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

GB/T 43940-2024

**4Mb/s digital time division command/response multiplex-data
bus test plan**

4Mb/s数字式时分制指令/响应型多路传输数据总线测试方法

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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 for standardization documents" Drafting: 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/TC425): This document was drafted by: Beijing Institute of Microelectronics Technology, China Academy of Space Electronics Technology, China Academy of Launch Vehicle Technology, Xi'an Aeronautical Computing Technology Research Institute of China Aviation Industry Corporation and Shenzhen Fengrunda Technology Co., Ltd: The main drafters of this document are: Yao Yongchang, Chen Lei, Wang Yong, Zhang Wei, Quan Haiyang, Xiong Kaili, Li Yongfeng, Zhang Qirong, Wang Keliang, Zhu Xiangdong, Zhao Kang, Zhou Hao, Niu Shiqi, Yao Tingwei, Ji Sharu, Wang Shikui, Feng Wei: 4Mb/s digital time-division command/response type Multiplexed data bus test method

1 Scope

GB/T 43940-2024 is the test plan for the 4 Mb/s digital time division command/response multiplex data bus, the higher-rate Chinese successor to the 1 Mb/s command/response bus familiar from MIL-STD-1553 and used in aircraft, launch vehicles and spacecraft. On a bus of this kind interoperability is total or absent: every terminal on it must agree exactly on the electrical waveform and on the protocol, and the only way to establish that is a published test plan that every supplier is measured against, which is precisely what this document is. It sets the general requirements, covering monitoring, bus operation, hardware characteristics, transformer coupling, connector polarity, characteristic impedance, stub

coupling and power on and off noise; then the electrical performance tests at the remote terminal, the bus controller and the bus monitor; then the protocol characteristics and terminal operation; and then the protocol tests themselves, sixteen pages for the remote terminal including the optional operations, twelve for the bus controller and seven for the bus monitor. It applies to the testing of devices, boards, equipment, subsystems and complete systems on this bus.

This document describes the electrical performance test and protocol test of a 4Mb/s digital time-division command/response multiplexed data bus: Test Methods: This document applies to devices, boards, equipment, subsystems or System testing:

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 to This document:

GB/T 14241-1993 Information processing system bus interface (Eurobus A)

GB/T 18759:3-2009 Open numerical control system for mechanical electrical equipment Part 3: Bus interface and communication protocol

3 Terms and definitions

The following terms and definitions apply to this document: 3:

1 Dynamic Bus Control dynamicbuscontrol An operation that grants control of the bus system to a specified terminal: 3:2 multiplexdatabus A system consisting of a data bus and related terminals and capable of performing multiplex transmission operations: 3:

3 An operation to determine whether there is any message transmission on the bus: 3:

4 Redundant data bus redundantdatabus Use more than one data bus and provide more than one data transfer path between subsystems: 3:

5 After receiving the broadcast instruction, the RT sets the corresponding status word position to "1", indicating that the valid instruction word received by this RT is a broadcast instruction word: 3:

6 Dynamic bus reception dynamicbusacceptance The response status: