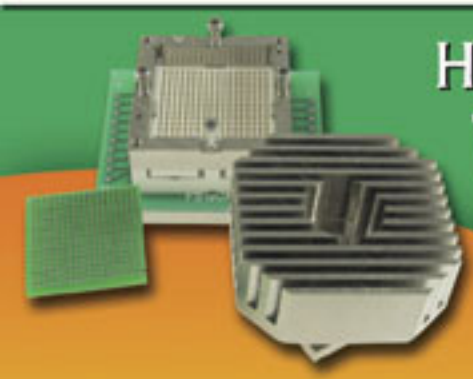
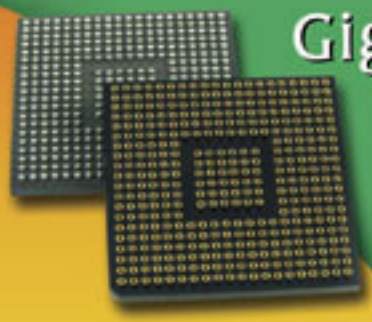
Ironwood ELECTRONICS

ISO 9001:2008 WITH DESIGN CERTIFIED

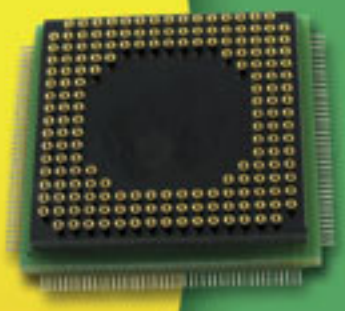


High Performance Thermal Socket



Giga-snaP

High Endurance GHz Socket



Package Converter

RoHS

High Performance Sockets & Adapters

Electronic Module

B.C.E. ELECTRONICS

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Mission Statement

Ironwood Electronics is committed to developing new technologies and methods in IC interconnection for the purpose of providing superior products and service for our customer's overall requirements. We offer the most comprehensive test and prototype adapter and socket line in the industry. We have detailed knowledge of interconnect technology in the areas of electrical, mechanical and software engineering. Products are designed for superior mechanical and electrical integrity utilizing the most advanced technologies. Continuous and open communication with our suppliers ensures top quality materials and on-time delivery. We are dedicated to quality in the services we provide and the parts we manufacture.

Catalog 23

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Introduction

Ironwood Electronics creates innovative IC interconnect solutions in prototype, test, and production applications for use in both product development and ongoing production.

What is in the catalog

The Short Form Catalog V. 23 is an abbreviated version of the information found on our web site. It contains an overview of each product line and listings for many of the products. Detailed information on a given part can be found on the web site. In addition, the web site contains drawings, maps, photos, specifications, and other information on the products so that you can quickly determine suitability for your application.

How to Use Web site With This Catalog www.ironwoodelectronics.com

Each section of the catalog has specific pointers to find drawings for a part in the different product lines. For instance for the GHz BGA product line, the pointer for these drawings is found at http://www.ironwoodelectronics.com/products/sockets/sockets_list.cfm and then select GHz BGA Sockets. When a product line is selected, a Standard Parts list will appear with parts tables and technical documents. After selecting a Standard Parts table, scroll through the table to select your product and click on a part number. When a product is selected, a window appears with the documentation and other information listed. Simply view the documentation on the selected part.

In addition to the Browse function you can search for a product with two different methodologies. The first is by part number where you enter the part number or a portion of a part number. A listing of the part(s) is returned after search activation. The second option is searching by package type, pitch, and pin counts. All parts for a given combination of these will be returned by the search. The web site also contains extensive information on product presentations, distributors, and new products. Ordering can also be quickly accomplished online.

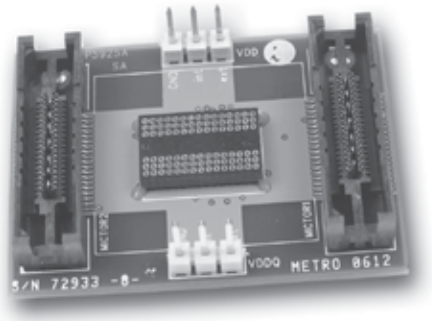
Can’t find your solution? Call us!

We will design a custom solution for your unique problem. The electronics industry is constantly changing with new packages, higher speed systems, and increasing miniaturization. We have an engineering staff with electrical and mechanical engineering capability to solve the most challenging packaging and electronic design problem. We can quickly convert the design to a practical solution sometimes within a few days. See page 3 for more details on engineered solutions.

Lead-Free Solutions Available

Ironwood Electronics has developed many RoHS compliant sockets and adapters. This applies to custom products as well as standard products.

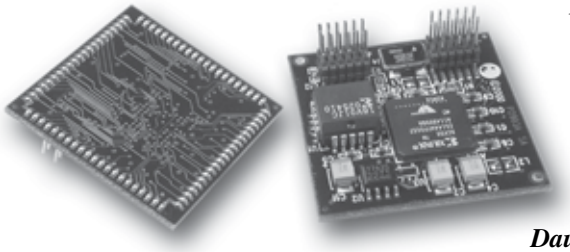
Custom Engineered Products



Ironwood has created thousands of custom adapters. A few recent ones are illustrated. Ironwood Electronics has the largest, most experienced staff of electrical and mechanical engineers in our industry. Quick turn custom projects are a cornerstone of our business. Our engineers utilize advanced CAD tools to help us design quality into each of our products. We are committed to developing high density interconnect technologies. Many of our innovative designs incorporate technologies such as:

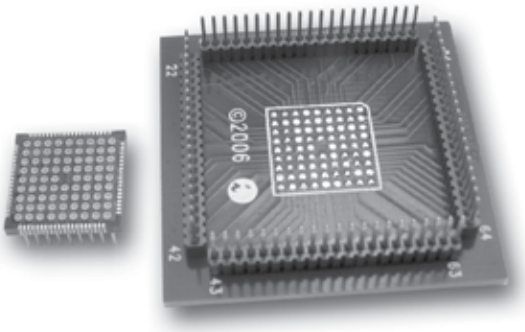
- Upgrade an existing design
- Replace an obsolete component
- Create a new capability for programming or test

- Controlled Impedance
- <0.8mm pin grid arrays
- Conductive Elastomers
- Blind/Buried Vias
- 3 mil Line & Space
- Embedded Resistors
- Laser Micro Vias
- Shaped Solder
- Flexible PCBs
- RoHS to Lead Adapters



Daughter Card module for obsolete IC

ISO 9001 Certified Design Process



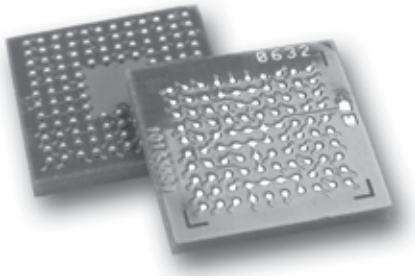
QFP Probing Adapter

Ordering custom adapters

We will be pleased to quote custom adapters to meet your requirements. When asking for a quote, you will need to provide the following information:

- Delivery schedule requirements
- Number of parts needed
- Description of your application (and drawings if possible).

In many cases custom solutions are feasible using off-the-shelf parts, allowing for fast delivery time and reduced NRE costs. In general, custom interconnect adapters can be developed and manufactured in 4 to 6 weeks. With increased NRE charges some adapters can be developed and manufactured in 1 to 2 weeks.

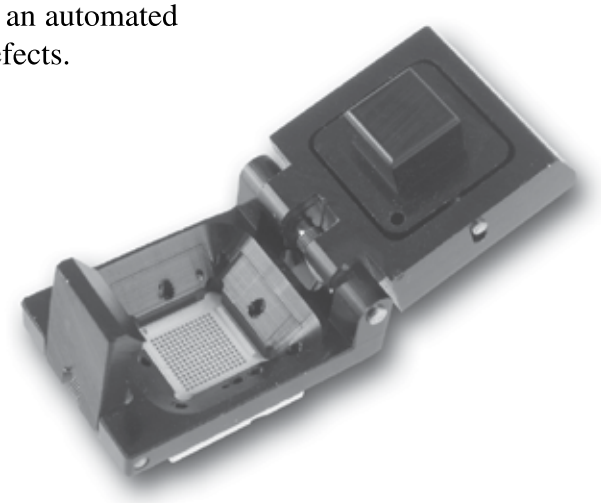


BGA Fix Adapter

CUSTOM

Socket For Burn-In and Test Applications

Ironwood Electronics SBT sockets are small footprint sockets that are compatible with other product lines such as GHz elastomer sockets, Giga-Spring sockets, etc. SBT socket uses SBT contact technology for high endurance and wide temperature applications. SBT Contact is a stamped contact with outside spring as well as inside leaf spring that provides a robust solution for Burn-in & Test applications. Solutions are available for 0.4mm to 1.27mm LGA, BGA, QFN, QFP, SOIC and other packages. Contact technology has 3 part system which includes top plunger, bottom plunger and a spring. The Beryllium Copper plungers are stamped and assembled to a stainless steel spring in an automated system to enable fast turnaround time, low cost and zero defects.



Typical specifications for the contact technology include:

- Over 20GHz bandwidth @-1dB
- Contact resistance under 15mΩ
- Self inductance under 1nH
- Capacitance under 0.3pF
- Operating temperature range -55C to +180C
- Insertion/Extraction life over 500, 000 cycles
- Current rating at 80C temperature rise is 4 to 8 Amps per pin

For drawings -> www.ironwoodelectronics.com then select Sockets -> Stamped Spring Pin Sockets

Part Number	Pitch (mm)	Max Balls	Body Size (mm)	Ball Array
SBT-BGA-7000	0.5	484	12x12	22x22
SBT-BGA-7001	0.5	729	14x14	27x27
SBT-BGA-7002	0.65	361	13x13	19x19
SBT-BGA-7003	0.5	196	8x8	14x14
SBT-BGA-7004	0.5	361	10x10	19x19

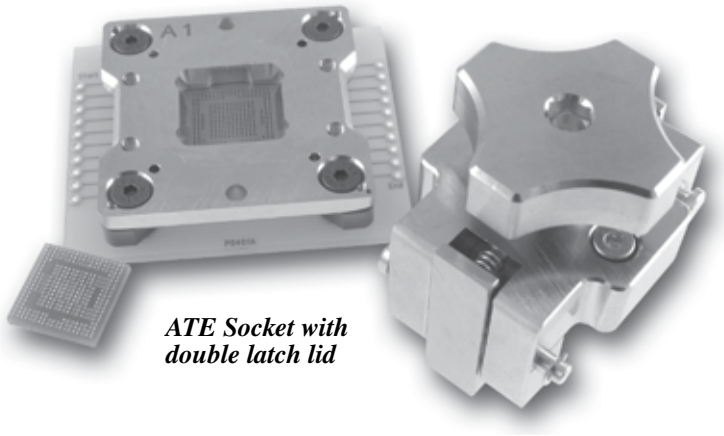
Part Number	Pitch (mm)	Max Balls	Body Size (mm)	Ball Array
SBT-BGA-6500	0.8	361	16x16	19x19
SBT-BGA-6501	0.8	256	14x14	16x16
SBT-BGA-6502	0.8	289	15x15	17x17
SBT-BGA-6503	0.8	225	13x13	15x15
SBT-BGA-6504	0.8	196	12x12	14x14
SBT-BGA-6505	0.8	399	17x17	20x20
SBT-BGA-6506	0.8	196	12x12	14x14
SBT-BGA-6507	0.8	144	10x10	12x12
SBT-BGA-6508	0.8	144	11x11	12x12
SBT-BGA-6509	0.8	324	15x15	18x18

Part Number	Pitch (mm)	Max Balls	Body Size (mm)	Ball Array
SBT-BGA-6000	1	1156	35x35	34x34
SBT-BGA-6001	1	484	23x23	22x22
SBT-BGA-6002	1	676	27x27	26x26
SBT-BGA-6003	1.27	400	27x27	20x20
SBT-BGA-6004	1	484	23x23	22x22
SBT-BGA-6005	1	324	19x19	18x18
SBT-BGA-6006	1	256	17x17	16x16
SBT-BGA-6007	1.27	676	35x35	26x26
SBT-BGA-6008	1	1513	40x40	39x39
SBT-BGA-6009	1	1521	40x40	39x39
SBT-BGA-6010	1	900	31x31	30x30
SBT-BGA-6011	1	196	15x15	14x14
SBT-BGA-6012	1	1764	42.5x42.5	42x42

Part Number	Pitch (mm)	Max Balls	Body Size (mm)	Ball Array
SBT-QFN-4000	0.5	16	3x3	4x4
SBT-QFN-4001	0.5	64	9x9	4x16
SBT-QFN-4002	0.5	80	12x12	4x20

Part Number	Pitch (mm)	Max Balls	Body Size (mm)	Ball Array
CBT-BGA-6002	0.8	196	12x12	14x14
CBT-BGA-7002	0.65	384	15x15	22x22

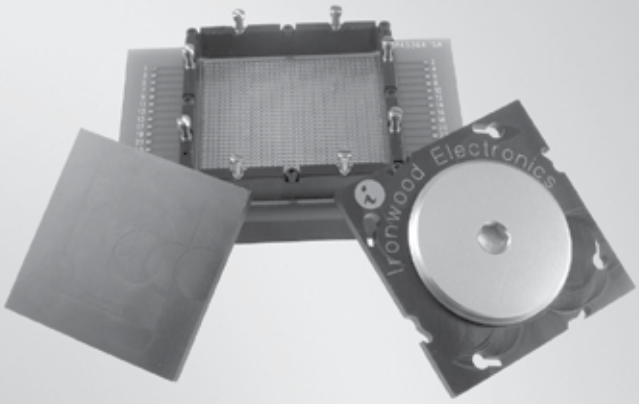
Part Number	Pitch (mm)	Max Balls	Body Size (mm)	Ball Array
CBT-QFN-7000	0.5	246	10.2x10.7	20x20



ATE Socket with double latch lid

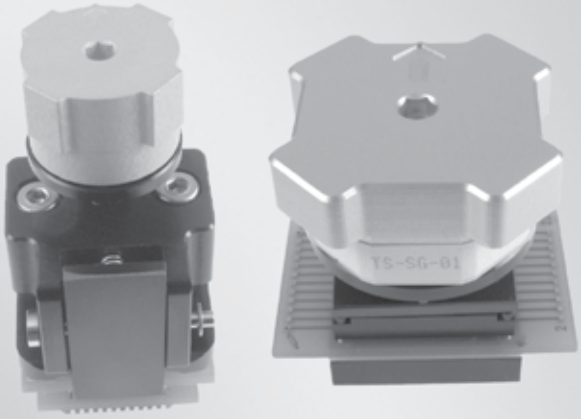
GHz Socket Lid Options

IMPROVED SWIVEL LID



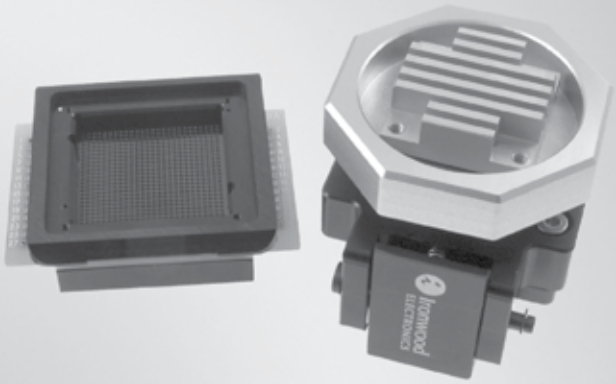
- Easier-to-use swivel lid
- Maintains low-profile design
- Quick IC installation

FORCE INDICATING COMPRESSION SCREW



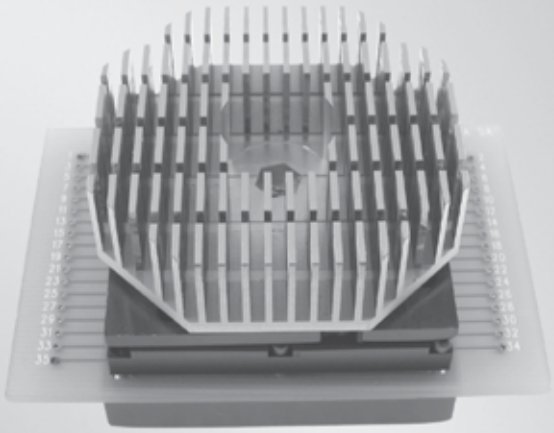
- No tools required
- Reliable installation
- Available for all IC's

DOUBLE LATCH LID



- Fully removable lid
- Optional heat sink
- Easy access to IC

HEAT SINK COMPRESSION SCREW



- Easy 2-in-1 installation
- Up to 100 watts
- Optional fan available

GHz BGA *SMALL Socket For Ultra High Speed- 0.75mm to 1.27mm Pitch*

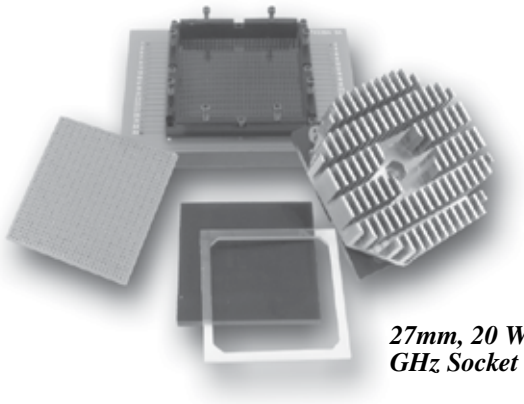
Optional heatsinks available for up to 70 Watts

Ironwood's GHz BGA sockets are ideal for prototyping and testing almost any BGA device application. These ZIF sockets provide excellent signal integrity yet remain cost effective. We use an innovative interconnect technology that delivers low signal loss (1dB at 6.5 GHz) and can support BGA pitches down to 0.5mm. The optional contactor has bandwidth over 10 GHz. Our sockets require far less PCB space than traditional mechanical-type sockets – only 2.5 mm larger perimeter than the IC.

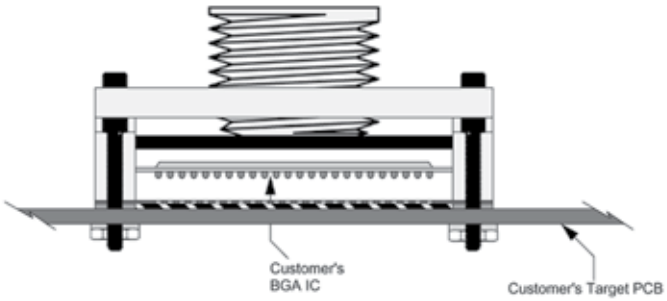
Ironwood's unique patented designs utilize a high-performance elastomer to provide electrical connections to the BGA chip. The elastomer can be continuously used in applications with temperatures up to 100ºC, with intermittent peaks to 150ºC. Each socket is a precision device, guiding the IC to the exact position for connection and does not damage solder balls.

The basic GHz BGA sockets are mechanically mounted over a target system's BGA lands. These low-profile SMT sockets are only 2.5 mm per side larger than actual IC packages. They support IC devices with body sizes ranging from 45mm down to 7mm. Larger body sizes may require a backing plate.

Note: The typical socket will accommodate any ball count BGA less than the maximum for a given Ball Array. For instance, a 14x14 array with 132 pins will fit in a socket with a max Ball Count of 196.



27mm, 20 Watt BGA GHz Socket



For the tables below, pitch and body size are mm. Select part by Pitch, Body, and Ball array.
For drawings -> www.ironwoodelectronics.com then select Sockets -> GHz Elastomer Sockets

SG-BGA_Table-0.8mm

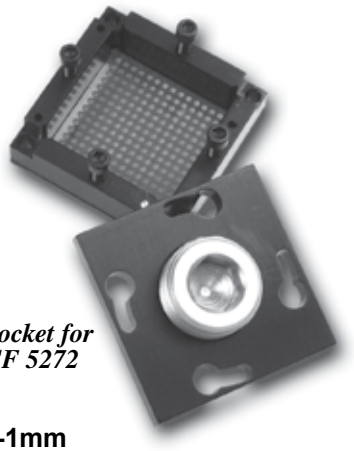
Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-6000	0.8	169	12x12	13x13
SG-BGA-6001	0.8	196	12x12	14x14
SG-BGA-6002	0.8	225	13x13	15x15
SG-BGA-6003	0.8	256	14x14	16x16
SG-BGA-6004	0.8	289	15x15	17x17
SG-BGA-6018	0.8	49	7x7	7x7
SG-BGA-6019	0.8	144	11x11	12x12
SG-BGA-6021	0.8	121	10x10	11x11
SG-BGA-6026	0.8	100	10x10	10x10
SG-BGA-6027	0.8	169	12x12	13x13
SG-BGA-6028	0.8	289	15x15	17x17
SG-BGA-6029	0.8	196	13x13	14x14
SG-BGA-6030	0.8	484	18x18	22x22
SG-BGA-6031	0.8	676	23x23	26x26
SG-BGA-6033	0.8	361	16x16	19x19
SG-BGA-6034	0.8	144	10x10	12x12
SG-BGA-6044	0.8	196	12x12	14x14
SG-BGA-6054	0.8	289	15x15	17x17
SG-BGA-6055	0.8	528	19x19	23x23
SG-BGA-6058	0.8	280	16x16	19x19
SG-BGA-6059	0.8	144	10x10	12x12
SG-BGA-6060	0.8	361	17x17	19x19
SG-BGA-6061	0.8	96	13.5x5.5	16x6
SG-BGA-6066	0.8	289	15x15	17x17
SG-BGA-6075	0.8	64	8x8	8x8
SG-BGA-6076	0.8	48	9x6	8x6
SG-BGA-6079	0.8	100	9x9	10x10
SG-BGA-6088	0.8	324	15x15	18x18
SG-BGA-6093	0.8	484	19x19	22x22
SG-BGA-6094	0.8	625	21x21	25x25
SG-BGA-6100	0.8	49	6x6	7x7
SG-BGA-6108	0.8	140	8x12	10x14
SG-BGA-6112	0.8	289	14x14	17x17
SG-BGA-6113	0.8x1x1.27	18	3.5 max X 6.04 max	4x6
SG-BGA-6124	0.8	529	19x19	23x23

Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-6125	0.8	136	10x14	8x17
SG-BGA-6129	0.8	400	17x17	20x20
SG-BGA-6134	0.8	64	7x7	8x8
SG-BGA-6136	0.8	400	17x17	20x20
SG-BGA-6138	0.8	72	8x7	9x8
SG-BGA-6142	0.8	49	7x7	7x7
SG-BGA-6146	0.75	100	8x8	10x10
SG-BGA-6148	0.8	140	11x13	10x14
SG-BGA-6149	0.8	81	9x9	9x9
SG-BGA-6152	0.8	196	12x12	14x14
SG-BGA-6155	0.8	196	12x12	14x14
SG-BGA-6156	0.8	361	17x17	19x19
SG-BGA-6157	0.8	136	14x11	17x12
SG-BGA-6158	0.8	189	21x21	9x21
SG-BGA-6161	0.8	48	8x9	6x8
SG-BGA-6165	0.75	48	6.2x6.3	6x8
SG-BGA-6166	0.8	48	6.15x8.15	6x8
SG-BGA-6168	0.75	48	7.91x6.5	8x6
SG-BGA-6169	0.75	48	9.5x12.5	8x6
SG-BGA-6173	0.8	363	17x17	20x20
SG-BGA-6175	0.8	336	17x17	20x20
SG-BGA-6178	0.8	144	10x10	12x12
SG-BGA-6182	0.8	100	8x8	10x10
SG-BGA-6184	0.8	136	14x10	17x12
SG-BGA-6186	0.8	48	10x6	10x6
SG-BGA-6190	0.8	441	18x18	21x21
SG-BGA-6191	0.8	90	8x13	9x15
SG-BGA-6201	0.8	484	19x19	22x22
SG-BGA-6206	0.8	135	12.5x10	15x9
SG-BGA-6209	0.8	324	15x15	18x18
SG-BGA-6212	0.8	96	11x8	12x8
SG-BGA-6214	0.8	169	11x11	13x13
SG-BGA-6215	0.8	256	14x14	16x16
SG-BGA-6216	0.8	196	12x12	14x14
SG-BGA-6217	0.8	529	19x19	23x23
SG-BGA-6218	0.8	1444	31x31	38x38

SG-BGA_Table-0.8mm continued

Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-6219	0.8	529	19x19	23x23
SG-BGA-6220	0.8	324	19x19	23x23
SG-BGA-6221	0.8	1024	27x27	32x32
SG-BGA-6223	0.8	169	11x11	13x13
SG-BGA-6227	0.8	841	24x24	29x29
SG-BGA-6229	0.8	324	15x15	18x18
SG-BGA-6231	0.8	528	18x20	22x24
SG-BGA-6236	0.8 x 1.27	104	14.5x14	11x12
SG-BGA-6238	0.8	528	18x20	22x24
SG-BGA-6239	0.8	528	18x20	22x24
SG-BGA-6240	0.8	289	15x15	17x17
SG-BGA-6242	0.8	60	10x11.5	6x10
SG-BGA-6243	0.8	81	8x8	9x9
SG-BGA-6247	0.8	1024	27x27	32x32
SG-BGA-6248	0.8	170	14x12	17x14
SG-BGA-6250	0.8	90	10.5x13	9x15
SG-BGA-6252	0.8	60	9x11	9x11
SG-BGA-6253	0.8	90	9x13	9x15
SG-BGA-6254	0.8	140	10.5x13	10x14

Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-6255	0.8	108	8x11	9x12
SG-BGA-6256	0.8	108	9x11	9x12
SG-BGA-6257	0.8	80	8x10	8x12
SG-BGA-6258	0.8	1024	27x27	32x32
SG-BGA-6270	0.75	441	17x17	21x21
SG-BGA-6279	0.8	126	11x19	6x21
SG-BGA-6281	0.8	84	8x12.5	9x15
SG-BGA-6282	0.8	729	23x23	27x27
SG-BGA-6283	0.8	812	27x27	33x33
SG-BGA-6284	0.8	528	21x21	25x25
SG-BGA-6292	0.8	100	multiple X multiple	11x16
SG-BGA-6293	0.8	100	multiple X multiple	11x16
SG-BGA-6301	0.8	1849	35x35	43x43
SG-BGA-6321	0.8	54	8x9	9x9
SG-BGA-6322	0.8	100	8.71x8.99	10x10
SG-BGA-6324	0.8	1024	27x27	32x32



15mm GHz Socket for Motorola MCF 5272

High-speed sockets and adapters continue to perform important functions for IC component testing, prototyping, and production, requiring an ever-increasing level of electrical and mechanical performance. In the area of electrical performance, it is particularly important that an accurate predictive model be available for performance at GHz frequencies. High speed simulation data helps test engineers with initial selection of a proper interconnect design, and also serves as a predictor of performance over a variety of simulated end-use conditions.

S-Parameter Simulation data for GHz BGA sockets available on website at http://www.ironwoodelectronics.com/catalog/ Content/ Drawings/ IE_SI_paper.pdf

SG-BGA_Table-1mm

Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-6005	1	289	18x18	17x17
SG-BGA-6006	1	256	19x19	16x16
SG-BGA-6007	1	484	23x23	22x22
SG-BGA-6008	1	576	25x25	24x24
SG-BGA-6009	1	676	27x27	26x26
SG-BGA-6017	1	256	17x17	16x16
SG-BGA-6020	1	1156	35x35	34x34
SG-BGA-6025	1	324	19x19	18x18
SG-BGA-6032	1	672	35x35	34x34
SG-BGA-6035	1	1521	40x40	39x39
SG-BGA-6037	1	1024	33x33	32x32
SG-BGA-6040	1	680	40x40	39x39
SG-BGA-6041	1	860	42.5x42.5	42x42
SG-BGA-6042	1	900	31x31	30x30
SG-BGA-6046	1	1156	35x35	34x34
SG-BGA-6047	1	289	19x19	17x17
SG-BGA-6048	1	196	15x15	14x14
SG-BGA-6049	1	1521	40x40	39x39
SG-BGA-6051	1	400	21x21	20x20
SG-BGA-6052	1	400	21x21	20x20
SG-BGA-6056	1	484	23x23	22x22
SG-BGA-6062	1	1156	35x35	34x34
SG-BGA-6063	1	276	27x27	26x26
SG-BGA-6064	1	256	17x17	16x16
SG-BGA-6067	1	484	23x23	22x22
SG-BGA-6068	1	420	27x27	26x26
SG-BGA-6068	1	420	27x27	26x26
SG-BGA-6070	1	144	13x13	12x12
SG-BGA-6071	1	Any	27x27	AnyxAny
SG-BGA-6072	1	1041	40x40	39x39
SG-BGA-6073	1	1716	45x45	44x44
SG-BGA-6077	1	228	23x23	22x22
SG-BGA-6078	1	1936	45x45	44x44
SG-BGA-6080	1	1521	40x40	39x39

Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-6082	1	1764	42.5x42.5	42x42
SG-BGA-6085	1	256	17x17	16x16
SG-BGA-6086	1	196	15x15	14x14
SG-BGA-6089	1	576	25x25	24x24
SG-BGA-6090	1	100	10x10	10x10
SG-BGA-6091	1	1156	35x35	34x34
SG-BGA-6092	1	81	10x10	9x9
SG-BGA-6095	1	156	17x17	16x16
SG-BGA-6097	1	961	33x33	31x31
SG-BGA-6098	1	625	27x27	25x25
SG-BGA-6099	1	829	31x31	29x29
SG-BGA-6102	1	784	29x29	28x28
SG-BGA-6104	1	1033	37.5x37.5	35x35
SG-BGA-6105	1	130	14x10	13x10
SG-BGA-6107	1	668	27x27	26x26
SG-BGA-6109	1	676	27x27	26x26
SG-BGA-6111	1	676	27x27	26x26
SG-BGA-6113	0.8x1x1.27	18	3.5 max X 6.04 max	4x6
SG-BGA-6116	1	165	13x15	11x15
SG-BGA-6117	1	1521	40x40	39x39
SG-BGA-6118	1	256	17x17	16x16
SG-BGA-6119	1	1764	42.5x42.5	42x42
SG-BGA-6120	1	484	23x23	22x22
SG-BGA-6123	1	784	29x29	28x28
SG-BGA-6126	1	144	13x13	12x12
SG-BGA-6127	1	1156	35x35	34x34
SG-BGA-6130	1	3528	42.5x42.5	42x42
SG-BGA-6131	1	1156	35x35	34x34
SG-BGA-6132	1	1156	35x35	34x34
SG-BGA-6133	1	196	15x15	14x14
SG-BGA-6135	1	1521	40x40	39x39
SG-BGA-6137	1	1297	37.5x37.5	36x36
SG-BGA-6141	1	900	31x31	30x30

GHz BGA *SMALL Socket For Ultra High Speed- 0.75mm to 1.27mm Pitch*

SG-BGA_Table-1mm continued

Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-6143	1	256	17x17	16x16
SG-BGA-6144	1	324	19x19	18x18
SG-BGA-6145	1	1521	40x40	39x39
SG-BGA-6147	1	625	25x25	24x24
SG-BGA-6153	1	676	27x27	26x26
SG-BGA-6154	1	64	9x9	8x8
SG-BGA-6159	1	900	31x31	30x30
SG-BGA-6160	0.8 x 1	272	13.6x16	17x16
SG-BGA-6162	1	556	35x35	34x34
SG-BGA-6163	1	576	25x25	24x24
SG-BGA-6167	1	64	10x13	8x8
SG-BGA-6170	1	1297	37.5x37.5	36x36
SG-BGA-6171	1	484	23x23	22x22
SG-BGA-6174	1	1513	40x40	39x39
SG-BGA-6177	1	676	27x27	26x26
SG-BGA-6179	1	400	21x21	20x20
SG-BGA-6181	1	676	27x27	26x26
SG-BGA-6187	1	256	17x17	16x16
SG-BGA-6196	1	1156	35x35	34x34
SG-BGA-6197	1	1521	40x40	39x39
SG-BGA-6198	1	900	31x31	30x30
SG-BGA-6199	1	676	27x27	26x26
SG-BGA-6202	1	400	21x21	20x20
SG-BGA-6203	1	256	17x17	16x16
SG-BGA-6204	1	144	13x13	12x12
SG-BGA-6210	1	225	16x16	15x15
SG-BGA-6211	1	484	23x23	22x22
SG-BGA-6213	1	100	11x11	10x10
SG-BGA-6222	1	64	13x10	8x8

Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-6224	1	1156	35x35	34x34
SG-BGA-6225	1	323	18x20	17x19
SG-BGA-6226	1	324	19x19	18x18
SG-BGA-6228	1	256	17x17	16x16
SG-BGA-6230	1	1156	35x35	34x34
SG-BGA-6233	1	1764	42.5x42.5	42x42
SG-BGA-6234	1	1521	40x40	39x39
SG-BGA-6235	1	1521	40x40	39x39
SG-BGA-6237	1	576	25x25	24x24
SG-BGA-6241	1	1521	40x40	39x39
SG-BGA-6244	1	961	32.5x32.5	31x31
SG-BGA-6245	1	1156	35x35	34x34
SG-BGA-6246	1	676	27x27	26x26
SG-BGA-6249	1	676	27x27	26x26
SG-BGA-6251	1	418	21x25	19x24
SG-BGA-6259	1	676	27x27	26x26
SG-BGA-6260	1	676	27x27	26x26
SG-BGA-6261	1	448	17x29	16x28
SG-BGA-6277	1	168	15x13	14x12
SG-BGA-6278	1	484	23x23	22x22
SG-BGA-6288	1	784	29x29	28x28
SG-BGA-6289	1	900	31x31	30x30
SG-BGA-6296	1	1936	45x45	44x44
SG-BGA-6297	1	900	31x31	30x30
SG-BGA-6299	1	676	27x27	26x26
SG-BGA-6300	1	400	21x21	20x20
SG-BGA-6304	1	933	35x35	33x33
SG-BGA-6305	1	632	31x31	29x29
SG-BGA-6325	1	1296	37.5x37.5	36x36

SG-BGA_Table-1.27mm

Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-6010	1.27	400	27x27	20x20
SG-BGA-6011	1.27	576	31x31	24x24
SG-BGA-6012	1.27	625	32.5x32.5	25x25
SG-BGA-6013	1.27	676	35x35	26x26
SG-BGA-6014	1.27	729	35x35	27x27
SG-BGA-6015	1.27	841	37.5x37.5	29x29
SG-BGA-6016	1.27	1089	42.5x42.5	33x33
SG-BGA-6022	1.27	484	29x29	22x22
SG-BGA-6023	1.27	256	21x21	16x16
SG-BGA-6024	1.27	208	23x23	17x17
SG-BGA-6036	1.27	961	40x40	31x31
SG-BGA-6038	1.27	352	35x35	26x26
SG-BGA-6039	1.27	432	40x40	31x31
SG-BGA-6043	1.27	289	23x23	17x17
SG-BGA-6045	1.27	529	31x31	23x23
SG-BGA-6050	1.27	121	15x15	11x11
SG-BGA-6053	1.27	560	42.5x42.5	33x33
SG-BGA-6065	1.27	360	25x25	19x19
SG-BGA-6069	1.27	729	35x35	27x27
SG-BGA-6074	1.27	1005	42.5x42.5	33x33
SG-BGA-6081	1.27	1225	45x45	35x35
SG-BGA-6083	1.27	256	27x27	20x20
SG-BGA-6084	1.27	480	37.5x37.5	29x29
SG-BGA-6087	1.27	72	15x15	11x11
SG-BGA-6096	1.27	576	31x31	24x24

Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-6101	1.27	841	37.5x37.5	29x29
SG-BGA-6106	1.27	437	30.48x25.4	23x19
SG-BGA-6110	1.27	529	31x31	23x23
SG-BGA-6113	0.8x1x1.27	18	3.5 max X 6.04 max	4x6
SG-BGA-6114	1.27	169	17.78x17.78	13x13
SG-BGA-6115	1.27	829	37.5x37.5	29x29
SG-BGA-6121	1.27	956	40x40	31x31
SG-BGA-6122	1.27	676	35x35	26x26
SG-BGA-6140	1.27	256	27x27	20x20
SG-BGA-6150	1.27	400	27x27	20x20
SG-BGA-6164	1.27	676	35x35	26x26
SG-BGA-6176	1.27	676	35x35	26x26
SG-BGA-6180	1.27	1156	45x45	34x34
SG-BGA-6183	1.27	360	25x25	19x19
SG-BGA-6188	1.27	441	27x27	21x21
SG-BGA-6189	1.27	361	27x27	19x19
SG-BGA-6193	1.27	676	35x35	26x26
SG-BGA-6194	1.27	676	35x35	26x26
SG-BGA-6195	1.27	676	35x35	26x26
SG-BGA-6200	1.27	400	27x27	20x20
SG-BGA-6205	1.27	961	40x40	31x31
SG-BGA-6207	1.27	1225	45x45	35x35
SG-BGA-6208	1.27	400	27x27	20x20
SG-BGA-6232	1.27	900	40x40	30x30

For drawings -> www.ironwoodelectronics.com then select Sockets -> GHz Elastomer Sockets

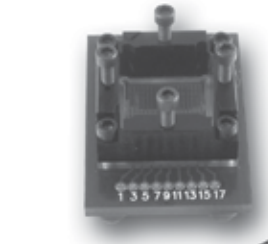
Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-8000	1	900	31x31	30x30
SG-BGA-8001	1	1156	35x35	34x34
SG-BGA-8002	1	256	17x17	16x16
SG-BGA-8003	1	324	19x19	18x18
SG-BGA-8004	1	420	27x27	26x26
SG-BGA-8005	1	144	13x13	12x12
SG-BGA-8006	1	196	15x15	14x14
SG-BGA-8007	1	484	23x23	22x22
SG-BGA-8008	1	526	25x25	24x24
SG-BGA-8009	1	500	31x31	30x30
SG-BGA-8010	1	484	23x23	22x22
SG-BGA-8011	1	676	27x27	26x26
SG-BGA-8012	1	676	27x27	26x26
SG-BGA-8015	0.8	324	15x15	18x18
SG-BGA-8018	1	256	17x17	16x16

Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-8019	1	1156	35x35	34x34

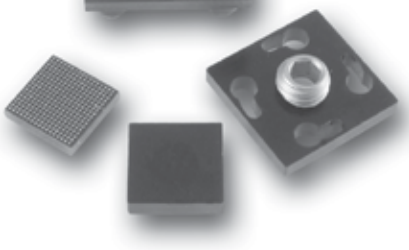
SG-BGA-8xxx sockets are high performance BGA sockets for 0.8mm, 1mm, and 1.27mm pitch BGA packages. The sockets operate at bandwidths up to 10 GHz with less than 1dB of insertion loss. They are designed to dissipate up to several watts without extra heat sinking and can be customized to handle up to 100 watts. The contact resistance is typically 23 milliohms per pin. The SG-BGA-8xxx is constructed with high performance and low inductance elastomer. The temperature range is -35 C to +100 C. The pin inductance is 10.15 nH and Capacitance to ground is 0.10 pF.

GHz BGA High Density Socket for Ultra High Speed – 0.4 to 0.75 mm Pitch

The High Density GHz BGA sockets allow prototyping and testing of 0.5 and 0.75 mm pitch BGA's with bandwidths of over 10 GHz. These small ZIF sockets provide excellent signal integrity allowing operation of circuits in any application including RF, GHz networking and high speed computing. The new 10 GHz bandwidth sockets easily support very dense BGA devices utilizing a high performance conductive elastomer contactor. The socket is a precision device, which guides the IC to the exact position for connection of each ball and uses an aluminum heat sink screw to provide compressive force. The SG-BGA-7XXX accommodates IC packages such as the Xilinx CP132, 0.5 mm pitch, 14X14 array.



Socket for 9x9 mm, 0.5mm Pitch



These patented ZIF sockets are simply mechanically mounted to the target PCB. The socket lid is twisted open, the IC is inserted, the lid is closed and an aluminum heat sink screw is rotated to provide downward force on the IC. The sockets are 5 mm high and only 2.5 mm per side larger than the actual IC packages, minimizing footprint on system boards while maximizing system speeds. The socket body and heat sink screw are constructed with aluminum to facilitate heat-sinking.

For drawings -> www.ironwoodelectronics.com then select Sockets -> GHz Elastomer Sockets

Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-7003	0.5	62	9x13	Any X Any
SG-BGA-7012	0.65	20	3x4	Any X Any
SG-BGA-7018	0.5	28	2.326x4.019	Any X Any
SG-BGA-7019	0.5	676	14x14	26x26
SG-BGA-7024	0.65	112	6x10	8x14
SG-BGA-7025	0.5	256	9x9	16x16
SG-BGA-7026	0.5	400	11x11	20x20
SG-BGA-7027	0.5	196	8x8	14x14
SG-BGA-7031	0.5	289	9x9	17x17
SG-BGA-7032	0.5	361	12x12	19x19
SG-BGA-7033	0.5	441	12x12	21x21
SG-BGA-7034	0.65	324	12x12	18x18
SG-BGA-7035	0.5	484	12x12	22x22
SG-BGA-7036	0.65	289	12x12	17x17
SG-BGA-7037	0.65	169	9.5x9.5	13x13
SG-BGA-7038	0.5	169	7x7	13x13
SG-BGA-7039	0.5	225	10x10	15x15
SG-BGA-7040	0.5	324	10x10	18x18
SG-BGA-7041	0.5	289	10x10	17x17
SG-BGA-7042	0.5	361	10x10	19x19
SG-BGA-7043	0.65	196	10x10	14x14
SG-BGA-7044	0.5	225	8x8	15x15
SG-BGA-7045	0.5	196	8x8	14x14
SG-BGA-7046	0.5	169	8x8	13x13
SG-BGA-7047	0.5	441	11x11	21x21
SG-BGA-7048	0.5	81	5x5	9x9
SG-BGA-7049	0.5	625	15x15	25x25
SG-BGA-7050	0.65	400	14x14	20x20
SG-BGA-7051	0.5	100	6x6	10x10
SG-BGA-7052	0.5	81	6x6	9x9
SG-BGA-7053	0.5	121	6x6	11x11
SG-BGA-7054	0.65	49	6x6	7x7
SG-BGA-7055	0.75	49	6x6	7x7
SG-BGA-7056	0.65	91	7x7	9x9
SG-BGA-7057	0.5	169	7x7	13x13
SG-BGA-7058	0.5	144	7x7	12x12
SG-BGA-7059	0.65	60	4.5x7	6x10
SG-BGA-7060	0.65	289	13x13	17x17
SG-BGA-7061	0.5	576	13x13	24x24
SG-BGA-7062	0.65	361	13x13	19x19
SG-BGA-7063	0.65	324	13x13	18x18
SG-BGA-7064	0.75	48	7.286x10.85	6x8
SG-BGA-7065	0.5	308	8x12	14x22
SG-BGA-7066	0.5	324	11x11	18x18
SG-BGA-7067	0.5	400	11x11	20x20
SG-BGA-7068	0.65	256	11x11	16x16
SG-BGA-7069	0.5	77	4x6	7x11
SG-BGA-7070	0.4	256	7x7	16x16
SG-BGA-7071	0.5	529	12x12	23x23
SG-BGA-7072	0.5	327	10x17	19x23
SG-BGA-7074	0.5	441	11x11	21x21
SG-BGA-7075	0.5	329	12x12	22x22
SG-BGA-7076	0.4	784	12x12	28x28
SG-BGA-7077	0.5	529	12x12	23x23
SG-BGA-7078	0.5	529	13x13	23x23

Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-7079	0.65	324	12x12	18x18
SG-BGA-7080	0.65	225	15x15	22x22
SG-BGA-7081	0.5	625	13x13	25x25
SG-BGA-7082	0.5	49	4x4	7x7
SG-BGA-7083	0.5	64	5x5	8x8
SG-BGA-7084	0.65	96	9x6	12x8
SG-BGA-7085	0.65	96	8x6	12x8
SG-BGA-7086	0.6	441	13x13	21x21
SG-BGA-7087	0.5	289	9x9	17x17
SG-BGA-7088	0.5	729	14x14	27x27
SG-BGA-7089	0.4	256	7x7	16x16
SG-BGA-7090	0.5	676	14x14	26x26
SG-BGA-7091	0.5	385	15x15	28x28
SG-BGA-7092	0.4	841	12x12	29x29
SG-BGA-7093	0.4	256	8x8	16x16
SG-BGA-7094	0.65	340	15x15	22x22
SG-BGA-7095	0.65	441	15x15	21x21
SG-BGA-7096	0.4	784	12x12	28x28
SG-BGA-7097	0.4	54	5x5	9x6
SG-BGA-7098	0.4	54	3.637x2.47	9x6
SG-BGA-7099	0.5	225	8x8	15x15
SG-BGA-7100	0.5	729	15x15	27x27
SG-BGA-7101	0.4	25	2x2	5x5
SG-BGA-7102	0.4	64	4x4.2	8x8
SG-BGA-7103	0.4	140	8x6	14x10
SG-BGA-7104	0.4	441	9x9	21x21
SG-BGA-7105	0.5	96	7x5	12x8
SG-BGA-7106	0.5	289	9x9	17x17
SG-BGA-7107	0.65	152	14x14	21x21
SG-BGA-7108	0.65	100	7x7	10x10
SG-BGA-7109	0.5	169	7x7	13x13
SG-BGA-7110	0.4	400	9x9	20x20
SG-BGA-7111	0.4	400	9x9	20x20
SG-BGA-7112	0.5	375	8x13	15x25
SG-BGA-7114	0.65	54	6x4	9x6
SG-BGA-7115	0.65	225	11x11	15x15
SG-BGA-7116	0.4	515	12x12	28x28
SG-BGA-7117	0.5	64	4.5x4.5	8x8
SG-BGA-7118	0.5	120	7x6	12x10
SG-BGA-7119	0.5	676	14x14	26x26
SG-BGA-7120	0.5	110	5.55x5.12	11x10
SG-BGA-7121	0.5	256	8x8	16x16
SG-BGA-7122	0.5	256	8x8	16x16
SG-BGA-7123	0.65	187	8x12	11x17
SG-BGA-7125	0.5	475	10x13	19x25
SG-BGA-7126	0.5	784	15x15	28x28
SG-BGA-7129	0.4	784	12x12	28x28
SG-BGA-7135	0.4	414	10x8	23x18
SG-BGA-7136	0.65	144	8.5x8.5	12x12
SG-BGA-7137	0.4	29	10x10	23x23
SG-BGA-7138	0.4	256	6x4	14x9
SG-BGA-7140	0.5	361	10.5x10.5	19x19
SG-BGA-7142	0.65	199	12x16	16x22
SG-BGA-7147	0.5	575	13x12	25x23
SG-BGA-7148	0.5	20	2x2	4x4

GHz BGA High Density Socket for Ultra High Speed – 0.4 to 0.75 mm Pitch

SG-BGA_Table-1mm continued

Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-7149	0.4	49	2.8x2.8	7x7
SG-BGA-7150	0.5	81	5x5	9x9
SG-BGA-7151	0.4	441	10x10	21x21
SG-BGA-7154	0.5	64	4x4	8x8
SG-BGA-7155	0.4	400	8.5x8.5	20x20
SG-BGA-7156	0.5	256	8x8	16x16
SG-BGA-7157	0.65	289	12x12	17x17
SG-BGA-7158	0.65	361	13x13	19x19
SG-BGA-7160	0.5	169	12x16	14x28

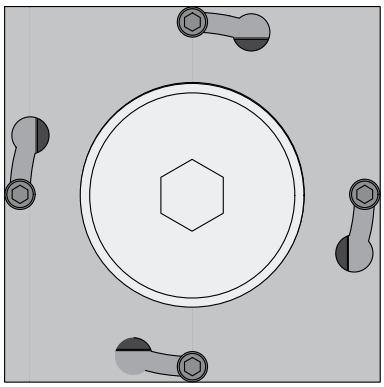
Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-7161	0.4	400	8x8	20x20
SG-BGA-7162	0.4	289	7x7	17x17
SG-BGA-7163	0.4	289	7.5x7.5	17x17
SG-BGA-7164	0.4	899	13x12	31x29
SG-BGA-7170	0.65	121	8x8	11x11
SG-BGA-7183	0.4	144	5.23x5.23	12x12
SG-BGA-7184	0.5	288	8x9	16x18
SG-BGA-7185	0.65	1369	25x25	37x37
SG-BGA-7186	0.4	1360	14x16.5	34x40

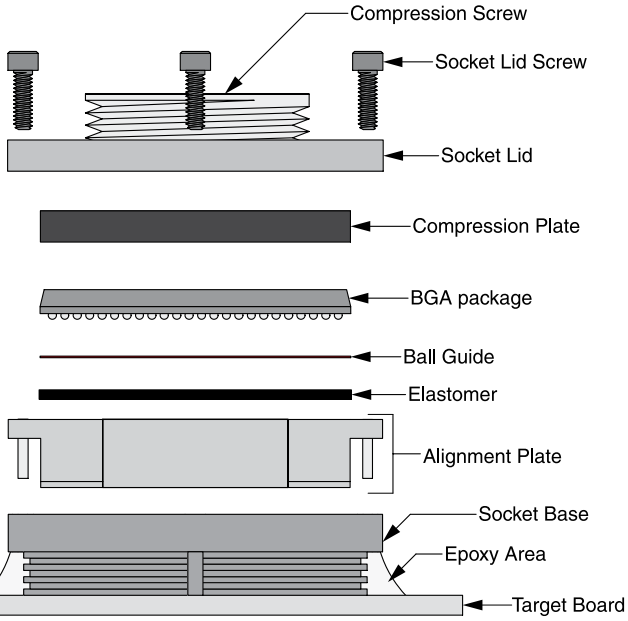
Epoxy Sockets

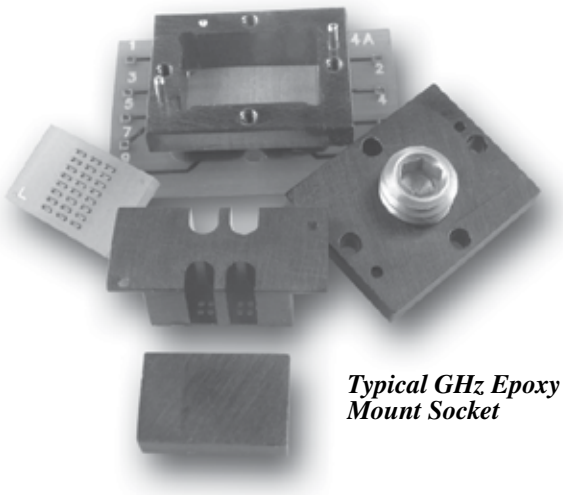
For drawings -> www.ironwoodelectronics.com then select Sockets -> GHz Elastomer Sockets

Part Number	Pitch	Max Balls	Body Size	Ball Array
SG-BGA-6147	1	576	25x25	24x24
SG-BGA-7026	0.5	400	11x11	20x20
SG-BGA-7027	0.5	196	8x8	14x14
SG-BGA-7028	0.65	184	13x13	18x18
SG-BGA-7029	0.5	225	8x8	15x15
SG-BGA-7030	0.5	361	10x10	19x19
SG-BGA-7031	0.5	289	9x9	17x17
SG-BGA-7047	0.5	441	11x11	21x21
SG-BGA-7064	0.75	48	7.286x10.85	6x8
SG-BGA-7071	0.5	529	12x12	23x23
SG-MLF-7015	0.5	68	10x10	17x17

If through-holes are unacceptable, or if an even smaller footprint is required, an epoxy mounting option may be considered. While this creates a more or less permanent bonding of the socket to the PC Board the socket is designed such that the contacting elements are replaceable should damage or excessive wear occur. These patented ZIF sockets are simply mounted to the target PCB by an epoxy band around the perimeter. The socket is placed into position with a precision alignment tool and epoxied in place. A bead of epoxy around the socket strongly holds it in place. There are special grooves on the socket wall for additional epoxy strength. The contactor can be easily replaced after hundreds of cycles.







Typical GHz Epoxy Mount Socket

For detail socket mounting instructions, visit our web site at www.ironwoodelectronics.com/catalog/Content/Drawings/EPM.pdf

GHz QFN High Density Socket for Ultra High Speed – 0.4 to 0.8 mm Pitch

Typical MLF/QFN GHz Socket

GHz QFN High density Sockets allow 0.4 mm pitch QFN (also called MLF, MLP, LPCC, QLP, HVQFN and LFCSP, just to name a few) IC's to be socketed and operate without compromising performance in very high speed communication or computing applications. The new 10 GHz bandwidth sockets easily support very dense QFN devices utilizing a high performance conductive elastomer contactor. The socket is a precision device, which guides the IC to the exact position for connection of each lead and uses an aluminum heat sink screw to provide compressive force. The SG-MLF-7000 accommodates IC packages such as the Amkor MLF68, 0.5 mm pitch.

These patented ZIF sockets are mechanically mounted to the target PCB. The socket lid is twisted open, the IC is inserted, the lid is closed and aluminum heat sink screw is rotated to provide downward force on the IC. The sockets are 5 mm high and only 2.5 mm per side larger than the actual IC packages, minimizing footprint on system boards while maximizing system speeds. The socket body and heat sink screw are constructed with aluminum to facilitate heat sinking.

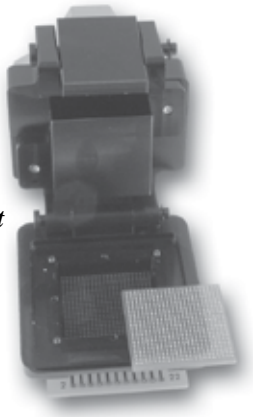
For drawings -> www.ironwoodelectronics.com then select Sockets -> GHz Elastomer Sockets

Part Number	Pin Pitch	Body Size	Part Description	Socket Lid	Max Pincount
SG-MLF-7000	0.4, 0.5, 0.65, 0.8	10x10	GHz QFN/MLF Socket (ZIF)	Swivel	84, 68, 72, 52, 44
SG-MLF-7001	0.65	2x3	GHz QFN/MLF Socket (ZIF)	Swivel	8
SG-MLF-7002	0.5, 0.65, 0.8	3x3	GHz QFN/MLF Socket (ZIF)	Swivel	8, 12, 16, 8, 12
SG-MLF-7003	0.5, 0.65, 0.8	4x4	GHz QFN/MLF Socket (ZIF)	Swivel	20, 24, 16, 12
SG-MLF-7004	0.5, 0.65, 0.8	5x5	GHz QFN/MLF Socket (ZIF)	Swivel	28, 32, 20, 16
SG-MLF-7005	0.5, 0.65, 0.8	6x6	GHz QFN/MLF Socket (ZIF)	Swivel	36, 40, 28, 20
SG-MLF-7006	0.5, 0.65, 0.8	7x7	GHz QFN/MLF Socket (ZIF)	Swivel	44, 48, 32, 28
SG-MLF-7007	0.5, 0.65, 0.8	8x8	GHz QFN/MLF Socket (ZIF)	Swivel	52, 56, 40, 32
SG-MLF-7008	0.5, 0.65, 0.8	9x9	GHz QFN/MLF Socket (ZIF)	Swivel	60, 64, 44, 36
SG-MLF-7009	0.4	12x12	GHz QFN/MLF Socket (ZIF)	Swivel	100
SG-MLF-7010	0.5	3.5x4.5	GHz QFN/MLF Socket (ZIF)	Swivel	20
SG-MLF-7011	0.5	3.5x4	GHz QFN/MLF Socket (ZIF)	Swivel	16
SG-MLF-7012	0.5	7x7	GHz QFN/MLF Socket (ZIF)	Swivel	84
SG-MLF-7013	0.5	8x6	GHz QFN/MLF Socket (ZIF)	Swivel	44
SG-MLF-7014	0.5	8x8	GHz QFN/MLF Socket (ZIF)	Swivel	92
SG-MLF-7015	0.5	10x10	GHz QFN/MLF Socket (ZIF)	Swivel	68
SG-MLF-7017	0.5	9x9	GHz QFN/MLF Socket (ZIF)	Swivel	60
SG-MLF-7018	0.5, 0.65, 0.8	5x5	GHz QFN/MLF Socket (ZIF)	Swivel	16, 20, 28, 32
SG-MLF-7019	0.4, 0.5, 0.65, 0.8	6x6	GHz QFN/MLF Socket (ZIF)	Swivel	20, 28, 36, 40, 52
SG-MLF-7020	0.5	8x8	GHz QFN/MLF Socket (ZIF)	Swivel	56
SG-MLF-7021	0.4	2.5x2.5	GHz QFN/MLF Socket (ZIF)	Swivel	12
SG-MLF-7022	0.5	13x13	GHz QFN/MLF Socket (ZIF)	Swivel	160
SG-MLF-7023	0.5	5x5	GHz QFN/MLF Socket (ZIF)	Swivel	32
SG-MLF-7024	0.5	9x9	GHz QFN/MLF Socket (ZIF)	Swivel	64
SG-MLF-7025	0.5	10x10	GHz QFN/MLF Socket (ZIF)	Swivel	72
SG-MLF-7026	0.5	9x9	GHz QFN/MLF Socket (ZIF)	Swivel	116
SG-MLF-7027	0.4, 0.65	2x2	GHz QFN/MLF Socket (ZIF)	Swivel	6, 10
SG-MLF-7028	0.5	9 x9	GHz QFN/MLF Socket (ZIF)	Swivel	64
SG-MLF-7029	0.5	10x10	GHz QFN/MLF Socket (ZIF)	Swivel	132
SG-MLF-7034	0.5	9x9	GHz QFN/MLF Socket (ZIF)	Swivel	112
SG-MLF-7035	0.5	8x8	GHz QFN/MLF Socket (ZIF)	Swivel	152
SG-MLF-7039	1.02	14.3x14.3	GHz QFN/MLF Socket (ZIF)	Swivel	48
SG-MLF-7040	0.5	12x12	GHz QFN/MLF Socket (ZIF)	Swivel	272
SG-MLF-7041	0.5	3.3x1.5	GHz QFN/MLF Socket (ZIF)	Swivel	12
SG-MLF-7043	0.5	7x7	GHz QFN/MLF Socket (ZIF)	no	48
SG-MLF-7044	0.5	10x10	GHz QFN/MLF Socket (ZIF)	no	72
SG-MLF-7047	0.4	5.5x6.5	GHz QFN/MLF Socket (ZIF)	Swivel	42

CG-BGA, CG-QFN

For drawings -> www.ironwoodelectronics.com then select Sockets -> GHz Elastomer Sockets

Part Number	Pitch	Max Balls	Body Size	Ball Array
CG-BGA-4000	1	1497	40x40	39x39
CG-BGA-4001	1	900	31x31	30x30
CG-BGA-4002	1	676	27x27	26x26
CG-BGA-4003	1	484	23x23	22x22
CG-BGA-4004	1	676	27x27	26x26
CG-BGA-4005	0.8	625	21x21	25x25
CG-BGA-4006	1	442	18x27	17x26
CG-BGA-4007	0.8	729	23x23	27x27
CG-BGA-4008	0.8	484	19x19	22x22
CG-BGA-4009	0.8	144	10x10	12x12
CG-BGA-4010	0.8	196	12x12	14x14
CG-BGA-4013	1.27	1156	45x45	34x34

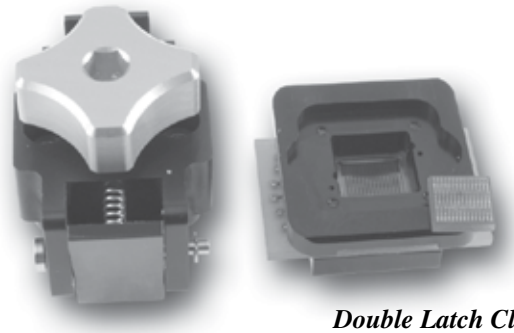


Clamshell GHz Socket for 23x23mm BGA

Clamshell BGA elastomer sockets have foot prints compatible with our standard GHz type sockets. These sockets enable for an easy access to the chip and are suitable for applications where chips need to be changed more frequently. CG-BGA sockets allow prototyping and testing of BGA packages with pitch as low as 0.4mm with frequency up to 10 GHz and have an option to use heat sinks up to 100 W.

For drawings -> www.ironwoodelectronics.com then select Sockets -> GHz Elastomer Sockets

Part Number	Pitch	Max Balls	Body Size	Ball Array
CG-BGA-5000	0.5	121	6x6	11x11
CG-BGA-5001	0.4	400	9x9	20x20
CG-BGA-5002	0.5	225	8x8	15x15
CG-BGA-5003	0.5	120	7x6	12x10
CG-BGA-5004	0.65	121	8x8	11x11
CG-BGA-5005	0.5	396	9.5x11.5	18x22
CG-BGA-5006	0.65	484	15x15	22x22
CG-BGA-5009	0.4	400	8x8	20x20



Double Latch Clamshell Socket for 9x9mm BGA

For drawings -> www.ironwoodelectronics.com then select Sockets -> GHz Elastomer Sockets

Part Number	Pitch	Max Balls	Body Size
CG-QFN-7000	0.5	296	11.5x11.5
CG-QFN-7001	0.4, 0.5, 0.65, 0.8	44, 52, 68, 72, 84, 88	10x10
CG-QFN-7002	0.4, 0.5, 0.65, 0.8	36, 44, 48, 60, 64, 76	9x9
CG-QFN-7003	0.4, 0.5, 0.65, 0.8	44, 52, 64, 68, 72, 84, 88	10x10
CG-QFN-7004	0.5	338	12.5x12.5

SG-SOIC

Epoxy Mount Socket for SOIC Package

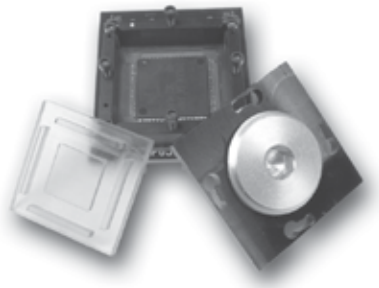
Ironwood has introduced new GHz sockets for SOIC chips. The sockets are ZIF sockets and provide excellent signal integrity. The sockets are compact and can be mounted on the small footprint. The socket needs about 2.5mm extra space around the chip than the actual chip size. The signal path is short (0.5mm or 0.75mm). The operating temperature is from -35 deg. C to 100 deg. C. It uses elastomeric interconnect technology and the signal loss is less than 1 dB at 6.5GHz or 10GHz. The contact resistance is typically 23 milliohms per lead. The SOIC leads are precisely guided in the socket.

There are two options available to mount these sockets. The socket can be mounted using hardware and needs holes for screws and for positioning on the target board. If the holes can not be drilled on the target board, epoxy mount sockets are the other option. Epoxy mount sockets use epoxy to mount the socket on the target board.

For drawings -> www.ironwoodelectronics.com then select Sockets -> GHz Elastomer Sockets

Part Number	Pin Pitch	Body Size	Part Description	Tip to Tip mm	Foot mm	Socket Lid	Max Pincount
SG-SOIC-3000	0.5	9.7x4.4	GHz SOIC Socket (ZIF)	6.4	0.6	Swivel	38

SG-QFE



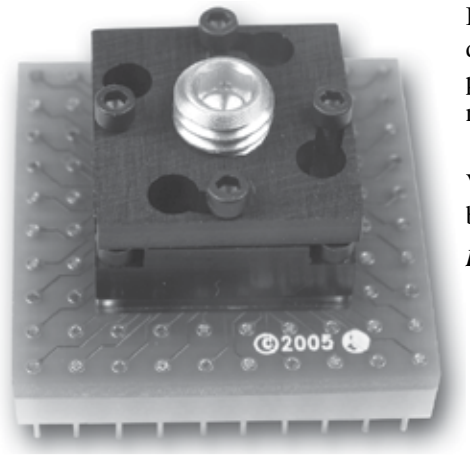
GHz QFE Socket for 14x14mm Body Size

For drawings -> www.ironwoodelectronics.com then select Sockets -> GHz Elastomer Sockets

Part Number	Pin Pitch	Body Size	Part Description	Tip to Tip X mm	Tip to Tip Y mm	Socket Lid	Max Pincount
SG-QFE-7000	0.4	14x14	GHz QFE Socket (ZIF)	16	16	Swivel	128
SG-QFE-7001	0.5	10x10	GHz QFE Socket (ZIF)	12	12	Swivel	64
SG-QFE-7002	0.5	14x14	GHz QFE Socket (ZIF)	16	16	Swivel	100
SG-QFE-7003	0.4	20x20	GHz QFE Socket (ZIF)	22	22	Swivel	176
SG-QFE-7004	0.5	14x14	GHz QFE Socket (ZIF)	16	16	Swivel	100
SG-QFE-7007	0.4	16x16	GHz QFE Socket (ZIF)	18	18	Swivel	144
SG-QFE-7008	0.4	7x7	GHz QFE Socket (ZIF)	9	9	Swivel	64
SG-QFE-7009	0.5	12x12	GHz QFE Socket (ZIF)	14	14	Swivel	80

Combining a small footprint with high performance, Ironwood Electronics QFE socket 10+GHz bandwidth socket (<-1 dB at 10GHz) supports very dense pitch QFP devices. These are constructed with a high performance and low inductance elastomer with a contact resistance close to 23 milliohms per pin.

