

JIS

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS C 5381-341 : 2022

(JSA)

**Components for low-voltage surge
protection — Part 341: Performance
requirements and test circuits for
thyristor surge suppressors (TSS)**

ICS 31.080.10 ; 31.080.20

Reference number : JIS C 5381-341: 2022 (E)

PROTECTED BY COPYRIGHT

49 S

C 5381-341 : 2022

Date of Establishment: 2005-03-20

Date of Revision: 2022-10-20

Date of Public Notice in Official Gazette: 2022-10-20

Developed by: Japanese Standards Association

Investigated by: JIS Development Committee on Electronics

JIS C 5381-341 : 2022, First English edition published in 2024-06

Translated and published by: Japanese Standards Association
Mita Avanti, 3-11-28, Mita, Minato-ku, Tokyo, 108-0073 JAPAN

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

© JSA 2024

All rights reserved. Unless otherwise specified, 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.

Printed in Japan

HN

PROTECTED BY COPYRIGHT

Contents

	Page
Introduction	1
1 Scope	1
2 Normative reference	2
3 Terms, definitions, abbreviated terms and circuit symbols	2
3.1 Parametric terms, letter symbols and definitions	2
3.2 General terms	2
3.3 Main terminal ratings	3
3.4 Main terminal characteristics	4
3.5 Additional and derived parameters	6
3.6 Temperature related parameters	6
3.7 Gate terminal parameters	8
3.8 Abbreviated terms	9
3.9 Circuit symbols	9
4 TSS types	11
5 Service conditions	13
5.1 Normal service conditions	13
5.2 Storage temperature range, T_{stgmin} to T_{stgmax}	14
6 Mechanical requirements and identification	14
6.1 Robustness of terminations	14
6.2 Solderability	14
6.3 Marking	14
6.4 Documentation	14
7 Standard test methods	15
7.1 Failure rates	15
7.2 Test conditions	15
7.3 Rating test procedures	17
7.4 Characteristic test procedures	23
Annex A (informative) Common impulse waveshapes	38
Annex B (informative) Glossary of IEC 60747-6 thyristor terms	47
Annex C (informative) Additional parametric tests	66
Annex D (normative) Preferred values	76
Annex JA (normative) Basic function and component description on TSS	80
Bibliography	89

Annex JB (informative) Comparison table between JIS and corresponding
International Standard 92

Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry based on the provision of Article 14, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act in response to a proposal for revision of Japanese Industrial Standard with a draft being attached, submitted by Japanese Standards Association (JSA), an accredited standards development organization. This edition replaces the previous edition (**JIS C 5381-341** : 2005), which has been technically revised.

This **JIS** document is protected by the Copyright Act.

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, published patent application or utility model rights. The relevant Minister is not responsible for identifying any of such patent rights, published patent application or utility model rights.

JIS C 5381 series consists of the following 13 parts.

- JIS C 5381-11 *Low-voltage surge protective devices — Part 11 : Surge protective devices connected to low-voltage power systems — Requirements and test methods*
- JIS C 5381-12 *Low-voltage surge protective devices — Part 12 : Surge protective devices connected to low-voltage power systems — Selection and application principles*
- JIS C 5381-21 *Low voltage surge protective devices — Part 21 : Surge protective devices connected to telecommunications and signalling networks — Performance requirements and testing methods*
- JIS C 5381-22 *Low-voltage surge protective devices — Part 22 : Surge protective devices connected to telecommunications and signalling networks — Selection and application principles*
- JIS C 5381-31 *Low-voltage surge protective devices — Part 31 : Requirements and test methods for SPDs for photovoltaic installations*
- JIS C 5381-32 *Low-voltage surge protective devices — Part 32 : Surge protective devices connected to the d.c. side of photovoltaic installations — Selection and application principles*
- JIS C 5381-311 *Components for low-voltage surge protective devices — Part 311 : Performance requirements and test circuits for gas discharge tubes (GDT)*
- JIS C 5381-312 *Components for low-voltage surge protective devices — Part 312 : Selection and application principles for gas discharge tubes*

- JIS C 5381-321 *Components for low-voltage surge protective devices — Specifications for avalanche breakdown diode (ABD)*
- JIS C 5381-331 *Components for low-voltage surge protection — Part 331 : Performance requirements and test methods for metal oxide varistors (MOV)*
- JIS C 5381-341 *Components for low-voltage surge protection — Part 341 : Performance requirements and test circuits for thyristor surge suppressors (TSS)*
- JIS C 5381-351 *Components for low-voltage surge protection — Part 351 : Performance requirements and test methods for telecommunications and signalling network surge isolation transformers (SIT)*
- JIS C 5381-352 *Components for low-voltage surge protection — Part 352 : Selection and application principles for telecommunications and signalling network surge isolation transformers (SITs)*

Components for low-voltage surge protection — Part 341 : Performance requirements and test circuits for thyristor surge suppressors (TSS)

Introduction

This Japanese Industrial Standard has been prepared based on **IEC 61643-341 : 2020**, Edition 2, without any modifications of the technical contents but adding the basic function and component description on TSS.

The dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JB.

1 Scope

This Standard specifies performance requirements and test circuits for thyristor surge suppressor (hereafter referred to as TSS) components. These surge protective components (SPCs) are specially formulated thyristors designed to limit overvoltages and divert surge currents by clamping and switching actions. These SPCs are used in the construction of equipment used in Information & Communications Technologies (ICT) networks and surge protective devices (SPDs) with voltages up to AC 1 000 V and DC 1 500 V. This Standard is applicable to gated or non-gated TSS components with third quadrant (-v and -i) characteristics of blocking, conducting or switching.

This Standard contains information on

- terminology;
- letter symbols;
- essential ratings and performances;
- rating verification and performance test.

This Standard does not apply to the conventional triode thyristors as covered by **IEC 60747-6**.

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

IEC 61643-341 : 2020 *Components for low-voltage surge protection—
Part 341 : Performance requirements and test circuits for thyristor surge
suppressors (TSS)* (MOD)

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**