



Ironwood ELECTRONICS

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Adapter Technologies



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Introduction

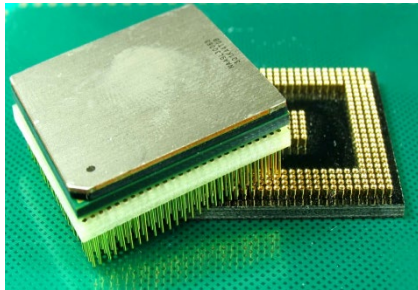
● Company Overview

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

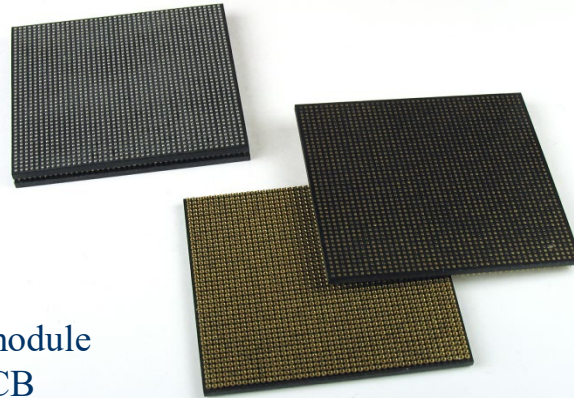
● Adapter Technology Overview

- 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™)

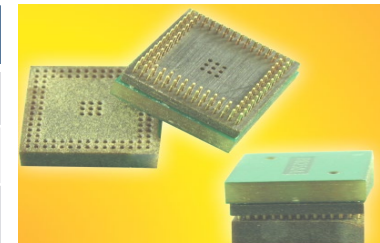


BGA device soldered on top module
& base module soldered on PCB



2000 pin count BGA system
plugged together & shown separately

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

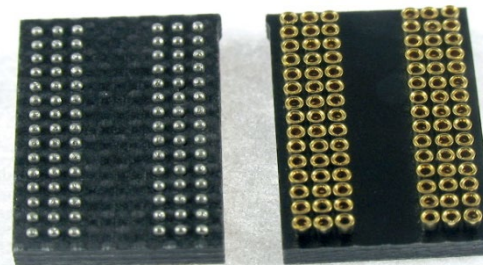


0.5mm pitch BGA
Pluggable adapter system

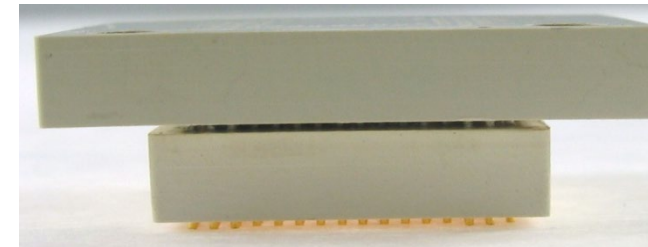


Capabilities

- 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

Continuous improvement

Proven Capability

Development

10 Years

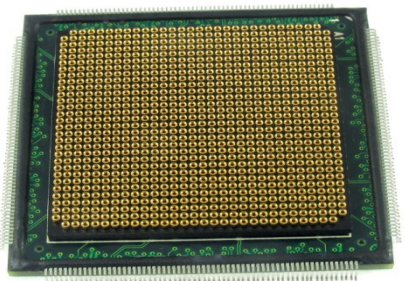
Surface Mount Package Emulators

Continuous improvement

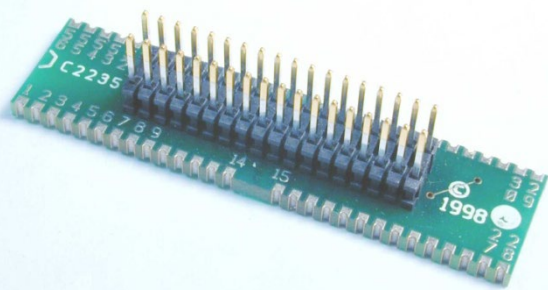
15 Years

Proven Capability

Development



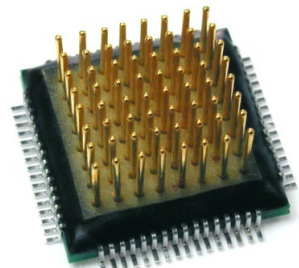
0.4mm pitch QFP emulator base with female interface



