BP MSX 60

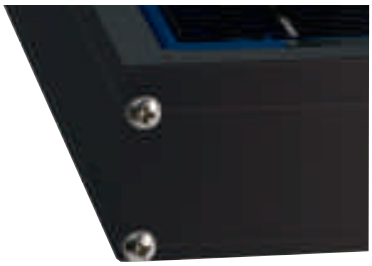
60-Watt Multicrystalline
Photovoltaic Module

BP Solar's MSX series is a premium line of PV modules with a 25-year performance warranty, tightly controlled electrical parameters, and labeling showing each module's tested electrical characteristics. The MSX 60 provides 60 watts of nominal maximum power, and is well-suited to traditional applications of photovoltaics such as telecommunications, remote villages and clinics, pumping, and land-based aids to navigation. Its attractive bronze-anodized frame also suits it well for architectural applications.

Proven Materials and Construction

BP Solar's quarter-century of field experience shows in every aspect of these module's construction and materials:

- 36 multicrystalline silicon solar cells configured as two 18-cell series strings;
- Cells are laminated between sheets of ethylene vinyl acetate (EVA) and high-transmissivity low-iron 3mm tempered glass;
- Frame strength exceeds requirements of certifying agencies.



Bronze Anodized Universal Frame

High-Capacity Versatile Junction Box

The junction box is raintight (IP54 rated) and accepts PG13.5 or 1/2" nominal conduit or cable fittings. Its volume (411cc, 25 cubic inches) and 6-terminal connection block enable most system array connections (putting modules in series or parallel) to be made right in the junction box. Options include:

- blocking and bypass diodes;
- an oversize terminal block which accepts conductors up to 25mm^2 (AWG #4); standard terminals accept up to 6mm^2 (AWG #10);
- a Solarstate™ charge regulator.

Shipped in 12V configuration, modules may easily be switched to 6V configuration by moving leads in the junction box. Six-volt modules are intended to support 6V loads, and are not recommended as series elements in higher voltage arrays.

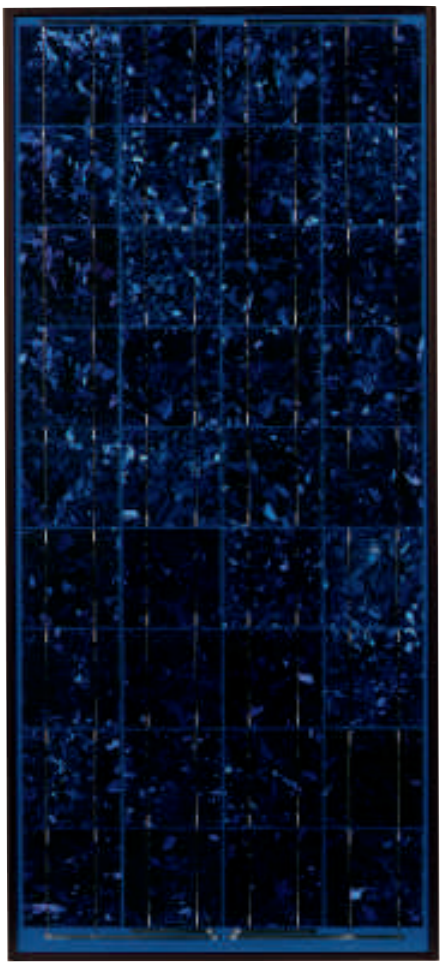
Quality and Safety

- Manufactured in ISO 9001-certified factories;
- Certified by PowerMark Corporation;
- Listed by Underwriter's Laboratories for electrical and fire safety (Class C fire rating);
- Certified by TÜV Rheinland as Class II equipment;
- Approved by Factory Mutual Research for application in NEC Class 1, Division 2, Groups C & D hazardous locations;
- Compliant with the requirements of IEC 61215 including:
  - repetitive cycling between -40°C and 85°C at 85% relative humidity;
  - simulated impact of 25mm (one-inch) hail at terminal velocity;
  - a "damp heat" test, consisting of 1000 hours of exposure to 85°C and 85% relative humidity;
  - a "hot-spot" test, which determines a module's ability to tolerate localized shadowing (which can cause reverse-biased operation and localized heating);
  - static loading, front and back, of 2400 pascals (50 psf); front loading (e.g. snow) of 5400 pascals (113 psf).

Limited Warranties

- Power output for 25 years;
- Freedom from defects in materials and workmanship for 5 years.

See our website or your local representative for full terms of these warranties.



BP MSX 60

Individually Tested and Labeled

Each module tested and labeled with its actual output—voltage, current, and power at maximum power point (P_{max})—at Standard Test Conditions and Standard Operating Conditions.

