

Cost-Effective, Accuracy Preserving Scalar Characterization for mmWave Transceivers

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Abstract : The development of instrument grade mmWave transceivers comes with many challenges. A general rule of thumb is that the performance of the instrument must be higher than the performance of the unit under test in terms of accuracy and stability. The calibration and characterizing of mmWave transceivers are important pillars for testing commercial products. Using a Vector Network Analyzer (VNA) with a mixer option has proven a high performance as an approach to calibrate mmWave transceivers. However, this approach comes with a high cost. In this work, a reduced-cost method to calibrate mmWave transceivers is proposed. A comparison between the proposed method and the VNA technology is provided. A demonstration of significant challenges is discussed, and an approach to meet the requirements is proposed.

Keywords : mmWave transceiver, scalar characterization, coupler connection, magic tee connection, calibration, VNA, vector network analyzer

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