TONGWEI SOLAR CELL DATASHEET

M182ABPERCBP Monocrystalline182 10BB Bifacial Solar Cell

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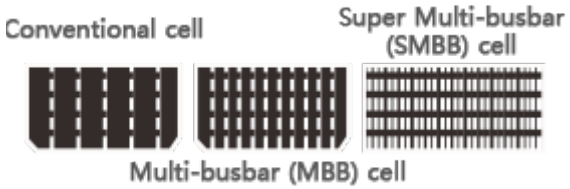
Tongwei has established 3 national first-class PV technology R&D centers and set up scientific research and technology teams led by industry experts, and is working to deepen the industry-university-research cooperation with universities and research institutes at home and abroad. Tongwei focuses on the cutting-edge technologies and independently developed first 1GW 210mm TNC mass production line and first large-size advanced metalization test line in the industry, and has been developing pilot test lines for new cells and mainstream module technologies. Tongwei has been injecting vitality into the industry development through continuous innovation.

Tongwei PV Technology System focused on the R&D and mass production of new technologies and new products (such as TNC and HJT) to further enhance the R&D and development of cross-generation and cutting-edge technologies in the industry (including HBC, perovskite, laminated cells/modules, PV+energy storage and other technologies). In the future, Tongwei will continue to consolidate our strengths of technological innovation, further enhance our overall competitiveness. While providing efficient and high-quality products for upstream and downstream partners, Tongwei will also contribute to the development of green energy and build a sustainable new ecology of the PV industry



Multi-busbar - reduced strings increase output, dense wires reduce losses

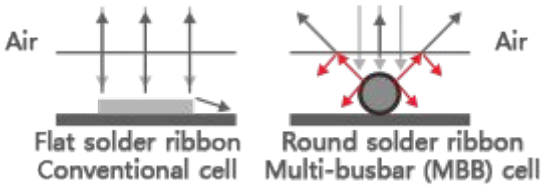
The grid lines are densely distributed, and the stress is uniform with SMBB design, Significantly reduce BOM cost, and the output power is 1-2W higher than that of MBB

Half-cell cut - reduce flow and loss

Current density is reduced by 1/2, internat power loss is reduced to 1/4 of conventional modules, and the rated output power is increased by 5-10w

Shading, not compromising energy Up-down symmetrical parallel module design, effectively reduce current mismatch due to shading. The power output is increased by 50%

Lossless Cutting Lossless laser cutting technology, no mechanical damage, smooth cutting surface without burrs. Low cell cracking risks, micro-cracking is reduced by more than 50%



New Solder Ribbon Adopt round-shaped solder ribbon, low shading area, Multiple reflections of incident light, power increased by 1-2W

High-Density Encapsulation Technology The 210 Series adopts advanced high-density encapsulation technology to ensure the perfect balance of efficiency and reliability. Module efficiency increased by more than 0.15%

Technical data and design

Dimensions	182mm * 182mm ± 0.5mm	TkVoltage：-0.36 %/K
Thickness	175±17.5μm	TkCurrent：+0.07%/K
Front (-)	10*0.06 ±0.03mm busbar (silver), 150 ±15 fingers Blue (dark blue) antireflective film (silicon nitride)	TkPower：-0.38%/K
Back (+)	Back electrode width (silver) 1.2 ±0.3mm, 170 ±17 fingers	Rsh≥50Ω，Irev2≤1.0A

Light intensity reliability

Intensity(W/m²)	1000	900	800	600	400
Uoc	1.000	0.996	0.991	0.988	0.962
Isc	1.000	0.903	0.803	0.602	0.403

