

Recent achievements in performance of 100 MHz crystals and OCXOs.

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In recent years requirements for phase noise of OCXOs at 100 MHz became significantly tighter. Often it is important to minimize both close-in phase noise (at 10, 100 and 1000 Hz from carrier) and noise floor (at 10, 100 and 1000 kHz from carrier).

To meet modern requirements to phase noise it is necessary to optimize both construction and electronics of oscillator and significantly improve quartz crystal.

Successful advancement in this direction was made in Morion Inc in Y 2013.

It is known that phase noise in different zones is influenced by different factors: noise floor is influenced mostly by electronics (noise coefficient of amplifying and buffer cascades, resistor noise, supply voltage noise and so on), close-in phase noise is mostly influenced by crystal.

To ensure the noise floor lower than -180 dBc/Hz it is important to use amplifying and buffer cascades optimized from the point of noise coefficient as well as filtering of output signal. It should be noted that noise floor -180 dBc/Hz was reached even at a supply voltage of just 5 V.

For improving of crystal's characteristics, from the point of close-in phase noises, ultra clean quartz material and its special processing have been used as a base of manufacturing technology. It helps to improve phase noise at 100 Hz offset by 5...10 dB. Special selection technology has been developed to control the quality of crystals. It allowed to significantly reduce manufacturing costs for OCXOs with most tight close-in phase noise requirements. Already completed OCXO design is very compact in size - just 25*25*10 mm, what significantly extends its applications.

All above mentioned actions ensured phase noise level as showed on Fig.1. Such performance makes subject 100 MHz OCXOs built by Morion compliant with practically all current phase noise requirements, being very efficient for modern compact equipment.

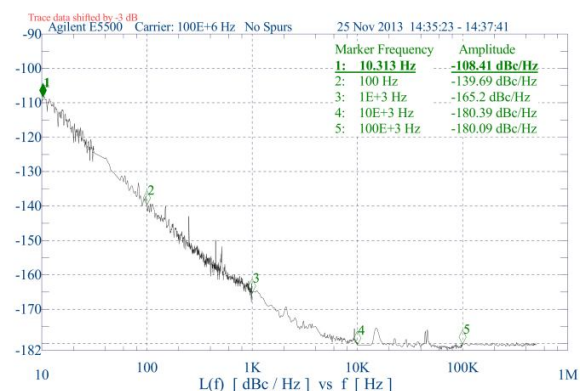


Fig. 1: Phase noise for new 100 MHz OCXO design. Supply voltage 5 V. Size 25*25*10 mm