
Series 4 Module Product Specification

1. General Product Description

The Product specified in this document are First Solar Series 4 and Series 4A modules intended for use in solar arrays. The product will be binned according to Maximum Power Point Power (P_{MPP}) at Standard Test Conditions (STC)¹ as measured at the First Solar Manufacturing Facility.

- a. The Product model number and nominal power rating shall be with tolerance of actual $P_{MPP} \pm 5\%$ under Standard Test Conditions¹:
- FS-490 & FS-490A – Nominal 90W PV module
 - FS-492 & FS-492A – Nominal 92.5W PV module
 - FS-495 & FS-495A – Nominal 95W PV module
 - FS-497 & FS-497A – Nominal 97.5W PV module
 - FS-4100 & FS-4100A – Nominal 100W PV module
 - FS-4102 & FS-4102A – Nominal 102.5W PV module
 - FS-4105A – Nominal 105W PV module

 - FS-4100-2 & FS-4100A-2 – Nominal 100W PV module
 - FS-4102-2 & FS-4102A-2 – Nominal 102.5W PV module
 - FS-4105-2 & FS-4105A-2 – Nominal 105W PV module
 - FS-4107-2 & FS-4107A-2 – Nominal 107.5W PV module
 - FS-4110-2 & FS-4110A-2 – Nominal 110W PV module
 - FS-4112-2 & FS-4112A-2 – Nominal 112.5W PV module
 - FS-4115-2 & FS-4115A-2 – Nominal 115W PV module
 - FS-4117-2 & FS-4117A-2 – Nominal 117.5W PV module
- b. The Product model number and nominal power rating shall be with tolerance of actual $P_{MPP} -0W/+5W$ under Standard Test Conditions¹:
- FS-4105-3 & FS-4105A-3 – Nominal 105W PV module
 - FS-4107-3 & FS-4107A-3 – Nominal 107.5W PV module
 - FS-4110-3 & FS-4110A-3 – Nominal 110W PV module
 - FS-4112-3 & FS-4112A-3 – Nominal 112.5W PV module
 - FS-4115-3 & FS-4115A-3 – Nominal 115W PV module
 - FS-4117-3 & FS-4117A-3 – Nominal 117.5W PV module
 - FS-4120-3 & FS-4120A-3 – Nominal 120W PV module
 - FS-4122-3 & FS-4122A-3 – Nominal 122.5W PV module

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

Series 4 Module Product Specification

2. Certifications and Independent Testing

Series 4 and Series 4A modules are certified in the following regions accordingly:

Global

- a. IEC 61730-1:2004 and IEC 61730-2:2004. Tested and certified for a maximum system voltage of 1500VDC with maximum overcurrent protection rating of 4.0A.
 - Protection Class II (Application Class A) up to 1500VDC when using MC4-EVO 2 connectors
 - Protection Class 0 (Application Class B) for 1500VDC and Protection Class II (Application Class A) up to 1000VDC when using MC4 connectors
- b. IEC 61701:2011 Salt Mist Corrosion Test. Tested and certified to the IEC 61701 standard, Severity 6.
- c. IEC 61646:2008 / IEC 61215-1:2016, IEC 61215-1-2:2016, and IEC 61215-2:2016. Tested and certified to the IEC 61646 / IEC 61215 standard with a maximum system voltage of 1500VDC.
- d. IEC 60068-2-68 Environmental Testing – Dust and Sand certified.
- e. IEC 62804 at +/- 1500V (PID)

North America

- f. UL 1703 Listed with maximum system voltage of 1500VDC and ULC 1703 Listed with maximum system voltage of 1000VDC. Maximum series fuse rating of 4.0A.
- g. UL 1703 and ULC 1703 Listed Fire Performance Type 10
 - Class A Spread of Flame/Class B Burning Brand
- h. Listed by the California Energy Commission (CEC) as CSI Eligible Photovoltaic Modules under the California Solar Initiative.
- i. Florida Solar Energy Center (FSEC) listed

Other Regions:

- j. **Australia:** Clean Energy Council (CEC) listed
- k. **United Kingdom:** Microgeneration Certification Scheme (MCS) listed
- l. **Israel*:** SII
- m. **Brazil*:** InMetro Certification

**Certain model type numbers may not meet all regional certifications.*

Please refer to www.firstsolar.com for additional module regional certifications and listings.

