

## MONO CRYSTALLINE DOUBLE-GLASS HALF CUT BIFACIAL MODULE

440 / 445 / 450 / 455 / 460 Watts

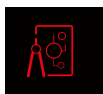
# Black Panther



## Overview

Ground breaking technology: higher power output, improved system performance - the ideal solution for end users who want a fast turnaround on their investments. A fully certified premium quality and high efficiency module made with A Grade materials.

## Key Benefits



Certified by Independent Engineering Bodies



Product Liability Insurance



Ultra High Power Output



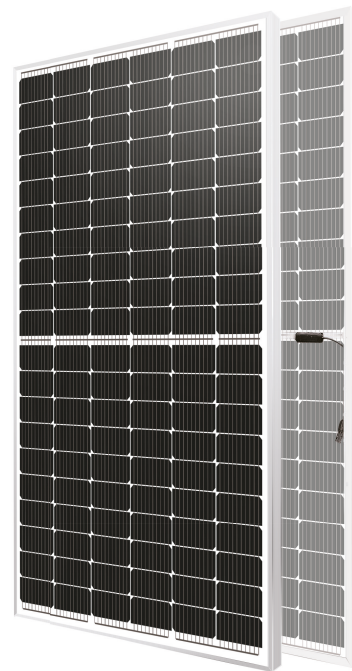
15 Years Limited Product Warranty



Low Resistive Losses



Higher Light Conversion



Guaranteed mechanical resistance to severe weather conditions



Positive Tolerance

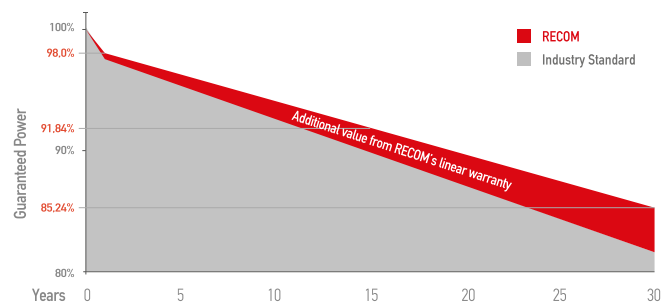


100 % electro-luminescence tested

## Tests, Certifications and Warranties

Standard Tests	IEC 61215, IEC 61730
Factory Quality Tests	ISO 9001: 2015, ISO 14001: 2015
Certifications	Conformity to CE, PV CYCLE Fire safety Class C according to UL790
Insurance	Third party liability insurance provided by Liberty Mutual
Wind and Snow Loads Testing	Module certified to withstand extreme wind (2400 Pascal) and snow loads (5400 Pascal)
Power Tolerance	Guaranteed +0%/+5% (STC condition)
Warranties	<ul style="list-style-type: none"> <li>15-year limited product warranty</li> <li>15-year manufacturer warranty on 91.84% of the nominal performance</li> <li>30-year transferable linear power output warranty</li> </ul>

## Linear Performance Warranty



First Year Output  $\geq 98.0\%$     2-30 Year Decline  $\leq 0.44\%$     30 Year Output  $\geq 85.24\%$

# MONO CRYSTALLINE DOUBLE-GLASS HALF CUT BIFACIAL MODULE

RCM-xxx-7BME(XXX=440-460)

## Electrical Characteristics

POWER CLASS <sup>(1)</sup>			440		445		450		455		460	
Testing Condition			STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
Maximum Power	Pmax	[Wp]	440	324	445	328	450	331	455	335	460	339
Maximum Power Voltage	Vmp	[V]	34,20	31,94	34,50	32,14	34,70	32,34	34,90	32,54	35,20	32,74
Maximum Power Current	Imp	[A]	12,84	10,14	12,90	10,21	12,96	10,24	13,02	10,30	13,08	10,35
Open Circuit Voltage	Voc	[V]	41,00	38,28	41,20	38,48	41,40	38,68	41,60	38,88	41,80	39,08
Short Circuit Current	Isc	[A]	13,58	10,68	13,63	10,73	13,68	10,78	13,73	10,83	13,78	10,88
Module Efficiency	Eff	[%]	20,33		20,56		20,79		21,02		21,25	
Maximum Series Fuse	IR	[A]	25									
Maximum System Voltage	Vsys	[V]	1500V DC									

