

PROFESSIONAL DIGITAL TWO-WAY RADIO SYSTEM



# MOTOTRBO™ PORTABLE

XPR 7550e

XPR 7580e

XPR 7350e

XPR 7380e

# DETAILED SERVICE MANUAL

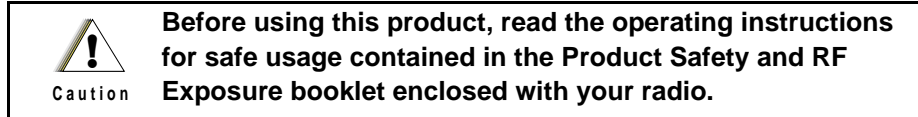




# Foreword

This manual covers all models of the XPR™ Series Portable Radios, unless otherwise specified. It includes all the information necessary to maintain peak product performance and maximum working time, using levels 1 and 2 maintenance procedures. This level of service goes down to the board replacement level and is typical of some local service centers, self-maintained customers, and distributors.

## Product Safety and RF Exposure Compliance



**For a list of Motorola-approved antennas, batteries, and other accessories, visit the following web site: <http://www.motorolasolutions.com>**

**For a list of Motorola TIA 4950 approved radio models, antennas, batteries, and other accessories, please refer to UL Safety manual MN001111A01 enclosed with your radio.**

## TIA 4950

The radio models listed in UL Safety Manual MN001111A01, when properly equip with the battery PMNN4489\_, is certified for use per the classification below:

- Classification Rating Division 1, Class I, Groups C, D; Class II Group E, F, G; Class III. T3C.  
Tamb = -25°C to +60 °C.
- Classification Rating Division 2, Class I, Groups A, B, C, D.



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## Document History

The following major changes have been implemented in this manual since the previous edition:

| Edition        | Description     | Date      |
|----------------|-----------------|-----------|
| MN002182A01-AA | Initial Release | Jan. 2016 |

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# Commercial Warranty

## Limited Warranty

### MOTOROLA COMMUNICATION PRODUCTS

#### I. What This Warranty Covers And For How Long

MOTOROLA INC. ("MOTOROLA") warrants the MOTOROLA manufactured Communication Products listed below ("Product") against defects in material and workmanship under normal use and service for a period of time from the date of purchase as scheduled below:

|  |                 |
|--|-----------------|
| XPR Series Digital Portable Radios                     | Three (3) Years |
| Product Accessories (Excluding Batteries and Chargers) | One (1) Year    |

The portables additionally ship with a standard 1-year Repair Service Advantage (RSA) (for U.S. customers) or 1-year Extended Warranty (for Canada customers). However, at the time of order, you may choose to omit these warranties. For more RSA or Extended Warranty information, please refer to the portable price pages or Motorola Online (<https://businessonline.motorola.com>) > Resource Center > Services > Service Product Offerings > Repair Service Advantage or Extended Warranty.

Motorola, at its option, will at no charge either repair the Product (with new or reconditioned parts), replace it (with a new or reconditioned Product), or refund the purchase price of the Product during the warranty period provided it is returned in accordance with the terms of this warranty. Replaced parts or boards are warranted for the balance of the original applicable warranty period. All replaced parts of Product shall become the property of MOTOROLA.

This express limited warranty is extended by MOTOROLA to the original end user purchaser only and is not assignable or transferable to any other party. This is the complete warranty for the Product manufactured by MOTOROLA. MOTOROLA assumes no obligations or liability for additions or modifications to this warranty unless made in writing and signed by an officer of MOTOROLA. Unless made in a separate agreement between MOTOROLA and the original end user purchaser, MOTOROLA does not warrant the installation, maintenance or service of the Product.

MOTOROLA cannot be responsible in any way for any ancillary equipment not furnished by MOTOROLA which is attached to or used in connection with the Product, or for operation of the Product with any ancillary equipment, and all such equipment is expressly excluded from this warranty. Because each system which may use the Product is unique, MOTOROLA disclaims liability for range, coverage, or operation of the system as a whole under this warranty.

## II. General Provisions

This warranty sets forth the full extent of MOTOROLA'S responsibilities regarding the Product. Repair, replacement or refund of the purchase price, at MOTOROLA's option, is the exclusive remedy. THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHER EXPRESS WARRANTIES. IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO THE DURATION OF THIS LIMITED WARRANTY. IN NO EVENT SHALL MOTOROLA BE LIABLE FOR DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT, FOR ANY LOSS OF USE, LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS, LOST PROFITS OR SAVINGS OR OTHER INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE SUCH PRODUCT, TO THE FULL EXTENT SUCH MAY BE DISCLAIMED BY LAW.

## III. State Law Rights

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION OR EXCLUSIONS MAY NOT APPLY.

This warranty gives specific legal rights, and there may be other rights which may vary from state to state.

## IV. How To Get Warranty Service

You must provide proof of purchase (bearing the date of purchase and Product item serial number) in order to receive warranty service and, also, deliver or send the Product item, transportation and insurance prepaid, to an authorized warranty service location. Warranty service will be provided by Motorola through one of its authorized warranty service locations. If you first contact the company which sold you the Product, it can facilitate your obtaining warranty service. You can also call Motorola at 1-800-927-2744 US/Canada.

## V. What This Warranty Does Not Cover

- A. Defects or damage resulting from use of the Product in other than its normal and customary manner.
- B. Defects or damage from misuse, accident, water, or neglect.
- C. Defects or damage from improper testing, operation, maintenance, installation, alteration, modification, or adjustment.
- D. Breakage or damage to antennas unless caused directly by defects in material workmanship.
- E. A Product subjected to unauthorized Product modifications, disassemblies or repairs (including, without limitation, the addition to the Product of non-Motorola supplied equipment) which adversely affect performance of the Product or interfere with Motorola's normal warranty inspection and testing of the Product to verify any warranty claim.
- F. Product which has had the serial number removed or made illegible.
- G. Rechargeable batteries if:
  - any of the seals on the battery enclosure or cells are broken or show evidence of tampering.
  - the damage or defect is caused by charging or using the battery in equipment or service other than the Product for which it is specified.
- H. Freight costs to the repair depot.

- I. A Product which, due to illegal or unauthorized alteration of the software/firmware in the Product, does not function in accordance with MOTOROLA's published specifications or the FCC type acceptance labeling in effect for the Product at the time the Product was initially distributed from MOTOROLA.
- J. Scratches or other cosmetic damage to Product surfaces that does not affect the operation of the Product.
- K. Normal and customary wear and tear.

## VI. Patent And Software Provisions

MOTOROLA will defend, at its own expense, any suit brought against the end user purchaser to the extent that it is based on a claim that the Product or parts infringe a United States patent, and MOTOROLA will pay those costs and damages finally awarded against the end user purchaser in any such suit which are attributable to any such claim, but such defense and payments are conditioned on the following:

- A. that MOTOROLA will be notified promptly in writing by such purchaser of any notice of such claim;
- B. that MOTOROLA will have sole control of the defense of such suit and all negotiations for its settlement or compromise; and
- C. should the Product or parts become, or in MOTOROLA's opinion be likely to become, the subject of a claim of infringement of a United States patent, that such purchaser will permit MOTOROLA, at its option and expense, either to procure for such purchaser the right to continue using the Product or parts or to replace or modify the same so that it becomes noninfringing or to grant such purchaser a credit for the Product or parts as depreciated and accept its return. The depreciation will be an equal amount per year over the lifetime of the Product or parts as established by MOTOROLA.

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## VII. Governing Law

This Warranty is governed by the laws of the State of Illinois, USA.

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# Battery and Charger Warranty

## Workmanship Warranty

The workmanship warranty guarantees against defects in workmanship under normal use and service.

|   |               |
|---|---------------|
| All MOTOTRBO Batteries                                    | Two (2) Years |
| IMPRES Chargers (Single-Unit and Multi-Unit, Non-Display) | Two (2) Years |
| IMPRES Chargers (Multi-Unit with Display)                 | One (1) Year  |
| Core Chargers (Single-Unit and Multi-Unit, Non-Display)   | Two (2) Years |

## Capacity Warranty

The capacity warranty guarantees 80% of the rated capacity for the warranty duration.

|   |           |
|---|-----------|
| Nickel Metal-Hydride (NiMH) or Lithium-Ion (Li-Ion) Batteries | 12 Months |
| IMPRES Batteries, When Used Exclusively with IMPRES Chargers  | 18 Months |



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# Section 1

## INTRODUCTION

### 1.0 Notations Used in This Manual

Throughout the text in this publication, you will notice the use of note and caution notations. These notations are used to emphasize that safety hazards exist, and due care must be taken and observed.

**NOTE** An operational procedure, practice, or condition that is essential to emphasize.



CAUTION indicates a potentially hazardous situation which, if not avoided, might result in equipment damage.

### 2.0 Radio Description

The XPR series portable radios are among the most sophisticated two-way radios available. They have a robust design for radio users who need high performance, quality, and reliability in their daily communications. This architecture provides the capability of supporting a multitude of legacy and advanced features resulting in a more cost-effective two-way radio communications solution.

### 3.0 Summary of Printed Circuit Boards and Bands Available

Table below lists all the bands available in this manual.

| <b>Frequency Band</b> | <b>Bandwidth</b> | <b>Power Level</b> | <b>PC Board Part Number</b> | <b>Board Revision</b> | <b>Chapter</b> |
|-----------------------|------------------|--------------------|-----------------------------|-----------------------|----------------|
| VHF                   | 136–174 MHz      | 1 W – 5 W          | PC000813A01                 | A                     | 6              |
| UHF                   | 403–512 MHz      | 1 W – 4 W          | PC000975A01                 | A                     | 7              |

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## Section 2

# MAINTENANCE

### 1.0 Introduction

This chapter provides details about the following

- Preventive maintenance (inspection and cleaning).
- Safe handling of CMOS and LDMOS devices.
- Repair procedures and techniques.

### 2.0 Preventive Maintenance

Periodic visual inspection and cleaning is recommended.

#### 2.1 Inspection

Check that the external surfaces of the radio are clean, and that all external controls and switches are functional. It is not recommended to inspect the interior electronic circuitry.

#### 2.2 Cleaning Procedures

The following procedures describe the recommended cleaning agents and the methods to be used when cleaning the external and internal surfaces of the radio. External surfaces include the front cover, housing assembly and battery case. These surfaces should be cleaned whenever a periodic visual inspection reveals the presence of smudges, grease, and/or grime.

**NOTE** Internal surfaces should be cleaned only when the radio is disassembled for service or repair.

The only recommended agent for cleaning the external radio surfaces is a 0.5% solution of a mild dishwashing detergent in water. The only factory recommended liquid for cleaning the printed circuit boards and their components is isopropyl alcohol (100% by volume).



**Caution**

Use all chemicals as prescribed by the manufacturer. Be sure to follow all safety precautions as defined on the label or material safety data sheet.

The effects of certain chemicals and their vapors can have harmful results on certain plastics. Avoid using aerosol sprays, tuner cleaners and other chemicals.

#### Cleaning External Plastic Surfaces

Apply the 0.5% detergent-water solution sparingly with a stiff, non-metallic, short-bristled brush to work all loose dirt away from the radio. Use a soft, absorbent, lintless cloth or tissue to remove the solution and dry the radio. Make sure that no water remains entrapped near the connectors, cracks, or crevices.

### **Cleaning Internal Circuit Boards and Components**

Isopropyl alcohol (100%) may be applied with a stiff, non-metallic, short-bristled brush to dislodge embedded or caked materials located in hard-to-reach areas. The brush stroke should direct the dislodged material out and away from the inside of the radio. Make sure that controls or tunable components are not soaked with alcohol. Do not use high-pressure air to hasten the drying process since this could cause the liquid to collect in unwanted places. After completing of the cleaning process, use a soft, absorbent, lintless cloth to dry the area. Do not brush or apply any isopropyl alcohol to the frame, front cover or back cover.

**NOTE** Always use a fresh supply of alcohol and a clean container to prevent contamination by dissolved material (from previous usage).

## **2.3 Safe Handling of CMOS and LDMOS Devices**

Complementary metal-oxide semiconductor (CMOS) and Laterally Diffused Metal Oxide Semiconductor (LDMOS) devices are used in this family of radios, and are susceptible to damage by electrostatic or high voltage charges. Damage can be latent, resulting in failures occurring weeks or months later. Therefore, special precautions must be taken to prevent device damage during disassembly, troubleshooting, and repair.

Handling precautions are mandatory for CMOS/LDMOS circuits and are especially important in low humidity conditions.

DO NOT attempt to disassemble the radio without first referring to the following CAUTION statement.

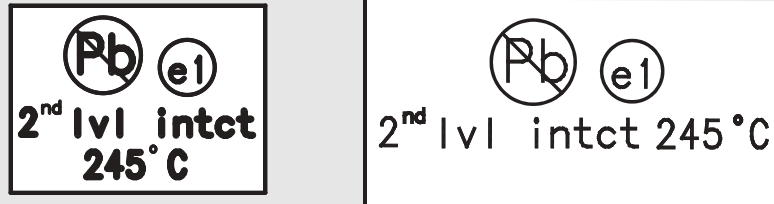
**Caution**

**This radio contains static-sensitive devices. Do not open the radio unless you are properly grounded. Take the following precautions when working on this unit:**

- Store and transport all CMOS/LDMOS devices in conductive material so that all exposed leads are shorted together. Do not insert CMOS/LDMOS devices into conventional plastic “snow” trays used for storage and transportation of other semiconductor devices.
- Ground the working surface of the service bench to protect the CMOS/LDMOS device. We recommend using a wrist strap, two ground cords, a table mat, a floor mat mat, ESD shoes, and an ESD chair.
- Wear a conductive wrist strap in series with a 100k resistor to ground. (Replacement wrist straps that connect to the bench top covering are Motorola part number 4280385A59).
- Do not wear nylon clothing while handling CMOS/LDMOS devices.
- Do not insert or remove CMOS/LDMOS devices with power applied. Check all power supplies used for testing CMOS/LDMOS devices to be certain that there are no voltage transients present.
- When straightening CMOS/LDMOS pins, provide ground straps for the apparatus used.
- When soldering, use a grounded soldering iron.
- If at all possible, handle CMOS/LDMOS devices by the package and not by the leads. Prior to touching the unit, touch an electrical ground to remove any static charge that you may have accumulated. The package and substrate may be electrically common. If so, the reaction of a discharge to the case would cause the same damage as touching the leads.

### 3.0 Repair Procedures and Techniques – General

**NOTE** Environmentally Preferred Products (EPP) (refer to the marking on the printed circuit boards – examples shown below) were developed and assembled using environmentally preferred components and solder assembly techniques to comply with the European Union’s Restriction of Hazardous Substances (ROHS 2) Directive 2011/65/EU and Waste Electrical and Electronic Equipment (WEEE) Directive 2012/19/EU. To maintain product compliance and reliability, use only the Motorola specified parts in this manual.



Any rework or repair on Environmentally Preferred Products must be done using the appropriate lead-free solder wire and lead-free solder paste as stated in the following table:

*Table 2-1. Lead Free Solder Wire Part Number List*

| Motorola Part Number | Alloy              | Flux Type   | Flux Content by Weight | Melting Point | Supplier Part number | Diameter | Weight    |
|----------------------|--------------------|-------------|------------------------|---------------|----------------------|----------|-----------|
| 1088929Y01           | 95.5Sn/3.8Ag/0.7Cu | RMA Version | 2.7-3.2%               | 217C          | 52171                | 0.015"   | 1lb spool |

*Table 2-2. Lead Free Solder Paste Part Number List*

| Motorola Part Number | Manufacturer Part Number | Viscosity                         | Type                  | Composition & Percent Metal      | Liquid Temperature |
|----------------------|--------------------------|-----------------------------------|-----------------------|----------------------------------|--------------------|
| 1085674C03           | NC-SMQ230                | 900-1000KCPs<br>Brookfield (5rpm) | Type 3<br>(-325/+500) | (95.5%Sn-3.8%Ag-0.7%Cu)<br>89.3% | 217°C              |

#### Parts Replacement and Substitution

When damaged parts are replaced, identical parts should be used. If the identical replacement part is not locally available, check the parts list for the proper Motorola part number and order the part from the nearest Motorola Radio Products and Solutions Organization (RPSO) listed in Appendix A of this manual.

#### Rigid Circuit Boards

The family of radios uses bonded, multi-layer, printed circuit boards. Since the inner layers are not accessible, some special considerations are required when soldering and unsoldering components. The printed through holes may interconnect multiple layers of the printed circuit. Therefore, exercise care to avoid pulling the plated circuit out of the hole.

When soldering near connector:

- Avoid accidentally getting solder in the connector.
- Be careful not to form solder bridges between the connector pins.
- Examine your work closely for shorts due to solder bridges.

For soldering components with Hot-Air or infra red solder systems, please check your user guide of the solder system to get information on solder temperature and time for the different housings of the integrated circuits and other components.



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## Section 3

# TEST EQUIPMENT AND SERVICE AIDS

### 1.0 Recommended Test Equipment

The list of equipment contained in Table 3-1 includes most of the standard test equipment required for servicing Motorola portable radios.

*Table 3-1. Recommended Test Equipment*

| Equipment                | Characteristics  | Example   | Application   |
|--------------------------|--|---|---|
| Service Monitor          | Can be used as a substitute for items marked with an asterisk (*)  | Aeroflex 3920<br>(www.aeroflex.com)   | Frequency/deviation meter and signal generator for wide-range troubleshooting and alignment |
| Digital RMS Multimeter * | 100 $\mu$ V to 300 V<br>5 Hz to 1 MHz<br>10 Mega Ohm Impedance   | Fluke 179 or equivalent<br>(www.fluke.com)  | AC/DC voltage and current measurements. Audio voltage measurements                          |
| RF Signal Generator *    | 100 MHz to 1 GHz<br>-130 dBm to +10 dBm<br>FM Modulation 0 kHz to 10 kHz<br>Audio Frequency 100 Hz to 10 kHz | Agilent N5181A<br>(www.agilent.com),<br>Ramsey RSG1000B<br>(www.ramseyelectronics.com), or equivalent | Receiver measurements   |
| Oscilloscope *           | 2 Channel<br>50 MHz Bandwidth<br>5 mV/div to 20 V/div  | Leader LS8050<br>(www.leaderusa.com),<br>Tektronix TDS1001b<br>(www.tektronix.com),<br>or equivalent  | Waveform measurements   |
| Power Meter and Sensor * | 5% Accuracy<br>100 MHz to 500 MHz<br>50 Watts  | Bird 43 ThruLine Watt Meter<br>(www.bird-electronic.com) or equivalent                                | Transmitter power output measurements   |
| RF Millivolt Meter       | 100 mV to 3 V RF<br>10 kHz to 1 GHz  | Boonton 92EA<br>(www.boonton.com) or equivalent   | RF level measurements   |
| Power Supply             | 0 V to 32 V<br>0 A to 20 A   | B&K Precision 1790<br>(www.bkprecision.com)<br>or equivalent  | Voltage supply  |

## 2.0 Service Aids

Table 3-2 lists the service aids recommended for working on the radio. While all of these items are available from Motorola, most are standard workshop equipment items, and any equivalent item capable of the same performance may be substituted for the item listed.

Table 3-2. Service Aids

| Motorola Part No. | Description                                     | Application   |
|-------------------|---|---|
| RLN4460_          | Portable Test Set                               | Enables connection to the audio/accessory jack. Allows switching for radio testing.       |
| RVN5115_          | Customer Programming Software on CD-ROM         | Allows servicer to program radio parameters, tune and troubleshoot radios.                |
| PMKN4012_*        | Portable Programming Cable                      | This cable connects the radio to a USB port for radio programming and data applications.  |
| PMKN4013_*        | Portable Programming, Testing & Alignment Cable | This cable connects the radio to a USB port for radio programming, testing and alignment. |
| PMNN4452_         | 7.5V Universal Battery Eliminator               | Connects to radio via battery eliminator cable.   |
| PMLN6154_         | RF Adaptor                                      | Adapts radio's antenna port to BNC cabling of test equipment.                             |
| PMLN6584_         | RF Adaptor Holder                               | Holds RF Adaptor  |
| 5880348B33        | DMR SMA to BNC RF Adaptor                       | Adapts radio's antenna port to BNC cabling of test equipment.                             |
| NLN9839_          | Vacuum Pump Kit                                 | Allows servicer to test for leakages.   |
| NTN4265_          | Pressure Pump Kit                               | Allows servicer to locate leakages.   |
| 5871134M01        | Connector Fitting                               | This connector allows the vacuum hose to be connected to the radio chassis.               |
| 3271133M01        | Fitting Seal                                    | This seal secures the connector fitting to the radio chassis.                             |

\* Version A of the programming cables will not work with the radio.

### 3.0 Programming, Testing and Alignment Cable

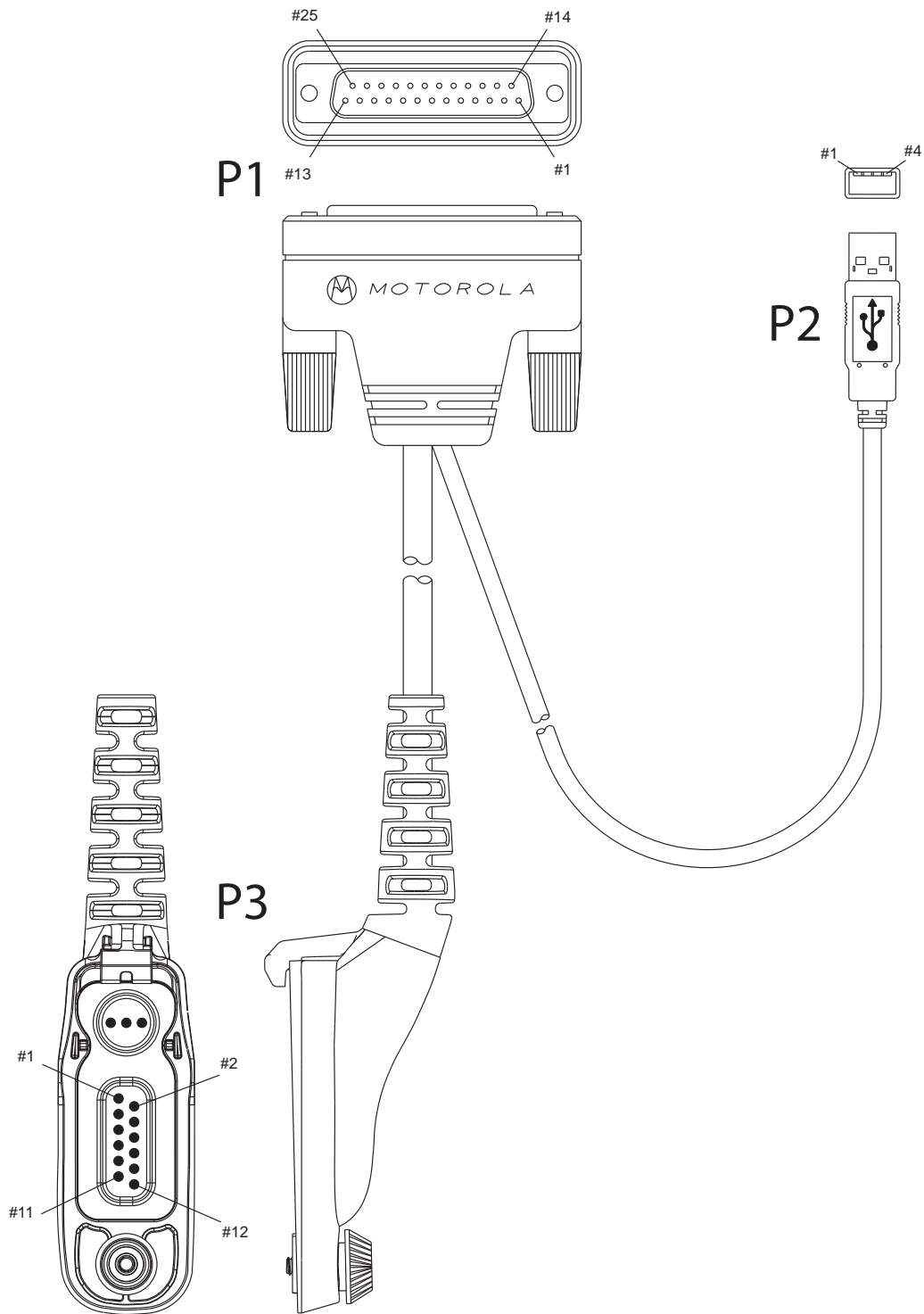


Figure 3-1. Programming, Testing and Alignment Cable

Table 3-3. Pin Configuration of Side Connector

| CONNECTION |     |     |                   |
|------------|-----|-----|-------------------|
| P1         | P2  | P3  |                   |
| Pin        | Pin | Pin | Function          |
|            |     | 1   | GROUND            |
|            | 1   | 3   | VCC (5V)          |
|            | 3   | 4   | DATA+             |
|            | 2   | 5   | DATA-             |
| 16         | 4   | 6   | GROUND            |
| 1 & 5      |     | 7   | EXTERNAL SPEAKER+ |
| 2 & 7      |     | 8   | EXTERNAL SPEAKER- |
| 20         |     | 9   | EXTERNAL PTT      |
| 17         |     | 10  | EXTERNAL MIC+     |
| 16         |     | 11  | EXTERNAL MIC-     |

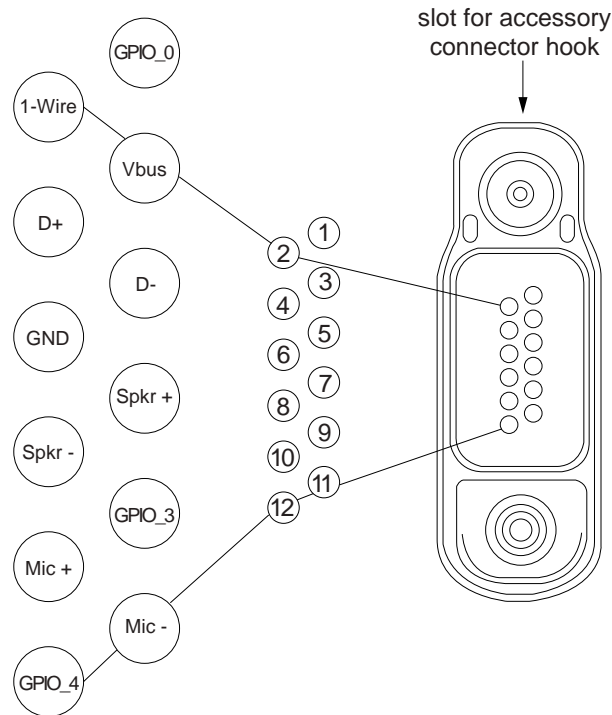


Figure 3-2. Pin Layout of Side Connector

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## Section 4

# POWER UP SELF-TEST

### 1.0 Power-Up Error Codes (Display Model only)

Upon powering up, the radio performs certain tests to determine if its basic electronics and software are in working order. Any error detected has an associated error code that is presented on the radio display. These error codes are intended to be used by a service technician when the radio generates the Self Test Fail Tone. If these tests are successfully completed, the radio will generate the Self Test Tone.

There are two classes of detectable errors, fatal and non-fatal. If it is considered as a fatal error, then the normal radio operation will be inhibited. Fatal errors include hardware errors detected by the microprocessor and certain memory errors. These memory errors include incorrect ROM checksum, incorrect RAM checksum, and incorrect checksums of codeplug (Persistent Storage) blocks that contain operating parameters. If the codeplug block operating parameters are corrupted, operation of the unit on the proper frequency, system, and group are in question. Attempts to use this information could provide the user with a false sense of security that others are receiving his messages. Corrupted codeplug blocks of call IDs, or their associated aliases are considered non-fatal errors. While the user may be inconvenienced, normal communication is still possible.

*Table 4-1. Power Up Self Codes*

| Error Code                     | Description   | Error Type | Corrective Action  |
|--------------------------------|---|------------|--|
| ERROR 01/02                    | Call ID or associated aliases codeplug block checksum is wrong. | Non-Fatal  | Normal communication is still possible, but the user may be inconvenienced.<br>Reprogram codeplug.                                       |
| ERROR 01/22                    | Tuning Codeplug block checksum is wrong.                        | Non-Fatal  | Normal communication is still possible.  |
| FAIL 01/82                     | External Codeplug block checksum is wrong.                      | Fatal      | Reprogram codeplug.  |
| FAIL 01/92                     | Secure Codeplug checksum error                                  | Fatal      | Reprogram codeplug.  |
| FAIL 01/A2                     | Tuning Codeplug block checksum is wrong.                        | Fatal      | Reprogram codeplug.  |
| FAIL 01/81                     | ROM Checksum is wrong.  | Fatal      | Reprogram FLASH Memory, then retest. If message reoccurs, replace main board or send radio to nearest Motorola Depot.                    |
| FAIL 01/88                     | Radio RAM Test Failure.   | Fatal      | Retest radio by turning it off and turning it on again. If message reoccurs, replace main board or send radio to nearest Motorola Depot. |
| FAIL 01/90<br>or<br>FAIL 02/90 | General hardware test failure.                                  | Fatal      | Retest radio by turning it off and turning it on again. If message reoccurs, replace main board or send radio to nearest Motorola Depot. |

Table 4-1. Power Up Self Codes (Continued)

| Error Code | Description   | Error Type | Corrective Action  |
|------------|---|------------|--|
| FAIL 02/81 | DSP ROM Checksum is wrong.  | Fatal      | Reprogram FLASH Memory, then retest. If message reoccurs, replace main board or send radio to nearest Motorola Depot.                    |
| FAIL 02/82 | DSP RAM1 test failure.  | Fatal      | Retest radio by turning it off and turning it on again. If message reoccurs, replace main board or send radio to nearest Motorola Depot. |
| FAIL 02/84 | DSP RAM2 test failure.  | Fatal      | Retest radio by turning it off and turning it on again. If message reoccurs, replace main board or send radio to nearest Motorola Depot. |
| FAIL 02/88 | DSP RAM test failure.   | Fatal      | Retest radio by turning it off and turning it on again. If message reoccurs, replace main board or send radio to nearest Motorola Depot. |
| FAIL 02/C0 | DSP ROM Checksum is wrong.  | Fatal      | Retest radio by turning it off and turning it on again. If message reoccurs, replace main board or send radio to nearest Motorola Depot. |
| No Display | Display module is not connected properly.<br>Display module is damaged. | Fatal      | Check connection between main board and display module.<br>Replace with new display module.  |

**NOTE** A non-display radio emits only the Self Test Fail Tone if it fails the self-test.

## 2.0 Operational Error Codes

During radio operation, the radio performs dynamic tests to determine if the radio is working properly. Problems detected during these tests are presented as error codes on the radio's display. The presence of an error code should prompt a user that a problem exists and that a Motorola Authorized MOTOTRBO dealer should be contacted. Use Table 4-5. to aid in understanding particular operational error codes.

Table 4-2. Operational Error Codes

| Error Code | Description                                | Error Type | Corrective Action  |
|------------|--|------------|--|
| FAIL 001   | Synthesizer Out-of-Lock                    | NON-FATAL  | 1. Reprogram the codeplug.<br>2. Refer to Detailed Service Manual. |
| FAIL 002   | Personality checksum or system block error | NON-FATAL  | Reprogram the codeplug.  |

# Section 5

## RADIO INFORMATION

### 1.0 General Controller Block

The controller section consists of a host processor, Power & Peripheral management (PMIC) IC, with supporting flash and RAM memory devices for the radio operation. In addition to these, Accelerometer, Wireless connectivity chip, Location & Position chip, Option board, color display, matrix keypad, audio amplifiers, backlighting scheme, and status indicator, from the controller section.

The host processor, masters all the tasks of the controller section in conjunction with the peripheral management processor within the PMIC IC.

The system is powered from a 7.5V battery supply and the power converters, both external and internal to the PMIC provides the necessary power to the above processors and peripherals of the system. The clock generation for the system operation and wireless connectivity chip are generated from two different TCXOs for the performance requirement.

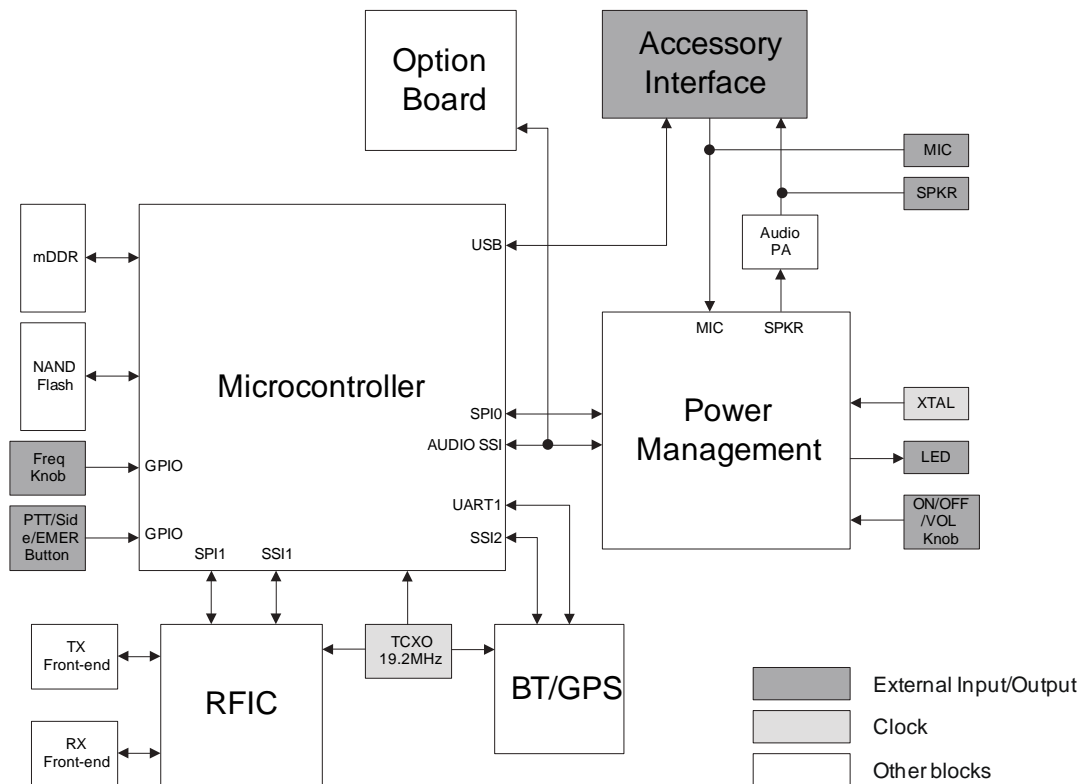
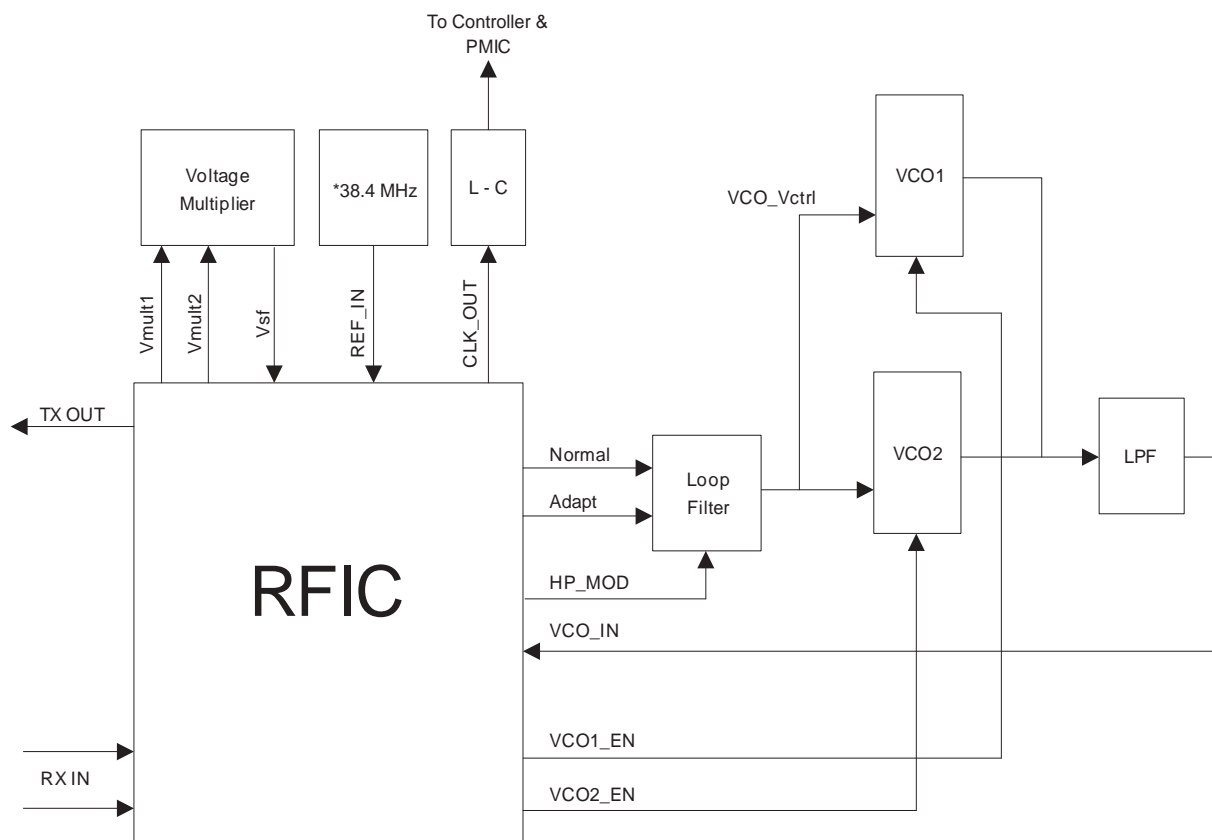


Figure 5-1. Controller Block Diagram

## 1.1 FGU

The synthesizer is powered from 1.8V and 2.8V supplied from CPCAP IC, U3000 as well as 3.6V of U3270 switching regulator. The synthesizer in turns generates a super-filtered of 3.6V which powers up the VCO where the output signals of VCO are feedback to RFIC to complete the PLL. The output of VCO is providing output power level of -4 to 7dBm to ROD\_VCO\_IN. An external 38.4MHz non-tunable TCXO is used as the main clock source. The 38.4MHz TCXO output is fed directly to CPCAP IC via CLK\_ROD\_19\_2MHZ\_SHIELD, and being divided down to 19.2MHz by D-type flip flop, U1081 before feeding to FREON IC, U1000 via 19\_2MHZ\_DIG. The radio uses a 2-port modulation scheme i.e. through low port and high port modulation at loop filter. This approach was undertaken to obtain flatter high port modulation sensitivity response across TX frequencies, larger passing margin for ACP and better modulation flatness across temperature.

For 8/900 MHz band, the synthesizer is powered from 1.8V and 2.8V supplied from CPCAP IC, U3000. The synthesizer in turn generates a super-filtered of 4.4V via U3250 regulator. which powers up the VCO where the output signals of VCO are feedback to RFIC to complete the PLL. The output of VCO is providing output power level of -1.5 to 6dBm to ROD\_VCO\_IN. An external 19.2MHz non-tunable TCXO is used as the main clock source. CPCAP uses 19.2MHz from ROD\_19.2MHZ\_CLKOUT. The radio uses a 2-port modulation scheme i.e. through low port and high port modulation at loop filter. This approach was undertaken to obtain flatter high port modulation sensitivity response across TX frequencies, larger passing margin for ACP and better modulation flatness across temperature.



\*Note:

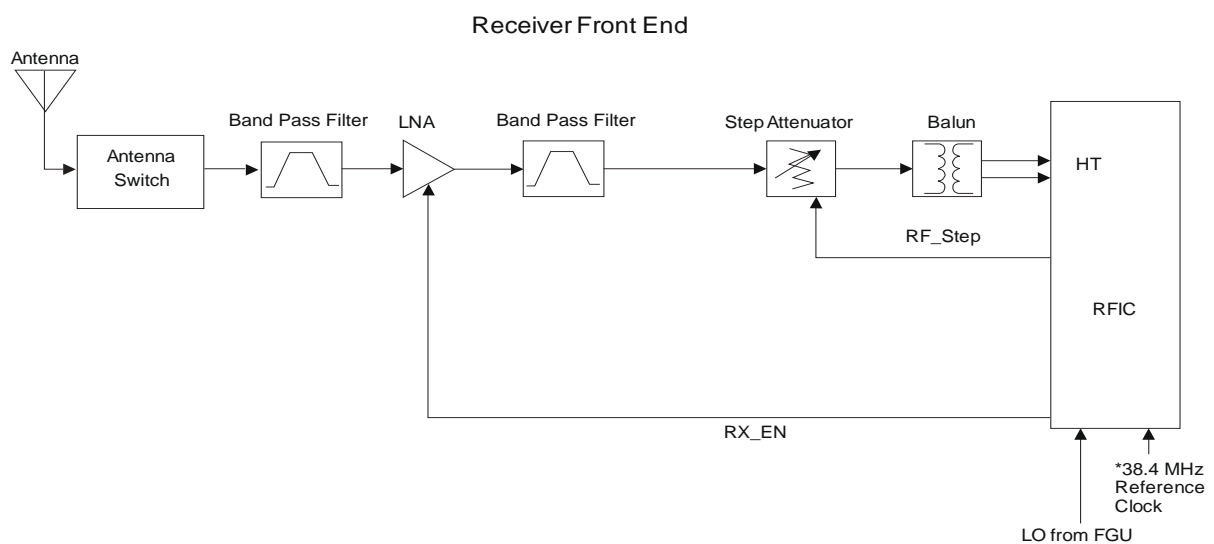
For 800/900, 19.2 MHz will be used for REF\_IN  
 For VHF/UHF, 38.4 MHz will be used for REF\_IN

Figure 5-2. FGU

## 1.2 Receiver

The receiver front end is defined as being the circuitry from the antenna input to the RFIC (U0001). The received signal from antenna will pass through the antenna switch. The antenna switch provide selection between receive and transmit path. The receive signal which was routed to the receive path will then flow through a bandpass filter of 403MHz to 527Mhz. The output signal of the bandpass filter will then fed into the low noise amplifier (LNA).

In VHF/UHF, the LNA provide 13 – 15dB gain depending on the RF frequency. After being amplified, the RF signal is further filtered by a bandpass filter. Depending on the level of the interference signal and mode of operation, step attenuator (U0480) will be trigger to provide protection to the RFIC from saturation. The Balun (T0490) is a 1:1 transformer providing single ended to differential transformation. Output of the Balun will then be fed to the RFIC for back end processing.



**\*Note**

For 800/900, 19.2 MHz will be used for REF\_IN  
 For VHF/UHF, 38.4 MHz will be used for REF\_IN

Figure 5-3. Receiver

### 1.3 Transmitter

The transmitter contains five basic circuits: power amplifier, antenna switch, harmonic filter, 50 ohms RF switch & antenna matching network, and power control.

The power amplifier is a 3-stage discrete design consisting of a Pre-driver, Driver and final PA. The gain of both Driver and final PA are controlled by Vcontrol from power control circuit.

The antenna matching network is used to match the antenna's impedance to the 50 ohms RF switch.

The transmitter power control uses discrete integrator (U0900) approach, the first stage is an I-V converter which converts current drained by Power Amplifier Driver (Q0710) and Power Amplifier Final (Q0720) across R0905 into a voltage drop and the second stage is an integrator used to control and shape the output Vcontrol to bias both PAs.

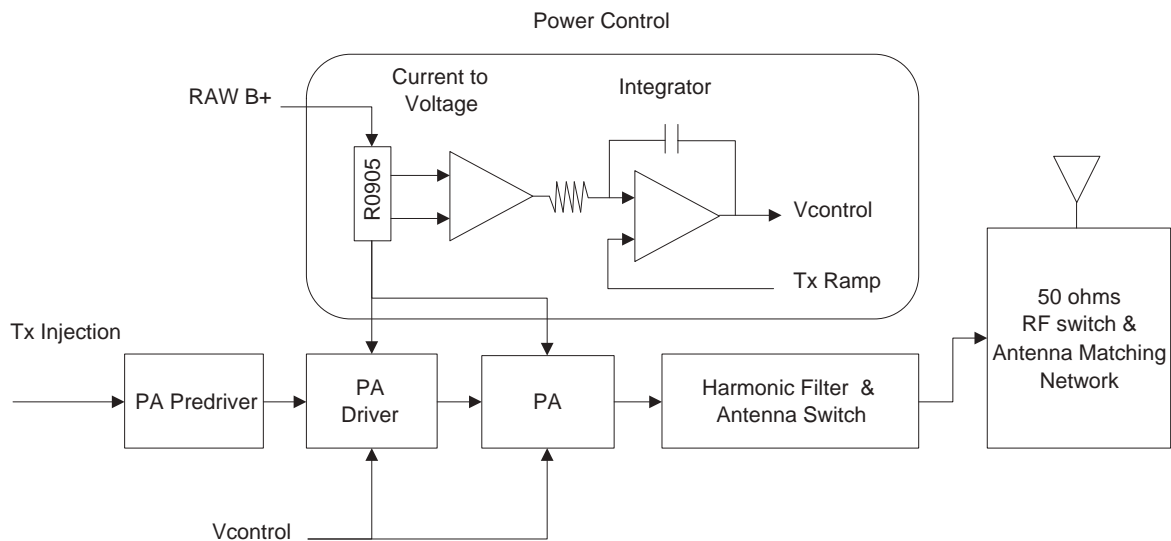


Figure 5-4. Transmitter

## 1.4 GNSS/Bluetooth/WiFi

### 1.4.1 GNSS

The GNSS section is a receiver which operates on 3 frequencies, 1.560GHz (Beidou), 1.575 GHz(GPS) & 1.602 GHz(GLONASS). It consists of Front end and Back end. The front end is made up of Diplexer, first SAW filter, LNA, second SAW filter and input match. The back end is made up of mixer, PLL for generation of LO, backend, baseband & microcontroller. The entire back end is inside the GNSS IC (UBlox). The function of Dual band diplexer is to isolated BT/WiFi and GNSS band and attenuates transmit & receive signals of main transceiver. The first SAW filter will filters spurious signals with frequencies close to GNSS frequency and the GNSS signals will be amplified by LNA for better sensitivity. The second SAW filter will provide additional filtering of spurious signals. The last stage is the input match for UBlock which is to provide impedance matching between 2nd SAW and UBlock IC.

### 1.4.2 Bluetooth/WiFi

The Bluetooth and WiFi section uses Marvell Avastar 88W8777 chipset to provide Bluetooth and WiFi functionality. The Marvell Avastar 88W8777 chipset is a single-chip Bluetooth/WiFi solution that provides both simultaneous and independent operation of IEEE 802.11b/g/n (2.4 GHz band operation) WiFi payload data rates and BT 4.0 with BT Smart Ready (BT Low Energy). The BT and WiFi section consists of front end and back end. The front end is made up of dual band diplexer, RF switch and input match. The function of dual band diplexer is to isolated Bluetooth/WiFi and GNSS band and attenuates transmit & receive signals of main transceiver. The RF switch provides selection of Bluetooth or WiFi RF path and operation. The input match provide impedance matching for the Bluetooth and WiFi output pin of the chipset. The back end is made up of Marvell Avastar 88W8777 (with integrated power amplifier) and microcontroller. The generic host interfaces utilizes a shared SDIO for connecting Bluetooth & WiFi to the microcontroller and utilizes PCM interface for BT audio.

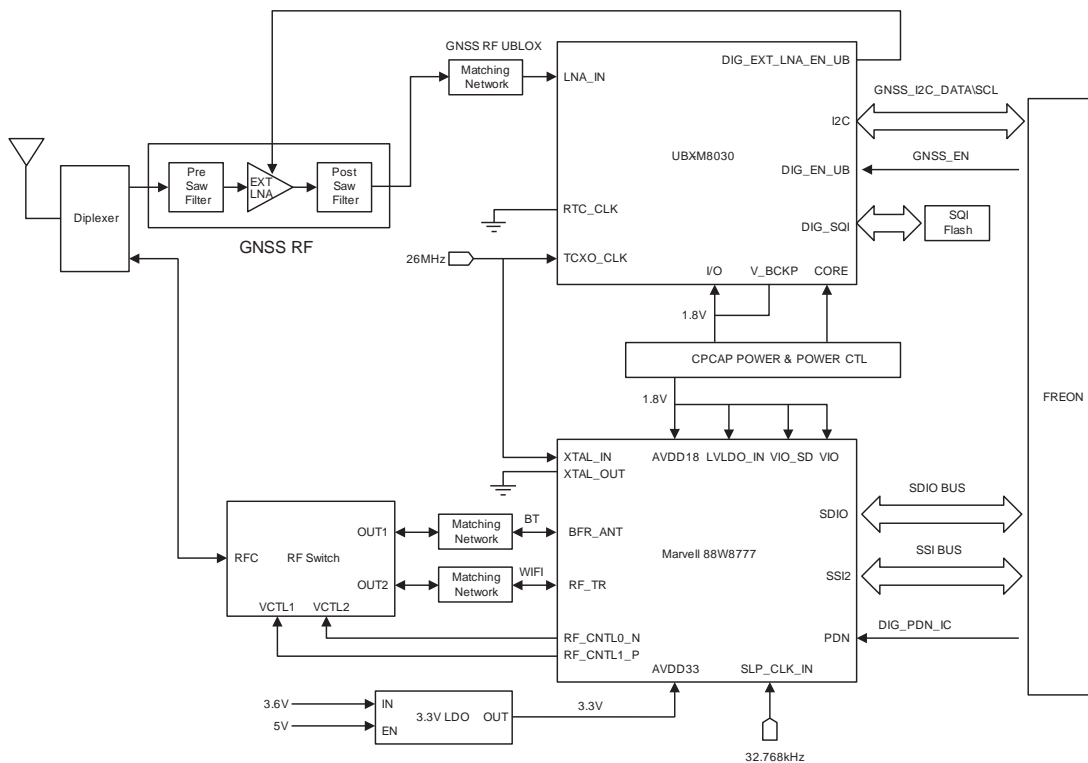


Figure 5-5. GPS/Bluetooth/WiFi

### 1.5 Keypad and Display Block

The LCD display module and keypad interfaces communicates directly to the host processor on the main board. To communicate and control the display driver, four control lines run between the main board and the display board. The LCD is reset from host processor through UART type connection. The keypad interfaces communicate to host processor by using a Row/Column resistor ladder through GPIOs.

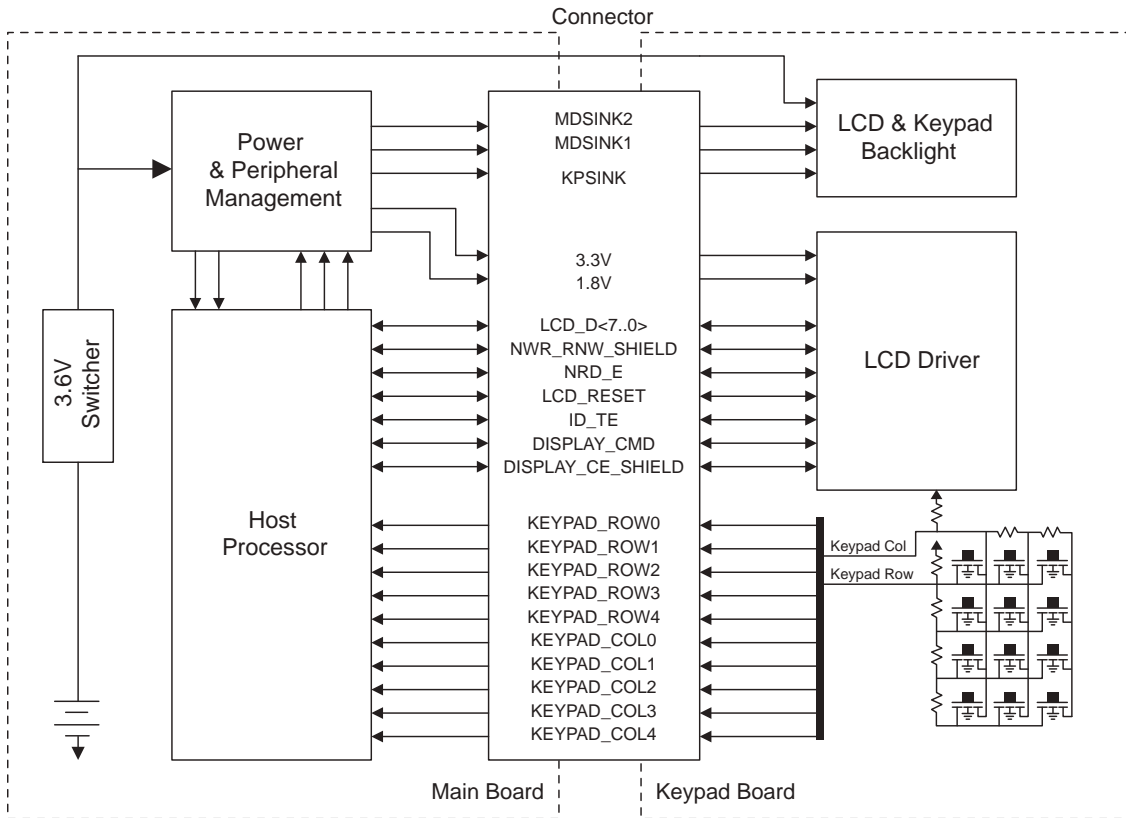


Figure 5-6. Full Keypad

### 1.6 GOB

Generic Option Board is powered by SWB+ (7.5V). TX Line Tri-State Control Circuit takes SSI\_CLK and SSI\_FSYNC as input to control the state in the SSI\_TX line. As an example, it can be a counter which starts counting on SSI\_FSYNC, and when the count reaches 32, it will enable the SSI\_TX line buffer to enable data sending. When the count reaches 128, it will reset to 0 and disable the SSI\_TX line buffer and move the SSI\_TX line to Tri-State.

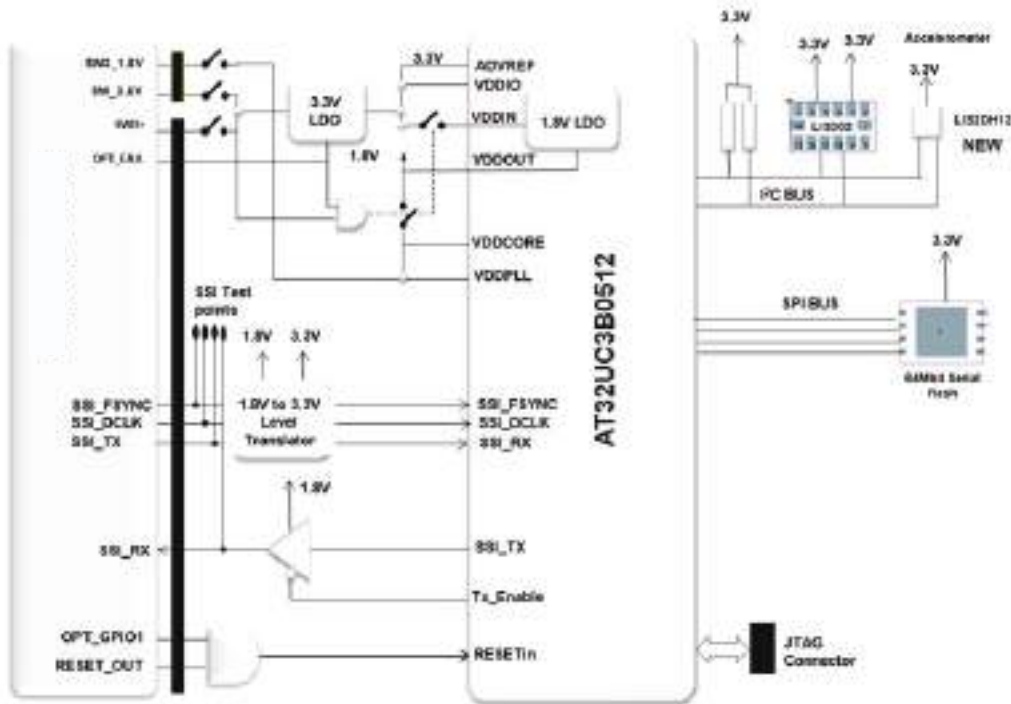
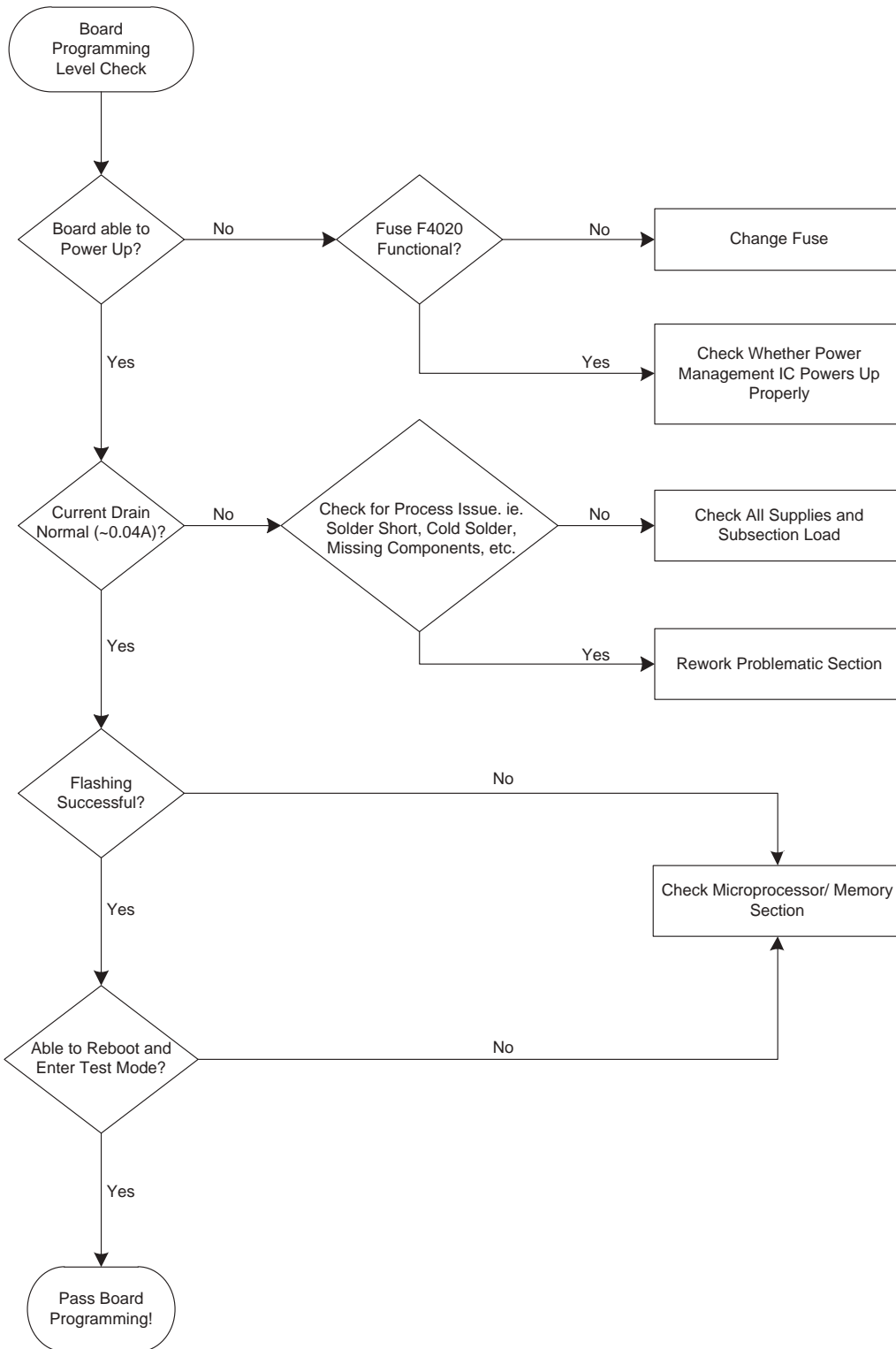
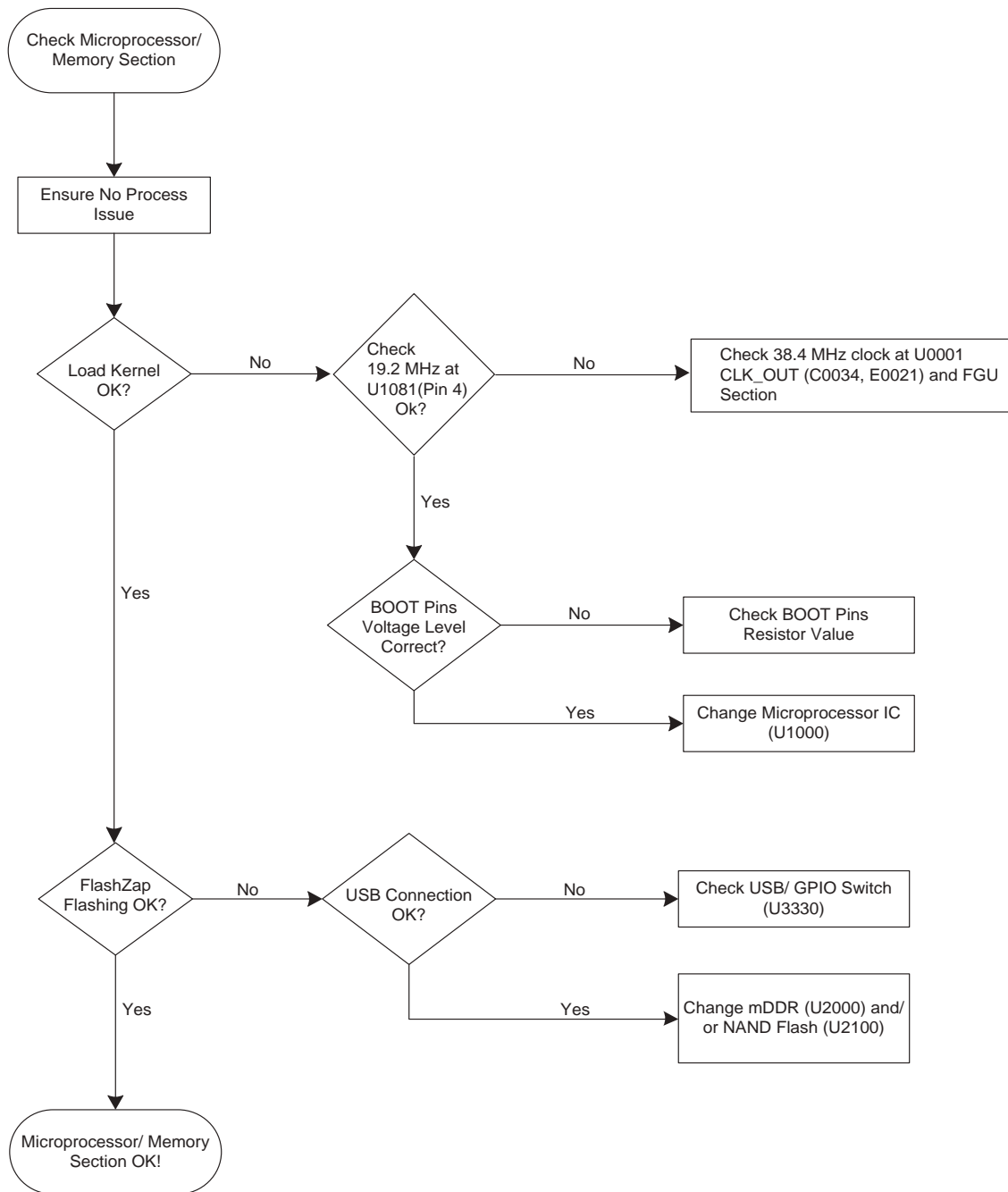


Figure 5-7. GOB

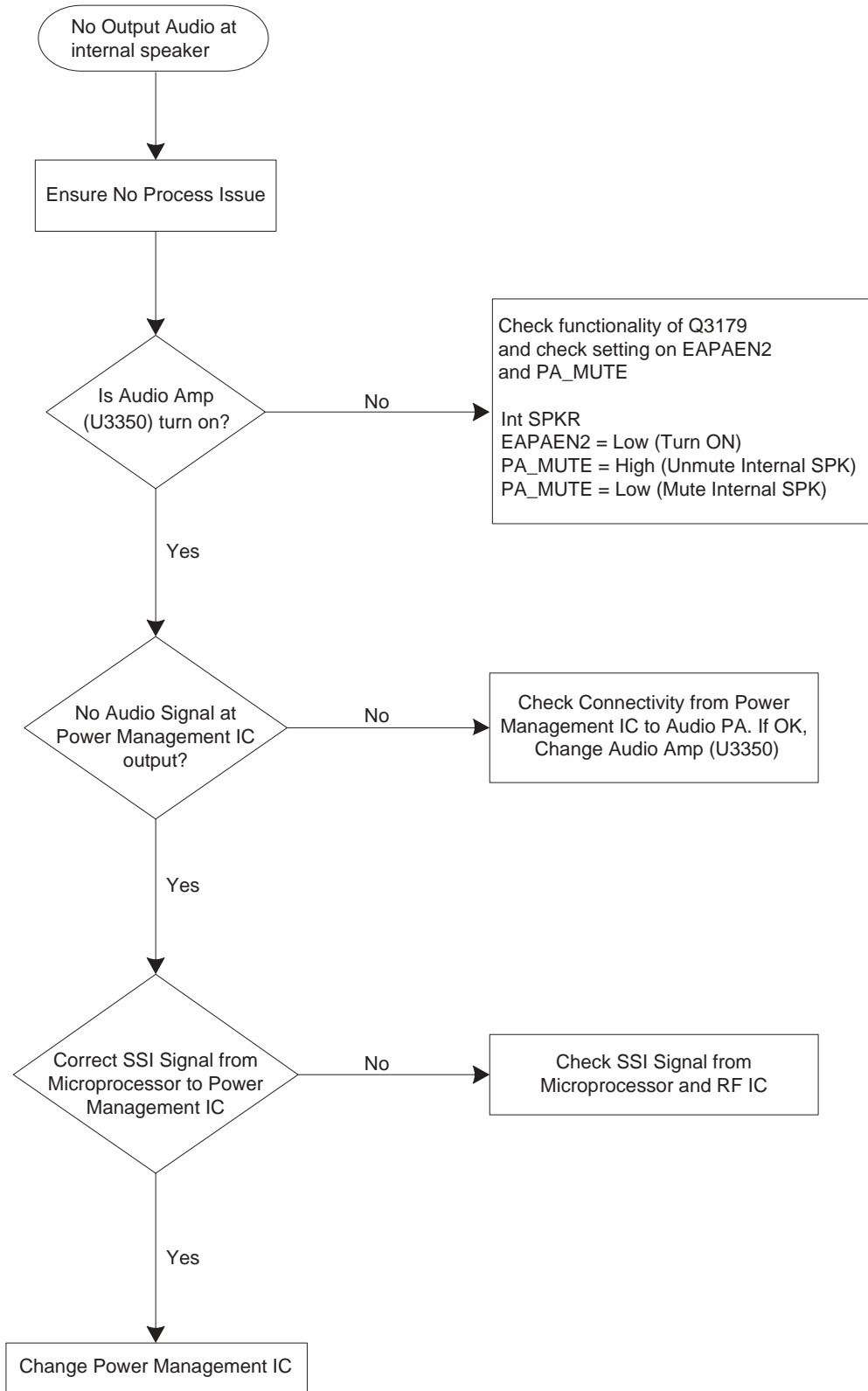
## 2.0 Troubleshooting Charts



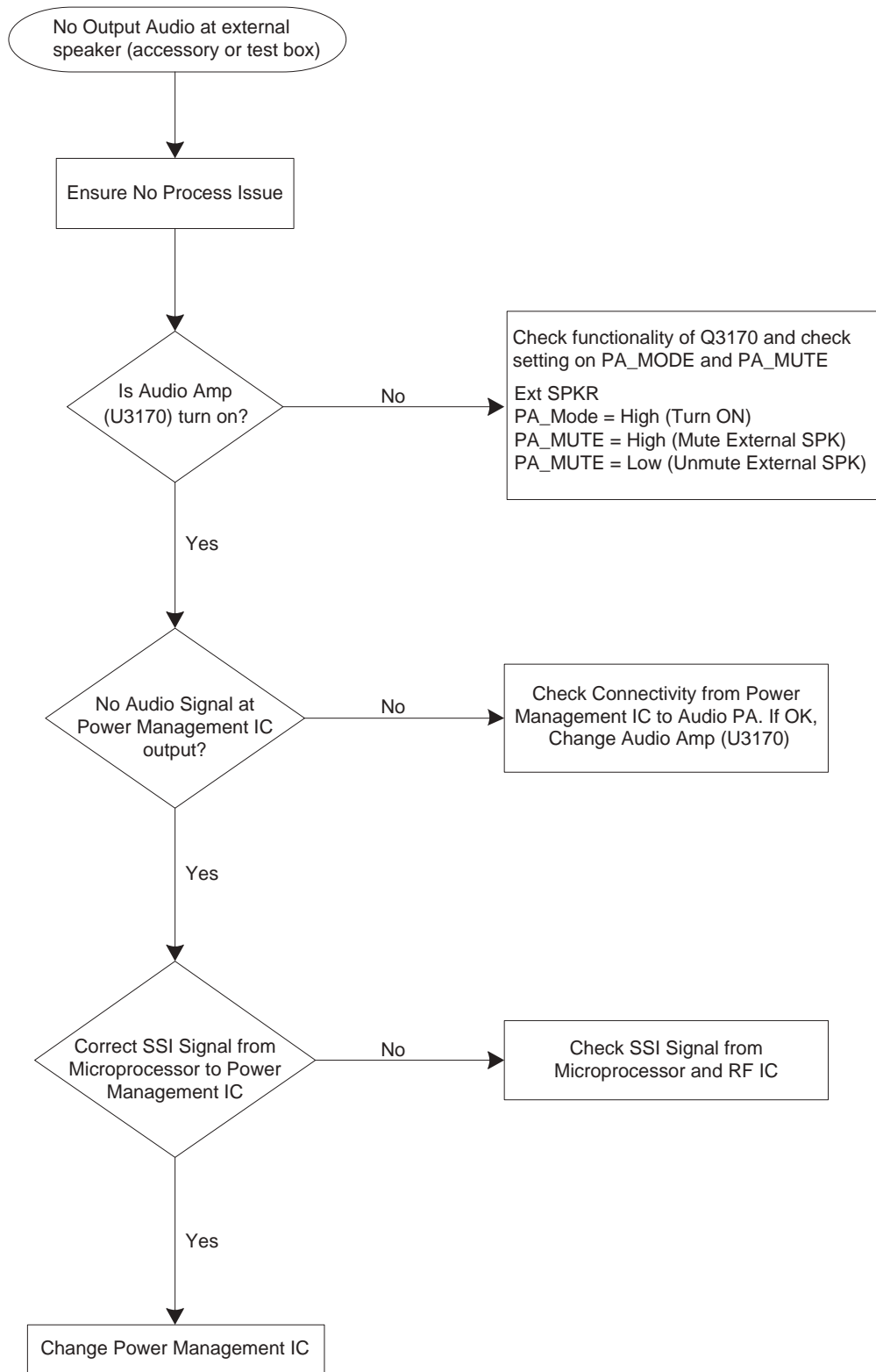
**Figure 5-8. Troubleshooting Flow Chart for Controller (Sheet 1 of 5)**



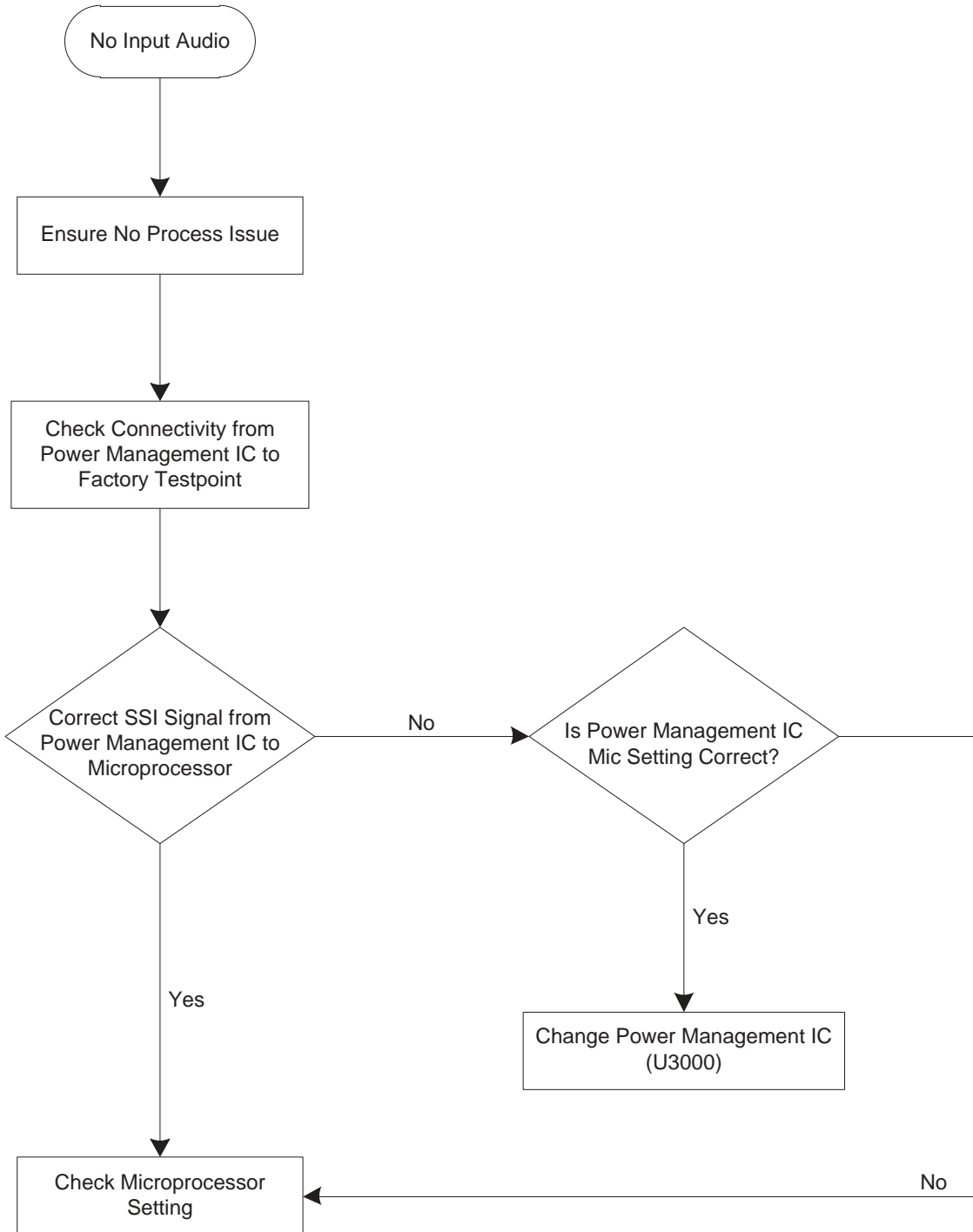
**Figure 5-9. Troubleshooting Flow Chart for Controller (Sheet 2 of 5)**



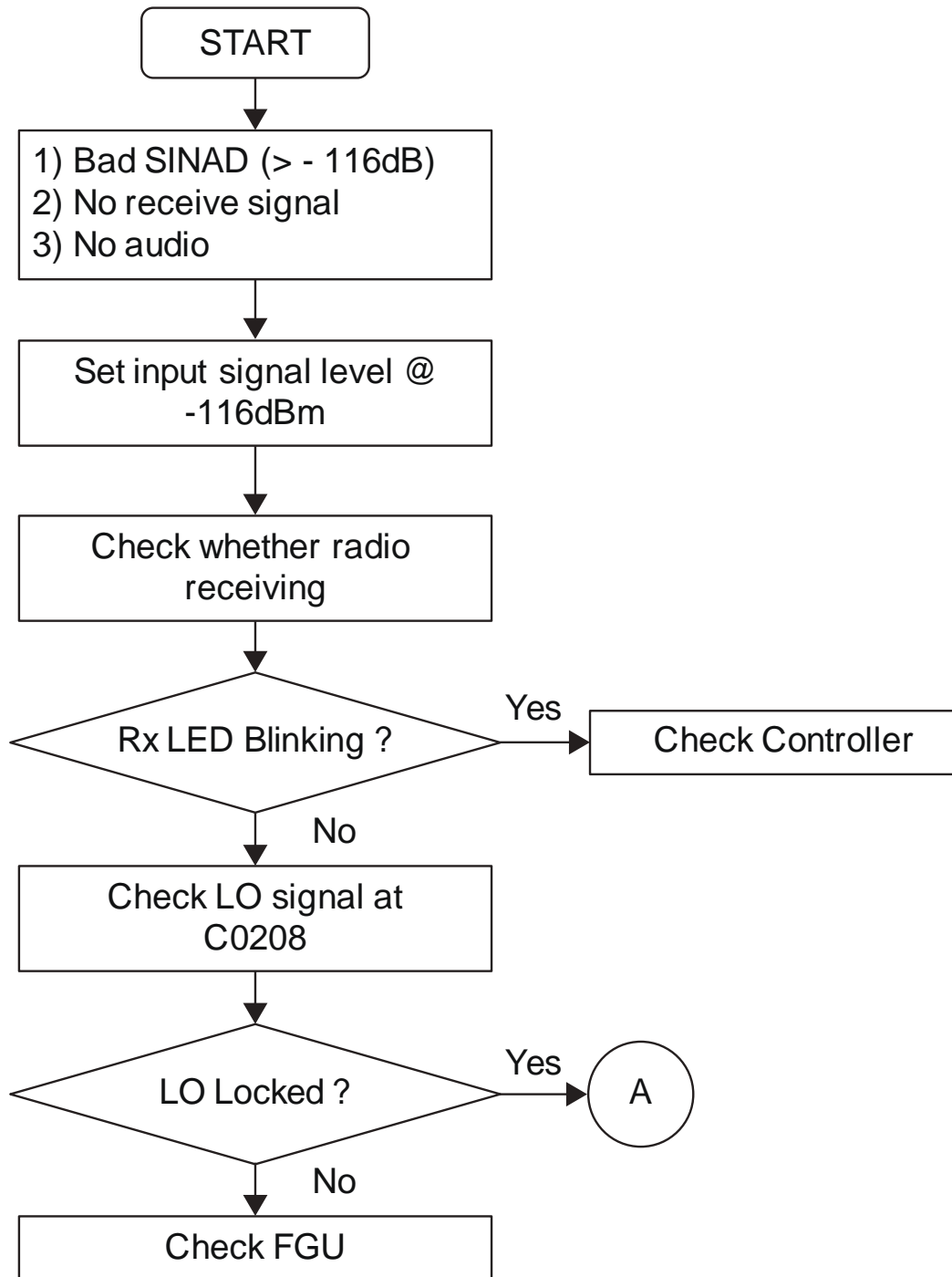
**Figure 5-10. Troubleshooting Flow Chart for Controller (Sheet 3 of 5)**



