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**Vehicles, Boats and Internal Combustion Engines—  
Radio Disturbance Characteristics—Limits and Methods  
of Measurement for the Protection of Onboard Receivers**  
车辆、船和内燃机 无线电骚扰特性 用于保护车载  
接收机的限值和测量方法

(CISPR 25:2021, MOD)

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# **Vehicles, Boats and Internal Combustion Engines—Radio Disturbance Characteristics—Limits and Methods of Measurement for the Protection of Onboard Receivers**

## **1 SCOPE**

This document specifies the limits and test methods for radio disturbances in the frequency range of 150 kHz to 5 925 MHz. This document applies to any vehicles, boats, trailers, internal combustion engines (ICE)-driven devices and any electronic/electrical components intended for use in vehicles, boats, trailers and ICE-driven devices. The details of frequency allocations in this document refer to the International Telecommunications Union (ITU) publications and the practical applications in China. The limits specified in this document are intended to provide protection for onboard receivers from disturbances produced by components/modules in the same vehicle.

The receiver types to be protected include broadcast receivers (sound and television), land mobile radio, radio telephone, amateur, citizens' radio equipment, satellite navigation systems (GPS etc.), Wi-Fi, V2X, and Bluetooth devices. This document does not include the information about protection of electronic control systems from radio frequency (RF) emissions or from transient or impulse voltage fluctuations. This information is included in the publications of other standardization committees.

The limits in this document are recommended and subject to modification as agreed between the vehicle manufacturer and the component supplier. This document is also intended to be applied by vehicle manufacturers and component/equipment suppliers which are to be added and connected to the vehicle harness or to an onboard power connector after delivery of the vehicle.

This document defines test methods for use by vehicle manufacturers and suppliers, to assist in improving the design of vehicles and components and ensure controlled levels of onboard radio frequency emissions.

The radiation requirements in this document are not applicable to the intentional transmissions from a radio transmitter as defined by the ITU, including their spurious emissions.

Note 1: This exclusion is limited to those intended transmitter emissions, which leave the EUT as radiated emissions and are coupled onto the wire line in the test setup. For conducted transmissions on frequencies intentionally produced by the radio part of an EUT, this exclusion does not apply.

Note 2: It is usual for customers and suppliers to use radio regulation standards to manage the spurious emissions from a RF transmitter unless limits of spurious emission are agreed in the test plan.

Note 3: See Annex A for the flow chart for checking the applicability of this document.

## **2 NORMATIVE REFERENCES**

The following normative documents contain provisions which, through normative reference in this text, constitute essential provision of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendment) applies.

GB 1002	Single phase plugs and socket-outlets for household and similar purposes—Types, basic parameters and dimensions
GB/T 2099.1	Plugs and socket-outlets for household and similar purposes—Part 1: General requirements (GB/T 2099.1-2021, IEC 60884-1:2013, MOD)
GB/T 4365-2024	Electrotechnical terminology—Electromagnetic compatibility (IEC 60050-161: 2021, MOD)
GB/T 6113.101	Specification for radio disturbance and immunity measuring apparatus

	and methods—Part 1-1: Radio disturbance and immunity measuring apparatus—Measuring apparatus (GB/T 6113.101-2021, CISPR 16-1-1:2019, IDT)
GB/T 6113.102-2018	Specification for radio disturbance and immunity measuring apparatus and methods—Part 1-2: Radio disturbance and immunity measuring apparatus—Coupling devices for conducted disturbance measurements (CISPR 16-1-2:2014, IDT)
GB/T 9254.1-2021	Information technology equipment, multimedia equipment and receivers—Electromagnetic compatibility—Part 1: Emission requirements (CISPR 32:2015, MOD)
GB/T 19596-2017	Terminology of electric vehicles
GB/T 29259-2012	Road vehicle - Electromagnetic compatibility terminology
GB/T 44119	Measurement method of antenna factor for 1m method radiated disturbance

### **3 TERMS AND DEFINITIONS**

For the purpose of this document, the terms and definitions given in GB/T 4365-2024, GB/T 19596-2017 and GB/T 29259-2012 as well as the following apply.

#### 3.1 antenna matching unit

device for matching the impedance of an antenna to that of the 50Ω measuring instrument over the antenna measuring frequency range

[Source: GB/T 29259-2012, 3.66]

#### 3.2 artificial mains network (AMN)

network that provides a defined impedance to the EUT at radio frequencies, couples the disturbance voltage to the measuring receiver and decouples the test circuit from the supply mains

Note 1: There are two basic types of AMN, the V-network (V-AMN) which couples the unsymmetrical voltages, and the  $\Delta$  (delta)-network which couples the symmetric and the asymmetric voltages separately.

Note 2: Network connected in series between the power mains and the vehicle in charging mode or a component (e.g. charger) which provides, in a given frequency range, a specified load impedance and which isolates the vehicle/component from the power mains in that frequency range.

#### 3.3 artificial network (AN)

network inserted in the supply lead or signal/load lead of EUT which provides, in a given frequency range, a specified load impedance for the measurement of disturbance voltages and which can isolate the EUT from the supply or signal/load lines in that frequency range

Note: Network connected in series between the DC power supply and the vehicle in charging mode which provides, in a given frequency range, a specified load impedance and which isolates the vehicle from the DC power supply in that frequency range.

#### 3.4 asymmetric artificial network (AAN)

network used to measure the common mode voltages (or inject the common mode voltages onto the unshielded symmetric signal lines) on unshielded symmetric signal (e.g., telecommunication) lines while suppressing the differential mode signal

Note: This network is inserted in the communication/signal lines of the vehicle in charging mode or of a component (e.g. charger) to provide a specific load impedance and/or a decoupling (e.g. between communication/signal lines and power mains).

#### 3.5 bandwidth



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