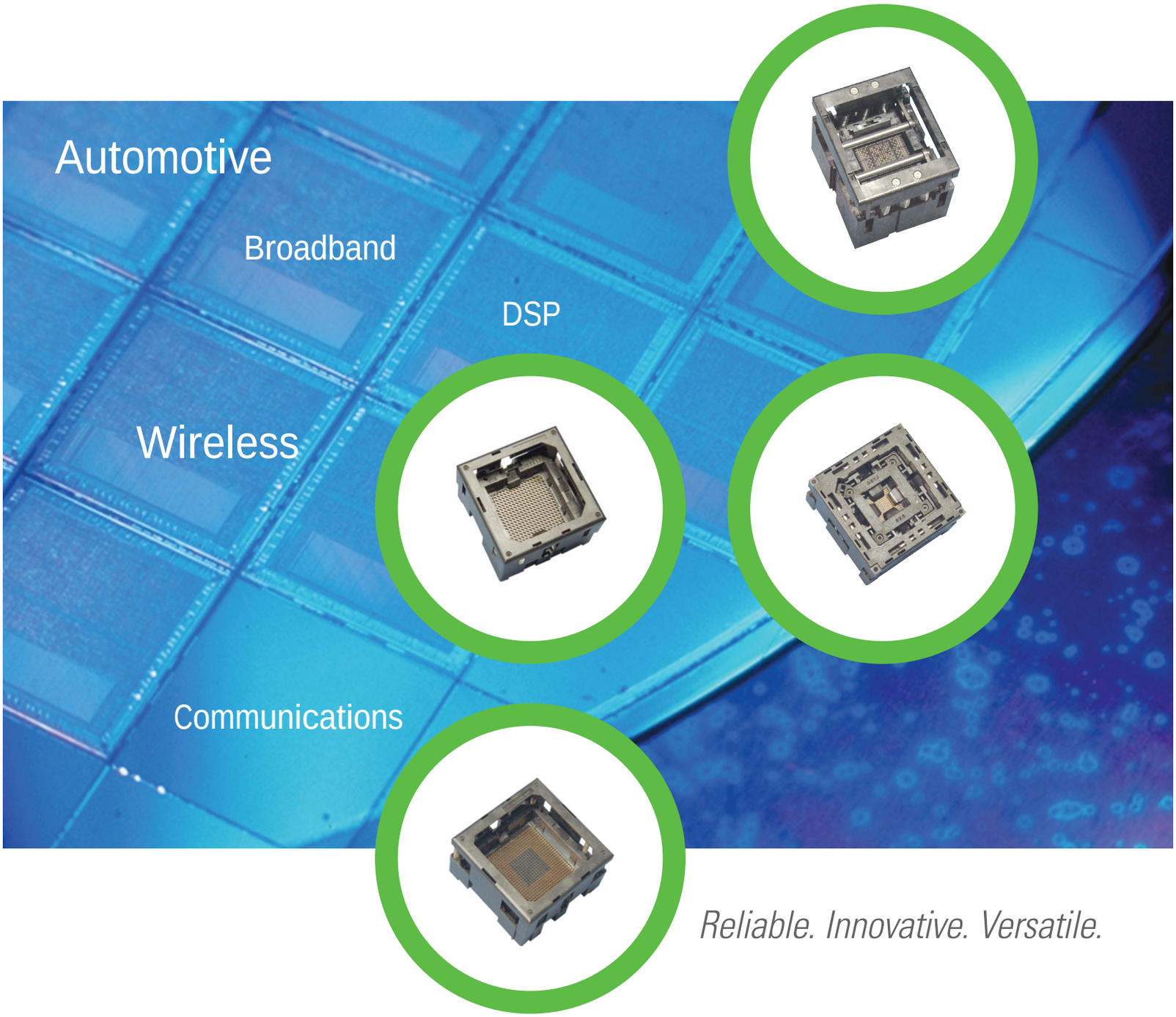
Sensata Technologies

INTERCONNECTION BUSINESS

A Network of Burn-In Solutions



Reliable. Innovative. Versatile.

Delivering World Class Solutions

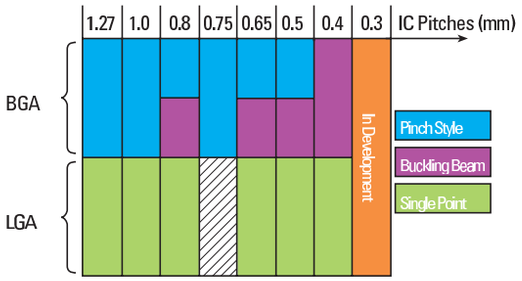
What Do We Do?

Sensata Technologies Interconnection is your partner in developing the solution. Moore's Law continues to be validated as semiconductor companies drive more function in smaller form factors. The back-end packaging and assembly teams support this drive with the development of new package formats for SIP, stacked die and stacked packages. Suppliers of burn-in sockets are challenged to develop sockets for these new packages with higher I/O. Sensata Technologies Interconnection team eliminates the burn-in socket selection process by partnering with our customers to understand their needs and provide the optimal solution.

Product Roadmap

The future is clear – More I/O at smaller sizes.

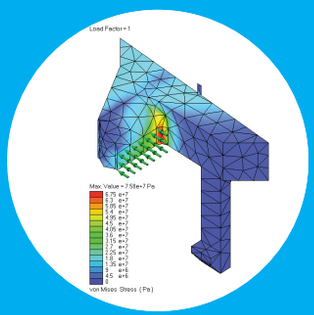
The Sensata Technologies Interconnection team continues to work on the next generation sockets so that we have the right solution, at the right time, to meet your socket needs.



Global Support Team

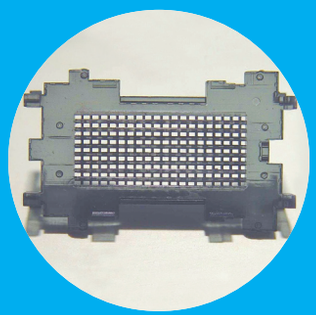
24 hour global support enables us to serve you with rapid response. With engineering teams in key geographic locations including Japan, Korea, and North America, the Sensata Technologies Interconnection team is never more than a few hours from your facility. The global availability of design and application engineers allows us to develop solutions 24 hours a day and complete designs to meet your schedule. Our distributed design and decision making capability allows our local application engineers and sales staff to meet with you in real time and make decisions today. Our global team is ready to assist you in finding the right solution.

Engineering and Design Capability



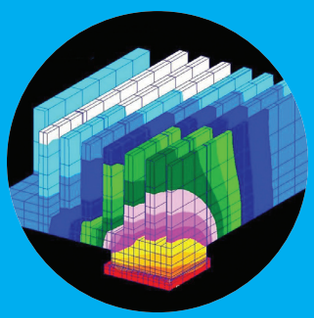
FEA

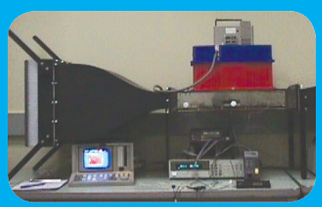
Using the latest 3D design tools such as SolidWorks and non-linear FEA analysis, our engineers create new designs in shorter periods of time.



SLA Prototype

The availability of on-site model shops and rapid prototyping facilities allows the creation of prototypes so that customers can evaluate new designs and concepts.





Wind Tunnel & Thermal Analysis

A comprehensive technical service laboratory, with advanced thermal analysis capabilities and wind tunnels, allows Sensata to evaluate the thermal characteristics of the sockets.

It's All About the Contact

Product Features

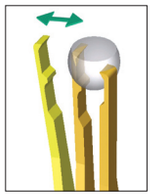
Sensata Technologies Interconnection burn-in sockets are designed for best performance and flexibility to accommodate several sized ICs. Our competitive advantage lies in key burn-in socket elements:

Contact Technology > Platform Socket Design > Small Socket Outline

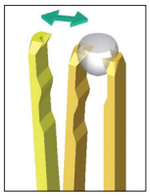
Contact Technology:

Three primary BGA contact designs have been developed to satisfy customer requirements for reliable electrical and mechanical interconnect. These contacts leave small "witness marks" on the solder ball and do not touch the bottom of the ball. These contacts are available for Pb/Sn and Pb-free solder balls.

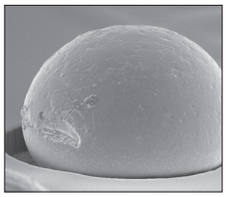
The contacts, which open to allow package insertion, touch the solder ball above the equator when closed. These contacts are typically used for 0.5 mm pitch and above.



