
Series 2 Module Product Specification – North America

1. General Product Description

The Product specified in this document is a First Solar FS Series 2 PV Module intended for use in large solar arrays. The product will be binned according to Pmpp at STC¹ as measured at the First Solar Manufacturing Facility.

- a. The Product model number and nominal power rating shall be:
 - FS-255 – Nominal 55W PV module
 - FS-257 – Nominal 57.5W PV module
 - FS-260 – Nominal 60W PV module
 - FS-262 – Nominal 62.5W PV module
 - FS-265 – Nominal 65W PV module
 - FS-267 – Nominal 67.5W PV module
 - FS-270 – Nominal 70W PV module
 - FS-272 – Nominal 72.5W PV module
 - FS-275 – Nominal 75W PV module
 - FS-277 – Nominal 77.5W PV module
 - FS-280 – Nominal 80W PV module
- b. The tolerance of actual Pmpp is +/-5% under Standard Test Conditions¹

2. Certifications

FS Series 2 PV modules are certified according to the following:

- a. IEC 61730-1 and IEC 61730-2. FS Series 2 modules are tested and certified for a maximum system voltage of 1000V with maximum overcurrent protection rating of 2A. Modules qualified to these safety standards are considered by the IEC to have met the requirements of Safety Class II.
- b. CE Mark with Declaration of Conformity.
- c. IEC 61646. FS Series 2 modules are tested and certified to the IEC 61646 Standard with a maximum system voltage of 1000VDC.
- d. UL 1703 and ULC 1703 Listed with maximum system voltage of 600VDC and maximum series fuse rating of 2A when used with a UL approved mounting system. Additional UL Listed applications require evaluation and mechanical load testing of the module in the end-use product.
- e. FS Series 2 modules (FS-280 pending) are listed by the California Energy Commission (CEC) as CSI Eligible Photovoltaic Modules under the California Solar Initiative.

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

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3. Physical Specifications

Dimensions provided below are for reference only. Refer to product drawing PRD-017-A for dimensions and tolerances.

- a. Length 1200mm
- b. Width 600mm
- c. Thickness 6.8mm
- d. Weight 12 kg
- e. Area 0.72m²
- f. Leadwire 4.0mm², 61 cm in length
- g. Connectors Solarline I type
- h. Bypass Diode None
- i. Serial Number: Engraved in glass on front of module and printed on module nameplate label

4. Electrical Specifications

Table 1

Model Numbers and Ratings at STC ^{1*}												
Nominal Values		FS-255	FS-257	FS-260	FS-262	FS-265	FS-267	FS-270	FS-272	FS-275	FS-277	FS-280
Nominal Power (+/-5%)	P _{mpp} (W)	55	57.5	60	62.5	65	67.5	70	72.5	75	77.5	80
Voltage at Pmax	V _{mpp} (V)	58.5	61.5	61.7	62.5	63.7	64.6	65.5	66.6	68.2	69.9	71.2
Current at Pmax	I _{mpp} (A)	0.94	0.94	0.97	1.00	1.02	1.05	1.07	1.09	1.10	1.11	1.12
Open Circuit Voltage	V _{oc} (V)	83.3	85.3	85.9	86.1	87.0	87.0	88.0	88.7	89.6	90.5	91.5
Short Circuit Current	I _{sc} (A)	1.18	1.17	1.17	1.17	1.17	1.18	1.23	1.23	1.23	1.22	1.22
Maximum System Voltage	V _{sys} (V)	1000										
Temp. Coefficient of P _{mp}	T _k (P _{mp})	-0.25%/°C										
Temp. Coefficient of Voc, high temp (>25°C)	T _k (V _{oc} , high temp)	-0.25%/°C										
Temp. Coefficient of Voc, low temp (-40°C to +25°C)	T _k (V _{oc} , low temp)	-0.20%/°C										
Temp. Coefficient of I _{sc}	T _k (I _{sc})	+0.04%/°C										
Limiting Reverse Current	I _R (A)	2										
Maximum Series Fuse	I _{cf} (A)	2										

*All ratings at Standard Test Condition (1000W/m², AM 1.5, 25°C Cell Temperature) +/-10%

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5. Quality Standards

Modules are manufactured in a highly automated production environment. While all efforts are made to produce modules that are visually uniform, some visual differences do exist between modules. Only visual differences that are deemed to affect the long term performance or durability of the module will be deemed intolerable.

