



# Qudra-S132/M12H- XXX

## 650-670W

210mm cells half cut cell technology

### Product Advantages



#### High customer value

Lower LCOE, reduce BOS cost, higher return in investment  
Lower guaranteed first year and annual degradation  
Designed for compatibility with existing mainstream system components



#### High power up to 670W

Larger area 210mm silicon wafers and laser cutting technology up to 21.6% module efficiency; Ga doped mono perc cell reduce LID/LeTID.



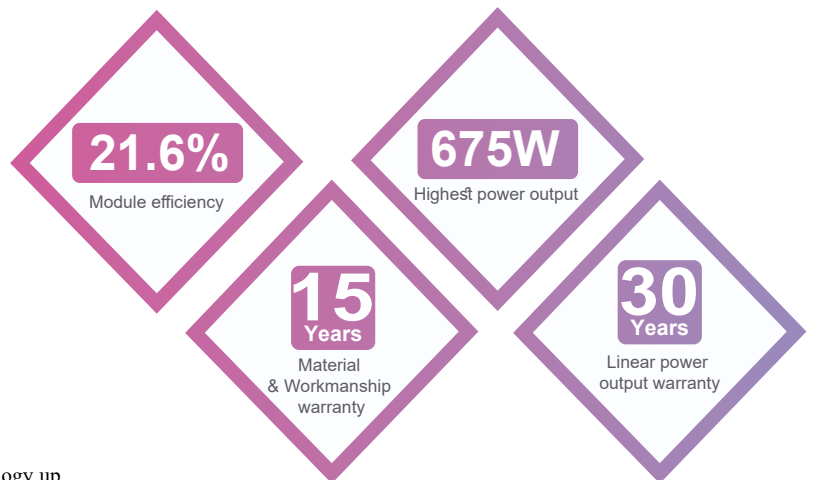
#### High reliability

Non-destructive cell cutting to avoid invisible micro-cracks in cells.  
Passes two different types of industry PID tests (IEC62804 Control Resistant to harsh environments such as salt (IEC61701), ammonia (IEC 62716), sand, high temperature and humidity tests (IEC 61215)

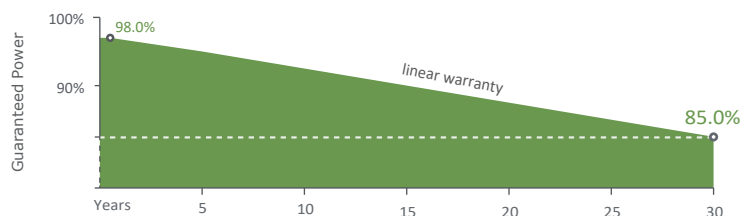


#### High energy yield

Excellent IAM(incident Angle Modifier) and low irradiation performance, validated by TUV SUD.  
Special circuit design with much lower hot spot temperature.  
Circular ribbons to reduce shading and greater light trapping.



### Product Guarantee



### Product Certification

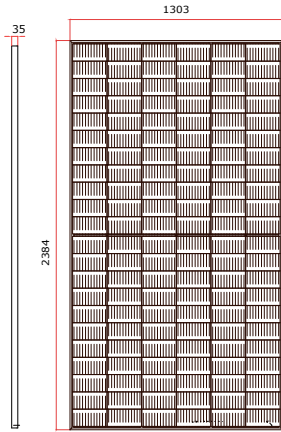


### Qudra Renewable Energy Solutions, Ramallah, Palestine

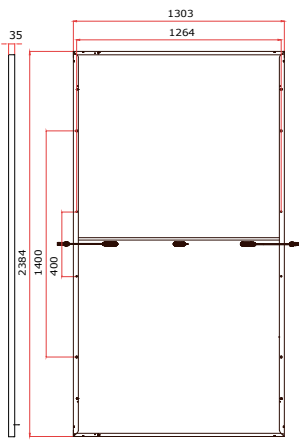
The company reserves the right for explanation on any information presented on this datasheet, and making any necessary adjustments to the information. The specification, features, and certifications given on the datasheet are for indicative purpose, and may slightly deviate in actual products, including due to on-going improvements. The Modules should be carefully handled and installed according to professional instructions.

