



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

GB/T 42284.1-2022

**Road vehicles - Environmental conditions and testing for
electrical and electronic equipment for drive system of electric
propulsion vehicles - Part 1: General**

Issued on: December 30, 2022

Implemented on: July 1, 2023

Issued by: SAMR; SAC

Table of Contents

Foreword...	3
Introduction...	6
1 Scope...	11
2 Normative references...	11
3 Terms and definitions...	12
4 Classification by mounting location...	13
4.1 Powertrain...	13
4.2 Passenger compartment...	13
4.3 Luggage compartment/load compartment...	13
4.4 Mounting on exterior/in cavities...	13
4.5 Other mounting location...	14
5 Operating modes...	14
5.1 Operating mode 1...	14
5.2 Operating mode 2...	14
5.3 Operating mode 3...	15
5.4 Operating mode 4...	15
6 Functional status classification...	15
6.1 General...	15
6.2 Class A...	15
6.3 Class B...	16
6.4 Class C...	16
6.5 Class D...	16
6.6 Class E...	16
7 Tests and requirements...	16
7.1 General...	16
7.2 General test conditions...	16
7.3 Test sequence...	17
8 Designation...	17
8.1 Coding...	17
8.2 Use of Code Z "as agreed"...	18
Annex A (Informative) Example of a test plan...	19
Annex B (Informative) Example of life test/reliability statement...	20

B.1 General Provisions...	20
B.2 Aim of life tests...	20
B.3 Calculation of characteristic reliability values based on test data...	21
Bibliography...	25

Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020, Directives for standardization - Part 1.Rules for the structure and drafting of standardizing documents.

This document is Part 1 of GB/T 42284 Road vehicles - Environmental conditions and testing for electrical and electronic equipment for drive system of electric propulsion vehicles. The following parts have been issued for GB/T 42284.

- Part 1.General;
- Part 3.Mechanical loads;
- Part 4.Climatic loads;
- Part 5.Chemical loads.

This document modifies and adopts ISO 19453-1.2018 Road vehicles - Environmental conditions and testing for electrical and electronic equipment for drive system of electric propulsion vehicles - Part 1.General.

The technical differences - between this document and ISO 19453-1.2018 - and the reasons are as follows.

- Remove the ISO and IEC database addresses for standardized maintenance terms, since the terms involved in this document have nothing to do with the ISO and IEC databases for standardized maintenance terms;
- Replace ISO/PAS 19295 (see Clause 3) with the normative reference ISO 21498-1, and ISO/PAS 19295 with ISO 21498-1;
- Replace ISO 6469-3 (see 6.1) with the normative reference GB 18384, between which there is no consistent correspondence (see 6.1);
- Replace ISO 16750-1 (see Clause 3) with the normative reference GB/T 28046.1,

between which the degree of consistency is modification, to adapt to the technical conditions in China and improve operability;

-- Replace ISO 20653 (see 8.1) with the normative reference GB/T 30038, between which the degree of consistency is modification, to adapt to the technical conditions in China and improve operability;

-- Replace ISO 19453-3 (see 7.1, 8.1, 8.2) with the normative reference GB/T 42284.3, between which the degree of consistency is modification, to adapt to the technical conditions in China and improve operability;

-- Replace ISO 19453-4 (see 7.1, 8.1, 8.2) with the normative reference GB/T 42284.4, between which the degree of consistency is modification, to adapt to the technical conditions in China and improve operability;

-- Replace ISO 19453-5 (see 7.1, 8.1, 8.2) with the normative reference GB/T 42284.5, between which the degree of consistency is modification, to adapt to the technical conditions in China and improve operability;

-- Adjust the range of voltage class A and voltage class B, and adjust the definition of electric propulsion system and electric propulsion vehicle, so as to adapt to the technical conditions in China;

-- Delete the definition of customer and supplier;

-- Add "control in typical operating mode" in operating mode 3.2, to clarify the requirements of the operating mode 3.2 (see 5.3);

-- In 6.2, add the test to only examine the function when it is in the active operating mode, to be consistent with the requirements of other parts of the document.

The following editorial changes have been made for this document.

-- Add the note "The load that is turned on in the typical operating mode can be determined through negotiation between the customer and the supplier" below the operating mode 2.2, operating mode 3.2, and operating mode 4.2, to make the typical operating mode easier to understand (see 5.2, 5.3, 5.4).

1 Scope

This document specifies requirements for the electric propulsion systems and components with maximum working voltages according to voltage class B. This document describes the potential environmental stresses and specifies requirements recommended for different stress levels on/in the vehicle. This document contains definitions, mounting location, operating mode and other general requirements.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB 18384, Electric vehicles safety requirements

3 Terms and definitions

Terms and definitions determined by GB/T 28046.1 and ISO 21498-1, as well as the following ones, are applicable to this document.

A general term for battery electric vehicles, hybrid electric vehicles, and fuel cell electric vehicles.

4 Classification by mounting location

For some locations with special environmental conditions (e.g., exhaust system), no standard specifications can be given. In these cases, it shall be stated in the specification of the DUT.

5 Operating modes

The DUT is electrically operated with a test voltage U_B as in a vehicle with shut-off combustion engine, high voltage battery (DC/DC) disconnected and all electrical connections made.

The DUT is electrically operated with test voltages U_A and U_X with all electrical connections made.