

**PARICON**<sup>®</sup>  
Paricon Technologies Corporation

# Testing RF Packages

By

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# Presentation Overview

- 1. Existing methodology of testing RF Packages**
- 2. The “NEW KID” on the Block..!!!**
- 3. The Technical Overview**
- 4. Guidelines**
- 5. Applications**



# Goals of Presentation

## Technical Overview

- a. **PariPoser® Structure**
- b. **PariPoser® Capabilities**
- c. **Environmental Testing**
- d. **Applications**
- e. **Application Guidelines**

# Existing Methodology

## Spring Loaded Probe Technology

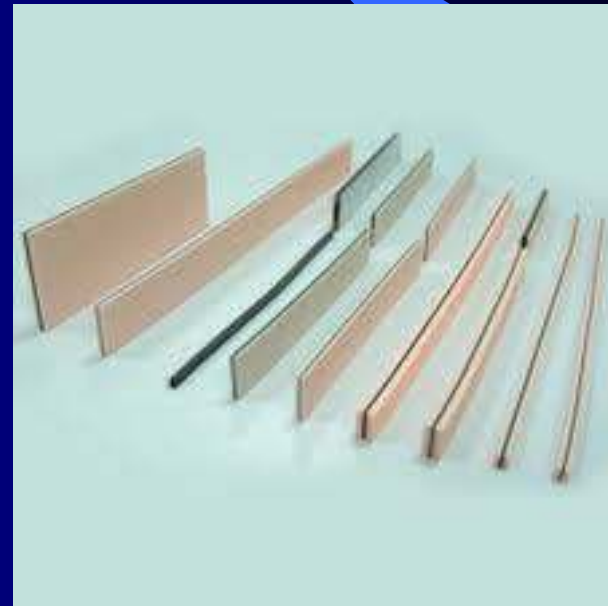
- ❖ Known Technology
- ❖ Limited frequency range
- ❖ Limited temperature range



# Existing Methodology

## Elastomeric Technology

- ❖ Known Technology
- ❖ Limited temperature range
- ❖ Many are FELT to unreliable
- ❖ Limited component insertions during testing





## What do we require to test RF packages..???

- ❖ Frequency Bandwidth.
  - One product that performs from DC to 50Ghz and beyond..!!!
- ❖ Stability
  - Repeatable results
- ❖ Temperature performance.
  - From -55degree to 125degree and beyond
- ❖ High Insertion performance
  - In excess of 1 million insertions
- ❖ Reliability



# Which Option..???

We know all about Spring Loaded Contacts  
and their limitations.

So why not Elastomeric Connectors..???

# Elastomeric Connector Types

- ❖ Carbon Filled / Silver Filled
- ❖ Imbedded Wire
- ❖ Conductive Particle
  - Isotropic
  - Anisotropic

But do any of the above really meet industry requirements..???





# Elastomeric Conductive Fabric

In the past Elastomeric Conductive Materials have generally been made up of:

**85% metallic content**

**15% Silicon content**



## Elastomeric Conductive Fabric

But if we can control the metallic content,  
we can manufacture a material with:

**15% Metallic content**

and

**85% Silicon content**

(Thus producing a material with memory)



# Visco-Elastic Conductive Fabric

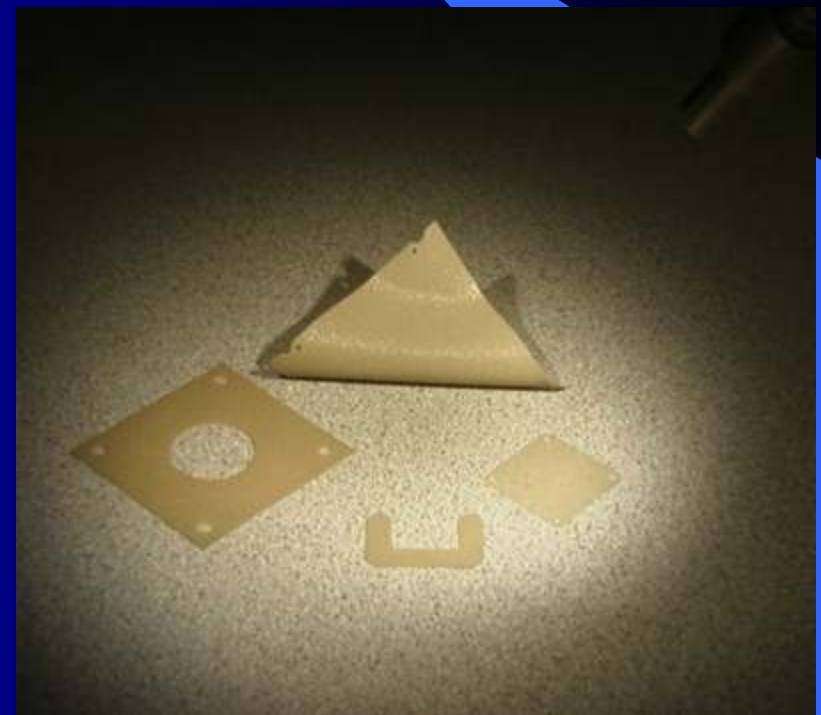
## Design Issues that need to be considered

