

XTE-LILT (Low Intensity Low Temperature) Space Qualified Triple Junction Solar Cell

- Based on 20+ years of heritage 3J devices
- Fully qualified under AIAA-S111 2014 Standard
- Targeting LILT and constellation missions
- 31.6% BOL 1 AU efficiency
- 37% BOL 5.5 AU efficiency
- Currently in Production



Cell Thickness = 80 μ m - 225 μ m
Cell Mass = 50 - 84mg/cm²

XTE-LILT Post 1 MeV e- Retention (US Standard AIAA S-111-2005)

Parameters*	BOL	1e14 (10-yr LEO)	5e14	1e15 (15-yr GEO)	1e16
Efficiency _{mp}	31.6%	0.93	0.88	0.84	0.68
V _{oc} (V)	2.755	0.92	0.89	0.87	0.78
J _{sc} (mA/cm ²)	18.1	1.00	1.00	0.99	0.96
V _{mp} (V)	2.459	0.92	0.88	0.86	0.76
J _{mp} (mA/cm ²)	17.4	1.00	0.99	0.98	0.90

* AM0 (135.3 mW/cm², 28°C), for 27 cm² cell size

(Fluence of 1 MeV electrons/cm²)

XTE-LILT Post 1 MeV e- Retention (European standard-ECSS**)

Parameters*	BOL	1e14 (10-yr LEO)	5e14	1e15 (15-yr GEO)	1e16
Efficiency _{mp}	31.6%	0.93	0.90	0.86	0.72
V _{oc} (V)	2.755	0.92	0.90	0.88	0.80
J _{sc} (mA/cm ²)	18.1	1.00	1.00	1.00	0.97
V _{mp} (V)	2.459	0.92	0.90	0.88	0.79
J _{mp} (mA/cm ²)	17.4	1.00	1.00	0.99	0.92

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

(Fluence of 1 MeV electrons/cm²)



ENVIRONMENTAL MANAGEMENT SYSTEM
CERTIFIED BY DNV

ISO 14001

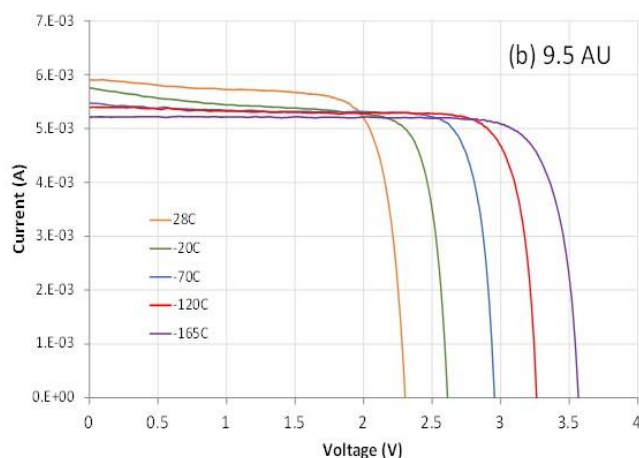
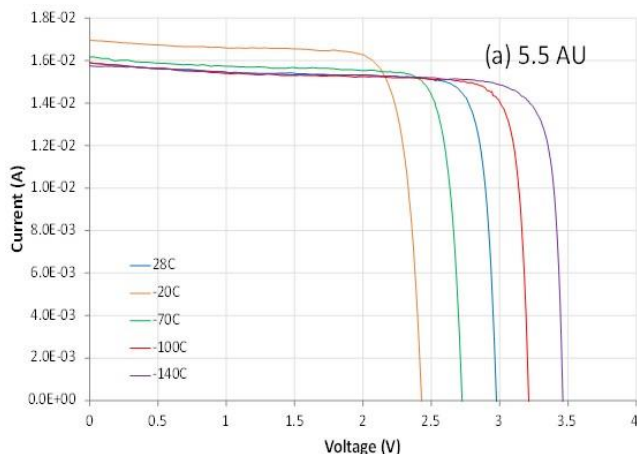
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1 AU Temperature Coefficients (15°C to 75°C)

Parameters		BOL	1e14	1e15	1e16
Open Circuit Voltage	$\Delta V_{oc}/\Delta T$ [mV/°C]	-5.7	-6.1	-6.5	-6.8
Short Circuit Current	$\Delta J_{sc}/\Delta T$ [$\mu\text{A}/\text{cm}^2/\text{°C}$]	10	11	12	12
Maximum Power Voltage	$\Delta V_{mp}/\Delta T$ [mV/°C]	-6.4	-6.5	-6.9	-6.9
Maximum Power Current	$\Delta J_{mp}/\Delta T$ [$\mu\text{A}/\text{cm}^2/\text{°C}$]	7	8	13	11

LILT BOL Temperature Coefficients (-165°C to 28°C)

Parameters		5.5 AU	9.5 AU
Open Circuit Voltage	$\Delta V_{oc}/\Delta T$ [mV/°C]	-6.3	-6.6
Short Circuit Current	$\Delta J_{sc}/\Delta T$ [$\mu\text{A}/\text{cm}^2/\text{°C}$]	0.266	0.082
Maximum Power Voltage	$\Delta V_{mp}/\Delta T$ [mV/°C]	-6.4	-6.0
Maximum Power Current	$\Delta J_{mp}/\Delta T$ [$\mu\text{A}/\text{cm}^2/\text{°C}$]	0.290	0.081



Standard Cell Sizes

Other cell Sizes Available

Thermal Parameters	Value
Solar Absorptance	0.91
Emittance	0.85