Prototyping Adapters

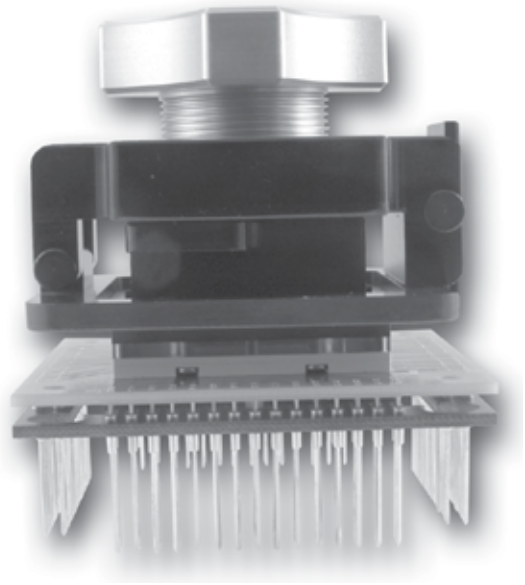


Ironwood Electronics has developed over one thousand prototyping adapter designs, supporting CSP, BGA, QFN, QFP, SOIC, PGA, PLCC, QIP, and DIP packages. We use high quality production and test burn-in sockets for reliable connections. Most popular development panels are supported.

Various probing adapter list and part drawings can be obtained using the link below:

For drawings -> www.ironwoodelectronics.com then select Adapters -> Prototyping Adapters

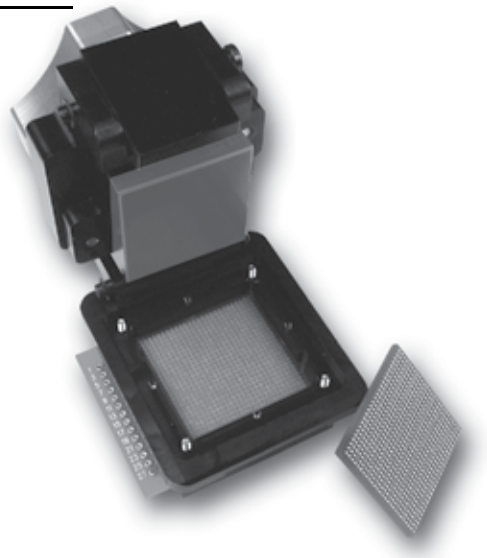
An example BGA Prototyping Adapter with clamshell spring pin socket and wire-wrap pins is shown below.



Giga Spring Pin Sockets

Ironwood Electronics Giga-Spring™ (POGO) are small footprint socket compatible with the GHz elastomer sockets with increased endurance and temperature range. The 1mm contactor is a spring pin (pogo) with 30 gram actuation force per ball and cycle life of 500,000 insertions. The self inductance of the contactor is 0.62 nH with a loss of < 1 dB at 10 GHz. The current capacity of each contactor is 4 amps at ambient temperature. Socket temperature range is -40C to +150C. The socket is mounted to the PCB with a backing plate and requires only 2.54mm border around the IC. The socket is constructed of aluminum which provides heatsinking up to 7.5 watts. Custom heatsinks can easily be designed for higher power dissipation. The user simply places the IC into the socket, closes the lid, and rotates the heatsink screw to seat the IC. PCB finish on pads can be HASL, Immersion, Au, Immersion Ag, or tin. The Giga-Spring family of sockets provide a small footprint high endurance socket for 0.4 to 1.27mm pitch BGA, LGA, and QFN IC's.

Now with optional series resistance control.



GHz Bandwidth, 500,000 insertions

Spring Pin Socket Table-0.5 to 1.27mm Pitch

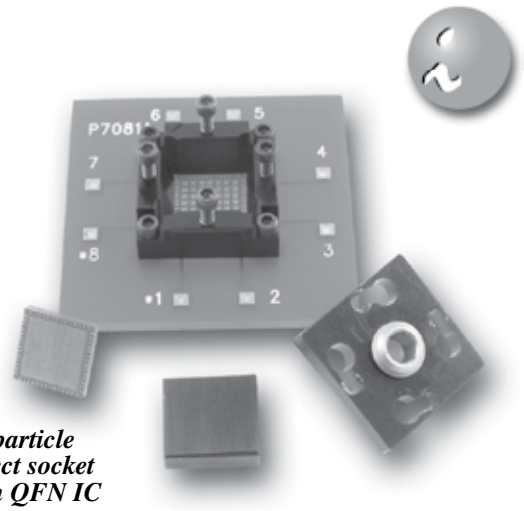
For drawings -> www.ironwoodelectronics.com then select Sockets -> Spring Pin Sockets

Part Number	Pitch	Max I/O	Body Size	Ball Array	Part Number	Pitch	Max I/O	Body Size	Ball Array
SS-BGA60G-M-01	0.8x1	60	8x13	9x12	SS-BGA420C-01	1	420	27x27	26x26
SS-BGA62C-01	0.8x1	62	11x12.5	9x12	SS-BGA420D-01	1	420	23x23	22x22
SS-BGA84G-M-01	0.8	84	10x12.5	9x15	SS-BGA442A-01	1	442	18x27	17x26
SS-BGA92E-M-01	0.8	92	10.2x18.2	9x21	SS-BGA456D-01	1	456	27x27	26x26
SS-BGA95A-01	0.8	95	11x20	9x21	SS-BGA456D-02	1	456	27x27	26x26
SS-BGA100K-01	0.65	100	7.8x8	10x10	SS-BGA484K-01	0.8	484	19x19	22x22
SS-BGA104A-01	0.5	104	8x8	15x15	SS-BGA548C-01	1	548	27x27	26x26
SS-BGA144L-M-01	0.8	144	12x12	12x12	SS-BGA560A-01	1.27	560	42.5x42.5	33x33
SS-BGA144R-01	0.5	144	7x7	12x12	SS-BGA564C-01	1	564	27x27	26x26
SS-BGA196C-01	1	196	15x15	14x14	SS-BGA600D-01	1	600	31x31	30x30
SS-BGA196E-01	0.8	196	12x12	14x14	SS-BGA625A-01	1.27	625	32.5x32.5	25x25
SS-BGA225G-01	0.65	225	11x11	15x15	SS-BGA650A-01	1	650	31x31	30x30
SS-BGA255B-01	1.27	255	27x27	20x20	SS-BGA672B-01	1	672	27x27	26x26
SS-BGA256A-01	1.27	256	27x27	20x20	SS-BGA672B-02	1	672	27x27	26x26
SS-BGA256E-01	1	256	17x17	16x16	SS-BGA676C-01	1	676	27x27	26x26
SS-BGA260A-01	1	260	19x19	18x18	SS-BGA676C-02	1	676	27x27	26x26
SS-BGA272A-01	1.27	272	27x27	20x20	SS-BGA676C-03	1	676	27x27	26x26
SS-BGA292A-01	1.27	292	27x27	20x20	SS-BGA680B-01	1	680	31x31	30x30
SS-BGA312B-01	1	312	27x27	26x26	SS-BGA680C-01	1	680	40x40	39x39
SS-BGA318A-M-01	0.8	318	15x15	18x18	SS-BGA736B-01	1	736	37.5x37.5	36x36
SS-BGA324E-01	1.27	324	27x27	20x20	SS-BGA772A-01	1	772	31x31	30x31
SS-BGA324G-01	1	324	19x19	18x18	SS-BGA800A-01	1	800	31x31	30x30
SS-BGA324J-01	1	324	23x13	22x22	SS-BGA1156A-01	1	1156	35x35	34x34
SS-BGA324J-02	1	324	23x23	22x22	SS-LGA48A-01	0.80	48	6x8	9x11
SS-BGA324J-M-01	1	324	23x13	22x22	SS-LGA144B-M-01	0.8	144	12x12	12x12
SS-BGA324K-01	0.5	324	12x12	22x22	SS-LGA318A-M-01	0.8	318	15x15	18x18
SS-BGA324M-01	0.8	324	15x15	18x18	SS-LGA324A-M-01	1	324	23x13	22x22
SS-BGA329A-01	0.5	329	12x12	22x22	SS-LGA376A-01	1	376	23x23	24x24
SS-BGA332A-01	0.8	332	17x17	19x19	SS-QFE128SD-01	0.4	N/A	14x14	N/A
SS-BGA352A-01	1.27	352	35x35	26x26	SS-QFE176SC-01	0.4	N/A	20x20	N/A
SS-BGA352B-01	1	352	27x27	26x26	SS-QFE240SF-01	0.5	N/A	31.01x31.01	N/A
SS-BGA361E-01	0.8	361	16x16	19x19	SS-QFN10A-01	0.5	10	2.5x2.5	N/A
SS-BGA361F-01	0.8	361	17x17	19x19	SS-QFN12D-01	0.4	12	2x2	5x2
SS-BGA372B-01	1.27	372	27x27	20x20	SS-QFN12E-01	0.5	12	3x3	N/A
SS-BGA376A-01	1	376	23x23	22x22	SS-QFN20A-01	0.5	20	4x4	5x5
SS-BGA379C-01	1	379	23x23	22x22	SS-QFN20F-01	0.4	20	3x3	5x5
SS-BGA388B-01	1	388	27x27	26x26	SS-QFN40A-01	0.5	40	6x6	10x10
SS-BGA400A-01	1	400	21x21	20x20	SS-QFN48C-01	0.5	48	7x7	12x12
SS-BGA400F-01	1.27	400	27x27	20x20	SS-QFN68A-01	0.5	68	10x10	17x17
SS-BGA400H-01	0.8	400	17x17	20x20	SS-QFN104A-01	0.4	104	12x12	26x26
SS-BGA416E-01	1	416	27x27	26x26	SS-QFN144A-01	0.5	144	11x11	36x36

Diamond Particle

The diamond particle interconnect is an ideal medium for very high frequency QFN/LGA applications up to 40 GHz. Typical specifications for the interconnect include:

- Contact resistance under 3 milliOHMS
- Inductance and Capacitance approaches zero
- 40 GHz bandwidth
- 10-12 grams per contact
- -70 to 200° C
- 100,000 insertions
- Pitch down to 0.4mm



Diamond particle interconnect socket for 8x8mm QFN IC

The contactor consists of diamond particles embedded into the circuitry on a Kapton or Teflon PCB. The diamond particles along with the circuitry are plated with nickel and over that with gold. Shown below is the DG-QFN40C-01. This socket provides interconnect at a 40 GHz bandwidth for a 5mm, 40 pin QFN with 0.4mm pitch leads. Nickel and gold plated diamond particles provide interconnect from the IC pads to the PCB including the center ground pad.

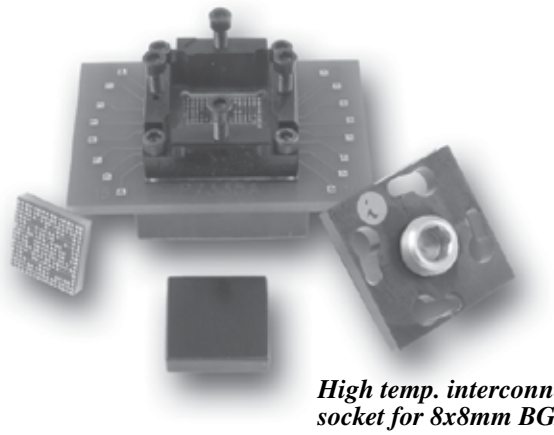
For drawings -> www.ironwoodelectronics.com then select Sockets -> Diamond Particle Interconnect Sockets

Part Number	Pin Pitch	Body Size	Part Description	Socket Lid	Max Pin-count
DG-QFN16A-01	0.5	3x3	Diamond GHz QFN/MLF Socket (ZIF)	Swivel	16
DG-QFN20A-01	0.5	4x4	Diamond GHz QFN/MLF Socket (ZIF)	Swivel	20
DG-QFN24C-01	0.5	4x4	Diamond GHz QFN/MLF Socket (ZIF)	Swivel	24
DG-QFN28B-01	0.65	6x6	Diamond GHz QFN/MLF Socket (ZIF)	Swivel	28
DG-QFN28D-01	0.4	4x4	Diamond GHz QFN/MLF Socket (ZIF)	Swivel	28
DG-QFN32A-01	0.5	5x5	Diamond GHz QFN/MLF Socket (ZIF)	Swivel	32
DG-QFN40C-01	0.4	5x5	Diamond GHz QFN/MLF Socket (ZIF)	Swivel	40
DG-QFN48A-01	0.5	7x7	Diamond GHz QFN/MLF Socket (ZIF)	Swivel	48
DG-QFN48H-01	1	16x16	Diamond GHz QFN/MLF Socket (ZIF)	Swivel	48
DG-QFN56A-01	0.5	8x8	Diamond GHz QFN/MLF Socket (ZIF)	Swivel	56
DG-QFN64A-01	0.5	9x9	Diamond GHz QFN/MLF Socket (ZIF)	Swivel	64

40 GHz Burn-in and Test Sockets for BGA, LGA, and QFN

Ironwood Electronics' new GHz Burn-in and Test sockets are for high temperature, high current, and high frequency applications. The socket uses high temperature conductive elastomer with gold over nickel cap. The sockets deliver the clearest possible signal due to the extremely short current path, low resistance, and ultra-low inductance and capacitance. The socket comes with overcompression stop. The interconnect consists of gold/nickel plated copper pads that makes contact with package leads. The interconnect can be cleaned in minutes. Typical specifications for the interconnect include:

- 40 GHz Bandwidth
- 0.11 nH Self Inductance
- 0.015 nH Mutual Inductance
- 0.028 pF Mutual Capacitance
- Less than 50 mOhms Contact Resistance
- -40 C to 155 C
- 5 Amps per pin
- 15-25 grams per pin



High temp. interconnect socket for 8x8mm BGA

For drawings -> www.ironwoodelectronics.com then select Sockets -> Silver Particle Interconnect Sockets

Part Number	Pitch	Max Balls	Body Size	Ball Array
XG-BGA-4000	0.8x1	375	12.5x25.5	15x25
XG-BGA-4004	1	900	31x31	30x30
XG-BGA-4001	1	156	17x17	16x16

40 GHz Burn-in and Test Sockets for BGA, LGA, and QFN

For drawings -> www.ironwoodelectronics.com then select Sockets -> Silver Particle Interconnect Sockets

Part Number	Pitch	Max Balls	Body Size	Ball Array
XG-BGA-5000	0.5	216	8x8	16x16

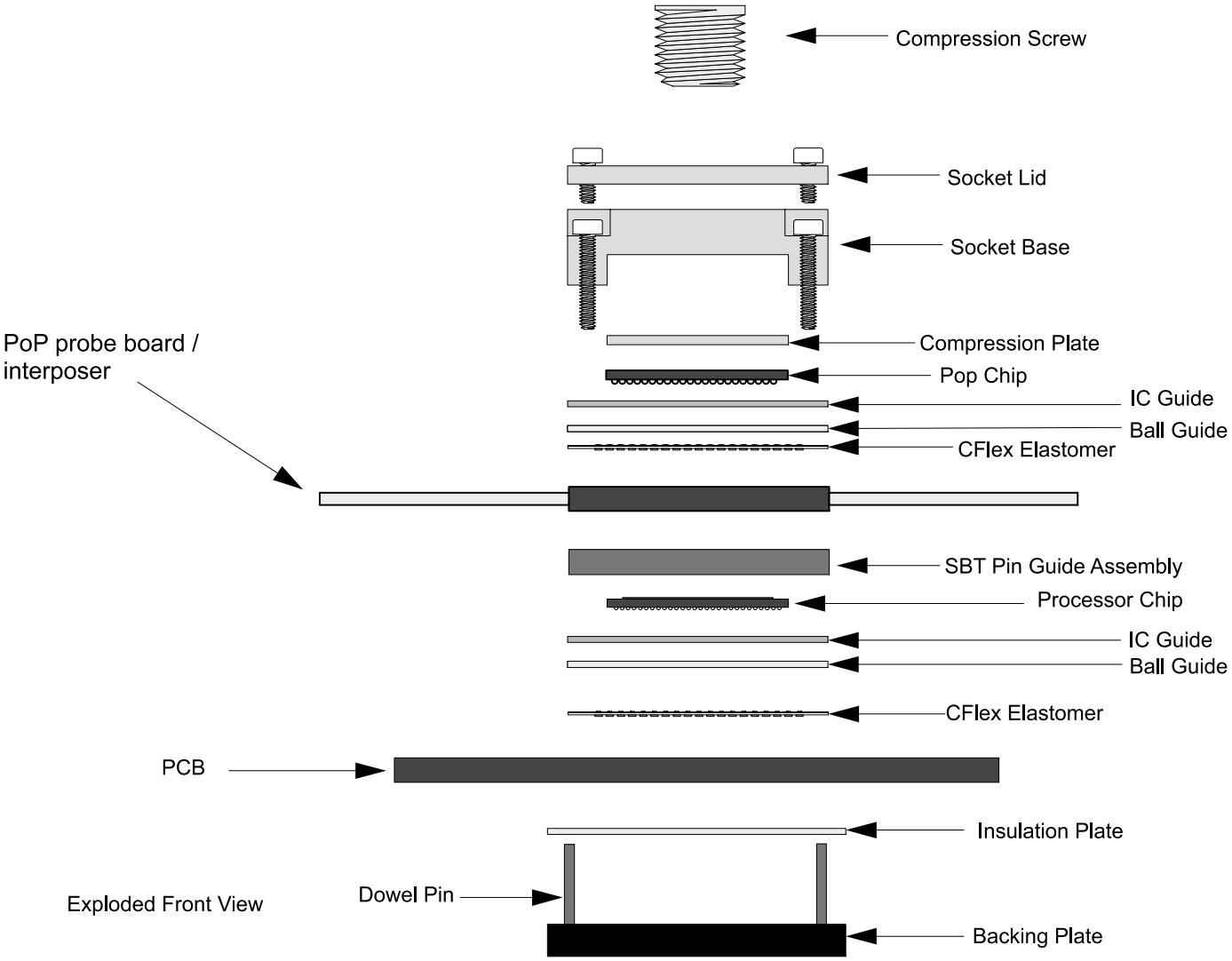
For drawings -> www.ironwoodelectronics.com then select Sockets -> Silver Particle Interconnect Sockets

Part Number	Pitch	Max Balls	Body Size	Ball Array
XG-LGA-7000	0.65	225	12x12	17x17
XG-LGA-7001	0.65	225	12x12	17x17
XG-LGA-7002	0.5	52	3.95x5.3	7x11
XG-LGA-7003	0.5	44	3.95x5.3	7x11

For drawings -> www.ironwoodelectronics.com then select Sockets -> Silver Particle Interconnect Sockets

Part Number	Pitch	Max Balls	Body Size
XG-QFN-9000	0.7	104	19.8 x 19.8
XG-QFN-9001	0.5	36	5x7

This conductive elastomer can also be used in multi-level stacked interconnection as depicted below:



Male Pin Adapters for GHz Sockets

The GHz Land Sockets allow the GHz BGA ZIF Sockets to be mounted on an adapter and then the male pin assembly can be either inserted into PCB holes or mounted on a Giga-snaP™ female BGA SMT adapter.

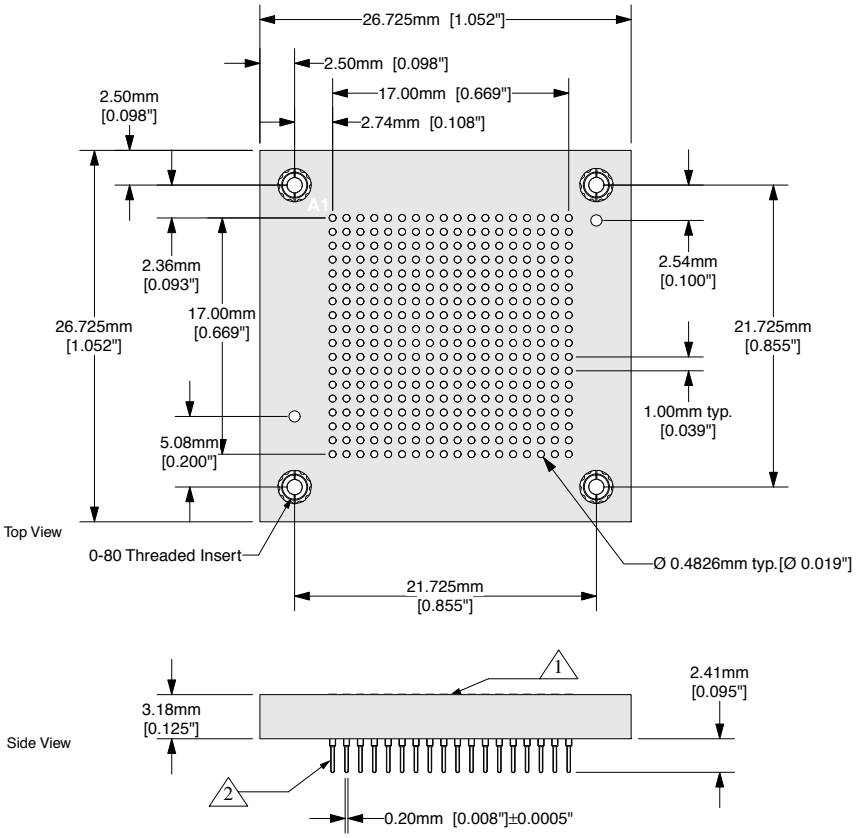
For drawings -> www.ironwoodelectronics.com then select Sockets -> Socket Accessories (thru-hole options)

Part Number	Pitch	Body Size	Ball Array
LS-BGA48D-05	0.8	8x9	6x8
LS-BGA48R-05	0.8	6x9	8x6
LS-BGA49B-05	0.8	7x7	7x7
LS-BGA64J-05	1	8x8	10x13
LS-BGA84G-05	0.8	9x15	8x12.5
LS-BGA100B-05	1	11x11	10x10
LS-BGA100C-05	0.8	10x10	10x10
LS-BGA121A-05	1.27	15x15	11x11
LS-BGA121D-05	0.8	10x10	11x11
LS-BGA128C-05	0.8	10x10	12x12
LS-BGA1296A-05	1	37.5x37.5	36x36
LS-BGA144K-05	0.8	11x11	12x12
LS-BGA144L-05	0.8	12x12	12x12
LS-BGA169F-05	0.8	12x12	13x13
LS-BGA196C-05	1	15x15	14x14
LS-BGA196E-05	0.8	12x12	14x14
LS-BGA196J-05	0.8	13x13	14x14
LS-BGA208A-05	1.27	23x23	17x17
LS-BGA225E-05	0.8	13x13	15x15
LS-BGA256B-05	1.27	21x21	16x16
LS-BGA256E-05	1	17x17	16x16
LS-BGA256G-05	1	19x19	16x16
LS-BGA256J-05	0.8	14x14	16x16
LS-BGA289A-05	1.27	23x23	17x17
LS-BGA289B-05	1	18x18	17x17
LS-BGA289D-05	0.8	15x15	17x17
LS-BGA289E-05	1	19x19	17x17
LS-BGA292E-05	0.8	17x17	20x20
LS-BGA324G-05	1	19x19	18x18
LS-BGA361E-05	0.8	16x16	19x19
LS-BGA363A-05	0.8	17x17	20x20
LS-BGA364B-05	1	21x21	20x20
LS-BGA372B-05	1.27	27x27	20x20
LS-BGA388A-05	1.27	35x35	26x26
LS-BGA388B-05	1	27x27	26x26
LS-BGA400F-05	1.27	27x27	20x20
LS-BGA456D-05	1	27x27	26x26
LS-BGA480B-05	1.27	37.5x37.5	29x29
LS-BGA484C-05	1	23x23	22x22
LS-BGA484E-05	0.8	18x18	22x22
LS-BGA492A-05	1.27	35x35	26x26
LS-BGA572A-05	1	25x25	24x24
LS-BGA576D-05	1	25x25	24x24
LS-BGA596B-05	1.27	35x35	26x26
LS-BGA600C-05	1.27	40x40	31x31
LS-BGA650A-05	1	31x31	30x30
LS-BGA672A-05	1.27	35x35	26x26
LS-BGA676C-05	1	27x27	26x26
LS-BGA676D-05	0.8	23x23	26x26
LS-BGA788B-05	1	35x35	34x34
LS-BGA913A-05	1	40x40	39x39
LS-BGA1020A-05	1	33x33	32x32
LS-BGA1044A-05	1	40x40	39x39
LS-BGA1069A-05	1	40x40	39x39
LS-BGA1152B-05	1.27	45x45	34x34
LS-BGA1156A-05	1	35x35	34x34
LS-BGA1497A-05	1	40x40	39x39
LS-BGA1521A-05	1	40x40	39x39

Ironwood's standard GHz elastomer or Spring pin sockets can be mounted on male pin adapters. The socket and adapter assembly can be plugged into our female Giga-snaP SMT adapter. This combination is used when there is no room to put mounting holes for socket on customer's board. The female Giga-snaP SMT adapter is same size as the chip and is only 2.87mm in thickness.

For drawings -> www.ironwoodelectronics.com then select Sockets -> GHz Socket Lid Options

Part Number	Part Description
HS-SG-6001	4.5W typ. Heat sink screw
HS-SG-6002	16W typ. Heat sink screw
HS-SG-6003	5-6W typ. Heat sink screw
HS-SG-6004	8.5W typ. Heat sink screw



SOCKETS

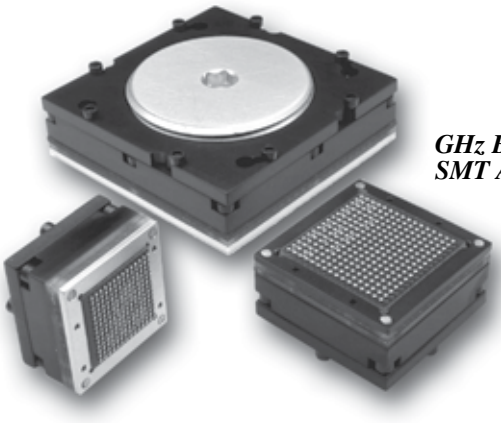
SMT Adapters for GHz BGA Sockets

When through hole mounting is not possible on the target PCB for the GHz socket, adapter bases are available that emulate the chip's BGA footprint and convert the socket to an SMT device. The socket bases available for 0.8mm to 1.27 mm pitch. SMT adapter bases are easily installed using standard flux and reflow techniques.

You simply solder the adapter to the BGA pads on your PCB. The GHz socket is then mounted to the adapter and the IC is installed into the ZIF GHz socket.

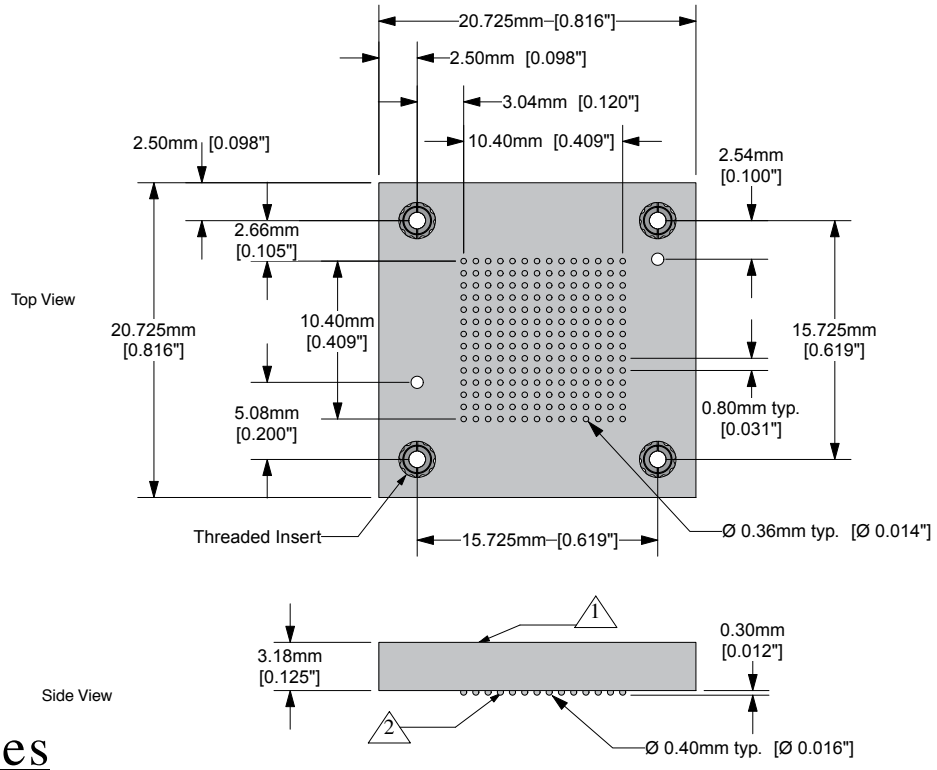
For drawings -> www.ironwoodelectronics.com then select Sockets -> Socket Accessories (SMT Options)

Part Number	Part Number
SF-BGA49B-B-05	SF-BGA289B-B-05F
SF-BGA49B-B-05F	SF-BGA289D-B-05
SF-BGA64J-B-05	SF-BGA289D-B-05F
SF-BGA64J-B-05F	SF-BGA289E-B-05
SF-BGA100C-B-05	SF-BGA289E-B-05F
SF-BGA100C-B-05F	SF-BGA304A-B-05
SF-BGA121A-B-05	SF-BGA304A-B-05F
SF-BGA121A-B-05F	SF-BGA324G-B-05
SF-BGA121D-B-05	SF-BGA324G-B-05F
SF-BGA121D-B-05F	SF-BGA332A-B-05
SF-BGA144K-B-05	SF-BGA332A-B-05F
SF-BGA144K-B-05F	SF-BGA336B-B-05
SF-BGA169F-B-05	SF-BGA336B-B-05F
SF-BGA169F-B-05F	SF-BGA336C-B-05F
SF-BGA169H-B-05	SF-BGA336D-B-05
SF-BGA169H-B-05F	SF-BGA361E-B-05
SF-BGA196C-B-05	SF-BGA361E-B-05F
SF-BGA196C-B-05F	SF-BGA372C-B-05
SF-BGA196E-B-05	SF-BGA376A-B-05
SF-BGA196E-B-05F	SF-BGA376A-B-05F
SF-BGA196J-B-05	SF-BGA400F-B-05
SF-BGA196J-B-05F	SF-BGA400F-B-05F
SF-BGA199B-B-05	SF-BGA456D-B-05
SF-BGA208A-B-05	SF-BGA456D-B-05F
SF-BGA208A-B-05F	SF-BGA484C-B-05
SF-BGA225E-B-05	SF-BGA484C-B-05F
SF-BGA225E-B-05F	SF-BGA484E-B-05
SF-BGA256B-B-05	SF-BGA484E-B-05F
SF-BGA256B-B-05F	SF-BGA512A-B-05
SF-BGA256E-B-05	SF-BGA512A-B-05F
SF-BGA256E-B-05F	SF-BGA576D-B-05
SF-BGA256G-B-05	SF-BGA576D-B-05F
SF-BGA256G-B-05F	SF-BGA676B-B-05F
SF-BGA256J-B-05	SF-BGA676C-B-05
SF-BGA256J-B-05F	SF-BGA676C-B-05F
SF-BGA261A-B-05F	SF-BGA676D-B-05
SF-BGA272C-B-05F	SF-BGA676D-B-05F
SF-BGA289A-B-05	SF-BGA961B-B-05
SF-BGA289A-B-05F	SF-BGA1156A-B-05
SF-BGA289B-B-05	



GHz BGA Socket with SMT Adapter

Typical Drawing, 15x15 mm, 0.8 mm adapter



Sockets & Receptacles

Sockets and receptacles provide pluggable interface for other packages such as PGA, QIP, QFP, etc. We also offer parts that provide sockets for in-circuit emulators. Ironwood offers the industry's widest array of high quality sockets and receptacles. Our parts utilize gold plated pins and through-hole connectors exclusively. Please see the web site for more details.

