TestConX 中国™ China

November 13, 2025
Shanghai

www.testconx.org

Test Solution Enables 224 Gbps PAM4, High Power & High Pin Count Requirements

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TestConX中国™ China

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smiths interconnect

Contents

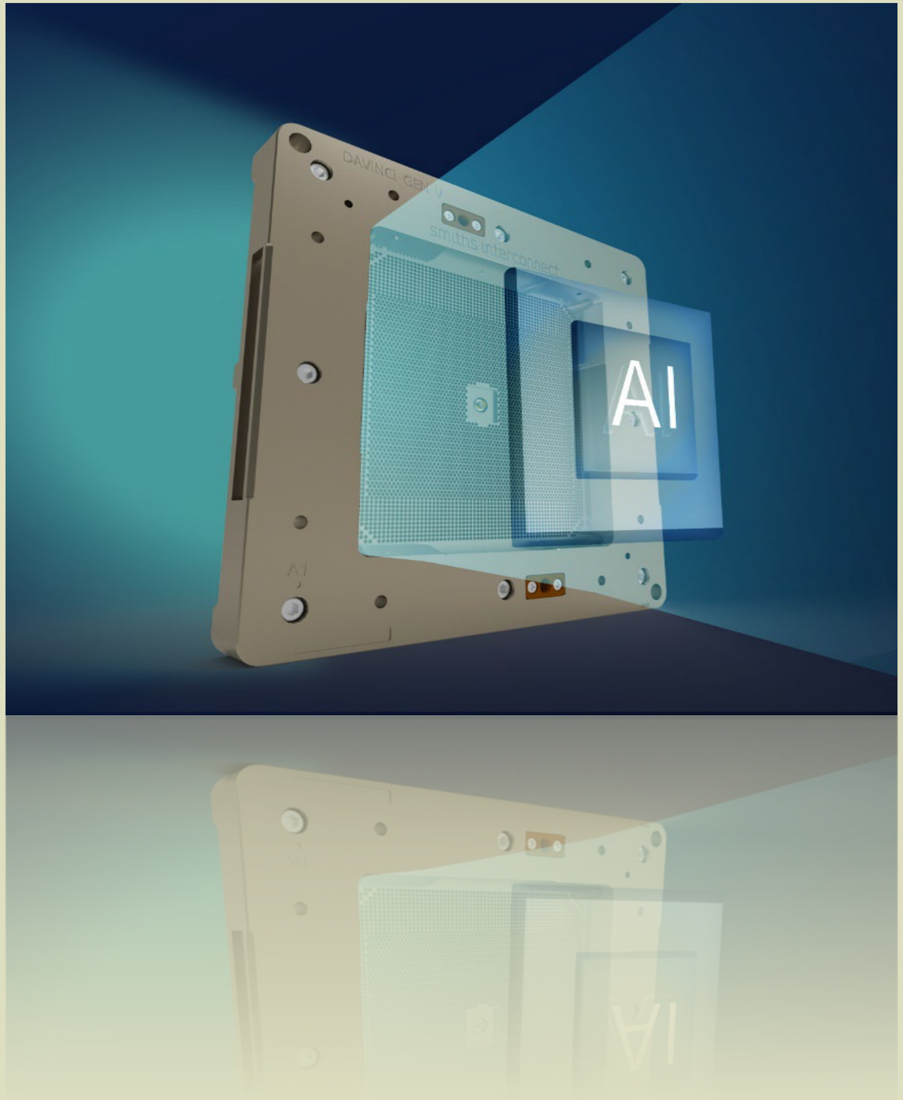
Today's Test Challenges

- High Speed
- High Pin Count
- High Power
- High Density
- High Current
- High Warpage

DaVinci Gen V | Compelling Story

Latest Co-axial product – DaVinci Gen V.

- Impedance Tunability to next-generation IC requirement.
- Hi-Coplanarity accommodation
- Excellent DC performance
- Full compatibility with existing test hardware

