



**Ironwood**  
**ELECTRONICS**  
www.ironwoodelectronics.com

## **Adapter Technologies**



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# Introduction

- **Company Overview**

- Over 8,000 products
- High Performance Adapters and Sockets
- Many Custom Designs
- Engineering – Electrical and Mechanical
- ISO9001:2015 Registration

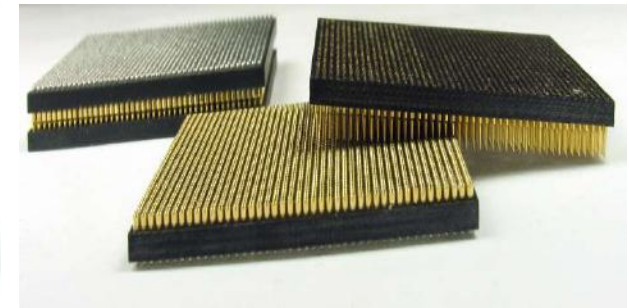
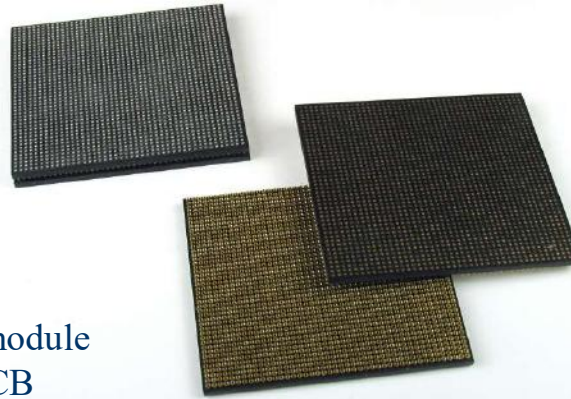
- **Adapter Technology Overview**

- Pluggable BGA adapter system (Giga-snaP™)
- Surface mount package emulators
- Package convertors & Fix adapters
- Prototype, probe & analysis adapters
- Receptacles, extenders, rotators and socket plugs
- Electronic modules

# Pluggable BGA Adapter System (Giga-snaP™)



BGA device soldered on top module & base module soldered on PCB



2000 pin count BGA system plugged together & shown separately

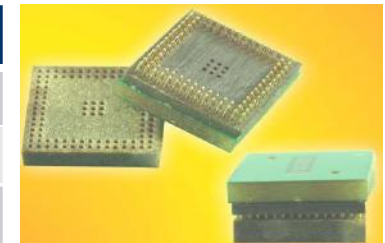
Continuous improvement

10 Years

Proven Capability

Development

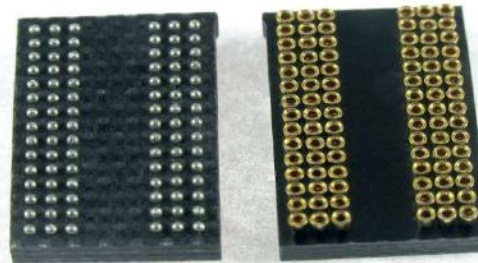
| Features                       | Benefits  |
|--------------------------------|---|
| Short contact                  | High bandwidth applications   |
| Gold plated clips & terminals  | Low contact resistance  |
| Chip size footprint            | Easy to place inductors, capacitors, resistors, etc for tuning and increasing bandwidth. Ideal for IC prototype and system testing and field upgradeable system designs |
| Epoxy over-mold & Matched CTE  | No solder wicking & No substrate warping  |
| Low insertion/extraction force | Easy operation to plug and remove module system   |



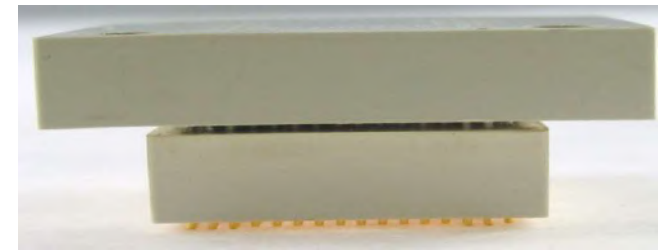
0.5mm pitch BGA Pluggable adapter system



- Capabilities
- 0.5mm to 1.27mm pitch
  - 2x2mm to 45x45mm device
  - 2000 pin count
  - Shortest signal path (2-7GHz)
  - Low insertion force (15-25g)
  - Co-planarity <100µm
  - Tape & reel
  - RoHS compatible



