# adani | Solar



# Empowering A Brighter Tomorrow

adani solar

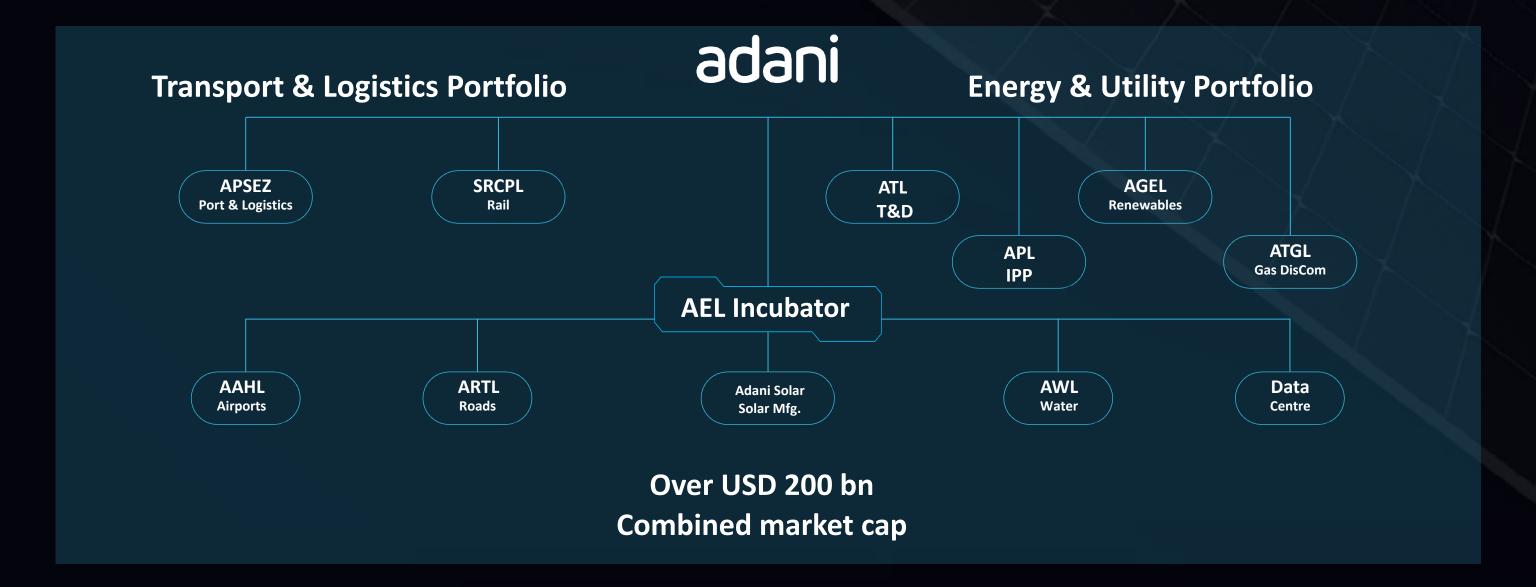
Visionary leadership, illustrious experience, and remarkable track record have been the signature of our legacy.

### Adani Group

- Founded in 1988
- Leading business conglomerate of India and a global integrated infrastructure play with businesses in key industry verticals resources, logistics, energy and agro
- Nine publicly traded companies with combined market cap of over USD 200 billion
- Expanding global footprints across Australia, Bangladesh, China, Dubai, Indonesia, Myanmar, Singapore, and the United States

# Adani Group - World Class Infrastructure & Utility Portfolio

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## In Tune with the Big Vision



"Of all the renewable energy technology options, today, solar is the fastest growing source of power. Over the past decade, the price of solar panels has dropped by 90% and possibly over the next decade we will see price drops of the same magnitude as panels become even more efficient and new materials come into play. The fact is that the marginal cost of solar power is moving towards "zero" and this is both transformative and disruptive."

- TIE 2021

Adani Group Chairman's grand keynote speech "No vaccine for Climate Change"

# \$50-70 bn investment planned across energy chain

"Over the next decade, we will invest over 20 billion dollars in renewable energy generation. Our overall organic and inorganic investments across the entire green energy value chain will range between 50 and 70 billion dollars. This will include investments with potential partners for electrolyzer manufacturing, backward integrations to secure the supply chain for our solar and wind generation businesses, and Al-based industrial cloud platforms."

Adani's focus is on renewable energy to enable a responsible energy transition with accelerated footprints in energy sector. Our proactive investments in clean energies and technologies validates our commitment to our sustainable future.

### Improving All Lives

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### Adani Solar

- Solar PV manufacturing arm of Adani Group
- India's first and largest vertically integrated solar company offering latest technology products across the spectrum of photovoltaics manufacturing
- Produces and offers Mono PERC and TOPCon (Monofacial and Bifacial) modules with superior efficiency,
   higher performance and enhanced reliability
- Dominant market share in retail (Rooftop and KUSUM) module sales in India
- One of the Largest exporters of solar modules in India
- Only Tier 1 Solar PV Manufacturer from India

### Adani Solar Highlights

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Annual production capacity of 4 GW placing it amongst **Top 15 Global Solar manufacturers** 



Located in India's largest electronic manufacturing cluster



Developed in an ecosystem with ancillary units that can supply important raw materials by substituting its imports



Strong & experienced team with ~5,000 employees to ensure process sustenance and continuously working on product development and research



Strict adherence to **Electro Luminescence Testing** ensuring micro-crack free Modules



Energy efficient building with IGBC Platinum rating



Best in class equipment from **European suppliers** 



All facilities are ISO 9001:2015 and ISO 14001:2015,ISO 45001:2018,ISO 50001:2018 certified and meet highest industry standards



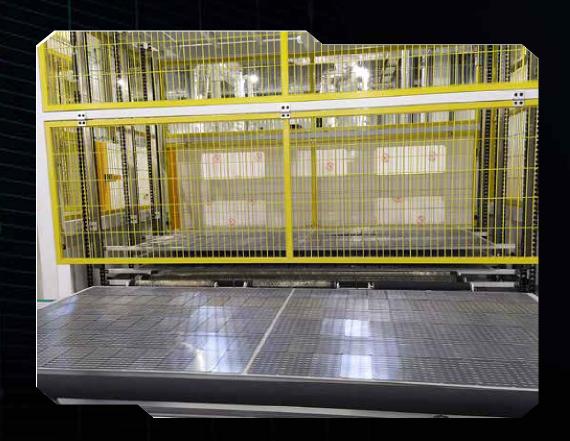
In-house testing facility For Cell sorting & Module flash test

## Being Matchless

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Cutting edge manufacturing technology procured from seven countries across the world





