Abstracts

MM-Wave Tapered Slot Antennas on Micromachined Photonic Bandgap Dielectrics

T.J. Ellis and G.M. Rebeiz. "MM-Wave Tapered Slot Antennas on Micromachined Photonic Bandgap Dielectrics." 1996 MTT-S International Microwave Symposium Digest 96.2 (1996 Vol. II [MWSYM]): 1157-1160.

Dramatic improvements in the radiation properties of tapered slot antennas (TSA) integrated on high dielectric constant substrates have been achieved through micromachining techniques. A periodic hole structure was micromachined into the substrate converting it into a photonic bandgap material. The measured directivity of a 4lambda/sub 0/ TSA on a 50 mil (1.27 mm) thick Duroid substrate (epsilon/sub r/ = 10.5) was increased by 240% using micromachined holes with a hexagonal geometry. A similar improvement was observed when the process was performed at 30 GHz on a 14 mil (350 µm) silicon wafer. We believe the technology can be scaled to 60 GHz and 94 GHz for communication systems, low-cost millimeter wave imaging arrays, and power combining systems.

❑ Return to main document.