

Q.CELLS
YIELD SECURITY

- ✓ ANTI PID TECHNOLOGY (APT)
- ✓ ADDITIONAL POWER BOOST (APB)
- ✓ 360° EFFICIENCY (TDE)

EUPD RESEARCH

TOP-BRAND PV

MODULES

GERMANY

2012

CIGS SOLAR MODULE

Q.SMART UF L 95-1 15

Performance champion and space wonder

The frameless **Q.SMART UF L** thin-film module offers world record efficiencies up to 13.4 %. On roof-parallel installations **Q.SMART UF L** allows yields twice as high as with elevated modules. But be careful: Not all solar modules are the same. Only **Q.SMART** modules are „Made in Germany“ with the unique triple Yield Security.

YOUR EXCLUSIVE TRIPLE YIELD SECURITY

- **Anti PID Technology (APT)** reliably prevents power loss resulting from unwanted leakage currents (potential-induced degradation)¹.
- **Additional Power Boost (APB)** provides up to 15 % more output resulting from positive sorting and the light soaking effect. More power at no additional cost!
- **360° Efficiency (TDE)** allows PV installations regardless of whether the roof faces to the north, south, east or west. **Q.SMART** modules produce high yields even when installed parallel to the roof.

ONE MORE ADVANTAGE FOR YOU

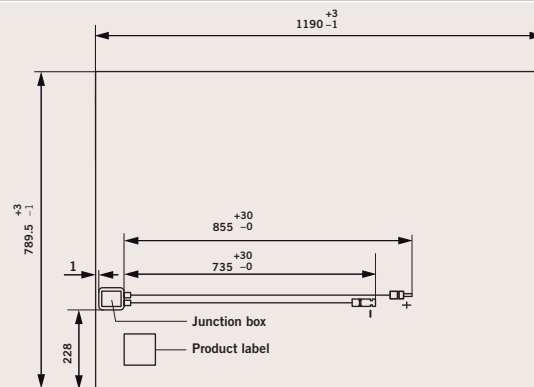
- **Esthetic appearance:** Completely black **Q.SMART** solar modules are ideal for architecturally demanding photovoltaic installations.
- **Controlled quality:** **Q.CELLS** tests its solar modules in the world's largest module testing center at head office in Thalheim, Germany, longer and more stringently than prescribed in the standards.
- **Guaranteed performance:** **Q.CELLS** offers the best warranties on the market. A 10-year product warranty plus a 25-year linear performance warranty².



¹ APT test conditions: Cells at -1000 V against grounded, with conductive metal foil covered module surface, 25 °C, 168 h (TUV test conditions)

² See data sheet on rear for further information.

MECHANICAL SPECIFICATION	
Length	1190 (+3/-1) mm
Width	789.5 (+3/-1) mm
Height	7.3 mm (+ Junction box, 15 mm)
Weight	16.5 kg
Front Cover	4 mm tempered low iron glass
Back Cover	3 mm float glass
Frame	None
Cell Type	CIGS [Cu(In, Ga) Se ₂]
Junction box	Protection class IP 65, with 1 bypass diode (3 A) 66 x 54 x 15 mm ³
Cable type	Solar cable 2.5 mm ² ; (+) 855 (+30/-0) mm; (-) 735 (+30/-0) mm
Connector	MC4



ELECTRICAL CHARACTERISTICS

PERFORMANCE AT STANDARD TEST CONDITIONS (STC: 1000 W/m², 25 °C, AM 1.5 G SPECTRUM)¹

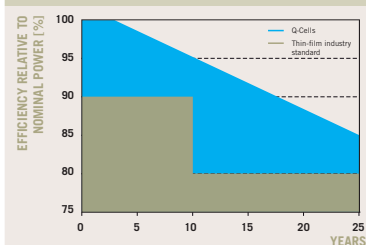
POWER CLASS (+5/-0 W)		[W]	95	100	105	110	115
Minimum Power	P_{MPP}	[W]	95.0	100.0	105.0	110.0	115.0
Short Circuit Current	I_{SC}	[A]	1.68	1.68	1.68	1.69	1.69
Open Circuit Voltage	V_{OC}	[V]	89.0	90.1	91.6	93.3	95.1
Current at P_{MPP}	I_{MPP}	[A]	1.43	1.46	1.49	1.52	1.54
Voltage at P_{MPP}	V_{MPP}	[V]	66.4	68.5	70.5	72.4	74.7
Nominal Efficiency	η	[%]	≥10.1	≥10.6	≥11.2	≥11.7	≥12.2

PERFORMANCE AT NORMAL OPERATING CELL TEMPERATURE (NOCT: 800 W/m², 51 ±2 °C, AM 1.5 G SPECTRUM)¹

POWER CLASS (+5/-0 W)		[W]	95	100	105	110	115
Minimum Power	P_{MPP}	[W]	68.7	72.3	75.9	79.5	83.1
Short Circuit Current	I_{SC}	[A]	1.34	1.34	1.34	1.35	1.35
Open Circuit Voltage	V_{OC}	[V]	81.0	82.0	83.4	84.9	86.5
Current at P_{MPP}	I_{MPP}	[A]	1.14	1.16	1.18	1.21	1.22
Voltage at P_{MPP}	V_{MPP}	[V]	60.2	62.1	64.0	65.7	67.8

¹ Measurement accuracy P_{MPP}: ±5%; measurement accuracy I_{SC}, V_{OC}, I_{MPP}, V_{MPP}: ±10 %. All STC measurements based on pre-treatment of modules with 1 hour light soak (1000 W/m² [1 kWh/m²], in open circuit) followed by cool down to 25 °C. For the system conception, please take into account the typical relative V_{OC} and V_{MPP} power increase of 2.5 % after 215 kWh/m² light soaking. This power boost is not included in the nominal values of this data sheet.

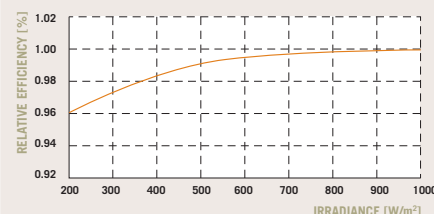
QCELLS WARRANTIES



At least 97 % of nominal power during first year. Thereafter max. 0.7 % degradation per year.
At least 92% of nominal power after 10 years.
At least 85% of nominal power after 25 years.

All data within measurement tolerances.
Full product and performance warranties in accordance with the Q-CELLS warranties applicable in your country.

PERFORMANCE AT LOW IRRADIANCE



The typical relative change in module efficiency (at nominal power) at an irradiance of 200 W/m² in relation to 1000 W/m² (both at 25 °C and AM 1.5 G spectrum) is -4.0 % rel.

TEMPERATURE COEFFICIENTS (AT 1000 W/m², AM 1.5 G SPECTRUM)

Temperature Coefficient of I_{SC}	α	[%/K]	+ 0.00 ± 0.04	Temperature Coefficient of V_{OC}	β	[%/K]	-0.29 ± 0.04
Temperature Coefficient of P_{MPP}	γ	[%/K]	-0.38 ± 0.04				

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V_{sys}	[V]	1000 (IEC) / 600 (UL 1703)	Safety Class	II
Maximum Reverse Current I_r	[A]	4	Fire Rating	C
Wind/Snow Load	[Pa]	2400	Permitted module temperature on continuous duty	-40 °C up to +85 °C

QUALIFICATIONS AND CERTIFICATES

IEC 61646 (Ed. 2), IEC 61730 (Ed. 1) Application Class A, UL 1703; The production site is certified according to ISO 9001.



Content of this data sheet according to DIN EN 50380.

PARTNER

NOTE: Installation instructions must be followed. See the installation and operating manual or contact the technical service for further information on approved installation and use of this product.

Q-CELLS SE

OT Thalheim, Sonnenallee 17–21
06766 Bitterfeld-Wolfen, Germany

TEL +49 (0)3494 66 99-0
FAX +49 (0)3494 66 99-199

EMAIL service@q-cells.com
WEB www.q-cells.com

