Irish Standard
I.S. EN IEC 62343-2-1:2019

Dynamic modules - Part 2-1: Reliability qualification - Test template

I.S. EN IEC 62343-2-1:2019

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:	*Published:*
EN IEC 62343-2-1:2019	2019-11-29

This document was published under the authority of the NSAI and comes into effect on:	ICS number:
2019-12-18	33.180.01
	NOTE: If blank see CEN/CENELEC cover page

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

National Foreword

I.S. EN IEC 62343-2-1:2019 is the adopted Irish version of the European Document EN IEC 62343-2-1:2019, Dynamic modules - Part 2-1: Reliability qualification - Test template

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

For relationships with other publications refer to the NSAI web store.

Compliance with this document does not of itself confer immunity from legal obligations.

In line with international standards practice the decimal point is shown as a comma (,) throughout this document.

This page is intentionally left blank

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62343-2-1

November 2019

ICS 33.180.01

Supersedes EN 62343-2:2014 and all of its amendments and corrigenda (if any).

English Version

Dynamic modules - Part 2-1: Reliability qualification - Test template (IEC 62343-2-1:2019)

Modules dynamiques - Partie 2-1: Qualification de fiabilité - Modèle d'essai (IEC 62343-2-1:2019)

Dynamische Module - Teil 2-1: Zuverlässigkeitsnachweis - Prüfvorlage (IEC 62343-2-1:2019)

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 86C/1567/CDV, future edition 1 of IEC 62343-2-1, prepared by SC 86C "Fibre optic systems and active devices" of IEC/TC 86 "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62343-2-1:2019.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-07-21
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-10-21

This document supersedes EN 62343-2:2014 and all of its amendments and corrigenda (if any). This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to EN 62343-2:2014:

a) addition of an Introduction to the background of this document;

b) replacement of "Reliability qualification consideration" by "reliability qualification test consideration";

c) deletion of the consideration of "Design 1" and "Design 2" and change of the contents of "Approach" in "Reliability qualification test considerations";

d) deletion of the details in "Reliability qualification requirements" and replacement by "Reliability qualification test items";

e) deletion of "Reliability calculations" from the sum of failure rates of constituting parts;

f) integration of "Pass/fail criteria" and "Guidance of FMEA" into Annex B (informative);

g) simplification of test items and conditions in Annex A and change of title of Annex A to "Examples of reliability qualification test conditions".

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62343-2-1:2019 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60068-2-14	NOTE	Harmonized as EN 60068-2-14
IEC 61300 (series)	NOTE	Harmonized as EN 61300 (series)
IEC 61300-2-4	NOTE	Harmonized as EN IEC 61300-2-4
IEC 62005-9-1	NOTE	Harmonized as EN 62005-9-1
IEC 62572-3	NOTE	Harmonized as EN 62572-3

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 62343	-	Dynamic modules – General and guidance	EN 62343	-

This page is intentionally left blank

IEC 62343-2-1

Edition 1.0 2019-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Dynamic modules –
Part 2-1: Reliability qualification – Test template

Modules dynamiques –
Partie 2-1: Qualification de fiabilité – Modèle d'essai

IEC 62343-2-1:2019-09(en-fr)

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,…). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary
67 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

A propos de l'IEC
La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC
Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC - webstore.iec.ch/advsearchform
La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,…). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished
Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc
Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

Electropedia - www.electropedia.org
Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary
67 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

IEC 62343-2-1

Edition 1.0 2019-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Dynamic modules –
Part 2-1: Reliability qualification – Test template

Modules dynamiques –
Partie 2-1: Qualification de fiabilité – Modèle d'essai

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.180.01

ISBN 978-2-8322-7356-2

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

DYNAMIC MODULES –

Part 2-1: Reliability qualification – Test template

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 itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
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 62343-2-1 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

This first edition cancels and replaces the second edition of IEC 62343-2 published in 2014. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC 62343-2:2014:

a) addition of an Introduction to the background of this document;
b) replacement of "Reliability qualification consideration" by "reliability qualification test consideration";
c) deletion of the consideration of "Design 1" and "Design 2" and change of the contents of "Approach" in "Reliability qualification test considerations";
d) deletion of the details in "Reliability qualification requirements" and replacement by "Reliability qualification test items";

e) deletion of "Reliability calculations" from the sum of failure rates of constituting parts;

f) Integration of "Pass/fail criteria" and "Guidance of FMEA" into Annex B (informative);

g) Simplification of test items and conditions in Annex A and change of title of Annex A to "Examples of reliability qualification test conditions".

The text of this International Standard is based on the following documents:

CDV	Report on voting
86C/1567/CDV	86C/1594/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62343 series, published under the general title *Dynamic modules,* can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

NOTICE

INTRODUCTION

Dynamic modules (DMs) are relatively new fibre optic devices. In the industry, there is no de-facto standard of reliability qualification test requirements for DMs. Also, there are many types and functions of DMs, such as optical path switching, wavelength management, chromatic dispersion management, optical channel power management, and optical channel powers and wavelength monitoring. Therefore, it is difficult to standardize the reliability qualification test requirements because their functionality is so diverse. For DMs, a reliability qualification test template rather than particular requirements has been standardized.

The first edition of IEC 62343-2, *Dynamic modules – Part 2: Reliability qualification,* was published in 2011, and the second edition was published in 2014. A survey on reliability qualification test items and conditions was carried out in Japan, China, North America and Europe in 2015 and 2016. The survey revealed that several reliability test conditions were inconsistent with those in IEC 62343-2:2014, and the responses indicated a lack of consensus. As a result of the discussion in SC 86C, it was agreed that it was impossible to unify the test conditions for the reliability qualification of DMs. Instead of a reliability qualification document, it was decided to prepare this template for a reliability qualification test for DMs. Consequently, IEC 62343-2:2014 will be withdrawn and replaced upon publication of this document.

DYNAMIC MODULES –

Part 2-1: Reliability qualification – Test template

1 Scope

This part of IEC 62343 provides a reliability qualification test template for dynamic modules (DMs). The template describes the reliability qualification test items and provides information on requirements or options. Example test conditions are given for information purposes in Annex A.

For reliability qualification purposes, some information about the internal components, parts and interconnections is needed. These internal parts are treated as black boxes. This document gives requirements for the evaluation of DM reliability by combining the reliability of such internal black boxes.

The object of this reliability qualification test template is to provide a framework for the reliability qualification tests for DMs. Developers of reliability qualification tests for DMs determine the test conditions for each test item by referring to the examples in Annex A.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 62343, *Dynamic modules – General and guidance*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purpose of this document, terms and definitions given in IEC 62343 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1.1
failure
non-compliance to product specification or change in parameters as set by the standard or agreed by the customer and supplier

3.1.2
qualification
formal test process to determine whether or not the product is suitable for applications

Note 1 to entry: "Pass or fail" is the expected outcome.