2G信号
50_UHBPAD_2G_LB_PA_OUT_2G_CPL_IN_E
RADIO_CPL2 R1813_E 0.00 1% 1/20W MF 0201 OMIT_TABLE
低频功放到CPL2G滤波器的2G信号
50_LBPAD_2G_OUT_2G_CPL_IN_JPN_E
RADIO_CPL2 R1812_E 0.00 1% 1/20W MF 0201 OMIT_TABLE
50_2G_CPL_IN_E
CPL2G_E WIFI LDJ0Q869M30CG015 LGA
IN
COUPLED_OUT
MAIN_OUT
TERMINATE
50_UHBCPL_OUT_2G_CPL_IN_E
UHBCPL中高频滤波器到CPL2G滤波器的2G信号
RADIO_CPL2 R1815_E 0.00 1% 1/20W MF 0201
50_2G_CPL_OUT_E
50_2G_LB_PA_OUT_CPL2_IN_E
C1810_E 1.0PF +/-0.1PF 16V NP0-C0G 01005 OMIT_TABLE
50_2G_CPL_OUT_CPL2_IN_E
TRX_2GLB
R1803_E 2.2NH+/-0.1NH-0.6A 0201-1
TRX_LB_UAT
50_CPL2_TRX_LB_E
上天线的低频 信号接收发
50_DAT_TRX_LB_MCS
METROCIRC
C1808_E 1.3PF +/-0.25PF 25V C0G-CERM 201 NOSTUFF RADIO_CPL2
R1806_E 68PF 5% 50V C0G 0201
TRX_LB_LAT
50_TRX_LB_LAT_E
下天线的低频 信号接收发射
50_TRX_LB_LAT_DIPLEXER_IN_E
L1802_E 150NH-5%-0.08A 0201 RADIO_CPL2
50_PAD_ANT_HB_CPL2_IN_E
功放到CPL2的高频信号
TRX_HB_IN
RADIO_CPL2 R1807_E 1.0NH-+/-0.05NH-1.1A-0.040HM 0201 0MIT_TABLE
TRX_HB_LAT
50_TRX_HB_LAT_E
下天线 高频 信号接收天线
50_TRX_HB_LAT_DIPLEXER_IN_E
L1801_E 15NH-3%-0.3A-0.7OHM 0201 0MIT_TABLE
50_2G_HB_PA_OUT_CPL2_IN_E
功放到CPL2的2G 高频信号
RADIO_CPL2 R1810_E 0.00 1% 1/20W MF 0201 OMIT_TABLE
TX_2GHB
DUPLICATE SERIES TO PREVENT STUB
50_2G_HB_PA_OUT_ROW_E
RADIO_CPL2 R1814_E 0.00 1% 1/20W MF 0201 OMIT_TABLE
50_PAD_MLB1_CPL2_IN_E
TRX_MLB_IN
RADIO_CPL2 R1802_E 0.00 1% 1/20W MF 0201
上天线的中低频、中频 、高频 信号
50_UAT_TRX_MLB_MB_HB_MCS
METROCIRC
C1811_E 0.5PF 0.05PF 25V NP0-C0G 0201 NOSTUFF
C1807_E 1.3PF +/-0.25PF 25V C0G-CERM 201 NOSTUFF RADIO_CPL2
50_PAD_MLB1_2G_HB_CPL2_IN_E
功放到CPL2滤波器的中低频、2G、高频
RADIO_CPL2 R1809_E 0.00 1% 1/20W MF 0201 OMIT_TABLE
DRX_HB_OUT
50_CPL2_DRX_HB_E
RADIO_CLP2 R1801_E 0.00 1% 1/20W MF 0201
50_LAT_DRX_MLB_MB_HB_MCS
METROCIRC
C1806_E 1.3PF +/-0.25PF 25V C0G-CERM 201 NOSTUFF RADIO_CPL2
50_2G_CPL_OUT_CPL2_IN_E
CPL滤波器到CPL2滤波器的2G信号
RF_CPL3_IN
CPL_OUT1
50_CPL2_CPLOUT_E

CPL2_E SKY13770 LGA SYM 2 OF 2
GND (4, 5, 8, 10, 12, 13, 14, 15, 16, 17, 21, 22, 24, 25, 26, 28, 29, 34, 36)

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Apple Inc.	
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LOWER ANTENNA

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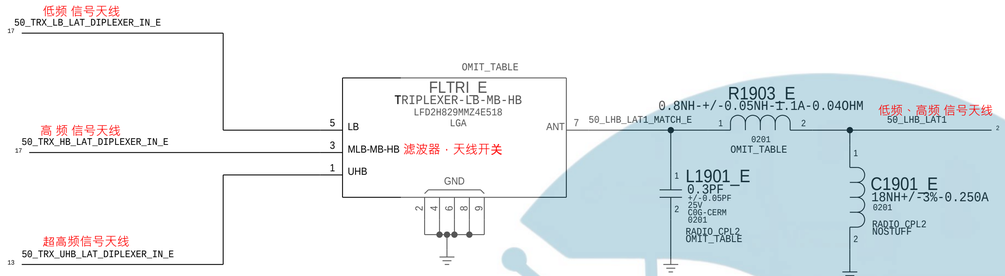

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
155S00298	1	TRIPLEXER, L+MLBMHB+UHB	FLTRI_E	CRITICAL	JPN
155S00297	1	DIPLEXER, L+MLBMHB	FLTRI_E	CRITICAL	ROW
152S00147	1	0.6NH UHQ, TRI ANT MATCH	R1903_E	CRITICAL	JPN
152S00151	1	0.8NH UHQ, TRI ANT MATCH	R1903_E	CRITICAL	ROW
131S00001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

PAGE TITLE: LOWER ANTENNA

Apple Inc.

DRAWING NUMBER: 051-02159 | SIZE: D

REVISION: 10.0.0

BRANCH:

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UAT & LB/UHB DIPLEXER

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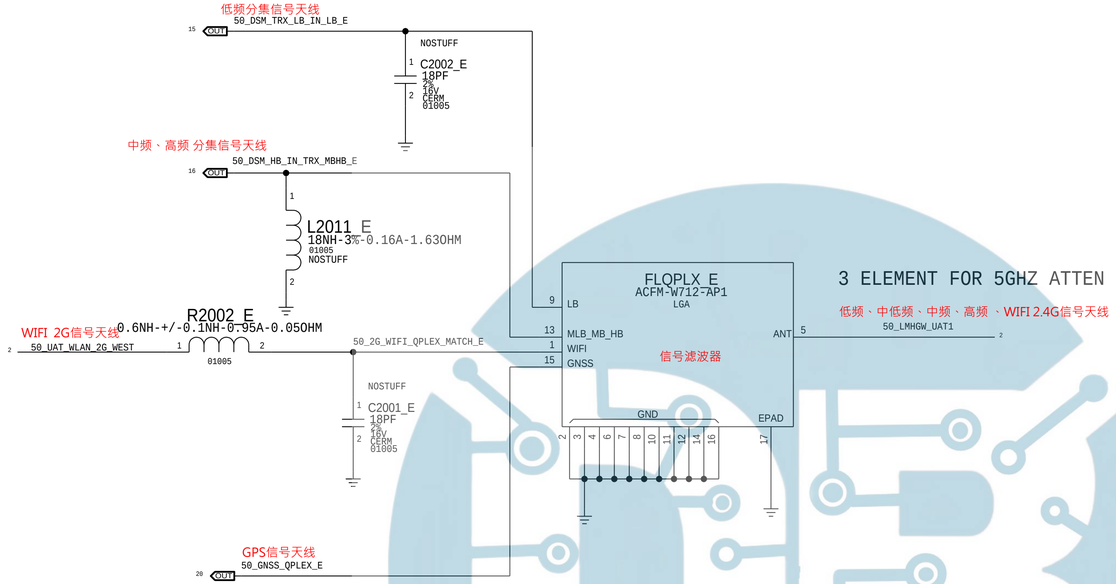

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	Apple Inc.
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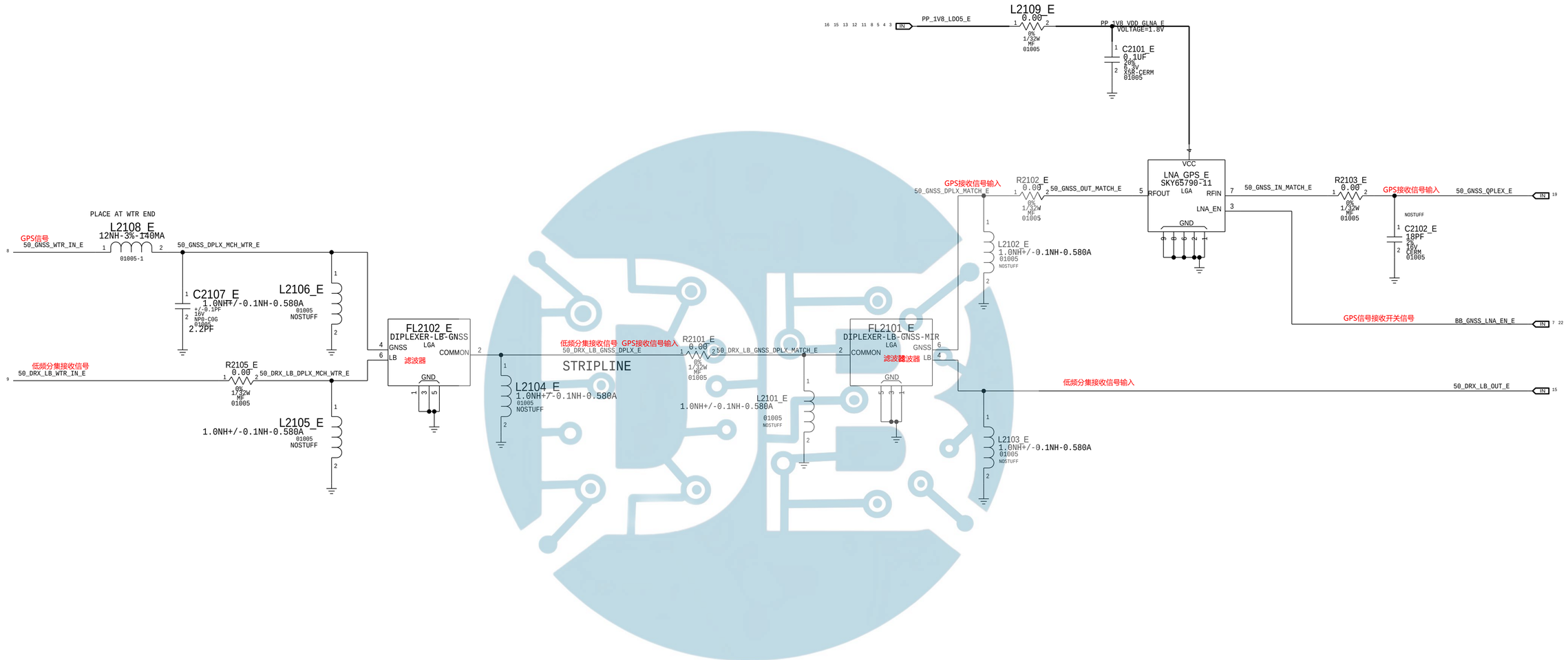
GPS & GPS/LB DIPLEXER



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SIM CARD: CONNECTOR

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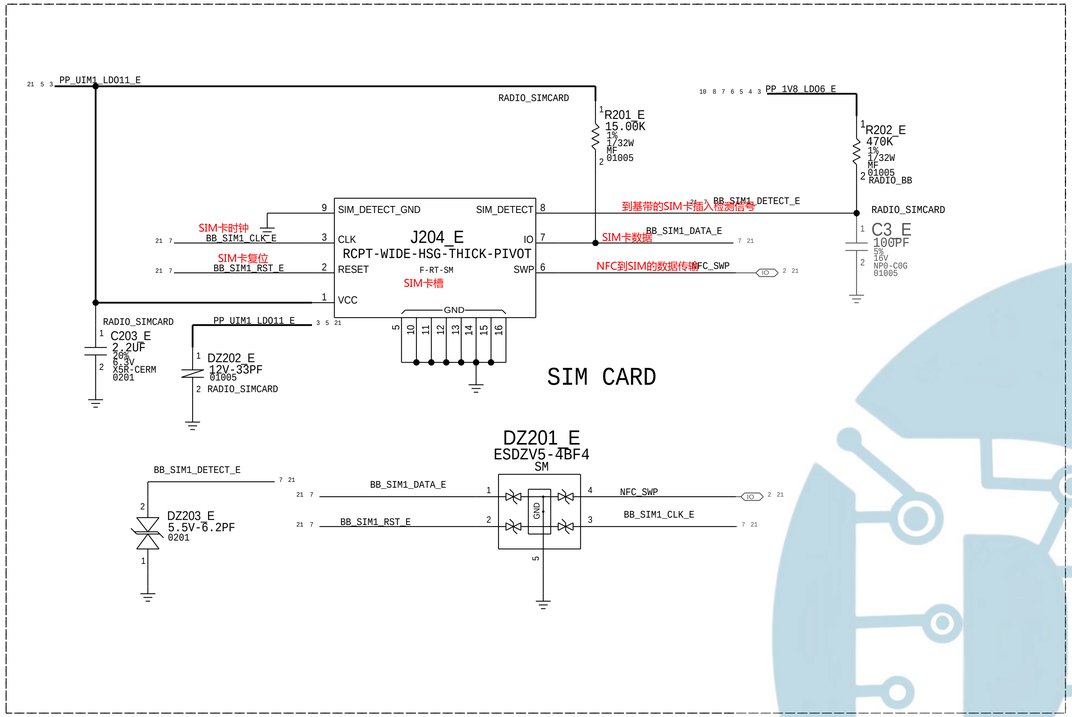
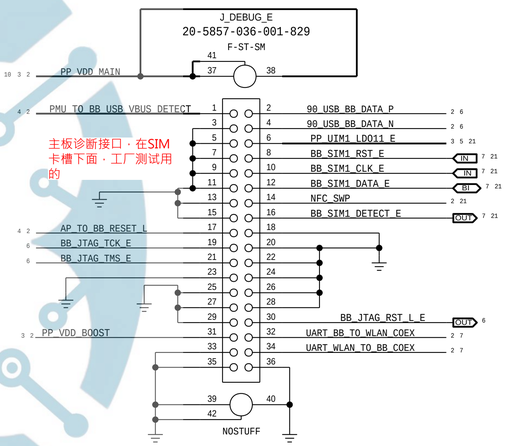
PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
512S00026	512S00017	BOM_TABLE_ALTS	J204_E	SIMCRD,KYOCERA



DEBUG CONNECTOR

MLB 51683185
FLEX 51683184



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BB PROBE POINTS

PCIE

LAYOUT: VIA STUB AT BB PINS

PP1_E — P2MM-NSM SM PP 1 — 90_PCIE_AP_TO_BB_REFCLK_P — 2 6

PP2_E — P2MM-NSM SM PP 1 — 90_PCIE_AP_TO_BB_REFCLK_N — 2 6

PWR SEQ

PP18_E — P2MM-NSM SM PP 1 — PMIC_RESOUT_L_E — 4 6

PP20_E — P2MM-NSM SM PP 1 — BB_TO_AP_RESET_DETECT_L — 2 7

BASEBAND CLK

PP33_E — P2MM-NSM SM PP 1 — BB_TO_NFC_CLK — 2 4 (基带给NFC时钟)

PP34_E — P2MM-NSM SM PP 1 — 50_MDM_19P2M_CLK_E — 4 6

PP36_E — P2MM-NSM SM PP 1 — XO_OUT_D0_EN_E — 4 6

PP32_E — P2MM-NSM SM PP 1 — 50_SLEEP_CLK_32K_E — 4 6

I2S

PP25_E — P2MM-NSM SM FP 1 — I2S_BB_TO_AP_LRCLK — 2 7

PP26_E — P2MM-NSM SM FP 1 — I2S_BB_TO_AP_BCLK — 2 7

PP27_E — P2MM-NSM SM FP 1 — I2S_AP_TO_BB_DOUT — 2 7

PP28_E — P2MM-NSM SM FP 1 — I2S_BB_TO_AP_DIN — 2 7

OTHERS

PP21_E — P2MM-NSM SM PP 1 — DISPLAY_TO_MANY_BSYNC (显示屏发出的同步信号) — 2 4

PP22_E — P2MM-NSM SM PP 1 — AP_TO_BB_COREDUMP — 2 7

PP35_E — P2MM-NSM SM PP 1 — AP_TO_BB_MESA_ON — 2 7

CTRL

PP23_E — P2MM-NSM SM PP 1 — BB_GNSS_LNA_EN_E — 7 20

PP29_E — P2MM-NSM SM PP 1 — AP_TO_BB_TIME_MARK — 2 7

PP30_E — P2MM-NSM SM PP 1 — BB_TO_STROBE_DRIVER_GSM_BURST_IND — 2 7

UART

PP31_E — P2MM-NSM SM PP 1 — UART_BB_TO_AOP_RXD — 2 7

PP24_E — P2MM-NSM SM PP 1 — UART_AOP_TO_BB_TXD — 2 7

QLINK

LAYOUT: VIA STUB AT WTR PINS

PP53_E — P2MM-NSM SM PP 1 — QLINK_UL0_P_E — 7 8

PP54_E — P2MM-NSM SM PP 1 — QLINK_UL0_N_E — 7 8

PP55_E — P2MM-NSM SM PP 1 — QLINK_CLK_P_E — 7 8

PP56_E — P2MM-NSM SM PP 1 — QLINK_CLK_N_E — 7 8

LAYOUT: VIA STUB AT BB PINS

PP47_E — P2MM-NSM SM PP 1 — QLINK_DL0_P_E — 7 8

PP48_E — P2MM-NSM SM PP 1 — QLINK_DL0_N_E — 7 8

PP49_E — P2MM-NSM SM PP 1 — QLINK_DL1_P_E — 7 8

PP50_E — P2MM-NSM SM PP 1 — QLINK_DL1_N_E — 7 8

PP51_E — P2MM-NSM SM PP 1 — QLINK_DL2_P_E — 7 8

PP52_E — P2MM-NSM SM PP 1 — QLINK_DL2_N_E — 7 8

RFFE

PP40_E — P2MM-NSM SM PP 1 — 75_RFFE3_SDATA_E — 7 11 12 13

PP41_E — P2MM-NSM SM PP 1 — 75_RFFE6_SDATA_E — 7 10 11 12 13

SPMI

PP57_E — P2MM-NSM SM PP 1 — SPMI_CLK_E — 4 6

PP58_E — P2MM-NSM SM PP 1 — SPMI_DATA_E — 4 6

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SYNC_MASTER=PROBE POINTS — SYNC_DATE=07/18/2016

PAGE TITLE: TEST POINTS

Apple Inc.

DRAWING NUMBER: 051-02159 — SIZE: D

REVISION: 10.0.0

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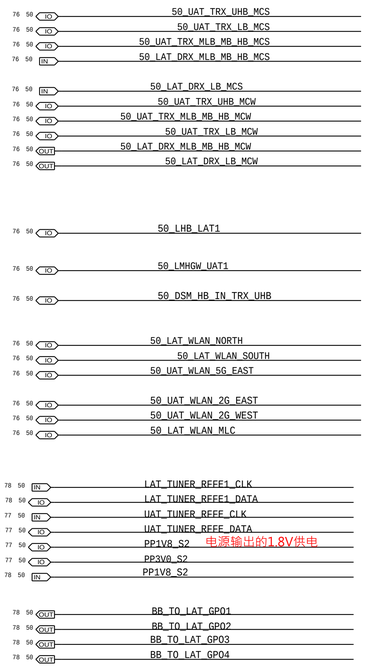
2. ALL CAPACITANCE VALUES ARE IN MICROFARADS.
3. ALL CRYSTALS & OSCILLATOR VALUES ARE IN HERTZ.

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

D21 RADIO_MLB_FF
5/22/2017



电源输出的1.8V供电

FRONT PAGE

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Apple Inc.	DRAWING NUMBER 051-02159 · SIZE D
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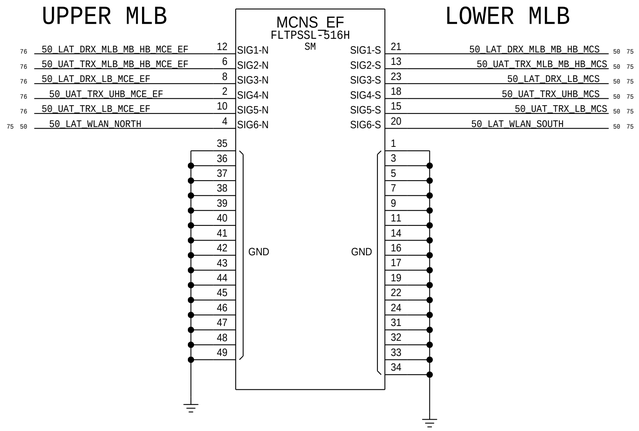
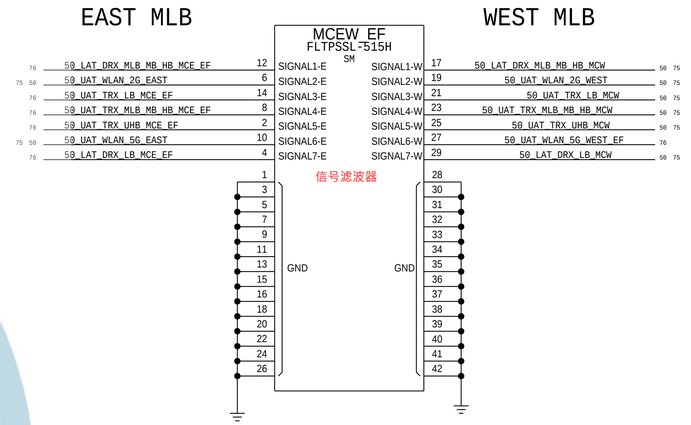
METROCIRC

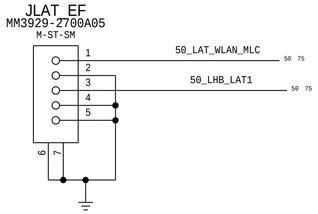
NORTH-SOUTH METROCIRC
339S00297



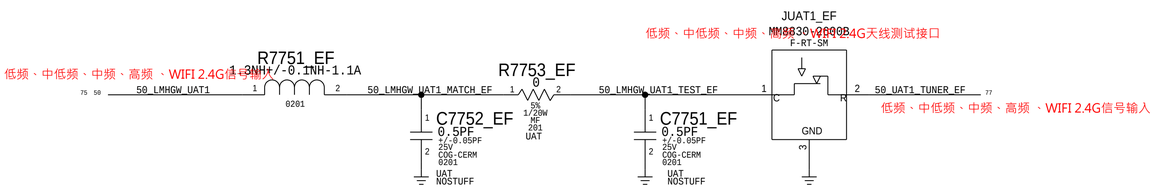
EAST-WEST METROCIRC
339S00296



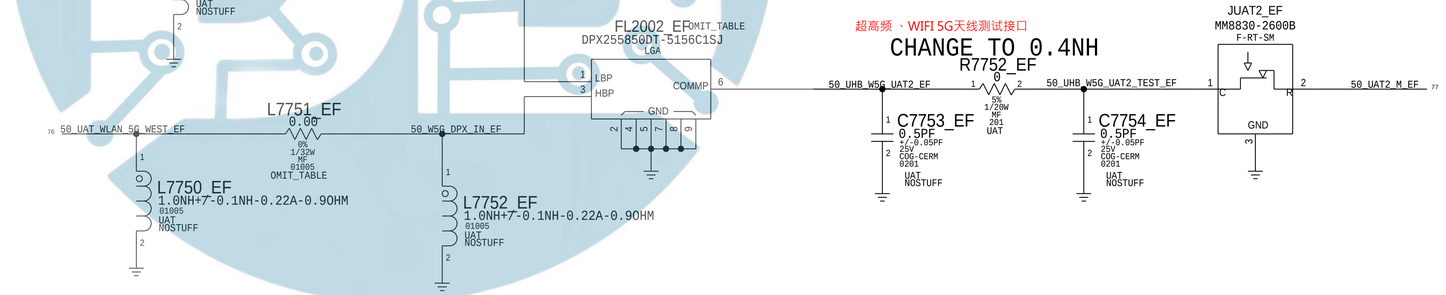
LAT MLC



LB/MLB/MB/HB
WIFI 2.4GHZ TEST



UHB/WIFI 5GHZ TEST



PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
155S00274	1	B42/5G DIPLEXER	FL2002_EF	CRITICAL	JPN
155S00275	1	5G PASSTHROUGH	FL2002_EF	CRITICAL	ROW
131S0598	1	B42/5G DIPLEXER 5G_IN MATCH	L7751_EF	CRITICAL	JPN
131S0385	1	5G PASSTHROUGH INPUT MATCH	L7751_EF	CRITICAL	ROW

PAGE TITLE: METROCIRC

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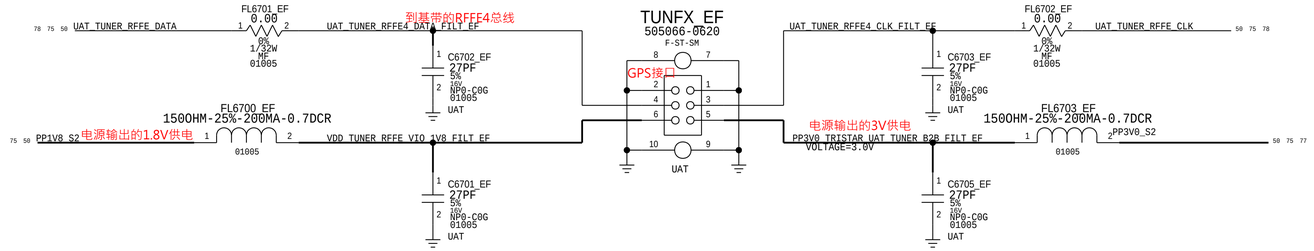
UAT TUNER FLEX

