Abstracts

LSE-mode balun for hybrid integration of NRD-guide and microstrip line

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A recently proposed hybrid integration technology of NRD-guide and planar circuits provides an alternative for exploiting advantageous features of the two complementary structures in view of three-dimensional circuit design at millimeter-wave frequencies. Such an integration scheme has been developed for use of the second fundamental mode (LSM) having the lowest transmission loss. In this work, a new balun structure (transition) integrating NRD-guide and microstrip line is reported for the first fundamental mode (LSE). A TLM algorithm is used to model and optimize the proposed LSE-mode related NRD-guide/microstrip line transition. Electrical characteristics of the new balun are studied theoretically and experimentally. Calculated and measured results are found to be in good agreement for designed experimental prototypes at 18-22 GHz.

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