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Electromagnetic compatibility and Radio spectrum Matters (ERM); Compliance tests for cognitive interference mitigation for use by UHF RFID using Detect-And-Avoid (DAA) or other similar techniques

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

Introduction

In order to accommodate the spectrum needs for the increasing number of RFID devices and systems, an extension band for high power RFID systems in the range between 915 MHz and 921 MHz has been requested. This band is already used by RFID in several countries worldwide and its designation in Europe would increase its functionality and simplify the international movement of goods using RFID identification systems. In Europe, part of this new frequency band will be shared between the primary user ER-GSM and RFID. In order to guarantee an interference-free coexistence between the two systems, mechanisms have to be implemented by RFID systems to reduce the probability of interference to an acceptable minimum. These techniques can be either regulatory, or technical mechanisms or operational restrictions.

This Technical Specification (TS) includes a description of the practical evaluation and the certification test procedure for the mitigation mechanisms defined in TS 102 902 [3] (Methods, parameters and test procedures for cognitive interference mitigation towards ER-GSM for use by UHF RFID using Detect-And-Avoid (DAA) or other similar techniques). The focus in the present document will be on the sensing of the environment and estimation of the isolation between a RFID high power interrogator and a potential victim ER-GSM terminal. The location based mechanisms presented in [2] are not part of the present TS. The interference evaluations performed in [2] have shown that RFID devices will not cause any harmful interference towards the potential ER-GSM victim terminals if the power is below 0 dBm (1mW) and the protection distance is larger than 20 m. Since the maximum TX power of RFID tags in the band 915 MHz to 921 Mhz is below -10 dBm, they do not require any additional mitigation.

The present document follows on from the recommendations contained in TS 102 902 [2]. It begins by describing the results of a demonstration of principle which was performed by members of STF 397 (Specialist Task Force 397). The knowledge gained from this work was central to the development of the specifications for the tests. Finally the document outlines a set of practical tests which are considered necessary in order to finalise the values of certain critical parameters and to validate that the mitigation techniques function as predicted in an operational environment.

1 Scope

The present document reports on the practical evaluation, demonstrations and certification procedures for the mitigation mechanisms for RFID systems operating in the band between 915 MHz to 921 MHz as described in [2]. The active mechanisms covered in this Technical Specification are intended to mitigate against any harmful interference generated by RFID interrogators towards ER-GSM terminals operated in the band between 918 MHz to 921 MHz.

The report does not cover the location based methods presented in [2] nor does it include RFID tags operating in the band with a power levels up to -10 dBm.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

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2.1 Normative references

The following referenced documents are necessary for the application of the present document.

[1] ETSI EN 302 208 (all parts) (V1.3.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio Frequency Identification Equipment operating in the band 865 MHz to 868 MHz with power levels up to 2 W".

[2] ETSI TS 102 902 (V1.1.1): "Electromagnetic compatibility and radio spectrum matters (ERM); Methods, parameters and test procedures for cognitive interference mitigation towards ER-GSM for use by UHF RFID using Detect-And-Avoid (DAA) or other similar techniques".

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI ERM TG34: ERM-TG34#15-04r1: "ETSI tests at a Distribution Centre", September 2006.