- ❖ Elastomeric Materials are Fluid Like
  - They Tend to Flow to “Container” Boundary
- ❖ Elastomeric Materials are Spring Like
  - Internal Forces Provide Elastic Restoring Force
- ❖ All Elastomers will take a set
  - Operate within Thermal - Elastic Limit

# The “New Kid on the Block”

## ❖ Pariposer<sup>®</sup>

“The Elastomeric  
Conductive Material,  
that meets the  
industry  
requirements”





Pariposer<sup>®</sup>

Material Technology

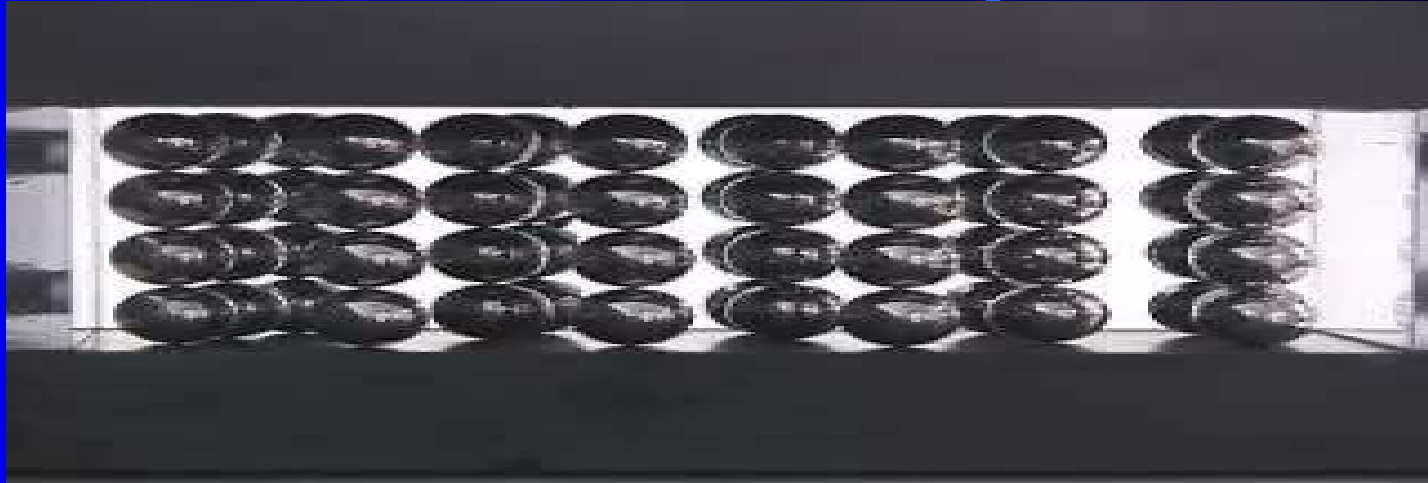
(An Elastomeric Conductive Material)

**CONTROL THE SILICON AND THE  
METAL CONTENT TO ENSURE  
THAT THE MATERIAL PERFORMS  
IN A UNIFORM AND  
CONTROLLED MANNER..!!!**

