

Powerful performance – high stability. Bosch Solar Module c-Si M 60

High-quality – high-performance – reliable.
Solar modules from Bosch Solar Energy.



BOSCH



NEW: positive power sorting starting July 1st 2010

Our crystalline solar modules offer impressive features including:

- ▶ Excellent quality assured through use of the best European-standard components
- ▶ Excellent processing and long-term stability right along the value-added chain
- ▶ Higher specific yields due to positive power sorting
- ▶ Professional customer service with unbureaucratic order and complaint processing carried out by designated contact persons
- ▶ Simple, safe installation thanks to standardized clamp mechanisms

Warranty conditions:

- ▶ 10 years product warranty
- ▶ 25-year performance guarantee (90% up to 10 years, 80% up to 25 years)
- ▶ Product certification to IEC 61215 (ed. 2)
- ▶ Protection class II / IEC 61730
- ▶ CE conformity

Manufacturer	Length [x]	Width [y]	Height [z]	Weight	Junction box	Plug connector type	Cable [l]	Front glass surface
01	1662.0	992.0	42.0	22	Spelsberg	MC4	2 x 1000	Structured
11	1659.5	988.0	40.0	22	Tyco	Tyco Solarlok	2 x 1000	Structured
14	1660.0	990.0	50.0	21	Spelsberg	MC3	Minus 800 Plus 1200	Structured

x, y, z, l in mm, ±2 mm; weight in kg ±0.5

Notes on assembly:

- ▶ See installation and operating manual at www.bosch-solarenergy.de/en/products/crystallinepvmmodules
- ▶ Horizontal and vertical assembly possible
- ▶ System voltage max. 1 000 V

Crystalline solar module	
Performance classes	220 Wp, 225 Wp, 230 Wp, 235 Wp, 240 Wp
Performance sorting	±2.5 Wp (-0/+4.99 Wp NEW starting July 1 st 2010)
Structure	Glass-foil laminate ▶ Anodized aluminum frame ▶ Junction box (IP 65) with 3 bypass diodes ▶ Weather-resistant back sheet (white)
Cells	60x monocrystalline solar cells in 156 mm x 156 mm format

Weak light performance:

Intensity [W/m ²]	V _{mpp} [%]	I _{mpp} [%]
800	0.0	-20
600	-0.9	-40
400	-2.1	-60
200	-5.1	-80
100	-8.7	-90

The electrical data applies for 25 °C and AM 1.5.

Electrical characteristics for STC*:

Designation	P _{mpp} [Wp]	V _{mpp} [V]	I _{mpp} [A]	V _{oc} [V]	I _{sc} [A]	Reverse-current load capacity [A]
M240 3BB	240	30.20	7.95	36.80	8.50	17
M235 3BB	235	30.00	7.85	36.60	8.40	17
M230 3BB	230	29.80	7.75	36.40	8.30	17
M225 3BB	225	29.60	7.65	36.20	8.20	17
M220 3BB	220	29.40	7.55	36.00	8.10	17

Reduction in module efficiency with decrease in irradiation level from 1000 W/m² to 200 W/m² (at 25 °C): -0.65 % (absolute); measuring tolerance P ±3 %

Thermal characteristics:

Operating temperature range	-40 to 85 °C
Temperature coefficient P _{mpp}	-0.50%/K
Temperature coefficient V _{oc}	-0.36%/K
Temperature coefficient I _{sc}	0.039%/K

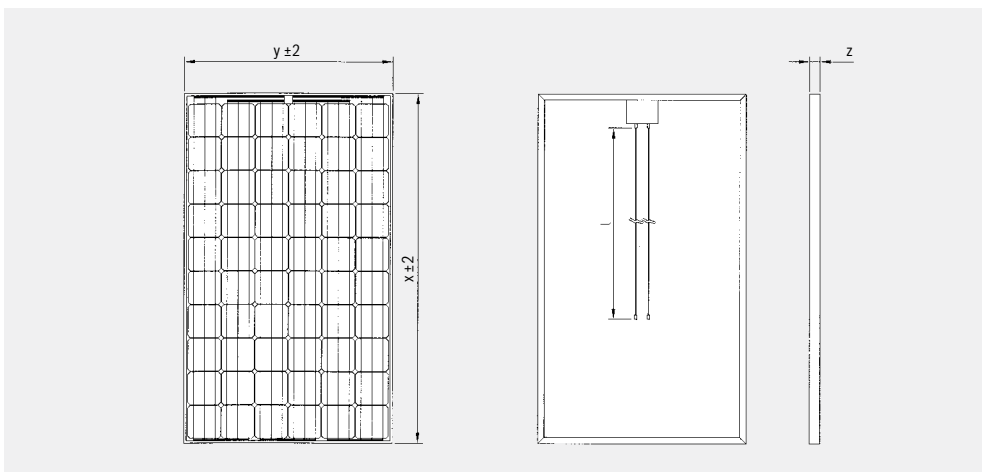
Electrical characteristics for NOCT*:

Designation	P _{mpp} [W]	V _{mpp} [V]	V _{oc} [V]	I _{sc} [A]
M240 3BB	173	27.44	34.09	6.84
M235 3BB	169	27.24	33.89	6.76
M230 3BB	166	27.04	33.69	6.68
M225 3BB	162	26.83	33.49	6.60
M220 3BB	158	26.62	33.30	6.52

NOCT: Normal Operation Cell Temperature 48.4 °C; Irradiation level 800 W/m², AM 1.5, temperature 20 °C, wind speed 1 m/s, electrical open circuit operation

* Electrical parameters are typical mean values from historical production data. Bosch Solar Energy AG assumes no liability for the accuracy of this data for future production batches.

Dimensions:**



** Drawings are not to scale. For detailed dimensions and tolerances, see above.

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