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

GB/T 46773-2025

**Determination of the thermal conductivity of ultra-thin ceramic
substrates - Flash method**

超薄陶瓷基片导热系数试验方法 闪光法

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Foreword

This document conforms to GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting is scheduled.

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1 Scope

GB/T 46773-2025 is the Chinese national standard covering measuring how well a thin ceramic substrate conducts heat - a laser pulse on one face, the temperature rise on the other, and the corrections that matter when the specimen is a few hundred micrometres thick and the pulse is no longer instantaneous by comparison. Substrate thermal conductivity is the limit on how much power a device can dissipate. First edition. It was issued on 2 December 2025 and has been in force since 1 July 2026, as a first edition. The

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This document describes a test method for testing the thermal conductivity of high thermal conductivity ceramic substrates from room temperature to 300 °C using the flash method. This document applies to homogeneous high-strength materials with a thickness of 0.1 mm to 1 mm and a room temperature thermal conductivity of 50 W/(m·K) to 2000 W/(m·K). Thermally conductive ceramic substrate material.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are listed below. 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 8170 Rules for rounding off numerical values and the representation and determination of limiting values

GB/T 22588-2008 Measurement of thermal diffusivity or thermal conductivity by flash method

GB/T 25995 Test methods for density and apparent porosity of fine ceramics

GB/T 39862-2021 Test of thermal conductivity of high thermal conductivity ceramics

3 Terms and Definitions

The terms and definitions defined in GB/T 22588-2008, as well as the following terms and definitions, apply to this document.

3.1 ceramic substrate A sheet-like ceramic support on which conductor patterns, film elements, or electronic components can be printed or attached.

Note. Abbreviated as substrate. [Source: GB/T 14619-2013, 3.1, with modifications]

4.Principles At a certain set temperature, the sample is subjected to high-intensity, short-duration energy pulse radiation. The light-receiving surface absorbs the pulse energy, causing the temperature of the back side to rise. Record the temperature change curve of the back side of the sample (as shown in Figure 1). Based on the sample thickness and the percentage of the back side temperature reaching its maximum value (generally...),... The thermal diffusivity of the sample is calculated using the time required to reach 50% of its maximum capacity. Based on the sample's thermal diffusivity, bulk density, and specific heat

capacity, the following calculations are performed. Thermal conductivity of the sample.

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