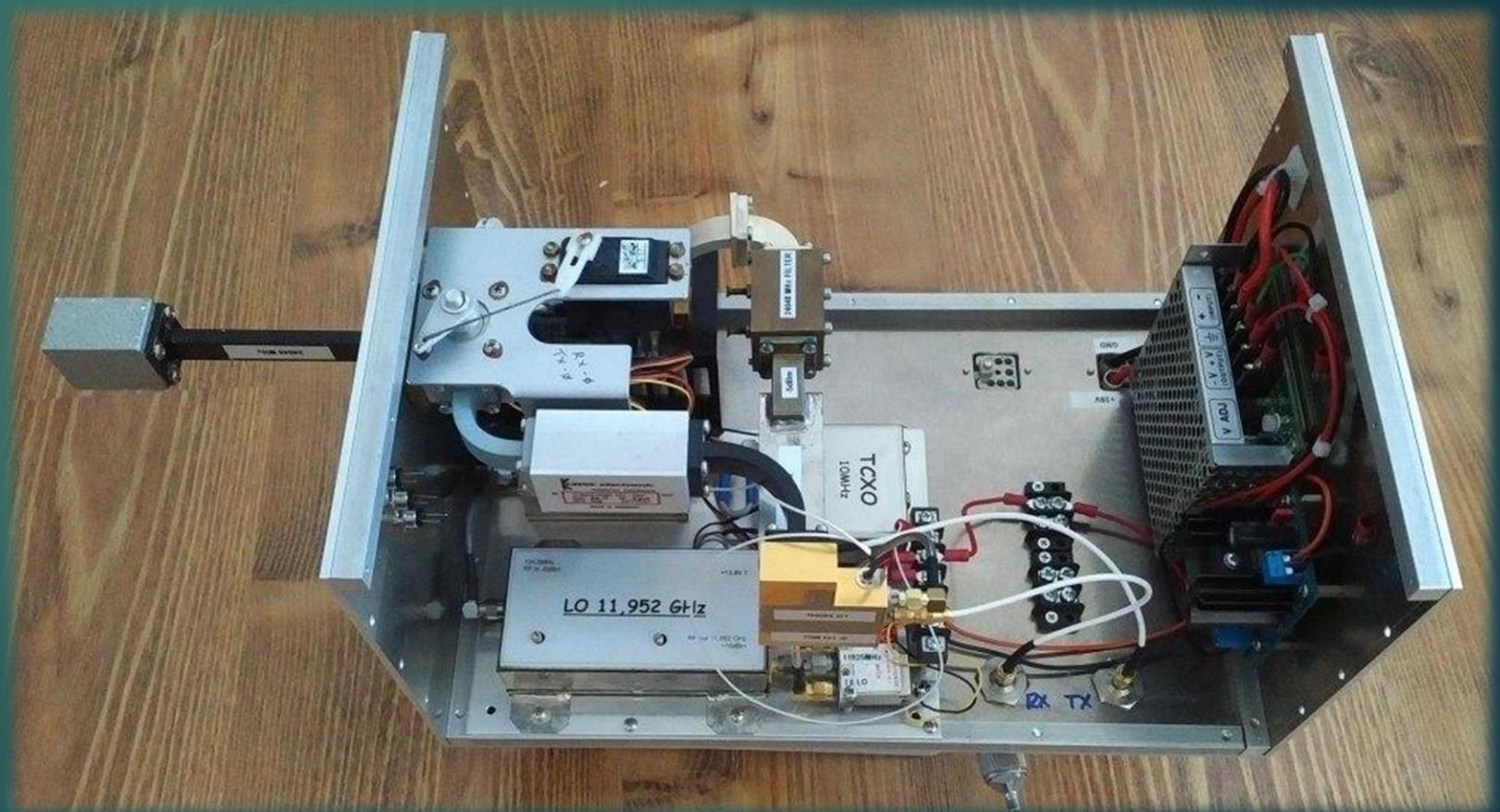


EME TRV for 24 GHz and SSPA - RF 15 W

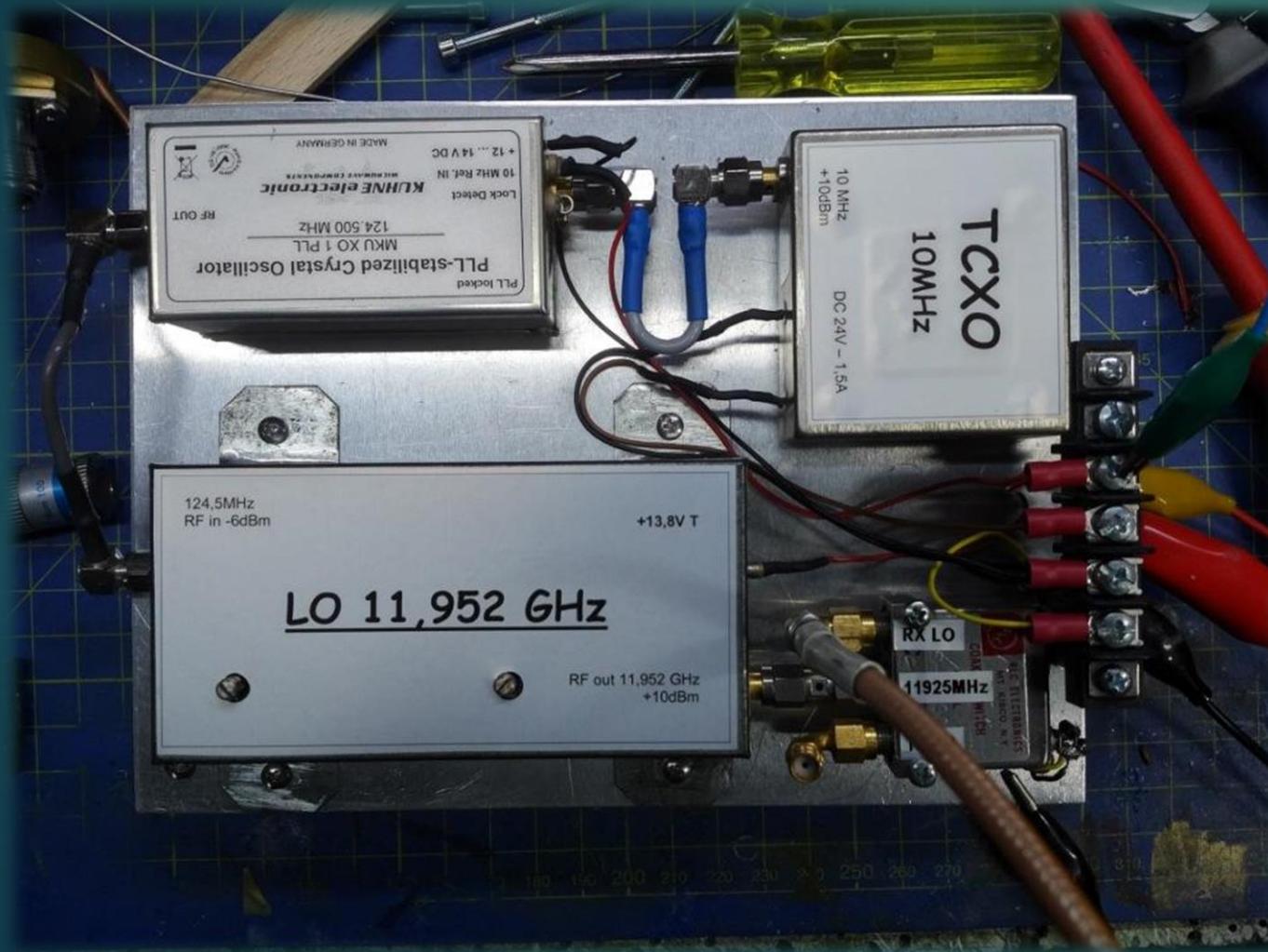
OK1DFC - ZDENĚK SAMEK

TRV 1. st generation - just only for RX performance test

- RF power out 2,6W
- N/F 1,6dB - 20db gain
- WR42 wave guide switch
- Powering 28V DC
- Separate RX/TX way
- LO11,925 GHz switched to RX - TX mixer

