RXG1490L

Rakon's RXG1490L GHz XO enables output frequencies of up to 2.2 GHz with ultra-low RMS phase jitter (as low as 15 fs typ, 12 kHz to 20 MHz). RXG1490L is an ideal solution for Optical Coherent Networking, and high speed ADC/DAC/SERDES clocking, where excellent oscillator phase noise and jitter is critical to system performance. This product is also available as a VCXO, Rakon RVG1490L.

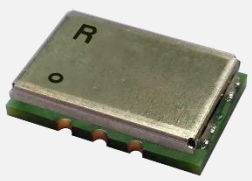
Features

- Frequency range from 1 GHz up to 2.2 GHz
- Ultra-low RMS phase jitter
- Sinewave, Differential Sinewave or LVPECL
- Lower temperature sensitivity than SAW

Applications

- 100G/400G Data communications
- High speed ADC/DAC/SERDES
- Coherent Optical Modules

14.0 x 9.0 x 3.0mm SMD



Standard Specifications

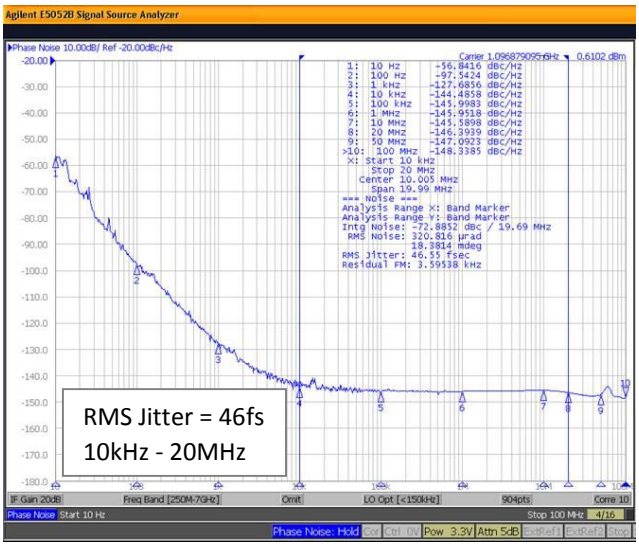
Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Frequency		1.0 – 2.2		GHz	Sinewave, Differential Sinewave or LVPECL output type
Operating temperature range	-40		85	°C	
Frequency stability			±70	ppm	Including initial calibration, temperature range, supply variation, load variation and 10 years aging at 25°C
Temperature stability			±20	ppm	Over operating temperature range only
Supply voltage (V_{DD})		3.3		V	±5%
Supply current			70 80 120	mA mA mA	Sinewave Differential Sinewave LVPECL
Oscillator output Sub-harmonics Output power Output differential swing Output differential swing	 2 0.6 1.1	 -30 4 1.6	 -25 6 1.6 	 dBc dBm V V	 Single sinewave, 50Ω load Differential sinewave LVPECL

SSB Phase Noise and RMS Phase Jitter

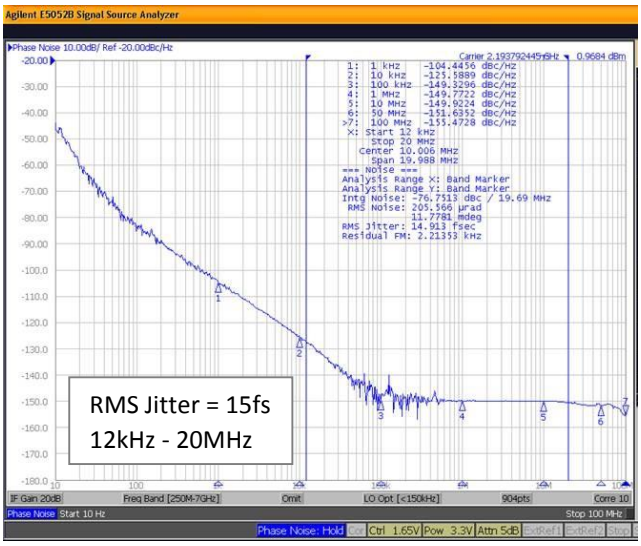
Offset / Carrier Frequency	1.096GHz LVPECL	2.193GHz Sinewave	Unit	Test Condition / Description
a. 100 Hz	-97	-83	dBc/Hz	Typical at 25°C, VDD 3.3V ±5%
b. 1 kHz	-127	-104	dBc/Hz	
c. 10 kHz	-144	-125	dBc/Hz	
d. 100 kHz	-146	-149	dBc/Hz	
e. 1 MHz	-146	-149	dBc/Hz	
f. 10 MHz	-145	-149	dBc/Hz	
g. Typical RMS phase jitter	46	 15	fs	Integrated 10kHz to 20MHz Integrated 12kHz to 20MHz

SSB Phase Noise and RMS Phase Jitter (Typical value at 25°C)

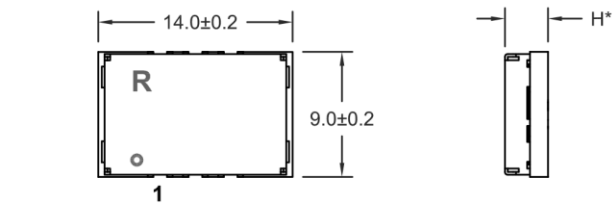
1.096GHz XO with LVPECL Output



2.193GHz XO with Sinewave Output

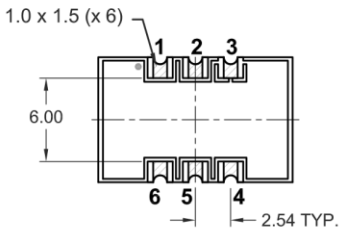


Model Outline and Recommended Pad Layout



H* NOTE:

H = 3.3 ±0.2 mm (for LVPECL)
H = 2.8 ±0.2 mm (for Single and Differential Sinewave)

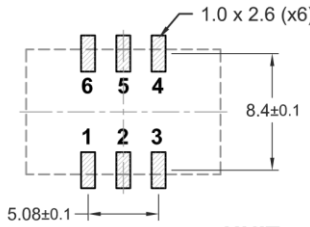


PIN CONNECTIONS (XO)

	Sinewave	Differential Sinewave	LVPECL
1	NC	NC	NC
2	GND	GND	GND
3	GND	GND	GND
4	Sinewave Output	Output 1 (Ø = 0°)	Output 1 ($\overline{Q}$)
5	GND	Output 2 ($\overline{Ø}$ = 180°)	Output 2 (Q)
6	VDD	VDD	VDD

RECOMMENDED PAD LAYOUT

TOP VIEW



UNIT: mm

XO Model Range

Footprint	Typical RMS Phase Jitter (12kHz-20MHz)			
	1.00ps CMOS, LVPECL, LVDS 8 - 1500MHz	0.50ps CMOS, LVPECL, LVDS 8 - 1500MHz	0.10ps CMOS, LVPECL, LVDS 10 – 800MHz	0.03ps Sine, Differential Sine, LVPECL 1.0 - 2.2GHz
14.0 x 9.0mm (1490)				**RXG1490L** Ultra-low jitter
7.0 x 5.0mm (7050)	**RXO7050R** Quick-turn, any frequency	**RXO7050P** Quick-turn, low jitter	**RXO7050M** Best-in-class jitter	
5.0 x 3.2mm (5032)	**RXO5032R** Quick-turn, any frequency	**RXO5032P** Quick-turn, low jitter	**RXO5032M** Best-in-class jitter	
2.5 x 2.0mm (2520)	**RXO2520R** Quick-turn, any frequency	**RXO2520P** Quick-turn, low jitter		