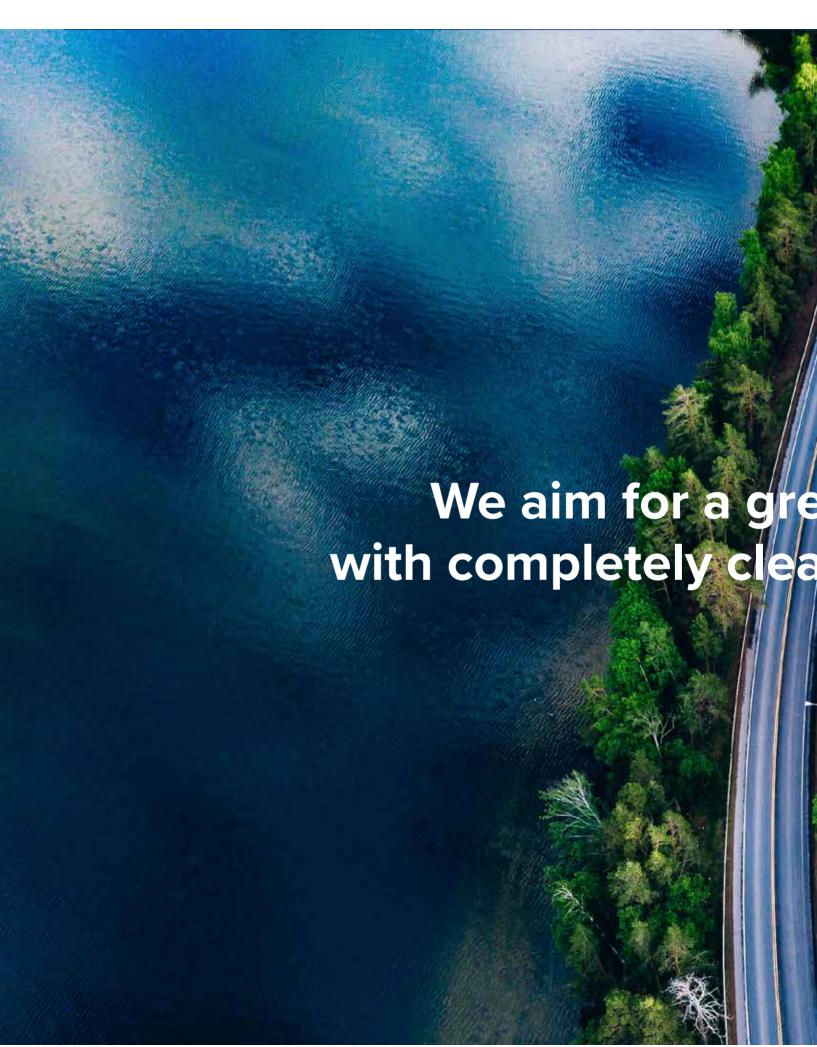


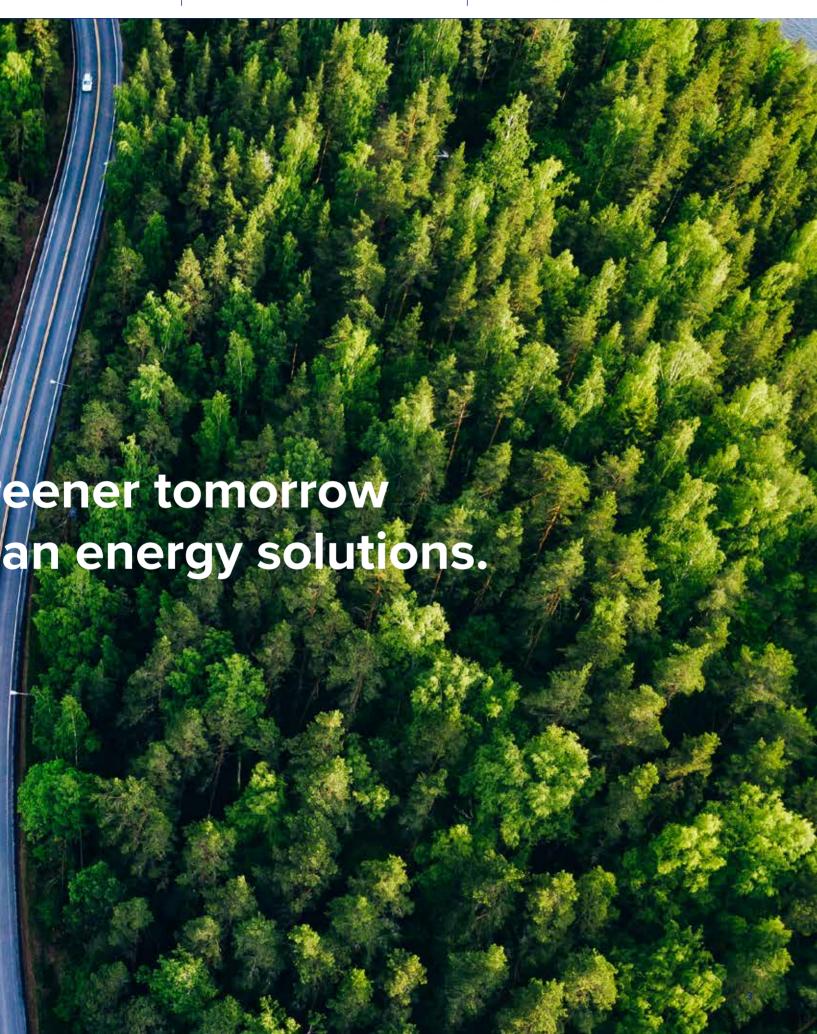
Completely Clean Energy

Our Mission



Qcells

2022 Product Brochure



Your SUCCESS is our PASSION

Dear customers,

Qcells have continuously thrived not just through unstoppable innovation in technology and manufacturing, but by listening to your needs in providing the best product and services. Making you successful is our passion to drive our business.

