

8		7		6		5		4		3		2		1	
1. ALL RESISTANCE VALUES ARE IN OHMS, 0.1 WATT +/- 5%.												REV	ECN	DESCRIPTION OF REVISION	CK APPD DATE
2. ALL CAPACITANCE VALUES ARE IN MICROFARADS.												10	0008927012	ENGINEERING RELEASED	2017-06-06
3. ALL CRYSTALS & OSCILLATOR VALUES ARE IN HERTZ.															
D21 MLB - DVT (OK2FAB)															
LAST_MODIFICATION= Tue Jun 6 18:57:04 2017															
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EEEE Codes

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
825-7691	1	EEEE FOR (MLB, 639-94441, JP, ULTRA)	EEEE_J08R	CRITICAL	EEEE_ULTIMATE
825-7691	1	EEEE FOR (MLB, 639-93377, JP, EXTREME)	EEEE_HNV8	CRITICAL	EEEE_EXTREME
825-7691	1	EEEE FOR (MLB, 639-94442, ROW, ULTRA)	EEEE_J08X	CRITICAL	EEEE_ULTIMATE_ROW
825-7691	1	EEEE FOR (MLB, 639-93389, ROW, EXTREME)	EEEE_HNVF	CRITICAL	EEEE_EXTREME_ROW

D21x Specific

D21x Specific

D21x Specific

D21x Specific

SOC

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
339S00416	1	SoC, H, 3GB 21nm D09, 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
339M00013	339M00012	BOM_TABLE_ALTS	M4100	HUNT, STATS SIP

D21x Specific

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		
ADRES OUTPUT	138S00159	9	CAP, SOFT-TERM, 2.2UF, 6.3V, 0201, KYOCERA	C2060, C2061, C2063, C2065, C2067, C2068, C2063	SOFT_CAP
	138S0831	9	CAP, TYPICAL, 2.2UF, 6.3V, 0201, MURATA	C2060, C2061, C2063, C2065, C2067, C2068, C2063	TYPICAL_CAP
ADRES INPUT	138S00159	15	CAP, SOFT-TERM, 2.2UF, 6.3V, 0201, KYOCERA	C3351, C3352, C3354, C3356, C3357, C3358, C3360	SOFT_CAP
	138S0831	15	CAP, TYPICAL, 2.2UF, 6.3V, 0201, MURATA	C3351, C3352, C3354, C3356, C3357, C3358, C3360	TYPICAL_CAP
	138S00159	10	CAP, SOFT-TERM, 2.2UF, 6.3V, 0201, KYOCERA	C3361, C3362, C3364, C3365, C3367, C3368, C3369	SOFT_CAP
	138S0831	10	CAP, TYPICAL, 2.2UF, 6.3V, 0201, MURATA	C3361, C3362, C3364, C3365, C3367, C3368, C3369	TYPICAL_CAP
I2	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
ANGEL 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
RCAR S205	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 S205	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
STORAGE S205	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, C5029, C5136	SOFT_CAP
	138S0831	5	CAP, TYPICAL, 2.2UF, 6.3V, 0201, MURATA	C5016, C5018, C5134, C5029, 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 S205	138S00159	4	CAP, SOFT-TERM, 2.2UF, 6.3V, 0201, KYOCERA	C5706, C5709, C5716, C5721	SOFT_CAP
	138S0831	4	CAP, TYPICAL, 2.2UF, 6.3V, 0201, MURATA	C5706, C5709, C5716, C5721	TYPICAL_CAP
DRS/MESA S205	138S00159	5	CAP, SOFT-TERM, 2.2UF, 6.3V, 0201, KYOCERA	C5802, C5804, C5811, C5808	SOFT_CAP
	138S0831	5	CAP, TYPICAL, 2.2UF, 6.3V, 0201, MURATA	C5802, C5804, C5811, C5808	TYPICAL_CAP
RAMBA L00	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. BUSX OUTPUT	138S00159	5	CAP, SOFT-TERM, 2.2UF, 6.3V, 0201, KYOCERA	C6326, C6321, C6322, C6323, C6324	SOFT_CAP
	138S0831	5	CAP, TYPICAL, 2.2UF, 6.3V, 0201, MURATA	C6326, C6321, C6322, C6323, C6324	TYPICAL_CAP
	138S00160	4	CAP, SOFT-TERM, 18UF, 10V, 0402, MURATA	C4907, C4903, C4904, C4931	SOFT_CAP
	138S0979	4	CAP, TYPICAL, 18UF, 10V, 0402, MUR/KYO	C4907, C4903, C4904, C4931	TYPICAL_CAP
CHESTNUT L00	138S00160	5	CAP, SOFT-TERM, 18UF, 10V, 0402, MURATA	C5600, C5602, C5603, C5702, C5703	SOFT_CAP
	138S0979	5	CAP, TYPICAL, 18UF, 10V, 0402, MUR/KYO	C5600, C5602, C5603, C5702, C5703	TYPICAL_CAP
RCAR (TELE)	138S00159	2	CAP, SOFT-TERM, 2.2UF, 6.3V, 0201, KYOCERA	C4825, C4826	SOFT_CAP
	138S0831	2	CAP, TYPICAL, 2.2UF, 6.3V, 0201, MURATA	C4825, C4826	TYPICAL_CAP

Default is typical

D21x Specific

D21x Specific

IKTARA DIODES SUB BOMS

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
685-00172	685-00171	BOM_TABLE_ALTS	SUBBOM_DS	SUBBOM_MLB, SHOTTKY DIODES, D210ES, D21

#31556972: Update Iktara Diodes APNs

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
685-00171	1	SUBBOM_MLB, SHOTTKY DIODES, D210ES, D21	SUBBOM_DS		
371S00133	4	DIODES, SHOTTKY DIODE, 30V, 2A, 9683	D3400, D3401, D3402, D3403		DIODES_DS
371S00132	4	ONSEMI, SHOTTKY DIODE, 30V, 2A, 9683	D3400, D3401, D3402, D3403		ONSEMI_DS

Footprint is ONSEMI

Primary is DIODES

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 Apple Inc.		DRAWING NUMBER	051-02159	SIZE
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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, B1CS3, ULTIMATE
335S00288	335S00287	BOM_TABLE_ALTS	U2600	S, B1CS3, ULTIMATE
335S00286	335S00287	BOM_TABLE_ALTS	U2600	SS, 3Dv4, ULTIMATE
335S00228	335S00240	BOM_TABLE_ALTS	U2600	T, B1CS3, EXTREME
335S00247	335S00240	BOM_TABLE_ALTS	U2600	S, B1CS3, EXTREME
335S00276	335S00240	BOM_TABLE_ALTS	U2600	SS, 3Dv4, EXTREME

Isolator Switch

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

Mamba LDO

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

Load Switch

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
353S00999	353S01039	BOM_TABLE_ALTS	U6100	TL, LOAD SW, TPS22915C
353S01097	353S01039	BOM_TABLE_ALTS	U6100	ONSEMI, LOAD SW, MCP333

Crystal Alts

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:	CRITICAL PART#	COMMENT
197S0012	197S00118	BOM_TABLE_ALTS	Y1000	NDK, XTAL, 24MHz, 1.6x1.2	197S00118	XTAL, 24M, 1612, TDK
197S00126	197S00118	BOM_TABLE_ALTS	Y1000	EPSON, XTAL, 24MHz, 1.6x1.2	197S0612	XTAL, 24M, 1612, NDK
					197S00120	XTAL, 24M, 1612, EPSON

PMID1 Zener Diode

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

ZRB Caps

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
138S0083	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
138S00024	138S0066	BOM_TABLE_ALTS	ALL	CAP, CER, 3.3UF, 1.5V, 20%, 4.0MM, 0.7-2GHZ, 8665
138S0706	138S0739	BOM_TABLE_ALTS	ALL	CAP, CER, 10P, 20V, 20%, 10V, 0.001, NPO/TA
138S0945	138S0739	BOM_TABLE_ALTS	ALL	CAP, CER, 10P, 20V, 20%, 10V, 0.001, NPO/TA
138S0739	138S0706	BOM_TABLE_ALTS	ALL	CAP, CER, X5R, 0.22UF, 20%, 6.3V, 20%
132S0436	132S0400	BOM_TABLE_ALTS	ALL	CAP, X5R, X5R, 0.22UF, 20%, 6.3V, 0.65MM
138S00133	138S00128	BOM_TABLE_ALTS	ALL	CAP, CER, X5R, 4.7UF, 20%, 6.3V, 0.1005
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, 28UF, 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, 28UF, 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	138S0031	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, 28UF, 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, X5R, 15UF, 6.3V, 0.65MM, 0402, X5R
132S0639	132S00008	BOM_TABLE_ALTS	ALL	CAP, X5R, 0.47UF, 25V, 0.20MM, 0201, MUR

Global Ferrites Alternates

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
155S00581	155S00067	BOM_TABLE_ALTS	ALL	FERR, 240OHM, 0.380MM DCR, 0201
155S00194	155S0010	BOM_TABLE_ALTS	ALL	FERR BD, 150OHM, TOK
155S00200	155S0010	BOM_TABLE_ALTS	ALL	FERR BD, 150OHM, TY
152S00558	152S00057	BOM_TABLE_ALTS	ALL	IND, 0.47UH, 20%, 2.5A, 60MO, 1608, H= .65
152S00655	152S00656	BOM_TABLE_ALTS	ALL	IND, MLD, 1.0UH, 20%, 3A, 60MO, H=0.6, 2012, H= .65
152S00653	152S00651	BOM_TABLE_ALTS	ALL	IND, MLD, 1.2UH, 2.5A, 160MO
152S00654	152S00652	BOM_TABLE_ALTS	ALL	IND, MLD, 1.2UH, 2.5A, 1A, 160MO, H= .65, 2012, H= .65
155S00012	155S00168	BOM_TABLE_ALTS	ALL	FLTR, 05 OHMS, 0605
152S00710	152S00617	BOM_TABLE_ALTS	ALL	IND, 0.10H, 250MHZ, 6.3A, 1608, H= .65
152S00711	152S00619	BOM_TABLE_ALTS	ALL	IND, 0.10H, 210MHZ, 7.2A, 2012, H= .65
152S00713	152S00621	BOM_TABLE_ALTS	ALL	IND, 0.47UH, 200MHZ, 3.5A, 2012, H= .65
152S00714	152S00622	BOM_TABLE_ALTS	ALL	IND, 1UH, 180MHZ, 2.1A, 2012, H= .65
152S00716	152S00626	BOM_TABLE_ALTS	ALL	IND, 1UH, 780MHZ, 2.5A, 2012, H= .80
152S00717	152S00631	BOM_TABLE_ALTS	ALL	IND, 1UH, 600MHZ, 3.2A, 2016, H= .80
152S00718	152S00632	BOM_TABLE_ALTS	ALL	IND, 1UH, 520MHZ, 3.2A, 2016, H= .80
152S00719	152S00639	BOM_TABLE_ALTS	ALL	IND, 0.47UH, 100MHZ, 3.5A, 2012, H= .65
152S00720	152S00640	BOM_TABLE_ALTS	ALL	IND, 0.47UH, 100MHZ, 3.5A, 2012, H= .65
152S00721	152S00641	BOM_TABLE_ALTS	ALL	IND, 1UH, 600MHZ, 3.5A, 2016, H= .80
155S00338	155S0061	BOM_TABLE_ALTS	ALL	FERR BD, 330OH, 1.5A, 500MHZ DCR, 0201
155S00340	155S00876	BOM_TABLE_ALTS	ALL	FERR BD, 330OH, 1.5A, 500MHZ DCR, 0201
155S00339	155S0060	BOM_TABLE_ALTS	ALL	FERR BD, 220OH, 1.5A, 400MHZ DCR, 0201

BUCK3 Slave

BUCK1 Slave

BUCK3/5/10

Ansil L

BUCK2/4/11 Master

BUCK3/7

BUCK1 Slave

Boost Alt

BUCK1 Master

Multi-Vendor Criticals

CRITICAL PART#	COMMENT	CRITICAL PART#	COMMENT
377S0106	SUPPR, TRANS, VARISTOR, 12V, 33PF, 01005	132S0288	CAP, CER, X5R, 0.1UF, 10%, 16V, 0201
197S0446	XTAL, 24MHZ, 30PPM, 9.5PF, 60 OHM MAX, 1612	132S0275	CAP, CER, X5R, 470PF, 10%, 10V, 01005
155S00576	FERR BD, 10 OHM, 50%, 750MA, 0.07 DCR, 01005	132S0249	CAP, CER, X7R, 220PF, 10%, 10V, 01005
155S00168	FLTR, NOISE, 65 OHMZ, 3.40MM, 0.7-2GHZ, 8665	132S0245	CAP, CER, X5R, 0.1UF, 10%, 6.3V, 01005
138S0979	CAP, CER, X5R, 10UF, 20%, 10V, 0402, H=0.65MM	132S00093	CAP, X5R, 0.022UF, 20%, 6.3V, 01005
138S0692	CAP, CER, X5R, 1UF, 20%, 6.3V, 0201	132S00025	CAP, CER, X5R, 0.047UF, 20%, 6.3V, 01005
138S0683	CAP, CER, X5R, 1UF, 10%, 25V, 0402	132S00008	CAP, CER, 0.1UF, 10%, 50V, X7R, 0402
138S0652	CAP, CER, X5R, 4.7UF, 20%, 6.3V, H=0.65MM, 0402	131S00883	CAP, CER, NP0/C0G, 220PF, 2%, 50V, 0201
138S00070	CAP, X5R, 4.7UF, 20%, 25V, 0402	131S00064	CAP, CER, 27PF, 5%, C0G, 25V, 0201
138S00014	CAP, CER, 1UF, 20%, 16V, X5R, 0201, H=0.39MM	131S00307	CAP, CER, NP0/C0G, 100PF, 5%, 16V, 01005
132S00664	CAP, CER, 0.047UF, 10%, 25V, X5R, 0201	131S02225	CAP, CER, NP0/C0G, 15PF, 5%, 16V, 01005
132S00663	CAP, CER, X5R, 1UF, 10%, 25V, 0402	131S02223	CAP, CER, NP0/C0G, 27PF, 5%, 16V, 01005
132S00534	CAP, CER, X5R, 0.1UF, 10%, 25V, 0201	131S02220	CAP, CER, NP0/C0G, 12PF, 5%, 16V, 01005
132S0436	CAP, CER, X5R, 0.22UF, 20%, 6.3V, 01005	131S02216	CAP, CER, NP0/C0G, 47PF, 5%, 16V, 01005
132S0396	CAP, CER, X5R, 1000PF, 10%, 10V, 01005	131S00053	CAP, CER, C0G, 220PF, 5%, 10V, 01005
132S0316	CAP, CER, X5R, 0.1UF, 20%, 6.3V, 01005	118S00068	RES, MF, 3.3 MOHM, 1%, 200PPM, 1/20W, 0201
132S0304	CAP, CER, X5R, 0.22UF, 20%, 6.3V, 0201	117S00055	RES, MF, 1/20W, 2M OHM, 5, 0201, SMD
132S0296	CAP, CER, X5R, 1000PF, 10%, 6.3V, 01005	107S0257	THERMISTOR, NTC, 10K OHM, 1%, B=3435, 01005

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
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

CRITICAL PART#	COMMENT
155S00610	FERR BD, 150OHM, 01005

CRITICAL PART#	COMMENT
152S00617	IND, MLD, 0.1UH, 20%, 3.5A, 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, 52MO, 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=0.6, 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=0.9MM, 2016
152S00651	IND, 1.2UH, 3A, 2016, 0.65Z
152S00650	IND, 0.47UH, 6.6A, 3225, 0.8Z

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		SHEET	3 OF 81	

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7

6

5

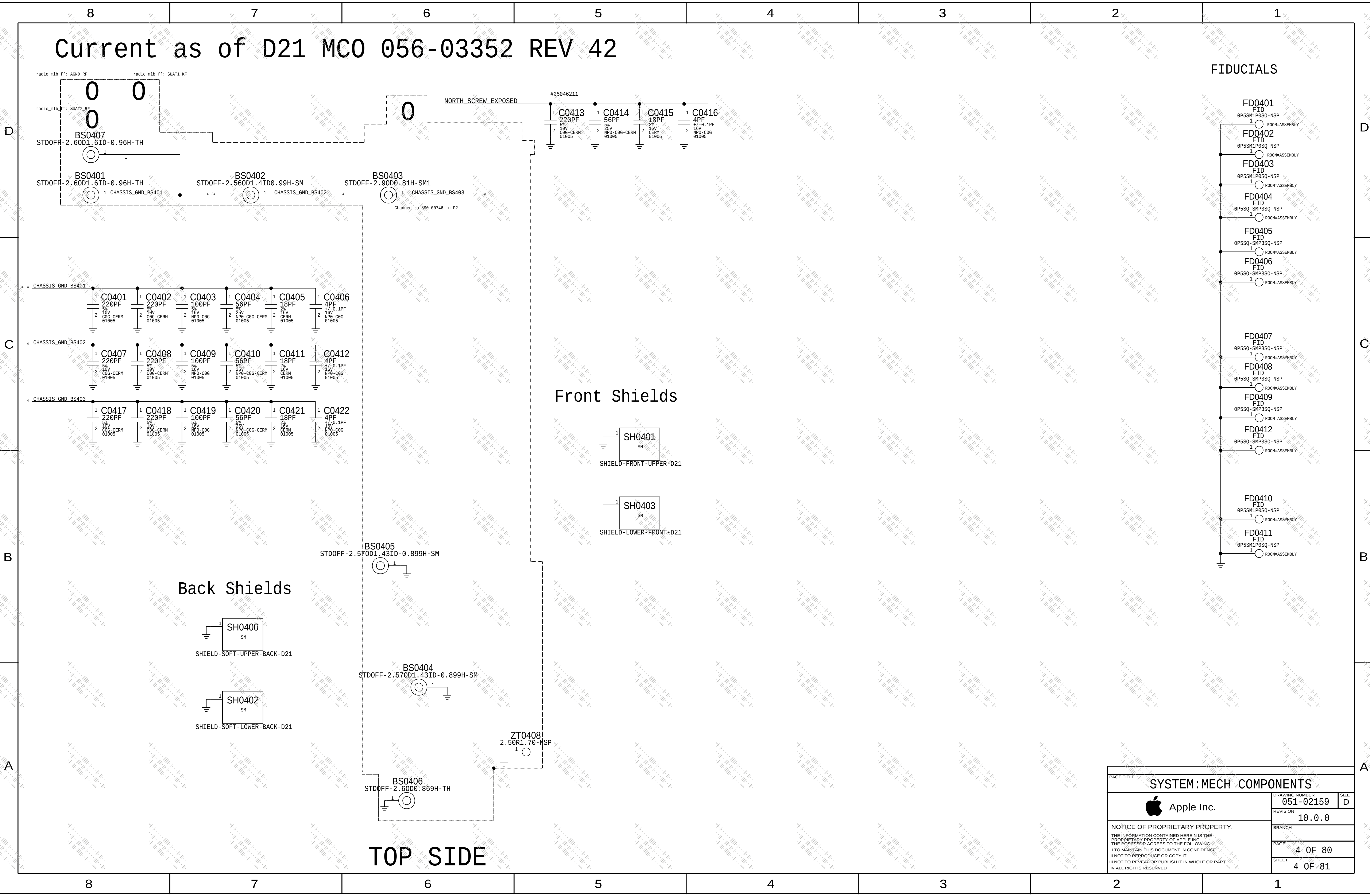
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3

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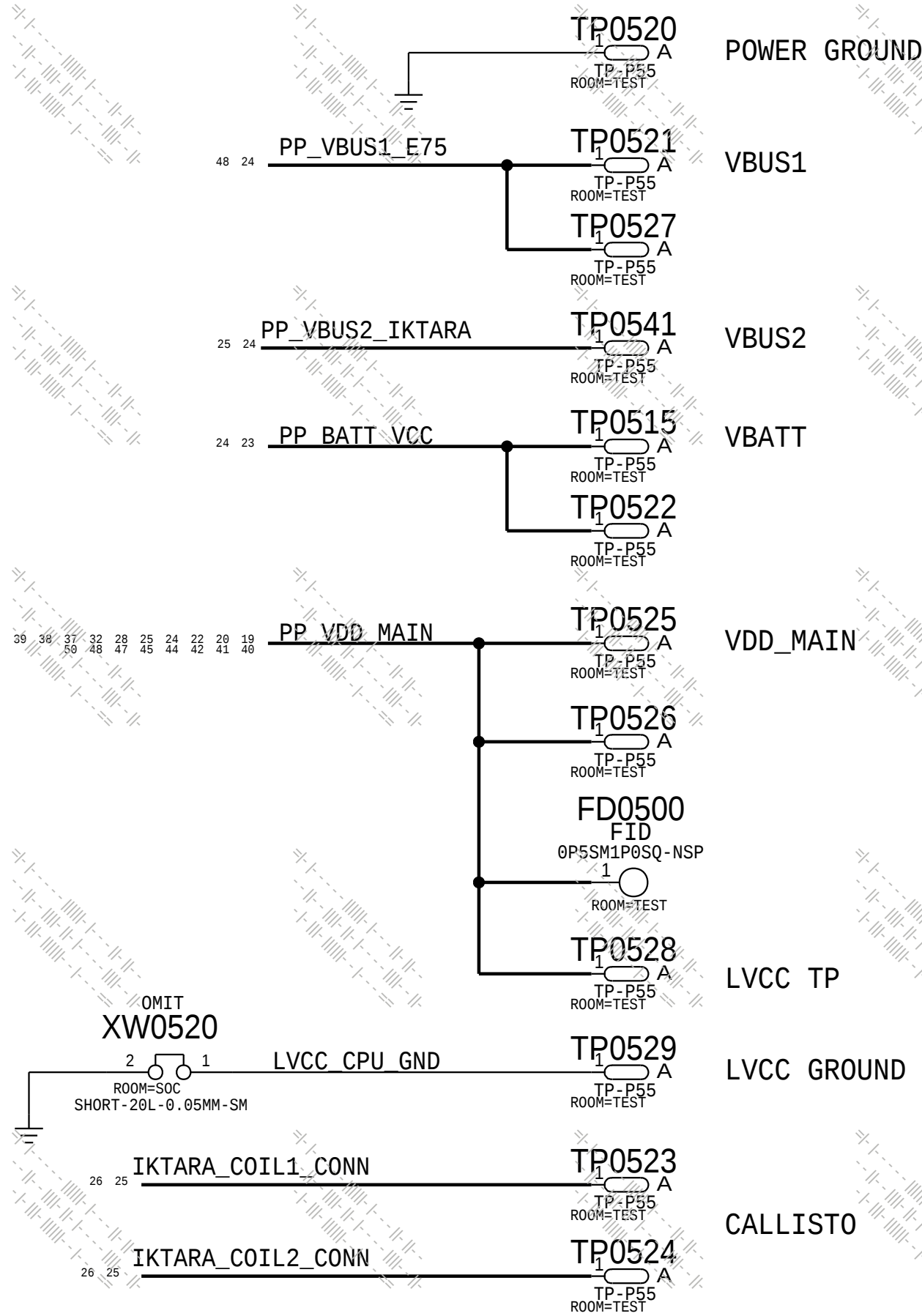
Current as of D21 MC0 056-03352 REV 42



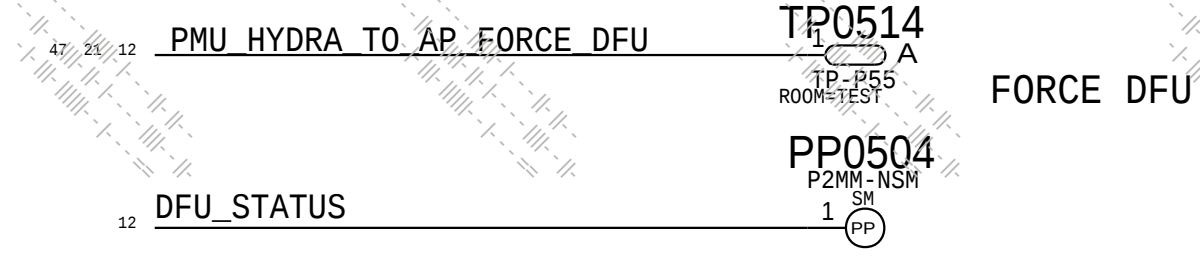
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SYSTEM:MECH COMPONENTS		
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Test Points

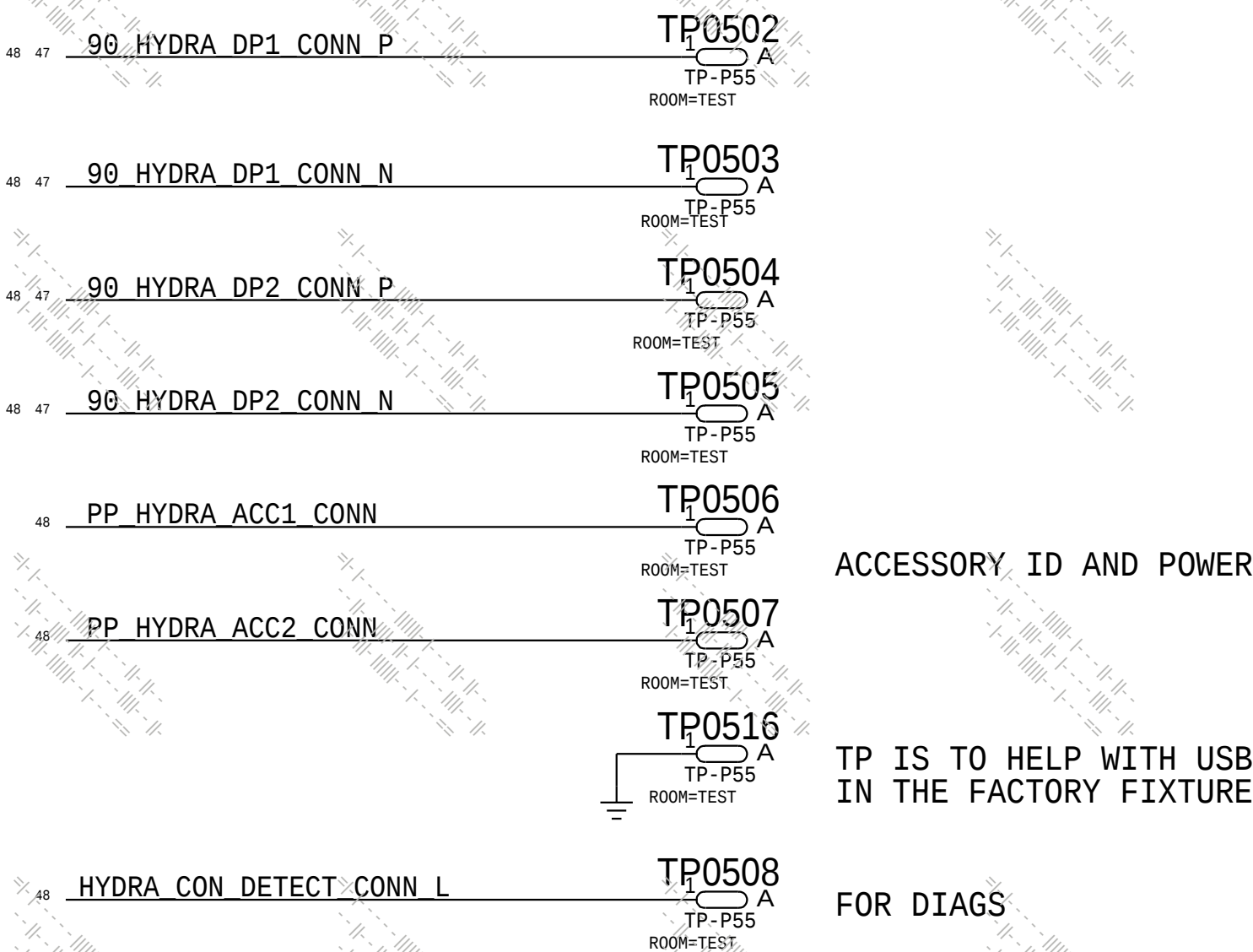
POWER



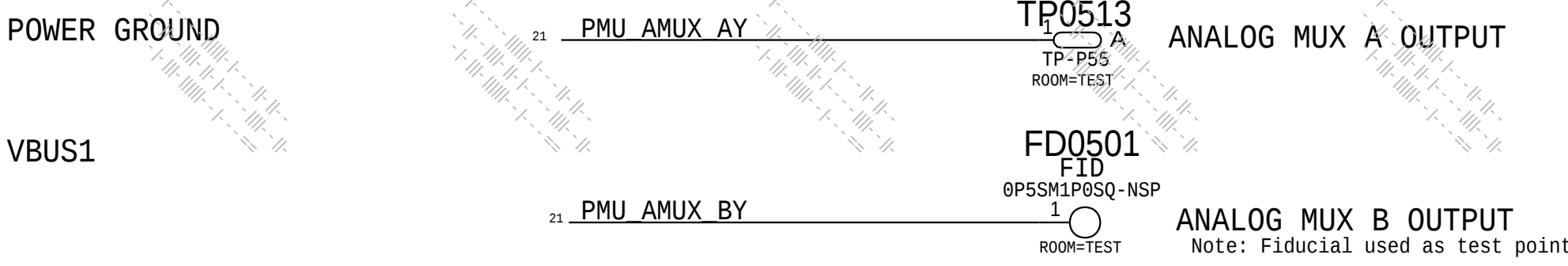
DFU



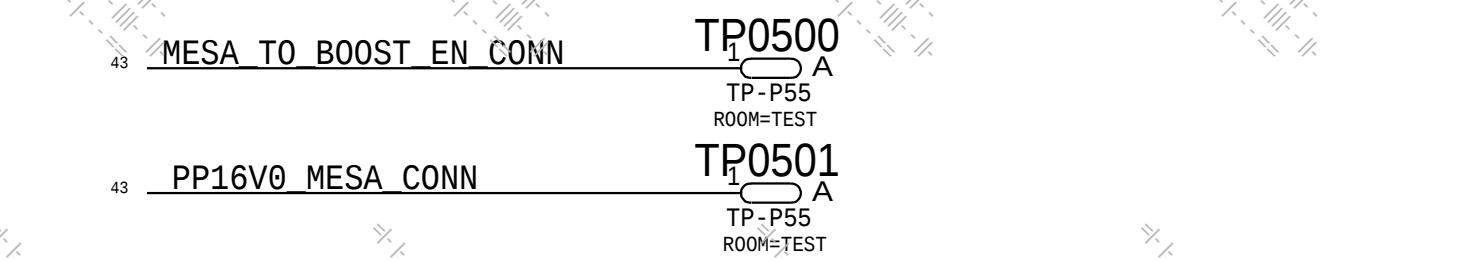
E75



AMUX



MOJAVE



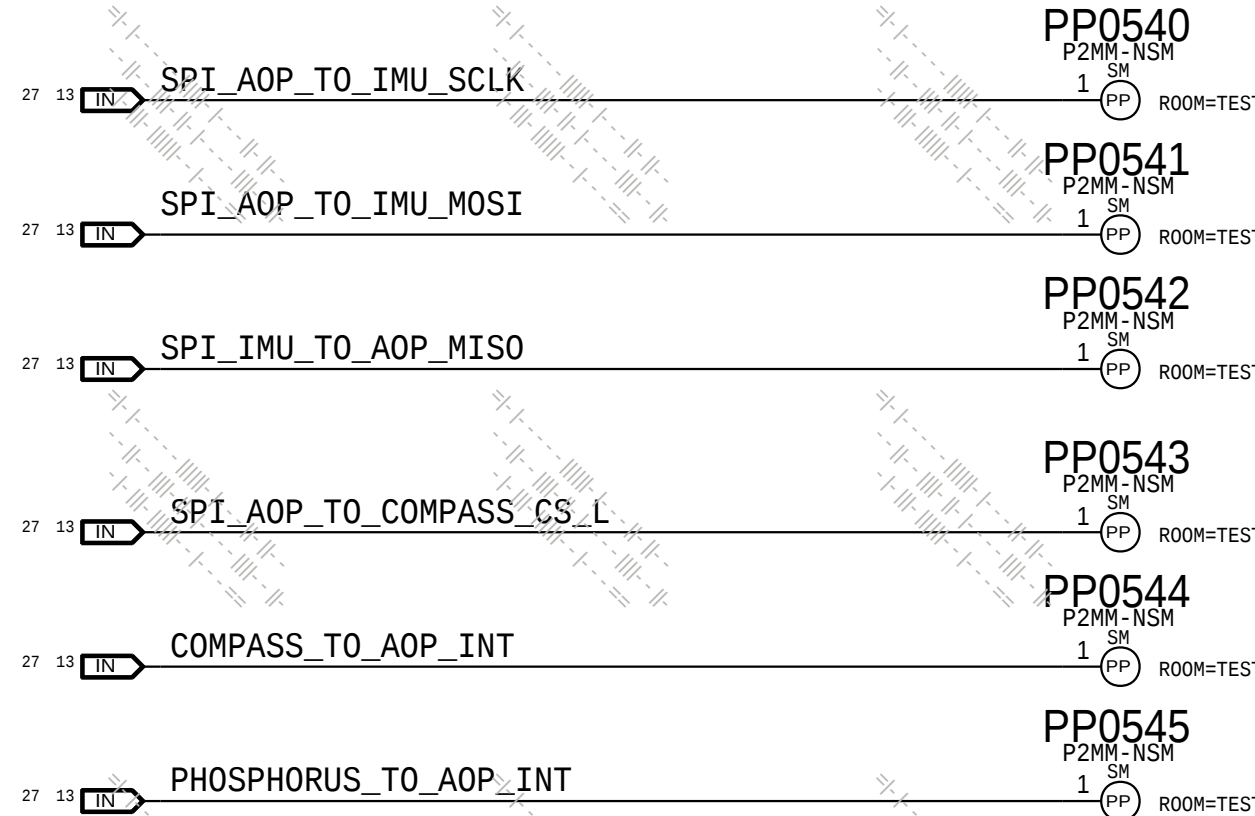
LCM



SENSE TP

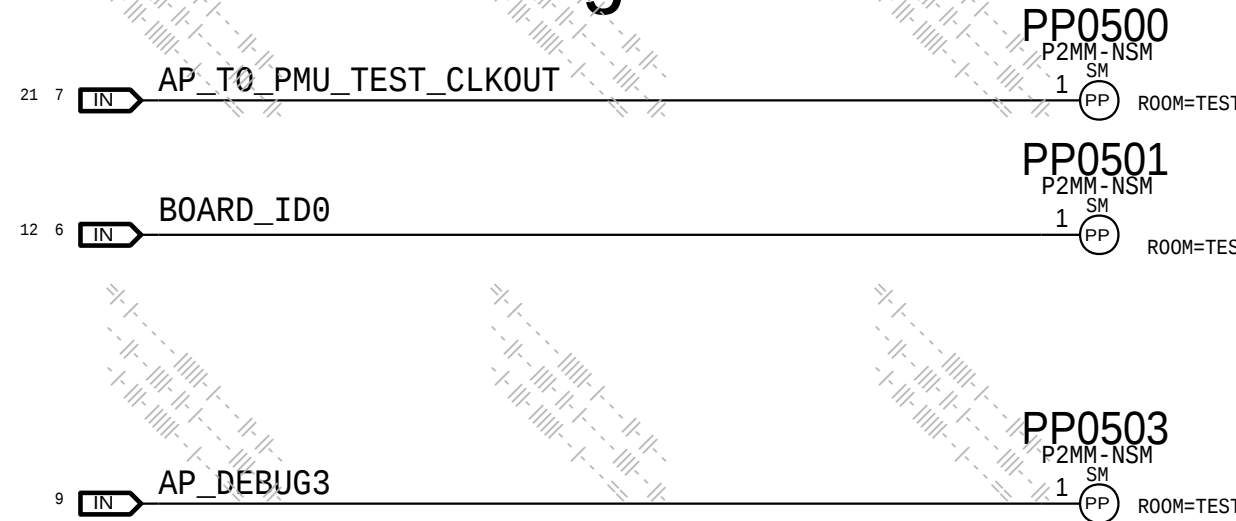


Sensor SPI

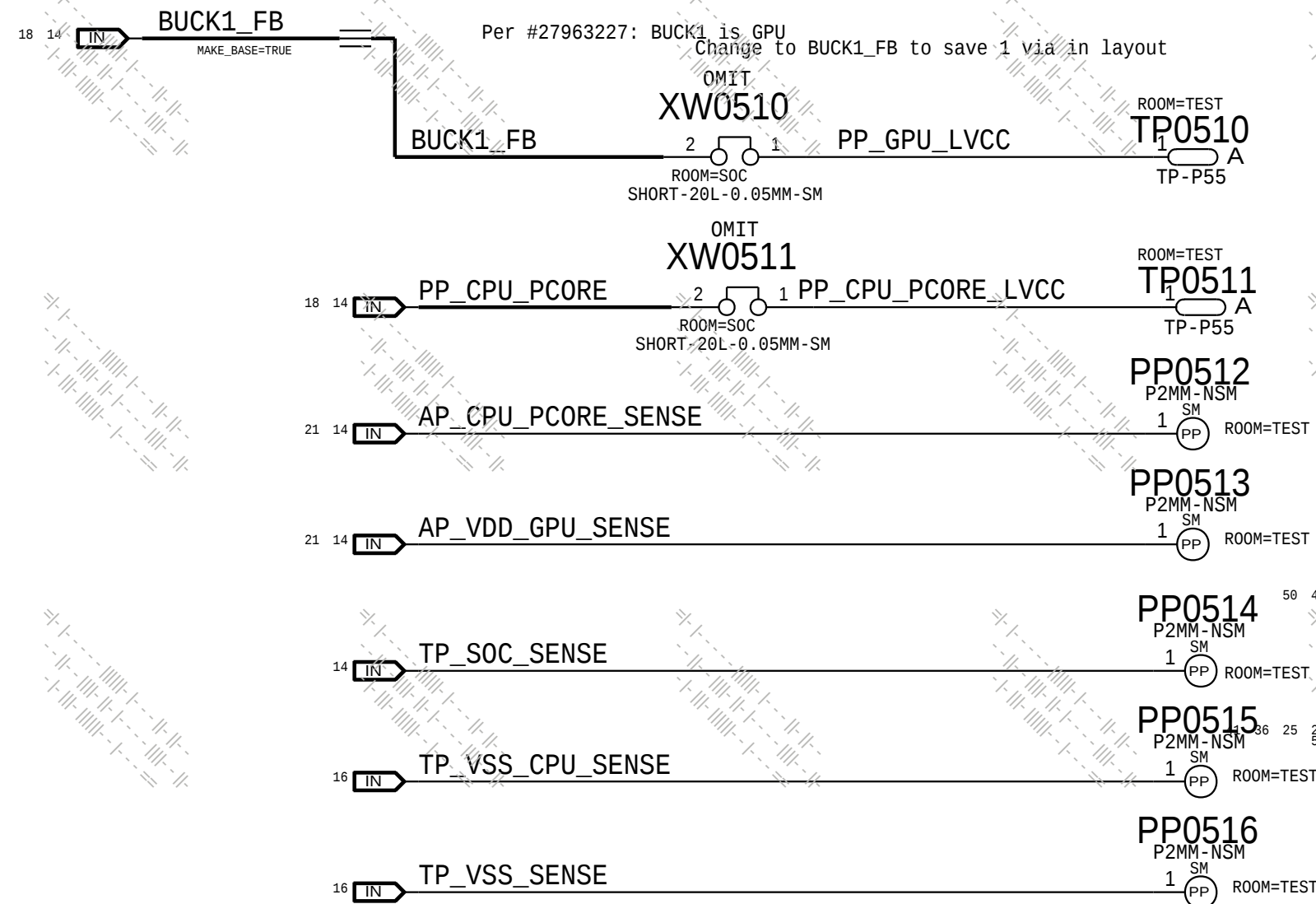


Probe Points

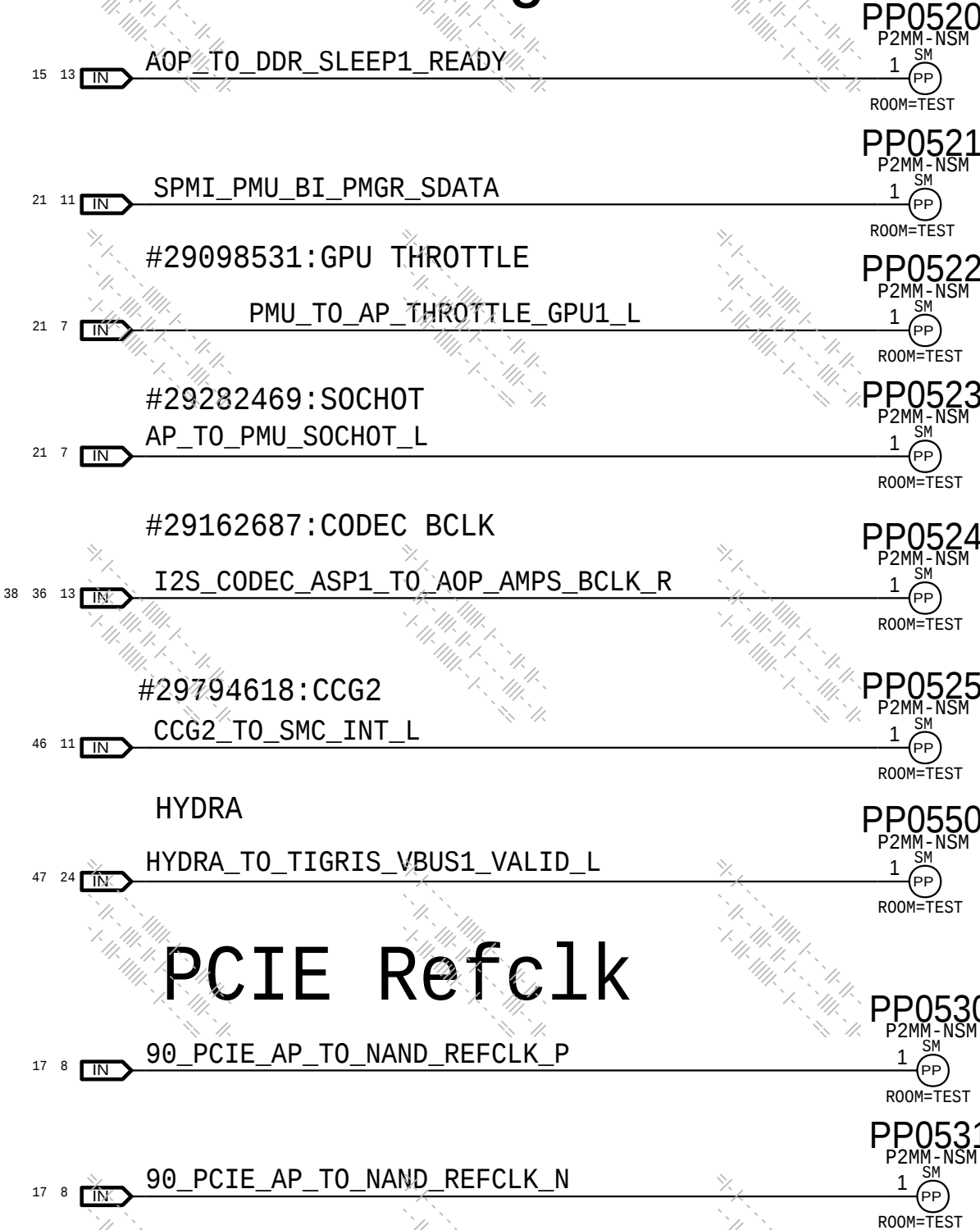
SOC Debug



SOC CPU/GPU

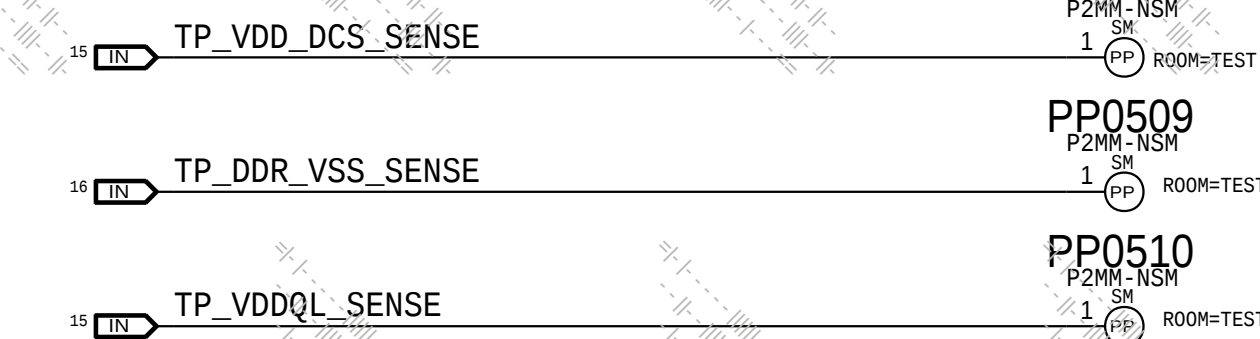


PMU Debug

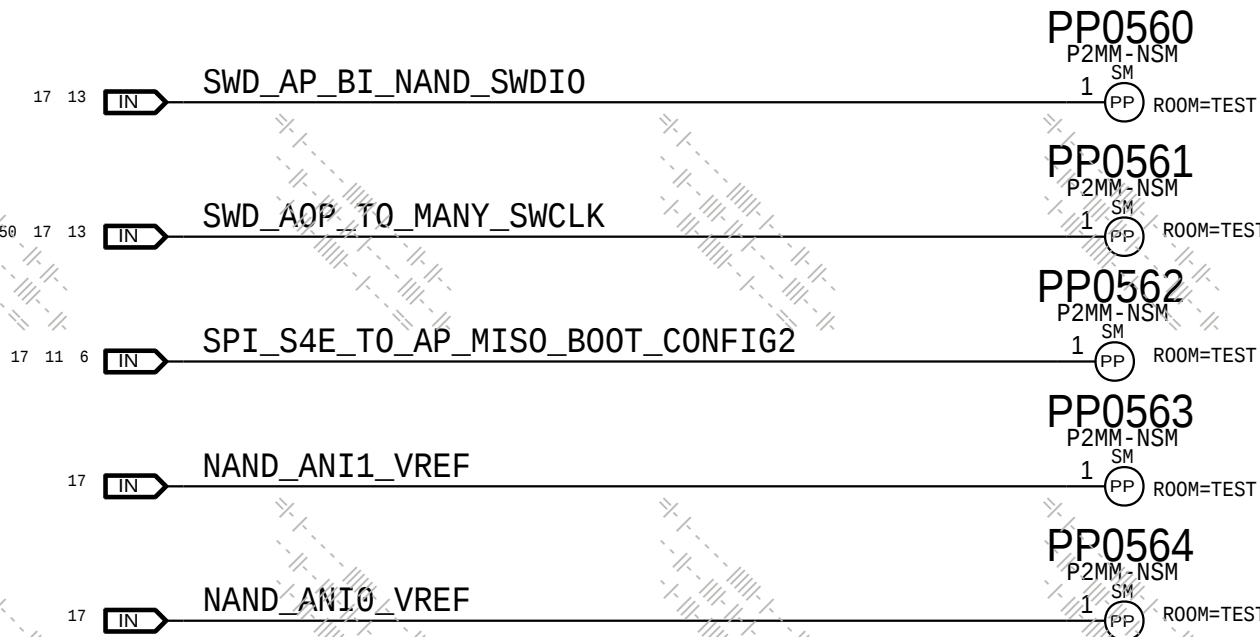


PCIE Refclk

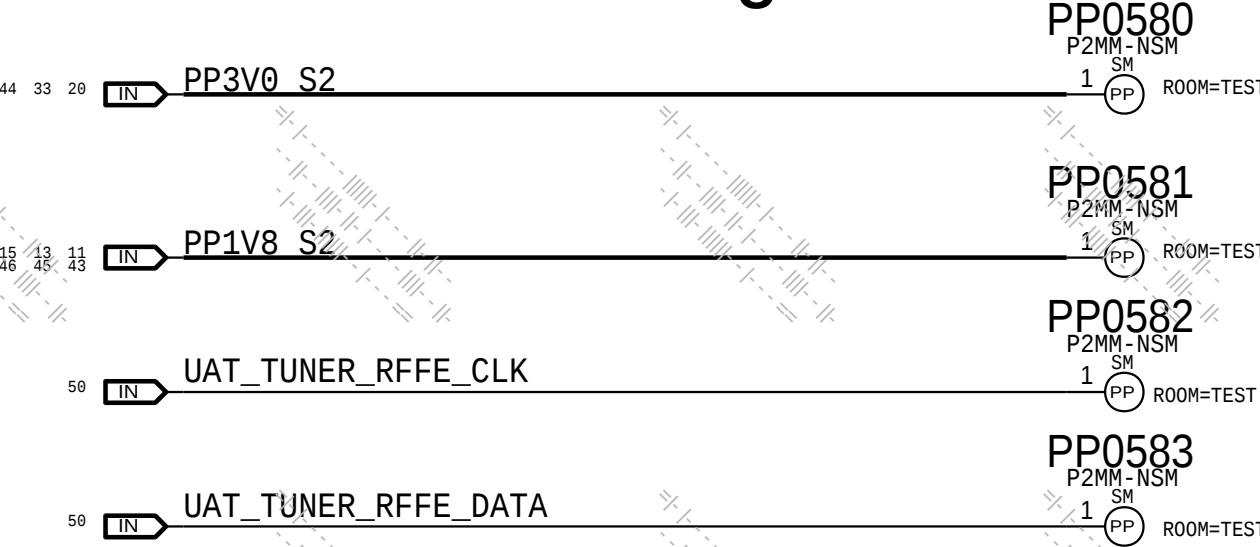
SOC DDR



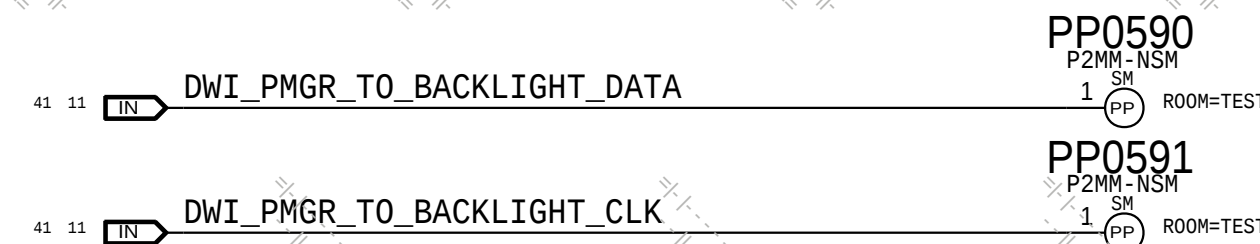
NAND Debug



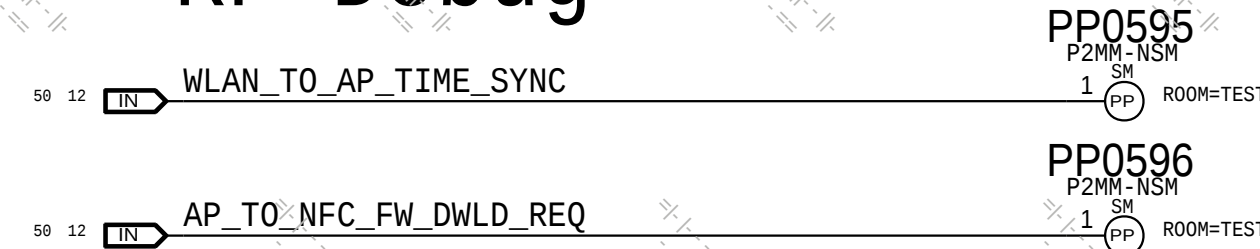
BB UAT Debug



BACKLIGHT Debug



RF Debug



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D



Note: Future board reys TBD

R

A

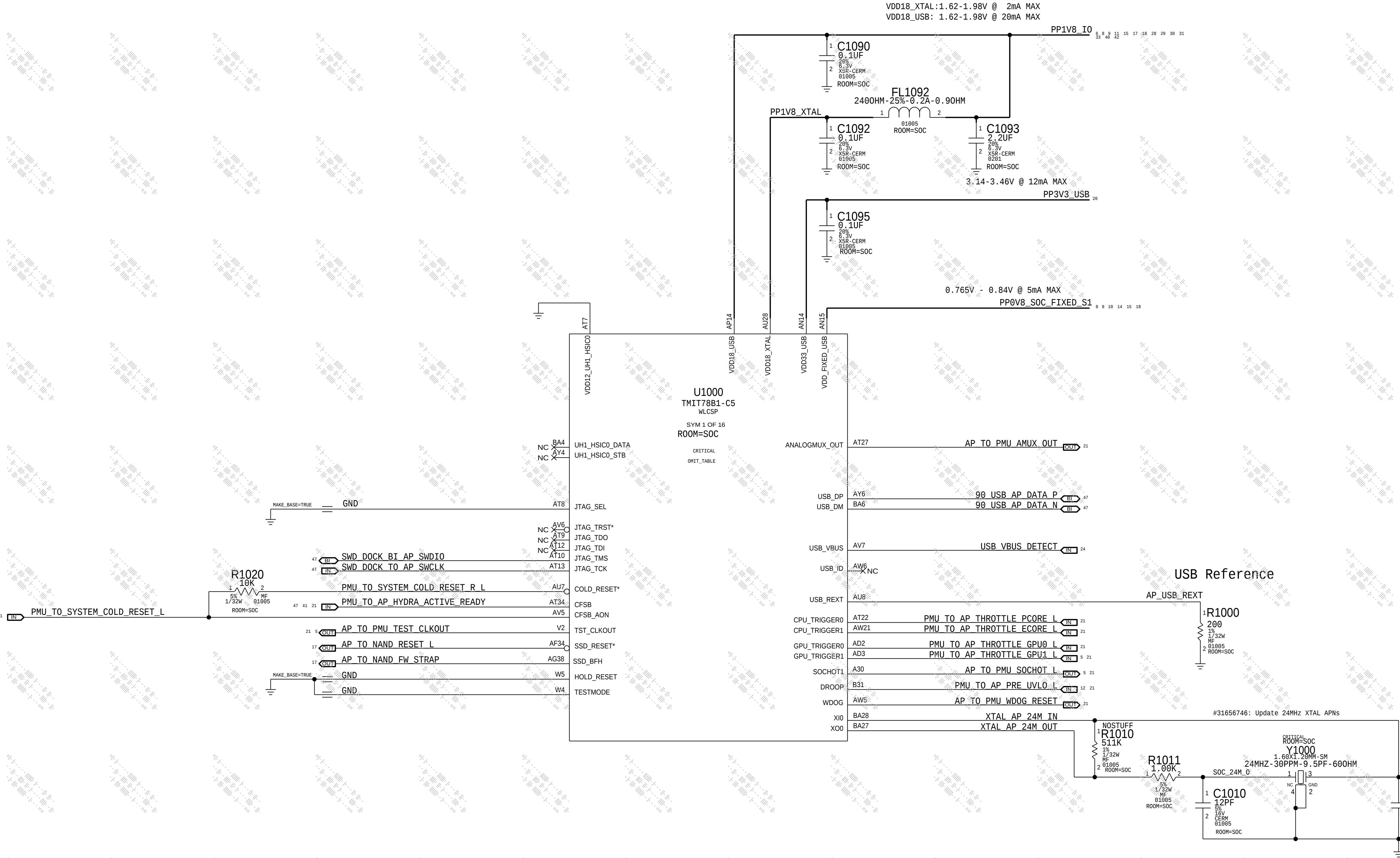
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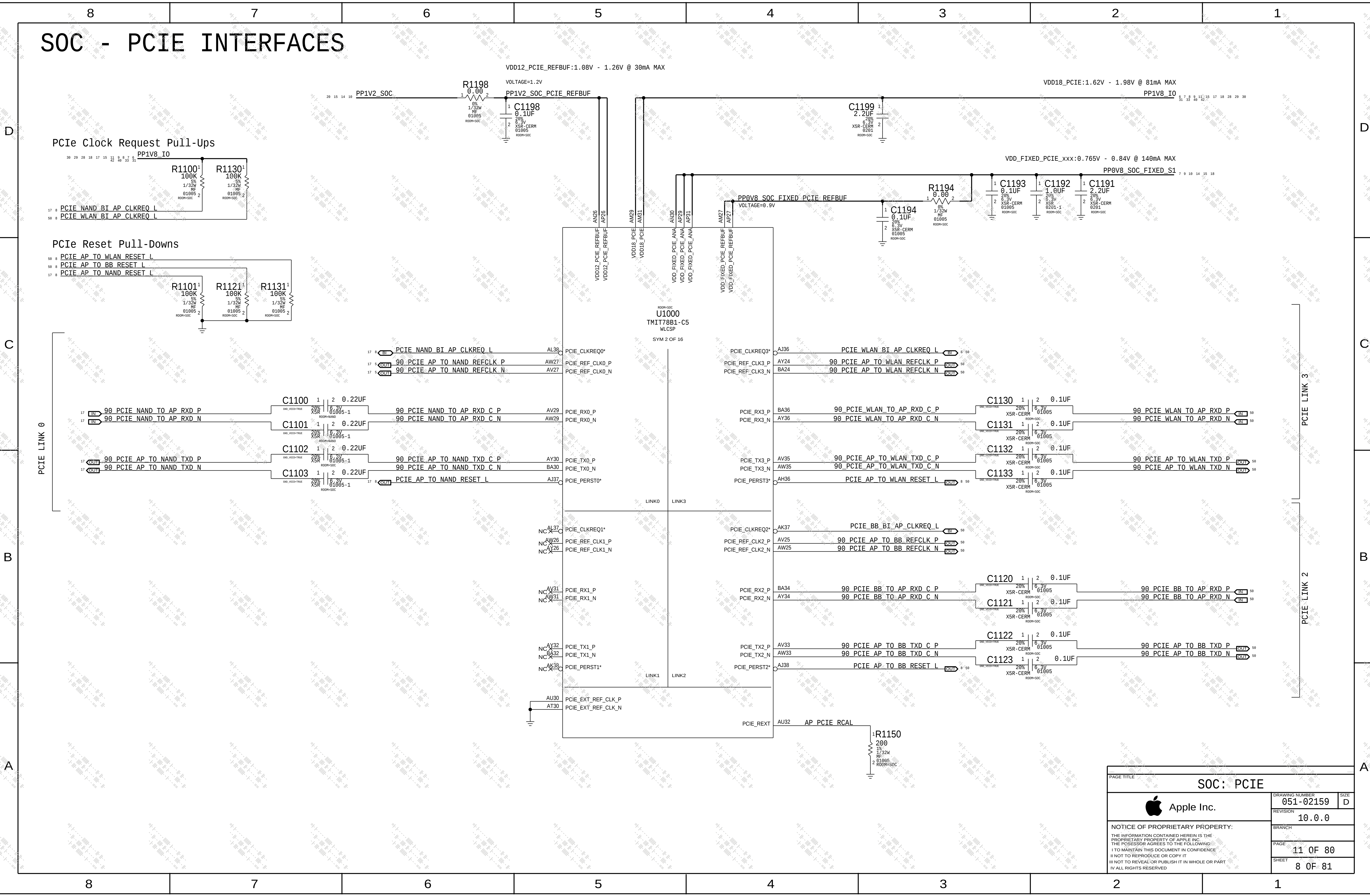
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SOC - USB, JTAG, XTAL

