

RK300NS

The RK300NS is a cost-effective and low-power TCXO developed for the NewSpace market, including smallsats and constellations. It is ideal for applications requiring high tolerance to Total Ionizing Dose (TID), low power consumption, high frequency stability, and excellent phase noise performance. Designed for missions lasting up to 7 years, the RK300NS can be adapted for longer durations if required.

Standard frequencies for the RK300NS are 80 MHz and 100 MHz, with custom options available from 60 to 120 MHz. As a part of Rakon's NewSpace Low Noise & Low Power Oscillators portfolio, the RK300NS TCXO is offered in a 25 x 25 x 13 mm Pin Through Hole (PTH) package.

Features

- Frequency (Fn): 60 to 120 MHz
- Supply voltage: 5 V
- Voltage control function
- Steady state consumption: 150 mW
- PTH hermetically sealed package
- Weight: 17 g max
- Output waveform: Sine 50 Ω or square
- TID limit: 30 krad¹
- Latch-up free up to LET: 43 MeV.cm²/mg

Applications

- Frequency converters
- Synthesizers

25.4 x 25.4 x 13 mm



Environmental Conditions

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Operating temperature	T _{OP}	-40	25	85	°C
Switch-on temperature	T _{SO}	-40	-	85	°C
Non-operating temperature	T _{NOP}	-40	-	85	°C
Random vibration	50 to 100 Hz: +6 dB/oct 100 to 1000 Hz: 0.6 g ² /Hz 1000 to 2000 Hz: -6 dB/oct				
Shocks	Mechanical shock as per MIL-STD-202, Method 213 - Half sine with a peak acceleration of 2000g for a duration of 0.5ms				
Radiation	Total Ionizing Dose (TID) of 30 krad ¹ , low dose rate (36 to 360 rad/h) Latch up free up to LET = 43 MeV.cm ² /mg				

Electrical Interface

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Power supply	V _{CC} /Maxing rating at 6 V	4.75	5	5.25	V
Load impedance ²	Sine wave	45	50	55	$\square$
	Square	-	10	-	k Ω
Resistance frequency adjustment	R _{CTRL}	0	3.3	10	k Ω
Reference voltage	V _{REF}	-	3.8	4.2	V
Load of reference voltage	-	-	-	1	mA

Screening Options

Parameter	Condition / Remarks	EM Option	FM Option
Ageing	At the maximum operating temperature range	–	✓
Random acceleration	Level as per MIL-STD-202, Method 214, Condition I-D	–	✓
Thermal shocks	MIL-STD-202, Method 107, Condition A1	–	✓
Final measurement	MIL-STD-883, Method 2020, Condition B	✓	✓
External visual inspection	MIL-STD-883, Method 2009	✓	✓

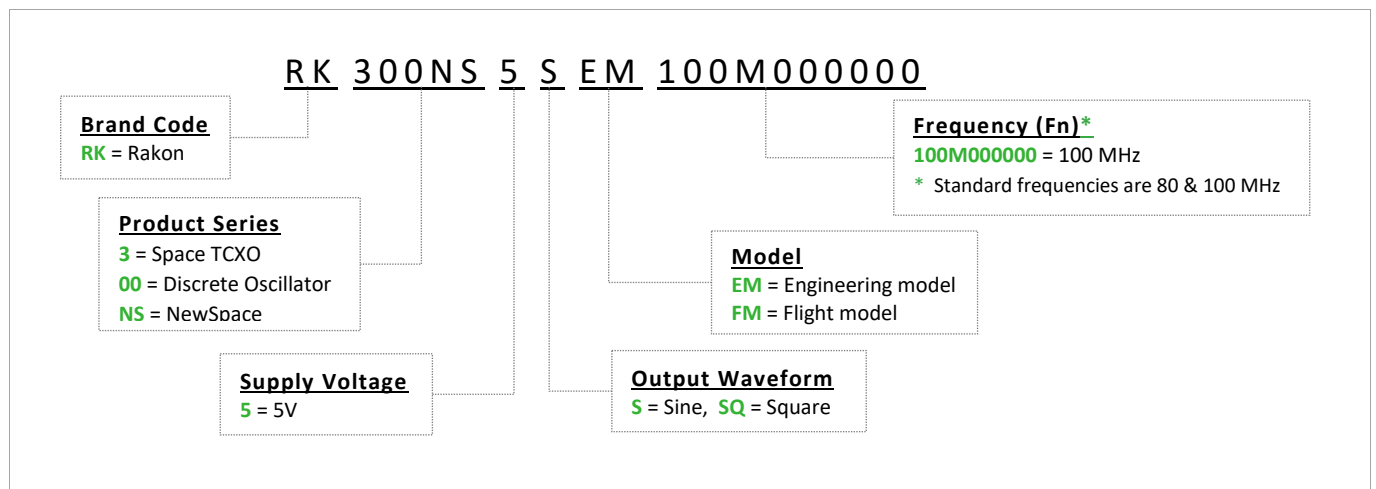
¹ For higher TID limits, please get in touch with the factory.

² Value of the capacitor in parallel to the resistive load depends on the frequency.

