Tune Up Procedure

Power Output

The power level of the 96281-x-05 Transmitter is not adjustable. In production the power level of the Main PCBA (P/N 670-1187-00) will be verified by an automated test of conducted power at J3OUT, at the band edges and centre. After final assembly, the transmitter is mounted in a jig incorporating a test antenna. An automated test system verifies the radiated level of ANT1 and the conducted power at the lead-wire antenna feed point, again at the band edges and centre.

Frequency

The 96281-x-05 Transmitter centre frequency and modulation are calibrated by an automatic system during production, and may be recalibrated using a semi-automatic procedure as a service operation. The automated and semi-automated procedures are equivalent; the semi-automated service calibration procedure is given below, with explanatory notes in italic. This should be read in conjunction with the transmitter block diagram.

The procedure provides a two-point calibration of the 19.2 MHz VCTCXO, controlling both the centre frequency and the depth of modulation.

Calibration method

Equipment required:

- PC with the 96281 Calibration Software installed
- Bluetooth v2.1 PC peripheral (dongle) installed on the PC.
- Spectrum analyser with ≤ 0.1 ppm class reference (OCXO or satellite)
- Antenna for 600MHz use, fitted to the spectrum analyser

1. Set the Spectrum Analyser to centre 608.0375MHz, span 50kHz, RWB 100Hz
2. Run the 96281 Calibration Software and establish Bluetooth communication from the PC to the 96281 transmitter

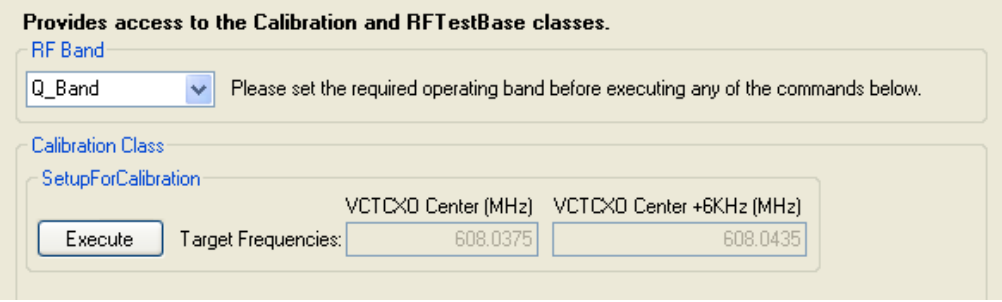

Fig 1

3. Set the RF Band to Q band in the dropdown menu (fig 1).
4. Press the SetupForCalibration [Execute] button (fig 1).

The software initialises the 96281 synthesiser settings and inhibits modulation

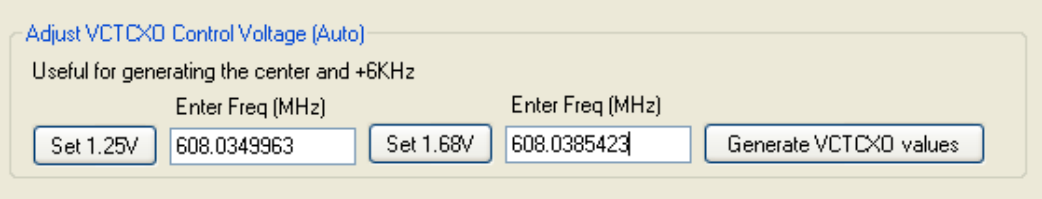

Fig 2

5. Press the [Set_1.25V] button at Adjust VCTCXO Control Voltage (fig 2)

This sets DAC1 to 1.25V

6. Measure the carrier frequency using the Spectrum Analyser.
7. Type this frequency into the left-hand Enter Freq box (fig 2)
8. Press the [Set_1.68V] button at Adjust VCTCXO Control Voltage (fig 2)

This sets DAC1 to 1.68V

9. Measure the carrier frequency using the Spectrum Analyser.
10. Type this frequency into the right-hand Enter Freq box (fig 2)
11. Press the [Generate VCTCXO values] button (fig 2)

The software now calculates DAC1 settings required to trim the centre frequency and to generate the intended depth of modulation.

