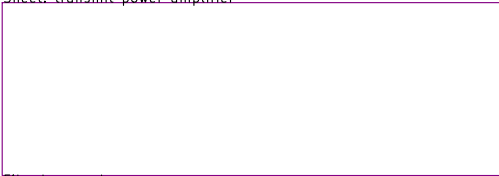Sheet: low pass filters
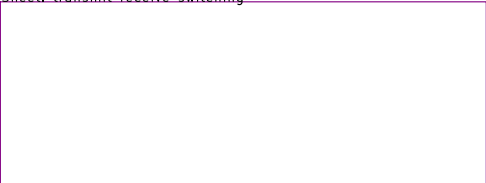
File: LPF.sch

Sheet: transmit power amplifier

File: tx_pa.sch

Sheet: transmit receive switching
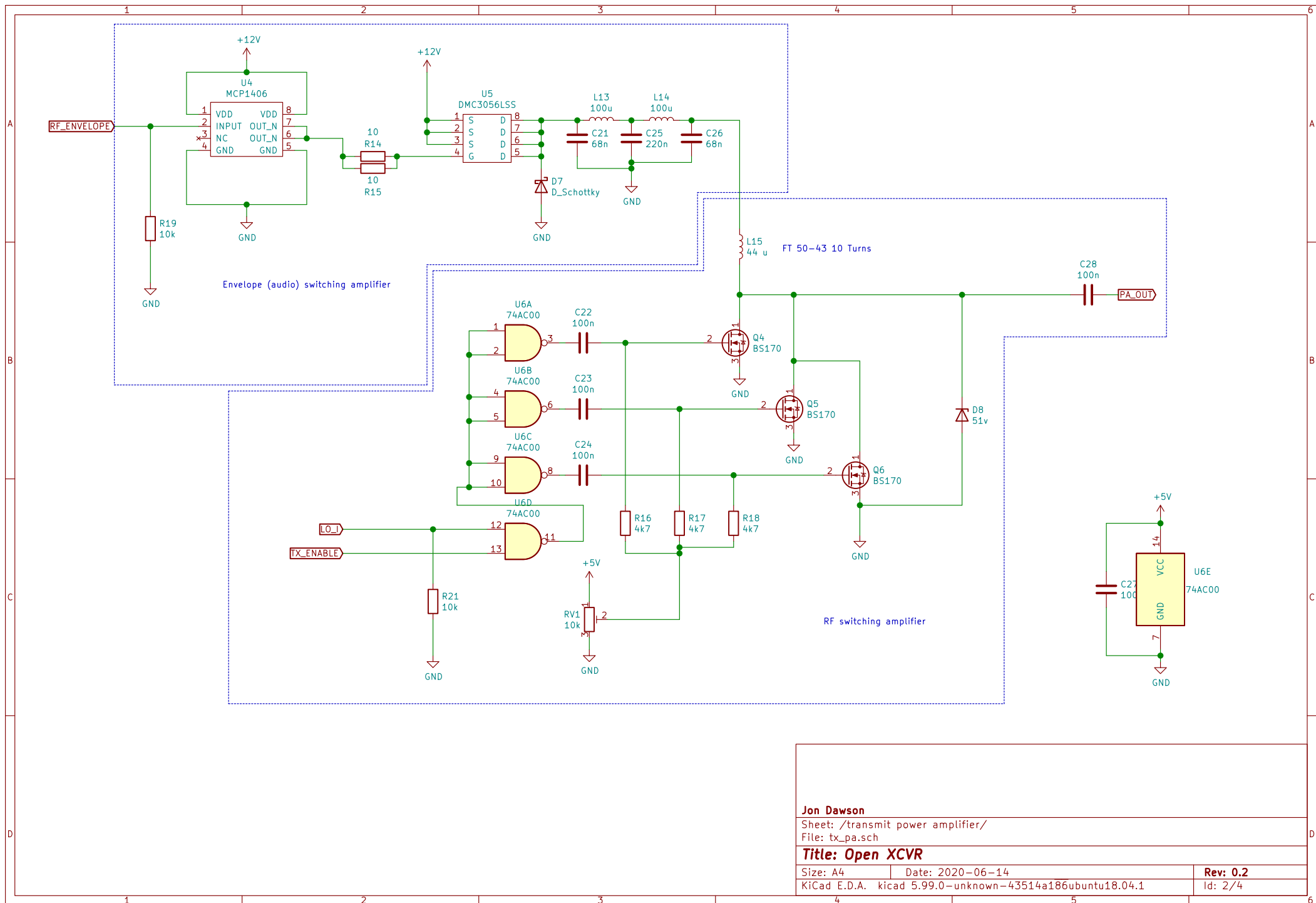
File: TX_RX.sch

