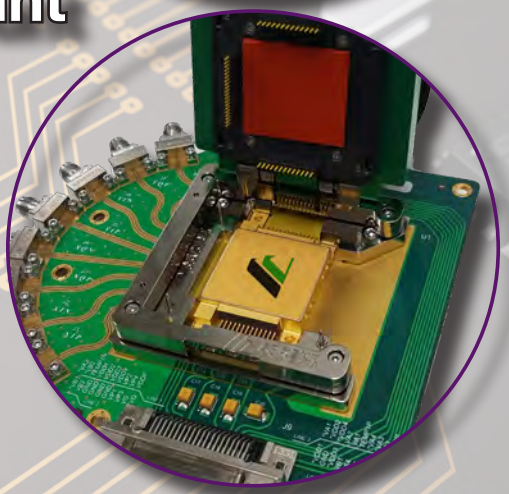
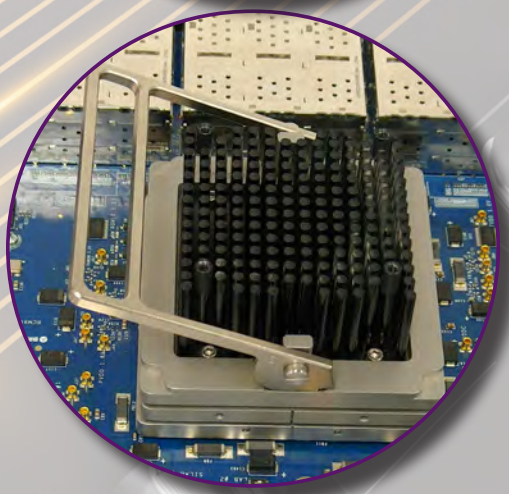
ARDENT CONCEPTS

Signal Integrity is our Passion

# SK™ Socket Series Catalog
# High Speed | Compression Mount





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# SK Series High Performance Sockets



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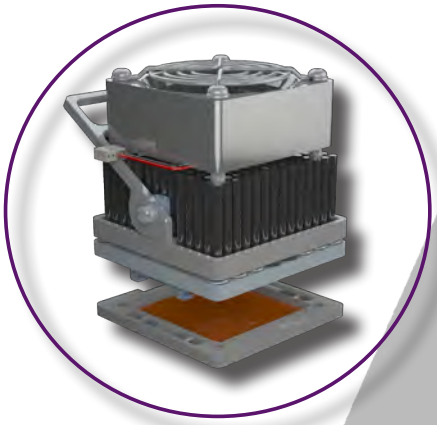
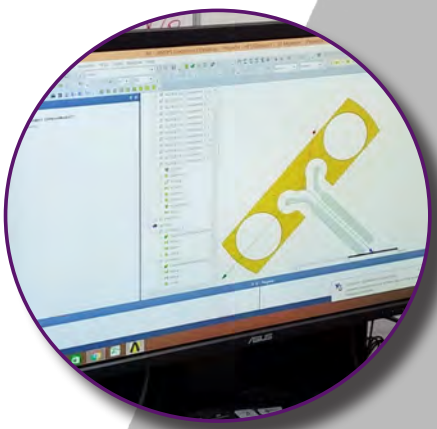
# SK Series High Performance Sockets

## Unmatched Design Services



## DESIGN

**Ardent engineers bring novel approaches to solving even the most difficult socket challenges by working with customers to identify their electrical and mechanical needs.**



## SIMULATE

**Advanced HFSS simulation lets our Signal Integrity Engineers ensure that our proprietary contacts will perform at the ever increasing speeds demanded by the markets we support.**

## MEASURE

**We recognize that simulation on its own is not always sufficient. Ardent's in house Signal Integrity Lab features 40 GHz & 67.5 GHz PNAs, and equipment to ensure that your sockets are measured to ensure success.**

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# SK Series High Performance Sockets

## Description

Engineers in test environments are focused on sockets that offer high performance at a reasonable cost. Ardent's patented compression mount contact technology which utilizes industry-leading alloys makes for a cost-effective and electrically robust socket solution. With designs supporting pitches down to 0.4 mm and speeds up to 40 GHz, Ardent sockets are being used in cutting edge BGA, LGA and other small form factor IC applications. With cycle lives of thousands of mating cycles, the electrical reliability & performance of our sockets can meet the most demanding application needs.

