SK™ Socket Series Catalog
High Speed | Compression Mount
SK Series High Performance Sockets

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

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.

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.
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

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

www.ardentconcepts.com
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 extremely short electrical path

Speciﬁcations

<table>
<thead>
<tr>
<th>Pitch</th>
<th>0.4 mm and above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>40 GHz+</td>
</tr>
<tr>
<td>Insertion Loss</td>
<td>-1 dB at 40 GHz @ 1 mm pitch</td>
</tr>
<tr>
<td>Self-Inductance</td>
<td>.5 nH</td>
</tr>
<tr>
<td>Mated Height</td>
<td>.76 mm and above</td>
</tr>
</tbody>
</table>

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

Speciﬁcations

<table>
<thead>
<tr>
<th>Pitch</th>
<th>0.8 mm and above (area), .6 mm and above (linear)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>40 GHz+</td>
</tr>
<tr>
<td>Insertion Loss</td>
<td>-1 dB at 40 GHz @ 1 mm pitch</td>
</tr>
<tr>
<td>Self-Inductance</td>
<td>.5 nH</td>
</tr>
<tr>
<td>Mated Height</td>
<td>1.57 mm</td>
</tr>
</tbody>
</table>
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.
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 | -1 dB @ 40 GHz
  - S11 | ≤ -15 dB 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™**

**QFN/QFP/MEMS**

- 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

**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)

**High Productivity**

** Specifications**

<table>
<thead>
<tr>
<th>Pitch</th>
<th>0.4 mm and above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insertion Loss</td>
<td>-1 dB at 40 GHz @ 1 mm pitch</td>
</tr>
<tr>
<td>Return Loss</td>
<td>-15 dB at 37 GHz @ 1 mm pitch</td>
</tr>
<tr>
<td>Self-Inductance</td>
<td>0.5 nH</td>
</tr>
<tr>
<td>Mated Height</td>
<td>0.76 mm and above</td>
</tr>
</tbody>
</table>

**33 GHz**

** Specifications**

<table>
<thead>
<tr>
<th>Pitch</th>
<th>0.4 mm and up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>up to 33 GHz</td>
</tr>
<tr>
<td>Insertion Loss</td>
<td>-1 dB at 33 GHz</td>
</tr>
<tr>
<td>Return Loss</td>
<td>-20 dB @ 13 GHz</td>
</tr>
<tr>
<td>DUT Compression</td>
<td>0.20 to 0.25 mm</td>
</tr>
<tr>
<td>Temperature</td>
<td>-40°C to +150°C</td>
</tr>
<tr>
<td>Life</td>
<td>500,000+ insertions</td>
</tr>
</tbody>
</table>
SK Series High Performance Sockets

**Optical Sockets**

- 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

**Specifications**

<p>| | |</p>
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Pitch</td>
<td>0.4 mm and above</td>
</tr>
<tr>
<td>Frequency</td>
<td>32 Gbps+</td>
</tr>
<tr>
<td>Insertion Loss</td>
<td>-1 dB at 40 GHz @ 1 mm pitch</td>
</tr>
<tr>
<td>Self-inductance</td>
<td>0.5 nH</td>
</tr>
<tr>
<td>Mated Height</td>
<td>0.76 mm and above</td>
</tr>
</tbody>
</table>

**Plunge to Board**

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

**Specifications**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitch</td>
<td>Down to 0.76 mm</td>
</tr>
<tr>
<td>Frequency</td>
<td>56 Gbps+ (performance as good as or better than direct attach and is largely a factor of PCB design)</td>
</tr>
<tr>
<td>Lid Types</td>
<td>Clip-on, clamshell, integrated heat sink &amp; fan, open top, etc.</td>
</tr>
</tbody>
</table>

Ideal for optical “Butterfly” gold box packages
Polycarbonate fingers provide compression without risk of damage
Precision combed alignment
SK Series | High Performance Sockets

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

**Clip-On**
- Quick and reliable attachment and detachment
- Ideal for smaller ICs

**Bale Lever Lid**
- Uniform compression for packages up to 70 x 70 mm
- Custom thermal solutions designed in
- Ideal for high voltage (up to 250W+) applications

**Custom Thermal Solutions**
- Heat sink & fan
- Liquid cooling
- High voltage heat dissipation
- Copper solutions
SK Series High Performance Sockets

Ordering Information

<table>
<thead>
<tr>
<th>Product</th>
<th># of Leads</th>
<th>Form Factor</th>
<th>Pitch (mm)</th>
<th>Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK</td>
<td>1292</td>
<td>BG (BGA), PB (Plunge to Board), LG (LGA)</td>
<td>e.g. 0.8 mm (08), 1.0 mm (10), 1.27 mm(12)</td>
<td>01 (standard)</td>
</tr>
</tbody>
</table>

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.
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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

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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