

# Powerful performance – high stability.

## Bosch Solar Module c-Si M 60

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



**BOSCH**

### **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
- ▶ 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:**

- ▶ 2-year 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	Cable [l]	Front glass surface
01	1662.0	992.0	42.0	22	Spelsberg PV 1410	MC4	2 x 1000	Structured
10	1660.0	990.0	40.0	20	Spelsberg PV 1410	H&S Radox Twist Lock	2 x 1200	Anti-reflective coating
11	1655.5	988.0	42.0	22	Tyco Solarlok	Tyco Solarlok	2 x 1000	Structured
13	1680.0	990.0	50.0	24	Tyco Solarlok	Tyco Solarlok	2 x 1200	Structured

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

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

**Electrical characteristics for STC\*:**

Designation	Pmpp [Wp]	Vmpp [V]	Impp [A]	Voc [V]	Isc [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

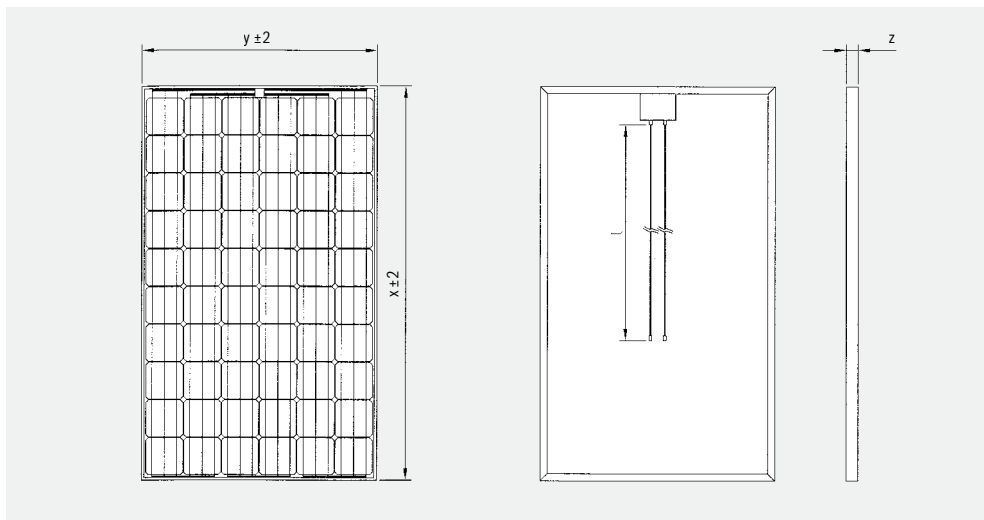
Reduction in module efficiency with decrease in irradiation level from 1000 W/m<sup>2</sup> to 200 W/m<sup>2</sup> (at 25 °C):  
-0.65 % (absolute); measuring tolerance P ±3 %

**Electrical characteristics for NOCT\*:**

Designation	Pmpp [W]	Vmpp [V]	Voc [V]	Isc [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/m<sup>2</sup>, AM 1.5, temperature 20 °C, wind speed 1 m/s, electrical open circuit operation

**Dimensions\*\*:**



**Notes on assembly:**

- ▶ See installation and operating manual at [www.bosch-solarenergy.de/en/products/crystallinepvmodes](http://www.bosch-solarenergy.de/en/products/crystallinepvmodes)
- ▶ Horizontal and vertical assembly possible
- ▶ System voltage max. 1000 V

**Weak light performance:**

Intensity [W/m <sup>2</sup> ]	Vmpp [%]	Impp [%]
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.

**Thermal characteristics:**

Operating temperature range	-40 to 85 °C
Temperature coefficient Pmpp	-0.50%/K
Temperature coefficient Voc	-0.36%/K
Temperature coefficient Isc	0.039%/K

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

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

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