## Applications

SK Series Sockets are ideal for use in/with:

- › BGA/LGA/ASIC/FPGA
- › Optical Engines
- › "Butterfly" Gold Box Packages
- › Network Switches
- › Analog/Digital Converters
- › Defense/Aerospace
- › QFN/QFP/MEMS
- › Custom Applications

Socket Example

## Key Benefits

### Compression Mount

- Sockets can be easily mounted and de-mounted with a few screws encouraging re-use across board revisions

### Bandwidth & Performance

- Durable 40 GHz+ socket solutions offer low loss connection for high performing devices

### Design Flexibility

- Up to 70 x 70 mm package sizes
- Multiple lid and base design options
- OEM moldable designs available

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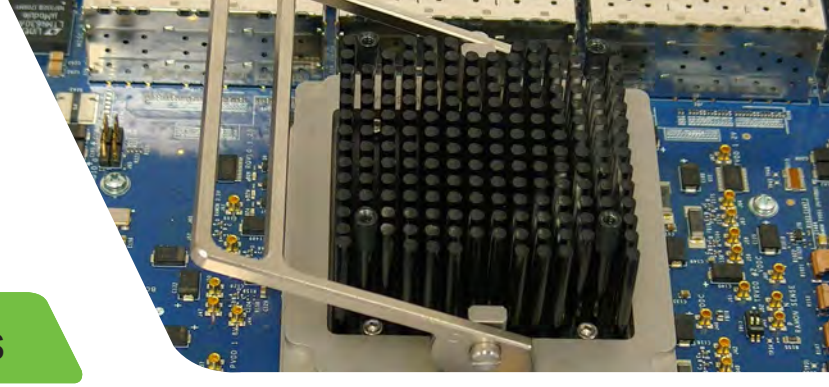
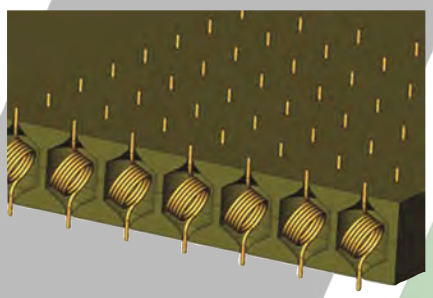


# SK Series High Performance Sockets

## Choose the Right Contact for Your Application

### Spring Probe™

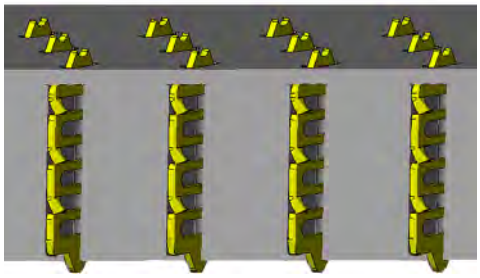
- Scalable solutions for sockets down to .4 mm Pitch
- Eliminates the barrel and the plunger from a traditional “pogo” style spring pin - Less mechanical components to fail
- Patented “wipe action” of the coils causes contact to behave like a solid element Instead of behaving like an inductor. The result is exceptionally clean AC performance in an extremly short electrical path



| Specifications | |
|---|---|
| Pitch | 0.4 mm and above |
| Frequency | 40 GHz+ |
| Insertion Loss | -1 dB at 40 GHz @ 1 mm pitch |
| Self-Inductance | .5 nH |
| Mated Height | .76 mm and above |

### Connect-R™

- Cost-Effective Automation Loaded Contacts
- High Performance
- Stamped Contact for Area Array Applications Down to .6mm Pitch



| Specifications | |
|---|---|
| Pitch | 0.8 mm and above (area), .6 mm and above (linear) |
| Frequency | 40 GHz+ |
| Insertion Loss | -1 dB at 40 GHz @ 1 mm pitch |
| Self-Inductance | .5 nH |
| Mated Height | 1.57 mm |

