

## The fpBGA Package

Developed in 1998, ASAT's fine pitch ball grid array fpBGA package entered the chip scale package market offering a competitive solution for mobile applications. The 1.2mm thick package offers a super low profile solution, while the 0.5mm ball pitch package is a technically superior solution for hand held products. ASAT's fpBGA package is an excellent choice for applications requiring enhanced electrical performance.

## Typical Applications

- ASIC's, Memory Devices, Microprocessors
- Disk Drives, PCMCIA
- Laptops, Digital Video
- Mobile Phones, PDA's

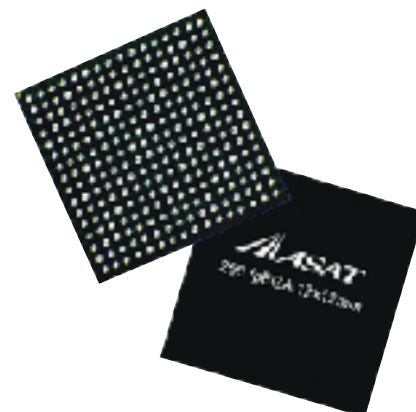
The fpBGA is constructed of standard materials and can be custom designed to meet your IC's special requirements.

## Advantages

- Recognizable density advantage over TQFP's
- Superior electrical performance
- Utilizes existing production equipment
- High I/O capability
- Low profile and lightweight
- High soldering yields

## Features

- Body sizes range from 4 to 27mm SQ.
- Ball counts range between 24 and 672
- Die up configuration
- Optional 1.2mm height and 0.5mm pitch
- Standard materials and processes
- Automated and SMT compatible assembly



## Performance

Electrical	
Typical Package:	144 fpBGA 10 x 10mm
Total capacitance (pF)	0.32 - 0.67
Self Inductance (nH)	3.01 - 5.91
Mutual Inductance (nH)	0.71- 0.82
Thermal	
Basis	Conduction to thermal vias
Conditions	1 watts, 0 airflow, 2s0p
Typical Package	Theta Ja = 50.9 °c/w

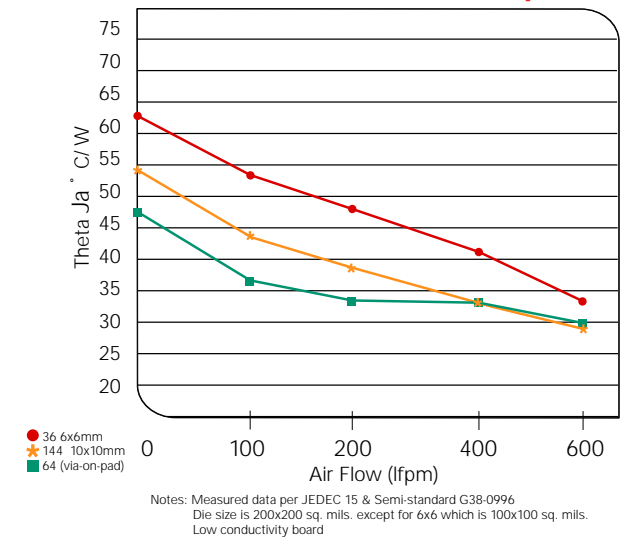
## Standard Materials

Substrate	BT Resin
Substrate Finish	Electrolytic plating
Die Attach	Conductive Epoxy
	Non-Conductive Epoxy
Bond Wire	Gold
Mold Compound	Epoxy Resin
Solder Ball	62 Sn / 36Pb / 2Ag
Marking Ink	White Epoxy Ink; Laser

## Reliability

Preconditioning	Level 2
Autoclave, 121°C	168 Hours
Temp Cycle, cond C	1000 cycles
Thermal Shock, cond. D	100 cycles
HAST, 130°C	96 Hours
HTSL, 150°C	1000 Hours

## Thermal Resistance Comparison



## Typical Configurations

Body Size	Ball Count	Ball Matrix	Layout	Ball Pitch	Thickness
4 x 4	24	5 x 5	Full Matrix	0.80	1.4
6 x 6	36/48	6 x 6 / 9 x 9	Full Matrix	0.80/0.50	1.4
7 x 7	48	7 x 7	Peripheral	0.80	1.4
7 x 12	48	6 x 8	Full Matrix	0.80	1.4
8 x 8	64	8 x 8	Full Matrix	0.80	1.4
9 x 9	64/80	8 x 8 / 10 x 10	Full Matrix	1.00/0.80	1.4
10 x 10	100/144	12 x 12	Peripheral/ Full Matrix	0.80	1.2
11 x 11	169	13 x 13	Full Matrix	0.80	1.4
12 x 12	160	14 x 14	4 Rows	0.80	1.4
13 x 13	144	12 x 12	Full Matrix	1.0	1.4
13 x 13	176	15 x 15	4 Rows	0.80/0.80	1.4
15 x 15	196/208	14 x 14/ 17 x 17	Full Matrix	1.00/0.80	1.4
17 x 17	256	20 x 20	Full Matrix	0.80	1.4