Ease of build	Easy
-partscount	Low
-density	Medium
Parts sourcing	Advanced
Enclosure fitting	Easy
Debugging level	Easy

5-band graphic EQ V1.3b

Overview

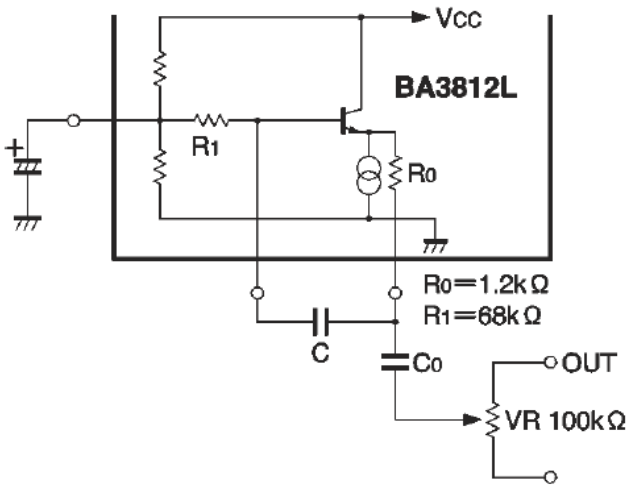
This circuit features a special application chip to allow a slimline 5-Band EQ with +/-12dB in each band.

General

The chip does allow you to calc your own cap values to really build an equalizer with the frequency bands where you need them.

You also can chain multiple of those boards to set up more than the initial five frequency bands.

Using the below formulas will allow you to define Q and frequency of each frequency band:



$$Q = \sqrt{\frac{CR_1}{C_O R_O}}$$

$$f_o\,(Hz) = \frac{1}{2\pi\sqrt{R_0 R_1 C C_0}} \quad (R: \Omega,\ C: F)$$

Common values:

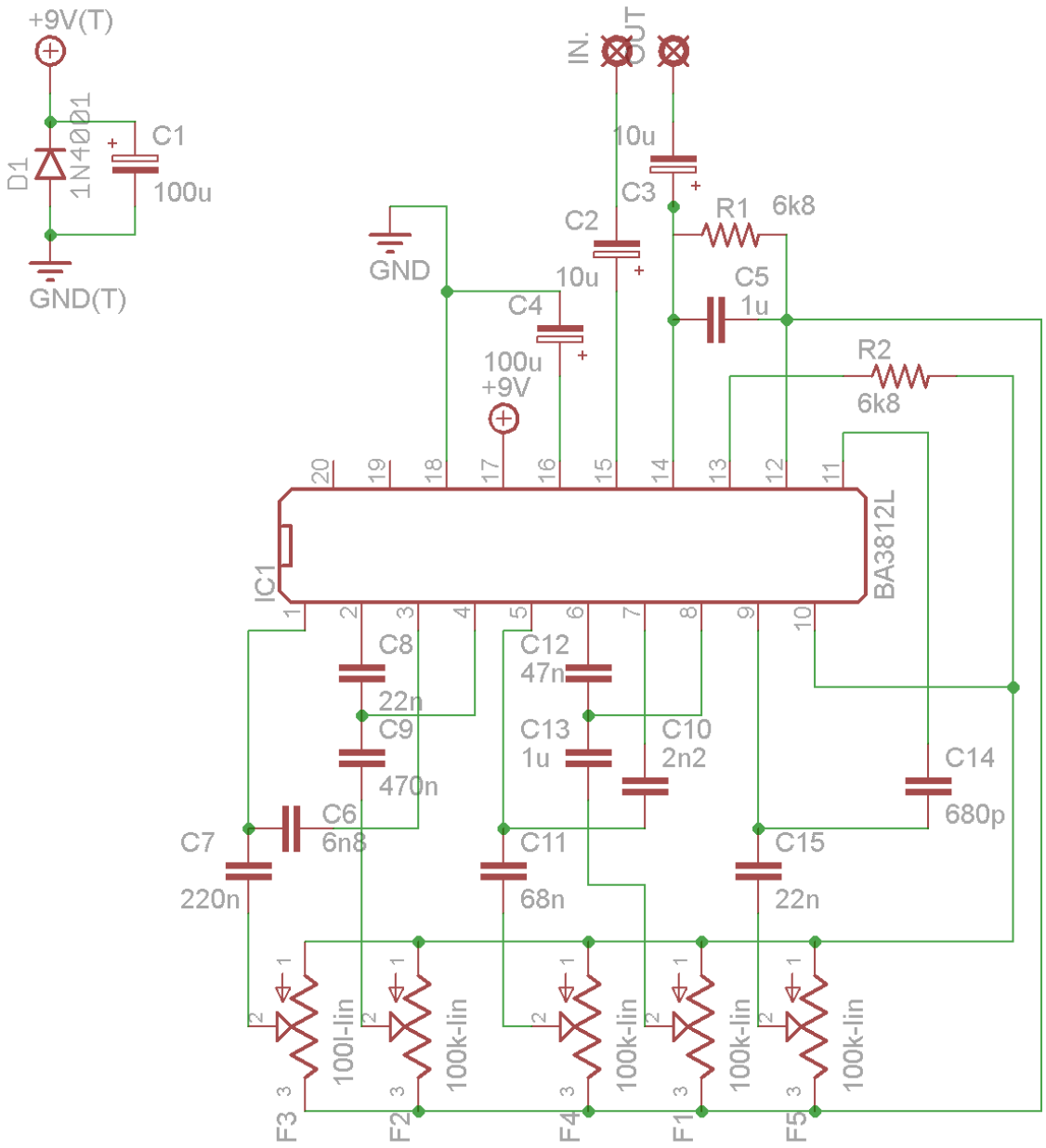
	100Hz	300Hz	1kHz	3kHz	10kHz
C0	1u	330n	100n	33n	10n
C	27n	8n2	2n7	820p	270p

