

PROFESSIONAL DIGITAL TWO-WAY RADIO SYSTEM



# MOTOTRBO™ PORTABLE

XPR 7550e

XPR 7580e

XPR 7350e

XPR 7380e

# DETAILED SERVICE MANUAL

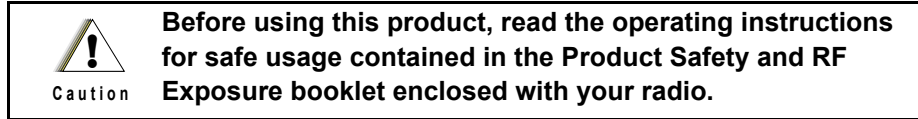




# Foreword

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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## Limited Warranty

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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.

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- 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 of 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.

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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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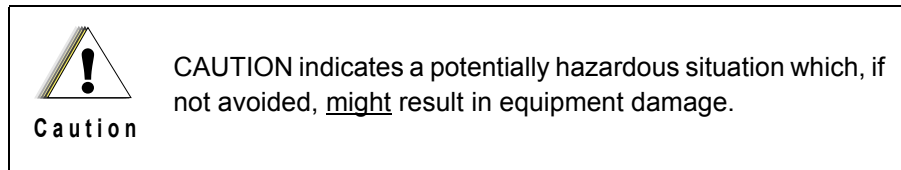
# Section 1

## 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.



### 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.

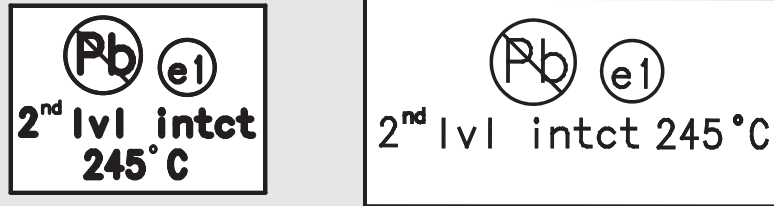
**Caution**

**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 Brookfield (5rpm)	Type 3 (-325/+500)	(95.5%Sn-3.8%Ag-0.7%Cu) 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 ( <a href="http://www.aeroflex.com">www.aeroflex.com</a> )	Frequency/deviation meter and signal generator for wide-range troubleshooting and alignment
Digital RMS Multimeter *	100 $\mu$ V to 300 V 5 Hz to 1 MHz 10 Mega Ohm Impedance	Fluke 179 or equivalent ( <a href="http://www.fluke.com">www.fluke.com</a> )	AC/DC voltage and current measurements. Audio voltage measurements
RF Signal Generator *	100 MHz to 1 GHz -130 dBm to +10 dBm FM Modulation 0 kHz to 10 kHz Audio Frequency 100 Hz to 10 kHz	Agilent N5181A ( <a href="http://www.agilent.com">www.agilent.com</a> ), Ramsey RSG1000B ( <a href="http://www.ramseyelectronics.com">www.ramseyelectronics.com</a> ), or equivalent	Receiver measurements
Oscilloscope *	2 Channel 50 MHz Bandwidth 5 mV/div to 20 V/div	Leader LS8050 ( <a href="http://www.leaderusa.com">www.leaderusa.com</a> ), Tektronix TDS1001b ( <a href="http://www.tektronix.com">www.tektronix.com</a> ), or equivalent	Waveform measurements
Power Meter and Sensor *	5% Accuracy 100 MHz to 500 MHz 50 Watts	Bird 43 ThruLine Watt Meter ( <a href="http://www.bird-electronic.com">www.bird-electronic.com</a> ) or equivalent	Transmitter power output measurements
RF Millivolt Meter	100 mV to 3 V RF 10 kHz to 1 GHz	Boonton 92EA ( <a href="http://www.boonton.com">www.boonton.com</a> ) or equivalent	RF level measurements
Power Supply	0 V to 32 V 0 A to 20 A	B&K Precision 1790 ( <a href="http://www.bkprecision.com">www.bkprecision.com</a> ) 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

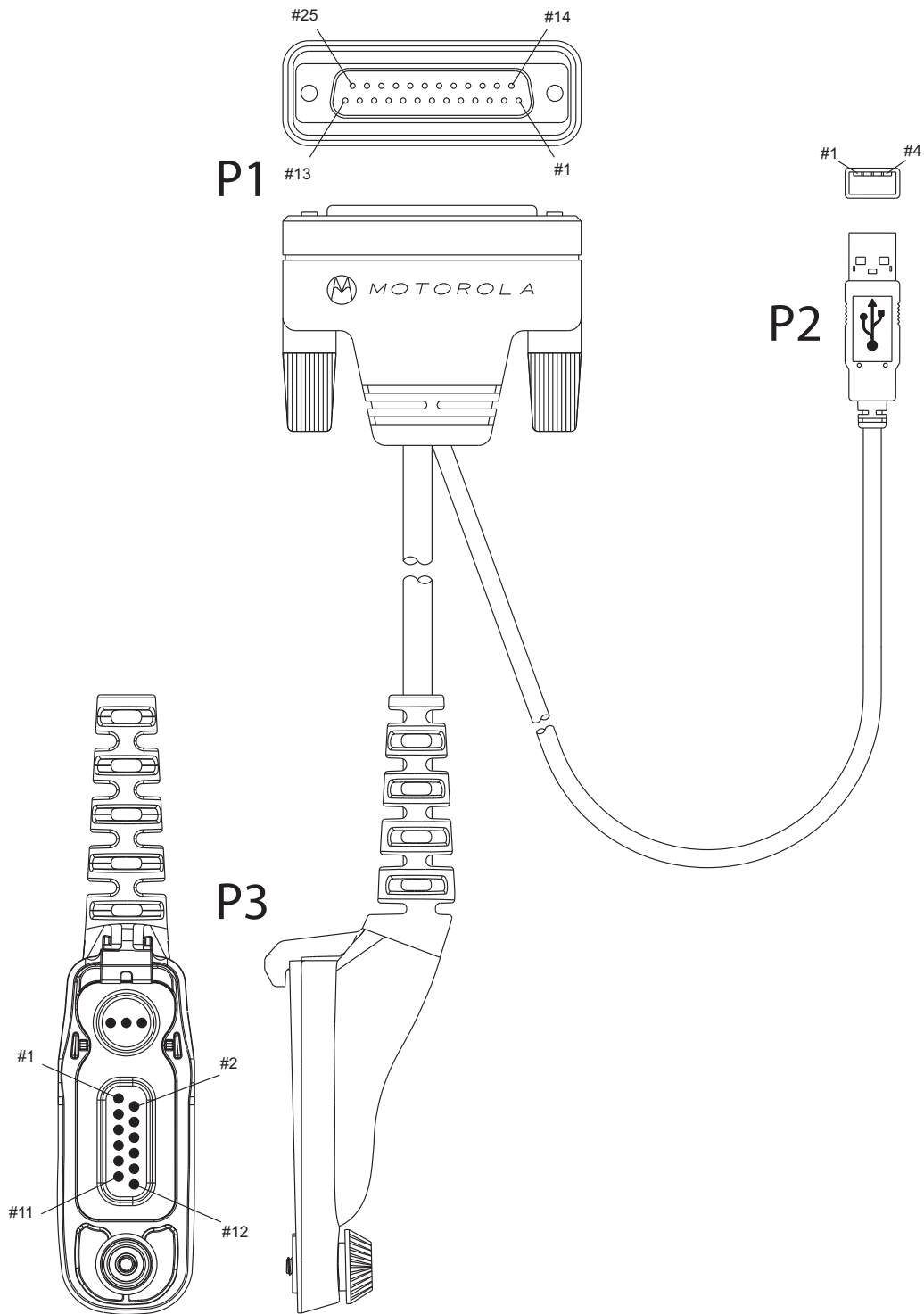


Figure 3-1. Programming, Testing and Alignment Cable

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-

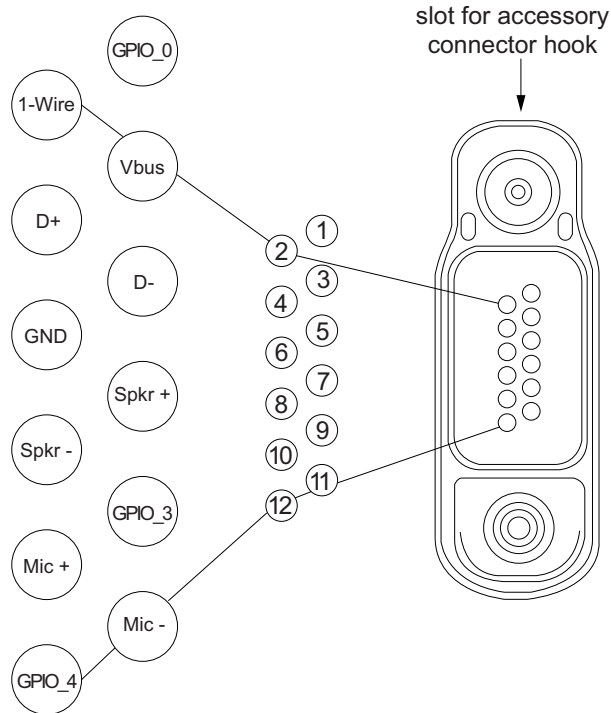


Figure 3-2. Pin Layout of Side Connector

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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. 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 or 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. Display module is damaged.	Fatal	Check connection between main board and display module. 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. 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.

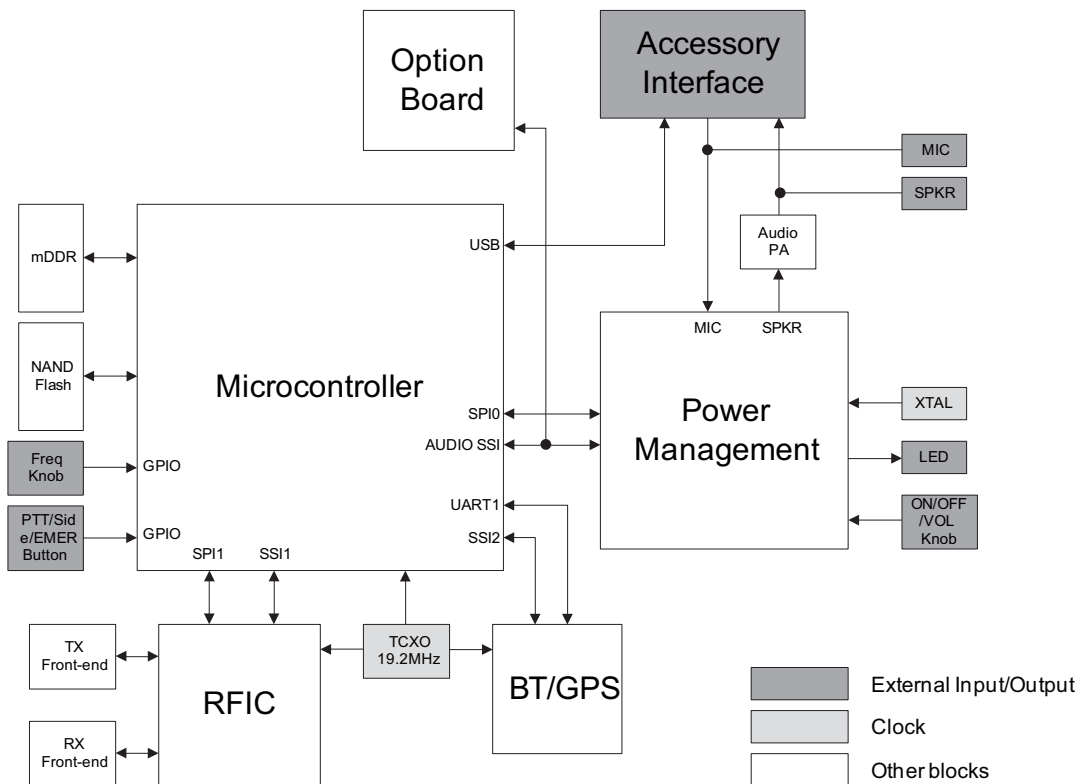
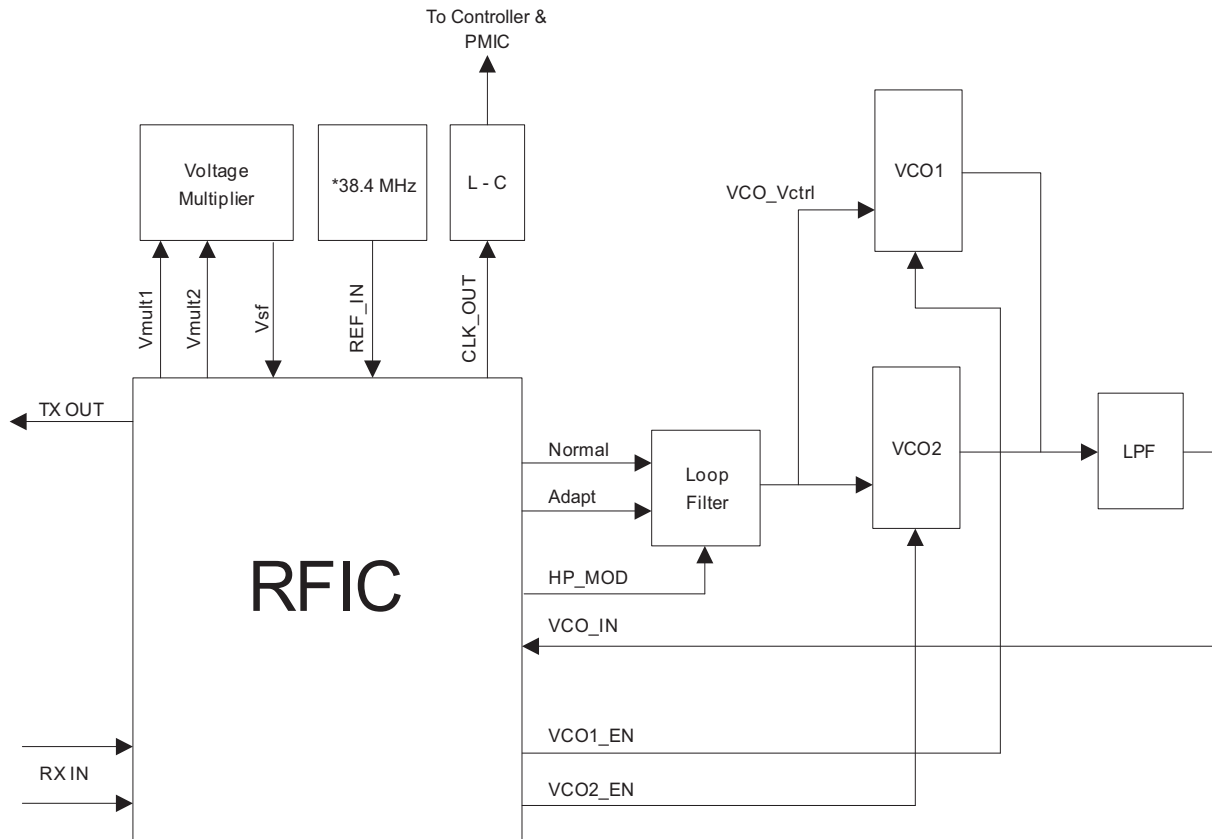


Figure 5-1. Controller Block Diagram

### 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

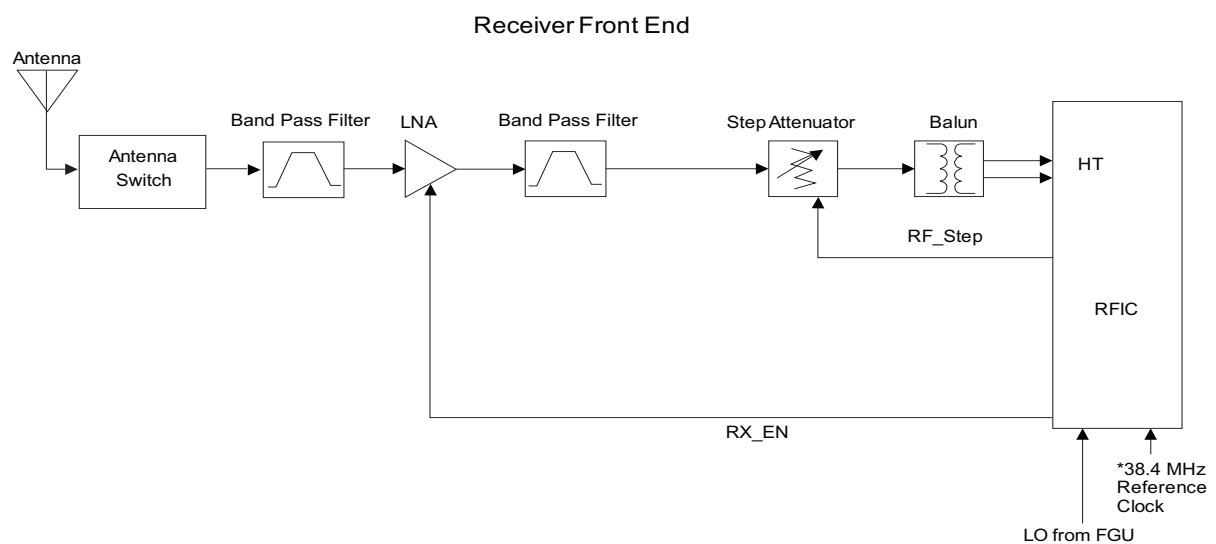
Figure 5-2. FGU



## 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.

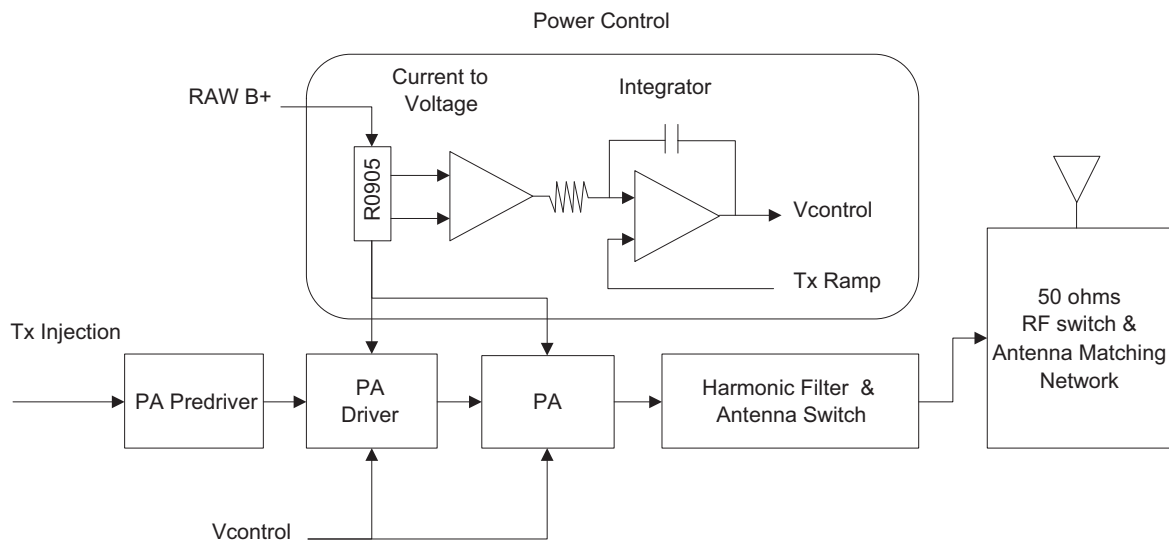


Figure 5-4. Transmitter

## 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.

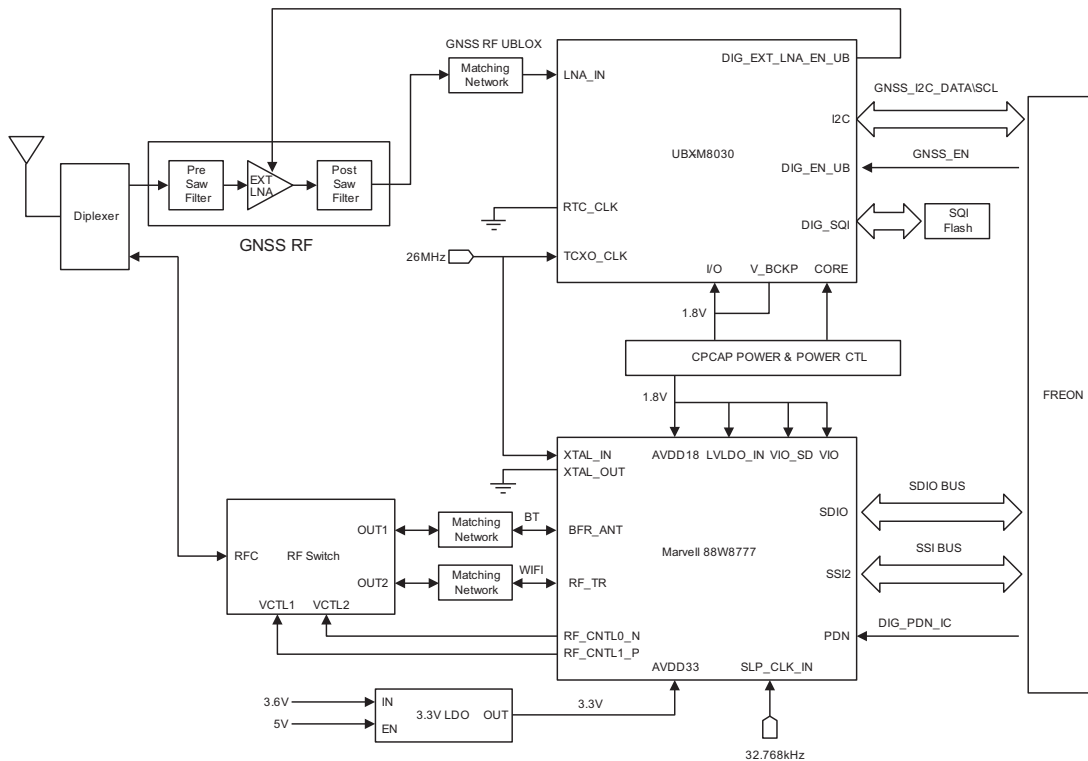


Figure 5-5. GPS/Bluetooth/WiFi

### 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.

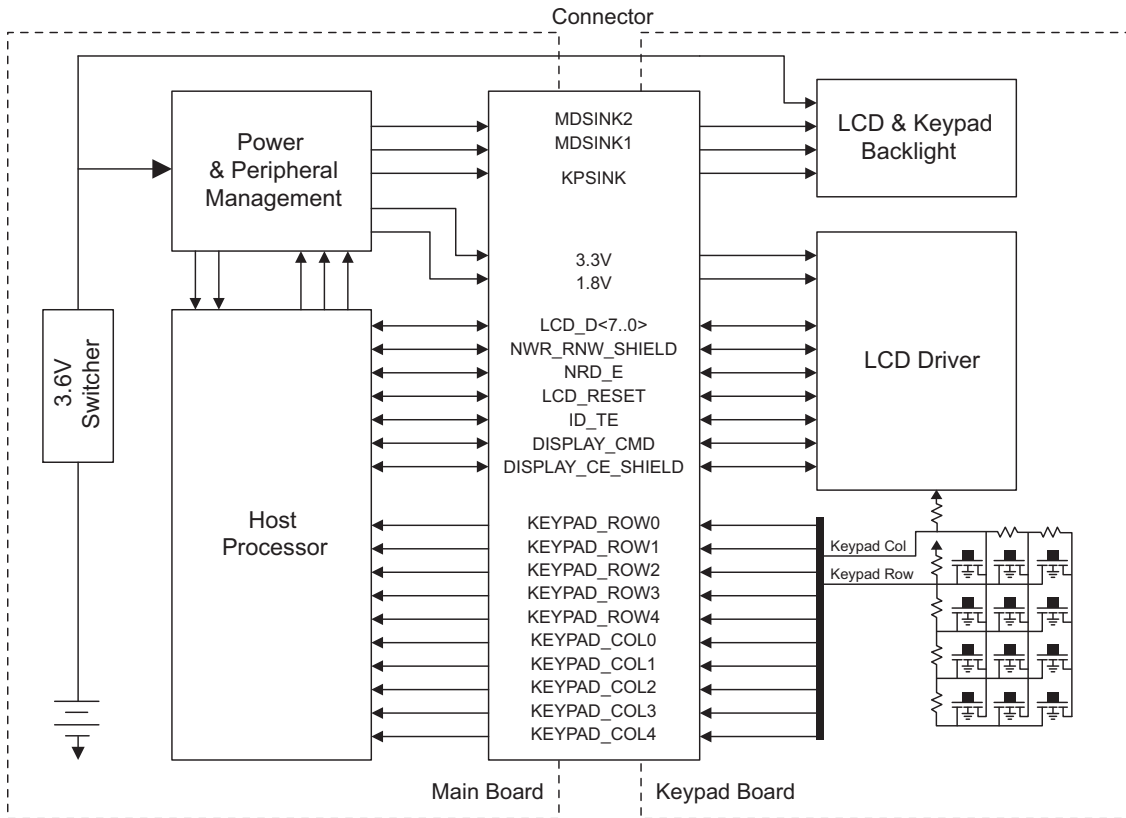


Figure 5-6. Full Keypad

## 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.

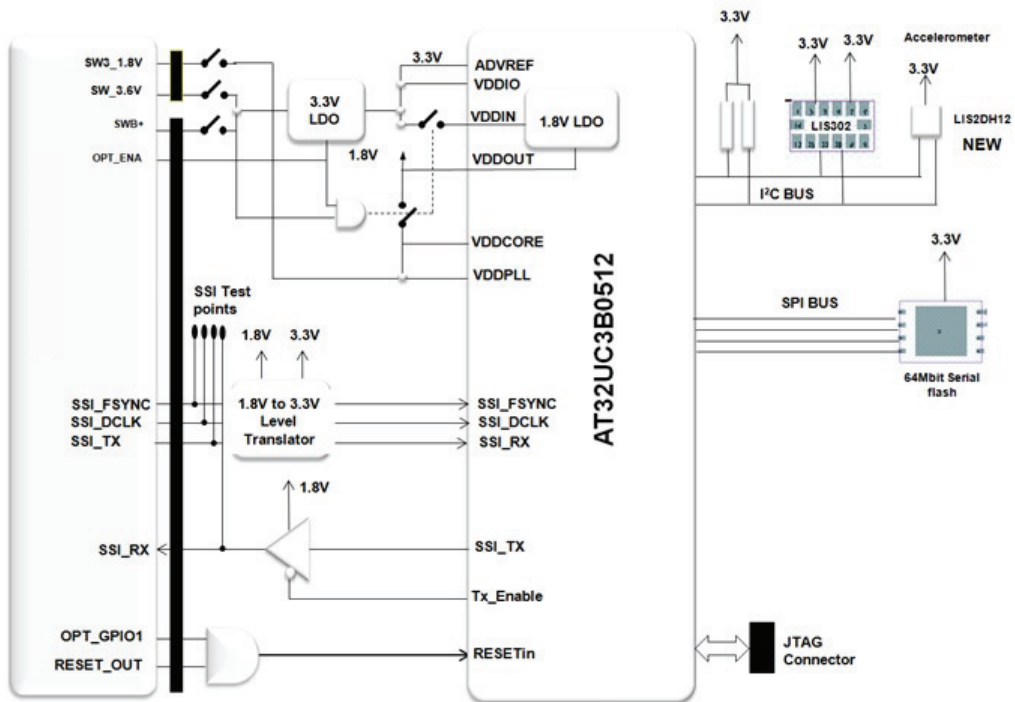
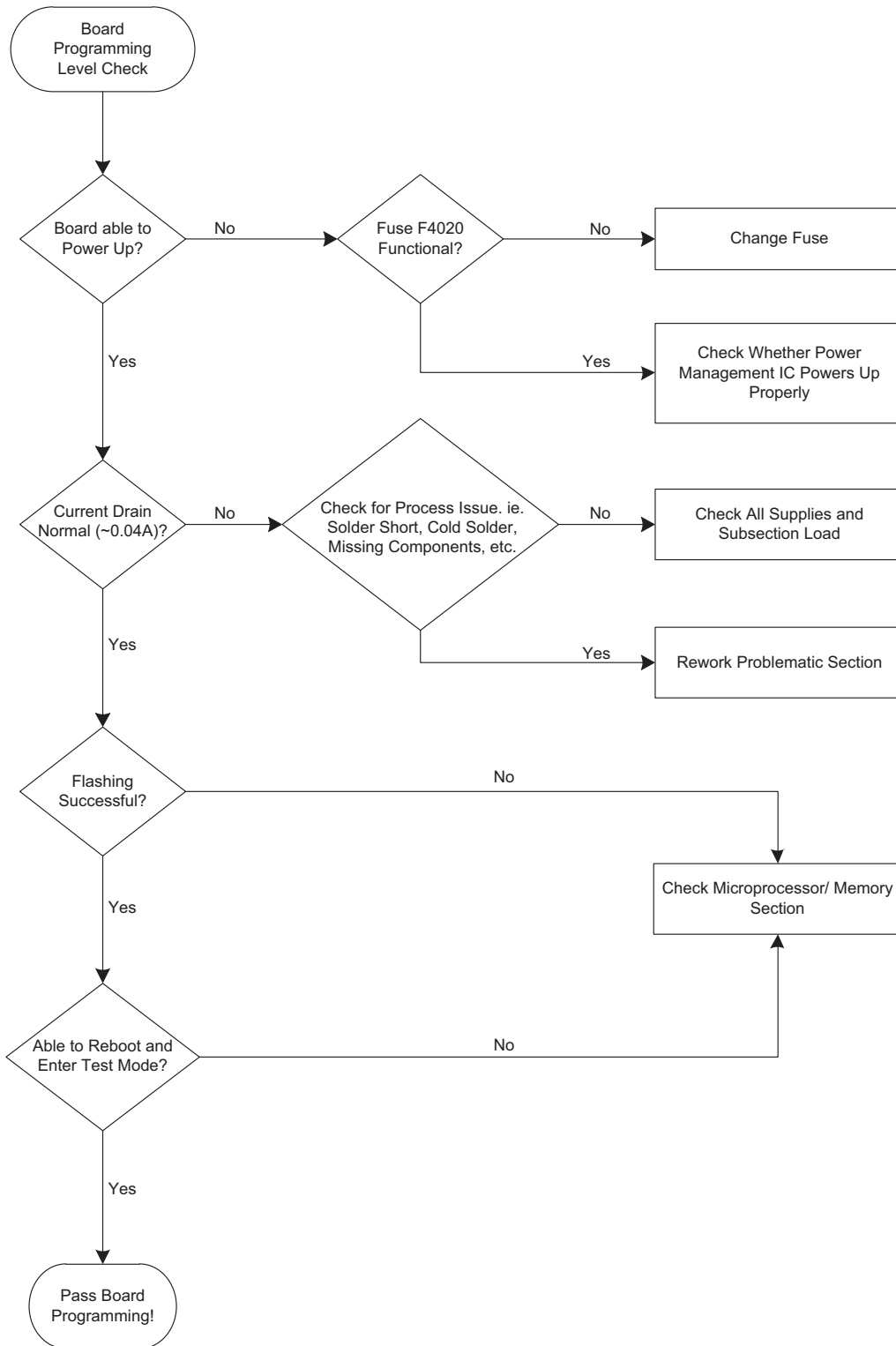
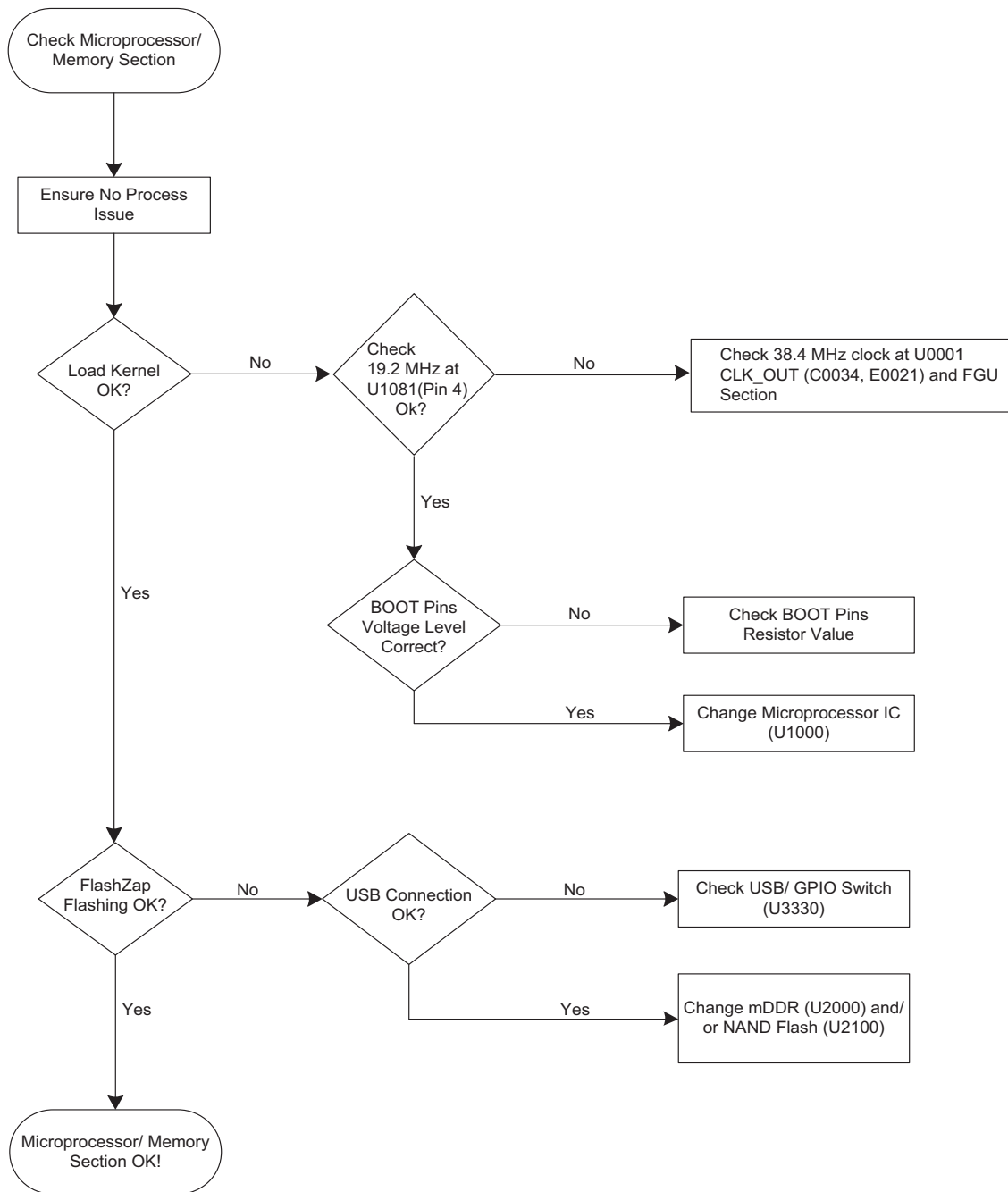


Figure 5-7. GOB

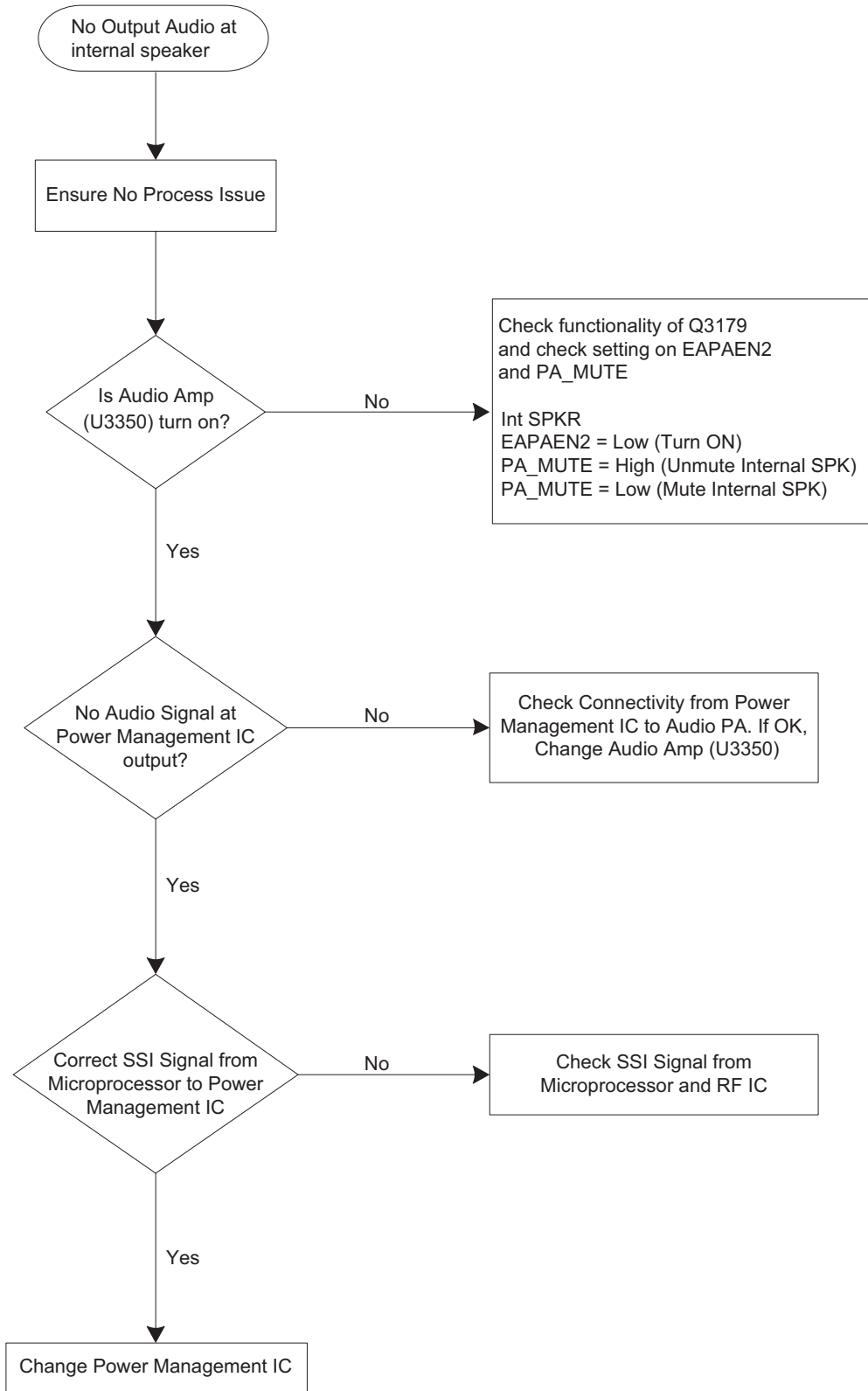
## 2.0 Troubleshooting Charts



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

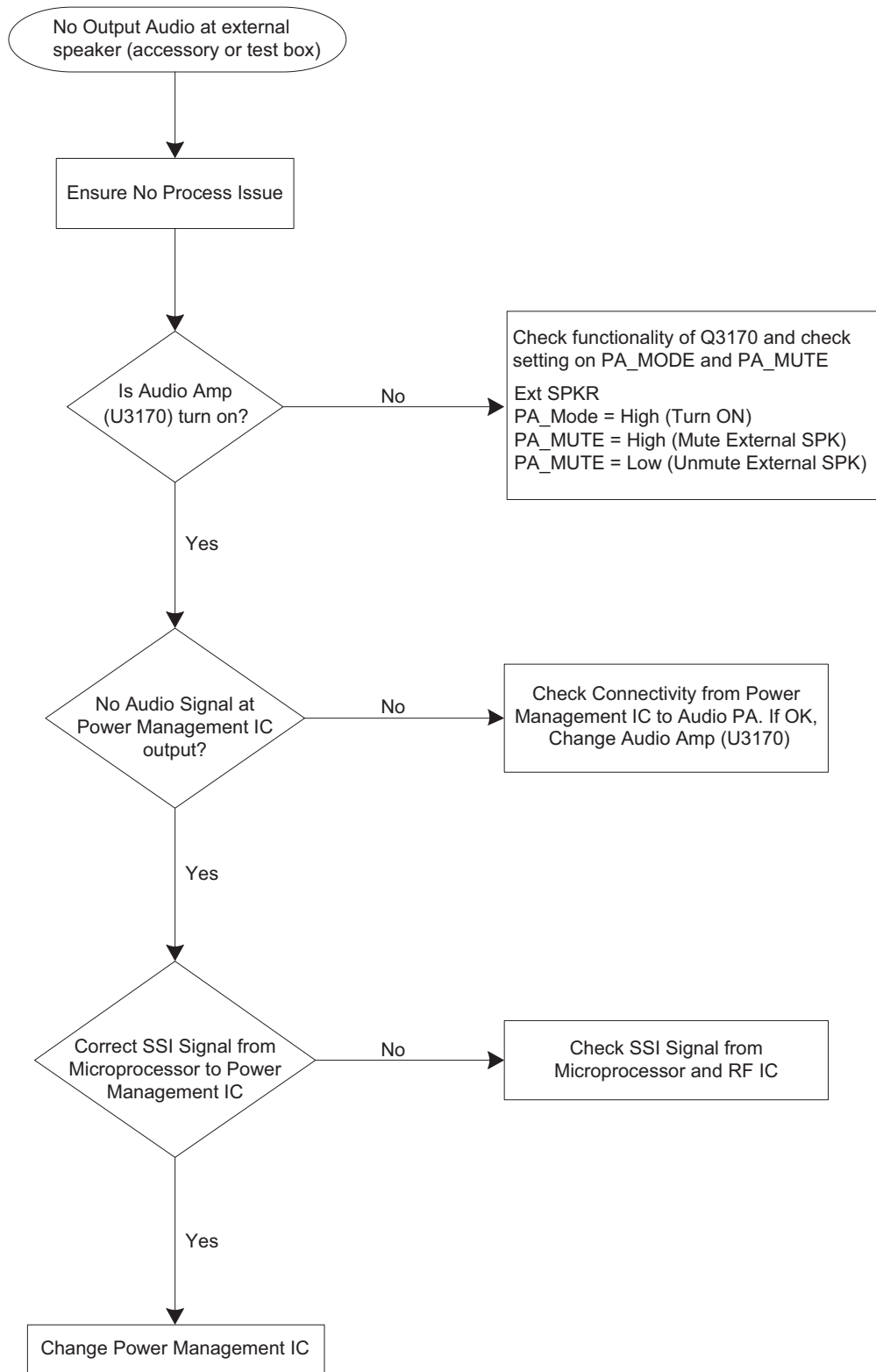


**Figure 5-9. Troubleshooting Flow Chart for Controller (Sheet 2 of 5)**

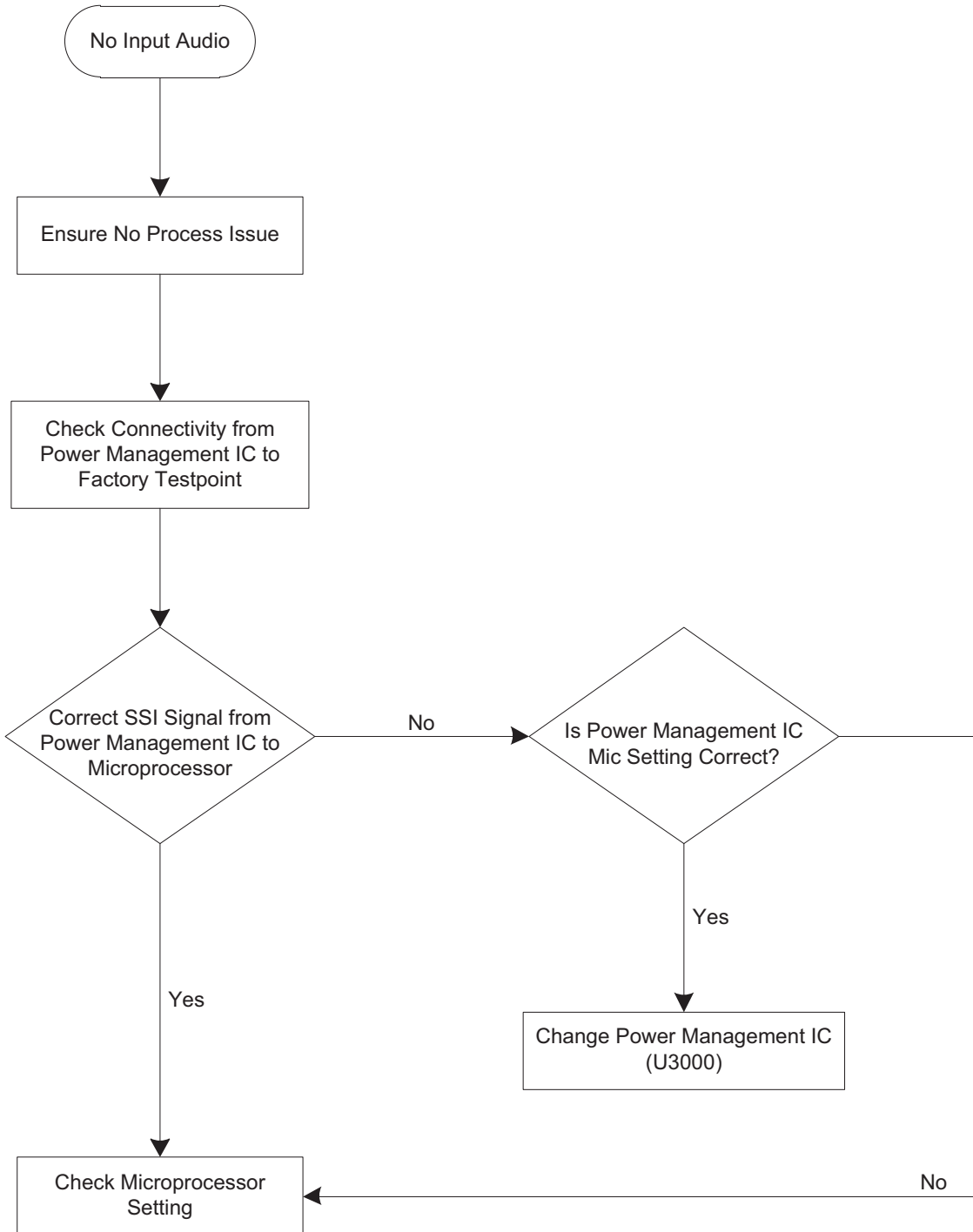


**Figure 5-10. Troubleshooting Flow Chart for Controller (Sheet 3 of 5)**

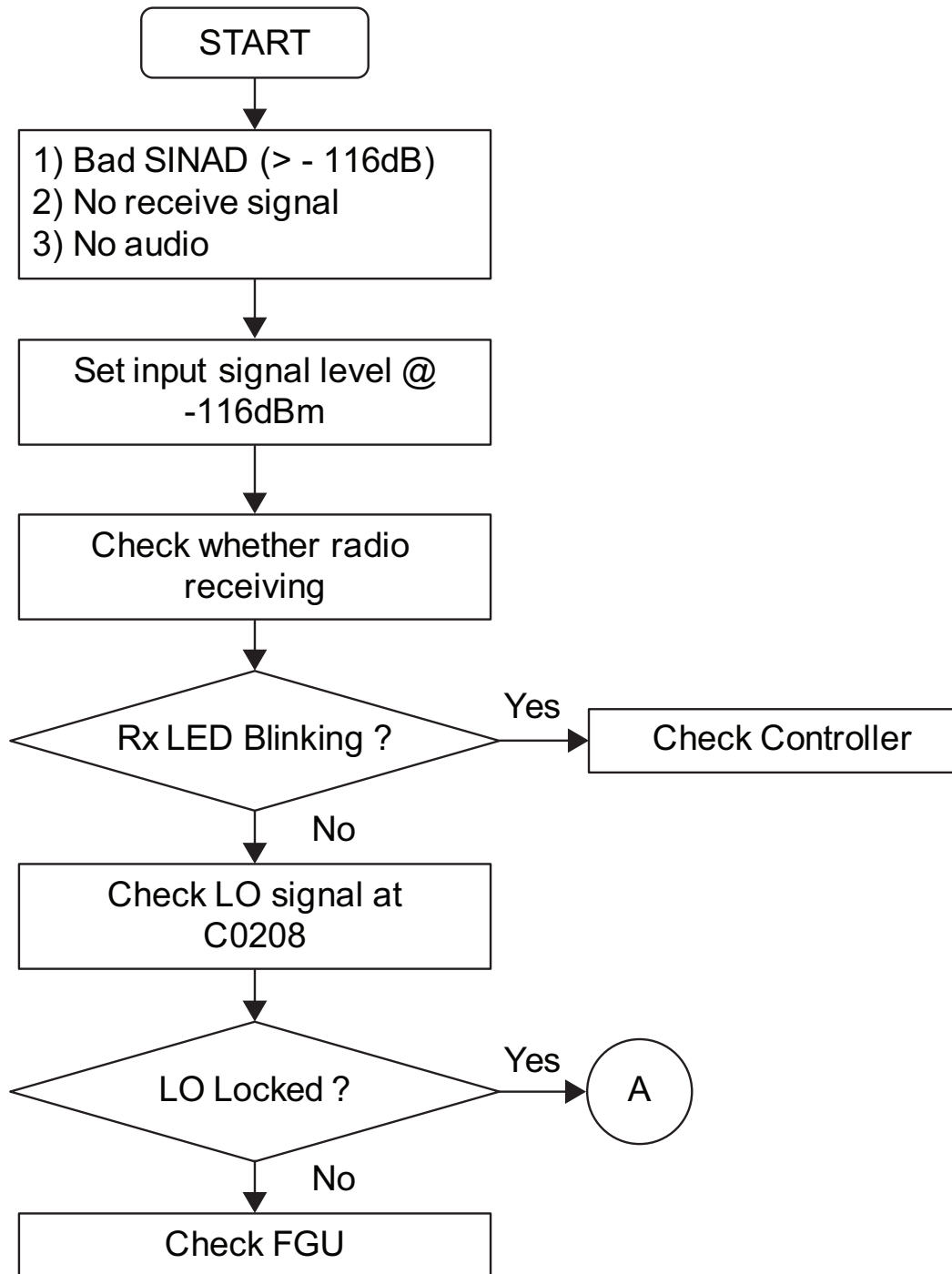




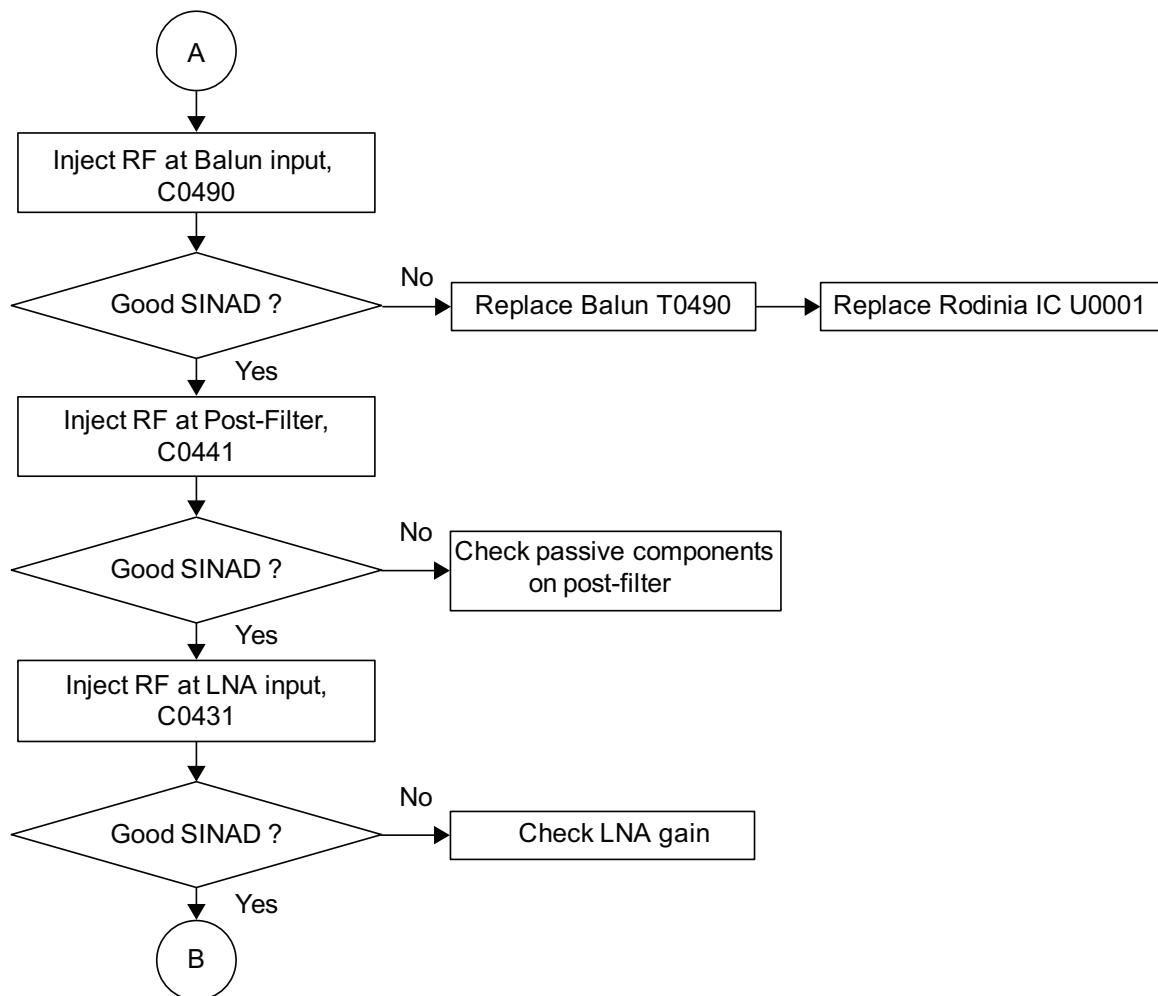
**Figure 5-11. Troubleshooting Flow Chart for Controller (Sheet 4 of 5)**



