



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

GB/T 5095.2507-2021

**Electromechanical components for electronic equipment - Basic testing
procedures and measuring methods - Part 25-7: Test 25g: Impedance, reflection
coefficient, and voltage standing wave ratio (VSWR)**

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Foreword

GB/T 5095 "Basic test procedures and measurement methods for electromechanical components for electronic equipment" is divided into several parts according to the test methods.

Part 25 of GB/T 5095 is a signal integrity test. The parts that have been released or planned to be released are as follows.

---Part 25-1. Test 25a. Crosstalk ratio;

---Part 25-2. Test 25b. Attenuation (insertion loss);

---Part 25-3.Test 25c. Rise time decay;

---Part 25-4.Test 25d. Transmission delay;

---Part 25-5.Test 25e. Return loss;

---Part 25-6.Test 25f. Eye diagram and jitter;

---Part 25-7.Test 25g. impedance, reflection coefficient and voltage standing wave ratio (VSWR);

--- Part 25-9.Signal Integrity Test Test 25i. Alien Crosstalk.

This part is part 25-7 of GB/T 5095.

This section was drafted in accordance with the rules given in GB/T 1.1-2009.

The translation method used in this part is equivalent to IEC 60512-25-7.2004 "Connector Test and Measurement for Electronic Equipment Part 25-7"

Points. Test 25g. Impedance, reflection coefficient and voltage standing wave ratio (VSWR)".

This section has made the following editorial changes.

---The name of the standard is from "Test and Measurement of Connectors for Electronic Equipment Part 25-7.Test 25g. Impedance, Reflection Coefficient and Voltage

The Standing Wave Ratio (VSWR) was revised to the Basic Test Procedures and Measurement Methods of Electromechanical Components for Electronic Equipment Part 25-7.Test

Test 25g. Impedance, reflection coefficient and voltage standing wave ratio (VSWR)".

1 Scope and purpose

This part of GB/T 5095 applies to interconnecting components, such as electrical connectors and cable assemblies within the scope of IEC TC48.

This section describes the test methods for measuring impedance, reflection coefficient and voltage standing wave ratio (VSWR) in the time and frequency domains.

Note. These test methods are written for professional testers who have professional knowledge in the electronics field and have been trained in the use of test equipment.

Because the measured value is strongly affected by the device and equipment, this method fails to describe all possible compound effects. Application theory provided by major equipment manufacturers

The book provides a more in-depth professional explanation on how to use the equipment most appropriately. It is essential that relevant standards should include

Instructions and diagrams of how to arrange and perform the required measurements.

2 Terms and definitions

The following terms and definitions apply to this document.

2.1

Measurement system rise time measurement system rise time

Rise time measured by a device with no sample installed and with filtering (or normalization) function. Usually, the measurement is 10%~90% level rise time.

2.2

Sample environment impedance

The impedance caused by the device on the sample signal wire. The impedance is determined by the transmission line, terminal resistance, attached receiver and signal source.

And the parasitic effects of the device.

2.3

Reflection coefficient

The ratio of the reflected voltage to the incident voltage at any given point. The reflection coefficient is given by equation (1).

$\Gamma =$

$\frac{V_{\text{reflected}}}{V_{\text{incident}}}$

$= \frac{Z_L - Z_0}{Z_L + Z_0}$

(1)

Where,

Γ --- reflection coefficient;

$V_{\text{reflected}}$ --- reflected voltage;

V_{incident} --- incident voltage;

Z_L --- device or sample impedance;

Z_0 --- characteristic impedance of the transmission line;

Z_0 --- sample environmental impedance.

Note. The symbol of the reflection coefficient in the time domain is usually ρ , and the frequency domain is Γ .

2.4

Impedance

At a certain frequency, the circuit presents all the obstacles to alternating current. It is a combination of measured resistance (R) and reactance (X) to