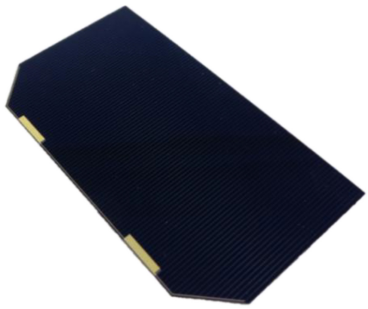
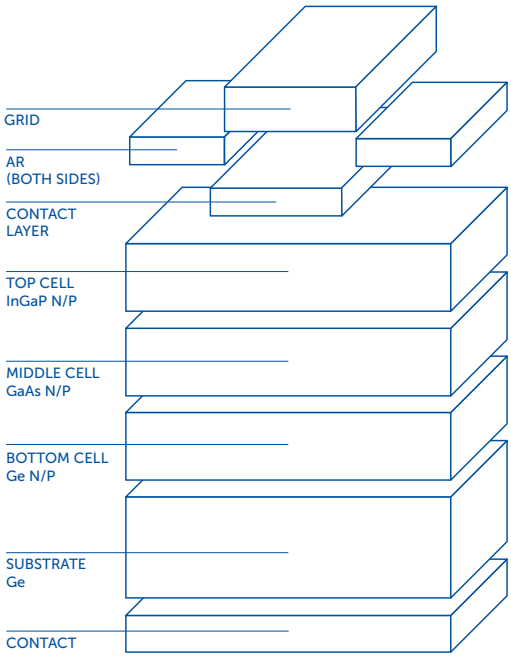
Triple-Junction Solar Cell for Space Applications (CTJ30)



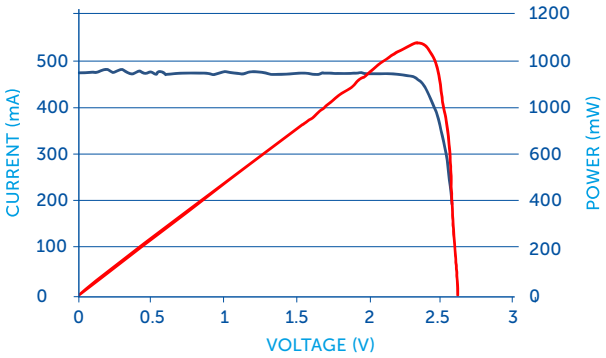
Features and characteristics

> Efficiency 29.5%
> Triple Junction Solar Cells InGaP/GaAs/Ge for Space Applications
> Polarity N on P
> Very low solar cell mass (81-89mg/cm^2)
> Thickness 150µm ± 20µm
> Fully qualified according to standard ECSS E ST20-08C for LEO and GEO orbit
> External By-pass diode for reverse bias protection
> Weldable Contacts, Front and Back, based on gold coated silver layers
> Standard sizes 6.9x3.9cm^2, area 26.5cm^2; 4x8cm^2 area 30.15cm^2 (also available: 7.6x3.7cm^2, area 27.5cm^2; 6x12cm^2; area 68.6cm^2)
> High Radiation Resistance
> Good mechanical strength
> High flexibility to customization (sizes, other)



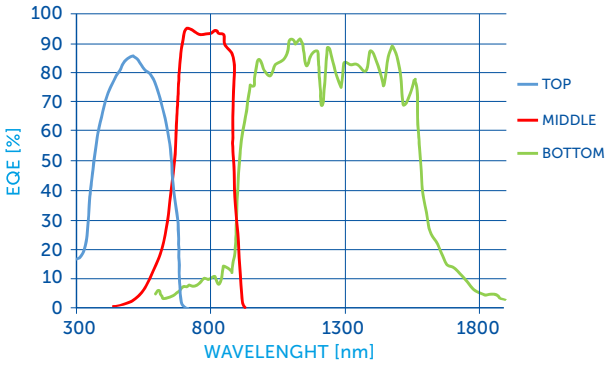
Typical Current-Voltage Characteristic

(CELL SIZE 26.5cm^2, EFFICIENCY 29.5% @ AM0, 25°C)



External Quantum Efficency

(BOL AVERAGE EXTERNAL QUANTUM EFFICIENCY)



CESI
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Performance Data

(AVERAGE ELECTRICAL OUTPUT PARAMETERS @AM0, 1367 W/m^2 , T=25°C)

Area (cm^2)	I_{SC} (mA)	V_{OC} (V)	I_m (mA)	V_m (V)	P_{max} (W)	Eff (%)
26.5	473	2.6	455	2.32	1.05	29.0
30.15	538	2.61	517	2.33	1.20	29.0

Temperature Coefficients

Electron Energy	Fluence (e/cm^2)	$\Delta J_{SC}/\Delta T$ (µA/cm^2/°C)	$\Delta V_{OC}/\Delta T$ (mV/°C)	$\Delta J_{pmax}/\Delta T$ (µA/cm2/°C)	$\Delta V_{pm}/\Delta T$ (mV/°C)	$\Delta P_m/\Delta T$ (µW/cm^2/°C)
0	BOL	15.3	-5.324	12.9	-6.026	-77.8
1MeV	1E14	16.7	-5.589	14.3	-5.964	-73.0
1MeV	5E14	17.2	-5.670	14.0	-6.050	-72.3
1MeV	1E15	16.4	-5.677	17.1	-6.092	-61.5

Radiation Degradation (Remaining Factors)

Electron Energy	Fluence (e/cm^2)	I_{SC}	V_{OC}	P_M
1MeV	1E14	0.99	0.98	0.97
1MeV	5E14	0.96	0.95	0.91
1MeV	1E15	0.91	0.93	0.84

Proton Energy	Fluence (p/cm^2)	I_{SC}	V_{OC}	P_M
100 keV	1E10	0.99	0.98	0.96
100 keV	1E11	0.86	0.94	0.72
1MeV	1E10	1.00	0.98	0.98
1MeV	1E11	1.00	0.93	0.89
10MeV	1E11	1.00	0.99	0.98
10MeV	1E12	1.00	0.94	0.91

Qualification

Fully qualified according ECSS-E-ST-20-8C:
"Photovoltaic Assemblies and components"

- Metal Contact thickness 5-10µm
- Degradation after reverse bias < 1%
- Contact Pull Strength > 500gr (4.9 N)
- Humidity and Temperature < 1%
- Solar Absorptance 0.903

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