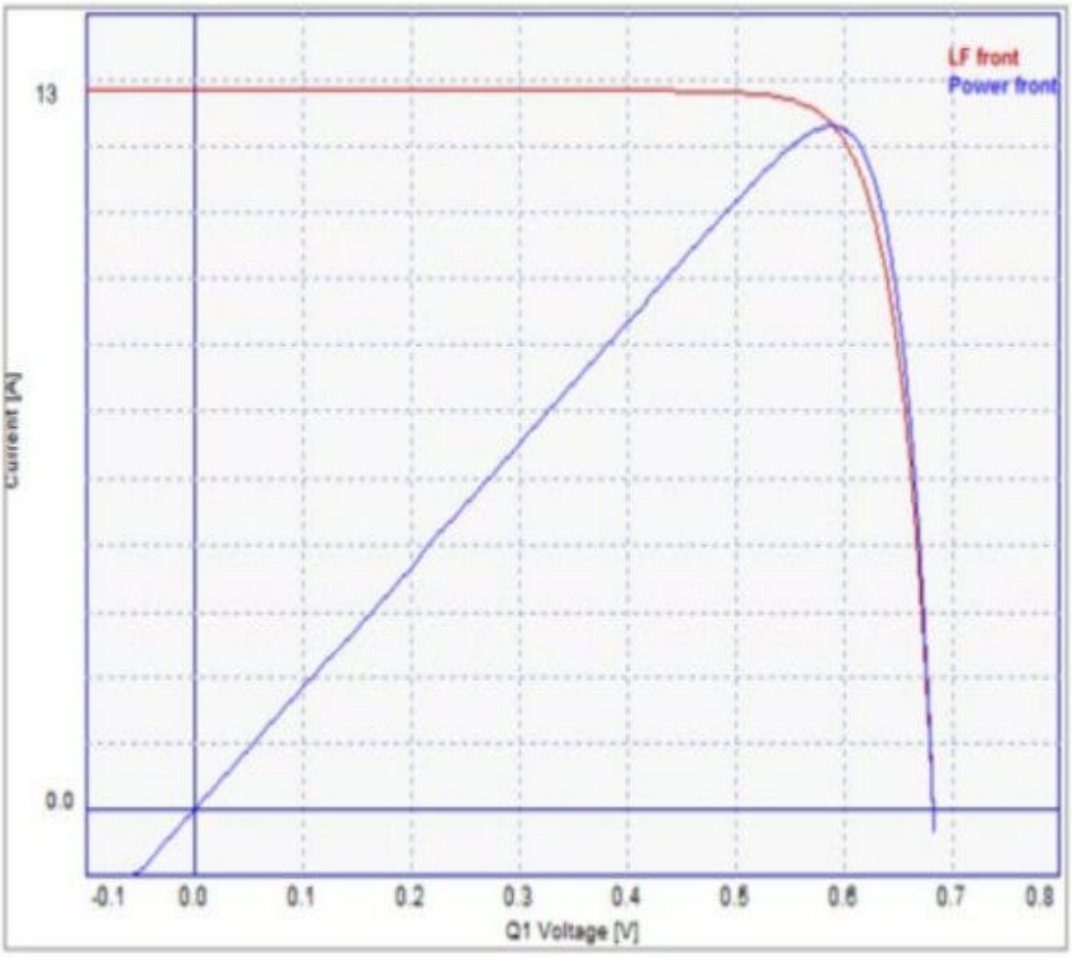
* Taking the Voc(Isc) tested at 1000W/m2 as the standard, test the decrease of Voc (Isc) with the light intensity.

Solderability

Minimum peeling strength ≥1.4N/mm

Results may vary depending on electrode, welding method, and conditions.

IV curve



Front electrical performance distribution

Efficiency code	Efficiency Eff(%)	Maximum output power Pmpp(W)	Maximum output voltage Umpp(V)	Maximum output current Impp(A)	Open-circuit voltage Uoc(V)	Short-circuit current Isc(A)	Fill factor FF(%)
TW-182M-232	23.2	7.66	0.591	12.965	0.692	13.593	81.49
TW-182M-231	23.1	7.63	0.590	12.924	0.691	13.584	81.26
TW-182M-230	23.0	7.59	0.589	12.888	0.690	13.577	81.05
TW-182M-229	22.9	7.56	0.588	12.850	0.689	13.568	80.85
TW-182M-228	22.8	7.53	0.587	12.819	0.688	13.560	80.64
TW-182M-227	22.7	7.49	0.586	12.785	0.687	13.554	80.45
TW-182M-226	22.6	7.46	0.585	12.755	0.686	13.548	80.26
TW-182M-225	22.5	7.43	0.584	12.729	0.684	13.541	80.16
TW-182M-224	22.4	7.40	0.582	12.709	0.683	13.534	80.03
TW-182M-223	22.3	7.36	0.580	12.685	0.681	13.528	79.90
TW-182M-222	22.2	7.33	0.579	12.652	0.681	12.501	79.78

Standard test conditions:1000W/m², AM1.5, 25℃
The above technical parameters are subject to technical changes and tests, and TW Solar reserves the right of final interpretation.

