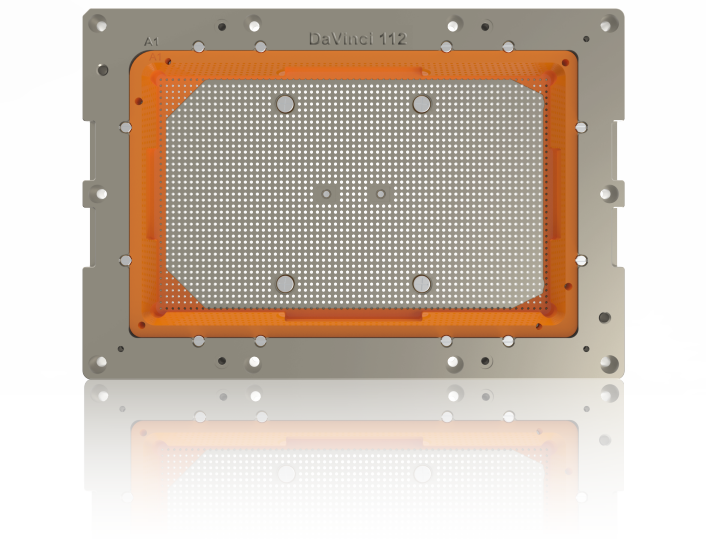
# DaVinci 112 Test Socket

## The Next Generation of High Speed Test Solutions




The DaVinci 112 test socket extends the 'DaVinci' Series with an innovative solution for testing the most complex functionality of ASICs (Application Specific Integrated Circuits).

These new systems have increased processing power by 5000 times and the current products can reach 5 petaFLOPS of bandwidth.

Addressing high speed signaling, device complexity and power requirements is leading to the largest Integrated Circuits ever manufactured, with pin count well over 4000 I/O's all working in tandem to meet the specification.

Testing these devices at full functionality is challenging. With hundreds of PAM-4 signals, the ability to isolate pin-to-pin cross-talk at the fundamental frequency below -40dB becomes critical.

The DaVinci 112 increases production yields and throughput, eliminating false faults and complete functional failures.

*PetaFLOPS and teraFLOPS are immense measures of processing speed. One petaFLOPS is equal to one thousand teraFLOPS.

