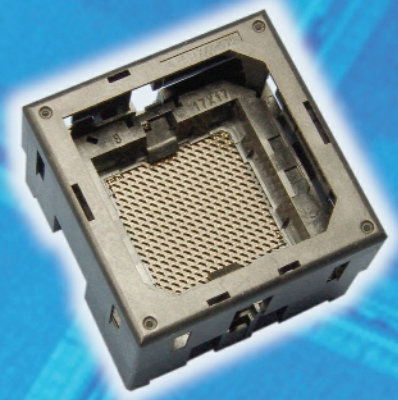
Texas Instruments

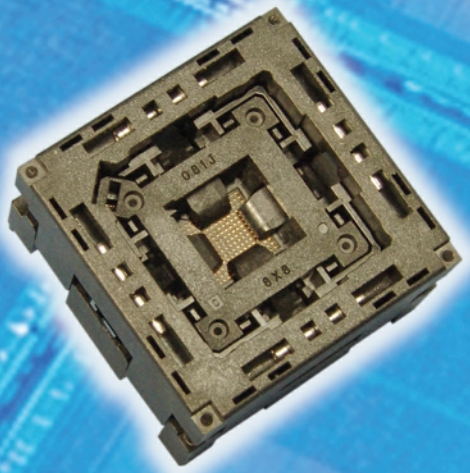
Technology for Innovators™

Interconnection Business

Automotive



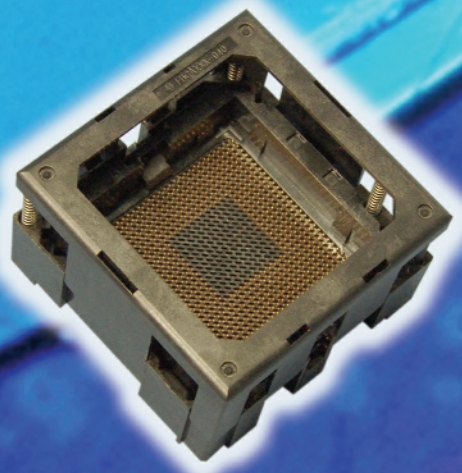
Wireless



Broadband

Communications

DSP



A Network of Burn-in Solutions

Reliable. Innovative. Flexible.

Delivering World Class Solutions

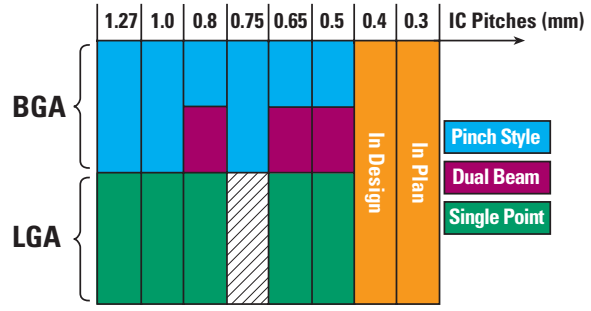
What Do We Do?

Texas Instruments 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. Texas Instruments 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 TI 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.

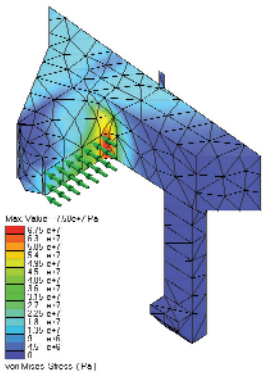


Global Support Team

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 TI 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.

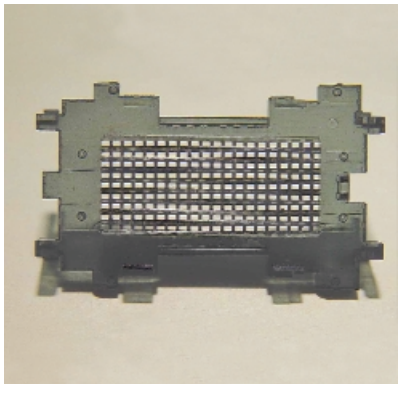
Engineering and Design Capability

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



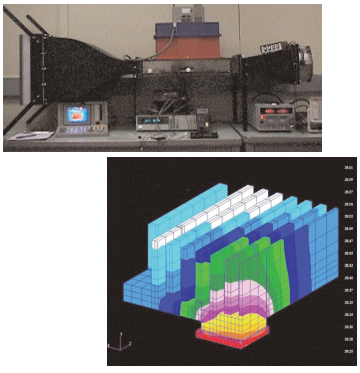
FEA

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.



