

Quad Flat No-Lead Package (QFN)

J-Devices' QFN package is suitable for devices requiring a thinner and smaller form factor. The exposed pad provides superior grounding and thermal dissipation for better electrical and thermal performance. Package enhancements are available for increased board level reliability performance.

QFN Offerings

- Single row (Up to 84 I/O)
- Multi chip package
- Plating: PPF (Ni/Pd/Au), Sn, Sn/Bi
- Punch & Saw Singulation
- Small package (less than 2.7 x 2.7 body size)
- Stacked die
- Thin micro lead frame
- Automotive grade package reliability

Applications

- Handheld, mobile, camera, wearable, automotive and audio applications
- Applications where low profile, minimum space, lightweight, low cost and high heat dissipation are required

Features

- Small size (reduce package footprint by 50% or more and improved RF performance) & weight when compared to other similar pin count leadframe products
- Standard lead frame process flow and equipment
- Excellent thermal and electrical performance
- 0.50-1.00 mm maximum height
- 16 to 84 lead counts
- 2.7-10 mm body size
- Thin profile and superior die to body size ratio
- Pb free/green
- Flexible designs with high yields
- Saw and punch versions available

QFN

Thermal Performance

Modeled data @ 0 air flow/JEDEC Multi-layer PCB

| Pkg | Body Size (mm) | Exposed Pad (mm) | Die (mm) | θ_{JA} (°C/W) |
|-------|----------------|------------------|----------|----------------------|
| 16 ld | 3 x 3 | 1.25 | 2.0 | 61.4 |
| 20 ld | 4 x 4 | 2.3 | 2.0 | 51.9 |
| 40 ld | 5 x 5 | 3.7 | 3.4 | 43.7 |
| 36 ld | 6 x 6 | 3.6 | 3.3 | 36.8 |
| 48 ld | 7 x 7 | 5.6 | 5.3 | 31.2 |
| 56 ld | 8 x 8 | 6.6 | 6.3 | 26.9 |
| 64 ld | 9 x 9 | 5.0 | 4.7 | 24.0 |

Electrical Performance

Simulated results @ 2 GHz. Values dependent on specific die and wire configurations.

| Pkg | Body Size (mm) | I/O | (nH) | (pF) | (mOhm) |
|-------|----------------|----------|------|-------|--------|
| 16 ld | 3 x 3 | Shortest | 1.5 | 0.071 | 38 |
| 24 ld | 3 x 3 | Shortest | 1.5 | 0.071 | 37 |
| 48 ld | 7 x 7 | Shortest | 2.1 | 0.124 | 48 |
| 64 ld | 9 X 9 | Shortest | 2.5 | 0.229 | 82 |

Reliability Qualification

J-Devices' QFN Package reliability is assured through optimized designs, materials and processes, and verified using industry standard testing.

| Moisture Sensitivity Characterization | JEDEC Level 3 30°C/60%, 192 hours |
|---------------------------------------|-----------------------------------|
| THB | 85°C/85% RH, 1000 hours |
| Unbiased HAST | 127°C, 100% RH, 200 hours |
| High Temp Storage | 150°C, 1000 hours |
| Temp Cycle | -65°C/+150°C, 1000 cycles |

QFN

Process Highlights

- Die thickness: 0.12-0.3 mm nominal (thinner for special applications)
- Plating: Matte Sn, Sn/Bi, Ni/Pd/Au (Pb-free)
- Marking: Laser mark

Standard Materials

- Leadframe: Cu alloy
- Die attach: Cu epoxy
- Mold compound: Epoxy mold compound
- Wire type: Au, Cu

Test Services

- Program conversion
- Product engineering
- Burn-in capabilities

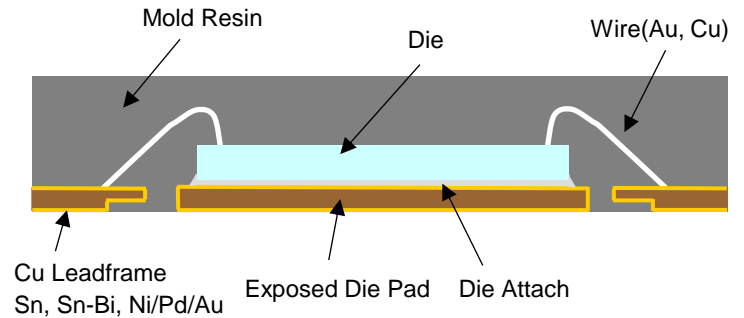
Shipping

- JEDEC outline trays, tape & reel

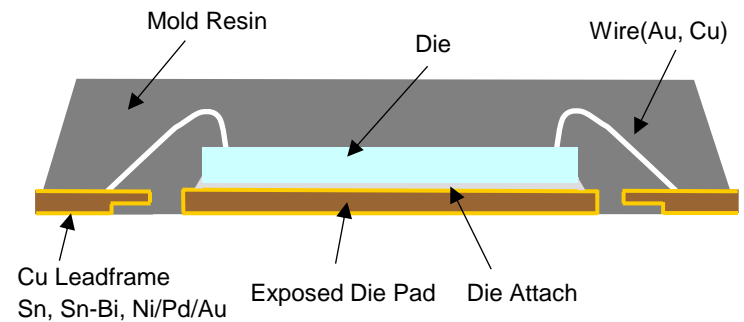
Configuration Options

| Body Size (mm) | QFN Saw Lead Counts 0.8, 0.65, 0.5, 0.4 mm Pitch | Punch Lead Counts |
|----------------|-----------------------------------------------------|-------------------|
| 3 x 3 | 16 | — |
| 4 x 4 | 20/24/28/32 | — |
| 5 x 5 | 28/32/36/40 | — |
| 6 x 6 | 20/36/40/48 | 48 |
| 7 x 7 | 48/52 | 48/52 |
| 8 x 8 | 52/56/64 | 52/56/64 |
| 9 x 9 | 64/76 | 64 |
| 10 x 10 | 68/84 | 84 |

MAP Design "Saw"



Individual Unit Design "Punch "



Package Height Comparison

