

# TEST & BURN-IN, PRODUCTION, PROTOTYPING SOCKETS AND RECEPTACLES

ET is proud to carry several thousand different sockets to meet your unique applications. When you're looking for a socket solution, ET is your one-stop shop providing you with the resources to quickly and accurately find the right socket to meet your needs. Whether you are looking for an off-the-shelf solution or a custom design, our technical staff can assist you.

## How to Choose The Right Socket

Finding the right socket for your project is easy. Gathering the following key characteristics will assist you in finding the correct ET part number:

1. Pin count
2. Chip size
3. Grid size
4. Socket style (Burn-in, Surface Mount)
5. Bandwidth of chip

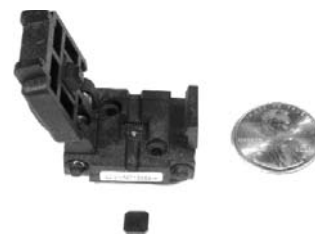
When you are ready to order, please provide the following:

1. Chip manufacturer, part number, and package outline drawing
2. Socket style: Production, Test & Burn-in, SMT or Thru Hole
3. Quantity and delivery requirements

See our complete socket listing online: [www.1800adapter.com/049](http://www.1800adapter.com/049)



BGA Screw Lock Production Sockets  
Page 130



QFN/MLF ZIF Sockets  
Page 149

Custom Configurations Available	Test & Burn-in (ZIF)	Production	Prototyping	Dual Beam	Pogo Pin / Spring Probe	Elastomer	< 1 GHz	Up to 3 GHz	Up to 14 GHz	Up to 40 GHz	SOCKET SOLUTIONS	
											Catalog	Page
<b>BGA (Ball Grid Array) Sockets</b>												
X		X	X		X			X			BGA SMT & Thru-hole Development up to 3 GHz	130-133
X	X	X			X			X			BGA SMT & Thru-hole Knob Lock	134
X		X			X			X			BGA SMT & Thru-hole ZIF Lock up to 3 GHz	135
X	X	X	X		X				X		BGA Custom High Speed 4.6 to 14 GHz BGA Sockets	136
X				X		X				X	BGA High Performance up to 40 GHz	137
X		X	X	X					X		BGA (BPE) Base Package Emulators	138, 139
X		X	X	X					X		BGA (FPA) Flat Pin Array	140, 141
X		X	X	X					X		BGA (XPA) Extender	142
X	X	X	X					X			BGA Chip Screening Socket System	143
X		X	X	X					X		HiLo Flexible Interconnect System up to 9.3 GHz	144, 145
X	X		X	X							Micro-BGA & BGA Sockets—Test & Burn-In	146-148
<b>non-BGA Sockets</b>												
X	X		X	X	X		X				QFN/MLF, MAP, TAP, LAP Sockets	149
X	X	X	X	X			X				TSOP/TSSOP, SOJ, SOIC	150
X	X	X	X	X			X				SSO/DIP/SDIP	151
X	X		X	X			X				PQFP/TQFP Sockets—Test & Burn-in/ SMT	154, 155
X	X		X	X			X				PGA Test & Burn-in	156, 157
X	X		X		X		X				PLCC Chip Screening Socket System	143
X	X		X	X	X		X				PGA & HGA Test & Burn-in	157
	X		X	X	X		X				PLCC Sockets—Burn-in/Production	158
<b>Socket Receptacles</b>												24, 25
X	X	X	X	X							Socket Receptacles	152, 153

# SOCKETS - BGA SMT AND THRU-HOLE DEVELOPMENT UP TO 3 GHz

## SCREW LOCK SOCKETS

These sockets can be either surface mount or thru-hole mount to your target PCB - for ease of chip insertion and removal utilizing a screw lock lid.

### FEATURES & BENEFITS

- Available for ceramic, plastic BGA and land grid array (LGA)
- Screw lock compression type socket guarantees contact continuity even under the highest shock and vibration
- Thru-hole version eliminates surface mount soldering problems
- Easily exchange and replace chips with no desoldering required
- Utilizes solder paste or solder flux and industry standard rework stations
- Prevents time-consuming board revisions
- Customs available upon request

### APPLICATIONS

- Development
- Debug
  - Hand Test
- Programming / Test
  - Qualification
  - Production

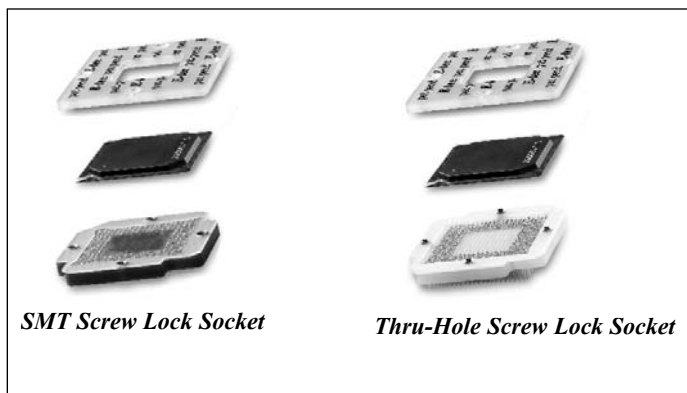
### BALL PITCH

- BGA (1.27mm)
- mBGA (1.00mm, 0.80mm, 0.75mm, 0.65mm, 0.50mm)

### GRID SIZES

- 8X8 through 40X40

**NOTE:** Manufacturer's chip package drawing required with each order.



SMT Screw Lock Socket

Thru-Hole Screw Lock Socket

### Electrical Specifications

Bandwidth	Up to 3GHz
Lead Inductance	< 2 nH
Contact Resistance	< 100m ohms
Insulation Resistance	100m ohms if 0.50 to 0.80mm pitch
	500m ohms 1.00mm pitch upwards
Current Rating	500 mA max.
Capacitance	<1 pF
Breakdown Voltage at 60Hz	500 V min.

### Mechanical Specifications

Contact Life	10,000 cycles minimum
Retention System Life	10,000 cycles minimum
Solderability (Method 208)	Exceeds MIL-STD-202
Individual Contact Force	40 grams max.
Max Torque for Retention Screws	7cN per meter, or 10 oz. per inch

### Materials

Insulator	Glass epoxy FR4
Terminal	Brass
Contact	BeCu

### Operating Temperature

Temperature Range	-55 degrees C to + 130 degrees C
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### EMULATION TECHNOLOGY RECOMMENDS:

#### Try our BGA Screw Lock Torque Screwdriver

Pre-set torque screwdriver ensures correct tightening of retention frames. Ideal accessory for BGA Screw Lock Socket users.

**Web Link: [www.1800adapter.com/120](http://www.1800adapter.com/120)**

#### Try our BGA Solder Stencils

Residue-free adhesive backing means these stencils are self-sticking ...so you can say goodbye to tape and fixturing forever!

**Web Link: [www.1800adapter.com/019](http://www.1800adapter.com/019)**

#### Try our BGA Emulator Solution

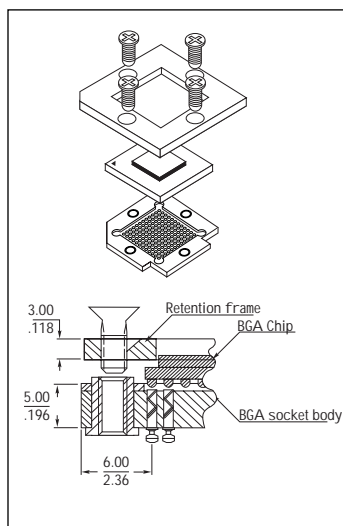
Converts ET screw-lock SMT or Thru-hole sockets into an emulator pod receptacle for JTAG or similar testing. Test. Emulate. Connect.

**Web Link: [www.1800adapter.com/127](http://www.1800adapter.com/127)**

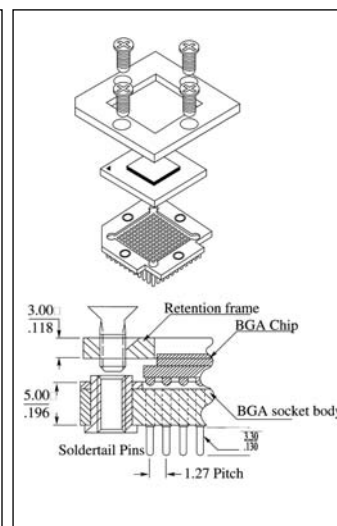
For a complete list of socket specifications, pricing and delivery information, please see:

BGA Sockets: **[www.1800adapter.com/048](http://www.1800adapter.com/048)**

### SMT STANDARD STYLE

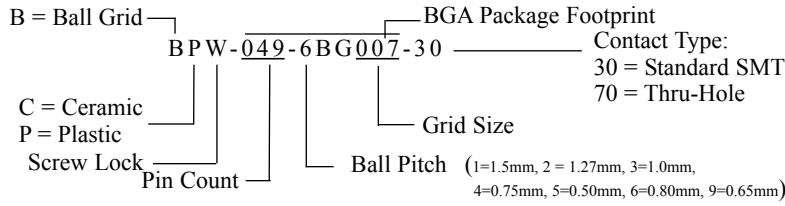


### THRU-HOLE STYLE



# BGA SMT & THRU-HOLE DEVELOPMENT UP TO 3 GHz - SOCKETS

## Ordering Information Example



## SCREW LOCK SOCKETS

For a complete list of socket specifications,  
pricing and delivery information, please see:

**Web Link:**  
[www.1800adapter.com/048](http://www.1800adapter.com/048)

SOCKETS & RECEPTACLES:  
TEST & BURN-IN, PRODUCTION

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
225	27	15X15	Surface Mount	BPW-225-1BG015-30	SKT1120
225	27	15X15	Thru Hole	BPW-225-1BG015-70	SKT1123

## 1.27mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
16	15.8X11.0	8X8	Surface Mount	BPW-016-2BG008-30	SKT1177
119	14X22	7X17	Surface Mount	BPW-119-2BG7X17-30	SKT846
119	14X22	7X17	Thru-hole	BPW-119-2BG7X17-70	SKT846
120	11X17	10X16	Surface Mount	BPW-120-3BG10X16-30	SKT1256
120	11X17	10X16	Thru-hole	BPW-120-3BG10X16-70	SKT1256
144	13X13	12X12	Surface Mount	BPW-144-3BG012-30	SKT1119
144	13X13	12X12	Thru-hole	BPW-144-3BG012-70	SKT1119
153	14X22	17X17	Surface Mount	BPW-153-2BG9X17-30	SKT1189
153	14X22	17X17	Thru-hole	BPW-153-2BG9X17-70	SKT1189
208	23X23	17X17	Surface Mount	BPW-208-2BG017-30	SKT992
208	23X23	17X17	Thru-hole	BPW-208-2BG017-70	SKT992
217	23X23	17X17	Surface Mount	BPW-217-2BG017-30	SKT996
217	23X23	17X17	Thru-hole	BPW-217-2BG017-70	SKT996
225	20X20	15X15	Surface Mount	BPW-225-2BG015-30	SKT1269
225	20X20	15X15	Thru-hole	BPW-225-2BG015-70	SKT1269
225	27X27	15X15	Surface Mount	BPW-225-1BG015-30	SKT1120
225	27X27	15X15	Thru-hole	BPW-225-1BG015-70	SKT1120
241	35X35	17X17	Thru-hole	BPW-241-2BG017-70	SKT952
241	23X23	17X17	Surface Mount	BPW-241-2BG017-30	SKT1343
249	23X23	17X17	Surface Mount	BPW-249-2BG017-30	SKT1273
249	23X23	17X17	Thru-hole	BPW-249-2BG017-70	SKT1273
255	23X23	16X16	Surface Mount	BPW-256-2BG016-30	SKT1066
256	23X23	16X16	Thru-hole	BPW-256-2BG016-70	SKT1066
256	27X27	20X20	Surface Mount	BPW-256-2BG020-30	SKT814
256	27X27	20X20	Thru-hole	BPW-256-2BG020-70	SKT814
256	31X31	23X23	Surface Mount	BPW-256-2BG023-30	SKT036
256	31X31	23X23	Thru-hole	BPW-256-2BG023-70	SKT036
272	27X27	20X20	Surface Mount	BPW-272-2BG020-30	SKT818
272	27X27	20X20	Thru-hole	BPW-272-2BG020-70	SKT818
272	29X29	21X21	Surface Mount	BPW-272-2BG021-30	SKT1027
272	29X29	21X21	Thru-hole	BPW-272-2BG021-70	SKT1027
289	23X23	17X17	Surface Mount	BPW-289-2BG017-30-P	SKT1512
292	27X27	20X20	Surface Mount	BPW-292-2BG020-30	SKT753
292	27X27	20X20	Thru-hole	BPW-292-2BG020-70	SKT753
308	27X27	20X20	Surface Mount	BPW-308-2BG020-30	SKT1191
308	27X27	20X20	Thru-hole	BPW-308-2BG020-70	SKT1191
316	27X27	20X20	Surface Mount	BPW-316-2BG020-30	SKT1192
316	27X27	20X20	Thru-hole	BPW-316-2BG020-70	SKT1192
324	27X27	24X24	Surface Mount	BPW-324-2BG020-30	SKT821
324	27X27	20X20	Thru-hole	BPW-324-2BG020-70	SKT821
328	27X27	20X20	Surface Mount	BPW-328-2BG020-30	SKT1327
328	27X27	20X20	Surface Mount	BPW-328-2BG020-30A	SKT1328
328	27X27	20X20	Thru-hole	BPW-328-2BG020-70	SKT1327
328	27X27	20X20	Thru-hole	BPW-328-2BG020-70A	SKT1328
329	30X30	23X23	Surface Mount	BPW-329-2BG023-30	SKT1160
329	30X30	23X23	Thru-hole	BPW-329-2BG023-70	SKT1160
336	27X27	20X20	Surface Mount	BPW-336-2BG020-30	SKT1000
336	27X27	20X20	Thru-hole	BPW-336-2BG020-70	SKT1000
348	27X27	20X20	Surface Mount	BPW-348-2BG020-30	SKT1001
348	27X27	20X20	Thru-hole	BPW-348-2BG020-70	SKT1001
352	35X35	26X26	Surface Mount	BPW-352-2BG026-30	SKT772
352	35X35	26X26	Thru-hole	BPW-352-2BG026-70	SKT772
356	27X27	20X20	Surface Mount	BPW-356-2BG020-30	SKT1176
356	27X27	20X20	Thru-hole	BPW-356-2BG020-70	SKT1176
356	35X35	26X26	Surface Mount	BPW-356-2BG026-30	SKT933

NOTE: Manufacturer's chip package drawing required with each order.

## 1.27mm Ball Pitch (cont.)

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
356	35X35	26X26	Thru-hole	BPW-356-2BG026-70	SKT933
360	31X31	23X23	Surface Mount	BPW-360-2BG023-30	SKT759
360	31X31	23X23	Thru-hole	BPW-360-2BG023-70	SKT759
380	31X31	24X24	Surface Mount	BPW-380-2BG024-30	SKT1324
380	31X31	24X24	Thru-hole	BPW-380-2BG024-70	SKT1324
384	37.5X37.5	28X28	Thru-hole	BPW-384-2BG028-70	SKT1618
388	35X35	26X26	Surface Mount	BPW-388-2BG026-30	SKT817
388	35X35	26X26	Thru-hole	BPW-388-2BG026-70	SKT817
409	31X31	23X23	Surface Mount	BPW-409-2BG023-30	SKT1029
409	31X31	23X23	Thru-hole	BPW-409-2BG023-70	SKT1029
416	31X31	30X30	Surface Mount	BPW-416-2BG030-30	SKT1134
416	31X31	30X30	Thru-hole	BPW-416-2BG030-70	SKT1134
420	35X35	26X26	Surface Mount	BPW-420-2BG026-30	SKT1002
420	35X35	26X26	Thru-hole	BPW-420-2BG026-70	SKT1002
421	31X31	23X23	Surface Mount	BPW-421-2BG023-30	SKT951
421	31X31	23X23	Thru-hole	BPW-421-2BG023-70	SKT951
432	40X40	31X31	Surface Mount	BPW-432-2BG031-30	SKT934
432	40X40	31X31	Thru-hole	BPW-432-2BG031-70	SKT934
480	37.5X37.5	29X29	Surface Mount	BPW-480-2BG029-30	SKT947
480	37.5X37.5	29X29	Thru-hole	BPW-480-2BG029-70	SKT947
484	30X30	22X29	Surface Mount	BPW-484-2BG022-30	SKT1274
484	30X30	22X29	Thru-hole	BPW-484-2BG022-70	SKT1274
492	35X35	26X26	Surface Mount	BPW-492-2BG026-30	SKT1005
492	35X35	26X26	Thru-hole	BPW-492-2BG026-70	SKT1005
500	40X40	30X30	Surface Mount	BPW-500-2BG030-30	SKT869
500	40X40	30X30	Thru-hole	BPW-500-2BG030-70	SKT869
516	35X35	26X26	Surface Mount	BPW-516-2BG026-30	SKT1300
516	35X35	26X26	Thru-hole	BPW-516-2BG026-70	SKT1300
520	35X35	26X26	Surface Mount	BPW-520-2BG026-30	SKT1276
520	35X35	26X26	Thru-hole	BPW-520-2BG026-70	SKT1276
528	40X40	30X30	Surface Mount	BPW-528-2BG030-30	SKT1149
528	40X40	30X30	Thru-hole	BPW-528-2BG030-70	SKT1149
548	40X40	26X26	Surface Mount	BPW-548-2BG026-30	SKT1071
548	40X40	26X26	Thru-hole	BPW-548-2BG026-70	SKT1071
560	42.5X42.5	33X33	Surface Mount	BPW-560-2BG033-30	SKT781
560	42.5X42.5	33X33	Thru-hole	BPW-560-2BG033-70	SKT781
564	40X40	30X30	Surface Mount	BPW-564-2BG030-30	SKT1562
564	40X40	30X30	Thru-hole	BPW-564-2BG030-70	SKT1562
576	40X40	30X30	Surface Mount	BPW-576-2BG030-30	SKT1030
576	40X40	30X30	Thru-hole	BPW-576-2BG030-70	SKT1030
596	40X40	30X30	Surface Mount	BPW-596-2BG030-30	SKT1199
596	40X40	30X30	Thru-hole	BPW-596-2BG030-70	SKT1199
600	45X45	35X35	Surface Mount	BPW-600-2BG035-30	SKT806
600	45X45	35X35	Thru-hole	BPW-600-2BG035-70	SKT806
600	45X45	35X35	Surface Mount	BPW-600-2BG035B-30	SKT1553
600	45X45	35X35	Thru-hole	BPW-600-2BG035B-70	SKT1553
652	45X45	35X35	Surface Mount	BPW-652-2BG035-30	SKT949
652	45X45	35X35	Thru-hole	BPW-652-2BG035-70	SKT949
652	45X45	35X35	Surface Mount	BPW-652-2BG035B-30	SKT1351
652	45X45	35X35	Thru-hole	BPW-652-2BG035B-70	SKT1351
728	35X35	27X27	Surface Mount	BPW-728-2BG027-30	SKT1436
728	35X35	27X27	Thru-hole	BPW-728-2BG027-70	SKT1436
841	37.5X37.5	29X29	Surface Mount	BPW-841-2BG029-30	SKT1427
841	37.5X37.5	29X29	Thru-hole	BPW-841-2BG029-70	SKT1427
957	40X40	31X31	Surface Mount	BPW-957-2BG031-30	SKT1411
957	40X40	31X31	Thru-hole	BPW-957-2BG031-70	SKT1411
1444	40X40	38X38	Surface Mount	BPW-1444-2BG038-30	SKT1146
1444	40X40	38X38	Thru-hole	BPW-1444-2BG038-70	SKT1146

Call us (1-800-ADAPTER) or visit this link to  
request an immediate custom socket quotation:

