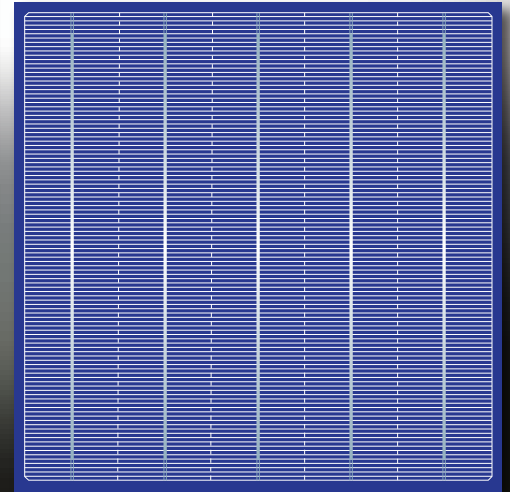




## SAPPHIRE Series

# M-156-5 ver.B



## Multicrystalline Solar Cell

### Features

- High-efficiency solar cells with an isotropically etched surface
- Silicon nitride anti-reflection coating
- Silver front contact bars and full surface aluminum back contact 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**

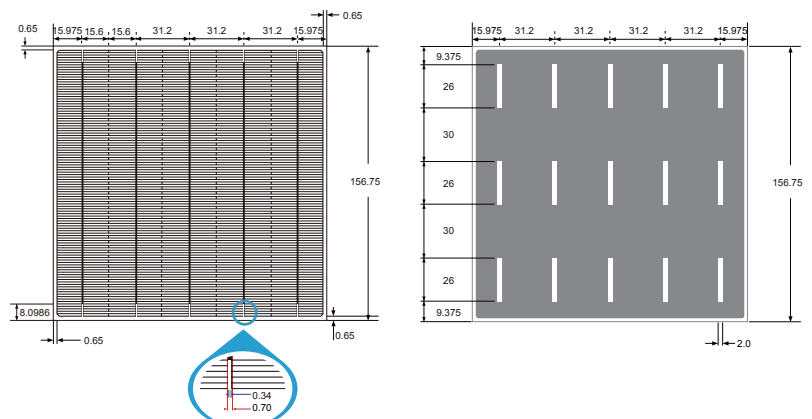
### Packaging

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

### Physical Characteristics

Dimension	156.75 mm x 156.75 mm ± 0.3 mm
Thickness (si)	180 μm - 20 / + 30 μm 200 μm ± 30 μm
Front Side (-)	Silicon nitride anti-reflection coating 0.7 mm silver busbar
Back Side (+)	Full surface aluminum back surface field 2.0 mm (silver) discontinuous soldering pads

### Cell Layout



# M-156-5 ver.B

## Multicrystalline Solar Cell



### Electrical Characteristics

Class	Efficiency Range (%)	Rated Power (Wp)	*Maximum Power Current (A)	*Short Circuit Current (A)	*Maximum Power Voltage (V)	*Open Circuit Voltage (V)
186	18.6-18.7	4.570	8.699	9.268	0.533	0.629
187	18.7-18.8	4.595	8.715	9.280	0.535	0.630
188	18.8-18.9	4.619	8.731	9.293	0.536	0.632
189	18.9-19.0	4.644	8.747	9.305	0.537	0.633
190	19.0-19.1	4.668	8.763	9.317	0.538	0.635
191	19.1-19.2	4.693	8.778	9.329	0.540	0.636
192	19.2-19.3	4.718	8.794	9.342	0.541	0.638
193	19.3-19.4	4.742	8.810	9.354	0.542	0.640
194	19.4-19.5	4.767	8.826	9.366	0.544	0.641
195	19.5-19.6	4.791	8.842	9.378	0.545	0.643
196	19.6-19.7	4.816	8.857	9.390	0.546	0.644
197	19.7-19.8	4.840	8.876	9.405	0.548	0.646
198	19.8-19.9	4.865	8.892	9.417	0.549	0.647
199	19.9-20.0	4.890	8.908	9.429	0.550	0.649
200	20.0-20.1	4.914	8.924	9.442	0.551	0.650
201	20.1-20.2	4.939	8.940	9.454	0.553	0.652
202	20.2-20.3	4.963	8.955	9.466	0.554	0.654
203	20.3-20.4	4.988	8.971	9.478	0.555	0.655

Test condition : 1000 W / m<sup>2</sup>, AM 1.5, 25°C Power measuring tolerance: ±1.5% rel.

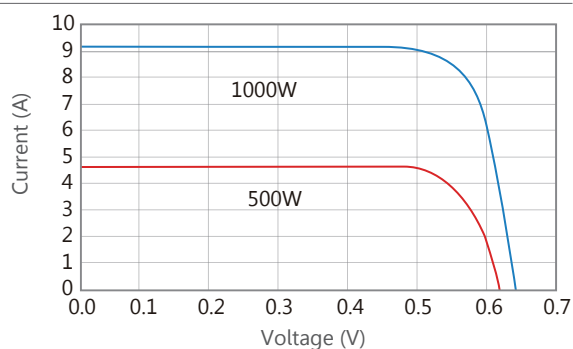
### Temperature coefficients

Current (%/K)	0.0535
Voltage (%/K)	-0.3043
Power (%/K)	-0.3718

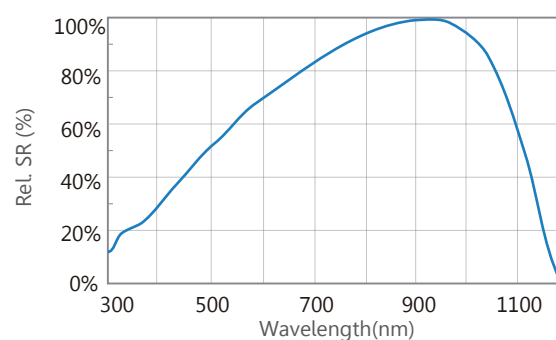
### Light Intensity Dependence

Intensity (W/m <sup>2</sup> )	V <sub>mpp</sub> (%)	I <sub>mpp</sub> (%)
1000	100.0	100.0
900	99.8	89.9
500	99.7	49.7
300	99.5	29.7
200	93.6	19.7

### IV-Curve



### Spectral Response



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