ICS 43.120
CCS T 47

# 中华人民共和国国家标准
# NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

**GB/T 31467-2023**
Replaces GB/T 31467.1-2015 and GB/T 31467.2-2015

# Electrical Performance Test Methods for Lithium-Ion Traction Battery Pack and System of Electric Vehicles
# 电动汽车用锂离子动力电池包和系统电性能试验方法

*(ISO 12405-4: 2018, Electrically propelled road vehicles-Test specification for lithium-ion traction battery packs and systems-Part 4: Performance testing，NEQ)*

**Issued on 2023-11-27** **Implemented on 2023-11-27**

**Jointly Issued by**
**State Administration for Market Regulation of the People's Republic of China &**
**Standardization Administration of the People's Republic of China**

# CONTENTS

# FOREWORD

This document is 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 replaces GB/T 31467.1-2015 "*Lithium-Ion Traction Battery Pack and System for Electric Vehicles -Part 1: Test Specification for High Power Applications*" and GB/T 31467.2-2015 "*Lithium-Ion Traction Battery Pack and System for Electric Vehicles -Part 2: Test Specification for High Energy Applications*". In addition to structural adjustments and editorial modifications, the following technical deviations have been made with respect to GB/T 31467.1-2015 and GB/T 31467.2-2015:

a) Modified the test environment conditions (See 5.1.1 vs. 5.1.1 of GB/T 31467.1-2015 and 5.1.1 of GB/T 31467.2-2015);

b) Modified the test environment adaption conditions (See 5.1.3 vs. 5.1.3 of GB/T 31467.1-2015 and 5.1.3 of GB/T 31467.2-2015);

c) Modified the requirements for range of difference between practical capacity and rated capacity of the battery (See 5.1.8 vs. 5.1.8 of GB/T 31467.1-2015 and 5.1.8 of GB/T 31467.2-2015);

d) Modified the test data record interval (See 5.3 vs. 5.3 of GB/T 31467.1-2015 and 5.3 of GB/T 31467.2-2015);

e) Modified the test methods of preconditioning cycle and standard cycle (See 6.1 & 6.2 vs. 6.1 & 6.2 of GB/T 31467.1-2015 and 6.1 & 6.2 of GB/T 31467.2-2015);

f) Modified the methods of adjusting SOC to the test target value (n%) (See 6.3 vs. 5.1.5 of GB/T 31467.1-2015 and 5.1.5 of GB/T 31467.2-2015);

g) Added the test methods of appearance, polarity, mass and overall dimensions (See 7.1, 7.2 and 7.3);

h) Modified the test methods of capacity and energy (See 7.4 vs. 7.1 of GB/T 31467.1-2015 and 7.1 of GB/T 31467.2-2015);

i) Modified the test methods of power and internal resistance (See 7.5 vs. 7.2 of GB/T 31467.1-2015 and 7.2 of GB/T 31467.2-2015);

j) Modified the test method of no-load capacity loss (See 7.6 vs. 7.3 of GB/T 31467.1-2015 and 7.3 of GB/T 31467.2-2015);

k) Modified the test method of capacity loss at storage (See 7.7 vs. 7.4 of GB/T 31467.1-2015 and 7.4 of GB/T 31467.2-2015);

l) Modified the test method of starting power at high/low temperature (See 7.8 vs. 7.5 of GB/T 31467.1-2015 and 7.5 of GB/T 31467.2-2015);

m) Modified the test methods of energy round trip efficiency (See 7.9 vs. 7.6 of GB/T 31467.1-2015 and 7.6 of GB/T 31467.2-2015);

n) Added the test methods of energy density, charging performance, and discharging under driving cycles (See 7.10, 7.11 and 7.12).

This document was drafted, but is not equivalent to, ISO 12405-4: 2018, Electrically propelled road vehicles-Test specification for lithium-ion traction battery packs and systems-Part 4: Performance testing.

*Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The organizations issuing this document shall not be held responsible for identifying any or all such patent rights.*

This document was proposed by the Ministry of Industry and Information Technology of the People's Republic of China.

This document was prepared by SAC/TC 114 (National Technical Committee on Road Vehicles of Standardization Administration of China).

This document was drafted by

Chief drafters of this document are

The previous editions of this document are as follows:

— This document was first issued in 2015 as GB/T 31467.1-2015 and GB/T 31467.2-2015;

— This edition is the first revision.

# Electrical Performance Test Methods for Lithium-Ion Traction Battery Pack and System of Electric Vehicles

## 1 SCOPE

This document describes the test methods for electrical performance of lithium-ion traction battery pack and system of electric vehicles.

This document is applicable to the development and testing of lithium-ion traction battery pack and system of electric vehicles.

## 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/T 19596 Terminology of Electric Vehicles

GB 38031 Electric Vehicles Traction Battery Safety Requirements

## 3 TERMS AND DEFINITIONS

For the purpose of this document, the terms and definitions given in GB/T 19596 and GB 38031, as well as the following apply.

3.1 High energy application

Device characteristic or application characteristic of a battery pack or system, i.e., the ratio between maximum allowed continuous electric power output (W) and electric energy output at a 1C discharge rate (W•h) at room temperature is lower than 10

Note: The high-energy battery is typically applied to battery electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV).

3.2 High power application

Device characteristic or application characteristic of a battery pack or system, i.e., the ratio between maximum allowed continuous electric power output (W) and electric energy output at a 1C discharge rate (W•h) at room temperature is equal to or greater than 10

Note: The high-power battery is typically applied to hybrid electric vehicles (HEV).

3.3 Energy density

electric energy delivered per unit mass of battery pack or system on average

Note: Energy density is expressed in W•h/kg.

3.4 Energy round trip efficiency

ratio between total discharge energy and total charge energy of a battery pack or system during test

Note: Total discharge energy and total charge energy are expressed in W•h.

## 4 SYMBOLS AND ABBREVIATED TERMS

For the purpose of this document, the following symbols and abbreviated terms apply.

BCU: Battery Control Unit

FS: Full Scale

RT: Room Temperature

SOC: State-of-Charge

$I_{max}(T)$: Maximum allowed continuous discharge current at a specific test environment

**The following pages are left blank intentionally.**