

Abstract

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“A new technology for Solid State Power Amplification applied to Amateur Radio Satellite Communications”

The promise of Gallium Nitride technology used in the design of power transistors has created much excitement in the amplifier design community. Gallium Nitride (GaN) transistors provide higher output power levels and greater efficiencies than any previous RF transistor technology. As the technology matures, some low and medium power devices are beginning to come onto the market for use in cellular and PCS applications.

This paper demonstrates (I believe for the first time) their application in Amateur Radio frequency bands. A 25W amplifier will be built and tested to cover the 144 – 450 MHz frequency range. A goal of 50% efficiency has been set which will allow the amplifier to be powered by a simple wal-wart style power supply. This type of amplifier is ideal for use with 1W dual band HT's when operating the LEO's such as AO-27 and AO-51.

Only very basic design theory will be presented. The paper will focus more on the construction and measured results with FM modulation in the VHF and UHF bands. The transistor to be used is the RT243 manufactured by RFHIC. It is relatively low cost and available to the radio amateur.