

# TWxxxP60-AA

Polycrystalline Silicon PV Module

## Product Specification

(60pcs Multi 156×156mmCells,With Tongling J-box1000V System Voltage)

### Typical Electrical Characteristics at Standard Test Conditions(STC)

Typical Type	Unit	TW220P60 - AA	TW225P60 - AA	TW230P60 - AA	TW235P60 - AA	TW240P60 - AA
Max-Power	P <sub>m</sub> (W)	220	225	230	235	240
Power Tolerance	W	0 ~ + 5				
Max-Power Voltage	V <sub>m</sub> (V)	29.00	29.30	29.70	30.10	30.3
Max-Power Current	I <sub>m</sub> (A)	7.59	7.68	7.74	7.81	7.92
Open-Circuit Voltage	V <sub>oc</sub> (V)	36.60	36.65	36.70	36.70	37.1
Short-Circuit Current	I <sub>sc</sub> (A)	8.45	8.60	8.72	8.86	8.88
Encapsulated Cell Efficiency	η <sub>c</sub> (%)	15.25	15.75	16.00	16.50	16.75
Module Efficiency	η <sub>m</sub> (%)	13.38	13.69	13.99	14.29	14.60

STC:AM=1.5, 1000W/m<sup>2</sup>, Cells Temperature 25°C

### Typical Electrical Characteristics at Nominal Operating Cell Temperature (NOCT)

Typical Type	Unit	TW220P60 - AA	TW225P60 - AA	TW230P60 - AA	TW235P60 - AA	TW240P60 - AA
Max-Power	P <sub>m</sub> (W)	159.3	162.8	166.1	170.9	173.1
Max-Power Voltage	V <sub>m</sub> (V)	25.9	25.8	26.0	26.3	26.5
Max-Power Current	I <sub>m</sub> (A)	6.20	6.31	6.40	6.49	6.54
Open-Circuit Voltage	V <sub>oc</sub> (V)	33.3	33.3	33.2	34.1	33.5
Short-Circuit Current	I <sub>sc</sub> (A)	6.9	7.02	7.12	7.24	7.25

NOCT: 800W/m<sup>2</sup> irradiance, 20°C ambient temperature, 1m/s wind speed

#### MECHANICAL CHARACTERISTICS

Dimension (L×W×H)	1653mm×995mm×45mm
Standard Installation Hole Dimension	873mm×945mm
Weight	20kg
Front cover (material/type/thickness)	Low iron tempered glass 3.2mm
Cell (quantity/material/type/dimensions)	60(6×10)/Multicrystalline/ 156mm×156mm
Encapsulant (material)	EVA
Frame(material/color/anodization color)	Anodized aluminum alloy/silver/clear
Junction box(Protection degree)	IP65 & IP67
Cable (length/cross-section area)	1100mm/4mm <sup>2</sup>

#### OPERATING CONDITIONS

Max. hailstone impact (diameter/velocity)	25mm hail, form 1 m of distance at 23 m/s
Max. system voltage	Dc1000 V (TUV)
Max. series fuse rating	15 A
Operating temperature range	-40 °C~+85 °C
Max. static load, front (snow & wind)	5400 Pa
Max. static load, back (wind)	2400 Pa

#### PACKAGING

Container	20Ft (pcs)	40Ft (pcs)	40Hft (pcs)
Modules/pallet	20	20	23
Capacity	240	560	644

#### THERMAL CHARACTERISTICS

Nominal operating temperature	47±2°C
Temperature coefficient of P <sub>max</sub>	- 0.44% / °C
Temperature coefficient of V <sub>oc</sub>	- 0.34% / °C
Temperature coefficient of I <sub>sc</sub>	0.06% / °C

#### CERTIFICATIONS



#### WARRANTY

Manufacturing: 10 years

Power Output:

- Within the first one year, the output power shall not degrade more than 2%
- Within the first two years, the output shall not degrade more than 3%
- In the following 23 years, the average annual power degradation shall not exceed more than 0.7%

#### I-V Curves of TW230P60-AA at different irradiance

