

ICS 49.140
CCS V 70



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

GB/T 44196-2024

Ground test requirements for lunar and deep space probes

月球与深空探测器地面试验要求

Issued on: July 24, 2024

Implemented on: February 1, 2025

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

1 Scope ...	1
2 Normative references ...	1
3 Terms and Definitions ...	1
4 General requirements ...	2
5 Experimental Matrix ...	3
6 Detector components, subsystems and system tests ...	9
7 Inter-system connection test ...	25

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 for standardization documents" Drafting is required. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed and coordinated by the National Technical Committee for Standardization of Aerospace Technology and Its Applications (SAC/TC 425). This document was drafted by: Beijing Space Vehicle General Design Department, China Aerospace Standardization Institute, Beijing Satellite Environment Engineering Research Institute, Beijing Institute of Space Mechanics and Electronics, Beijing Institute of Aerospace Systems Engineering, and Shanghai Institute of Aerospace Systems Engineering. The main drafters of this document are: Li Qing, Ren Depeng, Zhang Yan, Zhou Xiaozhou, Lu Yuntong, Zhang Tianyi, Deng Xiangjin, Li Jionghui, Ning Xianwen, Quan, H.F., Feng, G.S., Sui, Y., Li, P.Q., Zhang, H., and Zhang, N.K. Requirements for ground tests of lunar and deep space probes

1 Scope

China's national ground test requirements for lunar and deep space probes. A deep space probe cannot be repaired, cannot be recovered, and in most cases cannot be commanded quickly enough to react to a problem, so its ground test programme is the only opportunity to find anything wrong. The requirements have to cover the environments a probe will meet, which are more varied than an Earth-orbiting satellite's: launch, then a cruise of months or years, then an arrival that may involve aerobraking, a landing on a surface whose properties are known only approximately, or an orbit insertion that must work at the first attempt with a light-time delay that rules out intervention. Lunar and planetary landings add

the thermal extremes of a surface day and night and, in the lunar case, a dust that is abrasive, electrostatically charged and gets into everything - all of which have to be simulated on the ground.

This document specifies the ground test requirements for the docking of lunar and deep space probe (unmanned) components, subsystems, systems and systems. This document applies to the development and implementation of lunar and deep space probe product identification, quasi-identification and acceptance test plans.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies. in this document.

GB/T 7354 High voltage test technology Partial discharge measurement

GB/T 23642 Electrical measurements of partial discharge (PD) under transient rise and repetitive voltage surge conditions for electrical insulating materials and systems

GB/T 30114 (all parts) Terminology of space science and its applications

GB/T 32298 Requirements for spacecraft and launch vehicle matching tests

GB/T 32307 Spacecraft Magnetic Assessment and Control Methods

GB/T 32452 Spacecraft space environment terminology

GB/T 34515 Spacecraft thermal balance test method

GB/T 34516 Spacecraft vibration test method

GB/T 34522 Spacecraft thermal vacuum test method

GB/T 38241 Test specification for docking of deep space probes with ground data receiving systems

GB/T 40134 Electromagnetic compatibility requirements for aerospace systems

GB/T 42863-2023 General test methods for spacecraft

3 Terms and definitions

The terms and definitions defined in GB/T 30114 (all parts), GB/T 32452 and GB/T 42863-2023 and the following apply in this document.

3.1 probe An unmanned spacecraft that explores the moon and celestial bodies and space beyond the moon.

Note. A probe generally includes a single device or a combination of multiple devices such as an orbiter, lander, rover, ascender, returner, and entry device.

3.2 Hovering, hazard avoidance and constant low velocity descent The process in which a probe remains relatively stationary above the surface of an extraterrestrial body, gradually approaches a safe area and descends at a lower speed.

3.3 landing impact When a probe lands on the surface of an extraterrestrial body, the instantaneous kinetic energy is converted into impact energy, causing the probe to be subjected to impact.