

SEVENTEENTH ANNUAL

BiTS

Burn-in & Test Strategies Workshop

TM

March 6 - 9, 2016

**Hilton Phoenix / Mesa Hotel
Mesa, Arizona**

Archive- Session 7

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Session 7

Mike Ramsey
Session Chair

BiTS Workshop 2016 Schedule

Solutions Day

Wednesday March 9 - 8:00 am

Very Touching

"Implementation of MEMS Particles Dramatically Improves Conventional Rubber Sockets"

Dave OH, Justin Yun, Kanghee Kim - TSE Co., Ltd.

"Contacting DC - 40GHz and beyond"

Tony Tiengtum - Xcerra Corporation

"Small Form Factor Sockets and Circuits for Silicon and Platform Validation"

James Rathburn - HSIO Technologies, LLC

"Prediction of Contact Mark for QFN package"

Yuanjun Shi - Twin Solution

Contacting DC - 40GHz and Beyond - Tweaking Impedance

Tony Tiengtum
Jason Mroczkowski
Xcerra Corporation



2016 BiTS Workshop
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Topics

- Intro – Mech E vs. Elec E
- What do Test Engineers want?
- Link Family
- Too small, the ME solution
- The EE improvement
- The Simulation
- The Final Solution

Introduction

- Tester manufacturer to User to Interface supplier to socket supplier (the dark side).
- The Testers guys – “My tester is the best! Just give me any socket and I’ll make it work!”
- RF Test Engineers – “I’m building my own.” Requested lower inductance, resistance, longer lasting.
- Operations - want cheaper, better delivery, improved OEE, no board wear
- Suppliers want better margin on the best technology, the silver bullet, Gold Laying Goose.

Mechanical Solutions

Eco-System Integrating Test Hardware

Device Validation

- Fixture Design
- Thermal Solutions
- Sockets & Pins
- Package DFT



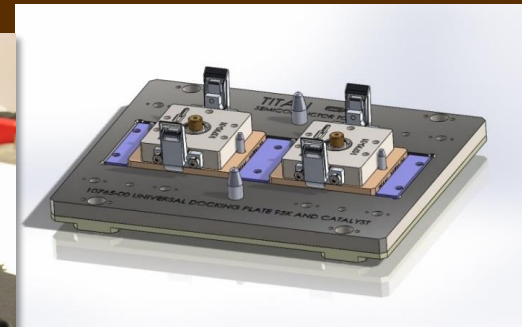
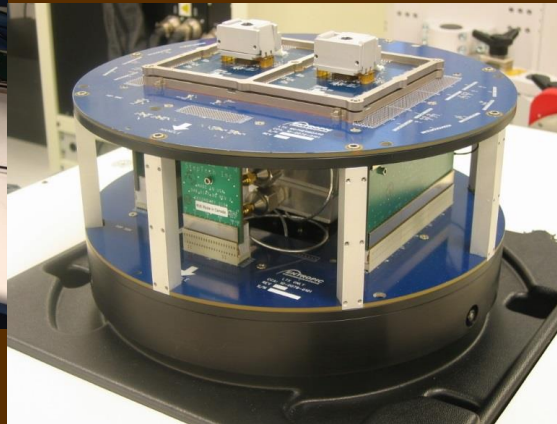
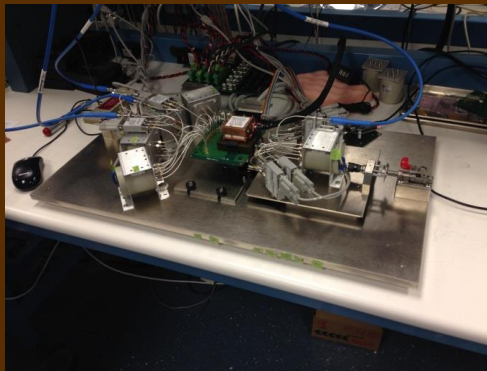
Test Development

- Tester Design
- Stiffeners
- Sockets & Pins
- Clamps



Production Test

- OSAT Test Transfer
- Handler Kits
- Yield Enhancement
- Trouble Shooting
- Test Cell analysis



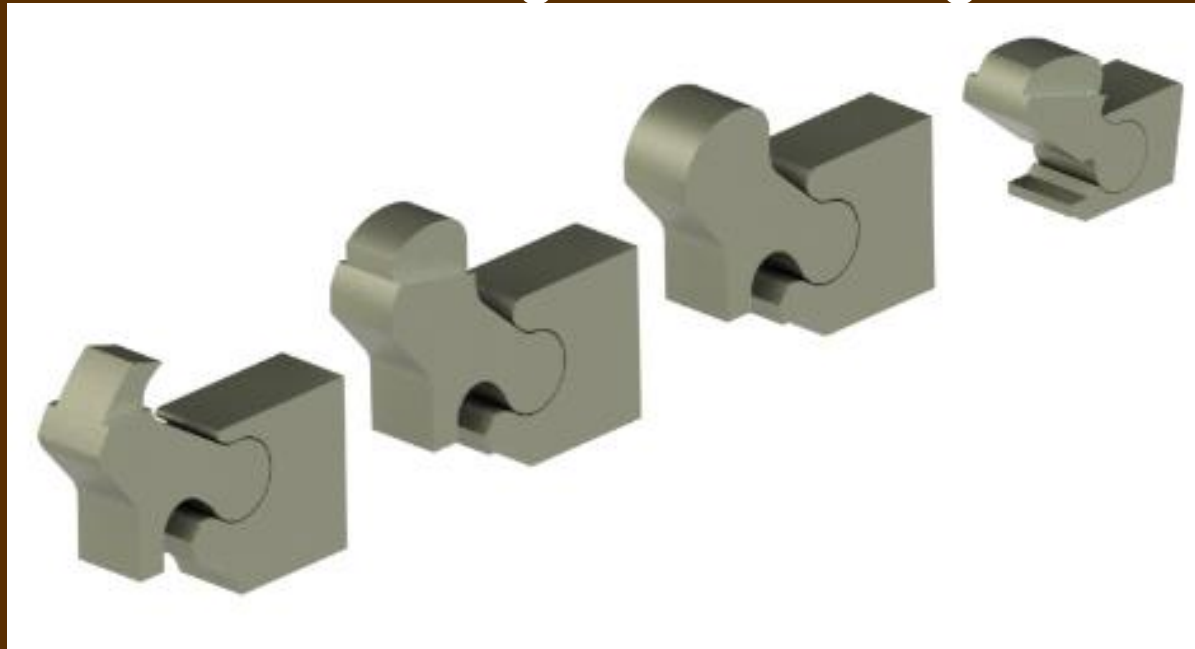
LTX Fixture

The Difficult Requirement

- Make a pin that's smaller, durable, provides for easy maintenance, and doesn't wear out load boards.
- Don't forget – *INEXPENSIVE!* (Low cost of ownership)