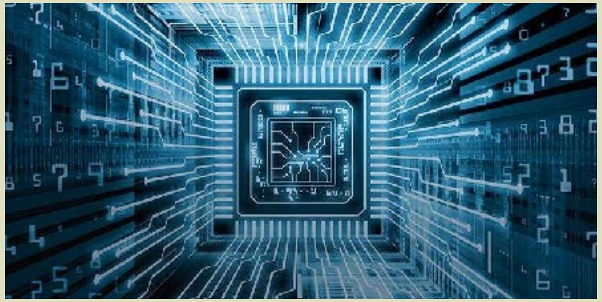


DaVinci Gen V | Applications

Data Centers / Cloud Computing

AI / Data Science

High-Performance Computing

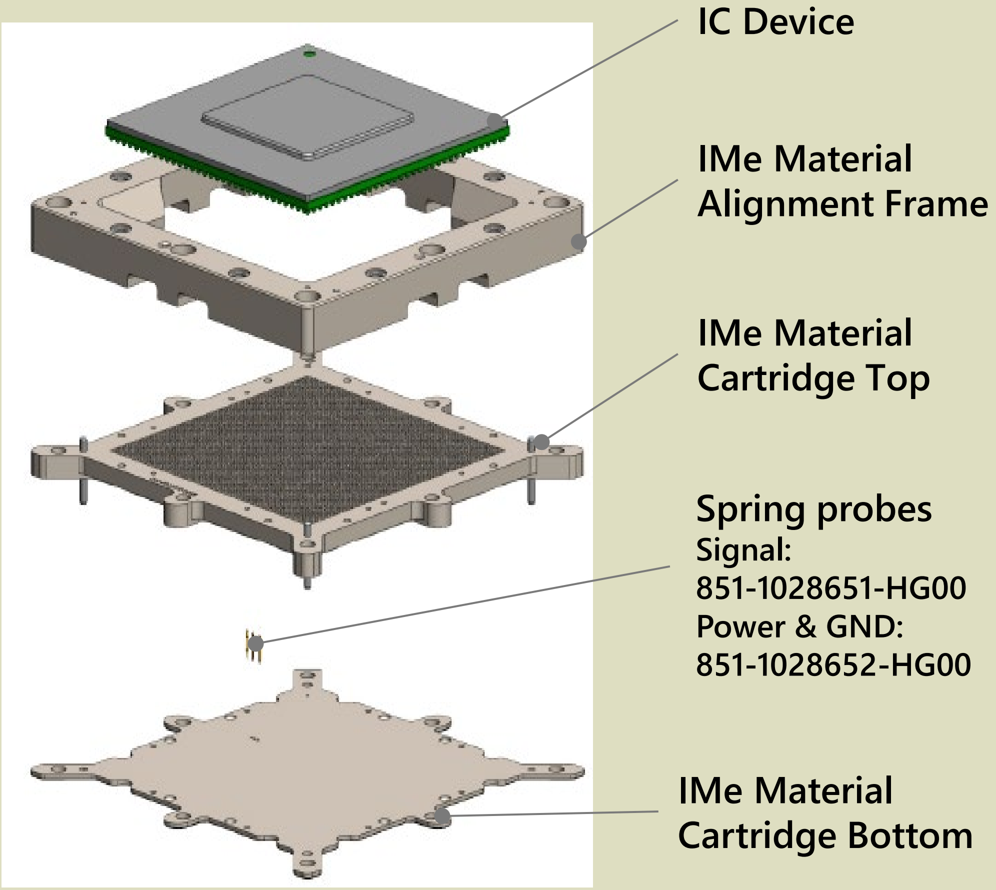


Autonomous Vehicles

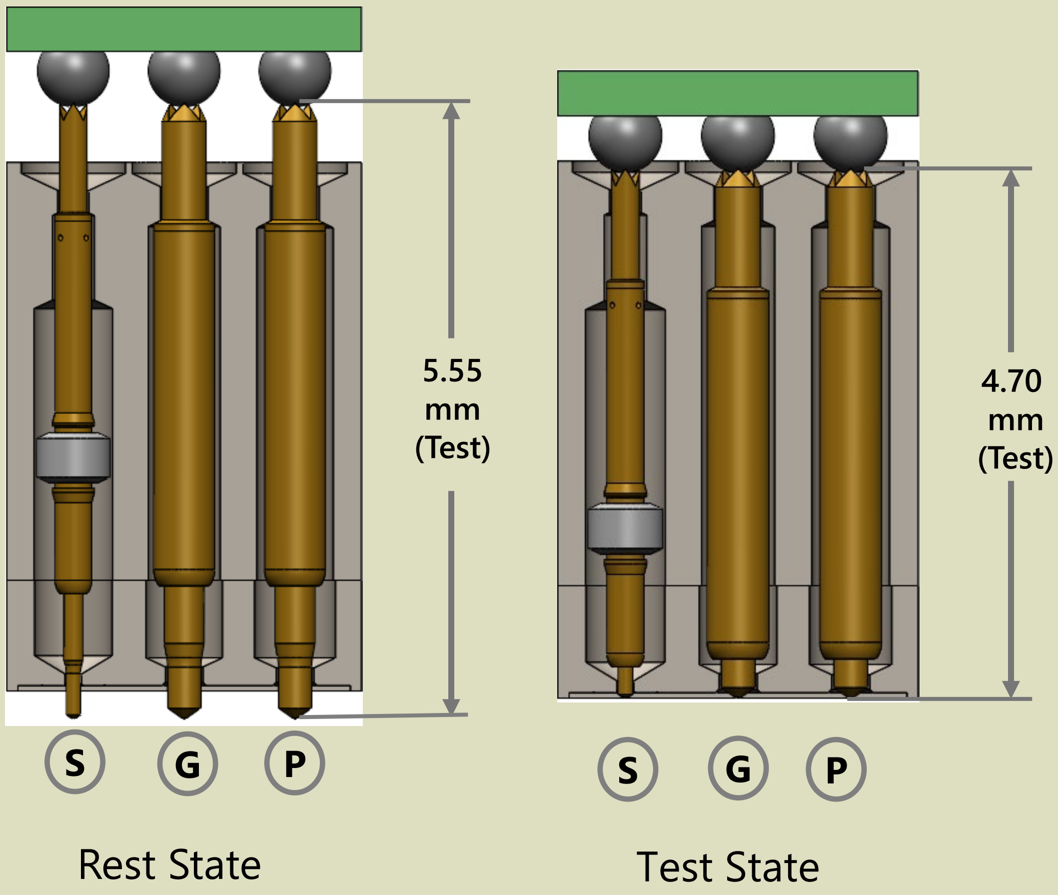
Product	CPU	GPU	Memory	GPU Memory	GPU Memory Bandwidth	Tensor/AI Core	Form Factor
Data Center / Cloud Computing	4~5.4 GHz up to 192 Cores	220+ Compute Units @ 1.9GHz	DDR5/DDR6	140GB HBM4	2039 GB/s	Up to 192 DPU Cores	Socket/SXM/ OAM/PCIe 5
AI / Data Science	192 CPU Cores	280+ Compute Units @ 2.6GHz	480 GB DDR6	282GB HBM4	10 TB/s	256 Tensor Cores	Socketed/ Rack mount
High Performance Compute	4~5.2 GHz up to 128 Cores	240 + Compute Units @ 2.2 GHz	LPDDR5X	282GB HBM4	10 TB/s	320 Tensor Cores	SXM/OAM/ PCIe 5
Autonomous Vehicles	16-24 Core CPU	>380 Compute Units	DDR5	128GB HBM3	4 TB/s	>14 instance Cores	SXM/OAM
Network Interface Component	32 Arm Core CPU	240 Compute Units	DDR5	80GB HBM3	2 TB/s	256 Tensor/AI	SXM/OAM/ PCIe 5
Network Accelerators	36 Core @ 2.8 GHz		16 GB DDR5		400 GB/s		PCIe Gen5

DaVinci Gen V | Socket Structure

- **DaVinci Gen V Socket Structure**



- **Illustration of Probes (0.8-1.0 Pitch)**



Key Product Features and Technical Highlights

Product Features

- Solution for BGA, LGA and other variants
- Spring probe technology using homogeneous alloy with gold plated for better grounding
- RF Bandwidth > 84 GHz @ -1dB IL
- Short signal path 4.90 mm test height
- Impedance tuned to match system
- Consistent stable contact resistance 55 mΩ (Avg.)
- Hi-Coplanarity accommodation
- Tri-Temp socket design to support -55 °C to +150 °C
- Designed for manual test, bench test, and HVM production test using the same socket
- New Manufacturing process to top and bottom cartridge

Benefits

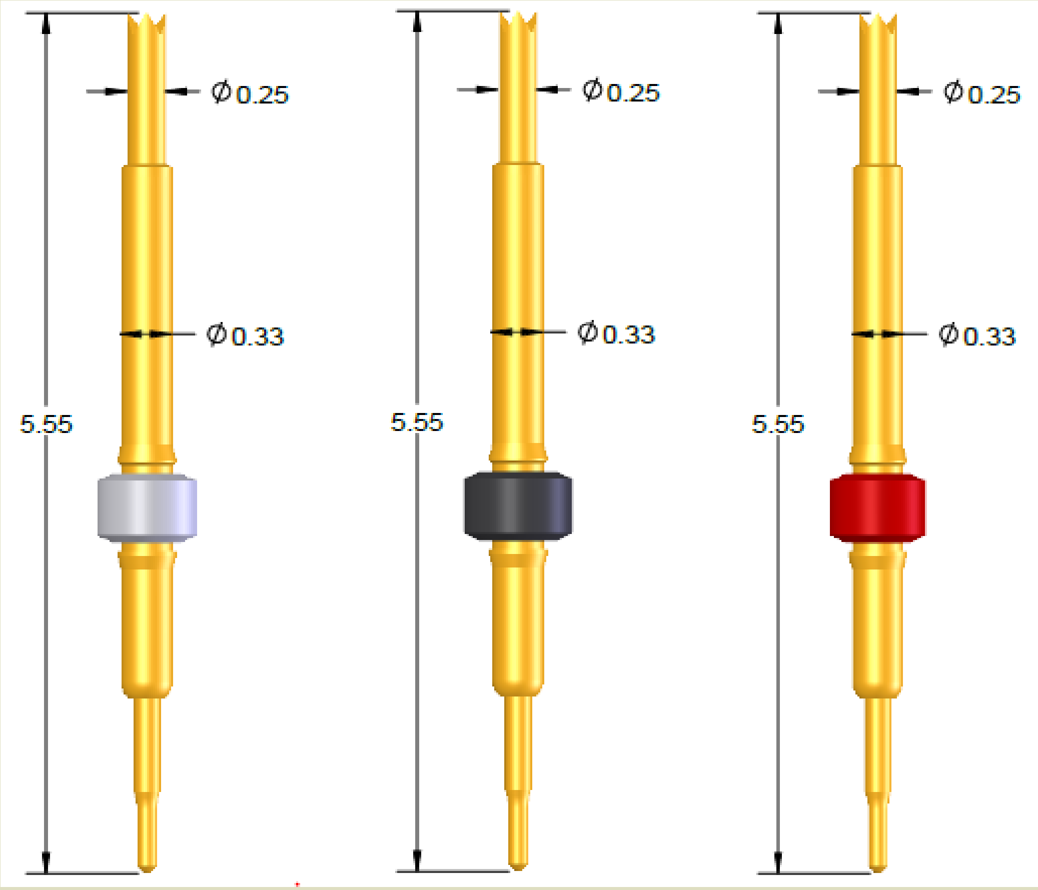
- Design adaptation to meet requirement
- Long contact life, tested to 500K insertions
- Impedance can match system or defined as needed
- Excellent DC performance
- Patented Insulated Metal socket housing for optimal signal integrity performance and strength
- Precision-machined socket housing ensures robust mechanical performance
- Field repairable, replace a single probe or full array
- Cleaning can be done while the system is running, using a cleaning surrogate
- Match existing PCB socket footprint and test hardware lead to cost saving for customers
- Shorter delivery time and improved overall costs of ownership