In this Qcells Product Brochure, you will find everything you need to understand about new advancements in technology, range of powerful PV products and Energy Solutions.

Part 1. Intro

Part 2. Solar Module

Part 3. System Solution

Part 4. 1st Package Solution

Part 1	•
Intro	

2022 Product Brochure

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Truely Reliable

solutions providers in the world.



World Presence



Facts & Figures



*Financial figures of Hanwha Solutions Corporation, the mother company of Qcells *Exchange rate: 1 USD = 1,191 KRW

Qcells Total Solution

Qcells Complete Energy Solutions

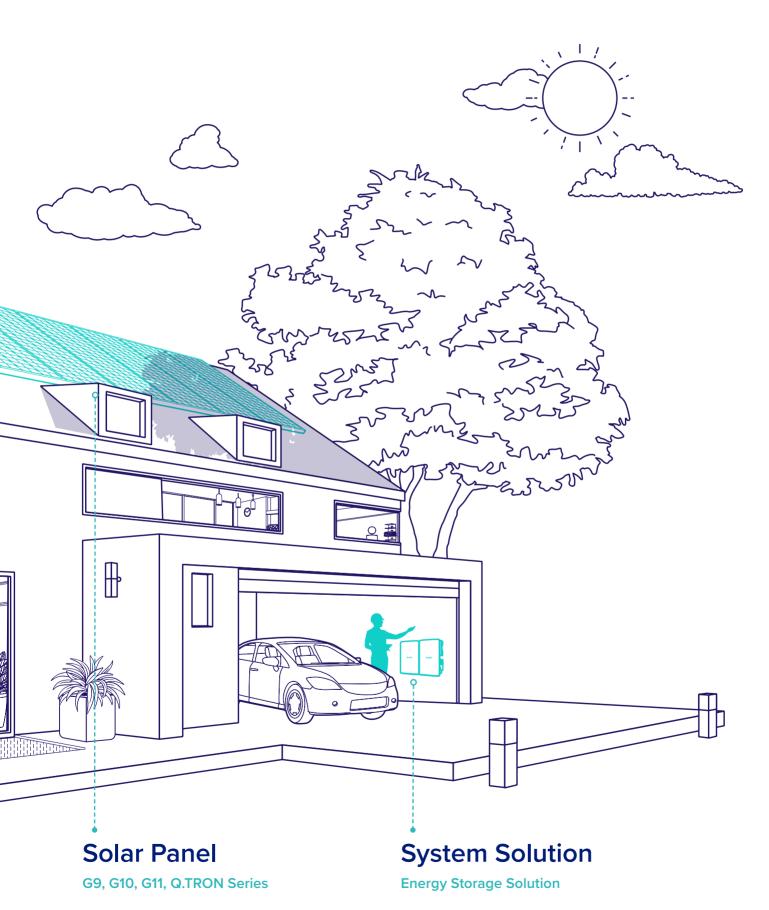
PV Module

■ High performance module based on Q.ANTUM Technology that has been continuously revolutionized.

System Solutions

- Q.HOME CORE energy storage solution with Qcells upgrade energy management system, Q.OMMAND.
- Q.TRON SMART Package is Qcells' 1st SMART package product, which consists of the most innovative Q.TRON SMART Module embedded with 3 MPPT chips with ESS. It is also provided with Q.OMMAND App (Energy Management System) that includes the system mapping tool.





Solar Module

2022 Product Brochure

Reliability from Strict Quality Managemen

The Four Quality Levels

Considering that solar modules have a long lifespan over 25 years, quality is one of the most important factors when you select the brand and the product. All Qcells' products, engineered in Germany, pass strict quality program which consist of four levels.

Level 1

Initial Certification

The Basic Requirement for Commercial Solar Modules

To guarantee the electrical safety and construction of the modules, Qcells' modules get initial certifications from external institutes, such as IEC and UL.

Level 2

Yield Security

The Most Trustful Cell Technology

Qcells Yield Security and Advanced Yield Security ensures long-term reliability of modules.



Quality Controlled PV TÜV Seal for the Most Reliable

Qcells is the first solar module manufacturer in the industry to pass TÜV Rheinland's new Quality Controlled PV (QCPV) certification, the most thorough testing program in the industry.





For more information

• Extended Stress Testing Standards

- Over 40 individual tests before production and after any changes.
- Up to 3 times stricter than IEC certification standards.

2 Onsite Production Monitoring

- Independent expert from TÜV Rheinland at Qcells sites.
- Samples randomly drawn from production line for testing.

Components and Materials Audits

- Supplier audits and material footprint analysis regularly held.
- Before using in production, and regularly during production.

Qcells' Unique Features

Level 3
Quality Controlled PV (QCPV)

The World's First to Pass Quality Controlled PV

Developed by TÜV Rheinland, QCPV is the strictest and most extensive testing program available in the industry. Along with that, it is the only certification in the industry to involve independent and random onsite testing as well as regular components and materials audits.

Level 4 Initial Quality Test

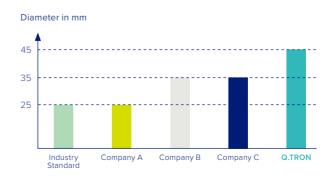
Uncompromising Testing Standard for the Ultimate Quality

Qcells' Internal Quality Test Program (IQT) ensures that all products meet high quality standards. As a leader in product quality, Qcells applies up to 3 times stricter testing standards than the global standard.



