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

GB/T 24366-2024

**Technical requirements of optoelectronic detector module for
communication**

通信用光电探测器组件技术要求

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1. Structure and drafting rules for standardization documents" Drafting. This document replaces GB/T 24366-2009 "Technical requirements for photoelectric detector components for communications" and is consistent with GB/T 24366-2009. In addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) Added parameter definitions for some detector components. sensitivity (see 3.7), minimum detectable optical power (see 3.8), overload optical power (see 3.9), breakdown voltage temperature coefficient (see 3.10), current response (see 3.11), spectral response range (see 3.12), dark current (see 3.13), optical return loss (see 3.14), receiving component bandwidth (-3dB) (see 3.15) and carrier-to-noise ratio (see 3.16);
- b) Changed "Classification by die type of photoelectric detector assembly" to "Classification by type of photoelectric chip used" (see 5.2, 2009 Version 4.2); added "PIN TIA SOA Photodetector Components" and "APD TIA SOA Photodetector Components" There are two types of "pieces" (see 5.2);
- c) The extreme working conditions have been changed (see Table 1, Table 1, Table 3 and

Table 5 of the.2009 edition);

d) Changed some parameters of the photoelectric characteristics of the PIN TIA detector assembly. optical return loss, sensitivity, pressure sensitivity, Overload optical power and receiving component bandwidth (-3dB) (see Table 2, Table 2 of the.2009 edition); dynamic range and TIA operation are deleted Voltage parameter indicators (Table 2 of the.2009 edition);

e) Modified some parameters of the photoelectric characteristics of the APD TIA detector assembly. spectral response range, photomultiplier factor, light Return loss, sensitivity, pressure sensitivity, overload optical power and receiving component bandwidth (-3dB) (see Table 3,.2009 edition) 4); The parameter index of TIA working voltage has been deleted (see Table 4 of the.2009 edition);

f) Changed some parameters of the photoelectric characteristics of the PIN detector assembly. current responsivity, minimum detectable optical power, optical echo Loss, dark current, reverse voltage, receiving component bandwidth (-3dB) and frequency response flatness (see Table 3, Table 6 of the.2009 edition); delete In addition to the TIA operating voltage parameter indicators (Table 6 of the.2009 edition);

g) Added the photoelectric characteristics of PIN TIA SOA detector components (see Table 5);

h) Environmental compliance requirements have been changed (see 6.3,

5.4 of the.2009 edition). Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by the Ministry of Industry and Information Technology of the People's Republic of China. This document is under the jurisdiction of the National Communications Standardization Technical Committee (SAC/TC485). This document was drafted by: China Information and Communications Technology Group Co., Ltd., China Academy of Information and Communications Technology, Langmeitong Communication Technology (Shenzhen) Ltd. The drafters of this document. Wang Hongya, Zheng Qingli, Song Mengyang, Liu Lu, Ma Guangpeng. The previous versions of this document and the documents it replaces are as follows:

---First published in.2009 as GB/T 24366-2009;

---This is the first revision. Technical requirements for photoelectric detector components for communications

1 Scope

GB/T 24366-2024 specifies the photodetector module used at the receiving end of an optical link. It is the component that turns light back into an electrical signal, and it sets the limit on how far a link can reach: the weakest optical power at which the receiver still

recovers data determines the span between amplifiers, and every decibel of receiver sensitivity is worth real money over a network. Its performance depends on properties that have to be specified precisely rather than described - responsivity, dark current, bandwidth, and the noise contributed by the detector and by the amplifier packaged with it - because a module a fraction of a decibel worse than specified turns into a link budget that does not close on a route already built. This document defines the terms, definitions and abbreviations for optoelectronic detector modules for communications and specifies their classification, their optoelectronic performance requirements and the associated requirements. Under ICS 33.180.10 and CCS M33, it is written for optical component manufacturers, for the makers of transceivers and line equipment, and for the telecom operators and testing laboratories that verify what they bought.

This document defines the terms, definitions, abbreviations and abbreviations of photoelectric detector assemblies for communications (hereinafter referred to as "detector assemblies"), and specifies the The classification, optoelectronic characteristics, environmental compliance and other technical requirements of device components. This document applies to the design, development, production and use of photodetector components in digital optical communication systems as well as analog optical communication systems. test.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 9771 (all parts) Single-mode optical fiber for communication

GB/T 12357 (all parts) Multimode optical fiber for communication

GB/T 24365-2009 Test methods for photoelectric detector components for communications

GB/T 26572 Limit requirements for restricted substances in electronic and electrical products

GB/T 39560 (all parts) Determination of certain substances in electrical and electronic products

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Under the specified modulation rate and the specified sinusoidal jitter stress conditions, and meeting the random bit error rate requirements, the optical receiver is at point R The

minimum optical modulation amplitude OMA that can be received. Note

1.It takes into account the worst extinction ratio, pulse rise and fall time, optical return loss on the optical transmitter side, and the allowable optical receiver under application conditions. The power penalty caused by connector performance degradation and test tolerance. Note

2.The definition of point R is given in Figure 1 of ITU-TG.957 (2006).

3.2 Breakdown voltage breakdown voltage; VBR The input optical power is equal to zero, and the reverse bias voltage of the APD is gradually increased, and the dark current increases accordingly. When the dark current reaches 10 μ A (or 100 μ A), The corresponding reverse bias voltage.

3.3 Photomultiplication factor

3.4 The maximum deviation of the response value from its best fit straight line within a certain frequency range.