

**GENERAL REQUIREMENTS FOR THE OPERATION OF LOW POWER  
RADIOCOMMUNICATION DEVICES**

The IX Meeting of the Permanent Consultative Committee II: Radiocommunications including Broadcasting,

**CONSIDERING:**

- a) That Resolution PCC III/RES. 74 (XI-98) includes “Low Power Radiocommunication Devices” within the terms of reference of the Working Group on Terrestrial Mobile Services;
- b) That the number of applications of Low Power Radiocommunication Devices as well as the radio frequencies they use are increasing;
- c) That a number of CITEL administrations have made provisions for Low Power Radiocommunication Devices to operate within their national boundaries;
- d) That it is the interest of CITEL member countries to harmonize their regulations on Low Power Radiocommunication Devices, and
- e) That the regulation of Low Power Radiocommunication Devices would be facilitated by the harmonization of regulations throughout CITEL member countries,

**RECOGNIZING:**

That PCC.II has developed Recommendations on specific Low Power technologies and applications such as RFIDs and 5 GHz RLANs,

**RECOMMENDS:**

- 1. That CITEL Member States should consider appropriate actions for “Low Power Radiocommunication Devices” and the general requirements listed in the Annex.
- 2. That CITEL Member States should consider appropriate actions for these devices so that they are subjected to recognized certification and verification procedures.

**RESOLVES:**

To derogate Recommendation PCC.III/REC. 67(XIX-01) on General Requirements for Low Power Radiocommunication Devices.

**INSTRUCTS THE SECRETARIAT:**

---

<sup>1</sup> CCP.II-RADIO/doc.1392/07 rev.1

To notify that to CITEL administrations and PCC.II Associate Members. .

## **ANNEX TO RECOMMENDATION PCC.II/REC. 21 (IX-07)**

### **1 Introduction**

This Recommendation sets out common technical and non-technical parameters for low power radiocommunication devices and widely recognized approaches for managing their use on a national basis. When using this Recommendation it should be remembered that it represents the most widely accepted views but it should not be assumed that all given parameters are accepted in all countries.

It should also be remembered that the pattern of radio use is not static. It is continuously evolving to reflect the many changes that are taking place in the radio environment; particularly in the field of technology. Radio parameters must reflect these changes and thus the views set out in this Recommendation are subject to periodic review.

Moreover, almost all administrations have national regulations. For these reasons, those wishing to develop or market low power radiocommunication devices based on this Recommendation are advised to contact the relevant national administration in advance to verify whether the guidelines set out herein apply.

Low power radiocommunication devices operate on a variety of frequencies. They must share these frequencies with other applications and are generally prohibited from causing harmful interference to those applications. If a low power radiocommunication device does cause interference to authorized radiocommunications, then its operator will be required to cease operation, at least until the interference problem is resolved; even if the device complies with all of the technical standards and equipment authorization requirements established within the national regulations.

### **2 Definition of low power radiocommunication devices**

For the purpose of this Recommendation the term "low power radiocommunication devices" is intended to cover radio transmitters which have low capability of causing interference to other radio equipment.

Due to the small probability of low power radiocommunication devices causing interference to licensed services, operation on a license exempt basis is preferred. If necessary, however, simple licensing requirements may be applied, e.g. general licenses or general frequency assignments. Information about the regulatory requirements for placing low power radiocommunication equipment on the market and for their use should be obtained by contacting individual national administrations.

### **3 Applications**

Due to the many different applications provided by these devices, their descriptions can be exhaustive. However, Recommendation ITU -R SM.1538 provides a comprehensive list of these applications provided by low power radiocommunication devices.

## 4 Frequency Ranges

Certain frequency bands are used worldwide for low power radiocommunication. These common bands are indicated in the table below. Although this table represents the most widely accepted set of frequency bands for low power radiocommunication devices it should not be assumed that all of these bands are available in all countries.

It should be noted that low power radiocommunication devices operating within the frequency bands designated for industrial, scientific and medical (ISM) applications must accept harmful interference which may be caused by these applications. Since low power radiocommunication devices generally operate on a non-interference, no protection from interference basis, ISM bands, among others, have been selected as home for these devices.