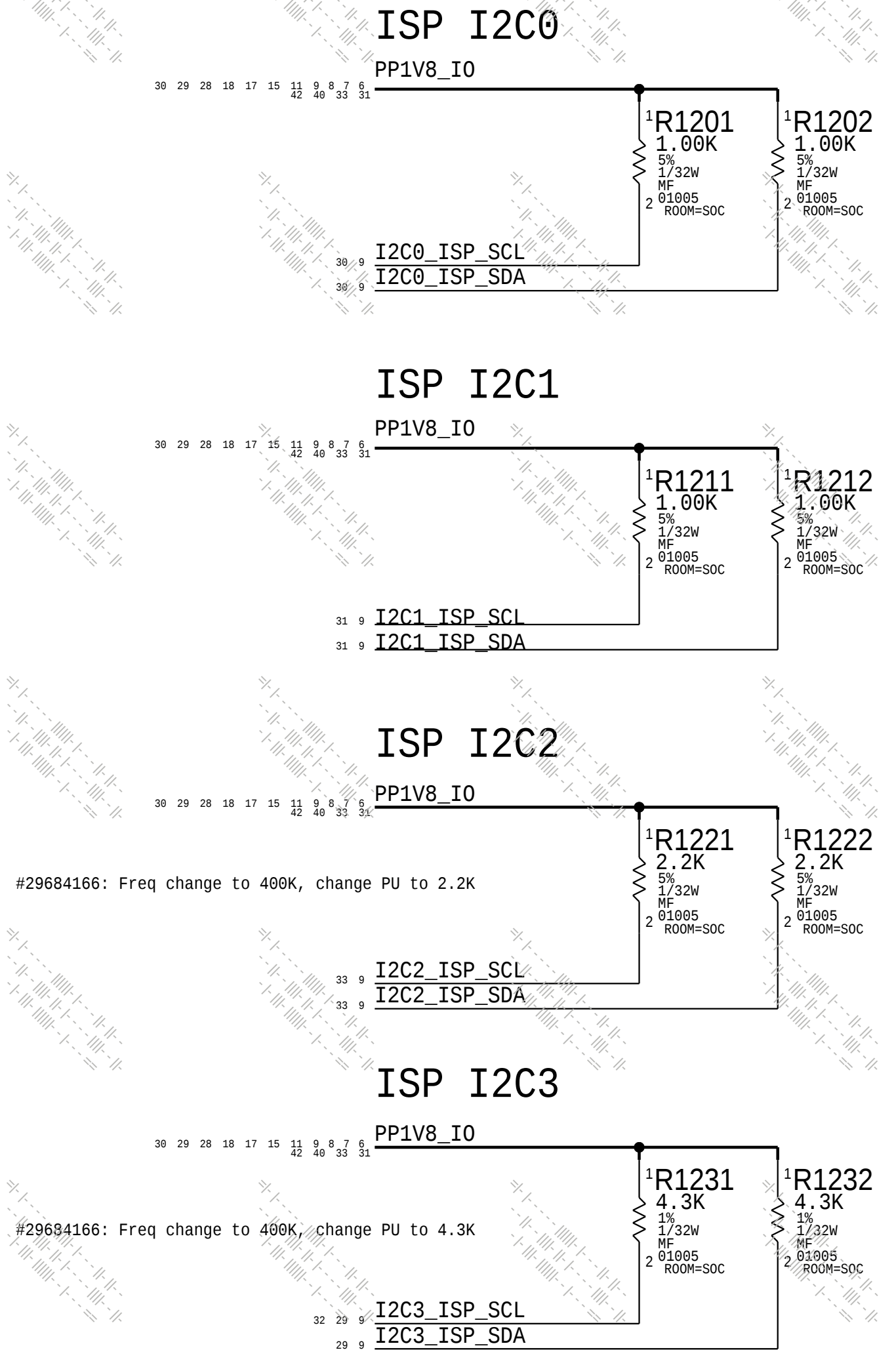
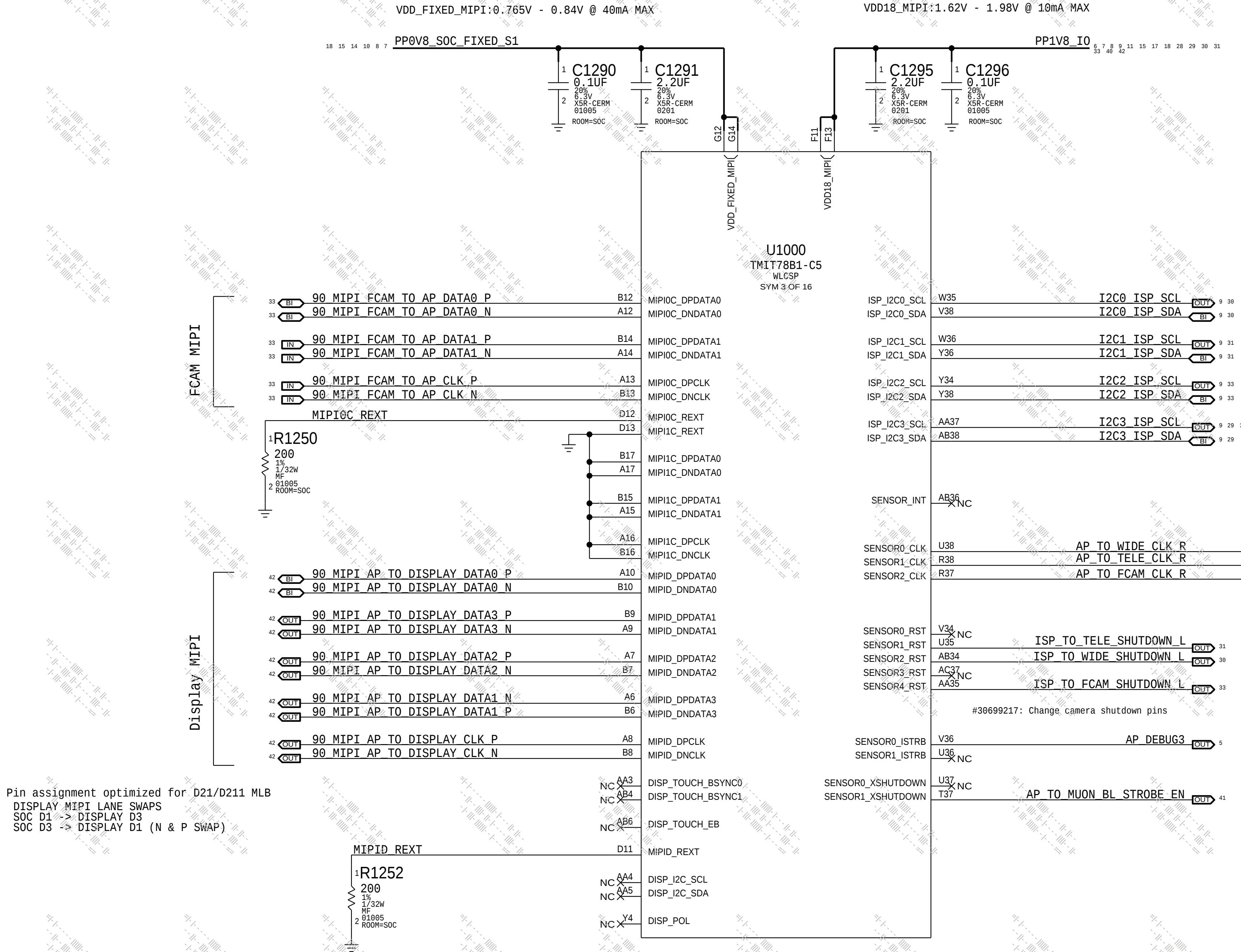


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SOC: JTAG,USB,XTAL		
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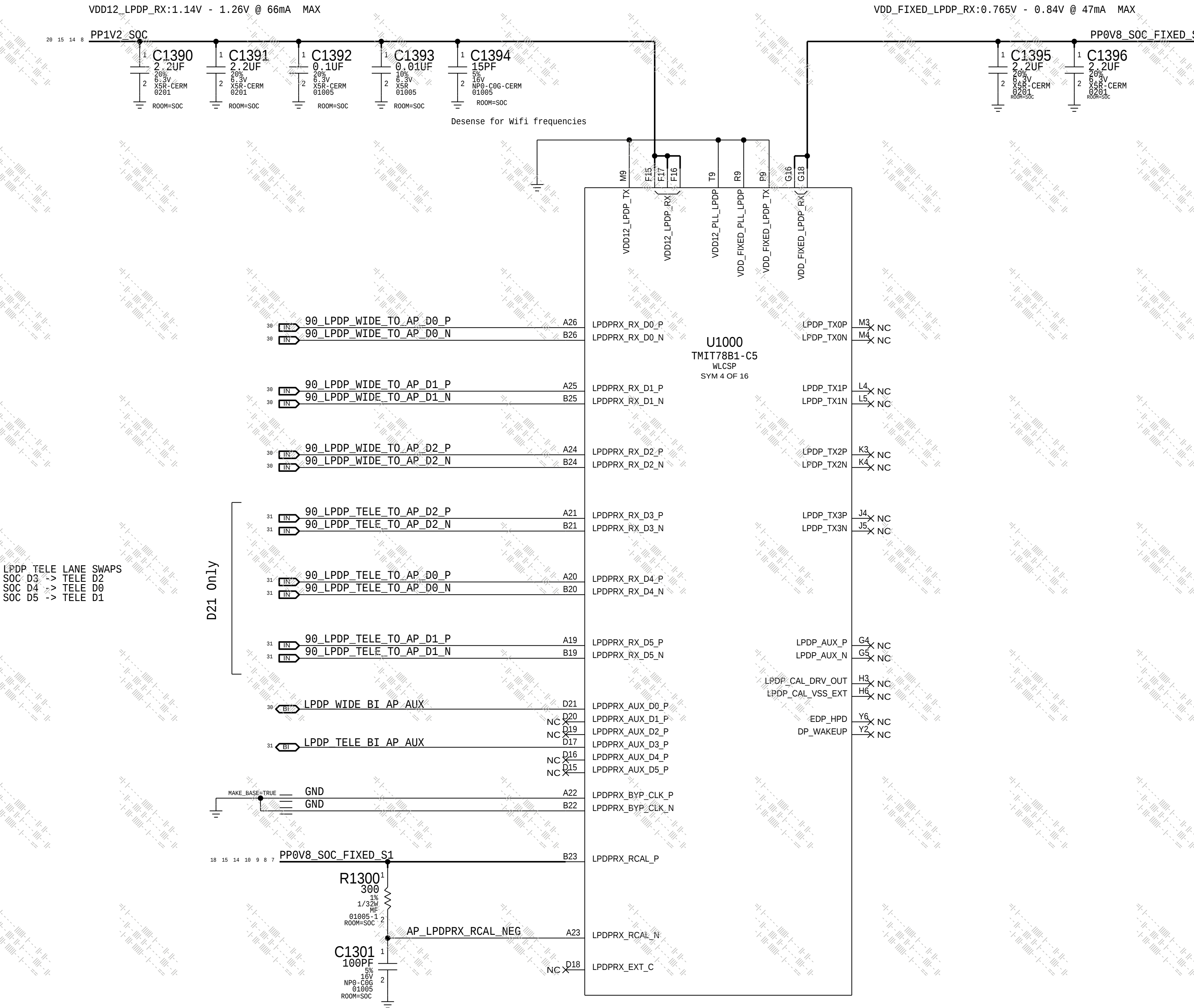
SOC - PCIE INTERFACES



SOC - MIPI & ISP INTERFACES



SOC - LPDP INTERFACES

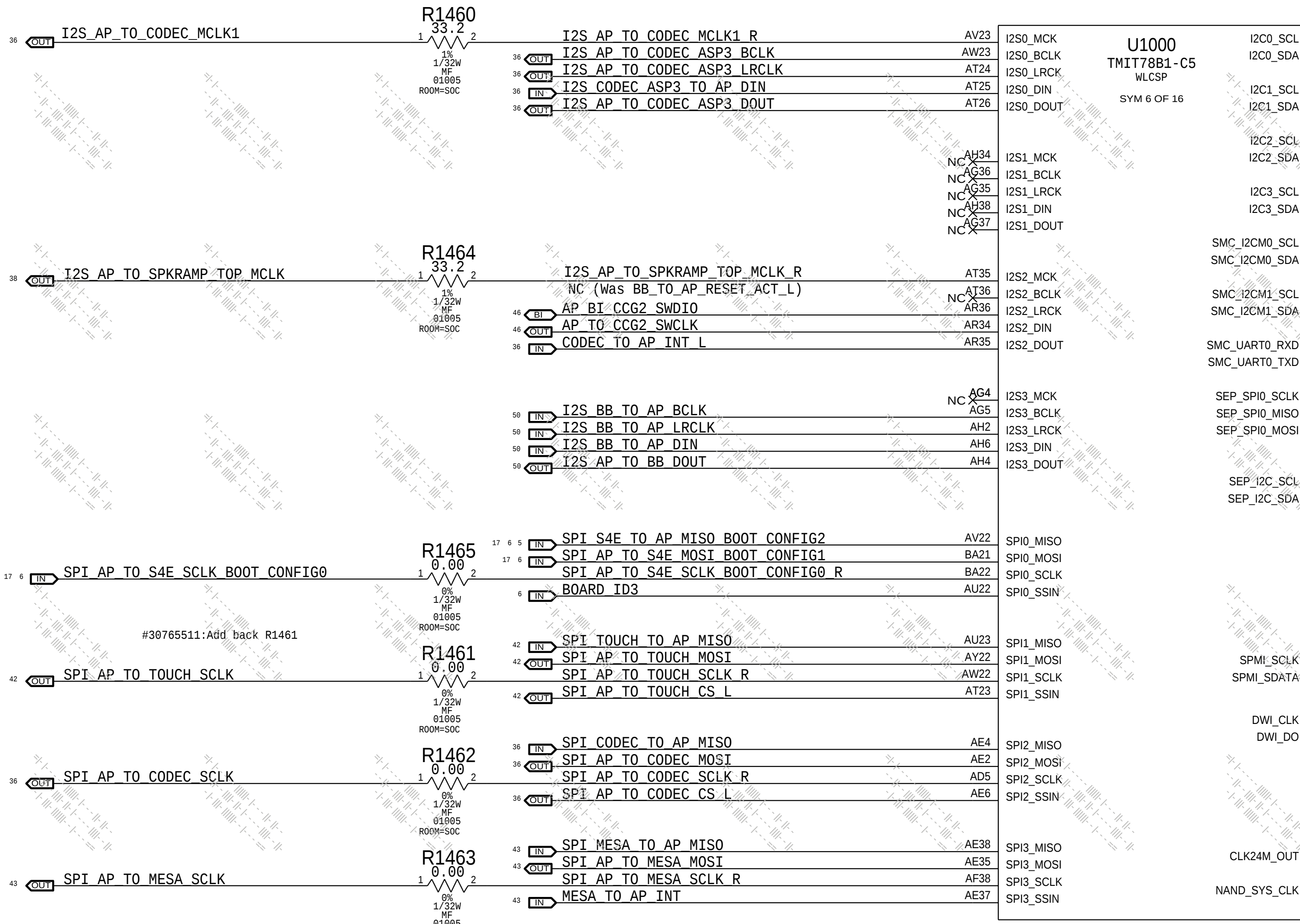


LPDP TELE LANE SWAPS
SOC D3 -> TELE D2
SOC D4 -> TELE D0
SOC D5 -> TELE D1

D21 Only

PAGE TITLE			SOC: LPDP		
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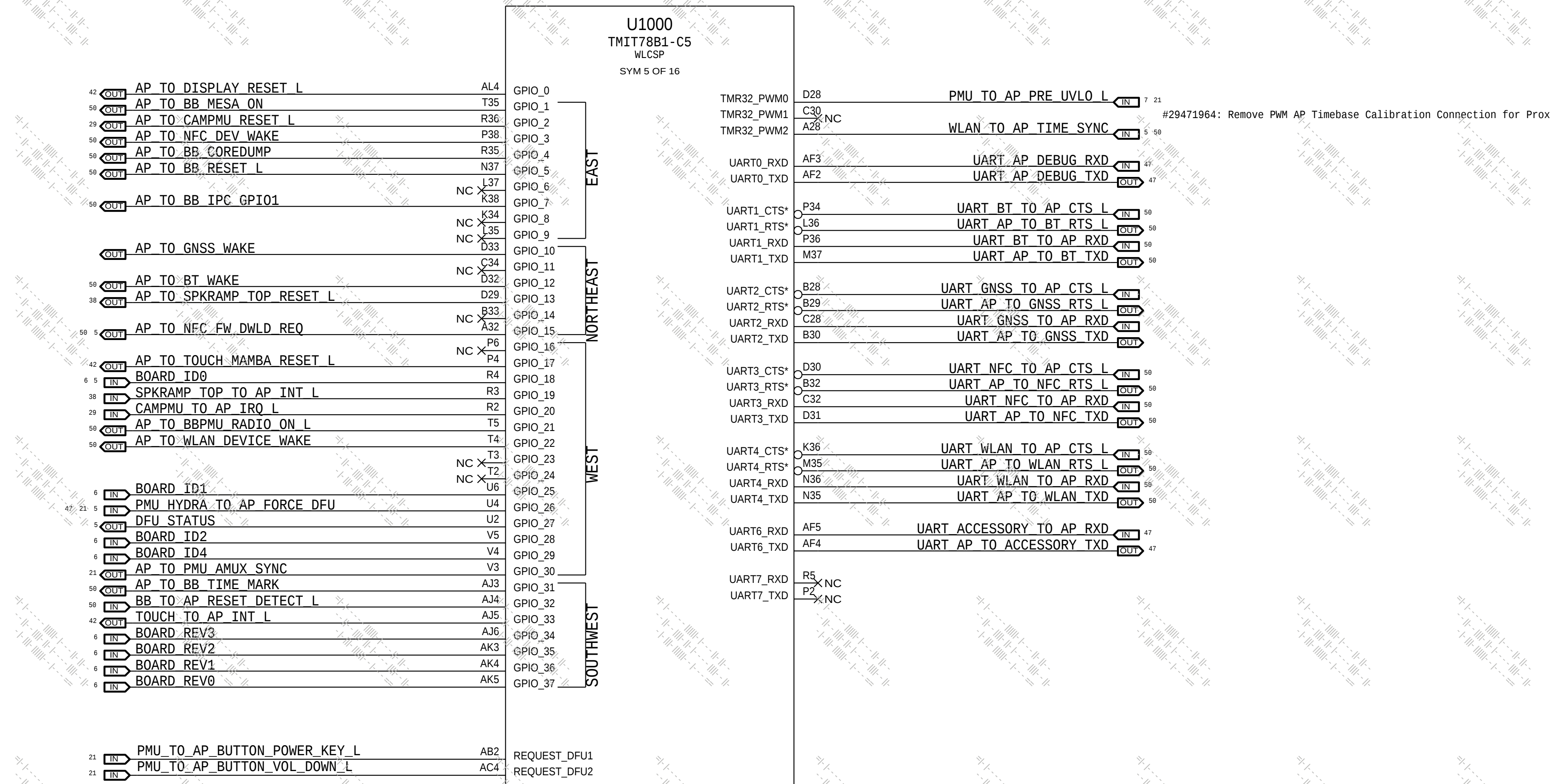
SOC - SERIAL INTERFACES



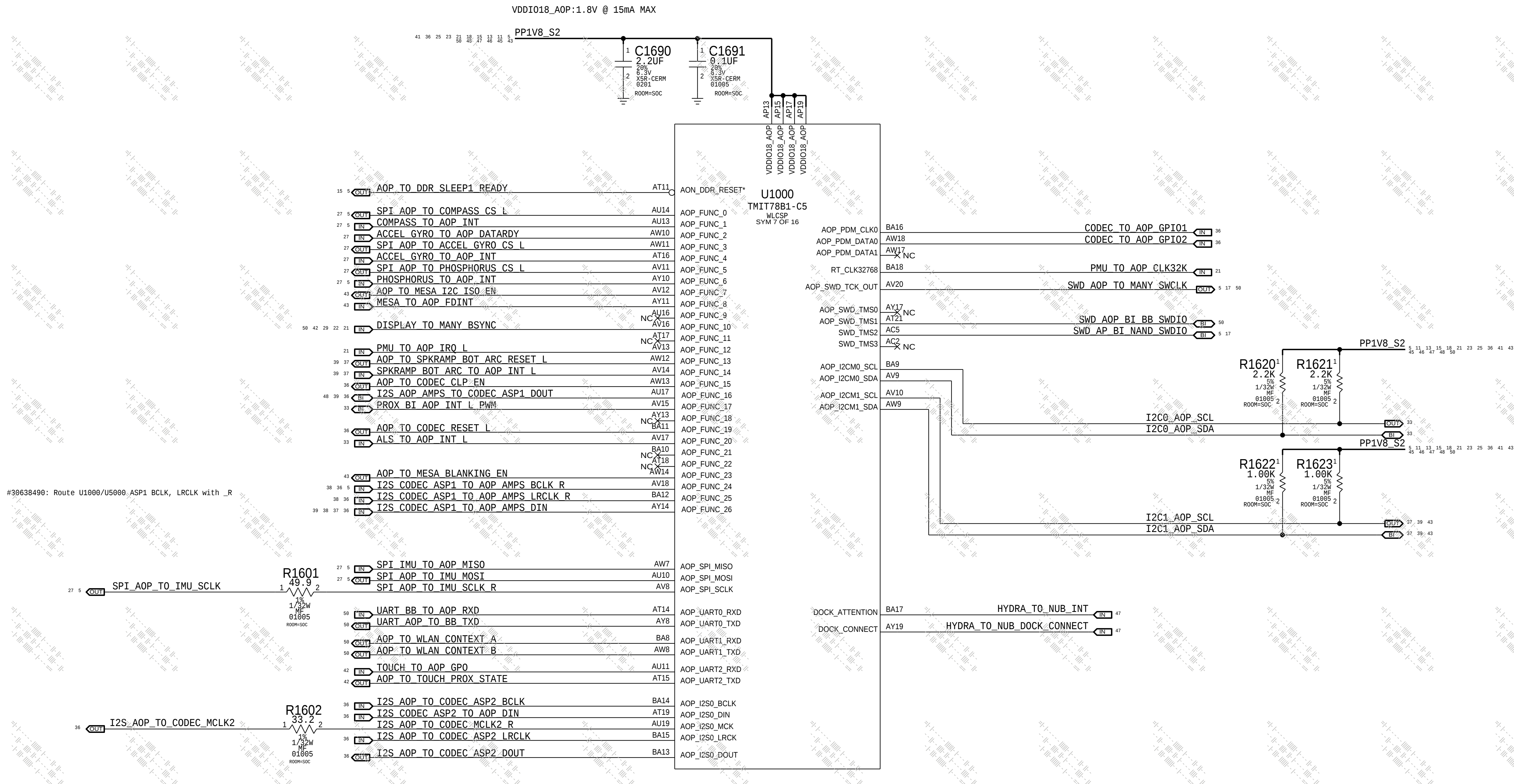
SPI: Route as Daisy-Chain (No T's Allowed)

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SOC: SERIAL + SMC		
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SOC - GPIO INTERFACES



SOC - AOP

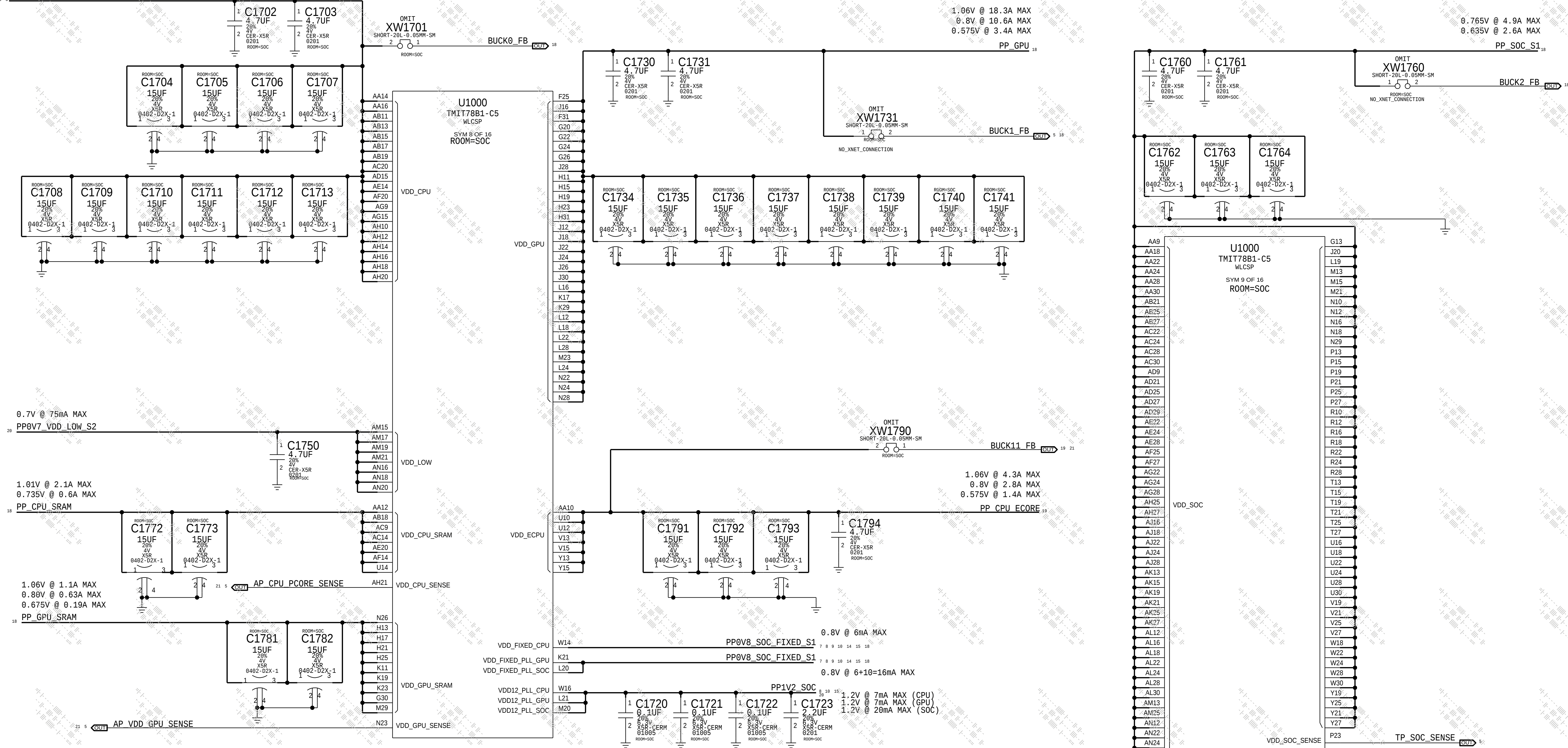


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SOC: AOP		
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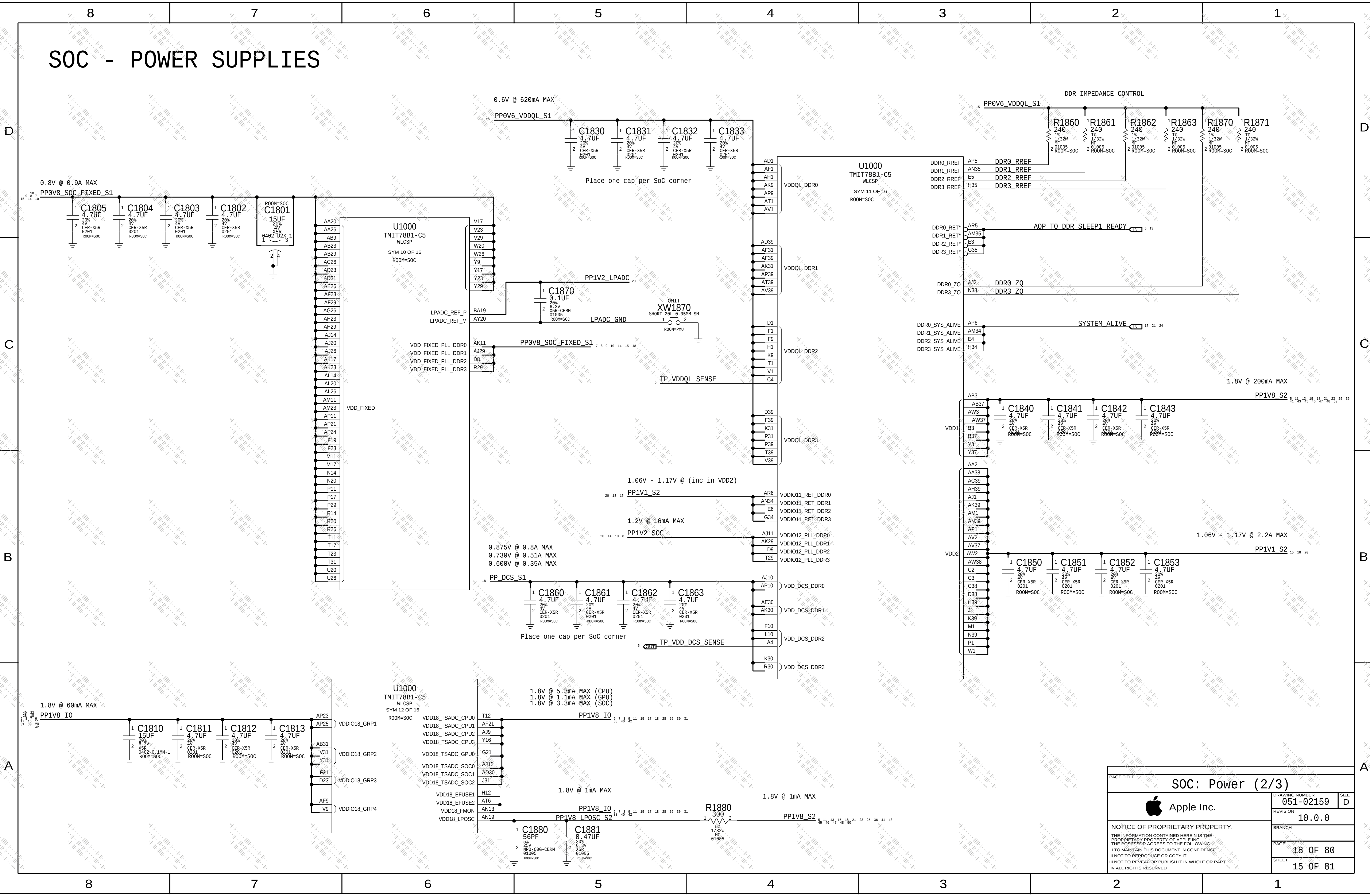
SOC - CPU, GPU & SOC RAILS

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

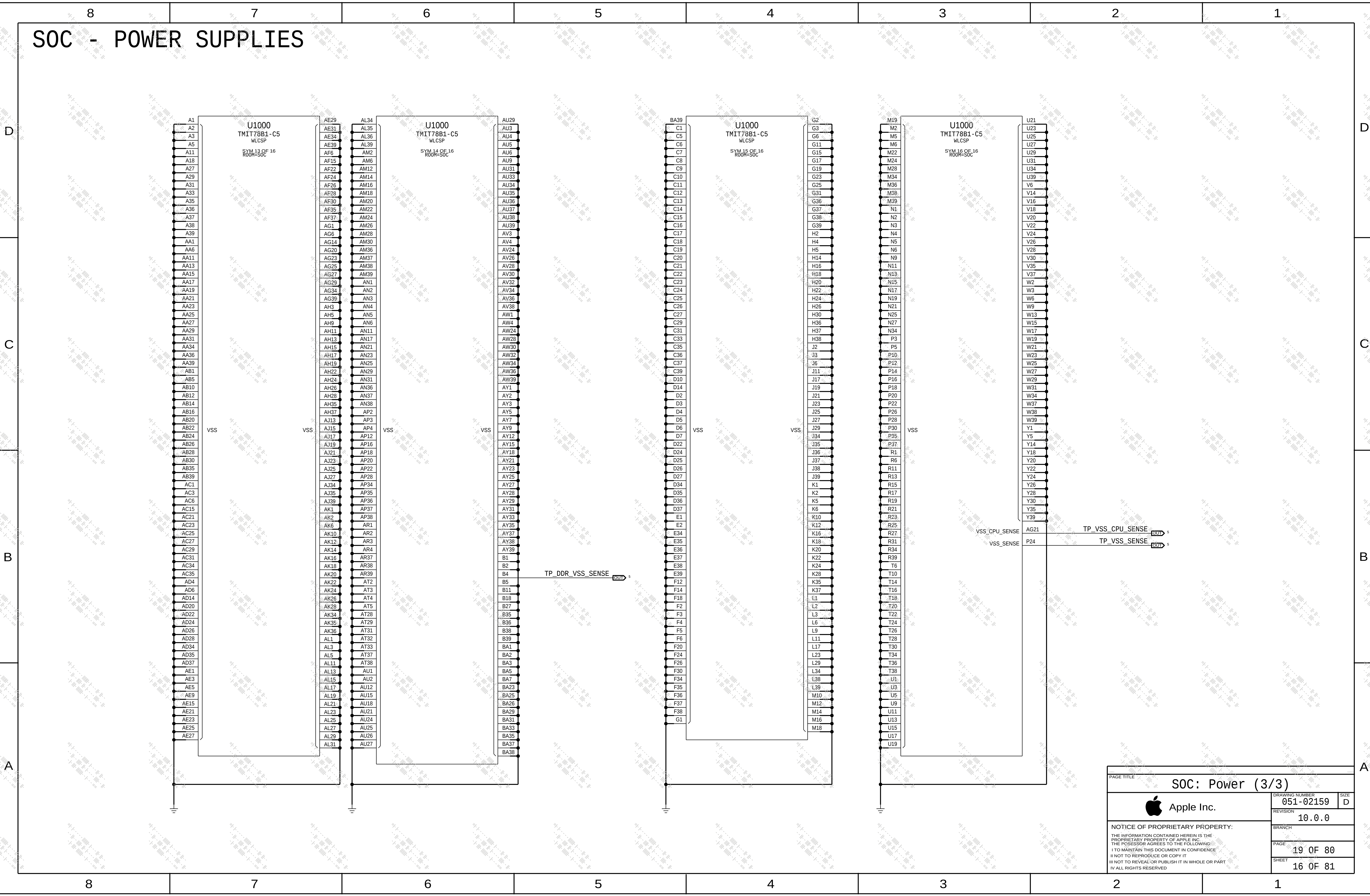
PP_CPU_PCORE

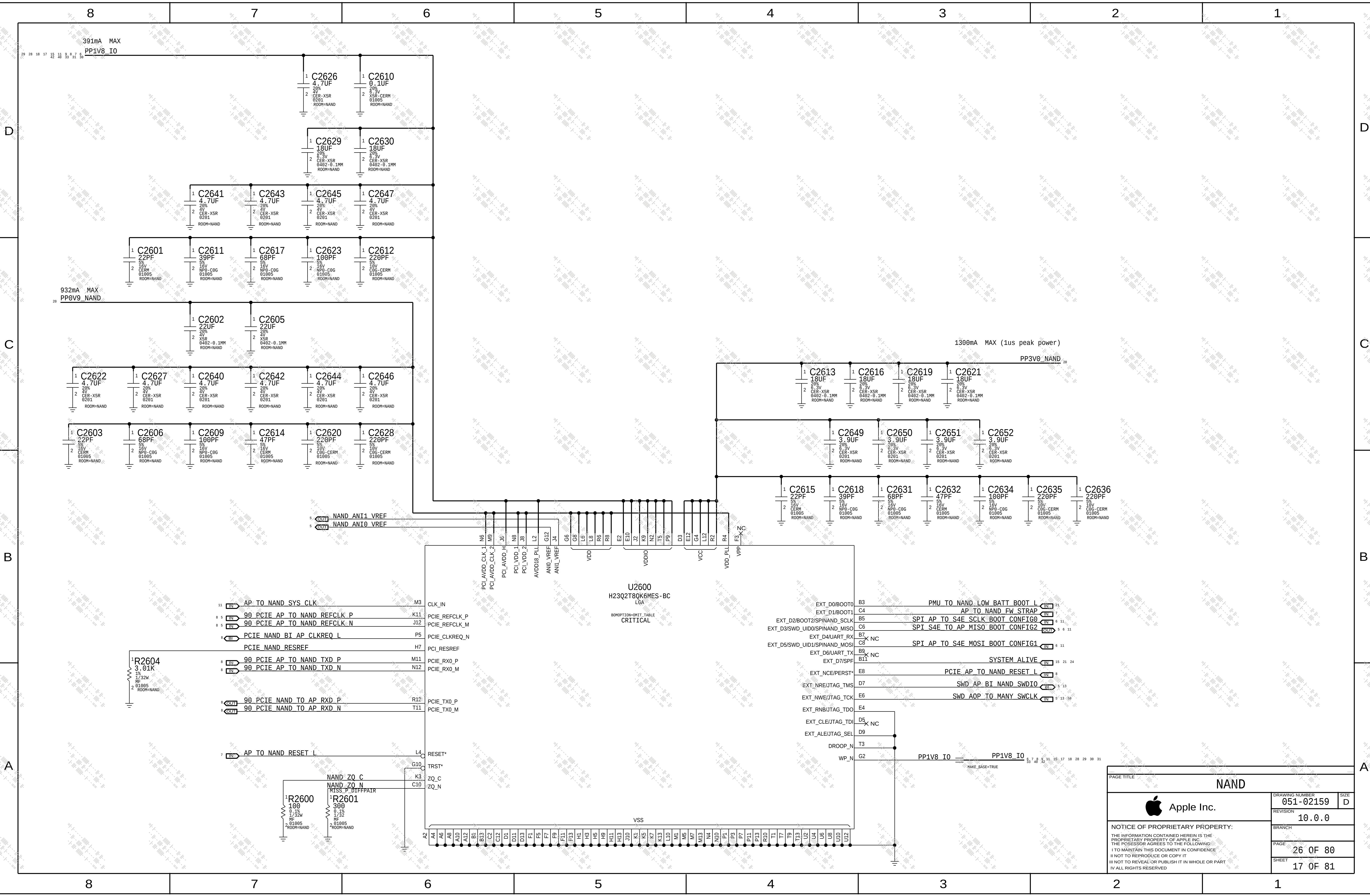


SOC - POWER SUPPLIES

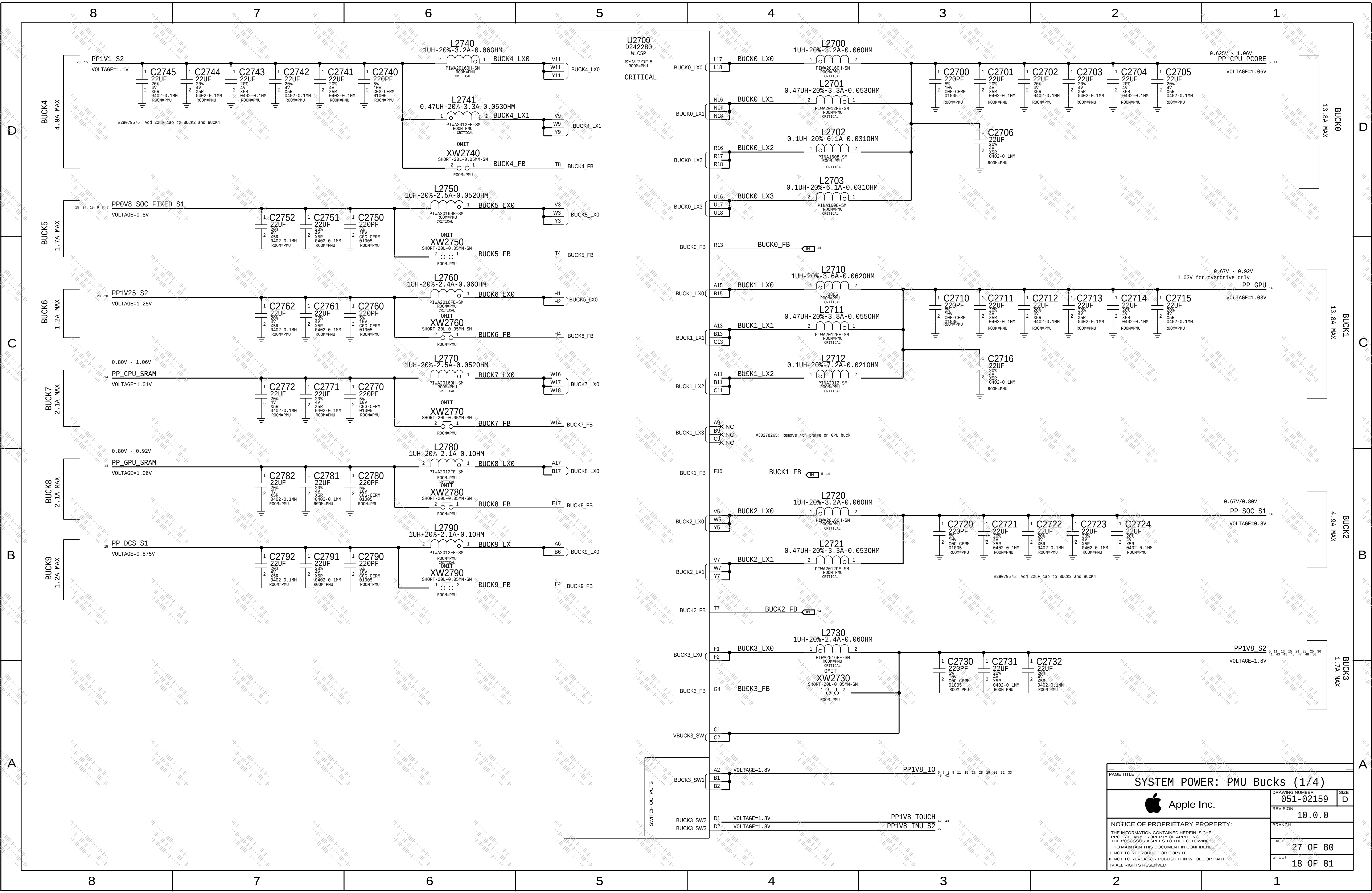


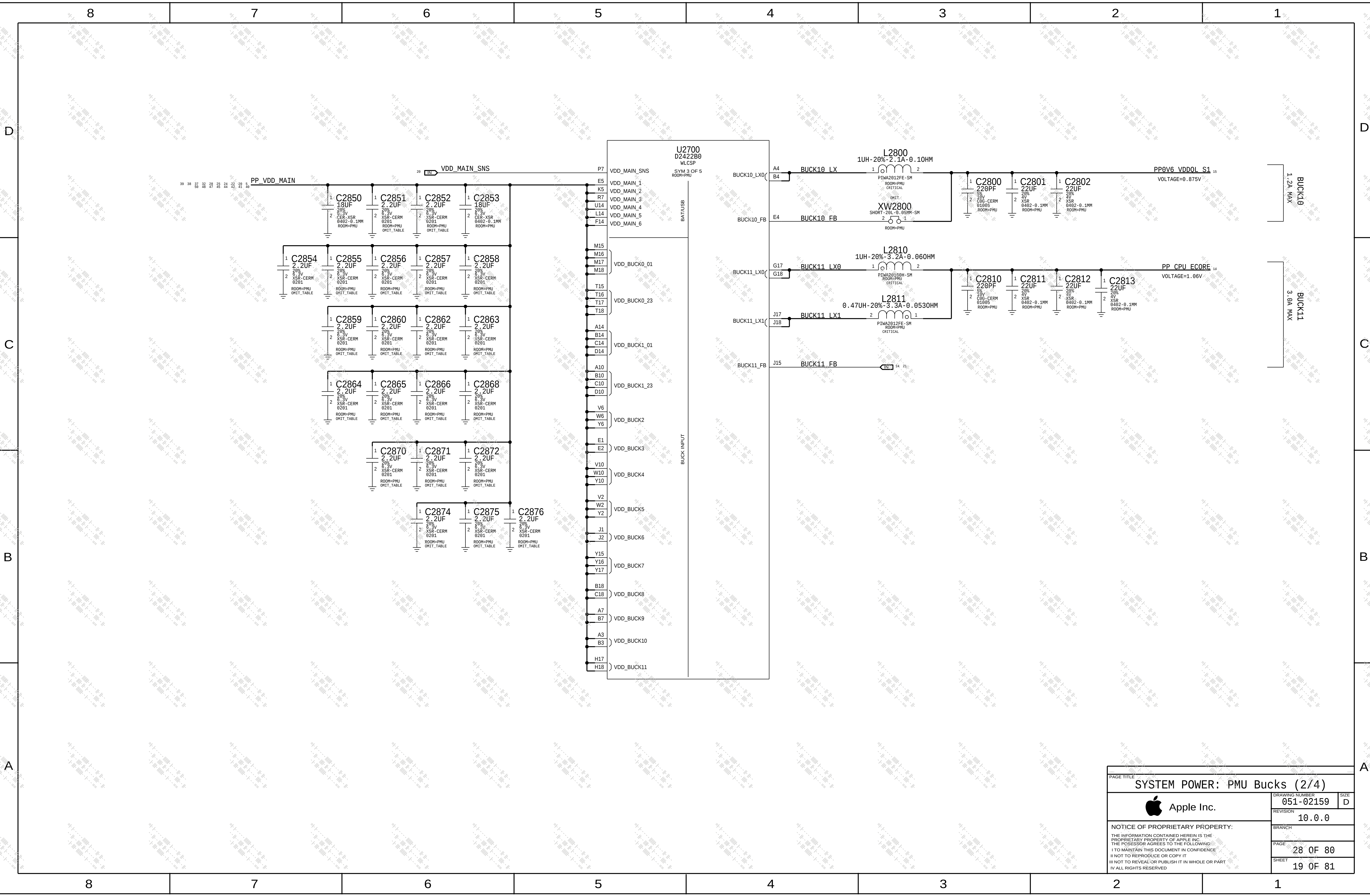
SOC - POWER SUPPLIES



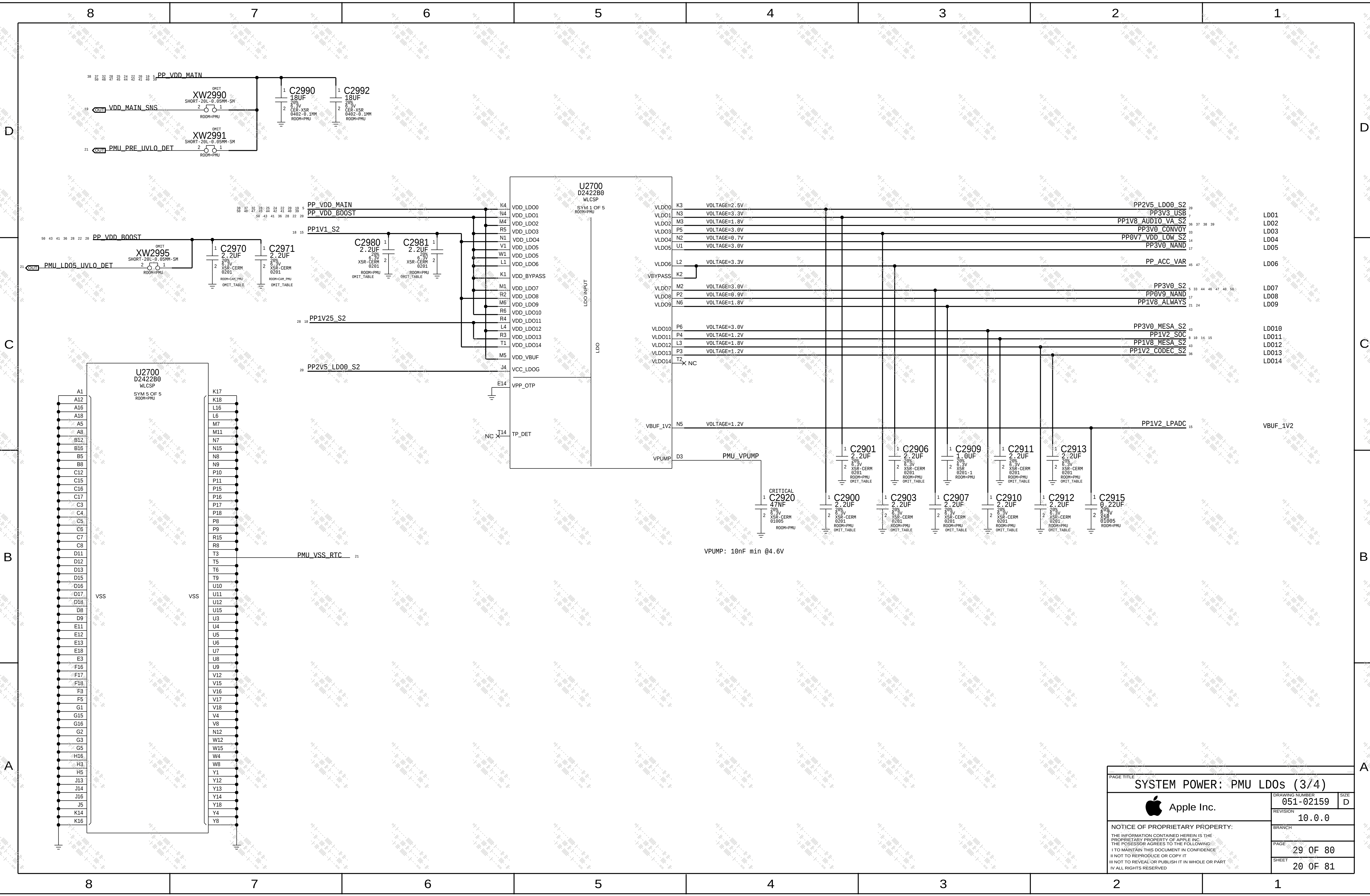


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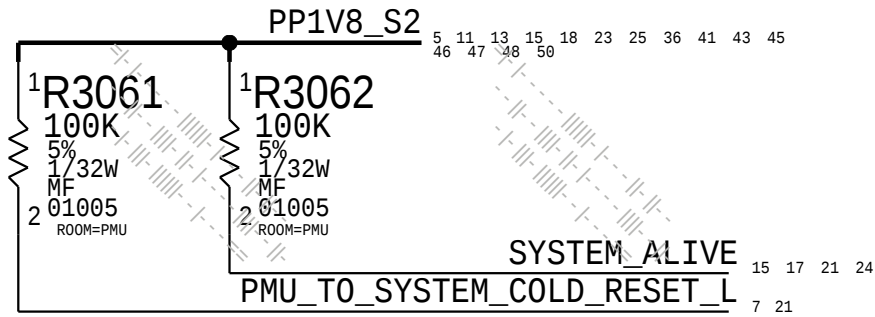


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SYSTEM POWER: PMU Bucks (2/4)		
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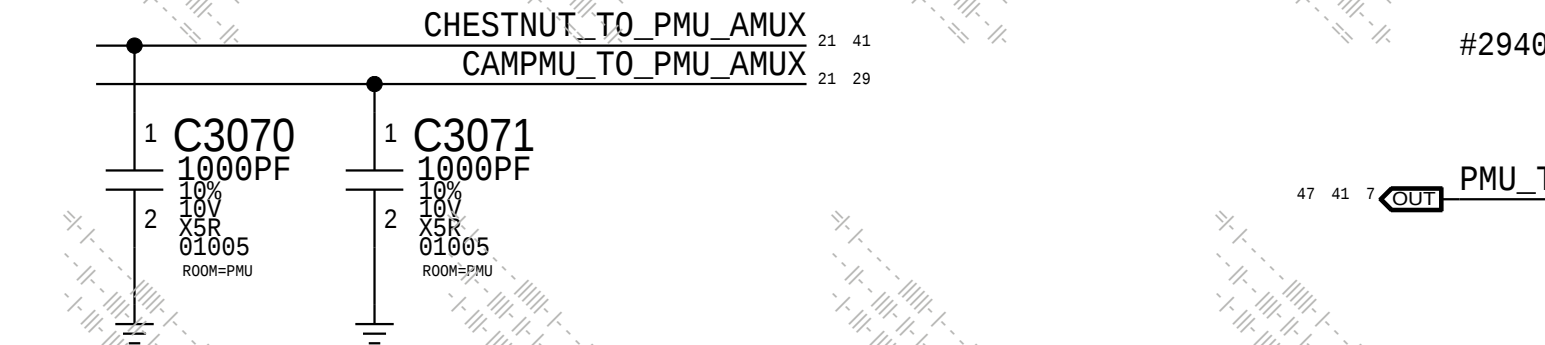


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COLD_RESET & SYSTEM_ALIVE

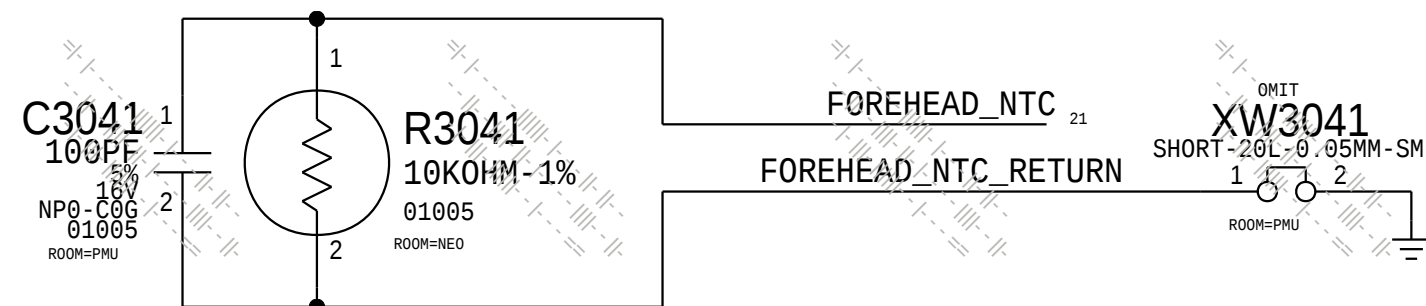


Chestnut / Ansel AMUX

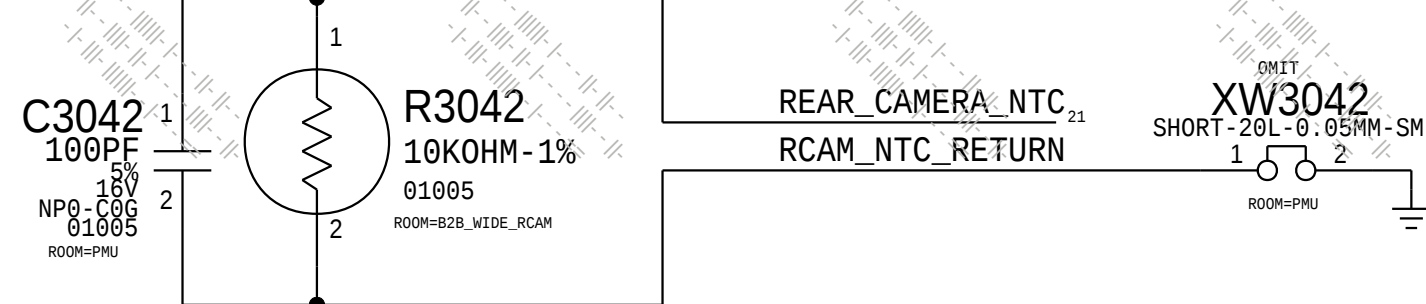


NTCs

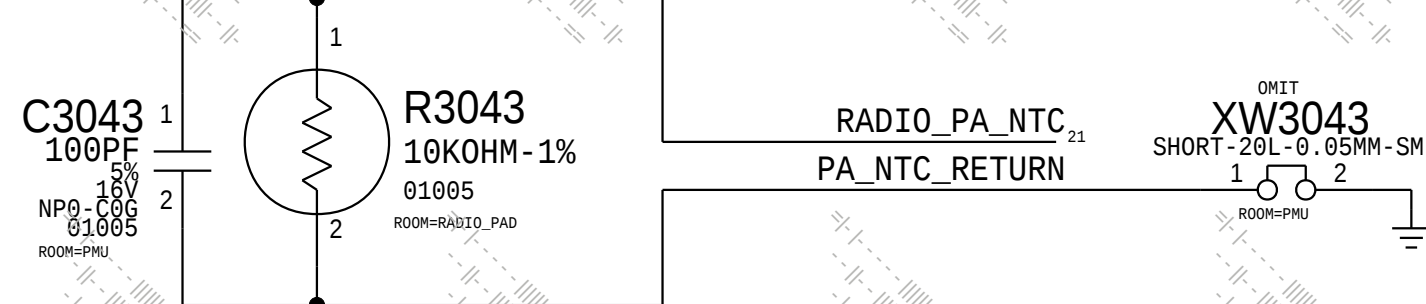
FOREHEAD NTC



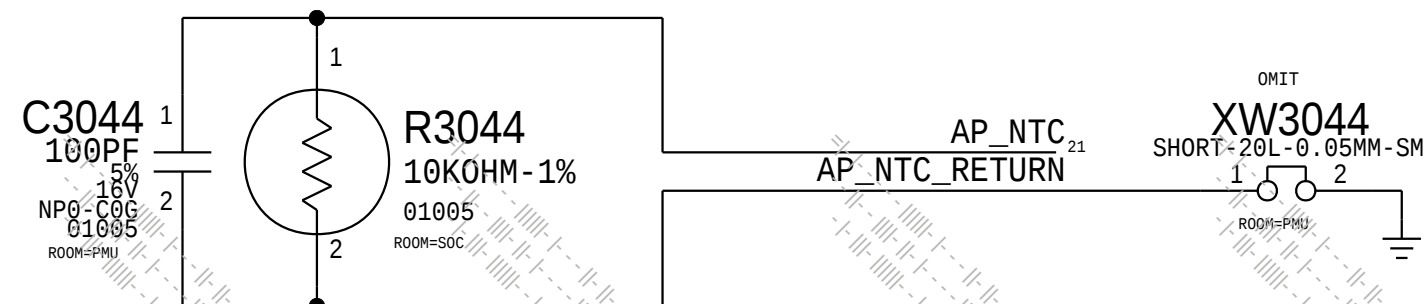
REAR CAMERA NTC



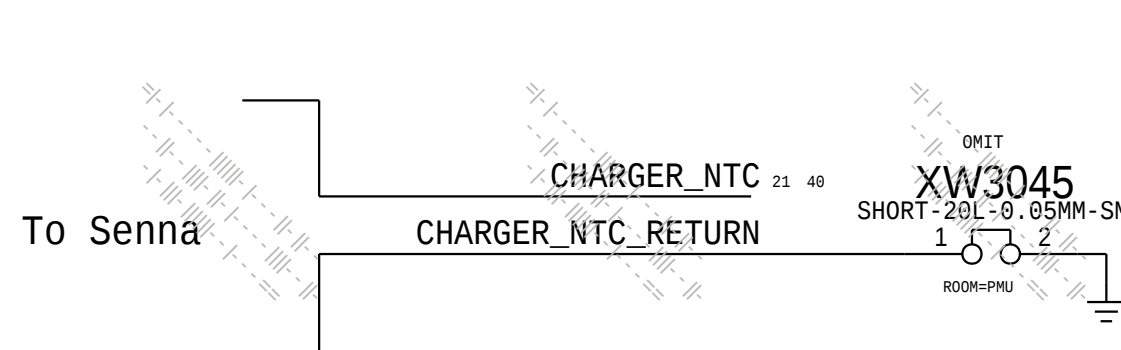
RADIO PA NTC



AP NTC



CHARGER NTC (IN SIP)



