Low Noise Oscillator series

LNO 640 D1 OCSO @ 640 MHz

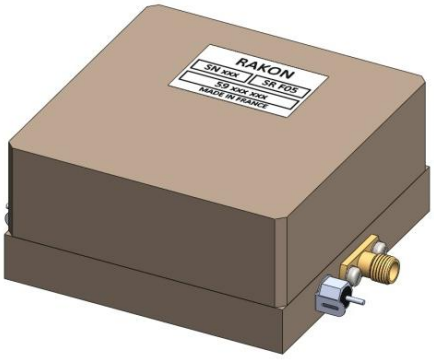
Specific request can be addressed to RAKON info@rakon.fr

Product Description

LNO 640 D1 is a low noise and low G vibration isolated OCVCSO (Oven Controlled Voltage Controlled SAW Oscillator) at 640 MHz, phase-lockable on an external 10 MHz reference.

LNO 640 D1 provides excellent phase noise performance, and is specially designed for airborne environment. The SAW oscillator is suspended with vibration and shock absorbers included.

LNO 640 D1 is available in a 70mm x 70mm x 34.75mm package.

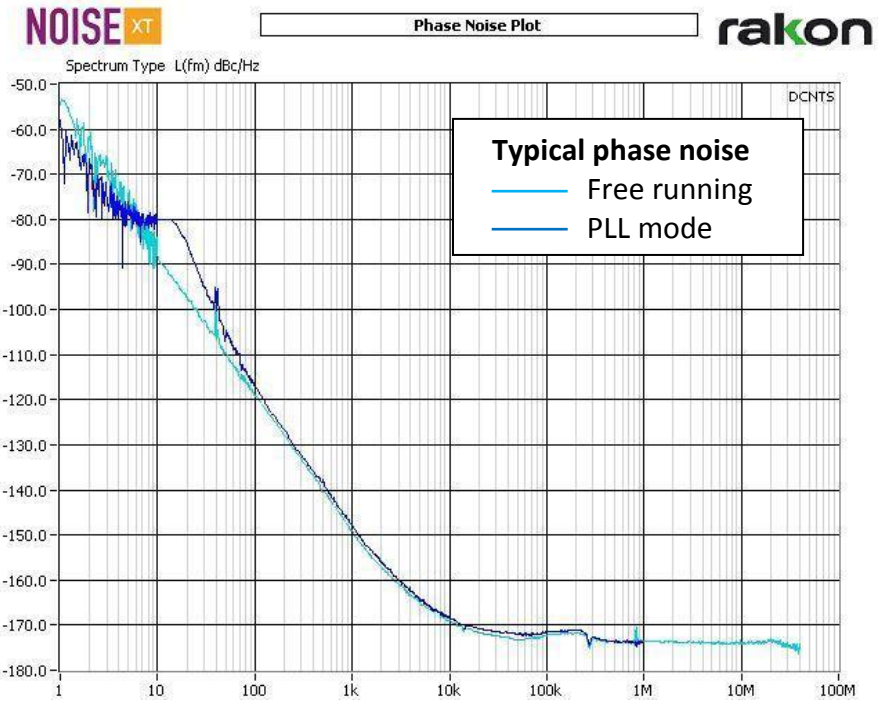


Three operating modes are available, through Control Input signal:

- Free running Control Input = Not connected
- Voltage controlled Control Input = DC Voltage
- Phase Lock Loop Control Input = 10 MHz Reference

Features

- Excellent phase noise performance (typical value) :
  - -168 dBc/Hz @ 10kHz offset
  - -174 dBc/Hz noise floor



- BIT Status: Ready or Alarm

Applications

- Airborne radars

Specifications

1.0 Environmental conditions

Line	Parameter	Test Condition	Typ. Value	Guaranteed	Unit
1.1	Operating temperature range		-40 to +70		°C
1.2	Storage temperature range		-40 to +85		°C
1.3	Shock	Half sine 30 g 11 ms			
1.4	Random vibration	0.02 g^2/Hz within [10 to 350Hz] 0.005 g^2/Hz within [1 to 2 kHz]			
1.5	G sensitivity	@100Hz vibration frequency, each axis	5.10^{-10}	< 2.10^{-9}	/g
1.6	Humidity	93 % RH at 60 °C			
1.7	Low pressure & temperature	120 hPa within [-40 to 55 °C]			
1.8	Constant acceleration	18 g all directions			

