Abstracts

Development of Accurate On-Wafer, Cryogenic Characterization Techniques (Short Papers)

J. Laskar, J.J. Bautista, M. Nishimoto, M. Hamai and R. Lai. "Development of Accurate On-Wafer, Cryogenic Characterization Techniques (Short Papers)." 1996 Transactions on Microwave Theory and Techniques 44.7 (Jul. 1996, Part I [T-MTT]): 1178-1183.

Significant advances in the development of high electron mobility field-effect transistors (HEMT's) have resulted in cryogenic, low-noise amplifiers (LNA's) whose noise temperatures are within an order of magnitude of the quantum noise limit (hv/k). Further advances in HEMT technology at cryogenic temperatures may eventually lead to the replacement of maser and superconducting-insulator-superconducting (SIS) front-ends in the 1-100 GHz frequency band. Key to identification of the best HEMT's and optimization of cryogenic LNA's is accurate and repeatable device measurements at cryogenic temperatures. A cryogenic on-wafer noise and scattering parameter measurement system has heen developed to provide a systematic investigation of HEMT noise characteristics. In addition an improved parameter extraction technique has been developed to help understand the relationship between device structure and LNA performance.

❑ Return to main document.