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

#29404057:Damping R for ACTIVE_RDY

#29300440:Connect.PMU crash to SoC

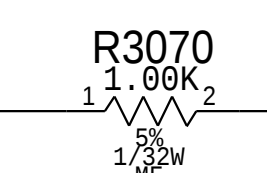
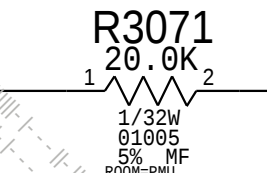
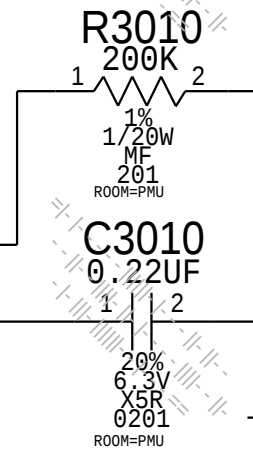
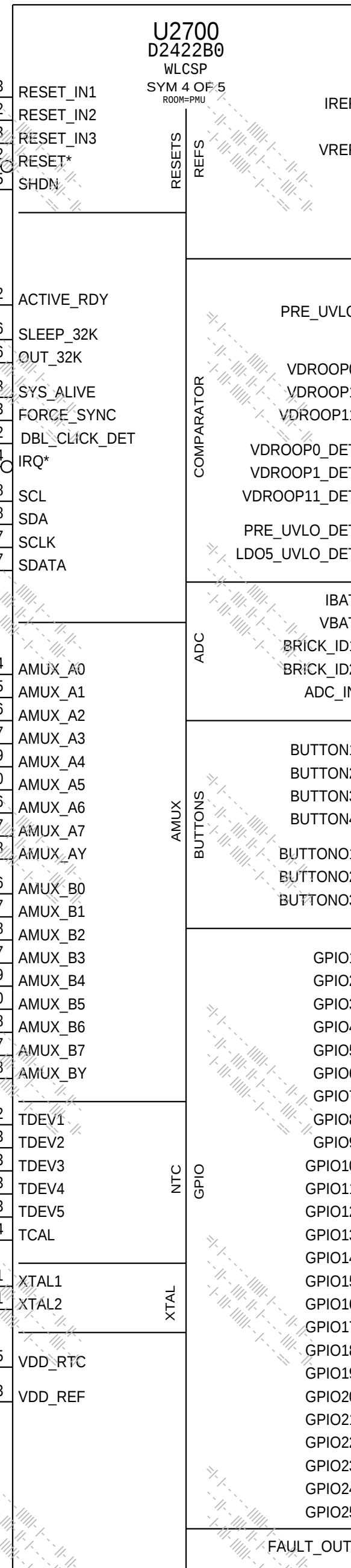
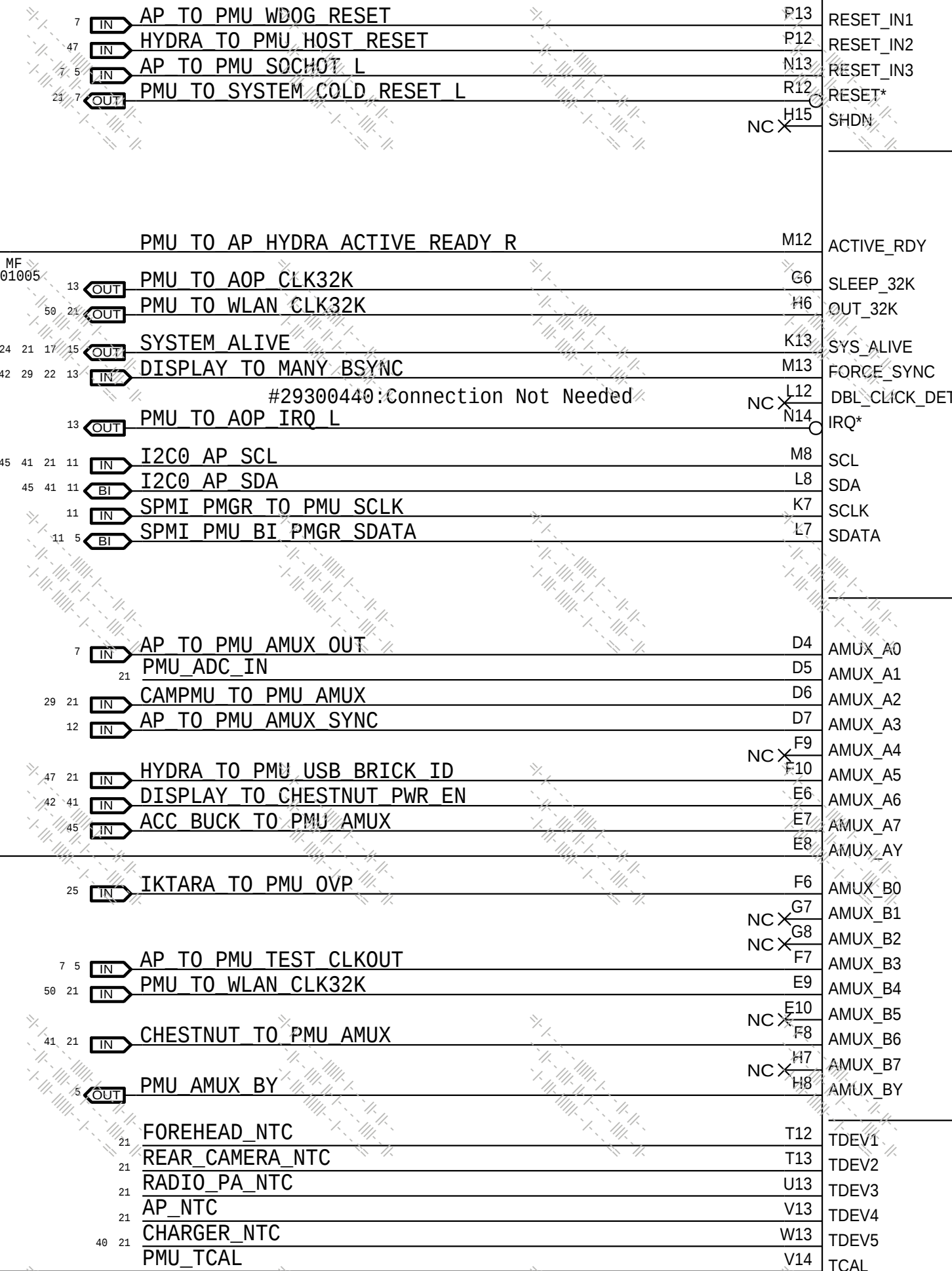
#27852679:No SDA R, PoR is SPMI

#25244799:200K pull-down

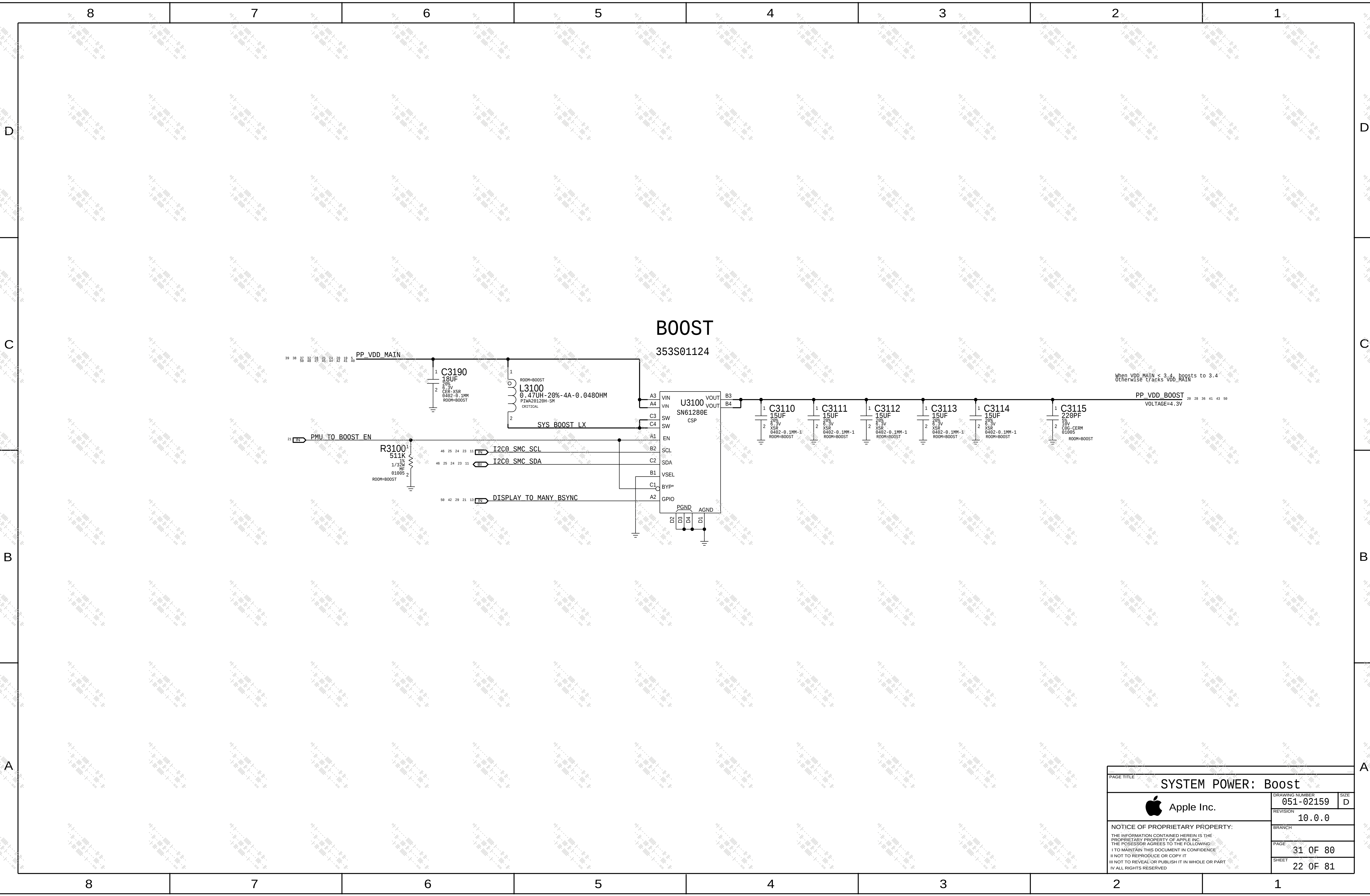
#25244799:CHESTNUT AMUX AND PWR_EN ON SAME CHANNEL
#28748132:CHESTNUT AMUX AND PWR_EN SWAP BETWEEN A6/B6

#25244799:0TP-AJ Connects XTAL1 to GND

#29312542:REPLACE PMU XTAL WITH XO



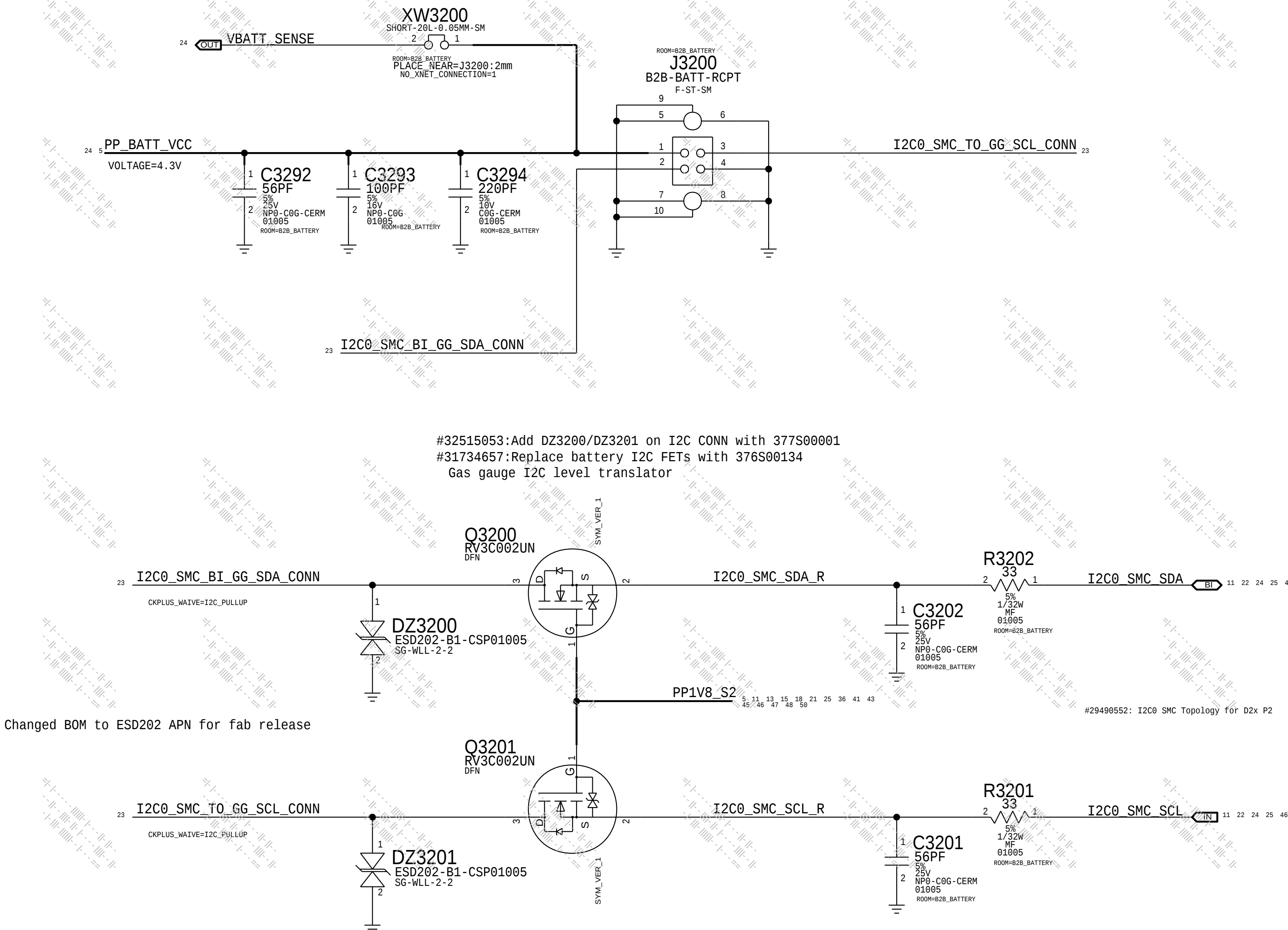
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		DRAWING NUMBER		SIZE	
		051-02159		D	
		REVISION		10.0.0	
		BRANCH			
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		SHEET		22 OF 81	

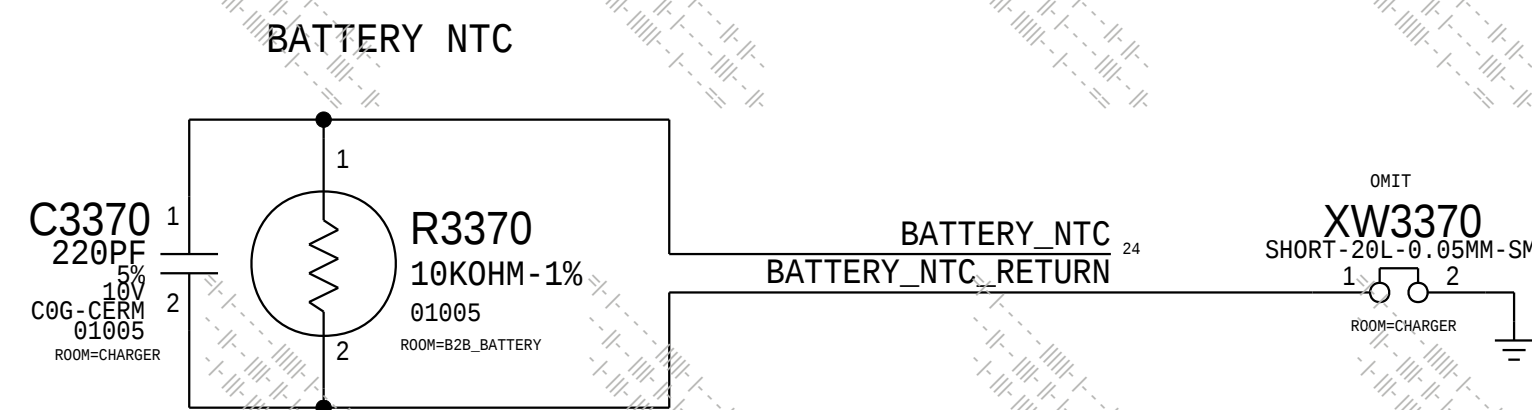
Battery Connector

THIS ONE ON MLB ---> 516S00232



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

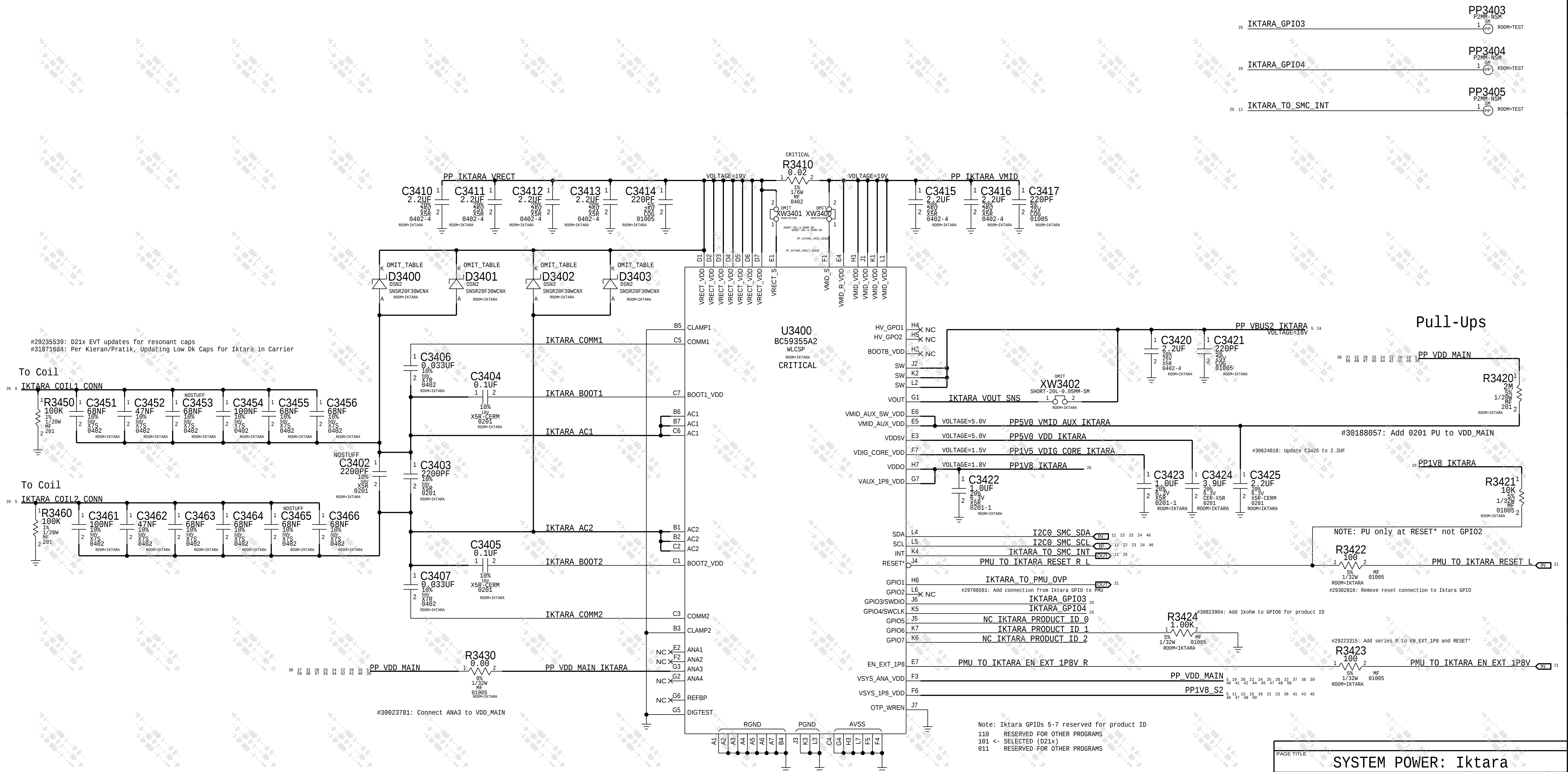
APN:343S00170



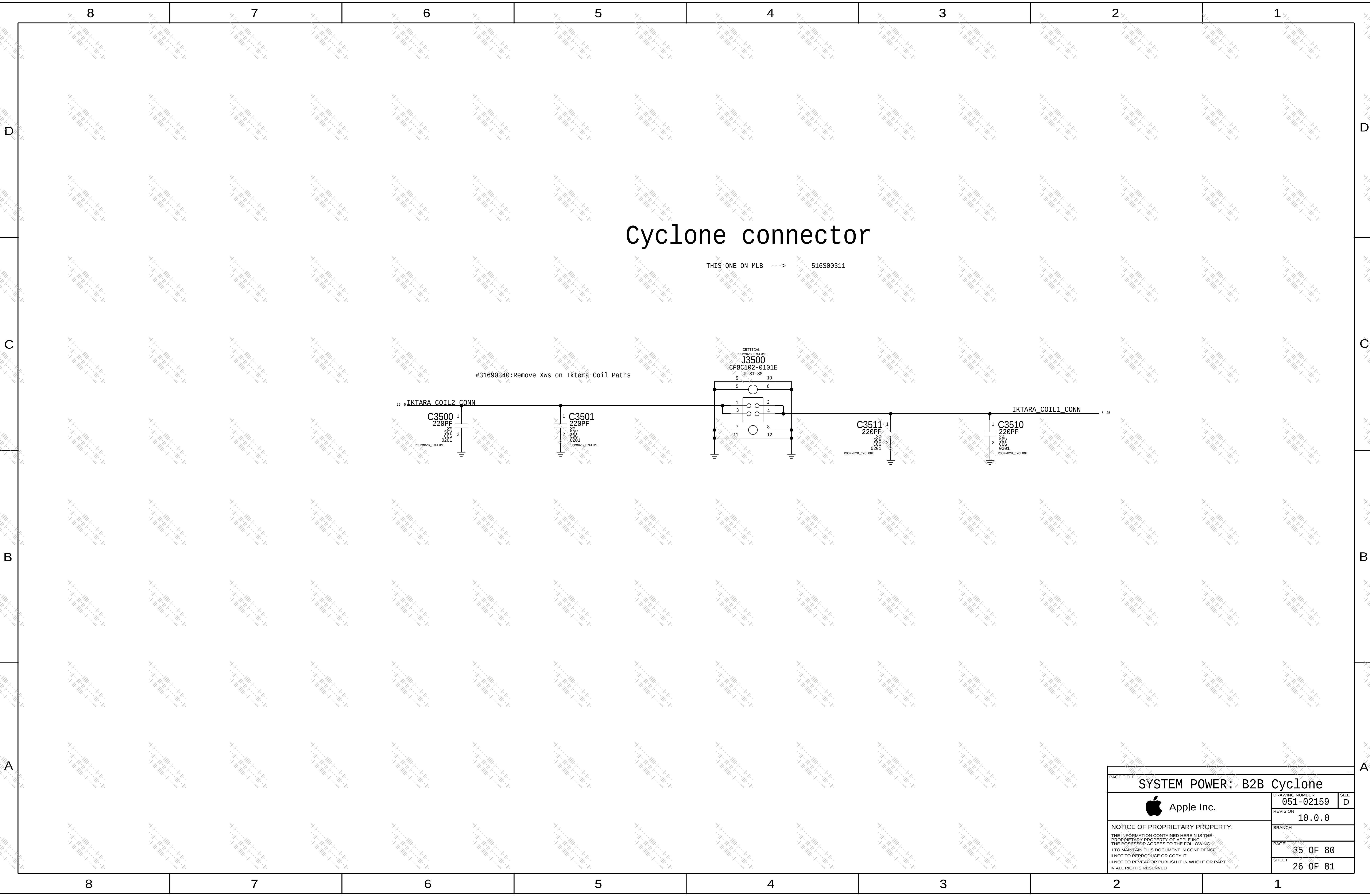
PAGE TITLE			
SYSTEM POWER: Charger			
 Apple Inc.	DRAWING NUMBER		SIZE
	051-02159		D
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	10.0.0		
	BRANCH		
	PAGE		
	33 OF 80		
	SHEET		
	24 OF 81		

Iktara

Iktara Debug

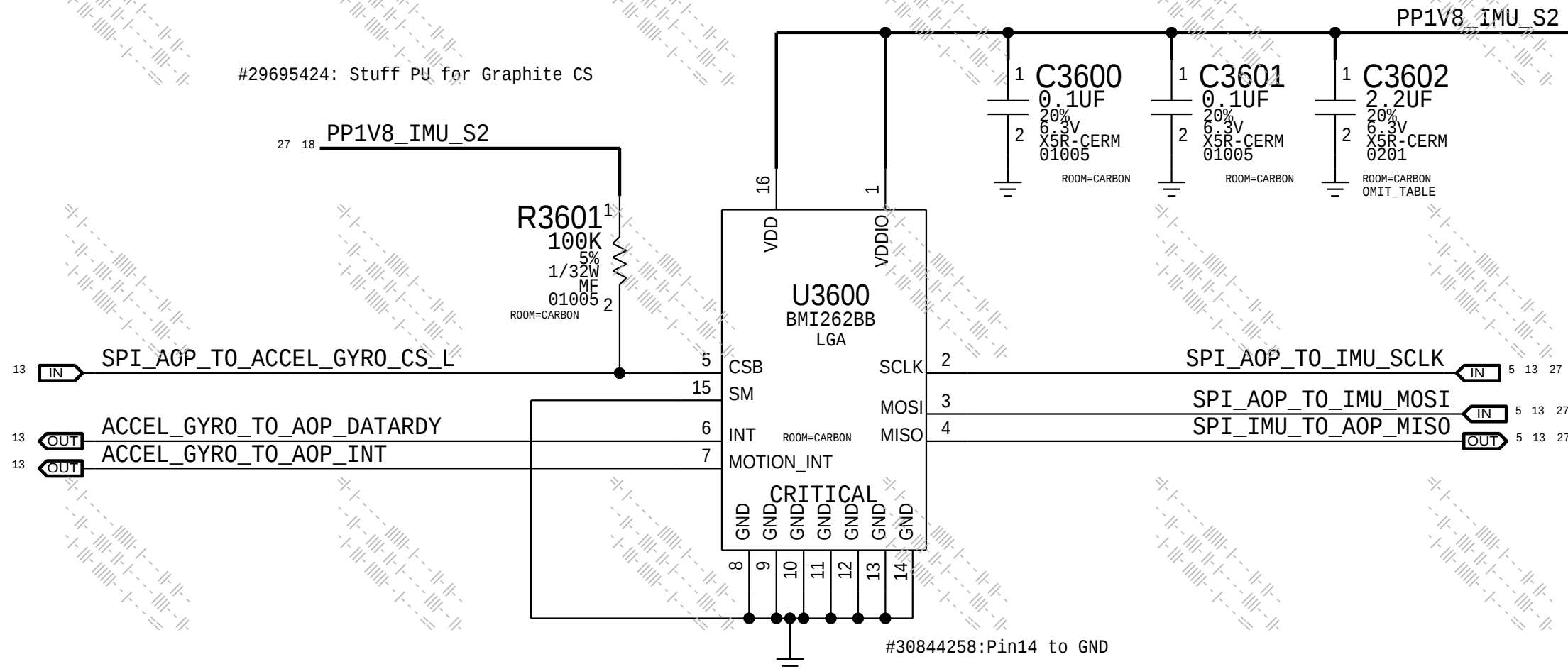


PAGE TITLE			SYSTEM POWER: Iktara		
 Apple Inc.	DRAWING NUMBER		051-02159		SIZE
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	NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT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



Graphite - Accel & Gyro

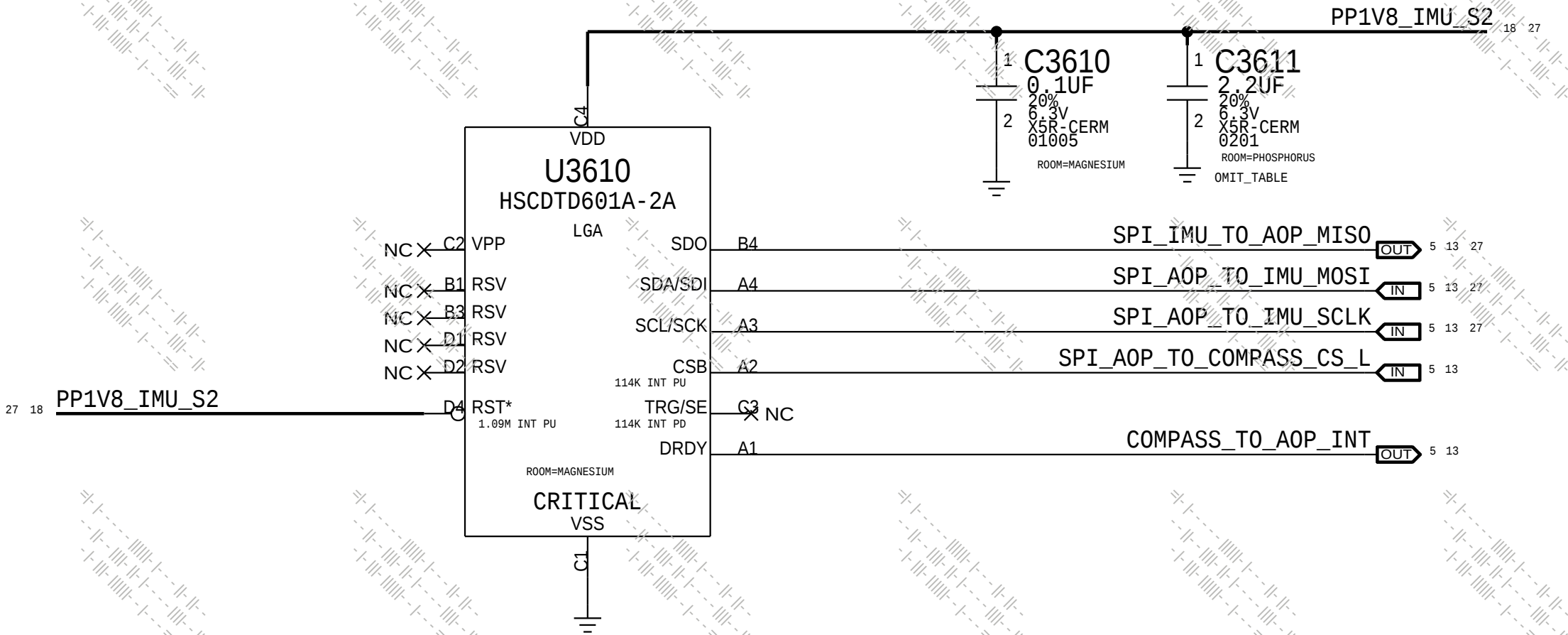
APN: 338S00304 (A1)



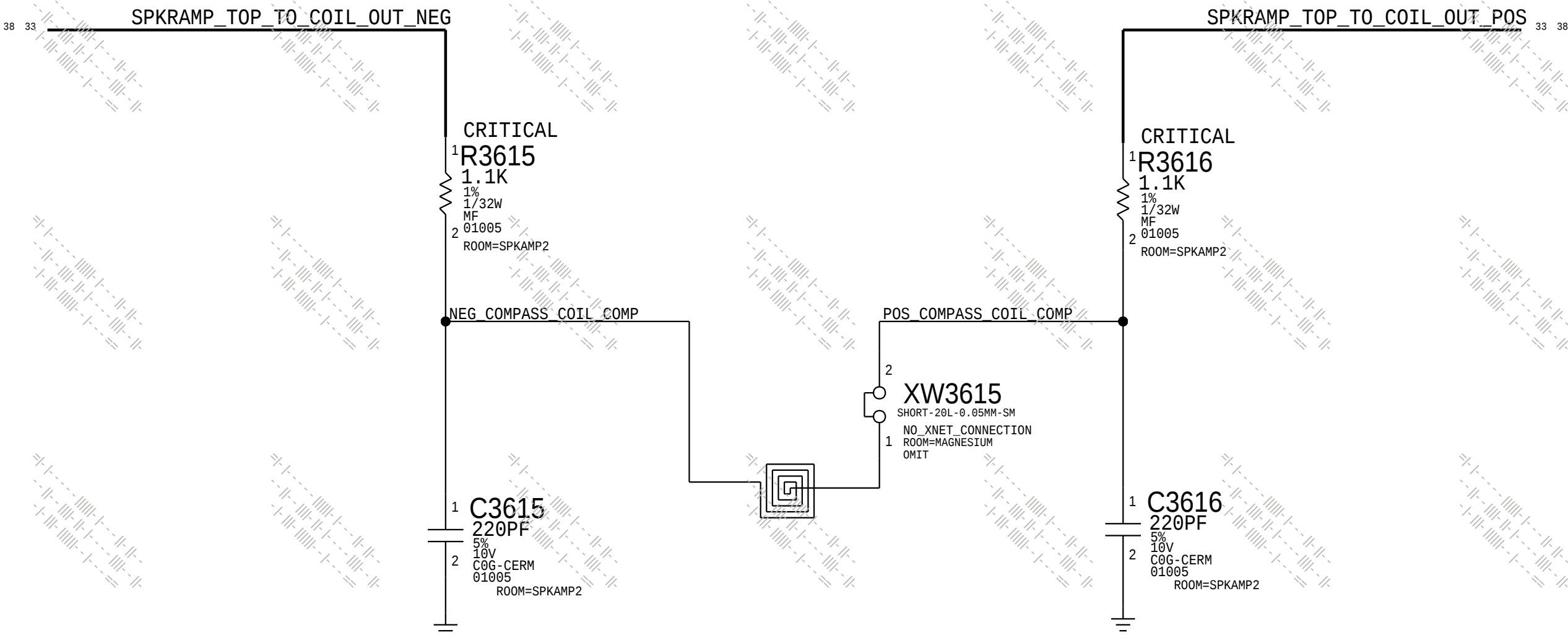
Magnesium - Compass

APN:338S00084

Shared decoupling with Phosphorus

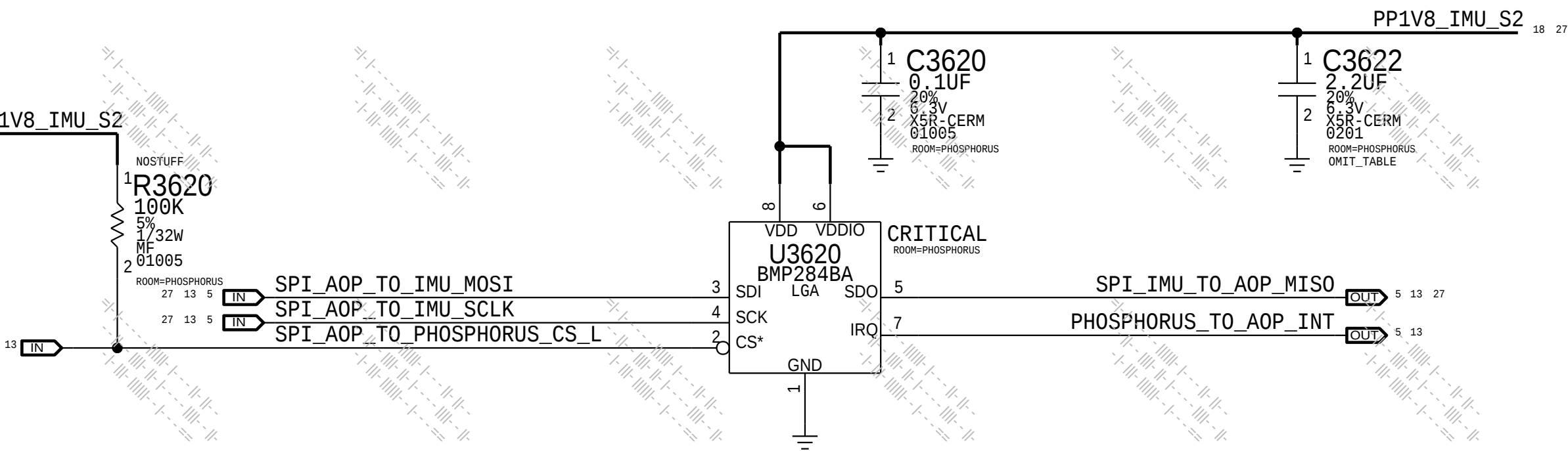


North Speaker Compass Compensation Coil



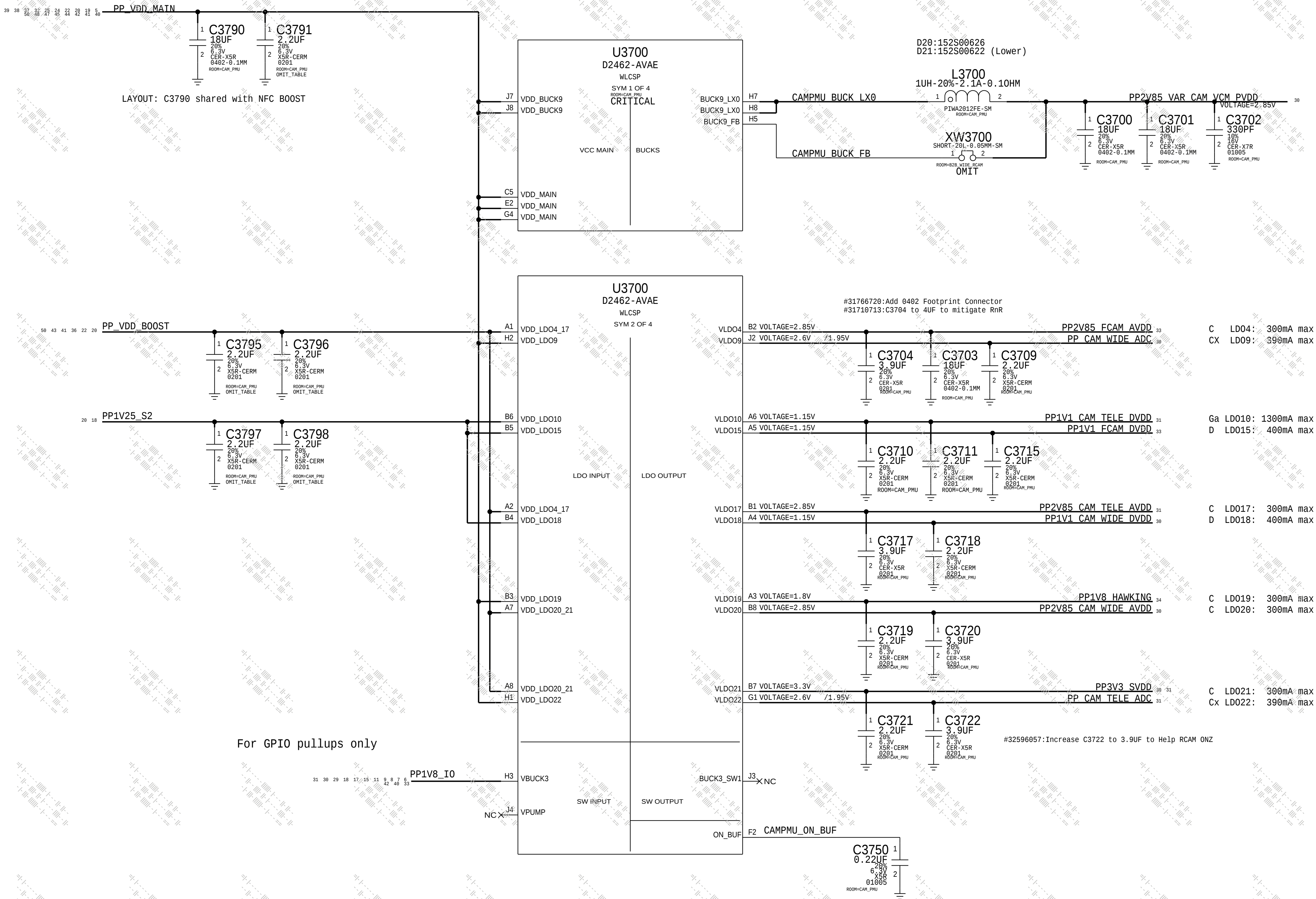
Phosphorus

APN: 338S00334

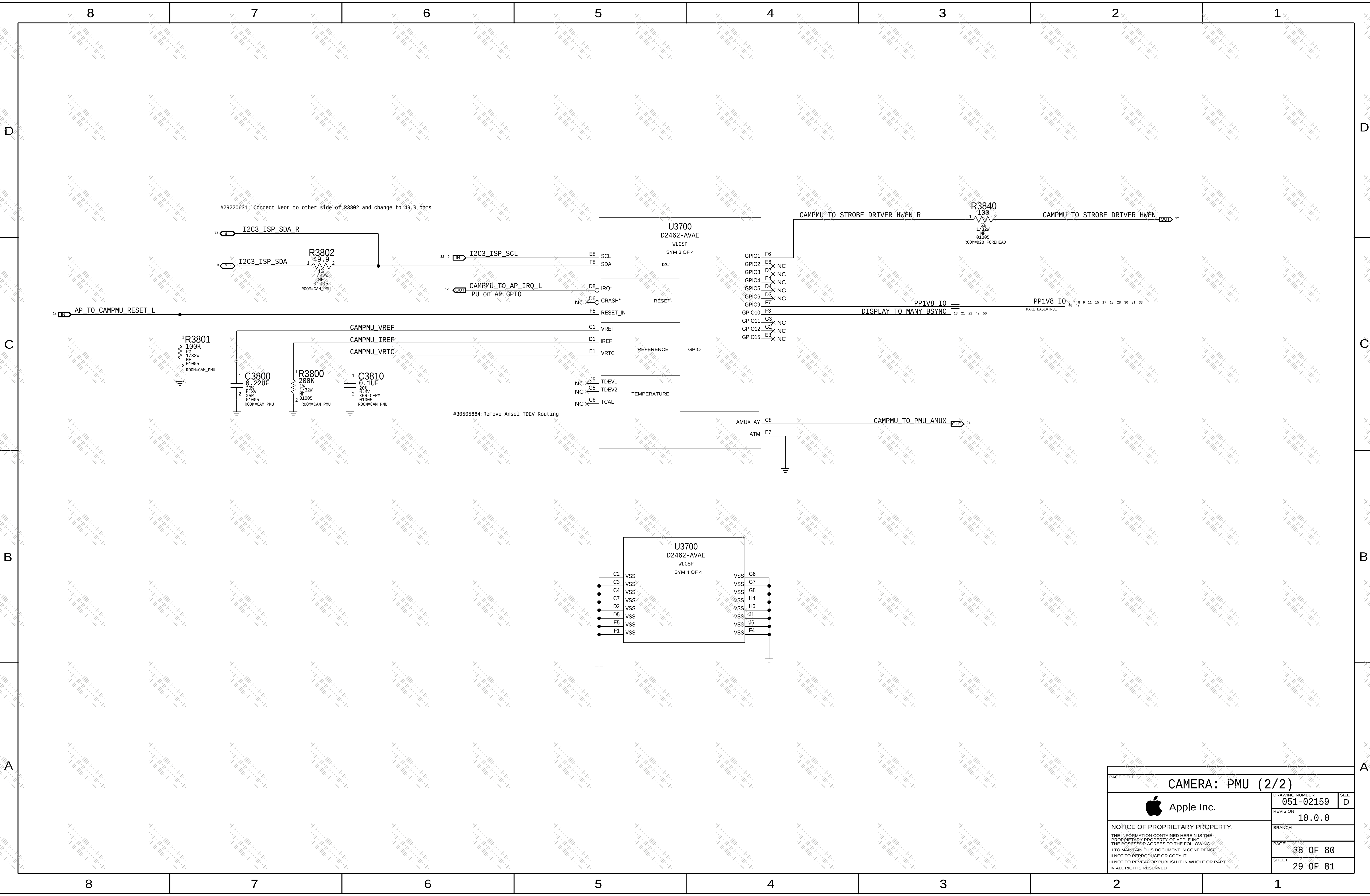


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		PAGE	36 OF 80
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Camera PMU

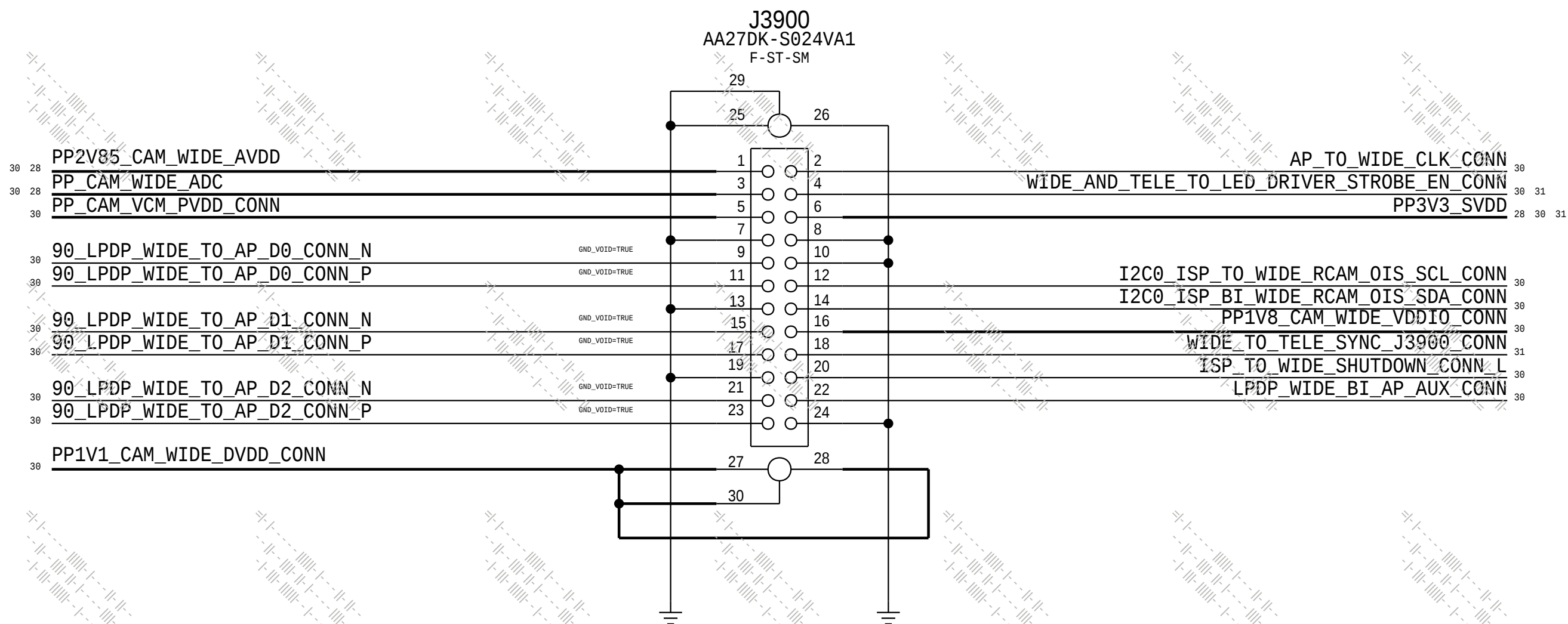


PAGE TITLE			CAMERA: PMU (1/2)		
 Apple Inc.		DRAWING NUMBER		SIZE	
		051-02159		D	
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		BRANCH			
		PAGE		37 OF 80	
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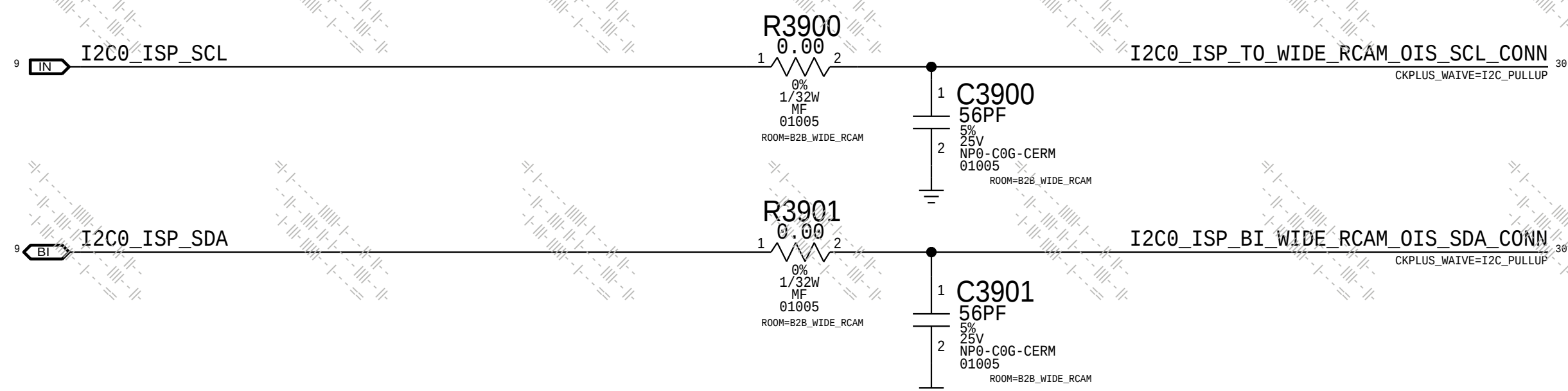


Wide Camera Connector

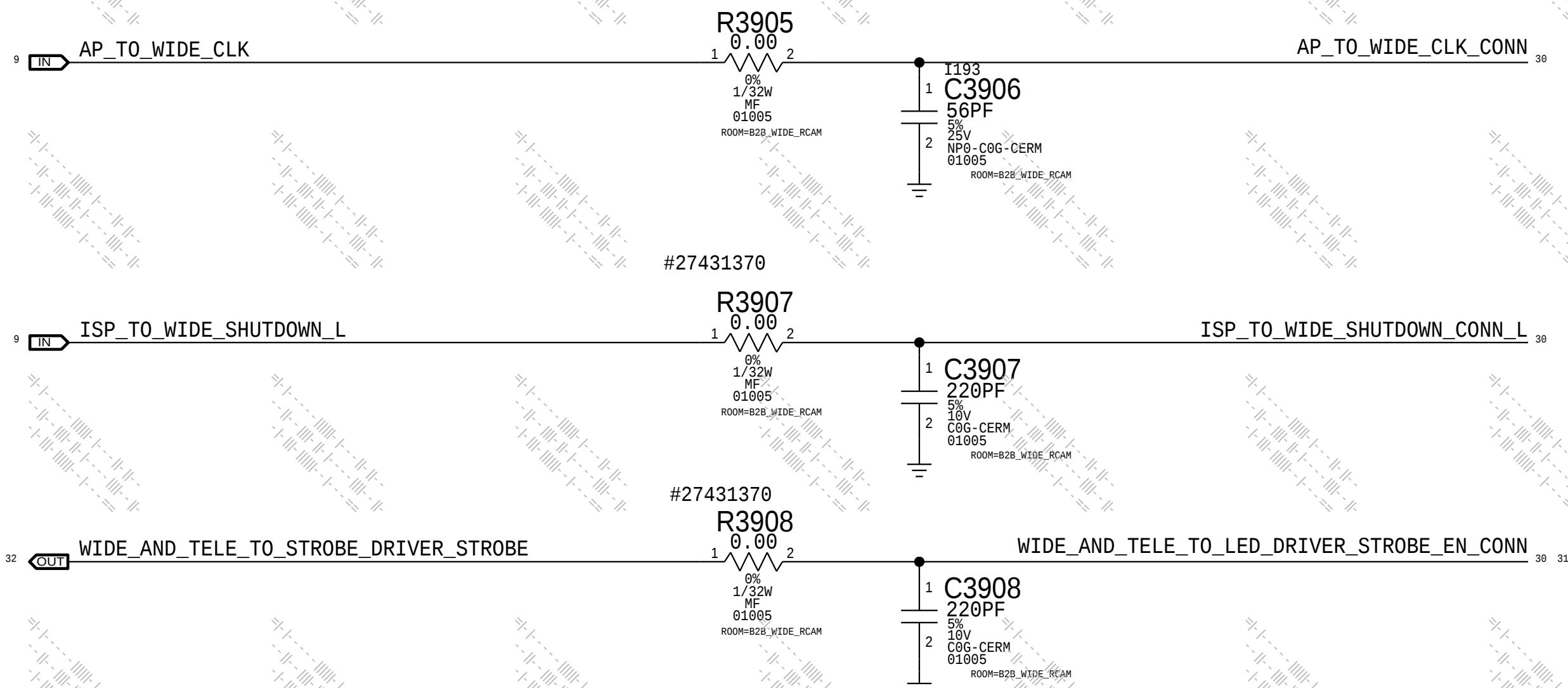
THIS ONE ----> 516S00310/P2 RCPT (USED ON MLB)
516S00309/P2 PLUG (USED ON FLEX)