DaVinci Gen V | Impedance Tuning

Impedance Identified

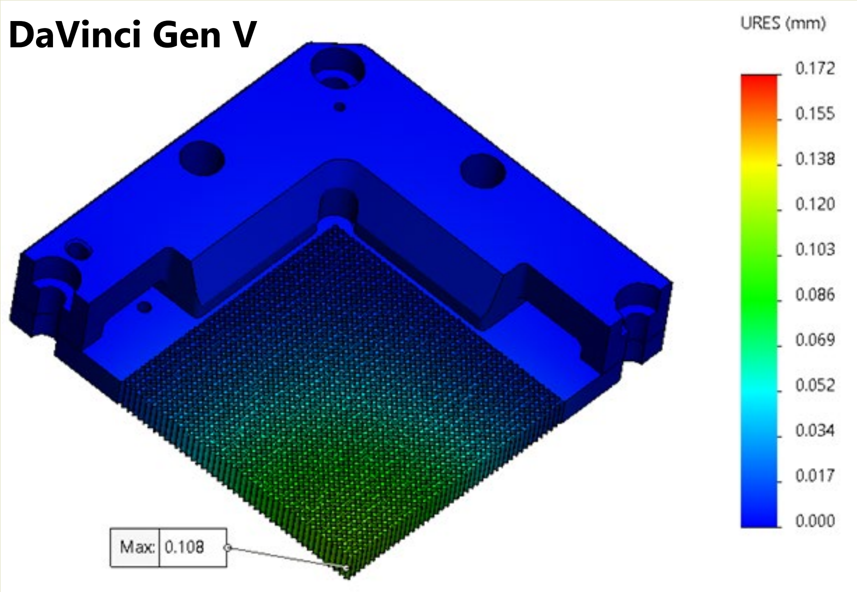
Colored Rings for ease of identification

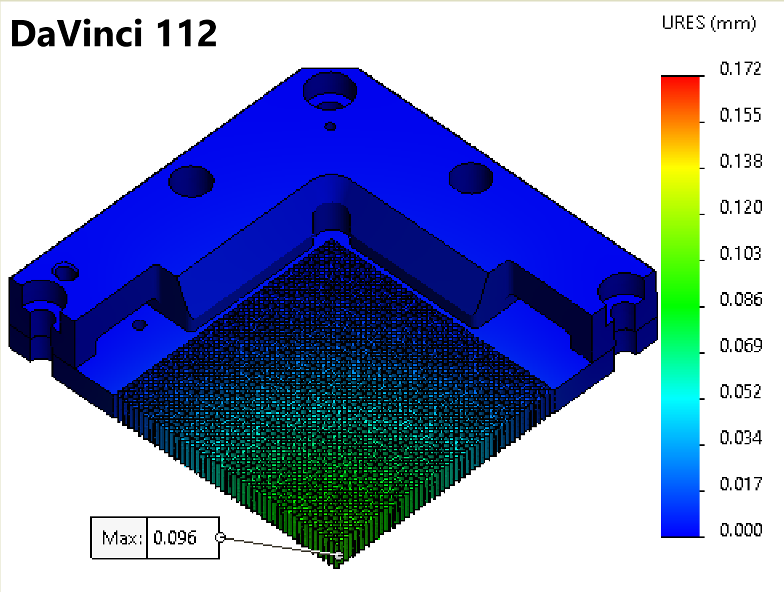
- Red ring = 40-42.5 Ohm
- Clear ring = 44.5- 45 Ohm
- Black ring = 50 Ohm

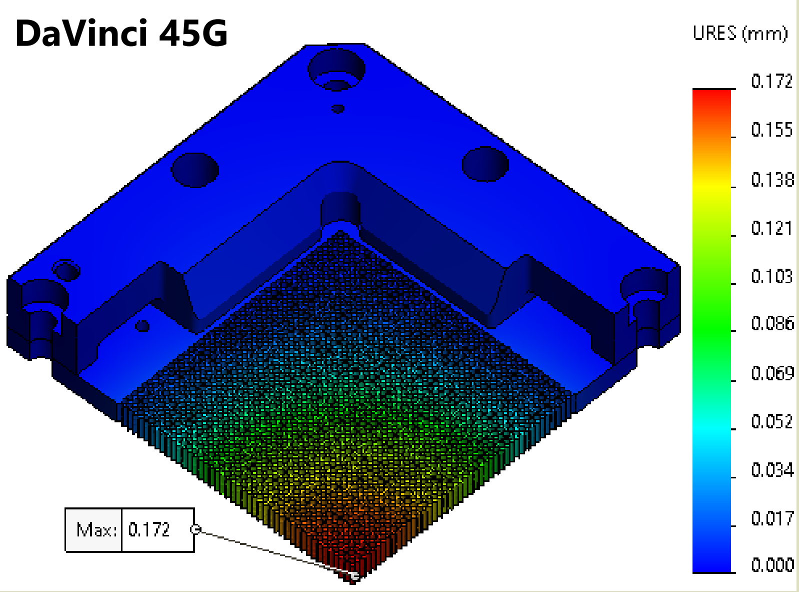


Impedance visually identified

DaVinci Gen V | Mechanical Performance







7569 BGA Preload FEA Analysis (Ball array 87 x 87 pattern, Pitch 0.80mm)

Socket	DaVinci Gen V	DaVinci 112	DaVinci 45G
Spring Probes P/N	851-1028651-HG00(S) 851-1028652-HG00(P&G)	851-1003338-H00(S) 851-1003345-HG02(P&G)	102209-000(S) 102118-000(P/G)
Spring Probes Preload	0.25mm	0.2mm	0.2mm
Max Deflection	0.108mm	0.096mm	0.172mm

