



Ultra-fine Pitch Socket Qualification

John Ronk
Design engineer

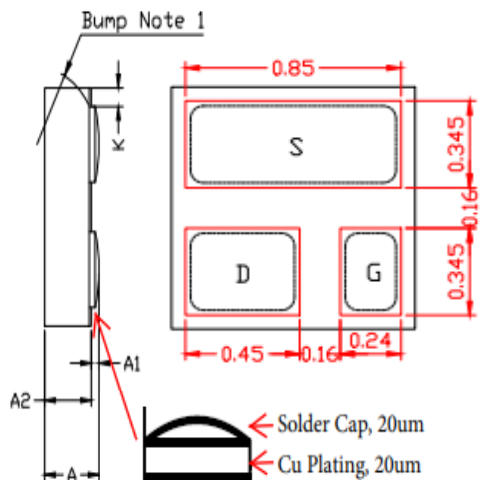
Michael Ricci
Principal Engineer

Application Challenges

Create A Final Test Solution For WCSP 0.96 x 0.96 With Cu/Sn Bumps:

- Eliminates Damage To Device With Cu/Sn Bumps
- Works As Production Contactor As Well As An Engineering Hand-test Socket
- Position Multiple Spring Probes In Gate, Drain Source Target Areas - 200 um Pitch

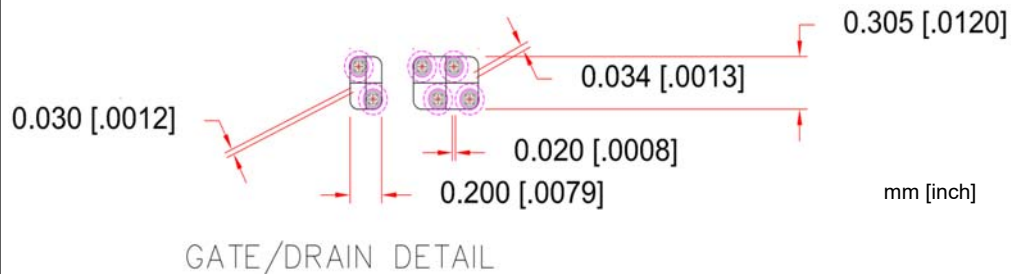
Test Structure Geometries



Undesirable Scrub Marks



Ultra-fine Pitch Geometries

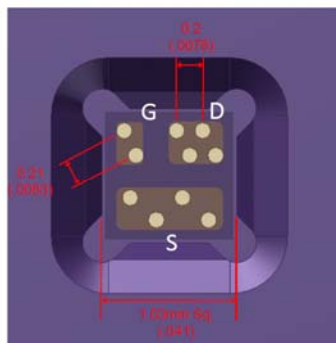


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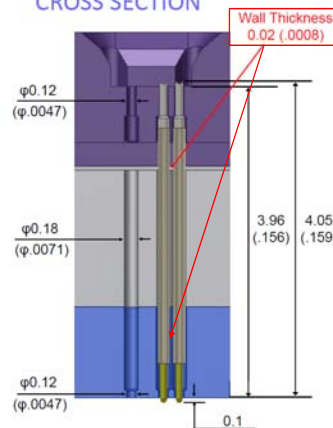
Contactors/Socket Design Solution

- Provide No-scrub Vertical Probe To Eliminate Bump Damage
- Deliver Adequate Gram Force For Good Contact, Yet Maintain CCC
- Identify Material For Micro-drilling With Excellent Side-wall Strength And Uniformity

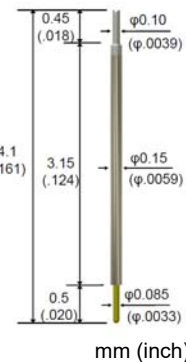
ARRAY DETAIL



CROSS SECTION



CONTACT PROBE



mm (inch)

