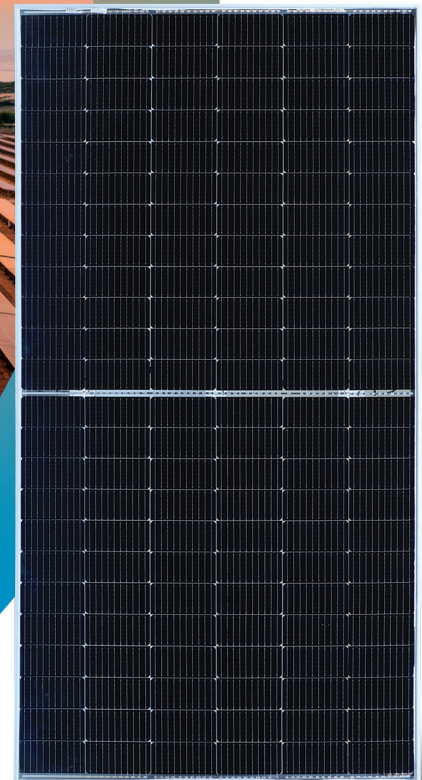




YOUR RELIABLE  
PARTNER FOR  
SOLAR ENERGY  
SINCE 1992



# EMMVEE CRAFTING SMART AND ADVANCED SOLAR ENERGY SOLUTIONS



## QUARTZ

### Monoperc Transparent Back Sheet Module



Committed to Quality, Punctuality, and Customer Support since 1992.



Over 15 Years of Sustainable Power with Photovoltaic Modules, New High WP Modules United with Quality and Efficiency



With presence in Green Energy Projects Across the Globe.



Our Mission: Delivering Clean, Reliable Energy while Reducing Carbon Footprint through wide range of Residential and Commercial Solar Offerings.

# 144 HALF CUT CELL MONOPERC TRANSPARENT BACK SHEET MODULE

## TECHNICAL SPECIFICATION

Electrical data at 1000W/m<sup>2</sup>, 25°C and A.M1.5 (STC in accordance with IEC 60904-3)

Model Name	E530HCBT144	E535HCBT144	E540HCBT144	E545HCBT144
Rated Power at STC	530	535	540	545
Power Tolerance	+5W	+5W	+5W	+5W
Module Efficiency at STC	20.52%	20.71%	20.90%	21.10%
Open Circuit Voltage-VOC(Volts)(±10%)	49.2	49.35	49.5	49.75
Short Circuit Current-ISC (AMPS)(±10%)	13.56	13.59	13.62	13.88
Max Power Voltage-VPM(Volts)	41.1	41.32	41.54	41.61
Max Power Current-IPM (AMPS)	12.9	12.95	13	13.1

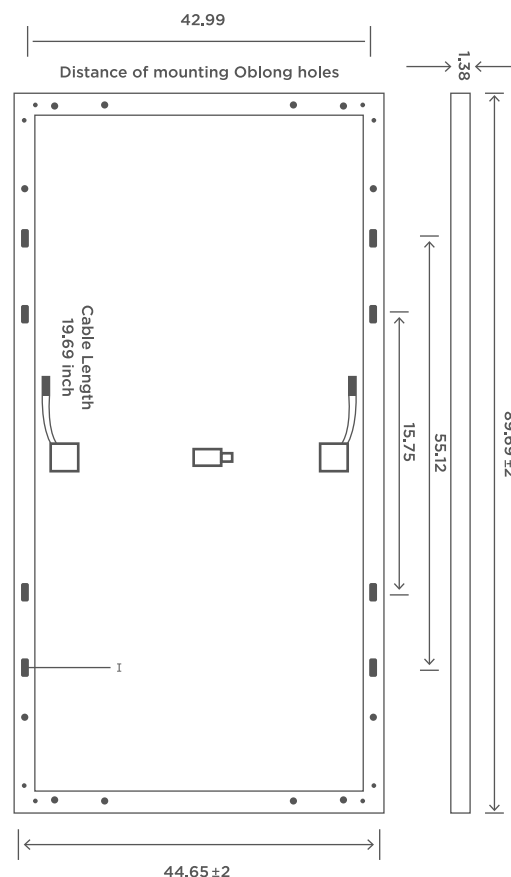
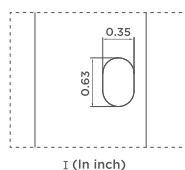
At low irradiance (200W/M<sup>2</sup>, 25°C and AM1.5) the module yields at least 95% of the STC efficiency.

