YINGLI SOLAR

panda 3.0 Mini 2

465W

MAXIMUM MODULE EFFICIENCY

23.3%

POSITIVE POWER TOLERANCE

0~+5W

N

N-type TOPCon Bifacial Module

IMPROVED POWER
NEVER SETTLE FOR LESS

- Backside Yield
- Wide Applications
- Superior Yield
- Outstanding Bifaciality
- Excellent Durability

30 YEAR POWER WARRANTY

12 YEAR PRODUCT WARRANTY

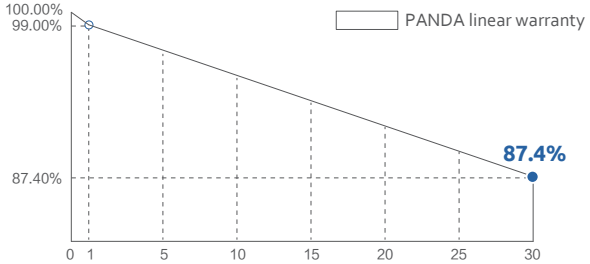
Yingli Solar Website

QUALIFICATIONS & CERTIFICATES

IEC 61215, IEC 61730, CE
ISO 9001: Quality management systems
ISO 14001: Environmental management systems
IEC 62941: Quality system for PV module manufacturing
ISO 45001: Occupational health and safety management systems

Warranty partner

Munich RE



1.00% the 1st year power degradation
0.40% annual power degradation

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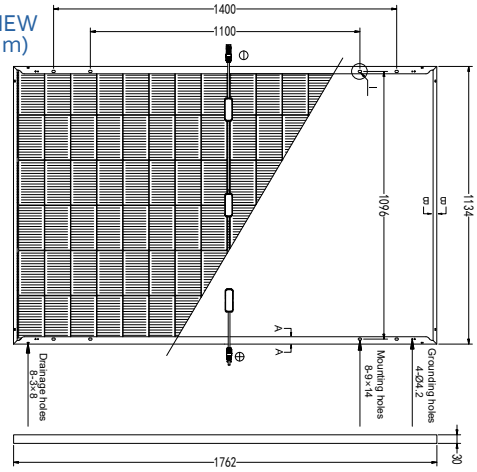
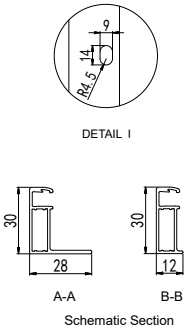
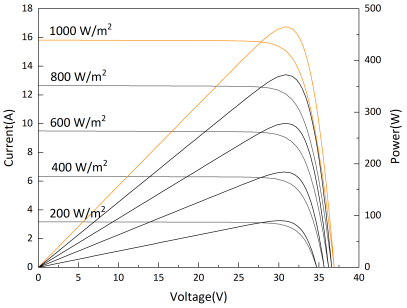
BACK VIEW
(units:mm)





I-V / P-V CURVES



Warning: Read the Installation and User Manual in its entirety before handling, installing and operating Yingli Solar modules.

Electrical Parameters at Standard Test Conditions (STC)

Module type	YLxxxCF48 i/2 (xxx=Pmax)					
Power output*-Pmax (W)	440	445	450	455	460	465
Power output tolerances– ΔPmax (W)	0 / + 5					
Module efficiency-η_m (%)	22.0	22.3	22.5	22.8	23.0	23.3
Voltage at Pmax - Vmpp (V)	29.68	29.91	30.14	30.37	30.60	30.83
Current at Pmax-Impp (A)	14.83	14.88	14.94	14.99	15.04	15.09
Open-circuit voltage*-Voc (V)	35.84	36.05	36.26	36.47	36.68	36.89
Short-circuit current*-Isc (A)	15.52	15.58	15.64	15.70	15.76	15.82

STC: 1000 W·m^{-2} irradiance, 25℃ cell temperature, AM 1.5. *Measruing tolerance: ±3%.

Electrical Parameters at Nominal Operating Cell Temperature (NOCT)

Power output-Pmax (W)	335	338	342	346	350	354
Voltage at Pmax - Vmpp (V)	28.31	28.53	28.75	28.97	29.19	29.41
Current at Pmax-Impp (A)	11.82	11.86	11.91	11.95	11.99	12.03
Open-circuit voltage-Voc (V)	34.03	34.23	34.43	34.63	34.83	35.03
Short-circuit current-Isc (A)	12.50	12.55	12.60	12.65	12.70	12.75

NOCT: open-circuit module operation temperature at 800 W·m^{-2} irradiance, 20℃ ambient temperature, 1 m · s^{-1} wind speed.

Bifacial Electrical Parameters at Standard Test Conditions(BNPI)

Power output-Pmax (W)	488	493	499	504	510	515
Voltage at Pmax - Vmpp (V)	29.68	29.91	30.14	30.37	30.60	30.83
Current at Pmax-Impp (A)	16.43	16.49	16.55	16.61	16.66	16.72
Open-circuit voltage-Voc (V)	35.84	36.05	36.26	36.47	36.68	36.89
Short-circuit current-Isc (A)	17.20	17.26	17.33	17.40	17.46	17.53

BNPI: 1000W·m^{-2} on the front side and 135 W·m^{-2} on the back side , 25℃ cell temperature, AM 1.5.
Bifaciality coefficient is 80% ± 5%.

Thermal Characteristics

Nominal operating cell temperature–NOCT(℃)	42±2
Temperature coefficient of Pmax– γ (% / ℃)	– 0.29
Temperature coefficient of Voc– β (% / ℃)	– 0.24
Temperature coefficient of Isc– α (% / ℃)	0.042

Packaging Specifications

Number of modules per pallet	36
Number of pallets per 40' container	26
Packaging box dimensions (L / W / H)	1780 mm / 1110 mm / 1245 mm
Box weight	782 kg

Operating Conditions

Max. system voltage	1500 VDC
Max. series fuse rating*	30 A
Operating temperature range	– 40℃~ 85℃
Max. static load, front (e.g., snow)	5400 Pa
Max. static load, back (e.g., wind)	2400 Pa
Max. hailstone impact (diameter / velocity)	25 mm / 23 m·s^{-1}

*Do not connect fuse in combiner box with two or more strings in parallel connection.

General Characteristics

Dimensions (L / W / H)	1762 mm / 1134 mm / 30 mm
Weight	20.7 kg

Construction Materials

Cell (material / quantity)	n-type monocrystalline silicon / 6 x 16
Glass (thickness)	1.6 mm / 1.6 mm
Frame (material)	anodized aluminum alloy
Junction box (type / protection degree)	3 bypass diodes / ⩾ IP68
Cable (length / cross-sectional area)	± 1200 mm / 4 mm^2

- Due to continuous innovation, research and product improvement, the specifications in this product information sheet are subject to change without prior notice. The specifications may deviate slightly and are not guaranteed.
- The data do not refer to a single module and they are not part of the offer, they only serve for comparison to different module types.

Yingli Solar Website

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