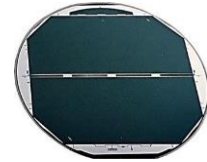


# 33% XTE+ GEO Space Qualified Triple Junction Solar Cell

- Based on 25+ years of heritage 3J devices
- Fully qualified under AIAA-S111 2014 Standard
- Targeting GEO to MEO missions
- 32.6% BOL efficiency
- 28.5% EOL, 1E15 1MeV electron\*\*
- Multiple Sizes Available (<85-cm<sup>2</sup>)
- Currently in Production

Operates 1° C Cooler  
Than Other Space Grade Solar Cells



Cell Thickness = 160 μm-240 μm  
Cell Mass = 50-84 mg/cm<sup>2</sup>

## XTE+ GEO Post 1 MeV e- Retention (US Standard AIAA S-111-2005)

Parameters*	BOL	1e14 (10-yr LEO)	5e14	1e15 (15-yr GEO)	1e16
Efficiency <sub>mp</sub>	32.6%	0.92	0.88	0.85	0.69
V <sub>oc</sub> (V)	2.803	0.92	0.88	0.86	0.78
J <sub>sc</sub> (mA/cm <sup>2</sup> )	18.21	1.00	1.00	0.99	0.96
V <sub>mp</sub> (V)	2.512	0.92	0.88	0.86	0.76
J <sub>mp</sub> (mA/cm <sup>2</sup> )	17.56	1.00	1.00	0.99	0.91

\* AM0 (135.3 mW/cm<sup>2</sup>, 28°C), for 27 cm<sup>2</sup> cell size

(Fluence of 1 MeV electrons/cm<sup>2</sup>)

## XTE+ GEO Post 1 MeV e- Retention (European standard-ECSS\*\*)

Parameters*	BOL	1e14 (10-yr LEO)	5e14	1e15 (15-yr GEO)	1e16
Efficiency <sub>mp</sub>	32.6%	0.94	0.90	0.87	0.74
V <sub>oc</sub> (V)	2.803	0.93	0.89	0.88	0.80
J <sub>sc</sub> (mA/cm <sup>2</sup> )	18.21	1.00	1.00	1.00	0.97
V <sub>mp</sub> (V)	2.512	0.93	0.89	0.88	0.79
J <sub>mp</sub> (mA/cm <sup>2</sup> )	17.56	1.01	1.01	0.99	0.94

\*\* Photon and temperature annealing according to ECSS-E-ST-20-08C

(Fluence of 1 MeV electrons/cm<sup>2</sup>)



ENVIRONMENTAL MANAGEMENT SYSTEM  
CERTIFIED BY DNV

ISO 14001

# 33% XTE+ GEO

## Space Qualified Triple Junction Solar Cell

### Temperature Coefficients (15°C to 75°C)

Parameters		BOL	1e14	1e15	1e16
Open Circuit Voltage	$\Delta V_{oc}/\Delta T$ [mV/°C]	-5.6	-6.0	-6.6	-6.9
Short Circuit Current	$\Delta J_{sc}/\Delta T$ [ $\mu\text{A}/\text{cm}^2/\text{°C}$ ]	10	10	10	10
Maximum Power Voltage	$\Delta V_{mp}/\Delta T$ [mV/°C]	-6.3	-6.4	-6.8	-7.0
Maximum Power Current	$\Delta J_{mp}/\Delta T$ [ $\mu\text{A}/\text{cm}^2/\text{°C}$ ]	7	7	8	11
Maximum Power	$\Delta P_{mp}/\Delta T$ [ $\mu\text{W}/\text{cm}^2/\text{°C}$ ]	-89	-94	-99	-90

### Standard Cell Sizes

*Other cell Sizes Available*

### Thermal Parameters

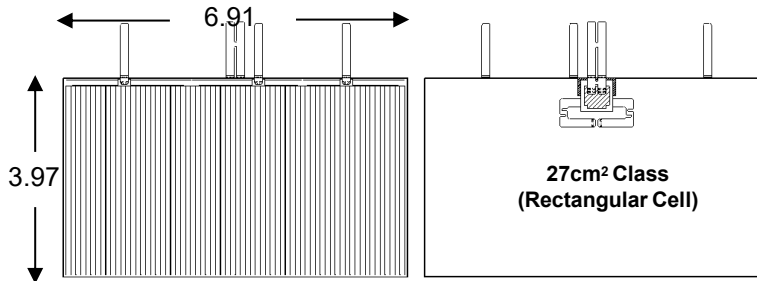
Solar Absorptance

Value

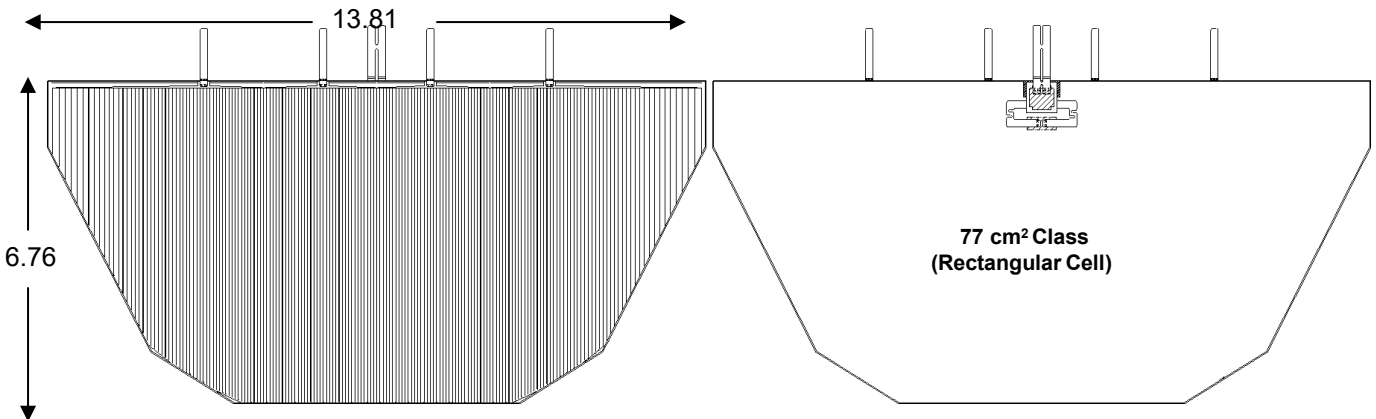
0.89

Emittance

0.85



27cm² Class  
(Rectangular Cell)



77 cm² Class  
(Rectangular Cell)