

SPACE POWER SYMPOSIUM (C3)  
Interactive Presentations (IP)

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COMPARISON OF CCM AND DCM FLYBACK CONVERTERS FOR SATELLITE PAYLOAD  
POWER SUPPLY**Abstract**

In the paper, design comparison of continuous conduction mode (CCM) and discontinuous conduction mode (DCM) flyback converters for satellite payload power supply is presented. The comparison is executed through theoretical analysis and experiment validation on the 12V/12W, 200kHz prototype CCM and DCM flyback converters, which have been designed and built with similar printed circuit layouts, components, and power ratings. Due to the direct current component in the CCM flyback converters, it is more difficult to design the transformer than the DCM flyback converters. A new method is provided to design the CCM flyback transformer which caters for not only the CCM converter (e.g. a boost converter and the a CCM flyback converter, etc) and but also the DCM converters such as forward converter, half-bridge converter. Other aspects in CCM and DCM flyback converters to be compared are component voltage and current stresses and efficiency whose conclusions redound to increase the reliability and life of satellite payload power supply. The pros and cons for each mode of operation are discussed based on the experimental results.