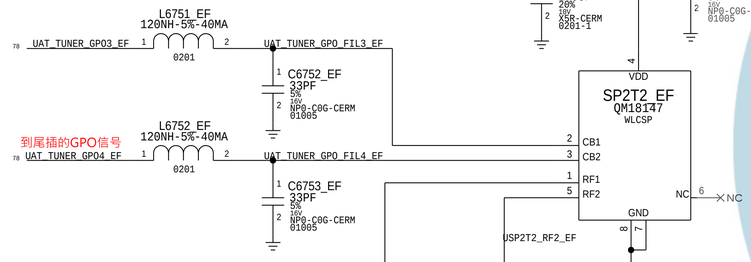
PLEASE CONTACT ANTENNA (MATT MOW)
FOR ANY COMPONENT CHANGE.

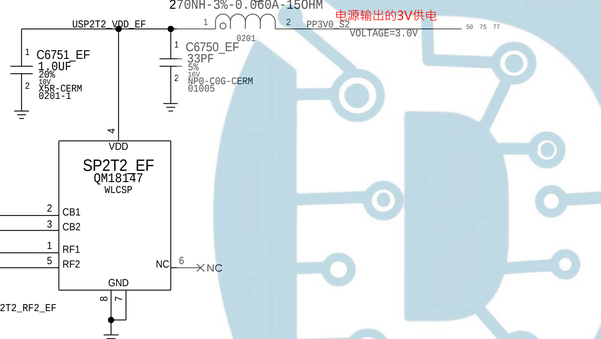


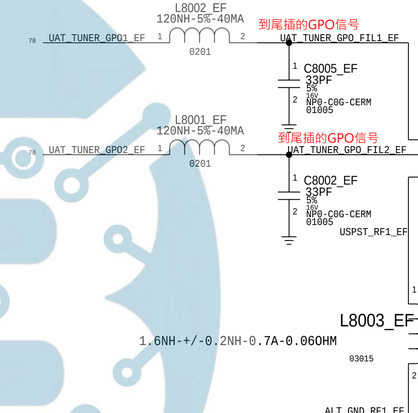
PINOUT IS ROTATED 180
COMPARED TO D20 & D201

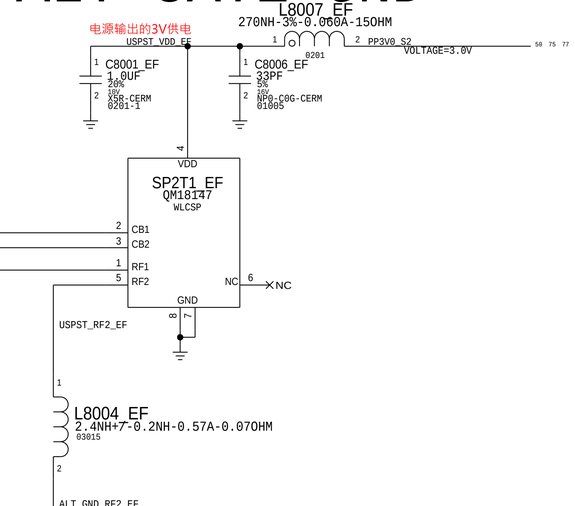
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
152S1240	1	4.3NH 03015 WW INDUCTOR	L8005_EF	CRITICAL	JPN
152S00749	1	3.6NH 03015 WW INDUCTOR	L8005_EF	CRITICAL	ROW

