

NATIONAL TELECOMMUNICATIONS AGENCY

ACT No. 5155, OF APRIL 17, 2024

THE SUPERINTENDENT OF GRANT AND PROVISION RESOURCES - ANATEL, in the use of the powers conferred on it by Ordinance No. 419, of May 24, 2013, and

CONSIDERING the competence given by Items XIII and XIV of Article 19 of Law No. 9,472/97 – General Telecommunications Law;

WHEREAS the Technical Requirements establish the technical parameters and criteria verified in the Conformity Assessment of one or more types of telecommunications product, in accordance with art. 22 of the Regulation for Conformity Assessment and Homologation of Telecommunications Products, approved by Resolution No. 715, of October 23, 2019;

CONSIDERING what is contained in the records of case No. 53500.027683/2020-20;

RESOLVE:

Art.1 Approve the Technical Requirements and Test Procedures for Conformity Assessment of Charger Used in Cellular Mobile Telephones, as set out in the annex to this Act.

Art. 2 Revoke the [Act No. 5159, of April 8, 2022](#).

Art. 3 Revoke the [Act No. 3481, of May 31, 2019](#), on October 14, 2024.

Art. 4 This Act comes into force on April 17, 2024, with the application of its annex being mandatory from October 14, 2024.



Document signed electronically by Vinicius Oliveira Caram Guimarães, Superintendent of Grants and Payment Resources, on 04/17/2024, at 1:54 pm, according to official Brasília time, based on art. 23, item II, of [Ordinance No. 912/2017](#) from Anatel.



The authenticity of this document can be checked at <http://www.anatel.gov.br/autenticidade>, informing the verification code 11836265 and the CRC code DF392FDE.

ATTACHMENT

TECHNICAL REQUIREMENTS AND TEST PROCEDURES FOR ASSESSING THE CONFORMITY OF CHARGER USED IN CELLULAR MOBILE TELEPHONES**1. GOAL**

1.1. Establish the minimum requirements to be demonstrated in the conformity assessment and approval, with the National Telecommunications Agency, of a charger used in a cell phone.

2. COVERAGE

2.1. The requirements defined in this document are applicable to the following mobile phone chargers:

- a) portable chargers whose electrical supply is from the alternating current electricity network (e.g.: residential charger).
- b) portable chargers whose electrical supply is a direct current source (e.g.: vehicle charger).
- c) inductive chargers, regardless of the type of electrical power source (alternating current or direct current).
- d) USB interfaces (ports) for specific purposes for powering electronic devices, without data transmission functionality, regardless of the type of electrical power source.

2.2. USB interfaces that integrate the electrical/electronic design of equipment (e.g.: TV, computer, multimedia center, etc.) are not covered by these requirements.

3. REFERENCES

3.1. The following references are adopted in this document:

- 3.1.1. [Law No. 9,472](#), of July 16, 1997 - General Telecommunications Law - LGT;
- 3.1.2. [Standard N-02/92](#) – Basic standard for electromagnetic disturbances produced by industrial, scientific and medical equipment (ISM equipment), approved by Ordinance No. 176, of June 10, 1992.
- 3.1.3. Anatel's internal regulations, approved by [Resolution No. 612](#), April 29, 2013;
- 3.1.4. Regulation for conformity assessment and approval of telecommunications products, approved by [Resolution No. 715](#), October 23, 2019;
- 3.1.5. Technical electrical safety requirements for conformity assessment of telecommunications products, approved by the [Act No. 17087, December 19, 2022](#) ;
- 3.1.6. Electromagnetic compatibility technical requirements for the assessment of conformity of telecommunications products, approved by the [Act No. 1120, of February 19, 2018](#).
- 3.1.7. ISO 10605/2008: Road vehicles – Test methods for electrical disturbances from electrostatic discharge.
- 3.1.8. ISO 7637-2/2004: Road vehicles – Electrical disturbances from conduction and coupling - part 2: electrical transient conduction along supply lines only.
- 3.1.9. *Code of Federal Regulations*– CFR FCC part 18 — Industrial, scientific, and medical equipment.
- 3.1.10. ABNT NBR NM 60884-1/2010: Plugs and sockets for domestic and similar use - Part 1: General requirements.
- 3.1.11. ABNT NBR 14136/2012: Plugs and sockets for domestic and similar use up to 20 A/250 V in alternating current — Standardization.
- 3.1.12. ABNT NBR IEC 60068-2-31:2022: Environmental tests - Part 2-31: Tests - Ec tests: Shock due to rough handling, test mainly intended for equipment.