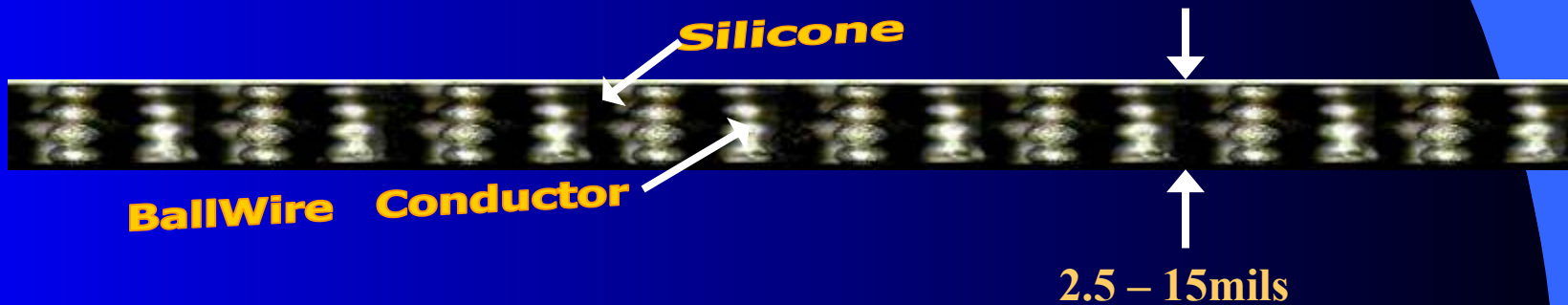


# PariPoser<sup>®</sup> Technology

North Pole

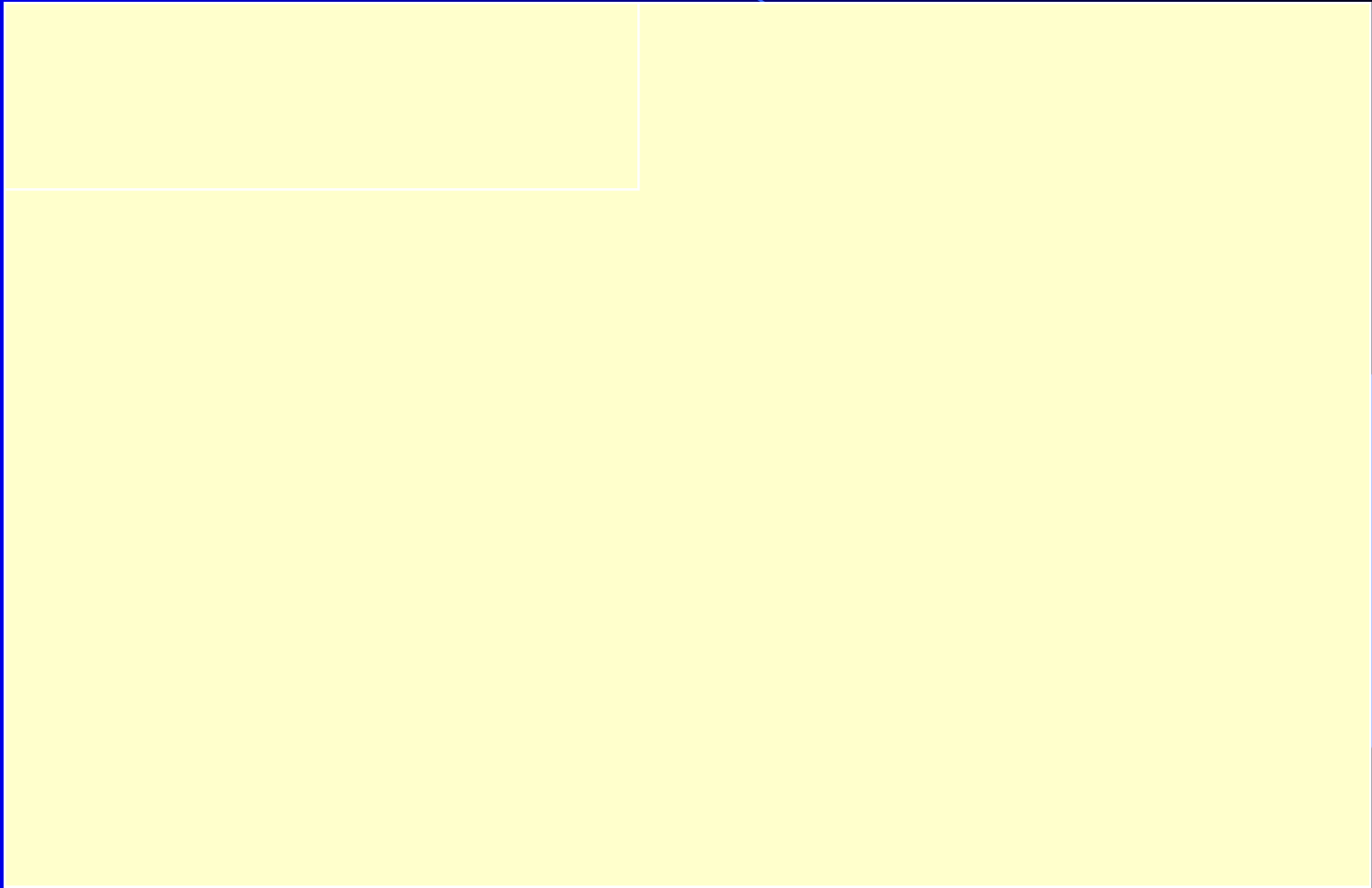


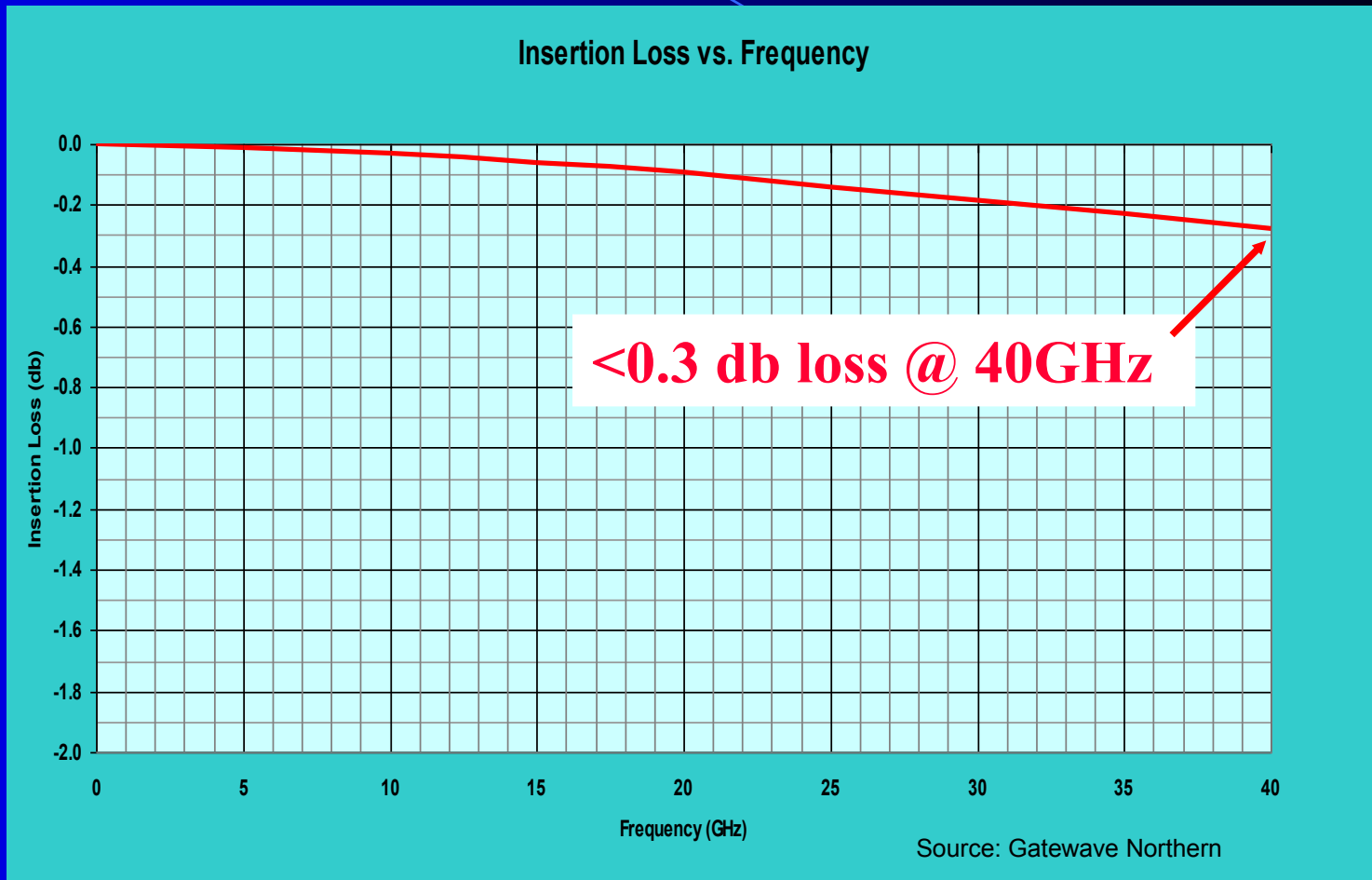
South Pole





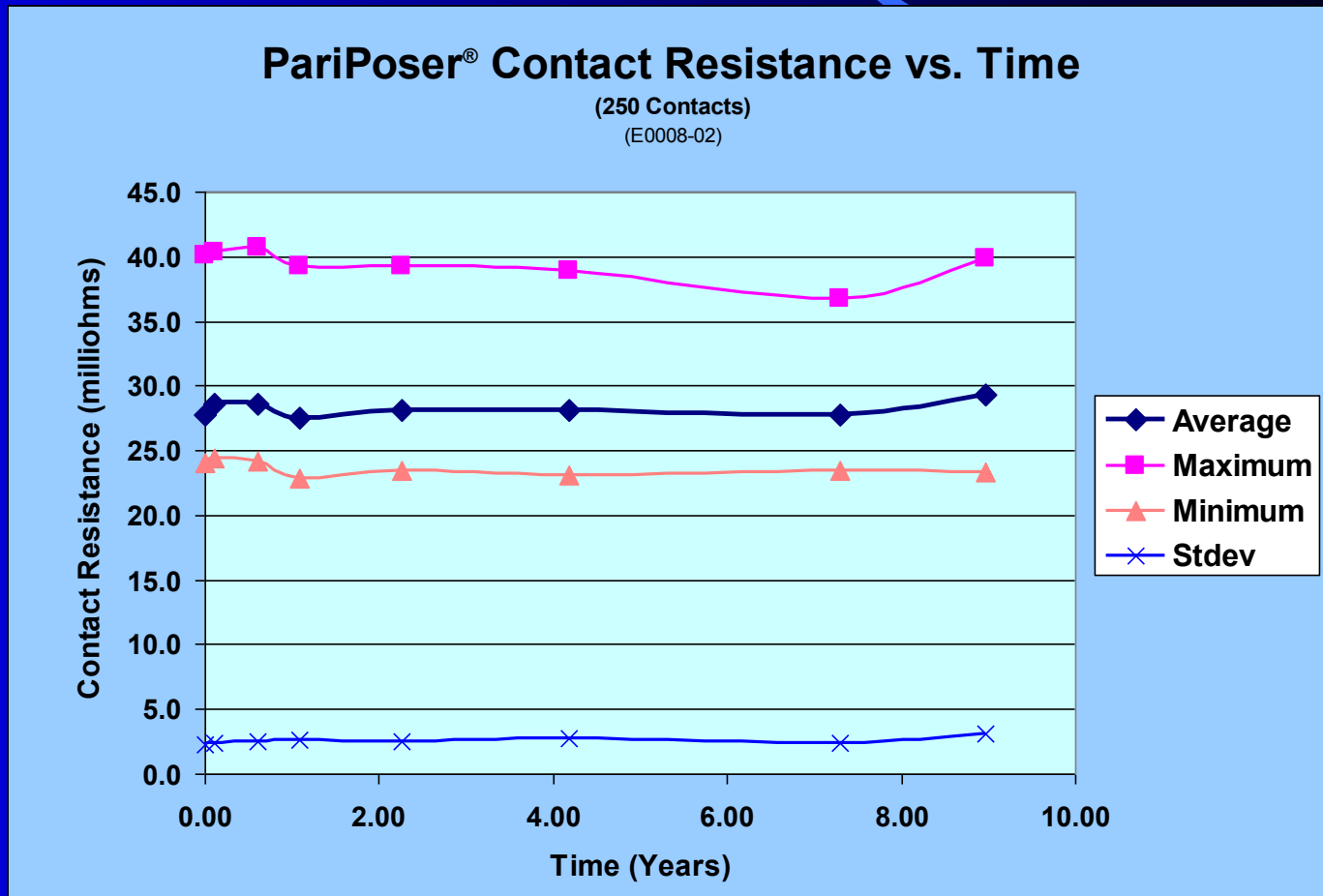
# PariPoser® Interconnection Fabric





(PariPoser<sup>®</sup> Material testing by an independent test facility, to 93GHz, will be complete by September 2012.)







## **Extensive Reliability and Qualification Studies have been Conducted on PariPoser® Contact Systems**

**❖ Bell Labs**

**❖ Gateway Northern Labs**

**❖ Customers (IBM, Selex Galileo, etc, etc.)