
**Information technology — Radio
frequency identification for item
management —**

Part 2:
**Interference rejection performance
test method between an Interrogator
as defined in ISO/IEC 18000-63 and a
heterogeneous wireless system**





COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2023

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols and abbreviated terms	2
4.1 Symbols.....	2
4.2 Abbreviated terms.....	2
5 Conditions applicable to the test methods	3
5.1 Number of UHF RFID interrogator for testing.....	3
5.2 Test environment.....	3
5.3 RF environment.....	3
5.4 Pre-conditioning.....	3
5.5 Default tolerance.....	3
5.6 Total measurement uncertainty.....	3
5.7 Test result reporting.....	3
5.8 Test mounting material.....	3
5.9 Test communication parameters.....	3
6 Test set-up	4
6.1 Test setup for UHF RFID interrogator's receiver sensitivity under non-interference environment.....	4
6.2 Reader sends ACK with the correct RN16Test setup for UHF RFID interrogator's receiver sensitivity under interference environment.....	5
7 Test procedure	6
7.1 General description.....	6
7.2 UHF RFID interrogator's receiver sensitivity power measurement under non-interference environment.....	7
7.2.1 Purpose.....	7
7.2.2 Test procedure.....	7
7.3 UHF RFID interrogator's receiver sensitivity power measurement under interference environment.....	9
7.3.1 Purpose.....	9
7.3.2 Test procedure.....	9
7.4 Test report.....	10
Bibliography	13

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*.

A list of all parts in the ISO/IEC 23200 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

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) operate at long read ranges of 2 km to 3 km. While LoRaWAN devices have a very slow data-transfer rate, they are useful for transmitting sensor data. For example, LoRaWAN, 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, can lead to a degradation of the systems performance or even application failures.

Information technology — Radio frequency identification for item management —

Part 2:

Interference rejection performance test method between an Interrogator as defined in ISO/IEC 18000-63 and a heterogeneous wireless system

1 Scope

This document specifies a test method to evaluate the interference rejection performance of UHF RFID interrogators covered by ISO/IEC 18000-63, and specifies the general requirements and test requirements of that test method.

NOTE The interference rejection test method of this document is different to the one in ISO/IEC 18046-3:2020, 8.5. This document covers interference effects between the tags and a heterogeneous (diverse content) wireless system. ISO/IEC 18046-3 covers interference effect between tags and homogeneous (same content) wireless systems.

This test method enables the comparison of the relative interference rejection performance among UHF RFID interrogators under a single wireless interference environment. In addition, this document can be used in a benchmarking test, according to requirements in a given application or service.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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*

ISO/IEC 18046-2:2020, *Information technology — Radio frequency identification device performance test methods — Part 2: Test methods for interrogator performance*

ISO/IEC 18000-63, *Information technology — Radio frequency identification for item management — Part 63: Parameters for air interface communications at 860 MHz to 960 MHz Type C*