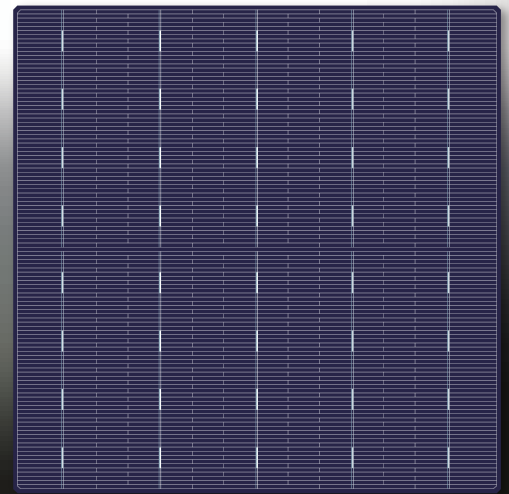




Black22
Ultra-Efficient

NSAW

Mono Crystalline Solar Cell
(Bi-Facial - Black22)



Features

- Ultra-Efficient solar cells with an anisotropically etched surface
- Silicon nitride anti-reflection coating
- Silver front contact bars and aluminum local back surface field

Performance and Quality

- Proper handling from incoming inspection through production, outgoing inspection and packaging
- 100% checked for reverse current and visual appearance
- Calibrated against Fraunhofer ISE
- RoHS compliance
- **100% PID Resistance**

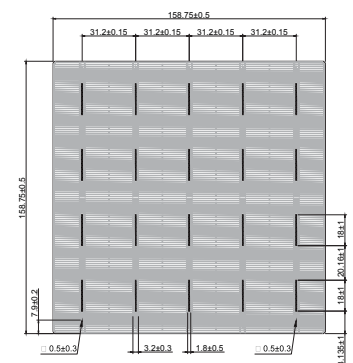
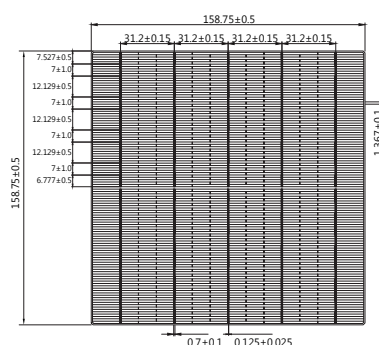
Packaging

- Minimize the risk of broken cells with special design
- Label with product information

Physical Characteristics

Dimension	158.75 mm x 158.75 mm $\pm$ 0.25 mm
Cell's Thickness (si)	170 μ m $\pm$ 30 μ m
Front Side (-)	Silicon nitride anti-reflection coating 0.7 mm silver busbar
Back Side (+)	Aluminum local back surface field 1.8 mm (silver) discontinuous soldering pads

Cell Layout



Mono Crystalline Solar Cell (Bi-Facial - Black22)

NSAW Ultra-Efficient



Electrical Characteristics

Class	Efficiency Range (%)	Rated Power (Wp)	*Maximum Power Current (A)	*Short Circuit Current (A)	*Maximum Power Voltage (V)	*Open Circuit Voltage (V)
217	21.7-21.8	5.468	9.598	10.208	0.571	0.672
218	21.8-21.9	5.493	9.609	10.219	0.573	0.674
219	21.9-22.0	5.519	9.620	10.230	0.575	0.676
220	22.0-22.1	5.544	9.630	10.240	0.577	0.678
221	22.1-22.2	5.569	9.640	10.250	0.579	0.680
222	22.2-22.3	5.594	9.650	10.260	0.581	0.682
223	22.3-22.4	5.619	9.660	10.270	0.583	0.684
224	22.4-22.5	5.645	9.671	10.281	0.585	0.686
225	22.5-22.6	5.670	9.681	10.291	0.587	0.688
226	22.6-22.7	5.695	9.690	10.300	0.589	0.690
227	22.7-22.8	5.720	9.700	10.310	0.591	0.692

Test condition : 1000 W / m², AM 1.5, 25°C Power measuring tolerance: ±1.5% rel.

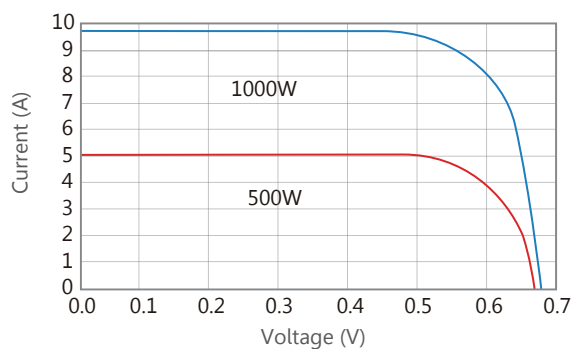
Temperature coefficients

Current (%/K)	0.0400
Voltage (%/K)	-0.2889
Power (%/K)	-0.3632

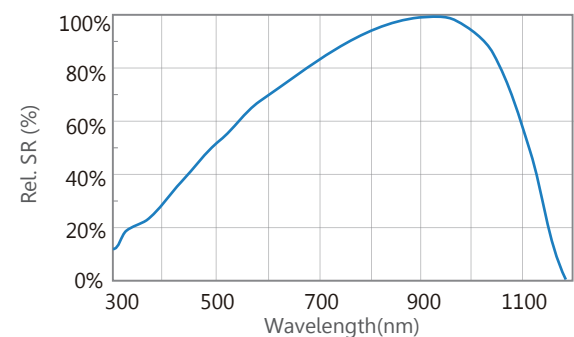
Light Intensity Dependence

Intensity [W/m ²]	Vmpp	I _{mp}
1000	1.000	1.000
900	0.998	0.899
500	0.977	0.497
300	0.955	0.297
200	0.936	0.197

IV-Curve



Spectral Response



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