

ICS 27.160
CCS K 83



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 20047.1-2006

**Photovoltaic (PV) module safety qualification -- Part 1:
Requirements for construction
(English Translation)**

Issued on: January 13, 2006

Implemented on: February 1, 2006

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China**

Table of Contents

Foreword...	4
1 Scope and object...	5
2 Normative references...	5
3 Application classes...	7
3.1 General...	7
3.2 Class A. General access, hazardous voltage, hazardous power applications...	7
3.3 Class B. Restricted access, hazardous voltage, hazardous power applications...	7
3.4 Class C. Limited voltage, limited power applications...	8
4 Construction requirements...	8
4.1 General requirements...	8
4.2 Metal parts...	9
5 Polymeric materials...	9
5.1 General...	9
5.2 Polymers serving as an enclosure for live parts...	9
5.3 Polymers serving to support live parts...	10
5.4 Polymers serving as an outer surface...	10
5.5 Barriers...	11
5.6 Structural glazing materials...	11
6 Internal wiring and current-carrying parts...	11
6.1 Internal wiring...	11
6.2 Splices...	12
6.3 Mechanical securement...	12
7 Connections...	12
7.1 Field connections -- general requirements...	12
7.2 Field wiring terminals...	12
7.3 Connectors...	13
7.4 Output lead or cables...	14
8 Bonding and grounding...	14
9 Creepage and clearance distances...	15
10 Field wiring compartments with cover...	16
10.1 General...	16
10.2 Wall thickness...	16

10.3 Internal volume...	17
10.4 Openings...	17
10.5 Gaskets and seals...	17
10.6 Strain relief...	17
10.7 Sharp edges...	18
10.8 Conduit applications - Metallic...	18
10.9 Conduit applications - Non-metallic...	18
11 Marking...	19
12 Requirements for supplied documents...	20
13 Modifications...	21
Bibliography...	22

Foreword

GB/T 20047 consists of the following two parts.

- Part 1. Photovoltaic (PV) module safety qualification. requirements for construction;
- Part 2. Photovoltaic (PV) module safety qualification. requirements for testing.

This Part is Part 1 of GB/T 20047, which is identical to IEC 61730-1:2004

"Photovoltaic (PV) module safety qualification - Part 1. requirements for construction"
(English version).

For ease of use, the following editorial changes have been made to this Part.

- a) USE decimal point "." instead of comma ",", that has been used as decimal point;
- b) DELETE the foreword of the international standard.

This Part was proposed by Ministry of Information Industry of the People's Republic of China.

This Part shall be under the jurisdiction of National Technical Committee on Solar Photovoltaic Energy System of Standardization Administration of China.

Drafting organizations of this Part. 18th Research Institute of China Electronics Technology Group Corporation, Tianjin Blue Sky Power Supply Company.

Main drafters of this Part. Guo Zengliang, Zhai Zuoxu, Ji Liangjun, Li Hui, Sun

Yanzheng, and Tang Jun.

Photovoltaic (PV) module safety qualification -

Part 1. Requirements for construction

1 Scope and object

This Part of GB/T 20047 describes the fundamental construction requirements for photovoltaic (PV) modules in order to provide safe electrical and mechanical operation during their expected lifetime. Specific topics are provided to assess the prevention of electrical shock, fire hazards, and personal injury due to mechanical and environmental stresses. Part 2 of GB/T 20047 outlines the requirements for testing. This Part of GB/T

20047 pertains to the particular requirements for construction.

This Part attempts to define the basic requirements for various application classes of PV modules, but it cannot be considered to encompass all national or regional building codes. The specific requirements for marine and vehicle applications are not covered in this Part. This Part is not applicable to modules with integrated AC inverters (AC modules).

This Part is designed so that its test sequence can coordinate with those of IEC

61215.2004 or GB/T 18911-2002, so that a single set of samples may be used to perform

both the safety and performance evaluation of a photovoltaic module design.

The object of this Part is to provide basic guidance in certifying the fundamental construction of photovoltaic modules presented for safety approval by testing under GB/T 20047.2. These requirements are intended to minimise the misapplication and misuse of modules or the breakdown of internal components which would result in fire, electric shock and personal injury. The Part defines the basic safety construction requirements and additional tests that are a function of the module end-use applications. Component requirements are intended to provide evidence of performance of that component appropriate to its application in the module construction and environment.

NOTE: The additional construction requirements outlined in relevant ISO standards, or the national or local codes which govern the installation and use of these modules in their intended locations, should be considered in addition to the requirements contained within this Part.

2 Normative references

The following documents contain the provisions which, through reference in this Part of GB/T 20047, become the provisions of this Part. For dated references, their subsequent amendments (excluding corrigendum) or revisions do not apply to this Part. However, the parties who enter into agreement based on this Part are encouraged to investigate whether the latest versions of these documents are applicable. For undated reference documents, the latest versions apply to this Part.

GB/T 5169.2 Fire hazard testing for electric and electronic products - Part 2.

Guidance for assessing the fire hazard - General guidelines (GB/T 5169.2-2002, IEC 60695-1-1.1999, IDT)

GB/T 11026.1 Electrical insulating materials-Thermal endurance properties-Part

1 Ageing procedures and evaluation of test results (GB/T 11026.1-2003, IEC 60216-

1.2001, IDT)

GB/T 18911-2002 Thin-film terrestrial photovoltaic (PV) modules - Design qualification and type approval (IEC 61646.1996, IDT)

GB/T 20047.2 1) Photovoltaic (PV) module safety qualification - Part 2.

Requirements for testing

IEC 60112 Method for the determination of the proof and the comparative tracking indices of solid insulating materials

IEC 60130 (all parts) Connectors for frequencies below 3 MHz

IEC 60189-2 Low-frequency cables and wires with PVC insulation and PVC sheath - Part 2.Cables in pairs, triples, quads and quintuples for inside installations

IEC 60216-1 Electrical insulating materials -Thermal endurance properties - Part 1.