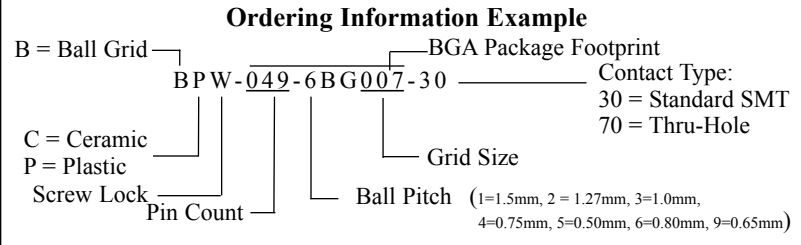
**Web Link: [www.1800adapter.com/128](http://www.1800adapter.com/128)**

# SOCKETS - BGA SMT & THRU-HOLE DEVELOPMENT UP TO 3 GHz

## SCREW LOCK SOCKETS

For a complete list of socket specifications, pricing and delivery information, please see:

**Web Link:**  
[www.1800adapter.com/048](http://www.1800adapter.com/048)



### 1.27mm Ball Pitch (cont.)

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
560	42.5X42.5	33X33	Surface Mount	BPW-560-2BG033-30	SKT781
560	42.5X42.5	33X33	Thru-hole	BPW-560-2BG033-70	SKT781
564	40X40	30X30	Surface Mount	BPW-564-2BG030-30	SKT1562
564	40X40	30X30	Thru-hole	BPW-564-2BG030-70	SKT1562
576	40X40	30X30	Surface Mount	BPW-576-2BG030-30	SKT1030
576	40X40	30X30	Thru-hole	BPW-576-2BG030-70	SKT1030
596	40X40	30X30	Surface Mount	BPW-596-2BG030-30	SKT1199
596	40X40	30X30	Thru-hole	BPW-596-2BG030-70	SKT1199
600	45X45	35X35	Surface Mount	BPW-600-2BG035-30	SKT806
600	45X45	35X35	Thru-hole	BPW-600-2BG035-70	SKT806
600	45X45	35X35	Surface Mount	BPW-600-2BG035B-30	SKT1553
600	45X45	35X35	Thru-hole	BPW-600-2BG035B-70	SKT1553
652	45X45	35X35	Surface Mount	BPW-652-2BG035-30	SKT949
652	45X45	35X35	Thru-hole	BPW-652-2BG035-70	SKT949
652	45X45	35X35	Surface Mount	BPW-652-2BG035B-30	SKT1351
652	45X45	35X35	Thru-hole	BPW-652-2BG035B-70	SKT1351
728	35X35	27X27	Surface Mount	BPW-728-2BG027-30	SKT1436
728	35X35	27X27	Thru-hole	BPW-728-2BG027-70	SKT1436
841	37.5X37.5	29X29	Surface Mount	BPW-841-2BG029-30	SKT1427
841	37.5X37.5	29X29	Thru-hole	BPW-841-2BG029-70	SKT1427
957	40X40	31X31	Surface Mount	BPW-957-2BG031-30	SKT1411
957	40X40	31X31	Thru-hole	BPW-957-2BG031-70	SKT1411
1444	40X40	38X38	Surface Mount	BPW-1444-2BG038-30	SKT1146
1444	40X40	38X38	Thru-hole	BPW-1444-2BG038-70	SKT1146

### 1.00mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
64	10X13	8X8	Surface Mount	BUW-064-3BG008-30	SKT1214
64	10x13	8X8	Thru Hole	BPW-064-3BG008-70	SKT1214
74	12X12	11X11	Surface Mount	BPW-074-3BG011-30	SKT1480
80	13x10	10X10	Surface Mount	BUW-080-3BG010-30	SKT1470
100	12X12	10X10	Surface Mount	BPW-100-3BG010-30	SKT1118
100	12X12	10X10	Thru Hole	BPW-100-3BG010-70	SKT1118
120	40X40	10X16	Thru Hole	BPW-120-3BG10X16-70	SKT1528
160	15X15	14X14	Surface Mount	BPW-160-3BG014-30	SKT1065
160	15X15	14X14	Thru Hole	BPW-160-3BG014-70	SKT1065
169	15X15	13X13	Raised SM	BPW-169-3BG013-29	SKT1454
196	15X15	14X14	Surface Mount	BPW-196-3BG014-30	SKT1347
196	15X15	14X14	Thru Hole	BPW-196-3BG014-70	SKT1347
208	17X17	16X16	Surface Mount	BPW-208-3BG016-30	SKT993
208	17X17	16X16	Thru Hole	BPW-208-3BG016-70	SKT993
256	17X17	16X16	Surface Mount	BPW-256-3BG016-30	SKT844
256	17X17	16X16	Thru Hole	BPW-256-3BG016-70	SKT844
289	19X19	17X17	Surface Mount	BPW-289-3BG017-30	SKT1153
289	19X19	17X17	Thru Hole	BPW-289-3BG017-70	SKT1153
321	19X19	18X18	Surface Mount	BPW-321-3BG018-30	SKT1456
324	19X19	18X18	Raised SM	BUW-324-3BG018-29	SKT1457
324	19X19	18X18	Surface Mount	BUW-324-3BG018-30	SKT1457
324	23X23	22X22	Surface Mount	BPW-324-3BG022-30	SKT1180
324	23X23	22X22	Thru Hole	BPW-324-3BG022-70	SKT1180
352	27X27	26X26	Surface Mount	BPW-352-3BG026-30	SKT1194
352	27X27	26X26	Thru Hole	BPW-352-3BG026-70	SKT1194
372	27X27	26X26	Surface Mount	BPW-388-3BG026-30	SKT1165
372	35X35	34X34	Surface Mount	BPW-372-3BG034-30	SKT1342
372	35X35	34X34	Thru Hole	BPW-372-3BG034-70	SKT1342
388	27X27	26X26	Thru Hole	BPW-388-3BG026-70	SKT1165
416	31X31	30X30	Surface Mount	BPW-416-3BG030-30	SKT1197
416	31X31	30X30	Thru Hole	BPW-416-3BG030-70	SKT1197
456	23X23	22X22	Surface Mount	BPW-456-3BG022-30	SKT1724
456	23X23	22X22	Thru Hole	BPW-456-3BG022-70	SKT1724

### 1.00mm Ball Pitch (cont.)

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
456	27X27	26X26	Surface Mount	BPW-456-3BG026-30	SKT1616
456	27X27	26X26	Surface Mount	BPW-456-3BG026-30H	SKT1621
456	27X27	26X26	Thru Hole	BPW-456-3BG026-70	SKT1616
480	35X35	34X34	Surface Mount	BPW-480-3BG034-30	SKT848
480	35X35	34X34	Thru Hole	BPW-480-3BG034-70	SKT848
484	23X23	22X22	Surface Mount	BPW-484-3BG022-30	SKT1128
484	23X23	22X22	Thru Hole	BPW-484-3BG022-70	SKT1128
484	27X27	26X26	Surface Mount	BPW-484-3BG026-30	SKT1124
484	27X27	26X26	Thru Hole	BPW-484-3BG026-70	SKT1124
603	31X31	30X30	Thru Hole	BPW-603-3BG030-70	SKT1600
648	35X35	33X33	Surface Mount	BPW-648-3BG033-30	SKT1293
648	35X35	33X33	Thru Hole	BPW-648-3BG033-70	SKT1293
672	27X27	26X26	Surface Mount	BPW-672-3BG026-30	SKT1129
672	27X27	26X26	Thru Hole	BPW-672-3BG026-70	SKT1129
676	27X27	26X26	Surface Mount	BPW-676-3BG026-30	SKT1201
676	27X27	26X26	Thru Hole	BPW-676-3BG026-70	SKT1201
680	35X35	34X34	Surface Mount	BPW-680-3BG034-30	SKT1723
680	35X35	34X34	Thru Hole	BPW-680-3BG034-70	SKT1723
680	40X40	39X39	Surface Mount	BPW-680-3BG039-30	SKT1426
696	40X40	38X38	Surface Mount	BPW-696-3BG038-30	SKT1420
788	35X35	34X34	Surface Mount	BPW-788-3BG034-30	SKT1498
788	35X35	34X34	Thru Hole	BPW-788-3BG034-70	SKT1498
792	14X14	39X39	Thru Hole	BPW-792-3BG039-70	SKT1200
792	40X40	39X39	Surface Mount	BPW-792-3BG039-30	SKT1200
896	31X31	30X30	Surface Mount	BPW-896-3BG030-30	SKT1601
896	31X31	30X30	Thru Hole	BPW-896-3BG030-70	SKT1601
900	31X31	30X30	Surface Mount	BPW-900-3BG030-30	SKT1561
900	31X31	30X30	Thru Hole	BPW-900-3BG030-70	SKT1561
956	40X40	38X38	Surface Mount	BPW-956-3BG038-30	SKT1379
1020	33X33	32X32	Surface Mount	BPW-1020-3BG032-30	SKT1223
1020	33X33	32X32	Thru Hole	BPW-1020-3BG032-70	SKT1223
1152	35X35	34X34	Surface Mount	BPW-1152-3BG034-30	SKT1312
1152	35X35	34X34	Thru Hole	BPW-1152-3BG034-70	SKT1312
1156	35X35	34X34	Surface Mount	BPW-1156-3BG034-30	SKT1218
1156	35X35	34X34	Thru Hole	BPW-1156-3BG034-70	SKT1218
1517	40X40	39X39	Surface Mount	BPW-1517-3BG039-30	SKT1313
1517	40X40	39X39	Thru Hole	BPW-1517-3BG039-70	SKT1313

### 0.80mm Ball Pitch

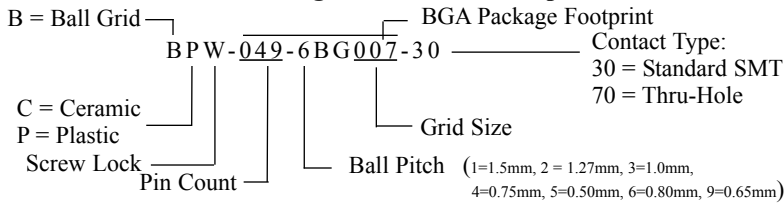
Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
49	7X7	7X7	Surface Mount	BPW-049-6BG007-30	SKT1154
49	7X7	7X7	Thru Hole	BPW-049-6BG007-70	SKT1154
63	11X12	8X12	Surface Mount	BUW-063-6BG8X12-30	SKT1729
64	8X8	8X8	Thru Hole	BPW-064-6BG008-YY	SKT1746
74	8X8	9X9	Surface Mount	BPW-074-6BG009-30	SKT1150
74	8X8	9X9	Thru Hole	BPW-074-6BG009-70	SKT1150
81	8X8	9X9	Thru Hole	BPW-081-6BG009-70	SKT1258
81	8X8	9X9	Surface Mount	BUW-081-6BG009-30	SKT1258
100	10.1X10.1	10X10	Surface Mount	BPW-100-6BG010-30	SKT1126
100	10.1X10.1	10X10	Thru Hole	BPW-100-6BG010-70	SKT1126
100	11X11	10X10	Surface Mount	BPW-100-6BG011-30	SKT1271
100	11X11	11X11	Thru Hole	BPW-100-6BG011-70	SKT1271
100	13.54X13.54	12X12	Surface Mount	BPW-100-6BG012-30	SKT1187
100	13.54X13.54	12X12	Thru Hole	BPW-100-6BG012-70	SKT1187
121	10X10	11X11	Surface Mount	BPW-121-6BG011-30	SKT1277
121	10X10	11X11	Thru Hole	BPW-121-6BG011-70	SKT1277
132	15X15	14X14	Surface Mount	BPW-132-6BG014-30	SKT1349
132	15X15	14X14	Surface Mount	BPW-132-6BG014-30-3	SKT1366
132	15X15	14X14	Thru Hole	BPW-132-6BG014-70	SKT1349
144	11X11	12X12	Surface Mount	BPW-144-6BG012-30	SKT1181

NOTE: Manufacturer's chip package drawing required with each order.



# BGA SMT & THRU-HOLE DEVELOPMENT UP TO 3 GHz - SOCKETS

## Ordering Information Example



## SCREW LOCK SOCKETS

For a complete list of socket specifications, pricing and delivery information, please see:

**Web Link:**  
[www.1800adapter.com/048](http://www.1800adapter.com/048)

## 0.80mm Ball Pitch (cont.)

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
144	12X12	13X13	Surface Mount	BPW-144-6BG013-30	SKT990
144	12X12	13X13	Thru Hole	BPW-144-6BG013-70	SKT990
144	13X13	13X13	Thru Hole	BPW-144-6BG013B-70	SKT1311
160	12X12	14X14	Thru Hole	BPW-160-6BG014-70	SKT1311
168	12.1X12.1	14X14	Surface Mount	BPW-168-6BG014-30	SKT1278
168	12.1X12.1	14X14	Thru Hole	BPW-168-6BG014-70	SKT1278
168	14X14	12X12	Thru Hole	BUW-168-6BG014-YY	SKT1747
180	12X12	14X14	Surface Mount	BPW-180-6BG014-30	SKT1386
180	12X12	14X14	Thru Hole	BPW-180-6BG014-70	SKT1386
192	16X16	16X16	Surface Mount	BPW-192-6BG016-30	SKT1279
192	16X16	16X16	Thru Hole	BPW-192-6BG016-70	SKT1279
196	12X12	14X14	Surface Mount	BPW-196-6BG014-30	SKT991
196	12X12	14X14	Thru Hole	BPW-196-6BG014-70	SKT991
208	15X15	17X17	Surface Mount	BPW-208-6BG017-30	SKT995
208	15X15	17X17	Thru Hole	BPW-208-6BG017-70	SKT995
228	12X12	22X22	Thru Hole	BPW-228-5BG022-YY	SKT1760
249	16X16	17X17	Surface Mount	BPW-249-6BG017-30	SKT1272
249	16X16	17X17	Thru Hole	BPW-249-6BG017-70	SKT1272
256	15X15	17X17	Surface Mount	BPW-256-6BG017-30	SKT1511
256	15X15	17X17	Thru Hole	BPW-256-6BG017-70	SKT1511
257	16X16	19X19	Surface Mount	BPW-257-6BG019-30	SKT1560
280	16X16	19X19	Surface Mount	BPW-280-6BG019-30	SKT1280
280	16X16	19X19	Thru Hole	BPW-280-6BG019-70	SKT1280

## 0.75mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
46	7.00X7.30	6X8	Thru Hole	BUW-046-4BG6X8-YY	SKT1761

## 0.50mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
144		13X13	Surface Mount	BPW-144-8BG013B-30	SKT1713

## 0.40mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
96	6x6	14X14	Surface Mount	BPW-096-5BG014-30	SKT1713

NOTE: Manufacturer's chip package drawing required with each order.

## EMULATION TECHNOLOGY RECOMMENDS:



ET's ultra-modern, high tech design torque limiting screwdriver ensures correct tightening of retention frames used with our BGA Screw Lock Sockets, BGA Socket Emulator Adapter and Bluetooth 104 001 Socket & Adapter Systems. (Part # ET-TORQ-7CN)

- Safely tighten retention socket frames
- Safeguard expensive devices
- Screwdriver preset to 0.7 oz. in.

For pricing and delivery information see:

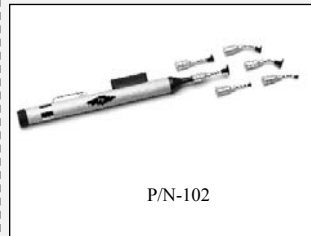
**Web Link:** [www.1800adapter.com/118](http://www.1800adapter.com/118)

## EMULATION TECHNOLOGY RECOMMENDS:

Safely handle your fine-pitch devices with a product from Emulation Technology's Vacuum handling systems.

### Vacuum Pens

ET's vacuum pens are hand-held, manually operated handling tools that allow you to lift and move fine pitch devices.



- Easily lift ICs without damaging device
- Eliminates need to touch fragile packages
- Built-in vacuum
- All pens come with tips

These ESD-safe units feature a silver aluminum body and non-marking static dissipative black rubber vacuum cups. The pens' vacuum is generated by pressing and releasing the vacuum push button.

For a complete list of vacuum specifications, pricing and delivery information, please see:

**Web Link:** [www.1800adapter.com/086](http://www.1800adapter.com/086)

## EMULATION TECHNOLOGY RECOMMENDS:

### Try our BGA Solder Stencils

Residue-free adhesive backing means these stencils are self-sticking ...so you can say goodbye to tape and fixturing forever!

**Web Link:** [www.1800adapter.com/019](http://www.1800adapter.com/019)

### Try our SolderQuik™ BGA Preform

Allows for easy and inexpensive testing of new BGA package designs. Use it for testing, rework and prototyping BGA packages.

**Web Link:** [www.1800adapter.com/043](http://www.1800adapter.com/043)

For a complete list of BGA socket specifications, pricing and delivery information, please see:

**Web Link:** [www.1800adapter.com/048](http://www.1800adapter.com/048)



# BGA SMT AND THRU-HOLE ZIF LOCK UP TO 3 GHz - SOCKETS

**BGA ZIF Lock Socket**



## Ordering Information Example

**B = Ball Grid** — BGA Package Footprint  
**C = Ceramic**  
**P = Plastic**  
**Z = ZIF Lock**

**BPZ-049-6BG007-30**  
 Pin Count: 49  
 Lead Pitch: 0.65mm (30)  
 Contact Type: 30 = Standard SMT, 70 = Thru-Hole

1=1.5mm  
 2 =1.27mm  
 3=1.0mm  
 4=0.75mm  
 5=0.50mm  
 6=0.80mm  
 9=0.65mm

## Electrical Specifications

Bandwidth	Up to 3 GHz
Lead Inductance	< 2 nH
Contact Resistance	< 100m ohms
Insulation Resistance	100m ohms if 0.50 to 0.80mm pitch
	500m ohms 1.00mm pitch upwards
Current Rating	500 mA max.
Capacitance	<1 pF
Breakdown Voltage at 60Hz	500V min.

## Mechanical Specifications

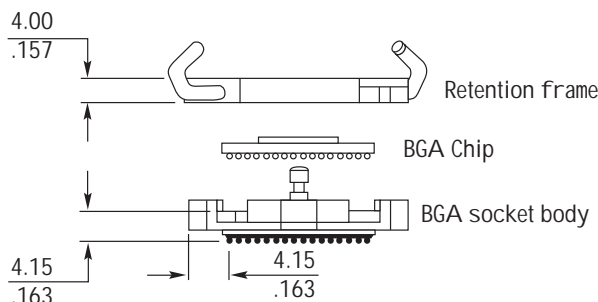
Contact Life	10,000 cycles minimum
Retention System Life	10,000 cycles minimum
Solderability (Method 208)	Exceeds MIL-STD-202
Individual Contact Force	40 grams max.

## Materials

Insulator	Glass epoxy FR4
Terminal	Brass
Contact	BeCu

## Operating Temperature

Temperature Range	-55 degrees C to +130 degrees C
Max Temperature Duration	220 degrees C for 10 sec.



NOTE: Manufacturer's chip package drawing required with each order.

## ZIF LOCK SOCKETS

With the zero insertion force socket (ZIF), users simply place the DUT into the socket which is automatically guided into the correct position. Contact force is only generated when closing the chip retention feature, which then applies force of less than 40 grams (1.4 oz.) per contact which protects your device from damage.

