data sheet

LQFP PowerQuad® 4

LQFP PowerQuad® 4 Packages:

LQFP PowerQuad® 4 (PQ4) is the same Amkor patented, advanced IC packaging technology used in MQFP PQ4s but applied to Low Profile 1.4 mm QFPs (LQFP). Improved power dissipation is achieved by using an exposed copper heatslug. This large copper heat slug extracts generated heat from the leadframe to which the IC is attached. Thermal resistance improvements of approximately 30% (over a standard LQFP) can be realized with this IC package without the use of any external cooling aids! In addition, the patented LQFP PQ4 heatsink has integrated mechanical "locking" features to ensure total package integrity and eliminates moisture penetration. The end result is a high-power, high-speed IC package with the properties to enable new, smaller, denser, portable electronic products and emerging end applications to operate with more features and greater reliability.

Applications:

Major semiconductor manufacturers and packaging engineers have chosen LQFP PQ4 as the IC package of choice for power microprocessors, controllers, DSPs, high speed logic/FPGAs, PLDs, ASICs and other advanced technologies. System designers and OEM product developers find the LQFP PQ4 solves power, thermal and speed concerns while supporting system constraints (standard package outlines, cost, SMT capability, product availability, technical support) in uses such as: laptops, notebooks, telecom, cordless/wireless, high-end audio/video, CPU/GUI board systems and many other small form-factor applications.

Features:

High-performance operation and attributes of the LQFP PowerQuad® 4 include the following:

- High conductive, solid exposed heatsink
- 1.4 mm body for lightweight, portable applications
- 50% reduction in package self-inductance
- 50% improvement in ΘJa over standard MQFP
- 44 to 128 lead counts
- 10 x 10 - 14 x 14 mm body sizes (JEDEC standard packages MS-026)
- Heatsink-up and down configurations available

Thermal Resistance:

Multi-Layer PCB

Pkg	Body Size	Pad Size	Theta JA (°C/W) by Velocity (LFPM) 0	200	500
64 ld	10 x 10	7.5	34.8	28.9	26.4
100 ld	14 x 14	9.5	23.2	12.8	15.8

Pre-JEDEC Standard Test Boards

Reliability:

Advanced design, manufacturing processes and materials assure long-term reliable performance.

- Temp cycle: -65/+150 °C, 1000 cycles
- Thermal shock (liq): -65/+150 °C, 1000 cycles
- Autoclave: 121 °C, 2 atm, 168 hours
- Temp/Humidity: 85 °C/85%RH, 1000 hours
- High temp storage: 150 °C, 1000 hours

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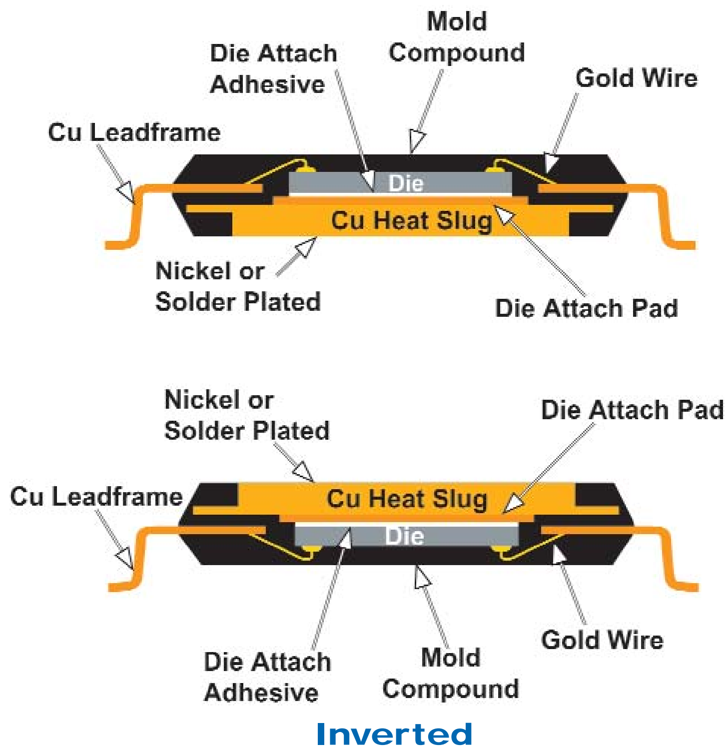
Cross-sections LQFP PowerQuad® 4



Inverted

Process Highlights

Die thickness (max)	15.0 mils
Strip solder plating	85/15 Sn/Pb
Strip marking	Pad
Lead inspection	Laser/optical
Pack/ship options	Bar code/dry pack/TNR

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

Shipping

Low profile tray (JEDEC Outline CS-007)

Configuration Options:

LOW PROFILE POWERQUAD® 4 PACKAGE FAMILY (units in mm)

Lead Count	Body Size	Body Thickness	Lead Pitch	Form Length	Tip To Tip	Foot Length	Board Standoff	JEDEC Package	Tray Matrix	Units Per Tray
44	10 x 10	1.4	0.80	1.0	12.0 x 12.0	0.60	0.1	MS-026	8 x 20	240
44	14 x 14	1.4	1.0	1.0	16.0 x 16.0	0.60	0.1	MS-026	6 x 15	90
64	10 x 10	1.4	0.50	1.0	12.0 x 12.0	0.60	0.1	MS-026	8 x 20	240
64	14 x 14	1.4	0.80	1.0	16.0 x 16.0	0.60	0.1	MS-026	6 x 15	90
80	14 x 14	1.4	0.65	1.0	16.0 x 16.0	0.60	0.1	MS-026	6 x 15	90
100	14 x 14	1.4	0.50	1.0	16.0 x 16.0	0.60	0.1	MS-026	6 x 15	90
120	14 x 14	1.4	0.40	1.0	16.0 x 16.0	0.60	0.1	MS-026	6 x 15	90
128	14 x 14	1.4	0.40	1.0	16.0 x 16.0	0.60	0.1	MS-026	6 x 15	90

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