Back electrical performance distribution

Efficiency code	Efficiency Eff(%)	Maximum output power Pmpp(W)	Maximum output voltage Umpp(V)	Maximum output current Impp(A)	Open-circuit voltage Uoc(V)	Short-circuit current Isc(A)
TW-182M-16.0	>16	5.28	0.578	9.136	0.676	10.119
TW-182M-15.7	15.5-16	5.18	0.572	9.068	0.675	10.056
TW-182M-15.2	>15-15.5	5.02	0.565	8.877	0.673	9.989
TW-182M-14.8	<15	4.89	0.559	8.743	0.671	9.903

Standard test conditions:1000W/m², AM1.5, 25℃
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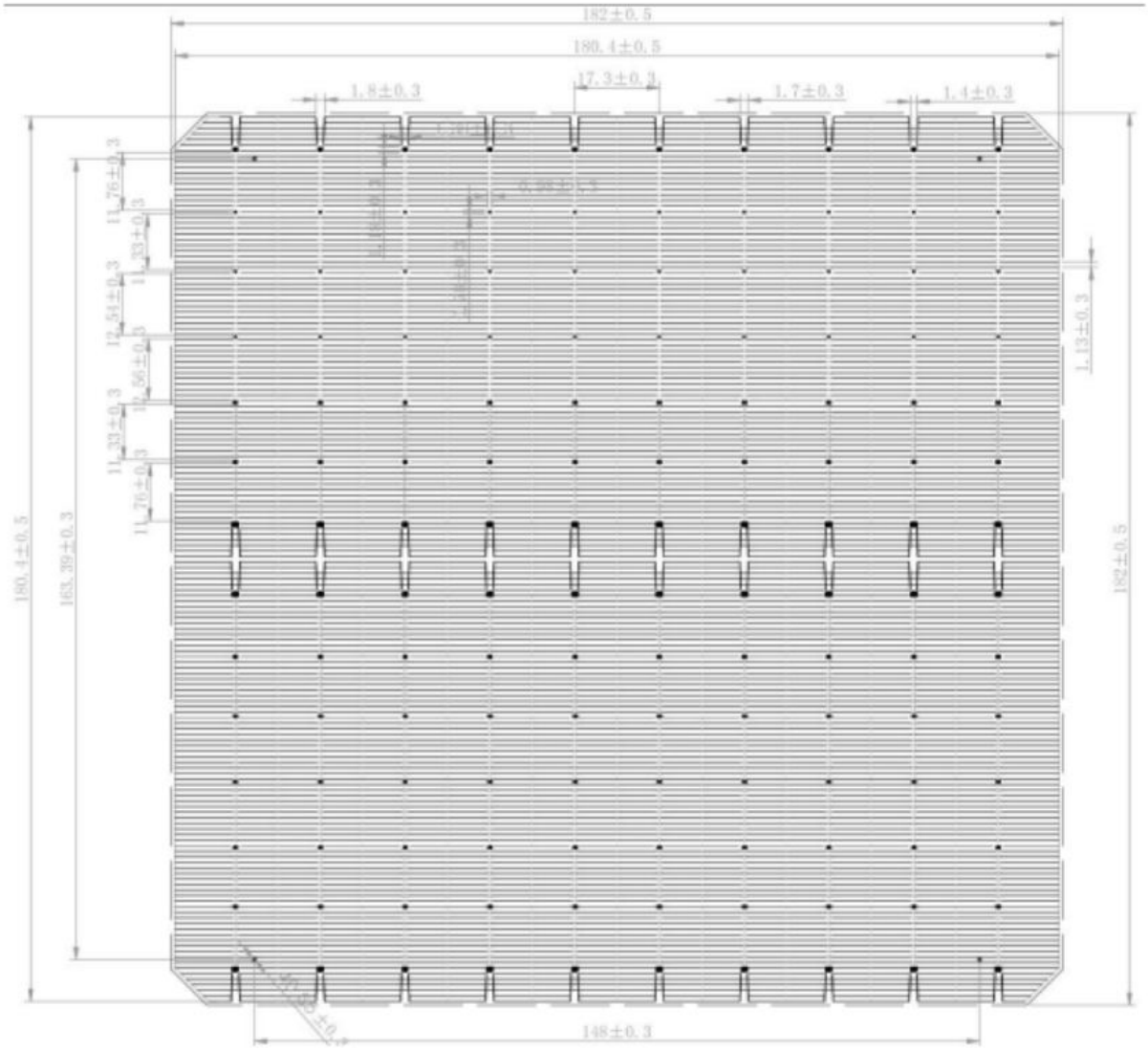
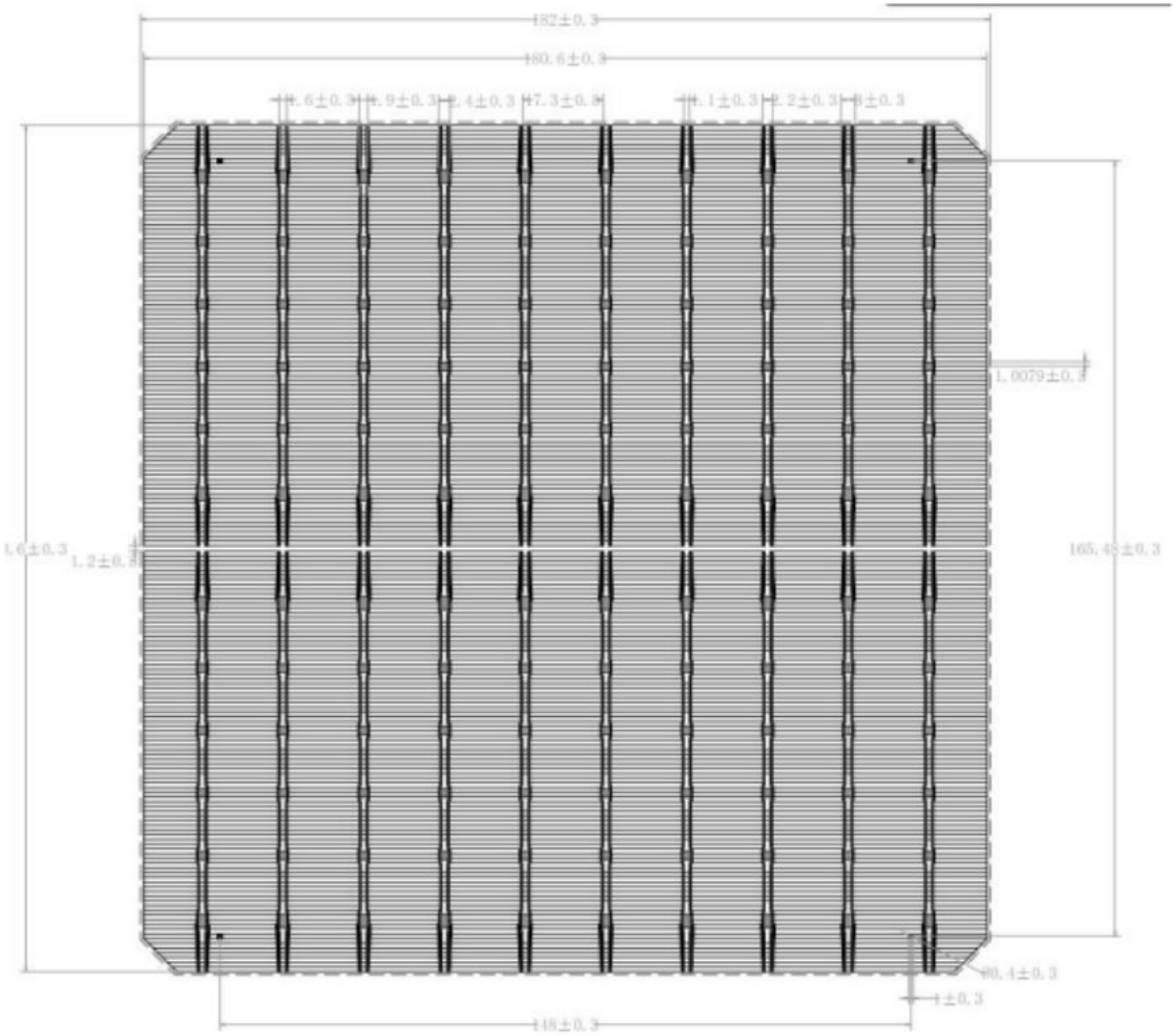

182±0.5
180.4±0.5
17.3±0.3
1.8±0.3
1.7±0.3
1.4±0.3
1.13±0.3
180.4±0.5
163.39±0.3
182±0.5
148±0.3


182±0.3
180.6±0.3
1.0079±0.3
1.6±0.3
1.2±0.3
165.48±0.3
80.4±0.3
1±0.3
148±0.3