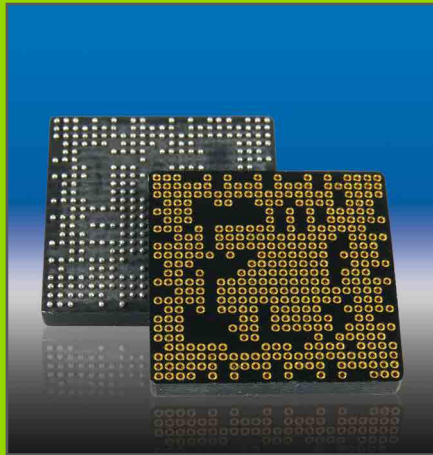




SOCKETS



ADAPTERS



MODULES

PRODUCT CATALOG

*High Performance IC Sockets, Adapters,
& Modules*

WWW.IRONWOODELECTRONICS.COM



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Ironwood's New GigaSnap™ Advanced Technology Adapters

INTRODUCTION

Welcome to Ironwood Electronics!

As a premier manufacturer of precision test sockets, adapters, and modules, Ironwood offers more than 6000 standard products. This short-form catalog is a brief introduction to our various categories and vast product range. Now in our 31st year, there are very few challenges we have not come across - we welcome your next challenge!

Mission Statement

We are committed to developing new technologies to provide superior products and services to meet our customer's requirements. We strive to offer the most comprehensive line of high performance test sockets, adapters, and custom modules in the industry, and maintain a deep understanding of the technologies involved. We will provide continuous and open communication with our suppliers and customers to ensure top quality materials and on-time delivery. We are dedicated to quality in the services we provide and the parts we manufacture.

Catalog 27

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CONTACT TECHNOLOGY SUMMARY

Ironwood has the most comprehensive collection of IC (Integrated Circuit) sockets for prototype, silicon validation, system development, thermal characterization, burn-in, and production test. Sockets are available in a variety of contact technologies:

Socket ^{AAAA} Technologies	Pitch ^{AAA} (mm)	Bandwidth (GHz) -1dB insertion loss	Self Inductance (nH)	Life Cycle ^{****} (# of insertions)	Operating Temperature (°C)	Continuous current capacity (A) @<20°C rise	Avg Contact resistance (mΩ)	Force per pin (g)
SG-6xxx (Elastomer)	0.8 - 1.27	27*	0.15**	2K	-35 to +100	2^	25	30
SG-7xxx (Elastomer)	0.5 - 0.75	30.5	0.11	2K	-35 to +100	2^	25	30
SG-8xxx (Elastomer)	0.8 - 1.27	30.5	0.11	2K	-35 to +100	2^	25	30
SG-9xxx (Elastomer)	0.65 - 0.75	30.5	0.11	2K	-35 to +100	2^	30	30
SG15-1xxx (Elastomer)	0.3 - 0.5	56.8***	0.06	2K	-35 to +100	1^	30	40
SG25-2xxx (Elastomer)	0.3 - 0.75	52.4***	0.06	2K	-35 to +100	1^	30	40
SM-9xxx (Elastomer)	0.4 - 1.27	>44.8	0.1	1K	-55 to +155^^	4	30	70
SMP-8xxx (Elastomer)	0.4 - 1.27	40	0.33	500K	-55 to +155	4	30	70
GT-xxxx (Elastomer)	0.2 - 0.5	75***	0.04	1K	-55 to +160^^	5	30	70
GT (Low Force Elastomer)	0.5 - 1.27	75***	0.04	1K	-55 to +160^^	5	30	35
SBT-0.35mm (Spring pin)	0.35 - 0.4	24.7	0.92	50K	-55 to +180	1	65	8.7
SBT-0.4mm (Spring pin)	0.4 - 0.5	31.7	0.75	50K	-55 to +180	1.5	35	17
SBT-0.5mm (Spring pin)	0.5 - 0.8	15.7	0.88	500K	-55 to +180	3	35	31
SBT-1.0mm (Spring pin)	1.0 - 1.27	21.9	1.04	500K	-55 to +180	4	35	19
*	Simulated data							
**	Linear extrapolated data							
***	Simulated data; Measured value >40GHz							
****	Contact life is influenced by introduction of bias to the IC, plating of the IC leads, cleanliness of IC leads and migration of solder from device to contact tips which will have an impact in the degradation of the contact performance/life							
^	Theoretical value based on 250mA per wire							
^^	In some cases socket will experience IC sticking issue for temperature tests above 60°C. After test, device will get stuck on the elastomer and may require tweezers to release the IC from the socket.							
^^^	General guideline. Ironwood Applications engineer will determine right technology based on the POD details.							
AAAA	Sockets available with swivel lid, clamshell lid, spring loaded snap lid, lever actuated lid. Ironwood Applications engineer will determine right option based on pin count and application requirement.							

SPRING PIN SOCKETS

Pin Technology Summary

Spring Pin Sockets offer very high endurance and wide temperature range testing of 0.35mm to 1.27mm pitch BGA, LGA, QFN, QFP and SOIC devices on the same footprint as other Ironwood socket technologies.



Pin Family	SBT	SBT	SBT	SBT	SBT	SBT	SBT
Part Number	P-P204A	P-P185A	P-P184A	P-P196A	P-P150A	P-P151A	P-P152A
Minimum Pitch (mm)	0.35	0.4	0.4	0.5	0.5	1.0	1.0
Pin Type	BGA	BGA	LGA	BGA	LGA	BGA	LGA
Length (mm)	3.46	3.81	2.9	3.86	2.95	5.69	4.45
DUT Side Tip Shape	Crown	V Shape	Radius Cone	V Shape	Radius Cone	Notched V	Radius Cone
DUT Side Tip Dimension (mm)	0.17	0.14	0.12	0.2	0.06	0.54	0.1
PCB Side Tip Shape	Radius Cone	Radius Cone	Radius Cone	Radius Cone	Radius Cone	Radius Cone	Radius Cone
PCB Side Tip Dimension (mm)	0.12	0.12	0.12	0.04	0.06	0.1	0.1
DUT Side Travel (mm)	0.3	0.5	0.3	0.33	0.33	0.6	0.6
PCB Side Travel (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Force (g)	8.7	17	14.5	30	30	19	19
Cres (mΩ)	<70	<50	<50	<30	<30	<15	<15
CCC @ ambient (Amps)	1	1.8	1.8	4.0	6.0	8.0	8.0
Bandwidth (GHz @ -1dB)	23.5 - 26.1	20.5 - 31.7	20.5 - 31.7	5.2 - 15.7	5.2 - 15.7	14.1 - 21.9	14.1 - 21.9
Self inductance (nH)	0.92	0.98	0.98	0.88	0.88	0.93	0.93
Temperature (°C)	-55 to +180	-55 to +180	-55 to +180	-55 to +180	-55 to +180	-55 to +180	-55 to +180
Insertion Cycles	50K	50K	50K	500K	500K	500K	500K

* 0.4mm/0.5mm pitch SBT pins are used in 0.65mm and 0.8mm pitch applications

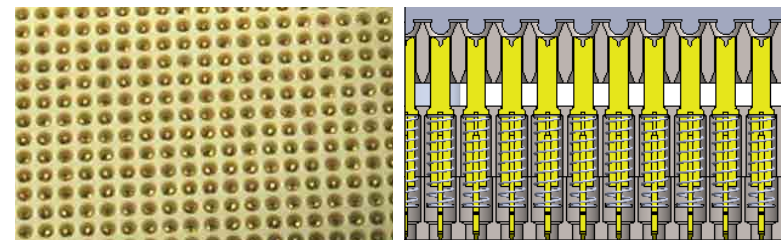
SPRING PIN SOCKETS

Stamped Spring Pins

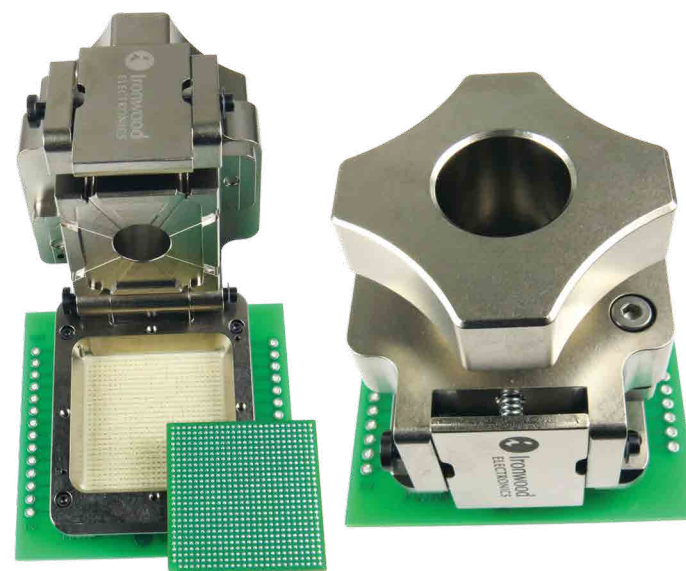
Stamped Spring Pin (SBT) sockets excel in both high insertion count and demanding thermal requirements. The SBT contact is a stamped contact with an external spring and a connecting inner leaf spring. SBT sockets offer low cost and better electrical/mechanical performance than conventional pogo pin sockets while providing a robust solution for Burn-in & Test applications.

