**Product: TSM-DE09C.05**

**Product Range:** 380-405W

### Vertex S

**Backsheet Monocrystalline Module**

**Maximum Power Output:** 405W

**Positive Power Tolerance:** 0~+5W

**Maximum Efficiency:** 21.1%

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**High Value**
- More productivity from same roof size.
- Outstanding visual appearance.
- Leading 210mm cell technology.

**Small in Size, Big on Power**
- Small format module allows greater energy generation in limited space.
- Up to 405W, 21.1% module efficiency with high density interconnect technology.
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current.
- Reduce installation cost with higher power bin and efficiency.
- Boost performance in warm weather with lower temperature coefficient (-0.34%) and operating temperature.

**Universal Solution for Residential and C&I rooftops**
- Designed for compatibility with existing mainstream optimizers, inverters and mounting systems.
- Perfect size and low weight makes handling and transportation easier and more cost-effective.
- Diverse installation solutions for flexibility in system deployment.

**High Reliability**
- 25 year product warranty.
- 25 year performance warranty with lowest degradation.
- Minimized micro-cracks with innovative non-destructive cutting technology.
- Ensured PID resistance through cell process and module material control.
- Mechanical performance up to +6000 Pa and -4000 Pa negative load.

**Trina Solar’s Backsheet Performance Warranty**

<table>
<thead>
<tr>
<th>Years</th>
<th>Guaranteed Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>5</td>
<td>90.0%</td>
</tr>
<tr>
<td>10</td>
<td>90.0%</td>
</tr>
<tr>
<td>15</td>
<td>90.0%</td>
</tr>
<tr>
<td>20</td>
<td>90.0%</td>
</tr>
<tr>
<td>25</td>
<td>84.8%</td>
</tr>
</tbody>
</table>

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**Comprehensive Products and System Certificates**

- IEC61215/IEC61730/IEC61701/IEC62716/UL61730
- ISO 9001: Quality Management System
- ISO 14001: Environmental Management System
- ISO14064: Greenhouse Gases Emissions Verification
- ISO45001: Occupational Health and Safety Management System
**ELECTRICAL DATA (STC)**

- Maximum Power Voltage (V)
- Maximum Power Current (A)
- Open Circuit Voltage (V)
- Short Circuit Current (A)
- Module Efficiency (η)
- Maximum Power (W)
- Power Tolerance (W)

**NOCT**

- Maximum Power Voltage (V)
- Maximum Power Current (A)
- Open Circuit Voltage (V)
- Short Circuit Current (A)

**Electrical characteristics with different power bin (reference to 10% Irradiance ratio)**

<table>
<thead>
<tr>
<th>Irradiance ratio</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Equivalent</td>
<td>390</td>
<td>405</td>
<td>422</td>
<td>427</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power (W)</td>
<td>401</td>
<td>406</td>
<td>417</td>
<td>422</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Power Voltage (V)</td>
<td>33.4</td>
<td>33.6</td>
<td>33.8</td>
<td>34.0</td>
<td>34.2</td>
<td>34.4</td>
</tr>
<tr>
<td>Maximum Power Current (A)</td>
<td>12.01</td>
<td>12.08</td>
<td>12.16</td>
<td>12.26</td>
<td>12.34</td>
<td>12.41</td>
</tr>
<tr>
<td>Open Circuit Voltage (V)</td>
<td>40.4</td>
<td>40.6</td>
<td>40.8</td>
<td>41.0</td>
<td>41.2</td>
<td>41.4</td>
</tr>
</tbody>
</table>

**Electrical Data (NOC)**

- Maximum Power Voltage (V)
- Maximum Power Current (A)
- Open Circuit Voltage (V)
- Short Circuit Current (A)

<table>
<thead>
<tr>
<th>Irradiance ratio</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Power Voltage (V)</td>
<td>31.3</td>
<td>31.5</td>
<td>31.8</td>
<td>32.0</td>
<td>32.2</td>
<td>32.5</td>
</tr>
<tr>
<td>Open Circuit Voltage (V)</td>
<td>38.0</td>
<td>38.2</td>
<td>38.4</td>
<td>38.6</td>
<td>38.8</td>
<td>38.9</td>
</tr>
</tbody>
</table>

**MECHANICAL DATA**

- Solar Cells: Monocrystalline
- Number of cells: 120
- Module Dimensions: 1754 x 1096 x 30 mm
- Weight: 21.0 kg
- Glass: 6.3 mm (0.25 inches), high transmission, All Coated, Heat Strengthened Glass
- Encapsulant material: EVA/POE
- Backsheet: Black Grid Transparent Backsheet
- Frame: 30mm (1.18 inches), Anodized Aluminum Alloy
- Connector: MC4 EVO2 / TS4
- IP 68 rated
- Photovoltaic Technology Cable: 4.0mm² (0.006 inches²), MC4 EVO2 / TS4

**WARRANTY**

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

**TEMPERATURE RATINGS**

- NOCT (Nominal Operating Cell Temperature): 43°C (±2°C)
- Temperature Coefficient of Power (W): -0.34%/°C
- Temperature Coefficient of Voc (V): -0.25%/°C
- Temperature Coefficient of ISC (A): 0.04%/°C

**PACKAGING CONFIGURATION**

- Modules per box: 36 pieces
- Modules per 40' container: 828 pieces

**DIMENSIONS OF PV MODULE (mm)**

- Portrait: 350 x 280 mm (13.78 x 11.02 inches)
- Landscape: 1100 x 1100 mm (43.31 x 43.31 inches)

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*STC: Irradiance 1000 W/m², Cell Temperature 25°C, Air Mass AM1.5.
*NOCT: Irradiance at 800 W/m², Ambient Temperature 20°C, Wind Speed 1 m/s.
*Measuring tolerance: ±3%.

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*Please refer to regional datasheet for specified connector.

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

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