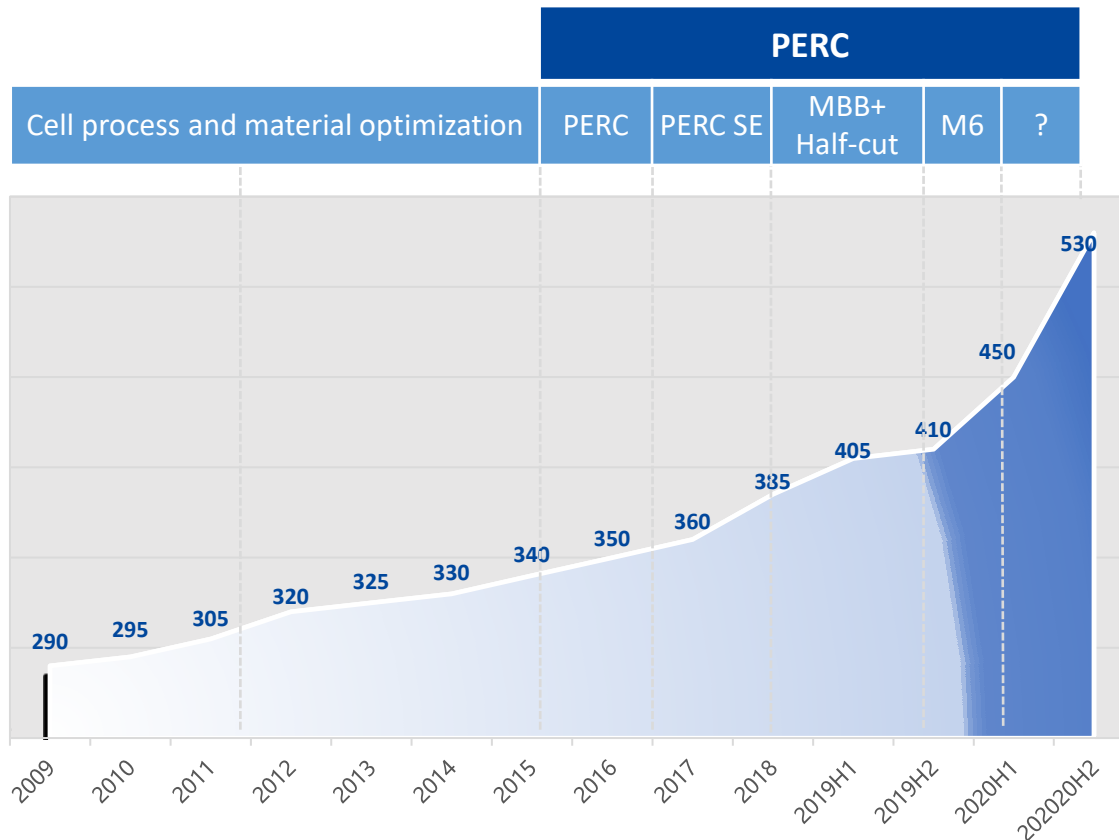


PART 1

TECHNOLOGY BACKGROUND



1. Background – Growth of module power



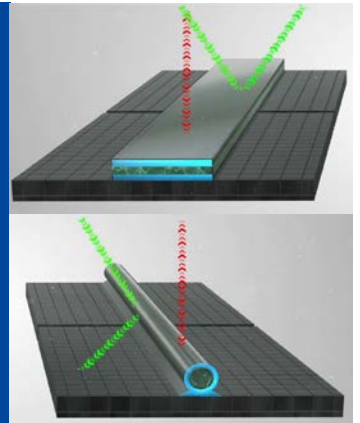
01 Half-cut technology

- Improved laser-cutting
- Lower Resistance Loss
- Lower NOCT
- Better shading behaviour
- Lower hot-spot temperature

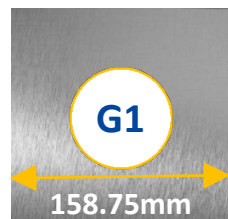


02 MBB technology

- Traditional flat ribbon is replaced by wire (round ribbon)
- Round ribbon enhances light absorption capability



