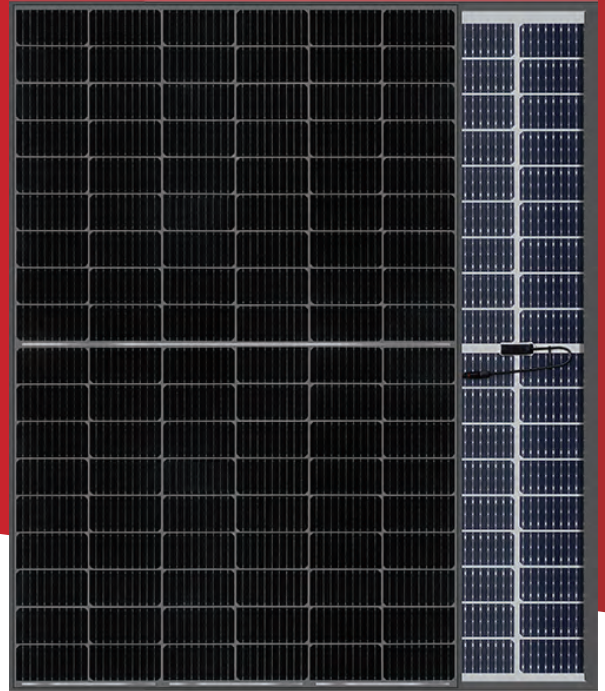


# ONYX

# 425-445W

High Efficiency N-TOPCon Bifacial Full Black Module



Bifacial technology enables additional energy harvesting from rear side (up to 30%)



30 years lifespan brings 10-30% additional power generation comparing with conventional P-type module



N-type solar cell has no LID naturally which can increase power generation



Excellent low irradiance performance.



Better light trapping and current collection to improve module power output and reliability.



Industry leading lowest thermal co-efficient of power.



Optimized electrical design and lower operating current for reduced hot spot loss and better temperature coefficient.

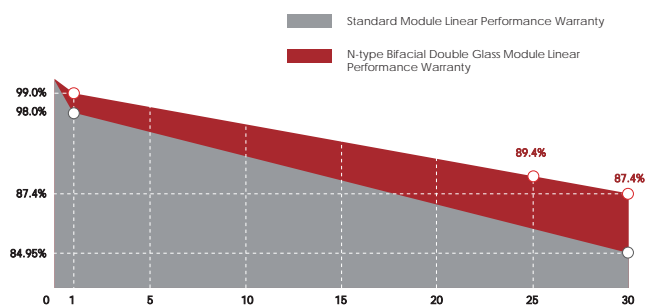


Certified to withstand: wind load (2400 Pa) and snow load (5400 Pa).



100% triple EL test enabling remarkable reduction of hidden crack rate of modules

## LINEAR PERFORMANCE WARRANTY



**30** years

Product Workmanship Warranty

**30** years

Output Power Warranty

## COMPREHENSIVE CERTIFICATES

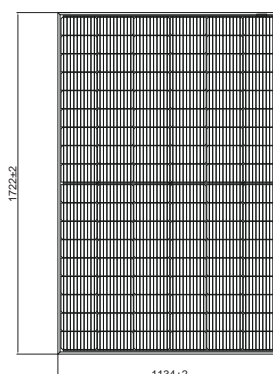


## ELECTRICAL DATA(STC)

Model Number	ES425M54-NT2-BF	ES430M54-NT2-BF	ES435M54-NT2-BF	ES440M54-NT2-BF	ES445M54-NT2-BF
Peak Power Watts- $P_{MAX}(Wp)^*$	425	430	435	440	445
Power Output Tolerance	0~5W				
Open Circuit Voltage- $V_{OC}(V)$	38.20	38.30	38.40	38.60	38.70
Short Circuit Current- $I_{SC}(A)$	14.15	14.23	14.31	14.39	14.47
Maximum Power Voltage- $V_{MPP}(V)$	31.70	31.90	32.00	32.20	32.40
Maximum Power Current- $I_{MPP}(A)$	13.42	13.50	13.60	13.68	13.76
Efficiency(%)	21.80	22.00	22.30	22.50	22.80

