DRAFT INTERNATIONAL STANDARD

# ISO/IEC DIS 23200

ISO/IEC JTC **1**/SC **31**

Secretariat: **ANSI**

Voting begins on:
**2020-05-13**

Voting terminates on:
**2020-08-05**

# Information technology — Interference rejection performance test method between tags as defined in ISO/IEC 18000-63 and a heterogeneous wireless system

ICS: 35.040.50

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Reference number
ISO/IEC DIS 23200:2020(E)

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Published in Switzerland

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# Foreword

The ISO (International Organization for Standardization) and the IEC (International Electrotechnical Commission) together form the specialized system for worldwide standardization. National bodies that are members of the ISO or IEC participate in the development of International Standards through technical committees established by the respective organizations to deal with particular fields of technical activity. The technical committees of the ISO and IEC collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with the ISO and IEC, also take part in the work. In the field of information technology, the ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules provided in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. The Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies that cast a vote.

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ISO/IEC DIS 23200 has been prepared by Joint Technical Committee ISO/IEC JTC 1, *Information Technology*, Subcommittee SC 31, *Automatic Identification and Data Capture Techniques*.


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# Introduction

This standard provides test procedures and method to evaluate the impact on tag as defined in ISO/IEC 18000-63 of interference generated by other wireless systems. The interference rejection test method of this standard has a differentiation from Chapter 8, Sec. 8 of the ISO/IEC 18046-3 standard. This standard covers interference effect between the tags and heterogeneous wireless system, while ISO/IEC 18046-3 standard covers interference effect between tags and homogeneous wireless systems.

Ultra-high-frequency (UHF) radio frequency identification (RFID) is a wireless technology that connects billions of everyday items to the Internet of Things (IoT), enabling consumers and businesses to identify, locate, authenticate, and engage each item. IoT applications require a data connection between the physical and digital world, and UHF RFID is the ideal technology to bridge these realms with the ability to bring low cost, unique identification to everyday items. Low-power wide-area networks (LoRaWan's) operate at long read ranges of 2 to 3 kilometers. While LoRaWan devices have a very slow data-transfer rate, they are useful for transmitting sensor data. For example, LoRa, WiFi-Halow (802.11ah), Sigfox, NB-IoT, WB-IoT, and LTE-M are representative technologies.

The frequencies used by LoRaWAN systems differ by region and country, as do the frequency bands designated for UHF RFID systems. In particular, LoRaWAN and RFID systems use different power levels and heterogeneous protocols in shared frequency bands. They are susceptible to interference generated by other wireless systems. This harsh signal propagation environment combined with interference from coexisting wireless technologies may lead to a degradation of the performance or even application failures. To evaluate possible interference on UHF RFID systems, industrial stakeholders make a constructive discussion on how to overcome interference problems.

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# Information technology — Interference rejection performance test method between tags as defined in ISO/IEC 18000-63 and a heterogeneous wireless system

## 1 Scope

This International standard defines a test method to evaluate the interference rejection performance of tags covered by ISO/IEC 18000-63, and specifies the general requirements and test requirements. This test method makes it possible to compare the relative interference rejection performance among tags under a single wireless interference environment. In addition, this standard can be used in a benchmarking test according to requirements in a given application or service

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 19762, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions provided in ISO/IEC 19762 (all parts) shall apply.

## 4 Symbols and abbreviated terms

| | |
|---|---|
| $P_{min}$ | minimum power required to activate a UHF RFID tag. $P_{min}$ is the power at the position of a tag |
| $P_{min_under_int}$ | $P_{min}$ under a single wireless interference environment |
| $PF_{iRej}$ | interference rejection performance between a UHF RFID tag and other wireless systems |
| $G_{dBi}$ | antenna gain |
| $D_{Interference}$ | distance between the tag and the antenna connected to the RF interference source |
| $D_{Interrogator}$ | distance between the tag and the interrogator antenna |
| $ANT_{TX}$ | $T_X$ interrogator antenna in the bistatic test set-up |
| $ANT_{RX}$ | $R_X$ interrogator antenna in the bistatic test set-up |
| $ANT_{TRX}$ | interrogator antena in the monostatic test set-up |
| $ANT_{INT}$ | antenna connected to the RF interference source |
| $R_X$ | Receiver |
| $T_X$ | Transmitter |

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