



Series 7 **TR1.**

450-500 Watt Thin Film Solar Module



Series 7 **TR1** modules combine First Solar's thin film technology with a larger form factor and an innovative new back rail mounting system to deliver improved efficiency, enhanced installation velocity, and unmatched lifetime energy performance for utility-scale PV projects.



More Energy per Nameplate Watt

- Superior temperature coefficient, spectral, and shading response
- No power loss from LID or LeTID
- Anti-reflective coated glass enhances energy production



Innovative Module Design

- Optimized back rails enhance installation velocity
- Frameless design improves soiling and snow shedding
- Dual junction box design reduces wire management complexity and cost



Unmatched Quality and Reliability

- End-to-end manufacturing process for globally consistent quality
- Tested and certified to IEC standards and beyond
- Durable glass/glass construction
- Immune to and warranted against power loss from cell cracking
- 12-year Limited Product Warranty



Industry's Most Eco-efficient PV Solution

- Industry leading carbon footprint, water footprint and energy payback time
- Globally available PV module recycling services



America's Solar Company

- Designed, responsibly sourced, and manufactured in the USA

17.9%
HIGH BIN EFFICIENCY

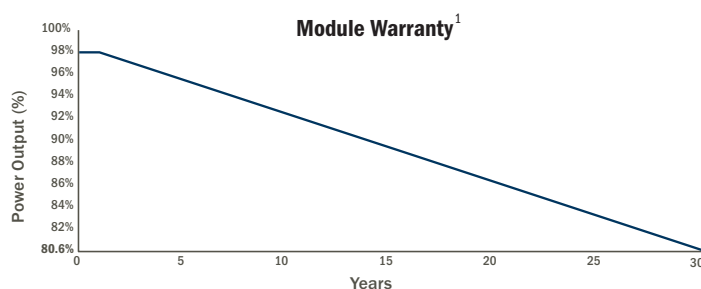
30YR
LINEAR PERFORMANCE
WARRANTY

98%
WARRANTY START POINT

0.6%
WARRANTED ANNUAL
DEGRADATION RATE



Learn more about First Solar
and Series 7 **TR1**
at firstsolar.com/S7



Series 7 TR1.

Electrical Specifications



LEADING THE WORLD'S
SUSTAINABLE ENERGY FUTURE

MODEL TYPES: FS-7XXXA-TR1 (XXX = NOMINAL POWER)

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

Nominal Power ³ (-0/+5%)	P _{MAX} (W)	450	455	460	465	470	475	480	485	490	495	500
Efficiency (%)	%	16.1	16.3	16.5	16.6	16.8	17.0	17.2	17.4	17.5	17.7	17.9
Cell Efficiency (%)	%	16.9	17.1	17.3	17.4	17.6	17.8	18.0	18.2	18.4	18.6	18.8
Voltage at P _{MAX}	V _{MAX} (V)	172.2	173.2	174.2	175.1	176.0	177.0	177.9	178.8	179.7	180.7	181.6
Current at P _{MAX}	I _{MAX} (A)	2.61	2.63	2.64	2.66	2.67	2.68	2.70	2.71	2.73	2.74	2.75
Open Circuit Voltage	V _{OC} (V)	217.6	218.2	218.8	219.4	220.0	220.5	221.1	221.7	222.3	222.8	223.4
Short Circuit Current	I _{SC} (A)	2.93	2.94	2.94	2.95	2.96	2.97	2.98	2.98	2.99	3.00	3.01
Maximum System Voltage	V _{SYS} (V)	1500 ⁵										
Limiting Reverse Current	I _R (A)	5.0										
Maximum Series Fuse	I _{CF} (A)	5.0										

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
Nominal Operating Cell Temperature	(°C)	45

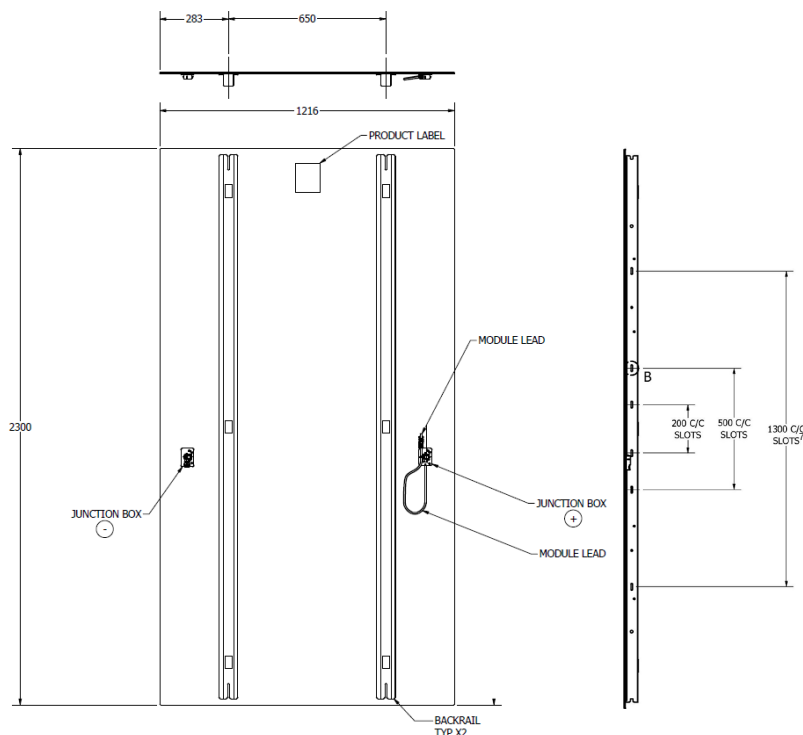
PACKAGING INFORMATION

Model Type	Modules Per Pack	Packs per 53' Container
FS-7XXXA-TR1	44 / 46	Up to 10

Mechanical Specifications

MECHANICAL DESCRIPTION

Length	2300mm
Width	1216mm
Area	2.80m ²
Module Weight	38.4 ⁷ / 39.7 kg
Leadwire ⁶	2.5mm ² , 650mm (+) & Bulkhead (-)
Connectors	TE Connectivity PV4-S or alternate
Junction Box	IP68 Rated
Bypass Diode	N/A
Cell Type	Thin film CdTe semiconductor, up to 268 cells
Back Rail Material	Galvanized steel
Front Glass	Heat strengthened
Back Glass	Heat strengthened
Encapsulation	Laminate material with edge seal
Frame to Glass Adhesive	Silicone
Load Rating	2400Pa



Certifications & Tests⁴

CERTIFICATIONS AND LISTINGS

IEC 61215:2021 & 61730-1:2016⁵, CE
IEC 61701 Salt Mist Corrosion
IEC 60068-2-68 Dust and Sand Resistance
IEC 62716 Ammonia Corrosion
UL 61730 1500V Listed

EXTENDED DURABILITY TESTS

IEC TS 63209-1 Extended Stress Test
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

- Limited power output and product warranties subject to warranty terms and conditions
- All ratings $\pm 10\%$, unless specified otherwise. Specifications are subject to change
- Measurement uncertainty applies
- Testing Certifications/Listings pending
- IEC 61730-1: 2016 Class II
- Leadwire length from junction box exit to connector mating surface
- ± 1300 mm mounting location added to product variant



Disclaimer

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