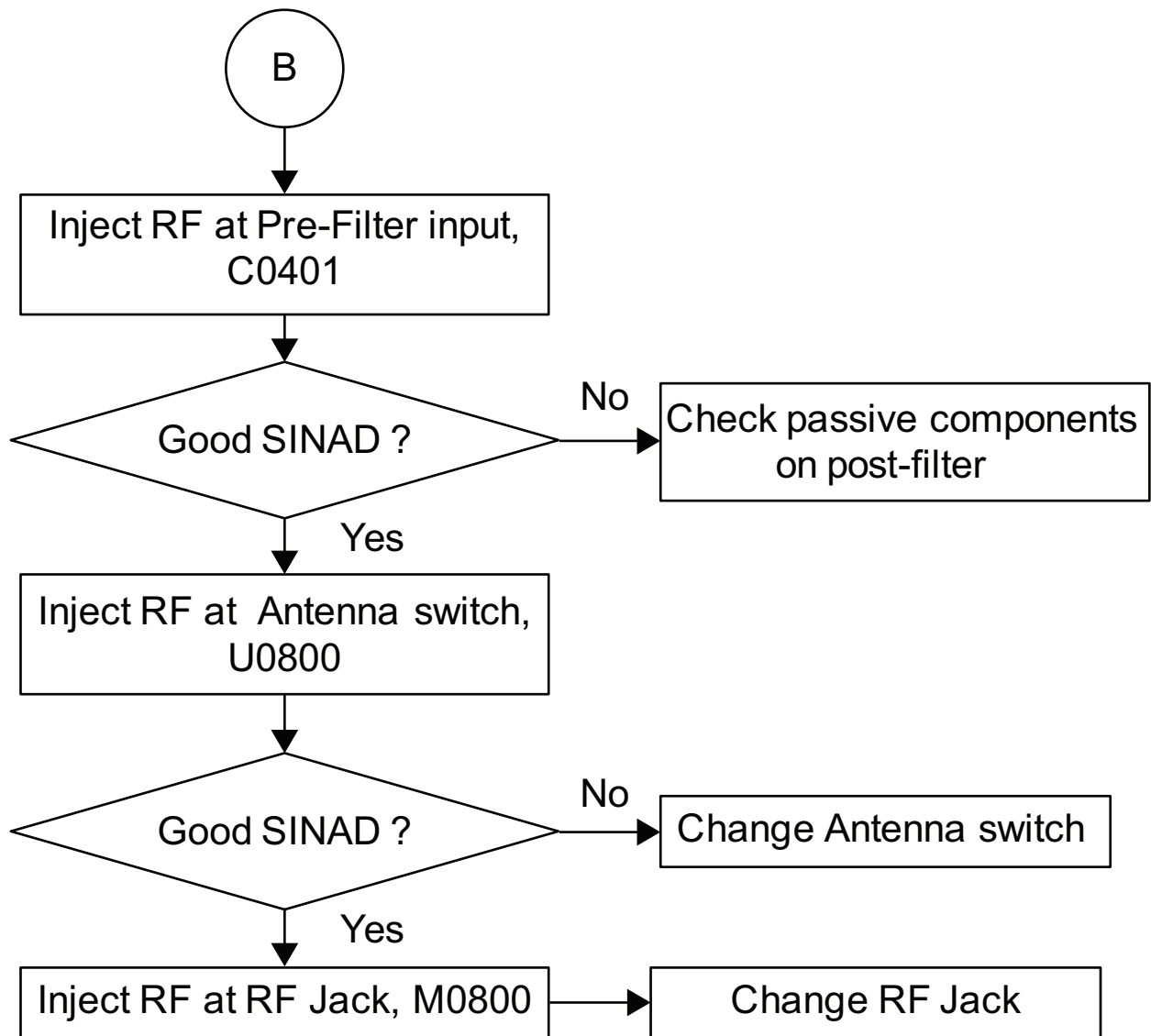
**Figure 5-12. Troubleshooting Flow Chart for Controller (Sheet 5 of 5)**



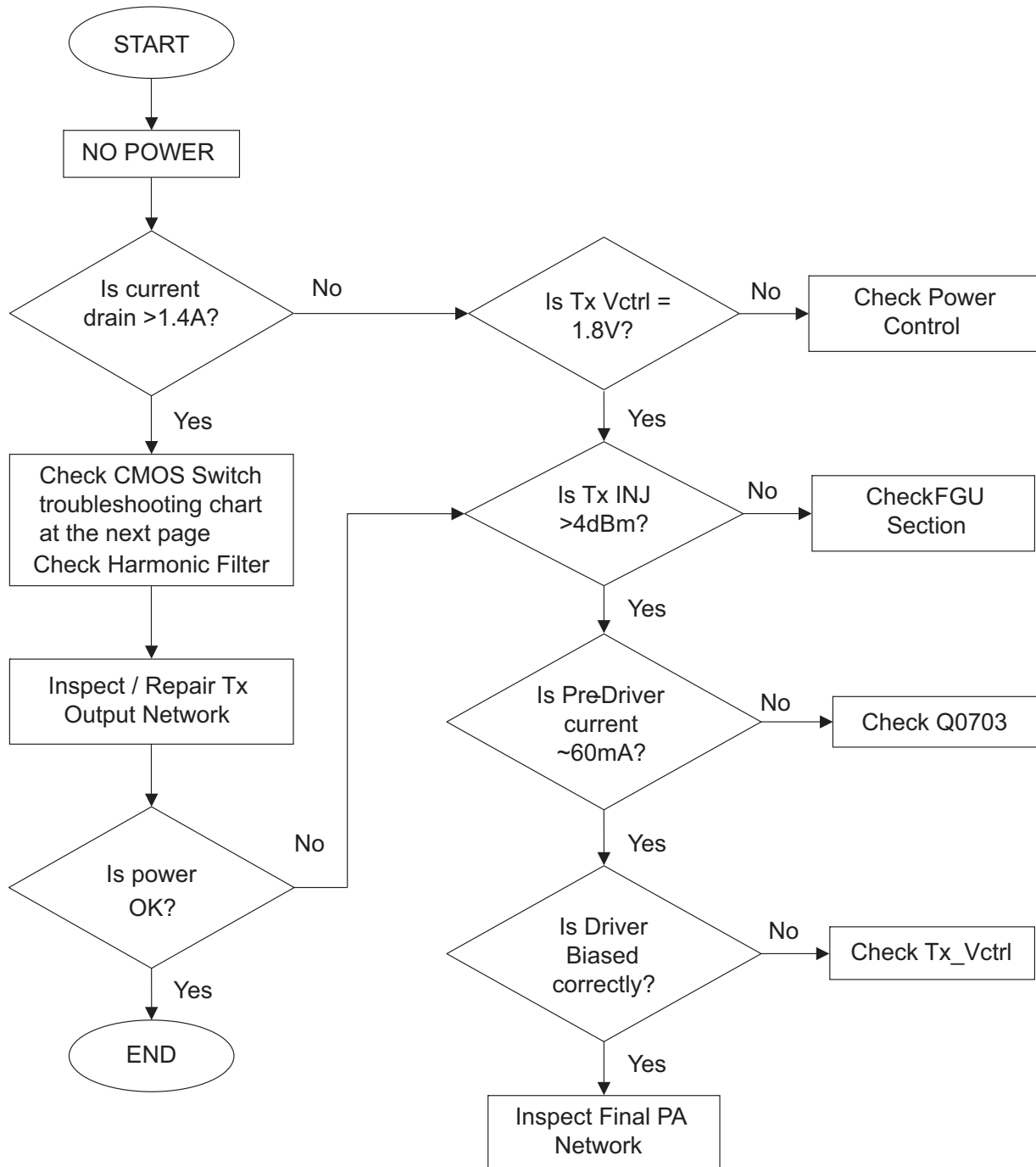
**Figure 5-13. Troubleshooting Flow Chart for Receiver (Sheet 1 of 3)**



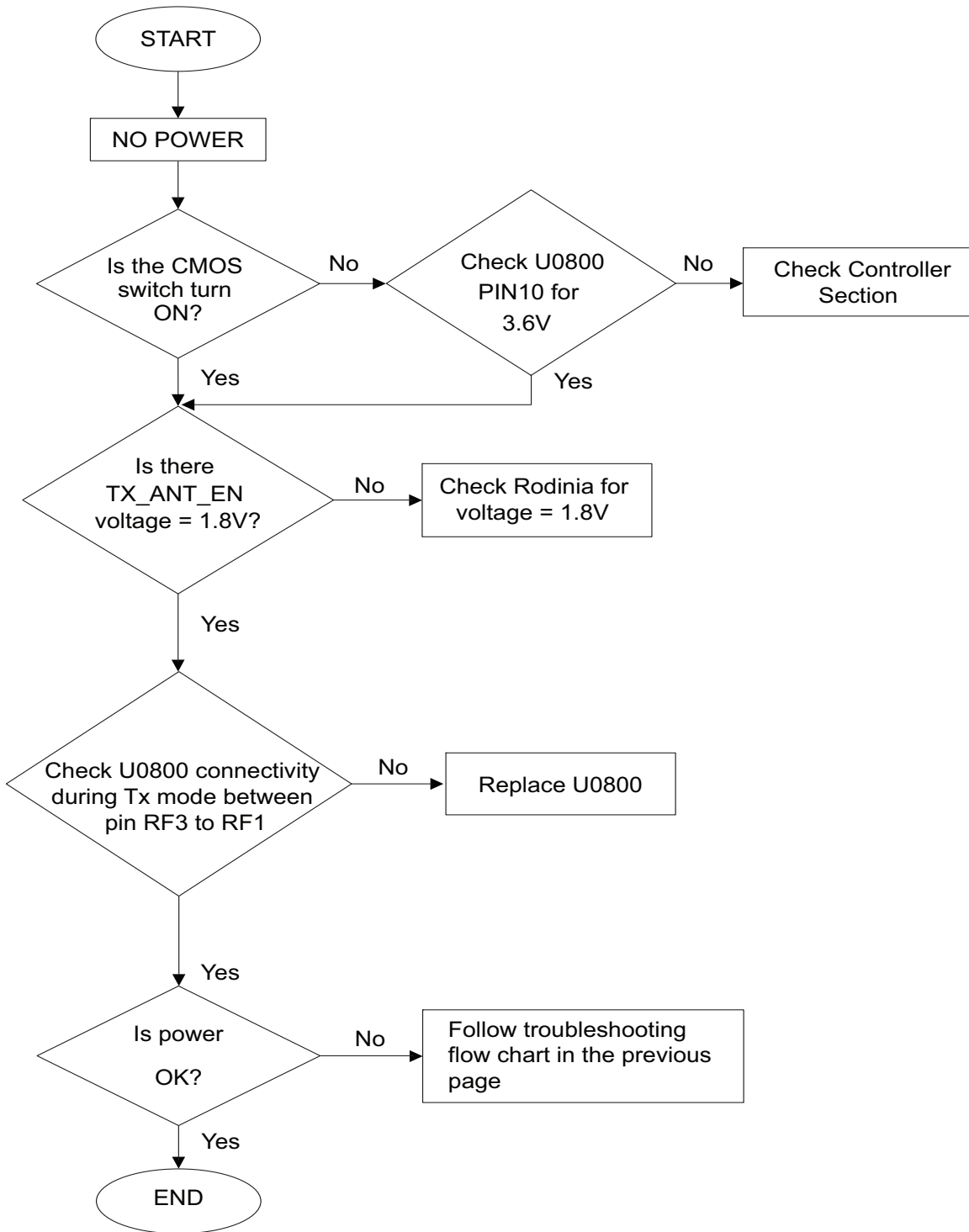
**Figure 5-14. Troubleshooting Flow Chart for Receiver (Sheet 2 of 3)**



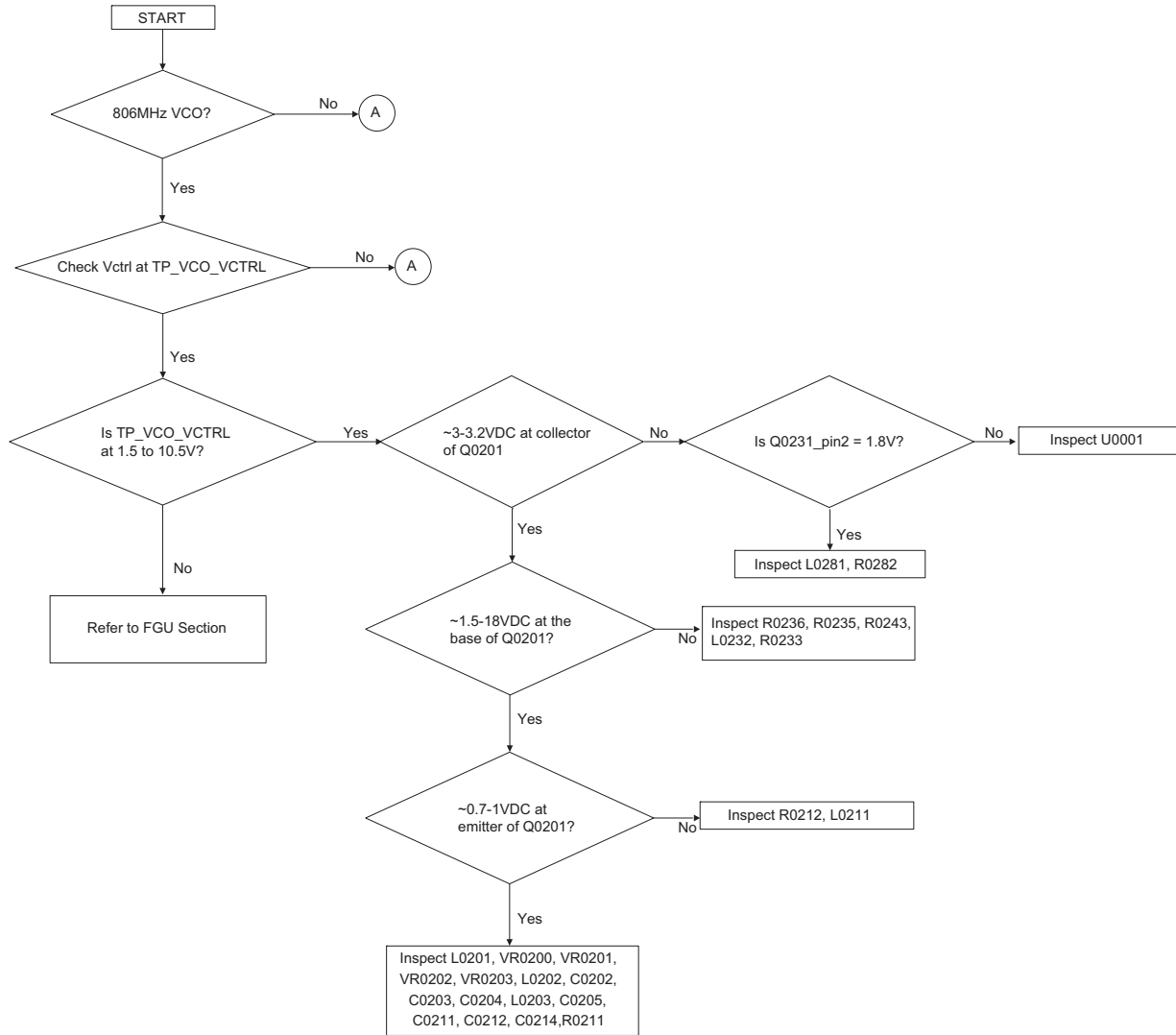
**Figure 5-15. Troubleshooting Flow Chart for Receiver (Sheet 3 of 3)**



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

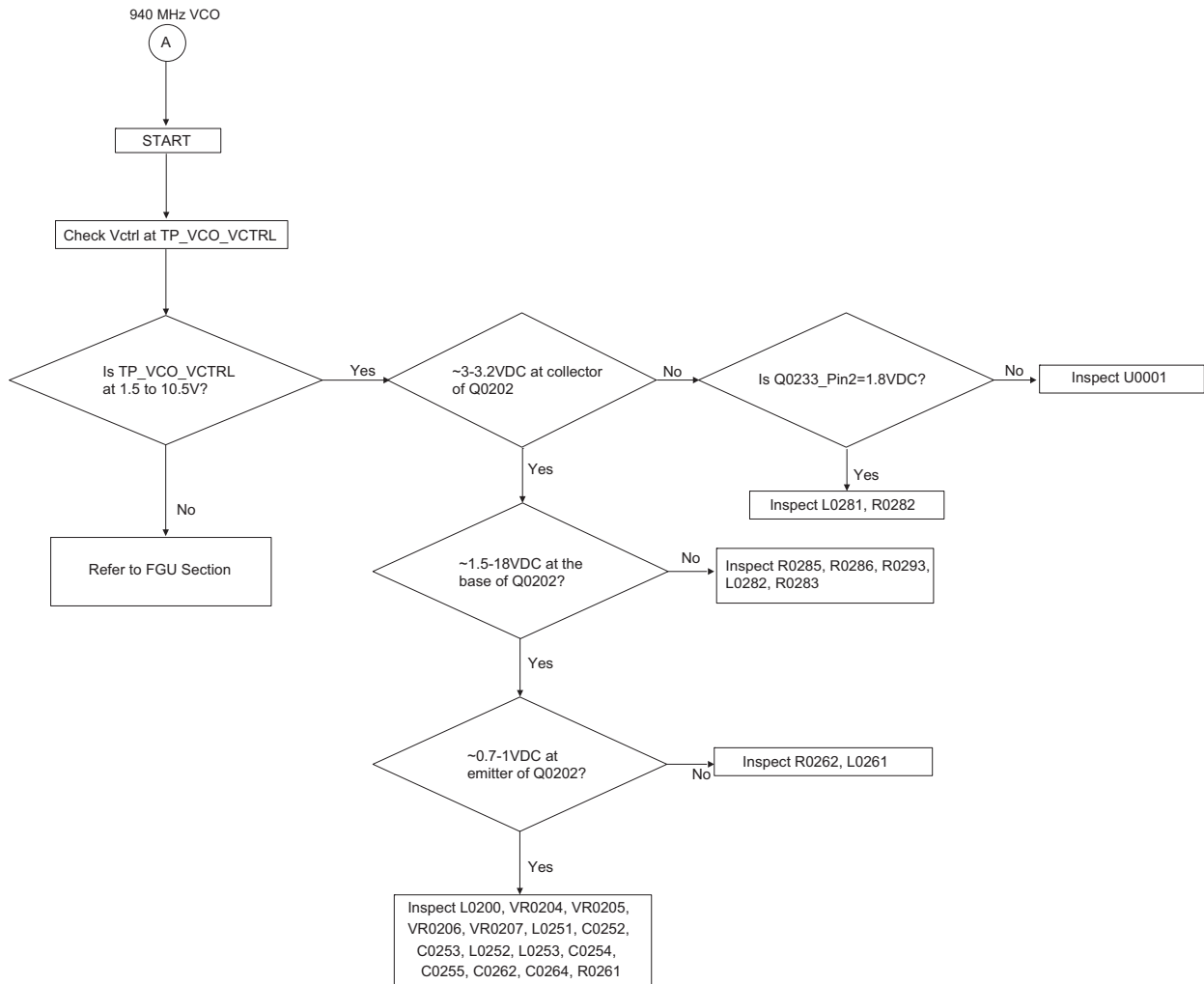


**Figure 5-17. Troubleshooting Flow Chart for Transmitter(CMOS Section)**

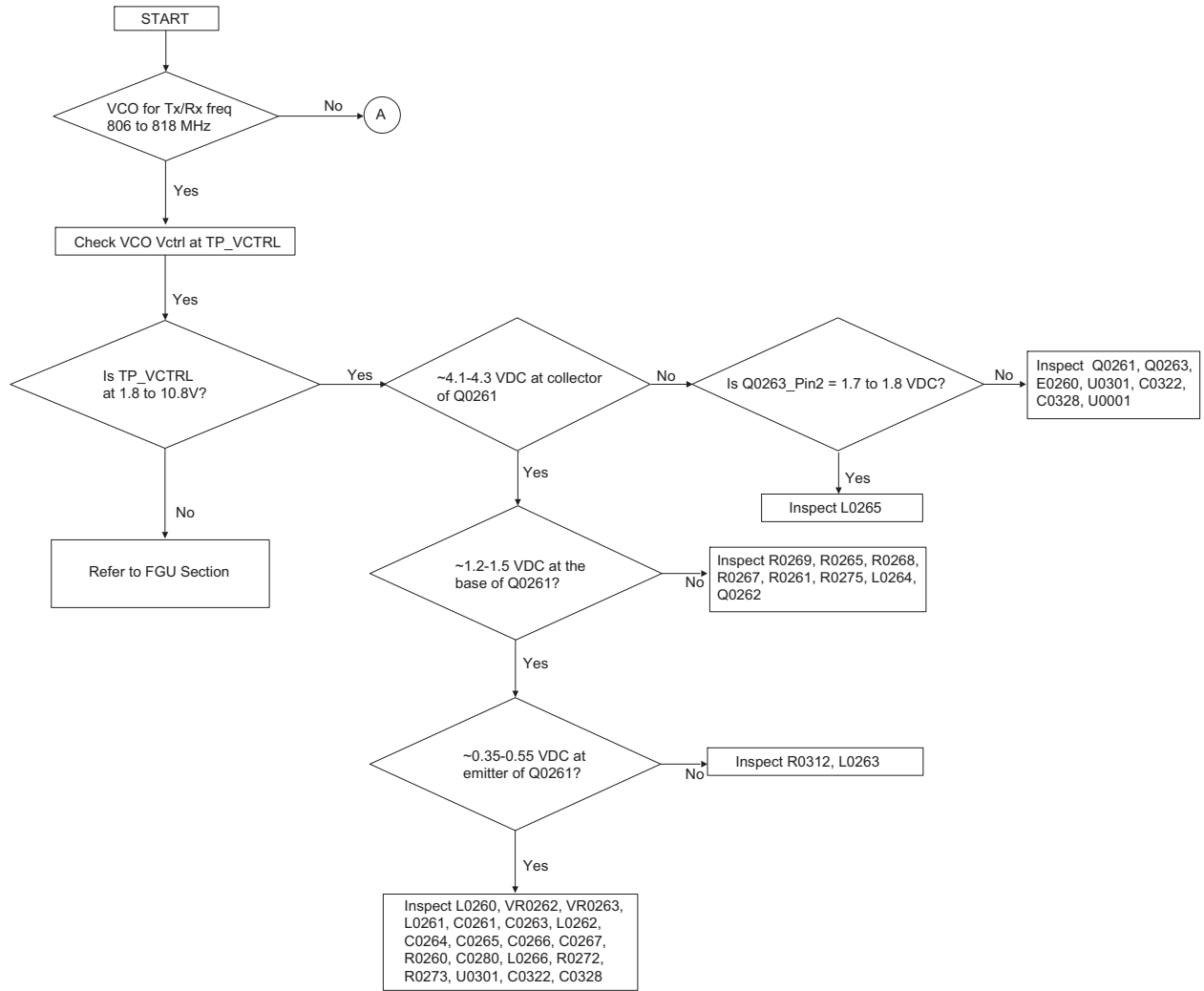


**Figure 5-18. Troubleshooting Flow Chart for VCO (Sheet 1 of 2)**

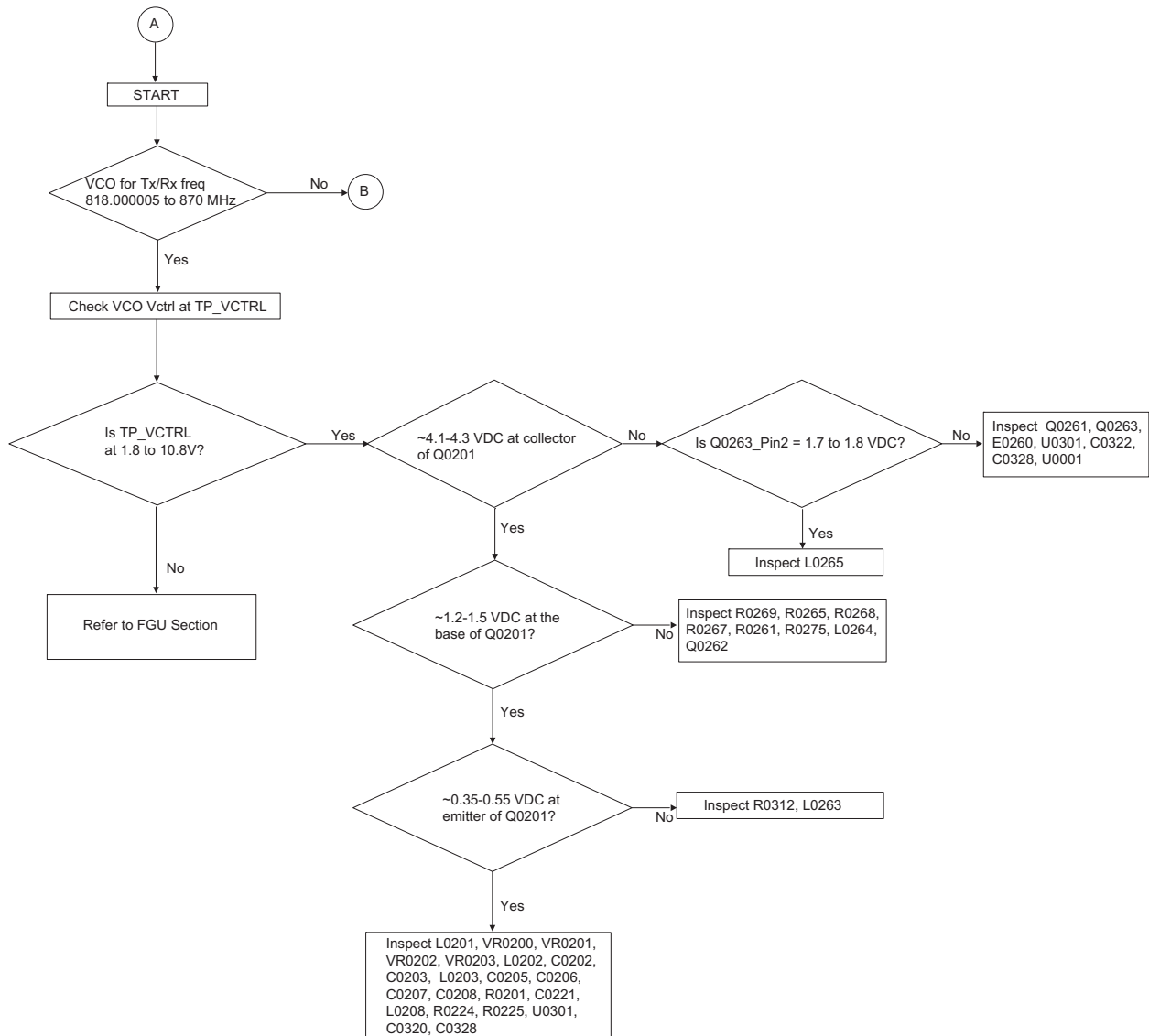




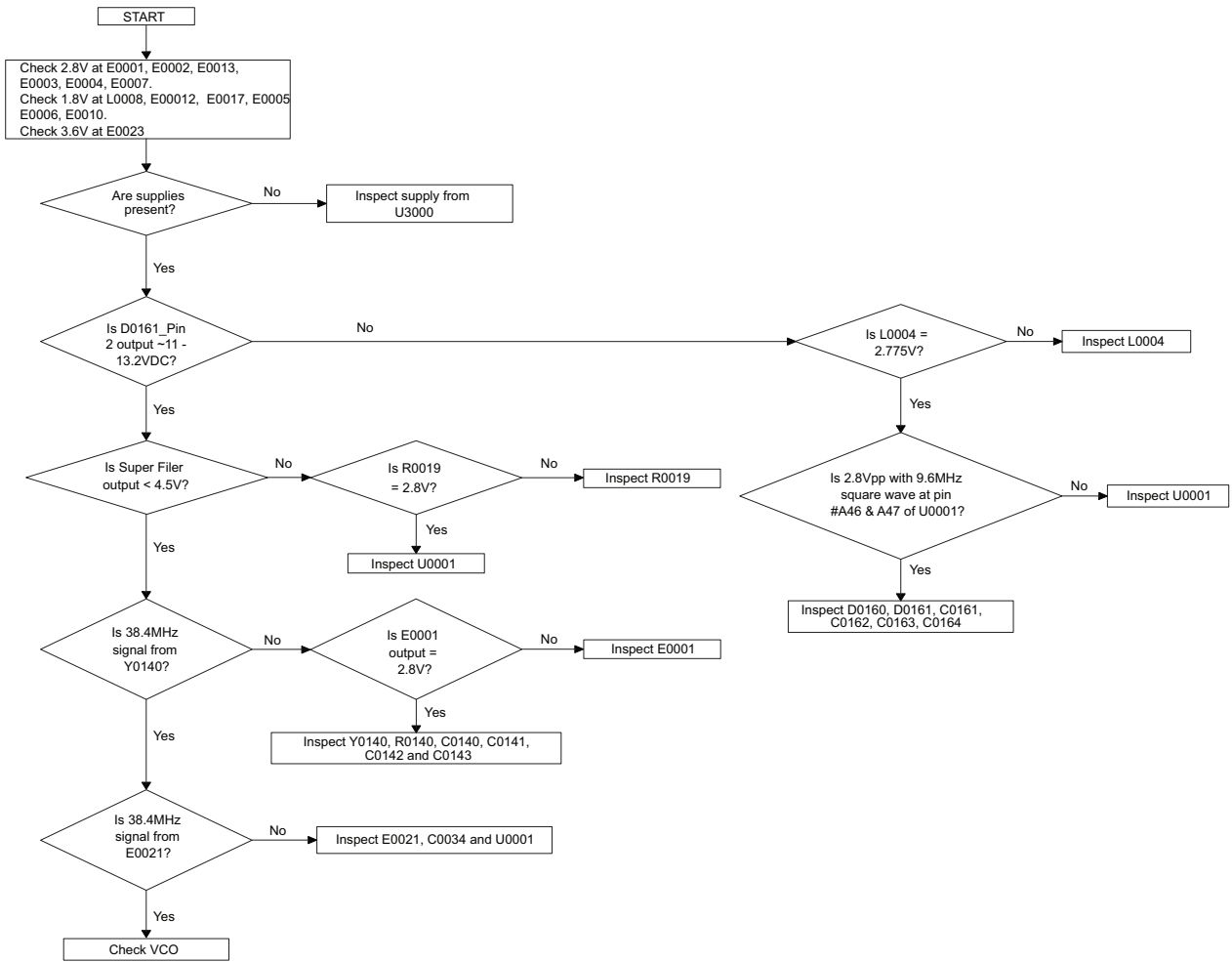
**Figure 5-19. Troubleshooting Flow Chart for VCO (Sheet 2 of 2)**



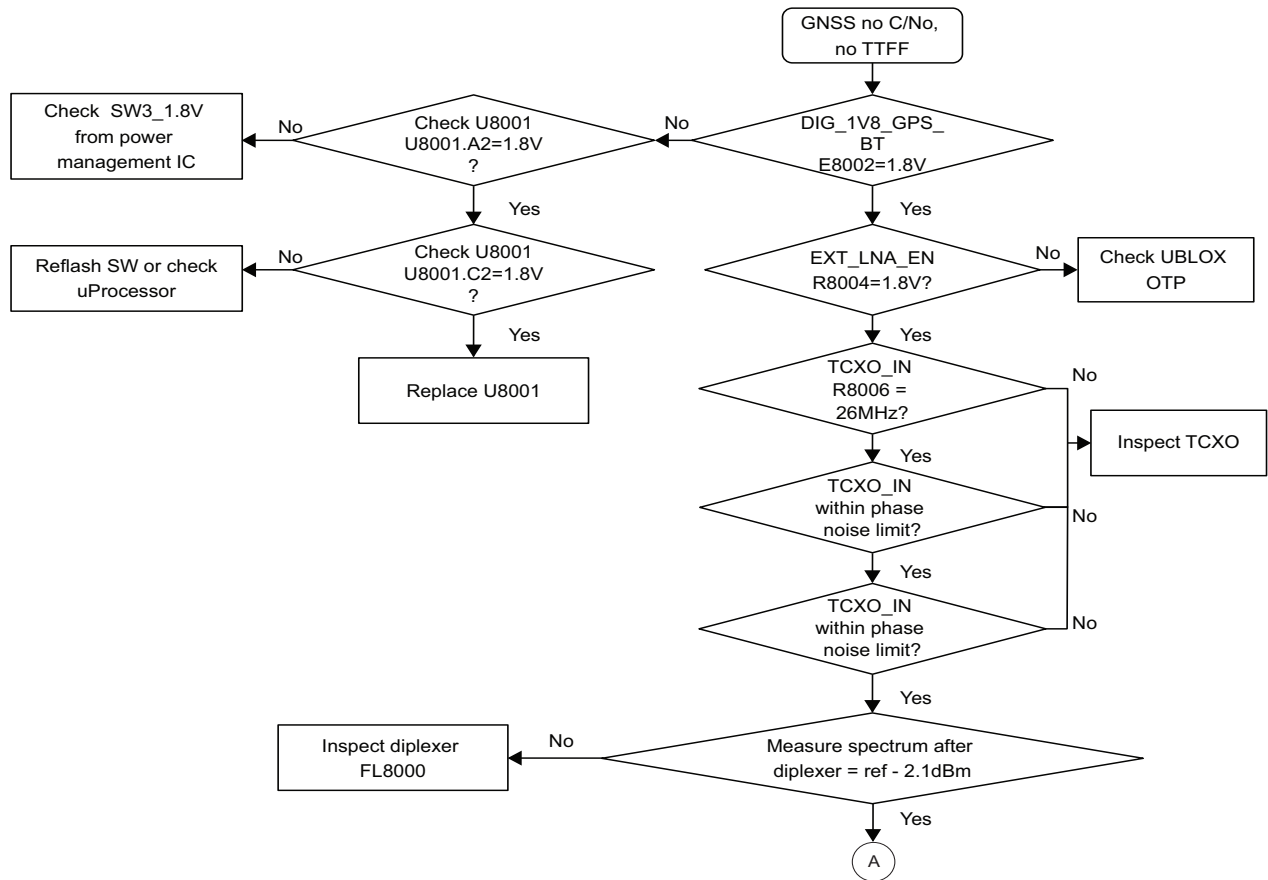
**Figure 5-20. Troubleshooting Flow Chart for VCO 8/900 MHz (Sheet 1 of 2)**



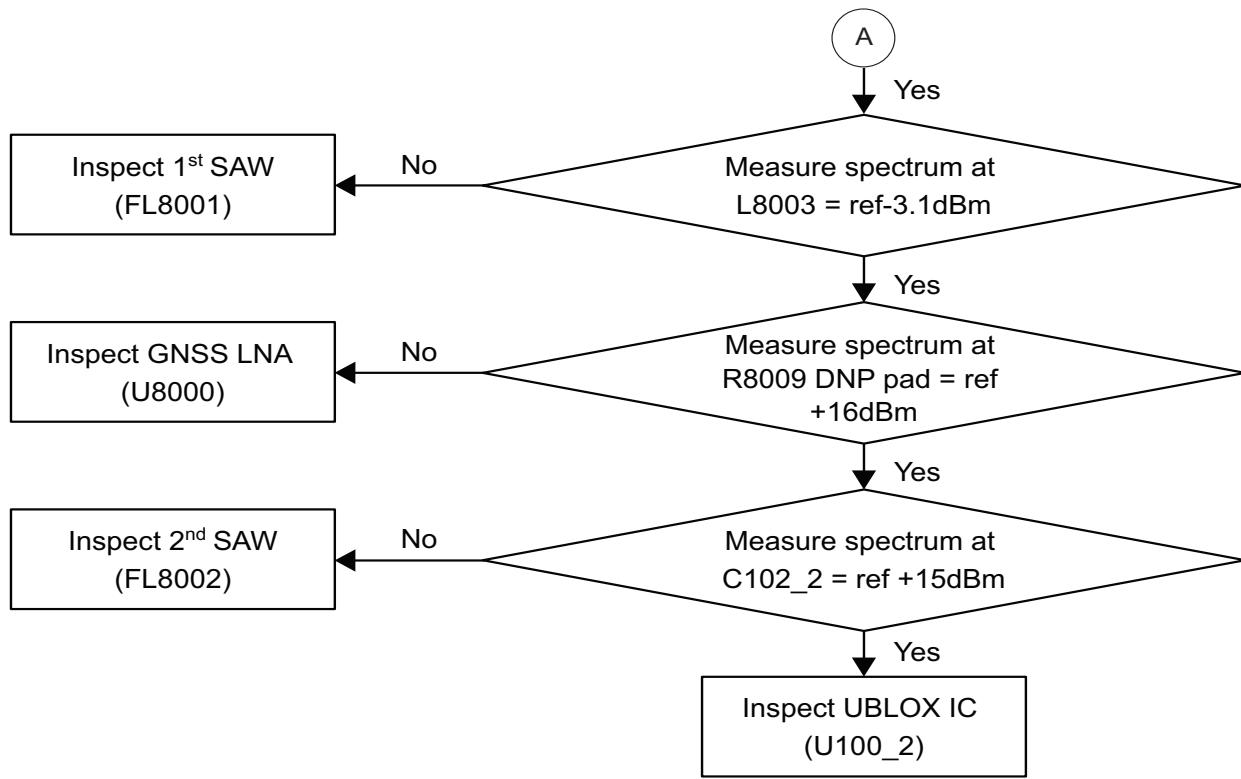
**Figure 5-21. Troubleshooting Flow Chart for VCO 8/900 MHz (Sheet 2 of 2)**



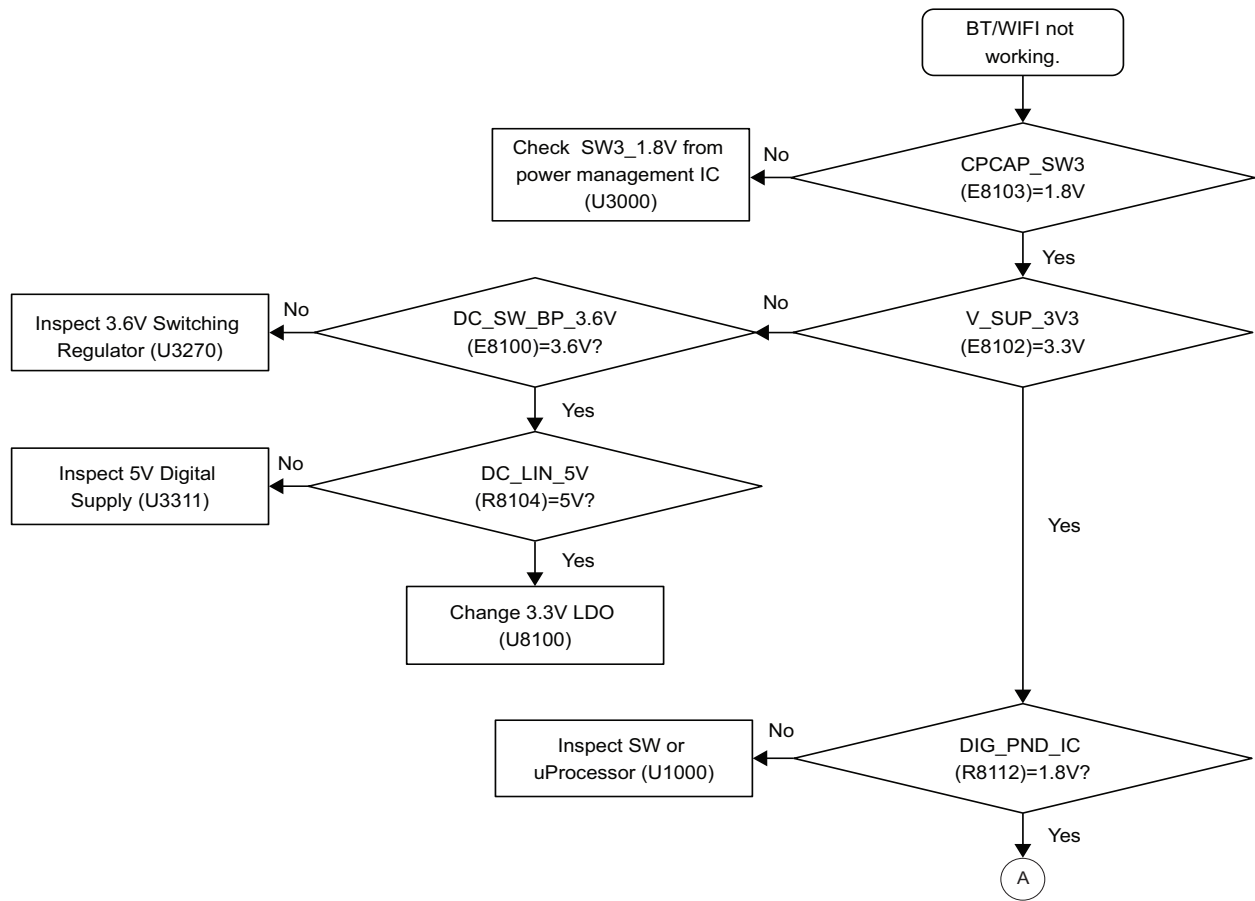
**Figure 5-22. Troubleshooting Flow Chart for Synthesizer**



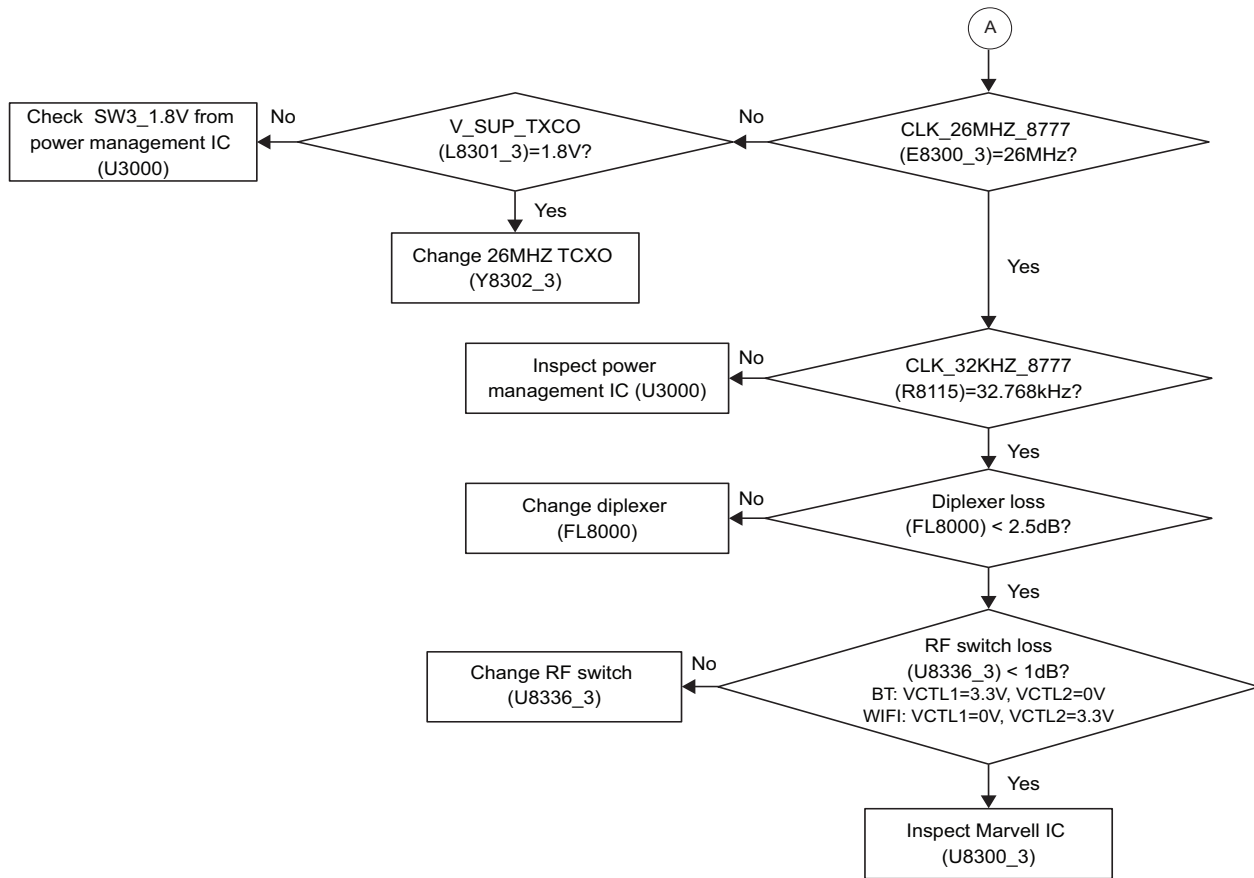
**Figure 5-23. Troubleshooting Flow Chart for GNSS (Sheet 1 of 2)**



