

## IXOLAR™ High Efficiency SolarBIT

### Description

IXOLAR™ SolarBITs are IXYS' product line of coated monocrystalline, high efficiency solar cell products using IXYS' XOD17 bondable solar cell dies. SolarBITs have reflow solderable surface mount packages, they are available in tape and reel packages and can be automatically pick and place mounted. There are 3 different SolarBITs available with different voltage and current output.

The IXOLAR™ SolarBITs are ideal for charging various battery powered and handheld consumer products such as mobile phones, cameras, PDAs, MP3-Players and toys. They are also suitable for industrial applications such as wireless sensors, portable instrumentation and for charging emergency backup batteries.

With a cell efficiency of typically 17%, SolarBITs give the ability to extend run time even in "low light" conditions and increase battery life and run time in a small footprint, which can be easily accommodated in the design of Portable Products. The design allows connecting SolarBITs flexibly in series and/or parallel to perfectly meet the application's power requirements.

IXOLAR™ products have a very good response over a wide wavelength range and therefore can be used in both indoor and outdoor applications.

### Product and Ordering Information

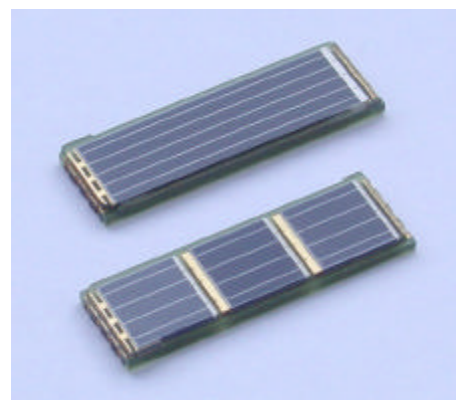
| Part Number | Open Circuit Voltage [V] | Short Circuit Current [mA] | Typ. Voltage @ P <sub>mpp</sub> [V] | Typ. Current @ P <sub>mpp</sub> [mA] |
|-------------|--------------------------|----------------------------|-------------------------------------|--------------------------------------|
| XOB17-12x1  | 0.63                     | 42.0                       | 0.51                                | 39.0                                 |
| XOB17-04x3  | 1.89                     | 12.6                       | 1.53                                | 11.7                                 |
| XOB17-01x8  | 4.90                     | 4.2                        | 4.00                                | 3.9                                  |

(parameters given are typical values)

Dimensions (L x W x H): 22 x 7 x 1.6 [mm]

SolarBIT Weight: 0.5 grams

SolarBITs are compliant to the RoHS Norm.



### SolarBIT Electrical Characteristics

| Symbol              | Cell Parameter                          | Typical Ratings *) | Units                  |
|---------------------|---|--------------------|------------------------|
| V <sub>OC</sub>     | open circuit voltage                    | 630                | mV                     |
| J <sub>SC</sub>     | short circuit current density           | 35                 | mA/cm <sup>2</sup>     |
| V <sub>mpp</sub>    | voltage at max. power point             | 505                | mV                     |
| J <sub>mpp</sub>    | current density at max. power point     | 32.5               | mA/cm <sup>2</sup>     |
| P <sub>mpp</sub>    | maximum peak power                      | 16.6               | mW/cm <sup>2</sup>     |
| FF                  | fill factor                             | > 75               | %                      |
| ?                   | efficiency                              | 17                 | %                      |
| ?V <sub>OC</sub> ?T | open circuit voltage temp. coefficient  | -2.1               | mV/K                   |
| ?J <sub>SC</sub> ?T | short circuit current temp. coefficient | 0.12               | mA/(cm <sup>2</sup> K) |

\*) All values measured at Standard Condition: 1 sun (= 1000 W/m<sup>2</sup>), Air Mass 1.5, 25°C

### Features

- Monocrystalline silicon technology
- High efficiency outdoor and indoor
- Long life and stable output
- Sealed Package
- Surface Mount Package
- Reflow Solderable
- Very high mechanical robustness

