

Development of Tuning Fork Crystal Resonators with Superior Shock Resistance

DAISHINKU CORP. (President: Minoru Iizuka) has developed a 3215 size tuning fork crystal resonators (type: DST310SA) with superior shock resistance.

In automotive electronic devices, it is required to maintain stable performance even in environments subject to high shock and vibration. In the newly developed DST310SA, the internal crystal chip is mounted in a ceramic package using metal bonding instead of conventional conductive adhesive. This makes it possible to reduce frequency fluctuations caused by drop impact and rotational stress compared to conventional products (Fig.1 and Fig.2).

In addition, the size of the crystal chip has been changed from that used in the conventional 3215 size tuning fork crystal resonator to an even smaller crystal chip. Miniaturization of crystal chip contributes to improved shock resistance performance and also leads to an increase in the number of crystal chips taken per crystal wafer of the same size. In short, the DST310SA is a more efficient production and cost-effective product.

These features make the DST310SA ideal for automotive devices such as TPMS (Tire Pressure Monitoring System), which requires shock resistance performance. It can also be used in a wide range of applications such as mobile terminals, PC-related equipment, and home medical equipment.

[Applications]

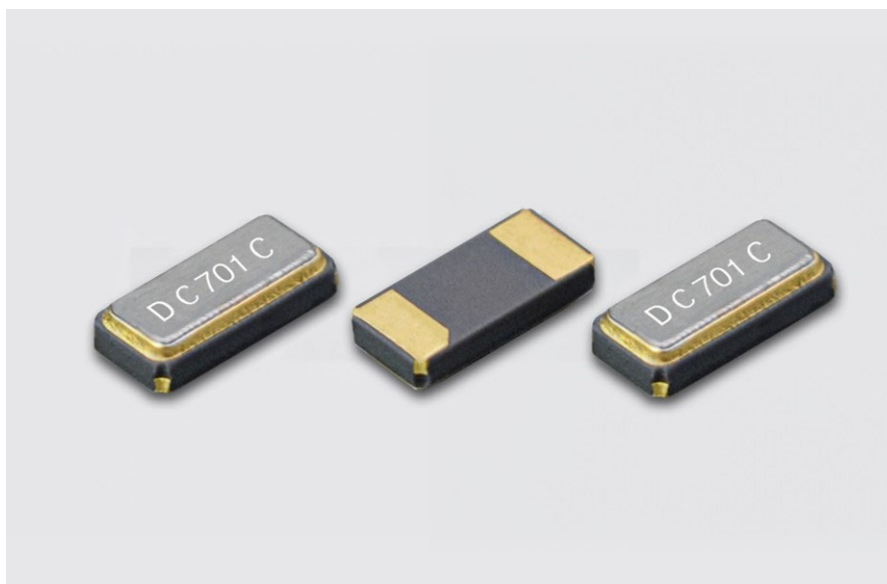
TPMS, in-vehicle ECUs, in-vehicle safety devices, in-vehicle multimedia devices, other consumer and telecommunications electronics

[Samples / Mass Production]

