

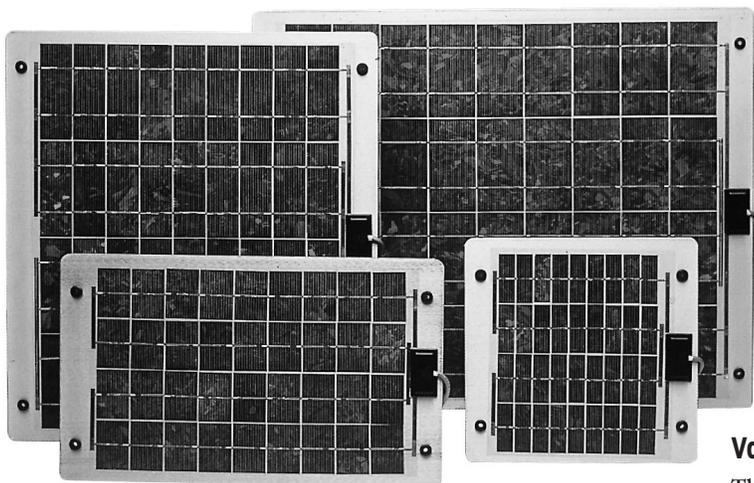
# MSX-Lite Photovoltaic Modules

25  
ANNIVERSARY  
1973-1998



MSX-Lite™ modules, part of Solarex's Megamodule™ series, are designed for applications requiring a combination of light weight, compactness, and ruggedness. They are particularly useful as 12VDC power sources for expeditions, mobile communications, recreational vehicles and railroad signaling devices.

Four models of MSX-Lite are available, the MSX-5 Lite, MSX-10 Lite, MSX-20 Lite and the MSX-30 Lite, delivering typical peak power of 4.5, 10, 20, and 30 watts respectively at Standard Test Conditions (STC). They are intended primarily for use in single-module power systems, but may be interconnected—up to a 30V nominal limit—to provide increased voltage or current.



## Individually Tested, Labeled and Warranted

As part of the final inspection procedure, every MSX-Lite module is tested in a solar simulator and labeled with its actual output—voltage, current, and power at maximum power point ( $P_{max}$ )—at Standard Test Conditions and Standard Operating Conditions. Furthermore, Solarex guarantees:

- that no module will generate less than its guaranteed minimum  $P_{max}$  when purchased;
- at least 90% of the guaranteed minimum  $P_{max}$  for five years.

Contact Solarex's Marketing Department for full terms and limitations of this warranty.

## Proven Materials and Construction

The materials used in these modules reflect Solarex' two decades of experience with solar modules and systems installed in virtually every climate on Earth.

- Polycrystalline silicon solar cells: efficient, attractive, stable.
- Modules are rugged and weatherproof: cell strings are laminated between sheets of ethylene vinyl acetate (EVA) with a stainless steel substrate and Tedlar™ cover.

- Proven cell interconnection technique and moisture-resistant metallization ensure electrical integrity in severe climates.

## Light, Rugged, Easily Mounted

Although extremely rugged, MSX-Lite modules are compact and lightweight. The largest, the MSX-30 Lite, weighs only 6 1/2 pounds (3 kg). The modules may be mounted from front or back through four grommet-finished holes which accept fasteners up to 0.2" (5mm) diameter. Total module thickness is only 16 mm, including the mounting grommets and the low-profile output termination box. The termination box is on the module's front, facilitating mounting on flat surfaces. MSX-Lite modules can also be mounted on curved surfaces: they will conform to curvature up to 1 inch per foot.

## Ample Charging Voltage

With 36 cells in series, MSX-Lite modules generate sufficient voltage to charge 12V batteries in virtually any climate, as shown by the electrical characteristics on the reverse of this sheet.

## Solarex Quality

MSX-Lite modules are tested and inspected in our ISO 9001-certified factories to demanding specifications.

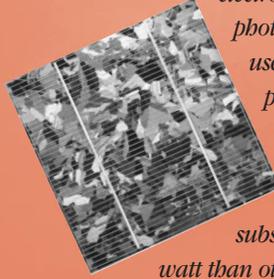
## Variables Affecting Performance

The performance of typical MSX-Lite™ modules is described by the I-V (current/voltage) curves and electrical characteristics table on the reverse side. Each module's actual, tested output characteristics are printed on its label.

## Options

MSX-Lite modules may be ordered with an integral blocking diode, which prevents battery discharge at night or during periods of poor insolation.

