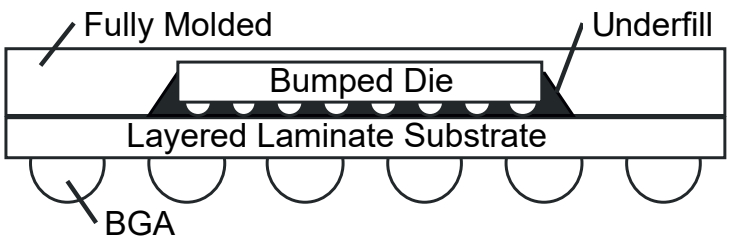
BGA/LGA Package

IC-Packages for Flip-Chips and Wire-Bonded Chips

Racyics

DESCRIPTION

Our packages use fine-pitch layered laminate substrates. On the topside, a single or multiple Flip Chips, Wire-Bonded Chips, or both can be assembled. The bottom side can be equipped with a user-specific LGA or BGA matrix. Thanks to its flexibility, the footprint can also replicate standard packages such as QFN. The entire construction is encapsulated using transfer molding. The figure below illustrates an example of a single-die Flip Chip BGA.



KEY FACTS

- Recommended for up to 160 signals (w/o supply pins).
- Mold encapsulation with flat surface for usage in test sockets and pick & place PCB assembly.
- From prototype to series production.
- Multiple test sockets available on the market.
- Laser marking with part serial number
- Multi-die package.
- SMD passives in package.

ELECTRICAL PERFORMANCE

The following table gives typical resistance, inductance, and capacitance values for the BGA225 package. A detailed SPICE model can be delivered after the design.

Net Type	R [mΩ]	L [nH]	C [pF]
Wire-Bonded signal net	~200	~1	~0.7
Flip-Chip signal net	~20	~0.3	~0.5
Wire-Bonded power rail with plane on substrate*	20 - 200	0.1 - 1	20 -150
Flip-Chip power rail with plane on substrate	1 - 5	0.01- 0.1	20 - 150

*Resistance and Inductance depend highly on the number of wire bonds per rail and wire diameter.

TYPES

	Pitch	Pins	Size	Signals (w/o Supply)
LGA 64 (QFN 64)	0.5 mm	64 (Peripheral)	9 x 9 mm²	50
LGA 124	0.5 mm	124 (Staggered)	9 x 9 mm²	85
BGA/LGA 169	0.65 mm	9x9	5.5 x 5.5 mm²	135
BGA/LGA 225	0.8 mm	15x15	13 x 13 mm²	160
BGA/LGA 324	0.8 mm	18x18	15 x 15 mm²	200

FLIP-CHIP COMPATIBILITY

Proper placement of bumps is crucial to enable production at medium volumes or for prototypes. Racyics provides working bump patterns based on your requirements.

	Easy	Standard	Advanced
Bump Diameter	>70 µm	>70 µm	>50 µm
Min. Bump Pitch	>200 µm	>150 µm	>110 µm

WIRE-BOND COMPATIBILITY

Our packages use ball-wedge bonding with gold wire. The bond pad passivation opening should be at least 2.5 times the wire diameter to accommodate the ball size. The minimum length of wires depends on the chip thickness.

	Easy	Standard	Advanced
Wire Diameter	25 µm	20 µm	17.5 µm
Min. Pad Opening	70 x 70 µm²	55 x 55 µm²	44 x 44 µm²
Min. Pad Pitch	90 µm	60 µm	51 µm

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