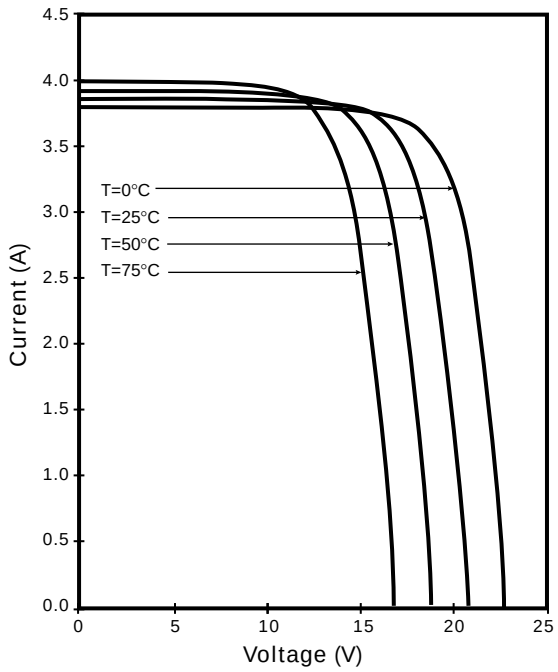
Electrical Characteristics[1]

	BP MSX 60	BP MSX 64[4]
Maximum power (P_{max})[2]	60W	64W
Voltage at P_{max} (V_{mp})	17.1V	17.5V
Current at P_{max} (I_{mp})	3.5A	3.66A
Minimum P_{max}	58W	62W
Short-circuit current (I_{sc})	3.8A	4.0A
Open-circuit voltage (V_{oc})	21.1V	21.3V
Temperature coefficient of I_{sc}	(0.065±0.015)%/°C	
Temperature coefficient of V_{oc}	-(80±10)mV/°C	
Temperature coefficient of power	-(0.5±0.05)%/°C	
NOCT[3]	47±2°C	
Maximum system voltage	600V (U.S. NEC rating) 1000V (TÜV Rheinland rating)	
Maximum series fuse rating	20A	

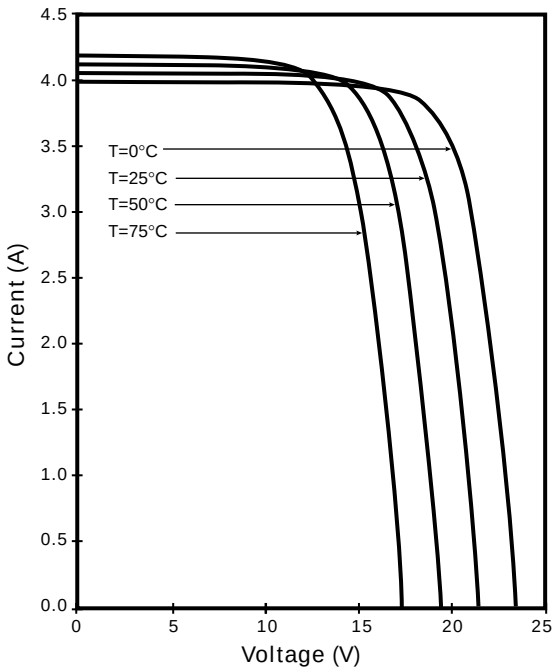
Notes

1. These data represent the performance of typical MSX 60 and MSX 64 modules as measured at their output terminals, and do not include the effect of such additional equipment as diodes or cables. The data are based on measurements made in accordance with ASTM E1036 corrected to SRC (Standard Reporting Conditions, also known as STC or Standard Test Conditions), which are:
   - illumination of 1 kW/m² (1 sun) at spectral distribution of AM 1.5 (ASTM E892 global spectral irradiance);
   - cell temperature of 25°C.
2. During the stabilization process which occurs during the first few months of deployment, module power may decrease approximately 3% from typical P_{max}.
3. The cells in an illuminated module operate hotter than the ambient temperature. NOCT (Nominal Operating Cell Temperature) is an indicator of this temperature differential, and is the cell temperature under Standard Operating Conditions: ambient temperature of 20°C, solar irradiation of 0.8 kW/m², and wind speed of 1 m/s.
4. The power of solar cells varies in the normal course of production; the MSX 64 is assembled in limited quantities using cells of slightly higher power than the MSX 60.

