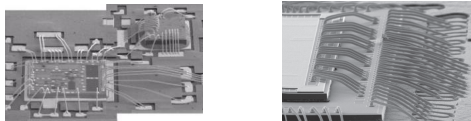


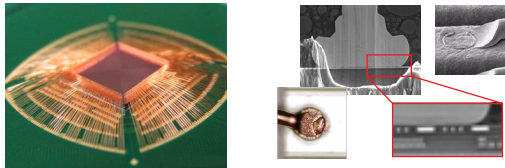
## ChipArray® Packages (CABGA/fBGA)

Amkor's ChipArray® Ball Grid Array (CABGA) packages are laminate based packages that are compatible with SMT mounting processes worldwide.

The near chip size CABGA fine-pitch BGA (fBGA) offers a broad selection of ball array pitches ( $\geq 0.3$  mm pitch), ball counts and body sizes (1.5 mm to 27 mm body), single and multi-die layouts, stacked die (1-16) and passive component integration.



Copper (Cu) wire is today's fastest growing interconnect method and Amkor offers high volume infrastructure at all Amkor CABGA production locations.



Thin core laminate (2 to 6 metal layer) from the strongest supply chain in the industry, ultra-thin mold cap thickness and Si thinning to 50  $\mu$ m enable next generation tablets, mobile handsets, game controllers, digital still & video cameras and remote devices.

Advances in substrate surface finishes and routing techniques reduce gold costs while improving electrical and board level reliability performance. Innovative thermal package structures offer cost competitive solutions to the most challenging thermal management needs.

## Applications

The ChipArray package family is applicable for a wide range of semiconductors from high end FPGAs, ASICs to memory, analog, RF devices, MCUs, and simple PLDs requiring a smaller package size than conventional PBGAs or leadframe packages. ChipArray packages fill the need for the low cost, minimum space, high performance and reliability requirements of mobile and gaming devices, notebooks, personal computers, networking, automotive and industrial applications.

Visit [Amkor Technology online](http://www.amkor.com) for locations and to view the most current product information.

[www.amkor.com](http://www.amkor.com)

## CABGA/fBGA

### Features

- Cutting edge technology and expanding package offerings provide a platform from prototype-to-production
- Lowest price using Amkor standard CABGA bill of materials selection
- 1.5-27 mm body size available
- Square or rectangle packages available
- 4-700 ball/lead counts
- 0.4, 0.5, 0.65, 0.75, 0.80 & 1.0 mm ball pitch available
- JEDEC Publication 95 Design Guide 4.5 (JEP95)
- RoHS-6 (green) BOM options for 100% of CABGA family
- Thermal conductivity epoxy (8 W/mk) and thermal conductivity compound (3 W/mK) are available

### Thermal Performance (Standard BOM)

Body Size (mm)	OJA at 1.0W and 0 Airflow (°C/W)		
	LFBGA	TFBGA	VFPGA
8 x 8	37.28	36.45	37.52
10 x 10	19.86	29.04	26.7
15 x 15	20.1	N/A	N/A
19 x 19	17.04	N/A	N/A

\*Additional thermal data available

### Reliability Qualification

- Moisture Sensitivity Characterization JEDEC Level 3 @ 260°C; L2 & L1 achievable in some structures/BOMs\*  
85°C/85% RH, 168 hours
- HAST 130°C/85% RH, 96 hours
- Temp/Humidity 85°C/85% RH, 1000 hours
- Temp Cycle -55°C/+125°C, 1000 cycles
- High Temp Storage 150°C, 1000 hours
- Automotive AEC-Q100 Grade 0 reliability available\*

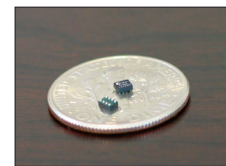
Board level reliability available\*

\*Contact Amkor for additional information.

