



Polycrystalline 230 Watt PV Solar Panels

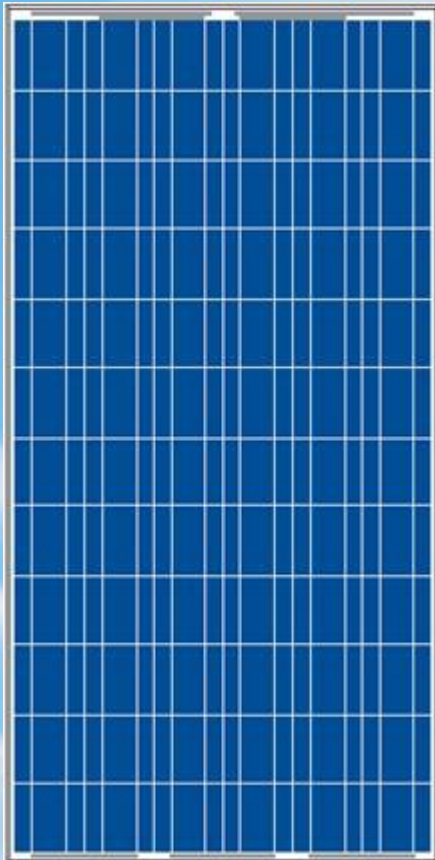
High Efficiency Polycrystalline Photovoltaic Module

Data Specifications, Model: CS-P-230-DJ

Engineering and Manufacturing for the Renewable World



www.patriotsolargroup.com



Overview

- ▶ High cell efficiency with quality silicon material for long term output stability and reliability
- ▶ Rigorous quality control to meet the highest international standards
- ▶ High transmittance, low iron tempered glass with enhanced stiffness and impact resistance
- ▶ Unique frame design with high mechanical strength for easy installation
- ▶ Advanced encapsulation material with multilayer sheet lamination to provide long-life and enhanced cell performance
- ▶ Outstanding electrical performance under high temperature and low irradiance conditions
- ▶ 60 polycrystalline high-efficiency solar cells (approx. 16.5%)

Applications

- ▶ Any large or small on-grid /off-grid solar power stations
- ▶ Commercial/industrial building roof-top systems
- ▶ Residential roof-top systems
- ▶ Any commercial/industrial ground mount systems
- ▶ Other industrial and commercial applications

Warranty

- ▶ 10 year limited product warranty on materials and workmanship
- ▶ 25 year limited power warranty on power output
- ▶ $\geq 90\%$ power output assurance for 10 years and $\geq 80\%$ power output assurance for 25 years
- ▶ Refer to warranty document for detailed warranty information

Certifications

- ▶ UL1703 ISO 9000:2000
- ▶ CE TUV IEC61215 IEC61730

Polycrystalline 230 Watt PV Solar Panels

High Efficiency Polycrystalline Photovoltaic Module
Model: CS-P-230-DJ

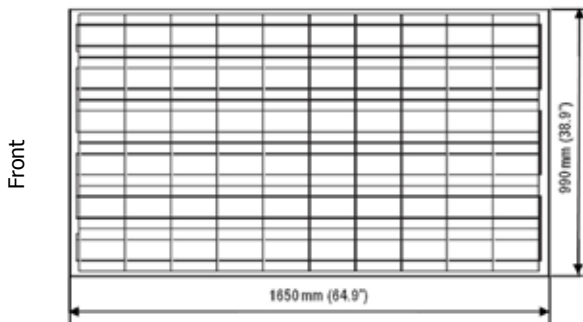


www.patriotsolargroup.com

Mechanical Specifications

Characteristic	Details
Cell Size	156mm x 156mm (6.14" x 6.14")
Module Dimension (L x W x T)	1650mm x 990mm x 40mm (64.9" x 38.9" x 1.6")
No. of Cells	6 x 10 = 60
Weight	19.5 kg (43.3 lbs)
Cable Length	1000mm (39.7") for positive (+) and negative (-)
Type of Connector	MC IV
Junction Box	Tonglin TL-BOX005B (E181720)
No. of Holes in Frame	4 draining holes, 8 installation holes, 2 grounding holes, 16 air outlet holes

Physical Specifications mm (inch)

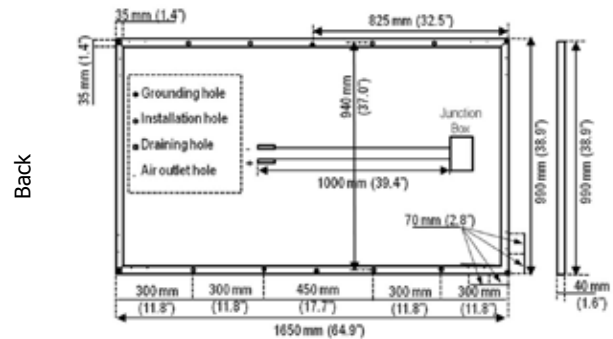


Electrical Specifications

(STC* = 25 °C, 1000W/m² irradiance and AM=1.5)

Model	CS-P-230-DJ
Max System Voltage	600 V
Maximum Power P _{max}	230 W (0%, +3%)
CEC Listed PTC Power	203.1 W
Voltage at Maximum Power Point V _{mpp}	29.7 V
Current at Maximum Power Point I _{mpp}	7.74 A
Open Circuit Voltage V _{oc}	36.23 V
Short Circuit Current I _{sc}	8.70 A
Module Efficiency (%)	14.1%
Temperature Coefficient of V _{oc}	-0.127 V / °C (-0.35% / °C)
Temperature Coefficient of I _{sc}	4.4x10 ⁻³ A/°C (0.05% / °C)
Temperature Coefficient of Pmax	-1.035 W/°C (-0.45% / °C)

*Standard Test Conditions



Other Performance Data

Power Tolerance	Operating Temperature	Max Series Fuse Rating	NOCT*
-3%, +3%	-40 °C to +85 °C	15 A	48 °C ± 2 °C

*Normal Operating Cell Temperature

Patriot Solar Group is dedicated to providing the highest quality units using only the best materials for solar and lighting products for home and commercial use that support renewable energy. Our products are environmentally safe, efficient, and affordable while offering the peace of mind of high durability able to withstand the ravages of wind, ice, and water. Our manufacturing processes are based on automotive quality standards to ensure high quality and reliability the first time.

For further information please contact:

Patriot Solar Group
1007 industrial Avenue
Albion, Michigan 49224 USA

Tel: (01) 517 629 9292
Fax: (01) 517 629 9296
info@patriotsolargroup.com

www.patriotsolargroup.com