

First Solar® FS Series 3™ Black PV Module

MECHANICAL DESCRIPTION	
Length	1200mm
Width	600mm
Weight	12kg
Thickness	6.8mm
Area	0.72m^2
Leadwire	4.0mm^2, 610mm
Connectors	MC4 type connector
Bypass Diode	None
Cell Type	CdS/CdTe semiconductor, 154 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

Contact Info:

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First Solar® FS Series 3™ Black PV Modules represent the latest advancements in thin film solar module technology. The Series 3 Black 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 Warranty Affairs provides technical support and comprehensive product documentation to support the design, installation, and long term operations of high performance PV systems.

High Performance PV System Solutions

Key Features:



- Produces high energy output across a wide range of climatic conditions with excellent 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 ISO 9001:2008 and ISO 14001:2004 quality and environmental management standards
- Enhanced accelerated life testing performance and robustness in hot climates and harsh operating conditions
- Produces high energy output across a wide range of climatic conditions with excellent temperature and spectral response characteristics

Warranty:

- Material and workmanship warranty for ten (10) years and a power output warranty of 90% of the nominal output power rating (P_{MPP}+/- 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, prefunded, end-of-life take back, and recycling of the modules.

All specifications and warranties apply only to products sold and installed in Europe. For applications in North America please refer to the NA datasheet.

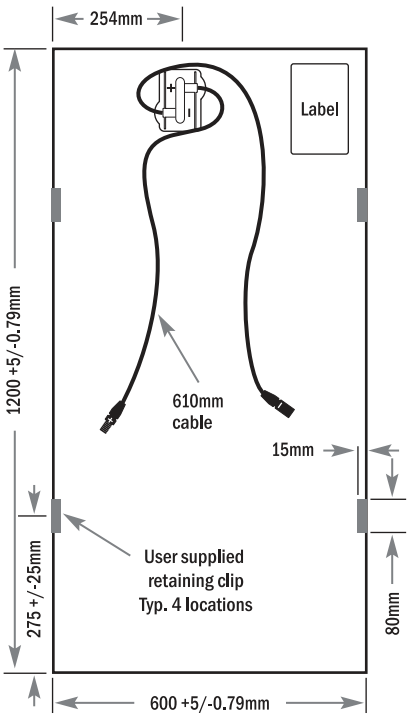
Electrical Specifications

MODEL NUMBERS AND RATINGS AT STC[1]*						
Nominal Values		FS-385	FS-387	FS-390	FS-392	FS-395
Nominal Power(+/-5%)	P_{MPP}(W)	85.0	87.5	90.0	92.5	95.0
Voltage at P_{MAX}	V_{MPP}(V)	46.4	47.0	47.4	47.7	47.5
Current at P_{MAX}	I_{MPP}(A)	1.83	1.86	1.90	1.94	2.00
Open Circuit Voltage	V_{OC}(V)	60.5	60.5	60.5	60.5	60.5
Short Circuit Current	I_{SC}(A)	1.94	1.99	2.06	2.11	2.17
Maximum System Voltage	V_{SYS}(V)			1000		
Limiting Reverse Current	I_R(A)			3.5		
Maximum Series Fuse	I_{CF}(A)			3.5		

TEMPERATURE CHARACTERISTICS		
Nominal Values		
Temperature Coefficient of P_{MPP}	$T_K(P_{MPP})$	-0.25%/°C
Temperature Coefficient of V_{OC}, high temp (>25°C)	$T_K(V_{OC, high\ temp})$	-0.27%/°C
Temperature Coefficient of V_{OC}, low temp (-40°C to + 25°C)	$T_K(V_{OC, low\ temp})$	-0.20%/°C
Temperature Coefficient of I_{SC}	$T_K(I_{SC})$	+0.04%/°C

MODEL NUMBERS AND RATINGS AT 800W/m², NOCT[2] 45°C, AM 1.5*						
Nominal Values		FS-385	FS-387	FS-390	FS-392	FS-395
Nominal Power(+/-5%)	P_{MPP}(W)	63.8	65.6	67.5	69.0	71.3
Voltage at P_{MAX}	V_{MPP}(V)	43.6	44.2	44.6	44.8	44.7
Current at P_{MAX}	I_{MPP}(A)	1.46	1.49	1.52	1.55	1.60
Open Circuit Voltage	V_{OC}(V)	56.3	56.3	56.3	56.3	56.3
Short Circuit Current	I_{SC}(A)	1.59	1.63	1.69	1.73	1.78

Mechanical Drawing



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

[1]Standard Test Conditions (STC) 1000W/m², AM 1.5, 25°C

[2]Nominal Operating Cell Temperature: Module operation temperature at 800W/ m² irradiance, 20°C air temperature, 1m/s wind speed.

Reliability and Safety

Tested by leading international institutes and certified for reliability and safety.

- Certified to IEC 61646
- Certified to IEC 61730
- Certified to IEC 61701
  Salt Mist Corrosion Test
- Certified to IEC 60068-2-68
  Environmental Testing—Dust and Sand
- CE Marking
- Safety Class II @ 1000 V
- UL 1703 and ULC 1703 Listed
  Class B Fire Rating
  (Class A Spread of Flame)
- MCS Certification

Disclaimer
The information included in this Module Datasheet is subject to change without notice and is provided for informational purposes only. No contractual rights are established or should be inferred because of user's reliance on the information contained in this Module Datasheet. Please refer to the appropriate Module User Guide and Module Product Specification document for more detailed technical information regarding module performance, installation and use.

About First Solar

First Solar is a leading global provider of comprehensive photovoltaic (PV) energy solutions which use its advanced thin film modules. The company's integrated power plant solutions deliver an economically attractive alternative to fossil-fuel electricity generation today. By delivering advanced PV energy solutions that address contemporary energy needs, First Solar is enabling a world powered by clean, affordable solar electricity.

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