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Broadband Power Amplifier With a Novel Tunable Output Matching Network

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BACKGROUND

In the past decade, InGaP/GaAs heterojunction bipolar transistors (HBTs) have been the key technology in delivering solutions for both high efficiency and high linearity monolithic microwave integrated circuit (MMIC) power amplifiers in various wireless communication systems, such as GSM, DCS, PCS, CDMA and WLAN. Traditionally, these MMIC power amplifiers are designed for narrow band operation and cannot be used as a broadband solution covering multiple bands in wireless communication systems. For decades, the realization of broadband, high power MMIC power amplifiers has posed a significant challenge to microwave design and systems engineers owing to limitations imposed by the electrical and thermal properties of GaAs transistor technology.

TECHNOLOGY DESCRIPTION

University researchers have developed an InGaP/GaAs heterojunction bipolar transistor (HBT) monolithic microwave integrated circuit (MMIC) broadband power amplifier with a novel tunable output matching circuit is first proposed and implemented. The 3-stage MMIC broadband power amplifier is realized by using the novel HBT structure and layout, applying broadband and compensating matching technique in matching network design, adopting power gain predistortion at the first stage, and optimizing the distribution of power gain among stages. The output matching circuit is implemented with parallel L_C tank circuits using PIN diodes to control the inductor value. This broadband power amplifier module (PAM) offers the advantage of tunable frequency band, low insertion loss, small size and high linearity.

APPLICATIONS

This broadband power amplifier module has potential use in several wireless communication systems, such as GSM, DCS, PCS and CDMA systems and other high frequency bands.

PATENT STATUS

Country	Туре	Number	Dated	Case
United States Of America	Issued Patent	7,602,240	10/13/2009	2005-580

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Available Technologies

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