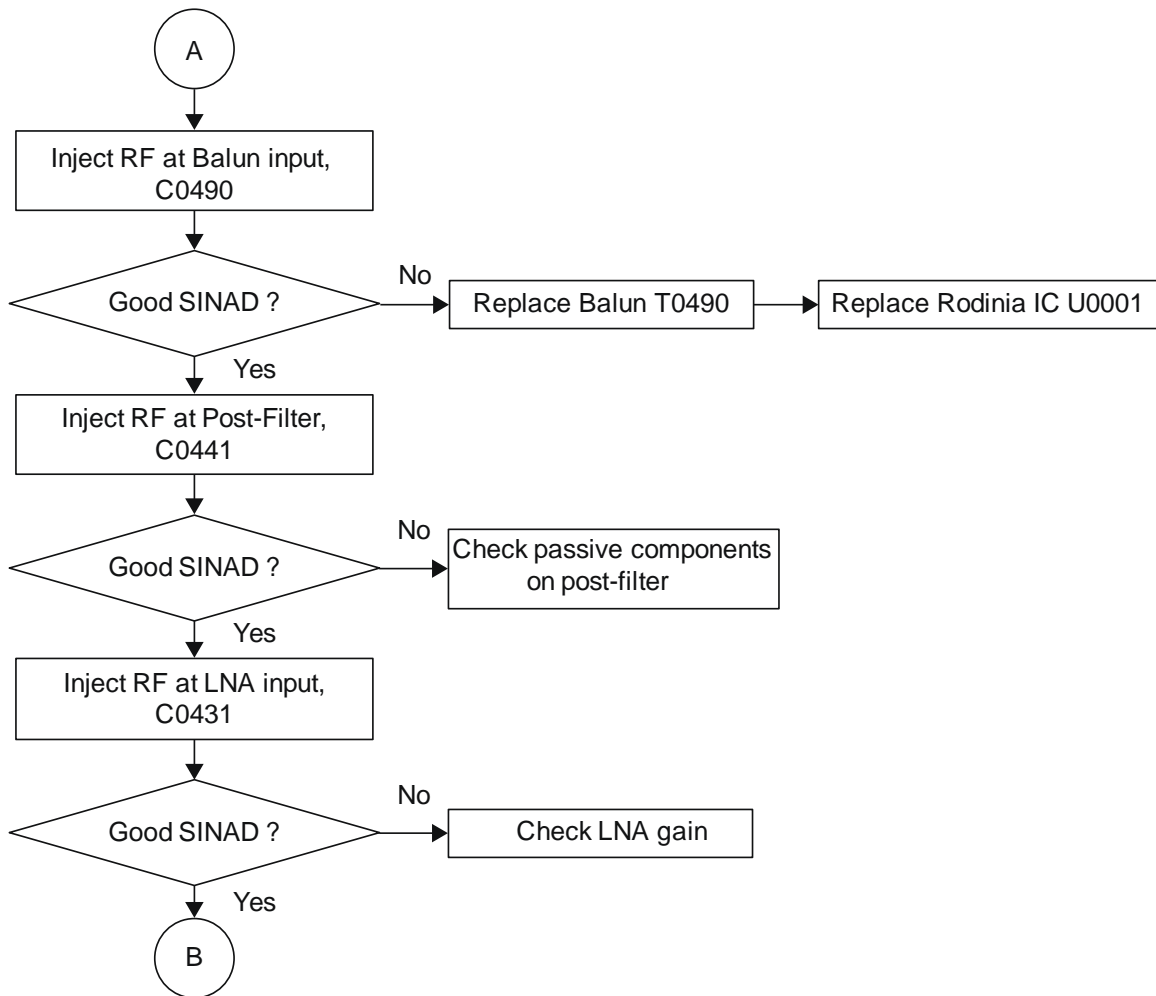
**Figure 5-11. Troubleshooting Flow Chart for Controller (Sheet 4 of 5)**



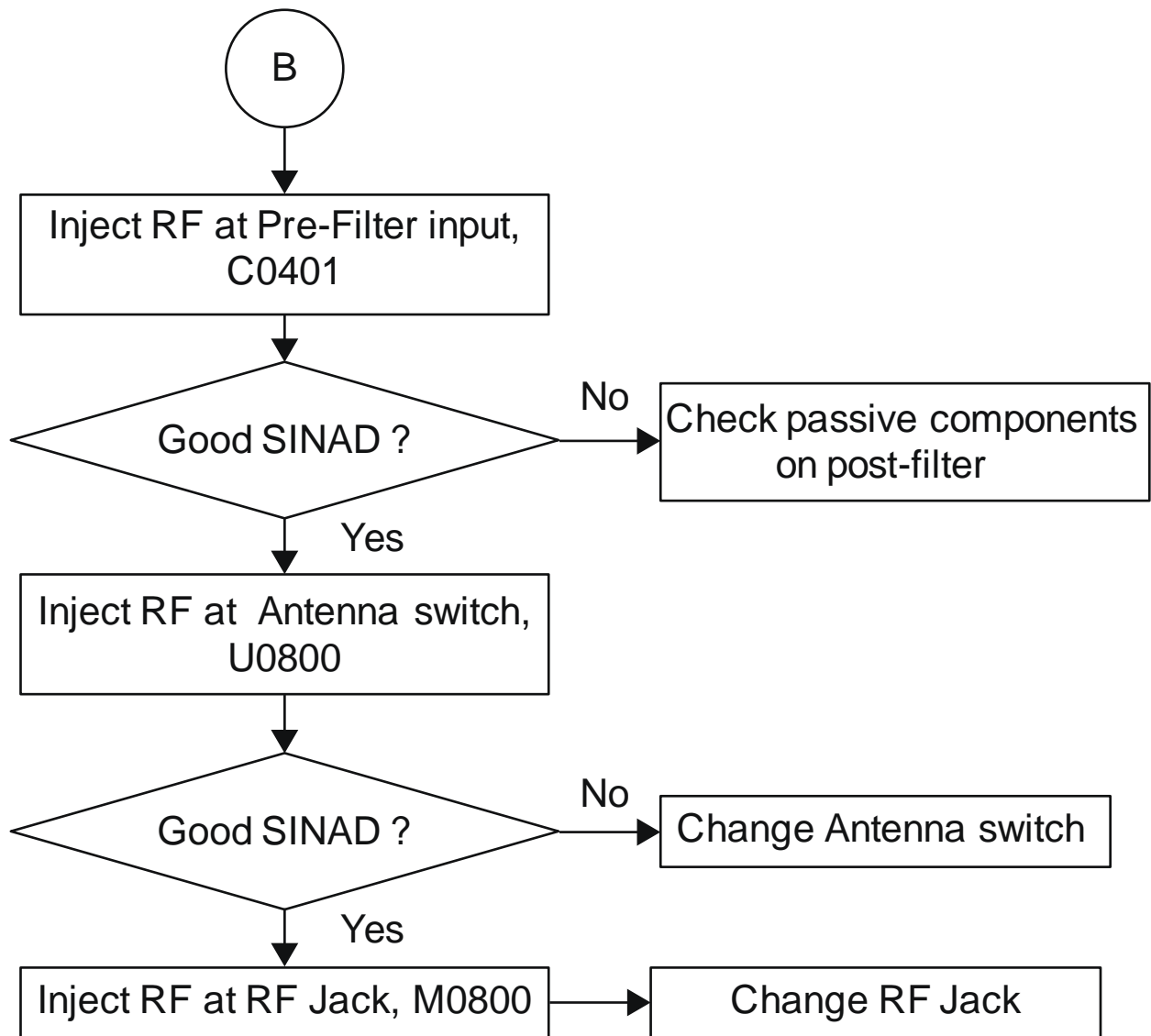
**Figure 5-12. Troubleshooting Flow Chart for Controller (Sheet 5 of 5)**



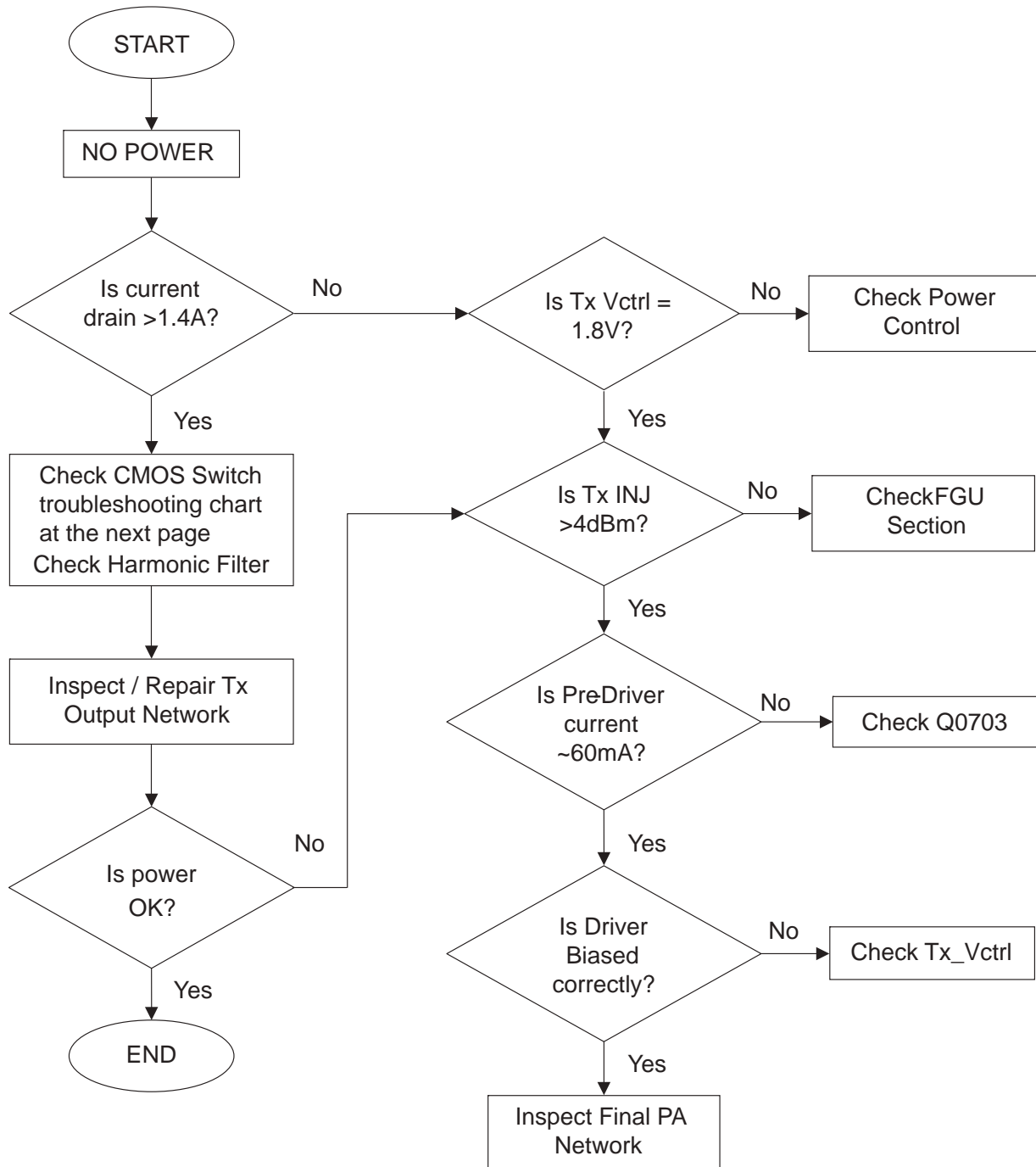
**Figure 5-13. Troubleshooting Flow Chart for Receiver (Sheet 1 of 3)**



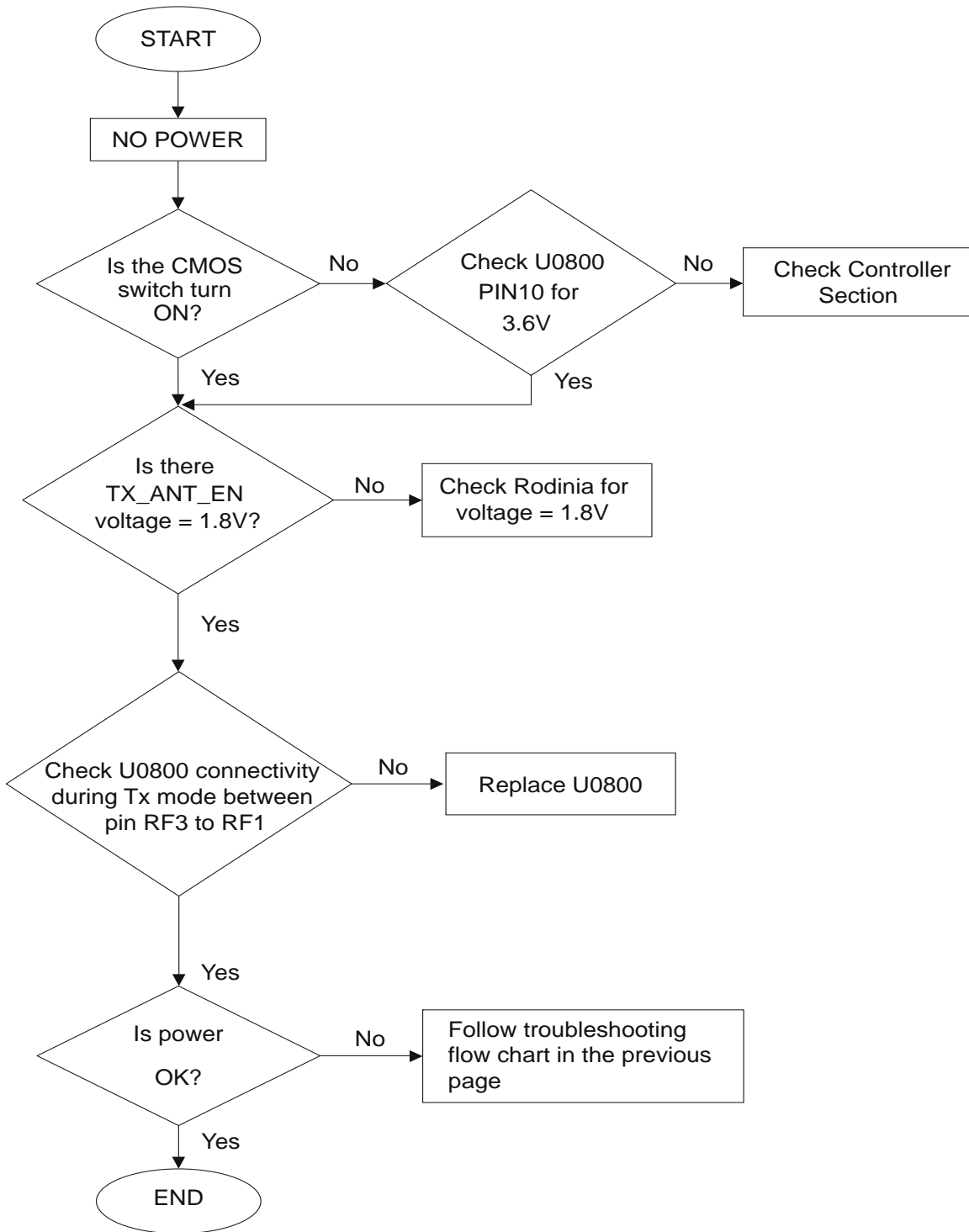
**Figure 5-14. Troubleshooting Flow Chart for Receiver (Sheet 2 of 3)**



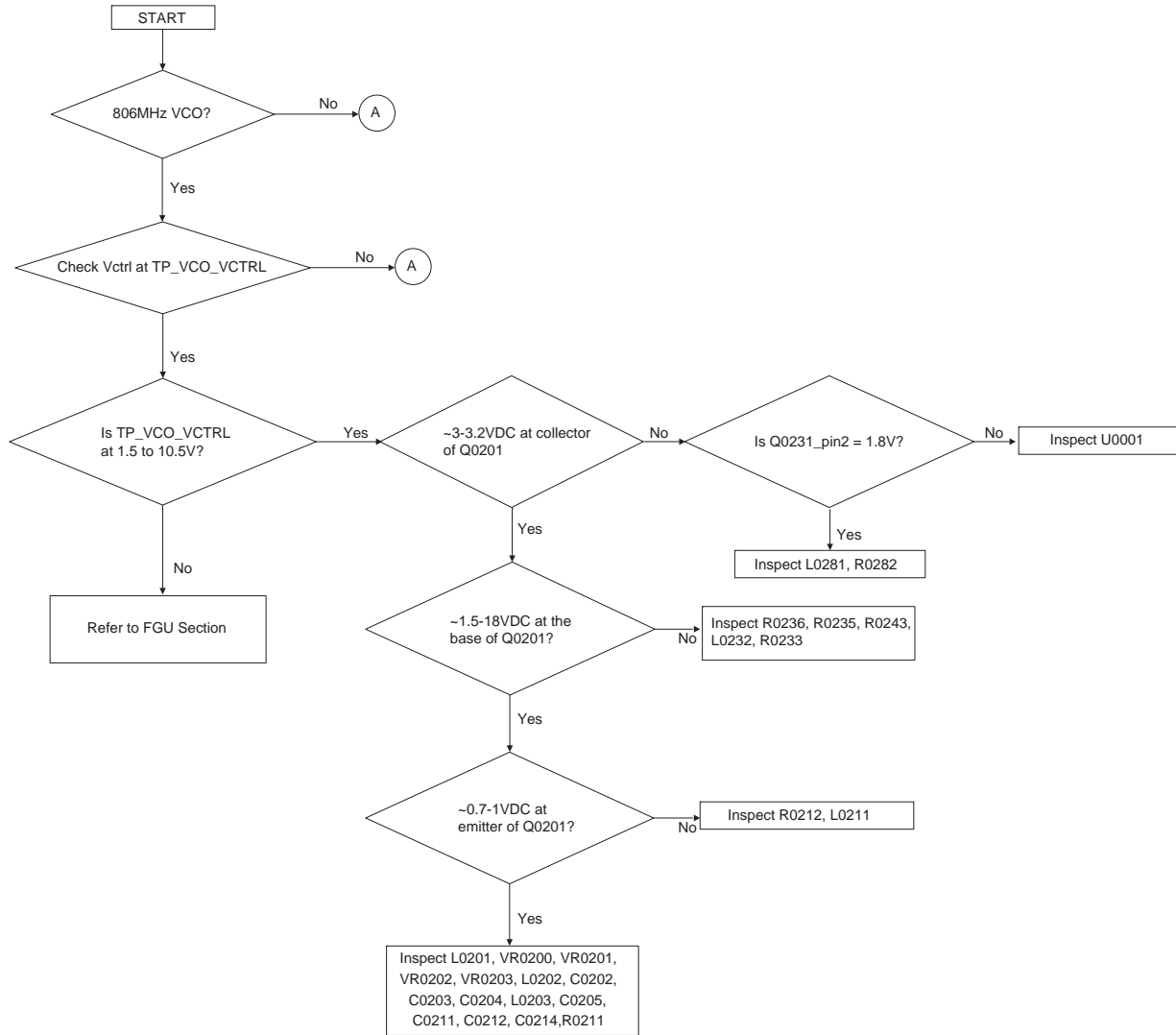
**Figure 5-15. Troubleshooting Flow Chart for Receiver (Sheet 3 of 3)**



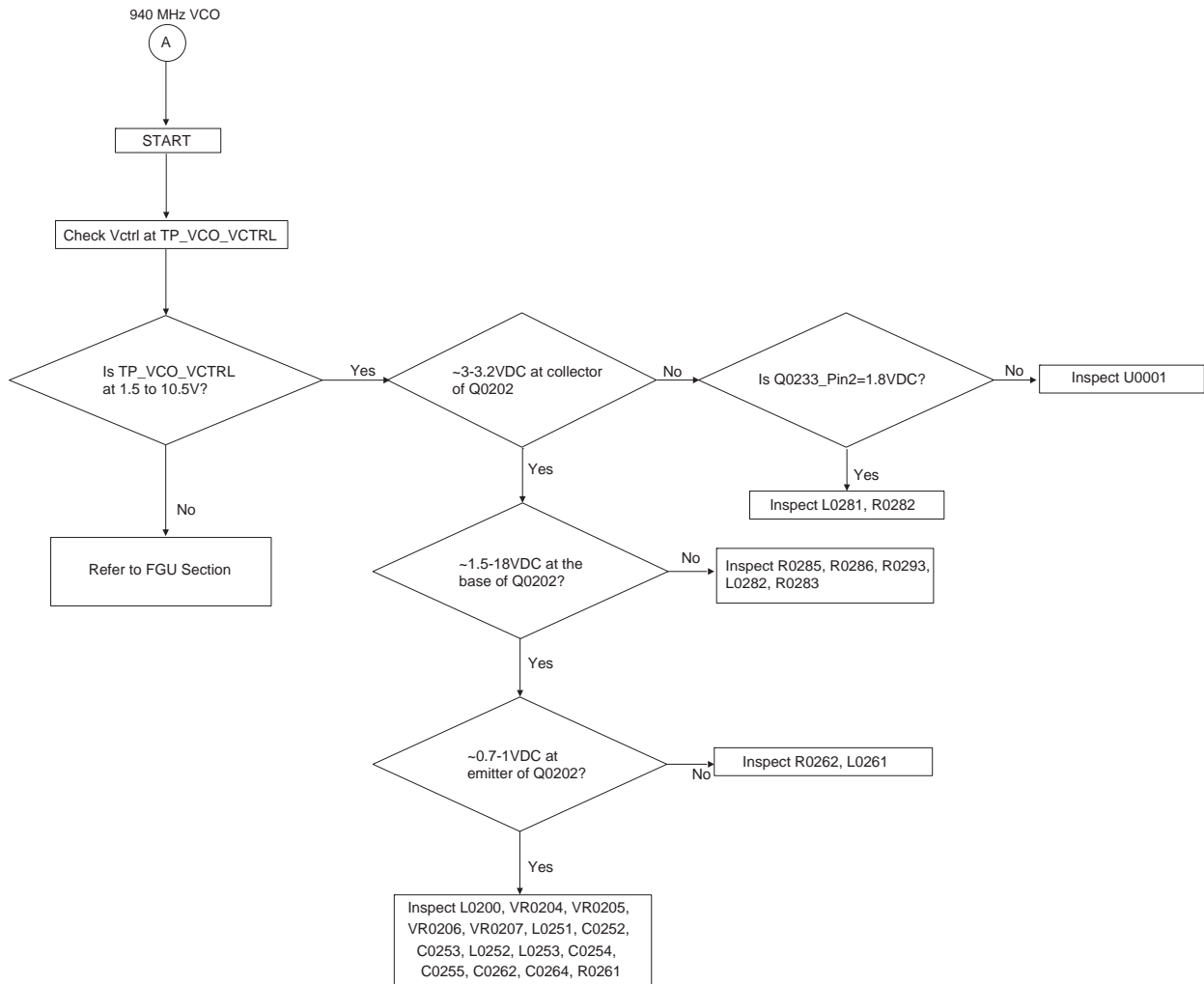
**Figure 5-16. Troubleshooting Flow Chart for Transmitter**



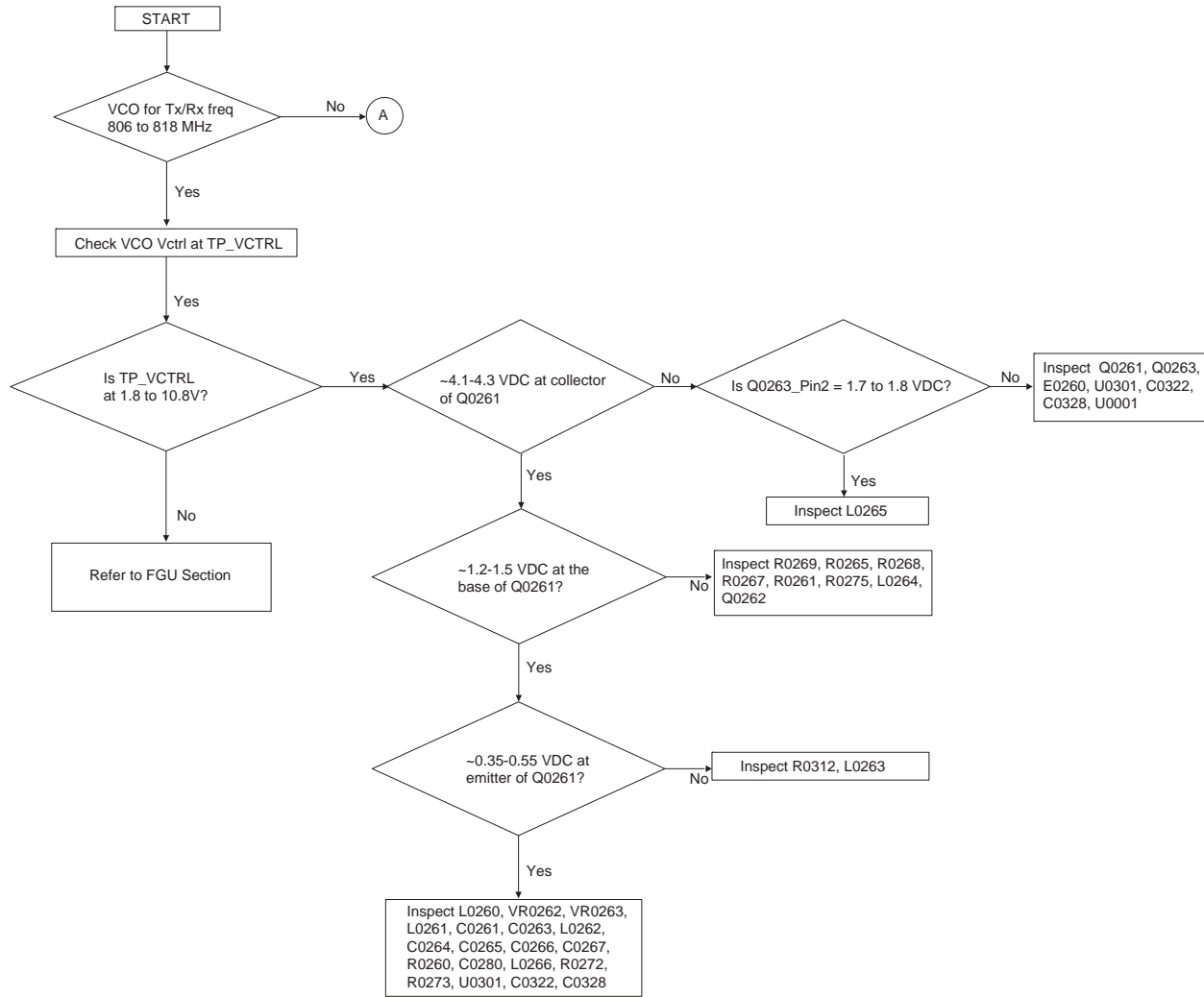
**Figure 5-17. Troubleshooting Flow Chart for Transmitter(CMOS Section)**



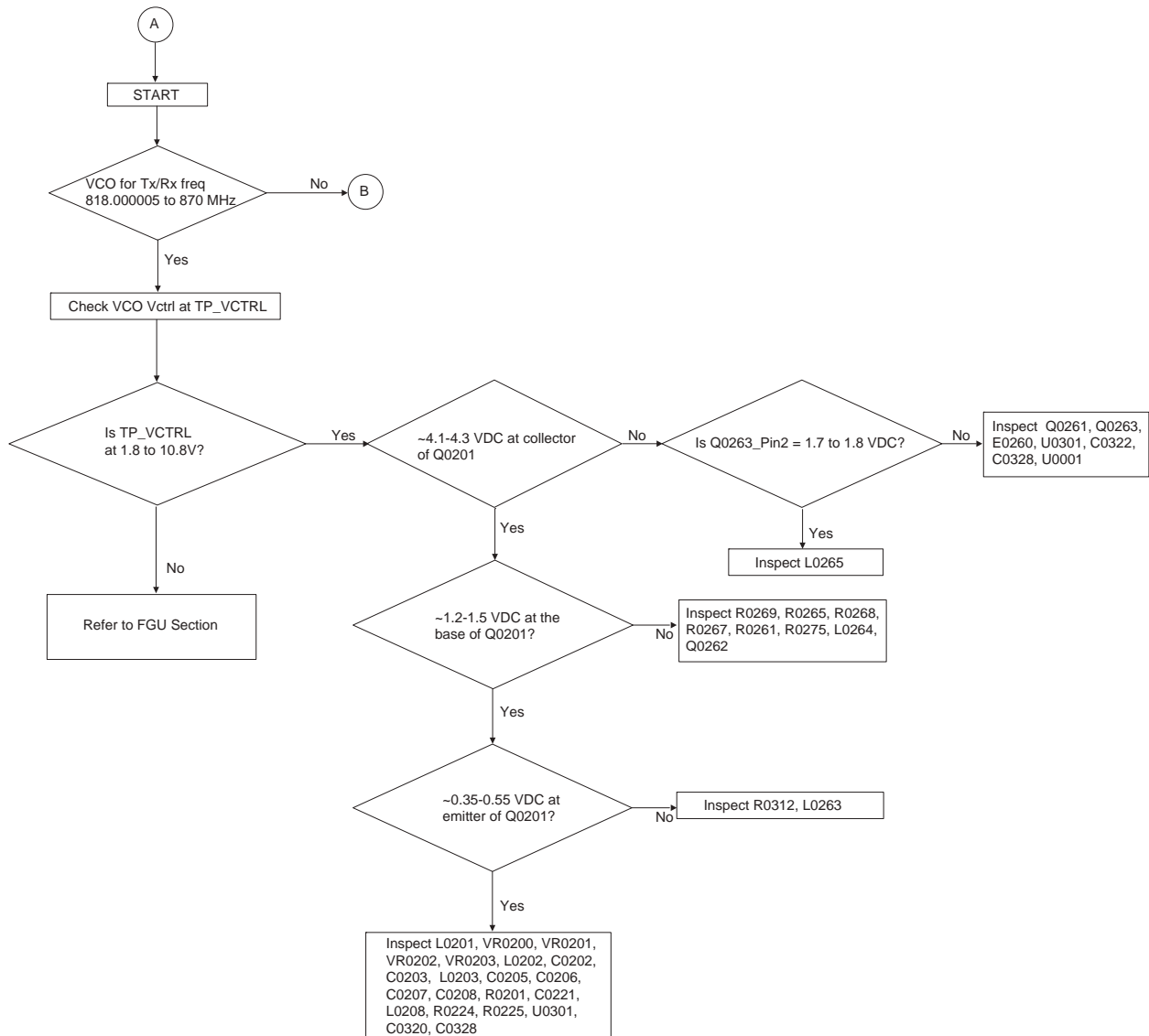
**Figure 5-18. Troubleshooting Flow Chart for VCO (Sheet 1 of 2)**



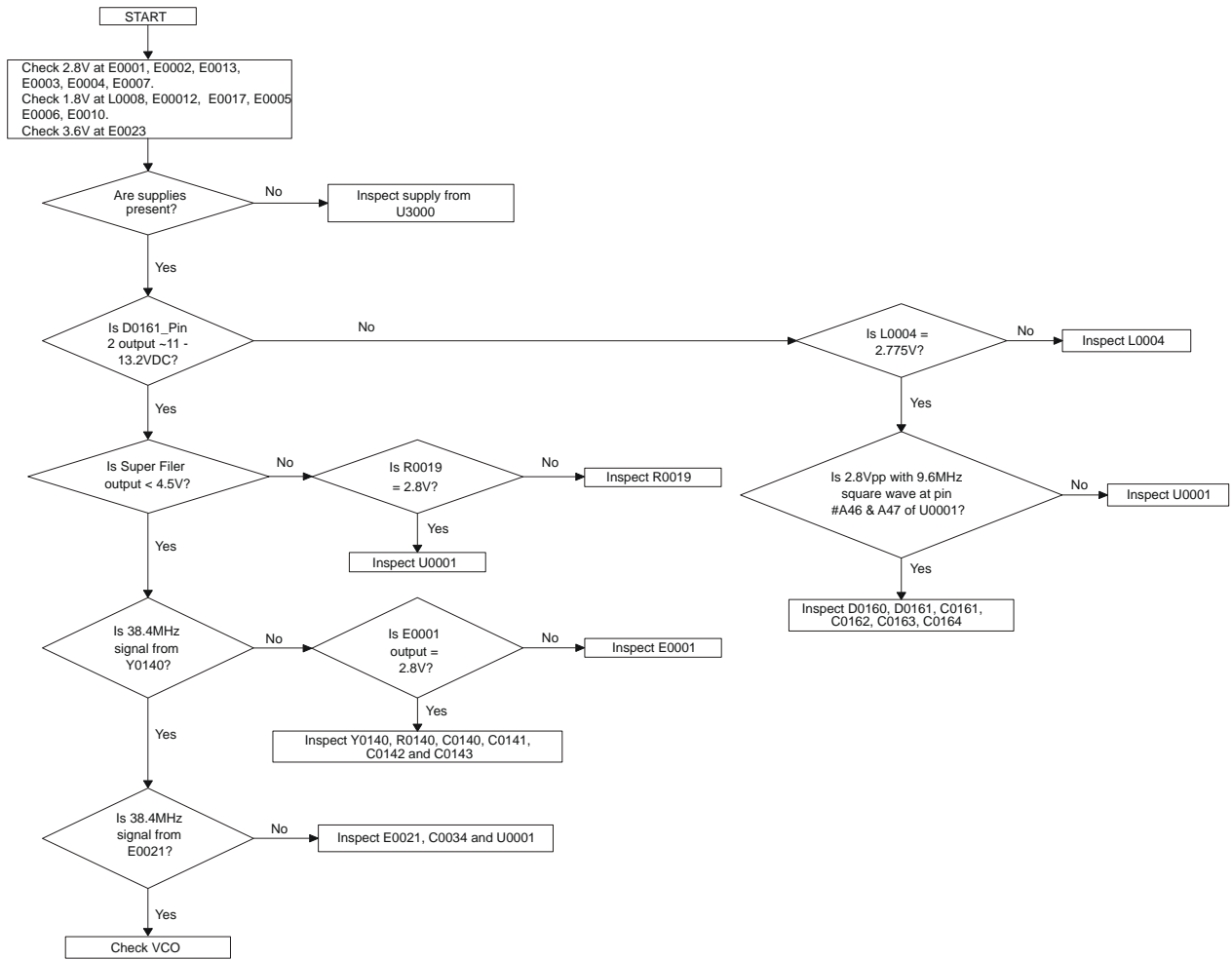
**Figure 5-19. Troubleshooting Flow Chart for VCO (Sheet 2 of 2)**



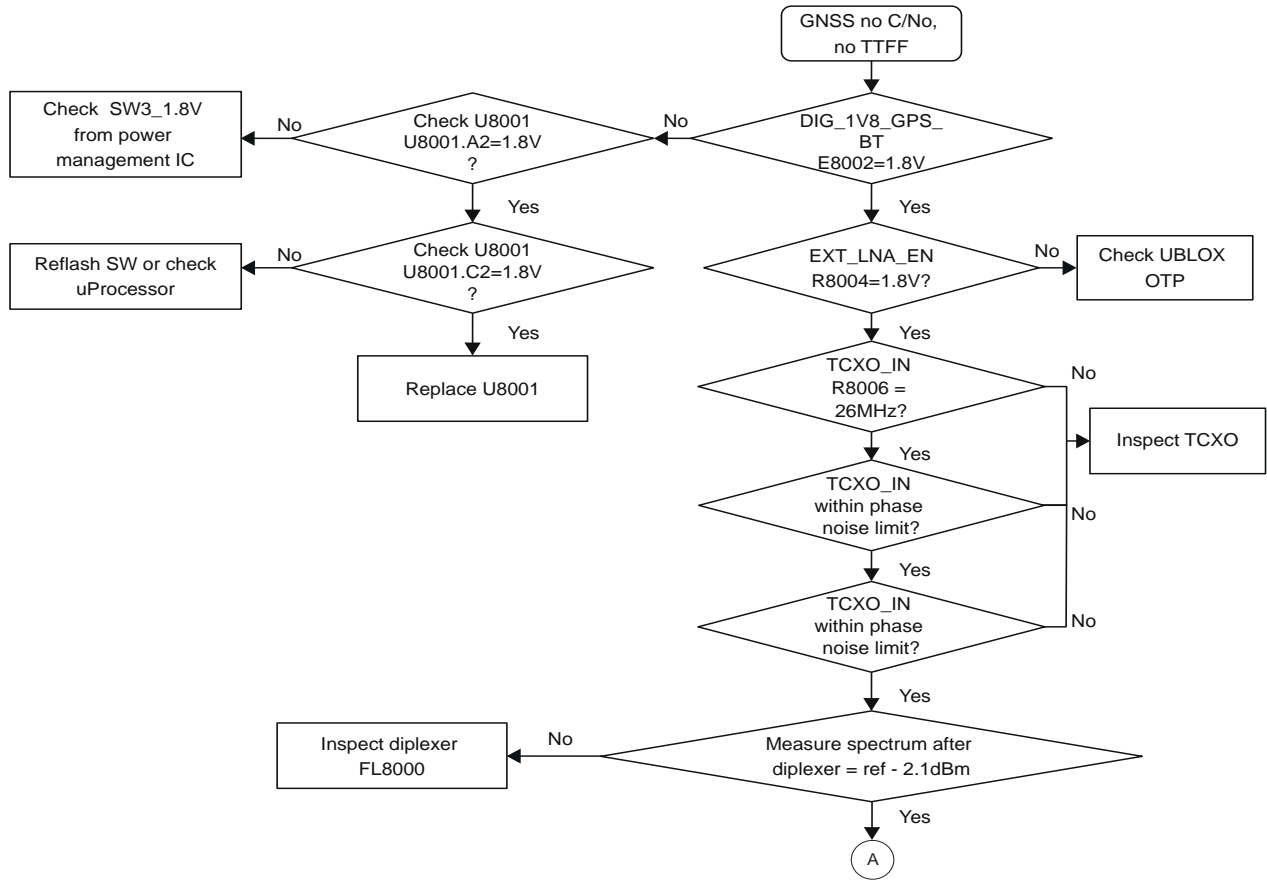
**Figure 5-20. Troubleshooting Flow Chart for VCO 8/900 MHz (Sheet 1 of 2)**



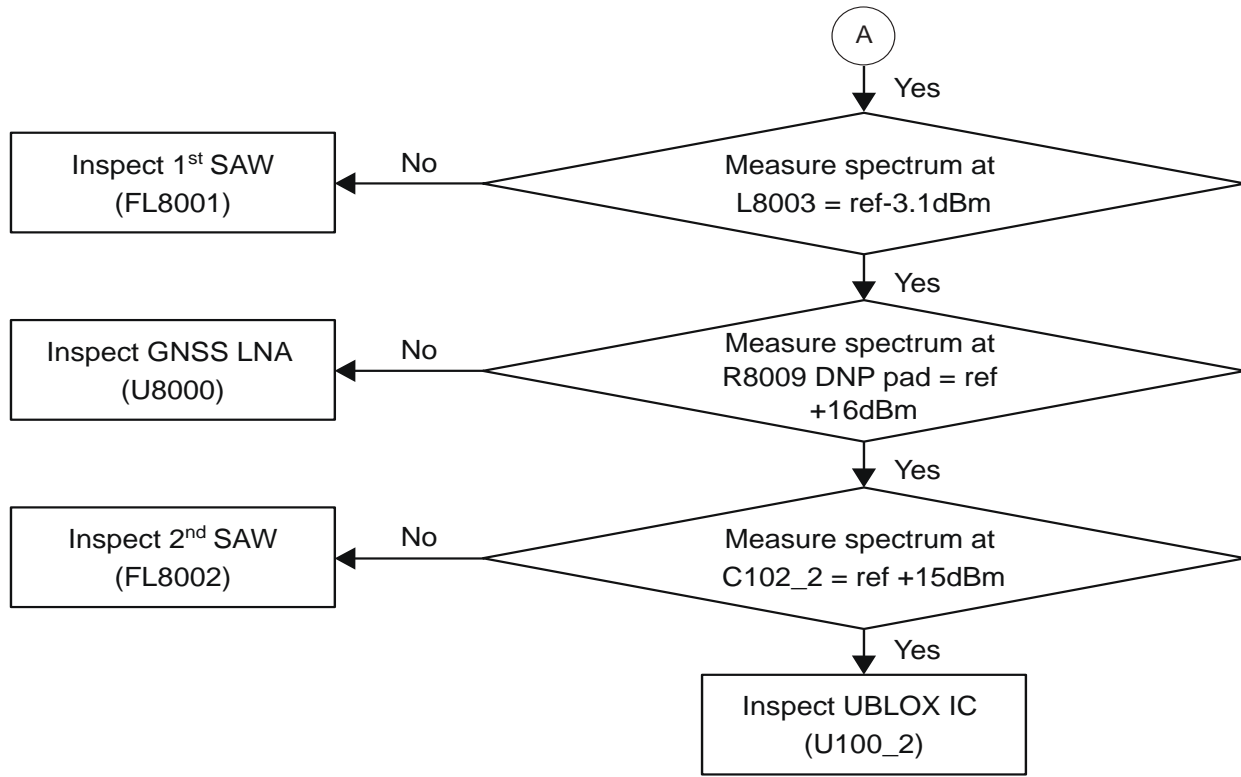
**Figure 5-21. Troubleshooting Flow Chart for VCO 8/900 MHz (Sheet 2 of 2)**



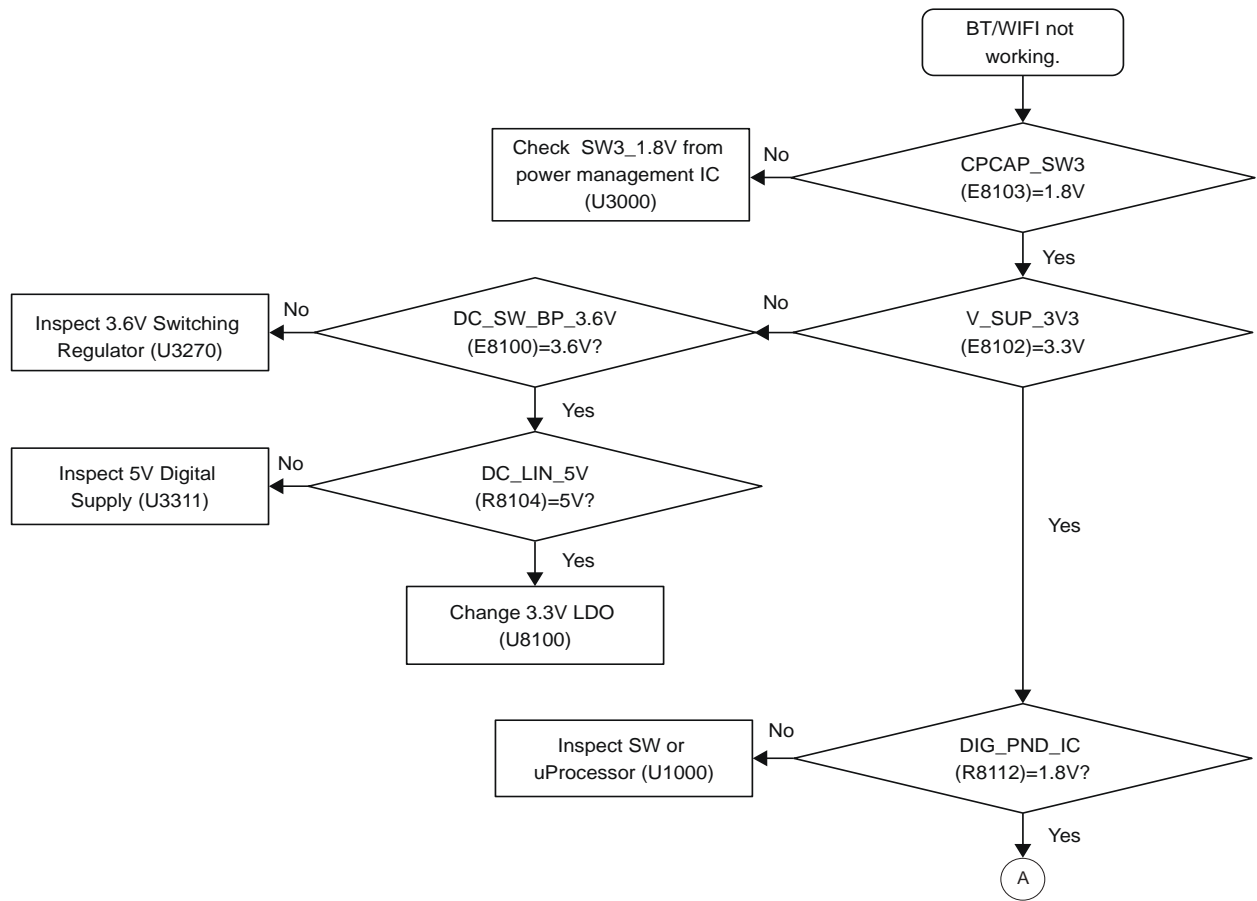
**Figure 5-22. Troubleshooting Flow Chart for Synthesizer**



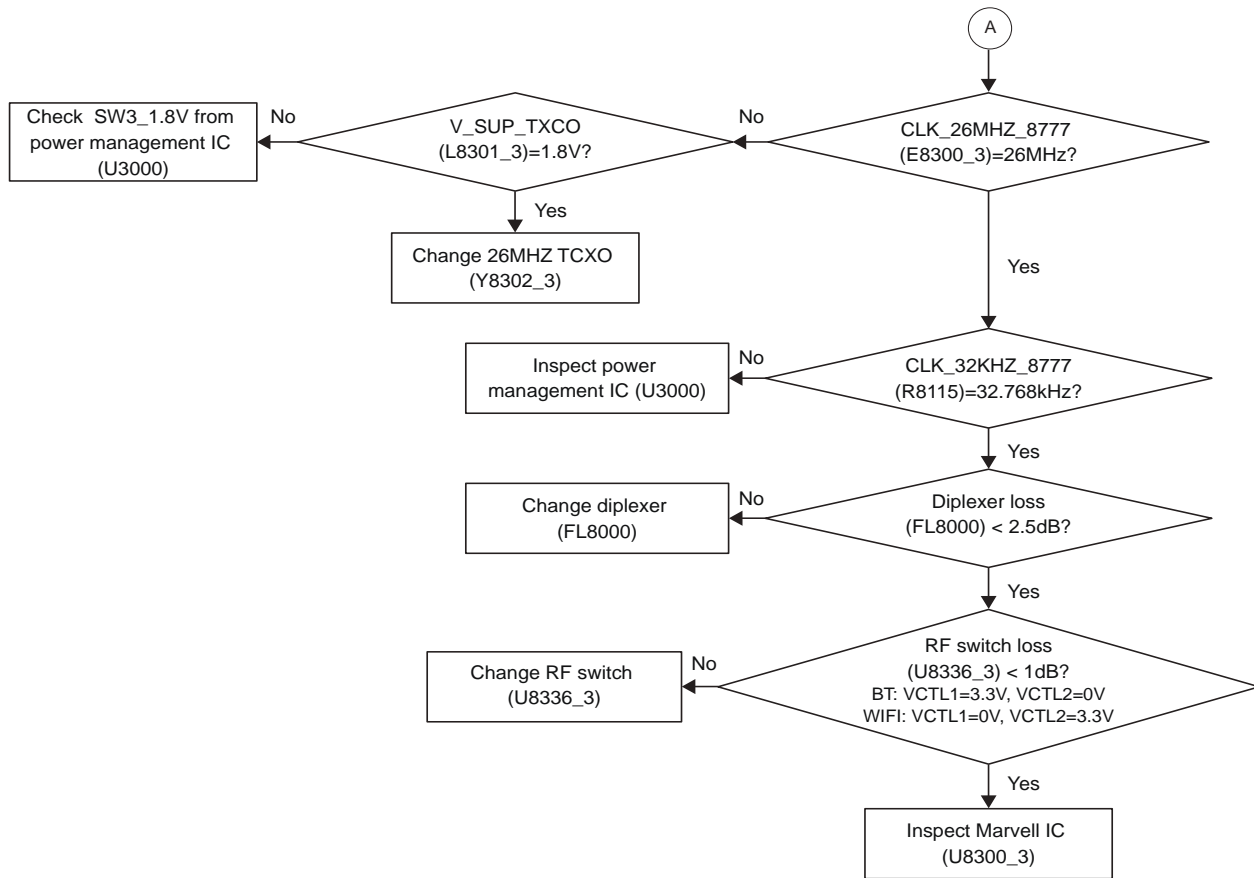
**Figure 5-23. Troubleshooting Flow Chart for GNSS (Sheet 1 of 2)**



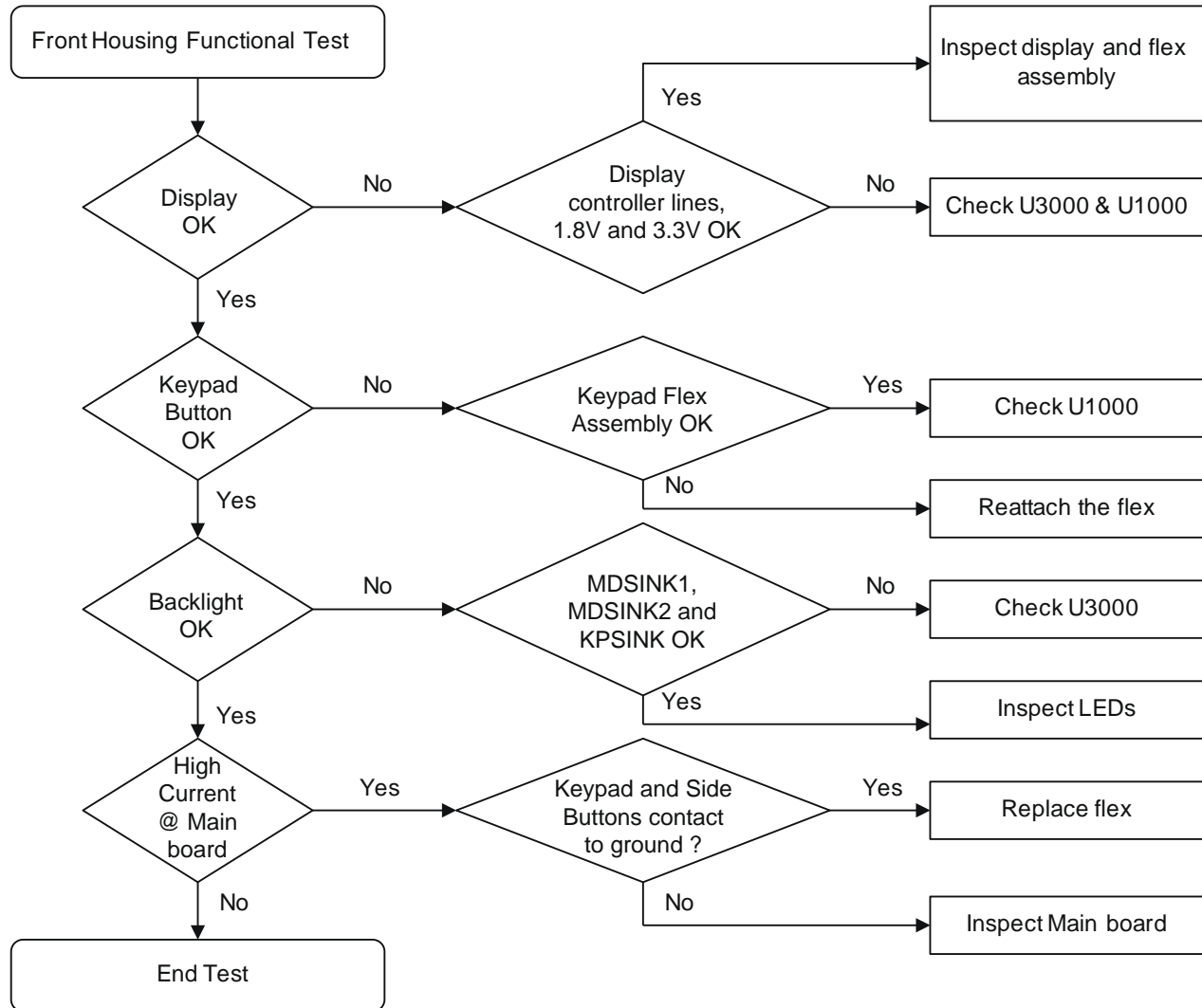
**Figure 5-24. Troubleshooting Flow Chart for GNSS (Sheet 2 of 2)**



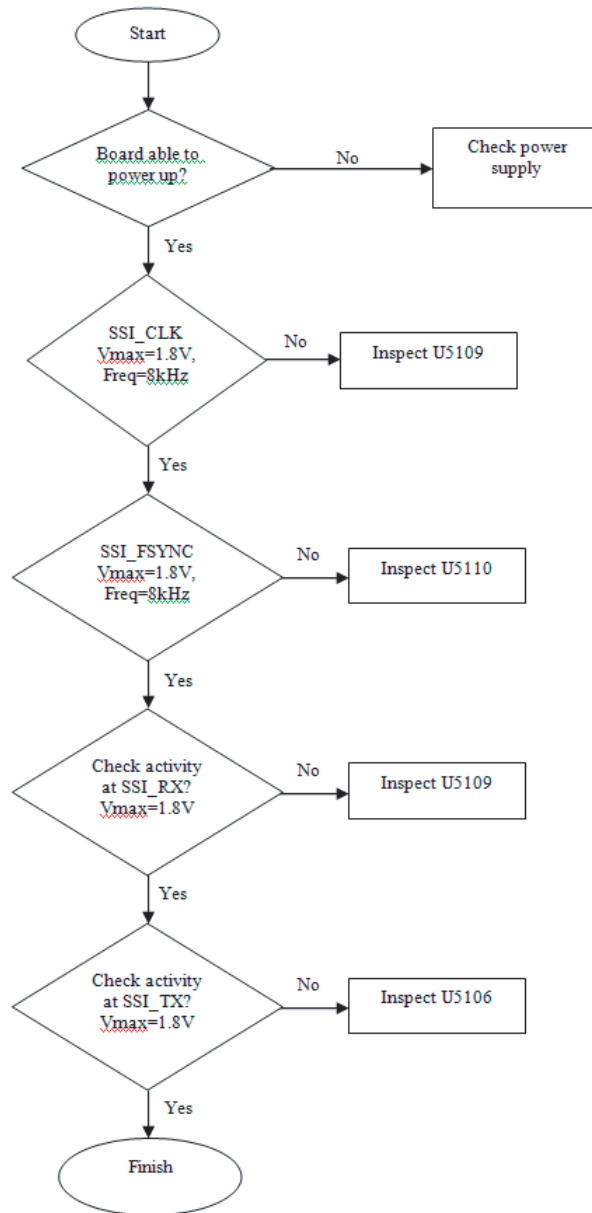
**Figure 5-25. Troubleshooting Flow Chart for Bluetooth/WiFi (Sheet 1 of 2)**



**Figure 5-26. Troubleshooting Flow Chart for Bluetooth/WiFi (Sheet 2 of 2)**

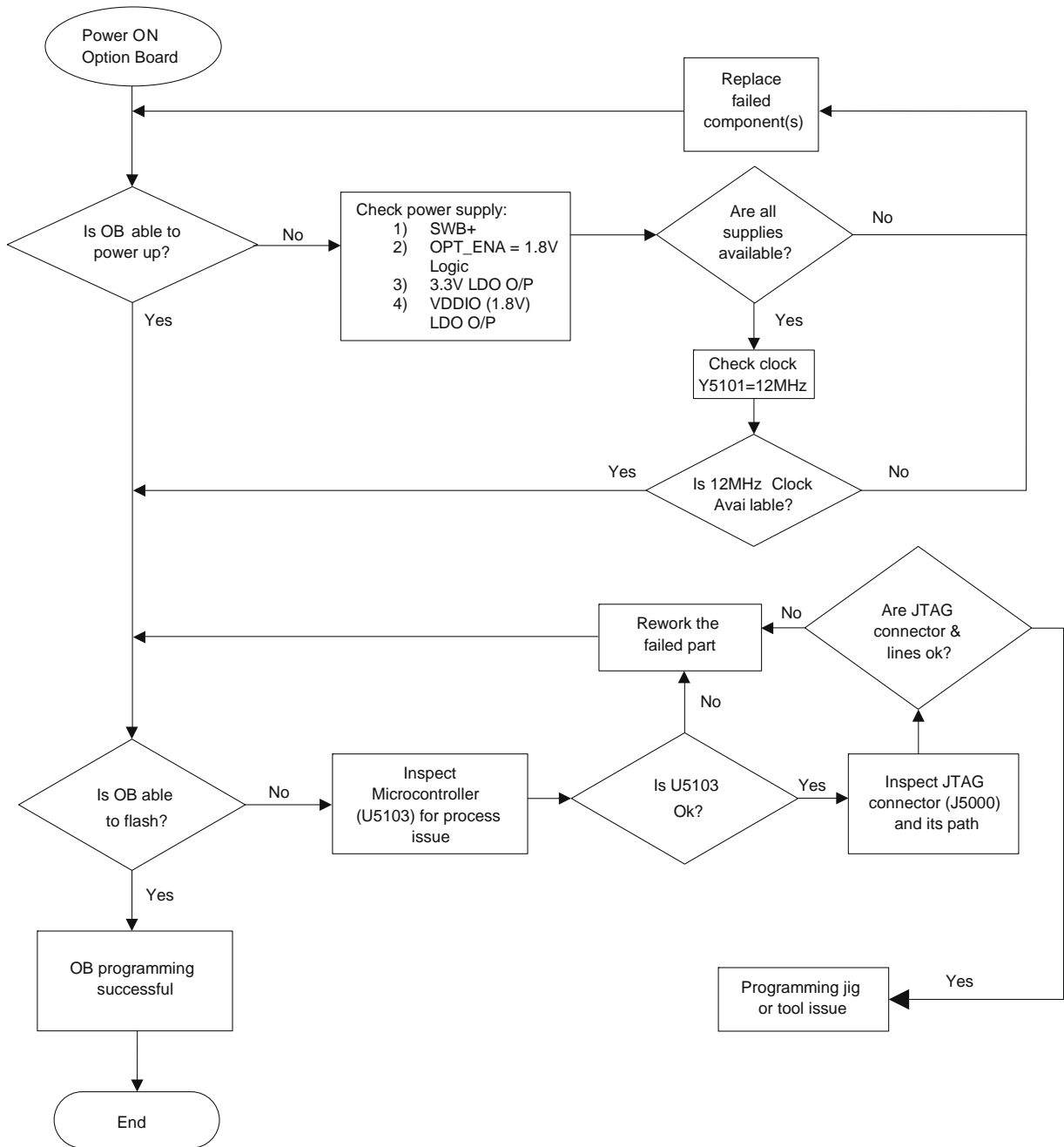


**Figure 5-27. Troubleshooting Flow Chart for Keypad**

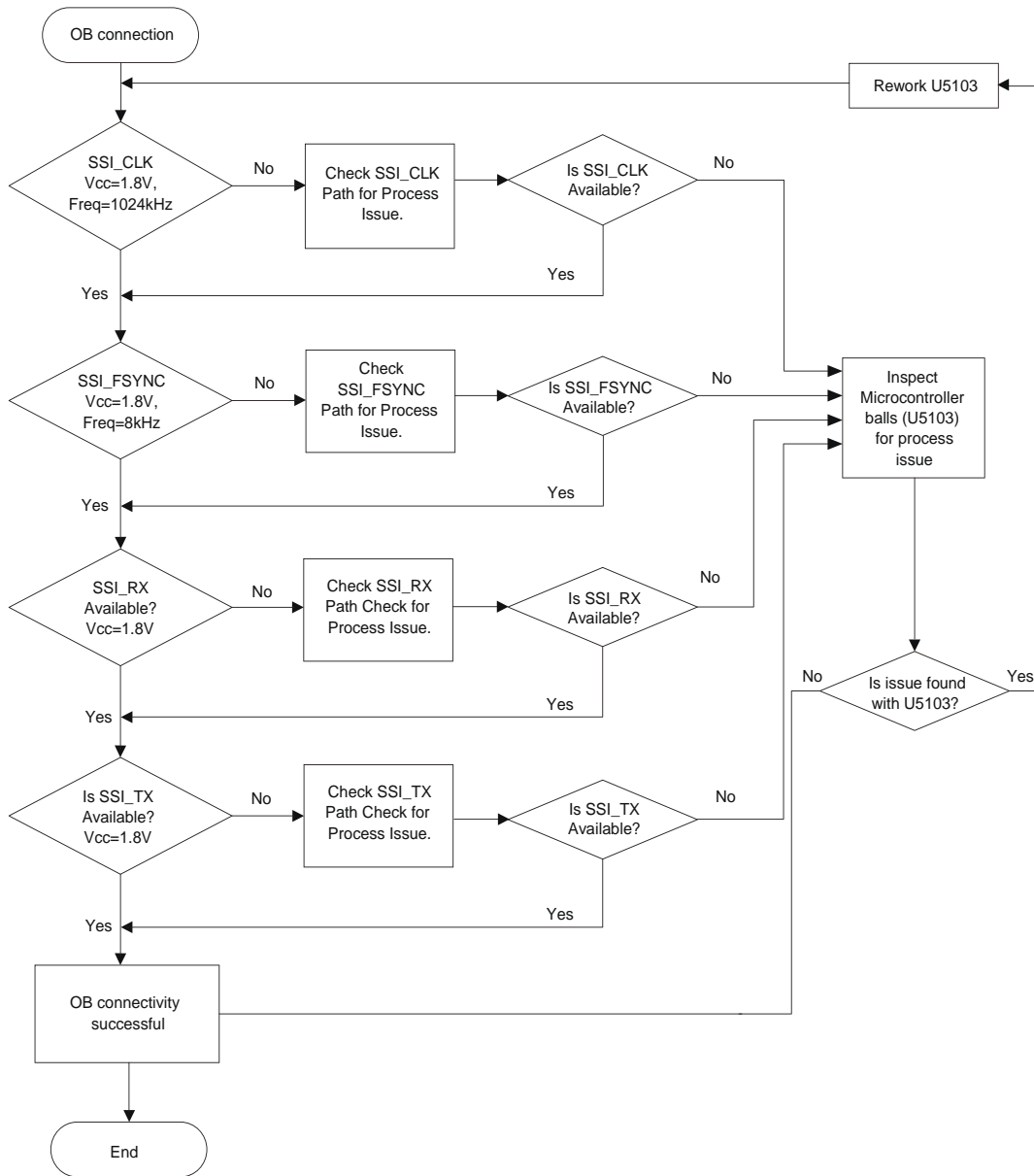


\*To check SSI lines, GOB needs to connect with radio  
\*All the SSI lines must probe with oscilloscope

**Figure 5-28. Troubleshooting Flow Chart for GOB**



**Figure 5-29. Troubleshooting Flow Chart for GOB 2 (Sheet 1 of 2)**



- \* To check SSI lines, GOB needs to connect with radio
- \* SSI activity will only continue if the connectivity with radio is successful on power up and within 4sec.
- \* All the SSI lines must be probed with oscilloscope.

**Figure 5-30. Troubleshooting Flow Chart for GOB 2 (Sheet 2 of 2)**

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## Section 6

# UHF (403–527 MHz) INFORMATION

## 1.0 Allocation of Schematics and Circuit Boards

### 1.1 Controller Circuits

The UHF circuits are contained on the Printed Circuit Board (PCB) which also contains the Controller circuits. This Chapter shows the schematics for the UHF circuits only, refer to the Controller section for details of the related Controller circuits. The PCB component layouts in this Chapter show both the Controller and UHF circuit components. The UHF schematics and the related PCB and parts list are shown in the tables below.

*Table 6-1. UHF Diagrams and Parts List*

|   |   |
|---|---|
| <b>PCB:</b><br>PC000813A01 Main Board Top Side<br>PC000813A01 Main Board Bottom Side  | <b>Page 6-3</b><br><b>Page 6-4</b>  |
| <b>SCHEMATICS:</b><br>Complete Radio Schematic Diagram<br>GNSS Schematic Diagram<br>Bluetooth and WiFi Schematic Diagram (1 of 3)<br>Bluetooth and WiFi Schematic Diagram (2 of 3)<br>Bluetooth and WiFi Schematic Diagram (3 of 3)<br>Controller Schematic Diagram<br>Memory Schematic Diagram<br>Microprocessor Schematic Diagram (1 of 2)<br>Microprocessor Schematic Diagram (2 of 2)<br>Power Management and Audio Schematic Diagram (1 of 3)<br>Power Management and Audio Schematic Diagram (2 of 3)<br>Power Management and Audio Schematic Diagram (3 of 3)<br>Overall RF Schematic Diagram<br>VCO Schematic Diagram (1 of 3)<br>VCO Schematic Diagram (2 of 3)<br>VCO Schematic Diagram (3 of 3)<br>Transmitter Schematic Diagram<br>Receiver Schematic Diagram<br>RFIC Schematic Diagram<br>Peripheral Schematic Diagram (1 of 3)<br>Peripheral Schematic Diagram (2 of 3)<br>Peripheral Schematic Diagram (3 of 3)<br>Factory Test Points Schematic Diagram | <b>Page 6-5</b><br><b>Page 6-6</b><br><b>Page 6-7</b><br><b>Page 6-8</b><br><b>Page 6-9</b><br><b>Page 6-10</b><br><b>Page 6-11</b><br><b>Page 6-12</b><br><b>Page 6-13</b><br><b>Page 6-14</b><br><b>Page 6-15</b><br><b>Page 6-16</b><br><b>Page 6-17</b><br><b>Page 6-18</b><br><b>Page 6-19</b><br><b>Page 6-20</b><br><b>Page 6-21</b><br><b>Page 6-22</b><br><b>Page 6-23</b><br><b>Page 6-24</b><br><b>Page 6-25</b><br><b>Page 6-26</b><br><b>Page 6-27</b> |
| <b>Parts List:</b><br>PC000813A01   | <b>Page 6-28</b>  |

## Notes

## 2.0 Circuit Board/Schematic Diagrams and Parts List for UHF

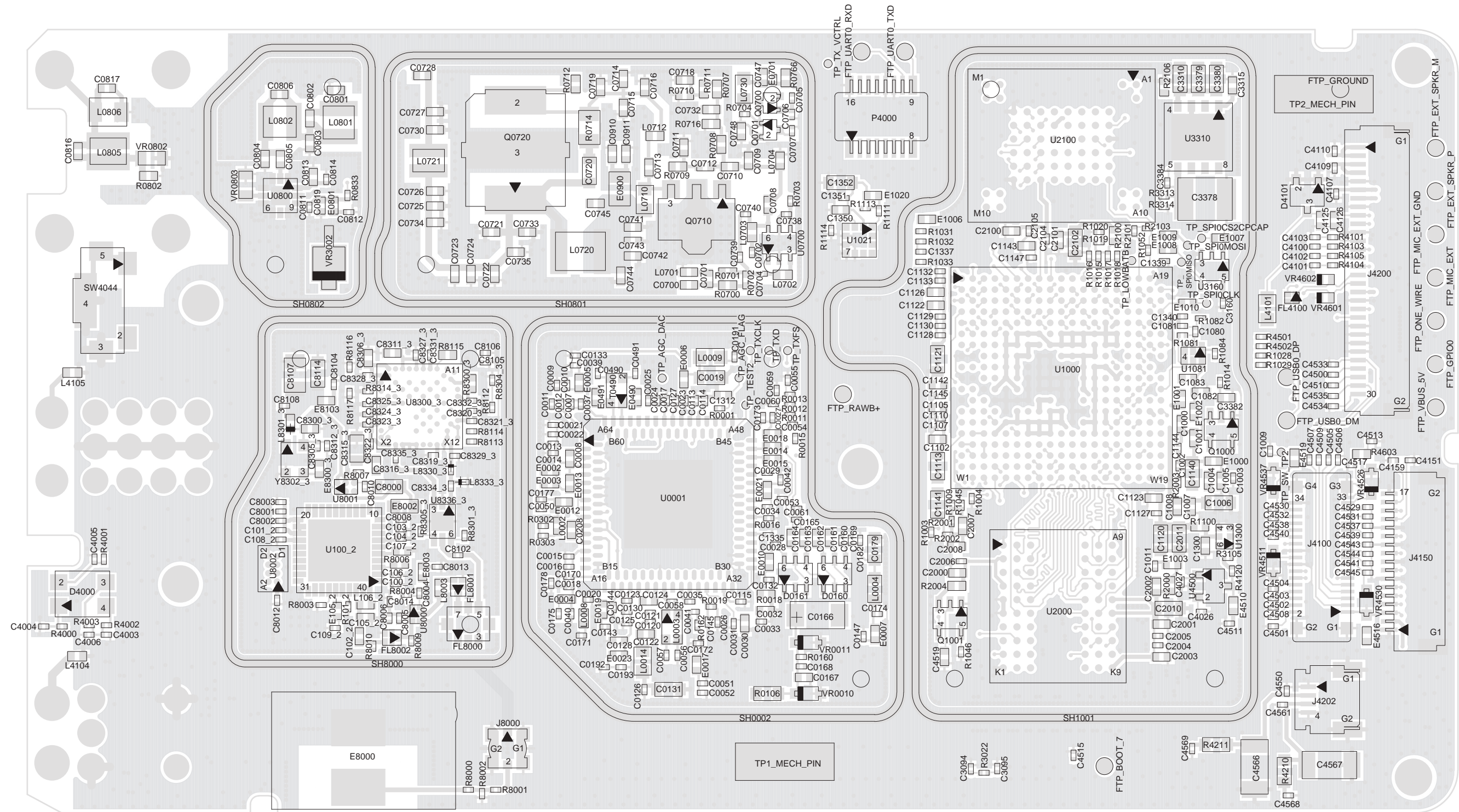
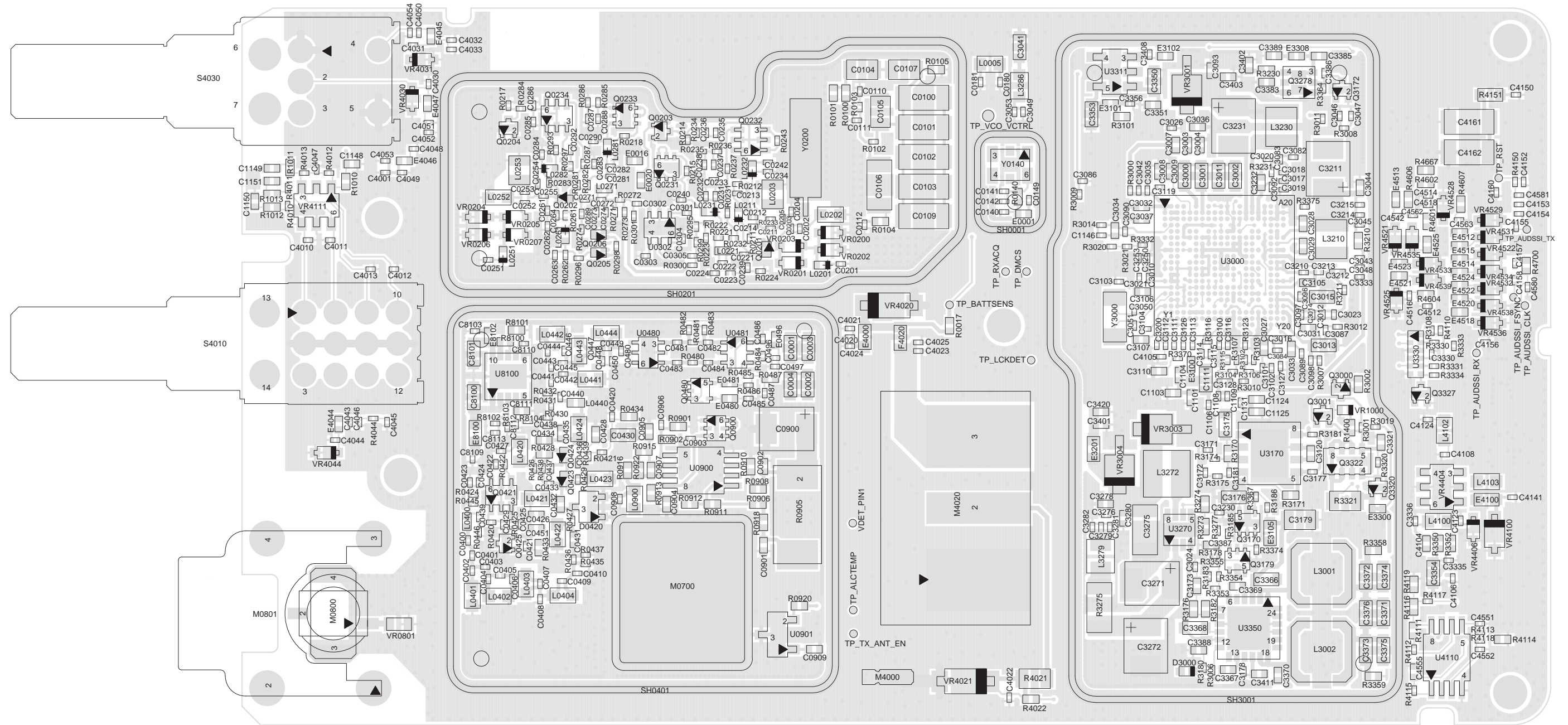