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

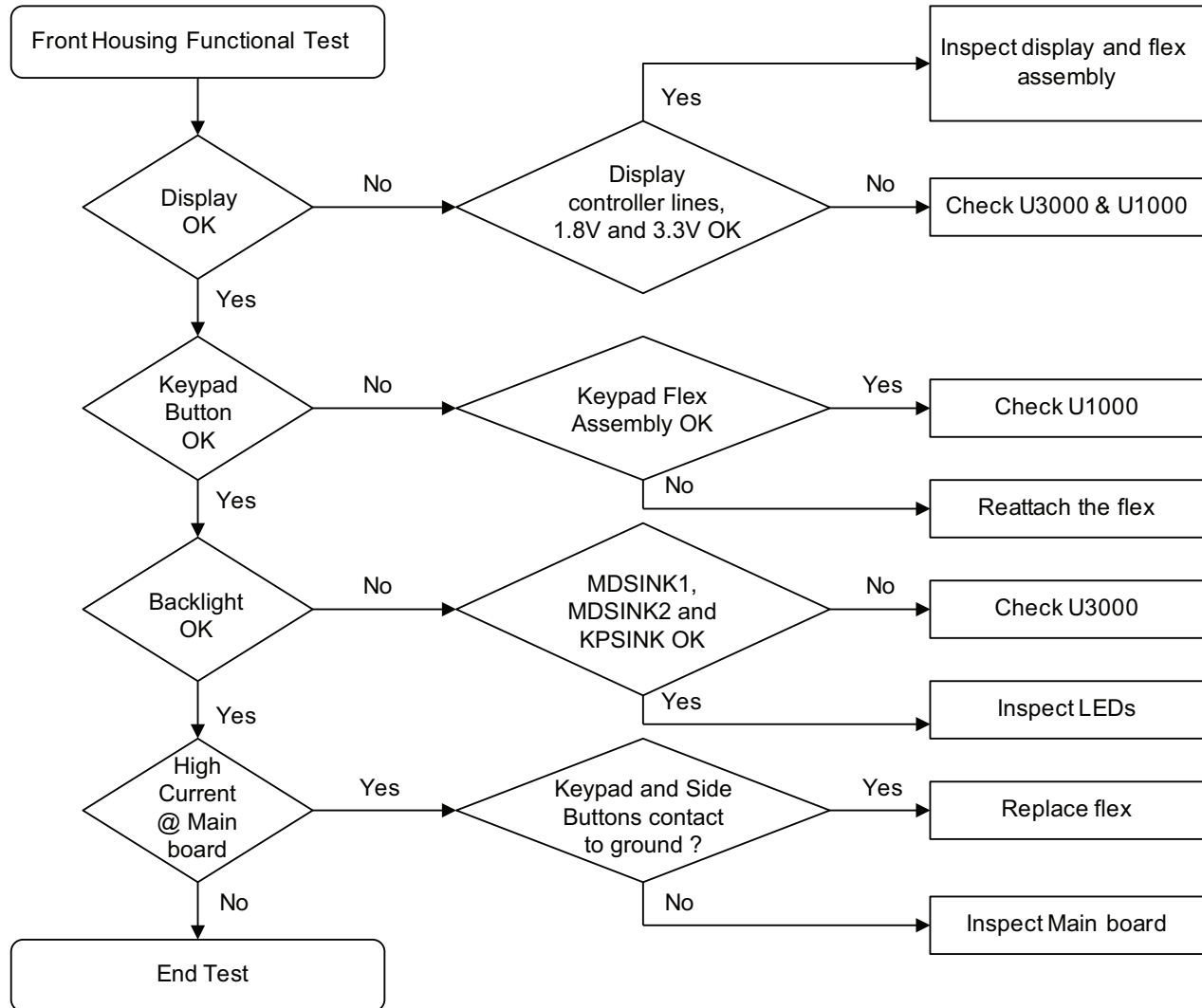


**Figure 5-25. Troubleshooting Flow Chart for Bluetooth/WiFi (Sheet 1 of 2)**

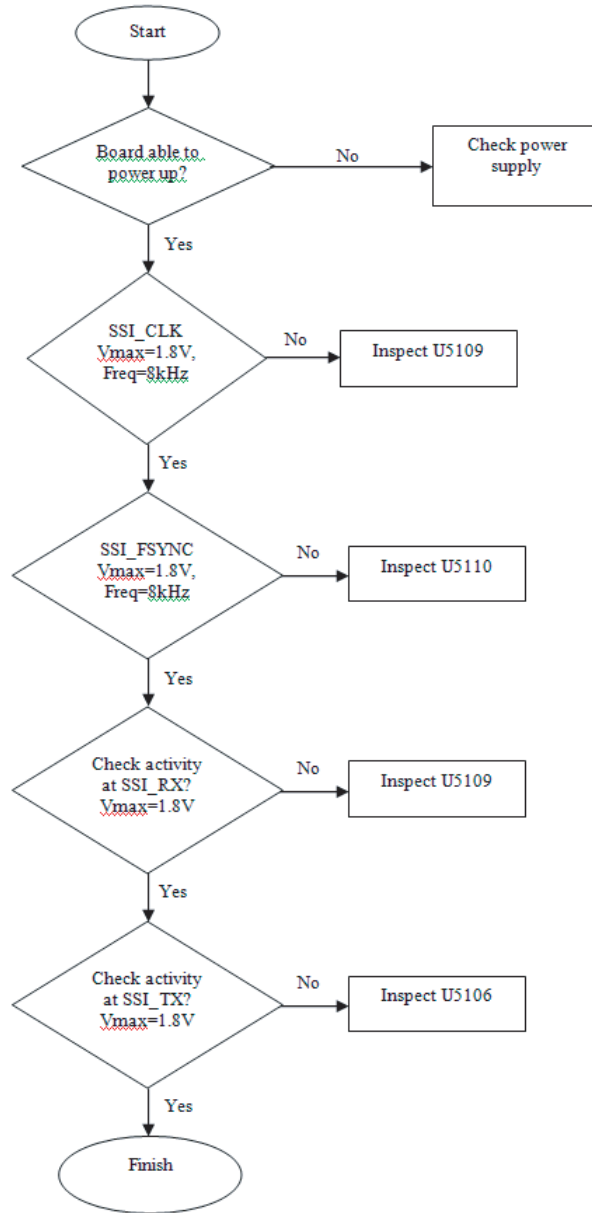


**Figure 5-26. Troubleshooting Flow Chart for Bluetooth/WiFi (Sheet 2 of 2)**



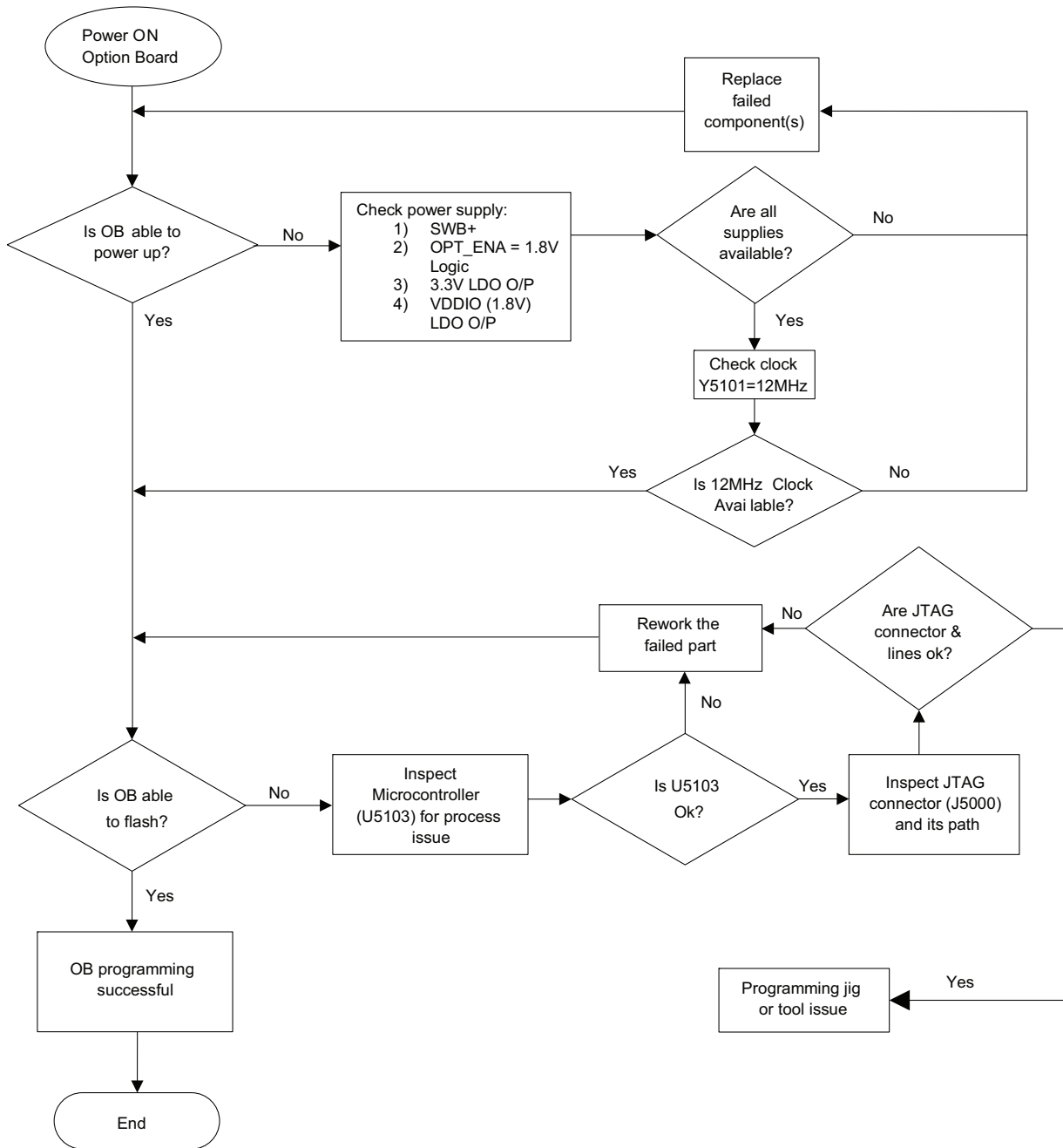


**Figure 5-27. Troubleshooting Flow Chart for Keypad**

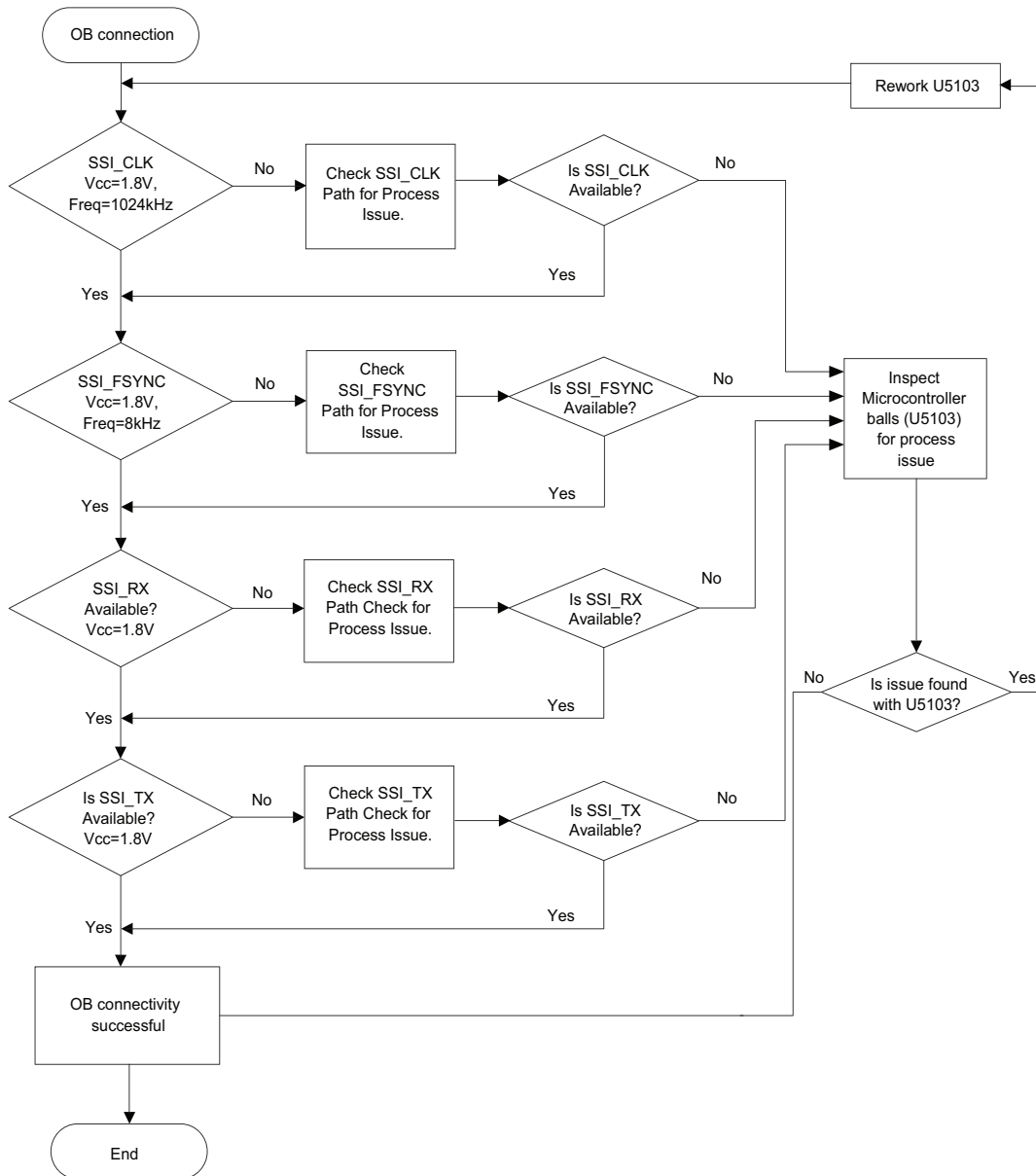


\*To check SSI lines, GOB needs to connect with radio  
\*All the SSI lines must probe with oscilloscope

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

**Notes**

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

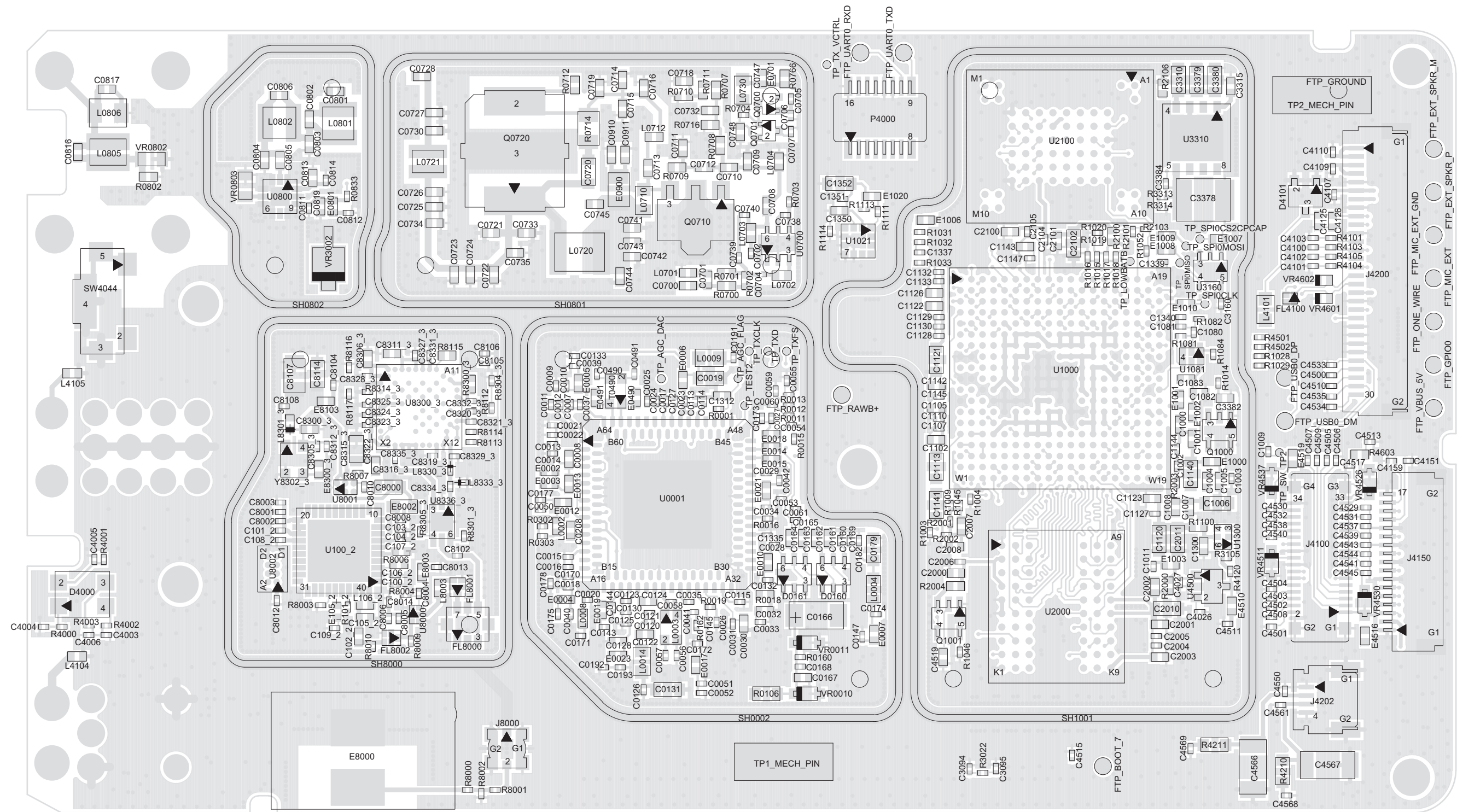


Figure 6-1. Main Board UHF Top Side PCB No. PC000813A01\_AB







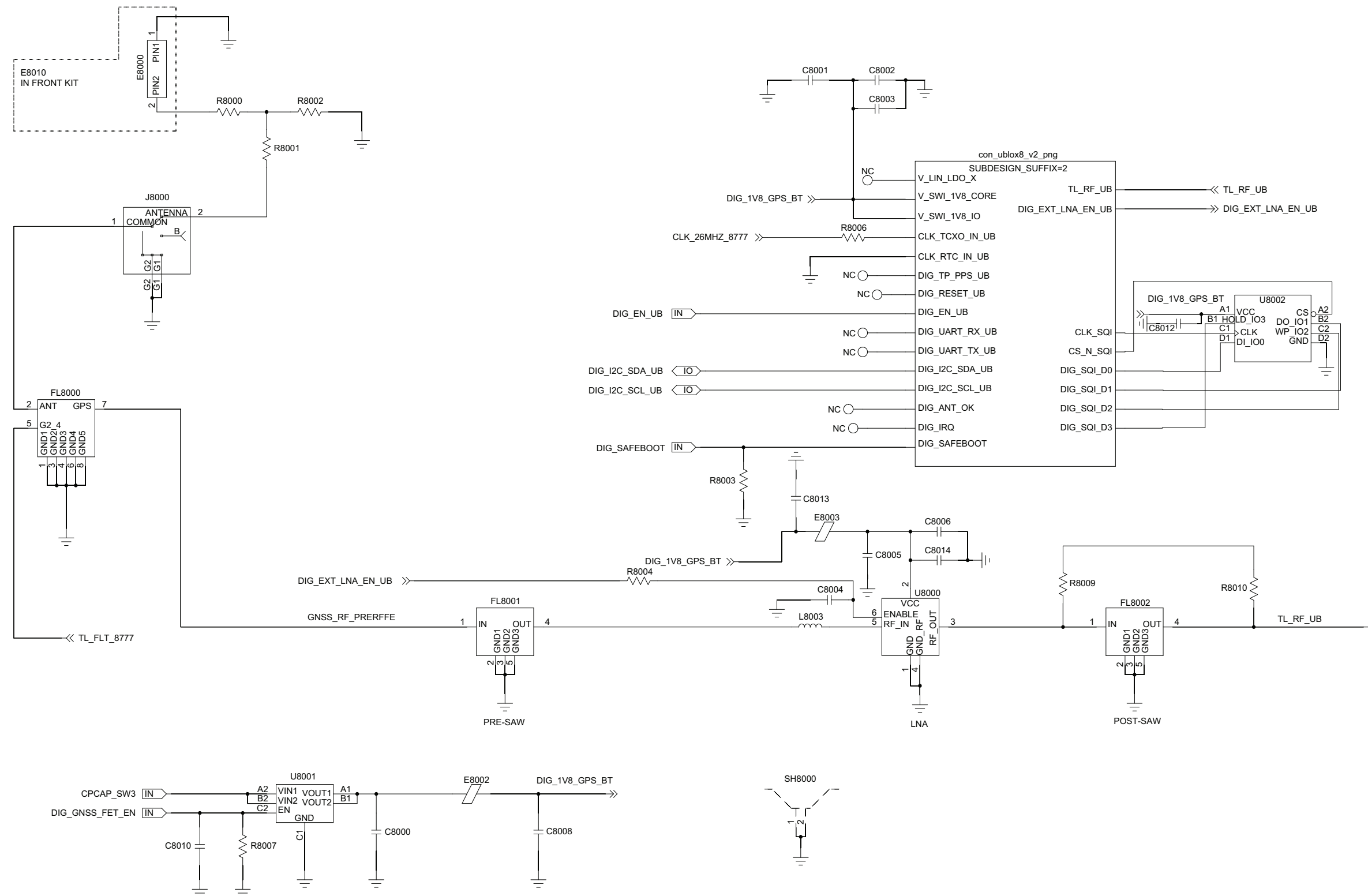


Figure 6-4. GNSS Schematic Diagram

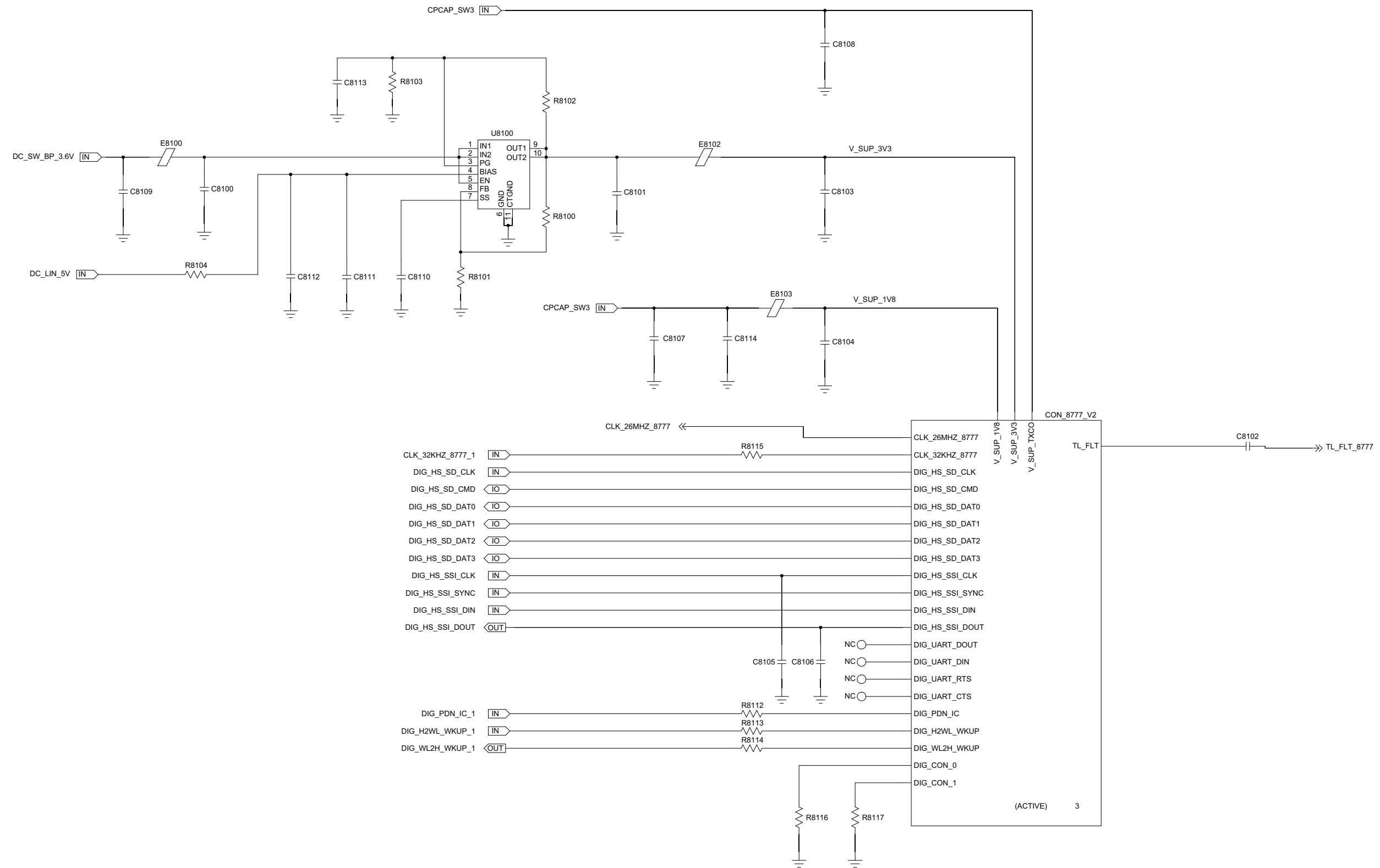


Figure 6-5. Bluetooth and WiFi Schematic Diagram (1 of 3)



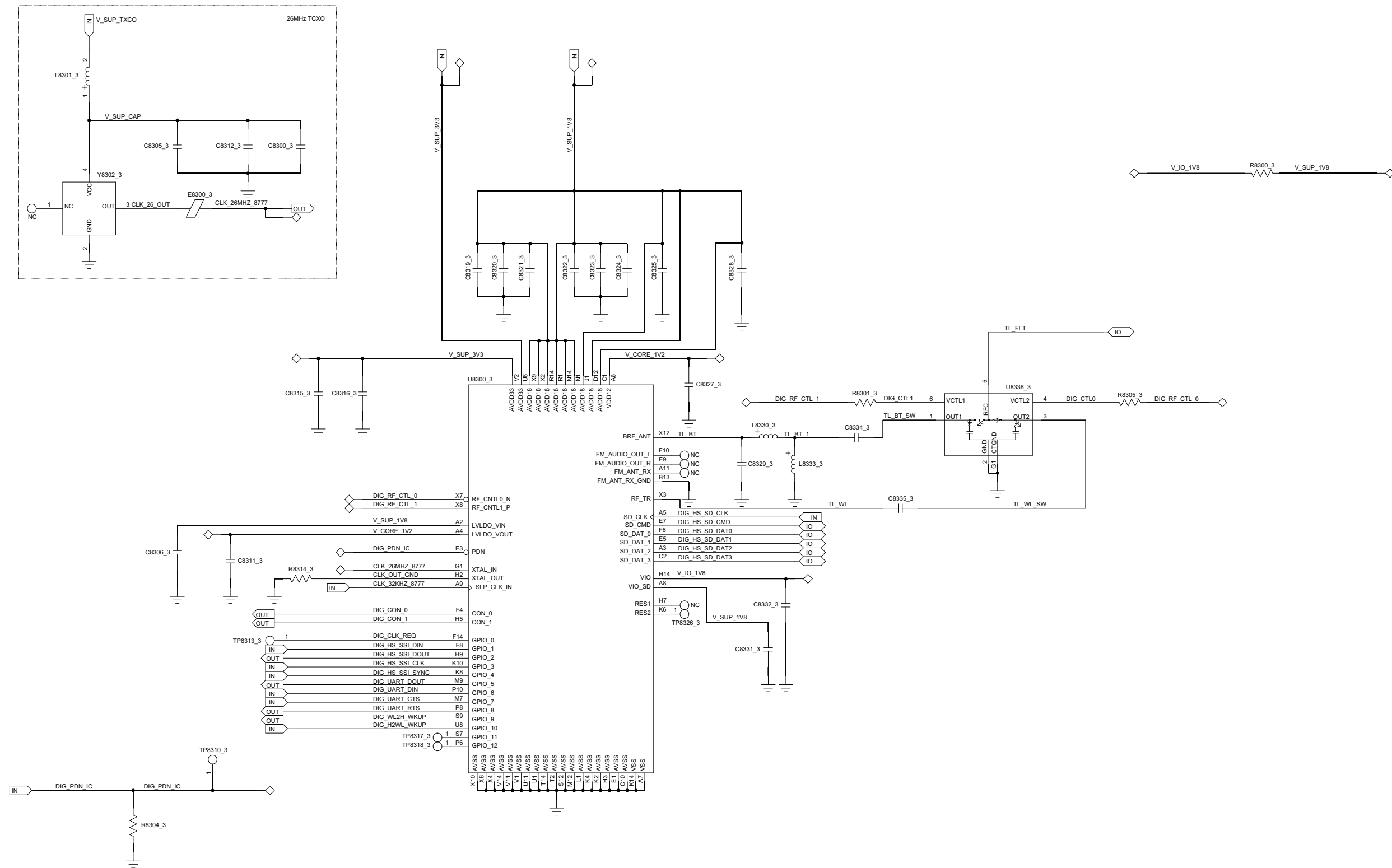


Figure 6-7. Bluetooth and WiFi Schematic Diagram (3 of 3)

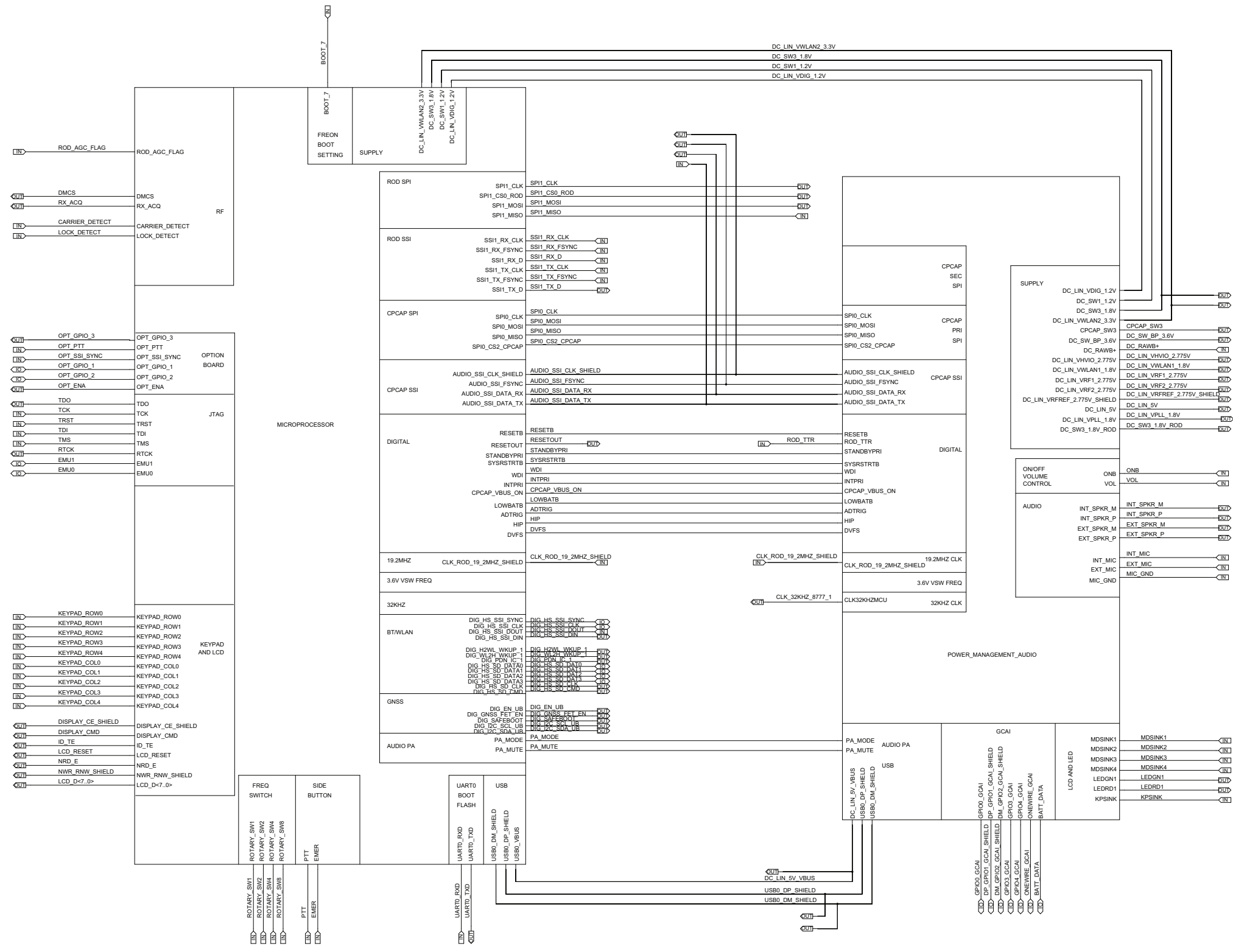


Figure 6-8. Controller Schematic Diagram

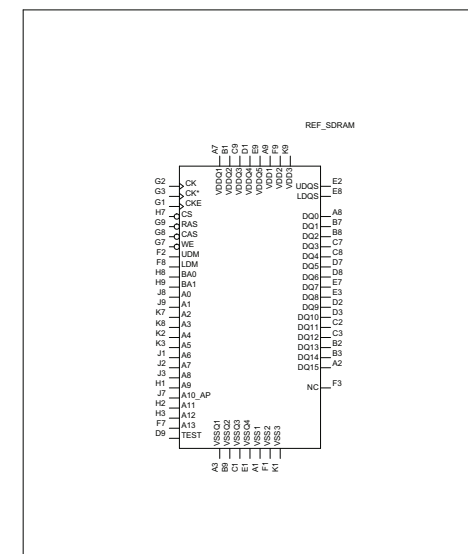
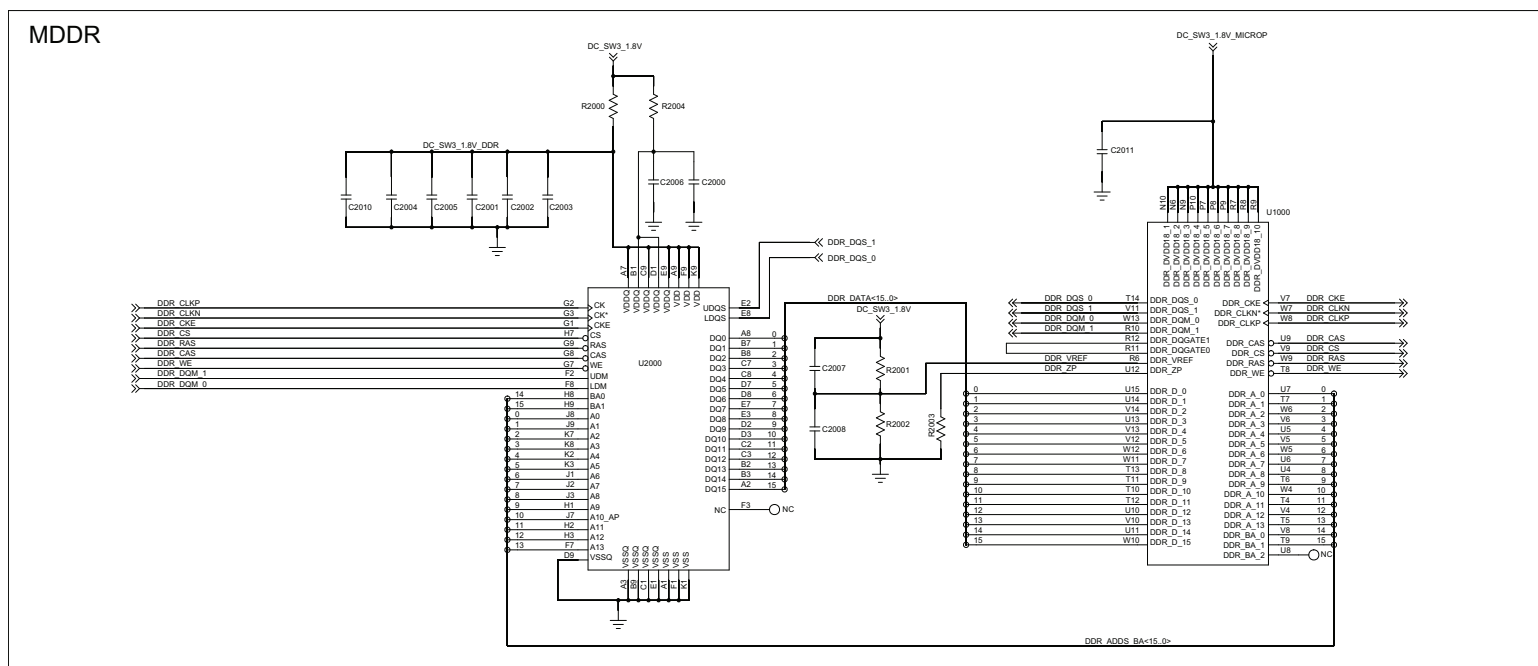
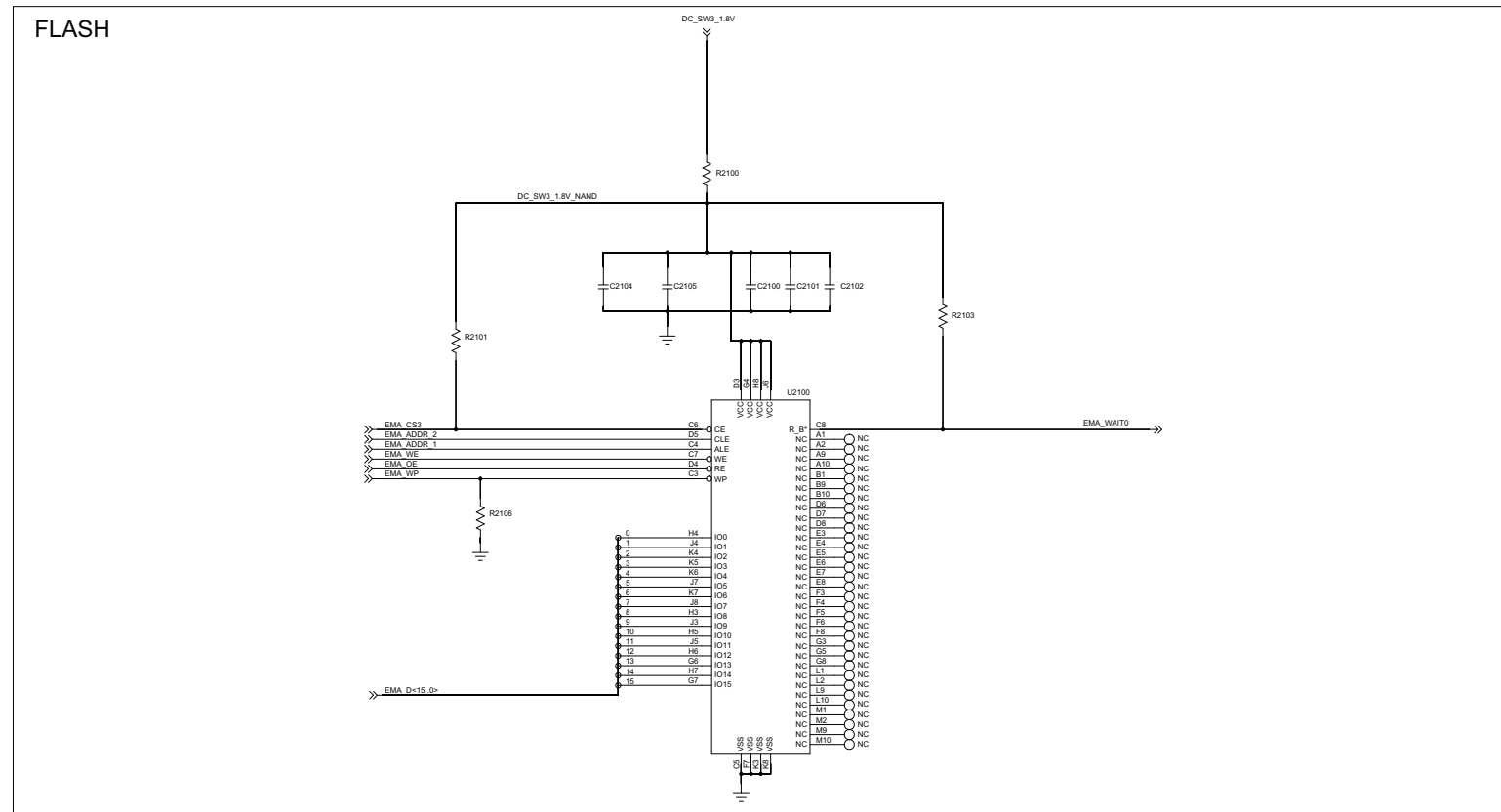


Figure 6-9. Memory Schematic Diagram

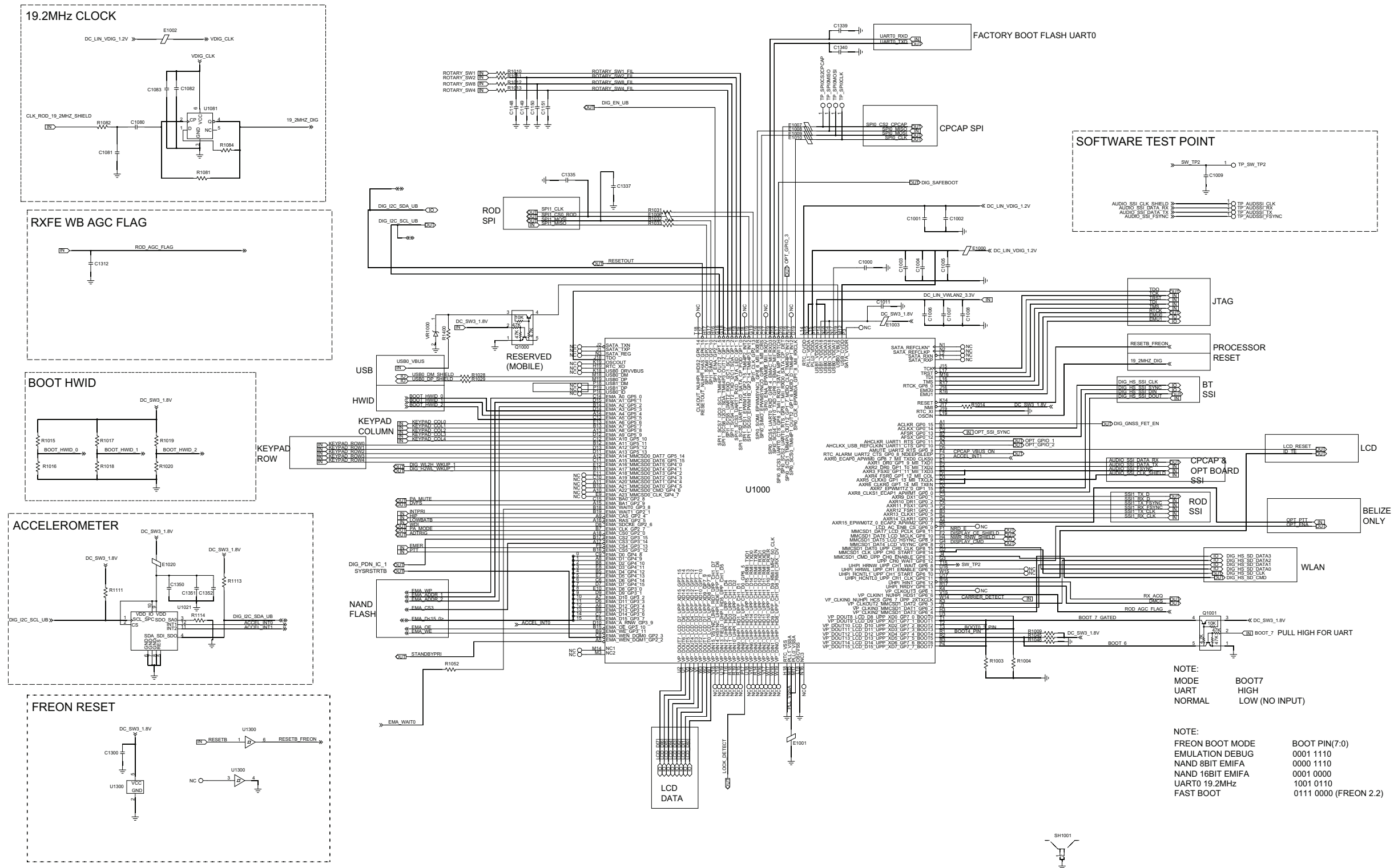


Figure 6-10. Microprocessor Schematic Diagram (1 of 2)



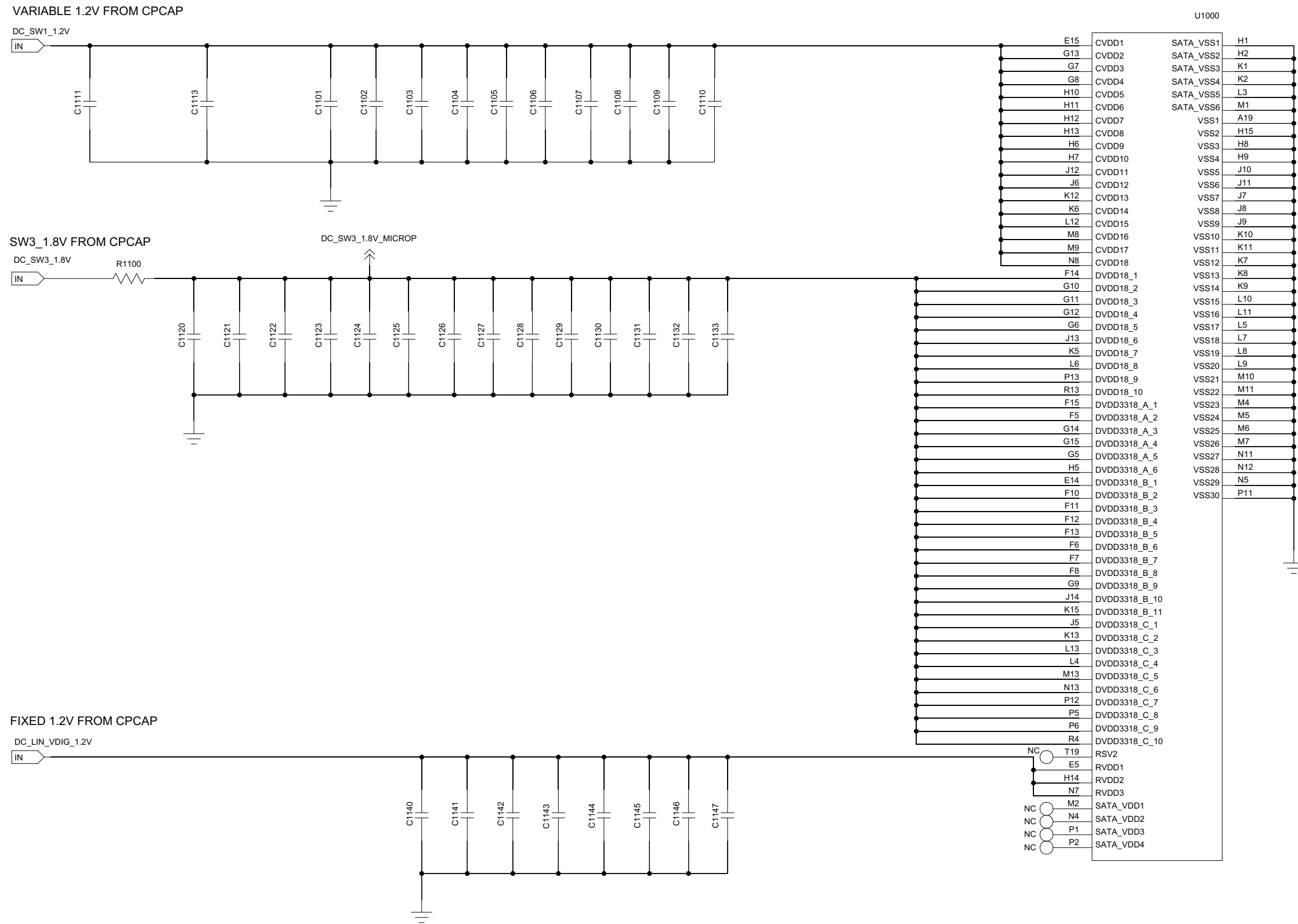


Figure 6-11. Microprocessor Schematic Diagram (2 of 2)

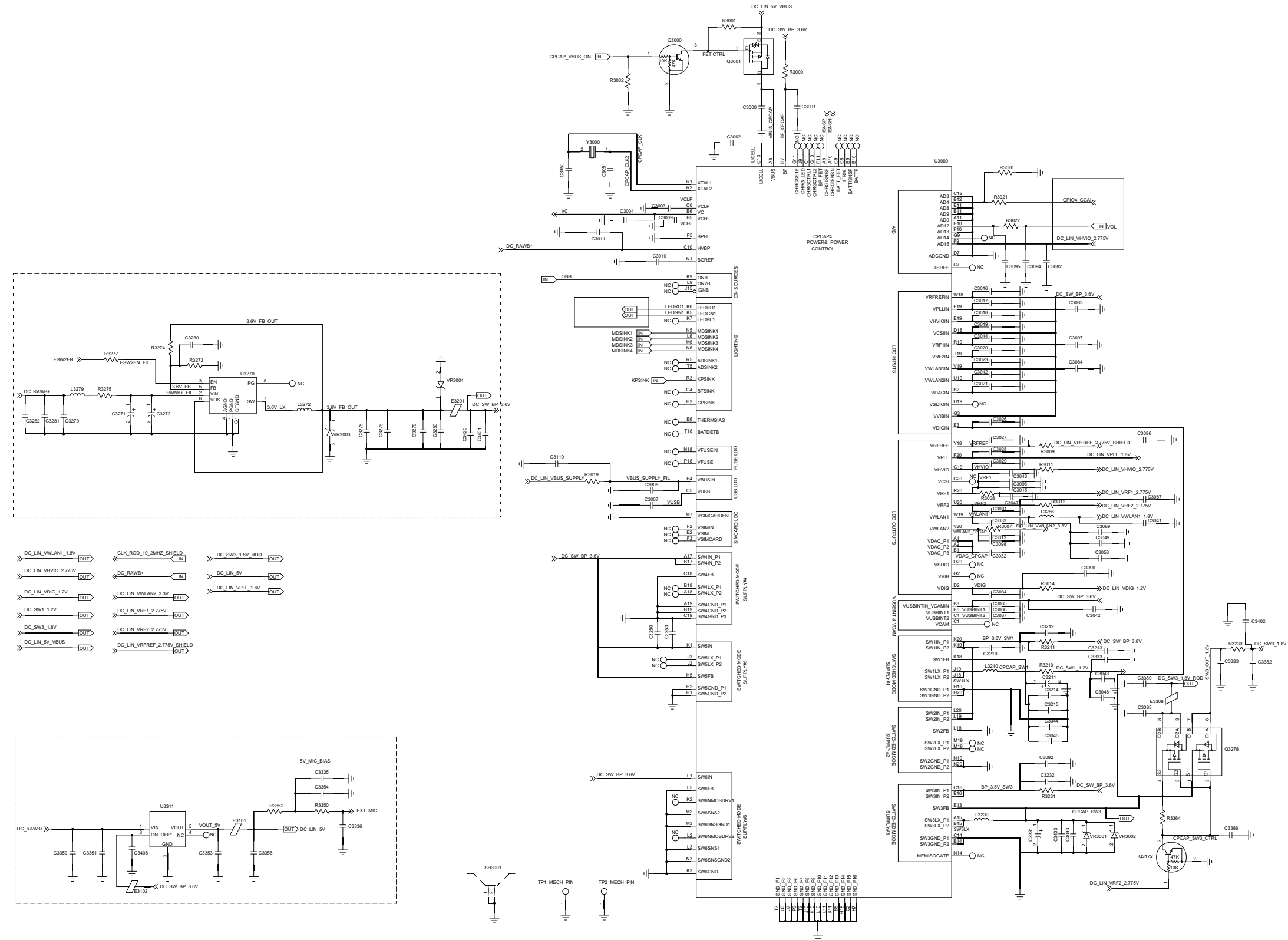


Figure 6-12. Power Management and Audio Schematic Diagram (1 of 3)

