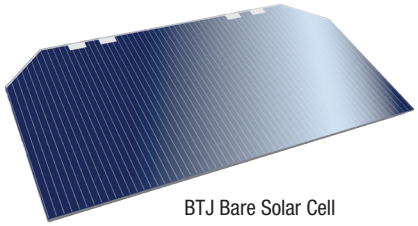
BTJ Space Solar Cell

Advanced Triple-Junction Solar Cell for Space Applications

DATASHEET - MARCH 2015

28.5% Minimum Average Efficiency



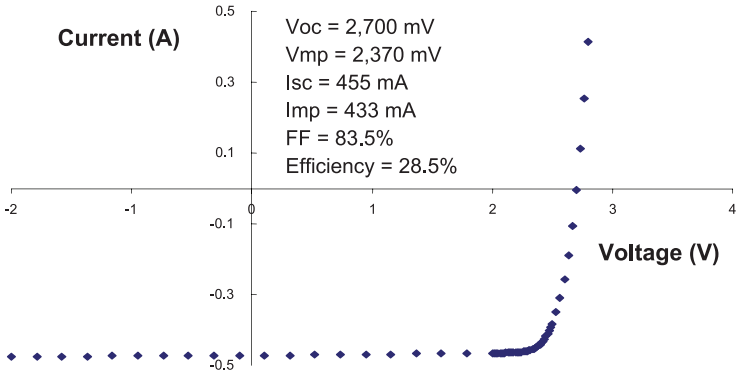
BTJ Bare Solar Cell

Features & Characteristics

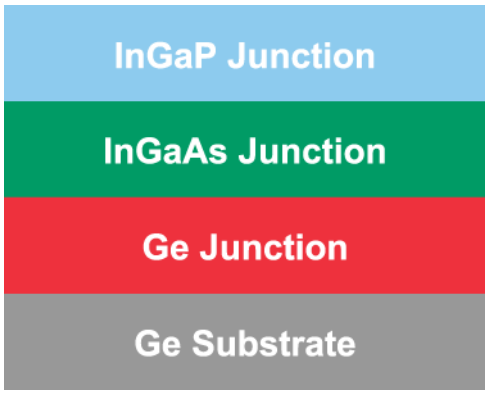
- Solar cell mass of 84 mg/cm^2
- 2nd generation triple-junction (BTJ) InGaP/InGaAs/Ge Solar Cells with n-on-p polarity
- Fully space-qualified with proven large volume manufacturing and flight heritage
- Excellent radiation resistance with P/Po = 0.89 @ 1-MeV, 5E14 e/cm^2 fluence
- Compatible with corner-mounted silicon bypass diode for individual cell reverse bias protection
- Excellent mechanical strength for reduced attrition during assembly and laydown
- Weldable or solderable contacts
- Custom sizes available

Typical BTJ Illuminated I-V Plot

Solar Cell Area = 26.6 cm^2



BTJ Solar Cell Structure



P +1 505.332.5000 E info@solaerotech.com W solaerotech.com

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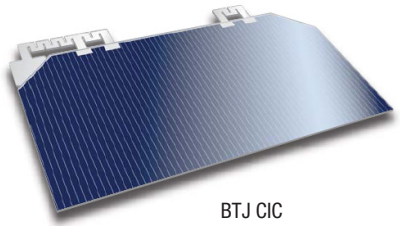
Typical Performance Data

Electrical Parameters @ AM0 (135.3 mW/cm²)	
BOL Efficiency at Maximum Power Point	28.5%
Voc (V)	2.70
Jsc (mA/cm²)	17.1
Vmp (V)	2.37
Jmp mA/cm²)	16.3

Optional Covered Interconnect Cell (CIC) Configurations



BTJ CIC

Radiation Performance at 1 MeV Electron Irradiation, EOL/BOL Ratios

Fluence (e/cm²)	Voc	Isc	Vmp	Imp	Pmp	Efficiency
5.00 E+ 13	0.97	1.00	0.97	1.00	0.97	0.97
1.00 E+ 14	0.96	1.00	0.96	1.00	0.96	0.96
5.00 E+ 14	0.92	0.98	0.92	0.96	0.89	0.89
1.00 E + 15	0.90	0.96	0.90	0.94	0.85	0.85

Temperature Coefficients

Fluence (e/cm²)	Voc (mV/°C)	Jsc(1) (µA/cm²-°C)	Jmp(2) (µA/cm²-°C)	Vmp (mv/°C)	Pmp (µW/cm² - °C)
0	-6.0	12.0	10.0	-6.0	-0.064
1.00 E+ 15	-6.5	14.0	12.0	-6.4	-0.061

(1) Jsc is the symbol for normalized Isc
(2) Jmp is the symbol for normalized Imp

Key Space Qualification Results

Test Performed	Industry Quality Standard	Typical Test Results
Metal Contact Thickness	4-8 µm	6 µm
Dark Current Degradation after reverse bias	ΔIspec<2%	<0.4%
Electrical Performance after 2,000 thermal cycles -180°C to +95°C	<2%	<0.8%
High-Temperature Anneal at 200°C for >5,000 hours	<2%	No Measurable Difference
Contact Pull Strength	>300 grams	>600 grams
Electrical Performance Degradation after 40 day humidity exposure at 60°C and 95% relative humidity	<1.5%	No measurable difference

MADE IN USA ISO 9001 QUALITY ASSURANCE AS 9100

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