

ICS 33.100
CCS L 06



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

GB 14023-2022

Replacing GB 14023-2011

**Vehicles, boats and internal combustion engines - Radio
disturbance characteristics - Limits and methods of
measurement for the protection of off-board receivers**

车辆、船和内燃机 无线电骚扰特性 用于保护车外接收机的限值 and 测量方法

Issued on: October 12, 2022

Implemented on: November 1, 2023

**Issued by: State Administration for Market Regulation;
Standardization Administration of China**

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1 Scope

This standard sets the limits and the methods of measurement for the radio disturbance produced by vehicles, boats and devices, in order to protect broadcast receivers outside them in the band from 30 MHz to 1 000 MHz in a residential environment.

Conformity with these limits does not necessarily protect newer types of transmission, nor receivers placed less than 10 m from the vehicle, boat or device. Experience shows that a product meeting them will often also protect receivers of other types and in other bands.

It applies to the electromagnetic emission of vehicles propelled by an internal combustion engine, by electric means or by both; of boats propelled in the same ways, which are tested as vehicles unless stated otherwise; and of devices fitted with an internal combustion engine or with traction batteries. Annex G gives a flow chart for checking applicability.

It does not apply to aircraft, to household appliances, to traction systems such as railways, tramways and trolleybuses, or to incomplete vehicles. On a dual-mode trolleybus the internal combustion propulsion is covered while the mains-fed part is not. Emissions produced while the vehicle is connected to the mains for charging are outside the scope, and the protection of on-board receivers is dealt with by GB/T 18655-2018.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition, including all amendments, applies.

GB/T 4365-2003 Electrotechnical terminology - Electromagnetic compatibility (IEC 60050-161:1990, IDT) · GB/T 6113.101-2016 Radio disturbance and immunity measuring apparatus - Part 1-1: Measuring equipment (CISPR 16-1-1:2010, IDT) · GB/T 6113.103-2021 Part 1-3: Ancillary equipment - Disturbance power (CISPR 16-1-3:2016, IDT) · GB/T 6113.104-2016 Part 1-4: Radiated disturbance measuring antenna and test site (CISPR 16-1-4:2012, IDT) · GB/T 6113.203-2020 Part 2-3: Methods of measurement of disturbances and immunity - Radiated disturbance measurements (CISPR 16-2-3:2016, IDT) · GB/T 18655-2018 Vehicles, boats and internal combustion engines - Radio disturbance characteristics - Limits and methods of measurement for the protection of on-board receivers (CISPR 25:2016, MOD)

3 Terms and definitions

For the purposes of this document, the terms and definitions given in GB/T 4365-2003 and the following apply.

3.1 vehicle. A land machine that carries persons or goods, including cars, trucks, buses, mopeds, agricultural machinery, earth-moving machinery, material-handling equipment, mining equipment, floor treatment machines and snowmobiles.

3.2 boat. A surface vessel of length not greater than 15 m.

3.3 device. Equipment driven by an internal combustion engine or fitted with traction batteries that is not intended to carry persons or goods, such as chainsaws, irrigation pumps, snow blowers, compressors, walk-behind floor machines and landscaping equipment.

The clause also defines impulsive ignition noise, the ignition noise suppressor, the outdoor test site (OTS), the resistive distributor brush, the frequency sub-band, the representative frequency, the characteristic level, the tracking generator, the RF disturbance power, the spark discharge, the resistive high-voltage ignition cable, the residential environment with its 10 m protection distance, and traction batteries.

4 Limits of disturbance

In the band from 30 MHz to 1 000 MHz the test object shall meet both sets of limits: the average detector limits with the ignition on and the engine off, and the peak or quasi-peak detector limits with the engine running.

The limits already take the measurement uncertainty into account. The peak and quasi-peak limits are given in 4.2 and the average limit in 4.3, as the limit curves of Figures 2 and 3.

5 Methods of measurement

5.1 The measuring instrument shall comply with GB/T 6113.101-2016, and the scan may be manual or automatic. Where a peak detector is used for speed against quasi-peak limits, any result that reaches or exceeds the limit shall be re-measured with a quasi-peak detector.

Where a spectrum analyzer is used, the scan rate depends on the CISPR band and on the detector and shall not exceed the maximum given in GB/T 6113.203-2020; the bandwidth shall be chosen so that the noise floor stays at least 6 dB below the limit curve.

5.2 to 5.4 lay down the requirements for the measuring site, the conditions of the test object - dry or wet, and the operating modes - and the collection of the data.

6 Evaluation method

Some differences in construction do not significantly affect the emission of ignition noise; examples for road vehicles are given in Annex D, the insertion loss of suppressors in Annex E, and the attenuation of high-voltage suppressors in Annex F.

In dry conditions, or more than 10 minutes after precipitation has stopped, the limit curves of Figures 2 and 3 apply. In wet conditions, during precipitation or within 10 minutes of its end, the test object is compliant if the measured levels stay at least 10 dB below those curves; any dispute is settled by measurements taken in dry conditions.

The clause also covers the type approval test, the surveillance of series production by quality audit, and an optional quick prototype check for development testing, which uses quasi-peak detector emissions only.