

Efficient DC Voltage Conversion Without Switching – A Path to Extremely Compact and Low-Noise DC Voltage Regulators

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Abstract

DC voltage regulators are crucial power management components in practically all modern defense electronics. However, a significant capability gap exists for incumbent voltage regulators that can simultaneously provide low electromagnetic interference (EMI) generation, a very compact footprint, high efficiency, and high radiation tolerance. In this paper we will present our patented technology, which utilizes heterogeneous integration of CMOS analog ICs with extremely high-performance optoelectronic components to deliver EMI-free, high-efficiency and extremely compact buck/boost DC voltage regulators. These components will be impactful for powering the most demanding defense applications, and our radiation-hard designs offer high performance in harsh space environments.