

Format $156.0^{+0.5}_{-0.5}$ mm x $156.0^{+0.5}_{-0.5}$ mm
Thickness 190 ± 30 μ m

SolarWorld EffiCell M

made of mono-crystalline Silicon

High quality standard, high efficiencies, homogeneous optical appearance – the solar cells of Solarworld are fabricated in one of the most up-to-date production plants worldwide. Our products meet the highest demands of module producers.

- > Increased performance by improved layout and three bus bar technology.
- > Each cell individually hot spot tested.
- > Uniform optical appearance due to texturization, antireflection silicon nitride coating and sorting into three predefined colour categories.
- > The colour of solar cells is specified by limiting samples.
- > The cells are packed in boxes each containing 150 cells. 6 boxes are placed in one cardboard box. 80 cardboard boxes are stacked on Euro pallets for shipping.

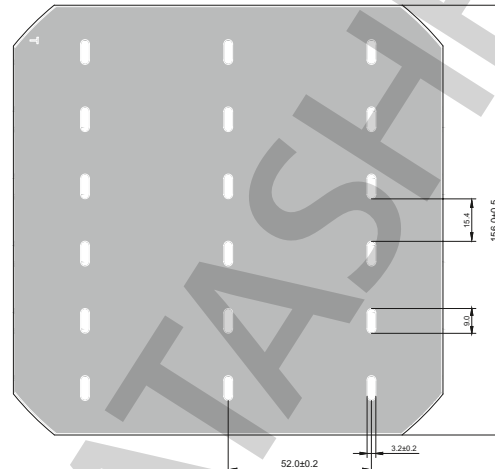
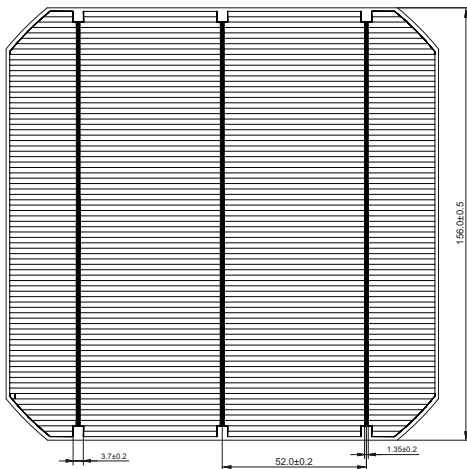


We turn sunlight into power.

SolarWorld EffiCell M

GEOMETRICAL PROPERTIES

Format	$156.0^{+0.5}_{-0.5}$ mm x $156.0^{+0.5}_{-0.5}$ mm
Thickness	190 ± 30 μ m
Area	23,988 mm ²



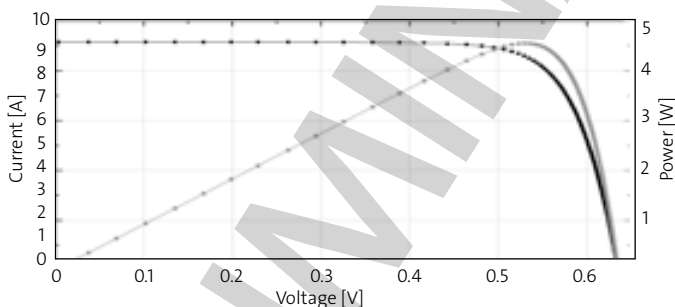
Shape	Pseudo-square	Back bus bar material	Silver
Distance between bus bars	52 ± 0.2 mm	Width of back bus bars	3.2 ± 0.2 mm
Front bus bar material	Silver	Back side coating	Aluminum
Width of front bus bars	1.35 ± 0.2 mm		
Anti reflection coating	SiN _x		

ELECTRICAL PROPERTIES AT STC	434	439	444	449	454	459
Fill Factor [%]	77.00	77.30	77.60	78.00	78.30	78.60
Voc [V]	0.632	0.633	0.634	0.635	0.636	0.637
Isc [A]	8.92	8.97	9.02	9.07	9.12	9.17
Umpp [V]	0.520	0.523	0.526	0.529	0.532	0.535
Imp [A]	8.34	8.39	8.43	8.48	8.53	8.57
Pmpp [W]	4.34-4.39	4.39-4.44	4.44-4.49	4.49-4.54	4.54-4.59	4.59-4.64
Efficiency [%]	18.09-18.30	18.30-18.51	18.51-18.72	18.72-18.93	18.93-19.13	19.13-19.34

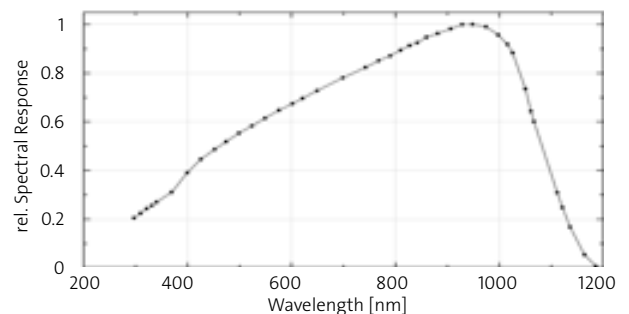
All electrical data measured under standard test conditions (STC): AM1.5G Ed-2, 1000 W/m², 25°C. Accuracy of all listed values is 3%.

Temperature coefficients: $T_K(P_{mpp})$ [%/K] = -0.43, $T_K(V_{oc})$ [%/K] = -0.34, $T_K(I_{sc})$ [%/K] = +0.05.

Current- and Voltage-Power Characteristics



Spectral Response



CONDITIONS OF SOLDERING / REMOVAL FORCE Value

Tabbing ribbon basic material	Cu-EPT1
Dimension of tabbing ribbon	1-2 mm x 0.12-0.20 mm
Solder material	Sn62Pb36Ag2 or Sn60Pb40
Solder thickness	10-30 μ m
Solder temperature	220-270°C
Solder time	1-2 s
Median tear force	≥ 1 N / mm

Storage Conditions

- > Protect against humidity and solar irradiation.
- > Store dry at temperature between 10-30 degree and below relative humidity of 70%.
- > Do not stack more than 3 cardboard boxes
- > Handle dustproof and shock-free.
- > Storing only in closed cardboard boxes.
- > Recommended maximum handling time: no longer than 6 months after date of delivery.
- > It is essential to use "first-in-first-out" - principle.

Transport Conditions:

- > Do not stack paletts.
- > Transport in a dry environment at temperature between 10-30 degrees and below relative humidity of 70%.

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SolarWorld AG advises customers of essential changes of product and production process.