RF Conductive Elastomer Interconnect User's Guide for Board-to-DUT Applications

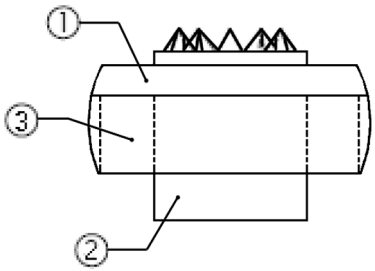
INTRODUCTION

Under normal operating conditions, RF Conductive Elastomer interconnects provides a balance of long life, contact resistance and compression force that is superior to anything else on the market. The product is designed to provide less than 50 milliohms resistance at 0.002" compression with less than 25g of force per pin. This force spec is dependent on column design.

The following information offers a basic description of the product with recommendations for handling and operation to achieving maximum performance.

CONSTRUCTION FOR BOARD-to-DUT INTERCONNECTS

The diagram identifies the construction of the B2D. The interconnect is inserted between the Device Under Test (DUT) and the Test Board.



1) The interposer is constructed of Kapton® with gold plated pads. Sharp asperates are formed on the top-side pads in order to break through any oxidation on the DUT and improve contact resistance.
2) The RF Conductive Elastomer comprised of conductive particles in a silicone matrix is placed directly onto the bottom side pads helping to improve the amount of force required for full compression.
3) An over-compression stop is added to prevent the RF Conductive Elastomer from becoming over compressed.

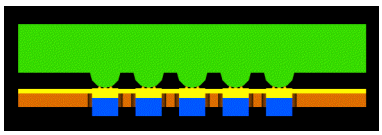
LIFE EXPECTANCY

Under recommended operating conditions, the board-to-DUT interconnect is expected to last for approximately 100k compression cycles.

Multiple factors affect the life expectancy of the RF Conductive Elastomer. Some common examples are: testing environment, test conditions, finishes (solder, gold, etc.) touching the contact points, excess contact force, etc.

The life expectancy is greatly reduced when the RF Conductive Elastomer flex columns are over-compressed. The recommended amount of compression is addressed in the Operation section of this guideline. *Interconnects that have been over-compressed will not be considered as cause for rejection.*

OPERATION



This sectional view illustrates the interconnect just before compression. This is the point where the compression stroke starts. The stroke is fully completed and actuated when the flex column returns to the non-compressed state after contact. The stroke is the total distance of contact from the first measurement of resistance – typically 0.003" to 0.006".

The RF Conductive Elastomer can be easily customized and configured to address different requirements.

The table indicates the maximum stroke distance before over-compression in relation to the RF Conductive Elastomer column height and compression stop thickness.

Differences in compressive resistance from edge-to-center or edge-to-edge is typically caused from coplanarity issues from test equipment, socket, test board, the DUT, or the board-to-DUT interconnect itself. It may be necessary to install shims in the appropriate areas to allow for even compression.

Standard Flex Column Height vs. Stop Height

Column Height	Over-Compression Stop Height	Maximum Stroke Before Over-Compression
9 mil	5 mil	4 mil
9 mil	6 mil	3 mil
12 mil	7 mil	5 mil
15 mil	9 mil	6 mil
19 mil	11 mil	7 mil
28 mil	15 mil	14 mil

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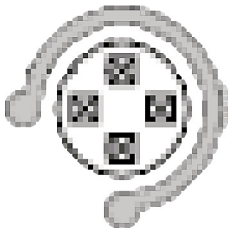
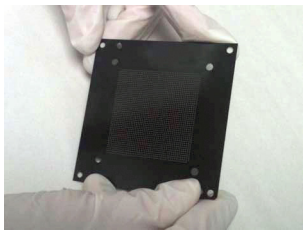
To minimize potential challenges associated with coplanarity, "horseshoe" shape reliefs can be cut in the interposer as the design permits. This illustration depicts a relief cut...

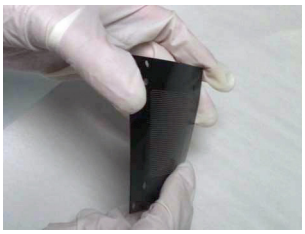


HANDLING

It is recommended to wear powder-free latex gloves when handling the interposer. This will prevent oils and skin particles from contaminating the part. Always handle the interposer by the edges taking care not to touch the RF Conductive Elastomer columns. Be certain not to flex the part as this causes stress with potential for damage. Photos below show correct and incorrect handling techniques.



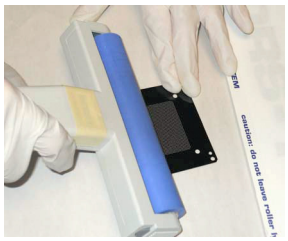
CORRECT
Holding part by edges



INCORRECT
Flex part and touching contacts

FOREIGN MATERIAL – What It Is and How to Remove It

To minimize foreign material (fibers, dust, or debris) on the part surface, first remove the interposer from the ESD safe package in an ionized field environment to minimize the amount of static. Using the handling techniques described above, lay the interposer down flat on a clean work surface.



To remove foreign material on the part surface, use a hand tacky roller as shown in the photo. First, prepare the roller by wiping it on a clean sheet of tacky paper. Then secure a corner of the interposer and make just one pass covering the surface area. Flip the part, and repeat this procedure.

Source for Tacky Rollers and Sheets...
Systems Division, Inc.
21 Morgan
Irvine, California 92618-2005 U.S.A.
Phone: 1-(949) 583-1001

CLEANING RF CONDUCTIVE ELASTOMER COLUMNS

Use the same procedure as removal of foreign material listed above (Tacky Roller). The cleaning frequency will depend on each customer's testing setup and environment.

CLEANING OF ASPIRATES

To maintain optimum performance, clean the aspirates by wiping the tips using a MIPOX WA6000 type probe card cleaning sheet (a less abrasive cloth). The frequency of cleaning will depend upon the period of use along with testing set-up and environment factors.

Link for cleaning cloths: http://www.mipox.co.jp/en/products/probe-card-cleaning-sheet