



Ironwood
ELECTRONICS
www.ironwoodelectronics.com



HBT – Socket for Lab and ATE Applications

**High Performance
IC Sockets And
Test Adaptors**

Application Need

- Longer tip life
 - Minimal plating wear or no plating
 - withstands aggressive cleaning
- Minimal Oxide Buildup
 - Less Material transfer rates from DUT to Pin tip
- Sharper tips
 - stay sharper over time
- Less Cleaning
 - Longer Mean Time Between Cleaning Frequency
 - Reinstates original performance after cleaning
- Electrical specs
 - Same or similar to BeCu alloys
- Less downtime
 - Excellent ROI and COO

Solution - HBT Contact

HBT Contact is an etched contact with outside spring that provides a robust solution for test applications that include thermal characterization, burn-in, SLT, ATE, etc.

Solution for 0.8mm to 0.40mm (LGA, BGA, QFP packages) in Burn-in & test applications.

Contact technology has 3 part system. Etched top plunger (unique proprietary alloy with no plating enables longer tip life & less cleaning), etched bottom plunger (standard BeCu with gold plating) and assembled to a gold plated stainless steel spring to enable reliable interconnect solution with less downtime.



HBT Socket

Features:

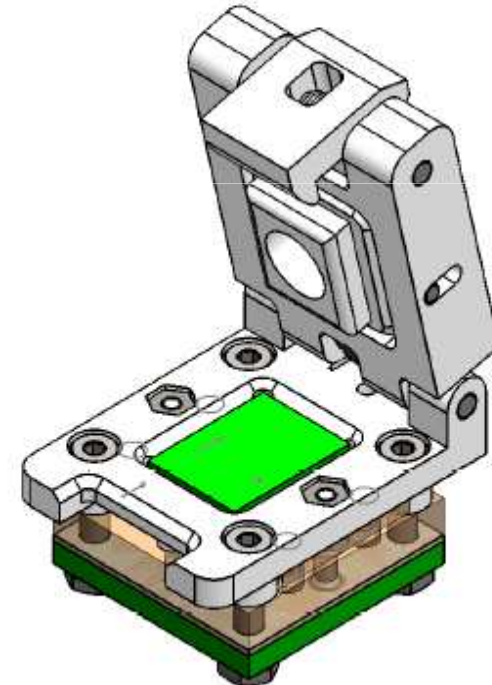
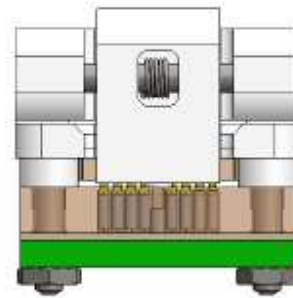
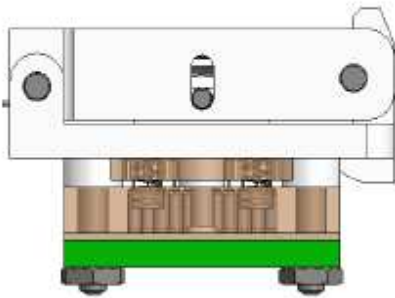
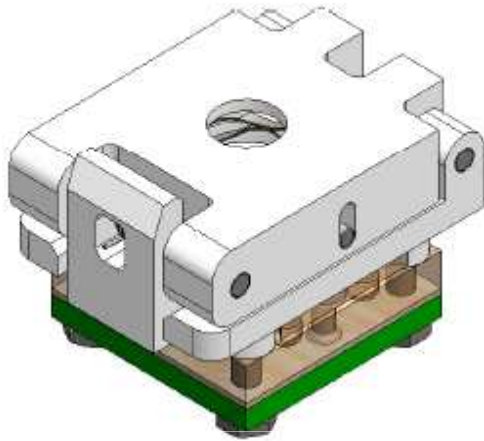
Wide temperature range