**Table 1: Commonly used frequency ranges**

<b>ISM within bands under Radio Regulations 5.138 and 5.150</b>	
	6 765-6 795 kHz
	13 553-13 567 kHz
	26 957-27 283 kHz
	40.66-40.70 MHz
	902-928 MHz
	2 400-2 483.5 MHz
	5 725-5 875 MHz
	24-24.25 GHz
	61-61.5 GHz
	122-123 GHz
	244-246 GHz
<b>Other Commonly used frequency ranges</b>	
9-135 kHz	Commonly used for inductive low power radiocommunication applications
402-405 MHz	Ultra Low Power Active Medical Implants, Recommendation ITU-R SA.1346
433.5-434.5 MHz	Radio Frequency Identification (RFID) systems
5 150-5 350 MHz	Characteristics of broadband radio local area networks Recommendations ITU-R M.1450 & M.1652
5 470-5 725 MHz	Characteristics of broadband radio local area networks Recommendations ITU-R M.1450 & M.1652
5 795-5 805 MHz	Transport Information and Control Systems Recommendation ITU-R M.1453
5 805-5 815 MHz	Transport Information and Control Systems

76-77 GHz	Recommendation ITU-R M.1453
	Transport Information and Control System (Radar)
	Recommendation ITU-R M.1452

However, it should be noted that low power radiocommunication devices may generally not be permitted to use bands allocated to the radioastronomy, aeronautical mobile services and safety of life services including radionavigation.

Low power radiocommunication devices are not permitted to operate in the following bands:

**Table 2: Restricted Bands - Spurious Emissions Only with Limited Exceptions (not indicated)**

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	1 300-1 427	9.3-9.5
2.1735-2.1905	16.69475-16.69525	1 435-1 626.5	10.6-11.7
4.125-4.128	16.80425-16.80475	1 645.5-1 646.5	12.2-12.7
4.17725-4.17775	25.5-25.67	1 660-1 710	13.25-13.4
4.20725-4.20775	37.5-38.25	1 718.8-1 722.2	14.47-14.5
6.215-6.218	73-74.6	2 200-2 300	15.35-16.2
6.26775-6.26825	74.8-75.2	2 655-2 900	20.2-21.26
6.31175-6.31225	108-121.94	3 260-3 267	22.01-23.12
8.291-8.294	123-138	3 332-3 339	23.6-24.0
8.362-8.366	156.52475-156.52525	3 345.8-3 352.5	31.2-31.8
8.37625-8.38675	156.7-156.9	4200-4 400	36.43-36.5
8.41425-8.41475	242.95-243	4800-5150	38.6-46.7
12.29-12.293	322-335.4	5350-5460	46.9-59.0
12.51975-12.52025	399.9-410	8025-8500	64.0-76.0
12.57675-12.57725	608-614	9000-9200	Above 77 GHz
13.36-13.41	960-1 215		

Other restricted bands in some CITEI countries are listed in the Attachments.

## 5 Power, Magnetic or Electric Field Strength

The electric field strength or power limits shown in the tables below are the required values to allow satisfactory operation of low power radiocommunication devices. The levels were determined after careful analysis and are dependent on the frequency range, the specific application chosen and the services and systems already used or planned in these bands. These field strengths define a limit chosen to guarantee that spurious emissions emanating from a transmitter with a higher power fundamental will not interfere with other communications. These field strengths will generally limit the operating range of a given low power device to approximately ten feet, depending on frequency. As a result, specific provisions for low power devices appear as Exceptions to the General Limits and are listed in Table 4.

Some administrations may establish additional radiated power limits or restrictions within their national regulations.

**Table 3: General Limits**

<b>Frequency (MHz)</b>	<b>Electric Field Strength (microvolts/metre)</b>	<b>Measurement Distance (metres)</b>
0.009-0.490	2 400/F(kHz)	300
0.490-1.705	24 000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

The following table contains exceptions or exclusions (indicated) to the general limits, otherwise the general limits can still be used. The emission limit for each type of operation, and the type of detector used to measure emissions (average with a peak limit, "A", or quasi-peak, "Q") is specified. When a transmitter power limit is specified instead of an emission limit, no emission detector is specified.