**



## Electrical Parameters

### *Performance of PariPoser Fabric* *Exceeds Test Set*

**Shunt Capacitance (G-S-G) <30 femto Farad**

**Self Inductance <94 pico Henry**

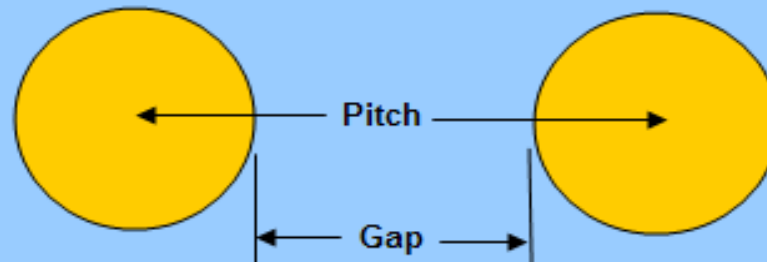
**Rise Time (Too Fast to Measure) <2 ps ?**

**Delay <1.5 ps**

## Contact Design Rules

Contact Pitch (mm)	Minimum Gap <sup>1</sup> (mm)	Minimum Pad Area <sup>3</sup> (mm) <sup>2</sup>	Minimum Pad Height <sup>2</sup> (inches)	Sheet Thickness (inches)	Sheet Thickness (mm)
1.27	0.51	0.46	0.0030	0.0150	0.38
1.00	0.40	0.28	0.0030	0.0100	0.25
0.80	0.32	0.18	0.0030	0.0090	0.23
0.65	0.26	0.12	0.0030	0.0068	0.17
0.50	0.20	0.071	0.0020	0.0065	0.17
0.40	0.16	0.045	0.0020	0.0053	0.13
0.30	0.12	0.025	0.0020	0.0044	0.11
0.20	0.08	0.011	0.0020	0.0034	0.09
0.10	0.04	0.0028	0.0014	0.0025	0.06

- 1- Gap applies to pads on both surfaces.
- 2 - Pad height includes total height of opposing pads
- 3 - Area is projected interconnection area between opposing pads



