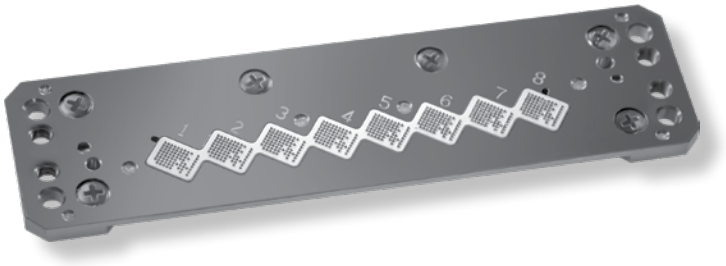
Volta Series Probe Head

Wafer Level Testing



The Volta Series Probe Head ensures improved efficiency in high reliability WLP, WLCSP and KGD testing.

Smiths Interconnect's Volta Series Probe Head addresses a need for reduced test time set-up and increased throughput in high reliability testing of Wafer Level Packages (WLP), Wafer Level Chip Scale Packages (WLCSP) and Known Good Die (KGD).

The Volta Probe Head is capable of testing sorted die for engineering development or failure analysis. Volta Probe Heads offer a high performance, cost-effective, easily maintainable alternative to cantilever and vertical probe card technologies.

Smiths Interconnect's high performance spring probe contacts are used in the Volta Series. It offers individually replaceable in the field with minimal tooling and technical expertise.

The state-of-the-art Volta Manual Actuator (Lid) design allows sorted die tests, at all sites, simultaneously. The unique lid design eliminates the possibility of die cracking even after repetitive testing. This feature enables Probe Card bring-ups prior to even wafer availability.

Smiths Interconnect's highly proficient lab and engineering capabilities include design validation, RF measurements and custom simulations including Probe Card Analyzer (PCA) test capability in Outgoing Quality Assurance.

Features

- Proprietary engineered plastic and machined ceramic for improved planarity allowing increased site to site test parallelism
- Customized footprint with component clearance close to Device Under Test (DUT)
- Probe Head to PCB alignment by guide pins with optional fiducials
- Lid design options include individual spring loaded device plunger and floating device guide
- Easy maintenance and quick installation
- Field repairable
- Compatible to industry standard interval cleaning

Benefits

- Long product life
- Increased test throughput
- Enables higher signal integrity performance
- Reduced test set-up time
- Lower cost of ownership

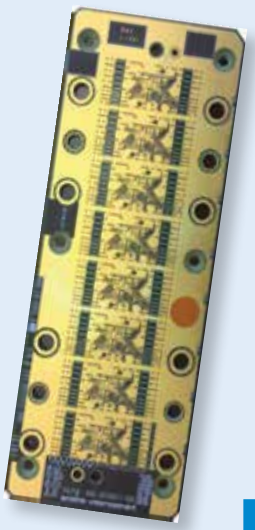
Value Proposition

World-class Technology	Non-plated noble material spring probe contact Optimized contact force for low and stable contact resistance Higher compliance compared to traditional vertical, cobra or pyramid contact technologies Sorted die test capability for test development Probe Card Analyzer (PCA) validation capability Suited for tri-temp test Replacement for cantilever and vertical probe card technologies Available for 200, 300, 350, 400 (or above) µm pitch applications
Superior Durability	Metal frame with removable cartridge Proprietary engineered plastic material for high rigidity Easy maintenance and field repairable 100% in-house manufacturing
Optimized Design	Improved structure based on finite element and Monte Carlo analyses Machinable ceramic material option for increased planarity Excellent site to site coplanarity High test parallelism (over 32 sites) 4-pt pin crown (less bump damage)
Exceptional Performance*	High Current Carrying Capacity (CCC) Excellent DC and RF performance Low and stable contact resistance Reduced signal path Long product life

