



**Ironwood
Electronics, Inc.**



Adapter Technologies



**High Performance
IC Sockets And
Test Adapters**

Overview



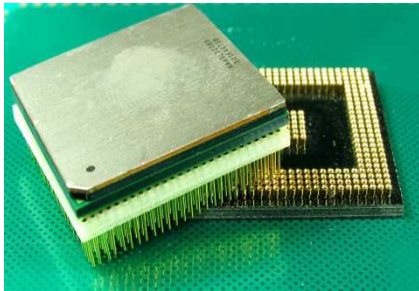
- **Company Overview**

- Over 5,000 products
- High Performance Adapters and Sockets
- Many Custom Designs
- Engineering – Electrical and Mechanical
- ISO9001:2008 Registration

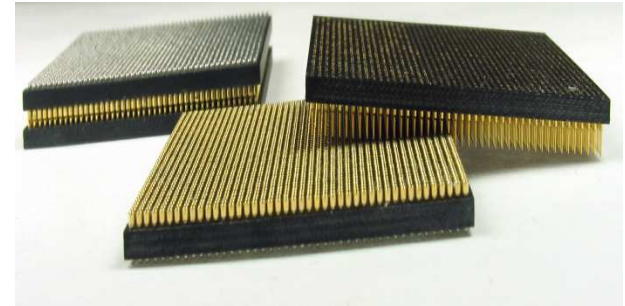
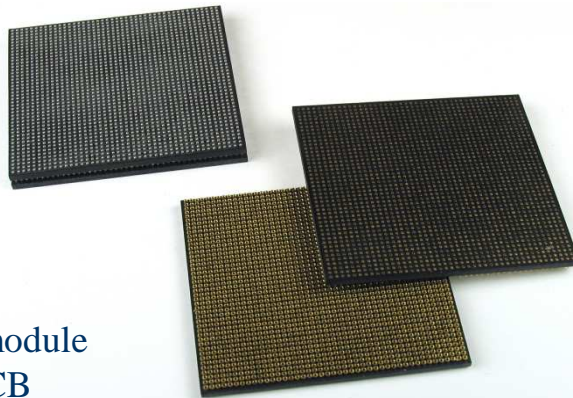
- **Adapter Technology Overview**

