

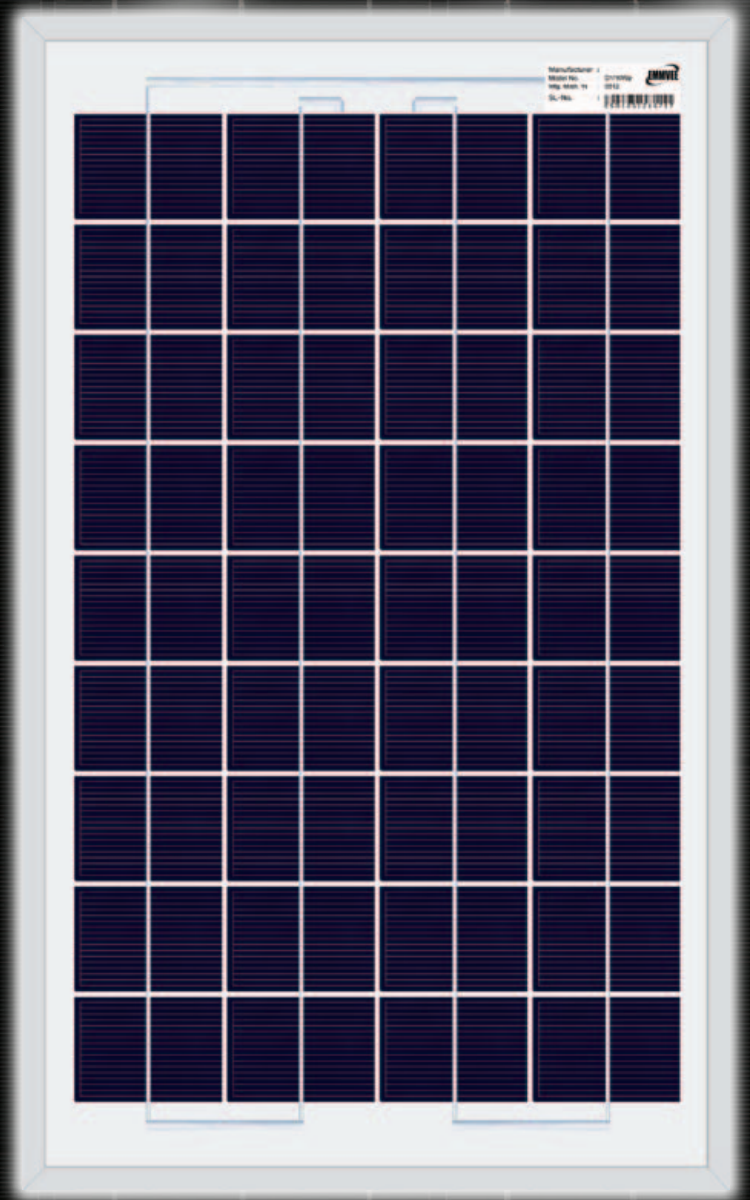
EMMVEE

ES 10-20 P36

Photovoltaic Module



**More
Efficiency
More
Reliability**



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EMMVEE

ES 10-20 P36

Photovoltaic Module



Electrical Data at 1000 W/m², 25 °C and AM 1.5 (STC in Accordance with EN 60904-3)

| | | | | |
|---------------------------------------|---------|---------|---------|---------|
| rated power at STC ¹ | 10 Wp | 12 Wp | 18 Wp | 20 Wp |
| module efficiency at STC ² | 10.0 % | 9.5 % | 10.1 % | 11.2 % |
| open-circuit voltage V _{oc} | 21.6 V | 21.6 V | 21.6 V | 21.6 V |
| short-circuit current I _{sc} | 0.60 A | 0.72 A | 1.05 A | 1.20 A |
| rated voltage V _{mpp} | 17.71 V | 17.71 V | 17.71 V | 17.71 V |
| rated current I _{mpp} | 0.57 A | 0.68 A | 1.02 A | 1.14 A |

¹ The measurement tolerance of the rated power is ± 3%.

² At low irradiance (200 W/ m², 25 °C and AM 1.5) the module yields at least 97% of the STC efficiency.

Electrical Data at 800 W/m², NOCT, 1m/s Wind Speed and AM 1.5

| | | | | |
|---------------------------------------|---------|---------|---------|---------|
| rated power P _{max} | 8.1 W | 9.7 W | 14.6 W | 16.2 W |
| open-circuit voltage V _{oc} | 21.4 V | 21.4 V | 21.4 V | 21.4 V |
| short-circuit current I _{sc} | 0.48 A | 0.58 A | 0.84 A | 0.96 A |
| rated voltage V _{mpp} | 17.77 V | 17.77 V | 17.77 V | 17.77 V |
| rated current I _{mpp} | 0.46 A | 0.55 A | 0.82 A | 0.92 A |

Thermal Data

| | |
|---|--------------|
| temperature coefficient open-circuit voltage | -0.34%/K |
| temperature coefficient short-circuit current | +0.05%/K |
| temperature coefficient rated power | -0.43%/K |
| noct (normal operating cell temperature) | 48 °C ± 2 °C |

Mechanical Data

| | | | | |
|--|--|-------------|-------------|-------------|
| number of cells and cell type | 36 polycrystalline solar cells | | | |
| module dimensions : length (a) x width (b) | 394 x 253mm | 356 x 356mm | 388 x 461mm | 388 x 461mm |
| mounting dimensions : length (c) x width (d) | 263 x 220mm | 237 x 323mm | 259 x 428mm | 259 x 428mm |
| weight | 1.1 kg | 1.2 kg | 2.0 kg | 2.0 kg |
| frame thickness | 35 mm anodized aluminum | | | |
| front glass | 3.2 mm high transmission, tempered glass | | | |
| embedding | EVA | | | |
| back sheet | composite film, white | | | |
| junction box | plastic, protection class IP 65 | | | |
| number of bypass diodes | 1 | | | |
| cables | no | | | |

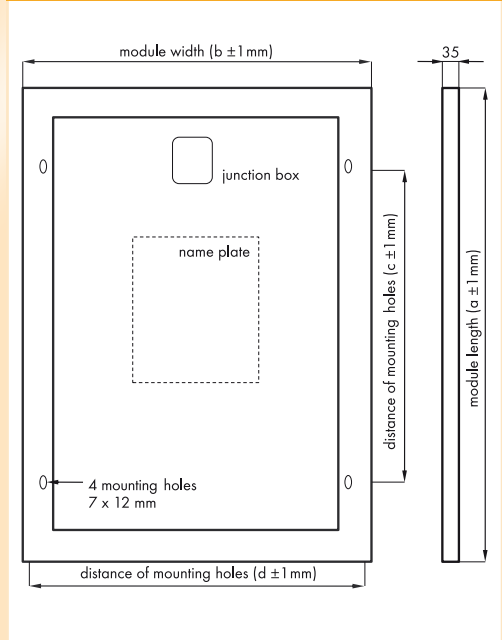
Permissible Operating Conditions

| | | | | |
|-------------------------------|--|-----|-----|-----|
| operating temperature range | - 40 °C to 85 °C | | | |
| max. system voltage | 600 V DC | | | |
| max. reverse current | 2 A | 2 A | 3 A | 3 A |
| maximum surface load capacity | 5400 Pa or 550 kg /m ² | | | |
| resistance against hail | maximum diameter of 24 mm with impact speed of 83 km/h | | | |
| protection class | II | | | |

Warranty and Certificates

| | |
|----------------------|-----------------------------|
| product warranty | 5 years |
| performance warranty | 90% up to 10 years |
| certifications | IEC 61215 Ed. II, IEC 61730 |

Technical Drawing – All Dimensions in mm



Your Retailer:



Datasheet according to EN 50380.

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