SPECIFICATIONS

- 7 to 31.7GHz Bandwidth
- 8 to 31g per pin
- 0.88 to 0.98nH Self Inductance
- 50,000 to 500,000 Insertions
- 0.06 to 0.3nH Mutual Inductance
- Less than 50m Ω Contact Resistance
- -55°C to +180°C
- 0.014 to 0.093pF Mutual Capacitance
- 4 to 8A per pin



Spring Pin Contacts



SBT sockets are typically designed with a clamshell lid for easy open and close where the compression plate is integrated into the clamshell lid. If a compression screw is utilized, a built in stop prevents over compression.

ELASTOMER SOCKETS

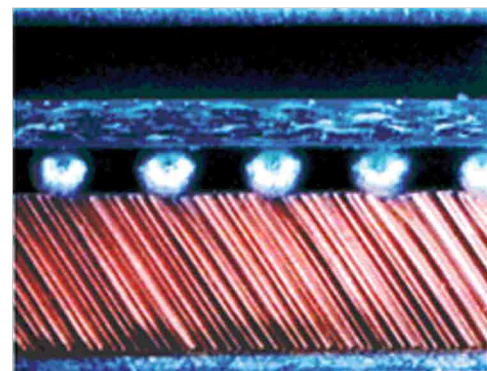
Embedded Wire Elastomer

SG elastomer sockets allow for very high speed testing of 0.3mm to 1.27mm pitch BGA, LGA, QFN, QFP and SOIC devices on the same footprint as other Ironwood socket technologies.

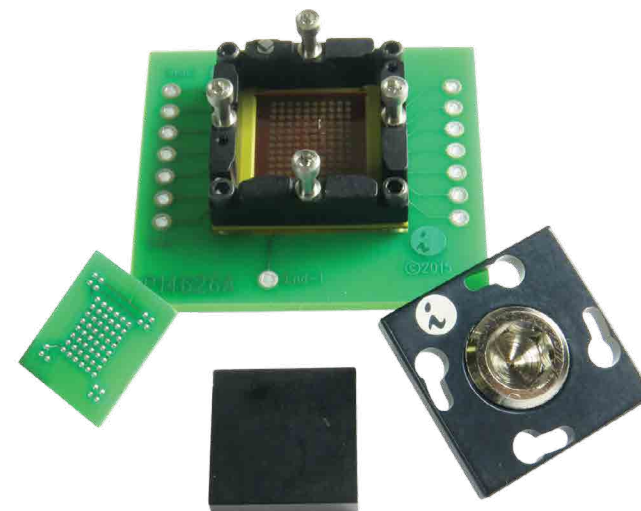
Embedded Wire in Elastomer (SG) contact technology consists of a fine pitch matrix (0.05mm x 0.05mm) of gold plated wires (20 micron diameter). These are embedded at a 63-degree angle in a soft insulating sheet of silicone rubber, which decreases the required contact force.

SPECIFICATIONS

- 27 to 56.8GHz Bandwidth
- -35°C to +100°C
- 0.06 to 0.11nH Self Inductance
- 0.2 to 2A per pin
- 0.023 to 0.041nH Mutual Inductance
- 25-35g per pin
- 0.012 to 0.02pF Mutual Capacitance
- Up to 3000 Insertions
- Less than 30mΩ Contact Resistance



Wire Elastomer



BGA socket using embedded wire in elastomer (SG) contact technology

ELASTOMER SOCKETS

Silver Ball Elastomer

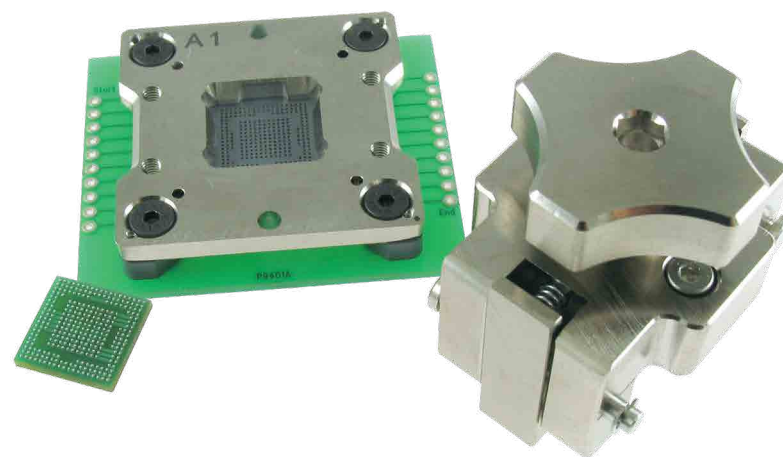
SM/P elastomer contacts support BGA/QFN packages using silver ball matrix technology. The optional protective “P-Layer” sits on top of the conductive columns to protect the conductive columns from contamination and erosion due to high insertion counts. The “P-Layer” is easily replaced with minimal downtime during final production test.

SPECIFICATIONS

- >44.8GHz Bandwidth
- -55°C to +155°C
- 0.1 to 0.14nH Self Inductance
- 4A per pin
- 0.017 to 0.031nH Mutual Inductance
- 50 to 80g per pin
- 0.004 to 0.01pF Mutual Capacitance
- 1,000 Insertions (SM)
- 500,000 Insertions (SMP)
- Less than 30mΩ Contact Resistance



Silver Ball Elastomer



SMP BGA socket with double latch lid for manual set up

ELASTOMER SOCKETS

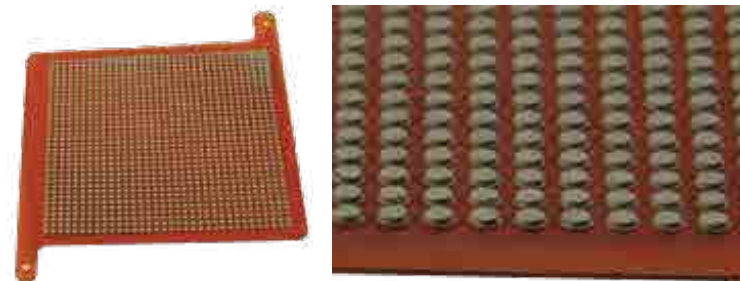
High Speed Silver Button Elastomer

GT elastomer contacts use an innovative interconnect technology that delivers low signal loss (-1dB at 75GHz)* and supports BGA/QFN packages with pitches down to 0.2mm. The contacts consist of silver particles held in a conductive column (buttons) which are embedded in a non-conductive polymer substrate providing high compliance and extreme temperature ranges.

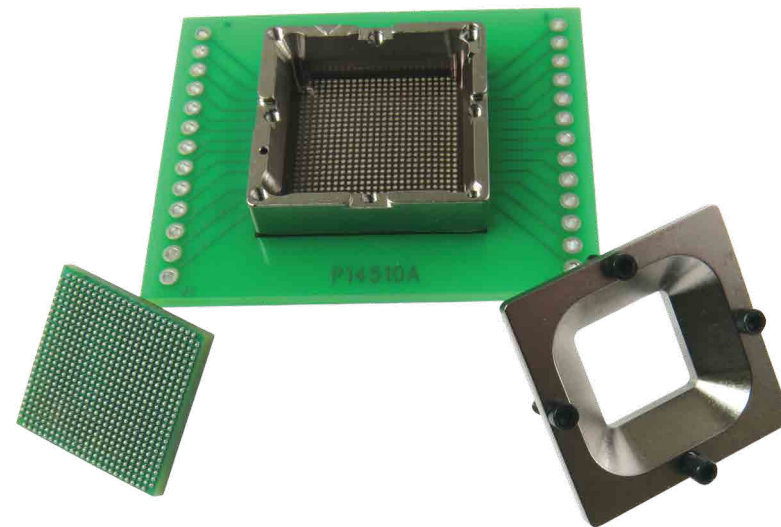
SPECIFICATIONS

- 75GHz Bandwidth*
- -55°C to +160°C
- 0.04 to 0.06nH Self Inductance
- 5A per pin
- 0.003 to 0.024nH Mutual Inductance
- 50-80g per pin
- 0.006 to 0.012pF Mutual Capacitance
- Up to 1000 Insertions
- Less than 30mΩ Contact Resistance

* Simulated



Silver Particle Elastomer



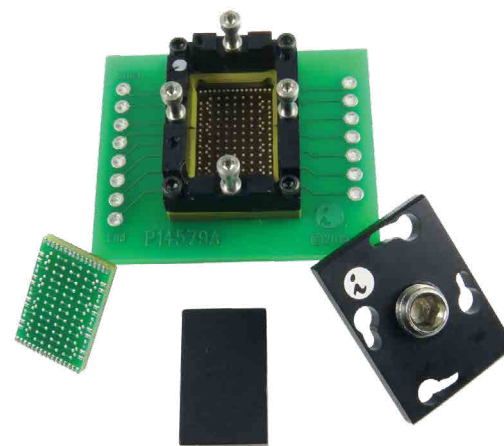
Open top BGA socket using silver button elastomer (GT) contact technology

LID AND BASE OPTIONS

GHz elastomer, spring pin and other socket technologies can accommodate different lid options depending upon the application requirement. Typical choices are swivel-lid, clamshell, double-latch, integral heatsink, etc. Custom lid solutions are also available.

