CISPR 36

Edition 1.0 2023-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE
COMITÉ INTERNATIONAL SPÉCIAL DES PERTURBATIONS RADIOÉLECTRIQUES

AMENDMENT 1
AMENDEMENT 1

Electric and hybrid electric road vehicles – Radio disturbance characteristics – Limits and methods of measurement for the protection of off-board receivers below 30 MHz

Véhicules routiers électriques et hybrides électriques – Caractéristiques de perturbations radioélectriques – Limites et méthodes de mesure pour la protection des récepteurs extérieurs en dessous de 30 MHz

CISPR 36:2020-07/AMD1:2023-05(en-fr)

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ELECTRIC AND HYBRID ELECTRIC ROAD VEHICLES – RADIO DISTURBANCE CHARACTERISTICS – LIMITS AND METHODS OF MEASUREMENT FOR THE PROTECTION OF OFF-BOARD RECEIVERS BELOW 30 MHz

AMENDMENT 1

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Amendment 1 to CISPR 36:2020 has been prepared by CISPR subcommittee D: Electromagnetic disturbances related to electric/electronic equipment on vehicles and internal combustion engine powered devices.

The text of this Amendment is based on the following documents:

Draft	Report on voting
CIS/D/483/CDV	CIS/D/490A/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Amendment is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications/.

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- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

Delete the existing second paragraph.

1 Scope

Replace the existing second and third paragraphs with the following:

This document applies to the emission of electromagnetic energy which might cause interference to radio reception and which is emitted from electric and hybrid electric vehicles (see 3.2 and 3.3) propelled by an electric motor supplied with electric energy by internal rechargeable energy storage system (with voltages above 60 V) when operated on the road.

Replace the existing seventh paragraph with the following:

The radiated emission requirements in this document are not intended to be applicable to the intentional transmissions from a radio transmitter as defined by the ITU-R, including their spurious emissions.

3 Terms and definitions

3.2
electric vehicle

Replace the existing definition and the existing note to entry with the following new definition and new note to entry:

vehicle propelled exclusively by electric motor(s) powered by on-board REESS

Note 1 to entry: Vehicles equipped with an additional power source (e.g. auxiliary combustion engine, fuel cell) used to provide electric power to the electric motor/REESS only, without contributing to the mechanical propulsion of the vehicle, are considered electric vehicles for the purposes of this document.

3.7
traction battery

Replace the existing term and the existing definition with the following new term, new definition and new note to entry:

3.7
rechargeable energy storage system
REESS
storage system that provides electric energy for electric propulsion, which can be recharged

Note 1 to entry: Components of the REESS can be high voltage (HV) batteries.

Add, after the existing definition of 3.8, the following new term, definition and note to entry:

3.9
high voltage
HV
operating voltage above 60 V

Note 1 to entry: The term high voltage can be defined with a different voltage range in other standards.

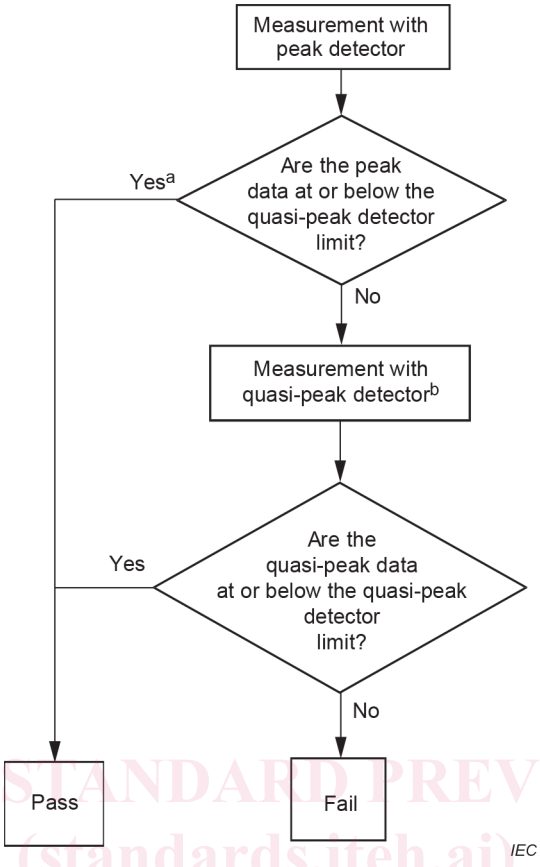
4.1 Determination of conformance of vehicle with limits

Replace the existing first paragraph with the following new paragraph:

The vehicle shall comply with the quasi-peak detector magnetic field strength limits specified in 4.2, when operated as per 5.4.2.2.