RF_ENVELOPE

U4
MCP1406
1 VDD   VDD 8
2 INPUT OUT_N 7
3 NC   OUT_N 6
4 GND   GND 5
x3

+12V

R19
10k

GND

GND

10
R14

10
R15

+12V

U5
DMC3056LSS
1 S   D 8
2 S   D 7
3 S   D 6
4 G   D 5

D7
D_Schottky

GND

L13
100u

L14
100u

C21
68n

C25
220n

C26
68n

GND

Envelope (audio) switching amplifier

L15
44 u   FT 50-43 10 Turns

C28
100n

PA_OUT

U6A
74AC00
1
2   3

C22
100n

2 Q4
   BS170
3

GND

U6B
74AC00
4
5   6

C23
100n

2 Q5
   BS170
3

GND

U6C
74AC00
9
10   8

C24
100n

2 Q6
   BS170
3

D8
51v

GND

R16
4k7

R17
4k7

R18
4k7

GND

U6D
74AC00
12
13   11

LO_I

TX_ENABLE

R21
10k

GND

+5V

RV1
10k
1
2
3

GND

RF switching amplifier

+5V

C27
100

U6E
74AC00
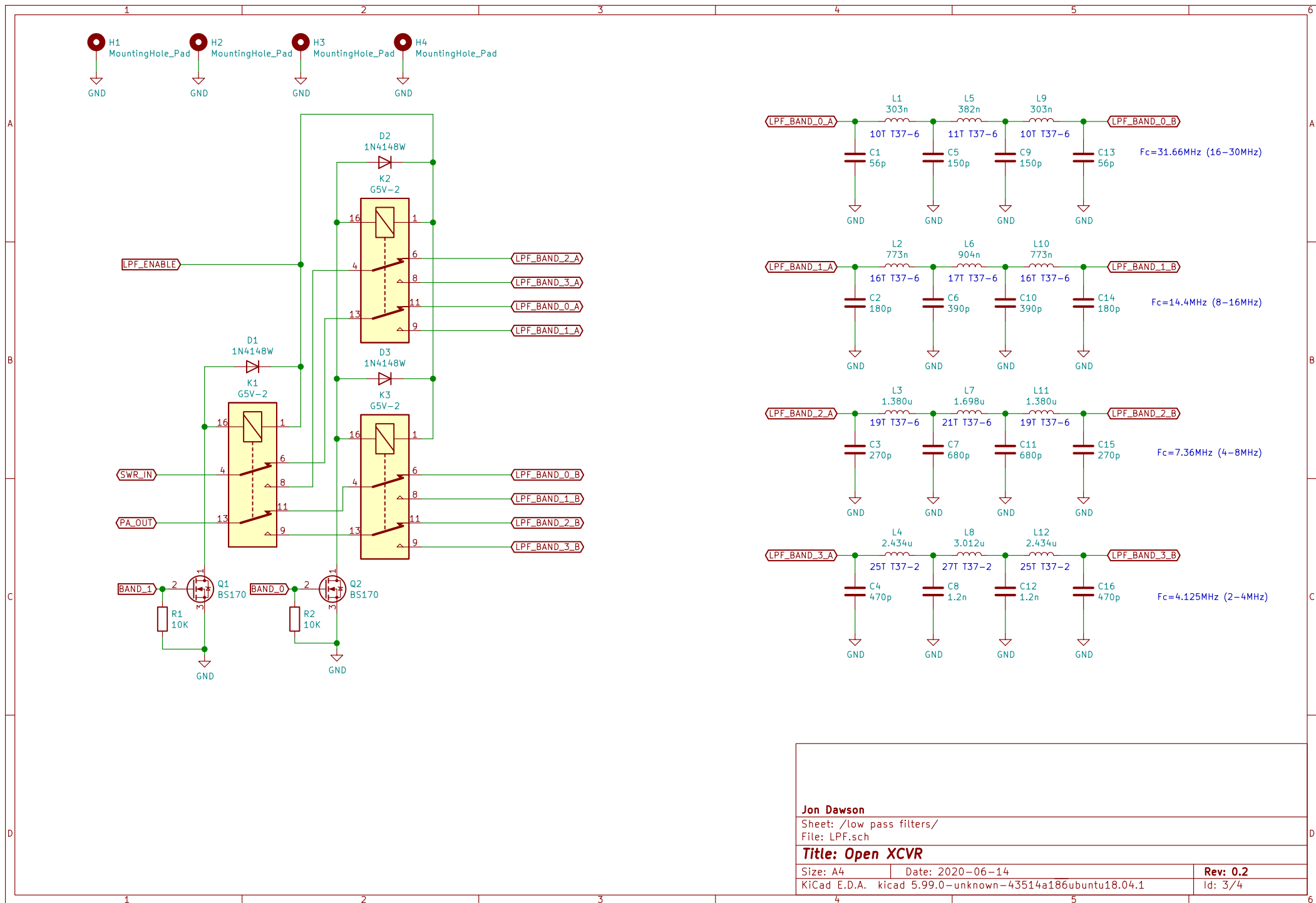14 VCC
7 GND

GND

Jon Dawson
Sheet: /transmit power amplifier/
File: tx_pa.sch

Title: Open XCVR

Size: A4   Date: 2020-06-14   **Rev: 0.2**
KiCad E.D.A. kicad 5.99.0-unknown-43514a186ubuntu18.04.1   Id: 2/4

Schematic: Low Pass Filters

Mounting Holes
- H1 MountingHole_Pad — GND
- H2 MountingHole_Pad — GND
- H3 MountingHole_Pad — GND
- H4 MountingHole_Pad — GND

Relay / Switching Section
- D2 1N4148W
- K2 G5V-2 (pins 16, 1, 6, 8, 11, 9, 4, 13)
- D1 1N4148W
- D3 1N4148W
- K1 G5V-2 (pins 16, 1, 6, 8, 11, 9, 4, 13)
- K3 G5V-2 (pins 16, 1, 6, 8, 11, 9, 4, 13)

Nets: LPF_ENABLE, SWR_IN, PA_OUT, BAND_1, BAND_0

- Q1 BS170
- Q2 BS170
- R1 10K
- R2 10K

Relay outputs: LPF_BAND_2_A, LPF_BAND_3_A, LPF_BAND_0_A, LPF_BAND_1_A, LPF_BAND_0_B, LPF_BAND_1_B, LPF_BAND_2_B, LPF_BAND_3_B

Filter Band 0 — LPF_BAND_0_A → LPF_BAND_0_B
