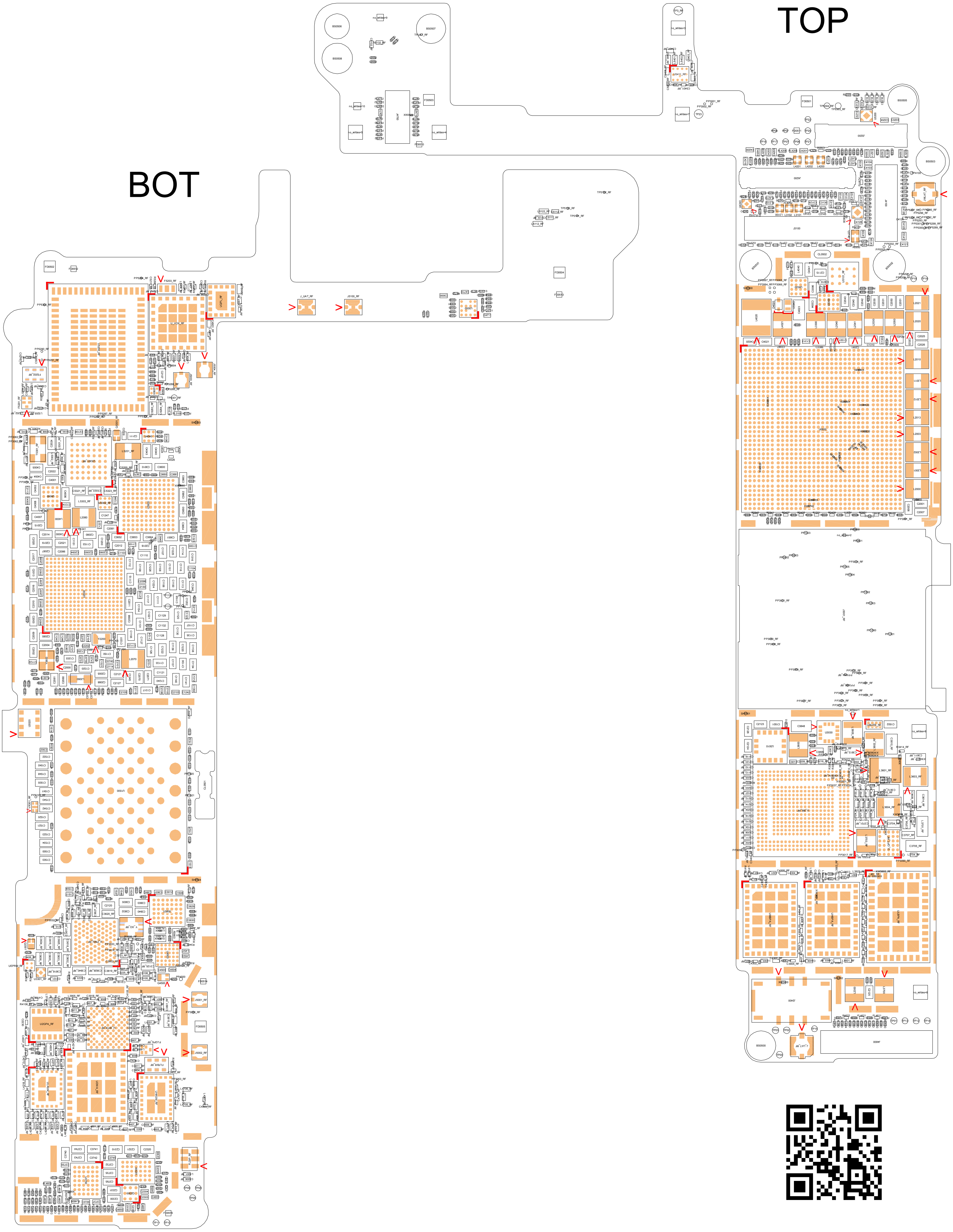
820-5507-A

# N71位置图



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 |
|---|---|---|---|
| A | 0004536627 | PRODUCTION RELEASED | 2015-07-21 |

# N71 MLB - PVT OK2FAB

LAST_MODIFICATION=Tue Jul 21 11:39:02 2015



SCH 051-1902
BRD 820-5507
MCO 056-01060

BOM 639-00263 (BETTER,DB30)
BOM 639-00265 (ULTRA,DB30)
BOM 639-00266 (SUPREME,DB30)
BOM 639-01056 (BETTER,B30)
BOM 639-01057 (ULTRA,B30)
BOM 639-01058 (SUPREME,B30)
BOM 639-01098 (BETTER,DB30C)
BOM 639-01100 (ULTRA,DB30C)
BOM 639-01099 (SUPREME,DB30C)
BOM 939-01627 (BETTER,DARWIN)

TABLE OF CONTENTS

DRAWING TITLE: SCHEM,SINGLE,BRD,N71

Apple Inc.

DRAWING NUMBER: 051-1902 SIZE: D

REVISION: A.0.0

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## SCHEMATIC & PCB BOM CALLOUTS

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | CRITICAL | BOM OPTION |
|---|---|---|---|---|---|
| 051-1902 | 1 | SCH,SINGLE_BRD,N71 | SCH | CRITICAL | ? |
| 820-5507 | 1 | PCBF,SINGLE_BRD,N71 | PCB | CRITICAL | ? |
| 825-6838 | 1 | EEEE CODE FOR 639-00263 | EEEE_G2KM | CRITICAL | EEEE_16G_DB30 |
| 825-6838 | 1 | EEEE CODE FOR 639-00265 | EEEE_G2KN | CRITICAL | EEEE_64G_DB30 |
| 825-6838 | 1 | EEEE CODE FOR 639-00266 | EEEE_G2KL | CRITICAL | EEEE_128G_DB30 |
| 825-6838 | 1 | EEEE CODE FOR 639-01056 | EEEE_GKF9 | CRITICAL | EEEE_16G_B30 |
| 825-6838 | 1 | EEEE CODE FOR 639-01057 | EEEE_GKFC | CRITICAL | EEEE_64G_B30 |
| 825-6838 | 1 | EEEE CODE FOR 639-01058 | EEEE_GKF8 | CRITICAL | EEEE_128G_B30 |
| 825-6838 | 1 | EEEE CODE FOR 639-01098 | EEEE_GLHL | CRITICAL | EEEE_16G_DB30C |
| 825-6838 | 1 | EEEE CODE FOR 639-01100 | EEEE_GLHR | CRITICAL | EEEE_64G_DB30C |
| 825-6838 | 1 | EEEE CODE FOR 639-01099 | EEEE_GLHM | CRITICAL | EEEE_128G_DB30C |
| 825-6838 | 1 | EEEE CODE FOR 939-01627 | EEEE_GR09 | CRITICAL | EEEE_16G_DARWIN |

## S3E NAND BOM OPTIONS

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | CRITICAL | BOM OPTION |
|---|---|---|---|---|---|
| 335S00039 | 1 | NAND,1YNM,16GX8,S3E,64G,T,SLGA70 | U1500 | CRITICAL | NAND_16G |
| 335S00075 | 1 | NAND,1YNM,64GX8,S3E,MLB,64G,H,SLGA70 | U1500 | CRITICAL | NAND_64G |
| 335S00079 | 1 | NAND,1YNM,128GX8,S3E,TLC,128G,H,SLGA70 | U1500 | CRITICAL | NAND_128G |

| PART NUMBER | ALTERNATE FOR PART NUMBER | BOM OPTION | REF DES | COMMENTS: |
|---|---|---|---|---|
| 335S00074 | 335S00039 | NAND_16G | U1500 | HYNIX 16G SLGA70 C DIE |
| 335S00078 | 335S00075 | NAND_64G | U1500 | HYNIX 64G SLGA70 |
| 335S00064 | 335S00075 | NAND_64G | U1500 | SANDISK 64G SLGA70 1Z |
| 335S00065 | 335S00079 | NAND_128G | U1500 | SANDISK 128G SLGA70 |

## CARBON/ACCEL BOM OPTIONS

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 338S1163 | 1 | IC,ACCEL,3-AXIS,DIG,BMA282,LGA14 | U3030 | NOSTUFF |
| 117S0202 | 1 | RES,MF,20 OHM,5%,1/32W,01005 | R3030 | NOSTUFF |
| 117S0202 | 1 | RES,MF,20 OHM,5%,1/32W,01005 | R3031 | NOSTUFF |
| 117S0202 | 1 | RES,MF,20 OHM,5%,1/32W,01005 | R3032 | NOSTUFF |
| 138S0831 | 1 | CAP,CER,X5R,2.2UF,20%,6.3V,0201 | C3031 | NOSTUFF |
| 132S0316 | 1 | CAP,CER,X5R,0.1UF,20%,6.3V,01005 | C3032 | NOSTUFF |
| 338S00017 | 1 | IC,CARBON,MPU-6700-12,LGA16 | U3010 | INVENSENSE_CARBON |
| 338S1163 | 1 | IC,ACCEL,3-AXIS,DIG,BMA282,LGA14 | U3030 | INVENSENSE_CARBON |
| 117S0202 | 1 | RES,MF,20 OHM,5%,1/32W,01005 | R3030 | INVENSENSE_CARBON |
| 117S0202 | 1 | RES,MF,20 OHM,5%,1/32W,01005 | R3031 | INVENSENSE_CARBON |
| 117S0202 | 1 | RES,MF,20 OHM,5%,1/32W,01005 | R3032 | INVENSENSE_CARBON |
| 138S0831 | 1 | CAP,CER,X5R,2.2UF,20%,6.3V,0201 | C3031 | INVENSENSE_CARBON |
| 132S0316 | 1 | CAP,CER,X5R,0.1UF,20%,6.3V,01005 | C3032 | INVENSENSE_CARBON |
| 338S00087 | 1 | IC,CARBON 1.1,MPU-6800-00,LGA16 | U3010 | INVENSENSE_STANDALONE_CARBON |

## ALTERNATE BOM OPTIONS

| PART NUMBER | ALTERNATE FOR PART NUMBER | BOM OPTION | REF DES | COMMENTS: | |
|---|---|---|---|---|---|
| 138S00032 | 138S0831 | ALTERNATE | C0610 | TY,2.2UF,0201 | NOT ALL REFERENCE DESIGNATORS LISTED. USED ~116 TIMES IN DESIGN. |
| 138S00049 | 138S0831 | ALTERNATE | C0610 | KYOCERA,2.2UF,0201 | USED ~116 TIMES IN DESIGN. |
| 155S0660 | 155S0513 | ALTERNATE | FL3100 | MURATA,FERR,22-OHM | USED ~7 TIMES IN DESIGN. |
| 138S00005 | 138S00003 | ALTERNATE | C2000 | TY,15UF,0402 | USED ~63 TIMES IN DESIGN. |
| 138S00048 | 138S00003 | ALTERNATE | C2000 | KYOCERA,15UF,0402 | USED ~63 TIMES IN DESIGN. |
| 138S0702 | 138S0657 | ALTERNATE | C2111 | MURATA,4.3UF,0610 | USED ~3 TIMES IN DESIGN. |
| 118S0764 | 118S0717 | ALTERNATE | R2250 | PANASONIC,3.92K-OHM,0201 | |
| 138S00006 | 138S0835 | ALTERNATE | C1106 | TY,4.3UF,0402 | USED ~19 TIMES IN DESIGN. |
| 152S2052 | 152S1929 | ALTERNATE | L2060 | CYNTEC,1UH,1608 | |
| 155S0773 | 155S0453 | ALTERNATE | FL3110 | TY,FERR,120-OHM,01005 | USED ~61 TIMES IN DESIGN. |
| 377S0168 | 377S0140 | ALTERNATE | DZ3150 | TDK,VARISTOR,6.8V,100PF,01005 | USED ~9 TIMES IN DESIGN. |
| 155S00067 | 155S0581 | ALTERNATE | FL4200 | TDK,FERR,240-OHM,0201 | USED ~8 TIMES IN DESIGN. |
| 155S00012 | 155S00009 | ALTERNATE | L3100 | MURATA,CHOKE,65-OHM,0605 | USED ~11 TIMES IN DESIGN. |
| 138S0706 | 138S0739 | ALTERNATE | C3302_RF | MURATA,CAP,CER,1UF,20%,10V,X5R,0201 | USED ~17 TIMES IN DESIGN. USED ~17 TIMES IN DESIGN. |
| 138S0945 | 138S0739 | ALTERNATE | C3302_RF | KYOCERA,CAP,CER,1UF,20%,10V,X5R,0201 | |
| 155S00095 | 155S00068 | ALTERNATE | FL1280 | FERR BD,100 OHM,25%,100MA,2 OHM,01005 | |
| 138S0648 | 138S0652 | ALTERNATE | C3650 | TY,4.7UF,0402 | USED ~12 TIMES IN DESIGN. |
| 132S0400 | 132S0436 | ALTERNATE | C1280 | CAP,CER,X5R,0.22UF,20%,6.3v,01005 | USED ~2 TIMES IN DESIGN. |
| 155S0960 | 155S0941 | ALTERNATE | FL3151 | FEER BD,70 OHM,25%,300MA,0.4 DCR,01005 | USED ~9 TIMES IN DESIGN. |
| 138S00024 | 138S0986 | ALTERNATE | C1107 | CAP,CER,3-TERM,7.5UF,20%,4V,0402 | USED ~7 TIMES IN DESIGN. |
| 335S00066 | 335S0946 | ALTERNATE | U0900 | IC,EEPROM,16KX8,1.8V,I2C,WLCSP4 | |
| 155S0653 | 155S0511 | ALTERNATE | FL4600 | FERR BD,33 OHM,25%,750MA,0.09DCR,0201 | USED ~4 TIMES IN DESIGN. |

## POWER INDUCTOR ALTERNATES

| PART NUMBER | ALTERNATE FOR PART NUMBER | BOM OPTION | REF DES | COMMENTS: |
|---|---|---|---|---|
| 152S00120 | 152S00077 | ALTERNATE | L2070 | TAIYO 2016 1.0UH 0.65MM |
| 152S00118 | 152S00075 | ALTERNATE | L3700 | TAIYO 2016 1.2UH |

## ACTIVE DIODE ALTERNATE

| PART NUMBER | ALTERNATE FOR PART NUMBER | BOM OPTION | REF DES | COMMENTS: |
|---|---|---|---|---|
| 376S00106 | 376S00047 | ALTERNATE | Q2300 | DIODES INC. ACT DIODE |

## SHIELD PART NUMBERS

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 806-02895 | 1 | SHIELD,EMI,UPPER FRONT,WTOP,N71 | SH0500 | COMMON |
| 806-04588 | 1 | SHIELD,EMI,LOWER FRONT,CLOSED,NOMU,N71 | SH0501 | COMMON |
| 806-03994 | 1 | SHIELD,EMI,SA,OPEN,N71 | SH0502 | COMMON |
| 806-02897 | 1 | SHIELD,EMI,UPPER BACK,WTOP,N71 | SH0503 | COMMON |
| 806-02898 | 1 | SHIELD,EMI,LOWER BACK,WTOP,N71 | SH0504 | COMMON |

## SOC/PMU SUB BOMS

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 685-00069 | 1 | SUBBOM,SINGLE,BRD,MAUI,N71 | SUBBOM_SOC | COMMON |
| 338S00120 | 1 | IC,PMU,ANTIGUA,A0,D2255A1,OTP-AL,WLCSP380 | U2000 | MAUI |
| 118S0631 | 1 | RES,MF,100 OHM,1%,1/32W,01005 | R0730 | MAUI |
| 131S0307 | 1 | CAP,CER,NP0/C0G,100PF,5%,16V,01005 | C0730 | MAUI |
| 339S00112 | 1 | PROD FUSED, H DRAM | U0600 | MAUI |
| 117S0161 | 1 | RES,MF,0 OHM,1/32W,01005 | R0651 | MAUI |

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 338S00122 | 1 | IC,PMU,ANTIGUA,D2255A1,OTP-ZL,WLCSP380 | U2000 | MALTA |
| 118S00009 | 1 | RES,MF,3.01KOHM,1%,1/32W,01005 | R0730 | MALTA |
| 131S0307 | 1 | CAP,CER,NP0/C0G,100PF,5%,16V,01005 | C0730 | NOSTUFF |
| 339S00124 | 1 | M DEV FUSED, M DRAM | U0600 | MALTA |
| 118S00025 | 1 | RES,MF,330 OHM,1%,1/32W,01005 | R0651 | MALTA |

| PART NUMBER | ALTERNATE FOR PART NUMBER | BOM OPTION | REF DES | COMMENTS: |
|---|---|---|---|---|
| 685-00070 | 685-00069 | ALTERNATE | SUBBOM_SOC | SUBBOM,SINGLE,BRD,MALTA,N71 |

## SOC ALTERNATES

| PART NUMBER | ALTERNATE FOR PART NUMBER | BOM OPTION | REF DES | COMMENTS: |
|---|---|---|---|---|
| 339S00113 | 339S00112 | MAUI | U0600 | PROD FUSED, M DRAM |
| 339S00114 | 339S00112 | MAUI | U0600 | PROD FUSED, S DRAM |

| | | | | |
|---|---|---|---|---|
| 339S00125 | 339S00124 | MALTA | U0600 | M PROD FUSED, H DRAM, ATK |
| 339S00126 | 339S00124 | MALTA | U0600 | M PROD FUSED, S DRAM, ATK |
| 339S00127 | 339S00124 | MALTA | U0600 | M PROD FUSED, M DRAM, SCK |
| 339S00128 | 339S00124 | MALTA | U0600 | M PROD FUSED, H DRAM, SCK |
| 339S00129 | 339S00124 | MALTA | U0600 | M PROD FUSED, S DRAM, SCK |

## INDUCTOR SUB BOMS

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 685-00081 | 1 | SUBBOM,SINGLE,BRD,CYNTEC,N71 | SUBBOM_IND | COMMON |
| 152S00074 | 6 | IND,PWR,SHLD,1.0UH,3.6A,0.060 OHM,2016 | L2000,L2002,L2010,L2012,L2020,L2030 | CYNTEC |
| 152S00074 | 5 | IND,PWR,SHLD,1.0UH,3.6A,0.060 OHM,2016 | L2040,L2050,L2300,L3300,L4021 | CYNTEC |
| 152S00081 | 6 | IND,PWR,SHLD,0.47UH,3.8A,0.048 OHM,2012 | L2001,L2003,L2011,L2013,L2021,L2041 | CYNTEC |

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 152S00117 | 6 | IND,PWR,SHLD,1.0UH,3.6A,0.060 OHM,2016 | L2000,L2002,L2010,L2012,L2020,L2030 | TAIYO |
| 152S00117 | 5 | IND,PWR,SHLD,1.0UH,3.6A,0.060 OHM,2016 | L2040,L2050,L2300,L3300,L4021 | TAIYO |
| 152S00121 | 6 | IND,PWR,SHLD,0.47UH,3.8A,0.048 OHM,2012 | L2001,L2003,L2011,L2013,L2021,L2041 | TAIYO |

| PART NUMBER | ALTERNATE FOR PART NUMBER | BOM OPTION | REF DES | COMMENTS: |
|---|---|---|---|---|
| 685-00080 | 685-00081 | ALTERNATE | SUBBOM_IND | SUBBOM,SINGLE,BRD,TAIYO,N71 |

PAGE TITLE
SYSTEM:BOM TABLES

Apple Inc.

