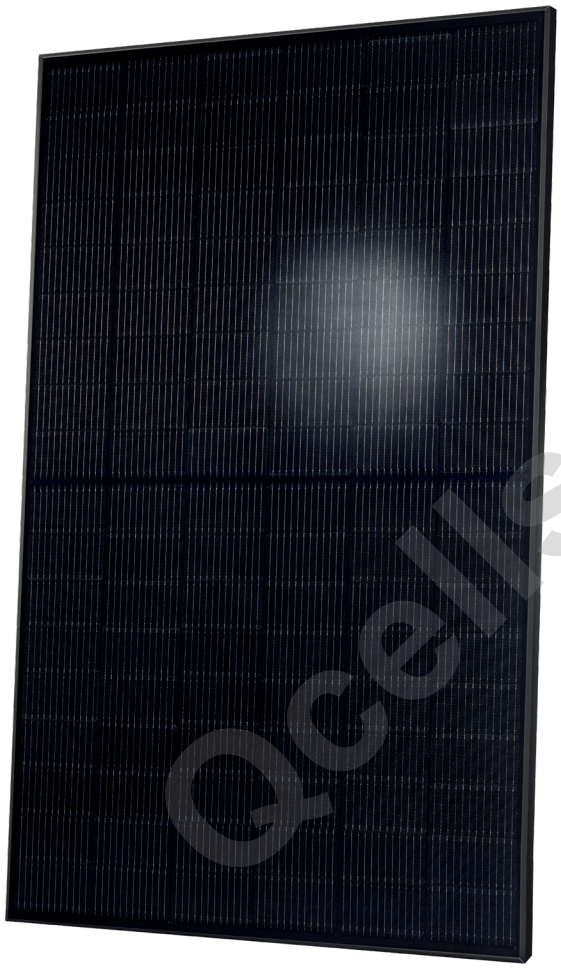
Q.PEAK DUO BLK M-G11 SERIES

380 - 400 Wp | 108 Cells
20.8 % Maximum Module Efficiency

MODEL Q.PEAK DUO BLK M-G11



Breaking the 20 % efficiency barrier

Q.ANTUM DUO Z technology with zero gap cell layout boosts module efficiency up to 20.8 %.

Enduring high performance

Long-term yield security with Anti LeTID Technology, Anti PID Technology[1] and Hot-Spot Protect.

Extreme weather rating

High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (3600 Pa).

Innovative all-weather technology

Optimal yields, whatever the weather with excellent low-light and temperature behaviour.

A reliable investment

Inclusive 12-year product warranty and 25-year linear performance warranty[2].

The most thorough testing programme in the industry

Qcells is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new “Quality Controlled PV” of the independent certification institute TÜV Rheinland.

[1] APT test conditions according to IEC / TS 62804-1:2015, method A (–1500 V, 96 h)
[2] See data sheet on rear for further information.

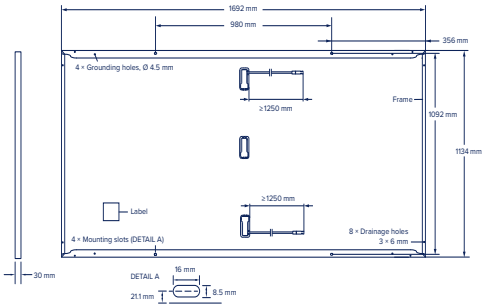
The ideal solution for:

Rooftop arrays on residential buildings

Q.PEAK DUO BLK SERIES

Mechanical Specification

Format	1692 mm × 1134 mm × 30 mm (including frame)
Weight	21.2 kg
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodised aluminium
Cell	6 × 18 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥1250 mm, (−) ≥1250 mm
Connector	Stäubli MC4, Hanwha Q CELLS HQC4; IP68

