



Product Brief

Compact Opto-Electronic Oscillator (OEO)

Low Phase Noise Microwave Signal Source Module



Compact OEO offers extremely low phase noise and low vibration & acceleration sensitivity for signal source modules required in high-frequency, high performance applications. Available in any output frequency between 10 - 12 GHz (consult factory for other frequencies). Compact OEO offers typical phase noise performance levels of better than **-140 dBc/Hz at 10 KHz offset** from the carrier. Compact OEO is offered with a variety of scalable features and options.

Features

- Low phase noise/jitter
- Low spurious content
- Compact size
- Frequency scalability
- EMI tolerant
- High stability
- Low vibration/acceleration sensitivity option
- Phase locking option
- Optical output option

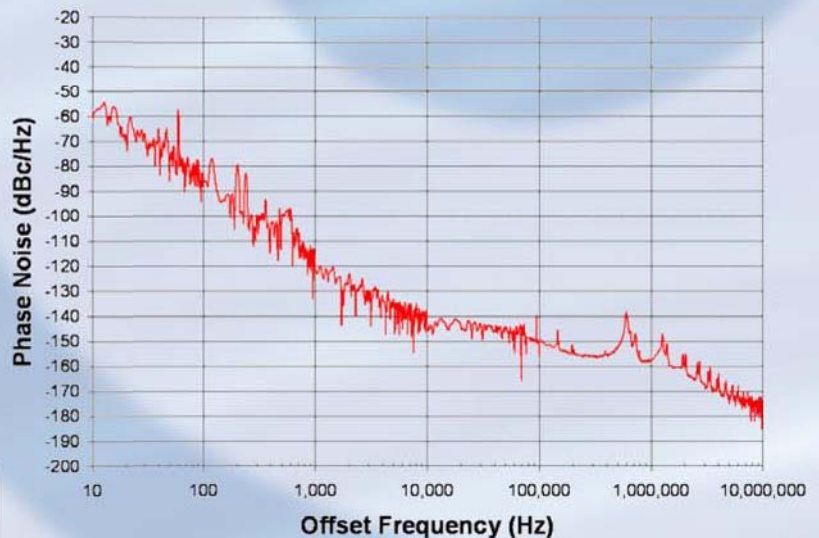
Applications

- Radar Systems
- Instrumentation
- Phase Noise Measurement
- Test Equipment
- Satellite Communications
- Imaging
- Microwave Communications

The unique design of Compact OEO is based on the photonic generation of spectrally pure signals at RF and millimeter wave frequencies that enables OEwaves signal sources to scale to higher frequencies with little or no penalty in phase noise performance.

The high performance of Compact OEO allows for clean and precise phase noise measurements, enhanced military radar system visibility by several fold, increased channel capacity of communications systems by an order of magnitude, and high capacity, high frequency future wireless communications systems. This level of performance will enable manufacturers to retrofit current systems as well as architect capabilities to address new markets.

Free Running Phase Noise Plot Compact OEO - 10 GHz



NOTE: "This product is designated as a defense article under Category XI(c) of the USML and is subject to ITAR licensing requirements."

Product Specifications

Parameter	Compact OEO	Notes
Output Frequency	10 to 12 GHz	Customer to designate frequency. Consult factory for other frequencies.
RF Output Power	+10 dBm	
Phase Noise	- 90 dBc/Hz @ 100Hz - 120 dBc/Hz @ 1kHz - 140 dBc/Hz @ 10kHz -150 dBc/Hz @ 100kHz -160 dBc/Hz @ 1MHz -170 dBc/Hz > 10 MHz	
Timing Jitter-RMS	7 fs	Noise frequency range 100 Hz to 100 MHz.
Harmonics	-40 dBc	
Spurious	-30log (f _{offset}) dBc -110 dBc -95 dBc	10Hz < f _{offset} < 1 kHz f _{offset} > 1 kHz 600kHz < f _{offset} < 700 kHz.
Short Term Stability	2x10 ⁻¹¹ @ 1 Sec.	Allan Deviation at constant ambient.
Thermal Stability	+/- 1 ppm	Over operating temperature range.
Operating Temp. Range	15° - 50° C	Case Temperature with 35° C range; Customer may specify any 35° C window between -20° to +60° C case temperature.
Power Sources	+23Vdc +/-15Vdc +8.4Vdc +5Vdc	
Power Consumption	28 W	At +25° C.
Package Size	4.5" x 5.9" x 0.94"	
Input/Output Connectors	DC/Control: 26-Pin DB RFin (Ref): S-SMA(F) RFout: S-SMA(F)	
Options		
Optical Output - Power	-3 dBm	LC/PC connector.
PLL - Loop Bandwidth	10 – 200 Hz	Phase locked operation with an external reference (not supplied) may degrade phase noise performance within the set loop bandwidth. Customer to specify bandwidth.
Reference Input Frequency	10MHz or 100 MHz	Ref input frequency requires to be integer divisible by the oscillator output frequency.
Extended Temp. Range	>35° C	Consult factory. Package size may increase to 7" x 7" x 2".
Vibration/Acceleration Sensitivity	5x 10 ⁻¹¹ /g	Consult factory. Package size may increase to 7" x 7" x 2".

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NOTE:

These specifications are subject to change without notice due to OEwaves ongoing development cycle. Unless otherwise noted, all specifications in this document are to be treated as "typical"; actual performance may vary contingent on operating environment.

This product line is covered by one or more of the following U.S. patents: 5,204,640; 5,723,856; 5,777,778; 5,929,430; 6,594,061; 6,762,869; 7,173,749. Other patents pending.



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