Series 4 Module Product Specification

3. Physical Specifications

Dimensions provided below are for reference only. Refer to product drawing PRD-027-A for dimensions and tolerances.

a. Length	1200mm
b. Width	600mm
c. Thickness	6.8mm
d. Weight	12 kg
e. Area	0.72m ²
f. Individual Leadwire	2.5mm ² , 657 mm in length (minimum from strain relief to connector mating surface)
g. Leadwire Connection Span	1314 mm (minimum from positive strain relief to negative strain relief of adjacent module)
h. Connectors	MC4 or MC4-EVO 2 type connector
i. Bypass Diode	None
j. Serial Number	Marked in glass on front of module and printed on module nameplate label

Series 4 Module Product Specification

4. Electrical Specifications

Table 1a

Model Numbers and Ratings at STC*								
Nominal Values		FS-490 FS-490A	FS-492 FS-492A	FS-495 FS-495A	FS-497 FS-497A	FS-4100 FS-4100A	FS-4102 FS-4102A	FS-4105A
Nominal Power (+/-5%)	P_{MPP} (W)	90.0	92.5	95.0	97.5	100.0	102.5	105.0
Voltage at P_{MAX}	V_{MPP} (V)	66.5	67.0	67.9	68.7	69.4	70.0	70.4
Current at P_{MAX}	I_{mpp} (A)	1.36	1.38	1.40	1.42	1.44	1.47	1.49
Open Circuit Voltage	V_{OC} (V)	85.5	86.0	86.5	87.0	87.6	88.0	88.2
Short Circuit Current	I_{SC} (A)	1.53	1.54	1.55	1.55	1.57	1.57	1.58
Maximum System Voltage	V_{SYS} (V)	1500V (UL 1500V Listed / ULC 1000V Listed)						
Limiting Reverse Current	I_R (A)	4.0						
Maximum Series Fuse	I_{CF} (A)	4.0						

*All ratings at Standard Test Condition (1000W/m², AM 1.5, 25°C Cell Temperature) ±10%, unless otherwise noted

Table 1b

Temperature Characteristics**		
Temp. Coefficient of P_{MPP}	$T_K(P_{MPP})$	-0.29%/°C
Temp. Coefficient of V_{OC}	$T_K(V_{OC})$	-0.28%/°C
Temp. Coefficient of I_{SC}	$T_K(I_{SC})$	+0.04%/°C

**All ratings ±10%

Series 4 Module Product Specification

Table 2a

		Model Numbers and Ratings at STC*							
Nominal Values		FS-4100-2 FS-4100A-2	FS-4102-2 FS-4102A-2	FS-4105-2 FS-4105A-2	FS-4107-2 FS-4107A-2	FS-4110-2 FS-4110A-2	FS-4112-2 FS-4112A-2	FS-4115-2 FS-4115A-2	FS-4117-2 FS-4117A-2
Nominal Power (+/-5%)	P_{MPP} (W)	100.0	102.5	105.0	107.5	110.0	112.5	115.0	117.5
Voltage at P_{MAX}	V_{MPP} (V)	66.2	67.0	67.8	68.6	69.4	70.2	70.5	71.2
Current at P_{MAX}	I_{MPP} (A)	1.51	1.53	1.55	1.57	1.59	1.60	1.63	1.65
Open Circuit Voltage	V_{OC} (V)	84.7	85.3	86.0	86.6	87.2	87.7	87.8	88.2
Short Circuit Current	I_{SC} (A)	1.73	1.74	1.74	1.75	1.75	1.75	1.78	1.79
Maximum System Voltage	V_{SYS} (V)	1500V (UL 1500V Listed / ULC 1000V Listed)							
Limiting Reverse Current	I_R (A)	4.0							
Maximum Series Fuse	I_{CF} (A)	4.0							