Swivel Lid

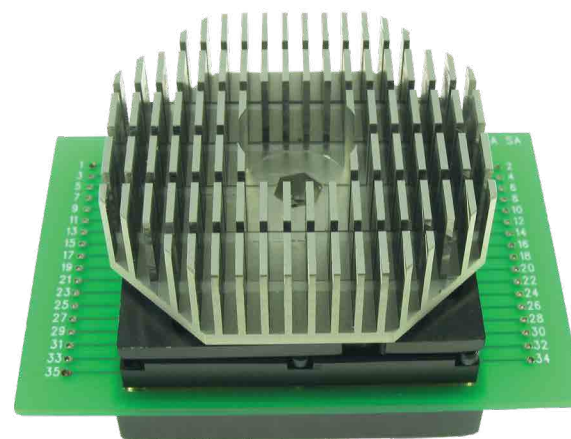
Sockets are constructed with shoulder screws and a pivoting lid. This simple and low cost approach is ideal for field use or where insertions are infrequent. The socket is mounted on the target PCB without soldering and uses the industry's smallest footprint (only 2.5mm needed on each side). To use, insert the device into the socket, place the compression plate, and swivel the lid to close. Vertical force is applied using a torque tool via the center compression screw. A proper torque driver is recommended for optimum performance and reliability.



GT elastomer BGA socket with Swivel Lid

Heatsink Compression Screw

Compression screws are also available with optional heatsinks, which can be designed specifically for the customer's application. More information on heatsinks can be found on page 23.



Heatsink Compression Screw

LID AND BASE OPTIONS

Clam Shell Lid with Compression Screw

The lid is attached to the base using a hinge - simply place the device inside the socket and close the lid using the latch. Apply vertical force by turning the compression screw.



Clam Shell with Compression Screw

Torque Indicating Compression Screw

The torque driver can also be integrated directly into the compression screw. These are precision calibrated to the proper torque before leaving the factory.

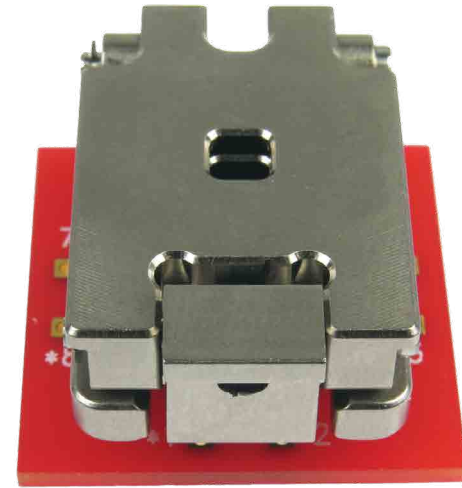


BGA socket with torque indicating screw

LID AND BASE OPTIONS

Snap Lid with Spring Loaded Compression

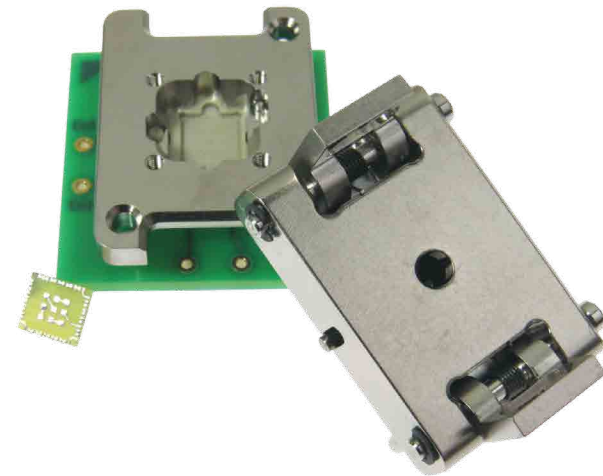
A variation of the clamshell lid where the correct compression is designed into the lid using calibrated springs between the lid and the compression plate. Simply place the IC and snap the lid closed for quick and easy insertions.



Snap Lid with Spring Loaded Compression

Removable Double Latch Lid for ATE

After initial setup, the lid can be easily removed for use with automated test equipment (ATE). Simply press both latches to remove. Similar to Snap Lids, the vertical force is applied by compression springs integrated between the lid and the compression plate.

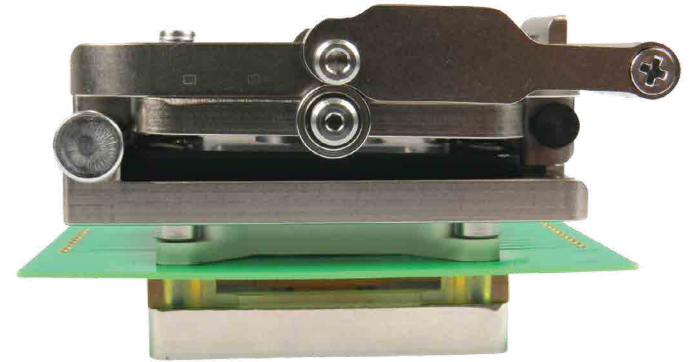


Removable Double Latch ATE

LID AND BASE OPTIONS

High Performance Lever/Cam Lid

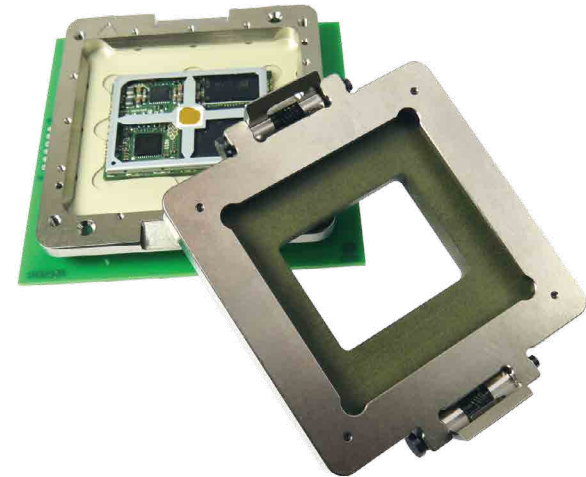
Lever and cam actuation simplifies application of 100+ lbs of vertical force with simple finger movement. This unique design enhances the user experience when using high pin count devices. The lid also features an integrated spring loaded compression plate that maintains force across various environmental conditions.



High Performance Lever/Cam

Open Top Lid

Optional open top designs provide access to the top side of the die or module for access to components or probe points during qualification test.