Test uncertainty for Pmax ±3%

Permissible Operating Conditions		Thermal Data	
Operating Temperature Range	-40° C TO 85° C	Temp. Coefficient Open-circuit Voltage	-0.28%/°C
Max.system Voltage	1500V DC	Temp. Coefficient Short Circuit Current	0.05%/°C
Maximum Snow Load Capacity	5400PA	Temp. Coefficient Rated Power	-0.35%/°C
Resistance Against Hail	Max Ø24mm with Impact Speed of 51 Mph	NOCT (Normal operating cell temperature)	45° C ±2°C
Protection Class Against Electrical Shock	II		
Maximum Reverse Current	25 A		
Bifaciality	70±5%		

Mechanical Data	
Number of Cells and Cell Type	144 Monoperc Bi-Facial Solar Cells (182mm X 91mm)
Dimensions: (L X W X H)	89.69 inch X 44.65 inch X 1.38 inch
Weight	57.32 pounds
Front Glass	3.2 mm High Transmission, Solar Glass
Embedding	EVA
Back Sheet	Transparent Back Sheet
Junction Box	3 Split Junction Box IP68
Number of Bypass Diodes	3
Cables	4mm <sup>2</sup> Solar Cables, Length 19.69±10inch
Connectors	MC4 Compatible / Staubli Option Available
Application Class	A

Warranty	
Product Warranty	12 years
Performance Warranty	25 years



1ST YEAR DEGRADATION <2.0%

YEAR 2-25 POWER DEGRADATION <0.55%

END OF 25 YEARS <84.8%

# 132 HALF CUT CELL MONOPERC TRANSPARENT BACK SHEET MODULE

## TECHNICAL SPECIFICATION

Electrical data at 1000W/m<sup>2</sup>, 25°C and A.M1.5 (STC in accordance with IEC 60904-3)

Model Name	E485HCBT132	E490HCBT132	E495HCBT132	E500HCBT132
Rated Power at STC	485	490	495	500
Power Tolerance	+5W	+5W	+5W	+5W
Model Efficiency at STC	20.40%	20.61%	20.82%	21.03%
Open Circuit Voltage – VOC (Volts) (±10%)	44.43	44.65	44.79	44.92
Short Circuit Current – ISC (Amps) (±10%)	13.00	13.09	13.15	13.24
Max Power Voltage – VPM (Volts)	38.81	38.94	39.14	39.27
Max Power Current – IPM (Amps)	12.50	12.59	12.65	12.74

At low irradiance (200W/M<sup>2</sup>, 25°C and AM1.5) the module yields at least 95% of the STC efficiency.

Test uncertainty for Pmax ±3%

### Permissible Operating Conditions

Operating Temperature Range	-40° C TO 85° C
Max.system Voltage	1500V DC
Maximum Snow Load Capacity	5400PA
Resistance Against Hail	Max Ø24mm with Impact Speed of 51 Mph
Protection Class Against Electrical Shock	II
Maximum Reverse Current	25 A
Bifaciality	70±5%

