



# Monocrystalline 230 Watt PV Solar Panels

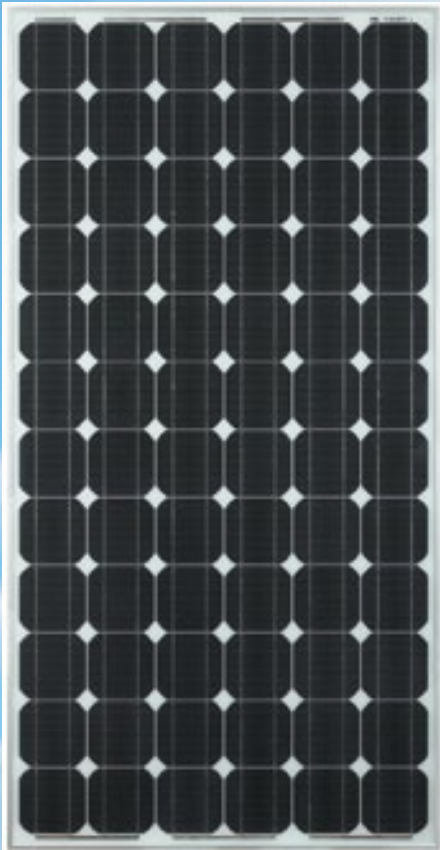
High Efficiency Monocrystalline Photovoltaic Module

Data Specifications, Model: GS-S-230-CS

Engineering and Manufacturing for the Renewable World



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## 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
- ▶ 96 monocrystalline high-efficiency solar cells (approx. 17%)

## 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

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Model: GS-S-230-CS



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## Mechanical Specifications

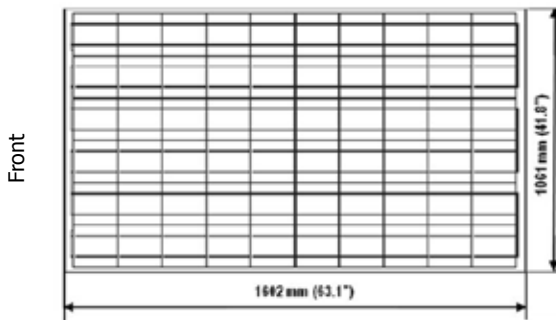
Characteristic	Details
Cell Size	125mm x 125mm (4.93" x 4.93")
Module Dimension (L x W x T)	1602mm x 1061mm x 40mm (63.1" x 41.8" x 1.57")
No. of Cells	8 x 12 = 96
Weight	20 kg (44.1 lbs)
Cable Length	950mm (37.4") for positive (+) and negative (-)
Type of Connector	MC IV
Junction Box	IP65
No. of Holes in Frame	12 installation holes, 2 ground line holes

## Electrical Specifications

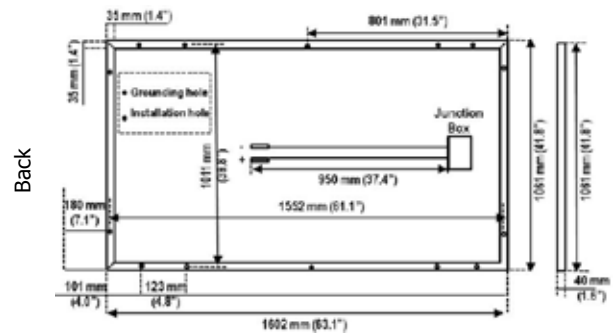
(STC\* = 25 °C, 1000W/m<sup>2</sup> irradiance and AM=1.5)

Model	GS-S-230-CS
Max System Voltage	600 V
Maximum Power P <sub>max</sub>	230 W (0%, +3%)
CEC Listed PTC Power	209.4 W
Voltage at Maximum Power Point V <sub>mpp</sub>	47.5 V
Current at Maximum Power Point I <sub>mpp</sub>	4.84 A
Open Circuit Voltage V <sub>oc</sub>	59.1 V
Short Circuit Current I <sub>sc</sub>	5.18 A
Module Efficiency (%)	13.5%
Temperature Coefficient of V <sub>oc</sub>	-0.207 V / °C (-0.35% / °C)
Temperature Coefficient of I <sub>sc</sub>	3.2x10 <sup>-3</sup> A/°C (0.06% / °C)
Temperature Coefficient of Pmax	-1.035 W/°C (-0.45% / °C)

## Physical Specifications mm (inch)



\*Standard Test Conditions



## Other Performance Data

Power Tolerance	Operating Temperature	Max Series Fuse Rating	NOCT*
±2.1%	-40 °C to +85 °C	10 A	45 °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](http://www.patriotsolargroup.com)