

# TM Series®

## HALF CELL

132 Cells (66) - 210mm

## 650 - 670 WP

- Mismatch loss reduction for maximum efficiency
- Reduced power loss by minimizing the effect of shadow shading (**9-12 BusBar**)
- **Positive** (0 - 3%) **tolerance** in all our TM Series® modules
- Proven reliability through PVEL's weatherproofing tests
- **Fully automated production** at all stages



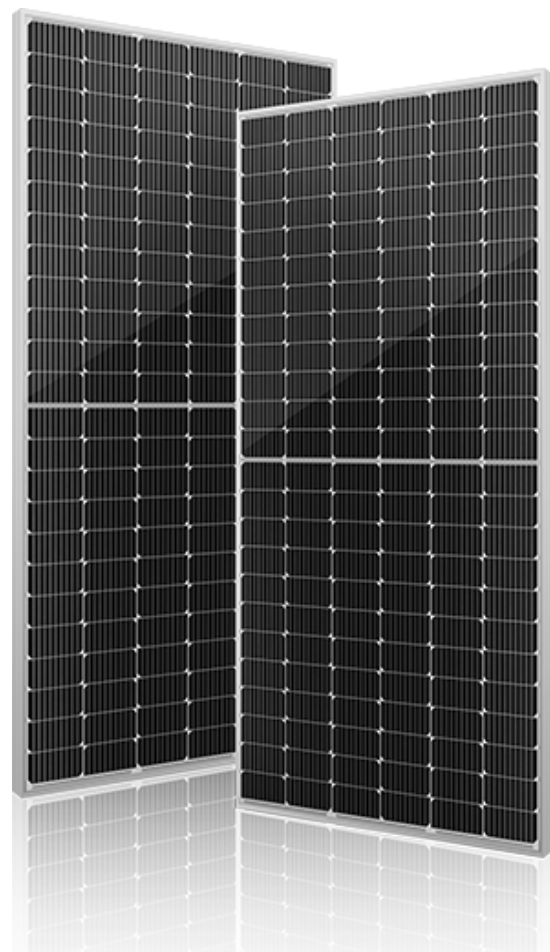
**25-YEAR WARRANTY**  
**MATERIALS & PROCESSING**



**30-YEAR WARRANTY**  
**LINEAR POWER OUTPUT**



**EUROPEAN WARRANTY &**  
**AFTER-SALES SERVICE**



## Product Certifications

CE

EC 61215

IEC 61730

ISO 9001: Quality Management System

ISO 14001: Environmental Management System



**21,6%**

MAX MODULE  
EFFICIENCY

**0 - 3%**

POWER  
TOLERANCE

**2,5%**

FIRST YEAR POWER  
DEGRADATION

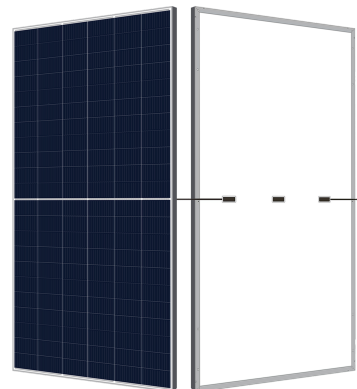
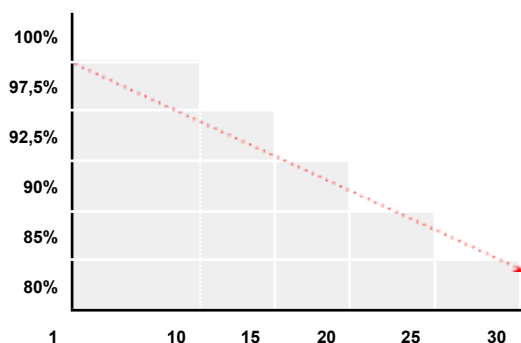
**0,50%**

YEAR 2-30  
POWER DEGRADATION

**HALF CELL**

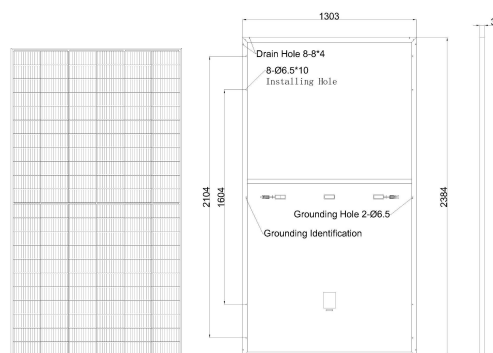
Lower operating temperature

### 30-Year Linear Power Warranty



### Mechanical parameters

Cell Orientation	single crystal PERC210x105mm (132 pieces)
Junction Box	IP68, three diodes
Output Cable	4.0mm² 1200mm(+) / 1200mm(-) or customized
Glass	3.2mm tempered coated glass, low iron
Frame	Anodized aluminum alloy frame
Weight	32 kg
Dimensión	2384x1303x35mm
Packaging	31 pcs*pallet / 124 cs*20GP / 558 pcs*40HC



### Electrical Characteristics

STC: AM1.5 1.000W/m² NOTC: AM1.5 800W/m² 20° 1 m/s Test uncertainty for Pmax + -3%

Module type	TM - 650 M-132 HC		TM - 655M-132 HC		TM - 660 M-132 HC		TM - 665M-132 HC		TM - 670 M-132 HC	
Testing condition	STC	NOTC	STC	NOTC	STC	NOTC	STC	NOTC	STC	NOTC
Maximum Power (Pmax/w)	650	484	655	487	660	491	665	495	670	498
Open Circuit Voltage (Voc/V)	45	42,6	45,2	42,8	45,4	43,0	45,6	43,1	45,8	43,3
Short Circuit Current (Isc/A)	18,39	14,41	18,43	14,43	18,47	14,48	18,51	14,57	18,55	14,58
Voltage at Maximum Power (Vmp/V)	37,6	35,7	37,8	35,9	38	36,05	38,2	36,1	38,4	36,3
Current at maximum Power (Imp/A)	17,29	13,56	17,33	13,57	17,37	13,62	17,41	13,71	17,45	13,72
Module Efficiency (%)	20,90%	15,58%	21,10%	15,68%	21,30%	15,81%	21,40%	15,94%	21,60%	16,03%

### Operating Parameters

Operational Temperature	-40°C - +85°C
Power Output Tolerance	(0, +3%)
Voc and Isc Tolerance	±3%
Maximum System Voltage	1500V DC
Maximum Series Fuse Rating	30 A
Nominal Operating Cell Temperature	45±2°C
Protection Glass	Class II
Fire Rating	Class C

### Mechanical Loading

Front Side Maximum Static Loading	5400 PA
Rear Side Maximum Static Loading	2400 PA
Hailstone Test	Diameter 25mm, impact speed 23m/s

### Temperatura ratings (STC)

Temperature Coefficient of Isc	+0.05%/°C
Temperature Coefficient of Voc	-0.27%/°C
Temperature Coefficient of Pmax	-0.35%/°C