



Recommended For



Residential Roof



Commercial Roof

TPSM5U

Black Mono Crystalline
Photovoltaic Module

190W/195W



Plus power tolerance (0-3%) to ensure the high reliability of power output



Modules certified by TÜV to withstand high level of wind loads (2400 Pa) and snow loads (5400 Pa)*



Anti-reflective, hydrophobic layer of module surface (proprietary 800° C online coating technology) improves light absorption and reduces surface dust



Easy installation and minimal maintenance with compatibility to industry standard inverters and mounting systems



Special PV Module Insurances by world leading insurance company guarantees the benefit of PV investors and PV module users



Junction box and bypass diodes guarantee the modules free of overheating and “hot spot effect”



Modules' excellent performance under low light environments (mornings, evenings, and cloudy days) create better kWh/kW ratio and produce average 2-3% more electricity in the field

Guaranteed Performance**

10 Years
Manufacturing Warranty

12 Years Warranty,
90% Power Output

25 Years Warranty,
80% Power Output

Free module recycling through
membership in the PV Cycle Association.

Choosing Topray Solar

- Professional solar producer and solutions provider since 1992, reliable partner of global distributors, installers and project integrators.
- The most vertically integrated solar manufacturer in the industry with production of ingots, wafer, solar cells and modules using both mono crystalline and multi crystalline technology.
- Manufacturing with international quality standards and environment management system: ISO 9001 and ISO 14001.
- Global distribution with local warehousing, delivery and after sales services.



- Minimal wiring effort required as the module has high reverse current resistance.
- Most updated design with drainage holes in the frame ensures the modules to withstand various weather conditions.



* Please refer to Topray Safety and Installation Manual for details.

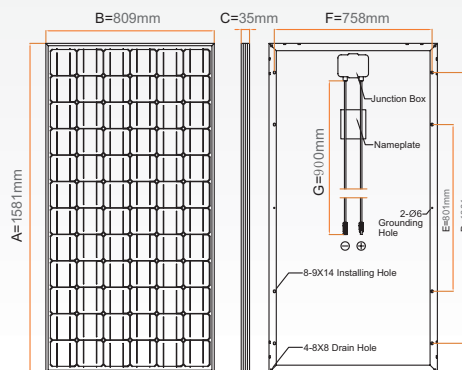
** Please refer to Topray Limited Product Warranty for details.

TPSM5U 190W/195W Black Mono Crystalline Photovoltaic Module

MECHANICAL SPECIFICATION

Cell Type	Mono crystalline 125×125 mm (5 inches)
Number of cells	72 (6×12)
Dimensions (A×B×C)	1581×809×35mm
Weights	13kg
Front Glass	3.2 mm Low iron tempered glass
Frame	Anodized aluminum
Junction Box	IP 65, with bypass diodes
Connector	MC4 compatible
Output Cables	TÜV, length 900mm, 4.0mm ²

MECHANICAL DRAWINGS



ELECTRICAL CHARACTERISTICS

PERFORMANCE AT STANDARD TEST CONDITION (STC: 1000 W/m², 25 °C, AM 1.5)

Module Series	TPSM5U – Topray Universal	
Maximum Power at STC (Pmax)	190W	195W
Short Circuit Current (Isc)	5.65A	5.71A
Open Circuit Voltage (Voc)	44.90V	45.20V
Maximum Power Current (Impp)	5.28A	5.36A
Maximum Power Voltage (Vmpp)	36.00V	36.40V
Encapsulated Cell Efficiency	17.20%	17.60%
Module Efficiency	14.90%	15.20%
Power Tolerance	0/+3%	0/+3%

PERFORMANCE AT NORMAL OPERATING CELL TEMPERATURE (NOCT: 800W/m², 47±3 °C, AM 1.5)

Maximum Power (Pmax)	137W	141W
Short Circuit Current (Isc)	4.76A	4.82A
Open Circuit Voltage (Voc)	41.60V	41.90V
Maximum Power Current (Impp)	4.32A	4.38A
Maximum Power Voltage (Vmpp)	31.70V	32.10V

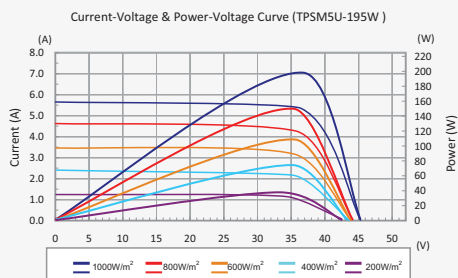
The typical relative change in module efficiency at an irradiance of 200W/m² in relation to 1000W/m² (both at 25 °C and AM 1.5 spectrum) is less than 6%.

TEMPERATURE CHARACTERISTICS

Nominal Operating Cell Temperature (NOCT)	47±3 °C
Temperature Coefficient of Pmax (γ)	-0.44%/K
Temperature Coefficient of Voc (β)	-0.36%/K
Temperature Coefficient of Isc (α)	0.05%/K

PACKING CONFIGURATION

Container	20' GP	40' HQ
Pieces per pallet	28	28
Pallets per container	14	28
Pieces per container	392	784+84



SYSTEM INTEGRATION PARAMETERS

Maximum system voltage	DC 1000V
Maximum Series Fuse	10A
Maximum reverse current	13.5A
Increased snowload acc. to IEC 61215	5400Pa
Operating Temperature	-40~+85 °C
Number of bypass diodes	3

QUALIFICATIONS AND CERTIFICATES

CE-Compliant, IEC 61215 (Ed.2), IEC 61730 (Ed.1) application class A, TÜV Safety Class II, UL 1703



DEALER INFORMATION BOX