



## Metric Quad Flat Pack (MQFP) Packages:

Amkor's MQFP package portfolio enables the designer, specifier or systems engineer the flexibility of growing or shrinking IC package size based upon application need. Amkor employs the most up-to-date, advanced equipment, material and processes to assure successful, reliable performance of your IC chips. Having a complete line of MQFPs available and at your disposal means security and convenience. Sourcing them from Amkor means success.

## Thermal Enhancement:

Some designs and applications require an added margin of thermal performance (power). Amkor's easy and cost-effective solution is a heatspreader. This optional embedded thermal aid improves Theta JA by greater than 15% (without external heatsinks or fans) by increasing the heat dissipation path from the IC chip to the PCB.

## Applications:

Amkor's MQFP line is adapted to meet the increasing challenges of advancing processors/controllers, DSP, ASIC, video-DAC, PC chip-sets, gate arrays, logic, multi-media and other technologies. These packages fill many end application needs in consumer, commercial, office, automotive, PC, industrial and other product areas.

## MQFP

### Features:

Amkor's MQFP IC package portfolio provides:

- 10 x 10 mm to 40 x 40 mm body size
- 44 to 304 lead counts
- Hi-conductivity copper leadframes
- Die up and down configurations
- JEDEC standard compliant
- Wide selection of leadframe die pad sizes
- Integrated thermal enhancement
- Heatspreader available
- Custom leadframe design available
- Fine pitch wire bond capability
- Lead free option available

### Thermal Resistance:

Multi-Layer PCB

Pkg	Body Size (mm)	Pad Size	Theta JA (°C/W) by Velocity (LFPM)		
			0	200	500
44 ld	10 x 10	7.4 x 7.4	38.4	32.1	29.4
64 ld	14 x 14	8.9 x 8.9	33.7	27.9	25.5

JEDEC Standard Test Boards

Multi-Layer PCB

Pkg	Body Size (mm)	Pad Size	Theta JA (°C/W) by Velocity (LFPM)		
			0	200	500
**44 ld	10 x 10	7.4 x 7.4	37.5	31.8	29.4
**64 ld	14 x 14	8.9 x 8.9	32.7	27.4	25.1
*100 ld	14 x 20	11.0 x 11.0	27.3	23.5	21.6
*208 ld	28 x 28	11.0 x 11.0	25.7	22.6	20.9
*240 ld	32 x 32	12.7 x 12.7	24.5	21.8	20.5
*304 ld	40 x 40	11.0 x 11.0	26.8	24.0	22.5

\* Pre-JEDEC Standard Test Boards

\*\* JEDEC Standard Test Boards

### Electrical:

Pkg	Body Size		Inductance (nH)	Capacitance (pF)	Resistance (mΩ)
	(mm)	Lead			
44 ld	10 x 10	Longest	1.660	0.322	19.8
		Shortest	1.460	0.342	17.0

Simulated Results @ 100 MHz

### Reliability:

Amkor's MQFPs are reliability assured through optimized design, material and process enabling high performance operation of your IC chip.

- Moisture Sensitivity Characterization: JEDEC Level 3, 30 °C/60% RH, 192 hours
- PCT: 121 °C/100% RH/2 atm., 504 hours
- Temp cycle: -65/+150 °C, 1000 cycles
- Temp/Humidity: 85 °C/85% RH, 1000 hours
- High temp storage: 150 °C, 1000 hours

VISIT AMKOR TECHNOLOGY ONLINE FOR LOCATIONS AND TO VIEW THE MOST CURRENT PRODUCT INFORMATION.

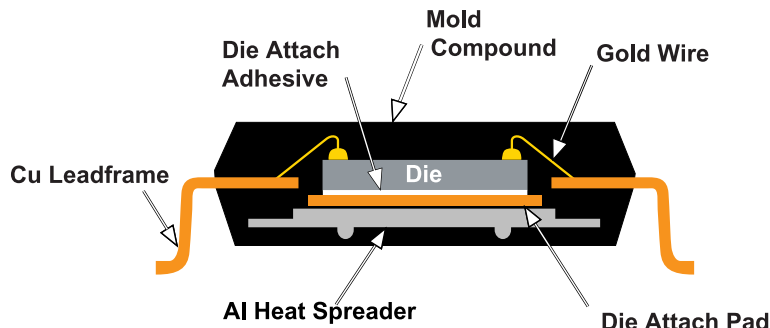
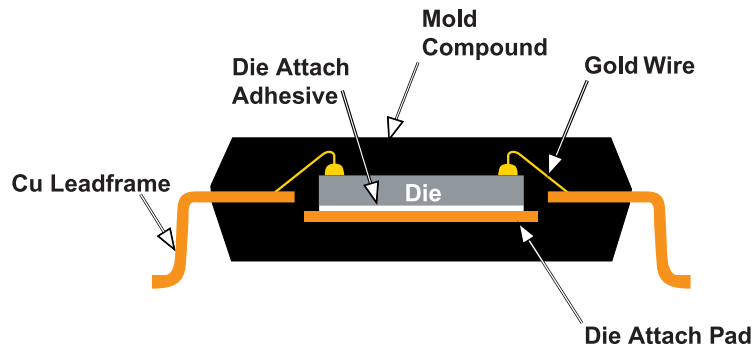
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DS2506  
Rev Date: 09'02

## MQFP

### Cross-sections MQFP



### MQFP w/Drop-in Al Heat Spreader

### Process Highlights

Die thickness (max)	25 mil
Solder plating	85/15 Sn/Pb
Marking	Pad/Laser
Lead inspection	Laser/Optical
Pack/ship options	Bar code, dry pack

### 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
- Tape and reel services

### Shipping

- JEDEC outline CS-004 low profile tray
- Bakable (125 °C and 150 °C)
- Non-bakable

### Configuration Options:

### MQFP NOMINAL PACKAGE DIMENSIONS (mm)

Body Size	Body Tkns	Lead Form	Standoff	Tip To Tip	Lead Count	JEDEC	Tray Matrix	Units Per Tray
10 x 10	2.00	1.60	0.15	13.2	44/52/64	MS-022	6 x 16	96
10 x 10	2.00	1.95	0.15	13.9	44/52/64	MO-112	6 x 16	96
14 x 14	2.00	1.60	0.15	17.2	52/64/80/100	MS-022	6 x 14	84
14 x 14	2.67	1.60	0.15	17.2	52/64/80/100	MS-022	6 x 14	84
14 x 14	2.67	1.95	0.15	17.9	52/64/80/100	MO-112	6 x 14	84
14 x 20	2.71	1.60	0.33	17.2 x 23.2	64/80/100/128	MS-022	6 x 11	66
14 x 20	2.71	1.95	0.23	17.9 x 23.9	64/80/100/128	MO-112	6 x 11	66
28 x 28	3.37	1.30	0.13	30.6	208/256	MS-029	3 x 8	24
28 x 28	3.37	1.30	0.33	30.6	120/128/144/160/208	MS-029	3 x 8	24
28 x 28	3.37	1.60	0.33	31.2	120/128/144/160/208	MS-022	3 x 8	24
32 x 32	3.40	1.30	0.38	34.6	240	MS-029	3 x 8	24
32 x 32	3.40	1.30	0.32	34.6	240	MS-029	3 x 8	24
40 x 40	3.80	1.30	0.43	42.6	304	MS-029	2 x 6	12

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