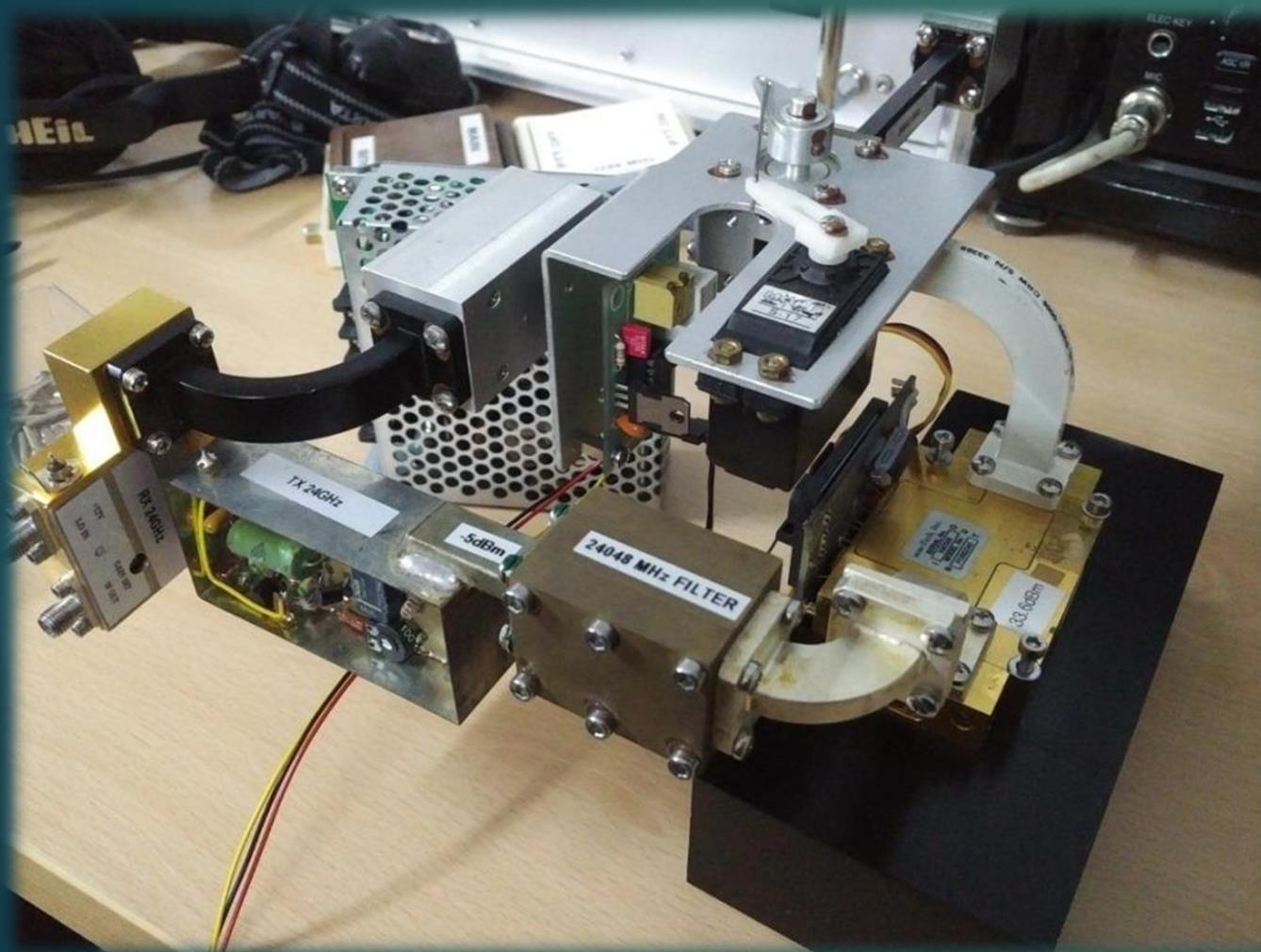


TRV 1. st generation

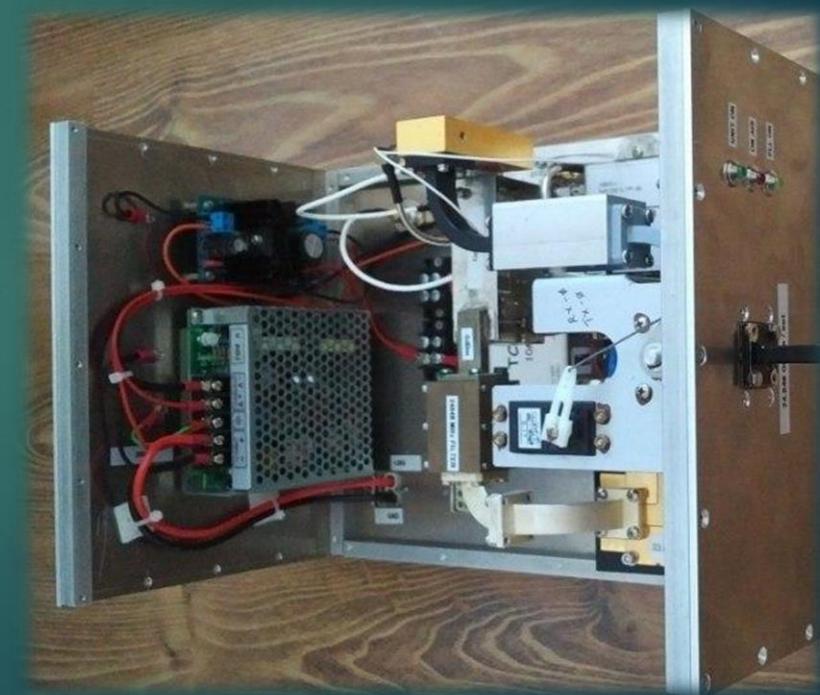


- TCXO 10 MHz Agilent
- PLL LO 124,5 MHz - DB6NT
- LO multiplier 124,5 MHz to 11,925 GHz
- Possible switch to 10 MHz GPS locked LO
- Low loss coaxial SMA relay

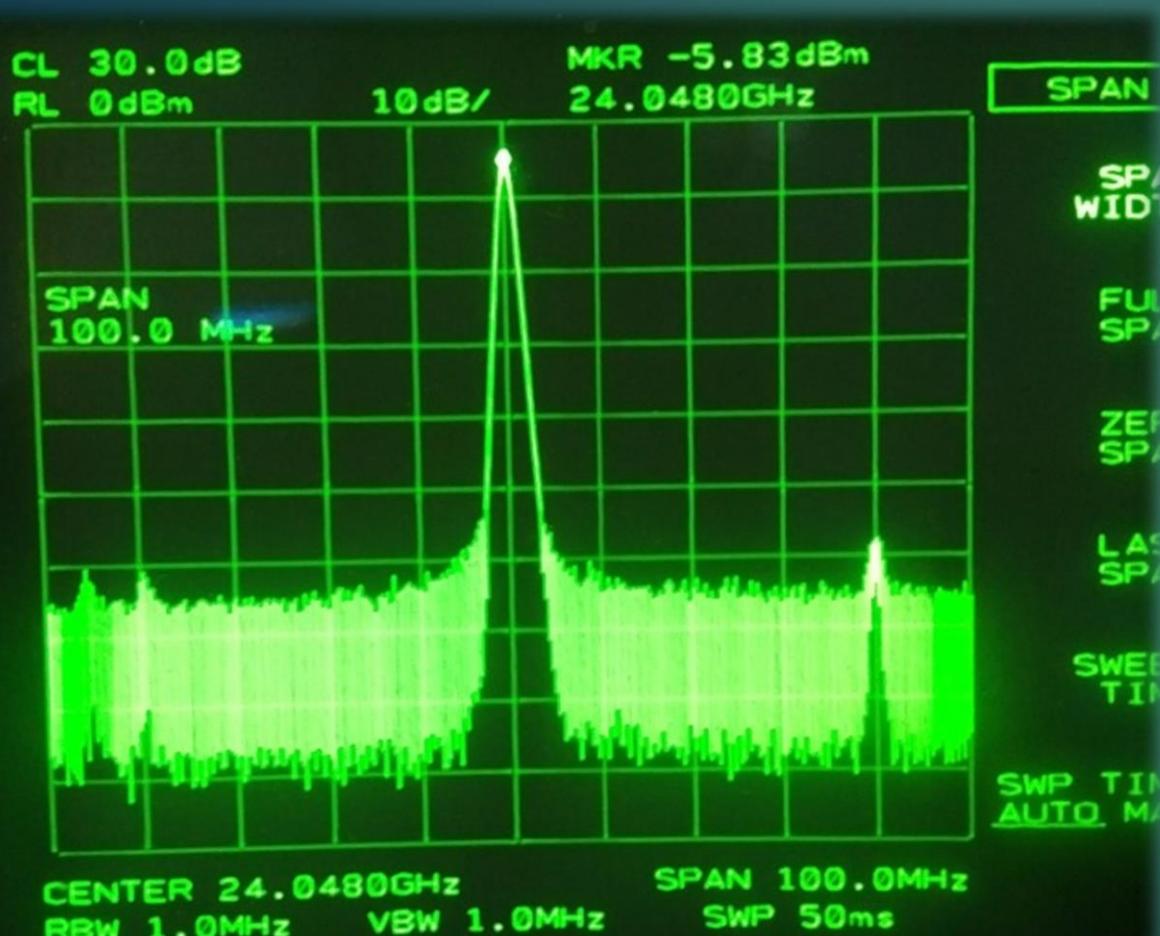
TRV 1. st generation



- WR42 switch
- Filter 24,048 GHz OE9PMJ
- Toshiba SSPA 2,6W RF out
- DC/DC down converter 28/13,8V-5A



TRV 1. st generation



- TX - 24,048 GHz signal after the mixer - 6dBm
- RF out 2,6W - 24,048 GHz
- RX test with feed horn and beacon OK0ET next page

11.952 GHz

TCXO
10MHz

DC 24V 1.0A

DCV A

A • A

• A

• A

• A

• A

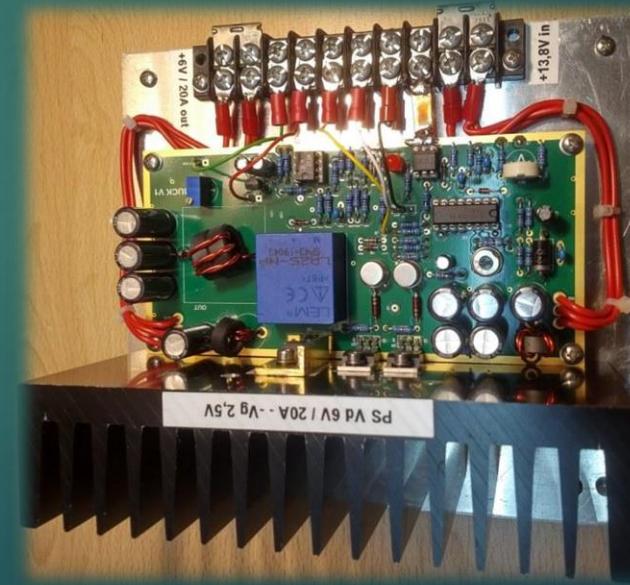
• A

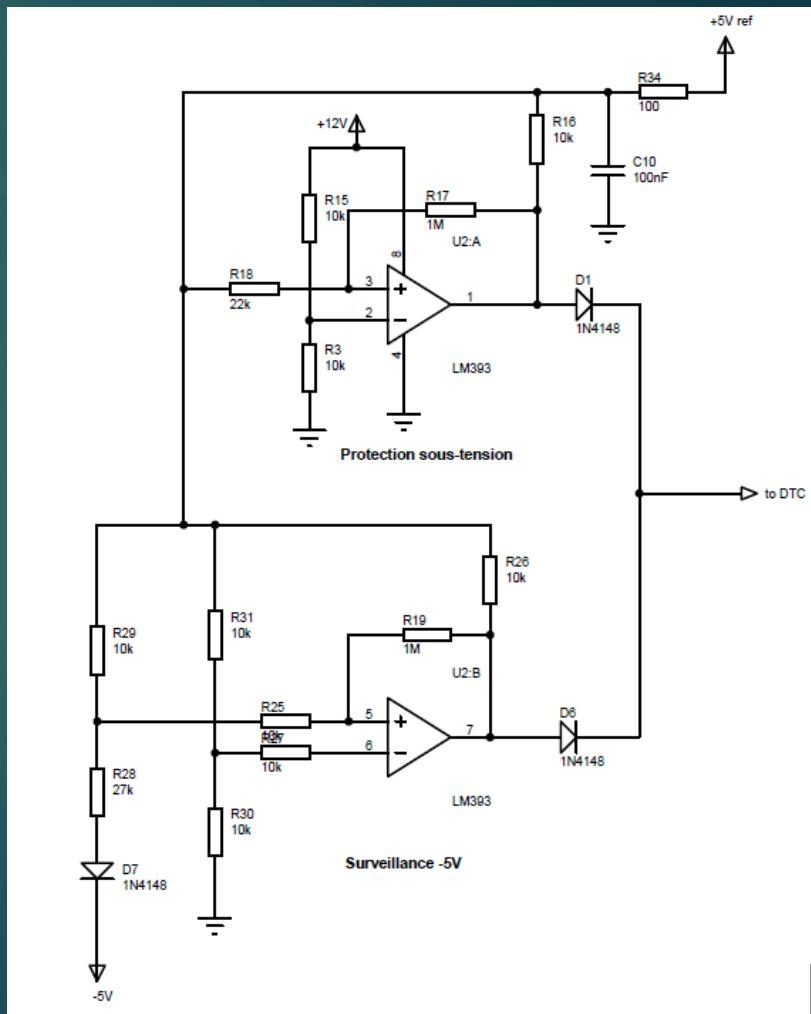
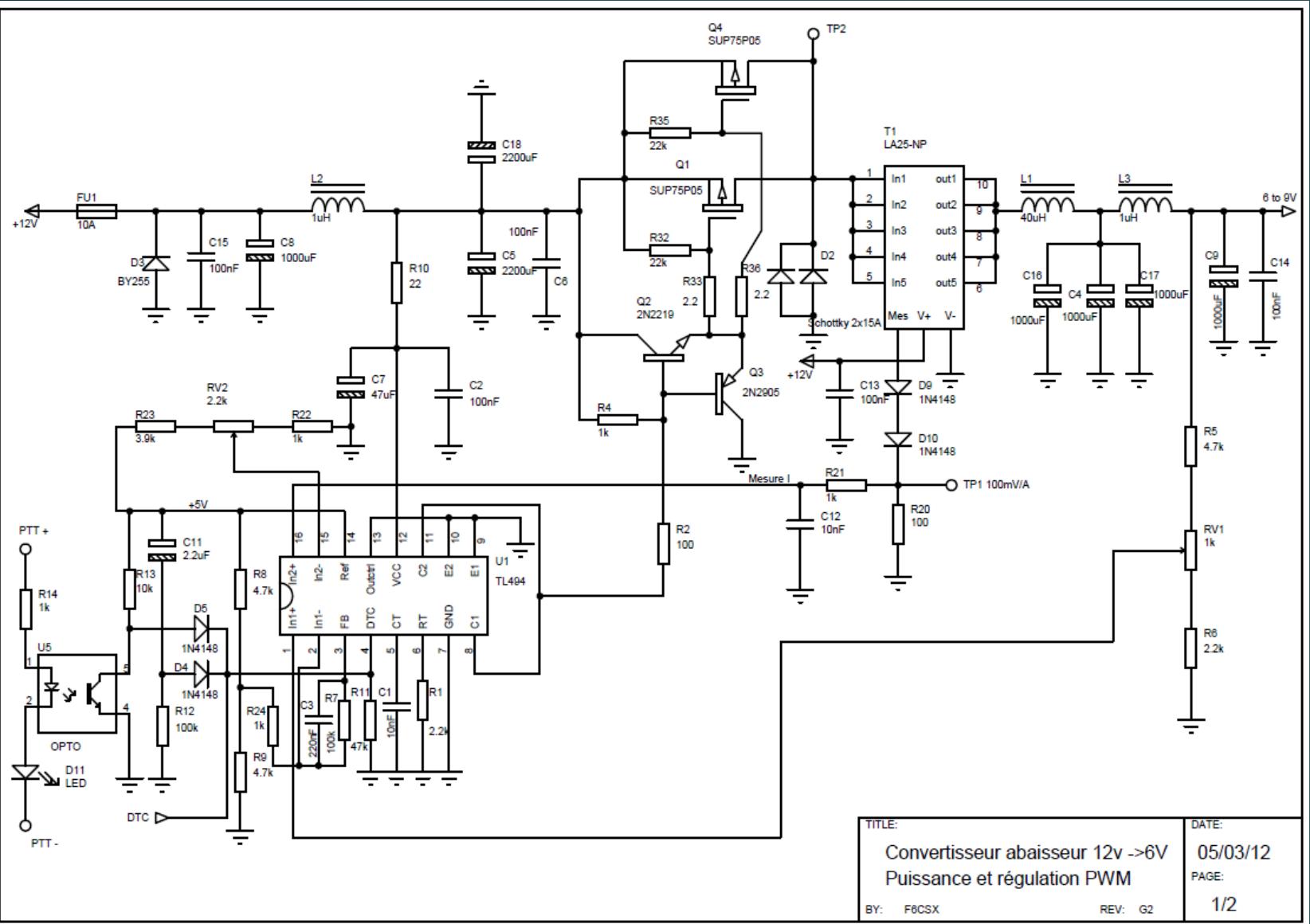
• A