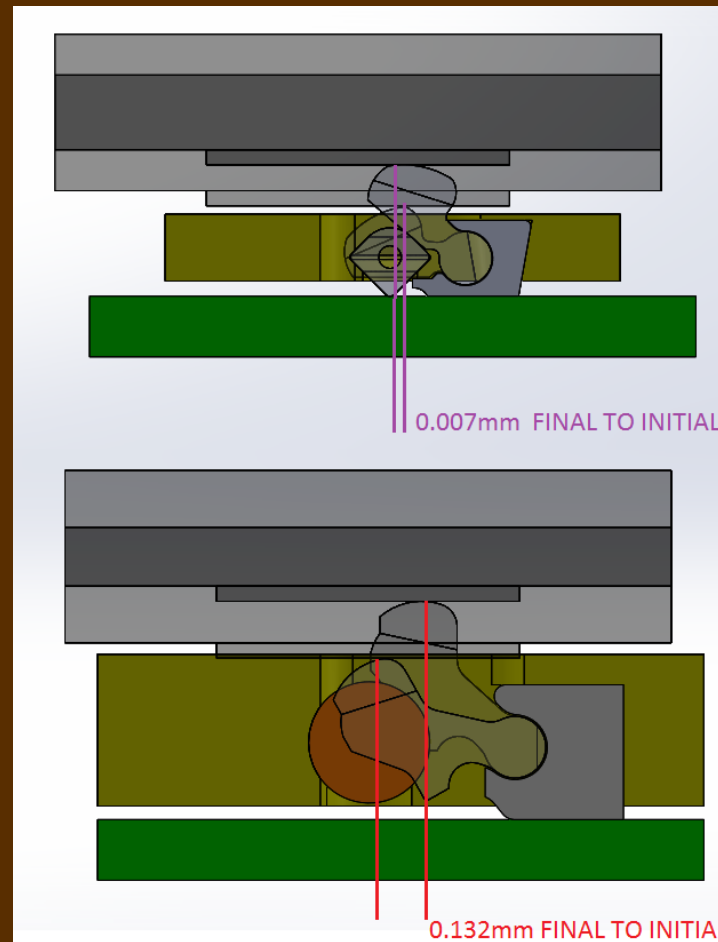
Link Family

Smallest wipe technology
0.373 mm Signal Path length



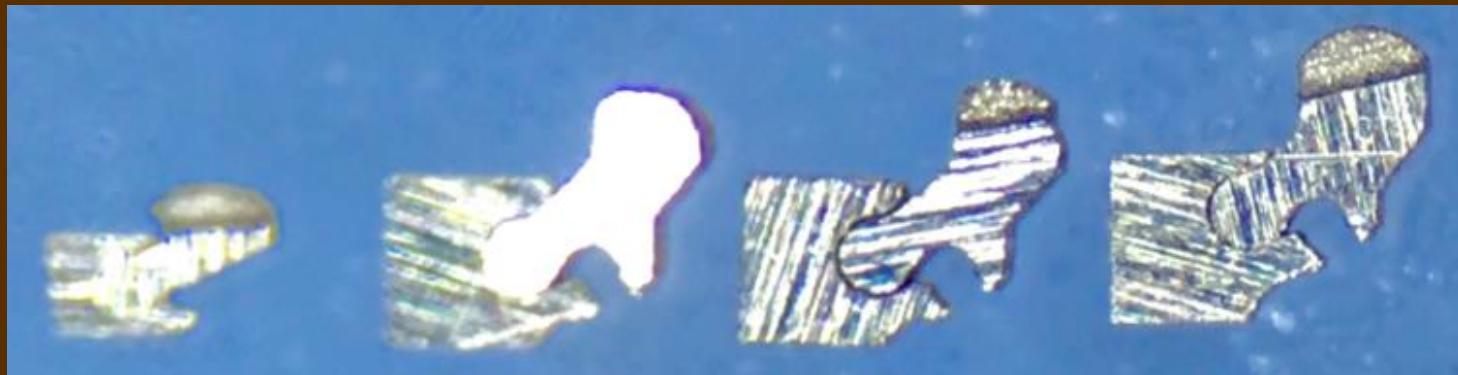
Link Family Pin Wipe Motion

BUT....it's too small!



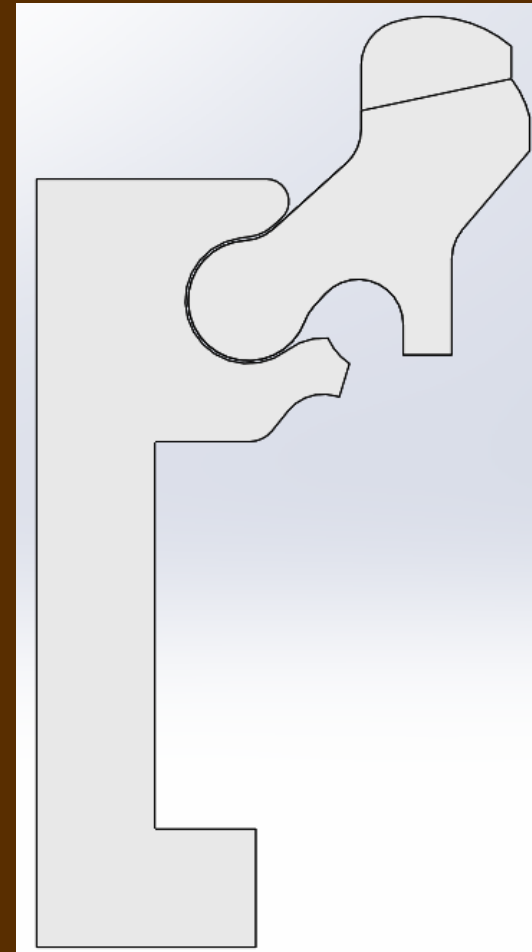
Application Requests

- We need it taller
- We need it to match Handler Kits.
- But we want the performance of the smaller pin



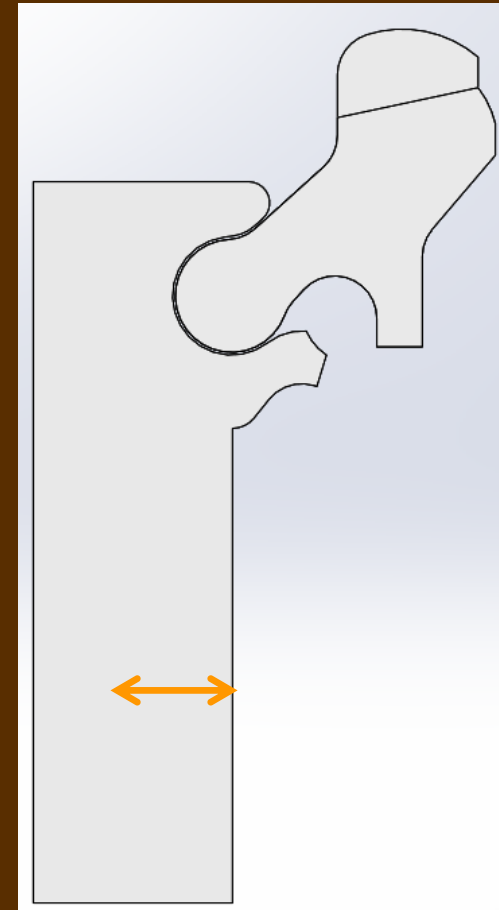
Mechanical Engineer - The Leg & Foot

- Adds height
- Match existing Handler kits
- But....
- Resistance too high, impedance