* Refer to the Volta Series Probe Specifications

Volta 200 Fan-out PCB

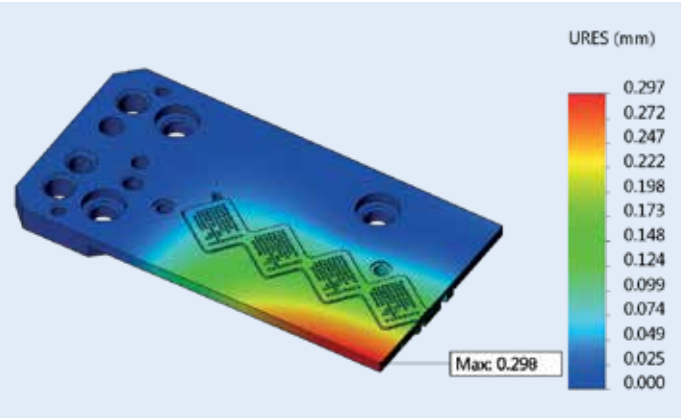
1. Fan-out routing approximately 600 pins from 200µm to ≥0.8mm per site; up to 10 sites
2. Identical routing for each site in parallel configuration
3. Up to 6 layers of Signal I/Os using laser stacked micro via
4. Up to 10 layers of Ground and Power I/Os; 18 layers maximum
5. Typical board size is 127x51 mm (1.5 mm thickness)
6. Fiducial Pads for accurate Probe Head true position
7. Optimized low loss material for high speed performance



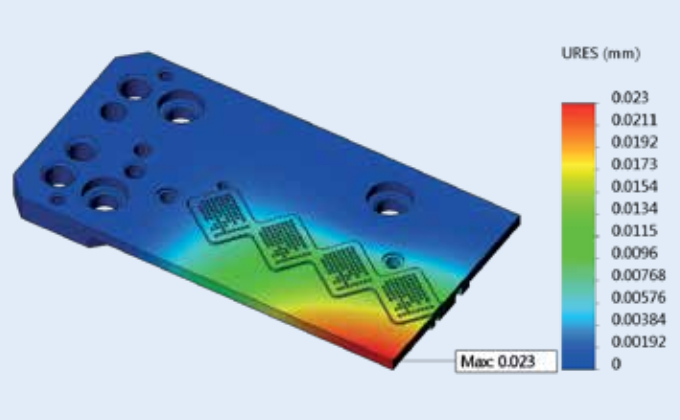
Manual Actuator for Sorted Die Test

Structural Simulation

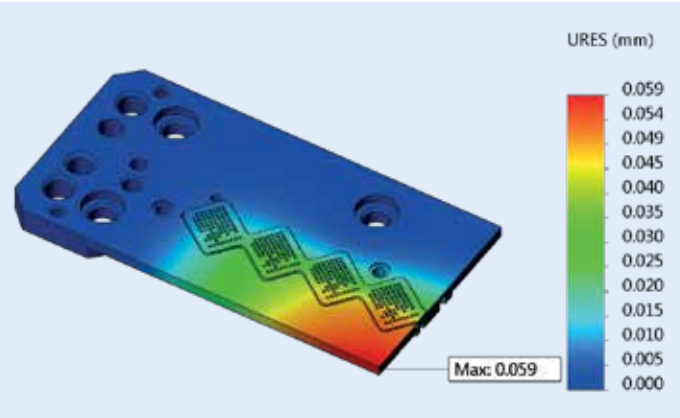
Probe Head Preload Deflection FEA Analysis



Ceramic PEEK Frame & Body



SST Frame & Proprietary Material "PEEK Rigid" Body



SST Frame & Material "PI-1" Body

Max Deflection Due to Preload

	Ceramic PEEK Frame & Body	Stainless Steel Frame & Proprietary Material "PEEK Rigid" Body	Stainless Steel Frame & Material "PI-1" Body
Max Deflection	0.298 mm	0.023 mm	0.059 mm