## FEATURES & BENEFITS

- Available for ceramic, plastic BGA and land grid array (LGA)
- ZIF Lock Socket guarantees contact continuity even under the highest shock and vibration
- Avoid having to solder socket to PCB
- Easily exchange and replace chips with no desoldering required
- Utilizes solder paste or solder flux and industry standard rework stations
- Prevents time-consuming board revisions
- Rapid new design applications
- Customs available upon request

## APPLICATIONS

- Development
- Debug
  - Hand Test
- Programming / Test
  - Qualification
  - Production

## BALL PITCH

- BGA (1.27mm)

## GRID SIZES

- 16X16 to 26X26 (only)

## 1.27mm Pitch Ball Pitch

Pin Count (mm)	Chip Size	Grid Size	Socket Style	ET Part #	Drawing #
233		17X17	Thru Hole	BPZ-233-2BG017-70	SKT971
256		20X20	Surface Mount	BPZ-256-2BG020-30	SKT941
256		20X20	Thru Hole	BPZ-256-2BG020-70	SKT940
272		20X20	Surface Mount	BPZ-256-2BG020-70	SKT938
272		20X20	Surface Mount	BPZ-272-2BG020-30	SKT1074
316	27x27	20X20	Thru Hole	BPZ-272-2BG020-70	SKT1463
352		26X26	Surface Mount	BPZ-316-2BG020-30	SKT1322
352		26X26	Thru Hole	BPZ-352-2BG026-70	SKT1322
352	35x35	26X26	Thru Hole	BPZ-352-2BG026L-70	SKT1466
357		19X19	Surface Mount	BPZ-357-2BG019-30	SKT1032
357		19X19	Thru Hole	BPZ-357-2BG019-70	SKT1032
372	27x27	20X20	Surface Mount	BPZ-372-2BG020-30	SKT1432
388		26X26	Surface Mount	BPZ-388-2BG026-30	SKT1033
388		26X26	Thru Hole	BPZ-388-2BG026-70	SKT1033
456		26X26	Surface Mount	BPZ-456-2BG026-30	SKT1777
568	35x35	26X26	Surface Mount	BPZ-568-2BG026-30	SKT1433

For a complete list of ZIF Lock Socket specifications, pricing and delivery information, please see:

**Web Link: [www.1800adapter.com/102](http://www.1800adapter.com/102)**

# SOCKETS - BGA CUSTOM HIGH SPEED 4.6 GHz to 14 GHz

## COMPRESSION SOCKETS, POGO-PIN BASED

ET's custom high speed test sockets are available for any package on the market. The Clam Shell style with a floating package nest and floating lid ensures reliability. The sockets can also be designed to fit an automated handler or BGA solder footprint. These sockets are spring probe based and exhibit very high mechanical and electrical performance. We have ultra high performance spring probes available that will reach bandwidths of 4.6 to 14 GHz.

### FEATURES & BENEFITS

- Precision micro-probe contacts display ideal electrical characteristics such as low inductance, resistance, and capacitance
- Custom designed and manufactured for any standard or non-standard package, for which an off the shelf socket does not exist, or the existing socket is not suitable for the user specifications
- Mount surface on chip (SOC) test fixtures using double-ended pogo pin technology
- Sockets are designed for long life of up to 5,000 insertions
- All socket contacts are individually replaceable in field, making repairs quick, easy and cost-effective
- Can be repopulated to accommodate different footprints

### APPLICATIONS

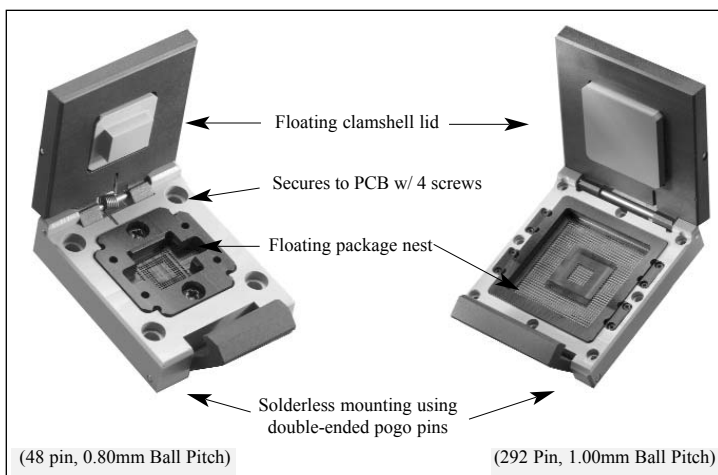
- Development
- Debug
  - Hand Test
- Programming / Test
  - Qualification
  - Production

### BALL PITCH

- BGA (1.27mm)
- mBGA (1.00mm, 0.80mm, 0.75mm, 0.65mm, 0.50mm)

### GRID SIZES

- 8X8 through 40X40



### Ordering Information Example

Socket Type \_\_\_\_\_ Internal Use  
 Product Code — S-BGA-20-292-A  
 Grid Size \_\_\_\_\_ Pin Count

### Electrical Specifications

Bandwidth	4.6Ghz to 14GHz depending on contact
Contact Resistance	<50m Ohms
Insulation Resistance 500V DC	>1000m Ohms
Current Rating	varies from 1A to 2~3A

### Mechanical Specifications

Individual Contact Force	Standard 18g/contact, can be changed
Contact Life	500,000 insertions
Heat Sink	Can be customized into the lid

### Materials

Insulator	Torlon 4203, Ultem 1000
Contact	Spring probes

### Operating Temperature

Temperature Range	Room temp to 150 degrees C
-------------------	----------------------------

### Information Required for Ordering:

- Package outline drawing needed, including pin counts, ball pitch & grid layout

**Sample Part #: S-BGA-16-292-A**

NOTE: Manufacturer's chip package drawing required with each order.

*Looking for a custom Adapter or PCB?*

We also design custom adapters & PCBs for your unique test application. Info:

**Web Link: [www.1800adapter.com/forms](http://www.1800adapter.com/forms)**

Call us (1-800-ADAPTER) or check out this link to request an immediate customsocket quotation:

**Web Link: [www.1800adapter.com/050](http://www.1800adapter.com/050)**





# SOCKETS - BGA (BPE)BASE PACKAGE EMULATORS

## LOW COST SOCKET SYSTEM

ET's Base Package Emulators (BPE) are a reliable, cost-effective alternative to soldering BGA devices directly to the PCB. These BPEs enable a BGA device to be plugged into a socket matching the BGAs device. The design provides results that are equivalent to direct PCB attach. These BPE sockets are an integral part of ET's BGA Socketing System.

## FEATURES & BENEFITS

- Very low inductance
- Protects valuable PC boards and subjects device to lower thermal stress
- Same footprint as BGA device
- Compact & easy to integrate into designs
- Customs available upon request

## APPLICATIONS

- Development
- Debug
  - Hand Test
- Programming/Test
  - Qualification
  - Production

## BALL PITCH

- 1.27mm, 1.00mm, 0.80mm

## GRID SIZES

- 6X8 through 44X44

NOTE: Manufacturer's chip package drawing required with each order.

### Emulation Technology Recommends:

*Try our Extender (XPA) Sockets...*

*to solve your BGA probing needs. Our XPA sockets are an integral part of our BGA Socket & Probing System*

**Web Link: [www.1800adapter.com/121](http://www.1800adapter.com/121)**

*Try our Flat Pin Array (FPA) Sockets...*

*to solve your BGA probing needs. Our FPA sockets are an integral part of our BGA Socket & Probing System*

**Web Link: [www.1800adapter.com/122](http://www.1800adapter.com/122)**

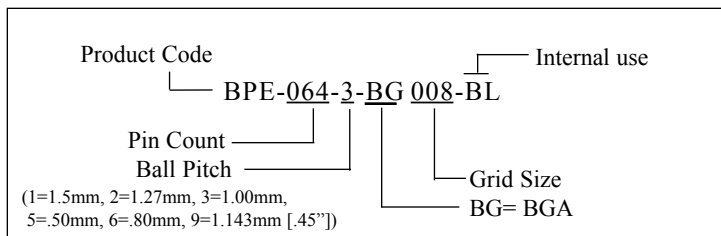
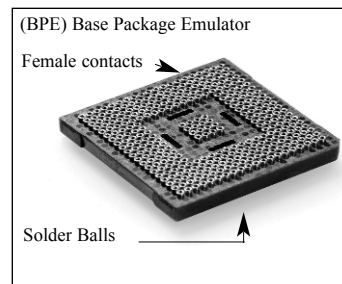
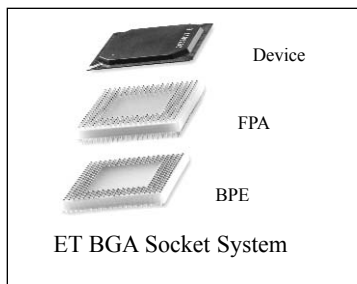
*Try our Chip Quik® SMD Removal Kit*

*Speeds up SMD removal without requiring expensive equipment or risking the use of heat guns.*

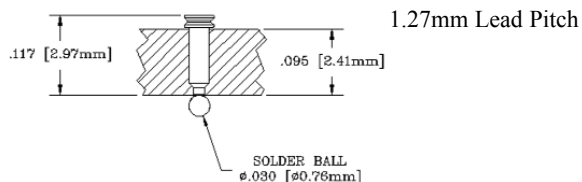
**Web Link: [www.1800adapter.com/046](http://www.1800adapter.com/046)**

*For a complete list of BPE Ssocket specifications, pricing and delivery information, please see:*

**Web Link: [www.1800adapter.com/123](http://www.1800adapter.com/123)**



Materials	
Terminals	Brass; copper alloy (C36000) ASTM-B-16
Contacts	Beryllium Copper; Copper Alloy (C17200), ASTM-B-194
Plating	Gold over nickel
Body Material	Molded or FR4
Solder Ball	63Sn/37Pb, Eutectic, 183 degrees C
Temperature Life	
U.L. Rated 94V-0	-60 degrees C to 260 degrees C



BPE				
Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
48	0.80	6X8	BPE-0048-6BG6X8-BL	F1082
49	0.80	7X7	BPE-049-6BG007-BL	F1098
64	1.00	8X8	BPE-0064-3BG008-BL	F6681
66	0.80	8X12	BPE-066-6BG8X12-BL	F6852
80	0.80	10X10	BPE-080-6BG010-BL	F6723
100	0.80	10X10	BPE-0100-6BG010-BL	F6414
100	0.80	11X11	BPE-0100-6BG011-BL	F6366
100	1.00	10X10	BPE-0100-3BG010-BL	F6055
108	1.00	12X12	BPE-0108-3BG012-BL	F6870
119	1.27	7X17	BPE-0119-2BG7X17-BL	F6369
121	0.80	11X11	BPE-121-6BG011-BL	F6871
128	0.80	12X12	BPE-128-6BG012-BL	F6872
144	0.80	12X12	BPE-0144-6BG012-BL	F6808
144	0.80	13X13	BPE-0144-6BG013-BL	F5935
144	1.00	12X12	BPE-0144-3BG012-BL	F3483
156	1.00	14X14	BPE-0156-3BG014-BL	F5367
160	0.80	14X14	BPE-0160-6BG014-BL	F1353
160	1.00	14X14	BPE-0160-3BG014-BL	F5557
176	0.80	15X15	BPE-0176-6BG015-BL	F6626
180	0.80	14X14	BPE-0180-6BG014-BL	SKT1394
196	1.00	14X14	BPE-0196-3BG014-BL	F5383
196	1.00	16X16	BPE-0196-3BG016-BL	F5982
208	0.80	17X17	BPE-0208-6BG017-BL	F5695
208	1.00	16X16	BPE-0208-3BG016-BL	F5983
208	1.27	17X17	BPE-0208-2BG017-BL	F6370

# BGA (BPE)BASE PACKAGE EMULATORS - SOCKETS

Product Code Internal use

BPE-064-3-BG 008-BL

Pin Count

Ball Pitch

Grid Size

BG= BGA

(1=1.5mm, 2=1.27mm, 3=1.00mm,  
5=.50mm, 6=.80mm, 9=1.143mm [.45"])

For a complete list of BPE Socket specifications,  
pricing and delivery information, please see:

**Web Link:**  
**www.1800adapter.com/123**

SOCKETS & RECEPTACLES:  
TEST & BURN-IN, PRODUCTION

## BPE (cont.)

Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
217	1.27	17X17	BPE-0217-2BG017-BL	F6371
225	1.27	15X15	BPE-0225-2BG015-BL	F6373
225	1.50	15X15	BPE-0225-1BG015-BL	F6372
233	1.27	17X17	BPE-0233-2BG017-BL	F6374
233	1.27	17X17	BPE-0233-2BG017-BL-1	F6862
233	1.27	17X17	BPE-0233-2BG017-BL-HL	F6817
241	1.27	17X17	BPE-0241-2BG017-BL	F6375
244	1.27	16X16	BPE-0244-2BG016-BL	F6873
255	1.27	16X16	BPE-0255-2BG016-BL	F6376
255	1.27	21X21	BPE-0255-2BG021-BL	F4472
256	0.80	20X20	BPE-0256-6BG020-BL	F6744
256	1.00	16X16	BPE-0256-3BG016-BL	F6060
256	1.27	16X16	BPE-0256-2BG016-BL	F6377
256	1.27	20X20	BPE-0256-2BG020-BL	F6063
256	1.27	23X23	BPE-0256-2BG023-BL	F6378
259	1.00	18X18	BPE-0259-3BG018-BL	F6754
272	1.27	20X20	BPE-0272-2BG020-BL	F3487
272	1.27	21X21	BPE-0272-2BG021-BL	F6379
280	0.80	19X19	BPE-0280-6BG019-BL	F6247
281	0.80	19X19	BPE-0281-6BG019-BL	F5984
288	0.80	19X19	BPE-0288-6BG019-BL	F6820
292	1.27	20X20	BPE-0292-2BG020-BL	F6381
300	1.00	20X20	BPE-0300-3BG020-BL	F6874
304	1.27	23X23	BPE-0304-2BG023-BL	F6382
304	1.27	16X19	BPE-0304-2BG16X19-BL	F4472
313	1.27	25X25	BPE-0313-2BG025-BL	F6952
316	1.27	20X20	BPE-0316-2BG020-BL	F6386
316	1.27	24X24	BPE-0320-2BG024-BL	F6387
324	1.00	18X18	BPE-0324-3BG018-BL	F6066
324	1.00	22X22	BPE-0324-3BG022-BL	F5985
324	1.27	20X20	BPE-0324-2BG020-BL	F6388
329	1.27	23X23	BPE-0329-2BG023-BL	F6875
342	1.27	24X24	BPE-0342-2BG024-BL	F4472
352	1.27	26X26	BPE-0352-2BG026-BL	F6084
352	1.27	31X31	BPE-0352-2BG031-BL	F4472
356	1.27	26X26	BPE-0356-2BG026-BL	F6069
357	1.27	19X19	BPE-0357-2BG019-BL	F6953
360	1.27	19X19	BPE-0360-2BG019-BL	F6390
360	1.27	23X23	BPE-0360-2BG023-BL	F6391
361	1.27	19X19	BPE-0361-2BG019-BL	F6392
361	1.27	25X25	BPE-0361-2BG025-BL	F4472
368	1.27	26X26	BPE-0368-2BG026-BL	F6393
372	1.27	20X20	BPE-0372-2BG020-BL	F6394

NOTE: Manufacturer's chip package drawing required with each order.

### Emulation Technology Recommends:

Try our Flat Pin Array (FPA)...

to solve your BGA probing needs. Our FPA sockets are an integral part of our BGA Socket & Probing System

**Web Link: www.1800adapter.com/122**

Try our HiLo Flexible Interconnect System

New connector design incorporates the highs, the lows, and the application flexibility your BGA design demands.

**Web Link: www.1800adapter.com/124**

For a complete list of BPE Socket specifications,  
pricing and delivery information, please see:

**Web Link: www.1800adapter.com/123**

## BPE (cont.)

Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
379	1.27	24X24	BPE-0379-2BG024-BL	F4472
387	1.27	26X26	BPE-0387-2BG026-BL	F6395
388	1.00	26X26	BPE-0388-3BG026-BL	F6397
388	1.27	26X26	BPE-0388-2BG026-BL	F3492
400	1.27	20X20	BPE-0400-2BG020-BL	F6396
413	1.00	23X23	BPE-0413-3BG023-BL	F6157
420	1.27	26X26	BPE-0420-2BG026-BL	F6398
421	1.27	23X23	BPE-0421-2BG023-BL	F6399
432	1.27	15X15	BPE-0432-2BG015-BL	F4472
432	1.27	24X24	BPE-0432-2BG024-BL	F6401
432	1.27	31X31	BPE-0432-2BG031-BL	F6155
452	1.27	26X26	BPE-0452-2BG026-BL	F6571
456	1.00	22X22	BPE-0456-3BG023-BL	F6826
456	1.00	26X26	BPE-0456-3BG026-BL	F6876
456	1.27	26X26	BPE-0456-2BG026-BL	F6249
460	1.27	28X28	BPE-0460-2BG028-BL	F6877
472	1.27	22X22	BPE-0472-2BG022-BL	F6402
474	1.27	19X25	BPE-0474-2BG19X25-BL	F6878
479	1.27	29X29	BPE-0479-2BG029-BL	F4472
480	1.27	26X26	BPE-0480-2BG026-BL	F6403
480	1.27	29X29	BPE-0480-2BG029-BL	F6404
483	1.27	22X22	BPE-0483-2BG022-BL	F6368
484	1.00	22X22	BPE-0484-3BG022-BL	F6072
484	1.00	26X26	BPE-0484-3BG026-BL	F6405
492	1.27	26X26	BPE-0492-2BG026-BL	F6049
500	1.27	30X30	BPE-0500-2BG030-BL	F6406
503	1.27	29X29	BPE-0503-2BG029-BL	F5513
505	1.27	26X26	BPE-0505-2BG026-BL	F5521
510	1.27	26X26	BPE-0510-2BG026-BL	F6407
516	1.27	26X26	BPE-0516-2BG026-BL	F6248
520	1.27	26X26	BPE-0520-2BG026-BL	F6954
528	1.27	30X30	BPE-0528-2BG030-BL	F6143
552	1.00	24X24	BPE-0552-3BG024-HL	F6672
560	1.27	33X33	BPE-0560-2BG033-BL	F6408
568	1.27	26X26	BPE-0568-2BG026-BL	F6673
575	1.27	24X24	BPE-0575-2BG024-BL	F6415
576	1.27	30X30	BPE-0576-2BG030-BL	F6409
596	1.27	30X30	BPE-0596-2BG030-BL	F6410
600	1.27	31X31	BPE-0600-2BG031-BL	F6879
600	1.27	35X35	BPE-0600-2BG035-BL	F6075
600	1.27	35X35	BPE-0600-2BG035-HL	F6631
608	1.00	30X30	BPE-0608-3BG030-BL	F6745
625	1.27	25X25	BPE-0625-2BG025-BL	F6412
652	1.27	35X35	BPE-0652-2BG035-BL	F6078
655	1.27	34X34	BPE-0655-2BG034-BL	F6413
672	1.00	26X26	BPE-0672-3BG026-BL	F6081
676	1.00	26X26	BPE-0676-3BG026-BL	F6880
680	1.00	39X39	BPE-0680-3BG039-BL	F5863
724	1.27	27X27	BPE-0724-2BG027-BL	F6194
728	1.27	27X27	BPE-0728-2BG027-BL	F6194
729	1.27	27X27	BPE-0729-2BG027-BL	F6881
783	1.00	28X28	BPE-0783-3BG028-BL	F6835
788	1.00	34X34	BPE-0788-3BG034-HL	F6882
820	1.00	34X34	BPE-0820-3BG034-BL	F6883
869	1.00	9X10	BPE-0086-9BG9X10-BL	F1033
896	1.00	30X30	BPE-0896-3BG030-BL	F6884
957	1.27	31X31	BPE-0957-2BG031-BL	F6416
1020	1.00	32X32	BPE-1020-3BG032-HL	F6885
1152	1.00	34X34	BPE-1152-3BG034-BL	F6886
1156	1.00	34X34	BPE-1156-3BG034-BL	F6227
1156	1.00	34X34	BPE-1156-3BG034-B1	F6887
1497	1.00	39X39	BPE-1497-3BG039-HL	F6888
1936	1.00	44X44	BPE-1936-3BG044-BL	F6858

# SOCKETS - BGA (FPA) FLAT PIN ARRAY

ET's Flat Pin Array (FPA) sockets are a reliable, cost-effective alternative to soldering BGA devices directly to the PCB. These FPAs enable a BGA device to be plugged into a socket matching the BGAs device. The design provides results that are equivalent to direct PCB attach. These FPAs sockets are an integral part of ET's BGA Socketing System.