Get the EE

- Add girth
- Improves Resistance, Impedance

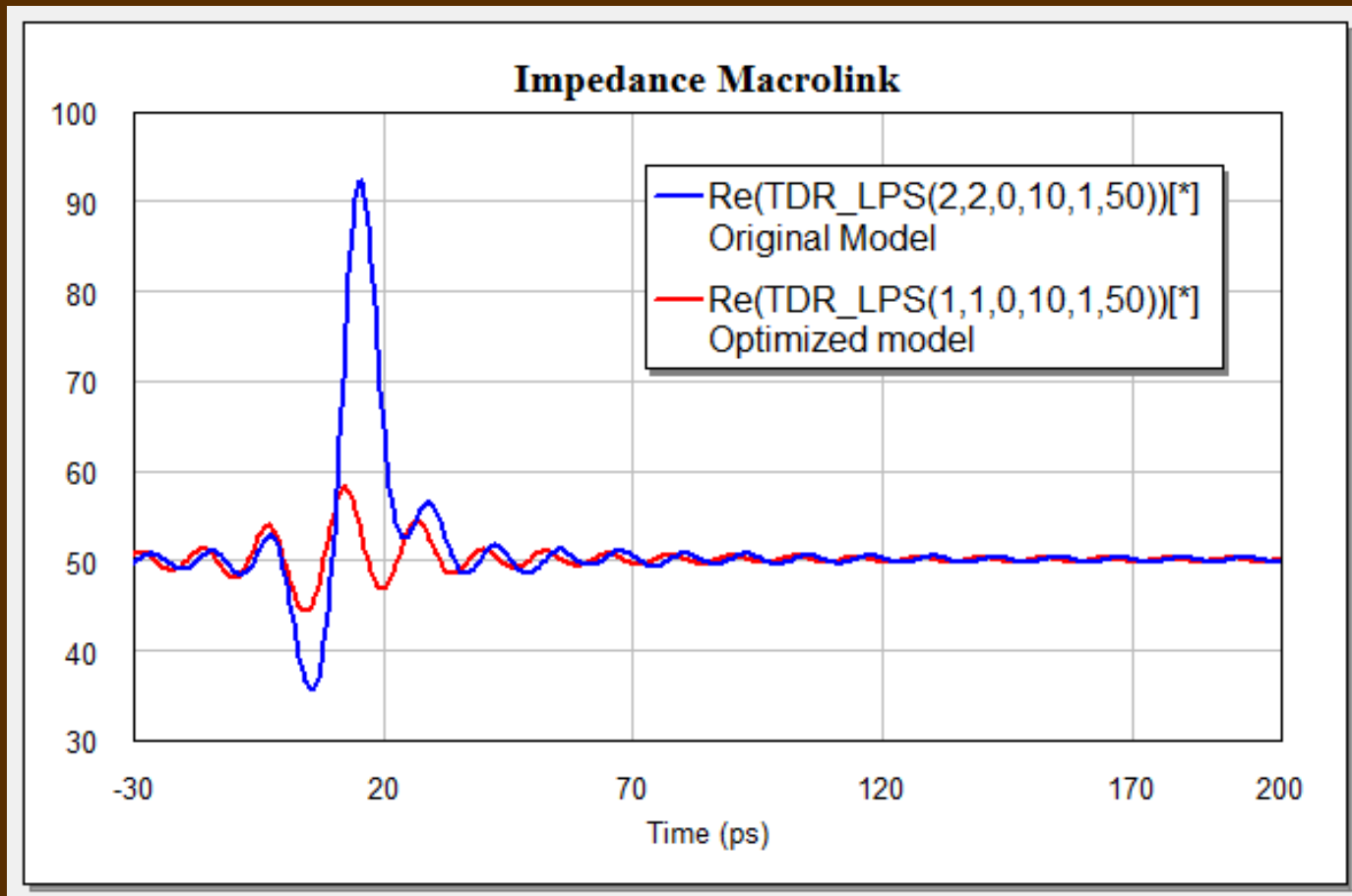


But....

Doesn't hit our EXISTING Board

So we tweaked it some more...

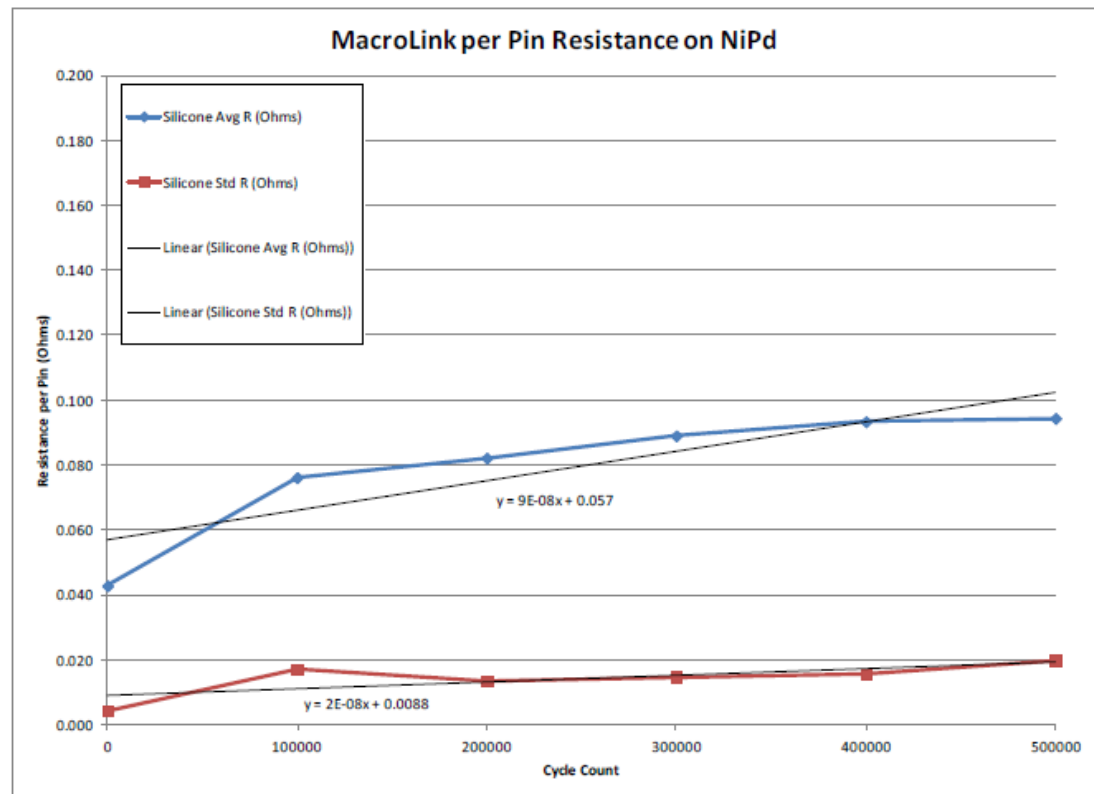
Impedance – Rise time 10ns



MacroLink Resistance

- 1M Cycles
- NiPd DUT Simulator
- No cleaning
- New elastomer @ 500k

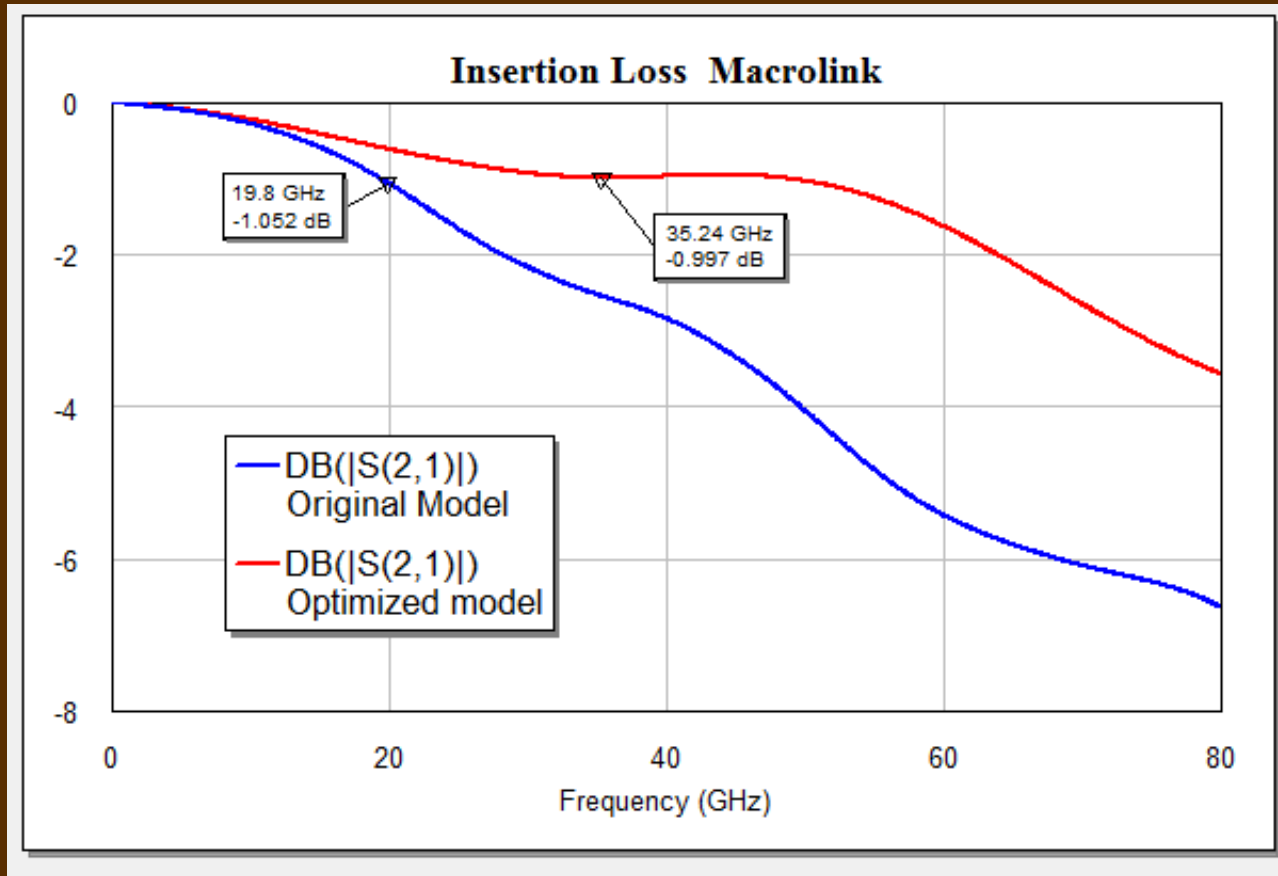
Resistance – Average and Standard Deviation