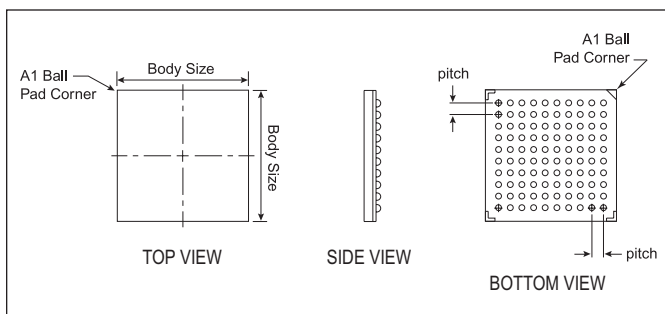


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Questions? Contact us: [sales@amkor.com](mailto:sales@amkor.com)



## CABGA/fBGA



### Standard Materials

- Package substrate
  - Conductor: Copper
  - Dielectric: Epoxy resin glass reinforced
- Die attach adhesive: Low stress elastomer
- Encapsulant: Epoxy mold compound
- Low alpha material: Available
- Solder ball: Pb-free
- Wire type: Copper (PCC, Au PCC), Silver and Gold (2N, 4N)

### Process Highlights

- Die thickness: 0.040-0.27 mm
- Marking: Laser
- Ball inspection: Optical
- Pack options: Dry pack
- Wafer backgrinding: Available
- Encapsulated SMT components: Available
- Micro Pb-free covered LGA Pads/LGAs: Available

### Test Services

- Program generation/conversion
- Product engineering
- Wafer sort
- 256 pin x 20 MHz test system available
- -55°C to +165°C test available
- Burn-in capability
- Tape and reel services

### Shipping

- JEDEC trays

### CABGA Package Thickness Capability

	LFBGA > 1.2 mm	TFBGA 1.2 mm (max)	VFBGA 1.0 mm (max)	WFBGA 0.8 mm (max)	UFBGA 0.65 mm (max)	XFBGA 0.50 mm (max)	XFBGA 0.45 mm (max)	XFBGA 0.40 mm (max)
	CA-lfBGA	CABGA-tfBGA CTBGA/CASON	CABGA-vfBGA CVBGA/CASON	CA-wfLGA CASON	CA-xfBGA CA-xfLGA	CA-xfBGA CA-xfLGA	CA-xfBGA CA-xfLGA	CA-xfBGA CA-xfLGA
<b>Mold Cap Thickness</b>	0.70 mm 0.95 mm	0.60 mm 0.53 mm	0.45 mm (BGA) 0.53 mm (LGA)	0.40 mm (BGA) 0.45 mm (LGA)	0.32/0.35 mm (BGA)* 0.40 mm (LGA)	0.25 mm (BGA)* 0.32 mm (LGA)	0.2 mm (BGA)* 0.25 mm (LGA)	0.18 mm (BGA)*
<b>Substrate Layer</b>	2lyr 0.32 mm, 0.56 mm 4lyr or 6lyr 0.34 mm, 0.56 mm	2lyr or 4lyr 0.21 mm, 0.26 mm	2lyr or 4lyr 0.21 mm	2lyr 0.21 mm, 0.13 mm	2lyr 0.13 mm	2lyr 0.13 mm	2lyr 0.1 mm	2lyr 0.085 mm
<b>Die Thickness**</b>	0.27 mm	0.23 mm	0.18 mm	0.13 mm	0.10 mm	0.075 mm	0.050 mm	0.040 mm
<b>Availability</b>	0.7 mm All Sites 0.95 mm P3, K4	All Sites	All Sites	0.45 mm All Sites 0.40 mm C3, K4	0.32 mm, K4, P3 0.35 mm, All Sites	0.25 mm All Sites	0.2 mm K4	0.18 mm K4

\*Options are available with microballs.

\*\*Die thickness is also dependent on the wirebond loop height requirement.

Visit Amkor Technology online for locations and to view the most current product information.



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