Volta Series Probe Specifications

Volta Series Specifications		Volta 200	Volta 300	Volta 350	Volta 400	
		**851-0012074-H01	*102121-H00	*102119-H00	**102120-H00	
Wafer I/O Pitch		200 µm	300 µm	350 µm	400 µm	500 µm
Minimum Probe Depth (At Test)		2.85 mm	3.80 mm	3.50 mm	2.90 mm	2.90 mm
Probe Travel	Wafer Side	230 µm	250 µm	300 µm	300 µm	300 µm
	PCB Side	160 µm	150 µm	150 µm	150 µm	150 µm
Spring Material		music wire	stainless steel	stainless steel	stainless steel	stainless steel
Device Side Contact Material		Homogenous				
Probe Tip Shape		4-Point Crown				
Spring Force		10 gf	17.5 gf	16 gf	17 gf	17 gf
Contact Resistance		< 250 mΩ	< 100 mΩ	< 70 mΩ	< 50 mΩ	< 50 mΩ
Continuous Current Carrying Capacity (Room Temp.)		1.2A	2A	2.50 A	3A	3A
Insertion Loss (Pattern: R-S-R @ -1 dB)		22 GHz	20 GHz	20 GHz	20 GHz	10 GHz
Loop Inductance		0.56 nH	0.95 nH	0.92 nH	0.82 nH	0.99 nH
Capacitance		0.22 pF	0.39 pF	0.41 pF	0.30 pF	0.35 pF
Working Temperature		-55° to 120°C	-55° to 150°C	-55° to 150°C	-55° to 150°C	-55° to 150°C
Max. Number of Test Sites		Defined by the FEA [Total pin count at a defined area is the limit]				
Sorted Die Test Feature (Alignment Plate and Manual Actuator)		Yes	Yes	Yes	Yes	Yes
Individual Contact Replacement		Yes	Yes	Yes	Yes	Yes

Notes:
* Suitable for engineering plastic and machined ceramic
** Suitable for engineering plastic only

Global
Support

UK Headquarters

- London, UK
  +44 20 7004 1600
  info.uk@smithsinterconnect.com

US Headquarters

- Stuart, FL
  +1 772 286 9300
  info.us@smithsinterconnect.com

Americas

- Costa Mesa, CA
  +1 714 371 1100
  info.us@smithsinterconnect.com
- Milpitas, CA
  +1 408 957 9607 x 1125
  info.us@smithsinterconnect.com
- Stuart, FL
  +1 772 286 9300
  info.us@smithsinterconnect.com
- Hudson, MA
  +1 978 568 0451
  info.us@smithsinterconnect.com
- Northampton, MA
  +1 413 582 9620
  info.northampton@smithsinterconnectinc.com
- Tampa, FL
  +1 813 901 7200
  info.tampa@smithsinterconnectinc.com
- Kansas City, KS
  +1 913 342 5544
  info.us@smithsinterconnect.com
- Salisbury, MD
  +1 800 780 2169
  info.us@smithsinterconnect.com
- Thousand Oaks, CA
  +1 805 267 0100
  info.thousandoaks@smithsinterconnectinc.com

Europe

- Deggendorf, Germany
  +49 991 250 120
  info.de@smithsinterconnect.com
- Genoa, Italy
  +39 0 10 60361
  info.it@smithsinterconnect.com
- Dundee, UK
  +44 1382 427 200
  info.dundee@smithsinterconnect.com
- Rouen, France
  +33 2 32 96 91 76
  info.fr@smithsinterconnect.com
- Elstree, UK
  +44 20 8236 2400
  info.uk@smithsinterconnect.com

Asia

- Shanghai, China
  +86 21 2283 8008
  info.asia@smithsinterconnect.com
- Suzhou, China
  +86 512 6273 1188
  info.asia@smithsinterconnect.com
- Singapore
  +65 6846 1655
  info.asia@smithsinterconnect.com