## Being Extraordinary

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Just in Time Supplies

Reduced import dependency

Seamless supply of key raw materials











Glass Project



Cell & Module **Facility** 



Warehouse



S gninierT Testing Lab



**Aluminium** Frame **Facility** 

# Building the World's 1st ever Fully Integrated and Comprehensive Ecosystem of 10 GW Solar PV manufacturing

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### Get SUNplugged















EVA Facility



Backsheet Facility



Glass Project



Aluminium Frame Facility



Cell & Module

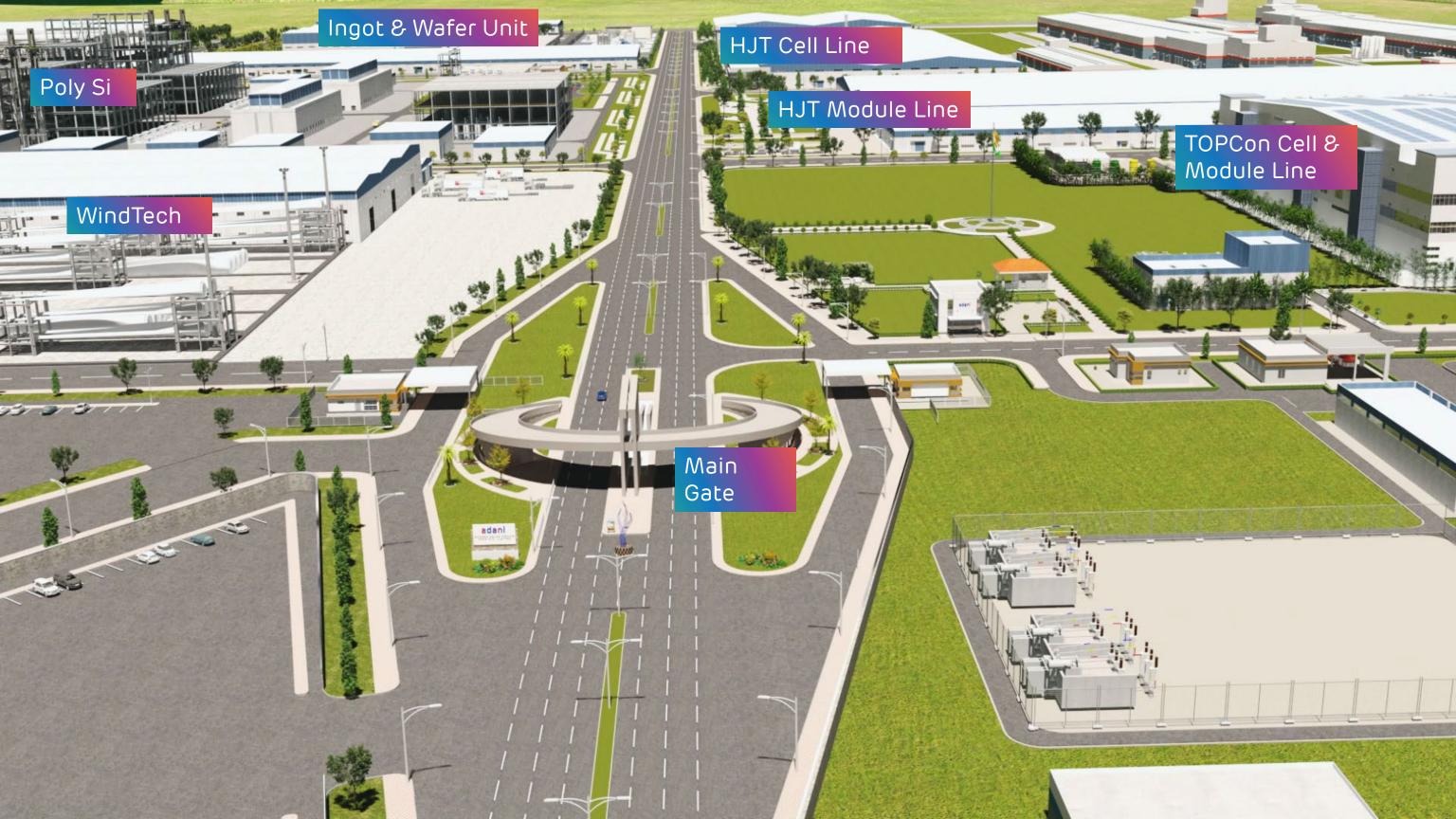


Warehouse



Training & Testing Lab

www.adanisolar.com











## The Right Place

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Uniquely located to leverage economic raw material from the east and supply to the west, leading to cost competitiveness for export-oriented PV manufacturing



- Head Quaters
- Global Presence

# Certified by International agencies



ISO

IEC 61215 Design Qualification And Type Approval Of PV Modules

IEC 61730 Safety Qualification Of PV Modules For Construction And Testing

UL61730 Complying With The National Electric Code NEC, OSHA, The National Fire Prevention Association

IEC 62716 Ammonia Corrosion Resistance Certificate

IEC 61701 Salt Mist Corrosion Testing Of Photovoltaic Module

BIS/IS 14286 To Comply All PSU / Domestic Tenders Requirement

IEC 62804 PID, 85% RH, 85°C, up to 3 Cycles, 288 Hours

IEC 62759 Shipping & Transportation Certification

IEC 60068 Sand & Dust Certification

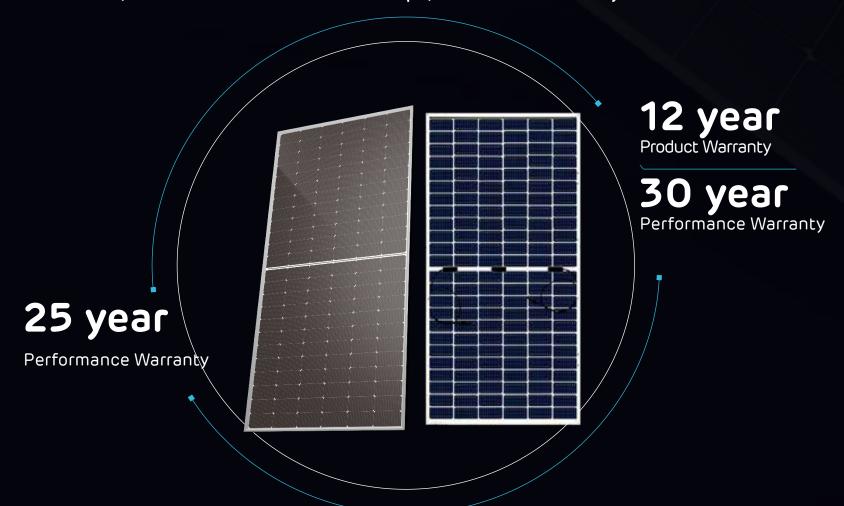
Occupational Health and Safety, Quality Management and Environmental Management System

