

INTERNATIONAL STANDARD

IEC 62391-2

First edition
2006-04

Fixed electric double-layer capacitors for use in electronic equipment –

Part 2: Sectional specification – Electric double-layer capacitors for power application

© IEC 2006 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE

T

For price, see current catalogue

CONTENTS

| | |
|--|----|
| FOREWORD..... | 3 |
| 1 General..... | 5 |
| 1.1 Scope..... | 5 |
| 1.2 Object..... | 5 |
| 1.3 Normative references..... | 5 |
| 1.4 Information to be given in a detail specification..... | 6 |
| 1.5 Terminology..... | 7 |
| 1.6 Marking..... | 7 |
| 2 Preferred rating and characteristics..... | 8 |
| 2.1 Preferred characteristics..... | 8 |
| 2.2 Preferred values of ratings..... | 8 |
| 3 Quality assessment procedures..... | 9 |
| 3.1 Primary stage of manufacture..... | 9 |
| 3.2 Structurally similar components..... | 9 |
| 3.3 Declaration of conformity (basic requirements)..... | 9 |
| 3.4 Test schedule and requirement for initial assessment (mandatory and optional tests)..... | 9 |
| 3.5 Quality conformance inspection..... | 14 |
| 4 Test and measurement procedures..... | 16 |
| 4.1 Preliminary drying..... | 16 |
| 4.2 Measuring conditions..... | 16 |
| 4.3 Visual examination and check of dimensions..... | 16 |
| 4.4 Electrical tests..... | 16 |
| 4.5 Robustness of terminations..... | 17 |
| 4.6 Resistance to soldering heat..... | 17 |
| 4.7 Solderability..... | 18 |
| 4.8 Rapid change of temperature..... | 18 |
| 4.9 Vibration..... | 18 |
| 4.10 Endurance..... | 19 |
| 4.11 Self-discharge..... | 19 |
| 4.12 Storage at high temperature..... | 20 |
| 4.13 Characteristics at high and low temperature..... | 20 |
| 4.14 Damp heat, steady state..... | 20 |
| 4.15 Passive flammability (if applicable)..... | 20 |
| 4.16 Pressure relief (if applicable)..... | 21 |
| Annex A (informative) Calculation procedure for power density..... | 22 |
| Figure A.1 – Voltage characteristics between capacitor terminals..... | 23 |
| Table 1 – Fixed sample size test plan for qualification approval..... | 11 |
| Table 2 – Tests schedule for qualification approval..... | 12 |
| Table 3a – Lot-by-lot inspection..... | 15 |
| Table 3b – Periodic test..... | 15 |

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIXED ELECTRIC DOUBLE-LAYER CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –

Part 2: Sectional specification – Electric double-layer capacitors for power application

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.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 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 62391-2 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 |
|--------------|------------------|
| 40/1641/FDIS | 40/1713/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.

IEC 62391 consists of the following parts, under the general title *Fixed electric double-layer capacitors for use in electronic equipment*:

Part 1: Generic specification

Part 2: Sectional specification – Electric double-layer capacitors for power application

The sectional specification mentioned above does have a blank detail specification being a supplementary document, containing requirements for style, layout and minimum content of detail specifications.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site 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.

A bilingual version of this standard may be issued at a later date.

FIXED ELECTRIC DOUBLE-LAYER CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –

Part 2: Sectional specification – Electric double-layer capacitors for power application

1 General

1.1 Scope

This part of IEC 62391 applies to electric double-layer capacitors for power application.

Electric double-layer capacitors for power are intended for applications that require discharge currents in the range from mA to A. The characteristics of the capacitors include such performance as relatively high capacitance and low internal resistance, which is applicable to Class 3 of the measurement classification specified in IEC 62391-1.

The definition of power density and its calculating procedure should be in accordance with Annex A.

1.2 Object

The object of this standard is to prescribe preferred ratings and characteristics and to select from IEC 62391-1 the appropriate quality assessment procedures, tests and measuring methods and to give general performance requirements for this type of capacitor. Test severities and requirements prescribed in detail specifications referring to this sectional specification shall be of equal or higher performance level; lower performance levels are not permitted.

1.3 Normative references

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

IEC 60063, *Preferred number series for resistors and capacitors*

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

IEC 60384-1, *Fixed capacitors for use in electronic equipment – Part 1: Generic specification*

IEC 60410, *Sampling plans and procedures for inspection by attributes*

IEC 62391-1, *Fixed electric double-layer capacitors for use in electronic equipment – Part 1: Generic specification*¹

IEC 62391-2-1, *Fixed electric double-layer capacitors for use in electronic equipment – Part 2-1: Electric double-layer capacitors for power application – Assessment level EZ*

ISO 3, *Preferred numbers – Series of preferred numbers*