



NIC COMPONENTS CORP.

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4/25/00

MECHANICAL FLEXURE CRACKING

PRODUCTS: SMT CERAMIC CHIP CAPACITORS ***SERIES: NMC, NMC-E & NMC-H***

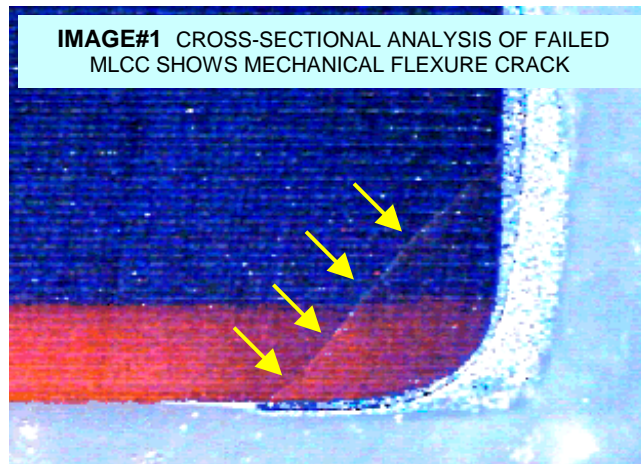
THE MOST COMMON CAUSE OF CERAMIC CHIP CAPACITOR FAILURE IS “SHORTED” – “LOW INSULATION RESISTANCE” – “HIGH LEAKAGE CURRENT” FAILURE MODE AS RESULT OF INTERNAL CONNECTION BETWEEN OPPOSING ELECTRODES.

CAUSE OF THIS CONNECTION IS MOST COMMONLY A MICRO-CRACK (SEE IMAGE #1).

CAUSE OF THE CRACKING IS VERY OFTEN THE RESULT OF MECHANICAL FLEXURE OF THE PCB AFTER COMPONENT SOLDERING. PCB FLEXURE DURING POST SOLDER OPERATIONS CAN RESULT IN MECHANICAL FLEXURE CRACKING IN CERAMIC BODY COMPONENTS (MLCC):

AREAS WHERE PCB FLEXURE CAN OCCUR INCLUDE:

- PCB DEPANELIZATION OPERATIONS
- SECONDARY (BACKSIDE) COMPONENT PLACEMENT - INSERTION
- ADDITIONAL ASSEMBLY (PRESS PINS – CONNECTORS)
- TESTING (BED OF NAILS)
- ASSEMBLY AREA PCB HANDLING PRACTICES



