Abstracts

38-GHz-band High-power MMIC Amplifier Module for Satellites On-Board Use

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This paper presents the design and development results of 38-GHz high-power MMIC amplifier modules for use in the solid state power amplifier (SSPA) to be carried aboard Engineering Test Satellite VI in 1993. This amplifier will be used in millimeter-wave intersatellite communication experiments. For the development of this amplifier, we designed high-power, highly reliable FET's with 0.25 µm-long gates. The FET large-signal impedance was accurately measured using an improved load-pull method and MMIC transformers. The measurements were used to design two types of MMIC 's: one composed of two FET cells with 600 µm wide gates, and the other of four FET cells with 400 µm wide gates. We also developed a two-stage amplifier package consisting of two of these MMIC's that can be used at 38 GHz. We obtained a Po (1 dB) of 25 dBm and a gain of 11 dB. A 38-GHz test conducted during chip screening achieves a high production yield without circuits adjustment.

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