Trina smart DC
THE OPTIMIZED SOLUTION

COMPATIBLE WITH MOST TRINA MODULES

245-310 W POWER OUTPUT RANGE

99.4% OPTIMIZER EFFICIENCY

FULLY INTEGRATED SMART SOLUTION

As a leading global manufacturer of next generation photovoltaic products, we believe close cooperation with our partners is critical to success. With local presence around the globe, Trina is able to provide exceptional service to each customer in each market and supplement our innovative, reliable products with the backing of Trina as a strong, bankable partner. We are committed to building strategic, mutually beneficial collaboration with installers, developers, distributors and other partners as the backbone of our shared success in driving Smart Energy Together.

Trina Solar Limited
www.trinasolar.com

Safer Solar
• Panel-level disconnect to remotely deactivate modules
• Arc, fire and safety hazard mitigation

More Efficient O&M
• Panel-level monitoring to pinpoint problems
• Detailed real-time alerts and analytics

Highest Power Density
• Install more modules on any roof
• Uneven string lengths enables design flexibility

Maximized Energy Harvest
• Impedance matching technology eliminates mismatch loses
• More power from each module bin

Lower BOS Costs from Smart Curve Technology
• 30% lower max open circuit voltage, 30% longer strings
• Fewer combiners, fuses and copper wiring required

Fully Integrated
• Compatible with any inverter
• No additional boxes to mount on module

LINEAR PERFORMANCE WARRANTY
10 Year Product Warranty • 25 Year Linear Power Warranty

- Additional value from Trina Solar’s linear warranty
- Graph showing performance over time
- Industry standard vs. Trina Solar performance
Trinasmart modules incorporate innovative power electronics from Tigo Energy to achieve module-level diagnostics, maximum energy harvest through module level DC power optimization, and reduction of arc, fire and safety hazards.

Integration of the module optimizer into the junction-box enables patented Smart Curve technology, which allows up to 30% longer strings and significant balance-of-system (BOS) savings.

**SYSTEM ARCHITECTURE**

Trinasmart system components work together with any inverter to maximize energy harvest. Trinasmart modules communicate wirelessly through the gateway, allowing users to monitor system performance in real time.

**SMART CURVE TECHNOLOGY**

Module-integrated Trinasmart technology reduces the open circuit voltage range for each module and allows longer strings to be designed. The maximum voltage is programmed by Trina Solar in the factory.

- Hardware voltage clamp prevents over-voltage
- Design up to 30% longer strings
- Fewer combiner boxes, fuses and wiring
- Smaller resistance losses
- TUV & CSA certified
**GATEWAY**

The Gateway provides wireless communication with up to 120 Trinasmart modules and the MMU. Up to seven Gateways can be connected to a single MMU.

**GATEWAY SPECIFICATIONS**

- **MMU Communications**
  - Wireless (802.15)
  - RS-485 cable connection; in series with other Gateways
- **Mounting Location**
  - Center of array
- **Mounting Method**
  - Mounted to module frame or rack
- **Wireless Range**
  - 15m line-of-sight
- **Maximum number of Trinasmart modules per Gateway**
  - 120
- **Mechanical Specifications**
  - Dimensions: 141.3 x 48.5 x 33.3mm (with bracket)
  - Weight: 0.9kg
  - Operating temperature range: -30°C to +70°C
  - Enclosure environmental rating: IP 65

**MODULE MANAGEMENT UNIT (MMU)**

The management unit controls processes in real time and sends data to a remote server for monitoring.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Communication</th>
<th>ONE UNIT SUPPORTS UP TO 360 TRINASMART MODULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Backhaul</td>
<td>Ethernet (MMU to Data Center)</td>
</tr>
<tr>
<td>On-Screen Prompts</td>
<td>Module (power, voltage, signal), Internet Check, basic troubleshooting</td>
</tr>
<tr>
<td>PV-Safe</td>
<td>Button deactivates the array (at the module-level)</td>
</tr>
<tr>
<td>Accessories</td>
<td>Pull data from most meters that speak Modbus (i.e., AC Meters)</td>
</tr>
<tr>
<td>Inverter Data</td>
<td>Can pull data from most inverters (SMA, Power One, Fronius, Kaco)</td>
</tr>
<tr>
<td>Power Compatibility</td>
<td>110 / 230V compatible converter (comes with international plugs)</td>
</tr>
<tr>
<td>Mechanical Specifications</td>
<td>Dimensions (L x W x H): 225.5 x 226 x 125 mm</td>
</tr>
<tr>
<td></td>
<td>Weight: 1 kg</td>
</tr>
<tr>
<td></td>
<td>Environmental Rating: NEMA 3R</td>
</tr>
<tr>
<td></td>
<td>Operating Temperature: 0° to +70°C</td>
</tr>
</tbody>
</table>

