IXOLAR™ High Efficiency Solar Bits

Description

IXOLAR™ Solar Bits are IXYS' product line of coated monocrystalline, high efficiency solar cell products using IXYS' XOD17 bondable solar cell dies. Solar Bits have reflow solderable surface mount packages, they are available in tape and reel packages and can be automatically pick and place mounted. There are 2 different Solar Bits available with different voltage and current output.

The IXOLAR™ Solar Bits 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%, Solar Bits 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 to flexibly connect Solar Bits 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_{mpp} [V]	Typ. Current @ P_{mpp} [mA]
XOB17-12x1	0.63	42.0	0.51	39.0
XOB17-04x3	1.89	12.6	1.53	11.7

(all parameters given are typical values)

Dimensions (L x W x H): 22 x 7 x 1.4 [mm]

Solar Bit Weight: 0.5 grams

Solar Bits are compliant to the RoHS Norm.

Solar Cell Electrical Characteristics

Symbol	Cell Parameter	Typical Ratings *)	Units
V_{OC}	open circuit voltage	630	mV
J_{SC}	short circuit current density	35	mA/cm²
V_{mpp}	voltage at max. power point	505	mV
J_{mpp}	current density at max. power point	32.5	mA/cm²
P_{mpp}	maximum peak power	16.6	mW/cm²
FF	fill factor	> 75	%
η	efficiency	17	%
$\Delta V_{OC}/\Delta T$	open circuit voltage temp. coefficient	-2.1	mV/K
$\Delta J_{SC}/\Delta T$	short circuit current temp. coefficient	0.12	mA/(cm²K)

*) All values measured at Standard Condition: 1 sun (= 1000 W/m²), 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

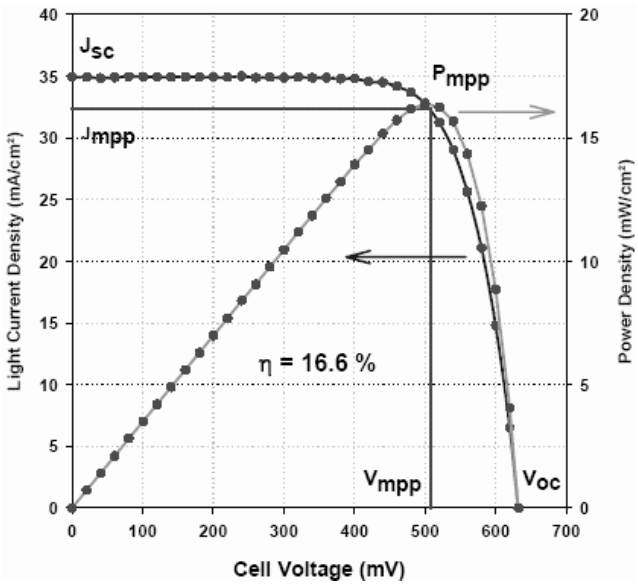
IXYS Semiconductor GmbH
Edisonstr. 15, D-68623 Lampertheim (Germany)
Phone +49-6206-503-0, Fax +49-6206-503-627

IXYS Corporation
1590 Buckeye Drive, Milpitas, CA 95035-7418
Phone (408) 457-9000, Fax 408-496-0670