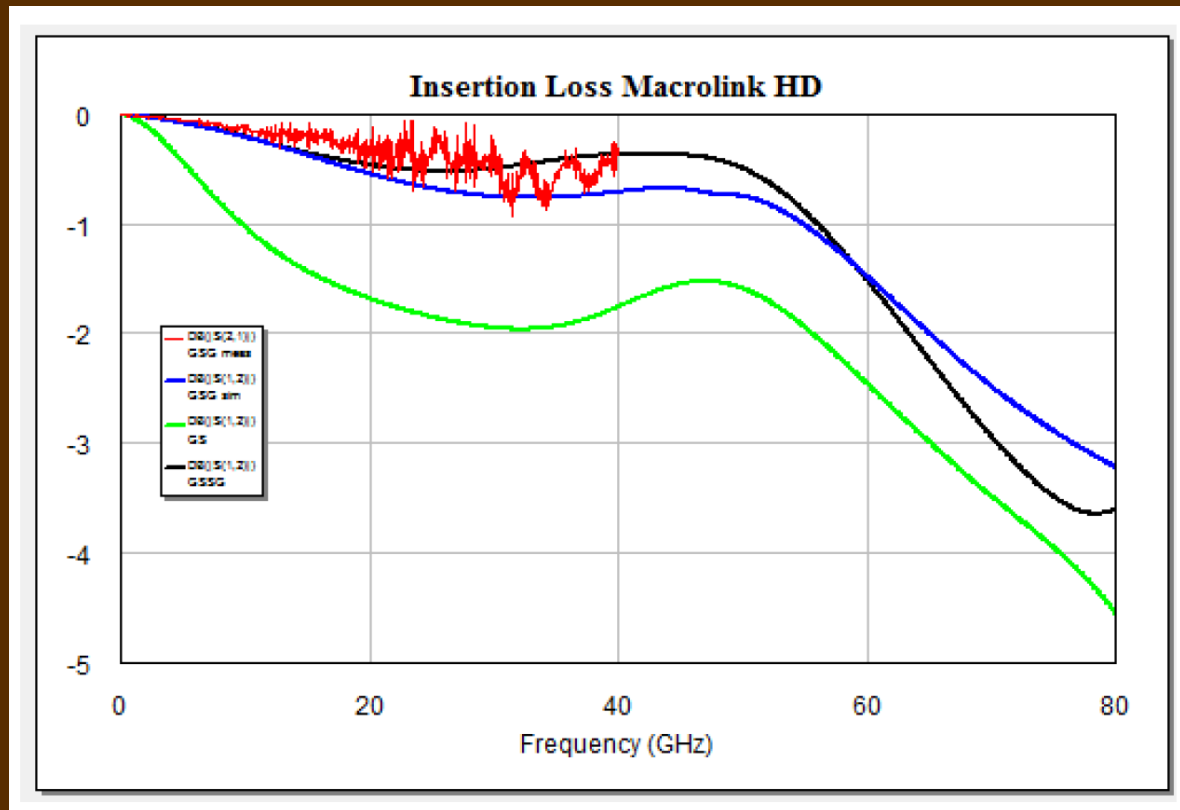
Other Benefits from Sparky

- Better overall RF performance
 - Better Insertion Loss
 - Better Return Loss
- Current Carrying Capability
 - Max current 8A