Figure 6-1. Main Board UHF Top Side PCB No. PC000813A01\_AB



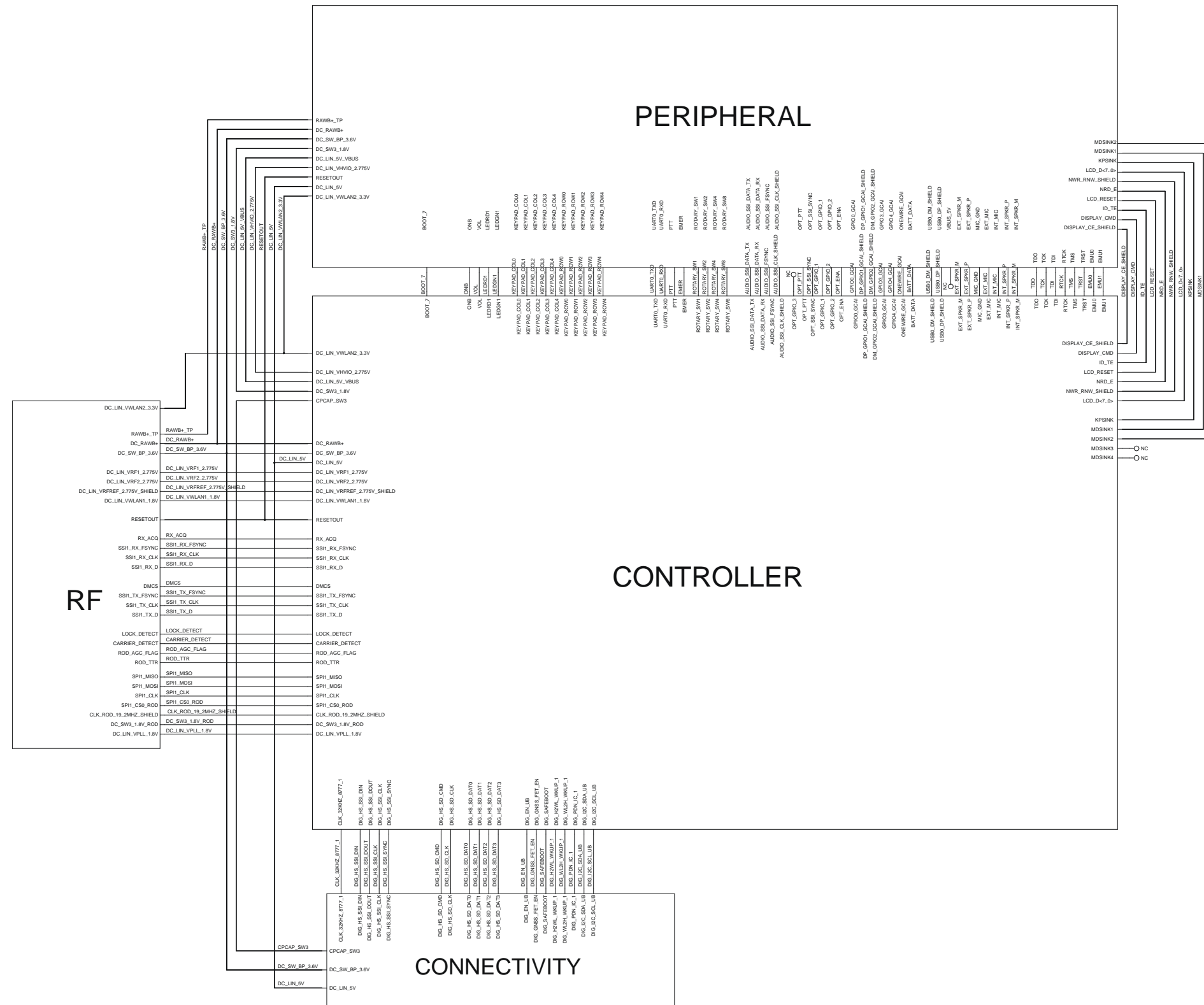


Figure 6-3. Complete Radio Circuit

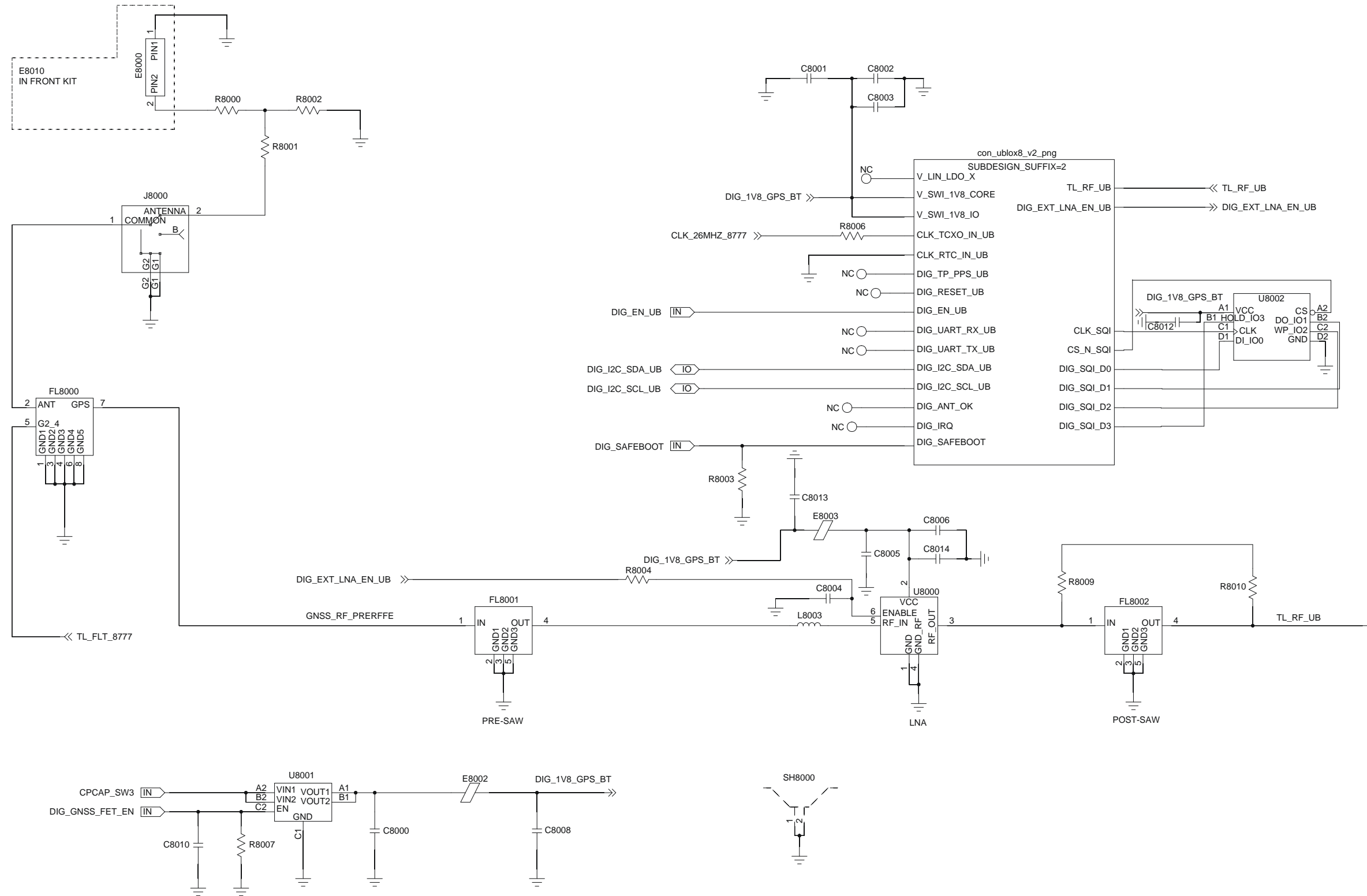


Figure 6-4. GNSS Schematic Diagram

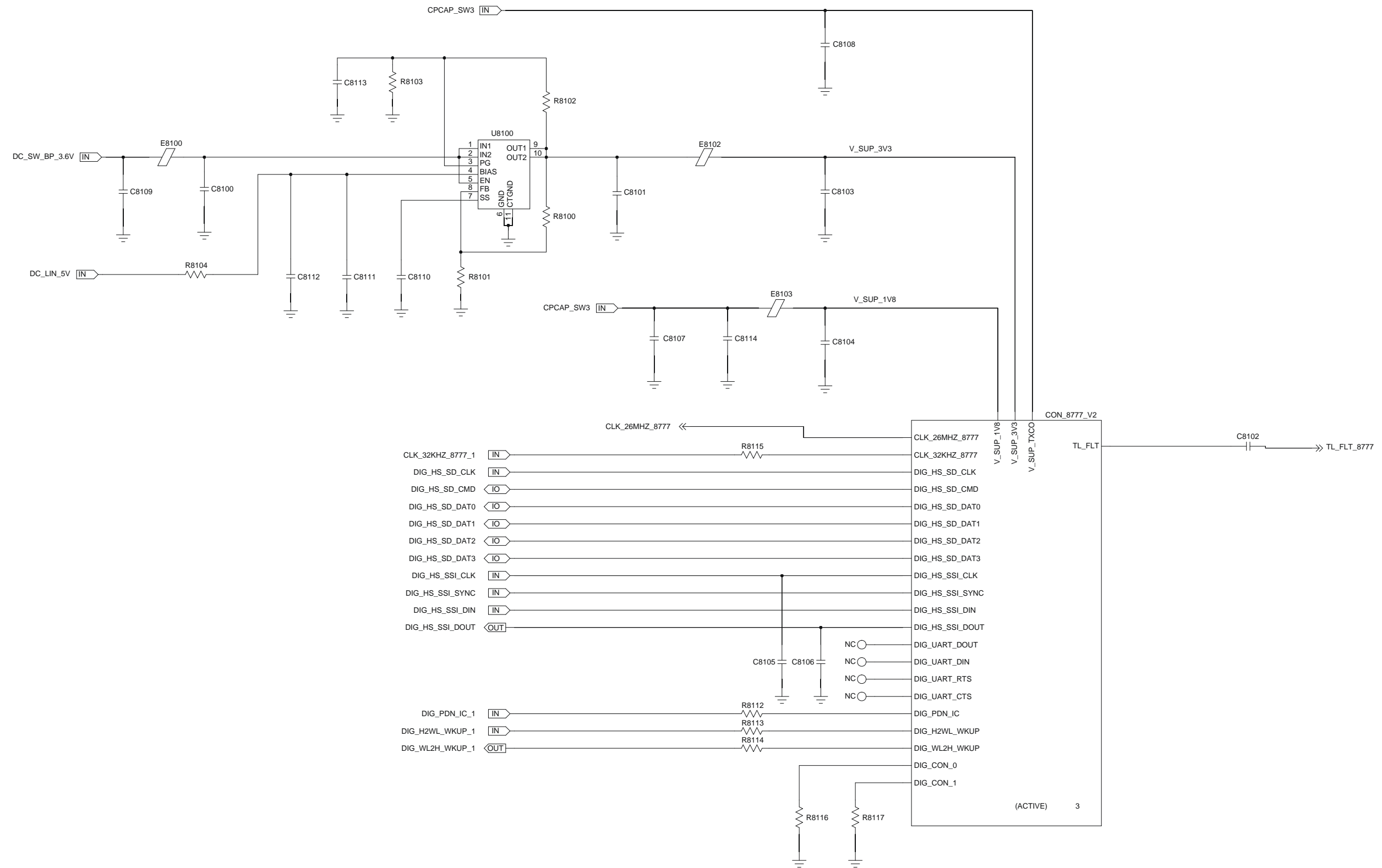


Figure 6-5. Bluetooth and WiFi Schematic Diagram (1 of 3)

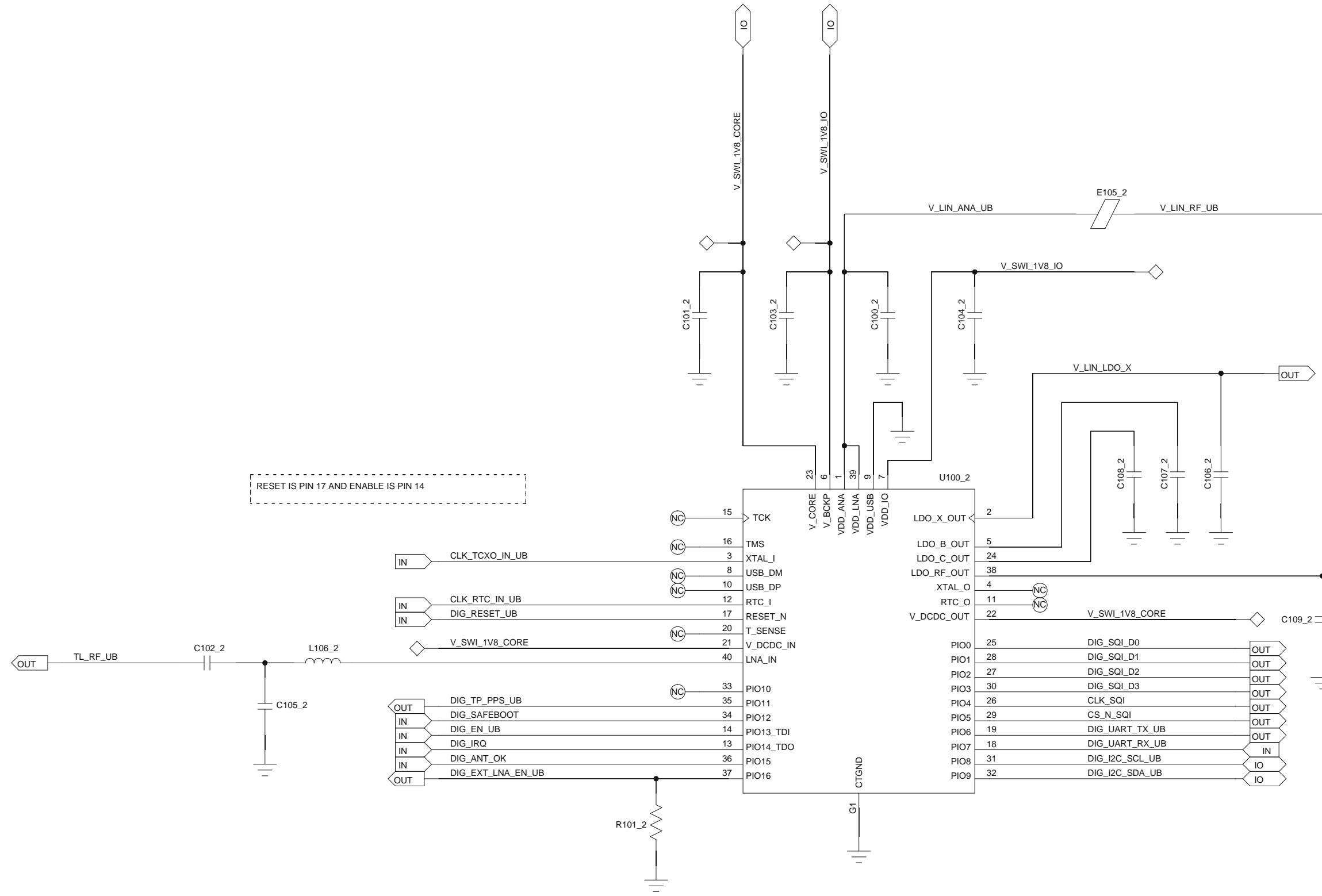


Figure 6-6. Bluetooth and WiFi Schematic Diagram (2 of 3)

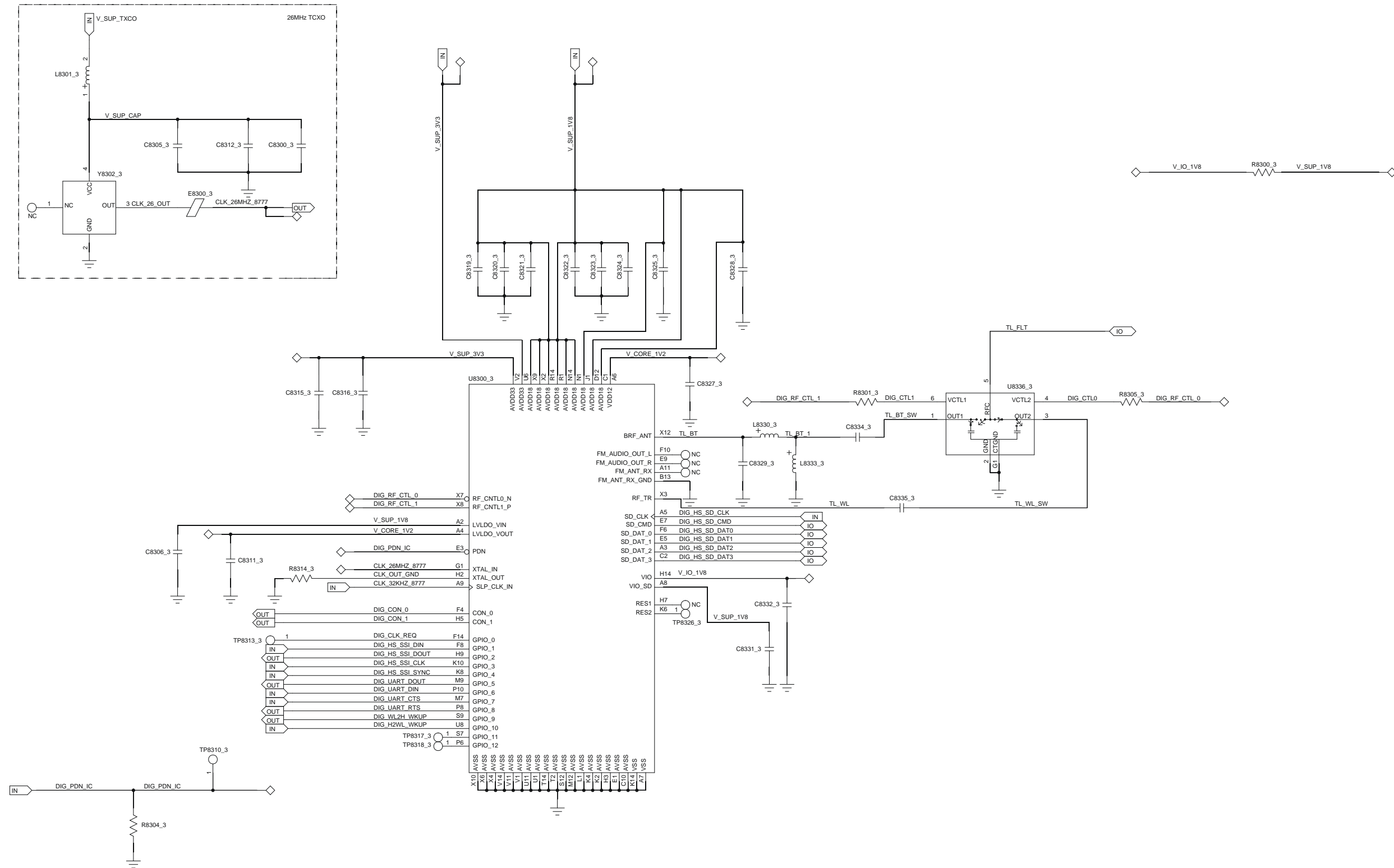


Figure 6-7. Bluetooth and WiFi Schematic Diagram (3 of 3)



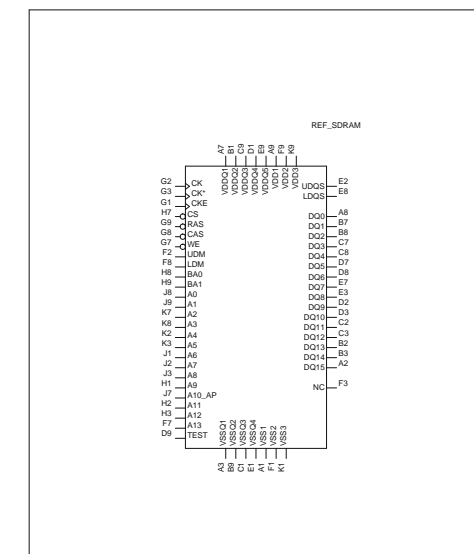
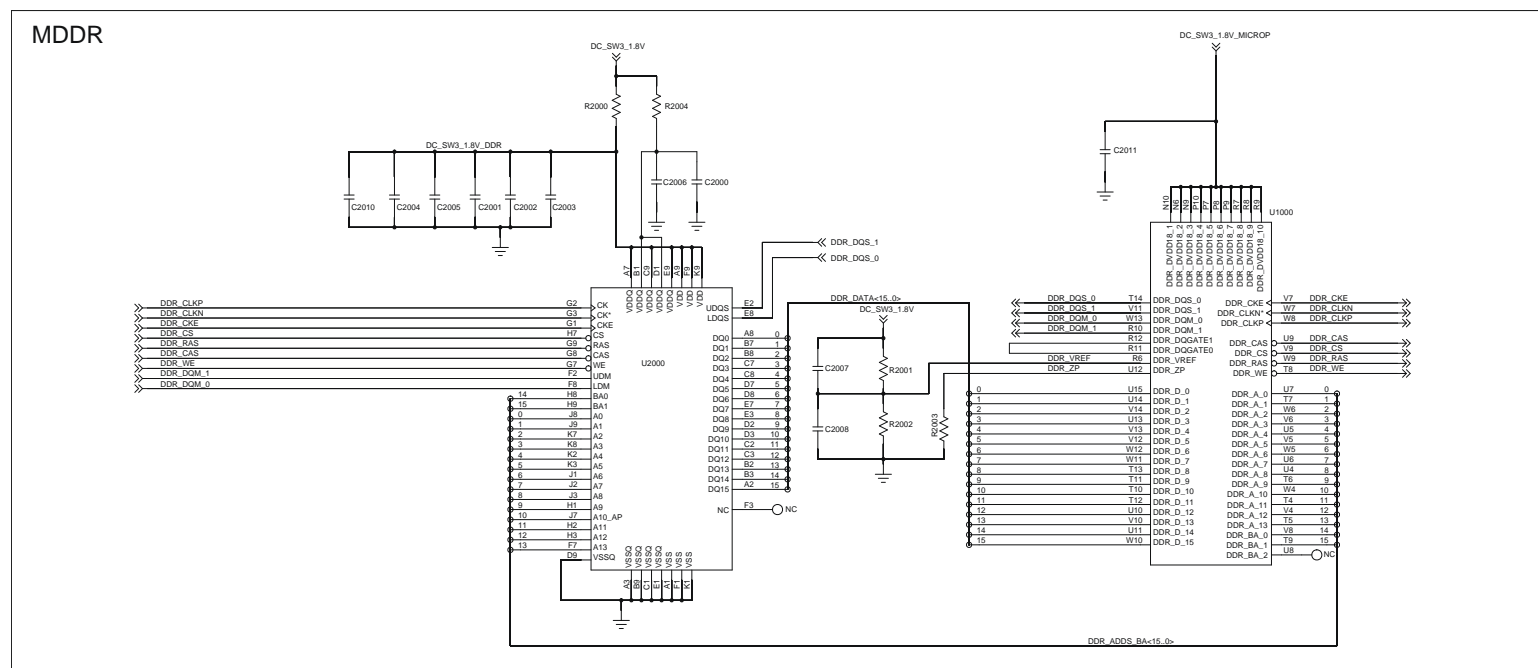
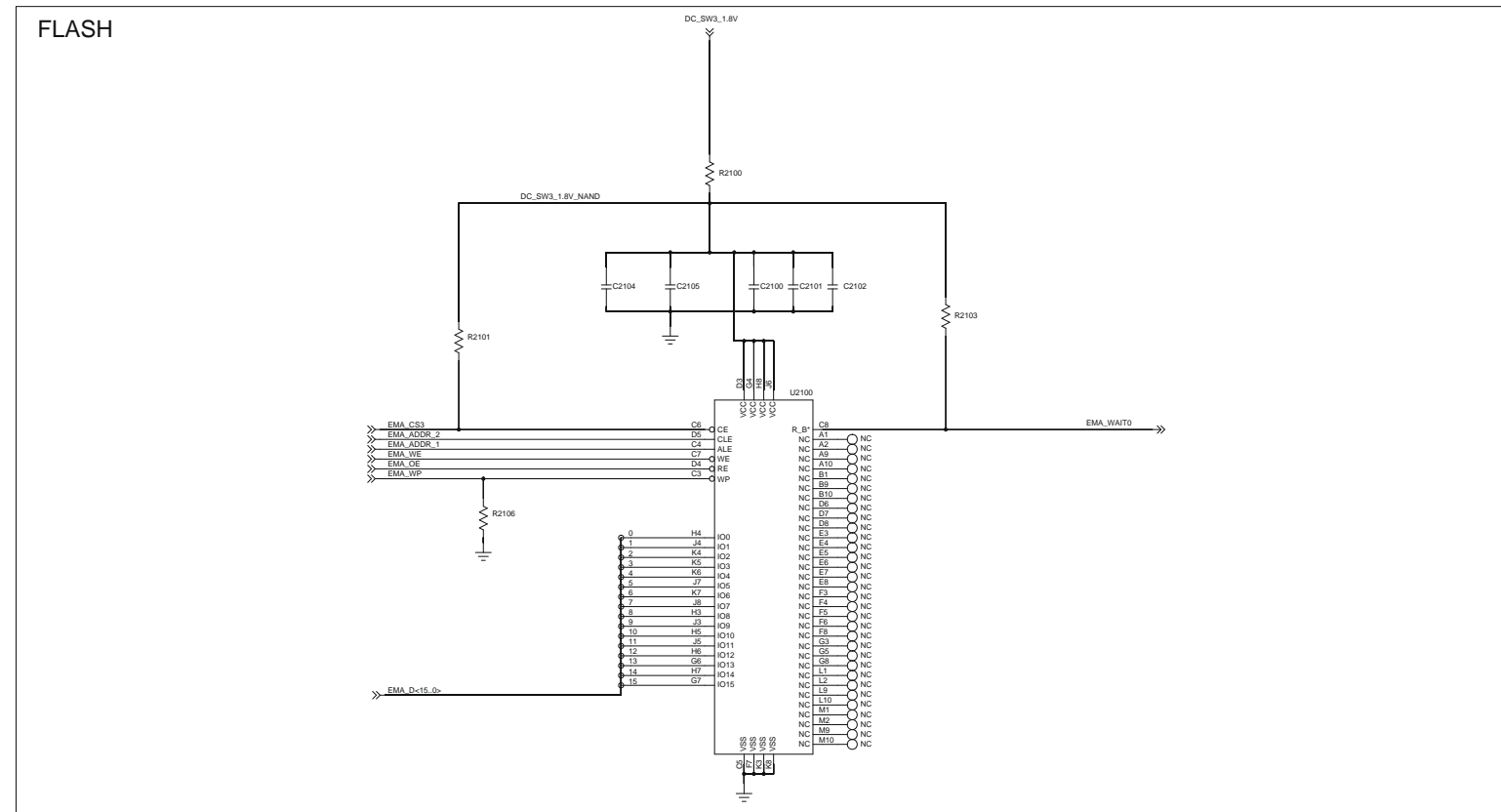


Figure 6-9. Memory Schematic Diagram

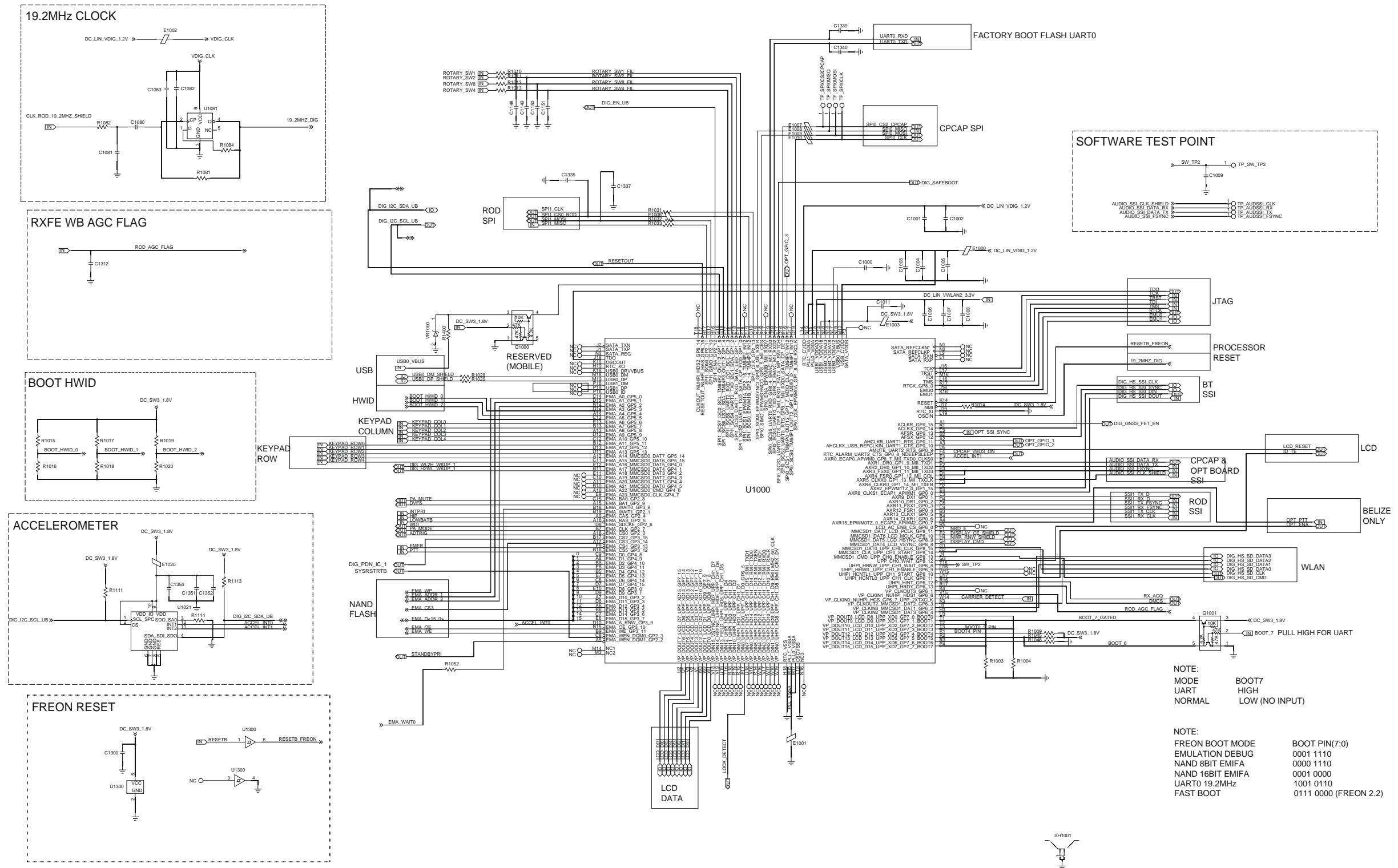


Figure 6-10. Microprocessor Schematic Diagram (1 of 2)

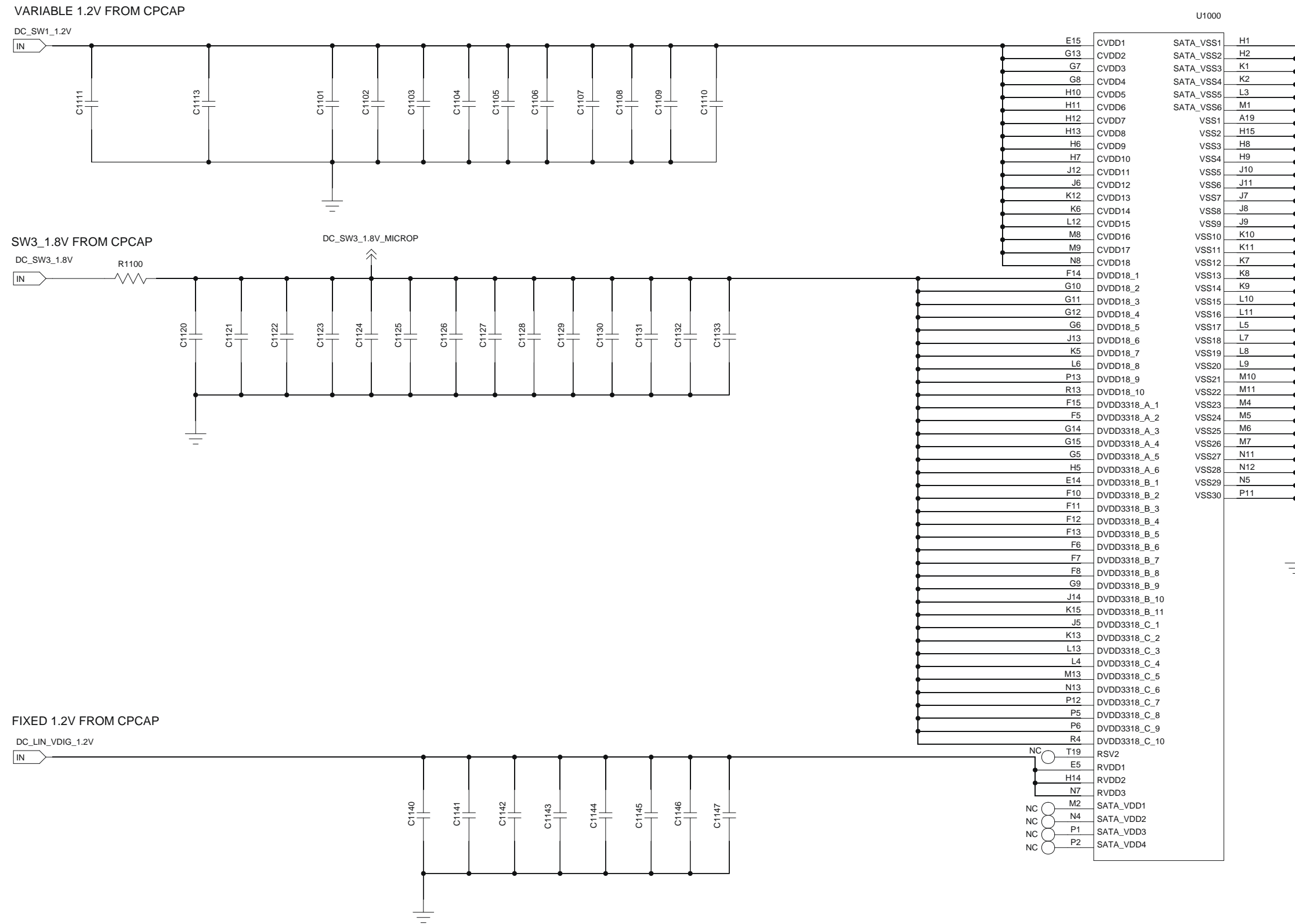


Figure 6-11. Microprocessor Schematic Diagram (2 of 2)



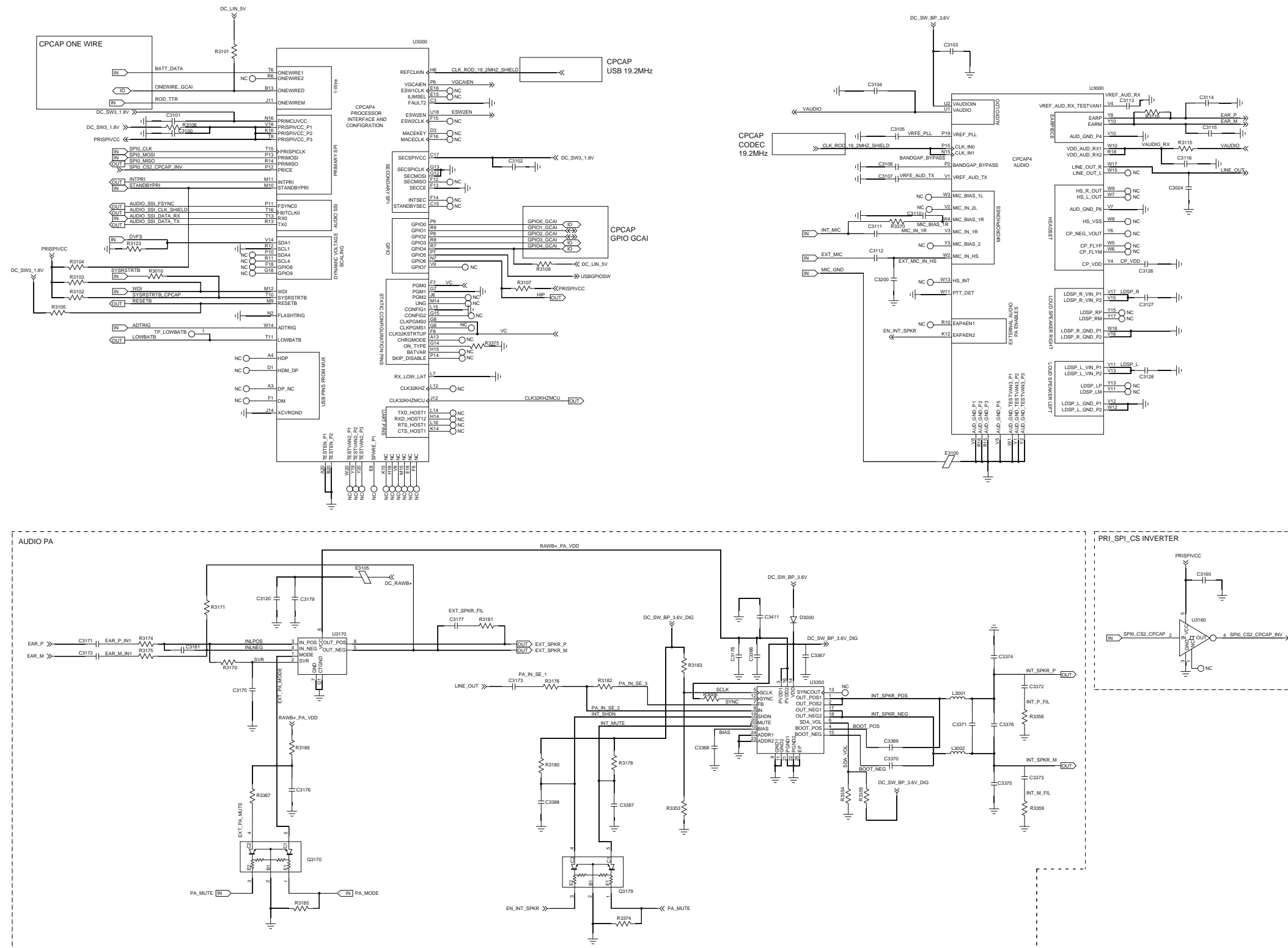


Figure 6-13. Power Management and Audio Schematic Diagram (2 of 3)

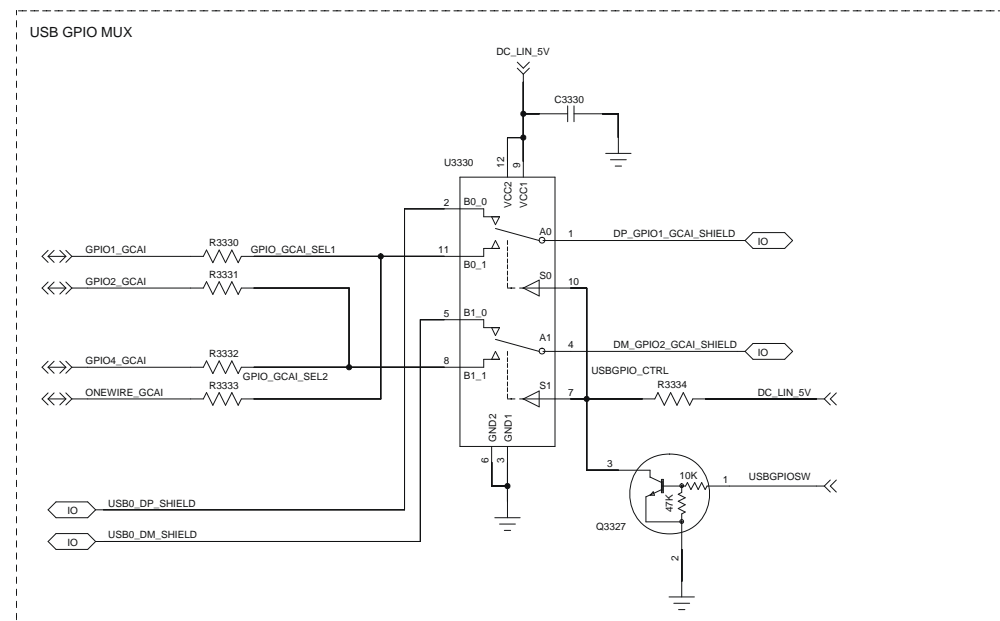
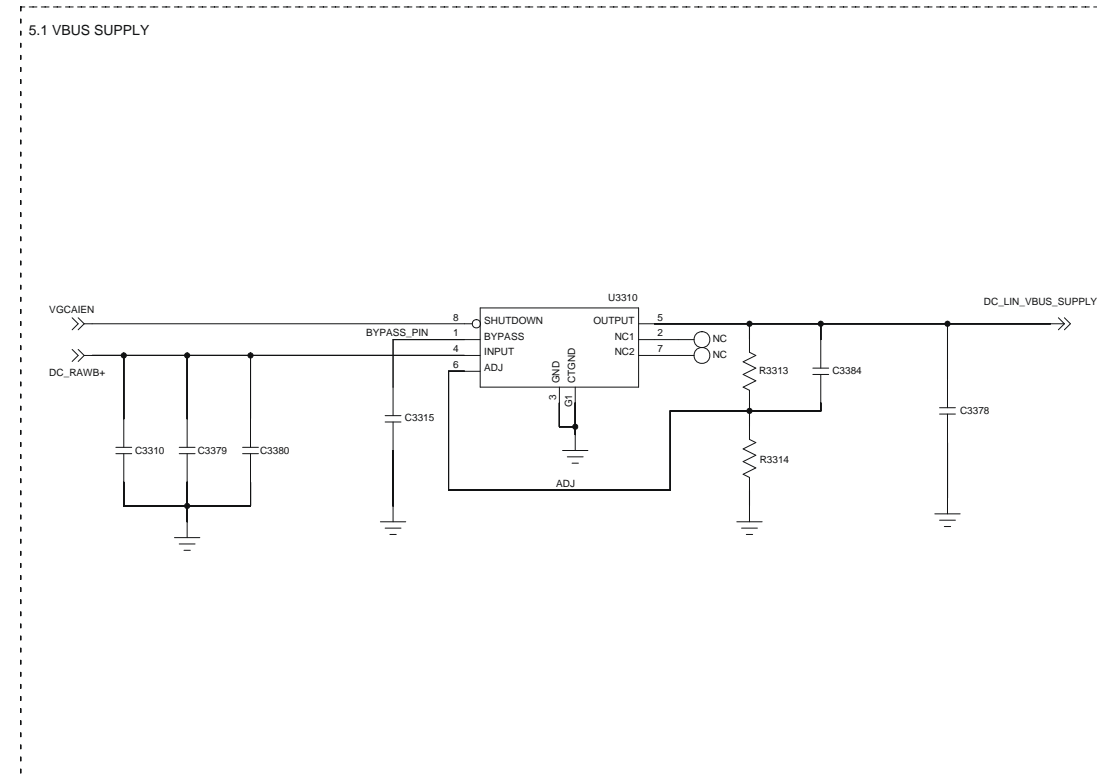
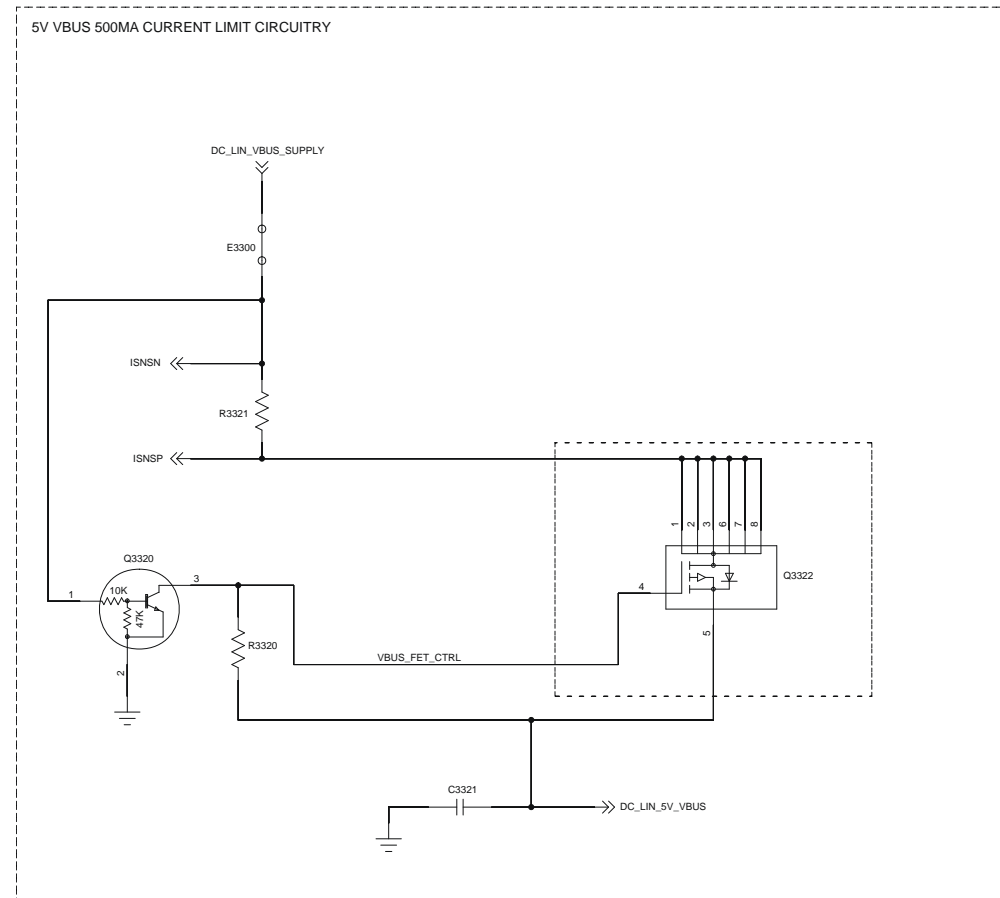


Figure 6-14. Power Management and Audio Schematic Diagram (3 of 3)

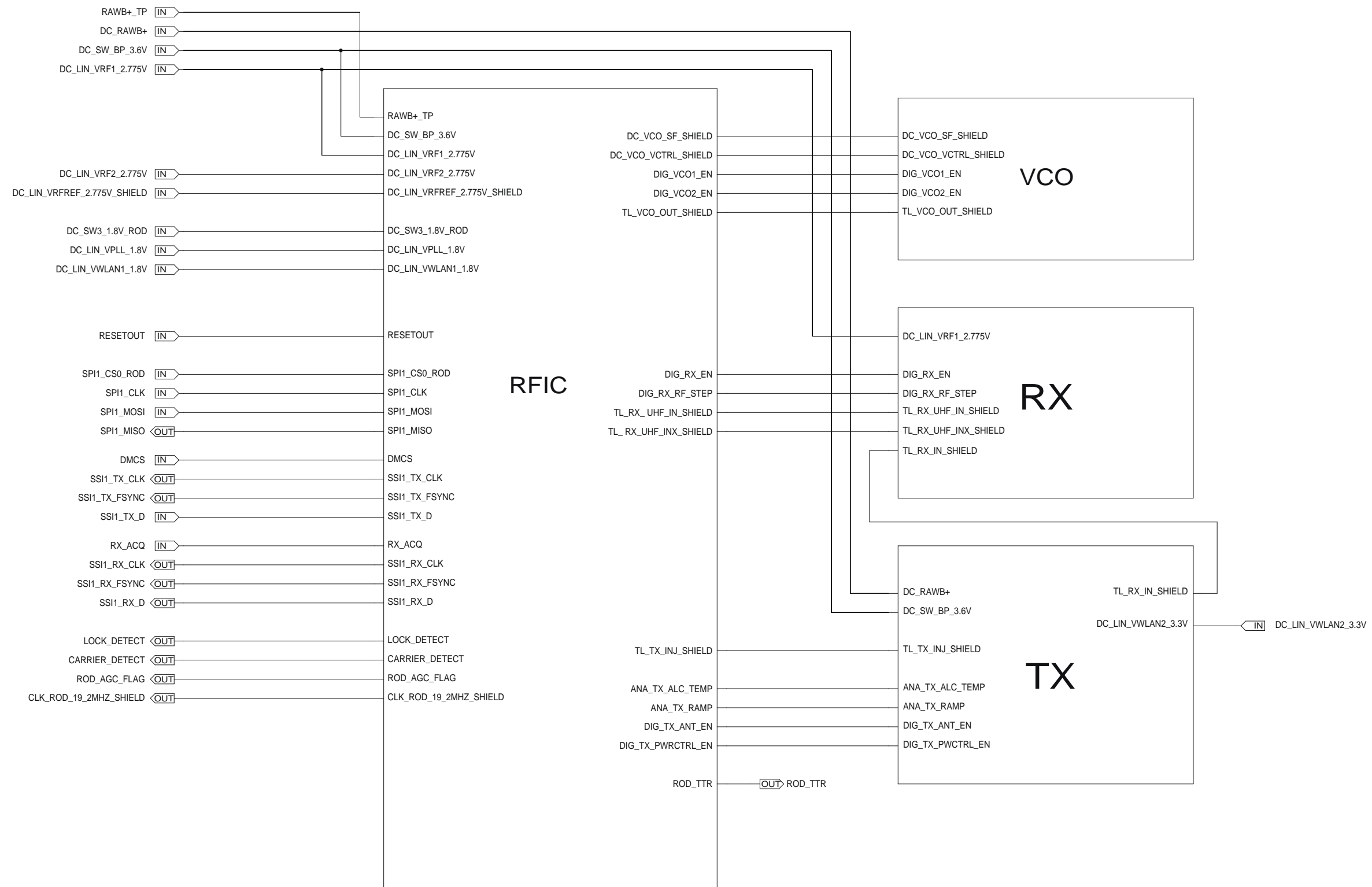


Figure 6-15. Overall RF Schematic Diagram

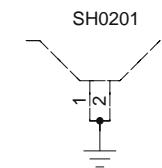
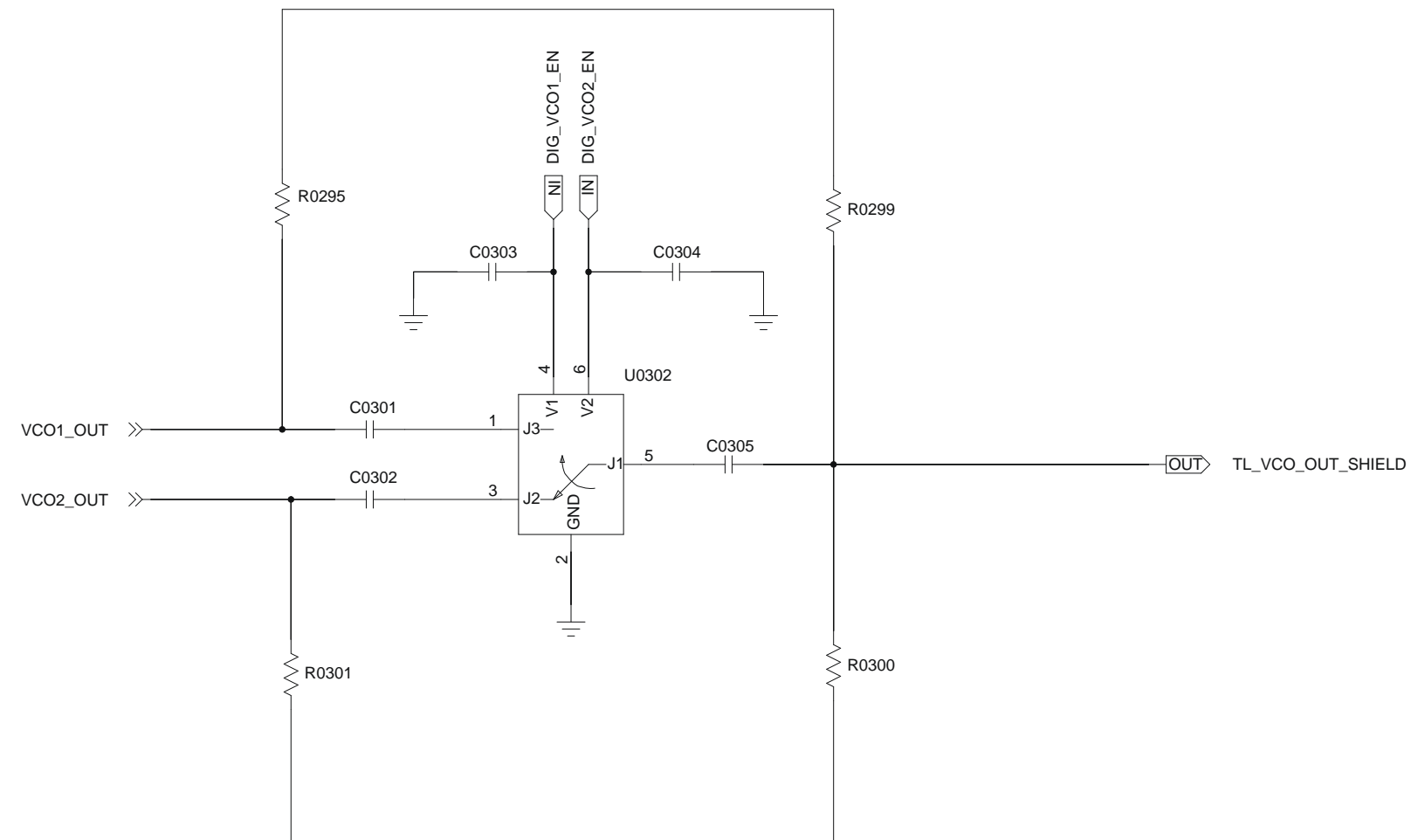


Figure 6-16. VCO Schematic Diagram (1 of 3)

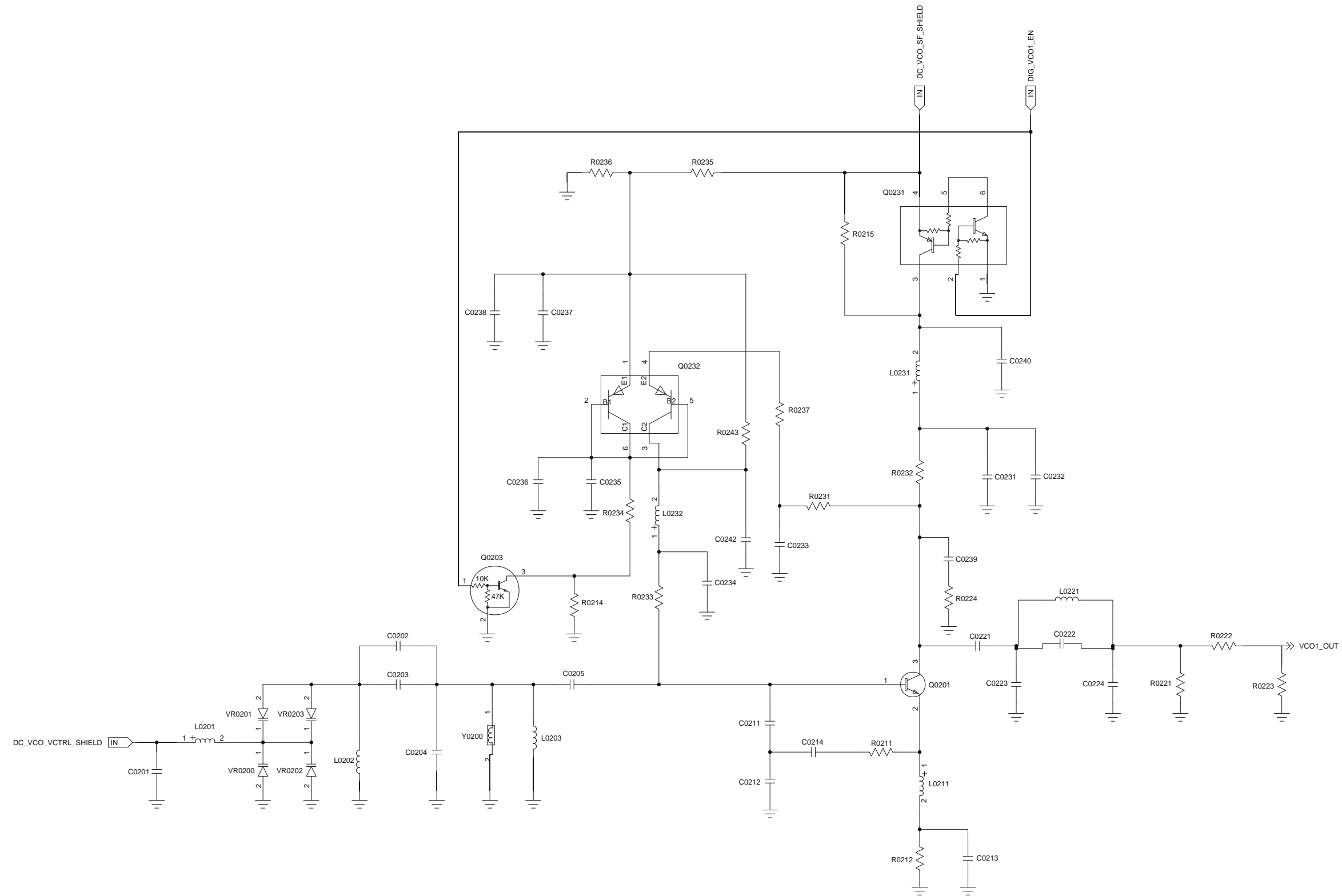


Figure 6-17. VCO Schematic Diagram (2 of 3)

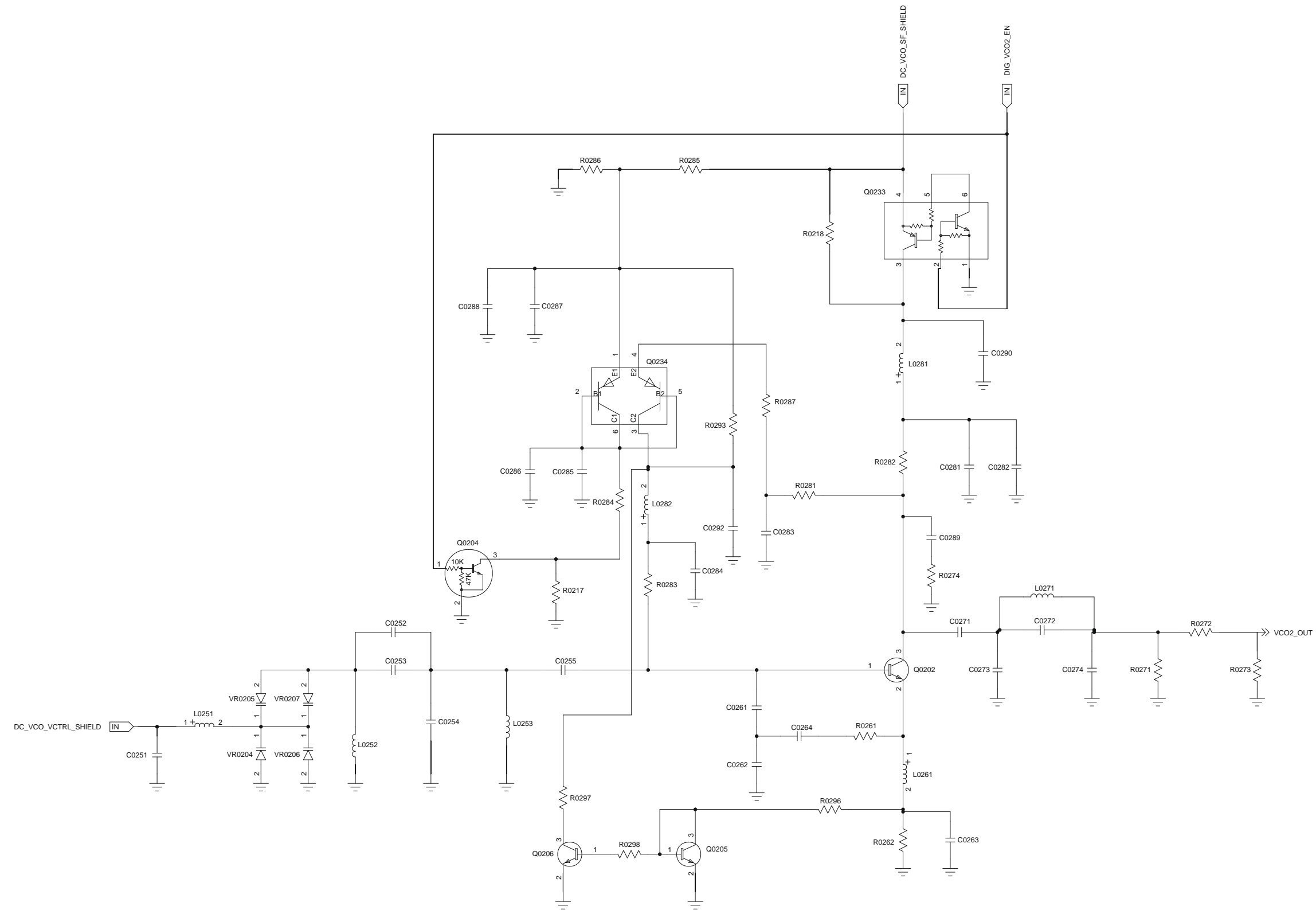


Figure 6-18. VCO Schematic Diagram (3 of 3)

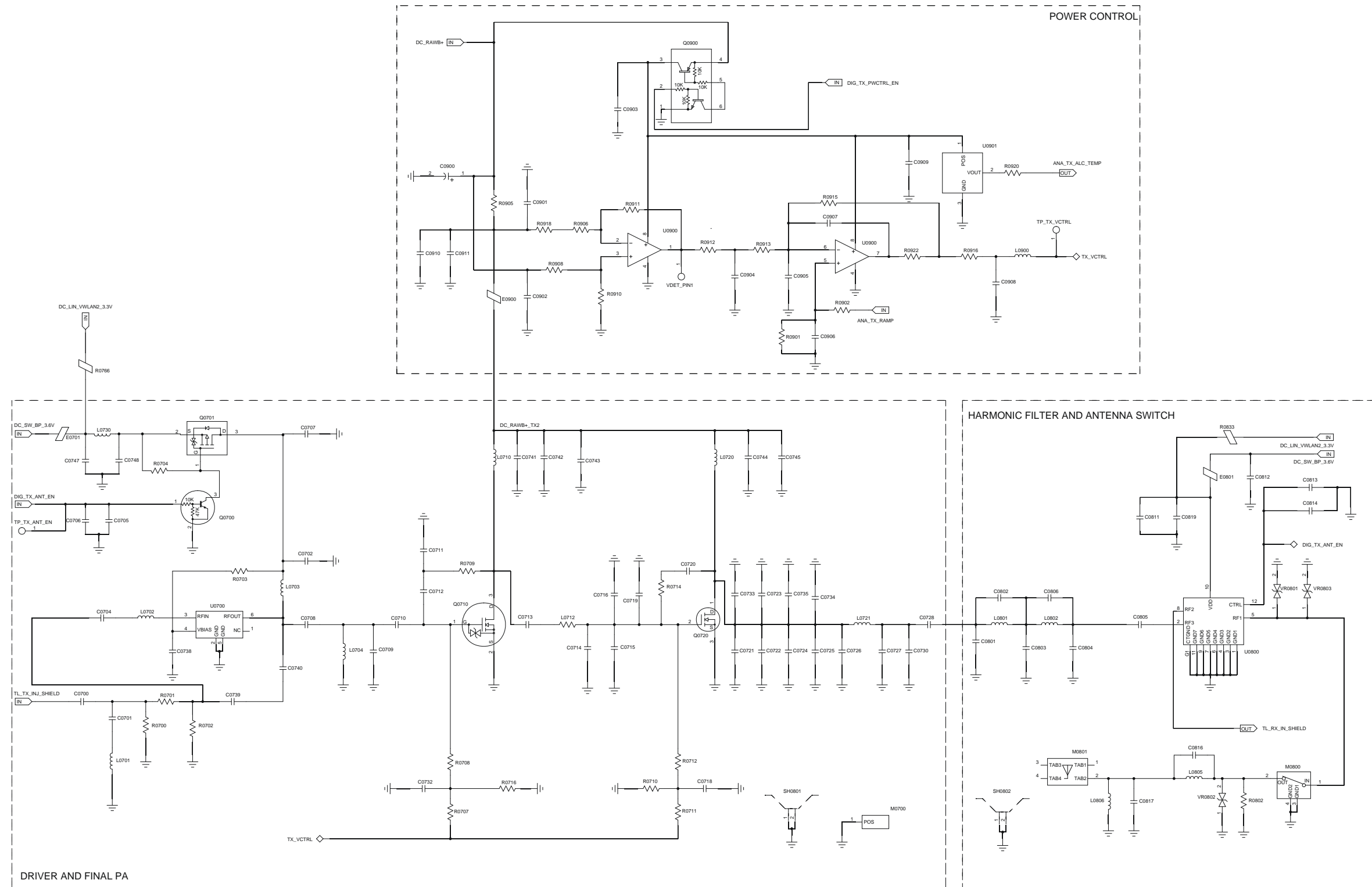


Figure 6-19. Transmitter Schematic Diagram

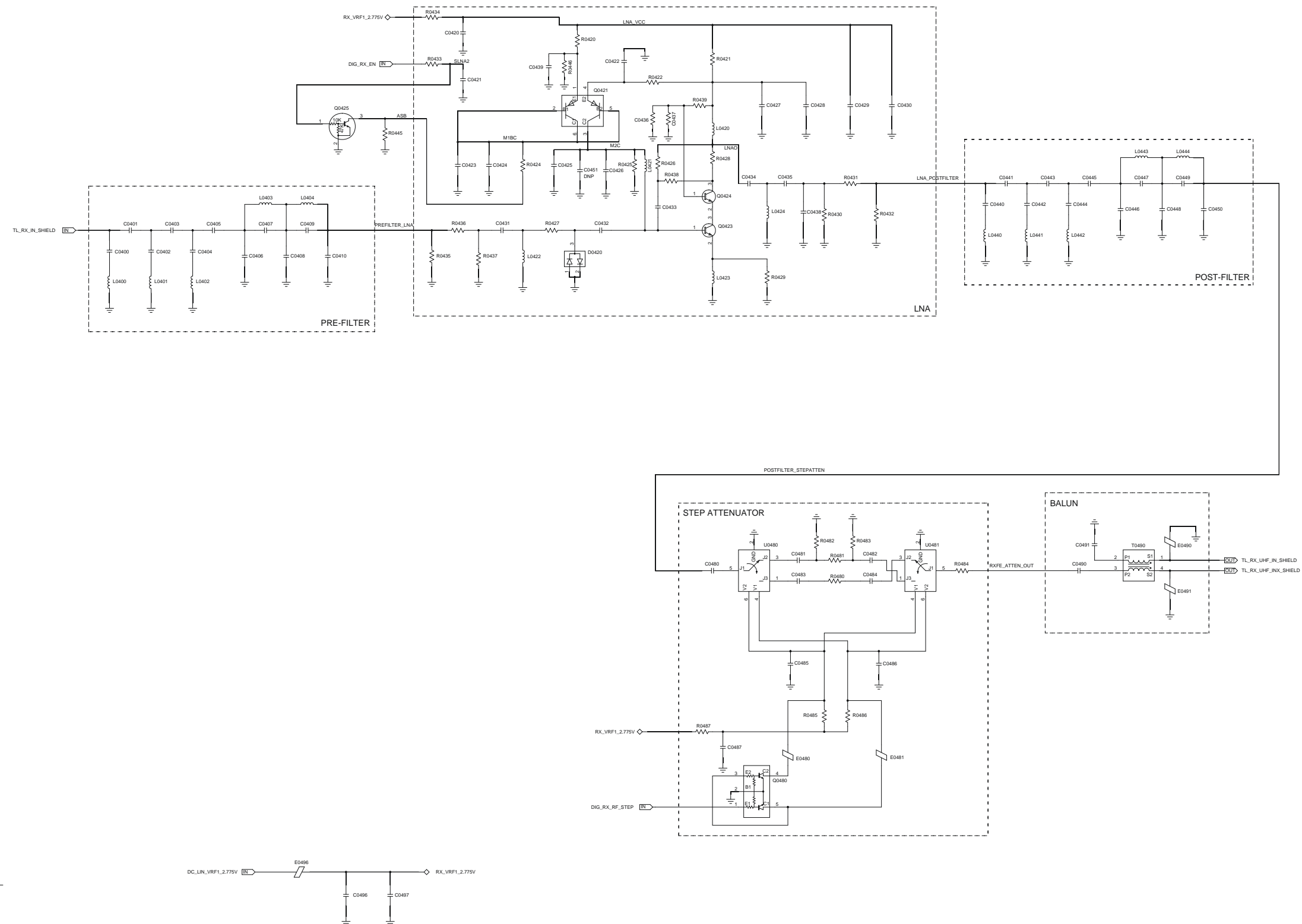


Figure 6-20. Receiver Schematic Diagram

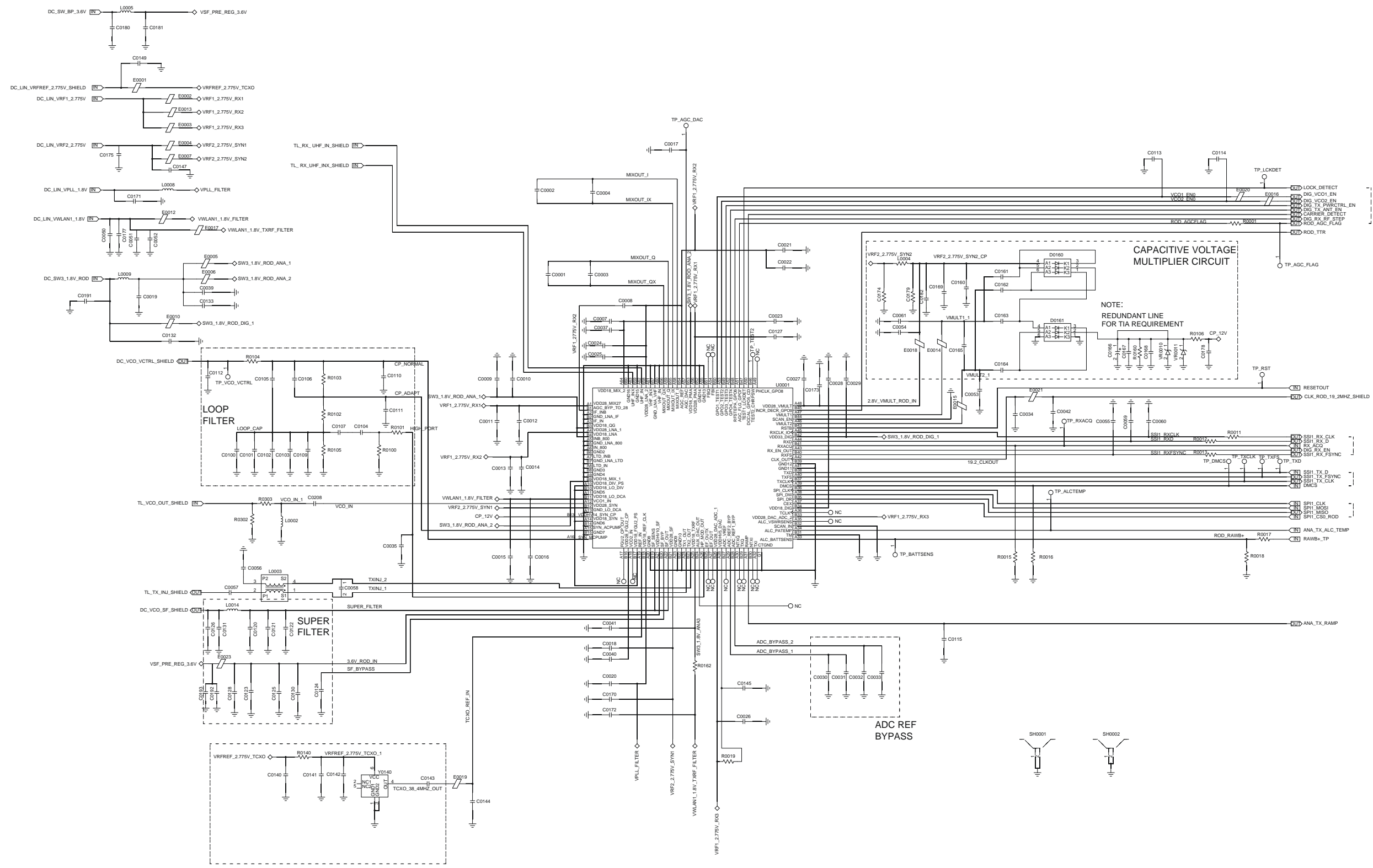


Figure 6-21. RFIC Schematic Diagram

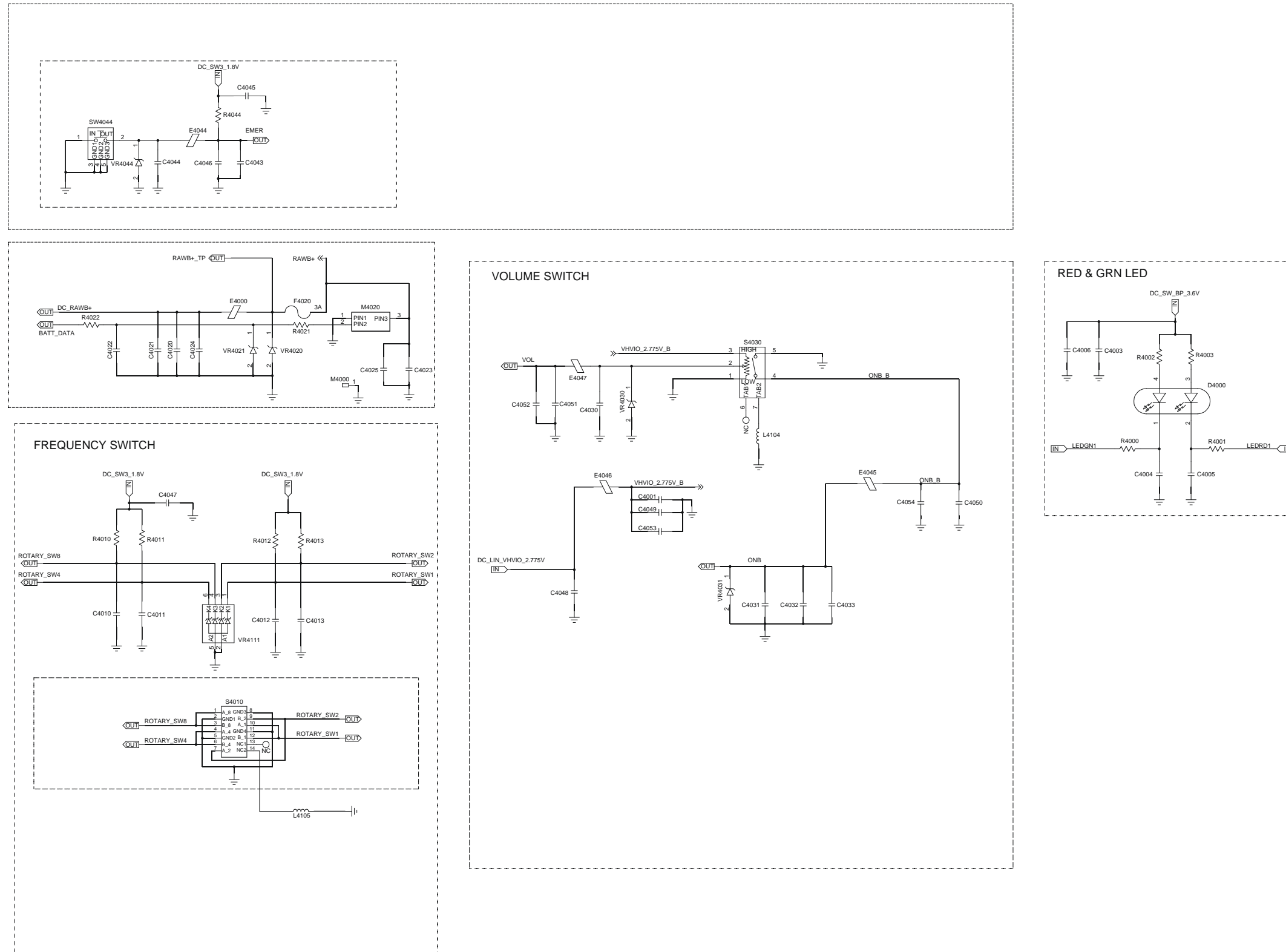


Figure 6-22. Peripheral Schematic Diagram (1 of 3)

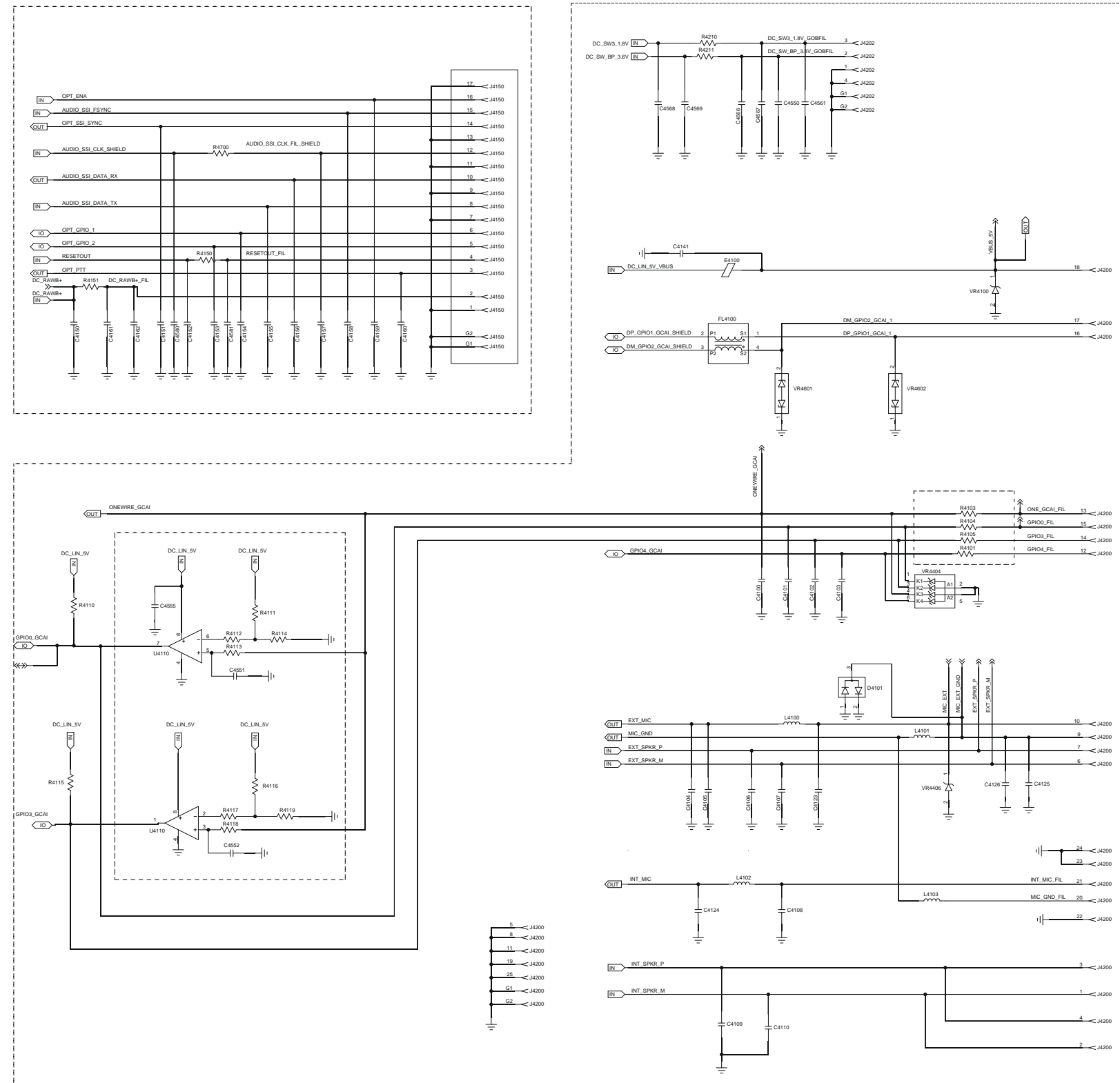


Figure 6-23. Peripheral Schematic Diagram (2 of 3)

