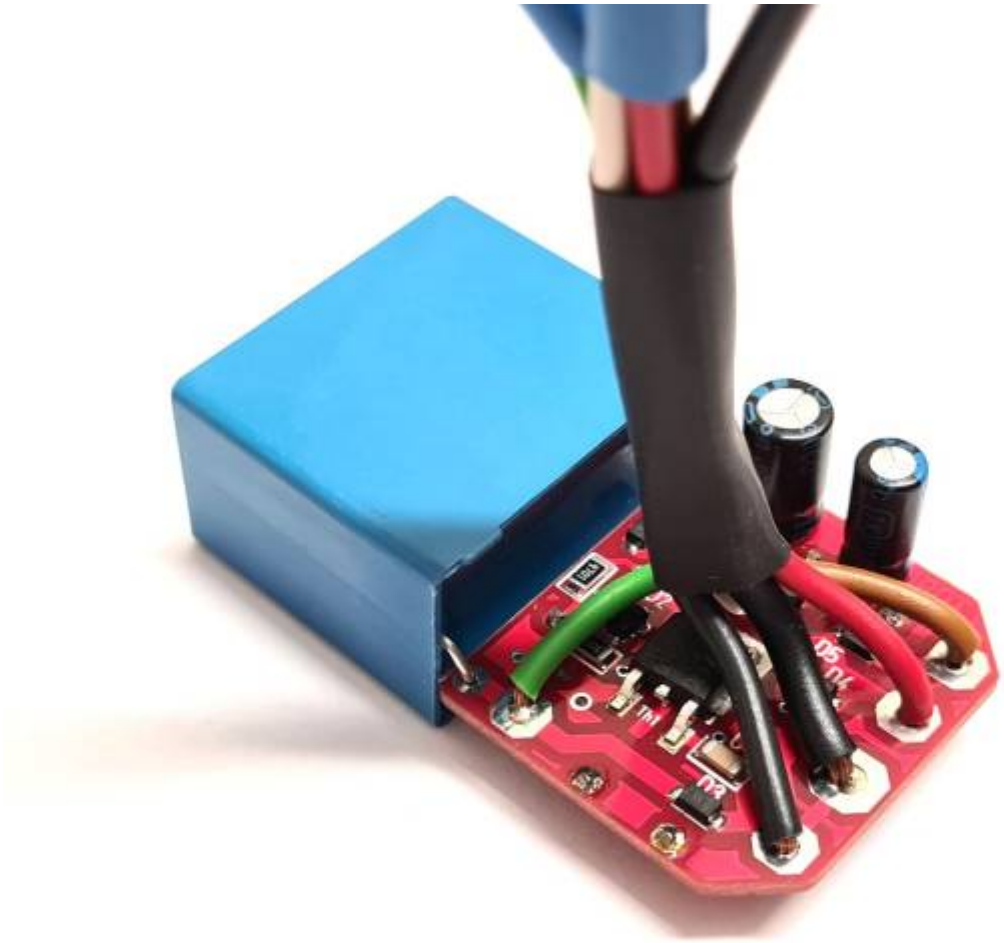
VSCDI3

I want to introduce how a CDI can be developed. The following CDI was developed in 2016. But it's just a BETA-Version and has never reached a final status. So please read and enjoy. It is not recommended for recreation.

Its project name was VSCDI3.