Physical Durability

The physical durability to withstand the external environment is important for any solar installation. One aspect that gives Q.TRON its premium edge is its excellent durability to resist 45 mm hail, larger than the industry standard.



Harvesting Energy Innovation

Continuous Development of Q.ANTUM Technology

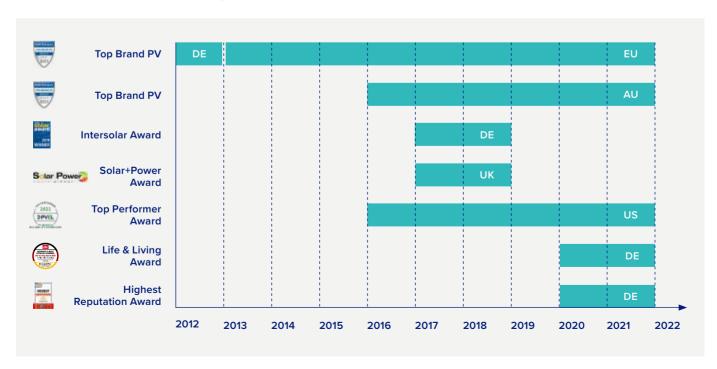
Qcells is the world's first company to commercialize the PERC technology, which is now the mainstream of the global solar industry. As a pioneer of solar technology, Qcells has led the great era of PERC, developing its proprietary Q.ANTUM Technology by incorporating PERC and its unique Yield Security features. Qcells has continued its technology innovation, and Q.ANTUM has been evolved into Q.ANTUM DUO mainly with half-cell technology, and Q.ANTUM DUO Z with Zero-gap technology. And now, 2022, Qcells is opening a new era of solar by introducing Q.ANTUM NEO Technology.

All of these technology advancements are always backed up by the world's strictest quality testing program QCPV, meeting the reliability customers need.



*Power Output compared to standard PERC technology solar module

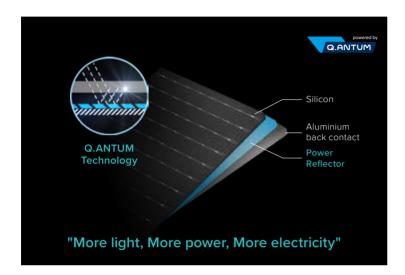
World-wide Recognition



The Q.ANTUM Effect The foundation of Qcells Technology

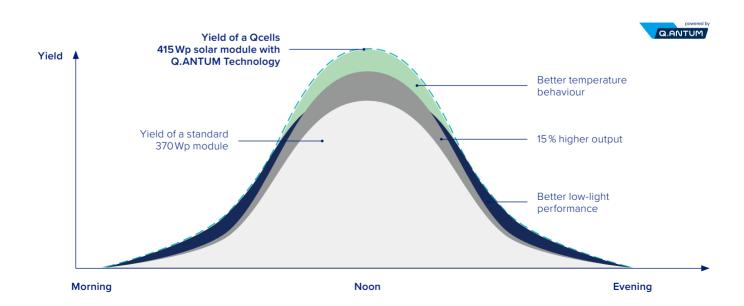
Qcells' Power Reflector

Rays of sunlight that would otherwise go to waste are mirrored by the Power Reflector back through the cell to generate more electricity. Laser-fired contacts complement the nano coating to enhance the module's electrical properties, increasing its efficiency considerably.



- Higher yields and lower LCOE
- Enhanced temperature coefficient
- Improved low-light behaviour
- Outstanding product reliability
- Best-in-class warranty terms

Q.ANTUM Ahead - More Yield, More Profit

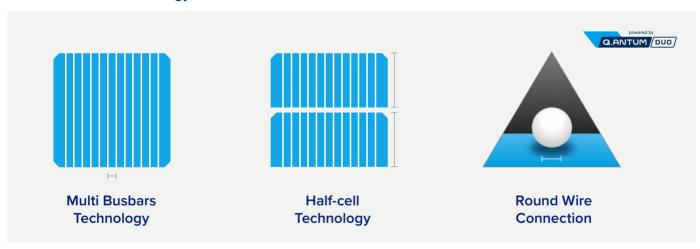


Ultimate PERC Solar Module

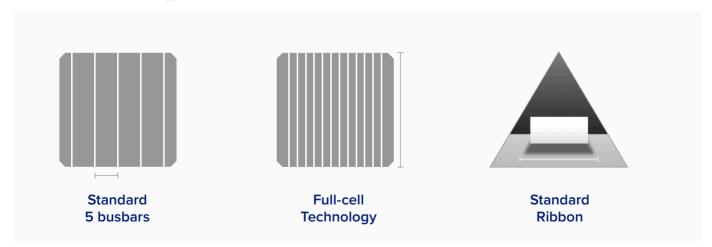
Q.ANTUM DUO Z Technology

Qcells solar modules with Q.ANTUM DUO Z Technology not only deliver impressive performance in real-world conditions, but also offer first-class performance guarantees of 98% in the first year and a full 86% after 25 years. The Q.ANTUM DUO Z Technology combines our Q.ANTUM cell with the innovative DUO cell separation method: The use of round connecting wires and zero-gap cell interconnection ensure higher power generation not only in the laboratory but also in everyday operation. Q.ANTUM DUO Z also increases the nominal power and improves the reliability of the module thanks to Qcells Yield Security consisting of Anti PID, Anti LID/LeTID and Hot-Spot Protect. With more than 23 GW of Q.ANTUM solar cells produced, only Qcells has the experience and knowledge to drive the development of cell and module technology and launch new technologies such as Q.ANTUM DUO Z.

