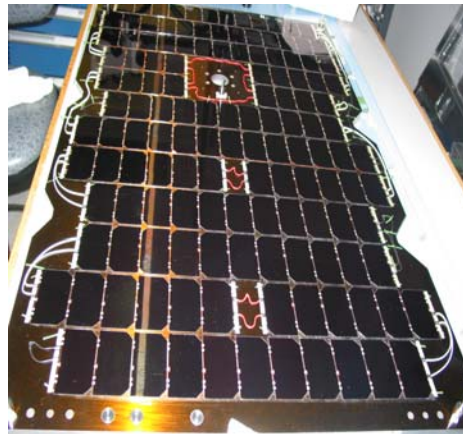


SPACE SOLAR PANEL & SOLAR CELL ASSEMBLY

SSTL is able to offer the following products and services in the field of photovoltaics:

- **Space Solar Cell Assemblies**
- **Space Solar Panels (Body mounted and Deployable)**
- **Solar Cell Testing (Terrestrial and Space)**
- **Space Solar Panel Consultancy**

Since the commissioning of the manufacturing facility and qualification of the processes in 2001, SSTL have produced flight panels for various missions both for internal and external projects. SSTL can now offer full solar panel capability, from initial mechanical and electrical design, through to in-house manufactured substrates and electrical lay-down, and then, final acceptance testing before delivery for spacecraft integration.

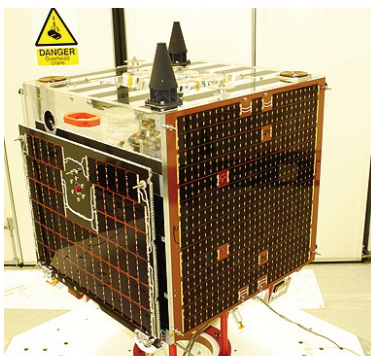


Large area triple junction cells on CFRP panel

SSTL designs and manufactures lightweight solar panel substrates of aluminium honeycomb construction sandwiched between either CFRP or aluminium face-skins. The front face-skin has a polyimide insulation layer ready for electrical lay-down either by the customer or SSTL. SSTL performs cell lay-down onto the substrate using state of the art, 28% high efficiency, triple junction cells from Europe and USA. Typical performance parameters for the completed panels, when using a CFRP face-skin, is 275Wm^{-2} with an areal mass density of 4.6kgm^{-2} . The electrical design can either be customer supplied or performed by SSTL.

The panel cell interconnections, busbarbing and wiring are fully welded for high reliability. All stages of manufacture are routinely checked for quality assurance. Final acceptance performance testing can either be performed in-house or at an established test-house depending on the customer's requirements.

Some 100 flight panels for LEO spacecraft (equating to a power generation capability of over 7kW) have been manufactured in the first ten years of SSTL solar panel production.



Deployable and body-mounted solar panels

All flight panels operate flawlessly and most will extend beyond their design lifetime.

Specifications

- SSTL can design, procure, manufacture and test solar panels to the customer's specification.
- SSTL offers electrical procurement and lay-down on customer supplied panels (flying electrical leads on the rear or customer furnished)
- SSTL can design, procure and manufacture aluminium or carbon fibre solar panels for body mounted satellites
- Single junction cells GaAs/Ge (19.6% eff @ 25°C AM0)
- Triple junction cells GaAs/Ge (28.5% eff @ 25°C AM0)

Qualification and Flight Heritage

- Qualification panels made and extensively tested for both aluminium substrate single junction cells and CFRP substrate triple junction cells
- Flight experience : Fedsat, Alsat, Nigeriasat, UK-DMC, Rapideye Beijing-1, Deimos,

Physical Characteristics

- Aluminium honeycomb sandwiched between carbon fibre (CFRP) or aluminium face-skin.
- Max panel dimensions: 1.2m x 2.0m
- Cell size from 20mm x 40mm to 40mm x 80mm using European or USA cells.

Manufacturing Facilities

- Fully welded electrical manufacturing capability for high lifetime reliability in all orbits
- Precision screen printed laydown giving controlled adhesive bond for the solar cells
- Purpose built cleanroom facility Class 100,000 (ISO Class 6)
- Experienced well qualified solar panel technicians

SPACE SOLAR PANEL & SURREY SOLAR CELL ASSEMBLY

SATELLITE TECHNOLOGY LTD

Space Solar Cell Assembly

SSTL has the capability to interconnect and glass bare solar cells in preparation for lay-down of the solar panel. SSTL uses an ultrasonic welding technique for the connection of silver or gold coated interconnector to the front busbar of the cell. The cells are then glassed using space qualified glass, followed by retesting and grouping in the appropriate current class.



Ultrasonic welding of interconnect to bare cell

Solar Cell Testing (Terrestrial and Space)

SSTL has an in-house solar cell test and characterisation facility. The test set-up consists of a I-V source, automated test software, a xenon lamp and a temperature controlled mounting block onto which the cell under test is placed. An I-V performance curve will be generated automatically for the cell under test, with temperatures ranging from 15°C to 90°C.

A Large Area Pulsed Solar Simulator (LAPSS) is also available for performance testing of solar panels from varying light intensities up to Air Mass Zero (1368 W.m⁻²).

Research and Development

As part of our on-going research and development, SSTL flies technology demonstrating microsattellites. This gives flight heritage for newly qualified high efficiency solar cells or can be used for proving novel solar panel designs. SSTL is always interested in receiving proposals for flight opportunities on these satellites.

Solar Panel Consultancy

SSTL is able to offer customers a consultancy service, ranging from the testing of solar cells, to design review participation. SSTL can also provides advice on the optimum solar panel design, manufacturing and testing suitability to meet customer mission requirements



*SSTL Solar Panel
Manufacturing Facility*



*Solar Panel Large Area
Pulsed Solar Simulator
(LAPSS)*



Solar Cell Test Facility

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Issue Number & Notice

SSTL 0035172 v005.01.18-07-11. This data sheet is for preliminary information purposes and can be changed without any notice. Please contact SSTL for further information.