

SPACE POWER SYMPOSIUM (C3)
Wireless Power Transmission Technologies, Experiments and Demonstrations (2)

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MICROWAVE WIRELESS POWER TRANSMISSION TEST POWER SATELLITE: SYSTEM
ENGINEERING

Abstract

Space based solar power relies on large and complex systems. The 1980s Design Reference Study called for a system of up to 60 satellites, each capable of supplying up to 5 GW of electric power to the grid. Each satellite in the constellation was to be constructed in orbit by teams of astronauts. The major satellite systems were: photovoltaic conversion; power management and distribution (including a rotary joint); electric to microwave conversion; and beam forming and pointing. Subsequent satellite designs have attempted to remedy perceived deficiencies in the original Reference design. The impact of changes made to one system can propagate through the entire satellite. Design optimization is discussed for the case of a microwave power transmission demonstration satellite.