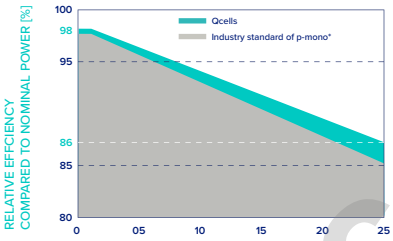


Electrical Characteristics

POWER CLASS				380	385	390	395	400
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / −0 W)								
Minimum	Power at MPP[1]	P_{MPP}	[W]	380	385	390	395	400
	Short Circuit Current[1]	I_{SC}	[A]	13.26	13.30	13.34	13.37	13.41
	Open Circuit Voltage[1]	V_{OC}	[V]	37.07	37.10	37.13	37.15	37.18
	Current at MPP	I_{MPP}	[A]	12.54	12.61	12.68	12.75	12.82
	Voltage at MPP	V_{MPP}	[V]	30.31	30.54	30.77	30.99	31.21
	Efficiency[1]	η	[%]	≥19.8	≥20.1	≥20.3	≥20.6	≥20.8
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]								
Minimum	Power at MPP	P_{MPP}	[W]	285.1	288.8	292.6	296.3	300.1
	Short Circuit Current	I_{SC}	[A]	10.69	10.72	10.75	10.78	10.81
	Open Circuit Voltage	V_{OC}	[V]	34.96	34.99	35.01	35.04	35.07
	Current at MPP	I_{MPP}	[A]	9.85	9.91	9.97	10.04	10.10
	Voltage at MPP	V_{MPP}	[V]	28.95	29.14	29.34	29.53	29.72

[1]Measurement tolerances P_{MPP} ±3%; I_{SC}; V_{OC} ±5% at STC: 1000 W/m², 25±2 °C, AM 1.5 according to IEC 60904-3 • [2]800 W/m², NMOT, spectrum AM 1.5

Qcells PERFORMANCE WARRANTY

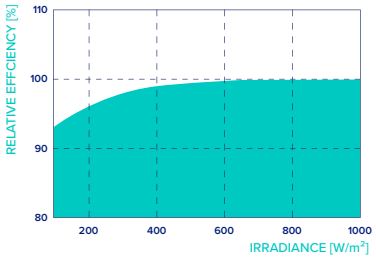


At least 98% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 86% of nominal power up to 25 years.

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

*Standard terms of guarantee for the 5 PV companies with the highest production capacity in 2021 (February 2021)

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	−0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.34	Nominal Module Operating Temperature	NMOT	[°C]	43±3

Properties for System Design

Maximum System Voltage	V_{SYS}	[V]	1000	PV module classification	Class II
Maximum Reverse Current	I_R	[A]	25	Fire Rating based on ANSI / UL 61730	C / TYPE 2
Max. Design Load, Push / Pull		[Pa]	3600 / 2400	Permitted Module Temperature on Continuous Duty	−40 °C - +85 °C
Max. Test Load, Push / Pull		[Pa]	5400 / 3600		

Qualifications and Certificates

Quality Controlled PV - TÜV Rheinland; IEC 61215:2016; IEC 61730:2016.
This data sheet complies with DIN EN 50380.

TÜV Rheinland CERTIFIED
www.tuv.com ID 1111220277

UK CA CE

Note: Installation instructions must be followed. Contact our technical service for further information on approved installation 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.qcells.com

qcells

powered by Q.ANTUM DUO Z

Q.PEAK DUO XL-G9.3

445-465

ENDURING HIGH PERFORMANCE

EUPD RESEARCH TOP BRAND PV MODULES EUROPE 2020

Q CELLS Yield Security

BREAKING THE 20 % EFFICIENCY BARRIER
Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 21.1 %.

LOW ELECTRICITY GENERATION COSTS
Higher yield per surface area, lower BOS costs and up to 30 watts more power per module.

ENDURING HIGH PERFORMANCE
Long-term yield security with Anti LID Technology, Anti PID Technology[1], Hot-Spot Protect and Traceable Quality Tra.Q™.

EXTREME WEATHER RATING
High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (2400 Pa).

A RELIABLE INVESTMENT
Inclusive 12-year product warranty and 25-year linear performance warranty[2].

STATE OF THE ART MODULE TECHNOLOGY
Q.ANTUM DUO combines cutting edge cell separation and innovative 12-busbar design with Q.ANTUM Technology.

[1] APT test conditions according to IEC/TS 62804-1:2015, method B (–1500 V, 168 h)
[2] See data sheet on rear for further information.

