Abstracts

Wide-bandwidth millimeter-wave bond-wire interconnects

T.P. Budka. "Wide-bandwidth millimeter-wave bond-wire interconnects." 2001 Transactions on Microwave Theory and Techniques 49.4 (Apr. 2001, Part I [T-MTT]): 715-718.

A new type of interconnect has been developed that significantly extends the bandwidth of fixed-length bond-wire interconnects between microwave circuits. This interconnect maximizes bond-wire length, as well as landing pad size while simultaneously extending the cutoff frequency of the interconnect. The bond-wire interconnect is treated as a five-stage low-pass filter where basic filter theory is used to develop an interconnect prototype. Microstrip interconnects are designed using electromagnetic simulators, which match a specific low-pass filter response on a 5-mil thick (127 /spl mu/m) glass substrates. The measurements indicate a return loss greater than 12 dB and an insertion loss from 0.0 to 0.3 dB from DC to 80 GHz using two 17-mil-long (432 /spl mu/m) 1-mil-diameter (25 /spl mu/m) ball bonds with a tolerance of /spl plusmn/2 mil (50 /spl mu/m). For comparison, an uncompensated interconnect with two 17-mil-long (432 /spl mu/m) bond wires has 1-dB insertion loss and 10-dB return loss at 40 GHz and continues to degrade at higher frequencies.

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