Ironwood ELECTRONICS

www.ironwoodelectronics.com

Socket Technologies

B.C.E. ELECTRONICS

Web Page: www.bce.it

Tel: (+39) 0536-811616

Fax: (+39) 0536-811500

email: bce@bce.it

Introduction

Ironwood ELECTRONICS
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- Company Overview
  - Over 5,000 products
  - High Performance Adapters and Sockets
  - Many Custom Designs
  - Engineering – Electrical and Mechanical
  - ISO9001:2008 Registration
- Socket Technology Overview
  - Embedded gold plated wire elastomer (SG)
  - Stamped & Etched spring pins (SBT)
  - Embedded silver ball elastomer matrix (SM/SMP)
  - Compressible silver button in polyimide (GT)
  - Surface mount adapters for sockets (SF)

Embedded gold plated wire
30.5 GHz elastomer socket (SG)

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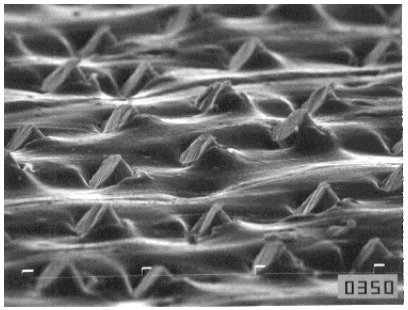
Continuous improvement

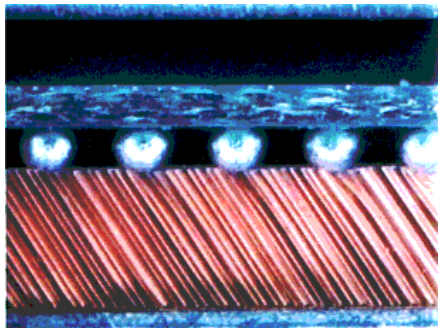
18 Years

Proven Capability

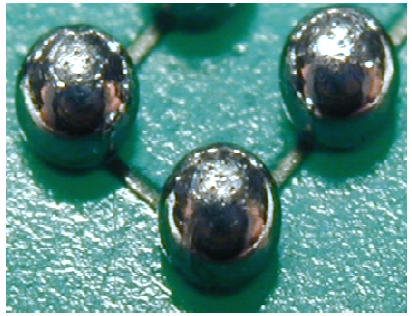
Development



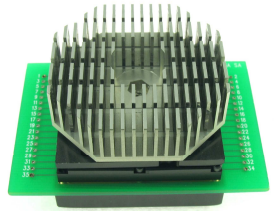
Protruded wire from elastomer



BGA compressed on Elastomer

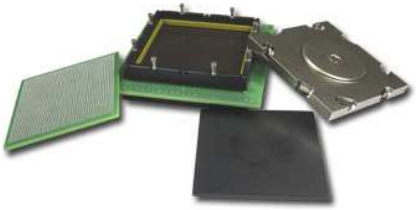


Wire marks on BGA



Heat sink lid

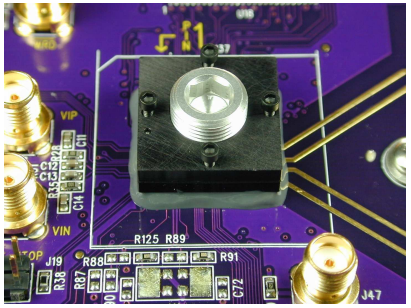
Features	Benefits
Short contact	High bandwidth applications
Gold plated Brass wire	Low contact resistance
Small socket footprint	Easy to place inductors, capacitors, resistors, etc for tuning and increasing bandwidth. Ideal for IC prototype and system testing and field upgradeable system designs
High resilient elastomer	Compression cycles in thousands
Optimized contact force	Reliable connection without damage to device or board



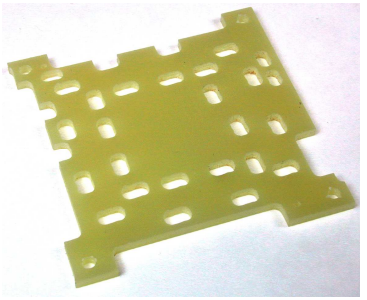
Xilinx FPGA socket

Capabilities
- 0.3mm to 1.27mm pitch
- 1x1mm to 55x55mm device
- BGA, QFN, QFP, SOIC
- 4000 pin count
- Heat sink options
- Easy chip replacement
- Custom support plate options