(1) Measurement Tolerances: Pmax (± 3%), Isc & Voc (± 5%) - Power Classification 0/+5W

(2) STC (Standard Testing Condition): Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, AM 1.5

(3) NMOT (Nominal Operating Module Temperature): Irradiance 800W/m<sup>2</sup>, NMOT, Ambient Temperature 20°C, AM 1.5, Wind Speed 1m/s

### Bi Facial Output (4)

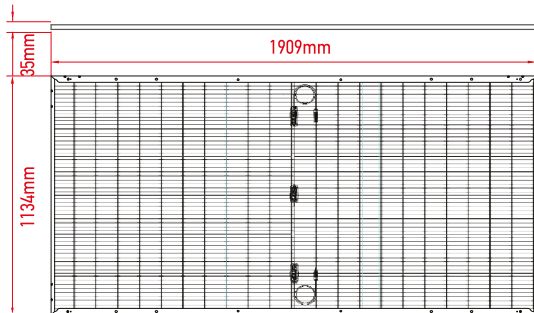
POWER CLASS			440		445		450		455		460		
Power with Backside Gain	Power	Gain [%]	Pmax [Wp]	Eff [%]	Pmax [Wp]	Eff [%]	Pmax [Wp]	Eff [%]	Pmax [Wp]	Eff [%]	Pmax [Wp]	Eff [%]	
			+5	462,0	21,3%	467,3	21,6%	472,5	21,8%	477,8	22,1%	483,0	22,3%
			+10	484,0	22,4%	489,5	22,6%	495,0	22,9%	500,5	23,1%	506,0	23,4%
			+15	506,0	23,4%	511,8	23,6%	517,5	23,9%	523,3	24,2%	529,0	24,4%
			+20	528,0	24,4%	534,0	24,7%	540,0	24,9%	546,0	25,2%	552,0	25,5%
			+25	550,0	25,4%	556,3	25,7%	562,5	26,0%	568,8	26,3%	575,0	26,6%
			+30	572,0	26,4%	578,5	26,7%	585,0	27,0%	591,5	27,3%	598,0	27,6%

(4) Bifaciality Factor > 70% - Back-side power gain depends upon the specific project albedo - Efficiency is according to the surface of the module

## Mechanical Data

Dimensions	1909 mm x 1134 mm x 35 mm
Weight	27,0 Kg
Cell Type	Mono Perc - 182mm x 91mm (2 x 60 Pcs) -M10
Front Glass	2.0 mm Tempered and low iron glass- ARC
Rear Side	2.0 mm Tempered and low iron glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 - 3 Bypass diodes
Connector	MC4 compatible
Output cable	4mm <sup>2</sup> - Landscape = (-) 1200mm (+) 1200mm Portrait = (-) 200mm (+) 300mm or customized

## Dimensions

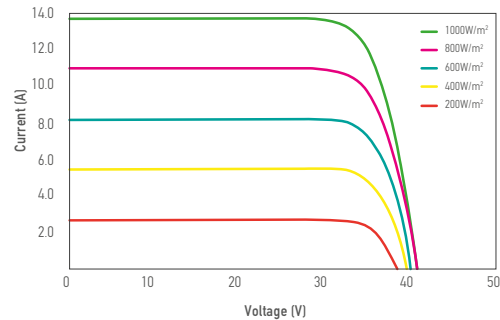


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## I-V Curve

The module relative power loss at low light irradiance of 200W/m<sup>2</sup> is less than 3%.



## Temperature Characteristics

Pmax Temperature Coefficient	-0.36% / °C
Voc Temperature Coefficient	-0.28% / °C
Isc Temperature Coefficient	+0.05% / °C
Operating Temperature	-40~+85 °C
Nominal Operating Module Temperature (NMOT)	41 ± 3 °C

## Packing Configuration

Container	40' (HC)
Pieces per Pallet	31
Pallets per Container	24
Pieces per Container	(31+31)x12=744 pcs

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