THE IDEAL SOLUTION FOR:

Ground-mounted solar power plants

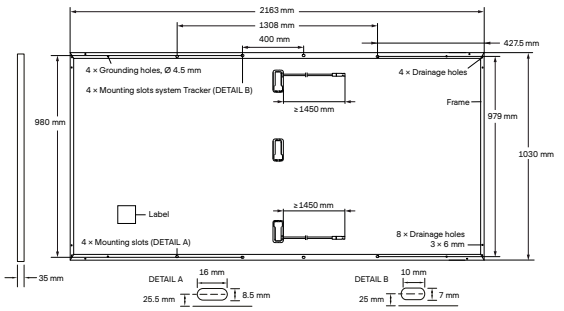
Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	2163 mm × 1030 mm × 35 mm (including frame)
Weight	25.5 kg
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Anodised aluminium
Cell	6 × 26 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥1450 mm, (–) ≥1450 mm*
Connector	Stäubli MC4-Evo2, Hanwha Q CELLS HQC4; IP68

*Short cables (+) ≥700 mm, (–) ≥350 mm are available upon request.

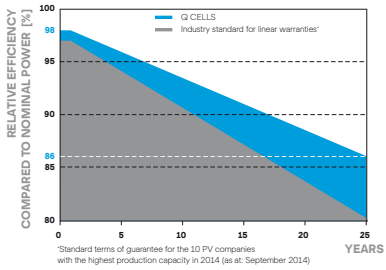


ELECTRICAL CHARACTERISTICS

POWER CLASS				445	450	455	460	465
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / –0 W)								
Minimum	Power at MPP[1]	P_{MPP}	[W]	445	450	455	460	465
	Short Circuit Current[1]	I_{SC}	[A]	10.62	10.65	10.67	10.70	10.73
	Open Circuit Voltage[1]	V_{OC}	[V]	53.15	53.18	53.22	53.25	53.29
	Current at MPP	I_{MPP}	[A]	10.10	10.15	10.20	10.25	10.30
	Voltage at MPP	V_{MPP}	[V]	44.06	44.34	44.61	44.89	45.16
	Efficiency[1]	η	[%]	≥20.0	≥20.2	≥20.4	≥20.6	≥20.9
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]								
Minimum	Power at MPP	P_{MPP}	[W]	333.2	337.0	340.7	344.5	348.2
	Short Circuit Current	I_{SC}	[A]	8.56	8.58	8.60	8.62	8.64
	Open Circuit Voltage	V_{OC}	[V]	50.12	50.15	50.18	50.22	50.25
	Current at MPP	I_{MPP}	[A]	7.95	7.99	8.03	8.08	8.12
	Voltage at MPP	V_{MPP}	[V]	41.93	42.17	42.41	42.64	42.87

[1]Measurement tolerances P_{MPP} ±3%; I_{SC}; V_{OC} ±5% at STC: 1000 W/m², 25±2°C, AM 1.5 according to IEC 60904-3 • [2]800 W/m², NMOT, spectrum AM 1.5

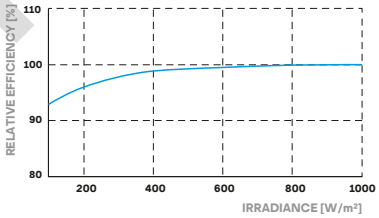
Q CELLS PERFORMANCE WARRANTY



At least 98% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 86% of nominal power up to 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



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	–0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	–0.35	Nominal Module Operating Temperature	NMOT	[°C]	43±3

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage	V_{SYS}	[V]	1500	PV module classification	Class II
Maximum Reverse Current	I_R	[A]	20	Fire Rating based on ANSI / UL 61730	C / TYPE 1
Max. Design Load, Push / Pull		[Pa]	3600 / 1600	Permitted Module Temperature on Continuous Duty	–40 °C - +85 °C
Max. Test Load, Push / Pull		[Pa]	5400 / 2400		

QUALIFICATIONS AND CERTIFICATES

IEC 61215:2016;
IEC 61730:2016.
This data sheet complies with DIN EN 50380.

TÜVRheinland CERTIFIED
www.tuv.com
ID 1111220277

CE

PACKAGING INFORMATION

Vertical packaging	2215 mm	1130 mm	1200 mm	816 kg	24 pallets	20 pallets	30 modules

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department 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

Engineered in Germany

Q.PEAK DUO XL-G10 SERIES

470 - 490 Wp | 156 Cells
21.2 % Maximum Module Efficiency

MODEL Q.PEAK DUO XL-G10.3
Q.PEAK DUO XL-G10.7

Breaking the 21% efficiency barrier

Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 21.2 %.