ISO 9002 REGISTERED



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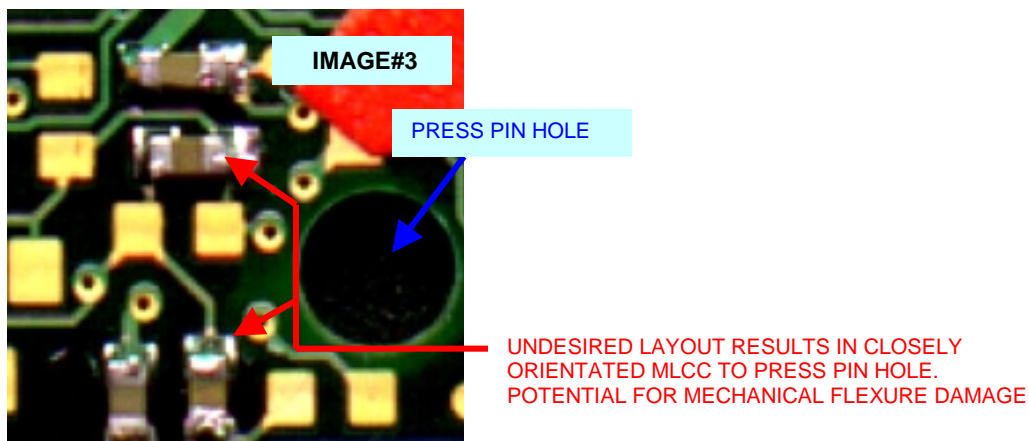
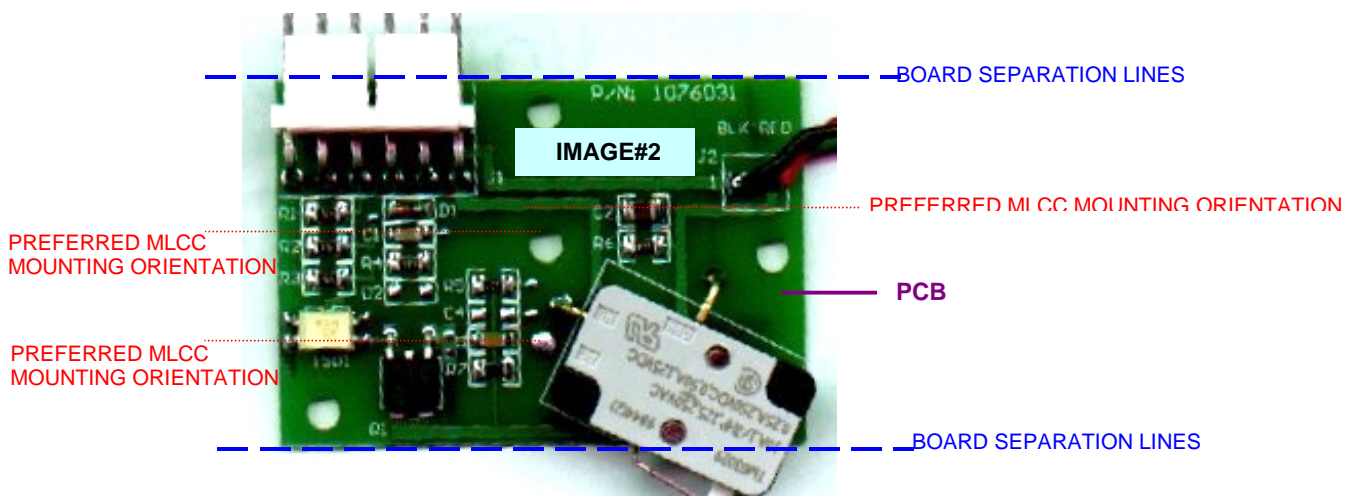
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RECOMMENDATIONS TO MINIMIZE MECHANICAL FLEXURE RELATED DAMAGE:

- PCB COMPONENT ORIENTATION:
 - ORIENT CERAMIC BODY DEVICES (MLCC) PARALLEL TO BOARD SEPARATION LINES (SEE IMAGE #2)
 - ISOLATE CERAMIC BODY DEVICES (MLCC) AWAY FROM SECONDARY PROCESSING PRESS-PIN LOCATIONS (SEE IMAGE #3)



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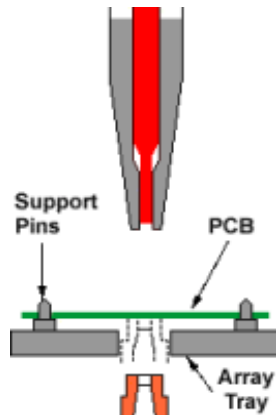
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▪ **DEPANELIZATION TECHNIQUES:**

- UTILIZE AUTOMATED ROUTING EQUIPMENT OR FIXTURE-JIGS TO REDUCE-ELIMINATE PCB FLEXURE.

*“By supporting the board on all sides during the (de-panelizing) operation and increasing pressure only when sensing resistance, the perforating process insures the safety of the boards and **components**” (source: **CTS** see below)*



CTS 1240 North Avenue West Chicago, Illinois 60185 USA <http://www.coxautomation.com/Depaneling.htm>

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Tel. 650-631-1888 Fax. 650-631-0888

Fancort Industries 31 Fairfield Place West Caldwell, NJ 07006 USA <http://www.fancort.com/>

Excellon Automation Co. 24751 Crenshaw Blvd. Torrance, CA 90505 USA <http://www.excellon.com/>

Christopher Associates | 714 · 979 · 7500 <http://www.christopherweb.com/grohmann.html>

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