- 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

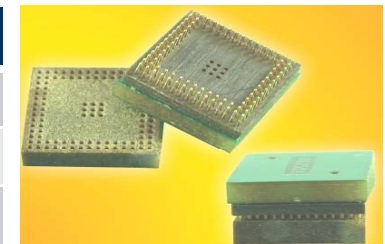
Continuous improvement

Proven Capability

Development

9 Years

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

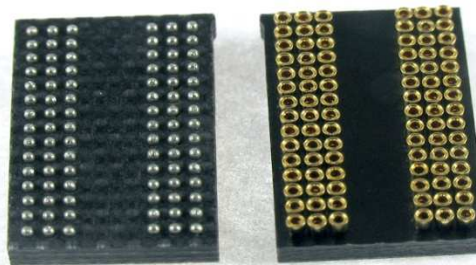


0.5mm pitch BGA Pluggable adapter system

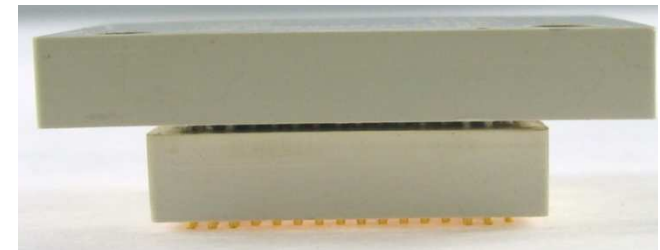


Capabilities

- 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

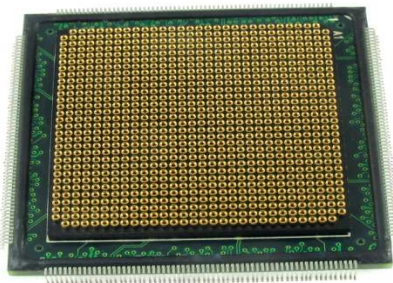


Continuous improvement

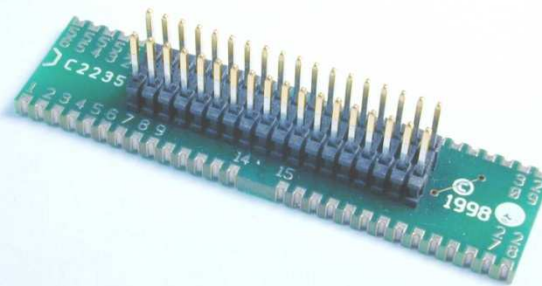
Proven Capability

Development

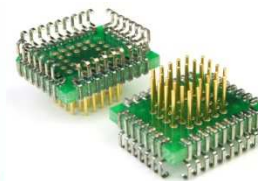
15 Years



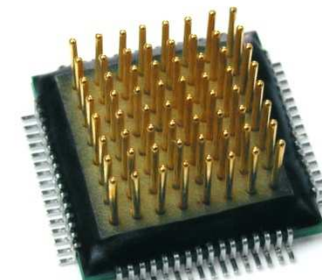
0.4mm pitch QFP emulator base with female interface



Leadless SOIC emulator



J-leaded PLCC emulator foot

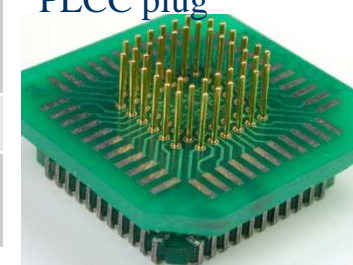


Gull-wing QFP emulator foot

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



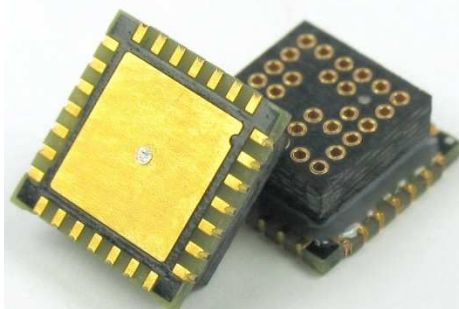
PLCC plug



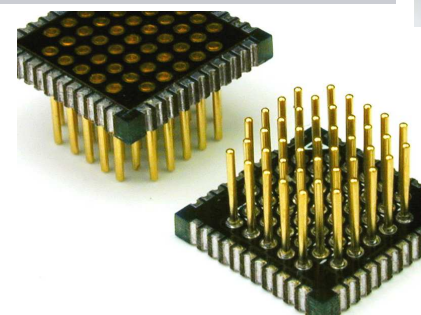
Side castellation SOIC emulator

Capabilities

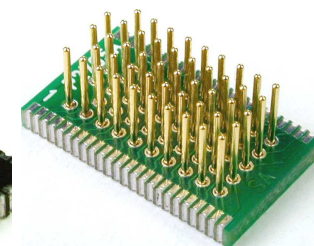
- 0.4mm to 1.27mm pitch
- 2x2mm to 50x50mm device
- QFN, QFP, SOIC, PLCC
- 500 pin count
- Gull-wing options
- Leadless options
- RoHS compatible



Leadless QFN emulator



Leadless PLCC emulator



Package Convertors & Fix Adapters

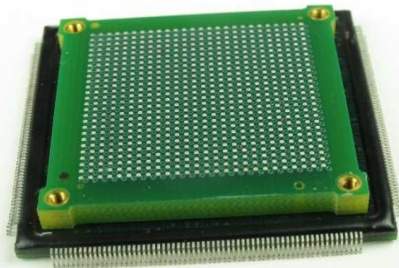


Continuous improvement

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

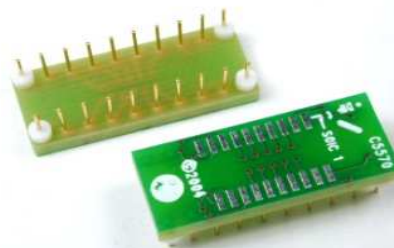
Features	Benefits
Shortest signal routing	Minimal loss for high bandwidth applications
Gold plated interconnection	Low contact resistance
Chip size footprint	No additional real estate needed. Ideal for replacing obsolete IC and field upgradeable system designs
Shaped solder	Solders same as IC it replaces.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



