XTE

SPECTROLAB
A Boeing Company

32%

- **Solar Cell Built on 20+ Years of 3J Heritage Devices**
- **Qualified Using AIAA S-111-2014 Standards**
- **Three Variants Available in 2019:**
  - **XTE-SF** (Standard Fluence) for LEO and GEO
    Up to 1e15 Equivalent Fluence
  - **XTE LILT** for Deep Space Missions
  - **XTE-HF** (High Fluence) > 1e15 (1 MeV Equivalence)
- **BOL & EOL Proven Performance:**
  - **32% BOL** Efficiency (XTE-SF)
  - **30% EOL** Efficiency (XTE-SF) 5e13 (1 MeV Equivalence)
- **Cell Sizes Available to Meet Customer Priorities:**
  - 26.62cm² to SuperCell > 80cm²
- **In Production**

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XTE-SF (Standard Fluence)

Space Qualified Triple Junction Solar Cell

XTE-SF Post 1 MeV e- Retention (US Standard AIAA S-111-2014)

Parameters*	BOL	1e14 (10-yr LEO)	5e14	1e15 (15-yr GEO)	1e16
$Efficiency_{mp}$	32.2 %	0.93	0.88	0.84	0.66
V_{oc} (V)	2.750	0.92	0.88	0.86	0.78
J_{sc} (mA/cm^2)	18.6	1.00	0.99	0.98	0.94
V_{mp} (V)	2.435	0.92	0.88	0.86	0.76
J_{mp} (mA/cm^2)	17.8	1.00	0.99	0.98	0.88

* Average of qualification 27.22 cm² cells; AM0 (135.3 mW/cm², 28°C) (Fluence of 1 MeV electrons/cm²)

XTE-SF Post 1 MeV e- Retention (European Standard-ECSS**)

Parameters*	BOL	1e14 (10-yr LEO)	5e14	1e15 (15-yr GEO)	1e16
$Efficiency_{mp}$	32.2%	0.93	0.89	0.87	0.72
V_{oc} (V)	2.750	0.93	0.90	0.88	0.80
J_{sc} (mA/cm^2)	18.6	1.00	1.00	0.99	0.96
V_{mp} (V)	2.435	0.93	0.90	0.87	0.79
J_{mp} (mA/cm^2)	17.8	1.00	1.00	0.99	0.91

** Photon and temperature annealing according to ECSS-E-ST-20-08C (Fluence of 1 MeV electrons/cm²)

Temperature Coefficients (10°C - 70°C)

Parameters			BOL	1e14	1e15	1e16
Open Circuit Voltage	$\Delta V_{oc}/\Delta T$	[mV/°C]	-5.5	-6.2	-6.7	-7.0
Short Circuit Current	$\Delta J_{sc}/\Delta T$	[µA/cm²/°C]	12.1	11.1	11.9	11.9
Maximum Power Voltage	$\Delta V_{mp}/\Delta T$	[mV/°C]	-6.2	-6.3	-7.1	-7.1
Maximum Power Current	$\Delta J_{mp}/\Delta T$	[µA/cm²/°C]	5.7	6.4	13.3	12.5

AS9100 CERTIFIED

CIC Thermal Parameters	Value
Solar Absorptance	0.89
Emittance	0.85

ENVIRONMENTAL MANAGEMENT SYSTEM
CERTIFIED BY DNV
ISO 14001

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