

“W-band low-noise amplifiers”

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Abstract – We report low noise amplifiers for a 94-GHz cloud profiling radar. Four amplifiers were designed using coplanar waveguides and they were manufactured with a 100-nm metamorphic high electron mobility transistor technology. Selected chips were assembled in a split block package having WR-10 waveguide interfaces and alumina microstrip transitions. The scattering parameters and the noise figures of the amplifiers were measured on-wafer and in WR-10 waveguide environment at Wband. At room temperature, the on-wafer measured gain at 94 GHz was between 18 and 23 dB and the measured noise figure ranged from 3.0 to 3.5 dB. Packaged amplifiers exhibit more than 20 dB of gain and noise figures around 3.7 dB. One packaged amplifier was also measured at cryogenic temperature and the results are presented.