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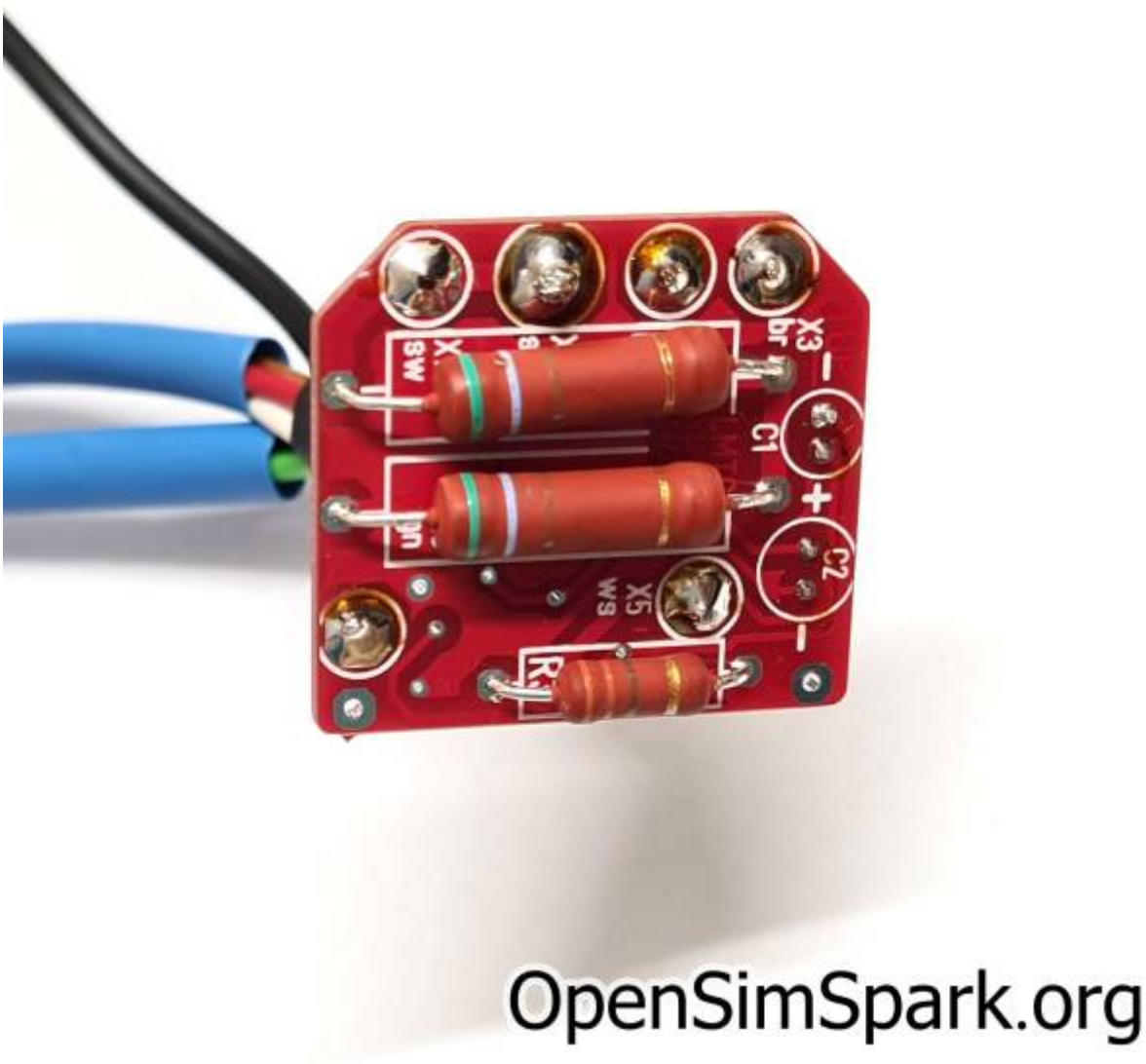
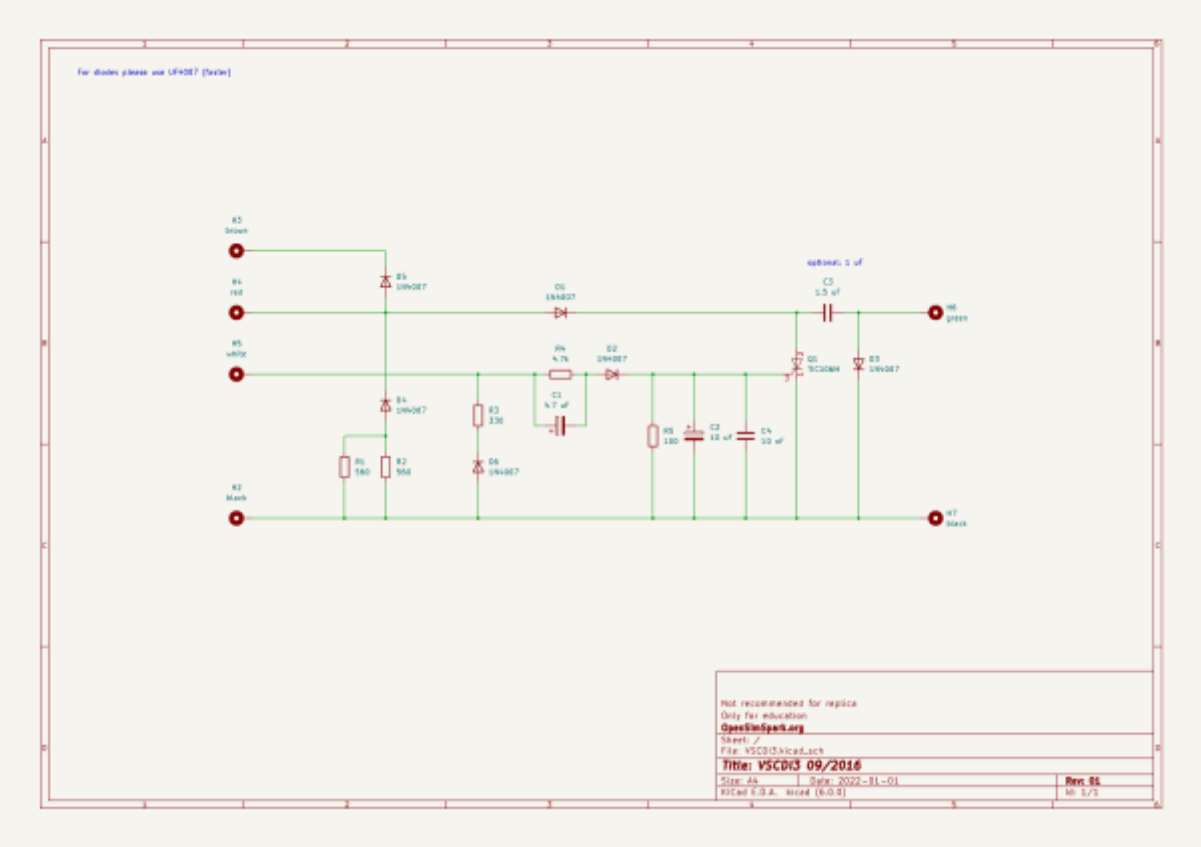