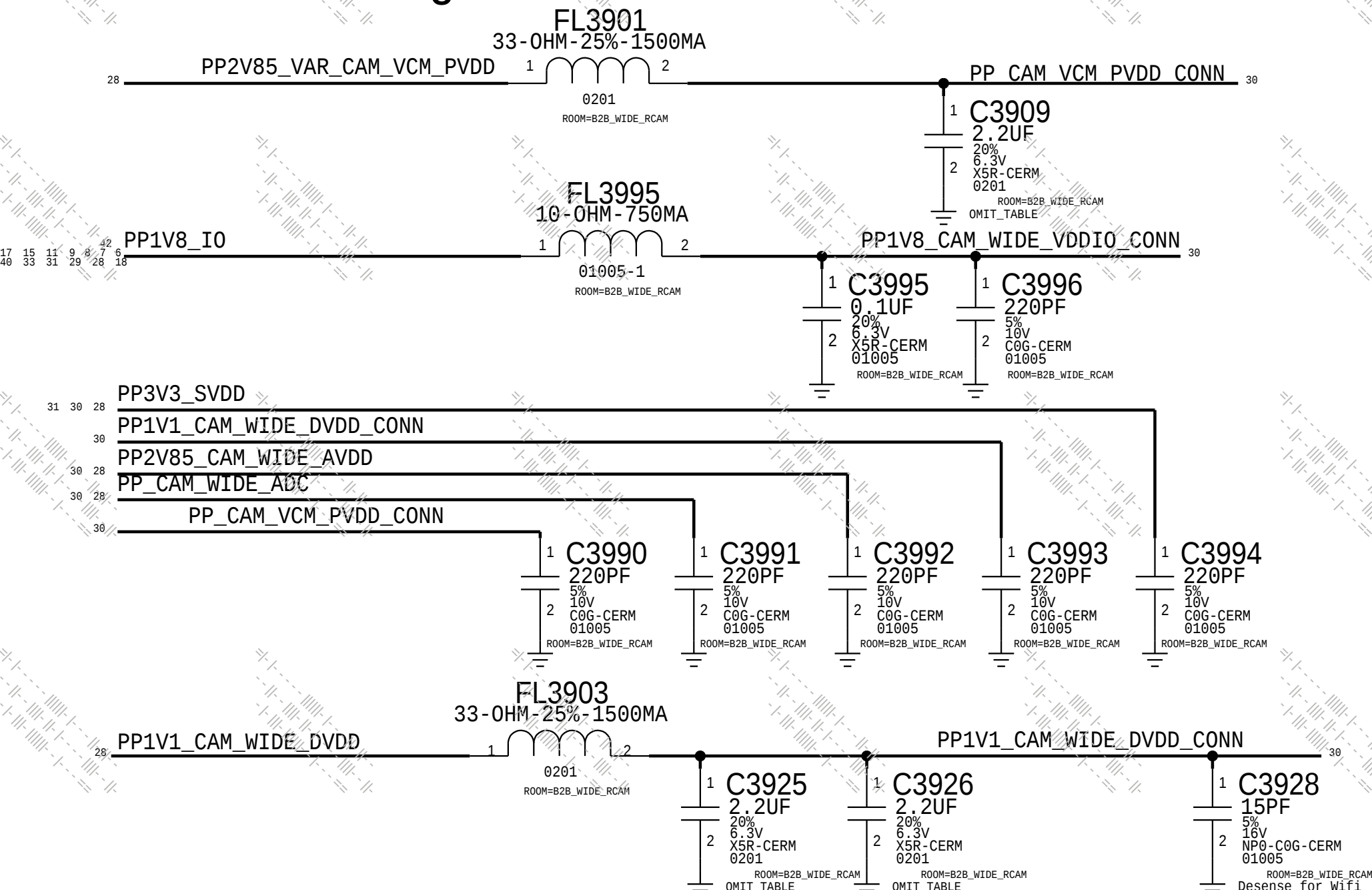
ISP I2C



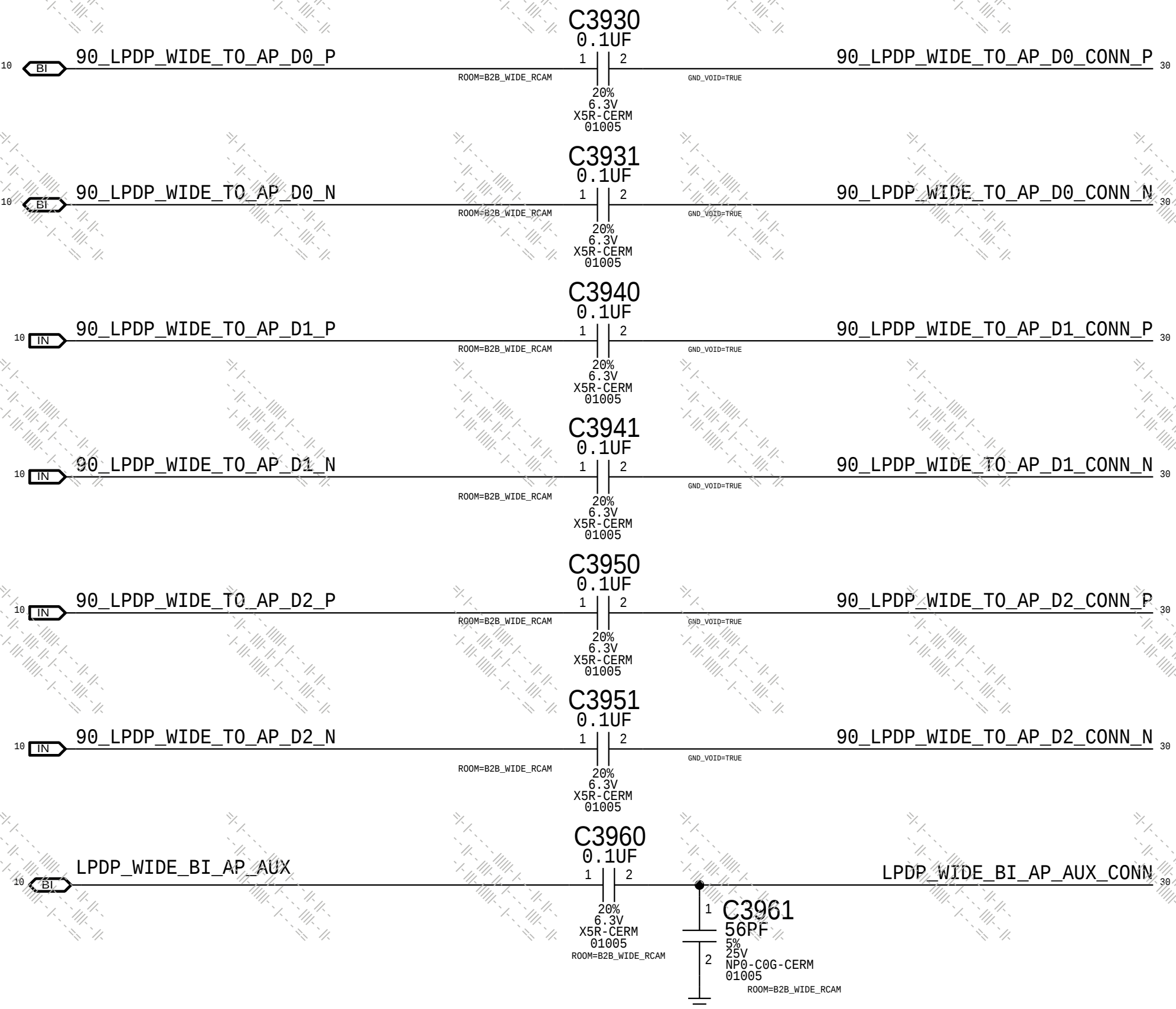
IO Filters



Power Filtering



LPDP Filters

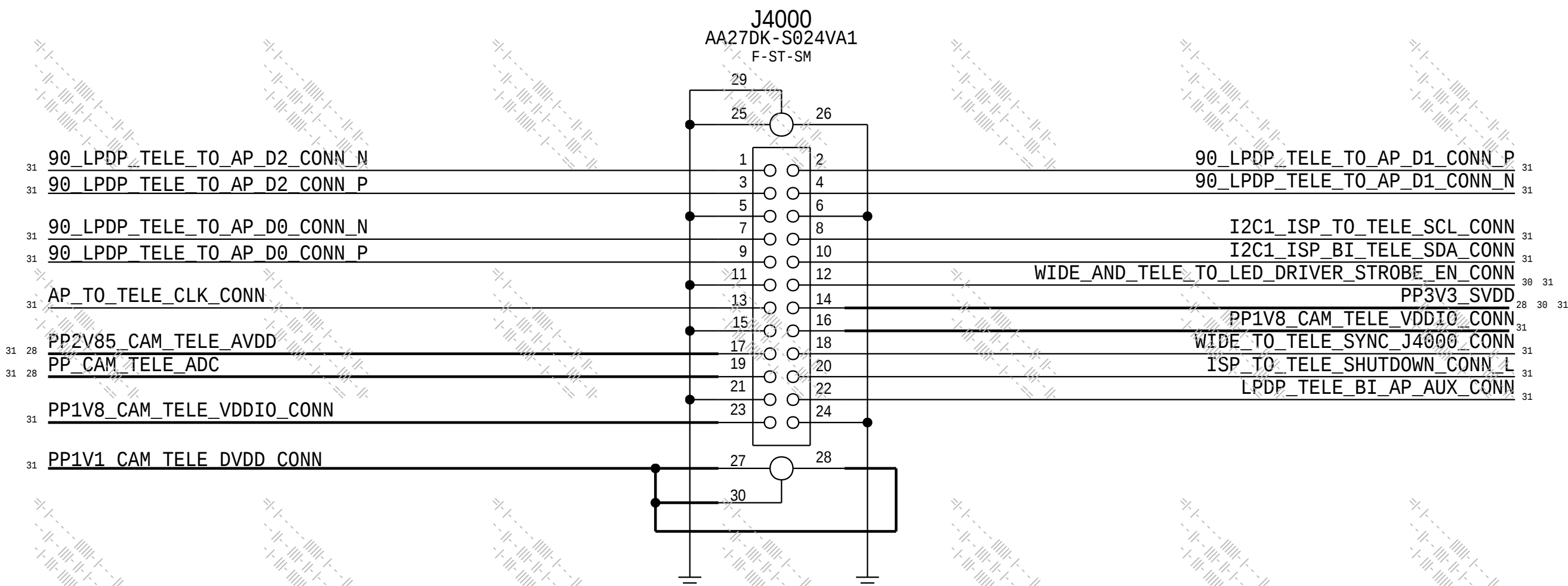


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CAMERA: B2B Wide (KY)			
Apple Inc.		DRAWING NUMBER	051-02159
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		PAGE	39 OF 80
		SHEET	30 OF 81

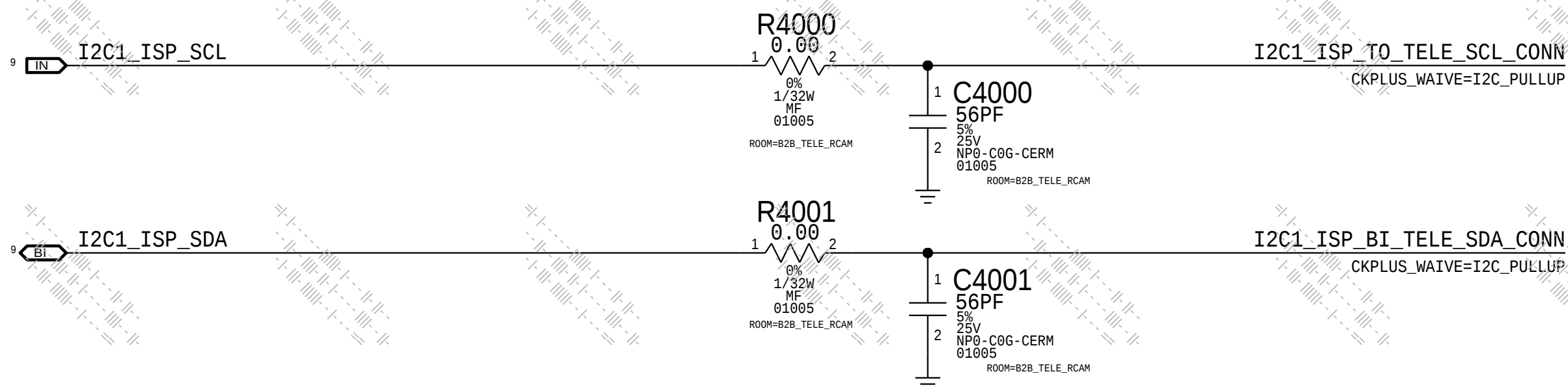
Tele Camera Connector

THIS ONE ---->

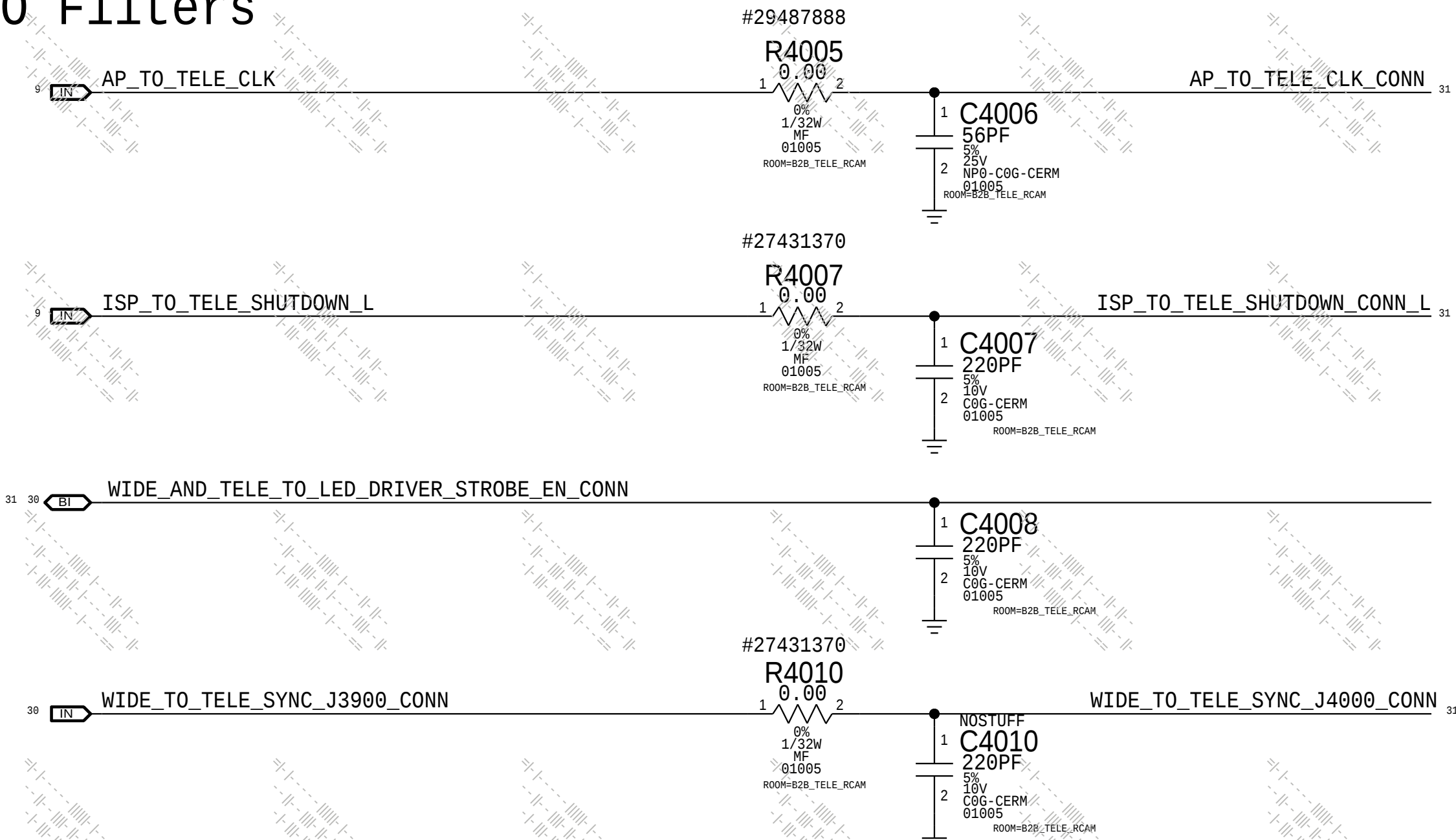
516S00310/P2 RCPT (USED ON MLB)
516S00309/P2 PLUG (USED ON FLEX)



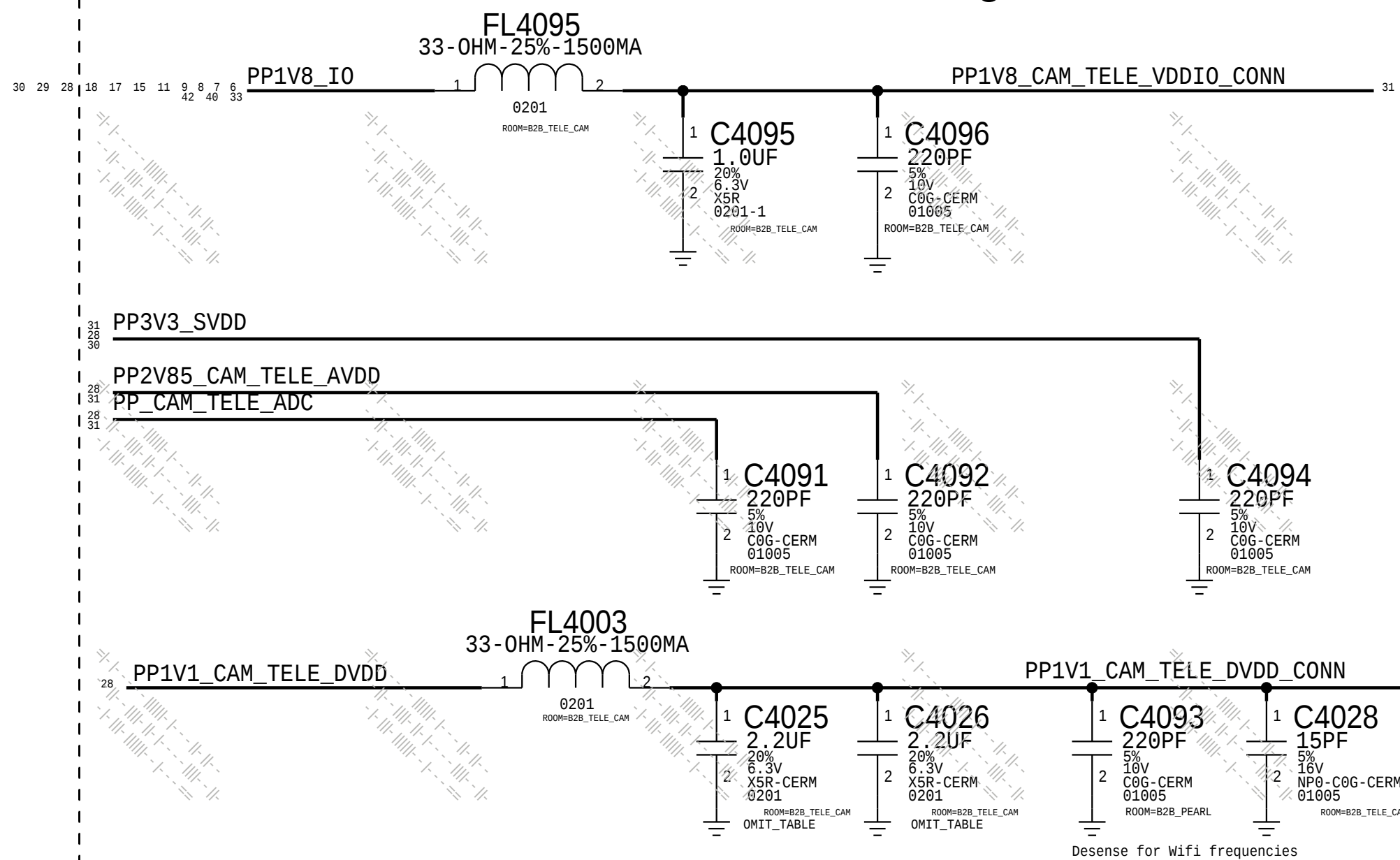
ISP I2C



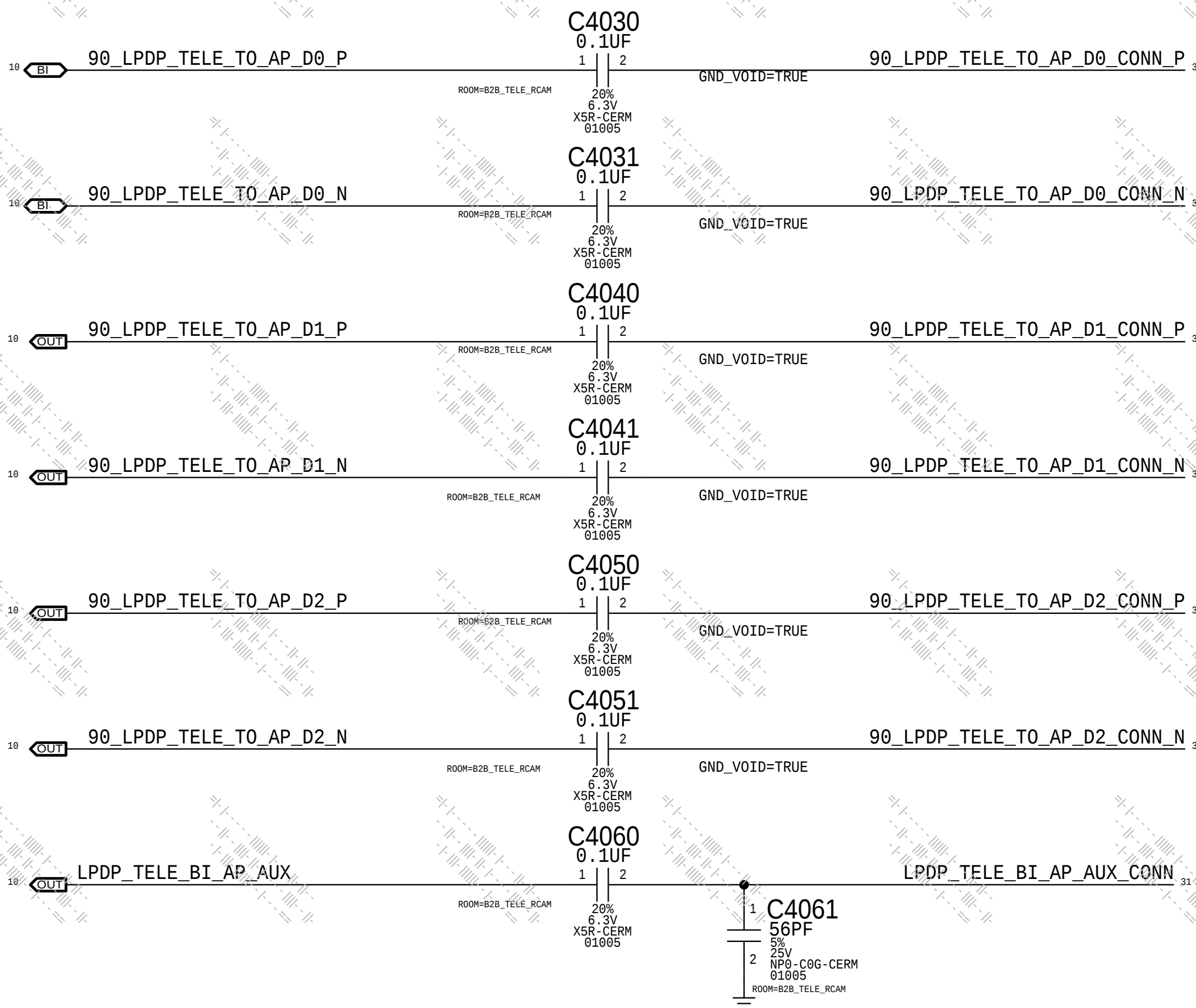
I/O Filters



Power Filtering



LPDP



CAMERA: B2B Tele (TN)

Apple Inc.

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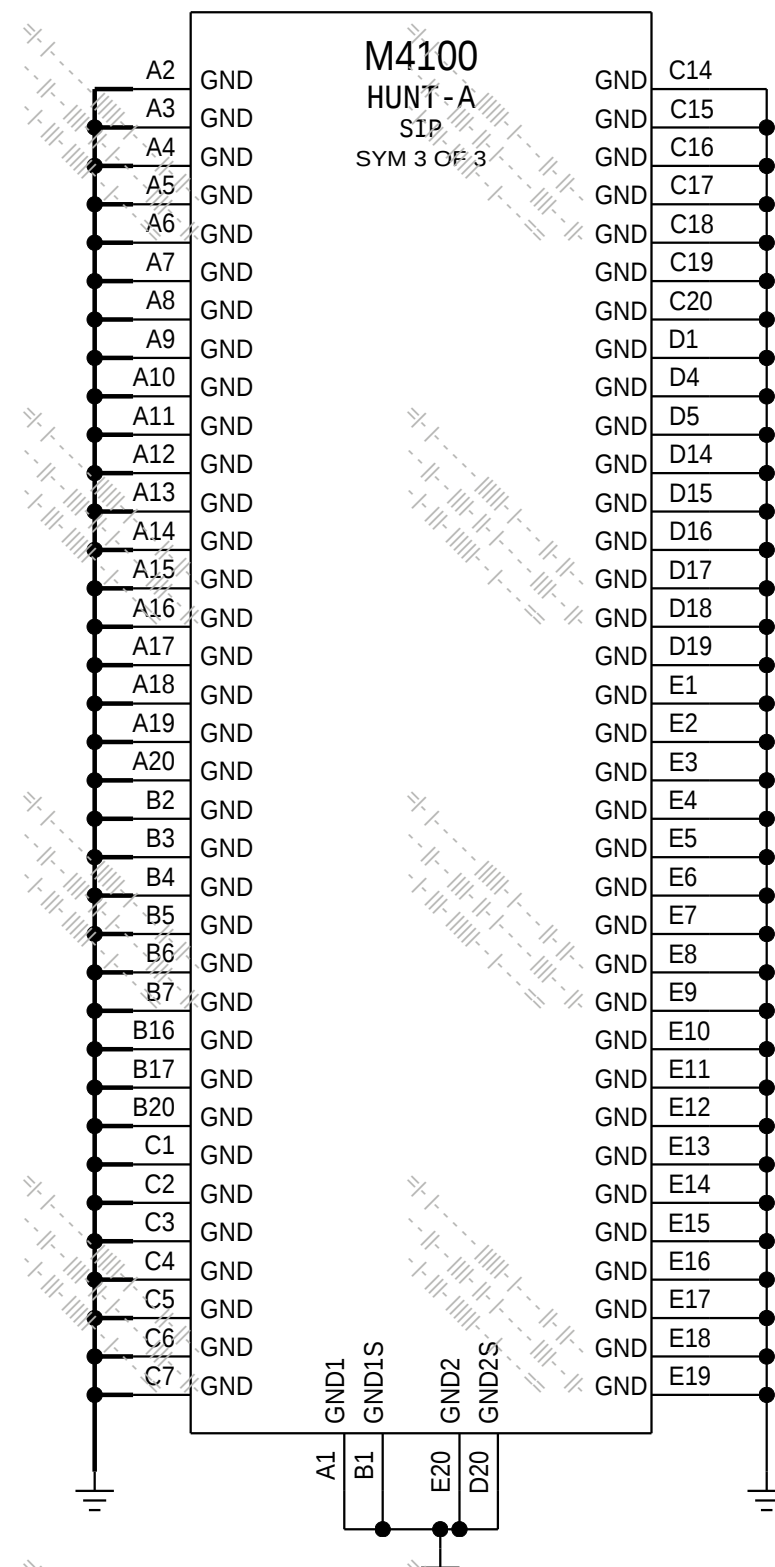
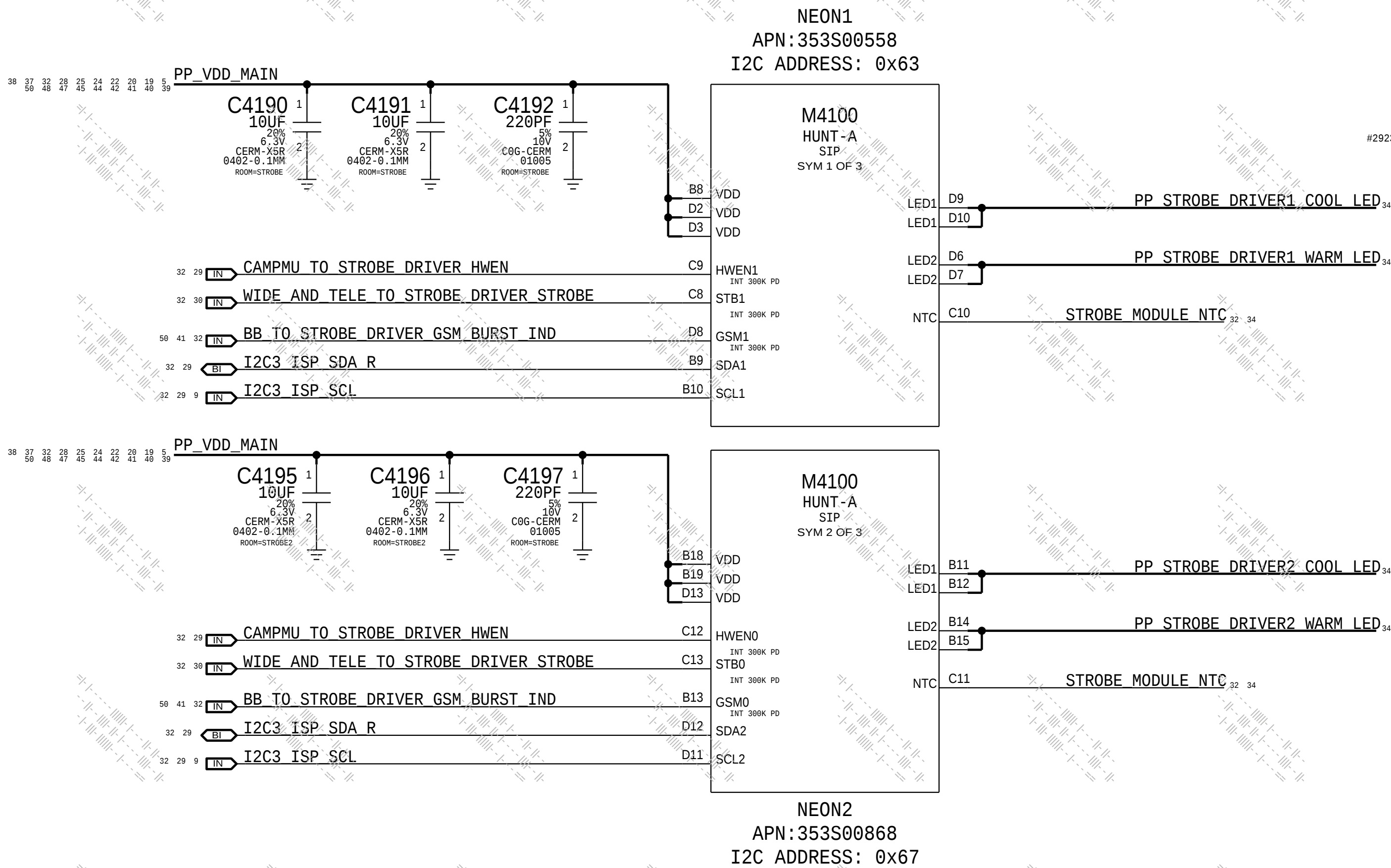
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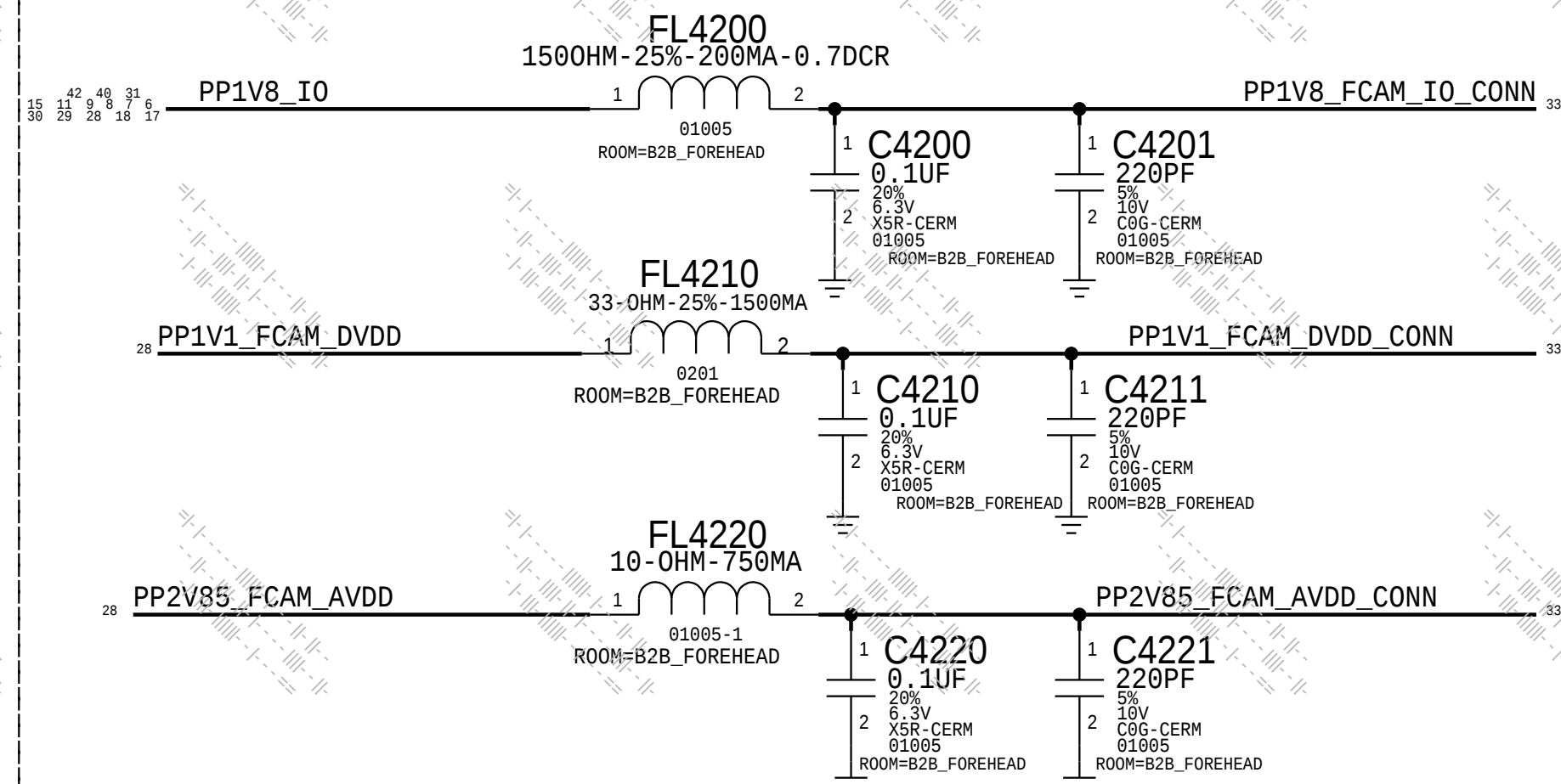
SHEET

31 OF 81

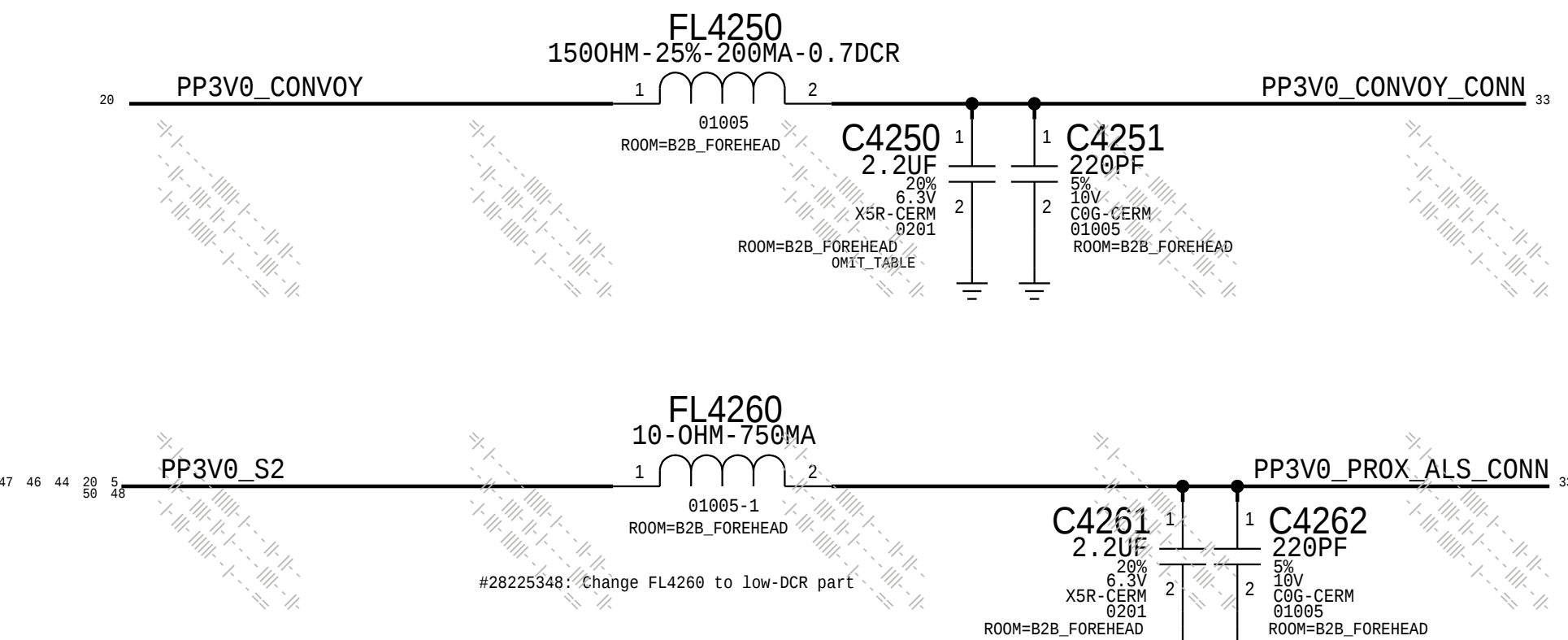
LED STROBE DRIVERS (NEON)



FCAM POWER

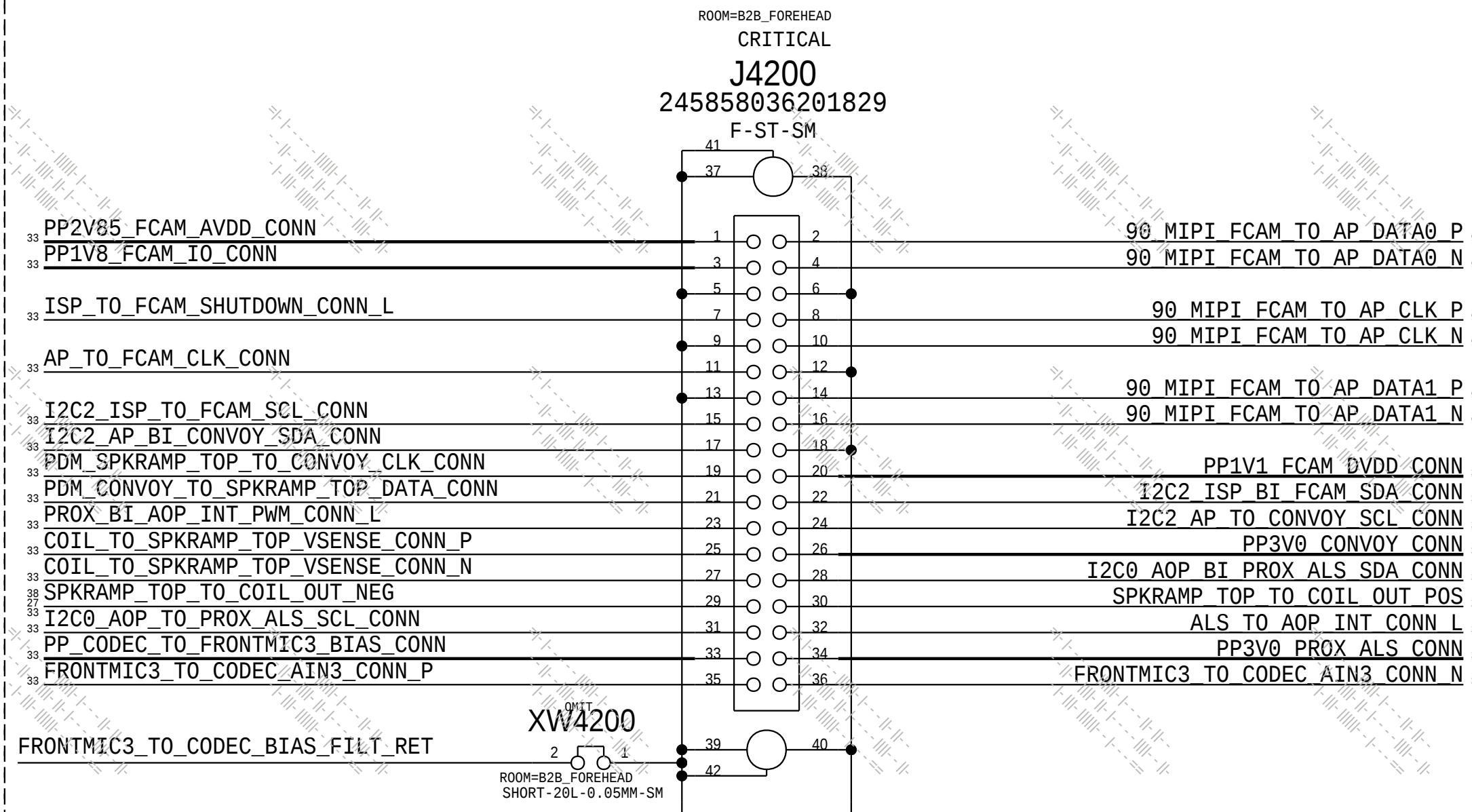


PROX + ALS + CONVOY POWER

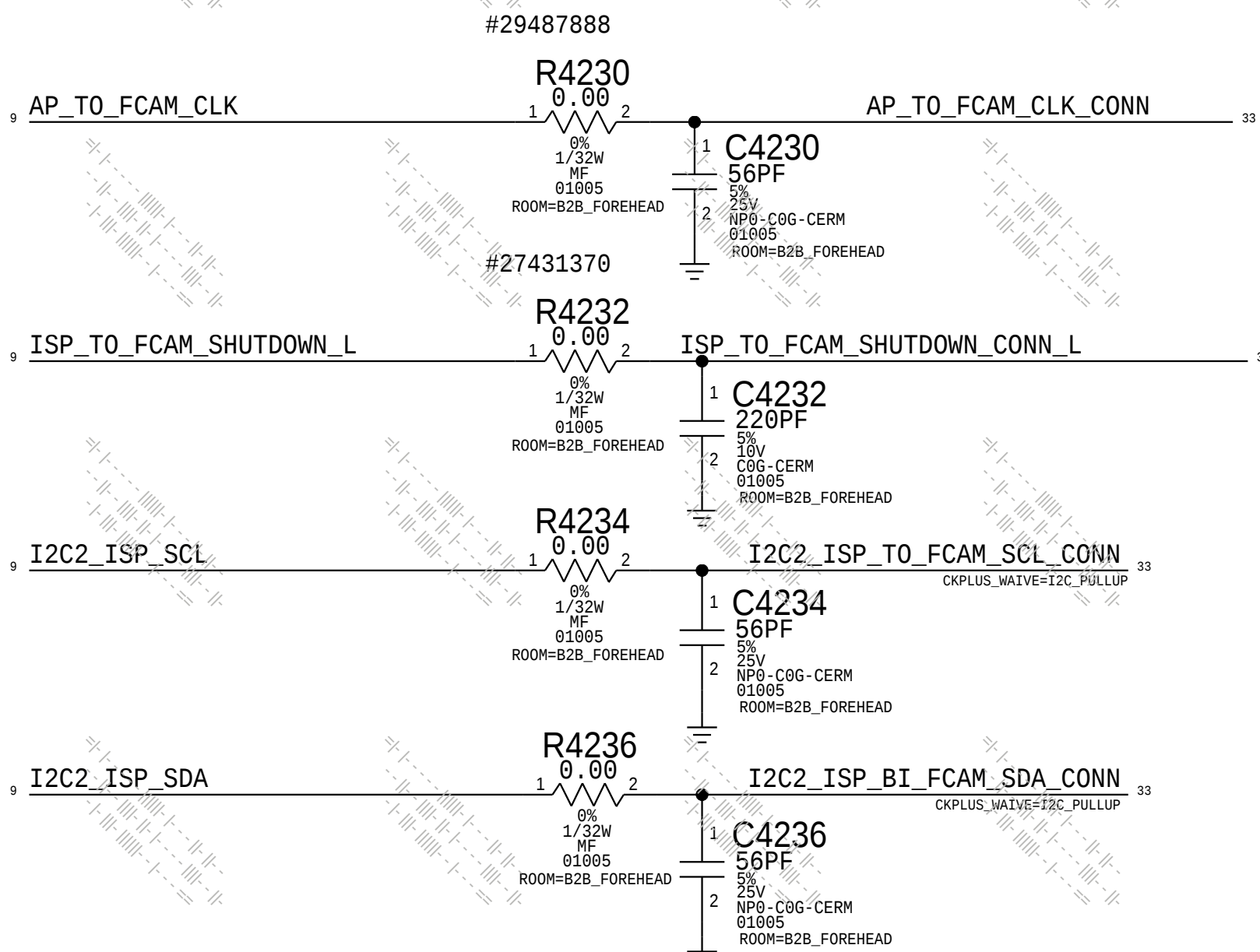


FOREHEAD CONNECTOR

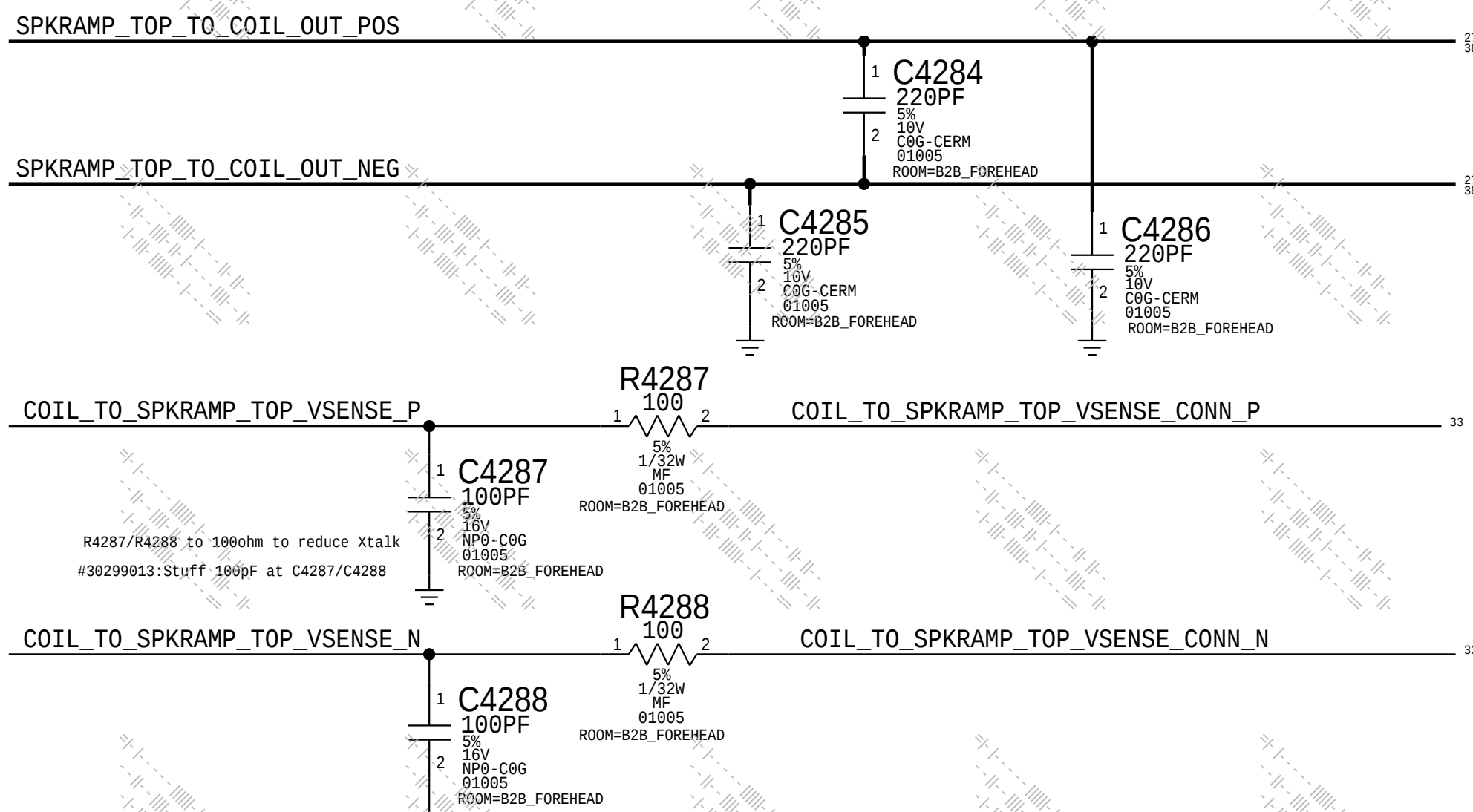
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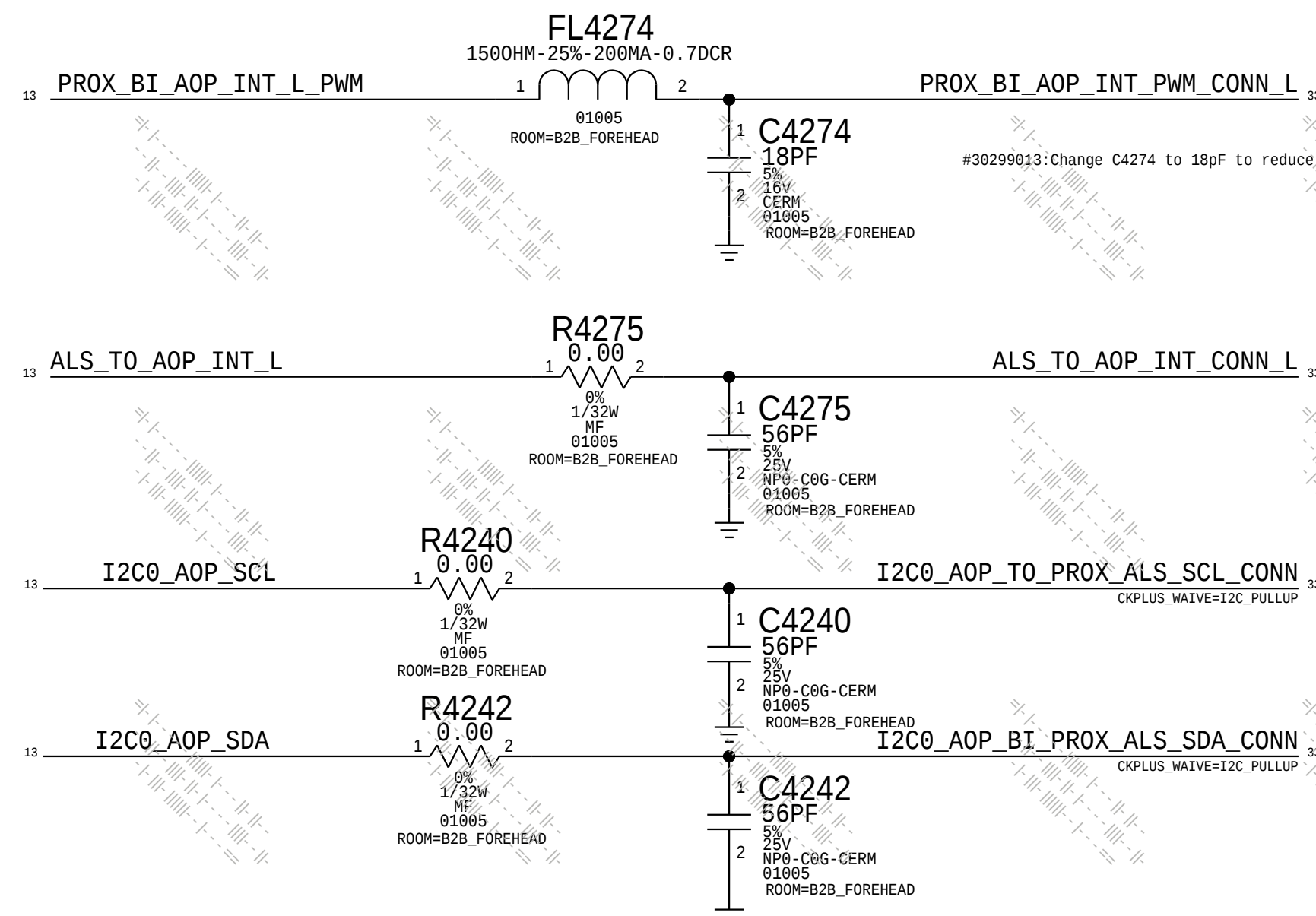
FCAM I/O