## FEATURES & BENEFITS

- Very low inductance
- Protects valuable PC boards and subjects device to lower thermal stress
- Same footprint as BGA device
- Compact & easy to integrate into designs
- Solder your BGA chip to the FPA for multiple insertions into a surface mount BPE
- Customs available upon request

## APPLICATIONS

- Development
- Debug
  - Hand Test
- Programming/Test
  - Qualification
  - Production

## BALL PITCH

- 1.27mm, 1.00mm, 0.80mm

## GRID SIZES

- 6X8 through 44X44

NOTE: Manufacturer's chip package drawing required with each order.

### Emulation Technology Recommends:

Try our **Base Pin Extender (BPE)**...

to solve your BGA probing needs. Our BPE sockets are an integral part of our BGA Socket & Probing System

**Web Link: [www.1800adapter.com/123](http://www.1800adapter.com/123)**

Try our **Extender (XPA) Sockets**...

to solve your BGA probing needs. Our XPA sockets are an integral part of our BGA Socket & Probing System

**Web Link: [www.1800adapter.com/121](http://www.1800adapter.com/121)**

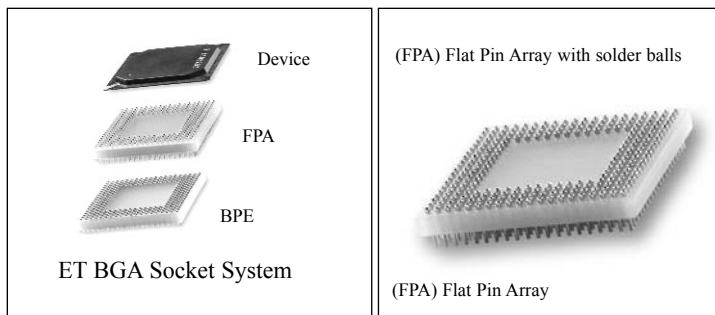
Try our **HiLo Flexible Interconnect System**

New connector design incorporates the highs, the lows, and the application flexibility your BGA design demands.

**Web Link: [www.1800adapter.com/124](http://www.1800adapter.com/124)**

For a complete list of FPA Socket specifications, pricing and delivery information, please see:

**Web Link: [www.1800adapter.com/122](http://www.1800adapter.com/122)**



### Ordering Information Example

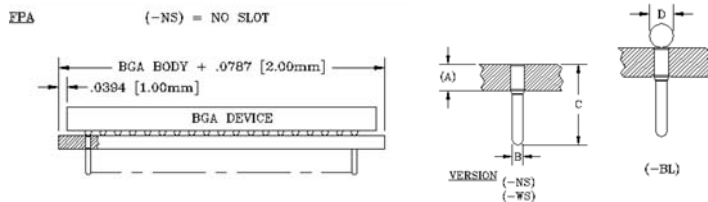
Product Code: FPA-304-2BG16X19-NS

Pin Count: 304  
Ball Pitch: 2 (1.27mm)

Grid Size: BG16X19 (BL = SMT Balls on Top Side, NS = No Slot, WS = With Slot)

(1=1.5mm, 2=1.27mm, 3=1.00mm, 5=.50mm, 6=.80mm, 9=1.143mm [.45"])

Materials	
Terminals	Brass; copper alloy (C36000) ASTM-B-16
Contacts	Beryllium Copper; Copper Alloy (C17200), ASTM-B-194
Plating	G-Gold over nickel
Body Material	M-Molded PPS (high-temp, glass-filled thermoplastic)
Solder Ball	63Sn/37Pb, Eutectic, 183 degrees C
Temperature Life	
U.L. Rated 94V-0	-60 degrees C to 260 degrees C

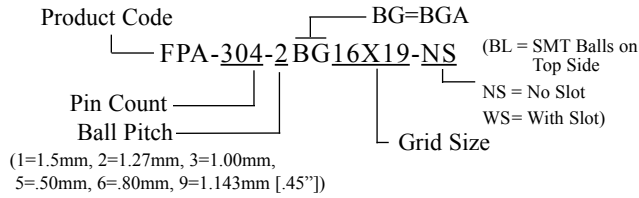


FPA				
Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
48	0.80	6X8	FPA-048-6BG6X8-NS	F4292
49	0.80	7X7	FPA-049-6BG007-BL	F6098
49	0.80	7X7	FPA-049-6BG007-NS	F6099
64	1.00	8X8	FPA-064-3-008-BL	F6889
64	1.00	8X8	FPA-064-3BG008-NS	F6680
66	0.80	8X12	FPA-066-6BG8X12-BL	F6721
66	0.80	8X12	FPA-066-6BG8X12-NS	F6890
80	0.80	10X10	FPA-080-6BG010-BL	F6722
100	0.80	10X10	FPA-100-6BG010-BL	F6891
100	0.80	10X10	FPA-100-6BG010-NS	F6079
100	1.00	10X10	FPA-100-3BG010-BL	F6056
100	1.00	10X10	FPA-100-3BG010-WS	F6057
121	0.80	11X11	FPA-121-6BG011-NS	F6892
128	0.80	12X12	FPA-128-6BG012-NS	F6893
144	0.80	13X13	FPA-144-6BG013-BL	F5988
144	0.80	12X12	FPA-144-6BG012-NS	F6867
144	1.00	12X12	FPA-144-3BG012-BL	F6070
144	1.00	12X12	FPA-144-3BG012-WS	F3484
156	1.00	14X14	FPA-156-3BG014-BL	F5989
160	0.80	14X14	FPA-160-6BG014-BL	F6972
160	1.00	14X14	FPA-160-3BG014-BL	F5821
160	1.00	14X14	FPA-160-3BG014-NS	F5569



# BGA (FPA) FLAT PIN ARRAY - SOCKETS

## Ordering Information Example



For a complete list of FPA Socket specifications, pricing and delivery information, please see:

**Web Link:**  
[www.1800adapter.com/122](http://www.1800adapter.com/122)

## FPA (cont.)

Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
176	0.80	15X15	FPA-176-6BG015-BL	F66F0
176	0.80	15X15	FPA-176-6BG015-NS	F6627
180	0.80	14X14	FPA-180-6BG014-BL	F6894
180	0.80	14X14	FPA-180-6BG014-NS	F6895
196	1.00	14X14	FPA-196-3BG014-BL	F5990
196	1.00	16X16	FPA-196-3BG016-BL	F5822
196	1.00	14X14	FPA-196-3BG014-NS	F5F41
196	1.00	14X14	FPA-196-3BG014-WS	F5245
208	0.80	17X17	FPA-208-6BG017-BL	F6689
208	1.00	16X16	FPA-208-3BG016-BL	F5823
208	1.00	16X16	FPA-208-3BG016-WS	F6071
225	1.27	15X15	FPA-225-2BG015-NS	F4471
225	1.27	15X15	FPA-225-2BG015-WS	F4471
225	1.50	15X15	FPA-225-1BG015-BL	F6058
225	1.50	15X15	FPA-225-1BG015-WS	F6059
233	1.27	17X17	FPA-233-2BG017-BL	F6955
233	1.27	17X17	FPA-233-2BG017-HL	F6896
233	1.27	17X17	FPA-233-2BG017-WS	F6956
233	1.27	17X17	FPA-233-2BG017-BL-1	F6869
241	1.27	17X17	FPA-241-2BG023-NS	F4471
256	0.80	20X20	FPA-256-6BG020-NS	F6742
256	1.00	16X16	FPA-256-3BG016-BL	F5825
256	1.00	16X16	FPA-256-3BG016-NS	F6061
256	1.27	20X20	FPA-256-2BG020-BL	F6065
256	1.27	16X16	FPA-256-2BG016-NS	F4471
256	1.27	16X16	FPA-256-2BG016-WS	F6602
256	1.27	20X20	FPA-256-2BG020-NS	F4471
256	1.27	20X20	FPA-256-2BG020-WS	F6065
272	1.27	20X20	FPA-272-2BG020-BL	F3488
272	1.27	20X20	FPA-272-2BG020-NS	F4471
272	1.27	20X20	FPA-272-2BG020-WS	F3490
280	0.80	19X19	FPA-280-6BG019-BL	F6250
280	0.80	19X19	FPA-280-6BG019-NS	F6250
281	0.80	19X19	FPA-281-6BG019-BL	F6212
281	0.80	19X19	FPA-281-6BG019-NS	F6897
292	1.27	20X20	FPA-292-2BG020-BL	F6789
292	1.27	20X20	FPA-292-2BG020-NS	F6790
304	1.27	23X23	FPA-304-2BG023-BL	F6970
304	1.27	29X29	FPA-304-2BG029-BL	F6971
304	1.27	23X23	FPA-304-2BG023-NS	F6898
304	1.27	16X19	FPA-304-2BG16X19-NS	F4471
304	1.27	16X19	FPA-304-2BG16X19-WS	F4471
313	1.27	25X25	FPA-313-2BG025-NS	F6899
320	1.27	24X24	FPA-320-2BG024-BL	F607F
320	1.27	24X24	FPA-320-2BG024-WS	F6900
324	1.00	18X18	FPA-324-3BG018-BL	F6067
324	1.00	22X22	FPA-324-3BG022-BL	F5993
324	1.00	18X18	FPA-324-3BG018-WS	F6068
324	1.00	22X22	FPA-324-3BG022-WS	F4471
324	1.27	20X20	FPA-324-2BG020-WS	F4471
329	1.27	23X23	FPA-329-2BG023-NS	F6694
352	1.27	26X26	FPA-352-2BG026-BL	F6008
352	1.27	26X26	FPA-352-2BG026-NS	F4471
352	1.27	26X26	FPA-352-2BG026-WS	F6085
356	1.27	26X26	FPA-356-2BG026-BL	F6901
356	1.27	26X26	FPA-356-2BG026-NS	F4471
356	1.27	26X26	FPA-356-2BG026-WS	F6071
357	1.27	19X19	FPA-357-2BG019-NS	F4471
357	1.27	19X19	FPA-357-2BG019-WS	F6581
361	1.27	19X19	FPA-361-2BG019-NS	F6512
372	1.27	20X20	FPA-372-2BG020-NS	F4471
388	1.00	26X26	FPA-388-3BG026-BL	F6809
388	1.00	26X26	FPA-388-3BG026-NS	F648F

NOTE: Manufacturer's chip package drawing required with each order.

## FPA (cont.)

Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
388	1.00	26X26	FPA-388-3BG026-WS	F6482
388	1.00	26X26	FPA-388-3BG026-ISI	F6902
388	1.27	26X26	FPA-388-2BG026-BL	F3494
388	1.27	26X26	FPA-388-2BG026-NS	F6577
388	1.27	26X26	FPA-388-2BG026-WS	F6046
400	1.27	20X20	FPA-400-2BG020-NS	F4471
405	1.27	31X31	FPA-405-2BG031X25-BL	F6903
416	1.00	26X26	FPA-416-3BG026-WS	F6353
421	1.27	21X21	FPA-421-2BG021-NS	F6904
421	1.27	23X23	FPA-421-2BG023-NS	F4471
432	1.27	31X31	FPA-432-2BG031-BL	F6905
432	1.27	31X31	FPA-432-2BG031-NS	F6142
432	1.27	31X31	FPA-432-2BG031-WS	F6048
441	1.27	21X21	FPA-441-2BG021-NS	F4471
441	1.27	21X21	FPA-441-2BG021-WS	F4471
452	1.27	26X26	FPA-452-2BG026-NS	F4471
452	1.27	26X26	FPA-452-2BG026-WS	F4471
456	1.00	22X22	FPA-456-3BG022-BL	F6825
456	1.00	26X26	FPA-456-3BG026-BL	F6906
456	1.00	22X22	FPA-456-3BG022-NS	F6824
456	1.00	26X26	FPA-456-3BG026-WS	F6907
456	1.27	26X26	FPA-456-2BG026-BL	F6F46
456	1.27	26X26	FPA-456-2BG026-NS	F6252
456	1.27	26X26	FPA-456-2BG026-WS	F4471
465	1.27	27X27	FPA-465-2BG027-NS	F6908
472	1.27	22X22	FPA-472-2BG022-BL	F5994
472	1.27	22X22	FPA-472-2BG022-NS	F4471
480	1.27	29X29	FPA-480-2BG029-BL	F6601
480	1.27	26X26	FPA-480-2BG026-NS	F6909
480	1.27	29X29	FPA-480-2BG029-NS	F4471
484	1.00	22X22	FPA-484-3BG022-BL	F6957
484	1.00	22X22	FPA-484-3BG022-NS	F6198
484	1.00	22X22	FPA-484-3BG022-WS	F6074
484	1.00	26X26	FPA-484-3BG026-WS	F6910
484	1.00	26X26	FPA-484-3BG026-ISI	F6613
484	1.00	26X26	FPA-484-3BG026-ISI	F6911
492	1.27	26X26	FPA-492-2BG026-BL	F6076
492	1.27	26X26	FPA-492-2BG026-NS	F4471
492	1.27	26X26	FPA-492-2BG026-WS	F6050
516	1.27	26X26	FPA-516-2BG026-BL	F6254
516	1.27	26X26	FPA-516-2BG026-NS	F6251
528	1.27	30X30	FPA-528-2BG030-NS	F6144
529	1.27	23X23	FPA-529-2BG023-WS	F4471
552	1.00	24X24	FPA-552-3BG024-HL	F6912
560	1.27	33X33	FPA-560-2BG033-NS	F4471
560	1.27	33X33	FPA-560-2BG033-WS	F4471
561	1.27	33X33	FPA-560-2BG033-BL	F6610
576	1.27	24X24	FPA-576-2BG024-NS	F4471
576	1.27	24X24	FPA-576-2BG024-WS	F4471
596	1.27	30X30	FPA-596-2BG030-BL	F6913
600	1.27	35X35	FPA-600-2BG035-BL	F6076
600	1.27	35X35	FPA-600-2BG035-WS	F6077
600	1.27	35X35	FPA-600-2BG035-HL	F6632
829	1.27	23X23	FPA-529-2BG023-NS	F4471
1020	1.00	32X32	FPA-1020-3BG032-HL	F6914
1152	1.00	34X34	FPA-1152-3BG034-WS	F6915
1156	1.00	34X34	FPA-1156-3BG034-WS	F6226
1497	1.00	39X39	FPA-1497-3BG039-HL	F6916
1497	1.00	39X39	FPA-1497-3BG039-HL-BL	F6917

For a complete list of FPA Socket specifications, pricing and delivery information, please see:

**Web Link:** [www.1800adapter.com/122](http://www.1800adapter.com/122)

# SOCKETS - BGA (XPA) EXTENDER

ET's Extender (XPA) sockets are a reliable, cost-effective alternative to soldering BGA devices directly to the PCB. These XPAs enable a BGA device to be plugged into a socket matching the BGAs device. The design provides results that are equivalent to direct PCB attach. These XPA sockets are an integral part of ET's BGA Adapter System.

## FEATURES & BENEFITS

- Very low inductance
- Protects valuable PC boards and subjects device to lower thermal stress
- Same footprint as BGA device
- Compact & easy to integrate into designs
- Solder your BGA chip to the XPA for multiple insertions into a surface mount BPE (page 7)

## APPLICATIONS

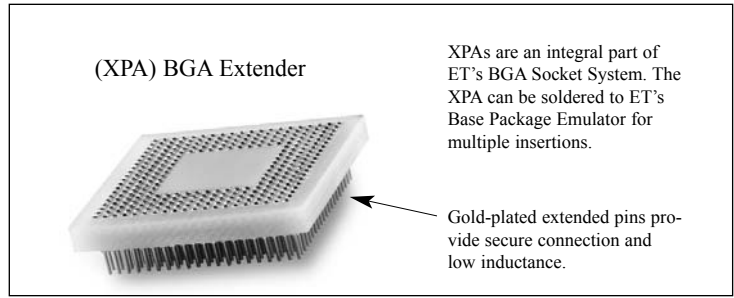
- Development
- Debug
  - Hand Test
- Programming/Test
  - Qualification
  - Production

## Ball PITCH

- 1.27mm, 1.00mm, 0.80mm

## GRID SIZES

- 6X8 through 44X44



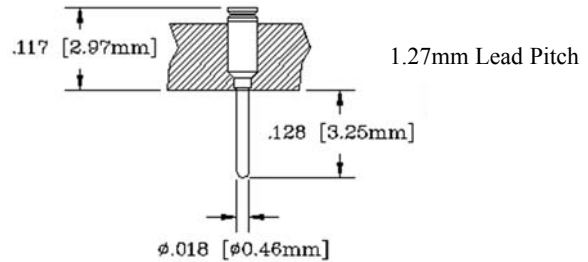
### Ordering Information EXample

Product Code (Extender) XPA-0361-2BG019 BG=BGA

Pin Count 361 Ball Pitch 2 Grid Size 19

(1=1.5mm, 2=1.27mm, 3=1.00mm, 5=.50mm, 6=.80mm, 9=1.143mm [45°])

Materials	
Insulator Material	Glass Filled Polyester and Glass Epoxy
Flamable Rating	UL 94V-0
Plating	G-Gold over nickel
Operating Temperature	
Glass Epoxy	-76 degrees F to +284 degrees F
Plastic	-65 degrees C to +125 degrees C
Pin Material	
Brass Pin	10 micro inches of gold over 100 micro inches of Nickel



XPA				
Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
48	1.00	6X8	XPA-048-3BG6X8	F5501
64	1.27	10X10	XPA-064-2BG010	F6677
144	1.27	12X12	XPA-0144-2BG012	F5045
160	0.80	14X14	XPA-0160-6BG014	F6965
160	1.00	14X14	XPA-0160-3BG014	F5995
160	1.27	13X15	XPA-0160-2BG13X15	F6966
176	0.80	15X15	XPA-0176-6BG015	F6958
196	0.80	14X14	XPA-0196-6BG014	F5573
217	1.27	17X17	XPA-0217-2BG017	F5045
255	1.27	16X16	XPA-0255-2BG016	F5045
256	1.00	16X16	XPA-0256-3BG016	F5579
256	1.27	16X16	XPA-0256-2BG016	F5045
256	1.27	20X20	XPA-0256-2BG020	F5045
256	1.27	21X21	XPA-0256-2BG021	F5045
272	1.27	20X20	XPA-0272-2BG020	F5045
292	1.27	20X20	XPA-0292-2BG020	F5045
303	1.27	23X23	XPA-0303-2BG023	F5045
304	1.27	23X23	XPA-0304-2BG023	F5045
313	1.27	25X25	XPA-0313-2BG025	F5045
324	1.00	18X18	XPA-0324-3BG018	F6959
324	1.00	22X22	XPA-0324-3BG022	F5996
336	1.27	20X20	XPA-0336-2BG020	F5045
352	1.27	26X26	XPA-0352-2BG026	F5045
352	1.27	26X26	XPA-0352-2BG026-A	F6583
356	1.27	26X26	XPA-0356-2BG026	F5045
357	1.27	19X19	XPA-0357-2BG019	F5045

XPA (cont.)				
Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
361	1.27	19X19	XPA-0361-2BG019	F5045
384	1.27	28X28	XPA-0384-2BG028	F6960
388	1.00	26X26	XPA-0388-3BG026	F6622
388	1.27	26X26	XPA-0388-2BG026	F5045
420	1.27	26X26	XPA-0420-2BG026	F5045
452	1.27	26X26	XPA-0452-2BG026	F5045
456	1.00	26X26	XPA-0456-3BG026	F5961
456	1.27	26X26	XPA-0456-2BG026	F5045
460	1.27	28X28	XPA-0460-2BG028	F5962
478	1.27	26X26	XPA-0478-2BG026-P4**	F6967
478	1.27	26X26	XPA-0478-2BG026-P4-L***	F6968
480	1.27	26X26	XPA-0480-2BG026	F5045
480	1.27	29X29	XPA-0480-2BG029	F6188
492	1.27	26X26	XPA-0492-2BG026	F5045
560	1.27	33X33	XPA-0560-2BG033	F6656
576	1.27	30X30	XPA-0576-2BG030	F5045
596	1.27	30X30	XPA-0596-2BG030	F5045
600	1.27	35X35	XPA-0600-2BG035	F5045
652	1.27	35X35	XPA-0652-2BG035	F6819
655	1.27	34X34	XPA-0655-2BG034	F5045
680	1.00	39X39	XPA-0680-3BG039	F5860
728	1.27	27X27	XPA-0728-2BG027	F6810
820	1.00	34X34	XPA-0820-3BG034	F5963

\*\* Pentium 4 .125 IN LENGTH \*\*\* Pentium 4 .250 IN LENGTH

For a complete list of XPA Socket specifications, pricing and delivery information, please see:  
**Web Link: [www.1800adapter.com/121](http://www.1800adapter.com/121)**

# BGA, LCC & PLCC - CHIP SCREENING ADAPTERS



## CONVERT ANY KNOWN GOOD PCB TO A TEST FIXTURE FOR CHIP SCREENING OR FAILURE ANALYSIS

This system ensures complete screening capabilities for sorting marginal or non-functional BGA circuits. The BGA System is built upon ET's BPE (Base Package Emulator) which accommodates thru-hole accessories via its top while the bottom is soldered to the PCBs BGA footprint, taking the place of the chip.

