



# TimesOne™

The Energy Efficiency Company

March 2008

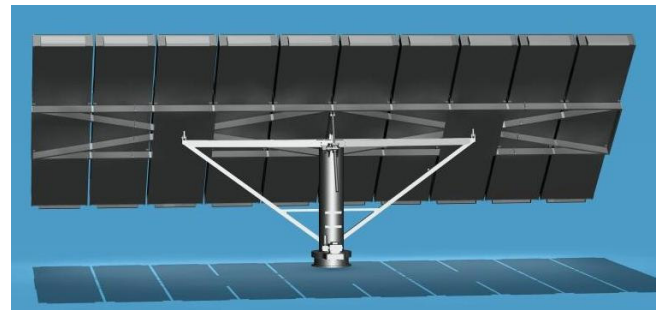
25 kW CPV Solar Array Fact Sheet

## 25 kW<sub>DC</sub> Concentration Photovoltaic (CPV) Array for Large Commercial and Utility Scale Electrical Power Generation

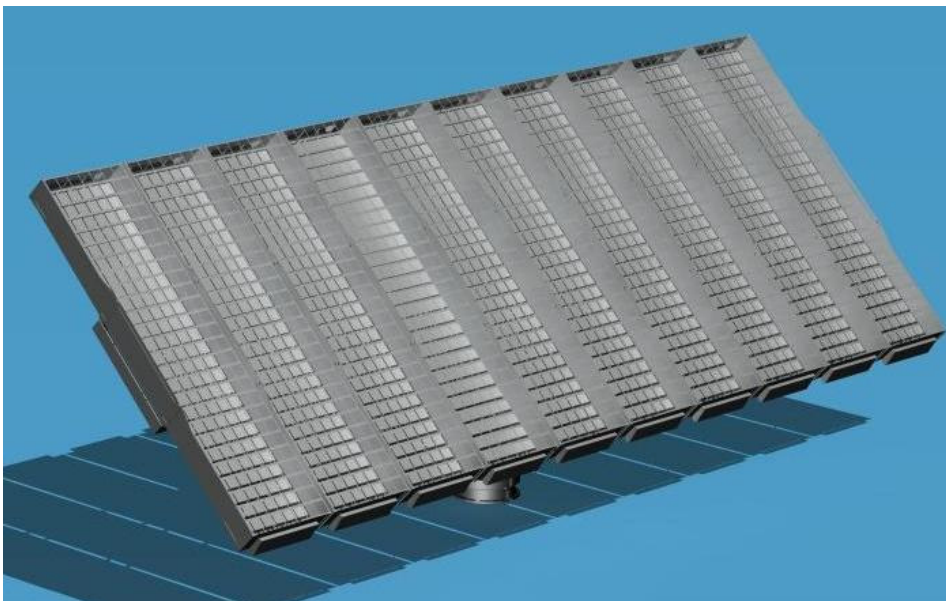


### Features and Characteristics

The Times One Solar Power System is designed to effectively deliver 25 kW peak DC power for unattended operation in either grid-tied or off-grid applications. The heart of the system is the Times One manufactured ultra high efficiency Multi-Junction (MJ) solar cell, leveraged from our leading Spacecraft Power technology. The system is designed for 500X concentration, using Fresnel optics and a secondary optical reflector.



The Times One array is configured with ten (10) modular 2.5 kW sub-arrays, each containing 182 MJ solar cell receivers. A reliable structure provides safe operation in all conditions, and an extremely accurate 2-axis tracking element maintains focus on the sun, allowing for maximum power output. The array was designed for ease of assembly, installation and maintenance.



# Times One 25 kW<sub>DC</sub> CPV Array for Large Commercial and Utility Scale Electrical Power Generation

## Electrical

- Each 25 kW CPV array contains its own power management electronics
- NEC compliant component and wiring architecture. Conforms to IEC 62108
- Cell and string-level diode protection. Modular sub-array circuit breaker protection
- Photovoltaic wiring and connectors
- Modular sub-array and cell string-level connection flexibility to match inverter design

## Mechanical

- Total Width: 1814 cm. Total Height: 740 cm. Total Collecting Area: 95 m<sup>2</sup>. Total Weight: 8620 kg.
- 500x point focus Fresnel lens optics, 1 cm<sup>2</sup> solar cells, distributed solar panel design with passive cooling
- Modular construction consisting of 10 (ten) 2.5 kW modular sub-arrays per array, assembled onto a weather resistant steel structure, with integral tracking system
- Decentralized 2-axis tracking, including Times One unique control software, for fully unattended operation
- Designed to withstand 145 km / h winds

## System

- Proprietary user-friendly control system with continuous data and state-of-health monitoring for remote fault detection and maximization of power production
- Designed for efficient assembly and installation
- Unique aspect ratio for minimum shadow-free land use. Packing density approximately 2.3 ha / MW without shadowing adjacent arrays (sun-angle 15° above the horizon)
- Eye-safe, no visible “bright spots”
- Clean, quiet, non-polluting

