

May 8th, 2019  
Nihon Dempa Kogyo Co., Ltd.  
Representative Director and President  
Hiromi Katoh

### **Development of high-reliability crystal oscillator for space electronics**

Nihon Dempa Kogyo Co., Ltd. has developed a highly reliable crystal oscillator (XO) that withstands severe vibrations and shocks during launch and is highly resistant to radiation in space environment as space-use electronics mounted on satellites and rockets, and has begun taking orders.

Since we obtained NASDA<sup>(\*)</sup> certification for quartz crystal units for space development in 1978, we have contributed to the development of the space industry as the only certified manufacturer of quartz crystal units in Japan. In the expansion of the space business from development to utilization of the recent years with anticipated increasing number of new entrants, domestically-manufactured crystal oscillators had been expected by the conventional use. In order to meet their needs, we have developed this high-reliability crystal oscillators for aerospace applications using our accumulated know-how in the design and manufacture of high-quality, high-reliability quartz crystal units and circuit design technologies for highly reliable products for industrial applications.

The reliability of this product has been improved by adopting a double hermetic seal structure of the package, and high-reliability parts<sup>(\*)</sup> are used to ensure the reliability requirement for space electronics. We carry out thorough process control and 100% inspection for electrical characteristics in manufacturing, and conduct Quality Conformance Inspection (QCI) (JAXA standard<sup>(\*)</sup>) for quality inspections. As a result, this crystal oscillator has become JAXA-qualified part by conforming to JAXA-QTS-2020 (Integrated Circuits, Hybrid, High Reliability, Space Use, General Specification for).

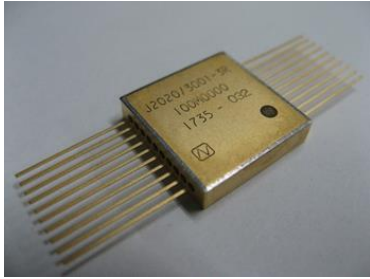
We will continue to contribute to the development of the space business with high-reliability products, with a view to expand into overseas markets.

<sup>(\*)</sup> NASDA is an abbreviation for the National Space Development Agency of Japan, and is now Japan Aerospace Exploration Agency (JAXA) as a result of the merger of the three institutions in 2003.

<sup>(\*)</sup> JAXA qualified parts, MIL-qualified parts or equivalent screened parts

<sup>(\*)</sup> Compliance with MIL-STD-883 (Test Method Standard for Microcircuits, approved for use by all Departments and Agencies of the Department of Defense)

### [Appearance of the product]



### [Sales starts from]

Orders began in April 2019.

### [Specifications/ characteristics]

Specification Number	JAXA-QTS-2020/3001
Part Number	JAXA2020/3001-3CBCR*****(*4)
External dimensions	15.8 x 15.8 x 3.5mm

(\*4) \*\*\* Output frequency

### Recommended operating conditions

Supply Voltage Range (VCC)	+3.3 V +/- 5 %
Storage Temperature Range (TSTG, Non-operating Temperature Range)	Tc = -45 deg C to +150 deg C
Operating Temperature Range (TOPR)	Tc = -45 deg C to +125 deg C
Output Current	+/- 4 mA or less
Load Capacitance (CL)	15 pF or less

### Electrical Characteristics

Nominal Frequency (fo)	41MHz to 100MHz
Current Consumption (Icc)	Max. 40 mA
Output waveform	AC-MOS Logic Level
Frequency-Temperature Stability	Max. +/- 50 x 10 <sup>-6</sup>
Frequency-Voltage Tolerance	Max. +/- 1.0 x 10 <sup>-6</sup> /+3.3 +/- 5%
Long-term Frequency Stability	Max. +/- 3.0 x 10 <sup>-6</sup> /year (Year 1) Max. +/- 1.5 x 10 <sup>-6</sup> /year (from the second year onward)

### Environmental Performance

Vibration Resistance	MIL-STD-883 process 2007 condition A
Shock Resistance	MIL-STD-883 process 2002 condition B
Temperature Cycling	MIL-STD-883 process 1010 condition C
Thermal Shock	MIL-STD-883 process 1011 condition B
Radiation-Resistant (Total Dose)	MIL-STD-883 Methods 1019 1,000 Gy (100 krad)

For more information on the product, please contact:

[Contact Info]

e-Mail : ndkpr-m@ndk.com