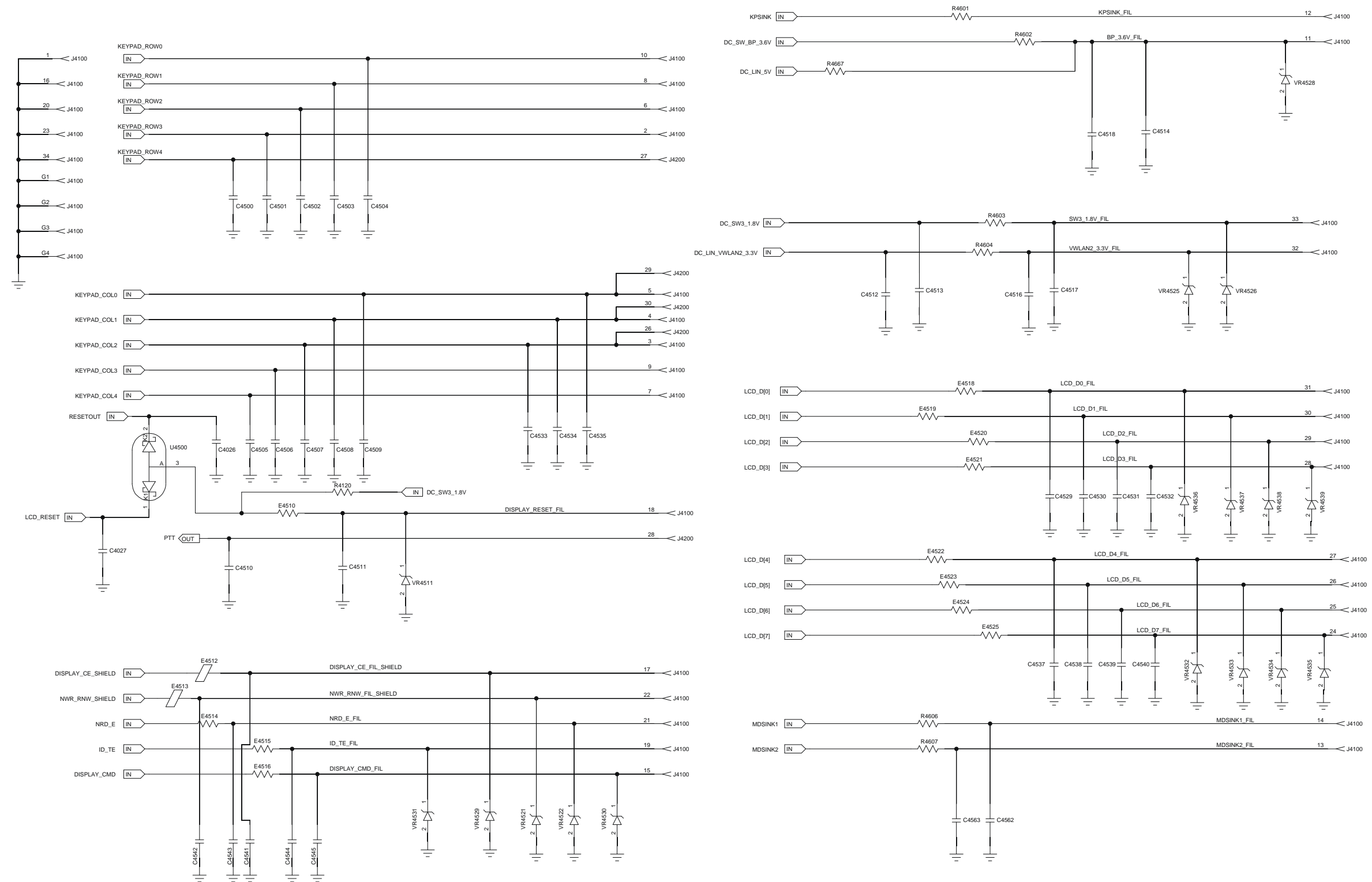


Figure 6-24. Peripheral Schematic Diagram (3 of 3)

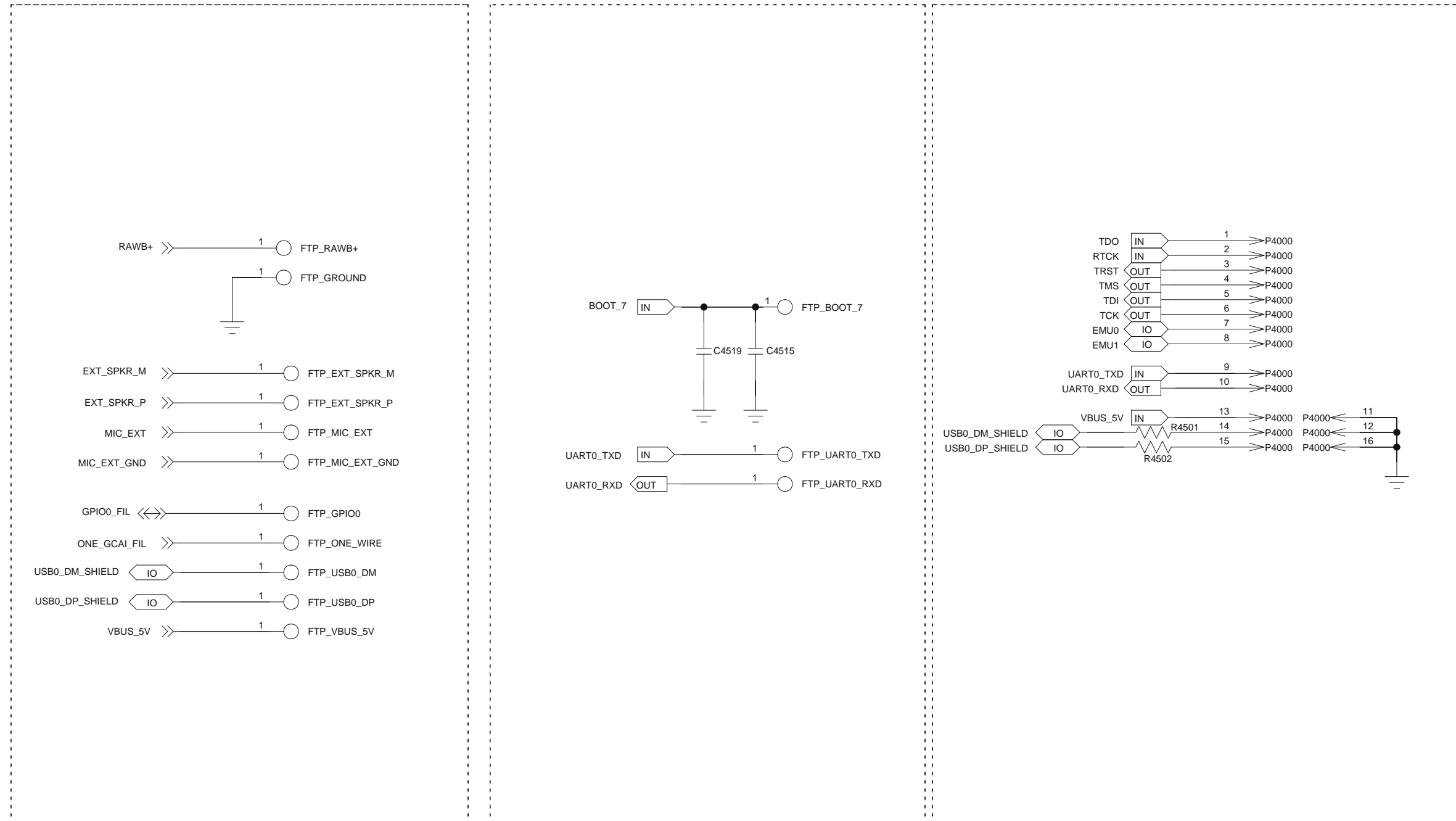


Figure 6-25. Factory Test Points Schematic Diagram

## UHF Radio Parts List (PC000813A01\_AB)

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0001        | 21012105001       |
| C0002        | 21012105001       |
| C0003        | 21012096001       |
| C0004        | 21012096001       |
| C0007        | 2113946U01        |
| C0008        | 21667009169       |
| C0009        | 21012193001       |
| C0010        | 2113946U01        |
| C0011        | 2113946U01        |
| C0012        | 21012193001       |
| C0013        | 2113946U01        |
| C0014        | 21012193001       |
| C0015        | 21012193001       |
| C0016        | 2113946U01        |
| C0017        | 2113946U01        |
| C0018        | 2113946U01        |
| C0019        | 2113956B33        |
| C0020        | NOTPLACED         |
| C0021        | 2113946U01        |
| C0022        | 21012193001       |
| C0023        | 21012193001       |
| C0024        | 2113946U01        |
| C0025        | 21012193001       |
| C0026        | 2113946U01        |
| C0027        | 2113946U01        |
| C0028        | 2113946U01        |
| C0029        | 21012193001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0030        | 2113956A51        |
| C0031        | 21667013162       |
| C0032        | 2113956A51        |
| C0033        | 21667013162       |
| C0034        | 21667013164       |
| C0035        | NOTPLACED         |
| C0037        | 21667013162       |
| C0039        | 21012193001       |
| C0040        | 21667013162       |
| C0041        | NOTPLACED         |
| C0042        | NOTPLACED         |
| C0050        | 2113946U01        |
| C0051        | 2113946U01        |
| C0052        | 21012081001       |
| C0053        | NOTPLACED         |
| C0054        | NOTPLACED         |
| C0055        | 21667013158       |
| C0056        | 21012192001       |
| C0057        | 21667013164       |
| C0058        | NOTPLACED         |
| C0059        | 21667013158       |
| C0060        | 21667013158       |
| C0061        | NOTPLACED         |
| C0100        | NOTPLACED         |
| C0101        | 21012044001       |
| C0102        | 21012044001       |
| C0103        | NOTPLACED         |
| C0104        | 21012044004       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0105        | 21012022001       |
| C0106        | 21012044002       |
| C0107        | 2113944F15        |
| C0109        | NOTPLACED         |
| C0110        | 21667013162       |
| C0111        | 21667013162       |
| C0112        | 21667013162       |
| C0113        | 21667013162       |
| C0114        | 21667013162       |
| C0115        | 21012193001       |
| C0120        | 21012193001       |
| C0121        | 2113946U01        |
| C0122        | 2187893N01        |
| C0123        | 2113946U01        |
| C0124        | 2187893N01        |
| C0125        | 21012193001       |
| C0126        | 21667013162       |
| C0127        | 21012193001       |
| C0128        | 2113946B06        |
| C0130        | 21667013162       |
| C0131        | 2113946C08        |
| C0132        | 21012193001       |
| C0133        | 2113946U01        |
| C0140        | 2113946U01        |
| C0141        | 2113946U01        |
| C0142        | 21667013162       |
| C0143        | 2113945F07        |
| C0144        | 21667012146       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0145        | 2113946U01        |
| C0147        | 21667013162       |
| C0149        | 2113946U01        |
| C0160        | 2113946U01        |
| C0161        | 2113945B02        |
| C0162        | 2113945B02        |
| C0163        | 2113945B02        |
| C0164        | 2113945B02        |
| C0165        | 21667013152       |
| C0166        | 21012071001       |
| C0167        | 2113945Y02        |
| C0168        | 21667013162       |
| C0169        | 21012193001       |
| C0170        | 21012193001       |
| C0171        | NOTPLACED         |
| C0172        | NOTPLACED         |
| C0173        | 21012193001       |
| C0174        | NOTPLACED         |
| C0175        | 21667013162       |
| C0177        | 21012081001       |
| C0178        | 21012193001       |
| C0179        | NOTPLACED         |
| C0180        | 2113946U01        |
| C0181        | 21012081001       |
| C0182        | 21667013162       |
| C0191        | 21012193001       |
| C0192        | 2113946U01        |
| C0193        | 21012193001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0201        | 21012191002       |
| C0202        | 21012084026       |
| C0203        | 21012084032       |
| C0204        | 21012084012       |
| C0205        | 21012084042       |
| C0208        | 21667009162       |
| C0211        | 21012084039       |
| C0212        | 21012084067       |
| C0213        | 21012191002       |
| C0214        | 21667013451       |
| C0221        | 21012084019       |
| C0222        | 21012084019       |
| C0223        | 21012084009       |
| C0224        | 21012084014       |
| C0231        | NOTPLACED         |
| C0232        | NOTPLACED         |
| C0233        | NOTPLACED         |
| C0234        | NOTPLACED         |
| C0235        | NOTPLACED         |
| C0236        | NOTPLACED         |
| C0237        | 21012191002       |
| C0238        | 2113946U01        |
| C0239        | 21012084009       |
| C0240        | 21012191002       |
| C0242        | 2113946U01        |
| C0251        | 21012191002       |
| C0252        | 21012084019       |
| C0253        | 21012084019       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0254        | NOTPLACED         |
| C0255        | 21012084038       |
| C0261        | 21667013441       |
| C0262        | 21667013303       |
| C0263        | 21012191002       |
| C0264        | 21667013451       |
| C0271        | 21012084038       |
| C0272        | 21012084029       |
| C0273        | 21012084009       |
| C0274        | 21012084019       |
| C0281        | NOTPLACED         |
| C0282        | NOTPLACED         |
| C0283        | NOTPLACED         |
| C0284        | NOTPLACED         |
| C0285        | NOTPLACED         |
| C0286        | NOTPLACED         |
| C0287        | 21012191002       |
| C0288        | 2113946U01        |
| C0289        | 21012084014       |
| C0290        | 21012191002       |
| C0292        | 2113946U01        |
| C0301        | 2113944E23        |
| C0302        | 2113944E23        |
| C0303        | 21012193001       |
| C0304        | 21012193001       |
| C0305        | 2113944E23        |
| C0400        | NOTPLACED         |
| C0401        | 21667013154       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0402        | 2113944E14        |
| C0403        | 2113944E15        |
| C0404        | 21667013303       |
| C0405        | 21667013147       |
| C0406        | 21012084055       |
| C0407        | 21012084029       |
| C0408        | 21012084099       |
| C0409        | NOTPLACED         |
| C0410        | 21012084039       |
| C0420        | 21012193001       |
| C0421        | 21012193001       |
| C0422        | 2113946U01        |
| C0423        | 21012193001       |
| C0424        | 2113946U01        |
| C0425        | 21012193001       |
| C0426        | 2113946B02        |
| C0427        | NOTPLACED         |
| C0428        | 2187893N01        |
| C0429        | 21012193001       |
| C0430        | 2113946D07        |
| C0431        | 21667009311       |
| C0432        | 2113945A09        |
| C0433        | 21012193001       |
| C0434        | 21667009388       |
| C0435        | 21667009291       |
| C0436        | 0613952U81        |
| C0437        | 0613952U30        |
| C0438        | 21667012218       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0439        | NOTPLACED         |
| C0440        | NOTPLACED         |
| C0441        | 2113944E14        |
| C0442        | 21012084059       |
| C0443        | 21667013303       |
| C0444        | 21012084067       |
| C0445        | 2113944E15        |
| C0446        | 21012084046       |
| C0447        | 21012084032       |
| C0448        | 2113944E12        |
| C0449        | 21012084032       |
| C0450        | 21012084046       |
| C0451        | NOTPLACED         |
| C0480        | 21012193001       |
| C0481        | 21012192001       |
| C0482        | 21012192001       |
| C0483        | 21012192001       |
| C0484        | 21012192001       |
| C0485        | 21012193001       |
| C0486        | 21012193001       |
| C0487        | 21012193001       |
| C0490        | 21012193001       |
| C0491        | 2113945E07        |
| C0496        | 2113946U01        |
| C0497        | 21012193001       |
| C0700        | 21667009166       |
| C0701        | 21667009390       |
| C0702        | 21012193001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0704        | 21012193001       |
| C0705        | 21012193001       |
| C0706        | 2113946U01        |
| C0707        | 2113946U01        |
| C0708        | 21667009166       |
| C0709        | NOTPLACED         |
| C0710        | 21667009370       |
| C0711        | NOTPLACED         |
| C0712        | 21667009416       |
| C0713        | 21667009166       |
| C0714        | NOTPLACED         |
| C0715        | 21667009374       |
| C0716        | 21667009368       |
| C0718        | 2113945A05        |
| C0719        | NOTPLACED         |
| C0720        | 2113944C49        |
| C0721        | NOTPLACED         |
| C0722        | NOTPLACED         |
| C0723        | CA000442A01       |
| C0724        | NOTPLACED         |
| C0725        | 2171846M10        |
| C0726        | 2171846M12        |
| C0727        | 2171846M09        |
| C0728        | 21667009163       |
| C0730        | 2175390H01        |
| C0732        | 2113945A05        |
| C0733        | NOTPLACED         |
| C0734        | CA000438A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0735        | 21667009383       |
| C0738        | 21012193001       |
| C0739        | NOTPLACED         |
| C0740        | NOTPLACED         |
| C0741        | 21667009156       |
| C0742        | 2113945B04        |
| C0743        | 2113945A09        |
| C0744        | 2113945A02        |
| C0745        | 2113946K02        |
| C0747        | NOTPLACED         |
| C0748        | NOTPLACED         |
| C0801        | 21667009332       |
| C0802        | 21667009288       |
| C0803        | 21667009366       |
| C0804        | 21667009332       |
| C0805        | 21667009163       |
| C0806        | 21667009284       |
| C0811        | 21012193001       |
| C0812        | NOTPLACED         |
| C0813        | 2113945Y02        |
| C0814        | 21012193001       |
| C0816        | 2171846M08        |
| C0817        | NOTPLACED         |
| C0819        | 2113945Y02        |
| C0900        | 21012150001       |
| C0901        | 21667009166       |
| C0902        | 21667009166       |
| C0903        | 21012193001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0904        | 2113945B04        |
| C0905        | NOTPLACED         |
| C0906        | 21012193001       |
| C0907        | 2113945B04        |
| C0908        | 21012193001       |
| C0909        | 2113945B04        |
| C0910        | 2113946K02        |
| C0911        | 21667009166       |
| C1000        | 2113946B06        |
| C1001        | 2113946B04        |
| C1002        | 2113945F07        |
| C1003        | 2113945F07        |
| C1004        | 2113946B04        |
| C1005        | 2113946B04        |
| C1006        | 2113956B54        |
| C1007        | 2113946B04        |
| C1008        | 2113946B04        |
| C1009        | 21667013156       |
| C1011        | 21012193001       |
| C1080        | 2113945F07        |
| C1081        | NOTPLACED         |
| C1082        | 2113946B04        |
| C1083        | 2113946B04        |
| C1101        | 2113946B06        |
| C1102        | 2113946B06        |
| C1103        | 2113946B06        |
| C1104        | 2113946B06        |
| C1105        | 2113946B06        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C1106        | 21012193001       |
| C1107        | 21012193001       |
| C1108        | 21012193001       |
| C1109        | 21012193001       |
| C1110        | 21012193001       |
| C1111        | NOTPLACED         |
| C1113        | NOTPLACED         |
| C1120        | NOTPLACED         |
| C1121        | NOTPLACED         |
| C1122        | 2113946B06        |
| C1123        | 2113946B06        |
| C1124        | 2113946B06        |
| C1125        | 2113946B06        |
| C1126        | 2113946B06        |
| C1127        | 21012193001       |
| C1128        | 21012193001       |
| C1129        | 21012193001       |
| C1130        | 21012193001       |
| C1131        | 21012193001       |
| C1132        | 21012193001       |
| C1133        | 21012193001       |
| C1140        | NOTPLACED         |
| C1141        | NOTPLACED         |
| C1142        | 2113946B06        |
| C1143        | 2113946B06        |
| C1144        | 21012193001       |
| C1145        | 21012193001       |
| C1146        | 21012193001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C1147        | 21012193001       |
| C1148        | NOTPLACED         |
| C1149        | NOTPLACED         |
| C1150        | NOTPLACED         |
| C1151        | NOTPLACED         |
| C1300        | 2113946B04        |
| C1312        | 2113946B04        |
| C1335        | 21012193001       |
| C1337        | 21012193001       |
| C1339        | 21012193001       |
| C1340        | 21012193001       |
| C1350        | 2113946B04        |
| C1351        | 21012193001       |
| C1352        | NOTPLACED         |
| C2000        | 2113946B04        |
| C2001        | 2113946B04        |
| C2002        | 2113946B04        |
| C2003        | 2113946B04        |
| C2004        | 21012193001       |
| C2005        | 2113945F07        |
| C2006        | 21012193001       |
| C2007        | 2113946B04        |
| C2008        | 2113946B04        |
| C2010        | NOTPLACED         |
| C2011        | NOTPLACED         |
| C2100        | 2113946B04        |
| C2101        | 2113946B04        |
| C2102        | 2113956B54        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C2104        | 2113945F07        |
| C2105        | 21012193001       |
| C3000        | 2113956B43        |
| C3001        | 2113956B43        |
| C3002        | 2113956B43        |
| C3003        | 2187893N01        |
| C3004        | 2187893N01        |
| C3007        | 2187893N01        |
| C3008        | 2113946B04        |
| C3009        | 2187893N01        |
| C3010        | 2113945F01        |
| C3011        | 2113956B21        |
| C3012        | 2113946U01        |
| C3013        | 2113956B43        |
| C3014        | 2113946U01        |
| C3015        | 2113956B43        |
| C3016        | 2113946U01        |
| C3017        | 2113946U01        |
| C3018        | 2113946U01        |
| C3019        | 2113946U01        |
| C3020        | 2113946U01        |
| C3021        | 2113946U01        |
| C3023        | 2113946U01        |
| C3024        | 21667013164       |
| C3026        | 2113946U01        |
| C3027        | 2187893N01        |
| C3028        | 2187893N01        |
| C3029        | 2187893N01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3031        | 2187893N01        |
| C3032        | 2187893N01        |
| C3033        | 2187893N01        |
| C3034        | 2187893N01        |
| C3035        | 2113946U01        |
| C3036        | 2187893N01        |
| C3037        | 2187893N01        |
| C3041        | 2113946D01        |
| C3042        | 21012193001       |
| C3043        | 2113945F07        |
| C3044        | 2187893N01        |
| C3045        | 2113945F07        |
| C3046        | 2113946U01        |
| C3047        | 2113946U01        |
| C3048        | 2113946U01        |
| C3049        | 21012193001       |
| C3050        | 21667013146       |
| C3051        | 21667013146       |
| C3053        | 2113945F07        |
| C3082        | 21012193001       |
| C3083        | 21012193001       |
| C3084        | 21012193001       |
| C3086        | 21012193001       |
| C3087        | 21012193001       |
| C3089        | 21012193001       |
| C3090        | 21012193001       |
| C3092        | 21012193001       |
| C3093        | 2113945A05        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3094        | 21667013156       |
| C3095        | 21667013156       |
| C3096        | 21012193001       |
| C3097        | 21012193001       |
| C3098        | 21012193001       |
| C3100        | 2113946U01        |
| C3101        | 2113946U01        |
| C3102        | 2113946U01        |
| C3103        | 2113946U01        |
| C3104        | 2113946U01        |
| C3105        | 2187893N01        |
| C3106        | 2187893N01        |
| C3107        | 2187893N01        |
| C3110        | 2187893N01        |
| C3111        | 2113946U11        |
| C3112        | 2113946U11        |
| C3113        | 2113946U01        |
| C3114        | 21667013164       |
| C3115        | 21667013164       |
| C3116        | 2113946U01        |
| C3119        | 21012193001       |
| C3120        | 2113946B04        |
| C3126        | 2113946U01        |
| C3127        | 2113946U01        |
| C3128        | 2113946B04        |
| C3160        | 2113946U01        |
| C3171        | 2113946U01        |
| C3172        | 2113946U01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3173        | 21012135001       |
| C3175        | 2113956B21        |
| C3176        | 2113956B21        |
| C3177        | NOTPLACED         |
| C3178        | 21012193001       |
| C3179        | 2113956C25        |
| C3181        | 2113945F01        |
| C3200        | 21012193001       |
| C3210        | 2113946U01        |
| C3211        | 21012150001       |
| C3212        | 2187893N01        |
| C3213        | 21012193001       |
| C3214        | 21012193001       |
| C3215        | 2113946U01        |
| C3230        | 21012193001       |
| C3231        | 21012150001       |
| C3232        | 2187893N01        |
| C3250        | 2113946U01        |
| C3253        | 21012193001       |
| C3271        | CA000402A01       |
| C3272        | CA000402A01       |
| C3275        | CA000534A01       |
| C3276        | CA000365A01       |
| C3278        | 2187893N01        |
| C3279        | 21012193001       |
| C3280        | 2113945A05        |
| C3281        | 21667013156       |
| C3282        | 21667013162       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3310        | 2113956B33        |
| C3315        | 2113945B02        |
| C3321        | 2187893N01        |
| C3330        | 2113946U01        |
| C3333        | 21012193001       |
| C3335        | 21012193001       |
| C3336        | 2113946U01        |
| C3350        | 2113956B21        |
| C3351        | 2113945B02        |
| C3353        | 2113946D05        |
| C3354        | 2113956B55        |
| C3356        | 21012193001       |
| C3366        | 2113956B21        |
| C3367        | 2187893N01        |
| C3368        | 2113956B43        |
| C3369        | 2113946B04        |
| C3370        | 2113946B04        |
| C3371        | NOTPLACED         |
| C3372        | 21012067001       |
| C3373        | 21012067001       |
| C3374        | 2113956B21        |
| C3375        | 2113956B21        |
| C3376        | NOTPLACED         |
| C3378        | 2113956E91        |
| C3379        | 2113956B33        |
| C3380        | 2113956B21        |
| C3382        | 2113956A51        |
| C3383        | 2113956A51        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3384        | 21012191002       |
| C3385        | 21667009166       |
| C3386        | 21667013162       |
| C3387        | 2113945B02        |
| C3388        | 2113945B02        |
| C3389        | 21667009166       |
| C3401        | 2113945A05        |
| C3402        | 2113945A05        |
| C3403        | 2113945A05        |
| C3408        | CA000491A01       |
| C3411        | 2187893N01        |
| C3420        | 2113945A05        |
| C4001        | 21012193001       |
| C4003        | 21012193001       |
| C4004        | 21012193001       |
| C4005        | 21012193001       |
| C4006        | 2113946U01        |
| C4010        | 21012193001       |
| C4011        | 21012193001       |
| C4012        | 21012193001       |
| C4013        | 21012193001       |
| C4020        | 21012193001       |
| C4021        | 21667013122       |
| C4022        | 21012193001       |
| C4023        | 21667012142       |
| C4024        | 21013083001       |
| C4025        | 21667012360       |
| C4026        | 21012193001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C4027        | 21012193001       |
| C4030        | 21012193001       |
| C4031        | 21012193001       |
| C4032        | 21667013156       |
| C4033        | 21667012360       |
| C4043        | 21667012360       |
| C4044        | 21012193001       |
| C4045        | 21012193001       |
| C4046        | 21667012360       |
| C4047        | 2113945E06        |
| C4048        | 21012193001       |
| C4049        | 21667013156       |
| C4050        | 21012193001       |
| C4051        | 21667013156       |
| C4052        | 21667012360       |
| C4053        | 21667012360       |
| C4054        | 21667013156       |
| C4100        | 21012136001       |
| C4101        | 21012193001       |
| C4102        | 21012193001       |
| C4103        | 21012193001       |
| C4104        | 2113944A43        |
| C4105        | 21012193001       |
| C4106        | 21012193001       |
| C4107        | 21012193001       |
| C4108        | 21012193001       |
| C4109        | 21012193001       |
| C4110        | 21012193001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C4123        | 21012193001       |
| C4124        | 21012193001       |
| C4125        | 21667009167       |
| C4126        | 21667009174       |
| C4141        | 21012193001       |
| C4150        | NOTPLACED         |
| C4151        | 21012193001       |
| C4152        | 2113946U01        |
| C4153        | NOTPLACED         |
| C4154        | NOTPLACED         |
| C4155        | NOTPLACED         |
| C4156        | 21012193001       |
| C4157        | 21012193001       |
| C4158        | 21012193001       |
| C4159        | 21012193001       |
| C4160        | NOTPLACED         |
| C4161        | 2113956D35        |
| C4162        | NOTPLACED         |
| C4500        | 21012193001       |
| C4501        | 21012193001       |
| C4502        | 21012193001       |
| C4503        | 21012193001       |
| C4504        | 21012193001       |
| C4505        | 21012193001       |
| C4506        | 21012193001       |
| C4507        | 21012193001       |
| C4508        | 21012193001       |
| C4509        | 21012193001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C4510        | 21012193001       |
| C4511        | 21012193001       |
| C4512        | 21012193001       |
| C4513        | 21012193001       |
| C4514        | 21012193001       |
| C4515        | 21667013156       |
| C4516        | 2113946U01        |
| C4517        | 2113946U01        |
| C4518        | 2113946U01        |
| C4519        | 21667009371       |
| C4529        | 21012193001       |
| C4530        | 21012193001       |
| C4531        | 21012193001       |
| C4532        | 21012193001       |
| C4533        | 21012193001       |
| C4534        | 21012193001       |
| C4535        | 21012193001       |
| C4537        | 21012193001       |
| C4538        | 21012193001       |
| C4539        | 21012193001       |
| C4540        | 21012193001       |
| C4541        | 21012193001       |
| C4542        | 21012193001       |
| C4543        | 21012193001       |
| C4544        | 21012193001       |
| C4545        | 21012193001       |
| C4550        | 21012193001       |
| C4551        | NOTPLACED         |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C4552        | NOTPLACED         |
| C4555        | NOTPLACED         |
| C4561        | 21012193001       |
| C4562        | 21012193001       |
| C4563        | 21012193001       |
| C4566        | 2113956D35        |
| C4567        | NOTPLACED         |
| C4568        | 21667013156       |
| C4569        | 21667013156       |
| C4580        | NOTPLACED         |
| C4581        | 21012193001       |
| C8000        | 2113946D05        |
| C8001        | NOTPLACED         |
| C8002        | 21667013156       |
| C8003        | 21667013156       |
| C8004        | 2113946U01        |
| C8005        | CA000365A01       |
| C8006        | 2113945E07        |
| C8008        | 21012193001       |
| C8010        | 21012193001       |
| C8012        | 21013062001       |
| C8013        | 21667013156       |
| C8014        | 21667013156       |
| C8100        | 2113946D05        |
| C8101        | 2113946D05        |
| C8102        | 21667013140       |
| C8103        | 21012193001       |
| C8104        | 21012193001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C8105        | NOTPLACED         |
| C8106        | NOTPLACED         |
| C8107        | 2113956C37        |
| C8108        | 21012193001       |
| C8109        | 21012193001       |
| C8110        | 21012193001       |
| C8111        | 21009304001       |
| C8112        | 21012193001       |
| C8113        | 21012193001       |
| C8114        | 21012129001       |
| C8300_3      | 21009304001       |
| C8306_3      | 21009304001       |
| C8311_3      | 21009304001       |
| C8316_3      | 21009304001       |
| C8315_3      | 21012129001       |
| C8329_3      | 21013048001       |
| C100_2       | 21013062001       |
| C101_2       | 21013062001       |
| C103_2       | 21013062001       |
| C104_2       | 21013062001       |
| C106_2       | 21013062001       |
| C108_2       | 21013062001       |
| C109_2       | 21013062001       |
| C8327_3      | 2113945F07        |
| C8312_3      | 2113946U01        |
| C8319_3      | 2113946U01        |
| C8320_3      | 2113946U01        |
| C8321_3      | 2113946U01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C8322_3      | 2113946U01        |
| C8323_3      | 2113946U01        |
| C8324_3      | 2113946U01        |
| C8325_3      | 2113946U01        |
| C8328_3      | 2113946U01        |
| C8331_3      | 2113946U01        |
| C8332_3      | 2113946U01        |
| C105_2       | 21667009201       |
| C102_2       | 21667009380       |
| C8305_3      | 21667012146       |
| C8335_3      | 21667013140       |
| C107_2       | 2170282H06        |
| C8334_3      | CA000445A01       |
| D0160        | 4871852M02        |
| D0161        | 4871852M02        |
| D0420        | 4813974A19        |
| D3000        | 4805656W89        |
| D4000        | 48009340001       |
| D4101        | 4813974A19        |
| E0001        | 91012036001       |
| E0002        | 91012036001       |
| E0003        | 91012036001       |
| E0004        | 91012036001       |
| E0005        | 91012036001       |
| E0006        | 91012036001       |
| E0007        | 91012036001       |
| E0010        | 91012036001       |
| E0012        | 91012036001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| E0013        | 91012036001       |
| E0014        | 91012036001       |
| E0015        | 91012036001       |
| E0016        | 91012036001       |
| E0017        | 91012036001       |
| E0018        | 91012036001       |
| E0019        | 2471132D14        |
| E0020        | 91012036001       |
| E0021        | 2471132D14        |
| E0023        | 91012036001       |
| E0480        | 2471132D14        |
| E0481        | 2471132D14        |
| E0490        | 2471132D14        |
| E0491        | 2471132D14        |
| E0496        | 2471132D14        |
| E0701        | NOTPLACED         |
| E0801        | NOTPLACED         |
| E0900        | 7686949J14        |
| E1000        | 24012051001       |
| E1001        | 24012051001       |
| E1002        | 24012051001       |
| E1003        | 24012051001       |
| E1006        | 91012036001       |
| E1007        | 91012036001       |
| E1008        | 91012036001       |
| E1009        | 91012036001       |
| E1010        | 91012036001       |
| E1020        | 24012065001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| E3100        | 2471132D14        |
| E3101        | 24012065001       |
| E3102        | 24012065001       |
| E3105        | HZ000290A01       |
| E3201        | HZ000290A01       |
| E3300        | NOTPLACED         |
| E3308        | 91013001001       |
| E4000        | 24010078002       |
| E4044        | 91012036001       |
| E4045        | 91012036001       |
| E4046        | 7688697V14        |
| E4047        | 91012036001       |
| E4100        | 24012178001       |
| E4510        | 0613952R66        |
| E4512        | 7688697V14        |
| E4513        | 7688697V14        |
| E4514        | 7688697V14        |
| E4515        | 0613952R66        |
| E4516        | 0613952K01        |
| E4518        | 24009314031       |
| E4519        | 24009314031       |
| E4520        | 24009314031       |
| E4521        | 24009314031       |
| E4522        | 24009314031       |
| E4523        | 24009314031       |
| E4524        | 24009314031       |
| E4525        | 24009314031       |
| E8000        | NOTPLACED         |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| E8002        | 7686949J08        |
| E8003        | 7688697V14        |
| E8100        | 7686949J22        |
| E8102        | 7688697V04        |
| E8103        | 7688697V04        |
| E105_2       | 7688697V14        |
| E8300_3      | 7688697V14        |
| F4020        | 65012019001       |
| FL4100       | 2571601G01        |
| FL8000       | 91012018002       |
| FL8001       | 91012057001       |
| FL8002       | 91012057001       |
| J4100        | 09012192001       |
| J4150        | 09012068001       |
| J4200        | CN000537A01       |
| J4202        | CN000225A01       |
| J8000        | CN000512A01       |
| L0002        | IN000122B19       |
| L0003        | 24012146001       |
| L0004        | 0613952G67        |
| L0005        | 2488183V02        |
| L0008        | 2471132D14        |
| L0009        | 24012161001       |
| L0014        | 24012161001       |
| L0201        | 2475122C39        |
| L0202        | 24009342012       |
| L0203        | 24013081002       |
| L0211        | 2475122C39        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| L0221        | IN000122B05       |
| L0231        | 2475122C39        |
| L0232        | 2475122C39        |
| L0251        | 2475122C39        |
| L0252        | 24009342008       |
| L0253        | 24013081002       |
| L0261        | 2475122C39        |
| L0271        | IN000122B02       |
| L0281        | 2475122C39        |
| L0282        | 2475122C39        |
| L0400        | NOTPLACED         |
| L0401        | IN000101A14       |
| L0402        | IN000101A14       |
| L0403        | 24009342013       |
| L0404        | 24009342013       |
| L0420        | IN000101A24       |
| L0421        | IN000101A24       |
| L0422        | IN000101A06       |
| L0423        | 24009342009       |
| L0424        | IN000101A13       |
| L0440        | NOTPLACED         |
| L0441        | IN000101A14       |
| L0442        | IN000101A14       |
| L0443        | 24009342015       |
| L0444        | 24009342015       |
| L0701        | IN000122A36       |
| L0702        | 24009314031       |
| L0703        | IN000122A46       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| L0704        | IN000122A21       |
| L0710        | 24009315039       |
| L0712        | 0613952R66        |
| L0720        | 2460591E64        |
| L0721        | 24012026001       |
| L0730        | 24009315039       |
| L0801        | 2471884M04        |
| L0802        | 2471884M04        |
| L0805        | NOTPLACED         |
| L0806        | 24012021008       |
| L0900        | 24009315039       |
| L3001        | IN000354A01       |
| L3002        | IN000354A01       |
| L3210        | 24013057001       |
| L3230        | 24013057001       |
| L3272        | 24012106001       |
| L3279        | IN000312A23       |
| L3286        | IN000269A18       |
| L4100        | 24009315046       |
| L4101        | 24009315046       |
| L4102        | 24009315046       |
| L4103        | 24009315046       |
| L4104        | 24009314047       |
| L4105        | 24009314047       |
| L8003        | 24010062003       |
| L8301_3      | 2475122C28        |
| L8330_3      | IN000095A01       |
| L8333_3      | IN000095A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| L106_2       | IN000122B13       |
| M0700        | 26012312001       |
| M0800        | 0987378K01        |
| M0801        | CN000794A01       |
| M4000        | NOTPLACED         |
| M4020        | 09012098001       |
| P4000        | NOTPLACED         |
| Q0201        | 48013025001       |
| Q0202        | 48013025001       |
| Q0203        | NOTPLACED         |
| Q0204        | NOTPLACED         |
| Q0205        | NOTPLACED         |
| Q0206        | NOTPLACED         |
| Q0231        | CR000346A01       |
| Q0232        | NOTPLACED         |
| Q0233        | CR000346A01       |
| Q0234        | NOTPLACED         |
| Q0421        | 4815267H01        |
| Q0423        | 48013025001       |
| Q0424        | 48013025001       |
| Q0425        | 48009494001       |
| Q0480        | 48012038001       |
| Q0700        | 4816134H01        |
| Q0701        | 48012059001       |
| Q0710        | 48012275001       |
| Q0720        | CR000510A01       |
| Q0900        | 4809939C31        |
| Q1000        | 4815055H01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| Q1001        | 4815055H01        |
| Q3000        | 48009494001       |
| Q3001        | 48012059001       |
| Q3170        | 48012038001       |
| Q3172        | 48009494001       |
| Q3179        | 48012038001       |
| Q3278        | CR000594A01       |
| Q3320        | 48009494001       |
| Q3322        | 4813970A62        |
| Q3327        | 48009494001       |
| R0001        | 0613952Y66        |
| R0011        | 0613952Y66        |
| R0012        | 0613952Y66        |
| R0013        | 0613952Y66        |
| R0015        | 0613952X89        |
| R0016        | 0613952X89        |
| R0017        | 0613952N89        |
| R0018        | 0613952N30        |
| R0019        | 0613952Y66        |
| R0100        | 0613952Q39        |
| R0101        | 0613952Q86        |
| R0102        | 0613952X34        |
| R0103        | 0613952X61        |
| R0104        | 0613952R66        |
| R0105        | NOTPLACED         |
| R0106        | 0613952G67        |
| R0140        | 0613952Q35        |
| R0160        | 0613952Y23        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R0162        | 0613952Y66        |
| R0211        | 0613952X19        |
| R0212        | 0613952X49        |
| R0214        | NOTPLACED         |
| R0215        | NOTPLACED         |
| R0217        | NOTPLACED         |
| R0218        | NOTPLACED         |
| R0221        | 0613952X71        |
| R0222        | 0613952X19        |
| R0223        | 0613952X71        |
| R0224        | 0613952Y66        |
| R0231        | NOTPLACED         |
| R0232        | 0613952Y66        |
| R0233        | 0613952Y66        |
| R0234        | NOTPLACED         |
| R0235        | 0613952X80        |
| R0236        | 0613952Y13        |
| R0237        | NOTPLACED         |
| R0243        | 0613952Y01        |
| R0261        | 0613952X28        |
| R0262        | 0613952X48        |
| R0271        | 0613952X68        |
| R0272        | 0613952X23        |
| R0273        | 0613952X68        |
| R0274        | 0613952Y66        |
| R0281        | NOTPLACED         |
| R0282        | 0613952Y66        |
| R0283        | 0613952Y66        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R0284        | NOTPLACED         |
| R0285        | 0613952X80        |
| R0286        | 0613952Y16        |
| R0287        | NOTPLACED         |
| R0293        | 0613952Y01        |
| R0295        | NOTPLACED         |
| R0296        | NOTPLACED         |
| R0297        | NOTPLACED         |
| R0298        | NOTPLACED         |
| R0299        | NOTPLACED         |
| R0300        | NOTPLACED         |
| R0301        | NOTPLACED         |
| R0302        | 0613952X45        |
| R0303        | 0613952Y66        |
| R0420        | 0613952X71        |
| R0421        | 0613952X41        |
| R0422        | 0613952X59        |
| R0424        | 0613952U93        |
| R0425        | 0613952V93        |
| R0426        | 0613952U30        |
| R0427        | 0613952Y66        |
| R0428        | 0613952R66        |
| R0429        | 0613952S25        |
| R0430        | 0613952X60        |
| R0431        | 0613952X31        |
| R0432        | 0613952X60        |
| R0433        | 7688697V14        |
| R0434        | 7688697V14        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R0435        | NOTPLACED         |
| R0436        | 0613952Y66        |
| R0437        | NOTPLACED         |
| R0438        | NOTPLACED         |
| R0439        | 0613952X60        |
| R0445        | NOTPLACED         |
| R0446        | NOTPLACED         |
| R0480        | 0613952Y66        |
| R0481        | 0613952X36        |
| R0482        | 0613952X53        |
| R0483        | 0613952X53        |
| R0484        | 0613952Y66        |
| R0485        | 0613952V01        |
| R0486        | 0613952U85        |
| R0487        | 7688697V14        |
| R0700        | 0613952Q49        |
| R0701        | 0613952Q46        |
| R0702        | 0613952Q49        |
| R0703        | 0613952X65        |
| R0704        | 0613952Y25        |
| R0707        | 0613952M37        |
| R0708        | 0613952Q66        |
| R0709        | 0613952Q47        |
| R0710        | NOTPLACED         |
| R0711        | 0613952R66        |
| R0712        | 0613952Q66        |
| R0714        | 0613958H56        |
| R0716        | 0613952M18        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R0766        | 91012036001       |
| R0802        | 0613952R01        |
| R0833        | 2475316C04        |
| R0901        | 0675679M01        |
| R0902        | 0613952N30        |
| R0905        | 06012064001       |
| R0906        | 0613952Z80        |
| R0908        | 0613952Z80        |
| R0910        | 0675679M01        |
| R0911        | 0675679M01        |
| R0912        | 0613952Q59        |
| R0913        | 0613952Q81        |
| R0915        | 0613952Q90        |
| R0916        | 0613952M18        |
| R0918        | 0613952M47        |
| R0920        | 0613952R66        |
| R0922        | 0613952Q59        |
| R1003        | 0613952X66        |
| R1004        | 0613952X66        |
| R1009        | 0613952X73        |
| R1010        | 0613952R66        |
| R1011        | 0613952R66        |
| R1012        | 0613952R66        |
| R1013        | 0613952R66        |
| R1014        | 0613952U01        |
| R1015        | NOTPLACED         |
| R1016        | 0613952X89        |
| R1017        | NOTPLACED         |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R1018        | 0613952X89        |
| R1019        | 0613952X73        |
| R1020        | NOTPLACED         |
| R1028        | 0613952Y66        |
| R1029        | 0613952Y66        |
| R1031        | 0613952Y66        |
| R1032        | 0613952Y66        |
| R1033        | 0613952Y66        |
| R1045        | 0613952X73        |
| R1046        | NOTPLACED         |
| R1052        | 0613952Y66        |
| R1081        | 0613952Y17        |
| R1082        | 0613952Y66        |
| R1084        | 0613952Y66        |
| R1100        | 0613952R66        |
| R1111        | 0613952Y01        |
| R1113        | 0613952Y01        |
| R1114        | 0613952Y01        |
| R1400        | 0613952Q65        |
| R2000        | 0613952R66        |
| R2001        | 0613952Y17        |
| R2002        | 0613952Y17        |
| R2003        | 0613952S68        |
| R2004        | 0613952R66        |
| R2100        | 0613952R66        |
| R2101        | 0613952Y01        |
| R2103        | 0613952Y01        |
| R2106        | 0613952Q81        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R3000        | 0613952Y66        |
| R3001        | 0613952V01        |
| R3002        | 0613952Q81        |
| R3006        | 0613952V01        |
| R3007        | 0613952Y66        |
| R3008        | 0613952Y66        |
| R3009        | 0613952Y66        |
| R3010        | 0613952Y66        |
| R3011        | 0613952Y66        |
| R3012        | 0613952Y66        |
| R3014        | 0613952Y66        |
| R3019        | 0613952Y66        |
| R3020        | 0613952Y66        |
| R3021        | NOTPLACED         |
| R3022        | 0613952X25        |
| R3101        | 0613952Q81        |
| R3102        | 0613952V01        |
| R3103        | 0613952V01        |
| R3104        | 0613952V01        |
| R3105        | 0613952V01        |
| R3106        | 0613952Y66        |
| R3107        | 0613952V01        |
| R3108        | 0613952V01        |
| R3115        | 0613952Y66        |
| R3116        | 0613952S89        |
| R3123        | 0613952V01        |
| R3170        | 0613952Z73        |
| R3171        | 0613952Z73        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R3174        | 0613952V01        |
| R3175        | 0613952V01        |
| R3176        | 0613952N30        |
| R3178        | 0613952V01        |
| R3180        | 0613952V01        |
| R3181        | NOTPLACED         |
| R3182        | 0613952Z61        |
| R3183        | 0613952V01        |
| R3185        | 0613952V01        |
| R3186        | 0613952V01        |
| R3210        | 0613952R66        |
| R3211        | 0613952Y66        |
| R3230        | 0613952R66        |
| R3231        | 0613952Y66        |
| R3273        | 0613952M78        |
| R3274        | 0613952N35        |
| R3275        | RE000207A01       |
| R3277        | 0613952Y66        |
| R3313        | 0613952V18        |
| R3314        | 0613952U55        |
| R3320        | 0613952V01        |
| R3321        | 0616416H01        |
| R3330        | 0613952Y66        |
| R3331        | 0613952Y66        |
| R3332        | NOTPLACED         |
| R3333        | NOTPLACED         |
| R3334        | 0613952V01        |
| R3350        | 0613952Q79        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R3352        | 0613952Q85        |
| R3353        | NOTPLACED         |
| R3354        | 0613952Y66        |
| R3355        | NOTPLACED         |
| R3358        | 0613952Q25        |
| R3359        | 0613952Q25        |
| R3364        | 0613952Y25        |
| R3367        | 0613952V01        |
| R3370        | 0613952X81        |
| R3374        | 0613952V01        |
| R3375        | 0613952Y66        |
| R4000        | 0613952X42        |
| R4001        | 0613952X42        |
| R4002        | 2475316C04        |
| R4003        | 2475316C04        |
| R4010        | 0613952X89        |
| R4011        | 0613952X89        |
| R4012        | 0613952X89        |
| R4013        | 0613952X89        |
| R4021        | 0613958H49        |
| R4022        | 0613952Q30        |
| R4044        | 0613952X89        |
| R4101        | 0613952X65        |
| R4103        | 0613952X59        |
| R4104        | 0613952X65        |
| R4105        | 0613952X65        |
| R4110        | NOTPLACED         |
| R4111        | NOTPLACED         |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R4112        | NOTPLACED         |
| R4113        | NOTPLACED         |
| R4114        | NOTPLACED         |
| R4115        | NOTPLACED         |
| R4116        | NOTPLACED         |
| R4117        | NOTPLACED         |
| R4118        | NOTPLACED         |
| R4119        | NOTPLACED         |
| R4120        | 0613952Y01        |
| R4150        | 0613952X29        |
| R4151        | 0613952B01        |
| R4210        | 0613952G67        |
| R4211        | 0613952G67        |
| R4501        | NOTPLACED         |
| R4502        | NOTPLACED         |
| R4601        | 0613952K01        |
| R4602        | 0613952R66        |
| R4603        | 0613952R66        |
| R4604        | 0613952R66        |
| R4606        | 0613952K30        |
| R4607        | 0613952K30        |
| R4667        | NOTPLACED         |
| R4700        | 0613952K01        |
| R8000        | 0613952Y66        |
| R8001        | 0613952Y66        |
| R8002        | NOTPLACED         |
| R8003        | NOTPLACED         |
| R8004        | 0613952Y66        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R8006        | 0613952R66        |
| R8007        | 0613952Y32        |
| R8009        | NOTPLACED         |
| R8010        | NOTPLACED         |
| R8100        | 0613952M59        |
| R8101        | 0613952M10        |
| R8102        | 0613952Y25        |
| R8103        | 0613952Y27        |
| R8104        | 0613952Y66        |
| R8112        | 0613952Y66        |
| R8113        | 0613952Y66        |
| R8114        | 0613952Y66        |
| R8115        | 0613952R66        |
| R8116        | 0613952V69        |
| R8117        | NOTPLACED         |
| R8300_3      | 0613952R66        |
| R8304_3      | 0613952X73        |
| R101_2       | 0613952Y01        |
| R8301_3      | 0613952Y66        |
| R8305_3      | 0613952Y66        |
| R8314_3      | 0613952Y66        |
| S4010        | 40012023001       |
| S4030        | 1875103C04        |
| SH0001       | SH000087A01       |
| SH0002       | SH000271A01       |
| SH0201       | SH000273A01       |
| SH0401       | SH000270A03       |
| SH0801       | SH000272A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| SH0802       | SH000329A01       |
| SH1001       | SH000269A01       |
| SH3001       | SH000268A01       |
| SH8000       | SH000267A01       |
| SW4044       | 4086470Z01        |
| T0490        | 24012146001       |
| U0001        | 51009877001       |
| U0302        | 5186310Y39        |
| U0480        | 5186310Y39        |
| U0481        | 5186310Y39        |
| U0700        | IC000382A01       |
| U0800        | 51013329001       |
| U0900        | IC000240A01       |
| U0901        | 5115022H01        |
| U1000        | 51012295002       |
| U1021        | IC000643A01       |
| U1081        | LD000091A01       |
| U1300        | 51012283001       |
| U2000        | MM000129A01       |
| U2100        | MM000157A01       |
| U3000        | IC000326A01       |
| U3160        | 5114007A43        |
| U3170        | 51012263001       |
| U3270        | 51012456001       |
| U3310        | 5171103N01        |
| U3311        | 5189092V44        |
| U3330        | 51012206001       |
| U3350        | 5175771A75        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| U4110        | NOTPLACED         |
| U4500        | CR000209A01       |
| U8000        | LN000494A01       |
| U8001        | LN000395A01       |
| U8002        | MM000054A01       |
| U8100        | 5114610F01        |
| U8336_3      | HZ000243A01       |
| U100_2       | IC000128A01       |
| U8300_3      | IC000285A01       |
| VR0010       | CR000093A01       |
| VR0011       | CR000093A01       |
| VR0200       | NOTPLACED         |
| VR0201       | NOTPLACED         |
| VR0202       | CR000291A01       |
| VR0203       | CR000291A01       |
| VR0204       | CR000291A01       |
| VR0205       | CR000291A01       |
| VR0206       | NOTPLACED         |
| VR0207       | NOTPLACED         |
| VR0801       | 4888116D01        |
| VR0802       | 4888116D01        |
| VR0803       | NOTPLACED         |
| VR1000       | CR000565A01       |
| VR3001       | CR000697A01       |
| VR3002       | CR000697A01       |
| VR3003       | CR000697A01       |
| VR3004       | CR000697A01       |
| VR4020       | 4813977C23        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| VR4021       | 4813977C11        |
| VR4030       | 4805656W76        |
| VR4031       | 4805656W76        |
| VR4044       | 4805656W76        |
| VR4100       | NOTPLACED         |
| VR4111       | 4813979P10        |
| VR4404       | NOTPLACED         |
| VR4406       | NOTPLACED         |
| VR4511       | NOTPLACED         |
| VR4521       | NOTPLACED         |
| VR4522       | NOTPLACED         |
| VR4525       | NOTPLACED         |
| VR4526       | NOTPLACED         |
| VR4528       | NOTPLACED         |
| VR4529       | NOTPLACED         |
| VR4530       | NOTPLACED         |
| VR4531       | NOTPLACED         |
| VR4532       | NOTPLACED         |
| VR4533       | NOTPLACED         |
| VR4534       | NOTPLACED         |
| VR4535       | NOTPLACED         |
| VR4536       | NOTPLACED         |
| VR4537       | NOTPLACED         |
| VR4538       | NOTPLACED         |
| VR4539       | NOTPLACED         |
| VR4601       | NOTPLACED         |
| VR4602       | NOTPLACED         |
| Y0140        | HZ000333A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| Y0200        | NOTPLACED         |
| Y3000        | 4809995L15        |
| Y8302_3      | HZ000202A01       |

**Notes**

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## Section 7

# VHF (136–174 MHz) INFORMATION

## 1.0 Allocation of Schematics and Circuit Boards

### 1.1 Controller Circuits

The VHF circuits are contained on the Printed Circuit Board (PCB) which also contains the Controller circuits. This Chapter shows the schematics for the VHF circuits only, refer to the Controller section for details of the related Controller circuits. The PCB component layouts in this Chapter show both the Controller and VHF circuit components. The VHF schematics and the related PCB and parts list are shown in the tables below.

*Table 7-1. VHF Diagrams and Parts List*

|   |   |
|---|---|
| <b>PCB:</b><br>PC000975A01 Main Board Top Side<br>PC000975A01 Main Board Bottom Side  | <b>Page 7-3</b><br><b>Page 7-4</b>  |
| <b>SCHEMATICS:</b><br>Complete Radio Schematic Diagram<br>GNSS Schematic Diagram<br>Bluetooth and WiFi Schematic Diagram (1 of 3)<br>Bluetooth and WiFi Schematic Diagram (2 of 3)<br>Bluetooth and WiFi Schematic Diagram (3 of 3)<br>Controller Schematic Diagram<br>Memory Schematic Diagram<br>Microprocessor Schematic Diagram (1 of 2)<br>Microprocessor Schematic Diagram (2 of 2)<br>Power Management and Audio Schematic Diagram (1 of 3)<br>Power Management and Audio Schematic Diagram (2 of 3)<br>Power Management and Audio Schematic Diagram (3 of 3)<br>Overall RF Schematic Diagram<br>VCO Schematic Diagram (1 of 2)<br>VCO Schematic Diagram (2 of 2)<br>Transmitter Schematic Diagram<br>Receiver Schematic Diagram<br>RFIC Schematic Diagram<br>Peripheral Schematic Diagram (1 of 3)<br>Peripheral Schematic Diagram (2 of 3)<br>Peripheral Schematic Diagram (3 of 3)<br>Factory Test Points Schematic Diagram | <b>Page 7-5</b><br><b>Page 7-6</b><br><b>Page 7-7</b><br><b>Page 7-8</b><br><b>Page 7-9</b><br><b>Page 7-10</b><br><b>Page 7-11</b><br><b>Page 7-12</b><br><b>Page 7-13</b><br><b>Page 7-14</b><br><b>Page 7-15</b><br><b>Page 7-16</b><br><b>Page 7-17</b><br><b>Page 7-18</b><br><b>Page 7-19</b><br><b>Page 7-20</b><br><b>Page 7-21</b><br><b>Page 7-22</b><br><b>Page 7-23</b><br><b>Page 7-24</b><br><b>Page 7-25</b><br><b>Page 7-26</b> |
| <b>Parts List:</b><br>PC000975A01   | <b>Page 7-27</b>  |

**Notes**

## 2.0 Circuit Board/Schematic Diagrams and Parts List for VHF

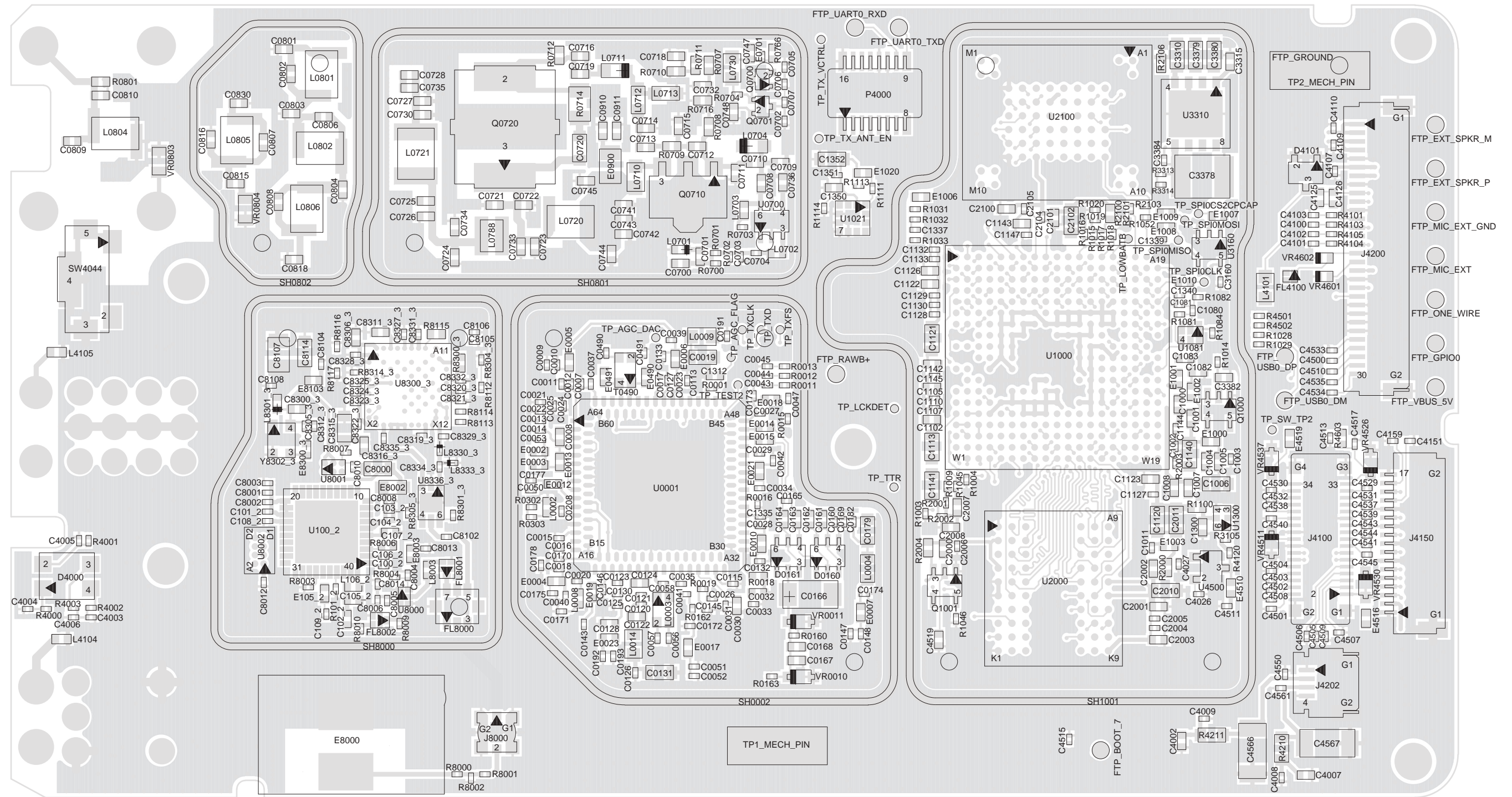


Figure 7-1. Main Board VHF Top Side PCB No. PC000975A01\_AA

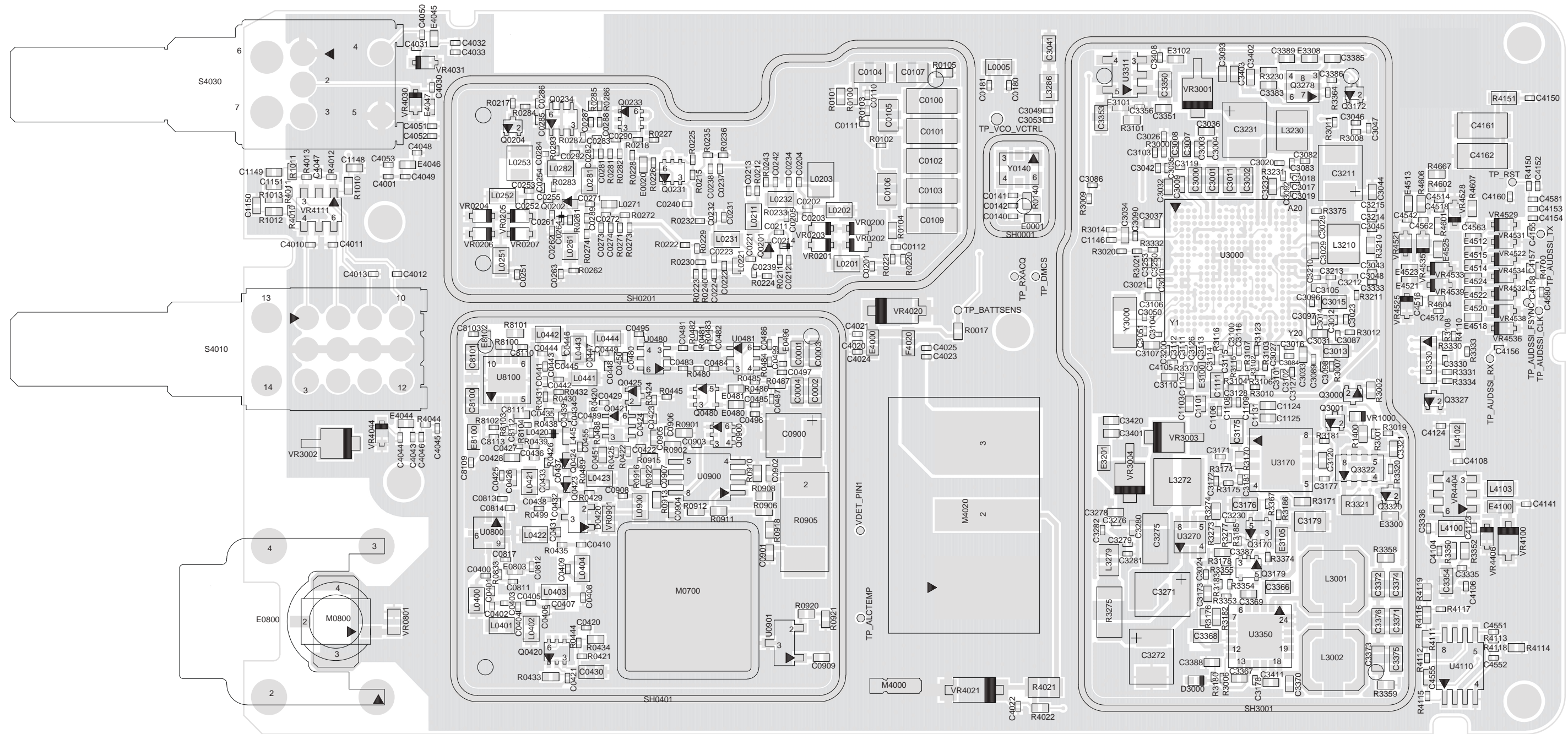


Figure 7-2. Main Board VHF Bottom Side PCB No. PC000975A01\_AA



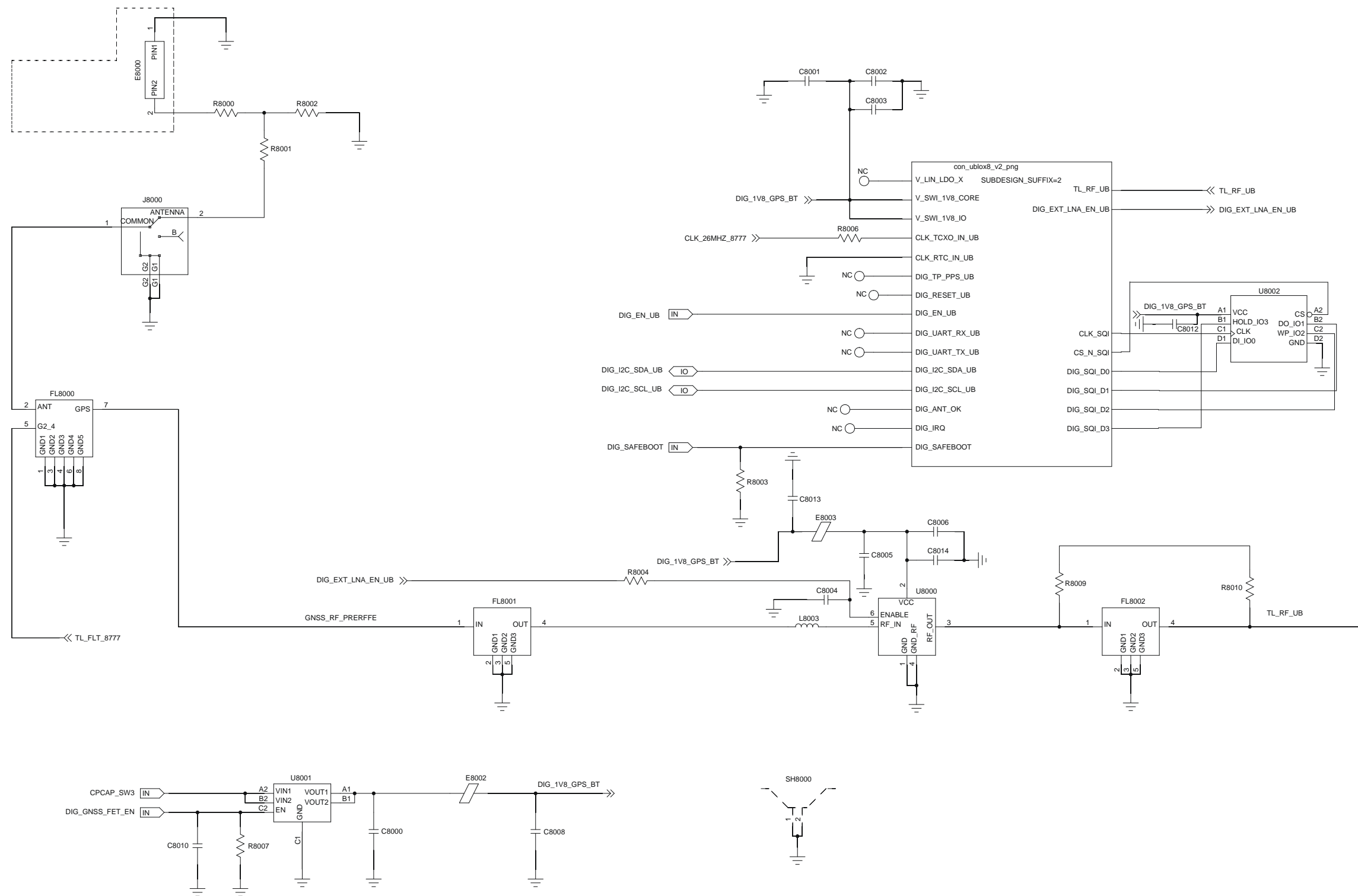


Figure 7-4. GNSS Schematic Diagram

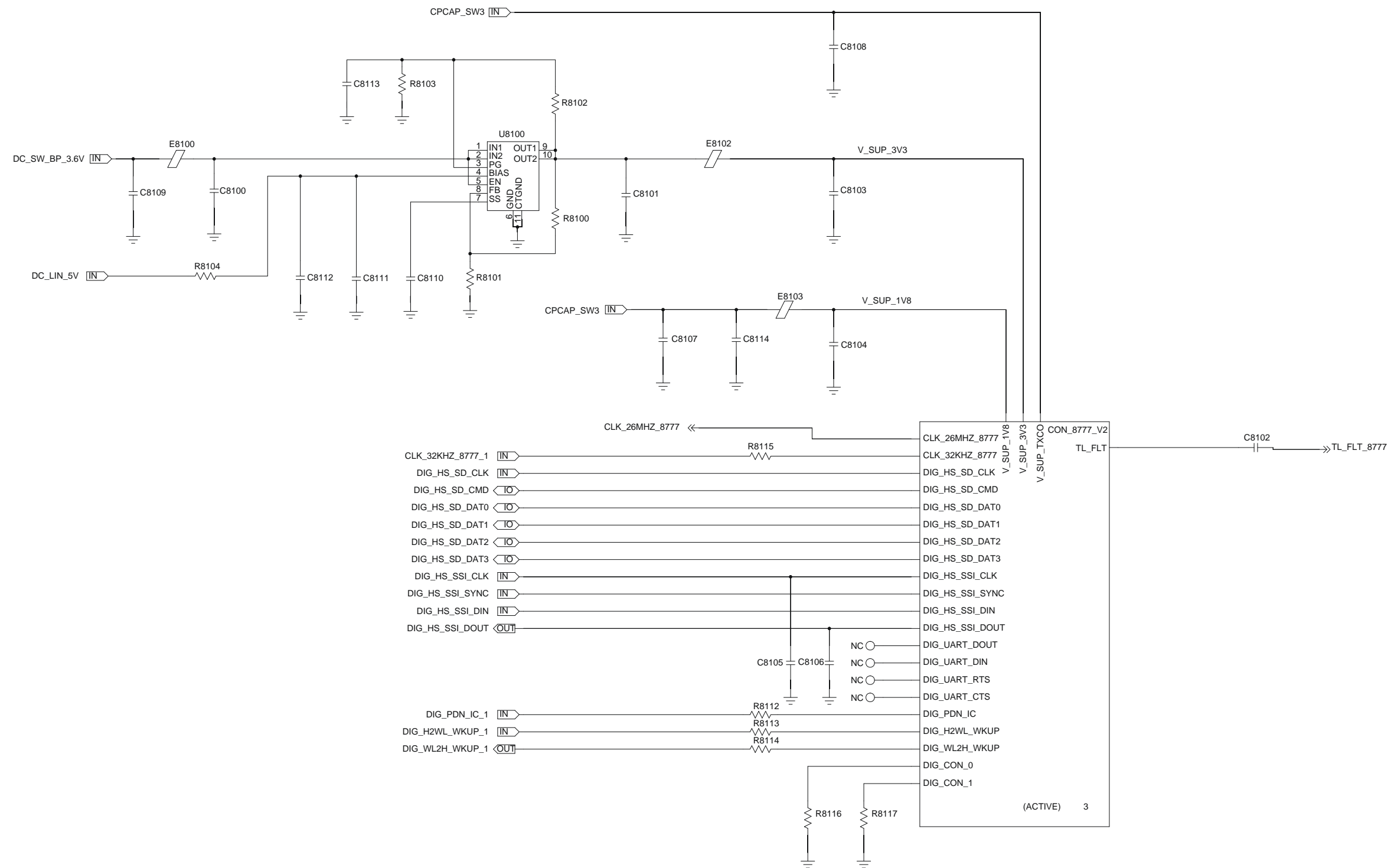


Figure 7-5. Bluetooth and WiFi Schematic Diagram (1 of 3)

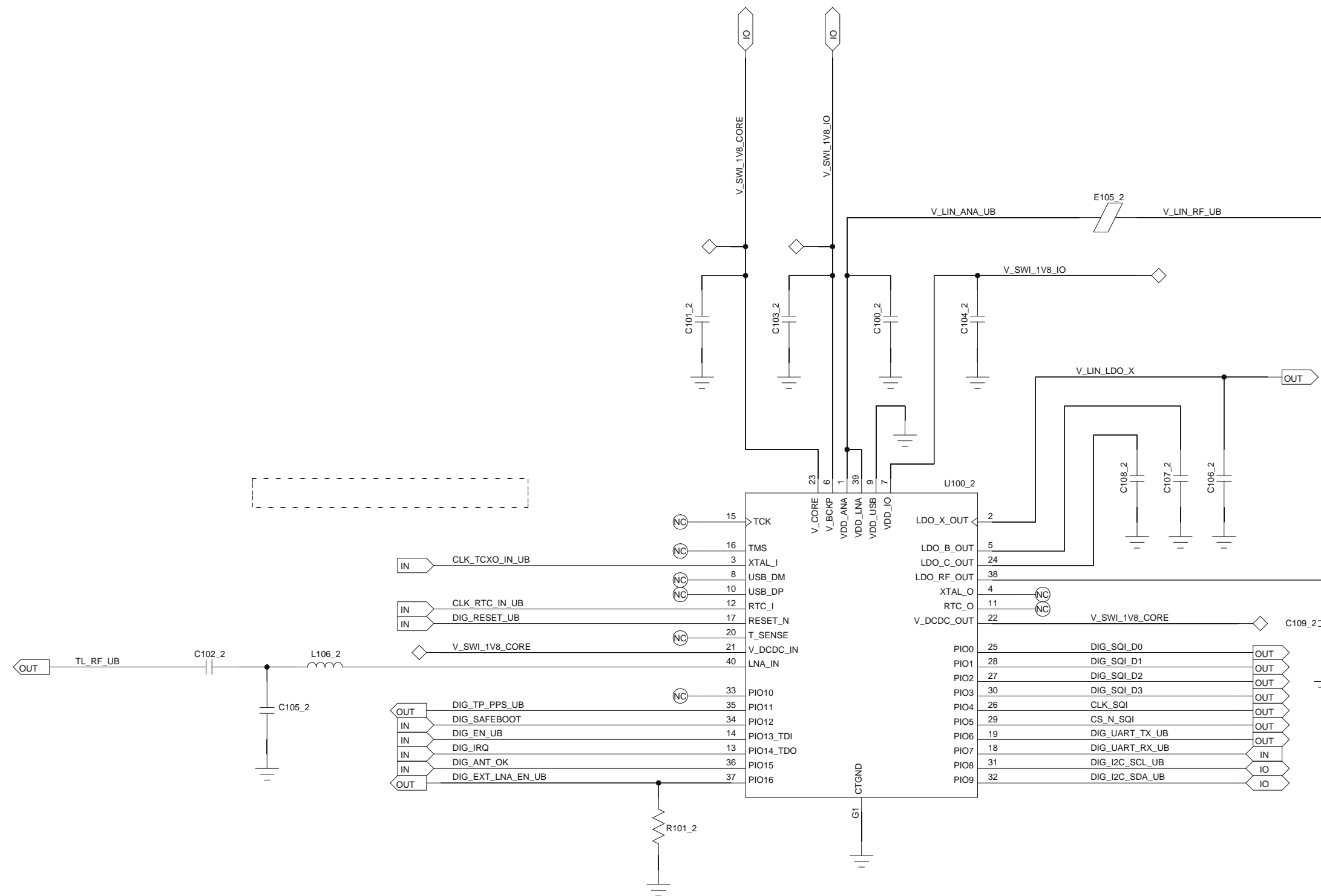


Figure 7-6. Bluetooth and WiFi Schematic Diagram (2 of 3)

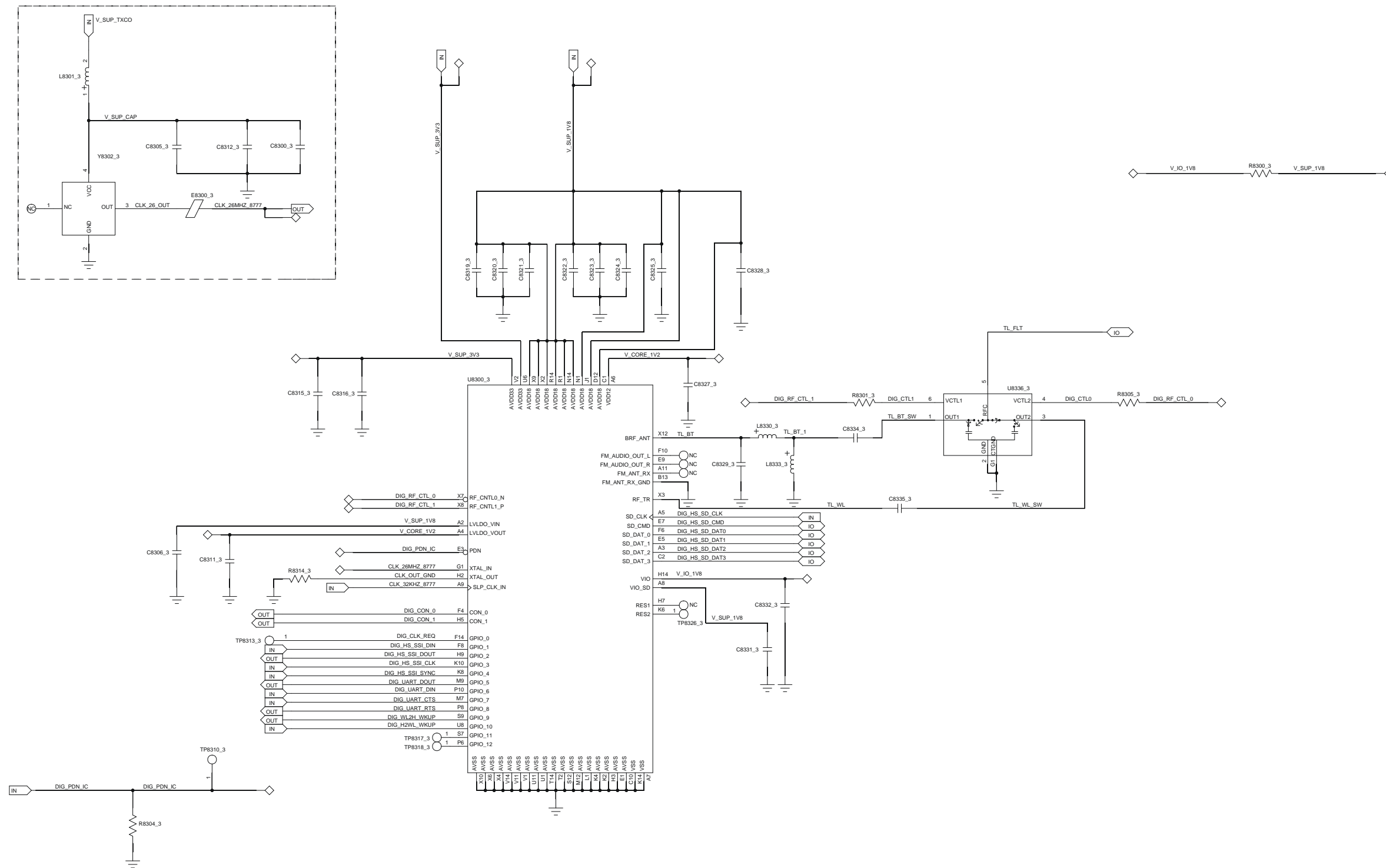


Figure 7-7. Bluetooth and WiFi Schematic Diagram (3 of 3)

