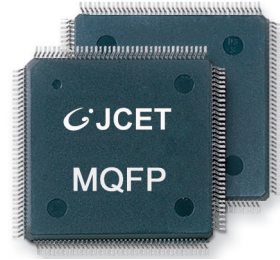


MQFP

Metric Quad Flat Pack



Highlights

- 10 x 10mm to 28 x 28mm body sizes
- 44 to 208 lead counts
- Lead pitch range from 0.80mm to 0.50mm

Features

- Body Sizes: 10 x 10mm to 28 x 28mm
- Package Height: 2.0mm to 3.4mm
- Lead Counts: 44L to 208L
- Lead Pitch: 0.80mm to 0.50mm
- Available in gold or copper wirebond versions
- Limited number of open tool leadframe and die pad sizes available
- Moisture Sensitivity: JEDEC Level 3
- JEDEC standard compliant
- Lead-free, Green and Low Alpha materials sets available

Applications

- ASIC
- DSP
- Gate Array
- Logic / Microprocessors / Controllers
- Multimedia and PC Chipsets
- 3D graphics, telecom, wireless, audio, CPU

Description

Metric Quad Flat Pack (MQFP) is a leadframe based, plastic encapsulated package with gull wing shaped leads on four sides. The MQFP is targeted at cost sensitive applications while providing a high degree of thermal and electrical performance. Offered in a wide range of body sizes and pin counts, the MQFP provides designers with the flexibility and convenience of meeting their packaging needs for a large variety of device designs.

Our Heat Spreader Metric Quad Flat Pack (MQFP-d) is a thermally enhanced version of the MQFP package. Thermal enhancement is achieved by an embedded anodized aluminum heat spreader which is dropped in during the mold process. This process allows the use of a standard leadframe while offering an added margin of thermal performance for high power applications. The MQFP-d package offers 30% improvement (typical) in thermal performance over standard MQFP packages.



Specifications

| | |
|-----------------|---------------------------------------|
| Die Thickness | 380-560μm (15-22mils) range preferred |
| Wire | |
| Gold: | 18-30μm (0.7-1.2mils) diameter |
| Copper: | 18-30μm (0.7-1.2mils) diameter |
| Lead Finish | Matte Tin |
| Marking | Laser |
| Packing Options | Tape & reel, tube, JEDEC tray |

Reliability

| | |
|----------------------------|--------------------------------|
| Moisture Sensitivity Level | JEDEC Level 3 |
| Temperature Cycling | -65°C/150°C, 1000 cycles |
| High Temperature Storage | 150°C, 500 hrs |
| Pressure Cooker Test | 121°C, 100% RH, 2 atm, 168 hrs |
| Liquid Therapy Shock (opt) | -55°C/125°C, 1000 cycles |

Thermal Performance θ_{ja} (°C/W)

| Package | Leads | Body Size (mm) | Pad Size (mm) | Die Size (mm) | Thermal Performance θ_{ja} (C/W) |
|---------|-------|----------------|---------------|---------------|---|
| MQFP | 100L | 14 x 14 x 2.0 | 9.0 x 9.0 | 7.8 x 7.8 | 37.0 |
| MQFP | 208L | 28 x 28 x 3.4 | 14.0 x 14.0 | 10.2 x 10.2 | 24.8 |
| MQFP-d | 208L | 28 x 28 x 3.4 | 14.0 x 14.0 | 10.2 x 10.2 | 18.4 |

Note: Simulation data for package mounted on 4 layer PCB (per JEDEC JESD51-7) under natural convection as defined in JESD51-2.

MQFP Electrical Performance

Electrical parasitic data is highly dependent on the package layout. 3D electrical simulation can be used on the specific package design to provide the best prediction of electrical behavior. Data below is for a frequency of 100MHz and assumes 1.0 mil gold bonding wire.

| Conductor Component | Length (mm) | Resistance (mOhms) | Inductance (nH) | Mutal Inductance (nH) | Capacitance (pF) | Capacitance Mutual (pF) |
|------------------------|-------------|--------------------|-----------------|-----------------------|------------------|-------------------------|
| Wire | 2 | 120 | 1.65 | 0.45 - 0.85 | 0.10 | 0.01 - 0.02 |
| Lead (10 x 10mm, 44L) | 2.4 - 3.2 | 19.0 - 25.0 | 1.56 - 1.75 | 0.70 - 0.79 | 0.31 - 0.38 | 0.14 - 0.17 |
| Total (10 x 10mm, 44L) | | 139 - 145 | 3.21 - 3.40 | 1.15 - 1.64 | 0.41 - 0.48 | 0.15 - 0.19 |

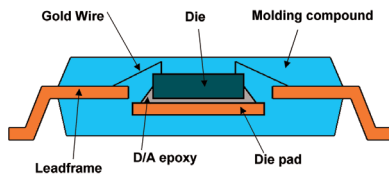
Note: Simulation data for package mounted on 4 layer PCB (per JEDEC JESD51-7) under natural convection as defined in JESD51-2. Based on TQFP-ep simulations.

MQFP-d Electrical Performance

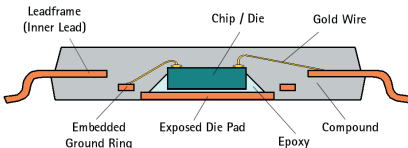
| Package | Body Size (mm) | Pad Size (mm) | Frequency | Self Inductance (nH) | Self Capacitance (pF) |
|---------|----------------|---------------|-----------|----------------------|-----------------------|
| 208L | 28 x 28 x 3.4 | 10.5 x 10.5 | 100MHz | 11.4 ~ 14.7 | 1.43 ~ 1.56 |

Cross Sections

MQFP



MQFP-d



Package Configurations

Package Size (mm)

10 x 10

14 x 20

28 x 28

Lead Count

44, 52

80, 100, 128

128, 160, 208

NOTE: MQFP-d version available in 28 x 28 body size. Check with your Technical Product Manager on heat spreader availability.

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