Portfolio Spring Probes Specification

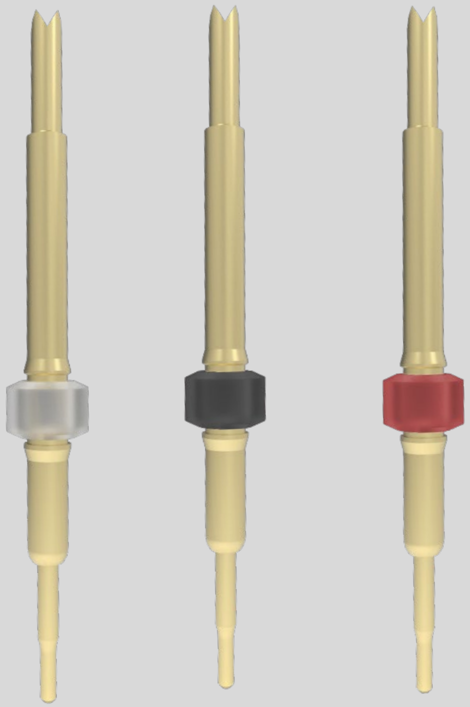
Mechanical Properties: 851-1028651-HG00/HGB01/HGR01

- Typical Application: BGA, LGA
- Minimum Pitch: ≥0.80 mm (0.65-0.70 mm ready in Q4-FY25)
- 851-1028651-HG00/HGB01/HGR01 = 40~50 Ohm impedance
- Probe Travel: 0.85 mm
- Contact Force: 25 Grams @ 0.85 mm (recommended travel)
- Spring Type: SS / Au plated
- Contact Type: 4-point crown
- Top Plunger: HG Alloy / Au Plated
- Barrel: Au Plated
- Bottom Plunger: Au Plated
- Probe Insulator: Teflon
- Operating Temperature: -55 ℃ ~ 150 ℃
- Spring Probe Life: Tested to 500K

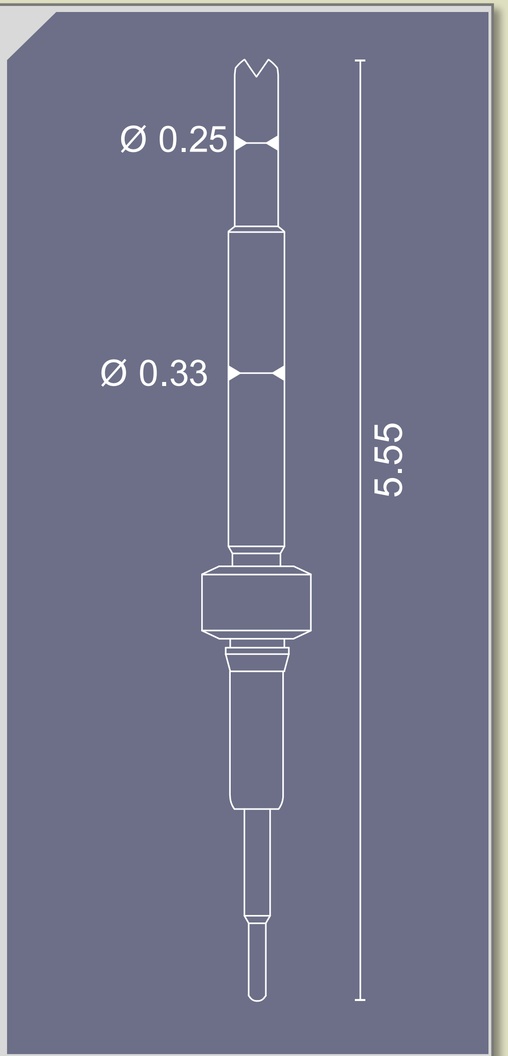
Electrical Properties

- Contact Resistance: <60 mΩ
- Current Carrying Capacity: 3.2 Amps
- Insertion Loss 43.7 GHz @ -1dB
- Return Loss 67 GHz @ -10dB
- Loop Inductance: 0.95 nH*
- Mutual Capacitance: 0.40 pF*

* in DaVinci structure



Signal Probe
851-1028651-HG00 (Clear-45 Ω)
851-1028651-HGB01 (Black-50 Ω)
851-1028651-HGR01 (Red-40 Ω)



Portfolio Spring Probes Specification

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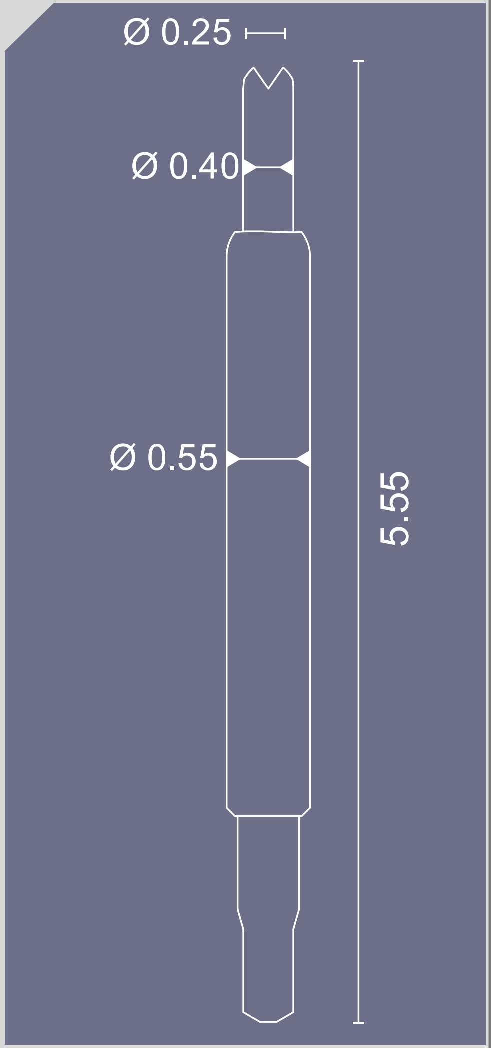
- Spring Type: SS / Au plated
- Contact Type: 4-point crown
- Top Plunger: HG Alloy / Au Plated
- Barrel: Au plated
- Bottom Plunger: Au plated
- Operating Temperature: -55 ℃ ~ 150 ℃
- Spring Probe Life: Tested to 500K

Electrical Properties

- Contact Resistance: <40 mΩ
- Current Carrying Capacity: 3.7 Amps
- Loop Inductance: 1.2 nH*
- Mutual Capacitance: 2.24pF*