### Product Portfolio (TOPCon)





Wafer Size M10 – 182 mm | 144 HC cells 550-575 Wp | 22%+ Efficiency



### Product Portfolio (Mono PERC)

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Elan & Eternal SHINE Series

Wafer Size M10 – 182 mm | 144 HC cells 520-545 Wp | 21%+ Efficiency

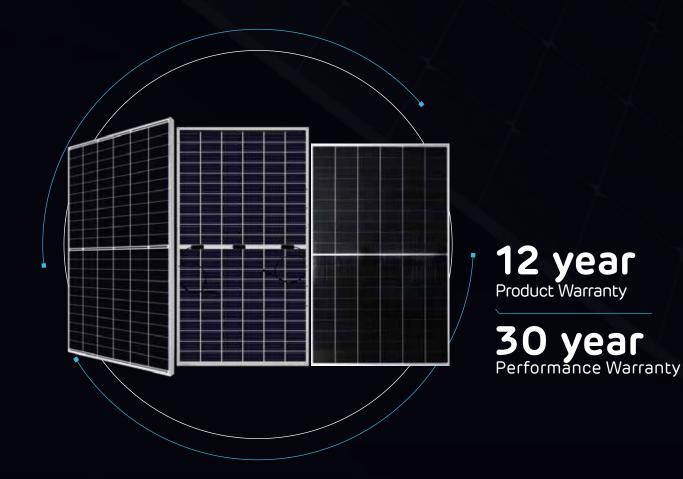
25 year
Performance Warranty

12 year
Product Warranty

30 year
Performance Warranty

Elan & Eternal PRIDE Series

Wafer Size G12 – 210 mm | 132 HC Cells 630-650 Wp | 21%+ Efficiency



## Offering Top-notch Quality



High efficiency modules for unparalled performance

### **PERFORMANCE**

High Fill Factor

Low Temperature Coefficient

**Lower NOCT** 

Lower LID

Lower LeTID

Better Performance at Low Irradiance

### RELIABILITY

Damp Heat - up to 2000 Hours Thermal Cycling - up to 600 Cycle

PID - up to 288 hrs.

UV Performance - >120 kWh/m<sup>2</sup>

Dynamic Mechanical Load - up to 2000 cycles

LeTID- 300 hrs. at 75 °C

### Beyond Certification



·		
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ーしてっし	UY	ЫC
		U

Damp Heat<sup>1</sup>

Thermal Cycling

Potential Induced Degradation @ 1500V; 85°C / 85% RH

Ultra Violet

**Humidity Freeze** 

Dynamic Mechanical Load

### Industry Criteria (IEC) < 5% Pmax Degradation

1000 Hours

200 Cycles

96 hours

15 Kwh/m<sup>2</sup>

10 Cycle

1000 cycles

### Targeted Criteria : (3 IEC) < 5% for Pmax Degradation

**3000 hours** 

800 Cycles

288 hours

120 Kwh/m<sup>2</sup>

30 Cycles

2000 cycles

Note: 1 Damp Heat Refers to the no. of hours of high temperature and penetration of humidity
IEC - International Electro Technical Commission • Pmax degradation • Maximum Power degradation • Kwh - Kilo Watt Hour | m2 - Square Meter • BOM - Bill of Materials | RH - Relative humidity

## Exceeding Expectations

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Deploying the latest technology available globally to enhance productivity



ONLY INDIAN TOP PERFORMER FOR 6 CONSECUTIVE YEARS FROM 2018 - 2023



MODULES INSURED FOR WARRANTY BY ARIEL RE & MUNICH RE



RATED AS BANKABLE MODULE BY BLACK & VEATCH FROM 2018 TO 2022



MODULE LINE AUDITED BY CEA IN 2019,2021, 2022, 2023



MODULE LINE AUDITED BY PI BERLIN (Solar Buyer) IN 2019, 2020, 2022, 2023



MODULE LINE AUDITED BY STS IN 2022, 2023

## Most Bankable Indian Company

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## Being Perfect

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Achieving landmark milestones like a rising star of the solar industry







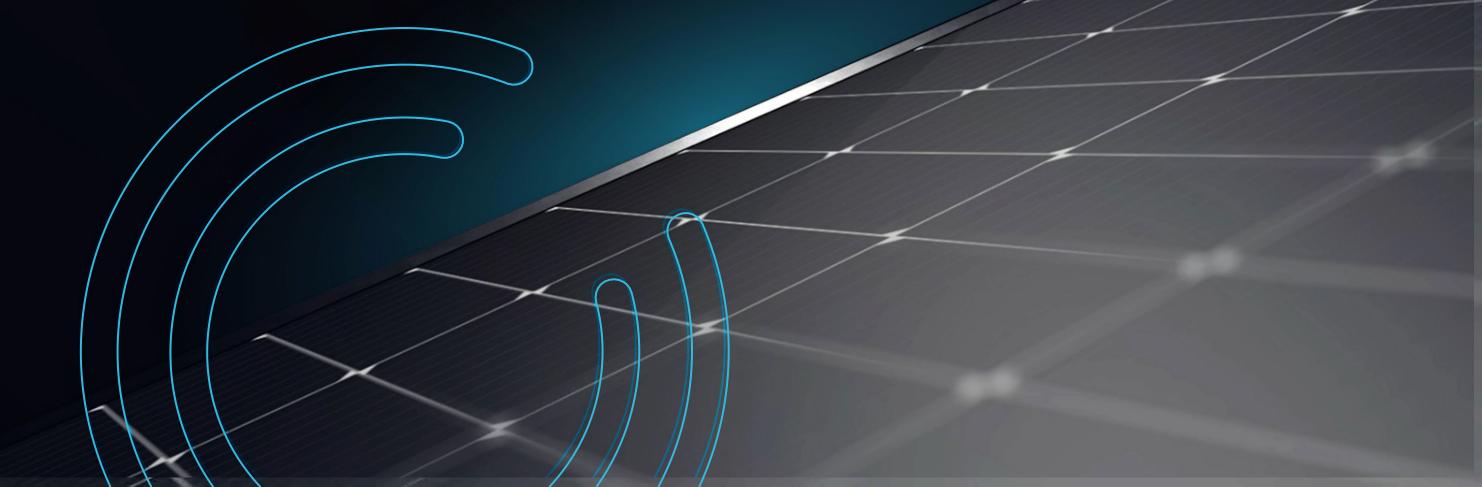


in linkedin.com/company/adani-solar



twitter.com/AdaniSolar

youtube.com/c/AdaniSolar



# TOPCon (G2TB)\* Datasheet



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### **ELAN SHINE TOPCON Series**