1. Background – Wafer Enlarges



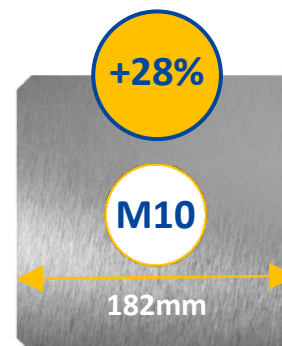
25,200 mm²

Series 10 Deep Blue 1.0



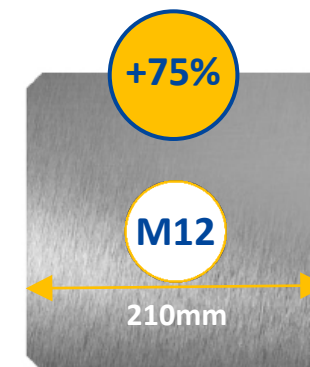
27,415 mm²

Series 20 Deep Blue 2.0



32,307 mm²

Series 30 Deep Blue 3.0



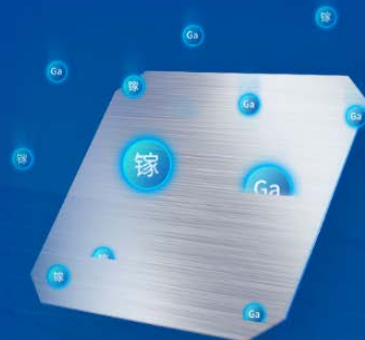
44,096 mm²

/

Gallium-doping

The first Module Supplier to apply
Ga-doped wafer on all high-eff. cells

IP rights granted in October 2019



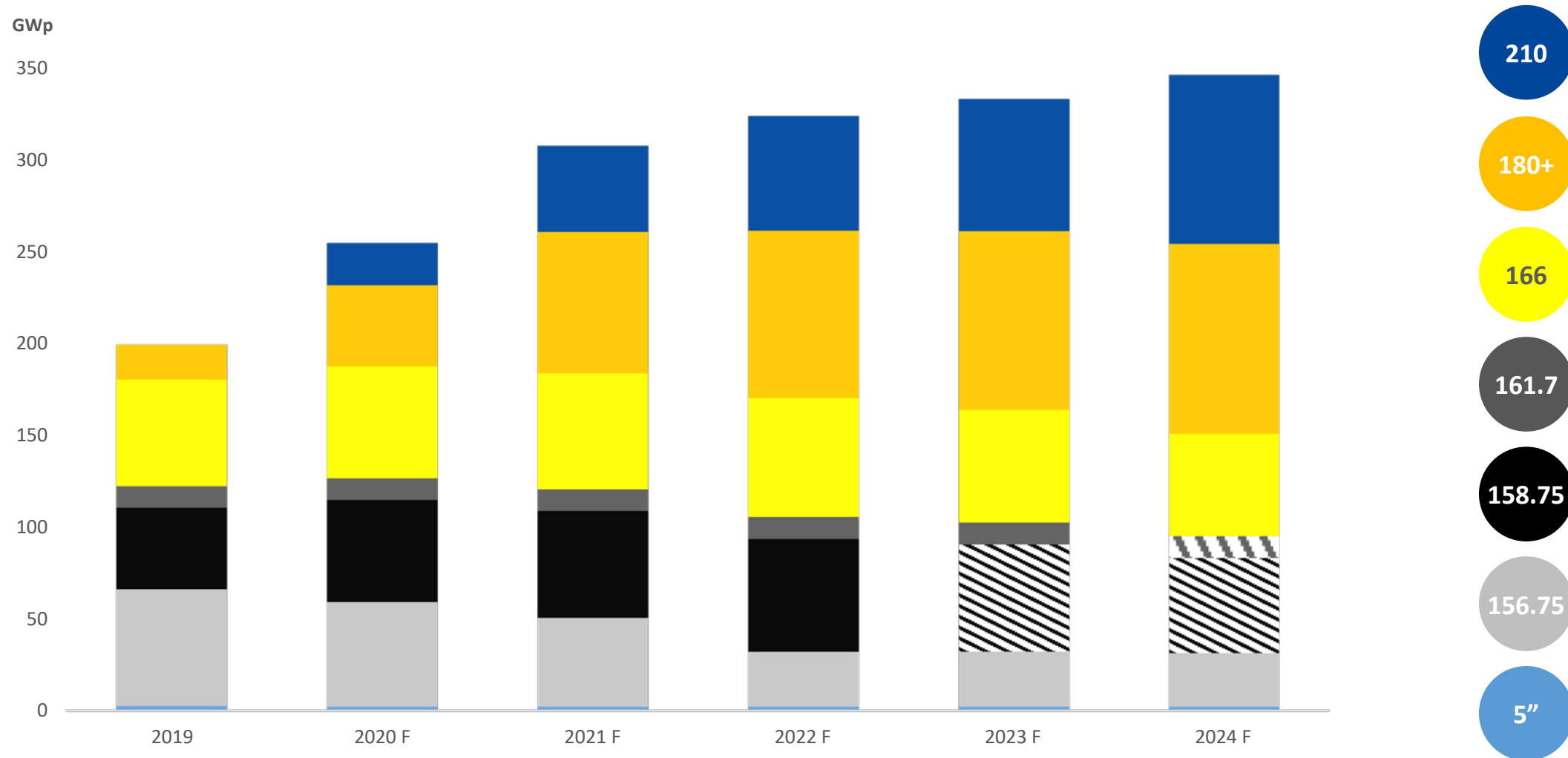
2%/0.55%

Warranty
(single glass)
84.8%

2%/0.45%

Warranty
(double glass)
85%

1. Background – Cell Capacity Changes

