BREAKING THE 20% EFFICIENCY BARRIER
Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 21.1%.

THE MOST THOROUGH TESTING PROGRAMME IN THE INDUSTRY
Q CELLS is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new “Quality Controlled PV” of the independent certification institute TÜV Rheinland.

LOW ELECTRICITY GENERATION COSTS
Higher yield per surface area, lower BOS costs and up to 30 watts more power per module.

ENDURING HIGH PERFORMANCE
Long-term yield security with Anti LID Technology, Anti PID Technology1, Hot-Spot Protect and Traceable Quality Tra.Q™.

EXTREME WEATHER RATING
High-tech aluminum alloy frame, certified for high snow (5400 Pa) and wind loads (2400 Pa).

A RELIABLE INVESTMENT
Inclusive 12-year product warranty and 25-year linear performance warranty2.

STATE OF THE ART MODULE TECHNOLOGY
Q.ANTUM DUO combines cutting edge cell separation and innovative 12-busbar design with Q.ANTUM Technology.

1 APT test conditions according to IEC/TS 62804-1:2015, method A (-1500 V, 96h)
2 See data sheet on rear for further information.
**MECHANICAL SPECIFICATION**

**Format**  
85.2 in × 40.6 in × 1.38 in (including frame)  
(2163 mm × 1030 mm × 35 mm)

**Weight**  
56.2 lbs (25.5 kg)

**Front Cover**  
0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology

**Back Cover**  
Composite film

**Frame**  
Anodized aluminum

**Cell**  
6 × 26 monocrystalline Q.ANTUM solar half cells

**Junction Box**  
2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in, IP67, with bypass diodes

**Cable**  
4 mm² Solar cable; (+) ≥ 27.6 in (700 mm), (−) ≥ 13.8 in (350 mm)*

**Connector**  
Stäubli MC4-Evo2, Hanwha Q CELLS HQC4, IP68

*Long cables (+) ≥ 57.1 in (1450 mm), (−) ≥ 57.1 in (1450 mm)

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**ELECTRICAL CHARACTERISTICS**

**Power Class**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>445</th>
<th>450</th>
<th>455</th>
<th>460</th>
<th>465</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage at MPP</td>
<td>50.12</td>
<td>50.15</td>
<td>50.18</td>
<td>50.22</td>
<td>50.25</td>
</tr>
<tr>
<td>Current at MPP</td>
<td>8.56</td>
<td>8.58</td>
<td>8.60</td>
<td>8.62</td>
<td>8.64</td>
</tr>
<tr>
<td>Open Circuit Voltage</td>
<td>10.62</td>
<td>10.10</td>
<td>10.15</td>
<td>10.20</td>
<td>10.25</td>
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<tr>
<td>Voltage at MPP</td>
<td>44.06</td>
<td>44.34</td>
<td>44.61</td>
<td>44.89</td>
<td>45.16</td>
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<tr>
<td>Efficiency</td>
<td>≥ 20.0</td>
<td>≥ 20.2</td>
<td>≥ 20.4</td>
<td>≥ 20.6</td>
<td>≥ 20.9</td>
</tr>
</tbody>
</table>

**MEASUREMENT TOLERANCES**

<table>
<thead>
<tr>
<th>Connector</th>
<th>Cable</th>
<th>Junction Box</th>
<th>Cell</th>
<th>Frame</th>
<th>Back Cover</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>± 3 %</td>
<td>± 3 %</td>
<td>± 3 %</td>
<td>± 5 %</td>
<td>± 5 %</td>
<td>± 5 %</td>
<td>± 5 %</td>
</tr>
</tbody>
</table>

**Q CELLS PERFORMANCE WARRANTY**

**Performance at Low Irradiance**

- At least 96% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 96% of nominal power up to 25 years.
- All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.

**TEMPERATURE COEFFICIENTS**

- Temperature Coefficient of I_{SC} \( \alpha \) [% / K] +0.04
- Temperature Coefficient of V_{OC} \( \beta \) [% / K] −0.27
- Temperature Coefficient of P_{MPPT} \( \gamma \) [% / K] −0.35

**Nominal Module Operating Temperature**

- Nominal Module Operating Temperature: 20.2°C ± 5.4°C (43 ± 3°C)

**PROPERTIES FOR SYSTEM DESIGN**

- Maximum System Voltage V_{MPP} [V]: 1500 (IEC)/1500 (UL)
- PV module classification: Class II
- Maximum Series Fuse Rating [A DC]: 20
- Fire Rating based on ANSI/UL 61730 TYPE I
- Max. Design Load, Push/Pull [lbs/ft²]: 75 (3600 Pa)/33 (1800 Pa)
- Permitted Module Temperature on Continuous Duty: −40°F up to +185°F (~−40°C up to +85°C)

**QUALIFICATIONS AND CERTIFICATIONS**


**PACKAGING AND TRANSPORT INFORMATION**

- Horizontal packaging: 2230 mm 24 pallets
- Vertical packaging: 5400 mm 22 pallets
- 400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | TEL +1 949 748 59 96 | EMAIL inquiry@us.q-cells.com | WEB www.q-cells.us

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*Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.*