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Field Disturbance Sensors in the Bands 46.7-46.9 GHz (Vehicular Radar) and 76-77 GHz (Vehicular and Airport Fixed Radar)

Preface

Radio Standard Specification RSS-251, Issue 1, *Field Disturbance Sensors in the Bands 46.7-46.9 GHz (Vehicular Radar) and 76-77 GHz (Vehicular and Airport Fixed Radar)*, replaces a portion of Annex 13 of RSS-210, [*Licence-exempt Radio Apparatus \(All Frequency Bands\): Category I Equipment*](#). RSS-251 replaces the sections of Annex 13 that focus on devices operating in the bands 46.7-46.9 GHz and 76-77 GHz, while Annex 13 continues to cover devices operating in the band 57-64 GHz.

This document will be in force as of the publication date of Notice No. SMSE-017-14 in [*Canada Gazette*](#), Part I. Upon publication, the public has 120 days to submit comments. Comments received will be taken into account in the preparation of the next issue of the document.

List of Changes:

- (1) A portion of Annex 13 of RSS-210, *Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment* — in particular, the text regarding devices operating in the bands 46.7-46.9 GHz and 76-77 GHz — has been integrated into this document.
- (2) Removal of the vehicle-mounted, orientation-specific limits for the field disturbance sensors operating in the frequency band 76-77 GHz.
- (3) Field disturbance sensors operating in the frequency band 76-77 GHz are allowed to be used as a fixed radar system at an airport.
- (4) Clarification of the power density limits in the band 46.7-46.9 GHz. The limits apply to the average power density and a requirement has been included for the peak power density.
- (5) Inclusion of a table in Section 5.2.2 regarding the power density limits of vehicle-mounted radar systems and fixed radar systems (i.e. field disturbance sensors) in the frequency band 76-77 GHz.

Issued under the authority of
the Minister of Industry

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1. Scope

Radio Standards Specification RSS-251, *Field Disturbance Sensors in the Frequency Bands 46.7-46.9 GHz (Vehicular Radar) and 76-77 GHz (Vehicular and Airport Fixed Radar)*, states the requirements for the technical compliance of licence-exempt, Category I radio apparatus operating in the bands 46.7-46.9 GHz and 76-77 GHz.

2. General

2.1 Purpose and Application

Field disturbance sensors are licence-exempt radio apparatus operating in the bands 46.7-46.9 GHz and 76-77 GHz. Field disturbance sensors are mounted on a vehicle for use as a vehicle radar system and, in the case of the band 76-77 GHz only, the field disturbance sensors are also used as fixed radar systems at airports. The fixed radar systems at airports detect foreign objects on runways; they also monitor aircraft along with service vehicles on taxiways and in other airport vehicle service areas that do not allow access to public vehicles. Field disturbance sensors functioning in the bands 46.7-46.9 GHz and 76-77 GHz operate on a no-protection, no-interference basis.

RSS-251 does not apply to radio apparatus intended for operation on aircraft or satellites.

2.2 RSS-Gen Compliance

In addition to RSS-251, the requirements in RSS-Gen, *General Requirements for Compliance of Radio Apparatus*, shall be met.

2.3 Radio Frequency Exposure (RSS-102)

The requirements in RSS-102, [*Radio Frequency \(RF\) Exposure Compliance of Radiocommunication Apparatus \(All Frequency Bands\)*](#), must be met.

2.4 Certification of Radio Apparatus (RSP-100)

The application for equipment certification shall be submitted in accordance with Industry Canada's Radio Standards Procedure RSP-100, [*Certification of Radio Apparatus*](#), which sets out the requirements for certification of radio apparatus. RSP-100 shall be used in conjunction with RSS-Gen and other RSSs specifically applicable to the type of radio apparatus seeking certification.

2.5 Normative Reference Publications

All Spectrum Management and Telecommunications publications are available on the following website: <http://www.ic.gc.ca/spectrum>, under *Official Publications*.

The following document shall be consulted as per the applicable version(s) specified in RSS-Gen, *General Requirements for Compliance of Radio Apparatus:ANSI C63.10 Testing Unlicensed Wireless Devices*.

3. Technical Restrictions

3.1 Information Transmitted

The transmission of additional information, such as data, within the bands 46.7-46.9 GHz and 76-77 GHz is permitted provided that the primary mode of operation is as a field disturbance sensor.

4. Measurement Requirements

The measurements shall be performed in accordance with the requirements of RSS-Gen and shall also follow the method of measurements provided in ANSI C63.10. The following measurement requirement shall also apply:

For field disturbance sensors operating in the band 76-77 GHz, the spectrum shall be investigated up to 231 GHz.

5. Limits

5.1 Frequency Bands

Field disturbance sensors operating within the 46.7-46.9 GHz band are restricted to vehicle-mounted field disturbance sensors (vehicular radar) applications.

Field disturbance sensors operating within the 76-77 GHz band are restricted to vehicle-mounted field disturbance sensors (vehicular radar) applications and to applications of fixed radar systems used at airports.

5.2 Power Density Limits

5.2.1 46.7-46.9 GHz Field Disturbance Sensors

The average power density emission for vehicle-mounted sensors operating within band 46.7-46.9 GHz shall not exceed the limits in the table below at a distance of 3 m from the radiating source. The peak power density emission shall also be measured with instrumentation properly adjusted for factors such as pulse desensitization to ensure that the peak emission is less than 20 dB above the average limit.

Table 1 – Power Density Limits for Field Disturbance Sensors in the Band 46.7-46.9 GHz

Vehicle-Mounted Sensor's Orientation	Vehicle Motion Status	Limit at 3m
Forward-looking Side-looking Rear-looking	Stationary	200 nW/cm ²
Forward-looking	In motion	60 μW/cm ²
Side-looking Rear-looking	In motion	30 μW/cm ²

5.2.2 Field Disturbance Sensors in the Band 76-77 GHz

Vehicle-mounted radar systems and fixed radar systems (i.e. field disturbance sensors) in the band 76-77 GHz shall not exceed the power density presented in the table below at a distance of 3 m from the radiating source.

Power Density	Power Density Limit at 3m	Total e.i.r.p.
Average power density	88 μW/cm ²	50 dBm (average)
Peak power density	279 μW/cm ²	55 dBm (peak)

5.3 Spurious Emissions

Field disturbance sensors' spurious emissions shall comply with the limits in the table below.

Emission Frequency Range	Parameter Measured	Limit
Below 40 GHz	Field strength	RSS-Gen field strength limits
40-200 GHz (outside the operating band)	Power density at 3 m: Field disturbance sensors in the band 46.7-46.9 GHz	2 pW/cm ²
	Power density at 3 m: Field disturbance sensors in the band 76-77 GHz	600 pW/cm ²
Above 200 GHz	Power density at 3 m: Field disturbance sensors in the band 76-77 GHz	1000 pW/cm ²

5.4 Frequency Stability

Fundamental emissions shall be contained within the frequency bands specified in this standard during all conditions of operation specified in RSS-Gen.