



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS C 5101-18 : 2010

(IEC 60384-18 : 2007)

(JEITA/JSA)

Fixed capacitors for use in electronic equipment— Part 18: Sectional specification— Fixed aluminium electrolytic surface mount capacitors with solid (MnO₂) and non-solid electrolyte

ICS 31.060.50

Reference number : JIS C 5101-18 : 2010 (E)

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Date of Establishment: 1999-02-20

Date of Revision: 2010-06-21

Date of Public Notice in Official Gazette: 2010-06-21

Investigated by: Japanese Industrial Standards Committee
Standards Board

Technical Committee on Electronics Technology

JIS C 5101-18:2010, First English edition published in 2011-03

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Electronics and Information Technology Industries Association (JEITA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS C 5101-18:1999** has been replaced with this Standard.

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JIS C 5101 series consists of the following 45 parts under the general title “*Fixed capacitors for use in electronic equipment*”:

JIS C 5101-1 *Part 1: Generic specification*

JIS C 5101-2 *Part 2: Sectional specification: Fixed metallized polyethylene-terephthalate film dielectric d.c. capacitors*

JIS C 5101-2-1 *Part 2-1: Blank detail specification: Fixed metallized polyethylene-terephthalate film dielectric d.c. capacitors—Assessment levels E and EZ*

JIS C 5101-3 *Part 3: Sectional specification—Surface mount fixed tantalum electrolytic capacitors with manganese dioxide solid electrolyte*

JIS C 5101-3-1 *Part 3-1: Blank detail specification—Surface mount fixed tantalum electrolytic capacitors with manganese dioxide solid electrolyte—Assessment level EZ*

JIS C 5101-4 *Part 4: Sectional specification—Aluminium electrolytic capacitors with solid (MnO₂) and non-solid electrolyte*

JIS C 5101-4-1 *Part 4-1: Blank detail specification—Fixed aluminium electrolytic capacitors with non-solid electrolyte—Assessment level EZ*

JIS C 5101-4-2 *Part 4-2: Blank detail specification—Fixed aluminium electrolytic capacitors with solid (MnO₂) electrolyte—Assessment level EZ*

JIS C 5101-8 *Part 8: Sectional specification: Fixed capacitors of ceramic dielectric, Class 1*

JIS C 5101-8-1 *Part 8-1: Blank detail specification: Fixed capacitors of ceramic dielectric, Class 1 Assessment level EZ*

- JIS C 5101-9 *Part 9: Sectional specification: Fixed capacitors of ceramic dielectric, Class 2*
- JIS C 5101-9-1 *Part 9-1: Blank detail specification: Fixed capacitors of ceramic dielectric, Class 2 Assessment level EZ*
- JIS C 5101-11 *Part 11: Sectional specification: Fixed polyethylene-terephthalate film dielectric metal foil d.c. capacitors*
- JIS C 5101-11-1 *Part 11: Blank detail specification: Fixed polyethylene-terephthalate film dielectric metal foil d.c. capacitors Assessment level E*
- JIS C 5101-13 *Part 13: Sectional specification—Fixed polypropylene film dielectric metal foil d.c. capacitors*
- JIS C 5101-13-1 *Part 13-1: Blank detail specification—Fixed polypropylene film dielectric metal foil d.c. capacitors—Assessment levels E and EZ*
- JIS C 5101-14 *Part 14: Sectional specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*
- JIS C 5101-14-1 *Part 14-1: Blank detail specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains—Assessment level D*
- JIS C 5101-14-2 *Part 14-2: Blank detail specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains—Safety tests only*
- JIS C 5101-14-3 *Part 14-3: Blank detail specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains—Assessment level DZ*
- JIS C 5101-15 *Part 15: Sectional specification: Fixed tantalum capacitors with level DZ non-solid or solid electrolyte*
- JIS C 5101-15-1 *Part 15: Blank detail specification: Fixed tantalum capacitors with non-solid electrolyte and foil electrode Assessment level E*
- JIS C 5101-15-2 *Part 15: Blank detail specification: Fixed tantalum capacitors with non-solid electrolyte and porous anode Assessment level E*
- JIS C 5101-15-3 *Part 15: Blank detail specification: Fixed tantalum capacitors with solid electrolyte and porous anode Assessment level E*
- JIS C 5101-16 *Part 16: Sectional specification: Fixed metallized polypropylene film dielectric d.c. capacitors*
- JIS C 5101-16-1 *Part 16-1: Blank detail specification: Fixed metallized polypropylene film dielectric d.c. capacitors—Assessment levels E and EZ*
- JIS C 5101-17 *Part 17: Sectional specification: Fixed metallized polypropylene film dielectric a.c. and pulse capacitors*
- JIS C 5101-17-1 *Part 17-1: Blank detail specification: Fixed metallized polypropylene film dielectric a.c. and pulse capacitors—Assessment levels E and EZ*