Enduring high performance

Long-term yield security with Anti LeTID Technology, Anti PID Technology[1], Hot-Spot Protect.

Low electricity generation costs

Higher yield per surface area, lower BOS costs and up to 80 watts more module power than standard 144 half-cell modules.

Extreme weather rating

High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (3000 Pa).

A reliable investment

Inclusive 12-year product warranty and 25-year linear performance warranty[2].

State of the art module technology

Q.ANTUM DUO combines cutting edge cell separation and innovative 12-busbar design with Q.ANTUM Technology.

[1] APT test conditions according to IEC / TS 62804-1:2015, method A (−1500 V, 96 h)
[2] See data sheet on rear for further information.

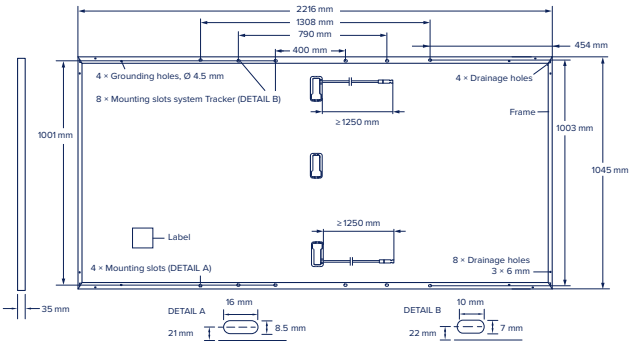
The ideal solution for:

Ground mounted solar panels

Q.PEAK DUO XL-G10 SERIES

Mechanical Specification

Format	2216 mm × 1045 mm × 35 mm (including frame)
Weight	26.0 kg
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Anodised aluminium
Cell	6 × 26 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥1250 mm, (−) ≥1250 mm*
Connector	Hanwha Q CELLS HQC4; IP68

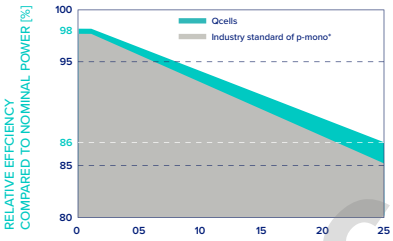


Electrical Characteristics

POWER CLASS				470	475	480	485	490
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / −0 W)								
Minimum	Power at MPP[1]	P_{MPP}	[W]	470	475	480	485	490
	Short Circuit Current[1]	I_{SC}	[A]	11.21	11.24	11.26	11.29	11.31
	Open Circuit Voltage[1]	V_{OC}	[V]	53.54	53.58	53.61	53.64	53.68
	Current at MPP	I_{MPP}	[A]	10.62	10.66	10.71	10.76	10.81
	Voltage at MPP	V_{MPP}	[V]	44.27	44.54	44.81	45.07	45.33
	Efficiency[1]	η	[%]	≥20.3	≥20.5	≥20.7	≥20.9	≥21.2
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]								
Minimum	Power at MPP	P_{MPP}	[W]	352.6	356.4	360.1	363.9	367.6
	Short Circuit Current	I_{SC}	[A]	9.03	9.05	9.07	9.09	9.12
	Open Circuit Voltage	V_{OC}	[V]	50.49	50.53	50.56	50.59	50.62
	Current at MPP	I_{MPP}	[A]	8.34	8.39	8.43	8.47	8.52
	Voltage at MPP	V_{MPP}	[V]	42.26	42.49	42.72	42.94	43.17

[1]Measurement tolerances P_{MPP} ±3%; I_{SC}; V_{OC} ±5% at STC: 1000 W/m², 25±2 °C, AM 1.5 according to IEC 60904-3 • [2]800 W/m², NMOT, spectrum AM 1.5

Qcells PERFORMANCE WARRANTY



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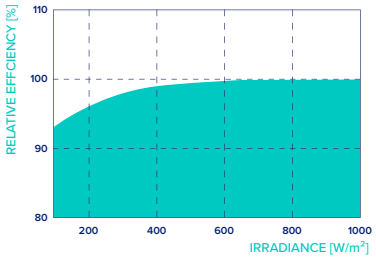
All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Qcells sales organisation of your respective country.

