

Photovoltaic modules

TE235/250-60M+

- ▶ High efficiency, reduced area, positive power classification

Tenesol manufactures its own photovoltaic modules in two facilities.

Tenesol's modules **use the high-output technology of the monocrystalline cell**. Each cell is individually measured and sorted before the encapsulation stage.

The combined use of **tempered glass, EVA and back sheet keeps its weight to a minimum**. The laminate **guarantees total watertightness** and long-term protection of the cells.

The **reinforced 50 mm aluminium frame** makes handling easy and allows for quick, easy and **highly resistant assembly**.

This Tenesol's module can withstand a heavy snowload **up to 5400 Pa**.

Each module is subject to an **individual quality control process**.

- Power tolerance : 0 / +5 Wp
- Module efficiency : Up to 15.2%
- Product warranty : 10 years
- Power warranty : 25 years*

The quality of TENESOL modules are CE certified.

Our production facilities are also certified according to ISO 9001 and ISO 14001 standards.

A rapidly expanding global player in the field of solar energy (with a turnover of €304 million in 2010, average 25% growth per year over last 3 years), Tenesol works on behalf of businesses, local authorities and private individuals.

For more than 28 years, Tenesol has been engineering, designing, manufacturing, installing and managing solar energy systems including production and consumption of supplied systems (Off-grid sites, general grid supply via direct connection, solar water heating) for its customers around the globe.

A benchmark player in its sector, Tenesol currently has a staff of more than 800 employees across 18 subsidiaries including 2 production facilities.



Sun access provider.

TENESOL
TOTAL GROUP

► TE235/250-60M+

Electrical characteristics

TE235/250-60M+

| Nominal Power (STC) | Wp | 235 | 240 | 245 | 250 ¹ |
|-----------------------|-----|--------|--------|--------|------------------|
| Minimum power | | 235 | 240 | 245 | 250 |
| Maximum power | | 240 | 245 | 250 | 255 |
| Sorting limits | Wp | -0/+5 | | | |
| Sorting limits | % | 0/+2.1 | 0/+2.1 | 0/+2.0 | 0/+2.0 |
| Voltage at max. power | (V) | 29.35 | 29.55 | 29.8 | 30.05 |
| Current at max. power | (A) | 8.1 | 8.2 | 8.3 | 8.4 |
| Open circuit voltage | (V) | 37.0 | 37.2 | 37.4 | 37.5 |
| Short circuit current | (A) | 8.5 | 8.6 | 8.7 | 8.8 |

According to specifications at STC: Irradiation 1000 W/m²; AM 1.5; Cell at ambient Temperature T: 25°C.

(1) : Modules available upon request.

| Nominal Pow. 45°C/800W/m ² | Wp | 175.0 | 178.8 | 182.6 | 186.5 |
|---------------------------------------|-----|-------|-------|-------|-------|
| Voltage at max. power | (V) | 26.7 | 26.9 | 27.2 | 27.4 |
| Current at max. power | (A) | 6.6 | 6.6 | 6.7 | 6.8 |
| Open circuit voltage | (V) | 34.4 | 34.6 | 34.8 | 34.9 |
| Short circuit current | (A) | 6.9 | 7.0 | 7.0 | 7.1 |

NOCT tests realized with a maximum power (in Wp), junction temperature 45 °C; irradiation 800 W/m²; Am 1,5 ; Ambient temperature 20 °C; Windspeed 1 m/sec.

Temperature coefficients

| | |
|------------------------------------|---------------|
| Temperature Coefficient of Voltage | - 129,0 mV/°C |
| Temperature Coefficient of Current | + 4,8 mA/°C |
| Temperature Coefficient of Power | - 0,43 %/°C |
| NOCT | 45°C |

Cells

| | |
|--------|-------------------|
| Size | 156 x 156 mm |
| Layout | 60 cells / 6 x 10 |
| Type | Monocrystalline |

General information

| | |
|-------------------------------|-----------------|
| Maximum system voltage | 1000 V |
| Maximum reverse current | 17 A |
| Diodes | 3 by-pass |
| Type of connection | Tyco connectors |
| Junction Box | IP55 |
| Weight | 19 kg |
| Operating ambient temperature | -40 / +85°C |

Certifications

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|---------------------|
| IEC61215 + IEC61730 |
|---------------------|

Warranty

| | |
|--------------------|--|
| Product warranty | 10 years |
| Power warranty (*) | 25 years - 80 % of minimal power 10 years - 90 % of minimal power |

Irradiant dependency

| Irradiation (W/m ²) | Pm | Vpm | Ipm |
|---------------------------------|-------|-------|-----|
| 1000 | 1 | 1 | 1 |
| 800 | 0,799 | 0,999 | 0,8 |
| 500 | 0,497 | 0,994 | 0,5 |
| 400 | 0,394 | 0,986 | 0,4 |
| 300 | 0,291 | 0,970 | 0,3 |
| 200 | 0,187 | 0,936 | 0,2 |
| 100 | 0,086 | 0,862 | 0,1 |

