



Low Profile Quad Flat Pack Packages (LQFP)

Amkor offers a broad line of LQFP IC packages designed to provide the same great benefits as MQFP packaging with a 1.4 mm body thickness. These packages allow IC packaging engineers, component specifiers and systems designers to solve issues such as increasing board density, die shrink programs, thin end-product profile and portability.

Applications

Amkor's LQFPs are an ideal package for most IC semiconductor technologies such as Digital Signal Processors (DSP), PLDs, microprocessors, microcontrollers, high-speed logic/FPGAs, ASICs, SRAMs and PC chip sets.

LQFP packages are particularly well suited for light weight, portable electronics requiring broad performance characteristics. Such applications include: laptop PCs, video/audio, telecom, cordless/RF, data acquisition, office equipment, disc-drives and communication boards.

Features

- 7 x 7 mm to 28 x 28 mm body size
- 32-256 lead counts
- Broad selection of die pad sizes
- Copper leadframes
- 1.4 mm body thickness
- Custom leadframe design available
- Low stress BOM for stress sensitive products
- Pb-free RoHs compliant materials

Visit [Amkor Technology](http://www.amkor.com) online for locations and to view the most current product information.

www.amkor.com

LQFP

Thermal Resistance

Single-layer PCB, JEDEC Standard Test Boards

Pkg	Body Size (mm)	Pad Size (mm)	ΘJA (°C/W) by Velocity (LFPM)		
			0	200	500
32 ld	7 x 7	5 x 5	67.8	55.9	50.1
100 ld	14 x 14	8 x 8	41.5	33.4	29.5
100 ld	14 x 20	9.5 x 9.5	39.7	31.8	28.3
144 ld	20 x 20	8.5 x 8.5	38.0	31.2	28.1
176 ld	24 x 24	8 x 8	38.3	31.9	29.0

JEDEC Standard Test Boards

Multi-layer PCB, JEDEC Standard Test Boards

Pkg	Body Size (mm)	Pad Size (mm)	ΘJA (°C/W) by Velocity (LFPM)		
			0	200	500
32 ld	7 x 7	5 x 5	47.9	42.1	39.4
100 ld	14 x 14	8 x 8	31.7	26.8	24.7
100 ld	14 x 20	9.5 x 9.5	30.0	25.1	23.0
144 ld	20 x 20	8.5 x 8.5	31.7	26.9	24.9
176 ld	24 x 24	8 x 8	31.9	27.3	25.4
208 ld*	28 x 28	16 x 16	18.1	15.3	14.4

JEDEC Standard Test Boards

*Pre-JEDEC Standard Test Boards, Tested @ 1W

Electrical Performance

Pkg	Body Size (mm)	Pad Size (mm)	Lead	Inductance (nH)	Capacitance (pF)	Resistance (mΩ)
32 ld	7 x 7	5 x 5	Longest	0.904	0.211	9.2
			Shortest	0.799	0.202	7.8
48 ld	7 x 7	5 x 5	Longest	1.110	0.225	13.8
			Shortest	0.962	0.200	12.0
100 ld	14 x 14	8 x 8	Longest	2.300	0.419	26.3
			Shortest	1.520	0.322	17.8
144 ld	20 x 20	8.5 x 8.5	Longest	6.430	1.100	62.9
			Shortest	4.230	1.070	52.6
176 ld	24 x 24	8 x 8	Longest	9.510	1.270	89.0
			Shortest	5.200	1.340	64.0
208 ld	28 x 28	11 x 11	Longest	9.670	1.380	86.2
			Shortest	6.190	1.210	64.8

Simulated Results @ 100 MHz

Reliability Qualification

Amkor devices are assembled in optimized package designs with proven reliable semiconductor materials.

- Moisture Sensitivity Characterization JEDEC Level 3, 30°C/60% RH, 192 hrs
- PCT 121°C, 100% RH, 2 atm, 504 hours
- Temp Cycle -55°C/+125°C, 1000 cycles
- Temp/Humidity 85°C/85% RH, 1000 hours
- High Temp Storage 150°C, 1000 hours



DS232D
Rev Date: 1/13

LQFP

Process Highlights

- Die thickness 14.5 ± .5 mil
- Strip solder plating Matte Sn and pre-plated package options, i.e. Ni/Pd frames
- Marking Laser
- Lead inspection Laser/optical
- Pack/ship options Bar code, dry pack
- Wafer backgrinding Available

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

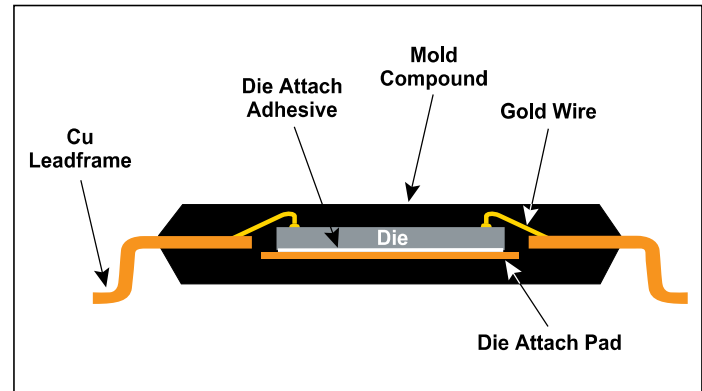
- JEDEC outline CO-124 low profile tray

Configuration Options

LQFP Nominal Package Dimensions (mm)

Lead Count	Body Size	Body Thickness	Lead Form	Standoff	Foot Length	Tip-to-Tip	JEDEC	Tray Matrix	Units Per Tray
32/48/64	7 x 7	1.40	1.00	0.10	0.60	9.0	MS-026	10 x 25	250
44/52/64/80	10 x 10	1.40	1.00	0.10	0.60	12.0	MS-026	8 x 20	160
80	12 x 12	1.40	1.00	0.10	0.60	14.0	MS-026	7 x 17	119
44/64/80/100/120/128	14 x 14	1.40	1.00	0.10	0.60	16.0	MS-026	6 x 15	90
100/128	14 x 20	1.40	1.00	0.10	0.60	16.0 x 22.0	MS-026	6 x 12	72
128/144/176	20 x 20	1.40	1.00	0.10	0.60	22.0	MS-026	5 x 12	60
160/176/216	24 x 24	1.40	1.00	0.10	0.60	26.0	MS-026	4 x 10	40
208/256	28 x 28	1.40	1.00	0.10	0.60	30.0	MS-026	4 x 9	36

Cross-section LQFP



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