NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

GB/T 18039.10-2018

Electromagnetic compatibility (EMC) -- Environment -- Description of HEMP environment -- Radiated disturbance

Issued on: May 14, 2018 **Implemented on: December 1, 2018**

Issued by: SAMR; SAC

Table of Contents

Foreword

The Electromagnetic Compatibility Environment is divided into the following sections.

---GB /Z 18039.1-2000 Classification of electromagnetic environment in electromagnetic compatibility environment;

---GB /Z 18039.2-2000 Electromagnetic compatibility environment industrial equipment power supply low frequency conducted disturbance emission level assessment;

---GB/T 18039.3-2017 Electromagnetic compatibility environment common low-voltage power supply system low-frequency conduction disturbance and signal transmission

Capacity level

---GB/T 18039.4-2017 Compatibility level of low frequency conducted disturbance in electromagnetic compatibility environment factory;

---GB /Z 18039.5-2003 Electromagnetic compatibility environment public power supply

system low frequency conduction disturbance and electromagnetic transmission of signal transmission

surroundings;

---GB /Z 18039.6-2005 Electromagnetic compatibility environment Low frequency magnetic field in various environments;

---GB /Z 18039.7-2011 Electromagnetic compatibility environment, voltage sag, short-term interruption and its measurement system

Counting results

---GB/T 18039.8-2012 Electromagnetic compatibility environment High altitude nuclear electromagnetic pulse (HEMP) environment describes conducted disturbance;

---GB/T 18039.9-2013 Electromagnetic compatibility environment common medium voltage power supply system low frequency conduction disturbance and signal transmission

Capacity level

This part is the 10th part of GB/T 18039.

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

This section uses the translation method equivalent to IEC 61000-2-9.1996 Electromagnetic Compatibility (EMC) Part 2. Environment Section 9.

The HEMP environment describes radiated disturbances.

This section has made the following editorial changes.

--- In line with the existing standard series, change the name of this part to "Electromagnetic compatibility environment HEMP environment describes radiated disturbance".

--- According to the original meaning, move the formula in the upper left corner of the original picture 5 to the footnote of Figure 5.

--- According to Chinese writing habits, the explanatory text of the original texts 14a), 14b) is placed before the figure in Figure 14.

--- According to the Chinese writing habits, the explanatory text of the original text 15 is placed before the figure in Fig. 15.

--- According to Chinese writing habits, the explanatory text of the original texts 16a), 16b) is placed before the figure in Figure 16.

This part is proposed and managed by the National Electromagnetic Compatibility Standardization Technical Committee (SAC/TC246).

This section was drafted by. Tsinghua University.

1 Scope

This part of the Electromagnetic Compatibility Environment defines a high altitude electromagnetic pulse (HEMP) environment, one of the effects of high altitude nuclear explosions.

There are two situations to consider when studying this topic.

---High altitude nuclear explosion;

--- Low-altitude nuclear explosion.

For civilian systems, the most serious situation is a high-altitude nuclear explosion. In this case, other effects of nuclear explosions, such as explosions,

Ground impact, heat radiation and ionizing radiation will not affect the ground. However, electromagnetic pulses generated by nuclear explosions may cause communication systems.

Damage and destruction of the system, electronics and power systems, which in turn affects the stability of modern society.

The purpose of this section is to establish a general reference for the HEMP environment, to select the actual environmental parameters for sensitive devices, and to evaluate their sensitivity.

Sensitivity.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 4365-2003 Electrotechnical terminology electromagnetic compatibility [idtIEC 60050 (161)..1990]

3 Overview

High-altitude (above 30km) nuclear explosions produce three types of electromagnetic pulses that can be observed on the Earth's surface.

--- Early high altitude electromagnetic pulse (fast);

--- Medium-term high altitude electromagnetic pulse (medium);

--- Late high altitude electromagnetic pulse (slow).

Historically, most of the attention has been focused on early high-altitude electromagnetic pulses, which once briefly recognized high-altitude electromagnetic pulses.

It means the early high-altitude electromagnetic pulse. And here, the term "high altitude EMP" or "HEMP" we use will include all three types of electricity.

Magnetic pulse. The term nuclear electromagnetic pulse (NEMP1) covers many categories, including nuclear electromagnetic pulses in the source region generated by ground nuclear explosions.

(SREMP2)) and system electromagnetic pulse (SGEMP3) excited in the space system.

Since high-altitude electromagnetic pulses (HEMP) are generated by high-altitude nuclear explosions, there will be no other nuclear weapons effects on the ground, such as gamma rays, heat.

Radiation, shock waves, etc. In the early 1960s, the United States conducted high-altitude nuclear explosion tests in the South Pacific, resulting in electronic settings far from the explosion point.

For the first time in the report of the huge effect, the term high-altitude electromagnetic pulse (HEMP) appeared.

1) NEMP. Nuclear electromagnetic pulse.

2) SREMP. Nuclear electromagnetic pulse in the source area.

3) SGEMP. System electromagnetic pulse.

4 Terms and definitions

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

4.1

Vertical plane elevation angleangleoflevationintheverticalplane

In the vertical plane of the horizontal plane, the angle between the direction of propagation and the horizontal plane (ground plane) (see Figure 1).

Figure 1 Definition of polarization, elevation angle Psi and azimuth Phi

4.2

Azimuth azimuthangle

The projection of the propagation direction on the ground plane is at an angle to the principal axis of the target (the Z axis for the transmission line in Figure 1).