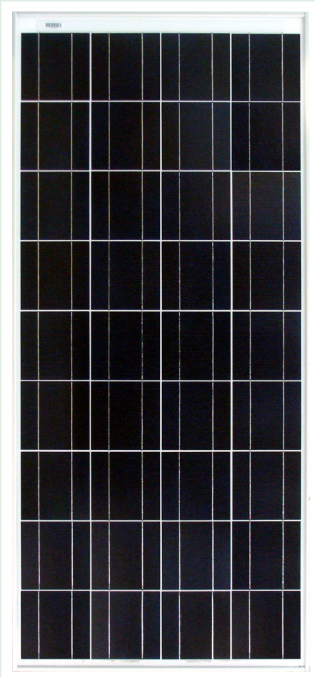




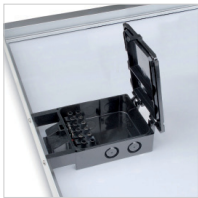
HAL-SPNL modules

This line of modules is the direct result of over three decades of design, manufacturing and use. Attending to every detail in the design and manufacture of our products, our process controls and testing methods have optimized module life and electrical energy production.

Larson Electronics off-grid module line offers the following features and 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 sections.



► Thick, durable scratch resistant back sheet

The thick back sheet provides extra insulation and increased resistance to protect your module against rough handling. Made of white polyester, it ensures longer term performance and increased energy production.



► High reliability

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

► Quality and certifications

ISO 9001 factory certification ensures that manufacturing facilities use proven manufacturing and quality control processes.

Certified to IEC 61215 and 61730

Certified to UL1703 and ULC1703
Certified for use in Class 1, Division 2 Hazardous locations

Conforms with European Directive 2006/95/EC

ISO 9001



Electrical characteristics

	(1) STC 1000W/m ²	(2) NOCT 800W/m ²
Maximum power (P_{max})	140W / 150W	101W / 108W
Voltage at P_{max} (V_{mpp})	17.5V / 18.1V	15.6V / 16.2V
Current at P_{max} (I_{mpp})	8.0A / 8.3A	6.5A / 6.7A
Short circuit current (I_{sc})	8.2A / 8.5A	6.6A / 6.9A
Open circuit voltage (V_{oc})	22.0V / 22.2V	20.0V / 20.2V
Module efficiency	13.7% / 14.6%	
Tolerance (P_{max})	+10% / -5%	
Nominal voltage	12V	
Efficiency reduction at 200W/m ²	<5% reduction efficiency 13.0% / 13.8%	
Limiting reverse current	8.2A / 8.5A	
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 (according to IEC 61730:2007)	Class C	

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

Mechanical characteristics

Solar cells	36 crystalline 6" silicon cells (156 x 156mm) in series
Front cover	High transmission 3.2mm (1/8th in) glass
Encapsulant	EVA
Back cover	White polyester
Frame	Silver anodized aluminum
Junction box	IP65 with 4 terminal screw connection block; accepts PG 13.5, M20 13mm (1/2") conduit, or cable fittings accepting 6-12mm diameter cable. Terminals accept 2.5-10mm ² (8-14 AWG) wire
Dimensions	1510 x 674 x 50mm / 59.4 x 26.5 x 2in
Weight	12kg / 26.5lbs

All dimensional tolerances within ±1% unless otherwise stated.

Warranty

Contact Larson Electronics for warranty options available.

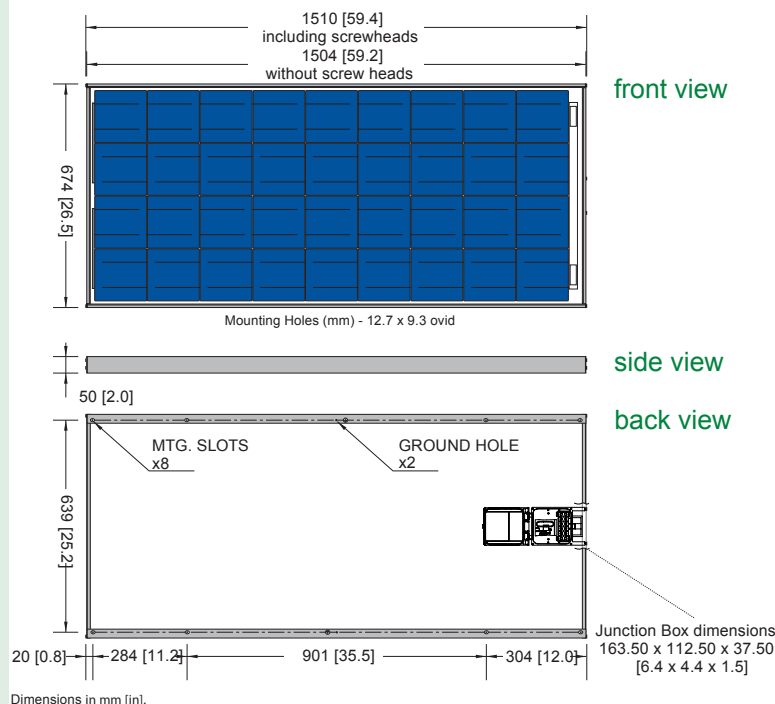
Certification

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

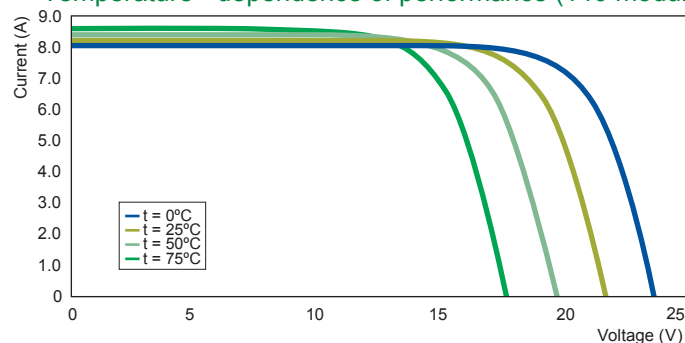
Certified according to IEC 61730-1 and IEC 61730-2 (ed.1), EN 61730-1:2007-05 and EN 61730-2:2007-05. (Photovoltaic module safety qualification, requirements for construction and testing).

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 (140 module)



Irradiance - dependence of performance (140 module)