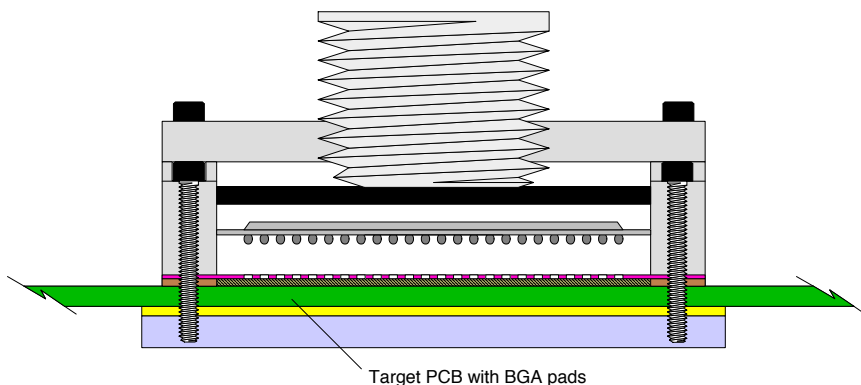
Open top BGA socket for MCMs

SOCKET MOUNTING OPTIONS

Direct mount with Hardware

For target boards with BGA pads and Ironwood socket mounting holes

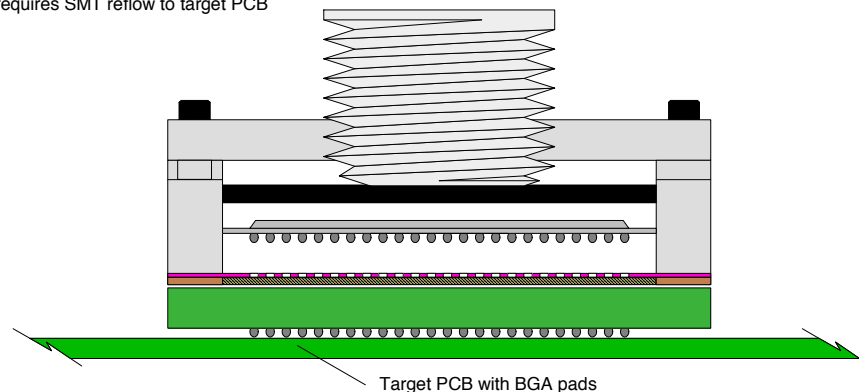
- Will work for all IC sizes
- requires backing plate and insulation plate on back of target board
- shortest signal path from BGA IC to target board
- requires target PCB be designed to socket footprint
- socket footprint is only 5mm larger than IC package



Surface Mount

For target boards with BGA pads

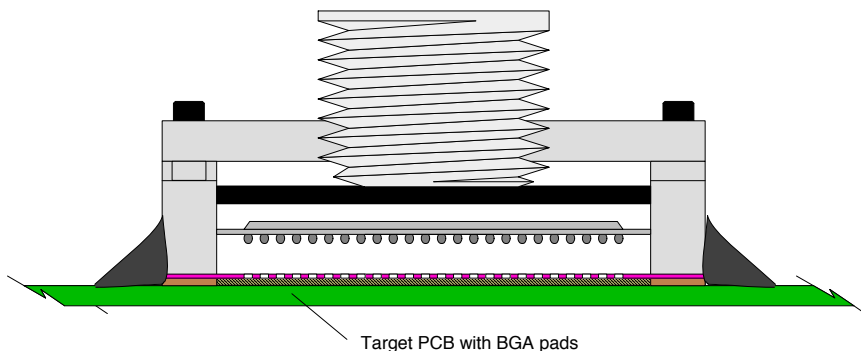
- Will work only for all BGA package sizes
- longer signal path from BGA IC to target board due to SMT adapter
- requires real estate around BGA outline of 10mm (5mm per side)
- requires SMT reflow to target PCB



Epoxy Mount

For target boards with BGA pads

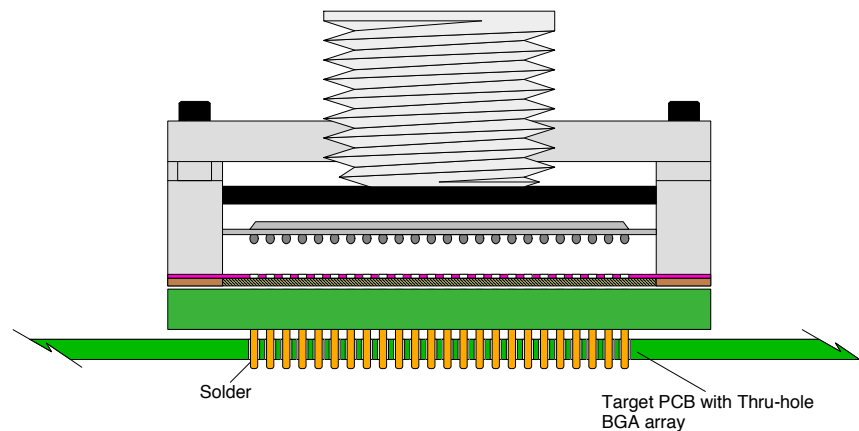
- Will work only for small IC sizes and/or small pin count
- shortest signal path from BGA IC to target board
- requires real estate around BGA outline of 10mm (5mm per side)
- additional space needed for epoxy
- socket may be difficult to remove after attaching



Thru-Hole Mount

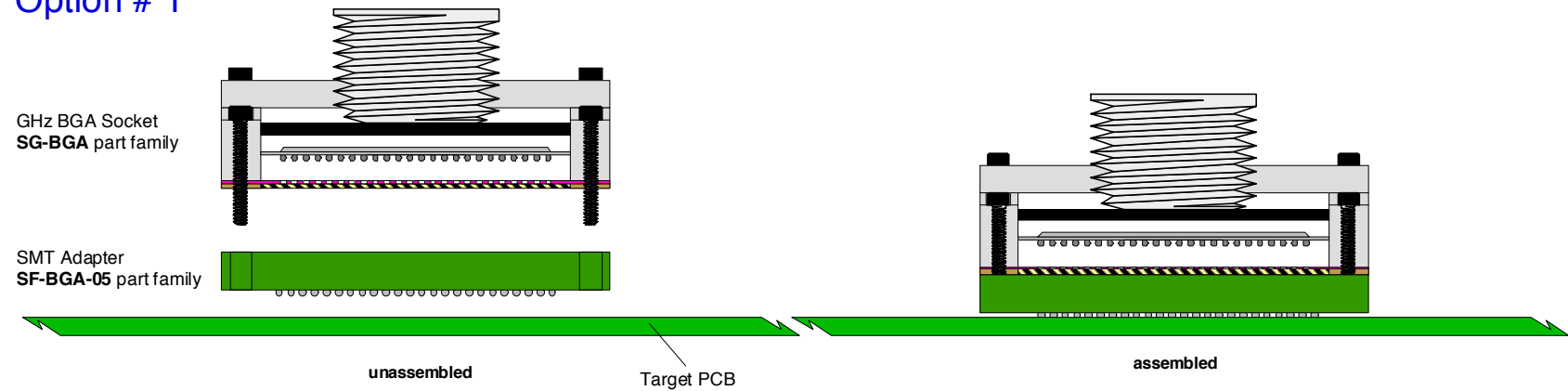
For target boards with BGA Thru-hole pattern

- Will work only for all BGA package sizes
- longer signal path from BGA IC to target board due to SMT adapter
- requires real estate around BGA outline of 10mm (5mm per side)
- requires thru-hole reflow to target PCB

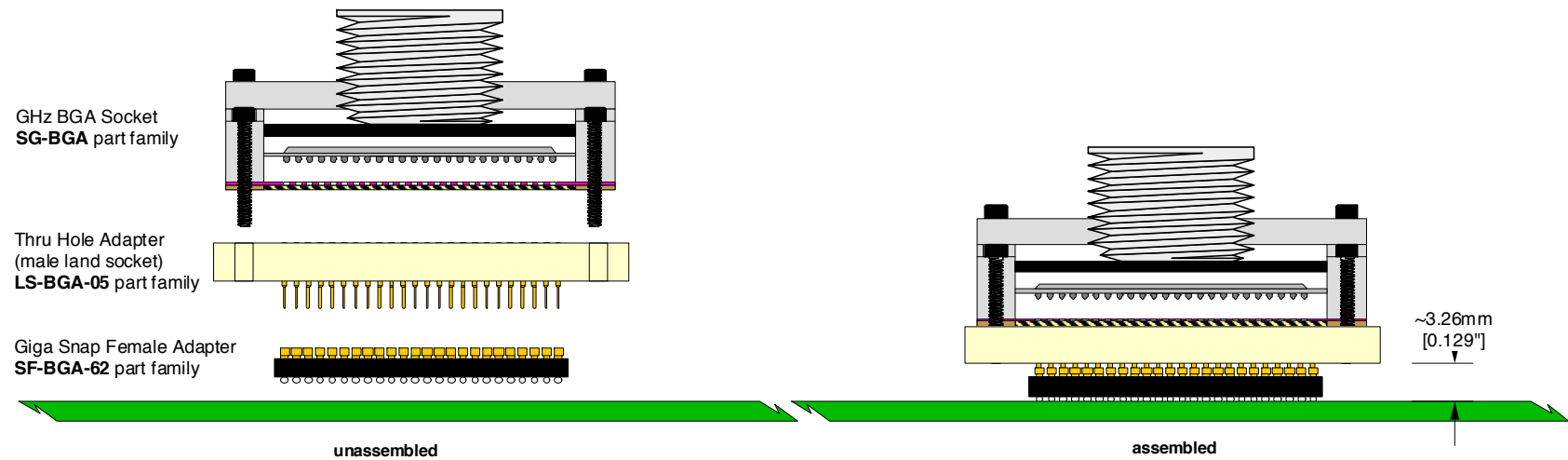


SOCKET MOUNTING OPTIONS (NO MOUNTING HARDWARE REQUIRED)

