ChipArray® CABGA/FBGA

Amkor's ChipArray Ball Grid Array (CABGA) laminate based packages are compatible with SMT mounting processes worldwide. The near chip size CABGA fine-pitch BGA (FBGA) offers a broad selection of ball array pitches (≥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.

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 µm enable next generation tablets, smartphones, game controllers, digital and 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 for the most challenging thermal management needs.

Features

- Cutting edge technology and expanding package offerings provide a platform from prototype-to-production
- Copper (Cu) wire interconnect method and high volume infrastructure at all Amkor CABGA production facilities
- Lowest cost 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

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 package size smaller 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.

Thermal Performance (Standard BOM)

Body Size (mm)	ΘJA at 1.0W and 0 Airflow (°C/W)		
	LFBGA	TFBGA	VFBGA
8 x 8	37.28	36.45	37.52
10 x 10	29.86	29.04	26.7
15 x 15	20.1	N/A	N/A
19 x 19	17.04	N/A	N/A

Reliability Qualification

Amkor assures reliable performance by continuously monitoring key indices:

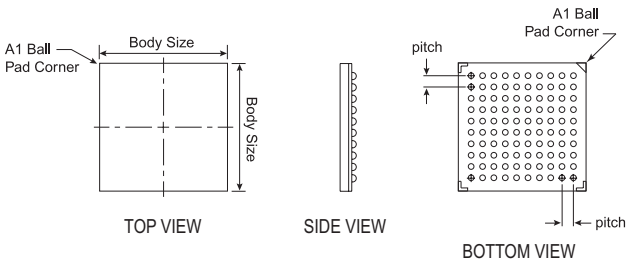
- Moisture Sensitivity Characterization: JEDEC Level 3 @ 260°C
  L2 & L1 achievable in some structures/BOMs*
  85°C/85% RH, 168 hours
- HAST: 130°C/85% RH, 96 hours
- Temp/Humidity: 85°C/85% RH, 1000 hours
- Temperature Cycle: -55°C/+125°C, 1000 cycles
- High Temperature Storage: 150°C, 1000 hours
-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

*Contact Amkor for additional information
**Board level reliability available

Amkor Technology®

ChipArray® CABGA/FBGA

Package View



Process Highlights

- Die thickness: 0.040-0.27 mm
- Marking: Laser
- Ball inspection: Optical
- Wafer backgrinding available
- Encapsulated SMT components available
- Micro Pb-free covered LGA pads/LGAs available

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 balls: Pb-free
- Wire type: Copper (PCC, Au Pcc), Silver and Gold (2N, 4N)

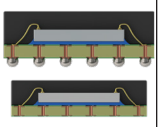
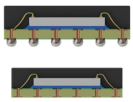
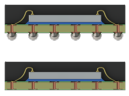
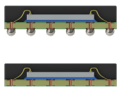
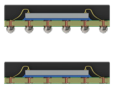
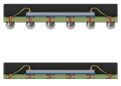
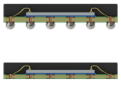
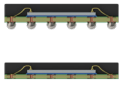
Test Services

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

Shipping

- Standard JEDEC trays
- Tape and reel
- Dry pack

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
								
Mold Cap Thickness	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)*
Substrate Layer	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 4ly 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
Die Thickness**	0.27 mm	0.23 mm	0.18 mm	0.13 mm	0.10 mm	0.075 mm	0.050 mm	0.040 mm
Availability	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.com or email sales@amkor.com for more information.

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