SLA Prototype

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



Wind Tunnel & Thermal Analysis

It's All About the Contact

Product Features

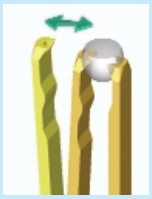
TI Interconnection burn-in sockets are designed for best performance and flexibility to accommodate several sized ICs. Our competitive advantage lies in key burn-in socket elements:

- Contact Technology
- Platform Socket Design
- Small Socket Outline

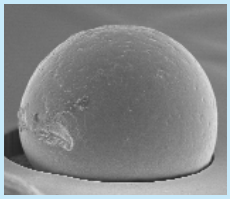
Contact Technology: Three primary BGA contact designs have been developed to satisfy customer requirements for reliable electrical and mechanical interconnect. These contacts leave small "witness marks" on the solder ball and do not touch the bottom of the ball. These contacts are available for Pb/Sn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



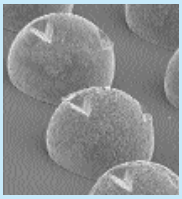
In-line Contact
Used for BGA Pitches
0.5 mm – 1.0 mm



Dual Pinch Contact
TI Internal SEM photo
showing minimal
ball damage

For finer pitch packages, 0.5 mm and below, TI 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

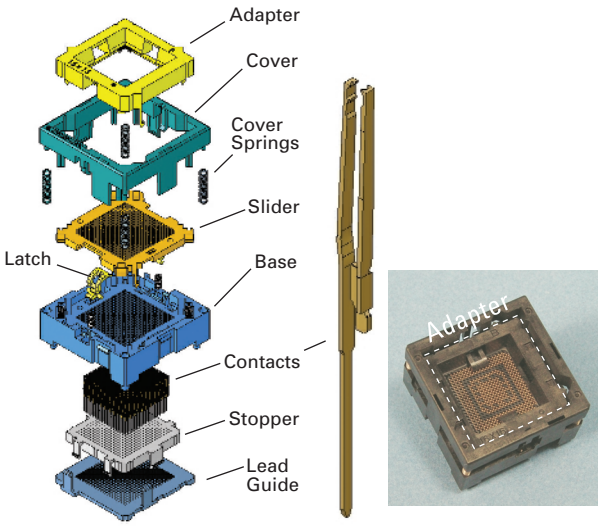


0.5 mm Buckling Beam
TI internal SEM photo showing
consistent alignment of
witness mark

Platform Design: TI 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
1.0mm and 0.8mm BGA Burn-in Sockets

Providing customers with solutions, TI Interconnection creates burn-in sockets for the semiconductor electronics industry to ensure the quality and reliability of the packaged device. TI 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 TI socket are described below:

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 that once loaded movement of the IC package, due to vibration in the oven, is limited.
- Low actuation force: Contacts minimize damage to the solder ball.

Mechanical Charateristics:

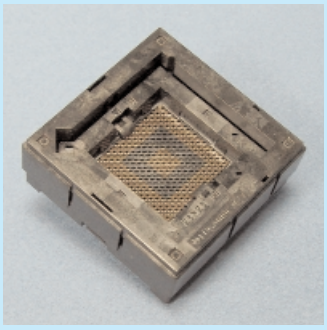
Contact System: ..... Normally closed
Contact Force: ..... Between 10 to 20g/pin
Actuation Force: ..... 3 to 5 kg (I/O independent)
Temperature Range: ..... -55ºC to 150ºC
Package Insertion Force: ... ZIF
Contact Point: ..... Side of solder ball
Durability: ..... 10,000 cycles min.

Electrical Characteristics:

Current Rating: ..... 1 amp/pin
Inductance: ..... 6nH (approx.) at 50 MHz
Contact Resistance: ..... 50 mohm max. initial, 1 ohm max. after 10,000 cycles
Insulation Resistance: ... 1000 Mohms at 500 VDC
Dielectric Withstanding Voltage: ... For 1 minute at 700 VAC

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

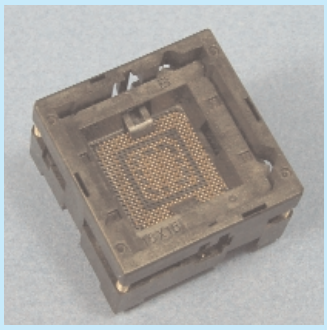
1.00 mm Pitch BGA



Product Availability:

Max Package Size: 27 x 27 mm. Socket Dimensions 46 x 46 mm
Max Package Size: 19 x 19 mm. Socket Dimensions 31 x 31 mm ***NEW!***
Max Package Size: 22 x 14 mm. Socket Dimensions 31 x 23 mm

0.8 mm Pitch BGA



Product Availability:

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

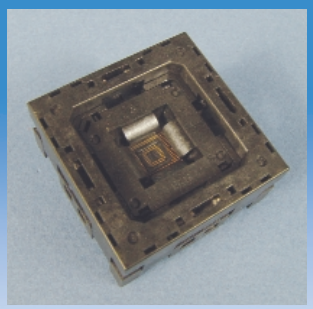
Featured Product

0.5mm BGA Compression Mount or Through-hole Burn-in Sockets

Buckling Beam Contact

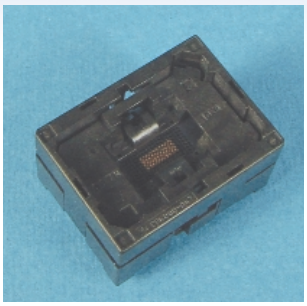
Accommodating package sizes from 15x15 to 5x5 mm, the TI Interconnection burn-in socket portfolio for 0.5 mm pitch BGA packages is available in both compression mount and through-hole.