### Thermal Data

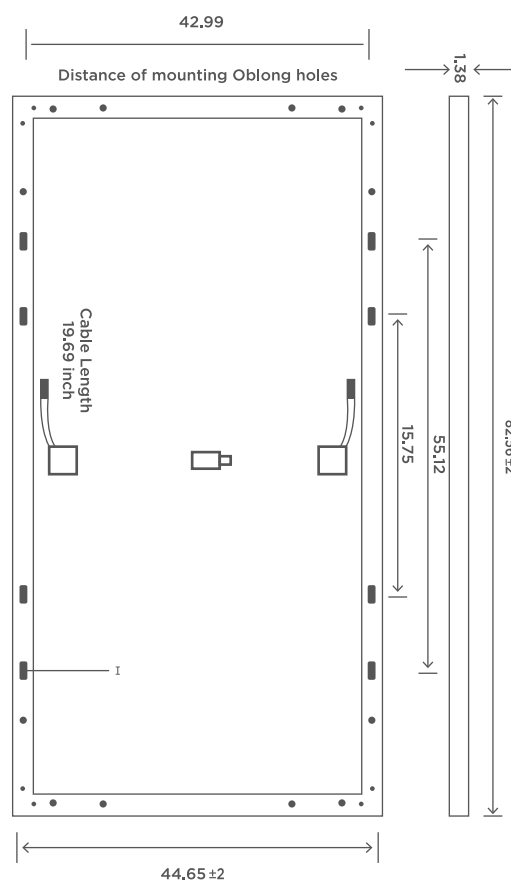
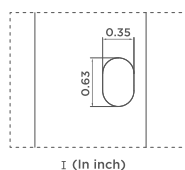
Temp. Coefficient Open-circuit Voltage	-0.28%/°C
Temp. Coefficient Short Circuit Current	0.05%/°C
Temp. Coefficient Rated Power	-0.35%/°C
NOCT (Normal operating cell temperature)	45° C ±2°C

### Mechanical Data

Number of Cells and Cell Type	132 Monoperc Bi-Facial Solar Cells (182mm X 91mm)
Dimensions: (L X W X H)	82.56 inch X 44.65 inch X 1.38 inch
Weight	55.12 pounds
Front Glass	3.2 mm High Transmission, Solar Glass
Embedding	EVA
Back Sheet	Transparent Back Sheet
Junction Box	3 Split Junction Box IP68
Number of Bypass Diodes	3
Cables	4mm <sup>2</sup> Solar Cables, Length 19.69±10inch
Connectors	MC4 Compatible / Staubli Option Available
Application Class	A

### Warranty

Product Warranty	12 years
Performance Warranty	25 years



1ST YEAR DEGRADATION <2.0%

YEAR 2-25 POWER DEGRADATION <0.55%

END OF 25 YEARS <84.8%

# 120 HALF CUT CELL MONOPERC TRANSPARENT BACK SHEET MODULE

## TECHNICAL SPECIFICATION

Electrical data at 1000W/m<sup>2</sup>, 25°C and A.M1.5 (STC in accordance with IEC 60904-3)

Model Name	E440HCBT120	E445HCBT120	E450HCBT120
Rated Power at STC	440	445	450
Power Tolerance	+5W	+5W	+5W
Model Efficiency at STC	20.28%	20.51%	20.74%
Open Circuit Voltage – VOC (Volts) (±10%)	41.44	41.46	41.56
Short Circuit Current – ISC (Amps) (±10%)	13.55	13.75	13.81
Max Power Voltage – VPM (Volts)	34.21	34.28	34.31
Max Power Current – IPM (Amps)	12.87	12.99	13.12

At low irradiance (200W/M<sup>2</sup>, 25°C and AM1.5) the module yields at least 95% of the STC efficiency.

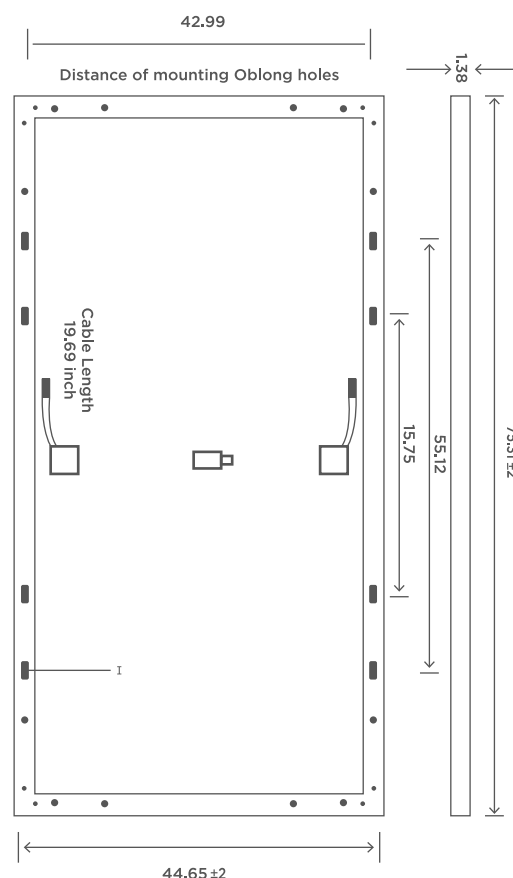
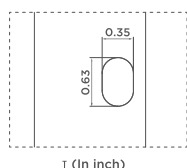
Test uncertainty for Pmax ±3%

