

Lightweight IMM PV Flexible Blanket Assembly

For high-voltage solar electric propulsion missions

Deployable Space Systems (DSS) has developed an inverted metamorphic multijunction (IMM) photovoltaic (PV) integrated modular blanket assembly (IMBA) that can be rolled or z-folded. This IMM PV IMBA technology enables a revolutionary flexible PV blanket assembly that provides high specific power, exceptional stowed packaging efficiency, and high-voltage operation capability. DSS's technology also accommodates standard third-generation triple junction (ZTJ) PV device technologies to provide significantly improved performance over the current state of the art.

This SBIR project demonstrated prototype, flight-like IMM PV IMBA panel assemblies specifically developed, designed, and optimized for NASA's high-voltage solar array missions.

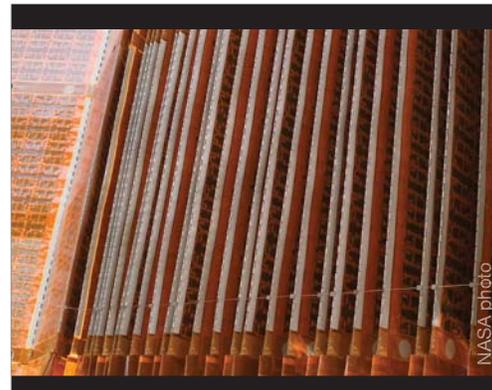
Applications

NASA

- ▶ Near- to medium-term NASA Discovery, Flagship Outer-Planets, and New Frontiers—class science missions
- ▶ Interplanetary comet rendezvous and solar electric propulsion science missions
- ▶ Low Earth orbit (LEO), geosynchronous Earth orbit (GEO), planetary or celestial-body lander, planetary orbiter, and/or deep space applications

Commercial and Military

- ▶ Power and energy production for fixed-ground, mobile, and roof-mounted consumer applications
- ▶ High-altitude airship applications
- ▶ LEO surveillance, reconnaissance, communications, commercial mapping, and other critical payload/equipment satellites
- ▶ GEO commercial and Defense Department communications and critical payload/equipment satellites



Phase II Objectives

- ▶ Demonstrate and validate prototype IMM PV IMBA panel assemblies specifically developed, designed, and optimized for NASA's high-voltage solar array missions
- ▶ Develop scalable analytical models and correlate with test results to validate IMM PV IMBA prototype hardware
- ▶ Develop technology and manufacture infrastructure

Benefits

- ▶ High-voltage operability
- ▶ High specific power (>1,000 W/kg beginning of life [BOL] at the blanket subsystem level; >500 W/kg BOL at the array level)
- ▶ Compact stowage volume (>50 kW/m³)
- ▶ Rollable or z-foldable for stowage
- ▶ Flexible and durable
- ▶ Adaptable to all existing industry flexible blanket solar array products

Firm Contact

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