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EnergyPal

Solar Panel Guide Specification Data Sheet

**Tata Power Solar Systems Ltd.
TP300 Series 288-300
TP288**

Also available on the web at
EnergyPal.com/tata-power-solar-systems-ltd-solar-panels/tp288

TP300 series

72-cell multi-crystalline solar photovoltaic modules



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



Reliability under extreme weather conditions, certified to withstand snow loads of up to 5,400 Pa



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



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



Greater energy generated due to positive power tolerance of up to 5W



TUV and UL certified Potential Induced Degradation free modules*



PRODUCT FEATURES

- 72 cell configuration with wattage ranging from 288 to 330 watts
- 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
- Highly reliable IP67 rated junction box
- MC4/MC4 compatible cable connectors
- Torsion and corrosion resistant with anodized aluminium frame
- Unique back sheet design for high resistance to moisture ingress
- 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, IEC62716, UL 1703 and REACH standards



About Tata Power Solar

Tier 1** bankable module manufacturer*** with 27 year history

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

Over 1 GW of modules shipped globally

Highest standards of quality and management (ISO 9001, 14001 and OHSAS 18001)

WARRANTY

Product warranty: 10 year warranty on material and workmanship

Power warranty: 25 year linear 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

* PID free certified modules available on order

** Rated tier-1 bankable by BNEF (Bloomberg New Energy Fund)

*** Bankability verified by third party auditors like Black & Veatch and BNEF

Modules in the TP300 series TP288 TP291 TP294 TP297 TP300

Electrical parameters at standard test conditions (STC)*

Nominal power output (W)	288	291	294	297	300
Power tolerance (W)	0 ~ +3	0 ~ +3	0 ~ +3	0 ~ +3	0 ~ +3
Module efficiency ($\eta\%$)	14.8	15.0	15.1	15.3	15.4
Voltage at P _{MAX} V _{MPP} (V)	36.3	36.4	36.5	36.6	36.6
Current at P _{MAX} I _{MPP} (A)	7.95	8.01	8.08	8.14	8.21
Open-circuit voltage V _{OC} (V)	44.6	44.6	44.7	44.7	44.8
Short-circuit current I _{SC} (A)	8.45	8.51	8.57	8.62	8.68

Electrical parameters at NOCT

Power output P _{MAX} (W)	207.4	209.5	211.7	213.8	216.0
Voltage at P _{MAX} V _{MPP} (V)	32.0	32.0	32.0	32.1	32.1
Current at P _{MAX} I _{MPP} (A)	6.49	6.55	6.60	6.65	6.71
Open-circuit voltage V _{OC} (V)	39.5	39.3	39.3	39.4	39.4
Short-circuit current I _{SC} (A)	7.12	7.15	7.18	7.21	7.24

Temperature coefficient characteristics

NOCT (°C)	47 ± 2
Module efficiency (%/°C)	-0.06 ± 0.01
Temperature coefficient of P _{MAX} (%/°C)	-0.42
Temperature coefficient of V _{OC} (%/°C)	-0.2931
Temperature coefficient of I _{SC} (%/°C)	0.058

Operating conditions

Maximum system voltage (UL & IEC) (V)	1000 & 1000
Maximum series fuse rating (A)	20
Limiting reverse current (A)	20
Operating temperature range (°C)	-40 and +85
Maximum static load (snow or wind)	113 psf (5400 Pa)

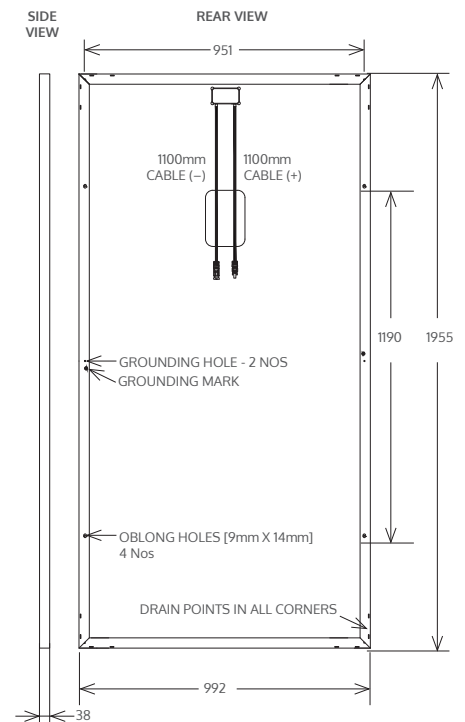
Module general characteristics

Module dimensions L x W x H (mm)**	1955 x 992 x 38
Module weight (approx) (kg [lbs])	24 [52.91]
Number of cells & size	72 cells & 156mm/156.75 (4BB/5BB)
Frame material	Anodized aluminium T6-6063 alloy
Glass	3.2mm ARC
Junction box	IP67 rated
Cable connector	MC4/MC4 compatible (4mm ²)
RFID	Outside the module (back side)

