



OCXO Overview

Rakon has extensive experience in creating standard and customised Oven Controlled Crystal Oscillator (OCXO) solutions for the Telecommunications, Space and Defense markets.

▶ **High Reliability Space OCXO**

▶ **High Stability OCXO**

▶ **Ultra Low Phase Noise OCXO (LNO): 80 – 125MHz OCXO**

▶ **Telecom OCXO** : High End Telecom Discrete OCXO | High Performance Discrete OCXO | Mercury IC OCXO

High Reliability Space OCXO

► **PROFILE:** The high reliability Space OCXO series is manufactured in accordance with MIL-PRF-55310 and is ITAR-free. They are designed for space applications. The key advantages of this range of OCXO are their remarkable overall frequency stability vs. temperature range up to ± 0.5 ppb under vacuum, for the mini Ultra Stable Oscillators (USO).

► **APPLICATIONS:** Transponders, GPS receivers, Digital cards, Down and up converters, Onboard calculators, Synthesizers, Frequency Generation Units (FGU), Navigation and Positioning systems, Gyroscopes and Master clocks.

MODEL	IMAGE	PACKAGE	FREQUENCY RANGE	STABILITY CLASS	ALLAN VARIANCE	PHASE NOISE
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RK407



25 x 25 x 17
mm

10 - 130 MHz

10^{-7}

1s, 5×10^{-11}




-150 dBc/Hz



@ 10 kHz offset

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MODEL	IMAGE	PACKAGE	FREQUENCY RANGE	STABILITY CLASS	ALLAN VARIANCE	PHASE NOISE
RK408 MS1		40 x 50 x 20 mm	10 - 125 MHz	10^{-8}	1s, 2×10^{-12}	-160 dBc/Hz @ 10 kHz offset
RK408 PS1		40 x 50 x 20 mm	10 - 125 MHz	10^{-8}	1s, 2×10^{-12}	-160 dBc/Hz @ 10 kHz offset
RK409 PIN		50 x 50 x 30 mm	10 - 40 MHz	10^{-9}	GP: 1s, 1×10^{-12} 10s, 2×10^{-12} AV: 1s, 6×10^{-13} 10s, 1×10^{-12}	-155 dBc/Hz @ 10 kHz offset

MODEL	IMAGE	PACKAGE	FREQUENCY RANGE	STABILITY CLASS	ALLAN VARIANCE	PHASE NOISE
RK409		50 x 55 x 30 mm	10 - 40 MHz	10 ⁻⁹	GP: 1s, 1 x 10 ⁻¹² 10s, 2 x 10 ⁻¹² AV: 1s, 6 x 10 ⁻¹³ 10s, 1 x 10 ⁻¹²	-155 dBc/Hz @ 10 kHz offset
RK410		100 x 94 x 55 mm	5 or 10 MHz	10 ⁻¹⁰	GP: 1s, 7 x 10 ⁻¹³ AV: 1s, 10 x 10 ⁻¹³ 10s, 5 x 10 ⁻¹³	-145 dBc/Hz @ 10 kHz offset




High Stability OCXO

► **PROFILE:** The “Ground USO” is specially designed to meet the requests of the calibration and metrology laboratories that have high stability frequency standards, but also the applications that require high performance reference oscillators.

► **APPLICATIONS:** Reference oscillator for Laboratories, Masers and Atomic fountains.


MODEL	IMAGE	PACKAGE	FREQUENCY RANGE	STABILITY CLASS	ALLAN VARIANCE	PHASE NOISE
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HSO13		67 x 60 x 40 mm	5 or 10 MHz	10^{-13}	3 – 30s, 2×10^{-13}	-125 dBc/Hz @ 1 Hz offset
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MODEL	IMAGE	PACKAGE	FREQUENCY RANGE	STABILITY CLASS	ALLAN VARIANCE	PHASE NOISE
HSO14		135 x 72 x 76 mm	5 or 10 MHz	10^{-14}	3 – 30s, 8×10^{-14}	-130 dBc/Hz @ 1 Hz offset

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Ultra Low Phase Noise OCXO (LNO): 80 – 125MHz

► **APPLICATIONS:** Phase Noise Measurement, Phase Noise applications in airborne environment, Synthesizers, Test Equipments, Radars, Military Communication.