**THE OPTIMIZED SOLUTION**

**FEATURES**

- **MODULE**
  - Historical data access: Complete History
  - Data Granularity: 1 minute
  - Summary Screen with Module-level Data: Complete History
  - Data with >1% Accuracy: Complete History
  - Performance Analytics: Complete History
  - Safety Alerts (email, sms): Complete History
  - Performance Alerts (email, sms): Complete History
  - Daily & Monthly Report Emails: Complete History
  - Environmental Impact: Complete History
  - Google Maps Integration: Complete History
  - Priority Access to New Features: Complete History
  - Fleet Management Tools: Complete History
  - API access: Complete History

- **ADVANCED**
  - Historical data access: Complete History
  - Data Granularity: 2 seconds
  - Summary Screen with Module-level Data: Complete History
  - Data with >1% Accuracy: Complete History
  - Performance Analytics: Complete History
  - Safety Alerts (email, sms): Complete History
  - Performance Alerts (email, sms): Complete History
  - Daily & Monthly Report Emails: Complete History
  - Environmental Impact: Complete History
  - Google Maps Integration: Complete History
  - Priority Access to New Features: Complete History
  - Fleet Management Tools: Complete History
  - API access: Complete History

- **PRO**
  - Historical data access: Complete History
  - Data Granularity: 2 seconds
  - Summary Screen with Module-level Data: Complete History
  - Data with >1% Accuracy: Complete History
  - Performance Analytics: Complete History
  - Safety Alerts (email, sms): Complete History
  - Performance Alerts (email, sms): Complete History
  - Daily & Monthly Report Emails: Complete History
  - Environmental Impact: Complete History
  - Google Maps Integration: Complete History
  - Priority Access to New Features: Complete History
  - Fleet Management Tools: Complete History
  - API access: Complete History

**MONITORING SERVICE**

Trinasmart monitoring provides total insight into the performance of any system. Module-level monitoring is included free with Trinasmart. You can choose to upgrade online once your system is installed.

Explore the monitoring portal at www.trinasmart.com
**Trinasmart DC**

**THE OPTIMIZED SOLUTION**

**TSM-PA05.002/PA05.082**

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### TEMPERATURE RATINGS

**Nominal Operating Cell Temperature (NOCT)**

- **Temperature Ratings**
  - **Nominal Operating Cell Temperature (NOCT)**: 45°C (±2°C)

**Temperature Coefficients**

- **Temperature Coefficient of P_{MAX}**: -0.43%/°C
- **Temperature Coefficient of V_{OC}**: 0%/°C
- **Temperature Coefficient of I_{SC}**: 0.05%/°C

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### MAXIMUM RATINGS

**Operational Temperature**

- **-40~+85°C**

**Maximum System Voltage**

- **600V DC (UL)**

**Max Series Fuse Rating**

- **15A**

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### WARRANTY

- **10 year workmanship warranty**
- **25 year linear performance warranty**

(Please refer to product warranty for details)

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### PACKAGING CONFIGURATION

- **Modules per box**: 29 pcs
- **Modules per 40’ container**: 812 pcs

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### MECHANICAL DATA

**Solar Cells**

- Multicrystalline 156 × 156mm (6 inches)

**Cell Orientation**

- 60 cells (6 × 10)

**Module Dimension**

- 1650 x 992 x 35mm (64.95 x 39.05 x 1.37 inches)

**Weight**

- 19 kg (41.9lb)

**Glass**

- High Transmission, Low Iron, Tempered Glass, 3.2mm (0.13 inches)

**Backsheet**

- White

**Frame**

- Silver Anodized Aluminium Alloy (PA05.002), Black (PA05.082)

**J-Box**

- IP 65 rated

**Cables / Connector**

- Photovoltaic Technology cable 4.0mm² (0.006 inches²), 1200 mm (47.2 inches); H4

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### ELECTRICAL DATA (STC)

**Peak Power Watts (W_{P_{MAX}})**

- 245 (Wp)
- 250 (Wp)
- 255 (Wp)
- 260 (Wp)

**Power Output Tolerance**

- 0 ~ +3%

**Maximum Power Voltage (V_{MPPT})**

- 30.2
- 30.3
- 30.5
- 30.7

**Maximum Power Current (I_{MPPT})**

- 8.13
- 8.27
- 8.36
- 8.47

**Open Circuit Voltage (V_{OC})**

- 33.4
- 33.4
- 33.4
- 33.4

**Short Circuit Current (I_{SC})**

- 9.50
- 9.50
- 9.50
- 9.50

**Module Efficiency (η)**

- 15.0
- 15.3
- 15.6
- 15.9

---

### ELECTRICAL DATA (NOCT)

**Maximum Power (W_{P_{MAX}})**

- 178 (Wp)
- 181 (Wp)
- 184 (Wp)
- 188 (Wp)

