Sheet: Power

File: Power.sch

Sheet: Amplifier

File: Amplifier.sch

Sheet: Control

File: control.sch

MH1 MH2 MH3 MH4 MH5

GND
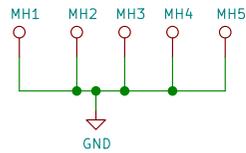
Design based on work by Steve Haynal KF7O and Claudio IN3OTD

Title: Radioberry − amplifier

| Size: A4 | Date: 2020−12−18 | **Rev: beta 1** |
| KiCad E.D.A. kicad (5.1.8)−1 | | Id: 1/4 |

From TX Radioberry

ant

C301
DNI

C302
DNI

R301
DNI

R302
DNI

C304
0.1uF

RF301
SMA
To Radioberry RX

+VPA

R303
0.04

C303
0.1uF

U301
5 IN− IN+ 4
       V+   3
1 REF
2 GND OUT 6   Vipa
INA199A1DC

C305 C306 C307 C308 C309
22uF 1uF   1uF   1uF   1uF

4   3
K301
+3V3   + 1
INTTR   5   8
       12
C310   NA3WK−K
100pF

10

9   ant   RF302
11   SMA
7   Antenna

RF303
SMA

C318
0.1uF

R307
5.9

R309
866

R310
866

1dB ATT

T302
1:1
3
2
1
4
5

R306
12

R312
12

C313
0.1uF

J301
JNC

bias1
C320
DNI
0.1uF

C322
0.1uF

J302
JNC

bias0
C323
DNI
0.1uF

R304
270

C311
0.1uF

Q301
G D
S
LDMOS

R311
270

C321
0.1uF

Q302
G D
S
LDMOS

C312
390pF

C314 C315 C316 C317
0.1uF 0.1uF 0.1uF 0.1uF

DNI R305

DNI R308

T301
1   5
2
3   4
4:1 Z

C319
0.1uF

Hand Wind
B62152A4X30 or BN43−202
4T Secondary, 1+1T Primary
BN43−1502
8T Secondary, 2+2T Primary
B62152A4X30 runs hot, use 24AWG PTFE/FEP Wire

W301
21
21 cm wire required

PA3GSB Johan Maas
AppMind
Sheet: /Amplifier/
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Title: Radioberry − amplifier
Size: A4   Date: 2020−12−18   Rev: beta 1
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+3V3

R201 2.2K   R202 2.2K

EXTDOT — R204 100 — dot

EXTDASH — R207 100 — dash
C204 1uF   C205 1uF
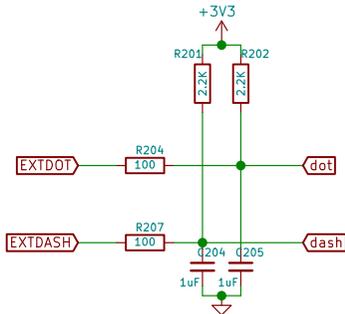
4 anolog inputs
On board current and temperature
External fwd/rev with AIN1/AIN2

+3.3V
PWR_FLAG
FB201

J201 JNC   AIN2   2   DB201   1
R203 DNI 1K   C201 DNI 4.7nF

U201
5 SCL   AIN3 4
6 SDA   AIN2 3
8 Vdd   AIN1 2
7 GND   AIN0 1
MAX11613
I2C ADDR 0x34

SCL
SDA
C206 0.1uF

R205 270 — Vipa
R206 1K   C203 4.7nF

J202 JNC — Vtemp
R208 DNI 1K   C207 4.7nF

J203 JNC   AIN1   2   DB202   1
R209 DNI 1K   C208 DNI 4.7nF
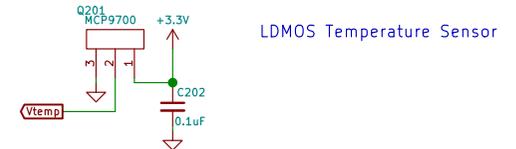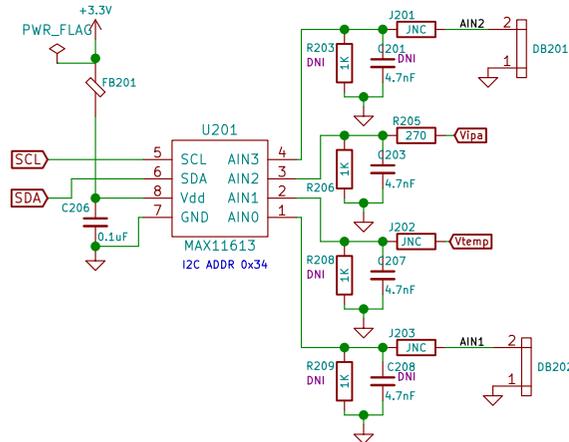
Q201 MCP9700   +3.3V
Vtemp   C202 0.1uF
LDMOS Temperature Sensor