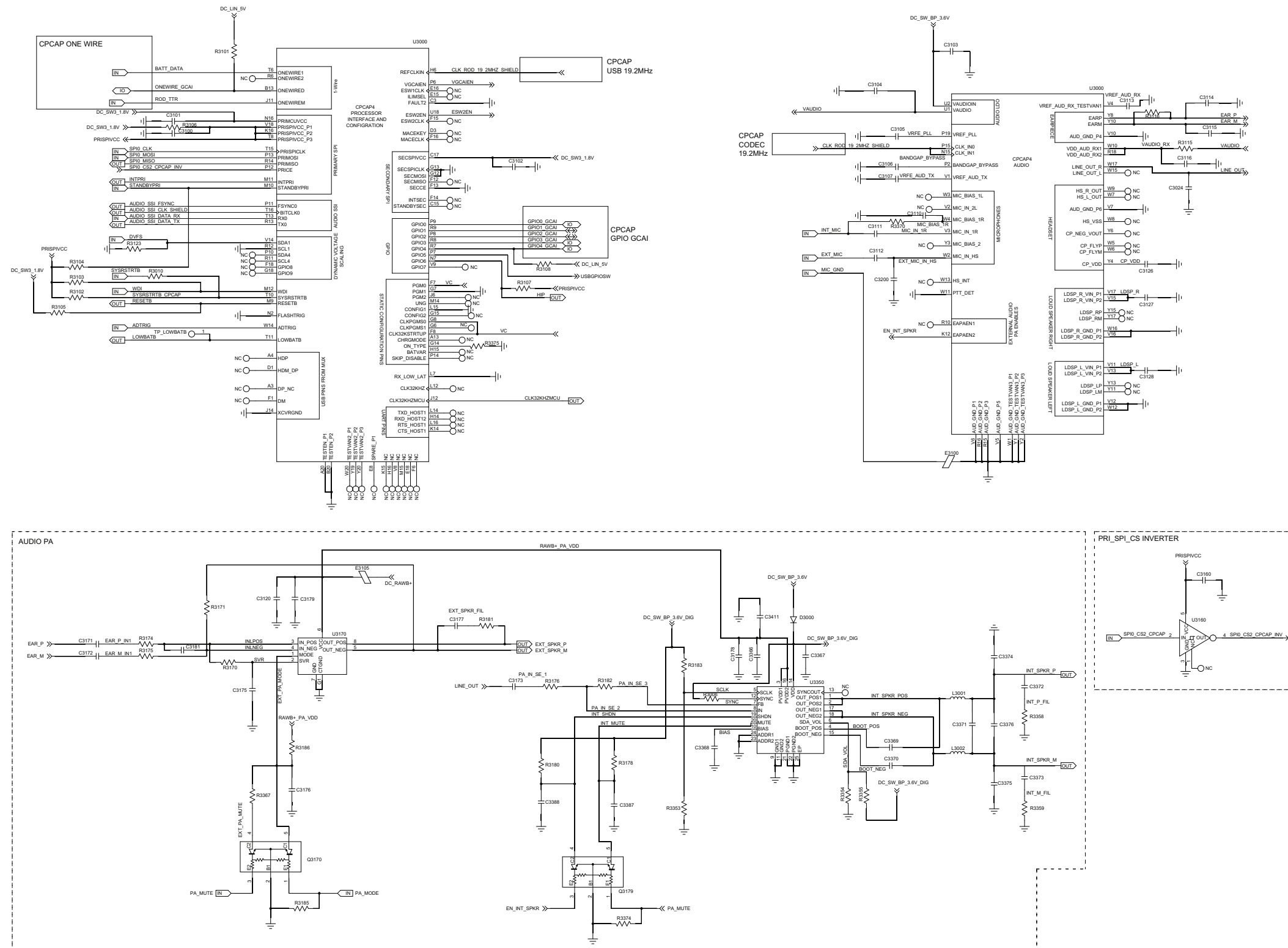


Figure 6-13. Power Management and Audio Schematic Diagram (2 of 3)

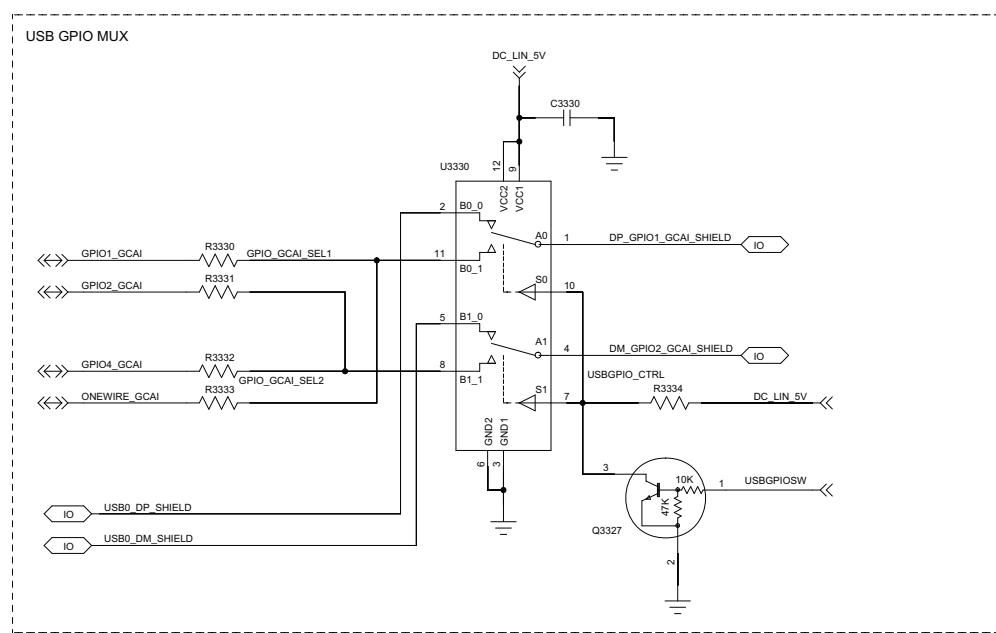
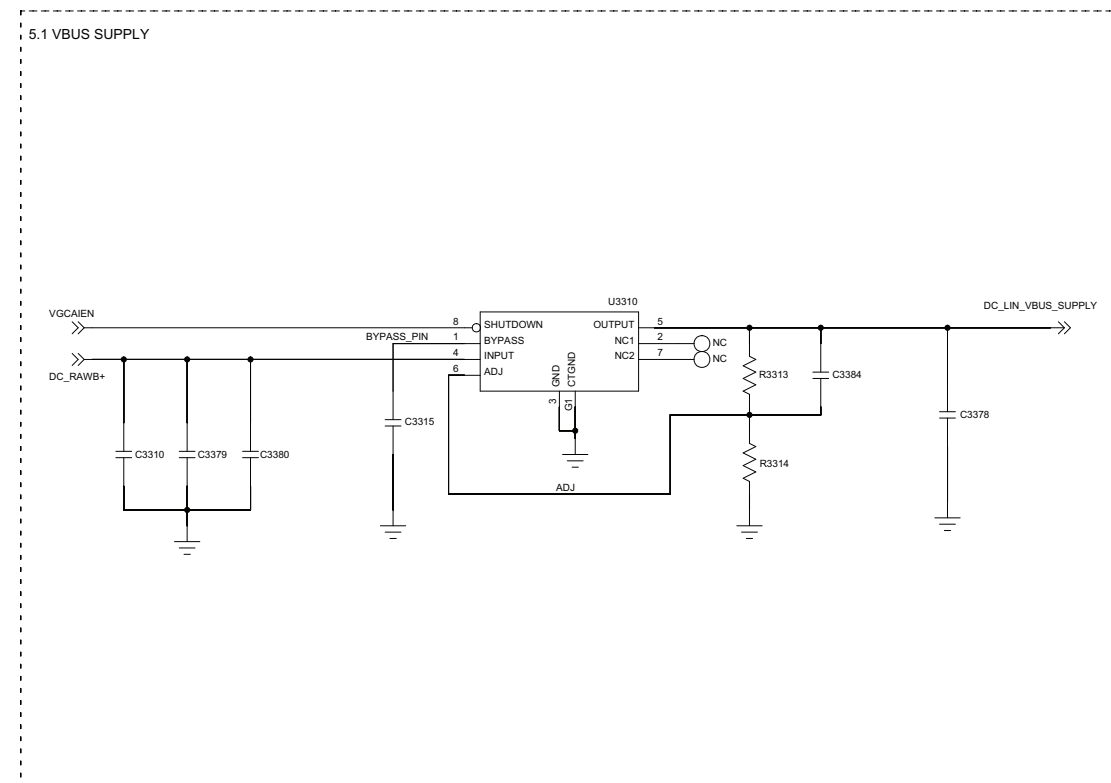
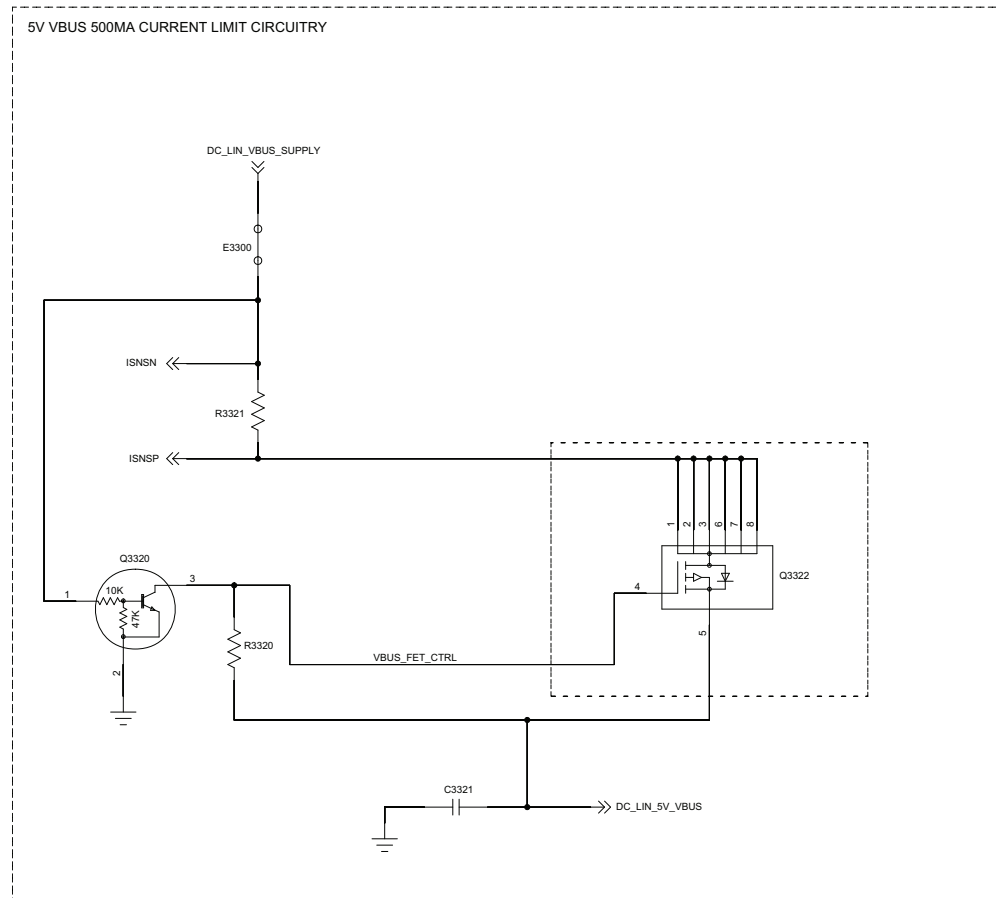


Figure 6-14. Power Management and Audio Schematic Diagram (3 of 3)

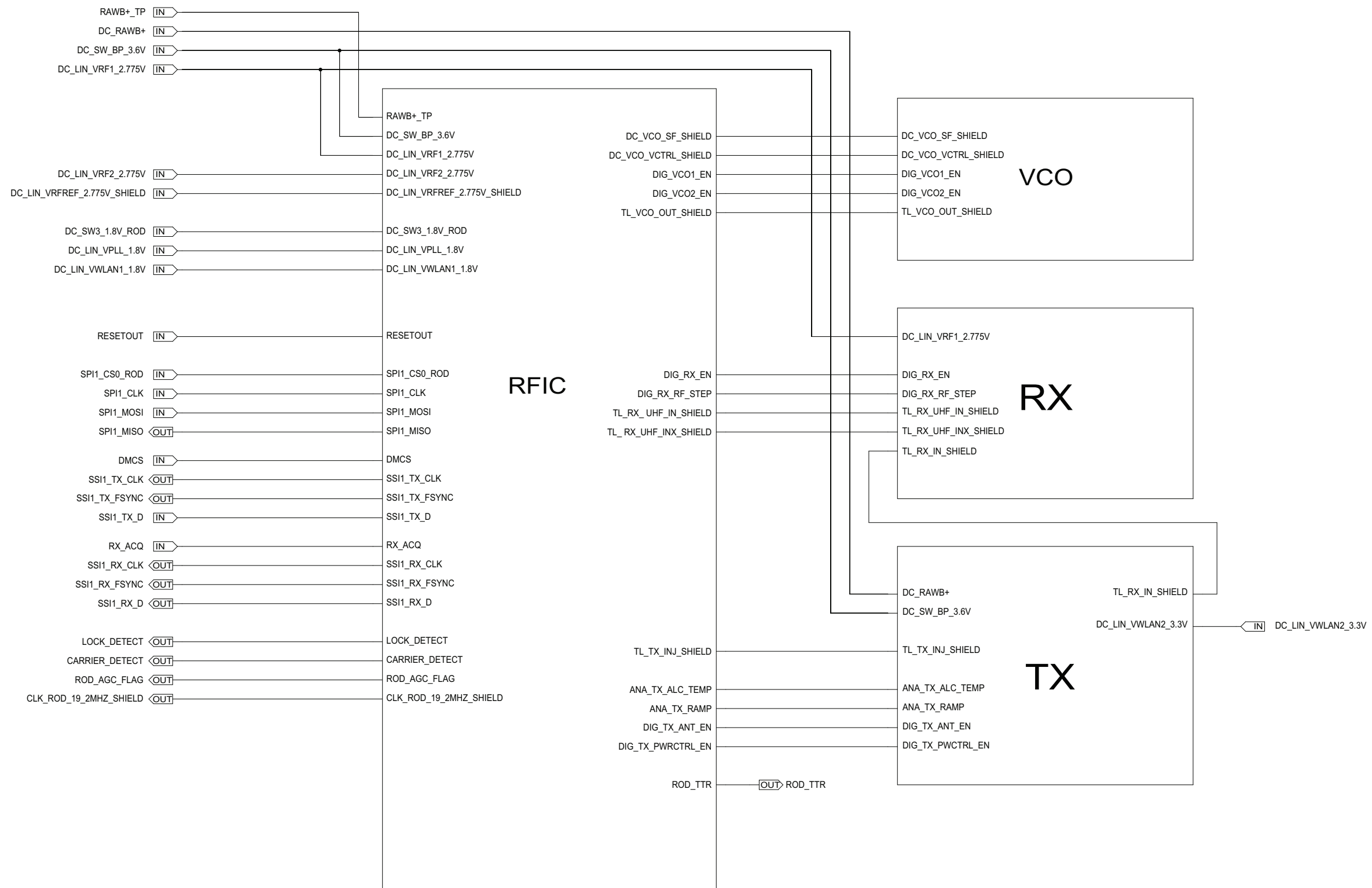


Figure 6-15. Overall RF Schematic Diagram

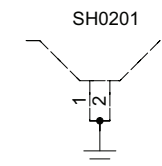
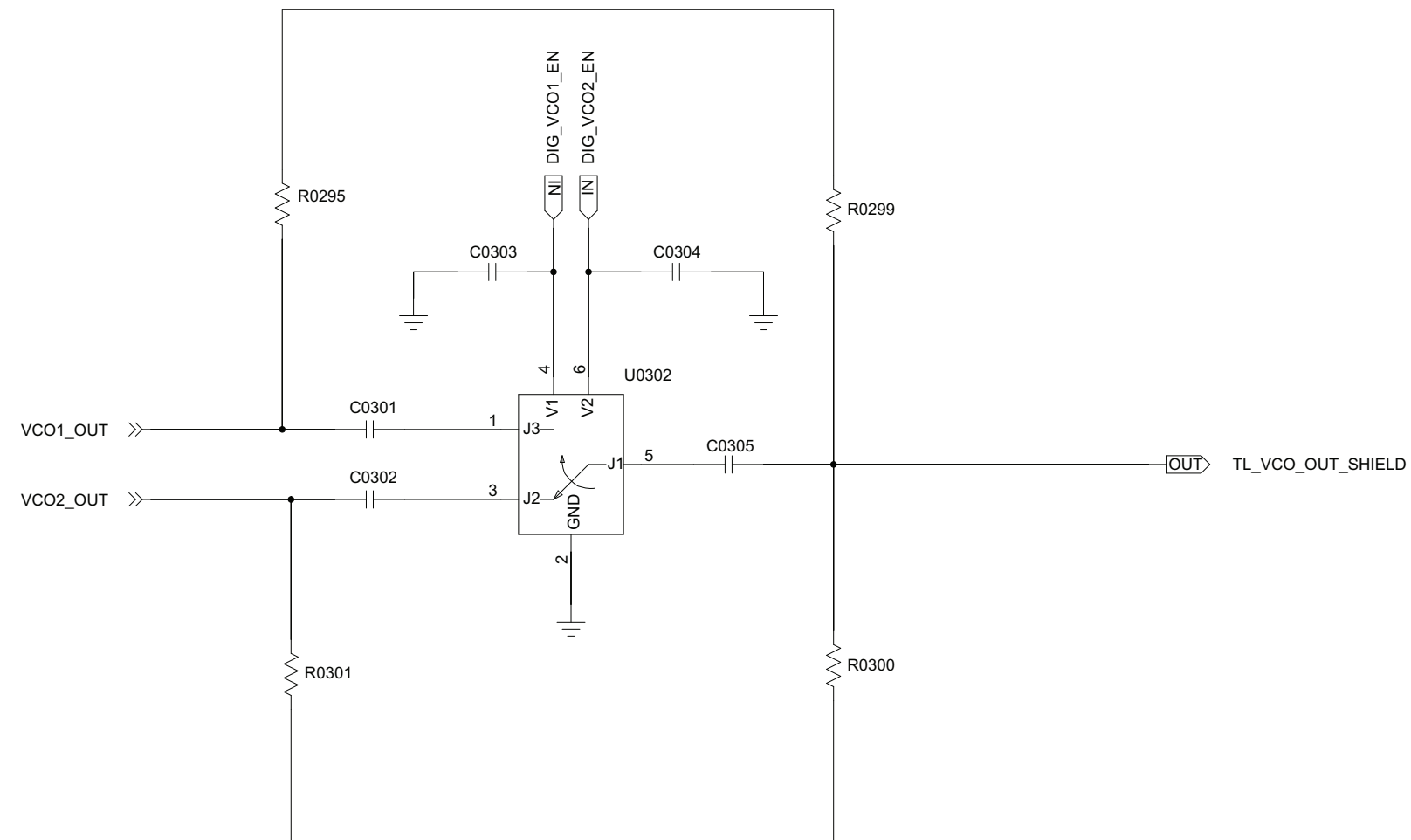


Figure 6-16. VCO Schematic Diagram (1 of 3)

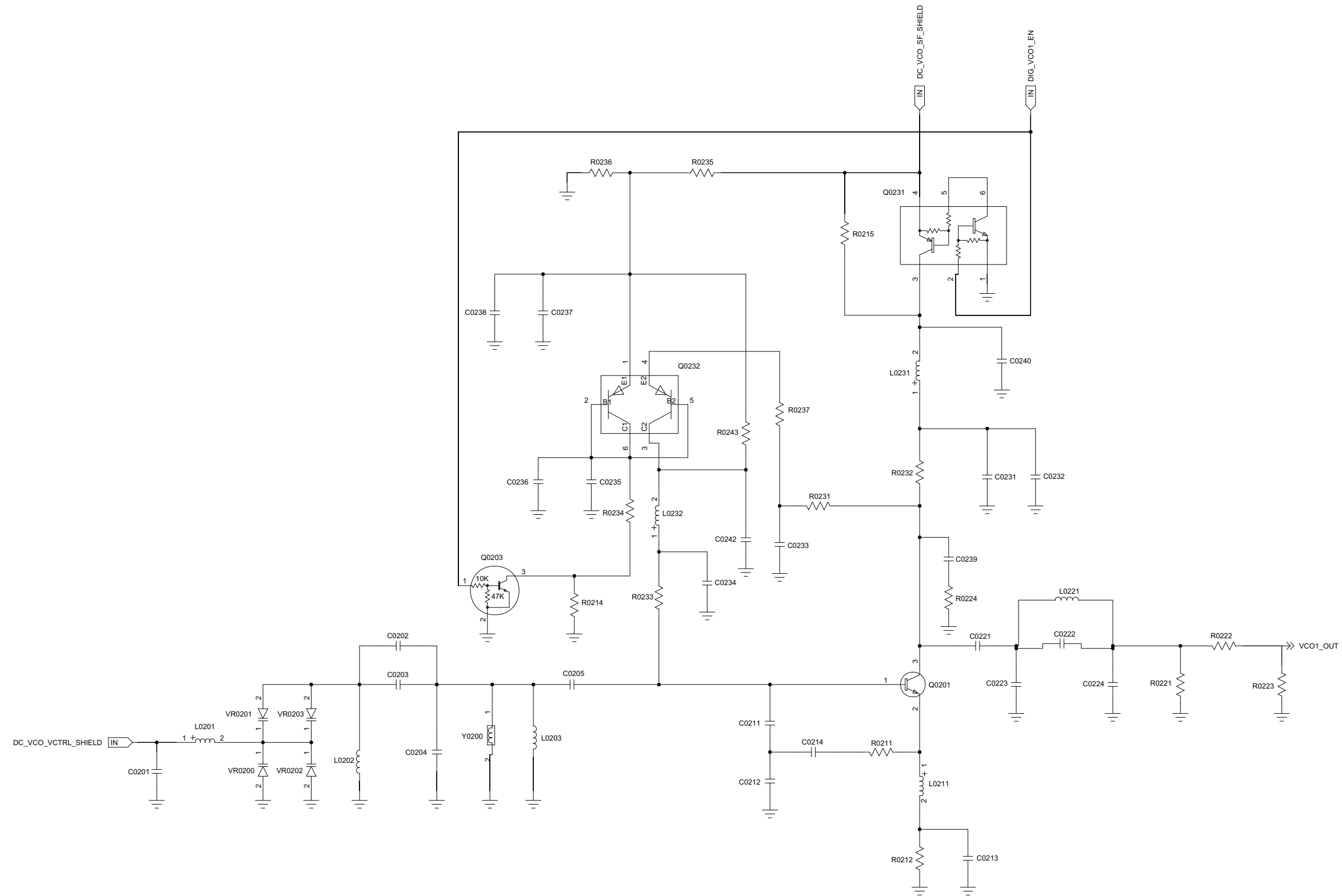


Figure 6-17. VCO Schematic Diagram (2 of 3)

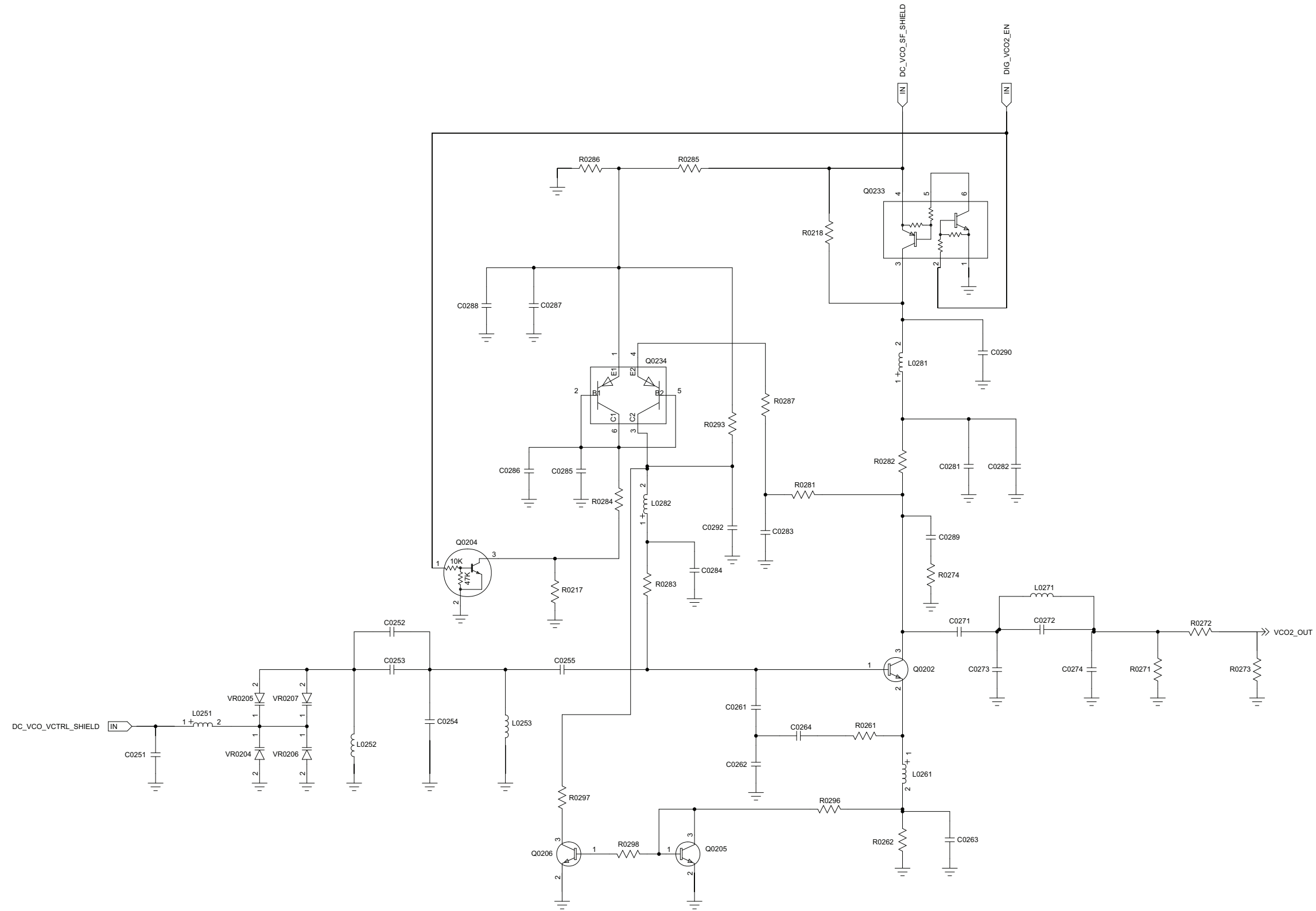


Figure 6-18. VCO Schematic Diagram (3 of 3)



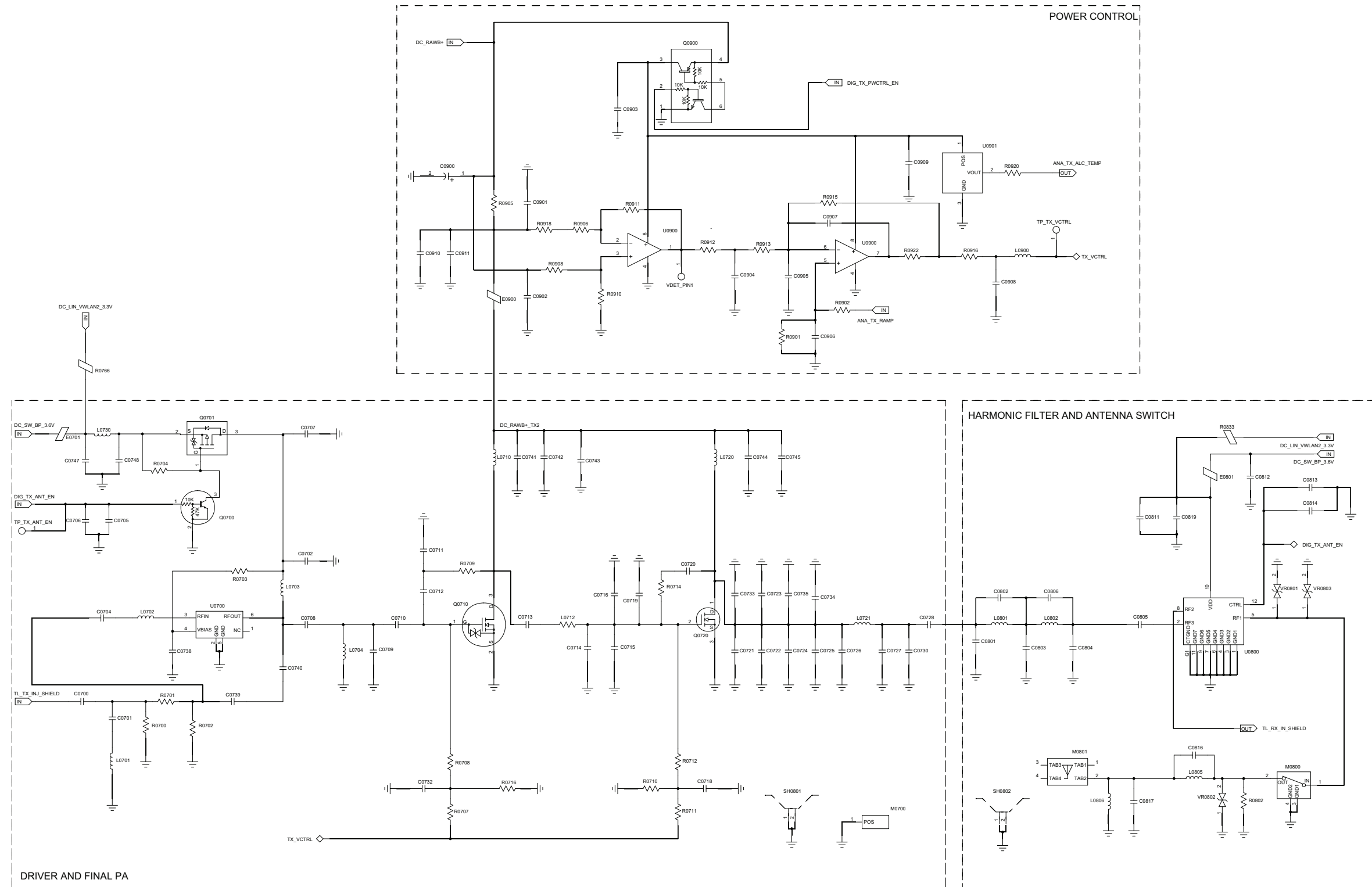


Figure 6-19. Transmitter Schematic Diagram

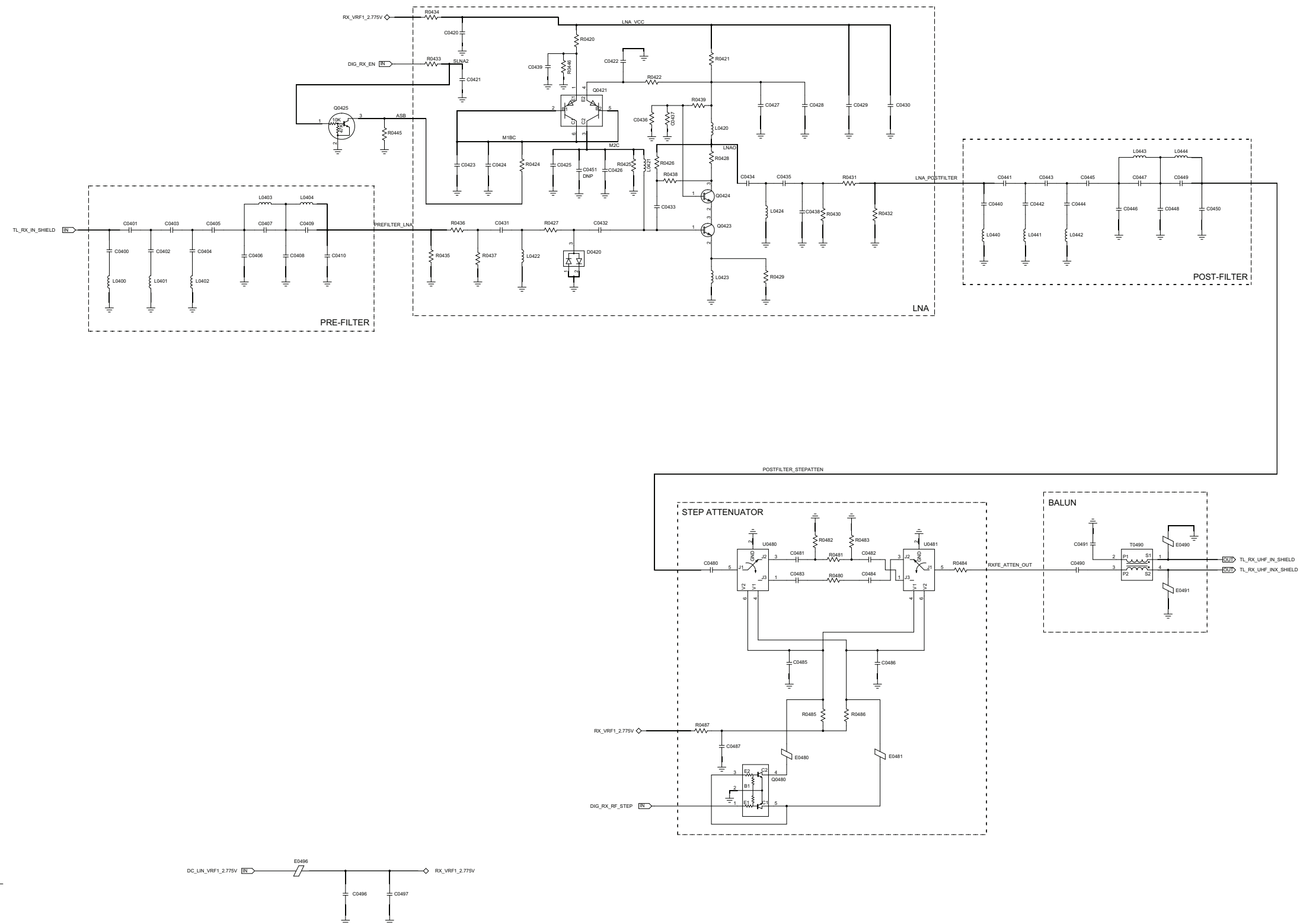


Figure 6-20. Receiver Schematic Diagram



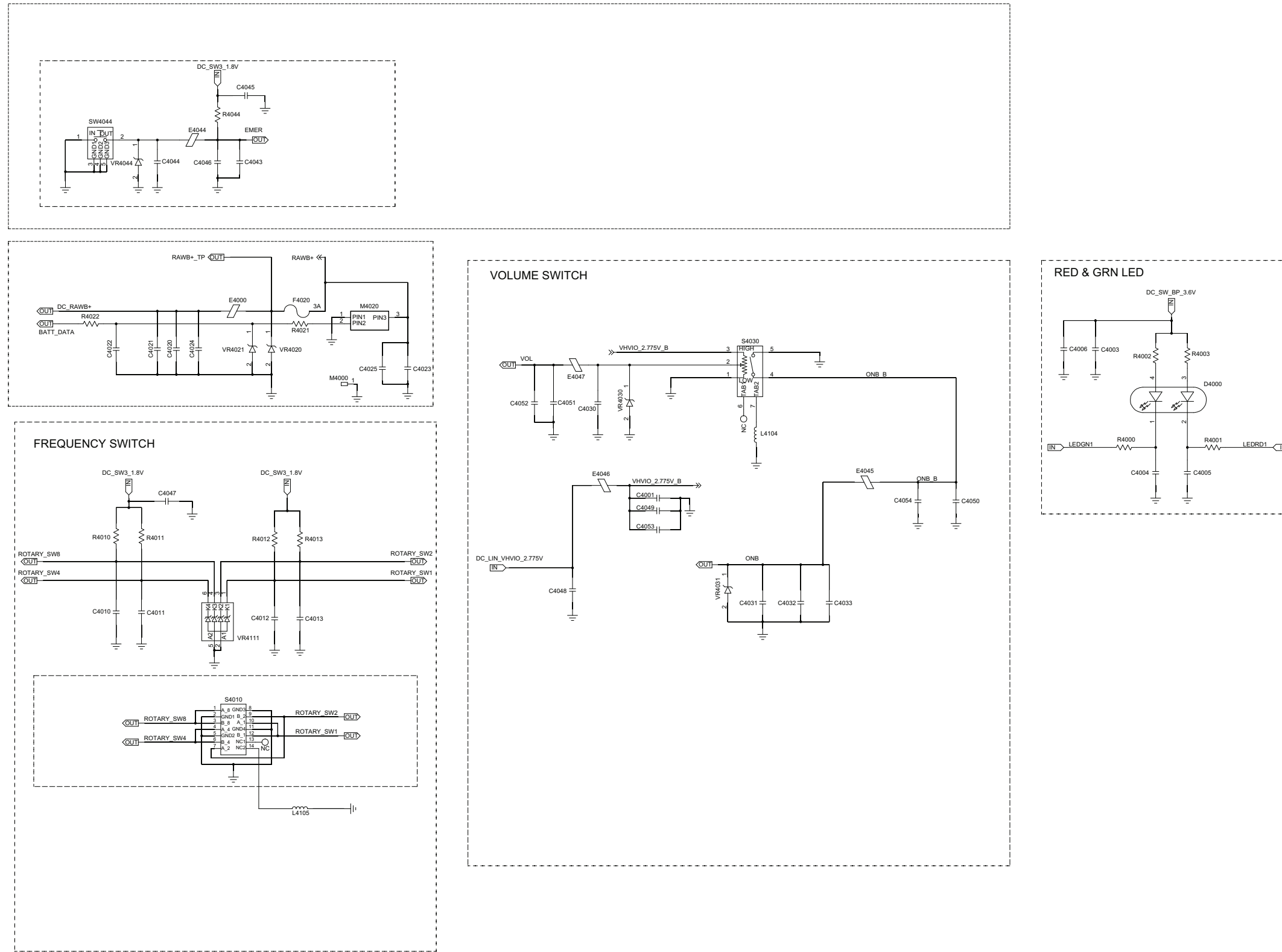


Figure 6-22. Peripheral Schematic Diagram (1 of 3)

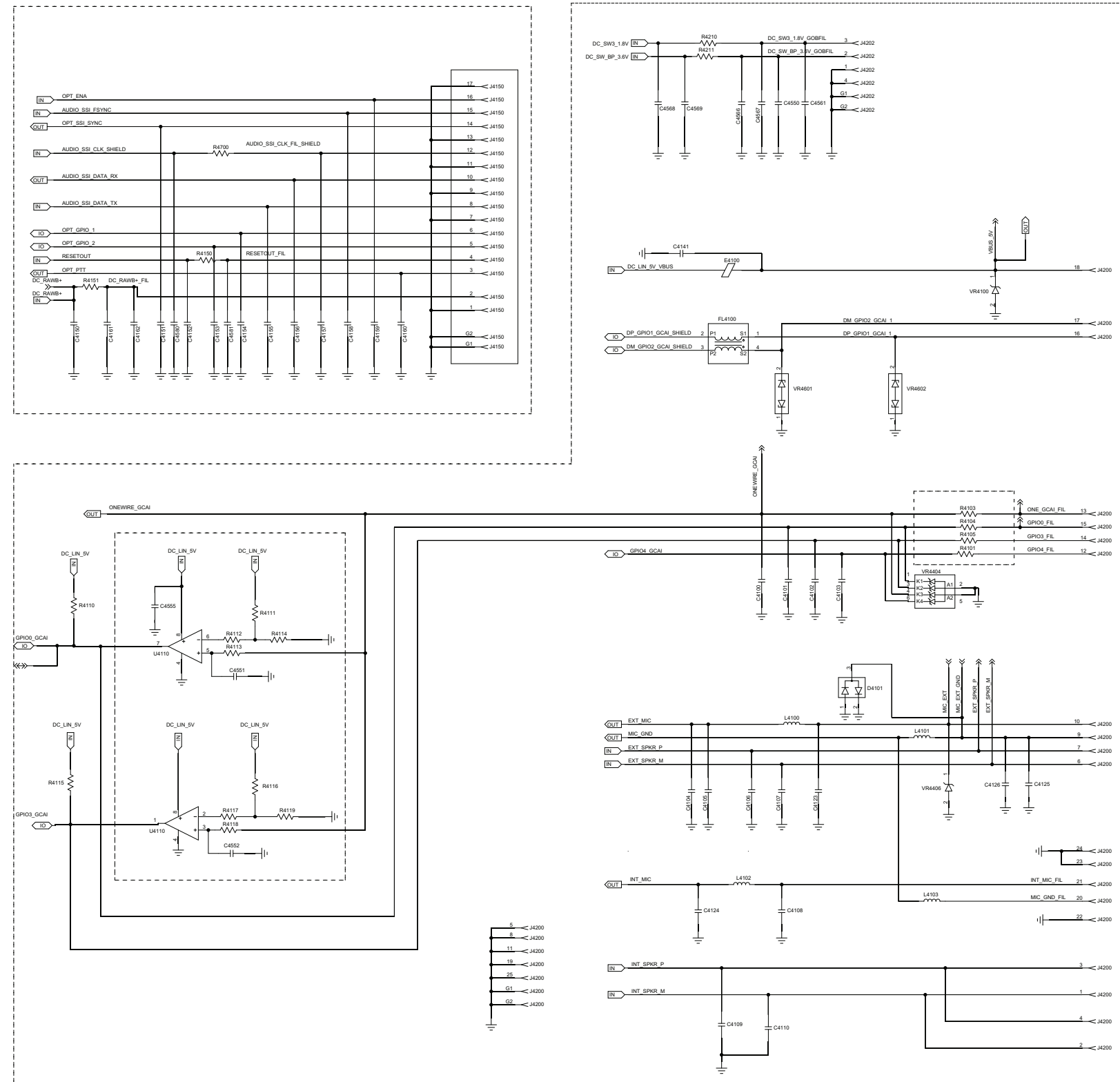


Figure 6-23. Peripheral Schematic Diagram (2 of 3)

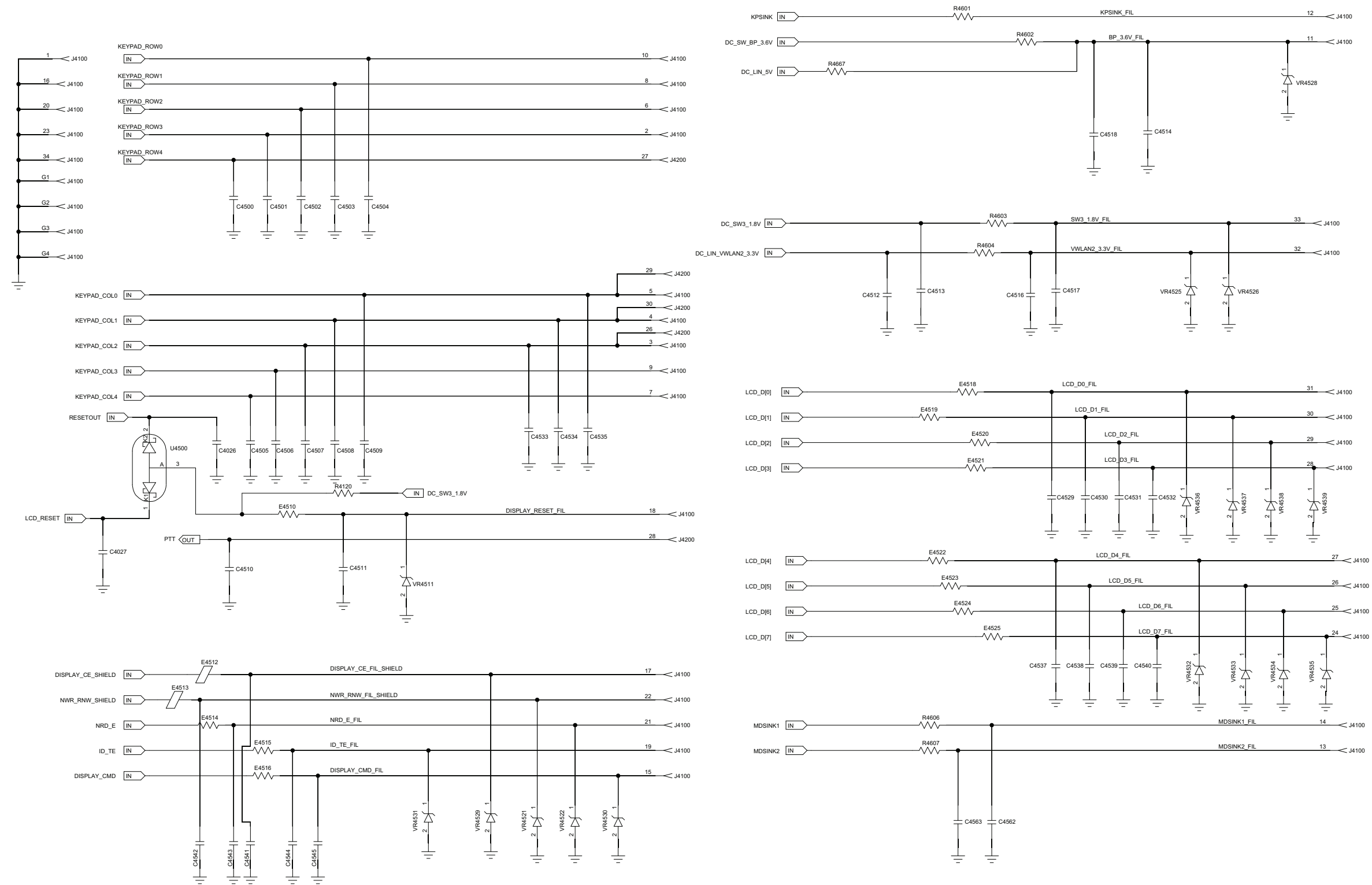


Figure 6-24. Peripheral Schematic Diagram (3 of 3)

