

Solar Frontier Europe GmbH

## Product Data Sheet SF165-S



### Electrical Characteristics

#### Electrical Performance at Standard Test Conditions (STC)\*1

		SF165-S
Nominal Power	P <sub>max</sub>	165 W
Power tolerance		+5 W / 0 W
Open circuit voltage	V <sub>oc</sub>	110.0 V
Short circuit current	I <sub>sc</sub>	2.20 A
Voltage at nominal power	V <sub>mpp</sub>	85.5 V
Current at nominal power	I <sub>mpp</sub>	1.93 A

#### Electrical Performance at Nominal Operating Cell Temperature (NOCT) Conditions\*2

		SF165-S
Nominal Power	P <sub>max</sub>	123 W
Open circuit voltage	V <sub>oc</sub>	100 V
Short circuit current	I <sub>sc</sub>	1.76 A
Voltage at nominal power	V <sub>mpp</sub>	80.2 V
Current at nominal power	I <sub>mpp</sub>	1.53 A

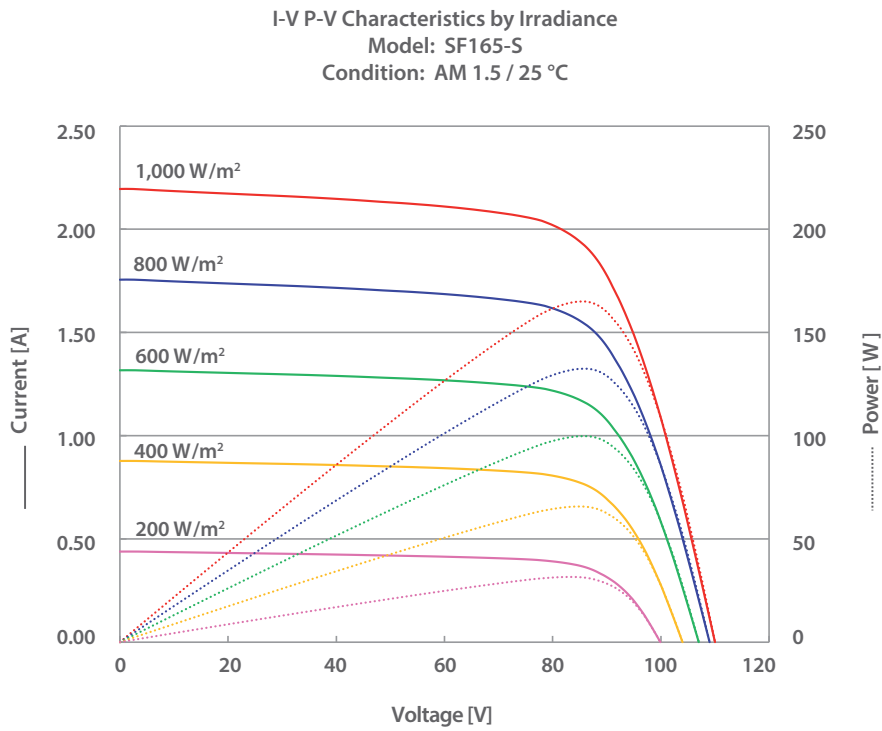
### Performance at Low Irradiance

Efficiency reduction of maximum power from an irradiance of 1,000 W/m<sup>2</sup> to 200 W/m<sup>2</sup> at 25 °C is typically 2.0 %.  
 The standard deviation for the reduction of efficiency is 1.9 %.

\*1 Standard Test Conditions (STC): 1,000 W/m<sup>2</sup> irradiance, module temperature 25 °C, air mass 1.5. I<sub>sc</sub> and V<sub>oc</sub> are ±10 % tolerance of STC rated values. Module output may rise due to the Light Soaking Effect. Subject to simulator measurement uncertainty (using best-in-class AAA solar simulator and applying Solar Frontier preconditioning requirements): +10 % / -5 %.

\*2 Nominal Operating Cell Temperature Conditions: Module operating temperature at 800 W/m<sup>2</sup> irradiance, air temperature 20 °C, wind speed 1 m/s and open circuit condition.