TRV 2nd generation



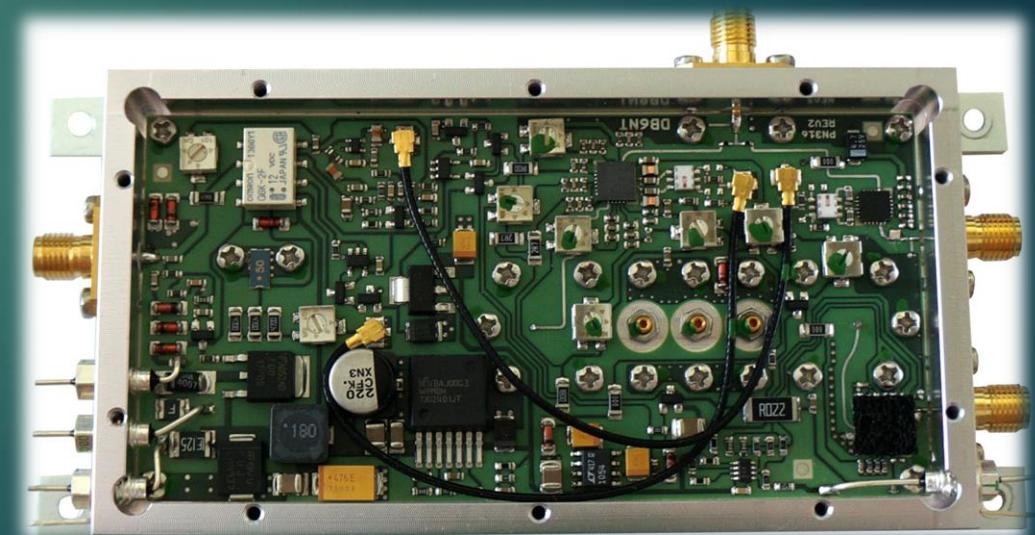
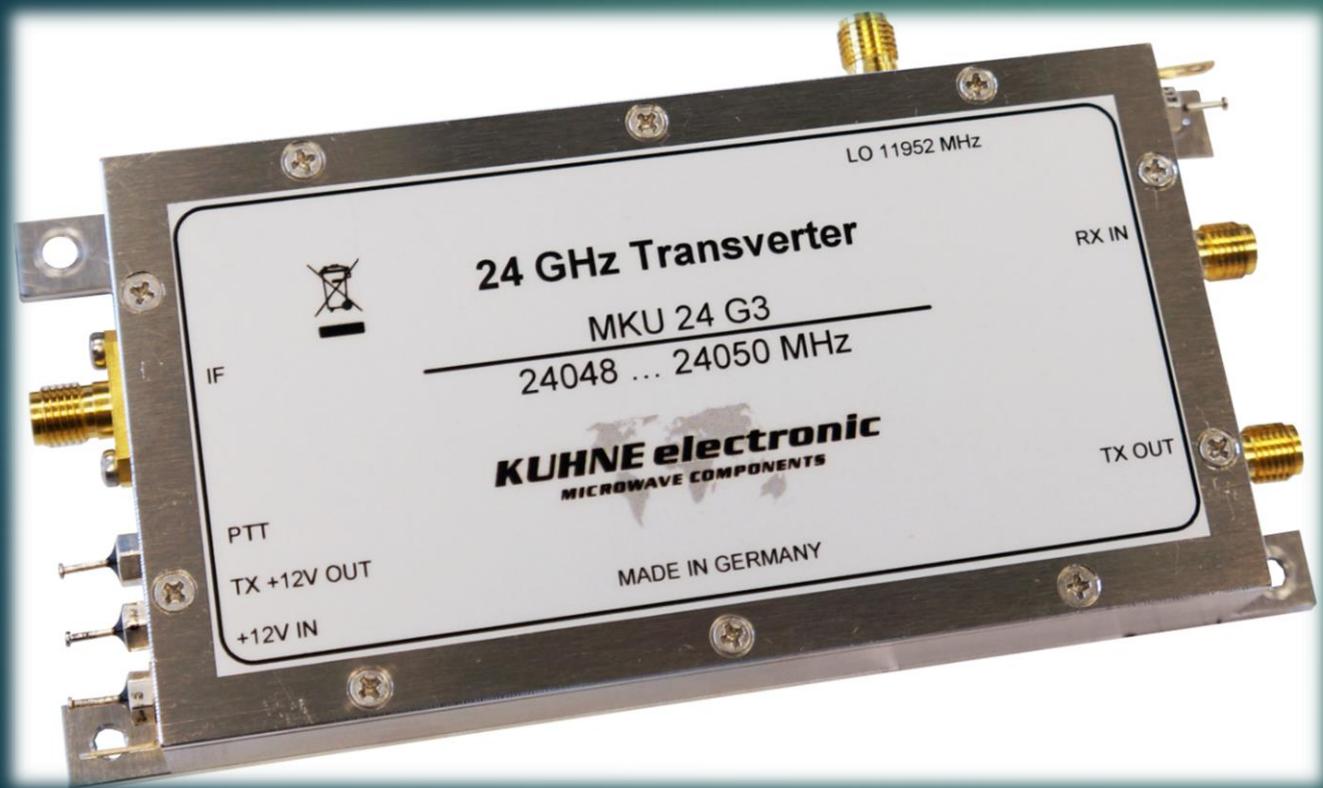
- Build most important part of SSPA
- Power supply 13,8V - 6V-20A and -5V DC gate powering
- PS switching Drain voltage only if -Ug is presented
- Measuring of Id build on PCB
- PTT switch on PCB build