Description of Intolerable Effects

- Any glass fracture, crack, or break on a module is unacceptable
- One or more glass scratches each greater than 5cm in length that are detectable with a straight edge
- Edge chips in the glass greater than 3mm (length or width) and 1.5mm depth
- 4mm maximum bow (concave or convex, measured along the 1200mm length of module)
- Back-front glass offset greater than 3mm
- Conductive foreign material inside the laminate
- Delamination of the laminate (corrosion)
- Damaged cordplate (junction box)
- Damaged wire assemblies or connectors

6. Module Application Requirements

In addition to the module application requirements specified in the FS Series 2 User Guide, all module applications using the FS Series 2 modules must meet the following requirements:

- a. Mechanical
 - i. Module shall be attached using mounting clips that meet the requirements of the FS Series 2 User Guide.
 - ii. Mounting system shall use EPDM rubber, silicone rubber, or equivalent to isolate the module from the mounting structure.
- b. Electrical
 - i. Lighting protection may be installed on source circuits

7. Documentation

- a. Technical data sheet will be provided in English.
- b. The First Solar FS Series 2 User Guide will be provided in English.
- c. Declaration of Conformity to CE will be provided.
- d. All documentation will be delivered electronically.


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8. Labeling

Each module will be delivered with a nameplate label adhered to the back of the module. See product drawing PRD-017-A for label location. The label will be printed in English and conform to the requirements of the EN 50380 DIN Standard.


Module Collection and Recycling Program Label: Each module will be delivered with a label containing instructions on contacting First Solar for proper reclamation and recycling of the module. Instructions will be provided in the native language of markets served.

Example Label:



First Solar

First Solar, Inc.
Perrysburg, Ohio
43551
www.FirstSolar.com




UL **CE**
US LISTED
Photovoltaic Panel
Photovoltaic Module
89LM

MADE IN USA

Nominal Power (+/-5%)	75 W
Current at mpp	1.10 A
Voltage at mpp	68.2 V
Short Circuit Current	1.23 A
Open Circuit Voltage	89.6 V
Maximum System Voltage	(600V UL) 1000V
Maximum Series Fuse	2A
Protection Class	Class II
Cell Type	CdTe
Fire Rating	Class C


Specifications (+/- 10 %) at STC: Irrad. 1000 W/m2, AM 1.5, Cell T 25



Warning - Electrical Shock Hazard

This solar module produces high voltages in sunlight. Read and observe the instructions before attempting installation or service. Do not disconnect under load. For field connections, use No.12 AWG copper wires insulated for a minimum of 90°C.

Serial Number



091123030589

Model Number

FS-275



4.125"

104.8mm

5.25"

133.4mm

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Example Label:

First Solar provides free of charge collection and environmentally responsible recycling of this solar module. Please do not dispose of this product in any manner before contacting First Solar via:

- the Web: **www.firstsolar.com/recycling**
- telephone:
1.866.456.8938 (North American Toll free)
+800.433.32.333* (International Freephone)
*For more details on dialing codes please visit First Solar's website.
- email: **recycling@firstsolar.com**

First Solar bietet für dieses Solarmodul die Möglichkeit zur kostenlosen Rücknahme und umweltgerechten Wiederverwertung. Bitte kontaktieren Sie First Solar, bevor Sie das Produkt entsorgen.

First Solar ofrece gratuitamente la recogida y el reciclaje responsable con el medio ambiente de este producto de módulo solar. Por favor, no elimine de cualquier modo los residuos de este producto antes de ponerse en contacto con First Solar.

La First Solar raccoglie gratuitamente questo modulo solare e lo ricicla nel rispetto dell'ambiente. Non getti via questo prodotto prima di aver contattato la First Solar.

First Solar assure gratuitement la collecte et le recyclage de ce module solaire de manière écologique et responsable. Merci de ne pas vous débarrasser de ce produit de quelque façon que ce soit avant d'avoir contacté First Solar.

First Solar παρέχει δωρεάν συλλογή και περιβαλλοντολογικά υπεύθυνη ανακύκλωση της παρούσας ηλιακής μονάδας. Αποφύγετε την απόρριψη του προϊόντος με οποιονδήποτε τρόπο προτού επικοινωνήσετε με τη First Solar.



www.firstsolar.com



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9. Packaging

- a. Modules will be packaged in First Solar's 50 pack module boxes.
- b. All modules within a box will be a single Model Number.
- c. FS will use commercially reasonable efforts to ship full containers or full truck loads only.
- d. Typical container volumes (for planning purposes only; actual volumes may vary based on any local load restrictions or shipment locations):
 - i. Sea Container: 30 - 32 boxes or 1500 – 1600 modules
 - ii. Truck Container: 32 - 36 boxes or 1600 – 1800 modules
- e. General Box Dimensions:

50 Pack

- Length: 1372 mm (54 in)
- Width: 1118 mm (44 in)
- Height: 876 mm (34.5 in)
- Weight: Not to exceed 665 kg (1466 lbs)