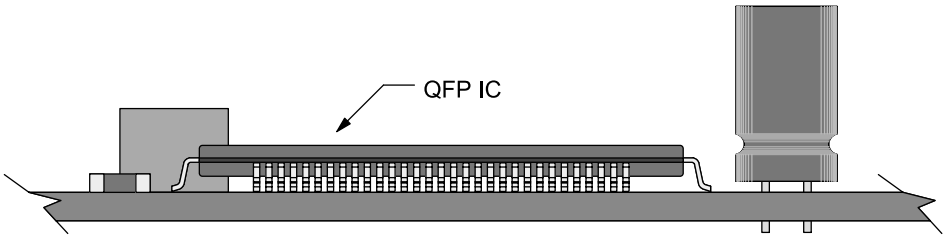
For drawings -> www.ironwoodelectronics.com then select Adapters -> Sockets & Receptacles

1 Substrate: 3.18mm Δ0.025mm [0.125" ±0.001"] FR4/G10 or equivalent high temp material. Non-clad.

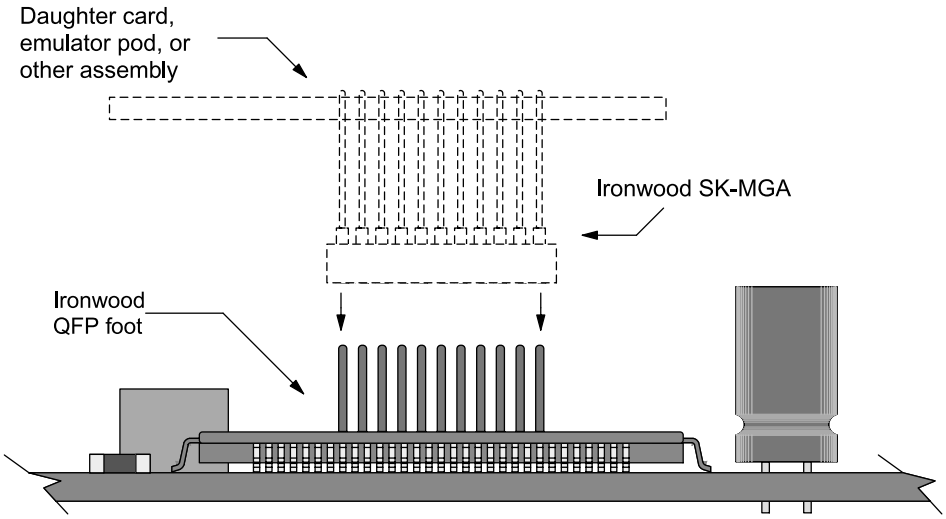
2 Solder ball: Eutectic Sn63Pb37

SMT Feet (SMT package emulation)

When it's necessary to socket an IC, run emulation tools or debug your system through a target board's IC pads, Ironwood offers a high quality solution in it's SMT foot line. A surface mount foot (base) will solder to a target PCB with no additional real estate needed. The Ironwood surface mount foot emulates very closely the actual SMT package. Attach your daughter card, test equipment, emulator pod or other assembly to the Ironwood surface mount foot via a highly reliable MGA sockeet. Ironwood can also provide turnkey solutions for daughter board and other top assemblies.



Side view: PCB with QFP IC

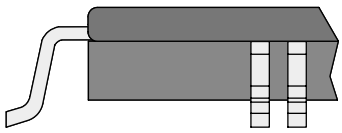


Side view: PCB with IC removed and Ironwood QFP foot (SF-QFP)

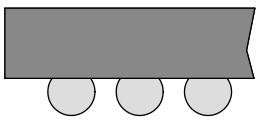
True package emulation

- Will not interfere with adjacent components
- Surface mount with oven profiles for actual IC
- Attach by hand with ease
- High reliability pluggable interfaces

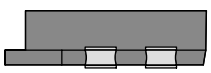
True package emulation



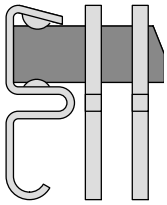
QFP and SOIC



BGA



QFN



PLCC

SMT Package Emulation

Surface Mount Package Emulators

The following types of SMT package emulator adapters are available in our on-line catalog. For your convenience, we have listed the compatible mini grid array socket for each part in the tables. Please refer to Appendixes at *www.ironwoodelectronics.com* -> Appendices for detailed chip package and package code specifications.

• BGA - Male Interface

These BGA surface mount feet are easily attached to target boards using standard flux and reflow methods. They present an array of gold plated pins, for pluggable connections to parts like probe boards and in-circuit emulator adapters. Ironwood has developed innovative interconnection technology that supports 0.8mm BGA packaging.

• BGA - Female Interface

These BGA surface mount feet present a female interface. We utilize blind pin technology to isolate our low temperature solder balls (63/37 PbSn) from the pins.

• QFP

Our proprietary shaped solder technology, gull wing leads, or leadless systems are employed to attach the part to the SMT lands. These parts typically present our MGA array of gold plated pins to provide pluggable connections.

• SOIC

Our SOIC surface mount feet are offered in leadless (-L), J-leaded (-J), or bottom termination (-K) variations. When soldered to the target SMT lands, they create a pluggable connection by presenting an array of gold plated pins.

• PLCC - SMT Bases

Our PLCC surface mount feet utilize J-leads to attach to the target system's SMT lands. They present an array of gold plated, .05" pitch MGA "mini-grid" pins. There are various part profiles and pin length configurations available.

Surface Mount Package Emulation

• PLCC - Clip on bases

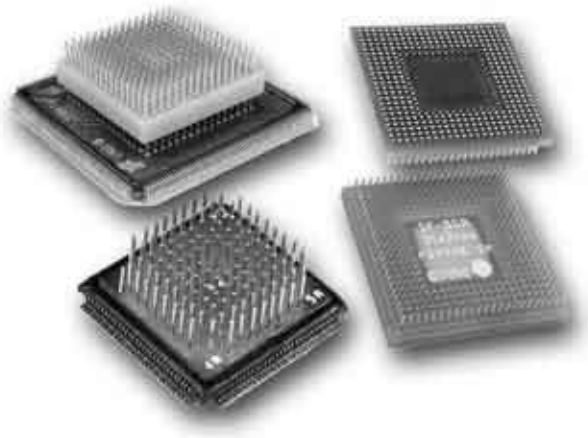
Our PLCC clips snap onto the leads of surface mounted PLCC packages and provide reliable mechanical and electrical interconnection to all signals. Depending on the specific part, the signals are then presented to one of three interfaces.

• PLCC - Socket Plugs

The Socket Plugs interconnect two PCB assemblies via a PLCC socket. Our PLCC Socket Plugs, constructed for true PLCC emulation, provide superior connections and eliminate the possibility of damage to the PLCC socket. Depending on the specific part, the signals are connected via through-hole, mini-grid array, SMT with optional alignment pins, or high density, 1.27 mm pin spacing.

• QFN SMT Feet

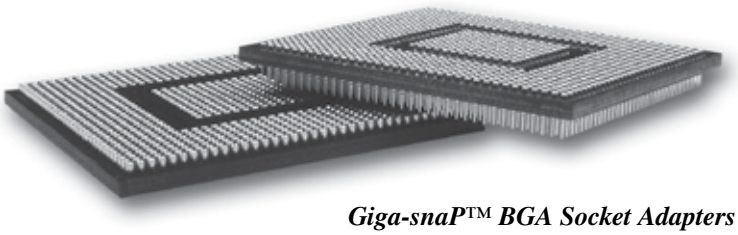
These feet provide accurate emulation including e-pad in our exclusive patented design.



Giga-snaP™ BGA Socket Adapter

Giga-snaP™ BGA SMT Adapters - Reliable, Easy to plug, High Speed.
The Giga-snaP™ 1 mm pitch BGA Surface Mount Feet Adapter line of products provide an inexpensive and reliable method for socketing 1mm BGA chips. The product line consists of patent pending female sockets with machined pins epoxy over molded into an assembly that matches a particular BGA pattern. The epoxy over molded female BGA socket is soldered to a PCB using standard soldering methods. A corresponding male pin BGA adapter, to which the user attaches a target BGA chip, is plugged into the female socket on the board and the chip is interconnected and the system is ready to go. The SMT adapters have the same solder ball types as the IC's they are emulating. A complete description and drawings of Giga-snaP™ 1 mm pitch BGA Surface Mount Feet Adapter can be found at: http://www.ironwoodelectronics.com/catalog

Benefits
The patent pending over molding method for the adapter results in a much more reliable device. The coefficient of thermal expansion of the BGA SMT foot adapter exactly matches that of the PCB to which it is attached, thus eliminating failures caused by CTE mismatch. Thermal changes from either heat from components or drastic environments will not result in fractured solder ball connections. Secondly the Gig-snaP SMT adapters can be reflowed up to at least 3 times while maintaining full integrity of all solder ball connections. Adapters with pressed pins fracture the substrate and this allows the solder ball to flow up the pin and basically disappear - sometimes on the initial solder attachment. With ball counts exceeding 1000 and approaching more than 2000 there are huge forces when inserting the male device. The force to mate conventional adapters can exceed 80 pounds or 356 Newtons for a 1000 pin device. The Giga-snaP™ BGA Surface Mount Feet Adapters require less than 1/3 the force of 26 pounds or 115 Newtons for a 1000 pin device. The electrical path of the Giga-snaP™ BGA SMT foot adapters is a high priority performance issue. The physical length from the point where the top connection point on the male adapter to the solder ball on the female is 4.5 mm. This is the shortest connection length by far and therefore providing better transmission of high frequency signals. Ironwood Electronics has the tooling, software, and equipment in place to deliver any array, custom or standard 1 mm Giga-snaP™ in a week or less. Our speed of delivery for BGA SMT adapters is the industry's best. For soldering, see *www.ironwoodelectronics.com/catalog/content/drawings/bsi.pdf*



Giga-snaP™ BGA Socket Adapters

Description of the Giga-snaP™ Epoxy Overmold Adapter
Our patent pending epoxy over mold method for Giga-snaP™ uses FR4 substrate with pins held in place by a thin ring of epoxy holding the pin in place in the FR4 and sealing the pin for the best possible solderability. This solves the PCB fracturing problem and warping caused by press fitting into a substrate. This also allows us to use FR4 rather than plastic and therefore avoiding CTE mismatch.

For drawings -> www.ironwoodelectronics.com then select Adapters -> Giga-snaP™ BGA SMT Adapters

LS-BGA Table-Male 0.8mm BGA Land Socket

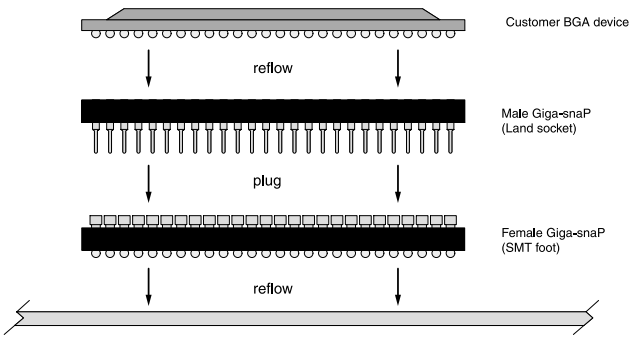
Part Number	Pin Count	Pitch	Array	Compatible Part	Part Number	Pin Count	Pitch	Array	Compatible Part
LS-BGA48N-61	48	0.8	6x8	None	LS-BGA84D-61	84	0.8	9x15	SF-BGA84D-B-62
LS-BGA49B-61	49	0.8	7x7	SF-BGA49B-B-62	LS-BGA90B-61	90	0.8	6x15	None
LS-BGA54B-61	54	0.8	9x6	None	LS-BGA90C-61	90	0.8	9x15	SF-BGA90C-B-62
LS-BGA54C-61	54	0.8	6x9	None	LS-BGA92D-61	92	0.8	9x21	SF-BGA92D-B-62
LS-BGA60C-61	60	0.8	6x10	SF-BGA60C-B-62	LS-BGA100C-61	100	0.8	10x10	SF-BGA100C-B-62
LS-BGA60F-61	60	0.8	9x11	None	LS-BGA120G-61	120	0.8	10x12	SF-BGA120G-B-62
LS-BGA64F-61	64	0.8	8x8	SF-BGA64F-B-62	LS-BGA121D-61	121	0.8	11x11	SF-BGA121D-B-62
LS-BGA64M-61	64	0.8	10x12	SF-BGA64M-B-62	LS-BGA136C-61	136	0.8	17x8	SF-BGA136C-B-62
LS-BGA68C-61	68	0.8	9x19	SF-BGA68C-62	LS-BGA144J-61	144	0.8	12x12	SF-BGA144J-B-62
LS-BGA71A-61	71	0.8	9x19	SF-BGA71A-B-62	LS-BGA169F-61	169	0.8	13x13	SF-BGA169F-B-62
LS-BGA80L-61	80	0.8	8x10	SF-BGA80L-B-62	LS-BGA196E-61	196	0.8	14x14	SF-BGA196E-B-62
LS-BGA81C-61	81	0.8	9x9	SF-BGA81C-B-62	LS-BGA217B-61	217	0.8	17x17	SF-BGA217B-B-62

LS-BGA Table-Male 0.8mm BGA Land Socket continued

Part Number	Pin Count	Pitch	Array	Compatible Part	Part Number	Pin Count	Pitch	Array	Compatible Part
LS-BGA225E-61	225	0.8	15x15	SF-BGA225E-B-62	LS-BGA400H-61	400	0.8	20x20	SF-BGA400H-B-62
LS-BGA240N-61	240	0.8	22x22	SF-BGA240N-B-62F	LS-BGA484E-61	484	0.8	22x22	SF-BGA484E-B-62
LS-BGA256J-61	256	0.8	16x16	SF-BGA256J-B-62	LS-BGA529D-61	529	0.8	23x23	SF-BGA529C-B-62
LS-BGA289D-61	289	0.8	17x17	SF-BGA289D-B-62	LS-BGA561A-61	541	0.8	27x27	SF-BGA561A-B-62
LS-BGA316C-61	316	0.8	20x20	SF-BGA316C-B-62F	LS-BGA625C-61	625	0.8	25x25	SF-BGA625C-B-62
LS-BGA324M-61	324	0.8	18x18	SF-BGA324M-B-62	LS-BGA676D-61	676	0.8	26x26	SF-BGA676D-B-62
LS-BGA361E-61	361	0.8	19x19	SF-BGA361E-B-62					

SF-BGA Table-Female 0.8mm BGA SMT Adapter

Part Number	Pin Count	Pitch	Array	Compatible Part	Part Number	Pin Count	Pitch	Array	Compatible Part
SF-BGA48R-B-62	48	0.8	8x6	LS-BGA48R-B-05	SF-BGA177A-B-62F	177	0.8	15x15	none
SF-BGA48R-B-62F	48	0.8	8x6	LS-BGA48R-B-05	SF-BGA196E-B-62	196	0.8	14x14	LS-BGA196E-61
SF-BGA49B-B-62	49	0.8	7x7	LS-BGA49B-61	SF-BGA196E-B-62F	196	0.8	14x14	LS-BGA196E-61
SF-BGA49B-B-62F	49	0.8	7x7	LS-BGA49B-61	SF-BGA208F-B-62	208	0.8	16x16	N/A
SF-BGA54B-B-62	54	0.8	9x9	LS-BGA54B-61	SF-BGA217B-B-62	217	0.8	17x17	LS-BGA217B-61
SF-BGA54B-B-62F	54	0.8	9x9	LS-BGA54B-61	SF-BGA224B-B-62	224	0.8	18x18	none
SF-BGA60C-B-62	60	0.8	6x10	LS-BGA60C-61	SF-BGA224B-B-62F	224	0.8	18x18	none
SF-BGA60G-B-62	60	0.8x1	9x12	SS-BGA60G-M-01	SF-BGA225E-B-62	225	0.8	15x15	LS-BGA225E-61
SF-BGA60G-B-62F	60	0.8x1	9x12	SS-BGA60G-M-01	SF-BGA225E-B-62F	225	0.8	15x15	LS-BGA225E-61
SF-BGA64F-B-62	64	0.8	8x8	LS-BGA64F-61	SF-BGA240L-B-62	240	0.8	18x18	none
SF-BGA64F-B-62F	64	0.8	8x8	LS-BGA64F-61	SF-BGA240L-B-62F	240	0.8	18x18	none
SF-BGA64M-B-62	64	0.8	10x12	LS-BGA64M-61	SF-BGA240N-B-62F	240	0.8	22x22	none
SF-BGA64M-B-62F	64	0.8	10x12	LS-BGA64M-61	SF-BGA256J-B-62	256	0.8	16x16	LS-BGA256J-61
SF-BGA68C-B-62	68	0.8	9x19	LS-BGA68C-61	SF-BGA256J-B-62F	256	0.8	16x16	LS-BGA256J-61
SF-BGA68C-B-62F	68	0.8	9x19	LS-BGA68C-61	SF-BGA256N-B-62F	256	0.8	20x20	none
SF-BGA68E-B-62	62	0.8	10x10	none	SF-BGA289D-B-62	289	0.8	17x17	LS-BGA289D-61
SF-BGA68E-B-62F	62	0.8	10x10	none	SF-BGA289D-B-62F	289	0.8	17x17	LS-BGA289D-61
SF-BGA71A-B-62	71	0.8	9x19	LS-BGA71A-61	SF-BGA292E-B-62F	292	0.8	20x20	none
SF-BGA71A-B-62F	71	0.8	9x19	LS-BGA71A-61	SF-BGA316C-B-62F	316	0.8	20x20	LS-BGA316C-61
SF-BGA80L-B-62	80	0.8	8x10	LS-BGA80L-61	SF-BGA318A-B-62	318	0.8	18x18	N/A
SF-BGA81C-B-62	81	0.8	9x9	LS-BGA81C-61	SF-BGA324M-B-62	324	0.8	18x18	LS-BGA324M-61
SF-BGA81C-B-62F	81	0.8	9x9	LS-BGA81C-61	SF-BGA324M-B-62F	324	0.8	18x18	LS-BGA324M-61
SF-BGA84D-B-62	84	0.8	9x15	LS-BGA84D-61	SF-BGA361E-B-62	361	0.8	19x19	LS-BGA361E-61
SF-BGA84D-B-62F	84	0.8	9x15	LS-BGA84D-61	SF-BGA361E-B-62F	361	0.8	19x19	LS-BGA361E-61
SF-BGA90C-B-62	90	0.8	9x15	LS-BGA90C-61	SF-BGA364A-B-62	364	0.8	20x20	N/A
SF-BGA90C-B-62F	90	0.8	9x15	LS-BGA90C-61	SF-BGA364A-B-62F	364	0.8	20x20	N/A
SF-BGA92D-B-62	92	0.8	13x13	LS-BGA92D-61	SF-BGA400H-B-62	400	0.8	20x20	LS-BGA400H-61
SF-BGA92D-B-62F	92	0.8	13x13	LS-BGA92D-61	SF-BGA400H-B-62F	400	0.8	20x20	LS-BGA400H-61
SF-BGA96D-B-62F	96	0.8	11x11	none	SF-BGA436B-B-62F	436	0.8	22x22	none
SF-BGA100C-B-62	100	0.8	10x10	LS-BGA100C-61	SF-BGA449A-B-62	449	0.8	25x25	
SF-BGA100C-B-62F	100	0.8	10x10	LS-BGA100C-61	SF-BGA449A-B-62F	449	0.8	25x25	
SF-BGA107C-B-62F	107	0.8	9x12	SF-BGA107C-B-61F	SF-BGA483B-B-62	483	0.8	25x25	none
SF-BGA121D-B-62	121	0.8	11x11	LS-BGA121D-61	SF-BGA483B-B-62F	483	0.8	25x25	none
SF-BGA121D-B-62F	121	0.8	11x11	LS-BGA121D-61	SF-BGA484E-B-62	484	0.8	22x22	LS-BGA484E-61
SF-BGA125A-B-62	125	0.8	13x13	SF-BGA125A-61	SF-BGA484E-B-62F	484	0.8	22x22	LS-BGA484E-61
SF-BGA128C-B-62	128	0.8	12x12		SF-BGA529D-B-62	529	0.8	23x23	N/A
SF-BGA128C-B-62F	128	0.8	12x12		SF-BGA529D-B-62F	529	0.8	23x23	N/A
SF-BGA130A-B-62	130	0.8	13x10	SF-BGA130A-B-61	SF-BGA548C-B-62	548	0.8	26x26	none
SF-BGA130A-B-62F	130	0.8	13x10	SF-BGA130A-B-61f	SF-BGA548C-B-62F	548	0.8	26x26	none
SF-BGA136C-B-62	136	0.8	17x8	LS-BGA136C-61	SF-BGA561A-B-62	561	0.8	27x27	LS-BGA561A-61
SF-BGA136C-B-62F	136	0.8	17x8	LS-BGA136C-61	SF-BGA561A-B-62F	561	0.8	27x27	LS-BGA561A-61
SF-BGA144J-B-62	144	0.8	12x12	LS-BGA144J-61	SF-BGA625C-B-62	625	0.8	25x25	LS-BGA625C-61
SF-BGA144J-B-62F	144	0.8	12x12	LS-BGA144J-61	SF-BGA625C-B-62F	625	0.8	25x25	LS-BGA625C-61
SF-BGA169F-B-62	169	0.8	13x13	LS-BGA169F-61	SF-BGA676D-B-62	676	0.8	26x26	LS-BGA676D-61
SF-BGA169F-B-62F	169	0.8	13x13	LS-BGA169F-61	SF-BGA676D-B-62F	676	0.8	26x26	LS-BGA676D-61
SF-BGA177A-B-62	177	0.8	15x15	none					



SF-BGA Table-Male 0.8mm BGA SMT Adapter

Part Number	Pin Count	Pitch	Array	Compatible Part	Part Number	Pin Count	Pitch	Array	Compatible Part
SF-BGA48R-B-61	48	0.8	8x6	SF-BGA48R-B-62	SF-BGA144J-B-61F	144	0.8	12x12	SF-BGA144J-B-62
SF-BGA48R-B-61F	48	0.8	8x6	SF-BGA48R-B-62F	SF-BGA169F-B-61	169	0.8	13x13	SF-BGA169F-B-62
SF-BGA49B-B-61	49	0.8	7x7	SF-BGA49B-B-62	SF-BGA169F-B-61F	169	0.8	13x13	SF-BGA169F-B-62F
SF-BGA49B-B-61F	49	0.8	7x7	SF-BGA49B-B-62F	SF-BGA177A-B-61	177	0.8	15x15	SF-BGA177A-B-62
SF-BGA54B-B-61	54	0.8	9x6	SF-BGA54B-B-62	SF-BGA177A-B-61F	177	0.8	15x15	SF-BGA177A-B-62F
SF-BGA54B-B-61F	54	0.8	9x6	SF-BGA54B-B-62F	SF-BGA196E-B-61	196	0.8	14x14	SF-BGA196E-B-62
SF-BGA60C-B-61	60	0.8	6x10	SF-BGA60C-B-62	SF-BGA196E-B-61F	196	0.8	14x14	SF-BGA196E-B-62F
SF-BGA60C-B-61F	60	0.8	6x10	SF-BGA60C-B-62	SF-BGA217B-B-61	217	0.8	17x17	SF-BGA217B-B-62
SF-BGA60G-B-61	60	0.8	9x12	SF-BGA60G-B-62	SF-BGA217B-B-61F	217	0.8	17x17	SF-BGA217B-B-62F
SF-BGA60G-B-61F	60	0.8	9x12	SF-BGA60G-B-62F	SF-BGA224B-B-61	224	0.8	18x18	SF-BGA224B-B-62
SF-BGA64F-B-61	64	0.8	8x8	SF-BGA64F-B-62	SF-BGA224B-B-61F	224	0.8	18x18	SF-BGA224B-B-62F
SF-BGA64F-B-61F	64	0.8	8x8	SF-BGA64F-B-62F	SF-BGA225E-B-61	225	0.8	15x15	SF-BGA225E-B-62
SF-BGA68C-B-61	68	0.8	9x9	SF-BGA68C-B-62	SF-BGA225E-B-61F	225	0.8	15x15	SF-BGA225E-B-62F
SF-BGA68C-B-61F	68	0.8	9x9	SF-BGA68C-B-62F	SF-BGA240L-B-61	240	0.8	18x18	SF-BGA240L-B-62
SF-BGA68E-B-61	68	0.8	10x10	SF-BGA68E-B-62	SF-BGA240L-B-61F	240	0.8	18x18	SF-BGA240L-B-62F
SF-BGA68E-B-61F	68	0.8	10x10	SF-BGA68E-B-62F	SF-BGA240N-B-61	240	0.8	22x22	SF-BGA240N-B-62
SF-BGA71A-B-61	71	0.8	9x19	SF-BGA71A-B-62	SF-BGA240N-B-61F	240	0.8	22x22	none
SF-BGA71A-B-61F	71	0.8	9x19	SF-BGA71A-B-62F	SF-BGA256J-B-61	256	0.8	16x16	SF-BGA256J-B-62
SF-BGA80L-B-61	80	0.8	8x10	SF-BGA80L-B-62	SF-BGA256J-B-61F	256	0.8	16x16	SF-BGA256J-B-62F
SF-BGA80L-B-61F	80	0.8	8x10	SF-BGA80L-B-62F	SF-BGA256N-B-61	256	0.8	20x20	SF-BGA256N-B-62
SF-BGA81C-B-61	81	0.8	9x9	SF-BGA81C-B-62	SF-BGA256N-B-61F	256	0.8	20x20	SF-BGA256N-B-62F
SF-BGA81C-B-61F	81	0.8	9x9	SF-BGA81C-B-62F	SF-BGA289D-B-61	289	0.8	17x17	SF-BGA289D-B-62
SF-BGA84D-B-61	84	0.8	9x15	SF-BGA84D-B-62	SF-BGA289D-B-61F	289	0.8	17x17	SF-BGA289D-B-62F
SF-BGA84D-B-61F	84	0.8	9x15	SF-BGA84D-B-62F	SF-BGA292E-B-61	292	0.8	20x20	SF-BGA292E-B-62
SF-BGA88C-B-61F	88	0.8	8x10	none	SF-BGA292E-B-61F	292	0.8	20x20	SF-BGA292E-B-62F
SF-BGA90C-B-61	90	0.8	9x15	SF-BGA90C-B-62	SF-BGA318A-B-61	318	0.8	18x18	SF-BGA318A-B-62
SF-BGA90C-B-61F	90	0.8	9x15	SF-BGA90C-B-62	SF-BGA318A-B-61F	318	0.8	18x18	SF-BGA318A-B-62F
SF-BGA92D-B-61	92	0.8	9x22	SF-BGA92D-B-62	SF-BGA324M-B-61	324	0.8	18x18	SF-BGA324M-B-62
SF-BGA92D-B-61F	92	0.8	9x22	SF-BGA92D-B-62F	SF-BGA324M-B-61F	324	0.8	18x18	SF-BGA324M-B-62F
SF-BGA96D-B-61	96	0.8	11x11	SF-BGA96D-B-62	SF-BGA361E-B-61	361	0.8	19x19	SF-BGA361E-B-62
SF-BGA96D-B-61F	96	0.8	11x11	SF-BGA96D-B-62F	SF-BGA361E-B-61F	361	0.8	19x19	SF-BGA361E-B-62F
SF-BGA100C-B-61	100	0.8	10x10	SF-BGA100C-B-62	SF-BGA364A-B-61	364	0.8	20x20	SF-BGA364A-B-62
SF-BGA100C-B-61F	100	0.8	10x10	SF-BGA100C-B-62F	SF-BGA364A-B-61F	364	0.8	20x20	SF-BGA364A-B-62F
SF-BGA105A-B-61F	105	0.8	9x12	none	SF-BGA400H-B-61	400	0.8	20x20	SF-BGA400H-B-62
SF-BGA107C-B-61F	107	0.8	9x12	SF-BGA107C-B-62F	SF-BGA400H-B-61F	400	0.8	20x20	SF-BGA400H-B-62F
SF-BGA107D-B-61F	107	0.8	10x14	none	SF-BGA436B-B-61	436	0.8	22x22	SF-BGA436B-B-62
SF-BGA120G-B-61	120	0.8	10x12	SF-BGA120G-B-62	SF-BGA436B-B-61F	436	0.8	22x22	SF-BGA436B-B-62F
SF-BGA120G-B-61F	120	0.8	10x12	SF-BGA120G-B-62F	SF-BGA449A-B-61	449	0.8	25x25	SF-BGA449A-B-62
SF-BGA121D-B-61	121	0.8	11x11	SF-BGA121D-B-62	SF-BGA449A-B-61F	449	0.8	25x25	SF-BGA449A-B-62F
SF-BGA121D-B-61F	121	0.8	11x11	SF-BGA121D-B-62F	SF-BGA484E-B-61	484	0.8	22x22	SF-BGA484E-B-62
SF-BGA125A-B-61	125	0.8	13x13	SF-BGA125A-B-62	SF-BGA484E-B-61F	484	0.8	22x22	SF-BGA484E-B-62F
SF-BGA125A-B-61F	125	0.8	13x13	SF-BGA125A-B-62F	SF-BGA529D-B-61	529	0.8	23x24	SF-BGA529D-B-62
SF-BGA128C-B-61	128	0.8	12x12	SF-BGA128C-B-62	SF-BGA529D-B-61F	529	0.8	23x24	SF-BGA529D-B-62F
SF-BGA128C-B-61F	128	0.8	12x12	SF-BGA128C-B-62F	SF-BGA548C-B-61	548	0.8	26x26	SF-BGA548C-B-62
SF-BGA130A-B-61	130	0.8	13x10	SF-BGA130A-B-62	SF-BGA548C-B-61F	548	0.8	26x26	SF-BGA548C-B-62F
SF-BGA130A-B-61F	130	0.8	13x10	SF-BGA130A-B-62F	SF-BGA625C-B-61	625	0.8	25x25	SF-BGA625C-B-62
SF-BGA136C-B-61	136	0.8	12x17	SF-BGA136C-B-62	SF-BGA625C-B-61F	625	0.8	25x25	SF-BGA625C-B-62F
SF-BGA136C-B-61F	136	0.8	12x17	SF-BGA136C-B-62F	SF-BGA676D-B-61	676	0.8	26x26	SF-BGA676D-B-62
SF-BGA144J-B-61	144	0.8	12x12	SF-BGA144J-B-62	SF-BGA676D-B-61F	676	0.8	26x26	SF-BGA676D-B-62F

SF-BGA Table-Male 1mm BGA SMT Adapter

Part Number	Pin Count	Pitch	Array	Part Number	Pin Count	Pitch	Array
SF-BGA64E-B-41	64	1	8x8	SF-BGA324A-B-41	324	1	20x20
SF-BGA81A-B-41	81	1	9x9	SF-BGA324G-B-41	324	1	18x18
SF-BGA100B-B-41	100	1	10x10	SF-BGA324G-B-41F	324	1	18x18
SF-BGA108B-B-41	108	1	12x12	SF-BGA324J-B-41	324	1	22x22
SF-BGA144C-B-41	144	1	12x12	SF-BGA324J-B-41F	324	1	22x22
SF-BGA156A-B-41	156	1	14x14	SF-BGA400A-B-41	400	1	20x20
SF-BGA160C-B-41	160	1	14x14	SF-BGA456D-B-41	456	1	26x26
SF-BGA160D-B-41	160	1	14x14	SF-BGA484C-B-41	484	1	22x22
SF-BGA176C-B-41	176	1	14x14	SF-BGA484C-B-41F	484	1	22x22
SF-BGA192D-B-41	192	1	16x16	SF-BGA672B-B-41	672	1	26x26
SF-BGA196D-B-41	196	1	14x14	SF-BGA676C-B-41	676	1	26x26
SF-BGA196F-B-41	196	1	20x20	SF-BGA676C-B-41F	676	1	26x26
SF-BGA196G-B-41	196	1	16x16	SF-BGA783B-B-41	783	1	28x28
SF-BGA208C-B-41	208	1	16x16	SF-BGA876A-B-41	876	1	30x30
SF-BGA256G-B-41	256	1	16x16	SF-BGA900A-B-41	900	1	30x30
SF-BGA260A-B-41	260	1	18x18	SF-BGA900A-B-41F	900	1	30x30
SF-BGA260A-B-41F	260	1	18x18	SF-BGA1020A-B-41	1020	1	32x32
SF-BGA288B-B-41	288	1	22x22	SF-BGA1704A-B-41	1704	1	42x42

