Abstracts

Transposing Conductors in Signal Buses to Reduce Nearest-Neighbor Crosstalk

R.H. Voelker. "Transposing Conductors in Signal Buses to Reduce Nearest-Neighbor Crosstalk." 1995 Transactions on Microwave Theory and Techniques 43.5 (May 1995 [T-MTT]): 1095-1099.

A conductor layout technique is described that reduces nearest-neighbor crosstalk for multiconductor signal buses with applications in high-speed digital and microwave pulse integrated circuits. Periodic transposition of conductors in a bus increases the average spacing of formerly nearest neighbors and thus decreases their capacitive and inductive coupling compared with ordinary parallel conductors. A conductor transposition pattern is evaluated for crosstalk, propagation delay, and chip area. SPICE simulations demonstrate that conductor transposition reduces, in certain situations, near- and far-end nearest-neighbor crosstalk by roughly 40% compared with parallel conductors. Quantitative guidelines are developed for reducing nearest-neighbor crosstalk in a transposed five-conductor bus, including effects of signal rise time, source resistance, load capacitance, and bus length.

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