



Photovoltaic Module Approval Certificate

ES08-NT90-0090

Awarded to:

Evergreen Solar Inc
138 Bartlett Street
Marlboro, MA 01752

Issue Date: 10/28/2009

Manufacturer: **Evergreen Solar**

Model Number: **ES-A-200-fa2 or -fa3**

Module Type: Flat Plate

Module Family: Polycrystalline

Mounting Type: Rail Mounted

Parameter	Symbol (units)	Manufacturer Rating	FSEC Rating
Maximum Power @ STC	P_{max} (Watts)	204.99	
Voltage at Maximum Power @ STC	V_{pmax} (Volts)	18.1	
Current at Maximum Power @ STC	I_{pmax} (Amps)	11.05	
Open Circuit Voltage @ STC	V_{oc} (Volts)	22.6	
Short Circuit Current @ STC	I_{sc} (Amps)	11.80	
Nominal Operating Cell Temperature	NOCT (°C)	45.4	
Temperature Coefficients	$\beta_{V_{oc}}$ at V_{oc} (%/°C)	-0.31	
	$\beta_{V_{pmax}}$ at V_{pmax} (%/°C)	-0.40	
	$\alpha_{I_{sc}}$ at I_{sc} (%/°C)	+0.05	
	$\alpha_{I_{pmax}}$ at I_{pmax} (%/°C)	-0.03	
	$\gamma_{P_{max}}$ at P_{max} (%/°C)	-0.43	
Voltage at Maximum Power and Low Irradiance	V_{low} (Volts)	17.8	
Current at Maximum Power and Low Irradiance	I_{low} (Amps)	2.25	
Voltage and Maximum Power and NOCT	V_{NOCT} (Volts)	146.4	
Current at Maximum Power and NOCT	I_{NOCT} (Amps)	8.87	

Verified testing in accordance with UL1703 by a Nationally Recognized Test Lab? Yes No

Number of Cells in Series Strings: 19

Number of Strings in Parallel: 3x2

Fire Class: C

Modules with certification numbers including the designation -NT90- have not been tested by the Florida Solar Energy Center. These modules have been certified at 90% of nominal nameplate power in accordance with the minimum power output requirements of UL-1703.

The FSEC PV Module Certification Nomenclature is: AA-YY-BBBB-XXXX

AA - Company Designation

YY - Year Certified

BBBB - Test at FSEC, ACTL-Tested by another accredited testing laboratory

XXXX - Sequential number

Module numbers may be followed by additional alphanumeric characters, (C for locking receptacles, U1F for current modules, UC1 for locking type connector models, etc.).



Photovoltaic Module Approval Certificate

ES08-FSEC-0091

Awarded to:

Evergreen Solar Inc
138 Bartlett Street
Marlboro, MA 01752

Issue Date: 10/28/2009

Manufacturer: **Evergreen Solar**

Model Number: **ES-A-205-fa2 or -fa3**

Module Type: Flat Plate

Module Family: Polycrystalline

Mounting Type: Rail Mounted

Parameter	Symbol (units)	Manufacturer Rating	FSEC Rating
Maximum Power @ STC	P_{max} (Watts)	209.99	
Voltage at Maximum Power @ STC	V_{pmax} (Volts)	18.2	
Current at Maximum Power @ STC	I_{pmax} (Amps)	11.27	
Open Circuit Voltage @ STC	V_{oc} (Volts)	22.7	
Short Circuit Current @ STC	I_{sc} (Amps)	11.93	
Nominal Operating Cell Temperature	NOCT (°C)	45.4	
Temperature Coefficients	$\beta_{V_{oc}}$ at V_{oc} (%/°C)	-0.31	
	$\beta_{V_{pmax}}$ at V_{pmax} (%/°C)	-0.40	
	$\alpha_{I_{sc}}$ at I_{sc} (%/°C)	+0.05	
	$\alpha_{I_{pmax}}$ at I_{pmax} (%/°C)	-0.03	
	$\gamma_{P_{max}}$ at P_{max} (%/°C)	-0.43	
Voltage at Maximum Power and Low Irradiance	V_{low} (Volts)	17.9	
Current at Maximum Power and Low Irradiance	I_{low} (Amps)	2.30	
Voltage and Maximum Power and NOCT	V_{NOCT} (Volts)	150.1	
Current at Maximum Power and NOCT	I_{NOCT} (Amps)	9.04	

Verified testing in accordance with UL1703 by a Nationally Recognized Test Lab? Yes No

Number of Cells in Series Strings: 19

Number of Strings in Parallel: 3x2

Fire Class: C

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The FSEC PV Module Certification Nomenclature is: AA-YY-BBBB-XXXX

AA - Company Designation

YY - Year Certified

BBBB - Test at FSEC, ACTL-Tested by another accredited testing laboratory

XXXX - Sequential number

Module numbers may be followed by additional alphanumeric characters, (C for locking receptacles, U1F for current modules, UC1 for locking type connector models, etc.).



Photovoltaic Module Approval Certificate

ES08-NT90-0092

Awarded to:

Evergreen Solar Inc
138 Bartlett Street
Marlboro, MA 01752

Issue Date: 10/28/2009

Manufacturer: Evergreen Solar

Model Number: ES-A-210-fa2 or -fa3

Module Type: Flat Plate

Module Family: Polycrystalline

Mounting Type: Rail Mounted

Table with 4 columns: Parameter, Symbol (units), Manufacturer Rating, FSEC Rating. Rows include Maximum Power @ STC, Voltage at Maximum Power @ STC, Current at Maximum Power @ STC, Open Circuit Voltage @ STC, Short Circuit Current @ STC, Nominal Operating Cell Temperature, Temperature Coefficients, Voltage at Maximum Power and Low Irradiance, Current at Maximum Power and Low Irradiance, Voltage and Maximum Power and NOCT, Current at Maximum Power and NOCT.

Verified testing in accordance with UL1703 by a Nationally Recognized Test Lab? Yes No

Number of Cells in Series Strings: 19

Number of Strings in Parallel: 3x2

Fire Class: C

Modules with certification numbers including the designation -NT90- have not been tested by the Florida Solar Energy Center. These modules have been certified at 90% of nominal nameplate power in accordance with the minimum power output requirements of UL-1703.

The FSEC PV Module Certification Nomenclature is: AA-YY-BBBB-XXXX

AA - Company Designation

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