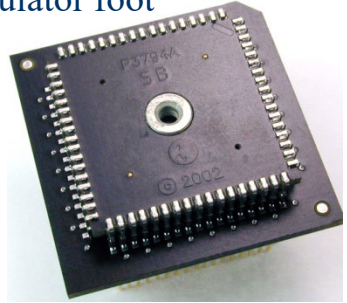
Leadless SOIC emulator



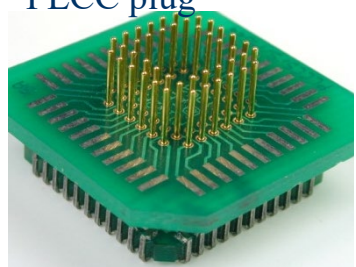
J-leaded PLCC emulator foot



Gull-wing QFP emulator foot



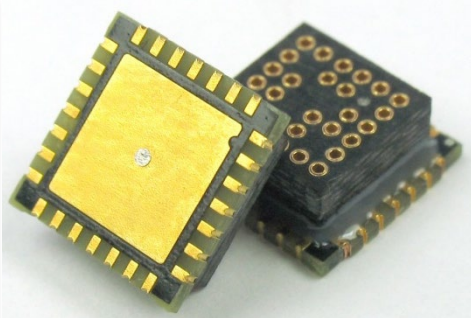
PLCC plug



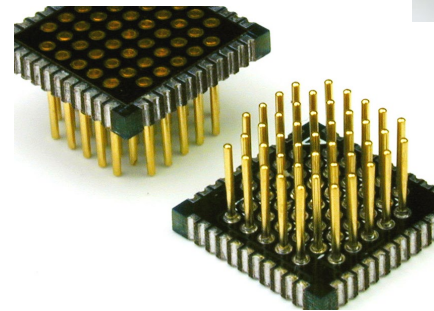
Side castellation SOIC emulator

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

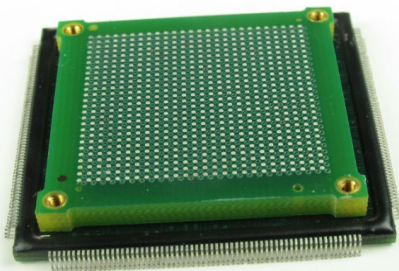


Leadless QFN emulator



Leadless PLCC emulator

Package Convertors & Fix Adapters



BGA device mounted to QFP footprint on mother board



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

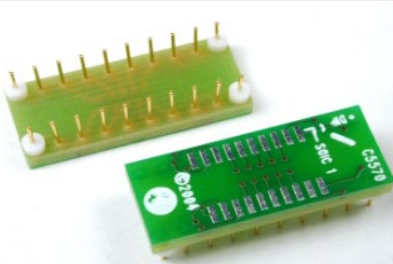


BGA to BGA conversion with complex signal swap due to device enhancement without additional real estate

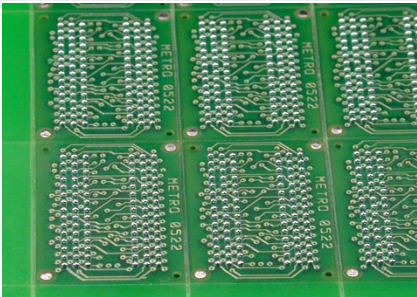
Features	Benefits
Shortest signal routing	Minimal loss for high bandwidth applications
Gold plated interconnection	Low contact resistance
Chip size footprint	No additional real estate needed. Ideal for replacing obsolete IC and field upgradeable system designs
Shaped solder	Solders same as IC it replaces. 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



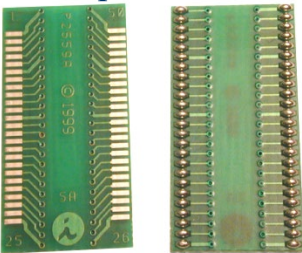
SOIC to DIP converter using blind hole technology



