Abstracts

High-isolation bonding pad with depletion-insulation structure for RF/microwave integrated circuits on bulk silicon CMOS

Sang Lam, Wing Hung Ki and Mansun Chan. "High-isolation bonding pad with depletion-insulation structure for RF/microwave integrated circuits on bulk silicon CMOS." 2002 MTT-S International Microwave Symposium Digest 02.2 (2002 Vol. II [MWSYM]): 677-680 vol.2.

Bonding pads for RF/microwave integrated circuits on bulk silicon CMOS is designed with a simple depletion-insulation (DI) structure. Experimental results show high isolation and low substrate loss. An inter-pad isolation of more than 40 dB at 10 GHz is obtained for a 90-/spl mu/m separation distance. The isolation is about two orders of magnitude higher than that of the conventional structure. The return loss is also less than 1.5 dB at 10 GHz. The high Q factor of the DI pad is achieved a few times greater that of the conventional type. The low pad capacitance of about 0.013 fF//spl mu/m/sup 2/ is attained. This will increase the resonant frequency of the bond-wire-pad connection. The application of the useful DI structure is extendable to interconnect and planar spiral inductor to reduce the substrate loss and increase the Q factor.

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