The Socket and Probing System is used by hardware, software, design and test engineers who have a need to screen a particular chip package. This can also be used to develop, debug, program, qualify or test BGA devices.

### 1.00mm Lead Pitch

Ball Count	BGA Grid Size	Ball Pitch (mm)	DESCRIPTION	DRAWING
223	18X18	1.00	ZR-MBGA-223-3-018-1	F6799
1936	44X44	1.00	ZR-MBGA-1936-3-044-1	F7201

### 1.27mm Lead Pitch

Ball Count	BGA Grid Size	Ball Pitch (mm)	DESCRIPTION	DRAWING
244	16X16	1.27	ZR-BGA-244-2-016-1	F6792
256	20X20	1.27	ZR-BGA-256-2-020-1	F6793
272	20X20	1.27	ZR-BGA-272-2-020-1	F6794
324	20X20	1.27	ZR-BGA-324-2-020-1	F6795
352	26X26	1.27	ZR-BGA-352-2-026-1	F6797
388	26X26	1.27	ZR-BGA-388-2-026-1	F6664
432	31X31	1.27	ZR-BGA-432-2-031-1	F6798
624	25X25	1.27	ZR-BGA-624-2-025-1	F6796

### BGA CHIP SCREENING

- Allow for quick screening with a known good PC board
- Prevents time-consuming board revisions
- Easy installation
- Easily removable
- Socket options are available for low profile (minimal clearance) needs
- Allows for rapid, new design capabilities
- Requires no extra tooling holes or extra space on the target PCB

SOCKETS & RECEPTACLES:  
TEST & BURN-IN, PRODUCTION



### LCC & PLCC Ordering Information Example

Target Socket \_\_\_\_\_ Chip Pkg Socket Footprint (see Footprint Section)  
 Product Code \_\_\_\_\_ CS-2-068-PCCT-M-Z-1  
 Target Socket Pin Count \_\_\_\_\_ 1 = Socket Included  
 Bottom Pin Type (see Figure 1) \_\_\_\_\_ Top Socket Type:  
 W=PLCC Block, M=Screw Machine Pins, S=Surface Mountable Z = Zero Insertion Force



Icons identify your target socket and chip package.



- CS-2-028-PCC6-M-Z-1  
Document # F3749
- CS-2-044-PCC3-M-Z-1  
Document # F3750
- CS-2-044-PCC3-W-Z-1  
Document # F1800
- CS-2-052-PCC4-M-Z-1  
Document # F3752
- CS-2-052-PCC4-W-Z-1  
Document # F2123
- CS-2-068-PCC1-M-Z-1  
Document # F3755
- CS-2-068-PCC1-W-Z-1  
Document # F3756
- CS-2-084-PCC5-M-Z-1  
Document # F3759
- CS-2-084-PCC5-W-Z-1  
Document # F3761



- CS-2-068-LCC2-M-Z-1  
Document # F3754
- CS-2-084-LCC5-M-Z-1  
Document # F3758



- CS-4-028-PCC6-M-Z-1  
Document # F3749
- CS-4-044-PCC3-M-Z-1  
Document # F3750
- CS-4-044-PCC3-W-Z-1  
Document # F1800
- CS-4-052-PCC4-M-Z-1  
Document # F3752
- CS-4-052-PCC4-W-Z-1  
Document # F2123
- CS-4-068-PCC1-M-Z-1  
Document # F3755
- CS-4-068-PCC1-W-Z-1  
Document # F3756
- CS-4-084-PCC5-M-Z-1  
Document # F3759
- CS-4-084-PCC5-W-Z-1  
Document # F3761

• Pre-wired, one-to-one, Convert-A-Sockets convert a production socket to a test/burn-in socket and vice-versa

• Socket footprints are in-line for production sockets and staggered for burn-in sockets, Convert-A-Sockets eliminates this incompatibility

• Complete line of male/female sockets for LCC, PLCC, and PGA packages

• Makes it possible to perform repeated insertions using a zero insertion force socket on a printed circuit board equipped with a production socket

• Low-cost alternative to creating a special board for simple drop and test procedures

• Pre-assigned wiring for convenience

For a complete list of specifications, pricing and delivery information, please see:

Web Link: [www.1800adapter.com/133](http://www.1800adapter.com/133)

# SOCKETS - BGA HiLo FLEXIBLE INTERCONNECT SYSTEM UP TO 9.3 GHz

This all new connector design can be used as a BGA production socket or a board to board connector system. The connectors unique design incorporates the highs, the lows, and the application flexibility the industry requires.

## FEATURES & BENEFITS

### HIGHS

- High Density: 1mm pitch and above
- High Speed: 1 dB cut-off measured at 9.3 GHz
- High Reliability: Proven dual-beam gold plated beryllium copper contacts
- High I/O: Can be supplied with over 2000 I/O
- High Speed Assembly: Pick and place compatible

### LOWS

- Low Profile: Socket height approximately 2mm
- Low Cost: Less than \$0.02 per mated pair in volume
- Low Insertion Force: Less than 1 oz. per contact
- Low Tooling Cost

### Quick Delivery:

- Prototype quantities shipped in 2 weeks

### Any Footprint:

- Not limited to standard arrays or geometries

### CTE Compliant:

- Designed to accommodate thermal mismatch

## APPLICATIONS

- BGA production socket
- Board to board connector
- Module interconnect
- Flex circuit connector
- Any creative use

**NOTE:** Manufacturer's chip package drawing required with each order.

### Emulation Technology Recommends:

Try our **Multi-Grid Size Extraction Tool**

Safely extract HGA & PGA devices.

Safely remove your HiLo socket using this quality tool.

**Web Link:** [www.1800adapter.com/056](http://www.1800adapter.com/056)

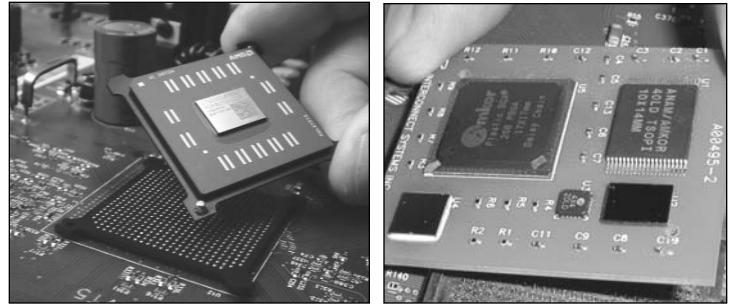
Try our **BGA Solder Stencils**

Residue-free adhesive backing means these stencils are self-sticking  
...so you can say goodbye to tape and fixturing forever!

**Web Link:** [www.1800adapter.com/019](http://www.1800adapter.com/019)

For a complete list of HiLo socket specifications,  
pricing and delivery information, please see:

**Web Link:** [www.1800adapter.com/124](http://www.1800adapter.com/124)



### Ordering Information EXample

HLS=HiLo Socket	HLS-160256-B-10	Lead Pitch
HLP=HiLo Pin Field		A = 1.27mm
		B = 1.0mm
		C = 0.80mm
		0 = Custom
Grid Size 00 if not square	Number of populated positions	
	Internal use	

### Electrical Specifications

Bandwidth	9.3 GHz
Contact Resistance	Less than 12 milliohms--Includes bulk Socket Resistance
Insulation Resistance 500V DC	Greater than 50,000 M Ohms
Current Rating	1 Amp per contact

### Mechanical Specifications

Individual Contact Force	1 oz per contact
Heat Sink	N/A

### Materials

Insulator	FR4 Epoxy Resin
Terminal	Pin Material: Phosphor Bronze
Contact	Socket Contact BeCu

### Operating Temperature

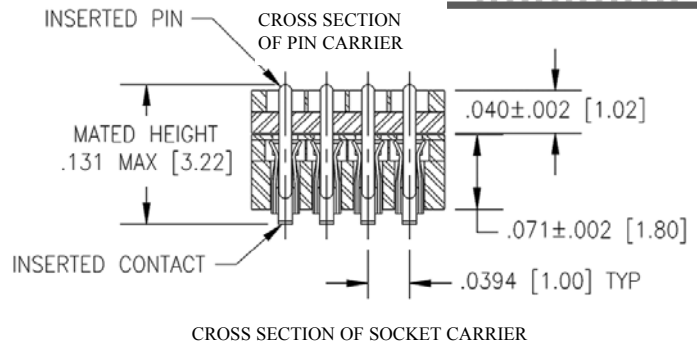
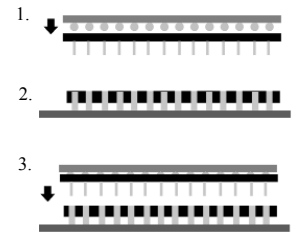
Temperature Range	0 to 105 degrees C
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### 3 Easy Steps:

**Step 1:** Reflow BGA to HiLo pin field to create a 'micro-PGA' package

**Step 2:** Solder HiLo socket to motherboard

**Step 3:** Insert pinned FPGA into socket



The drawing depicts a typical stack-up for a mated pair (pin field and socket). These dimensions can be changed to fit a specific application. Pin length can be shortened or lengthened to decrease or increase mated height.



# BGA HiLo FLEXIBLE INTERCONNECT SYSTEM UP TO 9.3 GHz - SOCKETS

SOCKETS & RECEPTACLES:  
TEST & BURN-IN, PRODUCTION

Xilinx								
Xilinx	Pin	Array	Lead Pitch	Body Size	Socket	Socket	HiLo	HiLo
Part #	Count	Size	(mm)	(mm)	Part #	Drawing	Pin Field	Drawing
BG255	225	15X15	1.50	27.00	HLS-150225-0-10	F7093	HLP-150225-0-10	F7094
FG256	256	16X16	1.00	17.00	HLS-160256-B-10	F7095	HLP-160256-B-10	F7096
BG256	256	20X20	1.27	27.00	HLS-200272-A-10	F7097	HLP-200272-A-10	F7098
FG324	324	22X22	1.00	23.00	HLS-220324-B-00	F7099	HLP-220324-B-00	F7100
BG352	352	26X26	1.27	35.00	HLS-250352-A-10	F7101	HLP-250352-A-10	F7102
BG388	388	26X26	1.27	35.00	HLS-260388-A-10	F7103	HLP-260388-A-10	F7104
BG432	432	31X31	1.27	40.00	HLS-310432-A-10	F7105	HLP-310432-A-10	F7106
FG456	456	22X22	1.00	23.00	HLS-220456-B-10	F7107	HLP-220456-B-10	F7108
BG492	492	26X26	1.27	35.00	HLS-260492-A-10	F7109	HLP-260492-A-10	F7110
FG556	556	30X30	1.00	31.00	HLS-300556-B-10	F7111	HLP-300556-B-10	F7112
BG560	560	33X33	1.27	42.50	HLS-330560-A-10	F7113	HLP-330560-A-10	F7114
BG575	575	24X24	1.27	31.00	HLS-240575-A-10	F7115	HLP-240575-A-10	F7116
FF672	672	26X26	1.00	27.00	HLS-260672-B-10	F7117	HLP-260672-B-10	F7118
FG676	676	26X26	1.00	27.00	HLS-260676-B-10	F7119	HLP-260676-B-10	F7120
FG680	680	39X39	1.00	40.00	HLS-390680-B-10	F7121	HLP-390680-B-10	F7122
BG728	728	27X27	1.27	35.00	HLS-270728-A-10	F7123	HLP-270728-A-10	F7124
FG860	860	42X42	1.00	42.50	HLS-420860-B-10	F7125	HLP-420860-B-10	F7126
FF896	896	30X30	1.00	31.00	HLS-300896-B-10	F7127	HLP-300896-B-10	F7128
FG900	900	30X30	1.00	31.00	HLS-300900-B-10	F7129	HLP-300900-B-10	F7130
BF957	957	31X31	1.27	40.00	HLS-310957-A-10	F7131	HLP-310957-A-10	F7132
FF1148	1148	34X34	1.00	35.00	HLS-341148-B-10	F7133	HLP-341148-B-10	F7134
FF1152	1152	34X34	1.00	35.00	HLS-341152-B-10	F7135	HLP-341152-B-10	F7136
FG1156	1156	34X34	1.00	35.00	HLS-341156-B-10	F7137	HLP-341156-B-10	F7138

Altera								
Pin	Array	Lead Pitch	Body	Socket	Socket	HiLo	HiLo	
Count	Size	(mm)	Size (mm)	Part #	Drawing	Pin Field	Drawing	
100	10X10	1.00	11.00	HLS-100100-B-00	F7145	HLP-100100-B-00	F7146	
144	12X12	1.00	13.00	HLS-120144-B-00	F7147	HLP-120144-B-00	F7148	
256	20X20	1.27	27.00	HLS-200256-A-10	F7149	HLP-200256-A-10	F7150	
256	16X16	1.27	17.00	HLS-160256-A-10	F7151	HLP-160256-A-10	F7152	
256	16X16	1.27	17.00	HLS-160256-A-10	F7153	HLP-160256-A-10	F7154	
324	18X18	1.00	19.00	HLS-180324-B-00	F7155	HLP-180324-B-00	F7156	
356	26X26	1.27	35.00	HLS-260356-A-10	F7157	HLP-260356-A-10	F7158	
484	22X22	1.00	23.00	HLS-220484-B-00	F7159	HLP-220484-B-00	F7160	
600	35X35	1.27	45.10	HLS-350600-A-10	F7161	HLP-350600-A-10	F7162	
652	35X35	1.27	45.00	HLS-350652-A-10	F7163	HLP-350652-A-10	F7164	
672	26X26	1.00	27.00	HLS-260672-B-00	F7165	HLP-260676-B-00	F7166	
672	26X26	1.27	35.00	HLS-260672-A-10	F7167	HLP-260672-A-10	F7168	
724	27X27	1.27	35.00	HLS-270724-A-10	F7169	HLP-270724-A-10	F7170	
780	28X28	1.00	29.00	HLS-280780-B-00	F7171	HLP-280780-B-00	F7172	
956	31X31	1.27	40.00	HLS-310956-A-10	F7173	HLP-310956-A-10	F7174	

Actel								
Pin	Array	Lead Pitch	Body	Socket	Socket	HiLo	HiLo	
Count	Size	(mm)	Size (mm)	Part #	Drawing	Pin Field	Drawing	
272	20X20	1.27	20.00	HLS-200272-A-11	F7179	HLP-200272-A-11	F7180	
313	25X25	1.27	35.00	HLS-250313-A-10	F7181	HLP-250313-A-10	F7182	
329	23X23	1.27	31.00	HLS-230329-A-10	F7183	HLP-230329-A-10	F7184	
456	26X26	1.27	35.00	HLS-260456-A-10	F7185	HLP-260456-A-10	F7186	
729	27X27	1.27	35.00	HLS-270729-A-10	F7187	HLP-270729-A-10	F7188	

## SOCKETS - BGA TEST & BURN-IN

These sockets can either surface mount or thru-hole mount to your target PCB. They provide easy chip insertion and utilize a screw lock lid for safe closure.

### FEATURES & BENEFITS

- BGA Test Sockets are available in all pitches (1.27mm, 1.00mm, 0.80mm, 0.75mm, 0.65mm, 0.50mm)
- Precision micro-probe contacts display ideal electrical characteristics such as low inductance, resistance, and capacitance
- Sockets are completely customizable and designed for up to 500k insertions
- All socket contacts are individually replaceable in the field, which makes repairs quick, easy and cost-effective
- Sockets can also be manufactured with etched or stamped contacts for high volume burn-in or test applications

### APPLICATIONS

- Development
- Debug
  - Hand Test
- Programming/Test
  - Qualification
  - Production

### BALL PITCH

- BGA (1.27mm)
- mBGA (1.00mm, 0.80mm, 0.75mm, 0.65mm, 0.50mm)

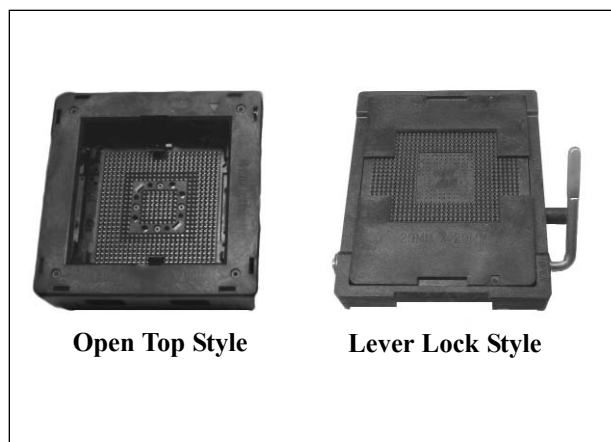
### GRID SIZES

- 8X8 through 40X40

1.27mm Ball Pitch				
Pin Count	Chip Size (mm)	Grid Size	ET Part #	Drawing #
119	14X22	7X17	S-BGA-7X17-119-A1	SKT1731
120	11X17	10X16	S-BGA-10-120-A	SKT1270
121	15X15	11X11	S-BGA-11-121-A	SKT734
121	15X15	11X11	S-BGA-11-121-A1	SKT735
144	13X13	12X12	S-BGA-12-144-A1	SKT1157
144	27X27	12X12	S-BGA-12-144-A	SKT736
144	27X27	20X20	S-BGA-20-144-A	SKT745
153	14X22	9X17	S-BGA-9X17-153-A	SKT1346
168	23X23	17X17	S-BGA-17-168-A	SKT740
192	23X23	17X17	S-BGA-17-192-A	SKT1566
204	27X27	20X20	S-BGA-20-204-A	SKT746
204	27X27	20X20	S-BGA-20-204-A1	SKT747
208	23X23	17X17	S-BGA-17-208-A	SKT537
208	23X23	17X17	S-BGA-17-208-B	SKT1034
208	23X23	17X17	S-BGA-17-208-C	SKT1373
225	23X23	15X15	S-BGA-15-225-B	SKT1474
225	27X27	15X15	S-BGA-15-225-A	SKT161

*For a complete list of socket specifications, pricing and delivery information, please see:*

**(BGA) Web Link: [www.1800adapter.com/100](http://www.1800adapter.com/100)**  
**(mBGA) Web Link: [www.1800adapter.com/107](http://www.1800adapter.com/107)**



Open Top Style

Lever Lock Style

### Ordering Information Example

Socket Type ———— | ———— Version  
 Product Code — S-BGA-20-272-A  
 Grid Size ———— | ———— Pin Count

### 1.27mm Ball Pitch (cont.)

Pin Count	Chip Size (mm)	Grid Size	ET Part #	Drawing #
244	22X22	16X16	S-BGA-16-244-A	SKT1506
255	21X21	16X16	S-BGA-16-255-A	SKT1738
256	21X21	16X16	S-BGA-16-256-A	SKT1739
256	21X21	16X16	S-BGA-16-256-D	SKT1503
256	23X23	16X16	S-BGA-16-256-B	SKT1762
256	27X27	20X20	S-BGA-20-256-A	SKT1038
256	27X27	20X20	S-BGA-20-256-A1	SKT820
256	27X27	20X20	S-BGA-20-256-B	SKT1748
256	27X27	20X20	S-BGA-20-256-C	SKT533
256	35X35	26X26	S-BGA-26-256-A	SKT1769
272	27X27	20X20	S-BGA-20-272-A	SKT802
272	27X27	20X20	S-BGA-20-272-A1	SKT1751
272	31X31	21X21	S-BGA-21-272-A	SKT1703
289	23X23	17X17	S-BGA-17-289-A	SKT1288
303	21X25	19X19	S-BGA-19-303-A	SKT1741
304	35X35	23X23	S-BGA-23-304-A	SKT1758
316	27X27	20X20	S-BGA-20-316-A	SKT1754
316	27X27	20X20	S-BGA-20-316-A1	SKT1036
324	27X27	20X20	S-BGA-20-324-A	SKT1755
336	27X27	20X20	S-BGA-20-336-A	SKT1555
340	35X35	26X26	S-BGA-26-340-A	SKT1770
352	35X35	26X26	S-BGA-26-352-A	SKT634
352	35X35	26X26	S-BGA-26-352-A1	SKT1771
352	35X35	26X26	S-BGA-26-352-B	SKT528
356	35X35	26X26	S-BGA-26-356-A	SKT1773
357	25X25	19X19	S-BGA-19-357-A	SKT636
361	24.7X24.7	19X19	S-BGA-19-361-A	SKT631
361	25X25	19X19	S-BGA-19-361-A1	SKT1743
361	25X25	19X19	S-BGA-19-361-A2	SKT1744
368	35X35	26X26	S-BGA-26-368-A	SKT1361
372	27X27	20X20	S-BGA-20-372-A	SKT1167
388	35X35	26X26	S-BGA-26-388-A	SKT1704
400	27X27	20X20	S-BGA-20-400-A	SKT1372
416	35X35	27X27	S-BGA-27-416-A	SKT1780
420	35X35	26X26	S-BGA-26-420-A	SKT1879
420	35X35	26X26	S-BGA-26-420-A1	SKT1733
432	31X31	24X24	S-BGA-24-432-A	SKT1760
432	40X40	31X31	S-BGA-31-432-A	SKT637
432	40X40	31X31	S-BGA-31-432-A1	SKT543
436	35X35	26X26	S-BGA-26-436-A	SKT1774
452	35X35	26X26	S-BGA-26-452-A	SKT1775

NOTE: Manufacturer's chip package drawing required with each order.