### Applications

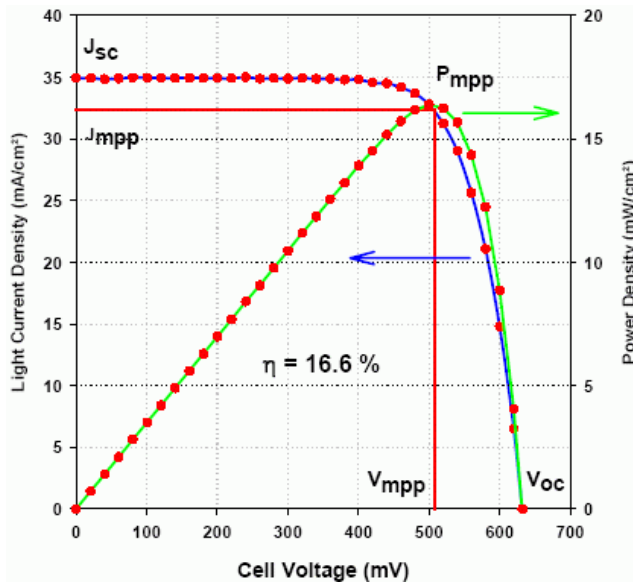
- Battery chargers for portables such as cell phones, PDAs, GPS-Systems, ...
- "Green" electricity generation
- Power backup for UPS, Sensors, Wearables

### Advantages

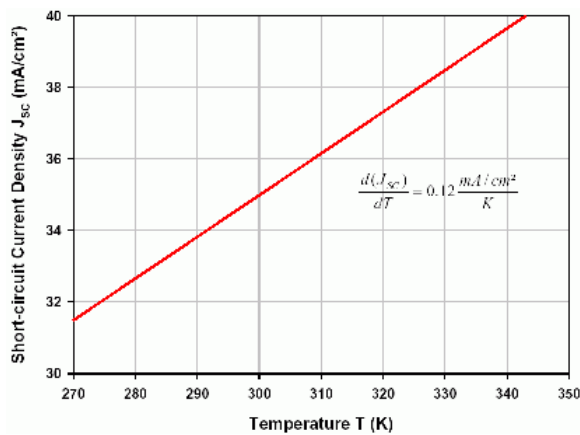
- Automatic Pick & Place Mounting
- One Product for Multiple Applications
- Flexible Integration into the Application

## Typical SolarBIT Performance Data

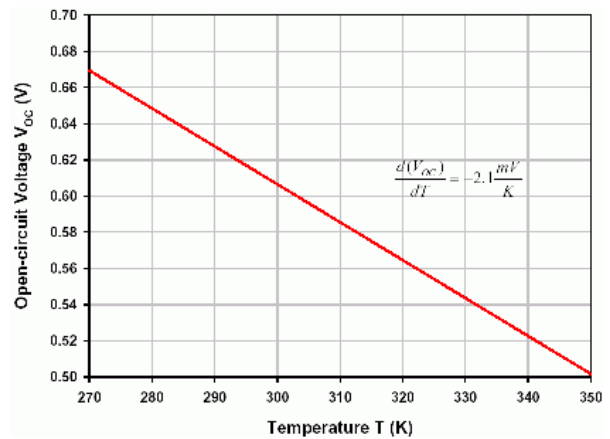
Cell Current/Voltage Behavior



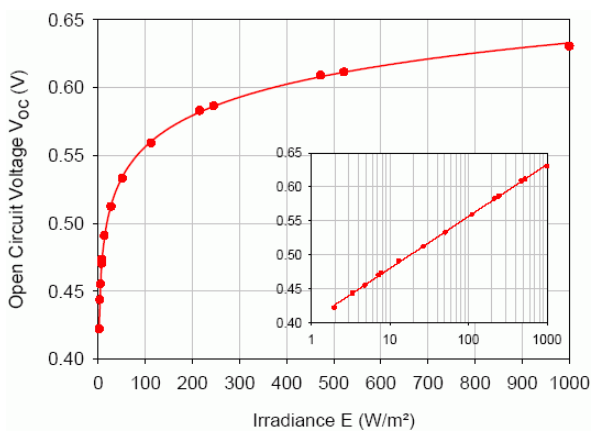
Short-Circuit Current Density vs. Temperature