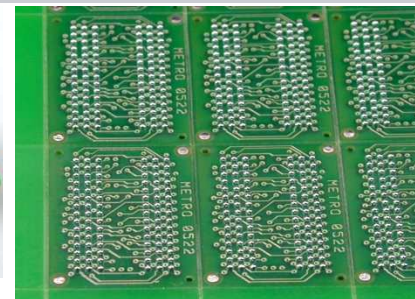
SOIC device mounted to PLCC footprint using solder column technology for high volume production

Capabilities

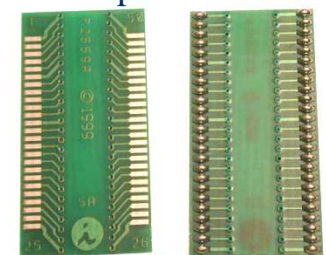
- 0.4mm to 2.54mm pitch
- 2x2mm to 50x50mm device
- BGA, LGA, QFN, SOIC, PLCC, QFP, DIP, PGA, etc
- 2000 pin count
- RoHS compatible
- Tray, Panel, Tape & Reel options



SOIC to DIP convertor using blind hole technology



BGA convertor in scored panel



SOIC pitch convertor

Prototype, Probe & Analysis Adapters

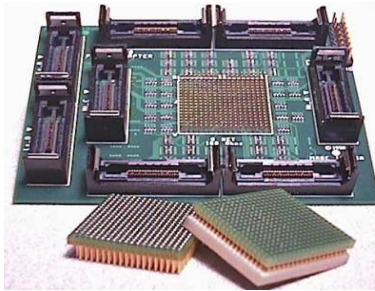


Continuous improvement

Proven Capability

Development

20 Years



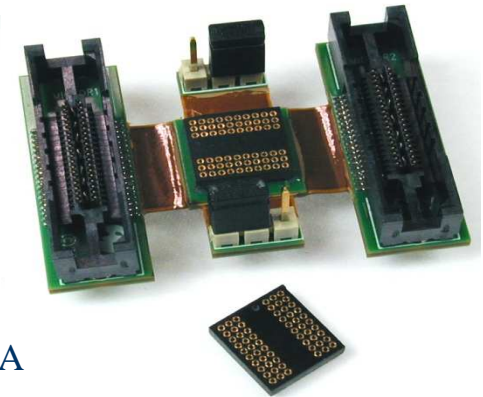
Power PC BGA device interfaced to Logic analyzer and mother board for functional analysis



SOIC, PLCC adapter

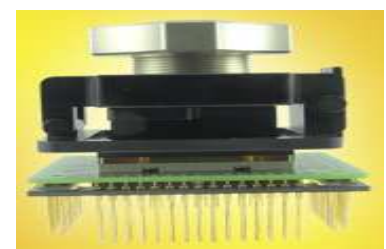


0.5mm pitch 21x21 array 289 position BGA solder balls to AMP 104068 connectors using rigid flex PCB with socket fixture



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

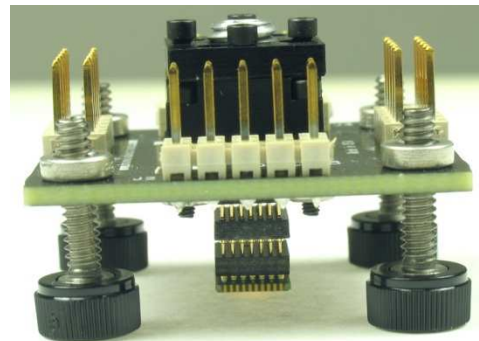
Features	Benefits
Shortest signal routing	Minimal loss for high bandwidth applications
Gold plated interconnection	Low contact resistance
Chip size footprint	No additional real estate needed. Ideal for IC prototype and system analysis testing
Conventional PCB material	CTE match and high temperature applications
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 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

