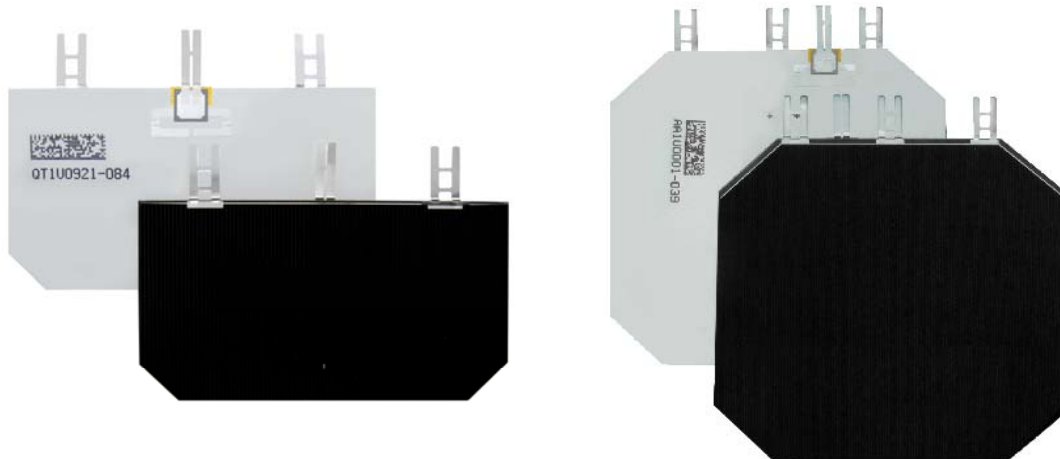


## 29.5% NeXt Triple Junction (XTJ) Solar Cells



Cells shown with interconnects, coverglass, and bypass diode

### Features

- Small and large cell sizes offered for optimum packing factor and cost competitiveness
- Geostationary Orbit (GEO) mission qualified
- 29.5% efficiency (min. average @ max power, 28°C, AM0)
- 29.3% efficiency (min. average @ load, 28°C, AM0)
- Discrete Si bypass diode protection
- Available as CIC assembly (Cell-Interconnect-Coverglass with diode) for ease of integration or delivered on completed solar panels (see Panel Data Sheet)
- Large area cell/CIC (59.65cm<sup>2</sup>) qualification in progress

### Product Description

Substrate	Germanium
Solar Cell Structure	GaInP <sub>2</sub> /GaAs/Ge
Method	Metal Organic Vapor Phase Epitaxy
Device Design	Monolithic, two terminal triple junction. n/p GaInP <sub>2</sub> , GaAs, and Ge solar cells interconnected with two tunnel junctions
Standard Sizes	26.62cm <sup>2</sup> and 59.65cm <sup>2</sup> are common standard sizes; other sizes available
Assembly Method	Welded
CIC Assembly	Coverglass thickness range from 3 mils to 30 mils with various coatings. Interconnects available with either out-of-plane or in-plane stress relief

### Key Qualification Results

- Qualified in accordance with AIAA-S111-2005
- Completed 2,000 GEO qualification cycles, including Combined Effects Test

### Heritage

- More than 2.6 million multi-junction cells delivered
- More than 820 kW of multi-junction arrays *on orbit*
- 1 MW annual capacity - cells and panels
- On orbit performance for multi-junction solar cells validated to ± 1.5% of ground test results

### Intellectual Property

This product is protected by Spectrolab's portfolio of patents including the following:

- 6,150,603
- 6,255,580
- 6,380,601
- 7,119,271
- 7,126,052

## 29.5% NeXt Triple Junction (XTJ) Solar Cells

### Typical Electrical Parameters

(AM0 (135.3 mW/cm<sup>2</sup>) 28°C, Bare Cell)

Jsc= 17.76 mA/cm<sup>2</sup>

Jmp= 17.02 mA/cm<sup>2</sup>

Jload min avg= 17.14 mA/cm<sup>2</sup>

Voc= 2.633 V

Vmp= 2.348 V

Vload= 2.310 V

Cff= 0.85

Effload= 29.3%

Effmp= 29.5%

### Radiation Degradation

(Fluence 1MeV Electrons/cm<sup>2</sup>)

Parameters	1x10 <sup>14</sup>	5x10 <sup>14</sup>	1x10 <sup>15</sup>
Jmp/Jmp <sub>0</sub>	1.00	0.99	0.95
Vmp/Vmp <sub>0</sub>	0.94	0.91	0.89
Pmp/Pmp <sub>0</sub>	0.95	0.90	0.85

### Thermal Properties

Solar Absorptance= 0.90 (5 mil CMG/AR, 0.88 for bare cell)

Emissance (Normal)= 0.85 (Ceria Doped Microsheet)

### Weight

84 mg/ cm<sup>2</sup> (Bare) @ 140 μm (5.5 mil) Ge wafer thickness

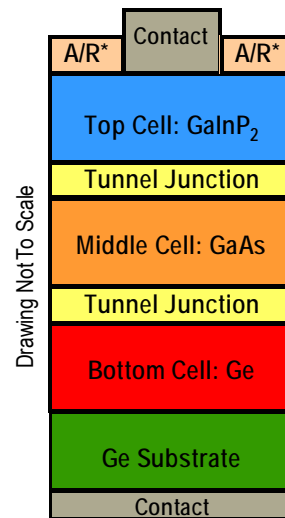
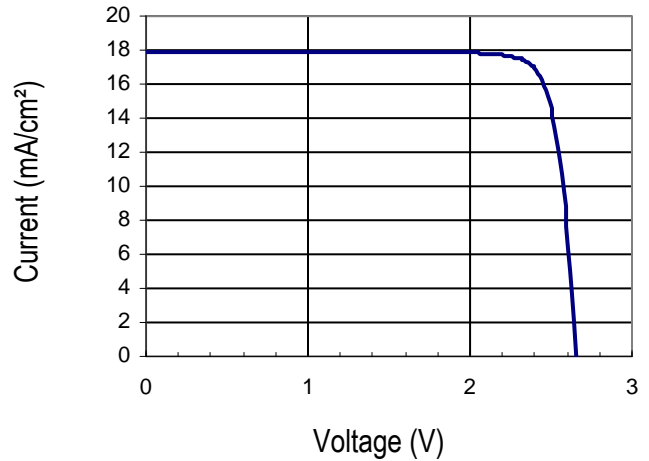
### Temperature Coefficients (15°C - 75°C)

(Fluence 1MeV Electrons/cm<sup>2</sup>)

Parameters	BOL	5x10 <sup>14</sup>	1x10 <sup>15</sup>
Jmp (μA/cm <sup>2</sup> /°C)	6.6	10.0	13.2
Jsc (μA/cm <sup>2</sup> /°C)	11.6	10.9	11.9
Vmp (mV/°C)	-6.5	-6.8	-6.9
Voc (mV/°C)	-5.8	-6.5	-6.6

### Typical IV Characteristic

AM0 (135.3 mW/cm<sup>2</sup>) 28°C, Bare Cell



\*A/R: Anti-Reflective Coating

The information contained on this sheet is for reference only. Specifications subject to change without notice.  
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