3.1.13. Operating Procedure containing Guidelines for Providing the Anatel Approval Security Seal for Lithium Batteries and Chargers Used in Cell Phones, approved by the [Act No. 14010, of 04 October 2022](#).

4. DEFINITIONS

4.1. Charger used in cell phone: equipment used to charge cell phone batteries. Cables or other equipment that do not convert/adapt electrical energy are not covered by this definition.

4.2. Inductive charger: system composed of a magnetic field generating coil that, when coupled to the device to be charged, transfers electrical energy through induction or magnetic resonance or through capacitive coupling; also known as WPT (Wireless Power Transmission) charger.

4.3. Charger used in a vehicular environment: is the one used in vehicles whose power supply is of the continuous type (DC), such as 12 V or 24 V. It can be built into the structure of the vehicle (e.g.: inductive or USB interface) or portable (removable).

5. GENERAL ORIENTATIONS

5.1. Unless otherwise specified, chargers for cell phones must be tested coupled to a cell phone during the assessment of the product's electromagnetic compatibility and electrical safety requirements.

5.1.1. The charger manufacturer must provide a cellular mobile phone with its battery initially discharged for testing.

6. TECHNICAL REQUIREMENTS FOR CHARGERS USED IN VEHICULAR ENVIRONMENTS

6.1. Criteria for evaluating Electromagnetic Compatibility (EMC) requirements

6.1.1. **Electrostatic discharge immunity requirement:** tests must be carried out in accordance with procedures contained in standard ISO 10605/2008: Road Vehicles – Test methods for electrical disturbances from electrostatic discharge.

6.1.1.1. Only perform the direct discharge test (item 8.3 of ISO 10605/2008).

6.1.1.2. Electrostatic discharges must be applied at the following levels:

a) 6 kV for contact discharges; It is

b) 8 kV for air discharges.

6.1.1.3. To evaluate the charger, criterion C defined in the technical requirements for electromagnetic compatibility for evaluating the conformity of telecommunications products published by Anatel must be adopted.

6.1.2. **Surge and transient immunity requirement:** tests must be carried out in accordance with procedures contained in standard ISO 7637-2/2004: Road vehicles – Electrical disturbances from conduction and coupling - part 2: electrical transient conduction along supply lines only.

6.1.2.1. Pulses 2a, 3a and 3b must be adopted with severity level 3 defined in Tables A.1 and A.2 of the ISO 7637-2/2004 standard, according to the supply voltage supported by the charger.

6.1.2.2. To evaluate the charger, criterion B defined in the technical requirements for electromagnetic compatibility for evaluating the conformity of telecommunications products published by Anatel must be adopted, observing-

the behavior of the charging process of the cell phone used in the tests.

6.2. Criteria for evaluating Electrical Safety requirements

6.2.1. Test applicable only to portable vehicle chargers. Not applicable to those built into the vehicle.

6.2.2. **Overheating protection requirement:** as established in the electrical safety technical requirements for conformity assessment of telecommunications products. During the test, the charger must not exceed the temperature rise limits prescribed in current requirements.

6.2.3. The test must be carried out under conditions of greatest current drainage during charging, as specified by the charger manufacturer. As an alternative to using a cell phone connected to the charger, a resistive load can be used.

7. TECHNICAL REQUIREMENTS FOR OTHER CHARGERS

7.1. Criteria for evaluating Electromagnetic Compatibility (EMC) requirements

7.1.1. Requirements for the emission of electromagnetic disturbances, as established in the technical requirements for electromagnetic compatibility for assessing the conformity of telecommunications products published by Anatel.

7.1.1.1. Apply in full, except, exclusively for inductive type chargers, the test for radiated emissions from the equipment.

7.1.1.2. The test must be carried out under conditions of greatest current drainage during charging, as specified by the charger manufacturer. Alternatively, to using a cell phone coupled to the charger, a resistive load can be used in parallel with a 1uF capacitor.

7.1.2. Requirements for immunity to electromagnetic disturbances, as established in the technical requirements for electromagnetic compatibility for assessing the conformity of telecommunications products published by Anatel.

7.1.2.1. Apply requirements in full, except for the test of immunity to radiated radiofrequency disturbances and test of immunity to variation and interruption of the electrical network.

7.1.2.2. During the execution of immunity tests to electromagnetic disturbances, the charger must present its normal operating conditions, evaluated through the charging process of a cell phone used in the tests.

7.1.3. Requirements for resistibility to electromagnetic disturbances, as established in the technical requirements for electromagnetic compatibility for assessing the conformity of telecommunications products published by Anatel.

7.1.3.1. Only apply the electromagnetic disturbance test to external electrical power ports. In this test, the charger must provide electrical insulation so that it is not damaged and does not allow damage to the phone.

7.2. Criteria for evaluating Electrical Safety requirements

7.2.1. For each charger model under evaluation, according to the requirements described in this section, the minimum number of samples for electrical safety tests is 22

(twenty-two) units.

7.2.2. Apply, in full, the following tests of technical electrical safety requirements to assess the conformity of telecommunications products published by Anatel on 1 (one) sample of the charger:

7.2.2.1. Protection against excessive heating. During the test, the charger must not exceed the temperature rise limits prescribed in current requirements;

7.2.2.2. Protection against electric shock under normal conditions;

7.2.2.3. Protection against electric shock in overvoltage conditions on the external electrical power port.

7.2.3. In electrical shock protection tests, the charger must not allow current to pass through to the phone in order to avoid damage to the device.

7.2.4. The excessive heating test must be carried out under the condition of greatest current drainage during charging, as specified by the charger manufacturer. As an alternative to using a cell phone connected to the charger, a resistive load can be used.

7.2.5. From 01/01/2025, charger plugs for new approval requirements must demonstrate compliance with the dimension specifications, as per item 9.1 of document 3.1.10 and Annex A of document 3.1.11, the latter being the standardization sheet to be used.

7.2.5.1. Chargers approved before 01/01/2025 will not need to prove compliance with this requirement during the process of maintaining their certification.

7.2.6. Chargers must withstand the mechanical, electrical and thermal stresses likely to occur under normal conditions of use. The tests must be carried out in sequence, according to items 7.2.6.1 and 7.2.6.2, on 3 (three) new samples of the charger, with the possibility of 3 (three) samples for replacements, according to item VI of item 7.2.6.1.

7.2.6.1. Safety when connecting and disconnecting the charger from the electrical outlet:

I - Charger compliance is checked using a test according to Figure 16 of reference 3.1.10.

II - Chargers are tested using a fixed socket in accordance with the specifications in reference 3.1.11.

III - Chargers are tested under the condition of greatest alternating current drainage during charging, as specified by the charger manufacturer. As an alternative to using a cell phone connected to the charger, a resistive load can be used.

IV - The plug is connected and disconnected from the socket 1,000 times (2,000 position changes) with a frequency of 30 position changes per minute.

V - After the test, the samples must not show deterioration that affects safety or prevents its further use, in particular:

a) no part of the charger must have become loose to the point of physical deformation resulting in live contact exposure;

b) the pins must not be deformed in such a way that the plug cannot be inserted into a socket in accordance with reference 3.1.11; It is

c) the pins must not rotate when a torque of 0.4 Nm is applied,

first in one direction for 1 min and then in the opposite direction for 1 min.

VI - In case of permanent damage to the sample, other than those mentioned in paragraphs of section V, which prevents normal operation with alternating current at the highest rated power supported by the charger, the damaged sample must be replaced with a new one up to a maximum of three replacements. For each replacement, the number of connections and disconnections in item IV must be recorded in the test report.

7.2.6.2. Withstand voltage:

I-After item 7.2.6.1, by applying a voltage of 2,000 V practically sinusoidal with a frequency of 50 Hz or 60 Hz for 1 minute between all poles connected to each other and to earth, assess the integrity of the charger. At the beginning of the test, the applied voltage must not exceed half of the prescribed value, and is then quickly raised to that value. During the test, there must be no current leaks or perforation of the charger casing.