DRAWING NUMBER 051-1902 SIZE D
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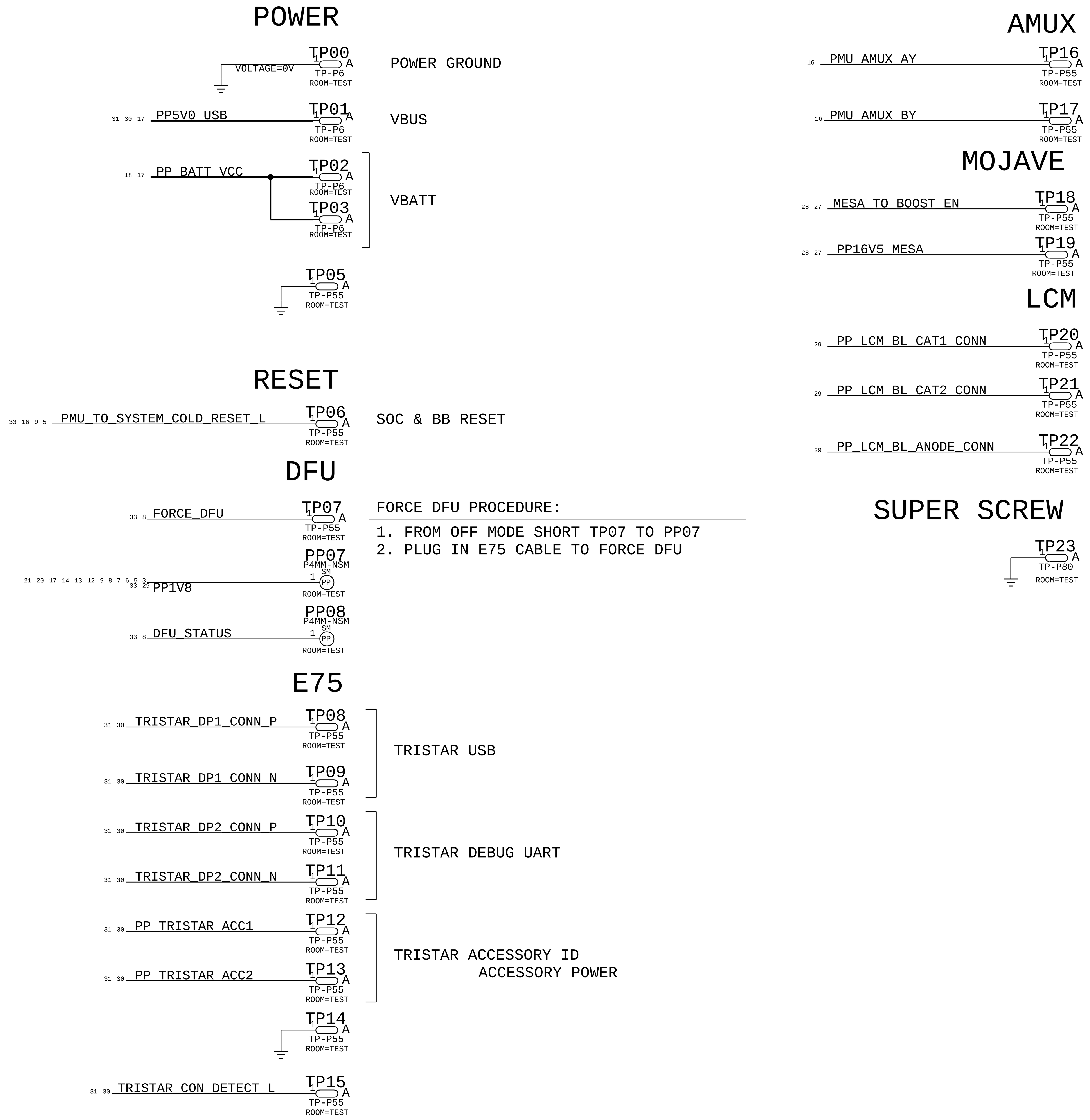
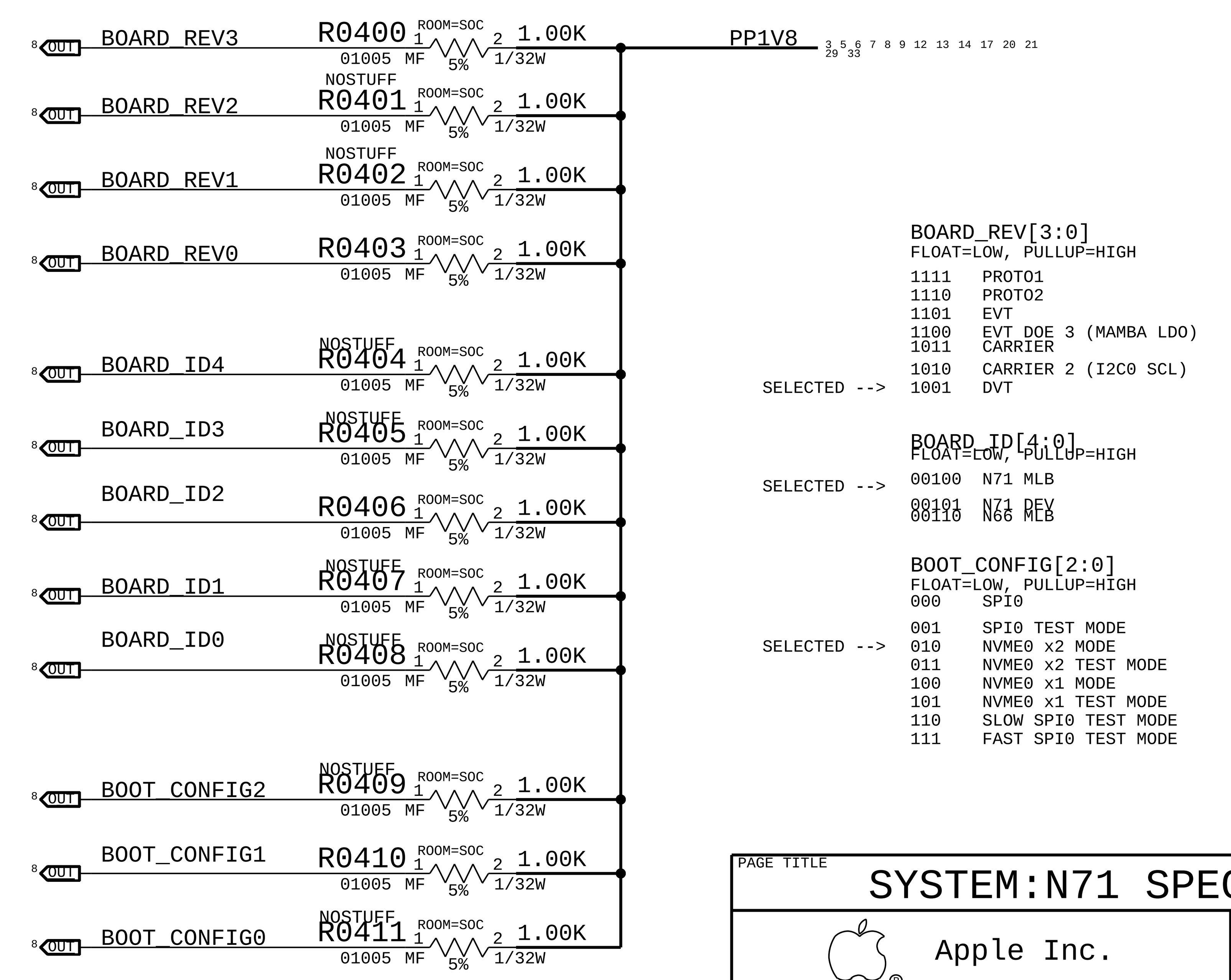
# TESTPOINTS




# N71 I2C DEVICE MAP

| I2C BUS | DEVICE | BINARY | 7-BIT HEX | 8-BIT HEX |
|---|---|---|---|---|
| I2C0 | ANTIGUA PMU | 1110100X | 0X74 | 0XE8 |
| | CHESTNUT | 0100111X | 0X27 | 0X4E |
| | MUON | 1100010X | 0X62 | 0XC4 |
| I2C1 | TIGRIS | 1110101X | 0X75 | 0XEA |
| | ARC DRIVER | 1000001X | 0X41 | 0X82 |
| | SPEAKER AMP | 1000000X | 0X40 | 0X80 |
| | TRISTAR | 0011010X | 0X1A | 0X34 |
| I2C2 | ALS | 0101001X | 0X29 | 0X52 |
| | DISP EEPROM | 1010001X | 0X51 | 0XA2 |
| OWL | UNUSED | N/A | N/A | N/A |
| ISP I2C0 | REAR CAM | TBD | TBD | TBD |
| | LED DRIVER | 1100011X | 0X63 | 0XC6 |
| ISP I2C1 | FRONT CAM | 0010000X | 0X10 | 0X20 |
| TOUCH I2C | MESON | 1000000X | 0x40 | 0x80 |
| | MAMBA | 1100000X | 0x60 | 0xC0 |
| | DOPPLER | 1011000X | 0x58 | 0xB0 |
| SEP I2C | SEP EEPROM | 1010001X | 0x51 | 0xA2 |

# BOOTSTRAPPING:BOARD REV
# BOARD ID
# BOOT CONFIG




BOARD_REV[3:0]
FLOAT=LOW, PULLUP=HIGH
1111 PROTO1
1110 PROTO2
1101 EVT
1100 EVT DOE 3 (MAMBA LDO)
1011 CARRIER
1010 CARRIER 2 (I2C0 SCL)
SELECTED --> 1001 DVT

BOARD_ID[4:0]
FLOAT=LOW, PULLUP=HIGH
SELECTED --> 00100 N71 MLB
00101 N71 DEV
00110 N66 MLB

BOOT_CONFIG[2:0]
FLOAT=LOW, PULLUP=HIGH
000 SPI0
001 SPI0 TEST MODE
SELECTED --> 010 NVME0 x2 MODE
011 NVME0 x2 TEST MODE
100 NVME0 x1 MODE
101 NVME0 x1 TEST MODE
110 SLOW SPI0 TEST MODE
111 FAST SPI0 TEST MODE

RESISTOR STUFF = HIGH '1'
RESISTOR NOSTUFF = LOW '0'

PAGE TITLE
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PAGE TITLE
SYSTEM:MECHANICAL

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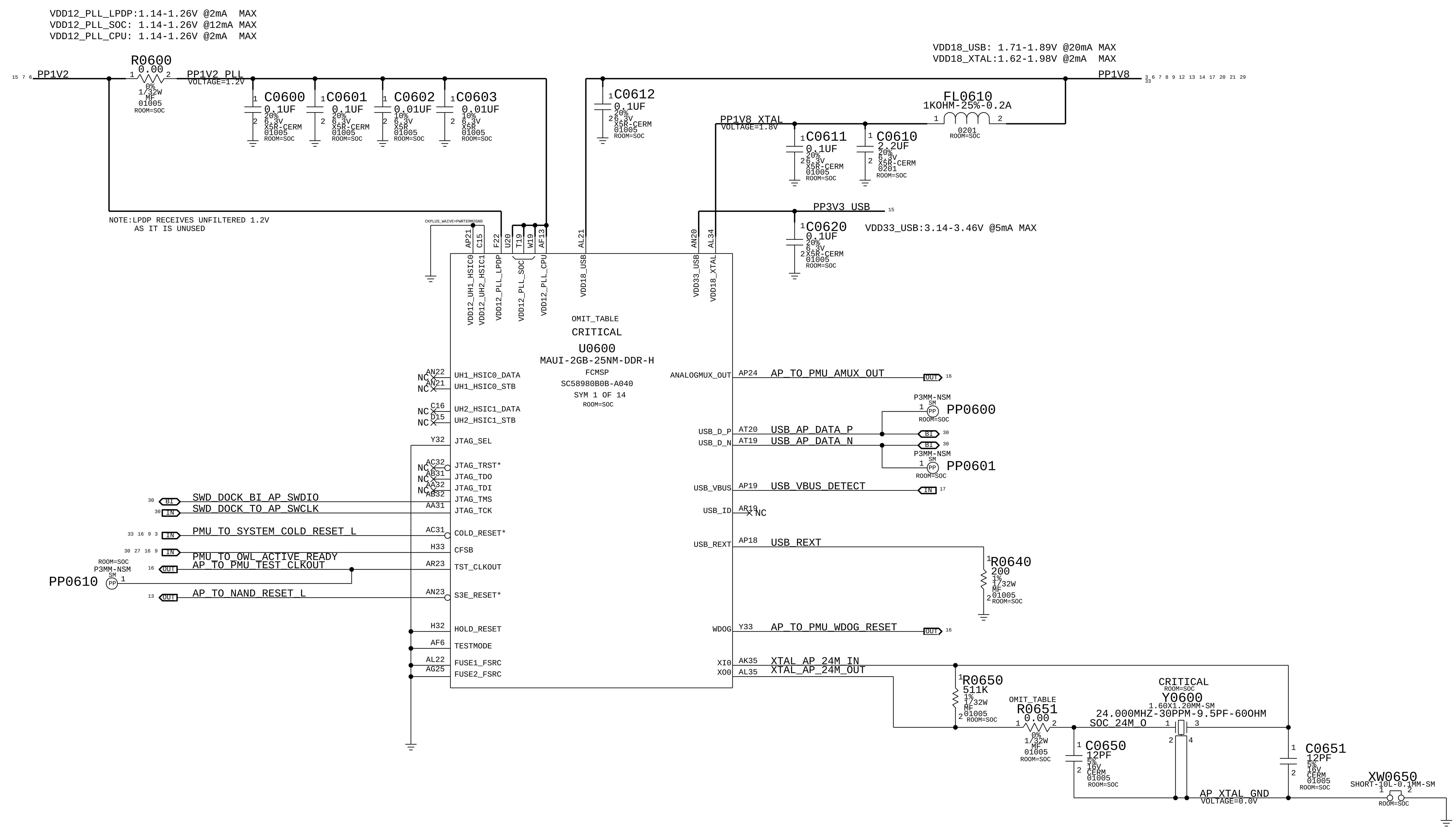
# MAUI - USB, JTAG, XTAL

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PAGE TITLE
SOC:JTAG,USB,XTAL

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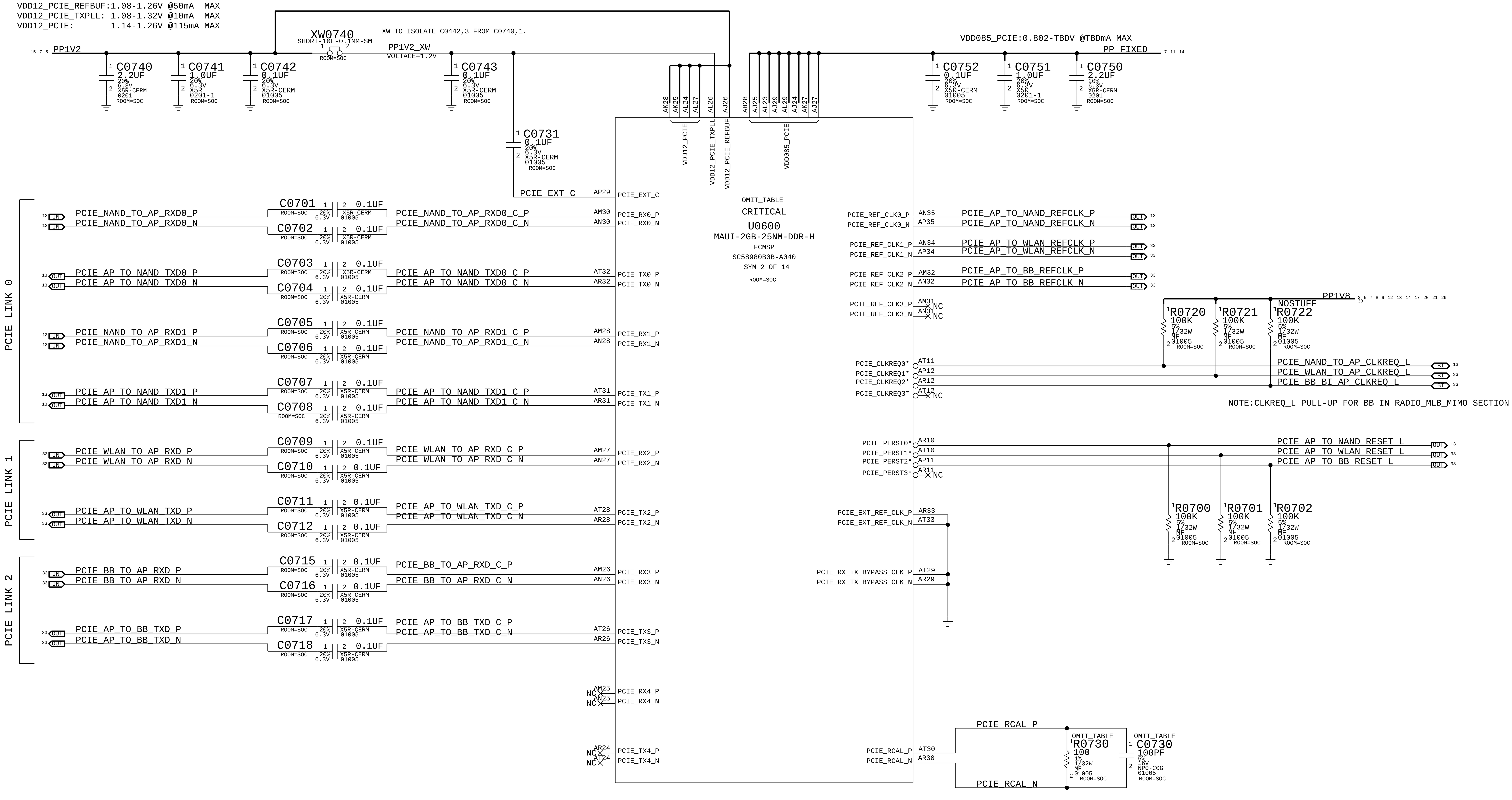
# MAUI - PCIE INTERFACES

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PAGE TITLE

## SOC:PCIE

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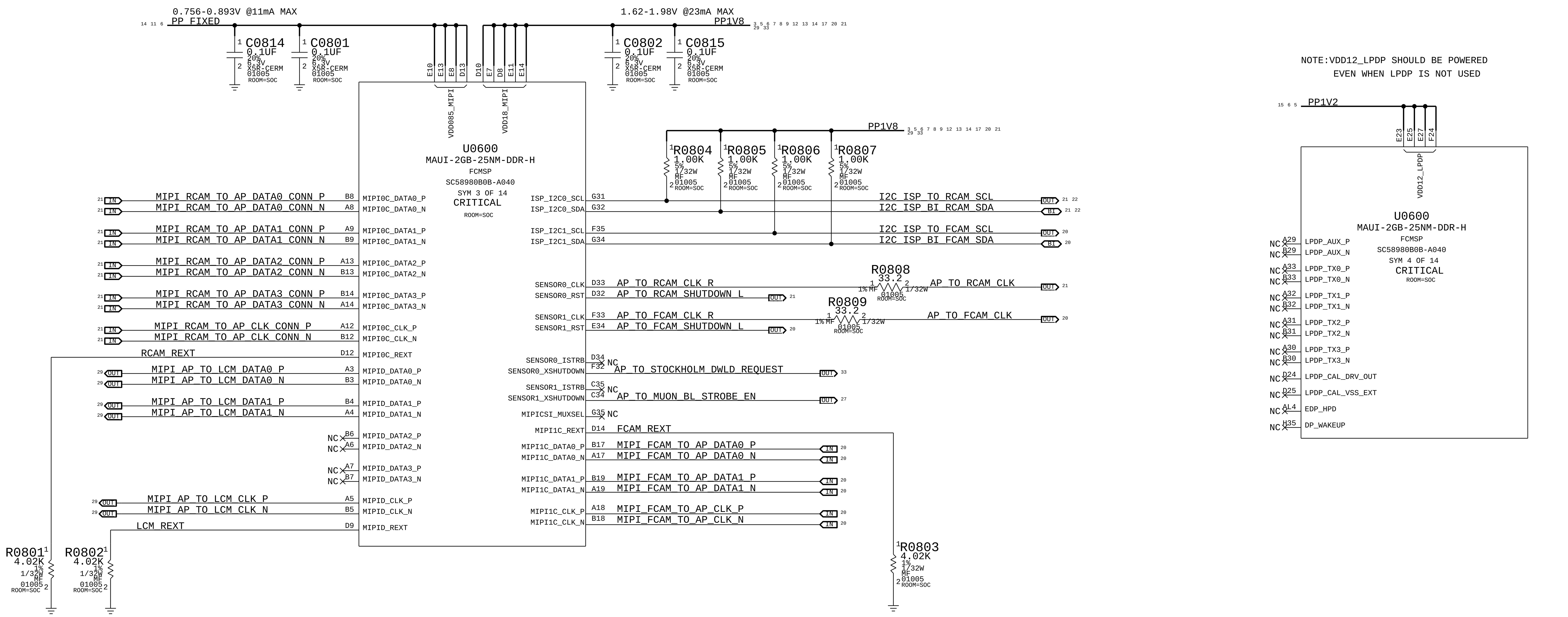
# MAUI - CAMERA & DISPLAY INTERFACES

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| PAGE TITLE SOC:CAMERA & DISPLAY | | |
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# MAUI - GPIO & SERIAL INTERFACES