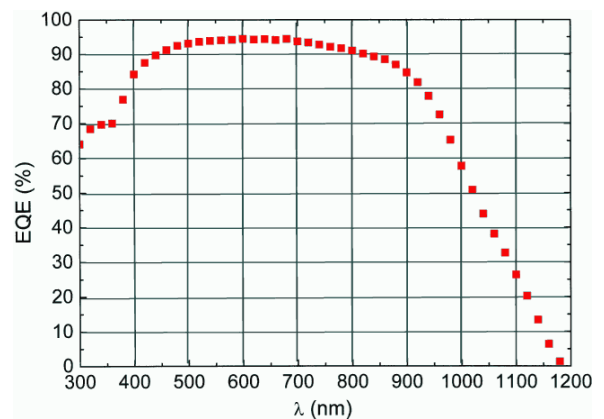
Open-Circuit Voltage vs. Temperature

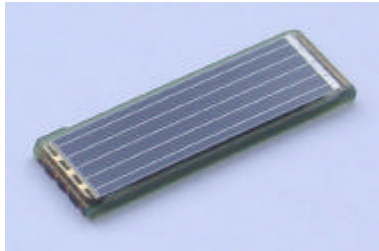
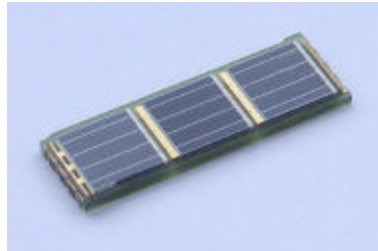
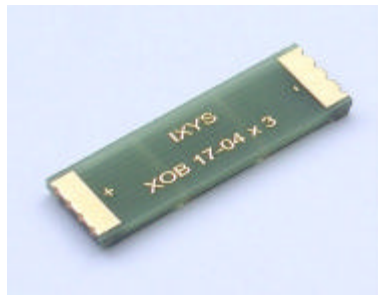
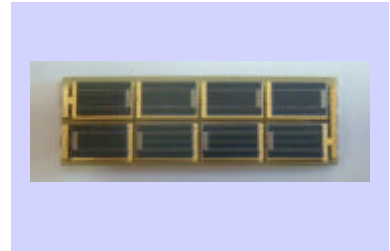
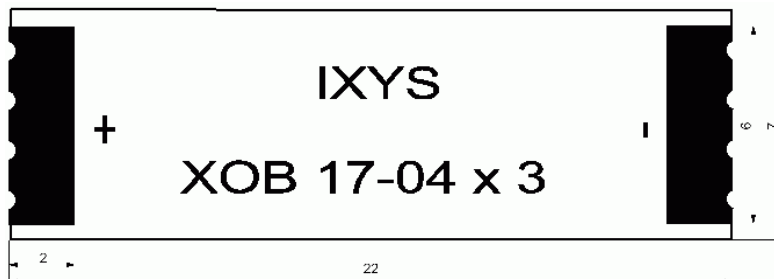


Open-Circuit Voltage vs. Irradiance



External Quantum Efficiency



**Package front-side and back-side view**
**XOB17-12x1**

**XOB17-04x3**

**XOB17-01x8**

**SolarBIT Pad Design**
**XOB17-12x1 and XOB17-04x3:**


(dimensions in millimeters)

**XOB17-01x8:**


A proper drawing will be added here.  
 The two contact pads on the left are 2.75mm by 2mm with 0.5mm spacing. The pad on the right is 6mm by 1.6mm with 0.4mm spacing from the boarder. The spacing between the pads on the left and the right is 18mm.

(dimensions in millimeters)

**SolarBIT PCB Layout Recommendation:**

The PCB layout foot print should be equivalent to the layout of the SolarBIT but on the contact pads on the short end(s) it should be half a millimeter larger than the SolarBIT. For the XOB17-12x1 and XOB17-04x3 SolarBIT one may use two pads of (6 x 2.5)mm size with 18mm spacing.

### Moisture Sensitivity, Reflow Soldering and Washing Information

IXYS has characterized the moisture reflow sensitivity of the SolarBITs using IPC/JEDEC standard J-STD-020. Moisture uptake from atmospheric humidity occurs by diffusion. During the solder reflow process, in which the component is attached to the PCB, the whole body of the component is exposed to high process temperatures. The combination of moisture uptake and high reflow soldering temperatures may lead to moisture induced delamination and cracking of the component. To prevent this, this component must be handled in accordance with IPC/JEDEC standard J-STD-020 per the labelled moisture sensitivity level (MSL), level 1.

IXYS does not recommend the use of chlorinated solvents.

### Tube Carrier Packaging

SolarBITs are shipped in 460 mm long clear PVC carrier tubes with antistatic coating. A tube contains 20 SolarBIT devices.

### Tape and Reel Information

Under development. It is the intention to use a tape with 44mm standard width and to pack 1kpcs SolarBITs per reel.

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