7.2.7. Chargers must not present deterioration that affects safety or prevents their subsequent use, as per item V of item 7.2.6.1, when subjected to mechanical evaluation on 3 (three) new samples, for each test in items 7.2.7.1 to 7.2. 7.5.

7.2.7.1. Free fall:

I -The 3 (three) charger samples must withstand 100 free falls, according to procedure 2 of reference 3.1.12; It is

II -The drum is rotated at a frequency of 5 revolutions per minute, giving causing 10 falls per minute.

7.2.7.2. Impact:

I-To the 3 (three) samples of the charger must withstand impacts according to item 24.4 of reference document 3.1.10.

7.2.7.3. Compression:

I-To the 3 (three) charger samples must support compression according to item 24.5 of reference document 3.1.10.

7.2.7.4. Traction:

I-To the 3 (three) charger samples must withstand traction as per item 24.10 of reference document 3.1.10.

7.2.7.5. Abrasion:

I-For chargers with pins fitted with insulating gloves, the 3 (three) samples of the charger must withstand abrasion according to item 24.7 of reference document 3.1.10.

7.2.8. Chargers used in cell phones must meet the marking requirements established in the electrical safety requirements for assessing the conformity of telecommunications products published by Anatel.

8. ADDITIONAL REQUIREMENTS FOR INDUCTIVE CHARGER

8.1. In addition to meeting the electromagnetic compatibility and electrical safety requirements, relating to their type of application (vehicle environment or other chargers, excluding the tests in items 7.2.6 and 7.2.7), inductive chargers must meet the following requirements:

8.1.1. Field Strength Requirements: paragraph 18.305 - Field strength limits

(equipment any type, operating frequency: any non-ISM frequency), subpart C – technical standards of the document code of federal regulations – CFR FCC part 18 – industrial, scientific, and medical equipment, applying the test methods established in the test procedures for assessing the conformity of radiocommunication equipment with restricted radiation established by Anatel.

8.1.2. **Fundamental frequency of the equipment:** must not be in one of the prohibited frequencies, according to Table 2 of the Basic Standard for electromagnetic disturbances produced by industrial, scientific and medical equipment (ISM equipment) reference 3.1.2.

9. IDENTIFICATION OF APPROVAL

9.1. The charger used in mobile phones distributed on the national market must bear the approval security seal affixed to its body, the specifications of which are contained in Anatel's operational procedure, specified in reference 3.1.13.

9.1.1. The Safety seal described in the caput is optional for built-in vehicle chargers supplied with the vehicle. However, the equipment must bear the Anatel approval identification in one of the forms provided for in the Operational Procedure for Marking the Anatel Approval Identification on Telecommunications Products.

9.1.2. At Anatel's discretion, chargers with construction characteristics that do not allow the approval security seal to be affixed to their body may have the seal affixed to their manual.

9.1.3. Regardless of its classification (type of telecommunications product), if the product has been evaluated according to the requirements and testing procedures to assess the conformity of chargers used in Mobile Cell Phones, even if this is not the main function of the equipment, it must bear the approval security seal.

9.1.3.1. Exclusively for cell phones, there is no need to affix the security seal when the equipment has an induction charger function.

10. FINAL DISPOSITIONS

10.1. Chargers that incorporate modules classified as restricted radiation radiocommunications equipment must also demonstrate compliance with the requirements applicable to these modules.

10.2. Chargers that have the same casing, the same circuit board, the same interconnection diagram, the same printed circuit layout and internal hardware may be covered by the same conformity assessment process, due to similarity with the model subjected to testing.

10.2.1. Case If the charger has an enclosure different from that already evaluated, additional tests relating to the requirements of items 7.2.5 to 7.2.7 must be carried out.

10.3. The document resulting from the conformity assessment must present the maximum voltage and current values applied to the input and output of the charger, specified by the manufacturer and used in its conformity assessment.

10.4. To prove compliance with the requirements for immunity to transients and immunity to electrostatic discharges, exclusively for vehicle chargers with a USB interface built into the dashboard or in another part of the vehicle, reports will alternatively be accepted

test documents issued by a first or second party laboratory, accredited or evaluated by an OCD to carry out tests in accordance with these requirements defined by Anatel.

10.4.1.O The test report to be analyzed by the OCD must contain specific tests to evaluate the charger and not the vehicle's electrical system as a whole.