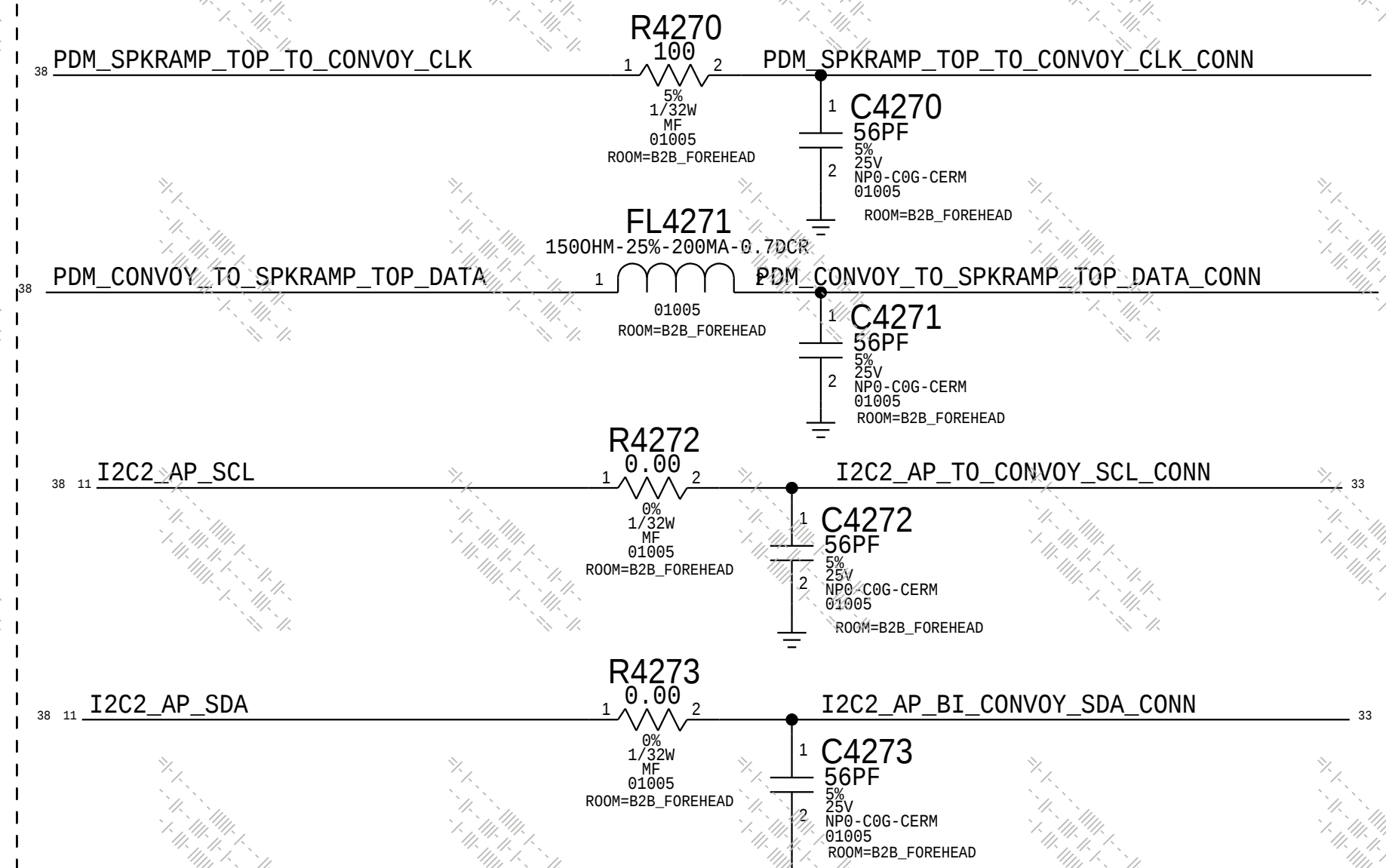
NORTH SPEAKER



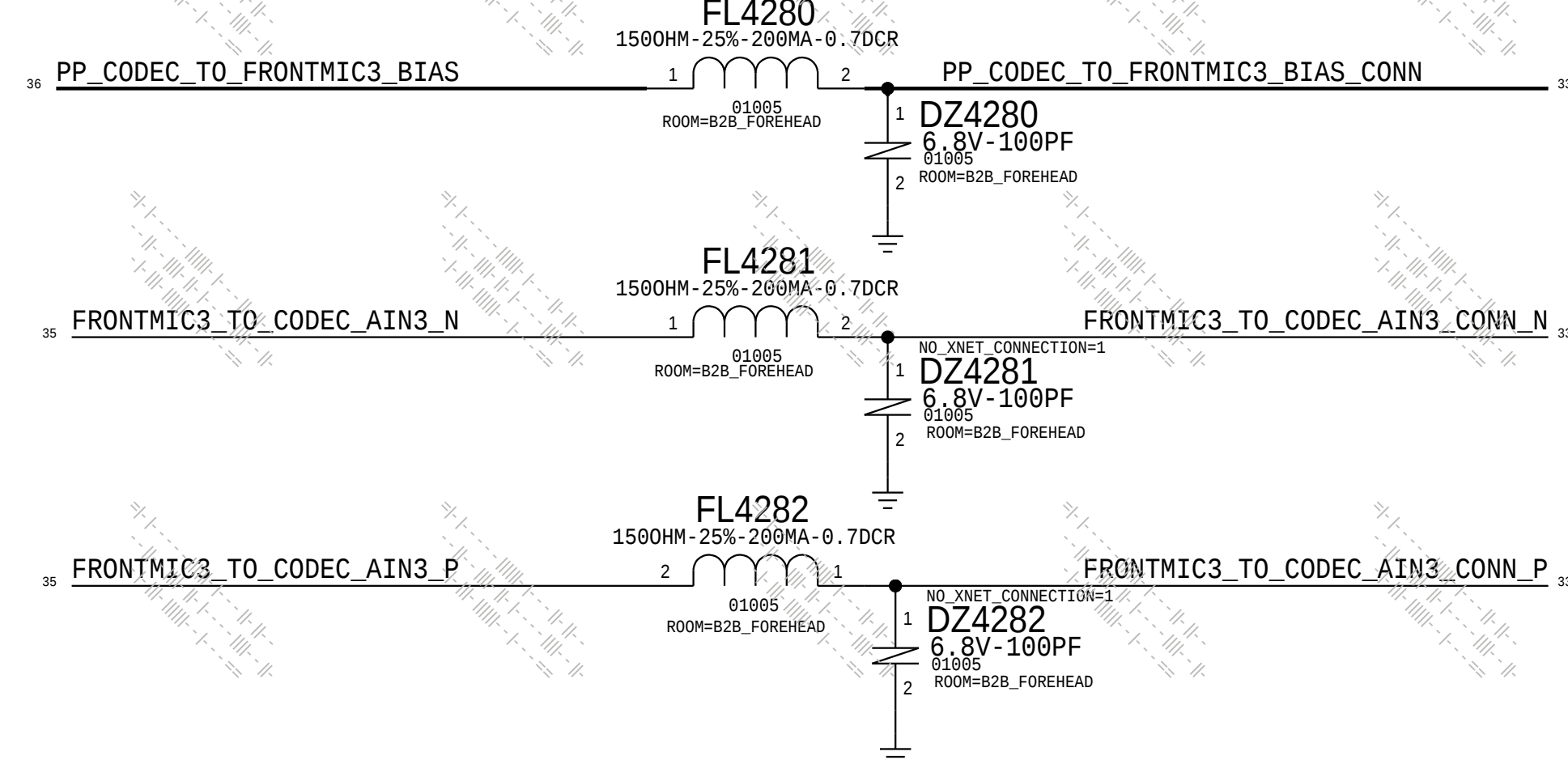
PROX + ALS I/O



CONVOY I/O

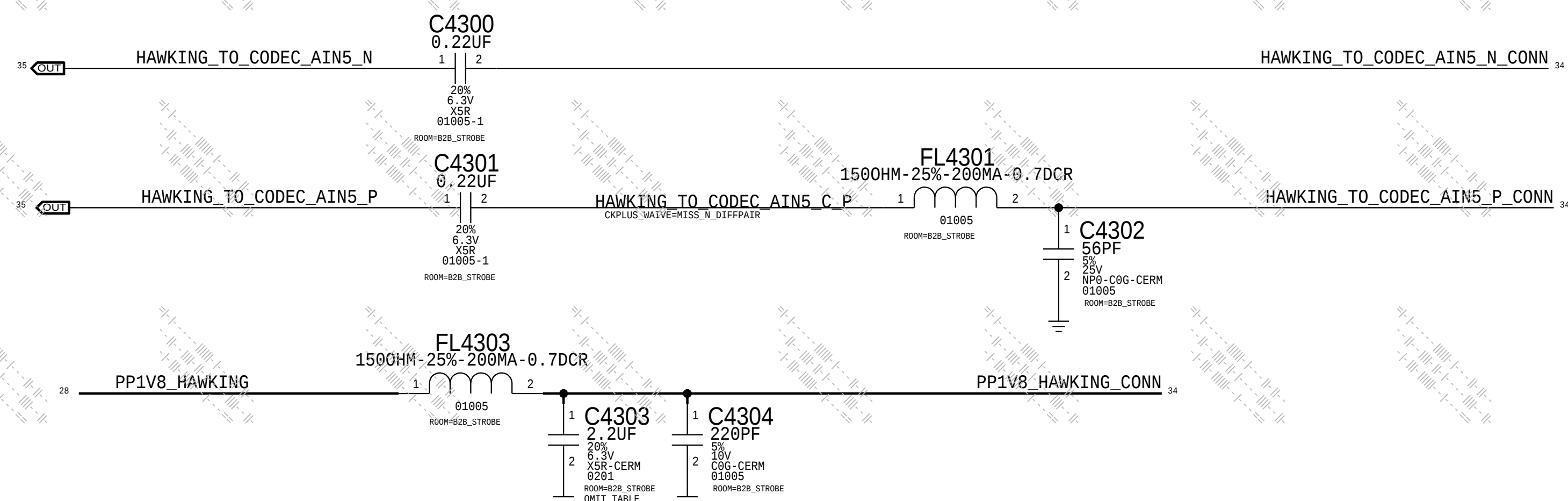


MIC3

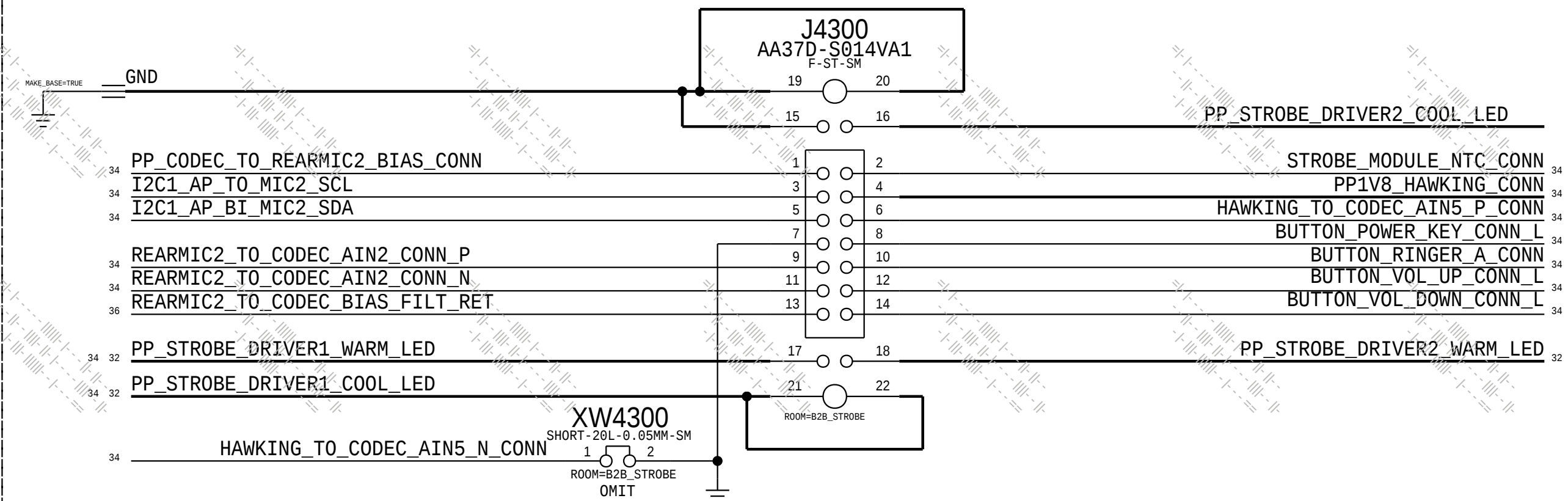


PAGE TITLE		
CAMERA: FCAM + FOREHEAD		
 Apple Inc.	DRAWING NUMBER	051-02159
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	PAGE	42 OF 80
	SHEET	33 OF 81

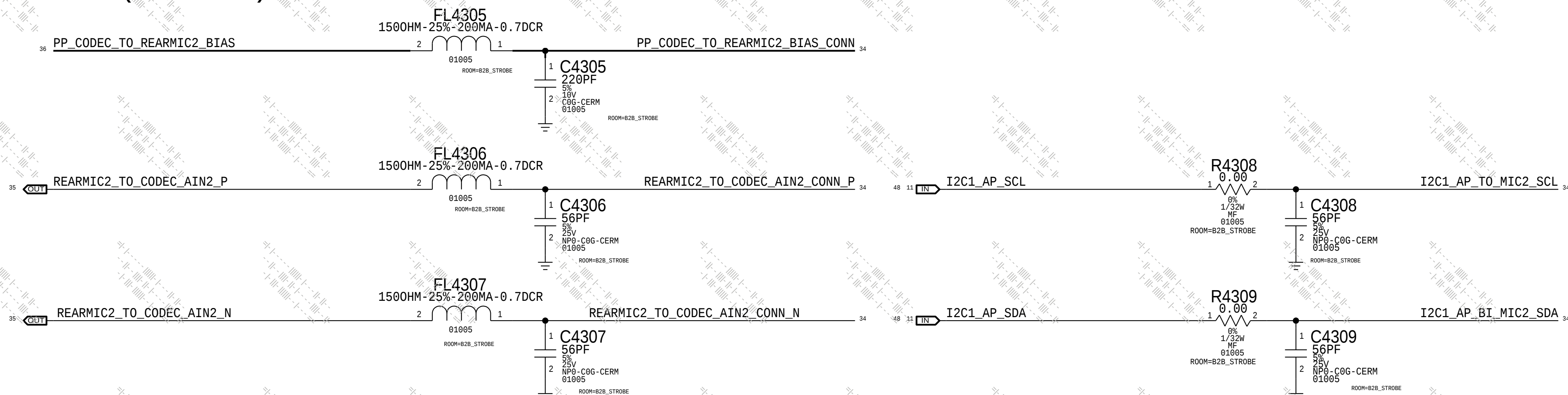
HAWKING



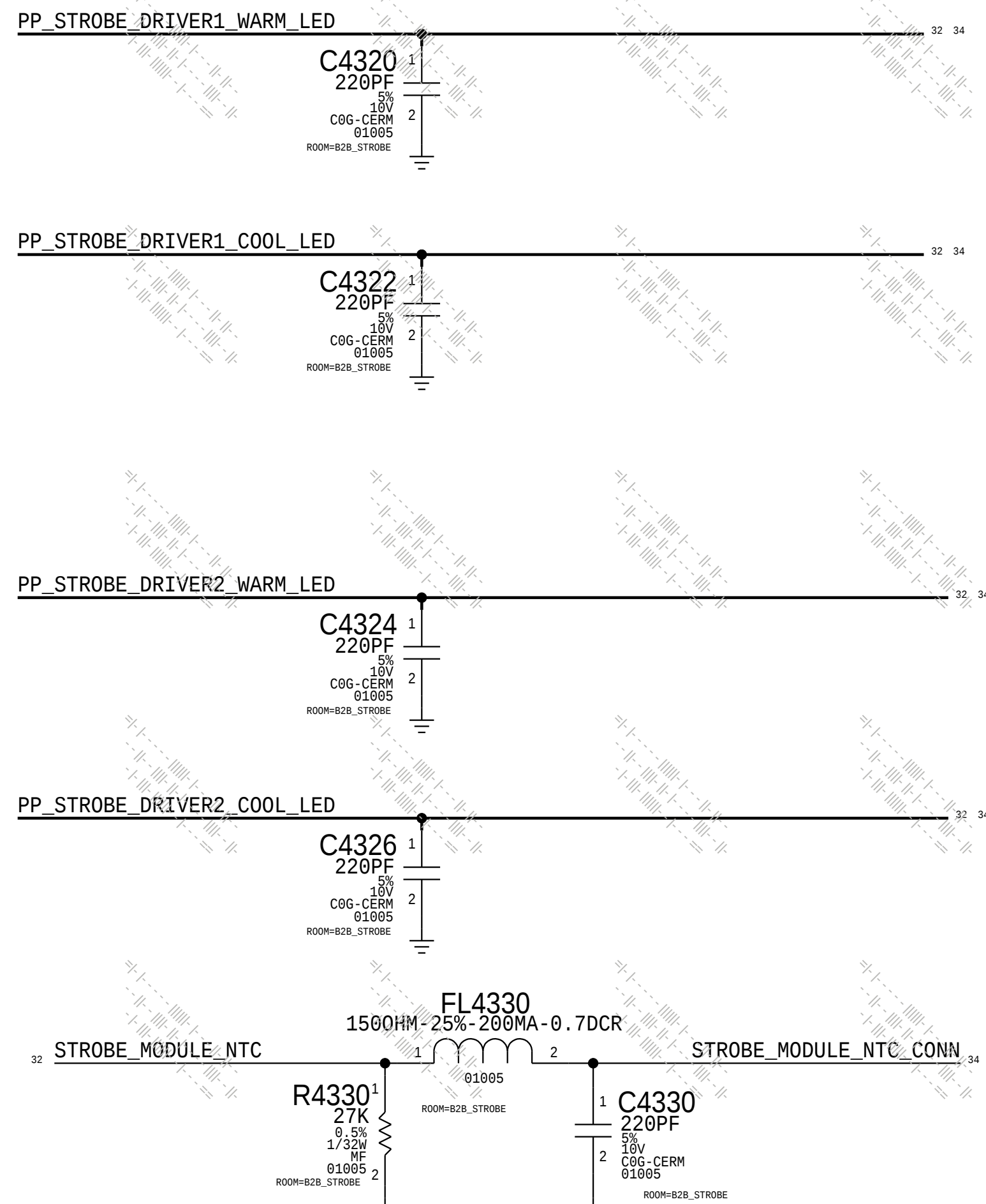
Strobe Connector



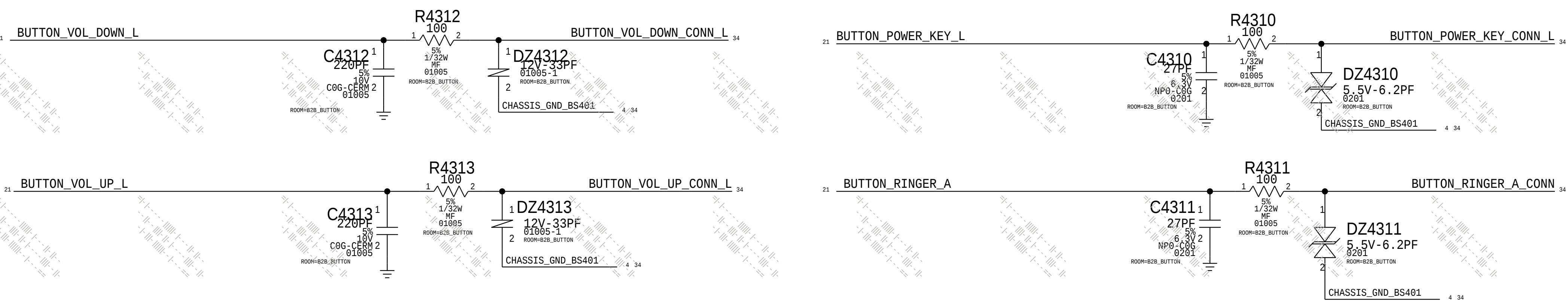
MIC2 (ANC REF)



Strobe Filtering



BUTTON



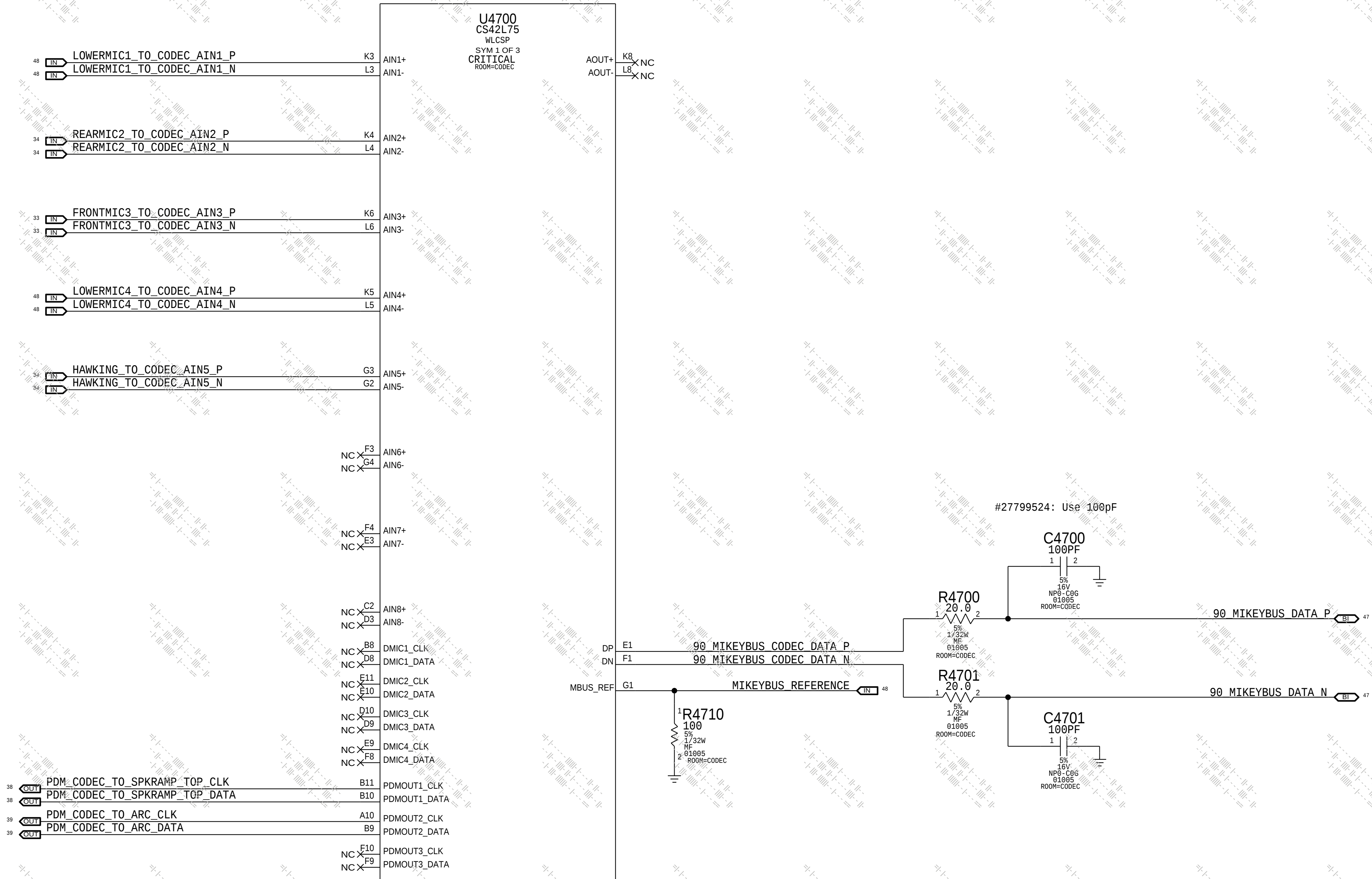
CAMERA: B2B Strobe + Buttons



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CALLAN AUDIO CODEC (ANALOG INPUTS & OUTPUTS)



PAGE TITLE		
AUDIO: CODEC (1/2)		
 Apple Inc.	DRAWING NUMBER	051-02159
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	PAGE	47 OF 80
	SHEET	35 OF 81

CALLAN AUDIO CODEC (POWER & I/O)

D

C

B

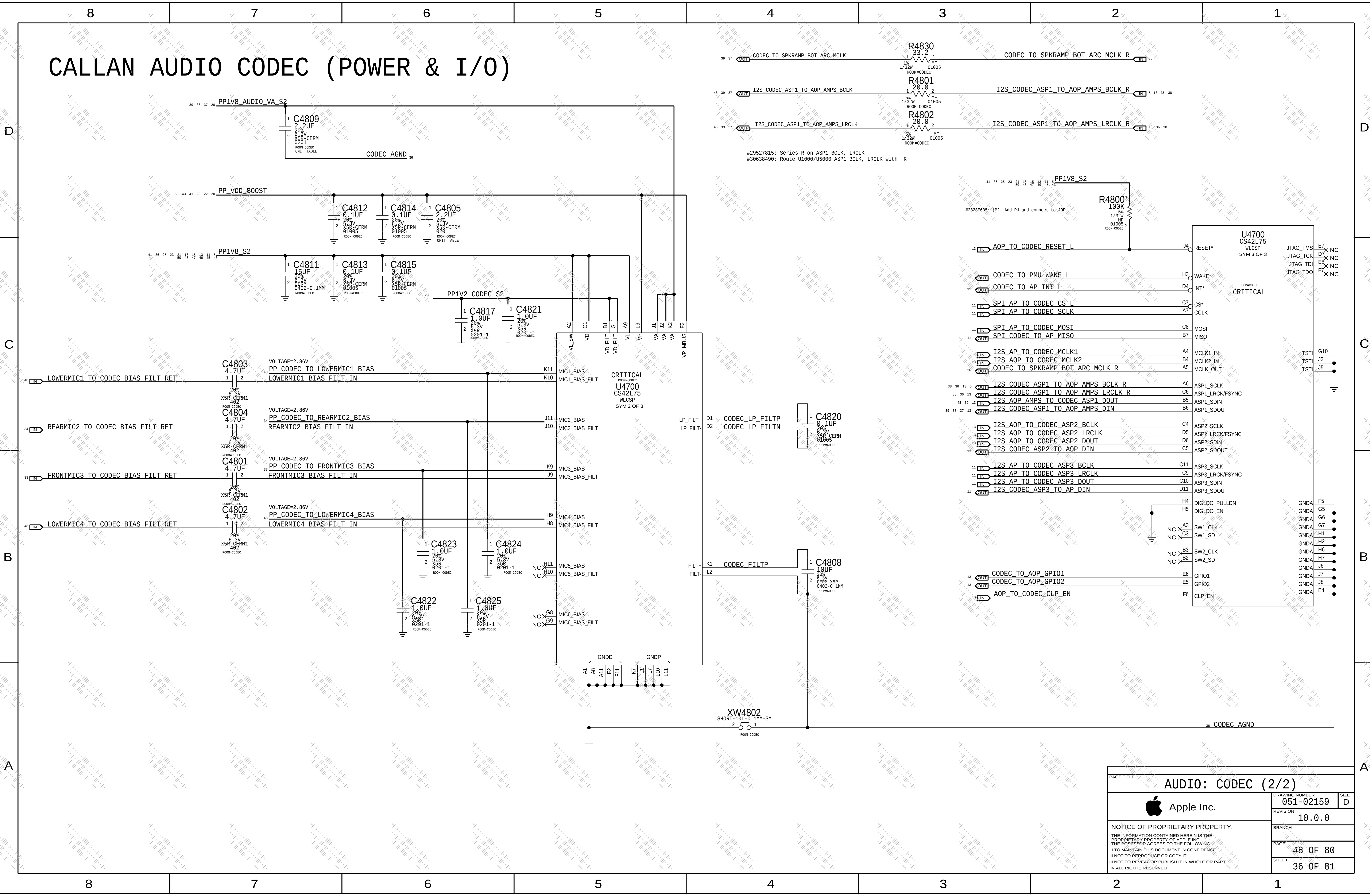
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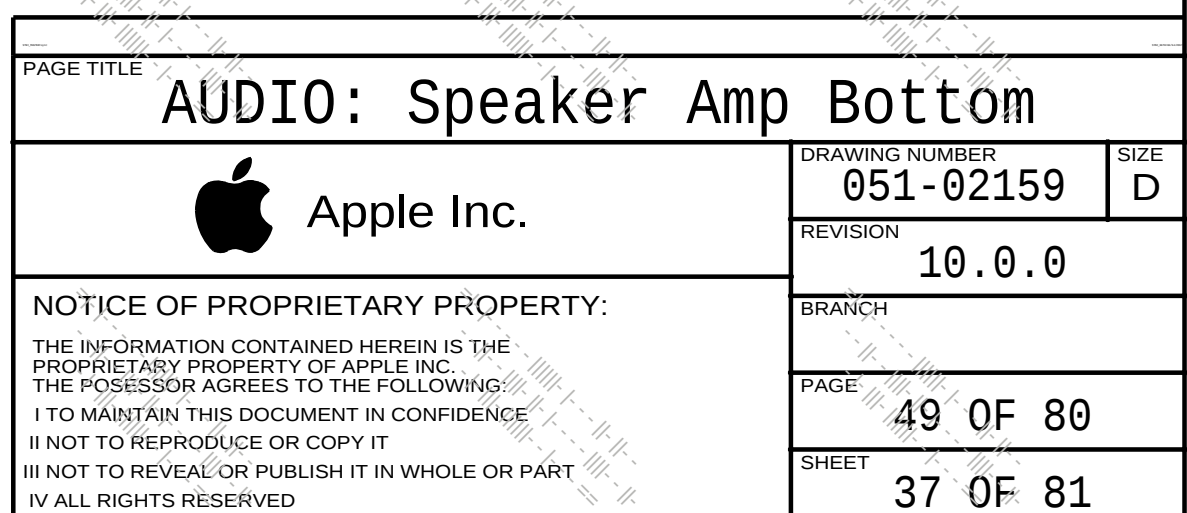
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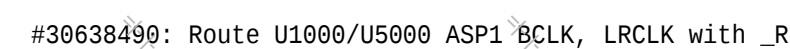


PAGE TITLE			
AUDIO: CODEC (2/2)			
 Apple Inc.	DRAWING NUMBER	051-02159	SIZE
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	BRANCH		
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APN: 338S00143
I2C ADDRESS: 1000 000x
0x80



I2C ADDRESS: 1000 000x (0x80)



AP_TO_SPKRAMP_TOP_RESET_L
1 SPKRAMP_TOP_TO_CONVOY_CLK

PAGE TITLE		
AUDIO10: Speaker Amp Top		
 Apple Inc.	DRAWING NUMBER	SIZE
	051-02159	D
	REVISION	
	10.0.0	
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ARC D

APN: 338S00295
I2C ADDRESS: 1

I2C ADDRESS: 1000 001x (0x82)



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 Apple Inc.	DRAWING NUMBER	051-02159	
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	SIZE	D	
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		51 OF 80	
		SHEET	
		39 OF 81	

D

D

C

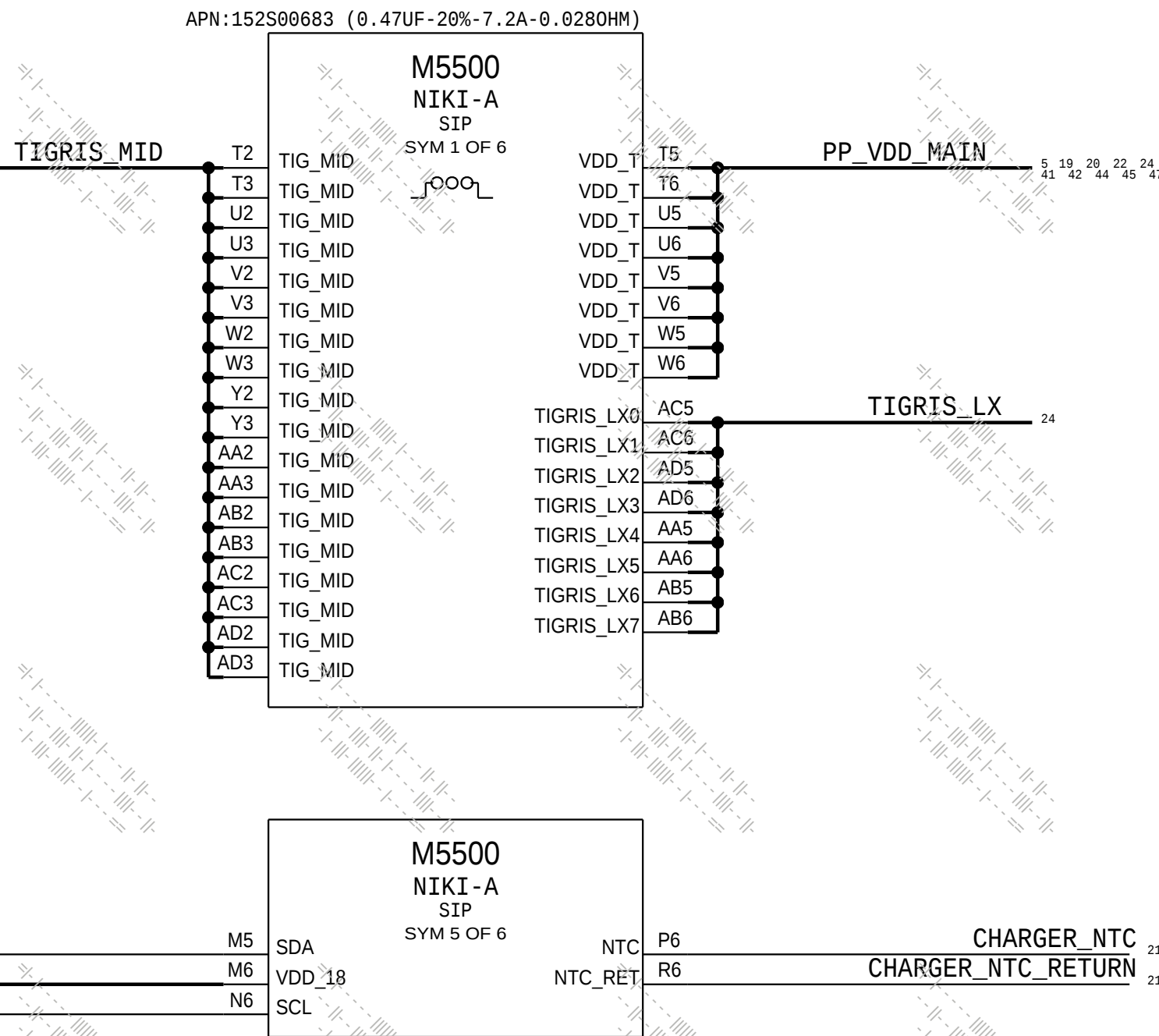
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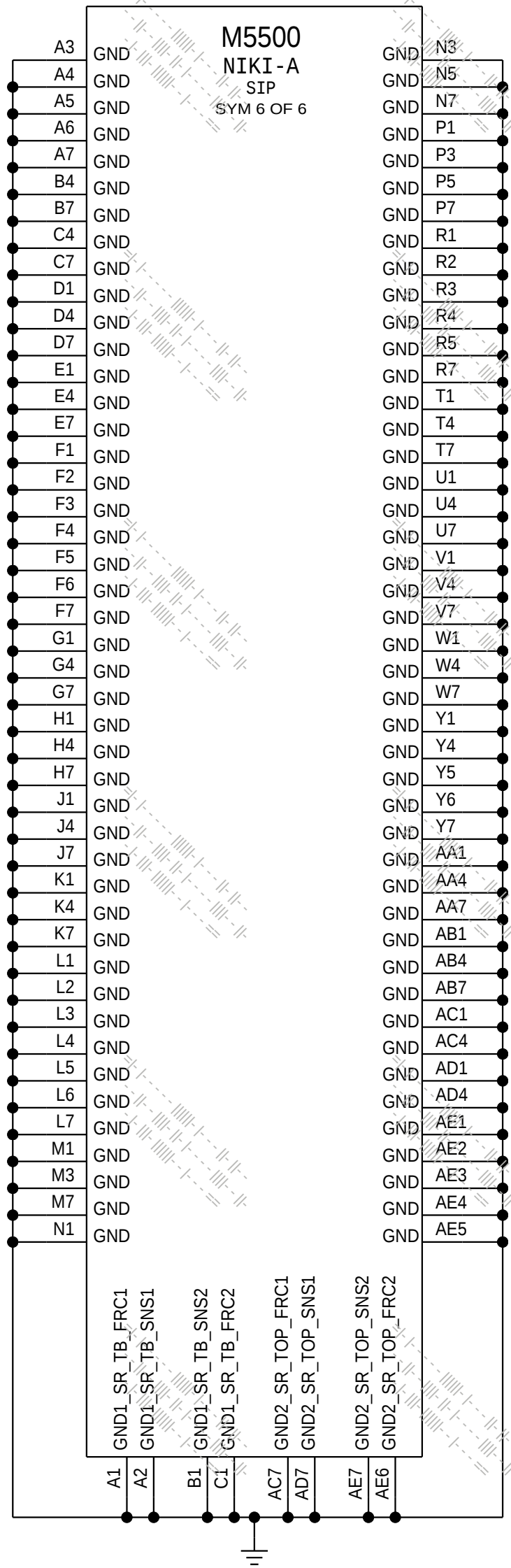
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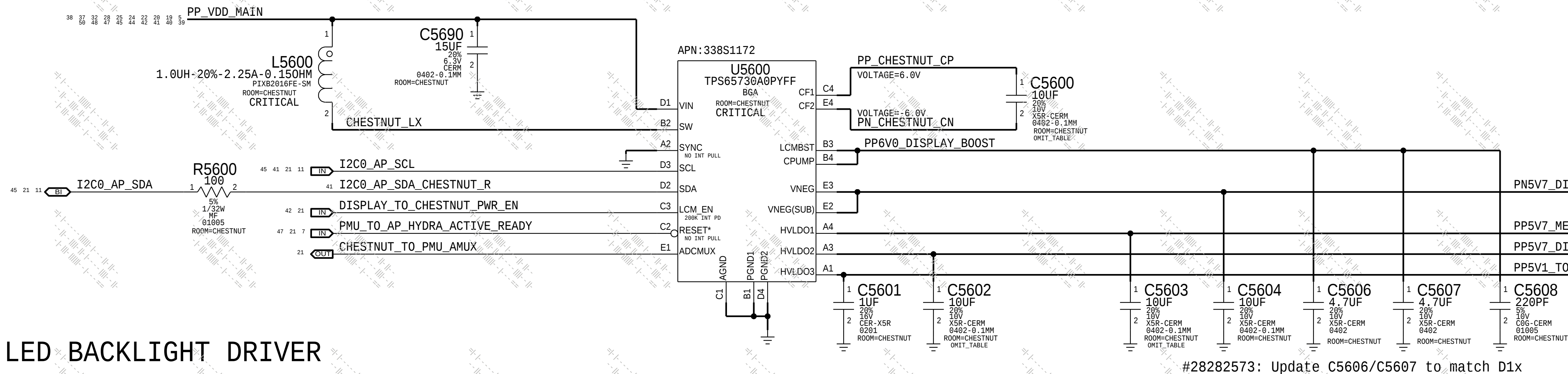
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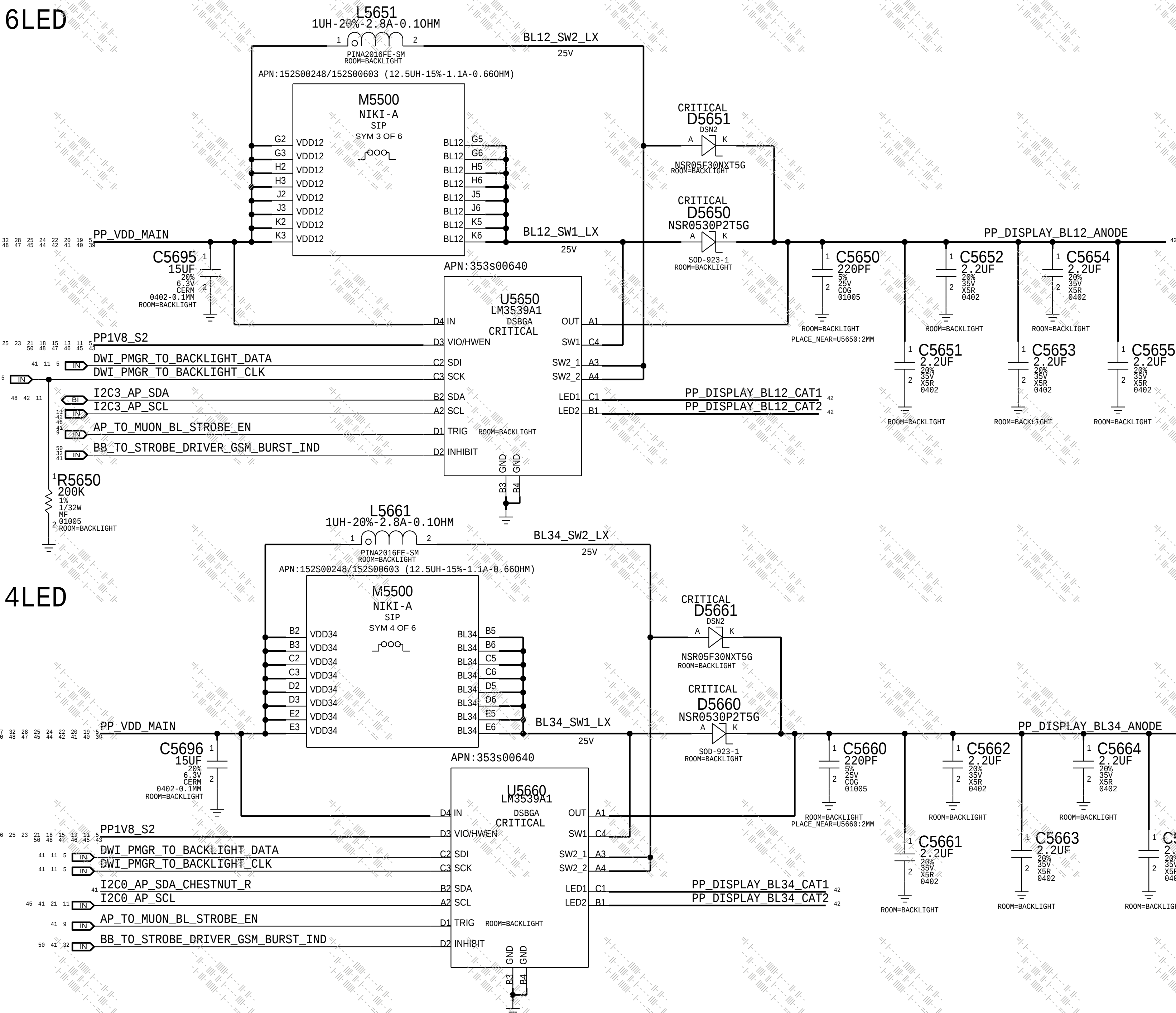
Note: inductors in SIP used for bottom speaker amplifier and backlight
See pages 49, and 56



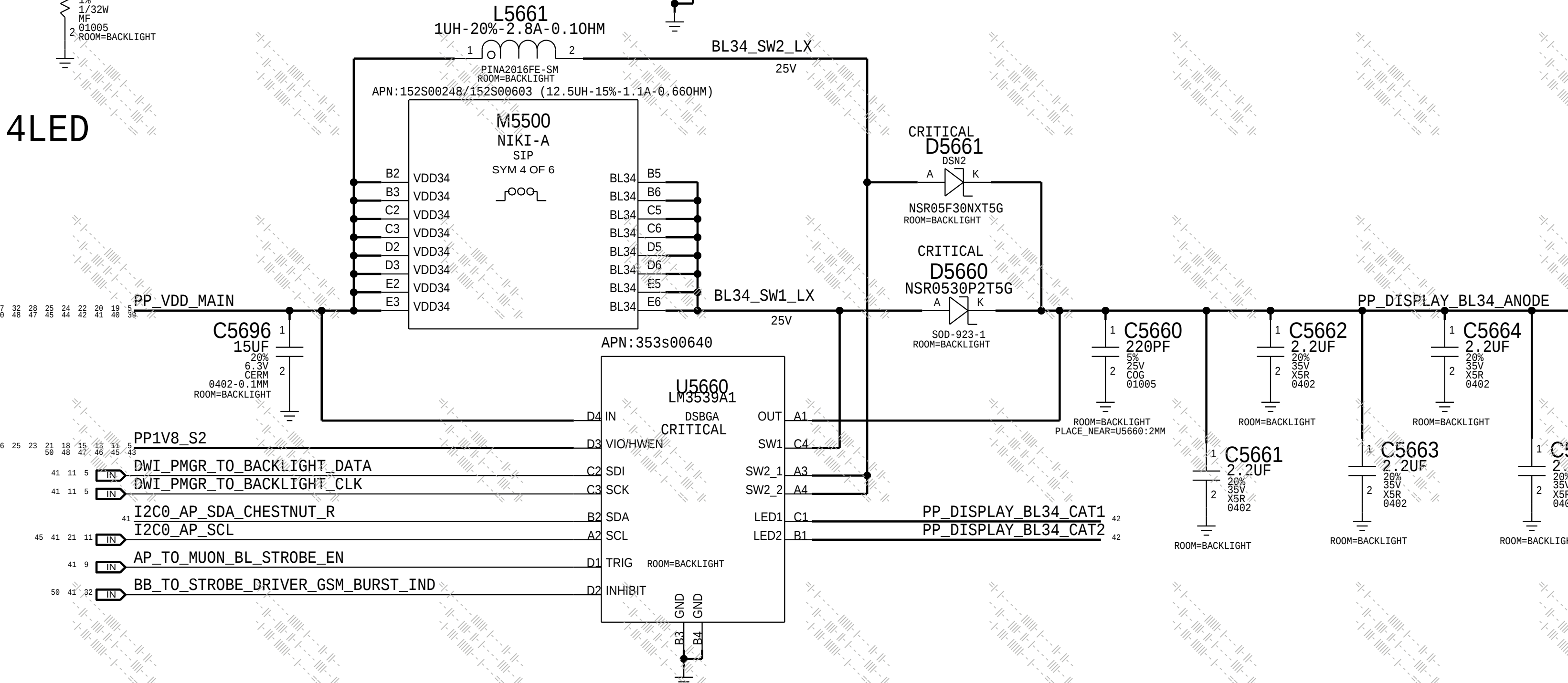
CHESTNUT DISPLAY PMU



LED BACKLIGHT DRIVER 6LED

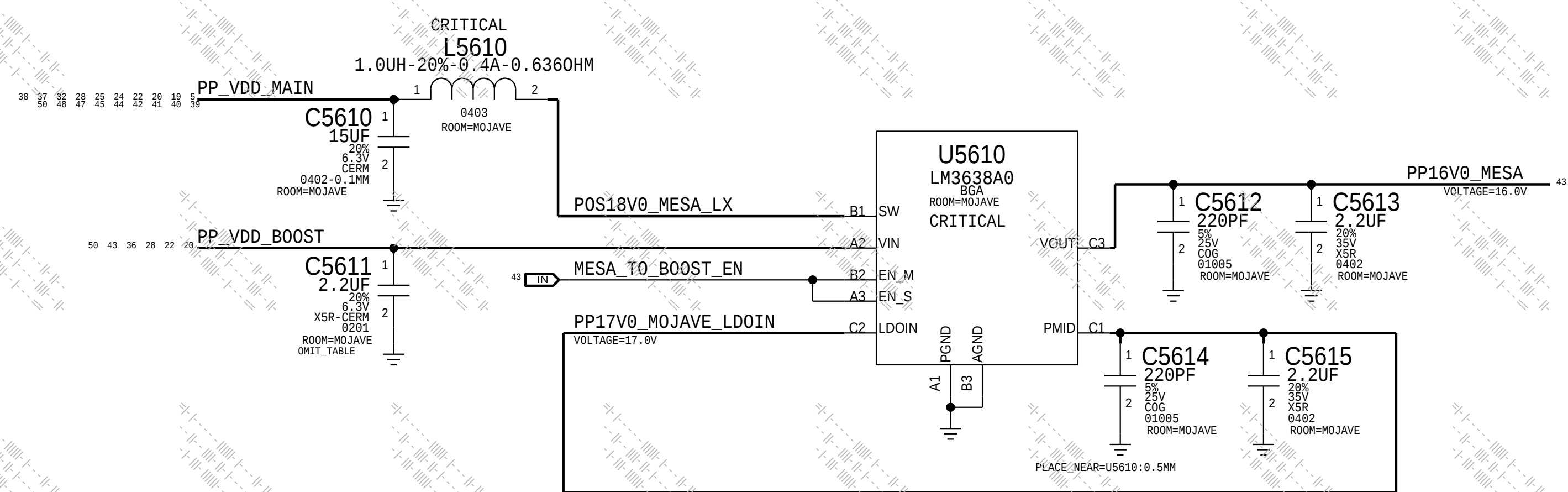


4LED

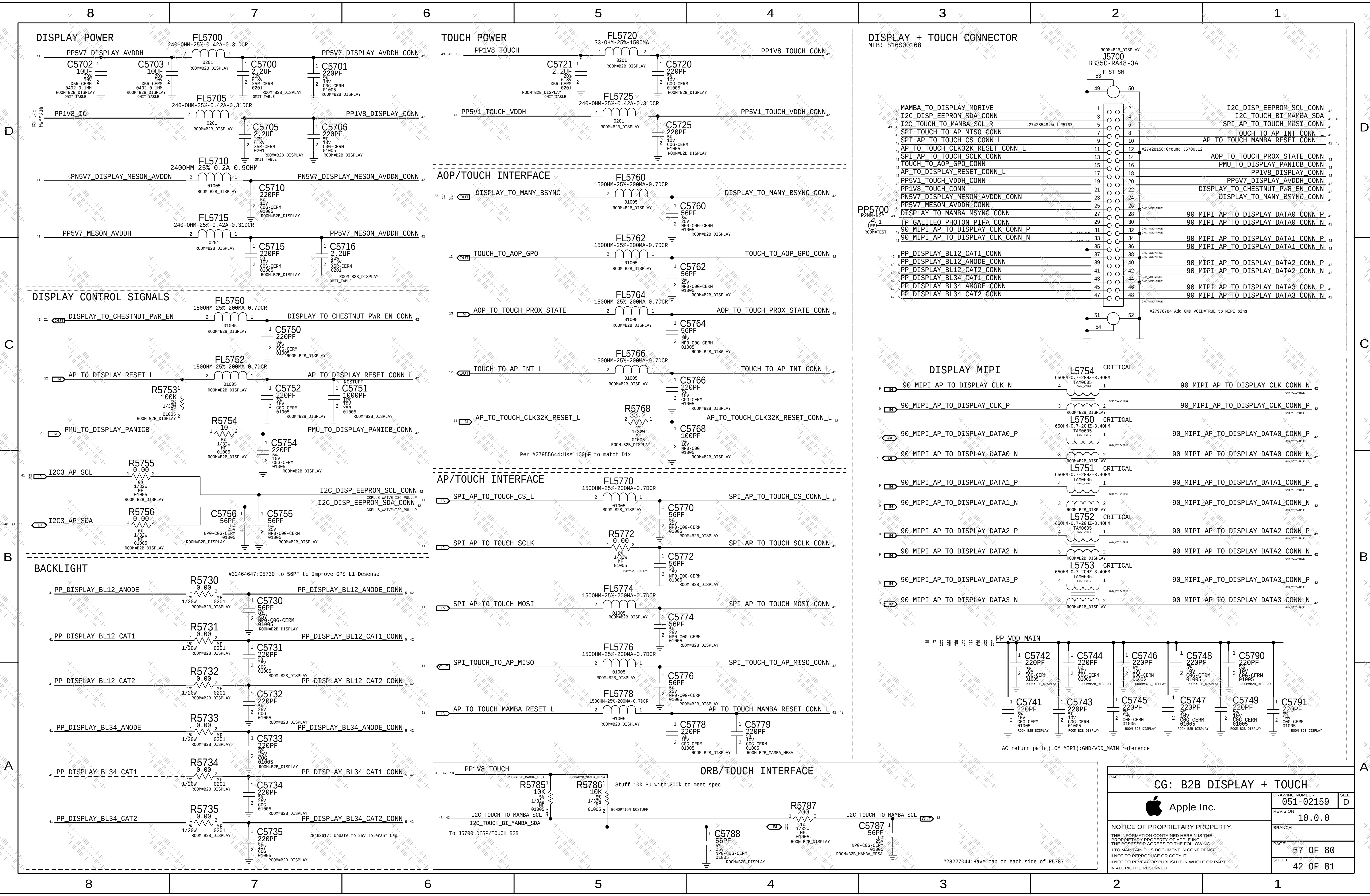


MOJAVE MESA BOOST

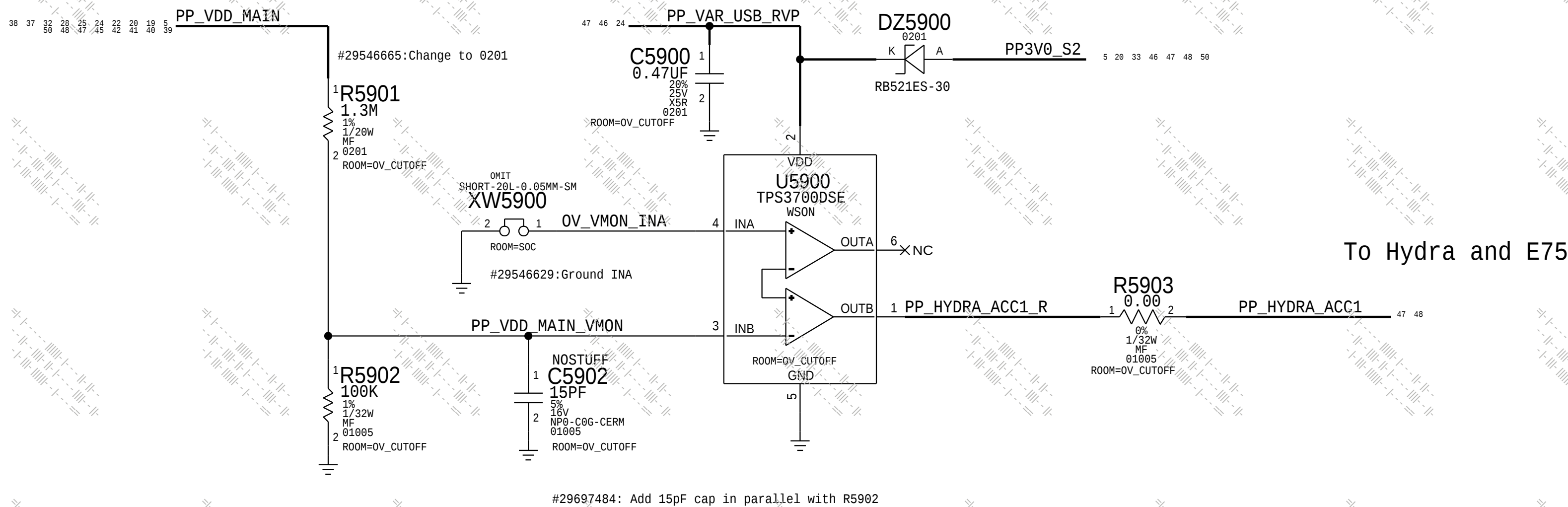
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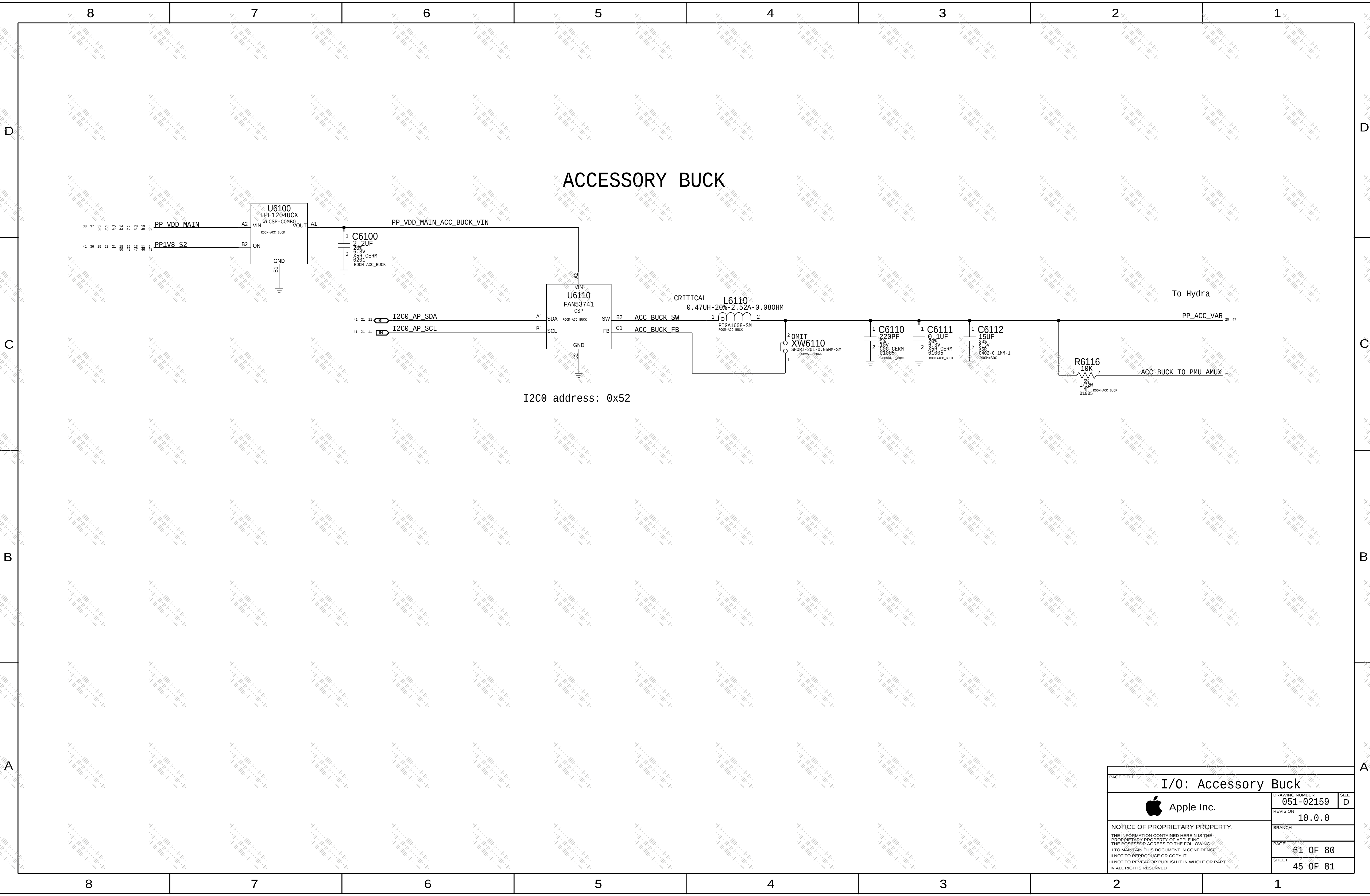
PAGE TITLE			
CG: PMUs			
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		SHEET	41 OF 81

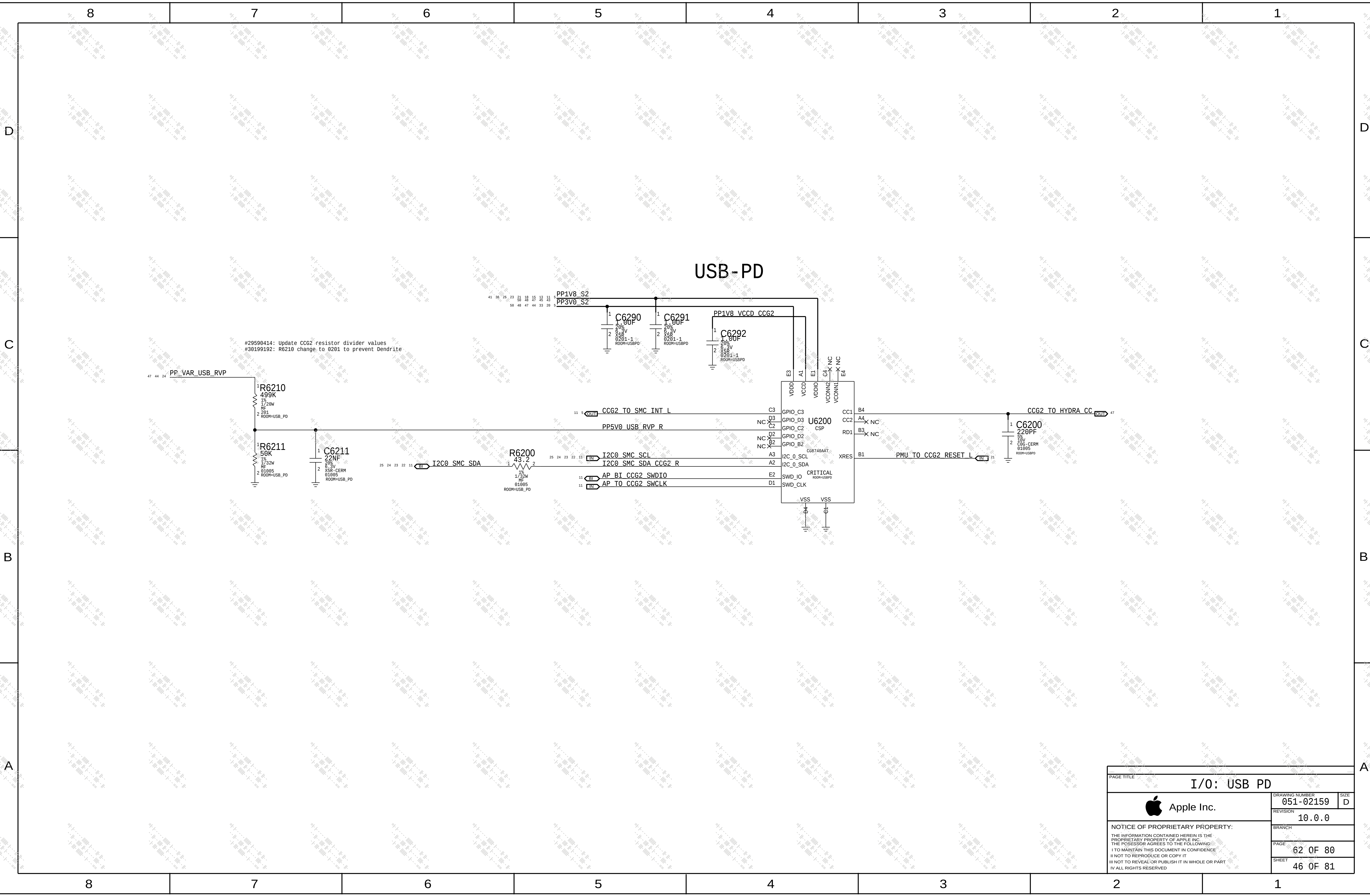


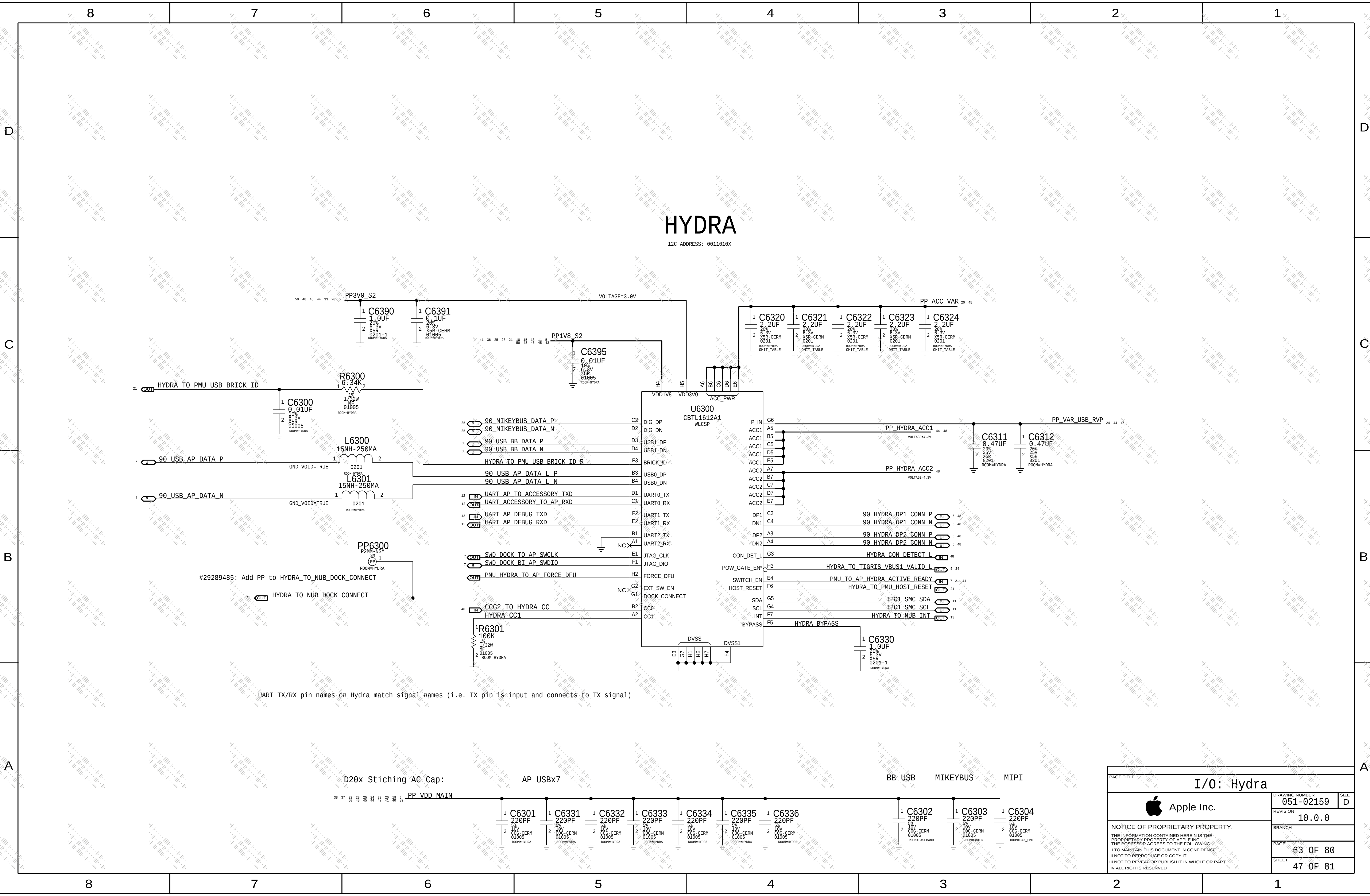
VDD_MAIN OV CUT-OFF CIRCUIT



PAGE TITLE		
I/O: Overvoltage Cut-Off Circuit		
 Apple Inc.	DRAWING NUMBER	051-02159
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	PAGE	59 OF 80
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D

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B

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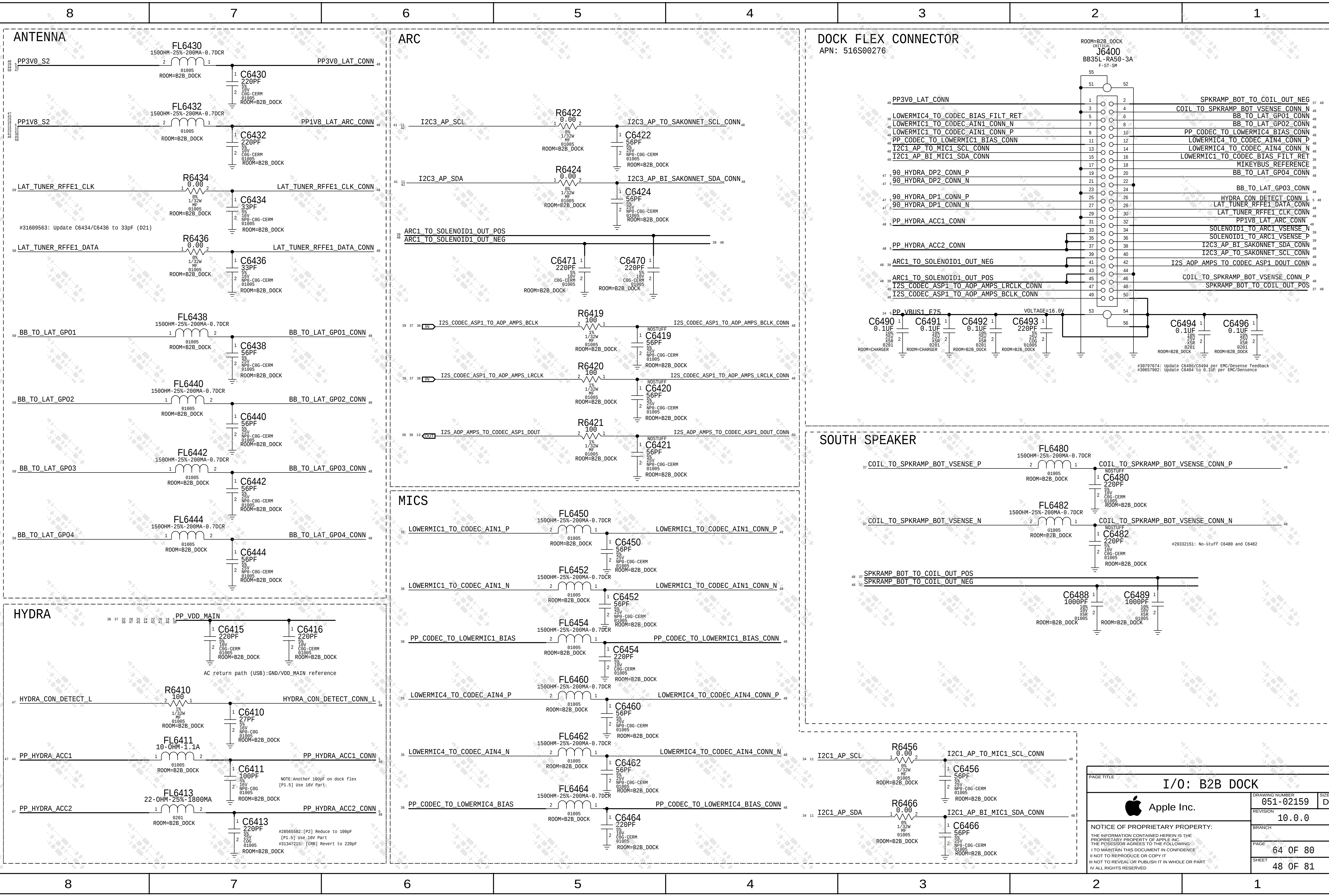
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PAGE TITLE		
I/O: Hydra		
	DRAWING NUMBER	051-02159
	REVISION	10.0.0
	BRANCH	
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PAGE TITLE			
I/O: B2B DOCK			
 Apple Inc.	DRAWING NUMBER	051-02159	SIZE
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SHEET			
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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 : LM35662)	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.

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051-02159

REVISION

10.0.0

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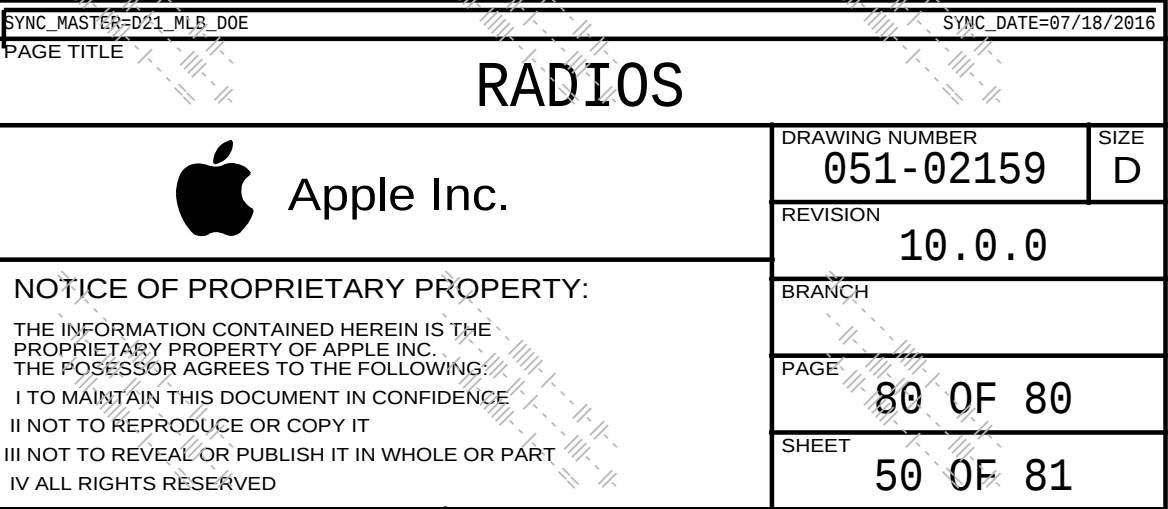
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SIZE

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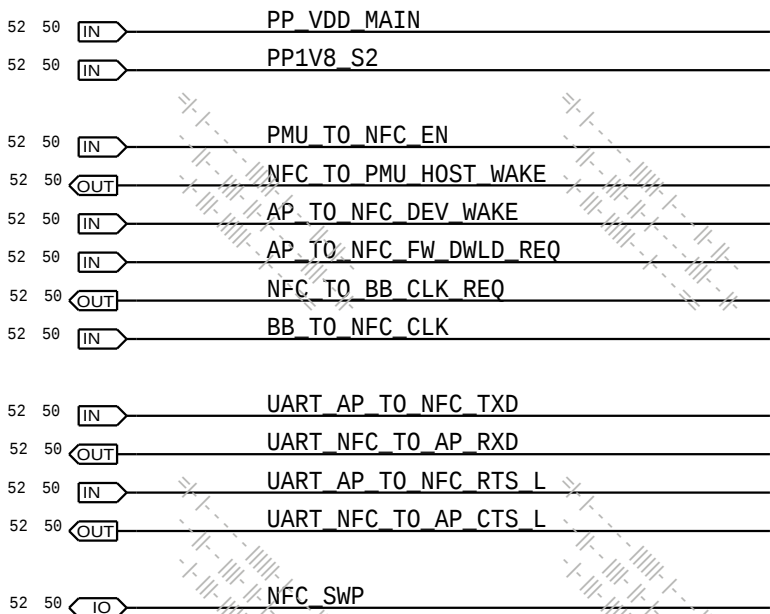
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NFC_MLB D20/D21

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
138S0031	3	CAP, TYPICAL, 2.2UF, 6.3V, 0201	C7500_S, C7502_S, C7505_S	CRITICAL	TYPICAL_CAP



PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
131S00882	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
131S00883	1	220PF, 0201, 2%, 50V	C7518_S	D20_JPN
131S00025	1	1000PF, 0201, 2%, 25V	C7510_S	D20_JPN
131S00025	1	1000PF, 0201, 2%, 25V	C7513_S	D20_JPN
157S00022	1	TDK, BALUN, 11T	T7500_S	D20_JPN

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
131S00138	1	39PF, 0201, 2%, 50V	C7512_S	D20_ROW
131S00016	1	470PF, 0201, 2%, 25V	C7514_S	D20_ROW
131S00025	1	1000PF, 0201, 2%, 25V	C7515_S	D20_ROW
131S00825	1	560PF, 0201, 2%, 25V	C7516_S	D20_ROW
131S00883	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	D201
131S00016	1	470PF, 0201, 2%, 25V	C7514_S	D201
131S00025	1	1000PF, 0201, 2%, 25V	C7515_S	D201
131S00825	1	560PF, 0201, 2%, 25V	C7516_S	D201
131S00883	1	220PF, 0201, 2%, 50V	C7518_S	D201
131S00026	1	820PF, 0201, 2%, 25V	C7510_S	D201
131S00026	1	820PF, 0201, 2%, 25V	C7513_S	D201
157S00022	1	TDK, BALUN, 11T	T7500_S	D201

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

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

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

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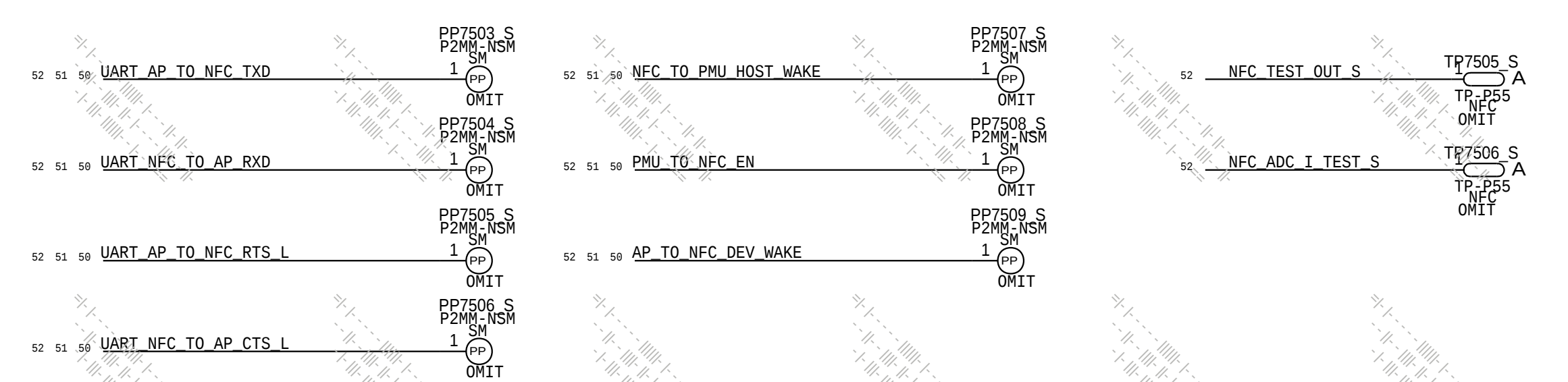
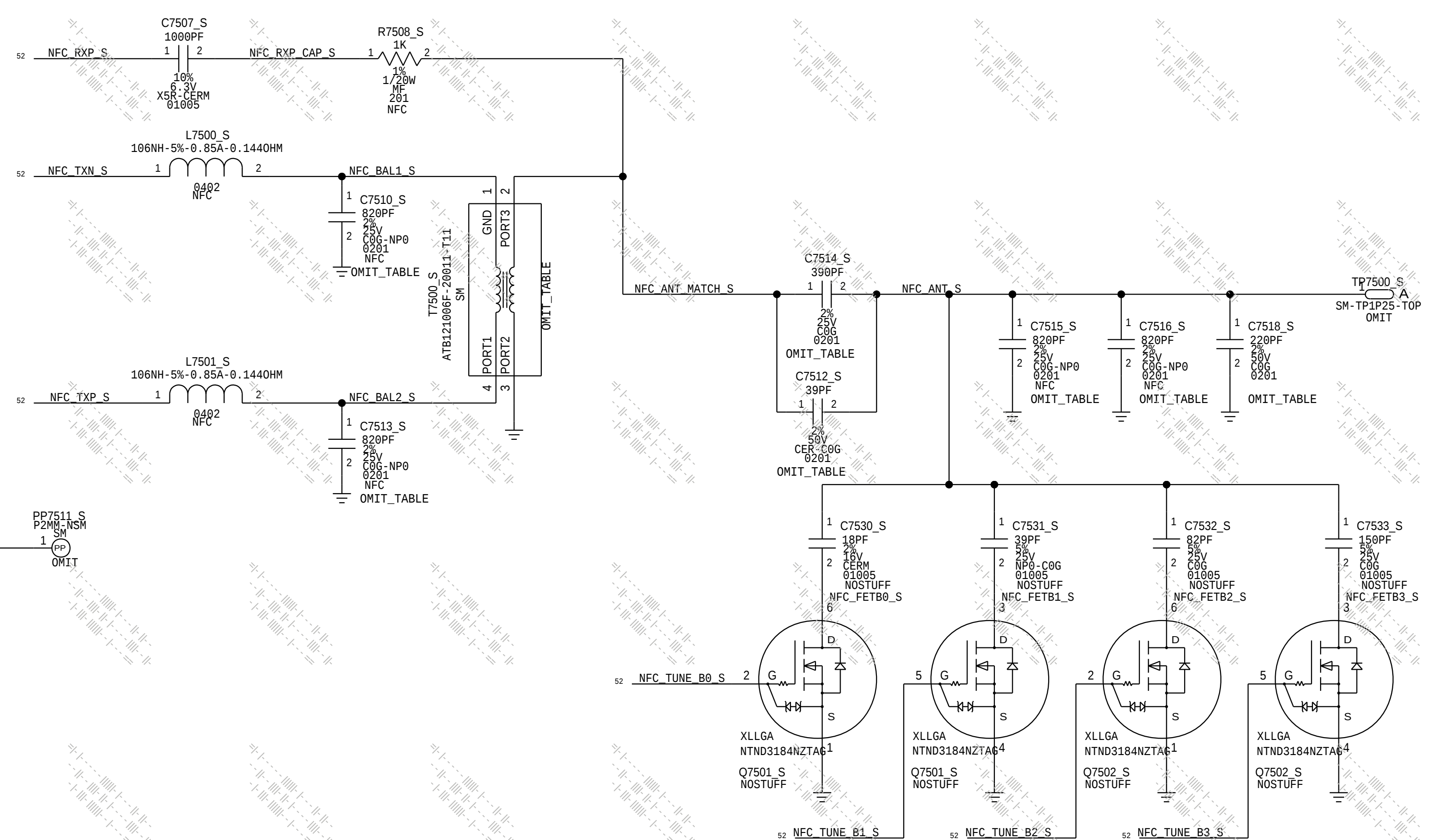
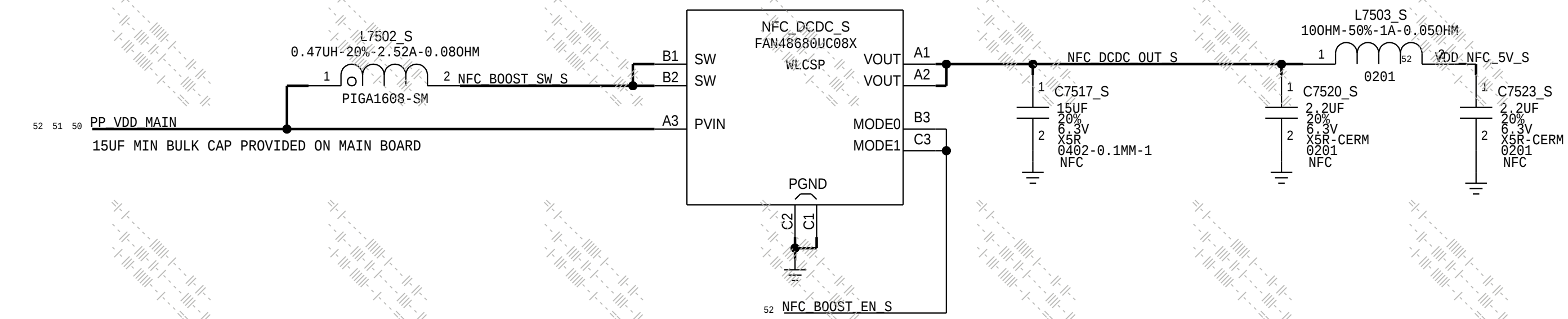
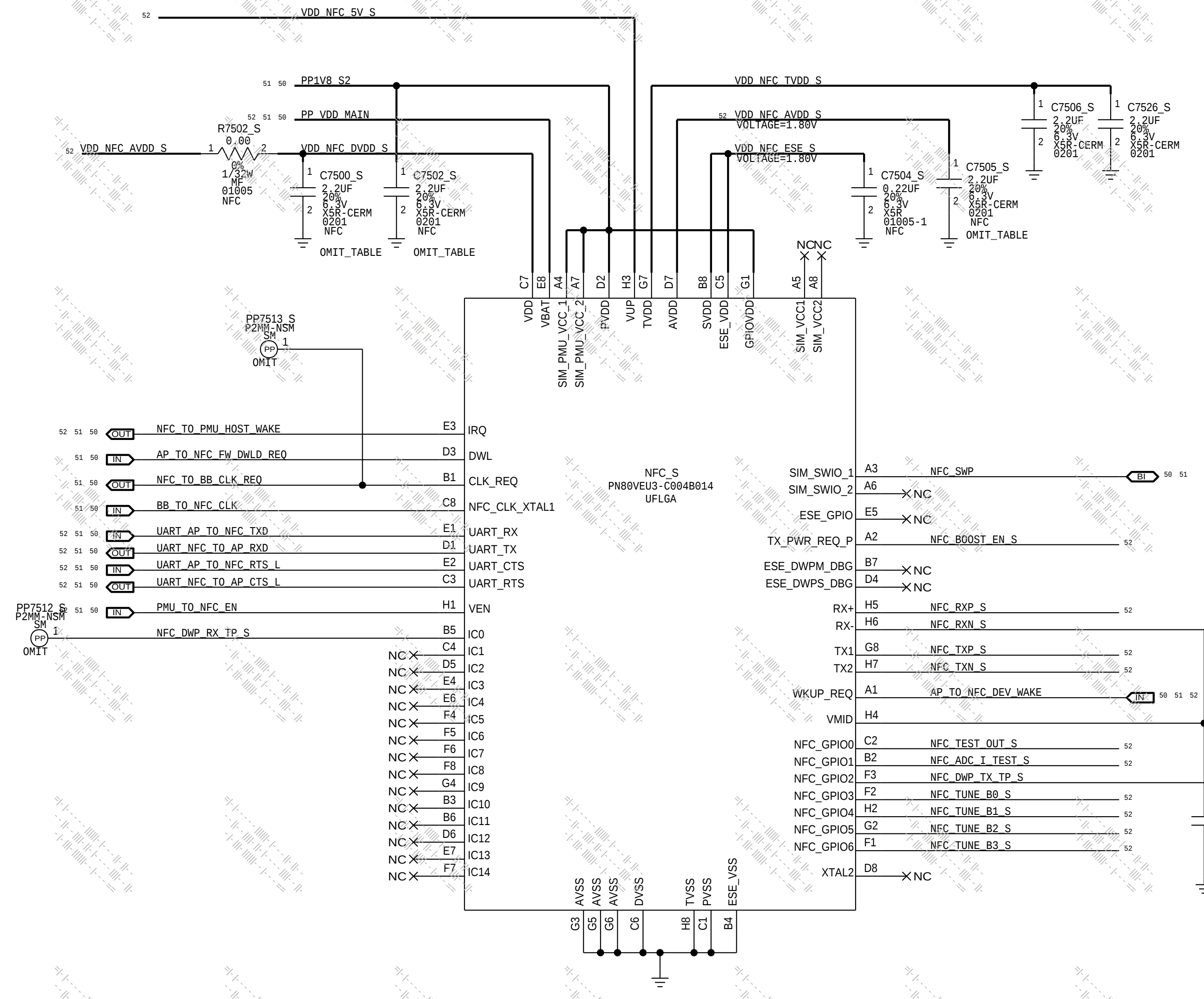
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STOCKHOLM

5V BOOSTER

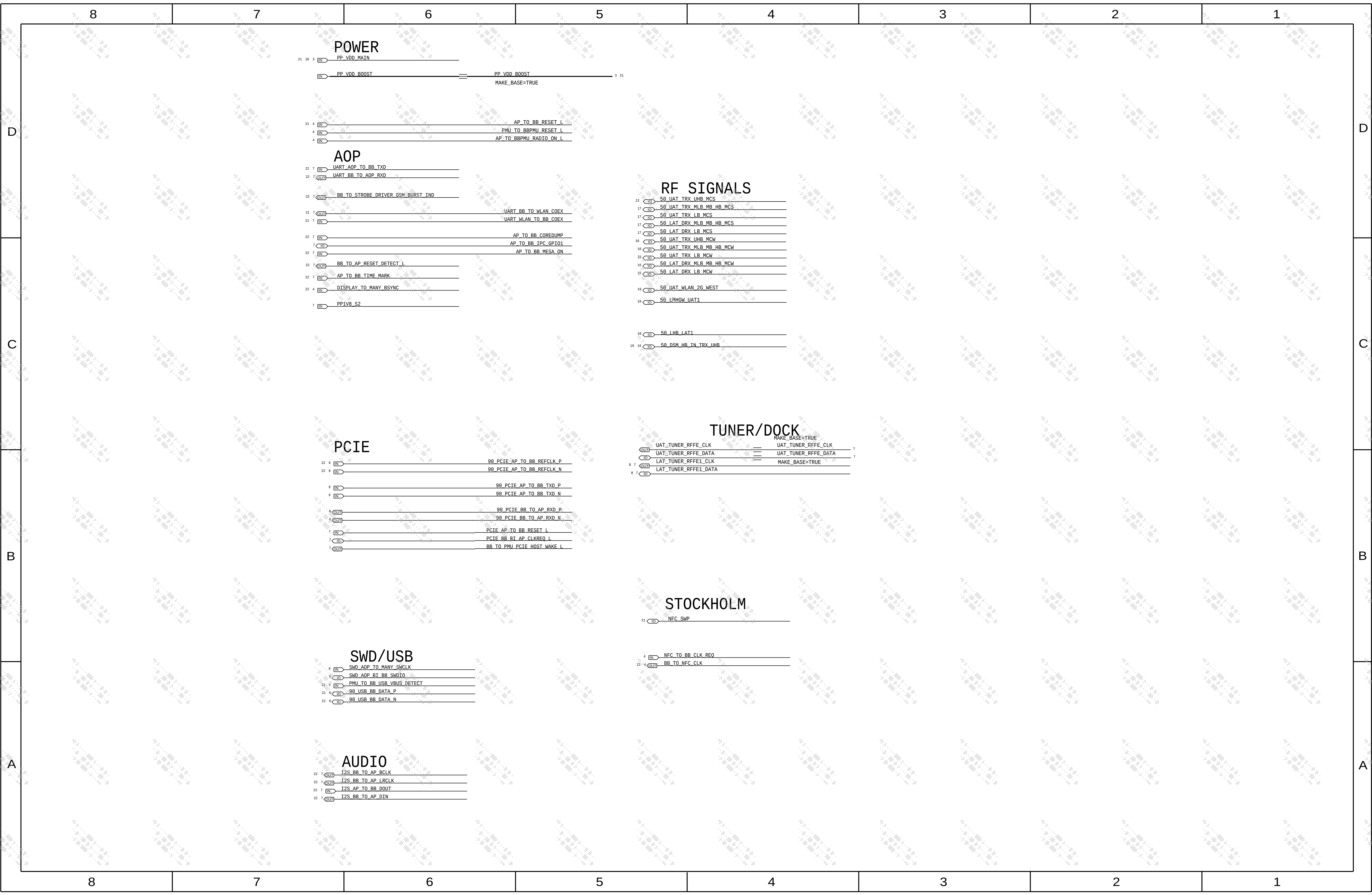
NFC CONTROLLER

NFC FRONT END



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NFC		
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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.												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 <table><thead><tr><th>PAGE</th><th>CSA</th><th>CONTENTS</th><th>SYNCH</th><th>DATE</th></tr></thead><tbody><tr><td>53</td><td>1</td><td>FRONT PAGE</td><td></td><td></td></tr><tr><td>54</td><td>2</td><td>HIERARCHY</td><td></td><td></td></tr><tr><td>55</td><td>3</td><td>PMIC: BUCKS & LDOS</td><td></td><td></td></tr><tr><td>56</td><td>4</td><td>PMIC: CLOCKS & CONTROL</td><td></td><td></td></tr><tr><td>57</td><td>5</td><td>BB: POWER</td><td></td><td></td></tr><tr><td>58</td><td>6</td><td>BB: CONTROL & HS PERIPHERALS [6]</td><td></td><td></td></tr><tr><td>59</td><td>7</td><td>BB: GPIOs & QLINK</td><td></td><td></td></tr><tr><td>60</td><td>8</td><td>XCVR</td><td></td><td></td></tr><tr><td>61</td><td>9</td><td>XCVR</td><td></td><td></td></tr><tr><td>62</td><td>10</td><td>QPOET MODULE</td><td></td><td></td></tr><tr><td>63</td><td>11</td><td>LB PAD</td><td></td><td></td></tr><tr><td>64</td><td>12</td><td>HB PAD</td><td></td><td></td></tr><tr><td>65</td><td>13</td><td>UHB PAD</td><td></td><td></td></tr><tr><td>66</td><td>14</td><td>2G PA</td><td></td><td></td></tr><tr><td>67</td><td>15</td><td>LB DSM</td><td></td><td></td></tr><tr><td>68</td><td>16</td><td>HB DSM</td><td></td><td></td></tr><tr><td>69</td><td>17</td><td>COUPLER2</td><td></td><td></td></tr><tr><td>70</td><td>18</td><td>LOWER ANTENNA</td><td></td><td></td></tr><tr><td>71</td><td>19</td><td>UPPER ANTENNA</td><td></td><td></td></tr><tr><td>72</td><td>20</td><td>GNSS</td><td></td><td></td></tr><tr><td>73</td><td>21</td><td>SIM, DEBUG CONN</td><td></td><td></td></tr><tr><td>74</td><td>22</td><td>TEST POINTS</td><td>PROBE POINTS</td><td>07/18/2016</td></tr></tbody></table>																PAGE	CSA	CONTENTS	SYNCH	DATE	53	1	FRONT PAGE			54	2	HIERARCHY			55	3	PMIC: BUCKS & LDOS			56	4	PMIC: CLOCKS & CONTROL			57	5	BB: POWER			58	6	BB: CONTROL & HS PERIPHERALS [6]			59	7	BB: GPIOs & QLINK			60	8	XCVR			61	9	XCVR			62	10	QPOET MODULE			63	11	LB PAD			64	12	HB PAD			65	13	UHB PAD			66	14	2G PA			67	15	LB DSM			68	16	HB DSM			69	17	COUPLER2			70	18	LOWER ANTENNA			71	19	UPPER ANTENNA			72	20	GNSS			73	21	SIM, DEBUG CONN			74	22	TEST POINTS	PROBE POINTS	07/18/2016	ALTERNATES <table><thead><tr><th>PART NUMBER</th><th>ALTERNATE FOR PART NUMBER</th><th>REFERENCE DESIGNATOR(S)</th><th>DESCRIPTION</th><th>BOM OPTION</th></tr></thead><tbody><tr><td>335S00013</td><td>335S0894</td><td>U_EEPROM_E</td><td>IC, EEPROM</td><td>BOM_TABLE_ALTS</td></tr><tr><td>197S00093</td><td>197S00065</td><td>Y401_E</td><td>XTAL, 38P4MHZ</td><td>BOM_TABLE_ALTS</td></tr><tr><td>197S00067</td><td>197S00065</td><td>Y401_E</td><td>XTAL, 38P4MHZ</td><td>BOM_TABLE_ALTS</td></tr><tr><td>353S01287</td><td>353S01109</td><td>U_QET_E</td><td>ET MODULE, QPOET</td><td>BOM_TABLE_ALTS</td></tr></tbody></table>				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
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SCH # : 951-03059 PCB # : 920-02293 BOM # : 939-02493 FRONT PAGE SCH, MLB, D21 Apple Inc. THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED DRAWING NUMBER 051-02159 SIZE D REVISION 10.0.0 BRANCH PAGE 1 OF 22 SHEET 53 OF 81																																																																																																																																																															
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RF PMIC: SWITCHERS & LDOS

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MAKE_BASE=TRUE
PP_VDD_BOOST
VOLTAGE=4.3V

SWITCHERS BULK CAPS

MAKE_BASE=TRUE
PP_VDD_MAIN
VOLTAGE=4.3V

C302_E
10uF
20V
X5R-CERM
0402-0.1MM-1

C303_E
10uF
20V
X5R-CERM
0402-0.1MM-1

C304_E
10uF
20V
X5R-CERM
0402-0.1MM-1

C301_E
10uF
20V
X5R-CERM
0402-0.1MM-1

C305_E
10uF
20V
X5R-CERM
0402-0.1MM-1

PP_VDD_MAIN
VDD_S1
VDD_S1
GND_S1
GND_S1
GND_S1
GND_S1

PP_VDD_MAIN
VDD_S2
GND_S2
VDD_S3
VDD_S3
GND_S3
GND_S3

PP_VDD_MAIN
VDD_S4
GND_S4
VDD_S5
VDD_S5
GND_S5
GND_S5

PP_VDD_MAIN
VDD_S6
GND_S6
VDD_S7
VDD_S7
GND_S7
GND_S7

PP_VDD_MAIN
VDD_S8
GND_S8
VDD_S9
VDD_S9
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GND_S35

U_PMIC_E
PDM9655
BGA
SYM 6 OF 6
SREG

VREG_S1
VSW_S1
VSW_S1
VREG_S2
VSW_S2
VSW_S2

VREG_S3
VSW_S3
VSW_S3
VREG_S4
VSW_S4
VSW_S4

VREG_S5
VSW_S5
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VREG_S34
VSW_S34
VSW_S34

VREG_S35
VSW_S35
VSW_S35
VREG_S36
VSW_S36
VSW_S36

PP_0V8_SMPS1_SNS_E
VOLTAGE=0.80V

PP_1V2_SMPS2_SNS_E
VOLTAGE=1.20V

PP_1V0_SMPS3_SNS_E
VOLTAGE=1.00V

PP_1V8_SMPS4_SNS_E
VOLTAGE=1.80V

PP_0V8_SMPS5_SNS_E
VOLTAGE=0.80V

PP_1V2_LD01_E
VOLTAGE=1.20V

PP_1V2_LD02_E
VOLTAGE=1.20V

PP_1V0_LD03_E
VOLTAGE=1.00V

PP_0V9_LD04_E
VOLTAGE=0.90V

PP_1V8_LD05_E
VOLTAGE=1.80V

PP_1V8_LD06_E
VOLTAGE=1.80V

PP_1V8_LD07_E
VOLTAGE=1.80V

PP_0V8_LD09_E
VOLTAGE=0.80V

PP_3V0_LD010_E
VOLTAGE=3.00V

PP_2V7_LD012_E
VOLTAGE=2.70V

PP_2V7_LD013_E
VOLTAGE=2.70V

PP_1V8_LD06_E
VOLTAGE=1.80V

PP_1V8_LD06_E
VOLTAGE=1.80V

PP_1V8_LD06_E
VOLTAGE=1.80V

PP_0V8_SMPS1_SNS_E
VOLTAGE=0.80V

PP_1V2_SMPS2_SNS_E
VOLTAGE=1.20V

PP_1V0_SMPS3_SNS_E
VOLTAGE=1.00V

PP_1V8_SMPS4_SNS_E
VOLTAGE=1.80V

PP_0V8_SMPS5_SNS_E
VOLTAGE=0.80V

PP_1V2_LD01_E
VOLTAGE=1.20V

PP_1V2_LD02_E
VOLTAGE=1.20V

PP_1V0_LD03_E
VOLTAGE=1.00V

PP_0V9_LD04_E
VOLTAGE=0.90V

PP_1V8_LD05_E
VOLTAGE=1.80V

PP_1V8_LD06_E
VOLTAGE=1.80V

PP_1V8_LD07_E
VOLTAGE=1.80V

PP_0V8_LD09_E
VOLTAGE=0.80V

PP_3V0_LD010_E
VOLTAGE=3.00V

PP_2V7_LD012_E
VOLTAGE=2.70V

PP_2V7_LD013_E
VOLTAGE=2.70V

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VOLTAGE=1.80V

PP_1V8_LD06_E
VOLTAGE=1.80V

PP_1V8_LD06_E
VOLTAGE=1.80V

PP_0V8_SMPS1_E
VOLTAGE=0.80V

PP_1V2_SMPS2_E
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PP_1V0_SMPS3_E
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PP_1V8_SMPS4_E
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PP_0V8_SMPS5_E
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PP_1V2_LD01_E
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VOLTAGE=2.70V

PP_2V7_LD013_E
VOLTAGE=2.70V

PP_1V8_LD06_E
VOLTAGE=1.80V

PP_1V8_LD06_E
VOLTAGE=1.80V

PP_1V8_LD06_E
VOLTAGE=1.80V

PMIC: BUCKS & LDOS

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RF PMIC: XTAL, CLOCKS AND MISCELLANEOUS

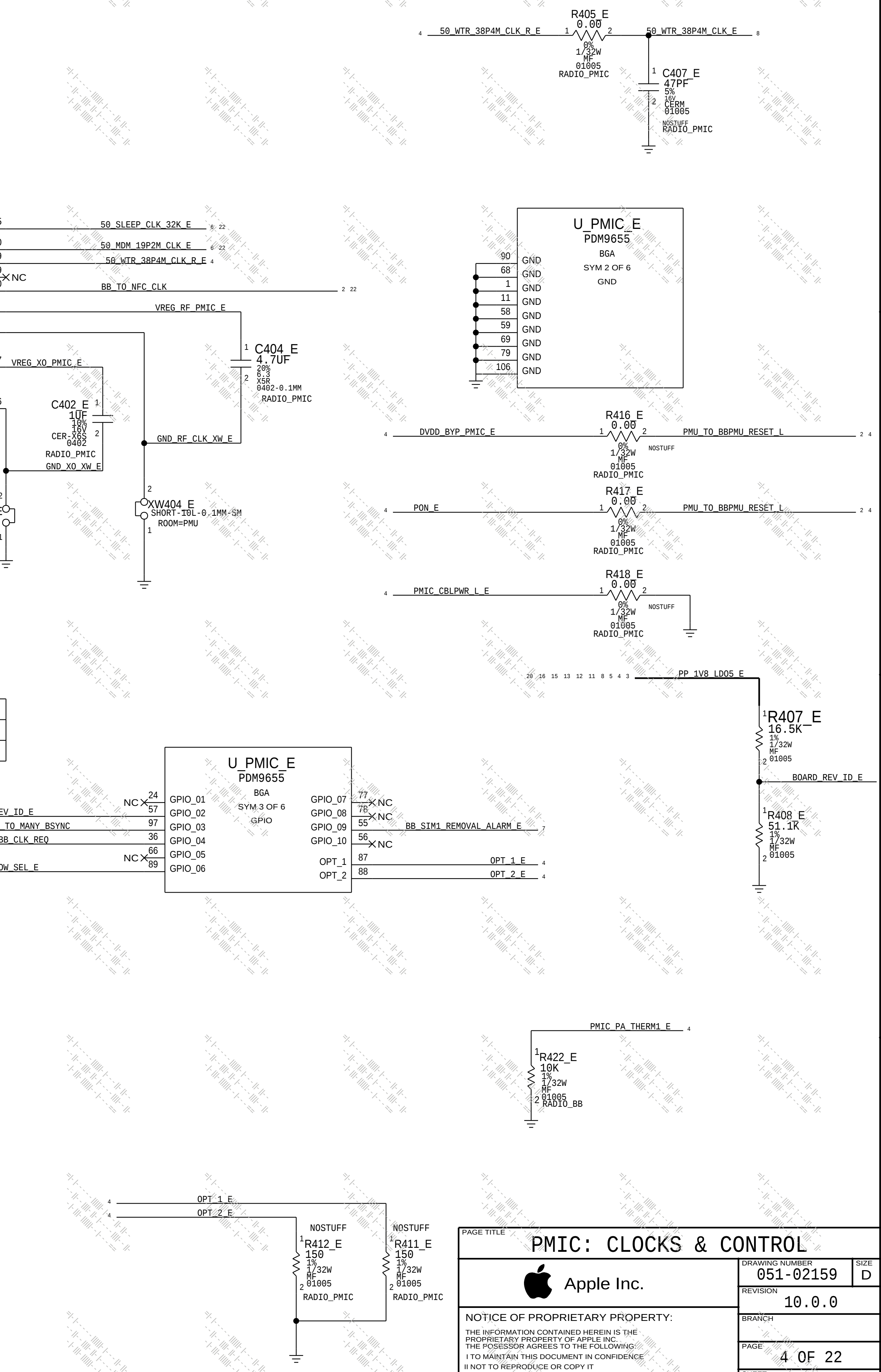
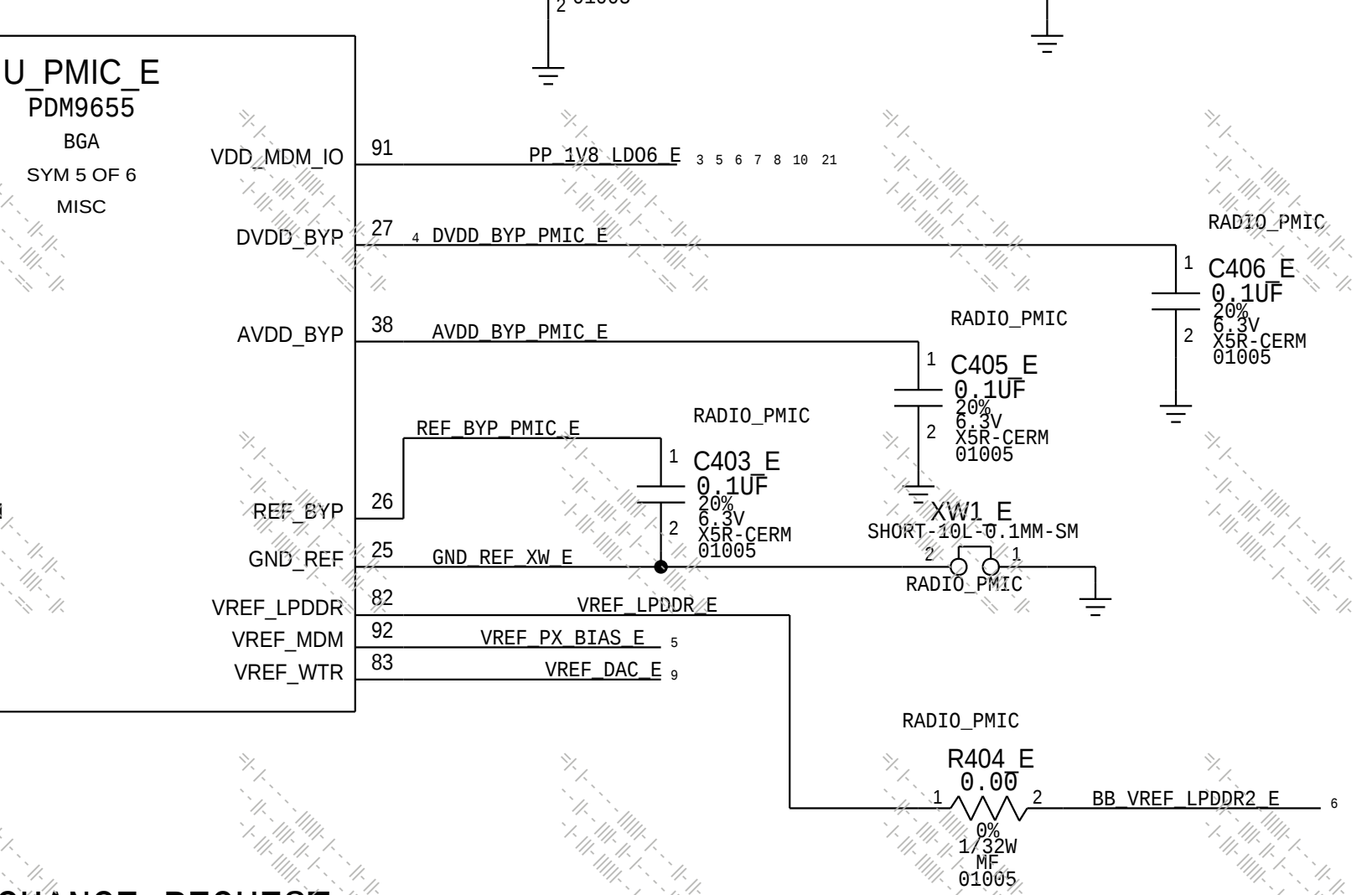
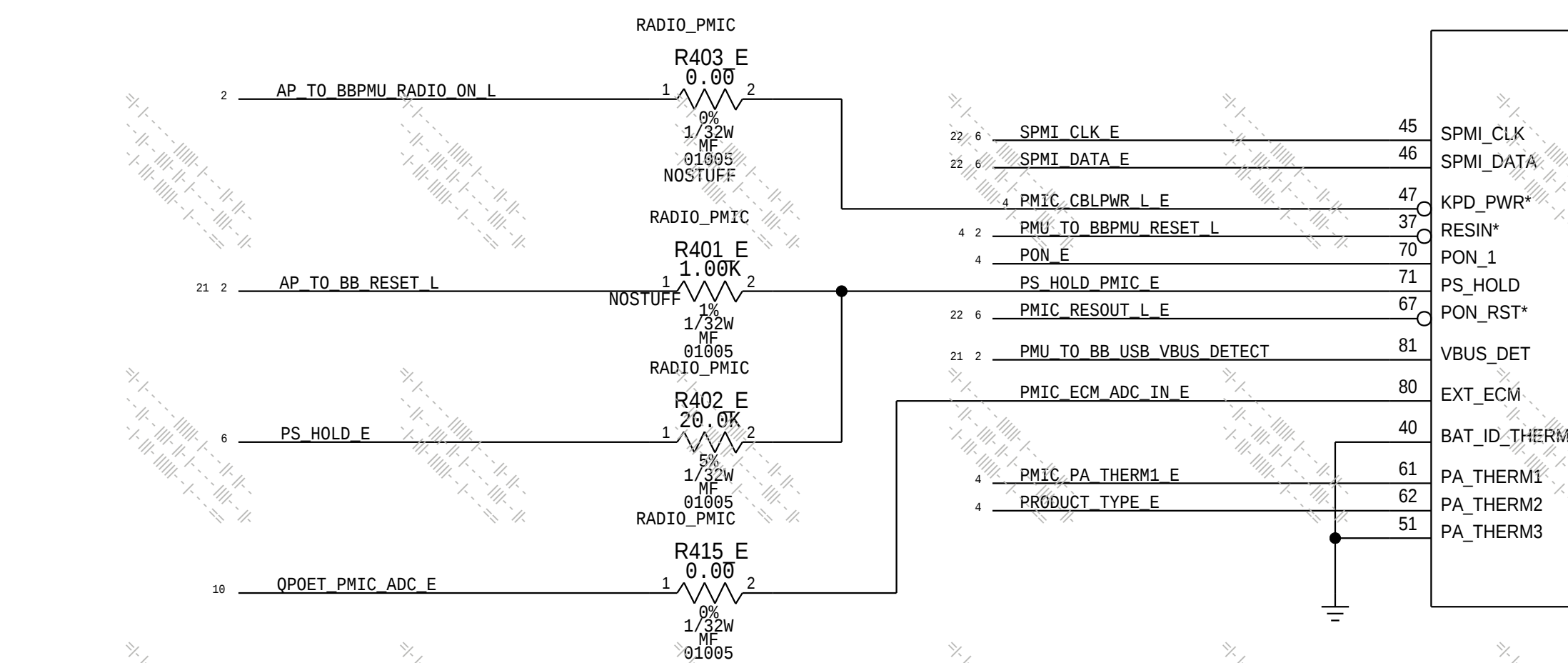
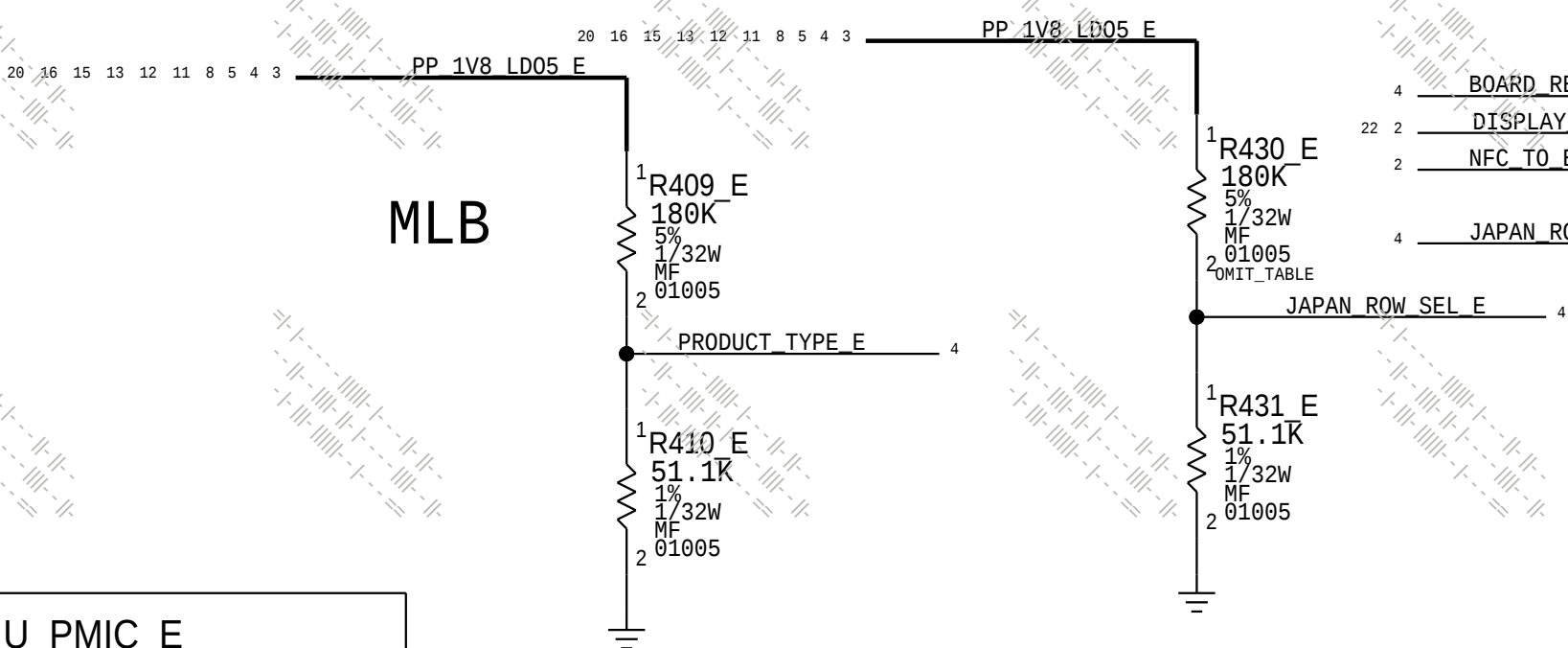
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<0.10V	NOSTUFF	51.1K	T500/DEV1
0.15V-0.25V	422K	51.1K	PROT01.5
0.35V-0.45V	180K	51.1K	PROT02.5/DEV2
0.55V-0.65V	105K	51.1K	PROT01/DEV3
0.75V-0.85V	66.5K	51.1K	PROT02/DEV4
0.95V-1.05V	44.2K	51.1K	EVT
1.15V-1.25V	28K	51.1K	CARRIER/DEV5
1.35V-1.45V	16.5K	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

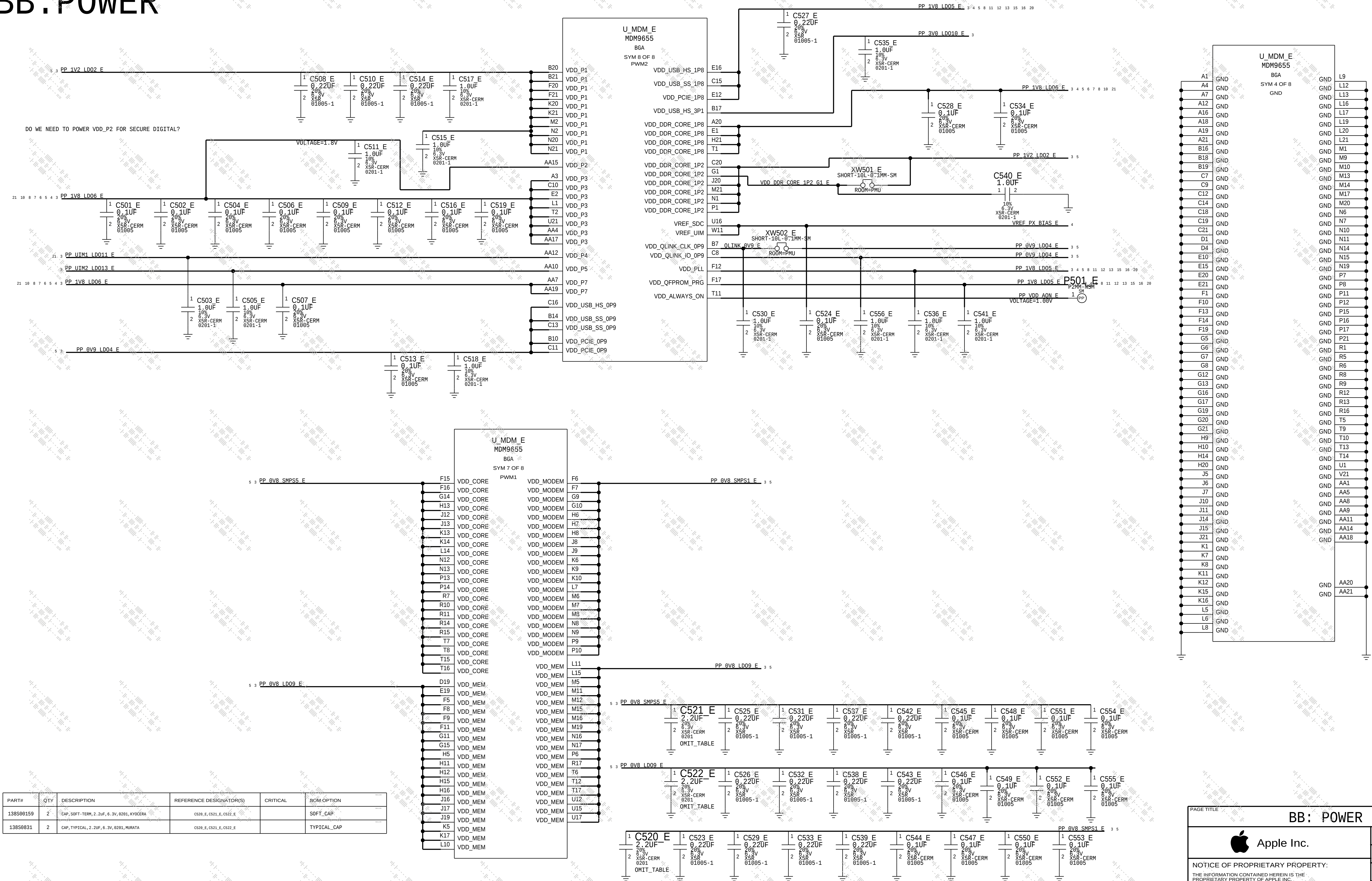
JPN_ROW_SEL	R430	R431	MAV PLATFORM	Y	SKU
<0.10V	NOSTUFF	51.1K	MAV17.0	0	ROW
0.15V-0.25V	422K	51.1K	MAV17.1	1	JPN
0.35V-0.45V	180K	51.1K	MAV17.2	2	ROW
0.55V-0.65V	105K	51.1K	MAV17.3	3	JPN
0.75V-0.85V	66.5K	51.1K	MAV17.4	4	ROW
0.95V-1.05V	44.2K	51.1K	MAV17.5	5	JPN
1.15V-1.25V	28K	51.1K	MAV17.6	6	ROW
1.35V-1.45V	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
11850686	1	RESISTOR, 01005, 105K OHMS	R430_E	CRITICAL	JPN
11750197	1	RESISTOR, 01005, 180K OHMS	R430_E	CRITICAL	ROW



BB:POWER

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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
138S0031	2	CAP, TYPICAL, 2.2UF, 6.3V, 0201, MURATA	C520_E, C521_E, C522_E		TYPICAL_CAP

