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**NATIONAL STANDARD OF THE  
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**GB/T 33779.2-2017**

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**Guidance for special characteristic of optical fibre -- Part 2:  
Interpretation of OTDR backscattering traces**

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## Table of Contents

Foreword

2007 chapter number comparison list.

1 Scope

2 normative reference documents

3 backscattering phenomenon

3.1 Rayleigh scattering

3.2 Fresnel reflex and blind spot

4 OTDR measurements

4.1 General rules

### Foreword

GB/T 33779 "Fiber Optic Properties Test Guide" is expected to be divided into the following sections.

- Part 1. attenuation uniformity;

Part 2. OTDR backscatter curve analysis;

Part 3. Effective area ( $A_{eff}$ ).

This part is part 2 of GB/T 33779.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This section uses the re-drafting method to modify IEC /T R62316..2007 "OTDR Backward Scattering Rules for Analytical Guidelines".

This section is structurally adjusted in comparison with IEC /T R62316..2007, which is listed in Appendix A and IEC /T R62316.

### 2007 chapter number comparison list.

This section has technical differences compared to IEC /T R62316..2007, and the terms involved in these differences have passed through the margin

The vertical single line (|) of the white position is marked, and a list of the corresponding technical differences and their causes is given in Appendix B.

### 1 Scope

This part of GB/T 33779 specifies the analytical guidelines for the backscattering curve of the OTDR.

This section applies to the analysis of fiber attenuation curves for independent and embedded OTDR measurements within the device.

## 2 normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article

Pieces. For undated references, the latest edition (including all modifications) applies to this document.

GB/T 15972.40-2008 Specifications for optical fiber test methods - Part 40. Measurement methods and tests for transmission characteristics and optical properties

Program --- attenuation (IEC 60793-1-40..2001, MOD)

IEC 61746 (all parts) Calibration of optical time domain reflectometer (OTDR)

[Calibration of optical time-domain reflectometers (OTDR)]

### 3.1 Rayleigh scattering

Diffusion of optical fiber material density will make the refractive index is not uniform will produce Rayleigh backscatter. As the fiber is composed of silicon dioxide

The fluctuation of its density is usually generated in the production process.

### 3.2 Fresnel reflex and blind spot

When a beam of light is incident at an angle to the interface between two different refractive index media, a portion of the light is refracted into the second

Inside, some part is reflected back to the first medium, which is the Fresnel reflex. Fresnel reflections sometimes reach very high values. Feene

The reflex is related to the refractive index difference between the two media, and also relates to the interface itself, such as the interface roughness, incident angle and interface defects. Have

Can detect a very strong Fresnel reflex, and even make the receiver to saturation, that is, the performance of the time signal on the flat response.

When the backscattered signal of a fiber is lower than the saturated reflected signal, the backscattered signal of this fiber can not be detected or

In the OTDR curve can not be reflected, this part of the OTDR test curve is defined as a blind spot. Usually tested at the OTDR output

And the measured fiber can be connected between a short section of the transition fiber to reduce the impact of blind spots.

#### 4.1 General rules

The intensity of the backscatter of an optical fiber can be measured by the OTDR, the principle is from the test end to the end of the fiber to send light pulses,

The OTDR measures the optical power from the fiber back to the beginning. In the OTDR curve, the distance and time in line with the relationship (1).

$t =$

$n_g(\lambda)$

(1)