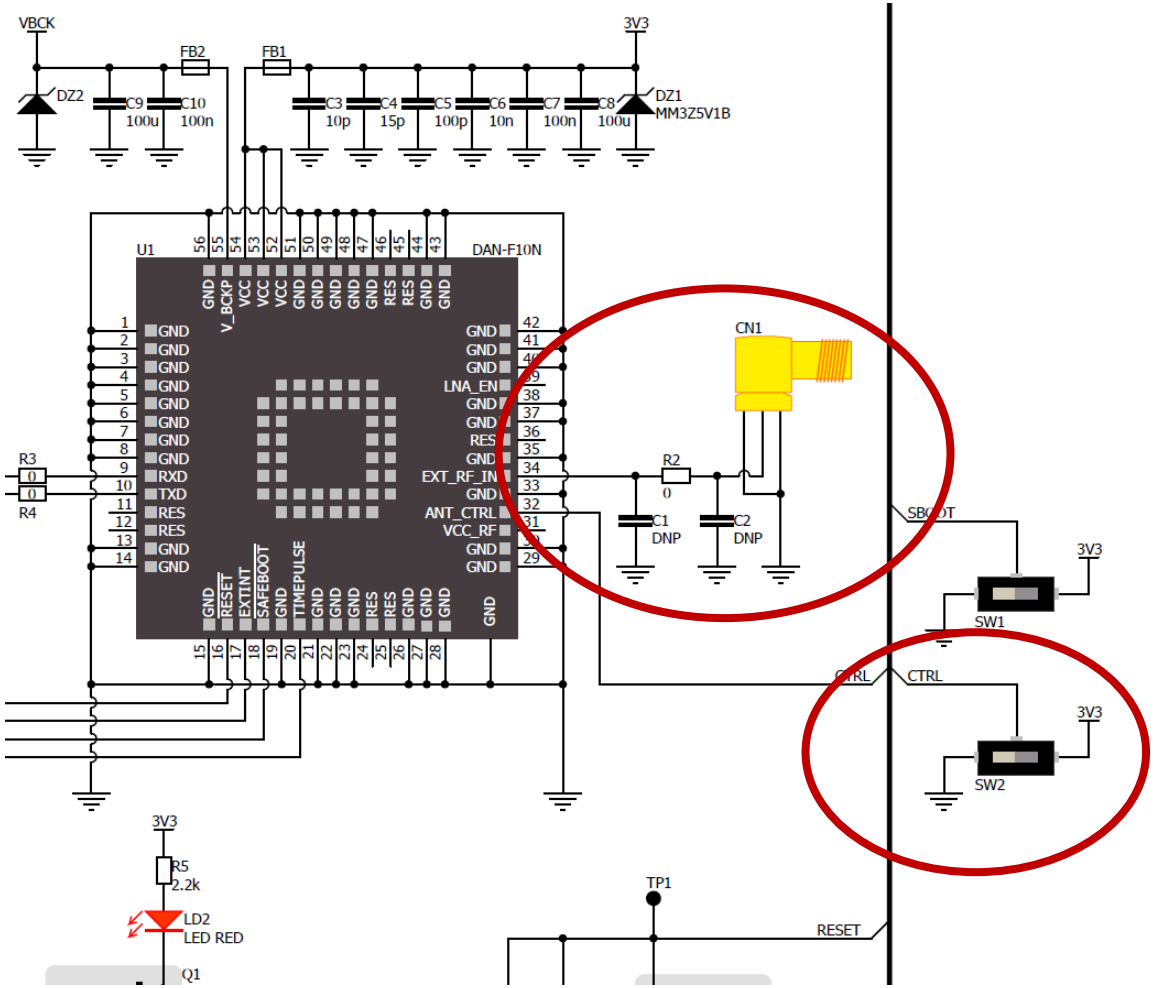
Schematic dan-f10n antenna board v100

1. No antenna power supply feed into the RF line from EXT_RF_IN to SMA connector
   - Required for an active external antenna
2. Antenna selection
   - Based on a switch (SW2)
   - Option: automatic detection circuit

- 1) must fix, 2) to be decided

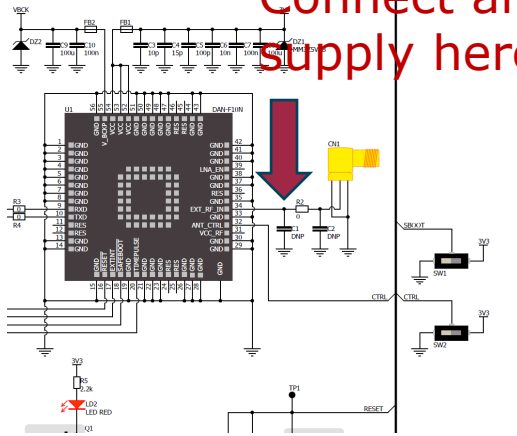


Antenna DC supply feed circuit (1)