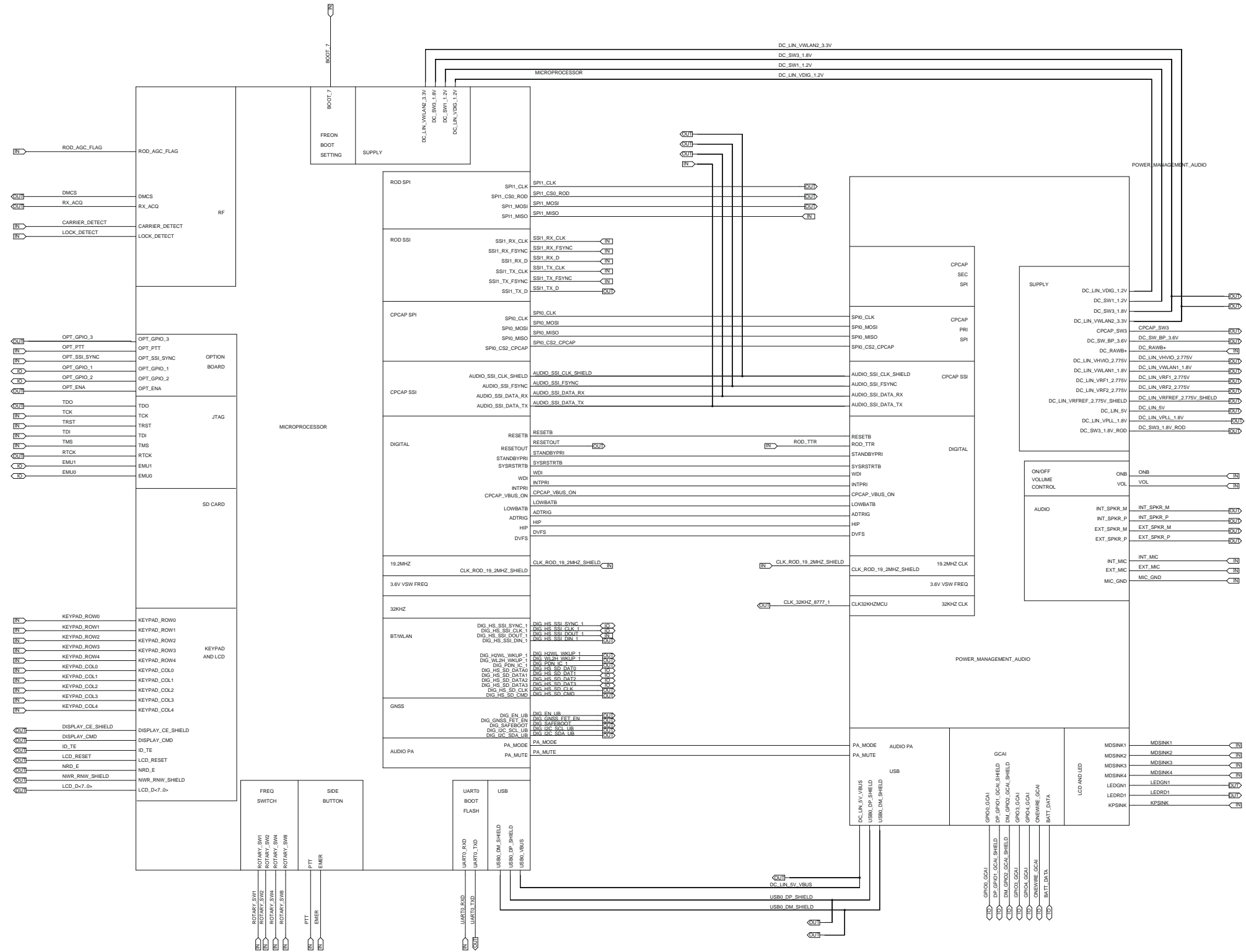


Figure 7-8. Controller Schematic Diagram



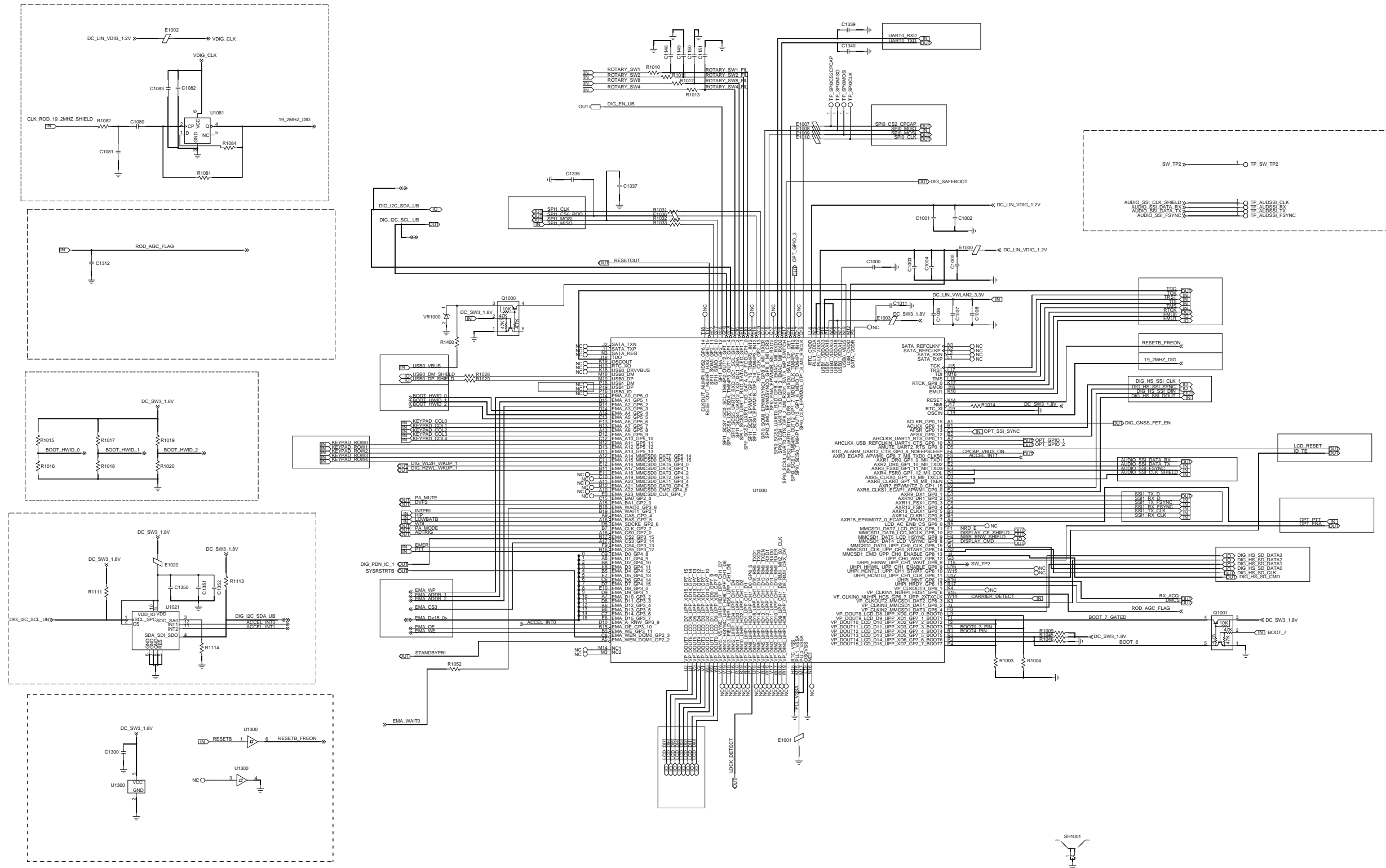


Figure 7-10. Microprocessor Schematic Diagram (1 of 2)

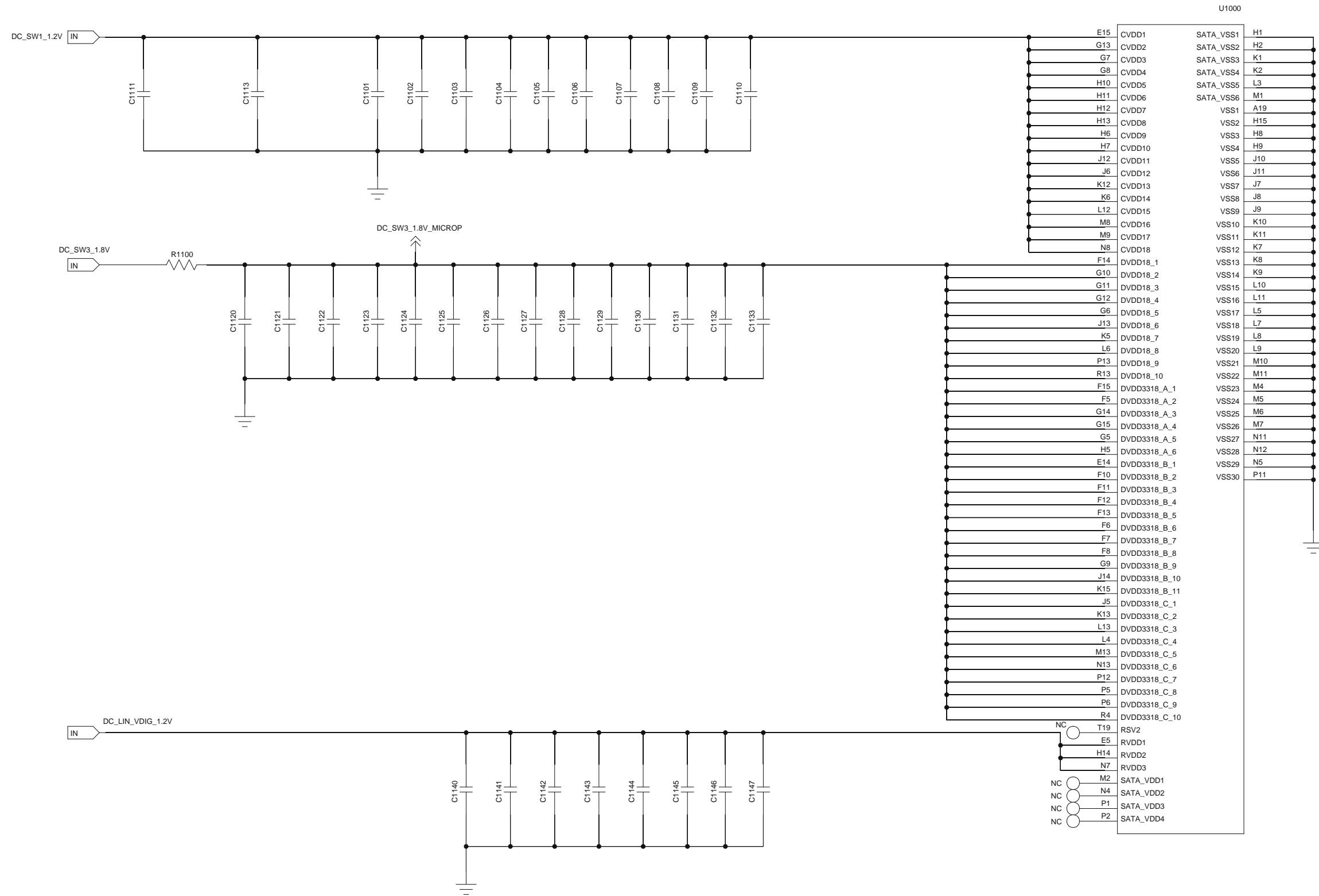


Figure 7-11. Microprocessor Schematic Diagram (2 of 2)

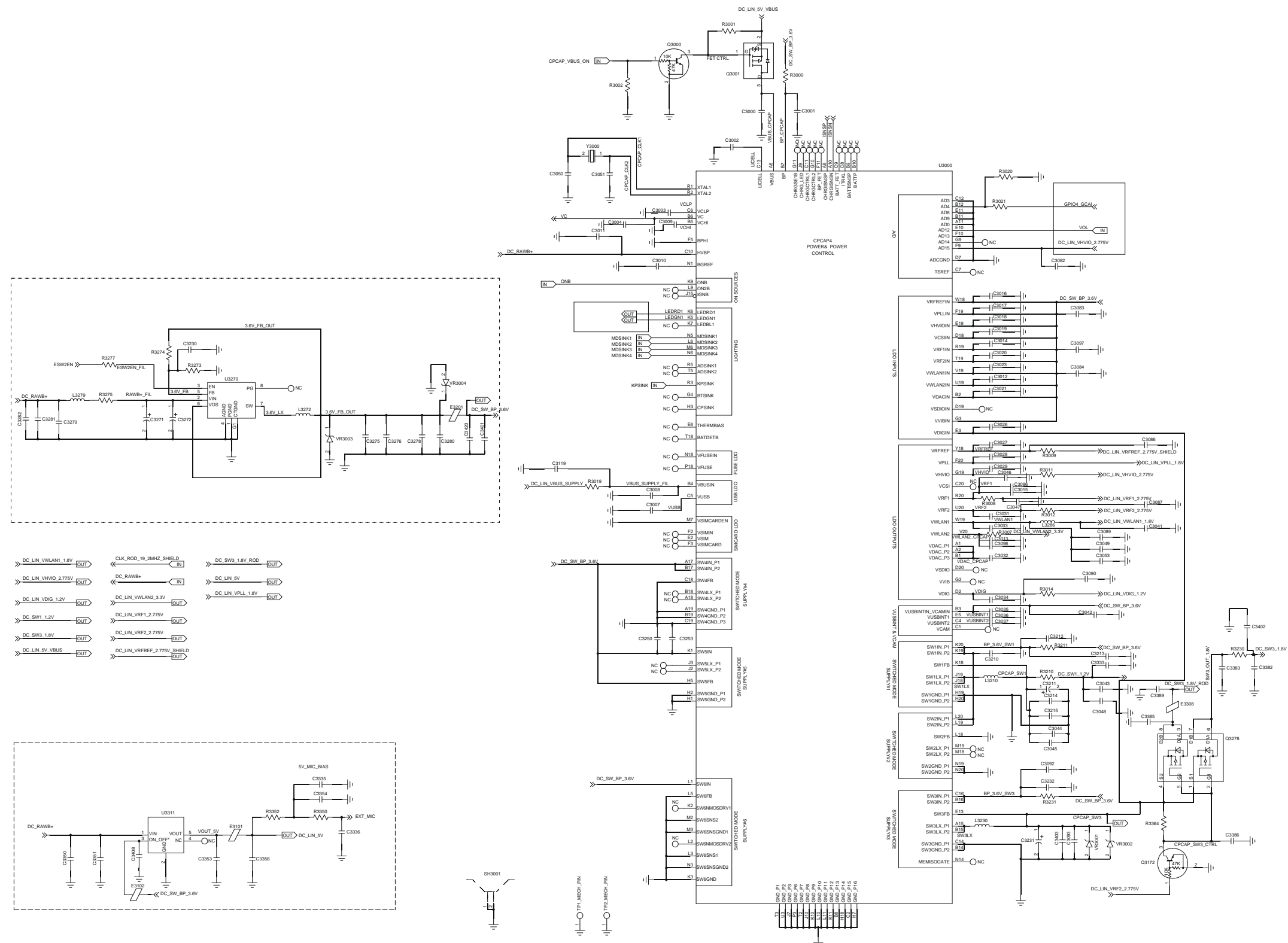


Figure 7-12. Power Management and Audio Schematic Diagram (1 of 3)

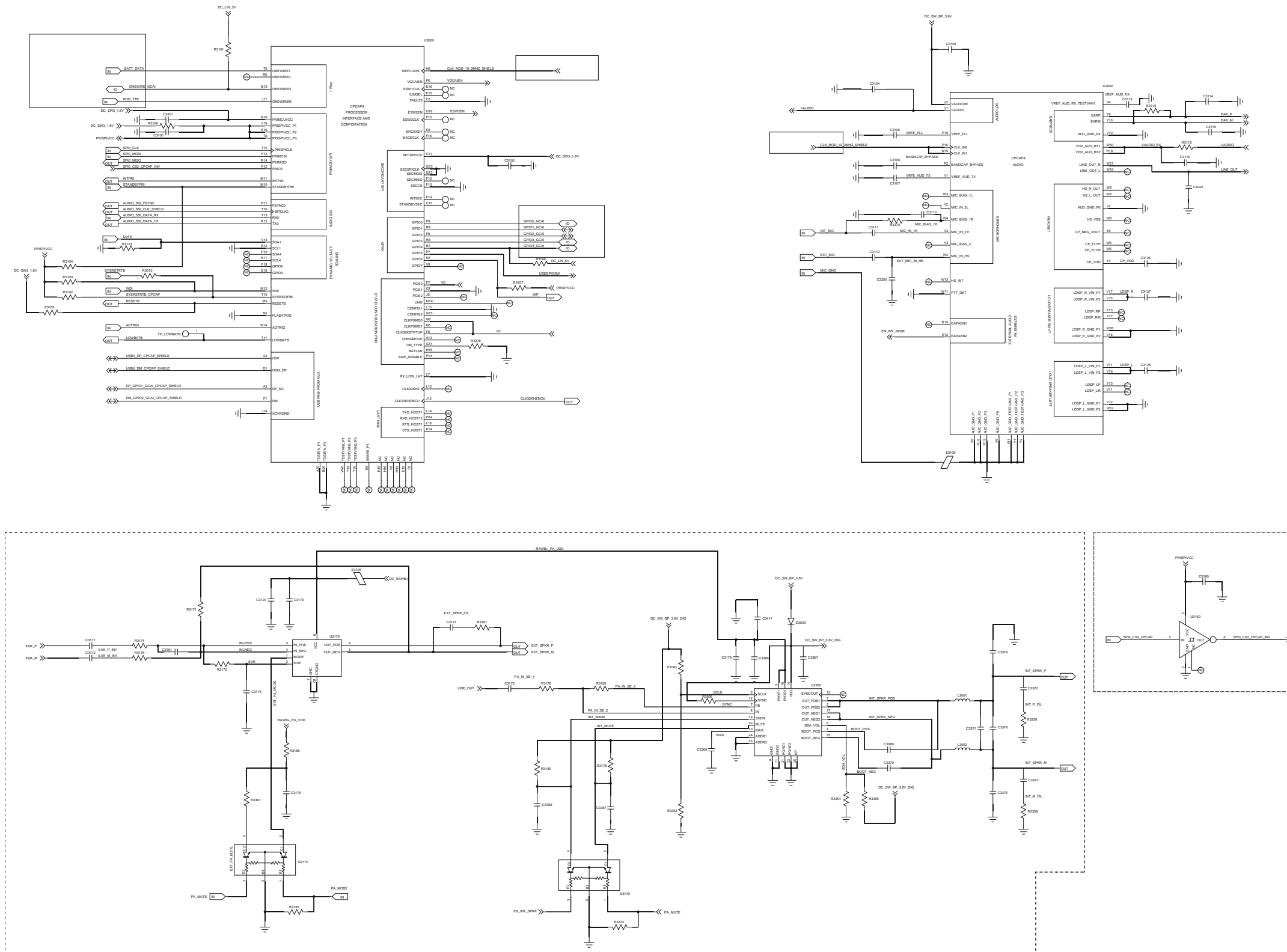


Figure 7-13. Power Management and Audio Schematic Diagram (2 of 3)

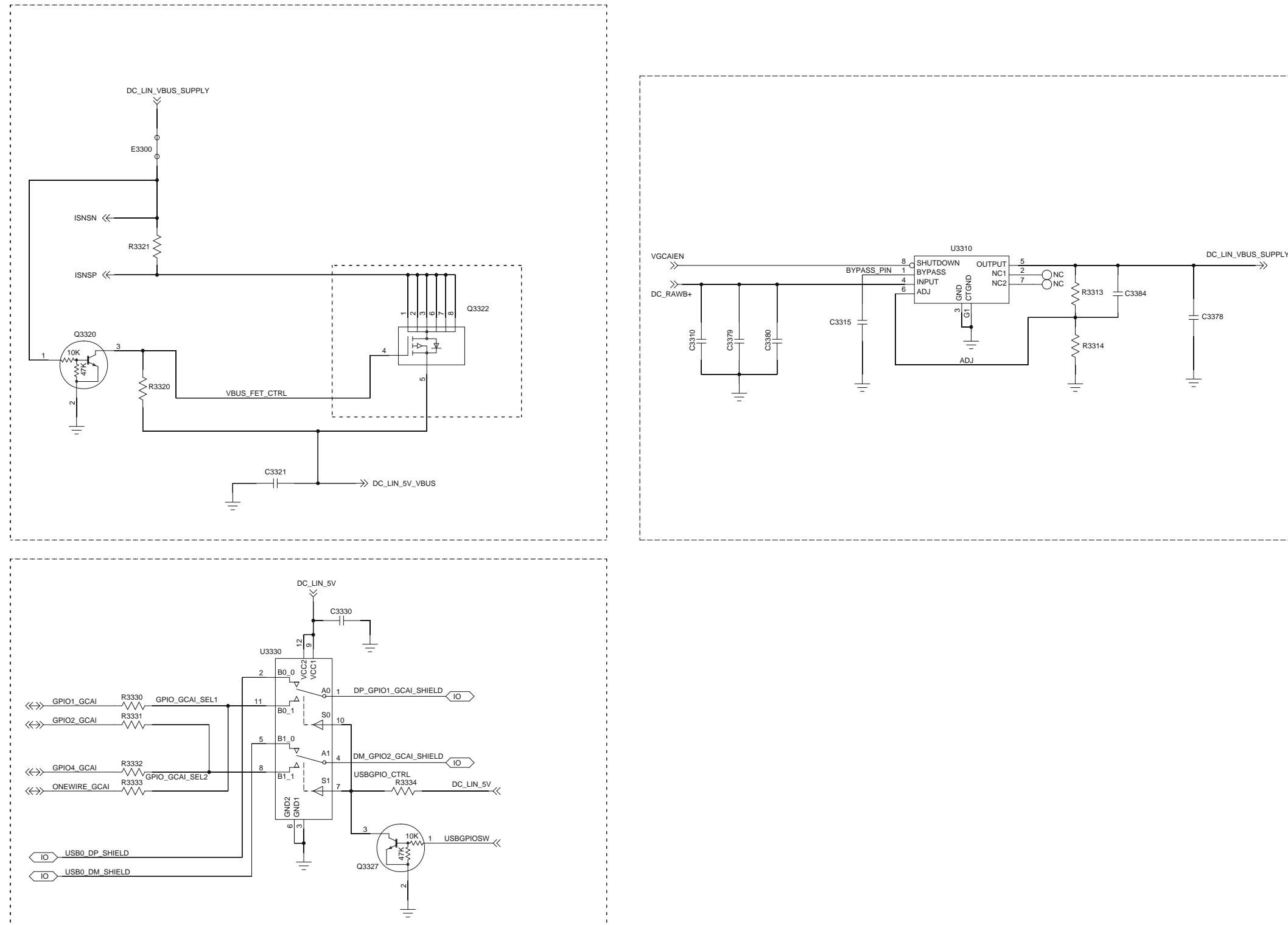


Figure 7-14. Power Management and Audio Schematic Diagram (3 of 3)

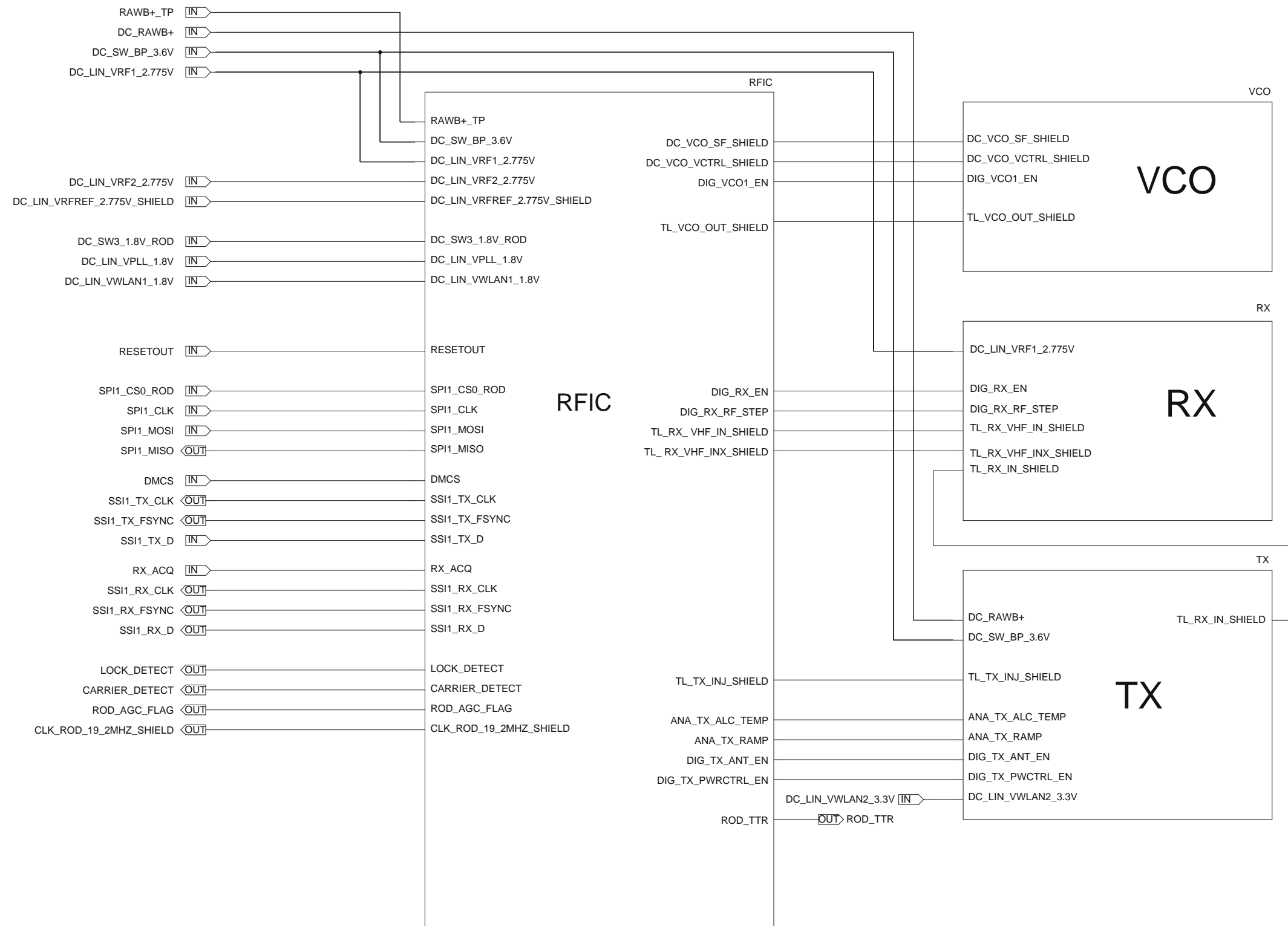


Figure 7-15. Overall RF Schematic Diagram

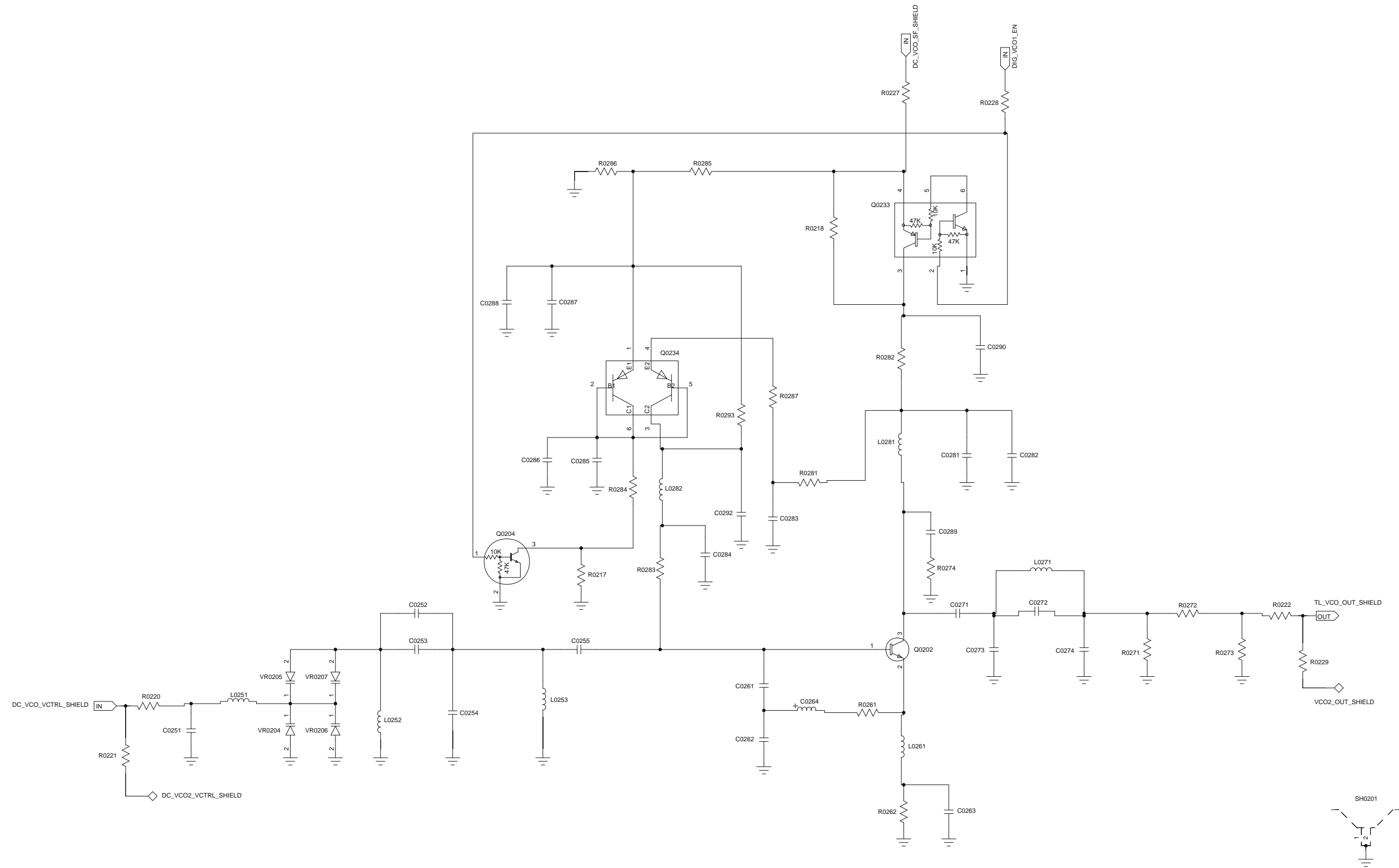


Figure 7-16. VCO Schematic Diagram (1 of 2)

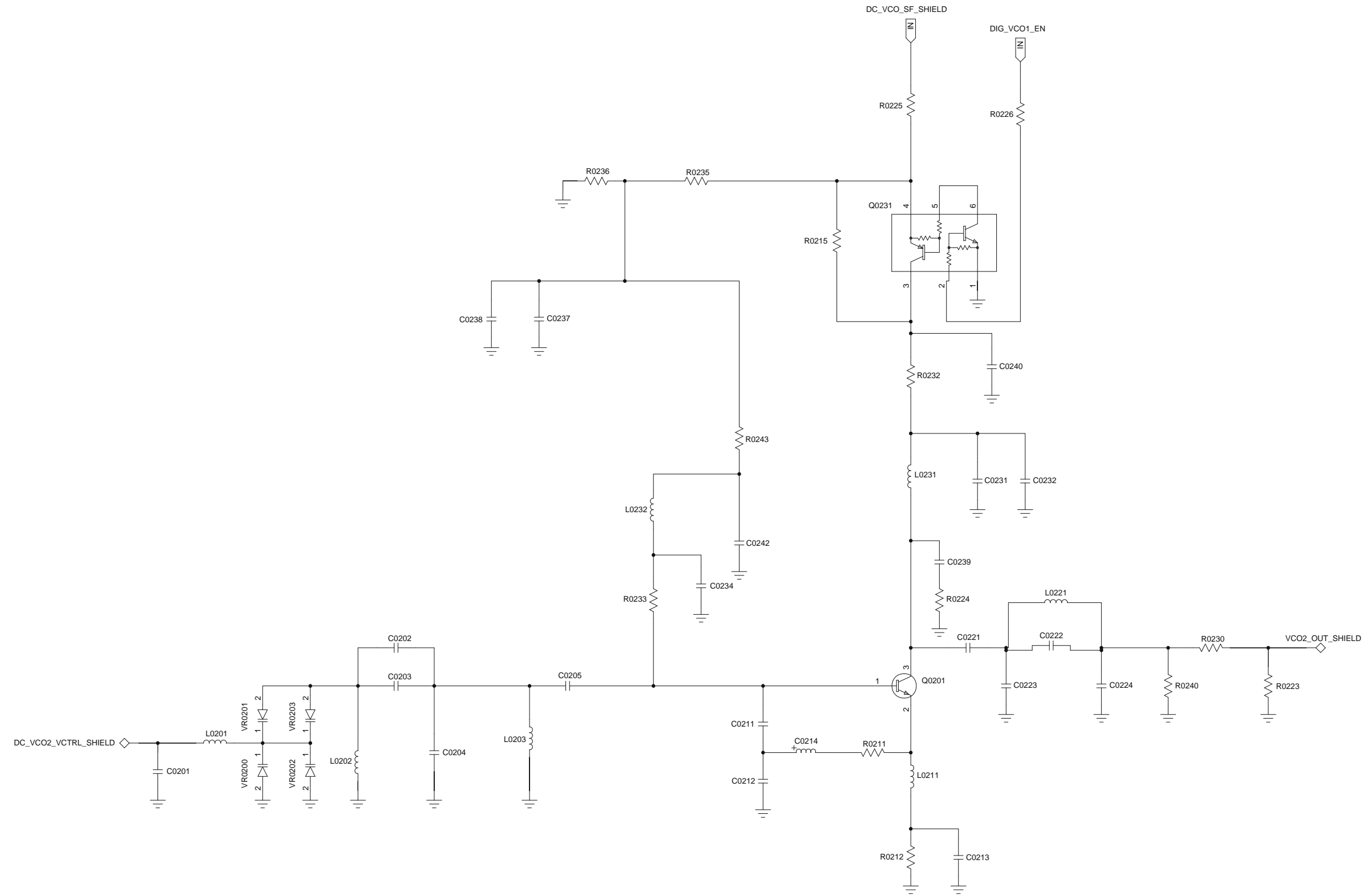


Figure 7-17. VCO Schematic Diagram (2 of 2)

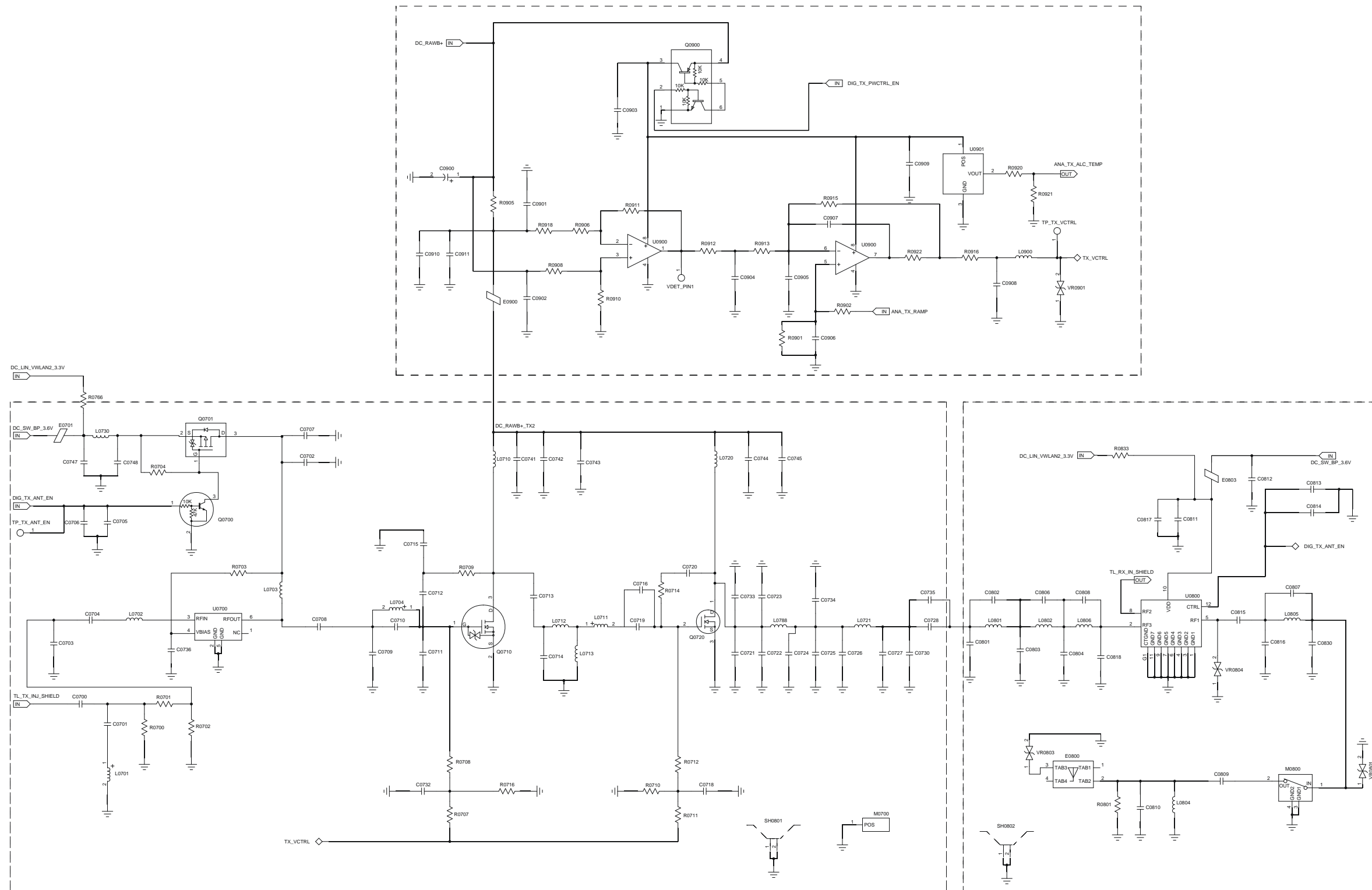


Figure 7-18. Transmitter Schematic Diagram

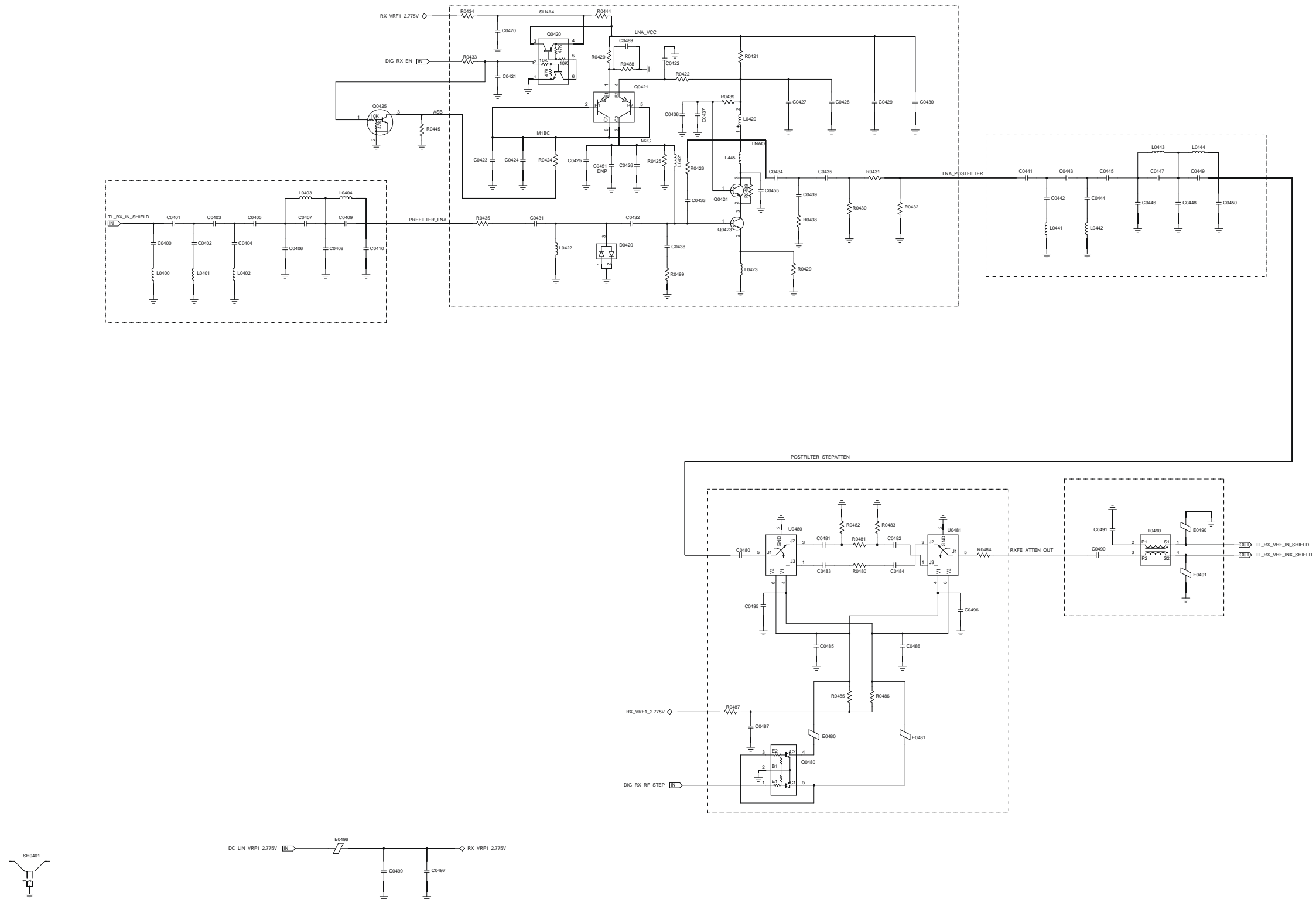


Figure 7-19. Receiver Schematic Diagram



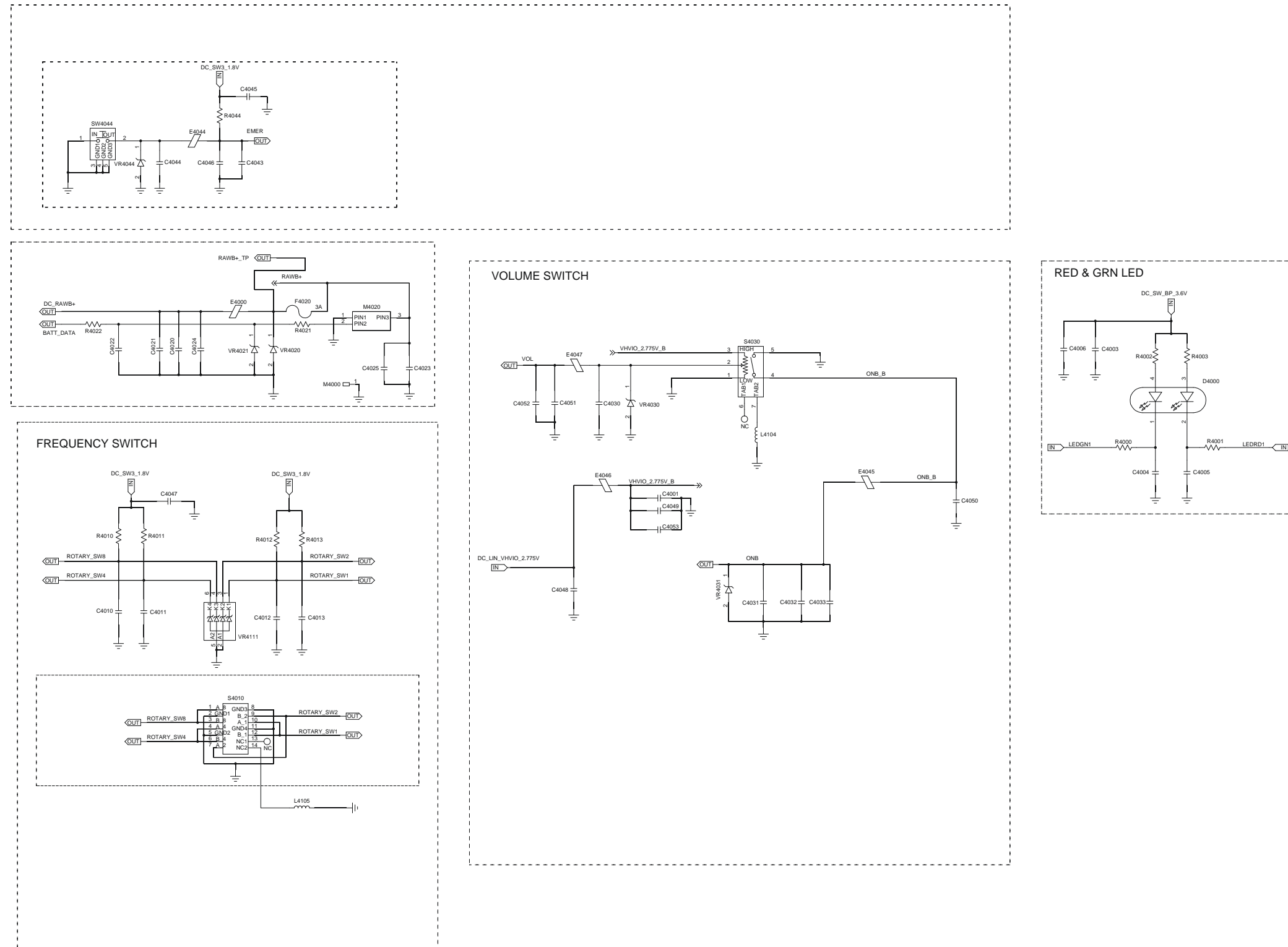


Figure 7-21. Peripheral Schematic Diagram (1 of 3)

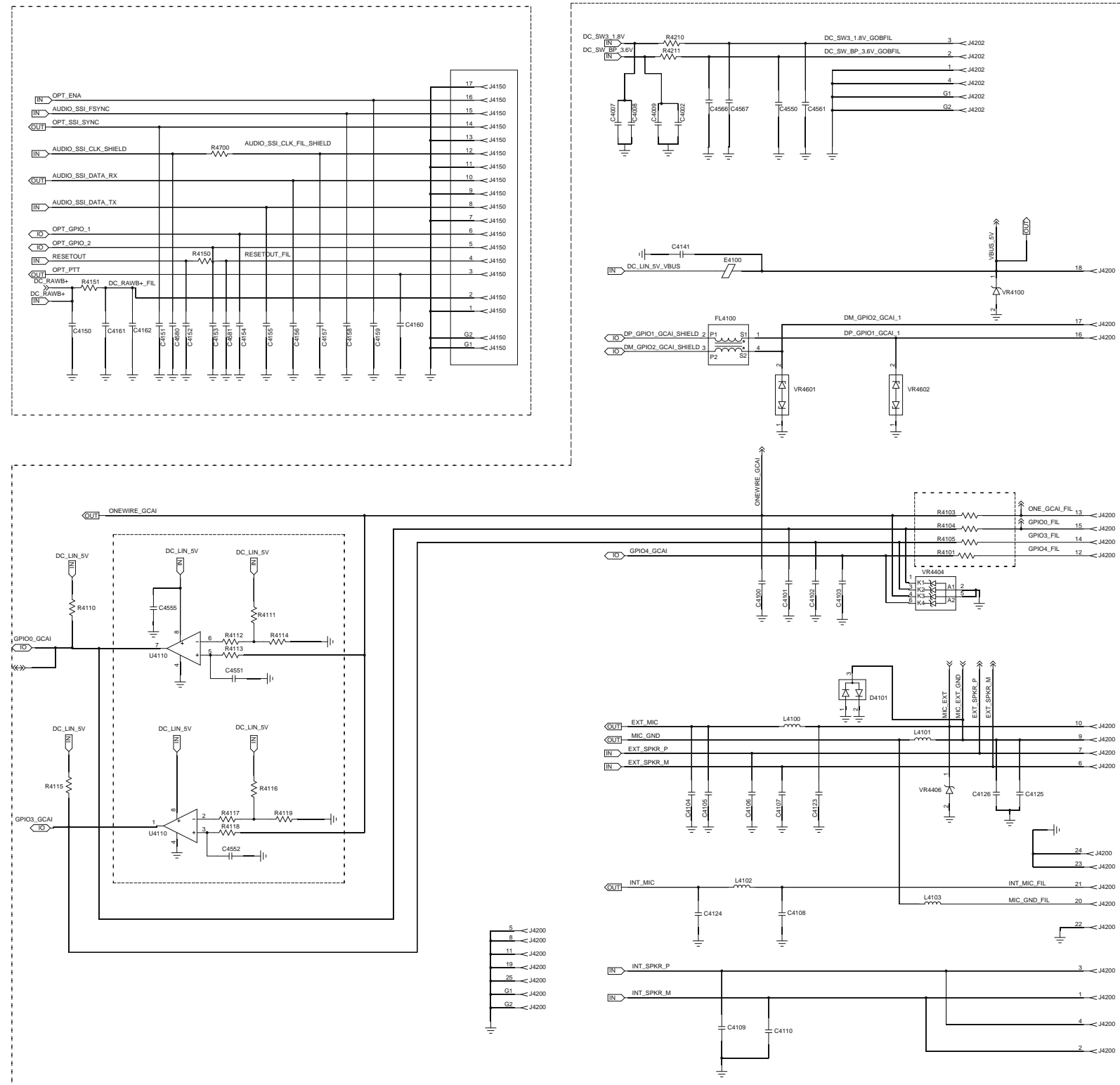


Figure 7-22. Peripheral Schematic Diagram (2 of 3)

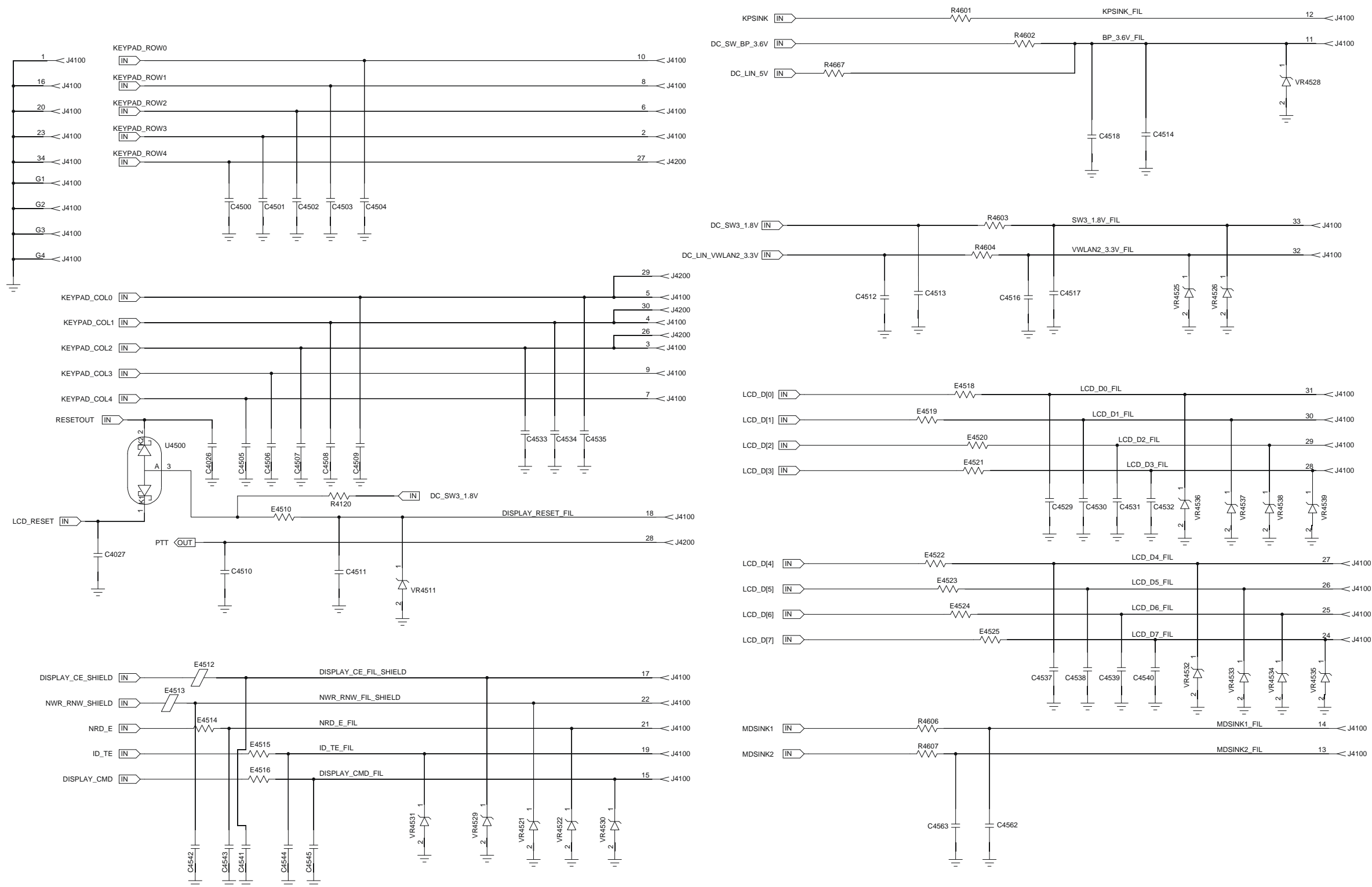


Figure 7-23. Peripheral Schematic Diagram (3 of 3)

