

**SRI LANKA STANDARD 1545 PART 1 : 2016**

**IEC 61853-1 : 2011**

**UDC 621.311**

**SPECIFICATION FOR  
PHOTOVOLTAIC (PV) MODULE  
PERFORMANCE TESTING AND ENERGY  
RATING**

**PART 1 : IRRADIANCE AND TEMPERATURE  
PERFORMANCE MEASUREMENTS AND POWER RATING**

**SRI LANKA STANDARDS INSTITUTION**

**Sri Lanka Standard Specification for  
PHOTOVOLTAIC (PV) MODULE PERFORMANCE TESTING AND ENERGY RATING  
PART 1 : IRRADIANCE AND TEMPERATURE PERFORMANCE MEASUREMENTS  
AND POWER RATING**

**SLS 1545 Part 1 : 2016  
IEC 61853-1 : 2011**

**Gr. H**

*Copyright Reserved*  
**SRI LANKA STANDARDS INSTITUTION  
17, Victoria Place  
Elvitigala Mawatha  
Colombo 8  
Sri Lanka**

**Sri Lanka Standard Specification for  
PHOTOVOLTAIC (PV) MODULE PERFORMANCE TESTING AND ENERGY RATING  
PART 1: IRRADIANCE AND TEMPERATURE PERFORMANCE MEASUREMENTS  
AND POWER RATING**

**NATIONAL FOREWORD**

This standard was approved by the Sectoral Committee on Electronic Engineering and was authorized for adoption and publication as a Sri Lanka Standard by the Council of Sri Lanka Standards Institution on 2016-11-24.

SLS 1545 Sri Lanka Standard Specification for Photovoltaic (PV) module performance testing and energy rating, Part 1: irradiance and temperature performance measurements and power rating. This part of standard is identical with IEC 61853 Photovoltaic (PV) module performance testing and energy rating, Part 1: 2011 Edition 1.0 irradiance and temperature performance measurements and power rating, published by the International Electrotechnical Commission (IEC).

All values given in this standard is in SI units.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or an analysis shall be rounded off in accordance with SLS 102, in case if the method of rounding off is not specified in the text of this standard. The number of figures to be retained in the rounded off value, shall be the same as that of the specified value in this standard.

**Terminology and conventions**

The text of the International Standard has been accepted as suitable for publication, without any deviation as a Sri Lanka Standard. However, certain terminology and conventions are not identical with those used in Sri Lanka Standards; attention is therefore drawn to the following:

- a) Wherever the words “International Standard” appear referring to this standard they should be interpreted as “Sri Lanka Standard”.
- b) Wherever the page numbers are quoted they are the page numbers of IEC standard.
- c) The comma has been used as a decimal marker. In Sri Lanka Standards it is the current practices to use a full point on the base line as a decimal marker.
- d) Attention is drawn to the possibility that some of the elements of the Sri Lanka Standard may be the subject of patent rights. SLSI shall not be held responsible for identifying any or all such patent rights.

**CROSS REFERENCES**

Any corresponding Sri Lanka Standard, for the international standards listed under reference, is not available.

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

---

**Photovoltaic (PV) module performance testing and energy rating –  
Part 1: Irradiance and temperature performance measurements and power rating**

**Essais de performance et caractéristiques assignées d'énergie des modules  
photovoltaïques (PV) –  
Partie 1: Mesures de performance en fonction de l'éclairement et de la  
température, et caractéristiques de puissance**

## CONTENTS

|  |    |
|--|----|
| FOREWORD.....  | 3  |
| INTRODUCTION.....  | 5  |
| 1 Scope and object.....  | 6  |
| 2 Normative references .....   | 6  |
| 3 Sampling.....  | 7  |
| 4 Marking.....   | 7  |
| 5 Testing and pass criteria .....  | 7  |
| 6 Report.....  | 8  |
| 7 Power rating conditions .....  | 8  |
| 7.1 General.....   | 8  |
| 7.2 STC (Standard Test Conditions).....  | 9  |
| 7.3 NOCT (Nominal Operating Cell Temperature).....   | 9  |
| 7.4 LIC (Low Irradiance Condition).....  | 9  |
| 7.5 HTC (High Temperature Condition) .....   | 9  |
| 7.6 LTC (Low Temperature Condition).....   | 9  |
| 8 Procedure for irradiance and temperature performance measurements .....                              | 9  |
| 8.1 Purpose .....  | 9  |
| 8.2 Simplified procedure for linear modules.....   | 10 |
| 8.3 Procedure in natural sunlight with tracker.....  | 11 |
| 8.4 Procedure in natural sunlight without tracker .....  | 13 |
| 8.5 Procedure with a solar simulator .....   | 13 |
| 9 Rating of power .....  | 15 |
| 9.1 Interpolation of $I_{SC}$ , $V_{OC}$ , $V_{max}$ and $P_{max}$ .....                               | 15 |
| 9.1.1 General .....  | 15 |
| 9.1.2 Interpolation of $I_{SC}$ , $V_{OC}$ , $V_{max}$ and $P_{max}$ with respect to temperature ..... | 15 |
| 9.1.3 Interpolation of $I_{SC}$ with respect to irradiance .....                                       | 15 |
| 9.1.4 Interpolation of $V_{OC}$ with respect to irradiance .....                                       | 15 |
| 9.1.5 Interpolation of $P_{max}$ with respect to irradiance .....                                      | 16 |
| 9.1.6 Appropriateness of fitting method .....  | 16 |
| 9.2 Power rating.....  | 16 |
| Figure 1 – Positions for measuring the temperature of the test module behind the cells .....           | 11 |
| Table 1 – Summary of reference power conditions (at AM 1,5).....                                       | 9  |
| Table 2 – $I_{SC}$ , $P_{max}$ , $V_{OC}$ and $V_{max}$ versus irradiance and temperature.....         | 10 |