High current capability

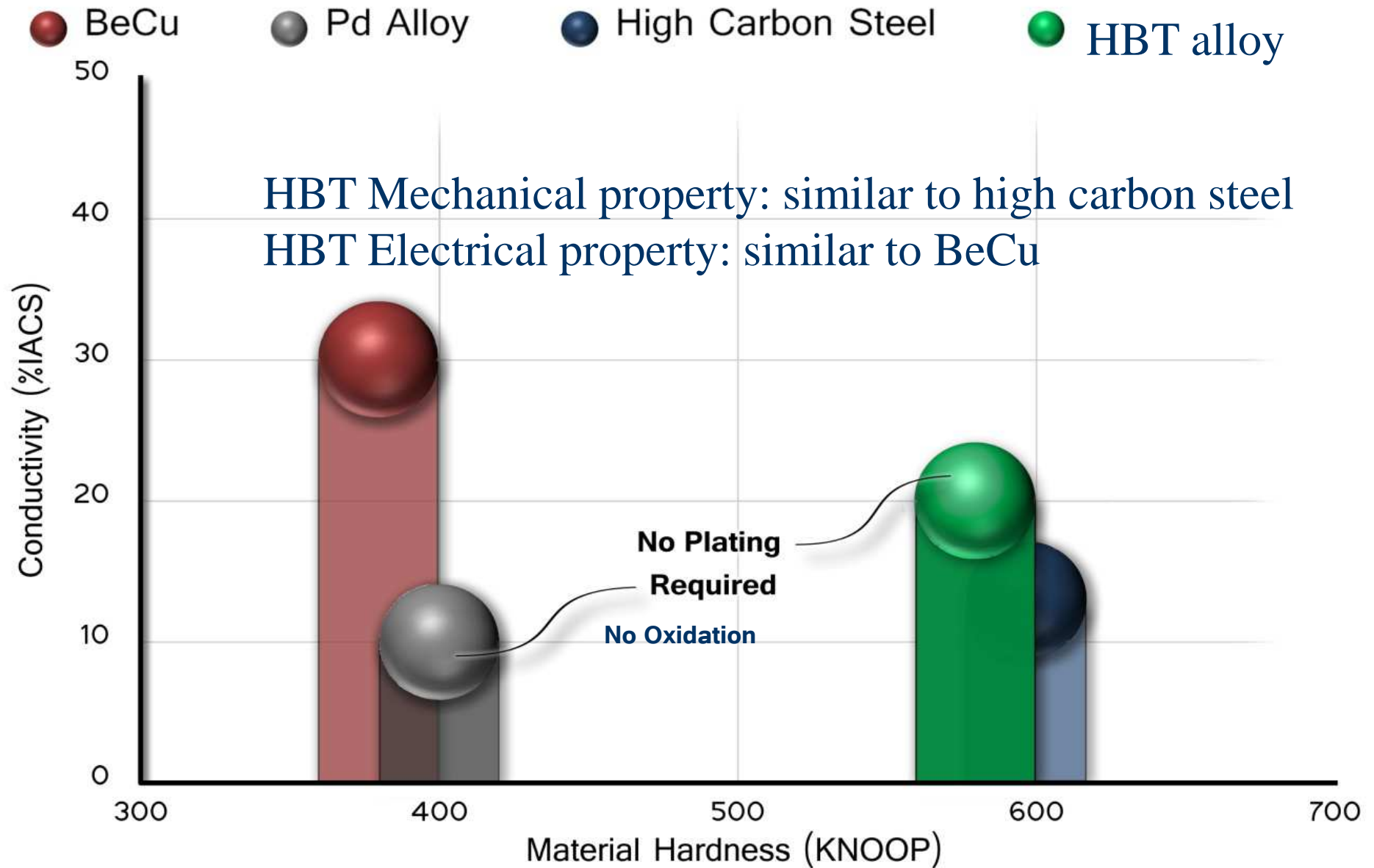
Excellent signal integrity

Low & stable contact resistance