# Features and Benefits

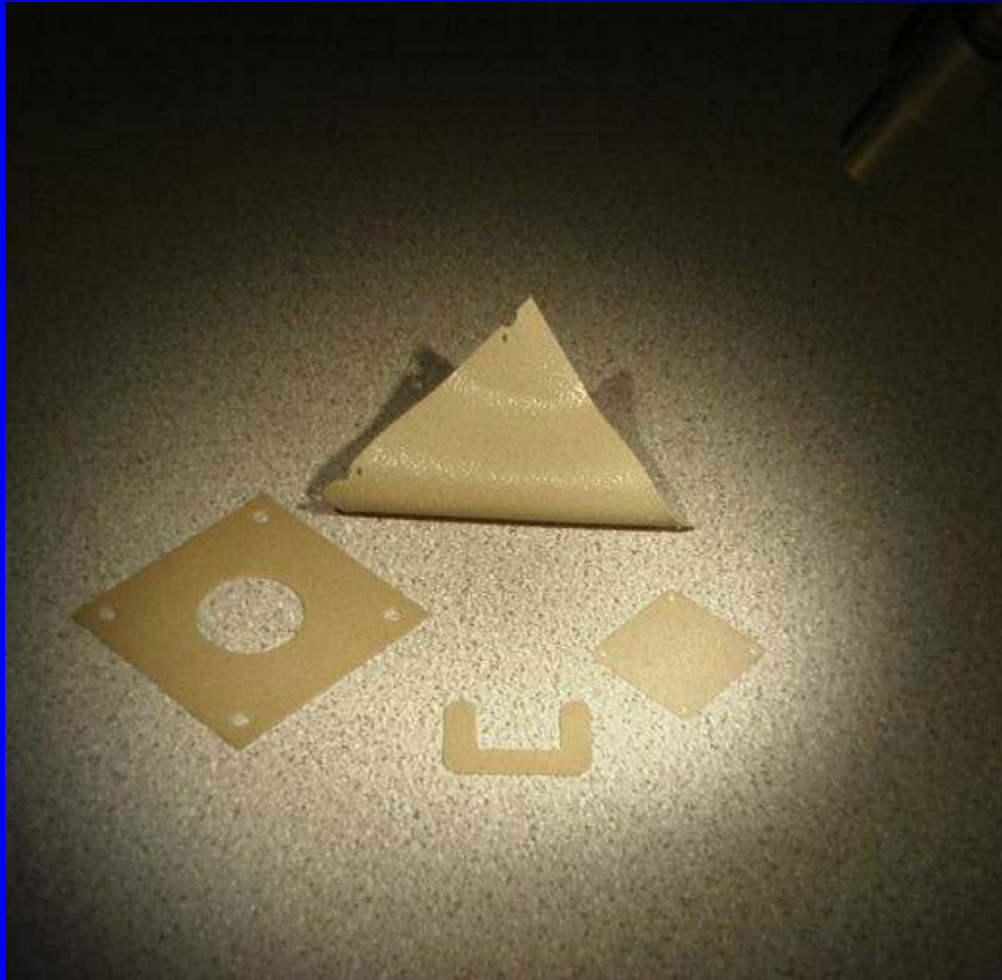
- ❖ Low Resistance (less than 10 milliohm)
- ❖ High Bandwidth (greater than 50 GHz)
- ❖ Fine Pitch Capability (less than 0.1 mm)
- ❖ Less than 0.3dB loss at 40Ghz
- ❖ Cost Effective
- ❖ Environmentally Friendly (RoHS compliant)
- ❖ Passes Major Reliability Standards.



# Applications



# PariPoser<sup>®</sup> Applications



PariPoser material is used in many applications from Chip and IC testing, Passive and non Passive Component Testing, RF Gaskets to OEM sockets within the Commercial, Industrial, Military, Automotive, Computer, and Medical markets.

## PariPoser<sup>®</sup> Socket



PariPoser OEM sockets are potentially a cost effective way to provide 100% connectivity on to the PCB, where in the past this has been a major issue.

PariPoser OEM sockets also provide a simple and effective solution of removing and replacing damaged or malfunctioning components from your PCB.



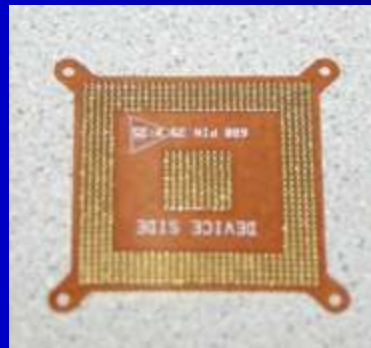
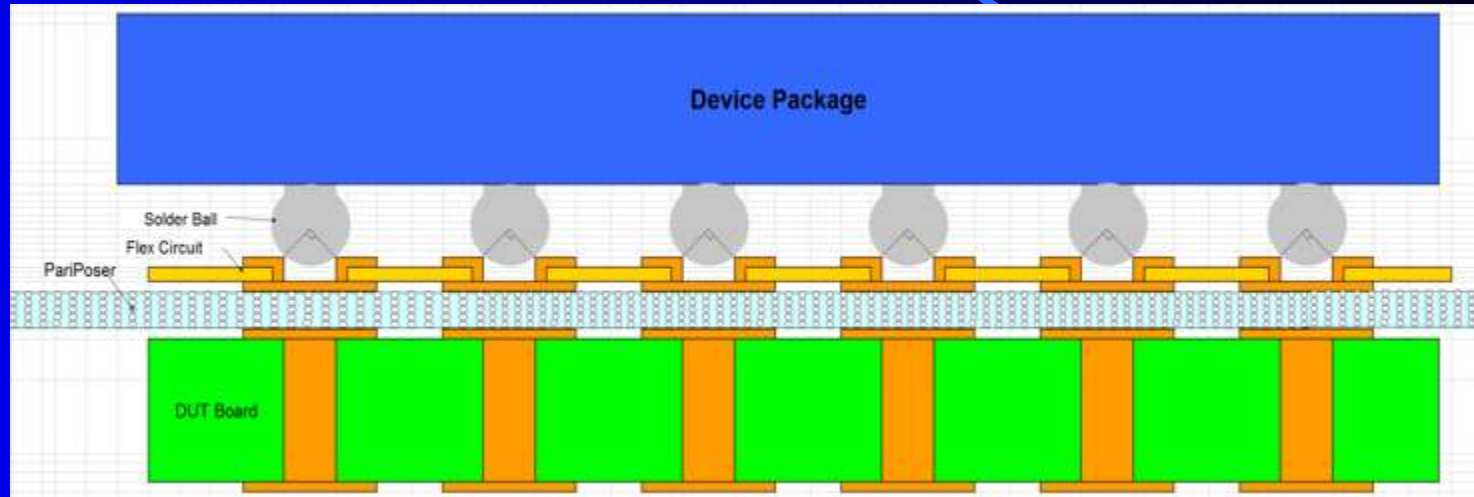


