

We present a balun-free, pure differential-mode noncontact measurement technique for on-wafer characterization of devices and integrated circuits (ICs). We demonstrate the validity of this novel approach in the H-band (220-325 GHz), where there are currently no available alternatives. To date, realization of differential-mode millimeter-wave and submillimeter-wave devices and ICs have been hindered by the lack of characterization tools. With the presented approach, we demonstrate a simple, noncontact and cost effective technique that enables much needed differential-mode metrology capability for current and future high-speed electronic systems.