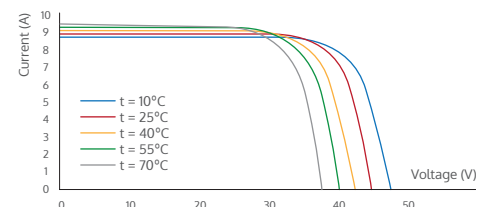
Packaging details

Number of modules per pallet	27
Number of pallets per 40ft container	18
Box weight (kg)	630
Box dimensions L x W x H (mm)**	2010 x 1170 x 1185

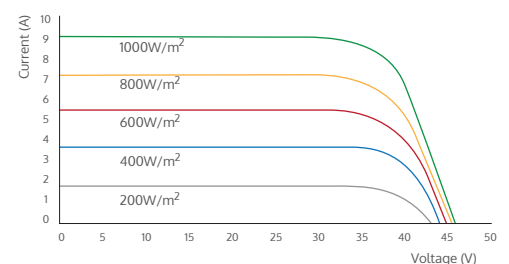
Technical Drawing** Dimensions in mm



IV curve at multiple temperatures



IV curve at multiple irradiance



* Irradiance of 1000W/m², spectrum AM of 1.5 and cell temperature of 25°C
Best in class AAA solar simulator (IEC 60904-9) used, electrical measurement tolerance ±3%

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

+ Frame type any of lock or screw and width could be 38 or 40 mm

++ Box dimension are subject to change

Listed specifications are subject to change without notice.

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Modules in the TP315 series TP303 TP306 TP309 TP312 TP315

Electrical parameters at standard test conditions (STC)*

Nominal power output (W)	303	306	309	312	315
Power tolerance (W)	0 ~ +3	0 ~ +3	0 ~ +3	0 ~ +3	0 ~ +3
Module efficiency (η %)	15.6	15.7	15.9	16.0	16.2
Voltage at P_{MAX} V_{MPP} (V)	36.7	36.8	36.9	36.9	37.0
Current at P_{MAX} I_{MPP} (A)	8.27	8.33	8.40	8.46	8.53
Open-circuit voltage V_{oc} (V)	44.8	44.8	44.9	44.9	44.9
Short-circuit current I_{sc} (A)	8.74	8.80	8.86	8.91	8.97

Electrical parameters at NOCT

Power output P_{MAX} (W)	218.2	220.3	222.5	224.6	226.8
Voltage at P_{MAX} V_{MPP} (V)	32.6	32.3	32.4	32.4	32.5
Current at P_{MAX} I_{MPP} (A)	6.76	6.82	6.87	6.93	6.98
Open-circuit voltage V_{oc} (V)	39.4	39.4	39.5	39.5	39.5
Short-circuit current I_{sc} (A)	7.27	7.30	7.32	7.35	7.38

Temperature coefficient characteristics

NOCT ($^{\circ}C$)	47 \pm 2
Module efficiency (%/ $^{\circ}C$)	-0.06 \pm 0.01
Temperature coefficient of P_{MAX} (%/ $^{\circ}C$)	-0.42
Temperature coefficient of V_{oc} (%/ $^{\circ}C$)	-0.2931
Temperature coefficient of I_{sc} (%/ $^{\circ}C$)	0.058

Operating conditions

Maximum system voltage (UL & IEC) (V)	1000 & 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)	113 psf (5400 Pa)

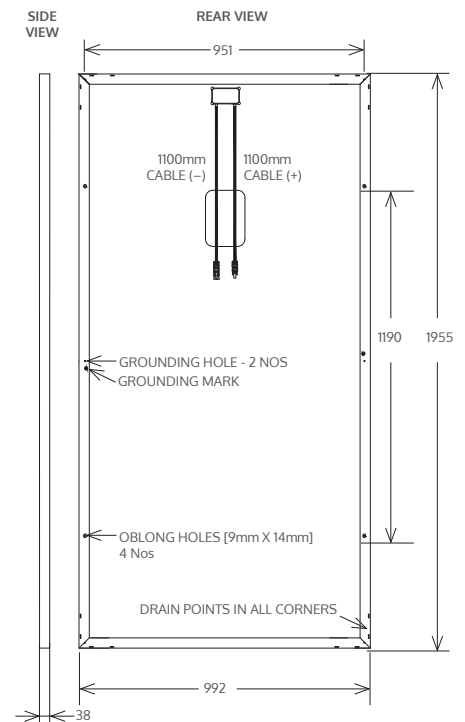
Module general characteristics

Module dimensions L x W x H (mm)**	1955 x 992 x 38
Module weight (approx) (kg [lbs])	24 [52.91]
Number of cells & size	72 cells & 156mm/156.75 (4BB/5BB)
Frame material	Anodized aluminium T6-6063 alloy
Glass	3.2mm ARC
Junction box	IP67 rated
Cable connector	MC4/MC4 compatible (4mm ²)
RFID	Outside the module (back side)