Offset Contact used for BGA Pitches 0.8 mm – 1.27 mm



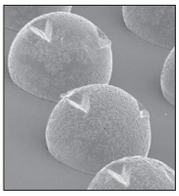
In-line Contact used for BGA Pitches 0.5 mm – 1.0 mm



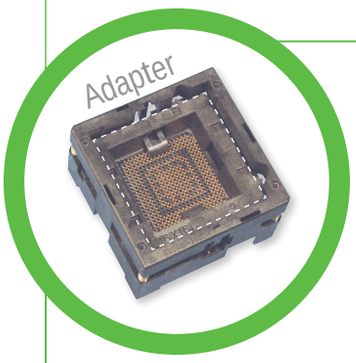
Dual Pinch Contact Sensata Internal SEM photo showing minimal ball damage

For finer pitch packages, 0.5 mm and below, Sensata Interconnection has developed a series of buckling beam contacts which can be used in the design of both through-hole and compression mount sockets.

Buckling Beam used for BGA pitches 0.5 mm and below

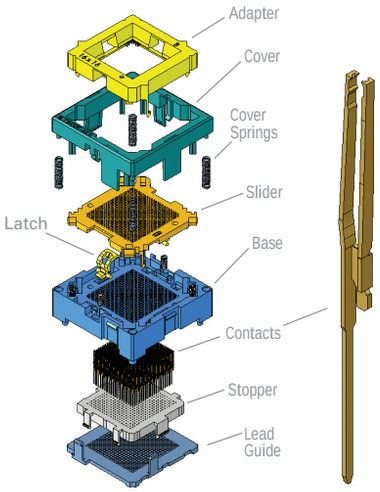


0.5 mm Buckling Beam Sensata internal SEM photo showing consistent alignment of witness mark



Platform Design

Sensata Technologies Interconnection burn-in sockets are designed with "Flexibility of Design" in mind. This allows easier modification for different package sizes. A platform design approach is utilized where a base socket can accommodate a variety of different package sizes. The adapter, which personalizes the socket for a specific customer's package, is designed as a separate part.



Platform Benefits:

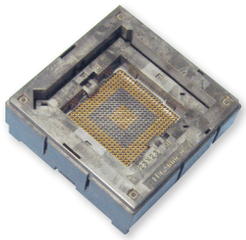
- Changing the adapter provides a **fast, low cost method** of supplying new sockets for each new package size without the expense and time of tooling an entire socket.
- The availability of different bases within a socket family allows the Interconnection team to work with our customers to select the smallest footprint, **maximizing burn-in board capacity and oven through-put.**
- The socket uses the same **proven, qualified contact technology** – improving reliability and confidence in the performance of the socket.

FEATURED PRODUCT

1.0 mm AND 0.8 mm BGA BURN-IN SOCKETS

Providing customers with solutions, Sensata Technologies Interconnection creates burn-in sockets for the semiconductor electronics industry to ensure the quality and reliability of the packaged device. Our engineers work with customers to provide a burn-in socket which maximizes the customers' burn-in system capacity for the lowest overall cost of ownership. Specific features of a Sensata Technologies socket are described below:

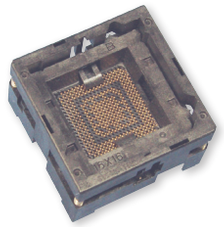
In addition to other sockets, Sensata Technologies offers the following small socket outline platforms to meet your socket requirements:



1.0 mm Pitch BGA

Product Availability:

Max Package Size	Socket Dimensions
27 x 27 mm	46 x 46 mm
19 x 19 mm	31 x 31 mm
22 x 14 mm	31 x 23 mm



0.8 mm Pitch BGA

Product Availability:

Max Package Size	Socket Dimensions
27 x 27 mm	41 x 41 mm NEW!
23 x 23 mm	36 x 36 mm
19 x 19 mm	32 x 32 mm
13 x 13 mm	25 x 25 mm

Design Features:

> Open top, auto-load, cover actuated socket.

> Contact protrusions pierce oxide to give reliable contact.

> Dual beam contacts touch each solder ball individually and independently.

> Socket latches ensure proper seating of IC package during loading.

> Low actuation force: Contacts minimize damage to the solder ball.

Mechanical Characteristics:

Contact System: ..... Normally closed

Contact Force: ..... Between 10 to 20 g/pin

Actuation Force: ..... 3 to 5 kg (I/O independent)

Temperature Range:..... -55˚C to 150˚C

Package Insertion Force: ..... Zero insertion force

Contact Point: ..... Side of solder ball

Durability: ..... 10,000 cycles min.