*All ratings at Standard Test Condition (1000W/m², AM 1.5, 25°C Cell Temperature) ±10%, unless otherwise noted

Table 2b

Temperature Characteristics**		
Temp. Coefficient of P_{MPP}	$T_K(P_{MPP})$	-0.34%/°C
Temp. Coefficient of V_{OC}	$T_K(V_{OC})$	-0.29%/°C
Temp. Coefficient of I_{SC}	$T_K(I_{SC})$	+0.04%/°C

**All ratings ±10%

Series 4 Module Product Specification

Table 3a

		Model Numbers and Ratings at STC*							
Nominal Values		FS-4105-3 FS-4105A-3	FS-4107-3 FS-4107A-3	FS-4110-3 FS-4110A-3	FS-4112-3 FS-4112A-3	FS-4115-3 FS-4115A-3	FS-4117-3 FS-4117A-3	FS-4120-3 FS-4120A-3	FS-4122-3 FS-4122A-3
Nominal Power** (-0/+5W)	P_{MPP} (W)	105.0	107.5	110.0	112.5	115.0	117.5	120.0	122.5
Voltage at P_{MAX}	V_{MPP} (V)	66.2	67.0	67.8	68.5	69.3	70.1	70.8	71.5
Current at P_{MAX}	I_{MPP} (A)	1.59	1.61	1.62	1.64	1.66	1.68	1.70	1.71
Open Circuit Voltage	V_{OC} (V)	85.2	85.8	86.4	87.0	87.6	88.1	88.7	88.7
Short Circuit Current	I_{SC} (A)	1.81	1.82	1.82	1.83	1.83	1.83	1.84	1.85
Maximum System Voltage	V_{SYS} (V)	1500V (UL 1500V Listed / ULC 1000V Listed)							
Limiting Reverse Current	I_R (A)	4.0							
Maximum Series Fuse	I_{CF} (A)	4.0							

*All ratings at Standard Test Condition (1000W/m², AM 1.5, 25°C Cell Temperature) ±10%, unless otherwise noted

**Measurement uncertainty applies

Table 3b

Temperature Characteristics***		
Temp. Coefficient of P_{MPP} [Temp Range: 25°C to 75°C]	$T_K(P_{MPP})$	-0.28%/°C
Temp. Coefficient of V_{OC}	$T_K(V_{OC})$	-0.28%/°C
Temp. Coefficient of I_{SC}	$T_K(I_{SC})$	+0.04%/°C

***All ratings ±10%

Series 4 Module Product Specification

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.

6. Labeling

Each module will be delivered with a nameplate label adhered to the back of the module. See product drawing PRD-027-A for label location. The label will be printed primarily English text and conform to the requirements of the EN 50380 Standard.







The label will contain instructions on contacting First Solar for proper collection and recycling of the module. Further information on the Collection and Recycling Program are available on the First Solar website (www.firstsolar.com/recycling).

Series 4V3 Example Label with MC4 connectors:

	Model Number: FS-4117A-3	Made in USA 																																									
COLLECTION & RECYCLING First Solar offers collection and recycling. First Solar offre collecte et recyclage. First Solar bietet Rücknahme und Wiederverwertung. First Solar ofrece recolección y reciclaje. www.firstsolar.com/recycling recycling@firstsolar.com	Serial Number:  150121261889	<table border="0"> <tr><td>Nominal Power (-0/+5W)</td><td>117.5 W</td></tr> <tr><td>Current at mpp</td><td>1.68 A</td></tr> <tr><td>Voltage at mpp</td><td>70.1 V</td></tr> <tr><td>Short Circuit Current</td><td>1.83 A</td></tr> <tr><td>Open Circuit Voltage</td><td>88.1 V</td></tr> <tr><td>Maximum Series Fuse</td><td>4.0 A</td></tr> <tr><td>Maximum System Voltage *</td><td>1500V 1000V</td></tr> <tr><td>Protection Class</td><td>Class 0 Class II</td></tr> <tr><td>CellType</td><td>CdTe</td></tr> <tr><td>Fire Performance Type</td><td>Type 10</td></tr> </table>	Nominal Power (-0/+5W)	117.5 W	Current at mpp	1.68 A	Voltage at mpp	70.1 V	Short Circuit Current	1.83 A	Open Circuit Voltage	88.1 V	Maximum Series Fuse	4.0 A	Maximum System Voltage *	1500V 1000V	Protection Class	Class 0 Class II	CellType	CdTe	Fire Performance Type	Type 10	<table border="0"> <tr><td>Potencia Nominal (-0/+5W)</td><td>117.5 W</td></tr> <tr><td>Corriente a máxima potencia</td><td>1.68 A</td></tr> <tr><td>Voltaje a máxima potencia</td><td>70.1 V</td></tr> <tr><td>Corriente de Cortocircuito</td><td>1.83 A</td></tr> <tr><td>Voltaje de Circuito Abierto</td><td>88.1 V</td></tr> <tr><td>Corriente Máxima de Fusible en Serie</td><td>4.0 A</td></tr> <tr><td>Voltaje Máximo del Sistema</td><td>1500V 1000V</td></tr> <tr><td>Clase de Protección</td><td>Class 0 Class II</td></tr> <tr><td>Tipo de Celda</td><td>CdTe</td></tr> <tr><td>Tipo de rendimiento al fuego</td><td>Type 10</td></tr> </table>	Potencia Nominal (-0/+5W)	117.5 W	Corriente a máxima potencia	1.68 A	Voltaje a máxima potencia	70.1 V	Corriente de Cortocircuito	1.83 A	Voltaje de Circuito Abierto	88.1 V	Corriente Máxima de Fusible en Serie	4.0 A	Voltaje Máximo del Sistema	1500V 1000V	Clase de Protección	Class 0 Class II	Tipo de Celda	CdTe	Tipo de rendimiento al fuego	Type 10
Nominal Power (-0/+5W)	117.5 W																																										
Current at mpp	1.68 A																																										
Voltage at mpp	70.1 V																																										
Short Circuit Current	1.83 A																																										
Open Circuit Voltage	88.1 V																																										
Maximum Series Fuse	4.0 A																																										
Maximum System Voltage *	1500V 1000V																																										
Protection Class	Class 0 Class II																																										
CellType	CdTe																																										
Fire Performance Type	Type 10																																										
Potencia Nominal (-0/+5W)	117.5 W																																										
Corriente a máxima potencia	1.68 A																																										
Voltaje a máxima potencia	70.1 V																																										
Corriente de Cortocircuito	1.83 A																																										
Voltaje de Circuito Abierto	88.1 V																																										
Corriente Máxima de Fusible en Serie	4.0 A																																										
Voltaje Máximo del Sistema	1500V 1000V																																										
Clase de Protección	Class 0 Class II																																										
Tipo de Celda	CdTe																																										
Tipo de rendimiento al fuego	Type 10																																										
	<p>Specifications (+/-10%) at STC: Irrad. 1000 W/m², AM 1.5, Cell T 25</p> <p>Warning Electrical Shock Hazard</p> <p>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 minimum No.14 AWG copper wires insulated for a minimum of 90°C.</p> <p>Not compatible with other Series modules – See User Guide</p>	<p>Especificaciones en condiciones estándar (STC) (+/-10%): Irradiancia 1000 W/m², AM 1.5, Temperatura de celda 25°C</p> <p>Advertencia Peligro Eléctrico</p> <p>Este panel solar produce alto voltaje bajo iluminación. Lea y observe las instrucciones antes de intentar su instalación o servicio de mantenimiento. No desconecte bajo carga. Para conexiones, use cables de cobre con un calibre mínimo de 14AWG y aislante resistente hasta un mínimo de 90°C.</p> <p>No es compatible con otras Series de Módulos – Consulte el Manual del Usuario</p>																																									

