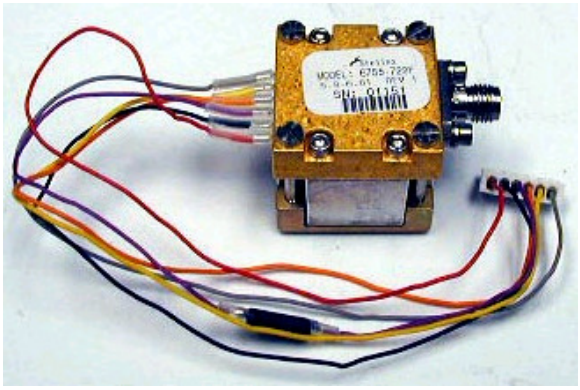
Preliminary stability tests of STELLEX MINI YIG OSCILLATOR

(Purchased on eBay)

Characteristics provided by the seller:



MiniYIG Tuned Oscillators
- 6.3 GHz in Center Frequency
- Low Phase Noise
- –105 dBc/Hz @ 10K (typ.)
- –128 dBc/Hz @ 100K (typ.)
- Up to ±1 GHz Tuning Range
- Output Power +14.5 dBm (typ.)
- Outstanding Phase Hit Performance in 64 and 128 QAM

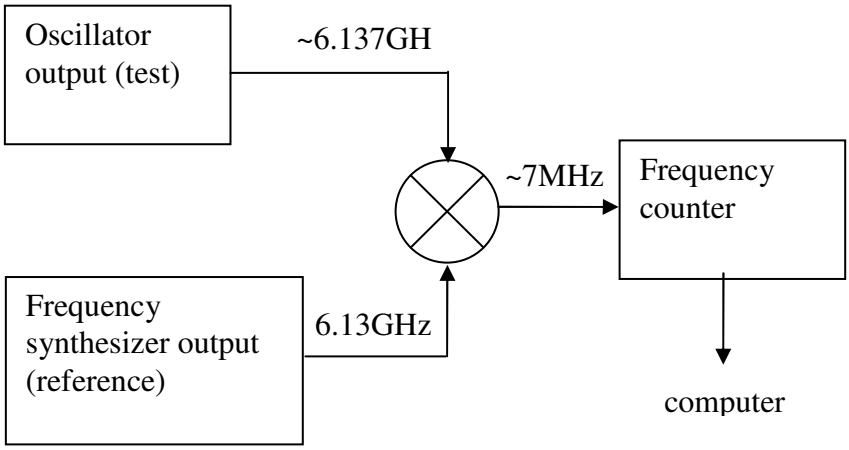
Radio Systems
- Offered in SMA Connector Package

Here is the pinout:
1 Red +Vcc
2 Black GND
3 Violet Tuning Coil+
4 Orange Tuning Coil-
5 Yellow Modulation Coil
6 Gray Modulation Coil

We've tested the tunability of the oscillator, although a high-precision low-noise voltage source is required.

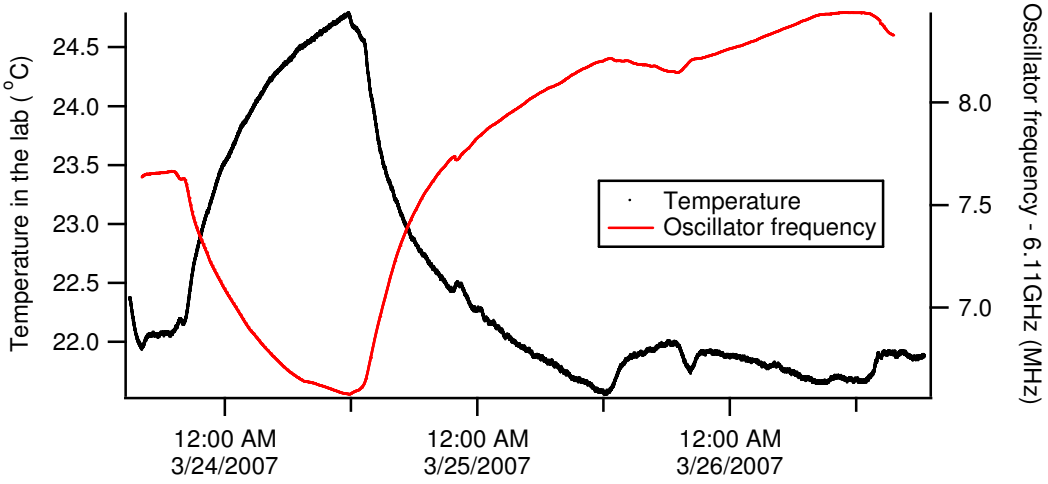
We've also tested the stability of a free-running oscillator with tuning voltage set to zero (both tuning voltage contacts are grounded).

We used the following scheme for stability tests:

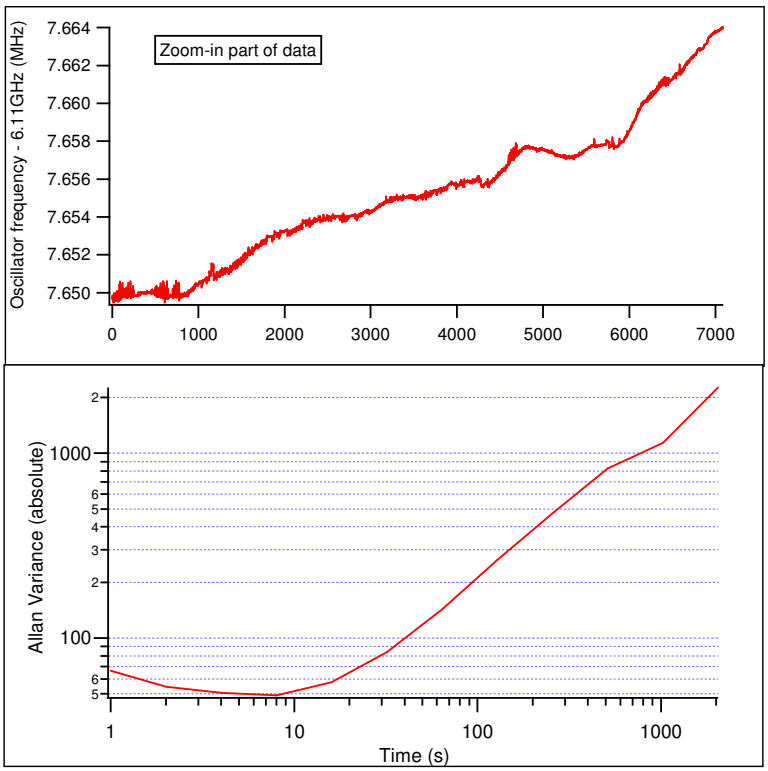


The oscillator was placed in an aluminum box to remove some of the parasitic electric signals, but no effort for temperature stabilization of the system was made. As a result we found that the long-term stability of the oscillator is determined by the temperature fluctuations in the room. *During these measurements we found that it is important to operate with external frequency reference feed into the counter – looks like the local frequency reference is defective.*

Data files for corresponding measurements C844D0323.dat(frequency) and temperature_in_the_lab_92.txtand temperature_in_the_lab_93.txt (temperature)



To determine the short-term stability I zoomed into the first (relatively flat) region of the graph and calculated absolute Allan variance.



It is easy to see that for a few second it is possible to localize the frequency of the oscillator below 100H. Relative Allan variance reaches its minimum 0f 10^{-8} at approx 5-10s.