



REGIONE BASILICATA
 PROVINCIA DI MATERA
 COMUNE DI GROTTOLE



AUTORIZZAZIONE UNICA EX D.Lgs 387/2003

INSTALLAZIONE DI UN IMPIANTO DI PRODUZIONE DI ENERGIA DA FONTE SOLARE DENOMINATO "GROTTOLE 3" DI POTENZA IN IMMISSIONE PARI A 20.000,00 kW E POTENZA DI PICCO PARI A 19.996,99 kW

Codice pratica: 202100420



Codice elaborato

Commessa	Livello prog.	Tipologia	Progressivo
SE220	PD	D	035

DATA	SCALA
Novembre 2021	-

Titolo elaborato

A.12.b.3-Schemi funzionali dei singoli pannelli

REVISIONI

REV.	DATA	DESCRIZIONE	ESEGUITO	VERIFICATO	APPROVATO

Progettazione:



STUDIO ENERGY SRL
 Via delle Comunicazioni snc
 75100 Matera
 C/F. e P.IVA 01175590775

Tecnici:

Dott. Ing. Calbi Francesco Rocco



Il Proponente:

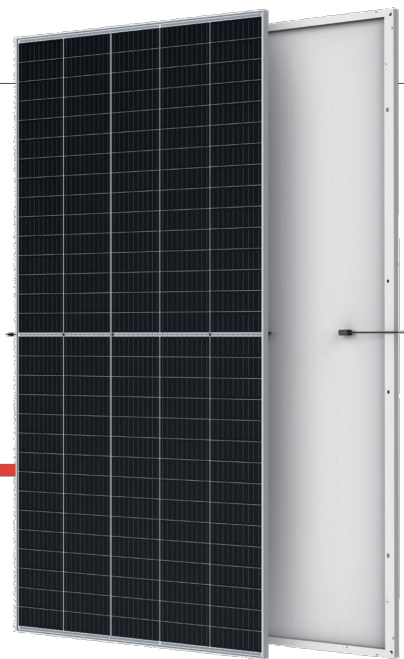


REN 184 S.R.L.
 Salita di Santa Caterina, 2/ISC.B - 16123 Genova (GE)
 C.F./P.IVA 02686820990

LEGALE RAPPRESENTANTE

Mono Multi Solutions

THE **Vertex** BACKSHEET MONOCRYSTALLINE MODULE



500W+
MAXIMUM POWER OUTPUT

21.1%
MAXIMUM EFFICIENCY

0~+5W
POSITIVE POWER TOLERANCE

PRODUCTS | POWER RANGE
TSM-DE18M(II) | **480-505W**



High customer value

- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance Of System) cost, shorter payback time
- Lower guaranteed first year and annual degradation
- Designed for compatibility with existing mainstream system components
- Higher return on Investment



High power up to 505W

- Large area cells based on 210mm silicon wafers and 1/3-cut cell technology
- Up to 21.1% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection



High reliability

- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load



High energy yield

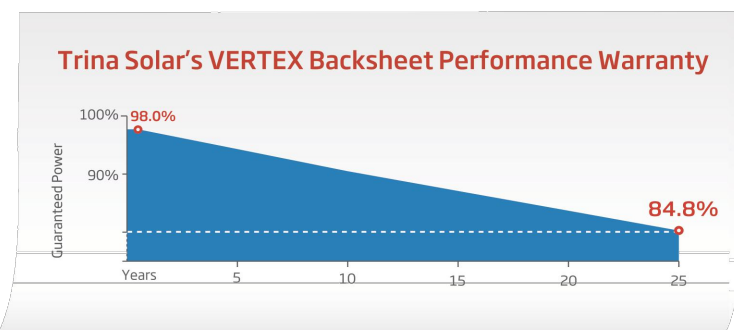
- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.36%) and operating temperature

Comprehensive Products and System Certificates

IEC61215/IEC61730/IEC61701/IEC62716
ISO 9001: Quality Management System
ISO 14001: Environmental Management System
ISO14064: Greenhouse Gases Emissions Verification
ISO45001: Occupational Health and Safety Management System



