



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

GB/T 24338.1-2018

**Railway applications -- Electromagnetic compatibility -- Part 1:
General**

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Foreword

GB/T 24338 "Railway applications - Electromagnetic compatibility" consists of the following parts.

- Part 1. General;
- Part 2. Emission of the whole railway system to the outside world;
- Part 3-1. Rolling stock - Train and complete vehicle;
- Part 3-2. Rolling stock - Apparatus;
- Part 4. Emission and immunity of the signalling and telecommunications apparatus;
- Part 5. Emission and immunity of fixed power supply apparatus and systems.

This Part is Part 1 of GB/T 24338.

This Part is drafted in accordance with the rules given in GB/T 1.1-2009.

This Part replaces GB/T 24338.1-2009 "Railway applications - Electromagnetic compatibility - Part 1. General". As compared with GB/T 24338.1-2009, the main technical changes are as follows.

- MODIFY the instructions that this Part shall be used in conjunction with

- other parts of GB/T 24338 (SEE Chapter 1; Chapter 1 of the 2009 version);
- ADD a normative reference. GB/T 28807 (SEE Chapter 2);
 - ADD the requirement that possible electromagnetic interference shall be considered when adding auxiliary apparatus to railway system (SEE Chapter 5);
 - ADD the requirement of management of electromagnetic compatibility between rolling stock and train detection systems (SEE Chapter 5);
 - MODIFY the composition of electric traction power supply system (SEE A.5; A.5 of the 2009 version);
 - ADD a description of the manner in which the track circuit detects whether there is a train (SEE A.7.5);
 - DELETE the Appendix B "Electromagnetic compatibility management of the interface between railway infrastructure and train" (SEE Appendix B of the

Introduction

GB/T 24338 (all parts) is used for electromagnetic compatibility management, also specifies the limits and measurement methods for the electromagnetic emission of the railway system as a whole to the outside world, and the limits of electromagnetic emission, immunity level, performance criteria, and measurement methods of railway apparatus. The electromagnetic emission level of the apparatus is compatible with the emission limits of the whole railway system, which is beneficial for apparatus applications in the whole railway environment. There are different stationary emission limits set for trunk railways, subways, and trams/trolleybuses. GB/T 24338 (all parts) is applicable to frequencies ranging from 0 GHz~400 GHz. No tests need to be performed at frequencies where no requirement is specified. GB/T 24338, through emission limits and immunity level requirements, achieves electromagnetic compatibility between the whole railway system and the outside world, as well as between various types of apparatus in the railway system.

The compatibility between the railway system and the outside world is related to the emission limits of railway system, which shall be set in consideration of the measurement results. Assuming that the compatibility between the railway system and the outside world is satisfactory after the measurements are completed, and it is confirmed that the measurement results related to the limits are acceptable, the rail system has satisfactory compatibility. The emission limits and immunity level requirements do not ensure electromagnetic compatibility between the rail system and the outside world. In exceptional circumstances, for instance near a special location which has unusual electromagnetic interference, the railway system may require additional measures to be taken to ensure proper compatibility. In special circumstances, particular care shall be taken when in proximity to special transmitting equipment such as radio frequency transmitter, or military/medical launchers. In particular, attention is drawn to any magnetic imaging equipment in hospitals which may be near to urban transport. The interested parties may consult and cooperate to achieve electromagnetic compatibility.

The emission limits and immunity levels also do not ensure that the integrated devices of the electric apparatus in railway system meet the requirements. GB/T

24338 does not cover all possible system compositions, but applies to most

apparatus. In exceptional circumstances, for instance near a special location which has unusual electromagnetic interference, the railway system may require additional measures to be taken to ensure proper operation. The resolution of this is a matter for discussion between the apparatus supplier and the project manager, infrastructure controller or equivalent.

Railway electric apparatus can form large systems (SEE Appendix A), such as
Railway applications - Electromagnetic compatibility -

Part 1. General

1 Scope

This Part of GB/T 24338 specifies the structure and content of other parts of GB/T 24338.

This Part specifies performance criteria which apply to the whole standard.

Chapter 5 gives information on electromagnetic compatibility management.

The use of this Part alone is insufficient to judge whether the basic requirements of the electromagnetic compatibility specification are met. It shall be considered in conjunction with other parts of GB/T 24338.

Appendix A gives the characteristics of a railway system which has an impact on electromagnetic compatibility behaviour.

This Part does not include the following phenomena. nuclear electromagnetic pulse, abnormal operating conditions, and the induction effects of direct lightning strike.

The emission limits specified in this Part do not apply to intentional transmitters within the railway system.

Safety considerations are not covered by this Part.

This Part does not consider the biological effects of non-ionizing radiation and apparatus for medical assistance (e.g., pacemakers).

2 Normative references

The following documents are indispensable for the application of this document.

For the dated references, only the versions with the dates indicated are applicable to this document. For the undated references, the latest version (including all the amendments) are applicable to this document.

GB/T 4365 Electrotechnical terminology - Electromagnetic compatibility
[GB/T 4365-2003, IEC 60050(161).1990, IDT]

GB/T 17799.2 Electromagnetic compatibility - Generic standards - Immunity
for industrial environments (GB/T 17799.2-2003, IEC 61000-6-2.1999, IDT)

- Electrostatic coupling, in which an electrostatic body is discharged to a