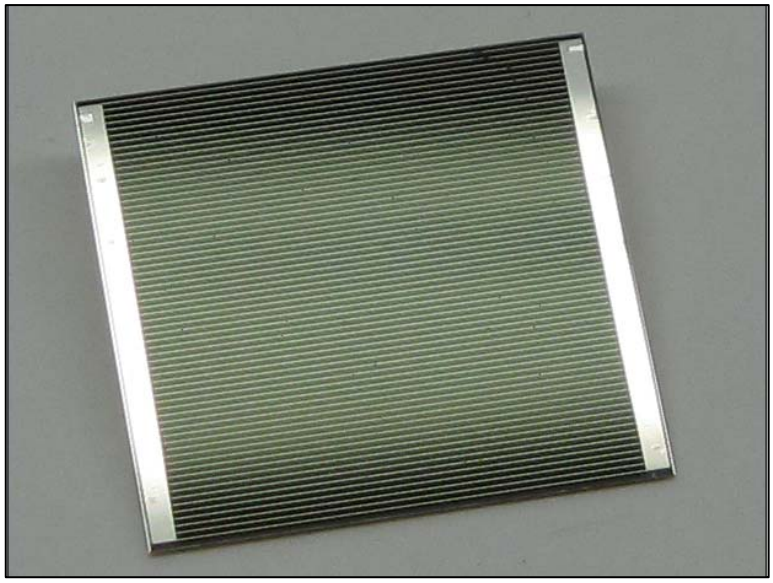
SPECTROLAB

A **BOEING** COMPANY

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

PP –MMMMMM– CCC

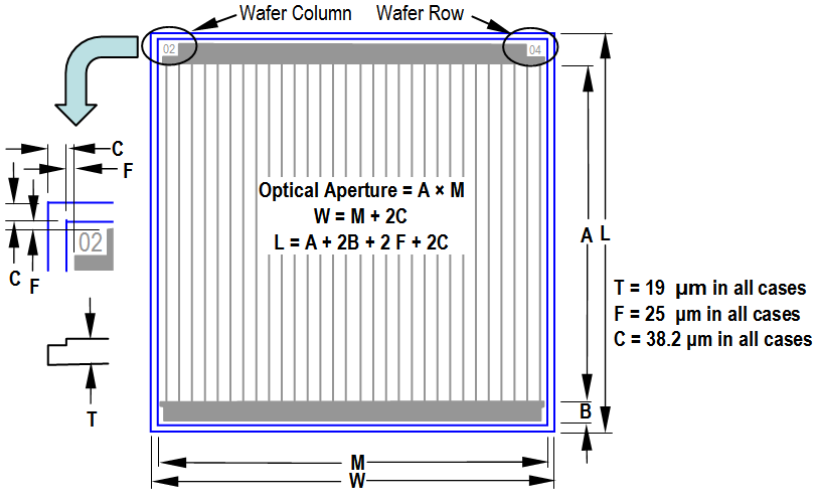
Mask Identifier

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
310, 320 – Same as above, Untested

