

EMMVEE

ES 10- 125 P36

Photovoltaic Module



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

| | 10 Wp | 12 Wp | 18 Wp | 20 Wp | 25 Wp | 30 Wp | 35 Wp | 40 Wp | 45 Wp | 50 Wp | 55 Wp | 60 Wp | 65 Wp | 70 Wp | 75 Wp | 80 Wp | 85 Wp | 90 Wp | 95 Wp | 100 Wp | 105 Wp | 110 Wp | 115 Wp | 120 Wp | |
|---------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| rated power at STC ¹ | 10 Wp | 12 Wp | 18 Wp | 20 Wp | 25 Wp | 30 Wp | 35 Wp | 40 Wp | 45 Wp | 50 Wp | 55 Wp | 60 Wp | 65 Wp | 70 Wp | 75 Wp | 80 Wp | 85 Wp | 90 Wp | 95 Wp | 100 Wp | 105 Wp | 110 Wp | 115 Wp | 120 Wp | |
| module efficiency at STC ² | 10.0% | 9.5% | 10.1% | 11.2% | 11.0% | 9.0% | 10.5% | 12.1% | 11.0% | 12.2% | 10.6% | 11.6% | 10.4% | 11.2% | 12.0% | 12.8% | 12.6% | 13.3% | 11.4% | 12.0% | 11.2% | 11.7% | 12.2% | 12.8% | |
| open-circuit voltage V _{oc} | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 21.6 V | 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 | 1.52 A | 1.79 A | 2.21 A | 2.45 A | 2.72 A | 2.99 A | 3.29 A | 3.59 A | 3.88 A | 4.18 A | 4.42 A | 4.78 A | 5.08 A | 5.38 A | 5.68 A | 5.98 A | 6.27 A | 6.57 A | 6.87 A | 7.17 A | |
| rated voltage V _{mpp} | 17.71 V | 17.71 V | 17.71 V | 17.71 V | 17.71 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V | 17.82 V |
| rated current I _{mpp} | 0.57 A | 0.68 A | 1.02 A | 1.14 A | 1.44 A | 1.70 A | 2.19 A | 2.33 A | 2.58 A | 2.84 A | 3.12 A | 3.41 A | 3.69 A | 3.97 A | 4.20 A | 4.54 A | 4.82 A | 5.11 A | 5.40 A | 5.68 A | 5.96 A | 6.24 A | 6.52 A | 6.81 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

| | 7.32 W | 8.78 W | 13.17 W | 14.63 W | 18.29 W | 21.95 W | 25.60 W | 29.26 W | 32.92 W | 36.58 W | 40.23 W | 43.89 W | 47.55 W | 51.21 W | 54.86 W | 58.52 W | 62.18 W | 65.84 W | 69.49 W | 73.15 W | 76.81 W | 80.47 W | 84.12 W | 87.78 W |
|---------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| rated power P _{max} | 7.32 W | 8.78 W | 13.17 W | 14.63 W | 18.29 W | 21.95 W | 25.60 W | 29.26 W | 32.92 W | 36.58 W | 40.23 W | 43.89 W | 47.55 W | 51.21 W | 54.86 W | 58.52 W | 62.18 W | 65.84 W | 69.49 W | 73.15 W | 76.81 W | 80.47 W | 84.12 W | 87.78 W |
| open-circuit voltage V _{oc} | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V | 19.66 V |
| short-circuit current I _{sc} | 0.49 A | 0.58 A | 0.86 A | 0.98 A | 1.24 A | 1.46 A | 1.80 A | 2.00 A | 2.22 A | 2.44 A | 2.68 A | 2.92 A | 3.16 A | 3.41 A | 3.61 A | 3.90 A | 4.14 A | 4.39 A | 4.63 A | 4.87 A | 5.11 A | 5.36 A | 5.60 A | 5.85 A |
| rated voltage V _{mpp} | 15.91 V | 15.91 V | 15.91 V | 15.91 V | 15.91 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V | 16.01 V |
| rated current I _{mpp} | 0.46 A | 0.55 A | 0.83 A | 0.93 A | 1.18 A | 1.39 A | 1.78 A | 1.90 A | 2.10 A | 2.31 A | 2.54 A | 2.77 A | 3.01 A | 3.24 A | 3.42 A | 3.70 A | 3.93 A | 4.16 A | 4.40 A | 4.62 A | 4.85 A | 5.09 A | 5.31 A | 5.55 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) in mm | 394 x 253 | 356 x 356 | 388 x 461 | 388 x 461 | 491 x 461 | 496 x 669 | 496 x 669 | 496 x 669 | 612 x 669 | 612 x 669 | 774 x 669 | 774 x 669 | 937 x 669 | 937 x 669 | 937 x 669 | 1009 x 669 | 1009 x 669 | 1242 x 669 | 1242 x 669 | 952 x 988 | 952 x 988 | 952 x 988 | 952 x 988 | |
| mounting dimensions: length (c) x width (d) in mm | 263 x 220 | 237 x 323 | 259 x 428 | 259 x 428 | 327 x 428 | 331 x 636 | 331 x 636 | 331 x 636 | 408 x 636 | 408 x 636 | 516 x 636 | 516 x 636 | 625 x 636 | 625 x 636 | 625 x 636 | 673 x 636 | 673 x 636 | 828 x 636 | 828 x 636 | 635 x 956 | 635 x 956 | 635 x 956 | 635 x 956 | |
| weight | 1.43 kg | 1.75 kg | 2.37 kg | 2.37 kg | 3.11 kg | 4.01 kg | 4.01 kg | 4.14 kg | 4.95 kg | 4.95 kg | 6.09 kg | 6.09 kg | 7.05 kg | 7.05 kg | 7.05 kg | 7.05 kg | 9.04 kg | 9.04 kg | 11.23 kg | 11.23 kg | 12 kg | 12 kg | 12 kg | 12 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 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| cables | no | | | | | | | | | | | | | | | | | | | | | | | |

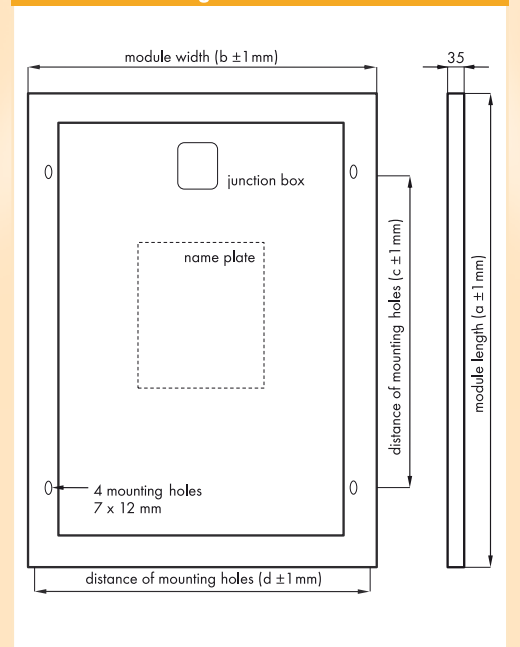
Permissible Operating Conditions

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|-------------------------------|--|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 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 | 5 A | 5 A | 5 A | 5 A | 15 A | 15 A | 15 A | 15 A | 15 A | 15 A | 15 A | 15 A | 15 A | 15 A | 15 A | 15 A | 15 A | 15 A | 15 A | 15 A |
| maximum surface load capacity | 2400Pa | | | | | | | | | | | | | | | | | | | | | | | |
| 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 and 80% up to 25 years | | | | | | | | | | | | | | | | | | | | | | | |
| certifications | IEC 61215 Ed. II, IEC 61730 | | | | | | | | | | | | | | | | | | | | | | | |

Technical Drawing – All Dimensions in mm



Subject to errors and technical modifications within the scope of product improvement.

Datasheet according to EN 50380.

