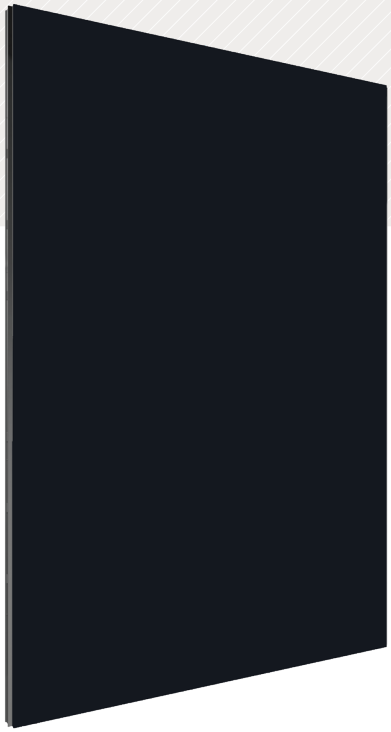
First Solar Series 6 *Plus*

ADVANCED THIN FILM SOLAR TECHNOLOGY

MODULE DATASHEET



HIGH-POWER PV MODULES

First Solar Series 6 *Plus* photovoltaic (PV) modules set the industry benchmark for reliable energy production, optimized design and environmental performance. The advanced design is optimized for every stage of your application, significantly reducing balance of system, shipping, and operating costs.

440-470 Watts
Up to 18.7% Efficiency

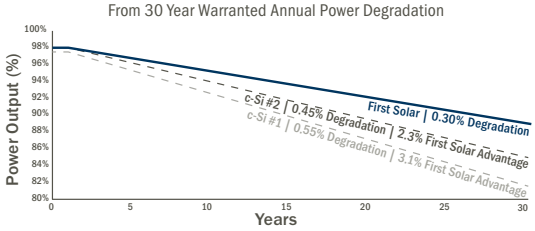
INDUSTRY-LEADING MODULE WARRANTY[1]

98% WARRANTY START POINT

0.3% WARRANTED ANNUAL DEGRADATION RATE

First Solar Lifetime Energy Advantage

From 30 Year Warranted Annual Power Degradation



- 30-Year Linear Performance Warranty
- 12-Year Limited Product Warranty
- Industry's first and only Cell Cracking Warranty

MORE LIFETIME ENERGY PER NAMEPLATE WATT

- Industry's best (0.3%) warranted degradation rate
- Superior temperature coefficient, spectral response and shading behavior
- Unlike crystalline silicon modules, First Solar's thin film technology does not experience the losses associated with LID and LeTID
- Anti-reflective coated glass enhances energy production

INNOVATIVE MODULE DESIGN

- Under-mount frame provides the cleaning and snow-shedding benefits of a frameless module while protecting edges against breakage
- Innovative SpeedSlots combine the robustness of bottom mounting with the speed of top clamping while utilizing fewer fasteners to achieve the industry's fastest installation times and lowest mounting hardware costs
- Dual junction box design optimizes module-to-module connections and eliminates the need for wire management

BEST IN-CLASS RELIABILITY & DURABILITY

- Manufactured under one roof with 100% traceable QA/QC
- Independently tested and certified for reliable performance that exceeds IEC standards in high temperature, high humidity, extreme desert and coastal applications
- Inherently immune to and warranted against power loss from cell cracking
- Durable glass/glass construction

BEST ENVIRONMENTAL PROFILE

- Fastest energy payback time in the industry
- Carbon footprint that is 2.5X lower and a water footprint that is 3X lower than mono crystalline silicon panels on a life cycle basis
- Global PV module recycling services available through First Solar or customer-selected third-party

FIRST SOLAR SERIES 6 *PLUS*

MODEL TYPES: FS-6XXX-P / FS-6XXXA-P / FS-6XXX-P-I / FS-6XXXA-P-I
(XXX = NOMINAL POWER)

RATINGS AT STANDARD TEST CONDITIONS (1000W/m², AM 1.5, 25°C)[2]

Nominal Power[3] (-0/+5%)	P_{MAX} (W)	440	445	450	455	460	465	470
Efficiency (%)	%	17.5	17.7	17.9	18.1	18.3	18.5	18.7
Voltage at P_{MAX}	V_{MAX} (V)	184.7	185.7	186.8	187.8	188.8	189.8	191.1
Current at P_{MAX}	I_{MAX} (A)	2.38	2.40	2.41	2.42	2.44	2.45	2.46
Open Circuit Voltage	V_{OC} (V)	220.0	220.4	221.1	222.0	222.9	223.8	224.3
Short Circuit Current	I_{SC} (A)	2.55	2.56	2.57	2.58	2.59	2.60	2.61
Maximum System Voltage	V_{SYS} (V)	1500[5]						
Limiting Reverse Current	I_R (A)	5.0						
Maximum Series Fuse	I_{CF} (A)	5.0						

