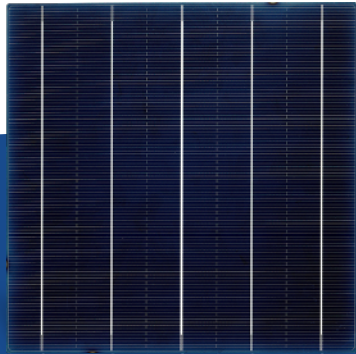


E-Cell

Multi Series

TSM65TN

6" Multi c-Si Solar Cell



Physical Characteristics

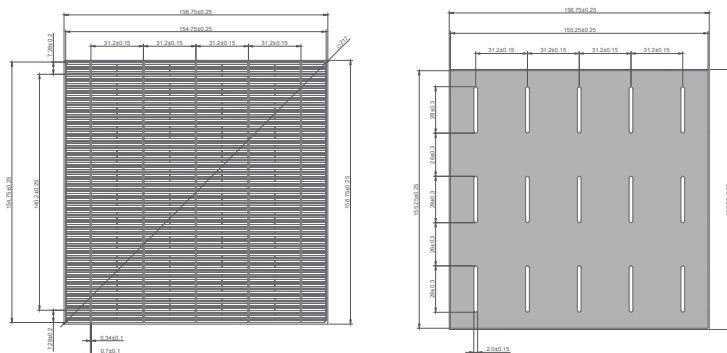
Dimensions	Dimension 156.75mm X 156.75mm±0.25mm
Thickness(Si)	Thickness(Si) 180 μm±20 μm, 200μ m ±30 μm
Front(-)	<p>Acid texturized surface with Silicon nitride anti-reflecting coating</p> <p>Color: Dark Blue, Blue, Sky Blue & Light Blue</p> <p>5 X 0.7 mm ± 0.1 mm wide bus bars</p> <p>Distance between bus bars : 31.2 mm</p>
Back(+)	<p>Aluminum back surface field</p> <p>5x3 soldering pads, 2 mm ± 0.15 mm wide bus bars</p> <p>Distance between bus bars : 31.2 mm</p>

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 solderability through high quality conductive materials and regular monitor soldering properties.

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		188	186	184	182	180	178	176
Efficiency	Eff(%)	18.80	18.60	18.40	18.20	18.00	17.80	17.60
Power	Pmpp(W)	4.62	4.57	4.52	4.47	4.42	4.37	4.32
Max. Power Current	Impp(A)	8.465	8.439	8.403	8.365	8.310	8.248	8.193
Short Circuit Current	Isc(A)	8.987	8.953	8.919	8.884	8.829	8.765	8.714
Max. Power Voltage	Vmpp(V)	0.546	0.542	0.538	0.535	0.532	0.530	0.528
Open Circuit Voltage	Voc(V)	0.640	0.637	0.633	0.630	0.628	0.627	0.625

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

TSM65TN

6" Multi c-Si Solar Cell

Temperature Coefficients

Current Temperature Coefficient	$\alpha(I_{SC})$	0.05%/K
Voltage Temperature Coefficient	$\beta(V_{OC})$	-0.31%/K
Power Temperature Coefficient	$\gamma(P_{max})$	-0.38%/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

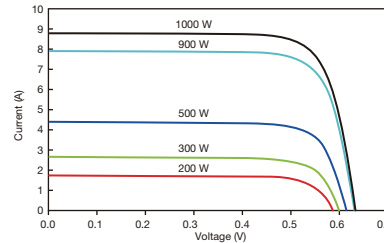
Soldering results may differ due to different flux, ribbons, soldering methods, and parameters.

Qualifications and Certificates

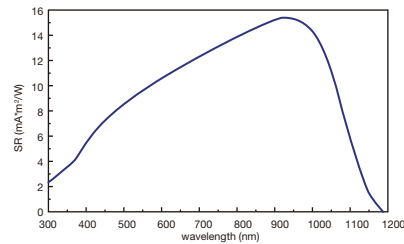


RoHS Compliance
SVHC tested

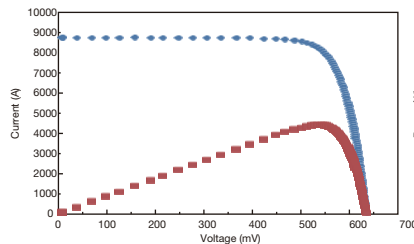
Typical Current-Voltage Curve



Typical Spectral Response

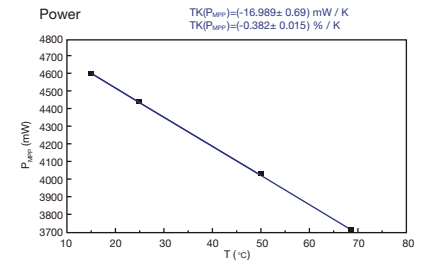
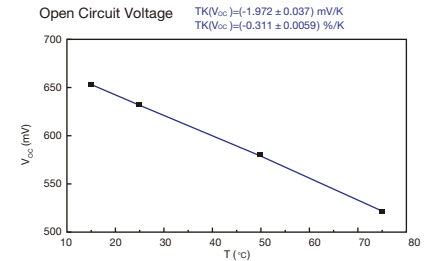
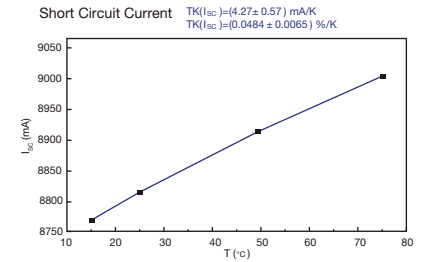


Typical IV-Power Curve



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

Calculated Temperature Coefficients



TSEC Corporation

Taipei Headquarters

8F, No.225, Sec. 3, Beixin Rd., Xindian Dist.,
New Taipei City 23143, Taiwan, R.O.C

t 886 2 2912 2199 f 886 2 2917 5399 m sales@tsecpv.com

Hsinchu Plant

No.85, Guangfu N. Rd., Hukou Township, Hsinchu County 30351,
Taiwan, R.O.C. (Hsinchu Industrial Park)

t 886 3 696 0707 f 886 3 696 0708

Specifications are subject to change without prior notice.
TSEC reserves the rights of final interpretation
and revision of datasheet.

Preliminary version-December 2016