*More than 20 years ago, Solarex made the first polycrystalline silicon solar cell, advancing photovoltaics beyond the first-generation monocrystalline technology developed for electronics. Developed specifically for photovoltaics, polycrystalline silicon is used in Solarex's Mega™ series to provide a wide range of attractive, efficient modules. They require substantially less energy to manufacture and generate substantially more energy per rated watt than other crystalline silicon modules.*

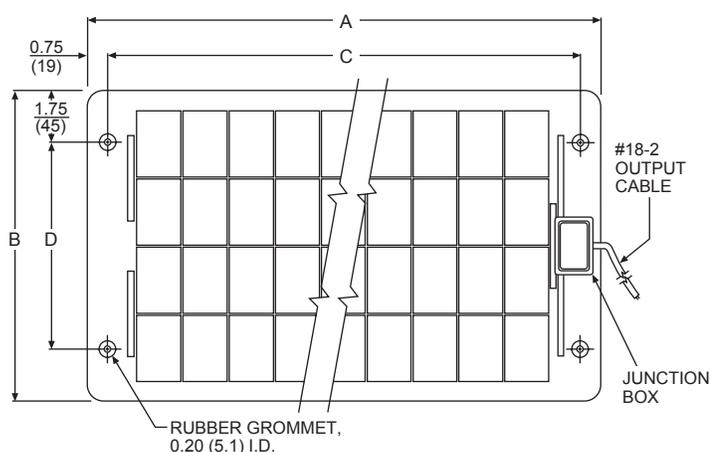


## Mechanical Characteristics

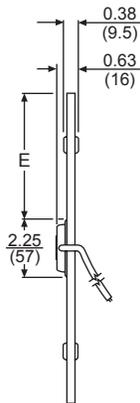
	MSX-30 Lite	MSX-20 Lite	MSX-10 Lite	MSX-5 Lite
Weight in pounds (kg)	6.5 (3.0)	4.5 (2.1)	2.5 (1.1)	1.6 (0.7)
Dimension (see dwg)	Inches (millimeters)			
A	24.25 (616)	17.5 (445)	17.5 (445)	10.75 (273)
B	19.5 (495)	19.5 (495)	10.5 (267)	10.5 (267)
C	22.75 (578)	16.0 (406)	16.0 (406)	9.25 (235)
D	16.0 (406)	16.0 (406)	7.0 (178)	7.0 (178)
E	8.63 (219)	8.63 (219)	4.13 (105)	4.13 (105)

**Output cable:** 3 meters long, AWG #18-2.

**Dimensions:** Dimensions in brackets are in millimeters. Unbracketed dimensions are in inches. Overall tolerances  $\pm 1/8"$  (3mm)



FRONT VIEW



SIDE VIEW

	DIM. A	DIM. B	DIM. C	DIM. D	DIM. E
MSX-5 LITE	10.75 (27)	10.50 (27)	9.25 (23)	7.00 (18)	4.13 (11)
MSX-10 LITE	17.50 (44)	10.50 (27)	16.00 (41)	7.00 (18)	4.13 (11)
MSX-20 LITE	17.50 (44)	19.50 (50)	16.00 (41)	16.00 (41)	8.63 (22)
MSX-30 LITE	24.25 (62)	19.50 (50)	22.75 (58)	16.00 (41)	8.63 (22)

For more information, contact:

## Typical Electrical Characteristics\*

	MSX-30 Lite	MSX-20 Lite	MSX-10 Lite	MSX-5 Lite
Maximum power ( $P_{max}$ )	... .30W	... .20W	... .10W	... .4.5W
Voltage @ $P_{max}$ ( $V_{mp}$ )	... .17.1V	... .17.1V	... .17.1V	... .16.8V
Current @ $P_{max}$ ( $I_{mp}$ )	... .1.75A	... .1.17A	... .0.58A	... .0.27A
Guaranteed minimum $P_{max}$	... .27W	... .18W	... .9W	... .4W
Short-circuit current ( $I_{sc}$ )	... .1.90A	... .1.27A	... .0.60A	... .0.29A
Open-circuit voltage ( $V_{oc}$ )	... .21.1V	... .20.8V	... .21.1V	... .20.6V
Temperature coefficient of $I_{sc}$	... .(0.065 $\pm$ 0.015)%/°C	...	...	...
Temperature coefficient of $V_{oc}$	... .-(80 $\pm$ 10)mV/°C	...	...	...
Approximate effect of temperature on power	... .-(0.5 $\pm$ 0.05)%/°C	...	...	...

### NOTES

\* These data represent the performance of typical modules as measured at their output cable terminations, and do not include the effect of such additional equipment as diodes. The data are based on measurements made in a solar simulator at Standard Test Conditions (STC), which are:

- Illumination of 1 kW/m<sup>2</sup> (1 sun) at spectral distribution of AM 1.5
- Cell temperature of 25°C or as otherwise specified (on curves).

Operating characteristics in sunlight may differ slightly.

### I-V Characteristics

