

SPECIFICATION FOR PRODUCTS

PRODUCTS NAME **PHOTOVOLTAIC MODULE**

MODEL NAME **PV-MF155EB3**

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 **Sept. 2, 2005**

**MITSUBISHI ELECTRIC CORPORATION
NAKATSUGAWA WORKS JAPAN**

Specification for Products

MODEL NAME : PV MODULE

PV-MF155EB3

APPROVED	CHECKED	WRITTEN
Jan. 31, 2005	Jan. 31, 2005	Jan. 26, 2005
A. Takami	H. Yoshinari	K. Shimasaki

1. SCOPE

This specification covers the design, performance, and warranty for Photovoltaic module, PV-MF155EB3, 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 TÜV Safety Class II 780VDC.

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/damage: PV module shall not be immersed in water and shall not be continually exposed to water from a sprinkler, fountain or the like.

Corrosion warning: PV module shall not be installed in corrosive area like,

Salty area: area within 500 m from a body of salt water and/or 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 for UL 1703, 1000V for IEC 61215,
780V for TUV Safety Class II

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	155	Nominal value +10%,-5%
Open circuit voltage	Voc	V	30.0	Nominal value $\pm 10\%$
Short circuit current	Isc	A	7.32	Nominal value $\pm 10\%$
Maximum power voltage	Vmp	V	23.4	-
Maximum power current	Imp	A	6.62	-

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 NR605A02A.

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".

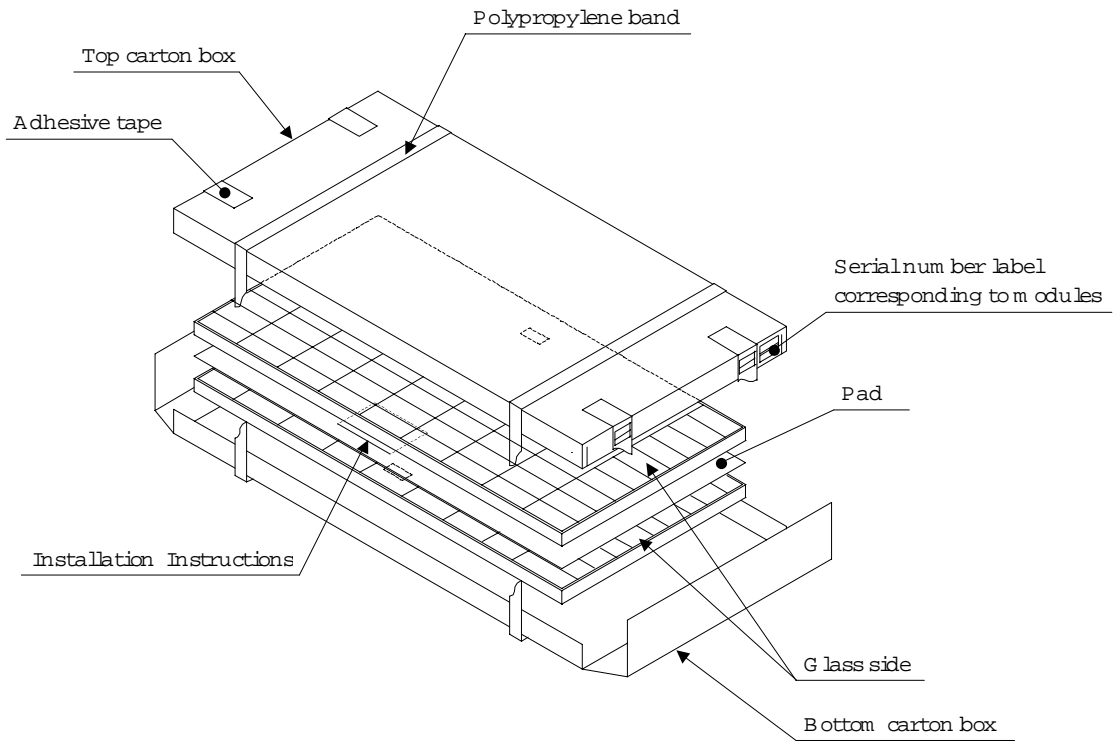
11. CAUTION

- 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 current 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.



