



# SLOVENSKI STANDARD

## SIST EN 62813:2015

01-september-2015

---

### Litij-ionski kondenzatorji za električno in elektronsko opremo - Metode za preskušanje električnih karakteristik

Lithium ion capacitors for use in electric and electronic equipment - Test methods for electrical characteristics

Lithium-Ionen-Kondensatoren zur Verwendung in elektrischen und elektronischen Geräten - Prüfverfahren für die elektrischen Kennwerte

Condensateurs au lithium-ion destinés à être utilisés dans les équipements électriques et électroniques - Méthodes d'essai applicables aux caractéristiques électriques

[https://standards.iteh.ai/catalog/standards/sist/d54e8003-26d3-437a-872d-](https://standards.iteh.ai/catalog/standards/sist/d54e8003-26d3-437a-872d-daa0b844e78b/sist-en-62813-2015)

Ta slovenski standard je istoveten z: **EN 62813:2015**

---

#### **ICS:**

31.060.99      Drugi kondenzatorji      Other capacitors

**SIST EN 62813:2015**      en

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 62813:2015

<https://standards.iteh.ai/catalog/standards/sist/d54e8003-26d3-437a-872d-daa0b844e78b/sist-en-62813-2015>

EUROPEAN STANDARD

**EN 62813**

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2015

ICS 31.060.99

English Version

**Lithium ion capacitors for use in electric and electronic equipment - Test methods for electrical characteristics  
(IEC 62813:2015)**

Condensateurs au lithium-ion destinés à être utilisés dans les équipements électriques et électroniques - Méthodes d'essai relatives aux caractéristiques électriques  
(IEC 62813:2015)

Lithium-Ionen-Kondensatoren zur Verwendung in elektrischen und elektronischen Geräten - Prüfverfahren für die elektrischen Kennwerte  
(IEC 62813:2015)

This European Standard was approved by CENELEC on 2015-02-12. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

SIST EN 62813:2015

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Foreword

The text of document 40/2322/FDIS, future edition 1 of IEC 62813, prepared by IEC TC 40, "Capacitors and resistors for electronic equipment" was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62813:2015.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2015-11-12
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-02-12

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

## Endorsement notice

The text of the International Standard IEC 62813:2015 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

- |                  |      |                                |
|------------------|------|--------------------------------|
| IEC 62391-1:2006 | NOTE | Harmonised as EN 62391-1:2006. |
| IEC 62576:2009   | NOTE | Harmonised as EN 62576:2010.   |

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-1	2013	Environmental testing -- Part 1: General and guidance	EN 60068-1	2014

## iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 62813:2015

<https://standards.iteh.ai/catalog/standards/sist/d54e8003-26d3-437a-872d-daa0b844e78b/sist-en-62813-2015>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 62813:2015

<https://standards.iteh.ai/catalog/standards/sist/d54e8003-26d3-437a-872d-daa0b844e78b/sist-en-62813-2015>



IEC 62813

Edition 1.0 2015-01

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Lithium ion capacitors for use in electric and electronic equipment – Test methods for electrical characteristics**

**Condensateurs au lithium-ion destinés à être utilisés dans les équipements électriques et électroniques – Méthodes d'essai relatives aux caractéristiques électriques**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

ICS 31.060.99

ISBN 978-2-8322-2196-9

**Warning! Make sure that you obtained this publication from an authorized distributor.  
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

## CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions .....	5
4 Test methods.....	7
4.1 Test requirements .....	7
4.1.1 Standard atmospheric conditions for tests .....	7
4.1.2 Standard atmospheric conditions for measurements .....	8
4.1.3 Pre-conditioning.....	8
4.2 Measurement.....	8
4.2.1 Capacitance, discharge accumulated electric energy, and internal resistance .....	8
4.2.2 Measurement for voltage maintenance rate.....	11
4.3 Calculation.....	12
4.3.1 Calculation of capacitance and discharge accumulated electric energy.....	12
4.3.2 Calculation of internal resistance.....	13
4.3.3 Calculation of voltage maintenance rate .....	13
Annex A (informative) Endurance test (continuous application of rated voltage at high temperature).....	14
A.1 General.....	14
A.2 Test procedure.....	14
A.2.1 Test conditions .....	14
A.2.2 Test procedure.....	14
A.2.3 Requirements .....	14
Annex B (informative) Calculation of the measuring currents based on the propagated error.....	15
B.1 General.....	15
B.2 Measurement propagated error and measuring currents.....	15
Annex C (informative) Procedures for defining the measuring current of LIC with uncertain nominal internal resistance .....	17
C.1 General.....	17
C.2 Defining procedures of measuring current for LIC .....	17
Bibliography .....	18
Figure 1 – Basic circuit for measuring capacitance, discharge accumulated electric energy, and internal resistance .....	9
Figure 2 – Voltage profile for measuring capacitance, discharge accumulated electric energy, and internal resistance .....	10
Figure 3 – Basic circuit for measuring the voltage maintenance rate .....	11
Figure 4 – Voltage profile for measuring voltage maintenance rate.....	12
Figure C.1 – Flowchart of current setting procedures .....	17



## INTERNATIONAL ELECTROTECHNICAL COMMISSION

LITHIUM ION CAPACITORS FOR USE  
IN ELECTRIC AND ELECTRONIC EQUIPMENT –  
TEST METHODS FOR ELECTRICAL CHARACTERISTICS

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.  
<https://standards.iteh.ai/catalog/standards/sis/1648003-26d2-437e-873d-11e5b6c5c0e5/iec-62813-2015>
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62813 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment.

The text of this standard is based on the following documents:

FDIS	Report on voting
40/2322/FDIS	40/2341/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## **iTeh STANDARD PREVIEW (standards.iteh.ai)**

[SIST EN 62813:2015](#)

<https://standards.iteh.ai/catalog/standards/sist/d54e8003-26d3-437a-872d-daa0b844e78b/sist-en-62813-2015>

# LITHIUM ION CAPACITORS FOR USE IN ELECTRIC AND ELECTRONIC EQUIPMENT – TEST METHODS FOR ELECTRICAL CHARACTERISTICS

## 1 Scope

This International Standard specifies the electrical characteristics (capacitance, internal resistance, discharge accumulated electric energy, and voltage maintenance rate) test methods of lithium ion capacitors (LIC) for use in electric and electronic equipment.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-1:2013, *Environmental testing – Part 1: General and guidance*

## 3 Terms and definitions

**ITeH STANDARD PREVIEW**  
**(standards.iteh.ai)**

For the purposes of this document, the following terms and definitions apply.

NOTE The terms printed in italics are those which are defined in this Clause 3.

<https://standards.iteh.ai/catalog/standards/sist/d54e8003-26d3-437a-872d-daa0b844e78b/sist-en-62813-2015>

### 3.1

#### **upper category temperature**

highest ambient temperature that a LIC is designed to operate continuously

[SOURCE: IEC 62576:2009, 3.3, modified]

### 3.2

#### **rated voltage**

$U_R$

maximum direct current (d.c.) voltage that may be applied continuously for a certain time under the *upper category temperature* (3.1) to a LIC so that it can exhibit specified demand characteristics

Note 1 to entry: This voltage is the setting voltage in LIC design.

Note 2 to entry: The endurance test using the rated voltage is described in Annex A.

[SOURCE: IEC 62576:2009, 3.6, modified]

### 3.3

#### **rated lower limit voltage**

$U_L$

minimum d.c. voltage such that a LIC can exhibit specified demand characteristics

Note 1 to entry: The rated lower limit voltage is designated by manufacturer.

### 3.4

#### **charging current**

current required to charge a LIC