Permissible Operating Conditions	
Operating Temperature Range	-40° C TO 85° C
Max.system Voltage	1500V DC
Maximum Snow Load Capacity	5400PA
Resistance Against Hail	Max Ø24mm with Impact Speed of 51 Mph
Protection Class Against Electrical Shock	II
Maximum Reverse Current	25 A
Bifaciality	70±5%

Thermal Data	
Temp. Coefficient Open-circuit Voltage	-0.28%/°C
Temp. Coefficient Short Circuit Current	0.05%/°C
Temp. Coefficient Rated Power	-0.35%/°C
NOCT (Normal operating cell temperature)	45° C ±2° C

Mechanical Data	
Number of Cells and Cell Type	120 Monoperc Bi-Facial Solar Cells (182mm X 91mm)
Dimensions: (L X W X H)	75.31 inch X 44.65 inch X 1.38 inch
Weight	52.91 pounds
Front Glass	3.2 mm High Transmission, Solar Glass
Embedding	EVA
Back Sheet	Transparent Back Sheet
Junction Box	3 Split Junction Box IP68
Number of Bypass Diodes	3
Cables	4mm <sup>2</sup> Solar Cables, Length 19.69±10inch
Connectors	MC4 Compatible / Staubli Option Available
Application Class	A

Warranty	
Product Warranty	12 years
Performance Warranty	25 years



1ST YEAR DEGRADATION <2.0%

YEAR 2-25 POWER DEGRADATION <0.55%

END OF 25 YEARS <84.8%

# 108 HALF CUT CELL MONOPERC TRANSPARENT BACK SHEET MODULE

## TECHNICAL SPECIFICATION

Electrical data at 1000W/m<sup>2</sup>, 25°C and A.M1.5 (STC in accordance with IEC 60904-3)

Model Name	E395HCBT108	E400HCBT108	E405HCBT108
Rated Power at STC	395	400	405
Power Tolerance	+5W	+5W	+5W
Model Efficiency at STC	20.25%	20.51%	20.76%
Open Circuit Voltage – VOC (Volts) (±10%)	36.34	36.61	36.77
Short Circuit Current – ISC (Amps) (±10%)	13.15	13.21	13.24
Max Power Voltage – VPM (Volts)	31.54	31.81	32.13
Max Power Current – IPM (Amps)	12.53	12.58	12.61

At low irradiance (200W/M<sup>2</sup>, 25°C and AM1.5) the module yields at least 95% of the STC efficiency.

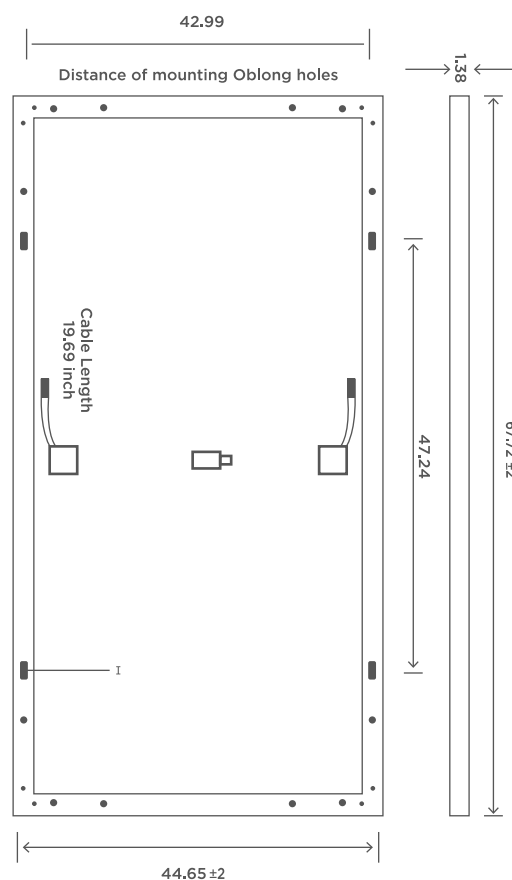
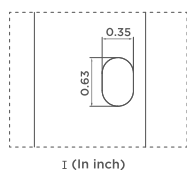
Test uncertainty for Pmax ±3%

