

Renewable Energy: Photovoltaic Modules



190 Watts

Surpass Performance Single (Mono) - crystalline PV module

Ekarat Engineering's 190 Watts PV module is produced under a state of the art automatic assembly machines to ensure a consistency and reliability of production quality. The 190 Watts PV module is commonly used for wide range applications such as commercial building, solar power plant, telecommunication station, particularly with grid-connected systems.

High efficiency module, more than 13%, is a result of solar cell's superior power output, which has been developed by our own solar cell factory. Moreover, other component materials are also selected to comply with international standards such as IEC 61215 and Safety Standard IEC 61730. These create a customer's confidence ensured with a manufacturing based 25 years limited warranty*.



- Low iron tempered glass allows a high light transmission rate with a great robustness.
- EVA encapsulate sheet, back-sheet, and clear anodized aluminum frame are technically equipped to protect the module against all weather condition.
- Junction box with IP65 to ensure water proof and prolong lifetime operation.
- Special cable with connectors is offered as option for easy interconnection in grid-connected systems as well as stand-alone systems.
- Bypass diode included in promptly provided junction box is to prevent the power dropped by partial shading.

*Warranty

- 25 year transferrable power output warranty: 10 years / 90%, 25 years / 80%
- Linear performance warranty
- 12 year material and workmanship warranty

Electrical Characteristics

Model No.	EE1190
Maximum power (Pmax)	190 W
Power tolerance	± 5%
No. of connected cells	54
Voltage of Pmax (Vmp)	25.7 V
Current at Pmax (Imp)	7.4 A
Short - Circuit current (Isc)	8 A
Open - Circuit voltage (Voc)	33 V
Temperature Coefficient of Voc	-0.0968 V / °C
Temperature Coefficient of Isc	+2.4 mA / °C
Temperature Coefficient of power	-0.4507 % / °C
Maximum series fuse rating	15 A
Maximum voltage system	1,000 V

Renewable Energy: Photovoltaic Modules



Mechanical Characteristics

Dimension	1489 x 978 x 38 mm.
Weight	17 kg.
Dimension tolerance	± 1 mm.
Junction Box	Degree of protection: IP65 and compatibility with 2.5 - 4.0 mm cross section cable size.
Diode	Silicon or Schottky By - pass diode for every 18 cells connection
Frame	Anodized Aluminum.
Construction structure	Front: High light transmission tempered glass with 3.20 mm thickness. Back: Weather proof back sheet material. Laminated Material: EVA.

Qualification and testing

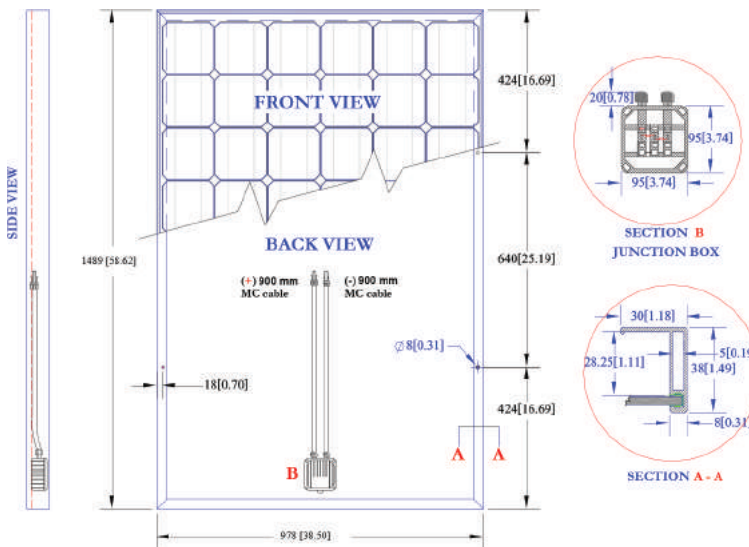
ISO 9001, ISO14001, OHSAS18001, ISO50001 for qualify management system.

IEC 61215 : Crystalline silicon terrestrial PV modules – Design qualification and type approval.

IEC 61730 : PV module safety qualification. To ensure a safety for users and installing operator of our products.

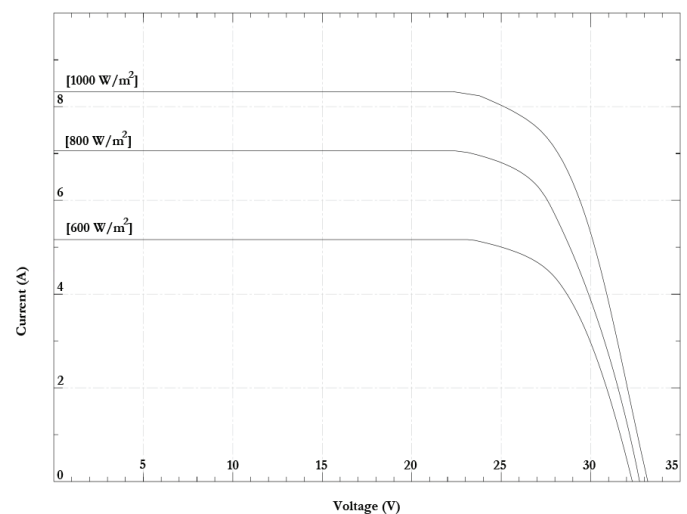
TIS 1843 : Thailand Industrial Standard equivalents to IEC 61215.

Module drawing diagram



IV - curves

Irradiance
1,000 W/m², 800 W/m², and 600 W/m²



These data represent the performance of typical modules as measured at their out put terminals, and do not include the effect of such additional equipment as diodes or cables. The data are based on measurements made in accordance with ASTM E1036-85 corrected to SRC (Standard Reporting Conditions, also known as STC or Standard Test Conditions), which are:

- Illumination of 1kW/m² (1sun) at spectral distribution of AM 1.5 (ASTME892-87 global spectral irradiance);
- Cell temperature of 25°C.



TIS-1843-2553
TIS-2580-2555

CONTACT US: Ekarat Engineering Public Company Limited

Solar Module Factory / Maintenance&Service Center

Address: 190/1 Moo 6, Thasa-An, Bangpakong, Chachoengsao 24130 Thailand.

Tel. 66(0)38 530-224 Fax. 66(0)38 530-225

Specifications subject to technical changes

© Ekarat Engineering PCL.