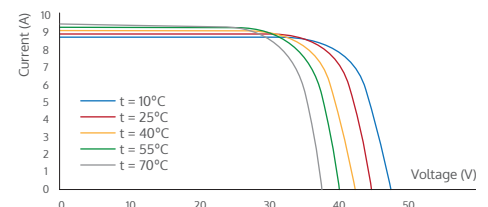
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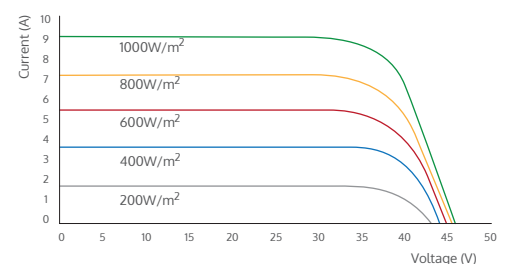
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IV curve at multiple temperatures



IV curve at multiple irradiance



* Irradiance of 1000W/m², spectrum AM of 1.5 and cell temperature of 25 $^{\circ}C$
Best in class AAA solar simulator (IEC 60904-9) used, electrical measurement tolerance \pm 3%

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

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Modules in the TP330 series TP318 TP321 TP324 TP327 TP330

Electrical parameters at standard test conditions (STC)*

Nominal power output (W)	318	321	324	327	330
Power tolerance (W)	0 ~ +3	0 ~ +3	0 ~ +3	0 ~ +3	0 ~ +3
Module efficiency (η %)	16.3	16.5	16.7	16.8	17.0
Voltage at P _{MAX} V _{MPP} (V)	37.1	37.2	37.2	37.3	37.4
Current at P _{MAX} I _{MPP} (A)	8.59	8.65	8.72	8.79	8.83
Open-circuit voltage V _{OC} (V)	45.0	45.0	45.1	45.1	45.1
Short-circuit current I _{SC} (A)	9.03	9.09	9.15	9.22	9.26

Electrical parameters at NOCT

Power output P _{MAX} (W)	229.0	231.1	233.3	235.5	237.0
Voltage at P _{MAX} V _{MPP} (V)	32.6	32.6	32.7	32.7	32.8
Current at P _{MAX} I _{MPP} (A)	7.03	7.09	7.14	7.20	7.24
Open-circuit voltage V _{OC} (V)	39.5	39.6	39.6	39.6	39.6
Short-circuit current I _{SC} (A)	7.41	7.44	7.47	7.50	7.53

Temperature coefficient characteristics

NOCT (°C)	47 ± 2
Module efficiency (%/°C)	-0.06 ± 0.01
Temperature coefficient of P _{MAX} (%/°C)	-0.42
Temperature coefficient of V _{OC} (%/°C)	-0.2931
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Operating conditions

Maximum system voltage (UL & IEC) (V)	1000 & 1000
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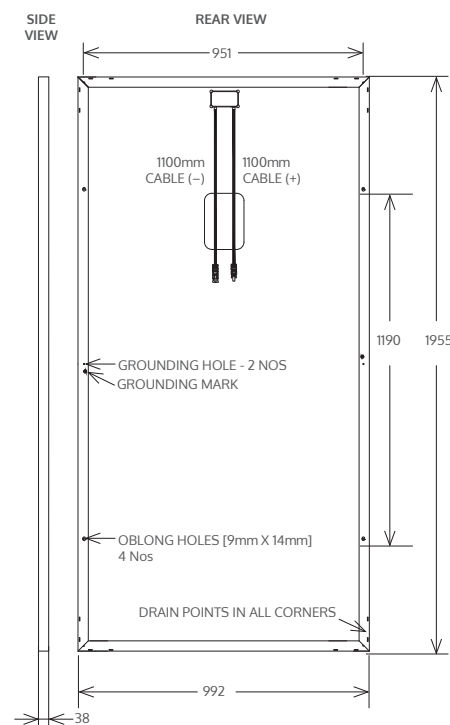
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Frame material	Anodized aluminium T6-6063 alloy
Glass	3.2mm ARC
Junction box	IP67 rated
Cable connector	MC4/MC4 compatible (4mm ²)
RFID	Outside the module (back side)

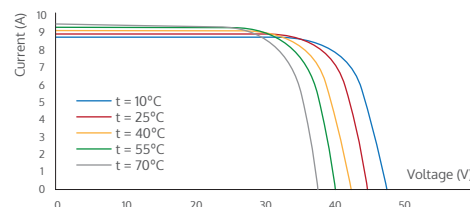
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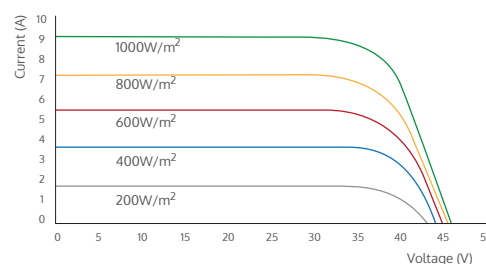
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