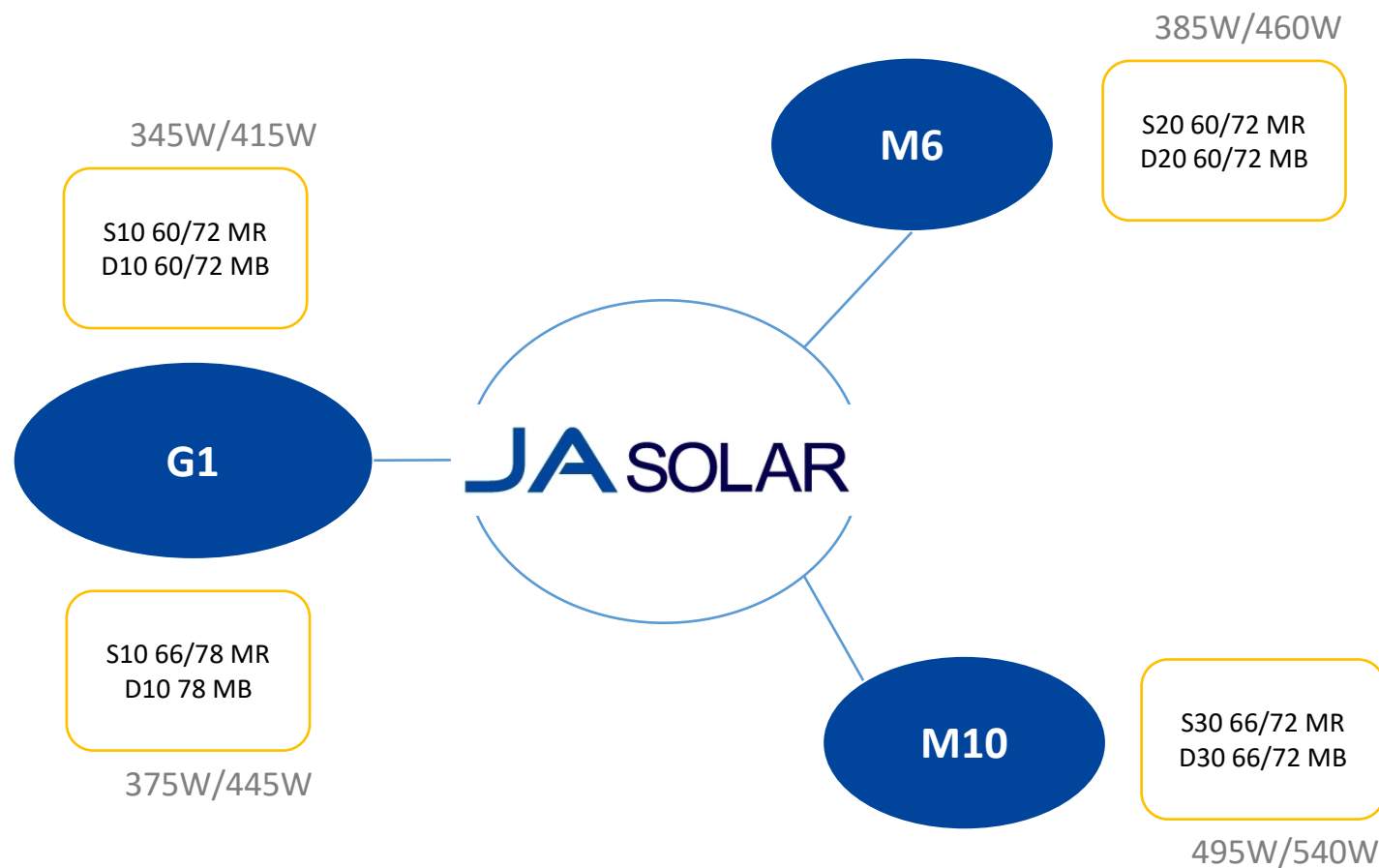


PART 2

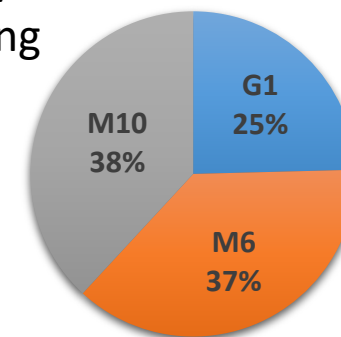
PRODUCT ROADMAP 2021



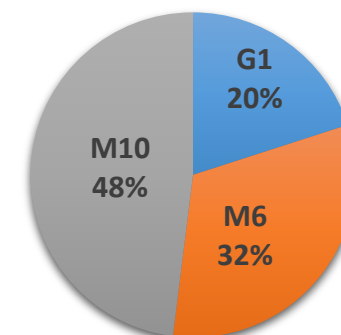
2. Product Roadmap 2021



Capacity
Beginning
2021

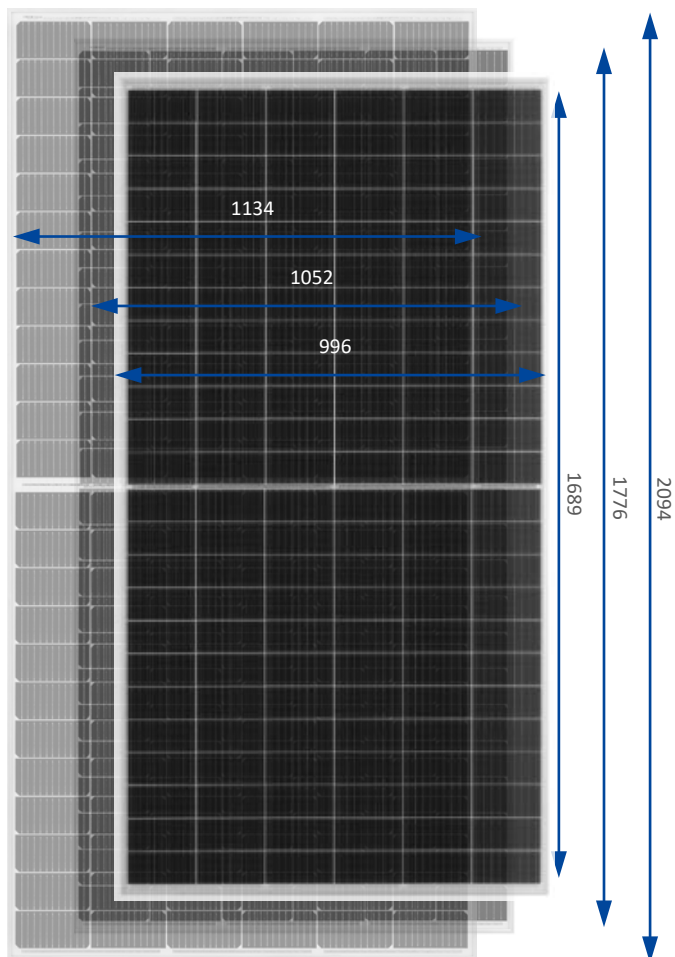


Capacity
Ending
2021



2. Product Roadmap 2021 – 60/66 cell

60/66 CELL – MBB HALF CELL – G1 / M6 / M10

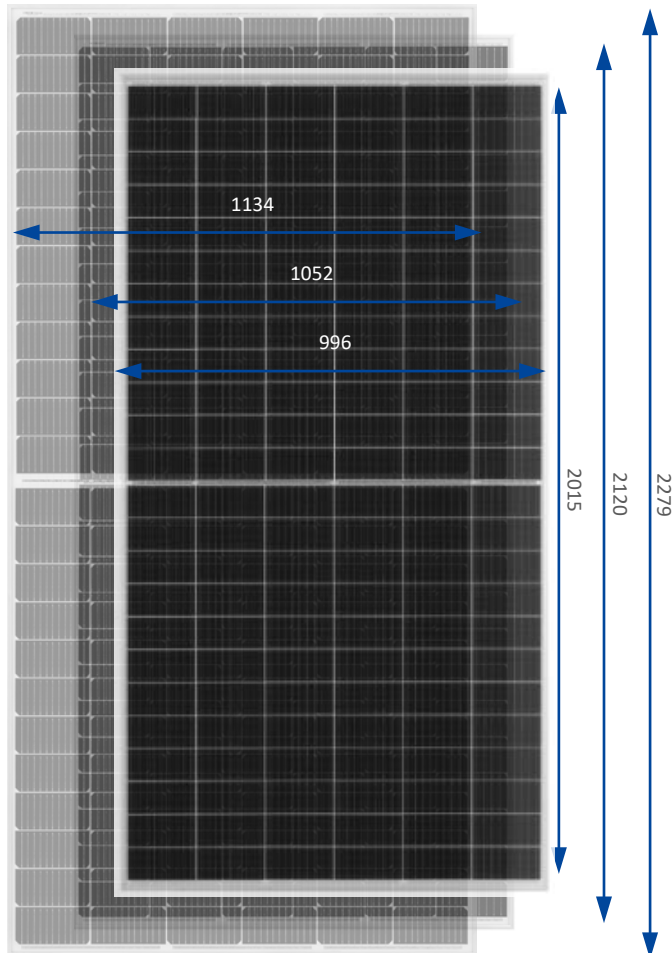


- Half cell design for lower resistance and higher power
- 9BB/11BB design, short current path, lower CTM Loss less affected by micro-cracks and broken fingers