Samples: In response

Mass Production: From August 2024

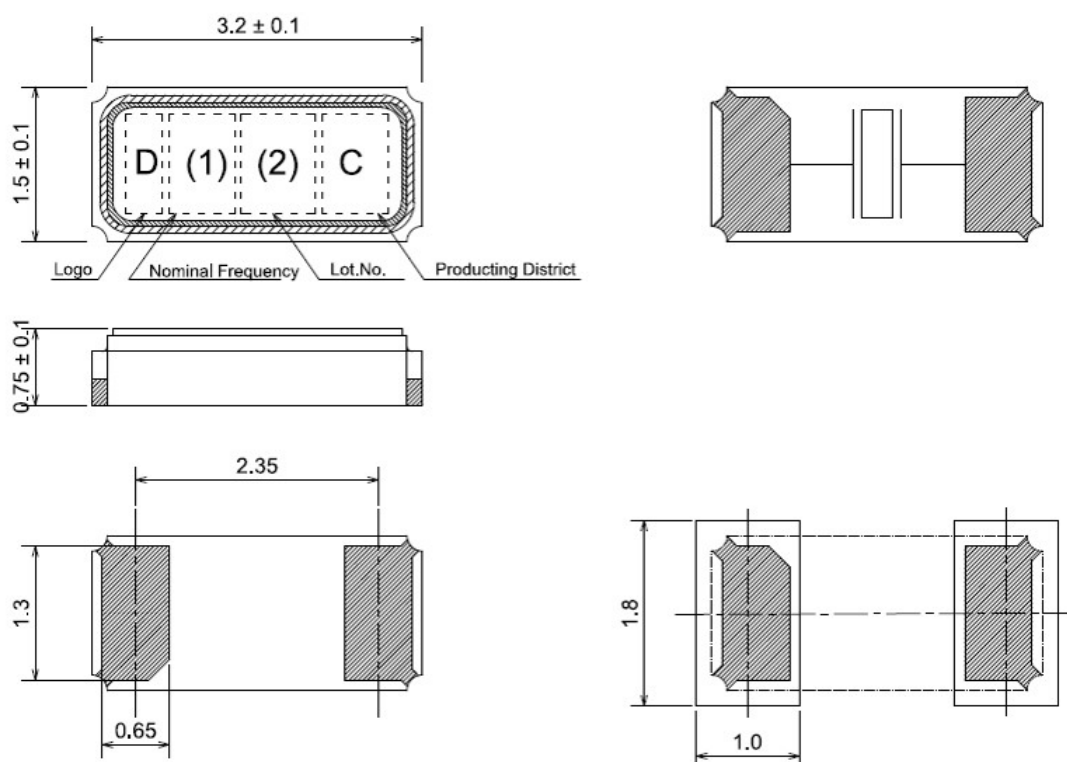
[Product Appearance]



[Electrical Specification]

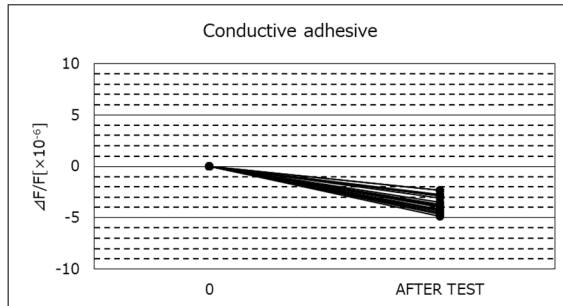
Type	DST310SA
Size	3.2 × 1.5 × 0.75 mm typ.
Nominal Frequency	32.768kHz
Load Capacitance	7pF, 9pF, 12.5pF
Operating Temperature Range	− 40 to +125℃
Frequency Tolerance	±20×10 ⁻⁶ (at 25℃)
Series Resistance	50kΩ max (-40 to +85℃) / 80kΩ max (-40 to +125℃)

[Dimensions]



[Shock Resistance]

Conventional product



DST310SA

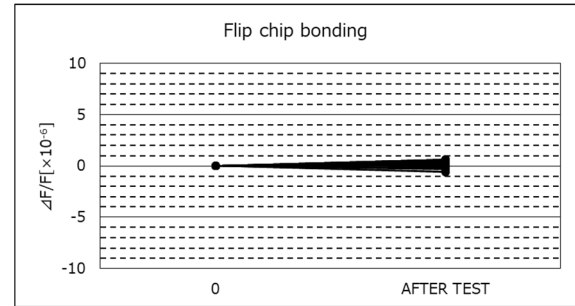
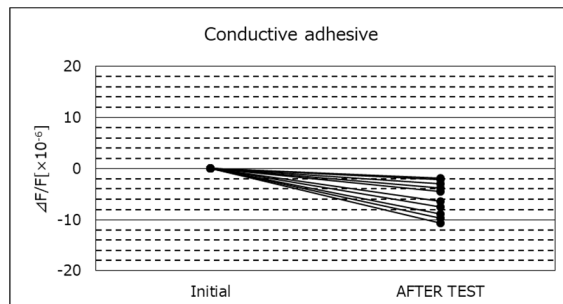


Fig.1: Comparison of frequency fluctuations after drop test

Conventional product



DST310SA

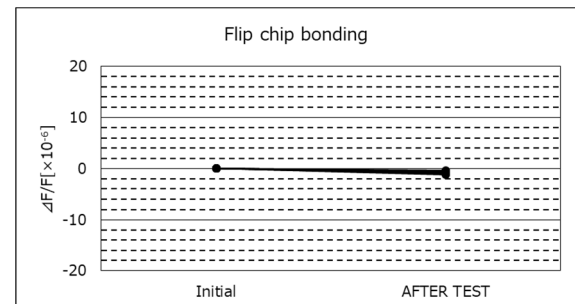


Fig.2: Frequency fluctuations after centrifugal constant acceleration impact test