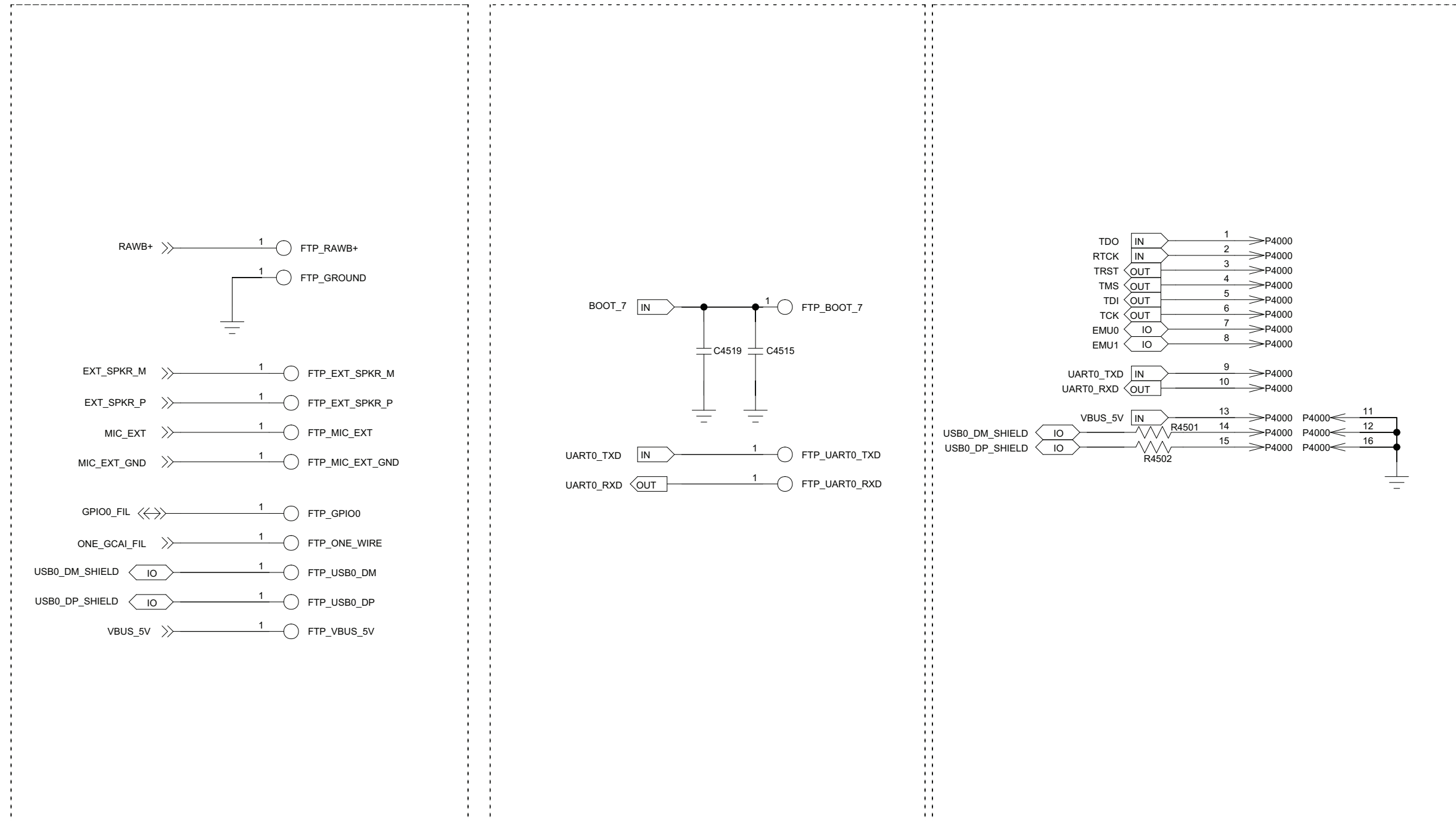


Figure 6-25. Factory Test Points Schematic Diagram

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

**Notes**



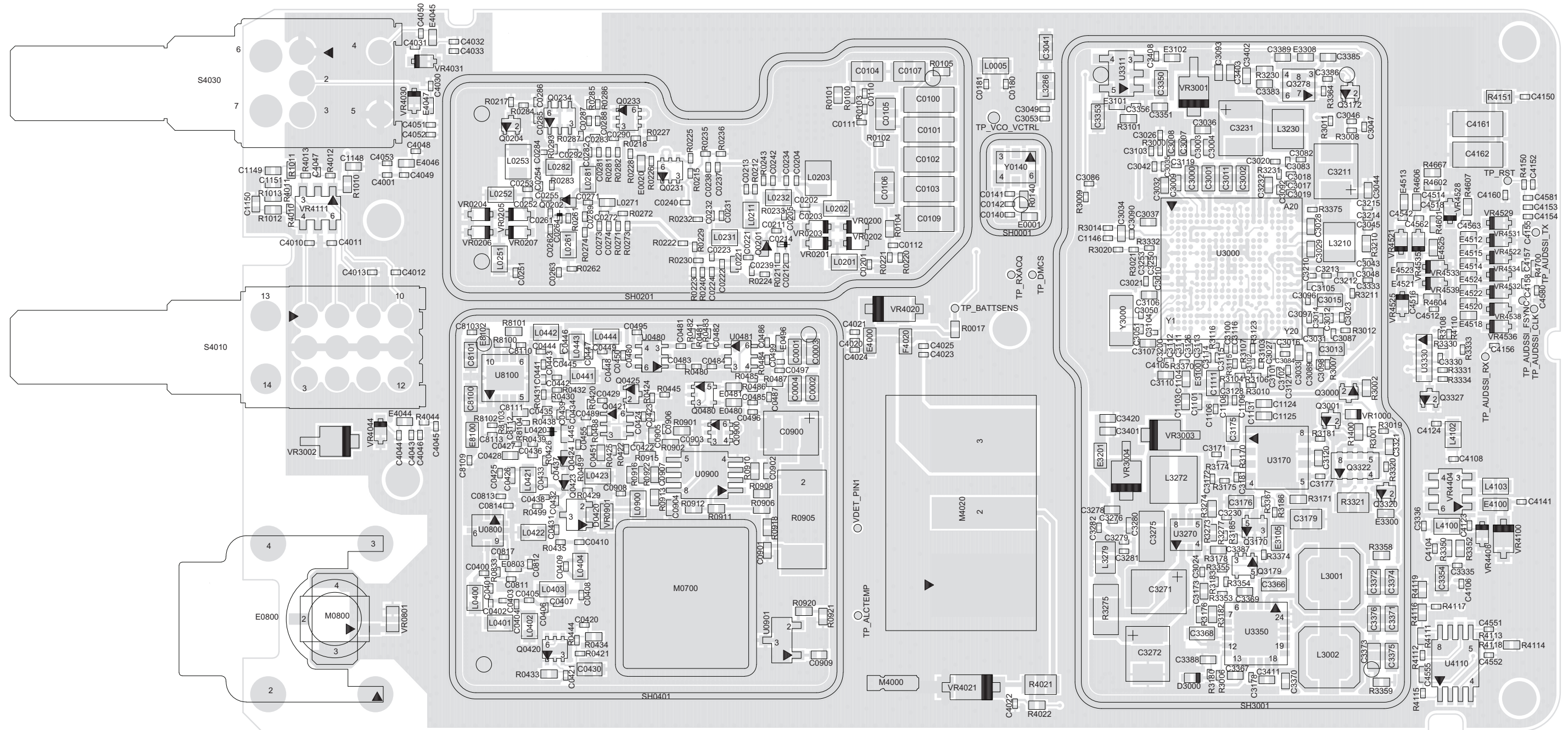


Figure 7-2. Main Board VHF Bottom Side PCB No. PC000975A01\_AA



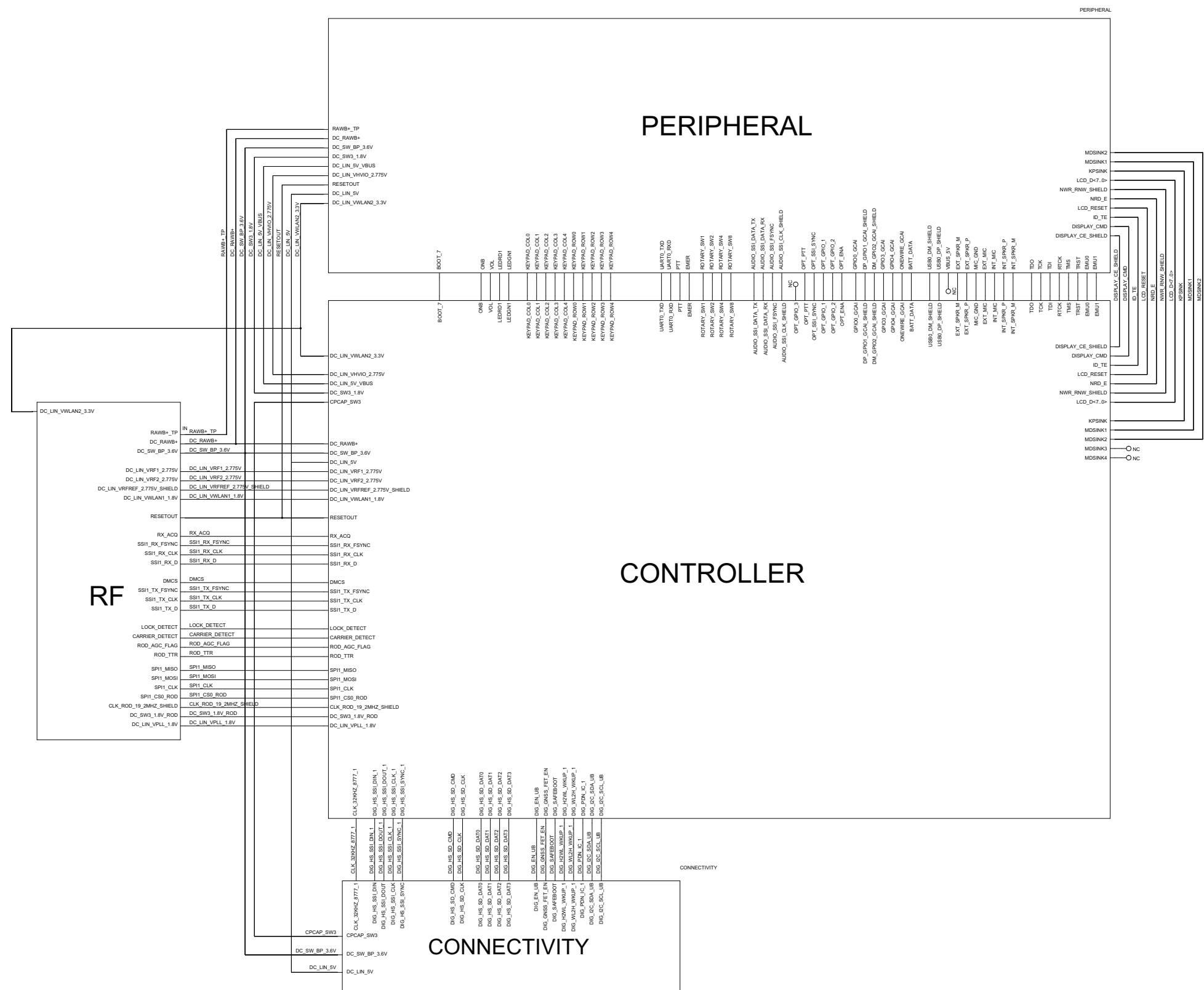


Figure 7-3. Complete Radio Schematic Diagram

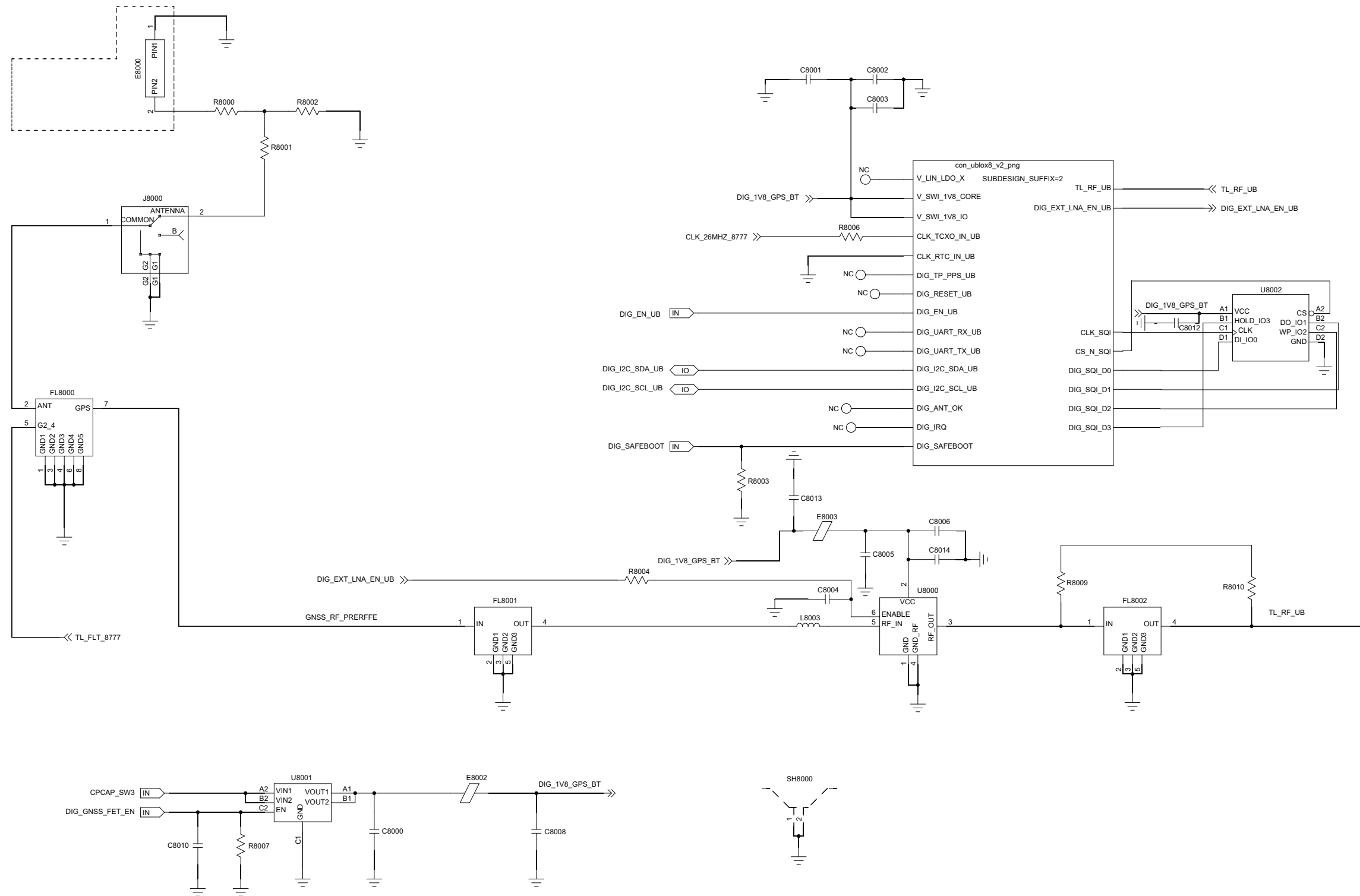


Figure 7-4. GNSS Schematic Diagram

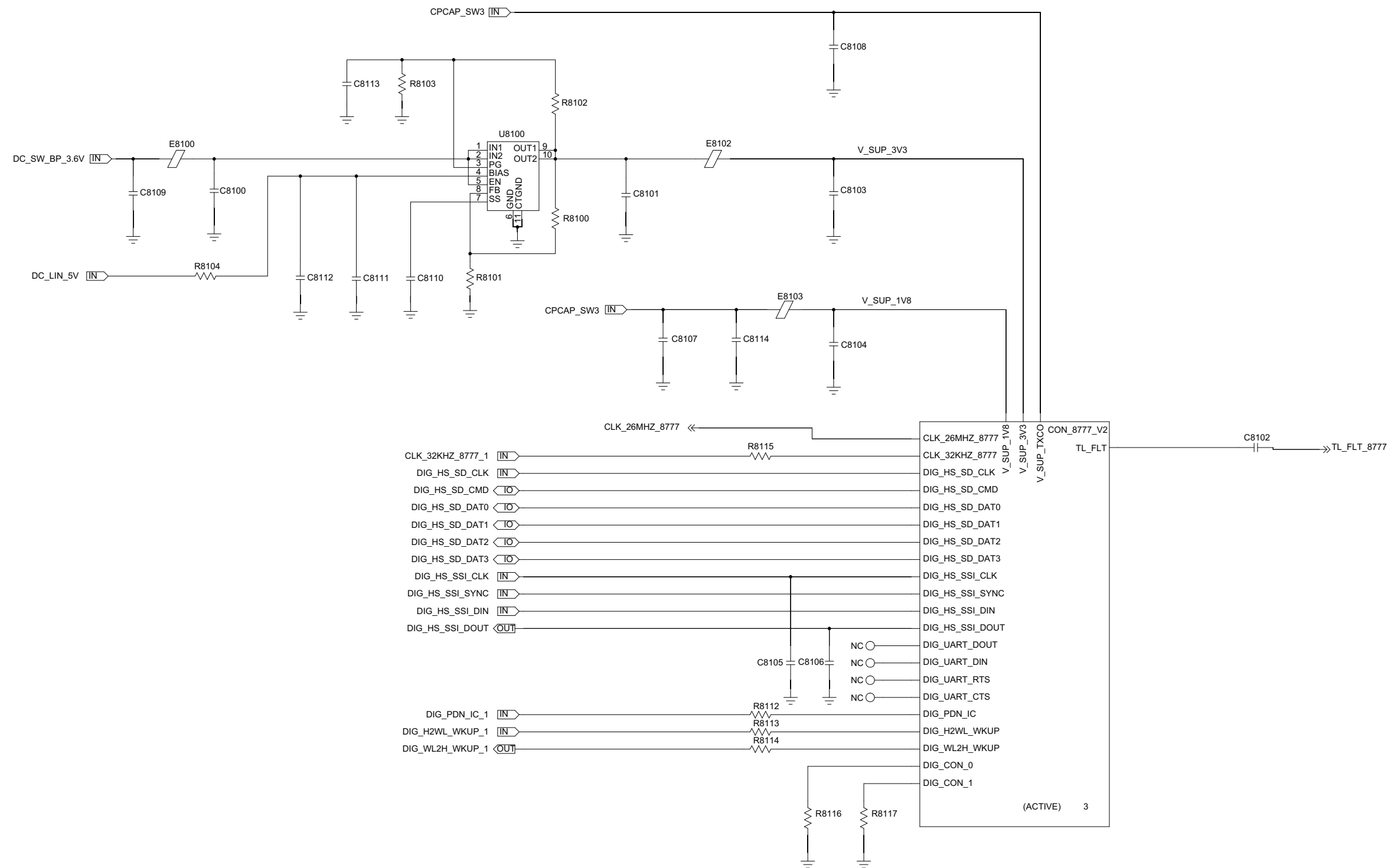


Figure 7-5. Bluetooth and WiFi Schematic Diagram (1 of 3)

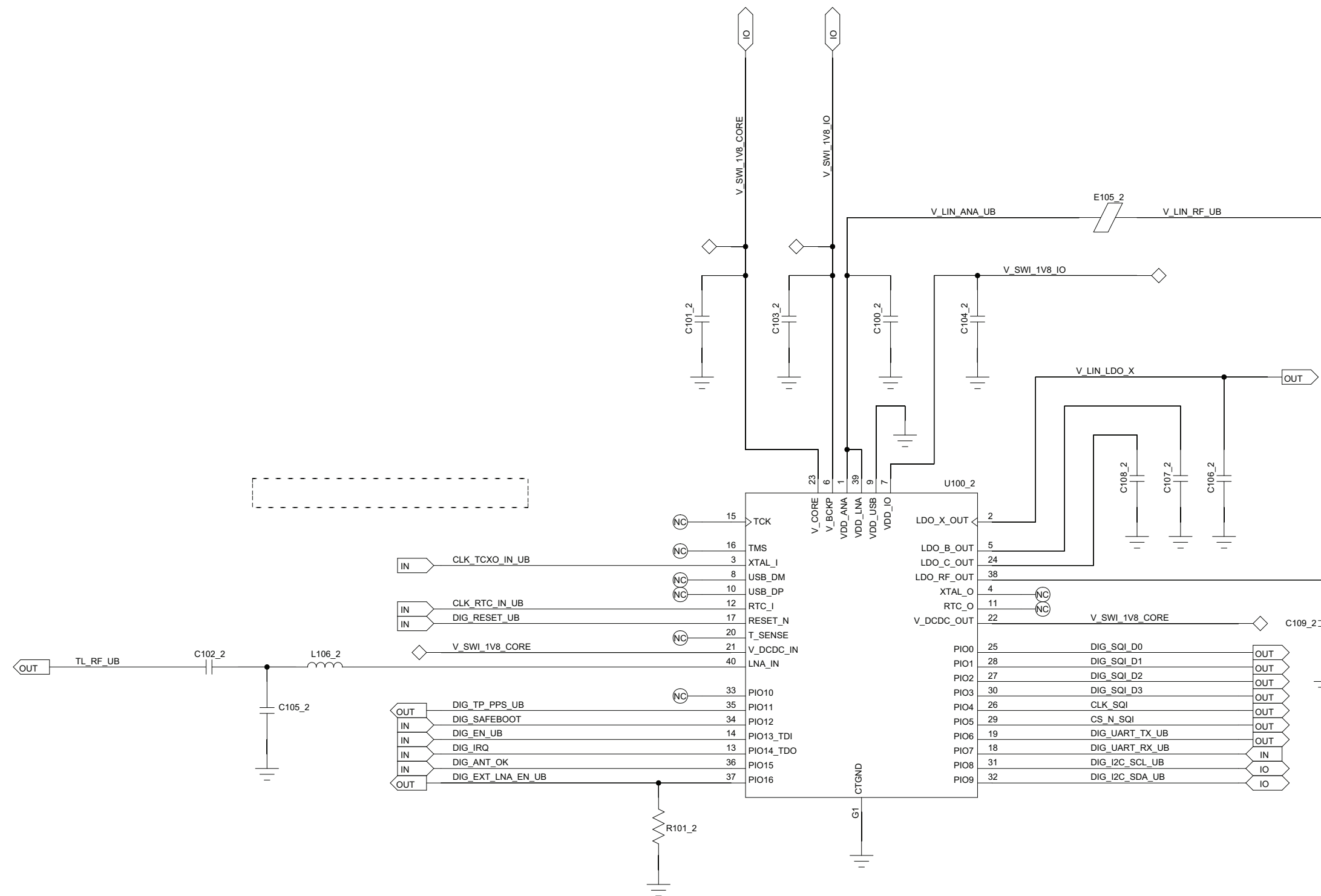


Figure 7-6. Bluetooth and WiFi Schematic Diagram (2 of 3)

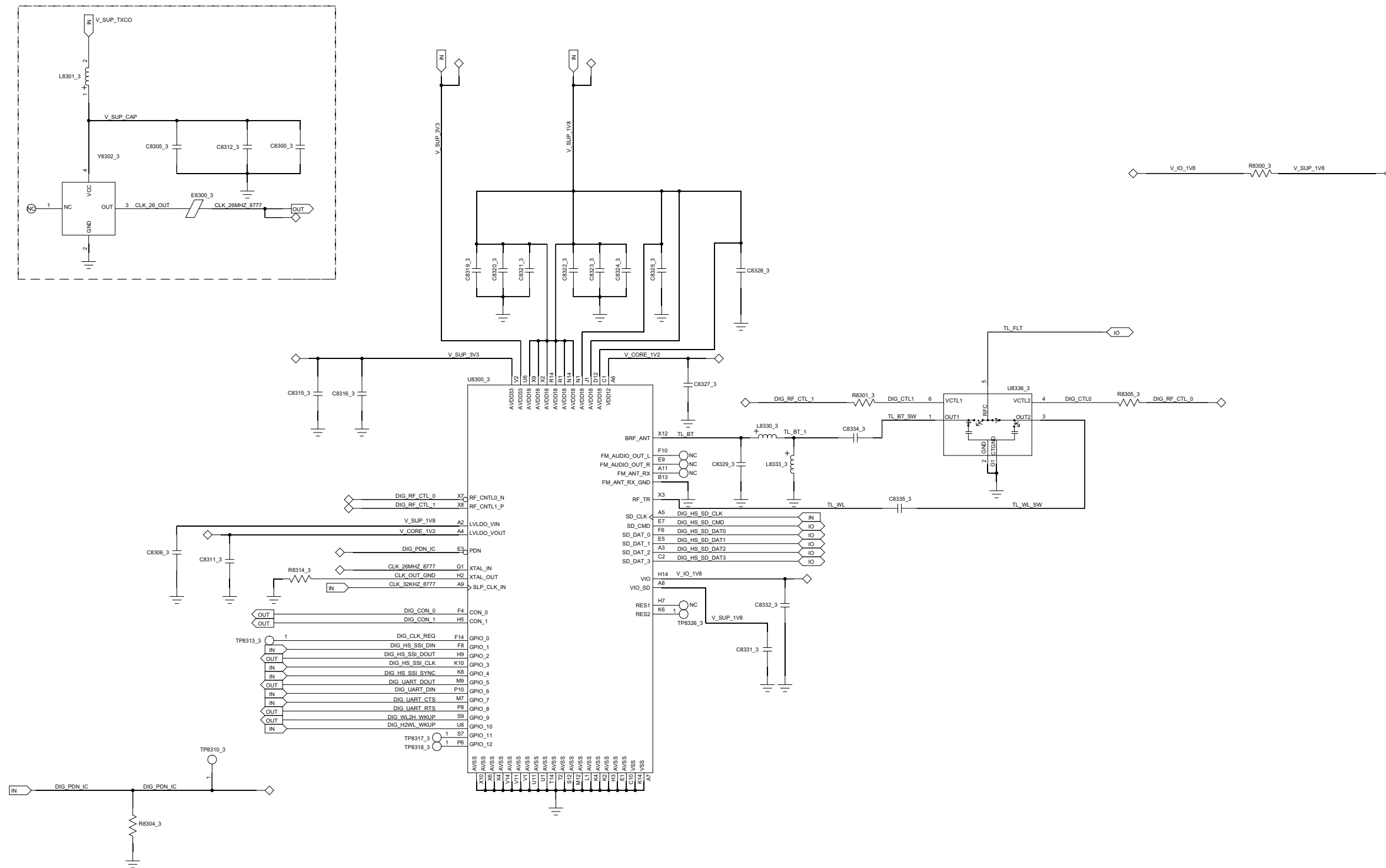


Figure 7-7. Bluetooth and WiFi Schematic Diagram (3 of 3)



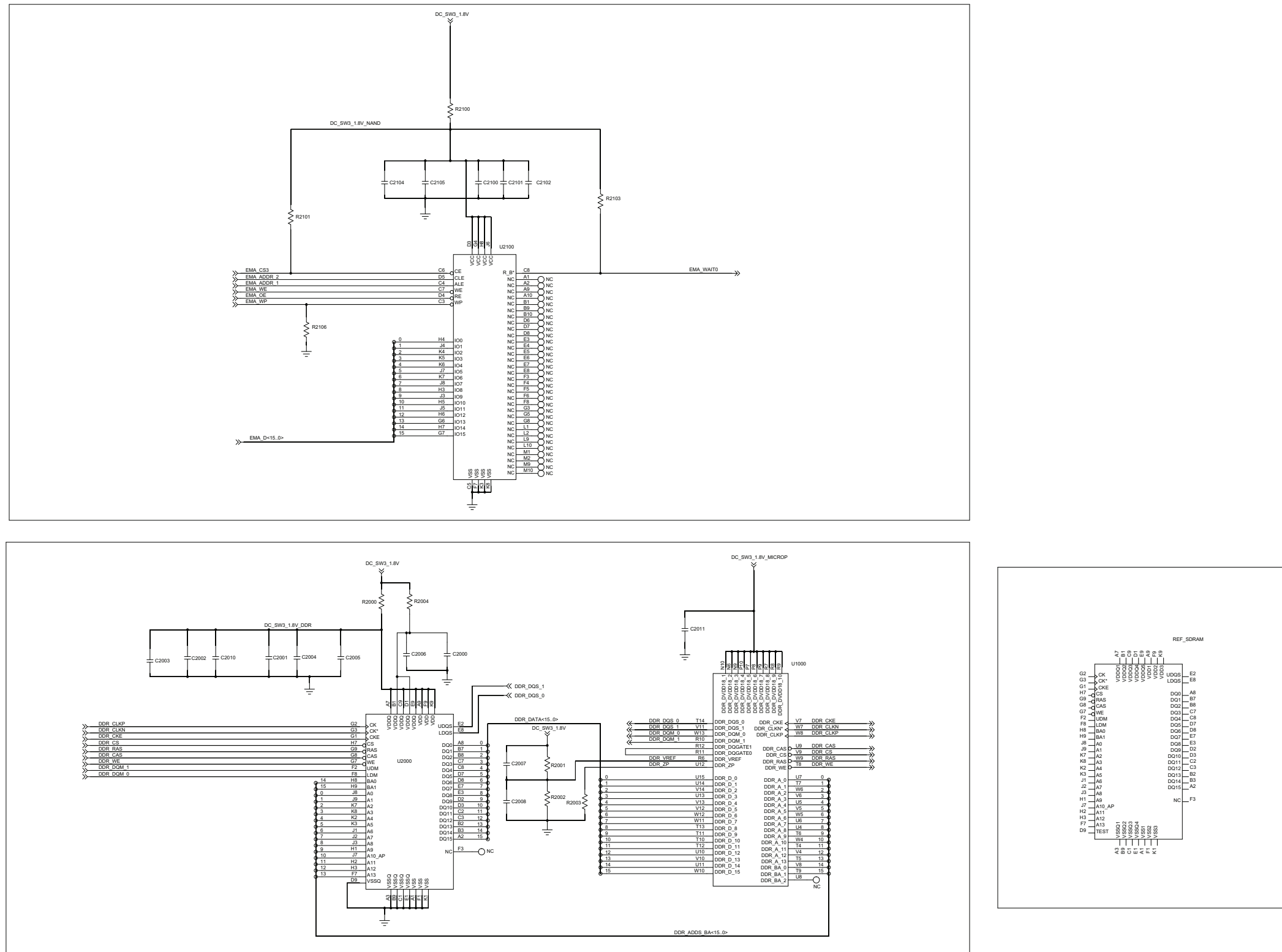


Figure 7-9. Memory Schematic Diagram





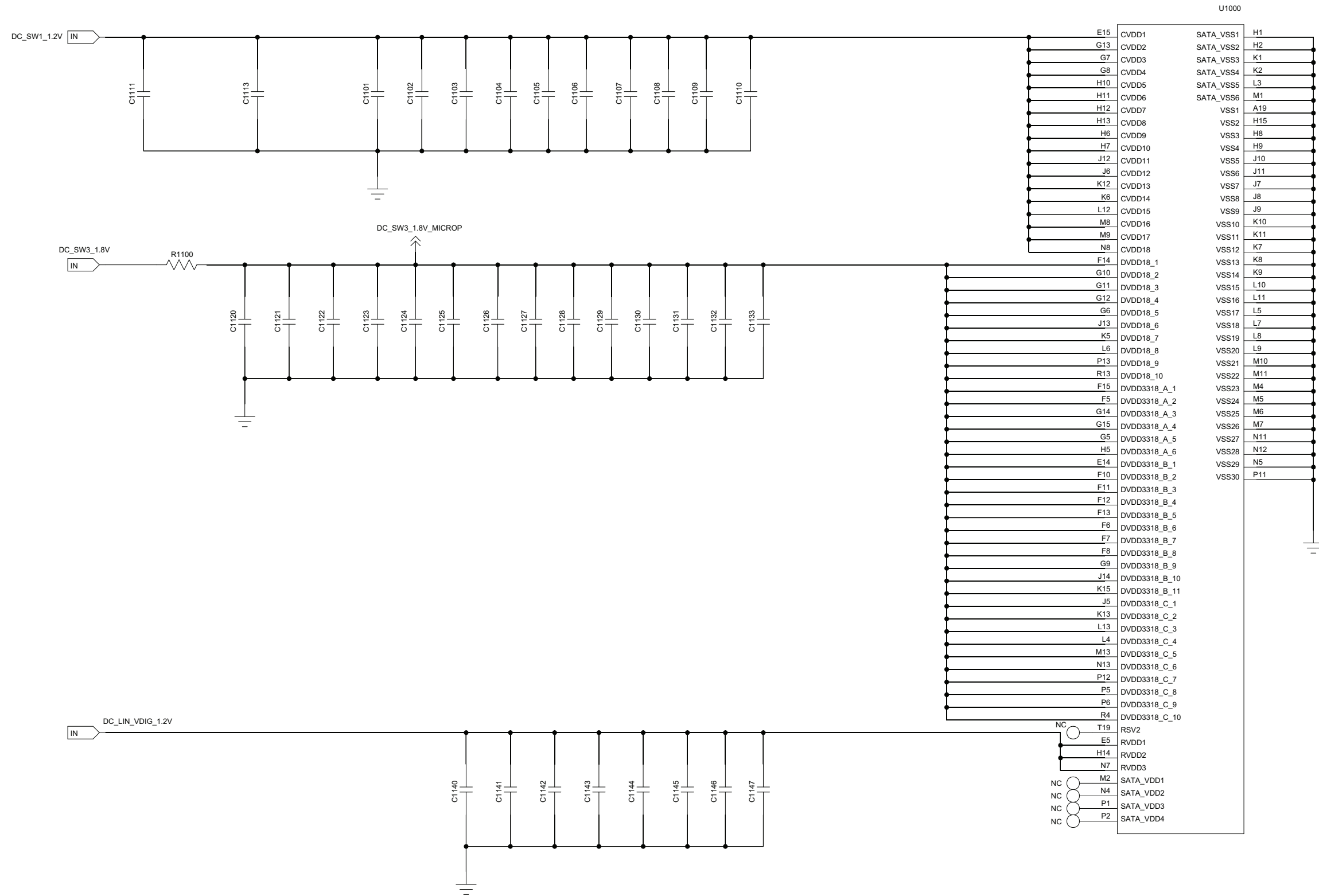


Figure 7-11. Microprocessor Schematic Diagram (2 of 2)





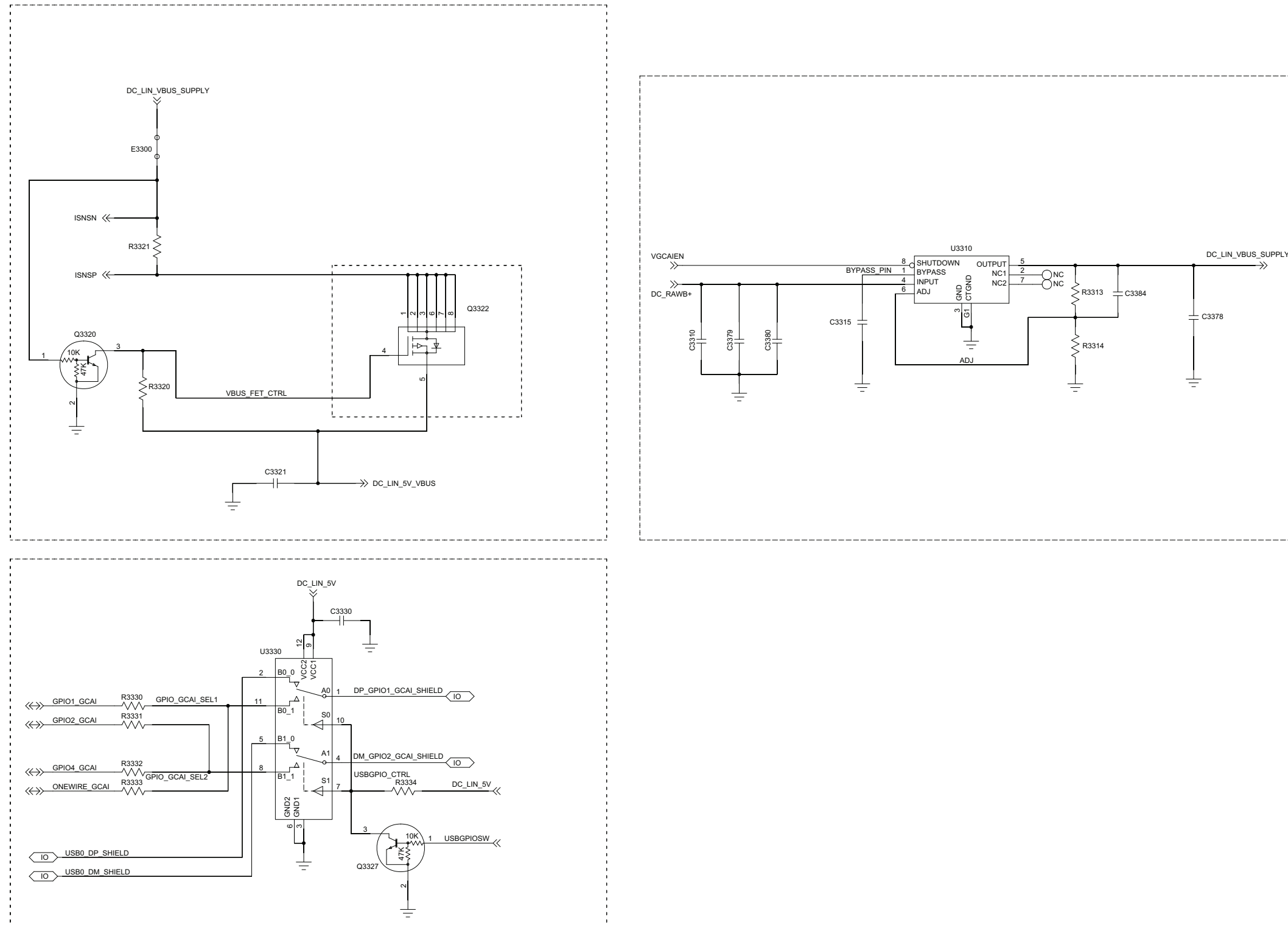


Figure 7-14. Power Management and Audio Schematic Diagram (3 of 3)

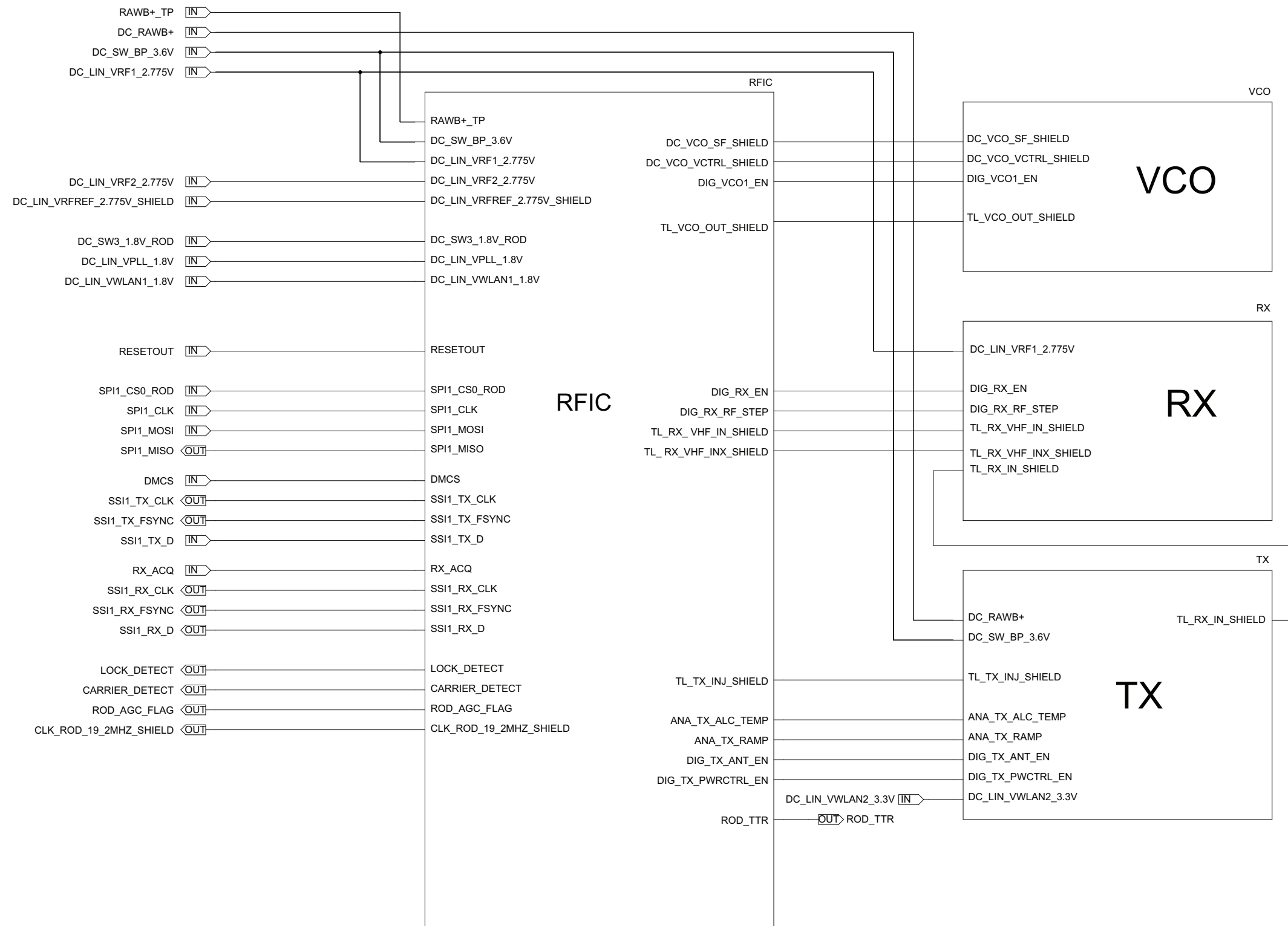


Figure 7-15. Overall RF Schematic Diagram

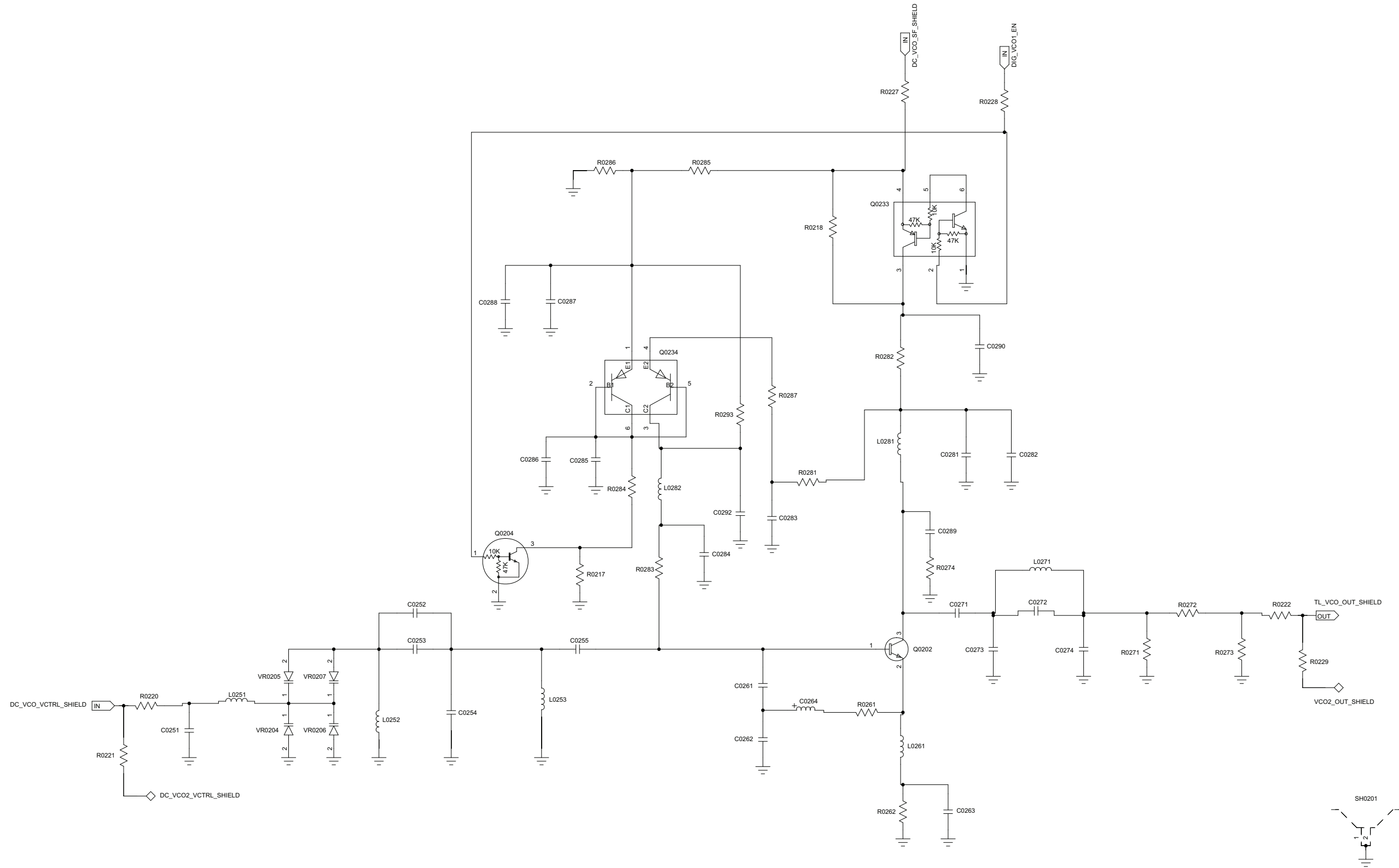


Figure 7-16. VCO Schematic Diagram (1 of 2)

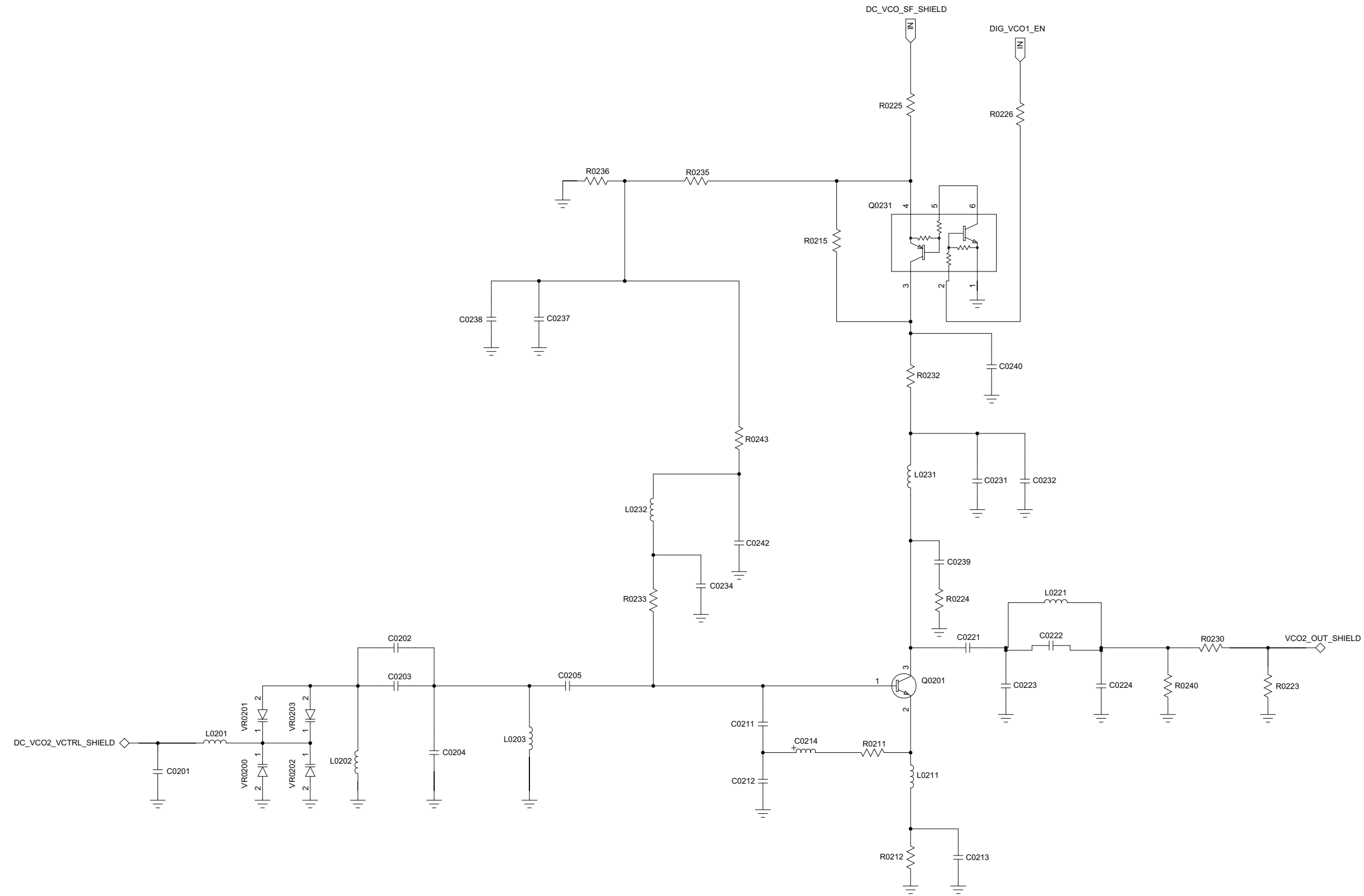


Figure 7-17. VCO Schematic Diagram (2 of 2)

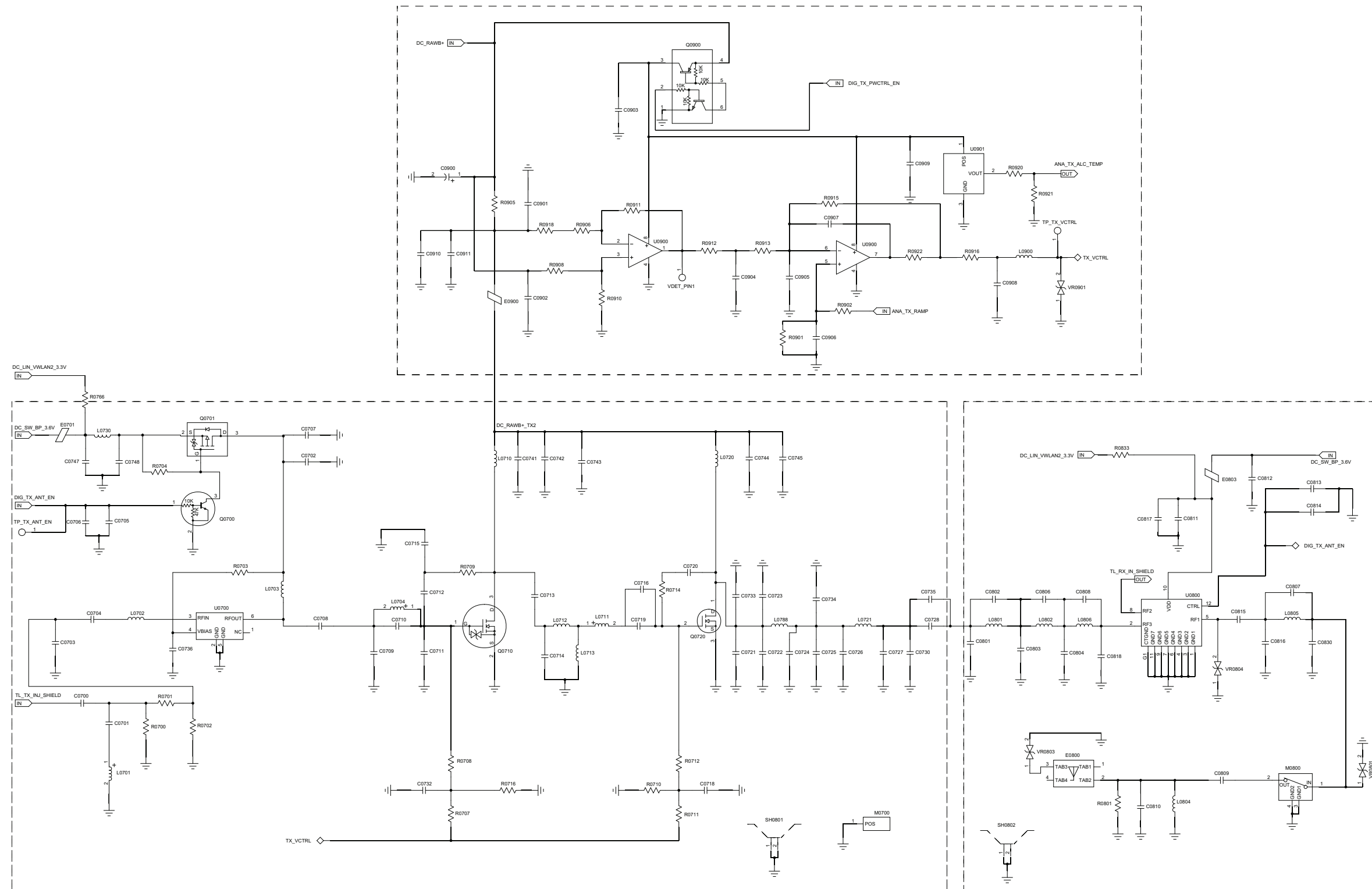


Figure 7-18. Transmitter Schematic Diagram







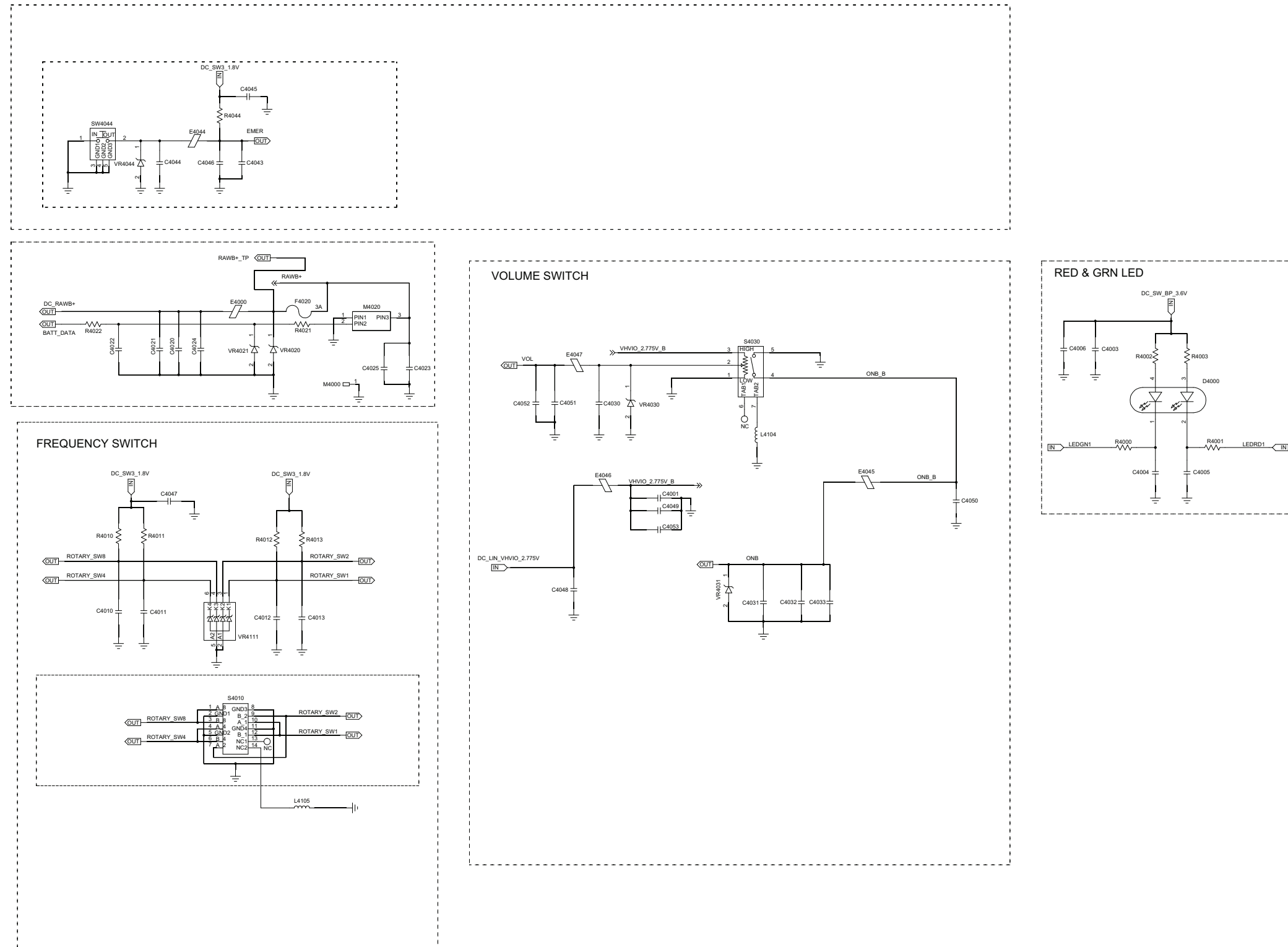


Figure 7-21. Peripheral Schematic Diagram (1 of 3)