**DaVinci 112 offers significant improvement of the cross-talk isolation over DaVinci 56**

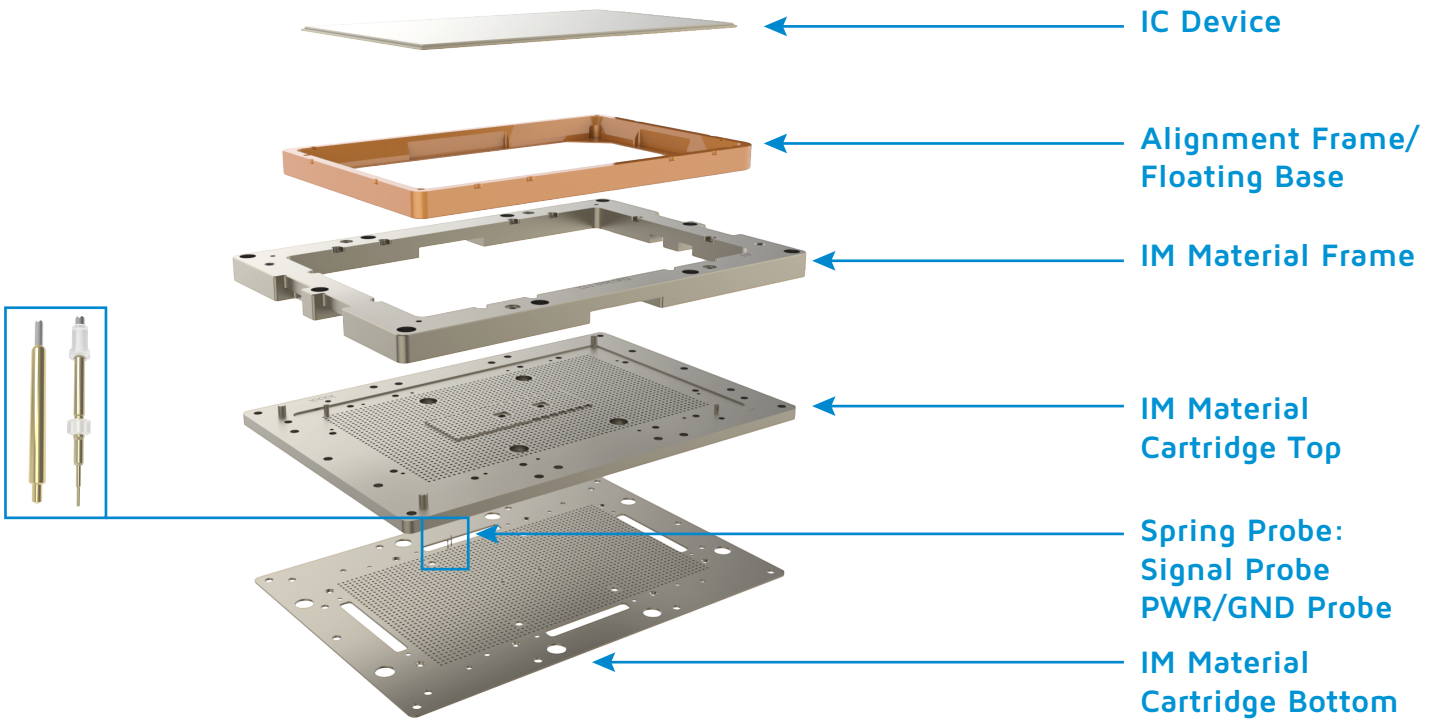
## Value proposition

- Designed for devices ≥70 mm$^2$ and over 4000 inputs/outputs and coplanarity tolerance of up to +/- 0.65 mm
- New ground probe design for cleaner power delivery and improved noise isolation
- Increased spring probe travel (0.8mm) to accommodate large device co-planarity tolerances
- Protection against socket deflection caused by large number of spring probes

## End Product Markets

- Wired Communication
- High Performance Computing
- Automotive
- Data Centers
- AI & Deep Learning

# Product Structure




## Product Features

- Solution for BGA, LGA and other variants
- Spring probe technology using Homogenous Alloy gold plated
- Short signal path  4.90 mm test height
- 43, 50 Ohm impedance (single ended)
- RF Bandwidth up to 40 GHz @ -1dB IL
- Consistent stable contact resistance 80 mΩ (Ave)
- Tri-Temp socket design to support -55 °C to +125 °C
- Designed for manual test, bench test, and HVM production test using the same socket
- GND block design configurable for System Impedance

## Benefits

- Long contact life, tested to 500K insertions
- Excellent DC performance
- Impedance can match system or defined as needed
- RF Bandwidth up to 40 GHz @ -1dB IL
- 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 without the need for additional training
- Cleaning and repair can be done without taking production equipment offline
- Match existing PCB socket footprint and test hardware lead to cost saving for customers

# Technical Characteristics

| | DaVinci 45G | | DaVinci 56 | DaVinci 112 |
|---|---|---|---|---|
| **Mechanical & Environmental** | | | | |
| Minimum Pitch | >0.7mm | 0.65mm | 0.8mm* | 0.8mm* |
| Compliance / Travel | 0.50mm | 0.40mm | 0.50mm | 0.8mm |
| Operating Temperature | -55˚ to +125˚C | | -55˚ to +125˚C | -55˚ to +125˚C |
| Life Span | 500,000 cycles | | 500,000 cycles | 500,000 cycles |
| **Electrical** | | | | |
| Loop Inductance | 0.71 nH | | 0.57 nH | 0.89 nH |
| Mutual Capacitance | 0.73 pF | | 0.68 pF | 1.19 pF |
| Contact Resistance | 80 mΩ | | <80 mΩ | <80 mΩ |
| Current Carrying Capacity | 3.0 A | | 3.0 A | 3.7 A |
| Bandwidth (-1dB) | 45 GHz / 26 Gbps | | 67 GHz / 56 Gbps | 67 GHz / 112 Gbps |

# IM Mechanical Performance

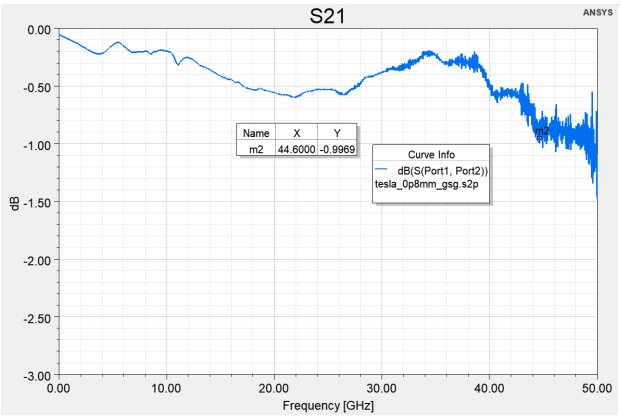
- Proprietary insulated IM Material exhibits least deflection as illustrated by below Max Deflection rates.