SF-BGA Table-Female 1mm BGA SMT Adapter

Part Number	Pin Count	Pitch	Array	Compatible Part	Part Number	Pin Count	Pitch	Array	Compatible Part
SF-BGA9A-B-42	9	1	3x3	N/A	SF-BGA441D-B-42	441	1	26x26	none
SF-BGA9A-B-42F	9	1	3x3	N/A	SF-BGA456C-B-42	456	1	22x22	LS-BGA456C-41
SF-BGA29A-B-42	29	1	6x6	N/A	SF-BGA456C-B-42F	456	1	22x22	LS-BGA456C-41
SF-BGA29A-B-42F	29	1	6x6	N/A	SF-BGA456D-B-42	456	1	26x26	LS-BGA456D-41
SF-BGA29B-B-42	29	1	6x6	N/A	SF-BGA456D-B-42F	456	1	26x26	LS-BGA456D-41
SF-BGA29B-B-42F	29	1	6x6	N/A	SF-BGA484C-B-42	484	1	22x22	LS-BGA484C-41
SF-BGA64E-B-42	64	1	8x8	LS-BGA64E-41	SF-BGA484C-B-42F	484	1	22x22	LS-BGA484C-41
SF-BGA64E-B-42F	64	1	8x8	LS-BGA64E-41	SF-BGA516B-B-42	516	1	30x30	LS-BGA516B-41
SF-BGA65A-B-42	65	1	9x9	N/A	SF-BGA516B-B-42F	516	1	30x30	LS-BGA516B-41
SF-BGA65A-B-42F	65	1	9x9	N/A	SF-BGA543A-B-42F	543	1	26x26	none
SF-BGA80F-B-42	80	1	10x8	LS-BGA80F-41	SF-BGA556A-B-42	556	1	30x30	LS-BGA556A-41
SF-BGA80F-B-42F	80	1	10x8	LS-BGA80F-41	SF-BGA556A-B-42F	556	1	30x30	LS-BGA556A-41
SF-BGA81A-B-42	81	1	9x9	LS-BGA81A-41	SF-BGA572A-B-42	572	1	24x24	LS-BGA572A-05
SF-BGA81A-B-42F	81	1	9x9	LS-BGA81A-41	SF-BGA572A-B-42F	572	1	24x24	LS-BGA572A-05
SF-BGA100B-B-42	100	1	10x10	LS-BGA100B-41	SF-BGA576D-B-42	576	1	24x24	none
SF-BGA100B-B-42F	100	1	10x10	LS-BGA100B-41	SF-BGA576D-B-42F	576	1	24x24	none
SF-BGA100J-B-42	100	1	13x13	LS-BGA100J-41	SF-BGA650A-B-42	650	1	30x30	LS-BGA650A-05
SF-BGA100J-B-42F	100	1	13x13	LS-BGA100J-41	SF-BGA650A-B-42F	650	1	30x30	LS-BGA650A-05
SF-BGA108B-B-42	108	1	12x12	LS-BGA108B-41	SF-BGA672B-B-42	672	1	26x26	LS-BGA672B-41
SF-BGA108B-B-42F	108	1	12x12	LS-BGA108B-41	SF-BGA672B-B-42F	672	1	26x26	LS-BGA672B-41
SF-BGA144C-B-42	144	1	12x12	LS-BGA144C-41	SF-BGA676C-B-42	676	1	26x26	LS-BGA676C-41
SF-BGA144C-B-42F	144	1	12x12	LS-BGA144C-41	SF-BGA676C-B-42F	676	1	26x26	LS-BGA676C-41
SF-BGA144Q-B-42	144	1	13x13	LS-BGA144Q-41	SF-BGA676F-B-42F	676	1	30x30	LS-BGA676F-41
SF-BGA144Q-B-42F	144	1	13x13	LS-BGA144Q-41	SF-BGA680B-B-42	680	1	34x34	none
SF-BGA156A-B-42	156	1	14x14	LS-BGA156A-41	SF-BGA680C-B-42	680	1	39x39	LS-BGA680C-41
SF-BGA156A-B-42F	156	1	14x14	LS-BGA156A-41	SF-BGA680C-B-42F	680	1	39x39	LS-BGA680C-41
SF-BGA160C-B-42	160	1	14x14	LS-BGA160C-41	SF-BGA701A-B-42F	701	1	30x30	none
SF-BGA160C-B-42F	160	1	14x14	LS-BGA160C-41	SF-BGA780A-B-42	780	1	28x28	LS-BGA780A-41
SF-BGA160D-B-42	160	1	14x14	LS-BGA160D-41	SF-BGA780A-B-42F	780	1	28x28	LS-BGA780A-41
SF-BGA160D-B-42F	160	1	14x14	LS-BGA160D-41	SF-BGA783B-B-42	783	1	28x28	LS-BGA783B-41
SF-BGA176C-B-42	176	1	14x14	LS-BGA176C-41	SF-BGA783B-B-42F	783	1	28x28	LS-BGA783B-41
SF-BGA176C-B-42F	176	1	14x14	LS-BGA176C-41	SF-BGA788B-B-42	788	1	34x34	LS-BGA788B-05
SF-BGA192D-B-42	192	1	16x16	LS-BGA192D-41	SF-BGA788B-B-42F	788	1	34x34	LS-BGA788B-05
SF-BGA192D-B-42F	192	1	16x16	LS-BGA192D-41	SF-BGA792A-B-42	792	1	34x34	LS-BGA792A-41
SF-BGA196D-B-42	196	1	14x14	LS-BGA196D-41	SF-BGA792A-B-42F	792	1	34x34	LS-BGA792A-41
SF-BGA196D-B-42F	196	1	14x14	LS-BGA196D-41	SF-BGA860A-B-42	860	1	42x42	LS-BGA860A-41
SF-BGA196F-B-42	196	1	20x20	LS-BGA196F-41	SF-BGA860A-B-42F	860	1	42x42	LS-BGA860A-41
SF-BGA196F-B-42F	196	1	20x20	LS-BGA196F-41	SF-BGA896A-B-42	896	1	30x30	LS-BGA896A-41
SF-BGA196G-B-42	196	1	16x16	LS-BGA196G-41	SF-BGA896A-B-42F	896	1	30x30	LS-BGA896A-41
SF-BGA196G-B-42F	196	1	16x16	LS-BGA196G-41	SF-BGA900A-B-42	900	1	30x30	LS-BGA900A-41
SF-BGA208C-B-42	208	1	16x16	LS-BGA208C-41	SF-BGA900A-B-42F	900	1	30x30	LS-BGA900A-41
SF-BGA208C-B-42F	208	1	16x16	LS-BGA208C-41	SF-BGA913A-B-42	913	1	39x39	LS-BGA913A-05
SF-BGA256E-B-42	256	1	16x16	LS-BGA256E-41	SF-BGA913A-B-42F	913	1	39x39	LS-BGA913A-05
SF-BGA256E-B-42F	256	1	16x16	LS-BGA256E-41	SF-BGA1020A-B-42	1020	1	32x32	LS-BGA1020A-41
SF-BGA256G-B-42	256	1	16x16	LS-BGA256G-41	SF-BGA1020A-B-42F	1020	1	32x32	LS-BGA1020A-41
SF-BGA256G-B-42F	256	1	16x16	LS-BGA256G-41	SF-BGA1044A-B-42	1044	1	39x39	LS-BGA1044A-05
SF-BGA260A-B-42	260	1	18x18	LS-BGA260A-41	SF-BGA1148A-B-42	1148	1	34x34	LS-BGA1148A-41
SF-BGA260A-B-42F	260	1	18x18	LS-BGA260A-41	SF-BGA1148A-B-42F	1148	1	34x34	LS-BGA1148A-41
SF-BGA272C-B-42	272	1	20x20	LS-BGA272C-B-41	SF-BGA1152A-B-42	1152	1	34x34	LS-BGA1152A-41
SF-BGA272C-B-42F	272	1	20x20	LS-BGA272C-B-41	SF-BGA1152A-B-42F	1152	1	34x34	LS-BGA1152A-41
SF-BGA288B-B-42	288	1	22x22	LS-BGA288B-41	SF-BGA1156A-B-42	1156	1	34x34	LS-BGA1156A-41
SF-BGA288B-B-42F	288	1	22x22	LS-BGA288B-41	SF-BGA1156A-B-42F	1156	1	34x34	LS-BGA1156A-41
SF-BGA289E-B-42	289	1	17x17	none	SF-BGA1296A-B-42	1296	1	36x36	LS-BGA1296A-05
SF-BGA292D-B-42	292	1	20x20	none	SF-BGA1296A-B-42F	1296	1	36x36	LS-BGA1296A-05
SF-BGA324A-B-42	324	1	20x20	LS-BGA324A-41	SF-BGA1497A-B-42	1497	1	39x39	LS-BGA1497A-05
SF-BGA324A-B-42F	324	1	20x20	LS-BGA324A-41	SF-BGA1497A-B-42F	1497	1	39x39	LS-BGA1497A-05
SF-BGA324G-B-42	324	1	18x18	LS-BGA324G-41	SF-BGA1517A-B-42	1517	1	39x39	LS-BGA1517A-41
SF-BGA324G-B-42F	324	1	18x18	LS-BGA324G-41	SF-BGA1517A-B-42F	1517	1	39x39	LS-BGA1517A-41
SF-BGA324J-B-42	324	1	22x22	LS-BGA324J-41	SF-BGA1521A-B-42	1521	1	39x39	LS-BGA1521A-05
SF-BGA324J-B-42F	324	1	22x22	LS-BGA324J-41	SF-BGA1521A-B-42F	1521	1	39x39	LS-BGA1521A-05
SF-BGA364B-B-42F	364	1	20x20	LS-BGA364B-05	SF-BGA1696A-B-42	1696	1	42x42	LS-BGA1696A-41
SF-BGA388B-B-42	388	1	26x26	none	SF-BGA1696A-B-42F	1696	1	42x42	LS-BGA1696A-41
SF-BGA400A-B-42	400	1	20x20	LS-BGA400A-41	SF-BGA1704A-B-42	1704	1	42x42	LS-BGA1704A-41
SF-BGA400A-B-42F	400	1	20x20	LS-BGA400A-41	SF-BGA1704A-B-42F	1704	1	42x42	LS-BGA1704A-41
SF-BGA416E-B-42	416	1	26x26	N/A	SF-BGA1936A-B-42	1936	1	44x44	LS-BGA1936A-41
SF-BGA416E-B-42F	416	1	26x26	N/A	SF-BGA1936A-B-42F	1936	1	44x44	LS-BGA1936A-41

LS-BGA Table-Male 1mm BGA Land Socket

Part Number	Pin Count	Pitch	Array	Compatible Part	Part Number	Pin Count	Pitch	Array	Compatible Part
LS-BGA64E-41	64	1	8x8	SF-BGA64E-B-42	LS-BGA1148A-41	1148	1	34x34	SF-BGA1148A-B-42
LS-BGA80F-41	80	1	10x8	SF-BGA80F-B-42	LS-BGA144C-41	144	1	12x12	SF-BGA144C-B-42
LS-BGA81A-41	81	1	9x9	SF-BGA81A-B-42	LS-BGA144Q-41	144	1	13x13	SF-BGA144Q-B-42
LS-BGA100B-41	100	1	10x10	SF-BGA100B-B-42	LS-BGA156A-41	156	1	14x14	SF-BGA156A-B-42
LS-BGA100J-41	100	1	13x13	N/A	LS-BGA160C-41	160	1	14x14	SF-BGA160C-B-42
LS-BGA108B-41	108	1	12x12	SF-BGA108B-B-42	LS-BGA160D-41	160	1	14x14	SF-BGA160D-B-42

LS-BGA Table-Male 1mm BGA Land Socket continued

Part Number	Pin Count	Pitch	Array	Compatible Part	Part Number	Pin Count	Pitch	Array	Compatible Part
LS-BGA176C-41	176	1	14x14	SF-BGA176C-B-42	LS-BGA576D-41	576	1	24x24	SF-BGA576D-B-42
LS-BGA192D-41	192	1	16x16	SF-BGA192D-B-42	LS-BGA672B-41	672	1	26x26	SF-BGA672B-B-42
LS-BGA196D-41	196	1	14x14	SF-BGA196D-B-42	LS-BGA676C-41	676	1	26x26	SF-BGA676C-B-42
LS-BGA196F-41	196	1	20x20	SF-BGA196F-B-42	LS-BGA676F-41	676	1	30x30	SF-BGA676F-B-42F
LS-BGA196G-41	196	1	16x16	SF-BGA196G-B-42	LS-BGA680C-41	680	1	39x39	LS-BGA680C-B-42
LS-BGA208C-41	208	1	16x16	SF-BGA208C-B-42	LS-BGA780A-41	780	1	28x28	LS-BGA780A-B-42
LS-BGA256E-41	256	1	16x16	SF-BGA256E-B-42	LS-BGA783B-41	783	1	28x28	SF-BGA783B-B-42
LS-BGA256G-41	256	1	16x16	SF-BGA256G-B-42	LS-BGA792A-41	792	1	34x34	SF-BGA792A-B-42
LS-BGA260A-41	260	1	18x18	SF-BGA260A-B-42	LS-BGA860A-41	860	1	42x42	SF-BGA860A-B-42
LS-BGA272C-41	272	1	20x20	SF-BGA272C-B-42	LS-BGA876A-41	876	1	30x30	none
LS-BGA288B-41	288	1	22x22	SF-BGA288B-B-42	LS-BGA896A-41	896	1	30x30	SF-BGA896A-B-42
LS-BGA324A-41	324	1	20x20	SF-BGA324A-B-42	LS-BGA900A-41	900	1	30x30	SF-BGA900A-B-42
LS-BGA324G-41	324	1	18x18	SF-BGA324G-B-42	LS-BGA1020A-41	1020	1	32x32	SF-BGA1020A-B-42
LS-BGA324J-41	324	1	22x22	SF-BGA324J-B-42	LS-BGA1152A-41	1152	1	34x34	SF-BGA1152A-B-42
LS-BGA400A-41	400	1	20x20	SF-BGA400A-B-42	LS-BGA1156A-41	1156	1	34x34	SF-BGA1156A-B-42
LS-BGA456C-41	456	1	22x22	SF-BGA456C-B-42	LS-BGA1517A-41	1517	1	39x39	SF-BGA1517A-B-42
LS-BGA456D-41	456	1	26x26	SF-BGA456D-B-42	LS-BGA1696A-41	1696	1	42x42	SF-BGA1696A-B-42
LS-BGA484C-41	484	1	22x22	SF-BGA484C-B-42	LS-BGA1704A-41	1704	1	42x42	SF-BGA1704A-B-42
LS-BGA516B-41	516	1	30x30	SF-BGA516B-B-42	LS-BGA1936A-41	1936	1	44x44	SF-BGA1936A-B-42
LS-BGA556A-41	556	1	30x30	LS-BGA556A-B-42					

LS-BGA Table-Male 1.27mm BGA Land Socket

Part Number	Pin Count	Pitch	Array	Compatible Part	Part Number	Pin Count	Pitch	Array	Compatible Part
LS-BGA49A-31	49	1.27	7x7	SF-BGA49A-B-32F	LS-BGA480B-31	480	1.27	29x29	SF-BGA480B-B-32
LS-BGA72B-31	72	1.27	11x11	SF-BGA72B-B-32	LS-BGA484G-31	484	1.27	22x22	SF-BGA484G-B-32
LS-BGA121A-31	121	1.27	11x11	SF-BGA121A-B-32	LS-BGA503C-31	503	1.27	25x25	SF-BGA503C-B-32F
LS-BGA1225C-31	1225	1.27	35x35	SF-BGA1225C-B-32	LS-BGA520A-31	520	1.27	31x31	SF-BGA520A-B-32
LS-BGA169A-31	169	1.27	13x13	SF-BGA169A-B-32	LS-BGA528A-31	528	1.27	26x26	SF-BGA528A-B-32
LS-BGA208A-31	208	1.27	17x17	SF-BGA208A-B-32	LS-BGA529C-31	529	1.27	23x23	SF-BGA529C-B-32
LS-BGA255A-31	255	1.27	16x16	SF-BGA255A-B-32F	LS-BGA560A-31	560	1.27	33x33	SF-BGA560A-B-32
LS-BGA256A-31	256	1.27	20x20	SF-BGA256A-B-32	LS-BGA576A-31	576	1.27	24x24	SF-BGA576A-B-32
LS-BGA256B-31	256	1.27	16x16	SF-BGA256B-B-32	LS-BGA625A-31	625	1.27	25x25	SF-BGA625A-B-32
LS-BGA289A-31	289	1.27	17x17	SF-BGA289A-B-32	LS-BGA676B-31	676	1.27	26x26	SF-BGA676B-B-32
LS-BGA304A-31	304	1.27	23x23	SF-BGA304A-B-32F	LS-BGA729A-31	729	1.27	27x27	SF-BGA729A-B-32
LS-BGA352A-31	352	1.27	26x26	SF-BGA352A-B-32	LS-BGA829A-31	829	1.27	29x29	SF-BGA829A-B-32
LS-BGA361A-31	361	1.27	19x19	SF-BGA361A-B-32	LS-BGA841A-31	841	1.27	29x29	SF-BGA841A-B-32
LS-BGA400F-31	400	1.27	20x20	SF-BGA400F-B-32	LS-BGA961A-31	961	1.27	31x31	SF-BGA961A-B-32
LS-BGA432B-31	432	1.27	31x31	SF-BGA432B-B-32	LS-BGA1005A-31	1005	1.27	33x33	SF-BGA1005A-B-32
LS-BGA437A-31	437	1.27	23x19	SF-BGA437A-B-32	LS-BGA1024B-31	1024	1.27	32x32	SF-BGA1024B-B-32F
LS-BGA479B-31	479	1.27	26x26	None	LS-BGA1089A-31	1089	1.27	33x33	SF-BGA1089A-B-32

SF-BGA Table-Female 1.27mm BGA SMT Adapter

Part Number	Pin Count	Pitch	Array	Compatible Part	Part Number	Pin Count	Pitch	Array	Compatible Part
SF-BGA49A-B-32F	49	1.27	7x7	LS-BGA49A-31	SF-BGA304A-B-32F	304	1.27	23x23	LS-BGA304A-31
SF-BGA72B-B-32	72	1.27	11x11	LS-BGA72B-31	SF-BGA336B-B-32	336	1.27	20x20	none
SF-BGA72B-B-32F	72	1.27	11x11	LS-BGA72B-31	SF-BGA352A-B-32	352	1.27	26x26	LS-BGA352A-31
SF-BGA119A-B-32	119	1.27	7x17	none	SF-BGA352A-B-32F	352	1.27	26x26	LS-BGA352A-31
SF-BGA119A-B-32F	119	1.27	7x17	none	SF-BGA361A-B-32	361	1.27	19x19	LS-BGA361A-31
SF-BGA121A-B-32	121	1.27	11x11	LS-BGA121A-31	SF-BGA361A-B-32F	361	1.27	19x19	LS-BGA361A-31
SF-BGA121A-B-32F	121	1.27	11x11	LS-BGA121A-31	SF-BGA388A-B-32	388	1.27	26x26	LS-BGA388A-31
SF-BGA1225C-B-32	1225	1.27	35x35	LS-BGA1225C-31	SF-BGA388A-B-32F	388	1.27	26x26	LS-BGA388A-31
SF-BGA1225C-B-32F	1225	1.27	35x35	LS-BGA1225C-31	SF-BGA400F-B-32	400	1.27	20x20	LS-BGA400F-31
SF-BGA169A-B-32	169	1.27	13x13	LS-BGA169A-31	SF-BGA400F-B-32F	400	1.27	20x20	LS-BGA400F-31
SF-BGA169A-B-32F	169	1.27	13x13	LS-BGA169A-31	SF-BGA432B-B-32	432	1.27	31x31	LS-BGA438B-31
SF-BGA176F-B-32	176	1.27	17x17	SK-UGA17/176A-33	SF-BGA432B-B-32F	432	1.27	31x31	LS-BGA438B-31
SF-BGA176F-B-32F	176	1.27	17x17	SK-UGA17/176A-33	SF-BGA437A-B-32	437	1.27	23x19	LS-BGA437A-31
SF-BGA208A-B-32	208	1.27	17x17	LS-BGA208A-31	SF-BGA437A-B-32F	437	1.27	23x19	LS-BGA437A-31
SF-BGA208A-B-32F	208	1.27	17x17	LS-BGA208A-31	SF-BGA480A-B-32	480	1.27	26x26	none
SF-BGA255A-B-32	255	1.27	16x16	SF-BGA255A-31	SF-BGA480A-B-32F	480	1.27	26x26	none
SF-BGA255A-B-32F	255	1.27	16x16	SF-BGA255A-31	SF-BGA480B-B-32	480	1.27	29x29	LS-BGA480B-31
SF-BGA256A-B-32	256	1.27	20x20	LS-BGA256A-31	SF-BGA480B-B-32F	480	1.27	29x29	LS-BGA480B-31
SF-BGA256A-B-32F	256	1.27	20x20	LS-BGA256A-31	SF-BGA484G-B-32	484	1.27	22x22	LS-BGA484G-31
SF-BGA256B-B-32	256	1.27	16x16	LS-BGA256B-31	SF-BGA484G-B-32F	484	1.27	22x22	LS-BGA484G-31
SF-BGA256B-B-32F	256	1.27	16x16	LS-BGA256B-31	SF-BGA492A-B-32	492	1.27	26x26	LS-BGA492A-05
SF-BGA272A-B-32	272	1.27	20x20	LS-BGA272A-31	SF-BGA492A-B-32F	492	1.27	26x26	LS-BGA492A-05
SF-BGA272A-B-32F	272	1.27	20x20	LS-BGA272A-31	SF-BGA503C-B-32F	503	1.27	25x25	LS-BGA503C-31
SF-BGA289A-B-32	289	1.27	17x17	LS-BGA289A-31	SF-BGA520A-B-32	520	1.27	31x31	LS-BGA520A-31
SF-BGA289A-B-32F	289	1.27	17x17	LS-BGA289A-31	SF-BGA520A-B-32F	520	1.27	31x31	LS-BGA520A-31

SF-BGA Table-Female 1.27mm BGA SMT Adapter continued

Part Number	Pin Count	Pitch	Array	Compatible Part	Part Number	Pin Count	Pitch	Array	Compatible Part
SF-BGA528A-B-32	528	1.27	26x26	LS-BGA528A-31	SF-BGA676B-B-32F	676	1.27	26x26	LS-BGA676B-31
SF-BGA528A-B-32F	528	1.27	26x26	LS-BGA528A-31	SF-BGA729A-B-32	729	1.27	27x27	LS-BGA729A-31
SF-BGA529C-B-32	529	1.27	23x23	LS-BGA529C-31	SF-BGA729A-B-32F	729	1.27	27x27	LS-BGA729A-31
SF-BGA529C-B-32F	529	1.27	23x23	LS-BGA529C-31	SF-BGA829A-B-32	829	1.27	29x29	LS-BGA829A-31
SF-BGA560A-B-32	560	1.27	33x33	LS-BGA560A-31	SF-BGA829A-B-32F	829	1.27	29x29	LS-BGA829A-31
SF-BGA560A-B-32F	560	1.27	33x33	LS-BGA560A-31	SF-BGA841A-B-32	841	1.27	29x29	LS-BGA841A-31
SF-BGA576A-B-32	576	1.27	24x24	LS-BGA576A-31	SF-BGA841A-B-32F	841	1.27	29x29	LS-BGA841A-31
SF-BGA576A-B-32F	576	1.27	24x24	LS-BGA576A-31	SF-BGA961A-B-32	961	1.27	31x31	LS-BGA961A-31
SF-BGA596B-B-32	596	1.27	26x26	LS-BGA596B-05	SF-BGA961A-B-32F	961	1.27	31x31	LS-BGA961A-31
SF-BGA596B-B-32F	596	1.27	26x26	LS-BGA596B-05	SF-BGA1005A-B-32	1005	1.27	33x33	LS-BGA1005A-31
SF-BGA600C-B-32	600	1.27	31x31	LS-BGA600C-05	SF-BGA1005A-B-32F	1005	1.27	33x33	LS-BGA1005A-31
SF-BGA600C-B-32F	600	1.27	31x31	LS-BGA600C-05	SF-BGA1024B-B-32F	1024	1.27	32x32	LS-BGA1024B-31
SF-BGA625A-B-32	625	1.27	25x25	LS-BGA625A-31	SF-BGA1089A-B-32	1089	1.27	33x33	LS-BGA1089A-31
SF-BGA625A-B-32F	625	1.27	25x25	LS-BGA625A-31	SF-BGA1089A-B-32F	1089	1.27	33x33	LS-BGA1089A-31
SF-BGA672A-B-32	672	1.27	26x26	none	SF-BGA1152B-B-32	1152	1.27	34x34	LS-BGA1152B-05
SF-BGA672A-B-32F	672	1.27	26x26	none	SF-BGA1152B-B-32F	1152	1.27	34x34	LS-BGA1152B-05
SF-BGA676B-B-32	676	1.27	26x26	LS-BGA676B-31					

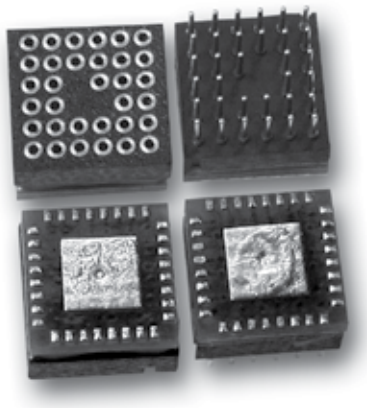
LS-BGA Table-Male 1.27mm BGA Land Socket with longer terminal pin for taller stack up

Part Number	Pin Count	Pitch	Array	Compatible Part
LS-BGA480B-71	480	1.27	29 x 29	SF-BGA480B-B-72

SF-BGA Table-Female 1.27mm BGA SMT adapter for taller stack up

Part Number	Pin Count	Pitch	Array	Compatible Part
SF-BGA256A-B-72	256	1.27	20 x 20	N/A
SF-BGA360A-B-72	360	1.27	19x19	N/A
SF-BGA360A-B-72F	360	1.27	19x19	N/A
SF-BGA480B-B-72	480	1.27	29 X 29	LS-BGA480B-71
SF-BGA480B-B-72F	480	1.27	29 X 29	LS-BGA480B-71

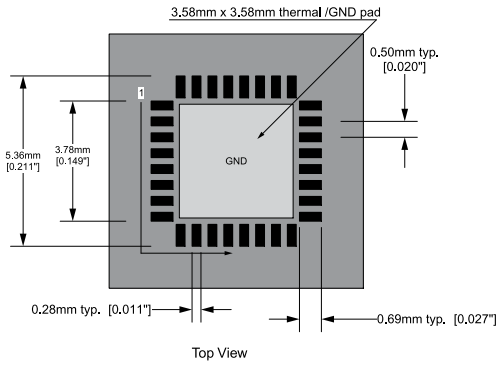
LS-QFN/MLF

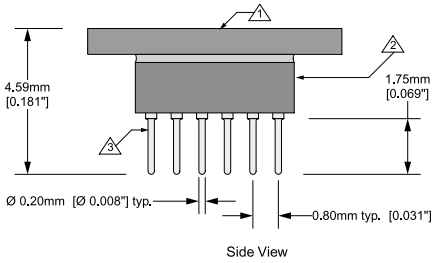


The new high performance SMD Socket Adapters, LS-QFN/MLF, allows user to socket a QFN/MLF chip having only the SMT pads on the target PCB without any additional space for a socket. The companion SF-QFN/MLF is attached directly to the target PCB using the same soldering methods as attaching a QFN/MLF IC. The target IC is soldered to the LS-QFN/MLF. The two parts are interconnected together with gold plated machined pins for highest reliability. The height of the socket not including IC is then 5 mm. This patent pending adapter set then allows easy prototyping or upgrading of QFN/MLF IC's reliably and inexpensively.

For drawings -> www.ironwoodelectronics.com then select Adapters -> Surface Mount Package Emulation

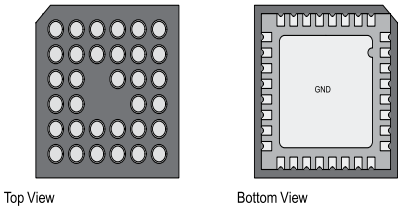
Part Number	Part Description	Top Pin Count	Top Pitch	Bottom Pin Count	Top Interface	Bottom Interface
LS-MLF32A-01	QFN/MLF Land Socket	32	0.5	32	Surface Mount Land Pattern	Thru Hole Pins

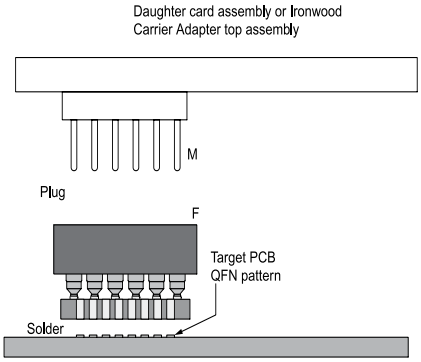


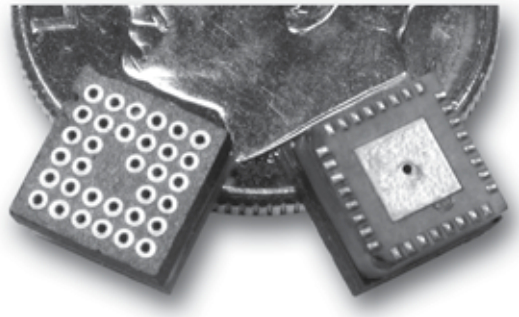


SF-MLF(QFN)

Surface Mount Package Emulator Foot line for range of sizes. These devices use patent pending technology to achieve a reliable and small SMT QFN adapter. The SF-MLF(QFN) have pads on the bottom that precisely match the pin layout for the QFN package including the E-pad or heatsink pad in the center of the pattern. This allows connection to a QFN land pattern of target board to provide a set of interconnects available for probing or connecting to another assembly. The user simply solders the SF-MLF(QFN) using the same solder reflow and attachment methods used for a QFN IC. The SF-MLF(QFN) is the same size as the QFN pin IC in the XY dimension and only 3.3 mm high. The top of the SF-MLF(QFN) after being attached to the target consists of female, machined socket pins with all gold plating for maximum reliability. Compatible gold plated male pin adapters are then plugged in and emulation, probing, or interconnect of the QFN is accomplished.







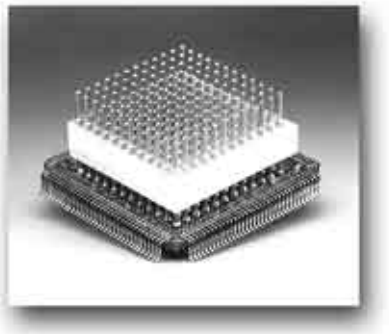
World's smallest SMT Emulator for MLF Connnect

For drawings -> www.ironwoodelectronics.com then select Adapters -> Surface Mount Package Emulation

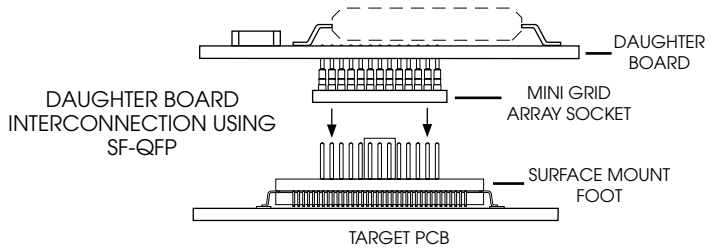
Part Number	Pin Count	Package Code	Body Size	Top Pitch	Bottom Pitch	Leads per side x/y
SF-MLF8C-A-02	8	MLF8C	3x3	1	0.65	4/0
SF-MLF8D-K-01F	8	MLF8D	8x8	1	0.8	0/4
SF-MLF16A-A-02	16	MLF16A	3x3	0.8	0.5	4/4
SF-MLF16A-A-02F	16	MLF16A	3x3	0.8	0.5	4/4
SF-MLF20A-A-02	20	MLF20A	4x4	0.8	0.5	5/5
SF-MLF20A-A-02F	20	MLF20A	4x4	0.8	0.5	5/5
SF-MLF24C-A-02	24	MLF24C	4x4	0.8	0.5	6/6
SF-MLF24C-A-02F	24	MLF24C	4x4	0.8	0.5	6/6
SF-MLF28B-A-02	28	MLF28B	6x6	1	0.65	7/7
SF-MLF28C-A-02	28	MLF28C	7x7	1	0.8	7/7
SF-MLF32A-A-02	32	MLF32A	5x5	0.8	0.5	8/8
SF-MLF44B-A-02	44	MLF44B	7x7	0.8	0.5	11/11
SF-MLF48A-A-02	48	MLF48A	7x7	0.8	0.5	12/12
SF-MLF52C-A-02	52	MLF52C	6x6	0.75	0.5	13/13
SF-MLF64A-A-02	64	MLF64A	9x9	1	0.5	16/16
SF-QFN8C-L-02	8	QFN8C	3x3	0.8	0.65	0/4
SF-QFN8F-L-02	8	QFN8F	4.5x3.5	0.8	0.8	4/0
SF-QFN16A-A-02B	16	QFN16A	3x3	0.8	0.5	4/4
SF-QFN20E-L-02	20	QFN20E	5x5	0.8	0.8	5/5
SF-QFN20G-L-02	20	QFN20G	6x5	0.8	0.8	5/4
SF-QFN28B-L-02	28	MLF28B	6x6	0.8	0.65	7/7
SF-QFN28C-L-02	28	QFN28C	7x7	0.8	0.8	7/7
SF-QFN32A-L-02	32	MLF32A	5x5	0.8	0.5	8/8
SF-QFN40A-L-02	40	QFN40A	6x6	0.5	0.5	10/10
SF-QFN44B-L-02	44	QFN44B	7x7	0.8	0.5	11/11
SF-QFN48A-L-02	48	QFN48A	7x7	0.8	0.5	12/12
SF-QFN56A-L-02	56	QFN56A	8x8	0.8	0.5	14/14
SF-QFN64A-L-02	64	MLF64A	9x9	0.8	0.5	16/16

QFP-SMT

QFP Surface Mount Feet provide access to QFP surface mount lands on PCBs for the interconnection of upgrade cards, daughter boards or our Probing Adapters and Package Converters. The interconnection is made via a gold plated mini grid array socket.