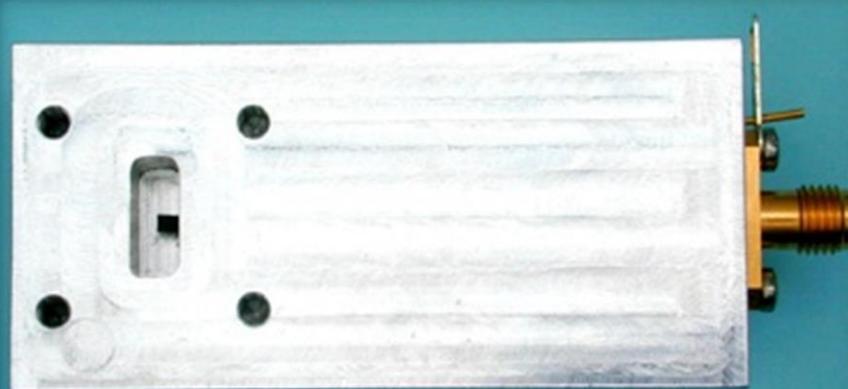


TRV 2nd generation - DB6NT

- TRV DB6NT
- 2,6 W RF out TX
- 4 dB N/F RX



TRV 2nd generation - DB6NT

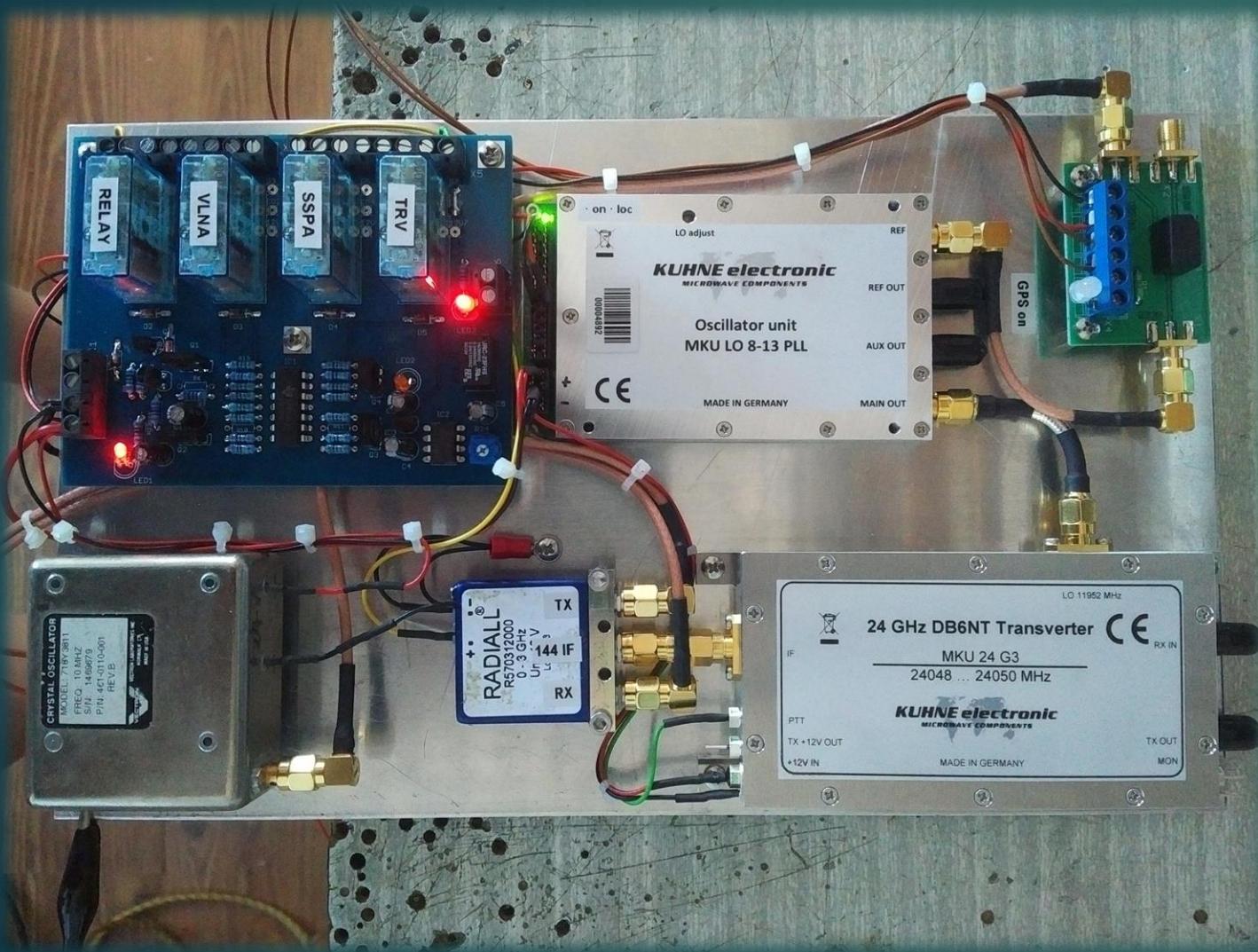


- WR42 VLNA - 1,5dB N/F
- Gain 25dB
- LO MKU programed to 11.952 GHz



GUI

TRV 2nd generation - DB6NT



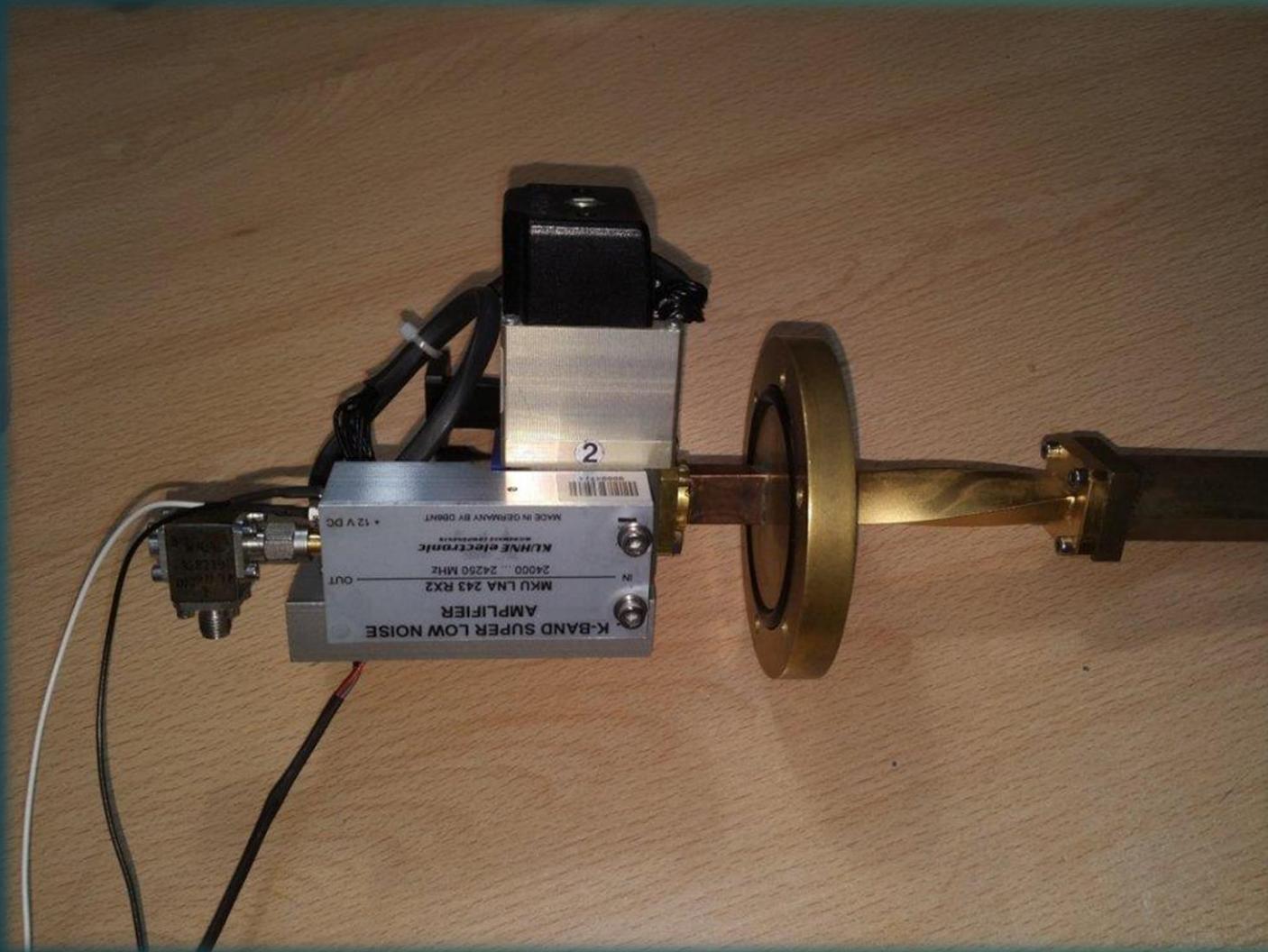
From Top left:

- Sequencer
- LO - MKU LO with 11.925 GHz out
- LO 10 MHz GPS-TCXO switch

From Down left:

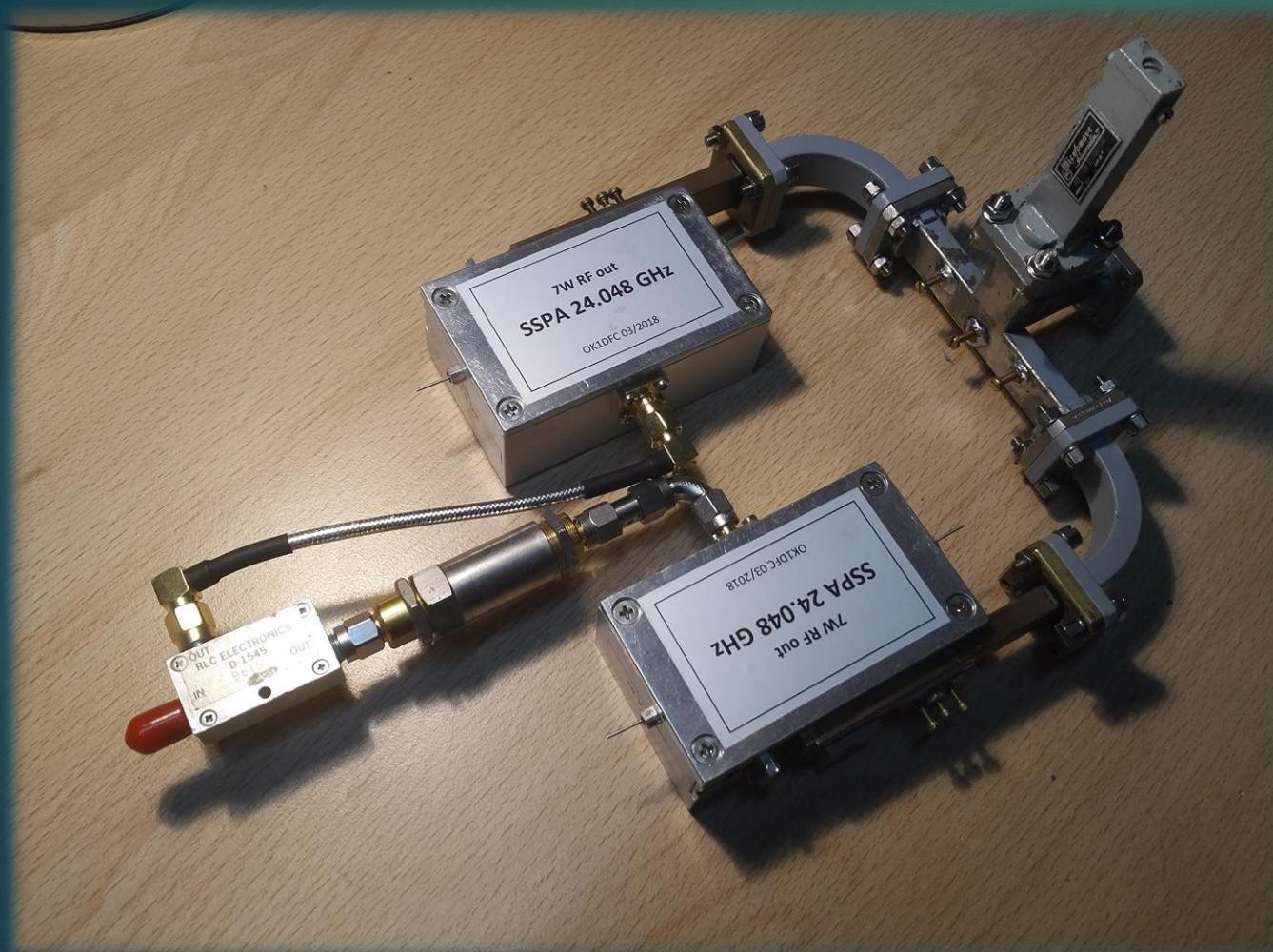
- TCXO - 10 MHz
- Relay 144 MHz IF switch to RX - TX way
- TRV 24,048 GHz 2,6W RF out

TRV 2nd generation - DB6NT

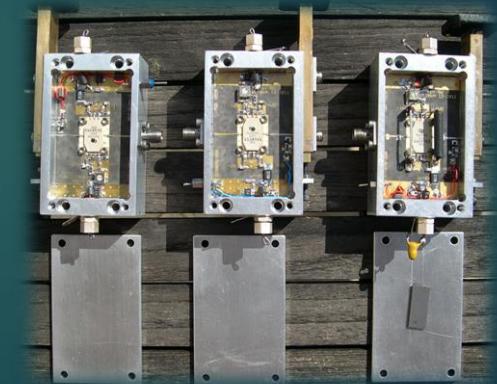


- WR42SPINNER switch and VLNA
 - 1,5dB N/F
- Gain 25dB
- 18-26,5GHz isolator
- Rectangular - Circular transition

