Abstracts

The operation of microwave power amplifiers fabricated from wide bandgap semiconductors

R.J. Trew. "The operation of microwave power amplifiers fabricated from wide bandgap semiconductors." 1997 MTT-S International Microwave Symposium Digest 1. (1997 Vol. I [MWSYM]): 45-48.

There are a variety of RF and microwave electronic devices that can be fabricated from wide bandgap semiconductors such as SiC and GaN. These semiconductors have many properties that make them near ideal for electronic devices intended for high temperature, high frequency, high power, and radiation hard applications. Prototype SiC and GaN-based electronic devices with very good DC and RF performance have been demonstrated and devices such as diodes are commercially available, while RF and high frequency transistors are rapidly approaching the commercialization stage. In this work the performance of microwave power amplifiers fabricated using SiC and GaN-based MESFET's are discussed and investigated. It is demonstrated that these amplifiers can produce RF output power on the order of 4-6 W/mm of gate periphery with near ideal power-added efficiency.

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