



October 30, 2017  
Nihon Dempa Kogyo Co., Ltd.  
Representative Director &  
Chairman of the Board,  
President and CEO  
Toshiaki Takeuchi

### A high-stability TCXO for globally superior<sup>(\*1)</sup> frequency temperature characteristics

Nihon Dempa Kogyo Co., Ltd. (NDK) has developed a high-stability temperature compensated crystal oscillator (TCXO; NT7050BB/BC; 7.0 x 5.0 x 2.0 mm) operable with temperature characteristics of  $\pm 100 \times 10^{-9}$  in a wide temperature range from -40 to +105 deg C.

Next generation WiFi communication systems, Communication networks (Stratum 3), and 5th generation mobile networks(5G) will need to handle much greater data volumes than at present with even higher speeds. To meet such demand, the idea of narrowing coverage of current base stations to create microcell or spot cell base stations enabling greater distribution of communication data and reducing potential loads on individual stations is being discussed. As oscillation source, crystal oscillator required for this purpose will need even higher temperature resistance, lower phase noise and lower power consumption. In this context, demand for TCXO with such outstanding characteristics is expected to increase.

To meet these needs, NDK has developed a highly stable TCXO with globally superior frequency temperature characteristics. This product incorporates new temperature compensation technology for high compensation accuracy. The TCXO uses an NDK high Q quartz crystal unit manufactured using NDK advanced synthetic quartz growing technology which allows the TCXO to exhibit improved phase noise characteristics. And this product provides temperature characteristics of  $\pm 100 \times 10^{-9}$  / -40 to +105 deg C, phase noise characteristics of -97 dBc/Hz (at Offset frequency of 10 Hz) and phase jitter of 112 fs (12 kHz to 5 MHz).

This product supports electronics manufacturers' design of equipment enabling high stability and wide temperature range for use in small cell base stations, mission critical networks, etc.

(\*1) Based on NDK research as of October 2017

[ Appearance ]



[ Samples / Mass production ]

Sample is scheduled for January 2018, and mass production is scheduled to start in June 2018.

[ Specifications / Characteristics ]

Model	NT7050BB / NT7050BC
Dimensions	7.0 x 5.0 x 2.0 mm

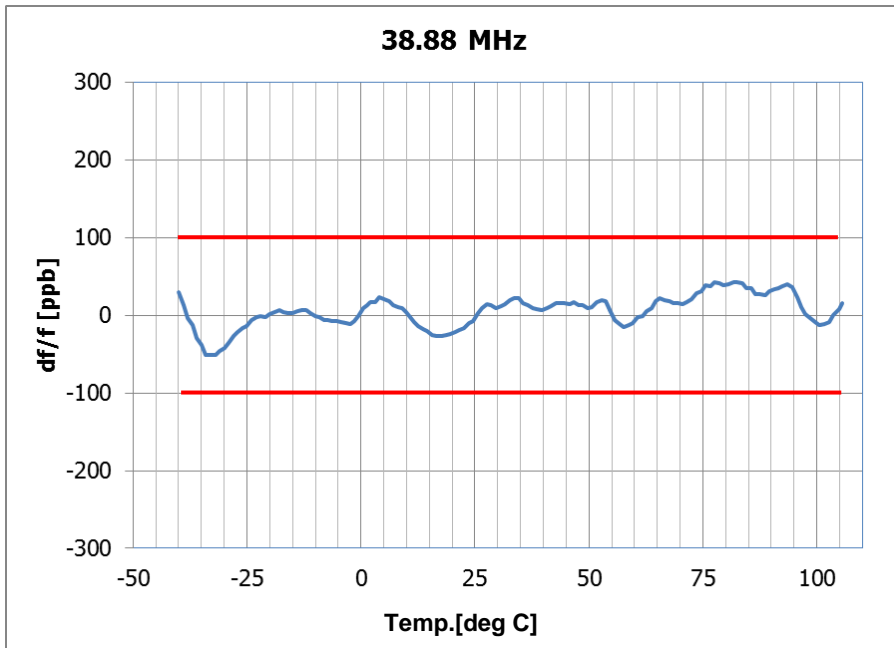
Absolute Maximum Rating

Supply Voltage	-0.6 V to +4.6 V
Storage Temperature Range	-55 deg C to +125 deg C

