

# Micro-Opto-Electronic Oscillator (uOEO)

## Low Phase Noise Microwave Photonic Hybrid Chip

Unprecedented low phase noise and low vibration and acceleration sensitivity in its class for signal sources.



Actual Size  
0.6" x 0.6" x 0.15"

### Features

- Low Phase Noise/Jitter
- Low Spurious Content
- Micro-Chip Form Factor
- Frequency Scalability
- EMI Tolerant
- High Stability
- Low Vibration/Acceleration Sensitivity

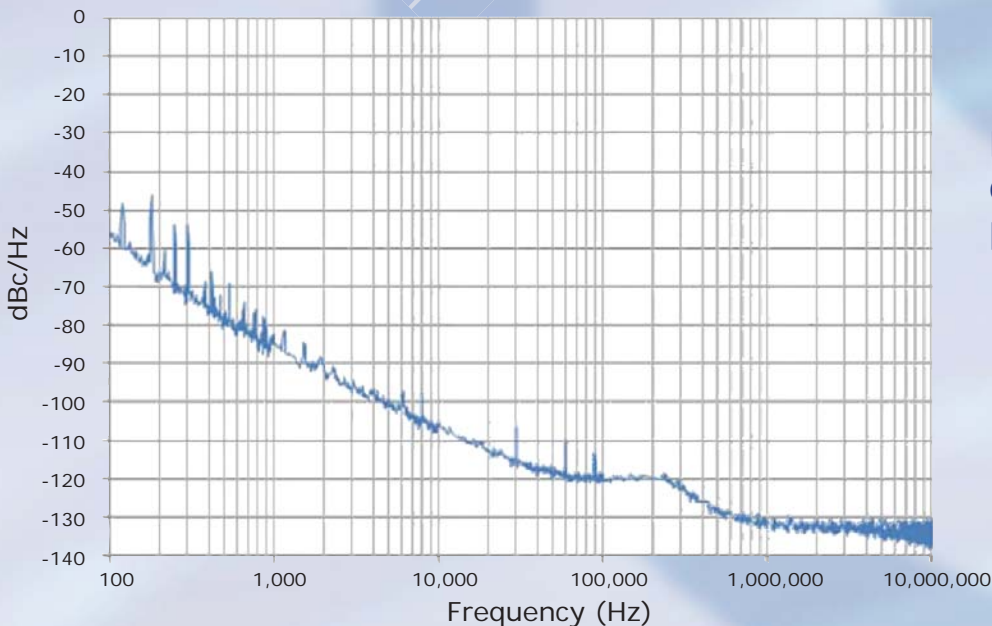
The unique design of the Micro-OEO is based on the photonic generation of spectrally pure signals at RF and millimeter wave frequencies that enable OEwaves' signal sources to scale to higher frequencies with little to no penalty in phase noise performance. This is accomplished through the patented technology of ultra-high quality factor (Q) crystalline whispering gallery mode (WGM) optical resonators.

The high performance Micro-OEO allows enhanced radar system visibility, increased channel capacity of communication systems, and high capacity, high frequency next generation wireless communication systems. This level of performance, in a micro-chip form factor, enables new capabilities in legacy as well as new markets for a variety of terrestrial and airborne applications.

### Applications

- Radar Systems
- Defense Communication
- Test and Measurement
- Satellite Communication
- Imaging
- Microwave Radio

**Free Running Phase Noise Plot**  
**Micro-Opto-Electronic Oscillator - 35 GHz**



Micro-Opto-Electronic Oscillator offers typical phase noise performance of -108 dBc/Hz at 10 KHz offset from the carrier.

Available in 34-36 GHz

# Specifications

Parameters	Specification (Typ.)	Notes
Output Frequency	34-36 +/- .1 GHz	Fixed frequency
RF Output Power	+6 dBm	
SSB Phase Noise	-55 dBc/Hz @ 100 Hz	
	-85 dBc/Hz @ 1 kHz	
	-108 dBc/Hz @ 10 kHz	
	-120 dBc/Hz @ 100 kHz	
	-130 dBc/Hz @ 1 MHz	
	-135 dBc/Hz @ 10 MHz	
Output Return Loss	12 dB	
Spurious	-70 dBc	
Short Term Stability	10 <sup>-9</sup> @ 1 s	Allan Deviation at constant case
Thermal Stability	1 ppm/°C	Case Temperature
Operating Temperature Range	-20° - +70° C	
Power Sources	+4Vdc; 200mA	
	+1V; 500mA max TEC1	
	+1V; 500mA max TEC2	
Package Size	0.6" x 0.6" x 0.15"	Excluding driver electronics
Options		
Extended Temperature Range	>90° C	Consult factory
Vibration/Acceleration Sensitivity	5 x 10 <sup>-11</sup> /g	

**Note:** These specifications are subject to change without notice due to OEwaves ongoing development cycles. Unless otherwise noted, all specification in this document are to be treated as "typical." This product line is covered by one or more of the following U.S. patents: 5,723,856; 6,389,197; 6,488,861; 6,795,481; 6,798,947; 7,173,749; 7,248,763; 7,356,214; 7,440,651. Other patents pending. **ITAR Restricted:** This product is designated as a defense article under Category XI(c) of the USML and is subject to ITAR licensing requirements.

For ordering or other inquiries contact:



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