Open top lid



No mounting hole socket



Custom insulation plate

Stamped & Etched spring pin
31.7 GHz socket (SBT)

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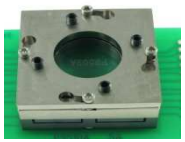
LGA high force pin

BGA low force pin

BGA socket w/ Snap Lid



Open top socket

Super short Etched spring pin

Continuous improvement

7 Years

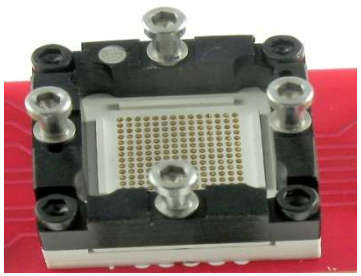
Proven Capability

Development

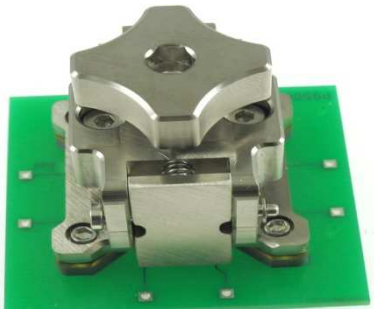
Features	Benefits
Long contact travel	Compliancy for large package warpage
Gold plated BeCu material	High temperature applications
Small socket footprint	Easy to place inductors, capacitors, resistors, etc for tuning and increasing bandwidth. Ideal for IC prototype and system testing and field upgradeable system designs
High resilient spring	Compression cycles in hundreds of thousands
Optimized pin diameter to length ratio	Impedance matched high speed applications
Stamped contact	High current applications
Automated assembly	Low cost, short lead time

Capabilities
- 0.4mm to 1.27mm pitch
- 1x1mm to 60x60mm device
- BGA, LGA, QFN, QFP, SOIC
- 5000 pin count
- Heat sink options
- Easy chip replacement
- Custom support plate options

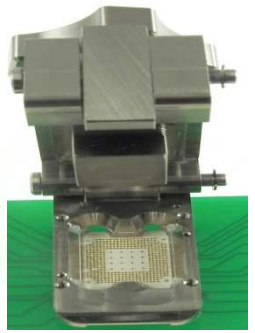
Cone /ball Plunger



Floating plate for precise alignment and swivel lid



Clamshell BGA socket



Embedded silver ball
40 GHz elastomer socket (SM/SMP)

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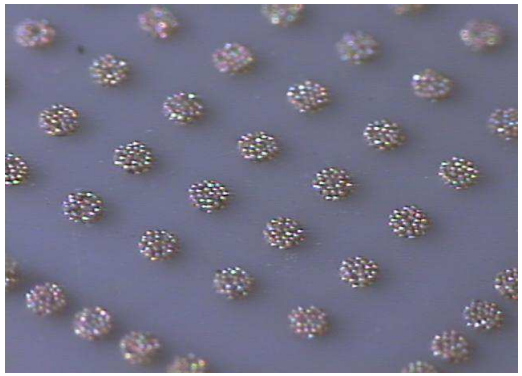
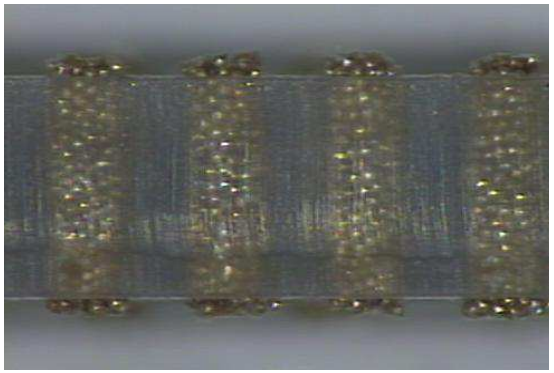
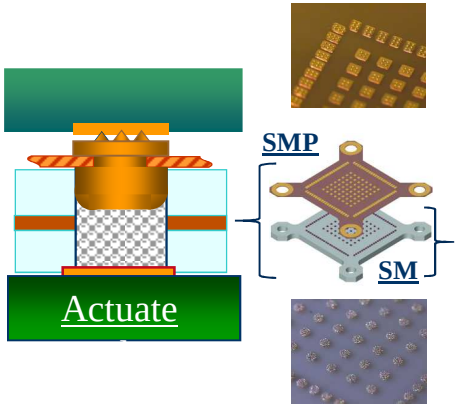


