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# **EnergyPal**

## **Solar Panel Guide Specification Data Sheet**

**TSEC Corporation  
TS72-6P3-280-290(4BB)  
TS72-6P3-285**

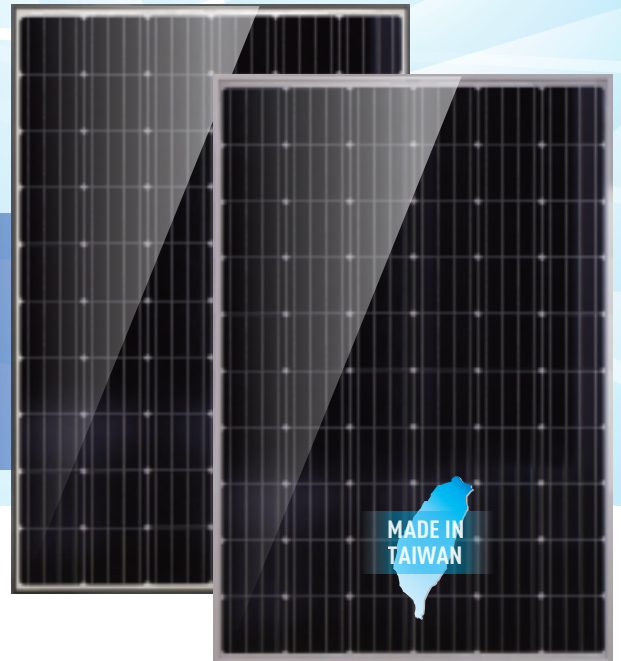
Also available on the web at  
[EnergyPal.com/tsec-corporation-solar-panels/ts72-6p3-285](http://EnergyPal.com/tsec-corporation-solar-panels/ts72-6p3-285)



# E-Series Modules

## Monocrystalline Solar Modules

Peak Power: 280-290Wp



### High Quality

- Powered by TSEC premium grade solar cells.
- PID free by adopting TSEC PID free solar cells plus PID resistant materials.

### High Reliability

- Snow Pressure (Mechanical loading) up to 10,000 pa (Optional)
- Snow and wind pressure (Mechanical loading) up to 5,400 pa
- PID resistance up to 1000hrs by TÜV Rheinland.
- Salt mist corrosion testing up to 56 days by ITRI, follow severity 6 in IEC 60068-2-52 standard.

### Strict Quality Control

- Current sorting for hot spot protection.
- 3-stage EL tests at pre-lamination, before framing and before delivery.

### Module Characteristics

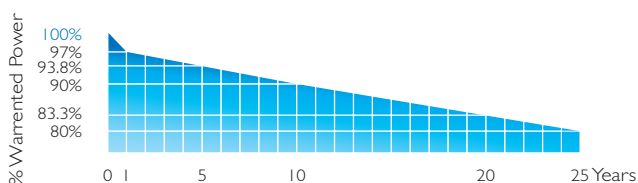
Dimension	1,649 × 993 × 40 mm
Weight	18.5 Kg

### Certifications

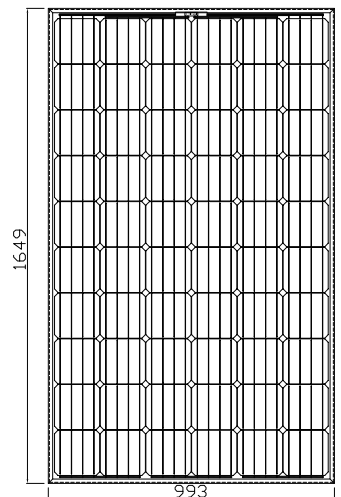
- TÜV Rheinland IEC 61215:2005、IEC 61730-1:2004&IEC 61730-2:2004
- CE / MCS / ETL UL-1703
- ISO 9001:2008 Quality management system
- ISO 14001:2004 Standards for environmental management system
- ISO 50001:2011 Energy management system
- OHSAS 18001:2007 International standards for occupational health and safety

