

IXOLAR™ High Efficiency SolarBIT.

Description

IXOLAR™ SolarBITs are IXYS' product line of SolarBITs made of monocrystalline, high efficiency solar cells. The IXOLAR™ SolarBITs is an 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 22% measured at a wafer level, 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 (Measured in Package)

Part Number	Open Circuit Voltage [V]	Short Circuit Current [mA]	Typ. Voltage @ P _{mpp} [V]	Typ. Current @ P _{mpp} [mA]
KXOB22-12X1	0.63	50.0	0.50	44.6



(parameters given are typical values)
Dimensions (L x W x H): 22 x 7 x 1.6 [mm]
SolarBITs Weight: 0.5 grams
SolarBITs are compliant to the RoHS Norm.

KXOB22-12X1 Electrical Characteristics (Measured in Package)

Symbol	Cell Parameter	Typical Ratings *	Units
V _{oc}	open circuit voltage	630	mV
J _{sc}	short circuit current density	42.4	mA/cm ²
V _{mpp}	voltage at max. power point	501	mV
J _{mpp}	current density at max. power point	37.2	mA/cm ²
P _{mpp}	maximum peak power	18.6	mW/cm ²
FF	fill factor	> 70	%
η	solar cell efficiency	22	%
ΔV _{oc} /ΔT	open circuit voltage temp. coefficient	-2.1	mV/K
ΔJ _{sc} /ΔT	short circuit current temp. coefficient	0.12	mA/(cm ² K)

* All values measured at Standard Condition: 1 sun (= 100 mW/cm²), Air Mass 1.5, 25°C

Features

- Monocrystalline silicon technology
 - High efficiency outdoor and indoor
 - Long life and stable output
 - Sealed Package
 - High mechanical robustness
 - Surface Mount Package
 - Reflow Solderable
- ### 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 reserves the right to change limits, test conditions and dimensions

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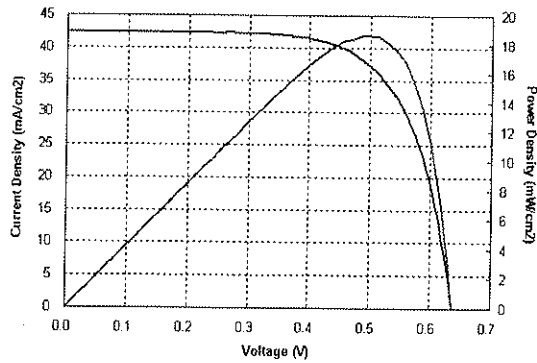
Rev. Jan. 2011

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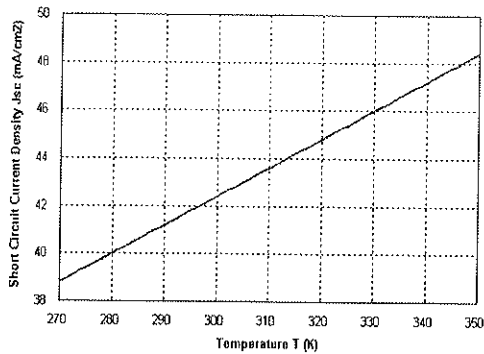
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Typical SolarBIT Performance Data (Measured in Package)

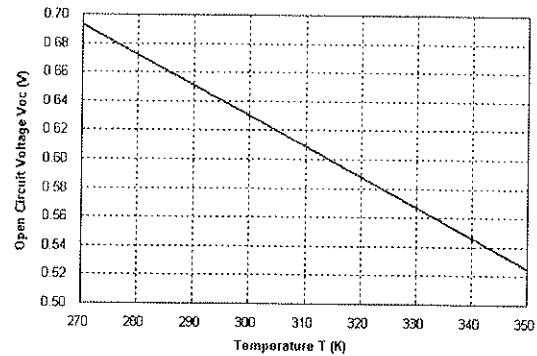
Current-Voltage Characteristics



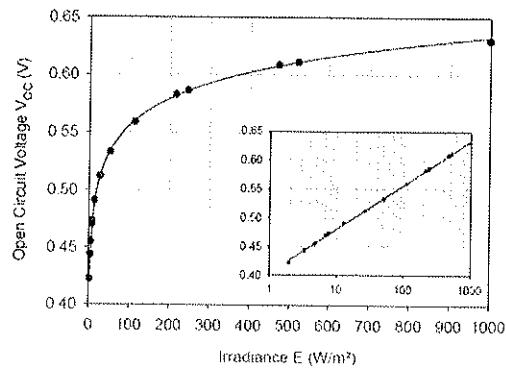
Short Circuit Current Density vs. Temperature



