Abstract

The millimeter-wave spectrum from 30 to 300 GHz features large available bandwidth and small wavelengths which can be leveraged for high-throughput wireless communications and high-resolution radar sensors. Key mass-market millimeter-wave applications include local-area networks at 60 GHz which can support multiple gigabit-per-second transfer rates, vehicular radars at 76-81 GHz for collision avoidance or adaptive cruise-control, and fifth-generation cellular networks at 28 GHz which can support higher data rates. Silicon technology has advanced to the point that it is now possible to realize high-performance and low-cost solutions for each of these applications. This talk will review application requirements and opportunities for these markets and then highlight the challenges associated with both antenna and package integration and manufacturing test for multi-antenna transceivers operating at millimeter-wave frequencies. Finally, a recently-developed 76-81-GHz radar transceiver chipset with built-in-test will be highlighted to illustrate an approach to simplify the manufacturing test of a millimeter-wave radar system.