Effect of PWB Copper Area on Thermal Performance

of 20-Lead, 4 x 4 mm QFN (Suffix ES) Package

Thermal Resistance ($R_{\theta JA}$) versus Copper Area on Printed Wire Board (PWB)

- All copper is 2 oz. thickness
- Area of Copper refers to individual test locations on PWB

Variable Copper Area Test Board

Red hatched areas are copper on side 1 of the PWB; blue-hatched areas are copper on side 2 of the PWB, at corresponding locations.

Package Exposed Pad Must Be Connected to Copper Area on Board

The QFN package has an exposed pad on the bottom as shown by the black hatched area. This pad should be attached to the additional copper area on the PWB.

Using a 2-Layer PWB

The 2-layer board (copper on 2 sides) has multiple device locations. Each location on side 1 has minimum length traces and a copper area equal to the size of the exposed pad on the device. Additional copper area on side 2 of the board is used as a heat spreader to improve thermal performance. The top and bottom layers are thermally connected using vias placed in the exposed pad area. See JEDEC Standard JESD51-5 for recommended via geometry (www.jedec.org).

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