



# Licensing opportunity

## *Quality multiplier for optoelectronic oscillator*

### Field of use

Ultralow phase noise microwave oscillators with high stability

### Current state of technology

prototype for optoelectronic oscillator side-mode suppression

### Intellectual Property

patent SI25111 (A), 2017-06-30  
EU patent pending

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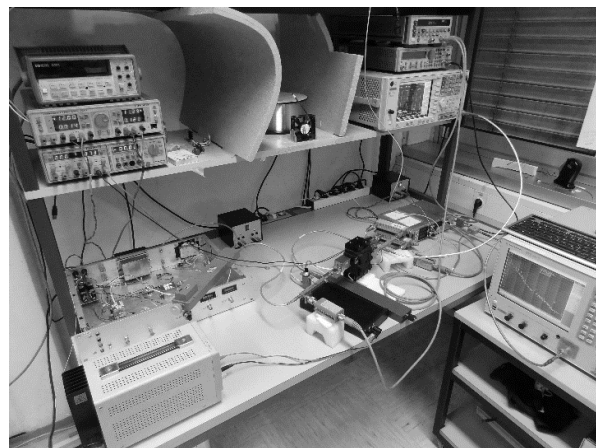
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### Background

Today, the opto-electronic oscillator (OEO) is a well-known solution for generating high-frequency signals with a ultralow phase noise. It is a drawback of said known solution that the electrical oscillator created by the band-pass filter and the feedback loop thereof increases the phase noise by side-modes. Spurious peaks appear in the spectrum because of the multimode nature of the OEO's oscillation.

### Description of the Invention

The OEO with a so-called "quality multiplier" (QM) is introduced. The QM is a positive feedback loop that increases the selectivity and gain of a related OEO. If the QM is added to a band-pass filter, both its bandwidth and the insertion loss decrease.

### Main Advantages

The purpose of the QM circuit is to simultaneously provide greater selectivity and amplification of the OEO's loop compared to a stand-alone band-pass filter. With this method it is possible to achieve very narrow loop bandwidths without placing very high demands on the microwave band-pass filter. The narrow loop bandwidths prevent oscillations at different modes and thus increase the side-mode suppression ratio. The QM is constructed from widely obtainable components and this makes the realization of the proposed method more economical than other methods that use additional optical loops.