Option # 1



Option # 2



Note: Drawing not to Scale

GIGA-SNAP™ ADAPTERS

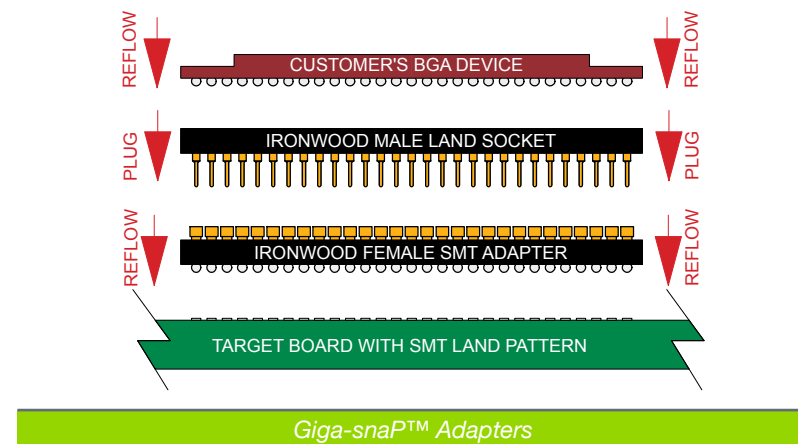
We offer BGA socket adapter systems, package emulation, and board-to-board interconnection for engineering and production use. Probing and package conversion adapters for BGA, QFP, PLCC, and other SMT package types greatly reduce development cycle time.

0.8mm, 1.0mm, and 1.27mm Pitch Giga-snaP™

Ideal for field replaceable BGA's and high density board-to-board interconnect, Giga-snaP™ 0.8, 1.0, and 1.27mm pitch BGA Surface Mount Foot Adapters provide an inexpensive and reliable solution. These patented adapters maintain connection thru vibration and temperature cycles and will not warp during soldering like plastic molded parts. Insertion force is half that of competitive products, with better high frequency performance due to the short connection length. Female sockets with epoxy over-molded machined pins and corresponding male pin adapters are available in standard as well as custom footprints.

SPECIFICATIONS

- Current rating at ambient is 3A per pin
- Contact resistance under 20mΩ
- Insertion/Extraction life over 100 cycles
- Operating temperature range -55°C to +125°C
- Self inductance under 1.62nH
- Capacitance under 0.779pF
- 3.6GHz bandwidth @-1dB



GIGA-SNAP™ ADAPTERS

0.5mm Micro Giga-snaP™

Micro Giga-snaP™ BGA adapters provide the most reliable interconnect to 0.5mm pitch BGA SMT pads. These patented adapters achieve 20GHz bandwidth with 20mΩ contact resistance, 14g insertion force (per contact pair), and high temperature CTE matched substrates. Male and female adapter pairs consist of patented female BGA sockets and corresponding male pin adapters. The RoHS compliant BGA socket can be soldered without warping to the PCB using standard methods, providing a reliable connection to the PCB.

SPECIFICATIONS

- 20GHz bandwidth @-1dB
- Insertion/Extraction life over 100 cycles
- Contact resistance under 20mΩ
- Self-inductance under 0.79nH
- Current rating at ambient is 3A per pin
- Capacitance under 0.088pF
- Operating temperature range -55°C to +160°C



Micro Giga-snaP™ Adapters

PACKAGE CONVERSION

Converter Adapters

Converter Adapters allow the use of a substitute device without requiring redesign of the target system. Package type, function, or pin-out can be changed with an adapter that fits within the original package outline.

TYPES

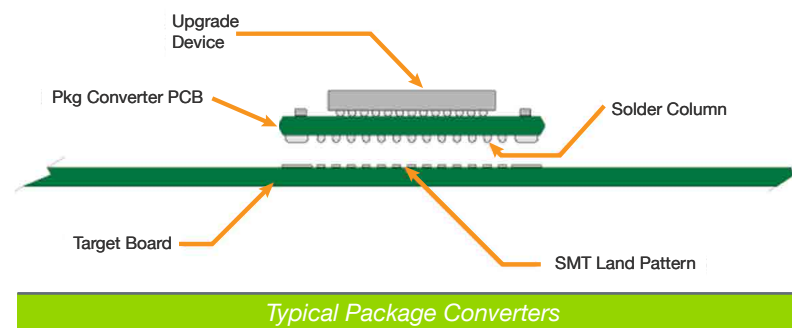
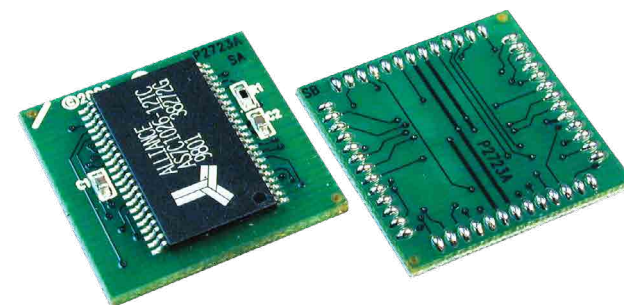
- DIP to DIP
- PGA to QFP
- DIP to QFP
- DIP to PLCC
- PLCC to PGA
- SOIC to DIP
- DIP to SOIC
- BGA to QFP
- PGA to PLCC

Fix Adapters

Fix Adapters can “fix” incorrect board lay out, i.e., wrong pitch, wrong conversion from English to metric, wrong pinout, etc. Fix Adapters are typically made of FR4 with leads or solder balls to match both the original device and the existing board footprint.

FEATURES

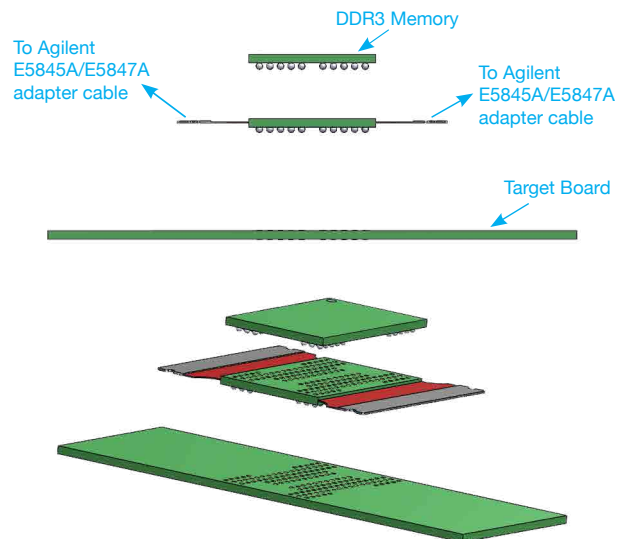
- Low Profile - Less than 2.0mm total added height
- Low Impact Footprint - Less than 0.7mm per side
- ICs including Voltage Regulation Available
 - On-board regulators and capacitors
 - Multi-chip and Multi-layer
- Matches Target Land Pattern
- Allows Simple Flux & Reflow Attach
- Cost Effective In Moderate to High Volume
- Proven Reliability and Performance
- Used in MIL Applications - Tough, Durable



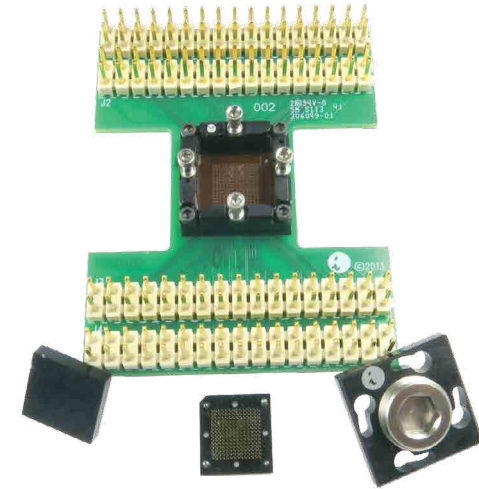
Typical Package Converters

PROBE ADAPTERS

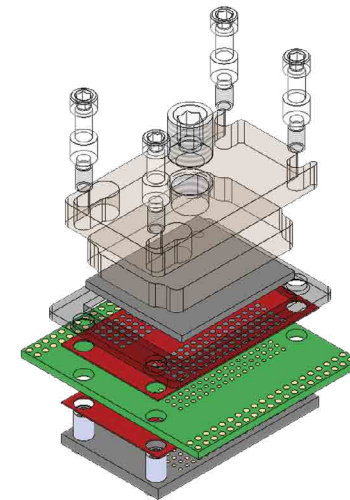
High speed probe adapters can be placed between the target chip (or socket) and the test board to facilitate memory and processor debugging during development. Probe points are routed to the periphery where they can be easily connected to an oscilloscope or signal analyzer. Designs can accommodate a variety of packages utilizing both rigid and flex probe boards as well as various interconnect technologies.