Series 4 Module Product Specification

Series 4V3 Example Label with MC4-EVO 2 Connector:

 <p>COLLECTION & RECYCLING</p> <p>First Solar offers collection and recycling.</p> <p>First Solar offre collecte et recyclage.</p> <p>First Solar bietet Rücknahme und Wiederverwertung.</p> <p>First Solar ofrece recolección y reciclaje.</p> <p>www.firstsolar.com/recycling recycling@firstsolar.com</p>	<p>Model Number: FS-4120A-3</p> <p>Made in USA</p>  <p>PHOTOVOLTAIC MODULE OVER 600 VOLTS 4VC6</p> 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="width: 50%;"></td> </tr> <tr> <td>Nominal Power (-0/+5W)</td> <td>120 W</td> </tr> <tr> <td>Current at mpp</td> <td>1.70 A</td> </tr> <tr> <td>Voltage at mpp</td> <td>70.8 V</td> </tr> <tr> <td>Short Circuit Current</td> <td>1.84 A</td> </tr> <tr> <td>Open Circuit Voltage</td> <td>88.7 V</td> </tr> <tr> <td>Maximum Series Fuse</td> <td>4.0 A</td> </tr> <tr> <td>Maximum System Voltage *</td> <td>1500V</td> </tr> <tr> <td>Protection Class</td> <td>Class II</td> </tr> <tr> <td>CellType</td> <td>CdTe</td> </tr> <tr> <td>Fire Performance Type</td> <td>Type 10</td> </tr> </table> <p style="font-size: small;">*UL 1500V Listed / ULC 1000V Listed</p>			Nominal Power (-0/+5W)	120 W	Current at mpp	1.70 A	Voltage at mpp	70.8 V	Short Circuit Current	1.84 A	Open Circuit Voltage	88.7 V	Maximum Series Fuse	4.0 A	Maximum System Voltage *	1500V	Protection Class	Class II	CellType	CdTe	Fire Performance Type	Type 10
Nominal Power (-0/+5W)	120 W																							
Current at mpp	1.70 A																							
Voltage at mpp	70.8 V																							
Short Circuit Current	1.84 A																							
Open Circuit Voltage	88.7 V																							
Maximum Series Fuse	4.0 A																							
Maximum System Voltage *	1500V																							
Protection Class	Class II																							
CellType	CdTe																							
Fire Performance Type	Type 10																							
<p>Serial Number:</p> <p style="font-size: large; font-weight: bold;">131014043084</p> 	<p>Specifications (+/-10%) at STC: Irrad. 1000 W/m², AM 1.5, Cell T 25</p> <p> Warning Electrical Shock Hazard</p> <p>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 minimum No.14 AWG copper wires insulated for a minimum of 90 °C.</p> <p>Not compatible with other Series modules – See User Guide</p>	<p>Especificaciones en condiciones estándar (STC) (+/-10%): Irradiancia 1000 W/m², AM 1.5, Temperatura de celda 25 °C</p> <p> Advertencia Peligro Eléctrico</p> <p>Este panel solar produce alto voltaje bajo iluminación. Lea y observe las instrucciones antes de intentar su instalación o servicio de mantenimiento. No desconecte bajo carga. Para conexiones, use cables de cobre con un calibre mínimo de 14AWG y aislante resistente hasta un mínimo de 90 °C .</p> <p>No es compatible con otras Series de Módulos – Consulte el Manual del Usuario</p>																						
