



Features

- ▶ 5 x 5 mm to 20 x 20 mm body size with 1.0 mm body height
- ▶ 32-176 lead counts
- ▶ Broad selection of die pad sizes available
- ▶ Pre-plated frames available
- ▶ Inverted pad configuration available
- ▶ Custom leadframe design available
- ▶ Cu, Au and Ag wire options
- ▶ Pb-free and RoHS compliant materials

Applications

Amkor's TQFPs are an ideal package for most IC semiconductor technologies such as ASIC, gate arrays (FPGA/PLD), microcontrollers and PMIC controllers.

TQFP packages are particularly well suited for electronic systems applications requiring broad performance characteristics, including: computing, video/audio, telecommunications, data acquisition, communication boards (Ethernet, ISDN, etc.), set-top box and automotive.



TQFP

Amkor offers a broad line of TQFP (Thin Quad Flat Pack) IC packages. 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.

Thermal Performance

Single-layer PCB

Package	Body Size (mm)	Pad Size (mm)	θ_{JA} at (°C/W) by Velocity (LFPM)		
			0	200	500
32 Ld	7 x 7	5 x 5	69.3	57.8	52.1
64 Ld	14 x 14	8 x 8	47.0	38.1	33.9
100 Ld	14 x 14	8 x 8	43.4	35.5	31.7

JEDEC Standard Test Boards

Multi-layer PCB

Package	Body Size (mm)	Pad Size (mm)	θ_{JA} at (°C/W) by Velocity (LFPM)		
			0	200	500
32 Ld	7 x 7	5 x 5	49.5	43.8	41.3
64 Ld	14 x 14	8 x 8	35.1	29.8	27.7
100 Ld	14 x 14	8 x 8	33.4	28.5	26.4

JEDEC Standard Test Boards
Tested @ 1W

Electrical Performance

Simulated Results @ 100 MHz

Package	Body Size (mm)	Pad Size (mm)	Lead	Inductance (nH)	Bulk Capacitance (pF)	Self Resistance (mF)
176 Ld	20 x 20	10 x 10	Longest Shortest	4.890 3.490	0.871 0.744	58.4 43.9

TQFP

Reliability Qualification

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

Commercial Qualification

- ▶ Moisture Sensitivity Characterization: JEDEC Level 3, 30°C/60% RH, 192 hours
- ▶ uHAST: 130°C/85% RH, 96 hours
- ▶ Temperature Cycle "C": -65°C/+150°C, 500 cycles
- ▶ High Temperature Storage: 150°C, 1000 hours
- ▶ AEC-Q100 qualified

Process Highlights

- ▶ Die thickness 11.5 ± .5 mils
- ▶ Strip solder plating Matte Sn
- ▶ Pre-plated Ni/Pd frames
- ▶ Roughened Cu frames
- ▶ Strip marking Laser
- ▶ Lead inspection Laser/optical
- ▶ Wafer backgrinding Available

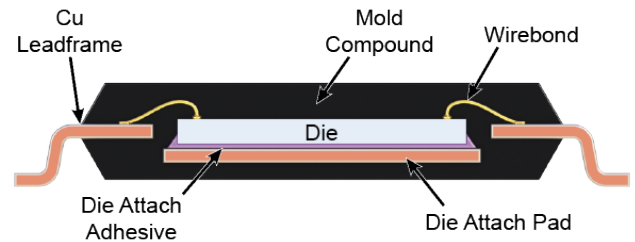
Test Services

- ▶ Program generation/conversion
- ▶ Product engineering support
- ▶ Wafer sort
- ▶ -55°C to +165°C test available

Shipping

- ▶ JEDEC outline CO-124 low profile tray
- ▶ Bar code
- ▶ Dry pack
- ▶ Tape & Reel

Cross Section TQFP



Configuration Options

TQFP Nominal Package Dimensions (mm)

Lead Count	Body Size	Body Thickness	Lead Form	Standoff	Foot Length	Tip-to-Tip	JEDEC	Tray Matrix	Units Per Tray
32/40	5 x 5	1.00	1.00	0.10	0.60	7.0	MS-026	12 x 30	360
32/48/64	7 x 7	1.00	1.00	0.10	0.60	9.0	MS-026	10 x 25	250
44/52/64/80	10 x 10	1.00	1.00	0.10	0.60	12.0	MS-026	8 x 20	160
80	12 x 12	1.00	1.00	0.10	0.60	14.0	MS-026	7 x 17	119
52/64/80/100/120/128	14 x 14	1.00	1.00	0.10	0.60	16.0	MS-026	6 x 15	90
144	16 x 16	1.00	1.00	0.10	0.60	16.0	MS-026	6 x 15	90
144/176	20 x 20	1.00	1.00	0.10	0.60	22.0	MS-026	5 x 12	60

Visit amkor.com or email sales@amkor.com for more information.



With respect to the information in this document, Amkor makes no guarantee or warranty of its accuracy or that the use of such information will not infringe upon the intellectual rights of third parties. Amkor shall not be responsible for any loss or damage of whatever nature resulting from the use of, or reliance upon it and no patent or other license is implied hereby. This document does not in any way extend or modify Amkor's warranty on any product beyond that set forth in its standard terms and conditions of sale. Amkor reserves the right to make changes in its product and specifications at any time and without notice. The Amkor name and logo are registered trademarks of Amkor Technology, Inc. All other trademarks mentioned are property of their respective companies.
© 2019 Amkor Technology Incorporated. All Rights Reserved. DS230H Rev Date: 07/19