Typical three component modular adapter system



1Gb Mobile DDR2-S4 SDRAM (12x12mm, 0.5mm pitch, 168 FBGA) Probe Adapter



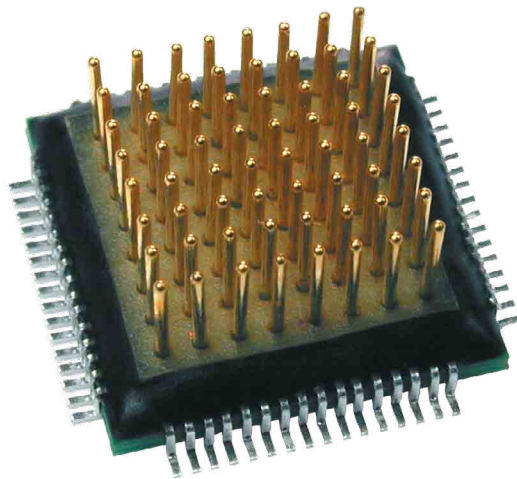
GDDR5 High Speed GT Elastomer Probe Adapter

SMT PACKAGE EMULATION

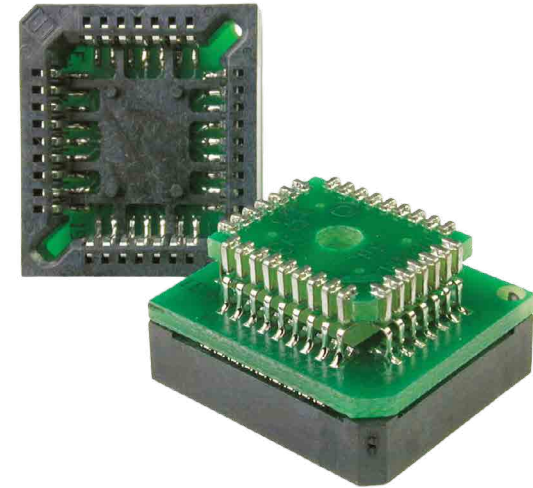
Surface mount feet emulate very closely the actual SMT package without occupying any additional real estate. Attach a socket, daughter card, emulator pod, or other assembly directly to the target PCB via a surface mount foot.

TYPES

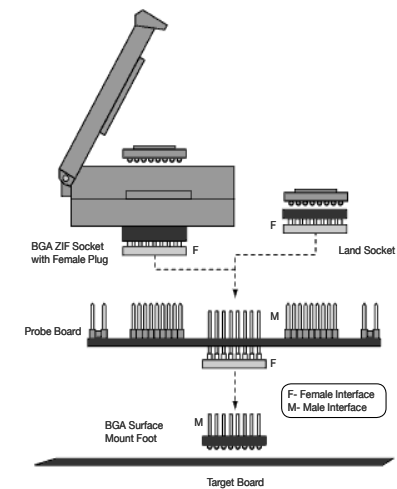
- BGA - Male Interface
- PLCC - SMT Bases
- BGA - Female Interface
- PLCC - Clip on bases
- QFP
- PLCC - Socket Plugs
- SOIC
- QFN SMT Feet



QFP Package Emulation



PLCC SMT Foot Extender



Typical three component modular adapter system with Surface Mount Foot

CUSTOM MODULES

Upgrade/Replacement Modules

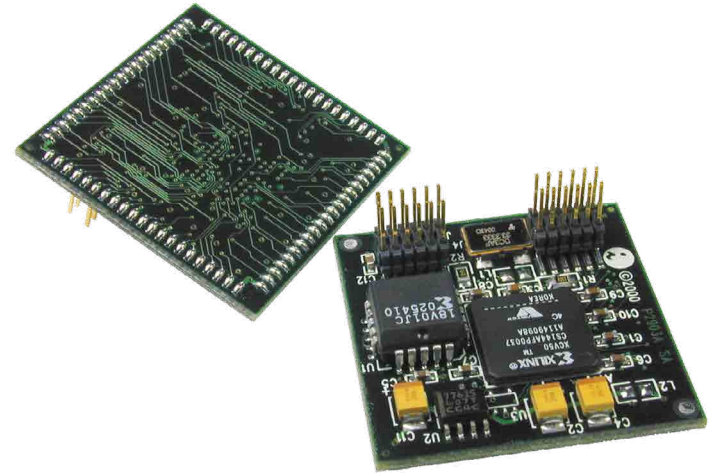
When more than just mechanical or trace re-configuration is needed, such as component change-out or updated circuitry, a module may be required. Ideal for updating older designs using components such as PLCC or PGAs, modules can be designed utilizing up-to-date FPGA, microcontroller, flash, etc. - without modifying the base board. Modules can utilize any connection technology - pins, SMT pads, solder columns, or even Ironwood's board-to-board interconnect technologies.

With the largest and most experienced engineering staff in our industry, Ironwood has created thousands of custom module solutions for customers worldwide. Our engineers utilize advanced tools to design precision and quality into each product - advanced mechanical design, finite element analysis, and tolerance stack up analysis ensure reliable connections throughout the product life.

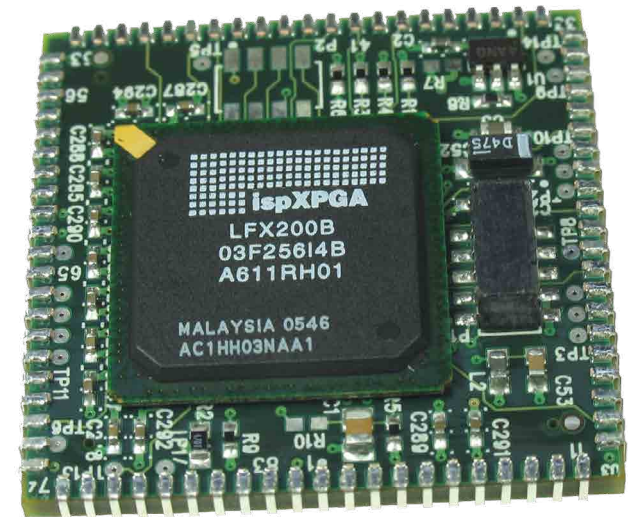
Quick turn solutions are our specialty, with some custom solutions available as fast as 1 week. We are dedicated to providing high quality services that meet or exceed customer requirements.

TECHNOLOGIES

- Controlled Impedance
- Laser Micro Vias
- 0.5mm pin grid arrays
- Shaped Solder
- Blind/Buried Vias
- Flexible PCBs
- 3 mil Line & Space
- Spring Pin Socket
- Embedded Resistors
- Elastomer Socket



Custom PLCC Module



Custom LCC Module

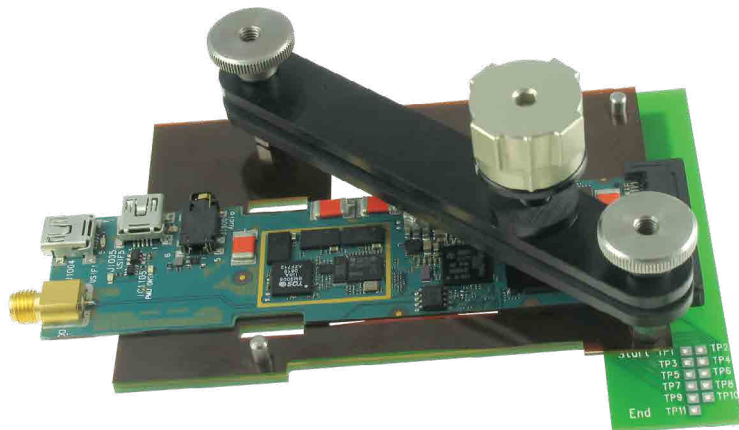
CUSTOM MODULES

Turn-Key & Complex Assemblies

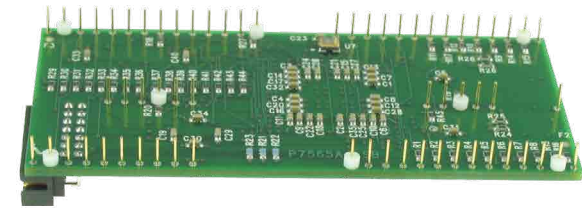
Complete turn-key solutions involve design, component procurement, and module/PCB manufacturing, including final assembly, X-ray/AOI service, functional/parametric testing and customized packaging.

