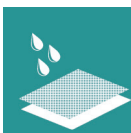


# TS250 series

## 60-cell multi-crystalline solar photovoltaic modules



Manufactured in India on leading edge module production line using world class processes



Enhanced resistance to moisture ingress owing to unique back sheet design



Peace of mind guaranteed by Tata Power Solar 25 year module warranty



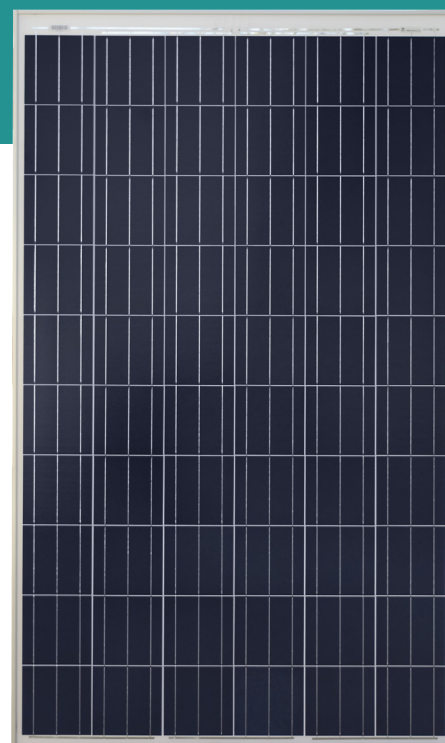
Stringent quality standards in materials, quality and manufacturing processes



Reduced risk of failure – warranty claims of less than 0.07% over two decades



Reliability of product enhanced by use of IP67 rated junction box



### PRODUCT FEATURES

- 60 cell configuration with wattage ranging from 235 to 250W
- High fill factor for improved energy conversion efficiency
- Cells sorted by power and current to minimize mismatch losses in the field
- Electroluminescence tested for micro-cracks
- MC4 compatible cable connectors
- Torsion and corrosion resistant with anodized aluminium frame
- Enhanced reliability through use of distinctive encapsulant and back sheet
- Ultra-soft interconnect with stress relief for enhanced reliability
- Optimized edge clearance for high quality rugged design

### CERTIFICATIONS



Certified to IEC 61730, IEC 61215, IEC 61701 and UL 1703 standards

### WARRANTY

Product warranty: 10 year warranty on material and workmanship  
Power warranty: 10 year 90% / 25 year 80% step power output warranty

Warranties are subject to the Terms and Conditions as per the Tata Power Solar Standard Warranty Document. Certifications may vary by module

### About Tata Power Solar

Tier 1\* bankable module manufacturer\*\* with 25 year history

Backed by \$100B Tata Group; eliminates need for expensive 3rd party insurance

BP Solar heritage of state-of-the-art technology and stringent quality processes

Over 500 MW of modules shipped globally

Highest standards of quality and management (ISO 9001: 14001)

\* Rated tier-1 bankable by Green Tech Media Research

\*\* Bankability verified by third party auditors like Black & Veatch

**Modules in the TS250 series** TS235 TS240 TS245 TS250

**Electrical parameters at standard test conditions (STC)\***

Nominal power output (W)	235	240	245	250
Power tolerance (%)	± 2.5	± 2.5	± 2.5	± 2.5
Module efficiency ( $\eta$ %)	14.10	14.40	14.70	15.00
Voltage at $P_{MAX}$ $V_{MPP}$ (V)	29.6	30.0	30.3	30.7
Current at $P_{MAX}$ $I_{MPP}$ (A)	7.95	8.03	8.11	8.16
Open-circuit voltage $V_{oc}$ (V)	37.0	37.3	37.7	38.1
Short-circuit current $I_{sc}$ (A)	8.48	8.52	8.55	8.58

**Electrical parameters at NOCT**

Power output $P_{MAX}$ (W)	169.2	172.8	176.4	180.0
Voltage at $P_{MAX}$ $V_{MPP}$ (V)	26.2	26.5	26.8	27.2
Current at $P_{MAX}$ $I_{MPP}$ (A)	6.47	6.53	6.60	6.64
Open-circuit voltage $V_{oc}$ (V)	32.5	32.8	33.1	33.5
Short-circuit current $I_{sc}$ (A)	7.04	7.07	7.10	7.15

