



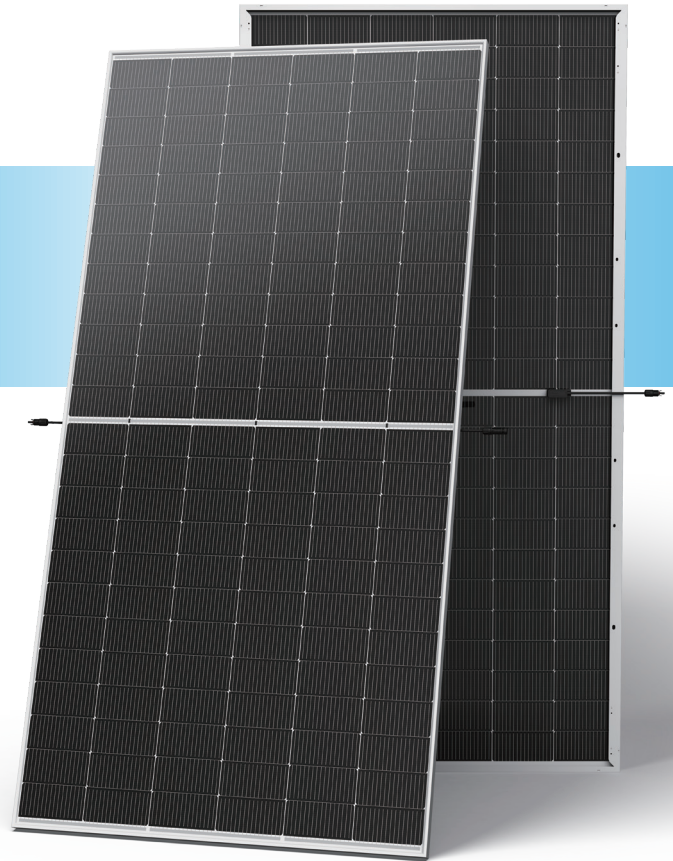
# P-type PERC

Bifacial Dual Glass Monocrystalline Module

TSM-DEG21C.20    **645-665W**

**665W** / MAXIMUM POWER OUTPUT

**21.4%** / MAXIMUM EFFICIENCY



## High customer value

- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance Of System) cost, shorter payback time
- Lowest guaranteed first year and annual degradation
- Designed for compatibility with existing mainstream system components



## High power up to 665W

- Up to 21.4% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection



## High reliability

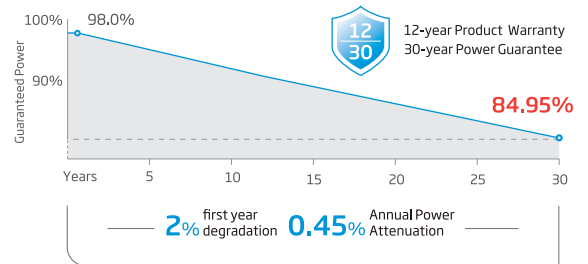
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load



## High energy yield

- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.34%) and operating temperature
- Up to 25% additional power gain from back side depending on albedo

## Performance Warranty



\* Please refer to product warranty for details

## Comprehensive Products and System Certificates

IEC61215/IEC61730/IEC61701/IEC62716/UL61730

ISO 9001: Quality Management System

ISO 14001: Environmental Management System

ISO14064: Greenhouse Gases Emissions Verification

ISO45001: Occupational Health and Safety Management System



**ELECTRICAL DATA** (STC & NOCT)

Testing Condition	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI
Peak Power Watts- $P_{MAX}(W_p)^*$	645	488	706	650	492	711	655	495	717	660	499	722	665	504	728
Power Selection (W)**	0 ~ +5														
Maximum Power Voltage- $V_{MPP}$ (V)	37.5	34.9	37.5	37.7	35.1	37.7	37.9	35.2	37.9	38.1	35.4	38.1	38.3	35.6	38.3
Maximum Power Current- $I_{MPP}$ (A)	17,23	13,98	18,83	17,27	14,01	18,87	17,31	14,05	18,92	17,35	14,10	18,96	17,39	14,16	19,00
Open Circuit Voltage- $V_{oc}$ (V)	45.3	42.7	45.3	45.5	42.9	45.5	45.7	43.0	45.7	45.9	43.2	45.9	46.1	43.4	46.1
Short Circuit Current- $I_{sc}$ (A)	18,31	14,75	20,04	18,35	14,79	20,08	18,40	14,83	20,14	18,45	14,87	20,19	18,50	14,91	20,25
Module Efficiency $\eta_m$ (%)	20.8			20.9			21.1			21.2			21.4		

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Air Mass AM1.5. NOCT: Irradiance at 800W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s. \*Measuring tolerance: ±3%. \*\*Power selection up to: +3%.

