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

GB/T 22319.8-2025

Replacing GB/T 22319.8-2008

**Measurement of quartz crystal unit parameters - Part 8: Test
fixture for surface mounted quartz crystal units**

石英晶体元件参数的测量 第8部分：表面贴装石英晶体元件用测量夹具

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 8 of GB/T 22319, "Measurement of parameters of quartz crystal elements". GB/T 22319 has published the following...

part.

---Part 6: Measurement of Excitation Level Dependence (DLD);

---Part 7: Measurement of Activity Jumps in Quartz Crystal Elements;

---Part 8: Measuring fixtures for surface mount quartz crystal components;

---Part 9: Measurement of Parasitic Resonances in Quartz Crystal Elements;

---Part 11: Standards for Determining Load Resonant Frequency and Effective Load Capacitance Using Automated Network Analysis Techniques and Error Correction method.

This document replaces GB/T 22319.8-2008 "Measurement of parameters of quartz crystal elements - Part 8: Surface mount quartz crystal elements".

Compared with GB/T 22319.8-2008, the main technical changes in "Measuring Fixtures" are as follows, except for structural adjustments and editorial modifications.

a) The measurement frequency has been expanded from 1MHz~150MHz to 1MHz~1200MHz (see Chapter 1);

b) Added reflection measurement, including calibration of the reflection measurement

system (see 6.3, 7.3).

This document is equivalent to IEC 60444-8:2016 "Measurement of parameters of quartz crystal elements - Part 8: Surface mount quartz crystal elements".

"Use measuring fixtures".

This document includes a new chapter on "Terms and Definitions".

The following minimal editorial changes have been made to this document.

---The error " $50\text{ohm}\pm 5\%$ " should be corrected to " $50\times(1\pm 0.05)\text{ohm}$ " (see 6.1).

Please note that some content in this document may involve patents. The issuing organization of this document assumes no 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 Technical Committee on Standardization of Piezoelectric Devices for Frequency Control and Selection (SAC/TC182).

Introduction

This document describes a measurement fixture for leadless surface-mount quartz crystal components.

Technical specifications for measuring fixtures for (series) resonant frequency, (series) resonant resistance, and equivalent circuit parameters. According to IEC 60444-5.

This document proposes a method for determining equivalent parameters using automatic network analysis and error correction. It describes a leadless surface-mount quartz crystal element.

Design recommendations for measuring fixtures.

The frequency measurement range in this document is 1MHz to 1200MHz. If a physical load capacitor is used, the measurement range is limited to 1MHz.

30MHz. A measuring fixture incorporating error correction technology achieves a frequency measurement accuracy of 10^{-6} and a resonant resistance accuracy of $\pm 2\text{ohm}$.

Or $\pm 10\%$.

GB/T 22319 "Measurement of Parameters of Quartz Crystal Elements" is proposed to consist of the following parts.

---Part 1: A fundamental method for measuring the resonant frequency and resonant resistance of a quartz crystal element using the pi-type network zero-phase method. The

purpose is to...

This document outlines the basic methods and applicable measurement networks for measuring the resonant frequency and resonant resistance of quartz crystal elements.

---Part 2: Phase Bias Method for Measuring the Dynamic Capacitance of Quartz Crystal Elements. The purpose is to define the measurement method for the dynamic capacitance of quartz crystal elements.

The capacitor method.

---Part 4: Measurement methods for the load resonant frequency and load resonant resistance R_L of quartz crystal elements up to 30MHz and their applications He derived the calculation of the parameters. The purpose was to specify the method for measuring parameters such as the load resonant frequency of a quartz crystal element using a physical load capacitance.

Methods of counting.

---Part 5: Methods for determining equivalent electrical parameters using automatic network analysis techniques and error correction. The aim is to specify the methods for determining equivalent electrical parameters using network analysis techniques and error correction.

A measurement method for determining the parameters of quartz crystal elements using network analysis techniques and linear equivalent circuits.

---Part 6: Measurement of Excitation Level Dependence (DLD). The aim is to specify the method for measuring quartz crystals using a pi-type network or oscillator method.

Methods for DLD of body components.

---Part 7: Measurement of the Activity Jump of Quartz Crystal Elements. The purpose is to define the activity jump of quartz crystal elements within a specified temperature range.

Methods for measuring change.

---Part 8: Measurement Fixtures for Surface Mount Quartz Crystal Components. The purpose is to specify accurate measurement methods for leadless surface mount quartz crystal components.

A measuring fixture for measuring the resonant frequency, resistance, and equivalent circuit parameters of crystal elements.

---Part 9: Measurement of Parasitic Resonances in Quartz Crystal Elements. The aim is to specify the methods for measuring parasitic resonances using automated network analysis techniques and resistance methods.

A method for measuring parasitic (useless) resonances in quartz crystal elements.

---Part 11: Standard Method for Determining Load Resonant Frequency and Effective Load

Capacitance Using Automated Network Analysis Techniques and Error Correction the purpose is to define the effective load when measuring the load resonant frequency and nominal frequency of a quartz crystal element without applying a physical load capacitance.

Methods involving capacitor loading.

Measurement of Parameters of Quartz Crystal Components Part 8: Surface Mount Quartz Crystal Components Measuring fixture

1 Scope

This document specifies measurement fixtures applicable to leadless surface-mount quartz crystal elements as defined in IEC 61837 (all parts).

These measuring fixtures, according to the measurement techniques specified in IEC 60444-5, measure (series) resonant frequencies, (series) resonant resistances, and equivalent circuit parameters.

L1, C1, and C0, the load resonant frequency, and the load resonant resistance are determined in IEC 60444-4 and IEC 60444-11.

This document specifies two measuring devices.

a) A measurement fixture using the pi-network zero-phase technology of IEC 60444-1, with a frequency up to 500MHz. This fixture includes...

The selected method involves applying a physical load capacitor and measuring the load resonant parameters at frequencies up to 30MHz. According to IEC 60444-4, the load...

The capacitance is 10pF or higher. This document also specifies the calibration of the measurement system and the CL plate.

b) A measurement fixture based on reflection measurement technology, with a frequency range up to 1200MHz. No physical load capacitance is applied. Its load harmonic...

Vibration parameters were measured using the method of IEC 60444-11.

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.

IEC 60444-5 Measurement of parameters of quartz crystal elements - Part 5: Determination of equivalent components using automated network analysis techniques and error