

## LPCC™

### Leadless Plastic Chip Carrier

The LPCC patented plastic package was developed by ASAT in 1998, introducing a "leadless" concept into ASAT's expanding portfolio. The LPCC package is a superior choice for high-speed applications where thermal and electrical performance is paramount and space constraints are unavoidable. For thermal solutions, this package has the ability to mount the die attach pad directly to the board for heat dissipation.

#### Typical Applications

- ASICs, DSP, ASSP
- High-speed networks
- Personal digital assistants
- RF applications
- Telecommunications

#### Advantages

- Moisture Sensitivity Level One (MSL-1) and "green" options available
- Lowest stress at solder joint compared to CSP & Flex packages
- Saw singulation technique provides larger die pads for better thermal performance
- Very low inductance for high-speed applications
- Ten day design cycle time including lead frame
- Immune to die shrink
- Die pad mounting to motherboard provides for excellent thermal performance

#### Features

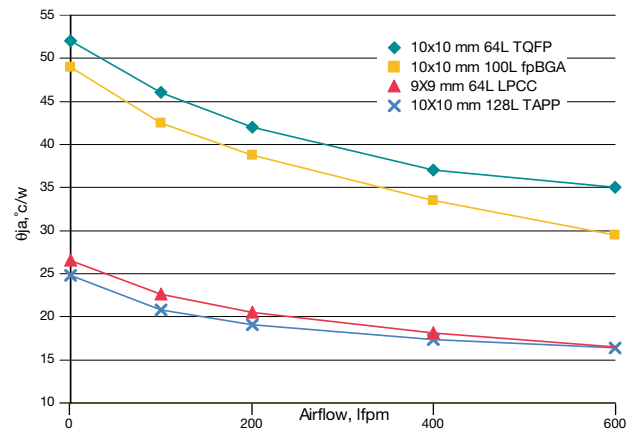
- Body sizes from 2 to 10 mm SQ\*
- Lead counts from 8 to 72
- Standard assembly materials, equipment and processes
- Ground plane bonding option
- Conforms to JEDEC registered outlines for QFP-N (MO-220) and SO-N (MO-229)
- Exposed die and dual-in-line versions available
- 0.4 mm, 0.5 mm and 0.65 mm thickness options per JEDEC outline MO-248
- Bumped LPCC available for JEDEC outline MO-250
- Stacked die option available

LPCC packages are constructed with standard materials and can be designed to meet your special packaging requirements

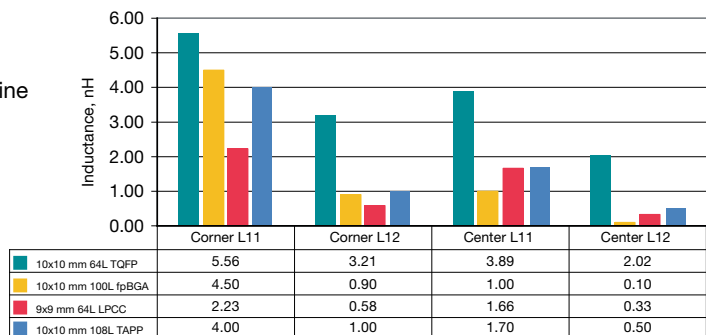


US Pat. 6,229,200  
 US Pat. 6,242,281  
 US Pat. 6,294,100  
 US Pat. 6,545,347  
 US Pat. 6,585,905  
 US Pat. 6,940,154

#### Thermal Performance (various package types)



#### Electrical Performance (various package types)



**Standard Materials**

Lead Frame	Copper Alloy
Lead Frame Finish	85/15 Sn/Pb or 100% Sn
Die Attach	Conductive Epoxy
Mold Compound	Standard or Green
Marking	Laser

**Reliability**

Preconditioning	MSL-1/MSL-2
Autoclave, 121°C	168 Hours
Temp. Cycle, Cond. C	500/1000 Cycles
Unbiased HAST, 130°C	96 Hours
HTSL, 150°C	1000 Hours
2nd Level, -40/+125°C	Up to 5000 Cycles

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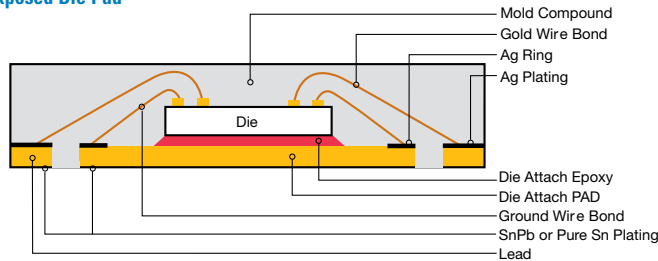
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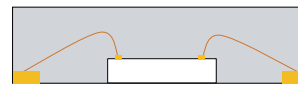
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**Typical Cross Section**

**Exposed Die Pad**



**Exposed Die**



**Typical Package Configurations**

Body Size	Pitch	Lead Count	Exposed * DAP Size	Max Die Size (w/o DB)*	Max Die Size (w/ DB)*	Min Die Size*	Package Thickness
3 x 3	0.65	8/16	65 x 65	65 x 65	35 x 35	35 x 3 5	0.90/0.75
3 x 3	0.5	12/16	65 x 65	65 x 65	35 x 35	35 x 35	0.90/0.75
4 x 4	0.65	12/16	104 x 104	104 x 104	74 x 74	35 x 35	0.90/0.75
4 x 4	0.5	20/24	104 x 104	104 x 104	74 x 74	35 x 35	0.90/0.75
4 x 5	0.5	24/28	104 x 144	104 x 144	74 x 114	35 x 35	0.90/0.75
5 x 5	0.65	20/24	144 x 144	144 x 144	114 x 114	35 x 35	0.90/0.75
5 x 5	0.5	28/32	144 x 144	144 x 144	114 x 114	35 x 35	0.90/0.75
6 x 6	0.65	24/28/32	183 x 183	183 x 183	153 x 153	73 x 73	0.90/0.75
6 x 6	0.5	36/40	183 x 183	183 x 183	153 x 153	73 x 73	0.90/0.75
7 x 7	0.65	32/36	222 x 222	222 x 222	192 x 192	112 x 112	0.90/0.75
7 x 7	0.5	40/44/48	222 x 222	222 x 222	192 x 192	112 x 112	0.90/0.75
8 x 8	0.65	36/40/44	261 x 261	261 x 261	232 x 232	151 x 151	0.90/0.75
8 x 8	0.5	48/52/56	261 x 261	261 x 261	232 x 232	151 x 151	0.90/0.75
9 x 9	0.65	44/48	301 x 301	296 x 296	271 x 271	191 x 191	0.90/0.75
9 x 9	0.5	56/60/64	301 x 301	296 x 296	271 x 271	191 x 191	0.90/0.75

Note: JEDEC Reference Outline MO-220, MO-229 and MO-248

\*dimensions in mils

Contact ASAT Sales offices for custom tooling of package types not listed.

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