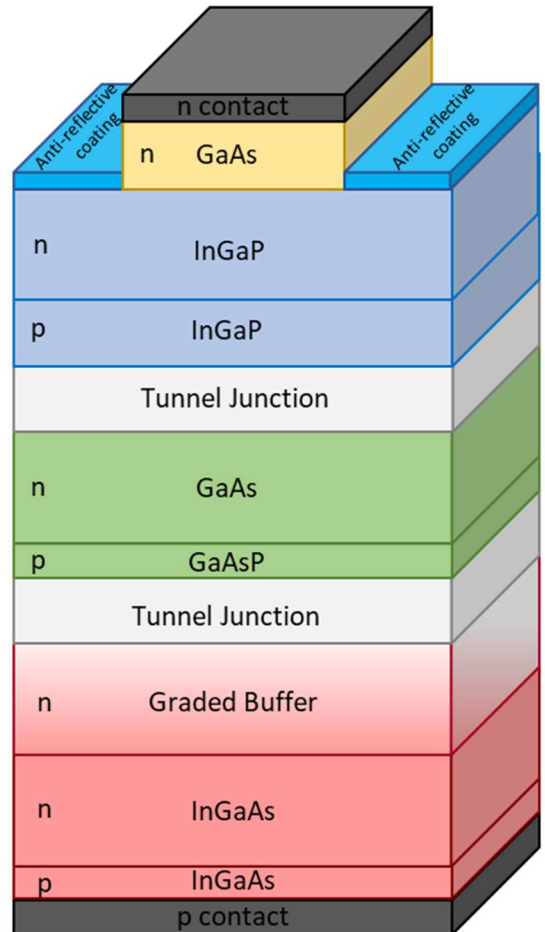


Sharp Inverted Metamorphic Triple Junction (IMM3J) Space Solar Space Qualified, InGaP/GaAs/InGaAs Triple Junction

Datasheet



Features

Inverted Metamorphic Triple-Junction Design – n-on-p type, 31.0% beginning of life (BOL) efficiency

Space Qualified – flight tested by the Japan Aerospace Exploration Agency (JAXA)

Lightweight – cell mass 86% less than traditional triple junction cells

Easy Panel Mounting – To fit orbital environment or desired design configuration, strings of cells may be mounted in glass or film sheets interconnected with silicon diodes

Product Information

Product Name Space Solar Sheet (IMM3J Solar Cells)

Product Group Space Qualified Solar

Product Description

Cell Dimensions Customizable sizes available starting from 4 cm², standard sizes include 27.4 cm² cells.

Cell Weight 12.4 mg/cm²

Cell N contact Ti/Pd/Ag

Cell P contact Ti/Pd/Ag s

Cell Coating AR Dual Layer Coating

Cell BOL Efficiency 31.0% (under AM0:136.7mW/cm², 25°C)

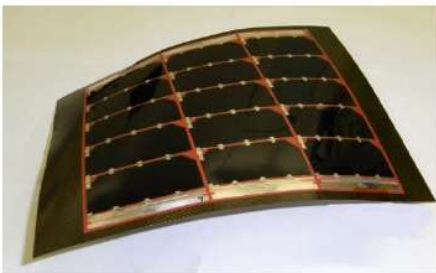
Cell EOL Efficiency 26.1% (under AM0:136.7mW/cm², 25°C, after 1MeV electron irradiation 1x10¹⁵e/cm²)

Cell Electrical Data (Typical values observed for 27.4cm² cell)

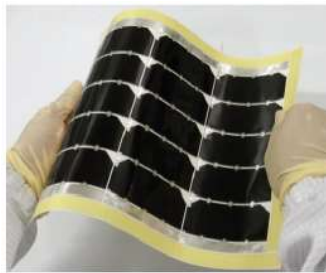
Voc (V)	3.05
Isc (A)	0.450
Imp (A)	0.435
Vmp (V)	2.67
FF	0.845
Pmax (W)	1.16

Remaining Factors	Voc	Isc	FF	Eff
1x10 ¹⁵	89.3	96.4	97.9	84.2

(for individual cells following 1MeV electron irradiation at rate 1x10¹²e/cm²/sec)



Glass Sheet



Film Sheet

	Glass Sheet	Film Sheet
Sheet size ¹	228 by 255 mm	238 by 251 mm
Installed cells	15 cells (three strings of five cells)	
Total power	17.4 W (5.8 W per each string)	
Weight	32.2 g	29.6 g
Power/weight	0.54 W/g	0.59 W/g
Curvature radius	500mm (bendable)	40 mm (flexible)
Radiation tolerance	GEO level	LEO level

¹Please note above sheet dimensions are used as examples; customizable sizes available for both glass and film sheets.

Reliability Tests	Condition	Result
Thermal cycling	1000 cycles between -180° C and +120° C	change <±1 %
Damp heat	720 hours at 65° C and 90% humidity	<±1 %
High Temperature, vacuum	168 hours at <133.3x10 ⁻⁵ Pa and 160° C	<±1 %
High-temperature, air	1000 hours at 150° C	<±1 %
Reverse bias	1000 hours at 150° C, reverse current 500 mA	<±1 %

This document is © 2023 Sharp Energy Solutions Corporation, 3-1-72 Kita-Kamei-cho, Yao, Osaka 581-8585, Japan.

All rights reserved in favor of their respective owners. Information is provided for reference only.

All specifications are subject to change without notice. Errors and omissions are excepted. 10.11.2023