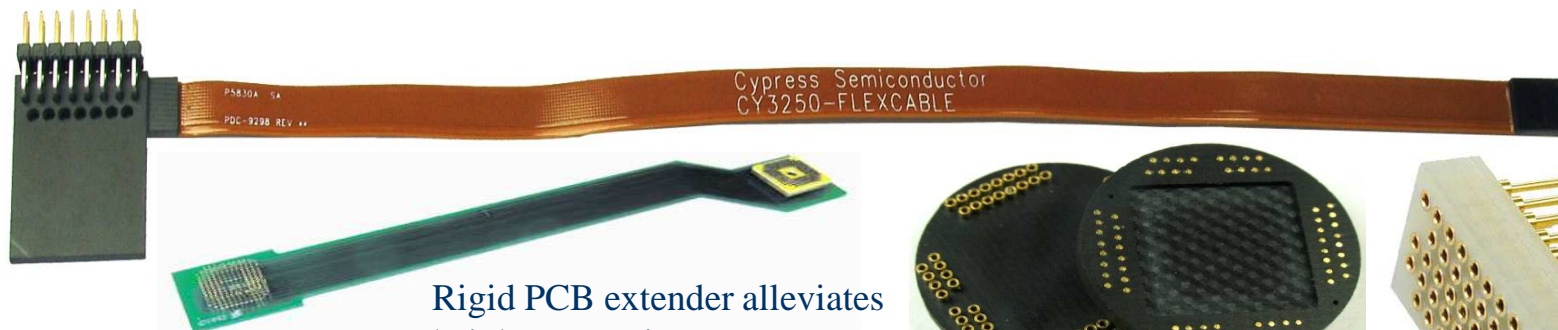


Continuous improvement

Proven Capability

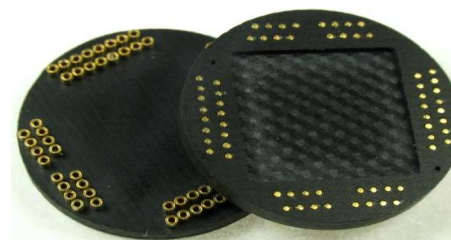
Development

20 Years

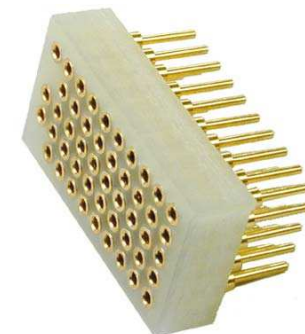


Rigid PCB extender alleviates height constraints

Flex PCB extender allows communication between device to moving head

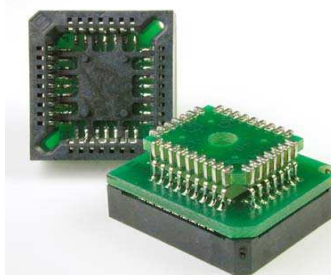


Circular receptacle



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



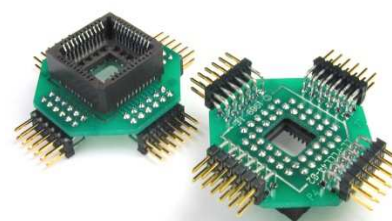
PLCC socket plugs

Capabilities

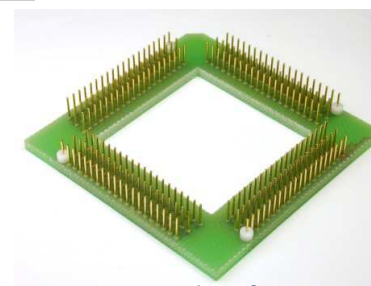
- 0.5mm to 2.54mm pitch
- 2x2mm to 50x50mm device
- BGA, LGA, QFN, QFP, SOIC
- 2000 pin count
- RoHS compatible
- Rigid & flex options
- Custom fixtures in days