## Typical I-V Characteristics at STC

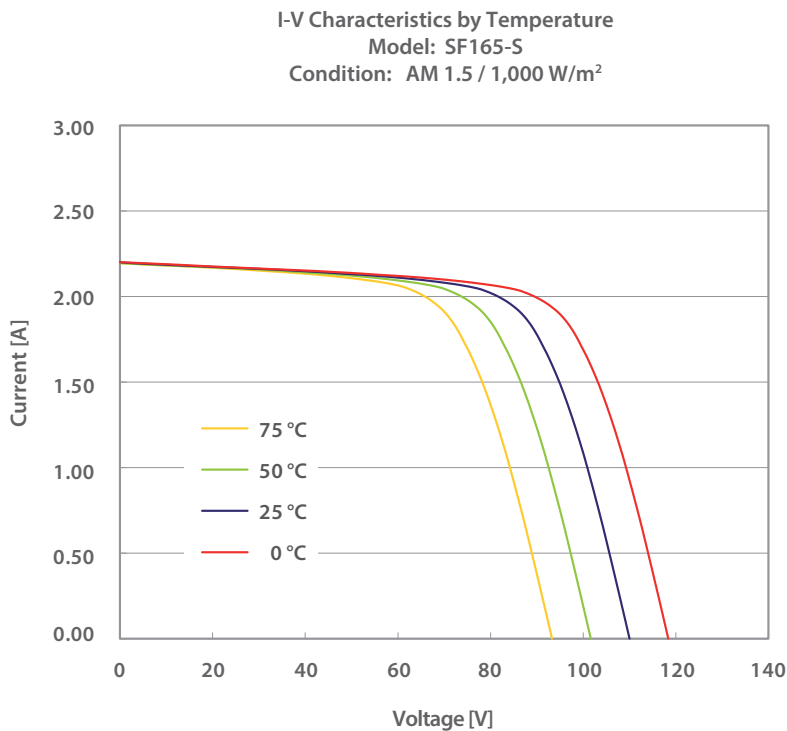


Typical characteristics

## Thermal Characteristics

NOCT	47 °C
Temperature coefficient of I <sub>sc</sub>	+0.01 %/K
Temperature coefficient of V <sub>oc</sub>	-0.30 %/K
Temperature coefficient of P <sub>max</sub>	-0.31 %/K

These thermal characteristics are typical data.



Typical characteristics

## Characteristics for System Design

Maximum system voltage	V <sub>sys</sub>	1,000 V DC (UL 600 V DC)
Limiting reverse current	I <sub>r</sub>	7 A
Maximum series fuse rating	I <sub>sf</sub>	4 A

## Mechanical Characteristics

Dimensions (L x W x H)* <sup>3</sup>	1,257 x 977 x 35 mm (49.5 x 38.5 x 1.4 inch)	
Weight	20 kg (44.1 lbs)	
Module operating temperature	-40 °C to 85 °C	
Application class on IEC61730	Class A	
Fire safety class on IEC61730	Class C	
Safety class on IEC61140	II	
Snow load (to the front of the module)* <sup>4</sup>	2,400 Pa (IEC61646) / 1,600 Pa design load (UL1703)	
Wind load (to the back of the module)	2,400 Pa (IEC61646) / 1,600 Pa design load (UL1703)	
Cell type	CIS substrate glass (cadmium free)	
Front cover	Clear tempered glass, 3.2 mm	
Encapsulant	EVA	
Back sheet	Weatherproof plastic film (color: black & silver)	
Frame	Anodized aluminum alloy (color: black)	
Edge sealant	Butyl rubber	
Junction box	Protection rating: IP67 (with bypass diode)	
Adhesive	Silicone	
Output cables (Conductor)	2.5 mm <sup>2</sup> / AWG14 (halogen free)	
Cable lengths (symmetrical)	1,200 mm (47.2 inch)	
Connectors	MC4 compatible	