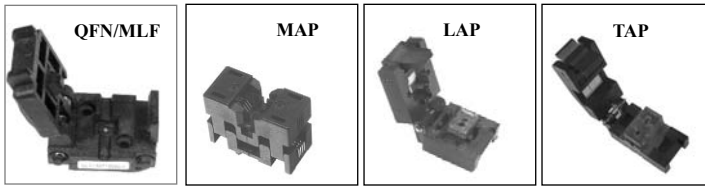




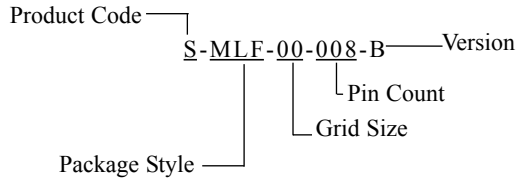


# QFN/MLF/MAP/LAP/TAP - SOCKETS

SOCKETS & RECEPTACLES:  
TEST & BURN-IN, PRODUCTION



## Ordering Information Example



### Electrical Specifications

Bandwidth	<1 GHz (inductance 3.2nH)
Contact Bulk Resistance	25m ohms
Insulation Resistance	1 x 10(11th) ohms
Current Rating	1A ~75C temp. rise

### Mechanical Specifications

Individual Contact Force	25-40 grams
Cycle Life	5,000
Heat Sink	Brass center pin included as standard. Larger copper center pin available upon special request for additional heat sinking.

### Materials

Insulator	Polyphenylene Sulfide (PPS)
Terminal	N/A
Contact	Beryllium Copper with gold plating

### Operating Temperature

Temperature Range	-50C to +150C
-------------------	---------------

These sockets offer a modular design in a small outline with very low inductance. ET has sockets for 8 to 100 lead devices with pitches of 0.40 mm, 0.50 mm, 0.65 mm and 0.80 mm to support this rapidly growing market.

### FEATURES & BENEFITS

- Very low inductance
- Center ground pin
- Small outline
- Modular design
- Compact & easy to integrate into designs

### APPLICATIONS

- Development
- Debug
  - Hand Test
- Programming/Test
  - Qualification
  - Production

### LEAD PITCH

- 0.80mm, 0.75mm, 0.65mm, 0.50mm, 0.40mm

### GRID SIZES

- 8X8 through 40X40

### QFN/MLF MAP LAP TAP (cont.)

Pin Count	Lead Pitch	Chip Size (mm)	Pad Layout	ET Part #	Drawing #
32	0.50	5X5	8-8	S-MLF-00-032-A	SKT1310
32	0.50	6X6	8-8	S-MLF-00-032-B	SKT1624
32	0.65	7X7	8-8	S-MLF-00-032-C	SKT1559
32	0.80	8X8	8-8	S-MLF-00-032-D	SKT258
32	0.90	9X9	8-8	S-MLF-00-032-E	SKT256
34	1.27	14X9.7	8-9	S-MLF-00-034-A	SKT251
36	0.50	6X6	9-9	S-MLF-00-036-A	SKT238
40	0.50	6X6	10-10	S-MLF-00-040-A	SKT1541
44	0.50	7X7	11-11	S-MLF-00-044-A	SKT1544
44	0.50	7X7	12-10	S-MLF-00-044-B	SKT255
44	0.65	9X9	11-11	S-MLF-00-044-C	SKT252
48	0.50	7X7	12-12	S-MLF-00-048-A	SKT1421
48	0.50	7X7	11-13	S-MLF-00-048-B	SKT219
52	0.50	8X8	13-13	S-MLF-00-052-A	SKT1413
56	0.50	8X8	14-14	S-MLF-00-056-A	SKT1527
56	0.50	8X8	14-14	S-MLF-00-056-A1	SKT218
64	0.50	9X9	16-16	S-MLF-00-064-A	SKT1496
68	0.50	10X10	17-17	S-MLF-00-068-A	SKT216

NOTE: Manufacturer's chip package drawing required with each order.

### QFN/MLF MAP LAP TAP

Pin Count	Lead Pitch	Chip Size (mm)	Pad Layout	ET Part #	Drawing #
8	0.50	3X2	4-0	S-MLF-00-008-B	SKT261
8	0.50	3X3	4-0	S-MLF-00-008-C	SKT264
8	0.65	4.93X3	4-0	S-MAP-00-008-A	SKT1471
8	0.65	6.4X3.65	4-0	S-TAP-00-008-A	SKT1472
8	1.27	5.99X4.93	4-0	S-LAP-00-008-B	SKT173
8	1.27	5.99X5.99	4-0	S-LAP-00-008-C	SKT287
8	1.27	6X5	4-0	S-MLF-00-008-A	SKT1483
8	1.27	8X5	4-0	S-LAP-00-008-A	SKT1455
10	0.50	3X2	4-1	S-MLF-00-010-A	SKT265
10	0.50	3X3	4-0	S-MLF-00-010-B	SKT1524
12	0.50	3X3	4-0	S-MLF-00-012-A	SKT268
16	0.50	3X3	5-0	S-MLF-00-016-C	SKT270
16	0.50	3X3	4-4	S-MLF-00-016-D	SKT1613
16	0.50	5X5	8-0	S-MLF-00-016-E	SKT277
16	0.65	4X4	4-0	S-MLF-00-016-B	SKT1444
16	0.80	5X5	4-0	S-MLF-00-016-A	SKT1309
20	0.50	4X4	5-5	S-MLF-00-020-C	SKT283
20	0.65	5.2X4.2	5-5	S-MLF-00-020-B	SKT282
20	0.65	5X5	5-5	S-MLF-00-020-A	SKT1307
24	0.50	4.5X3.5	3-9	S-MLF-00-024-A	SKT1557
24	0.50	4X4	6-6	S-MLF-00-024-B	SKT1558
28	0.50	5X5	7-7	S-MLF-00-028-A	SKT1308
28	0.65	6X6	7-7	S-MLF-00-028-C	SKT1592
28	0.65	6X6	7-7	S-MLF-00-028-D	SKT1576
28	0.80	7X7	7-7	S-MLF-00-028-B	SKT1497

### Emulation Technology Recommends:

Try our manually operated Vacuum Pens to easily lift ICs without damaging your device.

Web Link: [www.1800adapter.com/118](http://www.1800adapter.com/118)

### Try our 3-in-1 Adapter System

Emulate, Program, Analyze QFN/MLF with one adapter!

Web Link: [www.1800adapter.com/060](http://www.1800adapter.com/060)

For a complete list of QFN/MLF Socket specifications, pricing and delivery information, please see:

Web Link: [www.1800adapter.com/044](http://www.1800adapter.com/044)

# SOCKETS - TSOP/TSSOP/SOJ/SOIC

SOCKETS & RECEPTACLES:  
TEST & BURN-IN, PRODUCTION

## TSOP/TSSOP BURN IN & SMT PRODUCTION

Pin Count	Lead Pitch (mm)	Package Width (mm)	ET Part #	Drawing #
8	0.65	4.40	S-TSS-00-008-A	SKT1055
14	0.65	4.39	S-TSSO-00-014-A	SKT1752
20	0.65	4.40	S-TSSO-00-020-A	SKT987
20	0.65	4.40	S-TSO-00-020-B	SKT788
24	1.27	7.62	S-TSO-00-024-A	SKT1364
28	0.50	11.8	S-TSO-00-028-A	SKT049
32	0.50	11.8	S-TSO-00-032-G	SKT0666
32	0.50	12.4	S-TSO-00-032-B	SKT051
32	0.50	18.4	S-TSO-00-032-A	SKT050
32	0.50	18.4	S-TSO-00-032-D	SKT107
32	0.50	18.4	S-TSO-00-032-E	SKT591
32	0.50	18.4	S-TSO-SM-032-A1*	SKT1162
32	1.27	10.16	S-TSO-00-032-F	SKT1283
40	0.50	12.4	S-TSO-00-040-B	SKT496
40	0.50	18.4	S-TSO-00-040-A	SKT053
40	0.50	18.4	S-TSO-00-040-C	SKT1238
40	0.50	18.4	S-TSO-00-040-D	SKT1239
40	0.50	12.4	S-TSO-SM-040-B	SKT1244
40	0.50	18.40	S-TSO-SM-040-A	SKT518
40	0.50	18.40	S-TSO-SM-040-A1*	SKT1508
40	0.65	6.10	S-TSS-00-040-A	SKT1245
44	0.80	10.43	S-TSO-00-044-C	SKT845
44	0.80	10.16	S-TSO-00-044-B	SKT1139
44	0.80	10.16	S-TSO-00-044-D	SKT1240
48	0.50	16.4	S-TSO-00-048-A	SKT497
48	0.50	18.40	S-TSO-00-048-B	SKT498
48	0.50	18.40	S-TSO-00-048-D	SKT1469
48	0.50	18.4	S-TSO-00-048-B1	SKT723
48	0.50	18.4	S-TSO-00-048-C	SKT511
48	0.50	18.4	S-TSO-SM-048-A	SKT1111
48	0.50	18.4	S-TSO-SM-048-A1*	SKT1247
50	0.80	10.16	S-TSO-00-050-A	SKT1241
50	0.80	10.16	S-TSO-00-050-B	SKT1242
54	0.80	10.16	S-TSO-00-054-A	SKT839
54	0.80	10.16	S-TSO-00-054-B	SKT1243
54	0.80	10.16	S-TSO-00-054-C	SKT1445
56	0.50	18.4	S-TSO-00-056-A	SKT054

\*Available in Tape/Reel

For a complete list of TSOP & TSSOP Socket specifications, pricing and delivery information, please see:

Web Link: [www.1800adapter.com/113](http://www.1800adapter.com/113)

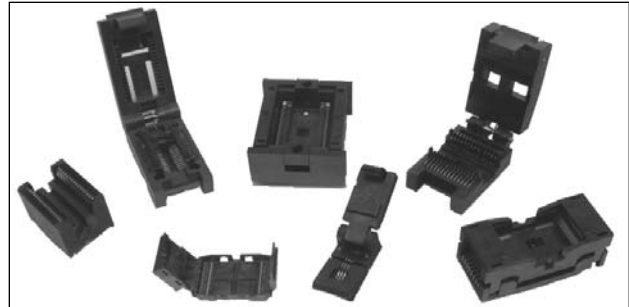
## SOJ TEST & BURN-IN & SMT PRODUCTION

Pin Count	Lead Pitch (mm)	Chip Size (mm)	ET Part #	Drawing #
20	1.27	7.62	S-SOJ-00-020-A	SKT450
24	1.27	7.62	S-SOJ-00-024-A	SKT451
26	1.27	7.62	S-SOJ-00-026-A	SKT1114
26	1.27	7.62	S-SOJ-00-026-C	SKT453
26	1.27	4.62	S-SOJ-SM-026-A	SKT1112
28	1.27	10.16	S-SOJ-00-028-A	SKT454
28	1.27	7.62	S-SOJ-00-028-B	SKT455
28	1.27	10.15	S-SOJ-SM-028-A	SKT1251
28	1.27	8.89	S-SOJ-SM-028-B	SKT112
32	1.27	10.16	S-SOJ-00-032-A	SKT457
32	1.27	7.62	S-SOJ-00-032-B	SKT458
32	1.27	10.15	S-SOJ-SM-032-A	SKT1251
32	1.27	10.15	S-SOJ-SM-032-B	SKT112
40	1.27	10.16	S-SOJ-00-040-A	SKT580
40	1.27	10.15	S-SOJ-SM-040-A	SKT1251
44	1.27	10.16	S-SOJ-00-044-A	SKT724

For a complete list of SOJ Socket specifications, pricing and delivery information, please see:

Web Link: [www.1800adapter.com/115](http://www.1800adapter.com/115)

NOTE: Manufacturer's chip package drawing required with each order.



Buy in quantity and save on these high quality sockets!

### Ordering Information Example

Product Code — S-SOP-00-020-A — Version

Package Style — S — Pin Count — 00 = Test & Burn-in Thru-hole Mount — SM = Production Surface Mount

## SOIC TEST & BURN-IN & SMT PRODUCTION

Count	Pitch (mm)	Width (mm)	ET Part #	Drawing #
8	1.27	5.30	S-SOP-00-008-B	SKT890
8	1.27	3.90	S-SOR-00-008-A	SKT525
16	1.27	3.90	S-SOR-00-016-A	SKT475
16	1.27	3.90	S-SOR-00-016-B	SKT476
16	1.27	3.90	S-SOR-00-016-C	SKT532
16	1.27	3.90	S-SOR-00-016-D	SKT1235
16	1.27	7.50	S-SOL-00-016-B	SKT460
16	1.27	5.30	S-SOL-00-016-C	SKT1054
16	1.27	5.30	S-SOL-00-016-D	SKT1093
20	1.27	5.60	S-SOR-00-020-A	SKT586
20	1.27	7.50	S-SOR-00-020-B	SKT984
24	1.27	5.60	S-SOP-00-024-A	SKT727
24	1.27	8.40	S-SOL-00-024-A	SKT462
28	1.27	11.40	S-SOP-SM-028-B	SKT1268
28	1.27	7.50	S-SOP-SM-028-C	SKT585
28	1.27	7.50	S-SOR-00-028-A	SKT113
28	1.27	7.90-8.2	S-SOR-00-028-B	SKT1236
28	1.27	7.50	S-SOR-00-028-D	SKT478
28	1.27	8.40	S-SOL-00-028-A	SKT463
28	1.27	8.89	S-SOL-00-028-B	SKT464
28	1.27	8.40	S-SOL-00-028-D	SKT583
28	1.27	8.40	S-SOL-SM-028-A	SKT1233
32	1.27	13.30	S-SOP-SM-032-A	SKT983
32	1.27	11.40	S-SOL-00-032-A	SKT465
32	1.27	10.16	S-SOL-00-032-B	SKT1172
32	1.27	10.70	S-SOL-00-032-C	SKT466
40	1.27	11.60	S-SOP-00-040-A	SKT891
40	1.27	11.20	S-SOR-00-040-A	SKT479
40	1.27	10.70	S-SOR-00-040-B	SKT106
44	1.27	13.20	S-SOP-00-044-A	SKT1094
44	1.27	13.30	S-SOP-SM-044-A	SKT516
44	1.27	12.60	S-SOP-SM-044-B	SKT1602
44	1.27	12.60	S-SOP-SM-044-C	SKT1488
44	1.27	13.20	S-SOR-00-044-B	SKT480
44	1.27	13.20	S-SOR-00-044-C	SKT481
44	1.27	12.60	S-SOR-00-044-D	SKT1489

For a complete list of SOIC Socket specifications, pricing and delivery information, please see:

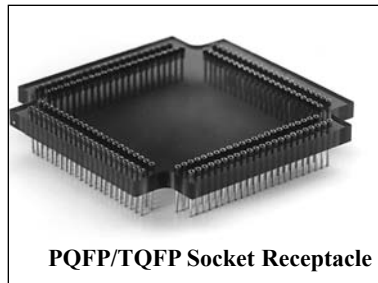
Web Link: [www.1800adapter.com/117](http://www.1800adapter.com/117)



# SOCKET RECEPTACLES - SOCKETS



**BGA Socket Receptacle**



**PQFP/QFP Socket Receptacle**

### Ordering Information Example

Product Code — SR-QFP-00-208-A — Internal Use

Chip Package Type — SR-QFP-00-208-A — Pin Count

Grid Size (when applicable) — SR-QFP-00-208-A — 0 = no socket  
1 = socket

Materials	
Terminals	Brass; copper alloy (C36000) ASTM-B-16
Contact Material	Beryllium Copper
Shell Plating	200 micro meters gold over 50 micro meters nickel
Contact Plating	30 micro meters gold over 50 micro meters nickel
Operating Temperature	
Operating Temperature	-50 degrees C to 140 degrees C

Receptacles are used in conjunction with your test burn-in and/or production sockets as an interface between the board and the socket. ET's receptacles are available for the most popular package styles including: DIP, PGA, PLCC, LCC, BGA, SOJ, SOIC, SOP, SSOP, VFP, TQFP, TAB, MLF, HGA, QFP, and MBGA.

### FEATURES & BENEFITS

- Eliminate the need for soldering your sockets directly onto the board and facilitate a plug-in media for ease of socket replacement without damage to the PCB
- Can be custom manufactured for any given socket header or contactor. We provide a wide variety of female contacts (standard fine pitch wire wrap) that can optimize matability for any given male contact.
- Provide ultra low insertion force contacts for direct insertion of any PGA (Pin Grid Array) IC package
- Feature ultherm as the standard substrate material which combines high temperature capabilities with great rigidity and electrical properties.

