

## First Solar FS Series 2 PV Module

### Thin film solutions for high performance PV systems

First Solar® FS Series 2™ PV Modules represent the latest advancements in thin film solar module technology. The Series 2 modules are IEC 61646 and IEC 61730 certified for use in systems up to 1000 VDC, and meet the requirements of Safety Class II. First Solar provides cost effective thin film module solutions to leading solar project developers and system integrators for large scale, grid-connected solar power plants. First Solar application engineers provide technical support and comprehensive product documentation to support the design, installation, and long term operations of high performance PV systems.



#### WARRANTY

- Material and workmanship warranty for five (5) years and a power output warranty of 90% of the nominal output power rating ( $P_{MPP} \pm 5\%$ ) during the first ten (10) years and 80% during twenty-five (25) years subject to the warranty terms and conditions.
- Modules are life cycle managed with a collection and recycling program, providing module owners with no cost, pre-funded, end-of-life take back, and recycling of the modules.

All specifications and warranties apply only to products sold and installed in the United States. For applications in Europe please refer to the EU datasheet (PD-5-401-02 EU).

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## ELECTRICAL SPECIFICATIONS

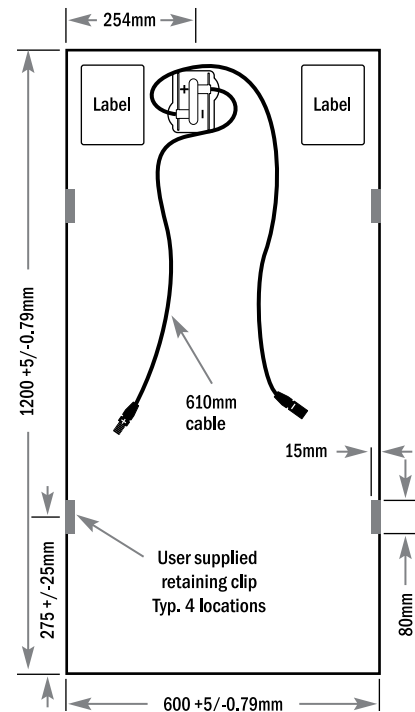
MODEL NUMBERS AND RATINGS AT STC <sup>1*</sup>					
Nominal Values		FS-270	FS-272	FS-275	FS-277
Nominal Power(+/-5%)	$P_{MPP}(W)$	70	72.5	75	77.5
Voltage at $P_{MAX}$	$V_{MPP}(V)$	65.5	66.6	68.2	69.9
Current at $P_{MAX}$	$I_{MPP}(A)$	1.07	1.09	1.10	1.11
Open Circuit Voltage	$V_{OC}(V)$	88.0	88.7	89.6	90.5
Short Circuit Current	$I_{SC}(A)$	1.23	1.23	1.23	1.22
Maximum System Voltage	$V_{SYS}(V)$	1000 (600 UL <sup>2</sup> )			
Temperature Coefficient of $P_{MPP}$	$T_K(P_{MPP})$	-0.25%/°C			
Temperature Coefficient of $V_{OC}$ , high temp (>25°C)	$T_K(V_{OC}, \text{high temp})$	-0.25%/°C			
Temperature Coefficient of $V_{OC}$ , low temp (-40°C to +25°C)	$T_K(V_{OC}, \text{low temp})$	-0.20%/°C			
Temperature Coefficient of $I_{SC}$	$T_K(I_{SC})$	+0.04%/°C			
Limiting Reverse Current <sup>3</sup>	$I_R(A)$	2			
Maximum Source Circuit Fuse	$I_{CF}(A)$	10 (2 UL/IEC61730 <sup>4</sup> )			

MODEL NUMBERS AND RATINGS AT 800W/m <sup>2</sup> , 45°C, AM 1.5*					
Nominal Values		FS-270	FS-272	FS-275	FS-277
Nominal Power(+/-5%)	$P_{MPP}(W)$	52.6	54.4	56.3	58.1
Voltage at $P_{MAX}$	$V_{MPP}(V)$	61.4	62.5	63.9	65.4
Current at $P_{MAX}$	$I_{MPP}(A)$	0.86	0.87	0.88	0.89
Open Circuit Voltage	$V_{OC}(V)$	81.8	82.5	83.3	84.2
Short Circuit Current	$I_{SC}(A)$	1.01	1.01	1.01	1.00

## MECHANICAL DESCRIPTION

Length	1200mm	Thickness	6.8mm
Width	600mm	Area	0.72m <sup>2</sup>
Weight	12kg	Leadwire	3.2mm <sup>2</sup> , 610mm
Connectors	Solarline 1 type connector		
Bypass Diode	None		
Cell Type	CdS/CdTe semiconductor, 116 active cells		
Frame Material	None		
Cover Type	3.2mm heat strengthened front glass laminated to 3.2mm tempered back glass		
Encapsulation	Laminate material with edge seal		

## MECHANICAL DRAWING



Efficiency at 200W/m<sup>2</sup>: First Solar Series 2 PV Modules experience an increase in efficiency of 2% at 200W/m<sup>2</sup> when compared to the efficiency at 1000W/m<sup>2</sup>. Refer to First Solar Application Note PD-5-420 for detailed analysis of the performance at low light levels.

\* All ratings +/-10%, unless specified otherwise. Specifications are subject to change.

<sup>1</sup> Standard Test Conditions (STC) 1000W/m<sup>2</sup>, AM 1.5, 25°C

<sup>2</sup> Required to maintain UL compliance

<sup>3</sup> The procedure specified in EN50380, Section 3.6.2 is designed for crystalline silicon modules. Because of the cell configuration of thin film modules, extreme voltage and power levels are required to induce reverse currents in the modules, resulting in temperatures well beyond normal operating ranges or the temperatures intended for the test. Because of this, the IR rating for the module is lower than the fuse requirement for safe operation of the module.

<sup>4</sup> Required to maintain UL and IEC 61730 compliance

## High Performance PV System Solutions

### Key Features:

- Produces high energy output across a wide range of climatic conditions with excellent low light response and temperature response coefficient
- Proven to perform as predicted with a high Performance Ratio (PR)
- Frameless laminate is robust, cost-effective and recyclable, and does not require module grounding
- Manufactured in highly automated, state-of-the-art facilities certified to ISO9001:2000 and ISO14001:2004 quality and environmental management standards
- Tested by leading international institutes and certified for reliability and safety:
  - Certified to IEC 61646
  - Safety Class II @ 1000 V
  - Certified to IEC 61730
  - UL 1703 and ULC1703 Listed and Recognized
  - CE Mark
  - Eligible CSI PV Module

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