* in DaVinci structure

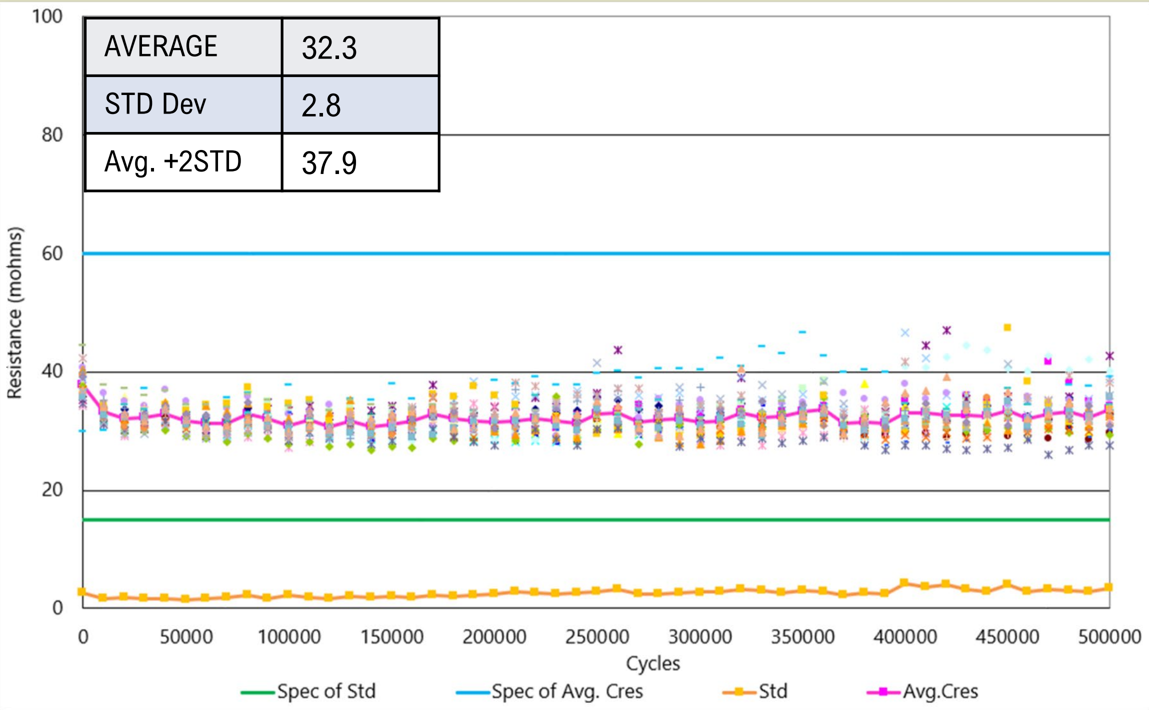
Power & GND Probe
851-1028652-HG00



DaVinci Gen V | LCT (Life Cycle Test)