*Standard terms of guarantee for the 5 PV companies with the highest production capacity in 2021 (February 2021)

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	−0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.34	Nominal Module Operating Temperature	NMOT	[°C]	43±3

Properties for System Design

Maximum System Voltage	V_{SYS}	[V]	1500	PV module classification	Class II
Maximum Reverse Current	I_R	[A]	20	Fire Rating based on ANSI / UL 61730	C / TYPE 1
Max. Design Load, Push / Pull		[Pa]	3600 / 2000	Permitted Module Temperature on Continuous Duty	−40 °C - +85 °C
Max. Test Load, Push / Pull		[Pa]	5400 / 3000		

Qualifications and Certificates

Quality Controlled PV - TÜV Rheinland; IEC 61215:2016; IEC 61730:2016.
This data sheet complies with DIN EN 50380.

TÜVRheinland CERTIFIED
www.tuv.com ID 1111220277

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Note: Installation instructions must be followed. Contact our technical service for further information on approved installation 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.qcells.com

qcells

Q.PEAK DUO ML-G11S SERIES

490 - 510 Wp | 132 Cells
21.5 % Maximum Module Efficiency

MODEL Q.PEAK DUO ML-G11S.2

Breaking the 21% efficiency barrier

Q.ANTUM DUO Technology with optimized module layout boosts module power.

Enduring high performance

Long-term yield security with Anti LeTID Technology, Anti PID Technology[1], and Hot-Spot Protect.

Extreme weather rating

High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (2400 Pa).

Innovative all-weather technology

Optimal yields, whatever the weather with excellent low-light and temperature behaviour.

A reliable investment

Inclusive 12-year product warranty and 25-year linear performance warranty[2].

The most thorough testing programme in the industry

Qcells is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new "Quality Controlled PV" of the independent certification institute TÜV Rheinland.

[1] APT test conditions according to IEC/TS 62804-1:2015, method A (−1500 V, 96 h)
[2] See data sheet on rear for further information.

The ideal solution for:

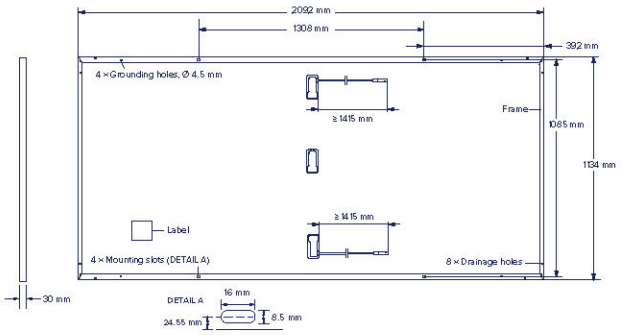
Rooftop arrays on commercial/industrial buildings

Ground mounted solar panels

Q.PEAK DUO ML-G11S SERIES

Mechanical Specification

Format	2092 mm × 1134 mm × 30 mm (including frame)
Weight	25.7 kg
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Anodized aluminium
Cell	6 × 22 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥1415 mm, (−) ≥1415 mm
Connector	Stäubli MC4-Evo 2, Hanwha Q CELLS HQC4; IP68

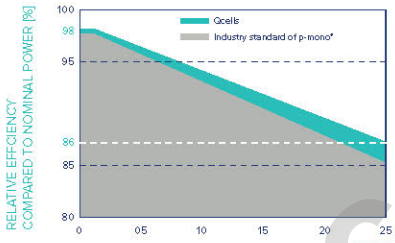


Electrical Characteristics

POWER CLASS			490	495	500	505	510
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / −0 W)							
Minimum	Power at MPP[1]	P_{MPP} [W]	490	495	500	505	510
	Short Circuit Current[1]	I_{SC} [A]	13.88	13.91	13.94	13.97	14.00
	Open Circuit Voltage[1]	V_{OC} [V]	45.30	45.32	45.35	45.38	45.41
	Current at MPP	I_{MPP} [A]	13.16	13.22	13.28	13.34	13.39
	Voltage at MPP	V_{MPP} [V]	37.23	37.44	37.66	37.87	38.08
	Efficiency[1]	η [%]	≥20.7	≥20.9	≥21.1	≥21.3	≥21.5
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]							
Minimum	Power at MPP	P_{MPP} [W]	367.6	371.4	375.1	378.9	382.6
	Short Circuit Current	I_{SC} [A]	11.18	11.21	11.23	11.26	11.28
	Open Circuit Voltage	V_{OC} [V]	42.72	42.74	42.77	42.79	42.82
	Current at MPP	I_{MPP} [A]	10.35	10.40	10.45	10.50	10.55
	Voltage at MPP	V_{MPP} [V]	35.52	35.71	35.89	36.07	36.25

[1]Measurement tolerances P_{MPP} ±3 %; I_{SC}; V_{OC} ±5 % at STC: 1000 W/m², 25 ± 2 °C, AM 1.5 according to IEC 60904-3 • [2]800 W/m², NMOT, spectrum AM 1.5

Qcells PERFORMANCE WARRANTY



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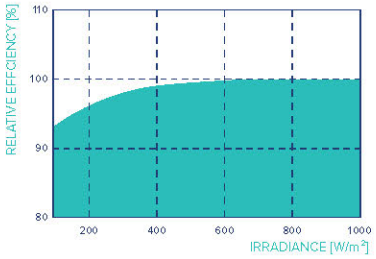
PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	−0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.34	Nominal Module Operating Temperature	NMOT	[°C]	43 ± 3

Properties for System Design

Maximum System Voltage	V_{SYS}	[V]	1500	PV module classification	Class II
Maximum Reverse Current	I_R	[A]	25	Fire Rating based on ANSI / UL 61730	C / TYPE 1
Max. Design Load, Push / Pull		[Pa]	3600 / 1600	Permitted Module Temperature on Continuous Duty	−40 °C - +85 °C
Max. Test Load, Push / Pull		[Pa]	5400 / 2400		

Qualifications and Certificates

Quality Controlled PV - TÜV Rheinland; IEC 61215:2016; IEC 61730:2016.
This data sheet complies with DIN EN 50380.

TÜV Rheinland www.tuv.com ID 1111220277

UK CA CE

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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.qcells.com

Q.PEAK DUO XL-G11S SERIES

580 - 600 Wp | 156 Cells
21.5 % Maximum Module Efficiency

MODEL Q.PEAK DUO XL-G11S.3 / BFG

Bifacial energy yield gain of up to 21%

Bifacial Q.ANTUM solar cells make efficient use of light shining on the module rear-side for radically improved LCOE.

Low electricity generation costs

Q.ANTUM DUO technology with optimized module layout to boost module power and improve LCOE.

A reliable investment

Double glass module design enables extended lifetime with 12-year product warranty and improved 30-year performance warranty[1].

Enduring high performance

Long-term yield security with Anti LID and Anti PID Technology[2], Hot-Spot Protect.

Frame for versatile mounting options

High-tech aluminum alloy frame protects from damage, enables use of a wide range of mounting structures and is certified regarding IEC for high snow (5400 Pa) and wind loads (2400 Pa).

Innovative all-weather technology

Optimal yields, whatever the weather with excellent low-light and temperature behavior.

[1] See data sheet on rear for further information.
[2] APT test conditions according to IEC / TS 62804-1:2015 method B (–1500 V, 168 h) including post treatment according to IEC 61215-1-1 Ed. 2.0 (CD)

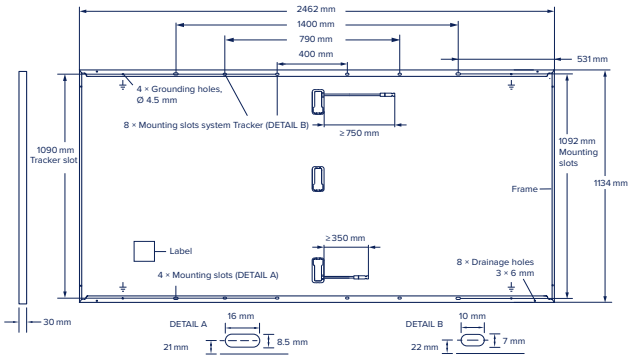
The ideal solution for:

Ground-mounted solar power plants

Q.PEAK DUO XL-G11S SERIES

Mechanical Specification

Format	2462 mm × 1134 mm × 30 mm (including frame)
Weight	34.8 kg
Front Cover	2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	2 mm semi-tempered glass
Frame	Anodised aluminium
Cell	6 × 26 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥750 mm, (−) ≥350 mm
Connector	Stäubli MC4-Evo2, Hanwha Q CELLS HQC4; IP68