BGA converter in scored panel



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



SOIC pitch converter

Continuous improvement

20 Years

Proven Capability

Development

Prototype, Probe & Analysis Adapters

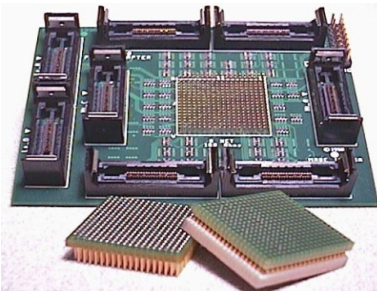
Continuous improvement

Proven Capability

Development



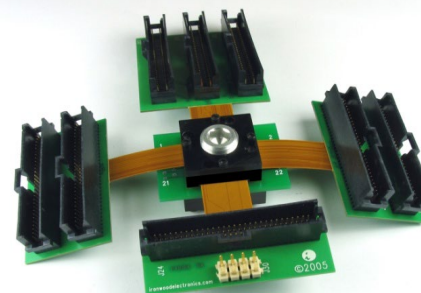
20 Years



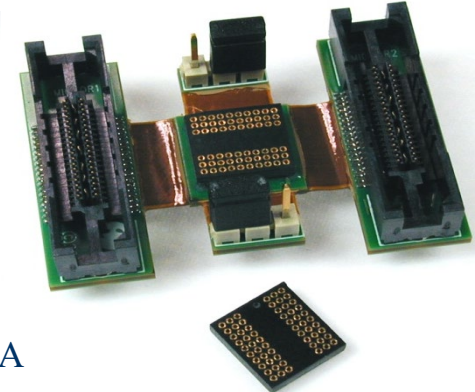
Power PC BGA device interfaced to Logic analyzer and mother board for functional analysis



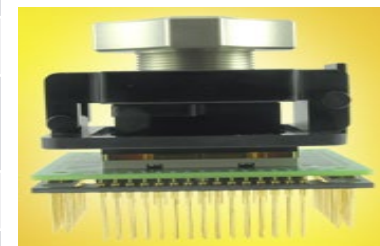
SOIC, PLCC adapter



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 mictor and BGA surface mount foot



BGA proto adapter with Clamshell pogo pin socket

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

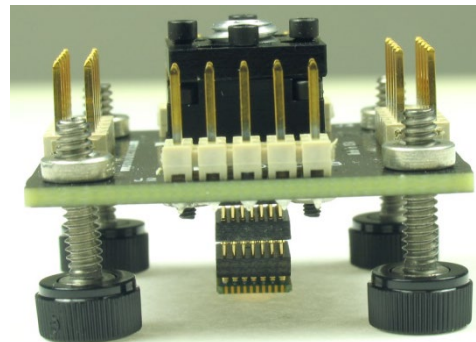
CTE match and high temperature applications

Flexible top side traces

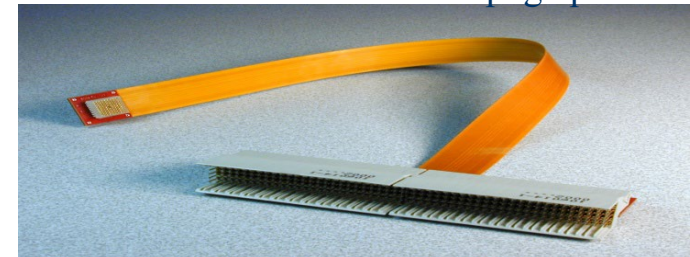
Probing solution without additional interconnect

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 mother board with signals brought out to test pins