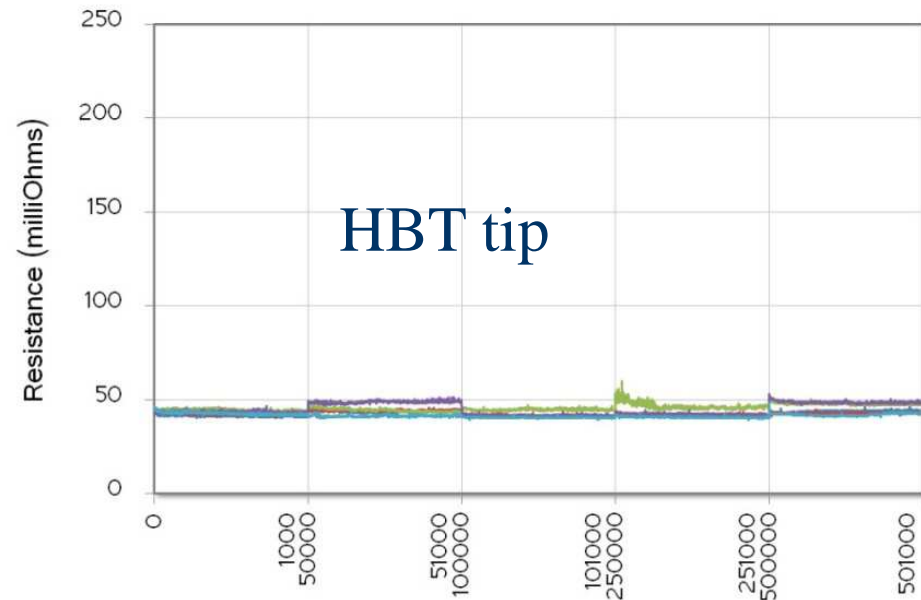
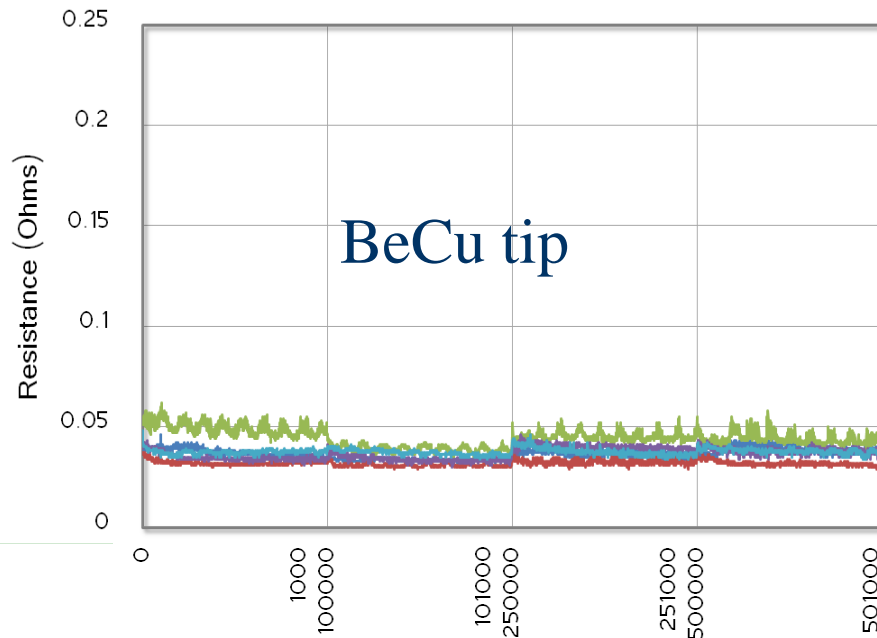
Less cleaning & down time



Mechanical Property Comparison



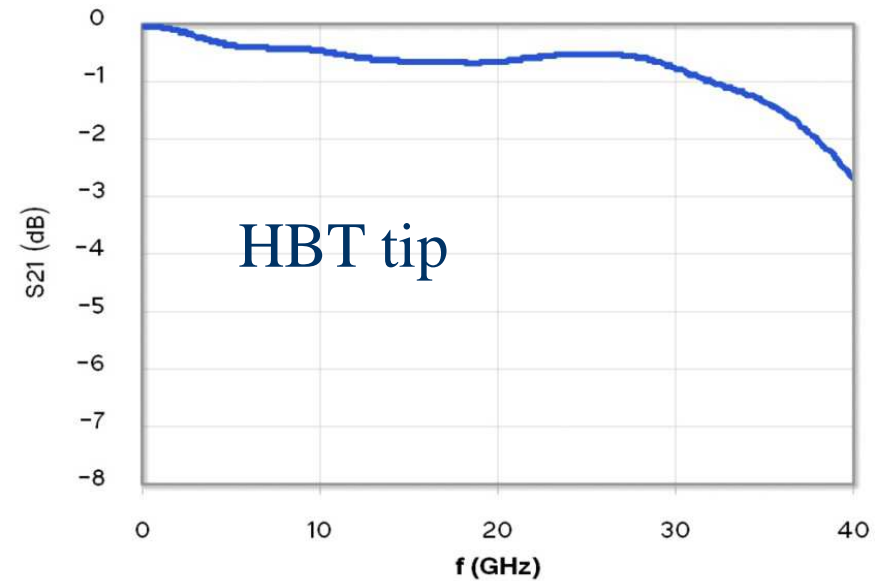
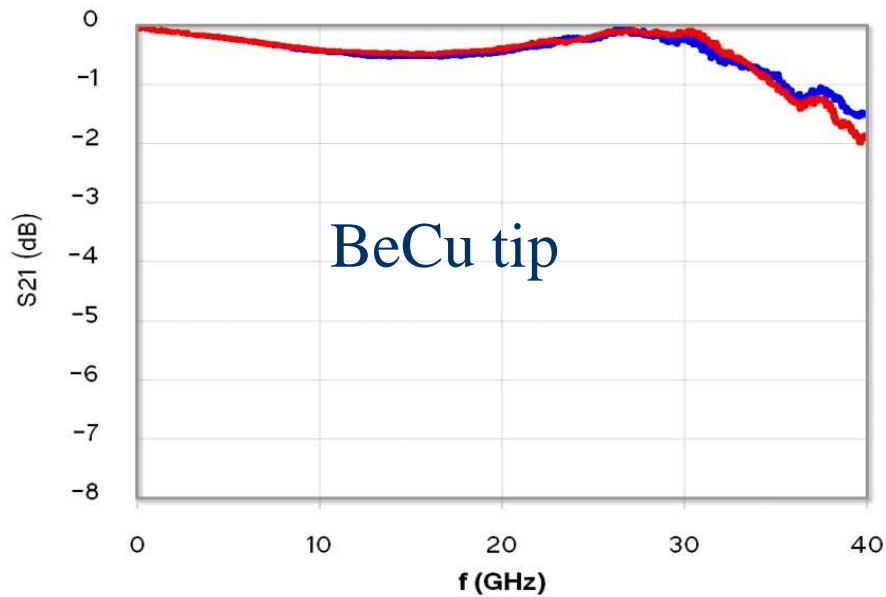
Life Cycle Comparison



Tested with gold plated device simulator. No difference in average Cres.
High standard deviation in BeCu tip due to uneven plating wear.

Cycle	BeCu, Avg Cres	HBT, Avg Cres
0	47mOhms	43 mOhms
100,000	40 mOhms	42 mOhms
250,000	45 mOhms	43 mOhms
500,000	45 mOhms	45 mOhms

