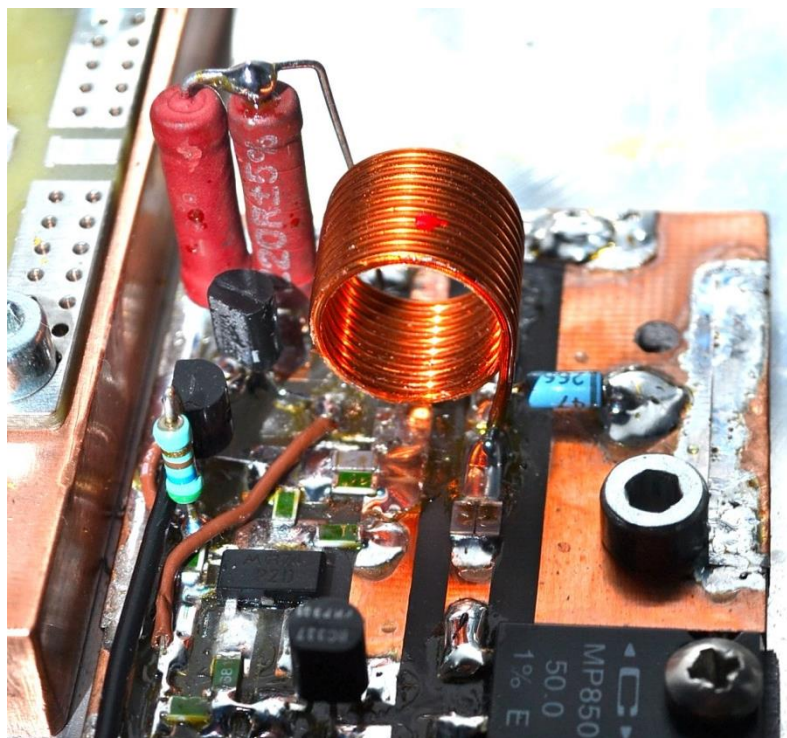
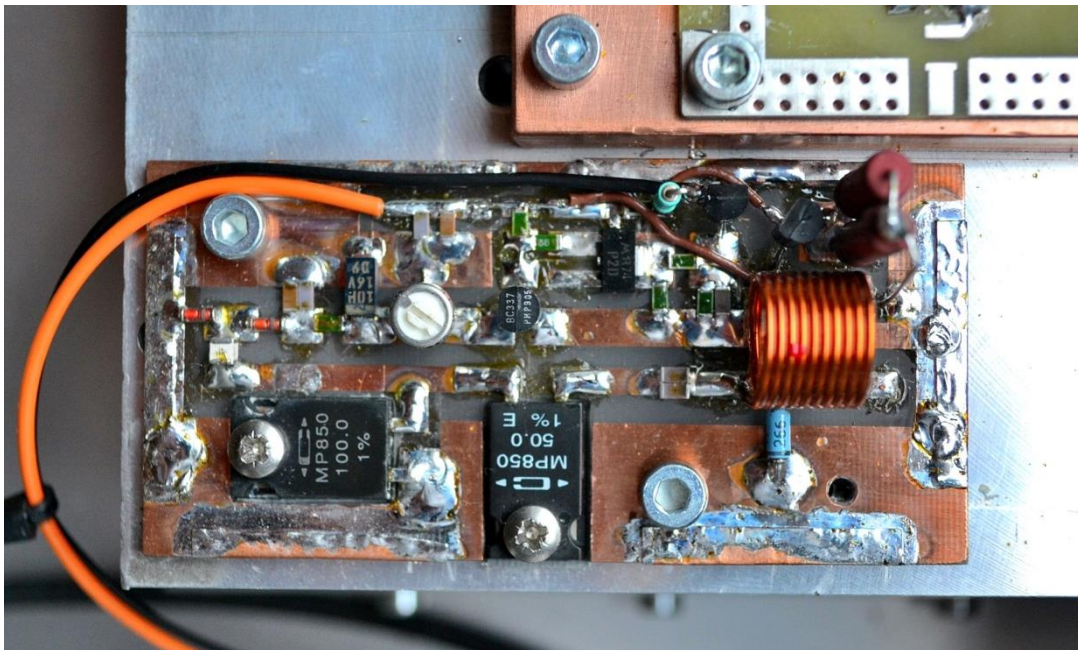