TI Interconnection 0.5 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.

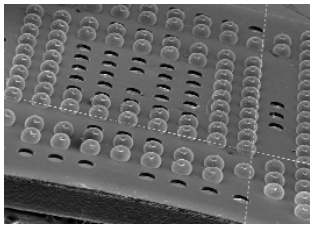


Pinch Style Contact

Texas Instruments also offers a small 26 x 19.5 mm outline through-hole socket for smaller 0.5 mm packages. This socket can accept packages up to 11x17 mm and utilizes a dual pinch style contact, eliminating any witness marks on the bottom of the ball.



- Proven contact
- Small socket outline
- Interchangeable adapter
- Assembled in controlled environment
- Open top
- Through-hole and compression mount



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 TI socket.

Design Features:

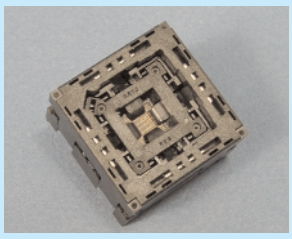
Open top auto-load actuated socket
Small socket outline: From 26mm x 19.5mm to 40mm x 40 mm
Low Actuation Force: From 1.2 kg depending on pin count
Contact Life exceeds 10,000 actuations
No contact on bottom of ball

Mechanical Characteristics:

Contact System: Buckling beam & dual pinch
Package Insertion Force: ZIF
Contact Force: 10-14g/pin range
Temperature Range: -55°C to 150°C
Contact Point: Side of solder ball

Electrical Characteristics:

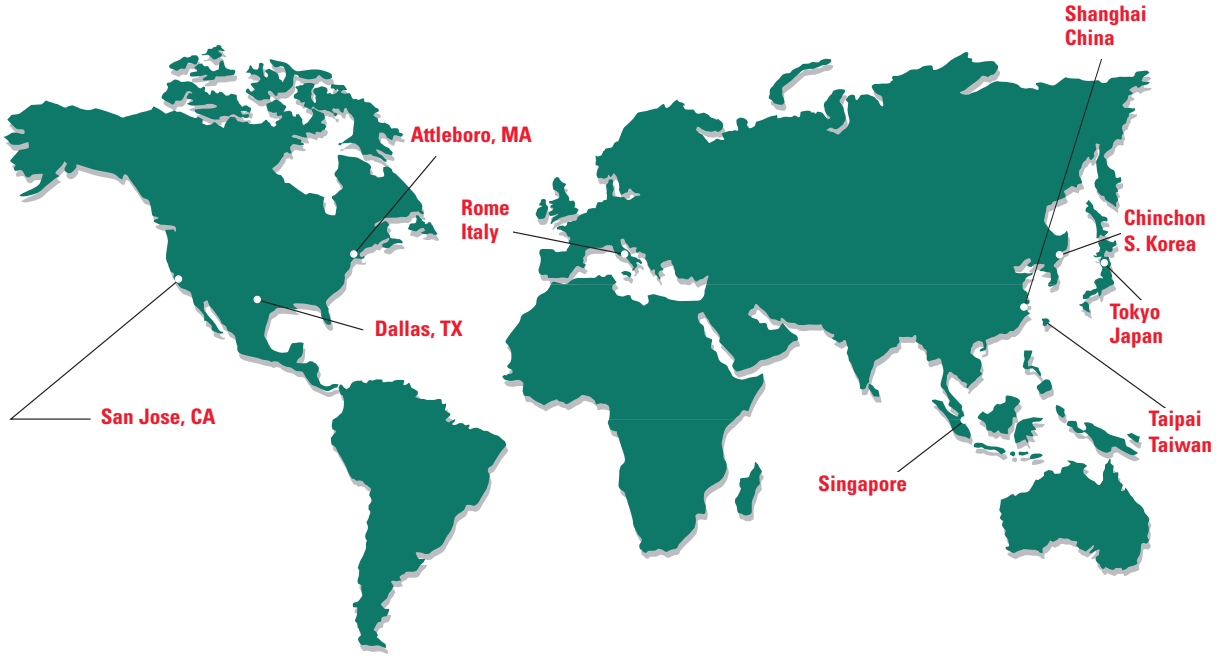
Current Rating: 0.25 amp/pin @ 125°C
Insulation Resistance: 1000 mohms at 500 VDC
Dielectric Withstanding Voltage: For 1 minute at 500 VDC
Inductance: 6nH (approx.) at 50 MHz
Contact Resistance: 150 Mohms max initially; 1 ohm max after 10K cycles.



Product Availability: (Buckling Beam Style)

Max Package Size: 15 x 15 mm. Socket Dimensions 40 x 40 mm
Max Package Size: 10 x 10 mm. Socket Dimensions 30 x 30 mm
Max Package Size: 11 x 10 mm. Socket Dimensions 26 x 19.5 mm

Texas Instruments Interconnection Business Global Marketing and Sales Contacts



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