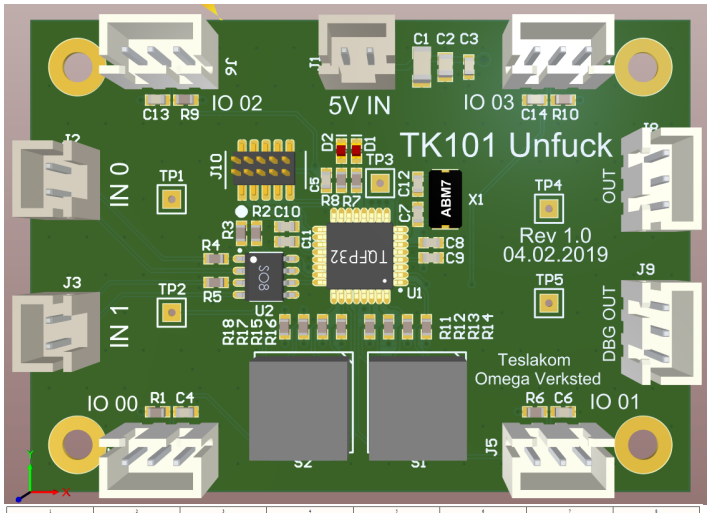
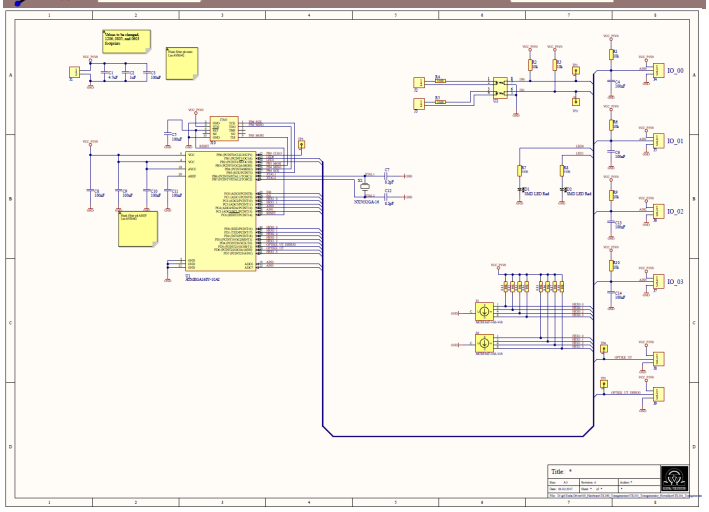
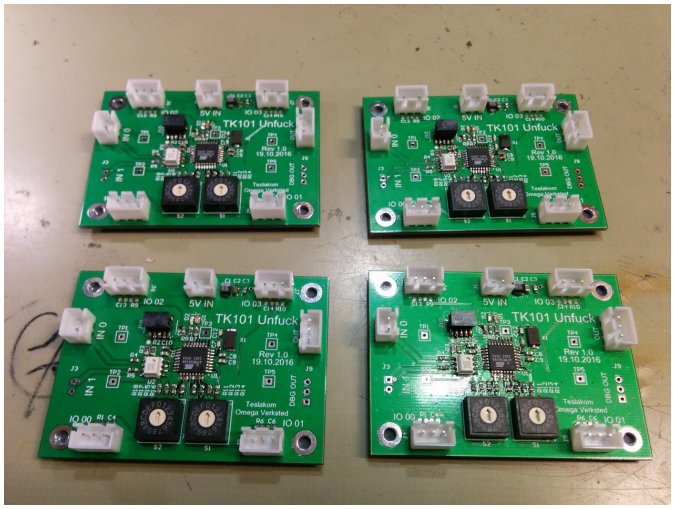
TK101 Unfuck

No more "fuck"







Teori

Bakgrunn

TBD

Virkemåte

The purpose of the pulse shaper is to take the input signal X1 and transform it to be suitable for a DRSSTC, in addition to not letting harmful signals through. The pulse shaper in this implementation is built separate from the driver. The first step in the pulse shaper is to transform the input signal X1 to two level as shown in fig. 2.2.