STC :Irradiance 1000w/m<sup>2</sup>,Cell Temperature 25°C ,Measure Tolerance :+/- 3%

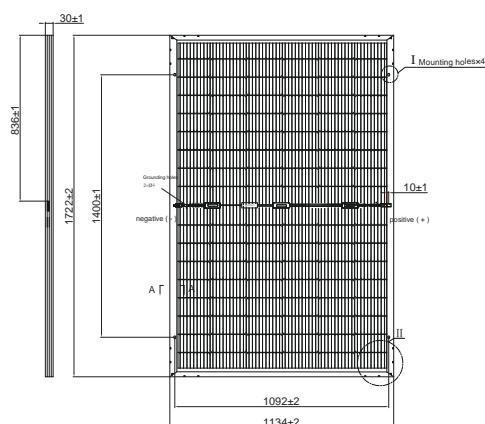
## DIMENSIONS OF PV MODULE(mm)



## ELECTRICAL DATA(NOCT)

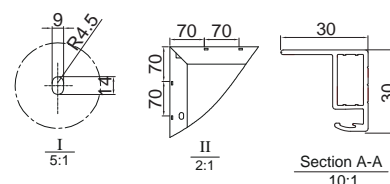
Maximum Power- $P_{MAX}(Wp)^*$	323	327	331	335	338
Open Circuit Voltage- $V_{OC}(V)$	36.70	36.80	36.90	37.10	37.20
Short Circuit Current- $I_{SC}(A)$	11.40	11.47	11.53	11.60	11.66
Maximum Power Voltage- $V_{MPP}(V)$	30.40	30.60	30.70	30.90	31.10
Maximum Power Current- $I_{MPP}(A)$	10.63	10.69	10.78	10.84	10.87

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

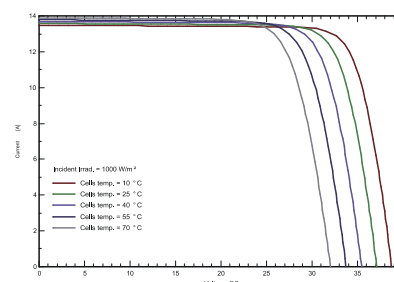
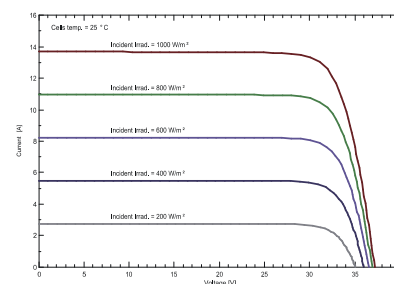


## MECHANICAL DATA

Dimensions	1722 x 1134 x 30 mm
Weight	24.5kg
Cell Type	N Type Mono crystalline
Cell Number	108
Front / Back Glass	2mm Double Glass AR coating semi-tempered glass
Frame Type	Black Anodized Aluminium Alloy
Junction Box Diodes	3
Junction Box Protection Class	IP68
Connector Type	PV-TT02
Cable	4.0mm <sup>2</sup> ,1100mm(+)/1100mm(-) or Customized Length



## I-V CURVES OF PV MODULE



## TEMPERATURE RATINGS

NOCT	42°C(±2°C)
Temperature Coefficient of $P_{MAX}$	-0.310%/°C
Temperature Coefficient of $V_{OC}$	-0.260%/°C
Temperature Coefficient of $I_{SC}$	+0.046%/°C

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

## MAXIMUM RATINGS

Operational Temperature	-40~+85 °C
Front/Rear Side Load	5400/2400pa
Max Series Fuse Rating	25A
Max System Voltage	1500V (IEC)
Fire Rating	Class A

## WARRANTY

30 years Product Workmanship Warranty
30 years Output Power Warranty

## PACKAGING CONFIGURATION

Modules per box:36 pieces
Modules per 40' container:936 pieces