### Warranty

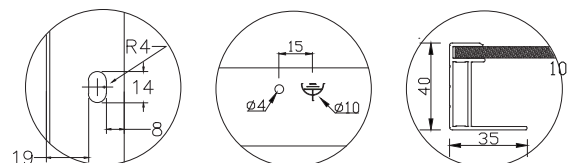
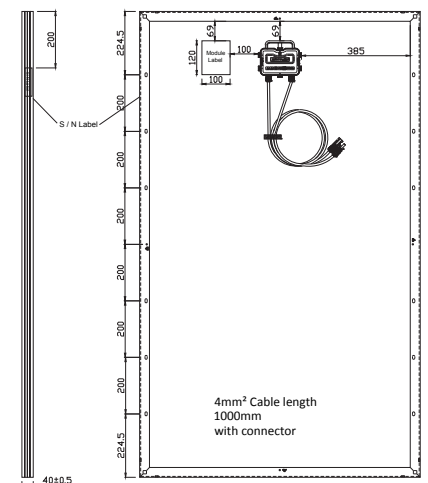
- 10-year materials and workmanship warranty.
- 25-year linear power warranty.



Module Front Side (4BB)



Module Rear Side



# E-Series 290W

## Monocrystalline Solar Module



Make the best better.

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### Performance Under Standard Test Conditions

Model Name		TS60-6M3-280	TS60-6M3-285	TS60-6M3-290
Max. power at STC	$P_{max}$ W	280	285	290
Max. power voltage	$V_{mp}$ V	31.90	32.28	32.64
Max. power current	$I_{mp}$ A	8.80	8.85	8.91
Open circuit voltage	$V_{oc}$ V	39.56	39.98	40.36
Short circuit current	$I_{sc}$ A	9.46	9.50	9.55
F.F. (%)	%	75.01%	75.22%	75.45%
Module Conversion Eff.	%	17.10%	17.41%	17.71%
Module Effective Conversion Eff.	%	19.10%	19.44%	19.78%

\* Standard Test Condition(1,000W/m<sup>2</sup>,25°C,AM 1.5)

\* Module Conversion Eff. (%) = [Max power at STC(w) / (Solar Module Area(m<sup>2</sup>) × 1000 (w/m<sup>2</sup>))] × 100%

\* Module Effective Conversion Eff. (%) = [Max power at STC(w) / (Solar Cell Total Area(m<sup>2</sup>) × 1000 (w/m<sup>2</sup>))] × 100%

### Thermal Characteristics

Normal Operating cell temperature	NOCT	°C	45±2
TC I <sub>sc</sub>	α <sub>Isc</sub>	%/°C	+0.05
TC V <sub>oc</sub>	β <sub>Voc</sub>	%/°C	-0.32
TC P <sub>max</sub>	γ	%/°C	-0.44

### Component Material

Cell type	Monocrystalline / 156.75 × 156.75mm (156×156 mm)
Cell per module	4BB / 60 pcs
Front	Low-iron glass / Tempered
Encapsulant Film	Ethylene Vinyl Acetate(EVA)
Rear	Backsheet
Frame	6063T5 Anodized aluminum (silver/black)
Junction Box	IP67
Connector	MC4 Compatible
Cable	1000mm / 12 AWG / 4mm <sup>2</sup>

### System Integration Parameters

Max. system voltage	1000V
Module fire resistance class	Class C
Application class (Safety class II)	Class A
series fuse rating	15 A
Number of bypass diodes	3
Max. mechanical load	5,400Pa
	10,000Pa (By ITRI, Optional)
Temperature range	-40 to +85°C

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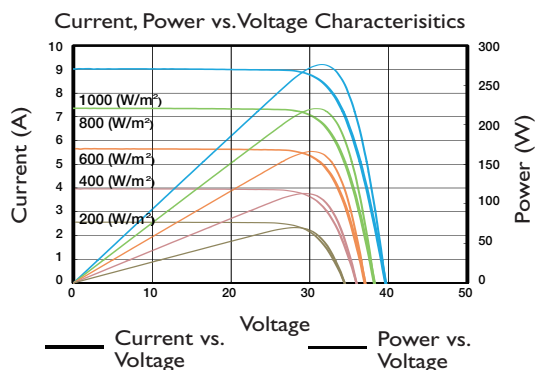
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### IV Curve



\* The information in this document is subject to change without notice.  
\* TSEC reserves the rights of final interpretation and revision of datasheet.  
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