

CPV Point Focus Solar Cells

C3MJ+ Improved Third Generation CPV Technology

- ✓ Enhanced efficiency of our C3MJ technology
- ✓ Fully qualified and field-proven

Product Description

Typical Efficiency 39.2%
 Recommended operating temperature <110°C

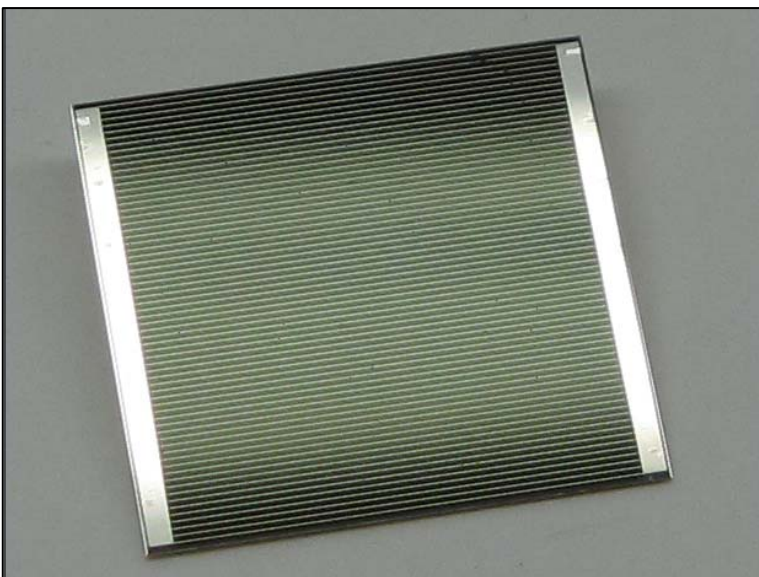
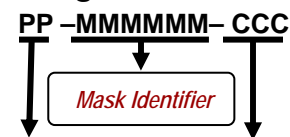
Epitaxial Structure

Triple junction solar cell on Germanium substrate
 GaInP (1.88 eV) / GaInAs (1.41 eV) / Ge (0.67 eV)

Metallization

- Silver metallization on front busbar and grid fingers (optional gold flash finish)
- Silver metallization with 500Å gold on back surface

CPV Cell Ordering Guide



Packaging Format

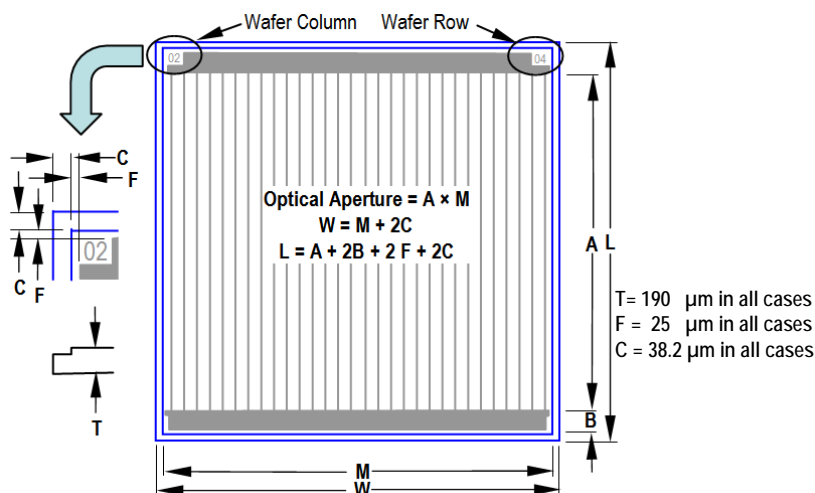
- 11 - Processed Wafer
- 21 - Bare Cell in Waffle Tray

Configuration Options

- 311 - C3MJ+, Silver front contact finish, 100% Tested
- 321 - C3MJ+, Gold front contact finish, 100% Tested

Example: 21 - 046191 - 321 Bare Cell in Waffle Tray -- 9.99x9.95mm Aperture -- C3MJ+ Gold Front Contact, 100% Tested

Mechanical Dimensions



Product	Aperture Area	Aperture Dimensions (mm)		Busbar (μm)	Typical Efficiency
CPV Cell #	(mm ²)	M	A	B	η
PP-046191 - CCC "CDO-100"	99.00	10.000	9.900	400 μm	39.20 %
PP-046167 - CCC "CDO-086"	86.47	9.299	9.299	252 μm	39.22 %
PP-046192 - CCC "CDO-076"	76.50	8.854	8.640	300 μm	39.25 %
PP-046193 - CCC "CDO-030"	30.74	5.547	5.542	300 μm	39.40 %