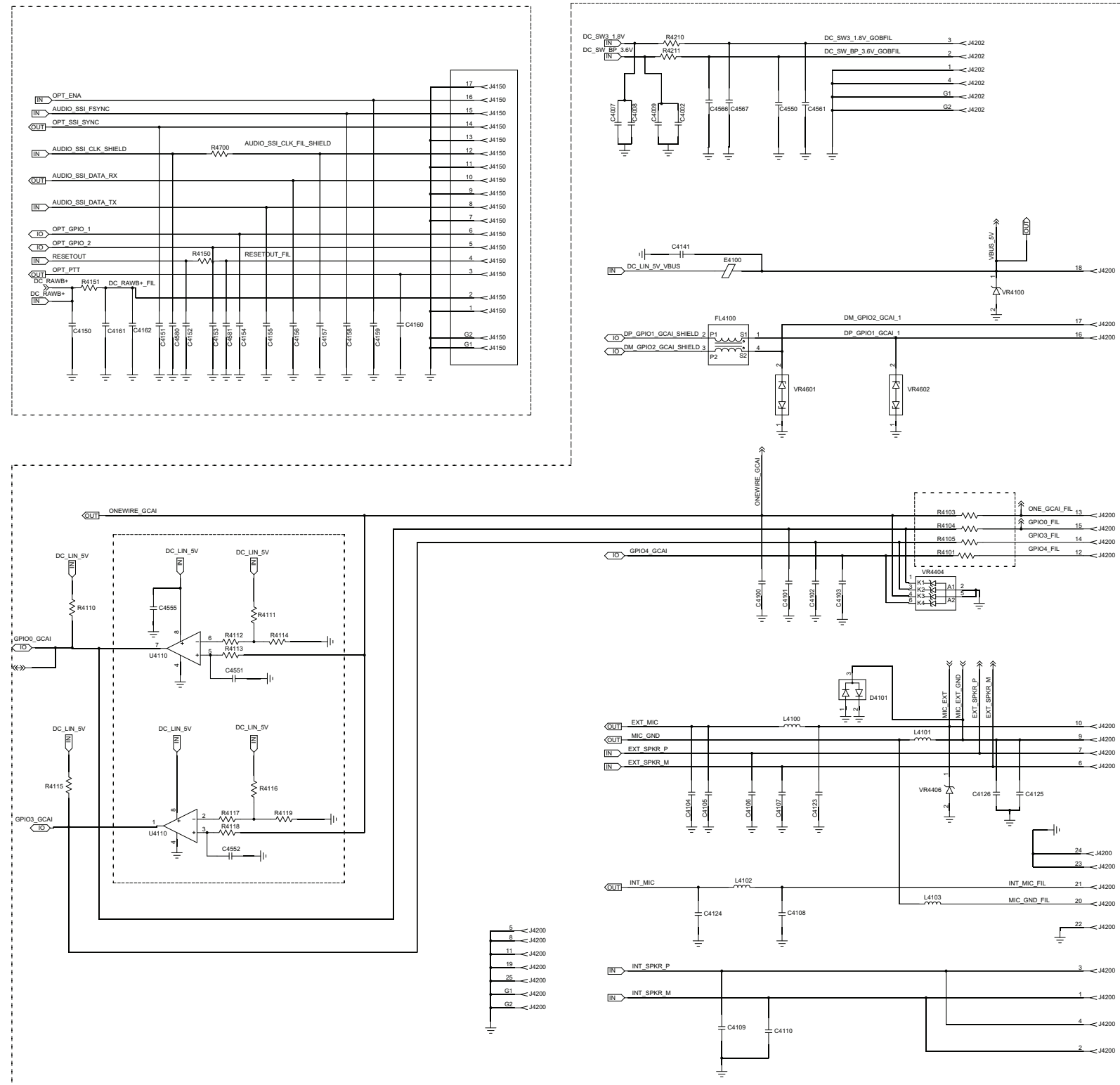


Figure 7-22. Peripheral Schematic Diagram (2 of 3)

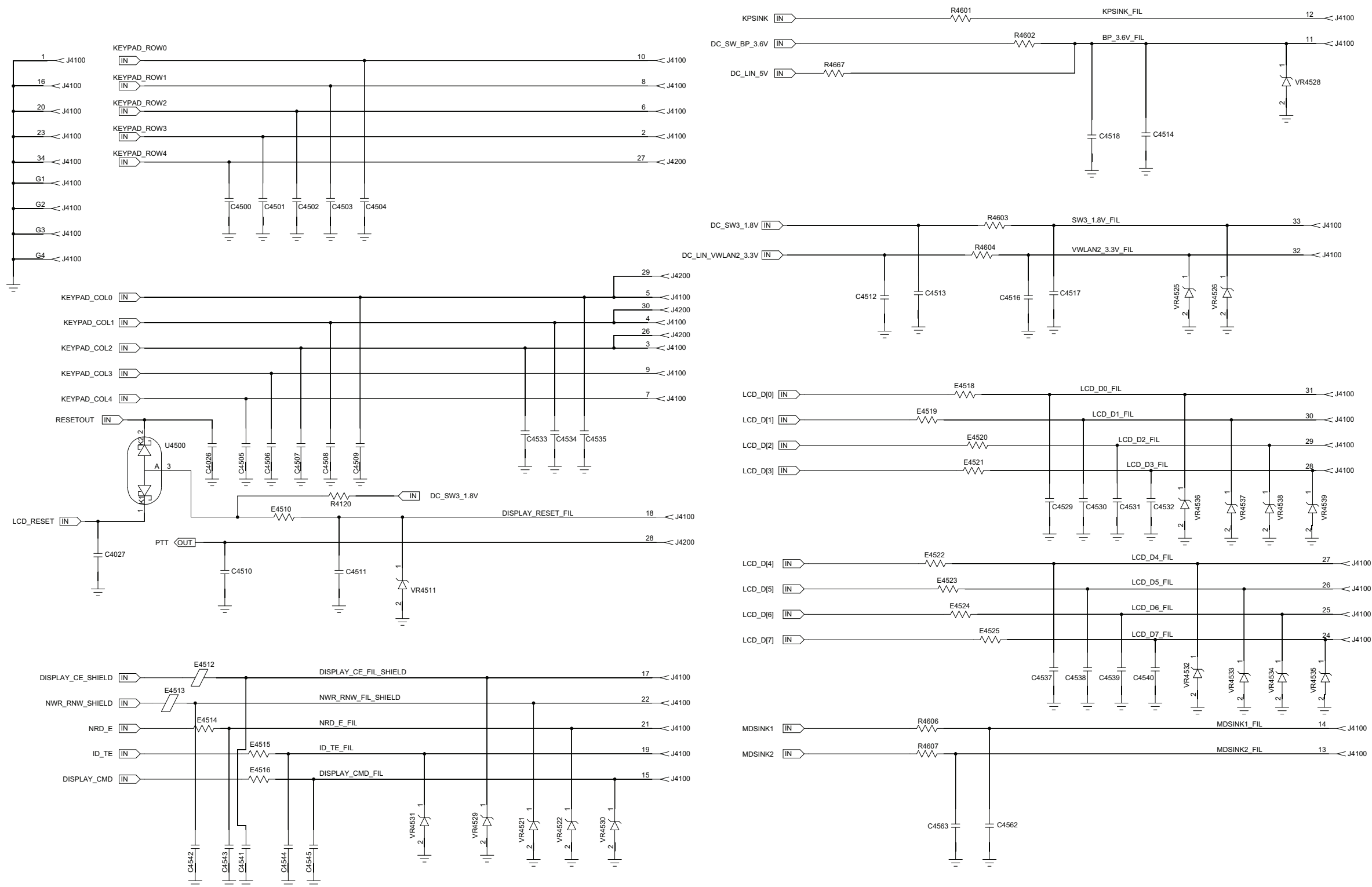


Figure 7-23. Peripheral Schematic Diagram (3 of 3)

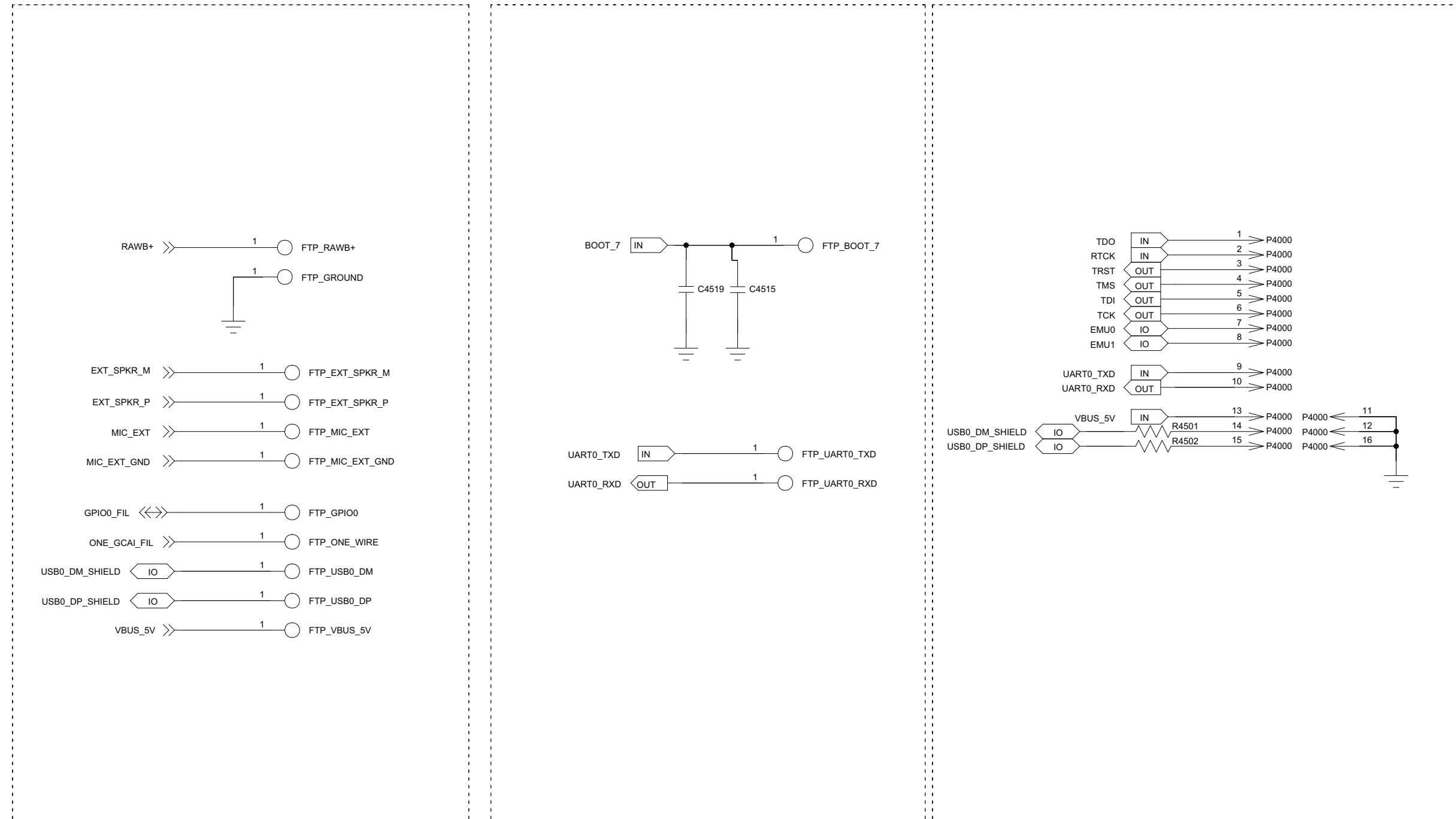


Figure 7-24. Factory Test Points Schematic Diagram

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

**Notes**

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

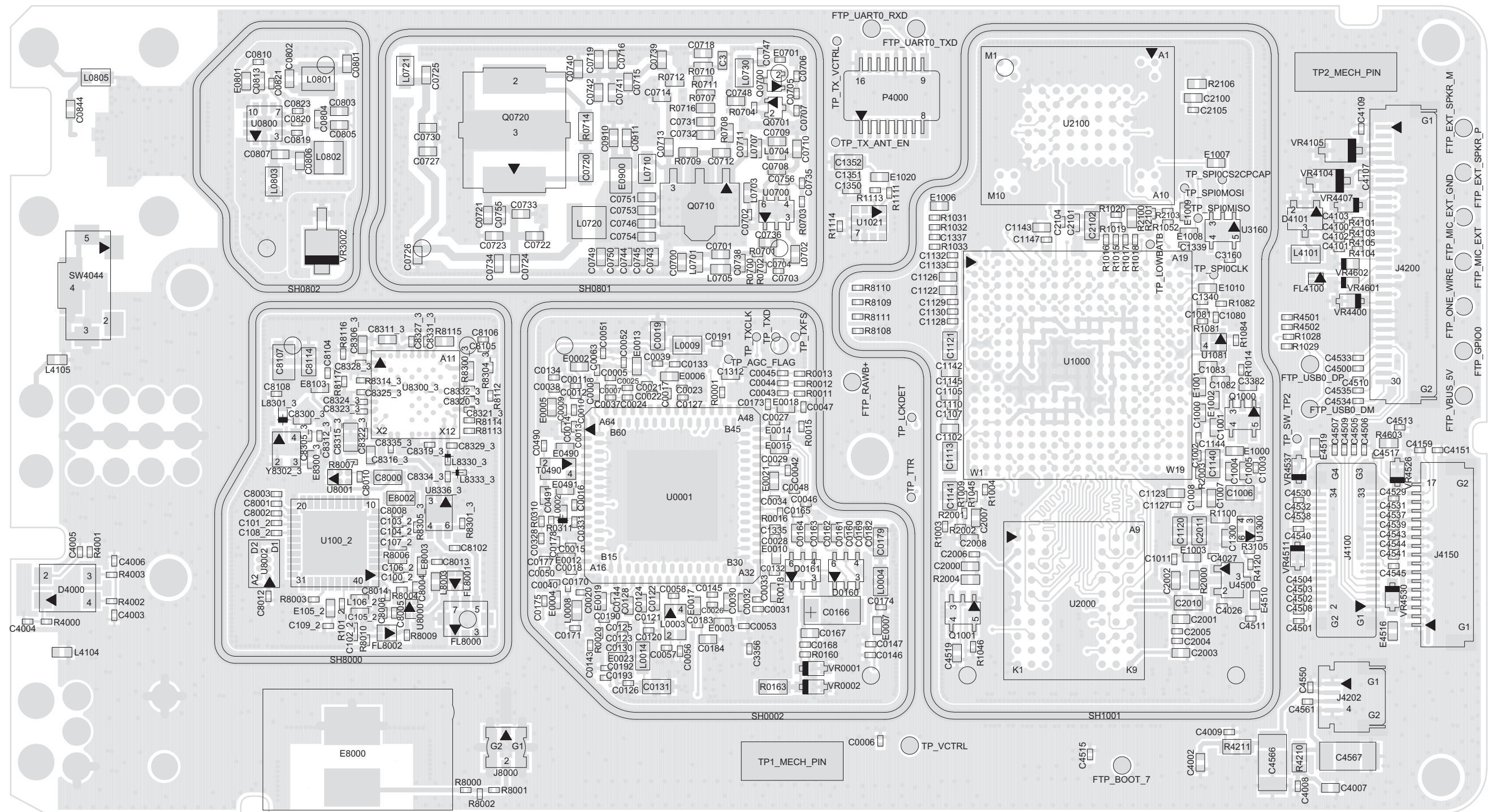


Figure 8-1. Main Board 800/900 MHz Top Side PCB No. PC000970A01\_AA

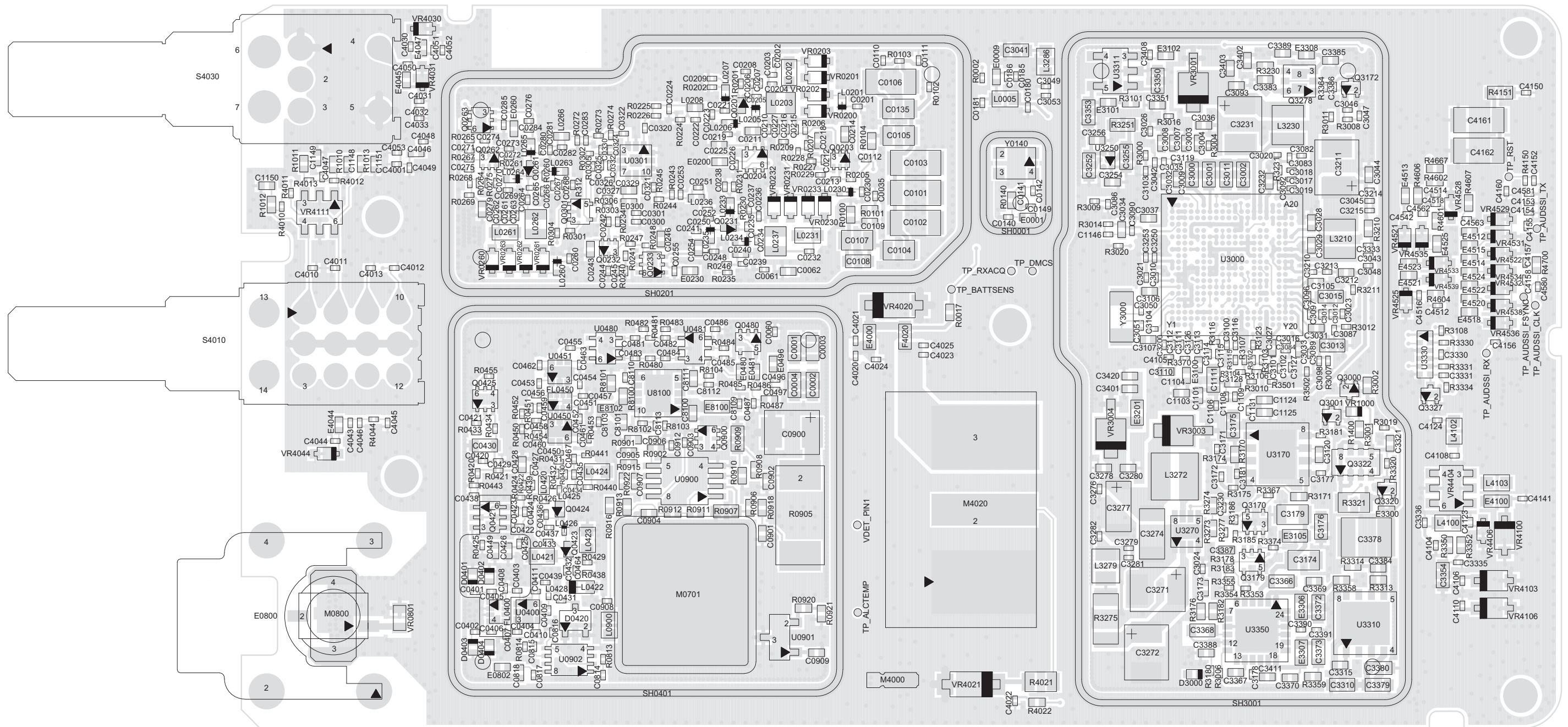


Figure 8-2. Main Board 800/900 MHz Bottom Side PCB No. PC000970A01\_AA

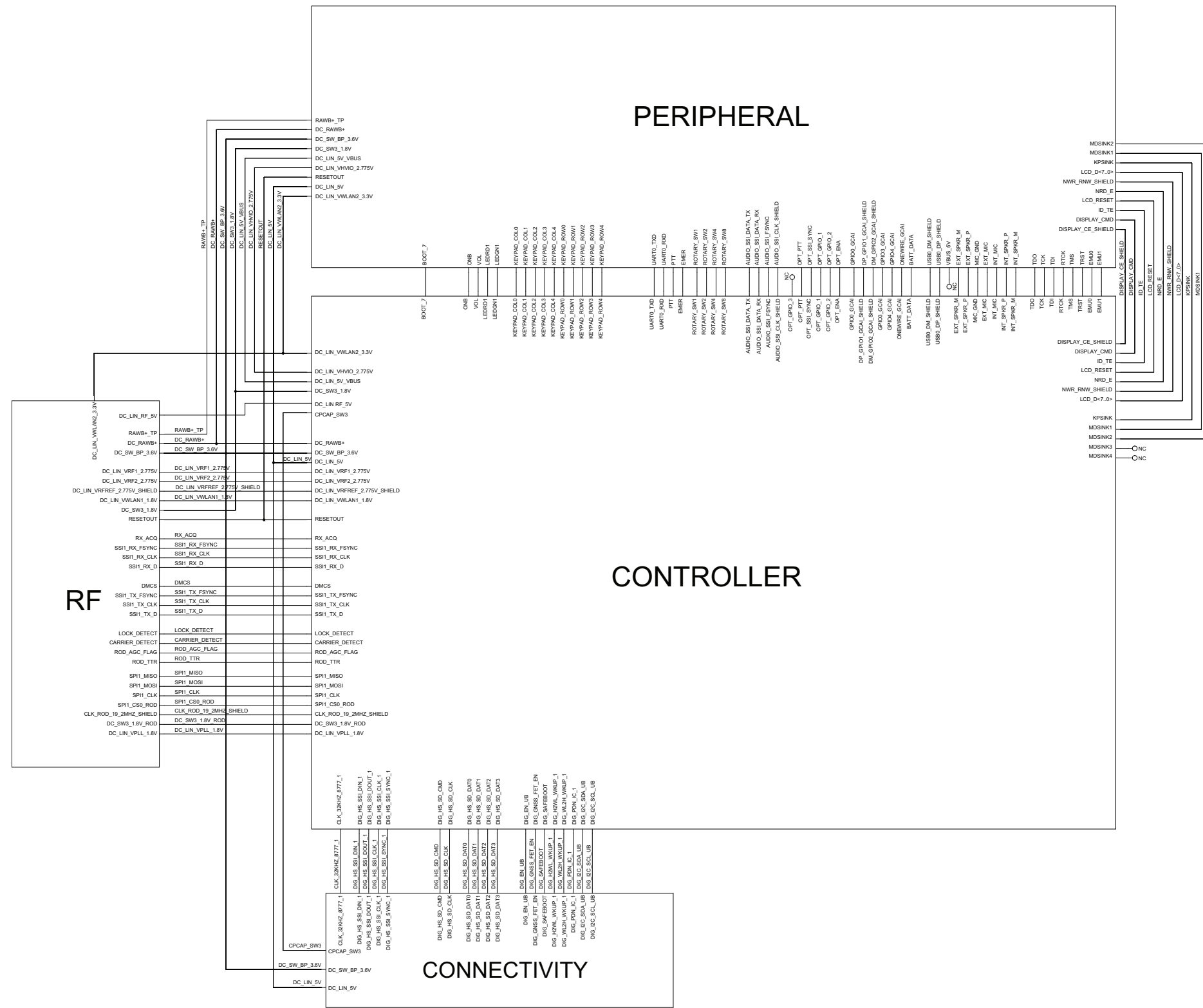


Figure 8-3. Complete Radio Schematic Diagram

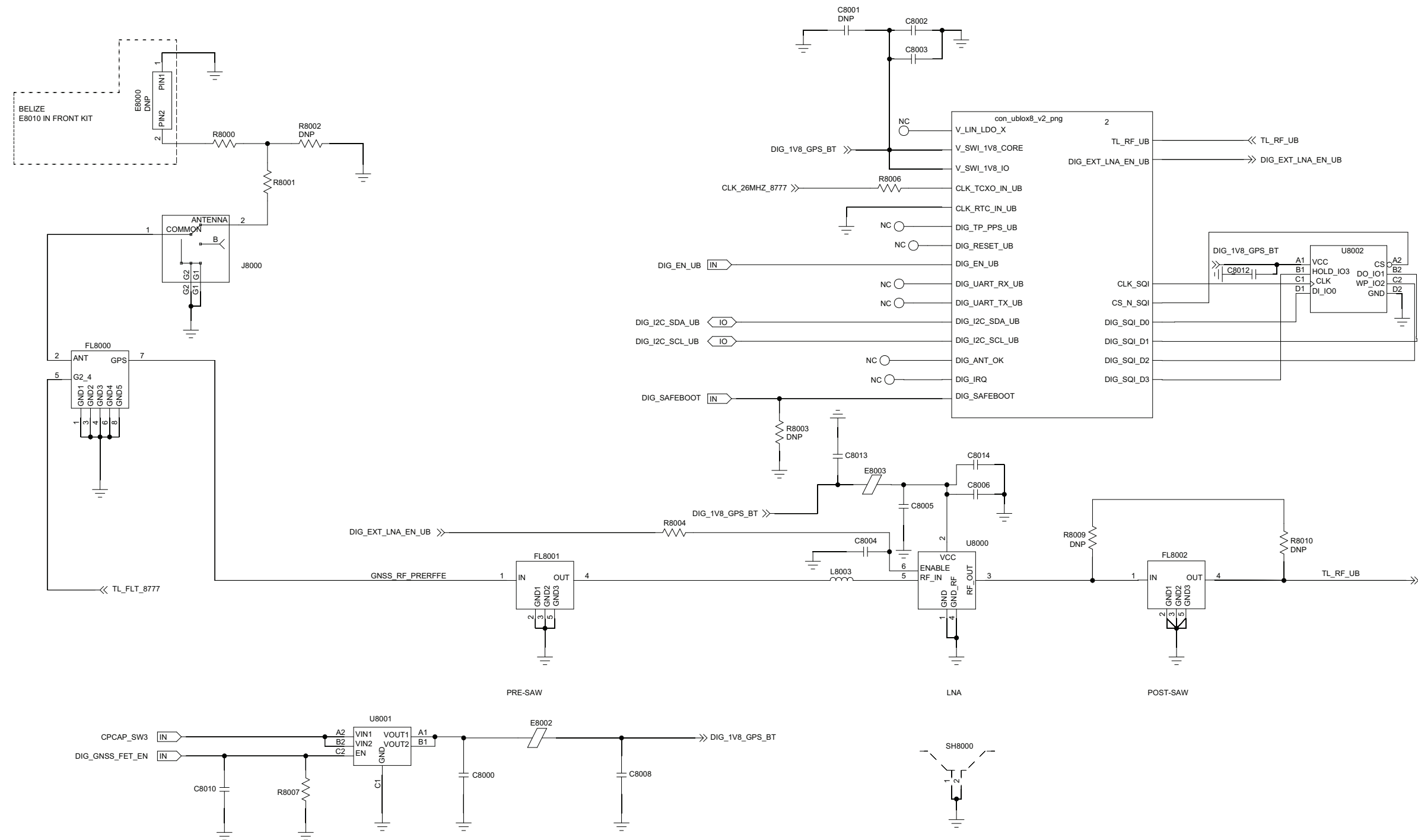


Figure 8-4. GNSS Schematic Diagram



# BT\_WLAN SCHEMATIC

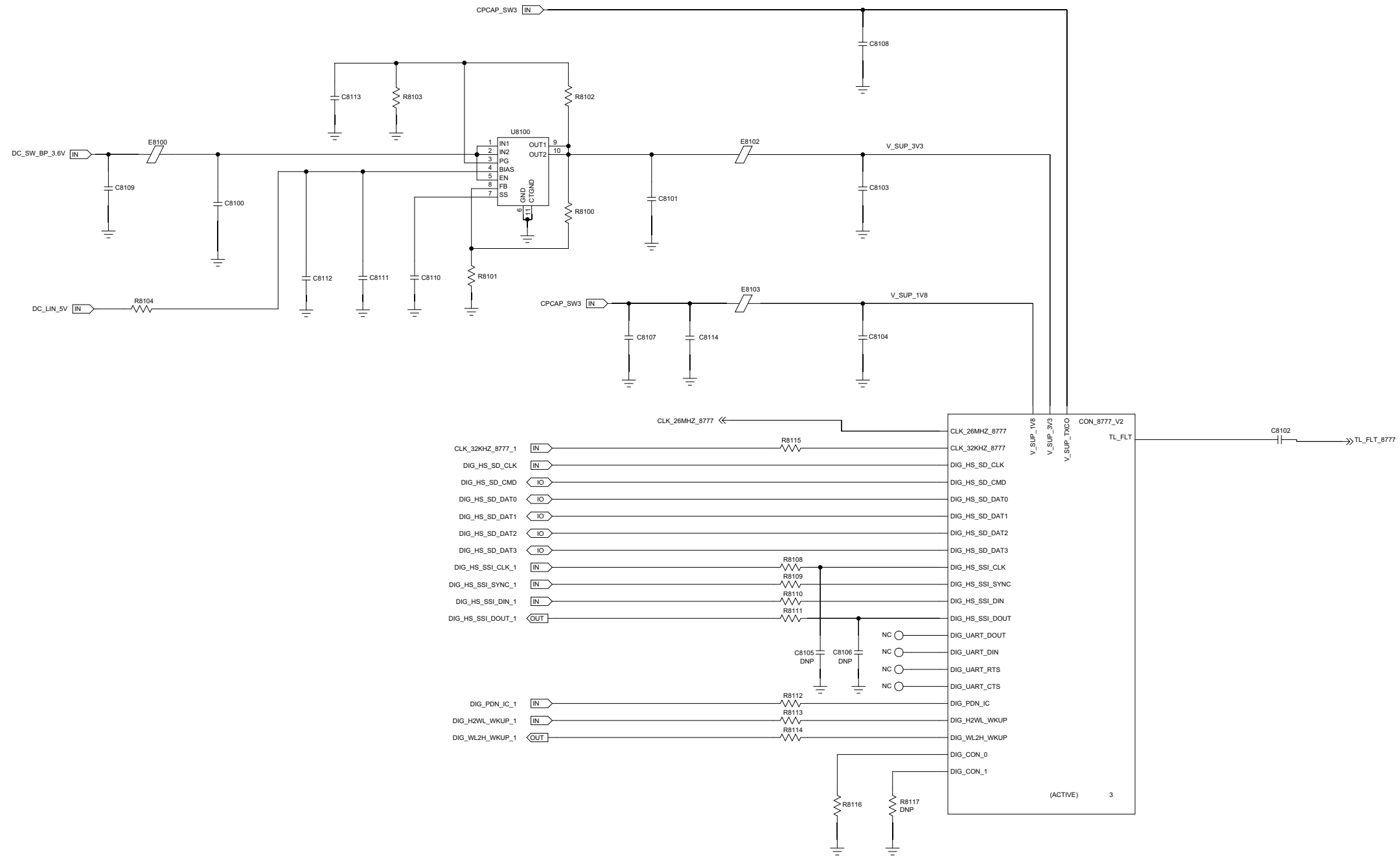


Figure 8-5. Bluetooth and WiFi Schematic Diagram (1 of 3)

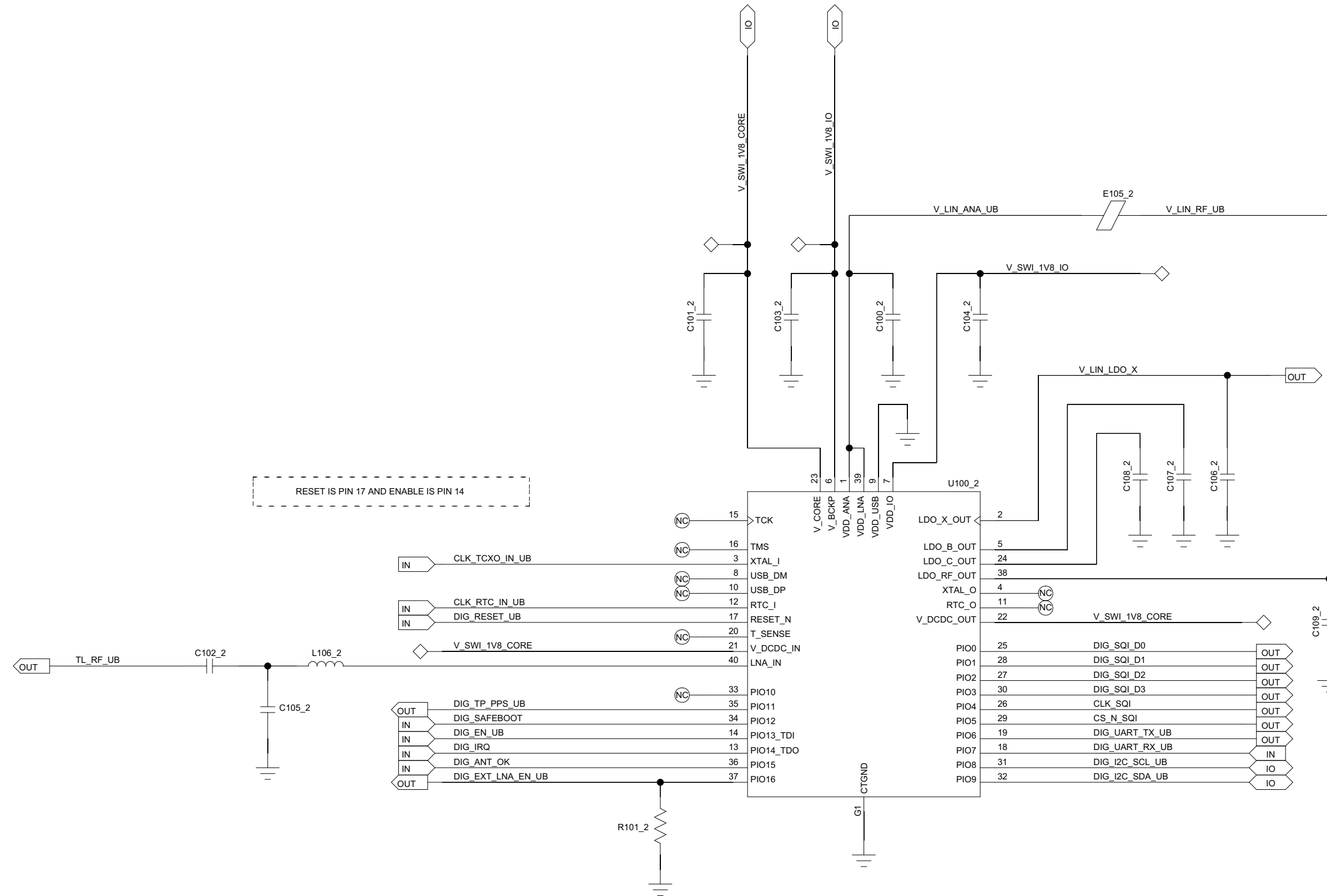


Figure 8-6. Bluetooth and WiFi Schematic Diagram (2 of 3)

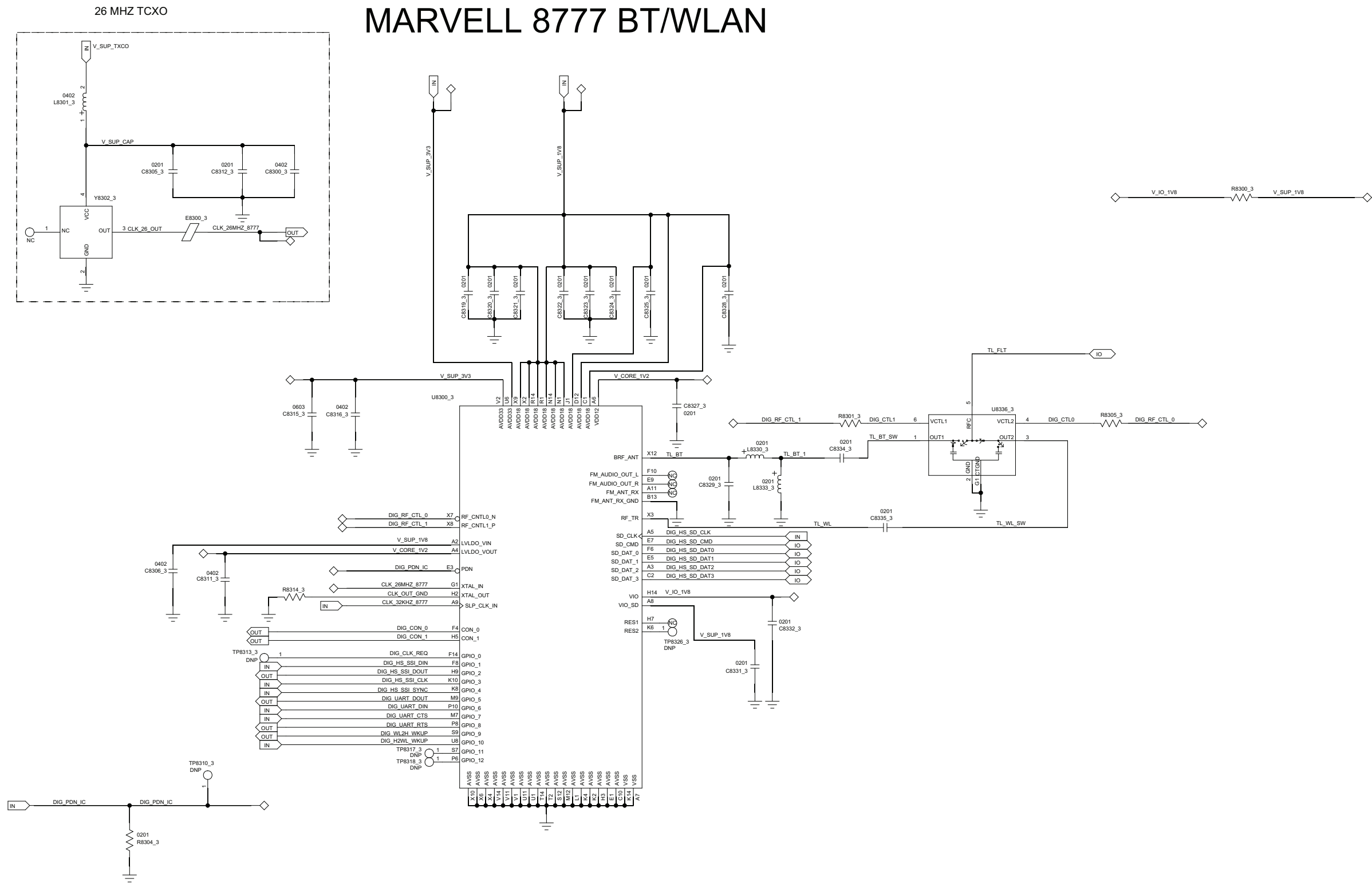


Figure 8-7. Bluetooth and WiFi Schematic Diagram (3 of 3)

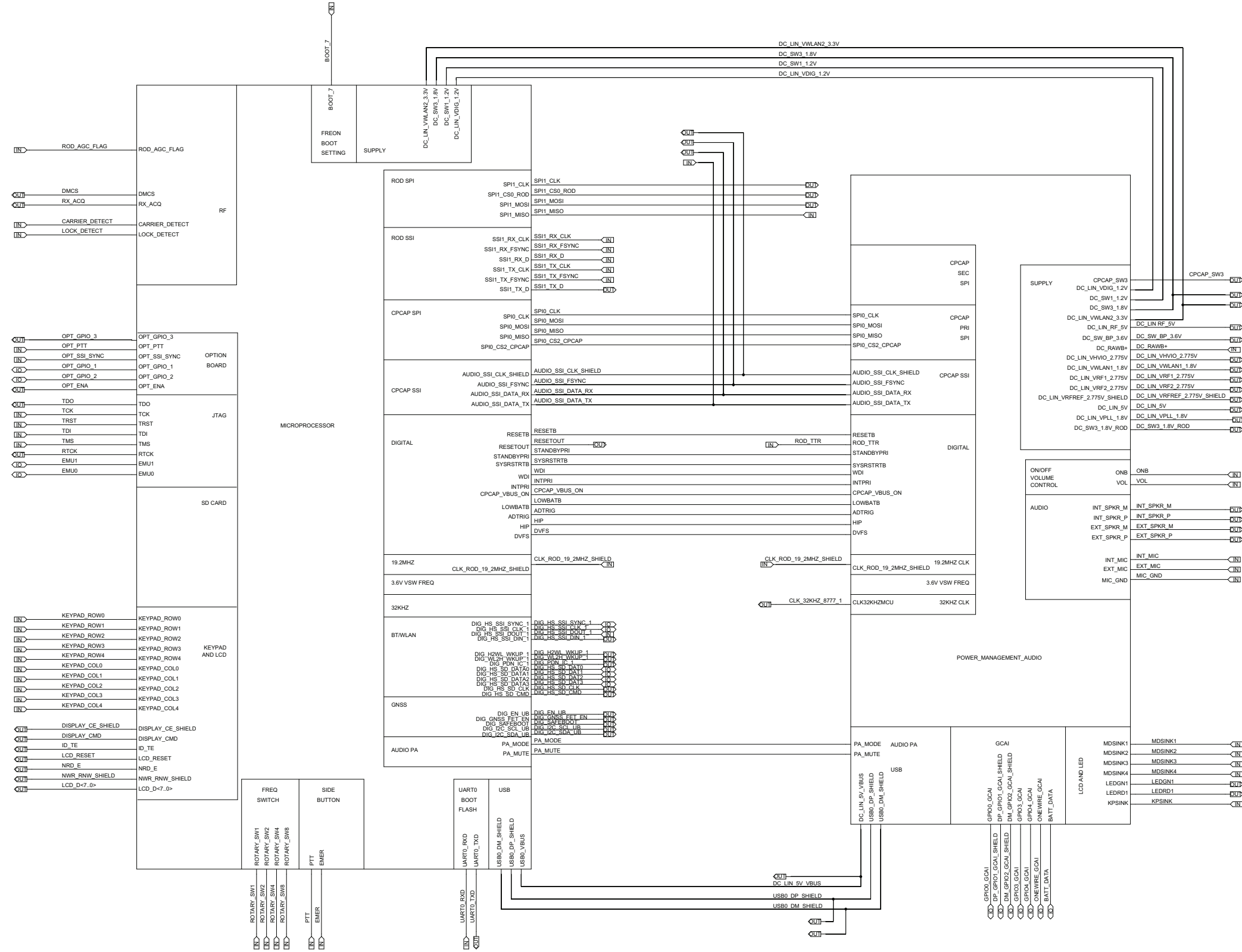


Figure 8-8. Controller Schematic Diagram

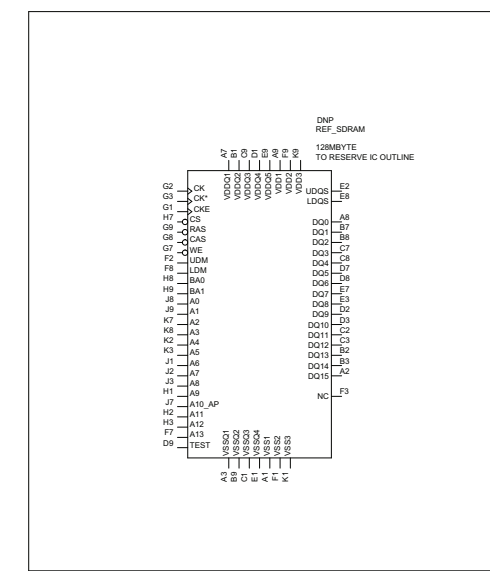
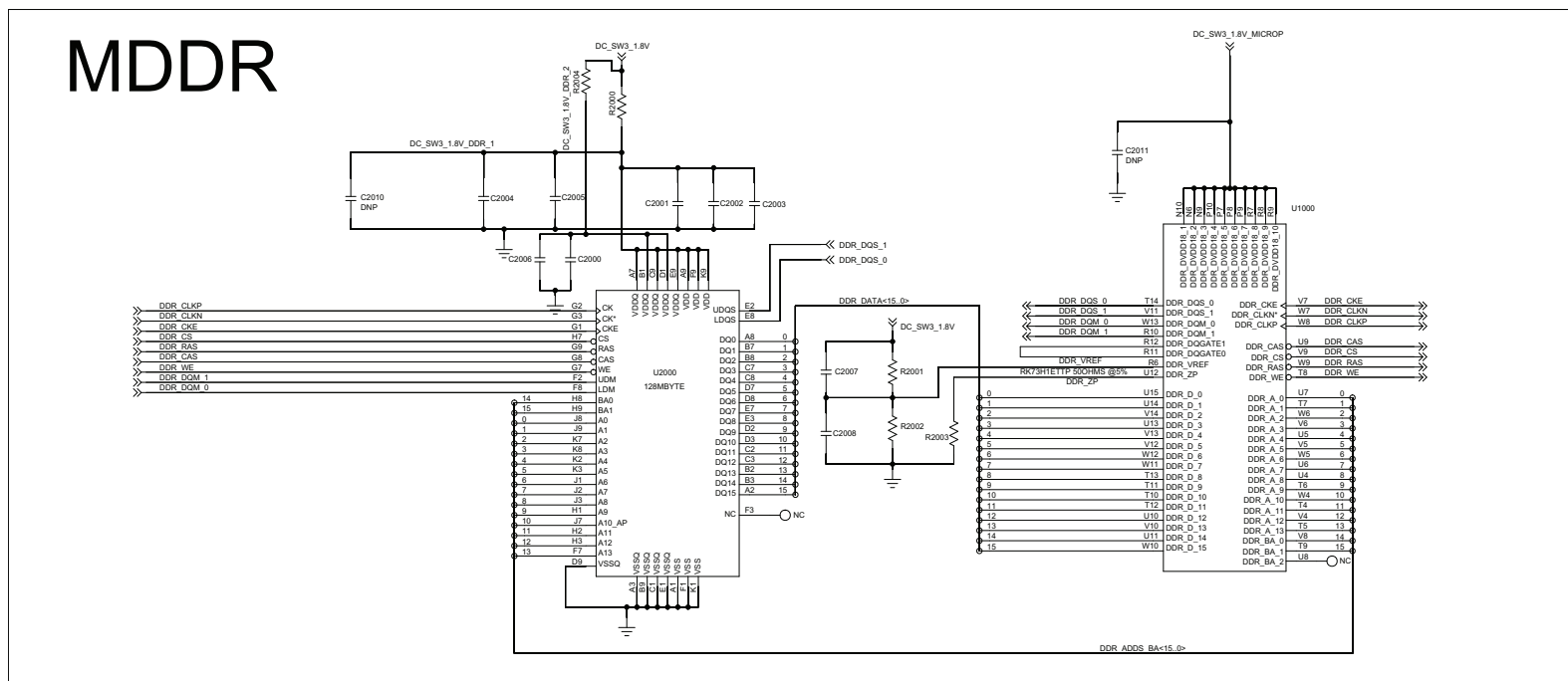
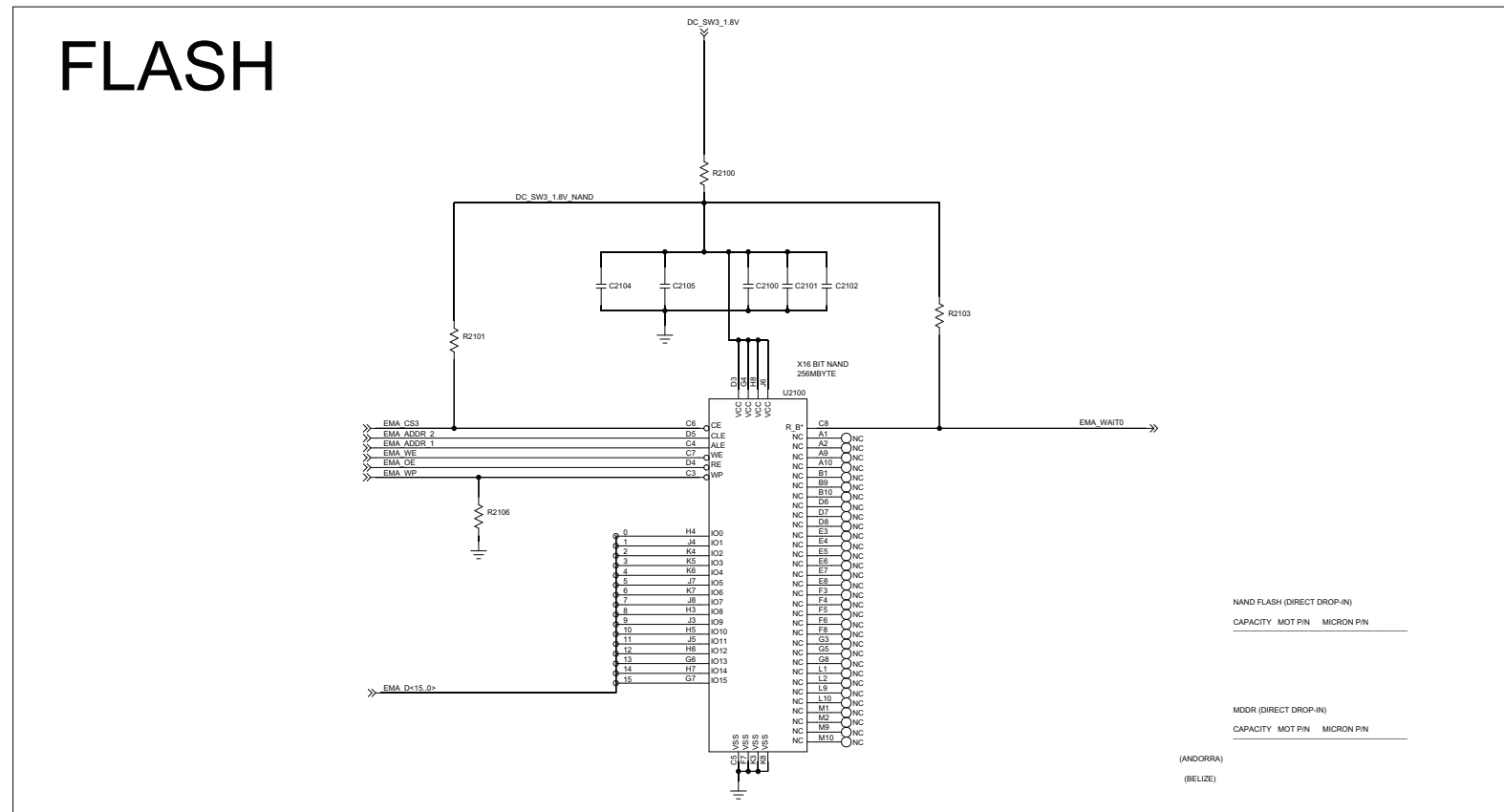