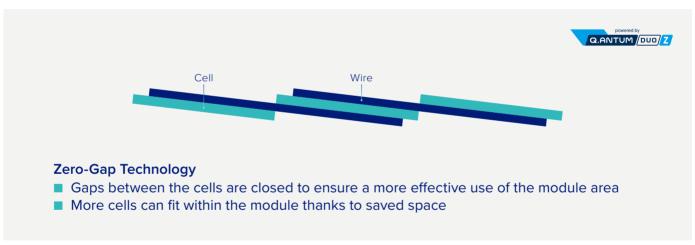
Q.ANTUM DUO Technology



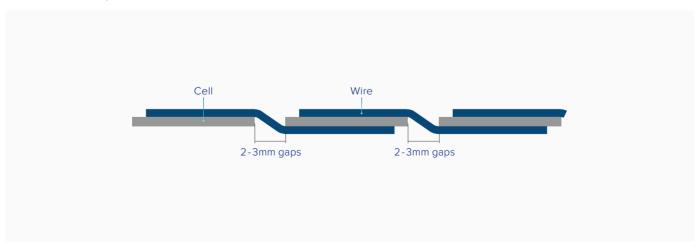
Conventional Technology



Q.ANTUM DUO Z Technology



Current Industry Standard



All New N-type Technology

Q.ANTUM NEO: High Power & Efficiency

The source of the highly efficient Q.ANTUM NEO solar cells lies within the NEO Power Transmitter.



Standard PERC Cells

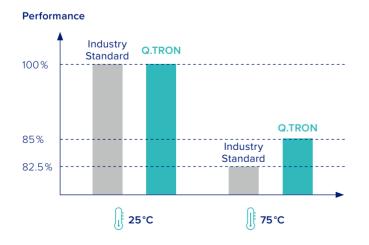
Standard PERC solar cells use a passivation layer with small holes for electrical interconnection of the cell's rear side. Passivation is reduced in the contact area which limits the maximum efficiency.

Q.ANTUM NEO Cells

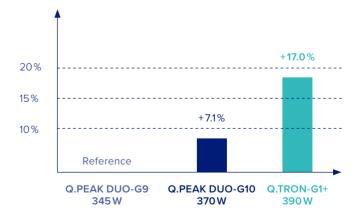
Within Q.ANTUM NEO solar cells, a passivation layer and electrical interconnection functionality are integrated in the NEO Power Transmitter. This allows full area passivation and contact at the same time, thus pushing beyond the limits of standard PERC technology.

Yield Comparison

With Q.ANTUM NEO Technology and Advanced Yield Security, Q.TRON modules can generate more energy and boost profits even under harsh conditions like high temperature and low light.



*Temperature Coefficient Q.TRON = - 0.30 %/K Industry Standard = - 0.35 %/K



*Simulation: 20 modules per system installed in San Francisco, USA

Advanced Yield Security: More Energy, More Benefits

Qcells' Advanced Yield Security protects the solar cell from critical degradation effects and potential hot spots.

Advanced Anti-PID (APT)

PID can lead to significant power loss for both P-type and N-type cells. The APT of Q.ANTUM NEO effectively protects the solar cells and secures high energy yield in the long-term.

*PID: Potential Induced Degradation

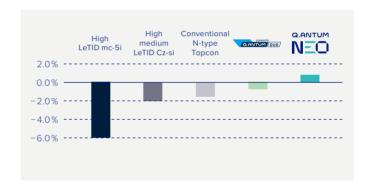
*LID: Light Induced Degradation

*LeTID: Light and Elevated Temperature Induced Degradation



Advanced Anti-LeTID (ALD)

Not only in P-type, but also in N-type, the power of solar cells can significantly decrease due to effects of LeTID. As the first company to observe LeTID effects and to devise a solution to suppress LeTID in 2015, Qcells secures high reliability against LeTID.



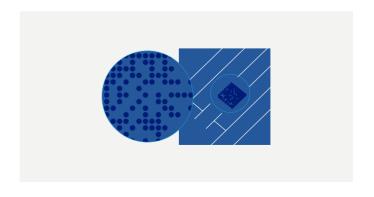
Hot-Spot Protect

In order to prevent potential hot spots in cells, we inspect 100% of the Q.ANTUM NEO cells with infrared camera scanning.