- L1 303n 10T T37-6
- L5 382n 11T T37-6
- L9 303n 10T T37-6
- C1 56p
- C5 150p
- C9 150p
- C13 56p

$Fc = 31.66\,MHz$ (16-30MHz)

Filter Band 1 — LPF_BAND_1_A → LPF_BAND_1_B
- L2 773n 16T T37-6
- L6 904n 17T T37-6
- L10 773n 16T T37-6
- C2 180p
- C6 390p
- C10 390p
- C14 180p

$Fc = 14.4\,MHz$ (8-16MHz)

Filter Band 2 — LPF_BAND_2_A → LPF_BAND_2_B
- L3 1.380u 19T T37-6
- L7 1.698u 21T T37-6
- L11 1.380u 19T T37-6
- C3 270p
- C7 680p
- C11 680p
- C15 270p

$Fc = 7.36\,MHz$ (4-8MHz)

Filter Band 3 — LPF_BAND_3_A → LPF_BAND_3_B
- L4 2.434u 25T T37-2
- L8 3.012u 27T T37-2
- L12 2.434u 25T T37-2
- C4 470p
- C8 1.2n
- C12 1.2n
- C16 470p

$Fc = 4.125\,MHz$ (2-4MHz)

J2 — RADIO BOARD CONNECTOR

+5V

Pin	Signal	Pin	Signal
1	VBATT	2	TX_ENABLE
3	FWD_PWR	4	✕
5	REV_PWR	6	BAND_1
7		8	BAND_0
9	RF_ENVELOPE	10	RF_OUT
11	✕	12	
13	LO_I	14	
15		16	

GND

SWR Bridge

SWR_IN — ANTENNA

TR1
FT50-43Transformer

GND   GND

TR2
FT50-43Transformer

FWD_PWR
R4 10k
D5 1N5711
D6 1N5711
R13 10k
REV_PWR

C17 100n
R5 10k
R6 100
R9 100
R10 100
R11 100
R12 10k
C20 100n

GND

TX RX Switching

+12V

D4 1N4148W

K4
G5V-2

16   1
RF_OUT — 4
6 — ANTENNA
8
11 ✕
LPF_ENABLE — 13
9

GND

Q3 BS170
TX_ENABLE
R3 10K

GND

GND

Linear Regulator

SW1
POWER SWITCH

+12V

U1
LM7805CV_TO220

+5V

J4
Battery Connector

J3
Power Jack

R7 10k

VI   VO

GND

VBATT

C18 10u

C19 10u

R8 1K

GND

U2
to220heatsink
mounting_hole

U3
to220heatsink
mounting_hole

GND

J1 — Antenna BNC Connector

ANTENNA — 1

J1
Antenna BNC Connector

GND