Array of Columns - Elastomer Matrix



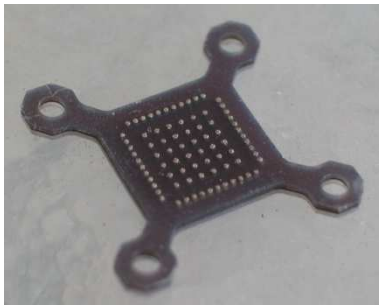
Cross section - Silver balls



SMP = Elastomer layer + Protective layer

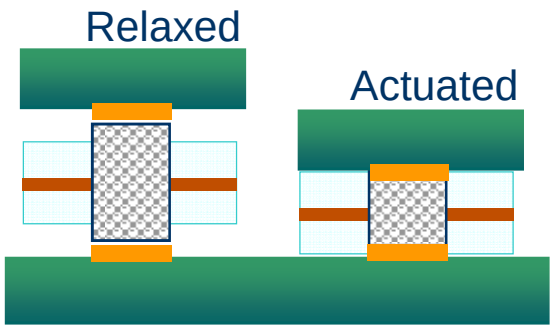
Continuous improvement
Proven Capability
Development
5 Years

Features	Benefits
Shortest contact	Highest bandwidth applications
Silver balls	Low contact resistance
Small socket 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
High resilient elastomer	Compression cycles in hundreds of thousands
Matrix with core	Optimized force and built-in compression stop mechanism

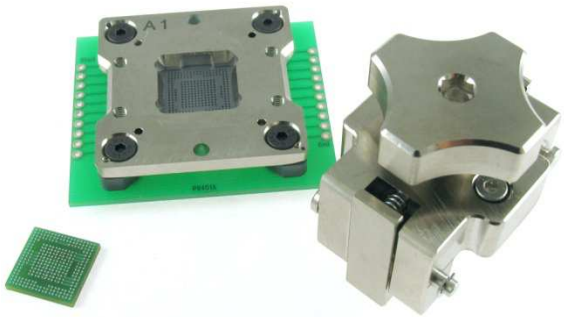


Replaceable elastomer module

Capabilities
- 0.25mm to 1.27mm pitch
- 1x1mm to 60x60mm device
- BGA, LGA, QFN
- 3000 pin count
- Heat sink options
- Easy chip replacement
- Custom support plate options



Rest & Test condition



ATE socket with double latch clam shell lid

Compressible silver button
75 GHz elastomer socket (GT)

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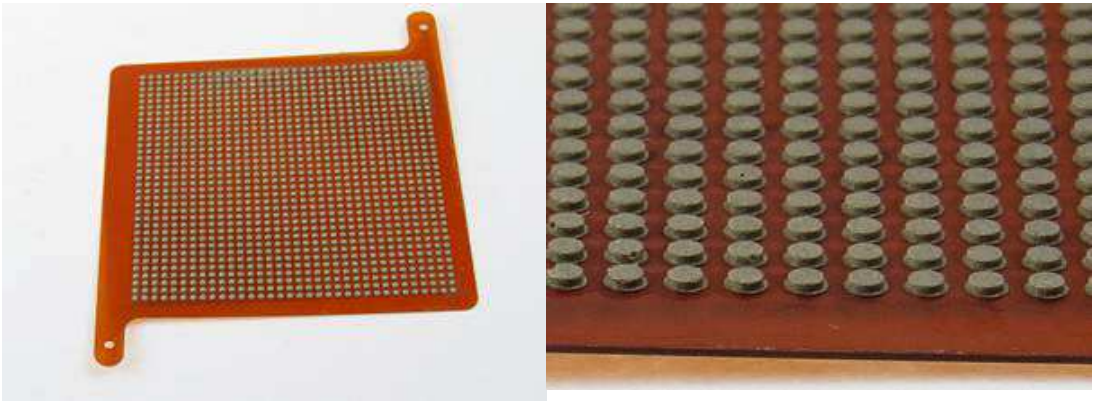
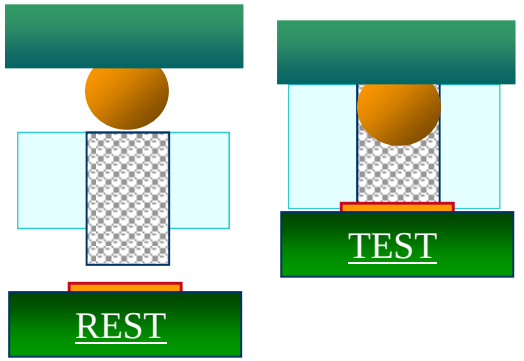