Bifacial Transparent Backsheet Modules

ASB-M10-144-AAA (AAA=550-575) 144 Cells | 550-575 Wp

### Highlights



Generation when compared with conventional P-type module



No LID Loss which means more power generation



Better Output In Low Irradiance Higher power output even under lowlight environments like on cloudy or foggy days



Better Temperature Coefficient Higher power generation under higher abient temperature

### Delivers Reliable Performance Over Time

- · Full-automatic facility and industry-leading
- · Best-in-class durability and reliability

### www.adanisolar.com

### N-type Bifacial 144 Half-cut cell Module

Electrical Properties	STC*					
Testing Condition	Front Side					
Peak Power (Pmax) (W)	550	555	560	565	570	575
MPP Voltage (Vmp) (V)	42.0	42.2	42.4	42.6	42.8	43.0
MPP Current (Imp) (A)	13.10	13.16	13.21	13.27	13.32	13.38
Open Circuit Voltage (Voc) (V)	50.2	50.4	50.6	50.8	51.0	51.2
Short Circuit Current (Isc) (A)	13.87	13.93	13.99	14.05	14.11	14.17
Module Efficiency (%)	21.42	21.62	21.81	22.01	22.20	22.40

Electrical Properties	NOCT*					
Testing Condition	Front Side					
Peak Power (Pmax) (W)	417	421	424	428	432	436
MPP Voltage (Vmp) (V)	39.5	39.6	39.8	40.0	40.2	40.4
MPP Current (Imp) (A)	10.56	10.61	10.65	10.70	10.74	10.79
Open Circuit Voltage (Voc) (V)	48.0	48.2	48.4	48.6	48.7	48.9
Short Circuit Current (Isc) (A)	11.18	11.23	11.28	11.33	11.38	11.42

Operating Temperature (°C)	-40 -+85	
Maximum System Voltage (V)	1500V DC (EC)	
Maximum SeriesFuseRating (A)	30	
PowerTolerance	0-+5W	
Bfacialty*	80%	

Temperature Coefficient		
emperature Coefficient of Pmax*	-0.31%/°C	
emperature Coefficient of Voc	-0.260%/°C	
emperature Coefficient of Isc	+0.046%/C	
Iominal Operating Cell Temperature (NOCT)	42±2°C	

Mechanical Properties	
Cell Size	182.0 0mm*91.00mm
Number of Cells	144pcs(12*12)
Module Dimension	2266mm*113.3mm
Weight	28kg
Front	3.2mm
Rear	Transparent Backsheet
Frame	Anodized Aluminium Alloy
JunctionBox	3 diodes
Length of Cable	4.0mm? 30.0mm (Cable length can be gustomized)

Power Gain (%)	Peak Power (Pmax) (W)	MPP Voltage (Vmp) (V)	MPP Current (Imp) (A)	Open Circuit Voltage (Voc) (V)	Short Circuit Current (Isc) (A)
10	594	42.0	14.13	50.2	14.97
15	616	42.0	14.65	50.2	15.51
20	638	42.1	15.17	50.3	16.06
25	660	42.1	15.69	50.3	16.61
30	682	42.1	16.20	50.3	17.16

### Warranty and certifications

Product warranty\*\* 12 years of product warranty Product warranty\*\* Lzyears or product warranty
Performance guarantee\*\* Power degradation Cl.00% in first year < 0.40% / year in 2-30 years
Approvals and certificates\*: IEG 61275 Ed2, IEC 61970, IEC 61701, UL 61730, MCS,
JET, CEC, CEC-Aus, IEC 6278, IEC 62782, IEC 60068-2-68, IEC 61853, IEC 61854.

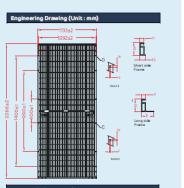


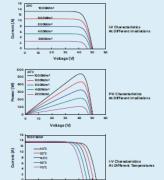
















TOPCon (G2G)\* Datasheet

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### **ELAN SHINE TOPCON Series**

### N-type

Bifacial Double Glass Module

ASB-M10-144-AAA (AAA=550-575) 144 Cells | 550-575 Wp

### Highlights



Up to 30% Additional Power Generation when compared with conventional P-type module



No LID Loss which means more power



Better Output In Low Irradiance Higher power output even under low-light environments like on cloudy or foggy



Better Temperature Coefficient Higher power generation under higher abient temperature conditions

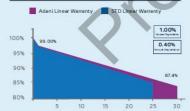
### Linear Performance Warranty

570+ Wp

Maximum Power

22.40% Maximum Efficiency

0~+5W Power Tolerance



### Delivers Reliable Performance Over Time

- · Full-automatic facility and industry-leading
- · Best-in-class durability and reliability