Material

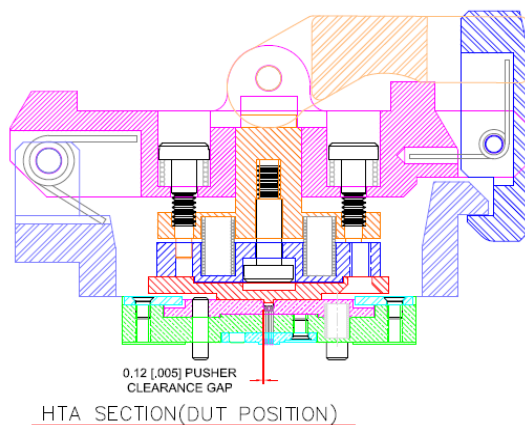
A Plunger	Pd Alloy
Barrel	Ni / Inner Au
Spring	SWP / Au-Plating
B Plunger	SK / Au-Plating

Electrical Spec

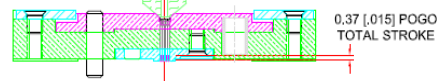
Cres(AVE)	< 160 mΩ
Current Rating	0.8A Continuous
Insertion Loss	-0.5dB @ 10GHz
Inductance	1.02 nH

Mechanical Spec

Pitch	0.2 mm [.0078 in]
Spring Force	10.0g(@0.3mm St) [0.35oz (@.0118 in St)]
Recommended Travel	0.3mm [.0118 in]



PUH SECTION(PRE-TEST POSITION)



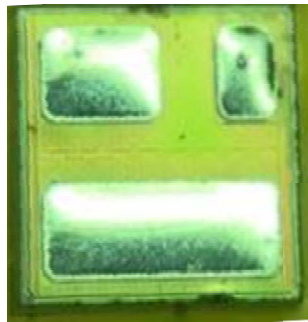
PUH SECTION(DUT POSITION)

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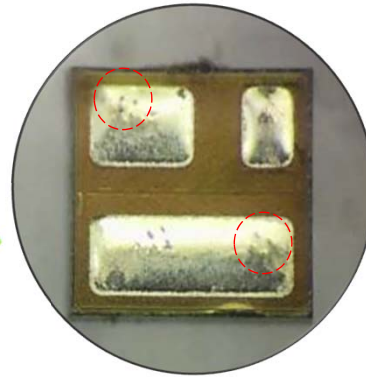
Customer Results = Qualification Successful

- No Device/Bump Damage
- 1000 Devices = **100% Yield**
- Photoveel II® Material Proven Robust For Spring Probe Guide Housing
- Repeatable Precise Vertical Motion Significantly Reduced Cleaning Frequency

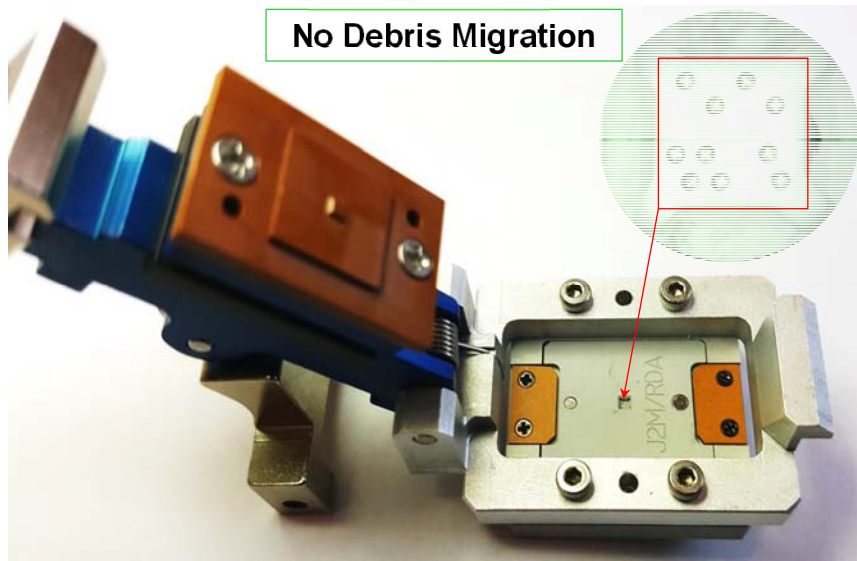
No Witness Marks - 1 Cycle



20 Cycles - No Damage



No Debris Migration



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