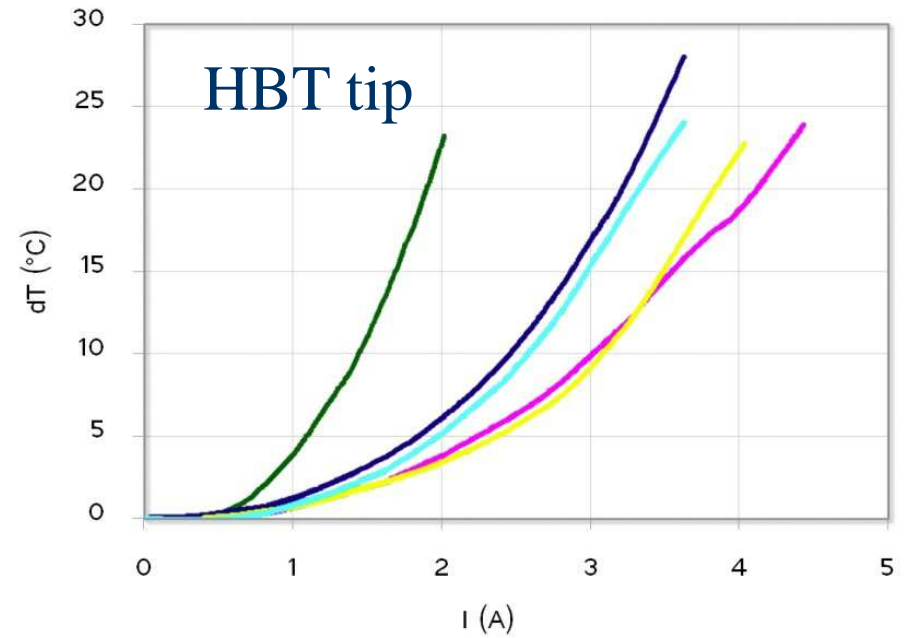
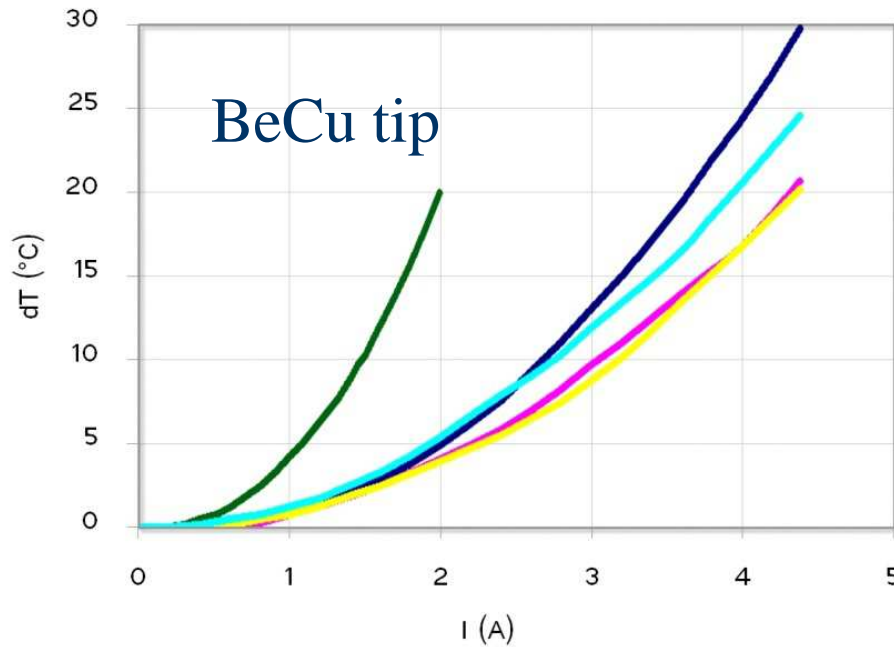
AC Data comparison



Conductivity of HBT is slightly lower than BeCu which is reflected in bandwidth data.