DDR memory BGA adapter system



Daughter card interface system or Board-to-board connector system

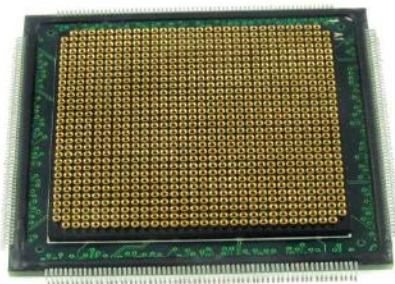
# Surface Mount Package Emulators

Continuous improvement

Proven Capability

Development

15 Years



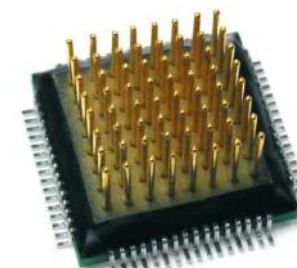
0.4mm pitch QFP emulator base with female interface



Leadless SOIC emulator



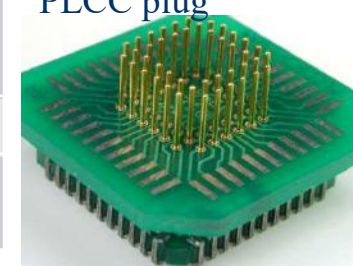
J-leaded PLCC Emulator foot



Gull-wing QFP Emulator foot



PLCC plug

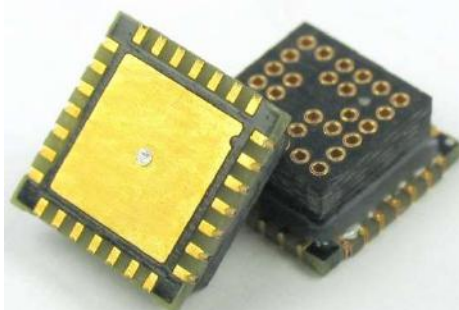


Side castellated SOIC emulator

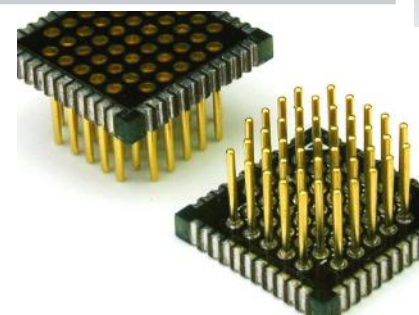
| Features                       | Benefits  |
|--------------------------------|---|
| Short contact                  | High bandwidth applications   |
| Gold plated clips & terminals  | Low contact resistance  |
| Chip size footprint            | Easy to place inductors, capacitors, resistors, etc for tuning and increasing bandwidth. Ideal for IC prototype and system testing and field upgradeable system designs |
| Side castellation              | Easy hand soldering and reflow soldering  |
| Low insertion/extraction force | Easy operation to plug and remove module system   |

## Capabilities

- 0.4mm to 1.27mm pitch
- 2x2mm to 50x50mm device
- QFN, QFP, SOIC, PLCC
- 500 pin count
- Gull-wing options
- Leadless options
- RoHS compatible



Leadless QFN emulator



Leadless PLCC emulator

# Package Convertors & Fix Adapters

Continuous improvement

Proven Capability

Development

20 Years



BGA device mounted to QFP footprint on mother board



QFP device mounted to PLCC Footprint on target board with shortest trace length



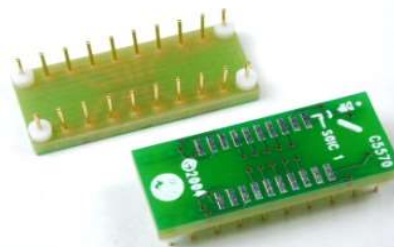
BGA to BGA conversion with complex signal swap due to device enhancement without additional real estate

| Features                    | Benefits   |
|-----------------------------|--|
| Shortest signal routing     | Minimal loss for high bandwidth applications   |
| Gold plated interconnection | Low contact resistance   |
| Chip size footprint         | No additional real estate needed. Ideal for replacing obsolete IC and field upgradeable system designs |
| Shaped solder               | Solders same as IC it replaces. No change in assembly process  |
| Conventional PCB material   | CTE match and high temperature applications  |