2.0 Electrical interface

Line	Parameter	Test Condition	Typ. Value	Guaranteed	Unit
2.1	Supply voltage	Pin 2	+12 ± 0.2		V
2.2	Load impedance	Pin 1, 50Ω all phases	-	< 1.3:1	VSWR
2.3	Control Input	Pin 4	+2 to +10 or 10		V MHz
2.4	BIT status	Pin 3	TTL logic level		

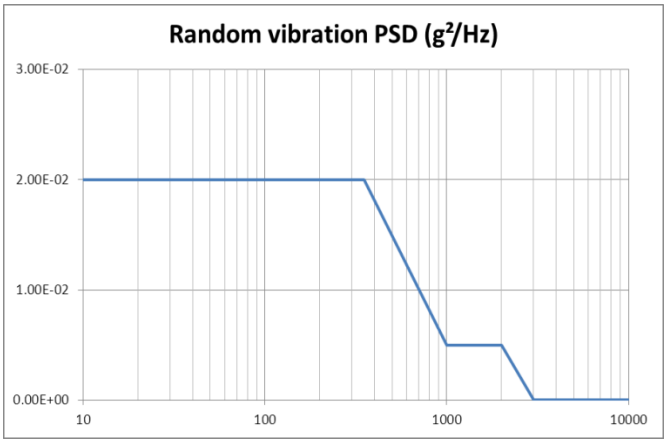
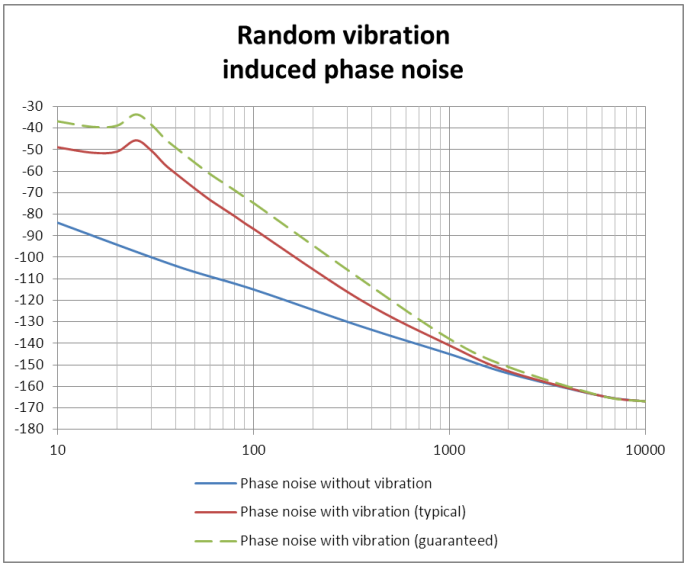
3.0 Performances

Line	Parameter	Test Condition	Typ. Value	Guaranteed	Unit
3.1	Nominal frequency	Definition	320		MHz
	Free running mode	***Control Input not connected***			
3.2	Frequency calibration	Initial calibration @ 25°C	±0.2	< ±0.5	ppm
3.3	Frequency stability	On full temperature range	-	< ±2	ppm
3.4	Long term stability	After 30 days of continuous operation 1st year 10 years	 - -	 < ±1 < ±6	 ppm ppm
	Voltage controlled mode	***Control Input with DC voltage***			
3.5	Tuning voltage	At Control Input	+2 to +10		V
3.6	Frequency tuning	Monotone	±8	> ±6	ppm
3.7	Slope	Positive slope	2	1.5 to 3	ppm/V

	PLL mode	***Control Input with 10MHz reference***			
3.8	Nominal Control Input frequency	Definition	10		MHz
3.9	Frequency stability	All causes	= Reference stability		
3.10	Input level	50Ω source & load	+10 to +13		dBm
3.11	Input waveform	Square waveform edge	-	> 100	mV/ns
3.12	Loop bandwidth		15	10 to 20	Hz
3.13	Harmonics suppression	10MHz harmonics	-100	< -60	dBc
	All modes	***Common specifications***			
3.14	Power consumption	Warm-up	11.5	< 12	W
3.15	Power consumption	25 °C (calm air)	3.8	< 4.5	W
3.16	Warm-up time	±1 ppm with reference to frequency reached after 1 hour of continuous operation at 25 °C	-	< 5	minutes
3.17	Output power	Sine wave into 50 Ω load	-	+9 ±1	dBm