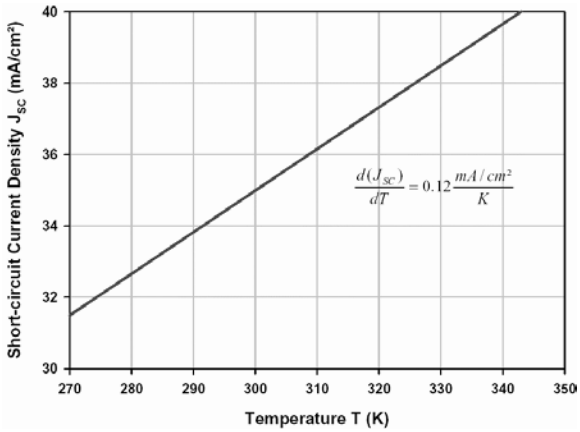
Rev. Mar. 2008

Typical Solar Cell Performance Data

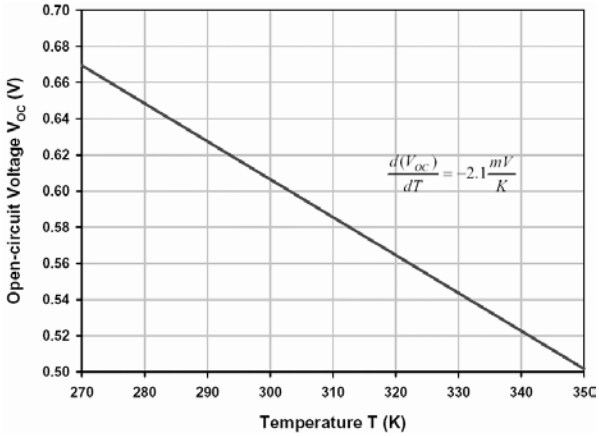
Cell Current/Voltage Behavior



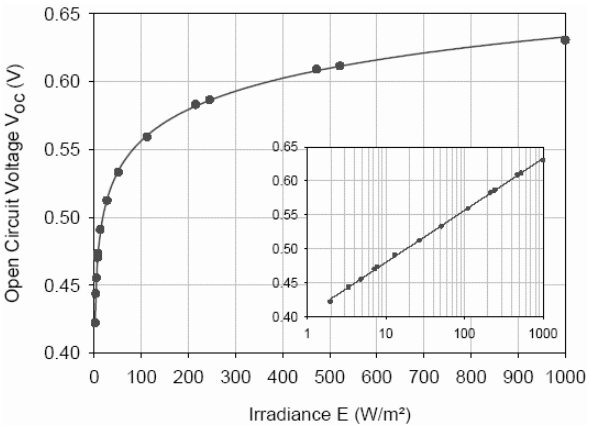
Short-Circuit Current Density vs. Temperature



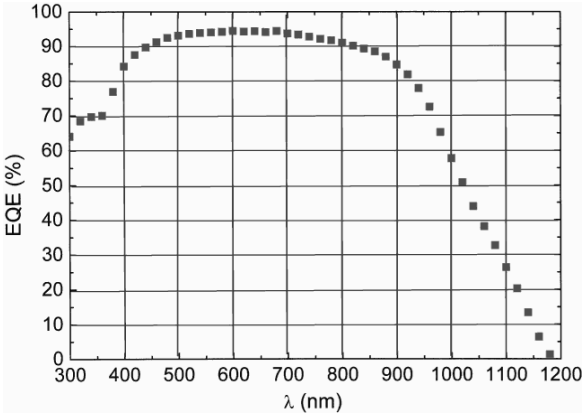
Open-Circuit Voltage vs. Temperature



Open-Circuit Voltage vs. Irradiance



External Quantum Efficiency



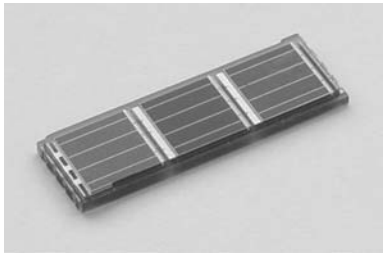
IXYS Semiconductor GmbH
Edisonstr. 15, D-68623 Lampertheim (Germany)
Phone +49-6206-503-0, Fax +49-6206-503-627

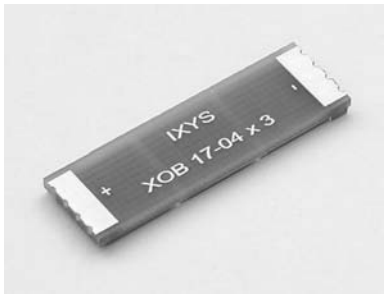
IXYS Corporation
1590 Buckeye Drive, Milpitas, CA 95035-7418
Phone (408) 457-9000, Fax 408-496-0670

Package front-side and back-side view

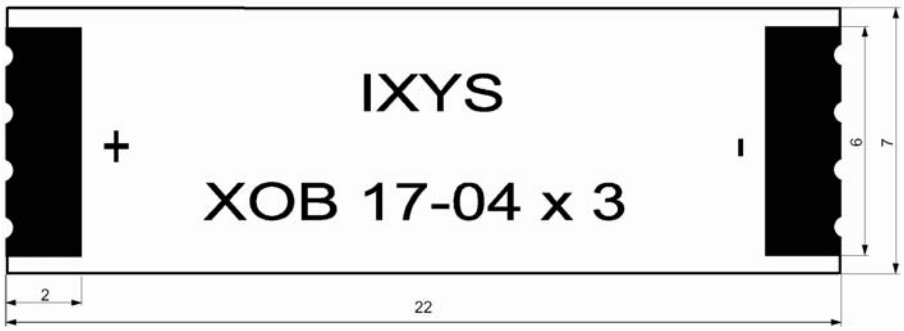
XOB17-12x1

XOB17-04x3





Solar Bit Pad Design



(dimensions in millimeters)

Solar Bit PCB Layout Recommendation:

The PCB layout foot print should be equivalent to the layout of the Solar Bit but on the short ends it should be half a millimeter larger than the Solar Bit: Please use two pads of (6 x 2.5)mm size with 18mm spacing.

Moisture Reflow Sensitivity, Soldering and Washing Information

IXYS has characterized the moisture reflow sensitivity of the Solar Bits 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.

IXYS Semiconductor GmbH
Edisonstr. 15, D-68623 Lampertheim (Germany)
Phone +49-6206-503-0, Fax +49-6206-503-627
IXYS Corporation
1590 Buckeye Drive, Milpitas, CA 95035-7418
Phone (408) 457-9000, Fax 408-496-0670

Tape and Reel Information

Under development. It is the intention to use a tape with 44mm standard width.

IXYS Semiconductor GmbH
Edisonstr. 15, D-68623 Lampertheim (Germany)
Phone +49-6206-503-0, Fax +49-6206-503-627

IXYS Corporation
1590 Buckeye Drive, Milpitas, CA 95035-7418
Phone (408) 457-9000, Fax 408-496-0670