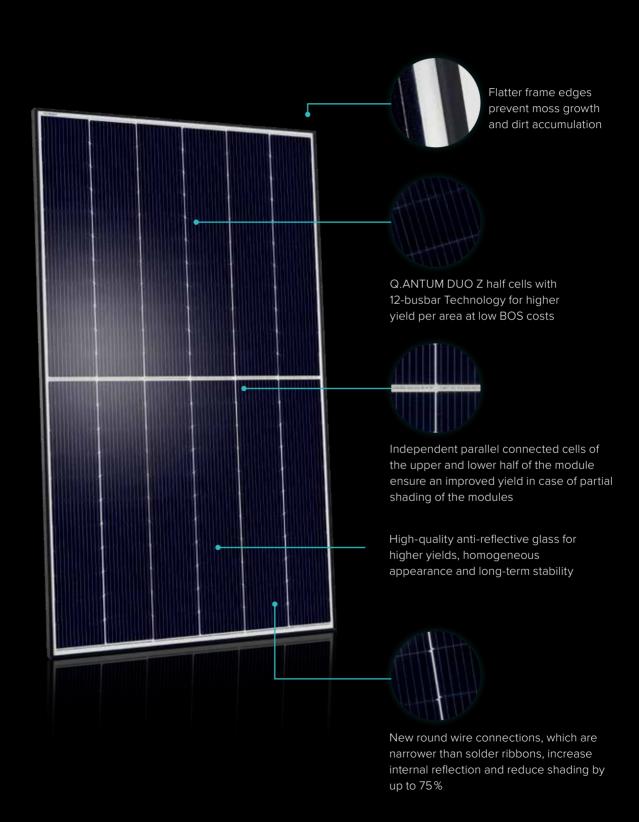


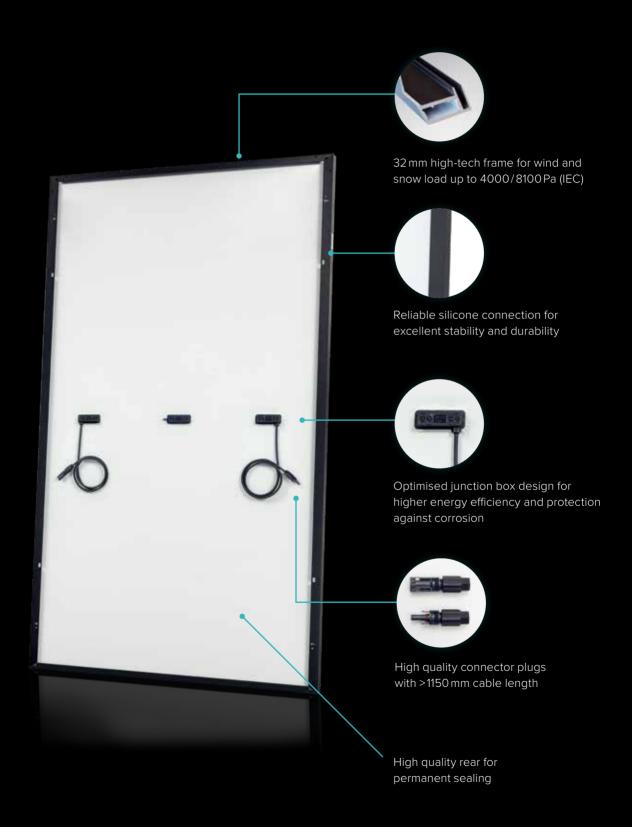
Tra.Q[™]

Qcells is the only solar manufacturer that conducts cell-level quality management. With Tra.Q™ laser marking, every single cell produced by Qcells is traced and monitored throughout the entire production process, enabling big data analysis and assuring high reliability and quality.



We Pay Attention to Every Detail





Complete Overview

Product Porfolio



Residential



Q.PEAK DUO BLK-G10 & G10+

Up to 20.6% efficiencyUp to 370 Wp19.9 kg



Q.PEAK DUO BLK M-G11 & G11+

Up to 20.8% efficiencyUp to 400Wp21.2 kg

12 year product warranty*
25 year performance warranty

*25 year product warranty available for plus products.



Q.TRON BLK-G1+

· Up to 22% efficiency · Up to 395 Wp · 19.9 kg



Q.TRON-G1+

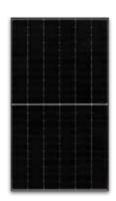
· Up to 22.3% efficiency · Up to 400 Wp · 19.9 kg



25 year product and performance warranty



C&I and Utility



Q.PEAK DUO ML-G10 & G10+

· Up to 21.1% efficiency · Up to 415 Wp · 22 kg



Q.PEAK DUO M-G11 & G11+

Up to 21.4% efficiency
 Up to 410 Wp
 21.2 kg

12 year product warranty*
25 year performance warranty

*25 year product warranty available for plus products.



Q.PEAK DUO ML-G11.2

· Up to 21.5% efficiency · Up to 500 Wp · 26 kg

12 year product warranty 25 year performance warranty



Q.PEAK DUO XL-G11.3 Q.PEAK DUO XL-G11.3/BFG

Up to 21.5% efficiency
 Up to 590 Wp
 30.7 kg

12 year product warranty
MF 25 year performance warranty
BFG 30 year performance warranty

MF: monofacial BFG: bifacial

Complete Overview

Product Porfolio - Residential

Product Name	Q.PEAK DUO BLK-G10 Q PEAK DUO BLK-G10+	Q.PEAK DUO BLK M-G11 Q.PEAK DUO BLK M-G11+
Power Class	350 Wp - 370 Wp	380 Wp - 400 Wp
Efficiency	19.5 % - 20.6 %	19.8% - 20.8%
Format (including frame)	1717 mm × 1045 mm × 32 mm	1692 mm × 1134 mm × 30 mm*
Weight	19.9 kg	21.2 kg
Frame	Black anodized aluminum	
Cell	6×20 Q.ANTUM solar half cell	6×18 Q.ANTUM solar half cell
Junction box IP	53-101mm × 32-60mm × 15-18mm Protection class IP67, with bypass diodes	
Temperature Coefficient of PMPP	-0.34%/K	
Snow Load	8100 Pa	5400 Pa
Wind Load	4000 Pa	3600 Pa

^{*} Thickness 32 mm available

Product Porfolio - C&I and Utility

Product Name	Q.PEAK DUO ML-G10 Q PEAK DUO ML-G10+	Q.PEAK DUO M-G11 Q.PEAK DUO M-G11+
Power Class	395 Wp - 415 Wp	390 Wp - 410 Wp
Efficiency	20.1% - 21.1%	20.3% - 21.4%
Format (including frame)	1879 mm × 1045 mm × 32 mm	1692 mm × 1134 mm × 30 mm*
Weight	22 kg	21.2 kg
Frame	Black anodized aluminum	Anodized aluminum
Cell	6×22 Q.ANTUM solar half cell	6×18 Q.ANTUM solar half cell
Junction box IP	53-101mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes	
Temperature Coefficient of PMPP	-0.34%/K	
Snow Load	5400 Pa	
Wind Load	4000 Pa	3600 Pa