- Circular ribbon can reduce the shading area, reflect more light to cell surface and improve the module power
- Monofacial & Bifacial

	JAM60S10	JAM60S20	JAM66S30
Power	340-350W	375-390W	490-495 W
Voc	41.76 V	41.62 V	45.46 V
String Length (25°C)	36	36	32
Isc	10.54 A	11.47 A	13.86 A
Length	1689 mm	1776 mm (+87)	2094 mm (+405)
Width	996 mm	1052 mm (+56)	1134 mm (+138)
Weight	18.7 Kg	20.7 Kg	28.6 Kg

2. Product Roadmap 2021 – 72/78 cell

72/78 CELL – MBB HALF CELL – G1 / M6 / M10



- Half cell design for lower resistance and higher power
- 9BB/11BB design, short current path, lower CTM Loss less affected by micro-cracks and broken fingers
- Circular ribbon can reduce the shading area, reflect more light to cell surface and improve the module power
- Monofacial & Bifacial

		+8%	+11%	+22%
	JAM72S10	JAM78S10	JAM72S20	JAM72S30
Power	410-415W	445-450W	450-465W	535-540 W
Voc	50.41 V	54.25 V	50.15 V	49.45 V
String Length (25°C)	29	27	29	30
Isc	10.51 A	10.44 A	11.49 A	13.86 A
Length	2015 mm	2180 mm (+165)	2120 mm (+105)	2279 mm (+264)
Width	996 mm	996 mm	1052 mm (+56)	1134 mm (+138)
Weight	22.7 Kg	24.6 Kg	25.0 Kg	28.6 Kg

2. Product Roadmap 2021 – 72/66 cell S30

DEEP BLUE 3.0

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WAFER

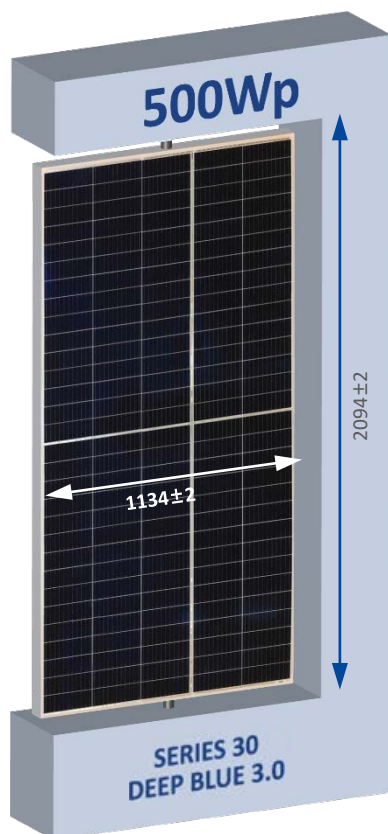
72

CELLS

2

CUT

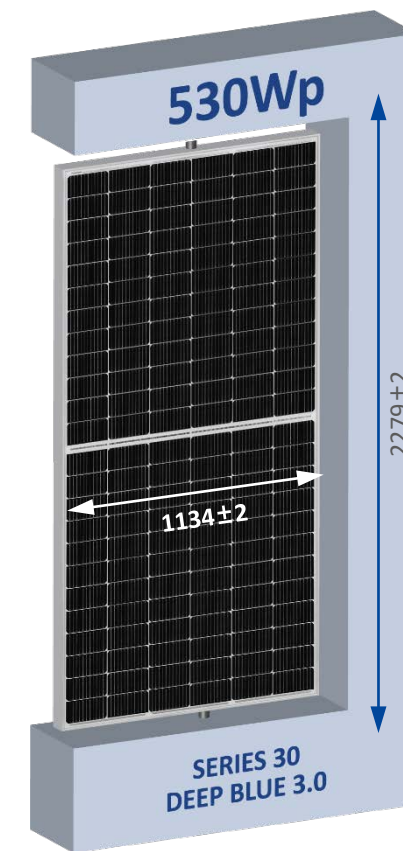
JAM66S30/D30



	JAM72S10	JAM66S30	JAM72S30
Power	410 W	495 W	535 W
Voc	50.2 V	45.46 V	49.45 V
String Length	28	29	28
Isc	10.45 A	13.86 A	13.79 A
Length	2015 mm	2094 mm	2279 mm
Width	996 mm	1134 mm	1134 mm
Weight	22.7 kg	26.3 kg	28.6 kg

- JAM72S30 best Density of Power
- JAM66S30 best Balanced Product as its length is near to 2m
- Isc not exceeding 14A

