Abstracts

A W-band dielectric-lens-based integrated monopulse radar receiver (1998 Vol. II [MWSYM])

S. Raman, N.S. Barker and G.M. Rebeiz. "A W-band dielectric-lens-based integrated monopulse radar receiver (1998 Vol. II [MWSYM])." 1998 MTT-S International Microwave Symposium Digest 98.2 (1998 Vol. II [MWSYM]): 517-520.

An integrated monopulse receiver has been developed for tracking applications at W-band frequencies. The receiver is based on dielectric-lens-supported, coplanar-waveguide-fed slot-ring antennas integrated with uniplanar subharmonic mixers. The design center frequency is 94 GHz and the IF bandwidth is 2-4 GHz. The measured DSB conversion losses of the individual receiver channels range from 14.4 to 14.7 dB at an LO frequency of 45.0 GHz and an IF of 1.4 GHz. This includes the lens reflection and absorption losses, backside radiation, RF feedline loss, mixer conversion loss, and IF distribution loss. Excellent monopulse patterns are achieved with better than 45 dB difference pattern nulls using IF monopulse processing. This translates to sub-milliradian angular accuracy for a 24 mm aperture. Better than 25 dB nulls are possible over a 600 MHz bandwidth.

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