- Spec
  - min 3.0 V antenna supply voltage at 20 mA antenna current

1. Connect between EXT_RF_IN and SMA connector
2. Use VCC_RF as the antenna supply voltage
   - VCC_RF = VCC = 3V3 (minus ferrite bead loss)
   - Max VCC_RF current 250 mA
   - Limit max antenna supply short-circuit current to 250 mA
   - Ensure 3.0 V @ 20 mA at SMA connector

1)



2)

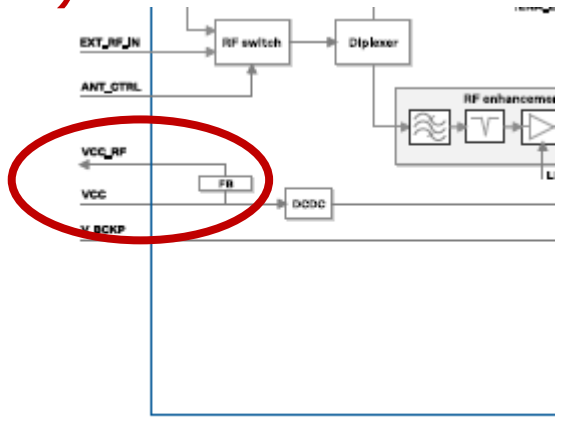


Figure 1: DAN-F10N block diagram

Antenna DC supply feed circuit (2)

- Components
  - R8 current limiting resistor
  - C14 filtering cap
  - L4 antenna supply feed inductor (critical component)
- Circuit
  - VCC_RF = VCC = 3V3
  - Max VCC_RF current 250 mA
    - Limit max short-circuit current to 250 mA (R8 value/power rating)
    - Set R8 >13R2, e.g. 0.5W
  - EXT antenna supply min 3.0 V @ 20 mA
    - Iant=(VCC_RF-3.0 V)/R8
    - Set R8 as small as possible for Iant>=20mA

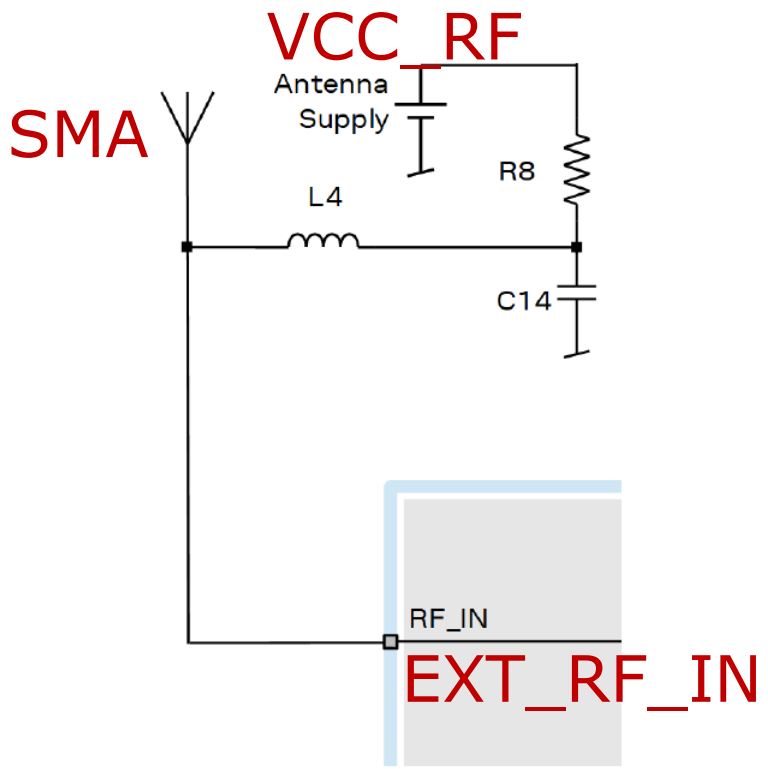


Figure 23: Antenna supply network

Name	Use	Type / Value	Recommended component
L4	RF Bias-T inductor	47 nH, 5%	Murata LQG15HS47NJ02 Johanson Technology L-07W series Any other inductor with impedance > 500 Ω at GNSS L1 and L5 frequencies and current rating above 300 mA.

