

INTERNATIONAL STANDARD

**Dynamic modules –
Part 3-1: Performance specification templates – Dynamic channel equalizers**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

DYNAMIC MODULES –**Part 3-1: Performance specification templates –
Dynamic channel equalizers**

FOREWORD

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International Standard IEC 62343-3-1 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

This second edition cancels and replaces the first edition published in 2010. This edition constitutes a technical revision.

This edition includes the following significant technical change with respect to the previous edition:

- modification of terms and definitions and references.

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

FDIS	Report on voting
86C/1370/FDIS	86C/1372/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.

This publication 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 publication will remain unchanged until the stability date indicated on the IEC website 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- withdrawn,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.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

A dynamic channel equalizer (DCE) is used to compensate and equalize the variations in channel power spectrum as the optical channels propagate through DWDM networks. A typical DCE module is an electrically controlled two port device, which controls the time varying power levels of multichannel input signals such that, at the output channel, powers are nominally equalized.

DYNAMIC MODULES –

Part 3-1: Performance specification templates – Dynamic channel equalizers

1 Scope

This part of IEC 62343 provides a performance specification template for the dynamic channel equalizer (DCE). The object of this performance specification template is to provide a framework for the preparation of detail specifications on the product or performance of dynamic channel equalizers.

Additional specification parameters may be included for product specifications or performance specifications. However, specification parameters specified in this standard should not be removed from the product specifications or performance specifications.

Technical information regarding dynamic channel equalizers and their applications in DWDM systems is described in IEC TR 62343-6-1.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61300-2-14, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-14: Tests – High optical power*

IEC 61300-3-2, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-2: Examinations and measurements – Polarization dependent loss in a single-mode fibre optic device*

IEC 61300-3-6, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-6: Examinations and measurements – Return loss*

IEC 61300-3-29, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-29: Examinations and measurements – Spectral transfer characteristics of DWDM devices*

IEC 61300-3-32, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-32: Examinations and measurements – Polarization mode dispersion measurement for passive optical components*

IEC 61300-3-38, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-38: Examinations and measurements – Group delay, chromatic dispersion and phase ripple*

IEC 61753-021-2, *Fibre optic interconnecting devices and passive components performance standard – Part 021-2: Grade C/3 single-mode fibre optic connectors for category C – Controlled environment*

IEC 62343, *Dynamic modules – General and guidance*

ITU-T Recommendation G.694.1, *Spectral grids for WDM applications: DWDM frequency grid*

3 Terms and definitions

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

4 Test report

Fully documented test reports and supporting evidence shall be prepared and be available for inspections as evidence that the tests have been carried out and complied with.

5 Reference components

The testing for DCE components does not require the use of reference components.

6 Performance requirements

6.1 Dimensions

Dimensions shall comply with either an appropriate IEC interface standard, or with those given in the manufacturer's drawings, where the IEC interface standard does not exist or cannot be used.

6.2 Sample size

The test sample size and sequencing requirements for the module components shall be defined in the relevant specification.

6.3 Test details and requirements

The requirements are given only for non-connectorized DCE devices. For connectorized components, the connector performances shall be in compliance with IEC 61753-021-2.

A minimum length of fibre or cable of 1,5 m per port shall be included in all climatic and environmental tests.

The channel spacings, unless otherwise specified, shall be in accordance with ITU-T Recommendation G.694.1. Environmental tests shall be measured for a single input/output port combination.

The test details and requirements are given in Table 1.

Table 1 – Tests and requirements

No.	Test parameters	Unit	Details
1	Insertion loss	dB Over the operating wavelength range	IEC 61300-3-29 Source: The source shall be tuneable over the operating wavelength range and shall have a spectral width of ≤ 1 GHz The source stability shall be $\leq 0,25$ GHz The source output shall be unpolarized Detector: The linearity of the detector shall be within $\pm 0,05$ dB The spectral response shall be matched to the source The dynamic range shall be consistent with the attenuation values to be measured The maximum attenuation value specified applies to any combination of input/output ports
2	In band extinction ratio	dB	Method under consideration
3	Out of band attenuation	dB	Method under consideration
4	Return loss (branching device method)	dB Class W	IEC 61300-3-6 Branching device: The nominal splitting ratio shall be 50/50 The directivity shall be ≥ 60 dB Source: The central wavelength shall be $1\,550\text{ nm} \pm 20\text{ nm}$ The power stability of the light source shall be better than $\pm 0,05$ dB over the measuring period Detector: The linearity of the detector shall be within $\pm 0,05$ dB The detector sensitivity shall be < -80 dBm All ports not under test shall be terminated to avoid unwanted back reflections contributing to the measurement
5	Polarization dependent loss	dB	IEC 61300-3-2, Method 1 Other details shall be the same as in test no. 1 The polarization dependant loss shall be measured between any input/output port combination
6	Polarization mode dispersion	ps	IEC 61300-3-32 Other details shall be the same as in test no. 1 The polarization mode dispersion shall be measured between any input/output port combination
7	Output channel non-uniformity	dB	IEC 61300-3-29
8	Input channel non-uniformity	dB	IEC 61300-3-29
9	Ripple	dB	IEC 61300-3-29
10	Channel frequency range	GHz	Method under consideration
11	Channel response time	s	Method under consideration
12	Channel spacing	GHz	Method under consideration
13	Chromatic dispersion	ps/nm	IEC 61300-3-38

No.	Test parameters	Unit	Details
14	Channel crosstalk	dB	IEC 61300-3-29
15	Adjacent channel attenuation crosstalk	dB	IEC 61300-3-29
16	Maximum input power	dBm	IEC 61300-2-14

Bibliography

IEC 61300 (all parts), *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures*

IEC 61753-1, *Fibre optic interconnecting devices and passive components performance standard – Part 1: General and guidance for performance standards*

IEC TR 62343-6-1, *Dynamic modules – Part 6-1: Dynamic channel equalizers*

ITU-T Recommendation G.671, *Transmission characteristics of optical components and subsystems*

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