MSX 60 I-V Curves



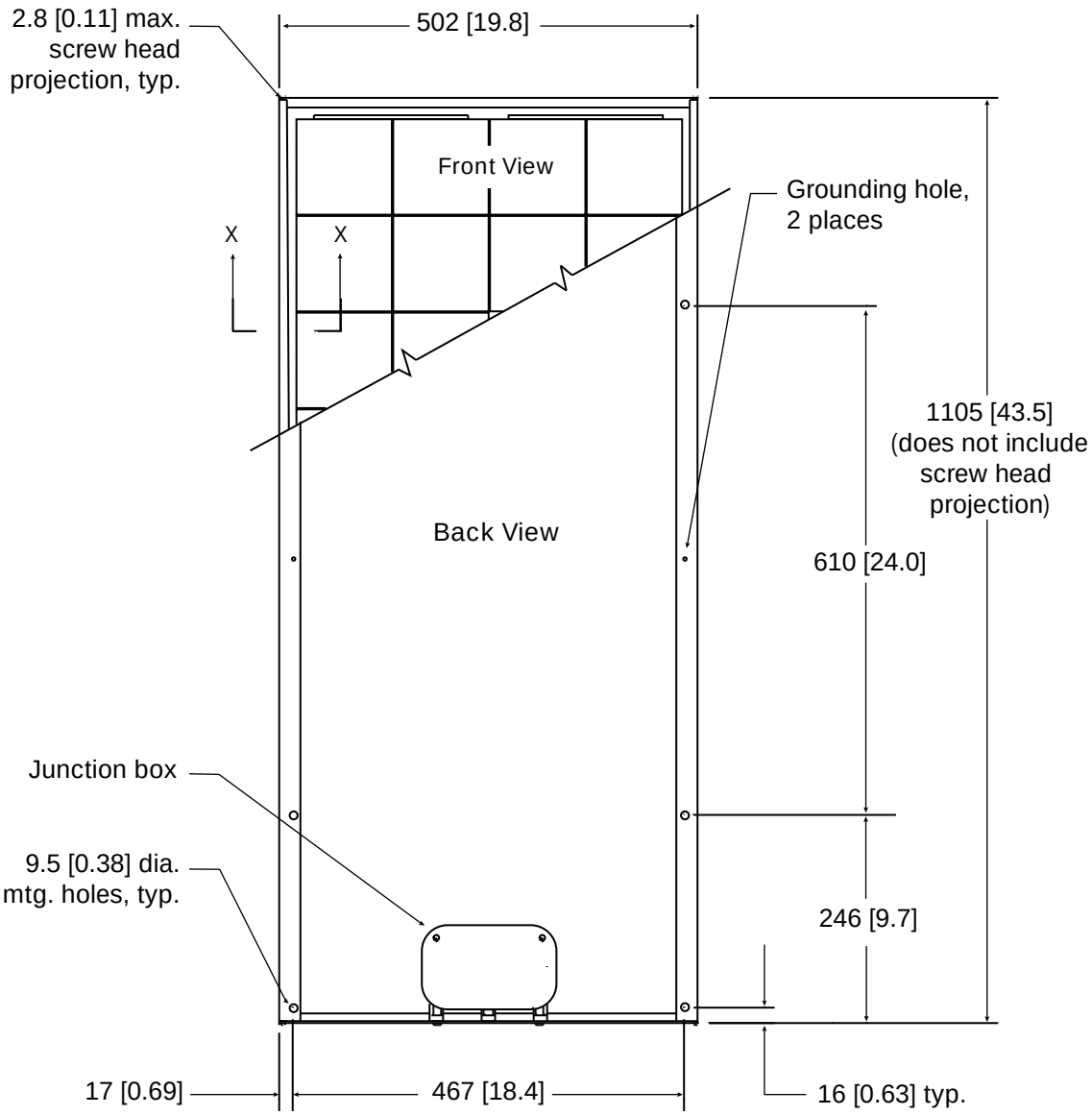
MSX 64 I-V Curves



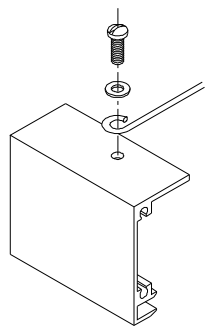
Mechanical Characteristics

Weight
MSX 60 7.2 kg (15.9 pounds)

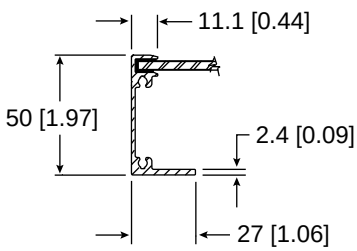
Dimensions
Unbracketed dimensions are in millimeters.
Dimensions in brackets are in inches.
Overall tolerances ±3mm (1/8")



MSX 60



Grounding Detail



Section X-X

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This publication summarizes product warranty and specifications, which are subject to change without notice and should not be used as the definitive source of information for final system design. Additional warranty and technical information may be found on our website www.bpsolar.com or may be obtained from your local representative.

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