## Qualifications and Compliance

IEC 61646 / IEC 61730 / UL 1703 / MCS 005-2.3

CE-Mark declaration

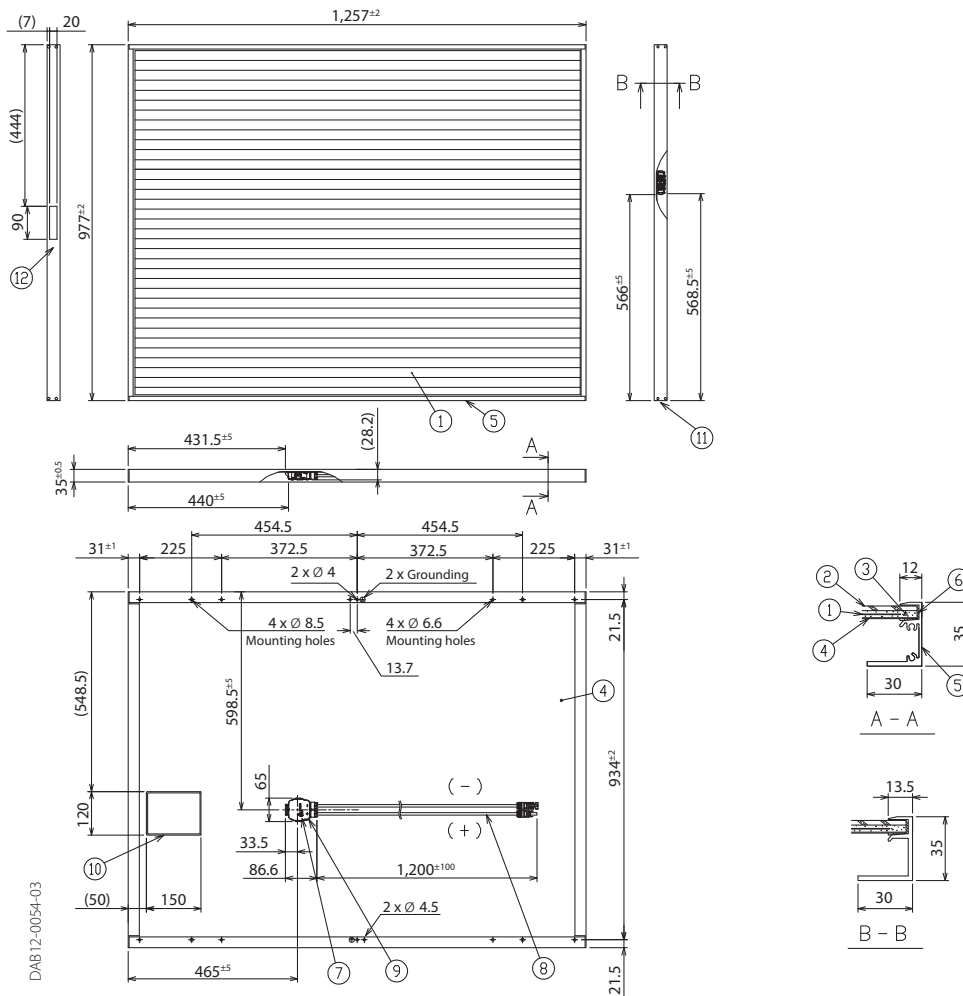
Solar Frontier is certified as: ISO 9001 / ISO 14001 / OHSAS 18001

RoHS compliant

\*3: Dimensional tolerances are stated in the drawing section of this product data sheet.

\*4: UL - 1.5 times design load is applied to the module. Accordingly, 2,400 Pa (50.1 lbs /ft<sup>2</sup>) is loaded to test the 1,600 Pa (33.4 lbs /ft<sup>2</sup>) UL design load.

## Module drawing



No.	Item	QT'Y	Description
1	Cell	1	CIS (Substrate glass)
2	Cover glass	1	Clear tempered glass
3	Encapsulant		EVA
4	Back sheet		Weatherproof plastic film (color: black & silver)
5	Frame	1 Set	Anodized aluminium alloy (color: black)
6	Edge sealant		Butyl rubber
7	Junction box	1	With bypass diode
8	Cable		2.5 mm <sup>2</sup> / AWG14 (with waterproof and locking connector)
9	Adhesive		Silicone
10	Label	1	Product label
11	Screw	8	Stainless tapping (SUS304J3)
12	Bar code label	1	Serial number

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