### N-type Bifacial 144 Half-cut cell Module

Electrical Properties	STC*					
Testing Condition	Front Side	Front Side	Front Side	Front Side	Front Side	Front Side
Peak Power (Pmax) (W)	550	555	560	565	570	575
MPP Voltage (Vmp) (V)	42.0	422	424	42.6	42.8	43.0
MPP Current (Imp) (A)	13.10	13.16	13.21	13.27	13.32	13.38
Open Circuit Voltage (Voc) (V)	50.2	50.4	50.6	50.8	51.0	51.2
Short Circuit Current (Isc) (A)	13.87	13.93	13.99	14.05	14.11	14.17
Module Efficiency (%)	21.42	21.62	21.81	22.01	22.20	22.40
*STC: Irradiance 1000 W/m², Cell Temp	erature 25°C./	VMI.5				

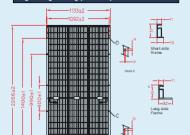
Electrical Properties	NOCT*					
Testing Condition	Front Side					
Peak Power (Pmax) (W)	417	421	424	428	432	436
MPP Voltage (Vmp) (V)	39.5	39.6	39.8	40.0	40.2	40.4
MPP Current (Imp) (A)	10.56	10.61	10.65	10.70	10.74	10.79
Open Circuit Voltage (Voc) (V)	48.0	48.2	48.4	48.6	48.7	48.9
Short Circuit Current (Isc) (A)	11.18	11.23	11.28	11.33	11.38	11.42

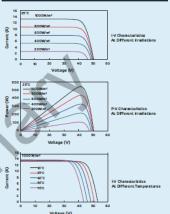
Operating Temperature (°C)	-40 ~+85	
Maximum System Voltage (V)	1500 V DC (IEC)	
Maximum Series FuseRating (A)	30	
PowerTolerance	0~+5W	
Bifaciality*	80%	

Temperature Coefficient of Pmax*	-0.31%/°C	
Temperature Coefficient of Voc	-0.260%/°C	
Tem perature Coefficient of Isc	+0.046%/°C	
Nominal Operating CellTemperature (NOCT)	42±2°C	
Management of the Control of the Con		

Cell Size	18 2.0 0mm*91.0 0mm	
Number of Cells	144pcs(12*12)	_
Module Dimension	2266 mm*1133mm	
Weight	33.5 kg	
Front	2.0 mm	
Frame	Anodized Aluminium Alloy	
Junction Box	3 diodes	
Length of Cable	4.0 mm², 30 0 mm (Cable length can be customized)	7

	(i max) (iv)	(emp) (e)	Auth And	(voc)(v)	(ISC) (A)
10	594	42.0	14.13	50.2	14.97
15	616	42.0	14.65	50.2	15.51
20	638	42.1	15.17	50.3	16.06
25	660	42.1	15.69	50.3	16.61
30	682	42.1	16.20	50.3	17.16





The specification and key features described in this datasheet may deviate slightly and are not guaranteed. Due to ongoing lineowition, 1850 enhancement, Adain Solar services the eight of the control of the datasheet which had be doly incorporated into the following control or the parties which shall be doly incorporated into the following contract made by the parties of the control of the control of the parties of the control of the control of the parties of the control of the con

### Warranty and certifications

Product warranty\*\* 12 years of product warranty

Performance guarantee\*\* Power degradation <1,00% in first year <0.40% / year in 2-30 years Approvals and certificates\*: IEC 61215 Ed2, IEC 61730, IEC 61701, UL 61730, MCS, JET, CEC, CEC-Aus, IEC 62716, IEC 62782, IEC 60068-2-68, IEC 61853, BIS