MODEL	IMAGE	PACKAGE	FREQUENCY RANGE	STABILITY (FVST)	G-SENSITIVITY	PHASE NOISE
LNO100		38 x 38 x 13 mm	80 - 125 MHz	±0.5 ppm (-40 to 85 °C)	2 - 0.5 ppb/g	-165 dBc/Hz @ 1 kHz Noise floor: -178 cBc/Hz



PTH1

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MODEL	IMAGE	PACKAGE	FREQUENCY RANGE	STABILITY (FVST)	G-SENSITIVITY	PHASE NOISE
LNO100 PTH2		38 x 25 x 13 mm	80 - 125 MHz	±0.5 ppm (-40 to 85 °C)	2 - 0.5 ppb/g	-165 dBc/Hz @ 1 kHz Noise floor: -178 cBc/Hz
LNO100 PTH3		25 x 25 x 13 mm	80 - 125 MHz	±0.5 ppm (-40 to 85 °C)	2 - 0.5 ppb/g	-165 dBc/Hz @ 1 kHz Noise floor: -178 cBc/Hz
LNO100 PSS1		51 x 51 x 13 mm	80 - 125 MHz	±0.5 ppm (-40 to 85 °C)	2 - 0.5 ppb/g	-165 dBc/Hz @ 1 kHz Noise floor: -178 cBc/Hz
LNO100 SMD1		25 x 25 x 13 mm	80 - 125 MHz	±0.5 ppm (-40 to 85 °C)	2 - 0.5 ppb/g	-165 dBc/Hz @ 1 kHz Noise floor: -178 cBc/Hz

MODEL	IMAGE	PACKAGE	FREQUENCY RANGE	STABILITY (FVST)	G-SENSITIVITY	PHASE NOISE
ULN-C 5 PIN		65 x 50 x 27 mm	80 - 125 MHz	±0.5 ppm (-40 to 85 °C)	2.5 ppb/g (25 Hz offset)	For a 100 MHz carrier: -163 dBc/Hz @ 1 kHz -178 dBc/Hz @ 10 khz
ULN-D		60 x 60 x 40 mm	80 - 125 MHz	±0.5 ppm (-40 to 85 °C)	0.045 ppb/g (100 Hz offset)	For a 100 MHz carrier: -163 dBc/Hz @ 1 kHz -178 dBc/Hz @ 10 khz

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High End Telecom Discrete OCXO



► **APPLICATIONS:** Stratum 2 timing modules, Time and frequency references, Wireless Base Stations, Instrumentation and Broadcasting.

MODEL	IMAGE	PACKAGE	FREQUENCY RANGE	FREQUENCY STABILITY	24 HOUR HOLDOVER (INCLUDING TEMP CHANGES)	RETRACE AT 25°C
ROX5252T1		52 x 52 x 38 mm	5 - 12.8 MHz	±0.1 ppb (-20 to 70 °C)	<1 μs	±5 ppb

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MODEL	IMAGE	PACKAGE	FREQUENCY RANGE	FREQUENCY STABILITY	24 HOUR HOLDOVER (INCLUDING TEMP CHANGES)	RETRACE AT 25°C
ROX5252T2		52 x 52 x 19 mm 52 x 54 x 25 mm	5 - 15 MHz	±0.2 ppb (-40 to 85 °C)	<3 μs	±5 ppb
ROX5242T2		52 x 42 x 14 mm 52 x 42 x 19 mm	5 - 15 MHz	±0.2 ppb (-40 to 85 °C)	<3 μs	±5 ppb

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High Performance Telecom Discrete OCXO




► **APPLICATIONS:** IEEE 1588 (G.8263, G.8273.x), SyncE and Stratum 3E modules, Time and frequency reference, Test equipment, Wireless and LTE-TDD Base Stations, Carrier Networking.

MODEL	IMAGE	PACKAGE	FREQUENCY RANGE	FREQUENCY STABILITY	24 HOUR HOLDOVER (CONSTANT TEMP)	RETRACE AT 25°C
ROX3827T3		38.1 x 27.1 x 11.7 mm 38.1 x 27.1 x 17 mm mm	5 - 40 MHz	1 ppb pk-pk (-40 to 85 °C)	<13 μs (H = 11.7 mm) <5 μs (H = 17 mm)	±5 ppb