TRV 2nd generation - SSPA

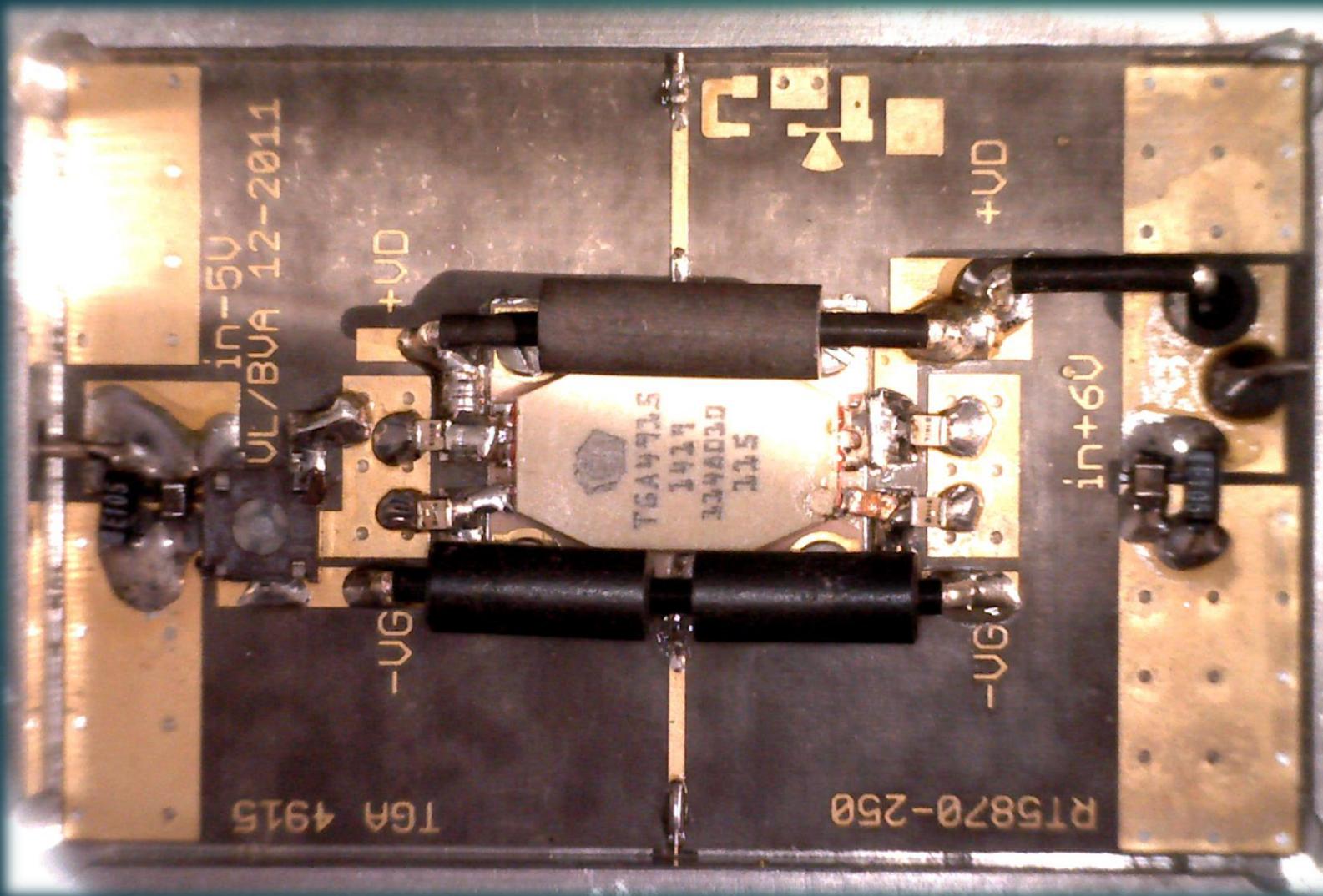


- SPINER latch switch WR42
- Magic "T" - combining 2 SSPA
- 2 PCs of QORVO TGA - 4915CP



F5BQP build and solution

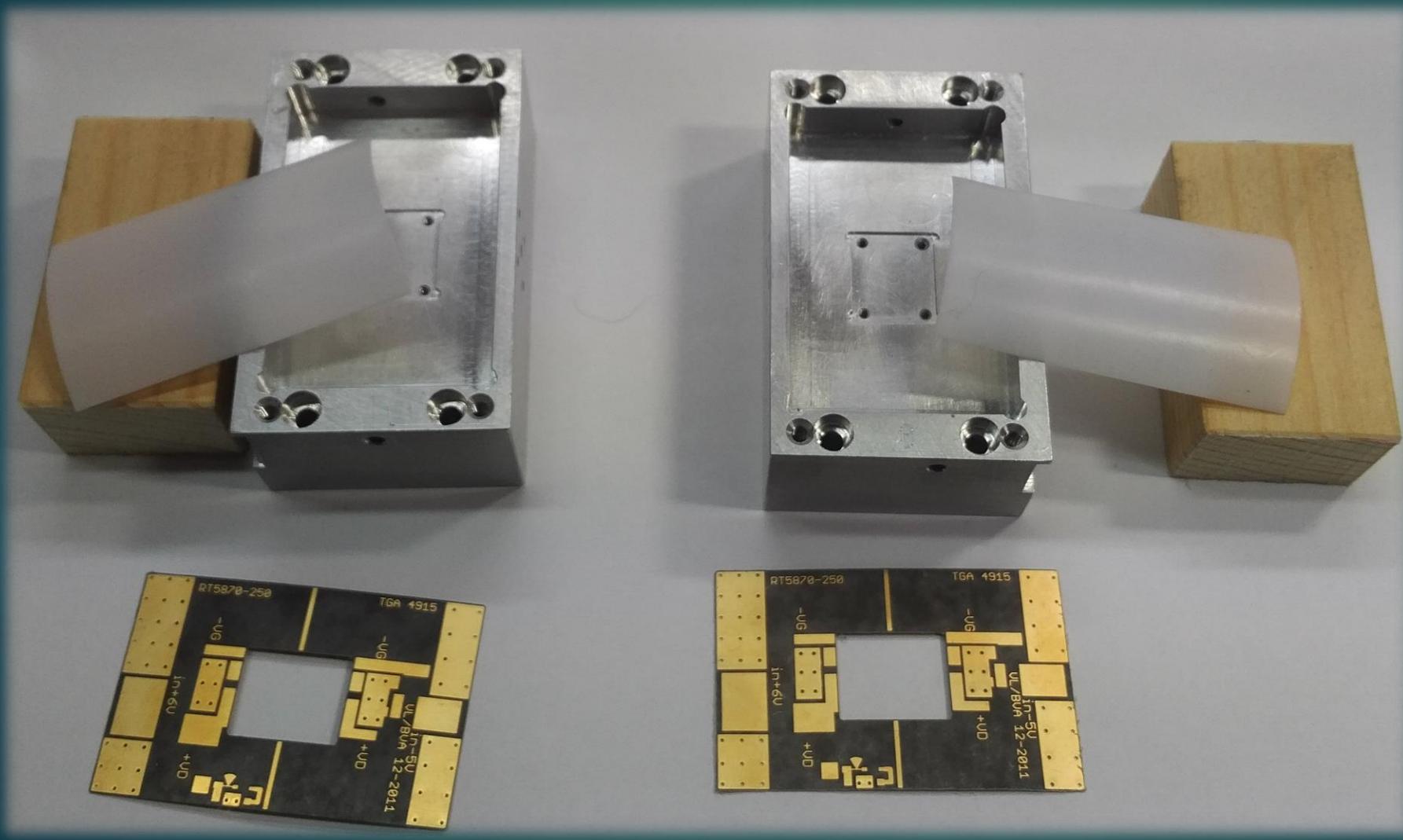
TRV 2nd generation - SSPA



- F5BQP had 8W RF out each SSPA
- Magic "T" for combining
- 2 PCs of QORVO TGA - 4915CP

OK1DFC build - 2PCs

SSPA - OK1DFC build

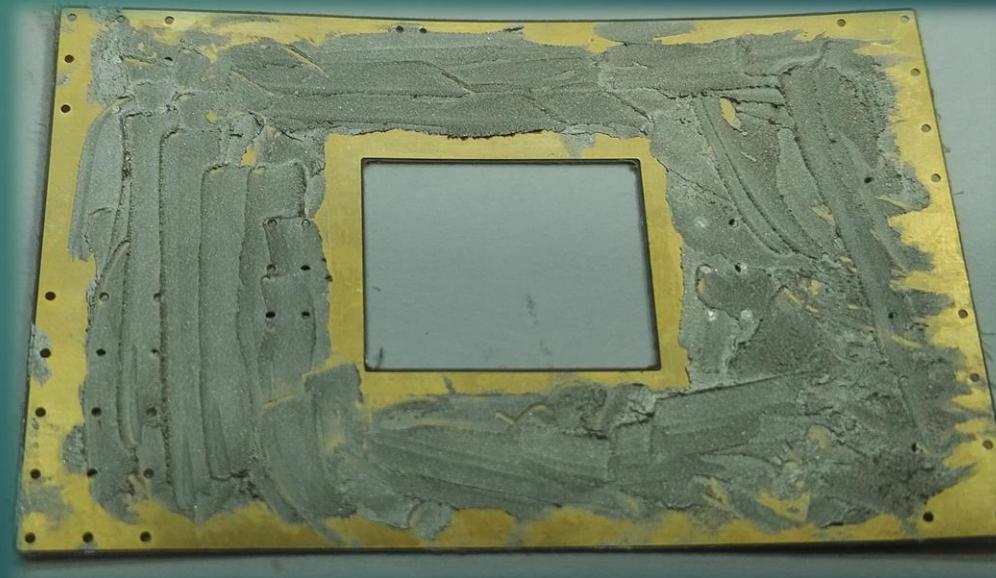


- 2 PCs of ALU box
- PTFE foil
- Wood for tighten PCB during gluing process

SSPA - OK1DFC build



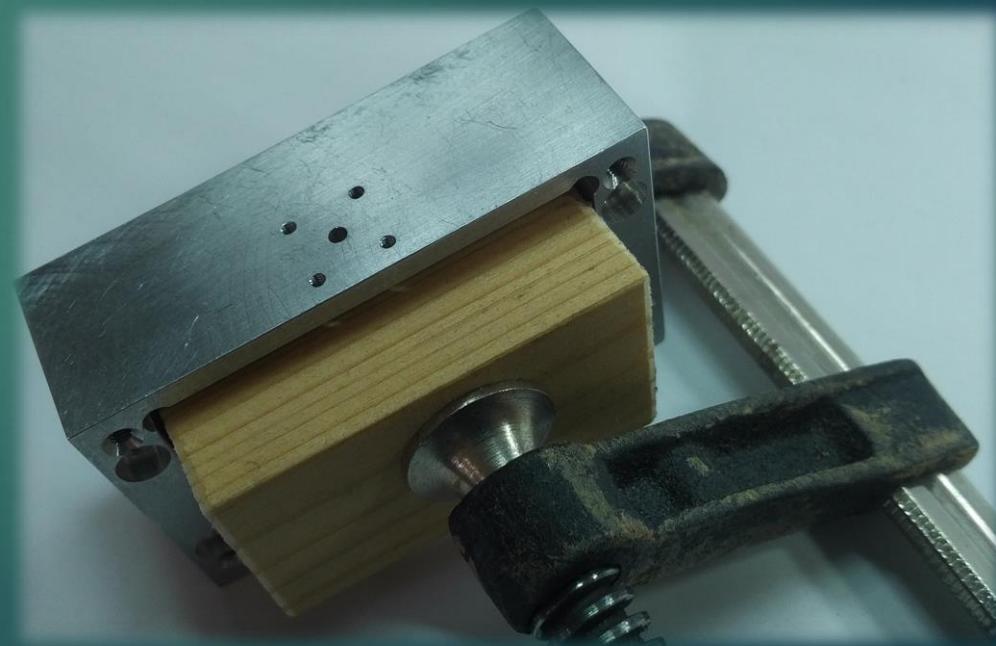
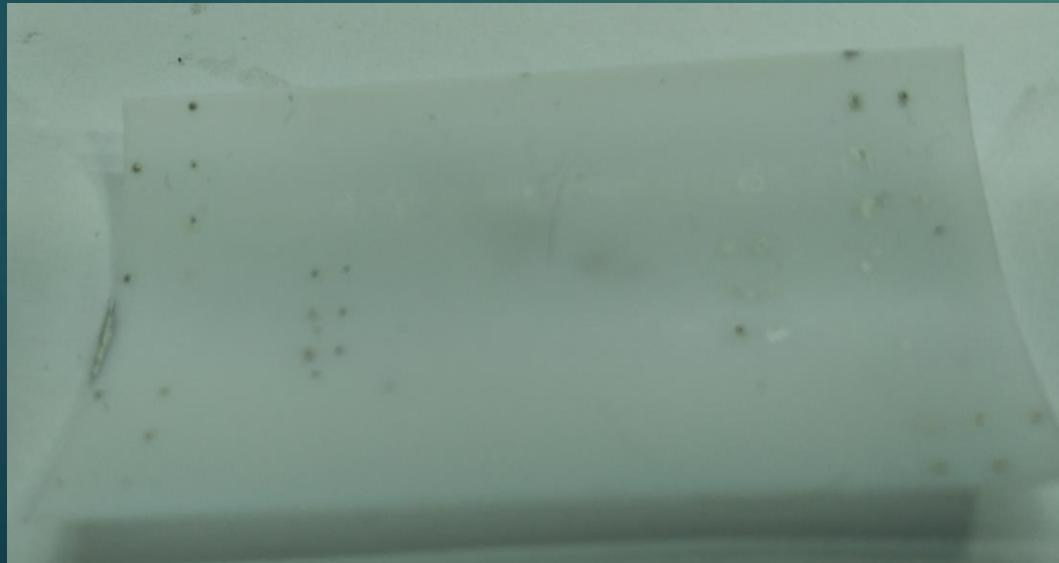
- 2 PCs of Special silver filled Conductive Epoxy - CHEMTRONIX CW2400
- 10 minutes for work
- Polymerization process with 80°C and 15-20 minutes
- Be careful with putting epoxy on the board !!!