- JIS C 5101-18 *Part 18: Sectional specification—Fixed aluminium electrolytic surface mount capacitors with solid (MnO₂) and non-solid electrolyte*
- JIS C 5101-18-1 *Part 18-1: Blank detail specification—Fixed aluminium electrolytic surface mount capacitors with solid (MnO₂) electrolyte—Assessment level EZ*
- JIS C 5101-18-2 *Part 18-2: Blank detail specification—Fixed aluminium electrolytic surface mount capacitors with non-solid electrolyte—Assessment level EZ*
- JIS C 5101-20 *Part 20: Sectional specification—Fixed metallized polyphenylene sulfide film dielectric surface mount d.c. capacitors*
- JIS C 5101-20-1 *Part 20-1: Blank detail specification—Fixed metallized polyphenylene sulfide film dielectric surface mount d.c. capacitors—Assessment level EZ*
- JIS C 5101-21 *Part 21: Sectional specification: Fixed surface mount multilayer capacitors of ceramic dielectric, Class 1*
- JIS C 5101-21-1 *Part 21-1: Blank detail specification: Fixed surface mount multilayer capacitors of ceramic dielectric, Class 1—Assessment level EZ*
- JIS C 5101-22 *Part 22: Sectional specification: Fixed surface mount multilayer capacitors of ceramic dielectric, Class 2*
- JIS C 5101-22-1 *Part 22-1: Blank detail specification: Fixed surface mount multilayer capacitors of ceramic dielectric, Class 2—Assessment level EZ*
- JIS C 5101-23 *Part 23: Sectional specification—Fixed surface mount metallized polyethylene naphthalate film dielectric DC capacitors*
- JIS C 5101-23-1 *Part 23-1: Blank detail specification—Fixed surface mount metallized polyethylene naphthalate film dielectric DC capacitors—Assessment level EZ*
- JIS C 5101-24 *Part 24: Sectional specification—Surface mount fixed tantalum electrolytic capacitors with conductive polymer solid electrolyte*
- JIS C 5101-24-1 *Part 24-1: Blank detail specification—Surface mount fixed tantalum electrolytic capacitors with conductive polymer solid electrolyte—Assessment level EZ*
- JIS C 5101-25 *Part 25: Sectional specification—Surface mount fixed aluminium electrolytic capacitors with conductive polymer solid electrolyte*
- JIS C 5101-25-1 *Part 25-1: Blank detail specification—Surface mount fixed aluminium electrolytic capacitors with conductive polymer solid electrolyte—Assessment level EZ*
- JIS C 5101-26 *Part 26: Sectional specification—Fixed aluminium electrolytic capacitors with conductive polymer solid electrolyte (to be published)*
- JIS C 5101-26-1 *Part 26-1: Blank detail specification—Fixed aluminium electrolytic capacitors with conductive polymer solid electrolyte—Assessment level EZ (to be published)*

**Fixed capacitors for use in
electronic equipment—
Part 18: Sectional specification—
Fixed aluminium electrolytic surface
mount capacitors with solid (MnO₂)
and non-solid electrolyte**

Introduction

This Japanese Industrial Standard has been prepared based on the second edition of **IEC 60384-18** published in 2007 without modifying the technical contents.

The portions with dotted underlines are the matters not given in corresponding International Standard.

1 General

1.1 Scope

This Standard is a sectional specification associated with generic specification **JIS C 5101-1** and specifies fixed aluminium electrolytic surface mount capacitors with solid (MnO₂) and non-solid electrolyte primarily intended for d.c. applications for use in electronic equipment (hereafter referred to as “capacitors”).

This Standard applies to capacitors primarily to be mounted directly onto hybrid circuits or printed-wiring boards. For capacitors for special-purpose applications, additional performance requirements may be listed when they are considered necessary to specify adequately for the application purposes.

NOTE : The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows:

IEC 60384-18:2007 *Fixed capacitors for use in electronic equipment—Part 18: Sectional specification—Fixed aluminium electrolytic surface mount capacitors with solid (MnO₂) and non-solid electrolyte* (IDT)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified) and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

1.2 Object

The object of this Standard is to prescribe preferred ratings and characteristics and to select from **JIS C 5101-1** 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 should be of equal or higher performance level, because lower performance levels are not permitted.

1.3 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. For standards with the year indication, only the editions of the indicated year shall be applied and any revisions (including amendments) made thereafter shall not be applied. For those without the indication of the year, the most recent edition (including amendments) shall be applied.

