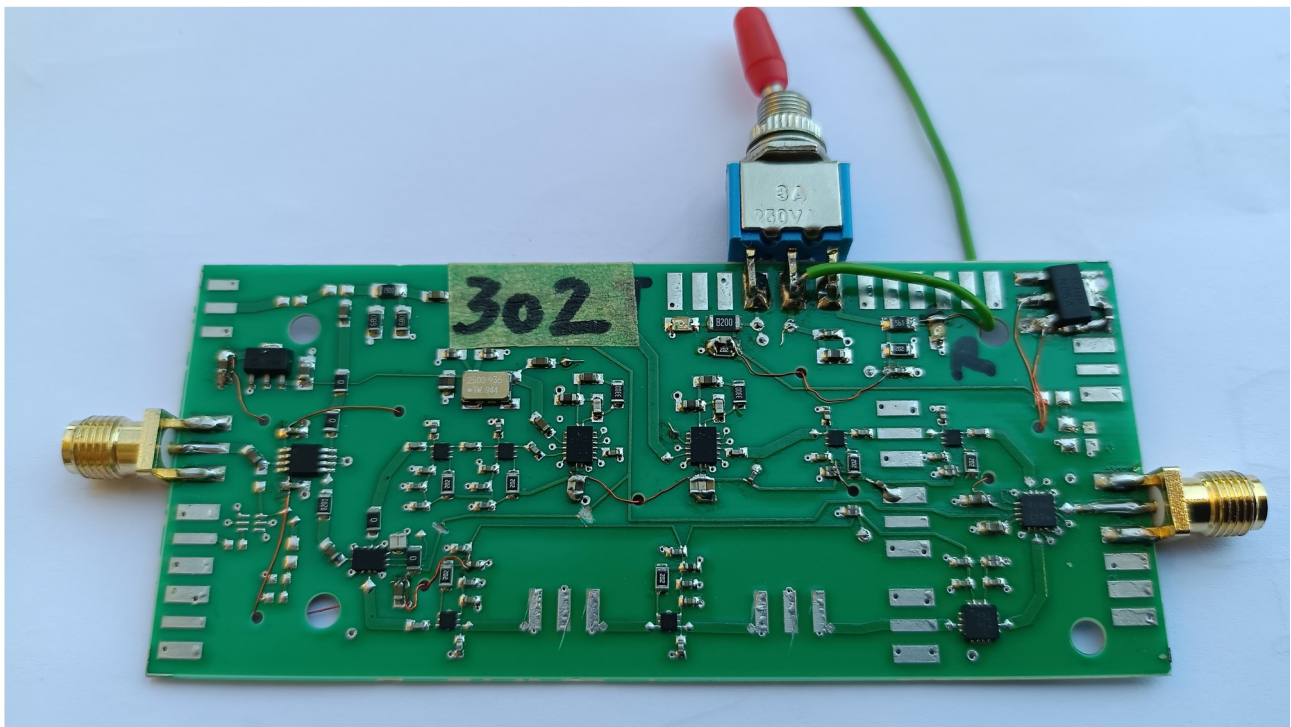


Q03 - The ÖVSV 3cm Transverter Project

"A compact plug-on transverter for entry into the 10 GHz band"



1. Introduction

- **Product Name:** Q03 ("Q zero three") 10GHz Plug-On Transverter
- **Target Audience:** Amateur radio operators
- **Purpose:** Easy entry into the 3cm band with all-mode operation and connection testing.