## Specifications

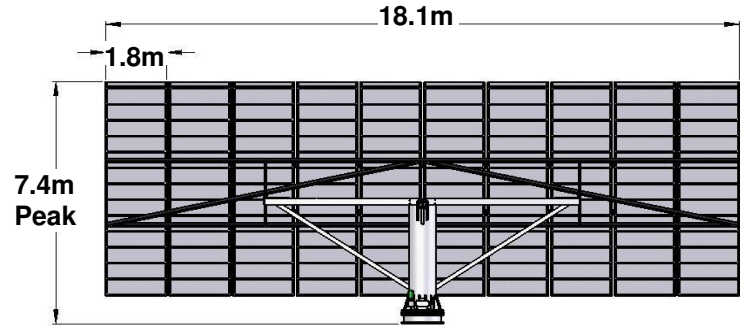
	Standard Test Conditions	Standard Operating Conditions	PVUSA Test Conditions
Peak Power Output (kW <sub>DC</sub> )	25.5	25.0	21.5
DNI (W / m <sup>2</sup> )	1000	1000	850
Cell Temperature (°C)	25	-	-
Ambient Temperature (°C)	n/a	20	20
Wind Speed (m / s)	n/a	3	1
I <sub>pp</sub> (A)	53.2	56.3	47.8
V <sub>pp</sub> (V)	480	444	449
I <sub>sc</sub> (A)	59.2	62.2	52.9
V <sub>oc</sub> (V)	552	514	520

All specifications assume AM1.5D spectrum scaled to the indicated irradiance level

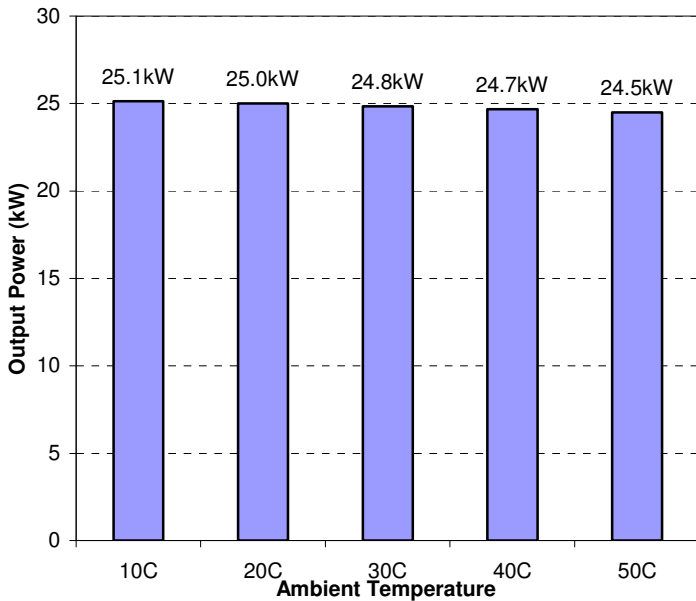


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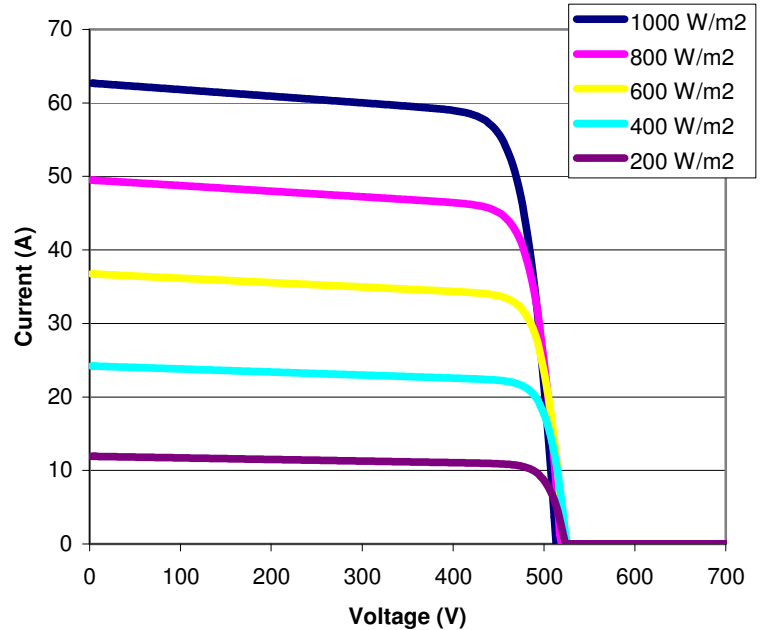
ABSOLUTE MAXIMUM RATINGS	
Operating Temperature (min to max, °F/°C)	-40 to 122°F / -40 to 50°C
Storage Temperature (min to max, °F/°C)	-40 to +140°F / -10 to 60°C
TEMPERATURE COEFFICIENTS	
$\alpha P_{mp}$ (%/°C)	- 0.16
$\alpha V_{mp}$ (%/°C)	-0.21
$\alpha I_{mp}$ (%/°C)	0.05
$\alpha V_{oc}$ (%/°C)	-0.23
$\alpha I_{sc}$ (%/°C)	0.05



## OUTPUT POWER TEMPERATURE DEPENDENCE 1000 W/m<sup>2</sup>



## IRRADIANCE DEPENDENCE (20°C Ambient)



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