

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Fixed capacitors for use in electronic equipment –
Part 20-1: Blank detail specification – Fixed metallized polyphenylene sulfide film
dielectric surface mount d.c. capacitors – Assessment level EZ**

**Condensateurs fixes utilisés dans les équipements électroniques –
Partie 20-1: Spécification particulière cadre – Condensateurs fixes pour montage
en surface pour courant continu à diélectrique en film de sulfure de
polyphénylène métallisé – Niveau d'assurance EZ**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –**Part 20-1: Blank detail specification –
Fixed metallized polyphenylene sulfide film
dielectric surface mount d.c. capacitors –
Assessment level EZ**

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.
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International Standard IEC 60384-20-1 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.

This bilingual version (2013-05) corresponds to the monolingual English version, published in 2008-01.

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

FDIS	Report on voting
40/1872/FDIS	40/1889/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.

The French version of this standard has not been voted upon.

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 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.

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

[IEC 60384-20-1:2008](https://standards.iteh.ai/catalog/standards/sist/f1185194-edd8-46ba-8e9a-e9302d93f2ad/iec-60384-20-1-2008)

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FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –

Part 20-1: Blank detail specification – Fixed metallized polyphenylene sulfide film dielectric surface mount d.c. capacitors – Assessment level EZ

Blank detail specification

A blank detail specification is a supplementary document to the sectional specification and contains requirements for style and layout and minimum content of detail specifications. Detail specifications not complying with these requirements may not be considered as being in accordance with IEC specifications nor shall they so be described.

In the preparation of detail specifications, the content of 1.4 of the sectional specification shall be taken into account.

The numbers between brackets on the first page correspond to the following information which shall be inserted in the position indicated.

Identification of the detail specification

- [1] The "International Electrotechnical Commission or the National Standards Organization under whose authority the detail specification is drafted.
- [2] The IEC or National Standards number of the detail specification, date of issue and any further information required by the national system.
- [3] The number and issue number of the IEC or national generic specification.
- [4] The IEC number of the blank detail specification.

Identification of the capacitor

- [5] A short description of the type of capacitor.
- [6] Information on typical construction (when applicable).
When the capacitor is not designed for use in printed-board applications, this shall be clearly stated in the detail specification in this position.
- [7] Outline drawing with main dimensions which are of importance for interchangeability and/or reference to the national or international documents for outlines. Alternatively, this drawing may be given in an annex to the detail specification.
- [8] Application or group of applications covered and/or assessment level.

NOTE The assessment level(s) to be used in a detail specification are selected from 3.5.4 of the sectional specification. This implies that one blank detail specification may be used in combination with several assessment levels, provided the grouping of the tests does not change.

- [9] Reference data on the most important properties, to allow comparison between the various capacitor types.

	IEC 60384-20-1XX [2]
[1]	QC 302001XXXXXX
ELECTRONIC COMPONENTS OF ASSESSED QUALITY IN ACCORDANCE WITH:	IEC 60384-20-1 [4]
	QC 302001
[3]	FIXED METALLIZED [5]
	POLYETHYLENE SULFIDE
	FILM DIELECTRIC SURFACE MOUNT D.C. CAPACITORS
Outline drawing: (see Table 1) [...angle projection]	
[7]	[6]
	Assessment level(s): EZ [8]
[Other shapes are permitted within the dimensions given.]	

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Information on the availability of components qualified to this detail specification is given in the Register of Approvals

<https://standards.iteh.ai/catalog/standards/sist/fl185194-edd8-46ba-8e9a-e9302d93f2ad/iec-60384-20-1-2008>

<https://standards.iteh.ai/catalog/standards/sist/fl185194-edd8-46ba-8e9a-e9302d93f2ad/iec-60384-20-1-2008>

(9)

1 General data

1.1 Recommended method(s) of mounting (to be inserted)

See 1.4.2 of IEC 60384-20.

1.2 Dimensions

Table 1 – Dimensions

Case size reference	Dimensions						
	mm						
	L_1	W_1	H_1	L_2	L_3	L_4

When there is no case size reference, Table 1 may be omitted and the dimensions shall be given in Table 2, which then becomes Table 1.

The dimensions shall be given as maximum dimensions or as nominal dimensions with a tolerance.

1.3 Ratings and characteristics

- Capacitance range (see Table 2)
- Tolerance on rated capacitance
- Rated voltage (see Table 2)
- Category voltage (if applicable) (see Table 2)
- Climatic category
- Rated temperature
- Maximum a.c. voltage (if applicable)
- Maximum pulse load (if applicable)
- Tangent of loss angle
- Insulation resistance

Table 2 – Values of capacitance and of voltage related to case sizes

Rated voltage				
Category voltage ^a				
Rated capacitance (in nF and/or µF)	Case size	Case size	Case size	Case size
^a If different from the rated voltage.				

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1.4 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 60384-1, *Fixed capacitors for use in electronic equipment – Part 1: Generic specification*

IEC 60384-20, *Fixed capacitors for use in electronic equipment – Part 20: Sectional specification – Fixed metallized polyphenylene sulfide film dielectric surface mount d.c. capacitors*

1.5 Marking

The marking of the capacitor and the package shall be in accordance with the requirements of 1.6 of IEC 60384-20.

