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

GB/T 17619-1998

**Limits and methods of testing for immunity of
electrical/electronic sub-assemblies in vehicles to
electromagnetic radiation**

(English Translation)

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1 Scope

This Standard specifies the limits and methods of testing for electromagnetic radiation immunity of electrical / electronic sub-assemblies (ESA) in vehicles.

This Standard applies to the electrical / electronic sub-assemblies in vehicles.

2 Normative references

The articles contained in the following standards become the articles of this Standard through reference in this Standard. When this Standard is published, all shown editions are effective. All standards can be revised. All parties who use this Standard are encouraged to explore the possibility of using the latest edition of the following standards.

GB/T 4365-1995 Terminology for electromagnetic compatibility

GB/T 6113.1-1995 Specifications for radio disturbance and immunity measuring apparatus

3 Definitions

This Standard adopts the following definitions.

3.1 Electromagnetic compatibility (EMC)

The ability of equipment or system that can work normally in its electromagnetic environment and does not cause such electromagnetic disturbance to any thing in this environment that they cannot withstand.

3.2 Electromagnetic disturbance

Any electromagnetic phenomenon which may cause performance reduction of device, equipment or system, or harm to living or lifeless substances. The electromagnetic disturbance can be the change of electromagnetic noise, unwanted signal or media itself.

3.3 Immunity (to a disturbance)

The ability of device, equipment or system that will not reduce the operating performance when encountering electromagnetic disturbances.

3.4 Electromagnetic environment

The sum of all electromagnetic phenomenon that is existed in the given site.

3.5 Immunity limit

The specified minimum immunity electrical level.

3.6 Reference antenna

Within 20MHz~80MHz, it refers to the short-balanced dipole antenna that is half-wave resonance dipole at 80MHz. Above 80MHz, it refers to the balanced half-wave resonance dipole which is tuned at the measuring frequency.

3.7 Shielded enclosure [Translator. enclosure]

Screen-grid or overall metal enclosed chamber which is specially designed to insulate indoor and outdoor electromagnetic environment. Its purpose is to prevent the outdoor electromagnetic field to interfere indoor environment, and to prevent various outdoor electromagnetic activities to generate interference emission.

3.8 Semi-anechoic chamber

The shield enclosure of which the internal surfaces, except floor, are installed with absorbing materials.

4 Immunity limit

CONDUCT test according to the measurement method described in this Standard and the immunity electrical level specified in Table 1.ESA can work normally under the normal working conditions. The field intensity shall be expressed in V/m, and the injection current shall be expressed in mA.

5 Measurement requirements

5.1

The test equipment shall be able to generate the required test signals in the entire frequency range as specified in this Standard. The test equipment shall meet the requirement of GB/T 6113.1.

5.2

The measuring equipment shall be placed outside the shield enclosure.

6 ESA condition during test

6.1

The measured ESA shall be at normal working condition. Unless that there already have a dedicated measurement method, otherwise, the measured ESA shall be placed according to the methods defied in this Standard.

6.2

The power supply shall be applied to the measured ESA through a (5 μ H/50ohm) artificial network (AN), and this network must be earthed. The voltage of power supply shall maintain constantly; its deviation shall not exceed $\pm 10\%$ of the nominal value of system working voltage; any fluctuated voltage measured in the monitoring port of artificial network shall be less than 1.5% of the nominal value of system working voltage.

6.3

When calibrating, place the auxiliary equipment that are required by ESA's operation according to the specification. And the distance between the auxiliary equipment and the reference point must not be less than 1m.

6.4

In order to guarantee to obtain repeatable test results, the technical conditions used in test signal generating device and its line configuration shall be the same as those used in each corresponding calibration (9.2.2, 9.2.4.3, 9.3.4, 9.4.2, 9.5.2 of this Standard).

7 Frequency range and withstanding time

7.1

It shall conduct tests within the frequency range of 20MHz~1000MHz.

7.2

In order to guarantee ESA meeting the requirements of this Standard, the test shall be conducted at least at 14 frequency points within this frequency range, for example.

8.1 The maximum envelope amplitude

The maximum envelope amplitude of test signals shall be equal to the maximum envelope amplitude of a unmodulated sine wave. The chapter 4 of this Standard specifies the root-mean-square values of this sine wave, see Figure 1.

8.2 Test signal waveform

The test signal shall be a sine wave, its amplitude is modulated by a 1kHz sine wave, and the modulation depth m is 0.8 ± 0.04 .

8.3 Modulation depth

The definition of modulation depth m is.

9.1 Selection of measurement method

Within the frequency range of 20MHz~1000MHz, ESA may be tested by selecting the following measurement methods.

9.2.1 Test method

This test method is to put the connection wire-harness connecting the parts in ESA in a specific field intensity. This is a kind of method to conduct immunity test.

9.2.2 Field intensity calibration in the strip-line

In each expected test frequency, it shall input a certain-grade power to the strip-line. And under the situation that measured ESA does not exist, it shall generate required field intensity in test region.

9.2.3 150mm strip-line method