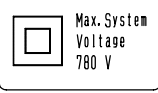

12. CONSULTATION

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

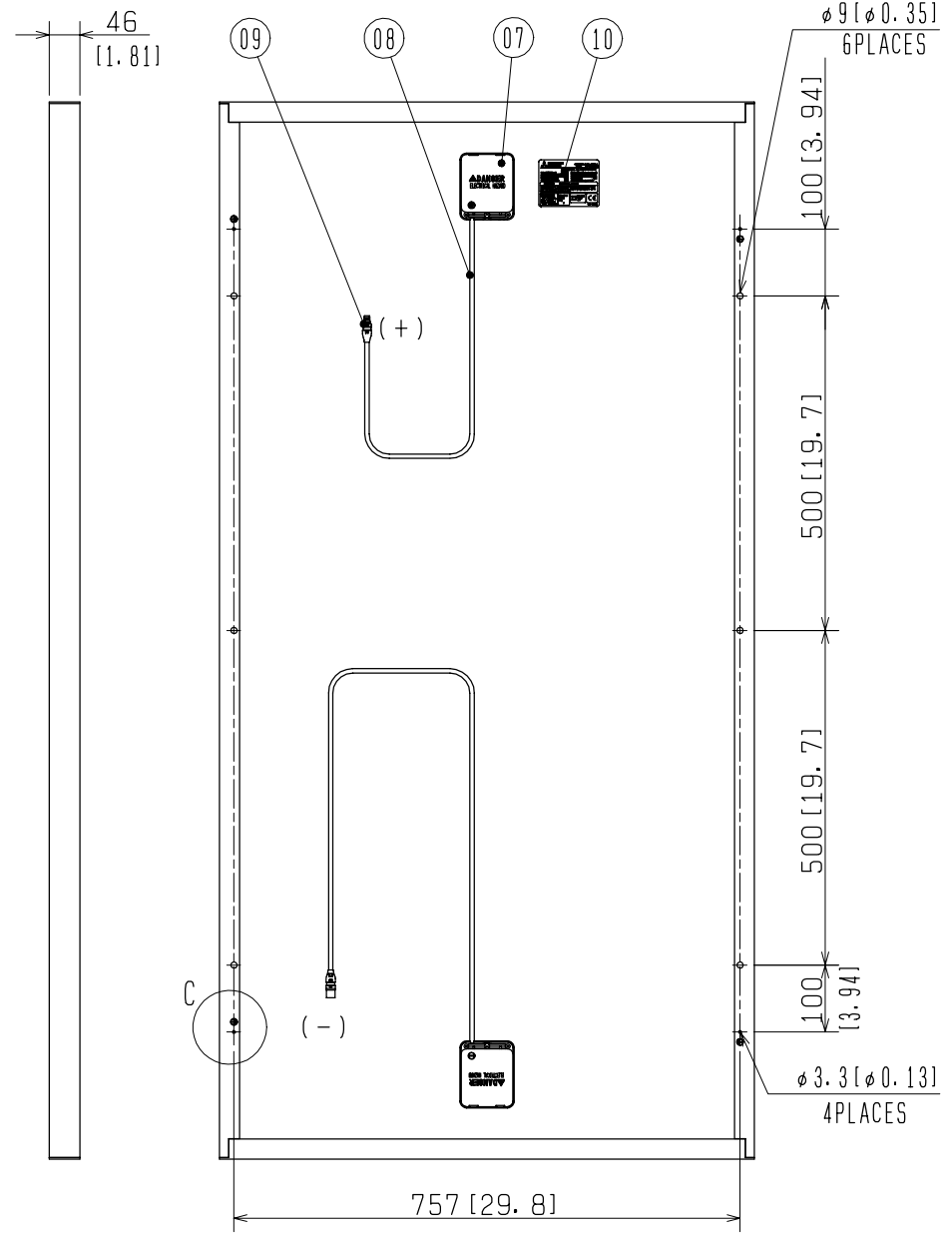
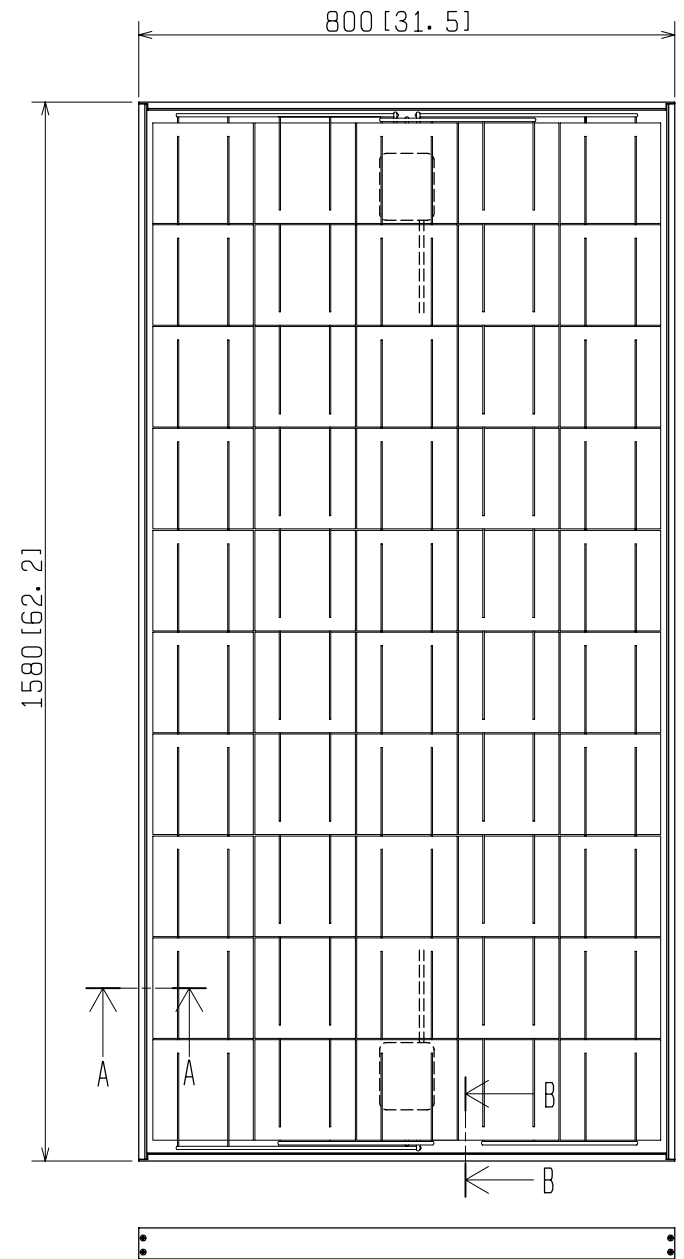