DB203
1
2 — EXTDOT
3
4 — EXTDASH
5
6 — EXTKEY
7
8 — EXTPTT
9
10 — EXTTR

U202
3 SDA   Vdd 10
2 SCL
6 P1W   P1B 5
7 P0W   P0B 8
1 A0
9 A1   Vss 4
MCP4662
I2C ADDR 0x2C

SDA
SCL

+3V3
C209 0.1uF

+VBIAS
R210 27K   R211 27K

R212 9.1K — bias1
R213 9.1K — bias0
R214 DNI   R215 DNI
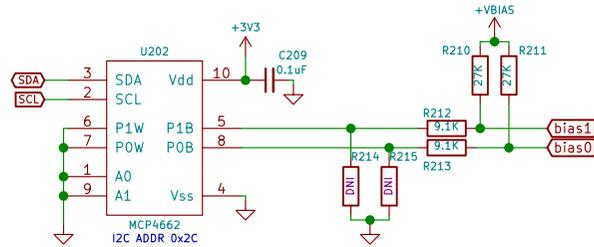
R210,R211,R212,R213 set for AFT05MS003. Bias voltage ranges from 2.5 to 3.5V

JP201
FEMALE_PINHEAD_PINHD-2X10

rb_exttr   2 1
           4 3
dot   6 5   dash
bias   8 7   envpa
          10 9
          12 11
ptt   14 13   key
fpga_sda 16 15   fpga_scl
rpi_sda   18 17   rpi_scl
          20 19

rb_inttr
rb_inttr

J204 DNI   J205 JNC
SDA
J206 DNI   J207 JNC
SCL
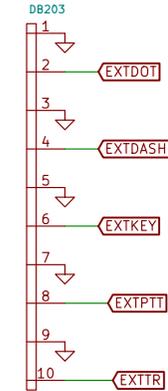
Internal PTT
May ground INTTR during TX
depending on firmware setting
Pullup to 3.3V by K2
May pullup to 28V if K2 absent

INTTR
NUD3124
G   Q202   D   S
rb_inttr
R216 4.7K
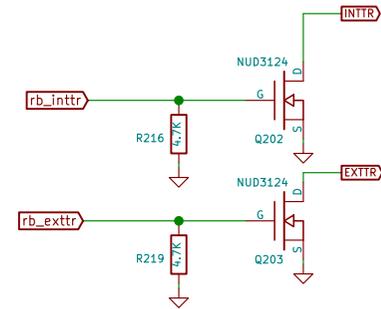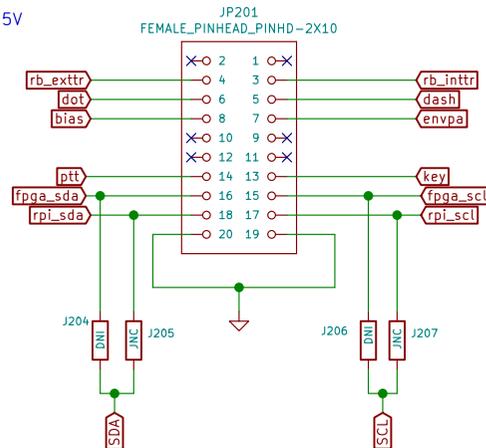
External PTT
Will ground EXTTR during TX
External PA to supply pullup
voltage up to 28V

EXTTR
NUD3124
G   Q203   D   S
rb_exttr
R219 4.7K

+3V3
R217 2.2K   R218 2.2K

EXTPTT — R220 100 — ptt

EXTKEY — R221 100 — key
C210 1uF   C211 1uF
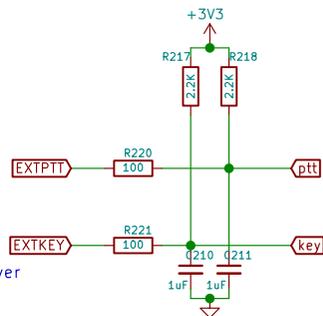
Two input only
CW/PTT or CW keyer
Ground to key

PA3GSB Johan Maas
AppMind
Sheet: /Control/
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Title: Radioberry – amplifier
Size: A4   Date: 2020-12-18   Rev: beta 1
KiCad E.D.A.   kicad (5.1.8)-1   Id: 3/4

CN101
PS
1
2
GND

F101
3A@20V

D101
SMBJ18CA
GND

C119
10pF
GND

C120
100pF
GND

C101
10uF
GND

Q101
DMP3099L
D   S
G
GND

PWR_FLAG

C121
10pF

C122
100pF

C123
1nF
GND

envpa

FB101

R101
10K
GND
DNI

U101
ST1S10
6 Vinsw   SW 7
2 EN
1 Vina   Vfb 3
4 AGND   PGND 8
5 SYNC   epad 9

C103
C102 4.7uF
10uF
GND

L101
3.3uH

R102
16K2
4.7nF
C104

R103
1K8
GND

PWR_FLAG

C105 22uF C107
22uF 22uF   C109
C106 C108 22uF
22uF
GND

+VPA

bias

FB102

R104
4k7
GND

U102
LP2985
3 EN Vout 5
1 Vin
2 GND BYP 4

C111
1uF
GND

C110
10uF

+VBIAS

C112
100nF
GND

IC101
LD1117S33
IN   OUT
ADJ

C113 C114
10uF 100nF

C115 C116 C117 C118
1nF 10nF 100nF 100uF

+3V3

GND

PA3GSB Johan Maas
AppMind
Sheet: /Power/
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Size: A4   Date: 2020-12-18   Rev: beta 1
KiCad E.D.A. kicad (5.1.8)-1   Id: 4/4