JIS C 0025:1988 *Basic environmental testing procedures Part 2: Tests Test N: Change of temperature*

JIS C 5063 *Preferred number series for resistors and capacitors*

NOTE : Corresponding International Standard: IEC 60063:1963 *Preferred number series for resistors and capacitors*, Amendment 1:1967 and Amendment 2:1977 (IDT)

JIS C 5101-1:2010 *Fixed capacitors for use in electronic equipment—Part 1: Generic specification*

NOTE : Corresponding International Standard: IEC 60384-1:2008 *Fixed capacitors for use in electronic equipment—Part 1: Generic specification* (IDT)

JIS C 60068-1:1993 *Environmental testing Part 1: General and guidance*

NOTE : Corresponding International Standard: IEC 60068-1:1988 *Environmental testing—Part 1: General and guidance* and Amendment 1:1992 (IDT)

JIS C 60068-2-58:2006 *Environmental testing—Part 2: Tests—Test Td: Test methods for solderability, resistance to dissolution of metallization and to soldering heat of surface mounting devices (SMD)*

NOTE : Corresponding International Standard: IEC 60068-2-58:2004 *Environmental testing—Part 2-58: Tests—Test Td: Test methods for solderability, resistance to dissolution of metallization and to soldering heat of surface mounting devices (SMD)* (MOD)

JIS Z 8601 *Preferred numbers*

NOTE : Corresponding International Standard: ISO 3:1973 *Preferred numbers—Series of preferred numbers* (MOD)

JIS Z 9015-1 *Sampling procedures for inspection by attributes—Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

NOTE : Corresponding International Standard: IEC 60410:1973 *Sampling plans and procedures for inspection by attributes* (MOD)

1.4 Information to be given in a detail specification

Detail specifications shall be derived from the relevant blank detail specification.

Detail specifications shall not specify requirements inferior to those of the generic, sectional or blank detail specification. When more severe requirements are included, they shall be listed in **1.9** of the detail specification and indicated in the test schedules, for example, by an asterisk (*).

The following information shall be given in each detail specification and the values quoted shall preferably be selected from those given in the appropriate clause of this sectional specification.

1.4.1 Outline drawing and dimensions

There shall be an illustration of the capacitor as an aid to easy recognition and for comparison of the capacitor with others. Dimensions and their associated tolerances, which affect interchangeability and mounting, shall be given in the detail specification. All dimensions shall preferably be stated in millimetres (mm).

NOTE : The information on dimensions and their associated tolerances may, for convenience, be presented in tabular form.

Normally, the numerical values shall be given for the length of the body, the width and height of the body in addition to the width and length of the terminations and the wire spacing. When a number of items (nominal capacitance values/rated voltage ranges) are covered by a detail specification, the dimensions and their associated tolerances shall be placed in a table below the drawing.

When the configuration is other than described above, the detail specification shall state such dimensional information as will adequately describe the capacitor.

1.4.2 Mounting

The detail specification shall specify the method of mounting to be applied for normal use. The capacitors shall be mounted by their normal means. The method of mounting for the application of tests and measurements shall be in accordance with 4.3.

1.4.3 Ratings and characteristics

The ratings and characteristics shall be in accordance with the relevant clauses of this specification, together with the following.

1.4.3.1 Nominal capacitance range

See 2.2.1.

NOTE: In the case of IEC Quality Assessment System (IECQ), when products approved to the detail specification have different ranges, the following statement should be added: "The range of nominal capacitance values available in each rated voltage range shall be as given in the Qualification approval certificate".

1.4.3.2 Particular characteristics

Additional characteristics may be listed when they are considered necessary to specify adequately the component for design and application purposes.

1.4.3.3 Soldering

The detail specification shall prescribe the test methods, severities and requirements applicable for the solderability and the resistance to soldering heat test.

1.4.4 Marking

The detail specification shall specify the content of the marking on the capacitor and on the package. Deviations in 1.6 of this sectional specification shall be specifically stated.

1.5 Terms and definitions

For the purposes of this Standard, the following terms and definitions, as well as those given in **JIS C 5101-1**, apply.

1.5.1 capacitance of an electrolytic capacitor

capacitance of an equivalent circuit having capacitance and resistance in series measured with alternating current approximately sinusoidal waveform at a specified frequency

1.5.2 surface mount capacitor

capacitor whose small dimensions or nature or shape of terminations make it suitable for surface mounting in hybrid circuits and printed-wiring boards

1.5.3 reverse voltage (for polar capacitors only)

voltage applied to the capacitor terminals in the reverse polarity direction

1.6 Marking

According to **2.4** of **JIS C 5101-1**, with the following details.

1.6.1 Marking on capacitor body and package

The information given in the marking is normally selected from the following list; the relative importance of each item is indicated by its position in the list:

- a) polarity of the terminations (unless identified by the construction)
- b) nominal capacitance;
- c) rated voltage (d.c. voltage may be indicated by the symbol: --- or —);
- d) tolerance on nominal capacitance;
- e) reference to the grade;
- f) year and month (or year and week) of manufacture;
- g) manufacturer's name or trade mark (including abbreviation);
- h) climatic category;
- i) manufacturer's type designation;
- j) reference to the detail specification.

1.6.2 Marking on capacitor body

Surface mount capacitors are generally not marked on the body. If some marking can be applied, they shall be surely marked with the polarity of the terminations and clearly marked with as many as possible of the remaining items in **1.6.1** as is considered useful. Any duplication of information in the marking on the capacitor should be avoided.

1.6.3 Requirements for marking

Any marking shall be legible and not easily smeared or removed by rubbing with the finger.