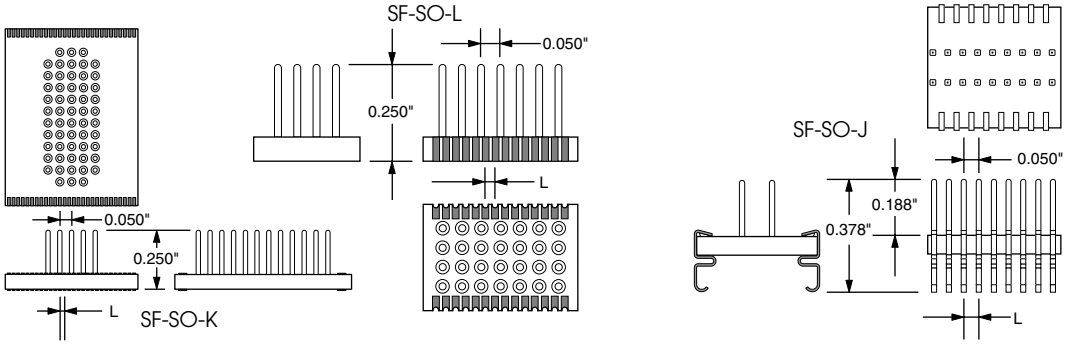
Consult the web site or CD-ROM for the compatible mini grid array socket for each part in the tables on the following pages. Please refer to Appendix C for detailed QFP chip package and package code specifications.



For drawings -> www.ironwoodelectronics.com then select Adapters -> Surface Mount Package Emulation

Part Number	Pitch	Type	Part Number	Pitch	Type	Part Number	Pitch	Type
SF-CSP28A-K-01	0.5	CSP 28	SF-QFE100RB-L-01	0.65	Leadless	SF-QFE176SA-G-03	0.5	Gull Wing
SF-QFE32SA-L-01	0.8	Leadless	SF-QFE100RB-L-02	0.65	Leadless	SF-QFE176SA-L-01	0.5	Leadless
SF-QFE32SA-L-01F	0.8	Leadless	SF-QFE100RC-L-01	0.65	Leadless	SF-QFE176SA-L-01F	0.5	Leadless
SF-QFE32SA-L-02	0.8	Leadless	SF-QFE100RC-L-02	0.65	Leadless	SF-QFE176SA-L-02	0.5	Leadless
SF-QFE44RA-L-01	0.8	Leadless	SF-QFE100SC-G-01	0.5	Gull Wing	SF-QFE184SA-L-01	0.65	Leadless
SF-QFE44SA-L-01	0.8	Leadless	SF-QFE100SC-G-02	0.5	Gull Wing	SF-QFE184SB-L-01	0.65	Leadless
SF-QFE44SA-L-01F	0.8	Leadless	SF-QFE100SC-L-01	0.5	Leadless	SF-QFE184SE-L-01	0.65	Leadless
SF-QFE44SB-L-01	0.8	Leadless	SF-QFE100SC-L-02	0.5	Leadless	SF-QFE208SA-L-01	0.5	Leadless
SF-QFE44SE-L-01	0.8	Leadless	SF-QFE100SC-L-03	0.5	Leadless	SF-QFE208SB-F-01	0.5	Shaped Sold.
SF-QFE44SE-L-01F	0.8	Leadless	SF-QFE100SD-L-01	0.5	Leadless	SF-QFE208SB-G-01	0.5	Gull Wing
SF-QFE44SH-L-01	0.8	LN	SF-QFE100SD-L-01F	0.5	Leadless	SF-QFE208SB-L-01	0.5	Leadless
SF-QFE48SB-L-02	0.5	Leadless	SF-QFE112SA-L-01	0.65	Leadless	SF-QFE208SC-L-01	0.5	Leadless
SF-QFE48SB-L-03	0.5	Leadless	SF-QFE112SA-L-02	0.65	Leadless	SF-QFE208SD-L-01	0.5	Leadless
SF-QFE52SA-L-01	0.5	Leadless	SF-QFE120SA-L-01	0.8	Leadless	SF-QFE216SB-K-01	0.4	Bot. Term.
SF-QFE52SB-L-01	0.65	Leadless	SF-QFE120SB-L-01	0.8	Leadless	SF-QFE240SC-F-01	0.5	Leadless
SF-QFE52SE-L-01	0.65	Leadless	SF-QFE120SC-K-01	0.4	Bot. Term.	SF-QFE240SC-G-02	0.5	Gull Wing
SF-QFE52SF-L-01	1	Leadless	SF-QFE120SC-L-01	0.4	Leadless	SF-QFE240SC-L-02	0.5	Leadless
SF-QFE52SF-L-02	1	Leadless	SF-QFE120SE-L-01	0.5	Leadless	SF-QFE256SB-L-01	0.5	Leadless
SF-QFE52SF-L-03	1	Leadless	SF-QFE128RA-L-01	0.5	Leadless	SF-QFE256SC-G-01	0.5	Gull Wing
SF-QFE52SF-L-03F	1	Leadless	SF-QFE128RA-L-02	0.5	Leadless	SF-QFE256SD-L-01	0.5	Leadless
SF-QFE64RA-L-01	1	Leadless	SF-QFE128RB-L-01	0.5	Leadless	SF-QFE304SA-F-01	0.5	Shaped Sold.
SF-QFE64RB-L-01	1	Leadless	SF-QFE128SA-L-01	0.8	Leadless	SF-QFE304SA-G-01	0.5	Gull Wing
SF-QFE64RC-L-01	1	Leadless	SF-QFE128SB-L-01	0.8	Leadless	SF-QFE352SA-G-01	0.5	Gull Wing
SF-QFE64RD-L-01	1	Leadless	SF-QFE128SD-K-01	0.4	Shaped Sold.	SF-QFE352SA-L-01	0.5	Leadless
SF-QFE64SA-L-01	0.8	Leadless	SF-QFE128SD-K-02	0.4	Shaped Sold.	SF-QFE352SB-L-01	0.5	Leadless
SF-QFE64SB-L-01	0.8	Leadless	SF-QFE128SD-L-01	0.4	Leadless	SF-QFJ68SB-L-01	1.27	Leadless
SF-QFE64SC-L-01	0.8	Leadless	SF-QFE128SD-L-01F	0.4	Leadless	SF-QFJ84SA-L-01	0.635	Leadless
SF-QFE64SC-L-02	0.8	Leadless	SF-QFE128SF-L-01	0.5	Leadless	SF-QFJ84SE-L-01	0.635	Leadless
SF-QFE64SD-G-02	0.5	Gull Wing	SF-QFE136SC-L-01	0.8	Leadless	SF-QFJ84SF-L-01	0.635	Leadless
SF-QFE64SD-L-01	0.5	Leadless	SF-QFE144SA-G-03	0.65	Gull Wing	SF-QFJ100SA-G-02	0.635	Gull Wing
SF-QFE64SD-L-01F	0.5	Leadless	SF-QFE144SA-L-01	0.65	Leadless	SF-QFJ100SA-L-01	0.635	Leadless
SF-QFE64SE-L-01	0.8	Leadless	SF-QFE144SA-L-02	0.65	Leadless	SF-QFJ100SA-L-02	0.635	Leadless
SF-QFE64SF-L-01	0.8	Leadless	SF-QFE144SA-L-03	0.65	Leadless	SF-QFJ132SA-G-02	0.635	Gull Wing
SF-QFE64SK-L-01	0.8	Leadless	SF-QFE144SB-G-03	0.65	Gull Wing	SF-QFJ132SA-L-01	0.635	Leadless
SF-QFE64SM-L-01	0.4	Leadless	SF-QFE144SB-L-01	0.65	Leadless	SF-QFJ132SA-L-02	0.635	Leadless
SF-QFE74SA-L-01	0.8	Leadless	SF-QFE144SC-G-01	0.5	Gull Wing	SF-QFJ132SA-L-03	0.635	Leadless
SF-QFE80RA-L-01	0.8	Leadless	SF-QFE144SC-L-01	0.5	Leadless	SF-QFJ132SA-L-04	0.635	Leadless
SF-QFE80RB-L-01	0.8	Leadless	SF-QFE144SC-L-02	0.5	Leadless	SF-QFJ132SC-G-01	0.65	Leadless
SF-QFE80RB-L-01F	0.8	Leadless	SF-QFE144SC-L-03	0.5	Leadless	SF-QFJ164SA-L-01	0.635	Leadless
SF-QFE80RC-L-01	0.8	Leadless	SF-QFE144SD-L-01	0.5	Leadless	SF-QFJ172SD-L-01	0.635	Leadless
SF-QFE80RD-L-01	0.8	Leadless	SF-QFE144SD-L-02	0.5	Leadless	SF-QFJ172SD-L-02	0.635	Leadless
SF-QFE80SA-L-01	0.65	Leadless	SF-QFE144SE-L-01	0.5	Leadless	SF-QFJ192SA-G-01	0.635	Gull Wing
SF-QFE80SA-L-02	0.65	Leadless	SF-QFE160SA-G-03	0.65	Gull Wing	SF-QFJ196SA-G-02	0.635	Gull Wing
SF-QFE80SA-L-03	0.65	Leadless	SF-QFE160SA-L-01	0.65	Leadless	SF-QFJ196SA-L-01	0.635	Leadless
SF-QFE80SA-L-04	0.65	Leadless	SF-QFE160SA-L-02	0.65	Leadless	SF-QFJ196SA-L-02	0.635	Leadless
SF-QFE80SC-G-01	0.5	Gull Wing	SF-QFE160SB-G-03	0.65	Gull Wing	SF-QFJ196SA-L-03	0.635	Leadless
SF-QFE80SC-K-01	0.5	Bot. Term.	SF-QFE160SB-L-01	0.65	Leadless	SF-QFJ256SA-L-01	0.5	Leadless
SF-QFE80SC-L-01	0.5	Leadless	SF-QFE160SC-G-01	0.5	Gull Wing	SF-QFJ256SC-L-01	0.5	Leadless
SF-QFE80SC-L-01F	0.5	Leadless	SF-QFE160SC-L-01	0.5	Leadless	SF-QFP-68340-L-02	0.5	Leadless
SF-QFE80SD-L-01	0.65	Leadless	SF-QFE168SA-L-01	0.65	Leadless	SF-QFP68360-G-01	0.5	Gull Wing
SF-QFE80SD-L-01F	0.65	Leadless	SF-QFE168SA-L-02	0.65	Leadless	SF-QFP68360-L-01	0.5	Leadless
SF-QFE88SA-L-01	0.65	Leadless	SF-QFE168SB-L-02	0.65	Leadless	SF-QFP-68360-L-01F	0.5	Leadless
SF-QFE94SA-L-01	0.8	Leadless	SF-QFE176SA-G-01	0.5	Gull Wing			
SF-QFE100RA-L-01	0.65	Leadless	SF-QFE176SA-G-02	0.5	Gull Wing			

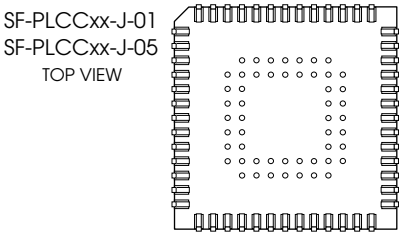
SOIC & PLCC-SMT



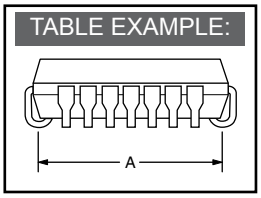
This table lists the SOIC Surface Mount Package Emulators. These BGA surface mount feet are all designed with gold plated 0.1" center headers for connecting to each pin for maximum connection reliability.

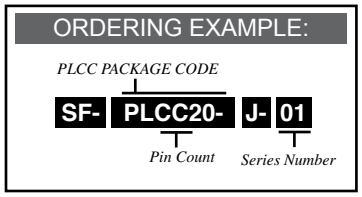
For drawings -> www.ironwoodelectronics.com then select Adapters -> Surface Mount Package Emulation

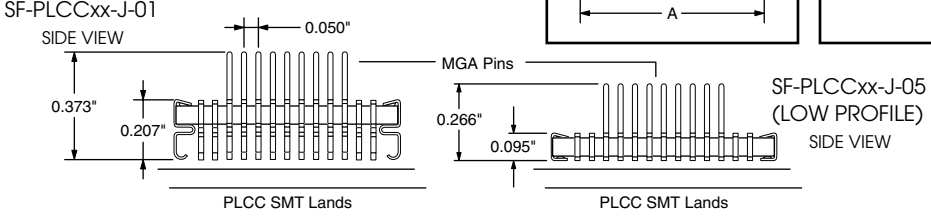
Part Number	Pitch	Part Number	Pitch	Part Number	Pitch	Part Number	Pitch	Part Number	Pitch
SF-SO6A-J-01	1.27	SF-SO18B-J-01	1.27	SF-SO24F-J-03	1.27	SF-SO32C-J-02	1.27	SF-SO56B-L-01	0.8
SF-SO8A-J-01	1.27	SF-SO20A-J-01	1.27	SF-SO24F-J-04	1.27	SF-SO32E-L-01	0.5	SF-SO56B-L-01F	0.8
SF-SO8A-J-01F	1.27	SF-SO20A-J-01F	1.27	SF-SO24G-L-01	0.65	SF-SO32H-L-01	0.65	SF-SO56D-L-01	0.635
SF-SO8A-K-01	1.27	SF-SO20A-J-02	1.27	SF-SO24K-L-01	0.65	SF-SO36C-L-01	0.8	SF-SO56D-L-02	0.635
SF-SO8E-J-01	1.27	SF-SO20A-J-03	1.27	SF-SO26D-J-01	1.27	SF-SO40B-J-01	1.27	SF-SO56F-L-01	1.27
SF-SO10C-L-01	0.5	SF-SO20A-J-03F	1.27	SF-SO28A-J-01	1.27	SF-SO40G-L-01	0.762	SF-SO56F-L-03	1
SF-SO14A-J-01	1.27	SF-SO20C-J-01	1.27	SF-SO28A-J-01F	1.27	SF-SO42A-J-01	1.27	SF-SO66A-B-02	0.65
SF-SO14A-J-01F	1.27	SF-SO20C-J-01F	1.27	SF-SO28A-J-02	1.27	SF-SO42B-L-01	1	SF-SO86A-L-01	0.5
SF-SO14G-L-01F	0.65	SF-SO20D-J-01	1.27	SF-SO28A-J-02F	1.27	SF-SO44A-J-01	1.27	SF-SOIC24A-G-01	1.27
SF-SO16A-J-01	1.27	SF-SO20E-L-01	0.65	SF-SO28A-J-03	1.27	SF-SO44A-J-01F	1.27	SF-SOJ20A-J-01	1.27
SF-SO16A-J-01F	1.27	SF-SO20E-L-02	0.65	SF-SO28A-J-03F	1.27	SF-SO44C-L-01	0.8	SF-SOJ20A-J-02	1.27
SF-SO16A-J-02	1.27	SF-SO20E-L-02F	0.65	SF-SO28G-L-01	0.65	SF-SO48C-L-01	0.5	SF-SOJ20B-J-01	1.27
SF-SO16B-J-01	1.27	SF-SO20E-L-41	0.65	SF-SO28H-L-01	0.65	SF-SO48D-L-01	0.5	SF-SOJ26A-J-01	1.27
SF-SO16B-J-02	1.27	SF-SO20E-L-42	0.65	SF-SO28H-L-01F	0.65	SF-SO48F-L-01	0.635	SF-SOJ28A-J-01	1.27
SF-SO16D-L-01	0.65	SF-SO20F-L-01	0.65	SF-SO28P-J-01	1.27	SF-SO48F-L-01F	0.635	SF-SOJ28D-J-02	1.27
SF-SO16G-L-01	0.65	SF-SO20F-L-01F	0.65	SF-SO28U-K-01	0.65	SF-SO48F-L-02	0.635	SF-SOJ40A-J-01	1.27
SF-SO16G-L-01F	0.65	SF-SO24A-J-01	1.27	SF-SO28V-L-01	0.65	SF-SO48H-L-01	0.5	SF-SOJ42A-J-01	1.27
SF-SO18A-J-01	1.27	SF-SO24A-J-02	1.27	SF-SO32A-J-01	1.27	SF-SO50B-L-01	0.8	SF-TSOP32E-L-01	1.27
SF-SO18A-J-01F	1.27	SF-SO24F-J-01	1.27	SF-SO32A-J-02	1.27	SF-SO54E-L-01	0.65		
SF-SO18A-J-02	1.27	SF-SO24F-J-02	1.27	SF-SO32C-J-01	1.27	SF-SO56A-K-01	1		



PLCC Surface Mount Feet allow access to your target board PLCC land patterns for the interconnection of upgrade cards, daughter boards or our Probing Adapters and Package Converters.





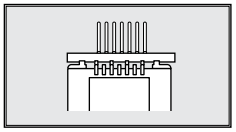
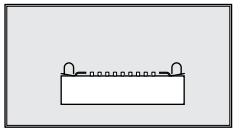
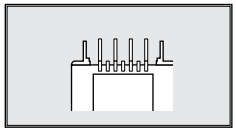


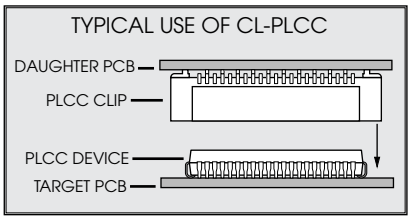
For drawings -> www.ironwoodelectronics.com then select Adapters -> Surface Mount Package Emulation

Part Number	MGA	Part Number	MGA	Part Number	MGA
SF-PLCC20-J-01	SK-MGA5/20A-01	SF-PLCC44-J-05	SK-MGA8/44A-01	SF-PLCC68-J-06	SK-MGA11/68B-01
SF-PLCC20-J-05	SK-MGA5/20A-01	SF-PLCC44-J-S-01	N/A	SF-PLCC68-J-S-01	N/A
SF-PLCC28-J-01	SK-MGA6/28A-01	SF-PLCC52-J-01	SK-MGA9/52A-01	SF-PLCC84-J-01	SK-MGA13/84A-01
SF-PLCC28-J-02	SK-MGA6/28B-01	SF-PLCC52-J-02	SK-MGA9/52A-02	SF-PLCC84-J-02	SK-MGA13/84A-01
SF-PLCC28-J-05	SK-MGA6/28A-01	SF-PLCC52-J-05	SK-MGA9/52A-01	SF-PLCC84-J-05	SK-MGA13/84A-01
SF-PLCC32-J-01	SK-MGA7/32A-01	SF-PLCC68-J-01	SK-MGA11/68B-01	SF-PLCC84-J-S-01	N/A
SF-PLCC32-J-05	SK-MGA7/32A-01	SF-PLCC68-J-03	SK-MGA11/68B-01		
SF-PLCC44-J-01	SK-MGA8/44A-01	SF-PLCC68-J-05	SK-MGA11/68B-01		

PLCC Clip On Bases & Socket Plugs

For drawings -> www.ironwoodelectronics.com then select Adapters -> PLCC Clips and Socket Plugs

PLCC Clip Mini Grid Array	PLCC Clip Surface Mount	PLCC Clip Through Hole
		
CL-PLCC20-M-01	CL-PLCC20-S-01	CL-PLCC20-T-01
CL-PLCC28-M-01	CL-PLCC28-S-01	CL-PLCC28-T-01
CL-PLCC32-M-01	CL-PLCC32-S-01	CL-PLCC32-T-01
CL-PLCC44-M-01	CL-PLCC44-S-01	CL-PLCC44-T-01
CL-PLCC52-M-01	CL-PLCC52-S-01	CL-PLCC52-T-01
CL-PLCC68-M-01	CL-PLCC68-S-01	CL-PLCC68-T-01
CL-PLCC84-M-01	CL-PLCC84-S-01	CL-PLCC84-T-01



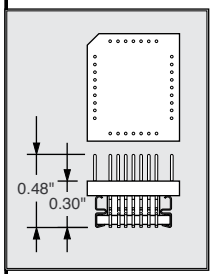
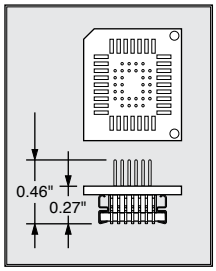
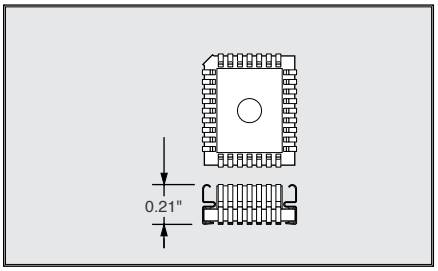
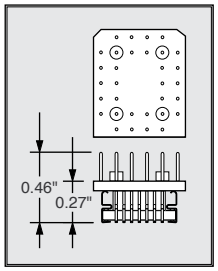
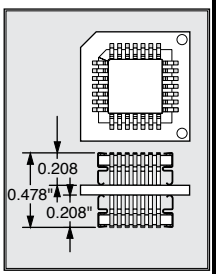
PLCC Clip On Bases

The PLCC clips snap onto the leads of surface mounted PLCC packages and provide reliable mechanical and electrical interconnection to all signals. Depending on the specific part, the signals are then presented to one of three interfaces. The MGA versions can be combined with our PLCC probe board/ Probing Adapters. Ironwood part numbers containing "-M" indicate the MGA interface, "-S" the surface mount lands, and "-T" the through hole pin interface.

PLCC Socket Plugs

Our PLCC socket plugs provide superior connections and eliminate the possibility of damage to the PLCC socket. Signals are typically routed to one of five interfaces.

For drawings -> www.ironwoodelectronics.com then select Adapters -> PLCC Clips and Socket Plugs

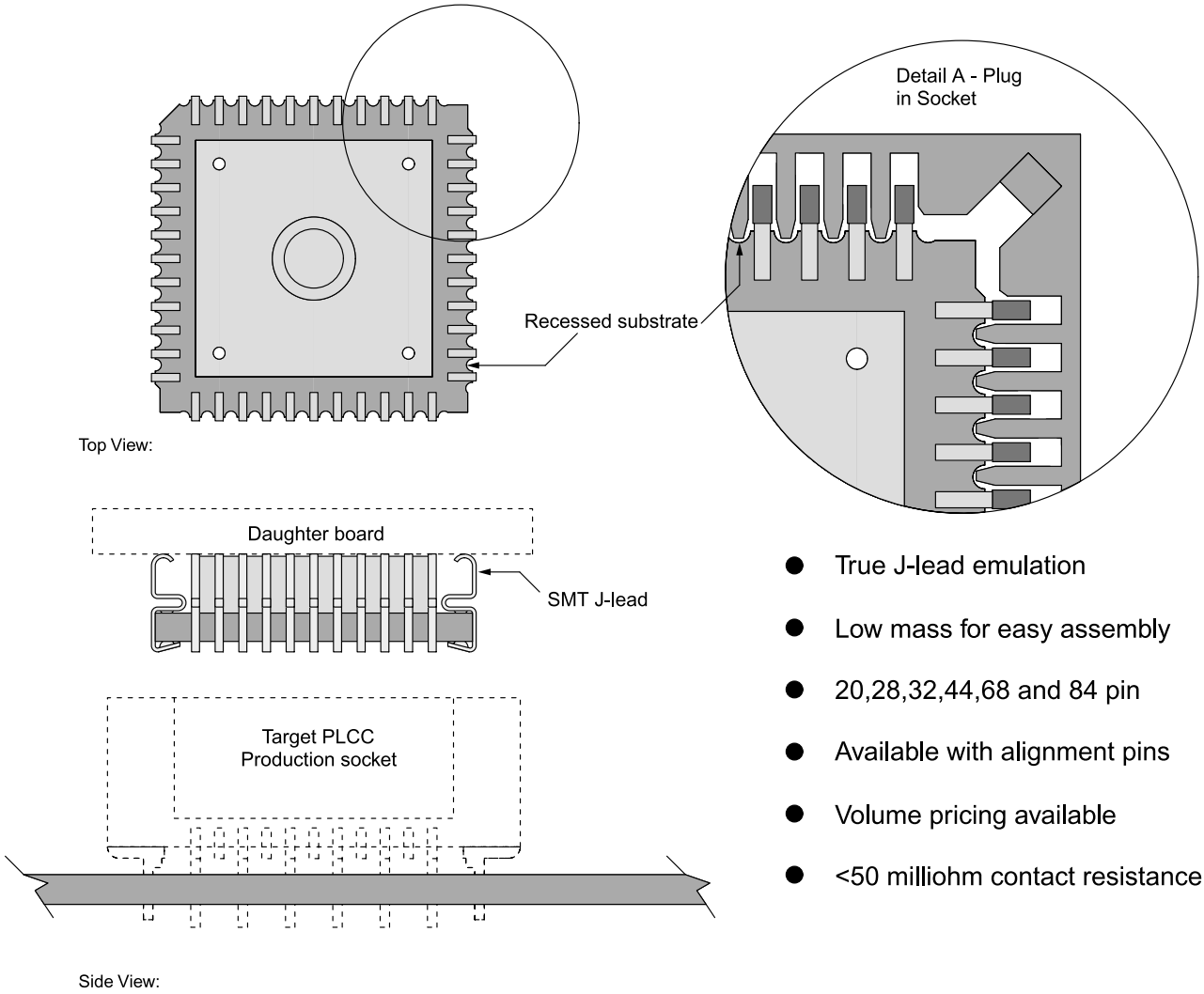
PLCC Plug Through Hole High Density [1]	PLCC Plug Through Hole Mini Grid Array [1]	PLCC Plug - Surface Mount without Alignment Pins	PLCC Plug - Surface Mount with Alignment Pins	PLCC Plug Through Hole Standard [2]	PLCC Plug to PLCC Plug
					
PL-PLCC20-H-01	PL-PLCC28-S-02	PL-PLCC44-H-01	PL-PLCC52-H-01	PL-PLCC68-M-01	PL-PLCC84-P-01
PL-PLCC20-M-01	PL-PLCC28-T-01	PL-PLCC44-H-02	PL-PLCC52-H-02	PL-PLCC68-P-01	PL-PLCC84-S-01
PL-PLCC20-P-01	PL-PLCC32-H-01	PL-PLCC44-M-01	PL-PLCC52-M-01	PL-PLCC68-S-01	PL-PLCC84-S-02
PL-PLCC20-S-01	PL-PLCC32-M-01	PL-PLCC44-P-01	PL-PLCC52-P-01	PL-PLCC68-S-01TR	PL-PLCC84-S-03
PL-PLCC20-S-02	PL-PLCC32-P-01	PL-PLCC44-S-01	PL-PLCC52-S-01	PL-PLCC68-S-02	PL-PLCC84-T-01
PL-PLCC20-T-01	PL-PLCC32-S-01	PL-PLCC44-S-01F	PL-PLCC52-S-02	PL-PLCC68-S-03	PL-SOJ28A-M-01
PL-PLCC28-H-01	PL-PLCC32-S-01F	PL-PLCC44-S-01TR	PL-PLCC52-S-03	PL-PLCC68-T-01	PL-SOJ28A-S-01
PL-PLCC28-M-01	PL-PLCC32-S-02	PL-PLCC44-S-02	PL-PLCC52-T-01	PL-PLCC84-H-01	PL-SOJ42A-M-01
PL-PLCC28-P-01	PL-PLCC32-T-01	PL-PLCC44-S-03	PL-PLCC68-H-01	PL-PLCC84-H-02	PL-SOJ42A-S-01
PL-PLCC28-S-01	PL-PLCC44-H-01	PL-PLCC44-T-01	PL-PLCC68-H-02	PL-PLCC84-M-01	

PLCC Socket Plugs

→ Eliminate "Socket Buster" plastic blocks.
→ Increase retention forces.

True J-lead PLCC Emulation Plug

The characteristics one should consider when selecting a PLCC package emulation plug are as follows: a) surface mountable b)durable c) reduced stress on target socket d) true j-lead design and e) retention force.
Competitive parts, although less expensive, are typically wirewrap pin on milled block assemblies which do not truly emulate the PLCC package. These 'block' designs may overstress the contacts or socket body of a PLCC socket after only a few insertions.
The Ironwood Electronics PLCC plug (the PL-PLCCxx-S-01 part family) has a true j-lead design and can insert into and extract from a PLCC socket several hundred times without harming the socket. The substrate between the j-leads is recessed to allow the ribs of the target PLCC socket to fall between the j-leads. This increases the retention force of the plug in the socket in the right place - The contact between the plugs j-lead and the socket contact and not between the substrate of the plug and the socket body as is the case with low cost, low endurance parts.
A J-lead interface allows the Plug to be surface mounted to a daughter board. The large mass 'block' type plugs typically can not be surface mounted. Please visit our website to view the full product line and to download drawings.



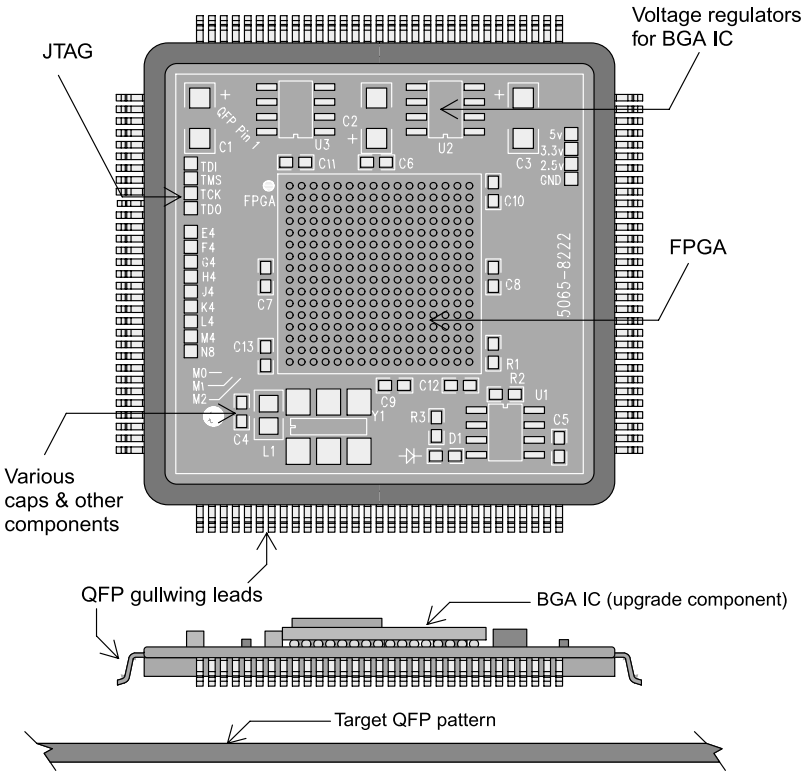
- True J-lead emulation
- Low mass for easy assembly
- 20,28,32,44,68 and 84 pin
- Available with alignment pins
- Volume pricing available
- <50 milliohm contact resistance

Package converters for production applications

quick and cost effective solutions

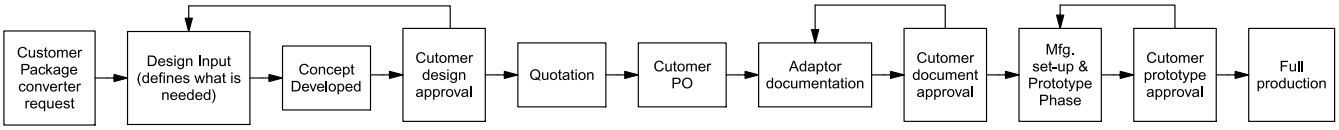
When a particular IC becomes unavailable or a design change requires an IC upgrade, a package converter is an inexpensive and reliable alternative to respinning large and expensive PCBs. Ironwood Electronics can offer an almost unlimited array of solutions for the conversion of one IC package type to another or from one device type to another (Device converters). Our package converters, like the BGA to QFP converter shown below, are designed with space efficiency and a reduced footprint in mind. The resulting adaptor is typically able to perform with similar electrical characteristics as the original IC package.

