

TBGA™ and CLTBGA™

Tape Ball Grid Array and Closed-Loop Tape Ball Grid Array

Developed and patented in 1995, ASAT's TBGA and CLTBGA packages provide the industry with a higher performance solution to PBGA. ASAT's TBGA package is an excellent choice for applications requiring enhanced thermal and electrical performance. ASAT's CLTBGA option provides solid electrical ground for improved signal-to-noise ratio and reduced ground inductance. The ultra-fine metal line width and spacing allows most designs to be routed on one metal layer. A two-metal option provides multiple power supply rings and improved routability for higher ball count applications, typically above 600.



US Pat. 5,397,921
 US Pat. 5,409,865
 US Pat. 5,843,808
 US Pat. 6,984,785
 US Pat. 6,429,048

Typical Applications

- ASICs, graphics, microprocessors
- High performance networks
- Laptops, workstations
- High-speed logic devices

Advantages

- Best thermal performance in class
- JEDEC standard body sizes and ball counts
- High performance (thermal/electrical and design density)
- Internal heat spreader as ground plane and EMI shield
- Low tooling cost (open tool designs also available)
- Fast design to production

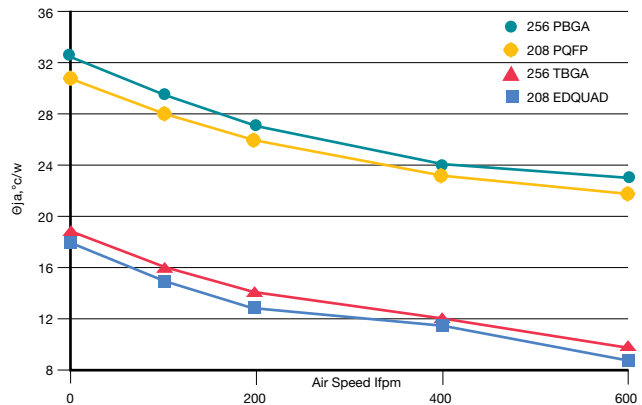
Features

- Body sizes from 15 to 45 mm SQ
- Lead counts from 46 to 792
- Die-down configuration
- One to two metal layer tape design, with and without bussing
- Ground ring on heat spreader or tape
- Option for electrically conductive spot on cavity
- Conforms to JEDEC registered outlines for MO-149
- Controlled impedance / differential pairs capability

The TBGA and CLTBGA packages are constructed with standard materials and can be designed to meet your special packaging requirements.

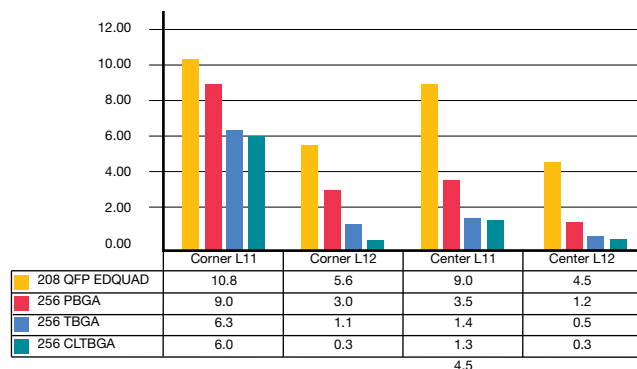
Thermal Performance

(various package types)



Electrical Performance

(various package types)

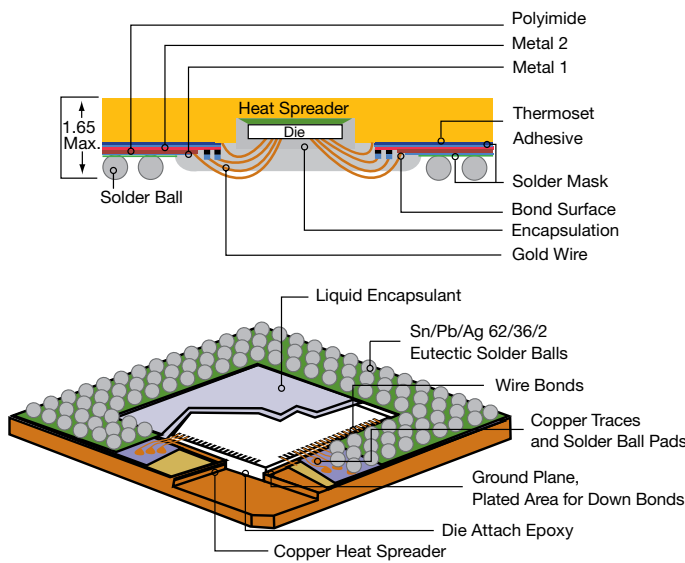


Standard Materials		Reliability	
Substrate	Polyimide Tape	Moisture Sensitivity	MSL-3
	Copper Stiffener	Autoclave, 121°C*	168 Hours
	Thermoset Adhesive	Temp. Cycle, Cond. C	250/500/1000 Cycles
Die Attach	Conductive Epoxy	Unbiased HAST, 130°C	50 Hours
Encapsulant	Liquid Epoxy Type Material	HTSL, 150°C	500/1000 Hours
Marking	Ink		
Solder Ball	62Sn/36Pb/2Ag or SAC 305		

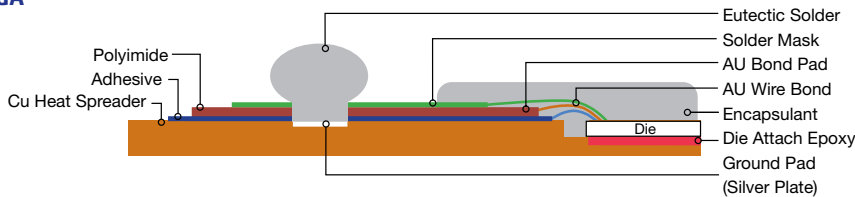
* JEDEC/JESD22-A102-C does not require Autoclave test on laminate or tape-based packages; i.e., FR4 material, polyimide tape, or equivalent.

Typical Cross Section

TBGA



CTBGA



Typical Package Configurations: Ball Pitch 1.00

Body Size	Ball Count
15 x 15	90, 92, 96, 120
21 x 21	256
23 x 23	228
25 x 25	320, 380
27 x 27	276, 352
31 x 31	324, 484
35 x 35	564, 580
37.5 x 37.5	396
40 x 40	680
42.5 x 42.5	728

Typical Package Configurations: Ball Pitch 1.27

Body Size	Ball Count
21 x 21	156, 192
23 x 23	195, 208
25 x 25	218, 240
27 x 27	256, 266, 298
31 x 31	304, 320
35 x 35	56, 59, 352, 356, 368, 420, 440, 504
37.5 x 37.5	46, 400, 480, 584
40 x 40	520, 600, 672, 792
45 x 45	652, 784

(dimensions in mm unless otherwise specified)
Contact ASAT sales offices for custom tooling of package types not listed.

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