Permissible Operating Conditions	
Operating Temperature Range	-40° C TO 85° C
Max.system Voltage	1500V DC
Maximum Snow Load Capacity	5400PA
Resistance Against Hail	Max Ø24mm with Impact Speed of 51 Mph
Protection Class Against Electrical Shock	II
Maximum Reverse Current	25 A
Bifaciality	70±5%

Thermal Data	
Temp. Coefficient Open-circuit Voltage	-0.28%/°C
Temp. Coefficient Short Circuit Current	0.05%/°C
Temp. Coefficient Rated Power	-0.35%/°C
NOCT (Normal operating cell temperature)	45° C ±2° C

Mechanical Data	
Number of Cells and Cell Type	108 Monoperc Bi-Facial Solar Cells (182mm X 91mm)
Dimensions: (L X W X H)	67.72 inch X 44.65 inch X 1.38 inch
Weight	44.09 pounds
Front Glass	3.2 mm High Transmission, Solar Glass
Embedding	EVA
Back Sheet	Transparent Back Sheet
Junction Box	3 Split Junction Box IP68
Number of Bypass Diodes	3
Cables	4mm <sup>2</sup> Solar Cables, Length 19.69±10inch
Connectors	MC4 Compatible / Staubli Option Available
Application Class	A

Warranty	
Product Warranty	12 years
Performance Warranty	25 years

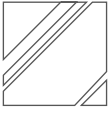


1ST YEAR DEGRADATION <2.0%

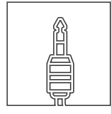
YEAR 2-25 POWER DEGRADATION <0.55%

END OF 25 YEARS <84.8%

# FEATURES



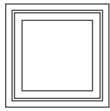
AR Coated High Transmission Glass



MC4 Compatible Connectors



PID Resistance



Anodised Aluminium Frame

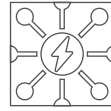


Snow Load Resistance upto 5400 Pa

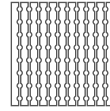
# BENEFITS



Low LCOE, Faster Payback Period



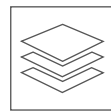
Best In Class Efficiency upto 21.5%



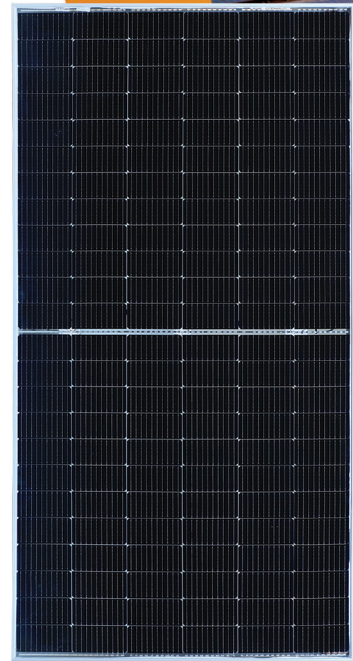
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Lowest Guaranteed First Year and Annual Degradation



Well-Composed Components Stress to Reduce Micro Cracks



	<p>IEC 61215 IEC 61730 Regular Production Surveillance</p> <p>www.tuv.com ID: 1111219603</p>	<p>Salt Mist Resistance Regular Production Surveillance</p> <p>www.tuv.com ID: 1111219643</p>	<p>Ammonia Resistance Regular Production Surveillance</p> <p>www.tuv.com ID: 1111219615</p>		<p>ISO 9001 - ISO 14001 DNV642-45000</p>			
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\*Product under testing at TUV for IEC standards.



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