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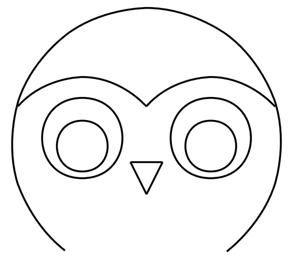
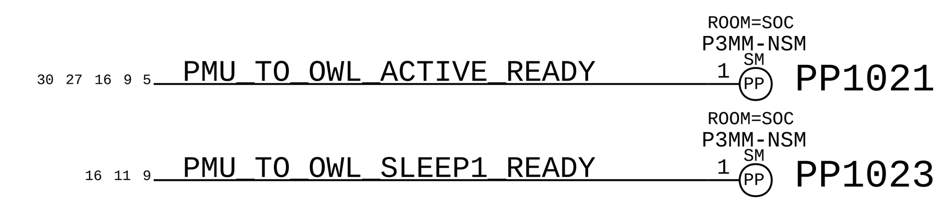
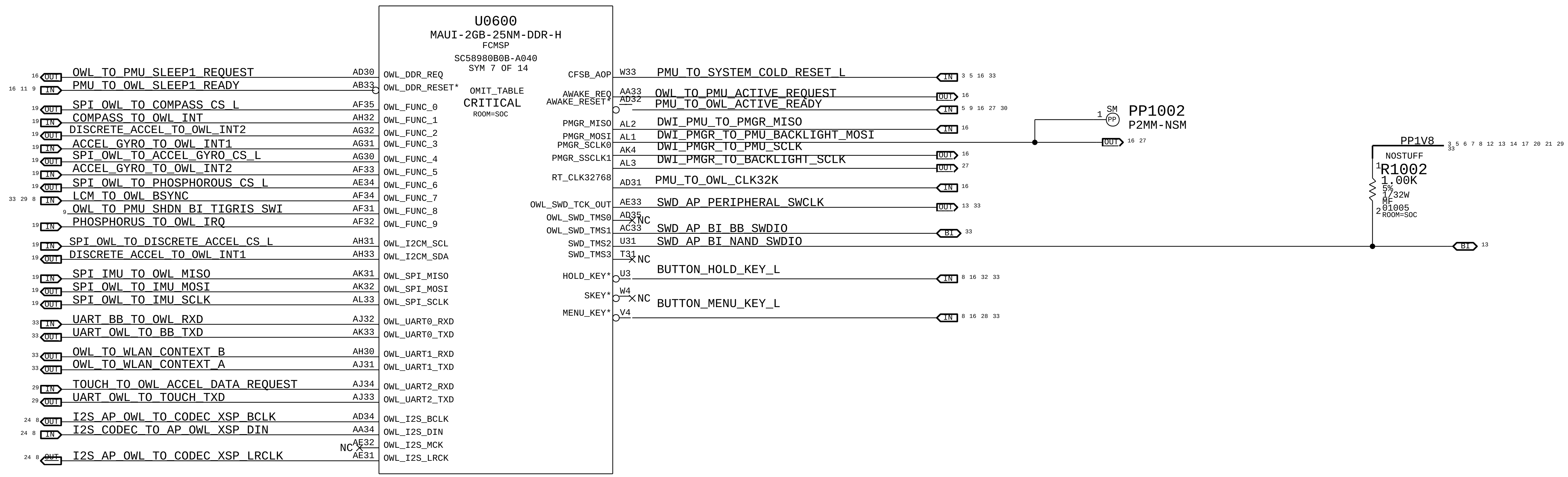
# MAUI - OWL

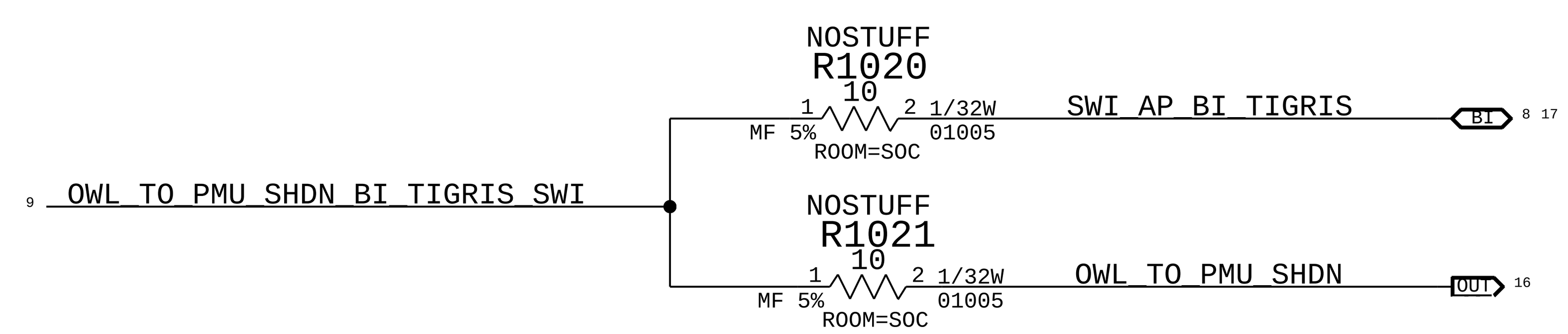


## POWER STATE CONTROL PROBE POINTS




## OWL SYSTEM SHUTDOWN OPTION

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PAGE TITLE: SOC:OWL

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# MAUI - CPU, GPU & SOC RAILS


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PAGE TITLE: SOC:POWER (1/3)

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# MAUI - POWER SUPPLIES


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SYNC_DATE=N/A

PAGE TITLE: SOC:POWER (2/3)

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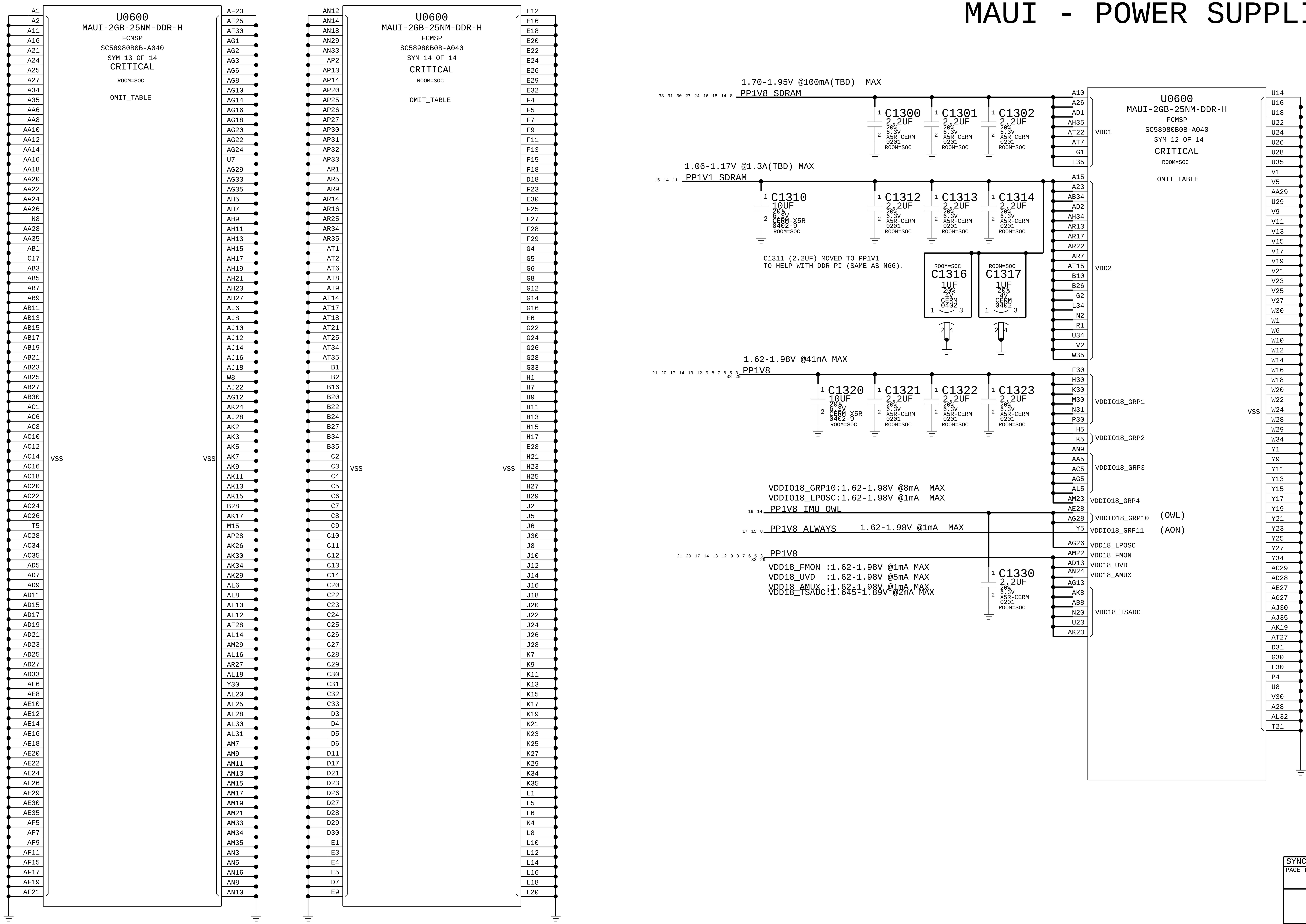
# MAUI - POWER SUPPLIES

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PAGE TITLE: SOC:POWER (3/3)

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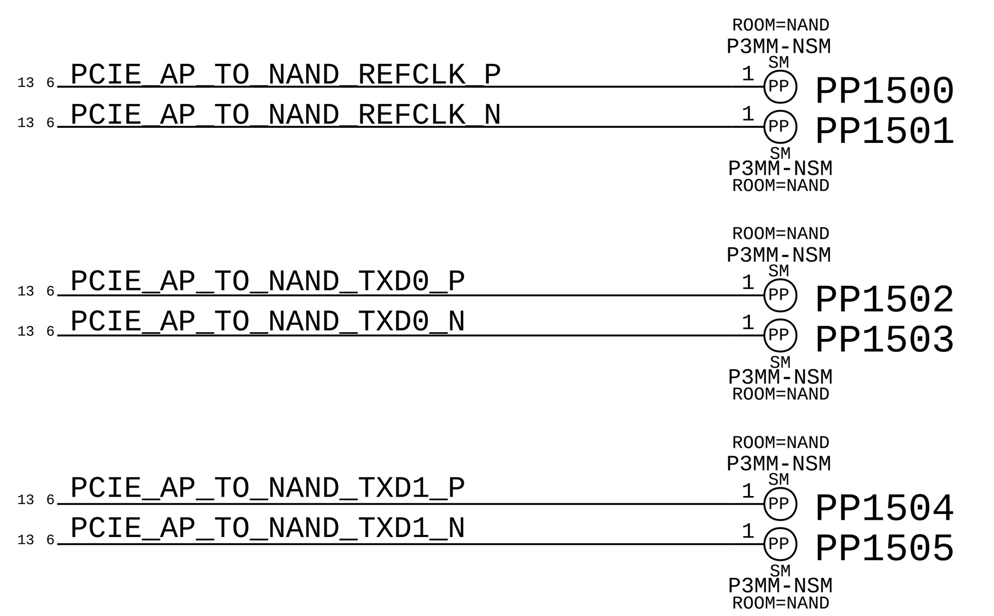
# S3E NAND


## PCIE RECEIVE-SIDE PROBE POINTS

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PAGE TITLE: NAND

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REVISION: A.0.0

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# ANTIGUA PMU - Buck Supplies


SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE
SYSTEM POWER:PMU (1/3)

Apple Inc.

DRAWING NUMBER 051-1902 SIZE D
REVISION A.0.0
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# ANTIGUA PMU - LDOs

## ANTIGUA LDO SPECS

| LDO# | ADJ.RANGE | ACCURACY | MAX.CURRENT |
|---|---|---|---|
| LDO1 (A) | 2.5-3.3V | +/-1.4% | 50mA |
| LDO2 (B) | 1.2-2.0V | +/-2.5% | 50mA |
| LDO3 (A) | 2.5-3.3V | +/-1.4% | 50mA |
| LDO4 (D) | 0.7-1.2V | +/-2.5% | 100mA |
| LDO5 (F) | 2.5-3.3V | +/-2.5% | 1000mA |
| LDO6 (C1) | 1.2-3.6V | +/-2.5% | 150mA |
| LDO7 (C) | 2.5-3.3V | +/-25mV | 250mA |
| LDO8 (C) | 2.5-3.3V | +/-25mV | 250mA |
| LDO9 (C) | 2.5-3.3V | +/-25mV | 250mA |
| LDO10 (G) | 0.7-1.2V | +/-5.5% | 1335mA |
| LDO11 (C) | 2.5-3.3V | +/-25mV | 250mA |
| LDO12 (E) | 1.8V | +/-5% | 10mA |
| LDO13 (C) | 2.5-3.3V | +/-25mV | 250mA |
| LDO14 (H) | 0.8-1.5V | +/-2.5% | 250mA |
| LDO15 (B) | 1.2-2.0V | +/-2.5% | 50mA |


SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE: SYSTEM POWER:PMU (2/3)

Apple Inc.

DRAWING NUMBER: 051-1902 SIZE: D

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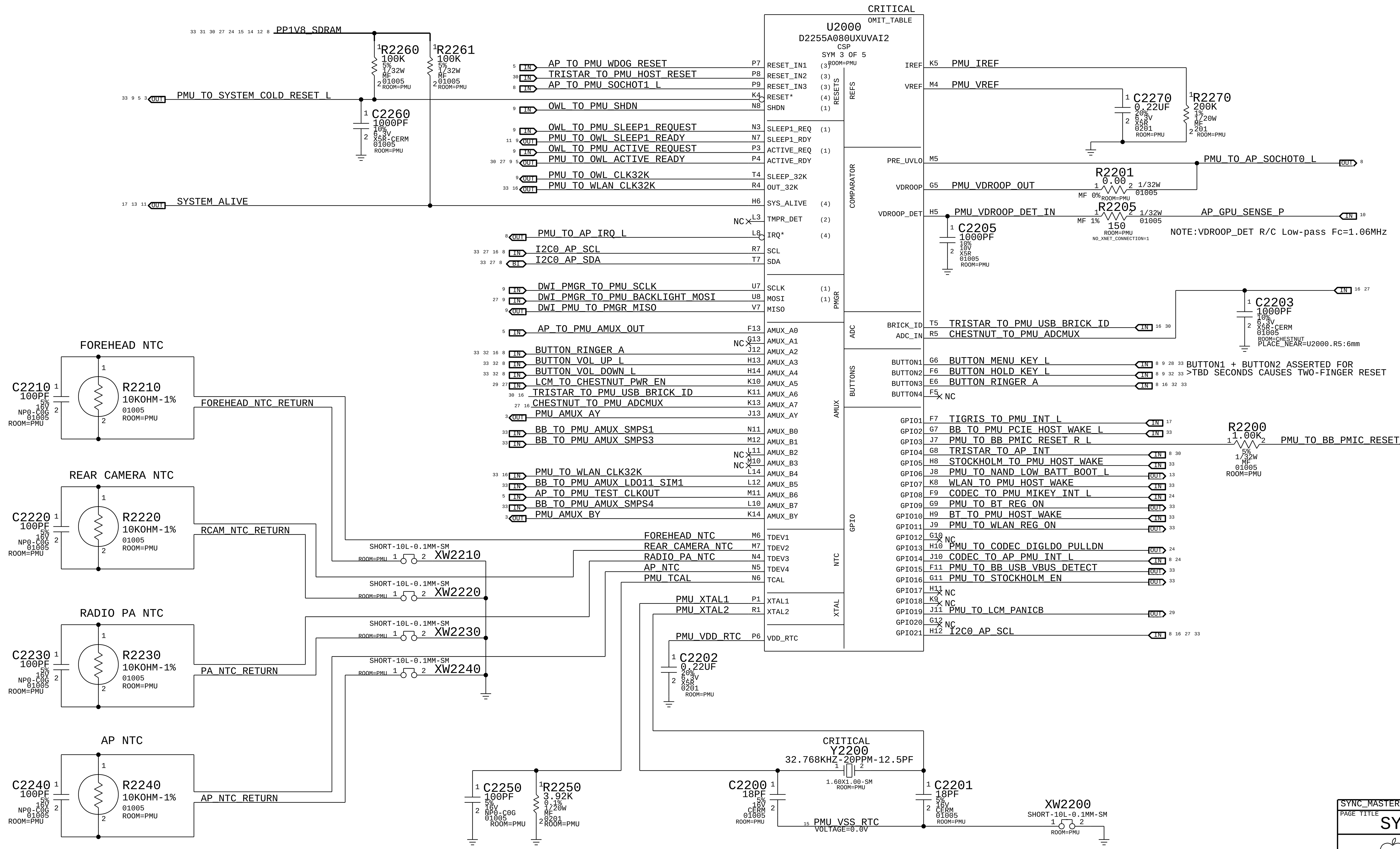
SHEET: 15 OF 59

# ANTIGUA PMU - GPIOs, NTCs

CONTROL PIN NOTES:

NOTE (1):INPUT PULL-DOWN 100-300k
NOTE (2):INPUT PULL-DOWN 1M
NOTE (3):INPUT PULL-UP OR DOWN 100k-300k
NOTE (4):OUTPUT OPEN-DRAIN, REQUIRES PULL-UP




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

SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE: SYSTEM POWER:PMU (3/3)

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DRAWING NUMBER: 051-1902 SIZE: D

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SHEET: 16 OF 59

# TIGRIS CHARGER

APN:343S00033


SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE

SYSTEM POWER:CHARGER

Apple Inc.

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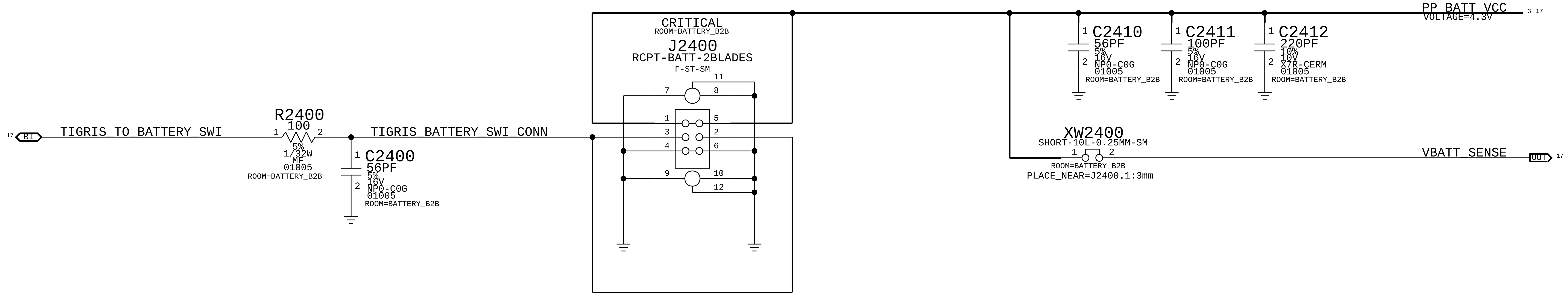
# BATTERY CONNECTOR

THIS ONE ON MLB ---> 516S00104 (RCPT)
516S00105 (PLUG)




SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE
SYSTEM POWER:BATTERY CONN

Apple Inc.

DRAWING NUMBER 051-1902
SIZE D
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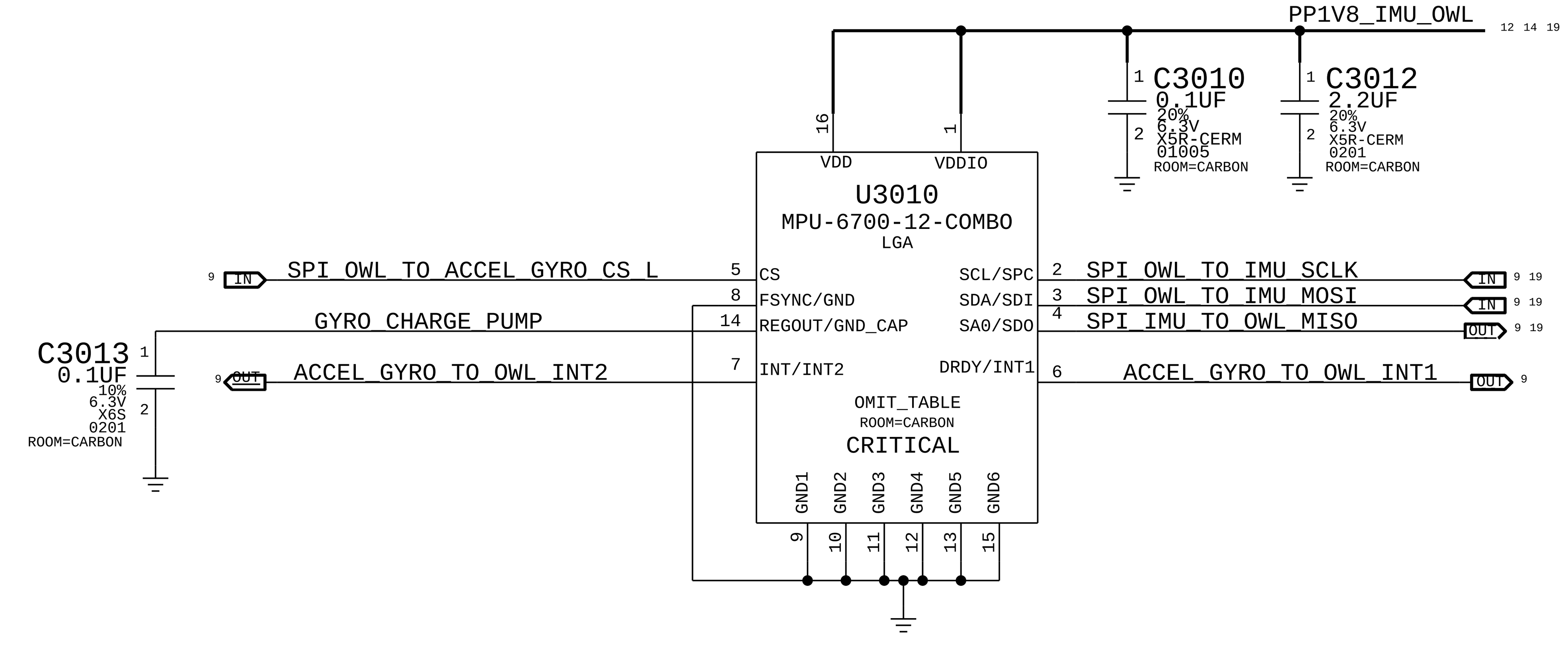
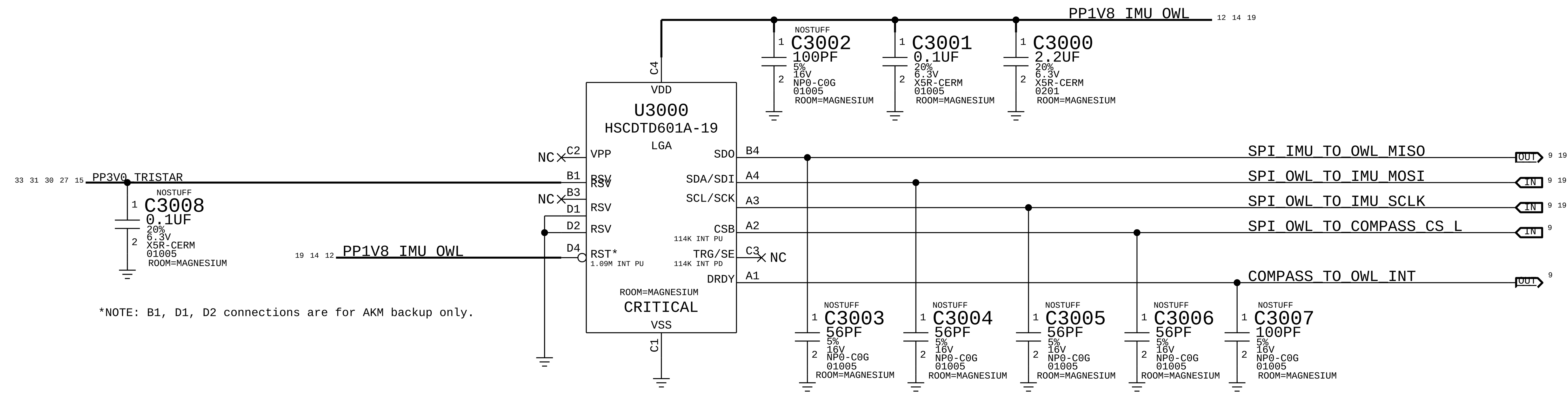
# CARBON - ACCEL & GYRO