4.0 Single side band phase noise (PN)

Line	Parameter	Test Condition	Typ. Value	Guaranteed	Unit
	In static environment (free running mode)				
4.1	PN power density @ 1 kHz offset	Static conditions, at 25°C (guaranteed values on full temperature range)	-145	< -140	dBc/Hz
4.2	PN power density @ 10 kHz offset		-168	< -164	dBc/Hz
4.3	PN power density @ 1 MHz offset		-174	< -172	dBc/Hz
4.4	Harmonic distortion	Sub, second and third harmonics	-40	< -30	dBc
4.5	Harmonic distortion	Non-harmonics		< -80	dBc

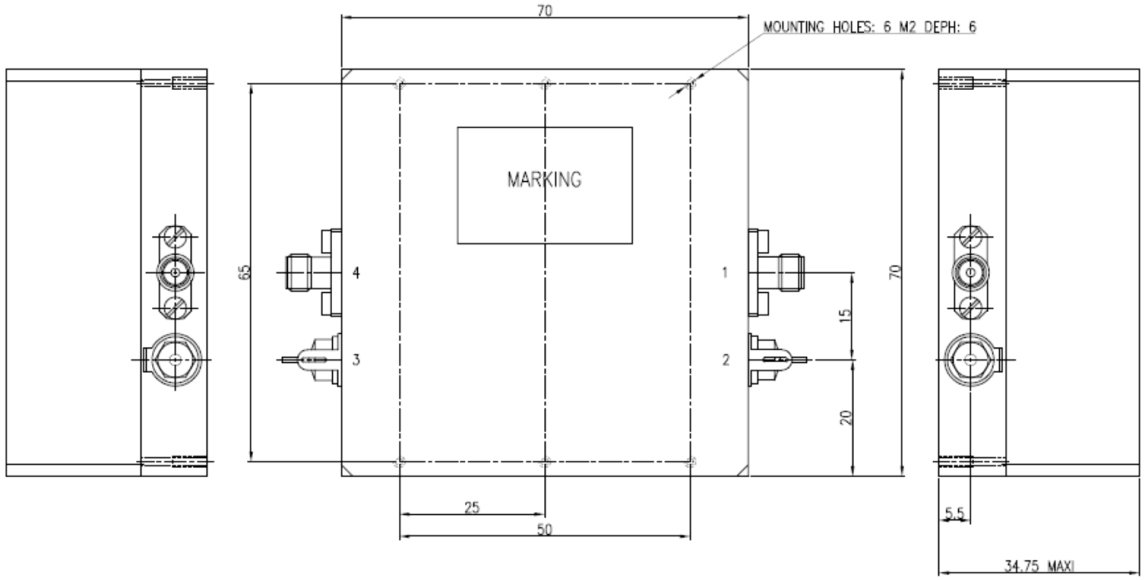
	In dynamic environment (free running mode)	
4.6	With the following random vibration spectrum (ref. 1.4):  The Single Side Band Phase Noise in dynamic environment is as described below :  	

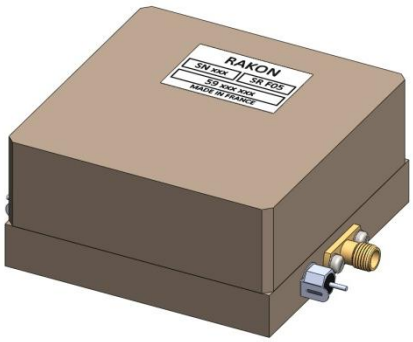
5.0 BIT output

Line	Parameter	Test Condition	Typ. Value	Guaranteed	Unit
5.1	Interface		Open collector		
5.2	Logic 1	TTL level	Oscillator ready		
5.3	Logic 0	TTL level	Alarm		

6.0 Mechanical features

Outline in mm





7.0 Pin description

Line	Pin number	Name	Description
7.1	1	Frequency output	Output signal
7.2	2 + lug	Supply voltage	Input supply (2) & ground (lug)
7.3	3 + lug	BIT status	Logic output signal (3) & ground (lug)
7.4	4	Control Input	Tuning DC voltage or 10MHz reference