JAM72S30/D30



PART 3

PRODUCT INITIATIVES

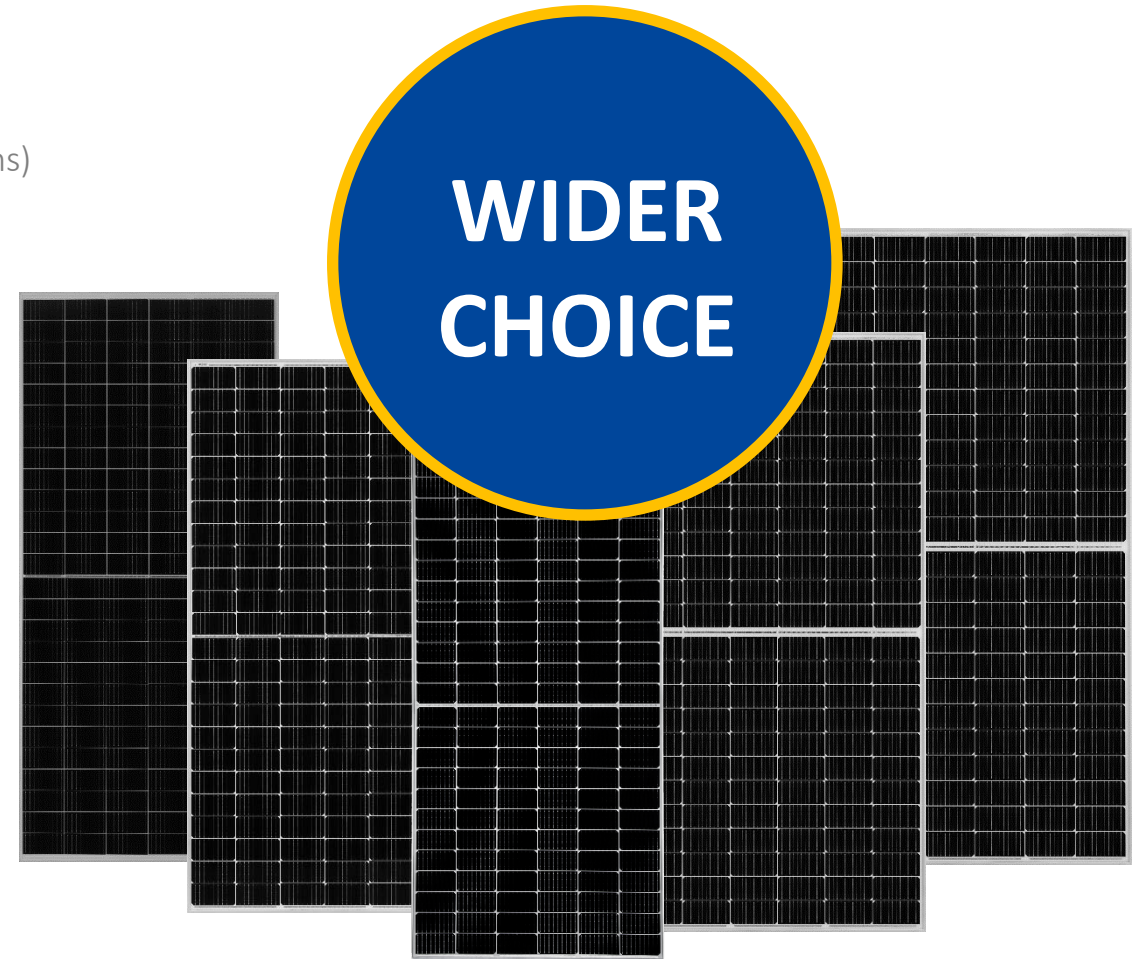


3. PRODUCT INITIATIVES

- Wider Choice of Wafers Sizes → New Products (Wider Possible Combinations)
- Customize Products for different uses
- Cell Layout

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WAFER

Cells	Length	Width	Power	Voc	Isc
72	2279 mm	1134 mm	540W	49.6V	13.86A
66	2097 mm	1134 mm	495W	45.5V	13.86A
60	1915 mm	1134 mm	450W	41.3V	13.86A
54	1733 mm	1134 mm	405W	<u>37.2V</u>	13.86A



PART 4

FUTURE/PRESENT TECHNOLOGIES

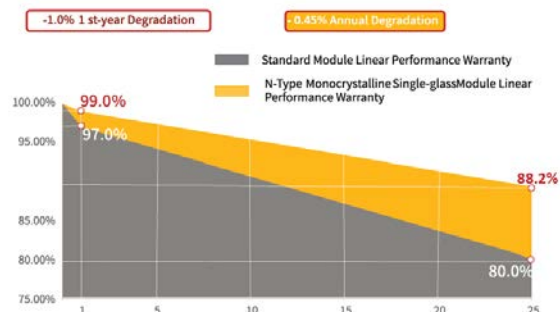


4. FUTURE/PRESENT TECHNOLOGIES

IBC

- IBC cell Technology – Half Cut Cell
- N-Type Cell with Low LID degradation
- >20% Mod. Efficiency

Cells	Length	Width	Power	Voc	Isc
JAM60S10 IBC	1665 mm	996 mm	340W	41.6V	10.38A
JAM60S17 IBC	1665 mm	996 mm	340W	41.6V	10.38A
JAM66S10 IBC	1690 mm	996 mm	385W	46.6V	10.72A



N-Type

- N-Type Cell with Low LID degradation
- >20% Mod. Efficiency

Cells	Length	Width	Power	Voc	Isc
JAM60S10 JT	1690 mm	996 mm	340W	41.8V	10.17A
JAM60S17 JT	1690 mm	996 mm	340W	41.8V	10.17A
JAM66S10 JT	1854 mm	996 mm	360W	45.2v	9.98A

