

# High performance – Stable yields.

## Bosch Solar Cell M 3BB

### C4 1200

**Efficient – high-performance – reliable.**  
Solar cells from Bosch Solar Energy.



**BOSCH**

#### **Our monocrystalline solar cells offer impressive features including:**

- ▶ High annual yields, even with sub-optimal levels of sunlight, thanks to excellent performance in weak light conditions
- ▶ Exceptionally stable performance thanks to using purest silicon and to high-resistance wafers
- ▶ Improved cell processing as a result of narrow performance tolerances
- ▶ Reliability of short and long term supply, due to high production capacity
- ▶ Pioneering 3-busbar technology reduces the series resistance and helps to boost the power output in the module

#### **Packaging:**

- ▶ 150 pack as smallest packaging unit
- ▶ Suitable for controlling/checking incoming goods digitally using a barcode system

#### **Production & quality control:**

- ▶ 100% classification under IEC 60904 and IEC 60891
- ▶ 100% testing of reverse-current
- ▶ Regular calibration at Fraunhofer ISE

Product characteristics	
Dimensions	156 mm x 156 mm (±0.5 mm) pseudo square
Diagonal	205 mm ±1 mm
Average thickness	190 µm (±30 µm) 210 µm (±30 µm)
Front contacts (-)	3 Busbars (silver) with 1.47 mm width, textured surface with silicon nitride anti-reflective coating
Back contacts (+)	3 rows of soldering pads (silver) with a pad width of 2.9 mm, full-surface aluminium BSF
Dark reverse current	$I_{rev} < 1.5 \text{ A @ } -12 \text{ V}$
Power sorting	+50/-0 mW

**Electrical data:**

Class	Pmpp [Wp]	Efficiency [%]	Vmpp* [mV]	Impp* [mA]	Voc* [mV]	Isc* [mA]
4.54	4.54-4.59	18.84-19.05	535	8505	636	9077
4.49	4.49-4.54	18.63-18.84	530	8476	631	9041
4.44	4.44-4.49	18.43-18.63	529	8408	631	8970
4.39	4.39-4.44	18.22-18.43	527	8387	630	8951
4.34	4.34-4.39	18.01-18.22	525	8339	629	8907
4.29	4.29-4.34	17.81-18.01	522	8274	627	8872
4.24	4.24-4.29	17.60-17.81	519	8212	627	8862

The electrical data applies for standard test conditions (STC): 1000 W/m<sup>2</sup>, 25 °C, AM 1.5 (IEC 60904-3 ed.2 2008); Tolerance P: ±1.5% rel. \*\*

Temperature coefficients:  $\alpha (I_{sc})$ : +0.04%/K  $\beta (V_{oc})$ : -0.33%/K  $\gamma (P_{mpp})$ : -0.43%/K

**Storage conditions:**

- Store at room temperature, protected from dust and moisture.

**Recommendations for processing:**

- Tin-plated copper ribbon
- Coating: 10-15 µm (62% Sn/36% Pb/2% Ag)

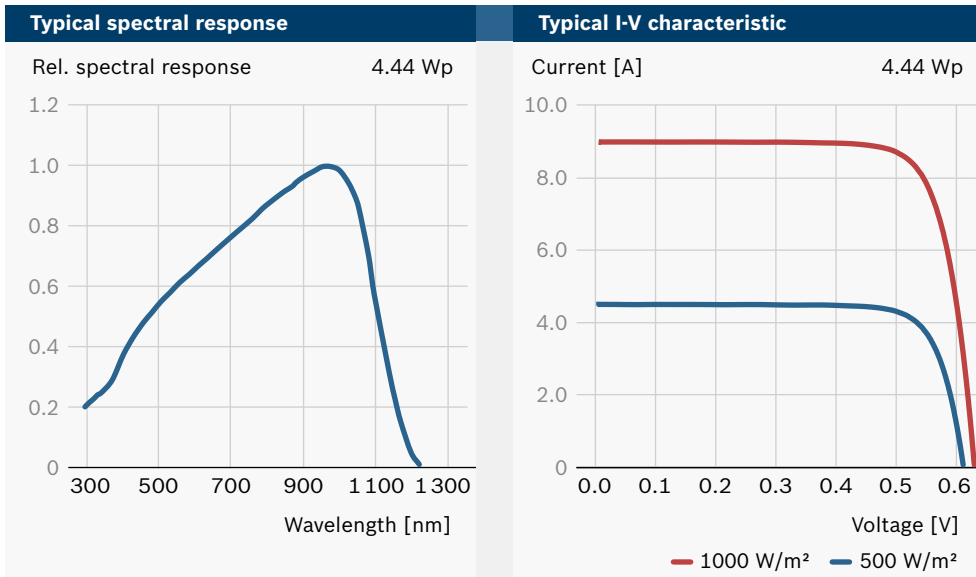
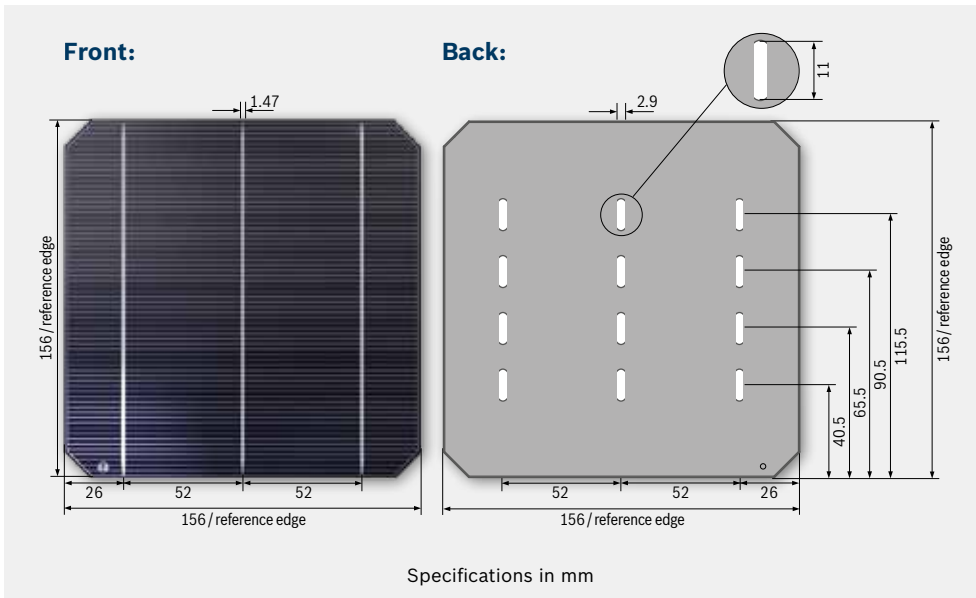
**Weak light performance:**

Intensity [W/m <sup>2</sup> ]	Vmpp* [%]	Impp* [%]
1000	0	0
900	-0.3	-10
500	-1.94	-50
300	-3.91	-70
200	-6.06	-80

The electrical data applies for 25 °C and AM 1.5 (IEC 60904-3 ed.2 2008).

\* These 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.

\*\*The tolerance value relates to a reference cell calibrated by the Fraunhofer ISE in Freiburg



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