

SPECIFICATION FOR PRODUCTS

PRODUCTS NAME **PHOTOVOLTAIC MODULE**

MODEL NAME **PV-MF120EA2LF**

Signature

Should this specification be approved, please be signed or sealed in the signature block on one of the specifications offered and be returned. This specification shall be approved unless the specification with sign is returned within one month from issue.

DATE OF ISSUE

**mitsubishi electric corporation
nakatsugawa works japan**

Specification for Products

MODEL NAME : PV MODULE

PV-MF120EA2LF

APPROVED	CHECKED	WRITTEN
March 23, 2004 Y. Shinoda	/	March 23, 2004 T. Takada

1. SCOPE

This specification covers the design, performance, and warranty for Photovoltaic module, PV-MF120EA2LF, hereinafter referred as to "PV module", manufactured by Mitsubishi Electric Corporation Nakatsugawa Works.

2. GENERAL

PV module shall be installed in Photovoltaic system and be used to generate DC power using solar energy.

3. CERTIFICATION

PV module is :
listed by Underwriter's Laboratories for UL 1703.
certified for IEC 61215.
certified for TUV class II 600VDC.

4. DESIGN CONDITION

4.1 Climate Condition

Ambient temperature: -20°C to 40°C
Operating temperature: -20°C to 83°C
Snowfall pressure: below 2000Pa.
Wind pressure: below 3000Pa.
Water resistance: PV module shall not be immersed in water and shall not be continually exposed to water from sprinkler and fountain etc.
Corrosion resistance: except for sulfurous area and corrosive salt area
Corrosive area: area within 500 m from sea and area where salty wind hit directly.
Sulfurous area: area near sulfurous volcano and sulfurous spring.

4.2 Install Condition

PV module shall be used under the condition described hereinafter

- 4.2.1 Mechanical condition
No vibration
No impact force
With draft under PV modules
- 4.2.2 Electrical condition
Maximum system operation voltage: 600V
Fuse rating: 15A

5. STORAGE CONDITION

Room temperature: -20°C to 50°C
Room relative humidity: below 90%. No condensation.

6. ELECTRIC PERFORMANCE

Electric performance shall be values that are corrected to Standard Test Conditions (STC) according to IEC 60891 from values measured with the measuring condition.

Table 6.1 Electric performance

Term	Abbr.	Unit	Nominal value	Tolerance
Maximum power	Pmax	W	120	Nominal value +10%, -5%
Open circuit voltage	Voc	V	23.9	Nominal value \pm 10%
Short circuit current	Isc	A	6.89	Nominal value \pm 10%
Maximum power voltage	Vmp	V	19.0	-
Maximum power current	Imp	A	6.30	-

Standard Test Conditions (STC)

- Module temperature: 25°C
- Irradiance: 1000W/m²
- Spectral distribution: AM1.5 reference global solar radiation according to IEC 60904-3.

Measuring condition

- Module temperature: 15 to 35°C
- Irradiance: 1000W: 1000 \pm 50W/m²

7. STRUCTURE

The structure is shown in attached drawing NR603A19.

8. LEAD - FREE SOLDER

Lead-free solder is used for the interconnection circuitry and terminals.

9. PACKAGING AND RATING LABEL

9.3 Packaging

Packaging style is shown in appendix 1.

9.4 Rating Label

Rating label is shown in appendix 2.

10. WARRANTY

Limited Warranty for electric performance shall be subject to "MITSUBISHI ELECTRIC LIMITED WARRANTY FOR MITSUBISHI BRAND PV MODULES".

