Abstracts

Design Techniques for Compact Monopulse W-Band Antenna Feeds for Radar Systems

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Radical differences between system requirements require great flexibility in the design process for the millimeter wave monopulse feed. This paper discusses design approaches used for three feed systems: a three channel multimode monopulse feed, a six channel dual linear polarized monopulse feed, and a four channel dual circular polarized monopulse feed. Each of these feeds was designed for a 94 GHz radar application. Performance levels achieved for each of these feeds include >35 dB null depth, >30 dB cross polarization, sidelobe levels >25 dB down, comparator insertion loss of <1 dB, axial ratios of 2 dB, pattern symmetry to BW/15 of <=3 degree, and boresight error of <=1 milliradian. The feed assemblies consist of brazed assemblies; package size varies from a volume of 8.0 cu. in. down to 0.32 cu. in., while cross sectional diameter ranges from 2.1 cu. in. down to 0.5 cu. in.

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