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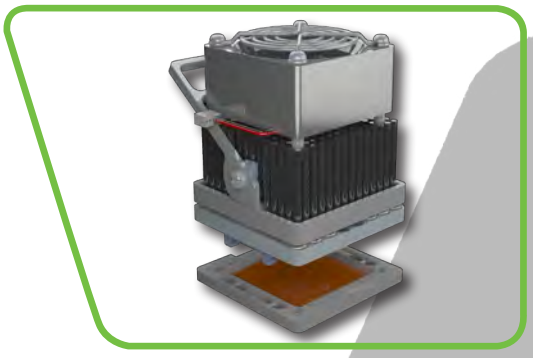
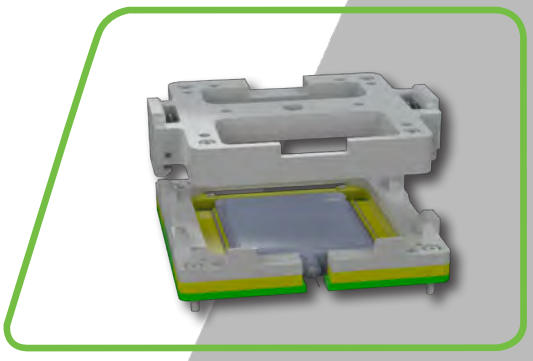
# SK Series High Performance Sockets

## SK Series | High Performance Sockets



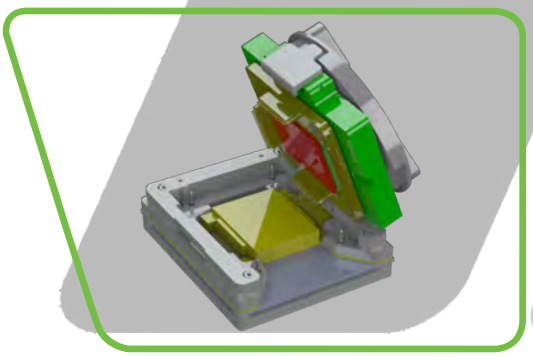
### BGA/LGA

Ideal for Multi-GHz - ASIC, SerDes, fPGA, Network Switches, and other high performing devices, our spring loaded test sockets offer the best available electrical performance for an all metal-solution making them the preferred discrete-node alternative to expensive 'pogo' style pins. With pitch capability as low as 0.4 mm and force per node as low as 20 grams, massively parallel interfaces are possible without massive force.



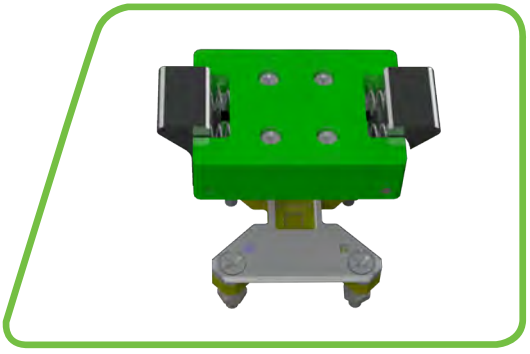
### Optical

The deployment of new backplane systems with high signal speed optical modules presents design challenges for large server systems manufacturers. With higher node counts, tighter pitches, and concerns about power consumption pushing the need for better, lower resistance interconnect solutions, computer makers need to build field service and upgrade options into advanced server systems. Optical sockets from Ardent give customers the flexibility to swap out optical devices, preventing significant down-time and preventing costly system rework by enabling solder-less device to board interconnection.



### Plunge to Board

In addition to our standard optical sockets, we also offer Plunge to Board sockets designed to support surface mount "Butterfly" Gold Box packages with tight pitches (down to 0.76 mm lead to lead ). These sockets utilize Ardent's mechanical design expertise to provide customers with a non-permanent test vehicle. Electrical performance of our Plunge to Board sockets is as good as or better than direct attach and is largely a function of PCB design.



### QFN/QFP/MEMS

SC Test sockets were designed with one goal in mind; Increase Yields in ATE Test of Chipscale packages. This technology is capable of over 2 Million mechanical insertions. The patented "Scrub" action on the DUT side cuts through oxidation and creates a new surface of contact for each insertion. The unique cavity of the pin itself targets this translation to the top side, virtually eliminating board wear. Capable of up to 33 GHz @ < -1dB, these are exceptionally robust test sockets with an exceptionally simple contact set.