PAGE TITLE

BB: POWER

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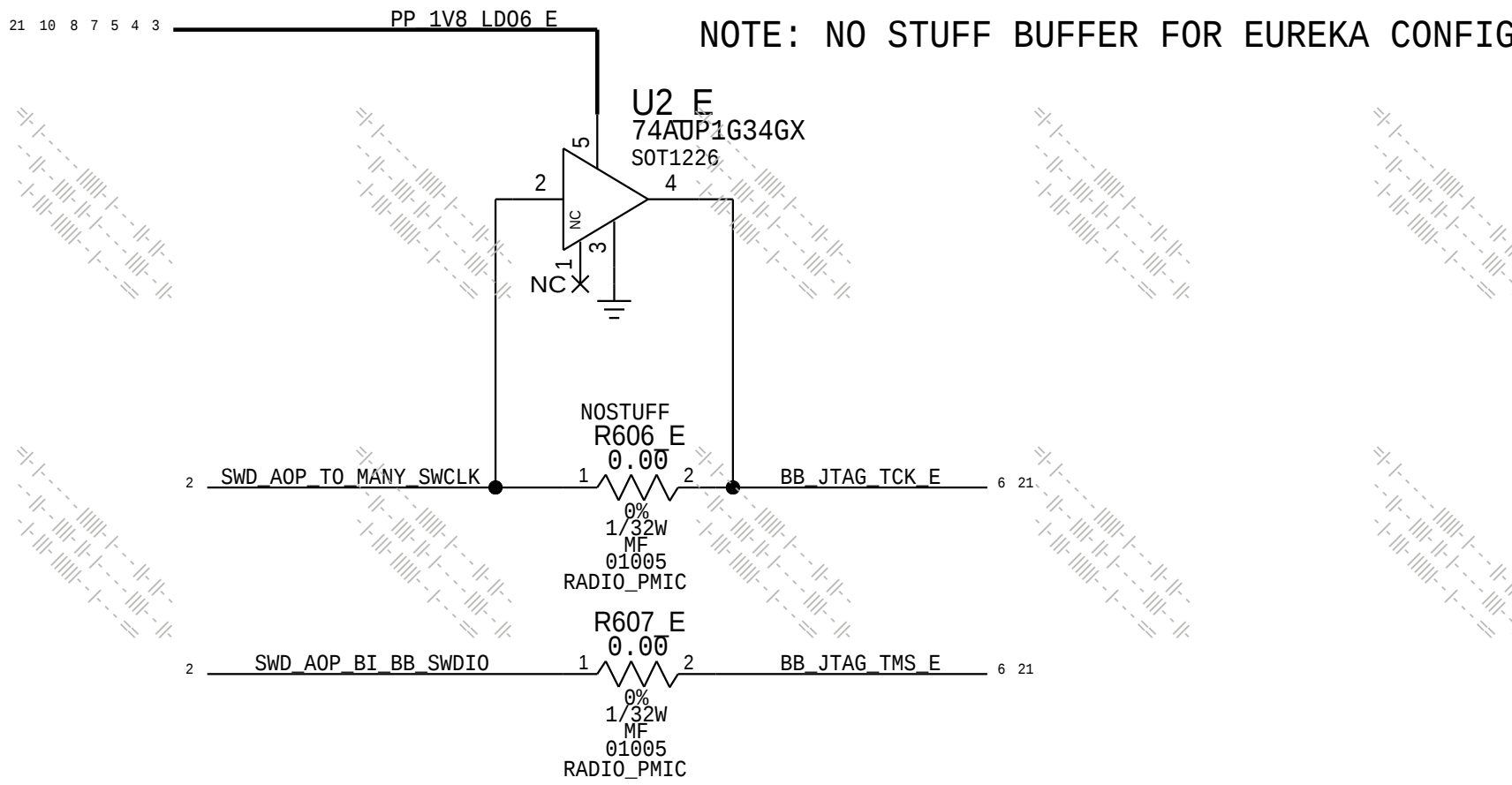
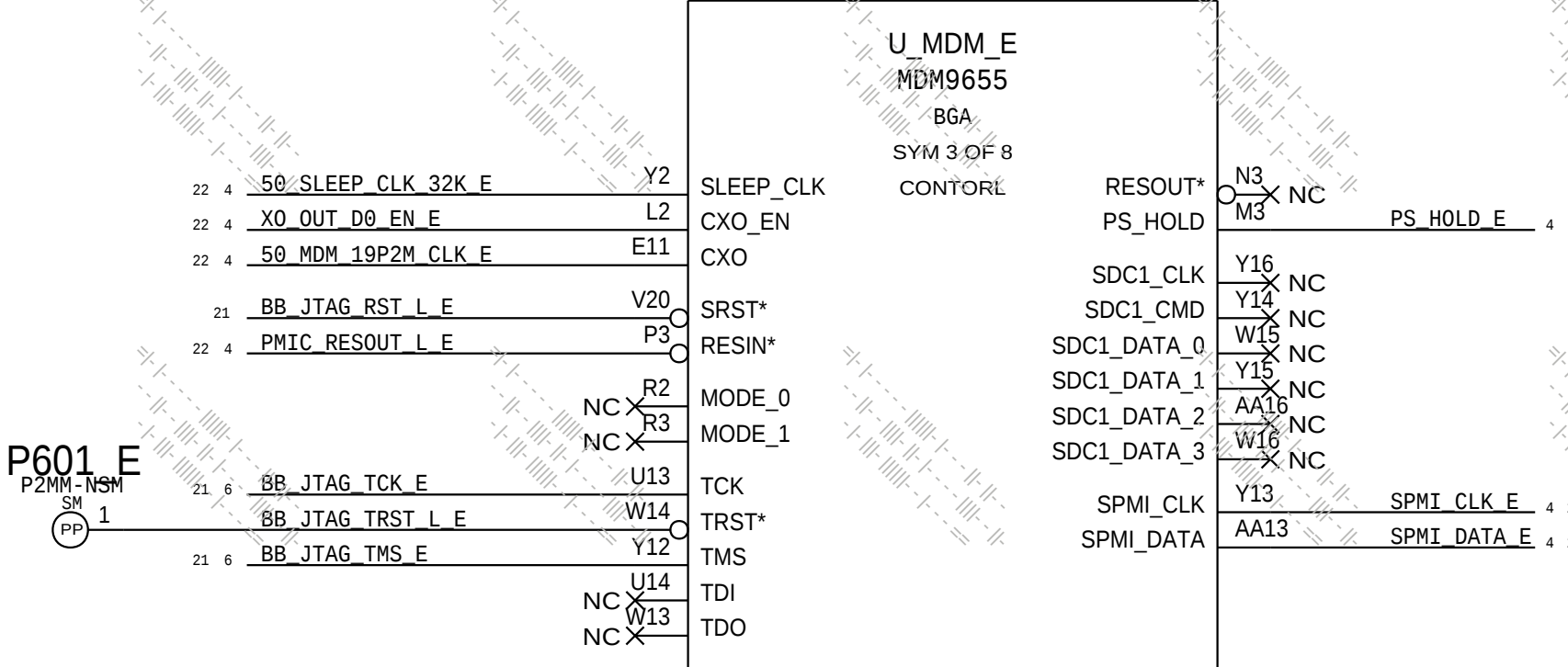
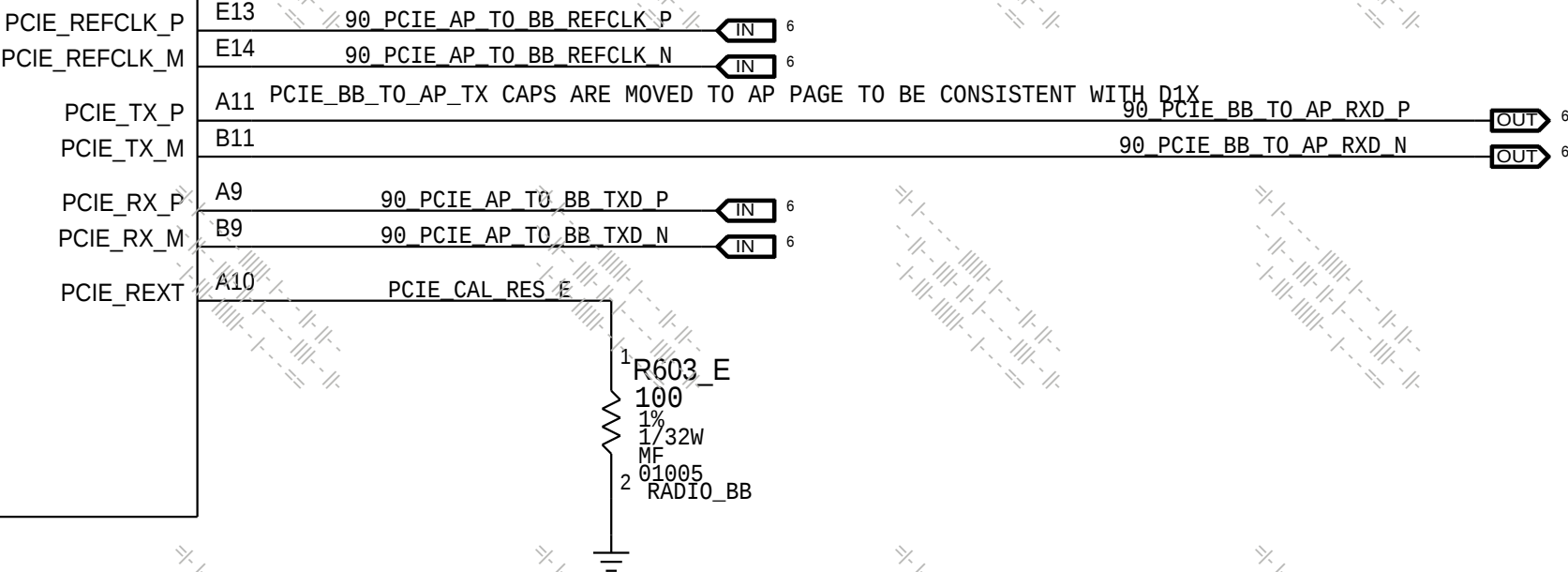
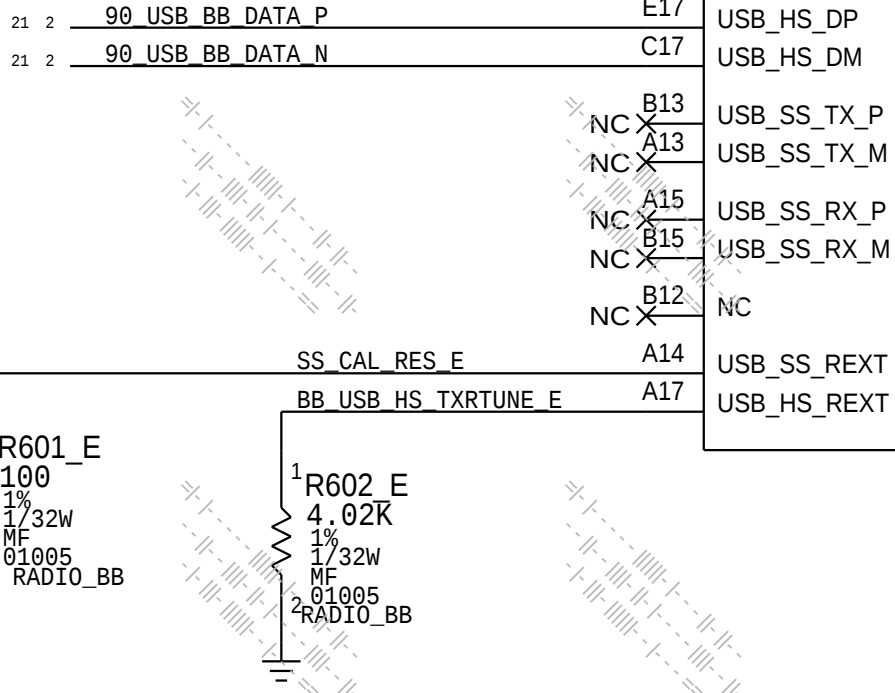
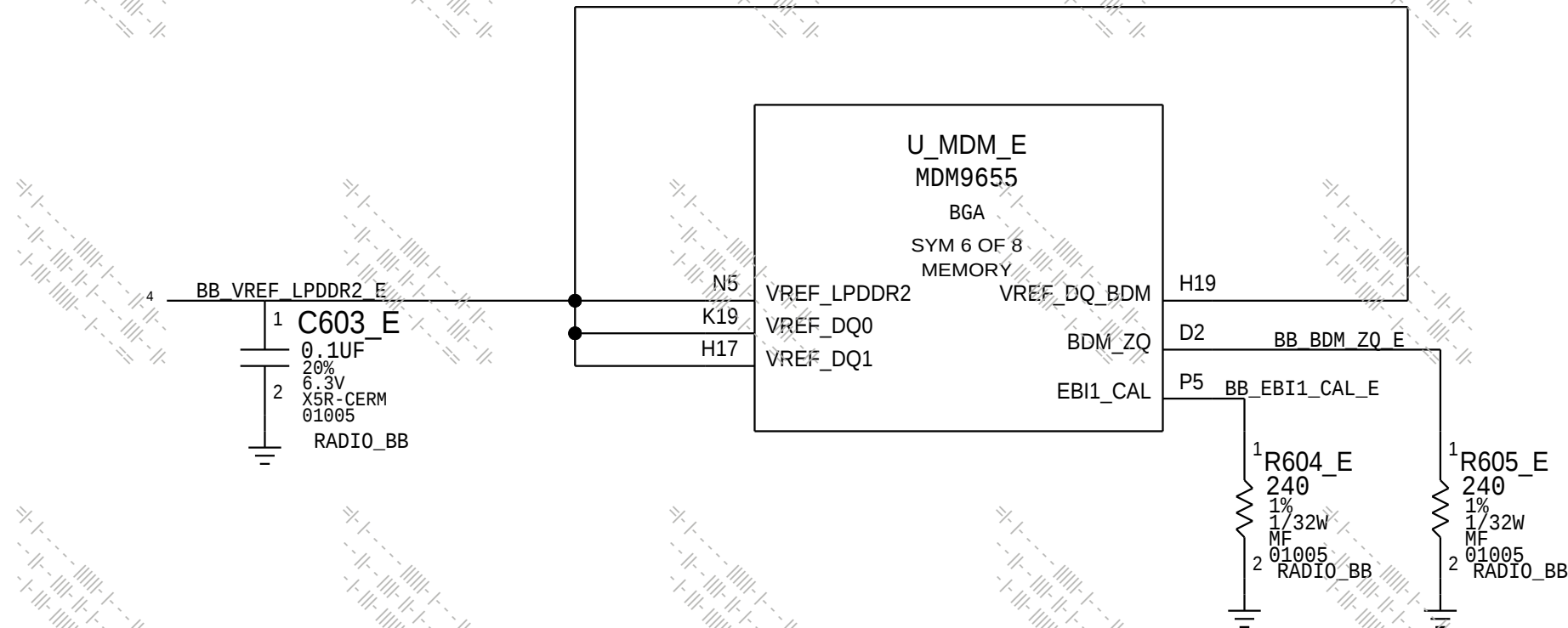
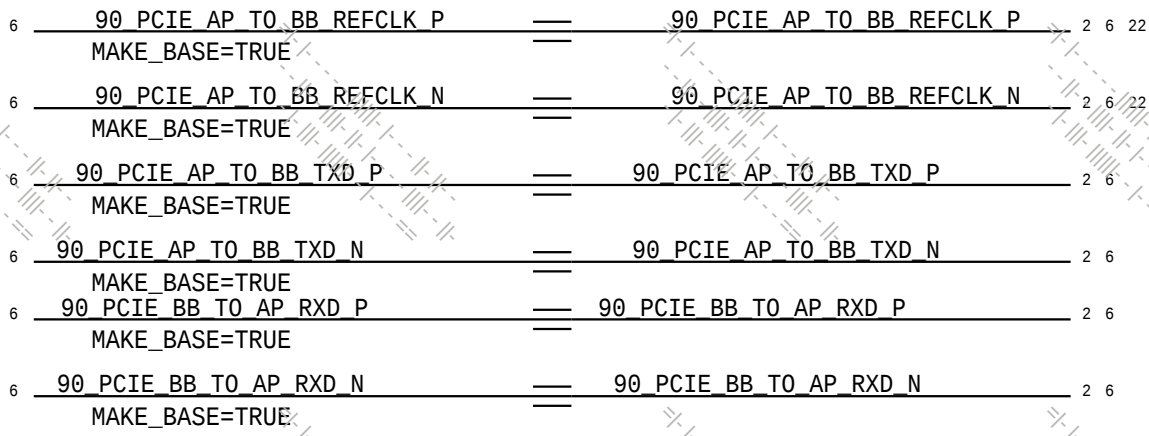
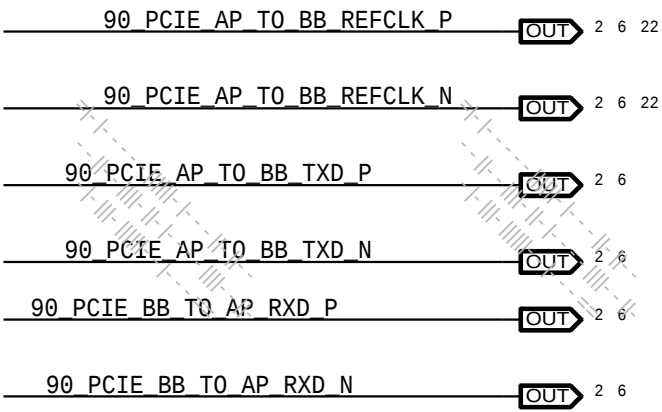
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BB: CONTROL & HS PERIPHERALS



BB:GPIOs & QLINK

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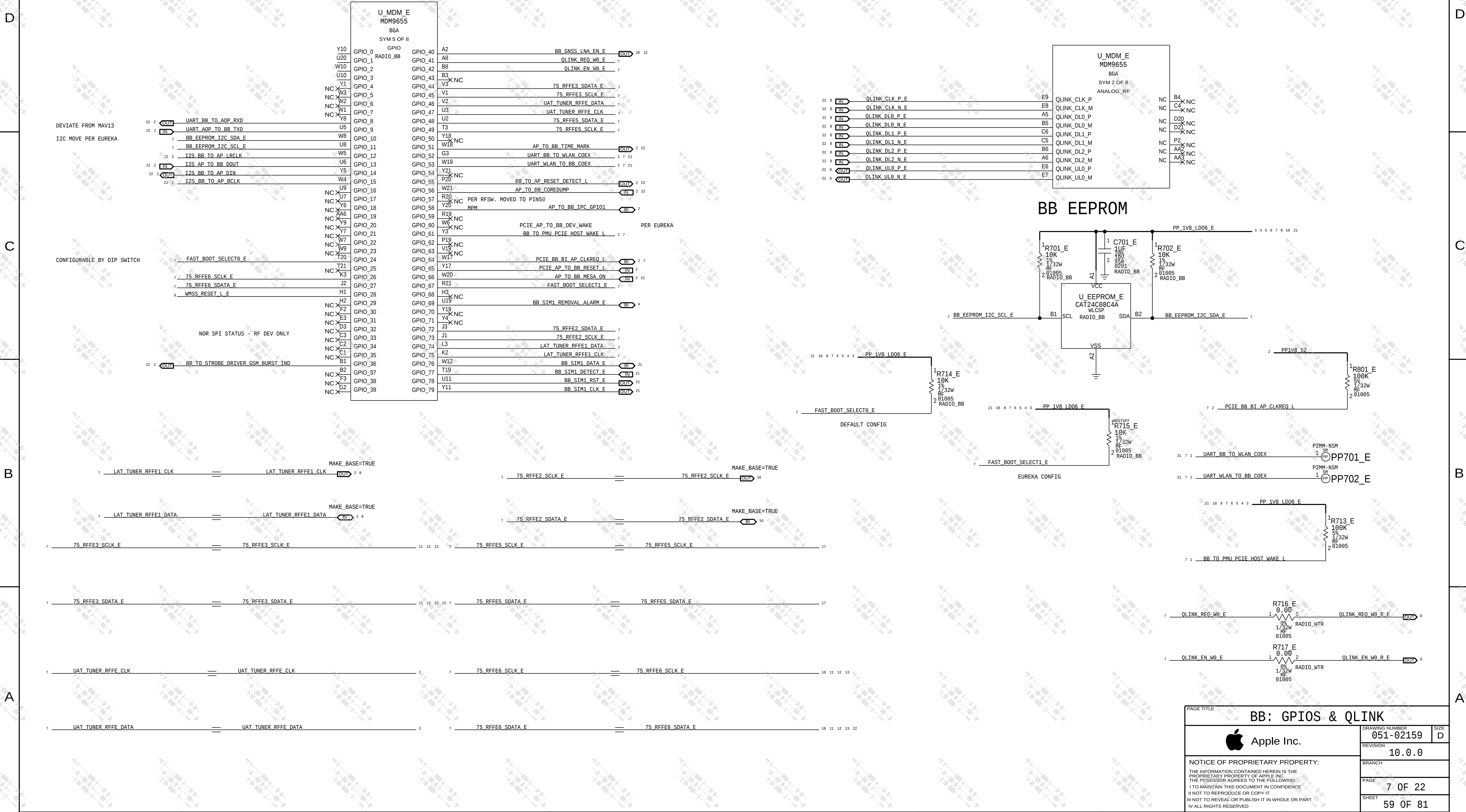
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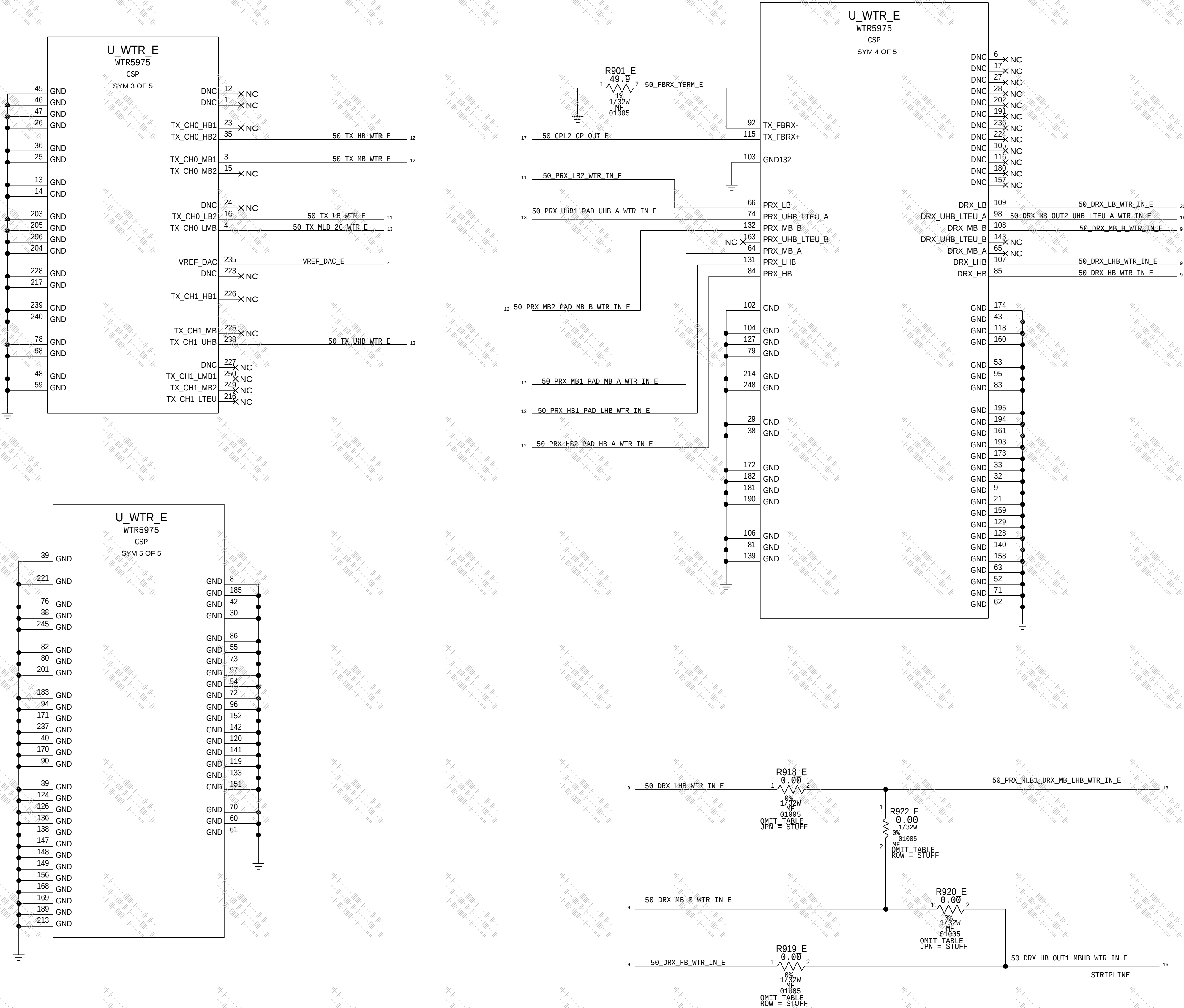
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TRANSCEIVER: TX & RX

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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

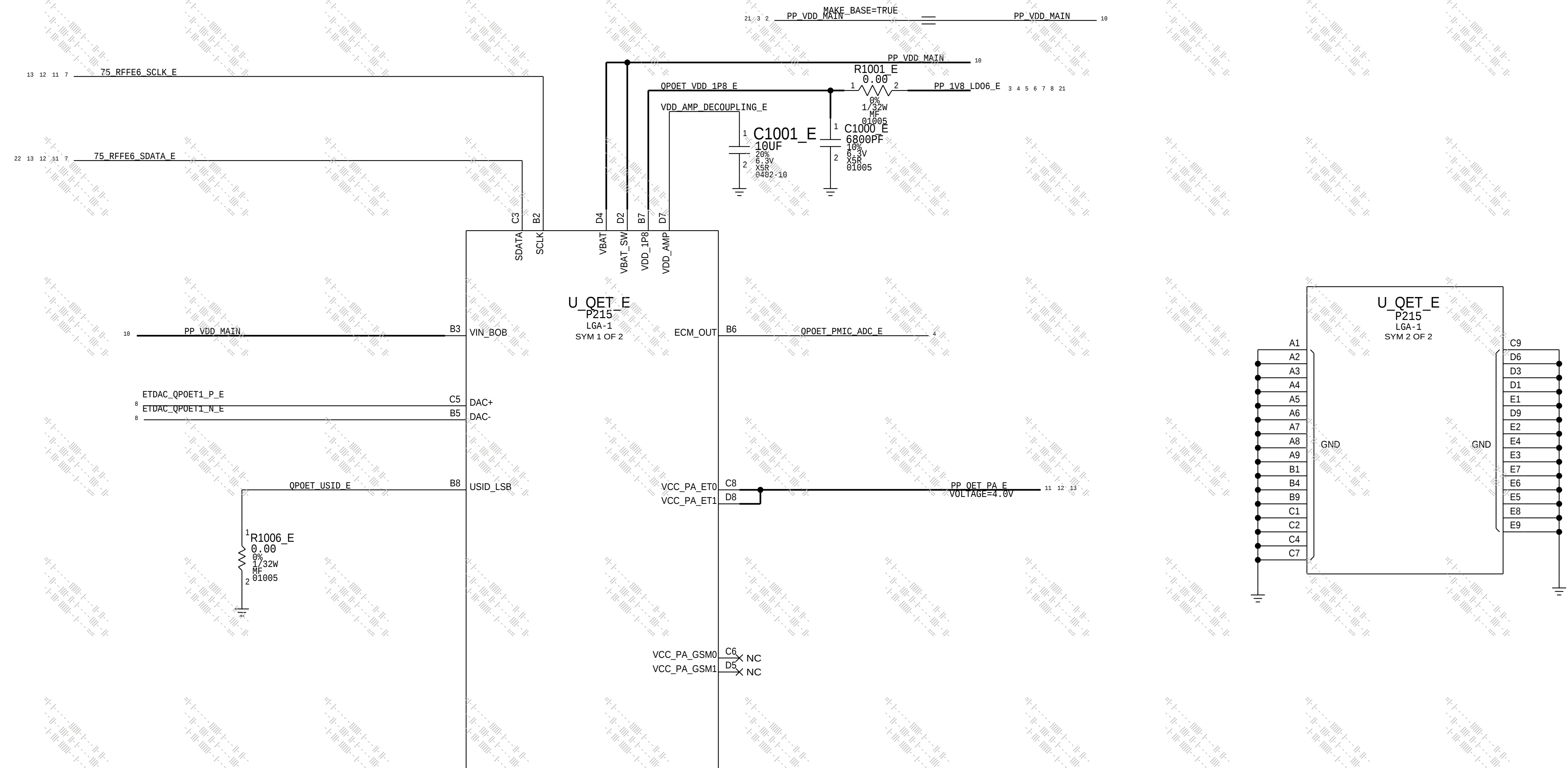
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
117S0161	1	01005 OR	R918_E	CRITICAL	JPN
117S0161	1	01005 OR	R920_E	CRITICAL	JPN



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XCVR		
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QET: MODULE

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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
152S08021	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
152S2086	1	6.2NH UHQ, LB ANT MATCH	R1104_E	CRITICAL	ROW

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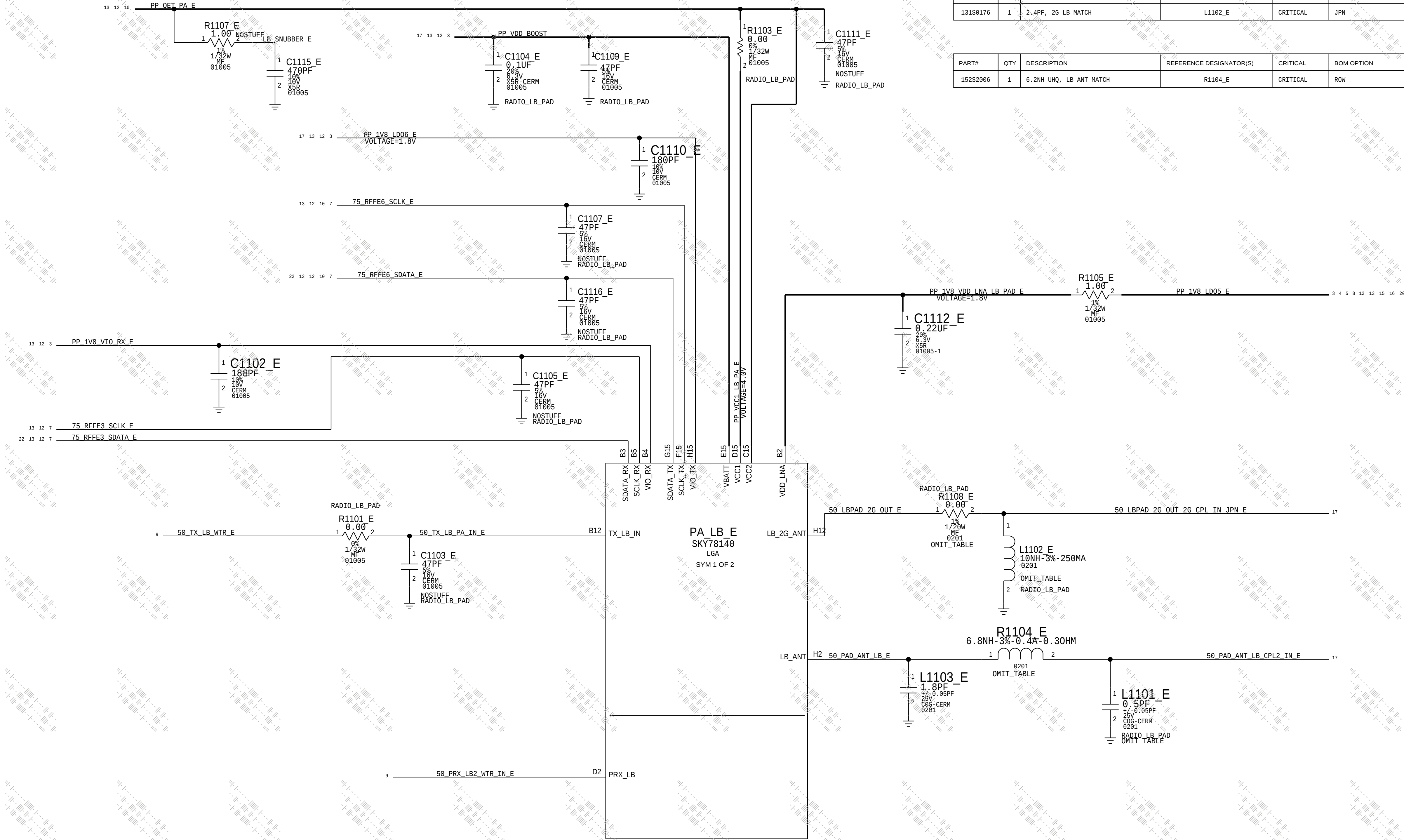
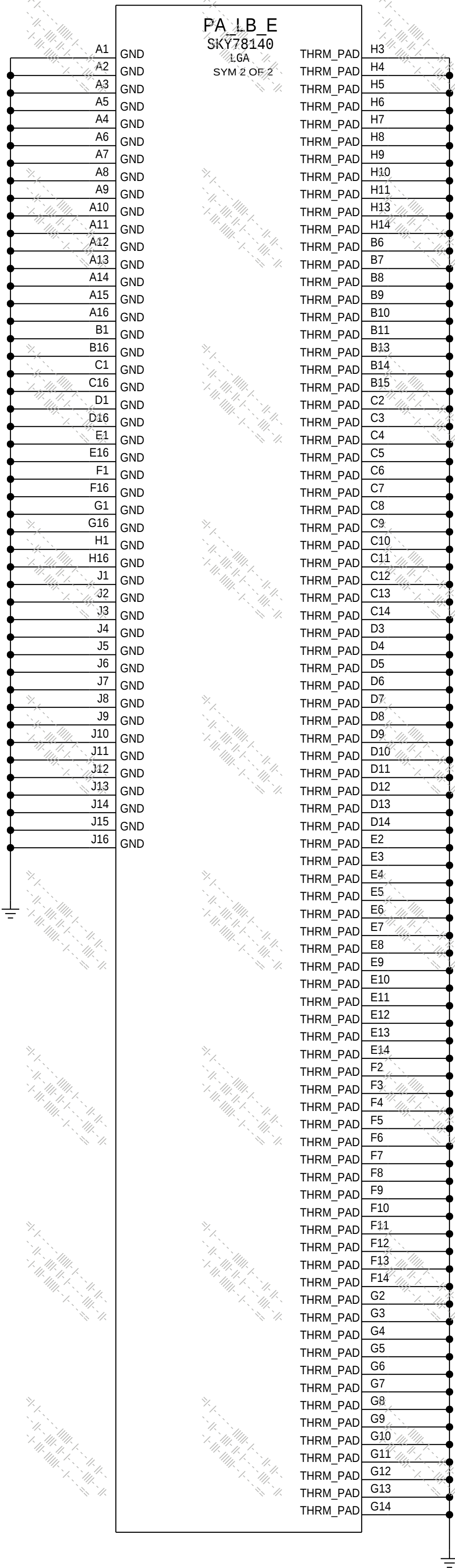
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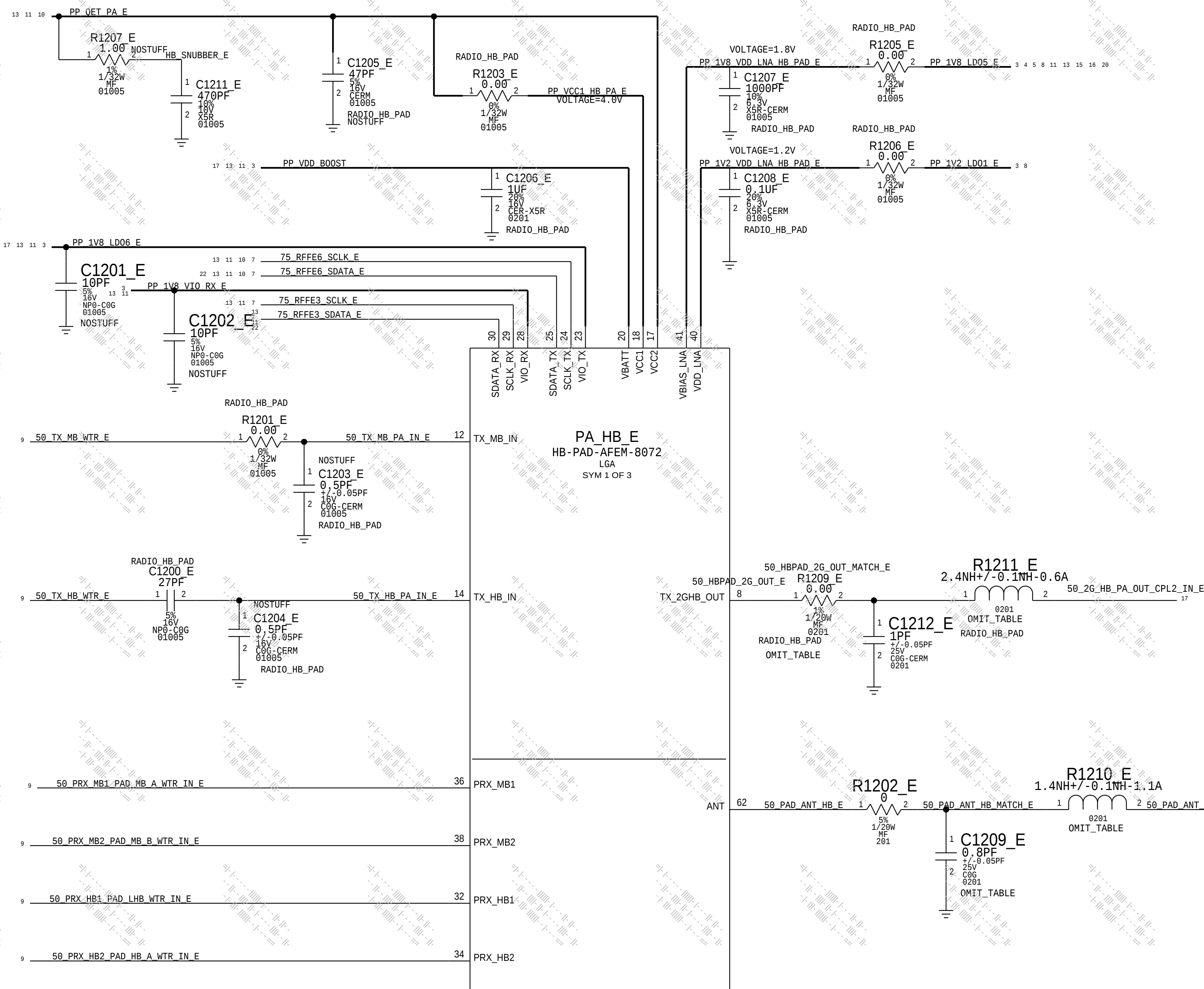
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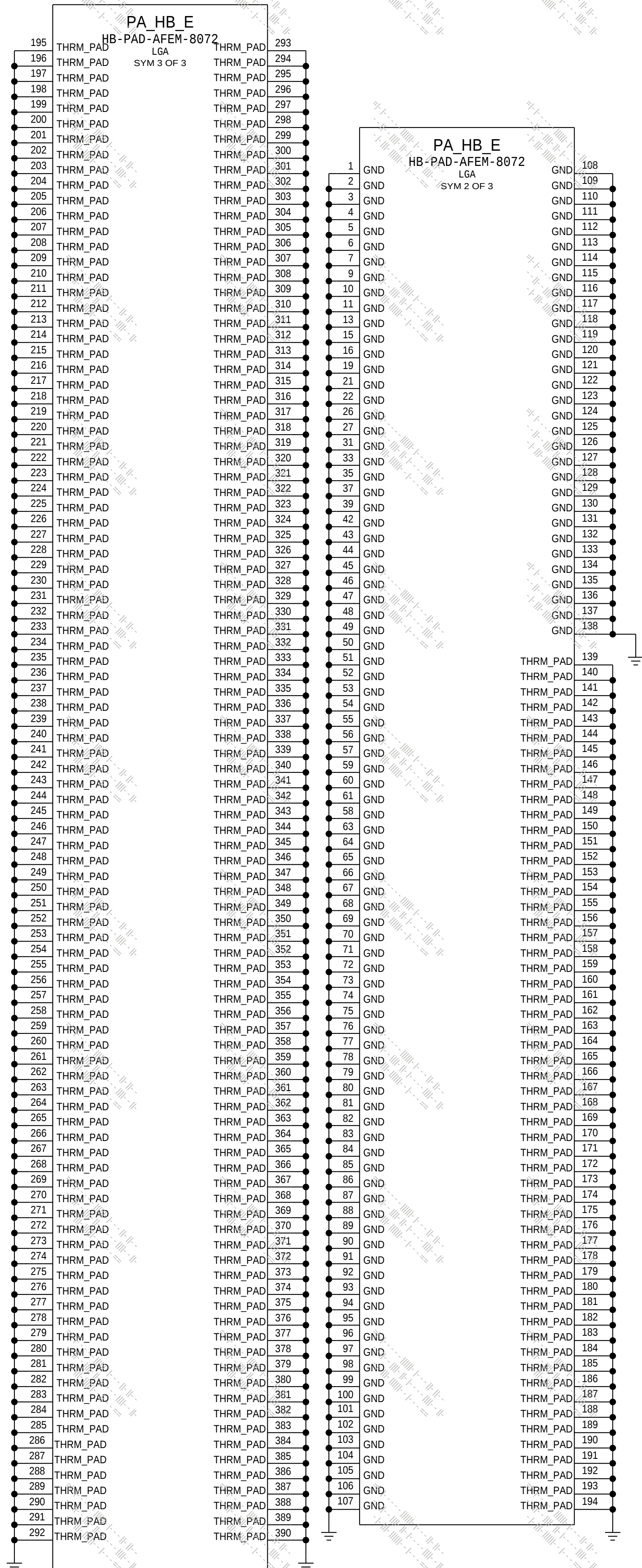
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HB PAD



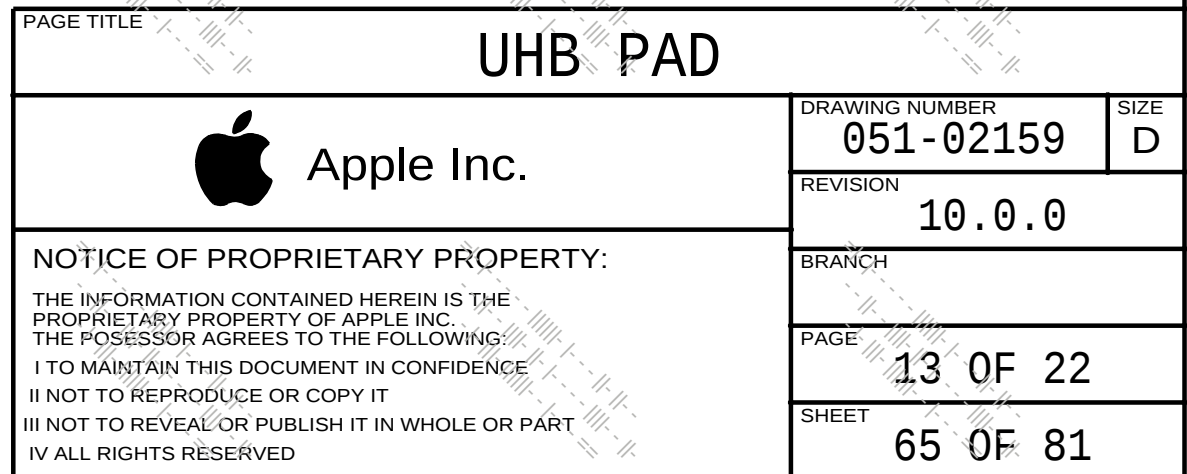
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152S2623	1	3.2NH UHQ, 2G HB PAD MATCH	R1289_E	CRITICAL	JPN
152S98153	1	1NH UHQ, 2G HB PAD MATCH	R1211_E	CRITICAL	JPN
131S9425	1	0.5PF, HB ANT MATCH	C1289_E	CRITICAL	JPN
152S2642	1	1.8NH UHQ, HB ANT MATCH	R1210_E	CRITICAL	JPN

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
131S9329	1	0.4PF, HB ANT MATCH	C1209_E	CRITICAL	ROW
152S2800	1	2.0NH UHQ, HB ANT MATCH	R1210_E	CRITICAL	ROW



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2G PA - ROW

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PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
353S01247	1	2G PA	PA_UHB_E	CRITICAL	ROW
117S0161	1	MLB/26TX 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, 10F	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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2G PA

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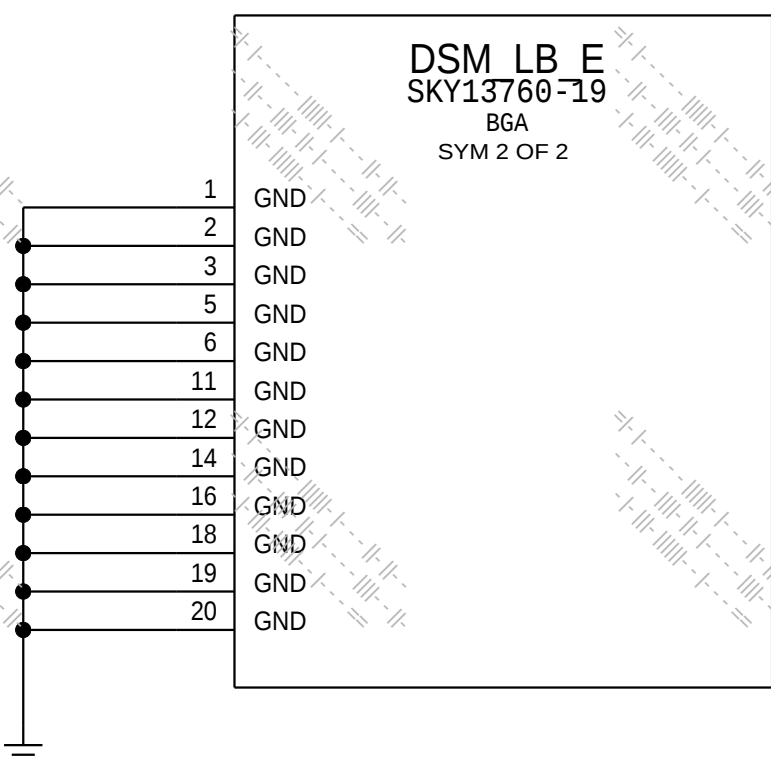
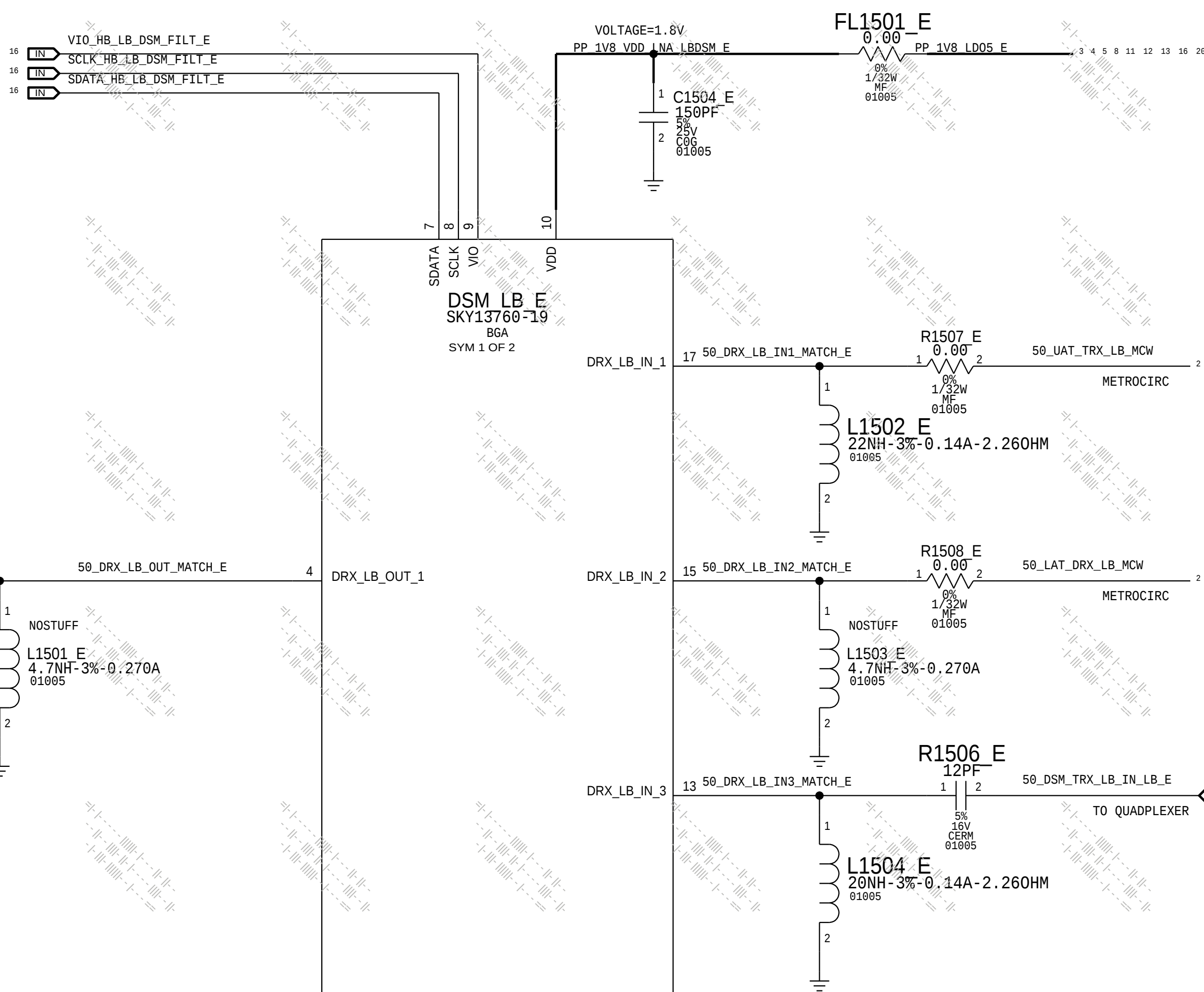
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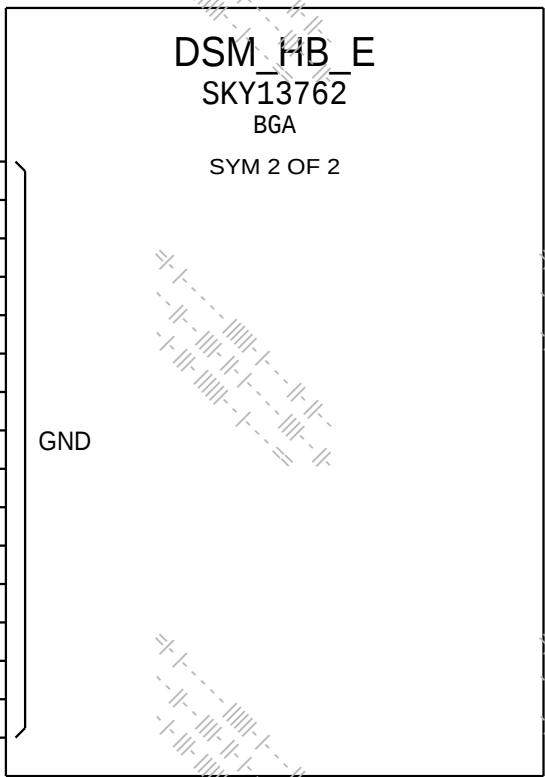
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HB DSM

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PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
117S0161	1	01005 0R	R1609_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



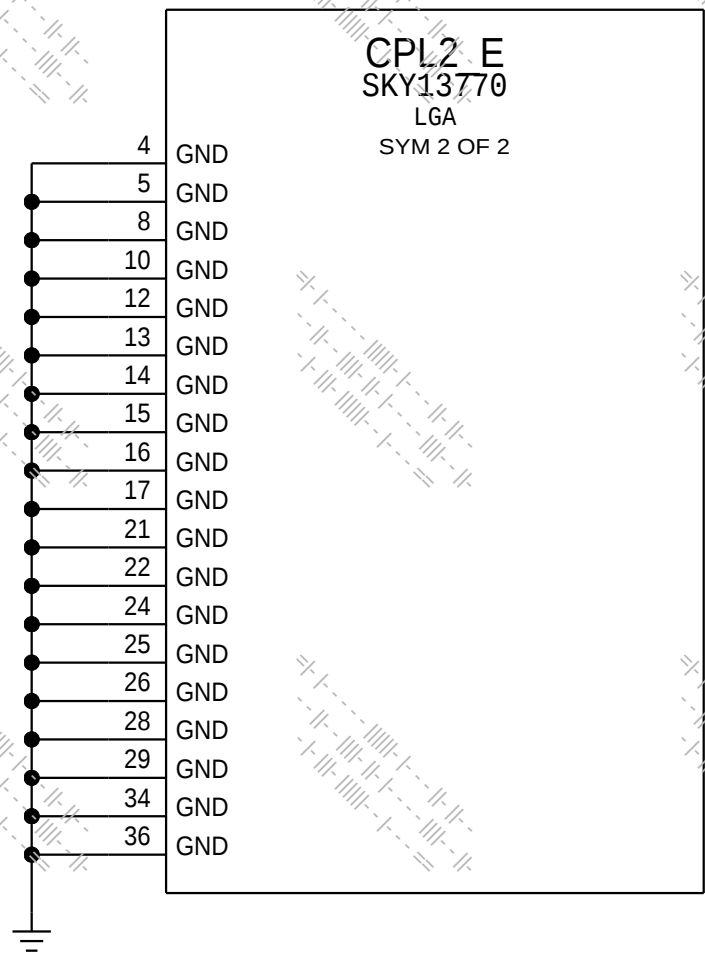
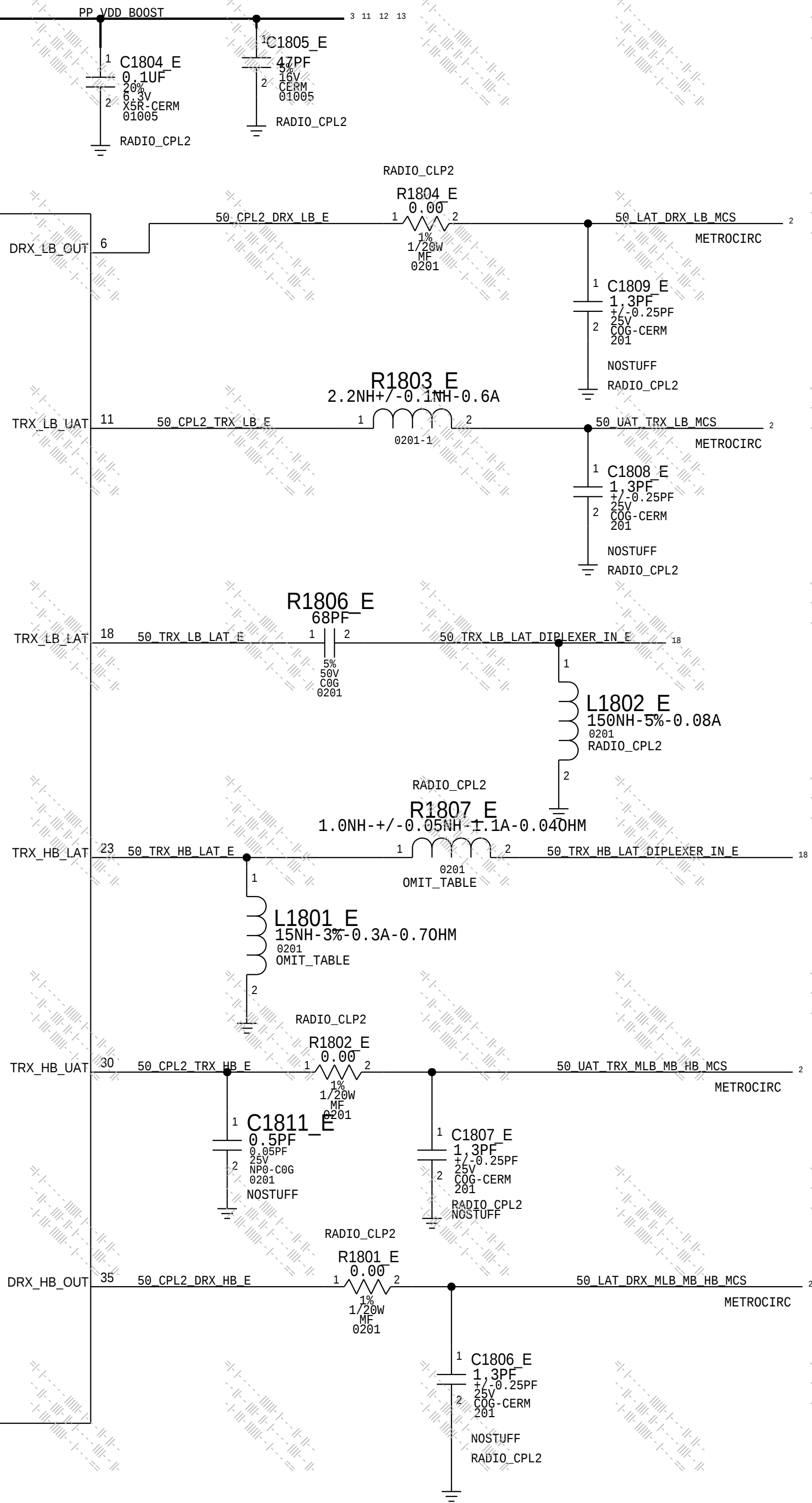
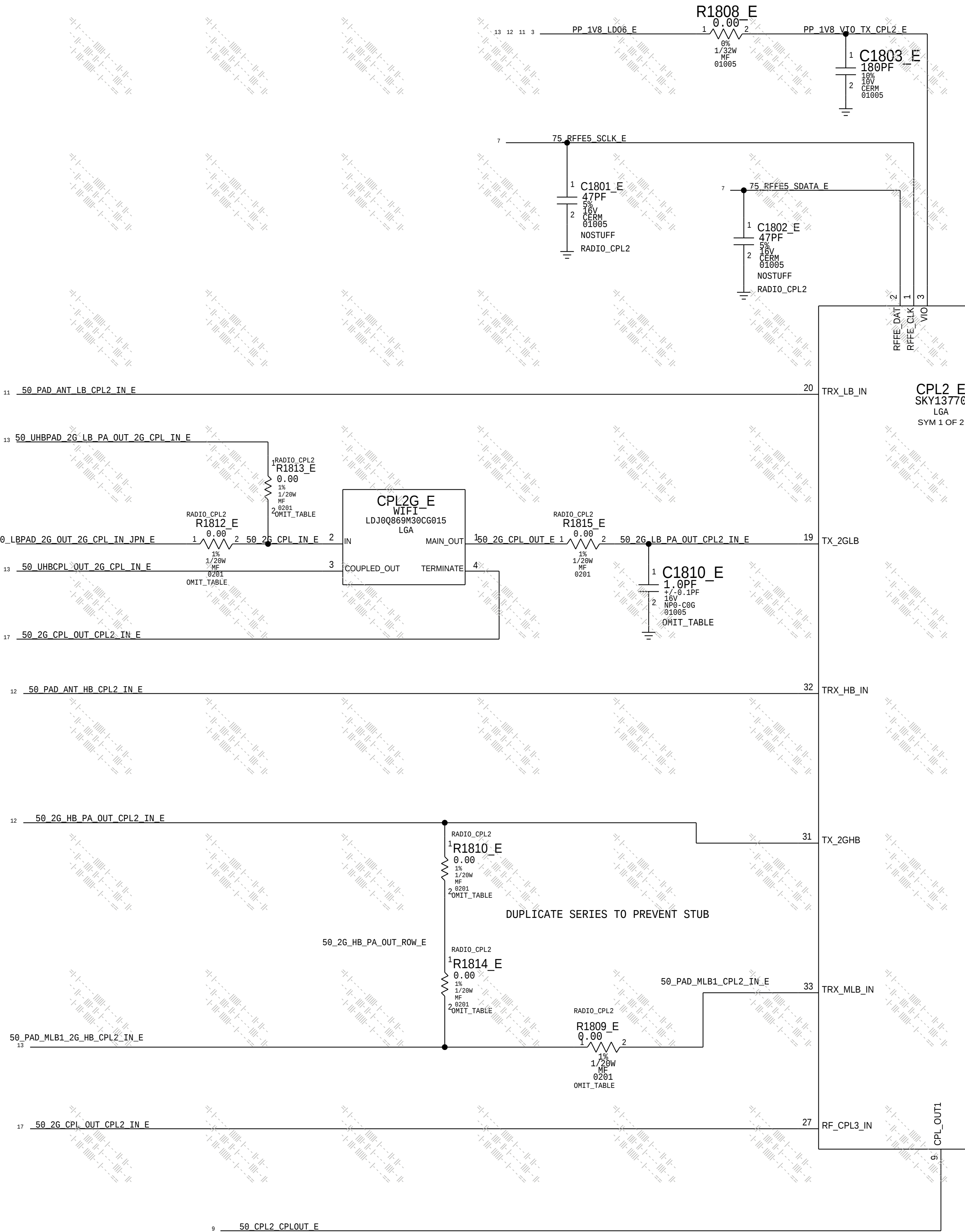
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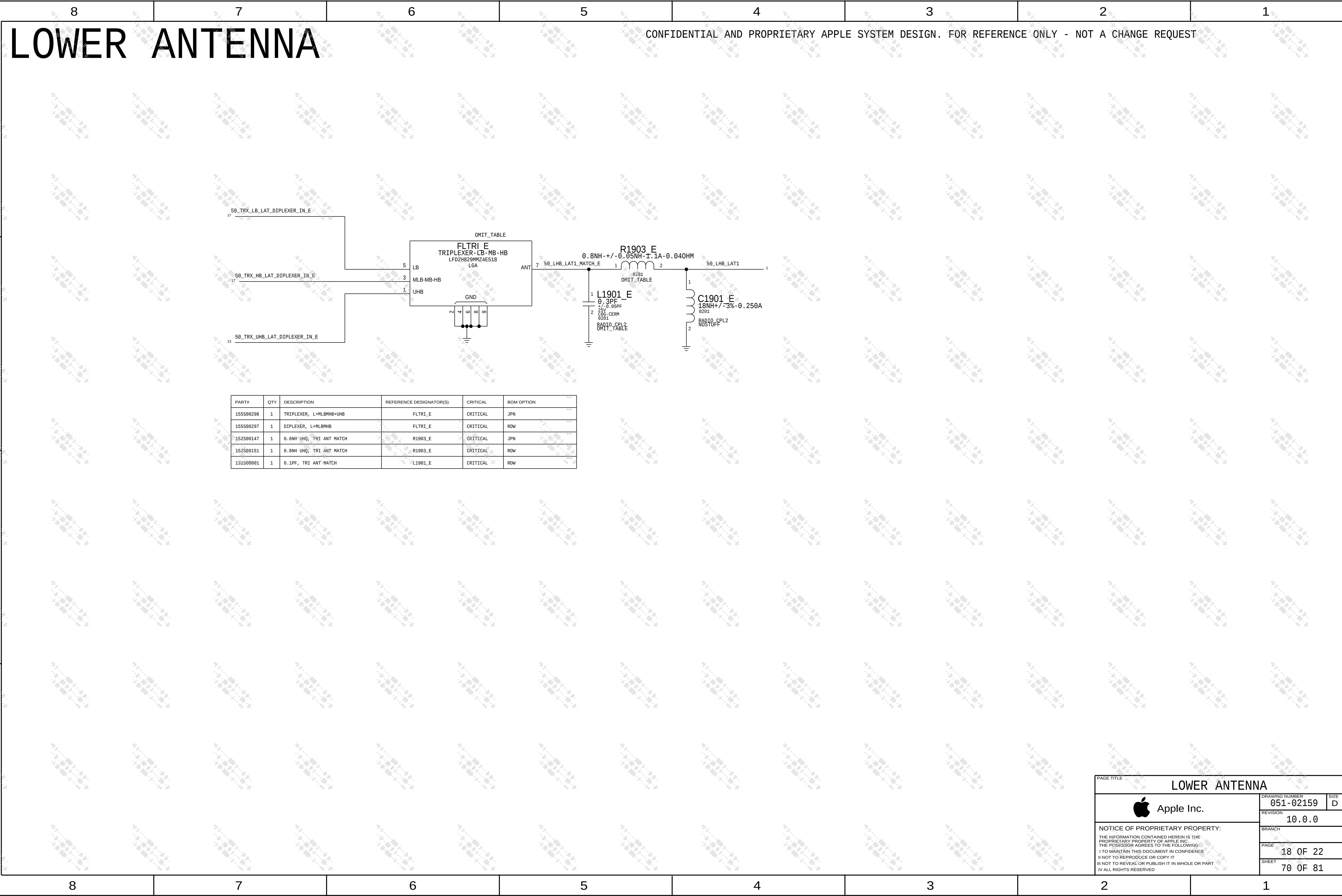
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PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
118S9724	1	0201 0R	R1810_E	CRITICAL	ROW
131S90142	1	150PF, DC BLOCK FOR GSM	R1813_E	CRITICAL	ROW
118S9724	1	0201 0R	R1814_E	CRITICAL	ROW
131S90901	1	0.1PF, CPLR HB LAT MATCH	L1801_E	CRITICAL	ROW
152S2944	1	2.2NH, CPLR HB LAT MATCH	R1807_E	CRITICAL	ROW