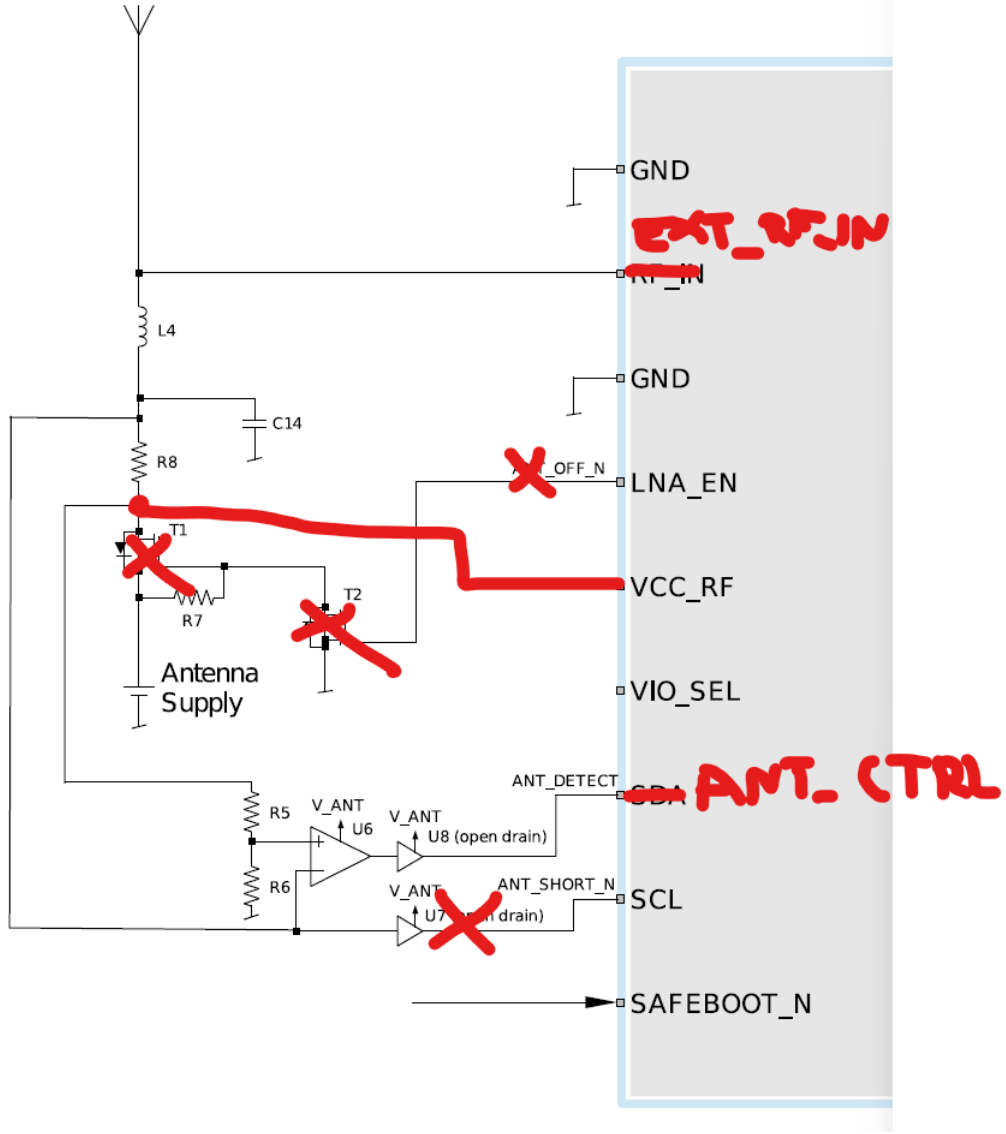
Table 44: Recommended inductors

Name	Use	Type / Value
C14	RF Bias-T capacitor	10 nF, 10%, 16 V, X7R

Table 42: Standard capacitors

Antenna selection circuit

- Operation
  - By default, use DAN-F10N integrated antenna
    - ANT_CTRL = low
  - Detect presence of an external active antenna
    - Set ANT_CTRL = high
  - Operation based on detecting ext antenna current
    - This is the antenna supervisor open detection circuit
- Proposed circuit (minor tuning may be required)
  - Extends the antenna supply feed circuit
  - Connect ext antenna RF to EXT_RF_IN
  - Monitor voltage over R8 using comparator U6 (low input-offset voltage ~500 uA)



Name	Manufacturer	Order no.
U6	Linear Technology	LT6000, LT6003

Table 45: Recommended parts list for the operational amplifier

R5	Antenna supervisor voltage divider	560 Ω, 5%, 0.1 W
R6	Antenna supervisor voltage divider	100 kΩ, 5%, 0.1 W

U7, U8	Fairchild	NC7WZ07P6X

Table 46: Recommended parts list for the open drain buffers

Locate and connect every thing.