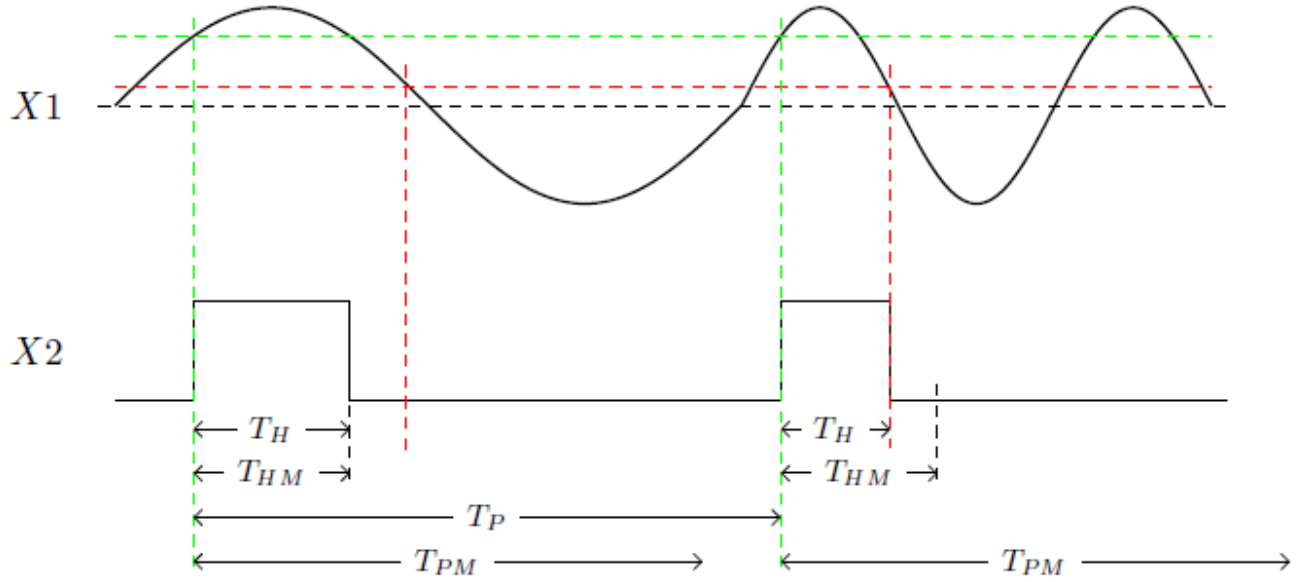


Figure 2.2: Detail view of signal $X2$

Here we see that the transformation to two level is done with a schmidt trigger, we also see that the pulse following immediately after the second pulse is suppressed wich will be explained below. Then the triggering signal X2 is two level and contains two pieces of information from X1, the frequency fX2 (tone) and the volume (intensity). Where the frequency fX2 = 1 TP is given by the time TP between the positive flanks of the signal. This is the base harmonic of the acoustic tone heard at the output 2.1. Pulse shaper 7 of the system. The volume is given by the duty cycle of the pulses D = TH TP. Figure 2.3 shows different tones (varying TP),

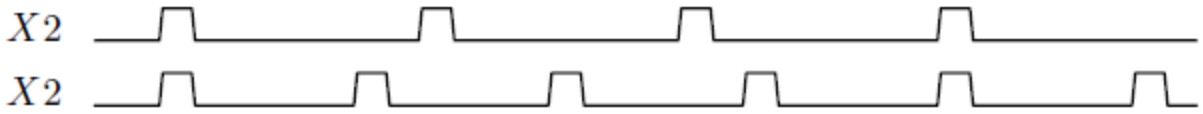


Figure 2.3: Different tones

and fig. 2.4 shows different volumes (varying TH).

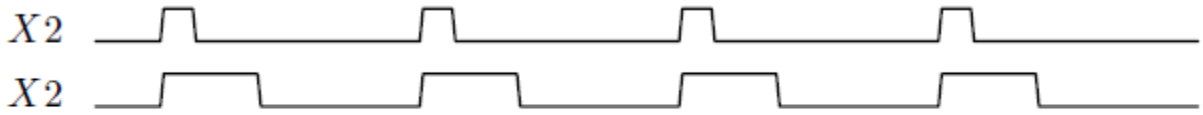


Figure 2.4: Different volumes

We also need to prevent harmful signals, meaning signals that may lead to destructive failure at the output. This is done by limiting the max duty cycle of the pulses as well as limiting the frequencies allowed. The duty cycle of the pulses is limited by choosing a maximum time THM the pulse is allowed to be high, this time is independent of the frequency. This means the preset max duty cycle is dependent on the frequency of the pulse. Limiting the frequencies allowed is done by choosing a minimum time TPM after a pulse goes high until X2 is allowed to go high again. How this can be implemented is not discussed any further in this thesis. But this thesis should give the basis for choosing maximum and minimum values for TH and TP.

	S0 (T-Hi)	S1 (Min T-Lo)
0	5 - 1000uS	180 - 344uS
1	5 - 900uS	165 - 324uS
2	5 - 800uS	156 - 306uS
3	5 - 700uS	146 - 286uS
4	5 - 600uS	136 - 268uS
5	5 - 500uS	128 - 246uS
6	5 - 451uS	115 - 226uS
7	5 - 402uS	106 - 205uS
8	5 - 352uS	96 - 188uS
9	5 - 303uS	86 - 167uS
A	5 - 252uS	76 - 145uS
B	5 - 203uS	65 - 126uS
C	5 - 154uS	56 - 105uS
D	5 - 104uS	45 - 85uS
E	5 - 53uS	35 - 75uS
F	5 - 5uS	30 - 65uS

	T-Hi	Min T-Lo
Fuck	0 - 554uS	0uS



Versjoner

V0.1 (2014)

Changelog

1. Laget fra bunn av basert på black box karakterisering av fuck

Errata

1. Tonen kan henge seg opp.

V1.0

Release: 2016-10-19

Changelog

1. Fjernet midi funksjonalitet (flyttes til eget kort)
2. Laget kortet på nytt (med ny specrunde)
3. Skrevet FW fra bunn

Errata

1. Mangler testpoint for GND

Produserte kort

SN	V	FW	Montert								Plassering	Kommentar
?	0.0	⚠	✓								Teslaskuffen	Buggen er kanskje fikset men prosjektet ble avsluttet grunnet for kort tid igjen til 95års jubileet til Omega. Har ligget i teslaskuffen siden
01	1.0	✗	✓								Hjemme hos Snorre Nilssen Vestli	
02	1.0	v1.0	✓								Teslaskuffen	
03	1.0	✗	✓								Teslaskuffen	
04	1.0	✗	✓								Teslaskuffen	