Array of Silver Buttons - Elastomer Matrix



BGA Rest & Test condition

Continuous improvement

Proven Capability

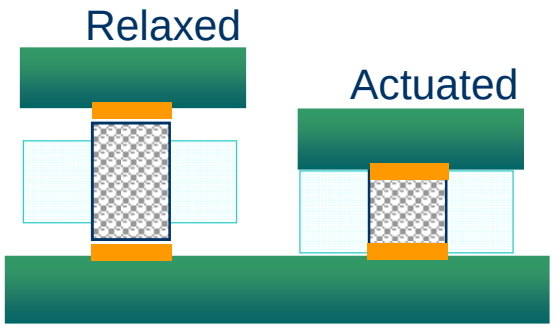
Development

2 Years

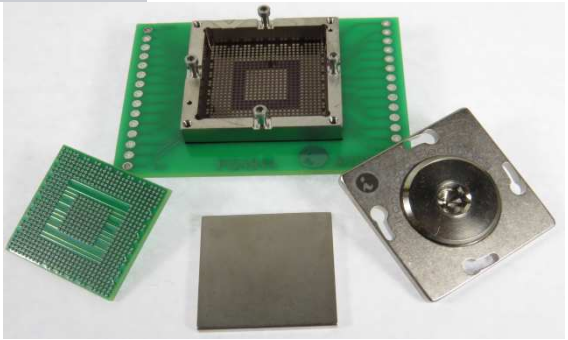
Features	Benefits
Shortest contact	Highest bandwidth applications
Silver particles	Low contact resistance
Small socket footprint	Easy to place inductors, capacitors, resistors, etc for tuning and increasing bandwidth. Ideal for IC prototype and system testing and field upgradeable system designs
Individual buttons	No mechanical coupling
Laser cut substrate	Precise contact location

Socket with heat sink

Capabilities
- 0.15mm to 1.27mm pitch
- 1x1mm to 50x50mm device
- BGA, LGA, QFN
- 3000 pin count
- Heat sink options
- Easy chip replacement
- Custom support plate options



QFN Rest & Test condition



BGA socket with Swivel lid

Contact Technology Summary

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Characteristics	Embedded Wire Elastomer (SG)	Stamped spring pins (SBT)	Embedded Silver Ball Elastomer Matrix (SM/SMP)	Silver Button Elastomer (GT)
Bandwidth, GHz	27 to >40	7 to 31.7	>40	75
Endurance, Cycles	2K	500K	5K/500K	1K
Resistance, mΩ	20	15	15	20
Self Inductance, nH	0.11 to 0.28	0.88 to 0.98	0.21	0.04
Max Current, Amp	2	8	4	5
Temp Range, ^{0}C	-35 to +100	-55 to +180	-55 to +155	-55 to +160
Pitch, mm	0.3 to 1.27	0.4 to 1.27	0.25 to 1.27	0.15 to 1.27
Package Types	BGA, QFN, QFP, SOIC	BGA, LGA, QFN, QFP, SOIC	BGA, LGA, QFN	BGA, LGA, QFN
Lab test	√	√	√	√
Production test		√	√	
Field upgrade	√	√		
Temperature test	√	√	√	√
Kelvin test	√	√	√	√
Burn-in test		√		

Pin Datasheet

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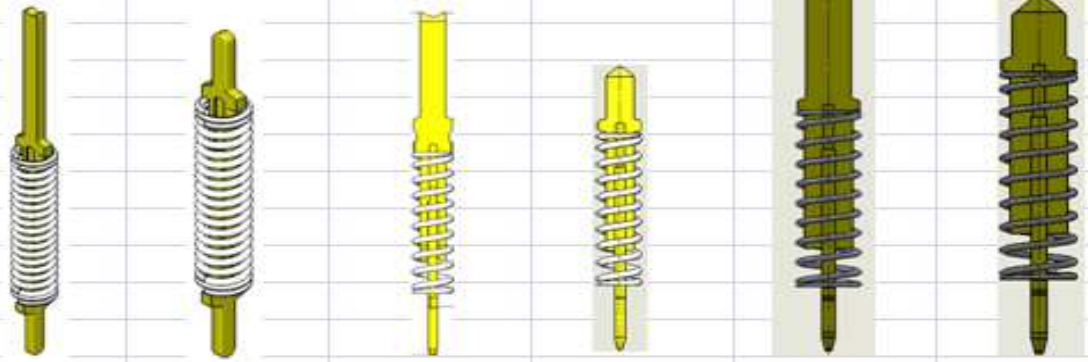

