Abstracts

Multifrequency Microstrip Antennas Using Alumina-Ceramic/Polyimide Multilayer Dielectric Substrate

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A novel microstrip antenna using an alumina-ceramic/polyimide multilayer dielectric substrate is presented. The multilayer configuration, in which two different multilayer materials with much different permittivities and thicknesses are stacked together, can be used for designing an antenna with selective substrate thickness, thus providing the optimum substrate thickness for the desired frequency. Both 10 GHz-band and 18 GHz-band antennas are designed and fabricated on the same substrate to demonstrate the feature. They achieve perfect matching and acceptable radiation characteristics. Furthermore, for application to array antennas, power combining circuits such as a 90° hybrid and a four-port divider are demonstrated. Finally, the possibility of applying this technology to active antenna systems is discussed. The measurement results confirm that the proposed multilayer substrate is extremely suitable for building active array systems integrated with active devices and monolithic microwave/millimeter wave integrated circuits (MMIC), as well as for constructing multifrequency antennas.

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