Electrical Characteristics

POWER CLASS				580		585		590		595		600	
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / −0 W)					BSTC*		BSTC*		BSTC*		BSTC*		BSTC*
Minimum	Power at MPP[1]	P_{MPP}	[W]	580	634.4	585	639.9	590	645.4	595	650.8	600	656.3
	Short Circuit Current[1]	I_{SC}	[A]	13.69	14.99	13.72	15.01	13.74	15.04	13.77	15.07	13.80	15.10
	Open Circuit Voltage[1]	V_{OC}	[V]	53.55	53.74	53.57	53.76	53.60	53.79	53.63	53.82	53.66	53.85
	Current at MPP	I_{MPP}	[A]	13.03	14.25	13.07	14.30	13.12	14.36	13.17	14.41	13.22	14.46
	Voltage at MPP	V_{MPP}	[V]	44.53	44.52	44.75	44.74	44.96	44.95	45.18	45.17	45.39	45.38
	Efficiency[1]	η	[%]	≥20.8		≥21.0		≥21.1		≥21.3		≥21.5	

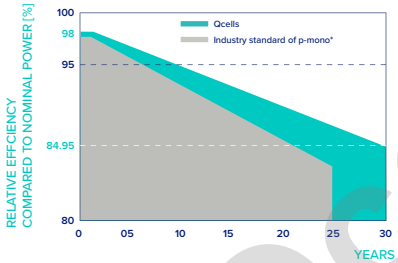
Bifaciality of P_{MPP} and I_{SC} 70 % ± 5 % • Bifaciality given for rear side irradiation on top of STC (front side) • According to IEC 60904-1-2

[1]Measurement tolerances P_{MPP} ±3 %; I_{SC}, V_{OC} ±5 % at STC: 1000 W/m²; *at BSTC: 1000 W/m² + φ × 135 W/m², φ = 70 %, 25 ± 2 °C, AM 1.5 according to IEC 60904-3

MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]w									
Minimum	Power at MPP	P_{MPP}	[W]	436.7	440.5	444.2	448.0	451.8
	Short Circuit Current	I_{SC}	[A]	11.03	11.05	11.07	11.09	11.11
	Open Circuit Voltage	V_{OC}	[V]	50.64	50.67	50.69	50.72	50.75
	Current at MPP	I_{MPP}	[A]	10.25	10.30	10.34	10.38	10.42
	Voltage at MPP	V_{MPP}	[V]	42.60	42.79	42.97	43.15	43.34

[2]800 W/m², NMOT, spectrum AM 1.5

Qcells PERFORMANCE WARRANTY

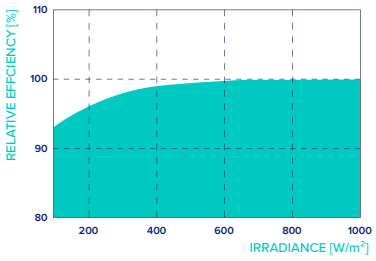


At least 98 % of nominal power during first year. Thereafter max. 0.45 % degradation per year. At least 93.95 % of nominal power up to 10 years. At least 84.95 % of nominal power up to 30 years.

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

*Standard terms of guarantee for the 5 PV companies with the highest production capacity in 2021 (February 2021)

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	−0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.34	Nominal Module Operating Temperature	NMOT	[°C]	42 ± 3

Properties for System Design

Maximum System Voltage	V_{SYS}	[V]	1500	PV module classification	Class II
Maximum Series Fuse Rating	I_R	[A]	25	Fire Rating based on ANSI / UL 61730	C/TYPE 29[4]
Max. Design Load, Push / Pull[3]		[Pa]	3600 / 1600	Permitted Module Temperature on Continuous Duty	−40 °C - +85 °C
Max. Test Load, Push / Pull[3]		[Pa]	5400 / 2400		

[3] See Installation Manual

[4] New Type is similar to Type 3 but with metallic frame

Qualifications and Certificates

Quality Controlled PV - TÜV Rheinland; IEC 61215:2016; IEC 61730:2016. This data sheet complies with DIN EN 50380.

TÜVRheinland CERTIFIED www.tuv.com ID 1111220277

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