ENVIRONMENTAL MANAGEMENT SYSTEM
 CERTIFIED BY DNV
 ISO 14001

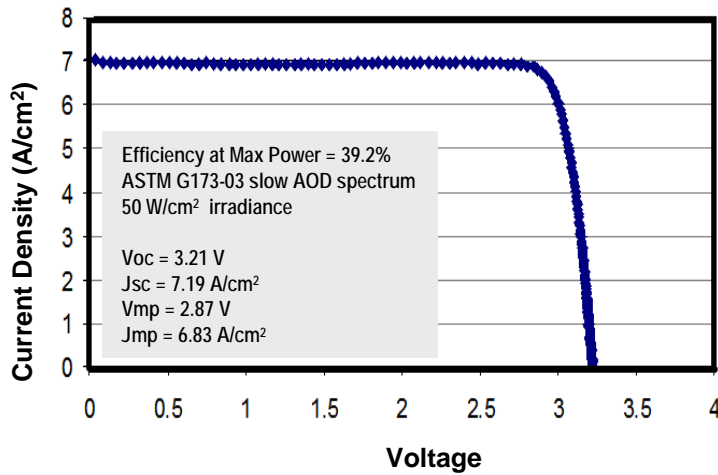
ISO 9001:2000
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AS9100
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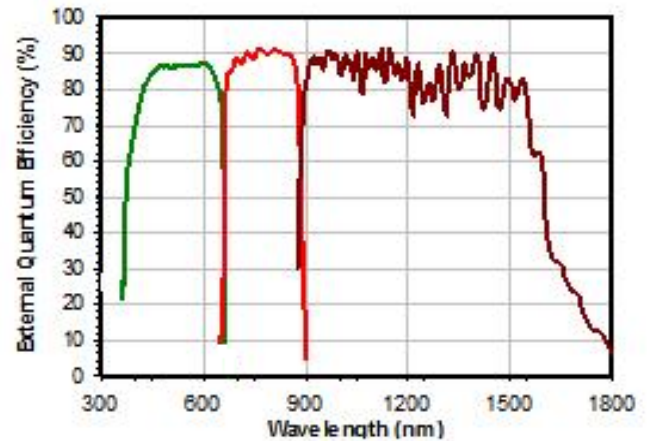
Spectrolab, Inc. 12500 Gladstone Avenue, Sylmar, California 91342 USA

• Phone 818.365.4611 • FAX: 818.361.5102 • Website : www.spectrolab.com

Typical Current-Voltage Characteristics



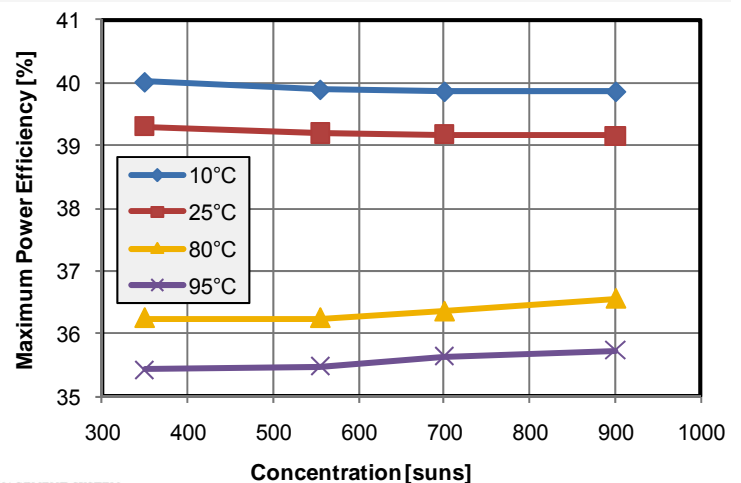
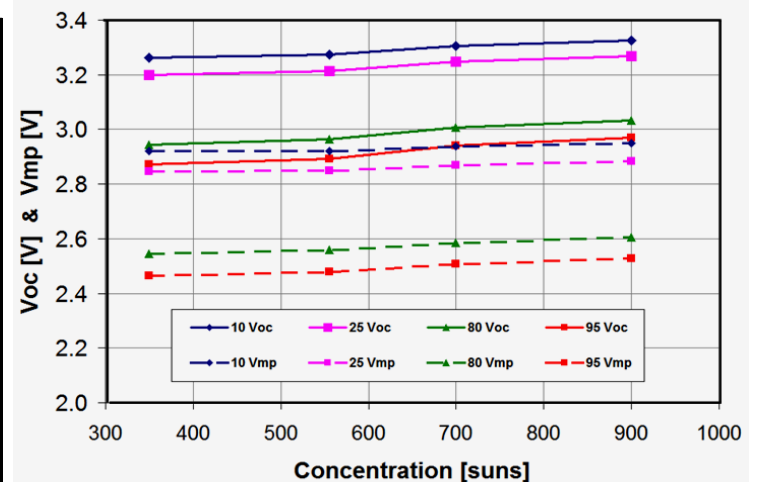
Spectral Response



Qualification Tests Completed

Test	Test Conditions	Qty	Requirement
Performance Tests			
LIV	50 W/cm ² under ASTM 173G	100%	Avg $\eta_{mp} > 38.5\%$; Min $\eta_{mp} > 36.2\%$
Temp Intensity	50, 75 & 100 W/cm ² , ASTM 173G at 10°C, 25°C, 65°C, and 110°C	20	Characterization
Weld Degradation	LIV test before and after weld	100% of scribed parts	NP _{mp} > 0.98
Spectral Response			Characterization
Angle of incidence	X25 or SR illumination source	10	Characterization
Solar Absorptance	Measure reflectance Refer to SR chart shown	10	Characterization
Accelerated Life Tests			
Damp Heat	85C, 85% RH for 2000 hours	30	NP _{mp} > 0.9
Thermal Cycle	IEEE 1513 (500 cycles -40°C to +110°C)	25	NP _{mp} > 0.9
High Temp Soak in Nitrogen	unbiased soak at 200°C and 250°C in Nitrogen	15 at each T	NP _{mp} > 0.95 after 25 yrs

Typical Performance Over Temperature



* Full Qualification Report Is Available Upon Request