Figure 8-9. Memory Schematic Diagram

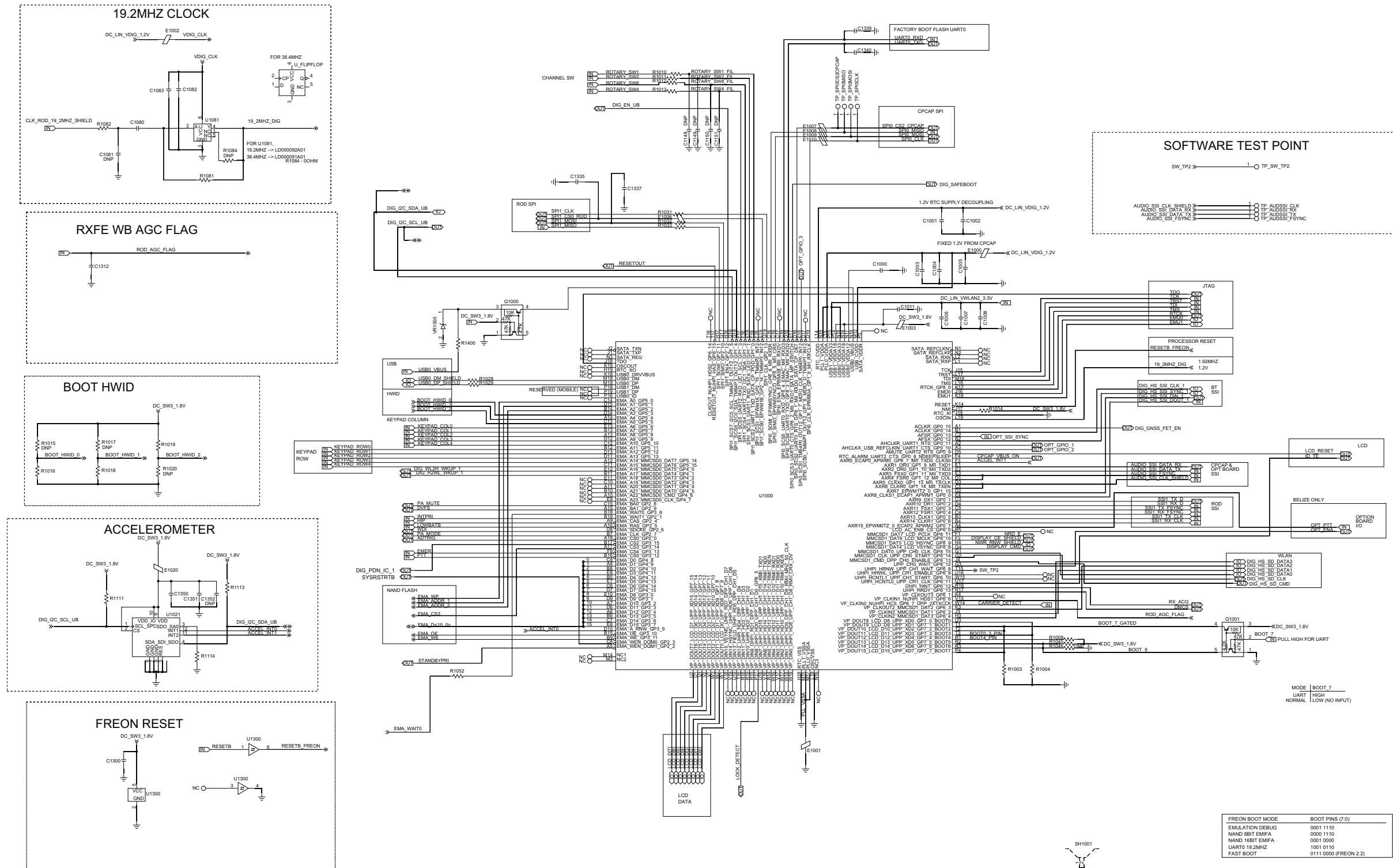
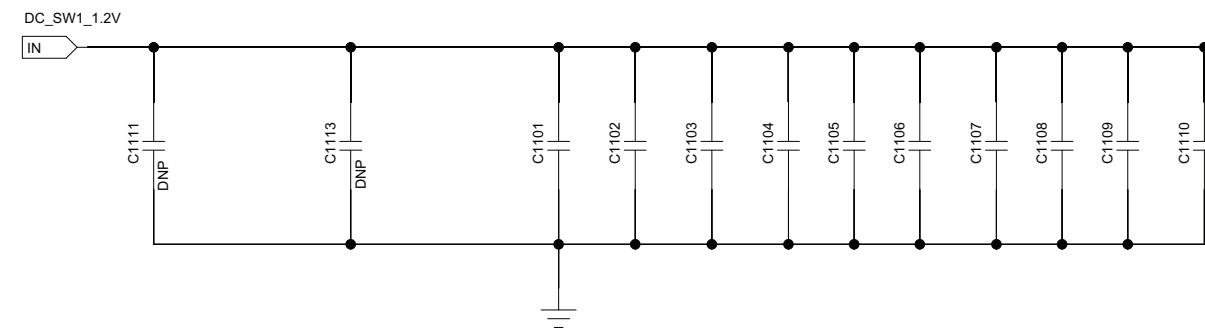
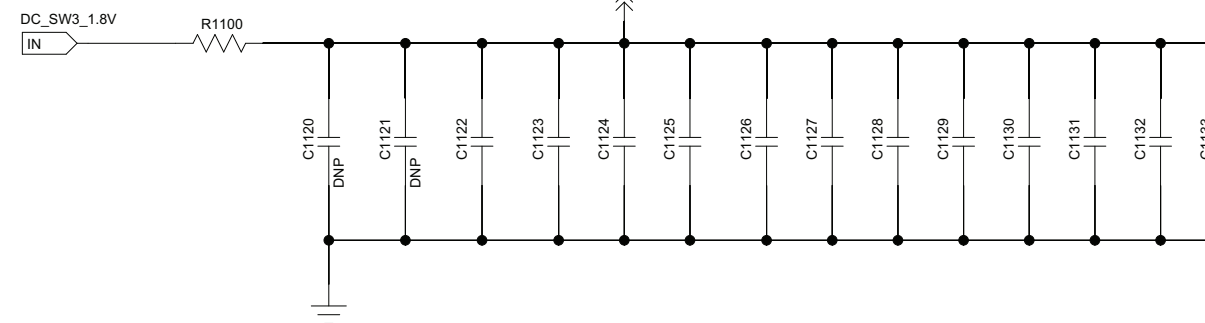


Figure 8-10. Microprocessor Schematic Diagram (1 of 2)

VARIABLE 1.2V FROM CPCAP



SW3\_1.8V FROM CPCAP



FIXED 1.2V FROM CPCAP

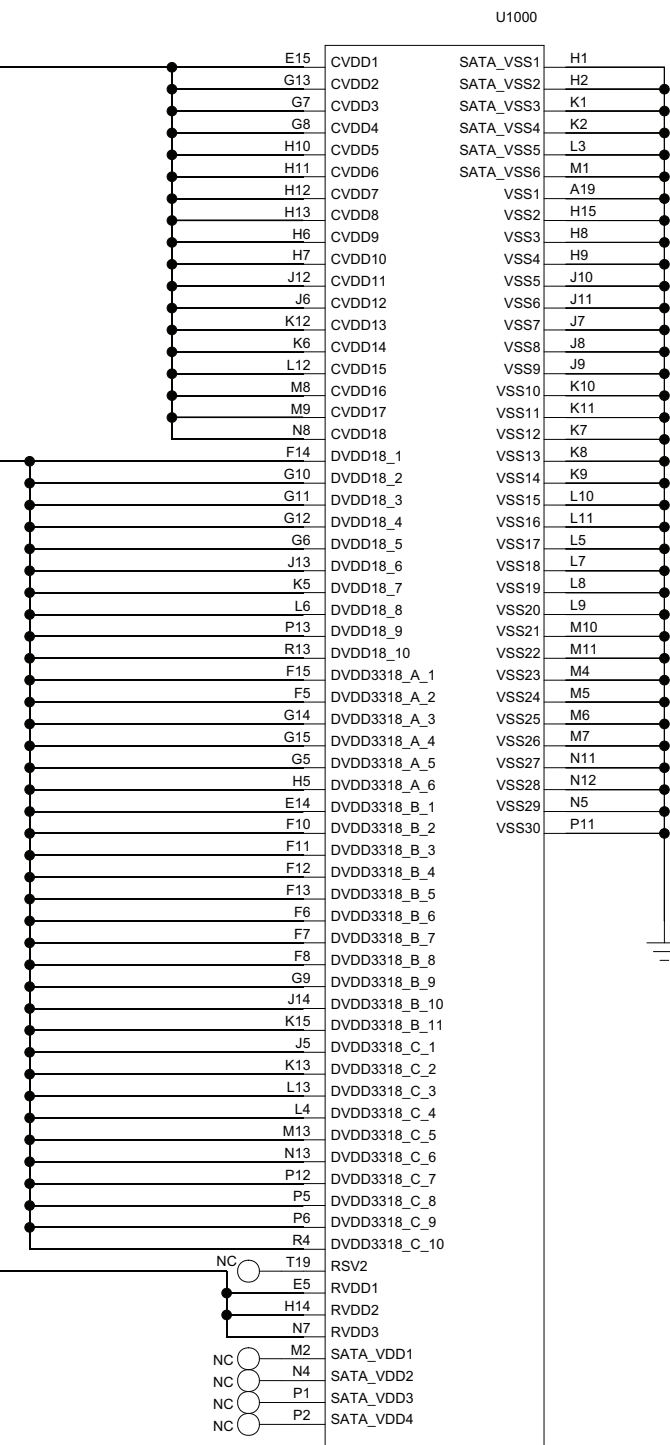
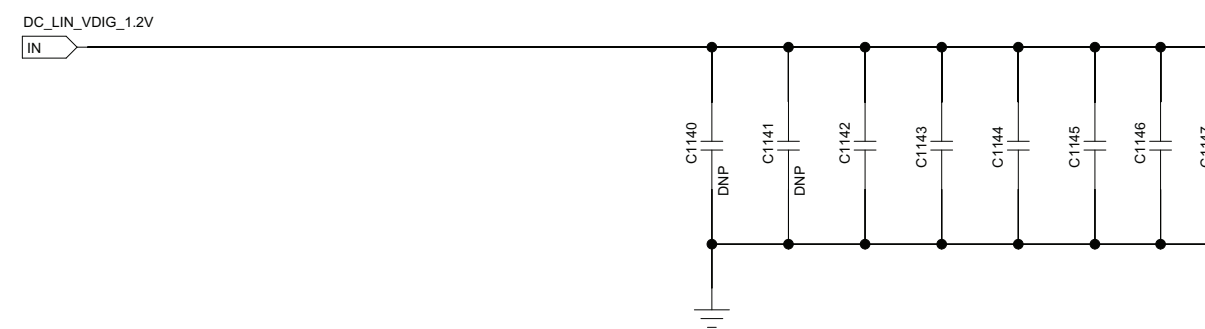


Figure 8-11. Microprocessor Schematic Diagram (2 of 2)

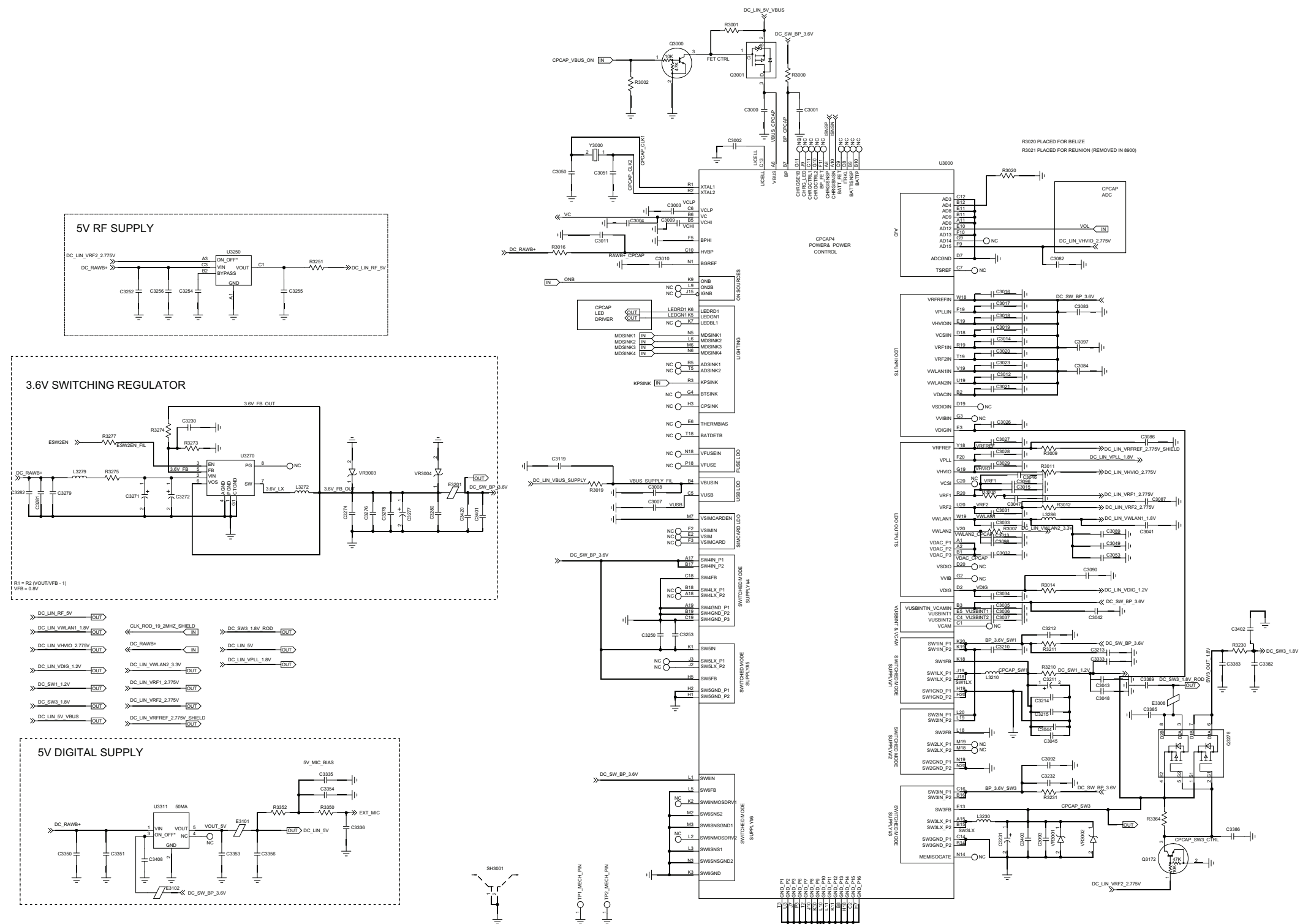


Figure 8-12. Power Management and Audio Schematic Diagram (1 of 3)





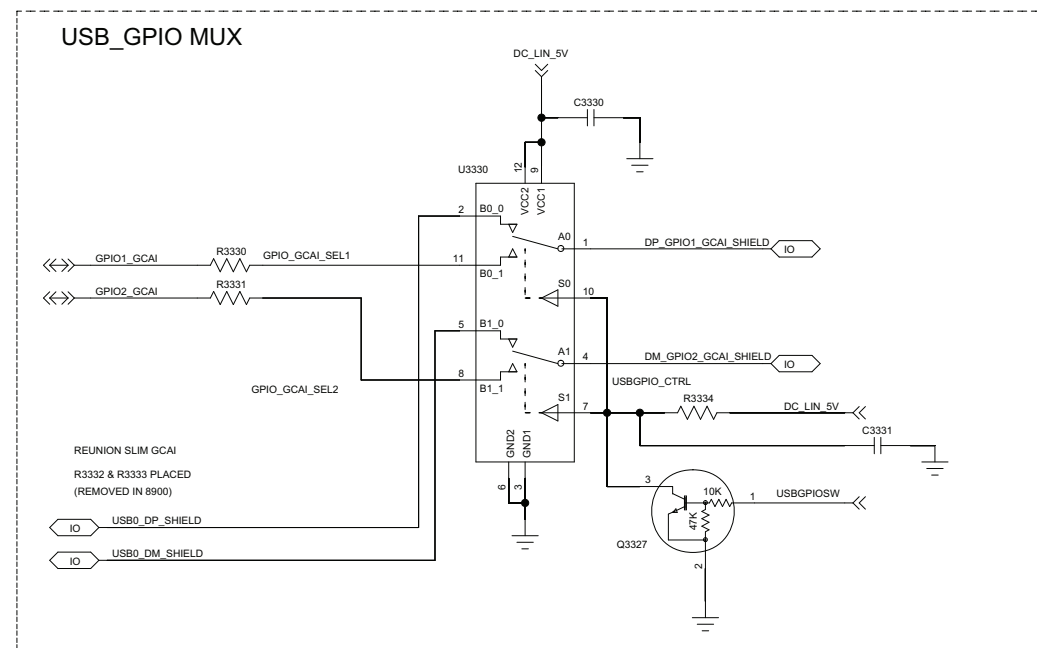
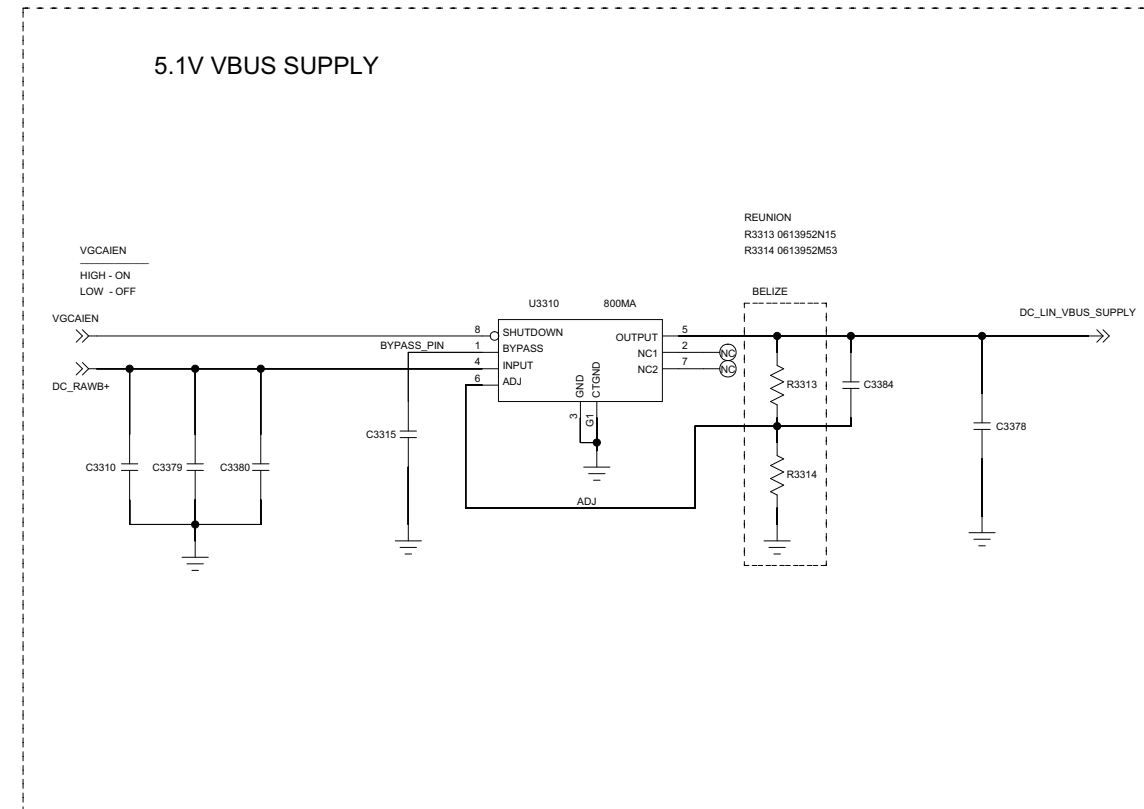
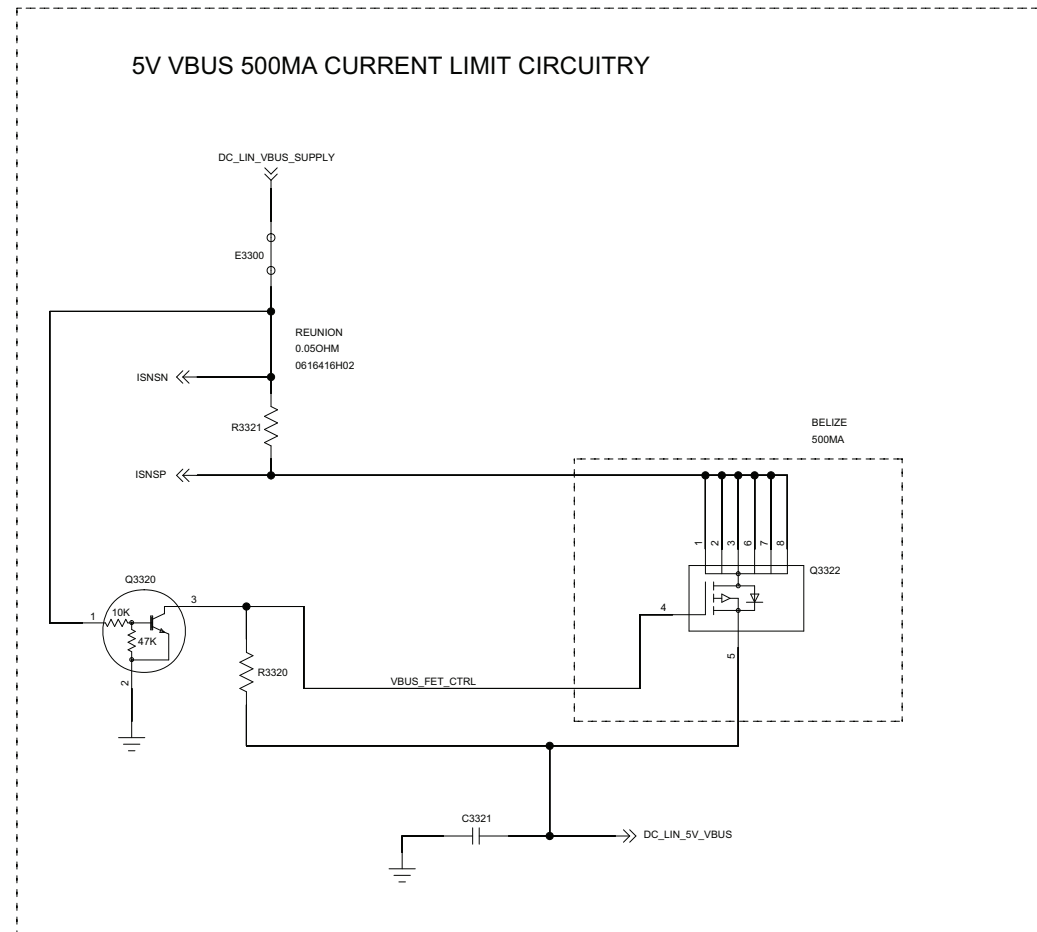


Figure 8-14. Power Management and Audio Schematic Diagram (3 of 3)

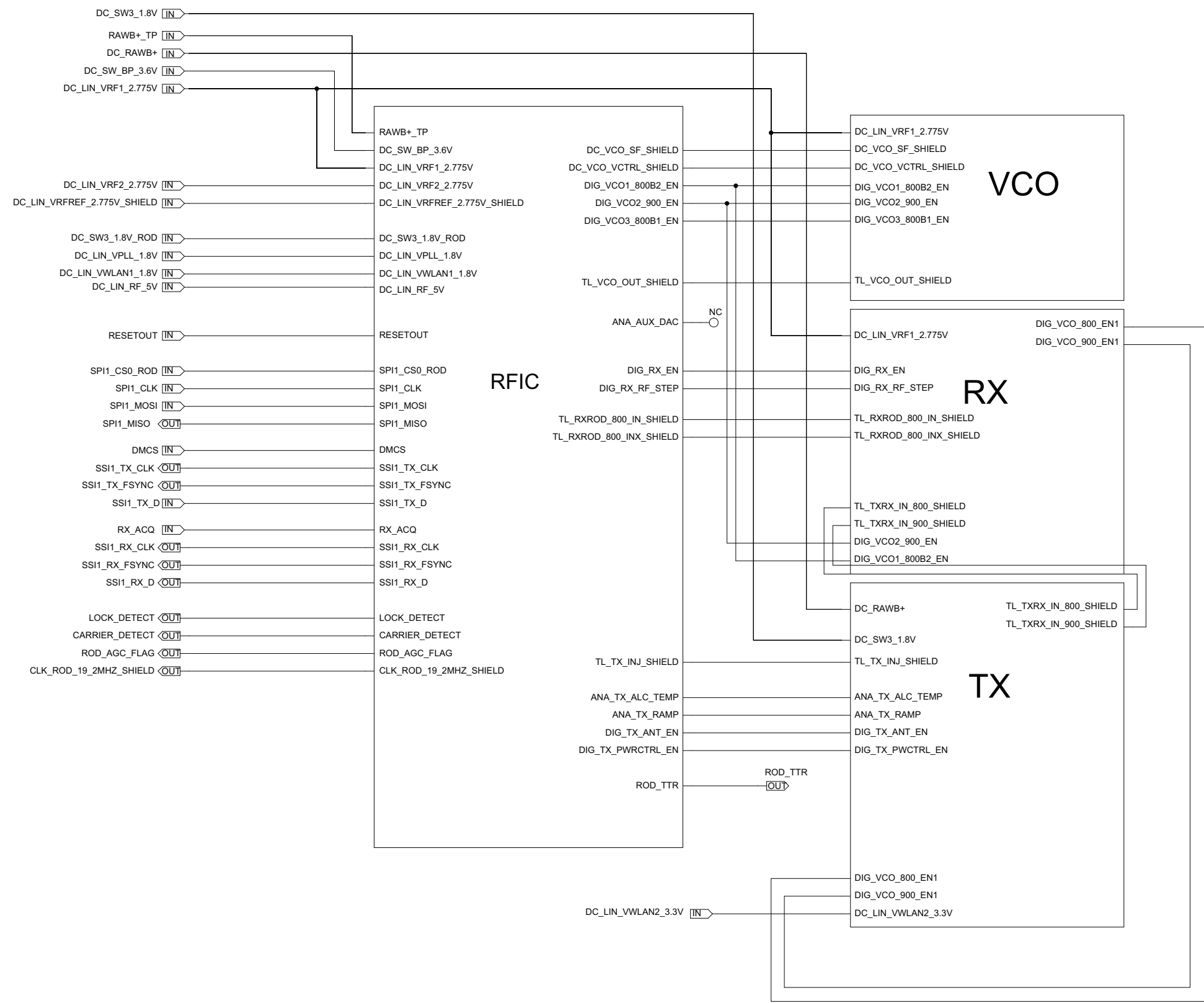


Figure 8-15. Overall RF Schematic Diagram

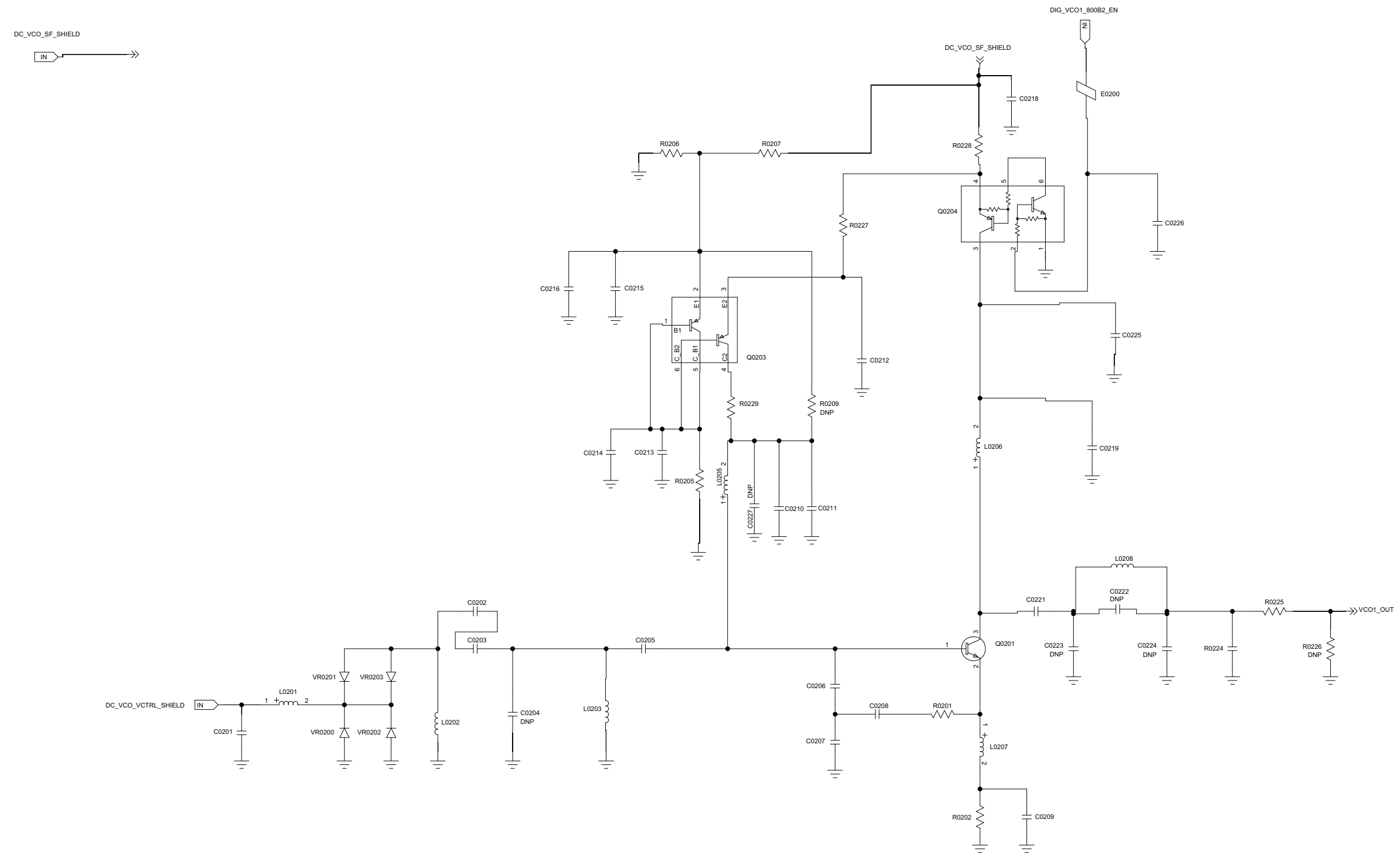


Figure 8-16. VCO Schematic Diagram (1 of 4)

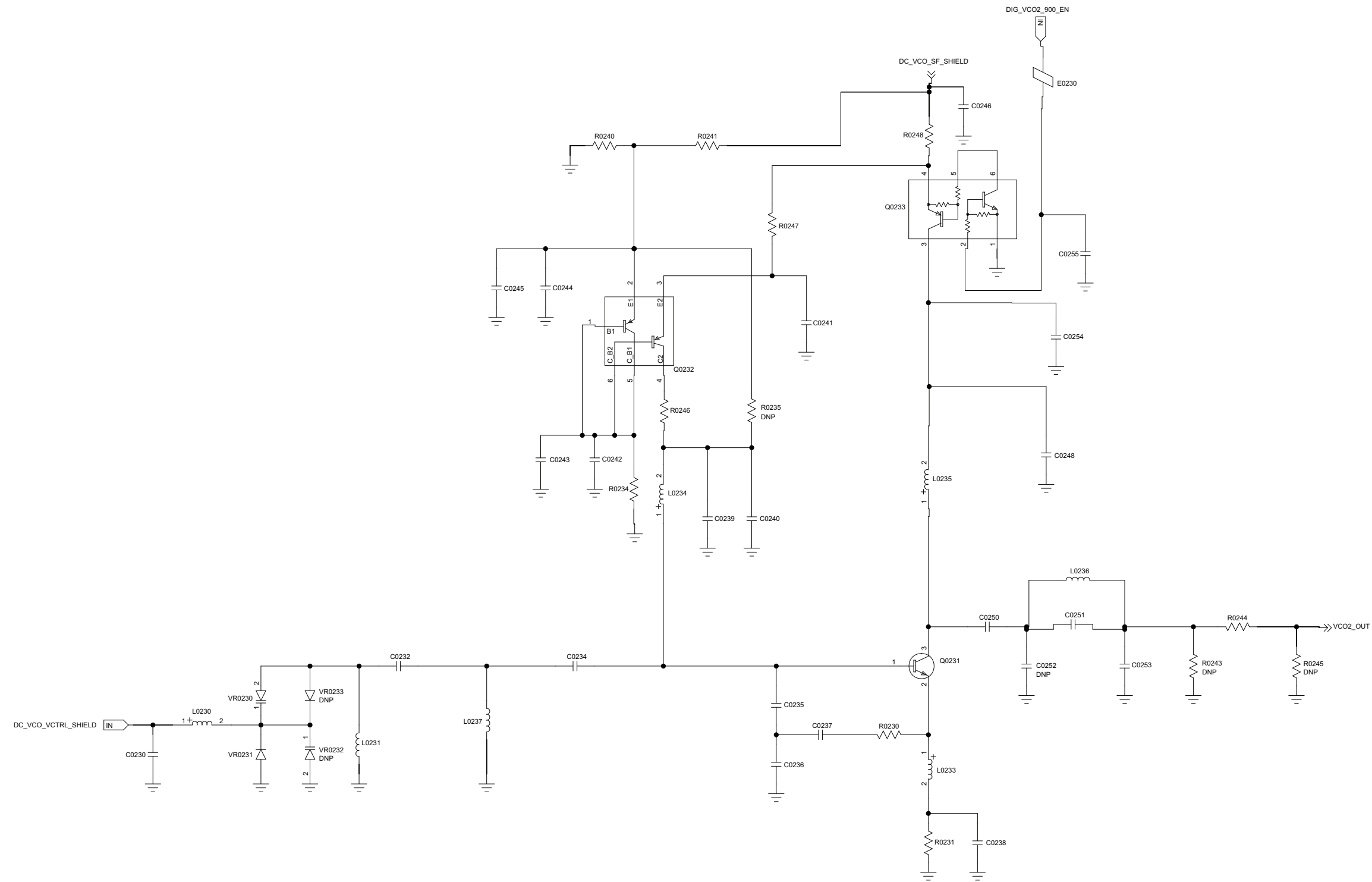


Figure 8-17. VCO Schematic Diagram (2 of 4)



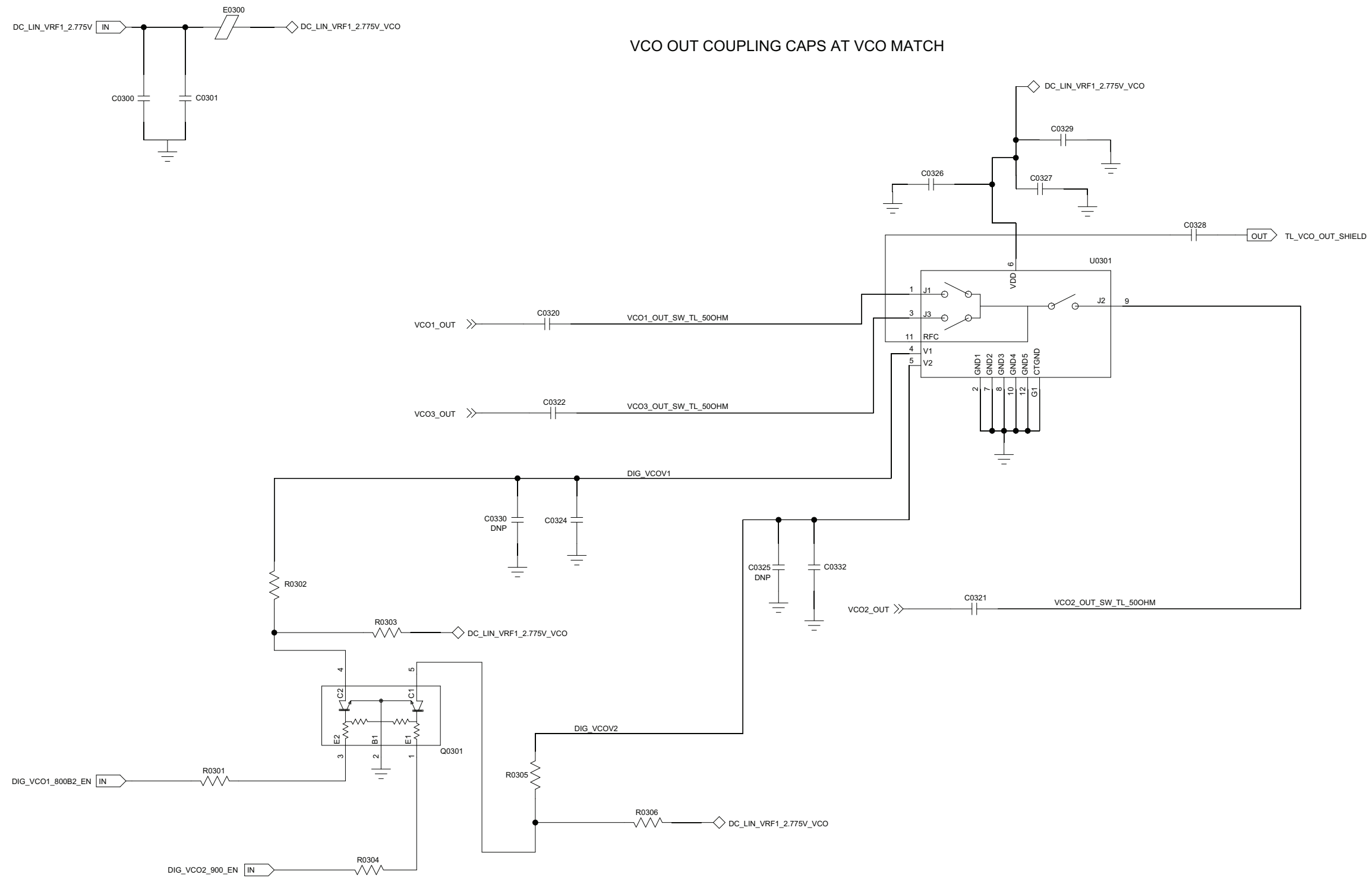


Figure 8-19. VCO Schematic Diagram (4 of 4)

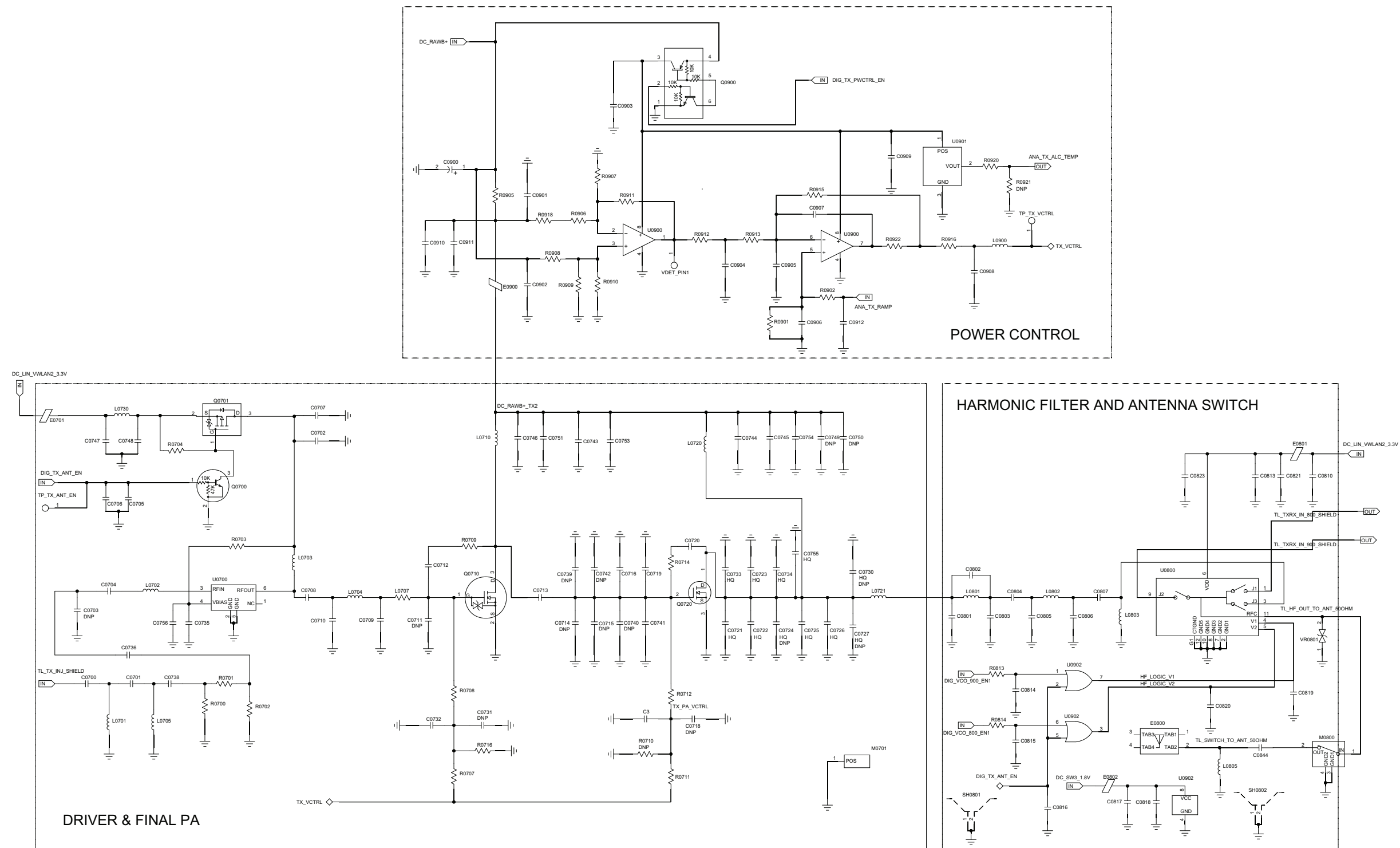


Figure 8-20. Transmitter Schematic Diagram



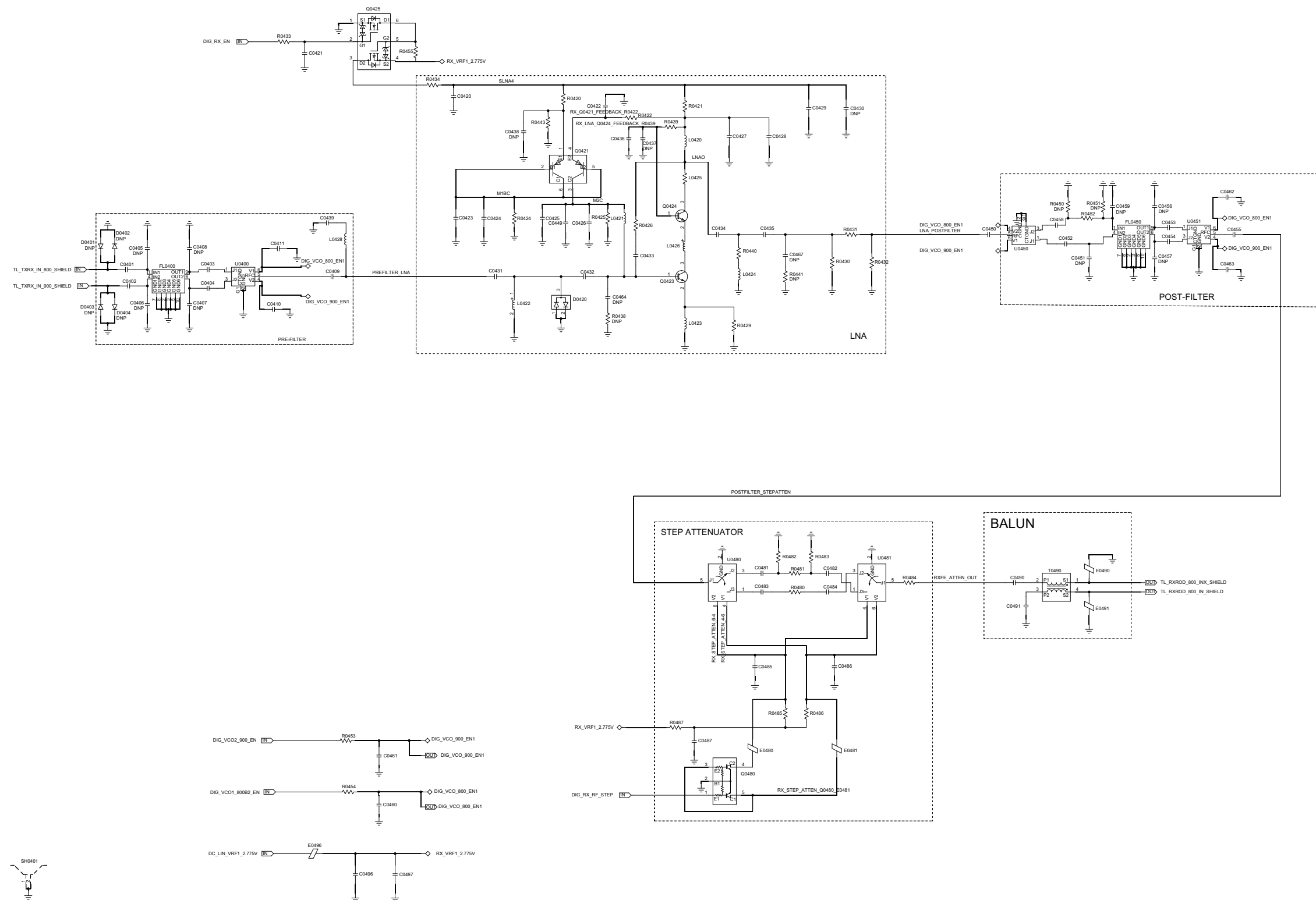


Figure 8-21. Receiver Schematic Diagram

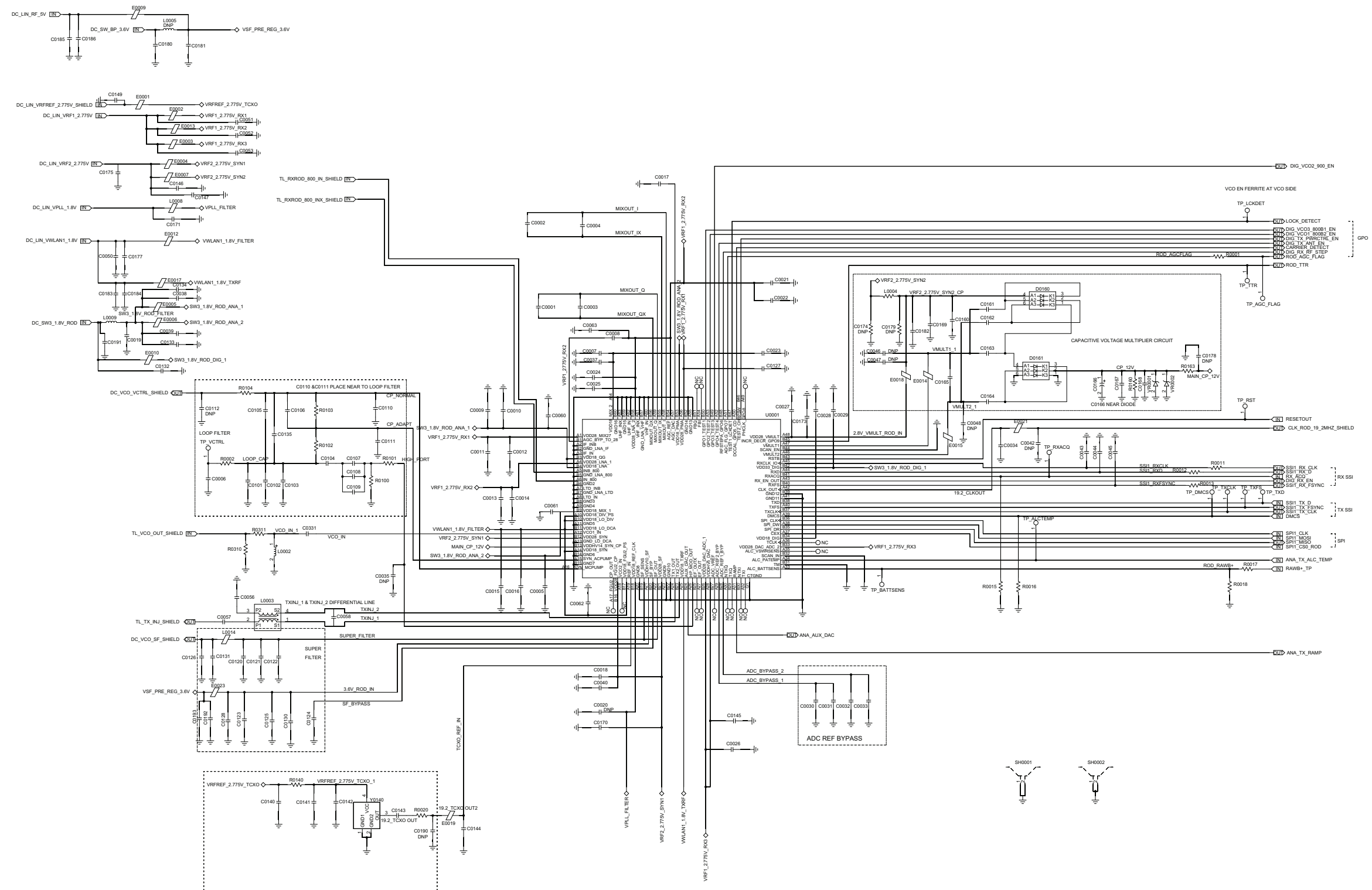


Figure 8-22. RFIC Schematic Diagram

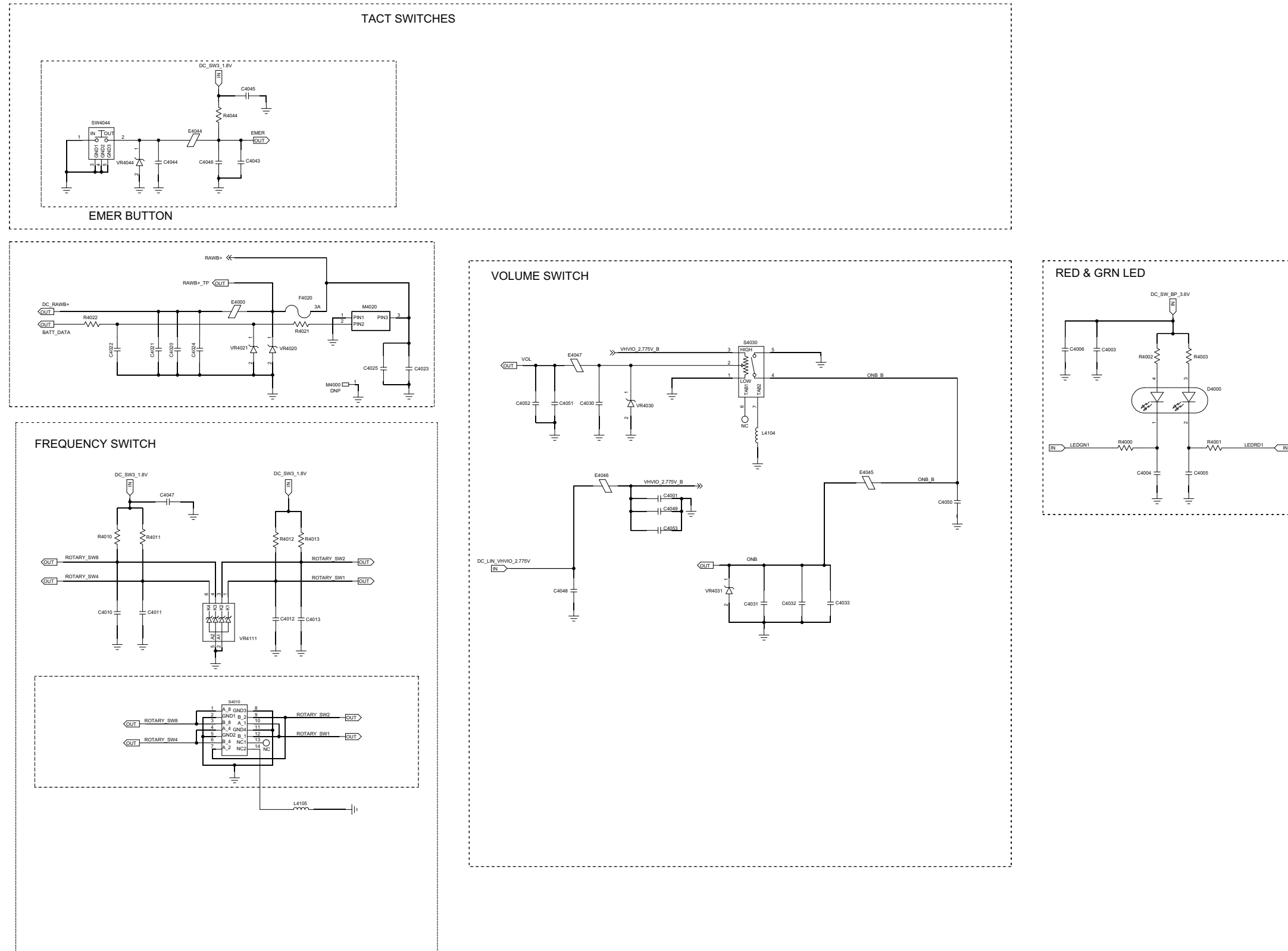


Figure 8-23. Peripheral Schematic Diagram (1 of 3)

