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

GY/T 194-2003

**Specifications and methods of measurement on optical node
used in CATV systems
(English Translation)**

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Foreword

This standard is based on the needs of China 's cable television network construction and operation, and refers to the performance parameters of optical workstations at home and abroad.

The technical requirements and measurement methods of the uplink optical transmitter are specified. The technical requirements and measurement methods of its downstream optical receiver are mainly referenced GB/T 11318.1-1996 "Cable distribution system equipment and components for television and sound signals-Part 1. General specifications" and GY/T 143-2000 "Technical Conditions and Measurement Methods for Amplifier Optical Transmitters and Receivers in Cable TV Systems". In the development of this standard, a comprehensive analysis A large number of test data and the specific requirements for the application of cable television systems. At the same time, both the advanced requirements and the production costs are taken into account in the index requirements.

The need for this and use.

Appendix A to this standard is an informative appendix.

This standard is under the jurisdiction of the National Radio and Television Standardization Technical Committee.

This standard was drafted. Radio and Television Metrology and Testing Center of the State Administration of Radio, Film and Television, Wuxi Lutong Electronic Technology Co., Ltd., Sichuan Jiuzhou Electronic Technology Co., Ltd.

1 Scope

This standard specifies the technical requirements and measurement methods for optical workstations in cable television systems. For tasks that ensure the same measurement uncertainty any equivalent measurement method can also be used. In case of dispute, this standard shall prevail.

This standard applies to the development, production, use, operation and maintenance of optical workstations for cable television systems.

2 Normative references

The clauses in the following documents have become the clauses of this standard after being referenced. For dated references, all subsequent Neither amendments (excluding errata) or revised versions are applicable to this standard, however, parties who have reached an agreement under this standard are encouraged to study is the latest version of these files available? For undated references, the latest version applies to this standard.

GB 5465.2-1985 Graphical symbols for electrical equipment GB/T 11318.1-1996 Cable and distribution system equipment and components for television and sound signals-Part 1. General specifications GY/T 143-2000 Cable TV system AM optical transmitter and receiver technical conditions and measurement methods

3 Terms and definitions

The following terms and definitions apply to this standard.

Return optical transmitter an optical transmitter that transmits an uplink transmission signal.

Forward optical receiver Optical receiver for receiving downlink transmission signals.

Return optical receiver Optical receiver for receiving uplink transmission signals.

Optical node

A transmission device with functions such as a downlink optical receiver and an uplink optical transmitter.

Noise power ratio (NPR) the total power (or power spectrum) of the digital modulation signal output by the uplink optical receiver within the specified temperature, specified link loss and return bandwidth the ratio of the density) to the total noise power (or power spectral density) within the return bandwidth is expressed in decibels.

Noise power ratio dynamic range when the noise power ratio is not less than a specified value within the specified temperature, specified link loss, and return bandwidth, it is added to the upstream optical transmitter the decibel difference between the maximum and minimum total power of the digitally modulated signal.

4.1 General requirements

The appearance should be tidy, the surface should not have obvious dents, scratches, cracks, burrs, deformation; the coating should not be blistering, cracking and falling off;

The metal parts should not be rusted and damaged; the pouring material should not spill. The structure and components of the whole machine should be fastened without looseness; text symbols and graphics to explain the function Symbols and signs shall be complete, correct, clear and firm; graphic symbols shall comply with the relevant provisions of GB 5465.2-1985.

4.2.1 Technical Requirements of Downlink Optical Receiver

Should comply with the relevant provisions of GY/T 143-2000.

4.2.2 Technical Requirements for Uplink Optical Transmitters

See Table 1.

Table 1 Technical requirements for uplink optical transmitters

Remarks on technical indicators of project unit

1 Laser type-DFB laser FP laser-1310 ± 20-

2 Output light wavelength nm 1550 ± 10-

3 Output optical power dBm >=-3-

4 RF input frequency range MHz 5 ~ 65-

5 RF input signal level dBμV 75 ~ 85 refers to the total power added to the upstream RF signal input port of the optical workstation.

7 Link flatness dB ± 1.5

Refers to uplink optical transmitter and uplink Optical receiver and other links index.

10 Optical connector form-FC/APC or SC/APC-

Noise power ratio (NPR) Dynamic Range dB >=15 (NPR>=30dB) >=10 (NPR>=30dB)

Refers to uplink optical transmitter and uplink Optical receiver and other links index.

4.2.3 Technical Requirements of Uplink Optical Receiver See Appendix A of this standard.

4.3 Environmental condition requirements

4.3.1 Environmental requirements for downlink optical receivers should comply with the relevant provisions of 5.3.2.2 of GY/T 143-2000.

4.3.2 Environmental requirements for uplink optical transmitters should comply with the relevant provisions of 4.3 in GB/T 11318.1-1996.

4.4 Security requirements should comply with the relevant provisions of 4.5 in GB/T 11318.1-1996.

4.5 EMC requirements should comply with the relevant provisions of 4.6 of GB/T 11318.1-1996.

5 Measurement method

5.1 Measuring equipment

5.1.1 Spectrum Analyzer Operating wavelength range. 1280nm ~ 1570nm;

Wavelength resolution. 30dB;

Stability. better than $\pm 0.1\text{dB}$;

Light reflection loss at each end. $> 50\text{dB}$.

5.1.4 Network Analyzer Impedance. 75ohm;

Operating frequency range. 1MHz ~ 1000MHz;

Measurement accuracy of flatness. 50dB.

5.1.9 Notch filter

Impedance. 75ohm;

Technical parameter chart. See Figure 1.

Figure 1 Technical parameters of the notch

5.2 Measurement of output light wavelength

5.2.1 Measurement block diagram See Figure 2.

Figure 2 Block diagram of output optical wavelength measurement of uplink optical transmitter

5.2.2 Measurement procedure

- a) Connect the measurement equipment as shown in Figure 2;
- b) Set the wavelength and scan width of the spectrum analyzer;
- c) At $25^\circ\text{C} \pm 5^\circ\text{C}$, adjust the measured wavelength to the middle of the screen from left to