**Table 4: Exception or Exclusions from the General Limits**

<b>Frequency Band</b>	<b>Type of Use</b>	<b>Emission Limit</b>	<b>Detector A-Average Q-Quasi-peak</b>
9-45 kHz	Cable locating equipment	10 Watts peak output power	
45-490 kHz	Cable locating equipment	1 Watt peak output power	
119-135 MHz	RFID	(2400/F) $\mu\text{V/m}$ @ 300m	A
13.11-13.36 MHz	RFID	106 000 $\mu\text{V/m}$ @ 30 m	A
13.41-14.01 MHz	RFID	106 000 $\mu\text{V/m}$ @ 30 m	A
26.96-27.28 MHz	Any	10 000 $\mu\text{V/m}$ @ 3 m	A
43.71-44.49 MHz	Cordless Telephones	10 000 $\mu\text{V/m}$ @ 3 m	A
46.6-46.98 MHz	Cordless Telephones	10 000 $\mu\text{V/m}$ @ 3 m	A
48.75-49.51 MHz	Cordless Telephones	10 000 $\mu\text{V/m}$ @ 3 m	A
49.66-49.82 MHz	Cordless Telephones	10 000 $\mu\text{V/m}$ @ 3 m	A
49.82-49.9 MHz	Any	10 000 $\mu\text{V/m}$ @ 3 m	A
	Cordless Telephones	10 000 $\mu\text{V/m}$ @ 3 m	A
49.9-50 MHz	Cordless Telephones	10 000 $\mu\text{V/m}$ @ 3 m	A
72-73 MHz	Auditory Assistance Devices	80 000 $\mu\text{V/m}$ @ 3 m	A
74.6-74.8 MHz	Auditory Assistance Devices	80 000 $\mu\text{V/m}$ @ 3 m	A

75.2-76 MHz	Auditory Assistance Devices	80 000 $\mu\text{V/m}$ @ 3 m	A
174-216 MHz <sup>1</sup>	Biomedical Telemetry Devices	1 500 $\mu\text{V/m}$ @ 3 m	A
433.5-434.5 MHz	RFID	70 359 $\mu\text{V/m}$ @ 3m	A
902-928 MHz <sup>2</sup>	Digital Transmission Systems / Spread Spectrum Transmitters <sup>3</sup>	1 Watt Output Power	
	Field Disturbance Sensors	500 000 $\mu\text{V/m}$ @ 3 m	A
	RFID	70 359 $\mu\text{V/m}$ @ 3m	A
	Any	50 000 $\mu\text{V/m}$ @ 3 m	Q
2.4-2.435 GHz	Digital Transmission Systems / Spread Spectrum Transmitters	1 Watt Output Power	
	Any	50 000 $\mu\text{V/m}$ @ 3 m	A
2.435-2.465 GHz	Digital Transmission Systems / Spread Spectrum Transmitters	1 Watt Output Power	
	Field Disturbance Sensors	500 000 $\mu\text{V/m}$ @ 3 m	A
	Any	50 000 $\mu\text{V/m}$ @ 3 m	A
2.465-2.4835 GHz	Digital Transmission Systems / Spread Spectrum Transmitters	1 Watt Output Power	
	Any	50 000 $\mu\text{V/m}$ @ 3 m	A
2.9-3.26 GHz	Automatic Vehicle Identification Systems	3 000 $\mu\text{V/m}$ per MHz of bandwidth @ 3 m	A
3.267-3.332 GHz	Automatic Vehicle Identification Systems	3 000 $\mu\text{V/m}$ per MHz of bandwidth @ 3 m	A
3.339-3.3458 GHz	Automatic Vehicle Identification Systems	3 000 $\mu\text{V/m}$ per MHz of bandwidth @ 3 m	A
3.358-3.6 GHz	Automatic Vehicle Identification Systems	3 000 $\mu\text{V/m}$ per MHz of bandwidth @ 3 m	A
5.150-5.350 GHz	Indoor WAS/RLAN	200 mW e.i.r.p. <sup>4</sup>	A
5.250-5.350 GHz	WAS/RLAN	200 mW or 1 Watt e.i.r.p. <sup>4</sup>	A
5.470-5.725 GHz	WAS/RLAN	1 Watt e.i.r.p. <sup>4</sup>	A
5.725-5.785 GHz	Digital Transmission Systems / Spread Spectrum Transmitters / WAS/RLAN	1 Watt Output Power	
	Any	50 000 $\mu\text{V/m}$ @ 3 m	A