Appendix 2: Rating label

 MITSUBISHI ELECTRIC	PHOTOVOLTAIC MODULE MODEL PV-MF155EB3	
	SERIAL NO. NCYYMDDXXXXXX	
MAX. POWER (P _{max}): 155W OPEN CIRCUIT VOLTAGE (V _{oc}): 30.0V SHORT CIRCUIT CURRENT (I _{sc}): 7.32A MIN. BYPASS DIODE (I _f): 12.5A	WARRANTED MIN. P _{max} : 147.3W MAX. POWER VOLTAGE (V _{mp}): 23.4V MAX. POWER CURRENT (I _{mp}): 6.62A FUSE RATING: 15 A 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.		
LISTED 3MA9 E219613 Photovoltaic Module  FIRE RATING CLASS C Max. System Voltage 600V	IEC 61215 certified	 Max. System Voltage 780 V
		 MADE IN JAPAN

REVISION RECORD

DATE	Revision index	Description	Written	Approved
Jan. 26, 2005	-	Established	K. Shimasaki	-
Sept. 1, 2005	A	<p>7. STRUCTURE</p> <ul style="list-style-type: none"> - Drawing No. was NR605A02. <p>Appendix 1: Packaging style</p> <ul style="list-style-type: none"> - The glass side of lower module was downward. <p>Appendix 2: Rating label</p> <ul style="list-style-type: none"> - The printing of "MAX. SYSTEM VOLTAGE 780V" is deleted. <p>Page 7</p> <ul style="list-style-type: none"> - The drawing of cross-section A-A is changed for its frame structure. 	K. Shimasaki	Sept. 1, 2005 K. Utsunomiya



No.	Component	Material	Remarks
01	Cell	Polycrystalline Silicon	150mm × 150mm
02	Cover glass	Tempered glass	
03	Encapsulant	EVA	
04	Back film	PVF/PET/PVF	Front color:White Back color :Black
05	Sealing	Hotmelt type seal agent	
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

■ Performance

Nominal Value		Lower Limit
Maximum power (Pmax)	155W	95% of nominal value
Open circuit voltage (Voc)	30.0V	90% of nominal value
Short circuit current (Isc)	7.32A	90% of nominal value
Maximum power voltage (Vmp)	23.4V	-
Maximum power current (Imp)	6.62A	-

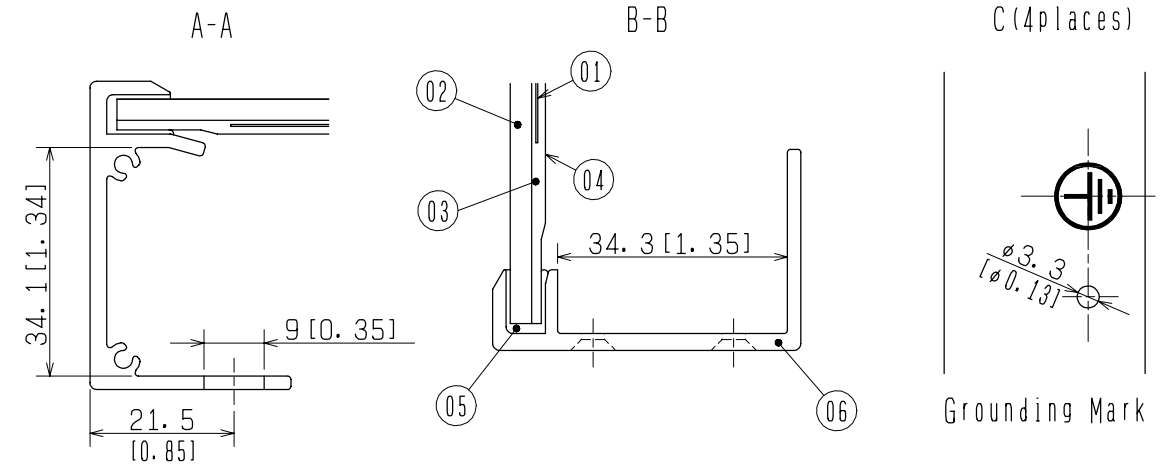
- Standard Test Condition (STC)
 1. Module temperature : 25°C
 2. Irradiance : 1000W/m²
 3. Spectral distribution : AM 1.5 reference global solar radiation (1).
 Note (1): See IEC 60904-3.

■ Weight : 15.5kg (34.2lbs.)

■ Packaging : 2pcs/set

■ Caution

1. Ground PV module and mounting structure.
2. Specifications is subject to change without notice.



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

3RD ANGLE PROJECTION DIM IN mm [inch]	DATE	MODEL	PV-MF155EB3 MITSUBISHI PHOTOVOLTAIC SYSTEM PV MODULE FOR FLAT ROOF
	Jan. 26. 2005		
MITSUBISHI ELECTRIC CORP.		NUMBER	NR605A02A