	BeCu	HBT
At -1 dB	34.6 GHz	31.5 GHz

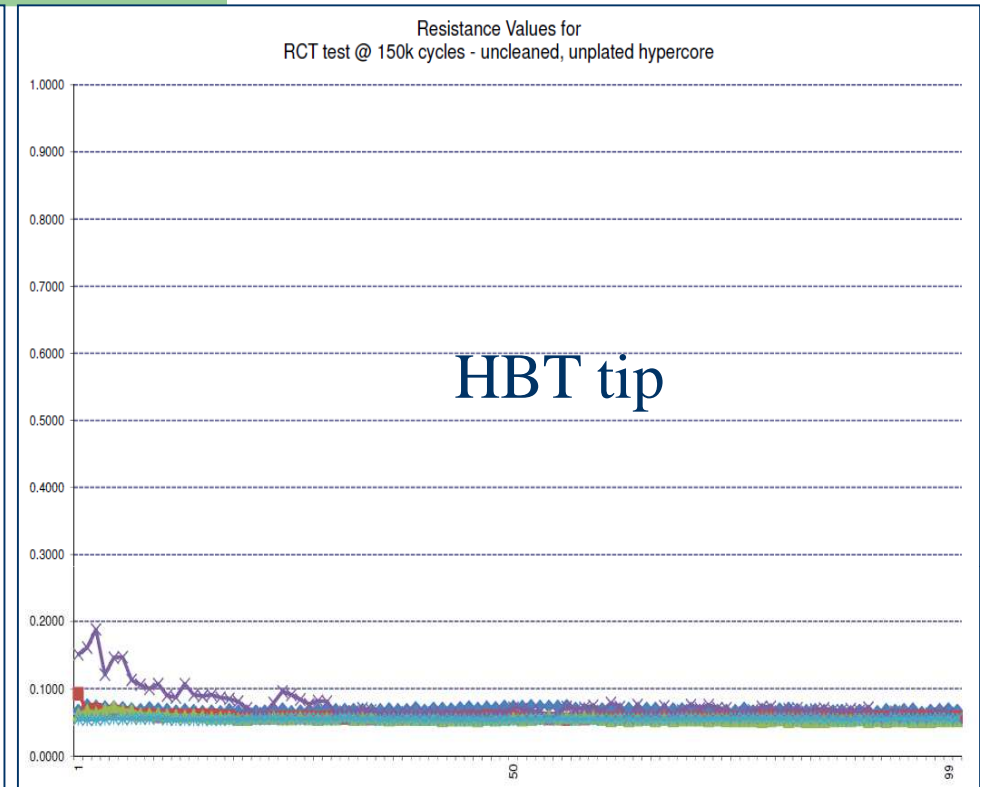
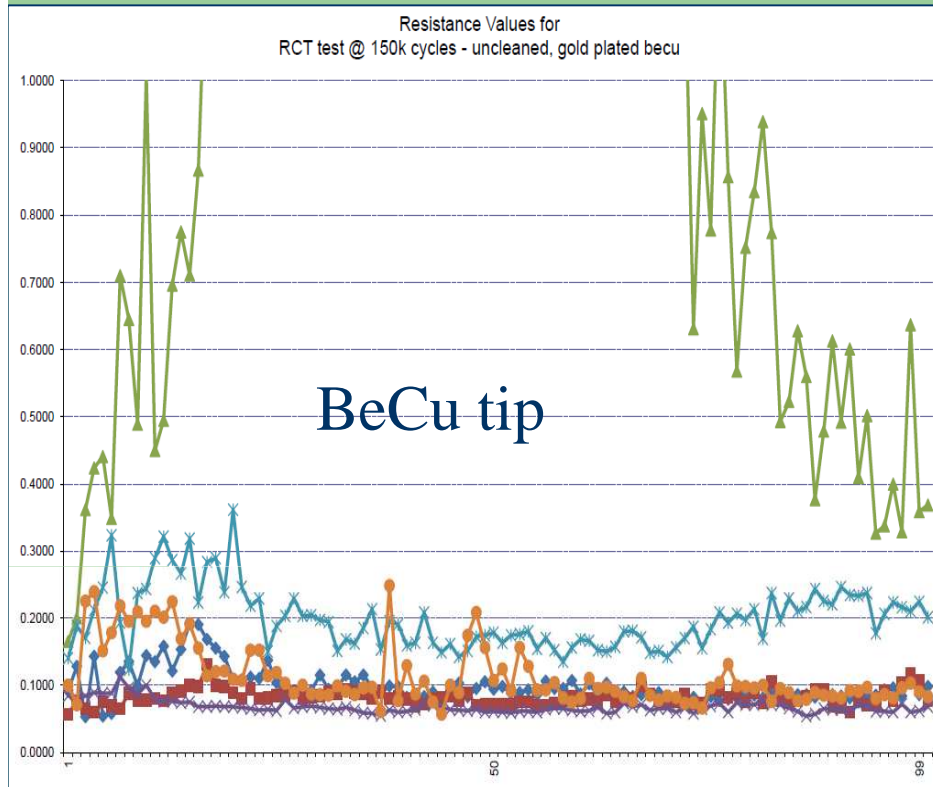
DC data comparison