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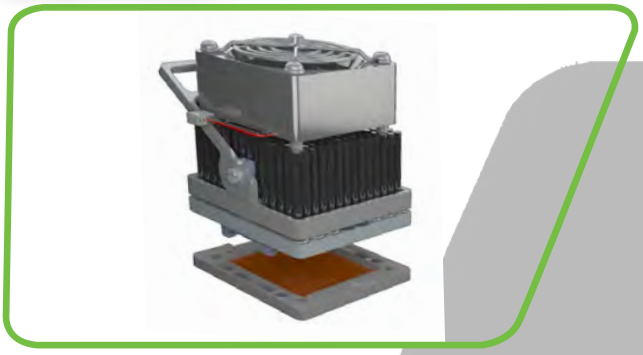
# SK Series High Performance Sockets

## BGA/LGA



- **Low loss connection for wireless devices, processors, fPGA and other high performing devices**
- **40 GHz AC performance in a highly configurable design (1-3000+ leads)**
  S21 | -1dB @ 40 GHz
  S11 | ≤ -15dB to 37 GHz
- **Compression mount - No solder**
- **Fill the gap between expensive spring pin solutions and unreliable elastomeric contact sets**
- **Let us help you choose the right contact set for your application**

Connect-R™

OR

Spring Probe™

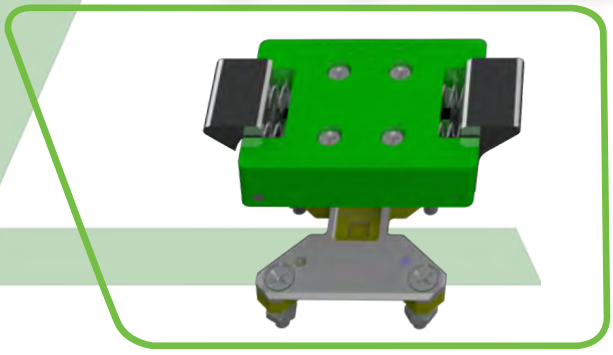
40 GHz

| Specifications | |
|---|---|
| Pitch | 0.4 mm and above |
| Insertion Loss | -1 dB at 40 GHz @ 1 mm pitch |
| Return Loss | -15dB at 37 GHz @ 1 mm pitch |
| Self-Inductance | 0.5 nH |
| Mated Height | 0.76 mm and above |

## QFN/QFP/MEMS

Scrub-R™

- **Extremely short signal length**
- **Insertion loss 33 GHz @ -1 dB**
- **Smallest pitch available 0.40 mm**
- **CRES below 50 mOhm**
- **Continuous current 2 Amps**
- **Tungsten pin with hard gold plating**
- **Wide package range: SO, DFN, QFN,**
- **MEMS**



33 GHz

### High Productivity

- **Easy to maintain**
- **Elastomer-free**
- **Pins easy to replace in less than 5 minutes**
- **Long cleaning intervals up to 100,000 cycles**
- **Lifetime - up to 500,000 cycles**
- **No load board wear & tear**
- **Wide temperature range (-40°C to +150°C)**

| Specifications | |
|---|---|
| Pitch | 0.4 mm and up |
| Frequency | up to 33 GHz |
| Insertion Loss | -1 dB at 33 GHz |
| Return Loss | -20dB @ 13 GHz |
| DUT Compression | 0.20 to 0.25 mm |
| Temperature | -40°C to +150°C |
| Life | 500,000+ insertions |

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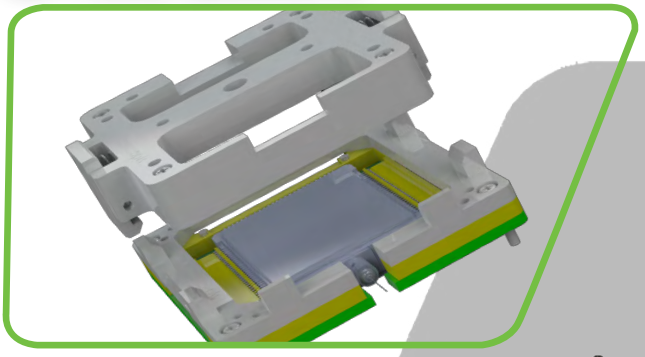
# SK Series High Performance Sockets

