Multiband Bandpass filters 30 MHz

Four bandpass filters are used in the RX and TX path to cover all HF bands. Filters are implemented using standard values capacitors and inductors. This is one of the most simple, compact and easy to build filters, not inferior to the filters of other designs. Recommends for novice or ham radio who do not want to make windings.

Filter switching is achieved via CMOS switches SN74CBT3253, two of them – one at the input and one at the output to prevent crosstalk. Two parallel data lines are used for control, plus the RX/TX lines that selects Receive or Transmit mode. Truth table is included in the schematics. Input DC of bandpass filter is 8-15Volts, but the Recommended input voltage for ABCD is 3-5Volts. SN74CBT3253 is not protected from the high voltage. Be careful with input voltages and static on it.

Mode	A (S0)	B (S1)	C (OE2)	D (OE1)	Band
RX	1	1	1	0	1.9-3.5 MHz
RX	1	0	1	0	7 MHZ
RX	0	0	1	0	10-14 MHz
RX	0	1	1	0	18-28 MHZ
TX	1	1	0	1	1.9-3.5 MHz
TX	1	0	0	1	7 MHZ
TX	0	0	0	1	10-14 MHz
TX	0	1	0	1	18-28 MHZ

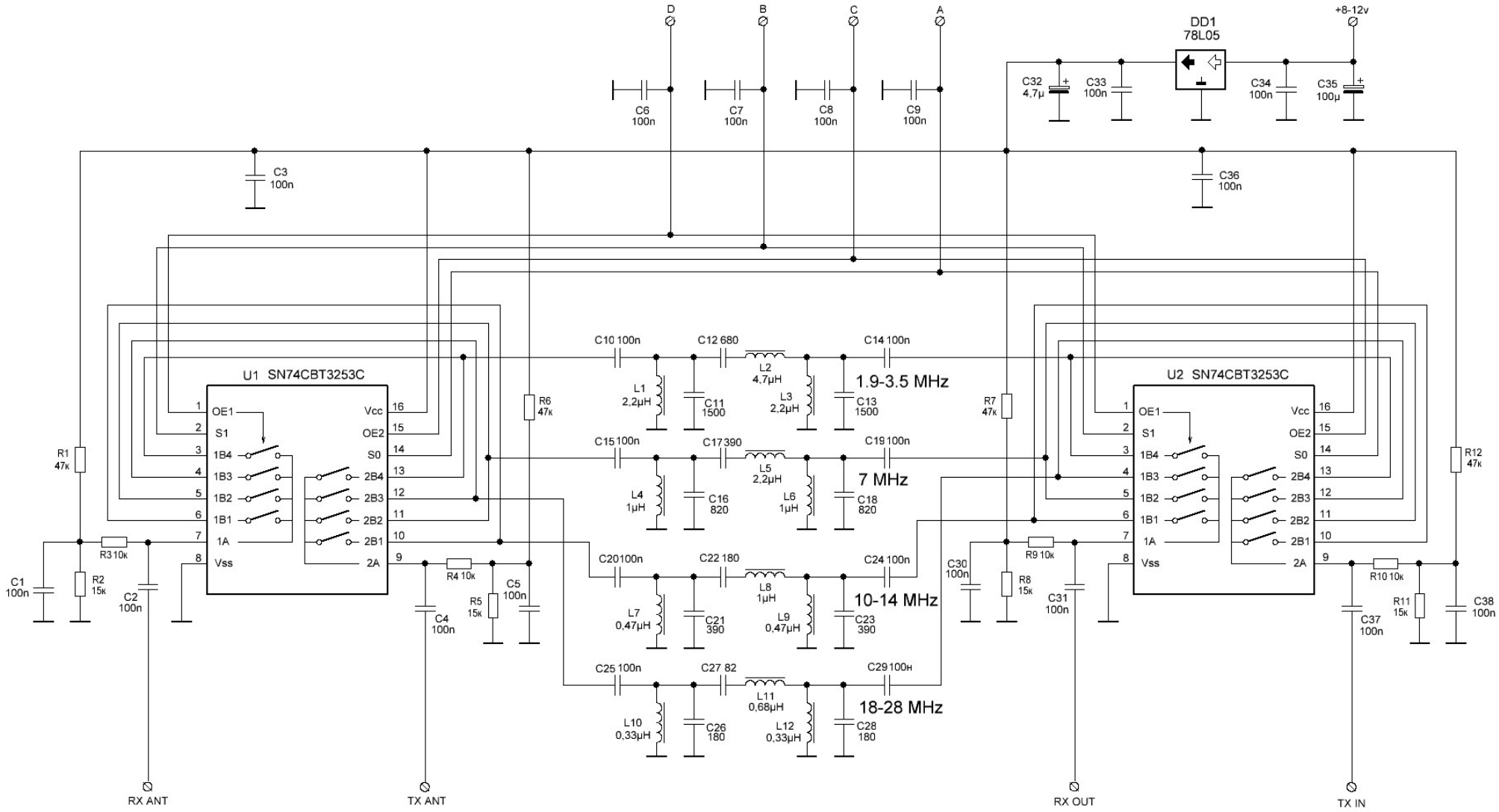
It is very convenient to use DDS synthesizer for switching bands, but switching could be realized by standard rotate switcher. For example, if look on the truth table – RX and TX modes has constant C and D; only A&B should be switched. If working range is 80m, then needs to provide 3-5V to A and B inputs + 3-5V that coming to “C” from TX/RX switcher. If mode changed to TX, then “C” will be null and “D” is 3-5V – TX mode is enabled.