If you do not find the receptacle you are needing or your desired package is not noted in the catalog please contact us for a quotation or to request more information on ordering receptacles

### APPLICATIONS

- Development
- Debug
  - Hand Test
- Programming/Test
  - Qualification
  - Production

### LEAD PITCH

- 1.27mm 1.00mm 0.80mm

### GRID SIZES

- 6X8 through 44X44

BGA						
Pin Count	Lead Pitch (mm)	Chip Size (mm)	Grid Size (mm)	Description	Corresponding ET Socket #	Drawing #
48	0.75	7X7	7X7	SR-MBGA-07-048-A	S-MBG-07-048-A	SKT1552
72	0.80	8X10	8X12	SR-MBG-8X12-072-A	S-MBG-8X12-72A	SSKT1773
208	1.27	23X23	17X17	SR-BGA-17-208-C	S-BGA-17-208-C	SKT1370
244	1.27	22X22	16X16	SR-BGA-16-244-A	S-BGA-16-244-A	SKT1774
256	1.00	17X17	16X16	SR-MBGA-16-256-A	S-MBG-16-256-A	SKT1522
256	1.27	27X27	20X20	SR-BGA-20-256-A	S-BGA-20-256-A	SKT1781
272	1.27	27X27	20X20	SR-BGA-20-272-A	S-BGA-20-272-A	SKT1547
272	1.27	31X31	21X21	SR-BGA-21-272-A	S-BGA-21-272-A	SKT791
292	1.27	27X27	20X20	SR-BGA-20-292-A	S-BGA-20-292-A	SKT975
304	1.27	27X27	20X20	SR-BGA-20-324-A	S-BGA-20-324-A	SKT976
304	1.27	35X35	23X23	SR-BGA-23-304-A	S-BGA-23-304-A	SKT792
316	1.27	27X27	20X20	SR-BGA-20-316-A	S-BGA-20-316-A	SKT1548
336	1.27	27X27	20X20	SR-BGA-20-336-A	S-BGA-20-336-A	SKT1556
352	1.27	35X35	26X26	SR-BGA-26-352-A	S-BGA-26-352-A	SKT720
356	1.27	35X35	26X26	SR-BGA-26-356-A	S-BGA-26-356-A	SKT978
368	1.27	35X35	26X26	SR-BGA-26-368-A	S-BGA-26-368-A	SKT1362
388	1.27	35X35	26X26	SR-BGA-26-388-A	S-BGA-26-388-A	SKT721
400	1.27	27X27	20X20	SR-BGA-20-400-A	S-BGA-20-400-A	SKT977
432	1.27	40X40	31X31	SR-BGA-31-432-A	S-BGA-31-432-A	SKT1083
456	1.27	35X35	26X26	SR-BGA-26-456-A	S-BGA-26-456-A	SKT1082
480	1.27	35X35	26X26	SR-BGA-26-480-A	S-BGA-26-480-A	SKT979
492	1.27	35X35	26X26	SR-BGA-26-492-A	S-BGA-26-492-A	SKT943
560	1.27	45X45	33X33	SR-BGA-33-560-A	S-BGA-33-560-A	SKT980
576	1.27	40X40	30X30	SR-BGA-30-576-A	S-BGA-30-576-A	SKT895
600	1.27	45X45	35X35	SR-BGA-35-600-A	S-BGA-35-600-A	SKT1523
600	1.27	45X45	35X35	SR-BGA-35-600-B	S-BGA-35-600-B	SKT1329
625	1.27	32.3X32.3	25X25	SR-BGA-25-626-A	S-BGA-25-626-A	SKT793
676	1.27	35X35	26X26	SR-BGA-26-676-A	S-BGA-26-676-A	SKT1408
1936	1.00	45X45	44X44	SR-MBGA-44-1936-A	S-MBG-44-1936A	SKT1775

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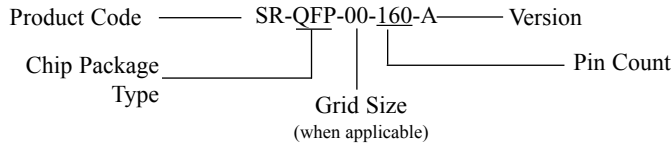
**Web Link: [www.1800adapter.com/forms](http://www.1800adapter.com/forms)**

For a complete list of BGA Socket Receptacle specifications, pricing and delivery information, see:

**Web Link: [www.1800adapter.com/125](http://www.1800adapter.com/125)**

# SOCKET RECEPTACLES - SOCKETS

## Ordering Information Example



For a complete list of socket specifications, pricing and delivery information, please see

**Web Link:**  
[www.1800adapter.com/126](http://www.1800adapter.com/126)

## MLF

Pin Count	Lead Pitch	Package Width (mm)	Pad Layout	ET Part #	Drawing #
32	0.50	5X5	8-8	SR-MLF-00-032-A	SKT1310
36	0.50	6X6	9-9	SR-MLF-00-036-A	SKT238

## PQFP/TQFP

Pin Count	Lead Pitch (mm)	Body Size (mm)	Tip-to-Tip (mm)	Description	Corresponding ET Socket #	Drawing #
48	0.50	7X7	9X9	SR-QFP-00-048-A	S-QFP-00-048-A	SKT1084
64	1.00	20X14	23.9X17.9	SR-QFP-00-064-A	S-QFP-00-064-A	SKT1085
80	0.50	12X12	14X14	SR-QFP-00-080-G2	S-QFP-00-080-G2	SKT1776
80	0.65	14X14	17.2X17.2	SR-QFP-00-080-A	S-QFP-00-080-A	SKT981
80	0.65	14X14	17.2X17.2	SR-QFP-00-080-H	S-QFP-00-080-H	SKT1452
100	0.65	20X14	23.9X17.9	SR-QFP-00-100-A	S-QFP-00-100-A	SKT596
120	0.80	28X28	31.9X31.9	SR-QFP-00-120-A	S-QFP-00-120-A	SKT1087
128	0.80	28X28	31.9X31.9	SR-QFP-00-128-A	S-QFP-00-128-A	SKT1088
128	0.50	20X14	23.2X17.2	SR-QFP-00-128-C1	S-QFP-00-128-C1	SKT1596
160	0.65	28X28	31.9X31.9	SR-QFP-00-160-A	S-QFP-00-160-A	SKT1089
176	0.50	24X24	26X26	SR-QFP-00-176-A	S-QFP-00-176-A	SKT1024
176	0.40	20X20	22X22	SR-QFP-00-176-B	S-QFP-00-176-C	SKT1406
208	0.50	28X28	Metal Pkg	SR-QFP-00-208-A	S-QFP-00-208-B4	SKT618

## TSSOP/TSSO

Pin Count	Lead Pitch (mm)	Body Size (mm)	Description	Corresponding ET Socket #	Drawing #
14	0.65	4.40 mm	SR-TSSO-00-014-A	S-TSSO-00-020-A	SKT1751
20	0.65	4.40 mm	SR-TSSO-00-020-A	S-TSS-00-020-A	SKT1730

NOTE: Manufacturer's chip package drawing required with each order.

## Emulation Technology Recommends:

### Ultra Mini Pogo Pins

Design the perfect interface with our custom or stock ultra-miniature pogo pins!



- BGA, CSP, MicroBGA, and cell phone battery pins are all available
- Our pogo pins can be built to your specification

For a complete list of pogo pins along with specifications, pricing and delivery information, please see:

**Web Link:** [www.1800adapter.com/017](http://www.1800adapter.com/017)

For a complete list of QFP Socket Receptacle specifications pricing and delivery information see:

**Web Link:** [www.1800adapter.com/126](http://www.1800adapter.com/126)



# SOCKETS - PQFP/TQFP TEST & BURN-IN / SMT

ET's broad range of PQFP/TQFP sockets are available in Test & Burn-in and SMT in a variety of grid and body sizes and styles. Our technical staff can assist you in finding the best PQFP/TQFP socket match for your application whether you are doing test & burn-in, development or production work.

## FEATURES & BENEFITS

- Tolerances
- Durability
- Small outline
- Quality
- Use of floating bases and parallel clamps

## APPLICATIONS

- Test & Burn-in
- Development
- Debug
  - Hand Test
- Programming/Test
  - Qualification
  - Production

## LEAD PITCH

- 1.00mm, 0.80mm, 0.65mm, 0.635mm, 0.50mm

**NOTE:** Manufacturer's chip package drawing required with each order.

## HOW TO CHOOSE THE RIGHT SOCKET

Finding the right socket for your project is easy. Gathering the following key characteristics will assist you in finding the correct ET part number:

1. Pin count
2. Lead pitch
3. Body size
4. Tip-to-Tip measurement

When you are ordering, provide the following:

1. Manufacturer part number and package outline drawing
2. Socket style: Production, Test & Burn-in or Male to Male
3. Quantity and delivery requirements
4. Socket application

### Emulation Technology Recommends:

#### Try our BGA Rework Stencils

Residue-free adhesive backing means these stencils are self-sticking  
...so you can say goodbye to tape and fixturing forever!

**Web Link:** [www.1800adapter.com/019](http://www.1800adapter.com/019)

For a complete list of QFP Test & Burn-In Socket specifications, pricing and delivery information, please see:

**Web Link:** [www.1800adapter.com/106](http://www.1800adapter.com/106)

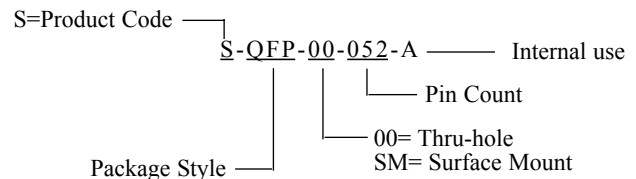


Test & Burn-in QFP Socket



Surface Mount QFP Socket

## Ordering Information Example



### Electrical Specifications

Current Rating	1 A max.
Contact Resistance	Less than 200m ohms (initial)
Insulation Resistance	500m ohms min. at 500V DC (0.80mm)

### Mechanical Specifications

Individual Contact Force	20-40g (typical)
Replaceable Anisotropic Conductive Pad Life	250,000 to 1,000,000

### Materials

Insulation Housing	PES, Turlon
Contacts	Plunger BeCu, Barrel PB
Terminal	BeCu

### Operating Temperature

Temperature Range	-55 degrees C to 100 degrees C
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### EMULATION TECHNOLOGY RECOMMENDS:

Safely handle your fine-pitch devices with a product from Emulation Technology's Vacuum handling systems.

#### Vacuum Pens

ET's vacuum pens are hand-held, manually operated handling tools that allow you to lift and move fine pitch devices.



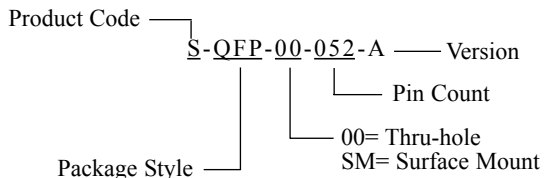
- Easily lift ICs without damaging device
- Eliminates need to touch fragile packages
- Built-in vacuum
- All pens come with tips

For a complete list of vacuum specifications, pricing and delivery information, please see:

**Web Link:** [www.1800adapter.com/086](http://www.1800adapter.com/086)

# POFP/TOFP TEST & BURN-IN / SMT - SOCKETS

## Ordering Information Example



For a complete list of QFP Test & Burn-In Socket specifications, pricing and delivery information, please see

**Web Link:**  
[www.1800adapter.com/106](http://www.1800adapter.com/106)

SOCKETS & RECEPTACLES:  
TEST & BURN-IN, PRODUCTION

## SMT

Pin Count	Lead Pitch (mm)	Chip Size (mm)	Tip to Tip (mm)	ET Part #	Drawing #
44	0.80	10X10	12.00 & 12.65	S-QFP-SM-044-A	SKT722
44	0.80	10X10	12.00 & 12.65	S-QFP-SM-044-A1	SKT1518
64	0.50	10X10	12X12	S-QFP-SM-064-C	SKT1422
64	0.50	10X10	12X12	S-QFP-SM-064-D	SKT1597
64	0.80	14X10	17.2X17.2	S-QFP-SM-064-B	SKT1501
64	0.80	14X14	17.2X17.2	S-QFP-SM-064-B1	SKT1662
64	1.00	12X14	24.80X18.85	S-QFP-SM-064-A	SKT500
80	0.50	12X12	14X14	S-QFP-SM-080-E	SKT832
80	0.65	14X14	17.2X17.2	S-QFP-SM-080-B	SKT425
80	0.65	14X14	16X16	S-QFP-SM-080-B1	SKT840
80	0.80	14X20	23.2-23.9	S-QFP-SM-080-A	SKT424
80	0.80	14X20	23.2X23.2	S-QFP-SM-080-C	SKT426
100	0.50	25X4	14X14	S-QFP-SM-100-B	SKT428
100	0.50	25X4	14X14	S-QFP-SM-100-B2	SKT1473
100	0.50	14X14	16X16	S-QFP-SM-100-E	SKT1369
100	0.65	14X20	23.20-23.90	S-QFP-SM-100-A	SKT499
100	0.65	14X20	23.2X23.2	S-QFP-SM-100-D	SKT503
128	0.50	14X20	16X22	S-QFP-SM-128-A	SKT836
132	0.635	27.9X27.9	27.9X27.9	S-QFP-SM-132-A	SKT431
144	0.50	20X20	22X22	S-QFP-SM-144-A	SKT535
144	0.50	20X20	22X22	S-QFP-SM-144-A1	SKT578
144	0.65	28X28	31.9X31.9	S-QFP-SM-144-B	SKT536
160	0.65	28X28	31.9X31.9	S-QFP-SM-160-A	SKT432
176	0.50	24X24	26X26	S-QFP-SM-176-D	SKT835
208	0.50	28X28	30.6X30.6	S-QFP-SM-208-A	SKT434
208	0.50	28X28	30.6X30.6	S-QFP-SM-208-A1	SKT1168
240	0.50	32X32	34.6X34.6	S-QFP-SM-240-A	SKT540
256	0.50	40X28	42.6/30.60	S-QFP-SM-256-A	SKT639

## TEST & BURN-IN

### 0.65mm Lead Pitch

Pin Count	Chip Size (mm)	Tip to Tip (mm)	ET Part #	Drawing #
52	10X10	13.9X13.9	S-QFP-00-052-A	SKT003
52	10X10	13.2X13.2	S-QFP-00-052-A1	SKT808
52	10X10	12X12	S-QFP-00-052-D	SKT572
52	10X10	12X12	S-QFP-00-052-F	SKT1614
64	14X14	17.2X17.2	S-QFP-00-064-F	SKT1022
64	12X12	14.6X14.6	S-QFP-00-064-H	SKT423
80	14X14	17.2X17.2	S-QFP-00-080-A	SKT005
80	14X14	16X16	S-QFP-00-080-F	SKT409
80	14X14	17.2X17.2	S-QFP-00-080-H	SKT1451
100	14X22	17.2/17.9 23.2/23.9	S-QFP-00-100-A	SKT007
100	14X20	17.2X23.2	S-QFP-00-100-A1	SKT410
100	14X20	16X22	S-QFP-00-100-A5	SKT573
112	20X20	23.2X23.2	S-QFP-00-112-A	SKT027
112	20X20	22X22	S-QFP-00-112-B	SKT1377
112	20X20	22X22	S-QFP-00-112-D	SKT1520
100	14X20	17.20X23.20	S-QFP-00-100-A2	SKT1706
144	26X26	31.2X31.2	S-QFP-00-144-B	SKT012
144	28X28	31.2X31.2	S-QFP-00-144-B1	SKT1705
144	28X28	31.2-31.9	S-QFP-00-144-D	SKT038
160	28X28	31.9X31.9	S-QFP-00-160-A	SKT013
160	28X28	31.2X31.2	S-QFP-00-160-A1	SKT800
160	28X28	31.9X31.9	S-QFP-00-160-A2	SKT013
160	28X28	31.20X31.90	S-QFP-00-160-B	SKT014
160	28X28	31.2X31.2	S-QFP-00-160-C	SKT1419

NOTE: Manufacturer's chip package drawing required with each order.

## TEST & BURN-IN

### 0.635mm / .025" Lead Pitch

Pin Count	Chip Size (mm)	Tip to Tip (mm)	ET Part #	Drawing #
100	22.9X22.9	22.9X22.9	S-QFP-00-100-B	SKT024
100	.900"	.880"	S-QFP-00-100-D	SKT008
132	24.13X24.13	27.94X27.94	S-QFP-00-132-E	SKT035
132	24.13	1.080"	S-QFP-00-132-A	SKT031
132	24.13	1.080"	S-QFP-00-132-B	SKT032
132	24.13	1.080"	S-QFP-00-132-C	SKT033
132	1.100"	1.080"	S-QFP-00-132-D	SKT034
164	1.300"	1.280"	S-QFP-00-164-C	SKT041
172	1.150"	1.610"	S-QFP-00-172-A	SKT043
196	34.39X34.39	38.1X38.1	S-QFP-00-196-B	SKT016

### 0.50mm Lead Pitch

Pin Count	Chip Size (mm)	Tip to Tip (mm)	ET Part #	Drawing #
32	5X5	7X7	S-QFP-00-032-B	SKT1006
48	7X7	9X9	S-QFP-00-048-A	SKT002
48	7X7	9X9	S-QFP-00-048-B	SKT1460
64	10X10	12X12	S-QFP-00-064-C	SKT116
64	10X10	13.2X13.2	S-QFP-00-064-E	SKT541
80	12X12	14X14	S-QFP-00-080-D	SKT021
80	12X12	14X14	S-QFP-00-080-G2	SKT1598
100	14X14	16X16	S-QFP-00-100-G	SKT010
100	14X14	16X16	S-QFP-00-100-H	SKT574
100	14X14	16.6/16.9	S-QFP-00-100-L	SKT1659
120	14X14	17.9X17.9	S-QFP-00-120-C	SKT412
128	20X14	22X16	S-QFP-00-128-C	SKT544
128	20X14	23.2X17.2	S-QFP-00-128-C1	SKT831
144	20X20	22X22	S-QFP-00-144-E	SKT039
144	20X20	22X22	S-QFP-00-144-E1	SKT576
144	20X20	22X20	S-QFP-00-144-E2	SKT1660
160	24X24	26X26	S-QFP-00-160-F	SKT1287
176	24X24	26X26	S-QFP-00-176-A	SKT052
176	44X4	24X24	S-QFP-00-176-B	SKT513
208	28X28	31.2X31.2	S-QFP-00-208-A	SKT017
208	28X28	30.6X30.6	S-QFP-00-208-A1	SKT508
208	28X28	31.2X31.2	S-QFP-00-208-B	SKT046
208	28X28	30.6X30.6	S-QFP-00-208-B3	SKT047
208	28X28	31.9X31.9	S-QFP-00-208-B4	SKT504
208	28X28	30X30	S-QFP-00-208-B5	SKT1661
208	28X28	30X30	S-QFP-00-208-B7	SKT841
240	32X32	34.6X34.6	S-QFP-00-240-B	SKT048
240	32X32	34.6X34.6	S-QFP-00-240-C	SKT1339
304	40X40	42.6X42.6	S-QFP-00-304-A	SKT119

### 0.4mm Lead Pitch

Pin Count	Chip Size (mm)	Tip to Tip (mm)	ET Part #	Drawing #
128	14X14	16X16	S-QFP-00-128-E	SKT1285
176	20X20	22X22	S-QFP-00-176-C	SKT420
176	20X20	22X22	S-QFP-00-176-E	SKT1182

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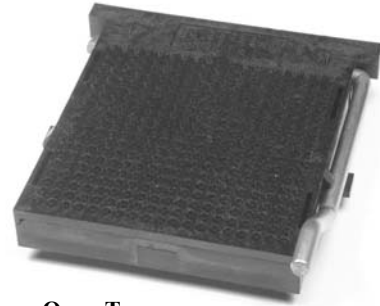
# SOCKETS - PGA TEST & BURN-IN SOCKETS

