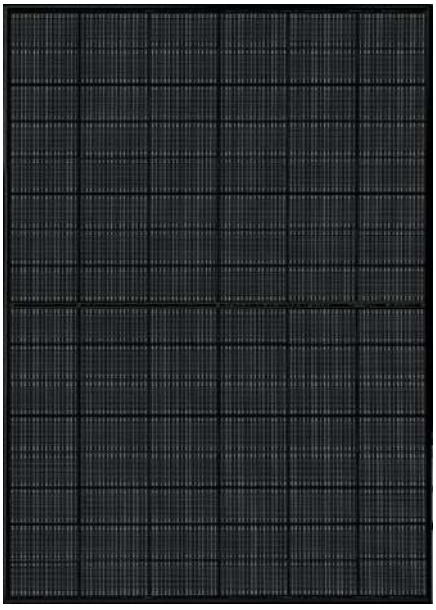
SUNTECH

Ultra T 2.0

HALF-CELL N-TYPE TOPCon
BLACK PRO BIFACIAL DOUBLE-GLASS MODULE
TYPE: STPXXXS-H48-Nsfb+

445-465W
POWER OUTPUT

23.3%
MAX EFFICIENCY



Aesthetic appearance design

Elegant design in all-black appearance, harmonious integration with the components of the building to provide an intense aesthetic experience

Multi busbar technology

Superior optical utilization and current collection capability, effectively improving product power and reliability

Excellent low light performance

Superior optical utilization and current collection capability, effectively improving product power and reliability

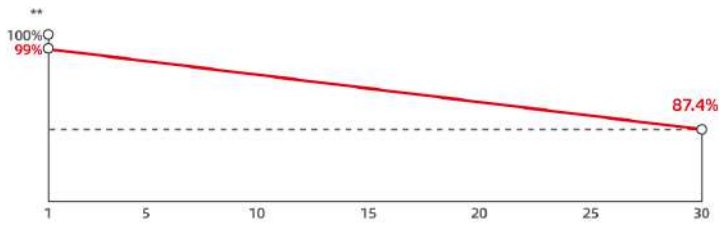
Superior load-bearing capability

Module certified to withstand **5400 Pa** front side max static test load and **2400 Pa** rear side max static test load *

ISO 14001	Environment Management System
ISO 45001	Occupational Health and Safety
ISO 9001	Quality Management System
SA 8000	Social Responsibility Standards
IEC TS 62941	Guideline for Module Design
IEC 61730-2 (UL790)	Fire Class C

30 years of linear warranty

25 years of product warranty



First year power degradation 1% Annual degradation 0.40%

* Please efer to Suntech Standard Module Installation Manual for details.

** Linear Power Output Warranty: Front-side performance only. Please refer to Suntech Limited Warranty for details.

*** WEEE only for EU market.

**** Suntech reserves the right to the final.

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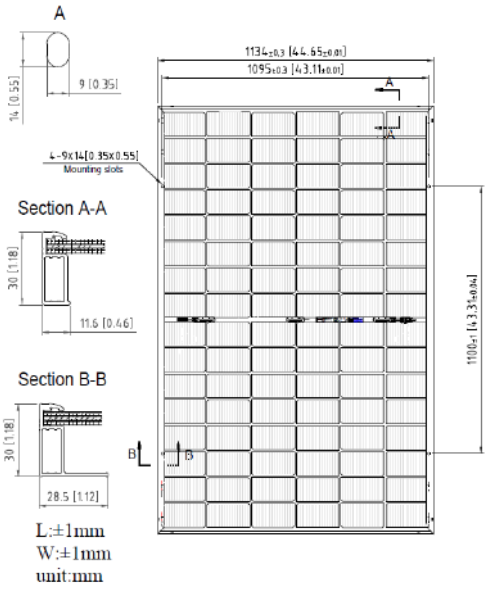
Ultra T 2.0 STPXXXS-H48-Nsfb+ 445-465W