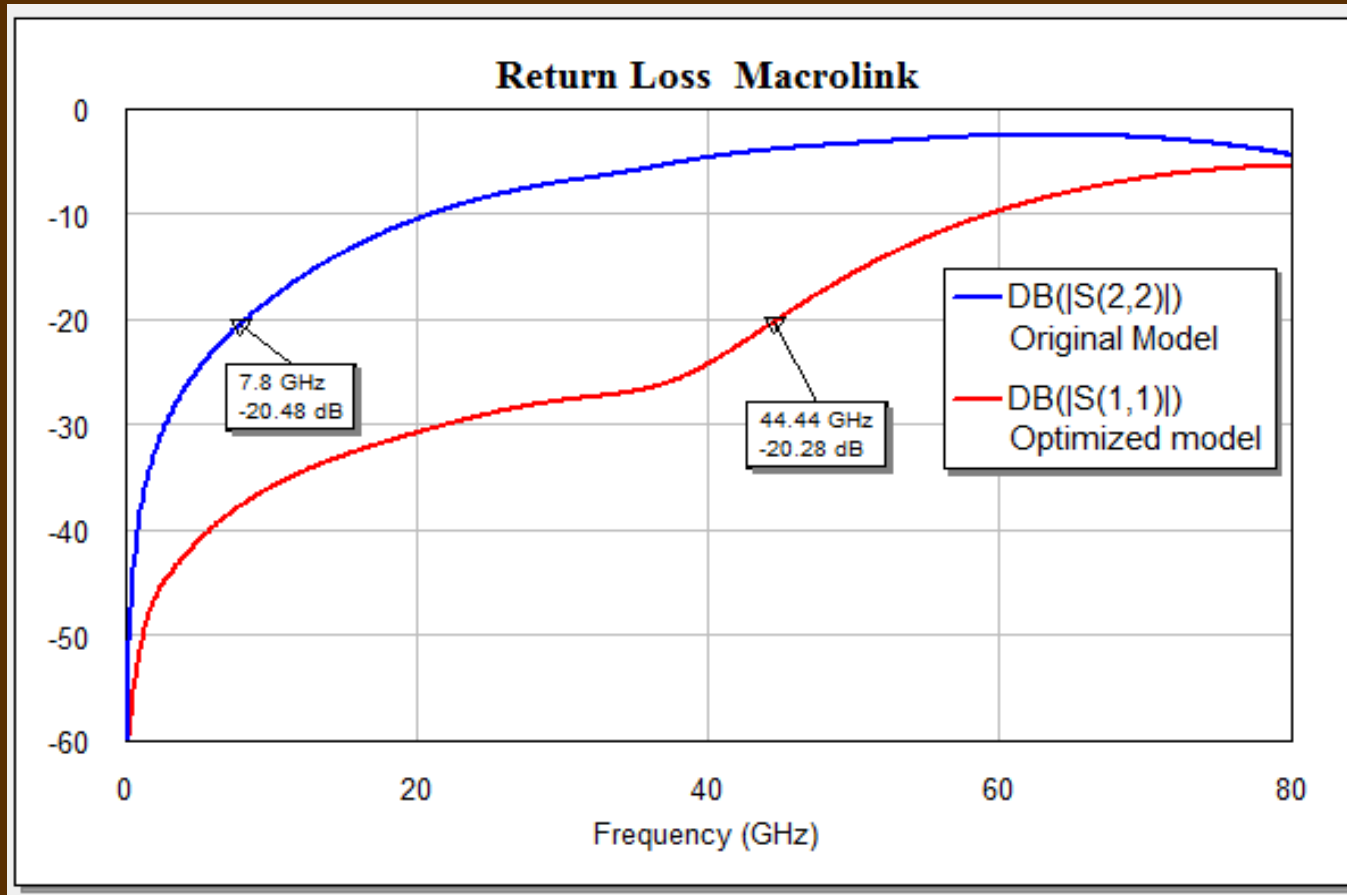
Model - Insertion Loss at 0.5mm pitch



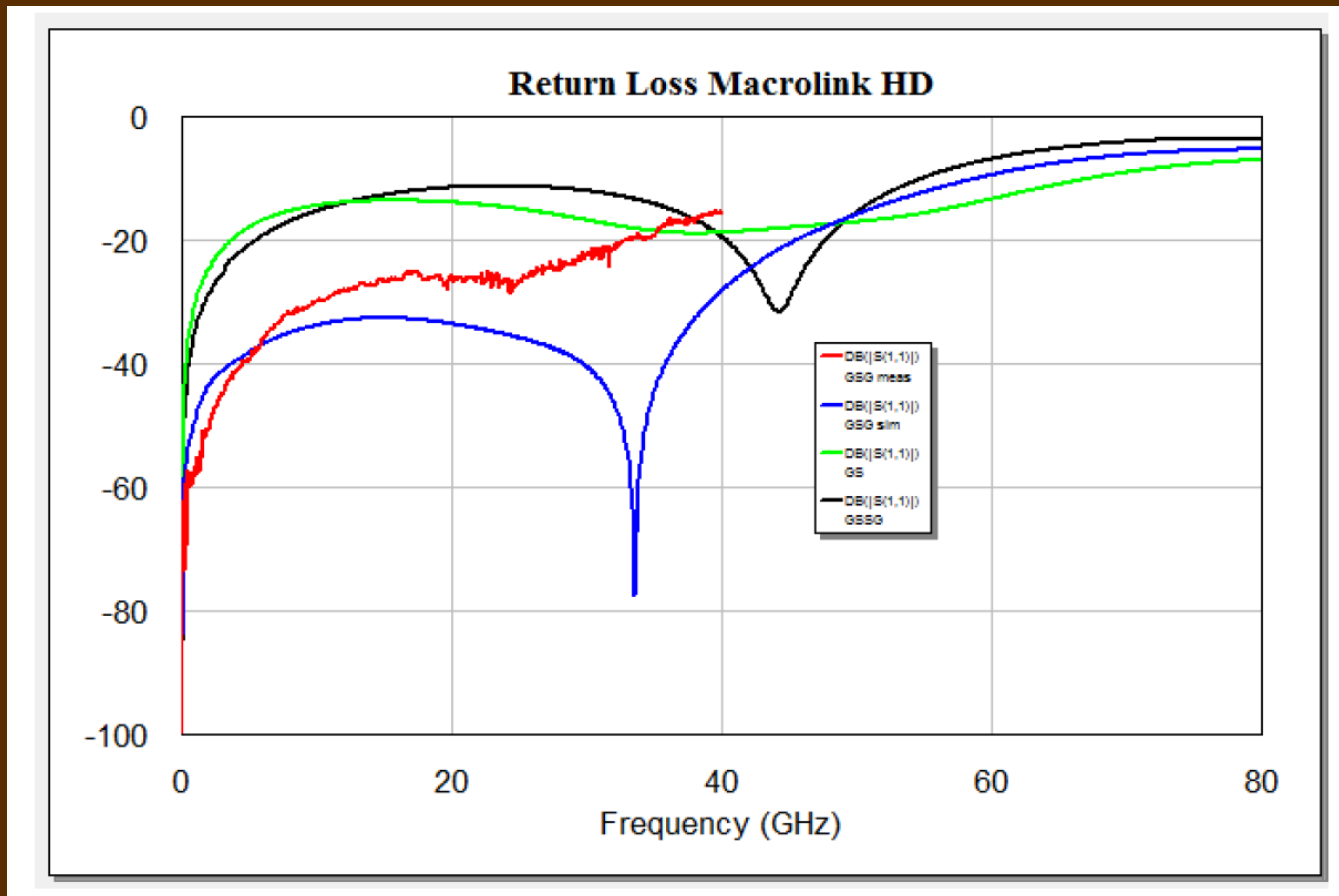
Actual Measurements



Model - Return Loss at 0.5mm pitch



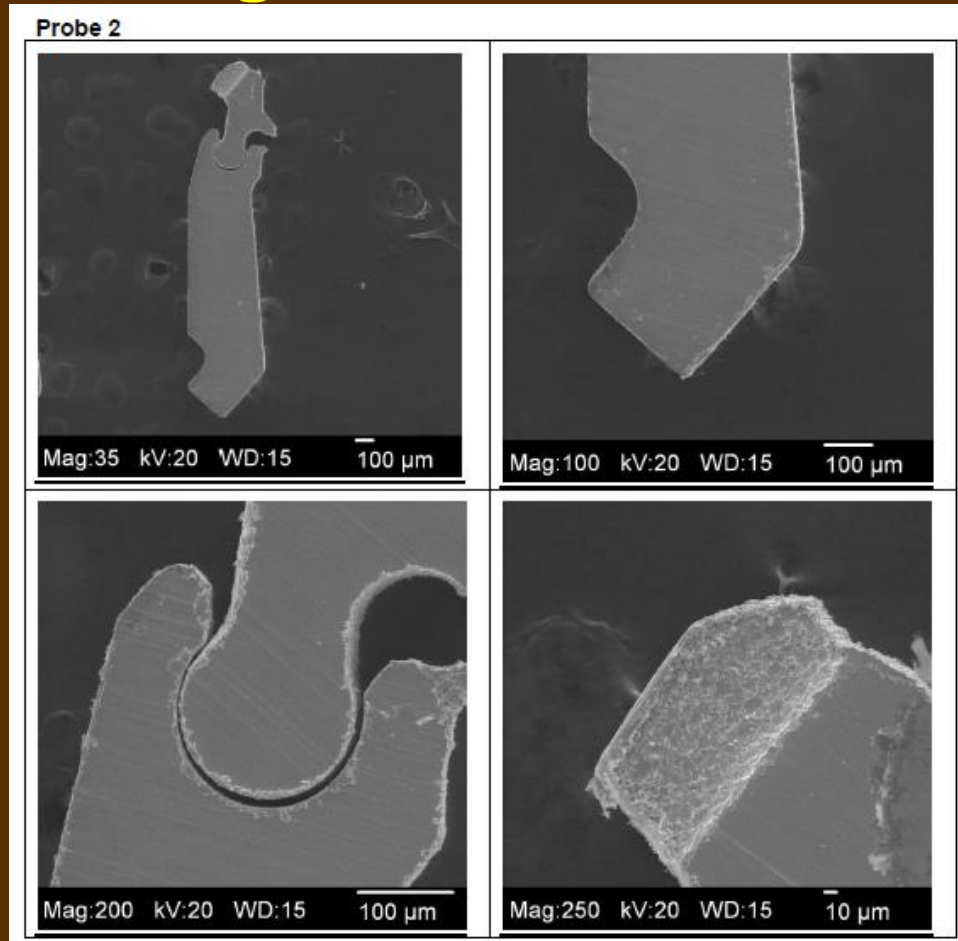
Actual Measurements



High Insertion Life

Solid construction

Foot to board



Stable Linkage

Minimal Tip wear

Conclusions

- Simple changes on mechanical geometry can drastically improve electrical parameters
- OK EE, we need you!

The End

Special Thanks to:

- Victor Landa
- Rachel Caballero
- Nadia Steckler
- Aaron Magnuson
- Dan Sikorski