





# The Ultimate Power

Performance | Durability | Reliability

## FEATURES

|  |  |   |  |
|--|--|---|--|
|  <p><b>Remarkable performance in shaded condition</b></p> <p>High yields with low radiation intensity</p> |  <p><b>Low-light Behaviour</b></p> <p>High yields with low radiation intensity</p> |  <p><b>Higher Performance</b></p> <p>Half cell technology offer more power per square meter, resulting in higher yields at lower BOS cost.</p> |  <p><b>Temperature Coefficient</b></p> <p>Even on hot days, Spark Solar modules produce reliable yields and lose less efficiency than standard solar modules.</p> |
|--|--|---|--|

## HOW IT WORKS

Spark Rapid 144 Cell Series module produces energy even if part of the module is shaded. Whereas if standard module is partially shaded minimum one string will completely stop producing power, this accounts to one third reduction in power generation. Moreover, it can even completely stop generating power if shaded across its breadth. Rapid 144 Cell Series module is split into two parts. Each section of 72 half cut cells generates power on standalone basis but combines again before current exits the module. This structure results in power generation in non-shaded area of the module even if one of the section is partially or completely shaded, resulting in higher overall energy yield as compared to standard module.

## QUADRATECH | SMART TECHNOLOGY

### New Multi-Busbar cell design

For more power and better reliability. Shorter distance between busbar allows better flow of electrons and reduces power loss. Less residual stress, less micro-cracks and hotspot risks.



### Half cut cells

With high-precision laser cut cells, the current (I) flowing in each busbar is halved resulting in lower electrical resistance and an increased overall efficiency of about 2.5%



### Three piece junction box

The unique three piece design lowers series resistance avoids diode heating and enable quicker heat dissipation, which guarantees long-term stable performance and improved power efficiency.



### Passivated Emitter Rear Cell (PERC)

Higher efficiency is achieved with latest PERC cell technology which captures more wavelengths of light through mirror like reflector behind the solar cell



# Spark 144 M10 RAPID Series

upto **21.5%**  
**15**  
**27**

EFFICIENCY

YEAR PRODUCT WARRANTY

YEAR LINEAR POWER OUTPUT WARRANTY

## TEMPERATURE RATINGS\*

|  |               |
|--|---------------|
| Nominal Module Operating Temperature :   | 44.0°C (±3°C) |
| Temperature coefficient of $P_{MPP}$ (Y) | -0.35 %/°C    |
| Temperature coefficient of $V_{OC}$ (β)  | -0.275 %/°C   |
| Temperature coefficient of $I_{SC}$ (α)  | 0.045 %/°C    |

\*The temperature coefficients stated are linear values

## GENERAL DATA

|                |  |
|----------------|--|
| Cell type :    | P type MBB Mono PERC cells   |
| Cell matrix :  | 144 cells [ 2 x (6 x 12)]  |
| Junction box : | 3-part, 3 bypass diodes, IP 68 rated   |
| Cable :        | 4mm <sup>2</sup> solar cable,<br>Portrait : N (-) 400 mm, P (+) 200 mm<br>Landscape : ≥ 1300 mm / Customized |
| Frame :        | Silver anodized aluminum alloy   |
| Glass :        | 3.2 mm low iron solar glass with<br>anti-reflective, high transmission technology                            |
| Connectors :   | EV02 / TS4 / Multi Contact MC4   |

## MAXIMUM RATINGS

|   |                                   |
|---|-----------------------------------|
| Operating temperature :                           | -40 upto +85°C                    |
| (Permitted Module Temperature on Continuous Duty) |                                   |
| Maximum system voltage :                          | 1500 V <sub>DC(IEC/UL)</sub>      |
| Max series fuse rating :                          | 25 A                              |
| Max reverse current :                             | 25 A                              |
| Maximum test load (front) :                       | 5400 Pa (550 kg/m <sup>2</sup> )* |
| Maximum test load (rear) :                        | 2400 Pa (244 kg/m <sup>2</sup> )* |
| Application classification :                      | Class A                           |
| Safety Class :                                    | II                                |
| Fire Rating :                                     | C                                 |

\* See installation manual for mounting instructions.  
Design load = Test load / 1.5 (safety factor)

## MECHANICAL SPECIFICATION

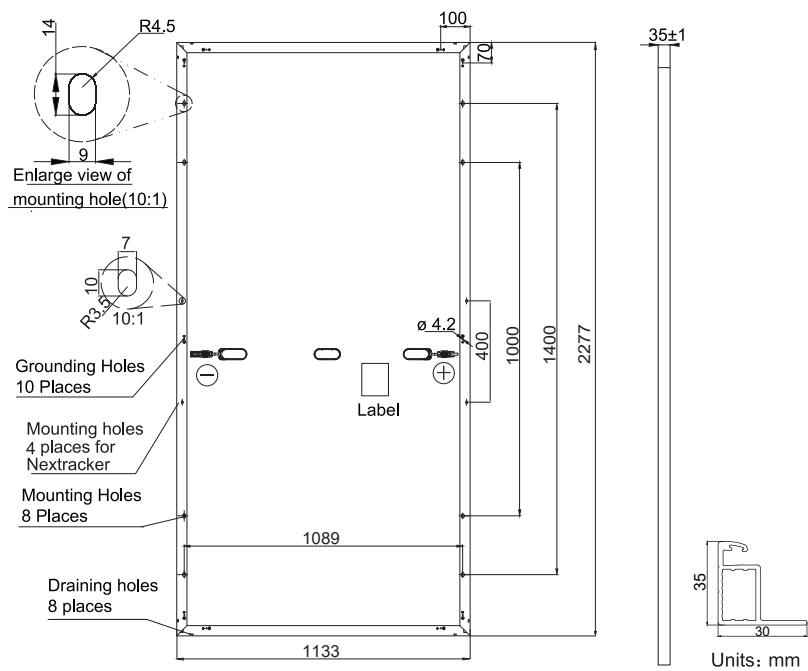
|              |                     |
|--------------|---------------------|
| Dimensions : | 2277 x 1133 x 35 mm |
| Area :       | 2.58 m <sup>2</sup> |
| Weight :     | 28 kg (61.73 lbs)   |

## PACKAGING INFORMATION

|                       |     |       |
|-----------------------|-----|-------|
| Container Size        | 20' | 40'HC |
| Quantity Per Pallet : | 30  | 30    |
| Pallets/Container :   | 10  | 20    |
| Quantity/Container :  | 300 | 600   |

(Two pallets = One stack)

\*Due to continuous innovation, research and product improvement the specifications in this product information sheet are subject to change without prior notice. Installation instructions must be followed. See the installation manual or contact technical service department for further information on approved installation. Atleast 97.5% of nominal power during first year. Thereafter max. degression in performance of 0.7% p.a. See warranty conditions for further details.



## ELECTRICAL DATA@STC

Module code\* : SSXXX144 M10

|                       |                  |       |       |       |       |       |
|-----------------------|------------------|-------|-------|-------|-------|-------|
| Nominal Power         | - $P_{MPP}$ (Wp) | 535   | 540   | 545   | 550   | 555   |
| Power Tolerance       | - (W)            | 0/+5  | 0/+5  | 0/+5  | 0/+5  | 0/+5  |
| Nominal Power Voltage | - $V_{MPP}$ (V)  | 41.47 | 41.64 | 41.80 | 41.96 | 42.00 |
| Nominal Power Current | - $I_{MPP}$ (A)  | 12.90 | 12.97 | 13.04 | 13.11 | 13.18 |
| Open Circuit Voltage  | - $V_{OC}$ (V)   | 49.45 | 49.60 | 49.75 | 49.9  | 50.05 |
| Short Circuit Current | - $I_{SC}$ (A)   | 13.79 | 13.86 | 13.93 | 14.00 | 14.07 |
| Panel Efficiency      | - (%)            | 20.7  | 20.9  | 21.1  | 21.3  | 21.5  |

Values at standard test conditions STC (airmass AM 1.5, irradiance 1000 W/m<sup>2</sup>, cell temperature 25°C).  
\*Where xxx indicates the nominal power class ( $P_{MPP}$ ) at STC indicated above.

## ELECTRICAL DATA@NMOT

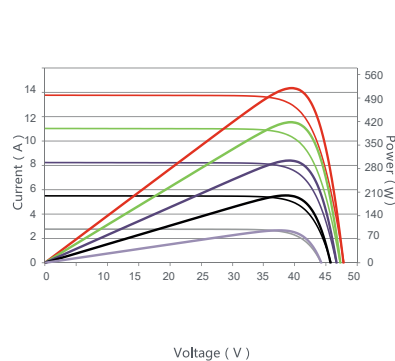
Module code\* : SSXXX144 M10

|                       |                  |       |       |       |       |       |
|-----------------------|------------------|-------|-------|-------|-------|-------|
| Nominal Power         | - $P_{MPP}$ (Wp) | 405   | 408   | 412   | 416   | 420   |
| Nominal Power Voltage | - $V_{MPP}$ (V)  | 38.78 | 38.99 | 39.20 | 39.43 | 39.64 |
| Nominal Power Current | - $I_{MPP}$ (A)  | 10.43 | 10.47 | 10.51 | 10.55 | 10.59 |
| Open Circuit Voltage  | - $V_{OC}$ (V)   | 46.31 | 46.43 | 46.55 | 46.68 | 46.8  |
| Short Circuit Current | - $I_{SC}$ (A)   | 11.05 | 11.09 | 11.13 | 11.17 | 11.21 |

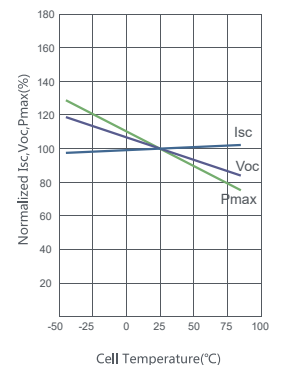
Nominal Module Operating Temperature NMOT (800 W/m<sup>2</sup>, AM 1.5, windspeed 1 m/s, ambient temperature 20°C). Typical values, actual values may differ. \*Where xxx indicates the nominal power class ( $P_{MPP}$ ) at STC indicated above.

## Electrical Performance & Temperature Dependence

### Current-Voltage & Power-Voltage Curves



### Temperature Dependence of $I_{sc}$ , $V_{oc}$ , $P_{max}$



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