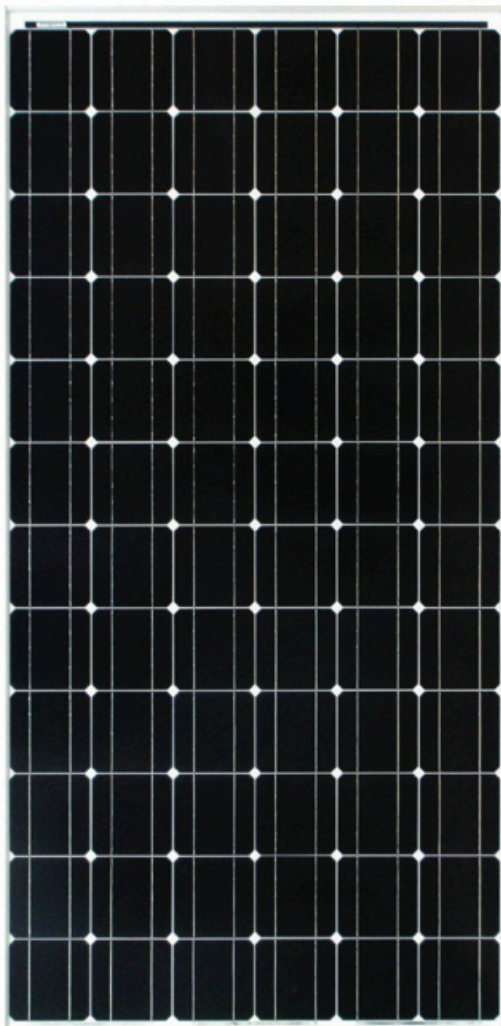




**SOLAR
ELECTRIC
SUPPLY, INC.**



Module appearance may vary.
Cells have rounded corners with
either 165 or 150mm diameter.

190W and 200W Photovoltaic modules **4190J - 4200J**

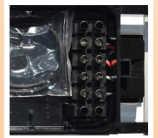
Our latest generation of small area modules offers the following benefits:

Built to last

From mountaintops to off-shore platforms, on weather stations in the bitter cold of Antarctica and on telephone signal repeaters in the hot Australian outback, the technology has been proven in the harshest environments.

Accessible junction box for off grid connections

J-type junction box has accessible terminals for easier module interconnections in off grid applications, and it allows fitting cable glands for various cable sections.



High reliability

Cell interconnections and diode placement use well-established industry practice and are field-proven to provide excellent reliability.



Thick, durable, scratch resistant back sheet

The thick back sheet provides extra insulation and increased resistance to protect your module against rough handling. The white polyester material lasts longer and increases energy production.



190W and 200W Photovoltaic modules – 4190J-4200J

4190J 4200J

Electrical characteristics

| | (1) STC 1000W/m ² | (2) NOCT 800W/m ² | (1) STC 1000W/m ² | (2) NOCT 800W/m ² |
|---|--|---------------------------------|----------------------------------|---------------------------------|
| Maximum power (P _{max}) | 190W | 137W | 200W | 144W |
| Voltage at P _{max} (V _{mpp}) | 38.0V | 33.1V | 38.0V | 34.0V |
| Current at P _{max} (I _{mpp}) | 5.0A | 3.82A | 5.3A | 4.2A |
| Short circuit current (I _{sc}) | 5.5A | 4.33A | 5.8A | 4.7A |
| Open circuit voltage (V _{oc}) | 45.3V | 40.2V | 45.3V | 41.0V |
| Module efficiency | 15.2% | - | 16.0% | - |
| Tolerance P _{max} | ± 5% | - | ± 5% | - |
| Nominal voltage | 24V | - | 12V | - |
| Efficiency reduction at 200W/m ² | <5% reduction (efficiency 14.4%) | | <5% reduction (efficiency 15.2%) | |
| Limiting reverse current | 5.5A | | 5.56A | |
| Temperature coefficient of I _{sc} | 0.105%/ °C | | | |
| Temperature coefficient of V _{oc} | -0.360%/ °C | | | |
| Temperature coefficient of P _{max} | -0.45%/ °C | | | |
| (3) NOCT | 47 ± 2 °C | | | |
| Maximum series fuse rating | 20A | | | |
| Application class | Class A (according to IEC 61730-2007) | | | |
| Maximum system voltage | 600V (U.S. NEC) 1000V (IEC 61730:2007) | | | |

1: Values at Standard Test Conditions (STC): 1000W/m² irradiance, AM1.5 solar spectrum and 25°C module temperature
 2: Values at 800W/m² irradiance, Nominal Operation Cell Temperature (NOCT) and AM1.5 solar spectrum
 3: Nominal Operation Cell Temperature: Module operation temperature at 800W/m² irradiance, 20°C air temperature, 1m/s wind speed

All solar modules are individually tested prior to shipment; an allowance is made within our factory measurement to account for the typical power degradation (LID effect) which occurs during the first few days of deployment.

SES MAPPS Solar Module Mechanical characteristics

| | |
|--------------|---|
| Solar cells | 72 monocrystalline 5" silicon cells (125x125mm) in series |
| Front cover | High transmission 3.2mm (1/8") glass |
| Encapsulant | EVA |
| Back cover | White polyester |
| Frame | Silver anodized aluminum (Universal II) |
| Junction box | IP65 with 4 terminal screw connection block; accepts PG 13.5, M20 13mm box (1/2") conduit, or cable fittings accepting 6-12mm diameter cable. |
| Terminals | accept 2.5-10mm ² (8-14 AWG) wire |
| Dimensions | 1587 x 790 x 50mm / 62.5 x 31.1 x 2in |
| Weight | 15.4kg / 33.95lbs |

All dimensional tolerances within ±1% unless otherwise stated.

Warranty*

- Free from defects in materials and workmanship for 2 years
- 90% Min power output for 12 years
- 25 year warranty optional *Refer to limited warranty certificate for terms and conditions

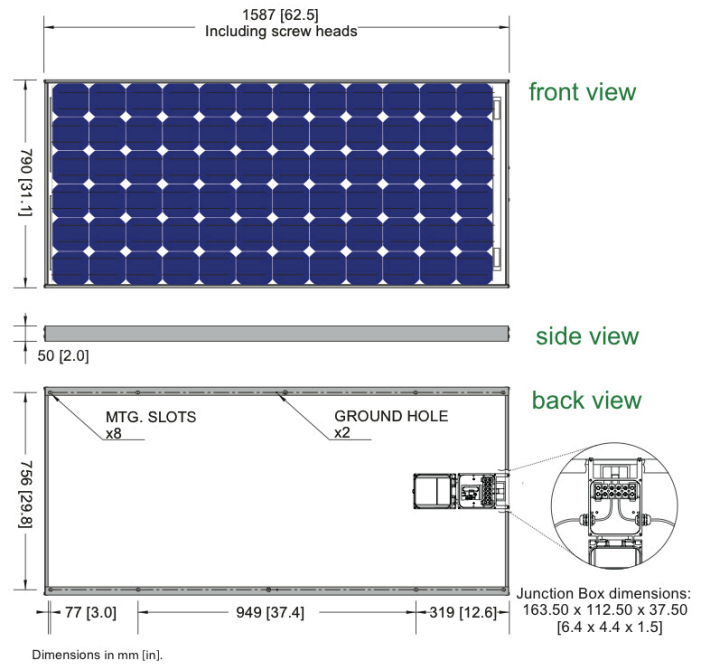
SES MAPPS Solar Module Certification

Certified according to the extended version of the IEC 61215 (ed. 2), EC 61215:2005-08 (Crystalline silicon terrestrial photovoltaic modules - Design qualification and type approval)

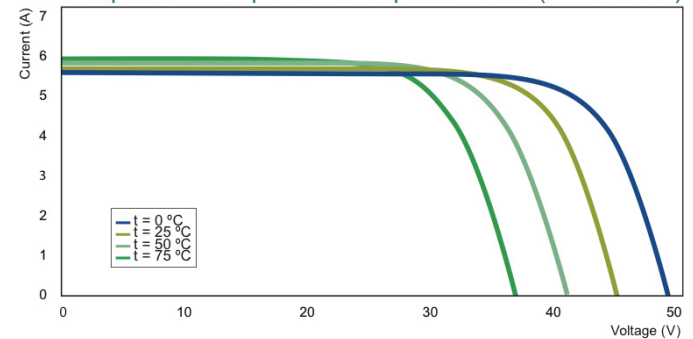
Certified according to IEC 61730-1 and IEC 61730-2 (ed. 1), EN 61730-1:2007-05 and EN 61730-2:2007-05. (Photovoltaic module safety qualification, requirements for construction and testing).

Listed to UL 1703 & ULC ORD-C1703 Standard for Safety by Intertek ETL. Class C Fire Rating.

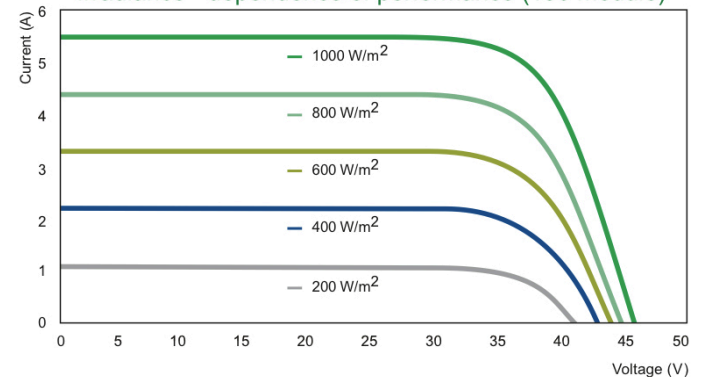
Approved by Intertek ETL according to FM 3611, Dec 2004, and according to CAN/CSA C22.2 No. 213-M1987, 1st Edition, Reaffirmed 2004, for use in a Class I, Division 2, Group A, B, C, D Hazardous (Classified) Location.



Temperature - dependence of performance (190 module)



Irradiance - dependence of performance (190 module)



**SOLAR
ELECTRIC
SUPPLY, INC.**

Toll Free: 877-297-0014

Phone: 831-462-8243 • Fax: 831-462-8246

Email: contact@solarelectricsupply.com

www.solarelectricsupply.com

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