

Edition 2.0 2008-01

### INTERNATIONAL STANDARD

QC 302000

Fixed capacitors for use in electronic equipment –
Part 20: Sectional specification – Fixed metallized polyphenylene sulfide film dielectric surface mount d.c. capacitors

INTERNATIONAL ELECTROTECHNICAL COMMISSION

PRICE CODE

Т

### CONTENTS

FC	REW	ORD		4		
1	Gen	eral		6		
•	1.1		)			
	1.2	•	t			
	1.3	-	ative references			
	1.4		nation to be given in a detail specification			
	1.4	1.4.1	Outline drawing and dimensions			
		1.4.1	Mounting			
		1.4.3	Ratings and characteristics			
		1.4.4	Marking			
	1.5		and definitions			
	1.6		ng			
2	· · · · · · · · · · · · · · · · · · ·					
_	2.1		red characteristics			
	۷. ۱	2.1.1	Preferred climatic categories			
	2.2		red values of ratings			
		2.2.1	Rated capacitance $(C_{R})$			
		2.2.2	Tolerance on rated capacitance			
		2.2.3	Rated voltage ( $U_{R}$ )			
		2.2.4	Category voltage ( $U_{ m C}$ )			
			- · · · · · · · · · · · · · · · · · · ·			
2	0	2.2.5	Rated temperature			
3	Quality assessment procedures					
	3.1	, ,				
	3.2	Structurally similar components				
	3.3	Certified records of released lots				
	3.4	3.4 Qualification approval		10		
		3.4.1	Qualification approval on the basis of the fixed sample size procedure			
		3.4.2	Tests			
	3.5	Qualit	y conformance inspection			
		3.5.1	Formation of inspection lots	16		
		3.5.2	Test schedule			
		3.5.3	Delayed delivery			
		3.5.4	Assessment levels			
4	Test and measurement procedures					
	4.1	3				
	4.2	Visual	examination and check of dimensions			
		4.2.1	Visual examination			
		4.2.2	Requirements			
	4.3		ical tests			
		4.3.1	Voltage proof			
		4.3.2	Capacitance			
		4.3.3	Tangent of loss angle (tan $\delta$ )			
	, .	4.3.4	Insulation resistance			
	4.4	Adhesion		21		

4.5	Bond strength of the end of plating	21
	4.5.1 Initial measurement	
	4.5.2 Final inspection	
4.6	Resistance to soldering heat	
	4.6.1 Initial measurement	
	4.6.2 Test conditions	
	4.6.3 Final inspection, measurements and requirements	21
4.7	Solderability	22
	4.7.1 Test conditions	22
	4.7.2 Final inspection, measurements and requirements	22
4.8	Rapid change of temperature	22
	4.8.1 Initial measurements	22
	4.8.2 Number of cycles: 5	22
	4.8.3 Intermediate inspection	22
4.9	Climatic sequence	22
	4.9.1 Initial measurements	22
	4.9.2 Dry heat	22
	4.9.3 Damp heat, cyclic, test Db, first cycle	22
	4.9.4 Cold	22
	4.9.5 Damp heat, cyclic, test Db, remaining cycles	23
	4.9.6 Final inspection, measurements and requirements	23
4.10	Damp heat, steady state	23
	4.10.1 Initial measurements	23
	4.10.2 Final inspection, measurements and requirements	
4.11	Endurance	
	4.11.1 Initial measurements	23
4.12	Charge and discharge	
	4.12.1 Initial measurements	
	Component solvent resistance (if applicable)	
4.14	Solvent resistance of the marking (if applicable)	24
Table 1	- Fixed sample size test plan for qualification approval – Assessment level EZ	12
	- Test schedule for qualification approval	
	- Lot-by-lot inspection	
	- Periodic tests	
Table 5 –	- Test voltages	19
Table 6 –	- Tangent of loss angle limits	20
Table 7 –	- Requirements insulation resistance	20
Table 8 –	- Correction factor dependent on test temperature	21
Table 9 –	- Endurance test Grade 1, Grade 2 and Grade 3 capacitors	23

#### INTERNATIONAL ELECTROTECHNICAL COMMISSION

#### FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT -

# Part 20: Sectional specification – Fixed metallized polyphenylene sulfide film dielectric surface mount d.c. capacitors

#### **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 60384-20 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment.

This second edition cancels and replaces the first edition published in 1996 and constitutes a minor revision related to tables and references.

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

FDIS	Report on voting	
40/1871/FDIS	40/1888/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 list of all parts of the IEC 60384 series, under the (new) general title *Fixed capacitors for use in electronic equipment*, can be found on the IEC website.

The QC number that appears on the front cover of this publication is the specification number in the IECQ Quality Assessment System for Electronic Components.

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 publication may be issued at a later date.

The contents of the corrigendum of February 2008 have been included in this copy.

#### FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT -

# Part 20: Sectional specification – Fixed metallized polyphenylene sulfide film dielectric surface mount d.c. capacitors

#### 1 General

#### 1.1 Scope

This part of IEC 60384 is applicable to fixed surface mount capacitors for direct current, with metallized electrodes and polyphenylene sulfide dielectric for use in electronic equipment. These capacitors have metallized connecting pads or soldering strips and are intended to be mounted directly onto substrates for hybrid circuits or onto printed boards. These capacitors may have "self-healing properties" depending on conditions of use. They are primarily intended for applications where the a.c. component is small with respect to the rated voltage.

Capacitors for radio interference suppression are not included, but are covered by IEC 60384-14.

#### 1.2 Object

The object of this standard is to prescribe preferred ratings and characteristics and to select from IEC 60384-1, 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 60062, Marking codes for resistors and capacitors

IEC 60063, Preferred number series for resistors and capacitors

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

NOTE For the tests in the IEC 60068 series of publications, the editions referenced in the applicable test clauses of the generic specification are applicable.

IEC 60384-1:1999, Fixed capacitors for use in electronic equipment – Part 1: Generic specification

IEC 60410, Sampling plans and procedures for inspection by attributes

ISO 3, Preferred numbers - Series of preferred numbers