A 10-band EQ might look like this:

	70Hz	100Hz	180Hz	300Hz	700Hz	1,1kHz	1,7kHz	3kHz	4,5kHz	10kHz
C0	1u	1u	470n	330n	150n	100n	47n	33n	22n	10n
C	68n	27n	22n	8n2	4n7	2n7	2n2	820p	680p	270p

Please note that the frequency bands in the schematic are not in any order. So if you want F1 to be 100Hz you need to use 1uF for C13 and 27n for C12.

Schematic

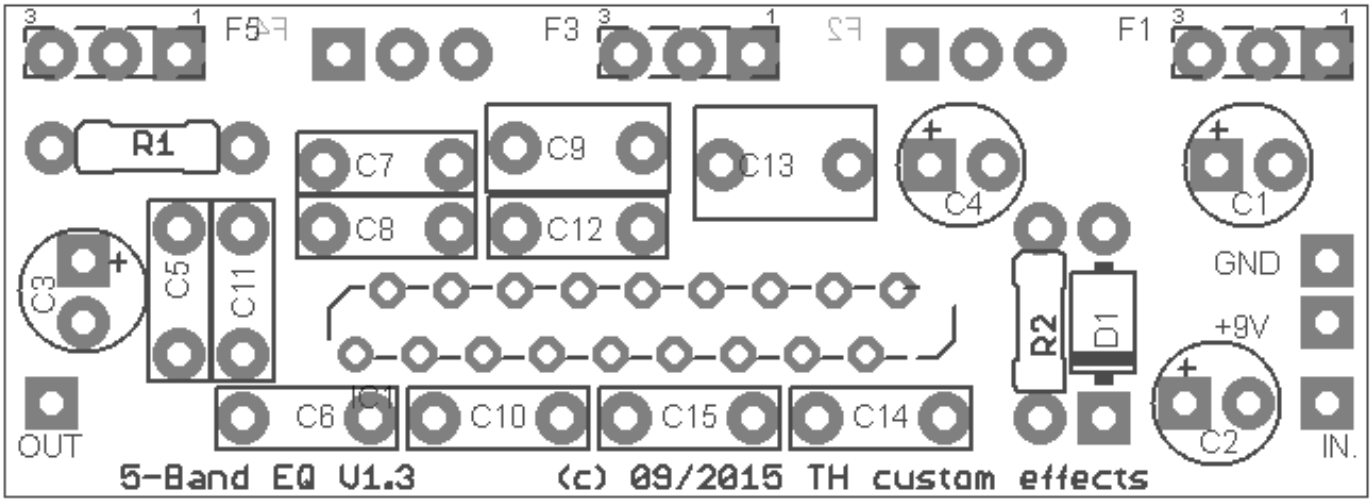

+9V(T)
D1
1N4001
C1
100u
GND(T)
IN.
OUT
10u
C3
R1
6k8
C2
GND
10u
C4
C5
1u
100u
+9V
R2
6k8
IC1
BA3812L
C8
22n
C9
470n
C12
47n
C13
1u
C10
2n2
C14
680p
C7
220n
C6
6n8
C11
68n
C15
22n
100l-lin
100k-lin
100k-lin
100k-lin
100k-lin
F3
F2
F4
F1
F5

Bill of Materials

	Device#	Qty	Value	Comment
Resistors	R1, R2	2	6k8	
Capacitors	C1,C4	2	100u	polarized electro
	C2,C3	2	10u	polarized electro
	C5	1	1n	box cap
F1	C13,C12		1u/27n	100Hz
F2	C9,C8		330n/8n2	300Hz
F3	C7,C6		100n/2n7	1kHz
F4	C11,C10		33n/820p	3kHz
F5	C15,C14		10n/270p	10kHz
Pots	F1-F5	5	100k-lin	9mm Alpha
Diodes	D1	1	1n4001	
ICs	IC1	1	BA3812L	

Building

Start populating resistors and diode first, then the IC and capacitors. Use low profile electrolytic caps to reduce build height. Pin 1 of the SIL IC is at the left hand side.



