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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 28511.2-2023

Replacing GB/T 28511.2-2012

**Integrated optical path devices based on planar lightwave
circuit-Part 2: Dense wavelength division multiplexing(DWDM)
filter based on arrayed waveguide grating(AWG) technology**

平面光波导集成光路器件 第2部分：基于阵列波导光栅（AWG）技术的密集波分
复用（DWDM）滤波器

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Foreword

This document complies with the provisions of GB/T 1:1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Drafting:

This document is Part 2 of GB/T 28511 "Planar Optical Waveguide Integrated Optical Circuit Devices": GB/T 28511 has released the following part:

- Part 1: Optical power splitter based on planar optical waveguide (PLC);
- Part 2: Dense wavelength division multiplexing (DWDM) filters based on arrayed waveguide grating (AWG) technology:

This document replaces GB/T 28511:2-2012 "Planar optical waveguide integrated optical circuit devices - Part 2: Arrayed waveguide grating based (AWG) technology Dense Wavelength Division Multiplexing (DWDM) filter", compared with GB/T 28511:2-2012, except for structural adjustments and editorial changes In addition, the main technical changes are as follows:

- a) Change the term "peak wavelength" to "center wavelength" (see 3:3, 3:3 in the:2012

version);

- b) Added the term and definition of "flatness" (see 3:6) and deleted "set temperature stability" (see 3:11 of the:2012 version);
- c) Changed the "Wavelength Accuracy", "Insertion Loss", "Bandwidth", "Adjacent Channel Crosstalk", "Non-Adjacent Channel Crosstalk" and Definition of the term "total crosstalk" (see 3:4, 3:5, 3:7, 3:8, 3:9, 3:10, 3:4, 3:5, 3:6, 3:7, 3:8, 3:9 of the:2012 edition);
- d) The operating wavelength of the C-band AWG filter has been changed [see 5:1, 4:1a) of the:2012 edition];
- e) Increased the operating wavelength of C-band AWG filter (see 5:1);
- f) Changed the non-adjacent channel crosstalk and total crosstalk optical performance parameters of the 100GHz channel spacing flat-top thermally insensitive AWG filter Number (see Table 5, Table 3 of the:2012 edition);
- g) Added optical performance parameters of 50GHz channel spacing flat-top heat-sensitive AWG filter (see Table 3);
- h) Added optical performance parameters of 50GHz channel spacing flat-top thermally insensitive AWG filter (see Table 6);
- i) Added optical performance parameters of industrial-grade flat-top thermally insensitive AWG filter (see Table 7);
- j) Added optical performance parameters of industrial-grade single-fiber bidirectional flat-top thermally insensitive AWG filter (see Table 8);
- k) Added optical performance parameters of ultra-wide spectrum flat-top thermally insensitive AWG filter (see Table 9);
- l) Added requirements for extreme working conditions (see Table 10);
- m) The return loss tester in the test instrument is deleted (see 5:3:7 of the:2012 version);
- n) The reference standards, test conditions, and failure criteria of the reliability test have been changed, and environmental requirements have been added (see Chapter 8, :2012 version of 5:5);
- o) Delete dispersion and polarization mode dispersion in daily inspection (see 6:2:1 of the:2012 version);
- p) Added specific requirements for type inspection (see 9:3:2, 9:3:3, 9:3:4, 9:3:5, 9:3:6, 9:3:7);
- q) Added specific requirements for marking (see 10:1);
- r) Added specific requirements for storage (see 10:4);

s) 8 frequencies/wavelengths have been added to the AWG filter frequency/wavelength allocation schedule (see Table A:1);

t) Changed the signals and types defined by the AWG filter electrical interface (see Table B:1, Table B:1 of the:2012 version);

u) Delete "50GHz channel spacing flat-top thermally insensitive AWG filter optical performance parameters" (see Appendix C of the:2012 version);

v) Added "Thermal Insensitive AWG Filter Outline Diagram" (see Appendix D):

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The main drafters of this document: Ling Jiuhong, Luo Yong, Cao Li, Ma Weidong, Zhao Wenyu, Zhang Dezhi, Shen Shikui, Ma Guangpeng, Xu Qiushuang:

The previous versions of this document and the documents it replaces are as follows:

- First published as GB/T 28511:2-2012 in:2012;
- This is the first revision:

Introduction

Planar optical waveguide integrated optical circuit device is a core device of optical communication information technology: The device is manufactured based on planar optical waveguide technology and can be implemented It now distributes and transmits the power and wavelength of light wave signals: At present, we mainly develop planar optical waveguide optical power splitters and array waveguides:

Develop standards for planar optical waveguide integrated devices such as gratings (AWG) and wavelength division multiplexing (DWDM) filters to unify and standardize planar optical waveguides The key parameters of integrated devices are conducive to promoting the standardized development of the industrial chain related to planar optical waveguide

integrated devices in China: GB/T 28511 "Flat Planar Optical Waveguide Integrated Optical Circuit Devices" aims to standardize the technical requirements, test methods, reliability tests, and inspection rules for planar optical waveguide integrated optical circuit devices:

and requirements for marking, packaging, transportation and storage, etc., and is planned to be composed of two parts:

- Part 1: Optical power splitter based on planar optical waveguide (PLC): The purpose is to specify planar optical waveguide optical power splitters Technical requirements, test methods, reliability tests, inspection rules and marking, packaging, transportation and storage:

- Part 2: Dense wavelength division multiplexing (DWDM) filters based on arrayed waveguide grating (AWG) technology: The purpose is to stipulate Technical requirements, test methods, reliability tests, and inspection regulations for arrayed waveguide grating (AWG) wavelength division multiplexing (DWDM) filters regulations, as well as marking, packaging, transportation and storage:

Planar optical waveguide integrated optical circuit device Part 2: Arrayed Waveguide Grating (AWG) Based Dense Wavelength Division Multiplexing (DWDM) Filters

1 Scope

This document defines dense wavelength division multiplexing (DWDM) filters based on arrayed waveguide grating (AWG) technology (hereinafter referred to as "AWG filter") terms and definitions; stipulates classification, technical requirements, reliability testing, inspection rules, marking, packaging, transportation and storage Requirements; corresponding test methods are described:

This document applies to the design, development, and production of dense wavelength division multiplexing (DWDM) filters based on arrayed waveguide grating (AWG) technology: and inspection:

2 Normative reference documents

GB/T 191

GB/T 2828

GB/T 20440-2006

GB/T 26125

GB/T 26572-2011

GB/T 33768-2017