## PariPoser® Socket

But....

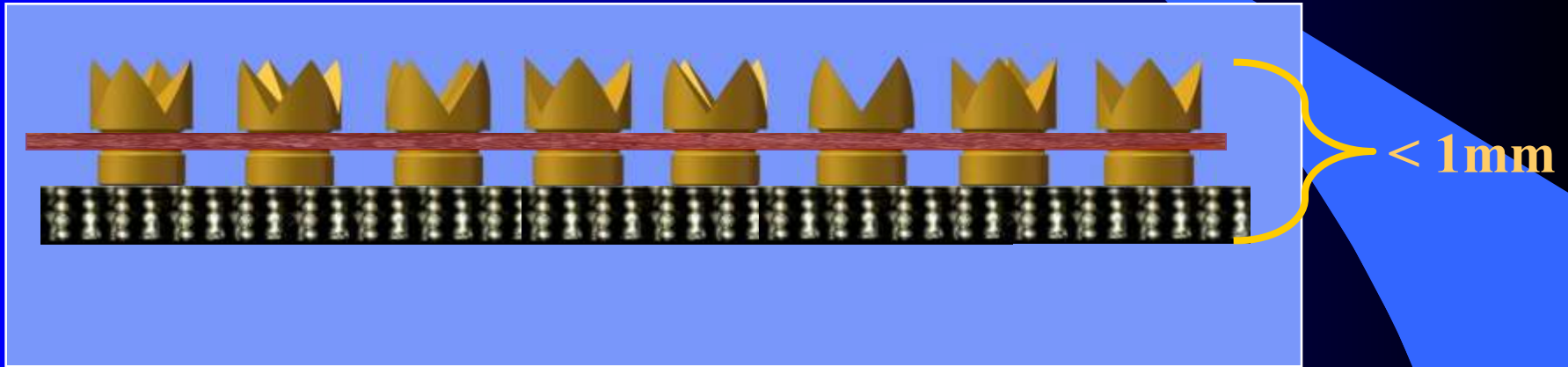
What about Testing BGA  
Devices..???