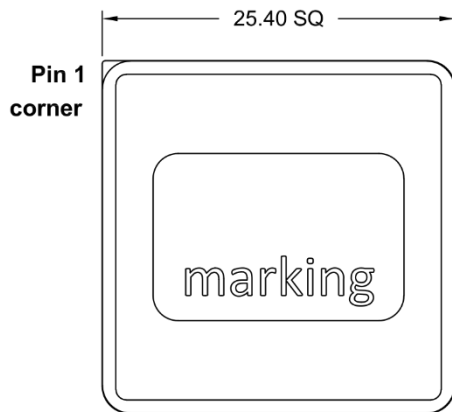
Performance @ 100 MHz

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Nominal frequency	-	-	100	-	MHz
Initial frequency accuracy	Vacuum, at time of shipment, RAKON provides the value of an adjusted resistor	-	-	±1	ppm
Freq. stability vs temperature	Referenced to +25°C	-	±2	±4	ppm
Freq. stability vs supply voltage	-	-	±0.1	±0.5	ppm
Freq. stability vs load	For ±10% variation of load	-	±0.05	±0.2	ppm
Freq. stability vs pressure	Atm to vacuum	-	-	±0.5	ppm
Freq. ageing	1 st year 7 years	-	-	±1.5 ±4	ppm
Allan standard deviation	Tau = 1s @25°C	-	-	5E-11	-
Phase noise	10 Hz offset 100 Hz offset 1 kHz offset 10 kHz offset	-	-	-80 -110 -130 -140	dBc/Hz
Output waveform – Sine wave					
Output power	50 Ω	0	-	4	dBm
Harmonics	DC to 1 GHz	-	-	-30	dBc
Spurious	DC to 5 GHz	-	-	-80	dBc
Output waveform – Square wave					
Output voltage high (V _{OH})	-	3	3.2	-	V
Output voltage low (V _{OL})	-	-	-	0.5	V
Duty cycle		45	-	55	%
Rise time	10% to 90%	-	3	5	ns
Fall time	90% to 10%	-	3	5	ns
Steady-state supply of power	At V _{CC} = 5 V	-	100	150	mW

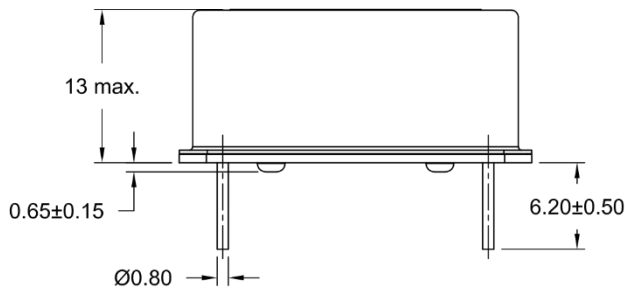
Order Part Example



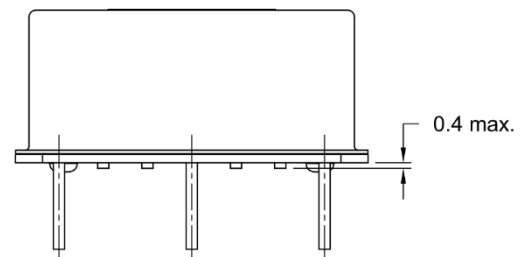
Model Outline and Pin Connections



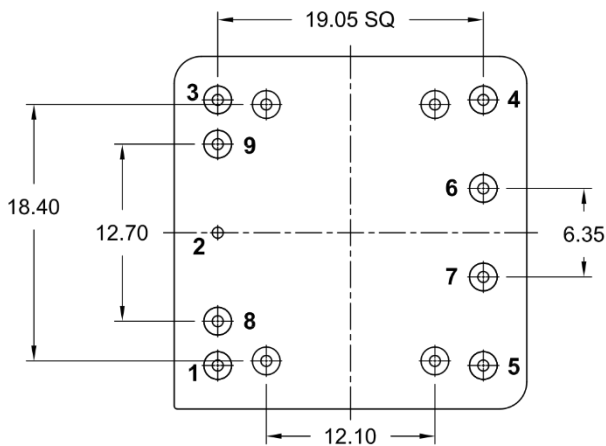
TOP VIEW



FRONT VIEW



SIDE VIEW



BOTTOM VIEW

Pin	Symbol	Connections
1	F _{OUT}	Frequency output
2	GND	Electrical & mechanical ground
3	R _{CR} L	Resistor frequency adjustment
4	V _{REF}	Reference voltage
5	V _{CC}	Supply voltage
6 to 9	DNC	Do not connected

TITLE: TCXO RK300NS Model Outline

RELATED DRAWINGS:

FILENAME: CAT1673A

REVISION: A

DATE: 29-Sep-2025

SCALE: 2 : 1

Millimetres

TOLERANCES:

XX =
X.X =
X.XX = ±0.25
X.XXX =
X° =
Hole =

rakon

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Model weight and 3D Model

Issue: 51003070.110 A1. 13 October 2025

Specifications are subject to change without notice

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Parameter	Package
Net weight	17 g/pc max.
STEP file	RK300NS 3D model <i>To open or view the STP file, you will need to import it into one of the following software programs: Autodesk Fusion 360, CATIA, SolidWorks, Solid Edge, TurboCAD, Kubotek KeyCreator, FreeCAD, ABViewer, ShareCAD, or eMachineShop.</i>