INVENSENSE (APN: 338S00017, 338S00087)




# MAGNESIUM - COMPASS

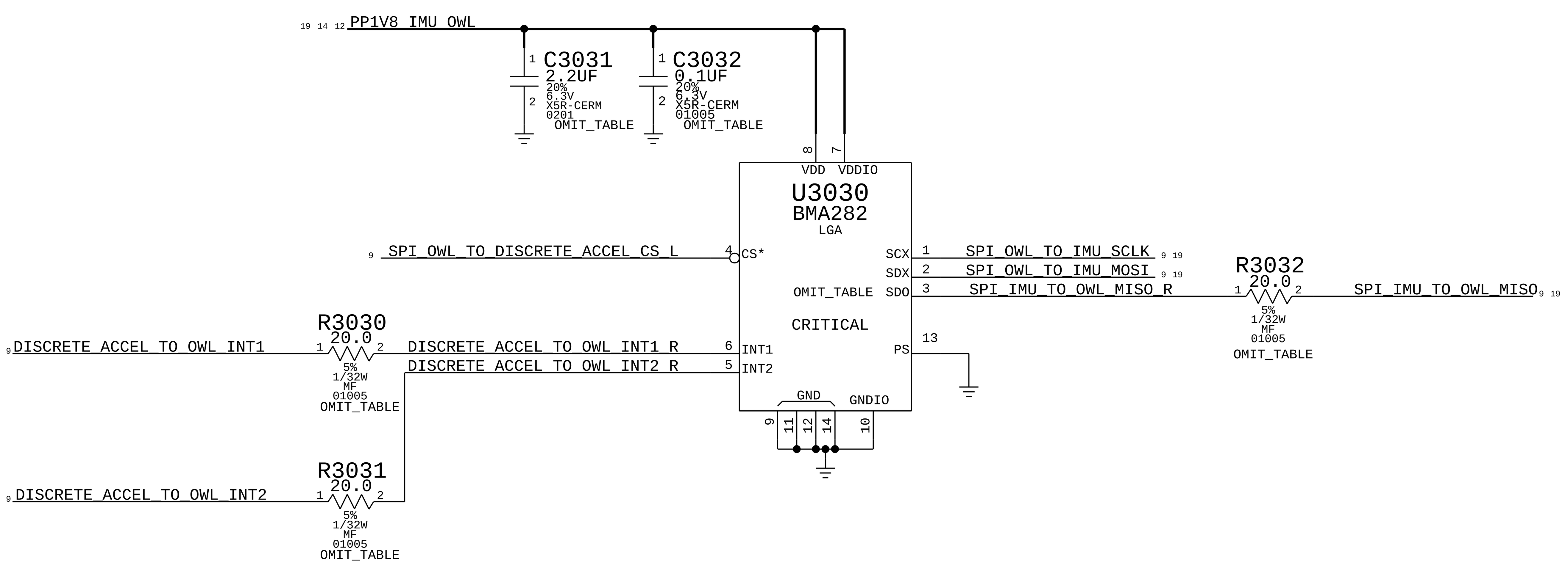
ALPS (APN:338S00084)




*NOTE: B1, D1, D2 connections are for AKM backup only.

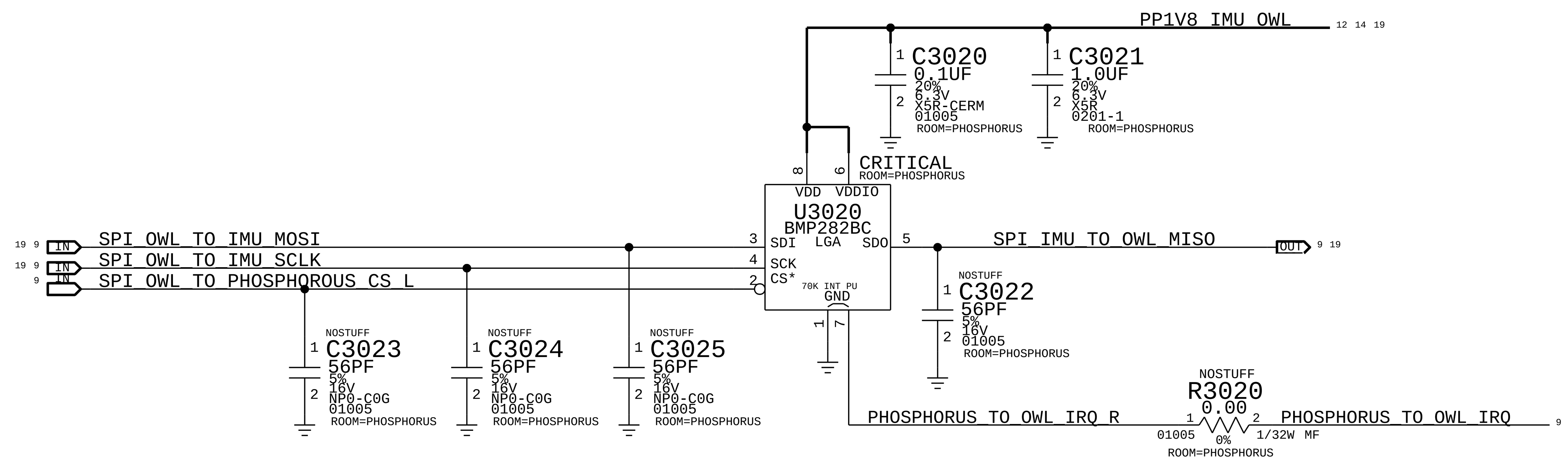
# DISCRETE ACCEL

BOSCH (APN: 338S1163)




# PHOSPHOROUS

BOSCH (APN:338S00044)




R3020 SHOULD BE STUFFED FOR ST PHOSPHORUS ONLY.
FOR BOSCH PHOSPHORUS, PINS 1 AND 7 ARE SHORTED INTERNALLY,
SO NO NEED FOR 0-OHM TO GROUND OPTION ON PIN 7.

SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE
## SENSORS:MOTION SENSORS

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SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE

# CAMERA:FOREHEAD FLEX B2B

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# REAR CAMERA FLEX


SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE: CAMERA:REAR CAMERA B2B

Apple Inc.

DRAWING NUMBER 051-1902 SIZE D

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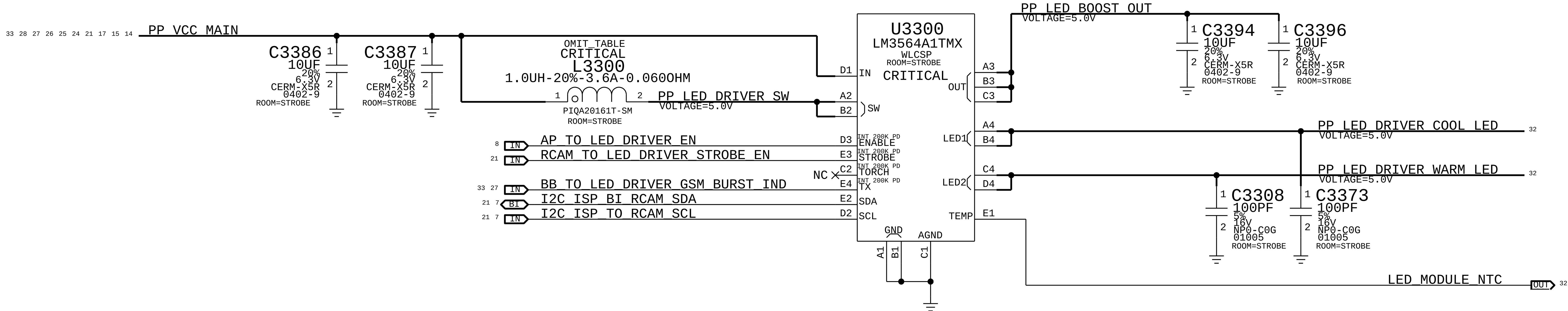
# DUAL LED STROBE DRIVER

APN:353S3899




SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE

## CAMERA:STROBE DRIVER

Apple Inc.

DRAWING NUMBER 051-1902 SIZE D

REVISION A.0.0

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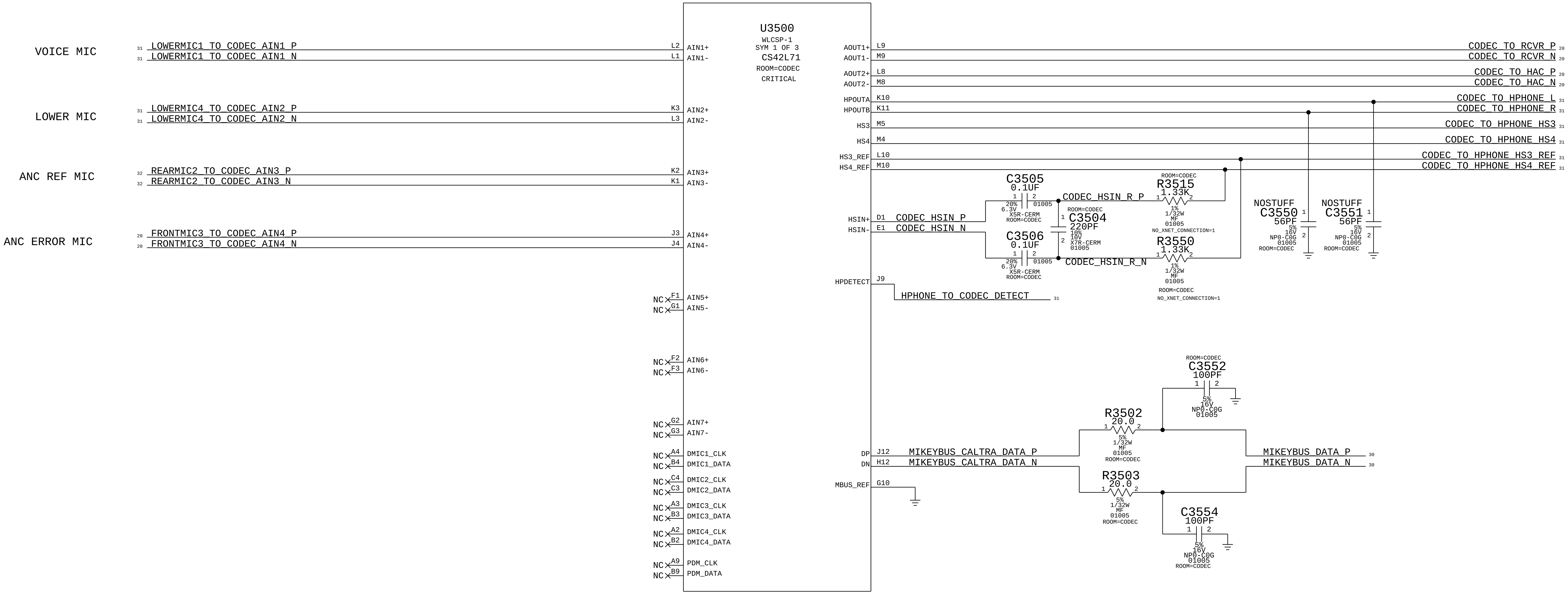
# CALTRA AUDIO CODEC (ANALOG INPUTS & OUTPUTS)




SYNC_MASTER=N71_SINGLE_BRD SYNC_DATE=05/29/2014

PAGE TITLE
AUDIO:CALTRA CODEC (1/2)

Apple Inc.

DRAWING NUMBER 051-1902 SIZE D
REVISION A.0.0
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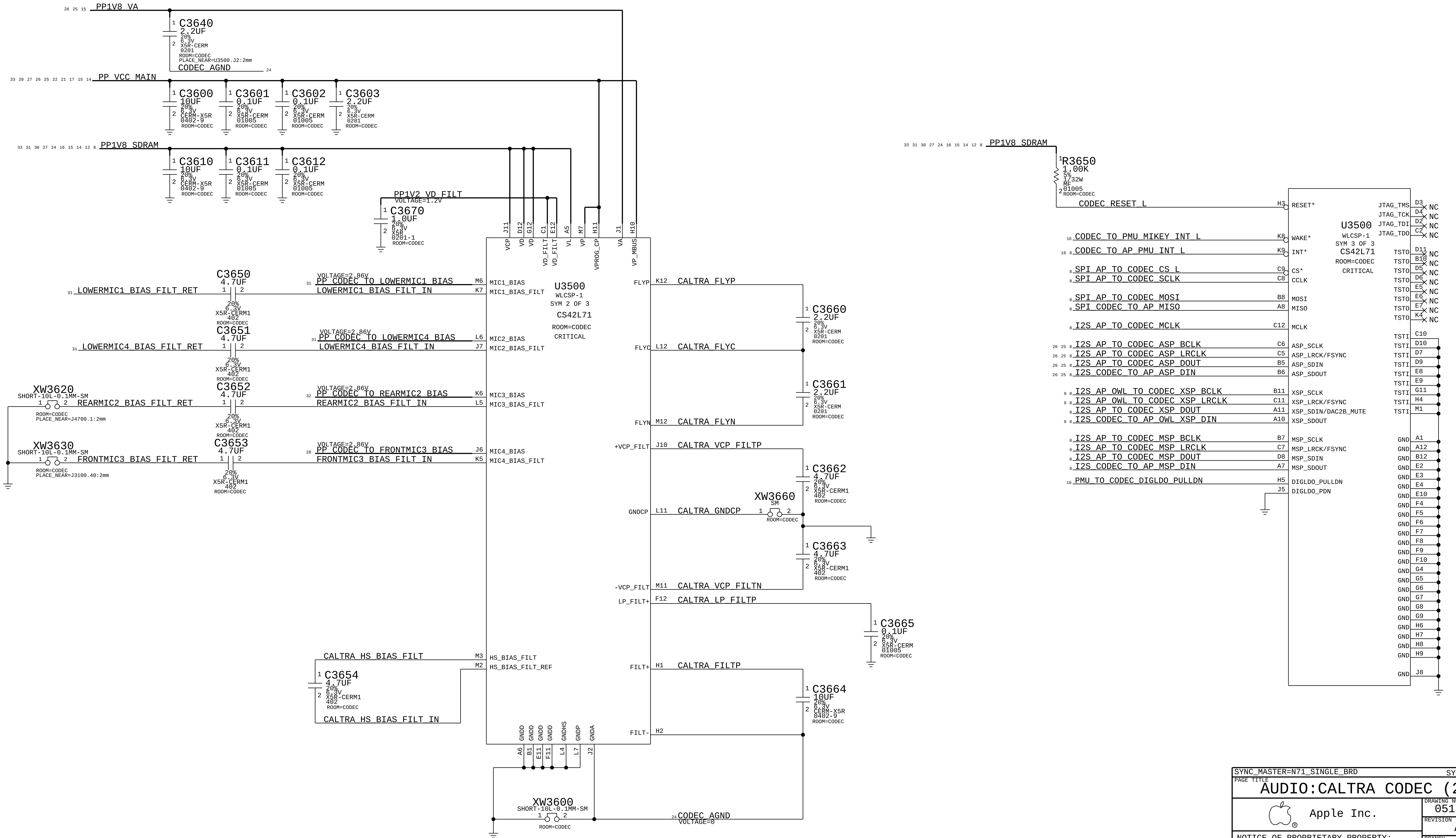
NOTICE OF PROPRIETARY PROPERTY:

# CALTRA AUDIO CODEC (POWER & I/O)




SYNC_MASTER=N71_SINGLE_BRD SYNC_DATE=05/29/2014

PAGE TITLE
AUDIO:CALTRA CODEC (2/2)

DRAWING NUMBER 051-1902 SIZE D

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# SPEAKER AMPLIFIER

APN: 338S1285


SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE: AUDIO:SPEAKER DRIVER

Apple Inc.

DRAWING NUMBER: 051-1902 SIZE: D

REVISION: A.0.0

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NOTICE OF PROPRIETARY PROPERTY:

# ARC DRIVER

APN: 338S1285


PAGE TITLE

## AUDIO:ARC DRIVER

Apple Inc.

| | |
|---|---|
| DRAWING NUMBER | 051-1902 |
| SIZE | D |
| REVISION | A.0.0 |
| BRANCH | |

NOTICE OF PROPRIETARY PROPERTY:

# DISPLAY & TOUCH - POWER SUPPLIES


SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE: DISPLAY:POWER

Apple Inc.

DRAWING NUMBER: 051-1902 SIZE: D

REVISION: A.0.0

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# MAMBA & MESA (M&M) FLEX


SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE: TOUCH:ORB & MESA B2B

Apple Inc.

DRAWING NUMBER: 051-1902 SIZE: D

REVISION: A.0.0

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# DISPLAY & TOUCH FLEX


SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE: DISPLAY:KEPLER B2B

Apple Inc.

