Abstracts

A low profile 77 GHz three beam antenna for automotive radar

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The design and fabrication of a 76.5 GHz, planar, three beam antenna is presented. This antenna has greater than 31 dB of gain and sidelobes that are less than -29 dB below the main beam. This antenna demonstrates the ability to achieve very low sidelobes in a simple, compact, and planar structure. This is accomplished uniquely by feeding waveguide slots that are coupled to microstrip radiating elements. This illumination technique allows for a very low loss and highly efficient structure. Also, a novel beam-scanning concept is introduced. To orient a beam from bore sight it requires phase differences between the excitations of the successive elements. This is achieved by varying the width of the W-band waveguide. This simple, beam steering two-dimensional structure offers the advantage of easy manufacturing compared to present lens and alternative technologies.

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