Electrical Characteristics:

Current Rating: ..... 1 A/pin

Inductance: ..... 6nH (approx.) at 50 MHz

Contact Resistance: ..... 50 mΩ max. initial, 1 Ω max. after 10,000 cycles

Insulation Resistance: ..... 1000 mΩ at 500 VDC Dielectric

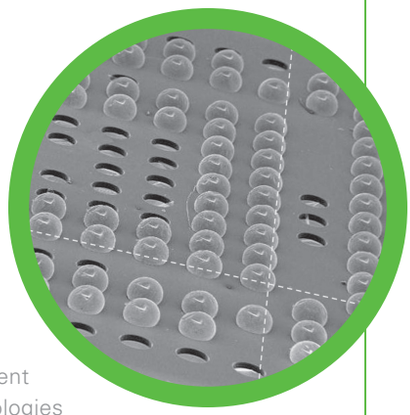
Withstanding Voltage: ..... For 1 minute at 700 VAC

FEATURED PRODUCT

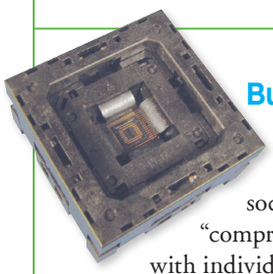
0.5 mm AND 0.4 mm BURN-IN SOCKETS

Accommodating package sizes from 15 x 15 to 4 x 4 mm, the Sensata Technologies Interconnection burn-in socket portfolio for 0.5 mm and 0.4 mm pitch BGA packages is available in both compression mount and through-hole.

> Assembled in controlled environment
> Available for range of package thicknesses
> Through-hole and compression mount
> Proven contact
> Small socket outline
> Interchangeable adapter



This SEM image shows an array of solder balls on a 0.5 mm BGA package after burn-in at 140˚C. Note the uniformity of the alignment of the contact witness marks illustrating the accurate alignment features of the Sensata Technologies socket.

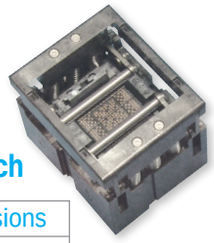


Buckling Beam Contact

Sensata Technologies Interconnection 0.5 mm and 0.4 mm pitch burn-in sockets employ a vertically actuated "compression" style contact that interfaces with individual solder balls. The contact-to-ball, interface at two locations per ball, gives minimum spherical deformation while providing a reliable electrical connection. The contact systems used accommodate both Pb and Pb-free balls.

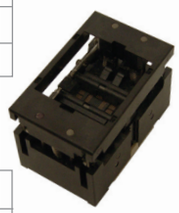
Product Availability:

New!



0.5 mm Pitch

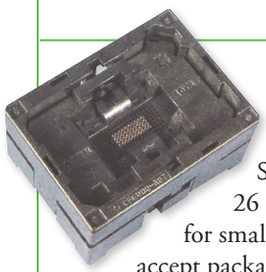
Max Package Size	Socket Dimensions
15 x 15 mm	40 x 40 mm
14 x 14 mm	30 x 25 mm NEW!
10 x 10 mm	30 x 30 mm
11 x 10 mm	26 x 20 mm



0.4 mm Pitch

Max Package Size	Socket Dimensions
14 x 14 mm	40 x 25 mm NEW!

New!



Pinch Style Contact

Sensata Technologies also offers a small 26 × 19.5 mm outline through-hole socket for smaller 0.5 mm packages. This socket can accept packages up to 11 × 17 mm and utilizes a dual pinch style contact, eliminating any witness marks on the bottom of the ball.

Design Features:

> Open top auto-load actuated socket
> Small socket outline: From 26 mm x 19.5 mm to 40 mm x 40 mm
> Low Actuation Force: From 1.2 kg depending on pin count
> Contact Life exceeds 10,000 actuations
> No contact on bottom of ball

Mechanical Characteristics:

> Contact System: Dual buckling beam & dual pinch
> Package Insertion Force: Zero insertion force
> Contact Force: 10-14 g/pin range
> Temperature Range: -55ºC to 150ºC
> Contact Point: Side of solder ball

Electrical Characteristics:

> Current Rating: 0.25 A/pin @ 125ºC
> Insulation Resistance: 1000 mΩ at 500 VDC
> Dielectric Withstanding Voltage: For 1 minute at 500 VDC
> Inductance: 6nH (approx.) at 50 MHz
> Contact Resistance: 150 mΩ max initially; 1 Ω max after 10K cycles.

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