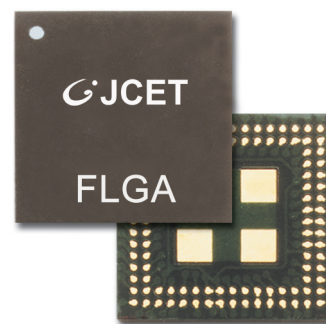


# FLGA

## Fine Pitch Land Grid Array

### Highlights

- Array molded, cost effective, space-saving packaging solution
- Available in 2.45mm (LFLGA), 1.20mm (TFLGA), 1.00mm (VFLGA) and 0.80mm (WFLGA) maximum thickness
- Thinner than FBGA
- Exposed thermal/mechanical lands available
- Laminate substrate based enabling 2 and 4 layers of routing flexibility



### Features

- Low profile
- Flexible body sizes range from 4 x 4mm to 13 x 13mm
- Flip chip and discrete passive options (SiP)
- Minimum 0.50mm pitch (array and peripheral land pads)
- Flexible land pattern arrangement
- Pb-free and halogen-free compatible materials available
- JEDEC standard compliant

### Applications

- Handheld devices
- Wireless RF
- Analog
- ASIC
- Memory
- Simple PLDs

### Description

Fine Pitch Land Grid Array (FLGA) is a laminate substrate based package with plastic overmolded encapsulation. Unlike a standard FBGA, second level interconnect is achieved on the LGA by connecting “lands” on the package directly onto the PCB through solder re-flow.

The elimination of solder balls brings better electrical performance and lower package profile without using the more expensive thinner BT core material. It also offers the flexibility of land pattern arrangement in the form of signal lands or heat spreader/ground pads to suit the thermal and electrical requirements of various devices.

The FLGA package’s reduced outline and thickness make it an ideal advanced technology packaging solution for high performance and/or portable applications. Our FLGA is available in a broad range of JEDEC standard body sizes including LFLGA (<2.45mm), TFLGA (<1.20mm), VFLGA (<1.00mm) and WFLGA (<0.80mm) package thickness.



## Specifications

Die Thickness	50-300 $\mu$ m (3-12mils)
Gold Wire	15-30 $\mu$ m (0.6/0.8/0.9/1.0/1.2mils) diameter
Pd/Cu Wire	15-25 $\mu$ m (0.6/0.7/0.8/1.0mils) diameter
Ag Wire	18-25 $\mu$ m (0.7/0.8/1.0mils) diameter
Mold Cap Thickness	0.25-1.22mm
Marking	Laser
Packing Options	JEDEC tray/tape & reel

## Reliability

Moisture Sensitivity Level	JEDEC Level 2A, 260°C Reflow
Temperature Cycling	Condition C (-65°C to 150°C), 1000 cycles
High Temperature Storage	150°C, 1000 hrs
Pressure Cooker Test	121°C, 100% RH/2 atm, 168 hrs
Temperature/Humidity Test	85°C/85% RH, 1000 hrs
Unbiased HAST	130°C/85% RH/2 atm, 96 hrs

## Thermal Performance $\theta_{ja}$ (°C/W)

Thermal performance is highly dependent on package size, die size, substrate layers and thickness, and land configuration. Simulation for specific applications should be performed to obtain maximum accuracy.

Package	Body Size (mm)	Pin Count	Die Size (mm)	Thermal Performance $\theta_{ja}$ (C/W)
VFLGA	9 x 9 (4L)	112	4.1 x 4.1	36.1

Note: Simulation data for package mounted on 4 layer PCB (per JEDEC JESD51-9) under natural convection as defined in JESD51-2.

## Electrical Performance

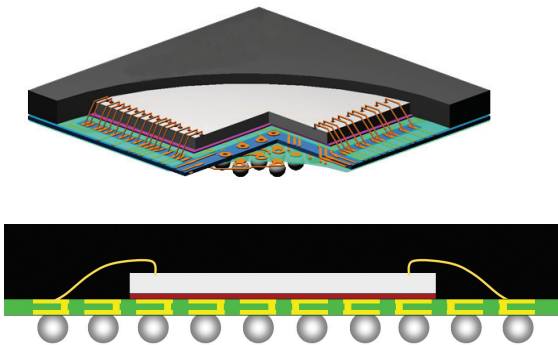
Electrical parasitic data is highly dependent on the package layout. 3D electrical simulation can be used on the specific package design to provide the best prediction of electrical behavior. First order approximations can be calculated using parasitics per unit length for the constituents of the signal path. Data below is for a frequency of 100MHz and assumes 1.0 mil gold bonding wire.

Conductor Component	Length (mm)	Resistance (mOhms)	Inductance (nH)	Inductance Mutual (nH)	Capacitance (pF)	Capacitance Mutual (pF)
Wire	2	120	1.65	0.45 - 0.85	0.10	0.01 - 0.02
Net (2L)	2 - 7	25 - 110	1.10 - 4.35	0.26 - 2.28	0.25 - 0.95	0.06 - 0.42
Total (2L)	4 - 0	145 - 230	2.75 - 6.00	0.71 - 3.13	0.35 - 1.05	0.07 - 0.44
Wire	2	120	1.65	0.45 - 0.85	0.10	0.01 - 0.02
Net (4L)	2 - 7	25 - 110	0.70 - 2.95	0.18 - 1.58	0.35 - 1.10	0.06 - 0.42
Total (4L)	4 - 9	145 - 230	2.35 - 4.60	0.63 - 2.43	0.45 - 1.20	0.07 - 0.44

Note: Results are simulated values per JEDEC EIA/JEP123 standards.

## Cross Sections

FBGA



## Package Configurations

Body Sizes (mm)	3x3 to 23x23 with square or rectangular body size options; Common body sizes: 5x10, 7x9, 8x10, 8x11, 8x12, 8x14, 10x12, 10x14, 13x13, 15x15, 16x16, 17x17
Ball Count	40 to 450
Ball Pitch (mm)	0.40 to 1.0
Typ. Pkg. Thickness	LFBGA: 1.70mm (1.40mm max. typical) TFBGA: 1.20mm max. VFBGA: 1.00mm max. WFBGA: 0.80mm max. UFBGA: 0.65mm max. XFBGA: 0.50mm max.

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