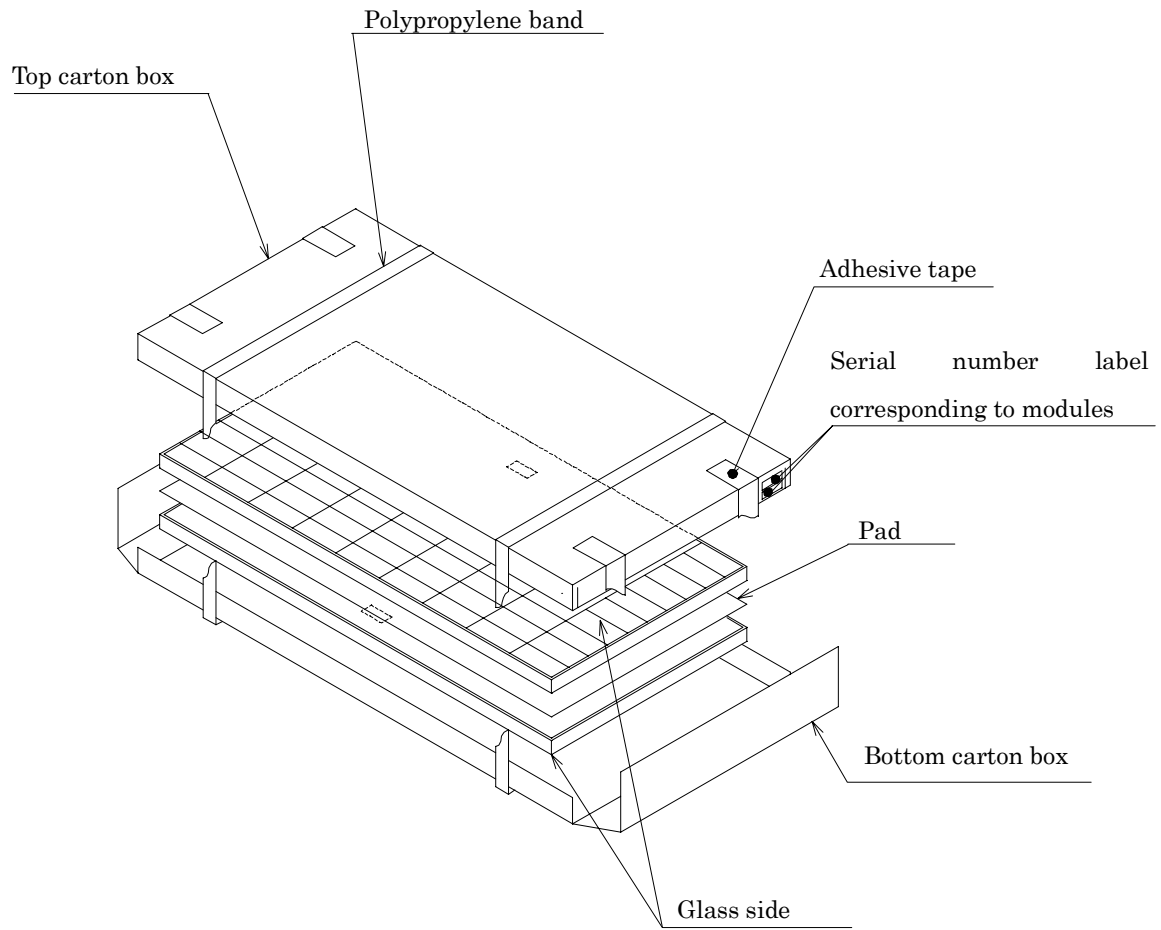
11. CAUTION

- Conditions and instructions stipulated in this specification shall be observed.
- PV module shall be used as part of general PV system under the condition stipulated in this specification. Quality, performance and safety of PV module shall be confirmed by a user to use as a part of any other systems.
- Safety in the strength, materials durability and the mounting structures for installing the PV module, shall be accordance with acceptable and approved engineering standards.
- PV module shall be installed not to cause any accidents resulting in injury or death and any damages to property.
- One or multi-connected PV modules can generate high voltage and current and may result in electrical shock. Therefore live parts of output terminals of PV module shall not be touched and be insulated properly.
- PV module has not been designed for, nor shall be installed with the use of, concentrated light sources such as lenses and concentrating mirrors.
- A glass of PV module is slippery and fragile. PV module shall not be stepped on.
- PV module shall not be dropped. Solid bodies such as tools shall not be dropped on PV module. Broken module shall not be used.
- The rear of the PV module can be easily damaged by sharp edges, resulting in the rupture of the protective backsheet. Such an event will shorten the life of the module and be outside the warranty conditions offered."





12. CONSULTATION

Any question arising out of, or in connection with this specification or any matter not stipulated herein shall be settled each time upon consultation between both parties.

Appendix 1: Packaging style

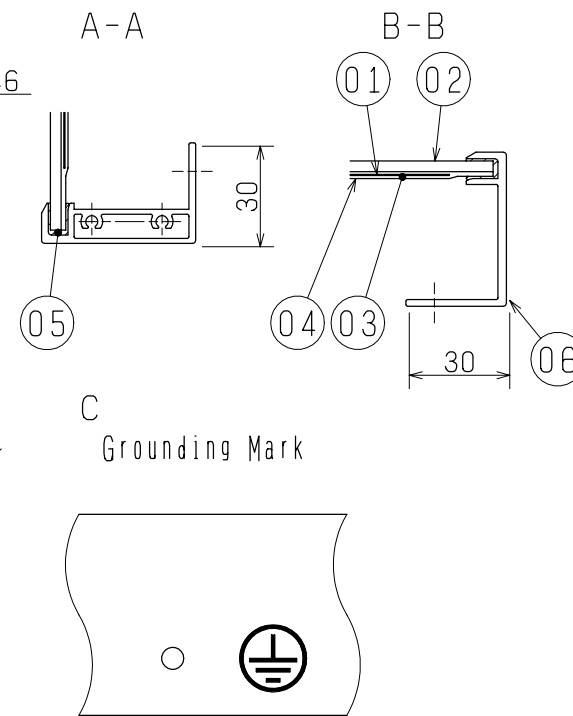
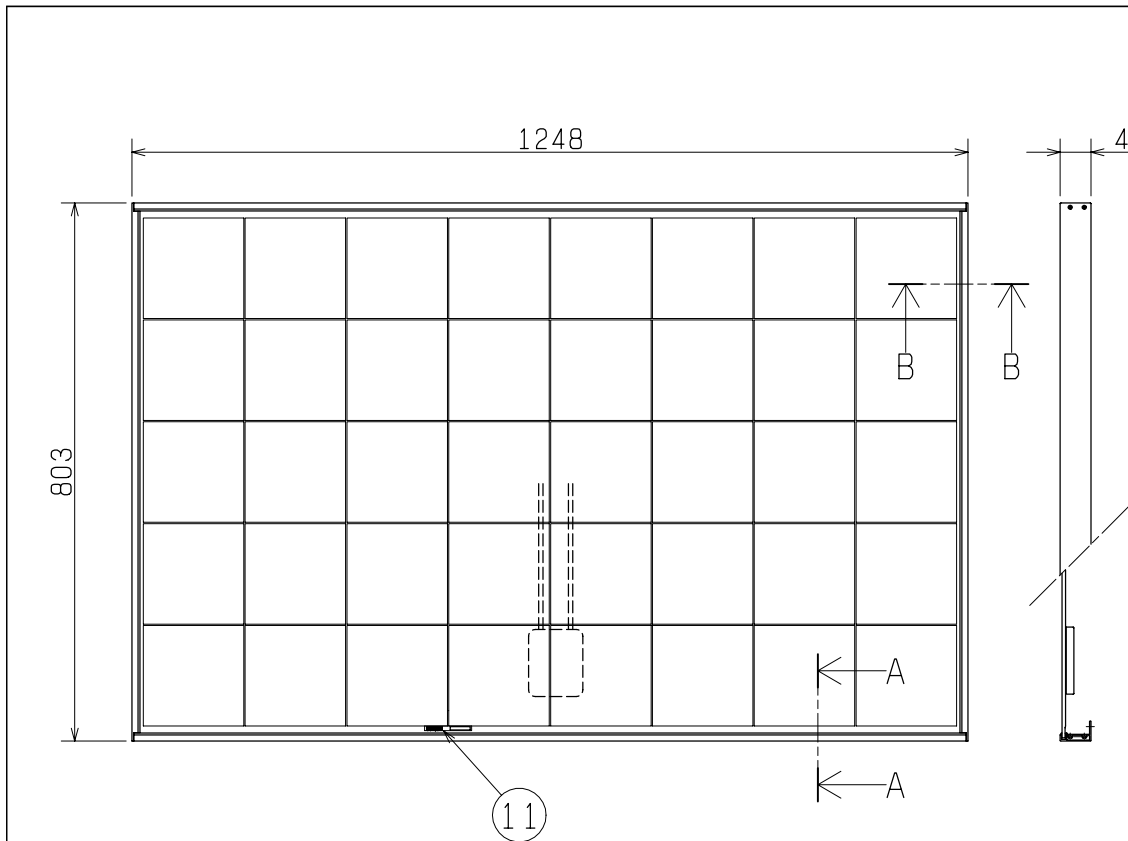


