



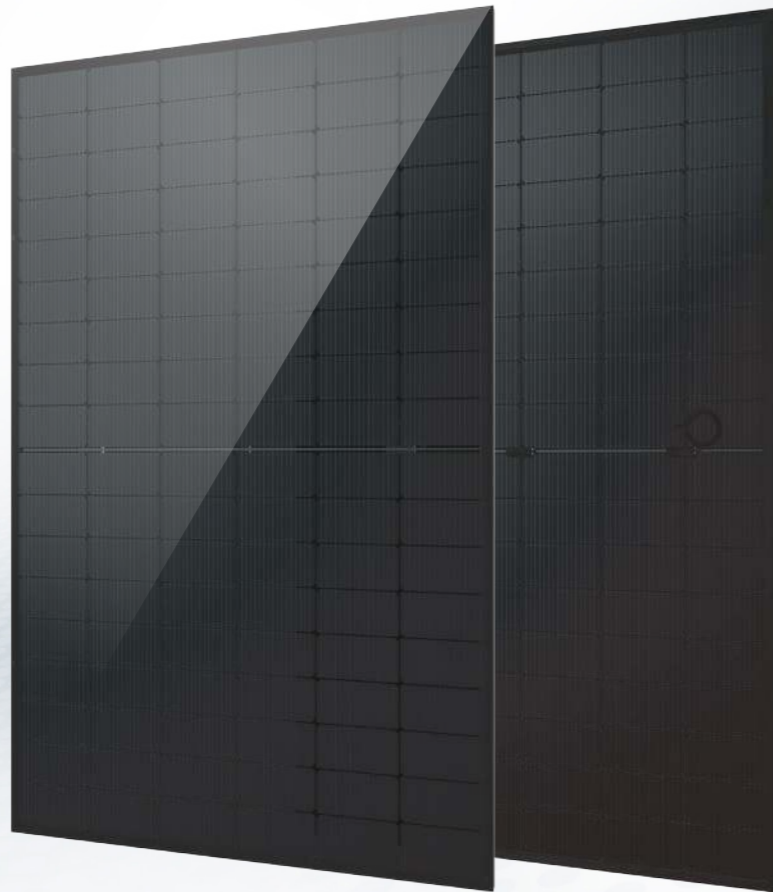
Black Series

TPC-RA54HD(BK)

Product Range

440-460W

N-Type Rectangle Bifacial
Double Glass High Efficiency



460W

Maximum Power Output

0~+5W

Positive Power Tolerance

23.02%

Maximum Efficiency

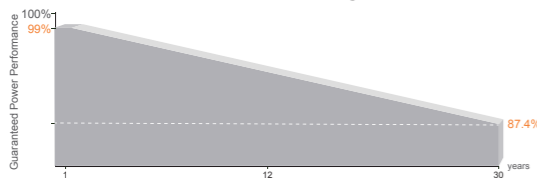
Linear Performance Warranty

25 Year Product Warranty

30 Year Linear Power Warranty

<1% First year Power Degradation

<0.4% Year 2-30 Power Degradation



Certifications

Quality Management System and Product Certification.

IEC61215(2021), IEC61730(2023), IEC61701

IEC61215-2 (bifaciality): 2021

ISO9001:2015: Quality Management System

ISO14001:2015: Environment Management System

ISO45001:2018: Occupational health and safety management systems



MBB Half-Cut Rectangle Solar Cell

182x94mm, 108 cells.

Small In Size, Bigger On Power

Up to 460W, 23.02% module efficiency with high density interconnect technology.

Transparent Dual-glass Design

Excellent fire rating, with better temperature coefficient.

Universal Solution For Residential And C&I Rooftops

Perfect size and low weight for handling and installation.