DRAWING NUMBER: 051-1902 SIZE: D

REVISION: A.0.0

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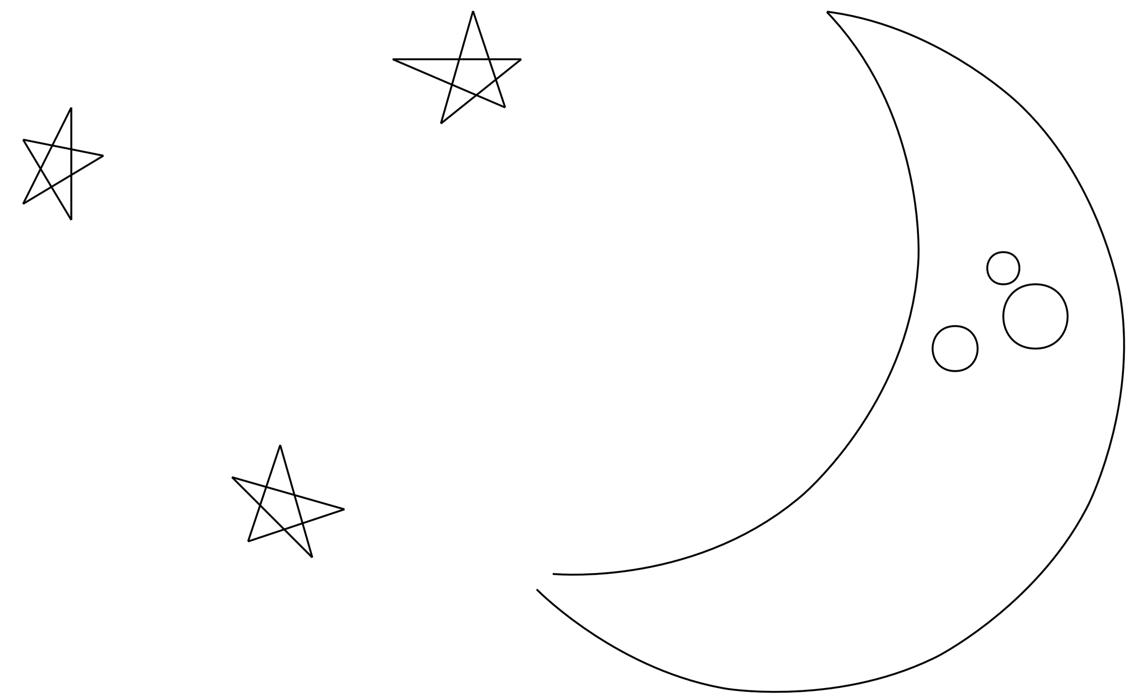
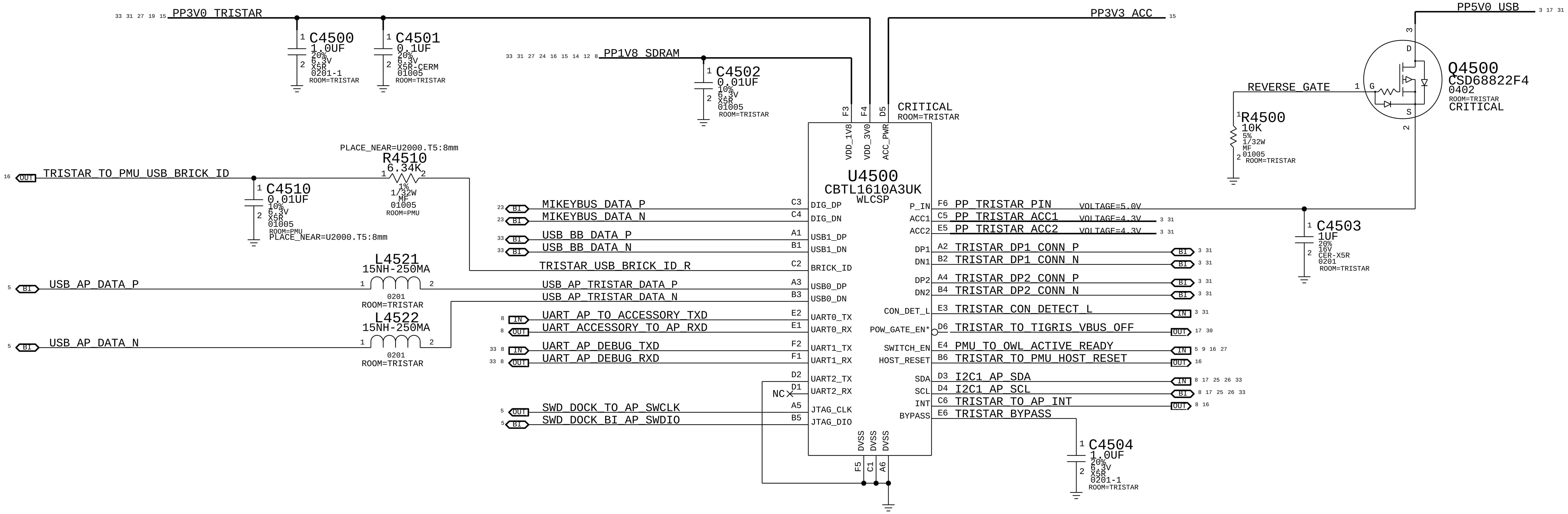
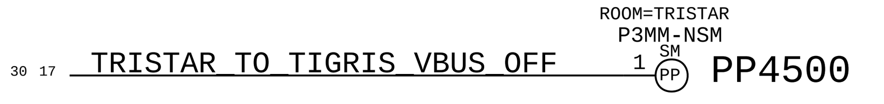


# TRISTAR 2 (A3)

APN:343S0695




SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE

## I/O:TRISTAR 2

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DRAWING NUMBER 051-1902 SIZE D

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PAGE 45 OF 49

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SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE: I/O:DOCK FLEX B2B

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DRAWING NUMBER: 051-1902 SIZE: D

REVISION: A.0.0

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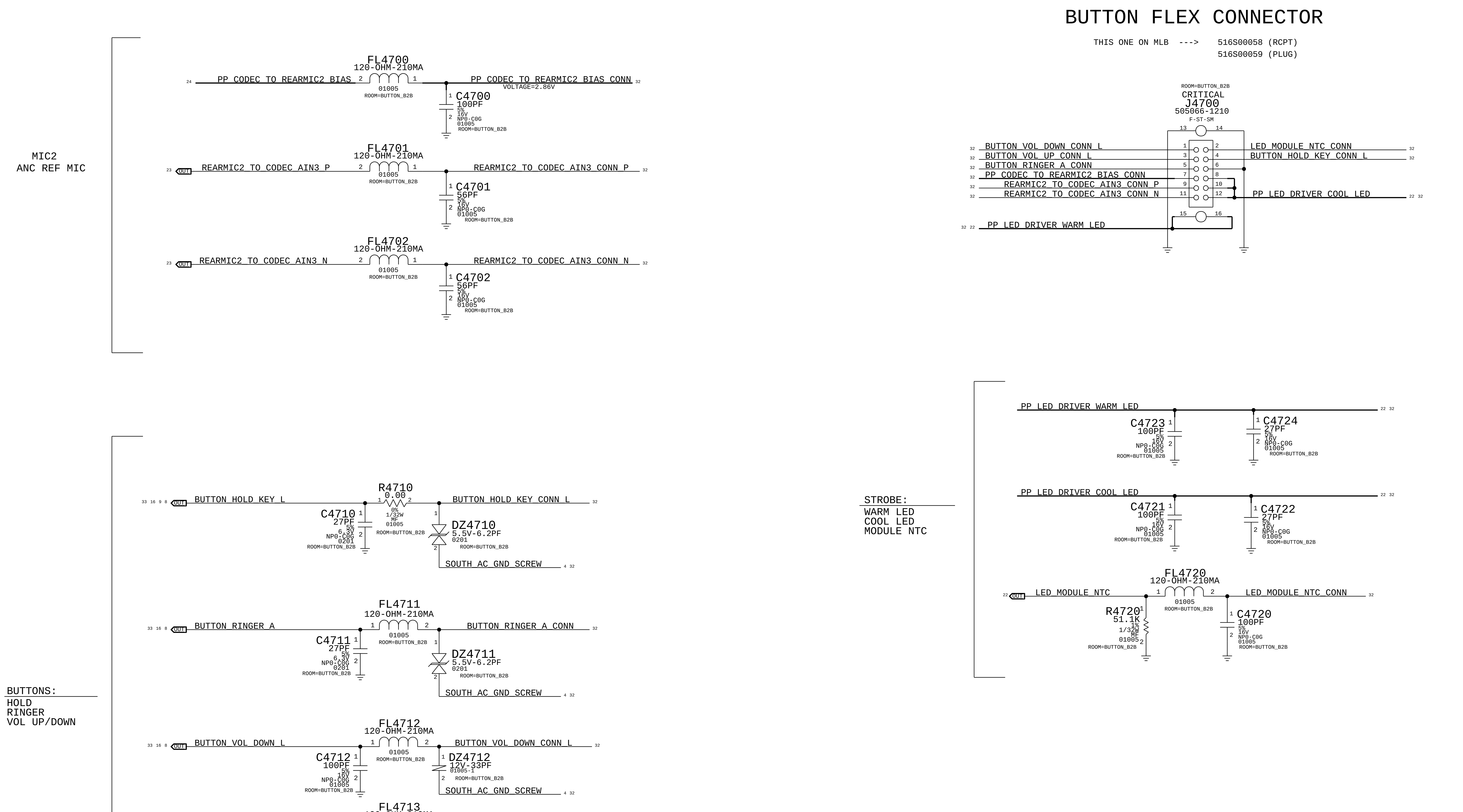
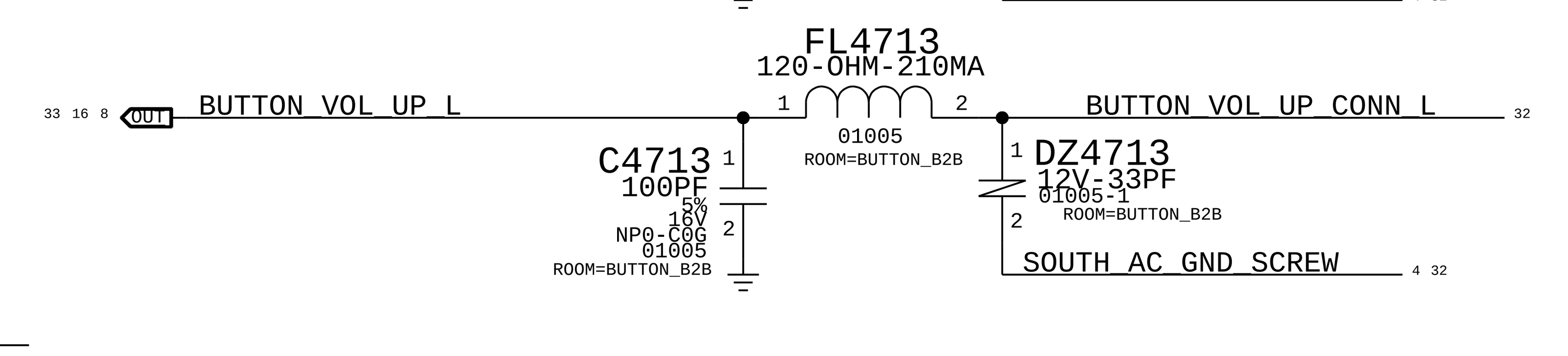
SHEET: 31 OF 59

# BUTTON FLEX




SYNC_MASTER=N/A SYNC_DATE=N/A

PAGE TITLE

## I/O:BUTTON FLEX B2B

Apple Inc.

DRAWING NUMBER 051-1902 SIZE D

REVISION A.0.0

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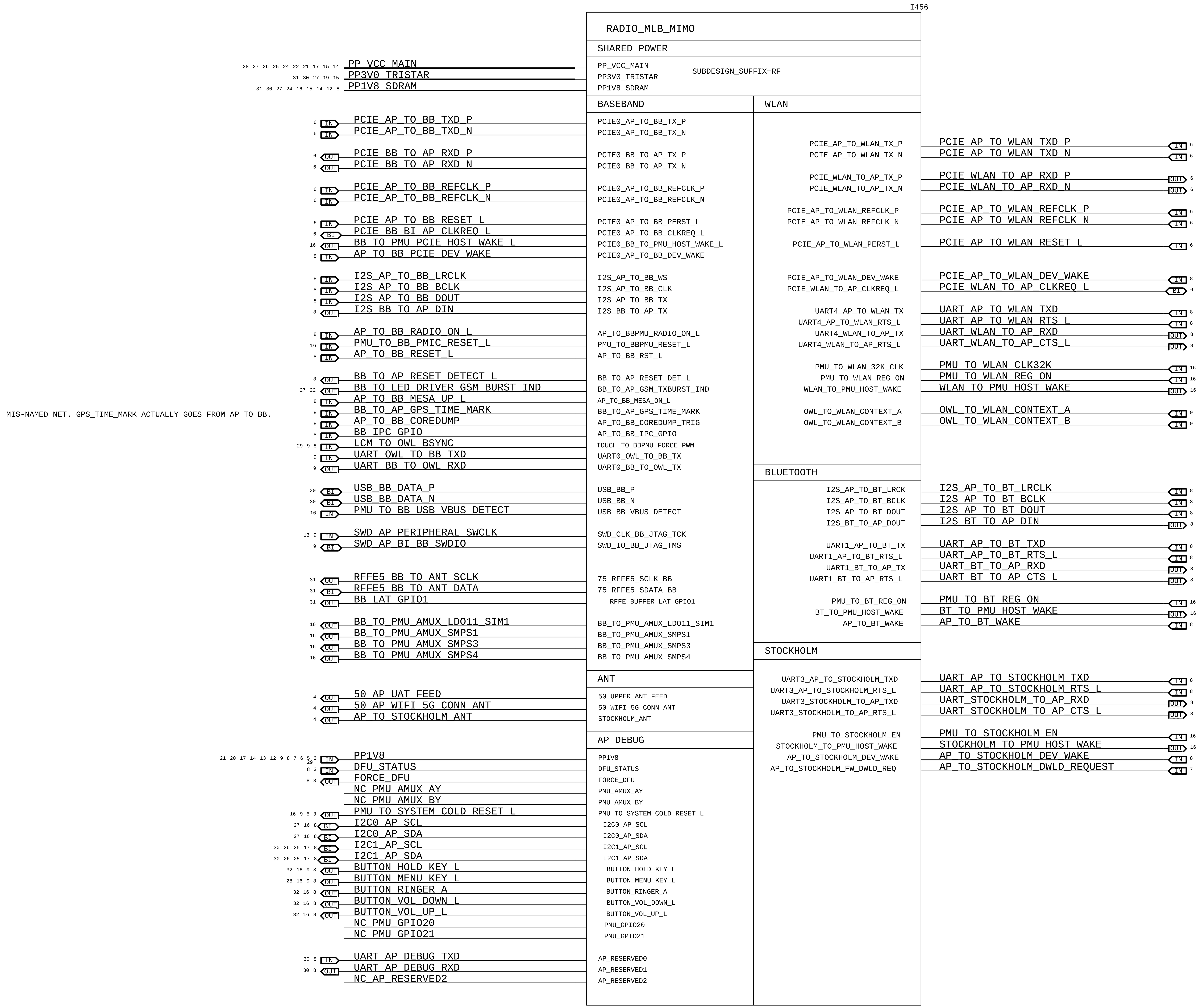
# BASEBAND, WLAN, BT & STOCKHOLM




PAGE TITLE
BASEBAND:RADIO SYMBOL

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DRAWING NUMBER 051-1902
SIZE D
REVISION A.0.0
BRANCH

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|

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

| REV | ECN | DESCRIPTION OF REVISION | CK APPD DATE |
|---|---|---|---|
| A | 0004536627 | PRODUCTION RELEASED | 2015-07-21 |

# N71 RADIO_MLB_MIMO - PVT
# JULY 07, 2015



## ROW/RF2 HB PAD MATCHING BOM OPTIONS

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 152S1907 | 1 | 3.3NH, INDUCTOR | L4105_RF | ROW |
| 152S1990 | 1 | 3.0NH, INDUCTOR | L4105_RF | RF2 |
| 131S0377 | 1 | 1.2PF, CAPACITOR | C4108_RF | RF2 |
| 152S2007 | 1 | 8.2NH, INDUCTOR | L4401_RF | ROW |
| 131S0426 | 1 | 22PF, CAPACITOR | C4405_RF | ROW |
| 152S2001 | 1 | 2.4NH, INDUCTOR | C4405_RF | RF2 |
| 131S0631 | 1 | 0.3PF, CAPACITOR | L4406_RF | RF2 |
| 152S2044 | 1 | 2.2NH, INDUCTOR | C4406_RF | ROW |
| 152S2021 | 1 | 1.5NH, INDUCTOR | C4406_RF | RF2 |
| 131S0631 | 1 | 0.3PF, CAPACITOR | L4407_RF | ROW |
| 152S2056 | 1 | 5.6NH, INDUCTOR | L4403_RF | ROW |
| 131S0429 | 1 | 8.2PF, CAPACITOR | C4407_RF | ROW |
| 152S2036 | 1 | 2.5NH, INDUCTOR | C4407_RF | RF2 |
| 131S0631 | 1 | 0.3PF, CAPACITOR | L4408_RF | RF2 |
| 152S00143 | 1 | 15NH, INDUCTOR | L4404_RF | ROW |
| 131S0823 | 1 | 33PF, CAPACITOR | C4408_RF | ROW |
| 152S2051 | 1 | 1.3NH, INDUCTOR | C4408_RF | RF2 |
| 152S2042 | 1 | 1.8NH, INDUCTOR | C4409_RF | RF2 |
| 117S0108 | 1 | 51 OHM, RESISTOR | L4410_RF | ROW |
| 131S0363 | 1 | 0.6PF, CAPACITOR | L4410_RF | RF2 |
| 152S00052 | 1 | 3.4NH, INDUCTOR | L3910_RF | ROW |
| 152S00026 | 1 | 3.5NH, INDUCTOR | L3910_RF | RF2 |
| 152S2039 | 1 | 3.8NH, INDUCTOR | L3911_RF | ROW |
| 117S0201 | 1 | 0 OHM, RESISTOR | L3911_RF | RF2 |
| 131S0279 | 1 | 1.3PF, CAPACITOR | L3919_RF | ROW |
| 152S2045 | 1 | 3.0NH, INDUCTOR | L3919_RF | RF2 |
| 152S00052 | 1 | 3.4NH, INDUCTOR | L3912_RF | RF2 |
| 131S0599 | 1 | 1.5PF, CAPACITOR | C3922_RF | RF2 |
| 131S0630 | 1 | 27PF, CAPACITOR | C3911_RF | RF2 |

## LB PAD

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 353S00461 | 1 | IC,PWR AMP,LB_PAD,SKWS | ULBPA_RF | ROW |
| 353S00461 | 1 | IC,PWR AMP,LB_PAD,SKWS | ULBPA_RF | RF2 |
| 353S00461 | 1 | IC,PWR AMP,LB_PAD,SKWS | ULBPA_RF | RFC |
| 353S00541 | 1 | IC,PWR AMP,LB_PAD,PT | ULBPA_RF | DARWIN |

## MB PAD

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 353S4495 | 1 | IC,PWR AMP,MB_PAD | UMBPA_RF | ROW |
| 353S4495 | 1 | IC,PWR AMP,MB_PAD | UMBPA_RF | RF2 |
| 353S4495 | 1 | IC,PWR AMP,MB_PAD | UMBPA_RF | RFC |
| 353S00477 | 1 | IC,PWR AMP,MB_PAD, PT | UMBPA_RF | DARWIN |

## RFC HB PAD MATCHING BOM OPTIONS

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 152S1907 | 1 | 3.3NH, INDUCTOR | L4105_RF | RFC |
| 152S2007 | 1 | 8.2NH, INDUCTOR | L4401_RF | RFC |
| 131S0426 | 1 | 22PF, CAPACITOR | C4405_RF | RFC |
| 152S2044 | 1 | 2.2NH, INDUCTOR | C4406_RF | RFC |
| 131S0631 | 1 | 0.3PF, CAPACITOR | L4407_RF | RFC |
| 152S2056 | 1 | 5.6NH, INDUCTOR | L4403_RF | RFC |
| 131S0429 | 1 | 8.2PF, CAPACITOR | C4407_RF | RFC |
| 152S00143 | 1 | 15NH, INDUCTOR | L4404_RF | RFC |
| 131S0823 | 1 | 33PF, CAPACITOR | C4408_RF | RFC |
| 117S0108 | 1 | 51 OHM, RESISTOR | L4410_RF | RFC |
| 152S00052 | 1 | 3.4NH, INDUCTOR | L3910_RF | RFC |
| 152S2039 | 1 | 3.8NH, INDUCTOR | L3911_RF | RFC |
| 131S0279 | 1 | 1.3PF, CAPACITOR | L3919_RF | RFC |

## DARWIN HB PAD MATCHING BOM OPTIONS

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 152S1907 | 1 | 3.3NH, INDUCTOR | L4105_RF | DARWIN |
| 152S2007 | 1 | 8.2NH, INDUCTOR | L4401_RF | DARWIN |
| 131S0426 | 1 | 22PF, CAPACITOR | C4405_RF | DARWIN |
| 152S2044 | 1 | 2.2NH, INDUCTOR | C4406_RF | DARWIN |
| 131S0631 | 1 | 0.3PF, CAPACITOR | L4407_RF | DARWIN |
| 152S2056 | 1 | 5.6NH, INDUCTOR | L4403_RF | DARWIN |
| 131S0429 | 1 | 8.2PF, CAPACITOR | C4407_RF | DARWIN |
| 152S00143 | 1 | 15NH, INDUCTOR | L4404_RF | DARWIN |
| 131S0823 | 1 | 33PF, CAPACITOR | C4408_RF | DARWIN |
| 117S0108 | 1 | 51 OHM, RESISTOR | L4410_RF | DARWIN |
| 152S00052 | 1 | 3.4NH, INDUCTOR | L3910_RF | DARWIN |
| 152S2039 | 1 | 3.8NH, INDUCTOR | L3911_RF | DARWIN |
| 131S0279 | 1 | 1.3PF, CAPACITOR | L3919_RF | DARWIN |

## LAT DIPLEXER1

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 155S0971 | 1 | LAT CELL DIPLEXER1,TDK | FLDIP_RF | ROW |
| 155S0971 | 1 | LAT CELL DIPLEXER1,TDK | FLDIP_RF | RF2 |
| 155S0971 | 1 | LAT CELL DIPLEXER1,TDK | FLDIP_RF | RFC |
| 155S0971 | 1 | LAT CELL DIPLEXER1,TDK | FLDIP_RF | DARWIN |

## HB PAD

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 353S00376 | 1 | IC,PWR AMP,HB_PAD,TQS | UHBPA_RF | ROW |
| 353S4494 | 1 | IC,PWR AMP,HB_PAD,AVAGO | UHBPA_RF | RF2 |
| 353S00376 | 1 | IC,PWR AMP,HB_PAD,TQS | UHBPA_RF | RFC |
| 353S00478 | 1 | IC,PWR AMP,HB_PAD,PT | UHBPA_RF | DARWIN |

## 19.2MHZ XTAL ALTERNATE

| PART NUMBER | ALTERNATE FOR PART NUMBER | BOM OPTION | REF DES | COMMENTS: |
|---|---|---|---|---|
| 197S0565 | 197S0593 | ALTERNATE | Y_XO_RF | XTAL, 19.2MHZ |
| 197S0598 | 197S0593 | ALTERNATE | Y_XO_RF | XTAL, 19.2MHZ |

## VINYL

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 337S00176 | 1 | IC, VINYL | U5101_RF | ROW |
| 337S00176 | 1 | IC, VINYL | U5101_RF | RF2 |

## VINYL RESISTOR

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 117S0161 | 1 | 0 OHM, RESISTOR | R3402_RF | RFC |
| 117S0161 | 1 | 0 OHM, RESISTOR | R3402_RF | DARWIN |

## HW_REV1_ID RESISTOR

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|---|---|---|---|---|
| 118S0646 | 1 | 51.1 KOHM, RESISTOR | R3503_RF | DARWIN |

## SIM ESD DIODE ALTERNATE

| PART NUMBER | ALTERNATE FOR PART NUMBER | BOM OPTION | REF DES | COMMENTS: |
|---|---|---|---|---|
| 377S00042 | 377S0163 | ALTERNATE | VR301_RF | ON SEMI ESD DIODE |

?