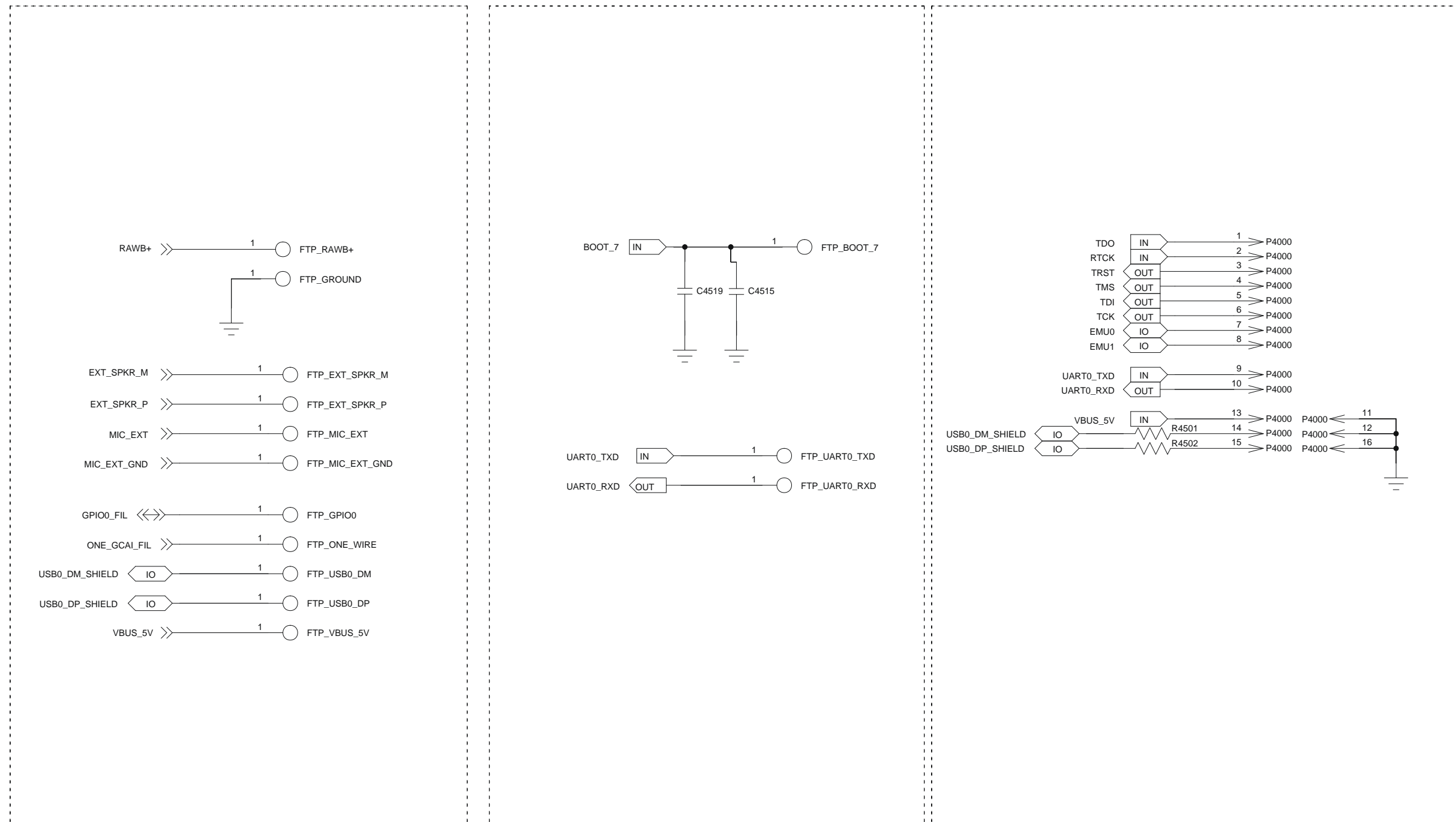


Figure 7-24. Factory Test Points Schematic Diagram

## VHF Radio Parts List (PC000975A01\_AA)

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0001        | 21012105001       |
| C0002        | 21012105001       |
| C0003        | NOTPLACED         |
| C0004        | NOTPLACED         |
| C0007        | 2113946U01        |
| C0008        | 21667009169       |
| C0009        | 2113946T03        |
| C0010        | 2113946U01        |
| C0011        | 2113946U01        |
| C0012        | 2113946T03        |
| C0013        | 2113946U01        |
| C0014        | 2113946T03        |
| C0015        | 2113946T03        |
| C0016        | 2113946U01        |
| C0017        | 2113946U01        |
| C0018        | 2113946U01        |
| C0019        | 2113956B33        |
| C0020        | NOTPLACED         |
| C0021        | 2113946U01        |
| C0022        | 2113946T03        |
| C0023        | 2113946T03        |
| C0024        | 2113946U01        |
| C0025        | 2113946T03        |
| C0026        | 2113946U01        |
| C0027        | 2113946U01        |
| C0028        | 2113946U01        |
| C0029        | 2113946T03        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0030        | 2113956A51        |
| C0031        | 2113946T03        |
| C0032        | 2113956A51        |
| C0033        | 2113946T03        |
| C0034        | 21667013164       |
| C0035        | NOTPLACED         |
| C0037        | 2113946T03        |
| C0039        | 2113946T03        |
| C0040        | 21012192001       |
| C0041        | 2113946U01        |
| C0042        | NOTPLACED         |
| C0043        | NOTPLACED         |
| C0044        | NOTPLACED         |
| C0045        | NOTPLACED         |
| C0047        | 2113946T03        |
| C0050        | 2113946U01        |
| C0051        | 2113946U01        |
| C0052        | NOTPLACED         |
| C0053        | 2113946U01        |
| C0056        | 21012192001       |
| C0057        | 21667013164       |
| C0058        | NOTPLACED         |
| C0100        | NOTPLACED         |
| C0101        | NOTPLACED         |
| C0102        | 21012044001       |
| C0103        | NOTPLACED         |
| C0104        | CA000532A01       |
| C0105        | 21012022001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0106        | 2113944F14        |
| C0107        | 21012027001       |
| C0109        | NOTPLACED         |
| C0110        | NOTPLACED         |
| C0111        | NOTPLACED         |
| C0112        | NOTPLACED         |
| C0113        | CA000491A01       |
| C0115        | 2113946T03        |
| C0120        | 2113946T03        |
| C0121        | 2113946U01        |
| C0122        | 2187893N01        |
| C0123        | 2113946U01        |
| C0124        | 2187893N01        |
| C0125        | 2113946T03        |
| C0126        | CA000491A01       |
| C0127        | 2113946T03        |
| C0128        | 2113946B06        |
| C0130        | 21012192001       |
| C0131        | 2113946C08        |
| C0132        | 2113946T03        |
| C0133        | 2113946U01        |
| C0140        | 2113946U01        |
| C0141        | 2113946U01        |
| C0142        | 2113946T03        |
| C0143        | 2113945F07        |
| C0145        | 2113946U01        |
| C0146        | 21667012146       |
| C0147        | 2113946T03        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0148        | 2113946U01        |
| C0160        | 2113946U01        |
| C0161        | 2113945B02        |
| C0162        | 2113945B02        |
| C0163        | 2113945B02        |
| C0164        | 2113945B02        |
| C0165        | 21667013152       |
| C0166        | 21012071001       |
| C0167        | 2113945Y02        |
| C0168        | 21667009174       |
| C0169        | 2113946T03        |
| C0170        | 2113946T03        |
| C0171        | NOTPLACED         |
| C0172        | 2113946T03        |
| C0173        | 2113946T03        |
| C0174        | NOTPLACED         |
| C0175        | CA000491A01       |
| C0177        | NOTPLACED         |
| C0178        | NOTPLACED         |
| C0179        | NOTPLACED         |
| C0180        | 2113946U01        |
| C0181        | 21012081001       |
| C0182        | 21012192001       |
| C0191        | 2113946U01        |
| C0192        | 2113946T03        |
| C0193        | 2113946U01        |
| C0201        | NOTPLACED         |
| C0202        | NOTPLACED         |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0203        | NOTPLACED         |
| C0204        | NOTPLACED         |
| C0205        | NOTPLACED         |
| C0208        | 21667012164       |
| C0211        | NOTPLACED         |
| C0212        | NOTPLACED         |
| C0213        | NOTPLACED         |
| C0214        | NOTPLACED         |
| C0221        | NOTPLACED         |
| C0222        | NOTPLACED         |
| C0223        | NOTPLACED         |
| C0224        | NOTPLACED         |
| C0231        | NOTPLACED         |
| C0232        | NOTPLACED         |
| C0234        | NOTPLACED         |
| C0237        | NOTPLACED         |
| C0238        | NOTPLACED         |
| C0239        | NOTPLACED         |
| C0240        | NOTPLACED         |
| C0242        | NOTPLACED         |
| C0251        | 21012192001       |
| C0252        | CA000209A01       |
| C0253        | 21012084061       |
| C0254        | NOTPLACED         |
| C0255        | 21012084035       |
| C0261        | 21012084055       |
| C0262        | CA000216A01       |
| C0263        | 21012192001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0264        | IN000167A01       |
| C0271        | CA000183A13       |
| C0272        | 21012084049       |
| C0273        | 21012084035       |
| C0274        | CA000183A11       |
| C0281        | NOTPLACED         |
| C0282        | NOTPLACED         |
| C0283        | NOTPLACED         |
| C0284        | NOTPLACED         |
| C0285        | NOTPLACED         |
| C0286        | NOTPLACED         |
| C0287        | 21012192001       |
| C0288        | 2113946U01        |
| C0289        | 21012084038       |
| C0290        | 21012192001       |
| C0292        | 2113945F07        |
| C0400        | 21667013152       |
| C0401        | 21667013150       |
| C0402        | 21667013156       |
| C0403        | 21667013150       |
| C0404        | 21667013150       |
| C0405        | CA000491A01       |
| C0406        | 21667013140       |
| C0407        | 21667013013       |
| C0408        | 21667013148       |
| C0409        | 21667013013       |
| C0410        | 21667013140       |
| C0420        | CA000491A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0421        | CA000491A01       |
| C0422        | 21012080001       |
| C0423        | CA000491A01       |
| C0424        | 21012080001       |
| C0425        | CA000491A01       |
| C0426        | 2113946B02        |
| C0427        | CA000491A01       |
| C0428        | 2187893N01        |
| C0429        | CA000491A01       |
| C0430        | 2113946D07        |
| C0431        | 21667013144       |
| C0432        | CA000491A01       |
| C0433        | CA000491A01       |
| C0434        | 21667013150       |
| C0435        | CA000491A01       |
| C0436        | NOTPLACED         |
| C0437        | NOTPLACED         |
| C0438        | NOTPLACED         |
| C0439        | 21012084038       |
| C0441        | 21667013154       |
| C0442        | 21667013154       |
| C0443        | 21667013154       |
| C0444        | 21667013150       |
| C0445        | 21667013154       |
| C0446        | 21667013150       |
| C0447        | 21012084026       |
| C0448        | 21667013156       |
| C0449        | 21012084026       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0450        | 21667013148       |
| C0451        | NOTPLACED         |
| C0455        | NOTPLACED         |
| C0480        | CA000491A01       |
| C0481        | CA000491A01       |
| C0482        | CA000491A01       |
| C0483        | CA000491A01       |
| C0484        | CA000491A01       |
| C0485        | CA000491A01       |
| C0486        | CA000491A01       |
| C0487        | CA000491A01       |
| C0489        | NOTPLACED         |
| C0490        | CA000491A01       |
| C0491        | CA000491A01       |
| C0495        | CA000491A01       |
| C0496        | CA000491A01       |
| C0497        | CA000491A01       |
| C0499        | 2113946U01        |
| C0700        | 21667009167       |
| C0701        | 21667009372       |
| C0702        | CA000491A01       |
| C0703        | NOTPLACED         |
| C0704        | 21012136001       |
| C0705        | CA000491A01       |
| C0706        | 2113946U01        |
| C0707        | 2113946U01        |
| C0708        | 21667009376       |
| C0709        | 21667009390       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0710        | NOTPLACED         |
| C0711        | NOTPLACED         |
| C0712        | 21667009174       |
| C0713        | 21667009376       |
| C0714        | 21667009382       |
| C0715        | NOTPLACED         |
| C0716        | 21667009388       |
| C0718        | 21667009167       |
| C0719        | NOTPLACED         |
| C0720        | 2113945C13        |
| C0721        | 21667009376       |
| C0722        | 21667009376       |
| C0723        | NOTPLACED         |
| C0724        | NOTPLACED         |
| C0725        | 21667009380       |
| C0726        | 21667009382       |
| C0727        | 21667009376       |
| C0728        | 21667009380       |
| C0730        | 21667009311       |
| C0732        | 2113945Y01        |
| C0733        | NOTPLACED         |
| C0734        | 21667009380       |
| C0735        | 21667009380       |
| C0736        | NOTPLACED         |
| C0741        | 2113946K02        |
| C0742        | 2113945B04        |
| C0743        | 21667009170       |
| C0744        | 2113945A11        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0745        | 21667009165       |
| C0747        | NOTPLACED         |
| C0748        | NOTPLACED         |
| C0801        | 21667009364       |
| C0802        | 21667009311       |
| C0803        | 21667009374       |
| C0804        | 21667009364       |
| C0806        | 21667009326       |
| C0807        | 21667009303       |
| C0808        | 0613952R66        |
| C0809        | 21667009374       |
| C0810        | 21667009332       |
| C0811        | CA000491A01       |
| C0812        | CA000491A01       |
| C0813        | 2113946U01        |
| C0814        | CA000491A01       |
| C0815        | 0613952R66        |
| C0816        | 21667009364       |
| C0817        | 2113945E02        |
| C0818        | NOTPLACED         |
| C0830        | 21667009366       |
| C0900        | 21012150001       |
| C0901        | 2113945A11        |
| C0902        | 2113945A11        |
| C0903        | CA000491A01       |
| C0904        | 2113945B04        |
| C0905        | NOTPLACED         |
| C0906        | CA000491A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0907        | 2113945B58        |
| C0908        | CA000491A01       |
| C0909        | 2113945B04        |
| C0910        | 2113946K02        |
| C0911        | 2113945A11        |
| C1000        | 2113946B06        |
| C1001        | 2113946B04        |
| C1002        | 2113945F07        |
| C1003        | 2113945F07        |
| C1004        | 2113946B04        |
| C1005        | 2113946B04        |
| C1006        | 2113956B54        |
| C1007        | 2113946B04        |
| C1008        | 2113946B04        |
| C1011        | CA000491A01       |
| C1080        | 2113945F07        |
| C1081        | NOTPLACED         |
| C1082        | 2113946B04        |
| C1083        | 2113946B04        |
| C1101        | 2113946B06        |
| C1102        | 2113946B06        |
| C1103        | 2113946B06        |
| C1104        | 2113946B06        |
| C1105        | 2113946B06        |
| C1106        | CA000491A01       |
| C1107        | CA000491A01       |
| C1108        | CA000491A01       |
| C1109        | CA000491A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C1110        | CA000491A01       |
| C1111        | NOTPLACED         |
| C1113        | NOTPLACED         |
| C1120        | NOTPLACED         |
| C1121        | NOTPLACED         |
| C1122        | 2113946B06        |
| C1123        | 2113946B06        |
| C1124        | 2113946B06        |
| C1125        | 2113946B06        |
| C1126        | 2113946B06        |
| C1127        | CA000491A01       |
| C1128        | CA000491A01       |
| C1129        | CA000491A01       |
| C1130        | CA000491A01       |
| C1131        | CA000491A01       |
| C1132        | CA000491A01       |
| C1133        | CA000491A01       |
| C1140        | NOTPLACED         |
| C1141        | NOTPLACED         |
| C1142        | 2113946B06        |
| C1143        | 2113946B06        |
| C1144        | CA000491A01       |
| C1145        | CA000491A01       |
| C1146        | CA000491A01       |
| C1147        | CA000491A01       |
| C1148        | NOTPLACED         |
| C1149        | NOTPLACED         |
| C1150        | NOTPLACED         |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C1151        | NOTPLACED         |
| C1300        | 2113946B04        |
| C1312        | 2113946B04        |
| C1335        | NOTPLACED         |
| C1337        | NOTPLACED         |
| C1339        | NOTPLACED         |
| C1340        | NOTPLACED         |
| C1350        | 2113946B04        |
| C1351        | CA000491A01       |
| C1352        | NOTPLACED         |
| C2000        | 2113946B04        |
| C2001        | 2113946B04        |
| C2002        | 2113946B04        |
| C2003        | 2113946B04        |
| C2004        | CA000491A01       |
| C2005        | 2113945F07        |
| C2006        | CA000491A01       |
| C2007        | 2113946B04        |
| C2008        | 2113946B04        |
| C2010        | NOTPLACED         |
| C2011        | NOTPLACED         |
| C2100        | 2113946B04        |
| C2101        | 2113946B04        |
| C2102        | 2113956B54        |
| C2104        | 2113945F07        |
| C2105        | CA000491A01       |
| C3000        | 2113956B43        |
| C3001        | 2113956B43        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3002        | 2113956B43        |
| C3003        | 2187893N01        |
| C3004        | 2187893N01        |
| C3007        | 2187893N01        |
| C3008        | 2113946B04        |
| C3009        | 2187893N01        |
| C3010        | 2113945F01        |
| C3011        | 2113956B21        |
| C3012        | 2113946U01        |
| C3013        | 2113956B43        |
| C3014        | 2113946U01        |
| C3015        | 2113956B43        |
| C3016        | 2113946U01        |
| C3017        | 2113946U01        |
| C3018        | 2113946U01        |
| C3019        | 2113946U01        |
| C3020        | 2113946U01        |
| C3021        | 2113946U01        |
| C3023        | 2113946U01        |
| C3024        | 21667013164       |
| C3026        | 2113946U01        |
| C3027        | 2187893N01        |
| C3028        | 2187893N01        |
| C3029        | 2187893N01        |
| C3031        | 2187893N01        |
| C3032        | 2187893N01        |
| C3033        | 2187893N01        |
| C3034        | 2187893N01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3035        | 2113946U01        |
| C3036        | 2187893N01        |
| C3037        | 2187893N01        |
| C3041        | 2113946D01        |
| C3042        | CA000491A01       |
| C3043        | 2113945F07        |
| C3044        | 2187893N01        |
| C3045        | 2113945F07        |
| C3046        | 2113946U01        |
| C3047        | 2113946U01        |
| C3048        | 2113946U01        |
| C3049        | 2113945F03        |
| C3050        | 21667013146       |
| C3051        | 21667013146       |
| C3053        | 2113945F07        |
| C3082        | 2113945F03        |
| C3083        | CA000491A01       |
| C3084        | CA000491A01       |
| C3086        | 2113945F03        |
| C3087        | 2113945F03        |
| C3089        | 2113945F03        |
| C3090        | 2113945F03        |
| C3092        | CA000491A01       |
| C3093        | 2113945A11        |
| C3096        | 2113945F03        |
| C3097        | CA000491A01       |
| C3098        | CA000491A01       |
| C3100        | 2113946U01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3101        | 2113946U01        |
| C3102        | 2113946U01        |
| C3103        | 2113946U01        |
| C3104        | 2113946U01        |
| C3105        | 2187893N01        |
| C3106        | 2187893N01        |
| C3107        | 2187893N01        |
| C3110        | 2187893N01        |
| C3111        | 2113946U11        |
| C3112        | 2113946U11        |
| C3113        | 2113946U01        |
| C3114        | 21667013164       |
| C3115        | 21667013164       |
| C3116        | 2113946U01        |
| C3119        | CA000491A01       |
| C3120        | 2113946B04        |
| C3126        | 2113946U01        |
| C3127        | 2113946U01        |
| C3128        | 2113946B04        |
| C3160        | 2113946U01        |
| C3171        | 2113946U01        |
| C3172        | 2113946U01        |
| C3173        | 21012135001       |
| C3175        | 2113956B21        |
| C3176        | 2113956B21        |
| C3177        | NOTPLACED         |
| C3178        | CA000491A01       |
| C3179        | 2113956C25        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3181        | 2113945F01        |
| C3200        | 21012193001       |
| C3210        | 2113946U01        |
| C3211        | 21012150001       |
| C3212        | 2187893N01        |
| C3213        | CA000491A01       |
| C3214        | 2113945F03        |
| C3215        | 2113946U01        |
| C3230        | CA000491A01       |
| C3231        | 21012150001       |
| C3232        | 2187893N01        |
| C3250        | 2113946U01        |
| C3253        | CA000491A01       |
| C3271        | CA000402A01       |
| C3272        | CA000402A01       |
| C3275        | CA000534A01       |
| C3276        | CA000365A01       |
| C3278        | 2187893N01        |
| C3279        | CA000491A01       |
| C3280        | 2113945A11        |
| C3281        | CA000216A01       |
| C3282        | 21667013162       |
| C3310        | 2113956B33        |
| C3315        | 2113945B02        |
| C3321        | 2187893N01        |
| C3330        | 2113946U01        |
| C3333        | 2113945F03        |
| C3335        | CA000491A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3336        | 2113946U01        |
| C3350        | 2113956B21        |
| C3351        | 2113945B02        |
| C3353        | 2113946D05        |
| C3354        | 2113956B55        |
| C3356        | CA000491A01       |
| C3366        | 2113956B21        |
| C3367        | 2187893N01        |
| C3368        | 2113956B43        |
| C3369        | 2113946B04        |
| C3370        | 2113946B04        |
| C3371        | NOTPLACED         |
| C3372        | NOTPLACED         |
| C3373        | NOTPLACED         |
| C3374        | 2113956B21        |
| C3375        | 2113956B21        |
| C3376        | NOTPLACED         |
| C3378        | 2113956E91        |
| C3379        | 2113956B33        |
| C3380        | 2113956B21        |
| C3382        | 2113956A51        |
| C3383        | 2113956A51        |
| C3384        | 21012191002       |
| C3385        | 21667009028       |
| C3386        | 21667013162       |
| C3387        | 2113945B02        |
| C3388        | 2113945B02        |
| C3389        | 21667009028       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3401        | 2113945A11        |
| C3402        | 2113945A11        |
| C3403        | 2113945A11        |
| C3408        | CA000491A01       |
| C3411        | 2187893N01        |
| C3420        | 2113945A11        |
| C4001        | CA000491A01       |
| C4002        | 2113956A51        |
| C4003        | CA000491A01       |
| C4004        | CA000491A01       |
| C4005        | CA000491A01       |
| C4006        | 2113946U01        |
| C4007        | 2113956A51        |
| C4008        | CA000491A01       |
| C4009        | CA000491A01       |
| C4010        | CA000491A01       |
| C4011        | CA000491A01       |
| C4012        | CA000491A01       |
| C4013        | CA000491A01       |
| C4020        | CA000491A01       |
| C4021        | 21667013122       |
| C4022        | CA000491A01       |
| C4023        | 21667012142       |
| C4024        | 21013083001       |
| C4025        | 21667012360       |
| C4026        | CA000491A01       |
| C4027        | CA000491A01       |
| C4030        | CA000491A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C4031        | CA000491A01       |
| C4032        | 21667012360       |
| C4033        | 21667012360       |
| C4043        | 21667012360       |
| C4044        | CA000491A01       |
| C4045        | CA000491A01       |
| C4046        | 21667012360       |
| C4047        | 2113945E06        |
| C4048        | CA000491A01       |
| C4049        | 21667012360       |
| C4050        | CA000491A01       |
| C4051        | 21667012360       |
| C4052        | 21667012360       |
| C4053        | 21667012360       |
| C4100        | 21012136001       |
| C4101        | CA000491A01       |
| C4102        | CA000491A01       |
| C4103        | CA000491A01       |
| C4104        | 21012193001       |
| C4105        | NOTPLACED         |
| C4106        | CA000491A01       |
| C4107        | CA000491A01       |
| C4108        | CA000491A01       |
| C4109        | CA000491A01       |
| C4110        | CA000491A01       |
| C4123        | CA000491A01       |
| C4124        | 21012193001       |
| C4125        | 21667009167       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C4126        | 21667009174       |
| C4141        | CA000491A01       |
| C4150        | NOTPLACED         |
| C4151        | CA000491A01       |
| C4152        | 2113946U01        |
| C4153        | NOTPLACED         |
| C4154        | NOTPLACED         |
| C4155        | NOTPLACED         |
| C4156        | NOTPLACED         |
| C4157        | CA000491A01       |
| C4158        | NOTPLACED         |
| C4159        | CA000491A01       |
| C4160        | NOTPLACED         |
| C4161        | 2113956D35        |
| C4162        | NOTPLACED         |
| C4500        | CA000491A01       |
| C4501        | CA000491A01       |
| C4502        | CA000491A01       |
| C4503        | CA000491A01       |
| C4504        | CA000491A01       |
| C4505        | CA000491A01       |
| C4506        | CA000491A01       |
| C4507        | CA000491A01       |
| C4508        | CA000491A01       |
| C4509        | CA000491A01       |
| C4510        | CA000491A01       |
| C4511        | CA000491A01       |
| C4512        | CA000491A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C4513        | CA000491A01       |
| C4514        | CA000491A01       |
| C4515        | CA000491A01       |
| C4516        | 2113946U01        |
| C4517        | 2113946U01        |
| C4518        | 2113946U01        |
| C4519        | 21667009371       |
| C4529        | 21012193001       |
| C4530        | 21012193001       |
| C4531        | 21012193001       |
| C4532        | 21012193001       |
| C4533        | CA000491A01       |
| C4534        | CA000491A01       |
| C4535        | CA000491A01       |
| C4537        | 21012193001       |
| C4538        | 21012193001       |
| C4539        | 21012193001       |
| C4540        | 21012193001       |
| C4541        | 21012193001       |
| C4542        | 21012193001       |
| C4543        | 21012193001       |
| C4544        | 21012193001       |
| C4545        | 21012193001       |
| C4550        | CA000491A01       |
| C4551        | NOTPLACED         |
| C4552        | NOTPLACED         |
| C4555        | NOTPLACED         |
| C4561        | CA000491A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C4562        | CA000491A01       |
| C4563        | CA000491A01       |
| C4566        | 2113956D35        |
| C4567        | 2113956D35        |
| C4580        | CA000491A01       |
| C4581        | CA000491A01       |
| C8000        | 2113946D05        |
| C8001        | NOTPLACED         |
| C8002        | CA000491A01       |
| C8003        | CA000491A01       |
| C8004        | 2113946U01        |
| C8005        | CA000365A01       |
| C8006        | 2113945E07        |
| C8008        | CA000491A01       |
| C8010        | CA000491A01       |
| C8012        | 21013062001       |
| C8013        | CA000491A01       |
| C8014        | CA000491A01       |
| C8100        | 2113946D05        |
| C8101        | 2113946D05        |
| C8102        | 21667013140       |
| C8103        | CA000491A01       |
| C8104        | CA000491A01       |
| C8105        | NOTPLACED         |
| C8106        | NOTPLACED         |
| C8107        | 2113956C37        |
| C8108        | CA000491A01       |
| C8109        | CA000491A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C8110        | 21012193001       |
| C8111        | 21009304001       |
| C8112        | CA000491A01       |
| C8113        | CA000491A01       |
| C8114        | 21012129001       |
| C8300_3      | 21009304001       |
| C8306_3      | 21009304001       |
| C8311_3      | 21009304001       |
| C8316_3      | 21009304001       |
| C8315_3      | 21012129001       |
| C8329_3      | 21013048001       |
| C100_2       | 21013062001       |
| C101_2       | 21013062001       |
| C103_2       | 21013062001       |
| C104_2       | 21013062001       |
| C106_2       | 21013062001       |
| C108_2       | 21013062001       |
| C109_2       | 21013062001       |
| C8327_3      | 2113945F07        |
| C8312_3      | 2113946U01        |
| C8319_3      | 2113946U01        |
| C8320_3      | 2113946U01        |
| C8321_3      | 2113946U01        |
| C8322_3      | 2113946U01        |
| C8323_3      | 2113946U01        |
| C8324_3      | 2113946U01        |
| C8325_3      | 2113946U01        |
| C8328_3      | 2113946U01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C8331_3      | 2113946U01        |
| C8332_3      | 2113946U01        |
| C105_2       | 21667009201       |
| C102_2       | 21667009380       |
| C8305_3      | 21667012146       |
| C8335_3      | 21667013140       |
| C107_2       | 2170282H06        |
| C8334_3      | CA000445A01       |
| D0160        | 4871852M01        |
| D0161        | 4871852M02        |
| D0420        | 4813974A19        |
| D3000        | 4805656W89        |
| D4000        | 48009340001       |
| D4101        | 4813974A19        |
| E0001        | 2471132D16        |
| E0002        | 2471132D16        |
| E0003        | 2471132D16        |
| E0004        | 2471132D16        |
| E0005        | 2471132D16        |
| E0006        | 2471132D16        |
| E0007        | 2471132D16        |
| E0010        | 2471132D16        |
| E0012        | 2471132D16        |
| E0013        | 2471132D16        |
| E0014        | 0613952R66        |
| E0015        | 0613952R66        |
| E0017        | 2471132D16        |
| E0018        | 91012036001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| E0019        | 2471132D14        |
| E0020        | 2471132D16        |
| E0021        | 2471132D14        |
| E0023        | 2471132D16        |
| E0480        | 2471132D16        |
| E0481        | 2471132D16        |
| E0490        | 2471132D16        |
| E0491        | 2471132D16        |
| E0496        | 2471132D16        |
| E0701        | NOTPLACED         |
| E0800        | 2012010003        |
| E0803        | NOTPLACED         |
| E0900        | 7686949J14        |
| E1000        | 24012051001       |
| E1001        | 24012051001       |
| E1002        | 24012051001       |
| E1003        | 24012051001       |
| E1006        | 91012036001       |
| E1007        | 91012036001       |
| E1008        | 91012036001       |
| E1009        | 91012036001       |
| E1010        | 91012036001       |
| E1020        | 24012065001       |
| E3100        | 2471132D14        |
| E3101        | 24012065001       |
| E3102        | 24012065001       |
| E3105        | HZ000290A01       |
| E3201        | HZ000290A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| E3300        | NOTPLACED         |
| E3308        | 91013001001       |
| E4000        | 24010078002       |
| E4044        | 91012036001       |
| E4045        | 91012036001       |
| E4046        | 91012036001       |
| E4047        | 91012036001       |
| E4100        | 24012178001       |
| E4510        | 0613952R66        |
| E4512        | HZ000399A01       |
| E4513        | HZ000399A01       |
| E4514        | 0613952R66        |
| E4515        | 0613952R66        |
| E4516        | 0613952R66        |
| E4518        | 0613952R66        |
| E4519        | 0613952R66        |
| E4520        | 0613952R66        |
| E4521        | 0613952R66        |
| E4522        | 0613952R66        |
| E4523        | 0613952R66        |
| E4524        | 0613952R66        |
| E4525        | 0613952R66        |
| E8000        | NOTPLACED         |
| E8002        | 7686949J08        |
| E8003        | 7688697V14        |
| E8100        | 7686949J22        |
| E8102        | 7688697V04        |
| E8103        | 7688697V04        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| E105_2       | 7688697V14        |
| E8300_3      | 7688697V14        |
| F4020        | 65012019001       |
| FL4100       | 2571601G01        |
| FL8000       | 91012018002       |
| FL8001       | 91012057001       |
| FL8002       | 91012057001       |
| J4100        | 0989851N11        |
| J4150        | 9012068001        |
| J4200        | 9012101001        |
| J4202        | CN000225A01       |
| J8000        | CN000512A01       |
| L0002        | IN000122B48       |
| L0003        | 24012146001       |
| L0004        | 0613952G67        |
| L0005        | 2488183V02        |
| L0008        | 2471132D16        |
| L0009        | 2488183V05        |
| L0014        | 2488183V05        |
| L0201        | NOTPLACED         |
| L0202        | NOTPLACED         |
| L0203        | NOTPLACED         |
| L0211        | NOTPLACED         |
| L0221        | NOTPLACED         |
| L0231        | NOTPLACED         |
| L0232        | NOTPLACED         |
| L0251        | 24009315048       |
| L0252        | 24009342030       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| L0253        | 24009344033       |
| L0261        | 24009315048       |
| L0271        | IN000122B21       |
| L0281        | 24009315048       |
| L0282        | 24009315048       |
| L0400        | IN000101A24       |
| L0401        | IN000101A18       |
| L0402        | IN000101A24       |
| L0403        | 24009342030       |
| L0404        | 24009342030       |
| L0420        | 2475122C36        |
| L0421        | IN000101A28       |
| L0422        | IN000101A20       |
| L0423        | 24009342019       |
| L0441        | IN000101A22       |
| L0442        | IN000101A22       |
| L0443        | 24009342030       |
| L0444        | 24009342030       |
| L445         | 24009314012       |
| L0701        | IN000122A46       |
| L0702        | 0613952R66        |
| L0703        | IN000122A46       |
| L0704        | 24667001011       |
| L0710        | 24009315126       |
| L0711        | 24667001012       |
| L0712        | 24667001016       |
| L0713        | 24667001016       |
| L0720        | 2416066H02        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| L0721        | 24012026013       |
| L0730        | 0613952G67        |
| L0788        | 24012026004       |
| L0801        | 2416066H02        |
| L0802        | 2416066H02        |
| L0804        | 2416066H02        |
| L0805        | 2416066H02        |
| L0806        | NOTPLACED         |
| L0900        | 24667001030       |
| L3001        | IN000354A01       |
| L3002        | IN000354A01       |
| L3210        | 24013057001       |
| L3230        | 24013057001       |
| L3272        | 24012106001       |
| L3279        | IN000312A23       |
| L3286        | IN000269A18       |
| L4100        | 24009315046       |
| L4101        | 24009315046       |
| L4102        | 24009315046       |
| L4103        | 24009315046       |
| L4104        | 24009314047       |
| L4105        | 24009314047       |
| L8003        | 24010062003       |
| L8301_3      | 2475122C28        |
| L8330_3      | IN000095A01       |
| L8333_3      | IN000095A01       |
| L106_2       | IN000122B13       |
| M0700        | 26012312001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| M0800        | 0987378K01        |
| M4000        | NOTPLACED         |
| M4020        | 9012098001        |
| P4000        | 2887818K02        |
| Q0201        | NOTPLACED         |
| Q0202        | 48013025001       |
| Q0204        | 48009494001       |
| Q0231        | NOTPLACED         |
| Q0233        | CR000483A01       |
| Q0234        | 4815267H01        |
| Q0420        | NOTPLACED         |
| Q0421        | 4815267H01        |
| Q0423        | 4889321V01        |
| Q0424        | 4889321V01        |
| Q0425        | 48009494001       |
| Q0480        | 48012038001       |
| Q0700        | 4816134H01        |
| Q0701        | 48012059001       |
| Q0710        | 4816547H01        |
| Q0720        | CR000510A01       |
| Q0900        | 4809939C31        |
| Q1000        | 4815055H01        |
| Q1001        | 4815055H01        |
| Q3000        | 48009494001       |
| Q3001        | 48012059001       |
| Q3170        | 48012038001       |
| Q3172        | 48009494001       |
| Q3179        | 48012038001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| Q3278        | CR000594A01       |
| Q3320        | 48009494001       |
| Q3322        | 4813970A62        |
| Q3327        | 48009494001       |
| R0001        | 0613952Y66        |
| R0011        | 0613952Y66        |
| R0012        | 0613952Y66        |
| R0013        | 0613952Y66        |
| R0015        | 0613952X89        |
| R0016        | 0613952X89        |
| R0017        | 0613952N89        |
| R0018        | 0613952N30        |
| R0019        | 0613952Y66        |
| R0100        | 0613952Q32        |
| R0101        | 0613952Q77        |
| R0102        | 0613952X53        |
| R0103        | 0613952X67        |
| R0104        | 0613952R66        |
| R0105        | NOTPLACED         |
| R0140        | 0613952Q35        |
| R0160        | NOTPLACED         |
| R0162        | 0613952Y66        |
| R0163        | 0613952Y66        |
| R0211        | NOTPLACED         |
| R0212        | NOTPLACED         |
| R0215        | NOTPLACED         |
| R0217        | NOTPLACED         |
| R0218        | NOTPLACED         |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R0220        | 0613952Y66        |
| R0221        | NOTPLACED         |
| R0222        | 0613952Y66        |
| R0223        | NOTPLACED         |
| R0224        | NOTPLACED         |
| R0225        | NOTPLACED         |
| R0226        | NOTPLACED         |
| R0227        | 0613952Y66        |
| R0228        | 0613952Y66        |
| R0229        | NOTPLACED         |
| R0230        | NOTPLACED         |
| R0232        | NOTPLACED         |
| R0233        | NOTPLACED         |
| R0235        | NOTPLACED         |
| R0236        | NOTPLACED         |
| R0240        | NOTPLACED         |
| R0243        | NOTPLACED         |
| R0261        | 0613952X30        |
| R0262        | 0613952X52        |
| R0271        | 0613952X72        |
| R0272        | 0613952X19        |
| R0273        | 0613952X72        |
| R0274        | 0613952Y66        |
| R0281        | NOTPLACED         |
| R0282        | 0613952Y66        |
| R0283        | 0613952X56        |
| R0284        | NOTPLACED         |
| R0285        | 0613952X93        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R0286        | 0613952Y16        |
| R0287        | NOTPLACED         |
| R0293        | 0613952Y08        |
| R0302        | 0613952X42        |
| R0303        | 0613952Y66        |
| R0420        | 0613952X76        |
| R0421        | 0613952X42        |
| R0422        | 0613952X59        |
| R0424        | 0613952X96        |
| R0425        | 0613952Y20        |
| R0426        | 0613952X77        |
| R0429        | 0613952X26        |
| R0430        | 0613952X60        |
| R0431        | 0613952X34        |
| R0432        | 0613952X60        |
| R0433        | 0613952R66        |
| R0434        | 0613952R66        |
| R0435        | 0613952Y66        |
| R0438        | 0613952X25        |
| R0439        | 0613952X73        |
| R0444        | 0613952Y66        |
| R0445        | NOTPLACED         |
| R0480        | 0613952Y66        |
| R0481        | 0613952X37        |
| R0482        | 0613952X53        |
| R0483        | 0613952X53        |
| R0484        | 0613952Y66        |
| R0485        | 0613952V01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R0486        | 0613952U85        |
| R0487        | 0613952R66        |
| R0488        | NOTPLACED         |
| R0489        | NOTPLACED         |
| R0499        | NOTPLACED         |
| R0700        | 0613952X52        |
| R0701        | 0613952X41        |
| R0702        | 0613952X49        |
| R0703        | 0613952X56        |
| R0704        | 0613952Y25        |
| R0707        | 0613952Q81        |
| R0708        | 0613952Q66        |
| R0709        | 0613952Q49        |
| R0710        | NOTPLACED         |
| R0711        | 0613952R66        |
| R0712        | 0613952Q66        |
| R0714        | 0613958H56        |
| R0716        | 0613952Q94        |
| R0766        | 2471132D16        |
| R0801        | 0613952R01        |
| R0833        | 2475316C04        |
| R0901        | 0675679M01        |
| R0902        | 0613952N30        |
| R0905        | 6012064001        |
| R0906        | 0613952Z80        |
| R0908        | 0613952Z80        |
| R0910        | 0675679M01        |
| R0911        | 0675679M01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R0912        | 0613952Q59        |
| R0913        | 0613952Q81        |
| R0915        | 0613952Q90        |
| R0916        | 0613952Q77        |
| R0918        | 0613952M47        |
| R0920        | 0613952R66        |
| R0921        | NOTPLACED         |
| R0922        | 0613952Q59        |
| R1003        | 0613952X66        |
| R1004        | 0613952X66        |
| R1009        | 0613952X73        |
| R1010        | 0613952R66        |
| R1011        | 0613952R66        |
| R1012        | 0613952R66        |
| R1013        | 0613952R66        |
| R1014        | 0613952U01        |
| R1015        | NOTPLACED         |
| R1016        | 0613952X89        |
| R1017        | NOTPLACED         |
| R1018        | 0613952X89        |
| R1019        | 0613952X73        |
| R1020        | NOTPLACED         |
| R1028        | 0613952Y66        |
| R1029        | 0613952Y66        |
| R1031        | 0613952Y66        |
| R1032        | 0613952Y66        |
| R1033        | 0613952Y66        |
| R1045        | 0613952X73        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R1046        | NOTPLACED         |
| R1052        | 0613952Y66        |
| R1081        | 0613952Y17        |
| R1082        | 0613952Y66        |
| R1084        | 0613952Y66        |
| R1100        | 0613952R66        |
| R1111        | 0613952Y01        |
| R1113        | 0613952Y01        |
| R1114        | 0613952Y01        |
| R1400        | 0613952Q65        |
| R2000        | 0613952R66        |
| R2001        | 0613952Y17        |
| R2002        | 0613952Y17        |
| R2003        | 0613952S68        |
| R2004        | 0613952R66        |
| R2100        | 0613952R66        |
| R2101        | 0613952Y01        |
| R2103        | 0613952Y01        |
| R2106        | 0613952Q81        |
| R3000        | 0613952Y66        |
| R3001        | 0613952V01        |
| R3002        | 0613952Q81        |
| R3006        | NOTPLACED         |
| R3007        | 0613952Y66        |
| R3008        | 0613952Y66        |
| R3009        | 0613952Y66        |
| R3010        | 0613952Y66        |
| R3011        | 0613952Y66        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R3012        | 0613952Y66        |
| R3014        | 0613952Y66        |
| R3019        | 0613952Y66        |
| R3020        | 0613952Y66        |
| R3021        | NOTPLACED         |
| R3101        | 0613952Q81        |
| R3102        | 0613952V01        |
| R3103        | 0613952V01        |
| R3104        | 0613952V01        |
| R3105        | 0613952V01        |
| R3106        | 0613952Y66        |
| R3107        | 0613952V01        |
| R3108        | 0613952V01        |
| R3115        | 0613952Y66        |
| R3116        | 0613952S89        |
| R3123        | 0613952V01        |
| R3170        | 0613952Z73        |
| R3171        | 0613952Z73        |
| R3174        | 0613952V01        |
| R3175        | 0613952V01        |
| R3176        | 0613952N30        |
| R3178        | 0613952V01        |
| R3180        | 0613952V01        |
| R3181        | NOTPLACED         |
| R3182        | 0613952Z61        |
| R3183        | NOTPLACED         |
| R3185        | 0613952V01        |
| R3186        | 0613952V01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R3210        | 0613952R66        |
| R3211        | 0613952Y66        |
| R3230        | 0613952R66        |
| R3231        | 0613952Y66        |
| R3273        | 0613952M78        |
| R3274        | 0613952N35        |
| R3275        | RE000207A01       |
| R3277        | 0613952Y66        |
| R3313        | 0613952V18        |
| R3314        | 0613952U55        |
| R3320        | 0613952V01        |
| R3321        | 0616416H01        |
| R3330        | 0613952Y66        |
| R3331        | 0613952Y66        |
| R3332        | NOTPLACED         |
| R3333        | NOTPLACED         |
| R3334        | 0613952V01        |
| R3350        | 0613952Q79        |
| R3352        | 0613952Q65        |
| R3353        | 0613952Y66        |
| R3354        | 0613952Y66        |
| R3355        | NOTPLACED         |
| R3358        | NOTPLACED         |
| R3359        | NOTPLACED         |
| R3364        | 0613952Y25        |
| R3367        | 0613952V01        |
| R3370        | 0613952X81        |
| R3374        | 0613952V01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R3375        | 0613952Y66        |
| R4000        | 0613952X42        |
| R4001        | 0613952X42        |
| R4002        | 0613952Y66        |
| R4003        | 0613952Y66        |
| R4010        | 0613952X89        |
| R4011        | 0613952X89        |
| R4012        | 0613952X89        |
| R4013        | 0613952X89        |
| R4021        | 0613958H49        |
| R4022        | 0613952Q30        |
| R4044        | 0613952X89        |
| R4101        | 0613952X65        |
| R4103        | 0613952X59        |
| R4104        | 0613952X65        |
| R4105        | 0613952X65        |
| R4110        | NOTPLACED         |
| R4111        | NOTPLACED         |
| R4112        | NOTPLACED         |
| R4113        | NOTPLACED         |
| R4114        | NOTPLACED         |
| R4115        | NOTPLACED         |
| R4116        | NOTPLACED         |
| R4117        | NOTPLACED         |
| R4118        | NOTPLACED         |
| R4119        | NOTPLACED         |
| R4120        | 0613952Y01        |
| R4150        | 0613952X29        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R4151        | 0613952B01        |
| R4210        | 0613952G67        |
| R4211        | 0613952G67        |
| R4501        | 0613952Y66        |
| R4502        | 0613952Y66        |
| R4601        | 0613952R66        |
| R4602        | 0613952R66        |
| R4603        | 0613952R66        |
| R4604        | 0613952R66        |
| R4606        | 0613952R66        |
| R4607        | 0613952R66        |
| R4667        | NOTPLACED         |
| R4700        | 0613952R66        |
| R8000        | 0613952Y66        |
| R8001        | 0613952Y66        |
| R8002        | NOTPLACED         |
| R8003        | NOTPLACED         |
| R8004        | 0613952Y66        |
| R8006        | 0613952R66        |
| R8007        | 0613952Y32        |
| R8009        | NOTPLACED         |
| R8010        | NOTPLACED         |
| R8100        | 0613952M59        |
| R8101        | 0613952M10        |
| R8102        | 0613952Y25        |
| R8103        | 0613952Y27        |
| R8104        | 0613952Y66        |
| R8112        | 0613952Y66        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R8113        | 0613952Y66        |
| R8114        | 0613952Y66        |
| R8115        | 0613952R66        |
| R8116        | 0613952V69        |
| R8117        | NOTPLACED         |
| R8300_3      | 0613952R66        |
| R8304_3      | 0613952X73        |
| R101_2       | 0613952Y01        |
| R8301_3      | 0613952Y66        |
| R8305_3      | 0613952Y66        |
| R8314_3      | 0613952Y66        |
| S4010        | 40012023001       |
| S4030        | 1875103C04        |
| SH0001       | SH000087A01       |
| SH0002       | SH000271A01       |
| SH0201       | SH000273A01       |
| SH0401       | SH000270A03       |
| SH0801       | SH000272A01       |
| SH0802       | SH000329A01       |
| SH1001       | SH000269A01       |
| SH3001       | SH000268A01       |
| SH8000       | SH000267A01       |
| SW4044       | 4086470Z01        |
| T0490        | 24012146001       |
| U0001        | 51009877001       |
| U0480        | 5186310Y39        |
| U0481        | 5186310Y39        |
| U0700        | IC000382A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| U0800        | 51013329001       |
| U0900        | IC000240A01       |
| U0901        | 5115022H01        |
| U1000        | 51012295002       |
| U1021        | IC000643A01       |
| U1081        | LD000091A01       |
| U1300        | 51012283001       |
| U2000        | MM000129A01       |
| U2100        | MM000157A01       |
| U3000        | IC000326A01       |
| U3160        | 5114007A43        |
| U3170        | 51012263001       |
| U3270        | 51012456001       |
| U3310        | 5171103N01        |
| U3311        | 5189092V44        |
| U3330        | 51012206001       |
| U3350        | 5175771A75        |
| U4110        | NOTPLACED         |
| U4500        | CR000209A01       |
| U8000        | LN000494A01       |
| U8001        | LN000395A01       |
| U8002        | MM000054A01       |
| U8100        | 5114610F01        |
| U8336_3      | HZ000243A01       |
| U100_2       | IC000128A01       |
| U8300_3      | IC000285A01       |
| VR0010       | CR000093A01       |
| VR0011       | CR000093A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| VR0200       | NOTPLACED         |
| VR0201       | NOTPLACED         |
| VR0202       | NOTPLACED         |
| VR0203       | NOTPLACED         |
| VR0204       | CR000291A01       |
| VR0205       | CR000291A01       |
| VR0206       | CR000291A01       |
| VR0207       | CR000291A01       |
| VR0801       | 4888116D01        |
| VR0803       | 4888116D01        |
| VR0804       | 4888116D01        |
| VR0901       | 4888116D01        |
| VR1000       | CR000565A01       |
| VR3001       | CR000697A01       |
| VR3002       | CR000697A01       |
| VR3003       | CR000697A01       |
| VR3004       | CR000697A01       |
| VR4020       | 4813977C23        |
| VR4021       | 4813977C11        |
| VR4030       | 4805656W76        |
| VR4031       | 4805656W76        |
| VR4044       | 4805656W76        |
| VR4100       | NOTPLACED         |
| VR4111       | 4813979P10        |
| VR4404       | NOTPLACED         |
| VR4406       | NOTPLACED         |
| VR4511       | NOTPLACED         |
| VR4521       | NOTPLACED         |

| <b>Circuit Ref.</b> | <b>Motorola Part No.</b> |
|---------------------|--------------------------|
| VR4522              | NOTPLACED                |
| VR4525              | NOTPLACED                |
| VR4526              | NOTPLACED                |
| VR4528              | NOTPLACED                |
| VR4529              | NOTPLACED                |
| VR4530              | NOTPLACED                |
| VR4531              | NOTPLACED                |
| VR4532              | NOTPLACED                |
| VR4533              | NOTPLACED                |
| VR4534              | NOTPLACED                |
| VR4535              | NOTPLACED                |
| VR4536              | NOTPLACED                |
| VR4537              | NOTPLACED                |
| VR4538              | NOTPLACED                |
| VR4539              | NOTPLACED                |
| VR4601              | NOTPLACED                |
| VR4602              | NOTPLACED                |
| Y0140               | HZ000333A01              |
| Y3000               | 4809995L15               |
| Y8302_3             | HZ000202A01              |

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## Section 8

# 800/900 MHz (800–900 MHz) INFORMATION

## 1.0 Allocation of Schematics and Circuit Boards

### 1.1 Controller Circuits

The 800/900 MHz Band circuits are contained on the Printed Circuit Board (PCB) which also contains the Controller circuits. This Chapter shows the schematics for the 800/900 MHz Band circuits only, refer to the Controller section for details of the related Controller circuits. The PCB component layouts in this Chapter show both the Controller and 800/900 MHz Band circuit components. The 800/900 MHz Band schematics and the related PCB and parts list are shown in the tables below.

*Table 8-1. 800/900 MHz Band Diagrams and Parts List*

|   |   |
|---|---|
| <b>PCB:</b><br>PC000970A01 Main Board Top Side<br>PC000970A01 Main Board Bottom Side  | <b>Page 8-3</b><br><b>Page 8-4</b>  |
| <b>SCHEMATICS:</b><br>Complete Radio Schematic Diagram<br>GNSS Schematic Diagram<br>Bluetooth and WiFi Schematic Diagram (1 of 3)<br>Bluetooth and WiFi Schematic Diagram (2 of 3)<br>Bluetooth and WiFi Schematic Diagram (3 of 3)<br>Controller Schematic Diagram<br>Memory Schematic Diagram<br>Microprocessor Schematic Diagram (1 of 2)<br>Microprocessor Schematic Diagram (2 of 2)<br>Power Management and Audio Schematic Diagram (1 of 3)<br>Power Management and Audio Schematic Diagram (2 of 3)<br>Power Management and Audio Schematic Diagram (3 of 3)<br>Overall RF Schematic Diagram<br>VCO Schematic Diagram (1 of 4)<br>VCO Schematic Diagram (2 of 4)<br>VCO Schematic Diagram (3 of 4)<br>VCO Schematic Diagram (4 of 4)<br>Transmitter Schematic Diagram<br>Receiver Schematic Diagram<br>RFIC Schematic Diagram<br>Peripheral Schematic Diagram (1 of 3)<br>Peripheral Schematic Diagram (2 of 3)<br>Peripheral Schematic Diagram (3 of 3)<br>Factory Test Points Schematic Diagram | <b>Page 8-5</b><br><b>Page 8-6</b><br><b>Page 8-7</b><br><b>Page 8-8</b><br><b>Page 8-9</b><br><b>Page 8-10</b><br><b>Page 8-11</b><br><b>Page 8-12</b><br><b>Page 8-13</b><br><b>Page 8-14</b><br><b>Page 8-15</b><br><b>Page 8-16</b><br><b>Page 8-17</b><br><b>Page 8-18</b><br><b>Page 8-19</b><br><b>Page 8-20</b><br><b>Page 8-21</b><br><b>Page 8-22</b><br><b>Page 8-23</b><br><b>Page 8-24</b><br><b>Page 8-25</b><br><b>Page 8-26</b><br><b>Page 8-27</b><br><b>Page 8-28</b> |
| <b>Parts List:</b><br>PC000970A01   | <b>Page 8-29</b>  |

**Notes**

## 2.0 Circuit Board/Schematic Diagrams and Parts List for 800/900 MHz

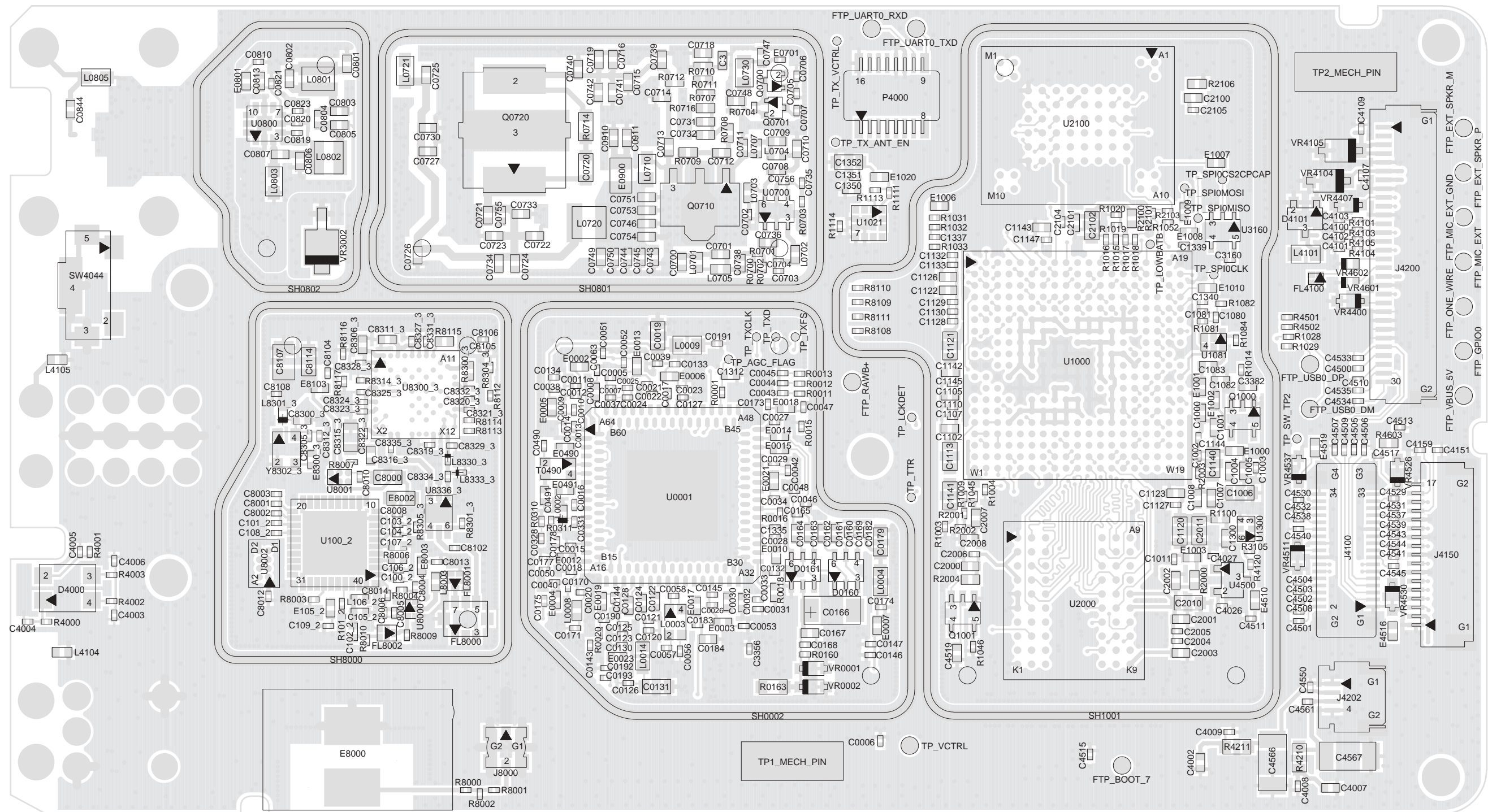


Figure 8-1. Main Board 800/900 MHz Top Side PCB No. PC000970A01\_AA

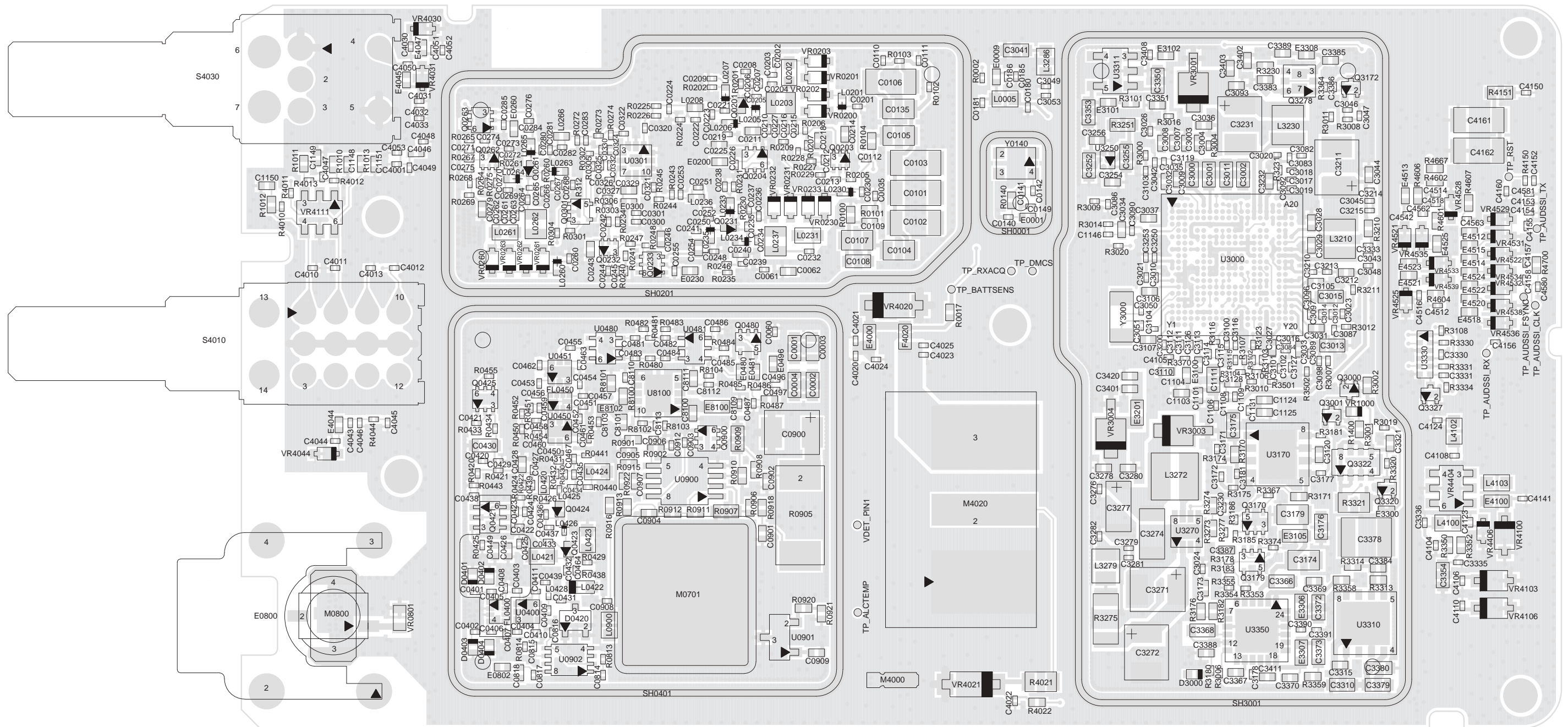


Figure 8-2. Main Board 800/900 MHz Bottom Side PCB No. PC000970A01\_AA



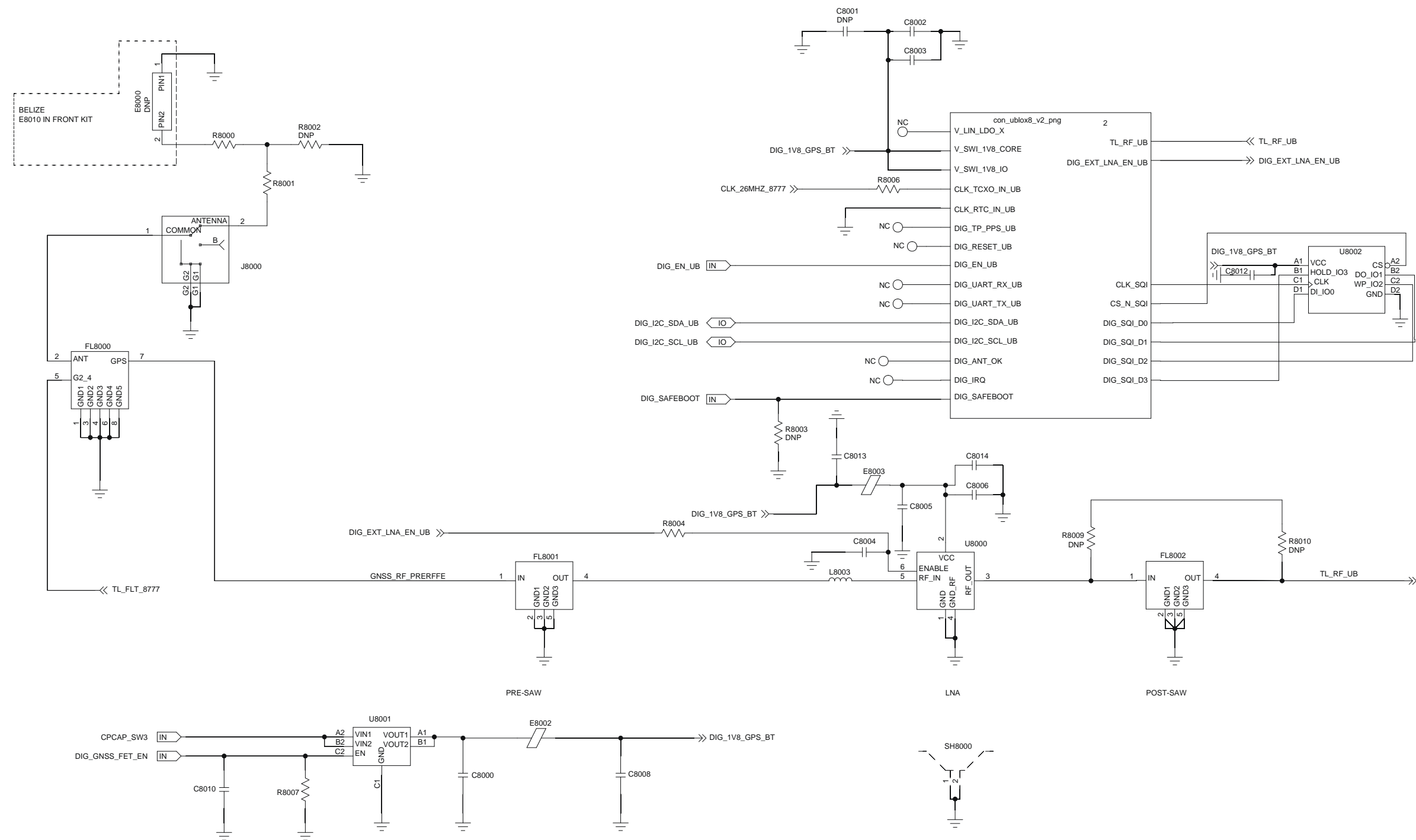


Figure 8-4. GNSS Schematic Diagram

# BT\_WLAN SCHEMATIC

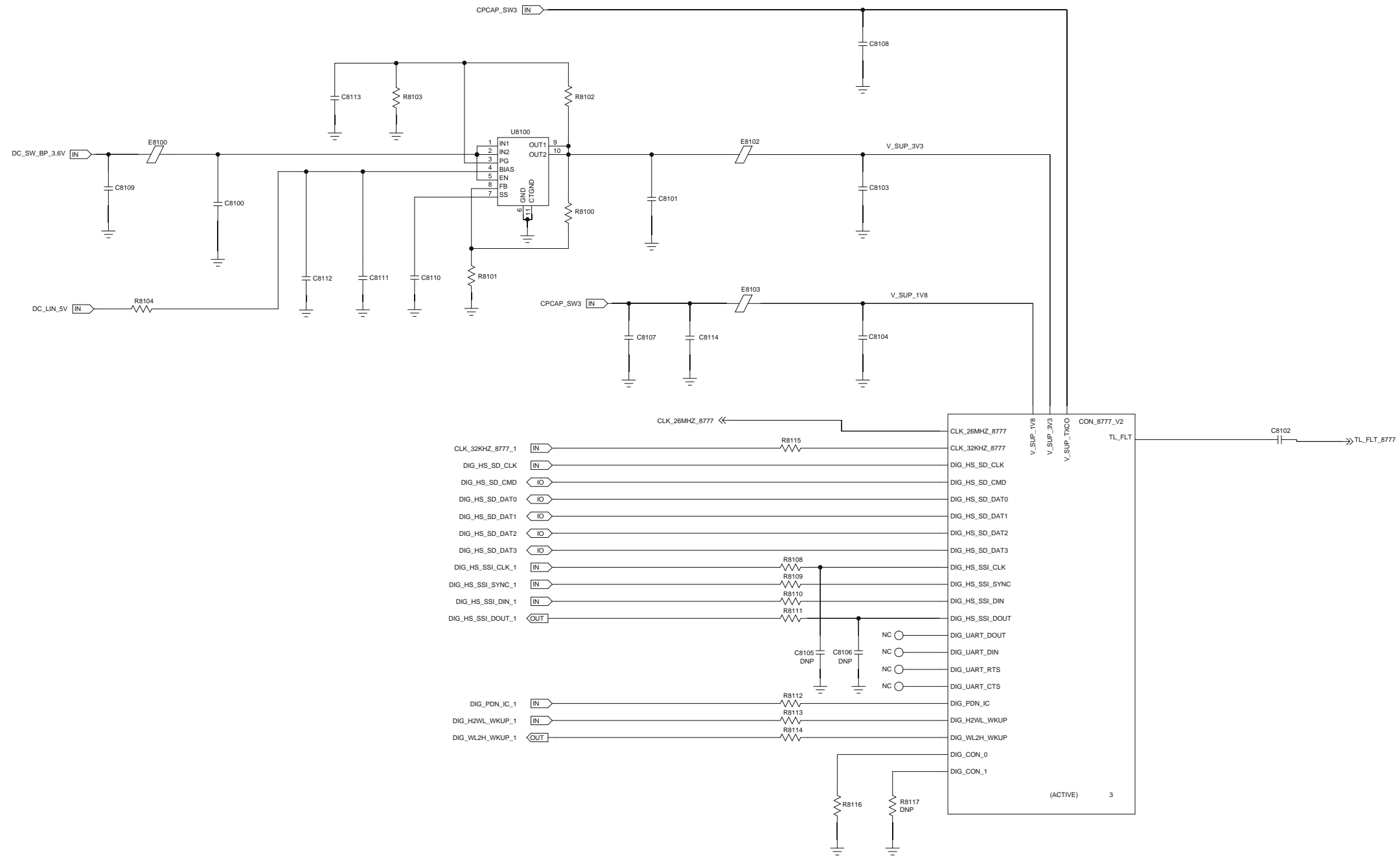


Figure 8-5. Bluetooth and WiFi Schematic Diagram (1 of 3)

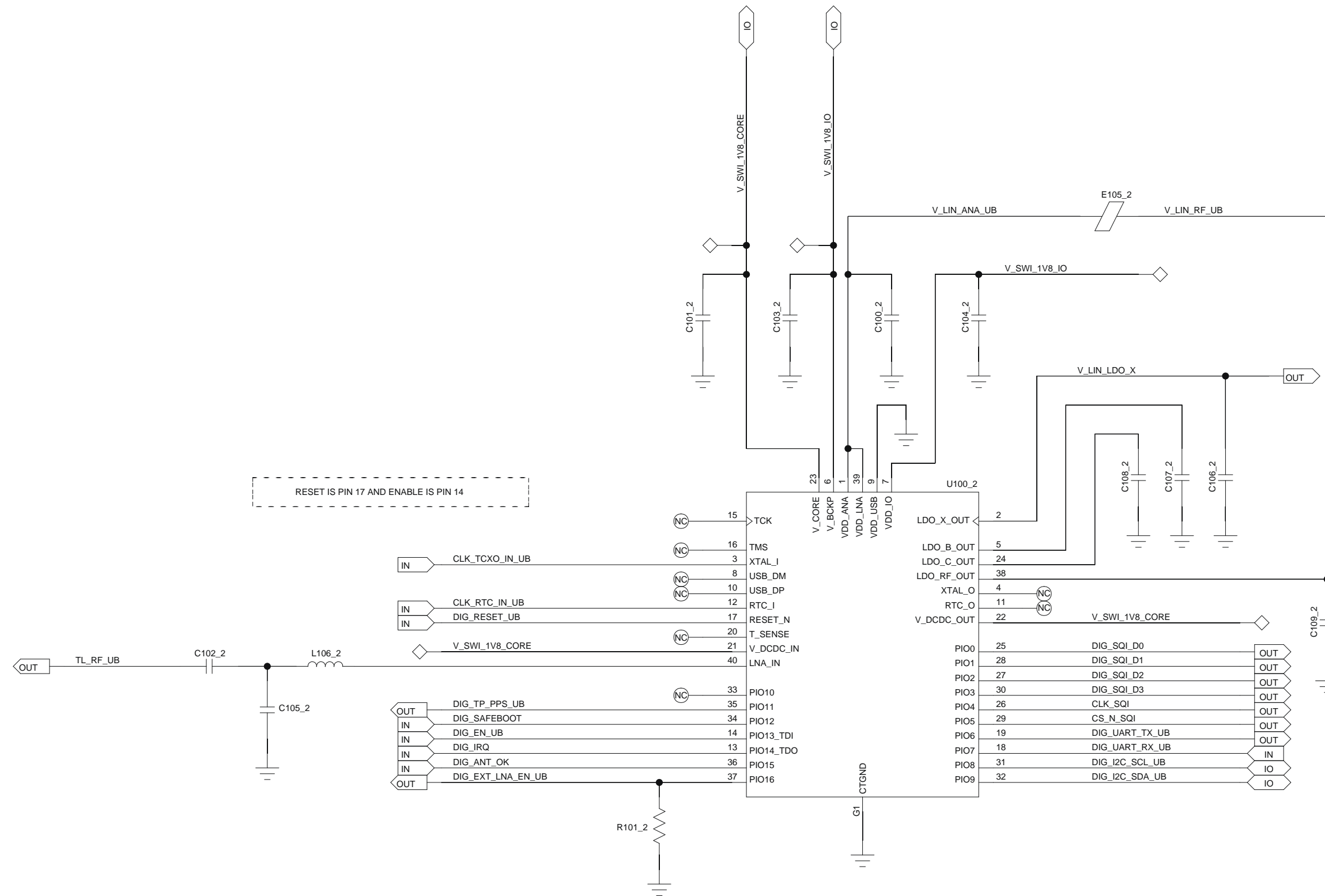


Figure 8-6. Bluetooth and WiFi Schematic Diagram (2 of 3)

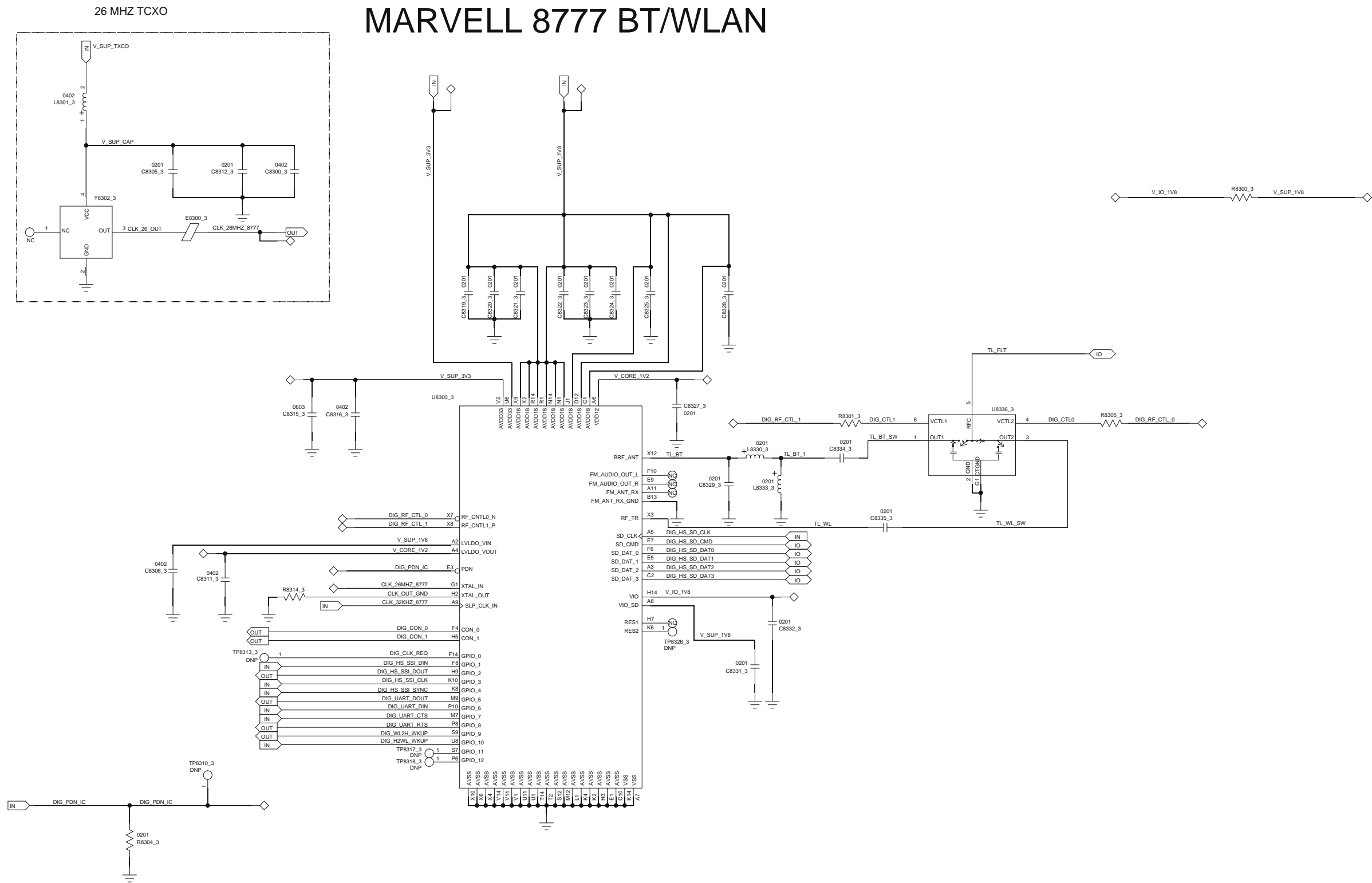


Figure 8-7. Bluetooth and WiFi Schematic Diagram (3 of 3)

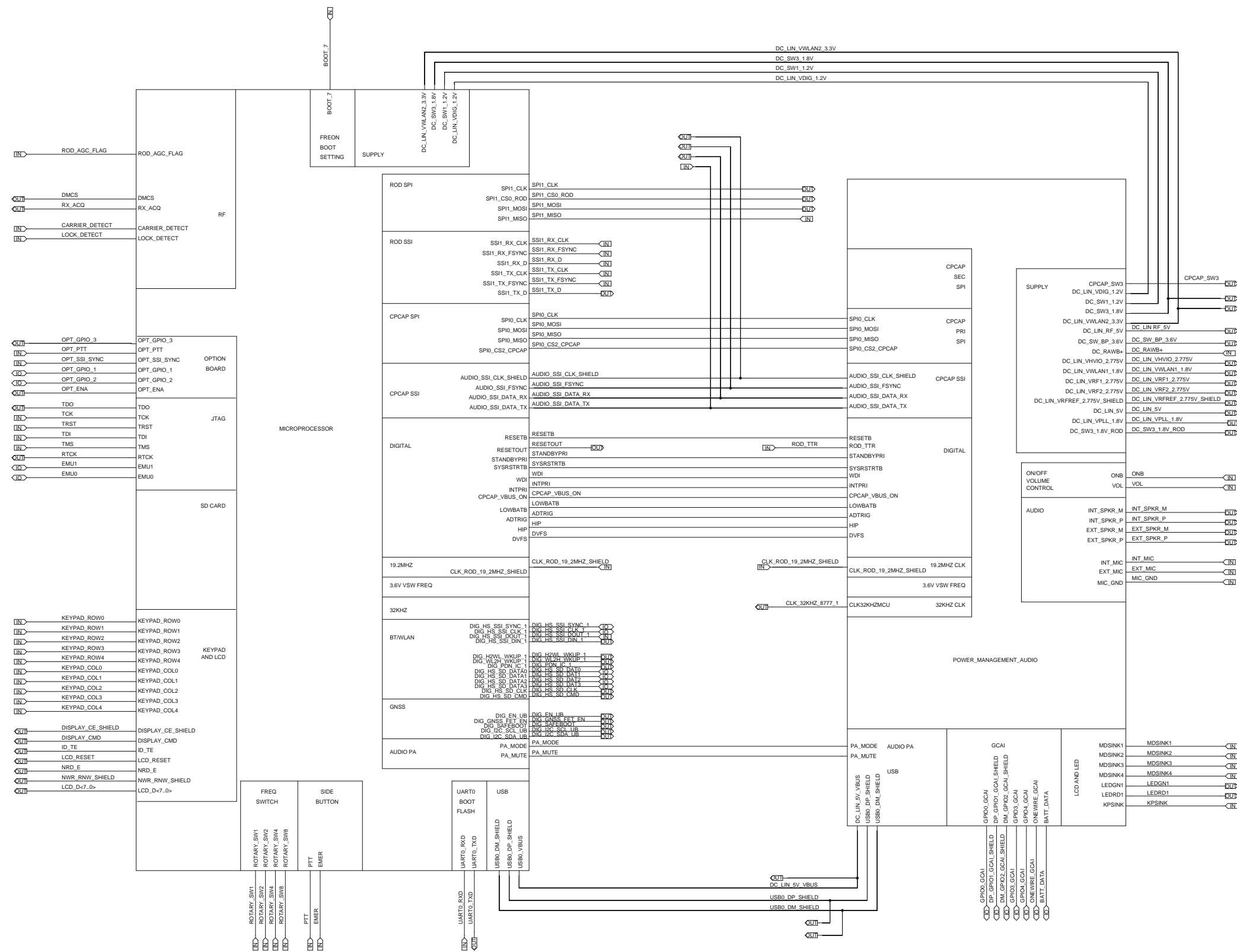


Figure 8-8. Controller Schematic Diagram

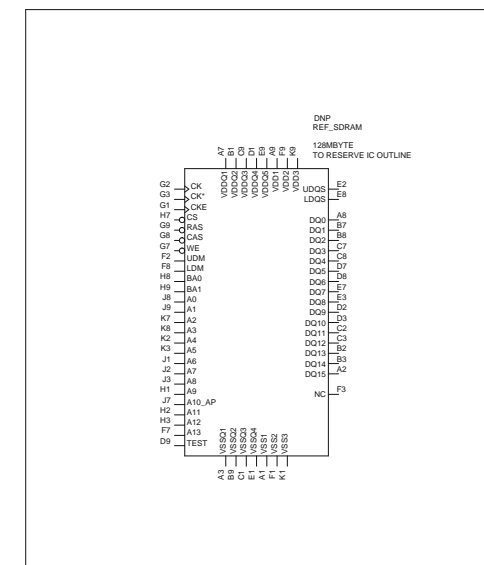
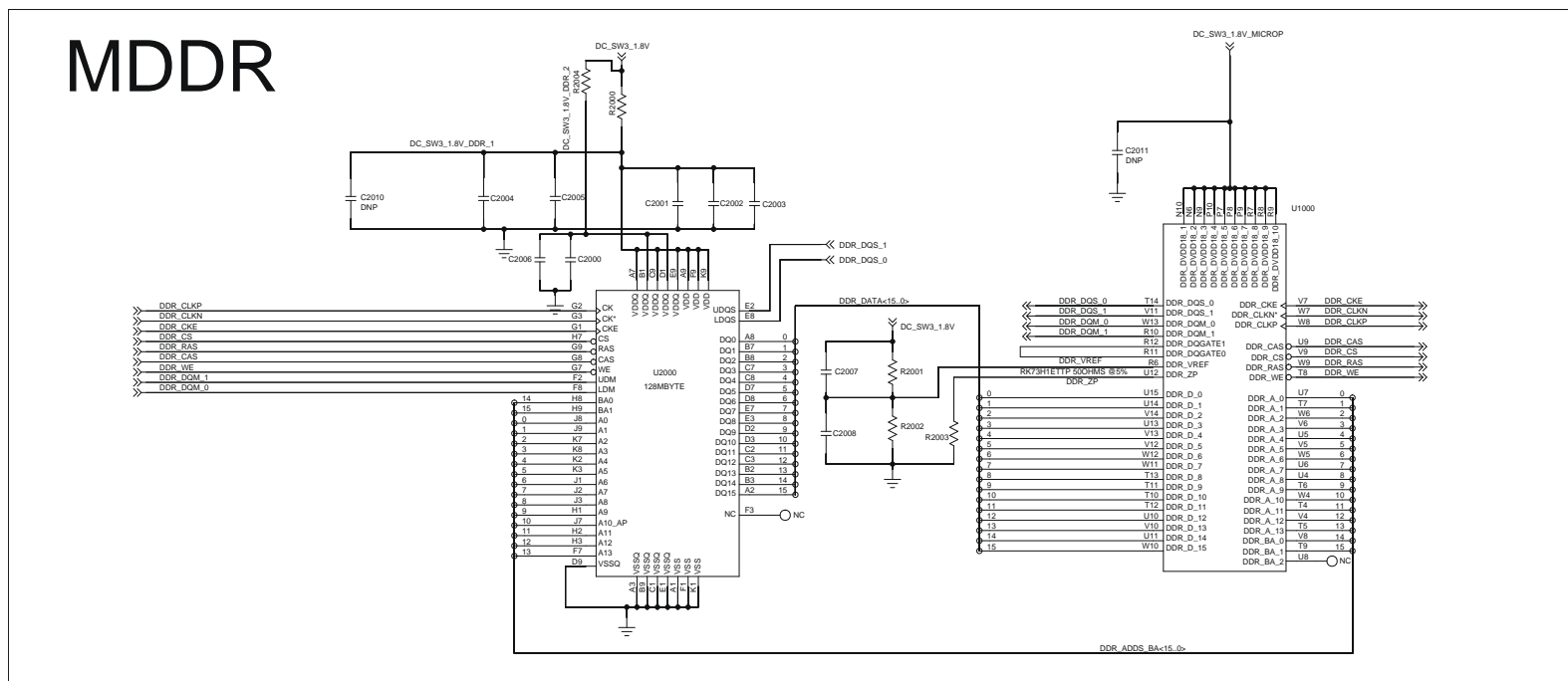
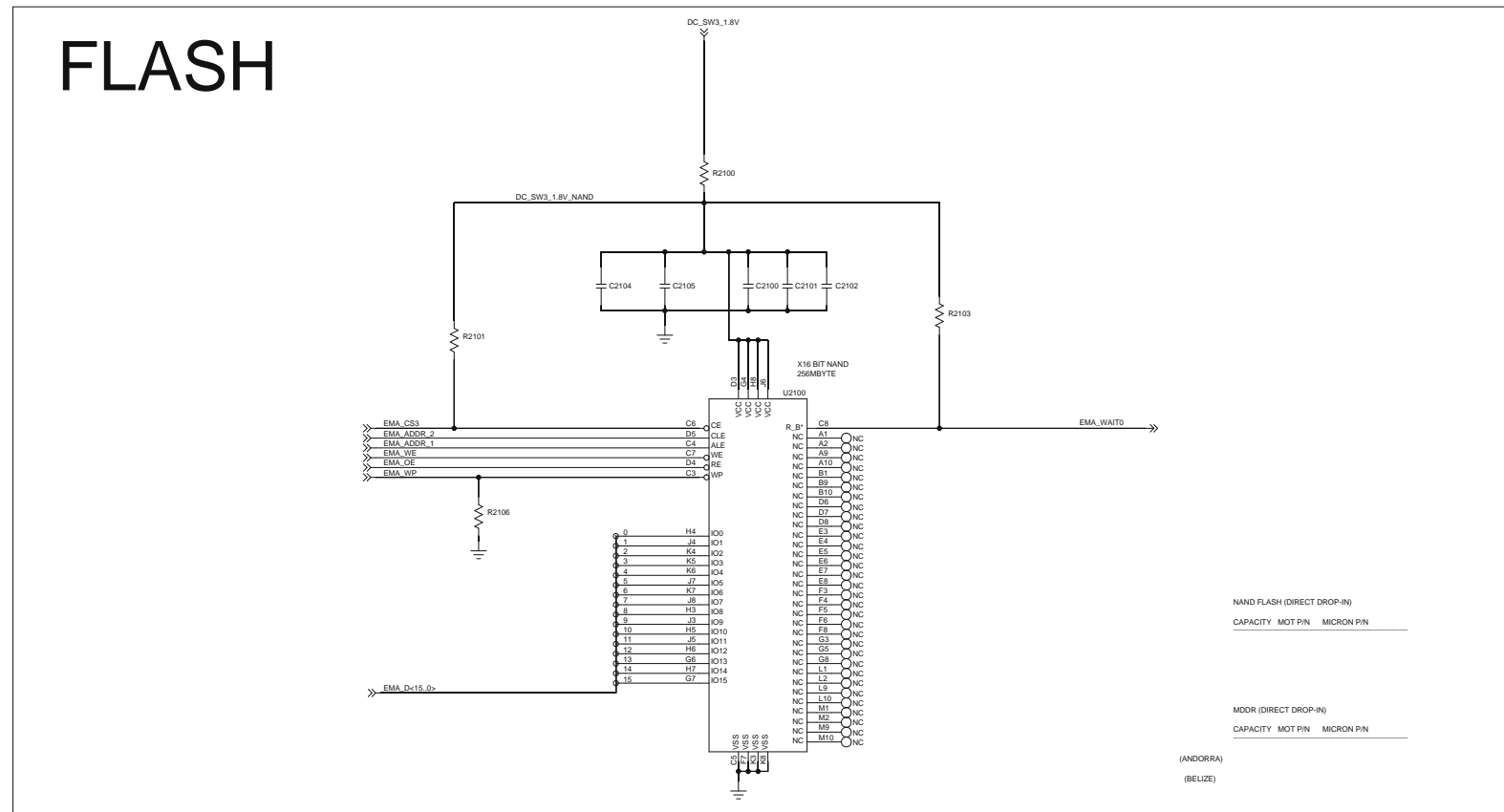


Figure 8-9. Memory Schematic Diagram

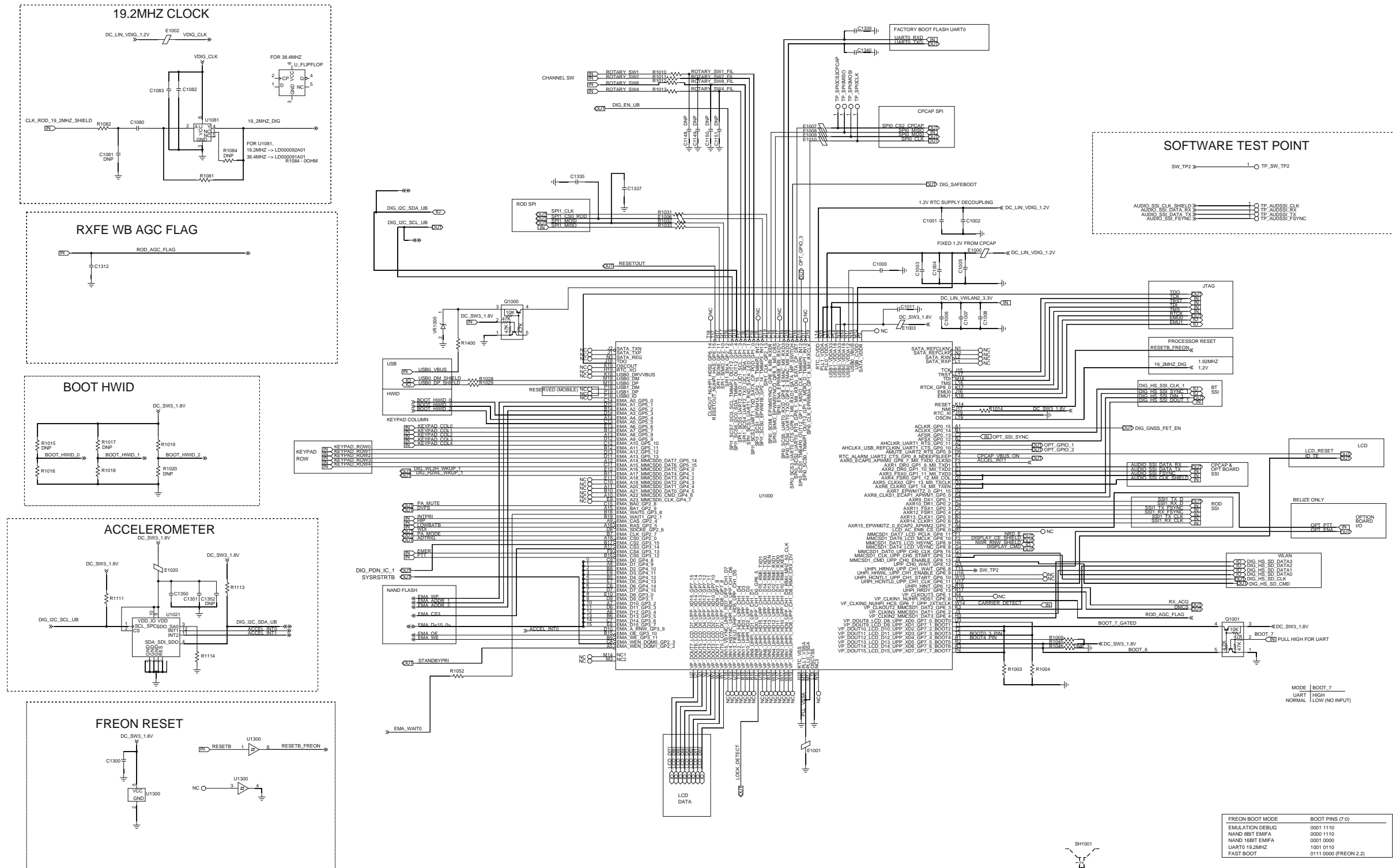
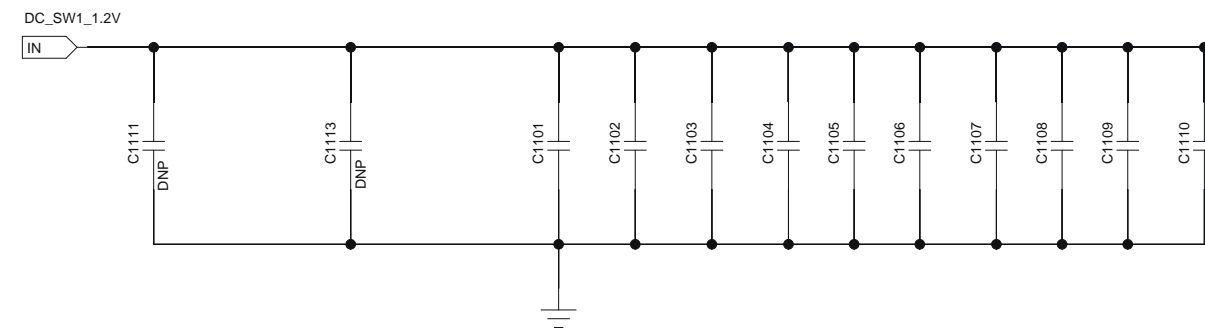
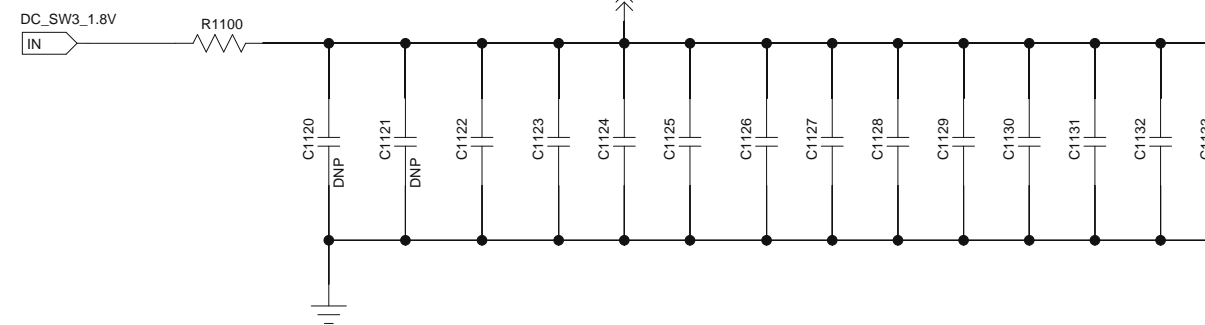


Figure 8-10. Microprocessor Schematic Diagram (1 of 2)

VARIABLE 1.2V FROM CPCAP



SW3\_1.8V FROM CPCAP



FIXED 1.2V FROM CPCAP

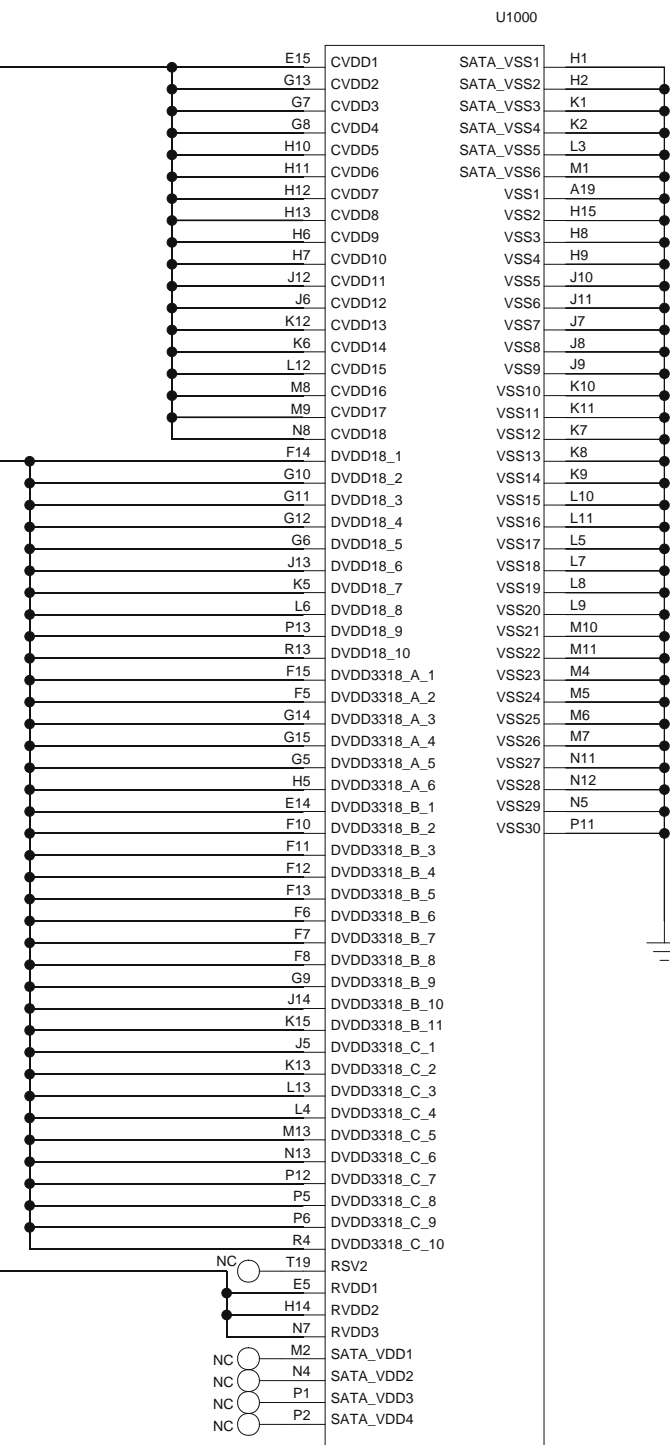
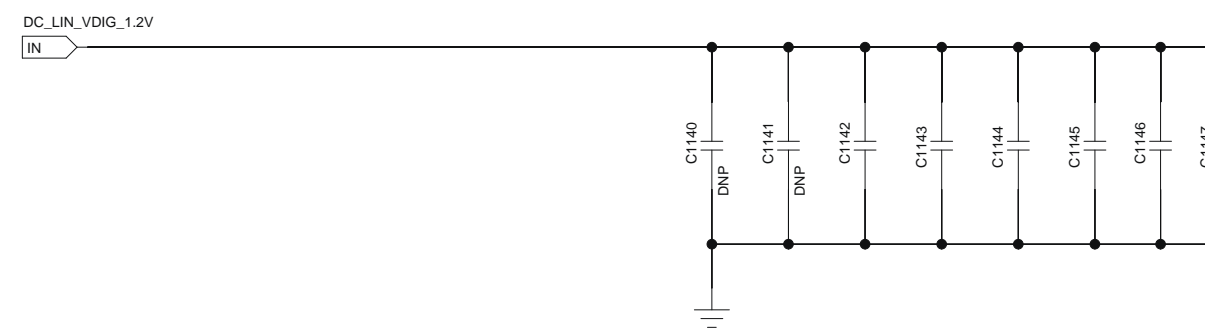
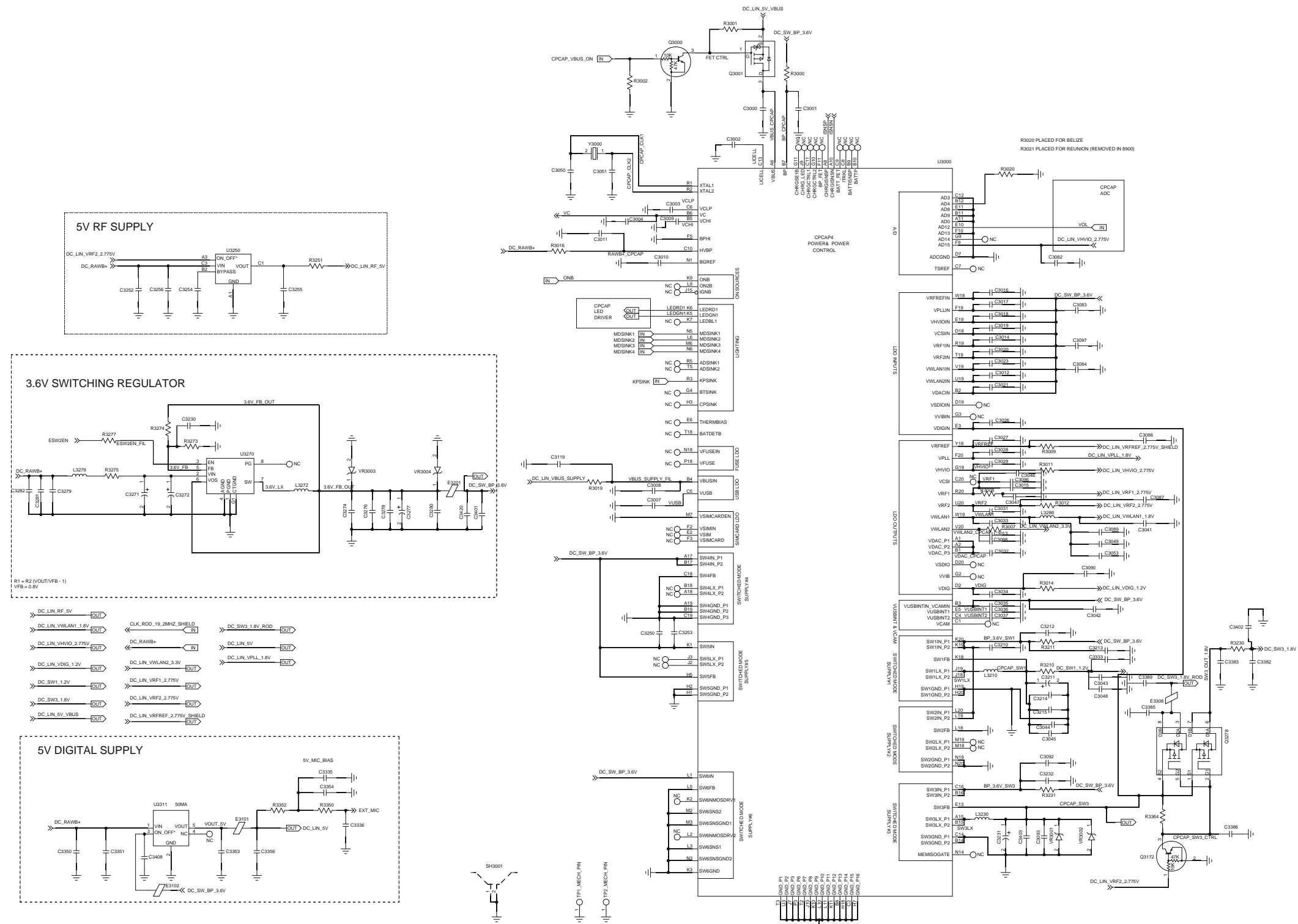