24 *Thickness 32 mm available

Product Name	Q.TRON BLK-G1+	Q.TRON-G1+
Power Class	370 Wp - 395 Wp	380 Wp - 400 Wp
Efficiency	20.6% - 22%	21.2% - 22.3%
Format (including frame)	1717 mm × 1045 mm × 32 mm	
Weight	19.9 kg	
Frame	Black anodized aluminum	
Cell	6×20 Q.ANTUM solar half cell	
Junction box IP	53-101mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes	
Temperature Coefficient of PMPP	-0.30%/K	
Snow Load	8100 Pa	
Wind Load	4000 Pa	

Product Name	Q.PEAK DUO ML-G11.2	Q.PEAK DUO XL-G11.3 Q.PEAK DUO XL-G11.3/BFG
Power Class	480 Wp - 500 Wp	570 Wp - 590 Wp
Efficiency	20.6% - 21.5%	20.8% - 21.5%
Format (including frame)	2054 mm × 1134 mm × 32 mm	2416 mm × 1134 mm × 35 mm
Weight	26 kg	30.7 kg
Frame	Anodized aluminum	
Cell	6×22 Q.ANTUM solar half cell	6×26 Q.ANTUM solar half cell
Junction box IP	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes	
Temperature Coefficient of PMPP	-0.34%/K	
Snow Load	5400 Pa	
Wind Load	2400 Pa	

System Solution

2022 Product Brochure

Q.HOME CORE

Never Compromise Between Performance and Design

Modular&Scalable Battery

Q.SAVE

Each 6.86 kWh battery up to 3 units scalable



SAMSUNG SDI Battery Cell

Sleek&Durable

Metallic Silver Cover





High-performance Inverter

Q.VOLT

4.6 kW Hybrid or AC-Coupled

Enhanced Warranty

15 yearsWarranty

For Web Enable

Network Connectivity

Wi-Fi/LAN

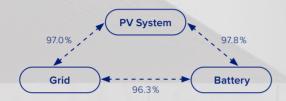
Q.HOME CORE

Integrated Solar Inverter and Storage



High Conversion Efficiency

Installers can check the status of multiple sites at a glance and able to find a particular site through search.





Maximum Energy Generation

Q.OMMAND maximizes energy yields by incorporating real-time weather information.



Samsung Battery for Safety

SAMSUNG NCA battery cells ensure maximum safety.



Assembled in South Korea

Assembled in Korea for enhanced quality.



Extended 15 years Warranty

Enhanced product and performance warranty backed with high quality control.



Scalable Battery

Three scalable batteries up to 20.5 kWh depending on your energy needs.



Emergency Backup from Blackout

Automatic transfer to battery power in blackout conditions. (ATS* Embedded)



Easy and Fast Installation

Wall-mounted or floor-mounting^(optional) brackets available for convenience and easy installation.

ATS (Automatic Transfer Switch)
A device that automatically transfers a power supply from energy grid to energy storage solutions in case of grid failure.

Part 3. System Solution

2022 Product Brochure



Q.OMMAND

Energy Management System

Q.OMMAND is Qcells' Energy Management System that consists of 3 Apps to support installation and module level monitoring. It provides real-time error feedback and performance assessment to keep the system at optimum state.



Installers | Remote System O&M

Q.OMMAND PRO



Homeowners | For your energy management

Q.OMMAND HOME



Commissioning | For easy & quick installation

Q.OMMAND GO

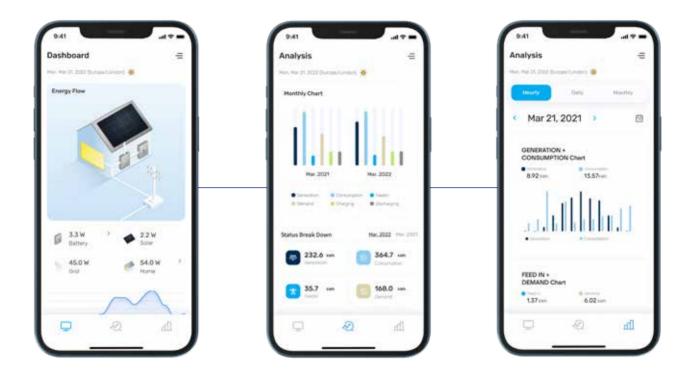




Q.OMMAND

Q.OMMAND HOME For Homeowners

For monitoring and managing energy generation, storage, and usage anytime, anywhere.



Real-Time Energy Flow

Real-time updated every three seconds.

Regular Report

Monthly, daily, and hourly reporting available.

Notifications

Provide energy overview, battery performance, usage data, and customised alerts and more.

Smart Functions

Q.OMMAND Home provides three smart functions as below.



Dynamic Optimiser Maximized Energy Yield

Ocells advanced AI algorithm incorporates weather information with real-time data from your solar modules and energy storage system to maximize energy usage and generation.



Energy Backup Blackout Precaution

In case of blackout, you can set the amount of energy your Q.HOME CORE will always store.

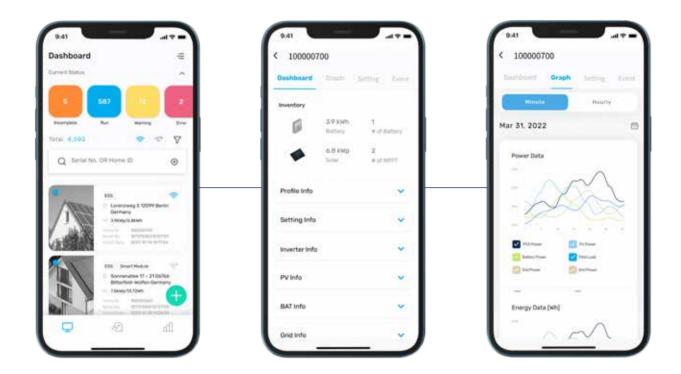


OTA (Over-The-Air) Software Updates

Cloud-based software updates continuously adds new monitoring and management features.

