

HIT[®] photovoltaic module with black back sheet (preliminary data sheet)

SANYO
by **Panasonic**

N235B
N230B

All-black design

For a uniform appearance

- Black frame
- Dark solar cells
- Dark back sheet

Thanks to our HIT solar cells

- Cell efficiency: 21.1 %
- Use of the latest technology from R&D

World's
highest
efficiency*

18.6%*
186 W/m²

Innovative

Implementing our latest module technology

- Anti-reflection glass
- New 3-tab design



* For full black modules, model N235B

HIT cell technology

The SANYO HIT (Heterojunction with Intrinsic Thin layer) solar cell is made of a thin monocrystalline silicon wafer surrounded by ultra-thin amorphous silicon layers. This product provides the industry's leading performance and value using state-of-the-art manufacturing techniques.

High performance at high temperatures

Even at high temperatures, the HIT solar cell can maintain higher efficiency than a conventional crystalline silicon solar cell. This is particularly relevant in all-black modules, where heat absorption is greater. Our black-backsheet modules minimise that effect, achieving a top-level temperature performance.

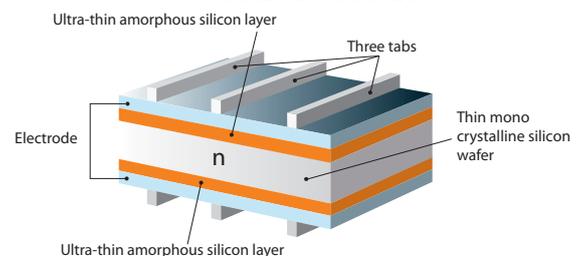
Quality

SANYO is truly committed to quality since it began developing and manufacturing solar PV modules in 1975. Our long track record is supported with our claim-rate of only 0.00214 % or 62 product-guarantee cases out of 2,885,689 solar modules produced in our European factory in Dorog, Hungary (as of November 2011) with 0 cases of output guarantee.

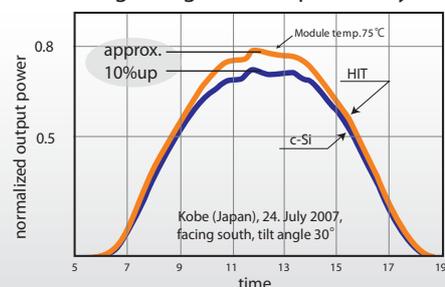
Special features

SANYO HIT solar modules are 100% emission free, have no moving parts and produce no noise. The dimensions of the HIT modules enable a space saving installation and the achievement of maximum output power possible on a given roof area.

HIT[®] solar cell structure



Changes in generated power daytime



The HIT cell and module have very high conversion efficiency in mass production.

Model	Cell efficiency	Module efficiency	Output/m ²
N235B (VBHN235SE51)	21.1%	18.6%	186 W/m ²
N230B (VBHN230SE51)	20.7%	18.2%	182 W/m ²

HIT[®]
Photovoltaic Module

HIT is a registered trademark of SANYO Electric Co., Ltd. The name "HIT" comes from "Heterojunction with intrinsic Thin-layer" which is an original technology of SANYO Electric Co., Ltd.

www.sanyo-solar.eu/en

SANYO Component Europe GmbH
Panasonic Group

Electrical data (at STC)

Models VBHNxxxSE51
235 230

Maximum power (Pmax) [W]	235	230
Max. power voltage (Vmp) [V]	43.4	42.5
Max. power current (Imp) [A]	5.43	5.42
Open circuit voltage (Voc) [V]	52.4	52.1
Short circuit current (Isc) [A]	5.78	5.78
Maximum over current rating [A]	15	
Output power tolerance [%]	+10/-5*	
Maximum system voltage [V]	1000	

Note: Standard Test Conditions: Air mass 1.5, Irradiance = 1000W/m², cell temperature = 25°C
* All modules measured by SANYO facility have output with positive tolerance

Temperature characteristics

Temperature (NOCT) [°C]	coming soon
Temperature coefficient of Pmax [%/°C]	coming soon
Temperature coefficient of Voc [V/°C]	coming soon
Temperature coefficient of Isc [mA/°C]	coming soon

At NOCT

Maximum power (Pmax) [W]	coming soon
Max. power voltage (Vmp) [V]	coming soon
Max. power current (Imp) [A]	coming soon
Open circuit voltage (Voc) [V]	coming soon
Short circuit current (Isc) [A]	coming soon

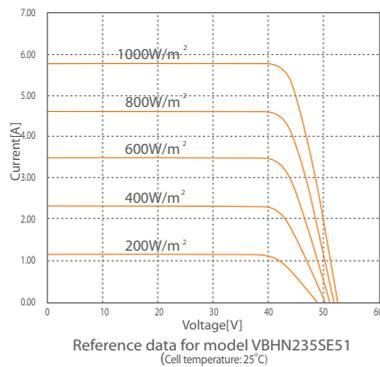
Note: Nominal Operating Cell Temperature : Air mass 1.5 spectrum, Irradiance = 800W/m², Air temperature = 20°C, wind speed 1 m/s

At low irradiance

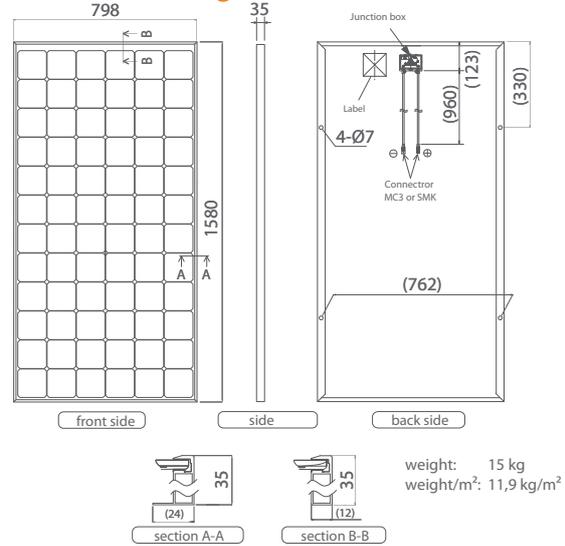
Maximum power (Pmax) [W]	coming soon
Max. power voltage (Vmp) [V]	coming soon
Max. power current (Imp) [A]	coming soon
Open circuit voltage (Voc) [V]	coming soon
Short circuit current (Isc) [A]	coming soon

Note: Low irradiance: Air mass 1.5 spectrum, Irradiance = 200W/m², cell temperature = 25°C

Dependence on irradiance



Dimensions and weight



Guarantee

Power output: 10 years (90% of Pmin), 25 years (80% of Pmin)
Product workmanship: 10 years
(Based on guarantee document)

Materials

Cell material: 5 inch HIT cells
Glass material: AR coated tempered glass
Frame materials: Black anodized aluminium
Connectors type: MC3 or SMK

Certificates



- Quality tested, IEC 61215
- Safety tested, IEC 61730
- Periodic inspection



Member of



Please consult your local dealer for more information.

CAUTION! Please read the installation manual carefully before using the products.

Due to our policy of continual improvement the products covered by this brochure may be changed without notice.