Add, after the second paragraph, the following new paragraph and new Figure 6:

If an initial peak detector prescan is performed (i.e., before any quasi peak detector measurements), then the compliance shall be determined based on the flowchart in Figure 6.



a Because the measurement result with peak detector is always higher than or equal to the measurement result with quasi-peak detector, this single detector measurement can lead to a simplified and quicker conformance process.

b This flow-chart is applicable for each individual frequency, i.e. only the emissions that are above the limit when measured with peak detector need to be remeasured with quasi-peak detector.

Figure 6 – Determination of conformance when using a peak detector prescan

Table 2 – Spectrum analyser parameters

Replace the existing table with the following new table:

Table 2 – Spectrum analyser parameters

Frequency range MHz	Quasi-peak detector		Peak detector	
	RBW at −6 dB	Minimum scan time	RBW at −6 dB	Minimum scan time
0,15 to 30	9 kHz	200 s/MHz	9 kHz	10 s/MHz

5.1.1.3 Scanning receiver parameters

Replace the existing first paragraph with the following:

The measurement time of the scanning receiver shall be adjusted for the CISPR frequency band and detection mode used. The bandwidth (BW), minimum measurement time and maximum step size are listed in Table 3.

Table 3 – Scanning receiver parameters

Replace the existing table with the following new table:

Table 3 – Scanning receiver parameters

Frequency range MHz	Quasi-peak detector			Peak detector		
	BW at −6 dB	Maximum step size	Minimum measurement time	BW at −6 dB	Maximum step size	Minimum measurement time
0,15 to 30	9 kHz	5 kHz	1 s	9 kHz	5 kHz	50 ms
NOTE The minimum dwell time for FFT based measurements should be 1 s. For further guidance on FFT-based measurement settings, see CISPR 16-2-3.						

5.2.2.2 Ambient magnetic field requirements

Replace the existing text with the following new text:

The ambient noise level shall be at least 6 dB below the limits of disturbance given in Clause 4 or, otherwise, the combination of emissions from the vehicle (while operating as specified in this document) and ambient noise shall comply with those limits. The ambient level shall be verified periodically or when test results indicate the possibility of non-compliance.

Annex A
(normative)

Measurement instrumentation uncertainty

Replace, in the title of this annex, “(normative)” *with* “(informative)”.

A.1 Overview

Add, at the end of the existing third paragraph, the following third bullet:

- loop antenna factor variations due to antenna imperfections are under study.

A.2 Radiated disturbance measurements at an OTS or in an ALSE in the frequency range 150 kHz to 30 MHz

Replace the title of this clause with the following:

A.2 Radiated disturbance measurements in the frequency range 150 kHz to 30 MHz

Figure A.1 – Sources of measurement instrumentation uncertainty

Replace the existing title of the figure with the following:

Figure A.1 – Sources of measurement instrumentation uncertainty (e.g., for ALSE)

Table A.1 – Input quantities to be considered for radiated disturbance measurements

Replace, in the table row for L_{CAB}, the text in the last table column with the following:

The cable(s) loss(es) values with associated expanded uncertainty and coverage factor are normally available from calibration reports.

The expanded uncertainty value and the corresponding probability distribution, as specified in the calibration report, shall be included here. In case the cable loss value is not corrected for during the measurement, another contributor shall be included, with a value between zero and the highest cable loss value within 150 kHz to 30 MHz, combined with a rectangular probability distribution.

Replace the existing footnote to table (2) with the following:

Single parameter for cable loss value (and bulkhead connector loss value), which includes all the different cables (and bulkhead connector) in the measuring system. If cable losses (including from the bulkhead connector) are measured separately, the table shall include one separate line for cable loss value per each cable (and for the bulkhead connector).

Replace the existing footnote to table (3) with the following:

Single parameter for cable loss frequency interpolation, which includes all the different cables in the measuring system. If cable losses (including from the bulkhead connector) are measured separately, the table shall include one separate line for cable loss interpolation error contributor per each cable (and for the bulkhead connector).

Replace the existing footnote to table (4) with the following:

The worst configuration (in ALSE with one mismatch between receiver and chamber bulkhead connector and one mismatch between chamber bulkhead connector and antenna) has been considered for the mismatch uncertainty contributor. When the measurements are performed without feedthrough (e.g., in OTS or OATS), only one mismatch (between receiver and antenna) needs to be considered.

Annex B
(informative)

Uncertainty budgets for radiated disturbance measurements of magnetic field strength

B.2 Typical CISPR 36 uncertainty budgets

Replace the existing first paragraph with the following:

Uncertainties related to site imperfections are not considered in these budgets.

Table B.1 – Typical uncertainty budget – 3 m distance – loop antenna

Replace the existing table with the following new table: