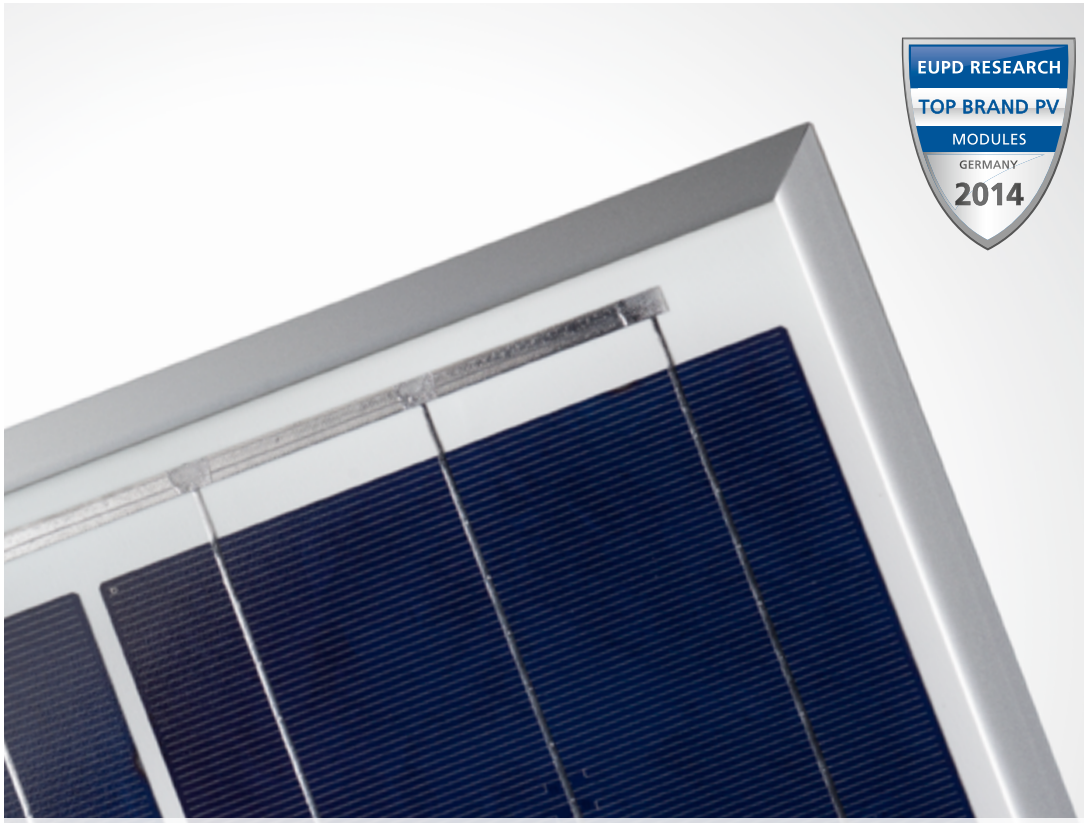


EUPD RESEARCH
TOP BRAND PV
MODULES
GERMANY
2014

Q CELLS
YIELD SECURITY
ANTI PID TECHNOLOGY (APT)
HOT-SPOT PROTECT (HSP)
TRACEABLE QUALITY (TRA.Q™)

Photon
YIELD MEASUREMENT
Q CELLS
Best polycrystalline solar module 2013
Q.PRO-G2 235
151 modules tested

VDE
Quality Tested
high reliability
low degradation
frequent product monitoring
ID 40032587

POLYCRYSTALLINE SOLAR MODULE

Q.PRO L 295-315

Power and cost efficiency

The polycrystalline solar module Q.PRO L solar module with power classes up to 315 W is the strongest module of its type on the market globally. Powered by 72 Q CELLS solar cells and with a size of 2 m² Q.PRO L was specially designed for large solar power plants to reduce BOS costs. But there is even more to our polycrystalline modules. Only Q CELLS offers German engineering quality with our 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].
- **Hot-Spot Protect (HSP)** prevents yield losses and reliably protects against module fire.
- **Traceable Quality (Tra.Q™)** is the 'Finger Print' of a solar cell. Tra.Q™ ensures continuous quality control throughout the entire production process from cells to modules while making Q CELLS solar modules forgery proof.

ONE MORE ADVANTAGE FOR YOU

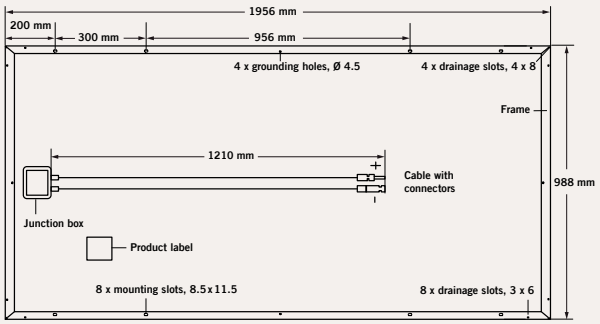
- **Reduced BOS costs:** Optimised design to reduce costs per Wp.
- **Improved energy yield:** The actual output of all Q CELLS solar modules is up to 5 Wp higher than the nominal power thanks to positive sorting.
- **Guaranteed performance:** Q CELLS offers the best warranties on the market. A 12-year product warranty plus a 25-year linear performance warranty[2].

[1] APT test conditions: Cells at -1000 V against grounded, with conductive metal foil covered module surface, 25 °C, 168 h
[2] See data sheet on rear for further information.

Q CELLS

MECHANICAL SPECIFICATION

Format	1956 mm x 988 mm x 45 mm (including frame)
Weight	$27^{\pm 0.5}$ kg
Front Cover	4.0 mm thermally pre-stressed glass with antireflection coating (ARC)
Back Cover	Composite film
Frame	Anodised aluminium
Cell	6 x 12 polycrystalline solar cells
Junction box	110 mm x 115 mm x 23 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) 1210 mm, (-) 1210 mm
Connector	SOLARLOK PV4, IP68



ELECTRICAL CHARACTERISTICS

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

NOMINAL POWER (+5 W/-0 W)		[W]	295	300	305	310	315
Average Power	P_{MPP}	[W]	297.5	302.5	307.5	312.5	317.5
Short Circuit Current	I_{SC}	[A]	8.89	8.93	8.97	9.01	9.06
Open Circuit Voltage	V_{OC}	[V]	44.99	45.27	45.56	45.84	46.13
Current at P_{MPP}	I_{MPP}	[A]	8.28	8.34	8.40	8.47	8.53
Voltage at P_{MPP}	V_{MPP}	[V]	35.94	36.27	36.59	36.91	37.23
Efficiency (Nominal Power)	η	[%]	≥ 15.3	≥ 15.5	≥15.8	≥16.0	≥16.3

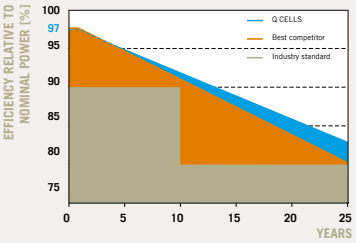
PERFORMANCE AT NORMAL OPERATING CELL TEMPERATURE (NOCT: 800 W/m², 47 ±3 °C. AM 1.5 G SPECTRUM)[2]

NOMINAL POWER (+5 W/-0 W)		[W]	295	300	305	310	315
Average Power	P_{MPP}	[W]	219.2	222.9	226.6	230.3	233.9
Short Circuit Current	I_{SC}	[A]	7.17	7.20	7.24	7.27	7.30
Open Circuit Voltage	V_{OC}	[V]	41.60	41.87	42.14	42.40	42.67
Current at P_{MPP}	I_{MPP}	[A]	6.47	6.53	6.58	6.64	6.69
Voltage at P_{MPP}	V_{MPP}	[V]	33.86	34.15	34.42	34.70	34.97

[1] Measurement tolerances STC: ±3% (P_{MPP}); ±10% (I_{SC}, V_{OC}, I_{MPP}, V_{MPP})

[2] Measurement tolerances NOCT: ±5% (P_{MPP}); ±10% (I_{SC}, V_{OC}, I_{MPP}, V_{MPP})

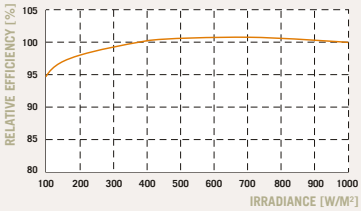
Q CELLS PERFORMANCE WARRANTY



At least 97% of nominal power during first year. Thereafter max. 0.6% degradation per year.
At least 92% of nominal power after 10 years.
At least 83% of nominal power after 25 years.

All data within measurement tolerances.
Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.

PERFORMANCE AT LOW IRRADIANCE



The typical change in module efficiency at an irradiance of 200 W/m² in relation to 1000 W/m² (both at 25 °C and AM 1.5 G spectrum) is -2% (relative).

TEMPERATURE COEFFICIENTS (AT 1000 W/m², 25 °C, AM 1.5 G SPECTRUM)

Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	**Temperature Coefficient of V_{OC}**	β	[%/K]	−0.33
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.42				

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V_{SYS}	[V]	1000	**Safety Class**	II
Maximum Reverse Current I_R	[A]	20	**Fire Rating**	C
Wind/Snow Load (in accordance with IEC 61215)	[Pa]	5400	**Permitted module temperature on continous duty**	-40 °C up to +85 °C

QUALIFICATIONS AND CERTIFICATES

VDE Quality Tested, IEC 61215 (Ed.2); IEC 61730 (Ed.1), Application class A
This data sheet complies with 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.

Hanwha Q CELLS GmbH
Sonnenallee 17-21, 06766 Bitterfeld-Wolfen, Germany | **TEL** +49 (0)3494 66 99-23444 | **FAX** +49 (0)3494 66 99-23000 | **EMAIL** sales@q-cells.com | **WEB** www.q-cells.com