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.

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.

Thermal Performance

Single-Layer PCB

Package	Body Size (mm)	Pad Size (mm)	θJA 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)	θJA 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

Amkor Technology®

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
- Temp cycle "C": -65°C/+150°C, 500 cycles
- High temp 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

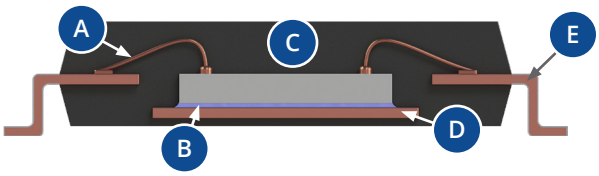
Test Services

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

Shipping

- JEDEC outline CO-124 low-profile tray
- Barcode
- Dry pack
- Tape and reel

Cross Section TQFP



- A Wirebond
- B Die attach adhesive
- C Mold compound
- D Die attach pad
- E Cu leadframe

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

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