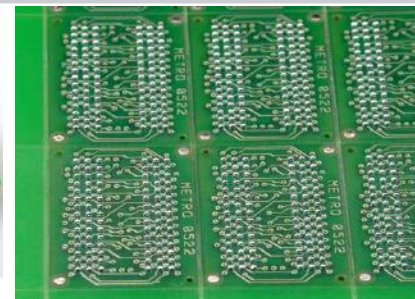
- Capabilities
- 0.4mm to 2.54mm pitch
  - 2x2mm to 50x50mm device
  - BGA, LGA, QFN, SOIC, PLCC, QFP, DIP, PGA, etc
  - 2000 pin count
  - RoHS compatible
  - Tray, Panel, Tape & Reel options



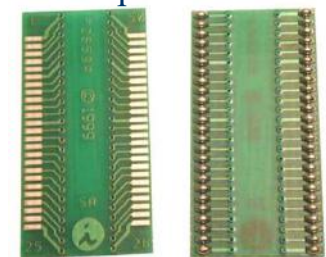
SOIC device mounted to PLCC footprint using solder column technology for high volume production



SOIC to DIP convertor using blind hole technology



BGA convertor in scored panel



SOIC pitch convertor

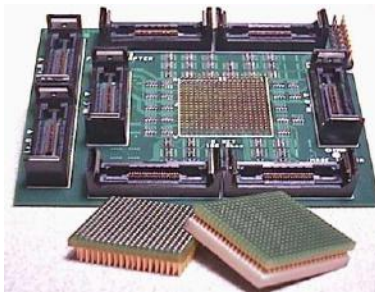
# Prototype, Probe & Analysis Adapters

Continuous improvement

Proven Capability

Development

20 Years



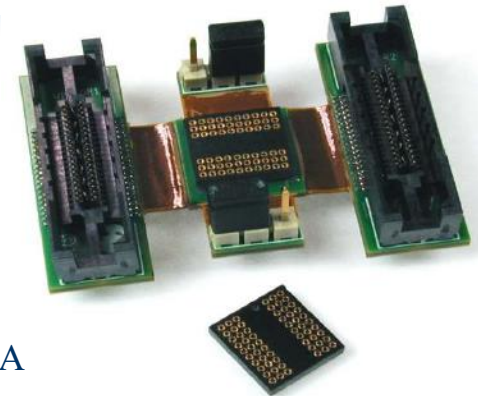
Power PC BGA device interfaced to Logic analyzer and motherboard for functional analysis



SOIC, PLCC adapter

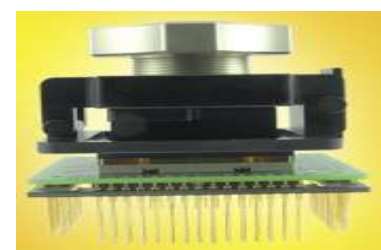


0.5mm pitch 21x21 array 289 position BGA solder balls to AMP 104068 connectors using rigid flex PCB with socket fixture



60 pin, 0.8mm pitch BGA rigid-flex probing adapter with AMP micro and BGA surface mount foot

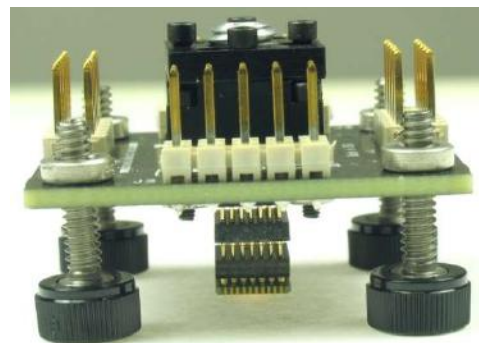
| Features                    | Benefits   |
|-----------------------------|--|
| Shortest signal routing     | Minimal loss for high bandwidth applications   |
| Gold plated interconnection | Low contact resistance   |
| Chip size footprint         | No additional real estate needed. Ideal for IC prototype and system analysis testing |
| Conventional PCB material   | CTE match and high temperature applications  |
| Flexible top side traces    | Probing solution without additional interconnect                                     |



BGA proto adapter with Clamshell pogo pin socket

## Capabilities

- 0.4mm to 1.27mm pitch
- 2x2mm to 50x50mm device
- BGA, LGA, QFN, SOIC, PLCC, QFP, DIP, PGA, etc
- 2000 pin count
- RoHS compatible
- Agilent, Tektronix compatible
- Rigid & flex options



