

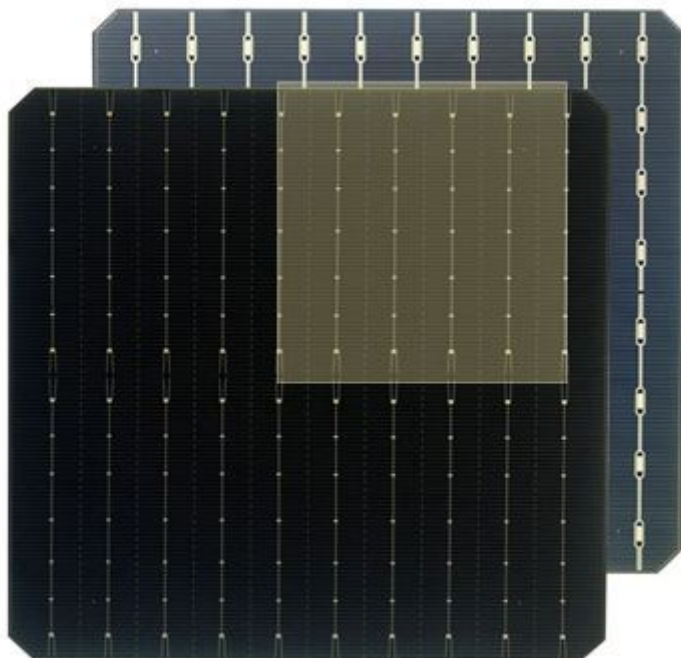
## **TONGWEI SOLAR CELL DATASHEET *Topsky 212-12BB***

### **Monocrystalline 210x210 12BB Bifacial Solar Cell**

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**Shenzhen Topsky Energy Co.,Ltd** was established in 1998 and has been engaged in the photovoltaic industry for more than ten years. Mainly committed to the production, development and

sales of solar cells, solar module, lightweight solar panel, customized small and mini solar panels and other application products. Our products have passed TUV Rhineland testing and obtained CE and other international certifications. Products are exported to global markets, including North America, South America, Europe, Southeast Asia, Middle East, Africa, and obtain highly appreciated by customers. Our customer base includes overseas solar module manufacturers, traders, overseas photovoltaic project contractors, installers, and other crossover partners.



#### **G12 Feature of 12BB 210mm Mono Solar Cell:**

- (1)High conversion efficiencies up to 23.1% resulting in superior power output performance;
- (2)Outstanding power output even in low light or high temperature conditions;
- (3)Optimized design for ease of soldering and lamination;
- (4)Long-term stability, reliability and performance;
- (5)Low breakage rate;
- (6)Uniform Color;
- (7)Both sides could generate electricity.

#### **Production and Quality Control:**

Precision cell efficiency sorting procedures;  
Stringent criteria for color uniformity and appearance;  
Reverse current and shunt resistance screening;  
ISO9001, ISO14001 and OHSAS 18001 certificated;

Calibrated against Fraunhofer ISE;

### Physical characteristic of 12BB 212mm Mono Solar Cell:

Dimension: 212mm x 212mm ± 0.5mm ;

Thickness(Si): 190μm ± 20μm,

Front: 10\*0.1±0.03mm bus bars(silver), blue anti-reflecting coating(silicon nitride)

Back: width of back electrode (silver ) 1.4mm±0.3mm, back surface field(aluminum)

Efficiency code	2200	2210	2220	2230	2240	2250	2260	2270	2280	2290	2300	2310
Efficiency(%)	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	23.0	23.1
Pmax(W)	9.66	9.70	9.75	9.79	9.83	9.88	9.92	9.97	10.01	10.05	10.10	10.14
Voc (V)	0.667	0.667	0.668	0.668	0.669	0.672	0.673	0.675	0.677	0.678	0.678	0.679
Isc (A)	17.89	17.95	17.98	18.06	18.11	18.11	18.16	18.19	18.21	18.24	18.30	18.33
Vmp(V)	0.571	0.572	0.572	0.572	0.573	0.573	0.574	0.576	0.577	0.578	0.578	0.579
Imp(A)	16.91	16.96	17.11	17.16	17.24	17.28	17.30	17.31	17.35	17.39	17.47	17.52

**\*Data under standard testing conditional (STC):1,000w/m2,AM1.5, 25°C .**

### Temperature Coefficients:

Current Temperature Coefficients: 0.04%/°C ;

Voltage Temperature Coefficients:-0.32%/°C ;

Power Temperature Coefficients:-0.43%/°C ;

TP Energy, with 3 subsidiaries, is currently headquartered located in Shenzhen, Guangdong, China. It has an experienced sales and after-sales team, provides the most competitive products in the market, and resolves all customer questions about photovoltaic products and markets. Our goal is to produce and provide high-quality solar products with the most competitive advantages in the market, to bring every customer engaged in green energy in the world, and make green energy closer to every user. At present, our production base is located in China's photovoltaic capital Jiangsu Province, with a production & management team of more than 200 people, and advanced fully automatic production line to achieve an annual production capacity of more than 500MW, which can meet various types of solar panel production and various project needs, and accept customization solar panel production.

Topsky Energy endeavors to provide efficient green clean energy, and constantly improving our living environment. We're united community, so protecting our earth is protecting our human beings.! We're devoted to promoting the application of efficient clean energy from every tiny aspect. We are the loyal partner of the photovoltaic industry, creating greater value for our customers' investment, making green power exist in everywhere.