DRAWING TITLE: SCHEM,SINGLE,BRD,N71

Apple Inc.

DRAWING NUMBER: 051-1902 SIZE: D

REVISION: A.0.0

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# N71-SPECIFIC RADIO PAGE 2

## DIVERSITY LNA

## WIFI ANT FEED

## UAT ANT FEED


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| | |
|---|---|
| PAGE TITLE | ELNA & UAT ANT FEED |
| Apple Inc. | DRAWING NUMBER 051-1902 SIZE D |
| | REVISION A.0.0 |
| | BRANCH |
| | PAGE 2 OF 51 |
| | SHEET 35 OF 59 |

# N71-SPECIFIC RADIO PAGE 3

## ANTENNA FEEDS AND CONNECTORS

## UAT TUNER

## SIM CARD CONNECTOR

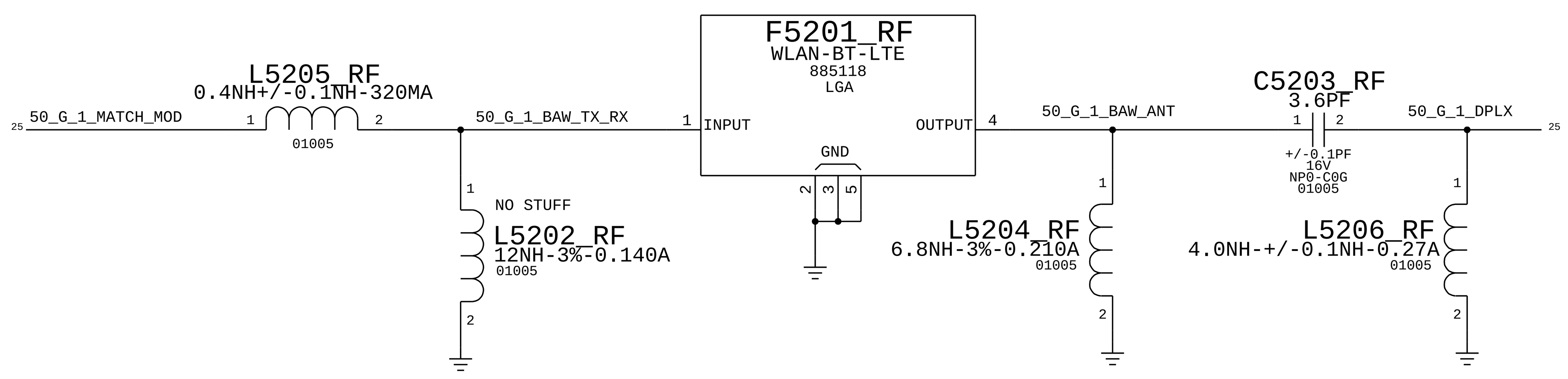
## SIM CARD ESD PROTECTION


| | |
|---|---|
| PAGE TITLE | FE: ANT CONNECTORS AND UAT TUNER |
| DRAWING NUMBER | 051-1902 |
| SIZE | D |
| REVISION | A.0.0 |
| BRANCH | |
| PAGE | 3 OF 51 |
| SHEET | 36 OF 59 |

Apple Inc.

# N71-SPECIFIC RADIO PAGE 4

## WLAN LAT 2.4GHZ BAW BPF




| | |
|---|---|
| PAGE TITLE | WLAN LAT 2.4GHZ BAW BPF |
| Apple Inc. | DRAWING NUMBER 051-1902 SIZE D |
| | REVISION A.0.0 |
| NOTICE OF PROPRIETARY PROPERTY: | BRANCH |
| | PAGE 4 OF 51 |
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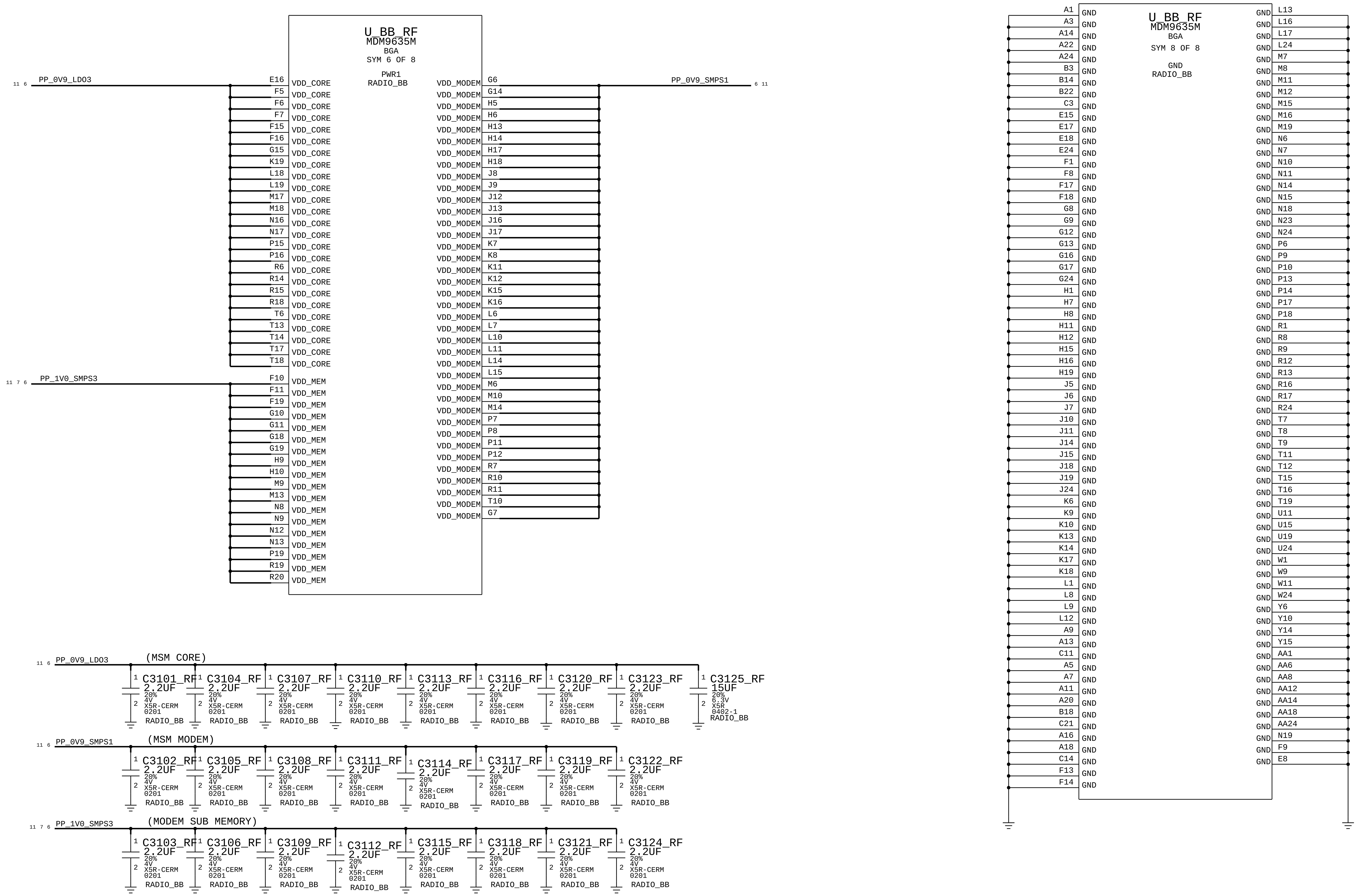
PAGE TITLE
DEBUG CONN & TEST POINTS

Apple Inc.

DRAWING NUMBER 051-1902 SIZE D
REVISION A.0.0
BRANCH
PAGE 30 OF 51
SHEET 38 OF 59

# BASEBAND: POWER 1

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PAGE TITLE
CELLULAR BASEBAND: POWER1

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DRAWING NUMBER 051-1902 SIZE D

REVISION A.0.0

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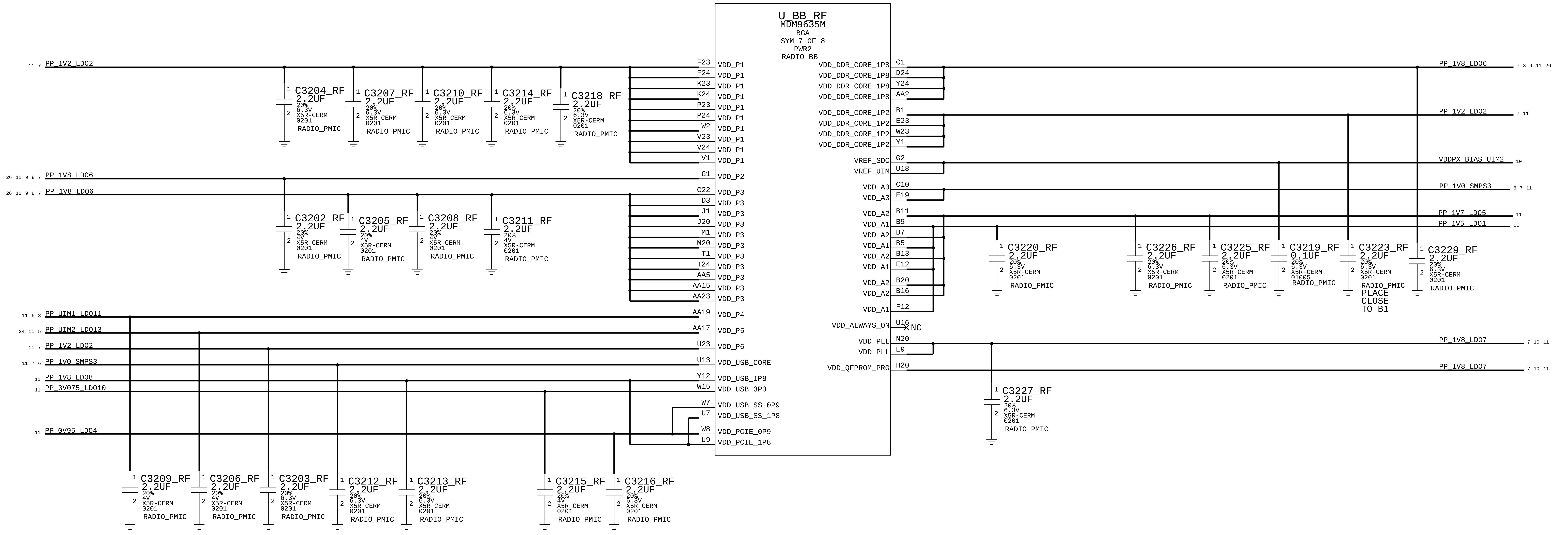
# BASEBAND: POWER 2






PAGE TITLE
CELLULAR BASEBAND: POWER2

Apple Inc.

DRAWING NUMBER 051-1902 SIZE D
REVISION A.0.0
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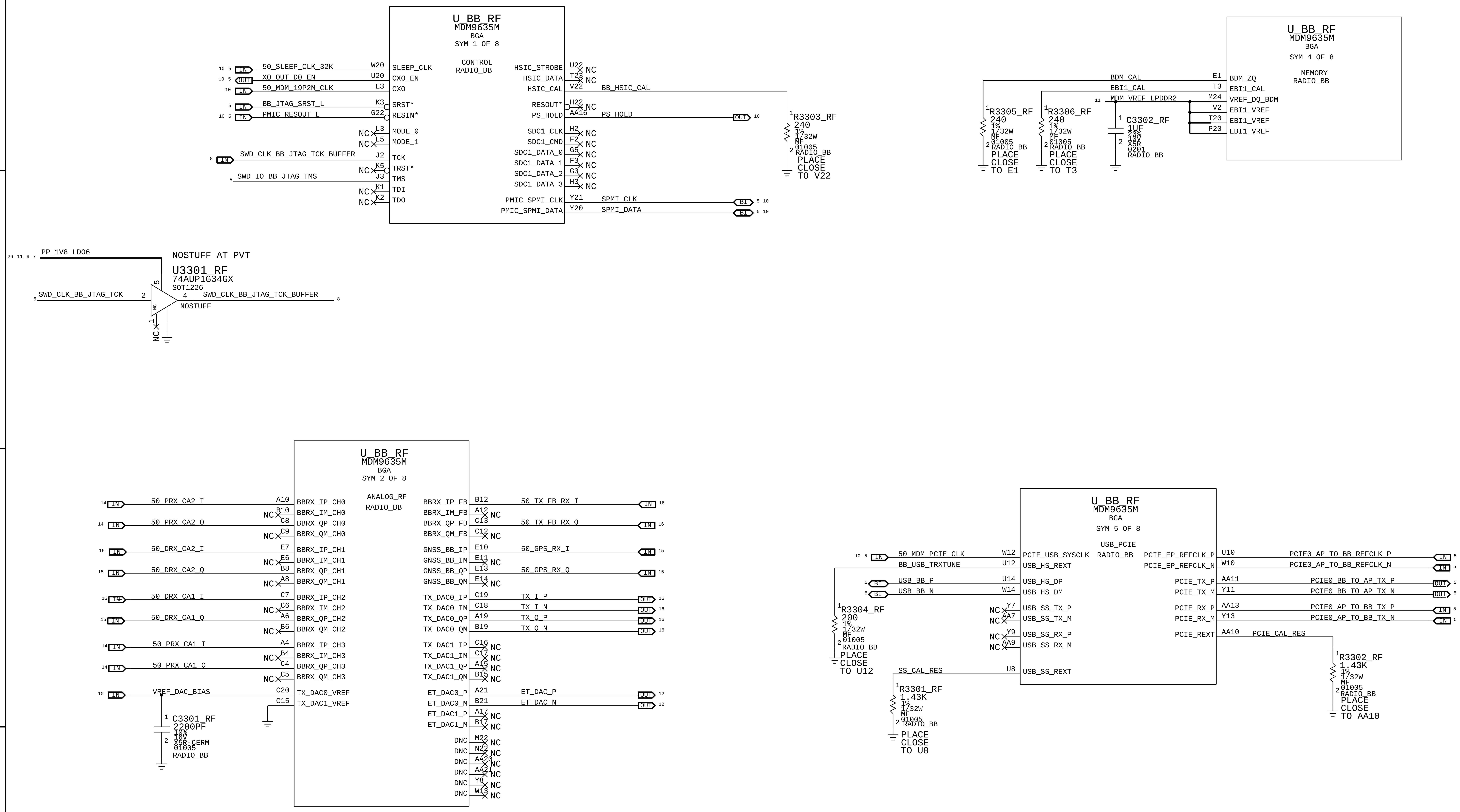
# BASEBAND: CONTROL AND INTERFACES

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PAGE TITLE
CELLULAR BASEBAND: CONTROL AND INTERFACES

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# BASEBAND: GPIOS


PCIE PULL-UPS TO BB RAIL

# RFFE USAGE TABLE

RFFE1 WTR

RFFE2 LB/MB/HB PAD, 2G PA, LB/MB/HB ASM

RFFE3 DIV ASM

RFFE4 QPOET

RFFE5 DIV LNA, ANT TUNERS

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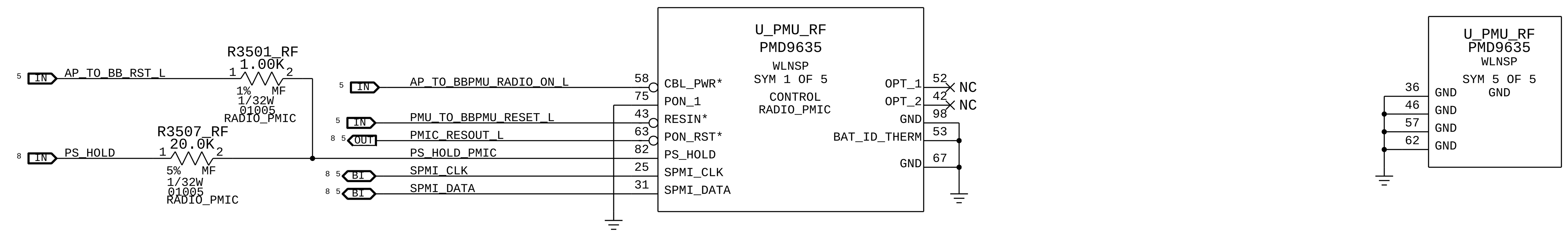
# PMU: CONTROL AND CLOCKS

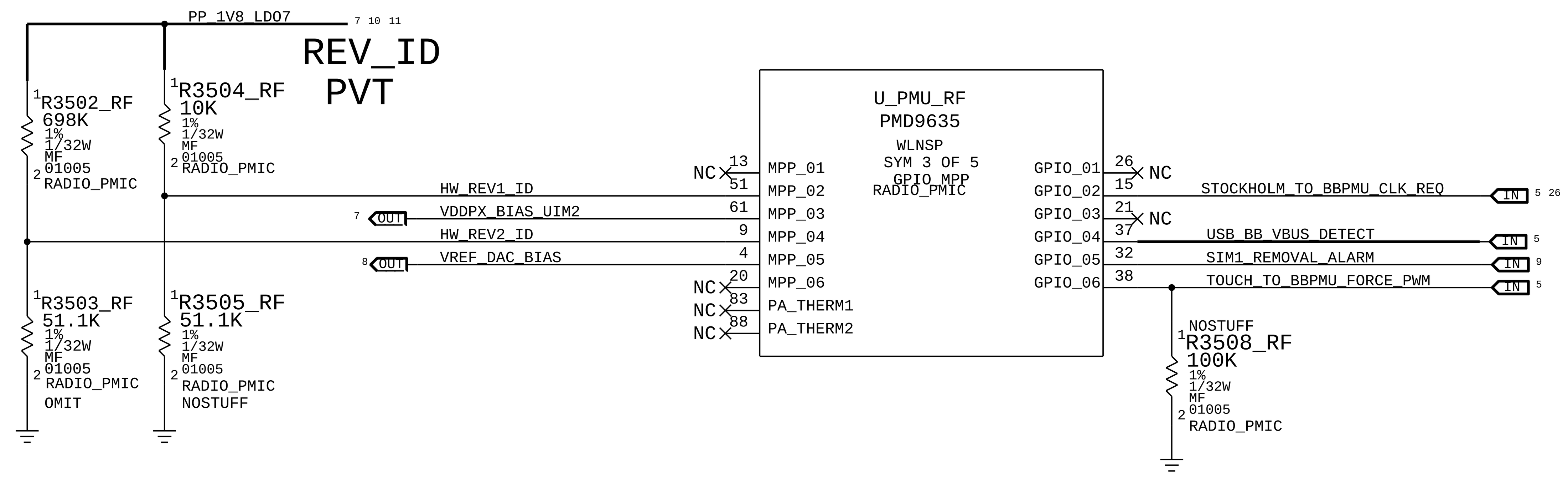
| HW_REV2_ID | R3502 | R3503 | CONFIG |
|---|---|---|---|
| 1.80V | 698K | - | MLB |
| 0.12V | 698K | 51.1K | SELF GEN |

| HW_REV_ID | R3504 | R3505 | REVISION |
|---|---|---|---|
| 0.10V | 887K | 51.1K | DEV1 |
| 0.30V | 255K | 51.1K | DEV2 |
| 0.50V | 124K | 51.1K | DEV3 |
| 0.70V | 82.5K | 51.1K | DEV4/PROTOMLB1 |
| 0.90V | 51.1K | 51.1K | PROTOMLB2 |
| 1.10V | 31.6K | 51.1K | DEV5/PROTO1 |
| 1.20V | 50K | 100K | PROTO2 |
| 1.31V | 39K | 105K | EVT |
| 1.43V | 13.3K | 51.1K | EVT_ALT |
| 1.55V | 8.25K | 51.1K | CARRIER BUILD |
| 1.67V | 3.92K | 51.1K | DVT |
| 1.80V | 10K | - | PVT |