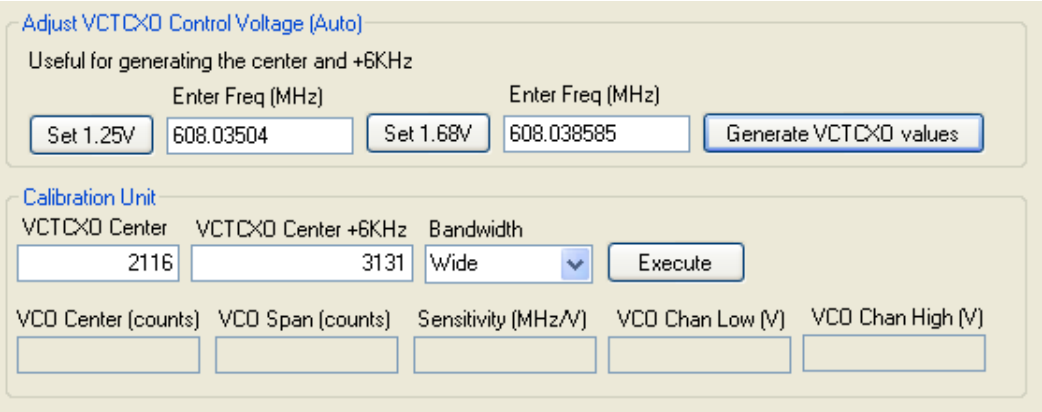

Fig 3

12. Select required transmission bandwidth (Wide or Narrow) from the Bandwidth drop-down (figure 3)
13. Press the adjacent [Execute] button (fig 3)

The software now carries out an automated measurement of the VCO sensitivity, by setting the PLL to a new frequency and using the BUFF/ADC feedback path to measure the change in VCO control voltage.
Using the VCTCXO calibration, the Narrow/Wide selection, and the VCO sensitivity measurement, the software scales and offsets the modulation data tables for DAC1 and DAC2. The calibration results and table values are then written to the 96281 transmitter.

Channel Setting and Verification

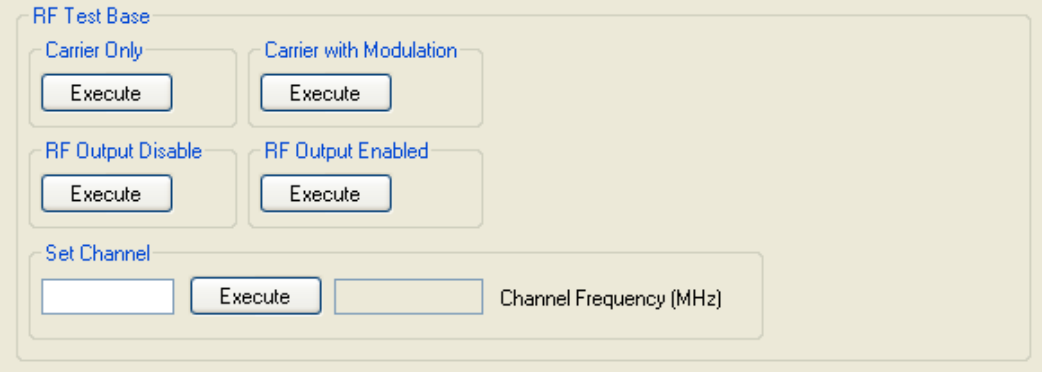

Fig 4

1. Enter the required channel number in the Set Channel box and press the adjacent [Execute] button (fig 4)
2. Press the Carrier Only [Execute] button (fig 4)
3. Measure the carrier frequency using the spectrum analyser and verify that the measurement is within +/-200 Hz of the tabulated channel frequency.
4. Press the Carrier with Modulation [Execute] button (fig 4)
5. Make an Adjacent Channel Power (ACP) measurement and verify that it is similar to fig 5, +/- 3dB.

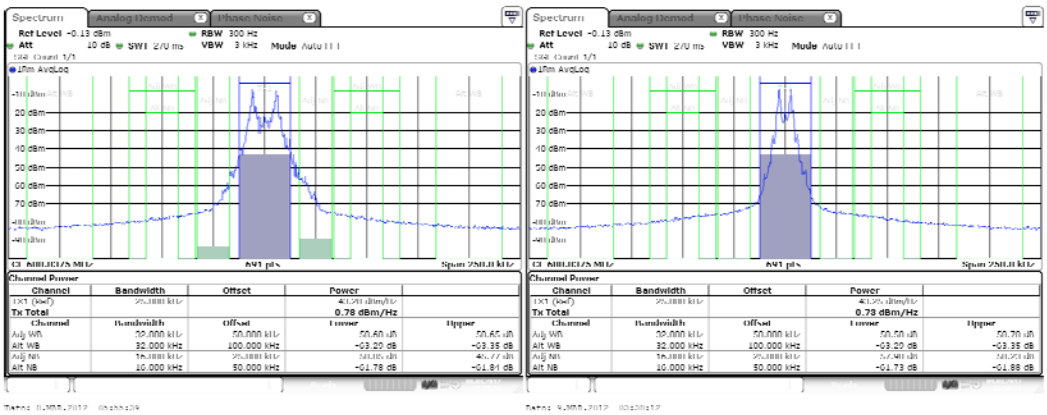

Fig 5 – ACP measurements: wideband (left) and narrowband (right)