

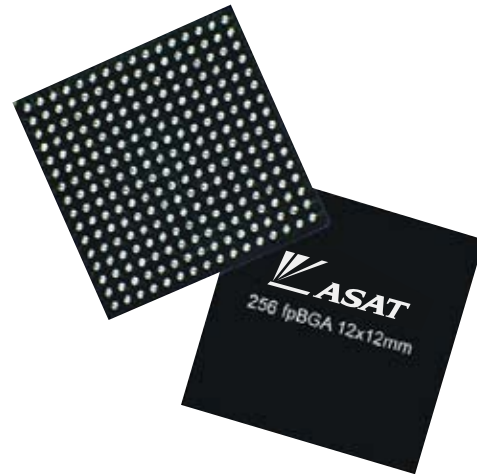
fpBGA™

Fine Pitch Ball Grid Array

Developed in 1998, ASAT's fpBGA entered the chip scale packaging market offering a competitive solution for mobile applications, with package height ranging from 1.4mm down to 0.6mm thin package, and with ball pitches from 0.4mm & up. ASAT's fpBGA package is an excellent choice for application requiring enhanced electrical performance.

Typical Applications

- ASICs, microprocessors/controllers.
- Networking, graphic & PC chipsets,
- PLDs, DSP, mix signals,
- Gate Arrays, memory,



Advantages

- Superior electrical performance
- Thermal enhancement
- Low profile, small footprint, light weight
- Lead free and 'Green' material sets available

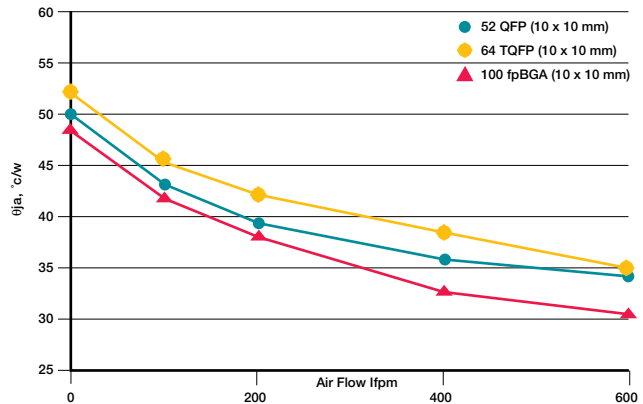
Features

- Body sizes from 4 to 27 sq mm
- Open and custom ball counts from 24 - 672
- Package thickness 0.6 / 0.8 / 1.0 / 1.2 / 1.4 / 1.7mm
- Ball Pitch 0.4, 0.5, 0.65, 0.80 and 1.00mm
- Die-up configuration

fpBGA packages are constructed with standard materials and can be designed to meet your special packaging requirements

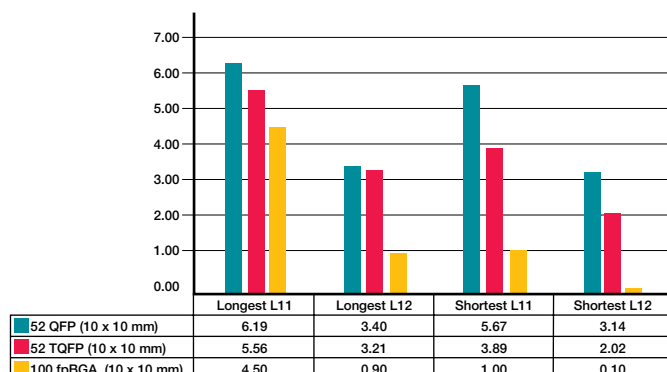
Thermal Performance

(various package types)



Electrical Performance

(various package types)



Standard Materials	
Substrate	BT Resin
Substrate Finish	Electrolytic Plating
Die Attach	Conductive/Non-Conductive Epoxy
Mold Compound	RoHS Compliant or Halogen Free Mold Compound
Marking	Laser Mark
Solder Ball	Standard: 62Sn/36Pb/2Ag or Pb-free: 96.5Sn/3Ag/0.5Cu or Cu-OSP: 98.25Sn/1.2Ag/ 0.5Cu/ 0.05Ni

Reliability	
Moisture Sensitivity	MSL-3
Autoclave, 121°C*	168 Hours
Temp. Cycle, Cond. C	1000 Cycles
Unbiased HAST, 130°C	96 Hours
HTSL, 150°C	1000 Hours

Test Vehicle: 27 x 27 mm 672 fpBGA

*JEDEC/JESD22-A102-C does not require Autoclave test on laminate- or tape-based packages; i.e., FR4 material, polyimide tape, or equivalent.

