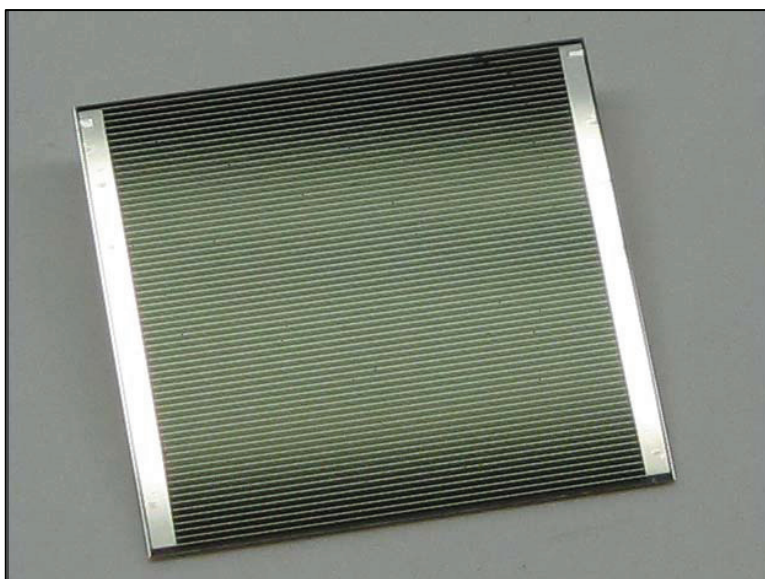


CPV Point Focus Solar Cells

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

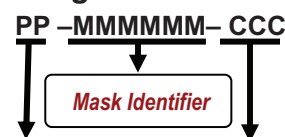
Epitaxial Structure

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

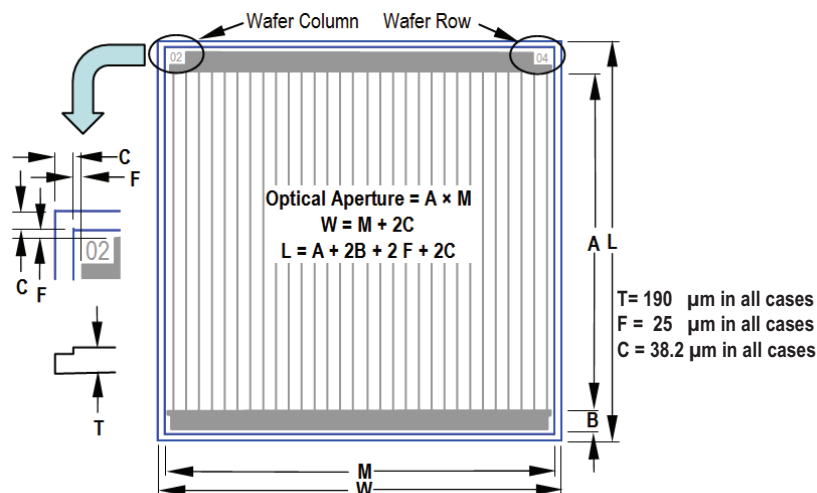
- 11 – Processed Wafer
- 21 – Bare Cell in Waffle Tray

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 -- 9.99×9.95mm 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

