Performance of an Advanced Stirling Convertor Based on Heat Flux Sensor Measurements

By Scott D Wilson

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.The U.S. Department of Energy (DOE) and Lockheed Martin Space Systems Company (LMSSC) have been developing the Advanced Stirling Radioisotope Generator (ASRG) for use as a power system for space science missions. This generator would use two high-efficiency Advanced Stirling Convertors (ASCs), developed by Sunpower, Inc., and NASA Glenn Research Center. The ASCs convert thermal energy from a radioisotope heat source into electricity. As part of ground testing of these ASCs, different operating conditions are used to simulate expected mission conditions. These conditions require achieving a particular operating frequency, hot-end and cold-end temperatures, and specified electrical power output for a given heat input. It is difficult to measure heat input to Stirling convertors due to the complex geometries of the hot components, temperature limits of sensor materials, and invasive integration of sensors. A thin-film heat flux sensor was used to directly measure heat input to an ASC. The effort succeeded in designing and fabricating unique sensors, which were integrated into a Stirling convertor ground test and exposed to test temperatures exceeding 700 C in air for 10,000 hr....

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