**Maximum Power Voltage (V_{MPPT})**

- 26.8
- 27.0
- 27.2
- 27.4

**Maximum Power Current (I_{MPPT})**

- 6.64
- 6.70
- 6.77
- 6.86

**Open Circuit Voltage (V_{OC})**

- 33.4
- 33.4
- 33.4
- 33.4

**Short Circuit Current (I_{SC})**

- 9.50
- 9.50
- 9.50
- 9.50

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### CERTIFICATION

- Trinasmart modules limit the open circuit voltage to 33.4V

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

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**TEMPERATURE RATINGS**

Nominal Operating Cell Temperature (NOCT) | 45°C (±2°C)
Temperature Coefficient of P_{MAX} | -0.44%/°C
Temperature Coefficient of V_{OC} | 0%/°C
Temperature Coefficient of I_{SC} | 0.05%/°C

**MAXIMUM RATINGS**

Operational Temperature | -40~+85°C
Maximum System Voltage | 1000V DC (UL) 1000V DC (IEC)
Max Series Fuse Rating | 15A

**ELECTRICAL DATA (STC)**

<table>
<thead>
<tr>
<th></th>
<th>295</th>
<th>300</th>
<th>305</th>
<th>310</th>
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<tbody>
<tr>
<td>Peak Power Watts-P_{MAX} (Wp)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Power Output Tolerance-P_{MAX} (%)</td>
<td>0 ~ +3</td>
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<tr>
<td>Maximum Power Voltage-V_{MPPT} (V)</td>
<td>36.6</td>
<td>36.9</td>
<td>37.0</td>
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<tr>
<td>Maximum Power Current-I_{MPPT} (A)</td>
<td>8.07</td>
<td>8.13</td>
<td>8.25</td>
<td>8.38</td>
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<tr>
<td>Open Circuit Voltage-V_{OC}(V)</td>
<td>39.4</td>
<td>39.4</td>
<td>39.4</td>
<td>39.4</td>
</tr>
<tr>
<td>Short Circuit Current-I_{SC}(A)</td>
<td>9.50</td>
<td>9.50</td>
<td>9.50</td>
<td>9.50</td>
</tr>
<tr>
<td>Module Efficiency η_{m} (%)</td>
<td>15.2</td>
<td>15.5</td>
<td>15.7</td>
<td>16.0</td>
</tr>
</tbody>
</table>

**ELECTRICAL DATA (NOCT)**

<table>
<thead>
<tr>
<th></th>
<th>214</th>
<th>218</th>
<th>222</th>
<th>226</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Power-P_{MAX} (Wp)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Power Voltage-V_{MPPT} (V)</td>
<td>33.0</td>
<td>33.3</td>
<td>33.7</td>
<td>33.8</td>
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<tr>
<td>Maximum Power Current-I_{MPPT} (A)</td>
<td>6.48</td>
<td>6.55</td>
<td>6.59</td>
<td>6.68</td>
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<tr>
<td>Open Circuit Voltage-V_{OC}(V)</td>
<td>39.4</td>
<td>39.4</td>
<td>39.4</td>
<td>39.4</td>
</tr>
<tr>
<td>Short Circuit Current-I_{SC}(A)</td>
<td>9.50</td>
<td>9.50</td>
<td>9.50</td>
<td>9.50</td>
</tr>
</tbody>
</table>

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1 m/s.

**MECHANICAL DATA**

- Solar Cells: Multicrystalline 156 × 156 mm (6 inches)
- Cell Orientation: 72 cells (6 × 12)
- Module Dimension: 1956 × 992 × 40 mm (77 × 39.05 × 1.57 inches)
- Weight: 28 kg (61.7lb)
- Glass: High Transmission, Low Iron, Tempered Glass 4.0 mm (0.16 inches)
- Backsheet: white
- Frame: Silver Anodized Aluminium Alloy
- J-Box: IP 65 rated
- Cables / Connector: Photovoltaic Technology cable 4.0mm² (0.006 inches²), 1200 mm (47.2 inches), H4

**WARRANTY**

- 10 year workmanship warranty
- 25 year linear performance warranty
  (Please refer to product warranty for details)

**PACKAGING CONFIGURATION**

- Modules per box: 25 pcs
- Modules per 40’ container: 550 pcs

**CERTIFICATION**

[Logo]

**ELECTRICAL DATA**

- Peak Power Watts-P_{MAX} (Wp)
- Power Output Tolerance-P_{MAX} (%)
- Maximum Power Voltage-V_{MPPT} (V)
- Maximum Power Current-I_{MPPT} (A)
- Open Circuit Voltage-V_{OC}(V)
- Short Circuit Current-I_{SC}(A)
- Module Efficiency η_{m} (%)

**DIMENSIONS OF PV MODULE**

<table>
<thead>
<tr>
<th>941mm</th>
<th>812mm</th>
<th>1956mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>941mm</td>
<td>812mm</td>
<td>1956mm</td>
</tr>
</tbody>
</table>

**I-V CURVES OF PV MODULE (295W)**

<table>
<thead>
<tr>
<th>Voltage (V)</th>
<th>10</th>
<th>9</th>
<th>8</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current (A)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**RECYCLABLE packaging**

Trinasmart DC THE OPTIMIZED SOLUTION TSM-PD14.002

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