



TimesOne™

The Energy Efficiency Company

March 2008

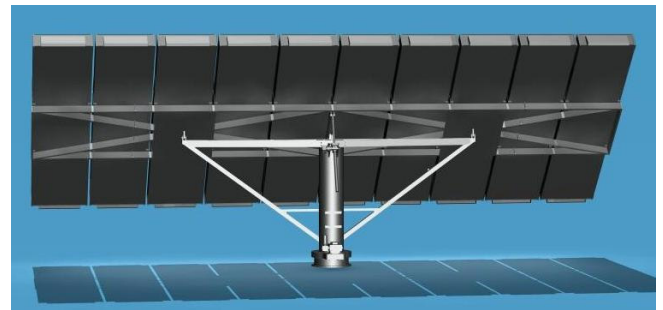
25 kW CPV Solar Array Fact Sheet

25 kW_{DC} Concentration Photovoltaic (CPV) Array for Large Commercial and Utility Scale Electrical Power Generation

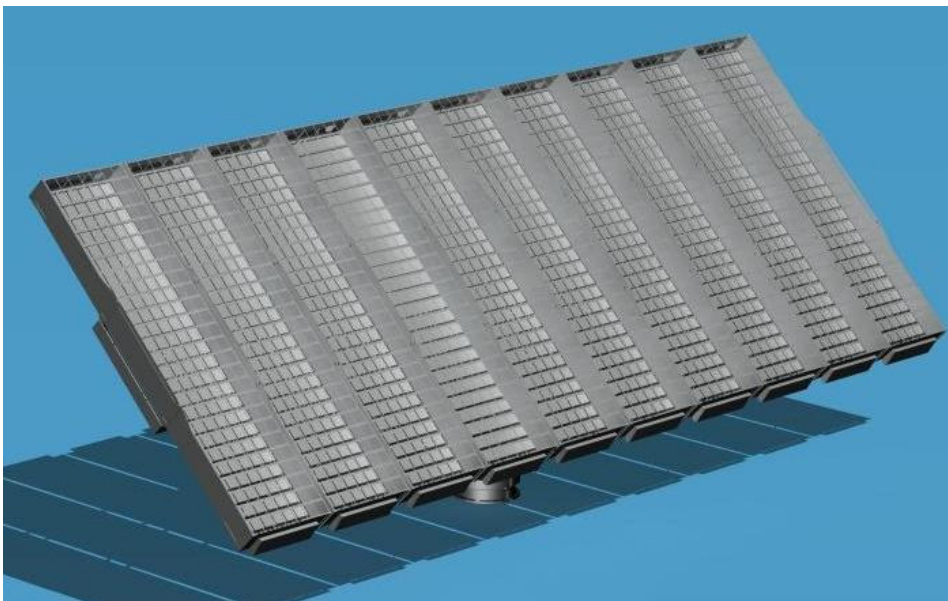


Features and Characteristics

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_{DC} 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 m². Total Weight: 8620 kg.
- 500x point focus Fresnel lens optics, 1 cm² 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

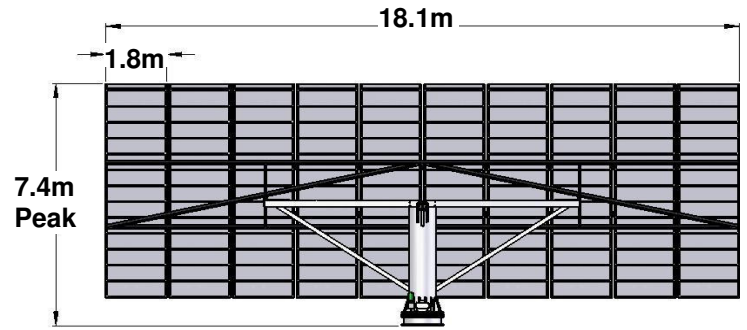
	Standard Test Conditions	Standard Operating Conditions	PVUSA Test Conditions
Peak Power Output (kW _{DC})	25.5	25.0	21.5
DNI (W / m ²)	1000	1000	850
Cell Temperature (°C)	25	-	-
Ambient Temperature (°C)	n/a	20	20
Wind Speed (m / s)	n/a	3	1
I _{pp} (A)	53.2	56.3	47.8
V _{pp} (V)	480	444	449
I _{sc} (A)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

