



## TW-SF Series a-Si

### Advantages

- ♦ Prominent performance at high temperature and weak sunlight!
- ♦ Cost-effective and economic energy production by a high level of efficiency.
- ♦ No application of polluting or toxic materials!
- ♦ Guaranteed steady production quality by manufacture in the worldwide latest and most up to date Oerlikon production facility.
- ♦ An exquisite overall picture regarding the integration in buildings and facades!

### Guarantees

- |   |          |
|---|----------|
| ♦ Product Warranty                        | 5 years  |
| ♦ 90% of the minimal Nominal Power Output | 10 years |
| ♦ 80% of the minimal Nominal Power Output | 25 years |

### Manufacture

Baoding TianWei SolarFilms Co., Ltd. is a globalized high-tech company, specialized in designing, manufacturing, selling and installing thin film solar modules and related accessories.

TW-SF Series a-Si (frameless)

Temperature Coefficient

$P_{mpp}$	$\alpha$	-0.21 %/K
$V_{oc}$	$\chi$	-0.28 %/K
$I_{sc}$	$\beta$	+0.04 %/K
$V_{mpp}$	$\varepsilon$	-0.29 %/K
$I_{mpp}$	$\sigma$	+0.09 %/K

Operating Conditions

- Transformerless DC-AC converters are not permitted
- Temperature range -40°C to +85°C, humidity max. 85 % (rh)
- Upright assembly, laser lines running vertically!

Certificates

- CE, TÜV, CQC, UL 1703, IEC 61646, IEC 61730, ISO9001:2008
- Certification Institute: TÜV Rheinland, UL, CQC

Electrical Characteristics

According to STC*		TW-SF85	TW-SF90	TW-SF95	TW-SF100
Power Output	$P_{mpp}$	85 W	90 W	95 W	100 W
MPP Voltage	$V_{mpp}$	98 V	100 V	102 V	104 V
MPP Current	$I_{mpp}$	0.87 A	0.90 A	0.93 A	0.96 A
Open-circuit Voltage	$V_{oc}$	135 V	136 V	138 V	138 V
Short-circuit Current	$I_{sc}$	1.12 A	1.14 A	1.17 A	1.22 A
Output Tolerance		-2 W / +3 W			
Tolerance of Electric Parameter		$\pm 3 \%$			
Maximum System Voltage	$V_{DC}$	1000 V (TÜV), 600 V (UL)			

\* STC (Standard Test Conditions): 1000 W/m² irradiance strength with a spectrum of AM 1.5 at a module temperature of 25°C.

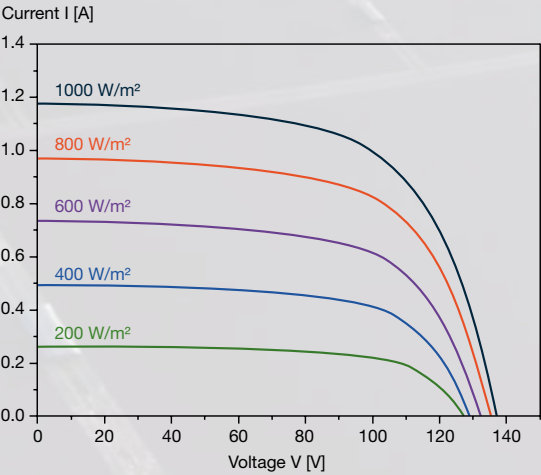
According to NOCT**		TW-SF85	TW-SF90	TW-SF95	TW-SF100
Power Output	$P_{mpp}$	68 W	73 W	77 W	81 W
MPP Voltage	$V_{mpp}$	96 V	98 V	100 V	101 V
MPP Current	$I_{mpp}$	0.71 A	0.74 A	0.77 A	0.80 A
Open-circuit Voltage	$V_{oc}$	132 V	133 V	135 V	135 V
Short-circuit Current	$I_{sc}$	0.93 A	0.95 A	0.97 A	0.99 A
Nominal Operation Cell Temperature		46 °C $\pm 2$ °C			

\*\* NOCT (Normal Operating Cell Temperature): Electrical data is measured to the irradiance of 800 W/m² and a wind velocity of 1m/s.

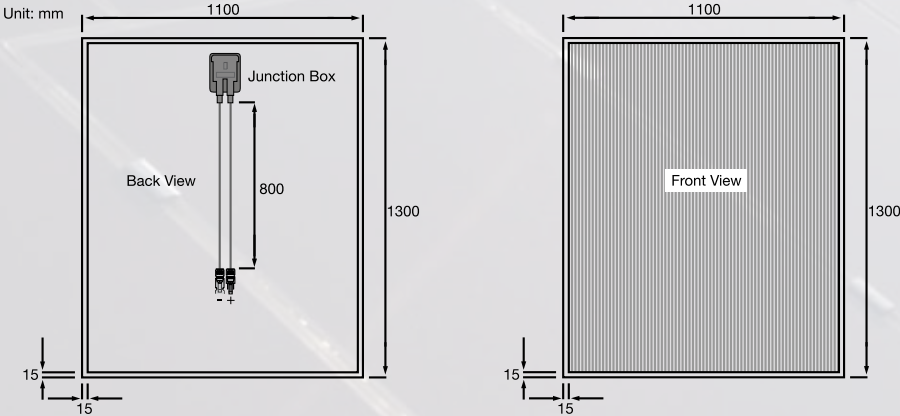
Mechanical Characteristics

Type	TW-SF85	TW-SF90	TW-SF95	TW-SF100
Cell Design	amorphous silicon single-junction			
Construction	glass-glass-laminate Polyvinyl butyral (PVB) thickness: 0.76 mm			
Cables	800 mm / 2.5 mm²			
Plug Connector	MC4 compatible			
Junction Box	conform to IP65 bypass diodes: 3 A, 1300 V			
Front Cover	white float glass, thickness: 3.2 mm			
Back Cover	tempered float glass, thickness: 3.2 mm			
Dimensions	1300 mm x 1100 mm x 6.8 mm			
Weight	approx. 24 kg			

I-V-Curve



Dimensions



Due to ongoing development the information in this data sheet can be changed without prior notice. The information is subject to errors. The electronic parameters are typical approximate average values taken from historical production data. We do not offer any guarantee for the accuracy of these data with future production batches. The illustrations are not true to scale. Please ask for detailed measures and tolerances. Status as of 7/1/2010