

SPACE POWER SYMPOSIUM (C3)
Advanced Space Power Technologies and Concepts (3)

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EXPERIMENTAL DEMONSTRATION OF HIGH FREQUENCY SWITCHING CONVERTER FOR
ENVELOPE TRACKING POWER AMPLIFIER APPLICATIONS**Abstract**

Spacecraft communicate with on-ground stations by means of Radio Frequency amplifiers. Such devices are supplied under constant voltage and feature efficiency figures decreasing with the RF power level. The so-called envelope tracking technique corresponds to a voltage supply proportional to the RF signal amplitude and significantly improves the overall efficiency performance. It is based on power switching converters requesting high frequency components. While state-of-the-art switching transistors, based on Silicon or Gallium Arsenide electronic technologies, are not up to the demands of high frequency and large voltage operation, the newly emerging Gallium Nitride transistor technology features very low parasitic capacitance and large breakdown voltage, thereby making the implementation of an efficient RF envelope tracking system possible. The present work consists in the practical realisation of an envelope tracking power switching converter, from component selection up to a Multi Module Integrated Circuits testing. With an objective of 50 MHz switching frequency for a 100 W power level, it is dedicated to enabling usage of component technologies based on GaN and significantly improving the overall efficiency of telecommunication satellites using solid state power amplifiers.