2. Technical Specifications

- **25 MHz TCXO:** 0.2ppm stability for SSB and CW operation.
- **LO Frequency:** Using the TFF1015 PLL as Local Oscillator: The leaked LO signal ($3\mu\text{W}$) at the IF output is selectively amplified and used as LO. The TCXO of 25 MHz is multiplied by 390 to get the **standard LO frequency of 9750 MHz**.
- **Downconverter:** A second TFF1015 chip, using the same 25 MHz TCXO is used as LNB, as intended by datasheet. With 2 more LNA stages, this enables very high receiving sensitivity.
- **Frequency Band:** 10368-10370 MHz is converted down to 618-620 MHz using the standard LNB LO frequency of 9750 MHz.
- **Control Transceiver:** Transmits and receives at 618-620 MHz (compatible with Quansheng UV-K5 or ADALM-PLUTO with Langstone software).
- **Key Components:**
 - LTC5549: High-performance mixer
 - Microstrip filter: Three 3rd order Microstrip filters, 1 for RX, 2 for TX.



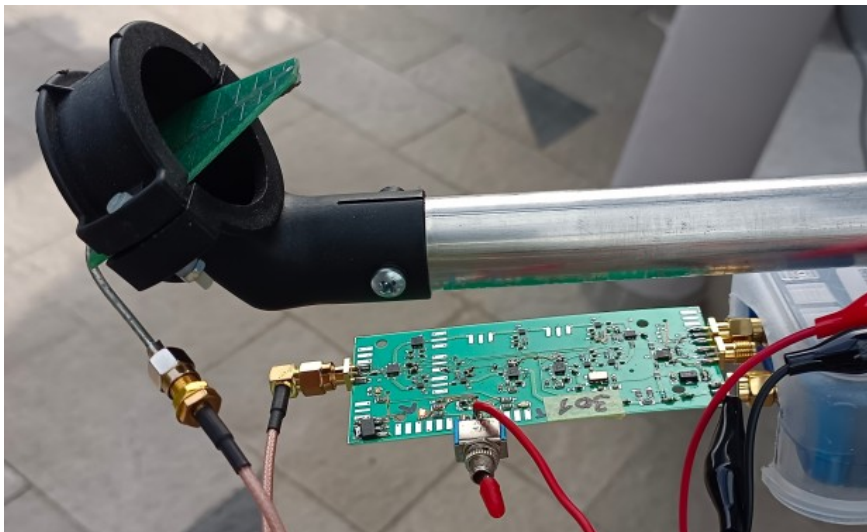
- GRF2710: Several. Low-noise amplifier (LNA) amplifies 8-12 GHz, which eases the demands of the microstrip filter
 - TFF1015: first used as PLL synthesizer and preamp for RX path as intended by datasheet.
 - TFF1015: 2nd use as PLL synthesizer for LO generation.
 - ADRF5019: RF switch for RX/TX switching
 - HMC451: Power amplifier
 - SMA connectors for Quansheng or Pluto RX/TX.
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3. Design and Features

- **Dual LNB Setup:** Separate chips for LO generation and enhanced reception.
 - **Microstrip Filter:** High selectivity, low insertion loss, adjustable for 10GHz and QO-100.
 - **PCB Material:** Rogers 4003e for low-loss high-frequency performance and much better thermal conductivity.
 - **Interfaces:** SMA connectors for Quansheng or Pluto RX/TX.
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4. Applications and Compatibility

- **Transceivers:** Compatible with Quansheng UV-K5 (FM, CW, AM) and ADALM-PLUTO (all modes with Portsdown software). Other transceivers are not supported!
- **Testing:** Successfully trialed during activity contests.



- **Use Case:** Entry-level all-mode 10GHz operation, with potential for extended range using parabolic dishes.
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5. Benefits

- **User-Friendly:** Easy integration for beginners and professionals.
 - **Cost-Effective:** High performance from standardized components.
 - **Flexible:** Supports various operating modes.
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6. Summary: The q03 combines cutting-edge technology with practical usability for 10GHz band applications.

- „It's the most simplified 3cm transverter with modern design.“
- Compact, cost-efficient, and high-performing.
- More description, schematics, assembly instructions is available at the ÖVSV Wiki German language:
- [https://wiki.oevsv.at/wiki/Q03 - Das %C3%96VSV 3cm Transverterprojekt](https://wiki.oevsv.at/wiki/Q03_-_Das_%C3%96VSV_3cm_Transverterprojekt)

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