Pin Family	SBT	SBT	SBT	SBT	SBT	SBT
Part Number	P-P185A	P-P184A	P-P196A	P-P150A	P-P151A	P-P152A
Minimum Pitch (mm)	0.4	0.4	0.5	0.5	1.0	1.0
Pin Type	BGA	LGA	BGA	LGA	BGA	LGA
Length (mm)	3.81	2.9	3.86	2.95	5.69	4.45
DUT Side Tip Shape	V Shape	Radius Cone	V Shape	Radius Cone	Notched V	Radius Cone
DUT Side Tip Dimension (mm)	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
PCB Side Tip Dimension (mm)	0.12	0.12	0.04	0.06	0.1	0.1
DUT Side Travel (mm)	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
Force (g)	17	14.5	30	30	19	19
Cres (mOhms)	< 50	< 50	< 30	< 30	< 15	< 15
CCC @ ambient (Amps)	1.8	1.8	4.0	6.0	8.0	8.0
Bandwidth (GHz @ -1dB)	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)	0.98	0.98	0.88	0.88	0.93	0.93
Temperature (deg C)	-55 to +180C	-55 to +180C	-55 to +180C	-55 to +180C	-55 to +180C	-55 to +180C
Insertion Cycles	50K	50K	500K	500K	500K	500K

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

Socket Lid Options

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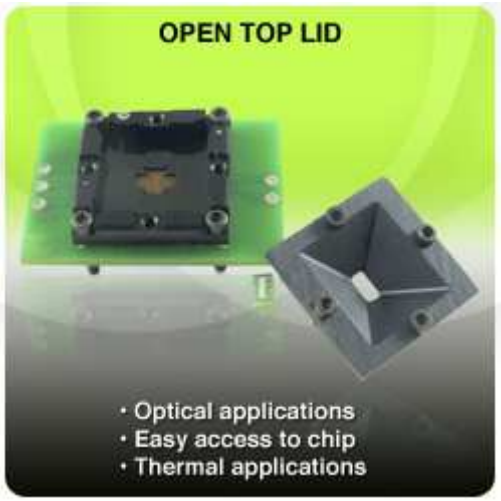

Surface Mount Adapters for sockets (SF)

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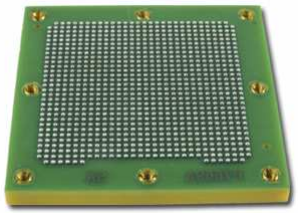
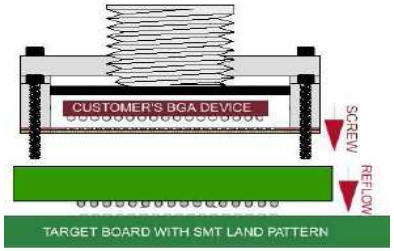
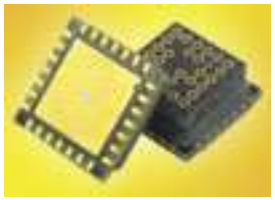