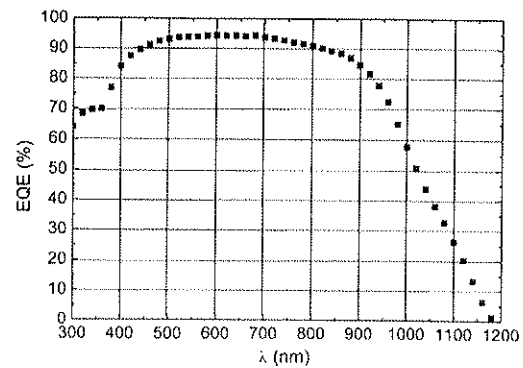
Open Circuit Voltage vs. Temperature



Open-Circuit Voltage vs. Irradiance



External Quantum Efficiency



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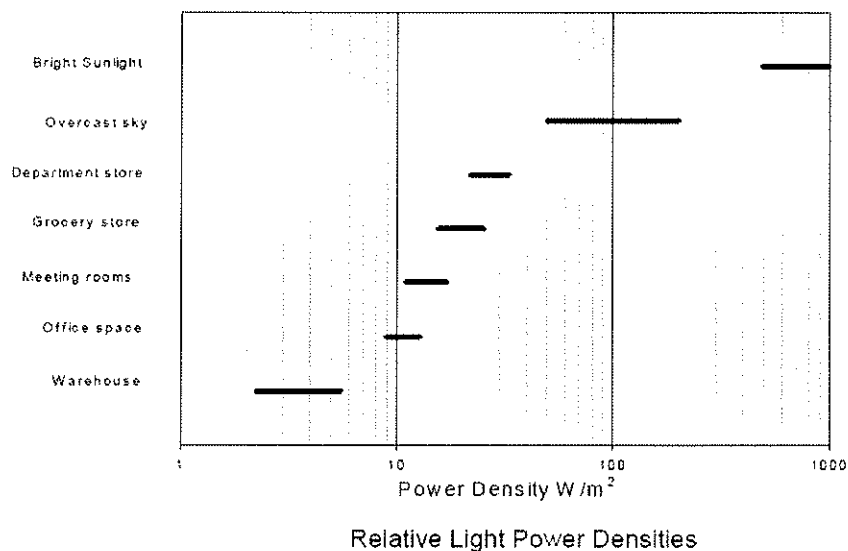
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SolarBit Description

SolarBITS are monocrystalline, high-efficiency solar cells in a surface mount package. They're robust and can be used in harsh environments. SolarBITS have a very high (22%) power conversion efficiency, which means that 22% of the light energy is converted into electrical energy. They're extremely useful in applications requiring solar power generation in a limited space.

Monocrystalline cells can be used in indoor and outdoor applications because they have a wide spectral sensitivity, 300 to 1100 nm. However, the output power of a solar cell is proportional (over a wide range) to the incoming light energy, and irradiance is generally much higher outdoors. The values in the data sheet are measured at "standard condition" of 1 sun, which is equal to 1000W per square meter sunlight irradiance at a defined light spectrum (air mass of 1.5) and 25°C cell temperature.



Relative Lighting Power Density

The figure above compares relative power density for various lighting conditions in units of Watts per square meter (W/m^2). The reference standard condition is 1 Sun and is equal to 1000 Watts per square meter of sunlight irradiance at a constant 25°C cell temperature and at 1.5 Air Mass (Air Mass stands for a well defined light spectrum which appears if the sunlight goes through the earth's atmosphere at a defined angle).

As the chart clearly shows, the power density of typical indoor lighting is dramatically lower than that of sunlight. Not only is irradiance from indirect and artificial light lower; the spectrum is also narrower. In typical Office Space lighting with a spectrum produced from incandescent or halogen light bulbs, the power output may be roughly 100 times less than bright sunlight. It may be 200 to 500 times less with fluorescent lighting due to the further limited spectrum.

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