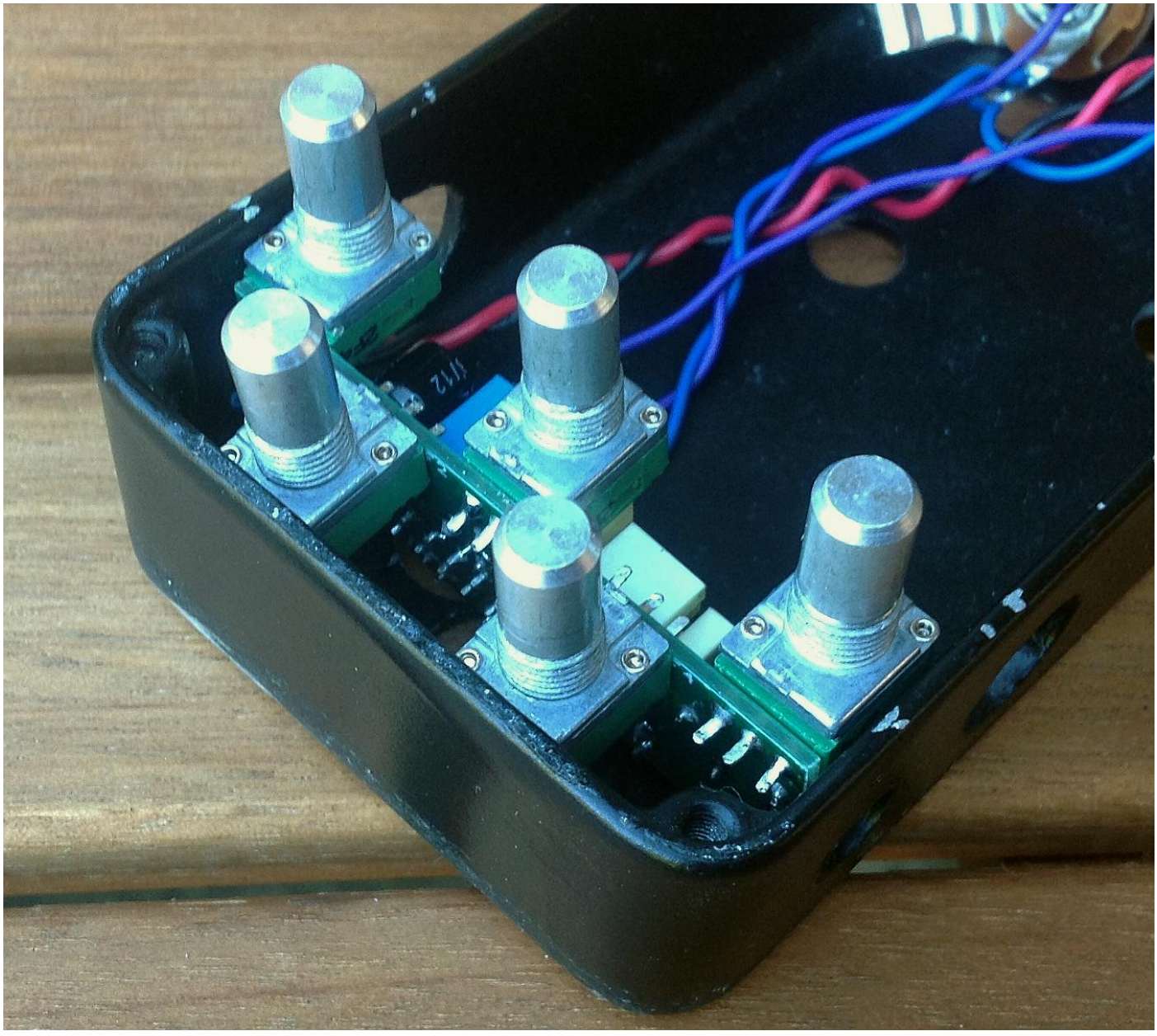
TIP

If you use this together with another effect in the same enclosure you might not need the decoupling caps C2,C3. Jumper them if you are sure you don't need them.

Finally

You now have made a very universal circuit which can be used in many ways and applications.

This picture shows how it fits in a 1590B enclosure:



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