

## Compact multibeam imaging antenna for automotive radars

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A compact multi-beam 77 GHz antenna has been developed for automotive applications. The antenna consists of a hemispherical Teflon lens with backside metallization, which is fed by endfire tapered slot antennas (TSAs) on a 127  $\mu$ m-thick Duroid/sup TM/ substrate. The TSAs are arranged in a circular arc covering 40 deg around the hemispherical lens. The measured patterns result in E and H-plane patterns with a 3 dB beamwidth of 5.5 deg, a sidelobe level of -18 to -20 dB and a cross-polarization level of -19 dB. The calculated efficiency of this antenna system is 54%. The off-axis antenna patterns are identical to the broadside patterns due to the symmetrical structure of the antenna. The antenna can provide coverage using a circular feed array around the hemispherical Teflon lens.

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