

# SOLAR MODULE

## Sunways Solar Module SM 215L-IN

### The advanced design solution:

Sunways Solar Laminates with the patented SOLRIF® mounting system for roof integrated installation. This system completely replaces the roof tiles. In this way the Solar Laminates come up for elementary functions of the roof.



### Product benefits

- **Easy installation**  
Mounting clamps included in scope of delivery, furthermore only standard roof battens are required
- **OutputPlus+**  
The actual output is greater than the rated output (0 to +5 W)
- **SolidPlus+**  
4 mm safety solar glass for high mechanical stress up to 5,400 Pa
- **High module efficiency**  
High-performance 3-busbar technology – made in Germany
- **High yields**  
High efficiencies and minimised module mismatch through precise sorting of cells and modules
- **Guaranteed quality**  
Five years of product guarantee on quality made in Germany
- **Guaranteed output**  
Min. 90% over 12 years, 80% over 25 years according to

### Product features

Category:	monocrystalline
Covering dim.: (LxWxD)	1710 mm x 980 mm x 20 mm
Area:	1,67 m <sup>2</sup>
Weight:	22 kg
Output classes:	235 / 230 / 225 Wp
Cells:	60 Sunways Solar Cells, mono, 3 Busbars
Cell format:	156 x 156 mm, pseudo-square

### Design

Front:	ESG solar glass 4 mm, highly transparent
Encapsulation:	EVA - Solar Cells - EVA
Back:	PLF-polyester laminated film
Junction box:	Tyco Solarlok with 3 bypass diodes
Connectors and cables:	Tyco Solarlok, 2 x 1.0 m, cable cross-section 4 mm <sup>2</sup>

### Information and Sales

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***sunways***  
Photovoltaic Technology

## Technical Data SM SM 215L-IN

Article No. in black	SM215LG65	SM215LG64	SM215LG63
<b>Output classes</b>	<b>235</b>	<b>230</b>	<b>225</b>

### Electrical data at STC <sup>1)</sup>

Rated output $P_{MPP}$ (W)	235	230	225
Voltage $U_{MPP}$ (V)	29.3	29.0	28.8
Current $I_{MPP}$ (A)	8.03	7.94	7.83
Open-circuit voltage $V_{OC}$ (V)	36.9	36.6	36.2
Short-circuit current $I_{SC}$ (A)	8.60	8.55	8.50
Reverse current capacity (A) <sup>2)</sup>	17.2	17.1	17.0

1) STC- Standard Test Conditions: Air mass AM. 1.5 – Irradiance 1000 W/ m<sup>2</sup> – Cell temperature 25°C; Measuring tolerance +/-5%

2) Reverse current capacity: Operation of modules with fed-in external current only admissible employing string fuse < 2 x I<sub>sc</sub> (STC)

### Electrical data at NOCT <sup>3)</sup>

Rated output $P_{MPP}$ (W)	170	167	163
Voltage $U_{MPP}$ (V)	27.6	27.3	27.1
Current $I_{MPP}$ (A)	6.60	6.53	6.44
Open-circuit voltage $V_{OC}$ (V)	34.8	34.5	34.1
Short-circuit current $I_{SC}$ (A)	7.07	7.03	6.99
Efficiency reduction at 200 W/m <sup>2</sup> (%) <sup>4)</sup>	0.7	0.7	0.7

3) The NOCT values are typical values. NOCT: Nominal operating cell temperature (45°C); Measuring tolerance +/-5%

Typical cell temperature with: Irradiance 800 W/mm<sup>2</sup> – Ambient temperature 20°C – Wind speed 1m/s

4) Efficiency reduction for irradiance reduction from 1000 W/m<sup>2</sup> to 200 W/m<sup>2</sup>, ambient temperature 25 °C, EN60904-1 comp.

### Other electrical parameters

Maximum system voltage (V)	1000
Temperature coefficient $P_{MPP}$ (% / K)	-0.48
Temperature coefficient $I_{SC}$ (% / K)	0.01
Temperature coefficient $U_{OC}$ (% / K)	-0.37

### Application

Scope of delivery	each 2 angle brackets: at the top, on profile and glass at the bottom
Permissible module temperature	-40°C ... +85°C
Snow load	5,400 Pa corresponds to 550 kg/m <sup>2</sup> , i.e. snow load zone 3
Wind load	130 km/h (800 Pa), factor 3 for wind gusts
Hail test	Ice balls: Ø 25 mm, speed: 23 m/s
Application class	A
Installation / operation	Follow the installation and operating manual.

### Qualifications and Certificates

IEC 61215 Ed.2, IEC 61730, CE, Protection class II

Internal quality checks: at least twice the load specified in IEC Standard

### Detail photos and dimensional drawings