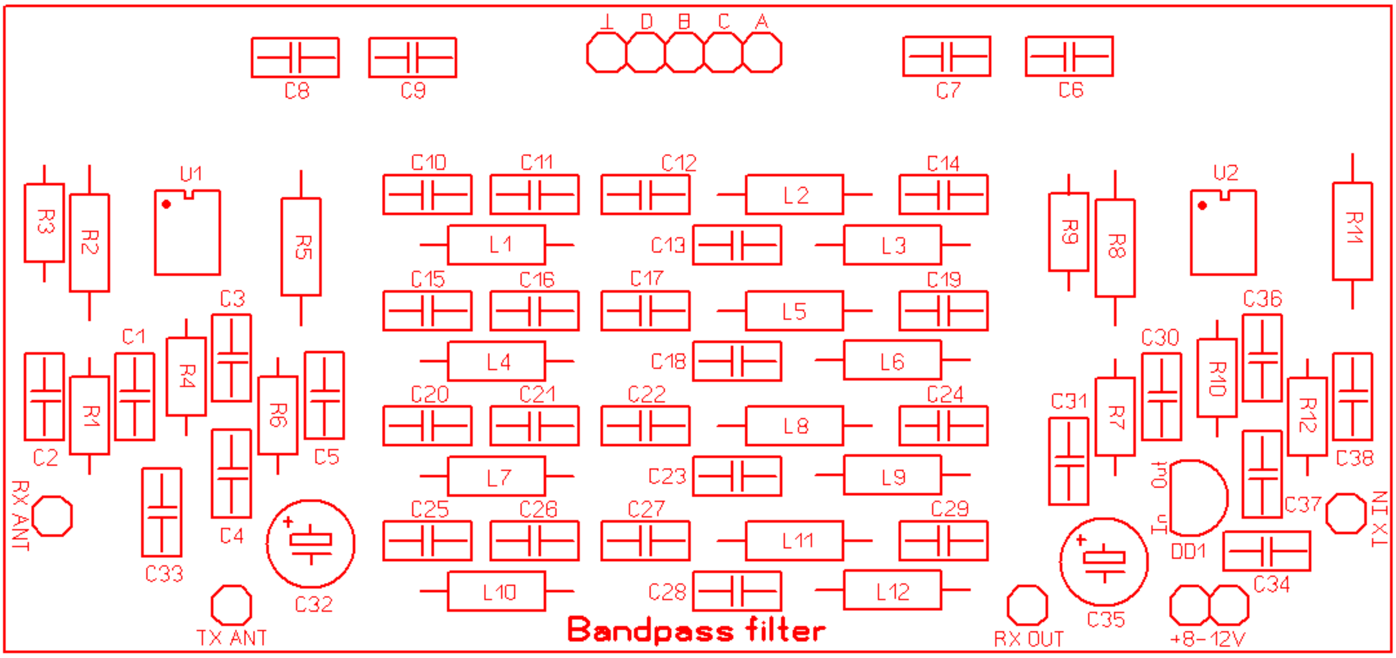
Connectors

- DC – power supply of filter is 8-15V
- RX ANT – RX input signal from antenna
- RX OUT – output from bandpass of rx path -> going to mainboard of receiver/transceiver
- TX IN – input from motherboard of transceiver or transmitter.
- TX ANT – output from bandpass -> usually going to power amplifier or antenna

Adjustment

If units soldered accurately and correctly it works from first power on and no need the adjustment. Anyway, if you have a NWT or RF voltmeter or Scope - look the picture of bandpass filters to be ensure that everything soldered fine.


D
B
C
A
+8-12v
DD1
78L05
C32 4,7µ
C33 100n
C34 100n
C35 100µ
C6 100n
C7 100n
C8 100n
C9 100n
C3 100n
C36 100n
U1 SN74CBT3253C
U2 SN74CBT3253C
OE1
S1
1B4
1B3
1B2
1B1
1A
Vss
Vcc
OE2
S0
2B4
2B3
2B2
2B1
2A
R1 47к
R2 15к
R3 10к
R4 10к
R5 15к
R6 47к
R7 47к
R8 15к
R9 10к
R10 10к
R11 15к
R12 47к
C1 100n
C2 100n
C4 100n
C5 100n
C30 100n
C31 100n
C37 100n
C38 100n
C10 100n
C12 680
C14 100n
L1 2,2µH
L2 4,7µH
L3 2,2µH
C11 1500
C13 1500
1.9-3.5 MHz
C15 100n
C17 390
C19 100n
L4 1µH
L5 2,2µH
L6 1µH
C16 820
C18 820
7 MHz
C20 100n
C22 180
C24 100n
L7 0,47µH
L8 1µH
L9 0,47µH
C21 390
C23 390
10-14 MHz
C25 100n
C27 82
C29 100н
L10 0,33µH
L11 0,68µH
L12 0,33µH
C26 180
C28 180
18-28 MHz
RX ANT
TX ANT
RX OUT
TX IN



⊥ D B C A
C8
C9
C7
C6
C10
C11
C12
C14
L1
L2
L3
C13
C15
C16
C17
C19
L4
L5
L6
C18
C20
C21
C22
C24
L7
L8
L9
C23
C25
C26
C27
C29
L10
L11
L12
C28
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
U1
U2
C1
C2
C3
C4
C5
C30
C31
C32
C33
C34
C35
C36
C37
C38
DD1
RX ANT
TX ANT
RX OUT
TX IN
+8-12V
Bandpass filter