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MODEL	IMAGE	PACKAGE	FREQUEN CY RANGE	FREQUENCY STABILITY	24 HOUR HOLDOVER (CONSTANT TEMP)	RETRACE AT 25°C
ROX3627T3		36.5 x 27 x 13.7 mm 36.5 x 27 x 19 mm	5 - 40 MHz	±5 - 10 ppb (-40 to 85 °C)	<13 μs (H = 13.7 mm) <5 μs (H = 19 mm)	±5 ppb
ROX2525T5		25.4 x 25.4 x 11.5 mm 25.4 x 25.4 x 12.7 mm	10 - 65 MHz	±5 - 10 ppb (-40 to 85 °C)	<25 μs	±5 ppb
ROX2525S4		25 x 25 x 15.24 mm	10 - 40 MHz	±5 - 10 ppb (-40 to 85 °C)	<25 μs	±5 ppb

MODEL	IMAGE	PACKAGE	FREQUEN CY RANGE	FREQUENCY STABILITY	24 HOUR HOLDOVER (CONSTANT TEMP)	RETRACE AT 25°C
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ROX2522S4



25 x 22 x 11.5 mm

10 - 40

±5 - 10 ppb

<25 μs

±5 ppb

25 x 22 x 15.2 mm

MHz

(-40 to 85 °C)

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Mercury™ IC and Small Form Factor OCXO


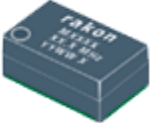

► **APPLICATIONS:** Basestation, Enterprise Networking, Network Timing and Synchronisation (IEEE1588, SyncE), Small Cell.

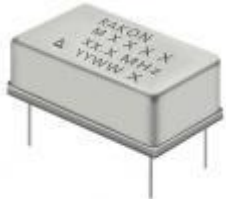
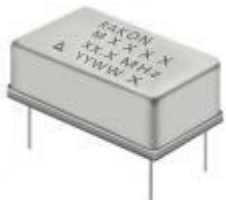
MODEL	IMAGE	PACKAGE	FREQUENCY RANGE	FREQUENCY STABILITY	AGING	PHASE NOISE
RFPO40		9.7 x 7.5 x 4.3 mm	5 - 50 MHz	±10 ppb (-20 to 70 °C) ±20 ppb (-40 to 85 °C)	±2 ppm max./1 year ±5 ppm max./10 years	For a 12.8 MHz carrier: -143 dBc/Hz @ 1kHz -152 dBc/Hz @ 10kHz

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MODEL	IMAGE	PACKAGE	FREQUENCY RANGE	FREQUENCY STABILITY	AGING	PHASE NOISE
RFPO45		9.7 x 7.5 x 4.3 mm	10 - 26 MHz	±10 ppb (-20 to 70 °C) ±20 ppb (-40 to 85 °C)	±1 ppm max./1 year ±3 ppm max./20 years	For a 12.8MHz carrier: -143 dBc/Hz @ 1kHz -152 dBc/Hz @ 10kHz
RFPO50		14.6 x 9.7 x 6.2 mm	5 - 50 MHz	±10 ppb (-20 to 70 °C) ±20 ppb (-40 to 85 °C)	±2 ppm max./1 year ±5 ppm max./10 years	For a 12.8 MHz carrier: -143 dBc/Hz @ 1kHz -152 dBc/Hz @ 10kHz
RFPO55		14.6 x 9.7 x 6.2 mm	10 - 26 Mhz	±10 ppb (-20 to 70 °C) ±20 ppb (-40 to 85 °C)	±1 ppm max./1 year ±3 ppm max./20 years	For a 12.8MHz carrier: -143 dBc/Hz @ 1kHz -152 dBc/Hz @ 10kHz

MODEL	IMAGE	PACKAGE	FREQUENCY RANGE	FREQUENCY STABILITY	AGING	PHASE NOISE
RFPO60		20.7 x 13.08 x 8.65 mm	5 - 50 MHz	±10 ppb (-20 to 70 °C) ±20 ppb (-40 to 85 °C)	±2 ppm max./1 year ±5 ppm max./10 years	For a 12.8MHz carrier: -143 dBc/Hz @ 1kHz -152 dBc/Hz @ 10kHz
RFPO65		20.7 x 13.08 x 8.65 mm	10 - 26 MHz	±10 ppb (-20 to 70 °C) ±20 ppb (-40 to 85 °C)	±1 ppm max./1 year ±3 ppm max./20 years	For a 12.8MHz carrier: -143 dBc/Hz @ 1kHz -152 dBc/Hz @ 10kHz

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