SERVICES

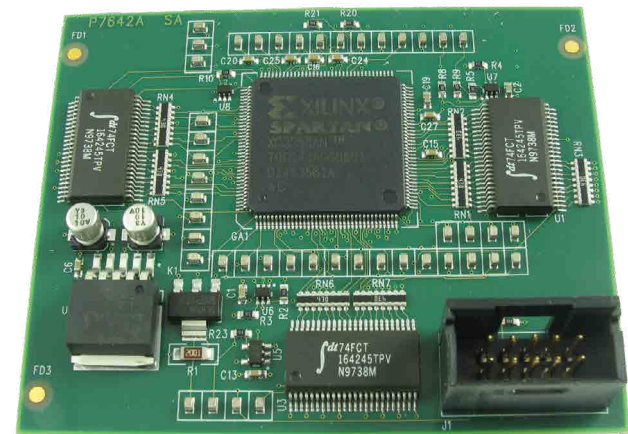
- ATE/High Speed Design
- 3D modeling
- Component procurement
- Board Simulation
- Auto Pick & Place assembly
- AOI/X-ray
- Parametric/boundary scan testing



Custom PCB Socket Module



Custom PGA Module



Double sided module with QFP, SOIC, connector, and discretes, on the top side, and PLCC plug on the bottom. Sub-system mates with PLCC socket on the main board providing easy system upgrade without complete redesign

CUSTOM HEATSINKS

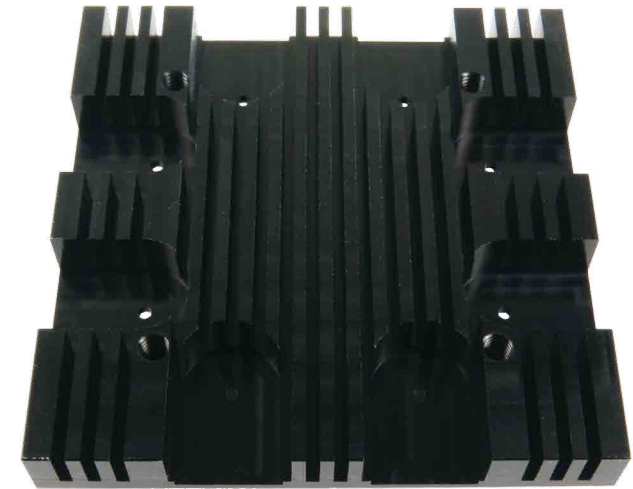
Ironwood has significant experience both designing and manufacturing custom heat-sinks. With extensive in-house machining capabilities, we can quickly design, analyze, and fabricate nearly any custom heatsink.

CAPABILITIES

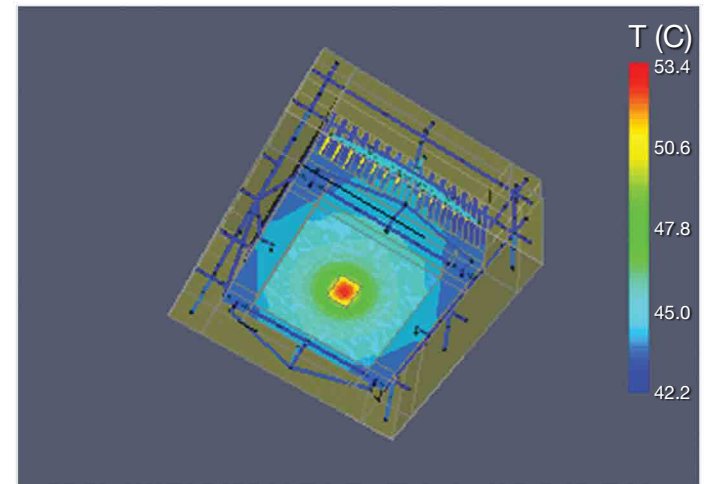
- Unidirectional fins
- Bidirectional fins
- Threaded pillars
- Aluminum, Copper

QFin

Thermal resistance is directly proportional to thickness of the material and inversely proportional to thermal conductivity of the material and surface area of heat flow. In short, heatsink design is a complex task requiring extensive math, finite element analysis, and fluid dynamics. Ironwood utilizes QFin, in conjunction with SolidWorks, to provide analysis and assurance that heatsinks will perform as designed, while at the same time being manufacturable. Many variables, such as surface area, mass, structural rigidity, fin geometry, air flow, etc., can all be adjusted for optimal thermal design.



Custom Heatsink

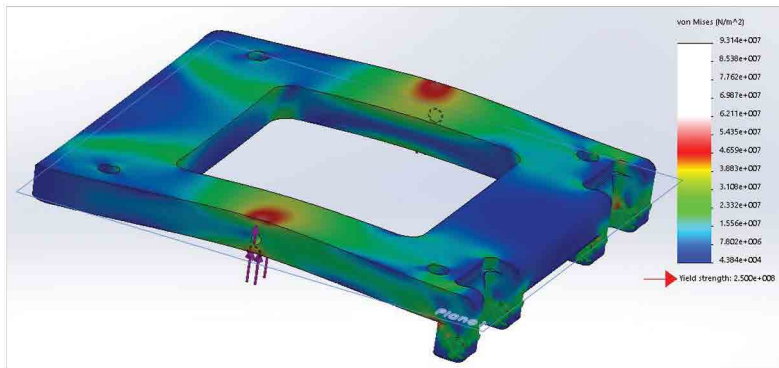


QFin Thermal Analysis

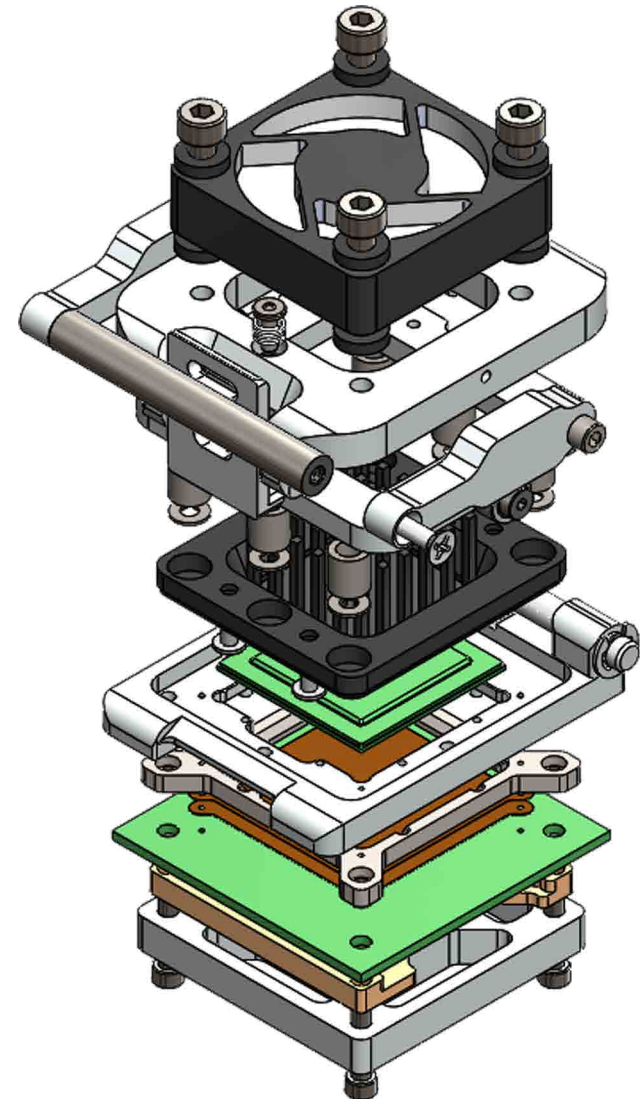
SIMULATION AND ANALYSIS CAPABILITY

SolidWorks

SolidWorks-embedded analysis software allows engineers to quickly simulate and analyze design performance. Advanced simulation techniques can optimize performance during the design phase, eliminate costly prototypes and rework during manufacturing, and assure product performance after delivery - saving both time and development costs. Virtual environments allow testing against a broad range of parameters, such as durability, static and dynamic response, assembly motion, and fluid dynamics. Motion simulation of 3D mechanisms allows interference checking, while stress analysis assures proper material selection.