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

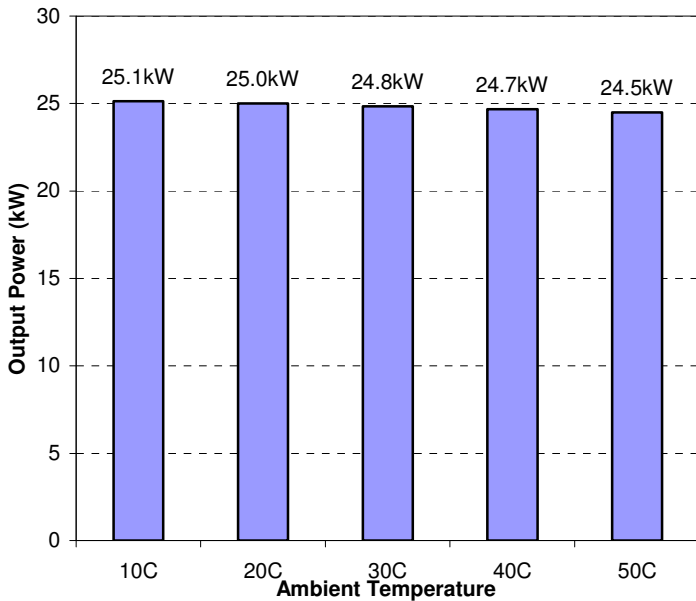


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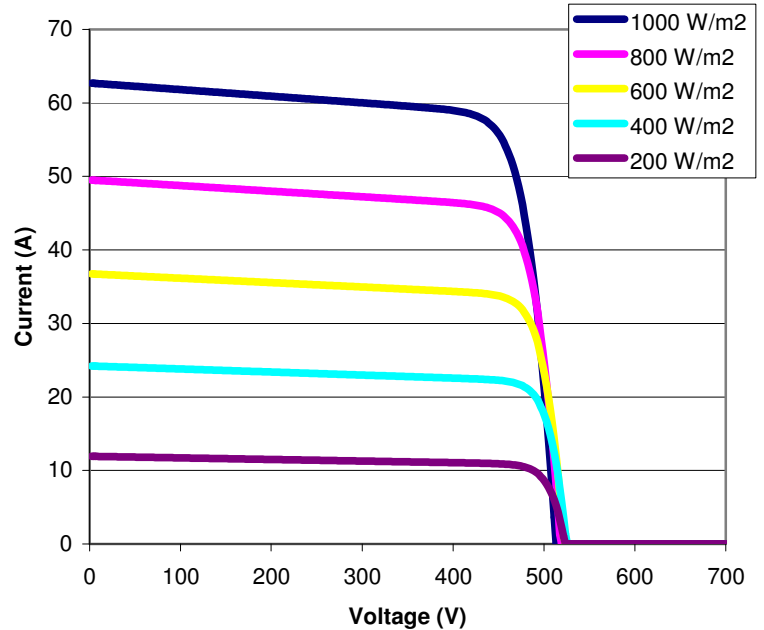
ABSOLUTE MAXIMUM RATINGS	
Operating Temperature (min to max, °F/°C)	-40 to 122°F / -40 to 50°C
Storage Temperature (min to max, °F/°C)	-40 to +140°F / -10 to 60°C
TEMPERATURE COEFFICIENTS	
αP_{mp} (%/°C)	-0.16
αV_{mp} (%/°C)	-0.21
αI_{mp} (%/°C)	0.05
αV_{oc} (%/°C)	-0.23
αI_{sc} (%/°C)	0.05



OUTPUT POWER TEMPERATURE DEPENDENCE 1000 W/m²



IRRADIANCE DEPENDENCE (20°C Ambient)



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