SOCKETS & RECEPTACLES:  
TEST & BURN-IN, PRODUCTION

## PGA TEST & BURN-IN

Pin Count	Grid Pattern	ET Part #	Drawing #
20	5X5	S-PGA-05-020-A	SKT202
28	6X6	S-PGA-06-028-A	SKT204
30	6X6	S-PGA-06-030-A	SKT213
30	6X6	S-PGA-06-030-AZ	SKT214
32	7X7	S-PGA-07-032-A	SKT206
44	8X8	S-PGA-08-044-A	SKT208
44	8X8	S-PGA-08-044-AW	SKT209
44	8X8	S-PGA-08-044-AZ	SKT210
48	8X8	S-PGA-08-048-A	SKT212
52	9X9	S-PGA-09-052-A	SKT211
68	10X10	S-PGA-10-068-A	SKT215
68	10X10	S-PGA-10-068-AZ	SKT105
68	11X11	S-PGA-11-068-A	SKT220
68	11X11	S-PGA-11-068-AW	SKT221
68	11X11	S-PGA-11-068-AZ	SKT222
69	11X11	S-PGA-11-069-A	SKT223
69	11X11	S-PGA-11-069-AZ	SKT224
81	12X12	S-PGA-12-081-A	SKT239
84	10X10	S-PGA-10-084-A	SKT217
84	11X11	S-PGA-11-084-A	SKT523
84	11X11	S-PGA-11-084-AW	SKT225
84	13X13	S-PGA-13-084-A	SKT245
84	13X13	S-PGA-13-084-AW	SKT246
85	11X11	S-PGA-11-085-A	SKT226
85	11X11	S-PGA-11-085-AW	SKT227
85	11X11	S-PGA-11-085-AZ	SKT228
88	13X13	S-PGA-13-088-A	SKT160
88	13X13	S-PGA-13-088-AZ	SKT249
88	13X13	S-PGA-13-088-B	SKT250
96	11X11	S-PGA-11-096-A	SKT230
96	11X11	S-PGA-11-096-AZ	SKT231
100	12X12	S-PGA-12-100-A	SKT559
100	13X13	S-PGA-13-100-A	SKT253
100	13X13	S-PGA-13-100-B	SKT254
101	13X13	S-PGA-13-101-A	SKT257
108	12X12	S-PGA-12-108-A	SKT240
108	12X12	S-PGA-12-108-AW	SKT241
108	12X12	S-PGA-12-108-AZ	SKT242
112	11X11	S-PGA-11-112-A	SKT232
112	11X11	S-PGA-11-112-AZ	SKT233
114	13X13	S-PGA-13-114-A	SKT260
114	13X13	S-PGA-13-114-AZ	SKT262
116	11X11	S-PGA-11-116-A	SKT234
120	13X13	S-PGA-13-120-A	SKT263
120	17X17	S-PGA-17-120-A	SKT334
121	11X11	S-PGA-11-121-A	SKT235
121	11X11	S-PGA-11-121-AW	SKT1698
121	11X11	S-PGA-11-121-AZ	SKT237
121	13X13	S-PGA-13-121-A	SKT266
121	13X13	S-PGA-13-121-AZ	SKT267
128	13X13	S-PGA-13-128-A	SKT269
128	13X13	S-PGA-13-128-AZ	SKT271
132	13X13	S-PGA-13-132-A	SKT272
132	13X13	S-PGA-13-132-AZ	SKT274
132	14X14	S-PGA-14-132-A	SKT284
132	14X14	S-PGA-14-132-AZ	SKT286
133	13X13	S-PGA-13-133-A	SKT275
133	13X13	S-PGA-13-133-B	SKT560
144	12X12	S-PGA-12-144-A	SKT243
144	12X12	S-PGA-12-144-AZ	SKT244
144	12X12	S-PGA-12-144-B	SKT248
144	13X13	S-PGA-13-144-A	SKT276
144	13X13	S-PGA-13-144-AZ	SKT278
144	15X15	S-PGA-15-144-A	SKT296
145	15X15	S-PGA-15-145-A	SKT297
145	15X15	S-PGA-15-145-SM	SKT1384
156	16X16	S-PGA-16-156-A	SKT318
156	16X16	S-PGA-16-156-AZ	SKT320
160	13X13	S-PGA-13-160-A	SKT279
160	15X15	S-PGA-15-160-A	SKT302
160	15X15	S-PGA-15-160-AZ	SKT304
160	15X15	S-PGA-15-160-B	SKT1078

## PGA Test & Burn-in Socket



Zero Insertion Force, Open Top

## Ordering Information EXample

Product Code ———— Production Socket  
**S-PGA-13-020-A(Z)** Optional:  
 Socket Type ———— (Z)= Burn-in Socket  
 Socket Male Pattern ———— (W)= Wire Wrap Posts  
 Pin Count ———— Note: No (Z) = Prod. Socket

## PGA TEST & BURN-IN

Pin Count	Grid Pattern	ET Part #	Drawing #
168	17X17	S-PGA-17-168-A	SKT335
168	17X17	S-PGA-17-168-AS	SKT958
168	17X17	S-PGA-17-168-AZ	SKT336
168	17X17	S-PGA-17-168-BS	SKT1615
169	13X13	S-PGA-13-169-A	SKT280
175	16X16	S-PGA-16-175-A	SKT321
175	16X16	S-PGA-16-175-B	SKT324
175	16X16	S-PGA-16-175-BW	SKT325
175	16X16	S-PGA-16-175-BZ	SKT326
176	15X15	S-PGA-15-176-A	SKT521
176	15X15	S-PGA-15-176-AW	SKT303
176	15X15	S-PGA-15-176-AZ	SKT522
176	16X16	S-PGA-16-176-A	SKT327
176	16X16	S-PGA-16-176-AZ	SKT328
179	18X18	S-PGA-18-179-A	SKT360
179	18X18	S-PGA-18-179-AZ	SKT361
179	18X18	S-PGA-18-179-SM	SKT1669
180	18X18	S-PGA-18-180-A	SKT362
180	18X18	S-PGA-18-191-A	SKT1680
181	15X15	S-PGA-15-181-A	SKT310
181	15X15	S-PGA-15-181-AW	SKT311
191	18X18	S-PGA-18-191-AZ	SKT365
192	16X16	S-PGA-16-192-AZ	SKT331
192	17X17	S-PGA-17-192-A	SKT342
192	17X17	S-PGA-17-192-AZ	SKT343
196	14X14	S-PGA-14-196-A	SKT293
200	15X15	S-PGA-15-200-A	SKT313
200	15X15	S-PGA-15-200-AZ	SKT314
206	18X18	S-PGA-18-206-A	SKT1670
207	17X17	S-PGA-17-207-AZ	SKT344
208	17X17	S-PGA-17-208-A	SKT345
209	17X17	S-PGA-17-209-A	SKT347
209	17X17	S-PGA-17-209-AZ	SKT349

**NOTE: Manufacturer's chip package drawing required with each order.**

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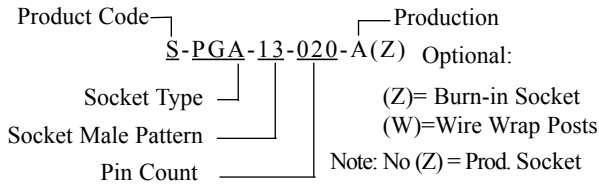
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For a complete list of PGA Test & Burn-In Socket specifications,  
pricing and delivery information, please see:

Web Link: [www.1800adapter.com/131](http://www.1800adapter.com/131)

# PGA & HGA, FLATPACK, TEST & BURN-IN SOCKETS - SOCKETS

## Ordering Information Example



## PGA TEST & BURN-IN (cont.)

Pin Count	Grid Pattern	ET Part #	Drawing #
220	16X16	S-PGA-16-220-A	SKT332
223	18X18	S-PGA-18-223-A	SKT366
223	18X18	S-PGA-18-223-AW	SKT367
223	18X18	S-PGA-18-223-AZ	SKT368
223	18X18	S-PGA-18-223B-B	SKT369
224	18X18	S-PGA-18-224-A	SKT370
224	18X18	S-PGA-18-224-AZ	SKT371
225	15X15	S-PGA-15-225-A	SKT316
225	15X15	S-PGA-15-225-AZ	SKT317
225	18X18	S-PGA-18-225-A	SKT372
225	15X15	S-PGA-15-225-AZ	SKT317
225	18X18	S-PGA-18-225-A	SKT372
225	18X18	S-PGA-18-225-AW	SKT566
232	17X17	S-PGA-17-232-A	SKT352
240	17X17	S-PGA-17-240-A	SKT353
240	17X17	S-PGA-17-240-AW	SKT354
240	17X17	S-PGA-17-240-AZ	SKT355
240	19X19	S-PGA-19-240-A	SKT384
240	20X20	S-PGA-20-240-AW	SKT889
241	18X18	S-PGA-18-241-A	SKT374
241	18X18	S-PGA-18-241-AZ	SKT375
244	19X19	S-PGA-19-244-A	SKT386
256	16X16	S-PGA-16-256-A	SKT1667
256	16X16	S-PGA-16-256-AW	SKT1668
256	20X20	S-PGA-20-256-A	SKT396
256	20X20	S-PGA-20-256-AW	SKT399
256	20X20	S-PGA-20-256-AZ	SKT397
257	19X19	S-PGA-19-257-A	SKT388
260	18X18	S-PGA-18-260-A	SKT376
271	21X21	S-PGA-21-271-A	SKT1673
273	21X21	S-PGA-21-273-A	SKT1079
280	19X19	S-PGA-19-280-A	SKT390
280	19X19	S-PGA-19-280-AW	SKT569
280	19X19	S-PGA-19-280-AZ	SKT391
288	18X18	S-PGA-18-288-AZ	SKT1671
289	17X17	S-PGA-17-289-A	SKT356
289	17X17	S-PGA-17-289-AW	SKT357
289	17X17	S-PGA-17-289-AZ	SKT358
300	20X20	S-PGA-20-300-A	SKT398
300	20X20	S-PGA-20-300-AW	SKT1672
300	20X20	S-PGA-20-300-AZ	SKT400
315	18X18	S-PGA-18-315-A	SKT568
319	21X21	S-PGA-21-319-A	SKT1586
324	18X18	S-PGA-18-324-AZ	SKT379
350	21X21	S-PGA-21-350-AZ	SKT1681
361	19X19	S-PGA-19-361-A	SKT1113
361	19X19	S-PGA-19-361-AZ	SKT392
400	20X20	S-PGA-20-400-A	SKT401
400	20X20	S-PGA-20-400-AW	SKT819
431	24X24	S-PGA-24-431-A	SKT1674
456	22X22	S-PGA-22-456-AW	SKT1583
625	25X25	S-PGA-25-625-A	SKT1675
625	25X25	S-PGA-25-625-AZ	SKT1676
625	25X25	S-PGA-25-625-BZ	SKT1677

NOTE: Manufacturer's chip package drawing required with each order.

Call us (1-800-ADAPTER) or check out this link to request an immediate custom quotation:  
**Web Link: [www.1800adapter.com/forms](http://www.1800adapter.com/forms)**

## HGA TEST & BURN-IN

Pin Count	Grid Pattern	ET Part #	Drawing #
141	19X19	S-HGA-19-141-A	SKT545
141	19X19	S-HGA-19-141-AL	SKT1010
296	37X37	S-HGA-37-296-A	SKT170
296	37X37	S-HGA-37-296-A1	SKT171
296	37X37	S-HGA-37-296-AL	SKT184
296	37X37	S-HGA-37-296-AZ	SKT545
320	37X37	S-HGA-37-320-PN	SKT1584
321	37X37	S-HGA-37-321-AL	SKT1331
325	35X35	S-HGA-35-325-A	SKT169
325	35X35	S-HGA-35-325-AZ	SKT1651
365	33X33	S-HGA-33-365-A	SKT552
365	33X33	S-HGA-33-365-AL	SKT1650
370	37X37	S-HGA-37-370-A	SKT1011
370	37X37	S-HGA-37-370-AL	SKT183
370	37X37	S-HGA-37-370-AZ	SKT838
387	47X47	S-HGA-47-387-AZ	SKT553
391	35X35	S-HGA-35-391-A	SKT520
403	37X37	S-HGA-37-403-A	SKT546
403	37X37	S-HGA-37-403-AL	SKT1484
403	37X37	S-HGA-37-403-AZ	SKT547
411	39X39	S-HGA-39-411-A	SKT708
411	39X39	S-HGA-39-411-AZ	SKT1374
423	39X39	S-HGA-39-423-A	SKT1290
429	37X37	S-HGA-37-429-A	SKT784
429	37X37	S-HGA-37-429-AL	SKT179
447	39X39	S-HGA-39-447-A	SKT548
447	39X39	S-HGA-39-447-AL	SKT549
463	37X37	S-HGA-37-463-A	SKT530
463	37X37	S-HGA-37-463-AL	SKT531
503	43X43	S-HGA-43-503-A	SKT534
503	43X43	S-HGA-43-503-AL	SKT550
503	43X43	S-HGA-43-503-AZ	SKT551
559	43X43	S-HGA-43-559-A	SKT709
655	47X47	S-HGA-47-655-AZ	SKT939
761	39X39	S-HGA-39-761-AZ	SKT177

## FLATPACK TEST & BURN-IN

Pin Count	Carrier Size (mm)	ET Part #	Drawing #
14	.75X1 CRR	S-FLT-00-014-A	SKT162
16	CONSULT FACTORY	S-FLT-00-016-A	SKT163
24	1.25X1.25	S-FLT-00-024-A	SKT164
24	1.25X1.25	S-FLT-00-024-B	SKT165
28	1.25X1.25	S-FLT-00-028-A	SKT168
28	1.25X1.25	S-FLT-00-028-B	SKT1646
32	CONSULT FACTORY	S-FLT-00-032-A	SKT1647
44	2.75X2.75	S-FLT-00-044-A	SKT1648
44	2.75X2.75	S-FLT-00-044-B	SKT1649
84	CONSULT FACTORY	S-FLT-00-084-A	SKT167
160	CONSULT FACTORY	S-FLT-00-160-A	SKT166
176	CONSULT FACTORY	S-FLT-00-176-A	SKT1391
176	CONSULT FACTORY	S-FLT-00-178-A	SKT750
256	CONSULT FACTORY	S-FLT-00-256-A	SKT1521

## LCC TEST & BURN-IN

Pin Count	ET Part #	Drawing #
8	S-LCC-00-008-A	SKT1385
20	S-LCC-00-020-A	SKT172
28	S-LCC-00-028-A	SKT175
32	S-LCC-00-032-A	SKT176
32	S-LCC-00-032-E	SKT1515
32	S-LCC-07-032-A	SKT185
32	S-LCC-SM-032-A	SKT192
32	S-LCC-SM-032-B	SKT193
44	S-LCC-00-044-A	SKT180
48	S-LCC-00-048-B	SKT181
52	S-LCC-00-052-A	SKT182
68	S-LCC-11-068-A	SKT188
68	S-LCC-SM-068-A	SKT1164
84	S-LCC-13-084-C	SKT191

SOCKETS & RECEPICLES:  
 TEST & BURN-IN, PRODUCTION

# SOCKETS - PLCC BURN-IN/ PRODUCTION/ THRU-HOLE & SMT

## PLCC BURN-IN TEST

Pin Count	ET Part #	Drawing #
20	S-PCC-00-020-A	SKT075
20	S-PCC-00-020-B	SKT076
28	S-PCC-00-028-A	SKT078
28	S-PCC-00-028-B	SKT079
28	S-PCC-00-028-C	SKT196
32	S-PCC-00-032-A	SKT080
32	S-PCC-00-032-C	SKT082
32	S-PCC-00-032-D	SKT083
32	S-PCC-00-032-K	SKT084
44	S-PCC-00-044-A	SKT085
44	S-PCC-00-044-B	SKT086
44	S-PCC-00-044-C	SKT197
44	S-PCC-00-044-D	SKT087
52	S-PCC-00-052-A	SKT088
52	S-PCC-00-052-B	SKT089
68	S-PCC-00-068-B	SKT091
68	S-PCC-00-068-C	SKT199
84	S-PCC-00-084-B	SKT093
84	S-PCC-00-084-C	SKT094

For a complete list of PLCC Test & Burn-In Socket specifications, pricing and delivery information, see:

**Web Link: [www.1800adapter.com/108](http://www.1800adapter.com/108)**

## PRODUCTION THRU-HOLE

Pin Count	ET Part #	Drawing #
20	S-PCC-05-020-A	SKT095
28	S-PCC-06-028-A	SKT096
32	S-PCC-07-032-A	SKT097
44	S-PCC-08-044-A	SKT098
52	S-PCC-09-052-A	SKT099
68	S-PCC-11-068-A	SKT100
84	S-PCC-13-084-A	SKT102

For a complete list of PLCC Thru-Hole Socket specifications, pricing and delivery information, please see:

**Web Link: [www.1800adapter.com/109](http://www.1800adapter.com/109)**

## PRODUCTION SMT

Pin Count	ET Part #	Drawing #
20	S-SMT-05-020-B	SKT1200
20	S-SMT-05-020-A	SKT443
28	S-SMT-07-028-A	SKT444
32	S-SMT-09-032-A	SKT445
44	S-SMT-11-044-A	SKT446
52	S-SMT-13-052-A	SKT447
68	S-SMT-17-068-A	SKT448
84	S-SMT-21-084-A	SKT449

For a complete list of PLCC Production Socket specifications, pricing and delivery information, please see:

**Web Link: [www.1800adapter.com/110](http://www.1800adapter.com/110)**

**NOTE:** Manufacturer's chip package drawing required with each order.

### Emulation Technology Recommends:

#### Try our PLCC Daughterboard Plugs

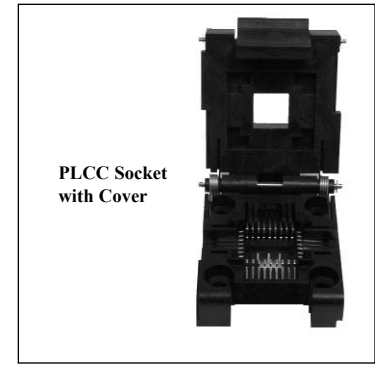
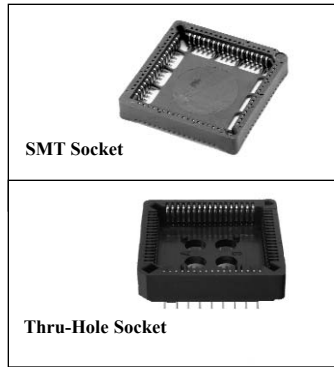
Designed to provide a connection between your printed circuit board and your PLCC production socket

**Web Link: [www.emulation.com/plccplugs](http://www.emulation.com/plccplugs)**

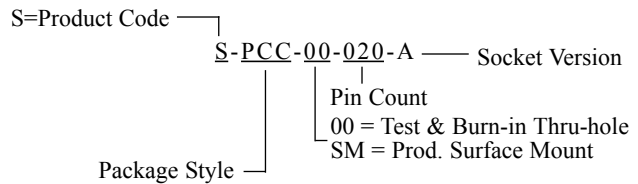
#### Try our PLCC Socketable Bug Katchers

PLCC Bug Katchers make it easy to attach test leads to socketed ICs in PLCC packages

**Web Link: [www.1800adapter.com/119](http://www.1800adapter.com/119)**



### Ordering Information Example



### PLCC Extraction Tool

- Use this to extract PLCC packages from their production sockets
- Prevents bending or breaking of adjacent leads
- Puller works on PLCC packages with 20, 28, 32, 44, 52, 68, 84, and 100 pin counts



**Web Link: [www.1800adapter.com/053](http://www.1800adapter.com/053)**

### PLCC Vacuum Insertion Tool

- Use this tool to easily insert PLCC packages into their sockets.
- Inserters works on PLCC packages with pin counts 28 to 84
- Conductive plastic material is an active grounding device against static charging



**Web Link: [www.1800adapter.com/053](http://www.1800adapter.com/053)**

### Vacuum Pen

- Eliminates need to touch fragile QFP and SOIC packages
- Few mechanical parts, will last for years
- Vacuum is built in
- Comes with 3 straight tips and 3 angled tips



**Web Link: [www.1800adapter.com/086](http://www.1800adapter.com/086)**