UAT TUNER

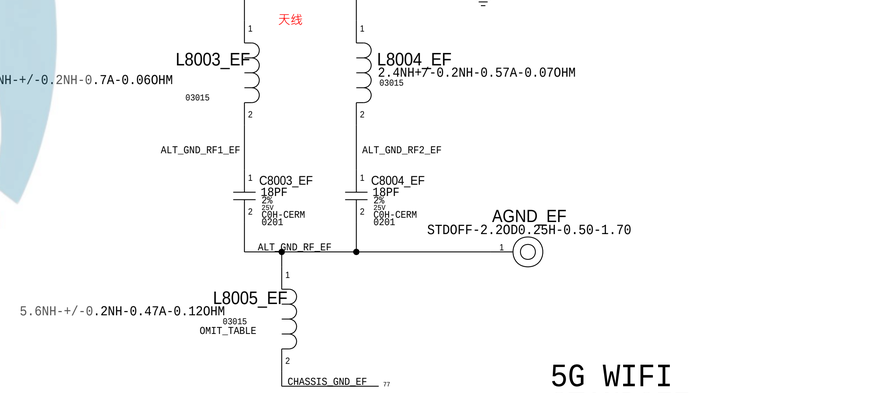




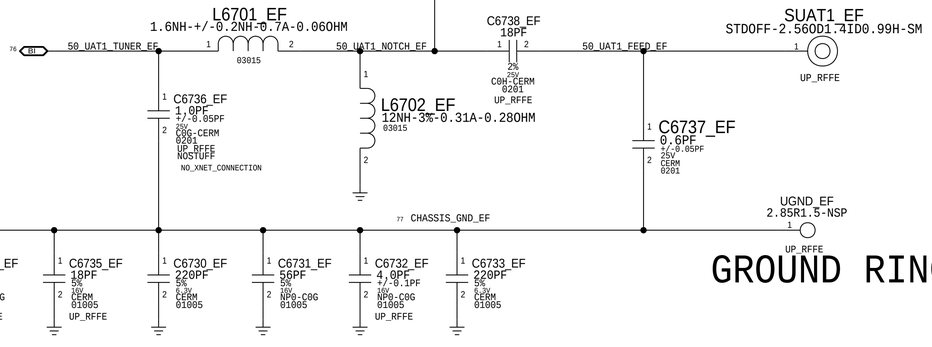




ALT UAT1 GND

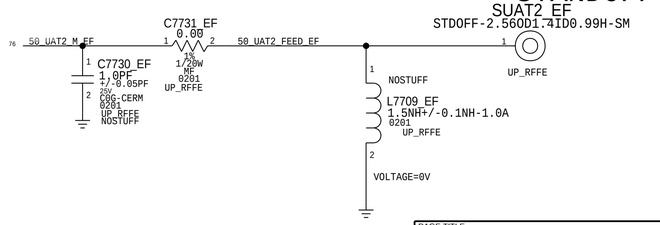


LB/MLB/GNSS/MB/HB
STANDOFF



GROUND RING

5G WIFI
STANDOFF



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Apple Inc.	DRAWING NUMBER 051-02159 · SIZE D
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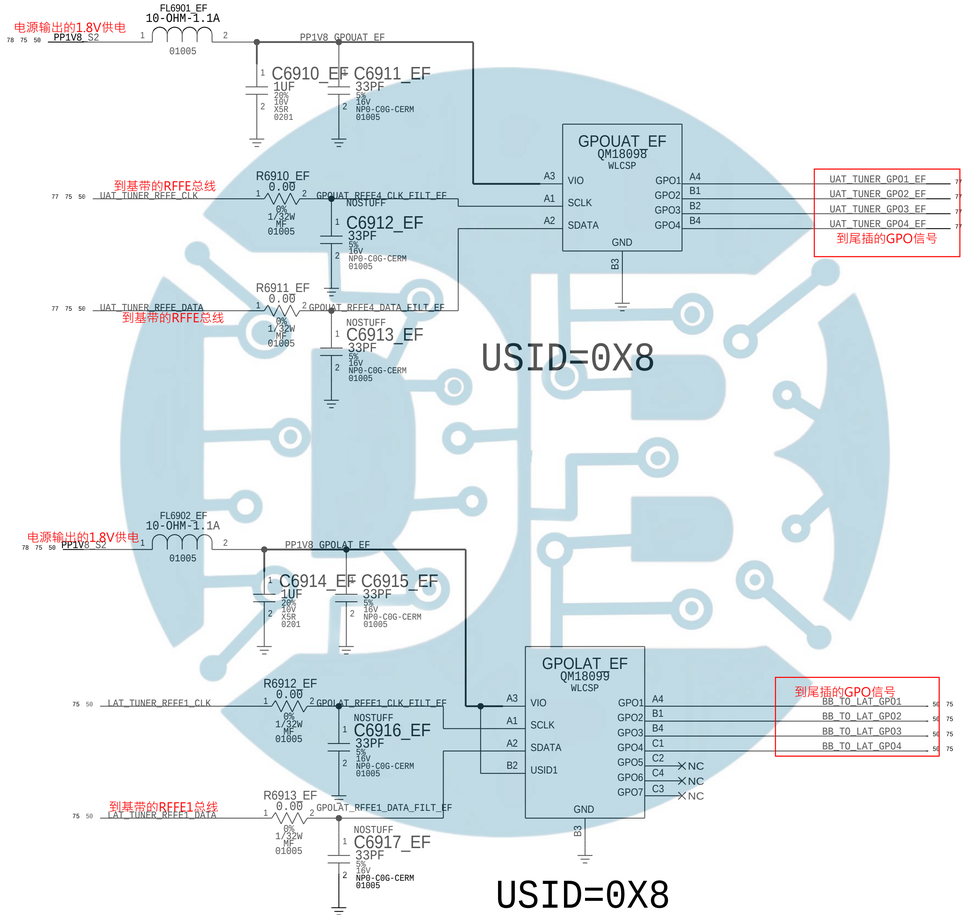

PAGE TITLE
RFFE TO GPO TRANSLATOR

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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
10	0008927012	ENGINEERING RELEASED	2017-06-06

D21X WIFI_MLB (GUINNESS)
NOV 28, 2016

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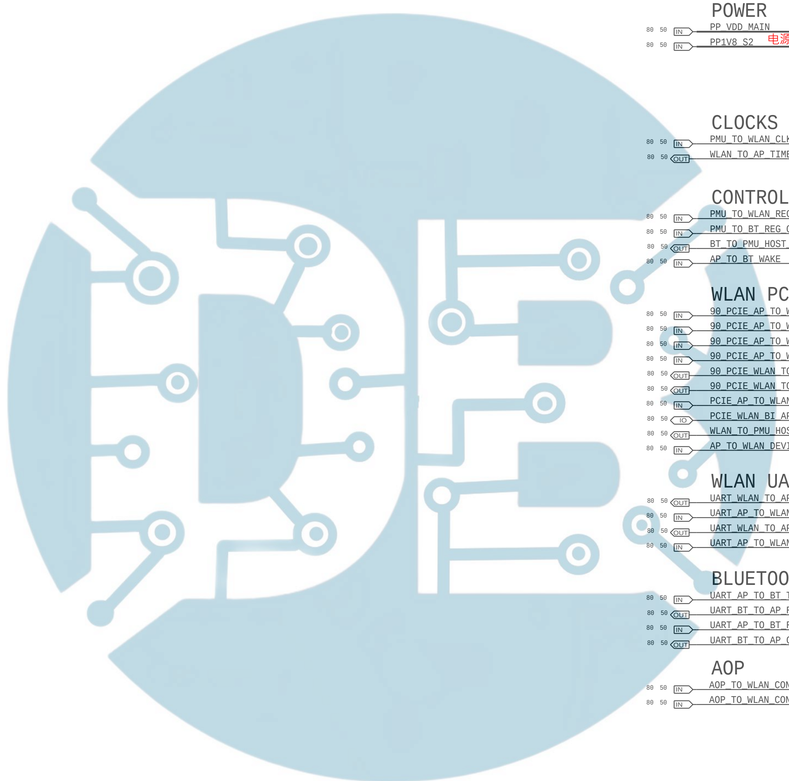
2	76	GUINNESS
3	77	WIFI FRONT-END



POWER
- PP_VDD_MAIN (IN)
- PP1V8_S2 (IN) 电源输出的1.8V供电

CLOCKS
- PMU_TO_WLAN_CLK32K (IN) 电源到WIFI的32K时钟信号
- WLAN_TO_AP_TIME_SYNC (OUT) WIFI到CPU的时间同步信号

CONTROL
- PMU_TO_WLAN_REG_ON (IN)
- PMU_TO_BT_REG_ON (IN)
- BT_TO_PMU_HOST_WAKE (OUT)
- AP_TO_BT_WAKE (IN)

WLAN PCIE
- 90_PCIE_AP_TO_WLAN_REFCLK_P (IN)
- 90_PCIE_AP_TO_WLAN_REFCLK_N (IN)
- 90_PCIE_AP_TO_WLAN_TXD_P (IN)
- 90_PCIE_AP_TO_WLAN_TXD_N (IN)
- 90_PCIE_WLAN_TO_AP_RXD_P (OUT)
- 90_PCIE_WLAN_TO_AP_RXD_N (OUT)
- PCIE_AP_TO_WLAN_RESET_L (IN)
- PCIE_WLAN_BT_AP_CLKREQ_L (IO)
- WLAN_TO_PMU_HOST_WAKE (OUT) WIFI到电源主机唤醒信号
- AP_TO_WLAN_DEVICE_WAKE (IN)

