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Title: Analysis and design of a novel W-band SPST switch by employing full-wave em simulator Authors:Xu, Zhengbin (1); Guo, Jian (1); Qian, Cheng (1); Dou, Wenbin (1) Author affiliation:(1) State Key Laboratory of Millimeter Waves, Southeast University, No.2 Sipailou, Nanjing 210096, China Corresponding author:Xu, Z.(Zhengbin\_xu@hotmail.com) Source title: Journal of Infrared, Millimeter, and Terahertz Waves Abbreviated source title: J. Infrared. Millim. Terahertz Waves Volume:32 Issue:12 Issue date:December 2011 Publication year:2011 Pages:1434-1445 Language:English ISSN:18666892 E-ISSN:18666906 Document type: Journal article (JA) Publisher:Springer New York, 233 Springer Street, New York, NY 10013-1578, United States Abstract:In this paper, a W-band single pole single throw (SPST) switch based on a novel PIN diode model is presented. The PIN diode is modeled using a full-wave electromagnetic (EM) simulator and its parasitic parameters under both forward and reverse bias states are described by a T-network. By this approach, the measurement-based model, which is usually a must for high performance switch design, is no longer necessary. A compensation structure is optimized to obtain a high isolation of the switch. Accordingly, a W-band SPST switch is designed using a full wave EM simulator. Measurement results agree very well with simulated ones. Our measurements show that the developed switch has less than 1.5 dB insertion loss under the 'on' state from 88 GHz to 98 GHz. Isolation greater than 30 dB over 2 GHz bandwidth and greater than 20 dB over 5 GHz bandwidth can be achieved at the center frequency of 94 GHz under the 'off' state.

Number of references:13