

July 19th, 2021
 Nihon Dempa Kogyo Co., Ltd.
 Representative Director and President
 Hiromi Katoh

Alps Alpine Co.,Ltd. adopted DuCULoN[®](*1) for AlpineF#1Status, the world's ultra high-end car audio system

We are pleased to inform you that Alps Alpine Co.,Ltd. announced on June 22th, 2021 that the AlpineF#1Status, (world's first in the car audio industry that achieves 384kHz/32bit high-resolution playback sound), adopted our DuCULoN[®] (NH47M47LA a quartz oscillator with the industry's best specifications) as the heart of the system.

Reasons for Adoption of DuCULoN[®] (pronounce as Due-Ka-Ron)

In order to accurately reproduce a high-resolution sound source^(*2), it is necessary to accurately convert the high-resolution data, which is a digital signal, into an analog signal.

In order to reproduce the true sound during recording, a master clock signal consisting of a high-precision conversion device (DAC: digital-to-analog converter) and an oscillator that reduces phase noise to the utmost limit is required.

We have commercialized DuCULoN[®] (Dual Crystal Ultra Low Noise OCXO with ultra-low phase noise) properties as a OCXO for high-resolution audio, and the concept of this OCXO has now been adopted that matches Alps Alpine's audio design philosophy.

Low phase noise by DuCULoN[®]

The low phase noise of DuCULoN[®] has been developed with a focus on improving the performance in the audible band (20Hz to 20kHz), which is considered to be the most effective for sound quality. The circuit configuration of DuCULoN[®] is shown in Fig. 1 in a simplified manner, but the low-noise circuit design uses two crystal units with higher Q-factor^(*3).

The signal output from the oscillation loop composed of Amp.1 and X-tal1 passes through a narrow-band crystal filter (X-tal2) as a clock output with extremely pure properties with low phase noise.

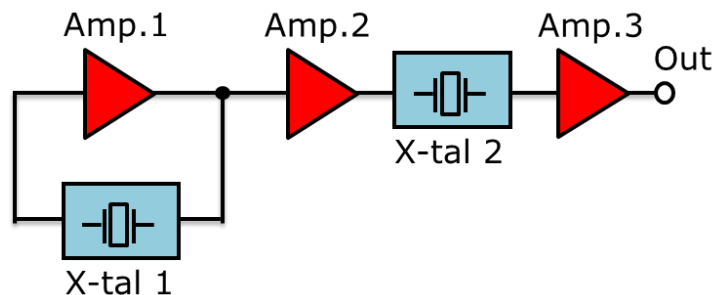


Fig. 1. Low Phase Noise Circuitry Configuration of DuCULoN[®]

In the future, we intend to further improve the phase noise characteristics by pursuing an oscillator circuit configuration that can maximize the Q-factor of the crystal in addition to the low phase noise technology cultivated in DuCULoN[®].

(*1) DuCULoN[®] is a registered trademark of Nihon Dempa Kogyo Co.,Ltd.

(*2) High-Resolution Audio

Digitizing an analog signal involves "sampling" at a fixed frequency. However, to achieve a true playback sound that is close to the original sound, it is necessary to increase the sampling frequency and bit rate. Compared with CD sources, current high-resolution sound sources have improved both sampling frequency and bit rate, enabling digitization of sound closer to the original.

(*3) Q-factor (Quality Factor) Indicates the quality of the resonator in the equivalent circuit of the crystal unit.

[Photo]



[Car Audio "AlpineF#1Status" \(Alps Alpine Co.,Ltd. News Release\)](#)
[Here's a special AlpineF#1Status site. \(Japanese\)](#)

[Technical information]
[Features of Ultra-low Phase Noise OCXO\(DuCULoN[®]\)](#)

[Product Information]
[NH47M47LA\(DuCULoN[®]\)](#)

[Reading]
[Relationship between audio equipment and crystal -Sound Quality and Clock Phase Noise-](#)

For inquiries regarding products, please contact [Contact Information] below.

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