| Material Type | IM Material | Peak Ceramic | MDS-100 |
|---|---|---|---|
| DaVinci 45G 1745 pin BGA | 0.009mm | 0.085mm | 0.046mm |
| DaVinci 56 4096 pin BGA | 0.050mm | 0.210mm | 0.168mm |
| DaVinci 112 4096 pin BGA | 0.050mm | 0.210mm | 0.168mm |

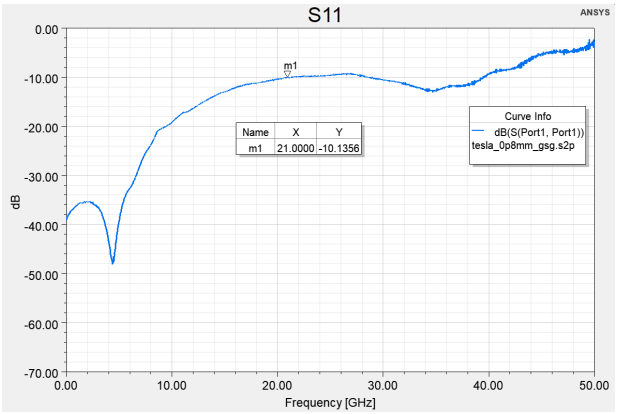
# Bandwidth & Frequency Measured Data

## DaVinci 45G Single Ended 0.8mm pitch probes - 8A Pattern (3x3 Array)

### Insertion Loss

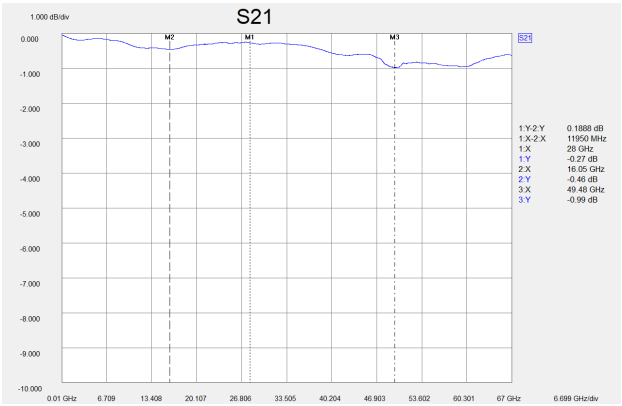



### Return Loss

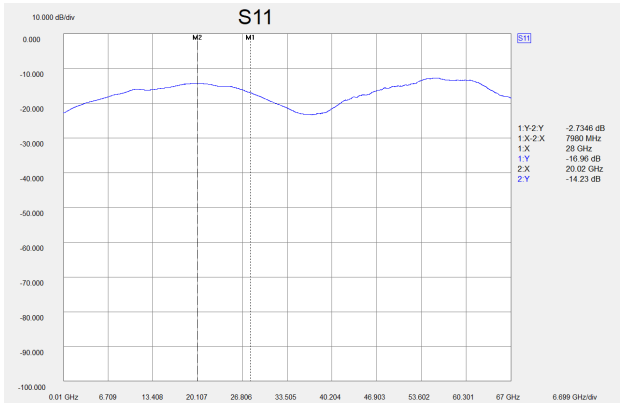



## DaVinci 56 Single Ended 0.8mm pitch probes - 8A Pattern (3x3 Array)

### Insertion Loss

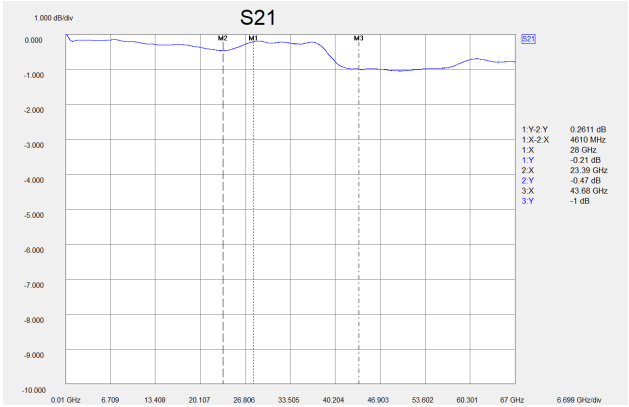



### Return Loss




## DaVinci 112 Single Ended 0.8mm pitch probes - 8A Pattern (3x3 Array)

### Insertion Loss




### Return Loss