V-Cell
Halfcut Series

TSEC

TSSCN

Mono c-Si Solar Cell
(Bi-Facial)

Physical Characteristics

Dimensions	182mm X 182mm ± 0.5mm
Diagonal	247mm± 0.5mm
Thickness(Si)	170μm ± 50μm
Front(-)	Alkaline texturized surface with silicon nitride anti-reflecting coating
	10 X 0.08mm ± 0.05mm bus bars
	Distance between bus bars : 18mm
Back(+)	Local aluminum back surface field
	10 X 8 soldering pads, 1.3mm±0.3mm wide bus bars
	Distance between bus bars : 18mm

Features

-High Cell-To- Module ratio through precise cell conversion efficiency sorting, classified efficiency grade by both minimum power and current.
-Excellent electrical long-term stability and reliability by using of best raw materials and through strict quality inspection control.
-Low breakage rate by using high qualified and stable wafers.
-High quality homogeneous appearance by sorting into defined color classes.
-100% screened for reverse current and shunt resistance.
-Excellent passivation quality of the rear side compared to the traditional solar cell is clearly visible in the long wavelength regime.
-The best solution for PV module with above 440W(6x20) and 530W(6x24) outputs.

Quality Control and Professional Service

-Regular calibration of test equipment using Fraunhofer ISE reference cell.
-Environmental friendly due to REACH-SVHC and RoHS compliances.
-Professional on-site service and support for module certification.
-Regular light source AAA class calibration for stable conversion efficiency.
-Lowest LID by periodic monitoring and superior wafer incoming control.

Electrical Characteristics

Efficiency Code		232	231	230	229	228	227	226	225	224	223	222
Efficiency	Eff(%)	23.20	23.10	23.00	22.90	22.80	22.70	22.60	22.50	22.40	22.30	22.20
Power	Pmpp(W)	7.66	7.63	7.59	7.56	7.53	7.49	7.46	7.43	7.40	7.36	7.33
Max. Power Current	Impp(A)	13.091	13.055	13.038	13.021	13.005	12.989	12.974	12.958	12.939	12.918	12.897
Short Circuit Current	Isc(A)	13.790	13.758	13.749	13.739	13.727	13.714	13.700	13.684	13.666	13.646	13.626
Max. Power Voltage	Vmpp(V)	0.585	0.584	0.582	0.581	0.579	0.577	0.575	0.573	0.572	0.570	0.568
Open Circuit Voltage	Voc(V)	0.691	0.689	0.688	0.687	0.686	0.685	0.683	0.682	0.681	0.679	0.678

Standard test condition: AM1.5, 1000W/m², 25°c
Average accuracy of all tests is +/-1.5% rel.
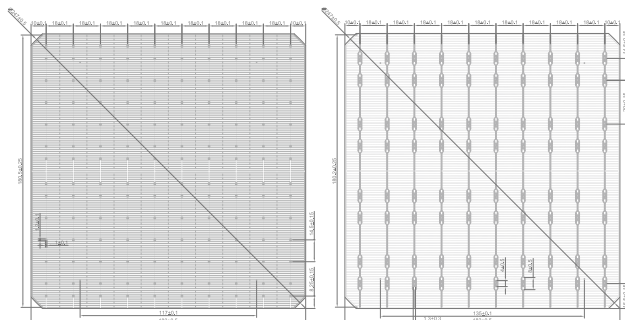
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Temperature Coefficients

Current Temperature Coefficient	α(ISC)	0.0423%/K
Voltage Temperature Coefficient	β(VOC)	-0.2903%/K
Power Temperature Coefficient	γ(Pmax)	-0.3535%/K

Standard test condition: AM1.5, 1000W/m², 25°c

Processing Recommendations

Solder Joint

Copper ribbons coated with 15~25μm:
62%Sn/36%Pb/2%Ag or 60%Sn/40%Pb
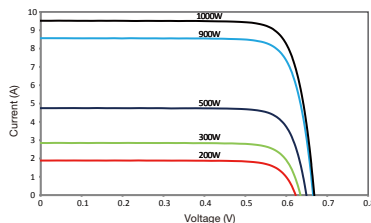
Standard test condition: AM1.5, 1000W/m², 25°c

Solderability
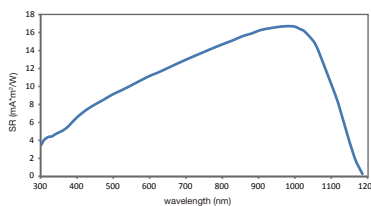
Peel Strength Minimum

> 1.25 N/mm

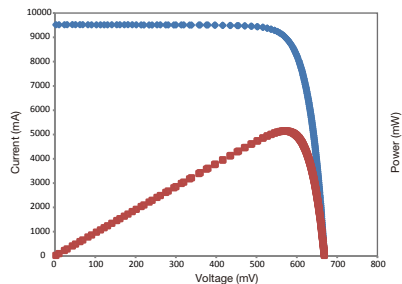Soldering results may differ due to different flux, ribbons, soldering methods, and parameters.

Typical Current-Voltage Curve

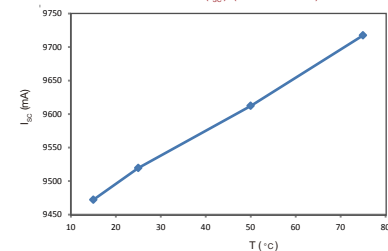## Typical Spectral Response

Typical IV-Power Curve

* All data measured under standard testing condition (STC):
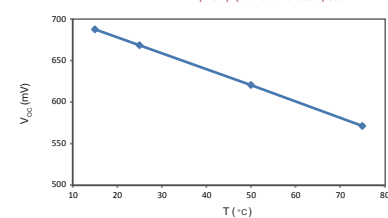 1000 W/m², AM 1.5, 25 °C.
* All figures bear ±2% tolerance.
* Reference cell are under testing by Fraunhofer ISE in Freiburg.

Calculated Temperature Coefficients

Short Circuit Current
TK(I_{SC})=(4.03±0.37) mA/K
TK(I_{SC})=(0.0423± 0.0039) %/K

Open Circuit Voltage
TK(V_{OC})=(-1.941± 0.045) mV/K
TK(V_{OC})=(-0.2903± 0.0068) %/K

Power
TK(P_{MPP})=(-18.19± 0.43) mW/K
TK(P_{MPP})=(-0.3535± 0.0084) %/K
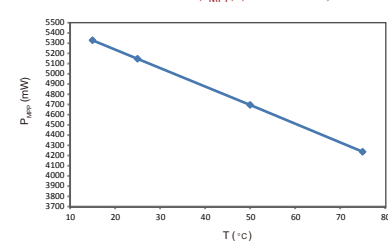
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