

Characteristics of a PV module

Manufacturer, model : **Trina Solar, TSM-455DE17M(II)**
 Availability : Prod. Since 2020
 Data source : UL 2020

STC power (manufacturer)	Pnom	455 Wp	Technology	Si-mono
Module size (W x L)	1.040 x 2.102	m ²	Rough module area	Amodule 2.19 m ²
Number of cells	2 x 72		Sensitive area (cells)	Acells 1.98 m ²
Specifications for the model (manufacturer or measurement data)				
Reference temperature	TRef	25 °C	Reference irradiance	GRef 1000 W/m ²
Open circuit voltage	Voc	49.8 V	Short-circuit current	Isc 11.61 A
Max. power point voltage	Vmpp	41.2 V	Max. power point current	Impp 11.06 A
=> maximum power	Pmpp	455.7 W	Isc temperature coefficient	mulsc 5.1 mA/°C
One-diode model parameters				
Shunt resistance	Rshunt	300 ohm	Diode saturation current	IoRef 0.012 nA
Serie resistance	Rserie	0.24 ohm	Voc temp. coefficient	MuVoc -148 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
Reverse Bias Parameters, for use in behaviour of PV arrays under partial shadings or mismatch				
Reverse characteristics (dark)	BRev	3.20 mA/V ²	(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/m², AM=1.5)				
Max. power point voltage	Vmpp	41.5 V	Max. power point current	Impp 10.99 A
Maximum power	Pmpp	456.0 Wc	Power temper. coefficient	muPmpp -0.35 %/°C
Efficiency(/ Module area)	Eff_mod	20.9 %	Fill factor	FF 0.789
Efficiency(/ Cells area)	Eff_cells	23.0 %		

