

## Characteristics of a PV module

Manufacturer, model : **Trina Solar, TSM-490DE18M(II)**

Availability : Prod. Since 2020

Data source : UL 2020

<b>STC power (manufacturer)</b>	<b>Pnom</b>	<b>490 Wp</b>	<b>Technology</b>	<b>Si-mono</b>
Module size (W x L)	1.098 x 2.176	m <sup>2</sup>	Rough module area	Amodule 2.39 m <sup>2</sup>
Number of cells	2 x 75		Sensitive area (cells)	Acells 2.21 m <sup>2</sup>
<b>Specifications for the model (manufacturer or measurement data)</b>				
Reference temperature	TRef	25 °C	Reference irradiance	GRef 1000 W/m <sup>2</sup>
Open circuit voltage	Voc	51.3 V	Short-circuit current	Isc 12.14 A
Max. power point voltage	Vmpp	42.4 V	Max. power point current	Impp 11.56 A
=> maximum power	Pmpp	490.1 W	Isc temperature coefficient	mulsc 6.2 mA/°C
<b>One-diode model parameters</b>				
Shunt resistance	Rshunt	300 ohm	Diode saturation current	IoRef 0.013 nA
Serie resistance	Rserie	0.24 ohm	Voc temp. coefficient	MuVoc -157 mV/°C
			Diode quality factor	Gamma 0.97
Specified Pmax temper. coeff.	muPMaxR	-0.36 %/°C	Diode factor temper. coeff.	muGamma -0.001 1/°C
<b>Reverse Bias Parameters, for use in behaviour of PV arrays under partial shadings or mismatch</b>				
Reverse characteristics (dark)	BRev	3.20 mA/V <sup>2</sup>	(quadratic factor (per cell))	
Number of by-pass diodes per module		3	Direct voltage of by-pass diodes	-0.7 V

### Model results for standard conditions (STC: T=25°C, G=1000 W/m<sup>2</sup>, AM=1.5)

Max. power point voltage	Vmpp	42.7 V	Max. power point current	Impp	11.49 A
Maximum power	Pmpp	490.5 Wc	Power temper. coefficient	muPmpp	-0.35 %/°C
Efficiency(/ Module area)	Eff_mod	20.5 %	Fill factor	FF	0.788
Efficiency(/ Cells area)	Eff_cells	22.2 %			