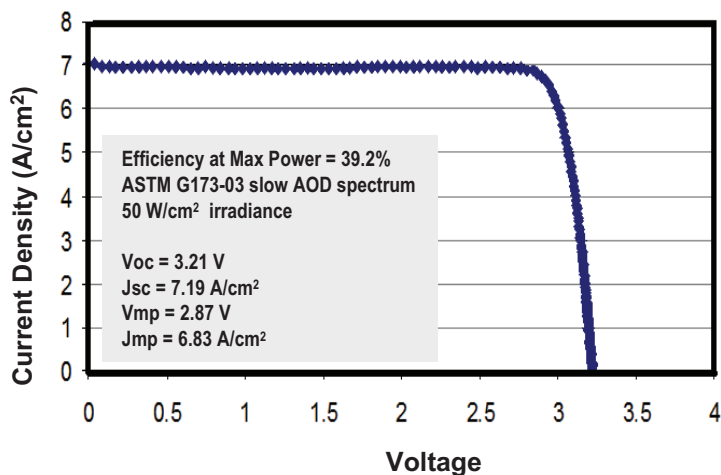
ISO9001:2000
REGISTERED

AS9100
REGISTERED

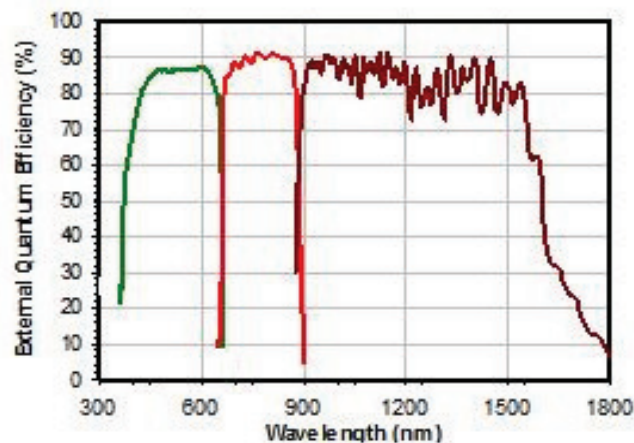
Spectrolab, Inc. 12500 Gladstone Avenue, Sylmar, California 91342 USA

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

Typical Current-Voltage Characteristics



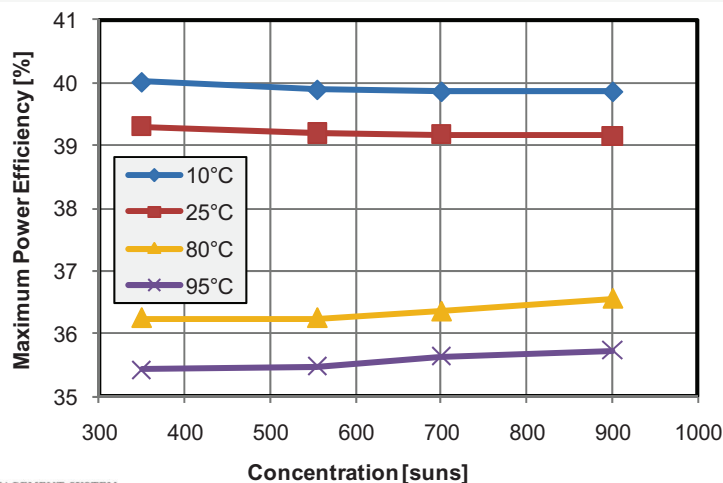
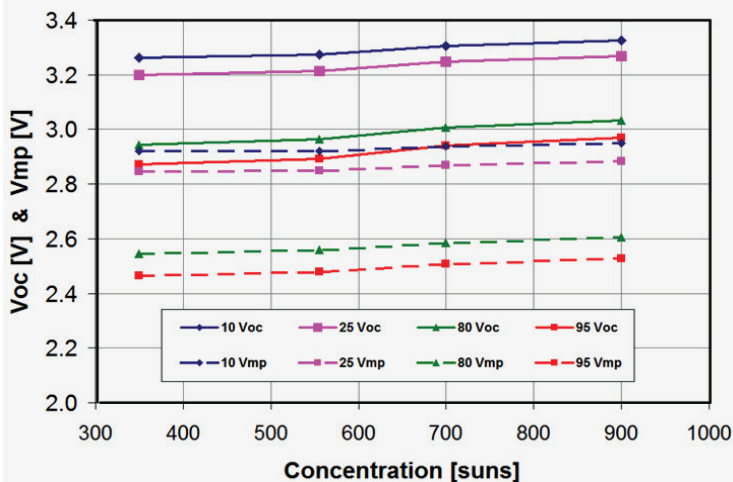
Spectral Response



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 Absorbance	Measure reflectance Refer to SR chart shown	10	Characterization
Accelerated Life Tests			
Damp Heat	85°C, 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