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
118S9724	1	0201 0R	R1809_E	CRITICAL	JPN
152S2007	1	8.2NH 2G LB MATCH	R1812_E	CRITICAL	JPN
131S9431	1	0.2PF, CPLR HB LAT MATCH	L1801_E	CRITICAL	JPN
152S90955	1	2.6NH, CPLR HB LAT MATCH	R1807_E	CRITICAL	JPN
131S9249	1	2.2PF, 2G LB MATCH	C1810_E	CRITICAL	JPN

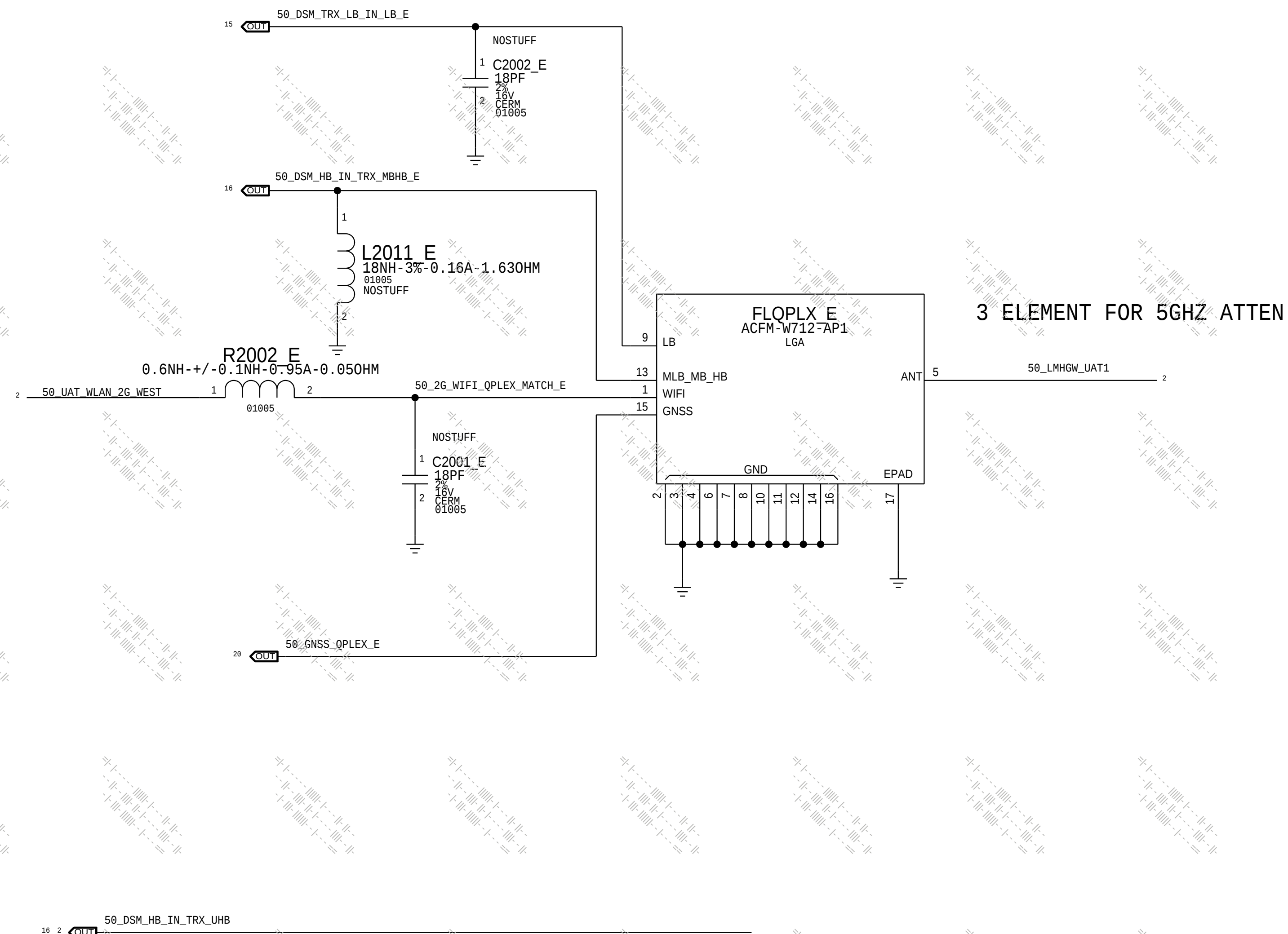


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	PAGE	17 OF 22
	SHEET	69 OF 81



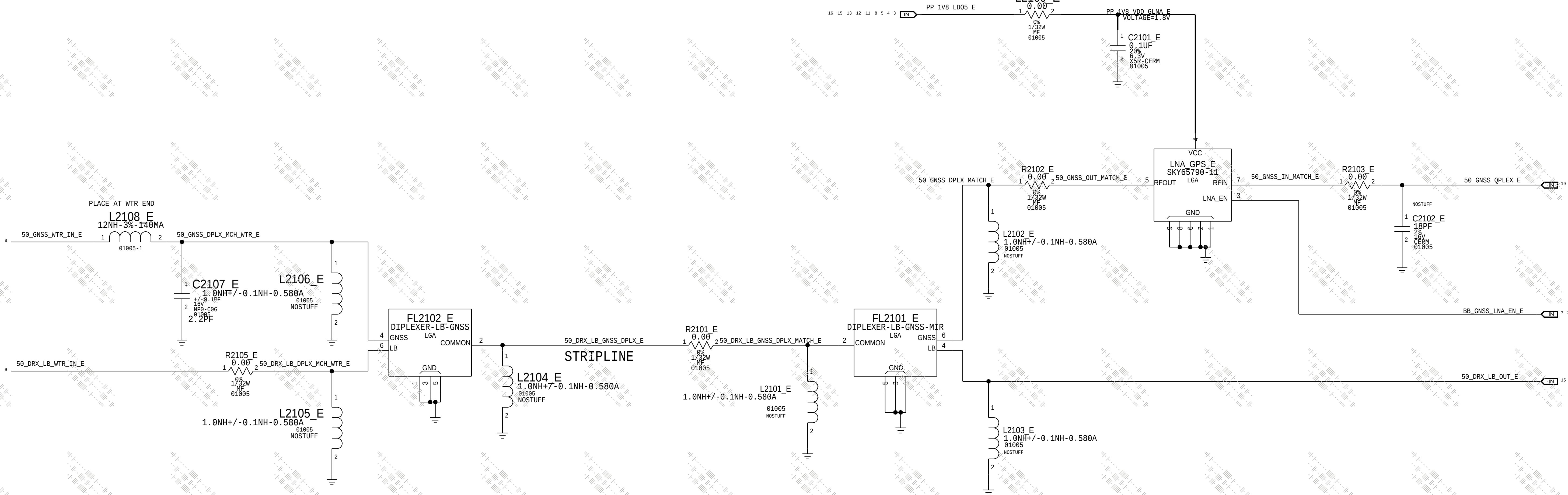
UAT & LB/UHB DIPLEXER

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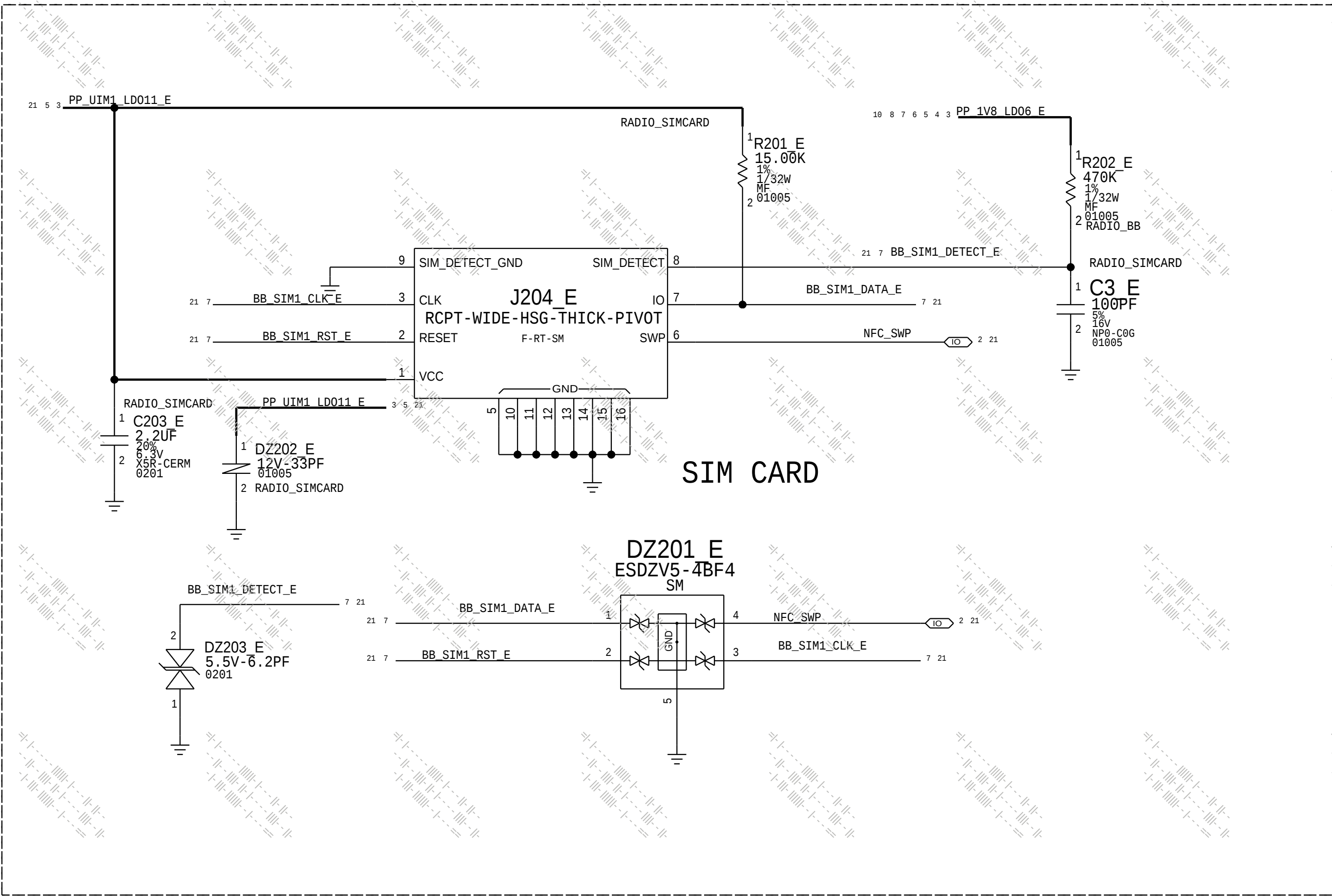
GPS & GPS/LB DIPLEXER



GNSS		
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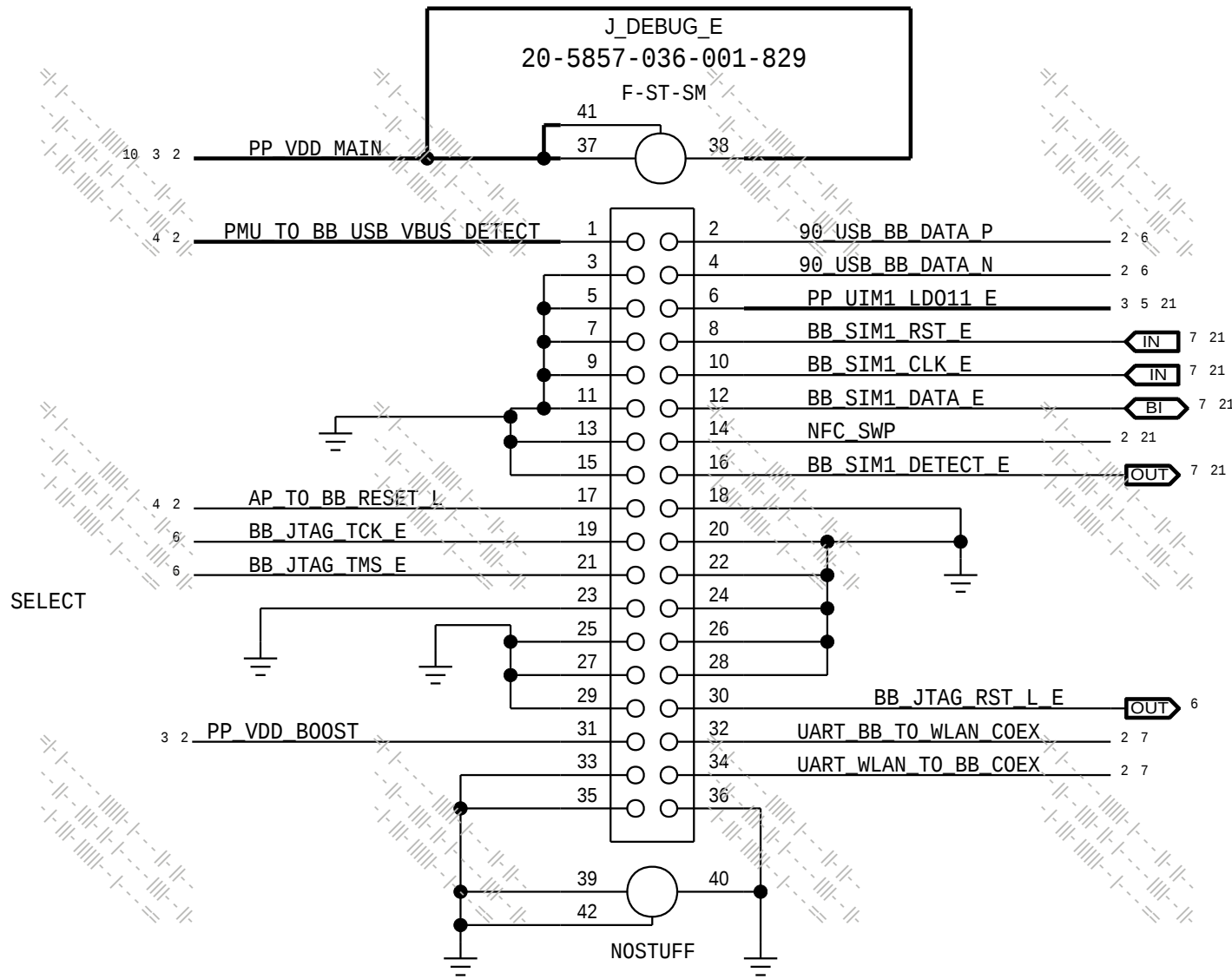
SIM CARD: CONNECTOR

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PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS
S12500026	512500017	BOM_TABLE_ALTS	2204_E	SIMCRD, KYOCERA

DEBUG CONNECTOR



SIM, DEBUG CONN			
	DRAWING NUMBER	051-02159	SIZE
	REVISION	10.0.0	D
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		PAGE	21 OF 22
		SHEET	73 OF 81

BB PROBE POINTS

QLINK

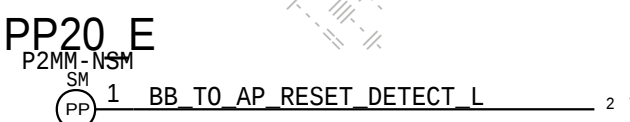
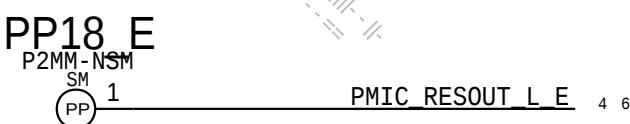
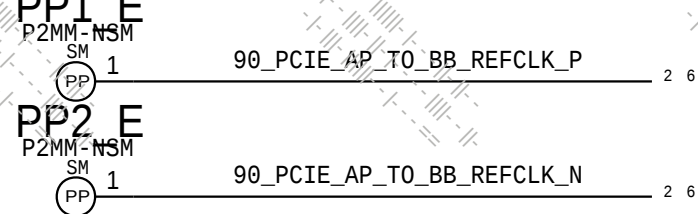
BASEBAND

CLK

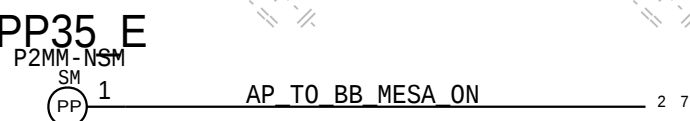
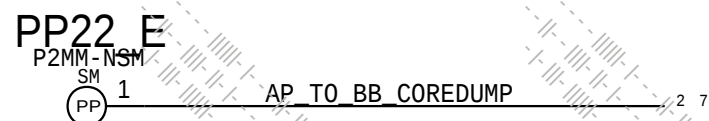
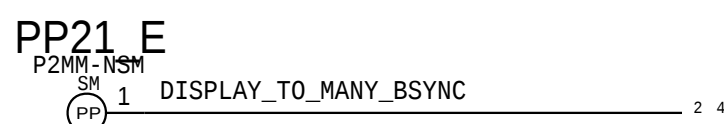
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PCIE

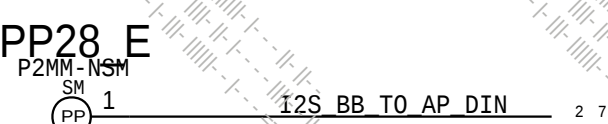
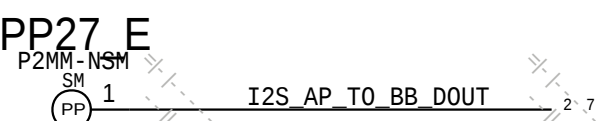
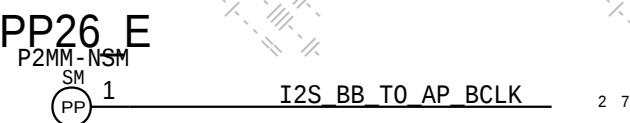
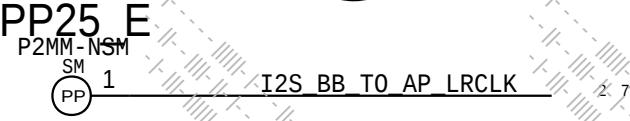
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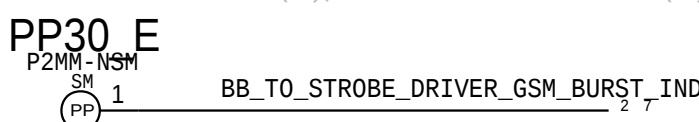
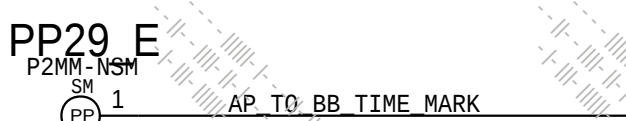
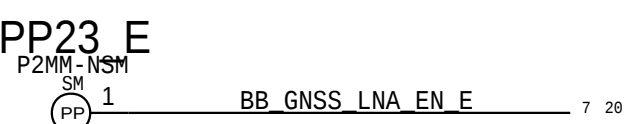
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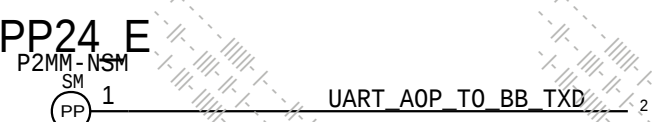
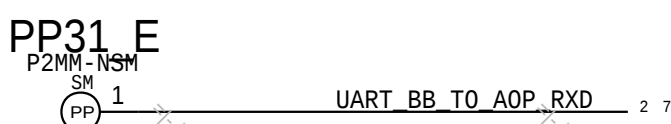
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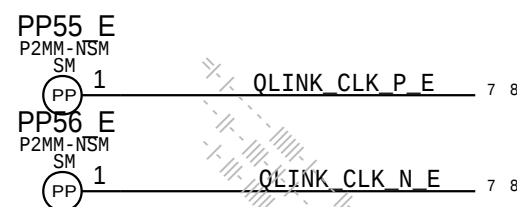
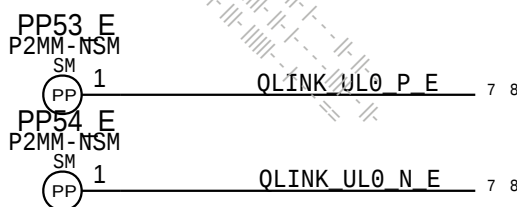
CTRL



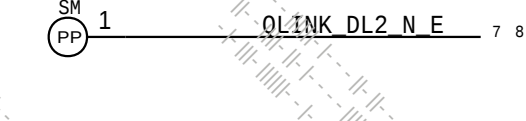
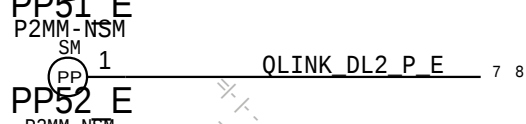
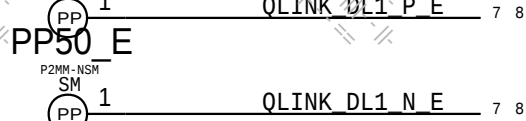
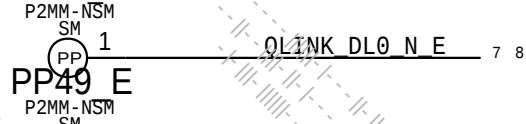
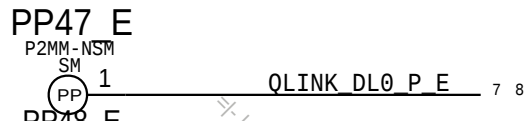
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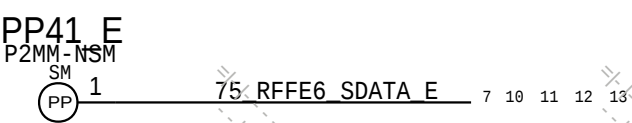
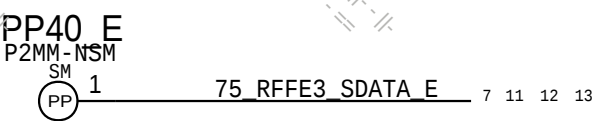
LAYOUT: VIA STUB AT WTR PINS



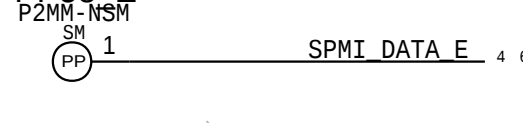
LAYOUT: VIA STUB AT BB PINS



RFFE



SPMI



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D21 RADIO_MLB_FF

5/22/2017

76	50	IO	50_UAT_TRX_UHB_MCS
76	50	IO	50_UAT_TRX_LB_MCS
76	50	IO	50_UAT_TRX_MLB_MB_HB_MCS
76	50	IN	50_LAT_DRX_MLB_MB_HB_MCS
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76	50	IO	50_LMHGW_UAT1
76	50	IO	50_DSM_HB_IN_TRX_UHB
76	50	IO	50_LAT_WLAN_NORTH
76	50	IO	50_LAT_WLAN_SOUTH
76	50	IO	50_UAT_WLAN_5G_EAST
76	50	IO	50_UAT_WLAN_2G_EAST
76	50	IO	50_UAT_WLAN_2G_WEST
76	50	IO	50_LAT_WLAN_MLC
78	50	IN	LAT_TUNER_REFE1_CLK
78	50	IO	LAT_TUNER_REFE1_DATA
78	77	IN	UAT_TUNER_REFE_CLK
78	77	IO	UAT_TUNER_REFE_DATA
77	50	IO	PP1V8_S2
77	50	IO	PP3V0_S2
78	50	IN	PP1V8_S2
76	50	OUT	BB_TO_LAT_GP01
76	50	OUT	BB_TO_LAT_GP02
76	50	OUT	BB_TO_LAT_GP03
76	50	OUT	BB_TO_LAT_GP04

FRONT PAGE

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		PAGE	1	OF 4
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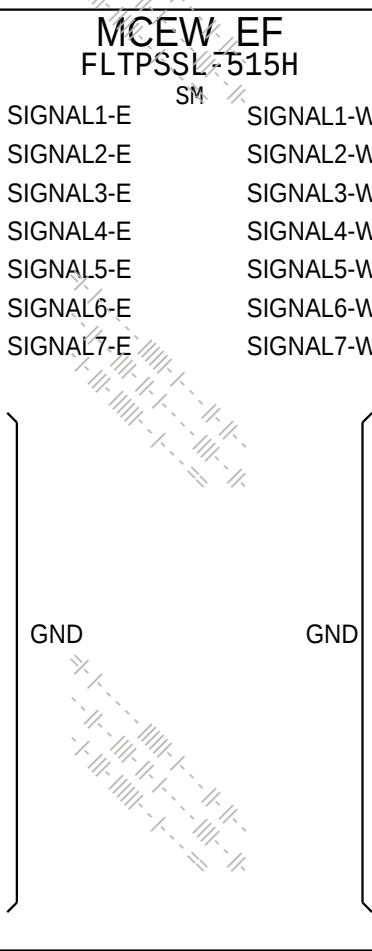
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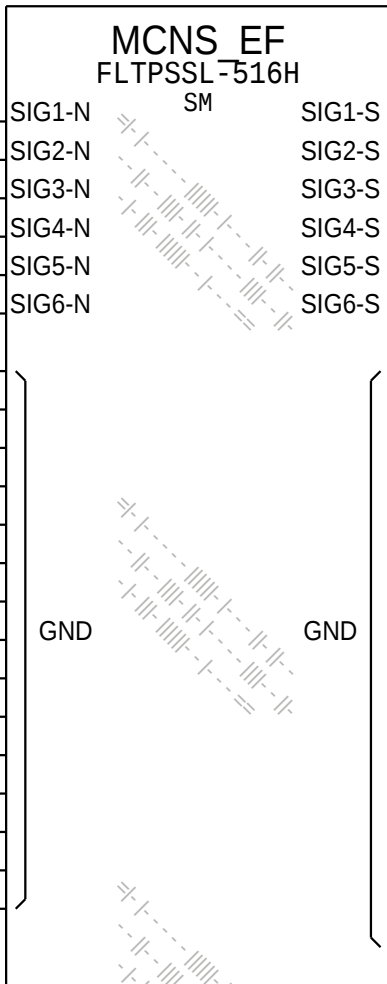
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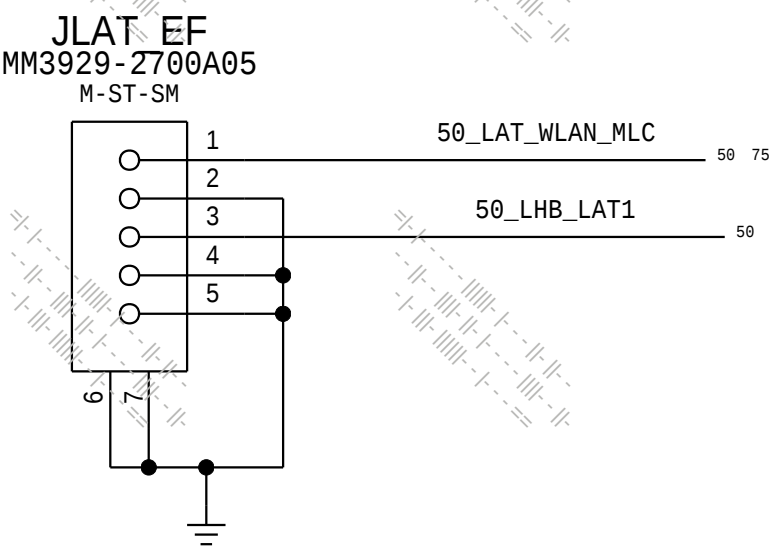
UPPER MLB

LOWER MLB



UHB/WIFI 5GHZ TEST

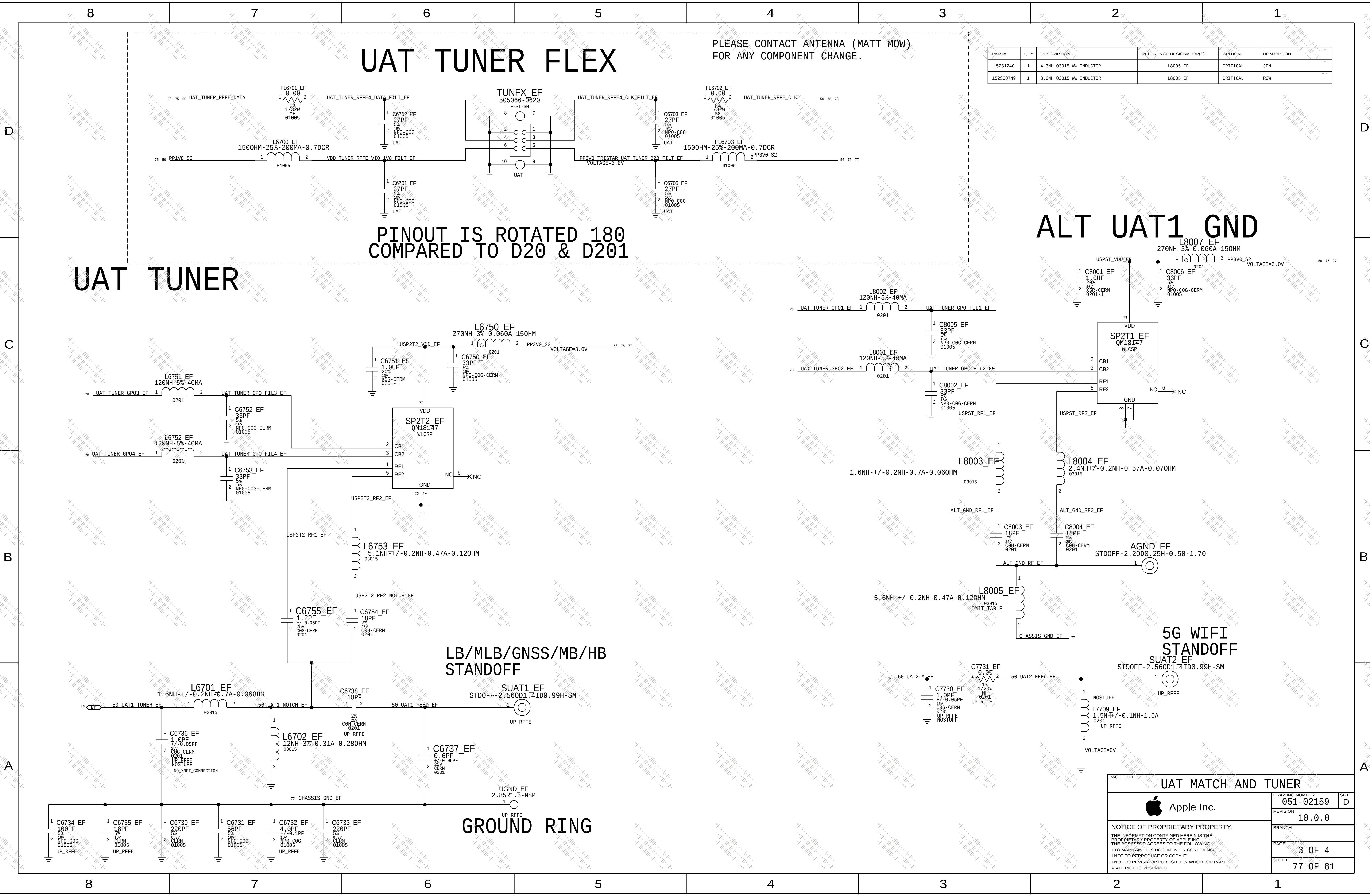
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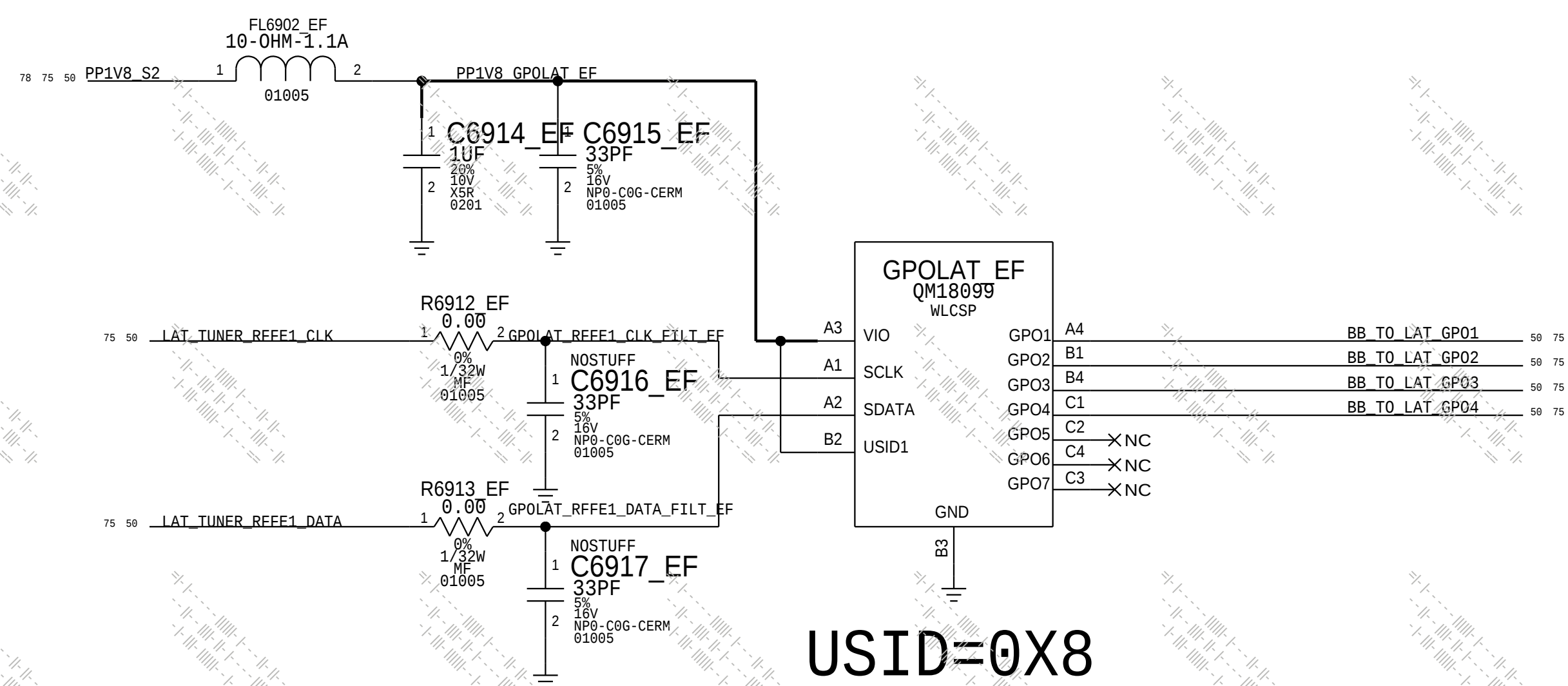
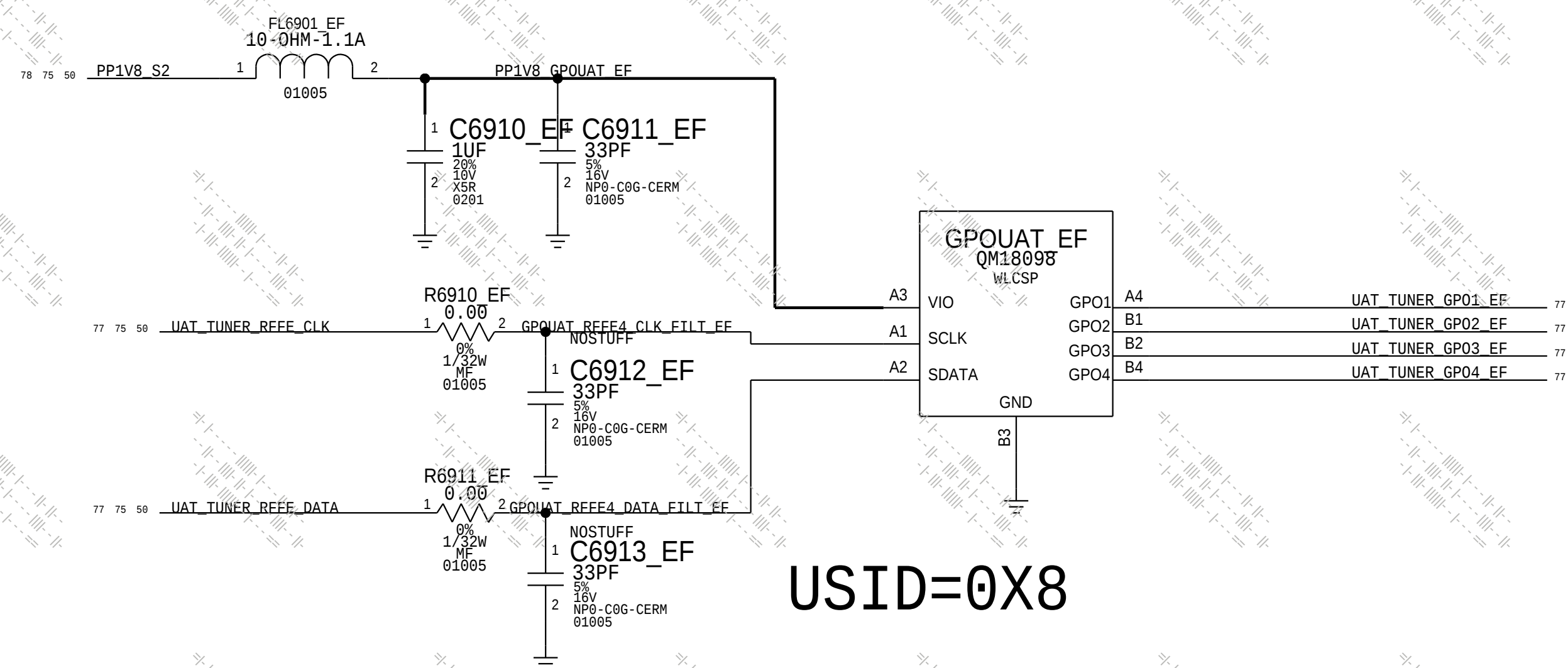


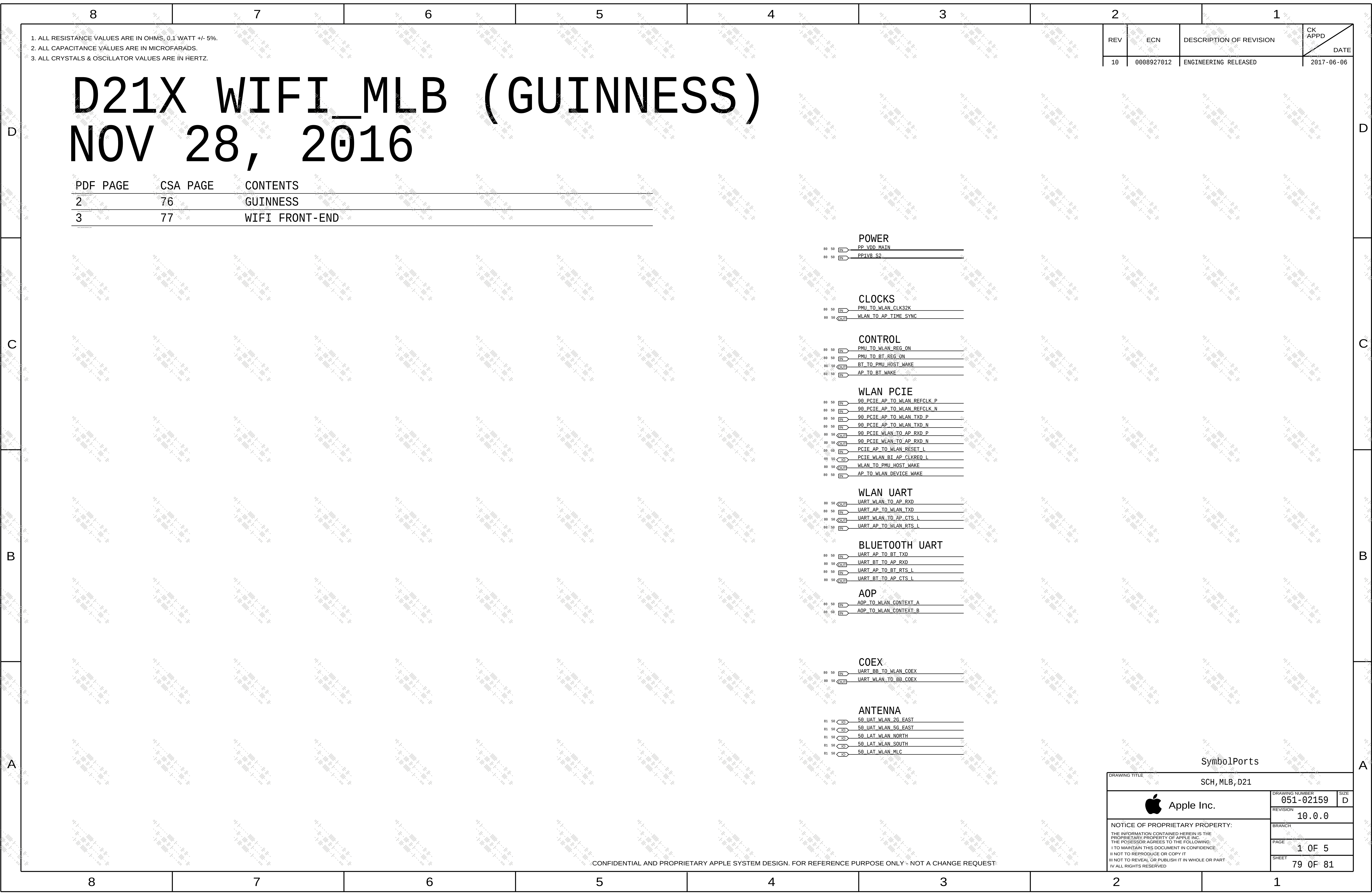
LB/MLB/MB/HB
WIFI 2.4GHZ TEST

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
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155500275	1	5G PASSTHROUGH	FL2002_EF	CRITICAL	ROW
131S0598	1	842/5G DIPLEXER 5G_IN MATCH	L7751_EF	CRITICAL	JPN
131S0385	1	5G PASSTHROUGH INPUT MATCH	L7751_EF	CRITICAL	ROW

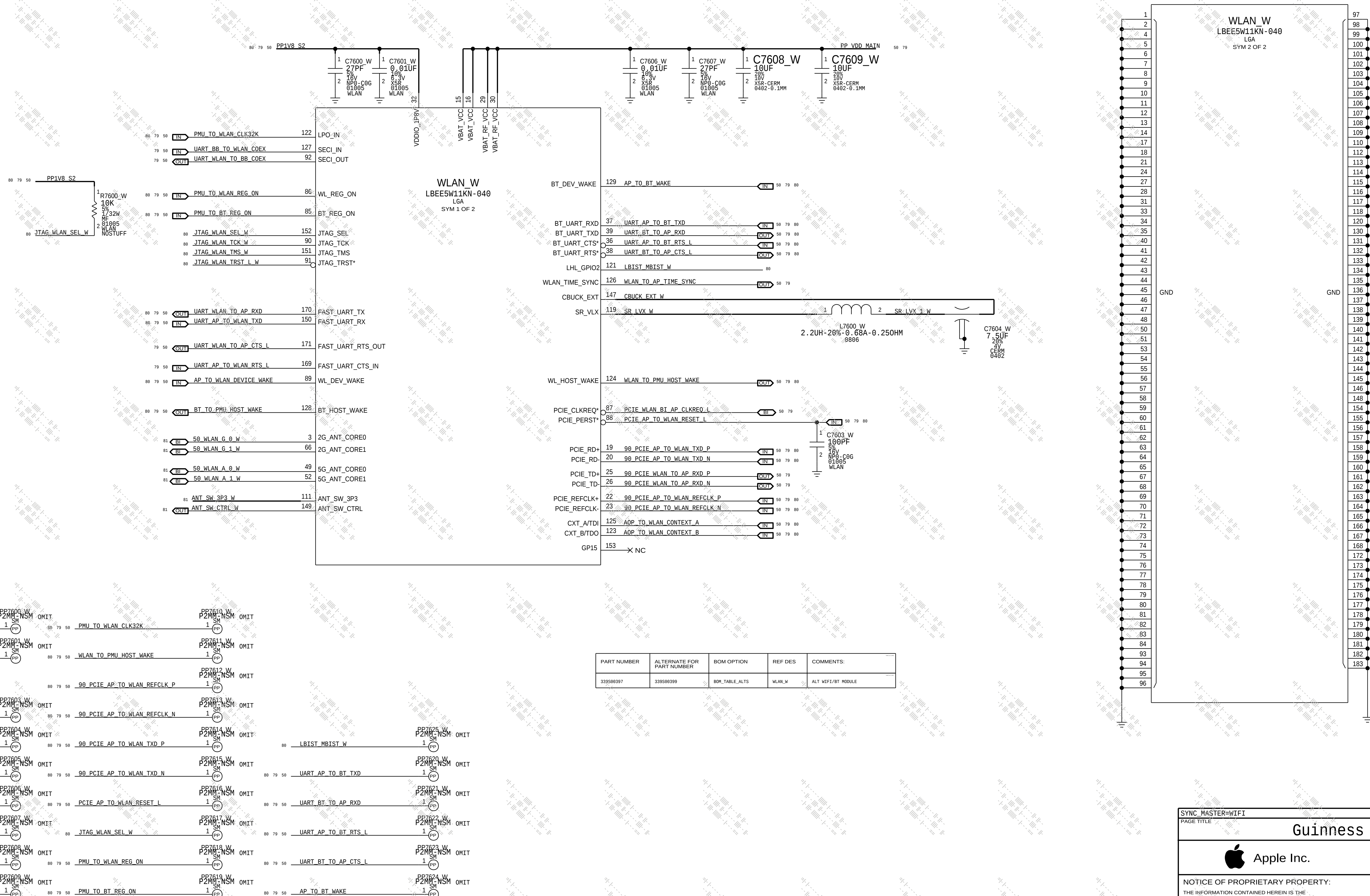
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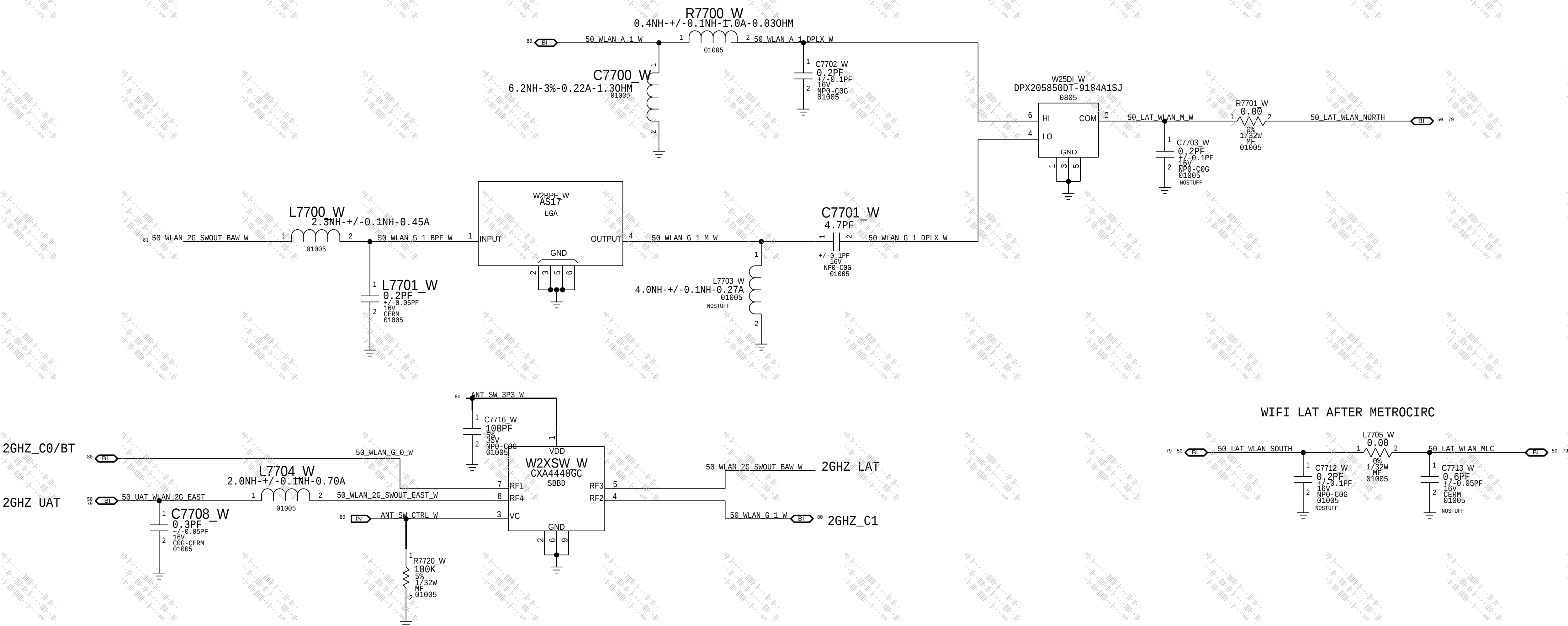


8	
WIFI/BT	

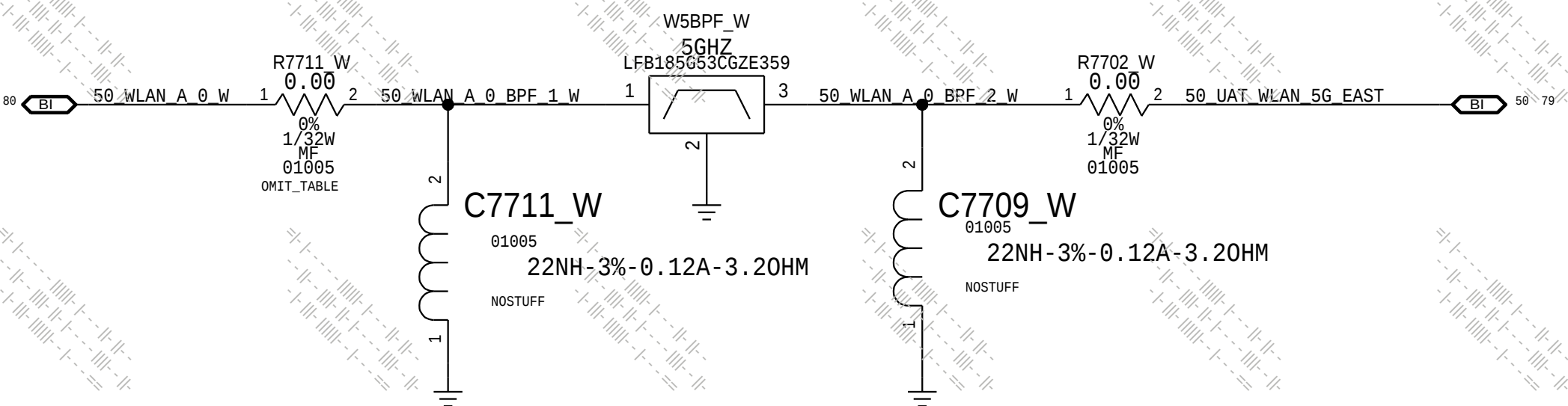


PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
339508397	339508399	BOM_TABLE_ALTS	WLAN_W	ALT WIFI/BT MODULE

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

PAGE TITLE\$PAGE_TITLE=WifiAntFeeds			DRAWING NUMBER051-02159		SIZE
 Apple Inc.			REVISION	10.0.0	
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			SHEET	81 OF 81	