**Temperature coefficient characteristics**

NOCT ( $^{\circ}C$ )	47 ± 2
Module efficiency ( $\%/^{\circ}C$ )	-0.06 ± 0.01
Temperature coefficient of $P_{MAX}$ ( $\%/^{\circ}C$ )	-0.4383
Temperature coefficient of $V_{oc}$ ( $\%/^{\circ}C$ )	-0.3305
Temperature coefficient of $I_{sc}$ ( $\%/^{\circ}C$ )	0.0638

**Operating conditions**

Maximum system voltage (UL & IEC) (V)	600 & 1000
Maximum series fuse rating (A)	20
Limiting reverse current (A)	20
Operating temperature range ( $^{\circ}C$ )	-40 and +85
Maximum static load (snow or wind)	50 psf (2400 Pa)

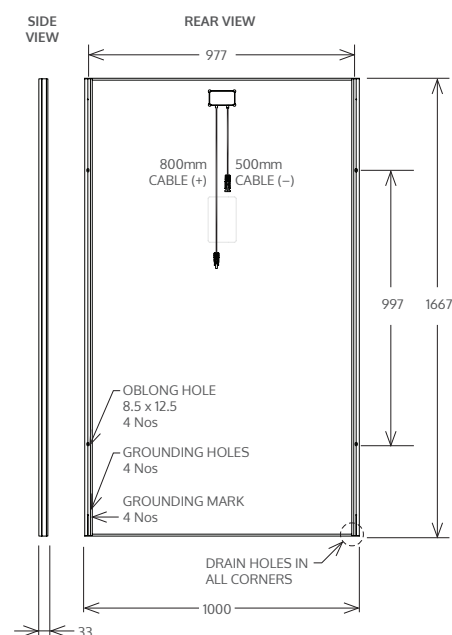
**Module general characteristics**

Module dimensions L x W x H (mm)	1667 x 1000 x 33
Module weight (approx) (kg [lbs])	19.1 [42.1]
Number of cells & size	60 cells & 156mm
Frame material	Anodized aluminium
Glass	3.2mm
Junction box	IP67 rated
Cable connector	MC4 compatible (4mm <sup>2</sup> )

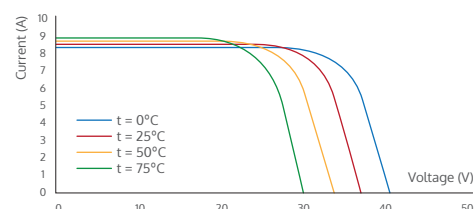
**Packaging details**

Number of modules per pallet	28
Number of pallets per 32ft container	20
Box weight (kg)	580
Box dimensions L x W x H (mm)	1750 x 1150 x 1200

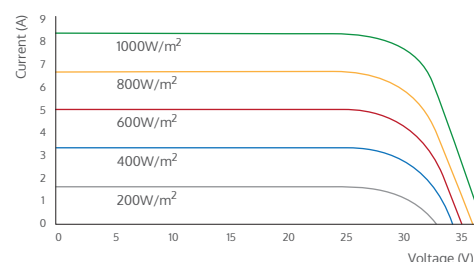
**Technical Drawing\*\*** Dimensions in mm



**IV curve at multiple temperatures**



**IV curve at multiple irradiance**



\* Irradiance of 1000W/m<sup>2</sup>, spectrum AM of 1.5 and cell temperature of 25 $^{\circ}C$   
Best in class AAA solar simulator (IEC 60904-9) used, power measurement tolerance ±3%

\*\* Tolerance for dimensions -3/+3mm  
Tolerance for cable length 0/+50mm

Listed specifications are subject to change without notice

Tata Power Solar is committed to enabling solar everywhere and bringing the power of the sun to people in the most efficient and cost effective way possible.



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[www.tatapowersolar.com](http://www.tatapowersolar.com)