SSPA - OK1DFC build



- Need to have handy ACETON thinner
- Cotton cleaners
- Clamps
- Check and clean after first 2 - 3 tightens



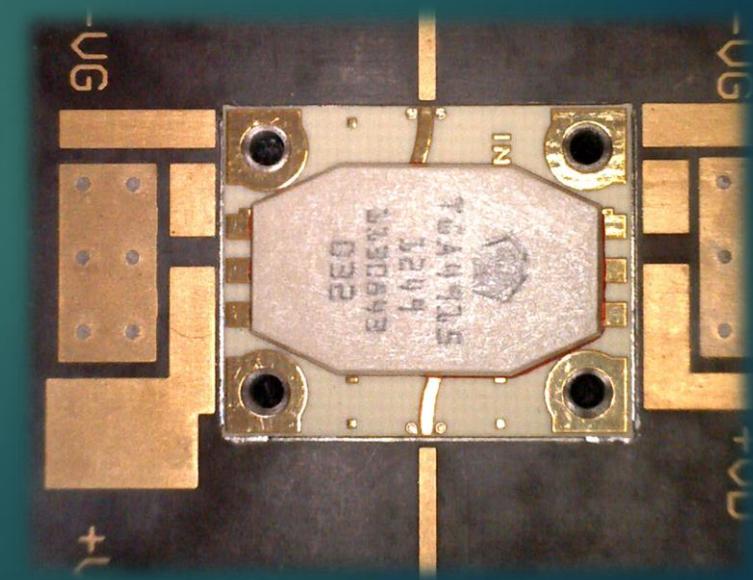
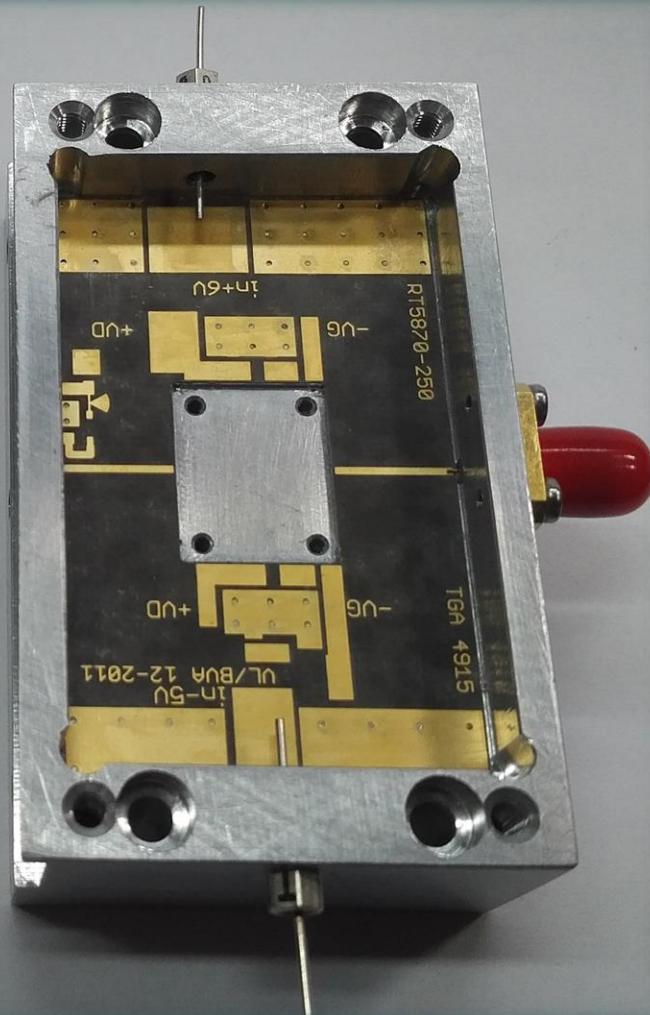
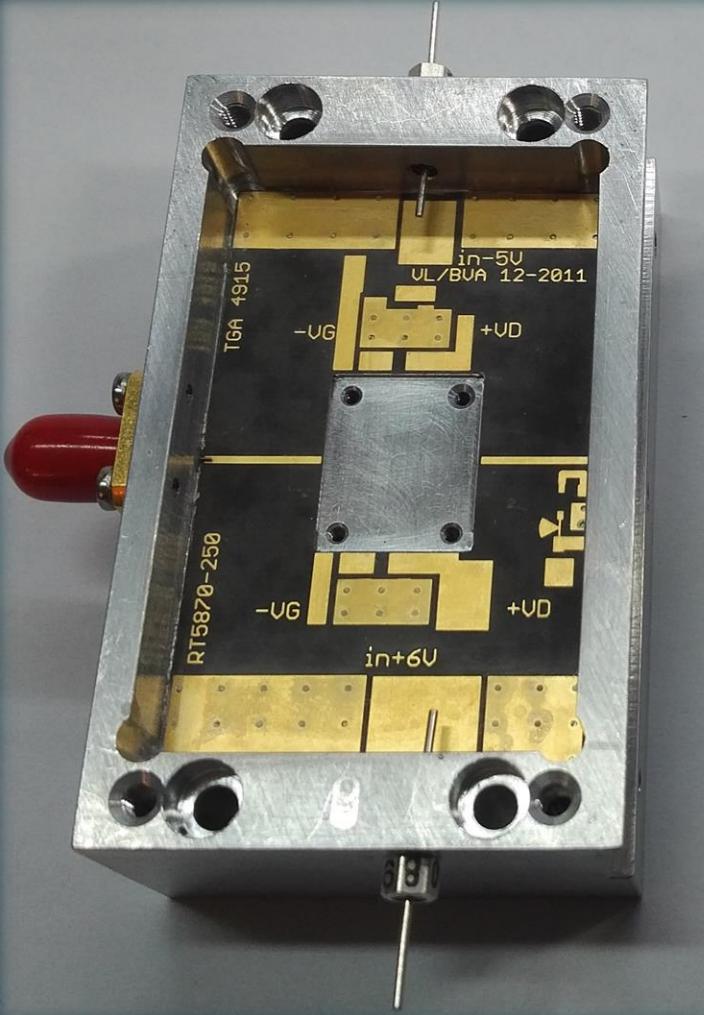
SSPA - OK1DFC build



- For avoid the problem with burning and damaging PCB during soldering process is necessary to use pre-heating for 150°C. After that is soldering easy and clear. Used unit with digital control of temperature

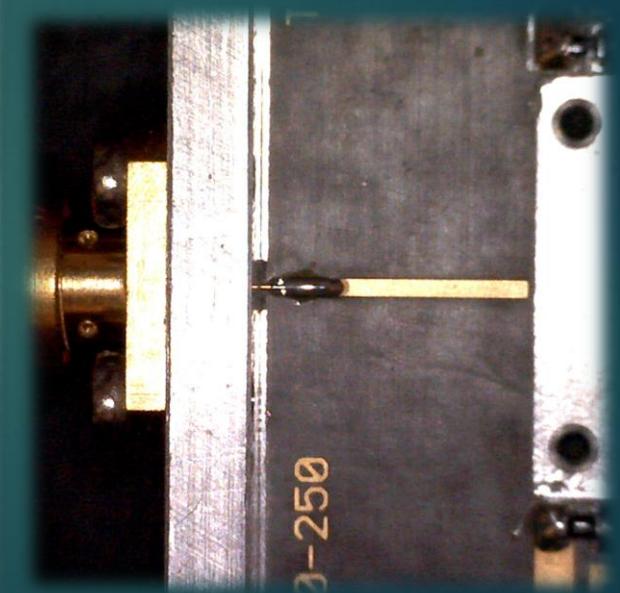
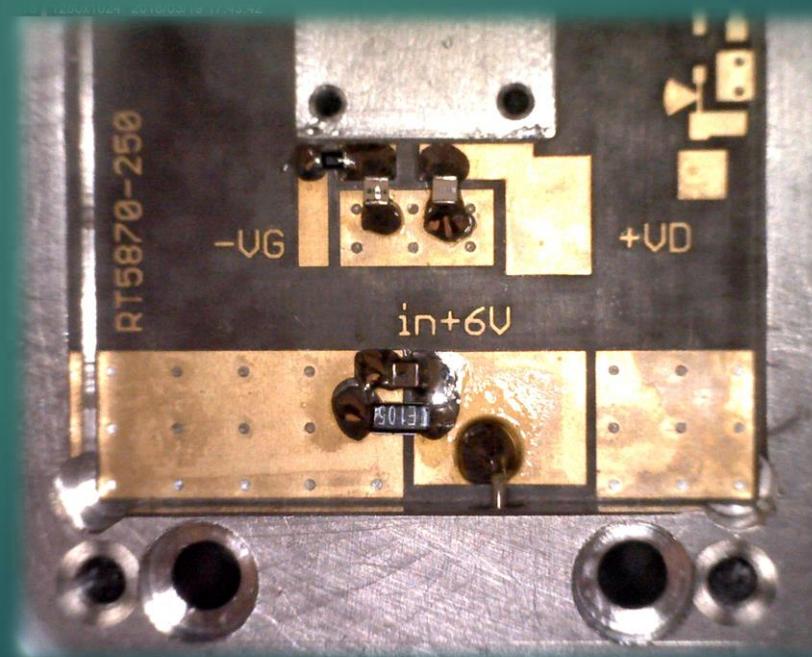
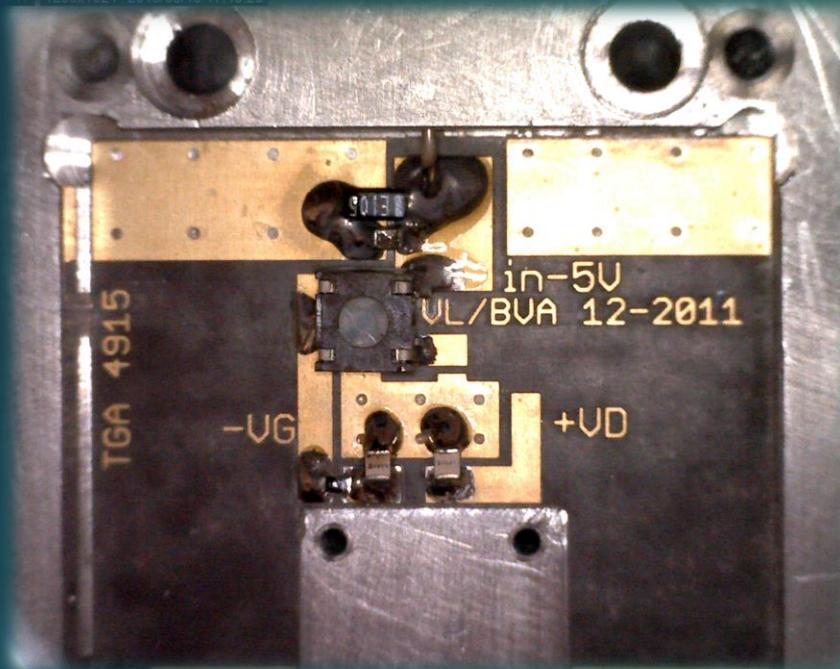


SSPA - OK1DFC build



- Final process after polymerization
- Clean PCB - very important for possible problems with RF and DC shorts etc.