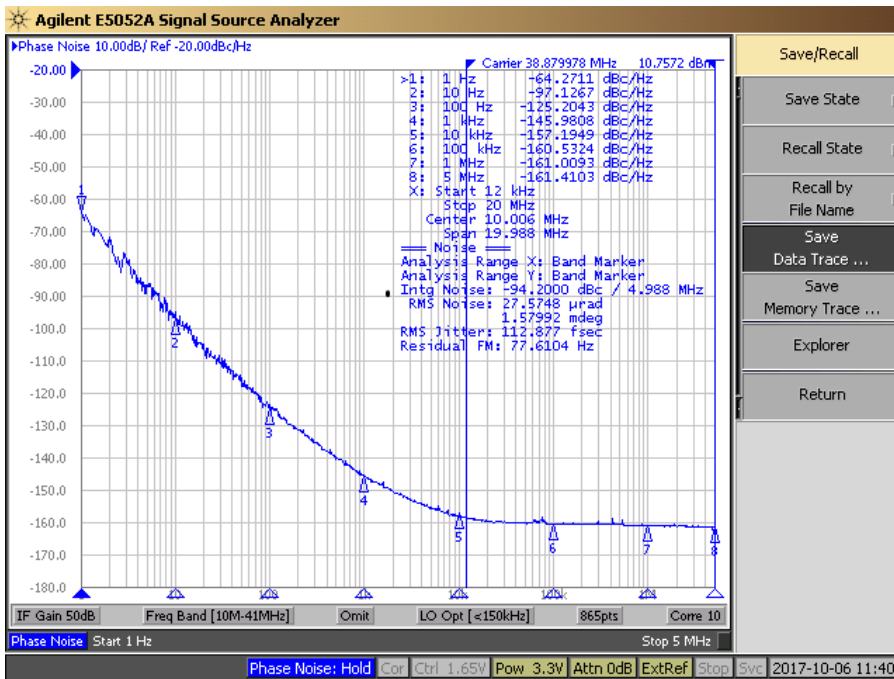
Electrical Characteristics

Nominal Frequency	38.88 MHz	
Supply Voltage (Vcc)	3.3 V +/-5%	
Load Impedance	15 pF or 10 kΩ//10 pF	
Operating Temperature Range	-40 deg C to +105 deg C	
Current Consumption	Max. 8 mA	
Output Voltage	CMOS or Clipped Sine	
Symmetry	45 to 55%	
Frequency Temperature Characteristics	Max. +/- 100 x 10 <sup>-9</sup>	
Frequency Voltage Coefficient	Max. +/- 100 x 10 <sup>-9</sup>	
Frequency Load Coefficient	Max. +/- 100 x 10 <sup>-9</sup>	
Long-term Frequency Stability	Max. +/- 3 x 10 <sup>-6</sup>	
Overall Frequency Tolerance	Max. +/- 4.6 x 10 <sup>-6</sup>	
Phase Noise	Offset Frequency 1 Hz	Typ. -64 dBc/Hz
	Offset Frequency 10 Hz	Typ. -97 dBc/Hz
	Offset Frequency 100 Hz	Typ. -125 dBc/Hz
	Offset Frequency 1 kHz	Typ. -145 dBc/Hz
	Offset Frequency 10 kHz	Typ. -157 dBc/Hz
	Offset Frequency 100 kHz	Typ. -160 dBc/Hz
	Offset Frequency 1 MHz	Typ. -161 dBc/Hz
Phase Jitter	Typ. 112 fs (12 kHz to 20 MHz)	
Number of Terminals	4 (NT7050BB), 10 (NT7050BC)	

[ Frequency Temperature Characteristics ]



[ Phase Noise Characteristics ]



For more information on the product, contact :

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