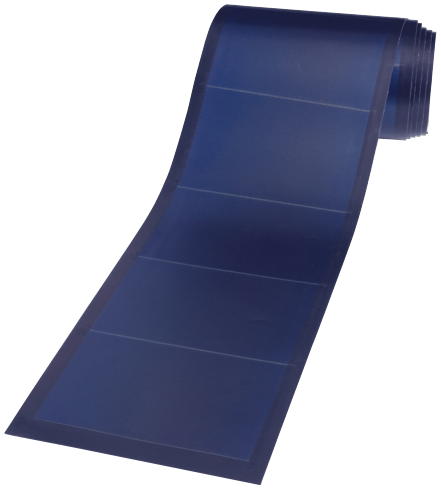
UNI-SOLAR

PowerBond™ PVL

TECHNICAL DATA SHEET
PVL-136

- High Temperature and Low Light Performance
- 5-Year Limited Product Warranty
- Limited Power Output Warranty:
  92% at 10 years, 84% at 20 years, 80% at 25 years (of minimum power)
- Quick-Connect Terminals and Adhesive Backing
- Bypass Diodes for Shadow Tolerance



Performance Characteristics

Rated Power (P_{max}):	136 Wp
Production P_{max} Tolerance:	± 5 %

Construction Characteristics

Dimensions:	Length: 5486 mm (216”), Width: 394 mm (15.5”), Depth: 4 mm (0.2”), 16 mm (0.6”) including potted terminal housing assembly
Weight:	7.7 kg (17.0 lbs)
Output Cables:	4 mm^2 (12 AWG) cable with weatherproof DC-rated quick-connect terminals 560 mm (22“) length
Bypass Diodes:	Connected across every solar cell
Encapsulation:	Durable ETFE high light-transmissive polymer
Adhesive:	Ethylene propylene copolymer adhesive sealant with microbial inhibitor
Cell Type:	22 triple junction amorphous silicon solar cells 356 mm x 239 mm (14” x 9.4”) connected in series

Qualifications and Safety

c UL us — UL 1703 Listed by Underwriters Laboratories for electrical and fire safety (Class A Max. Slope 2/12, Class B Max. Slope 3/12, Class C Unlimited Slope fire ratings) for use in systems up to 600 VDC.

TÜV Rheinland — IEC 61646 and IEC 61730 certified by TÜV Rheinland for use in systems up to 1000 VDC.

Laminate Standard Configuration

Photovoltaic laminate with potted terminal housing assembly with output cables and quick-connect terminals on top.

Application Criteria*

- Installation temperature between 10 °C - 40 °C (50 °F - 100 °F)
- Maximum roof temperature: 85 °C (185 °F)
- Minimum slope: 3° (1/2:12)
- Maximum slope: 60° (21:12)
- Approved substrates include certain membrane and metal roofing products. See United Solar for details.

**Detailed installation requirements are specified in United Solar‘s installation manuals.*

Flexible
Lightweight
Durable
No-Glass
Shadow Tolerant
More kWh
High Temp Performance
Low Light Performance

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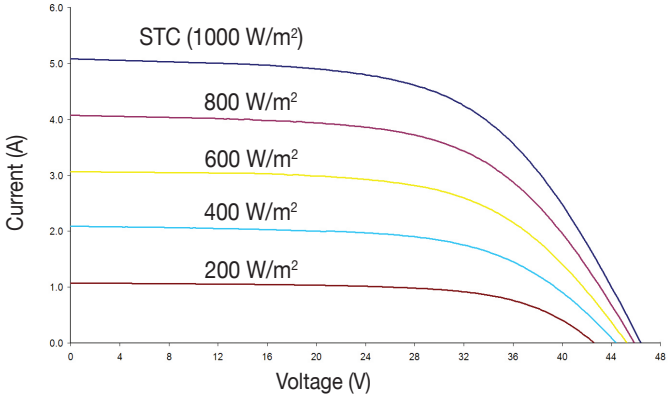
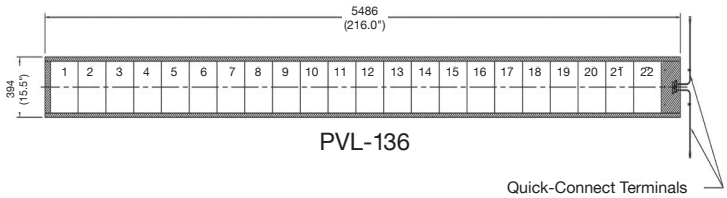
IV Curves at various Levels of Irradiance at Air Mass 1.5 and 25 °C Cell Temperature





All measurements in mm
Inches in parentheses
Tolerances: Length: ± 5 mm (1/4"), Width: ± 3 mm (1/8")

Electrical Specifications

STC

(Standard Test Conditions)
(1000 W/m², AM 1.5, 25 °C Cell Temperature)

Maximum Power (P_{max}): 136 W
Voltage at Pmax (V_{mpp}): 33.0 V
Current at Pmax (I_{mpp}): 4.13 A
Short-circuit Current (I_{sc}): 5.1 A
Open-circuit Voltage (V_{oc}): 46.2 V
Maximum Series Fuse Rating: 10 A (UL), 8 A (IEC)

NOCT

(Nominal Operating Cell Temperature)
(800 W/m², AM 1.5, 1 m/sec. wind)

Maximum Power (P_{max}): 105 W
Voltage at Pmax (V_{mpp}): 30.8 V
Current at Pmax (I_{mpp}): 3.42 A
Short-circuit Current (I_{sc}): 4.1 A
Open-circuit Voltage (V_{oc}): 42.2 V
NOCT: 46 °C

Temperature Coefficients

(at AM 1.5, 1000 W/m² irradiance)

Temperature Coefficient (TC) of I_{sc}: 0.001/K (0.10%/°C)
Temperature Coefficient (TC) of V_{oc}: -0.0038/K (-0.38%/°C)
Temperature Coefficient (TC) of P_{max}: -0.0021/K (-0.21%/°C)
Temperature Coefficient (TC) of I_{mpp}: 0.001/K (0.10%/°C)
Temperature Coefficient (TC) of V_{mpp}: -0.0031/K (-0.31%/°C)

y = yreference • [1 + TC • (T- Treference)]

Notes:
1. During the first 8-10 weeks of operation, electrical output exceeds specified ratings. Power output may be higher by 15%, operating voltage may be higher by 11% and operating current may be higher by 4%.
2. Production tolerance for P_{max} at standard test conditions (STC) is +/-5% and for other electrical parameters is +/-10%. Electrical specifications are based on measurements performed at standard test conditions of 1000 W/m² irradiance, Air Mass 1.5, and cell temperature of 25 °C after stabilization.
3. Actual performance may vary up to 10% from rated power due to low temperature operation, spectral and other related effects. Maximum system open-circuit voltage not to exceed 600 VDC per UL, 1000 VDC per IEC regulations.
4. Specifications subject to change without notice.

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