WLAN UART
- UART_WLAN_TO_AP_RXD (OUT)
- UART_AP_TO_WLAN_TXD (IN)
- UART_WLAN_TO_AP_CTS_L (OUT)
- UART_AP_TO_WLAN_RTS_L (IN)

BLUETOOTH UART
- UART_AP_TO_BT_TXD (IN)
- UART_BT_TO_AP_RXD (OUT)
- UART_AP_TO_BT_RTS_L (IN)
- UART_BT_TO_AP_CTS_L (OUT)

AOP
- AOP_TO_WLAN_CONTEXT_A (IN) CPU到WIFI调试总线数据输入
- AOP_TO_WLAN_CONTEXT_B (IN) CPU到WIFI调试总线数据输入

COEX
- UART_BB_TO_WLAN_COEX (IN)
- UART_WLAN_TO_BB_COEX (OUT)

ANTENNA
- 50_UAT_WLAN_2G_EAST (IO)
- 50_UAT_WLAN_5G_EAST (IO)
- 50_LAT_WLAN_NORTH (IO)
- 50_LAT_WLAN_SOUTH (IO)
- 50_LAT_WLAN_MLC (IO)

SymbolPorts

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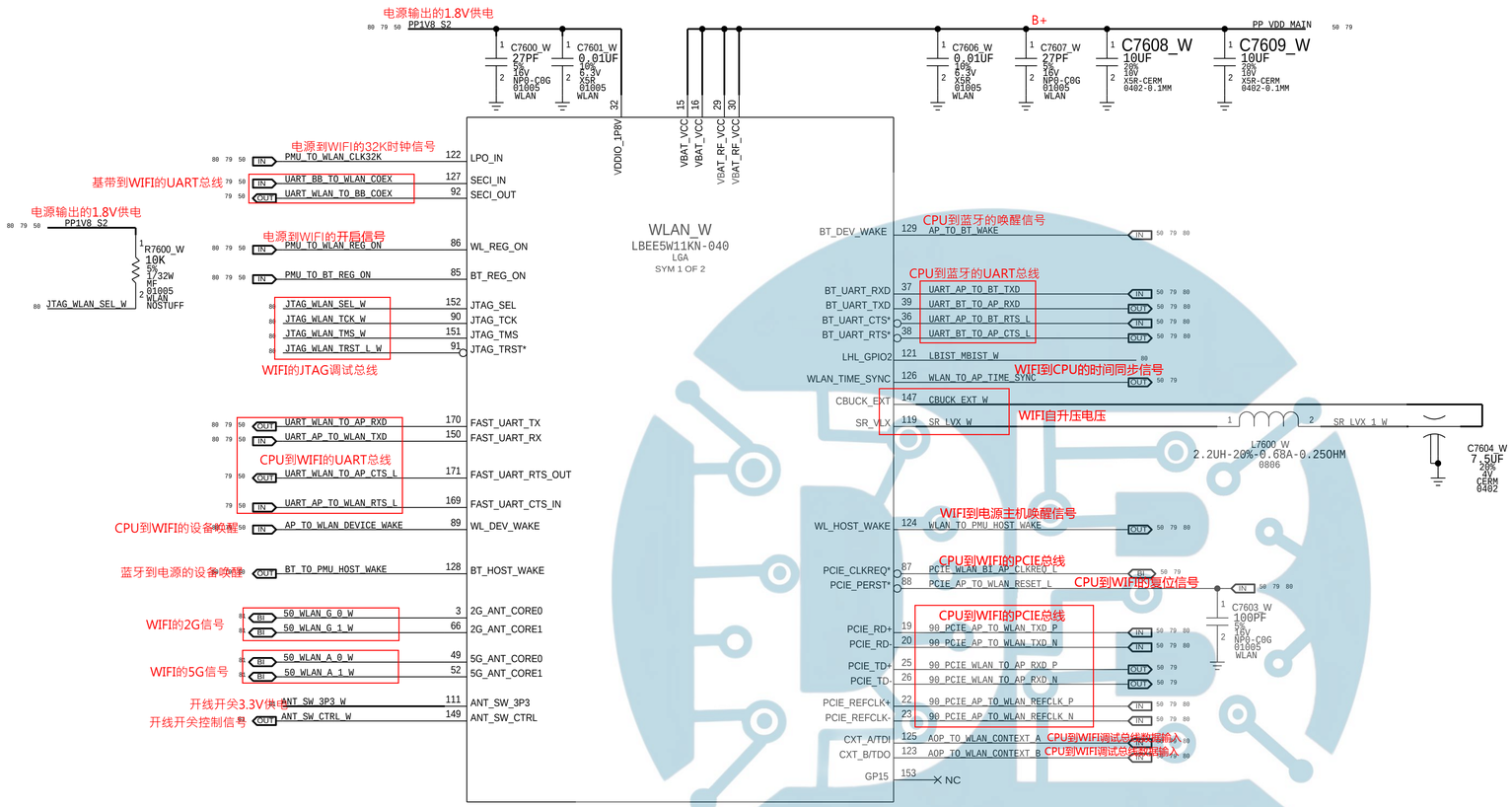