Figure 8-11. Microprocessor Schematic Diagram (2 of 2)



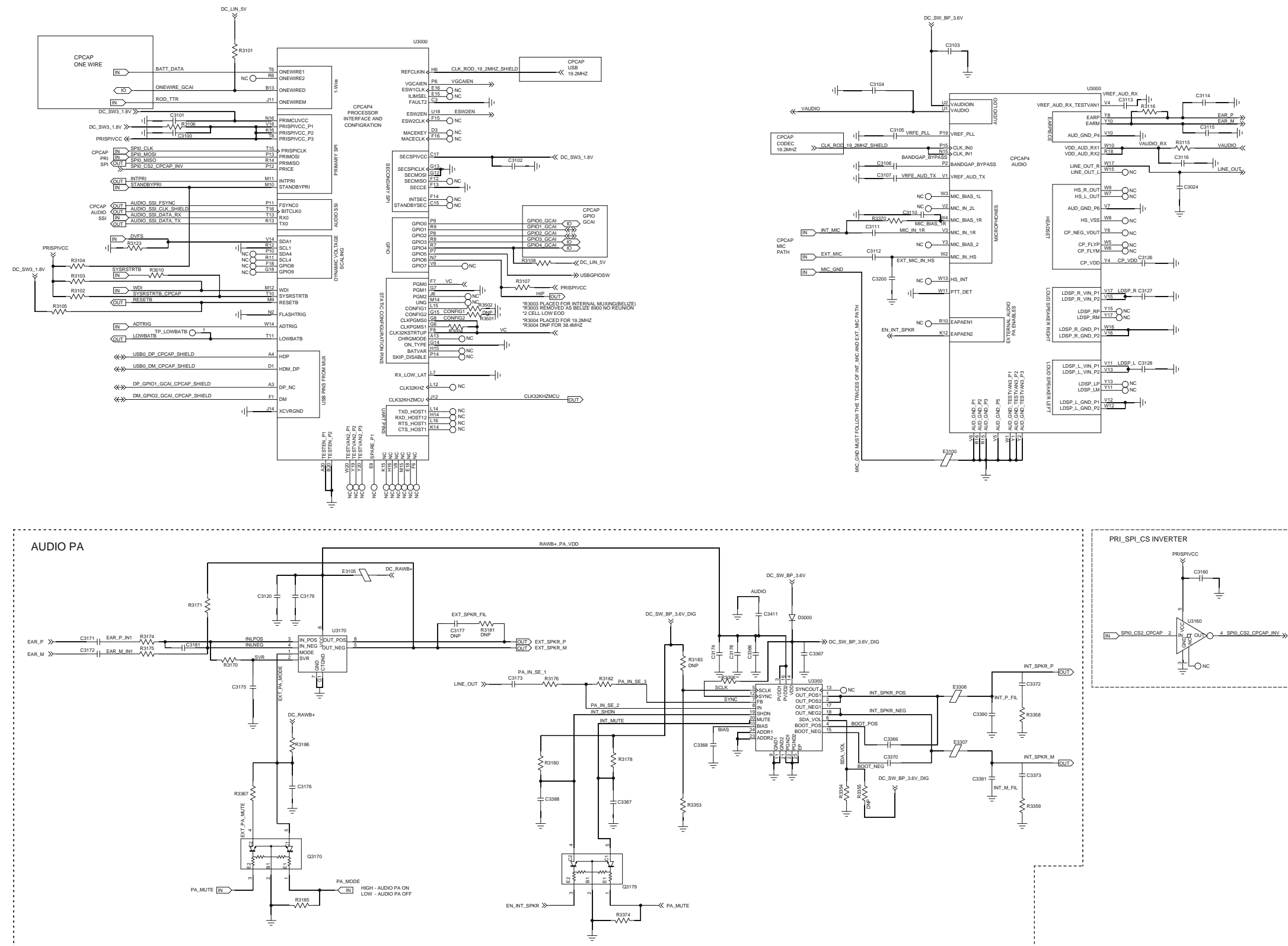


Figure 8-13. Power Management and Audio Schematic Diagram (2 of 3)

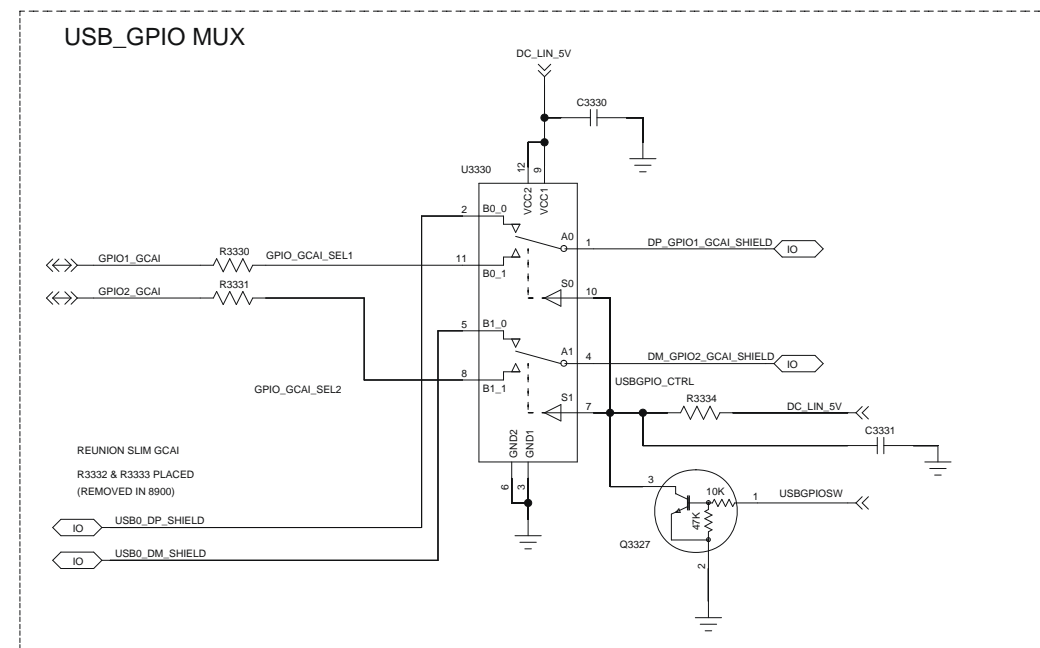
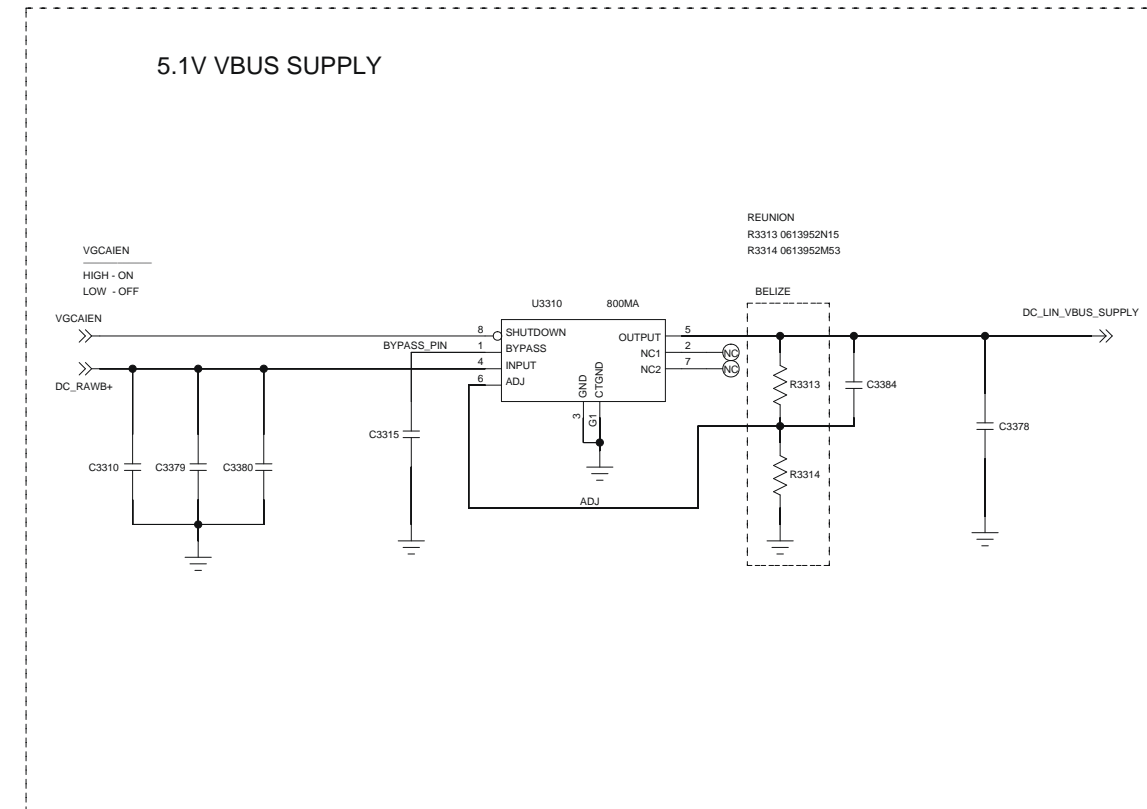
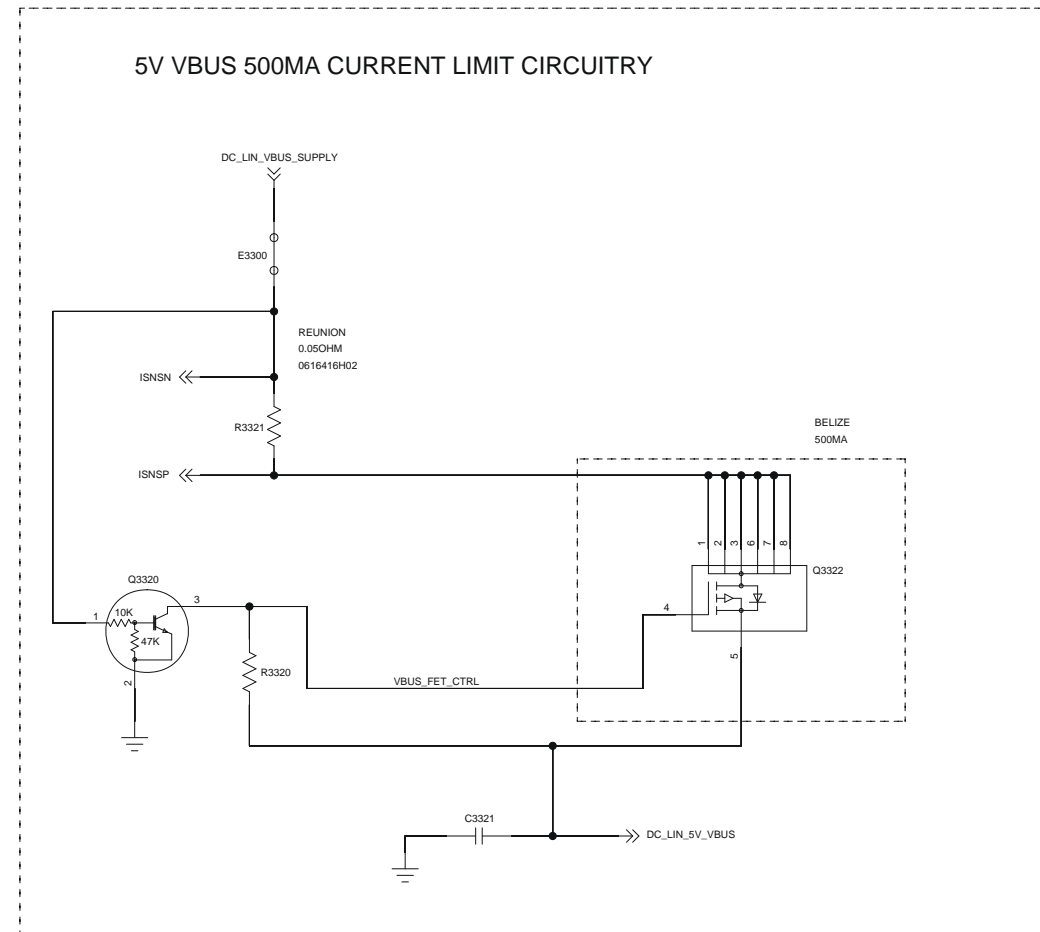


Figure 8-14. Power Management and Audio Schematic Diagram (3 of 3)

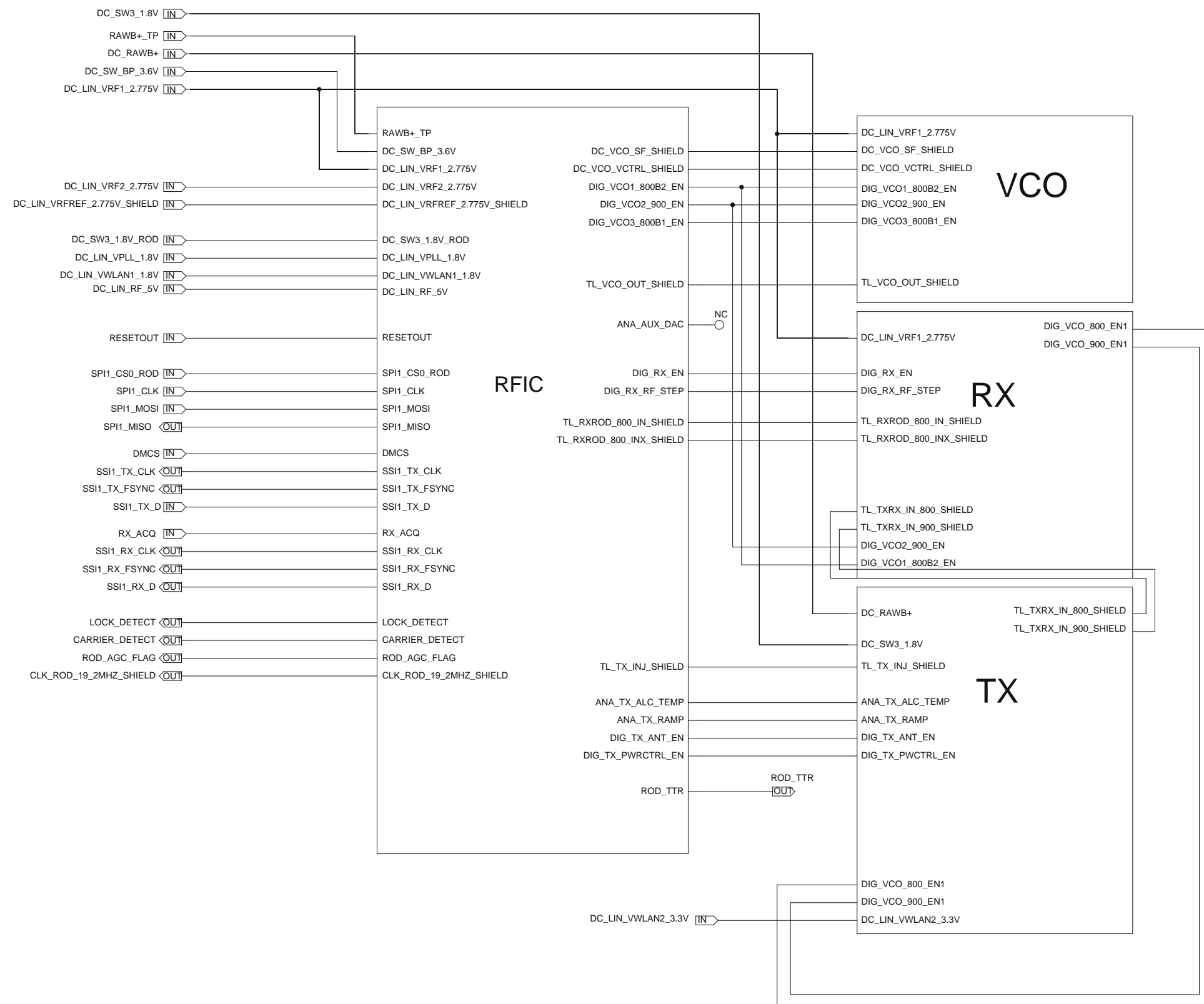


Figure 8-15. Overall RF Schematic Diagram

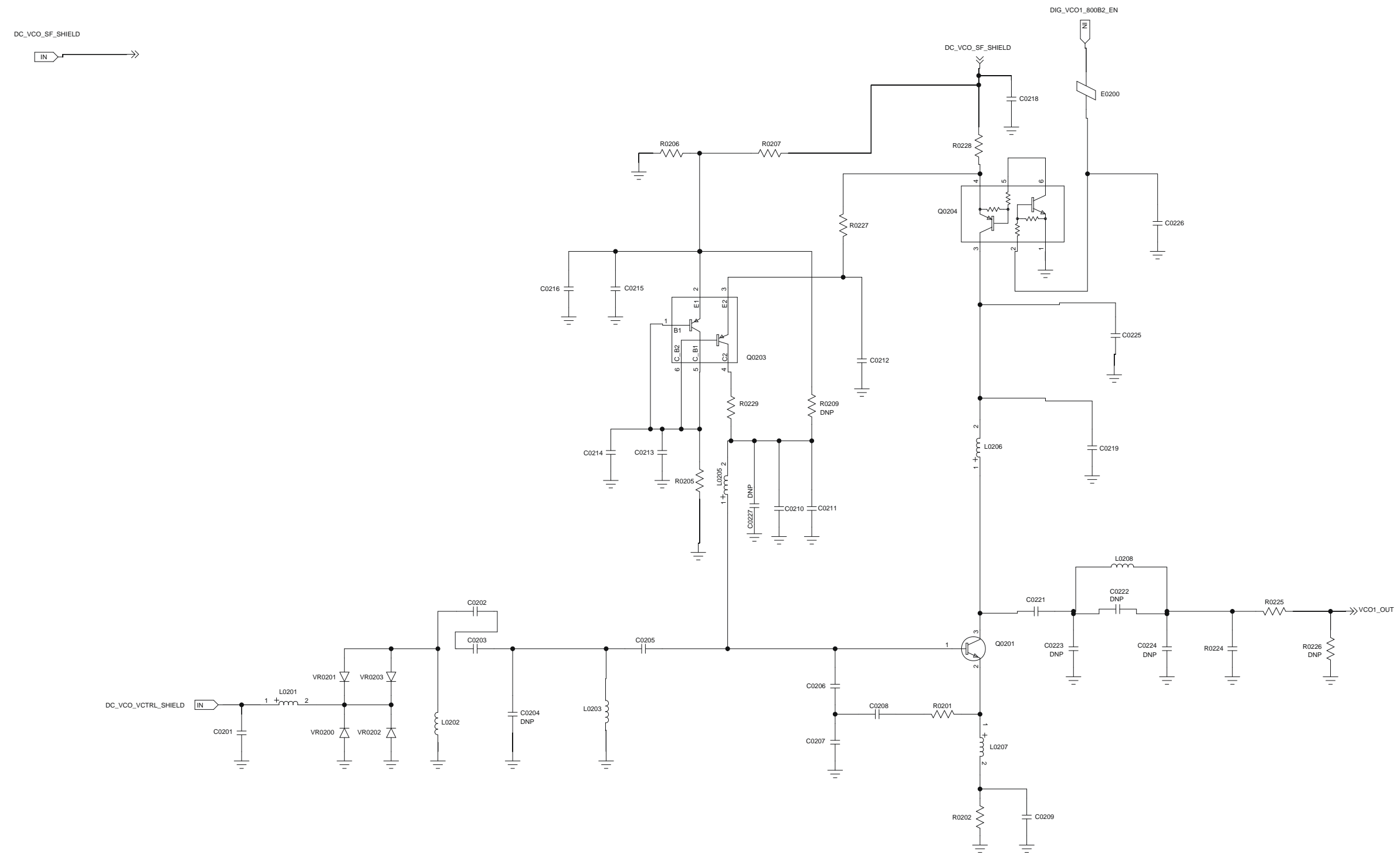


Figure 8-16. VCO Schematic Diagram (1 of 4)

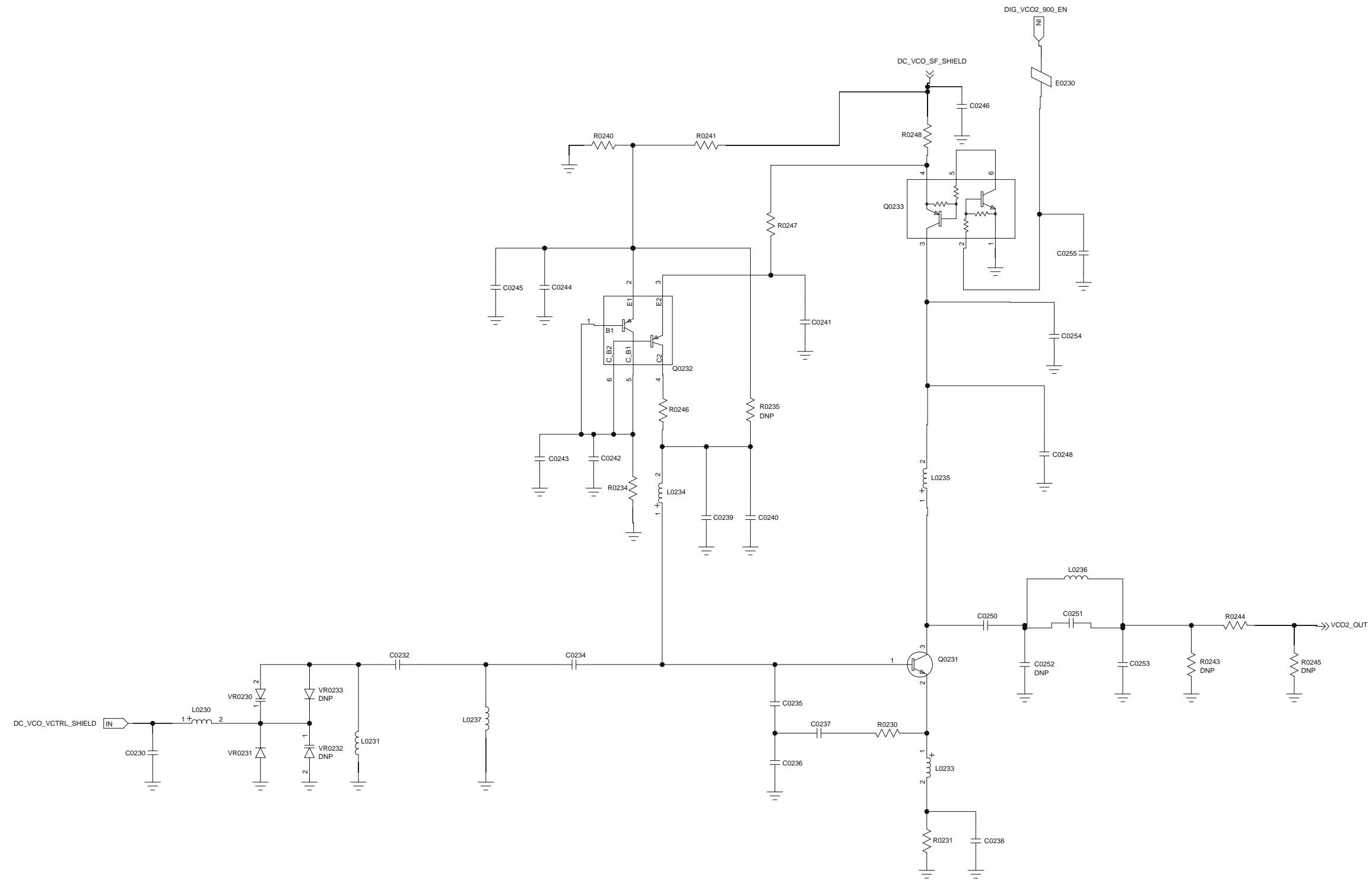


Figure 8-17. VCO Schematic Diagram (2 of 4)

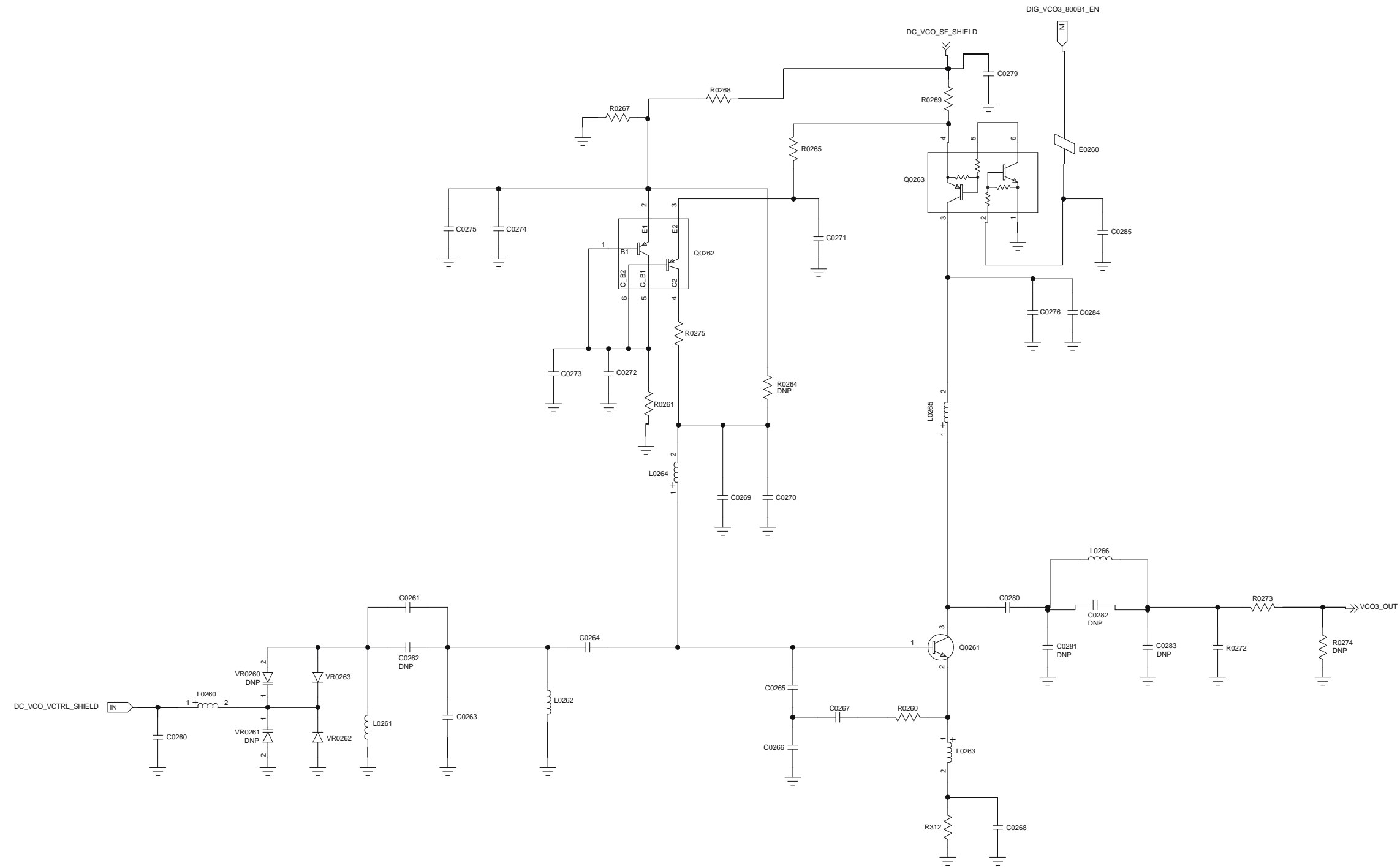


Figure 8-18. VCO Schematic Diagram (3 of 4)

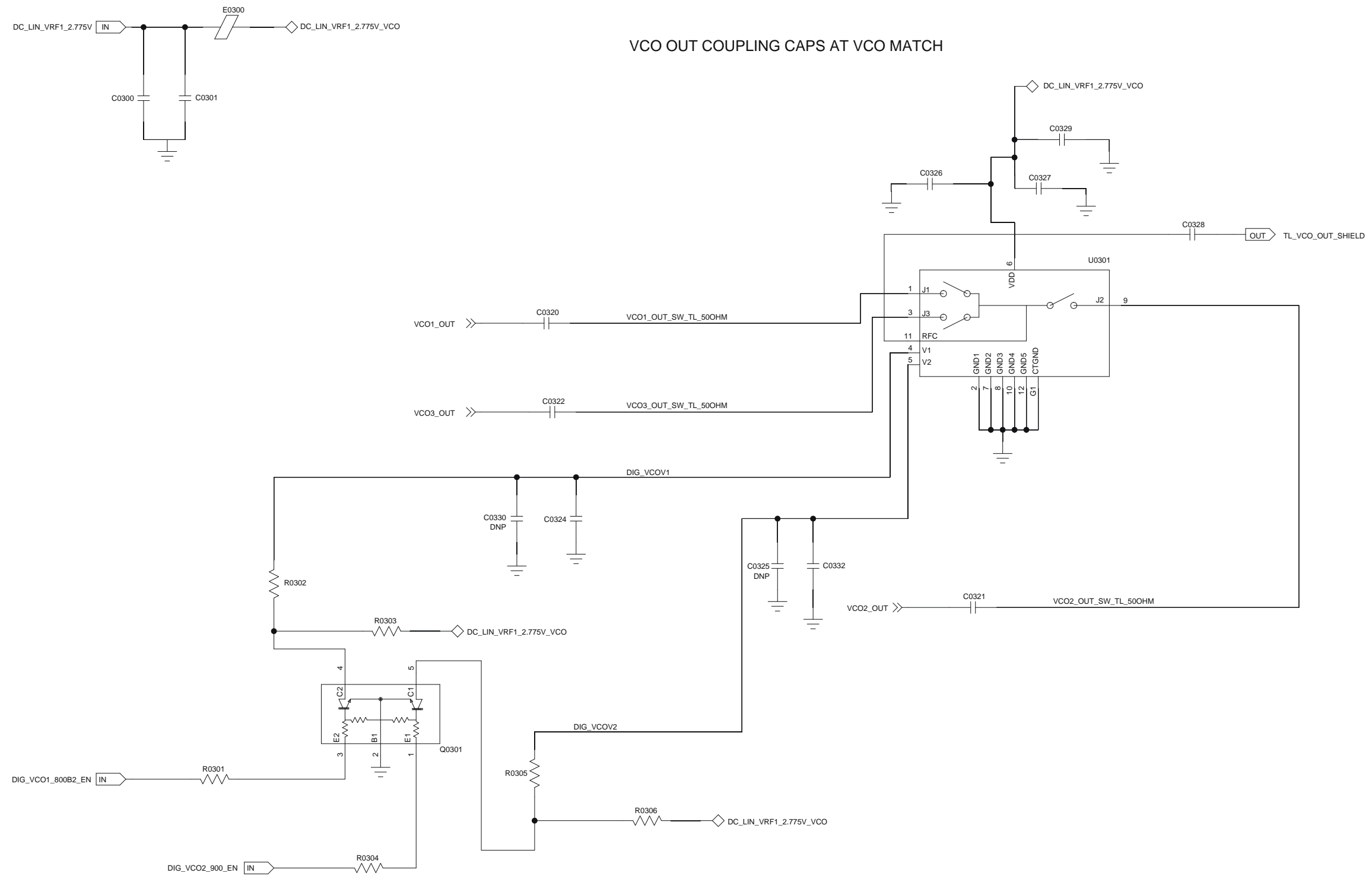


Figure 8-19. VCO Schematic Diagram (4 of 4)



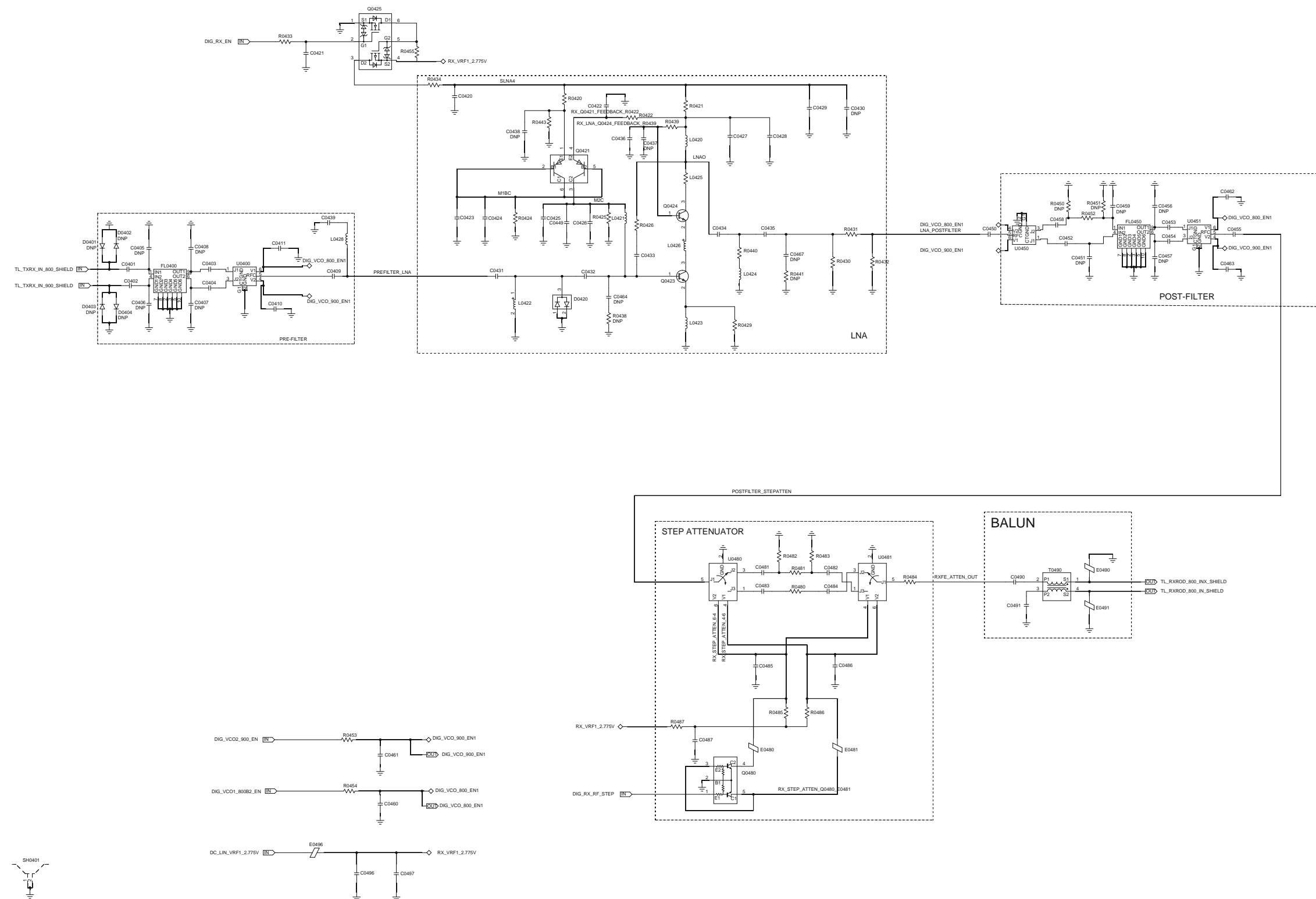


Figure 8-21. Receiver Schematic Diagram



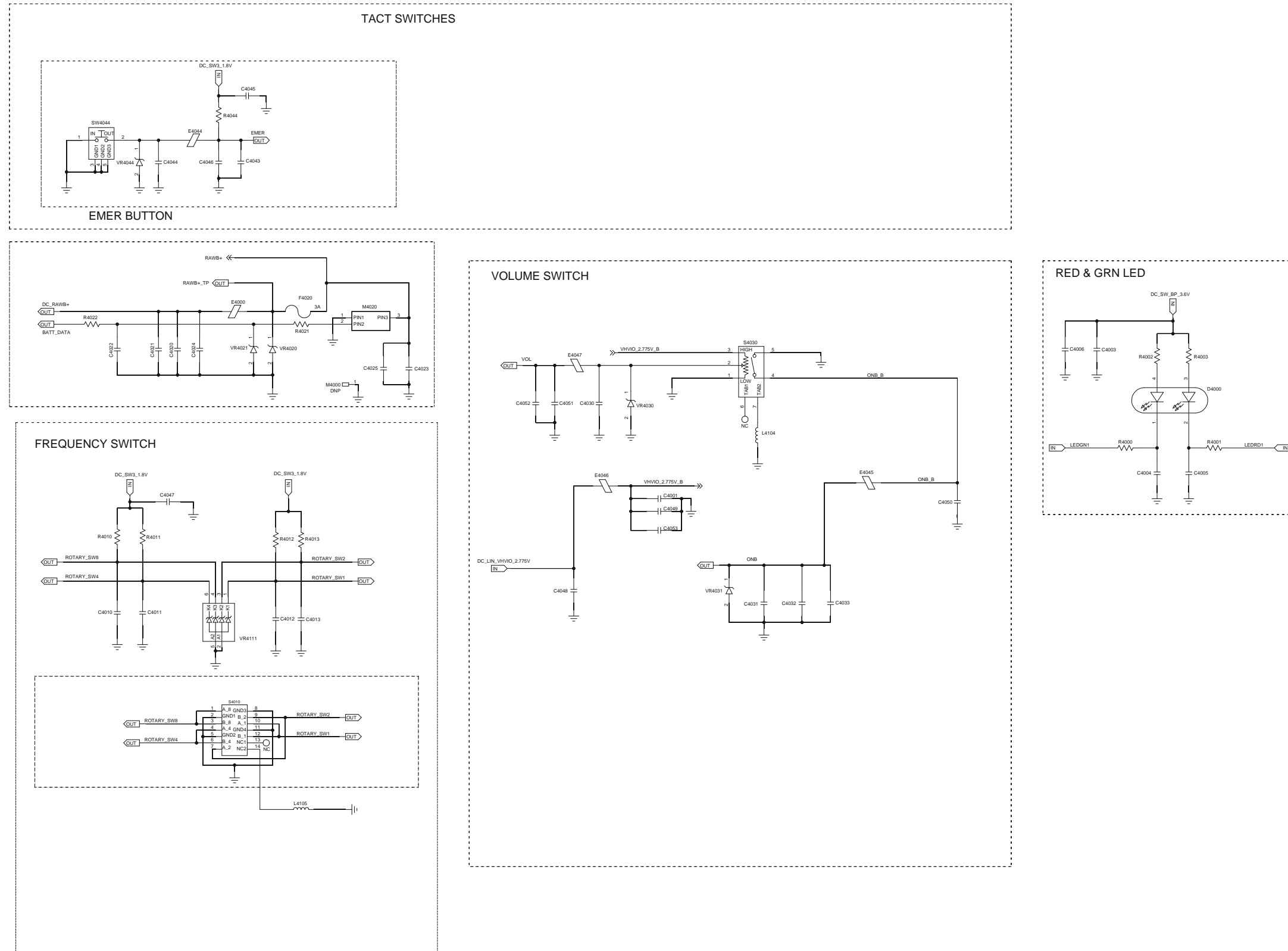


Figure 8-23. Peripheral Schematic Diagram (1 of 3)

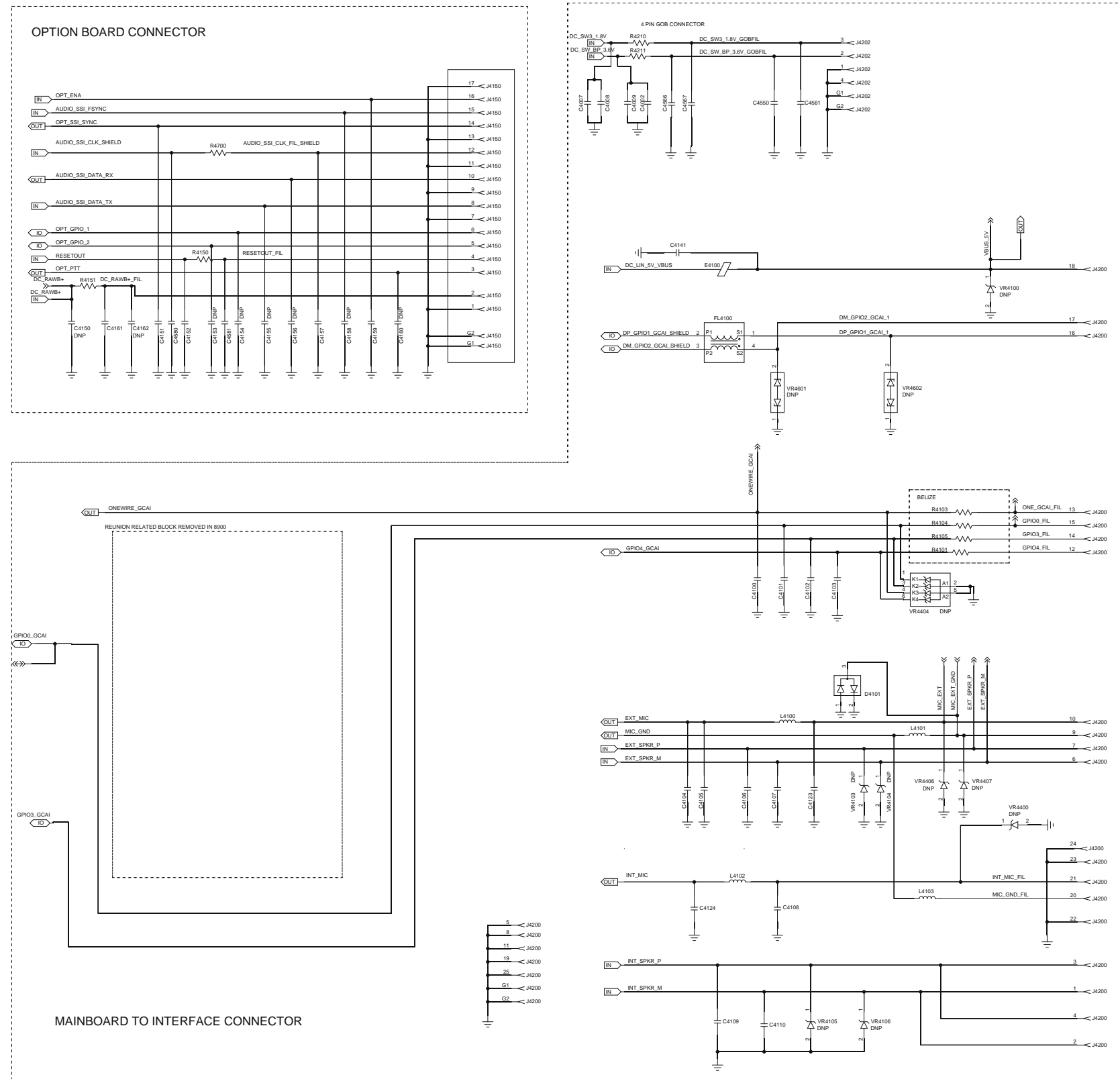


Figure 8-24. Peripheral Schematic Diagram (2 of 3)

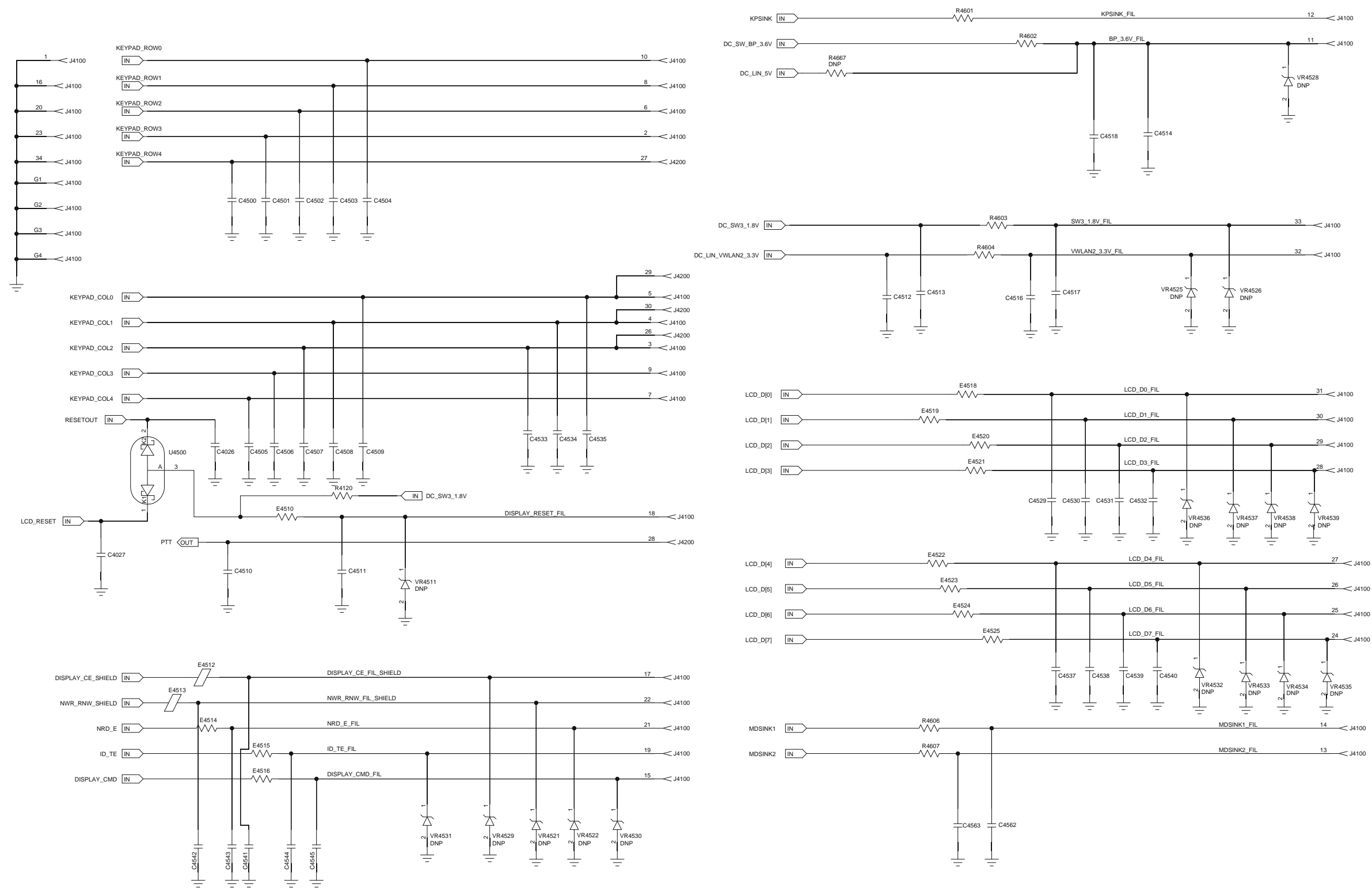
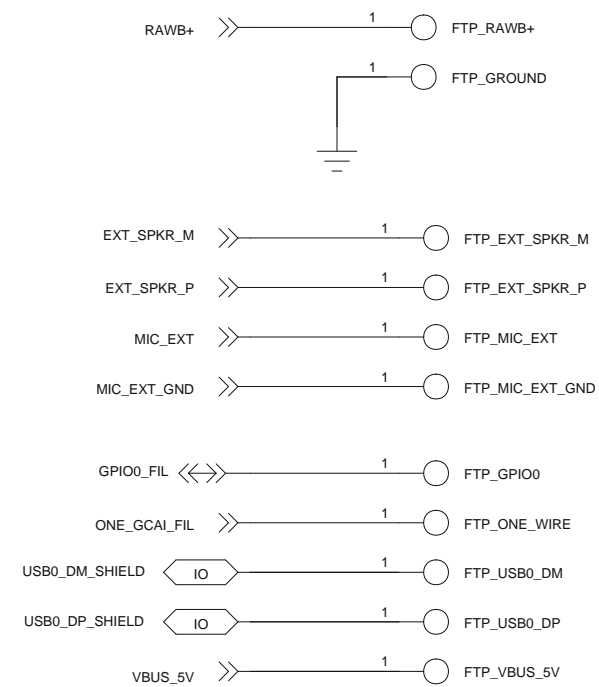


Figure 8-25. Peripheral Schematic Diagram (3 of 3)

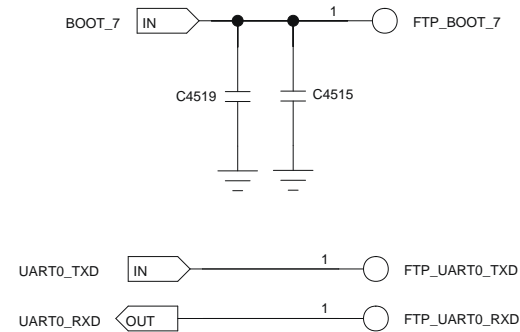
### FACTORY TEST POINTS

1.02MM DIAMETER  
FOR TEST & TUNE AND  
RE-FLASHING



### FACTORY TEST POINTS

1.02MM DIAMETER  
FOR BLANK BOARD FLASHING



### JTAG CONNECTOR

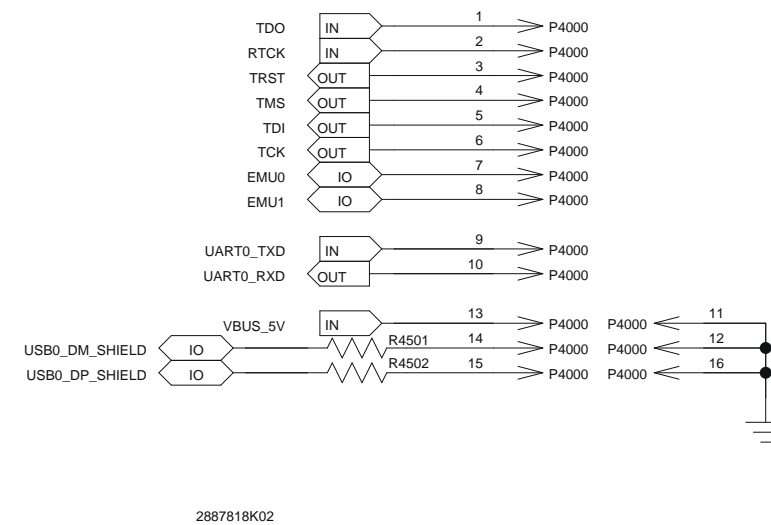


Figure 8-26. Factory Test Points Schematic Diagram

**800/900 MHz Radio Parts List  
(PC000970A01\_AA)**

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0001        | 2113944C55        |
| C0002        | 2113944C55        |
| C3           | 2113945B02        |
| C0003        | 21012096001       |
| C0004        | 21012096001       |
| C0005        | 2113946U01        |
| C0006        | 21667013162       |
| C0007        | 2113946U01        |
| C0008        | 2113944A47        |
| C0009        | 2113946U01        |
| C0010        | 21667013162       |
| C0011        | 2113946U01        |
| C0012        | 21667013162       |
| C0013        | 21667013162       |
| C0014        | 2113946U01        |
| C0015        | 21667013162       |
| C0016        | 21667013146       |
| C0017        | 2113946U01        |
| C0018        | 21667013146       |
| C0019        | 2113956B33        |
| C0020        | NOTPLACED         |
| C0021        | 2113946U01        |
| C0022        | 21667013162       |
| C0023        | 21667013162       |
| C0024        | 21667013162       |
| C0025        | 2113946U01        |
| C0026        | 2113946U01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0027        | 21667013162       |
| C0028        | 2113946U01        |
| C0029        | 21667013162       |
| C0030        | 2113956A51        |
| C0031        | 21667013162       |
| C0032        | 2113956A51        |
| C0033        | 21667013162       |
| C0034        | 21667013162       |
| C0035        | NOTPLACED         |
| C0037        | 21667013162       |
| C0038        | 21667013162       |
| C0039        | 21667013162       |
| C0040        | 21012080001       |
| C0042        | NOTPLACED         |
| C0043        | 21667013162       |
| C0044        | 21667013162       |
| C0045        | 21667013162       |
| C0046        | NOTPLACED         |
| C0047        | NOTPLACED         |
| C0048        | NOTPLACED         |
| C0050        | 21012081001       |
| C0051        | 2113946U01        |
| C0052        | 2113946U01        |
| C0053        | 2113946U01        |
| C0056        | 21012192001       |
| C0057        | 21667013164       |
| C0058        | 21667012322       |
| C0060        | 21667013162       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0061        | 21667013162       |
| C0062        | 2113945Y02        |
| C0063        | 21667013162       |
| C0101        | 21012044001       |
| C0102        | 21012044001       |
| C0103        | 21012044001       |
| C0104        | 2113944F15        |
| C0105        | 21012044004       |
| C0106        | 21012044010       |
| C0107        | 21012021001       |
| C0108        | 21012096001       |
| C0109        | 21667009415       |
| C0110        | 21667013146       |
| C0111        | 21667013146       |
| C0112        | NOTPLACED         |
| C0120        | 21667013162       |
| C0121        | 2113946U01        |
| C0122        | 2187893N01        |
| C0123        | 2113946U01        |
| C0124        | 2187893N01        |
| C0125        | 21667013146       |
| C0126        | 21667013162       |
| C0127        | 21667013162       |
| C0128        | 2113946B06        |
| C0130        | 21667013162       |
| C0131        | 2113946C08        |
| C0132        | 2113946U01        |
| C0133        | 2113946U01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0134        | 2113946U01        |
| C0135        | 21012021001       |
| C0140        | 2113946U01        |
| C0141        | 2113946U01        |
| C0142        | 21667013162       |
| C0143        | 2113945F07        |
| C0144        | 21667013146       |
| C0145        | 21667013162       |
| C0146        | 21667013162       |
| C0147        | 2113946U01        |
| C0149        | 2113946U01        |
| C0160        | 2113946U01        |
| C0161        | 2113945B02        |
| C0162        | 2113945B02        |
| C0163        | 2113945B02        |
| C0164        | 2113945B02        |
| C0165        | 21667013152       |
| C0166        | 21012071001       |
| C0167        | 2113945Y02        |
| C0168        | 21667013162       |
| C0169        | 21667013162       |
| C0170        | 21667013162       |
| C0171        | 21667013146       |
| C0173        | 2113946U01        |
| C0174        | NOTPLACED         |
| C0175        | 2113946U01        |
| C0177        | 2113946U01        |
| C0178        | NOTPLACED         |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0179        | NOTPLACED         |
| C0180        | 2113946U01        |
| C0181        | 21012081001       |
| C0182        | 21667013146       |
| C0183        | 21012081001       |
| C0184        | 2113945Y02        |
| C0185        | 2113946U01        |
| C0186        | 21012081001       |
| C0190        | NOTPLACED         |
| C0191        | 2113946U01        |
| C0192        | 21667013162       |
| C0193        | 2113946U01        |
| C0201        | 21667013146       |
| C0202        | 21012084032       |
| C0203        | 21012084024       |
| C0204        | NOTPLACED         |
| C0205        | 21012084021       |
| C0206        | 21012084042       |
| C0207        | 21012084026       |
| C0208        | 21667013451       |
| C0209        | 21667013156       |
| C0210        | 21667013146       |
| C0211        | 2113945Y02        |
| C0212        | 21667013146       |
| C0213        | 21667013146       |
| C0214        | 2113945Y02        |
| C0215        | 21667013146       |
| C0216        | 2113946U01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0218        | 2113945Y02        |
| C0219        | 21667013146       |
| C0221        | 21012084019       |
| C0222        | NOTPLACED         |
| C0223        | NOTPLACED         |
| C0224        | NOTPLACED         |
| C0225        | 2113945Y02        |
| C0226        | 21667013146       |
| C0227        | NOTPLACED         |
| C0230        | 21667013146       |
| C0232        | 21012084011       |
| C0234        | 21012084021       |
| C0235        | 21012084042       |
| C0236        | 21012084026       |
| C0237        | 21667013451       |
| C0238        | 21667013156       |
| C0239        | 21667013146       |
| C0240        | 2113945Y02        |
| C0241        | 21667013146       |
| C0242        | 21667013146       |
| C0243        | 2113945Y02        |
| C0244        | 21667013146       |
| C0245        | 2113946U01        |
| C0246        | 2113945Y02        |
| C0248        | 21667013146       |
| C0250        | 21012084017       |
| C0251        | 21012084002       |
| C0252        | NOTPLACED         |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0253        | 21012084029       |
| C0254        | 2113945Y02        |
| C0255        | 21667013146       |
| C0260        | 21667013146       |
| C0261        | 21012084011       |
| C0262        | NOTPLACED         |
| C0263        | 21012084008       |
| C0264        | 21012084021       |
| C0265        | 21012084038       |
| C0266        | 21012084026       |
| C0267        | 21667013451       |
| C0268        | 21667013156       |
| C0269        | 21667013146       |
| C0270        | 2113946U01        |
| C0271        | 21667013146       |
| C0272        | 21667013146       |
| C0273        | 2113946U01        |
| C0274        | 21667013146       |
| C0275        | 2113946U01        |
| C0276        | 2113946U01        |
| C0279        | 2113945Y02        |
| C0280        | 21012084023       |
| C0281        | NOTPLACED         |
| C0282        | NOTPLACED         |
| C0283        | NOTPLACED         |
| C0284        | 21667013146       |
| C0285        | 21667013146       |
| C0300        | 21667013162       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0301        | 2113946U01        |
| C0320        | 21667013164       |
| C0321        | 21667013164       |
| C0322        | 21667013164       |
| C0324        | 21667013146       |
| C0325        | NOTPLACED         |
| C0326        | 21667013146       |
| C0327        | 21667013162       |
| C0328        | 21667013164       |
| C0329        | 2113945Y02        |
| C0330        | NOTPLACED         |
| C0331        | 21667013164       |
| C0332        | 21667013146       |
| C0401        | 21667013162       |
| C0402        | 21667013162       |
| C0403        | 21667013162       |
| C0404        | 21667013162       |
| C0405        | NOTPLACED         |
| C0406        | NOTPLACED         |
| C0407        | NOTPLACED         |
| C0408        | NOTPLACED         |
| C0409        | 2113945E07        |
| C0410        | 21667013162       |
| C0411        | 21667013162       |
| C0420        | 21667013162       |
| C0421        | 21667013162       |
| C0422        | 21012080001       |
| C0423        | 21667013162       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0424        | 2113946U01        |
| C0425        | 21667013162       |
| C0426        | NOTPLACED         |
| C0427        | 21667013162       |
| C0428        | 2113946B06        |
| C0429        | 21667013162       |
| C0430        | 2113946D07        |
| C0431        | 2113944E10        |
| C0432        | 21667012152       |
| C0433        | 21667013162       |
| C0434        | 21667013162       |
| C0435        | 21012084026       |
| C0436        | 21667012205       |
| C0437        | NOTPLACED         |
| C0438        | 2113946U01        |
| C0439        | 24009378001       |
| C0449        | 2113946B01        |
| C0450        | 21667012152       |
| C0451        | NOTPLACED         |
| C0452        | 21667013162       |
| C0453        | 21667013162       |
| C0454        | 21667013162       |
| C0455        | 2113945E07        |
| C0456        | NOTPLACED         |
| C0457        | NOTPLACED         |
| C0458        | 21667013162       |
| C0459        | NOTPLACED         |
| C0460        | 21667013162       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0461        | 21667013162       |
| C0462        | 21667013162       |
| C0463        | 21667013162       |
| C0464        | NOTPLACED         |
| C0467        | 2113944E07        |
| C0481        | 21012192001       |
| C0482        | 21012192001       |
| C0483        | 21012192001       |
| C0484        | 21012192001       |
| C0485        | 21667013162       |
| C0486        | 21667013162       |
| C0487        | 21667013162       |
| C0490        | 2113945E07        |
| C0491        | 21667009156       |
| C0496        | 2113946U01        |
| C0497        | 21667013162       |
| C0700        | 2188881Y17        |
| C0701        | 21012161001       |
| C0702        | 21667012162       |
| C0703        | NOTPLACED         |
| C0704        | 21012191002       |
| C0705        | 21667012162       |
| C0706        | 2113946U01        |
| C0707        | 2113946U01        |
| C0708        | 2113944A31        |
| C0709        | 2113944A68        |
| C0710        | 2113944A10        |
| C0711        | NOTPLACED         |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0712        | 2113944A50        |
| C0713        | 2113944A31        |
| C0714        | NOTPLACED         |
| C0715        | NOTPLACED         |
| C0716        | NOTPLACED         |
| C0718        | NOTPLACED         |
| C0719        | 21667009368       |
| C0720        | 2113945L21        |
| C0721        | 21012043034       |
| C0722        | 21012043033       |
| C0723        | 21012043019       |
| C0724        | NOTPLACED         |
| C0725        | 21012043023       |
| C0726        | 21012043016       |
| C0727        | NOTPLACED         |
| C0730        | NOTPLACED         |
| C0731        | NOTPLACED         |
| C0732        | 2113945B02        |
| C0733        | 21667009355       |
| C0734        | 21012043016       |
| C0735        | CA000348A01       |
| C0736        | 2113944A31        |
| C0738        | 21012161001       |
| C0739        | NOTPLACED         |
| C0740        | NOTPLACED         |
| C0741        | 21667009355       |
| C0742        | 21667009332       |
| C0743        | 2113945A09        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0744        | 2113944A31        |
| C0745        | 2113946K02        |
| C0746        | 2113946K02        |
| C0747        | 21001124003       |
| C0748        | 21001124003       |
| C0749        | NOTPLACED         |
| C0750        | NOTPLACED         |
| C0751        | 2113945B04        |
| C0753        | 2113944A31        |
| C0754        | 2113944A17        |
| C0755        | 21012043034       |
| C0756        | 21667013152       |
| C0801        | 21667009291       |
| C0802        | 21667009276       |
| C0803        | 21667009294       |
| C0804        | 2113944A22        |
| C0805        | 21667009291       |
| C0806        | 21667009286       |
| C0807        | 21667009297       |
| C0810        | 21667012162       |
| C0813        | 2113945Y02        |
| C0814        | 21667012162       |
| C0815        | 21667012162       |
| C0816        | 21667012162       |
| C0817        | 21667012162       |
| C0818        | 2113945Y02        |
| C0819        | 21667012162       |
| C0820        | 21667012162       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C0821        | 21667012360       |
| C0823        | 21667013303       |
| C0844        | 2113944A31        |
| C0900        | 21012150001       |
| C0901        | 21667009156       |
| C0902        | 21667009156       |
| C0903        | 21667012162       |
| C0904        | 2113945B04        |
| C0905        | 2113944A45        |
| C0906        | 21667012162       |
| C0907        | 2113945B06        |
| C0908        | 21667012162       |
| C0909        | 2113945B04        |
| C0910        | 2113946K02        |
| C0911        | 21667009156       |
| C0912        | 21667012162       |
| C1000        | 2113946B06        |
| C1001        | 2113946B04        |
| C1002        | 2113945F07        |
| C1003        | 2113945F07        |
| C1004        | 2113946B04        |
| C1005        | 2113946B04        |
| C1006        | 2113956B54        |
| C1007        | 2113946B04        |
| C1008        | 2113946B04        |
| C1011        | 21667013162       |
| C1080        | 2113945F07        |
| C1081        | NOTPLACED         |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C1082        | 2113946B04        |
| C1083        | 2113946B04        |
| C1101        | 2113946B06        |
| C1102        | 2113946B06        |
| C1103        | 2113946B06        |
| C1104        | 2113946B06        |
| C1105        | 2113946B06        |
| C1106        | 21667013162       |
| C1107        | 21667013162       |
| C1108        | 21667013162       |
| C1109        | 21667013162       |
| C1110        | 21667013162       |
| C1111        | NOTPLACED         |
| C1113        | NOTPLACED         |
| C1120        | NOTPLACED         |
| C1121        | NOTPLACED         |
| C1122        | 2113946B06        |
| C1123        | 2113946B06        |
| C1124        | 2113946B06        |
| C1125        | 2113946B06        |
| C1126        | 2113946B06        |
| C1127        | 21667013162       |
| C1128        | 21667013162       |
| C1129        | 21667013162       |
| C1130        | 21667013162       |
| C1131        | 21667013162       |
| C1132        | 21667013162       |
| C1133        | 21667013162       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C1140        | NOTPLACED         |
| C1141        | NOTPLACED         |
| C1142        | 2113946B06        |
| C1143        | 2113946B06        |
| C1144        | 21667013162       |
| C1145        | 21667013162       |
| C1146        | 21667013162       |
| C1147        | 21667013162       |
| C1148        | NOTPLACED         |
| C1149        | NOTPLACED         |
| C1150        | NOTPLACED         |
| C1151        | NOTPLACED         |
| C1300        | 2113946B04        |
| C1312        | 2113946B04        |
| C1335        | 21667013162       |
| C1337        | 21667013162       |
| C1339        | 21667013162       |
| C1340        | 21667013162       |
| C1350        | 2113946B04        |
| C1351        | 21667013162       |
| C1352        | NOTPLACED         |
| C2000        | 2113946B04        |
| C2001        | 2113946B04        |
| C2002        | 2113946B04        |
| C2003        | 2113946B04        |
| C2004        | 21667013162       |
| C2005        | 2113945F07        |
| C2006        | 21667013162       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C2007        | 2113946B04        |
| C2008        | 2113946B04        |
| C2010        | NOTPLACED         |
| C2011        | NOTPLACED         |
| C2100        | 2113946B04        |
| C2101        | 2113946B04        |
| C2102        | 2113956B54        |
| C2104        | 2113945F07        |
| C2105        | 21667013162       |
| C3000        | 2113956B43        |
| C3001        | 2113956B43        |
| C3002        | 2113956B43        |
| C3003        | 2187893N01        |
| C3004        | 2187893N01        |
| C3007        | 2187893N01        |
| C3008        | 2113946B04        |
| C3009        | 2187893N01        |
| C3010        | 2113945F01        |
| C3011        | 2113956B21        |
| C3012        | 2113946U01        |
| C3013        | 2113956B43        |
| C3014        | 2113946U01        |
| C3015        | 2113956B43        |
| C3016        | 2113946U01        |
| C3017        | 2113946U01        |
| C3018        | 2113946U01        |
| C3019        | 2113946U01        |
| C3020        | 2113946U01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3021        | 2113946U01        |
| C3023        | 2113946U01        |
| C3024        | 21667013164       |
| C3026        | 2113946U01        |
| C3027        | 2187893N01        |
| C3028        | 2187893N01        |
| C3029        | 2187893N01        |
| C3031        | 2187893N01        |
| C3032        | 2187893N01        |
| C3033        | 2187893N01        |
| C3034        | 2187893N01        |
| C3035        | 2113946U01        |
| C3036        | 2187893N01        |
| C3037        | 2187893N01        |
| C3041        | 2113946D01        |
| C3042        | 21667013162       |
| C3043        | 2113945F07        |
| C3044        | 2187893N01        |
| C3045        | 2113945F07        |
| C3046        | 2113946U01        |
| C3047        | 2113946U01        |
| C3048        | 2113946U01        |
| C3049        | 21667013162       |
| C3050        | 21667013146       |
| C3051        | 21667013146       |
| C3053        | 2113945F07        |
| C3082        | 21667013162       |
| C3083        | 21667013162       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3084        | 21667013162       |
| C3086        | 21667013162       |
| C3087        | 21667013162       |
| C3089        | 21667013162       |
| C3090        | 21667013162       |
| C3092        | 21667013162       |
| C3093        | 21667009161       |
| C3096        | 21667013162       |
| C3097        | 21667013162       |
| C3098        | 21667013162       |
| C3100        | 2113946U01        |
| C3101        | 2113946U01        |
| C3102        | 2113946U01        |
| C3103        | 2113946U01        |
| C3104        | 2113946U01        |
| C3105        | 2187893N01        |
| C3106        | 2187893N01        |
| C3107        | 2187893N01        |
| C3110        | 2187893N01        |
| C3111        | 2113946U11        |
| C3112        | 2113946U11        |
| C3113        | 2113946U01        |
| C3114        | 21667013164       |
| C3115        | 21667013164       |
| C3116        | 2113946U01        |
| C3119        | 21667013162       |
| C3120        | 2113946B04        |
| C3126        | 2113946U01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3127        | 2113946U01        |
| C3128        | 2113946B04        |
| C3160        | 2113946U01        |
| C3171        | 2113946U01        |
| C3172        | 2113946U01        |
| C3173        | 21012135001       |
| C3174        | NOTPLACED         |
| C3175        | 2113956B21        |
| C3176        | 2113956B21        |
| C3177        | NOTPLACED         |
| C3178        | 21667013162       |
| C3179        | 2113956C25        |
| C3181        | 2113945F01        |
| C3200        | 21667013162       |
| C3210        | 2113946U01        |
| C3211        | 21012150001       |
| C3212        | 2187893N01        |
| C3213        | 21667013162       |
| C3214        | 21667013162       |
| C3215        | 2113946U01        |
| C3230        | 21667013162       |
| C3231        | 21012150001       |
| C3232        | 2187893N01        |
| C3250        | 2113946U01        |
| C3252        | 2113956B21        |
| C3253        | 21667013162       |
| C3254        | 2113945B02        |
| C3255        | 2113946D05        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3256        | 2113945B02        |
| C3271        | CA000402A01       |
| C3272        | CA000402A01       |
| C3274        | CA000534A01       |
| C3276        | CA000365A01       |
| C3277        | NOTPLACED         |
| C3278        | 2187893N01        |
| C3279        | 21667013162       |
| C3280        | 21667009161       |
| C3281        | NOTPLACED         |
| C3282        | NOTPLACED         |
| C3310        | 2113956B33        |
| C3315        | 2113945B02        |
| C3321        | 2187893N01        |
| C3330        | 2113946U01        |
| C3331        | 21667013162       |
| C3333        | 21667013162       |
| C3335        | 21667013162       |
| C3336        | 2113946U01        |
| C3350        | 2113956B21        |
| C3351        | 2113945B02        |
| C3353        | 2113946D05        |
| C3354        | 2113956B55        |
| C3356        | 21667013162       |
| C3366        | 2113956B21        |
| C3367        | 2187893N01        |
| C3368        | 2113956B43        |
| C3369        | 2113946B04        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C3370        | 2113946B04        |
| C3372        | 2113944C03        |
| C3373        | 2113944C03        |
| C3378        | 2113956E91        |
| C3379        | 2113956B33        |
| C3380        | 2113956B21        |
| C3382        | 2113956A51        |
| C3383        | 2113956A51        |
| C3384        | 2113944A44        |
| C3385        | 21667009161       |
| C3386        | 21667013162       |
| C3387        | 2113945B02        |
| C3388        | 2113945B02        |
| C3389        | 21667009161       |
| C3390        | 21667013162       |
| C3391        | 21667013162       |
| C3401        | 21667009161       |
| C3402        | 21667009161       |
| C3403        | 21667009161       |
| C3408        | CA000491A01       |
| C3411        | 2187893N01        |
| C3420        | 21667009161       |
| C4001        | 21667013162       |
| C4002        | 2113956A51        |
| C4003        | 21667013162       |
| C4004        | 21667013162       |
| C4005        | 21667013162       |
| C4006        | 2113946U01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C4007        | 2113956A51        |
| C4008        | 21667013162       |
| C4009        | 21667013162       |
| C4010        | 21667013162       |
| C4011        | 21667013162       |
| C4012        | 21667013162       |
| C4013        | 21667013162       |
| C4020        | 21667013162       |
| C4021        | 21667013122       |
| C4022        | 21667013162       |
| C4023        | 21667012142       |
| C4024        | 21013083001       |
| C4025        | 21667012360       |
| C4026        | 21667013162       |
| C4027        | 21667013162       |
| C4030        | 21667013162       |
| C4031        | 21667013162       |
| C4032        | 21667012360       |
| C4033        | 21667012360       |
| C4043        | 21667012360       |
| C4044        | 21667013162       |
| C4045        | 21667013162       |
| C4046        | 21667012360       |
| C4047        | 21667013162       |
| C4048        | 21667013162       |
| C4049        | 21667012360       |
| C4050        | 21667013162       |
| C4051        | 21667012360       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C4052        | 21667012360       |
| C4053        | 21667012360       |
| C4100        | 21667013162       |
| C4101        | 21667013162       |
| C4102        | 21667013162       |
| C4103        | 21667013162       |
| C4104        | 21667013162       |
| C4105        | 21667013162       |
| C4106        | 21667013162       |
| C4107        | 21667013162       |
| C4108        | 21667013162       |
| C4109        | 21667013162       |
| C4110        | 21667013162       |
| C4123        | 21667013162       |
| C4124        | 21667013162       |
| C4141        | 21667013162       |
| C4150        | NOTPLACED         |
| C4151        | 21667013162       |
| C4152        | 2113946U01        |
| C4153        | NOTPLACED         |
| C4154        | NOTPLACED         |
| C4155        | NOTPLACED         |
| C4156        | NOTPLACED         |
| C4157        | 21667013162       |
| C4158        | NOTPLACED         |
| C4159        | 21667013162       |
| C4160        | NOTPLACED         |
| C4161        | 2113956D35        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C4162        | NOTPLACED         |
| C4500        | 21667013162       |
| C4501        | 21667013162       |
| C4502        | 21667013162       |
| C4503        | 21667013162       |
| C4504        | 21667013162       |
| C4505        | 21667013162       |
| C4506        | 21667013162       |
| C4507        | 21667013162       |
| C4508        | 21667013162       |
| C4509        | 21667013162       |
| C4510        | 21667013162       |
| C4511        | 21667013162       |
| C4512        | 21667013162       |
| C4513        | 21667013162       |
| C4514        | 21667013162       |
| C4515        | 21667013162       |
| C4516        | 2113946U01        |
| C4517        | 2113946U01        |
| C4518        | 2113946U01        |
| C4519        | 2115153H40        |
| C4529        | 21667013162       |
| C4530        | 21667013162       |
| C4531        | 21667013162       |
| C4532        | 21667013162       |
| C4533        | 21667013162       |
| C4534        | 21667013162       |
| C4535        | 21667013162       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C4537        | 21667013162       |
| C4538        | 21667013162       |
| C4539        | 21667013162       |
| C4540        | 21667013162       |
| C4541        | 21667013162       |
| C4542        | 21667013162       |
| C4543        | 21667013162       |
| C4544        | 21667013162       |
| C4545        | 21667013162       |
| C4550        | 21667013162       |
| C4561        | 21667013162       |
| C4562        | 21667013162       |
| C4563        | 21667013162       |
| C4566        | NOTPLACED         |
| C4567        | NOTPLACED         |
| C4580        | 21667013162       |
| C4581        | 21667013162       |
| C8000        | 2113946D05        |
| C8001        | NOTPLACED         |
| C8002        | 21667013162       |
| C8003        | 21667013162       |
| C8004        | 2113946U01        |
| C8005        | CA000365A01       |
| C8006        | 21667013162       |
| C8008        | 21667013162       |
| C8010        | 21667013162       |
| C8012        | 21013062001       |
| C8013        | 21667013162       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C8014        | 2113945E07        |
| C8100        | 21012134001       |
| C8101        | 21012134001       |
| C8102        | 21667013140       |
| C8103        | 21667013162       |
| C8104        | 21667013162       |
| C8105        | NOTPLACED         |
| C8106        | NOTPLACED         |
| C8107        | 2113956C37        |
| C8108        | 21667013162       |
| C8109        | 21667013162       |
| C8110        | 21012193001       |
| C8111        | 21009304002       |
| C8112        | 21667013162       |
| C8113        | 21667013162       |
| C8114        | 21012129001       |
| C100_2       | 21013062001       |
| C101_2       | 21013062001       |
| C102_2       | 21667009380       |
| C103_2       | 21013062001       |
| C104_2       | 21013062001       |
| C105_2       | 21667009201       |
| C106_2       | 21013062001       |
| C107_2       | 2170282H06        |
| C108_2       | 21013062001       |
| C109_2       | 21013062001       |
| C8300_3      | 21009304001       |
| C8305_3      | 21667012146       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| C8306_3      | 21009304001       |
| C8311_3      | 21009304001       |
| C8312_3      | 2113946U01        |
| C8315_3      | 21012129001       |
| C8316_3      | 21009304001       |
| C8319_3      | 2113946U01        |
| C8320_3      | 2113946U01        |
| C8321_3      | 2113946U01        |
| C8322_3      | 2113946U01        |
| C8323_3      | 2113946U01        |
| C8324_3      | 2113946U01        |
| C8325_3      | 2113946U01        |
| C8327_3      | 2113945F07        |
| C8328_3      | 2113946U01        |
| C8329_3      | 21013048001       |
| C8331_3      | 2113946U01        |
| C8332_3      | 2113946U01        |
| C8334_3      | CA000445A01       |
| C8335_3      | 21667013140       |
| D0160        | 4871852M02        |
| D0161        | 4871852M02        |
| D0401        | NOTPLACED         |
| D0402        | NOTPLACED         |
| D0403        | NOTPLACED         |
| D0404        | NOTPLACED         |
| D0420        | 4813974A19        |
| D3000        | 4805656W89        |
| D4000        | 48009340001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| D4101        | 4813974A19        |
| E0001        | 91013001001       |
| E0002        | 91013001001       |
| E0003        | 91013001001       |
| E0004        | 91013001001       |
| E0005        | 91013001001       |
| E0006        | 91013001001       |
| E0007        | 91013001001       |
| E0009        | 91013001001       |
| E0010        | 91013001001       |
| E0012        | 91013001001       |
| E0013        | 91013001001       |
| E0014        | 91012036001       |
| E0015        | 91012036001       |
| E0017        | 91013001001       |
| E0018        | 91013001001       |
| E0019        | 2471132D14        |
| E0021        | 2471132D14        |
| E0023        | 91013001001       |
| E0200        | 91013001001       |
| E0230        | 91013001001       |
| E0260        | 91013001001       |
| E0300        | 91013001001       |
| E0480        | 2471132D14        |
| E0481        | 2471132D14        |
| E0490        | 91013001001       |
| E0491        | 91013001001       |
| E0496        | 2471132D14        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| E0701        | 2475316C04        |
| E0800        | CN000794A01       |
| E0801        | 91013001001       |
| E0802        | 91013001001       |
| E0900        | 7686949J14        |
| E1000        | 24012051001       |
| E1001        | 24012051001       |
| E1002        | 24012051001       |
| E1003        | 24012051001       |
| E1006        | 91012036001       |
| E1007        | 91012036001       |
| E1008        | 91012036001       |
| E1009        | 91012036001       |
| E1010        | 91012036001       |
| E1020        | 24012065001       |
| E3100        | 2471132D14        |
| E3101        | 24012065001       |
| E3102        | 24012065001       |
| E3105        | HZ000290A01       |
| E3201        | HZ000290A01       |
| E3300        | NOTPLACED         |
| E3306        | HZ000290A01       |
| E3307        | HZ000290A01       |
| E3308        | 91013001001       |
| E4000        | 24010078002       |
| E4044        | 91012036001       |
| E4045        | 91012036001       |
| E4046        | 91012036001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| E4047        | 91012036001       |
| E4100        | 24012178001       |
| E4510        | 0613952R66        |
| E4512        | 24012065001       |
| E4513        | 24012065001       |
| E4514        | 0613952R66        |
| E4515        | 0613952R66        |
| E4516        | 0613952R66        |
| E4518        | 0613952R66        |
| E4519        | 0613952R66        |
| E4520        | 0613952R66        |
| E4521        | 0613952R66        |
| E4522        | 0613952R66        |
| E4523        | 0613952R66        |
| E4524        | 0613952R66        |
| E4525        | 0613952R66        |
| E8000        | NOTPLACED         |
| E8002        | 7686949J08        |
| E8003        | 7688697V14        |
| E8100        | 7686949J22        |
| E8102        | 7688697V04        |
| E8103        | 7688697V04        |
| E105_2       | 7688697V14        |
| E8300_3      | 7688697V14        |
| F4020        | 65012019001       |
| FL0400       | 91009269001       |
| FL0450       | 91009269001       |
| FL4100       | 2571601G01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| FL8000       | 91012018002       |
| FL8001       | 91012057001       |
| FL8002       | 91012057001       |
| J4100        | 09012192001       |
| J4150        | 09012068001       |
| J4200        | CN000537A01       |
| J4202        | CN000225A01       |
| J8000        | CN000512A01       |
| L0002        | 2475122C12        |
| L0003        | 24012146001       |
| L0004        | 0613952G67        |
| L0005        | NOTPLACED         |
| L0008        | 7688697V15        |
| L0009        | 2488183V05        |
| L0014        | 24001720007       |
| L0201        | 2475122C39        |
| L0202        | 24009342005       |
| L0203        | 24013081001       |
| L0205        | 2475122C39        |
| L0206        | 2475122C37        |
| L0207        | 2475122C39        |
| L0208        | IN000122B04       |
| L0230        | 2475122C39        |
| L0231        | 24009342008       |
| L0233        | 2475122C39        |
| L0234        | 2475122C39        |
| L0235        | 2475122C37        |
| L0236        | IN000122B02       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| L0237        | 24013081001       |
| L0260        | 2475122C39        |
| L0261        | 24009342007       |
| L0262        | 24013081001       |
| L0263        | 2475122C39        |
| L0264        | 2475122C39        |
| L0265        | 2475122C37        |
| L0266        | IN000122B04       |
| L0420        | IN000096A42       |
| L0421        | IN000101A19       |
| L0422        | IN000101A35       |
| L0423        | 24667008005       |
| L0424        | 24009315017       |
| L0425        | 24013047014       |
| L0426        | 24013047011       |
| L0428        | 21667012210       |
| L0701        | 24009314016       |
| L0702        | IN000122A03       |
| L0703        | IN000122B37       |
| L0704        | IN000122A03       |
| L0705        | 24009314016       |
| L0707        | 0613952R66        |
| L0710        | 24009342035       |
| L0720        | 2471884M03        |
| L0721        | 24009342007       |
| L0730        | IN000101A22       |
| L0801        | 2471884M02        |
| L0802        | 2471911M01        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| L0803        | 24009342019       |
| L0805        | 24009342004       |
| L0900        | 24009315136       |
| L3210        | 24013057001       |
| L3230        | 24013057001       |
| L3272        | 24012106001       |
| L3279        | IN000312A23       |
| L3286        | IN000269A18       |
| L4100        | 24009315046       |
| L4101        | 24009315046       |
| L4102        | 24009315046       |
| L4103        | 24009315046       |
| L4104        | 24009314047       |
| L4105        | 24009314047       |
| L8003        | 24010062003       |
| L106_2       | IN000122B13       |
| L8301_3      | 2475122C28        |
| L8330_3      | IN000095A01       |
| L8333_3      | IN000095A01       |
| LABEL        | 54012239001       |
| M0701        | 26012312001       |
| M0800        | 0987378K01        |
| M4000        | NOTPLACED         |
| M4020        | 09012098001       |
| P4000        | 2887818K02        |
| PASTE1       | BU000032A01       |
| PASTE2       | BU000032A01       |
| PASTE3       | BU000032A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| PCB          | PC000970A01       |
| Q0201        | 48013025001       |
| Q0203        | 48012203001       |
| Q0204        | CR000346A01       |
| Q0231        | 48013025001       |
| Q0232        | 48012203001       |
| Q0233        | CR000346A01       |
| Q0261        | 48013025001       |
| Q0262        | 48012203001       |
| Q0263        | CR000346A01       |
| Q0301        | 48012038001       |
| Q0421        | 4815267H01        |
| Q0423        | 48013025001       |
| Q0424        | 48013025001       |
| Q0425        | 4813972A34        |
| Q0480        | 48012038001       |
| Q0700        | 4816134H01        |
| Q0701        | 48012059001       |
| Q0710        | 48012275001       |
| Q0720        | CR000510A01       |
| Q0900        | 4809939C31        |
| Q1000        | 4815055H01        |
| Q1001        | 4815055H01        |
| Q3000        | 48009494001       |
| Q3001        | 48012059001       |
| Q3170        | 48012038001       |
| Q3172        | 48009494001       |
| Q3179        | 48012038001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| Q3278        | CR000594A01       |
| Q3320        | 48009494001       |
| Q3322        | 4813970A62        |
| Q3327        | 48009494001       |
| R0001        | 0613952Y66        |
| R0002        | 0613952X73        |
| R0011        | 0613952Y66        |
| R0012        | 0613952Y66        |
| R0013        | 0613952Y66        |
| R0015        | 0613952X89        |
| R0016        | 0613952X89        |
| R0017        | 0613952N89        |
| R0018        | 0613952N30        |
| R0020        | 0613952Y66        |
| R0100        | 0613952Q39        |
| R0101        | 0613952Q81        |
| R0102        | 0613952X56        |
| R0103        | 0613952X62        |
| R0104        | 0613952R66        |
| R0140        | 0613952Q35        |
| R0160        | 0613952Y23        |
| R0163        | 0613952G67        |
| R0201        | 0613952X31        |
| R0202        | 0613952X42        |
| R0205        | 0613952Y09        |
| R0206        | 0613952X95        |
| R0207        | 0613952X89        |
| R0209        | NOTPLACED         |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R0224        | 21012084035       |
| R0225        | 0613952Y66        |
| R0226        | NOTPLACED         |
| R0227        | 0613952Y05        |
| R0228        | 0613952X19        |
| R0229        | 0613952Y04        |
| R0230        | 0613952X31        |
| R0231        | 0613952X42        |
| R0234        | 0613952Y08        |
| R0235        | NOTPLACED         |
| R0240        | 0613952X95        |
| R0241        | 0613952X93        |
| R0243        | NOTPLACED         |
| R0244        | 0613952Y66        |
| R0245        | NOTPLACED         |
| R0246        | 0613952Y04        |
| R0247        | 0613952Y05        |
| R0248        | 0613952X19        |
| R0260        | 0613952X36        |
| R0261        | 0613952Y09        |
| R0264        | NOTPLACED         |
| R0265        | 0613952Y05        |
| R0267        | 0613952X95        |
| R0268        | 0613952X89        |
| R0269        | 0613952X19        |
| R0272        | 21012084038       |
| R0273        | 0613952Y66        |
| R0274        | NOTPLACED         |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R0275        | 0613952Y04        |
| R0301        | 0613952Y66        |
| R0302        | 0613952X49        |
| R0303        | 0613952Y01        |
| R0304        | 0613952Y66        |
| R0305        | 0613952X49        |
| R0306        | 0613952Y01        |
| R0310        | 0613952X40        |
| R0311        | 0613952Y66        |
| R312         | 0613952X42        |
| R0420        | 0613952X80        |
| R0421        | 0613952X42        |
| R0422        | 0613952X81        |
| R0424        | 0613952Y03        |
| R0425        | 0613952V30        |
| R0426        | 0613952X92        |
| R0429        | NOTPLACED         |
| R0430        | 0613952X62        |
| R0431        | 0613952X29        |
| R0432        | 0613952X62        |
| R0433        | 0613952Y66        |
| R0434        | 0613952Y66        |
| R0438        | NOTPLACED         |
| R0439        | 0613952X80        |
| R0440        | 0613952Y66        |
| R0441        | 0613952Y66        |
| R0443        | NOTPLACED         |
| R0450        | NOTPLACED         |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R0451        | NOTPLACED         |
| R0452        | 0613952Y66        |
| R0453        | 0613952Y66        |
| R0454        | 0613952Y66        |
| R0455        | 0613952Y25        |
| R0480        | 0613952Y66        |
| R0481        | 0613952X36        |
| R0482        | 0613952X53        |
| R0483        | 0613952X53        |
| R0484        | 0613952Y66        |
| R0485        | 0613952V01        |
| R0486        | 0613952U85        |
| R0487        | 0613952R66        |
| R0700        | 0613952X68        |
| R0701        | 0613952X37        |
| R0702        | 0613952X68        |
| R0703        | 0613952X63        |
| R0704        | 0613952Y25        |
| R0707        | 0613952M18        |
| R0708        | 0613952Q66        |
| R0709        | 0613952Q49        |
| R0710        | NOTPLACED         |
| R0711        | 0613952M18        |
| R0712        | 0613952Q66        |
| R0714        | 0613952H49        |
| R0716        | 0613952M34        |
| R0813        | 0613952Y66        |
| R0814        | 0613952Y66        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R0901        | 0675679M01        |
| R0902        | 0613952N30        |
| R0905        | 06012064001       |
| R0906        | 0613952Z80        |
| R0907        | 06012042001       |
| R0908        | 0613952Z80        |
| R0909        | 06012042001       |
| R0910        | 0675679M01        |
| R0911        | 0675679M01        |
| R0912        | 0613952Q59        |
| R0913        | 0613952Q81        |
| R0915        | 0613952Q90        |
| R0916        | 0613952M26        |
| R0918        | 0613952M47        |
| R0920        | 0613952R66        |
| R0921        | NOTPLACED         |
| R0922        | 0613952Q59        |
| R1003        | 0613952X66        |
| R1004        | 0613952X66        |
| R1009        | 0613952X73        |
| R1010        | 0613952R66        |
| R1011        | 0613952R66        |
| R1012        | 0613952R66        |
| R1013        | 0613952R66        |
| R1014        | 0613952U01        |
| R1015        | NOTPLACED         |
| R1016        | 0613952X89        |
| R1017        | NOTPLACED         |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R1018        | 0613952X89        |
| R1019        | 0613952X73        |
| R1020        | NOTPLACED         |
| R1028        | 0613952Y66        |
| R1029        | 0613952Y66        |
| R1031        | 0613952Y66        |
| R1032        | 0613952Y66        |
| R1033        | 0613952Y66        |
| R1045        | 0613952X73        |
| R1046        | NOTPLACED         |
| R1052        | 0613952Y66        |
| R1081        | 0613952Y17        |
| R1082        | 0613952Y66        |
| R1084        | NOTPLACED         |
| R1100        | 0613952R66        |
| R1111        | 0613952Y01        |
| R1113        | 0613952Y01        |
| R1114        | 0613952Y01        |
| R1400        | 0613952Q65        |
| R2000        | 0613952R66        |
| R2001        | 0613952Y17        |
| R2002        | 0613952Y17        |
| R2003        | 0613952S68        |
| R2004        | 0613952R66        |
| R2100        | 0613952R66        |
| R2101        | 0613952Y01        |
| R2103        | 0613952Y01        |
| R2106        | 0613952Q81        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R3000        | 0613952Y66        |
| R3001        | 0613952V01        |
| R3002        | 0613952Q81        |
| R3004        | 0613952Y66        |
| R3006        | 0613952V01        |
| R3007        | 0613952Y66        |
| R3008        | 0613952Y66        |
| R3009        | 0613952Y66        |
| R3010        | 0613952Y66        |
| R3011        | 0613952Y66        |
| R3012        | 0613952Y66        |
| R3014        | 0613952Y66        |
| R3016        | 0613952Y66        |
| R3019        | 0613952Y66        |
| R3020        | 0613952Y66        |
| R3101        | 0613952Q81        |
| R3102        | 0613952V01        |
| R3103        | 0613952V01        |
| R3104        | 0613952V01        |
| R3105        | 0613952V01        |
| R3106        | 0613952Y66        |
| R3107        | 0613952V01        |
| R3108        | 0613952V01        |
| R3115        | 0613952Y66        |
| R3116        | 0613952S89        |
| R3123        | 0613952V01        |
| R3170        | 0613952Z73        |
| R3171        | 0613952Z73        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R3174        | 0613952V01        |
| R3175        | 0613952V01        |
| R3176        | 0613952N30        |
| R3178        | 0613952V01        |
| R3180        | 0613952V01        |
| R3181        | NOTPLACED         |
| R3182        | 0613952Z61        |
| R3183        | NOTPLACED         |
| R3185        | 0613952V01        |
| R3186        | 0613952V01        |
| R3210        | 0613952R66        |
| R3211        | 0613952Y66        |
| R3230        | 0613952R66        |
| R3231        | 0613952Y66        |
| R3251        | 0613952G67        |
| R3273        | 0613952M78        |
| R3274        | 0613952N35        |
| R3275        | RE000207A01       |
| R3277        | 0613952Y66        |
| R3313        | 0613952N18        |
| R3314        | 0613952M55        |
| R3320        | 0613952V01        |
| R3321        | 0616416H01        |
| R3330        | 0613952Y66        |
| R3331        | 0613952Y66        |
| R3334        | 0613952V01        |
| R3350        | 0613952Q79        |
| R3352        | 0613952Q65        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R3353        | 0613952Y66        |
| R3354        | 0613952Y66        |
| R3355        | NOTPLACED         |
| R3358        | 0613952R66        |
| R3359        | 0613952R66        |
| R3364        | 0613952Y25        |
| R3367        | 0613952V01        |
| R3370        | 0613952X81        |
| R3374        | 0613952V01        |
| R3501        | NOTPLACED         |
| R3502        | 0613952Y66        |
| R4000        | 0613952X42        |
| R4001        | 0613952X42        |
| R4002        | 0613952Y66        |
| R4003        | 0613952Y66        |
| R4010        | 0613952X89        |
| R4011        | 0613952X89        |
| R4012        | 0613952X89        |
| R4013        | 0613952X89        |
| R4021        | 0613958H49        |
| R4022        | 0613952Q30        |
| R4044        | 0613952X89        |
| R4101        | 0613952X65        |
| R4103        | 0613952X59        |
| R4104        | 0613952X65        |
| R4105        | 0613952X65        |
| R4120        | 0613952Y01        |
| R4150        | 0613952X29        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R4151        | 0613952B01        |
| R4210        | 0613952G67        |
| R4211        | 0613952G67        |
| R4501        | 0613952Y66        |
| R4502        | 0613952Y66        |
| R4601        | 0613952R66        |
| R4602        | 0613952R66        |
| R4603        | 0613952R66        |
| R4604        | 0613952R66        |
| R4606        | 0613952R66        |
| R4607        | 0613952R66        |
| R4667        | NOTPLACED         |
| R4700        | 0613952K01        |
| R8000        | 0613952Y66        |
| R8001        | 0613952Y66        |
| R8002        | NOTPLACED         |
| R8003        | NOTPLACED         |
| R8004        | 0613952Y66        |
| R8006        | 0613952R66        |
| R8007        | 0613952Y32        |
| R8009        | NOTPLACED         |
| R8010        | NOTPLACED         |
| R8100        | 0613952M59        |
| R8101        | 0613952M10        |
| R8102        | 0613952Y25        |
| R8103        | 0613952Y27        |
| R8104        | 0613952Y66        |
| R8108        | 0613952Y66        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| R8109        | 0613952Y66        |
| R8110        | 0613952Y66        |
| R8111        | 0613952Y66        |
| R8112        | 0613952Y66        |
| R8113        | 0613952Y66        |
| R8114        | 0613952Y66        |
| R8115        | 0613952R66        |
| R8116        | 0613952V69        |
| R8117        | NOTPLACED         |
| R101_2       | 0613952Y01        |
| R8300_3      | 0613952R66        |
| R8301_3      | 0613952Y66        |
| R8304_3      | 0613952X73        |
| R8305_3      | 0613952Y66        |
| R8314_3      | 0613952Y66        |
| S4010        | 40012023001       |
| S4030        | 1875103C04        |
| SH0001       | SH000087A01       |
| SH0002       | SH000271A01       |
| SH0201       | SH000291A01       |
| SH0401       | SH000270A03       |
| SH0801       | SH000272A01       |
| SH0802       | SH000329A01       |
| SH1001       | SH000269A01       |
| SH3001       | SH000268A01       |
| SH8000       | SH000267A01       |
| SW4044       | 4086470Z01        |
| T0490        | 24012146001       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| U0001        | 51009877001       |
| U0301        | 51009857001       |
| U0400        | 40012048001       |
| U0450        | 40012048001       |
| U0451        | 40012048001       |
| U0480        | 5186310Y39        |
| U0481        | 5186310Y39        |
| U0700        | IC000382A01       |
| U0800        | 51009857001       |
| U0900        | IC000240A01       |
| U0901        | 5115022H01        |
| U0902        | 5114007M32        |
| U1000        | 51012295002       |
| U1021        | IC000643A01       |
| U1081        | LD000092A01       |
| U1300        | 51012283001       |
| U2000        | MM000129A01       |
| U2100        | MM000157A01       |
| U3000        | IC000326A01       |
| U3160        | 5114007A43        |
| U3170        | 51012263001       |
| U3250        | 5171389M02        |
| U3270        | 51012456001       |
| U3310        | 5171103N01        |
| U3311        | 5189092V44        |
| U3330        | 51012206001       |
| U3350        | 5175771A75        |
| U4500        | CR000209A01       |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| U8000        | LN000494A01       |
| U8001        | LN000395A01       |
| U8002        | MM000054A01       |
| U8100        | 5114610F01        |
| U100_2       | IC000128A01       |
| U8300_3      | IC000285A01       |
| U8336_3      | HZ000243A01       |
| VR0001       | CR000093A01       |
| VR0002       | CR000093A01       |
| VR0200       | 4885095Y01        |
| VR0201       | 4885095Y01        |
| VR0202       | 4885095Y01        |
| VR0203       | 4885095Y01        |
| VR0230       | NOTPLACED         |
| VR0231       | 4885095Y01        |
| VR0232       | NOTPLACED         |
| VR0233       | 4885095Y01        |
| VR0260       | NOTPLACED         |
| VR0261       | NOTPLACED         |
| VR0262       | 4885095Y01        |
| VR0263       | 4885095Y01        |
| VR0801       | 4888116D01        |
| VR1000       | CR000565A01       |
| VR3001       | CR000697A01       |
| VR3002       | CR000697A01       |
| VR3003       | CR000697A01       |
| VR3004       | CR000697A01       |
| VR4020       | 4813977C23        |