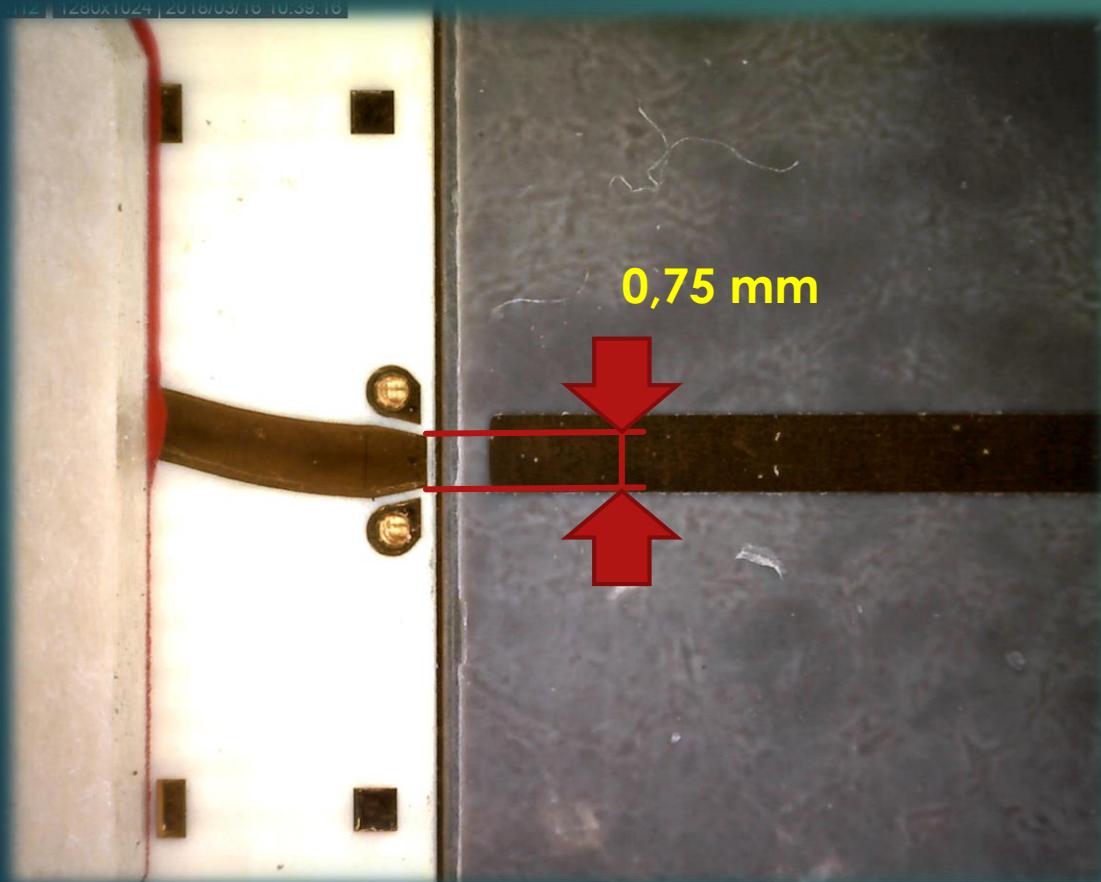
SSPA - OK1DFC build



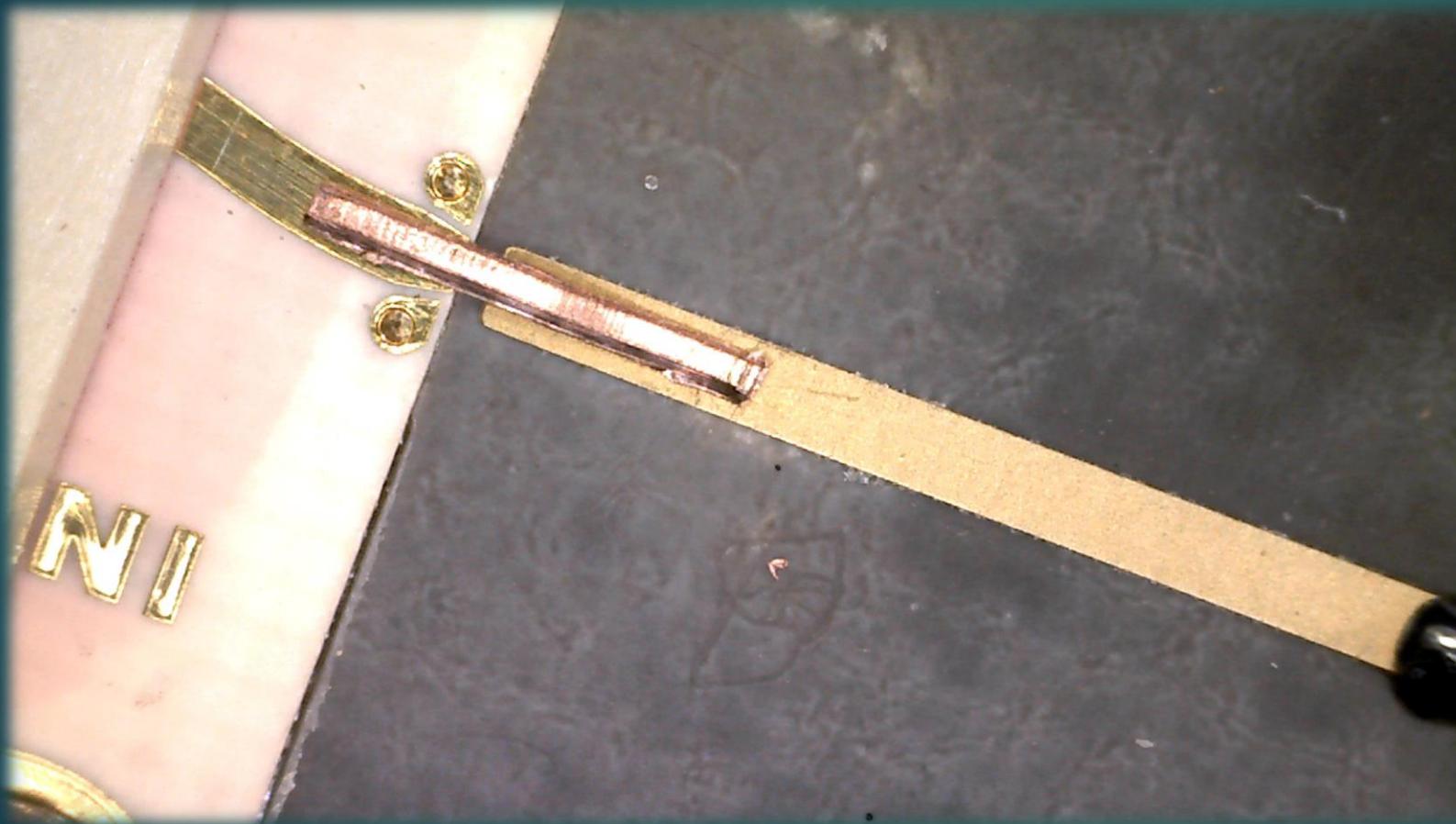
- Very easy and clear soldering
- ACT capacitors

