

As a major supplier to the aerospace industry, Renesas' Intersil product development methodologies reflect nearly seven decades of experience designing products to meet the highest standards for reliability and performance in challenging environments. In 2017, Intersil was acquired by Renesas Electronics, who continues to develop the Intersil brand and is committed to providing the same quality, reliability, and performance you have grown to know and trust. Renesas is proud of this rich heritage and that the Intersil line of products can be found in virtually every satellite in orbit and every deep space mission.

RTG4 Reference Design

In collaboration with Microchip and Ibeos, Microsemi's RTG4 FPGA development boards have been modified to replace the existing commercial grade power solution with Renesas' Radiation-Hardened power products. The [ISLRTG4DEMO1Z](#) reference board has the same functionality as the Microchip RTG4 Development Kit, but includes the space grade power solution from Renesas' Intersil family of power management ICs.



RTG4 Power Supply Requirements

Power Supply Rails There are three main rails required for the FPGA, these are for the core voltage (VDD), the charge pumps (VPP), and for the I/O banks (VDDIx). Depending on the configuration and what devices the FPGA needs to interface with, the I/O rail can be different voltages ranging from 1.2V to 3.3V. The SerDes portion of the FPGA also requires three rails. One for its analog I/O voltage (SERDES_x_Lyz_VDDAIO), another for the SerDes internal phase locked loops (SERDES_x_Lyz_VDDAPLL), and one for the clock receiver supply (SERDES_VDDI). In addition, there is the White Paper - Space Grade Power Solution for the Microchip® RTG4™ FPGA Page 2 of 9 VDDPLL rail that powers the PLLs used on the FPGA, DRAM memory, and PCIe/PCS rails. Finally, there is a SerDes reference voltage that is 50% of the SerDes clock receiver supply.



Rad Hard 14-Bit 1MSPS SAR ADC Provides Precision and Robustness for Space Applications

Renesas' Intersil brand [ISL73141SEH](#) delivers best-in-class dynamic and static performance, including signal-to-noise ratio (SNR), effective number of bits (ENOB), integral non-linearity (INL) and differential non-linearity (DNL). The ADC fully resets after every sample, clearing any errors that result from a single event upset (SEU) due to heavy ion radiation during spaceflight.

Radiation Tolerant SPDT RF Switch for Wireless and Other RF Applications



The Renesas Intersil brand [ISL71934M](#) is a high reliability, low insertion loss, 50Ω SPDT absorptive RF switch covering a broad frequency range of 50MHz to 6000MHz. This device offers best-in-class AC performance for satellite communication systems, antenna switching, digital pre-distortion feedback, and IF switching applications.