

June 1, 2016  
Nihon Dempa Kogyo Co., Ltd.  
Representative Director &  
Chairman of the Board,  
President and CEO  
Toshiaki Takeuchi

**World's smallest<sup>\*1</sup> (2016 size) low phase noise Crystal Oscillator  
developed for digital audio**

Nihon Dempa Kogyo Co., Ltd. (NDK) has developed the world's smallest (2016 size) low phase noise crystal oscillator (NZ2016SDA) for digital audio. This product exhibits an overall frequency tolerance<sup>\*2</sup> of Max.  $\pm 50 \times 10^{-6}$ , which is the same value as existing NDK low phase noise crystal oscillator in the same size, but boasts the world's highest-level phase noise<sup>\*3</sup> of “-164 dBc/kHz -169 dBc/10 kHz”.

As high-resolution sound gains popularity, digital audio equipment (such as smart phones, portable audio players and car audio systems) is increasingly expected to provide higher-quality sound. Suppressing the phase noise of the master clock in the digital-analog converters (DAC) of these devices will enhance the accuracy of conversion to analog signals, thereby enabling better sound quality.

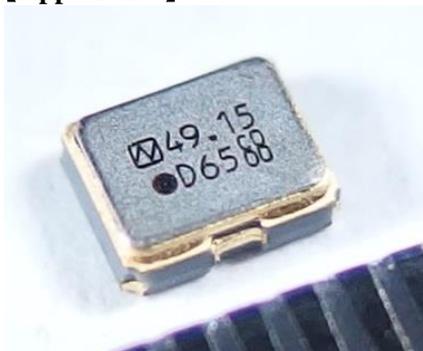
In response to demand for higher-quality sound from digital audio equipment, NDK has combined its proprietary crystal technology with optimal IC for lower phase noise to achieve the world's highest-level low phase noise for master clocks used in digital-analog converters. The product can also be used with a low-voltage power supply (Min. +1.8 V) that can be integrated into compact digital equipment such as portable audio players, thereby contributing to improved sound quality. For matching other size equipment, NDK has developed two different size products (2520 size : NZ2520SDA and 3225 size : NZ3225SDA) with identical specifications at the same time.

\*1: Based on NDK research as of May 2016

\*2: Stability with normal temperature (25 °C) tolerance, frequency temperature stability and Frequency / voltage coefficient.

\*3: Based on NDK research as of May 2016

**【Appearance】**



**【Samples and Mass production】**

Sample delivery has already begun and mass production is scheduled to start in October 2016.

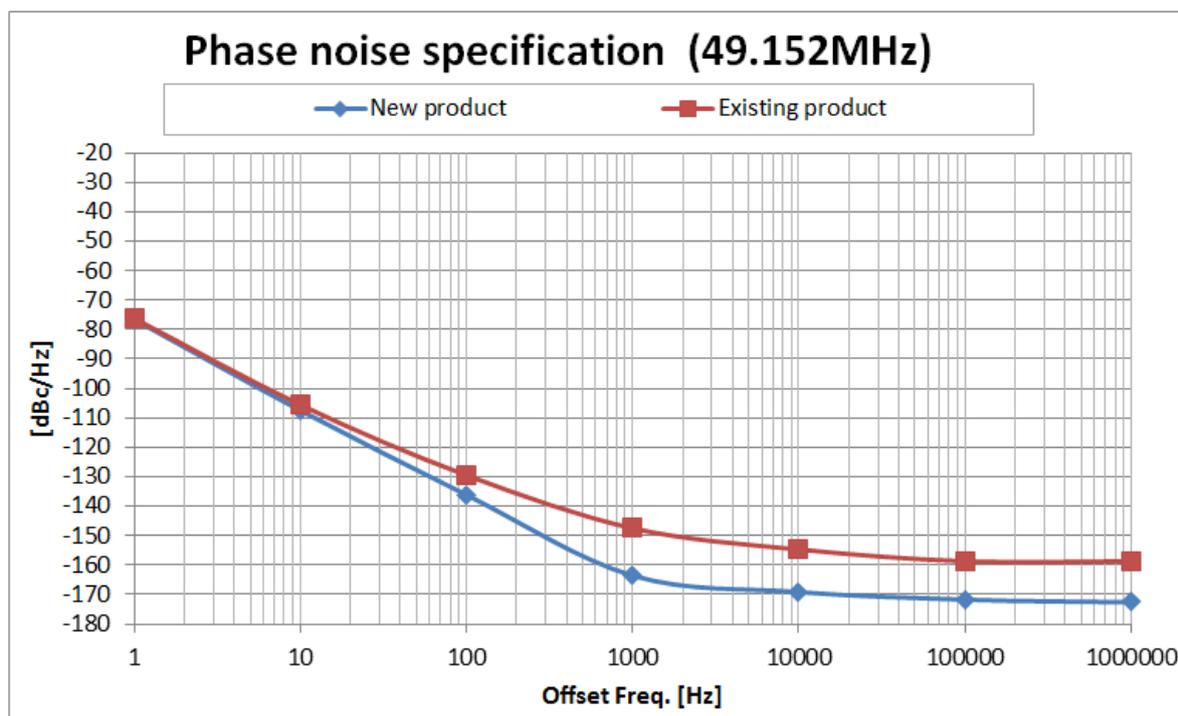
**【Product specifications】**

Model	NZ2016SDA
Dimensions	2.0 x 1.6 x Max. 0.8 mm
Nominal Frequency Range	20 MHz to 50 MHz
Output	CMOS
Operating Temperature Range	-40 °C to +85 °C
Overall Frequency Tolerance	Max. $\pm 50 \times 10^{-6}$
Supply Voltage [V <sub>CC</sub> ]	+1.8 V to +3.3 V
Current Consumption	Max. 15 mA
Phase Noise Characteristics	-164 dBc/Hz @ 1 kHz offset -169 dBc/Hz @ 10 kHz offset (Nominal Frequency: 49.152 MHz; Supply Voltage [V <sub>CC</sub> ]: +3.3 V; Temperature: +25 °C)

**【Phase noise characteristic sample data (Comparison to Existing product)】**

Conditions: Nominal frequency: 49.152 MHz; Supply voltage [V<sub>CC</sub>]: +3.3 V;

Temperature: +25 °C



For more information on the product, contact:

**【Contact Info】**

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