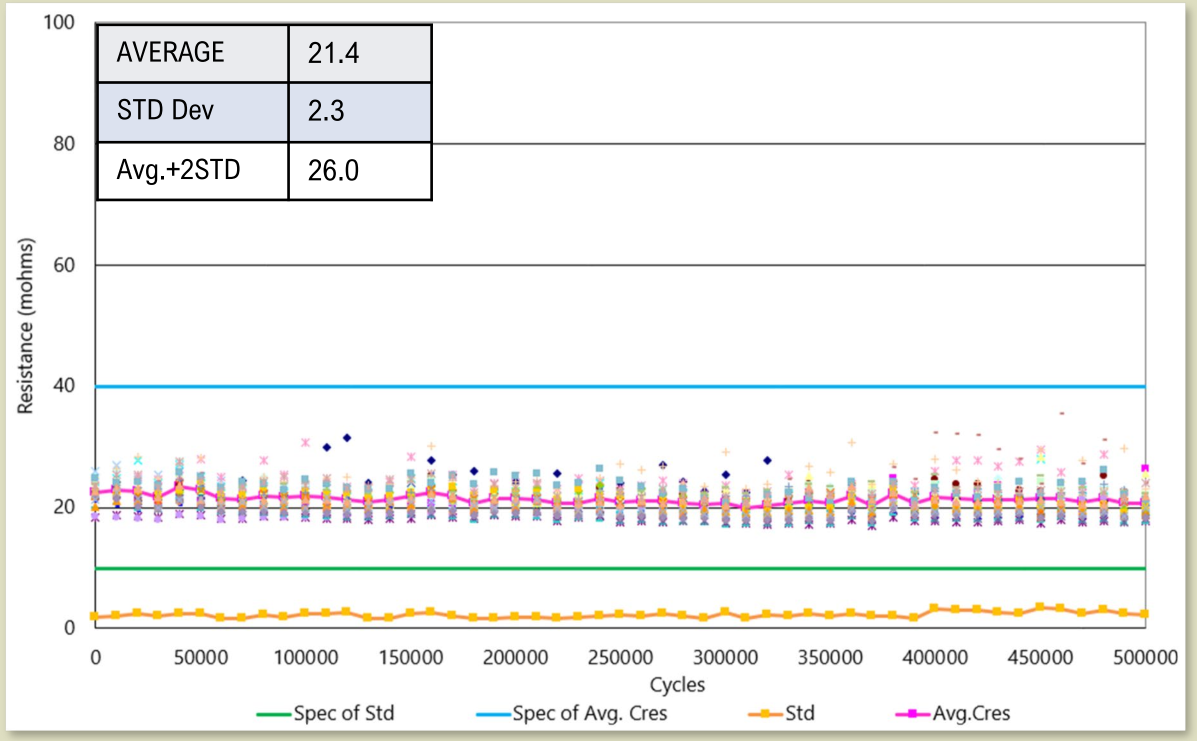
Signal Spring Probe 851-1028651-HG00

AVERAGE	32.3
STD Dev	2.8
Avg. +2STD	37.9



Power & GND Spring Probe 851-1028652-HG00

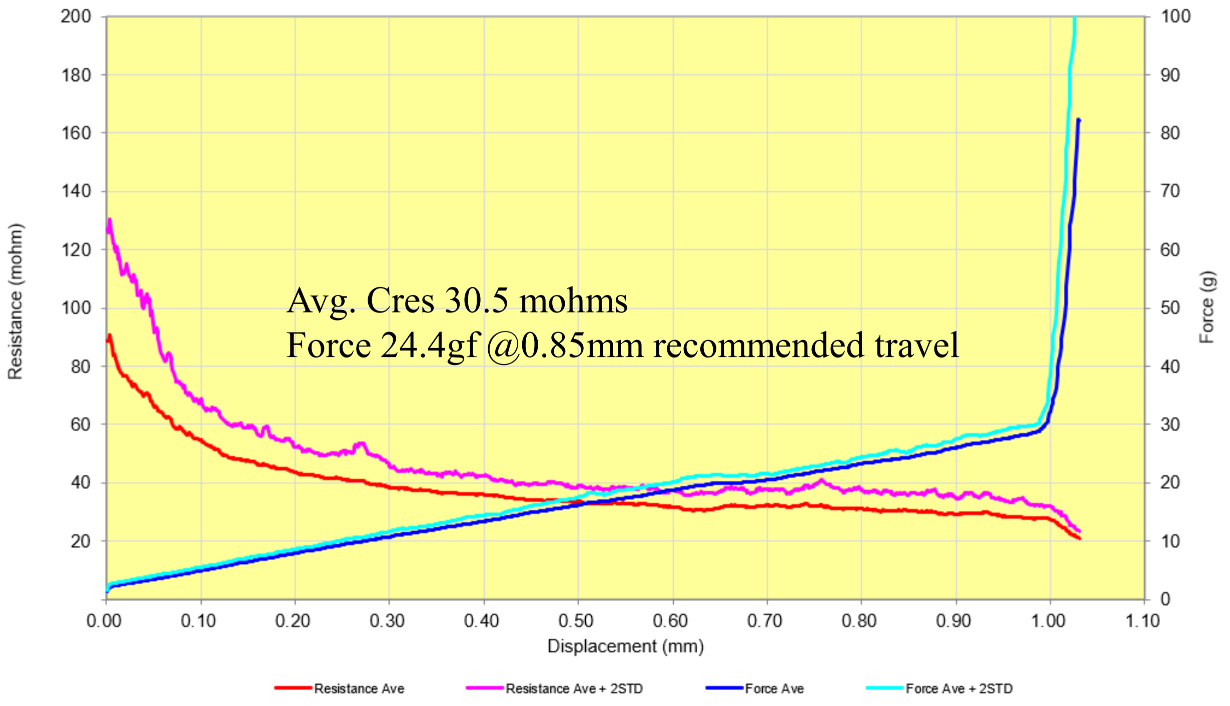
AVERAGE	21.4
STD Dev	2.3
Avg.+2STD	26.0



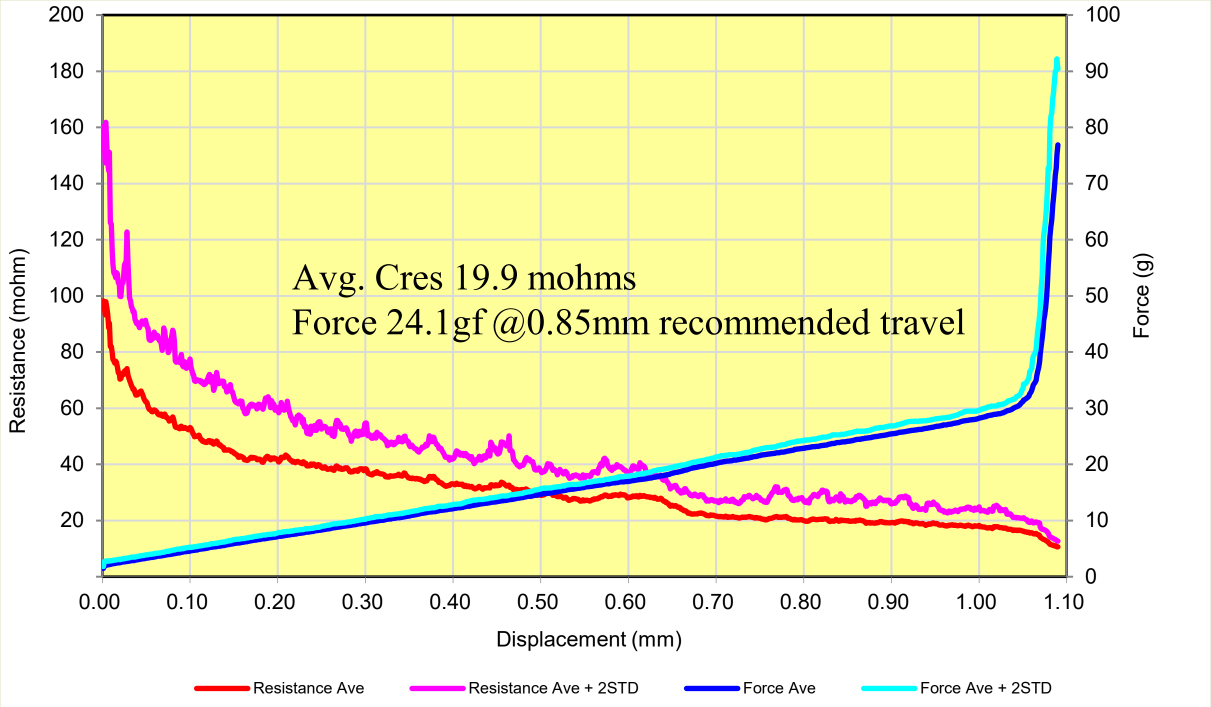
500,000 insertions @ Ambient Temperature