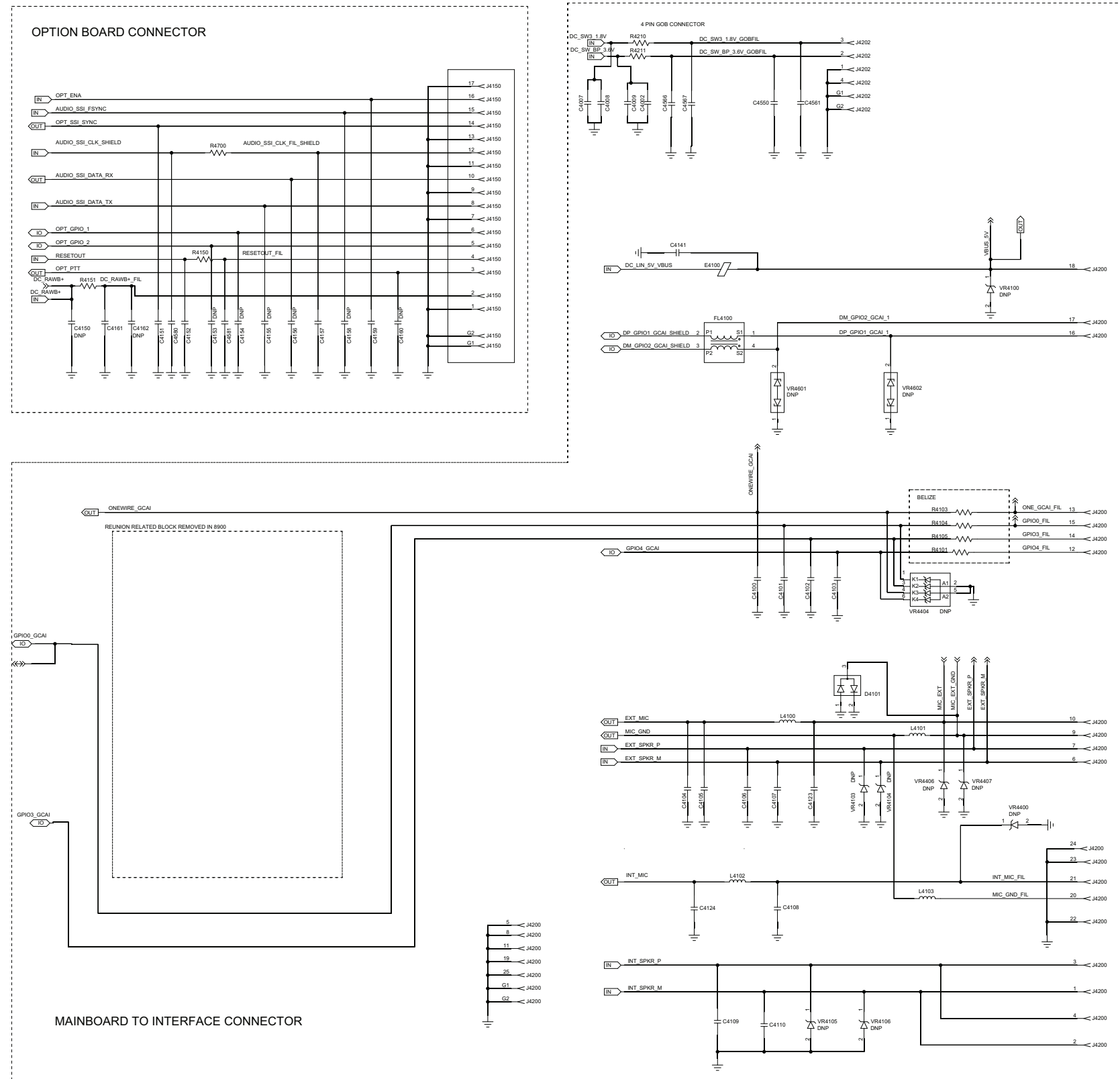


Figure 8-24. Peripheral Schematic Diagram (2 of 3)

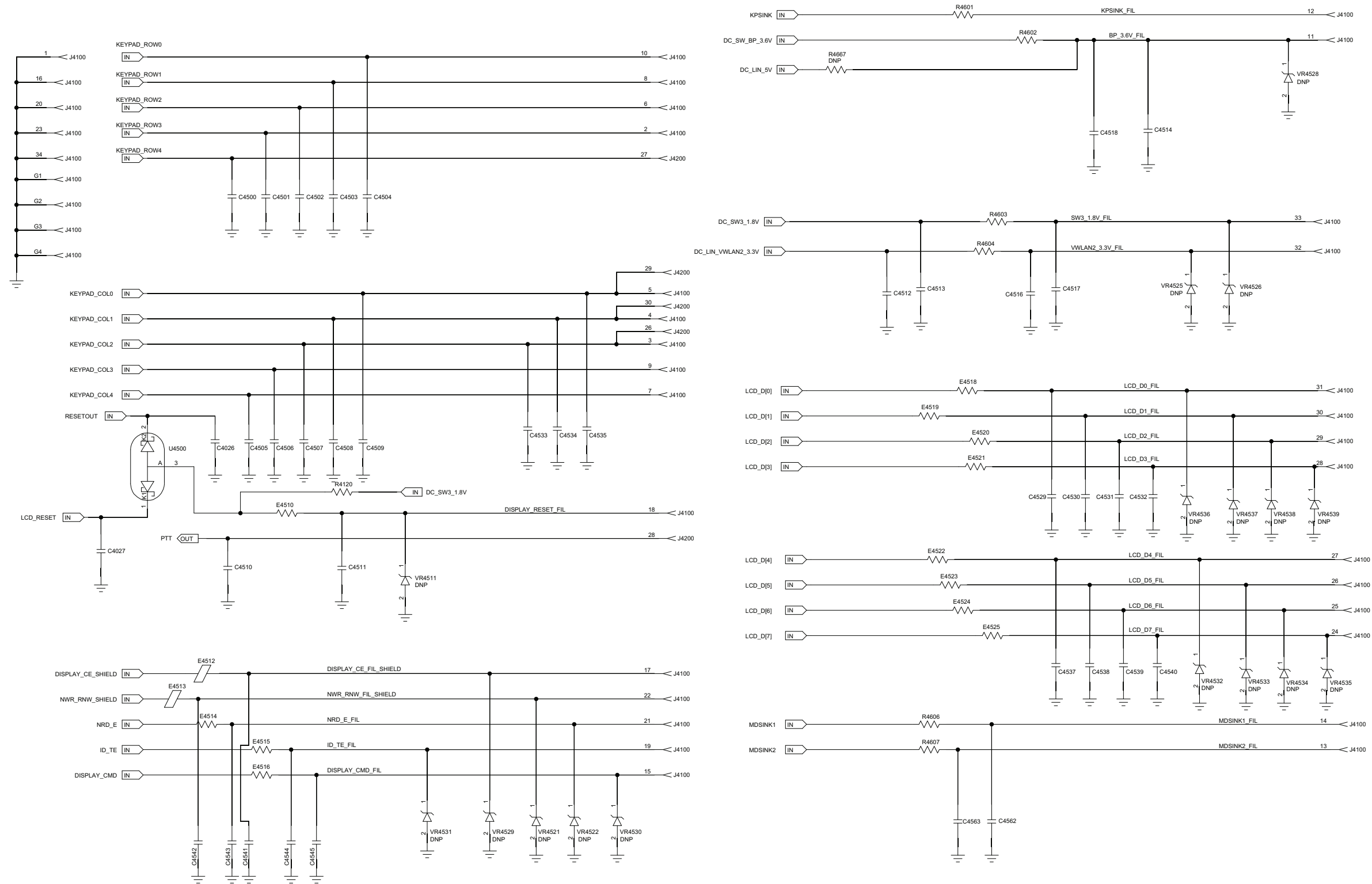
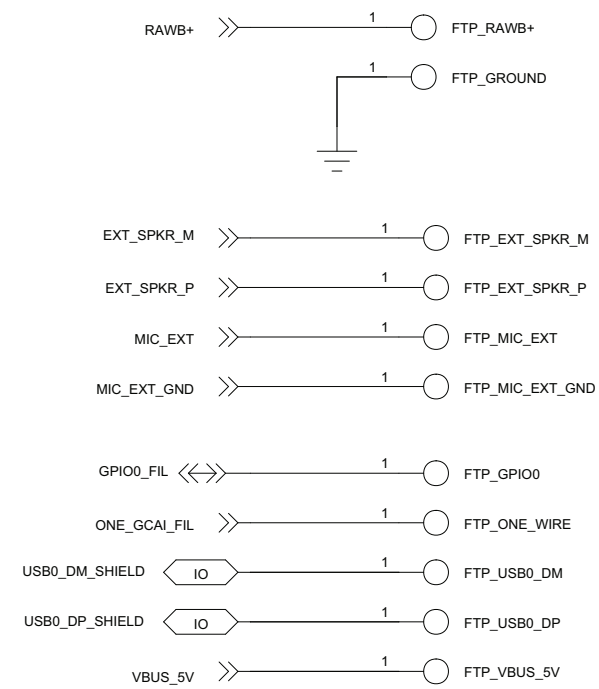


Figure 8-25. Peripheral Schematic Diagram (3 of 3)

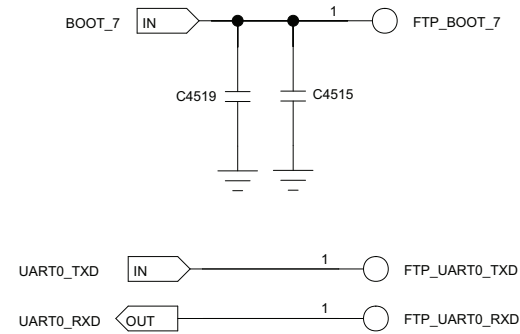
### FACTORY TEST POINTS

1.02MM DIAMETER  
FOR TEST & TUNE AND  
RE-FLASHING



### FACTORY TEST POINTS

1.02MM DIAMETER  
FOR BLANK BOARD FLASHING



### JTAG CONNECTOR

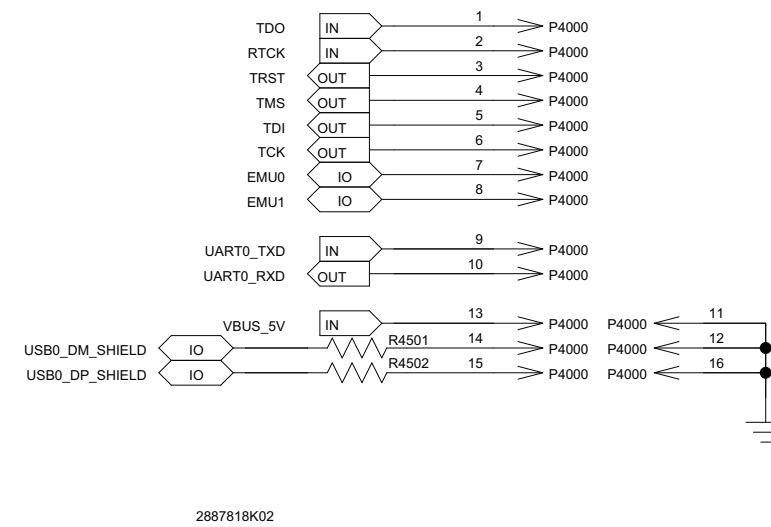


Figure 8-26. Factory Test Points Schematic Diagram

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

## Notes

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

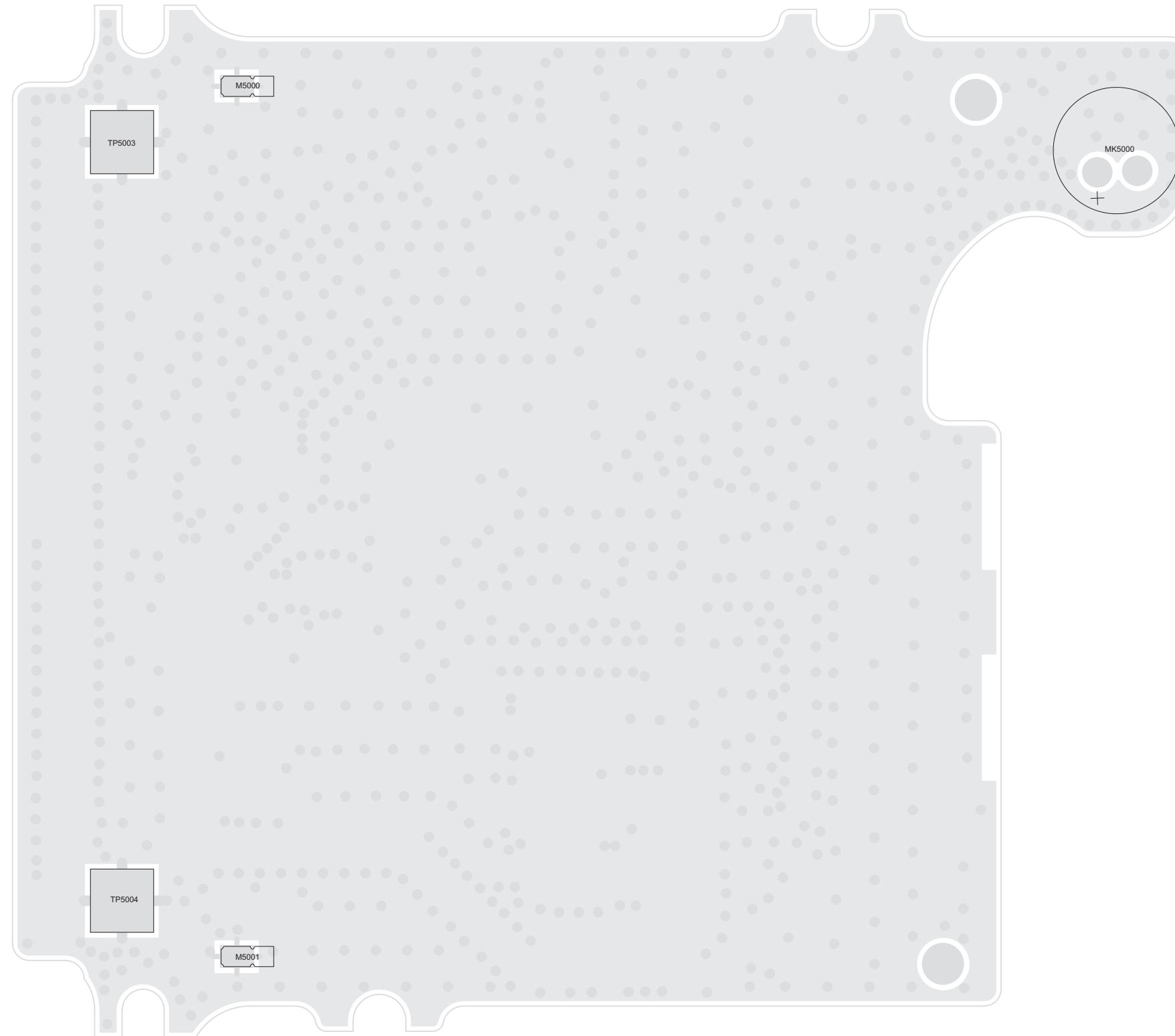


Figure 9-1. Interface Board Top Side PCB No. PC000864A01\_AA

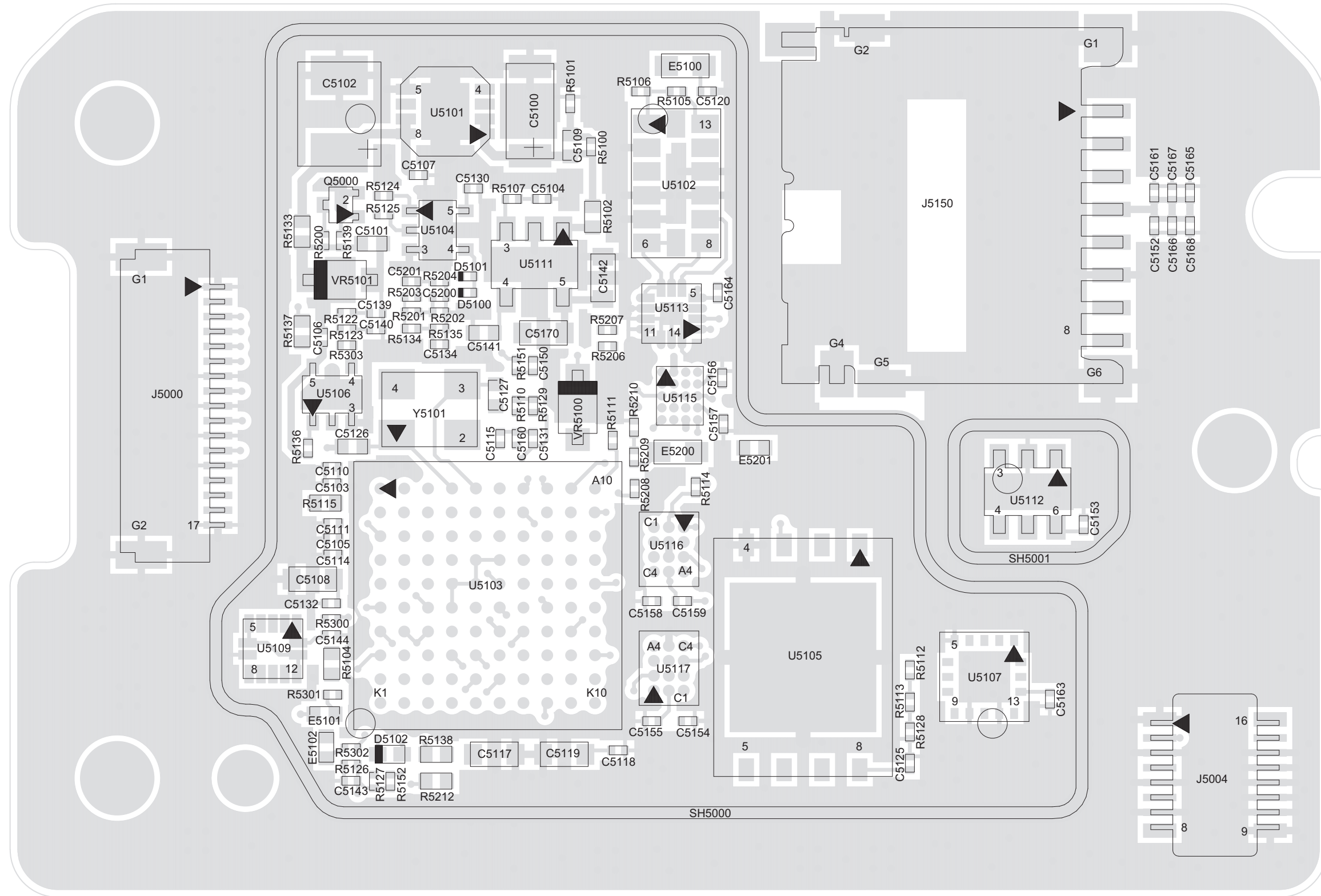


Figure 9-2. Interface Board Bottom Side PCB No. PC000864A01\_AA

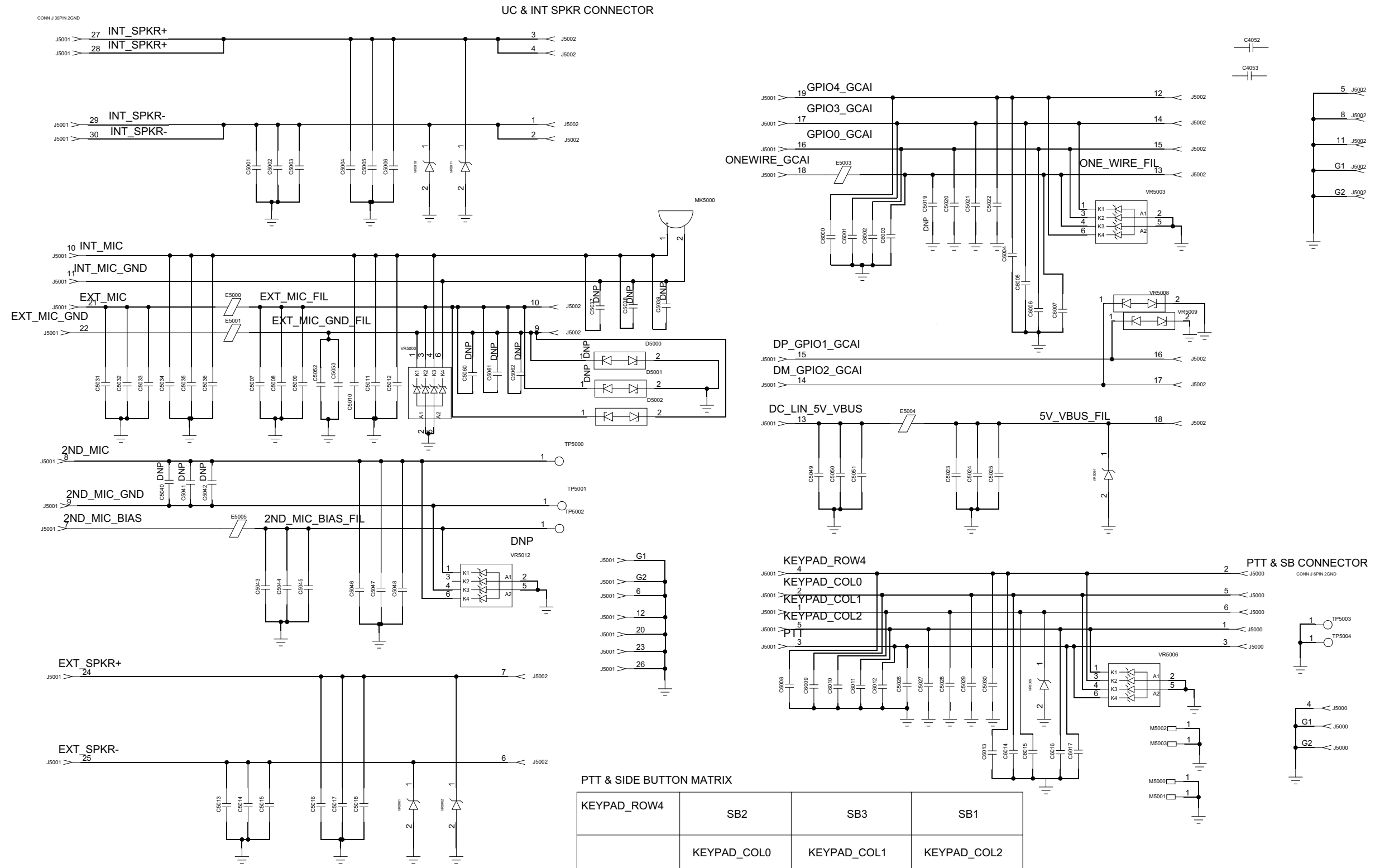
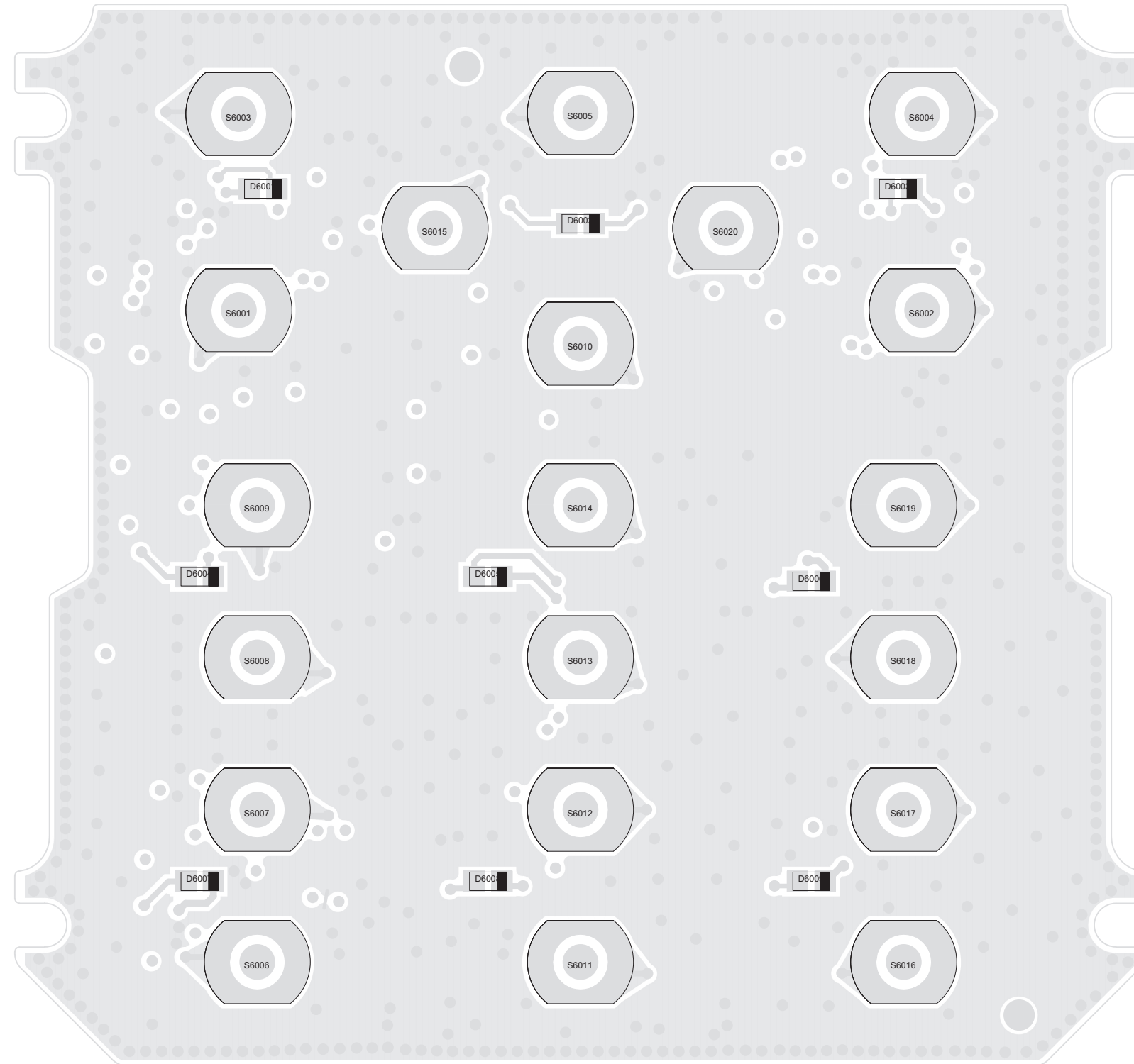


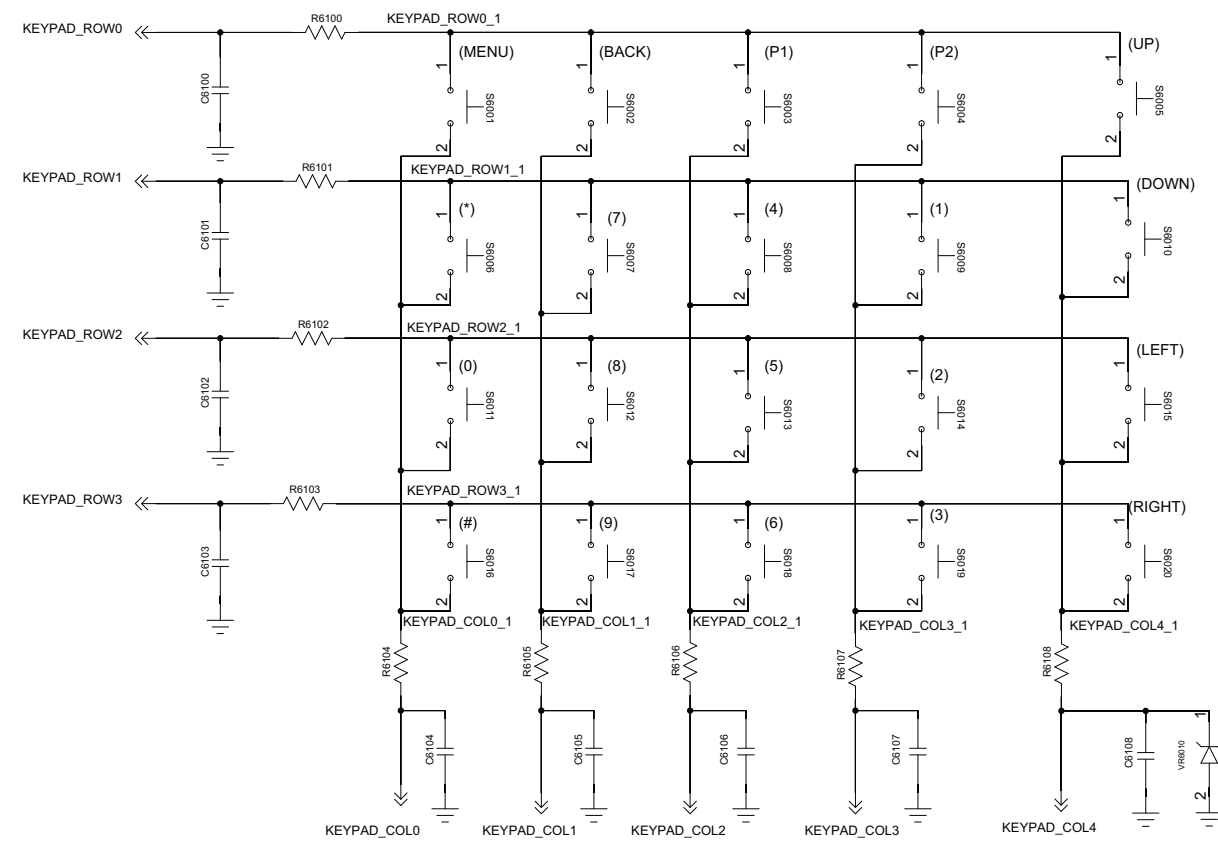
Figure 9-3. Interface Board Schematic Diagram





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





P1	P2
OK	U
L	D
1	2
4	5
7	8
*	0
	#
	BACK
	3
	6
	9

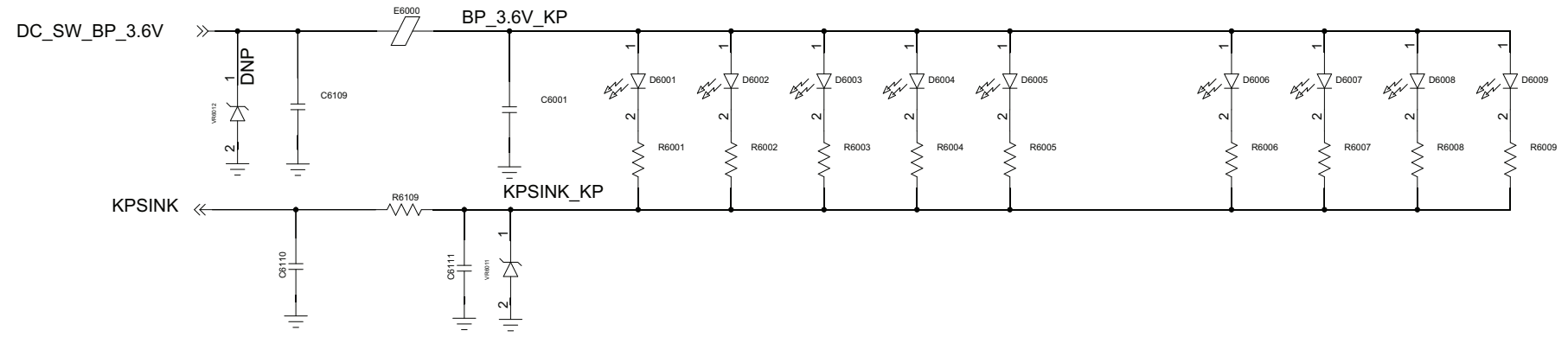
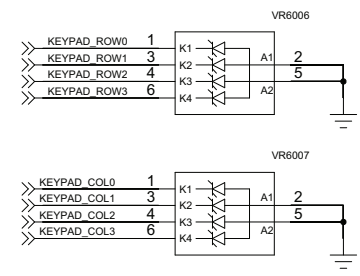


Figure 9-6. Keypad Board Schematic Diagram (1 of 3)

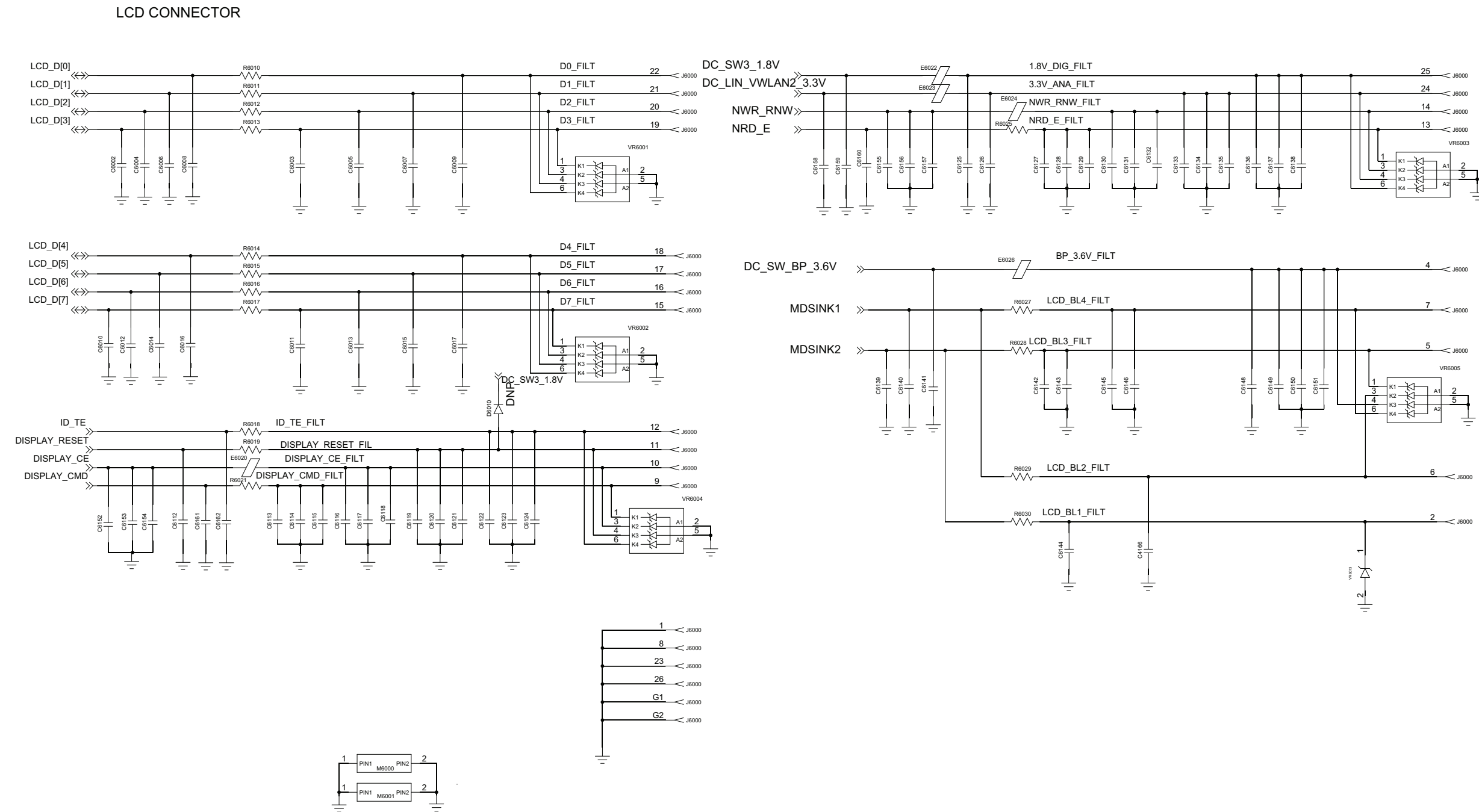


Figure 9-7. Keypad Board Schematic Diagram (2 of 3)

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

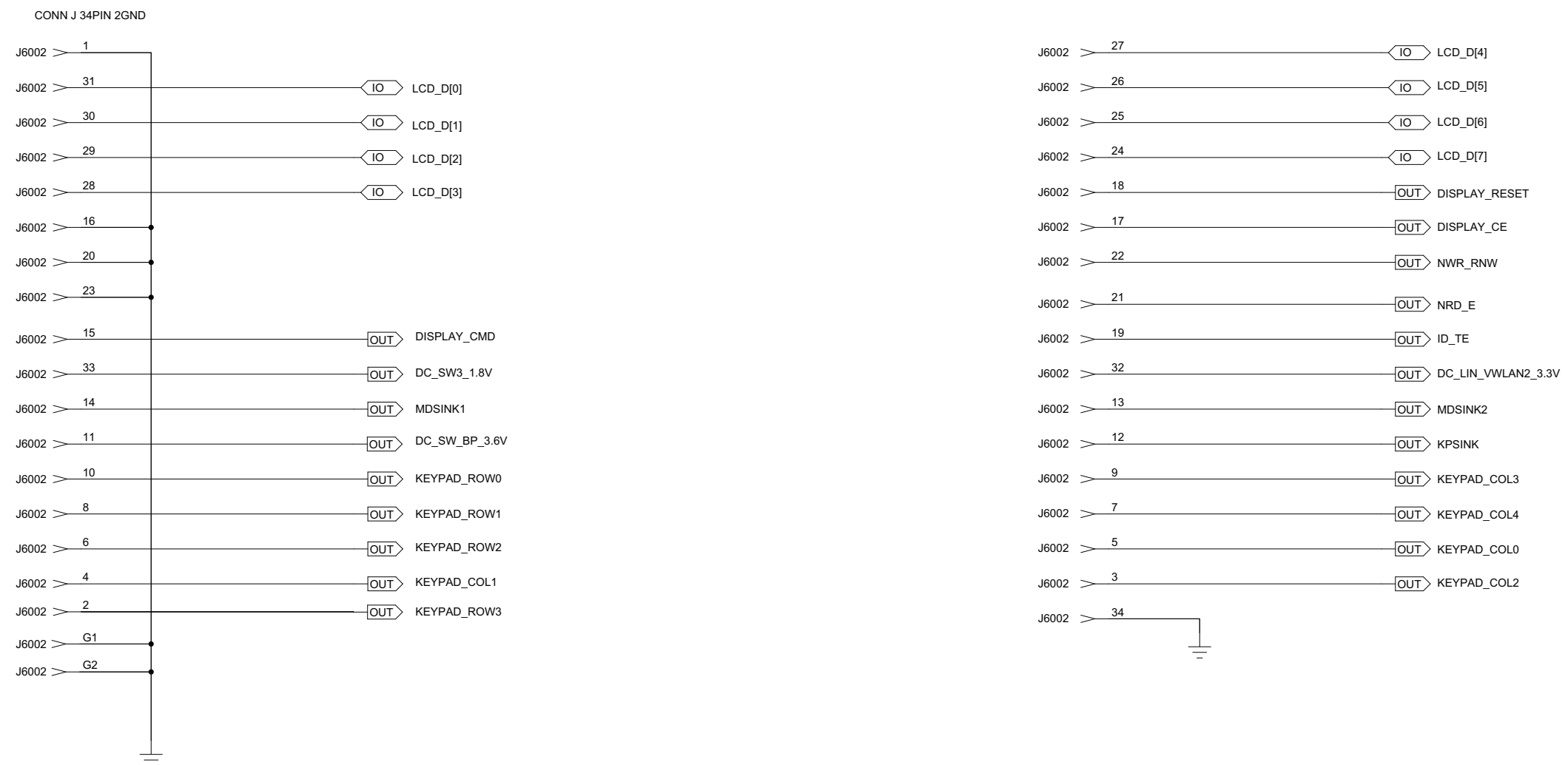
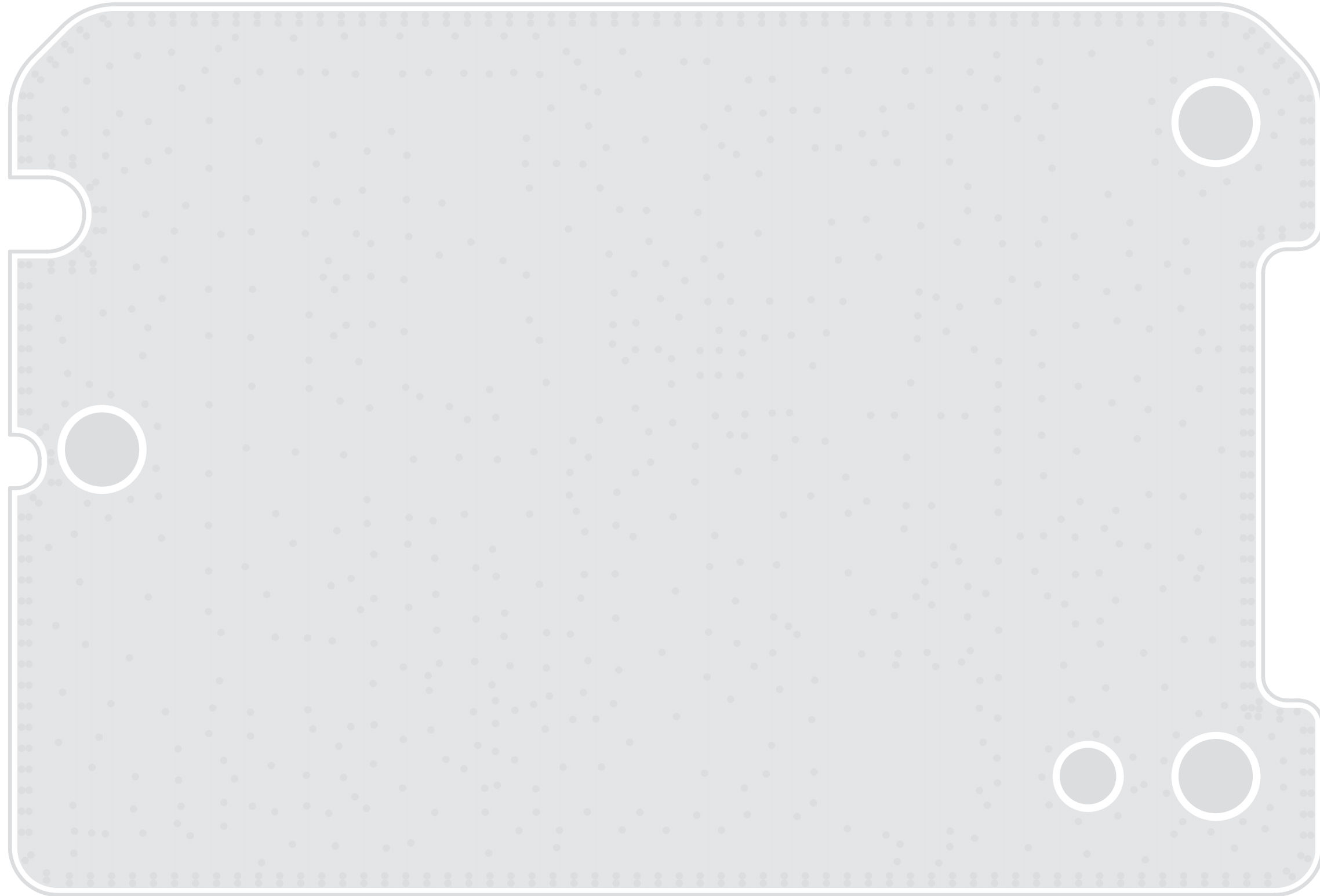


Figure 9-8. Keypad Board Schematic Diagram (3 of 3)



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

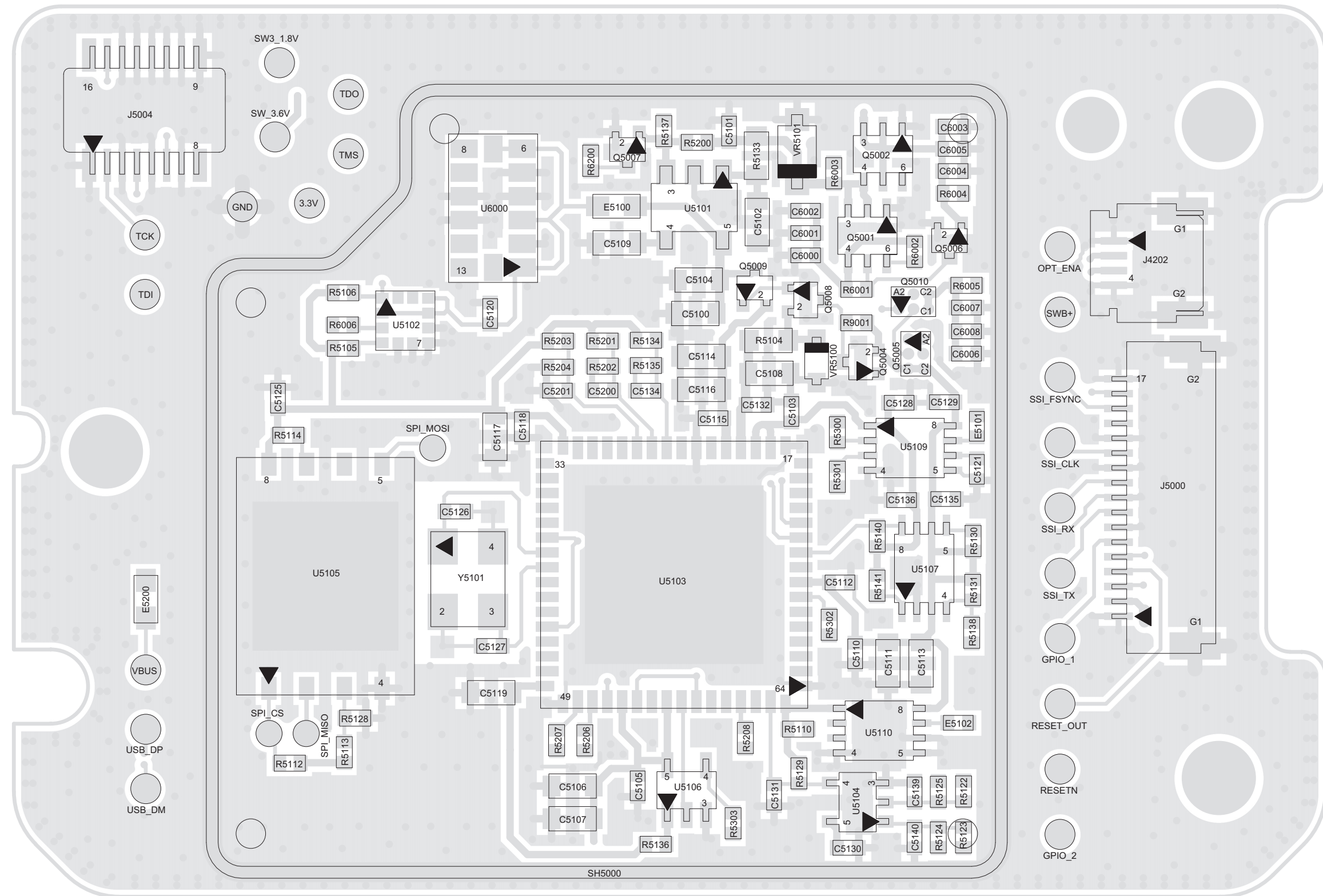


Figure 9-10. GOB Board Bottom Side PCB No. PC000957A01\_CA





## 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.

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**Notes**





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