Conductivity of HBT is slightly lower than BeCu which is reflected in current carrying data.

Duty Cycle	BeCu	HBT
1%	4.36 A	3.81 A
10%	4.32 A	4.09 A
25%	3.94 A	3.31 A
50%	3.64 A	3.18 A
100%	1.99 A	1.89 A

Life Cycle Comparison

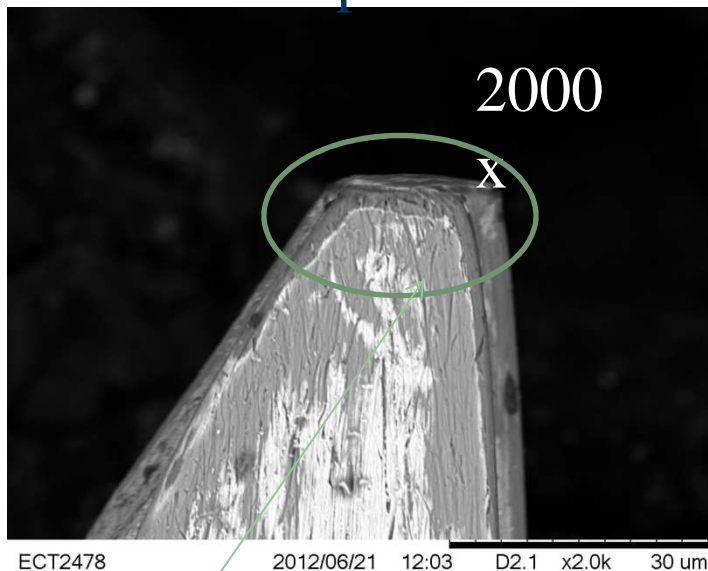


Test completed for 150K units of actual BGA devices with solder balls on both type of pins. After testing, used gold plated device simulator and measured Cres for 100 cycles. Wide Cres variation in BeCu tip due to solder adhesion and plating wear compared to minimal Cres variation in HBT tip.

Tip Strength - Deformation Study in the same socket

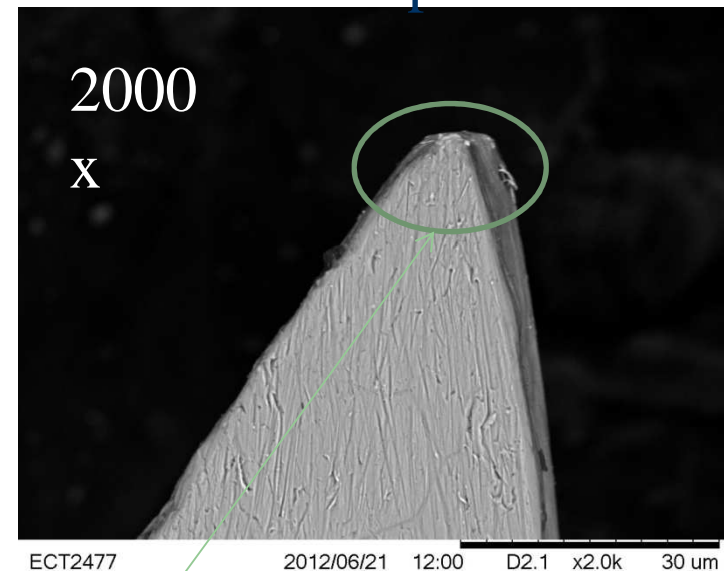
SEM picture of tips shown below were impacted against hard steel for 500K cycles.