Height extender



PLCC device clips with probing option



Receptacles for burn-in sockets

Electronic Modules

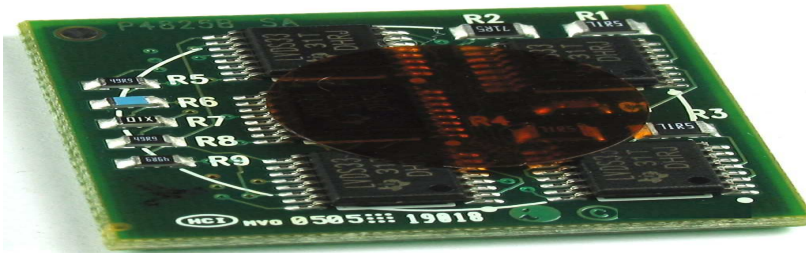


Continuous improvement

Proven Capability

Development

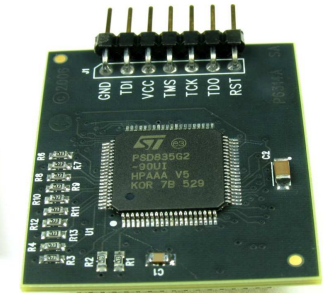
7 Years



Multi chip module with components on both side



BGA device, discrete & voltage regulator



QFP device, discrete & connector

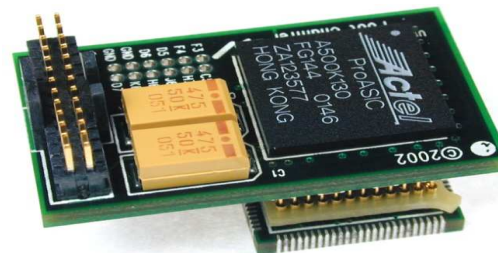
Features	Benefits
Conventional PCB material	CTE match and high temperature applications
Shortest signal routing	Minimal loss for high bandwidth applications
Chip size footprint	No additional real estate needed. Ideal for replacing obsolete IC and field upgradeable system designs
Conductive filled via	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)



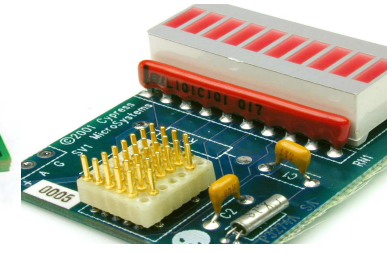
SoC module with high density connector

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



Daughter card module
Interfaced to QFP footprint



Dual technology (SMT & thru hole) assembly

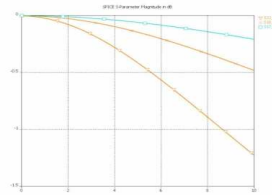
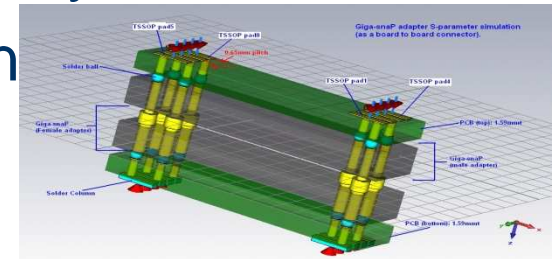


BGA device, SOIC device & discrete

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





Tack	Obrigado	Vielen Dank
Merci	ありがとうございます	
Bedankt	Takk	感謝您
谢谢	Grazie	
	Спасибо	Thank You
Kiitos	Tak	
	Gracias	감사합니다
Dziękujemy		Σας ευχαριστούμε

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