FT817 DC on Transmit

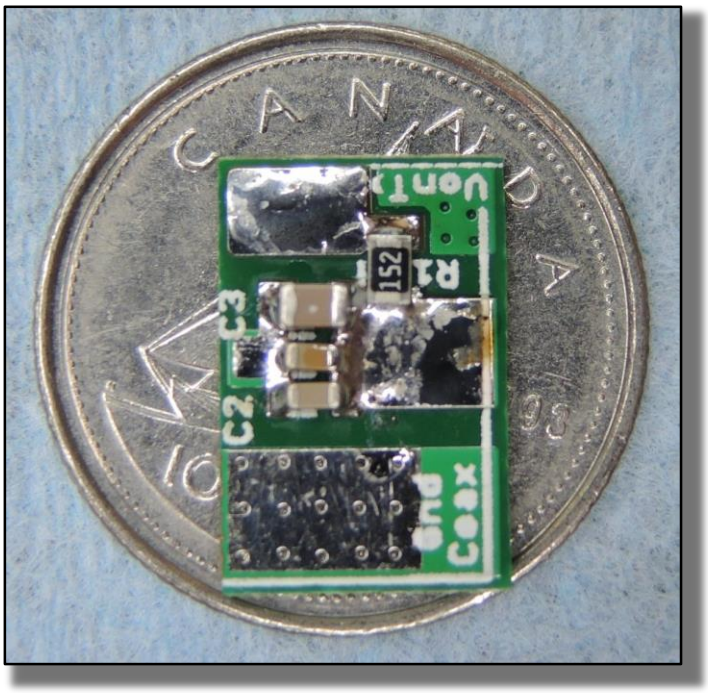
Version

This document is for printed circuit board version 0.0a.

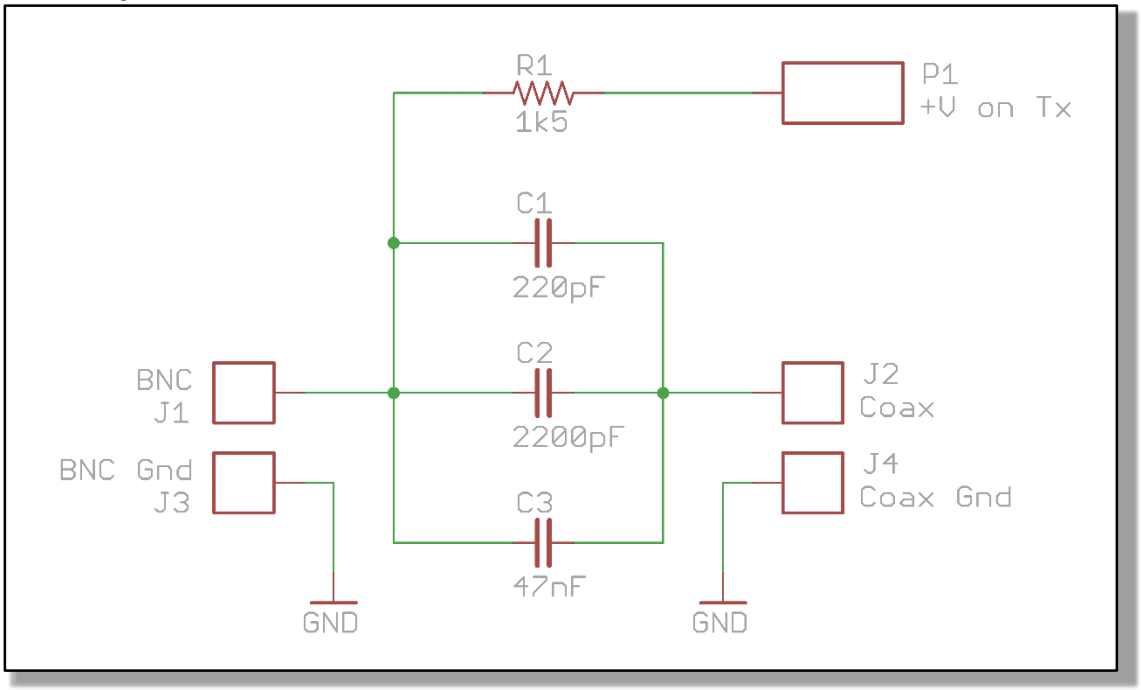
Overview & Features:

This design provides a DC bias on the FT817 BNC connector center pin during transmit for use with some transverters

- Small 12x 8 mm PCB installs inside the unit directly on the front panel BNC connector



Circuit Description

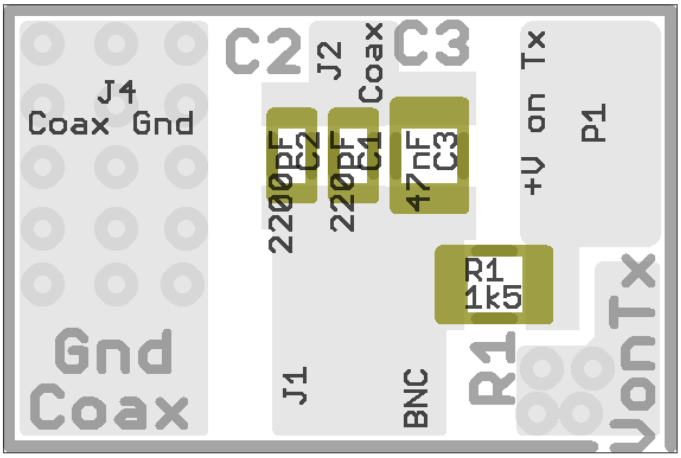


P1 is connected to a suitable switched DC voltage that is high during transmit. R1 limits the current drawn from the V+ on transmit point, and provides a positive voltage on transmit to an attached transverter through the BNC center pin that is soldered to the PCB at J1. C1, C2, and C3 provide a DC block from the coax to the BNC connector center pin while providing a low impedance RF path. Three capacitors are chosen so that the AC impedance is less than two ohms on the 160 meter band and under an ohm at all other amateur radio bands up past 450MHz. These capacitors were chosen to have series resonance (self-resonance) points that insure the coupling from the coax to the antenna is always capacitive and low impedance. All DC blocking capacitors have a breakdown voltage of 250V. If substitutes are used they should have breakdown voltages of at least 100V or more to insure they have sufficient breakdown capability even when transmitting into an open load.

Assembly Guidelines

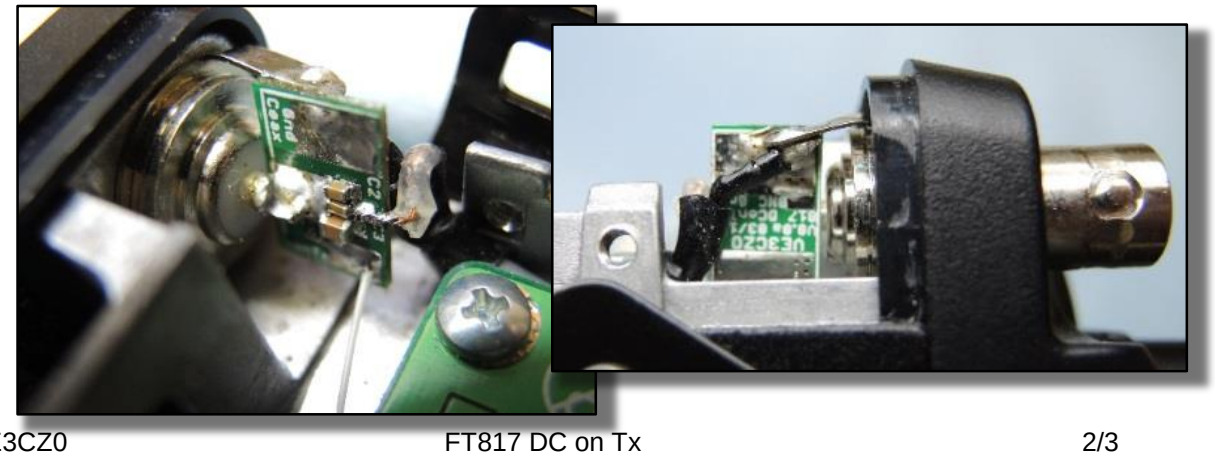
1. Install all top side components

- C1 220 pF 10% 250V X7R 0603 Murata GRM188R72E221KW07D
- C2 2200 pF 10% 250V X7R 0603 Murata GRM188R72E222KW07D
- C3 47 nF 10% 250V X7T 0805 TDK C2012X7T2E473K125AA
- R1 1K5 0805

