

FBGA

Fine pitch Ball Grid Array

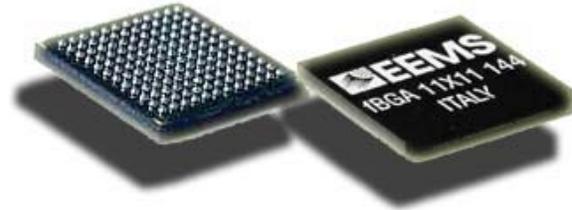
EEMS offers the FBGA as a near Chip Size Package, based on a BT laminate substrate with a Ball Grid Array format.

The assembly technology is gold wire and molding on the PCB with solder balls for board contact.

The board contact area is minimized by placing the balls on the entire area under the die, allowing a very small and light weight package.

Body sizes and ball counts are designed to fit the specific customers needs (the two Tables show the range of the FBGA capabilities and the packages in production).

These packages are also well suited to products requiring low inductance as the PCB design can take this requirement into account and be designed accordingly.



Features & Benefits

- Small board area needed
- Small size
- Cost competitive
- High reliability
- Compliant to Rohs directive 2002/95/CE
- Die Stack capability

Applications

Anywhere a smaller footprint is required, an FBGA should be used.

These packages are smaller than conventional BGA's and also comparable with leadframe packages.

Device

- SRAM
- Flash
- Dram
- DSP's
- ASIC's
- RF Devices

End Equipment

- Portable PC's
- Hard Disk Drivers
- PC Graphics
- Mobile phones
- PDA's

Standard Materials

Substrate	BT or equivalent
Die Attach	Low stress mtl
Gold wire	24 - 30 um
Mold Compound	Epoxy
Solder Ball	Eutectic 63/37 or Sn/4.0Ag/0.5Cu alloy
Packing	Jedec Tray/Tape & Reel
Packing option	Dry Pack

FBGA Capabilities

Item	Min.	Max.	Notes
Foot Print (mm)	5 x 5	17 x 17	All dimensions in increment of 0.1 mm, quad and rectangular
Thickness (mm)	1.00	1.70	All dimensions in increment of 0.1 mm
Ball Dia (um)	300	500	All dimensions in increment of 50 um
Ball Arrays	5 x 5	21 x 21	Full matrix and depopulated
Ball Pitches (mm)	0.5	1.0	0.65, 0.75, 0.80 mm also available

Process Highlights

Processable wafer	200 – 300 mm
Die Thickness	0.300 mm max
Bond Pad Pitch	60 um min
Marking	Laser
Ball inspection	Auto inspection

FBGA

Specifications

Electrical (simulated w/bondwire)

(11 x 11 mm body with 144 balls)

Capacitance (pF)	: 0.34 – 0.75 at 1.5 GHz
Inductance (nH)	: 2.0 – 3.4 at 1.5 GHz
Resistance (mΩ)	: 310 – 770 at 1.5 Ghz

Thermal Resistance (simulated)

(11x11 mm body with 144 balls; 4 layers PCB and 1 Watt, 0 m/s airflow as per JEDEC JESD51.2):

$$\Theta_{ja} = 25 \text{ }^{\circ}\text{C/watt Typical}$$

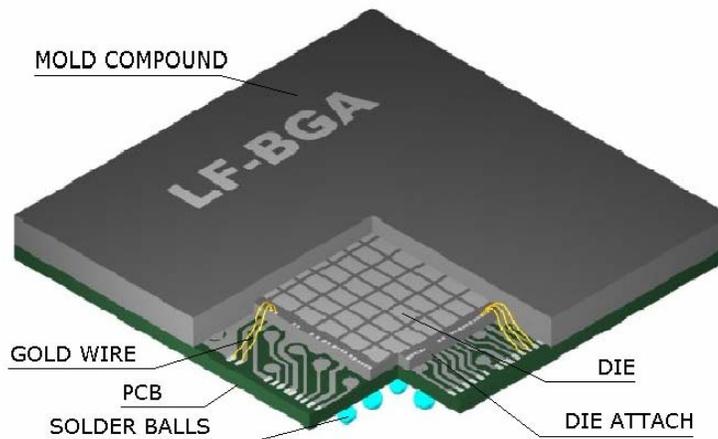
Reliability

Moisture Sensitivity	: JEDEC MSL 3 @ up to 260 °C,
High Temp Storage	: 150 °C, 1000 hours
Temp Cycle	: -55/+125 °C, 1000 cycles
Temp Humidity Test	: 130 °C /85% RH, 96 hours HAST
PCT	: 121 °C/2 atm., 240 hours

Available Services

- PCB Design and simulation
- 300 mm wafer full processing
- Wafer backgrinding
- Wafer map / sort
- Product Engineering
- -30 + 125 °C full test
- Dynamic Burn In
- Compliant to Rohs directive 2002/95/CE

Cross – Section



FBGA Packages in production: Nominal Dimensions (mm)

ID Letter	Body Size	Ball Count	Ball Pitch	Ball Matrix	Ball Diameter	PCB Thickness	Mold Cap Thickness	Total Thickness
L-FBGA	11 x 11	144	0.80	12 x 12	0.48	0.31	0.77	1.7 max
T-FBGA	8 x 10	48	0.75	6 x 8	0.40	0.26	0.52	1.2 max
T-FBGA	6.4 x 6.4	46	0.75	6 x 8	0.40	0.31	0.52	1.2 max
V-FBGA	6 x 8	54	0.75	6 x 9	0.35	0.21	0.48	1.0 max
V-FBGA	6 x 8	48	0.75	6 x 8	0.35	0.21	0.48	1.0 max
V-FBGA	7.7 x 9	44	0.50	4 x 10 + 4	0.30	0.21	0.43	1.0 max