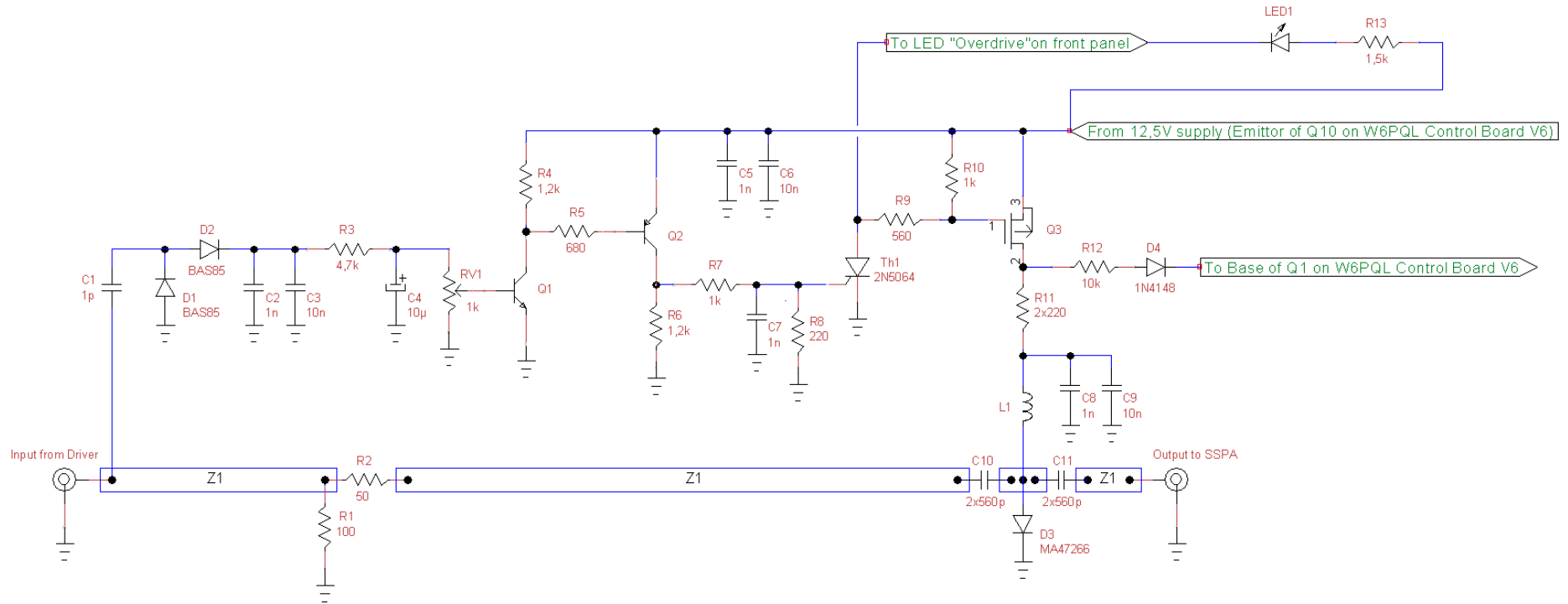
Overdrive SSPA protection circuit

To avoid damages on the (expensive) power transistors embedded in the popular SSPA's nowadays, it is mandatory not to overdrive them.

As I wasn't willing to use the ALC feature of the W6PQL "Ultimate Amplifier Control Board (V6)" (but well using its other numerous features) to limit the input drive power of my SSPA, I have been developing the circuit described here. It ensures that as soon as the RF drive power level exceeds a preset level at its input, it prevents the power to reach the output, so that the subsequent expensive transistor is protected. This circuit can be used together with the W6PQL board.

The circuit is depicted below. The theory of operation and schematic are shown on the following pages.





R1 : 100 ohm / 50W Caddock MP850
 R2 : 50 ohm / 50W Caddock MP850
 R3 : 4,7k ohm / 0,25W SMD1206
 R4, R6 : 1,2k ohm / 0,25W SMD1206
 R5 : 680 ohm / 0,25W SMD1206
 R7 : 1k ohm / 0,25W SMD1206
 R8 : 220 ohm / 0,25W SMD1206
 R9 : 560 ohm / 0,25W SMD1206
 R10 : 1k ohm / 0,25W SMD1206
 R11 : 2x220 ohm in parallel / 3W PR03 Philips
 R12 : 10k ohm / 0,25W through hole
 R13 : 1,5k ohm / 0,5W through hole
 RV1 : 1k ohm Bourns type 3359

C1 : 1pF Hi-Q Tekelec
 C2, C5, C7, C8 : 1nF X7R SMD1206
 C3, C6, C9 : 10nF X7R SMD1206
 C4 : 4,7µF / 16V Tantalum
 C10, C11 : 2x560pF NP0 in parallel SMD1206

L1 : 800 nH (Z~750 ohm @ 144 MHz). 9,5 turns of 0,8 mm diam. Cu wire on 11 mm internal diam. Total length 10mm.

D2 : BAS85 schottky diodes SMD
 D3 : MA47266 M/A-Com PIN diode
 D4 : 1N4148 through hole
 LED1 : red LED diode ("Overdrive")

Q1 : 2N2222, BC549, PZTA42,... (any standard NPN)
 Q2 : 2N2907, BC559, PZTA92,... (any standard PNP)
 Q3 : BST100 P-channel MOSFET
 Th1 : 2N5064 thyristor

Z1 : 50 ohm strip-line (2,7 mm width on 1,6 mm thick FR4 PCB)

