



**117.5 WATT MODULE
EFFICIENCY OF 16.3%**

INDUSTRY BENCHMARK SOLAR MODULES

As a global leader in PV energy, First Solar's advanced thin film solar modules have set the industry benchmark with over 10 gigawatts (GW) installed worldwide and a proven performance advantage over conventional crystalline silicon solar modules. Generating more energy than competing modules with the same power rating, First Solar's Series 4™ and Series 4A™ PV Modules deliver superior performance and reliability to our customers.



PROVEN ENERGY YIELD ADVANTAGE

- Generates more energy than conventional crystalline silicon solar modules with the same power
- Superior temperature coefficient resulting in greater energy yield in typical field operating temperatures
- Superior spectral response resulting in a proven energy yield advantage in humid environments
- Anti-reflective coated glass (Series 4A™) enhances energy production



ADVANCED PERFORMANCE & RELIABILITY

- Long-term power-output warranted for 25 years
- Compatible with advanced 1500V plant architectures
- Highly predictable energy in all climates and applications
- Independently certified for reliable performance in high temperature, high humidity, extreme desert and coastal environments based on accelerated life and stress tests

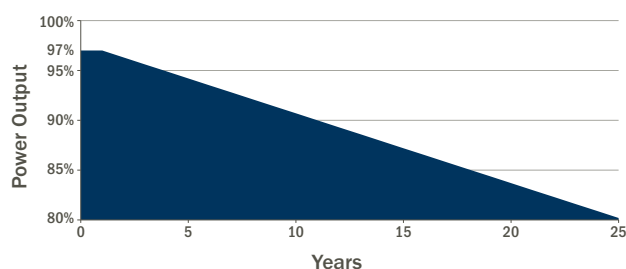


CERTIFICATIONS & TESTS

- PID-Free, Thresher Test, Long-Term Sequential Test, and ATLAS 25+¹
- IEC 61646 1500V, IEC 61730 1500V, CE
- IEC 61701 Salt Mist Corrosion, IEC 60068-2-68 Dust and Sand Resistance
- ISO 9001:2008 and ISO 14001:2004
- UL 1703 and ULC 1703 Listed Class B Fire Rating (Class A Spread of Flame)
- CSI Eligible (CA-USA), FSEC (FL-USA), MCS (UK), CEC Listed (Australia), JET (Japan)², SII (Israel), InMetro (Brazil)²



