**Backsheet Monocrystalline Module**

**PRODUCT:** TSM-DE21  
**POWER RANGE:** 650-670W

<table>
<thead>
<tr>
<th>Maximum Power Output</th>
<th>Positive Power Tolerance</th>
<th>Maximum Efficiency</th>
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<tbody>
<tr>
<td>670W</td>
<td>0~+5W</td>
<td>21.6%</td>
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**High customer value**
- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance of System) cost, shorter payback time
- Lowest guaranteed first year and annual degradation;
- Designed for compatibility with existing mainstream system components

**High power up to 670W**
- Up to 21.6% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection

**High reliability**
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load

**High energy yield**
- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.34%) and operating temperature

**Trina Solar’s Backsheet Performance Warranty**

<table>
<thead>
<tr>
<th>Years</th>
<th>Trina standard</th>
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<tbody>
<tr>
<td>5</td>
<td>98.9%</td>
</tr>
<tr>
<td>10</td>
<td>90.0%</td>
</tr>
<tr>
<td>15</td>
<td>84.8%</td>
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<tr>
<td>20</td>
<td></td>
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<tr>
<td>25</td>
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**Comprehensive Products and System Certificates**
- IEC61215/IEC61730/IEC61701/IEC62716
- ISO 9001: Quality Management System
- ISO 14001: Environmental Management System
- ISO14064: Greenhouse Gases Emissions Verification
- ISO45001: Occupational Health and Safety Management System
**OPERATIONAL TEMPERATURE**

-40~+85ºC

**MAXIMUM SYSTEM VOLTAGE**

1500V DC (IEC)

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### ELECTRICAL DATA (STC)

- Peak Power Watts-Pmax (Wp)*: 650, 655, 660, 665, 670
- Power Tolerance-Pmax (W): 0~+5
- Maximum Power Voltage-Vmp (V): 37.4, 37.6, 37.8, 38.0, 38.2
- Open Circuit Voltage-Voc (V): 45.3, 45.5, 45.7, 45.9, 46.1
- Module Efficiency\(\eta_m\) (%): 20.9, 21.1, 21.2, 21.4, 21.6

**ELECTRICAL DATA (NOCT)**

- Peak Power Watts-Pmax (Wp): 492, 496, 500, 504, 508
- Maximum Power Voltage-Vmp (V): 34.9, 35.1, 35.3, 35.4, 35.6
- Open Circuit Voltage-Voc (V): 42.7, 42.9, 43.0, 43.2, 43.4
- Short Circuit Current-Isc (A): 14.86, 14.89, 14.93, 14.96, 15.01

**MECHANICAL DATA**

- **Solar Cells**: Monocrystalline
- **No. of cells**: 132 cells
- **Module Dimensions**: 2384×1303×33 mm (93.86×51.30×1.30 inches)
- **Weight**: 33.3 kg (73.4 lb)
- **Glass**: 3.2 mm (0.13 inches), High Transmission, All Coated Heat Strengthened Glass
- **Encapsulant material**: EVA
- **Backsheet**: White
- **Frame**: 33mm(1.30 inches) Anodized Aluminium Alloy
- **J-Box**: IP68 rated
- **Cables**: Photovoltaic Technology Cable 4.0mm² (0.006 inches²), Portrait: 350/280 mm (13.78/11.02 inches)
- **Connector**: MC4 EVO2 / TS4* (Please refer to regional datasheet for specified connector)

**TEMPERATURE RATINGS**

- NOCT (Nominal Operating Cell Temperature): 43ºC (±2ºC)
- Temperature Coefficient of Pmax: -0.34%/ºC
- Temperature Coefficient of Voc: -0.25%/ºC
- Temperature Coefficient of Isc: 0.04%/ºC

**WARRANTY**

- 12 year Product Workmanship Warranty
- 25 year Power Warranty
- 2% first year degradation
- 0.55% Annual Power Attenuation

**PACKAGING CONFIGURATION**

- Modules per box: 33 pieces
- Modules per 40’ container: 594 pieces

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**CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.**

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