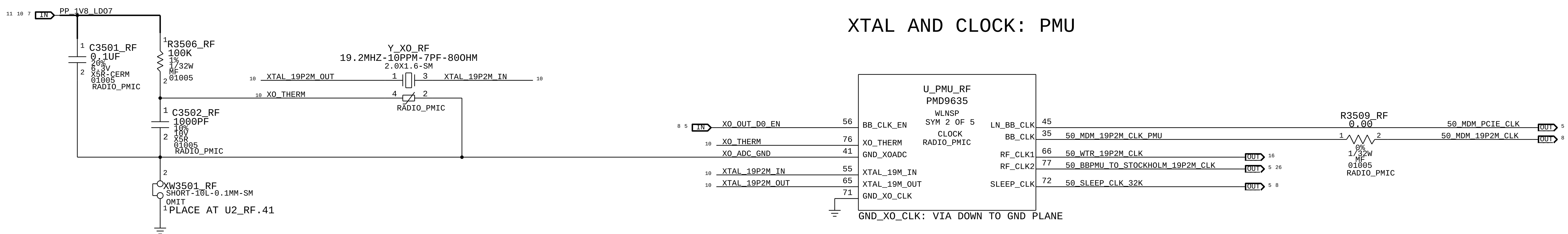
## RESET AND CONTROL: PMU




## MPPS AND GPIOS: PMU




## XTAL AND CLOCK: PMU

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# PMU: SWITCHERS AND LDOS

## SWITCHERS BULK CAPS




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CELLULAR PMU: SWITCHERS AND LDOS

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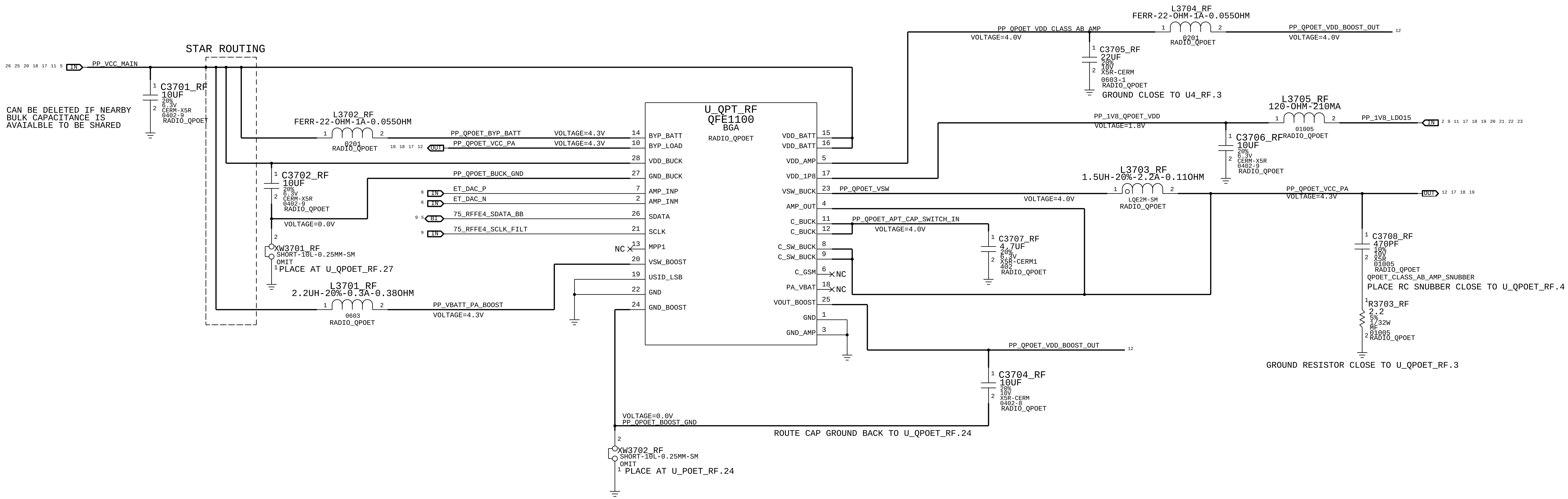
# PMU: ET MODULATOR

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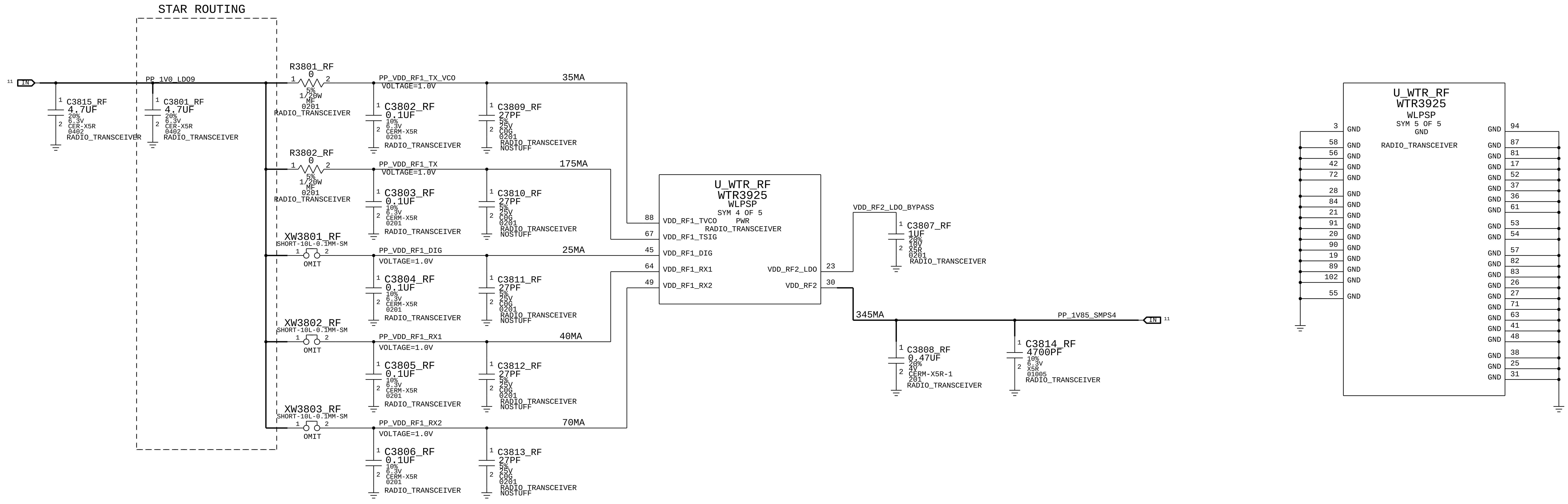
# TRANSCEIVER: POWER

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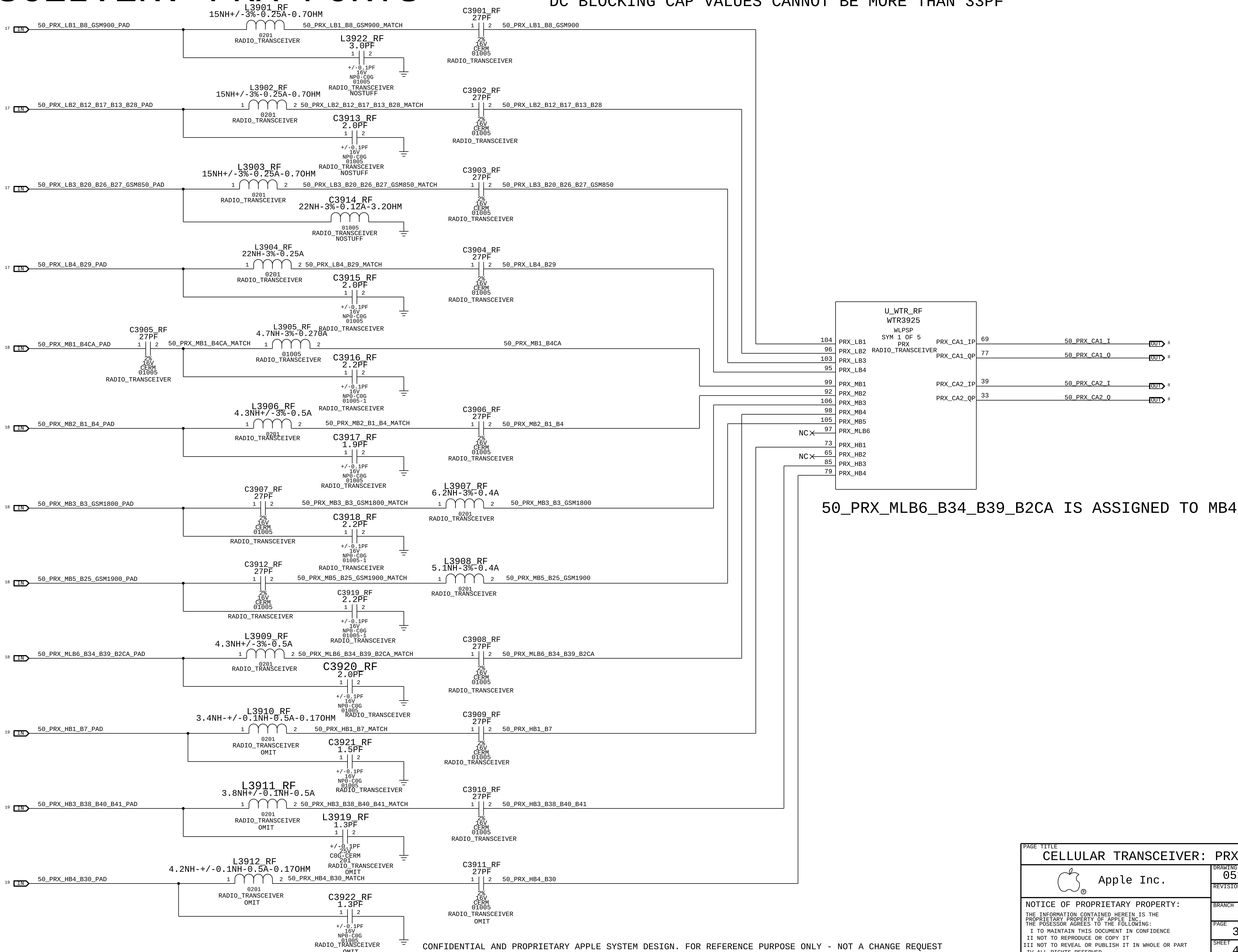
# TRANSCEIVER: PRX PORTS

DC BLOCKING CAP VALUES CANNOT BE MORE THAN 33PF




50_PRX_MLB6_B34_B39_B2CA IS ASSIGNED TO MB4

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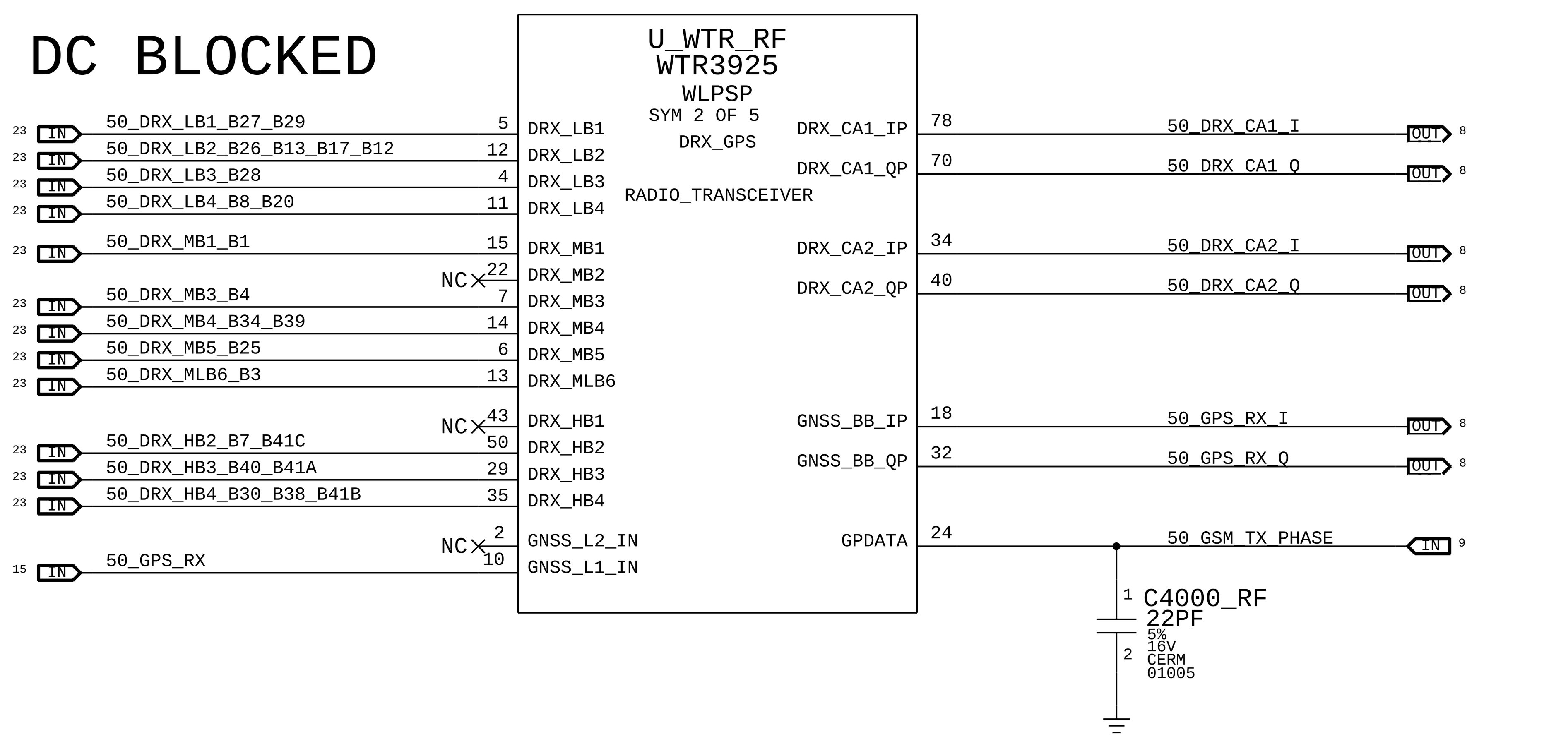
# TRANSCEIVER: DRX/GPS PORTS

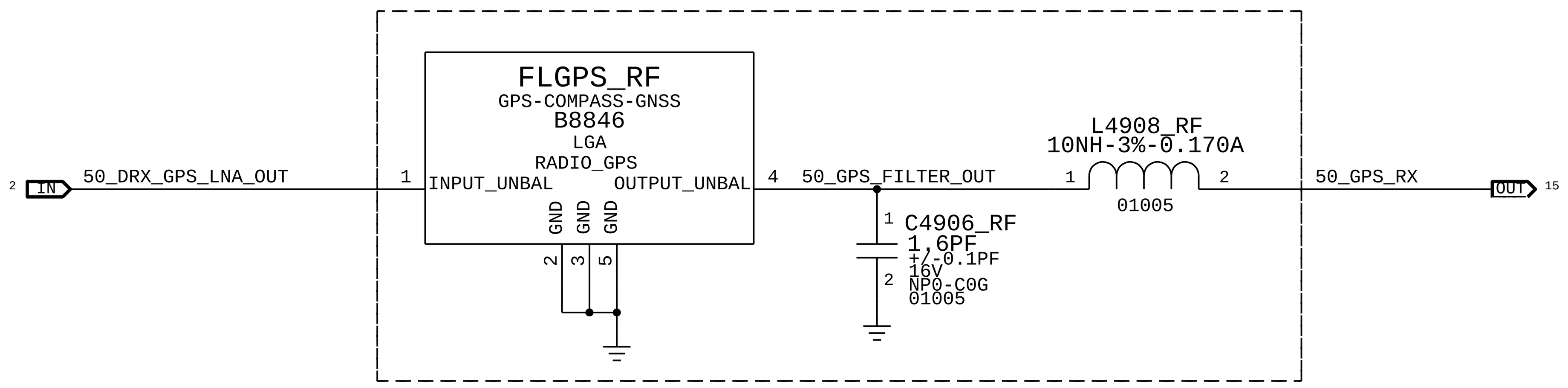
## DRX MODULE PORTS ARE DC BLOCKED




PLACE CAP CLOSE TO MDM GPIO14
IMPROVES RXBN BY 4DB

## GPS FILTER

PLACE NEAR U_WTR

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# TRANSCEIVER: TX PORTS


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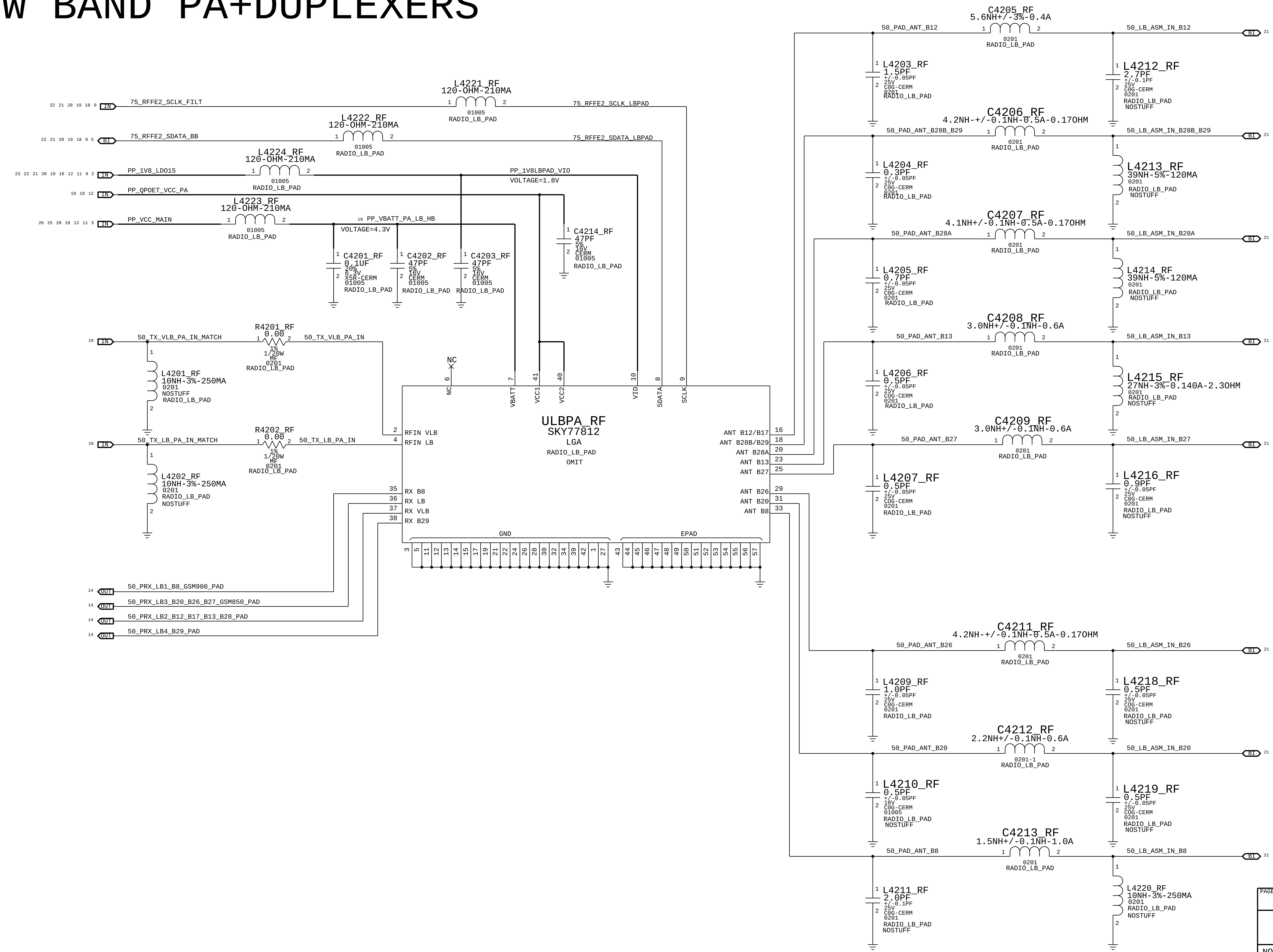
# LOW BAND PA+DUPLEXERS