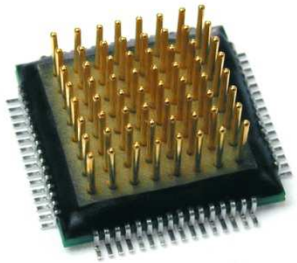
Surface mount adapter



Socket + SM adapter

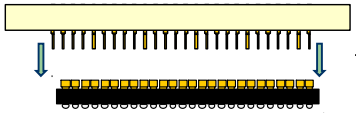


QFN SM adapter



QFP SM adapter

Spring pin socket +
Thru hole adapter +
Surface mount adapter



Thru hole adapter +
Surface mount adapter

Continuous improvement

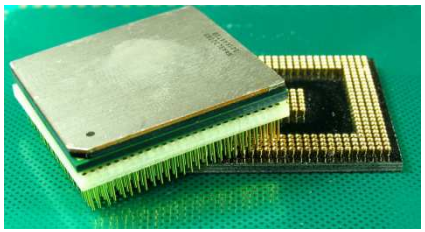
18 Years

Proven Capability

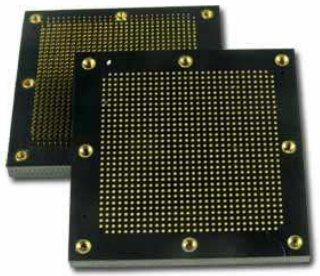
Development

Features	Benefits
Pluggable interface	Easy insertion and extraction for device swap
FR4 & Gold plated contacts	High temperature applications
Small adapter 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
Conductive filled via	Excellent thermal dissipation and high current applications
Optimized plated thru hole with filled via	Low inductance and high speed applications
Edge castellation (QFN)	Easy manual assembly
Standard Solder (BGA)	Easy assembly (industry standard reflow profile)

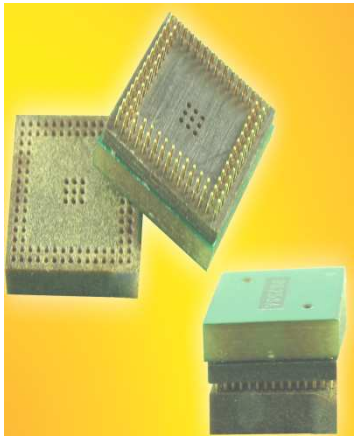
Capabilities
- 0.5mm to 1.27mm pitch
- 2x3mm to 50x50mm device
- BGA, LGA, QFN, QFP, SOIC
- 2000 pin count
- Lead free options
- Easy pluggable module
- Custom height extension



Pluggable adapter pair
with soldered device



Thru hole adapter



0.5mm pitch
Pluggable adapter pair

Custom Capability

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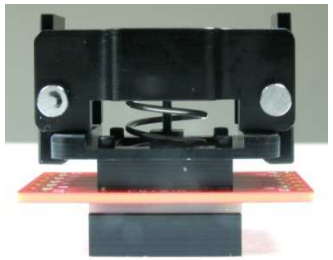
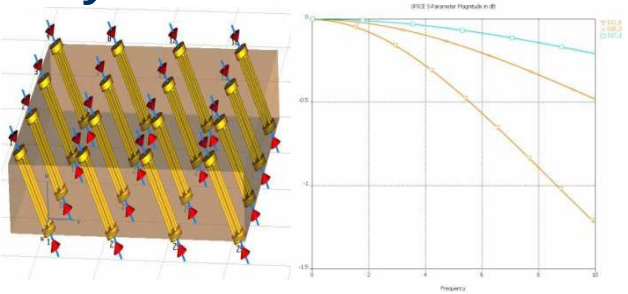
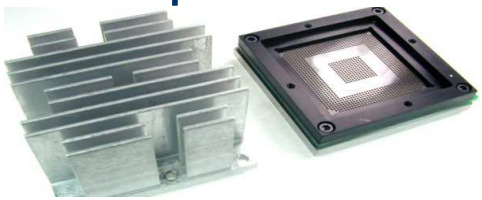
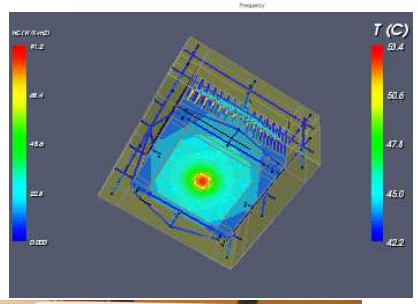
- Custom socket designs in 2 days
- Match customer's PCB footprint
- Custom socket manufacturing in 10 days
- Multiple contactor technologies
- Heat sink simulation and design
- Contactor signal integrity simulation
- In-house automated optical inspection
- In-house machining
- Quick-turn production









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B.C.E. s.r.l.
Via Regina Pacis, 54/c - 41049 SASSUOLO (MO) Italy
Tel. +39 0536 811.616 r.a. - Fax +39 0536 811.500
www.bce.it - E-mail: bce@bce.it

SYSTEM CERTIFICATION ISO 9001 SGS