



All-Black Solar Panels-48 440-450W



Highly Anti PID

linear power warranty with first year $\leq 1\%$ degradation and an annual degradation rate of up to 0.4% after that



Better low irradiance response

Superior power generation under shading conditions



Highly reliable

15-year product warranty, 30-year linear power output warranty



Improvement in power generation performance

Conversion efficiency up to 22.5%



Bifacial Energy Yield | N-type Silicon Wafer

Bifacial rate of up to 80%, module additional power generation of up to 10% over regular modules

QUALITY SYSTEM

IEC 61215(2021), IEC 61730(2018)

ISO 9001:2015: Quality management systems

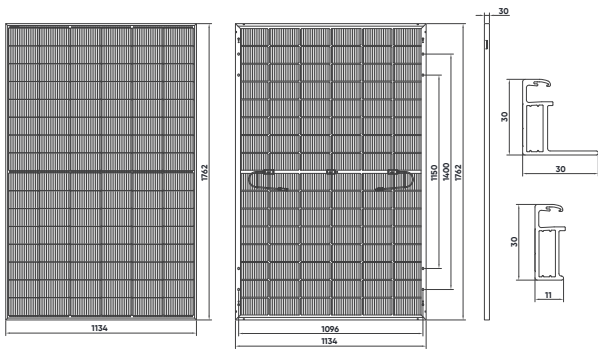
ISO 14001:2015: Environmental management systems

ISO 45001:2018: Occupational health and safety management systems

Electrical Characteristics

Module Type	QM210 THCD-440-48	QM210 THCD-445-48	QM210 THCD-450-48
	STC	STC	STC
Maximum Power[W]	440	445	450
Maximum Power Voltage[V]	29.50	29.70	29.90
Maximum Power Current[A]	14.92	14.99	15.06
Open circuit voltage[V]	34.98	35.19	35.40
Short Circuit Current[A]	15.98	16.06	16.14
Module Efficiency	22.0%	22.3%	22.5%
Operating Temperature	-40°C~+85°C		
Maximum System Voltage	DC 1500V		
Maximum Series Fuse Rating	25A		
Power Tolerance[W]	0~+5W		
Voc Temperature Coefficient	-0.28%/°C		
Pmax Temperature Coefficient	-0.29%/°C		
Isc Temperature Coefficient	0.04%/°C		
Nominal Operating Cell Temperature	45±2°C		

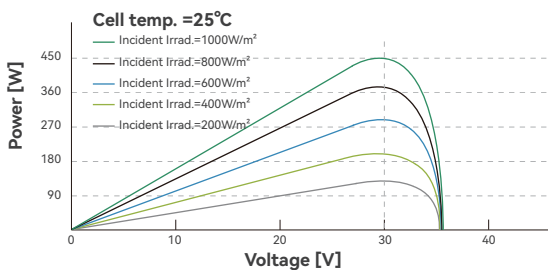
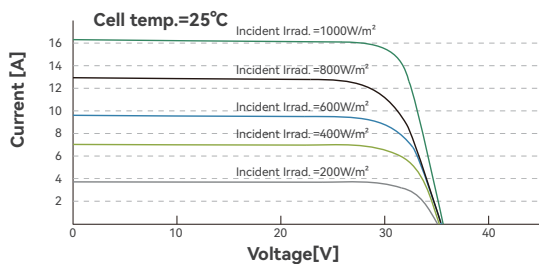
Technical drawing



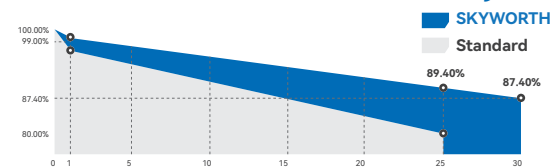
Mechanical Specifications

Solar Cells	96(48×2)
Dimension	1762×1134×30mm
Weight	24.2kg
Front Glass	2.0mm AR coated heat strengthened-Glass
Back Glass	2.0mm heat strengthened-Glass
Frame	Anodized aluminium alloy
Junction Box	IP68 / 3 diodes
Output Cables	4mm ² (IEC),+1200mm/-1200mm or customiz
Bifaciality	ed 80%+5%

Characteristic



Linear Performance Warranty



15 YEARS 15-year product warranty
30 YEARS 30-year linear power output warranty
0.4% year 2-30 power degradation

Level

Fire Performance	C
Security Protection	Class II

Packing Configuration

Pallet	36pcs/Pallet
Container	936pcs/40HQ Container

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