


PRODUCT CHANGE NOTIFICATION

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| PCN tracking number: PCNNJ21001 | | Issue date: 2021-05-06 |
| Contact: Li Wei | Phone: +852 2389 9201 | |
| Title: ENG Manager | E-mail: sales@nkg.com.hk | |
| Product influenced: <input checked="" type="checkbox"/> Major change <input type="checkbox"/> Minor change | | |
| NKG Part Number: This PCN is applicable to all PN families that utilize crystal package HC-49/S in any form or style, the PN families are listed here below. 01-CR1-02, 01-CR1-03, 01-CR1-08, 01-CR1-09, 01-CR1-13, 01-CR1-32, 01-CR1-33, 01-CR1-38, 01-CR1-39, 01-CR1-43, 01-CR1-49, 01-CR1-53 | | |
| Customer Number: ANY in compliance to our PN families listed above | | |
| Effective Date: 2021 May 01 | | |
| Reason for change(s): <input type="checkbox"/> Electrical / Appearance Specification <input type="checkbox"/> Products Package Outline/ Dimension <input checked="" type="checkbox"/> Material <input type="checkbox"/> Appearance <input type="checkbox"/> Packaging <input type="checkbox"/> Data Sheet <input type="checkbox"/> Process / Technology <input type="checkbox"/> Manufacturing Equipment <input type="checkbox"/> Other | | <p>Recent new regulations to better control volatile organic compounds (VOC) and air pollutants, released in many countries and China as well, have been leading into investigation for solvents used in the conductive adhesives for quartz crystals and other products that use quartz crystals as frequency source.</p> <p>As a result of this, one of the conductive adhesives, used for over 30 years on certain types of quartz crystal products, was found to contain a small amount of a "to be banned" volatile substance. The manufacturer THREE BOND has therefore decided to remove this silver filled conductive adhesive, model TB-3301F, from the market.</p> |
| <p>Since the original manufacturer is not having an alternate adhesive available, a search for a replacement was conducted and an adhesive chosen that has been used for 10 years on the market already. The new silver filled conductive adhesive, model TS-0515J, from the manufacturer Shanghai Teng Shuo Electronics Material Co. Ltd. was chosen and a comprehensive qualification test executed. The qualification tests have been showing the same good electrical performance (mainly in regards of resistance) and the same mechanical stability for the crystal attachment. The detailed qualification report is available upon request.</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <p>REPORT FILE: "NK-RPT_ConductiveAdhesive_TS-0515J_210414.pdf"</p> </div> </div> <p>The qualification of the new conductive adhesive was successful and passed in all points, the electrical performance, mechanical stability and shock resistance (drop test) and meets applicable environmental compliances as well. The new adhesive is not containing substance that are listed in today's environmental compliance directives such as RoHS (EU), China RoHS, SVHCs of REACH including Annex XVII, Halogen-Free (per IEC 61249-2-21:2003), TSCAs listed by EPA, POP (EC No. 850 / 2004 on Persistent Organic Pollutants), and the new China GB standard to ban VOCs (volatile organic compounds).</p> | | |

Anticipated (positive and negative) impact on fit, form, function, quality or reliability:

1. A NEGATIVE effect occurs for manufacturing due to the fact that the new conductive adhesive, model TS-0515J, requires twice the time for curing. But this does not affect the customer nor does it has an impact on the performance of the adhesive on the finished product.
2. Since the conductive adhesive is used for the assembly of the quartz crystal blank inside the unit, this change does not have any impact on FIT and FORM. It does therefore also not affect the mechanical dimensions of the finished product.
3. The function of the quartz crystal units can be fully guaranteed when using the new conductive adhesive. The electrical parameters of the quartz crystal units can be fully met when using the newly qualified conductive adhesive. No cut-backs, restrictions or limitations apply for the finished products, all specifications per our Part Numbers as released can be fully met.
4. In regards of Quality and Reliability of the quartz crystal units have our tests shown that the products can meet all criteria as defined in the test standards. The crystal units made with the new conductive adhesive are showing the same good performance in all tests.
5. The POSITIVE effect when using the new conductive adhesive is that our quartz crystal units can fully meet environmental standards, especially in regard of volatile organic compounds (VOC).
By using the new adhesive we have done another step in order to contribute to the improvement of our working and living environment and to reduce negative impacts that these pollutants may have on humans and nature.

Customer acknowledgement of receipt within 30 days of delivery of the PCN:

The qualification of the new conductive cement is an indispensable change, it does therefore NOT require a written acknowledgement or response by the customers.
This PCN is considered to be for information only.

Customer Name / Division:

Approvers name / Title:

Approval date:

QA approval of PCN:

2021-05-06

Date

Li Wei

Name and signature

ENG Manager

Title



QA signature or chop

Mario Bruech / VP QA/ENG