Appendix 2: Rating label

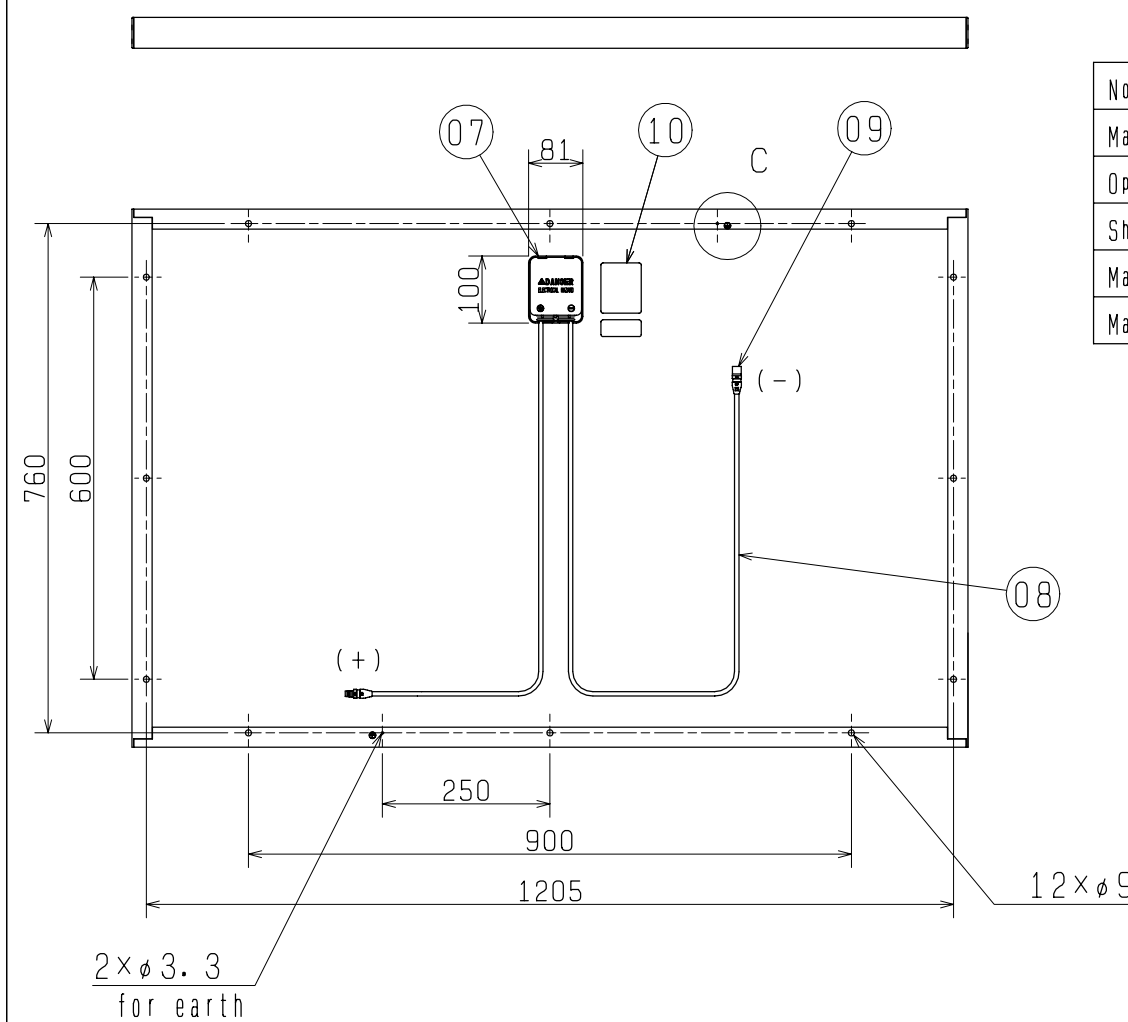
 MITSUBISHI ELECTRIC		PHOTOVOLTAIC MODULE MODEL PV-MF120EA2LF	
		SERIAL NO. EBYMMDDXXXXXX	
MAX. POWER(Pmax):	120W	WARRANTED MIN. Pmax:	114W
OPEN CIRCUIT VOLTAGE(Voc):	23.9V	MAX. POWER VOLTAGE(Vmp):	19.0V
SHORT CIRCUIT CURRENT(Isc):	6.89A	MAX. POWER CURRENT(Isc):	6.30A
MIN. BYPASS DIODE(I _f):	12.5A	FUSE RATING:	15A
MAX. SYSTEM VOLTAGE:	600V	AT STC 1000W/m ² , AM 1.5, Cell T 25°C	
WARNING ELECTRICAL HAZARD			
This module exposed to sunlight generates high voltage and current. Follow all safety precautions. Before installation, operation and maintenance, be sure to read and understand the instruction manual			
3MA9 LISTED E219613 Photovoltaic Module  FIRE RATING CLASS C Max. Sys. Voltage 600V		IEC 61215 certified Type: F123EA2LFC	
		 Max. Sys. Voltage 600V	
MADE IN JAPAN			