\*All certifications are under process

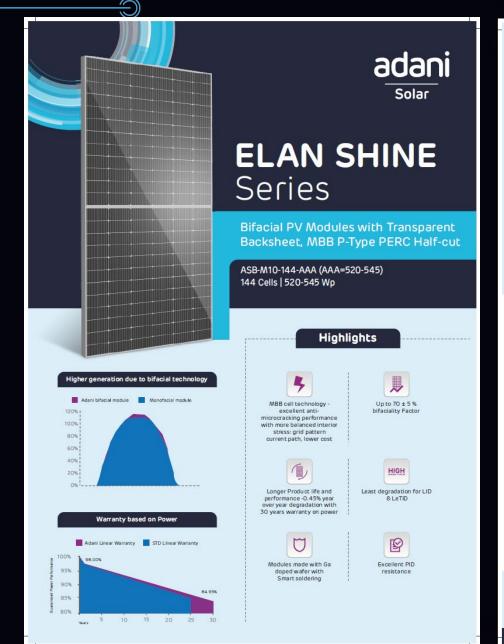




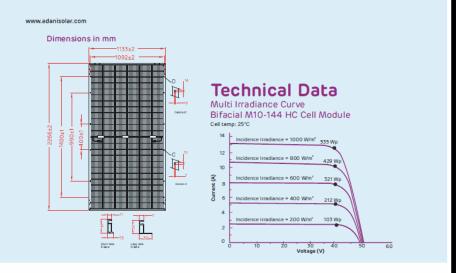




### MonoPERC (G2TB) Datasheet



### adani | Solar



20			0	nly front (	(STC)		permissible operating conditions		
	520	525	530	535	540	545	T <sub>r</sub> of open circuit voltage (β)	-0.26% /*C	
	41.18	41.34	41.49	41.64	41.80	41.94	T. of short circuit current (a )	0.054% /°C	
	12.65	12.73	12.79	12.86	12.93	13.01			
	48.60	48.78	48.95	49.12	49.32	49.48	T <sub>c</sub> of power (γ)	-0.32% /°C	
	13.41	13.48	13.55	13.63	13.71	13.79	Maximum system voltage	1500 VDC (IEC 8 UL)	
	20.25	20.44	20.64	20.83	21.03	21.22	NOCT	45°C ± 2°C	
	ture 25°C % at 200 \						Temperature range	-40°C to + 85°C	
	/-3%, meas				4 1. Excep	pp			

### Electrical Characteristics with different rear side power gain (Reference 525 Wp Front) 15% 20% Weight Peak power, (0 ~+ 4.99 Wp) Pmax(Wp) 300 mm length cable, MC4 compatible 13.89 14.51 15.24 15.72 Open circuit voltage. Voc (\ 48.36 48.36 48.36 48.36 22.39 23.37 24.54 25.32 144 Half-cut mono-crystalline P-type PERC bifacial solar cells; Multi bus bar ransparent Backsheet 3600 Pa-downward; 1600 Pa-Upward

 The specifications included in this datasheet are subject to change without notice The electrical data given here is for reference purpose only.
 Please confirm your exact requirements with the sales representative while placing your order.

Electrical data - All data measured to STC\*

Peak power, (0 ~+ 4.99 Wp) Maximum voltage, Vmpp (V) Open circuit voltage, Voc (V) Short circuit current, Isc (A)

Bifaciality Gain

### Warranty and certifications

Product warranty\*\* 12 years of product warranty
Performance guarantee\*\* Power degradation <2.0% in first year <0.45% / year in 2-30 years Approvals and certificates\*: IEC 61215 Ed2, IEC 61730, IEC 61701, UL 61730, MCS,

JET, CEC, CEC-Aus, IEC 62716, IEC 62782, IEC 60068-2-68, IEC 61853, BIS \*All certifications are under process













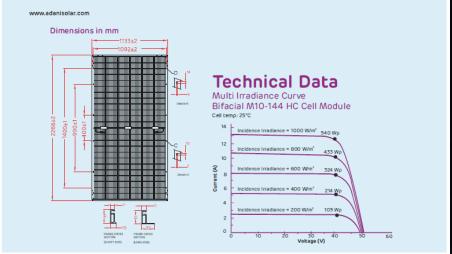


Higher generation due to bifacial technology

Warranty based on Power



### adani | Solar



e efficiency (9	6)	20.25	20.44 2	0.64	20.83	21.03	21.22	NOCT	45°C ± 2°C
	N/m², cell tempera							Temperature range	-40°C to + 85°C
	ve a tolerance of								
trical Ch	naracteris	tics v	vith di	ffer	ent r	ear s	ide	Mechanical data	
ver gain (	Referenc	e 525	Wp F	ront	:)			Length	2266 mm
Flor	trical Specification			Den av e	nin from	rear side*		Width	1133 mm
	crical specificacii	UEI						Height	35 mm
ality Gain			10%	15%	2	0%	25%	Weight	33.5 kg
ower, (0 ~+ 4	.99 Wp) Pmax(\	Wp)	575	600	6	30	650	Junction box	IP68; Junction box
num voltage, V	mpp (V)		41.35	41.35	5 4	1.36	41.36	Cable and connectors	300 mm length cable, MC4 compatible
num current, Ir	прр (А)		13.89	14.50	0 19	5.25	15.75		connectors
circuit voltage	, Voc (V)		48.36	48.3	6 4	8.36	48.36	Application class	Class A (Safety class II)
circuit current	t, Isc (A)		15.01	15.66	5 10	6.47	17.01	Superstrate	High Transmission ARC, Heat Strengthened Glass 2.0 mm
e efficiency (9	6)		22.39	23.3	7 2	4.54	25.32	Cells	144 Half-cut mono-crystalline P-type
gain from rear sid	e depends upon the	e ground ret	flectance (Al	bedo) 8	Bifacialit	y factor.		Cells	PERC bifacial solar cells; Multi bus bar
ging Config	uration							Encapsulation	High volume resistivity and low MVTR
ner	40'HC							Substrate	Semi Tempered Glass -2.0 mm
				_		-		Frame	Anodized Frame
/Container	20	Pieces/	Containe	r	620	_		Design Mechanical load	3600 Pa-downward; 1600 Pa-Upward
								Safety Factor for Mechanical load	1.5
oscifications is	ncluded in this d	atacheet	are subject	to cha	nne wêt	houe noti	ine	Maximum series fuse rating	30 A
	iven here is for n				inge with	nour nou	u e.		
e confirm your	exact requireme	nts with t	he sales re	present	tative w	hile placi	ing your or	fer.	

