

## ES-A SERIES photovoltaic panels

NEW BLACK FRAME



### 200, 205 & 210 W Best power tolerance available (-0/+5W)

A range of high quality String Ribbon™ solar panels providing more electricity, industry-leading environmental credentials and efficient installs made with our revolutionary wafer technology.

#### MORE ELECTRICITY

- **Guaranteed no power below nameplate<sup>1</sup>**  
Never pay for power you're not getting
- **Get up to 5W more power than nameplate<sup>2</sup>**  
More power for more electricity
- **Power calibrated by four independent test labs<sup>3</sup>**  
Ensuring you get the power we promise
- **Anti-reflective treated glass**  
Maximizing light capture during the whole day
- **Temperature ratings over 90%<sup>4</sup>**  
Producing more on hot days
- **5 year workmanship and 25 year power warranty<sup>5</sup>**

#### LESS IMPACT

- **Smallest carbon footprint<sup>6</sup>**  
Leading the fight against climate change
- **12 month energy payback<sup>6</sup>**  
Maximizing the generation of clean electricity
- **100% cardboard free, re-usable packaging**  
Minimizes job site waste and disposal costs
- **Lead-free solar cells**  
Reduces the need for specialized end of life disposal

1 - Guaranteed upon initial delivery of the panel; 2 - Maximum power up to 4.99 W above nameplate rating; 3 - Power regularly calibrated by taking the straight average of test data from NREL, TÜV Rheinland PTL, TÜV Rheinland Cologne and Fraunhofer ISE; 4 - based on comparing PTC/STC ratings of major competing multi-crystalline silicon brands; 5 - For full details see the **Evergreen Solar Limited Warranty** available upon request or online. 6 - According to research carried out by the Energy Research Foundation of the Netherlands (2008) and evaluation by Evergreen Solar of latest published competitor data.



Born in the USA

## Electrical Characteristics

### Standard Test Conditions (STC)<sup>1</sup>

	ES-A-200 -fa3*	ES-A-205 -fa3*	ES-A-210 -fa3*	
$P_{mp}$ <sup>2</sup>	200	205	210	W
$P_{tolerance}$	-0/+4.99	-0/+4.99	-0/+4.99	W
$P_{mp, max}$	204.99	209.99	214.99	W
$P_{mp, min}$	200.00	205.00	210.00	W
$\eta_{min}$	12.7	13.1	13.4	%
$P_{ptc}$ <sup>3</sup>	180.6	185.2	189.8	W
$V_{mp}$	18.10	18.20	18.30	V
$I_{mp}$	11.05	11.27	11.48	A
$V_{oc}$	22.60	22.70	22.80	V
$I_{sc}$	11.80	11.93	12.11	A

### Nominal Operating Cell Temperature Conditions (NOCT)<sup>4</sup>

	ES-A-200	ES-A-205	ES-A-210	
$T_{NOCT}$	45.4	45.4	45.4	°C
$P_{max}$	146.4	150.1	153.8	W
$V_{mp}$	16.5	16.6	16.7	V
$I_{mp}$	8.87	9.04	9.21	A
$V_{oc}$	20.8	21.0	21.1	V
$I_{sc}$	9.44	9.57	9.76	A

<sup>1</sup> 1000 W/m<sup>2</sup>, 25°C cell temperature, AM 1.5 spectrum;

<sup>2</sup> Maximum power point or rated power

<sup>3</sup> At PV-USA Test Conditions: 1000 W/m<sup>2</sup>, 20°C ambient temperature, 1 m/s wind speed

<sup>4</sup> 800 W/m<sup>2</sup>, 20°C ambient temperature, 1 m/s wind speed, AM 1.5 spectrum  
\* f-framed, a-low voltage, 3-matt blue (textured) cells and black anodized frame

### Low Irradiance

The typical relative reduction of module efficiency at an irradiance of 200W/m<sup>2</sup> both at 25°C cell temperature and spectrum AM 1.5 is 0%.

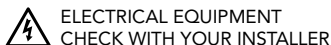
### Temperature Coefficients

$\gamma P_{mp}$	-0.43	%/°C
$\beta V_{mp}$	-0.40	%/°C
$\alpha I_{mp}$	-0.03	%/°C
$\beta V_{oc}$	-0.31	%/°C
$\alpha I_{sc}$	+0.05	%/°C

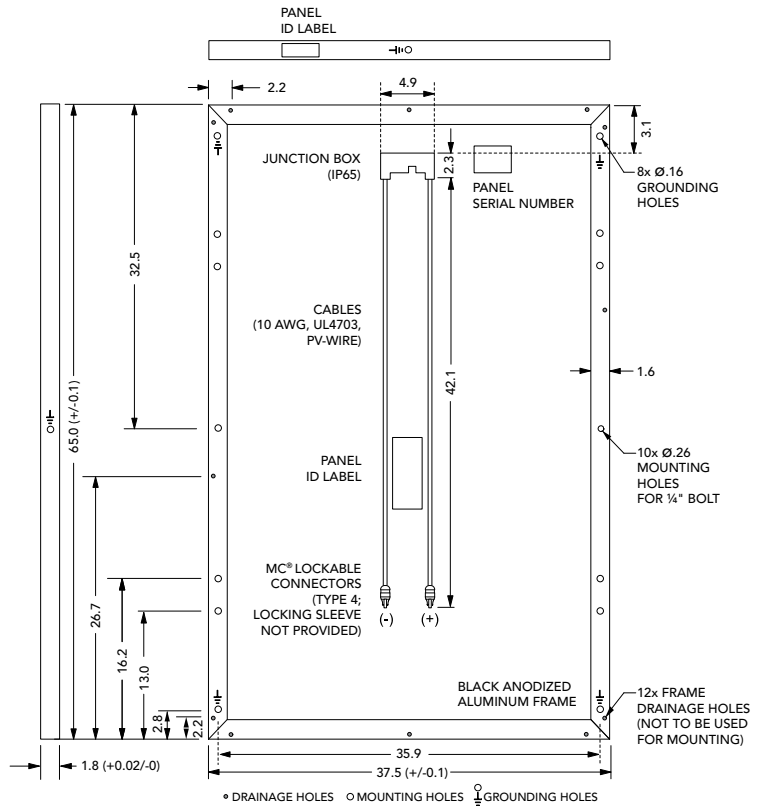
### System Design

Series Fuse Rating <sup>5</sup>	20 A
Maximum System Voltage (UL)	600 V

<sup>5</sup> Also known as Maximum Reverse Current.



## Mechanical Specifications



ALL DIMENSIONS IN INCHES; PANEL WEIGHT 41 LBS

The above drawing is a graphical representation of the product; for engineering quality drawings please contact Evergreen Solar. MC<sup>®</sup> is a registered trademark of Multi-Contact AG. Product constructed with 114 poly-crystalline silicon String Ribbon™ solar cells, anti-reflective tempered solar glass, EVA encapsulant, polymer back-skin and a black anodized double-walled aluminum frame.

Product packaged 28 per pallet and tested to International Safe Transit Association (ISTA) Standard 2B. All specifications in this product information sheet conform to EN 50380. See the **Evergreen Solar Safety, Installation and Operation Manual, Mounting Guide and Inverter Selection Guide** for further information on approved installation and use of this product.

Due to continuous innovation, research and product improvement, the specifications in this product information sheet are subject to change without notice. No rights can be derived from this product information sheet and Evergreen Solar assumes no liability whatsoever connected to or resulting from the use of any information contained herein.

### Partner:

ES-A\_fa3\_200\_205\_210\_US\_010409; effective April 1st 2009