Allows QFN device to be socketed to motherboard with signals brought out to test pins



Flex emulator - 125 position AMP Z pack connector to 80 position female interface

# Receptacles, Extenders, Rotators & Socket Plugs

Continuous improvement

Proven Capability

Development

20 Years

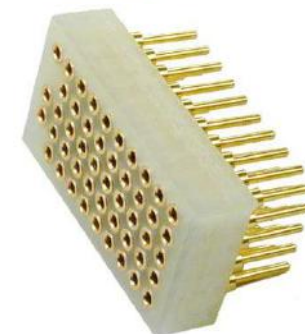


Flex PCB extender allows communication between device to moving head

Rigid PCB extender alleviates height constraints



Circular receptacle



Array receptacle

| Features  | Benefits   |
|---|--|
| Gold plated interconnection                       | Low contact resistance   |
| Small footprint                                   | No additional real estate needed. Ideal for IC prototype and daughter card interface |
| Conventional PCB material                         | CTE match and high temperature applications  |
| Flexible top side traces                          | Probing solution without additional interconnect                                     |
| Differential and impedance matched signal routing | High speed applications with accommodation of space constraints                      |



PLCC socket plugs

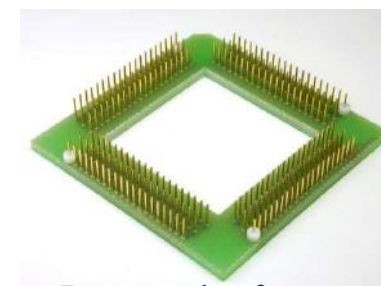
- Capabilities
- 0.5mm to 2.54mm pitch
  - 2x2mm to 50x50mm device
  - BGA, LGA, QFN, QFP, SOIC
  - 2000 pin count
  - RoHS compatible
  - Rigid & flex options
  - Custom fixtures in days



Height extender

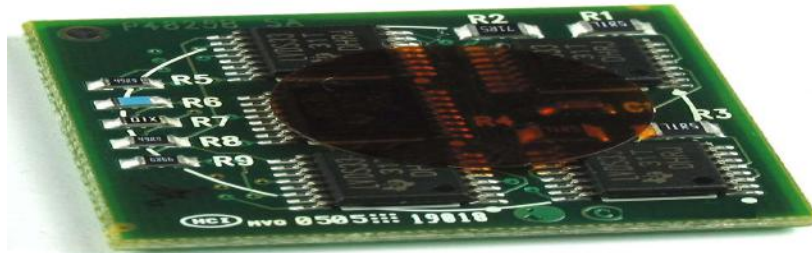


PLCC device clips with probing option



Receptacles for burn-in sockets

# Electronic Modules



Multi chip module with components on both side



BGA device, discrete & voltage regulator



QFP device, discrete & connector



SoC module with high density connector



Daughter card module  
Interfaced to QFP footprint



Dual technology (SMT & thru hole) assembly



BGA device, SOIC device & discrete

| Features                                   | Benefits   |
|--|--|
| Conventional PCB material                  | CTE match and high temperature applications  |
| Shortest signal routing                    | Minimal loss for high bandwidth applications   |
| Chip size footprint                        | No additional real estate needed. Ideal for replacing obsolete IC and field upgradeable system designs |
| Conductive filled via                      | Excellent thermal dissipation and high current applications  |
| Optimized plated thru hole with filled via | Low inductance and high speed applications   |
| Fiducial, Kapton dot                       | Optical alignment, pick & place assembly   |
| Shaped solder (QFN, QFP)                   | Easy assembly (industry standard reflow profile)   |

- Capabilities
- 0.25mm to 2.54mm pitch
  - 3 mil trace/space
  - Laser micro vias
  - Embedded caps & resistors
  - Lead free options
  - Tray, Tape & Reel options
  - Turnkey solutions

Continuous improvement

Proven Capability

Development

8 Years



# Custom Capability

- Custom adapter designs in 2 days
- Match customer's PCB footprint
- Custom adapter manufacturing in 10 days
- In-house automated optical inspection
- Stencil print, Pick & Place, Reflow
- Adapter signal integrity simulation
- Innovative adapter technologies
- In-house machining
- Quick turn production