Typical Package converter solution



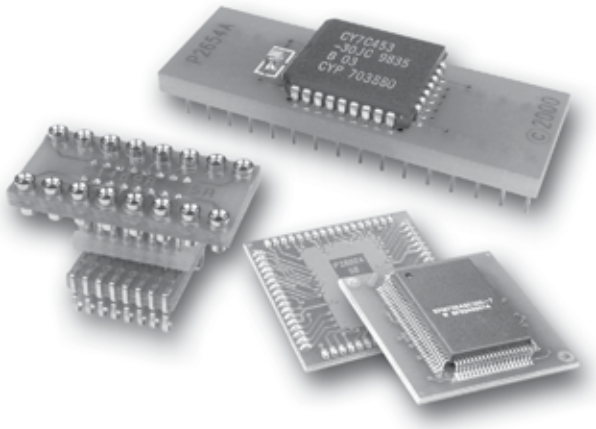
- **True target package emulation**
- **Low mass for easy assembly**
- **All package types (BGA, QFN/MLF, SOIC, etc.) accommodated**
- **Tape and Reel or tray packaging available**
- **Parametric and functional test services available**
- **Turn key solutions**

ISO 9001 Product Development Phase



Package Conversion

We offer over 500 adapters for converting IC packaging and device pin outs, solving many IC availability and performance issues. We also offer "fix" adapters to solve layout problems and some known chip deficiencies. Custom, quick turn solutions are our speciality.



Package Converters

Package converters provide an electrical and mechanical conversion from one package type to another. We use gold plated interconnects and pins for our through-hole converters. Ironwood has developed an innovative shaped solder technology for some SMT adapter bases that reduces cost and adds reliability. We offer hundreds of products converting between virtually any two packages: DIP, SDIP, ZIP, PGA, QFP, SOIC, PLCC, BGA, even BGA/CSP.

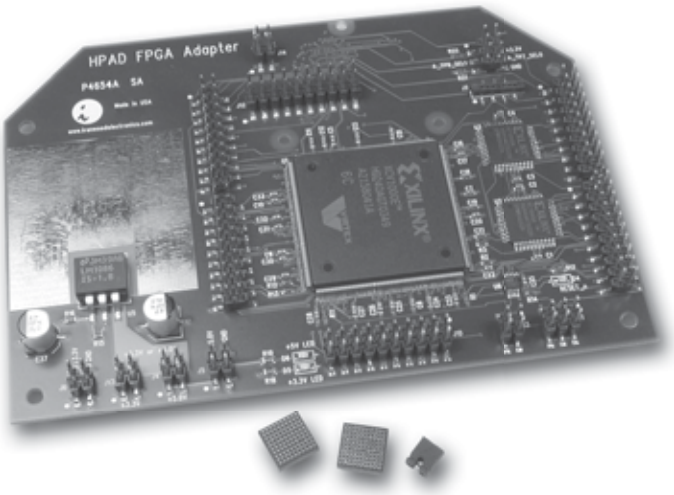
PGA to PLCC

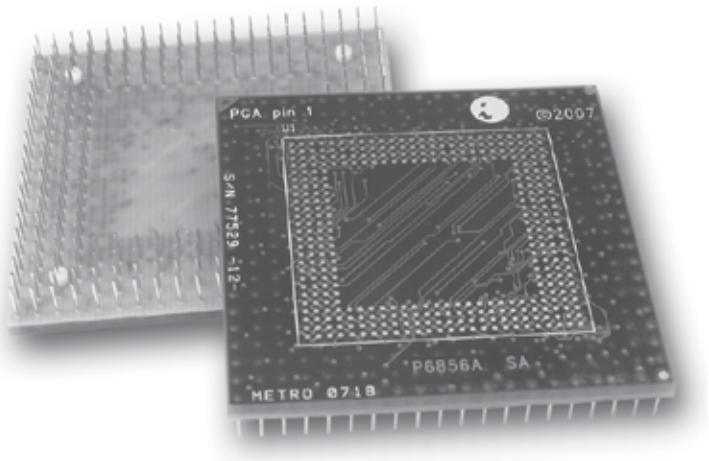
These adapters connect a PGA package to a PLCC interface. Two interface options for the bottom PLCC interface are available: a surface mounted J-Lead or a pluggable foot for use with production sockets.
These converters can be combined with a PGA male to male socket to create a connection for an in-circuit emulator's female PGA head to a target board's PLCC footprint.

For drawings -> www.ironwoodelectronics.com then select Adapters -> Package Converters & Fix Adapters

Part Number	Bottom Interface	Part Number	Bottom Interface	Part Number	Bottom Interface
PC-PGA/PLCC20-01	PLCC Plug	PC-PGA/PLCC32-02	J-Lead SMT Foot	PC-PGA/PLCC68-01	PLCC Plug
PC-PGA/PLCC20-02	J-Lead SMT Foot	PC-PGA/PLCC44-01	PLCC Plug	PC-PGA/PLCC68-02	J-Lead SMT Foot
PC-PGA/PLCC28-01	PLCC Plug	PC-PGA/PLCC44-02	J-Lead SMT Foot	PC-PGA/PLCC84-01	PLCC Plug
PC-PGA/PLCC28-02	J-Lead SMT Foot	PC-PGA/PLCC52-01	PLCC Plug	PC-PGA/PLCC84-02	J-Lead SMT Foot
PC-PGA/PLCC32-01	PLCC Plug	PC-PGA/PLCC52-02	J-Lead SMT Foot		

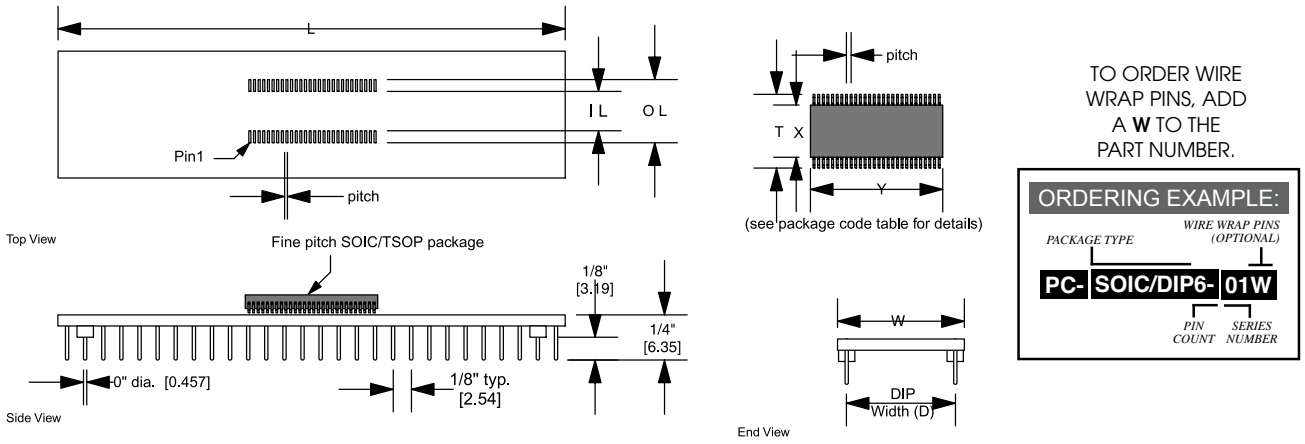
Hundreds More Available Online!





Fine standard pitch SOIC and TSOP to DIP conversion

Ironwood's newest line of SOIC to DIP adapters will accommodate fine pitch SOIC packages (commonly VSOIC and TSOP) with pitches down to 0.4mm. The adapters convert an SMT land pattern down to a DIP configuration (0.3" or 0.6" wide options available). The converters complete the interconnection to gold plated terminal pins with a 1:1 connection. Additionally, the adapters can be plugged or wire wrapped (with an optional sub-base) into a prototyping panel.



For drawings -> www.ironwoodelectronics.com then select Adapters -> Package Converters & Fix Adapters

Part Number	SOFootprint	Pin Count	Pitch	Inside-Land (IL)	Outside-Land (OL)	DipWidth (D)	OverallL(in.)	OverallW (in.)
PC-SOIC/DIP6-01	SO6A	6	1.27mm	0.150	0.349	0.300	0.300	0.400
PC-SOIC/DIP8-01	SO8A/B/E	8	1.27mm	0.150	0.375	0.300	0.400	0.400
PC-SOIC/DIP8-02	SO8A/B	8	1.27mm	0.125	0.325	0.600	0.400	0.700
PC-SOIC/DIP8-03	SO8C	8	1.27mm	0.300	0.450	0.600	0.400	0.700
PC-SOIC/DIP8-04	SO8A	8	1.27mm	0.127	0.275	0.300	0.400	0.400
PC-SOIC/DIP8-05	SO8D	8	0.65mm	0.246	0.252	0.300	0.400	0.400
PC-SOIC/DIP8-06	SO8D	8	0.65mm	0.246	0.252	0.600	0.400	0.700
PC-SOIC/DIP8-07	SO8G	8	0.65mm	0.246	0.252	0.300	0.400	0.400
PC-SOIC/DIP8-08	SO8G	8	0.65mm	0.246	0.252	0.600	0.400	0.700
PC-SOIC/DIP14-01	SO14A/B/D SOJ14A	14	1.27mm	0.125	0.325	0.300	0.700	0.400
PC-SOIC/DIP14-02	SO14C	14	0.65mm	0.246	0.252	0.300	0.700	0.400
PC-SOIC/DIP14-03	SO14C	14	0.65mm	0.246	0.252	0.600	0.700	0.700
PC-SOIC/DIP14-04	SO14G	14	0.65mm	0.246	0.252	0.300	0.700	0.400
PC-SOIC/DIP14-05	SO14G	14	0.65mm	0.246	0.252	0.600	0.700	0.700
PC-SOIC/DIP16-01	SO16A/F	16	1.27mm	0.300	0.500	0.600	0.800	0.700
PC-SOIC/DIP16-02	SO16B	16	1.27mm	0.275	0.475	0.300	0.800	0.500
PC-SOIC/DIP16-02F	SO16B	16	1.27mm	0.275	0.475	0.300	0.800	0.500
PC-SOIC/DIP16-03	SO16A/C SOJ16A	16	1.27mm	0.150	0.350	0.300	0.800	0.400
PC-SOIC/DIP16-04	SO16A/C SOJ16A	16	1.27mm	0.150	0.350	0.300	0.800	0.400
PC-SOIC/DIP16-05	SO16E	16	0.025″	0.236	0.412	0.300	0.800	0.400
PC-SOIC/DIP16-06	SO16E	16	0.025″	0.236	0.412	0.600	0.800	0.700
PC-SOIC/DIP16-07	SO16D	16	0.65mm	0.246	0.252	0.300	0.700	0.500
PC-SOIC/DIP16-08	SO16D	16	0.65mm	0.246	0.252	0.600	0.700	0.700
PC-SOIC/DIP16-09	SO16G	16	0.65mm	0.246	0.252	0.300	0.800	0.400
PC-SOIC/DIP16-10	SO16G	16	0.65mm	0.246	0.252	0.600	0.800	0.700
PC-SOIC/DIP16-11	SO16H	16	0.65mm	0.257	0.319	0.300	0.800	0.400
PC-SOIC/DIP16-12	SO16H	16	0.65mm	0.257	0.319	0.600	0.800	0.700
PC-SOIC/DIP18-01	SO18A/D	18	1.27mm	0.275	0.475	0.600	0.900	0.700
PC-SOIC/DIP18-02	SO18E	18	0.65mm	0.246	0.252	0.300	0.900	0.400
PC-SOIC/DIP18-03	SO18E	18	0.65mm	0.246	0.252	0.600	0.900	0.700
PC-SOIC/DIP20-01	SO20B/C SOJ20A/B	20	1.27mm	0.187	0.347	0.300	1.000	0.400
PC-SOIC/DIP20-02	SO20B/C SOJ20A/B	20	1.27mm	0.187	0.347	0.400	1.000	0.500
PC-SOIC/DIP20-03	SO20A/B/D	20	1.27mm	0.275	0.475	0.600	1.000	0.700
PC-SOIC/DIP20-04	SO20A/B/D	20	1.27mm	0.275	0.475	0.300	1.000	0.400
PC-SOIC/DIP20-05	SO20G	20	0.025″	0.236	0.412	0.300	1.000	0.400
PC-SOIC/DIP20-06	SO20G	20	0.025″	0.236	0.412	0.600	1.000	0.700
PC-SOIC/DIP20-07	SO20F	20	0.65mm	0.246	0.252	0.300	1.000	0.400
PC-SOIC/DIP20-08	SO20F	20	0.65mm	0.246	0.252	0.600	1.000	0.700
PC-SOIC/DIP20-09	SO20H	20	0.65mm	0.246	0.252	0.300	1.000	0.400
PC-SOIC/DIP20-10	SO20H	20	0.65mm	0.246	0.252	0.600	1.000	0.700
PC-SOIC/DIP20-11	SO20E	20	0.65mm	0.257	0.319	0.300	1.000	0.400
PC-SOIC/DIP20-12	SO20E	20	0.65mm	0.257	0.319	0.600	1.000	0.700
PC-SOIC/DIP20-13	SO20B/C SOJ20A/B	20	1.27mm	0.187	0.347	0.300	1.000	0.400
PC-SOIC/DIP24-01	SOJ24A/B/C/D	24	1.27mm	0.167	0.367	0.300	1.200	0.400

**** 10X10 panalized version of PC-SO/DIP8-01 ** 26 position pattern, 6 center pads removed *** Device specific pin assignment, SO to DIP***

Package Conversion-Fine Pitch SO to DIP

SOIC and TSOP to DIP continued

Part Number	SOFootprint	Pin Count	Pitch	Inside-Land (IL)	Outside-Land (OL)	DipWidth (D)	OverallL(in.)	OverallW (in.)
PC-SOIC/DIP24-02	SO24A_SO24B	24	1.27mm	0.275	0.475	0.600	1.200	0.700
PC-SOIC/DIP24-03	SO24H	24	0.025″	0.236	0.412	0.300	1.200	0.400
PC-SOIC/DIP24-04	SO24H	24	0.025″	0.236	0.412	0.600	1.200	0.700
PC-SOIC/DIP24-05	SO24K	24	0.65mm	0.246	0.252	0.300	1.200	0.400
PC-SOIC/DIP24-06	SO24K	24	0.65mm	0.246	0.252	0.600	1.200	0.700
PC-SOIC/DIP24-07	SO24G	24	0.65mm	0.257	0.319	0.300	1.200	0.400
PC-SOIC/DIP24-08	SO24G	24	0.65mm	0.257	0.319	0.600	1.200	0.700
PC-SOIC/DIP24-09	SO24J	24	0.65mm	0.257	0.319	0.300	1.200	0.400
PC-SOIC/DIP24-10	SO24J	24	0.65mm	0.257	0.319	0.600	1.200	0.700
PC-SOIC/DIP28-01	SOJ28A/B/C	28	1.27mm	0.167	0.367	0.300	1.400	0.400
PC-SOIC/DIP28-02	SOJ28A/B/C	28	1.27mm	0.170	0.370	0.600	1.400	0.700
PC-SOIC/DIP28-03	SO28A/B SOJ28J/D	28	1.27mm	0.275	0.475	0.600	1.400	0.400
PC-SOIC/DIP28-04	SO28A/B SOJ28J	28	1.27mm	0.275	0.475	0.300	1.400	0.400
PC-SOIC/DIP28-05	SO28B	28	0.025″	0.236	0.412	0.300	1.400	0.400
PC-SOIC/DIP28-06	SO28B	28	0.025″	0.236	0.412	0.600	1.400	0.700
PC-SOIC/DIP28-07	SO28H	28	0.65mm	0.257	0.319	0.300	1.400	0.400
PC-SOIC/DIP28-08	SO28H	28	0.65mm	0.257	0.319	0.600	1.400	0.700
PC-SOIC/DIP28-09	SO28U	28	0.65mm	0.257	0.319	0.300	1.400	0.400
PC-SOIC/DIP28-10	SO28U	28	0.65mm	0.257	0.319	0.600	1.400	0.700
PC-SOIC/DIP28-11	SO28G	28	0.65mm	0.257	0.319	0.300	1.400	0.400
PC-SOIC/DIP28-12	SO28G	28	0.65mm	0.257	0.319	0.600	1.400	0.700
PC-SOIC/DIP30-01	SO30B	30	0.65mm	0.257	0.319	0.300	1.500	0.400
PC-SOIC/DIP30-02	SO30B	30	0.65mm	0.257	0.319	0.600	1.500	0.700
PC-SOIC/DIP30-03	SO30C	30	0.65mm	0.257	0.319	0.300	1.500	0.400
PC-SOIC/DIP30-04	SO30C	30	0.65mm	0.257	0.319	0.600	1.500	0.700
PC-SOIC/DIP32-01	SOJ32A/B/C	32	1.27mm	0.215	0.415	0.600	1.600	0.700
PC-SOIC/DIP32-02	SO32A/B SOJ32C	32	1.27mm	0.275	0.475	0.600	1.600	0.700
PC-SOIC/DIP32-03	SOJ32A/B	32	1.27mm	0.175	0.375	0.300	1.600	0.400
PC-SOIC/DIP32-04	SO32A SOJ32B/G	32	1.27mm	0.275	0.475	0.400	1.600	0.500
PC-SOIC/DIP32-05	SO32E	32	0.50mm	0.787	0.787	0.300	1.600	0.400
PC-SOIC/DIP32-06	SO32E	32	0.50mm	0.787	0.787	0.600	1.600	0.700
PC-SOIC/DIP32-07	SO32F	32	0.50mm	0.787	0.787	0.300	1.600	0.400
PC-SOIC/DIP32-08	SO32F	32	0.50mm	0.787	0.787	0.600	1.600	0.700
PC-SOIC/DIP32-09	SO32H	32	0.65mm	0.257	0.319	0.300	1.600	0.400
PC-SOIC/DIP32-10	SO32H	32	0.65mm	0.257	0.319	0.600	1.600	0.700
PC-SOIC/DIP36-01	SO36D	36	0.80mm	0.463	0.470	0.300	1.800	0.400
PC-SOIC/DIP36-02	SO36D	36	0.80mm	0.463	0.470	0.600	1.800	0.700
PC-SOIC/DIP40-01	SOJ40A	40	1.27mm	0.275	0.475	0.600	2.000	0.700
PC-SOIC/DIP40-02	SO40H	40	0.80mm	0.463	0.470	0.300	2.000	0.400
PC-SOIC/DIP40-03	SO40H	40	0.80mm	0.463	0.470	0.600	2.000	0.700
PC-SOIC/DIP42-01	SO42D	42	0.80mm	0.463	0.470	0.300	2.100	0.400
PC-SOIC/DIP42-02	SO42D	42	0.80mm	0.463	0.470	0.600	2.100	0.700
PC-SOIC/DIP44-01	SOJ44A	44	1.27mm	0.275	0.475	0.600	2.200	0.700
PC-SOIC/DIP44-02	SO44C	44	0.80mm	0.463	0.470	0.300	2.200	0.400
PC-SOIC/DIP44-03	SO44C	44	0.80mm	0.463	0.470	0.600	2.200	0.700
PC-SOIC/DIP48-01	SO48J	48	0.40mm	0.252	0.252	0.300	2.400	0.400
PC-SOIC/DIP48-02	SO48J	48	0.40mm	0.252	0.252	0.600	2.400	0.700
PC-SOIC/DIP48-03	SO48D	48	0.50mm	0.787	0.787	0.300	1.400	0.400
PC-SOIC/DIP48-04	SO48D	48	0.50mm	0.787	0.787	0.600	1.400	0.700
PC-SOIC/DIP50-01	SO50B	50	0.80mm	0.463	0.470	0.300	2.500	0.400
PC-SOIC/DIP50-02	SO50B	50	0.80mm	0.463	0.470	0.600	2.500	0.700
PC-SOIC/DIP50-03	SO50A	50	0.80mm	0.543	0.563	0.300	2.500	0.400
PC-SOIC/DIP50-04	SO50A	50	0.80mm	0.543	0.563	0.600	2.500	0.700
PC-SOIC/DIP52-01	SO52A	52	0.80mm	0.543	0.563	0.300	2.600	0.400
PC-SOIC/DIP52-02	SO52A	52	0.80mm	0.543	0.563	0.600	2.600	0.700
PC-SOIC/DIP54-01	SO54B	54	0.80mm	0.463	0.470	0.300	2.700	0.400
PC-SOIC/DIP54-02	SO54B	54	0.80mm	0.463	0.470	0.600	2.700	0.700
PC-SOIC/DIP54-03	SO54C	54	0.80mm	0.463	0.470	0.300	2.700	0.400
PC-SOIC/DIP54-04	SO54C	54	0.80mm	0.463	0.470	0.600	2.700	0.700
PC-SOIC/DIP54-05	SO54A	54	0.80mm	0.543	0.563	0.300	2.700	0.400
PC-SOIC/DIP54-06	SO54A	54	0.80mm	0.543	0.563	0.600	2.700	0.700
PC-SOIC/DIP56-01	SO56G	56	0.40mm	0.252	0.252	0.300	2.400	0.400
PC-SOIC/DIP56-02	SO56G	56	0.40mm	0.252	0.252	0.600	2.400	0.700
PC-SOIC/DIP56-03	SO56A	56	0.50mm	0.787	0.787	0.300	2.800	0.400
PC-SOIC/DIP56-04	SO56A	56	0.50mm	0.787	0.787	0.600	2.800	0.700
PC-SOIC/DIP56-05	SO56E	56	0.50mm	0.787	0.787	0.300	2.800	0.400
PC-SOIC/DIP56-06	SO56E	56	0.50mm	0.787	0.787	0.600	2.800	0.700
PC-SOIC/DIP64-01	SO64A	64	0.80mm	0.543	0.563	0.300	3.200	0.400
PC-SOIC/DIP64-02	SO64A	64	0.80mm	0.543	0.563	0.600	3.200	0.700
PC-SO28/DIP-Z-01	SO28A	28	1.27mm	0.408	0.408	0.300	1.300	1.400
PC-SO/DIP-AD7244-01	SO28C	28	1.27mm	0.250	0.450	0.300	1.200	0.400
PC-SO/DIP-75162-01	SO24	24	1.27mm	0.275	0.475	0.400	1.100	0.400
PC-TSOP/DIP40-01	SO40C	40	0.50mm	0.670	0.830	0.600	2.000	0.900
PC-TSOP/DIP40-02	SO40C	40	0.50mm	0.670	0.830	0.300	2.000	0.900
PC-TSOP/DIP8-01	SO8F	8	0.65mm	0.125	0.325	0.600	0.700	0.400

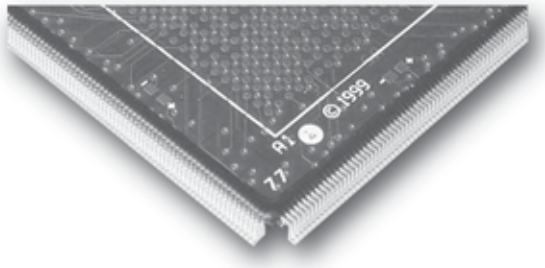
**** 10X10 panalized version of PC-SO/DIP8-01 ** 26 position pattern, 6 center pads removed *** Device specific pin assignment, SO to DIP***

Package Conversion-Misc., PGA/QFP

Misc. Package Converters

Many device specific package converters of all types are in this category. Pictured at right is a BGA to QFP converter which supports a Motorola 68338 device. Available Package Converters:

SOIC to LCC	QFP to PLCC	SOIC to ZIP	PGA to DIP
SOIC to SOIC	QFP to DIP	QFP to PGA	TSOP to SOIC
QFP to QFP	QIP to DIP	PGA to BGA	BGA to QFP



This adapter converts 361 pin BGA to 304 pin 0.5 mm pitch QFP.

For drawings -> www.ironwoodelectronics.com then select Adapters -> Package Converters & Fix Adapters

Part Number	Part Number	Part Number	Part Number	Part Number
PC-BGA/BGA225-B-01	PC-MLF/DIP32-N-R-01	PC-QFP/PGA-53700-02	PC-QFP/PGA-XE4006E-S-01	PC-SO/SO8-F-02
PC-BGA/PGA-68360-Z-01	PC-MLF/DIP32-Z-01	PC-QFP/PGA-64765-S-01	PC-QFP/PLCC44-01	PC-SO/ZIP24-01
PC-BGA/QFP-ALDC-F-01	PC-PGA/BGA-68338-B-01	PC-QFP/PGA-68837-S-01	PC-QFP/QFP-1020-Z-L-T-01	PC-SOIC/ZIP20-01
PC-BGA/QFP-ALDC-G-01	PC-PGA/BGA-68360-B-01	PC-QFP/PGA-68838-S-01	PC-QFP/QFP-1280-Z-L-T-01	PC-SOIC/ZIP24-01
PC-BGA/QFP-SX32A-S-01	PC-PGA/DIP28-01	PC-QFP/PGA-68839-S-01	PC-QFP/QFP-68332-L-01	PC-SOIC_LCC-74FCT16-01
PC-BGA/QFP-SX32A-Z-01	PC-PGA/DIP28-01R	PC-QFP/PGA-7611-S-01	PC-QFP/QFP-IDT7025-F-01	PC-SSOP/SOIC28-01
PC-BGA/QFP-SX72A-S-01	PC-PGA/DIP32-01	PC-QFP/PGA-80386-S-01	PC-QFP/QFP-SPT7820-L-01	PC-TQFP64/PL68-P-01
PC-BGA/QFP-SX72A-Z-01	PC-QFN/DIP32-N-R-01	PC-QFP/PGA-A1020-S-01	PC-QFP160SA/SB-G-01	PC-TQFPS64/P11/68-01
PC-CQFP/QFJ-RTX2010-01	PC-QFN/DIP32-N-R-01	PC-QFP/PGA-A1020-S-02	PC-QFP64SC/SD-L-S-01	PC-TSOP/SOIC-M29F400-J-01
PC-CSP/DIP-XC9536-01	PC-QFP/DIP-8031/51-T-01	PC-QFP/PGA-CX3002-01	PC-QIP/DIP70-01	
PC-DIP/QFP-8031-51-L-T-01	PC-QFP/DIP-8031/51-Z-T-01	PC-QFP/PGA-CY7C-01	PC-SO/SO32-S-L-01	
PC-FP/PLCC-100158-S-F-01	PC-QFP/PGA-486DX2-Z-01	PC-QFP/PGA-QL16X24B-S-01	PC-SO/SO50-F-01	
PC-FP/PLCC68-P-Z-T-01	PC-QFP/PGA-53700-01	PC-QFP/PGA-TMS320F-Z-01	PC-SO/SO8-F-01	

PGA to QFP

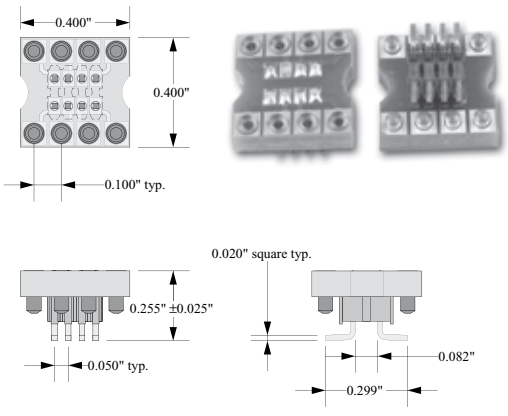
These two piece adapters connect a PGA package to a QFP land pattern. The bottom QFP surface mount base part is available in gullwing (-G) or low profile leadless (-L) versions. The top PGA part plugs onto the base using gold plated connections.

For drawings -> www.ironwoodelectronics.com then select Adapters -> Package Converters & Fix Adapters

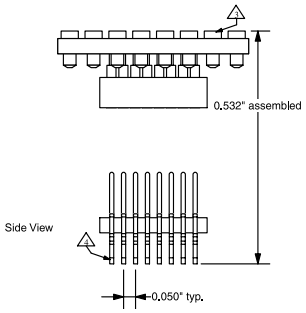
Part Number	Part Number	Part Number	Part Number	Part Number
PC-IPGA/QFP-TMS320C40-L-01	PC-PGA/QFP-56001-L-01	PC-PGA/QFP-68336-G-01	PC-PGA/QFP-80386-G-01	PC-PGA/QFP-80C186EC-L-03
PC-PGA/QFP-1020-L-01	PC-PGA/QFP-64700-L-01	PC-PGA/QFP-68336-L-01	PC-PGA/QFP-80386-L-01	PC-PGA/QFP-ADSP2100-L-01
PC-PGA/QFP-1020-M-Z-T-02	PC-PGA/QFP-68020-G-01	PC-PGA/QFP-68338-L-01	PC-PGA/QFP-80486-G-01	PC-PGA/QFP-DCCR-01
PC-PGA/QFP-1280-L-01	PC-PGA/QFP-68020-L-01	PC-PGA/QFP-68340-G-03	PC-PGA/QFP-80486-G-02	PC-PGA/QFP-DSP32C-G-02
PC-PGA/QFP-1280-L-02	PC-PGA/QFP-68030-G-01	PC-PGA/QFP-68340-L-01	PC-PGA/QFP-80486-G-03	PC-PGA/QFP-NEP-L-01
PC-PGA/QFP-1280-L-Z-01	PC-PGA/QFP-68030-L-01	PC-PGA/QFP-68340-L-02	PC-PGA/QFP-80486-G-04	PC-PGA/QFP-V53-L-01
PC-PGA/QFP-1280-L-Z-T-03	PC-PGA/QFP-68040-G-01	PC-PGA/QFP-68360-G-01	PC-PGA/QFP-80486-L-01	PC-PGA68/QFP74-03
PC-PGA/QFP-132-G-01	PC-PGA/QFP-68040-L-01	PC-PGA/QFP-68360-L-01	PC-PGA/QFP-80486-L-02	PC-PGA84/QFP80-03
PC-PGA/QFP-14100-L-01	PC-PGA/QFP-68040-L-02	PC-PGA/QFP-68360-L-01F	PC-PGA/QFP-80960JA-G-01	PC-PGA84/QFP94-03
PC-PGA/QFP-1460-L-01	PC-PGA/QFP-68302-G-01	PC-PGA/QFP-68EC020-L-01	PC-PGA/QFP-80960JA-L-01	
PC-PGA/QFP-1553-L-01	PC-PGA/QFP-68302-G-02	PC-PGA/QFP-68EC020-L-02	PC-PGA/QFP-80960-L-01	
PC-PGA/QFP-3041-L-01	PC-PGA/QFP-68302-L-01	PC-PGA/QFP-68F333-L-01	PC-PGA/QFP-80C186EC-L-01	
PC-PGA/QFP-56001-G-01	PC-PGA/QFP-68330-L-01	PC-PGA/QFP-68MP302-G-01	PC-PGA/QFP-80C186EC-L-02	

Production DIP to SOIC Adapter

- Low profile one piece adapter converts larger DIP package to smaller SOIC footprint
- Ideal for high volume pick and place assembly
- Tape and reel, tray or tube packaging options available
- Gold plated flush mounted DIP receptacles for lowest profile
- RoHS and non-RoHS versions available
- Custom DIP to SOIC netlist conversions capability



DIP/SOIC



DIP to SOIC

These adapters connect DIP packages to SOIC surface mount lands. We use a J-leaded foot that will interface with "J-lead" or gull wing land patterns. Parts are available in one-piece or two-piece (pluggable) versions.