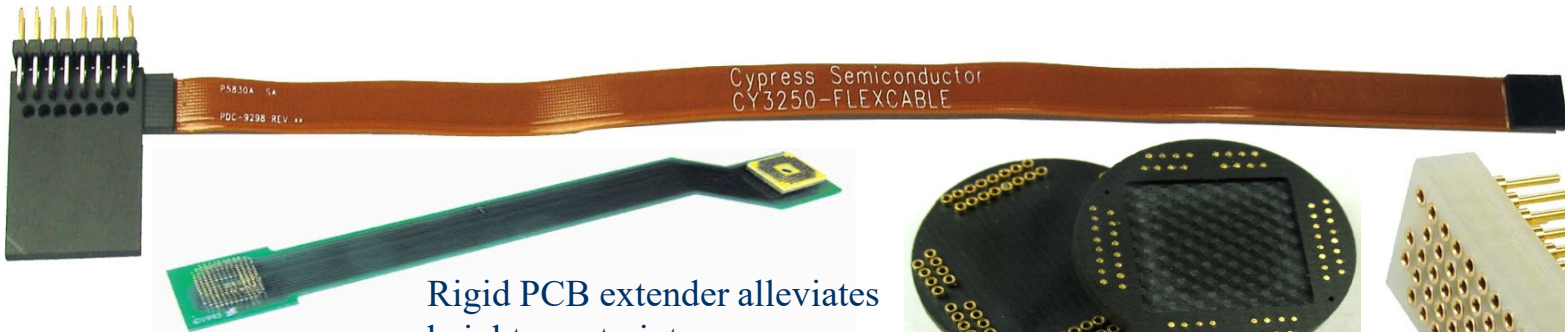


Flex emulator – 125 position AMP Z pack connector to 80 position female interface

Receptacles, Extenders, Rotators & Socket Plugs

Continuous improvement
Proven Capability
Development

20 Years



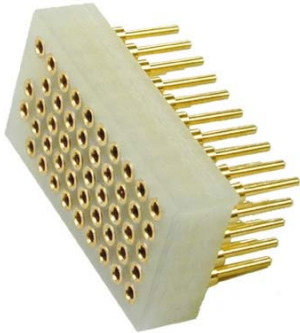
Flex PCB extender allows communication between device to moving head

Rigid PCB extender alleviates height constraints

Circular receptacle

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

- 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



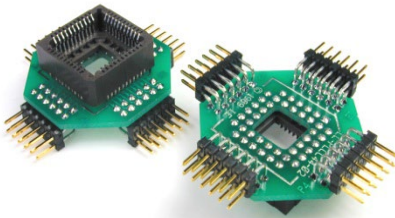
Array receptacle



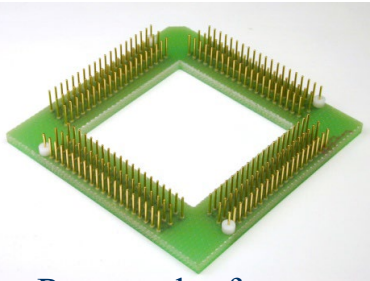
PLCC socket plugs



Height extender

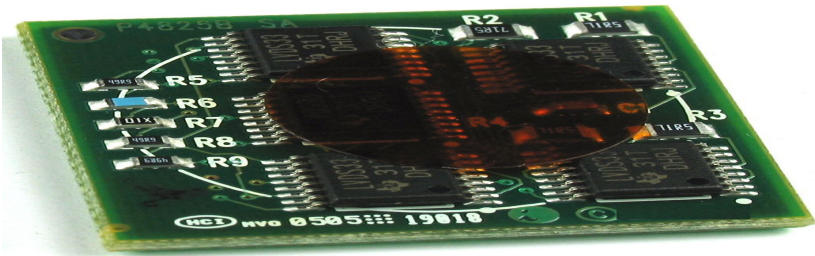


PLCC device clips with probing option



Receptacles for burn-in sockets

Electronic Modules



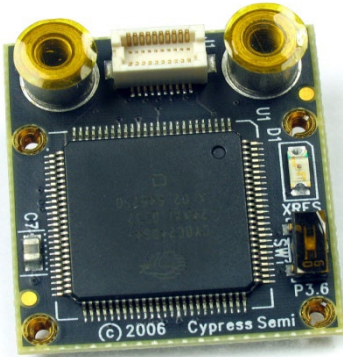
Multi chip module with components on both side



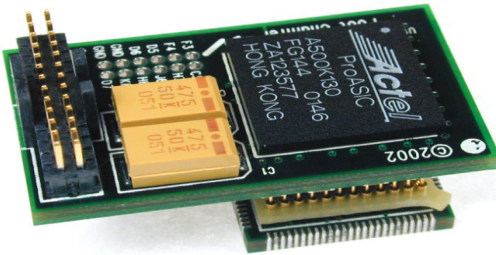
BGA device, discrete & voltage regulator



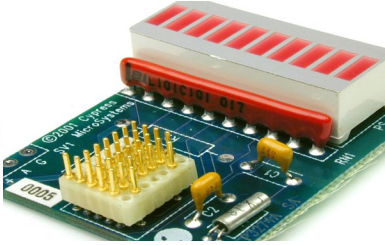
QFP device, discrete & connector



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

8 Years

Proven Capability

Development

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