## Optical Sockets

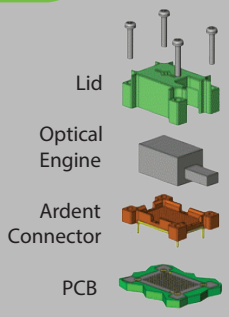


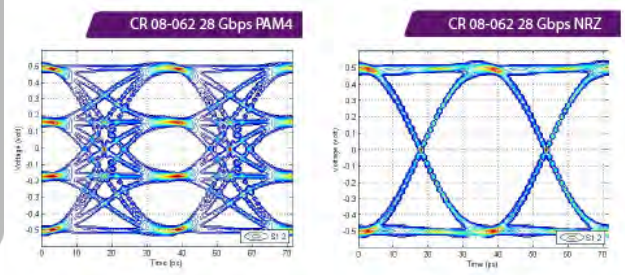
- Low loss connection for optical engines, modulators, transmitters, receivers and other optical devices
- Compression mount solderless technology
- Ideal for 10G, 100G, 400G+ development

Spring Probe™

32 Gbps

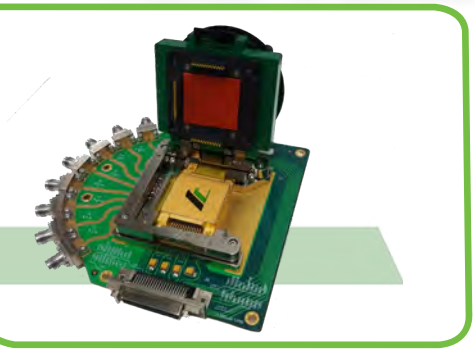
| Specifications | |
|---|---|
| Pitch | 0.4 mm and above |
| Frequency | 32 Gbps+ |
| Insertion Loss | -1 dB at 40 GHz @ 1 mm pitch |
| Self-Inductance | 0.5 nH |
| Mated Height | 0.76 mm and above |



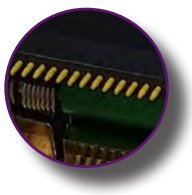

## Plunge to Board

56 Gbps



- Ideal solution for Gold Box “Butterfly” packages
- Compression mount solderless technology
- Fine alignment of leads to pads on the PCB
- Won’t damage fragile leads

Ideal for optical “Butterfly” gold box packages



Polycarbonate fingers provide compression without risk of damage

Precision combed alignment

| Specifications | |
|---|---|
| Pitch | Down to 0.76 mm |
| Frequency | 56 Gbps+ (performance as good as or better than direct attach and is largely a factor of PCB desgin) |
| Lid Types | Clip-on, clamshell, integrated heat sink & fan, open top, etc. |

Specifications subject to change without notice
US Patent Numbers 6,787,709, 6,909,056, 7,126,062, 7,556,503, 8,926,342.
 Revision 1/2018

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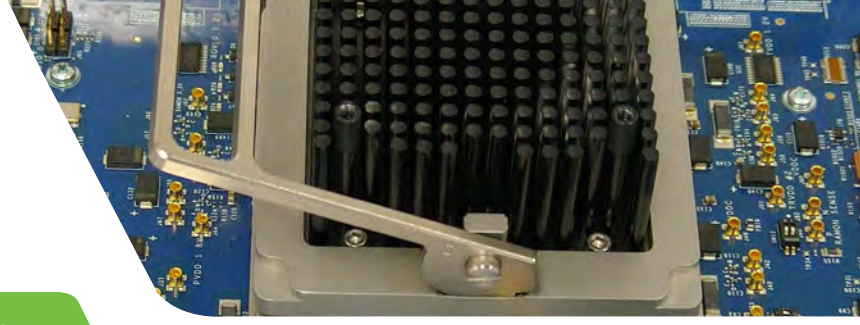
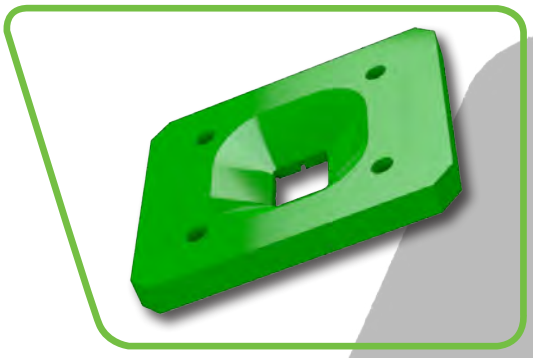