RATINGS AT NOMINAL OPERATING CELL TEMPERATURE OF 45°C (800W/m², 20°C air temperature, AM 1.5, 1m/s wind speed)[2]

Nominal Power	P_{MAX} (W)	332.4	336.0	339.9	343.6	347.3	351.3	355.0
Voltage at P_{MAX}	V_{MAX} (V)	173.1	174.1	175.2	176.2	176.3	177.4	179.3
Current at P_{MAX}	I_{MAX} (A)	1.92	1.93	1.94	1.95	1.97	1.98	1.98
Open Circuit Voltage	V_{OC} (V)	207.7	208.0	208.7	209.6	210.4	211.3	211.8
Short Circuit Current	I_{SC} (A)	2.06	2.06	2.07	2.08	2.09	2.10	2.10

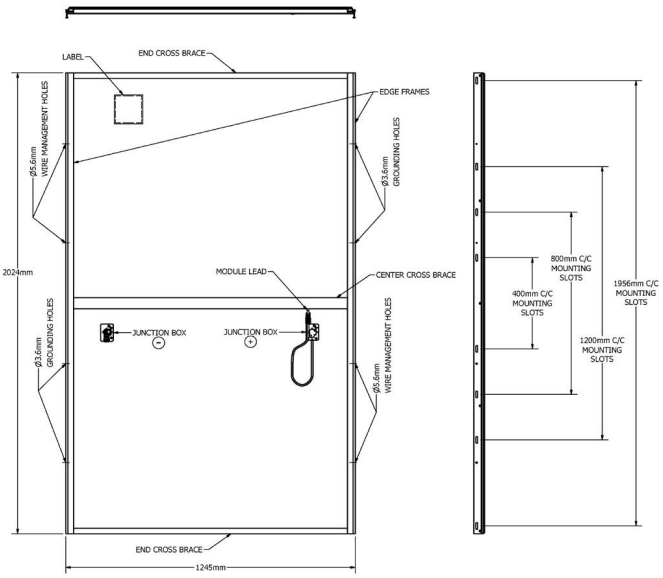
TEMPERATURE CHARACTERISTICS

Module Operating Temperature Range	(°C)	-40 to +85
Temperature Coefficient of P_{MAX}	T_K (P_{MAX})	-0.32%/°C [Temperature Range: 25°C to 75°C]
Temperature Coefficient of V_{OC}	T_K (V_{OC})	-0.28%/°C
Temperature Coefficient of I_{SC}	T_K (I_{SC})	+0.04%/°C

MECHANICAL DESCRIPTION

Length	2024mm
Width	1245mm
Area	2.52m²
Module Weight	34.9kg (FS-6XXX-P / FS-6XXXA-P) 34.2kg (FS-6XXX-P-I / FS-6XXXA-P-I)
Leadwire[6]	2.5mm², 733mm (+) & Bulkhead (-)
Connectors	TE Connectivity PV4-S, MC4-EVO 2, or alternate
Junction Box	IP68 Rated
Bypass Diode	N/A
Cell Type	Thin film CdTe semiconductor, up to 264 cells
Frame Material	Anodized Aluminum
Front Glass	Heat strengthened
Back Glass	Heat strengthened
Encapsulation	Laminate material with edge seal
Frame to Glass Adhesive	Silicone
Load Rating[7,8]	2400Pa

MECHANICAL DRAWING



PACKAGING INFORMATION

Model Type	Modules Per Pack	Packs per 40' Container
FS-6XXX-P / FS-6XXXA-P	27	18
FS-6XXX-P-I / FS-6XXXA-P-I	29	18

CERTIFICATIONS AND TESTS [4]

IEC

61215:2016 & 61730-1:2016[5], CE
61701 Salt Mist Corrosion
60068-2-68 Dust and Sand Resistance

UL

UL 61730 1500V Listed

REGIONAL CERTIFICATIONS

InMetro SII
BIS
MyHijau
Buy American Act (BAA) Compliant

EXTENDED DURABILITY TESTS

ANSI/CAN/CSA-C450-18
Long-Term Sequential Thresher Test
PID Resistant

QUALITY & EHS

ISO 9001:2015
ISO 14001:2015
ISO 45001:2018
ISO 14064-3:2006
EPEAT Silver Registered

Install in portrait only

1 Limited power output and product warranties subject to warranty terms and conditions
2 All ratings ±10%, unless specified otherwise. Specifications are subject to change
3 Measurement uncertainty applies
4 Testing Certifications/Listings pending
5 IEC 61730-1: 2016 Class II
6 Leadwire length from junction box exit to connector mating surface
7 1500Pa tentative load rating for 1956mm mounting slots. Higher loads may be acceptable, subject to testing
8 Model Types FS-6XXX-P-I and FS-6XXXA-P-I meet UL 61730 with a reduced mechanical design load. Consult Module User Guide for additional details