# BGA Testing



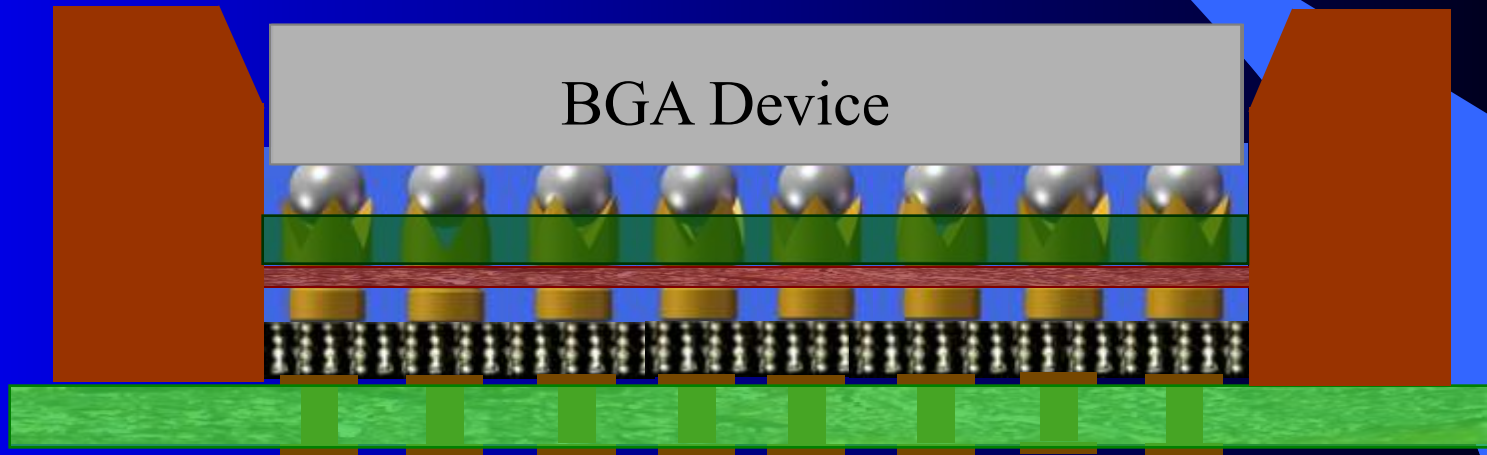


# *PariProbe® Contactor*





# *PariProbe® Socket*

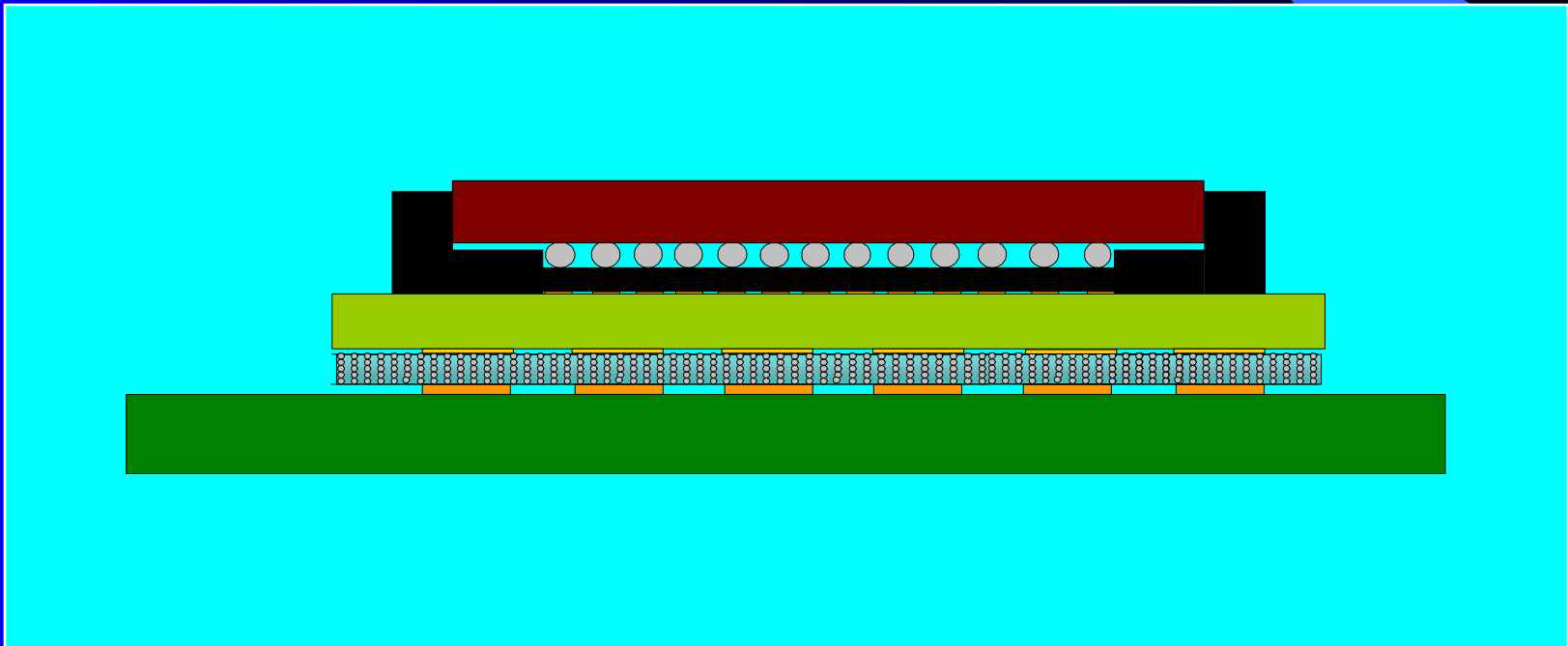




# Pitch Transformers

Just because the pitch of your device is different to that of your test board, doesn't mean you have to redesign your board or discard the device.

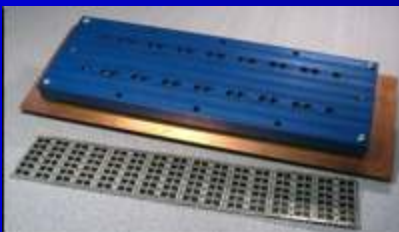
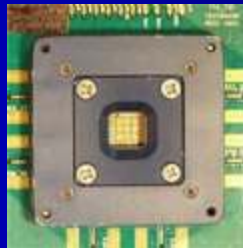
Paricon Pitch Transformers, when sizes doesn't really matter...!!!!





## PariPoser® Elastomeric Material

*It's the PariPoser® material that's important.  
Everything else is just clothing..!!!*





# PariPoser® Elastomeric Interconnection Material

## *Properly Implemented*

Has the ability to meet the Electronic Packaging Industry performance and cost objectives for many years to come.



# Thank you for your attention

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