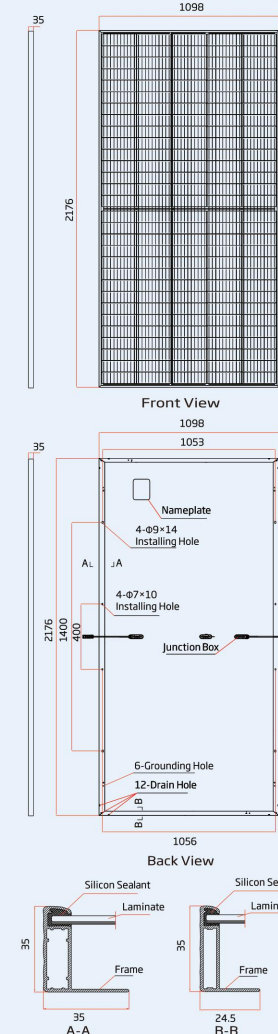
Trina solar



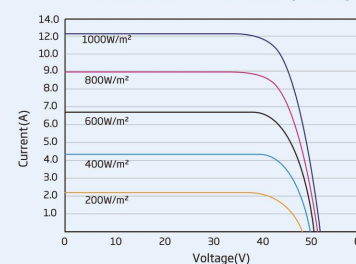
Vertex

BACKSHEET MONOCRYSTALLINE MODULE

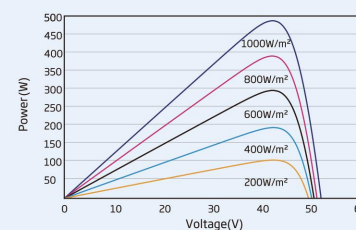
DIMENSIONS OF PV MODULE(mm)



I-V CURVES OF PV MODULE(490W)



P-V CURVES OF PV MODULE(490W)



ELECTRICAL DATA (STC)

	480	485	490	495	500	505
Peak Power Watts- P_{MAX} (Wp)*	480	485	490	495	500	505
Power Tolerance- P_{MAX} (W)	0 ~ +5					
Maximum Power Voltage- V_{MPP} (V)	42.0	42.2	42.4	42.6	42.8	43.0
Maximum Power Current- I_{MPP} (A)	11.42	11.49	11.56	11.63	11.69	11.75
Open Circuit Voltage- V_{OC} (V)	50.8	51.1	51.3	51.5	51.7	51.9
Short Circuit Current- I_{SC} (A)	11.99	12.07	12.14	12.21	12.28	12.35
Module Efficiency η_m (%)	20.1	20.3	20.5	20.7	20.9	21.1

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
*Measuring tolerance: ±3%.

ELECTRICAL DATA (NMOT)

	363	367	371	375	379	382
Maximum Power- P_{MAX} (Wp)	363	367	371	375	379	382
Maximum Power Voltage- V_{MPP} (V)	39.6	39.8	40.0	40.2	40.4	40.6
Maximum Power Current- I_{MPP} (A)	9.15	9.20	9.26	9.32	9.37	9.43
Open Circuit Voltage- V_{OC} (V)	48.0	48.2	48.4	48.6	48.8	49.0
Short Circuit Current- I_{SC} (A)	9.65	9.72	9.77	9.83	9.89	9.94

NMOT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

MECHANICAL DATA

Solar Cells	Monocrystalline
Cell Orientation	150 cells
Module Dimensions	2176 × 1098 × 35 mm (85.67 × 43.23 × 1.38 inches)
Weight	26.3 kg (58.0 lb)
Glass	3.2 mm (0.13 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant Material	EVA
Backsheet	White
Frame	35 mm (1.38 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm ² (0.006 inches ²), Portrait: N 280mm/P 280mm(11.02/11.02inches) Landscape: N 1400 mm / P 1400 mm (55.12/55.12 inches)
Connector	MC4 EV02 / TS4*

*Please refer to regional datasheet for specified connector.

TEMPERATURE RATINGS

NMOT (Nominal Module Operating Temperature)	41 C (±3 C)
Temperature Coefficient of P_{MAX}	-0.36%/ C
Temperature Coefficient of V_{OC}	-0.26%/ C
Temperature Coefficient of I_{SC}	0.04%/ C

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

WARRANTY

- 12 year Product Workmanship Warranty
- 25 year Power Warranty
- 2% first year degradation
- 0.55% Annual Power Attenuation

(Please refer to product warranty for details)

MAXIMUM RATINGS

Operational Temperature	-40 ~ +85 C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	20A

PACKAGING CONFIGURATION

- Modules per box: 30 pieces
- Modules per 40' container: 600 pieces

Trina solar

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

© 2020 Trina Solar Co., Ltd. All rights reserved. Specifications included in this datasheet are subject to change without notice.
Version number: TSM_EN_2020_A www.trinasolar.com