BeCu tip



Evidence of tip wear

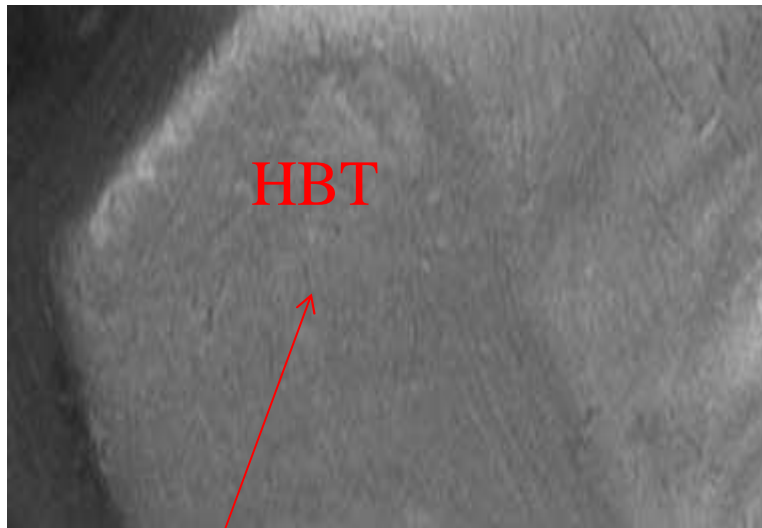
HBT tip



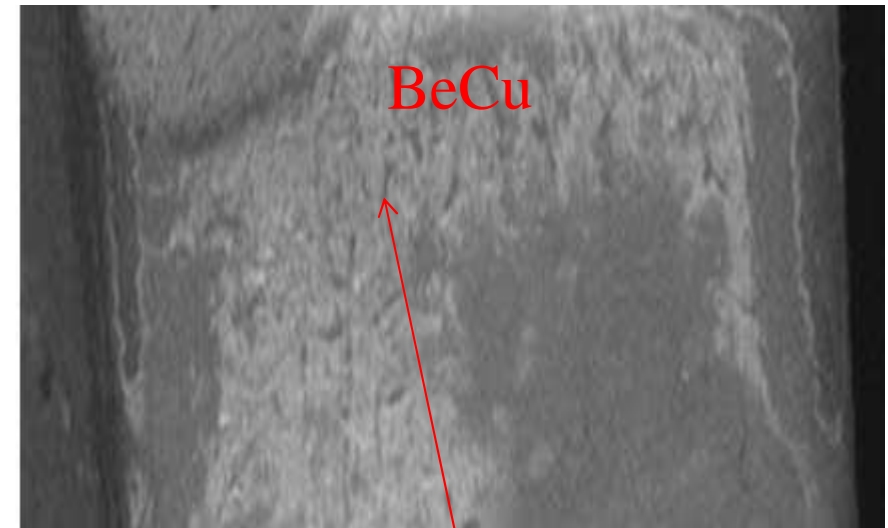
No evidence of tip wear

Contamination Study

SEM picture of Tips after 500k cycles on Matte Tin, including cycles with MIPOX cleaning pad @25k Intervals.



No Sn contamination and no wear on surface



Sn adhesion on worn flat areas as well as on gold plated surfaces

HBT Value Proposition

- HBT contact enables repeatable electrical/mechanical performance in all lab and ATE applications.
- Custom socket can be produced using HBT contact in 4 weeks.
- HBT sockets with wide temperature range (-50C to +150C) are available in same footprint as elastomer GHz sockets with 31.5GHz bandwidth.
- HBT sockets are robust and can be used in application demonstration modules for multiple handling process without contact degradation.