For drawings -> www.ironwoodelectronics.com then select Adapters -> Package Converters & Fix Adapters

Part Number	Part Number	Part Number	Part Number	Part Number
PC-DIP/SOIC6-01	PC-DIP/SOIC16-05	PC-DIP/SOIC20-08	PC-DIP/SOIC28-01F	PC-DIP/SOIC32-02
PC-DIP/SOIC8-01	PC-DIP/SOIC18-01	PC-DIP/SOIC20-08F	PC-DIP/SOIC28-02	PC-DIP/SOIC32-03
PC-DIP/SOIC8-01F	PC-DIP/SOIC18-02	PC-DIP/SOIC20-09	PC-DIP/SOIC28-02F	PC-DIP/SOIC32-04
PC-DIP/SOIC8-02	PC-DIP/SOIC18-03	PC-DIP/SOIC20-10F	PC-DIP/SOIC28-05	PC-DIP/SOIC32-05
PC-DIP/SOIC8-02F	PC-DIP/SOIC18-04	PC-DIP/SOIC20-11F	PC-DIP/SOIC28-06	PC-DIP/SOIC40-01
PC-DIP/SOIC8-03	PC-DIP/SOIC18-04F	PC-DIP/SOIC24-01	PC-DIP/SOIC28-07	PC-DIP/SOIC48-10
PC-DIP/SOIC8-03F	PC-DIP/SOIC20-01	PC-DIP/SOIC24-02	PC-DIP/SOIC28-07F	PC-DIP/SOIC48-10F
PC-DIP/SOIC8-04F	PC-DIP/SOIC20-01F	PC-DIP/SOIC24-03	PC-DIP/SOIC28-08	PC-DIP/SOGW16-02F
PC-DIP/SOIC14-01	PC-DIP/SOIC20-02	PC-DIP/SOIC24-04	PC-DIP/SOIC28-08F	PC-DIP/SOGW20-02F
PC-DIP/SOIC14-01F	PC-DIP/SOIC20-02F	PC-DIP/SOIC24-05	PC-DIP/SOIC28-09	PC-DIP/SO-Z86D74-L-01
PC-DIP/SOIC14-02	PC-DIP/SOIC20-03	PC-DIP/SOIC24-06	PC-DIP/SOIC28-10	PC-DIP/SO-Z86D74-L-01F
PC-DIP/SOIC16-01	PC-DIP/SOIC20-04	PC-DIP/SOIC24-07	PC-DIP/SOIC28-11F	PC-DIP/T08-01
PC-DIP/SOIC16-02	PC-DIP/SOIC20-05	PC-DIP/SOIC24-08	PC-DIP/SOIC28-12F	
PC-DIP/SOIC16-03	PC-DIP/SOIC20-06	PC-DIP/SOIC24-09	PC-DIP/SO28-XLT28SS2-L-01	
PC-DIP/SOIC16-04	PC-DIP/SOIC20-07	PC-DIP/SOIC28-01	PC-DIP/SOIC32-01	

Probing and Analysis Adapters

We offer probing and logic analyzer adapters for all SMT package types, as well as socket probes for DIP and PLCC. We are Agilent and Tektronix partners. In addition, we offer adapters to facilitate the use of in-circuit emulators and FPGA development systems.

Probing Adapters - Simplifies system verification

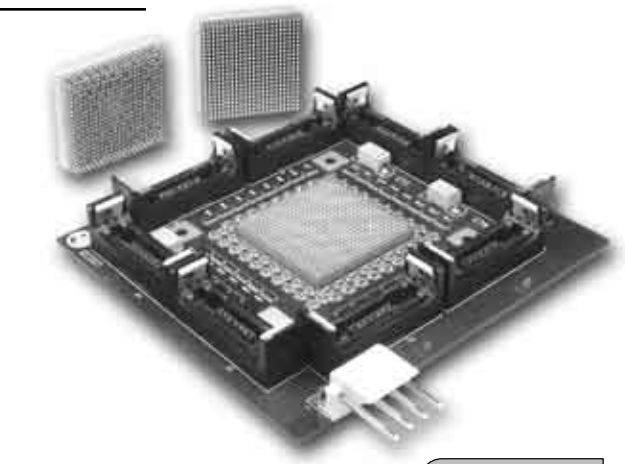
No matter how well designed a circuit is, there is almost always a need to hook up test instruments to it to verify function, look for bugs, or baseline performance. As IC packages become smaller and pin counts grow this becomes harder and harder. probing adapters are required to alleviate this de-bug problem. Many different types of adapters fall into the test and debug category. The common feature is that they bring the signals of an IC out to a format that is easy to interface with test and analysis equipment.
Various probing adapter list and part drawings can be obtained using the link below:

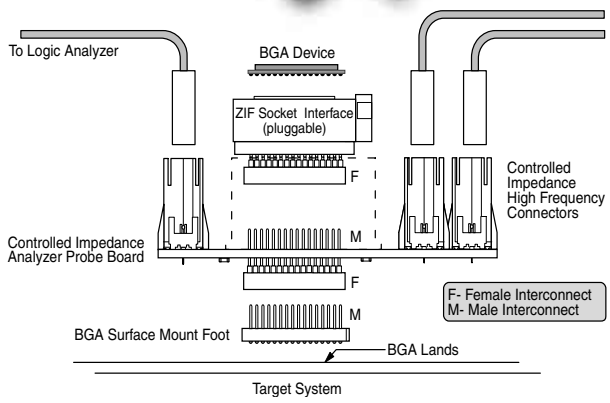
For drawings -> www.ironwoodelectronics.com then select Adapters -> Probing & Analysis Adapters

Logic AnalyzerAdapters

As qualified Agilent and Tektronix partners, Ironwood Electronics offers adapters for high speed probing with Agilent 16xxx or Tektronix TLA7xx logic analyzers. These adapters incorporate vendor-specific interfaces and controlled impedance signals.

Mounted in place of an IC device, Ironwood's line of logic analyzer adapters eliminate the need to design debug features into target systems. Our modular designs offer the capability to remove the probe connections and choose between using a ZIF socket or one of our fast surface mount land sockets. Real time, high speed analysis of target systems requires excellent signal integrity. Our pluggable components employ gold plated connections. Controlled impedance, vendor specific Mictor connectors are used and each signal's integrity is maintained with high speed as the priority. All of these adapters incorporate high speed PCB design techniques to support state analysis and timing of microprocessors. The drawing highlights a typical three component adapter application: (zif socket, probe board, and SMT foot).



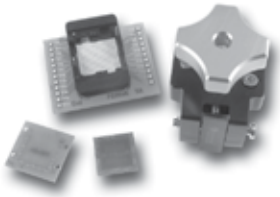


For drawings -> www.ironwoodelectronics.com then select Adapters -> Probing and Analysis Adapters -> Logic Analyzer Adapters

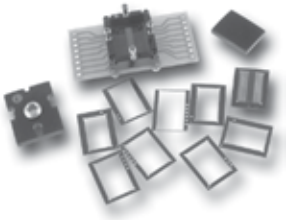
Part Number	Device	Pkg Code	Pin Cnt	Analyzer	Top Socket (included)	SMT Foot (included)
LA-BGA-7C1351-S-B-01	CY7C1351B	BGA119A	119	Tektronix TLA7XX	LS-BGA119A-02	SF-BGA119A-B-11
LA-BGA60C-DDRRAM-01	Infineon DDR RAM	BGA60C	60	Agilent/HP 16XXX	PB-BGA60C-DDRRAM-01	SK-UGA10/60C-13
LA-BGA90C-SDRAM-01	SDRAM	BGA90C	90	AMP mictor	SF-BGA90C-B-62	N/A
LA-BGA92D-DDR2-SDRAM-01	SDRAM	BGA92D	92	Samtec 65067-01	SF-BGA92D-B-62	N/A
LA-BGA136C-GDDR3-01	GDDR3	BGA136C	136	Tektronix TLA7XX	LS-BGA136C-61	SF-BGA136C-B-62
LA-BGA-405GP-S-B-01	IBM PowerPC 405GP	BGA413A	413	Tektronix TLA7XX	LS-BGA413A-02	SF-BGA413A-B-11
LA-BGA-603E-S-B-02	PowerPC 603e	BGA255A	255	Agilent 16XXXX	LS-BGA255A-B-01	SF-BGA255A-B-11
LA-BGA-603E-Z-B-02	PowerPC 603e	BGA255A3	255	Agilent 16XXXX	SK-BGA255A-Z-03	SF-BGA255A-B-11
LA-BGA-740-S-B-01	PowerPC 740	BGA255A	255	Tektronix TLA7XX	LS-BGA255A-02	SF-BGA255A-B-11
LA-BGA-740-S-B-02	PowerPC 740	BGA255A	255	Agilent 16XXXX	LS-BGA255A-02	SF-BGA255A-B-11
LA-BGA-740-Z-B-02	PowerPC 740	BGA255A3	255	Agilent 16XXXX	SK-BGA255A-Z-03	SF-BGA255A-B-11
LA-BGA-750CX-S-B-01	IBM PowerPC 750CX	BGA256A	256	Tektronix TLA7XX	LS-BGA256A-01	SF-BGA256A-B-02
LA-BGA-750FX-Z-01	IBM Power PC 750FX	BGA292D	292	Tektronix TLA7XX	PB-BGA750FX-01	SF-BGA292D-B-11
LA-BGA-750-S-B-01	PowerPC 750	BGA360A	360	Tektronix TLA7XX	LS-BGA360A-02	SF-BGA360A-B-11
LA-BGA-750-S-B-02	PowerPC 750	BGA360A	360	Agilent 16XXXX	LS-BGA360A-02	SF-BGA360A-B-11
LA-BGA-750-S-B-02F	PowerPC 750	BGA360A	360	Agilent 16XXXX	LS-BGA360A-72F	SF-BGA360A-B-11F
LA-BGA-750-S-B-03	PowerPC 750	BGA360A	360	Tektronix TLA7XX	N/A	N/A
LA-BGA-750-Z-B-02	PowerPC 750	BGA360A2	360	Agilent 16XXXX	SK-BGA360A-Z-02	SF-BGA360A-B-11
LA-BGA-850-Z-B-01	Motorola MPC850	BGA256B3	256	Tektronix TLA7XX	SK-BGA256B-Z-02 -B-01	SF-BGA256B
LA-BGA-56311-S-B-01	Motorola DSP56311	BGA196C	196	Agilent 16XXXX	LS-BGA196C-02	SF-BGA196C-B-11
LA-BGA-64130-S-B-01	Galileo GT-64130	BGA388A	388	Tektronix TLA7XX	LS-BGA388A-01	SF-BGA388A-B-02
LA-BGA-7400-Z-B-02	Motorola MPC7400	BGA360A	360	Agilent 16XXXX	SK-BGA360A-Z-M-02	SF-BGA360A-B-11
LA-BGA-7450-S-B-01	Motorola MPC7450	BGA483A	483	Tektronix TLA7XX	LS-BGA483A-11	SF-BGA483A-B-02
LA-BGA-8240-S-B-01	Motorola MPC8240	BGA352A	352	Tektronix TLA7XX	PB-BGA8240-01	SF-BGA352A-B-04
LA-BGA-8240-S-B-01	Motorola MPC8240	BGA352A	352	Tektronix TLA7XX	LS-BGA352A-01	SF-BGA352A-B-02
LA-BGA-8260-S-B-01	Motorola MPC8260	BGA480B	480	Tektronix TLA7XX	LS-BGA480B-02	SF-BGA480B-B-11
LA-BGA-8260-S-B-02	Motorola MPC8260	BGA480B	480	Tektronix TLA7XX	LS-BGA480B-02	SF-BGA480B-B-11
LA-BGA-8260-S-B-03	Motorola MPC8260	BGA480B	480	Tektronix TLA7XX	LS-BGA480B-02	SF-BGA480B-B-11
LA-BGA-FG680-S-B-01	Xilinx FG680	BGA680C	680	Tektronix TLA7XX	LS-BGA680C-02	SF-BGA680C-B-11
LA-BGA-MCP84-DDR2-01	DDR2	BGA84	84	Tektronix TLA7XX	none	none
LA-BGA-MPC555-S-B-01	Motorola MPC555	BGA272A	272	Agilent 16XXXX	LS-BGA272A-01	SF-BGA272A-B-02
LA-BGA-MPC7445-Z-B-01	Motorola MPC7445	BGA360A	360	Tektronix TLA7XX	PB-BGA-MPC7445-Z-01	SF-BGA360A-B-02
LA-BGA-MPC7447/48-Z-B-01	Motorola MPC7447,7448	BGA360A	360	Tektronix TLA7XX	SF-BGA360A-B-72	N/A
LA-BGA-MPC7457-Z-B-01	Motorola MPC7457	BGA483A	483	Agilent 16700B	PB-BGA-MPC7457-Z-01	SF-BGA483A-B-04
LA-BGA-MPC8270-Z-B-01	Motorola MPC8270	BGA480B	480	Tektronix P6860	SG-BGA-6084	SF-BGA480B-B-72f
LA-BGA-RM7000-S-B-01	QED RM7000	BGA304A	304	Tektronix TLA7XX	LS-BGA304A-02	SF-BGA304A-B-11
LA-MPROBE-01	Intel M-Probe Interposer	N/A	N/A	Tektronix TLA7XX	N/A	N/A
PB-BGA-8260-04	Motorola MPC8260	BGA480B	480	Tektronix TLA7XX	LS-BGA480B-02	SF-BGA480B-B-11
LA-BGA-740-Z-B-03	PowerPC 740	BGA225A	225	Agilent/HP	LS-BGA225A-05	SF-BGA225A-B-04
LA-BGA-740-S-B-04	PowerPC 740	BGA255A	255	Agilent/HP	LS-BGA255A-31	SF-BGA225A-B-31F

What's NEW In This Catalog

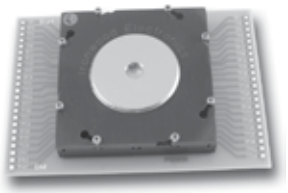
Precisely etched spring pin socket allows 0.4mm pitch device testing at high speed
SBT-QFN-xxxx is found on pg 4



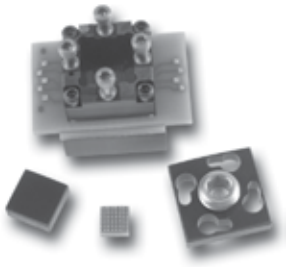
Socket your BGA Processor and BGA Memory using Extreme Temperature Stamped Spring pin Socket with Superior Electrical Performance
CBT-BGA-xxxx is found on pg 4



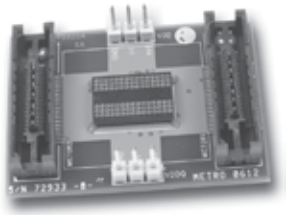
Multi GHz Bandwidth Universal Socket for DDR2 & DDR3 Memory Packages
SG-BGA-6292 is found on pg 6



8 GHz Bandwidth Socket for 1924 pin, 1mm Pitch Xilinx BGA Packages
SG-BGA-6296 is found on pg 6



GHz Bandwidth Transceiver Socket for Wafer Level Ball Grid Array
SG-BGA-7154 is found on pg 6



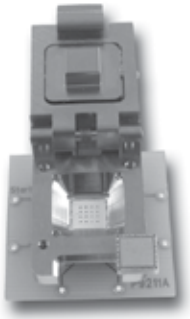
Logic Analyzer Adapter for 90 Pin LPDDR SDRAM memory device
LA-BGA-LPDDR-SDRAM-01 is found on pg 38

N E W !

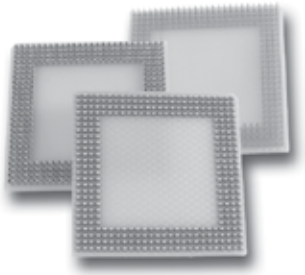
What's NEW In This Catalog

NEW!

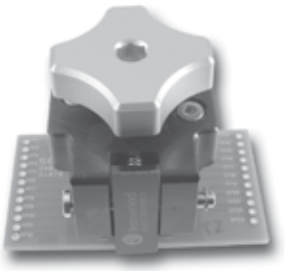
PLCC plugs Allow Reliable Socketing or Soldering of Upgraded Modules
PL-PLCC68-S-01 is found on pg 30



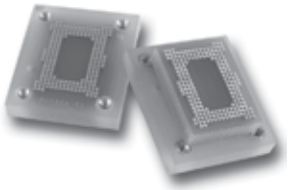
Low profile Stamped Spring Pin Socket allows quick screening of QFN devices
CBT-QFN-xxxx is found on pg 4



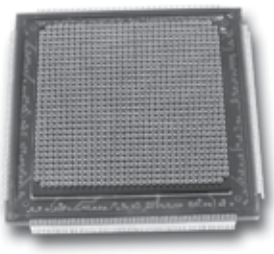
Chip Size Board to Board Socket Adapter System for 352BGA. RoHS compatible parts are also available
SF-BGA352B-B-XX is found on pg 21



High endurance (500K insertions) spring pin socket allows testing of SOT packages
SS-BGA196E-01 is found on pg 14

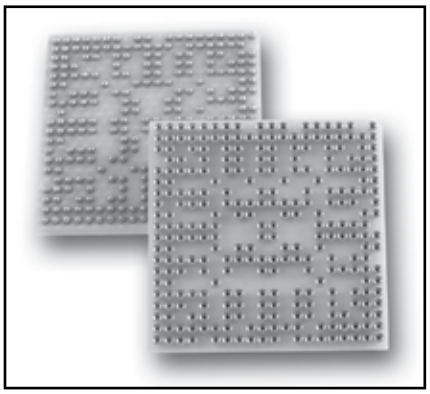


0.65mm Pitch BGA Socket Adapter for Samsung MCP Memory Device
SF-BGA199B-B-05 is found on pg 18

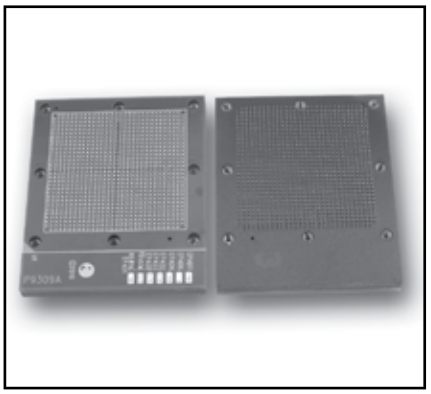


Volume package converter allos replacement of a xxx pin QFP with a latest xxx pin BGA device or pluggable module
BGA to QFP package converter is found on pg 36

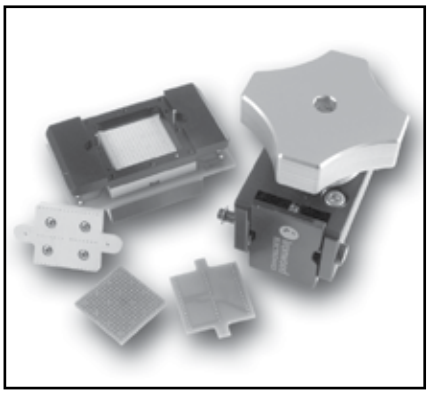
Socket & Adapter Examples



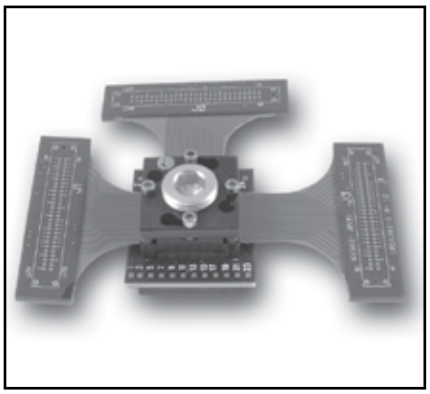
Giga-snaP Adapters for device/board to board connection



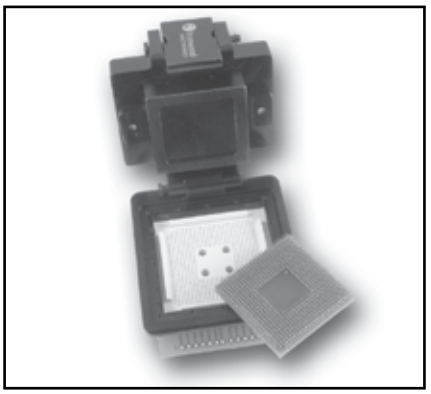
Package Converters



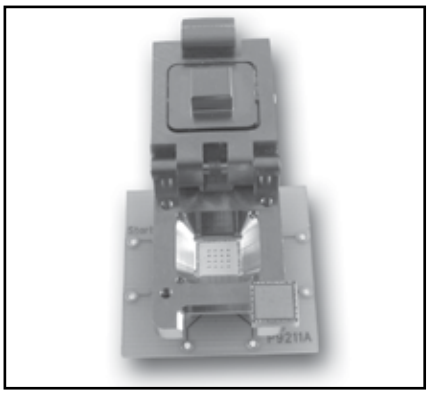
Double Stack BGA Socket with Double Latch Lid



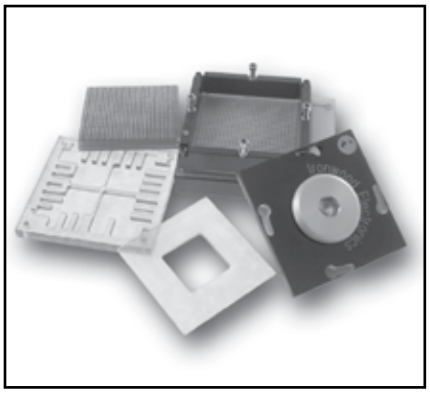
GHz socket with Flex Probe Board



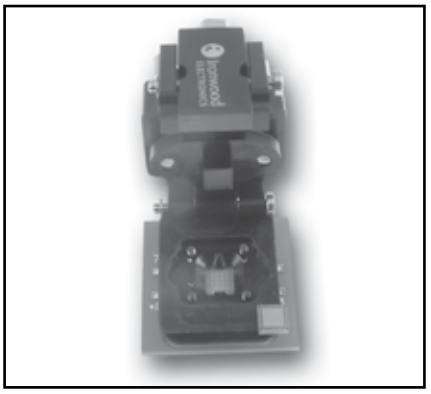
High Endurance CGA Spring Pin Socket



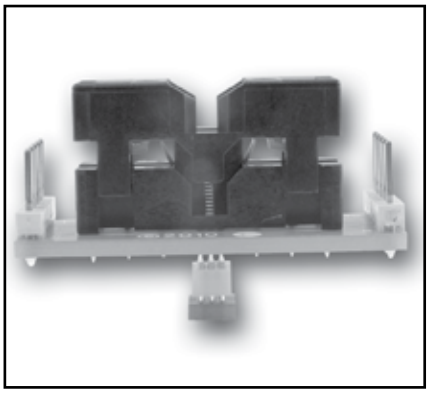
Low Profile QFN Socket with snap lid



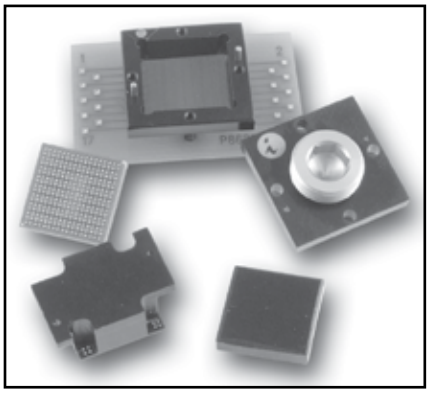
GHz Socket with custom insulation plate



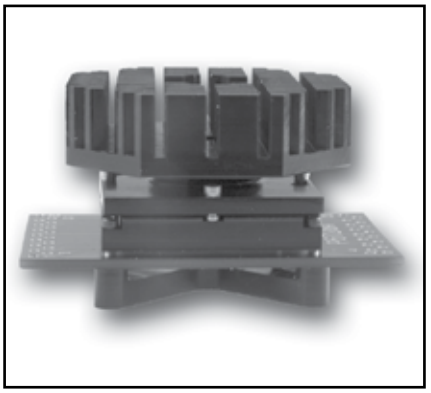
Diamond Particle Interconnect Socket



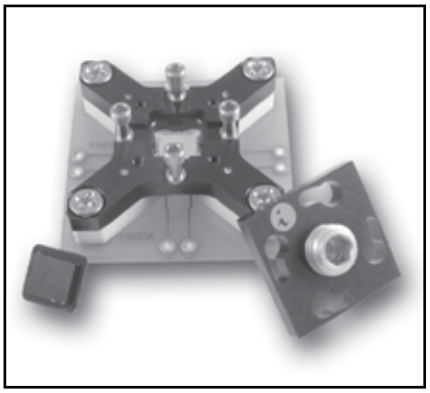
SOIC Carrier Adapter



No Mounting Hole, Epoxy GHz Socket



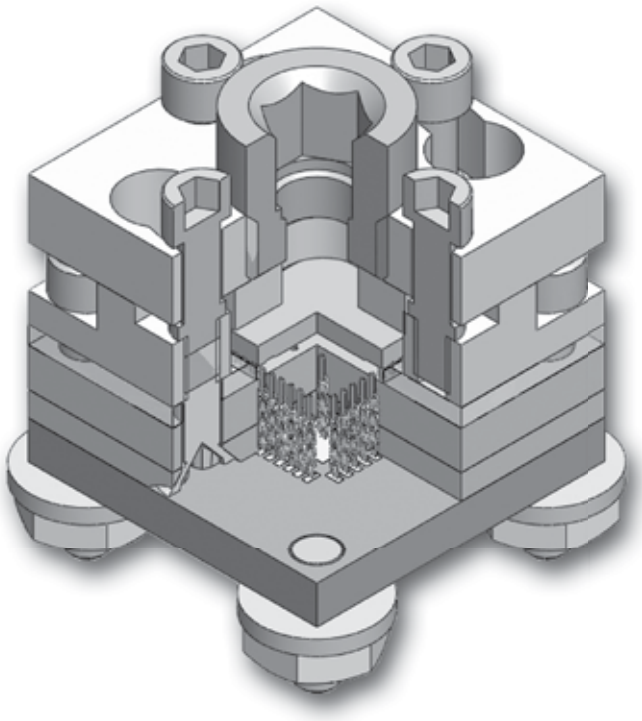
GHz Socket with Heat Sink



SBT-QFN Socket

EXAMPLES

SBT simplifies Burn-in and Test Challenges down to 0.4mm pitch



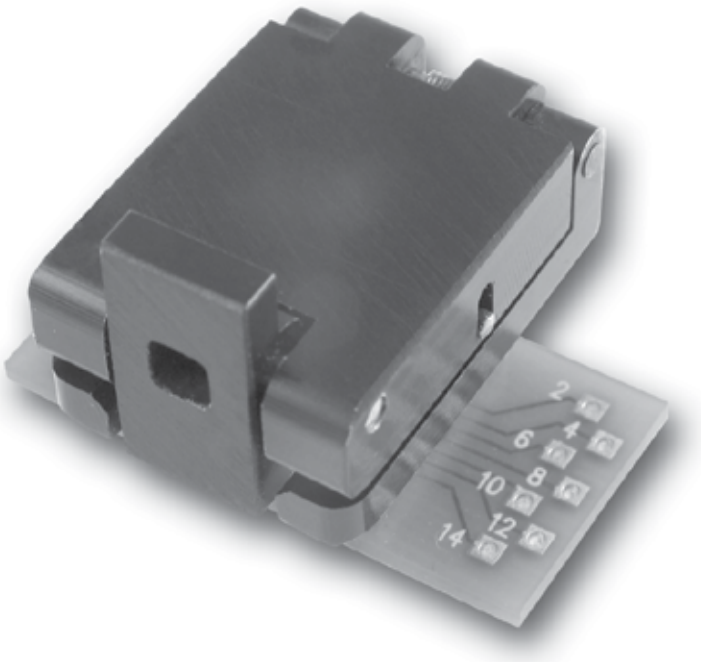
Ironwood Electronics' SBT sockets are small footprint sockets. The socket needs about 2.5mm extra space around the chip than the actual chip size, utilizing only very small PCB real estate. A clamshell lid with a wave spring provides the compression force. This mechanism provides easy chip replacement and compatible with an automated handler system also. If heat dissipation is of concern, a heat sink can be integrated in the middle of the clamshell lid to dissipate up to 100 watts.

The 0.4mm pitch SBT socket uses innovative contact technology for high endurance and wide temperature applications. The 0.4mm pitch SBT Contact is an etched contact with outside spring that provides a robust solution for Burn-in & Test applications. Solutions are available for 0.4mm to 1.27mm LGA, BGA, QFN, QFP, SOIC and other packages. The SBT contact technology has 3 part system which includes top plunger, bottom plunger and a spring. The BeCu alloy plungers are etched/stamped, plated and assembled to a stainless steel gold plated spring inside a high temperature plastic cavity eliminating the need for an external shell or barrel.

Typical specifications for the 0.4mm SBT contact technology include:

- Over 34GHz bandwidth @-1dB
- Contact resistance under 50mΩ
- Loop inductance under 0.95nH
- Capacitance under 0.06pF
- Operating temperature range -55C to +155C
- Insertion/Extraction life over 500, 000 cycles
- Current rating at ambient is 2.6 Amps per pin

There are three options available to mount these sockets. The socket can be mounted using hardware and needs holes for screws and can be positioned on the target board. If the holes cannot be drilled on the target board, epoxy mount sockets are the alternate option. Epoxy mount sockets use epoxy and special mechanism to mount the socket on the target board. The third option is using SMT emulator base. The SMT emulator base has balls on the bottom side that precisely matches the device array and has hardware for socket mounting.

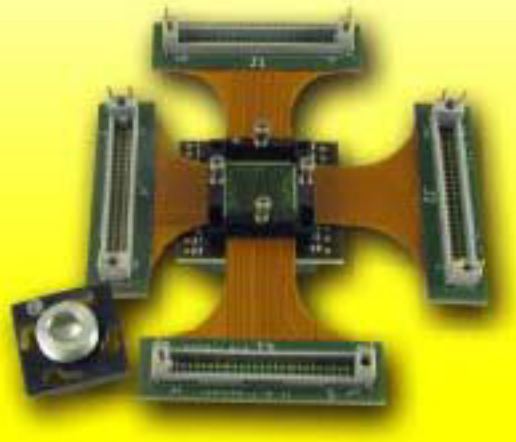


We can accommodate Kelvin applications using these new 0.4mm pitch SBT technology which uses offset plunger tips. Visit our web site for technical documents and socket drawings.

New Innovative Technologies

Heat Sink compression screws for GHz Socket

Ironwood Electronics' heat sink screws are constructed with 7075 aluminum and optimized using fin design with maximum surface area per simulation results from Qfin software. In addition to the heat dissipation, the heat sink screws provide compression mechanism for the device. The heat sink screw family consists of 4 different types with a cross reference to corresponding GHz socket family

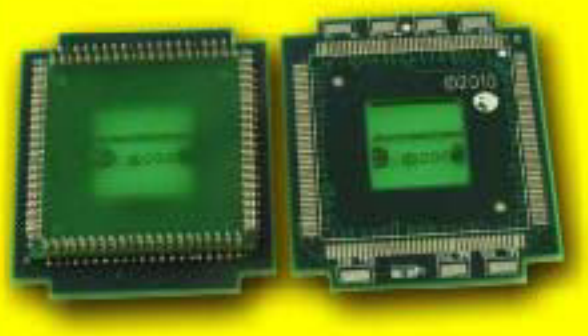


Multi-Level GHz Bandwidth Socket for Memory Probing

Ironwood Electronics offers high performance BGA sockets for high speed probing of the memory chip and debugging of the system during the design phase. The contactor operates at bandwidths up to 10GHz with less than 1dB insertion loss. Installation is quick and easy with a compression mechanism.

Stacked GHz Bandwidth Socket for POP (Processor and Memory)

Ironwood Electronics offers double stacked sockets addressing high performance requirements for testing processor and memory simultaneously. The contactor is a stamped spring pin with 26 gram actuation force per ball and cycle life of 500,000 insertions. A known good memory attached to the socket lid allows processor screening quick and easy by testing both sides simultaneously.



Device Converter allows reliable conversion to upgraded modules

Ironwood Electronics offers device converters allowing upgraded system programmable devices to be used in the previous generation system boards. These device converters can be soldered directly onto the SMT pads using standard solder methods. Ironwood Electronics device converter consists of footprint and pin out conversion multi layer PCB with a true j-lead adapter for SMT processing.

B.C.E. ELECTRONICS

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