SSPA - OK1DFC build

- Tricky soldering input and output to TGA4915CP



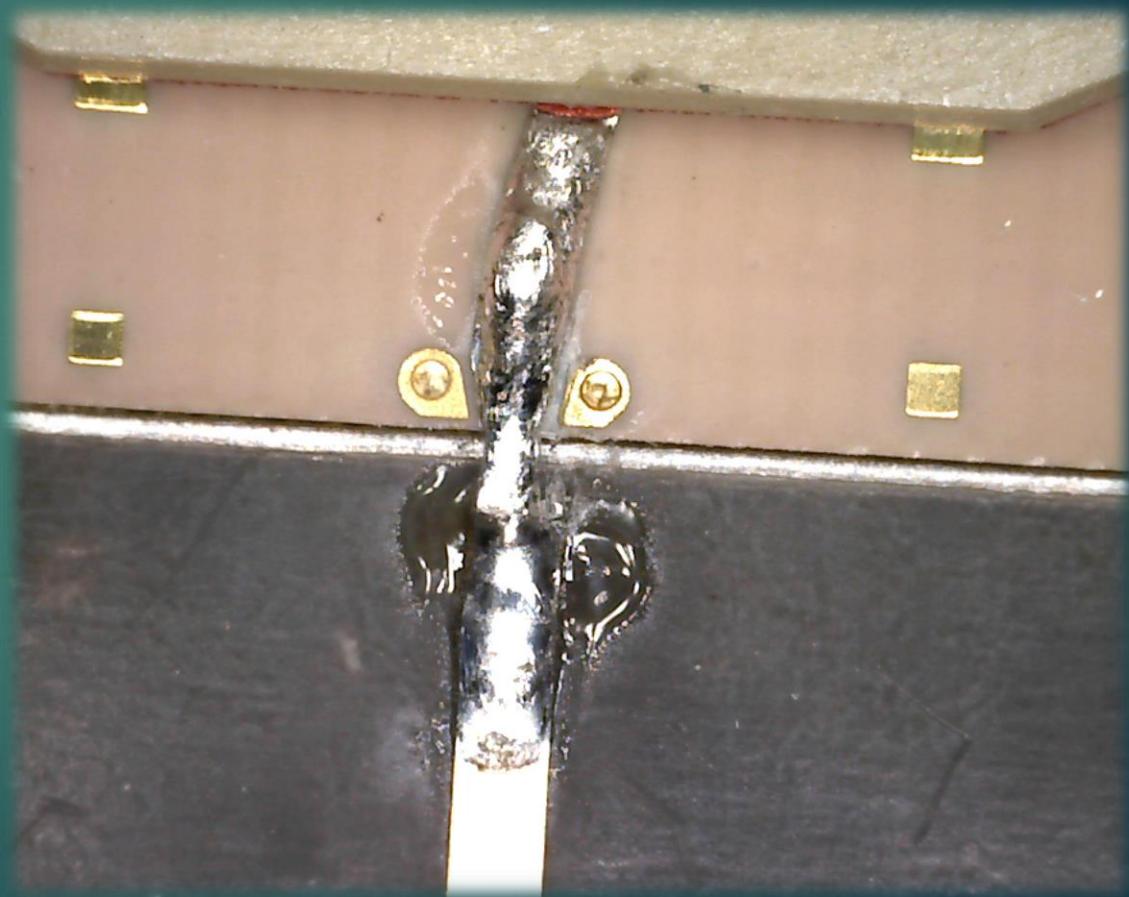
SSPA - OK1DFC build



- Tricky soldering input and output to TGA4915CP
- Used tiny copper foil strip

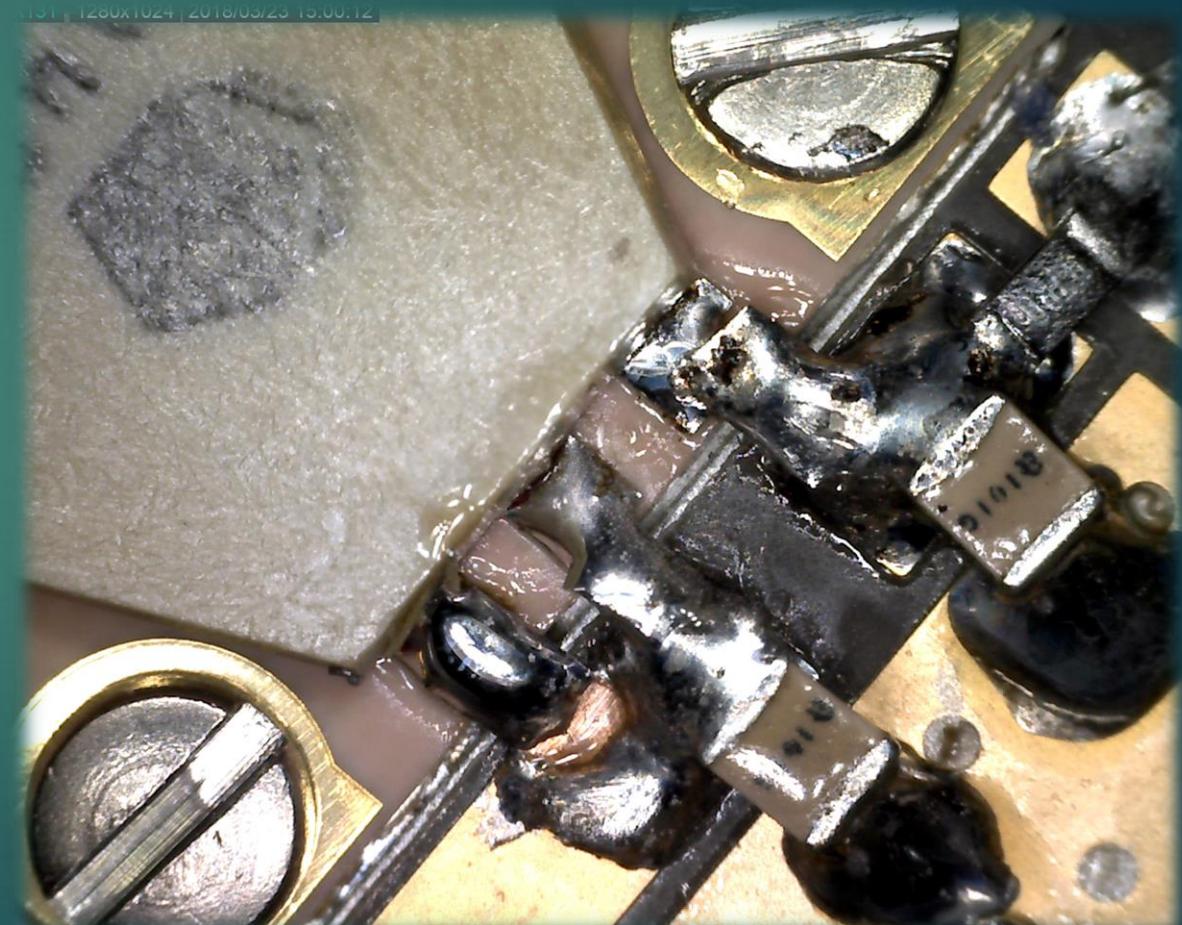
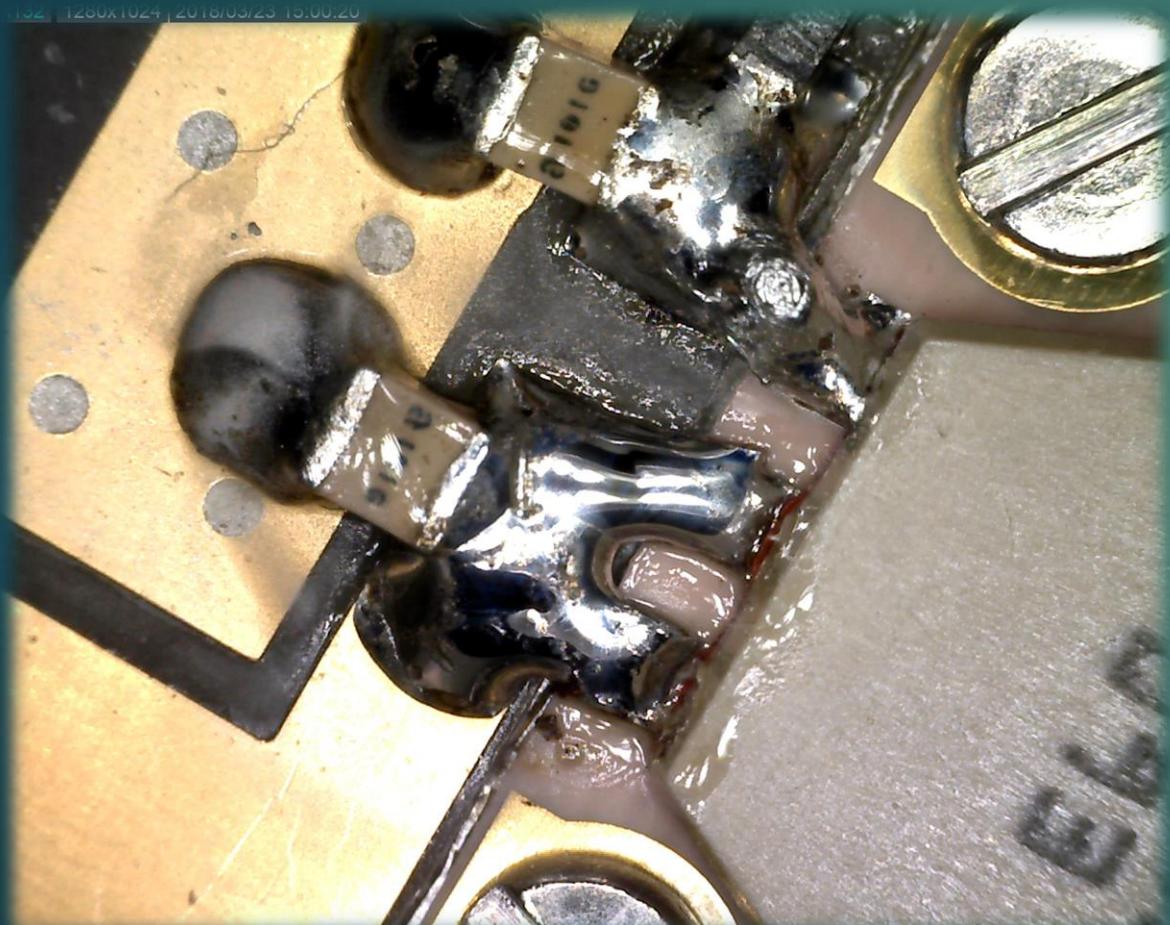
SSPA - OK1DFC build

- Tricky soldering input and output to TGA4915CP

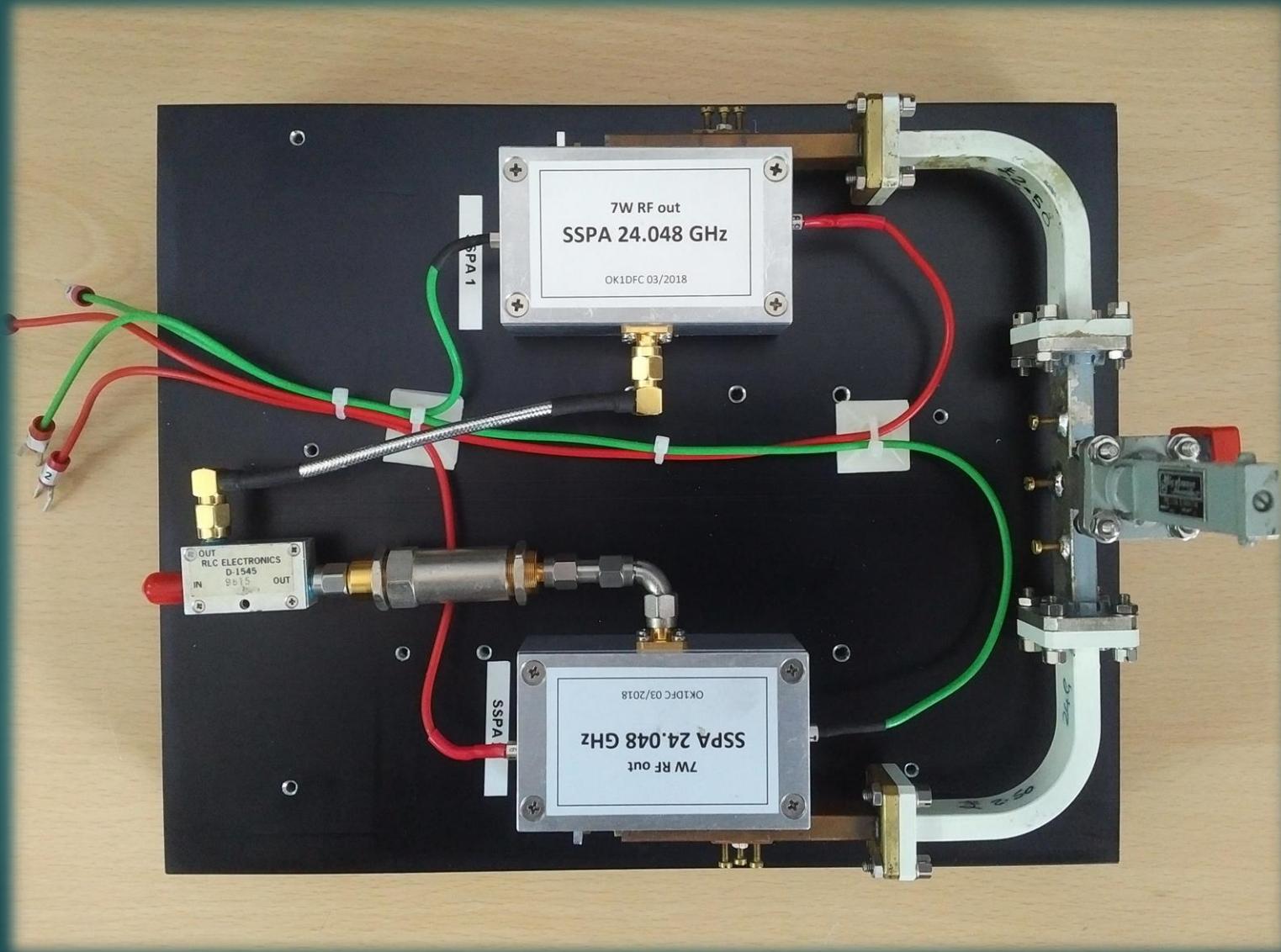


SSPA - OK1DFC build

- Soldering of Vd and -Vg is not so big problem



TRV 2nd generation - SSPA



OK1DFC feed for PF dish



- Zero loss transformation from rectangular to circular waveguide
- Feed PF dish 0,4 F/D made by PE1RKI
- Offset F/D 0,8 made by W1GHZ



See you via Moon on 24 GHz