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

GB/T 40432-2021

**Conductive On-Board Charger for Electric Vehicles**  
**电动汽车用传导式车载充电机**

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# Conductive On-Board Charger for Electric Vehicles

## 1 SCOPE

This document specifies the technical requirements and test methods for the conductive on-board charger for electric vehicles.

This document applies to the conductive on-board charger for electric vehicles with a nominal input voltage of 220V (AC) (single-phase) or 380V (AC) (three-phase) and a maximum output voltage of 1,500V (DC), while other type of on-board charger may use this document as a reference.

## 2 NORMATIVE REFERENCES

The following documents contain provisions which, through reference in this text, constitute essential provisions of this document. For dated references, only the editions cited apply. For undated references, the latest editions of the normative document (including any amendments) apply.

GB 4824-2019	Industrial scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
GB/T 12113	Methods of measurement of touch current and protective conductor current
GB 17625.1	Electromagnetic compatibility - Limits - Limits for harmonic current emissions (equipment input current $\leq 16$ A per phase)
GB/T 17625.2	Electromagnetic compatibility (EMC)-Limits-Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current $\leq 16$ A per phase and not subject to conditional connection
GB/T 17625.7	Electromagnetic compatibility-Limits-Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current $\leq 75$ A and subject to conditional connection
GB/T 17625.8	Electromagnetic compatibility-Limits-Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current $>16$ A and $\leq 75$ A per phase
GB/T 17626.4-2018	Electromagnetic compatibility-Testing and measurement techniques-Electrical fast transient/burst immunity test
GB/T 17626.5	Electromagnetic compatibility—Testing and measurement techniques—Surge immunity test
GB/T 17626.11	Electromagnetic compatibility-Testing and measurement techniques-Voltage dips, short interruptions and voltage variations immunity tests
GB/T 18655-2018	Vehicles, boats and internal combustion engines-Radio disturbance characteristics-Limits and methods of measurement for the protection of on-board receivers
GB/T 19596	Terminology of Electric Vehicles
GB/T 19951	Road vehicles - Disturbances test methods for electrical/electronic component from electrostatic discharge
GB/T 28046.3-2011	Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Part 3: Mechanical loads
GB/T 28046.4-2011	Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Part 4: Climatic loads
GB/T 30427-2013	Technical requirements and test methods for grid-connected PV inverters
ISO 7637-2:2011	Road vehicles - Electrical disturbances from conduction and coupling - Part 2: Electrical transient conduction along supply lines only
ISO 11452-2	Road vehicles - Component test methods for electrical disturbances from narrowband radiated electromagnetic energy - Part 2: Absorber-lined shielded enclosure

## 3 TERMS AND DEFINITIONS

For the purposes of this document, the terms and definitions given in GB/T 19596, and the following

apply.

3.1

On-board charger

an equipment, securely fixed to the vehicle, which converts the electric energy in compliance with public grid into the DC current required by the onboard energy storage device and recharges the onboard energy storage device

[Source: GB/T 19596-2017, 3.4.1.5.1, modified]

3.2

Power factor

Ratio of the input active power of the on-board charger to its input apparent power

3.3

Charging efficiency

Ratio (%) of the output power to the input active power

3.4

Output voltage tolerance

Ratio (%) of the difference between actual output voltage and output voltage setting to the output voltage setting

3.5

Output current tolerance

Ratio (%) of the difference between actual output current and output current setting to the output current setting

3.6

Voltage ripple factor

Ratio of the half of the difference between peak and valley of output DC ripple voltage of the on-board charger to the average of these DC voltages

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