Mechanical Characteristics

Solar Cell	N-type monocrystalline silicon
No. of Cells	96 (6 × 16)
Dimensions	1762 × 1134 × 30 mm (69.4 × 44.6× 1.2 inches)
Weight	24.8 kg (54.67 lbs.)
Front/Back Glass	2.0 + 2.0 mm (0.079 + 0.079 inches) semi-tempered glass
Output Cables	4.0 mm², (-) 1400 mm (+) 1400 mm in length or customized length
Junction Box	IP68 rated (3 bypass diodes)
Operating Module Temperature	-40 °C to +70 °C (T98th)
Maximum System Voltage	1500 V DC (IEC)
Connectors	Wuxi Suntech STP-XC4-4 (Default) Stäubli PV-KST4-EVO2A/xy, PV-KBT4- EVO2A/xy (Optional)
Maximum Series Fuse Rating	35 A
Power Tolerance	0 ~ + 3%
Refer. Bifaciality Factor	(80 ± 5)%
Frame	Anodized aluminum alloy frame
Packing Configuration	36 pieces per pallet 936 pieces per container / 40'HC 1796 × 1120 × 1255 mm per pallet 935 kg per pallet



Electrical Characteristics (STC)

Module Type	STP465S-H48-Nsfb+	STP460S-H48-Nsfb+	STP455S-H48-Nsfb+	STP450S-H48-Nsfb+	STP445S-H48-Nsfb+
Maximum Power (Pmax/W)	465	460	455	450	445
Optimum Operating Voltage (Vmp/V)	30.73	30.51	30.28	30.04	29.81
Optimum Operating Current (Imp/A)	15.13	15.08	15.03	14.98	14.93
Open Circuit Voltage (Voc/V)	36.42	36.25	36.08	35.91	35.74
Short Circuit Current (Isc/A)	15.87	15.82	15.77	15.72	15.67
Short Circuit Current at BSI (Isc/A)	19.68	19.62	19.55	19.49	19.43
Module Efficiency (%)	23.3	23.0	22.8	22.5	22.3

STC: Irradiance 1000 W/m², module temperature 25 °C, AM=1.5; BSI: Front irradiance 1000 W/m², rear irradiance 300 W/m², module temperature 25 °C, AM=1.5; Measuring tolerance of Pmax, Voc, Isc is within +/- 3%;

Electrical Characteristics (BNPI)

Maximum Power (Pmax/W)	505	500	494	489	484
Optimum Operating Voltage(Vmp/V)	31.00	30.77	30.53	30.30	30.07
Optimum Operating Current (Imp/A)	16.29	16.24	16.18	16.13	16.08
Open Circuit Voltage (Voc/V)	36.53	36.36	36.19	36.02	35.85
Short Circuit Current (Isc/A)	17.29	17.24	17.18	17.13	17.08

BNPI: Irradiance frontside 1000 W/m², backside 135 W/m², module temperature 25 °C, AM=1.5; Bifaciality coefficient (±5%): ϕPmax=80%, ϕVoc=99%, ϕIsc=80%.

Bifacial Gain with 5%

Maximum Power (Pmax/W)	488	483	478	473	467
Optimum Operating Voltage (Vmp/V)	30.73	30.51	30.28	30.04	29.81
Optimum Operating Current (Imp/A)	15.89	15.83	15.78	15.73	15.68
Open Circuit Voltage (Voc/V)	36.42	36.25	36.08	35.91	35.74
Short Circuit Current (Isc/A)	16.66	16.61	16.56	16.51	16.45

The bifacial gain is the additional gain from the back side of PV. It depends on the mounting method, orientation, tilt angle of the PV module and the albedo of the ground.

Temperature Characteristics

Temperature Coefficient of Pmax	-0.29%/°C
Temperature Coefficient of Voc	-0.25%/°C
Temperature Coefficient of Isc	0.046%/°C

Information on how to install and operate this product is available in the installation instruction. All values indicated in this data sheet are subject to change without prior announcement. The specifications may vary slightly . All specifications are in accordance with standard EN 50380. Color differences of the modules relative to the figures as well as discolorations of/in the modules which do not impair their proper functioning are possible and do not constitute a deviation from the specification.

Graphs Current-Voltage & Power-Voltage (460W)