The details of the marking of the component and package shall be given in full in the detail specification.

1.6 Ordering information

Orders for capacitors covered by this specification shall contain, in clear or in coded form, the following minimum information:

- a) rated capacitance;
- b) tolerance on rated capacitance;
- c) rated d.c. voltage;
- d) number and issue reference of the detail specification and style reference;
- e) packaging instructions.

1.7 Certified records of released lots

Required/not required.

1.8 Additional information (not for inspection purposes)

1.9 Additional or increased severities or requirements to those specified in the generic and/or sectional specification

NOTE Additions or increased requirements should be specified only when essential.

Table 3 – Other characteristics

This table is to be used for defining characteristics which are additional to, or more severe than, those given in the sectional specification.

2 Inspection requirements

2.1 Procedures

2.1.1 For qualification approval, the procedures shall be in accordance with 3.4 of the sectional specification IEC 60384-20.

2.1.2 For quality conformance inspection, the test schedule (Table 4) includes sampling, periodicity, severities and requirements. The formation of inspection lots is covered by 3.5.1 of IEC 60384-20.

[IEC 60384-20-1:2008](https://standards.iteh.ai/catalog/standards/sist/fl185194-edd8-46ba-8e9a-e9302d93f2ad/iec-60384-20-1-2008)

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Table 4 – Test schedule for quality conformance inspection

Subclause number and test ^a	D or ND ^c	Conditions of test ^a	IL	n c	c	Performance requirements ^a
Group A inspection (lot-by-lot) Sub-group A0 4.3.2 Capacitance 4.3.3 Tangent of loss angle 4.3.1 Voltage proof (Test A) 4.3.4 Insulation resistance (Test A)	ND	Frequency: 1 kHz for all capacitance values Method: ... Measuring point 1a Measuring point 1a	100 % ^d			Within specified tolerance As in 4.3.3.2 No breakdown or flashover. Self-healing breakdowns allowed As in 4.3.4.3
Sub-group A1 4.2.1 Visual examination	ND		S-4	^b	0	As in 4.2.2 Legible marking (if applicable) and as specified in 1.5 of this specification
Sub-group A2 4.2 Dimensions ^e	ND		S-3	^b	0	As specified in Table 1 of this specification
Group B inspection (lot-by-lot) Sub-group B1 4.7 Solderability 4.7.2 Final measurements	D	No ageing method Visual examination	S-3	^b	0	As in 4.7.2
Sub-group B2 4.14 Solvent resistance of the marking (if applicable) ^f	D	Solvent: ... Solvent temperature: ... Method 1 Rubbing material: cotton wool Recovery: ...	S-3	^b	0	Legible marking

Table 4 (continued)

Subclause number and test ^a	D or ND ^c	Conditions of test ^a	Sample size and acceptance criterion ^c			Performance requirements ^a
			<i>p</i>	<i>n</i>	<i>c</i>	
Group C inspection (periodic) Sub-group C1 4.6 Resistance to soldering heat 4.6.1 Initial measurements 4.6.2 Test conditions 4.6.3 Final measurements 4.13 Component solvent resistance (if applicable)	D	Method: ... Capacitance Duration: ... If Method 1 is applied immersion and withdrawal speed shall be 25 mm/s ± 2,5 mm/s Recovery: 24 h ± 2 h Visual examination Capacitance Solvent: ... Solvent temperature: ... Method 2 Recovery: ...	3	12	0 ^g	As in 4.6.3 $\Delta C/C$ for Grade 1 and Grade 2: ≤ 2 %, Grade 3: ≤ 3 % of value measured in 4.6.1 See detail specification
Sub-group C2 4.5 Bond strength of the end face plating 4.5.1 Initial measurements 4.5.2 Final inspection	D	IEC 60384-20-1:2008 https://standards.iteh.ai/catalog/standards/sist/1185194-edd8-46ba-8c9a-e9302d93f2ad/iec-60384-20-1-2008 Capacitance Capacitance (with board in bent position) Visual examination	3	12	0 ^g	$\Delta C/C$ for Grade 1 and Grade 2: ≤ 2 %, Grade 3: ≤ 5 % of value measured in 4.5.1 No visible damage
Sub-group C3 4.1 Mounting 4.2.1 Visual examination 4.3.2 Capacitance 4.3.3 Tangent of loss angle 4.3.4 Insulation resistance	D	Substrate material: ... * Frequency: 1 kHz (for all capacitance values) 10 kHz for capacitors with $C_R \leq 1 \mu\text{F}$ (in addition, see 4.3.3.3)				As in detail specification $\Delta C/C \leq 2\%$ of value measured in Sub-group A0 As in 4.3.3.2 (Reference values for final measurements in sub-groups C3.1, C3.3 and C3.4) As in 4.3.4.3

* When different substrate materials are used for the individual sub-groups, the detail specification shall indicate which substrate material is used in each sub-group.