MODULE WARRANTY³

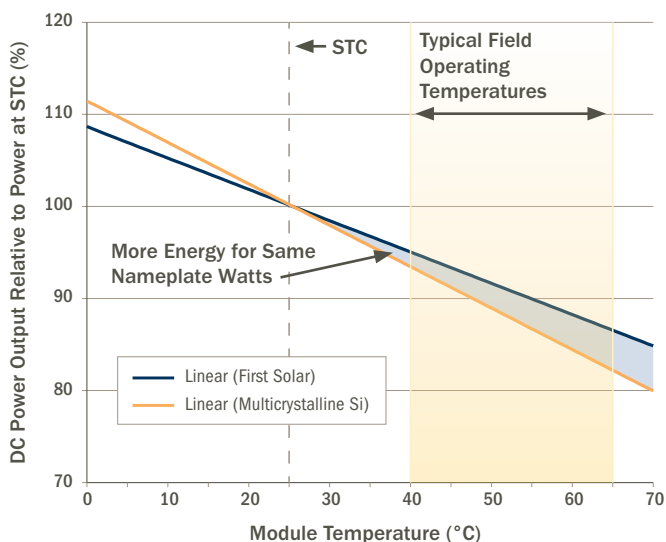


- 25-Year Linear Performance Warranty⁴
- 10-Year Limited Product Warranty

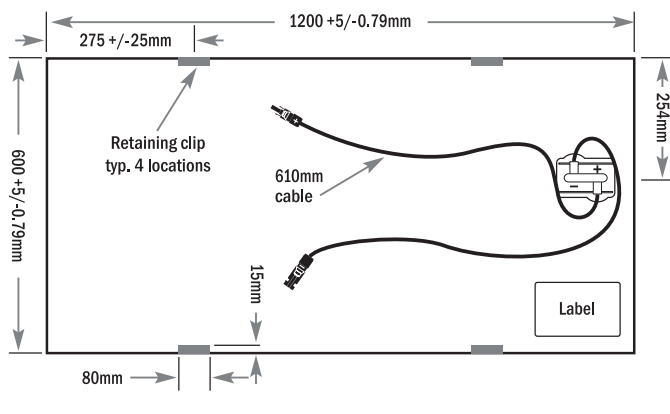
FIRST SOLAR SERIES 4™ PV MODULE

MECHANICAL DESCRIPTION		MODULE NUMBERS AND RATINGS AT STC ^{5,6}							
Length	1200mm	NOMINAL VALUES		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
Width	600mm	Nominal Power ($\pm 5\%$)	P_{MPP} (W)	105.0	107.5	110.0	112.5	115.0	117.5
Weight	12kg	Voltage at P_{MAX}	V_{MPP} (V)	67.8	68.6	69.4	70.2	70.5	71.2
Thickness	6.8mm	Current at P_{MAX}	I_{MPP} (A)	1.55	1.57	1.59	1.60	1.63	1.65
Area	0.72m ²	Open Circuit Voltage	V_{OC} (V)	86.0	86.6	87.2	87.7	87.8	88.2
Leadwire	2.5mm ² , 610mm	Short Circuit Current	I_{SC} (A)	1.74	1.75	1.75	1.75	1.78	1.79
Connectors	MC4 ⁹	Module Efficiency	%	14.6	14.9	15.3	15.6	16.0	16.3
Bypass Diode	None	Maximum System Voltage	V_{SYS} (V)	1500 ⁷					
Cell Type	Thin-film CdTe semiconductor, up to 216 cells	Limiting Reverse Current	I_R (A)	4.0					
Frame Material	None	Maximum Series Fuse	I_{CF} (A)	4.0					
Front Glass	3.2mm heat strengthened Series 4A™ includes anti-reflective coating	MODULE NUMBERS AND RATINGS AT 800W/m ² , NOCT ⁸ 45°C, AM 1.5 ⁶							
Back Glass	3.2mm tempered	Nominal Power ($\pm 5\%$)	P_{MPP} (W)	78.3	80.1	82.0	83.9	85.8	87.6
Encapsulation	Laminate material with edge seal	Voltage at P_{MAX}	V_{MPP} (V)	62.6	63.1	64.1	65.0	65.5	65.9
Load Rating	2400Pa ¹⁰	Current at P_{MAX}	I_{MPP} (A)	1.25	1.27	1.28	1.29	1.31	1.33
		Open Circuit Voltage	V_{OC} (V)	81.0	81.6	82.1	82.6	82.7	83.1
		Short Circuit Current	I_{SC} (A)	1.40	1.41	1.41	1.41	1.44	1.44
		TEMPERATURE CHARACTERISTICS							
		Module Operating Temperature Range	(°C)	-40 to +85					
		Temperature Coefficient of P_{MPP}	$T_K (P_{MPP})$	-0.34%/°C					
		Temperature Coefficient of V_{OC}	$T_K (V_{OC})$	-0.29%/°C					
		Temperature Coefficient of I_{SC}	$T_K (I_{SC})$	+0.04%/°C					

SUPERIOR TEMPERATURE COEFFICIENT



MECHANICAL DRAWING



- 1 Device package meets ATLAS 25+.
- 2 Testing Certifications/Listings pending.
- 3 Limited power output and product warranties subject to warranty terms and conditions.
- 4 Ensures 97% rated power in first year, -0.7%/year through year 25.
- 5 Standard Test Conditions (STC) 1000W/m², AM 1.5, 25°C
- 6 All ratings $\pm 10\%$, unless specified otherwise. Specifications are subject to change.
- 7 Application Class A for 1000V (class II), Application Class B for 1500V (class 0)
- 8 Nominal Operating Cell Temperature: Module operation temperature at 800W/m² irradiance, 20°C air temperature, 1m/s wind speed.
- 9 Multi-Contact MC4 (PV-KST4/PV-KBT4)
- 10 Higher load ratings can be met with additional clips or wider clips, subject to testing

END-OF-LIFE RECYCLING

- Recycling services available through First Solar's industry-leading recycling program or customer-selected third party.

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.

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