

BUREAU OF INDIAN STANDARDS

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**मसौदा भारतीय मानक
विद्युत घटक - विश्वसनीयता -
विफलता दर के लिए संदर्भ शर्तें
और रूपांतरण के लिए स्ट्रेस मॉडल्स**

Draft Indian Standard

**Electric components – Reliability –
Reference conditions for failure rates
And stress models for conversion**

(Superseding IS 7354 (Part 3): 2011)

ICS 31.020

Dependability of Electronic, Electrical Components, Equipment and Systems Sectional Committee, LITD 02	Last Date for Comments: 20 October 2023.
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NATIONAL FOREWORD

(Formal clauses will be added later)

This draft Indian Standard which is identical with IEC 61709: 2017 ‘Electric components – Reliability – Reference conditions for failure rates and stress models for conversion’ issued by the International Electrotechnical Commission (IEC) *will be* adopted by the Bureau of Indian Standards on the recommendations of the Dependability of Electronic, Electrical Components, Equipment and Systems Sectional Committee and approval of the Electronics and Information Technology Division Council.

IS 7354 (Part 3) was originally published in 1975 and subsequently revised in 1984. The second revision of this standard was done in 2011 to bring its in line with latest technical developments by adopting the latest version of IEC 60319: 1999. IEC 60319 has now been withdrawn by the IEC and Annex J of IEC 61709 replaces guidance previously provided by IEC 60319. On publication of this draft Standard, IS 7354 (Part 3): 2011 will be withdrawn.

The text of IEC Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions and terminologies are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words ‘International Standard’ appear referring to this standard, they should be read as ‘Indian Standard’, and
- b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted in their respective places, are listed below along with their degree of equivalence for the editions indicated. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies:

International Standards	Corresponding Indian Standard	Degree of Equivalence
IEC 60050-192: 2015 International electrotechnical vocabulary – Part 192: Dependability	IS 1885 (Part 192): 2015 Electrotechnical vocabulary Part 192 Dependability	Identical

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2:1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Scope of IEC 61709:2017 is as follows:

This document gives guidance on the use of failure rate data for reliability prediction of electric components used in equipment.

The method presented in this document uses the concept of reference conditions which are the typical values of stresses that are observed by components in the majority of applications.

Reference conditions are useful since they provide a known standard basis from which failure rates can be modified to account for differences in environment from the environments taken as reference conditions. Each user can use the reference conditions defined in this document or use their own. When failure rates stated at reference conditions are used it allows realistic reliability predictions to be made in the early design phase.

The stress models described herein are generic and can be used as a basis for conversion of failure rate data given at these reference conditions to actual operating conditions when needed and this simplifies the prediction approach. Conversion of failure rate data is only possible within the specified functional limits of the components.

This document also gives guidance on how a database of component failure data can be constructed to provide failure rates that can be used with the included stress models. Reference conditions for failure rate data are specified, so that data from different sources can be compared on a uniform basis. If failure rate data are given in accordance with this document then additional information on the specified conditions can be dispensed with.

This document does not provide base failure rates for components – rather it provides models that allow failure rates obtained by other means to be converted from one operating condition to another operating condition.

The prediction methodology described in this document assumes that the parts are being used within its useful life. The methods in this document have a general application but are specifically applied to a selection of component types as defined in Clauses 6 to 20 and I.2.

NOTE– The Technical content of this document has not been enclosed as these are identical with the corresponding IEC Standard. For details please refer IEC 61123:2019 or kindly contact.

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