

ICS 43.040

QB

**LIGHT INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**Fur-liner garment
(English Translation)**

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1 Scope

This Document specifies technical requirements, test methods, and requirements for marking, packaging, transportation, and storage of cable assembly for conducting charging of electric vehicles with a function box.

This Document applies to cable assembly for conducting charging of electric vehicles with a function box with a rated current not exceeding 10 A (hereinafter referred to as "cable assembly").

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this Document.

GB/T 1002 Single phase plugs and socket-outlets for household and similar purposes -

Types, basic parameters and dimensions

GB/T 2099.1 Plugs and socket-outlets for household and similar purposes - Part 1.General requirements

GB/T 2423.5 Environmental testing - Part 2.Test methods - Test Ea and guidance. Shock

GB/T 4207-2022 Method for the determination of the proof and the comparative tracking indices of solid insulating materials

GB/T 4208-2017 Degrees of protection provided by enclosure (IP code)

GB 4824-2019 Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement

GB/T 6829-2017 General Requirements for Residual Current Operated Protective Devices

GB/T 11918.1-2014 Plugs, socket-outlet and couplers for industrial purposes - Part 1.

General requirements

GB 17625.1-2012 Electromagnetic compatibility - Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

GB/T 17626.4-2018 Electromagnetic compatibility - Testing and measurement techniques
-Electrical fast transient/burst immunity test

GB/T 17626.5-2019 Electromagnetic compatibility - Testing and measurement techniques
-Surge immunity test

GB/T 17626.6-2017 Electromagnetic compatibility - Testing and measurement techniques
-Immunity to conducted disturbances, induced by radio-frequency fields

3 Terms and Definitions

For the purposes of this Document, the terms and definitions given in GB/T 18487.1 and GB/T

20234.1-2023 and the following apply.

3.1 Vehicle coupler

A component that can connect a cable to an electric vehicle, consisting of a vehicle connector and a vehicle socket.

[SOURCE. GB/T 20234.1-2023, 3.6]

3.2 Vehicle connector

The movable part of the vehicle coupler that is connected to the charging cable.

[SOURCE. GB/T 20234.1-2023, 3.8]

3.3 Function box

A device that is contained in the Mode 2 cable assemblies, implementing control guidance functions and safety functions.

3.4 Operating mode

It is used to describe the input and output status of the sample under test.

Operating mode 1. The sample under test is not connected to the input and output.

Operating mode 2. The input end of the sample under test is connected to the AC power supply, but it is not in the charging output state.

Operating mode 3. The input and output of the sample under test are both in the rated state.

4.1 Requirements for functional status level

The functional level of the cable assembly shall meet the relevant requirements of Clause 6 of

GB/T 28046.1-2011.

Level A. All functions of the cable assembly meet the design requirements during and after the test.

Level B. All functions of the cable assembly meet the design requirements during the test, but one or more functions are allowed to exceed the specified tolerance. All functions shall automatically recover to the specified limits after the test.

Level C. One or more functions of the cable assembly do not meet the design requirements during the test, but all functions can automatically recover to normal operation after the test.

Level D. One or more functions of the cable assembly do not meet the design requirements during the test and cannot automatically recover to normal operation after the test; and the device or system needs to be reactivated through simple operations.

4.2 General requirements

4.2.1

The easily accessible surface of the cable assembly for conductive charging of electric vehicles with a function box shall be free of burrs, flash and similar sharp edges.

4.2.2

The cable assembly housing shall be marked with the manufacturer's name or trademark, product model, rated voltage and rated current, etc.; and the writing shall be clear and not easy to erase. The function box shall have a high-voltage warning mark.

4.2.3

The vehicle connector of the cable assembly shall comply with the provisions of GB/T 20234.1-2023 and GB/T 20234.2-2015.

4.2.4

The three-core plug of the cable assembly shall comply with the provisions of GB/T 2099.1 and GB/T 1002.

4.2.5

The shell protection level of the vehicle connector and the three-core plug of the cable assembly and the corresponding socket after being plugged in shall at least meet the requirements of IPXXD in GB/T 4208-2017.

4.3 Control and guidance function

The control and guidance function of the cable assembly shall comply with the relevant provisions of GB/T 18487.1.

4.4.5 Residual current protection

The cable assembly shall at least be able to meet the operating characteristic requirements for type A residual current protection devices in GB/T 6829-2017. The rated residual operating current values of different products should refer to the provisions of Table 1.

4.4.6 Overtemperature protection

The function box of the cable assembly shall have an overtemperature protection function.

When the temperature exceeds its set value, the function box shall enter the overtemperature protection state, and the functional state level shall be no lower than Level D. When the temperature returns to normal, it shall be able to charge normally. The specific temperature value and response time shall be subject to the manufacturer's agreed requirements.

4.4.7 Grounding warning function

When the cable assembly cuts off the electrical connection of the protective grounding conductor before charging, the charging shall not be started. When the electrical connection of the protective grounding conductor is cut off during charging, the output shall be cut off within

100 ms, and an alarm shall be given through an indicator light or other means.

4.5.1 Insulation resistance

The insulation resistance of the cable assembly shall meet the following requirements.

a) The insulation resistance between each independent live port loop and the ground (housing) shall be no less than 100 Mohm;