REVISION RECORD

DATE	Revision index	Description	Written	Approved
March 23, 2004	-	Established	T. Takada	-



No.	Component	Material	Remarks
01	Cell	Polycrystalline Silicon	150mm X 150mm
02	Cover glass	Tempered glass	
03	Encapsulant	EVA	
04	Back film	PVF/PET	Color:White
05	Sealing	Butyl rubber	
06	Frame	Aluminium Alloy	Color:Silver
07	Junction box		including diodes
08	Output cable		Length:Plus 800±50mm Minus 1250±50mm
09	Connector	UL-94 HB(outer jacket)	MC connector(Water-proof) PV-KBTII-UR PV-KSTII-UR
10	Rating label	Polyester	description; 1.Serial number 2.Nominal Characteristic
11	Control number label	PET	description; 1.Control number 2.bar cord



■ Performance

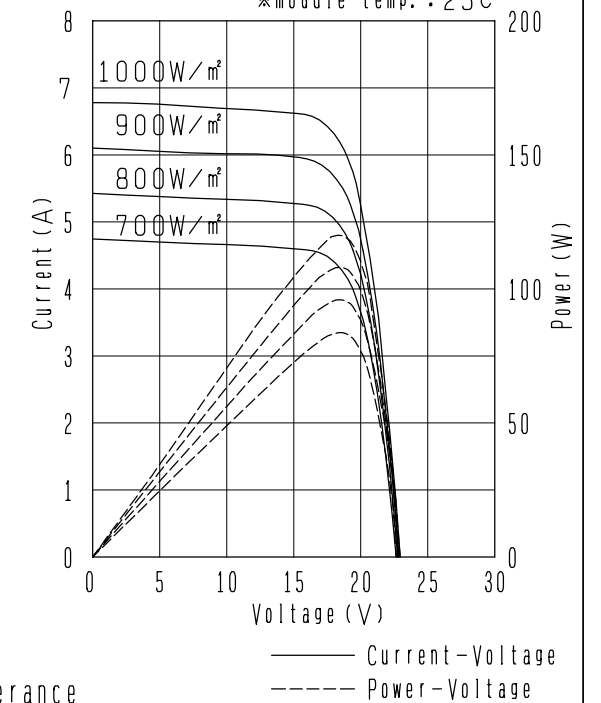
Nominal Value		Tolerance
Maximum power (Pmax)	120W	Nominal value +10%, -5%
Open circuit voltage (Voc)	23.9V	Nominal value ±10%
Short circuit current (Isc)	6.89A	Nominal value ±10%
Maximum power voltage (Vmp)	19.0V	-
Maximum power current (Imp)	6.30A	-

- Standard Test Condition (STC)
 1. Module temperature : 25°C
 2. Irradiance : 1000W/m²
 3. Spectral distribution : AM 1.5 reference global solar radiation(1).
 Note (1); See IEC 60904-3.

- Weight : 12.5kg
- Packaging : 2pcs/set

- Caution
 1. Ground PV module and Mounting structure.
 2. Specifications are subject to change without notice.

■ Electrical Performance
*module temp. : 25°C



length (mm)	Tolerance				
	30 ≤	120 ≤	315 ≤	1000 ≤	1000 ≤
	<30	<120	<315	<1000	<2000
tolerance	±0.6	±1.1	±1.6	±2.8	±4.5

3RD ANGLE PROJECTION DIM IN mm	DATE	MODEL	PV-MF120EA2LF	
	June. 19. 2003		MITSUBISHI PHOTOVOLTAIC SYSTEM	
MITSUBISHI ELECTRIC CORP.		NUMBER	NR603A19	1/1