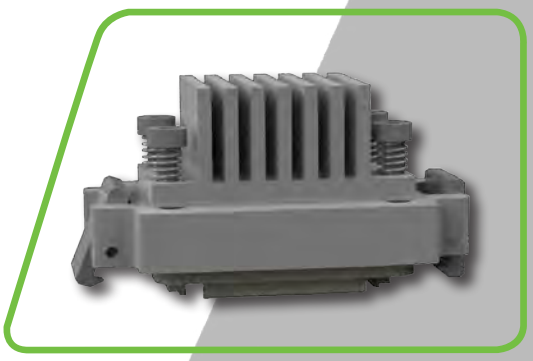
# SK Series High Performance Sockets

## SK Series | Lid Types



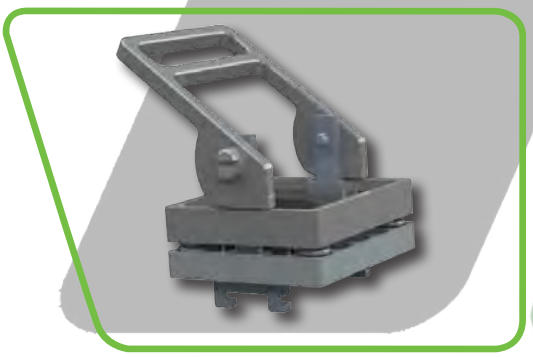
### Screw Down

- Ideal for static applications
- Simple design
- Solid or open-top available



### Clip-On

- Quick and reliable attachement and detachment
- Ideal for smaller ICs



### Bale Lever Lid

- Uniform compression for packages up to 70 x 70 mm
- Custom thermal solutions desinged in
- Ideal for high voltage (up to 250W+) applications

### Custom Thermal Solutions

- Heat sink & fan
- Liquid cooling
- High voltage heat dissipation
- Copper solutions

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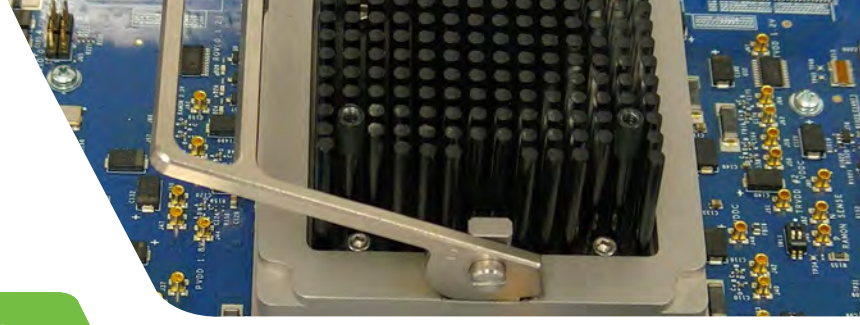

# SK Series High Performance Sockets

## Ordering Information

| Product | # of Leads | Form Factor | Pitch (mm) | Revision |
|---|---|---|---|---|
| SK | 1292 | BG (BGA), PB (Plunge to Board), LG (LGA) | e.g. 0.8 mm (08), 1.0 mm (10), 1.27 mm(12) | 01 (standard) |
| SK | 1932 | BG | 10 | 01 |

For custom applications please consult factory

Specifications subject to change without notice

US Patent Numbers 6,787,709, 6,909,056, 7,126,062, 7,556,503, 8,926,342.

 Revision 4/2016

SK1932BG1001

Note: Image includes SOCKET LID sold separately

## Related Products

### TR Multicoax Series™

- Superior signal integrity up to 70 GHz+
- Better long term repeatability of connector performance
- Solderless system eliminates signal distortion
- Quick connection of multiple signals to PCB
- 80% space savings over SMPs
- High density gets TR closer to the DUT
- Reusable across programs for exponential cost savings

### QUICKLINK™ Coaxial Connector

- Superior signal integrity DC to 70 GHz+
- Reusable across programs promotes exponential cost savings
- Board component reduction while increasing reliability and density
- Rapid connection to PCB - No threading or tools required

### CA Series™ - Connectors & Interposers

- 32 Gbps+
- Area array to 0.4mm pitch
- Compression mount & solderless
- Pure vertical interface – no offset required
- Ideal for high shock and vibration/extreme temperatures applications

## More Information

For questions please contact us:

Phone: (603)474-1760

E-mail: info@ardentconcepts.com

Technical: support@ardentconcepts.com

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For our full product portfolio, datasheets, additional resources/videos, case studies and app notes please visit our website at: www.ardentconcepts.com