Q.OMMAND PRO For Installers

For fast and easy O&M services.



Dashboard

Installers can check the status of multiple sites at a glance and able to find a particular site through search.

Notifications

Immediately notifies when service or maintenance is required.

Tracking History

Installers can track the history of each site including service history, error messages, replacements and others.

Grouping System

Installers can group the sites by region to easily modify grid code, energy policy, and more.

Q.OMMAND GO For Commissioning

For easy installation of Q.HOME CORE.

1 Network Connection One-click Update Oate Setting

Simple connection to the network within the house. One-click update to the latest version.

Save the date and time of the installation.

modules, batteries, and meters, including grid code, country and time zone.

4 Device Setting

1st Package Solution

2022 Product Brochure

Q.TRON Smart Package

One Warrantor Complete System

Qcells introduces 1st full system solution comprised of Q.TRON SMART Module, Q.VOLT SMART Inverter and Q.OMMAND Energy Management System. Complete solar solution all backed by ONE warrantor, Qcells.





Q.TRON SMART MODULE

Home Solar Module

- 1. Q.ANTUM NEO Technology
- 2. With 3 built-in MPP trackers
- 3. Power gain up to 30%
- 4. Maximum power class 400 WP
- 5. Module efficiency 22.3%

Q.HOME⁺ ESS HYB-G3

Energy Storage Solution UPS

- 1. Scalable storage solution 3.1kWh up to 12.3kWh
- 2. Intelligents and modular design for easy and quick installation
- 3. Remote controllable system with hybrid inverter
- 4. Lithium-ion battery
- 5. Backup Power availbale in the event of a power failure.

 Consumers can be supplied with a total output of (up to) 15 kW

Q.TRON SMART Specification

Specification







3 DC Optimizer Chips for Power Optimization

Q.TRON SMART Module is built-in with 3 solar power optimizers, which will significantly improve power density and efficiency in the event of shading and different orientation. Power optimizers also enables real-time communication and monitoring.



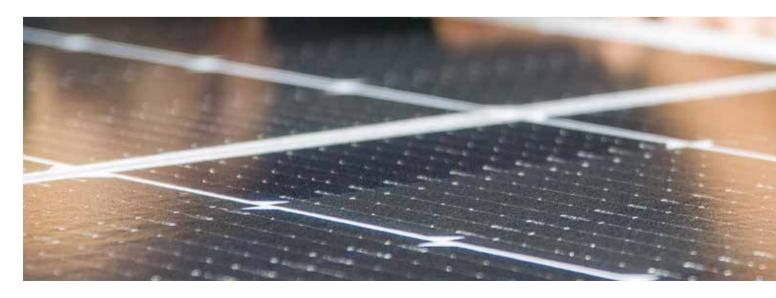
N-type Half-cell Technology, Q.ANTUM NEO

Combining N-type technology with Advanced Yield Security and the world's strictest quality testing program QCPV, Q.ANTUM NEO surpasses the performance of conventional N-type products.



25 Year Performance & Product Warranty

With its proven quality, Qcells confidently provides an inclusive 25-year product warranty and 25-year linear performance warranty bringing users peace of mind.



Q.TRON SMART Module based on Ultimate Cell Technology

Q.TRON SMART module power up to 400 Wp is based on Qcells' Zero-Gap Technology and the innovative N-type cell technology called Q.ANTUM NEO. Combining N-type cell technology with Advanced Yield Security and the world's strictest quality testing program QCPV, Q.ANTUM NEO surpasses the performance of conventional N-type products.

This module also contains an integrated DC/DC converter. Voltage limitation will lead to increased output current. The output voltage and current will not exceed its limit respectively.

Product Name	Q.TRON SMART BLK-G1+	Q.TRON SMART-G1+
Power Class	370 Wp - 390 Wp	380 Wp - 400 Wp
Efficiency	20.6% - 22%	21.2% - 22.3%
Voltage Limit (VLIM)	35V	
Current Limit (ILIM)	132.2 A	
Format (including frame)	1717 mm × 1045 mm × 32 mm	
Weight	19.9 kg	
Frame	Black anodized aluminum	
Cell	6×20 Q.ANTUM solar half cell	
Junction box IP	Smart junction box: 85-198 mm × 85-102 mm × 22 mm Protection class IP6	
Temperature Coefficient of PMPP	-0.30%/K	
Snow Load	8100 Pa	
Wind Load	4000 Pa	

*Maximum voltage control by MLPE (installation available up to 27 modules/string)



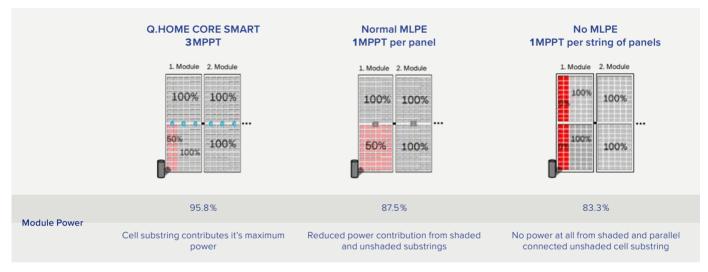
Q.TRON SMART Key Features

3MPPT - Maximum Power in Shaded Environment

Clouds, leaves, rooftop structure and more can cause shading in solar module. Having not one but 3MPPT provides 5.6% more power output compared to conventional module. It is the perfect choice of module to get most power in shaded environment.



