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

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**Electromagnetic compatibility - General - Part 3: The effects of
high-altitude EMP(HEMP) on civil equipment and systems**

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules of Standardization Documents" Drafting.

This document is the third part of GB/T (Z)17624 "Electromagnetic Compatibility Overview". GB/T (Z)17624 has released the following parts.

---Part 1 Application and interpretation of basic terms and definitions of electromagnetic compatibility;

---Part 2. Methods for achieving functional safety of electrical and electronic systems of equipment related to electromagnetic phenomena;

---Part 3 The effect of high-altitude electromagnetic pulse (HEMP) on civilian equipment and systems;

---Part 4 The historical basis for limiting equipment power frequency harmonic current conducted emission within 2kHz.

This document uses the redrafting method to modify and adopt IEC /T R61000-1-3.2002 "Electromagnetic Compatibility (EMC) Part 1-3. Overview

The effect of high-altitude electromagnetic pulse (HEMP) on civilian equipment and systems."

Compared with IEC /T R61000-1-3.2002, this document has technical differences, and the clauses involved in these differences have been passed on its outer page.

The vertical single line (|) of the margin position is marked, and a list of the corresponding

technical differences and their reasons is given in Appendix A.

This document has made the following editorial changes.

---In order to be consistent with my country's standard system, the name of this document is changed to "Electromagnetic Compatibility Overview Part 3.High-altitude Electromagnetic Pulse

(HEMP) Effects on Civil Equipment and Systems;

---In order to facilitate the understanding and use of Figure 7, Figure 8, Figure 9 and Figure 16, the figure title of the sub-figure has been added, and Figure 7, Figure 8, and Figure 9 have been deleted.

The description of the sub-picture of the question;

---The first paragraph of Chapter 7 adds the article number and title, and the number of the remaining articles in this chapter has been extended.

Introduction

GB/T (Z)17624 is a basic and universal standard and guiding technical document in the field of electromagnetic compatibility in my country, which aims to describe the

General considerations (introduction, basic principles), definitions and terminology in the field of electromagnetic compatibility. Electromagnetic disturbances exist in most environments

In, therefore, for the overview of electromagnetic compatibility technology, there are many parties in application scenarios, product objects, user needs, and standard compilation purposes.

In view of the differences, it is unrealistic to establish an overall overview. GB/T (Z)17624 maintains consistency with the IEC 61000-1 series of standards,

Divide GB/T (Z)17624 into several parts. At present, GB/T (Z)17624 is composed of the following four parts.

---Part 1 Application and interpretation of basic terms and definitions of electromagnetic compatibility. The purpose is to explain and explain the design of electromagnetic compatibility system

The basic concepts and practical applications in calculation and evaluation have important meanings.

---Part 2.Methods for achieving functional safety in electrical and electronic systems of equipment related to electromagnetic phenomena. The purpose is to achieve violence

Provide guidelines for the functional safety of electrical and electronic systems and devices

exposed to electromagnetic disturbances.

---Part 3 The effect of high-altitude electromagnetic pulse (HEMP) on civilian equipment and systems. The purpose is to describe what has been done and the simulation

The effect produced during the high-altitude electromagnetic pulse (HEMP) test.

---Part 4 The historical basis for limiting equipment power frequency harmonic current conducted emission within 2kHz. The purpose is to describe the power grid 2kHz

The source and influence of internal power frequency harmonic current conduction emission.

Overview of electromagnetic compatibility Part 3.High-altitude electromagnetic pulse (HEMP) Effect on civilian equipment and systems

1 Scope

This document describes the effects produced during the conducted and simulated electromagnetic pulse tests, including the observations of high-altitude nuclear tests conducted abroad.

Observed effects and effects observed in the HEMP simulator test.

Note 1.In addition to direct effects, this document also includes information about HEMP and "long-term" coupling.

Note 2.Not all tests and exposures will cause equipment failure. Factors such as the geometric structure of the HEMP interaction and the electromagnetic shielding of the equipment

The same result.

This document is suitable for understanding the severity of the possible effects of HEMP on modern electronic systems, and for verifying that HEMP is coupled to the "long-term"

The specific amplitude of the induced current and voltage, and the reference for the direct injection test of electronic equipment.

2 Normative references

The contents of the following documents constitute the indispensable clauses of this document through normative references in the text. Among them, dated quotations

Only the version corresponding to that date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to

This document.

GB/T 4365-2003 Electrotechnical terminology electromagnetic compatibility (IEC 60050-161.1990, IDT)

GB/T 18039.8 Electromagnetic compatibility environment High altitude nuclear electromagnetic pulse (HEMP) environment description Conducted disturbance (GB/T 18039.8-

2012, IEC 61000-2-10..1998, IDT)

GB/T 18039.10 electromagnetic compatibility environment HEMP environment description radiated disturbance (GB/T 18039.10-2018, IEC 61000-

2-9.1996, IDT)

IEC 61000-4-32 Electromagnetic Compatibility (EMC) Part 4-32. Test and Measurement Technology High Altitude Electromagnetic Pulse (HEMP) Mode

Outline of the proposed device [Electromagnetic compatibility (EMC)-Part 4-32. Testing and measurement techniques-High-

altitude electromagnetic pulse HEMP simulator compendium]

3 Terms and definitions

The following terms and definitions defined in GB/T 4365-2003 apply to this document.

3.1

Attenuation

The reduction of electric field, magnetic field or current and voltage amplitude caused by absorption and scattering.

Note. The attenuation value is usually expressed in decibels (dB).

3.2

Aperture point-of-entry

Aperture port-of-entry

Including intentional or unintentional holes, cracks, openings, or other discontinuous holes or gaps on the shielding surface.

Note. Intentional entry points include personnel and/or equipment entrances and exits and vents on electromagnetic barriers.

3.3

Commonmode voltage

The average value of the phase voltage between each conductor and a specified reference