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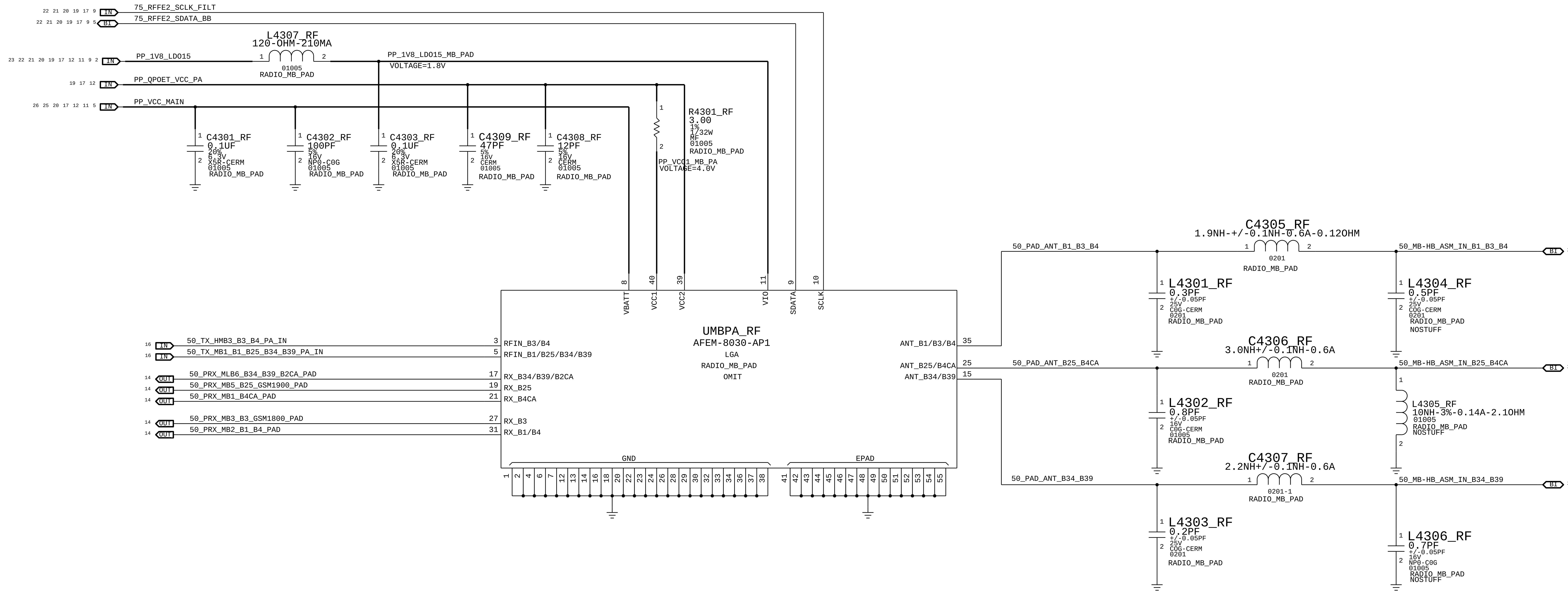
# MID BAND PA+DUPLEXERS

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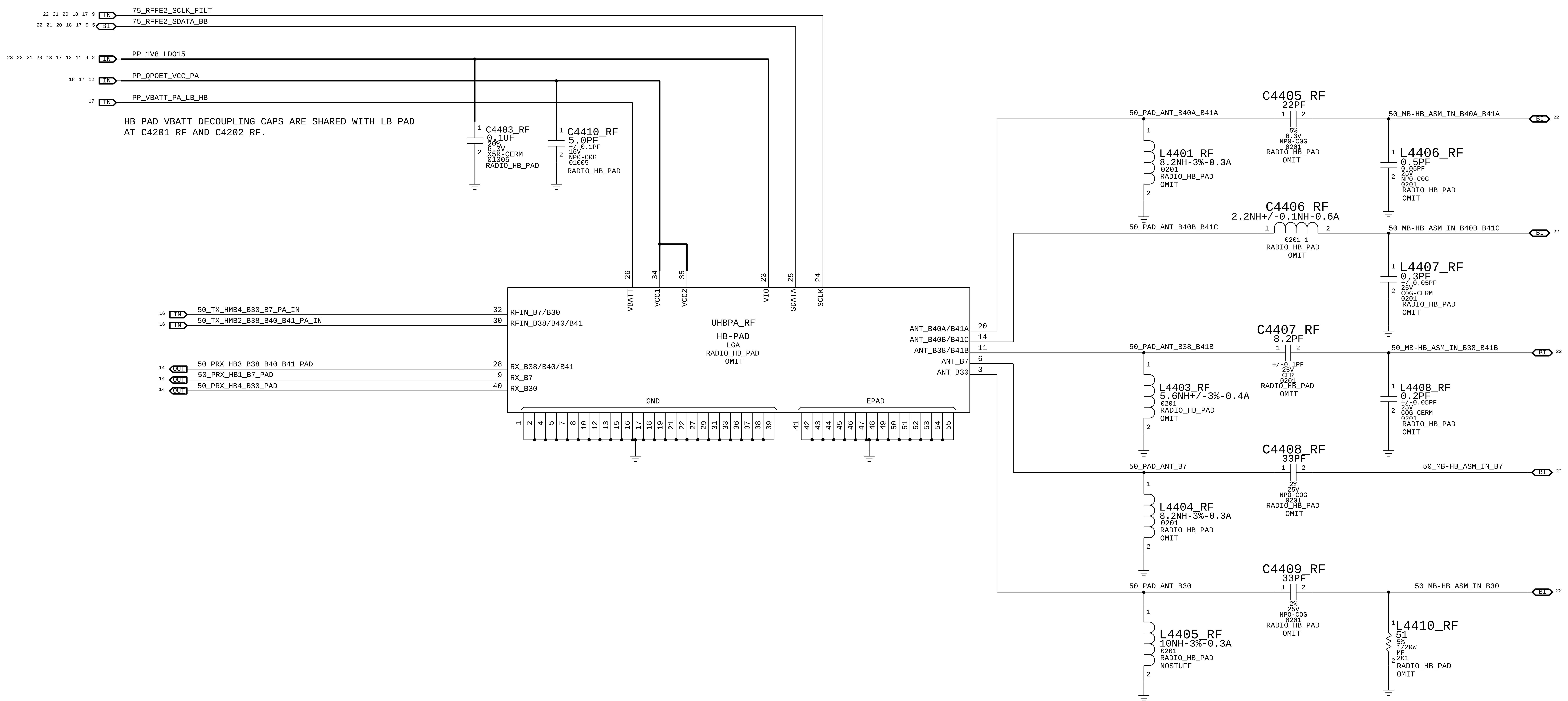
# HIGH BAND PA+DUPLEXERS

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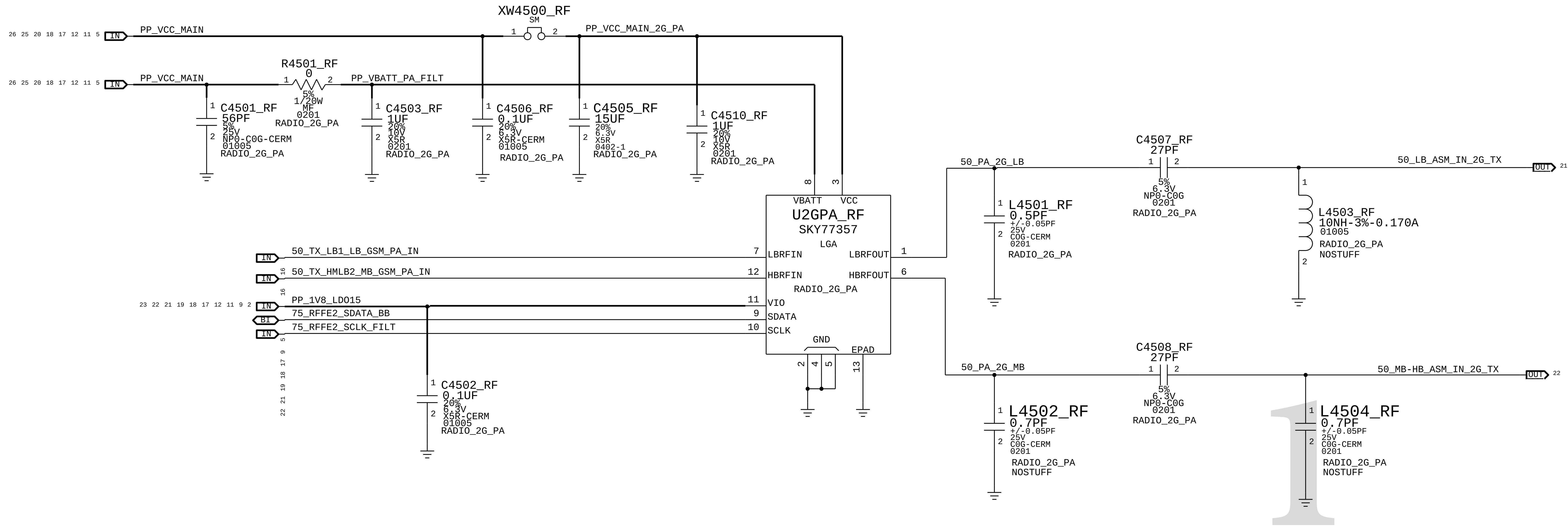
# 2G PA

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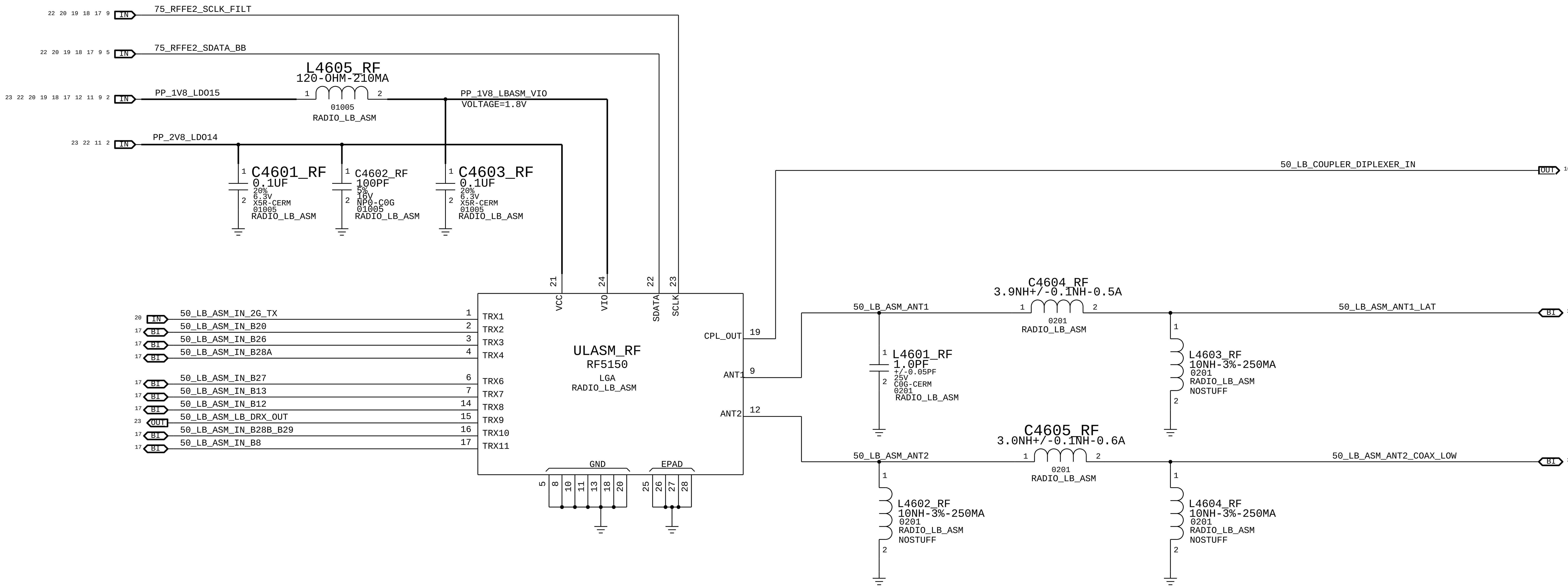
# LOW BAND ANTENNA SWITCH MODULE



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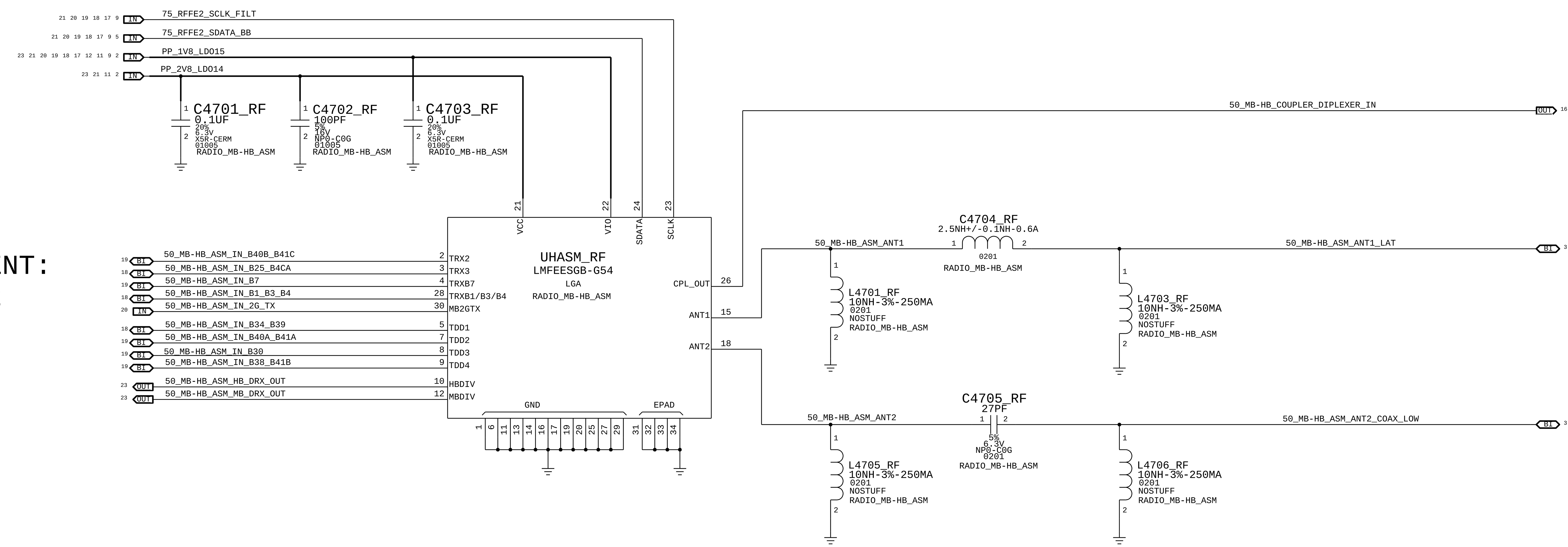
# MID-HIGH BAND ANTENNA SWITCH MODULE

EVT ASM ASSIGNMENT:
B40B/B41C - TRX2
B30 - TDD3

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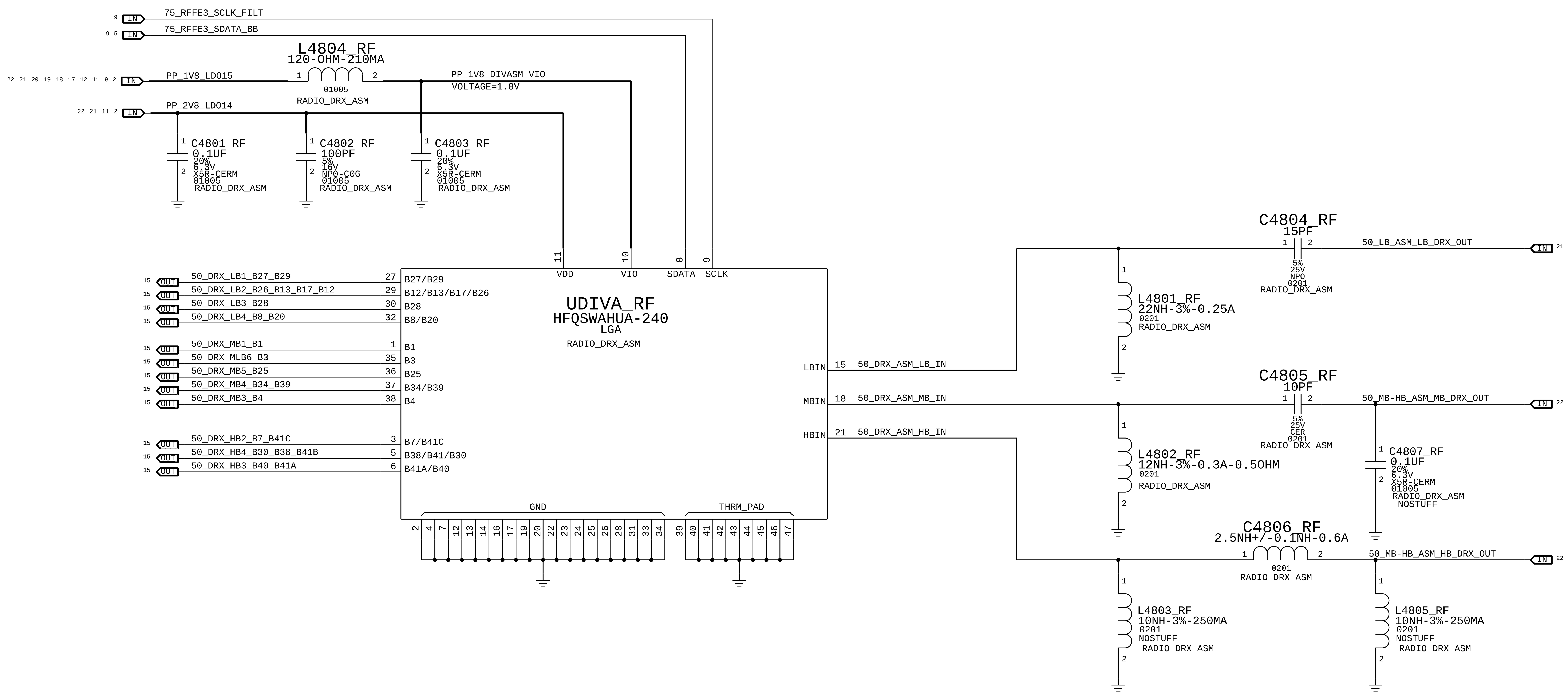
# DIVERSITY MODULE

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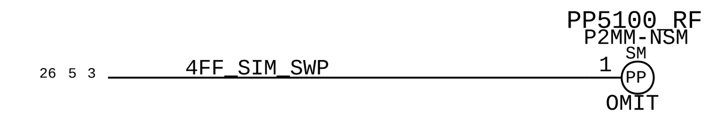
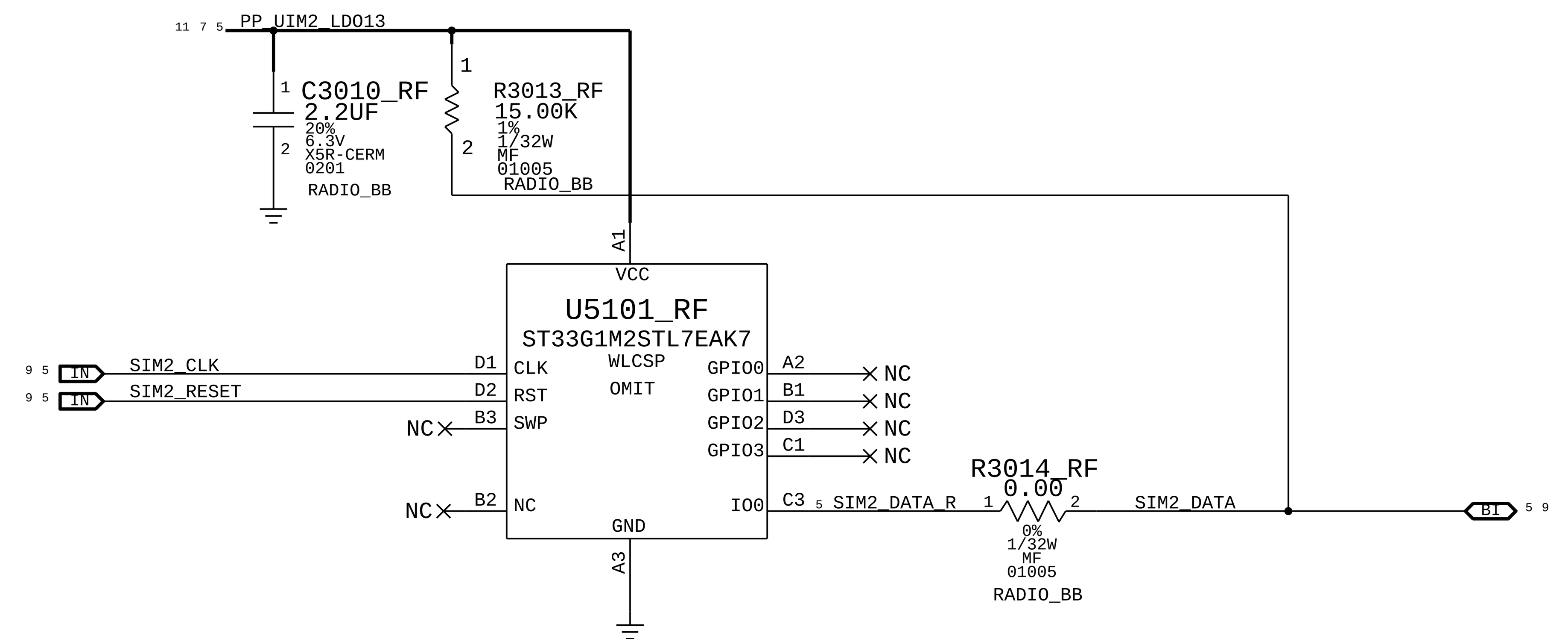
# SIM

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# WIFI/BT


| PART NUMBER | ALTERNATE FOR PART NUMBER | BOM OPTION | REF DES | COMMENTS: |
|---|---|---|---|---|
| 339S00043 | 339S00033 | | U5200_RF | ALT WIFI/BT MODULE |

LAST UPDATED: 4/30/2014

SYNC_MASTER=WIFI
SYNC_DATE=01/30/2014

PAGE TITLE
WIFI/BT: WIFI/BT MODULE

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ALL NETNAMES NEED TO BE CHECKED


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