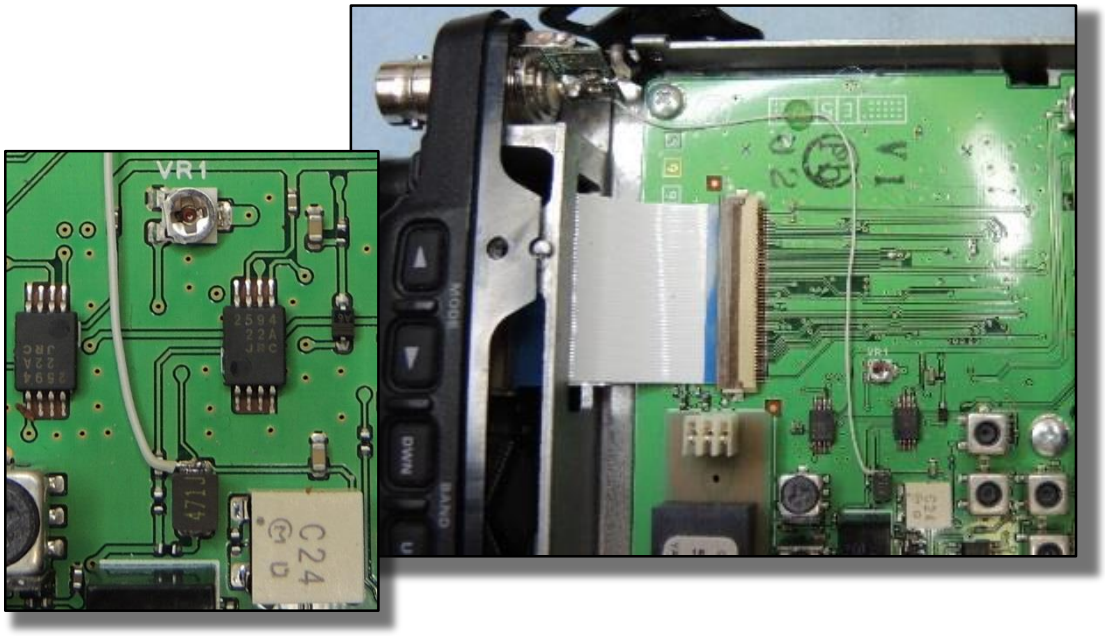


2. Final assembly

a. Solder a small gage wire about 10cm long to the PCB VonTx solder pad (30 AWG wire wrap wire works well).
b. Unsolder the center and ground coax connections the front panel BNC.
c. Place the PCB between the BNC center conductor and ground lug with the center pin resting on the PCB's Coax Gnd pad and the BNC ground lug resting against the bottom side of the PCB



d. Solder the BNC center pin to the PCB and the ground lug to the PCB bottom ground plane
e. Solder the coax center pin to the PCB J2 coax pad and the coax ground to the PCB ground plane.
f. Find a V+ on transmit pick-off location on the FT817 main board. The most convenient point is the TX5 rail at the junction of L1034 and C1416. Dress then solder the fine wire running from the VonTx pad to the side of L1034 nearest the BNC connector. (PCB layout co-ordinates B3 lower right corner closest to C4).



Performance Measurements

Transmit output power was measured before and after the addition of the DC on Tx PCB on one transceiver.

FT817 O/P power before & after DC on Tx mod

Frequency	Before mod		After mod		Difference	
MHz	dBm	Watts	dBm	Watts	dBm	Watts
1.8	37.8	6.0	37.8	6.1	0.06	0.1
3.5	38.0	6.3	38.0	6.3	0.05	0.1
5.0	31.3	1.3	31.3	1.3	0.00	0.0
7.0	37.9	6.1	37.9	6.2	0.04	0.1
10.1	37.9	6.1	37.9	6.1	0.02	0.0
14.0	37.7	5.9	37.7	5.9	0.00	0.0
18.1	37.7	5.9	37.7	5.9	0.00	0.0
21.0	37.8	6.0	37.8	6.0	0.00	0.0
24.9	37.8	6.1	37.8	6.0	-0.02	0.0
28.0	37.9	6.1	37.8	6.1	-0.03	0.0
50.0	37.6	5.8	37.6	5.8	0.00	0.0
144.0	37.6	5.7	37.6	5.8	0.02	0.0
430.0	37.2	5.3	37.1	5.1	-0.11	-0.1