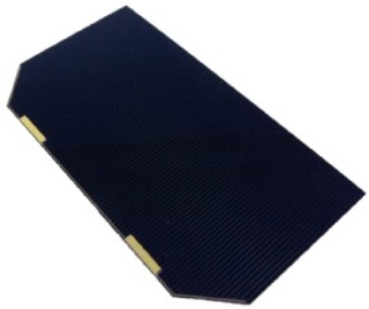
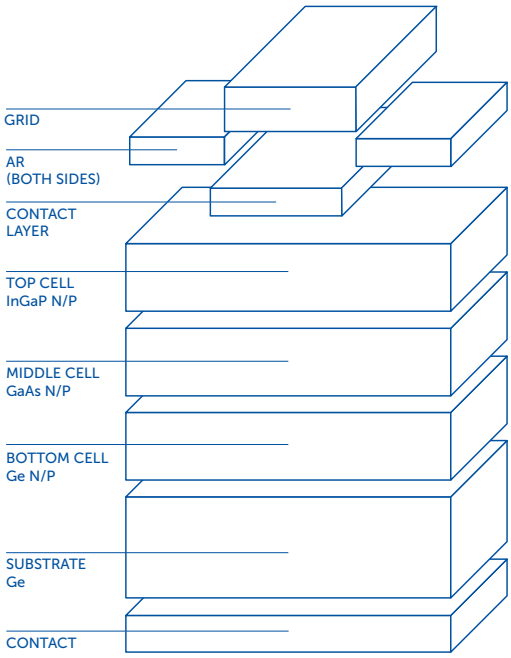
Low Cost Triple-Junction Solar Cell for Space Applications (CTJ – LC)



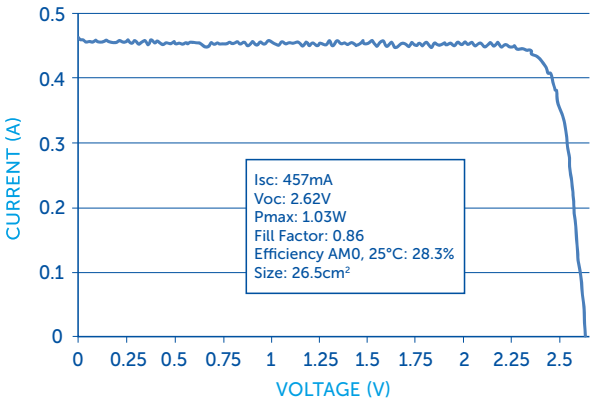
Features and characteristics

> Efficiency 28%
> Triple Junction Solar Cells InGaP/GaAs/Ge for Space Applications
> Polarity N on P
> Very low solar cell mass (81-89 mg/cm^2)
> Thickness 150µm ± 20µm
> Fully Qualified according to standard ECSS E ST20-08C rev.1 for LEO and GEO orbit at bare level
> External By-pass diode for reverse bias protection
> Weldable or Solderable Contacts, Front and Back, based on gold coated silver layers.
> Standard size 6.9x3.9cm^2, area 26.5cm^2 (also available: 7.6x3.7cm^2, area 27.5cm^2; 4x8cm^2, area 30.15cm^2; 6x12cm^2, area 68.6cm^2)
> Thin version: in progress (80µm)
> High Radiation Resistance
> Good mechanical strength
> High flexibility to customization available (sizes, other)



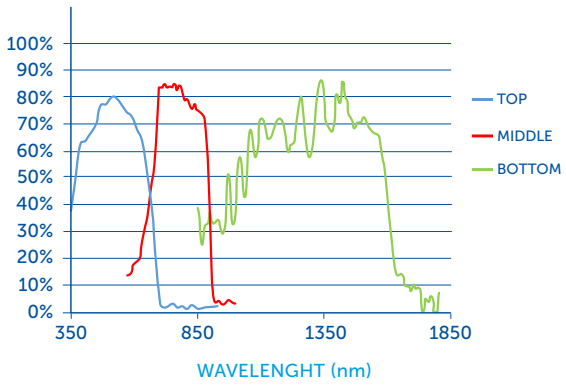
Typical Current-Voltage Characteristic

(CELL SIZE 26.5cm^2, EFFICIENCY >28% @ AM0, 25°C)



External Quantum Efficency

(BOL AVERAGE EXTERNAL QUANTUM EFFICIENCY)



CESI
Shaping a Better Energy Future

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Performance Data

(AVERAGE ELECTRICAL OUTPUT PARAMETERS @AM0, 1367 W/m2 , T=25°C)

	Area (cm^2)	I_{SC} (mA)	V_{OC} (V)	I_m (mA)	V_m (V)	P_{max} (W)	Eff (%)
BOL	26.5	457	2.62	436	2.32	1.01	28.0
EOL*	26.5	444	2.48	422	2.18	0.92	25.5

*After irradiation 1MeV electrons, dose 5E14 e/cm^2

Temperature Coefficients

(@AM0, TEMPERATURE RANGE +15/+ 140 °C)

	$\Delta I_{SC}/\Delta T$ (mA/cm^2/°C)	$\Delta V_{OC}/\Delta T$ (mV/°C)	$\Delta I_{Pm}/\Delta T$ (mA/cm^2/°C)	$\Delta V_{Pm}/\Delta T$ (mV/°C)	$\Delta P_m/\Delta T$ (mW/cm^2/°C)
BOL	0.0114	-6.19	0.007	-6.31	-0.093
Electron 1MeV 3E15 (e/cm^2)	0.0100	-6.71	0.009	-6.93	-0.076

Radiation Degradation (Remaining Factors)

Electron Energy	Fluence (e/cm^2)	I_{SC}	V_{OC}	P_M
1MeV	1E14	0.99	0.98	0.96
1MeV	5E14	0.96	0.95	0.91
1MeV	1E15	0.91	0.94	0.85
1MeV	3E15	0.81	0.91	0.73

Proton Energy	Fluence (p/cm^2)	I_{SC}	V_{OC}	P_M
1MeV	2E10	0.99	0.97	0.94
1MeV	5E10	0.98	0.95	0.90
1MeV	1E11	0.97	0.94	0.87
1MeV	3E11	0.91	0.89	0.74
2MeV	1.5E11	0.98	0.94	0.89
10MeV	5E11	0.99	0.97	0.94
10MeV	5E12	0.92	0.89	0.74

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