12.65 12.72 12.79 12.86 12.93 13.01 48.60 48.78 48.95 49.12 49.32 49.48

13.41 13.48 13.55 13.63 13.71 13.79

### Warranty and certifications

Product warranty\*\* 12 years of product warranty
Performance guarantee\*\* Power degradation <2.0% in first year < 0.45% / year in 2-30 years Approvals and certificates\*: IEC 61215 Ed2, IEC 61730, IEC 61701, UL 61730, MCS, JET, CEC, CEC-Aus, IEC 62716, IEC 62782, IEC 60068-2-68, IEC 61853, BIS

Electrical Specification Peak power, (0 ~+ 4.99 Wp)

Maximum voltage, Vmpp (V)

Open circuit voltage, Voc (V)

Short circuit current, Isc (A)





Temperature co-efficients (Tc) and

T. of short circuit current (a)











0.050% /°C

-0.38%/\*0

### adani | solar MonoPERC (G2WB) Datasheet



### Dimensions in mm **Technical Data** Multi irradiance curve Monofacial M10-144 HC Cell Module

Electrical Specification	Electrical Specification					
Peak power, (0 ~+ 4.99 Wp) Pmax(Wp)	520	525	530	535	540	545
Maximum voltage, Vmpp (V)	41.18	41.34	41.49	41.64	41.80	41.94
Maximum current, Impp (A)	12.65	12.72	12.79	12.86	12.93	13.01
Open circuit voltage, Voc (V)	48.60	48.78	48.95	49.12	49.32	49.48
Short circuit current, Isc (A)	13.41	13.48	13.55	13.63	13.71	13.79
Module efficiency (%)	20.25	20.44	20.64	20.83	21.03	21.22
*STC: Irradiance 1000 W/m², cell t 60904-3. Average efficiency reduc 60904-1. Expect Pmpp, all other uncertainty < 3%.	tion is ap	prox. 3%	6 at 200	W/m²	according	to Et

Electrical	Characteristics a	t NOCT**
	Electrical Specification	Pmax gain from re

Electrical Specific	Pmax gain from rear side*					
Pmax(Wp)-NOCT	390	393	3 97	401	405	408
Maximum voltage, Vmpp (V)	38.39	38.54	38.68	38.82	38.98	39.10
Maximum current, Impp (A)	10.16	10.22	10.27	10.33	10.38	10.46
Open circuit voltage, Voc (V)	45.43	45.76	45.92	46.09	46.28	46.42
Short circuit current, Isc (A)	10.90	10.96	11.02	11.08	11.13	11.22

\*\*NOCT irradiance 800 W/m², ambient temperature 20°C, wind speed 1 m/sec

derance of +	1-3 %, measurement uncertai	nty <3 %
ıration		
40'HC		
20	Pieces / Container	620
	uration 40'HC	40'HC

The specifications included in this datasheet are subject to change without notice.
 The electrical data given here is for reference purpose only.
 Please confirm our exact requirements with the safes representative while placing your.

*Caution:	
Please read safety and installation instructions before using the product.	

Temperature co-efficients (Tc) and permissible operating conditions

i <sub>e</sub> or open circuit voltage ( p )	-0.28% /°C
T <sub>c</sub> of short dircuit current (α)	0.048% /°C
T <sub>c</sub> of power (γ)	-0.37% /°C
Maximum system voltage	1500 V (IEC & UL)
NOCT	45°C ±2°C
Temperature range	-40°C to + 85°C

Voltage (V)

Mechanical data	
Length	2266 mm
Width	1133 mm
Height	35 mm
Weight	28.0 kg
Junction box	IP68; Junction box
Cable and connectors	300 mm length cable, MC4 compatible connectors
Application class	Class A (Safety class II)
Superstrate	High transmittance ARC glass-3.2 mm
Cells	144 Half-cut mono-crystalline P-type PERC solar cells; Multi bus bar
Encapsulation	High volume resistivity and low MVTR
Substrate	White Backsheet
Frame	Anodized Frame
Design Mechanical load	3600 Pa-downward; 1600 Pa-upward

read Adani solar warranty documents thoroughly.

Maximum series fuse rating 25 A

### Warranty and certifications

Product warranty\*\* 12 years of product warranty
Performance warranty\*\* Power degradation <2.0% in first year and <0.55% / year in 2-25 years

Approvals and certificates: IEC 61215, IEC 61730, UL 61215, UL 61730, BIS, IEC 61853-1,IEC 62782,IEC 61701, IEC 61853-2

