DaVinci Gen V | Spring Probes FDR

Signal Spring Probe **851-1028651-HG00**

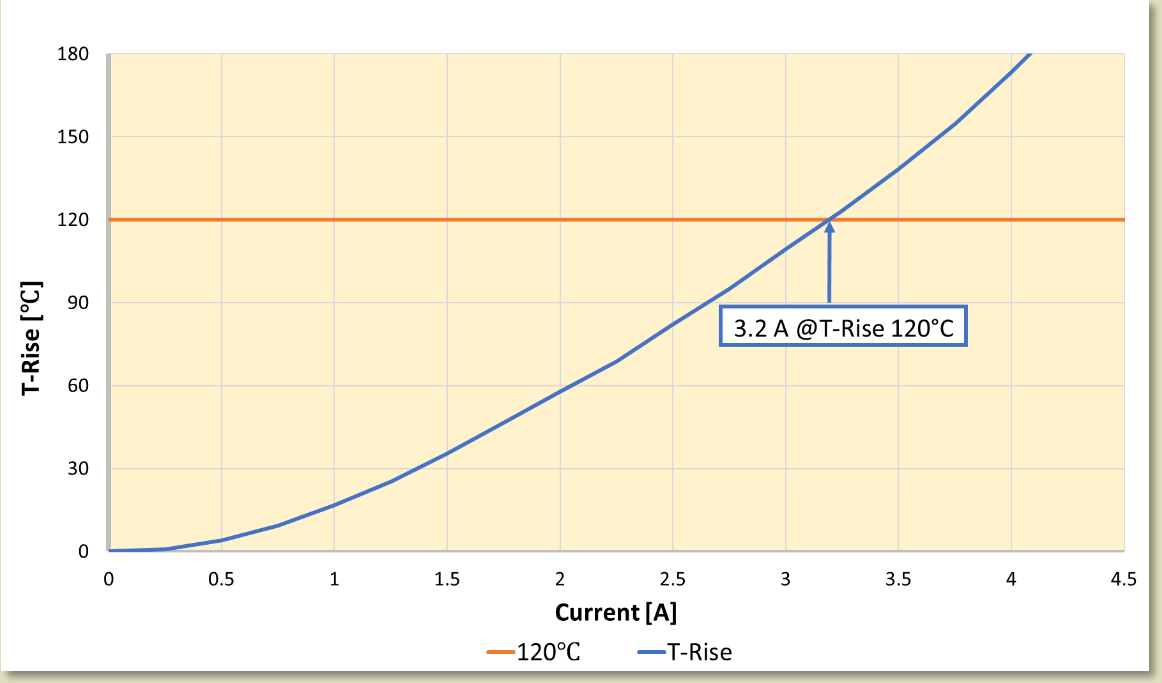


Power & GND Spring Probe 851-1028652-HG00

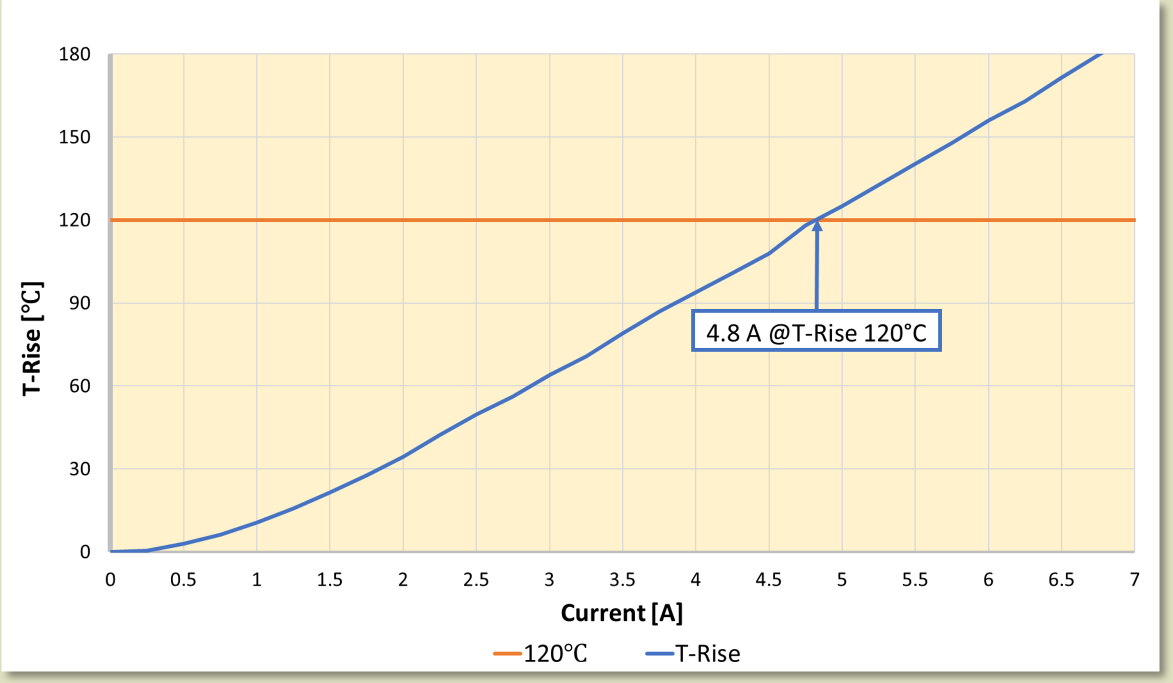


Spring Probes CCC (Current Carrying Capacity)

Signal Spring Probe **851-1028651-HG00**



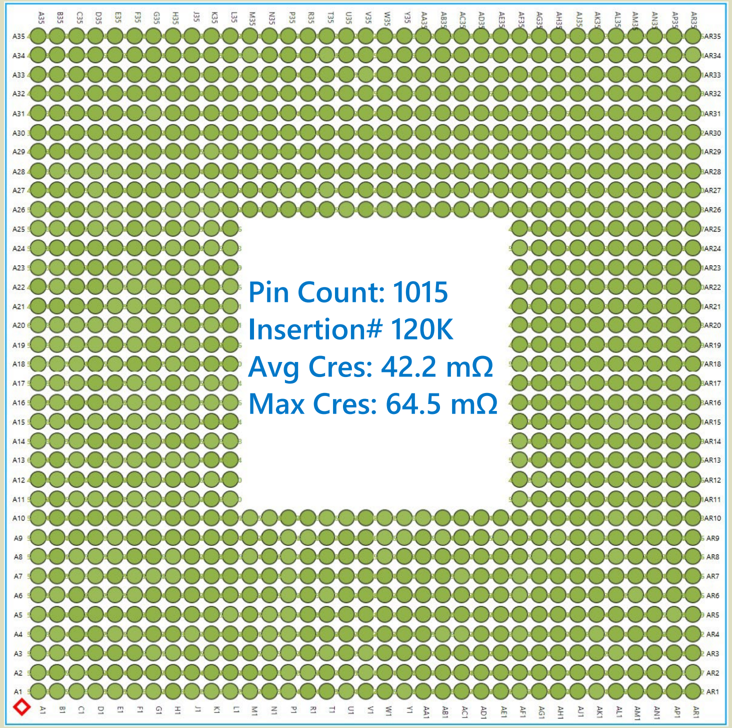
Power & GND Spring Probe 851-1028652-HG00



Current Capacity Test - Single Pin in Free Air
Max T-Rise (C) Vs Current (A)

Life Span Study 851-1028651-HG00

Insertion Number	Average Cres (mOhms)	Max Cres (mOhms)	Std Dev
Insertion #10k	41.7	73.6	3.9
Insertion #20k	42.4	65.9	3.6
Insertion #30k	41.5	62.2	3.5
Insertion #40k	41.2	68.2	3.5
Insertion #50k	41.6	64.3	3.7
Insertion #60k	41.7	81.3	3.6
Insertion #70k	41.9	71.7	3.6
Insertion #80k	41.8	82.4	3.6
Insertion #90k	41.9	66.7	3.5
Insertion #100k	42.0	67.0	3.7
Insertion #110k	42.2	60.6	3.8
Insertion #120k	42.2	64.5	3.7

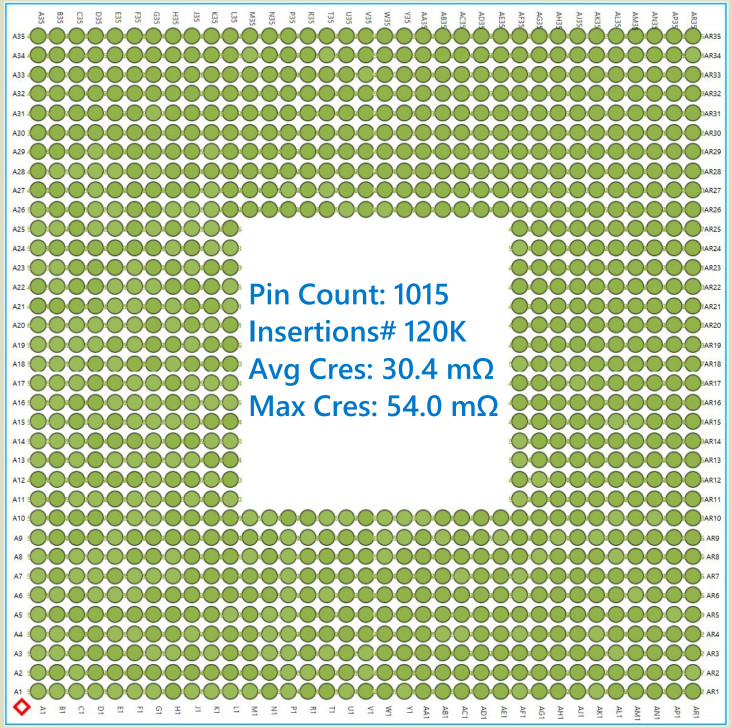


Unit: mΩ

- MPT is referring Modus Parametric Tester, which is an equipment to measure contact resistance in socket.

Life Span Study 851-1028652-HG00

Insertion Number	Average Cres (mOhms)	Max Cres (mOhms)	Std Dev
Insertion #10k	31.0	54.0	3.5
Insertion #20k	30.9	56.2	3.5
Insertion #30k	30.6	63.3	3.4
Insertion #40k	30.3	50.2	3.4
Insertion #50k	30.9	54.1	3.6
Insertion #60k	31.6	63.8	3.8
Insertion #70k	31.0	57.9	3.5
Insertion #80k	30.6	51.2	3.5
Insertion #90k	30.2	66.5	3.5
Insertion #100k	30.5	71.1	3.6
Insertion #110k	30.4	56.6	3.5
Insertion #120k	30.4	54.0	3.7



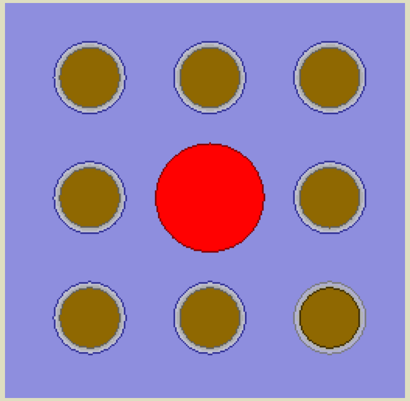
Unit: mΩ

- MPT is referring Modus Parametric Tester, which is an equipment to measure contact resistance in socket.