motivation

The VSCDI3 was created to work with Vape A70-3 and A70-5. It should have an easy structure with not to much components. The adjustment timing should be soft to work with nearly every engine with a moderate rev level.

circuit diagram

The basic design is close to the ST reference design, but with an added negative wave handling and a modified signal shaping.



Negative wave handling

The branch with R1, R2 and D4 is limiting the negative waves. A first Version had R1 = 10 k (and R2 empty), but this created to much heat dissipation and the SCR get out.

The following values were obtained after measurement:

- U_Peak = 800 V
- I_Peak = 0,08 A

A current of 0,08 A does not sounds much. But the Heat power loss is be calculated with:

$$P = I^2 \times R = (0{,}08\ A)^2 \times 10\,000\ \Omega = 64\ W$$

And 64 W are a huge heat load! So next time do the math and the measurement first. After a few more test R1 and R2 was dimensioned to 560 W each.

Signal shaping

Again a branch with D6 and R3 is handling the negative signal waves.

The positive signal waves are shaped with „the rest“ between H5/white and the SCR gate. With vary C1 and C2 the signal timing can be customized.

Capazitor

A standard size of the Capazitor C3 is 1 uF. But to get more energy at low revs it was contemplated to use 1,5 uF. By the way this are just thoretical approaches, no driving test have been made.

SMD elements

This elements were used for the SMD version with the pictures above.

Element	Value	Comment
R1	560	3 W
R2	560	2 W
R3	330	-
R4	4,7 k	-
R5	100	-
D1...6	SL1M	-
Q1	STM TS820	-
C1	4,7 uF	Elko
C2	10 uF	Elko
C3	1 / 1,5 uF	-
C4	10 nF	-

Note: The SCR ON CR708AG does not work with this scheme.

For a THT version the should be used UF4007 for the diodes and a TIC106M for the SCR