**Electrical characteristics with different power bin** (reference to 5% & 10% backside power gain)

Backside Power Gain	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%
Peak Power Watts- $P_{MAX}(W_p)$	677	710	683	715	688	721	693	726	698	732
Maximum Power Voltage- $V_{MPP}$ (V)	37,5	37,5	37,7	37,7	37,9	37,9	38,1	38,1	38,3	38,3
Maximum Power Current- $I_{MPP}$ (A)	18,09	18,95	18,13	19,00	18,18	19,04	18,22	19,09	18,26	19,13
Open Circuit Voltage- $V_{oc}$ (V)	45,3	45,3	45,5	45,5	45,7	45,7	45,9	45,9	46,1	46,1
Short Circuit Current- $I_{sc}$ (A)	19,23	20,14	19,27	20,19	19,32	20,24	19,37	20,30	19,43	20,35

Power Bifaciality: 70±5%.

**TEMPERATURE RATINGS**

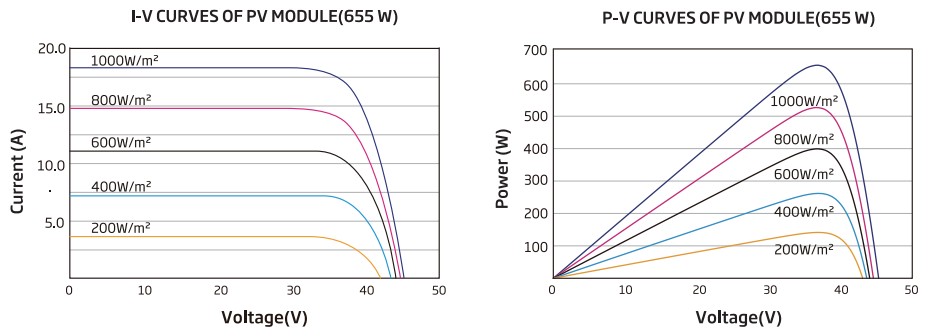
NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of $P_{MAX}$	-0.34% /°C
Temperature Coefficient of $V_{oc}$	-0.25% /°C
Temperature Coefficient of $I_{sc}$	0.04% /°C

Due to different testing methods, the actual performances might differ from the declared specifications.

**MAXIMUM RATINGS**

Operational Temperature	-40~+85°C
Maximum System Voltage	1500V DC (IEC) 1500V DC (UL)
Max Series Fuse Rating	35A

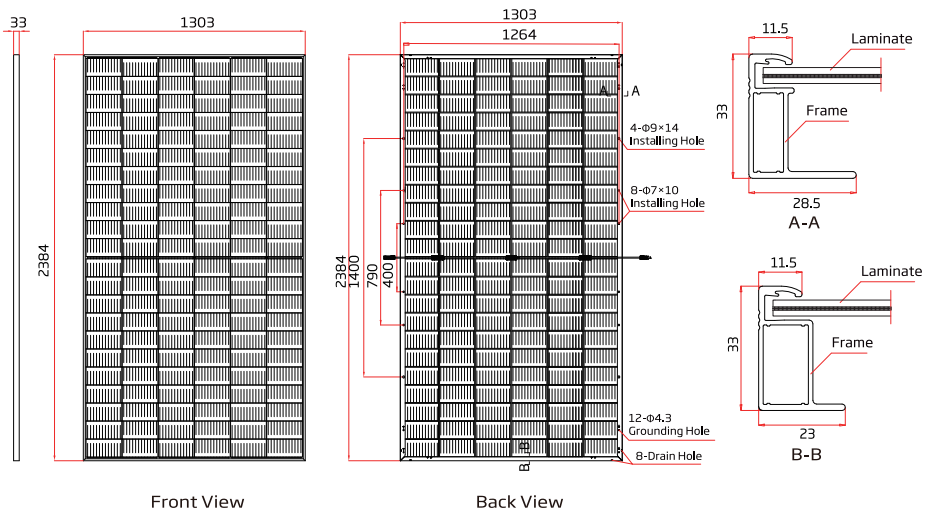
**CURVES OF PV MODULE**



**MECHANICAL DATA**

Solar Cells	Monocrystalline
No. of cells	132 cells
Module Dimensions	2384×1303×33 mm (85.51×51.30×1.30 inches)
Weight	38.3 kg (84.4 lb)
Front Glass	2.0 mm (0.08 inches), AR Coating Heat Strengthened Glass
Back Glass	2.0 mm (0.08 inches), Heat Strengthened Glass (White Coating)
Frame	33mm (1.30 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm <sup>2</sup> (0.006 inches <sup>2</sup> ) Portrait: 350/280 mm (13.78/11.02 inches) Length can be customized
Connector	MC4 EV02 / TS4*
PACKAGING CONFIGURATION	Modules per box: 33 pieces Modules per 40' container: 594 pieces

\*Please refer to regional datasheet for specified connector.



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CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.  
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