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 %

ISO9001:2000 REGISTERED

ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFIED BY DNV ISO 14001

AS9100 REGISTERED

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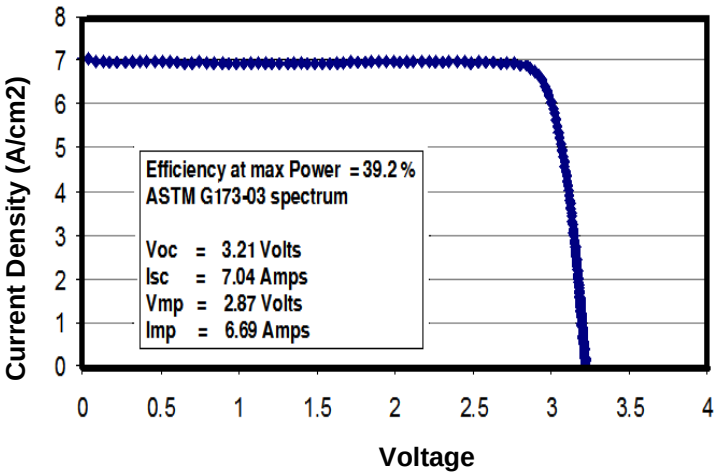
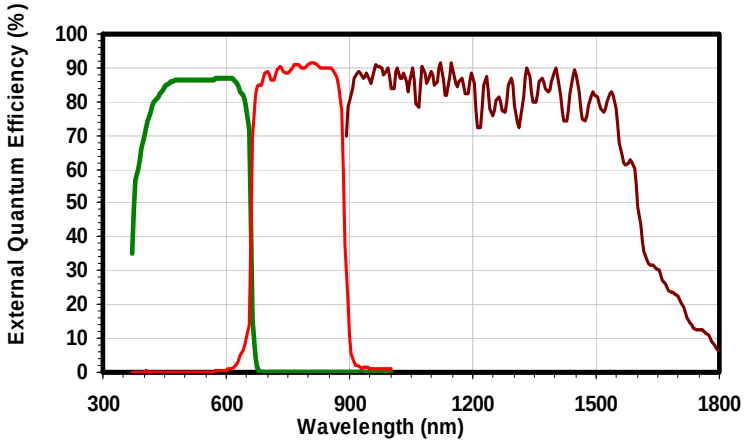
Specifications Subject to Change without Notice.

Typical Current-Voltage Characteristics



Spectral Response

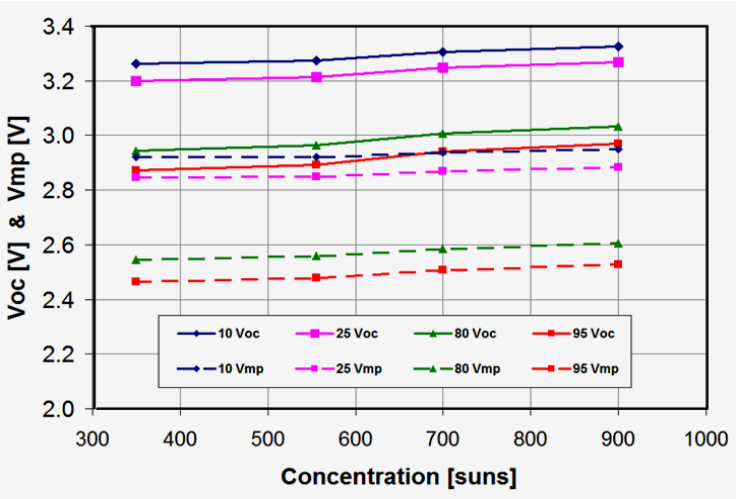


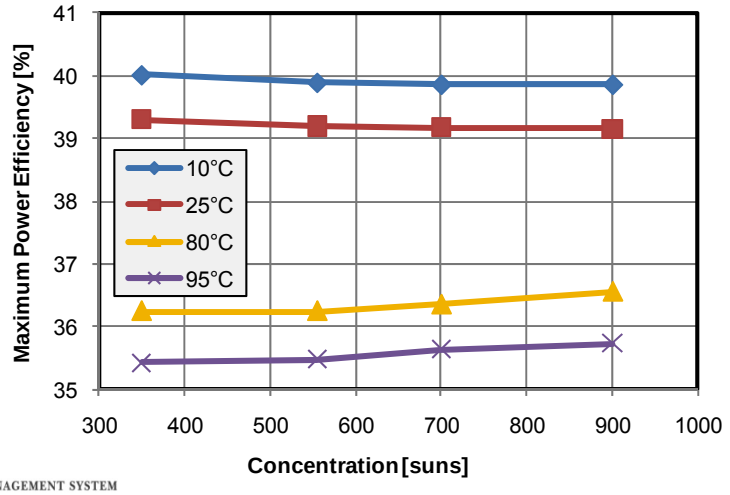
Qualification Tests Completed

Test	Test Conditions	Qty	Requirement
Performance Tests			
LIV	50 W/cm2 under ASTM 173G	100%	Avg η_{mp}>38.5%; Min η_{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

* Full Qualification Report Is Available Upon Request

Typical Performance Over Temperature





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