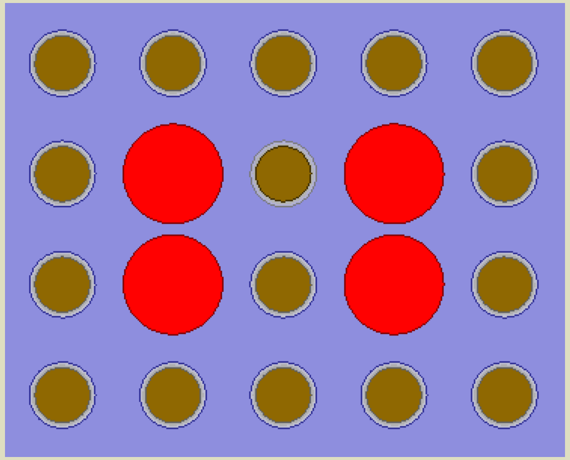
Signal Integrity (SI) Analysis & Test Pattern

- **Single-Ended: 8A Pattern (3X3)**
  - Terminated in 45 Ω(default) / 50 Ω
  - Pitch: 0.8 mm / 1.0 mm

- **Differential Pair: 2x10A Pattern(5X4)**
  - Terminated in 90 Ω (by default) / 100Ω
  - Pitch: 0.8 mm / 1.0 mm



- **G:** 851-1028652-HG00
- **S:** 851-1028651-HG00



Signal Pin: S **Return/GND:** G

Signal Integrity (SI) Performance Summary

Socket Cavity fine tune at SE Z = 42.5 Ω / Diff Z= 85 Ω

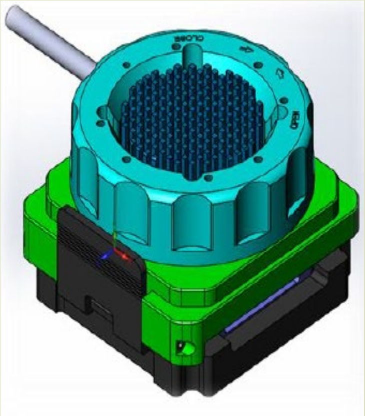
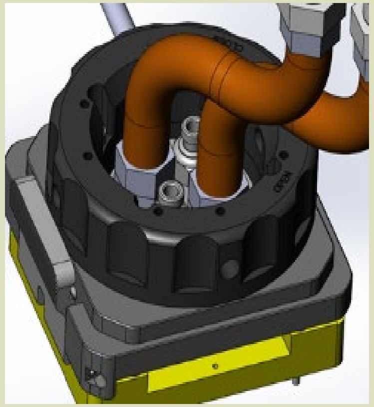
- Single-Ended: 8A (3x3 Array) Pattern)

Product	Data	Pitch (mm)	SE Z_0 (42.5 Ω)	IL @ -1dB (GHz)	RL @ -10dB (GHz)	RL @ -30dB (GHz)
DaVinci Gen V	Simulated	1.0	42.3~43.4	71.1	73.6	16.7

- Differential Pair: 2-10A (5x4 Array Pattern) (Simulated)

Product	Pitch (mm)	Diff Z_0 (85 Ω)	IL @ -1dB (GHz)	RL @ -10dB (GHz)	RL @ -30dB (GHz)	NEXT @ -40dB (GHz)	NEXT @ -60dB (GHz)	FEXT @ -40dB (GHz)	FEXT @ -60dB (GHz)
DaVinci Gen V	1.0	83.6~86.9	70.0	64.2	15.0	67.5	22.0	69.5	21.8

Thermal Solution | Heat Removal Lids


As next generation logic IC packages, network processors [NP], central processing units [CPU] and graphic processing units [GPU] become more powerful the amount of heat they generate increases exponentially. Thermal management is a challenge all device manufacturers and test houses must overcome.

- These ICs provide a critical contribution to the end product's functionality and represent a significant portion of its cost.
- Smiths Interconnect's Thermal Management Lid solutions are high value options, including air-chilled or liquid cooled technology, capable of dissipating up to 2x00 Watts.
- We develop our solutions to be compatible with existing test hardware footprints for simple integration, reducing test set-up time and overall cost. The off-the-shelf chiller unit is compact and uses very little space within the test lab.
- Smiths Interconnect's design team utilizes extensive system simulation models throughout product development to ensure an optimal solution for the specific test environment.

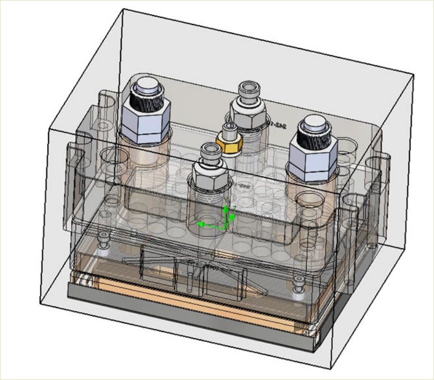
Smiths Interconnect Thermal Solutions Include:

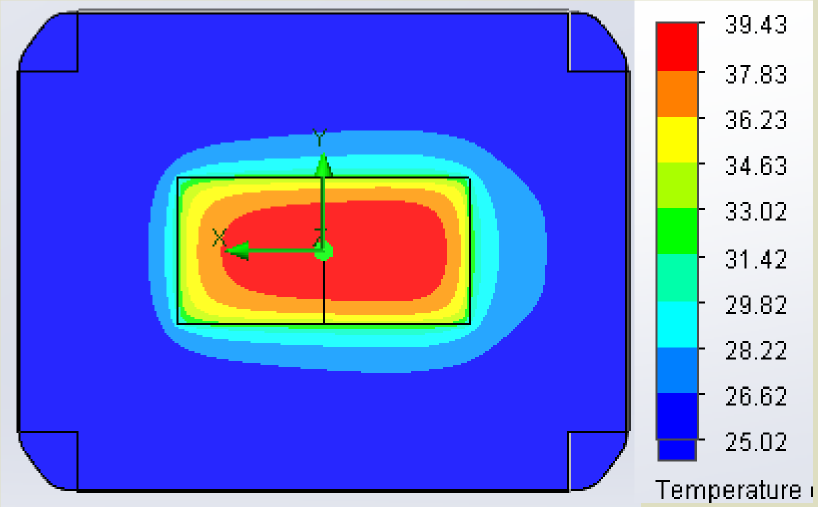
- Finned Heatsink
- Liquid Cooled Heatsink
- Heatpipe | Heatsink
- Hi-Perform LC with Chiller (with optional Purge)

Thermal Solution: Simulation and Validation MLCP

MLCP Simulation based on Actual Power distribution @ Rjc 0.06˚C/W		
Power (W)	Case Temp (°C)	Junction Temp (°C)
2100	30.4	81.3
2207	31.5	85

Simulation and Validation based on ceramic heater With higher heat density		
Power (W)	Validation Junction Temp (°C)	Simulation Junction Temp (°C)
1778	61.7	66.1





Summary

- As next generation challenges increase - high speed, high power, high pin counts, high current, and high density – sockets and liquid cooling solutions need increased performance. Smiths meets these challenges with the DaVinci Gen V product and others.

- Smiths continues to innovate solutions for future test needs and thermal challenges.

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