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

GB/T 46611-2025

**Lithium niobate single-crystal thin film for electro-optic
modulators**

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Foreword

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1 Scope

GB/T 46611-2025 is the Chinese national standard covering thin-film lithium niobate on insulator - the film thickness and its uniformity across the wafer, the crystal orientation and the domain structure, the optical loss, and the surface quality, on the material that is replacing bulk lithium niobate in high-speed optical modulators. First edition, in force from 1 May 2026. Issued on 31 October 2025, it has been in force since 1 May 2026.

This document specifies the requirements, inspection and testing rules, packaging, labeling/marketing, storage and transportation of lithium niobate single-crystal thin films for electro-optic modulators. The requirements for output are described, along with the detection method. This document applies to lithium niobate thin films with thicknesses ranging from 100 nm to 1000 nm and diameters of

76.2 mm, 100.0 mm, 150.0 mm, and... For 200.0 mm, X-tangential electro-optic modulators, use lithium niobate single-crystal thin films of the same composition; for other specifications of lithium niobate single-crystal thin films, refer to the same specifications.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 191-2008 Pictorial Symbols for Packaging and Storage

GB/T 1185 Surface defects of optical components

GB/T 1551 Determination of resistivity of single crystal silicon. Four-probe method and two-probe method

GB/T 2828.1-2012 Sampling Procedures for Inspection by Attributes - Part

3 Terms and Definitions

The terms and definitions defined in GB/T 14264, GB/T 6619 and GB/T 30118, as well as the following terms and definitions, apply to this document.

3.1 A single-crystal lithium niobate compound thin film with a thickness of 100 nm to 1000 nm and the chemical formula LiNbO_3 was prepared on a specific substrate.

Note. TFLN typically consists of a lithium niobate single-crystal thin film layer, an insulating layer, a trapping layer, and a substrate stacked sequentially. The trapping layer can be omitted depending on the requirements. Its structure is shown in Figure 1.