| Circuit Ref. | Motorola Part No. |
|--------------|-------------------|
| VR4021       | 4813977C11        |
| VR4030       | 4805656W76        |
| VR4031       | 4805656W76        |
| VR4044       | 4805656W76        |
| VR4100       | NOTPLACED         |
| VR4103       | NOTPLACED         |
| VR4104       | NOTPLACED         |
| VR4105       | NOTPLACED         |
| VR4106       | NOTPLACED         |
| VR4111       | 4813979P10        |
| VR4400       | NOTPLACED         |
| VR4404       | NOTPLACED         |
| VR4406       | NOTPLACED         |
| VR4407       | NOTPLACED         |
| VR4511       | NOTPLACED         |
| VR4521       | NOTPLACED         |
| VR4522       | NOTPLACED         |
| VR4525       | NOTPLACED         |
| VR4526       | NOTPLACED         |
| VR4528       | NOTPLACED         |
| VR4529       | NOTPLACED         |
| VR4530       | NOTPLACED         |
| VR4531       | NOTPLACED         |
| VR4532       | NOTPLACED         |
| VR4533       | NOTPLACED         |
| VR4534       | NOTPLACED         |
| VR4535       | NOTPLACED         |
| VR4536       | NOTPLACED         |

| <b>Circuit Ref.</b> | <b>Motorola Part No.</b> |
|---------------------|--------------------------|
| VR4537              | NOTPLACED                |
| VR4538              | NOTPLACED                |
| VR4539              | NOTPLACED                |
| VR4601              | NOTPLACED                |
| VR4602              | NOTPLACED                |
| Y0140               | 4875185M05               |
| Y3000               | 4809995L15               |
| Y8302_3             | HZ000202A01              |

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## Section 9

# INTERFACE, KEYPAD & GOB BOARD INFORMATION

### 1.0 Allocation of Schematics and Circuit Boards

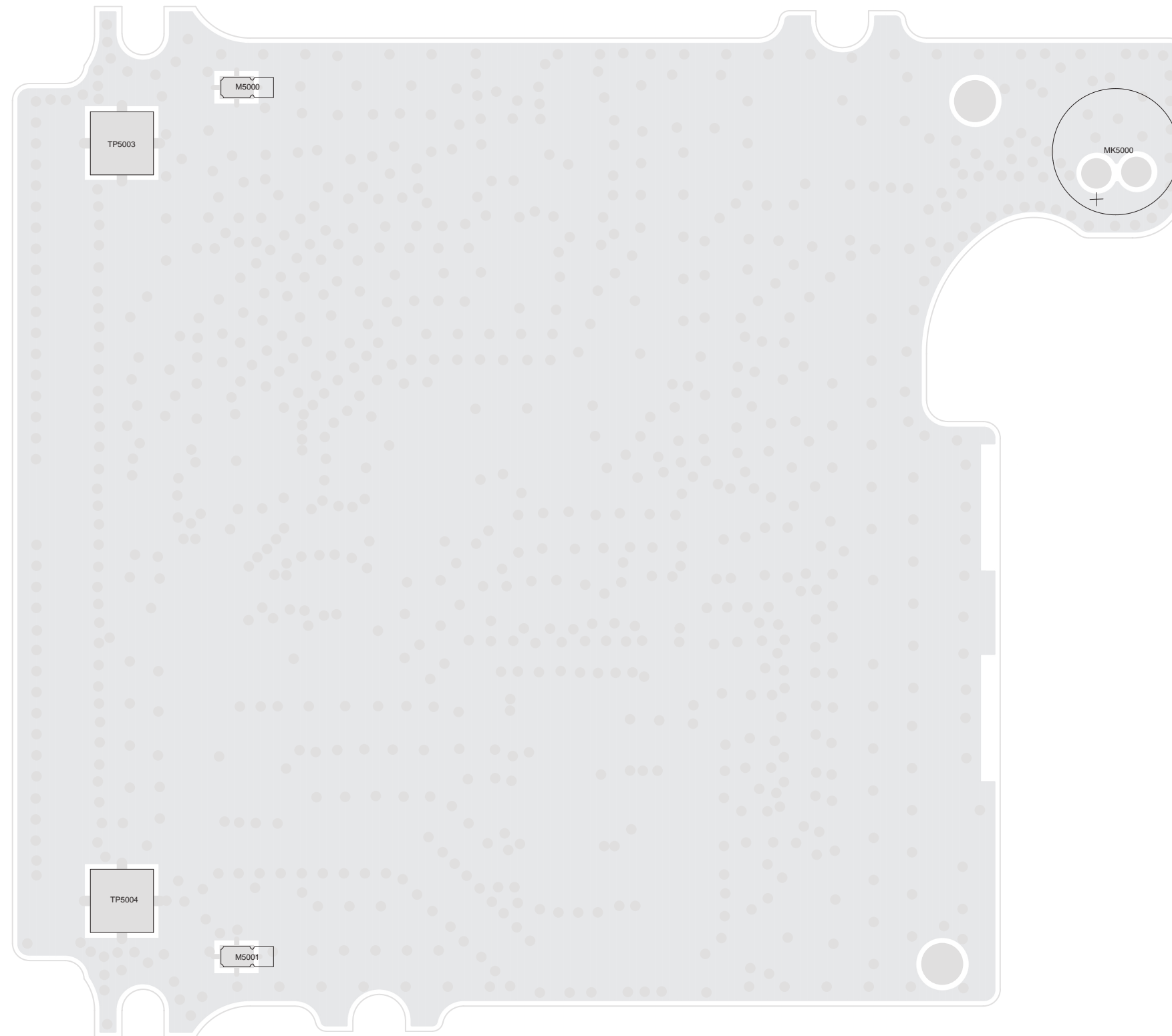
The Interface, Keypad and GOB board schematics and the related PCB and parts list are shown in the tables below.

*Table 9-1. Interface, Keypad and GOB Diagrams and Parts List*

|   |  |
|---|--|
| <b>PCB:</b><br><b>Interface Board</b><br>PC000864A01_AA Main Board Top Side<br>PC000864A01_AA Main Board Bottom Side<br><b>Keypad Board</b><br>PC000865A02_AB Main Board Top Side<br>PC000865A02_AB Main Board Bottom Side<br><b>GOB Board</b><br>PC000957A01_CA Main Board Top Side<br>PC000957A01_CA Main Board Bottom Side | <b>Page 9-3</b><br><b>Page 9-4</b><br><b>Page 9-6</b><br><b>Page 9-7</b><br><b>Page 9-11</b><br><b>Page 9-12</b> |
| <b>Parts List:</b><br>PC000864A01_AA<br>PC000865A02_AB<br>PC000957A01_CA  | <b>Page 9-14</b><br><b>Page 9-15</b><br><b>Page 9-16</b>   |

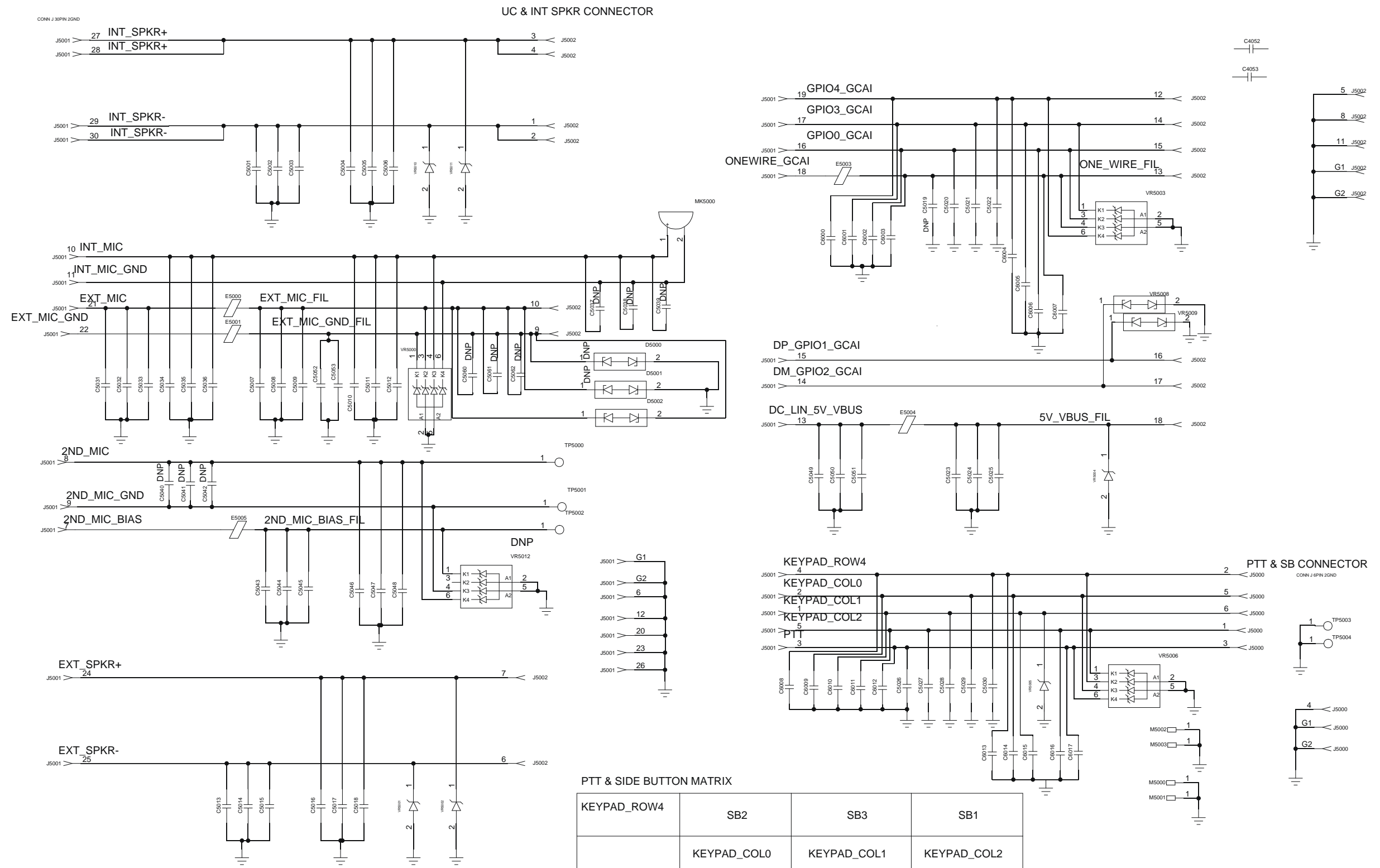
## Notes

## 2.0 Circuit Board/Schematic Diagrams and Parts List for Interface, Keypad and GOB Board



**Figure 9-1. Interface Board Top Side PCB No. PC000864A01\_AA**

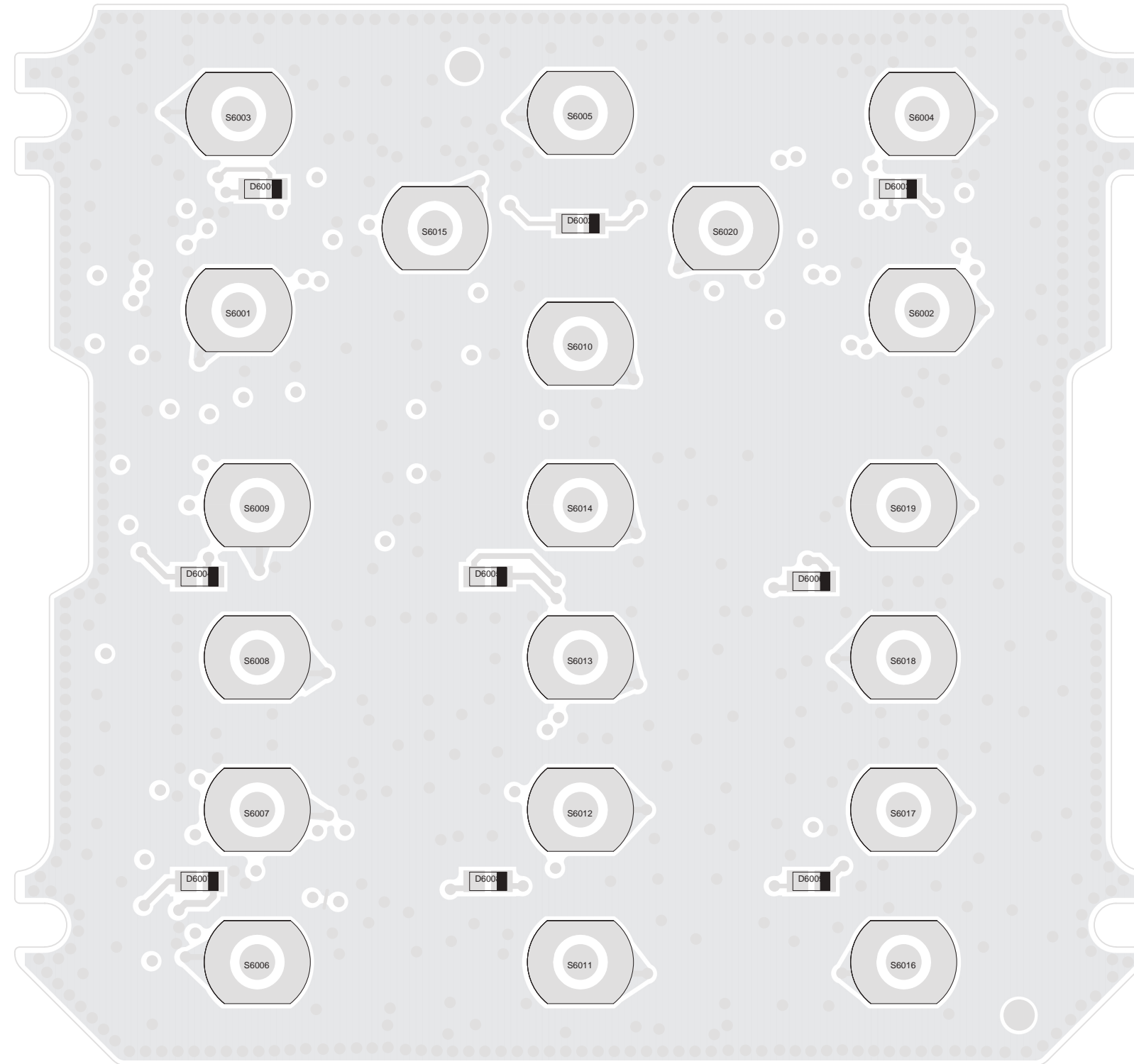




PTT & SIDE BUTTON MATRIX

|             |             |             |             |
|-------------|-------------|-------------|-------------|
| KEYPAD_ROW4 | SB2         | SB3         | SB1         |
|             | KEYPAD_COL0 | KEYPAD_COL1 | KEYPAD_COL2 |

Figure 9-3. Interface Board Schematic Diagram



**Figure 9-4. Keypad Board Top Side PCB No. PC000865A02\_AB**



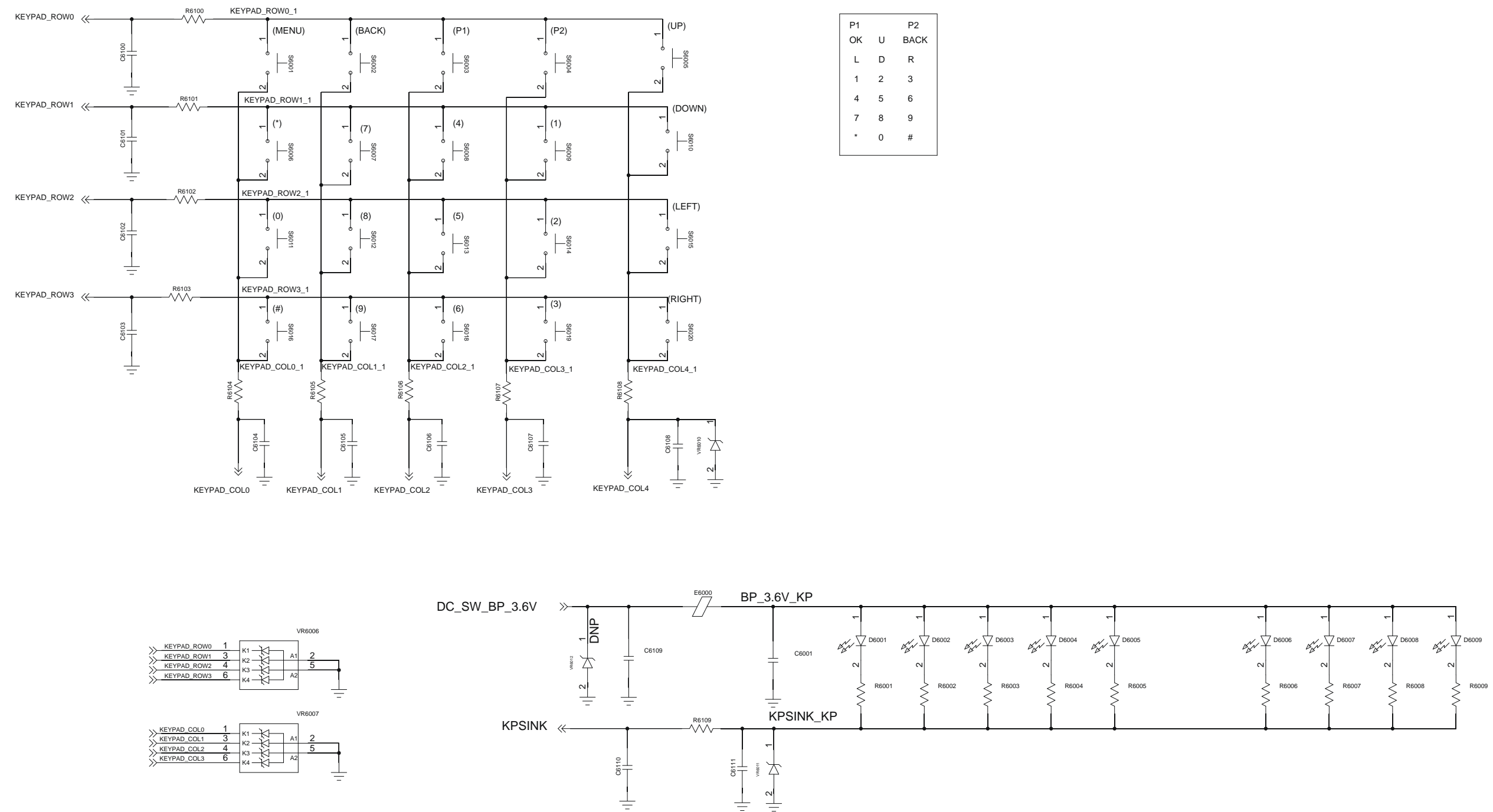


Figure 9-6. Keypad Board Schematic Diagram (1 of 3)

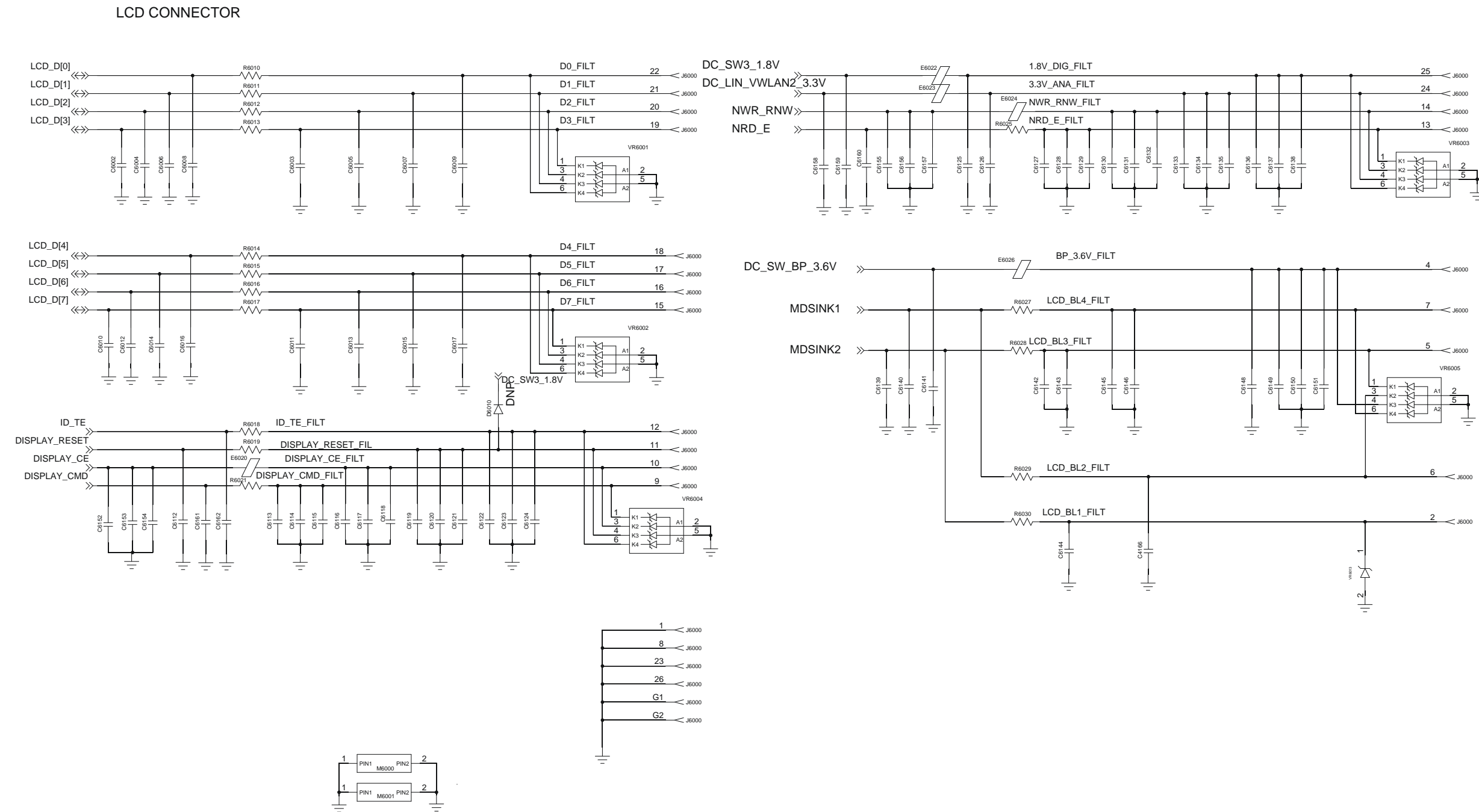


Figure 9-7. Keypad Board Schematic Diagram (2 of 3)

34PINS CONNECTOR (J6002 IS DNP, FOR ME STUDY PURPOSE)

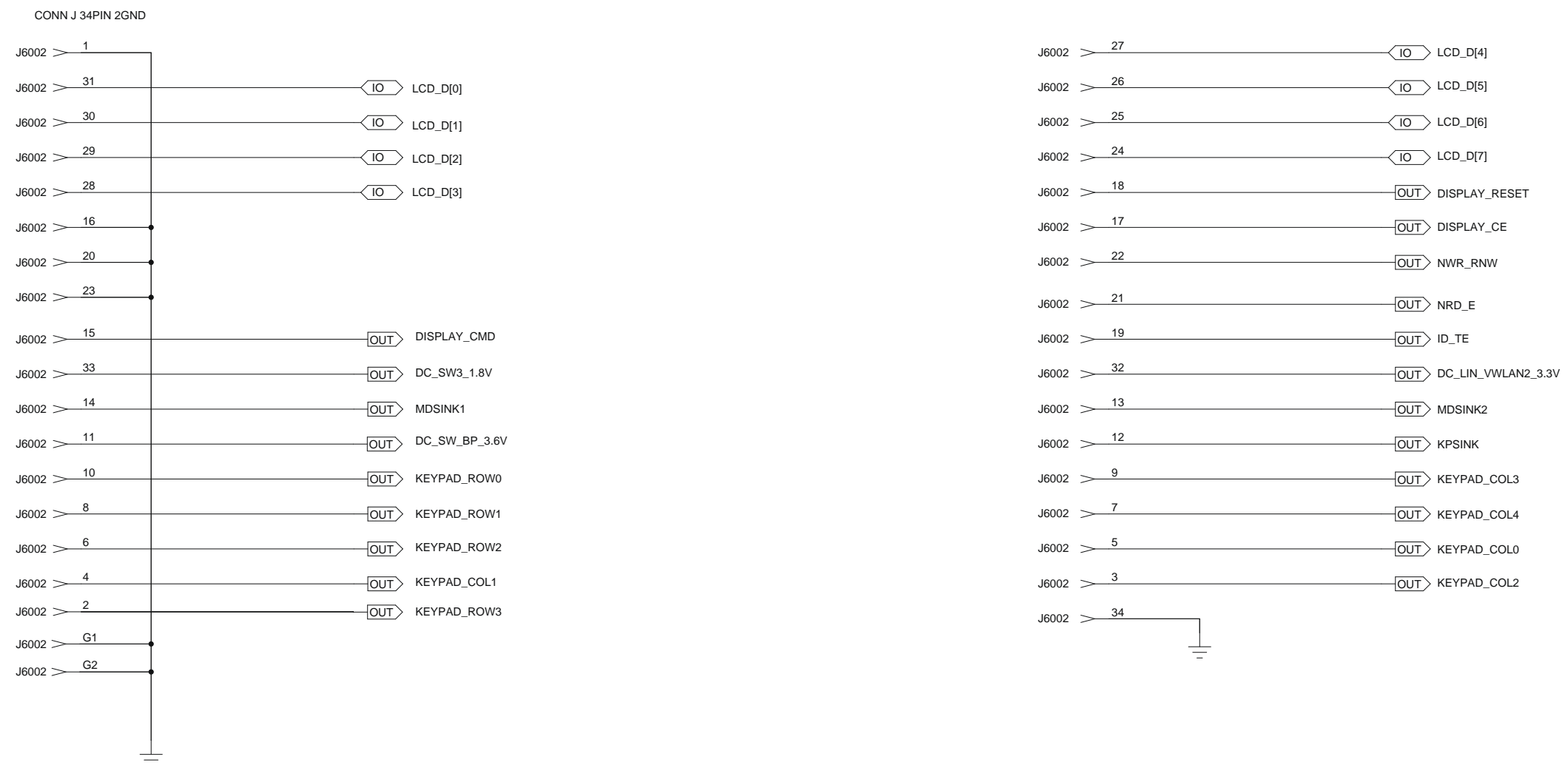
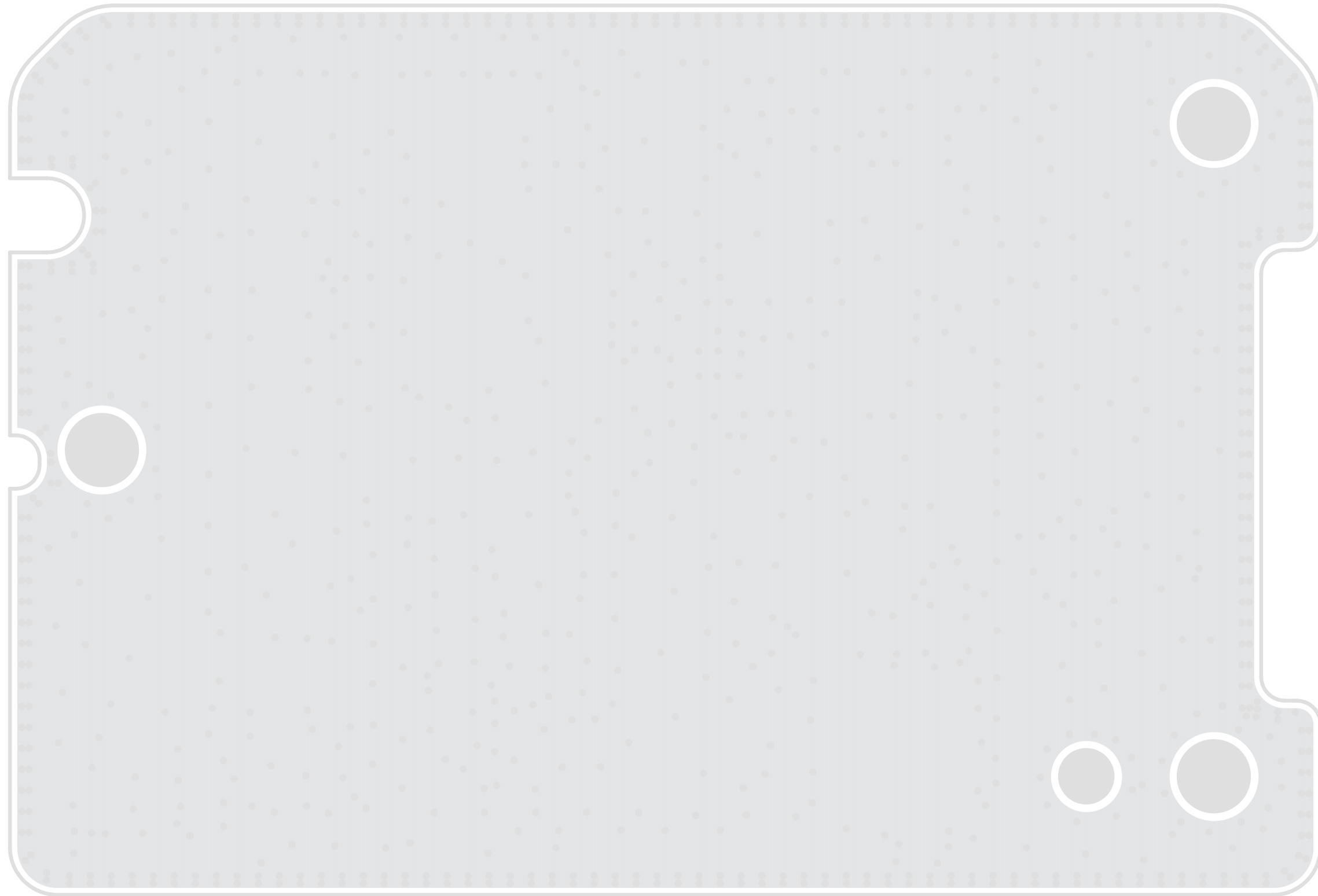


Figure 9-8. Keypad Board Schematic Diagram (3 of 3)



**Figure 9-9.GOB Board Top Side PCB No. PC000957A01\_CA**

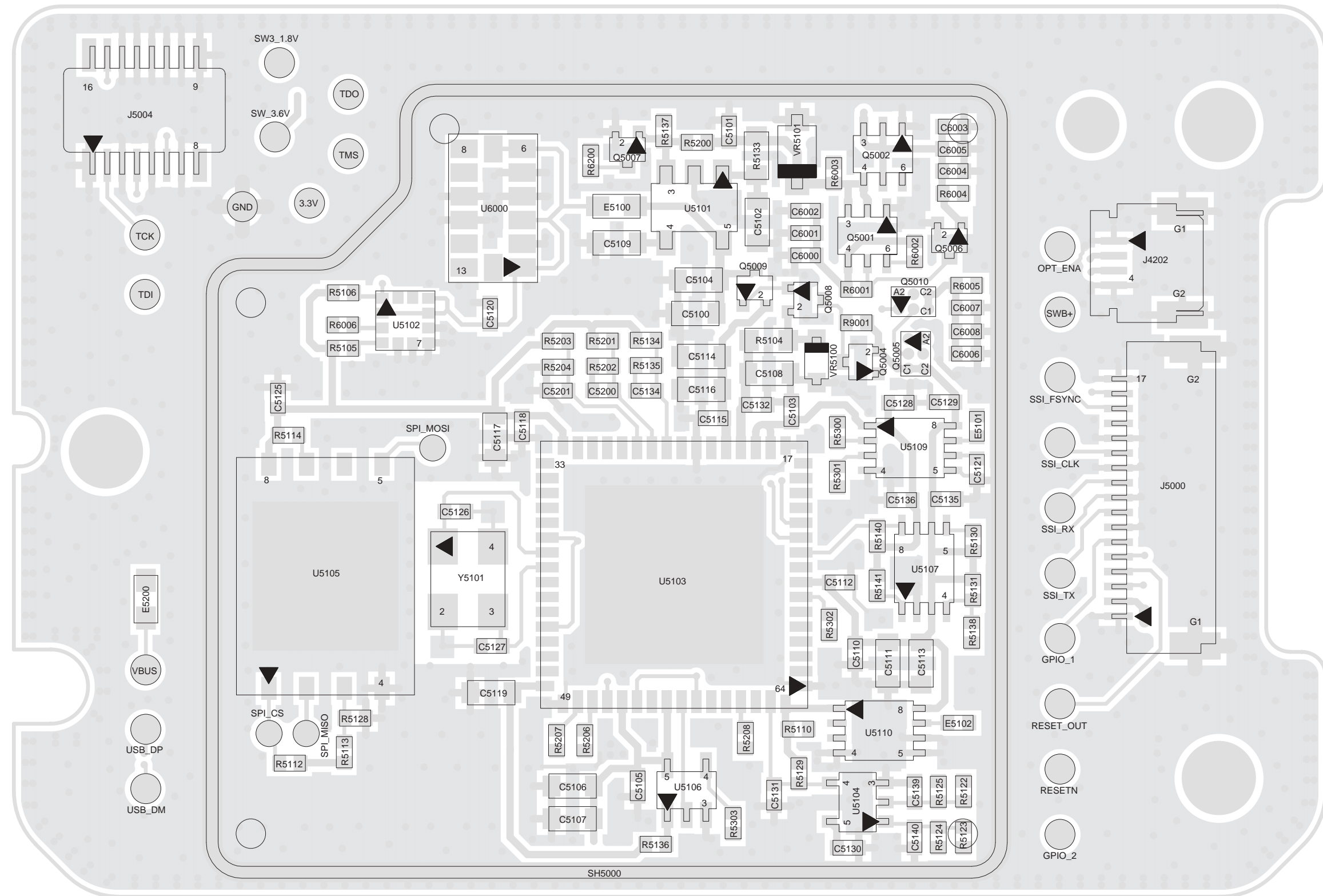


Figure 9-10. GOB Board Bottom Side PCB No. PC000957A01\_CA

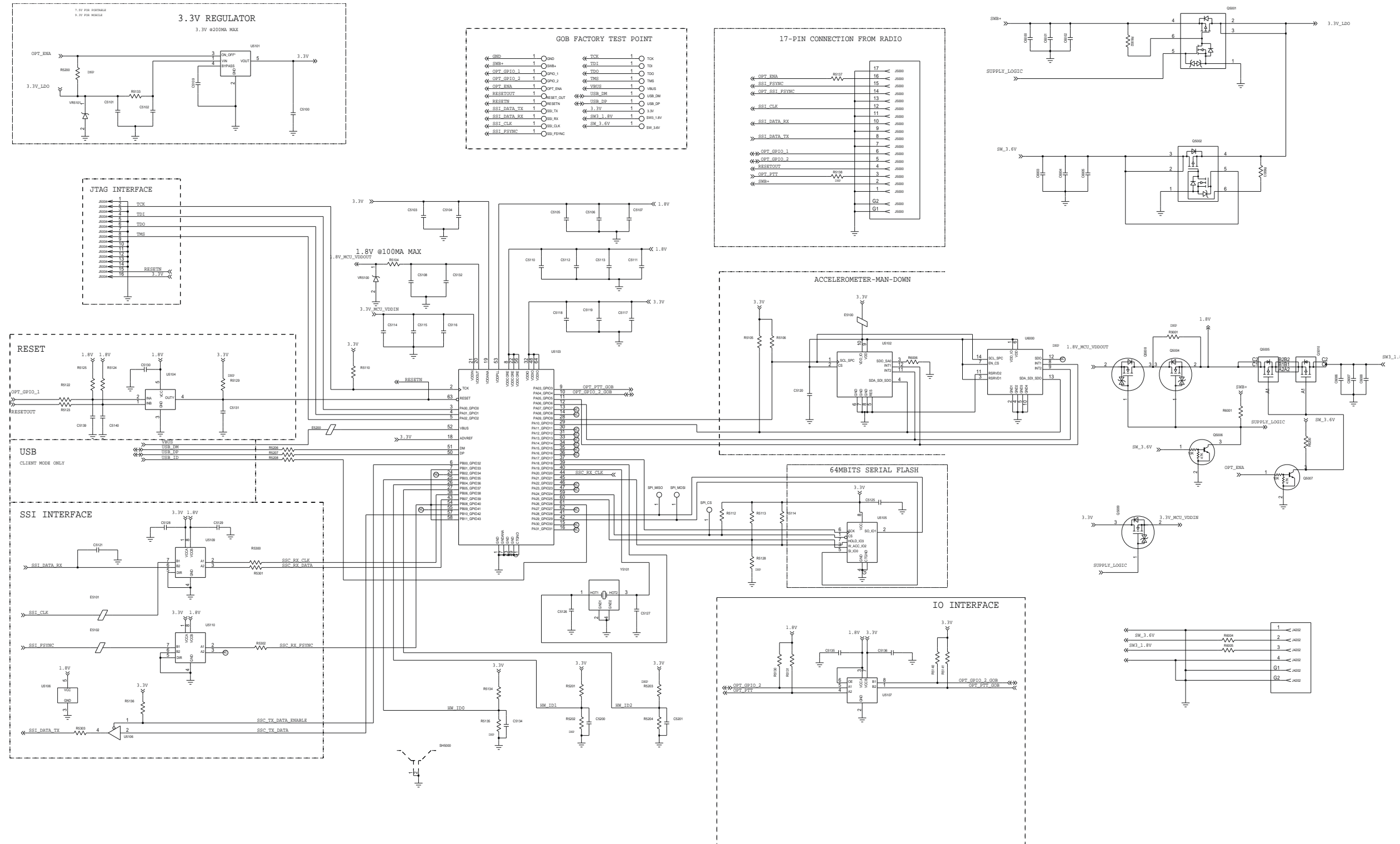


Figure 9-11.GOB Board Schematic Diagram

## Interface Board Parts List (PC000864A01\_AA)

| Circuit Ref | Motorola Part No. |
|-------------|-------------------|
| C4052       | 2113946N02        |
| C4053       | 2113946N02        |
| C5001       | 21667009156       |
| C5002       | 21667009166       |
| C5003       | 2113945A09        |
| C5004       | 21667009156       |
| C5005       | 21667009166       |
| C5006       | 2113945A09        |
| C5007       | 21667009156       |
| C5008       | 21667009166       |
| C5009       | 2113945A09        |
| C5010       | 21667009156       |
| C5011       | 21667009166       |
| C5012       | 2113945A09        |
| C5013       | 21667009156       |
| C5014       | 21667009166       |
| C5015       | 2113945A09        |
| C5016       | 21667009156       |
| C5017       | 21667009166       |
| C5018       | 2113945A09        |
| C5019       | NOTPLACED         |
| C5020       | 21667009166       |
| C5021       | 21667009166       |
| C5022       | 21667009166       |
| C5023       | 21667009156       |
| C5024       | 21667009166       |
| C5025       | 2113945A09        |
| C5026       | 21667009166       |
| C5027       | 21667009166       |
| C5028       | 21667009166       |
| C5029       | 21667009166       |
| C5030       | 21667009166       |
| C5031       | 21667009156       |
| C5032       | 21667009166       |
| C5033       | 2113945A09        |
| C5034       | 21667009156       |
| C5035       | 21667009166       |
| C5036       | 2113945A09        |
| C5037       | NOTPLACED         |

| Circuit Ref | Motorola Part No. |
|-------------|-------------------|
| C5038       | NOTPLACED         |
| C5039       | NOTPLACED         |
| C5040       | NOTPLACED         |
| C5041       | NOTPLACED         |
| C5042       | NOTPLACED         |
| C5043       | 21667009156       |
| C5044       | 21667009166       |
| C5045       | 2113945A09        |
| C5046       | 21667009156       |
| C5047       | 21667009166       |
| C5048       | 2113945A09        |
| C5049       | 21667009156       |
| C5050       | 21667009166       |
| C5051       | 2113945A09        |
| C5060       | NOTPLACED         |
| C5061       | NOTPLACED         |
| C5062       | NOTPLACED         |
| C6000       | 21667009156       |
| C6001       | 21667009156       |
| C6002       | 21667009156       |
| C6003       | 21667009156       |
| C6004       | 2113945A09        |
| C6005       | 2113945A09        |
| C6006       | 2113945A09        |
| C6007       | 2113945A09        |
| C6008       | 2113945A09        |
| C6009       | 2113945A09        |
| C6010       | 2113945A09        |
| C6011       | 2113945A09        |
| C6012       | 2113945A09        |
| C6013       | 21667009156       |
| C6014       | 21667009156       |
| C6015       | 21667009156       |
| C6016       | 21667009156       |
| C6017       | 21667009156       |
| D5000       | NOTPLACED         |
| D5001       | NOTPLACED         |
| D5002       | CR000051A01       |
| E5000       | 24012065001       |
| E5001       | 24012065001       |
| E5003       | 24012065001       |

| Circuit Ref | Motorola Part No. |
|-------------|-------------------|
| E5004       | 7686949J14        |
| E5005       | 24012065001       |
| J5000       | CN000209A01       |
| J5001       | CN000537A01       |
| J5002       | CN000549A01       |
| M5000       | CN000143A03       |
| M5001       | CN000143A03       |
| M5002       | CN000143A05       |
| M5003       | CN000143A05       |
| MK5000      | 50012012003       |
| VR5000      | 4813979P12        |
| VR5001      | 4815040H01        |
| VR5002      | 4815040H01        |
| VR5003      | 4813979P10        |
| VR5004      | 4815040H01        |
| VR5005      | 4805656W76        |
| VR5006      | 4813979P10        |
| VR5008      | CR000529A01       |
| VR5009      | CR000529A01       |
| VR5010      | 4815040H01        |
| VR5011      | 4815040H01        |
| VR5012      | NOTPLACED         |

**Keypad Board Parts List (PC000865A02\_AB)**

| Circuit Ref | Motorola Part No. |
|-------------|-------------------|
| C4166       | 21667009166       |
| C6001       | 2187893N01        |
| C6002       | 21667009156       |
| C6003       | 21667009166       |
| C6004       | 21667009156       |
| C6005       | 21667009166       |
| C6006       | 21667009156       |
| C6007       | 21667009166       |
| C6008       | 21667009156       |
| C6009       | 21667009166       |
| C6010       | 21667009156       |
| C6011       | 21667009166       |
| C6012       | 21667009156       |
| C6013       | 21667009166       |
| C6014       | 21667009156       |
| C6015       | 21667009166       |
| C6016       | 21667009156       |
| C6017       | 21667009166       |
| C6100       | 21667009166       |
| C6101       | 21667009166       |
| C6102       | 21667009166       |
| C6103       | 21667009166       |
| C6104       | 21667009166       |
| C6105       | 21667009166       |
| C6106       | 21667009166       |
| C6107       | 21667009166       |
| C6108       | 21667009166       |
| C6109       | 2187893N01        |
| C6110       | 21667009166       |
| C6111       | 2113946B04        |
| C6112       | 2187893N01        |
| C6113       | 21667009156       |
| C6114       | 21667009166       |
| C6115       | NOTPLACED         |
| C6116       | 21667009156       |
| C6117       | 21667009166       |
| C6118       | NOTPLACED         |
| C6119       | 21667009156       |
| C6120       | 21667009166       |

| Circuit Ref | Motorola Part No. |
|-------------|-------------------|
| C6121       | 2113945A11        |
| C6122       | 21667009156       |
| C6123       | 21667009166       |
| C6124       | 2113945A11        |
| C6125       | 2113946B04        |
| C6126       | 2113946B04        |
| C6127       | 21667009156       |
| C6128       | 21667009166       |
| C6129       | NOTPLACED         |
| C6130       | 21667009156       |
| C6131       | 21667009166       |
| C6132       | NOTPLACED         |
| C6133       | 21667009156       |
| C6134       | 21667009166       |
| C6135       | 2113945A11        |
| C6136       | 21667009156       |
| C6137       | 21667009166       |
| C6138       | 2113945A11        |
| C6139       | 2113946B04        |
| C6140       | 2113946B04        |
| C6141       | 2187893N01        |
| C6142       | 21667009156       |
| C6143       | 21667009166       |
| C6144       | 21667009166       |
| C6145       | 21667009156       |
| C6146       | 21667009166       |
| C6148       | 2113946B04        |
| C6149       | 21667009156       |
| C6150       | 21667009166       |
| C6151       | 2113945A11        |
| C6152       | 21667009156       |
| C6153       | 21667009166       |
| C6154       | NOTPLACED         |
| C6155       | 21667009156       |
| C6156       | 21667009166       |
| C6157       | NOTPLACED         |
| C6158       | 2113946B04        |
| C6159       | 2113946B04        |
| C6160       | 21667009156       |

| Circuit Ref | Motorola Part No. |
|-------------|-------------------|
| C6161       | NOTPLACED         |
| C6162       | 2113945A11        |
| R6001       | 0613952Q25        |
| R6002       | 0613952Q25        |
| R6003       | 0613952Q25        |
| R6004       | 0613952Q25        |
| R6005       | 0613952Q25        |
| R6006       | 0613952Q25        |
| R6007       | 0613952Q25        |
| R6008       | 0613952Q25        |
| R6009       | 0613952Q25        |
| R6010       | 0613952R66        |
| R6011       | 0613952R66        |
| R6012       | 0613952R66        |
| R6013       | 0613952R66        |
| R6014       | 0613952R66        |
| R6015       | 0613952R66        |
| R6016       | 0613952R66        |
| R6017       | 0613952R66        |
| R6018       | 0613952R66        |
| R6019       | 0613952R66        |
| R6021       | 0613952R66        |
| R6025       | 0613952R66        |
| R6027       | 0613952Q25        |
| R6028       | 0613952Q25        |
| R6029       | 0613952Q25        |
| R6030       | 0613952Q25        |
| R6100       | 0613952R66        |
| R6101       | 0613952R66        |
| R6102       | 0613952R66        |
| R6103       | 0613952R66        |
| R6104       | 0613952R66        |
| R6105       | 0613952R66        |
| R6106       | 0613952R66        |
| R6107       | 0613952R66        |
| R6108       | 0613952R66        |
| R6109       | 0613952R66        |

**GOB Board Parts List (PC000957A01\_CA)**

| Circuit Ref | Motorola Part No. |
|-------------|-------------------|
| C5100       | 2113946S35        |
| C5101       | 2113945A05        |
| C5102       | 2113946S35        |
| C5103       | 2113945Y02        |
| C5104       | 2113945D01        |
| C5105       | 2113945A11        |
| C5106       | 2113945D01        |
| C5107       | 2113956B21        |
| C5108       | 2113956B21        |
| C5109       | 2113945L49        |
| C5110       | 2113945A11        |
| C5111       | 2113945D01        |
| C5112       | 2113945Y02        |
| C5113       | 2113956B21        |
| C5114       | 2113956B21        |
| C5115       | 2113945Y02        |
| C5116       | 2113945D01        |
| C5117       | 2113945D01        |
| C5118       | 2113945Y02        |
| C5119       | 2113956B21        |
| C5120       | 2113946B04        |
| C5121       | 21667009168       |
| C5125       | 2113945Y02        |
| C5126       | 21667009326       |
| C5127       | 21667009326       |
| C5128       | 2113945Y02        |
| C5129       | 2113945Y02        |
| C5130       | 2113945Y02        |
| C5131       | 2113945Y02        |
| C5132       | 2113945A05        |
| C5134       | 2113945Y02        |
| C5135       | 2113945Y02        |
| C5136       | 2113945Y02        |
| C5139       | 2113945Y02        |
| C5140       | 2113945Y02        |
| C5200       | 2113945Y02        |
| C5201       | 2113945Y02        |
| C6000       | 21667009156       |
| C6001       | 21667009166       |

| Circuit Ref | Motorola Part No. |
|-------------|-------------------|
| C6002       | 2113945A11        |
| C6003       | 21667009156       |
| C6004       | 21667009166       |
| C6005       | 2113945A11        |
| C6006       | 2113945A11        |
| C6007       | 21667009166       |
| C6008       | 21667009156       |
| R5104       | 0613952G67        |
| R5105       | 0613952R01        |
| R5106       | 0613952R01        |
| R5110       | 0613952R01        |
| R5112       | 0613952R25        |
| R5113       | 0613952R25        |
| R5114       | 0613952R25        |
| R5122       | 0613952Q25        |
| R5123       | 0613952Q25        |
| R5124       | 0613952R01        |
| R5125       | 0613952R01        |
| R5128       | NOTPLACED         |
| R5129       | NOTPLACED         |
| R5130       | 0613952R01        |
| R5131       | 0613952R01        |
| R5133       | 0613952G67        |
| R5134       | 0613952R01        |
| R5135       | NOTPLACED         |
| R5136       | 0613952R01        |
| R5137       | 0613952R66        |
| R5138       | NOTPLACED         |
| R5140       | 0613952R01        |
| R5141       | 0613952R01        |
| R5200       | NOTPLACED         |
| R5201       | 0613952R01        |
| R5202       | NOTPLACED         |
| R5203       | NOTPLACED         |
| R5204       | 0613952R01        |
| R5206       | 0613952K58        |
| R5207       | 0613952K58        |
| R5208       | 0613952R01        |
| R5300       | 0613952Q33        |

| Circuit Ref | Motorola Part No. |
|-------------|-------------------|
| R5301       | 0613952Q33        |
| R5302       | 0613952Q33        |
| R5303       | 0613952Q73        |
| R6001       | 0613952R01        |
| R6002       | 0613952P01        |
| R6003       | 0613952P01        |
| R6004       | 0613952R66        |
| R6005       | 0613952R66        |
| R6006       | 0613952R01        |
| R6200       | 0613952R25        |
| R9001       | NOTPLACED         |

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# Appendix A Replacement Parts Ordering

## 1.0 Basic Ordering Information

When ordering replacement parts or equipment information, the complete identification number should be included. This applies to all components, kits, and chassis. If the component part number is not known, the order should include the number of the chassis or kit of which it is a part, and sufficient description of the desired component to identify it.

## 2.0 Motorola Online

Motorola Online users can access our online catalog at

<https://www.motorolasolutions.com/businessonline>

To register for online access, please call 800-422-4210 (for U.S. and Canada Service Centers only). International customers can obtain assistance at <https://www.motorolasolutions.com/businessonline>

## 3.0 Mail Orders

Mail orders are only accepted by the US Federal Government Markets Division (USFGMD).

Motorola  
7031 Columbia Gateway Drive  
3rd Floor – Order Processing  
Columbia, MD 21046  
U.S.A.

## 4.0 Telephone Orders

The Radio Products and Solutions Organization\*  
(United States and Canada)  
7:00 AM to 7:00 PM (Central Standard Time)  
Monday through Friday (Chicago, U.S.A.)  
1-800-422-4210  
1-847-538-8023 (United States and Canada)

U.S. Federal Government Markets Division (USFGMD)  
1-800-826-1913 Federal Government Parts - Credit Cards Only  
8:30 AM to 5:00 PM (Eastern Standard Time)

## 5.0 Fax Orders

The Radio Products and Solutions Organization\*  
(United States and Canada)  
1-800-622-6210  
847-576-3023 (United States and Canada)

USFGMD  
(Federal Government Orders)  
1-800-526-8641 (For Parts and Equipment Purchase Orders)

## 6.0 Parts Identification

The Radio Products and Solutions Organization\*  
(United States and Canada)  
1-800-422-4210

## **7.0 Product Customer Service**

Radio Products and Solutions Organization (United States and Canada)  
1-800-927-2744

\* The Motorola Radio Products and Solutions Organization (RPSO) was formerly known as the Radio Products Services Division (RPSD) and/or the Accessories and Aftermarket Division (AAD).

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## **Appendix B    Motorola Service Centers**

### **1.0    Servicing Information**

If a unit requires further testing, knowledge and/or details of component level troubleshooting or service than is customarily performed at the basic level, please send the radio to a Motorola Service Center as listed below.

### **2.0    Motorola Service Center**

45D Butterfield Trail  
El Paso, TX 79906  
Tel: 1-800-227-6772

### **3.0    Motorola Federal Technical Center**

4395 Nicole Drive  
Lanham, MD 20706  
Tel: 800-969-6680  
Fax: 800-784-4113

## Notes

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# Glossary

This glossary contains an alphabetical listing of terms and their definitions that are applicable to portable and mobile subscriber radio products. All terms do not necessarily apply to all radios, and some terms are merely generic in nature.

| Term              | Definition  |
|-------------------|---|
| <b>Analog</b>     | Refers to a continuously variable signal or a circuit or device designed to handle such signals.  |
| <b>Band</b>       | Frequencies allowed for a specific purpose.   |
| <b>CPS</b>        | Customer Programming Software: Software with a graphical user interface containing the feature set of a radio.  |
| <b>Default</b>    | A pre-defined set of parameters.  |
| <b>Digital</b>    | Refers to data that is stored or transmitted as a sequence of discrete symbols from a finite set; most commonly this means binary data represented using electronic or electromagnetic signals.                                       |
| <b>dispatcher</b> | An individual who has radio-system management duties and responsibilities.  |
| <b>DPL</b>        | Digital Private-Line: A type of digital communications that utilizes privacy call, as well as memory channel and busy channel lock out to enhance communication efficiency.   |
| <b>FCC</b>        | Federal Communications Commission.  |
| <b>Frequency</b>  | Number of times a complete electromagnetic-wave cycle occurs in a fixed unit of time (usually one second).  |
| <b>GPIO</b>       | General-Purpose Input/Output: Pins whose function is programmable.  |
| <b>GPS</b>        | Global Positioning System   |
| <b>IC</b>         | Integrated Circuit: An assembly of interconnected components on a small semiconductor chip, usually made of silicon. One chip can contain millions of microscopic components and perform many functions.                              |
| <b>IF</b>         | Intermediate Frequency.   |
| <b>kHz</b>        | kilohertz: One thousand cycles per second. Used especially as a radio-frequency unit.   |
| <b>LCD</b>        | Liquid-Crystal Display: An LCD uses two sheets of polarizing material with a liquid-crystal solution between them. An electric current passed through the liquid causes the crystals to align so that light cannot pass through them. |
| <b>LED</b>        | Light Emitting Diode: An electronic device that lights up when electricity is passed through it.  |

| Term                                       | Definition   |
|--|--|
| <b>MDC</b>                                 | Motorola Digital Communications.   |
| <b>MHz</b>                                 | Megahertz: One million cycles per second. Used especially as a radio-frequency unit.   |
| <b>Paging</b>                              | One-way communication that alerts the receiver to retrieve a message.  |
| <b>PC Board</b>                            | Printed Circuit Board. Also referred to as a PCB.  |
| <b>PL</b>                                  | Private-Line Tone Squelch: A continuous sub-audible tone that is transmitted along with the carrier.   |
| <b>Programming Cable</b>                   | A cable that allows the CPS to communicate directly with the radio using USB.  |
| <b>Receiver</b>                            | Electronic device that amplifies RF signals. A receiver separates the audio signal from the RF carrier, amplifies it, and converts it back to the original sound waves.                        |
| <b>Repeater</b>                            | Remote transmit/receive facility that re-transmits received signals in order to improve communications range and coverage (conventional operation).  |
| <b>RF</b>                                  | Radio Frequency: The portion of the electromagnetic spectrum between audio sound and infrared light (approximately 10 kHz to 10 GHz).  |
| <b>RX</b>                                  | Receive.   |
| <b>Signal</b>                              | An electrically transmitted electromagnetic wave.  |
| <b>Spectrum</b>                            | Frequency range within which radiation has specific characteristics.   |
| <b>Squelch</b>                             | Muting of audio circuits when received signal levels fall below a pre-determined value. With carrier squelch, all channel activity that exceeds the radio's preset squelch level can be heard. |
| <b>TOT</b>                                 | Time-out Timer: A timer that limits the length of a transmission.  |
| <b>TPL</b>                                 | Tone Private Line  |
| <b>Transceiver</b>                         | Transmitter-receiver. A device that both transmits and receives analog or digital signals. Also abbreviated as XCVR.   |
| <b>Transmitter</b>                         | Electronic equipment that generates and amplifies an RF carrier signal, modulates the signal, and then radiates it into space.   |
| <b>trunking priority monitor scan list</b> | A scan list that includes talkgroups that are all from the same trunking system.   |
| <b>TX</b>                                  | Transmit.  |
| <b>UHF</b>                                 | Ultra-High Frequency.  |
| <b>USB</b>                                 | Universal Serial Bus: An external bus standard that supports data transfer rates of 12 Mbps.   |

| <b>Term</b> | <b>Definition</b>   |
|-------------|---|
| <b>XPR</b>  | Refers to Digital Professional Radio model names in the MOTOTRBO Professional Digital Two-Way Radio System. |

**Notes**





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