*Shading scenario: One cell substring is shaded by 50%



Single Point of Contact and One Warrantor

To buy and get support for Q.TRON SMART is easy. Contact Qcells to get support for all of the devices of this package. We provide remote diagnostics of installed system and our expertise will visit the site to correct or provide the necessary service.



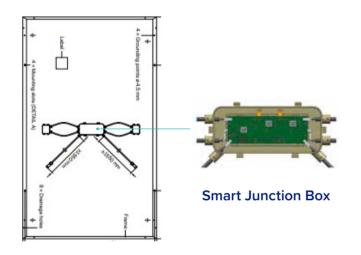
Easy and Flexible Installation

No complex installation and configuration is necessary. Q.TRON SMART is preassembled with 3MPPT and Q.HOME+ ESS HYB-G3 with communication device, so it can be easily installed and put into operation. When using this package, Installers don't have to worry about selecting the type of module model or look for the right type of MLPE. Distributed MPPT also enables flexible roof-top PV design. Simply design and install the system like normal Solar Panel.

Pre-installed MLPE and Communication Device

MLPE embedded in J-Box already, no additional installation process for MLPE

Q.HOME+ ESS HYB-G3 compatible, no additional effort for MLPE







Use Q.OMMAND Pro to Map the System

Energy Management System



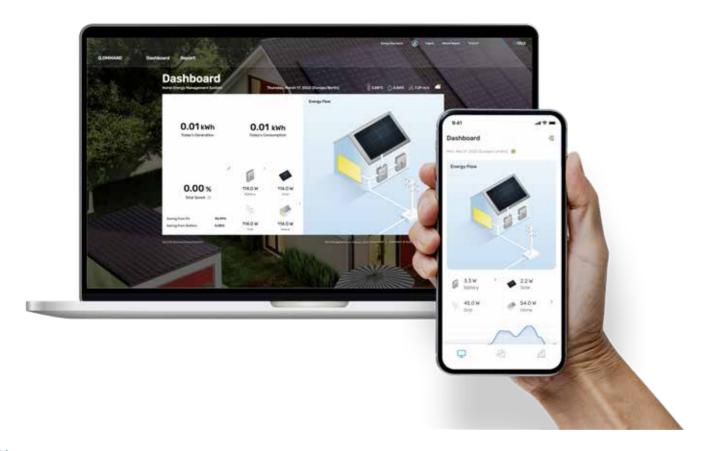
Installers | Remote System O&M

Q.OMMAND PRO



Homeowners | For your energy management

Q.OMMAND HOME For more Q.OMMAND HOME detail, go to page 34.





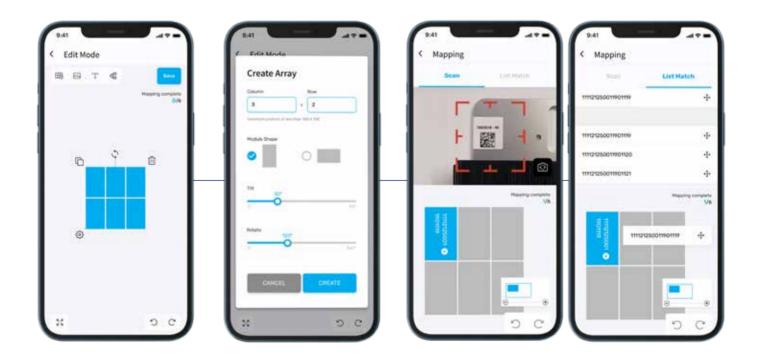
Q.OMMAND PRO For Installers

Start MAPPING the system for Q.TRON SMART modules.

New site registration and system mapping

You can easily register new site and use intuitive mapping application to get a virtual physical layout of the installation for conducting real-time monitoring and diagnostics anywhere at anytime.

For mapping you can scan the QR code or match the module with automatically uploaded serial numbers, creating a complete replica of physical layout.



Dashboard

Installers can check the status of multiple sites at a glance and able to find a particular site through search.

Notifications

Immediately notifies when service or maintenance is required.

Tracking History

Installers can track the history of each site including service history, error messages, replacements and others.

Grouping System

Installers can group the sites by region to easily modify grid code, energy policy, and more.

Q.HOME+ ESS HYB-G3

Solar power storage - the ideal complement

The Q.HOME+ ESS HYB-G3 energy storage system is the ideal solution for private homes. With it, you immediately save electricity costs and trust in long-term operational and yield security.



Efficient utilization of the self-produced electricity

Your goal is the best possible use of your solar system with self-generated and affordable solar power. The batteries store surplus electricity that is not currently needed for later consumption. For example, when the sun is not shining and the solar modules cannot generate electricity. The average self-consumption with a solar system is about 25-30 percent. With a battery storage system, you can increase your share up to 75-80 percent.

Flexible design for any room situation



Your benefits at a glance



Narrow design

Intelligent design for easy installation even in small spaces. Even suitable for installation in the garage, where temperatures can be below 0 °C.



External monitoring

The energy management system is easy to use and provides a very clear overview. With the remote monitoring system, users can monitor their energy production and usage anytime, anywhere.



Backup power function

When the power grid is off, the PV system and batteries provide power to the loads.



Longevity

Thanks to a 10-year product warranty and maintaining at least 80% of the original battery capacity after 10 years.



Fast charging

The Q.SAVE-G3 battery can be fully charged after only one hour under favorable conditions.

Part 4. 1st Package Solution 2022 Product Brochure



Qcells