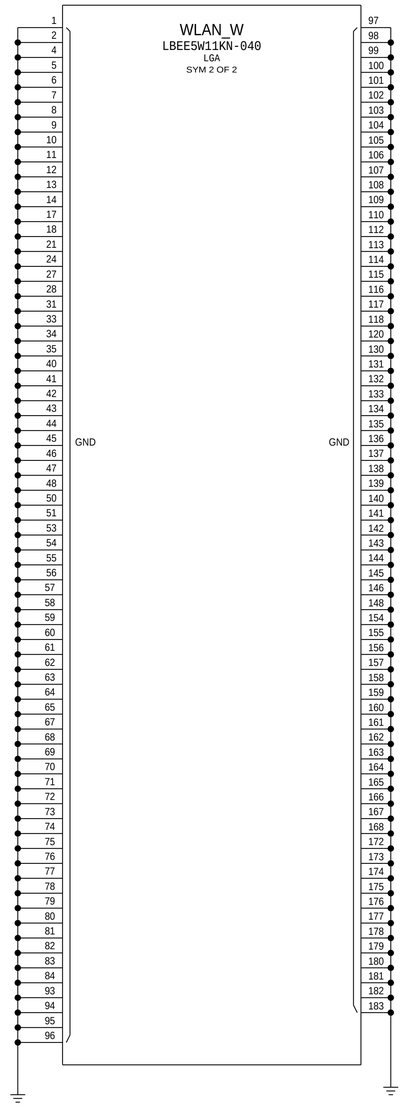

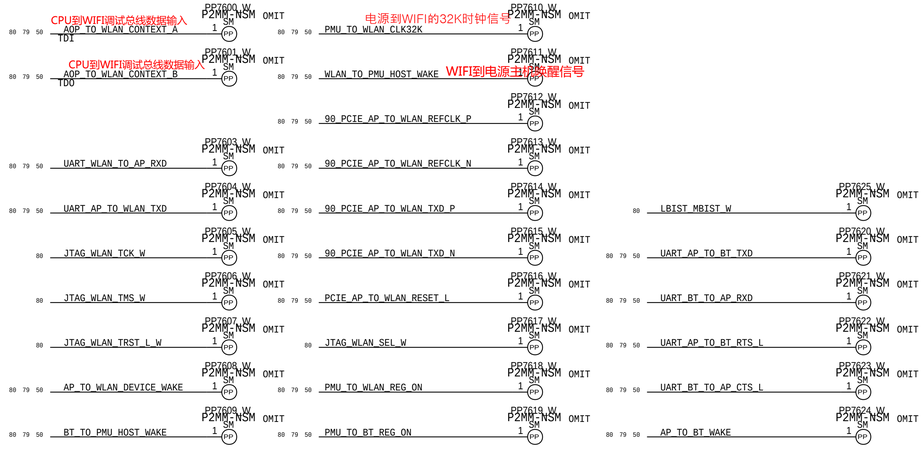

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
339S00397	339S00399	BOM_TABLE_ALTS	WLAN_W	ALT WIFI/BT MODULE

SYNC_MASTER=WIFI SYNC_DATE=11/28/2016

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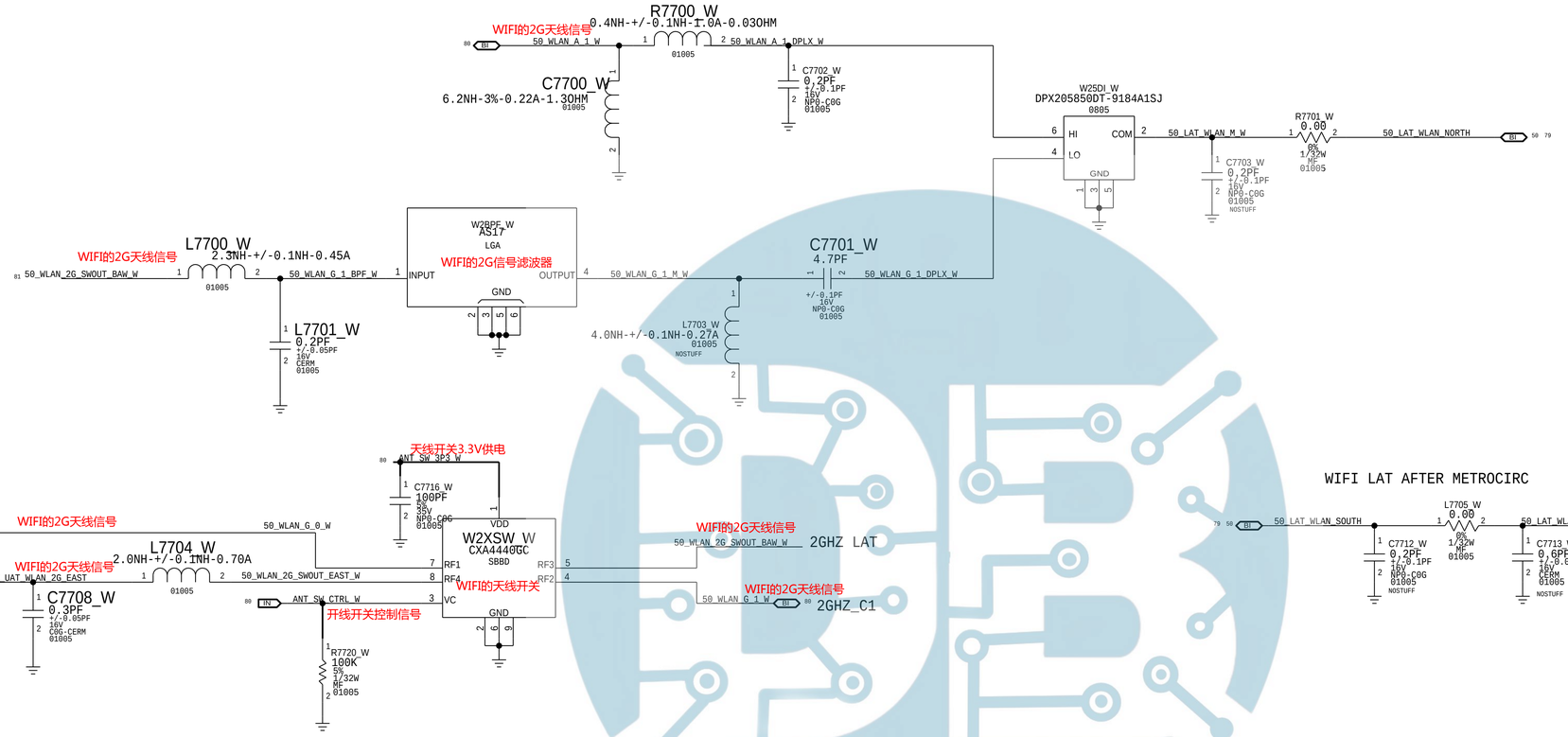
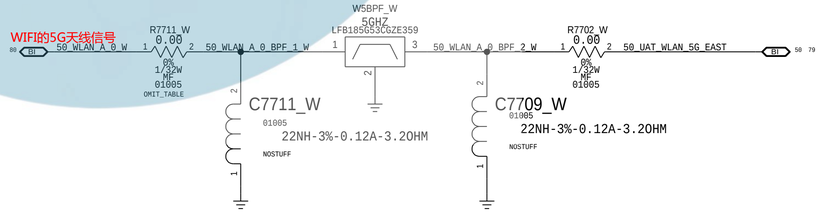
WIFI LOWER ANTENNA FEED



WIFI UPPER ANTENNA FEED



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

SYNC_DATE=11/28/2016

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