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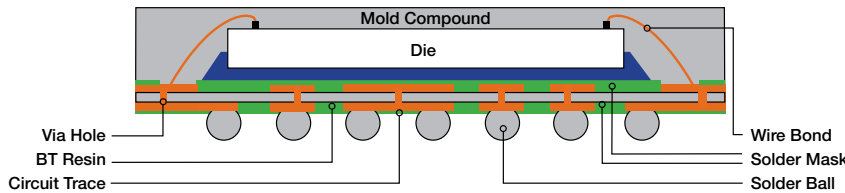
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Typical Cross Section



Note: Various mold caps are available to meet specific customer's overall package thickness requirement from 1.4 to 2.52 mm.

Typical Package Configurations

Package	Dimension	Ball Count	Ball Pitch
B-fpBGA	10.16 x 11.43	36	1.27
>1.7mm	9 x 11	24	1.27
F-fpBGA	21 x 21	256, 316	1.00
>1.7mm	23 x 23	484	1.00
	25 x 25	529	1.00
	27 x 27	672	1.00
	35 x 35	388	1.27
L-fpBGA	4 x 4	24	0.80
1.7mm max	5 x 5	32, 36	0.50, 0.80
	5.5 x 16	114	0.80
	6 x 6	36, 48, 56	0.50, 0.80
	6.0 x 5.35	26	0.65
	6 x 9	48	0.80
	7 x 7	48, 49, 64, 81, 100, 104	0.50, 0.65, 0.75, 0.80
	7 x 8	48	0.75
	7 x 12	48, 54	0.50, 0.75
	8 x 8	64, 72, 80, 100	0.65, 0.80
	8 x 9	48	0.80
	9 x 9	64, 80, 100, 113	0.80, 1.00
	10 x 10	100, 108, 109, 140, 144, 165, 296, 302	0.50, 0.80, 1.00
	10 x 12	48	1.00
	10 x 14	48, 117	1.00
	11 x 11	64, 100, 169, 282, 355	0.50, 0.80, 1.00
	12 x 12	121, 160, 168, 180, 196, 204, 276	0.65, 0.80, 1.00
	12 x 7	47	0.50

Package	Dimension	Ball Count	Ball Pitch
L-fpBGA	12 x 16	130	0.80
1.7mm max	13 x 13	132, 144, 160, 176, 200, 225, 256, 417, 517	0.50, 0.80, 1.00
	13 x 10	48	1.00
	15 x 15	176, 196, 208, 289, 301, 324, 448	0.65, 0.80, 1.00
	17 x 17	192, 220, 256, 329	0.80, 1.00
	19 x 19	324	1.00
	21 x 21	256, 316, 400	1.00
T-fpBGA	4 x 4	49	0.50
1.2mm max	5 x 5	41, 49, 52, 65	0.50, 0.65
	5.7 x 5	25	0.75
	6 x 6	56, 95, 96	0.50
	7 x 7	48, 100, 144	0.50, 0.75
	7 x 12	54	1.00
	8 x 8	64, 100	0.50, 0.80
	8 x 10	48	0.80
	10 x 10	112, 164, 281	0.50
	10 x 13	54, 64, 80	1.00
	10.1 x 10.9	281	0.50
	12 x 12	160	0.80
	13 x 13	132	1.00
V-fpBGA	4.5 x 7	52	0.65
1.0mm max	5 x 5	80	0.50
	6 x 6	96	0.50
	10 x 10	192	0.50

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