

LIMITED WARRANTY AND SPECIFICATIONS

Between
user name
and
Kaneka Corporation

For Kaneka Thin film PV Modules
(GSA type)

KANEKA CORPORATION

OVERSEAS MARKETING

PV BUSINESS DEVELOPMENT DIVISION

3-2-4, NAKANOSHIMA, KITA-KU
OSAKA 530-8288, JAPAN



Effective from August 01, 2004

A. Limited Warranty

1. Scope and period of warranty

This warranty applies exclusively to you for the Kaneka thin-film silicon photovoltaic modules (hereinafter referred to as the MODULES) you purchased directly from Kaneka Corporation (hereinafter referred to as Kaneka) or its sales agent. The warranty is limited to the terms and conditions stated herein

2. Terms of warranty

Product name	Type	Material/workmanship	Output
GSA type	Amorphous	5 years after the shipment from Kaneka	80% of the specified minimum output of the module for a 25-year period after shipment from Kaneka

(1) Warranty on material and workmanship

Kaneka warrants that the MODULES have been manufactured conforming to the prescribed specifications and is free from defects in material and/or workmanship for a period set out in the above table. If any non-conformity to the specifications or defect in material and/or workmanship is found during the period set out in the above table, Kaneka will repair or replace the MODULES.

Warranty on workmanship shall not apply any defects of the MODULES arising from installation. For details, please see Item 3. Warranty Exemptions.

(2) Warranty on Output

Kaneka warrants that the MODULES generate the output set out in the above table for the period set out in the same. If the output becomes less than that during the period, Kaneka will replace the MODULES. Kaneka may, at its sole discretion, compensate the output shortage by adding equivalent MODULES.

(3) If any defects are found, you will notify Kaneka or its sales agent of the following items immediately:

- a) Product Name
- b) Serial number of the MODULES
- c) Details of the defect

(4) Repair, replacement, or addition of the MODULES shall be performed free of charge only if the MODULES are found to be non-conforming to the specifications, defective in material or workmanship, or short in output through an inspection by Kaneka. Kaneka's inspection shall be final and decisive for the existence or

non-existence of the defect, non-conformity and/or output shortage.

- (5) Repair, replacement, or addition of the MODULES shall be the sole and exclusive remedy under this warranty. Kaneka hereby disclaim any other responsibility or liability in connection with MODULES.
- (6) If any of defects in material or workmanship, non-conforming to the specifications or output shortage are not found through an inspection by Kaneka, the MODULES shall be returned to you. You shall bear all shipment cost incurred by Kaneka.
- (7) If Kaneka requests you to repair the MODULES, you shall repair in accordance with Kaneka's instruction for your original consumer purchasers.
- (8) If Kaneka requests you to replace the MODULES, and if you have its available stock, you shall replace the MODULES for your original consumer purchasers.
- (9) NO WARRANTIES, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, HAVE BEEN MADE UNLESS EXPRESSLY INCLUDED HEREIN.
- (10) With the light-receiving glass surface of the MODULES cleaned, a qualification test shall be carried out according to UL1703 with an air mass of 1.5, an irradiance of 100 mW/cm², and a module temperature of 25 ± 1.0 °C (Standard Test Condition). Measurements shall be made after outside air temperatures in the sunshine reported by the Meteorological Agency have reached 20 °C for at least 20 consecutive days.

3. Warranty Exemptions

This warranty does not apply to the following defects in material or workmanship, non-conformity to the specifications or shortage in output caused by the following reasons:

- (1) failure to comply with the installation/handling procedures and precautions described in the module installation manual, "Instruction for using KANEKA PV modules", caution labels, and other written information provided by Kaneka;
- (2) use for unusual purposes;
- (3) use under an unusual condition or environment;
- (4) any modification to the MODULES which has not been approved by Kaneka;
- (5) force majeure, such as fire, explosion, war, riot, earthquake, eruption, tidal wave, lightning, induced lighting, snow, freeze, frost, briny air, ground movement, ground cracking, earth flow, and pollution; provided, however, that exemption for these reasons for which UL set out the standard shall apply when they exceed UL's standard;
- (6) noise, voltage fluctuation, and other trouble in an grid connected commercial power supply system;
- (7) negligence or intention of you, the original consumer purchaser or a third party;
- (8) naturally occurred scratches, stains, mechanical wear, rust, mold, degradation,



GSA211

discoloring, and other alteration that occurred after shipment from Kaneka but do not affect the power generation performance or mechanical strength of the product.

4. Kaneka disclaims any and all warranty for the MODULES in the cases that:

- a)** the warranty period for the MODULES has been expired;
- b)** you fail to notify Kaneka immediately after the defect is discovered or should be discovered;
- c)** the MODULES are repaired by anyone other than Kaneka except when Kaneka instructed you to do so.

B. Specifications –GSA type

1. Module Specifications

Table 1.

PRODUCT : THIN-FILM SILICON PV MODULE			
MODEL: GJA211	DATE: June 01, 2004		
SPECIFICATION LISTS	UNIT	VALUE	REMARK
Performance at STC (stabilized)			Tolerance: ±10%
Nominal Power (Pmax)	W	60.0	
Open Circuit Voltage (Voc)	V	92.0	
Open circuit Voltage (Voc) at -10°C and 1250W/m²	V	101.2	
Short Circuit Current (Isc)	A	1.19	
Short Circuit Current (Isc) at 70°C and 1250W/m²	A	1.53	
Voltage at Pmax (Vpm)	V	67.0	
Current at Pmax (Ipm)	A	0.90	
Max. System Voltage	V	530	
Fire Rating		Class C	
Dimension	mm	990 ± 2.5 x 960 ± 2.5	
Depth	mm	40 ± 1.0	
Weight	kg	13.7	
<p>(REMARK)</p> <p>1. During initial 6 weeks of operation, the MODULE has higher electrical output than rated output (See Performance at STC (stabilized)). The Pmax may be higher by 38% and Imp may be higher by 19%.</p> <p>2. The Electrical characteristics are within ±10% of the indicated values of Isc, Voc, and Pmax under standard test conditions (irradiance of 100mW/cm², AM1.5 spectrum, and a cell temperature of 25°C(77°F)).</p> <p>3. Specifications subject to change without notice.</p> <p>4. Refer to Section 690-8 of the National Electric Code for an additional multiply factor of 125% (80% derating) which may be applicable.</p>			

1.1 Materials**1.1.1 Photovoltaic cell**

Amorphous silicon-based

1.1.2 Superstrate (glass substrate)

Float glass (dimensions: 980 ± 1 mm x 950 ± 1 mm x 5 ± 0.2 mm, squareness: 1/300 or less)

1.1.3 Back cover sheet

Stacked fluorine-based films (reference thickness: 0.18 mm) are fusion bonded by using EVA resin (reference thickness: 400 μ m).

1.1.4 Wiring material

Solder-coated copper ribbon (thickness: 180 μ m or less)

1.1.5 Frame, junction box, output cable, connectors

Frame: aluminum extrusion mold (inner-brim-type frame)

Junction box and cable: Onamba's PVU-B4 (PVC-jacketed cross linked high-resistant polyethylene, MC connectors)

2. Packing Specifications (GSA type)

Standard Shipment Lot: 40ft container (1100pcs, 70.40kW)

25pcs are packed in a carton, and one carton is placed on a pallet.

3. If the specifications hereof are changed, Kaneka will notify such change in writing to you as soon as possible.