FEA Stress Analysis



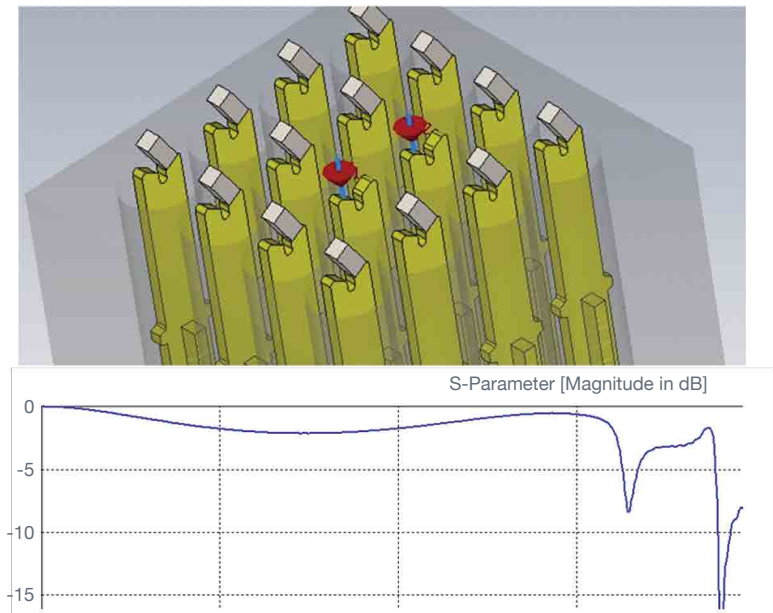
Lever/Cam Actuated Exploded View

SIMULATION AND ANALYSIS CAPABILITY

CST Microwave Studio

As frequencies climb, it becomes increasingly important to understand the scattering and reflection parameters when a socket is inserted between an IC device and the PC Board. S-parameters are typically obtained using network and signal analyzers, coupled with special test fixtures and probes. However, the inability to probe within the center of an array, as well as the time and expense of performing such analysis, presents a serious drawbacks to this traditional approach.

Computer-aided simulation offers an alternative approach to S-parameter derivation that is timely and cost-effective. As a modeling technique, simulation also provides the capability to generate data across a complete array of interconnection ports. Ironwood utilizes CST Microwave Studio to perform high frequency simulation and analysis. The application of this simulation to high-speed interconnection sockets and adapters provides data that is both accurate and reliable.



High Frequency Spring Pin Contactor Simulation

LASER CUTTING SERVICES

Ironwood provides laser cutting services utilizing Microline 2820P high performance UV lasers. We can provide fast, high quality, custom projects with finished part tolerances ± 12 microns. Our complete solution includes 3D design services, material procurement, Laser processing, optical inspection, and customized packaging.

Typical materials processed include Kapton, Cirlex, FR4, FR5, etc. of various thicknesses from 25 microns to 1.5mm.

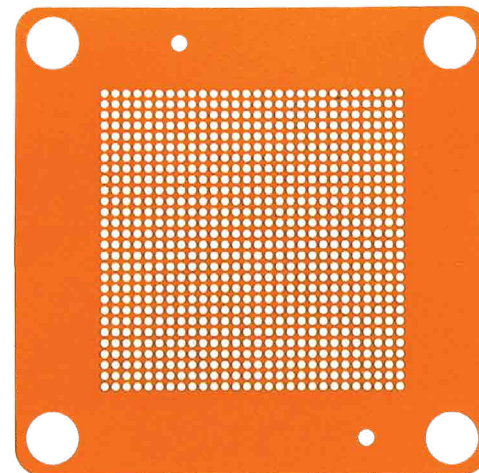
SERVICES

- Laser Cutting
- Laser Drilling
- Laser Marking
- Laser Skiving

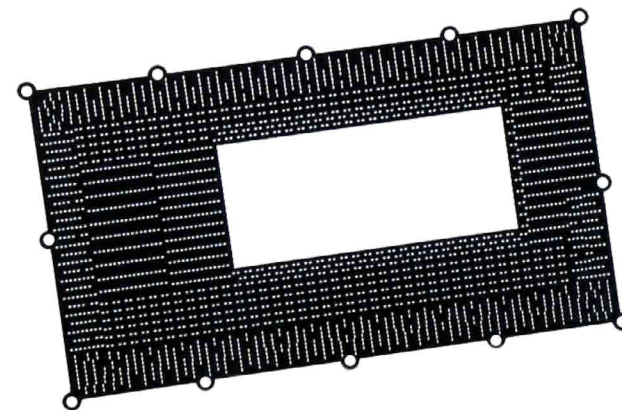
One piece prototype or high volume production - we can support you through your design, engineering and production cycles. We have the ability to provide quick turn prototypes and can easily ramp up for economical high volume production.

Send us your print or fill out our online Request for Quote form and we will have a quote back to you within a few hours and deliver prototype quantities in 24 hours.

For additional information go to www.ironwoodelectronics.com/laser/index.html



Laser Cut Kapton - 1mm Pitch



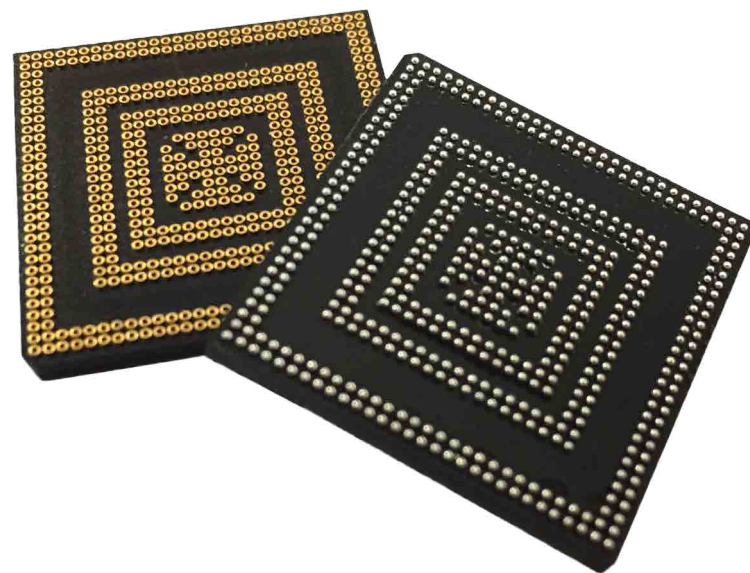
Laser Drilled Cirlex

NEW COMPOSITE GIGA-SNAP™ (CGS)

Through a combination of advanced material engineering and a proprietary manufacturing process, adapters are now able to achieve exceptionally strong and void-free solder joints, without wicking, across wide temperature ranges. This design has been verified thru extensive solder reflow testing and destructive pull testing.

Ironwood's New Giga-snaP™ Advanced Technology Adapters

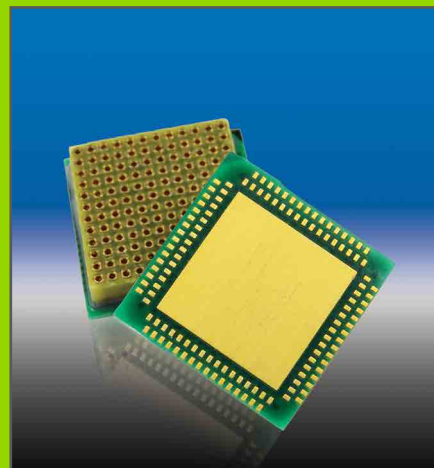
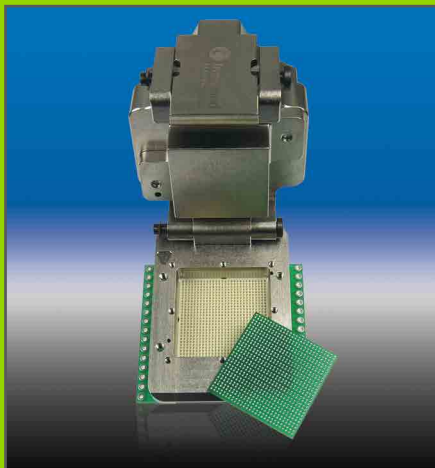
- 100% sealed design- Absolutely “Zero” solder wicking - pins are sealed all the way to the solder joint, similar to BGA device
- Optimized for all solder reflow temperatures and processes, even low temperature processes
- High quality solder joints with minimal voids and exceptional pull strength - verified with actual solder parts
- Improved co-planarity
- Increased stand-off increases air flow
- Lower thermal mass yields faster heat transfer
- Locked pin design, pins cannot be dislodged after sealing process
- Adapters are machined to order for shortest possible lead time - no expensive tooling cost!
- New patents pending



New Composite Giga-snaP™ (CGS)

ISO 9001 Certified Design Process

We will be pleased to quote your custom socket, adapter, or module in 1-2 business days. Just give us a call!



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