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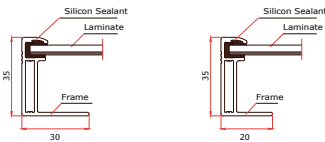
## DIMENSIONS OF PV MODULE(mm)



Front View



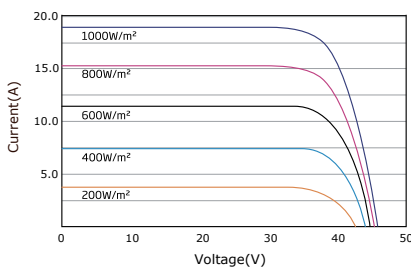
Back View



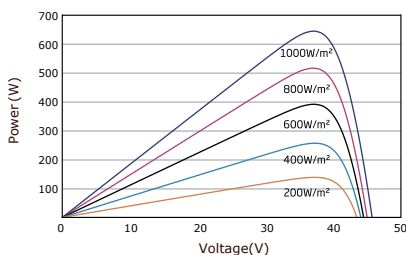
A-A

B-B

## I-V CURVES OF PV MODULE(650W)



## P-V CURVES OF PV MODULE(650W)



## ELECTRICAL DATA (STC)

Peak Power Watts- $P_{MAX}(W_p)^*$	650	655	660	665	670
Power Tolerance- $P_{MAX}$ (W)	0 ~ +5				
Maximum Power Voltage- $V_{MPP}$ (V)	37.4	37.6	37.8	38.0	38.2
Maximum Power Current- $I_{MPP}$ (A)	17.39	17.43	17.47	17.51	17.55
Open Circuit Voltage- $V_{OC}$ (V)	45.3	45.5	45.7	45.9	46.1
Short Circuit Current- $I_{SC}$ (A)	18.44	18.48	18.53	18.57	18.62
Module Efficiency $\eta_m$ (%)	20.9	21.1	21.2	21.4	21.6

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Air Mass AM1.5.

## ELECTRICAL DATA (NOCT)

Maximum Power- $P_{MAX}$ (Wp)	492	496	500	504	508
Maximum Power Voltage- $V_{MPP}$ (V)	34.9	35.1	35.3	35.4	35.6
Maximum Power Current- $I_{MPP}$ (A)	14.09	14.13	14.17	14.22	14.26
Open Circuit Voltage- $V_{OC}$ (V)	42.7	42.9	43.0	43.2	43.4
Short Circuit Current- $I_{SC}$ (A)	14.86	14.89	14.93	14.96	15.01

NOCT: Irradiance at 800W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s.

## MECHANICAL DATA

Solar Cells	Monocrystalline
No.of cells	132 cells
Module Dimensions	2384x1303x35mm
Weight	33.9 kg
Glass	2.0 mm, High Transmission, Anti-reflection coating
Encapsulant Material	enhanced EVA
Backsheet	White
Frame	35 mm Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm <sup>2</sup> Cable length 350mm or customized length
Connector	MC4 Compatible

## TEMPERATURE RATINGS

NOCT(Nominal Operating Cell Temperature)	43°C (± 2°C)
Temperature Coefficient of $P_{MAX}$	- 0.34%/C
Temperature Coefficient of $V_{OC}$	- 0.25%/C
Temperature Coefficient of $I_{SC}$	0.04%/C

## MAXIMUM RATINGS

Operational Temperature	-40~+85 °C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	30A

(Do not connect Fuse in Combiner Box with two or more strings in parallel connection)

## MECHANICAL LOADING

Snow Load: 5400 Pa
Wind Load: 2400 Pa

## PACKAGING CONFIGURATION

Modules per box: 31 pieces
Modules per 40' container: 558 pieces

## WARRANTY

15 year Product Workmanship Warranty	2% first year degradation
30 year Power Warranty	0.5% Annual Power Attenuation

(Please refer to product warranty for details)



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**Qudra**

Renewable Energy Solutions