Double Glass, 54-CELL HALF-CUT SERIES

ELECTRICAL PARAMETERS AT STC

Module Type: TPCRA54HD(BK)	440M	445M	450M	455M	460M
Maximum Power(Wp)	440W	445W	450W	455W	460W
Open Circuit Voltage(Voc)	38.90V	39.10V	39.30V	39.50V	39.65V
Short Circuit Current(Isc)	14.31A	14.40A	14.48A	14.56A	14.64A
Maximum Power Voltage(Vm)	32.47V	32.65V	32.82V	33.00V	33.17V
Maximum Power Current(Imp)	13.55A	13.63A	13.71A	13.79A	13.87A
Module Efficiency	22.02%	22.27%	22.52%	22.77%	23.02%
Maximum Series Fuse	25A				
Watts Positive Tolerance	0~+5W				
Number Of Diode	3				
Standard Test Conditions	1000W/M ² ,25°C,AM1.5				
Maximum System Voltage	1500V/DC				
Temperature-Coefficient Isc	+0.046%/°C				
Temperature-Coefficient Voc	-0.26%/°C				
Temperature-Coefficient Pmpp	-0.30%/°C				
Operating Temperature	-40°C...+85°C				
Normal Operating Cell Temperature	45±2				
Load Capacity For The Cover Of The Module (Glass)	3600Pa(IEC61215)(snow)				
Load Capacity For The Front & Back Of The Module	2400Pa(IEC61215)(wind)				

108HC BNPI (1000w/m² + 135w/m²)

Module Type: TPC-RA54HD(BK)	440M	445M	450M	455M	460M
Maximum Power(Wp)	484W	490W	495W	501W	506W
Open Circuit Voltage(Voc)	38.93V	39.11V	39.32V	39.51V	39.65V
Short Circuit Current(Isc)	15.74A	15.84A	15.93A	16.02A	16.09A
Maximum Power Voltage(Vm)	32.49V	32.67V	32.83V	33.01V	33.16V
Maximum Power Current(Imp)	14.90A	15.00A	15.08A	15.18A	15.26A

108HC BSI (1000w/m² + 300w/m²)

Module Type: TPC-RA54HD(BK)	440M	445M	450M	455M	460M
Maximum Power(Wp)	541W	547W	554W	560W	566W
Open Circuit Voltage(Voc)	38.92V	39.12V	39.32V	39.54V	39.75V
Short Circuit Current(Isc)	17.60A	17.71A	17.81A	17.91A	18.00A
Maximum Power Voltage(Vm)	32.49V	32.67V	32.84V	33.04V	33.20V
Maximum Power Current(Imp)	16.66A	16.75A	16.85A	16.95A	17.05A

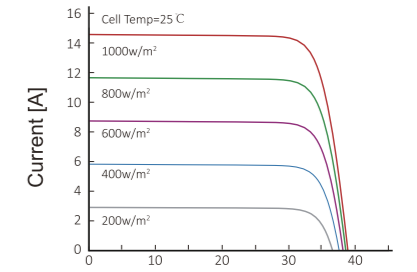
MECHANICAL CHARACTERISTICS

Front/Back Cover (Material / Thickness)	low-iron tempered glass 2.0 / 2.0 mm
Cell (Quantity / Material / Dimensions)	108(6x18) / monocrystalline silicon
Frame (Material / Color)	aluminum hollow-chamber frame on each side anodized aluminum alloy / Black
Junction Box (Protection Degree)	≥IP68
Cables & Plug Connectors	4mm ² , 300mm in length,length can be customized
Module Dimensions (L / W / H)	1762(±2)x1134(±2)x30(±1)mm
Module Weight	22.5 kg
Application Class	Class A
Electrical Protection Class	Class II
Fire Safety Class	Class A

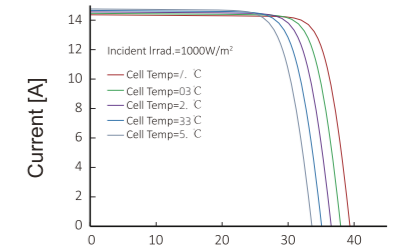
PACKING

Container Size	Units/Pallet (PCS)	Weight/Pallet (KG)	Pallet Measurement (mm)	Units/Container (PCS)
40HQ	36	845	1790x1120x1260	936

CURRENT-VOLTAGE CURVES:



Module characteristics at constant module temperatures of 25°C and variable levels of irradiance



Module characteristics at variable module temperatures and constant module irradiance of 1.000 W/m²

MODULE DIAGRAM:

