

Product Roadmap 2020

663

September 2020



Size trend of silicon wafer in semiconductor and PV industry





Roadmap | Cell efficiency





Roadmap | Cell technology



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NOTE: Timeline above indicates manufacturing time. Arrival time to customers can vary depending on shipment lead time and availability

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* Total equivalent Pmax = Front side Pmax + Front side Pmax * Bifaciality * Bifacial energy gain at 10% (e.g., desert)





210 wafer modules for HIGHEST BOS cost saving



High Power, Low Voltage, High Current

Maximum expected power : 600W+. Voc: 47.1V, lsc:18.4A



High Efficiency

Benefit from square mono cells and highdensity technology, the efficiency of VERTEX can reach up to 21.2%.





High Reliability

lower first & yearly degradation. 30 years of power warranty for VERTEX (dual glass bifacial version) 25 years of power warranty for VERTEX (backsheet version)



High Power Generation

Excellent temperature coefficient and low irradiation performance.

5% - 30% of additional power generation brought by the backside.





BOS analysis of 600W+ Vertex PV system







Low Voltage, High Current

Product Specification Comparison

Module Type	Reference Module	Trina Solar VERTEX
Power (W)	585	600
Length (mm)	2438	2172
Width (mm)	1135	1303
Weight (kg/pcs)	35	35.3
lsc (A)	13.87	18.4
Voc (V)	53.2	41.7
Module eff.	21.1%	21.2%





Low Voltage, High Current

	41	%
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Higher string power compared to reference module

Comparison Module Quantity per String& Power

Module	Module Quantity/String	Per Module Power	Total Power per String
Trina Solar VERTEX	33	600W	19800W
Reference Module	24	585W	14040W

10 degrees below zero , 1500 V system

Single string power is a core factor that determines the cost of BOS system.





Power guarantee improvement

Trina Solar VERTEX (Bifacial Dual Glass) Performance Warranty

- 1st year degradation $\leq 2\%$
- Average annual degradation from 2^{nd} year $\leq 0.45\%$



166 wafer module for high BOS cost saving

Honey™



TSM-DE08M(II)

PERC Mono, 120 cells

Available in both silver frame and black frame



TALLMAX[®]



DUOMAXtwin

TSM-DE17M(II) TSM-DEG17MC.20(II) PERC Mono, 144 cells PERC Mono bifacial, 144 cells High Power
 Up to 450W in 2020

- Technology PERC mono, 166 wafer half-cut, multi-busbar
- Bifacial Gain (DuomaxTwin) Additional 5% ~ 30% power generation from rear side
- BOS Cost saving
 5~6% BOS cost saving
 (case study Spain, 450W vs. 410W)



Black module for aesthetics

Aesthetics

- Black cell
 - Dedicated cell blackening treatment & Machine selection for color accurate control
 - 1GW black cell capacity
- Black background, frame, main busbar, label and adhesive
- MBB: nearly invisible
- High Power Density
 - 335Wp maximum (NEW version)
 - Square cell to maximize sunlight capture
 - Over 13% extra power can be installed on roof
- 24 authorized patents including 15 inventions, and 3 international papers
- High Reliability
 - Half cut cell: lower working temperature, hot resistance and shading resistance
 - MBB: More strength uniformity; less power loss caused by crack





PERC Mono, 120 cells Black cells, frame, backsheet



Bifacial module for highest performance

- Up to 30% of additional energy production from the rear side of solar modules
- Robust glass-glass structure provides cell protection in all conditions
- Bifacial system solution (TRINAPRO) available: Trina module, Nclave tracker, tier 1 inverter, value added services
- High Reliability
 - Half cut cell: lower working temperature, hot resistance and shading resistance
 - MBB: More strength uniformity; less power loss caused by crack





Double Glass module for highest reliability

- No. 1 Tracker record
 - > 3GW accumulative shipment
 - > 20% global market share
- 10GW capacity
 - Fully automated workshops
 - 99.5% industry leading yield
- 68 authorized patents including 18 inventions, and 3 international standards
- 20% more power and 20% longer lifetime are GARANTEED
 - 30 year performance warranty
 - Annual degradation 0.5% (from the 2nd year)
- Fire class rating A according to IEC 61730
- Robust glass-glass structure provides cell protection in heavy snow or high wind environments

- Double glass design minimizes PID risk in high humidity & high temperature environments
- Professional logistics services and on-site installation instruction to minimize breakage rate (<0.01%)





Conventional modules

- 79 independent IPs of PERC technology, including 56 inventions
- Leading MBB (Multi-Busbar) technology
 - Available on Honey M and Tallmax M
 - More strength uniformity; less power loss caused by crack
 - 24 authorized patents, including 15 inventions, published 3 international papers
 - Trina received the first MBB certificate from TUV Rheinland in China, March 2018
 - Market share among tier 1 manufacturers > 40%
 - Capacity: 7.6 GW in 2019
 - Track record >1GW

- BOM management according to climate at project location
- Half Cut Cell design leads to higher efficiency and lower power loss
 - lower working temperature and hot resistance
 - Less shading resistance



144 cells

Honey

Poly

120 cells



Poly





PERC Mono

120 cells



Application: Residential Rooftop | Channel: Distributor, Installer | Delivery from: Rotterdam



NOTE: Timeline above indicates manufacturing time. Arrival time to customers can vary depending on shipment lead time and availability.



Application: C&I Rooftop | Channel: Distributor, Installer | Delivery from: Rotterdam Warehouse

Application: Large Ground Mount Project | Channel: Ultilities, IPP, PD, EPC | Delivery from: Factory to



Note:

- Double glass versions are also available for models above
- Timeline above indicates manufacturing time. Arrival time to customers can vary depending on shipment lead time and availability.



Application: Large Ground Mount Project | Channel: Ultilities, PD, EPC | Delivery from: Factory to project



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MBB Technology



