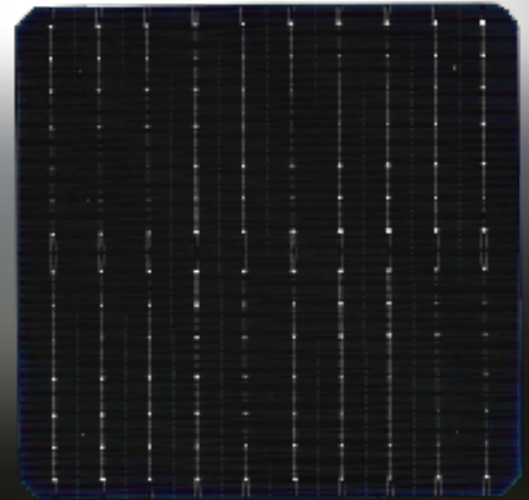


NSEY Ultra-Efficient

Black23 Series

Mono Crystalline Solar Cell (Bifacial - Black23)



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
- **Exceptional PID Resistance**

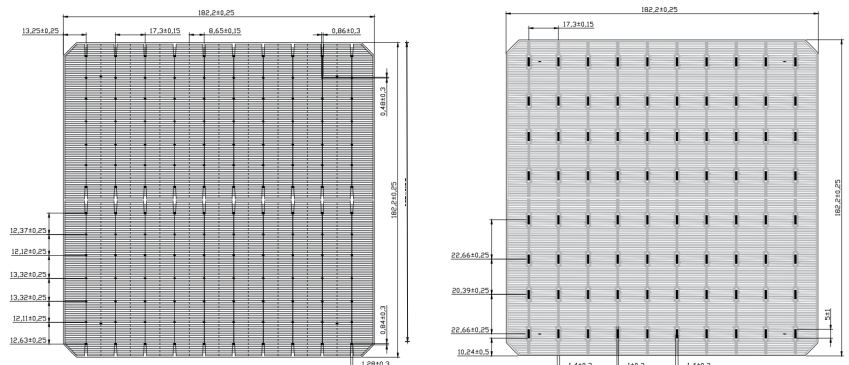
Packaging

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

Physical Characteristics

Dimension	182.2 mm x 182.2 mm ± 0.25 mm
Cell's Thickness (si)	150 μm ± 30 μm
Front Side (-)	Silicon nitride anti-reflection coating 0.86 mm ± 0.3 mm silver pad
Back Side (+)	Aluminum local back surface field 1.4 mm ± 0.3 mm (silver) discontinuous soldering pads

Cell Layout



Electrical Characteristics

Class	Efficiency Range (%)	Rated Power (Wp)	*Maximum Power Current (A)	*Short Circuit Current (A)	*Maximum Power Voltage (V)	*Open Circuit Voltage (V)
227	22.7-22.8	7.508	12.972	13.664	0.578	0.678
228	22.8-22.9	7.542	13.049	13.727	0.578	0.678
229	22.9-23.0	7.575	13.062	13.726	0.580	0.679
230	23.0-23.1	7.608	13.077	13.792	0.582	0.683
231	23.1-23.2	7.641	13.086	13.779	0.584	0.683
232	23.2-23.3	7.674	13.103	13.786	0.586	0.685
233	23.3-23.4	7.707	13.125	13.802	0.587	0.686
234	23.4-23.5	7.740	13.146	13.815	0.589	0.687
235	23.5-23.6	7.773	13.170	13.827	0.590	0.687
236	23.6-23.7	7.773	13.199	13.842	0.591	0.688

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

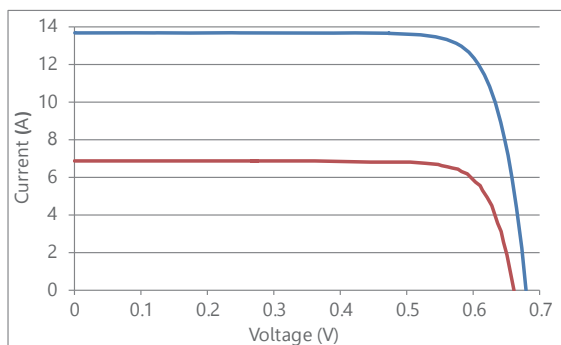
Temperature coefficients

Current (%/K)	0.0411
Voltage (%/K)	-0.2809
Power (%/K)	-0.3441

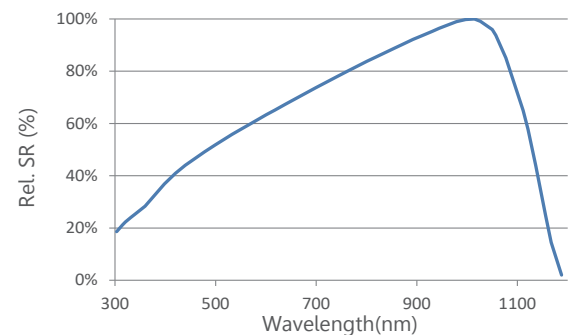
Light Intensity Dependence

Intensity [W/m ²]	Vmpp	I _{mp}
1000	1.000	1.000
900	0.998	0.900
500	0.979	0.499
300	0.960	0.299
200	0.941	0.199

IV-Curve



Spectral Response



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