5.785-5.815 GHz	Digital Transmission Systems / Spread Spectrum Transmitters / WAS/RLAN	1 Watt Output Power	
	Field Disturbance Sensors	500 000 $\mu\text{V/m}$ @ 3 m	A
	Any	50 000 $\mu\text{V/m}$ @ 3 m	A
5.815-5.85 GHz	Digital Transmission Systems / Spread Spectrum Transmitters	1 Watt Output Power	
	Any	50 000 $\mu\text{V/m}$ @ 3 m	A
5.85-5.875 GHz	Any	50 000 $\mu\text{V/m}$ @ 3 m	A
10.5-10.55 GHz	Field Disturbance Sensors	2 500 000 $\mu\text{V/m}$ @ 3 m	A
24-24.075 GHz	Any	250 000 $\mu\text{V/m}$ @ 3 m	A
24.075-24.175 GHz	Field Disturbance Sensors	2 500 000 $\mu\text{V/m}$ @ 3 m	A
	Any	250 000 $\mu\text{V/m}$ @ 3 m	A
24.175-24.25 GHz	Any	250 000 $\mu\text{V/m}$ @ 3 m	A

Notes:

- <sup>1</sup> In the United States no new biomedical telemetry devices are approved for use in this band.
- <sup>2</sup> In Paraguay and Venezuela, only partial use of this band for certain applications is permitted.
- <sup>3</sup> In Brazil other modulation schemes are allowed in using this frequency band.
- <sup>4</sup> According to CITEC Recommendation PCC.II/REC. 11(VI-05). This Recommendation also specifies a maximum e.i.r.p. density of 10 mW/MHz in any 1 MHz band in the 5150-5250 MHz band.

Additional specific exceptions or exclusions from the general limits in some CITEC countries are indicated in the attachments.

## 6 Antenna Requirements

Basically three types of transmitter antennas are used for low power radiocommunication transmitters: Integral (no external antenna socket); Dedicated (included in the equipment certification); and, External (not included in the equipment certification).

In most cases low power radiocommunication transmitters are equipped with either integral or dedicated antennas, because changing the antenna on a transmitter can significantly increase, or decrease, the strength of the signal that is ultimately transmitted. Except for some special applications, the RF requirements are not based solely on output power but also take into account the antenna characteristics. Thus, a low power radiocommunication transmitter that complies with the technical standards with a particular antenna attached could exceed the power limits given if a different antenna is attached. Should this happen a serious interference problem to authorized radio communications such as emergency, broadcast and air-traffic control communications could occur.

In order to prevent such interference problems, low power radiocommunication transmitters shall be designed to ensure that no type of antenna can be used unless it has been included in the transmitter certification to show conformity with the appropriate emission level. This means that normally low power

radiocommunication transmitters must have permanently attached, or detachable antennas with a unique connector. A "unique connector" is one that is not of a standard type found in electronic supply stores. National administrations may define the term "unique connector" differently.

Some administrations allow the use of antennas of equal or lower gain that are not specifically listed in the certification report to be substituted for the one in the actual certification report.

## **7 Mutual Recognition Agreements (MRA)**

Administrations have in many cases found it is beneficial and efficient to establish mutual agreements between countries providing for the recognition by one country of the conformity test results of a recognized/accredited test laboratory in the other country/region.

These MRAs enable manufacturers to have the conformity of their products assessed in accordance with the regulatory requirements of the relevant third country by appropriately designated laboratories, inspection bodies and Conformity Assessment Bodies (CABs) in their own countries, hence reducing the costs of such assessments and the time needed to access markets.

The agreements comprise a "framework" agreement which establishes the mutual recognition principles and procedures, and a series of sectoral annexes which detail, for each sector, the scope in terms of products and operations, the respective legislation, and any specific procedures.



## ATTACHMENT 1

### Brazil

#### Some specific exceptions

1. The bands listed below are also considered restricted for operation of low power radicomunication devices in Brazil:

**Table 1: Restricted Bands**

MHz	MHz
0.495-0.505	1626.5-1645.5
21.87-21.924	2483.5-2500
23.2-23.35	6650-6675.2
121.94-123	59000-64000
149.9-150.5	

2. Besides those listed in the Annex, the following table contains other exceptions or exclusions to the general limits in Brazil. Additionally, under special conditions telecommand systems can operate in some specific frequencies of 26 MHz, 27 MHz, 50 MHz, 71 MHz and 75 MHz bands.

**Table 2: Exception or Exclusions from the General Limits**

Frequency Band	Type of Use	Emission Limit	Detector A-Average Q-Quasi-peak
40.66-40.7 MHz	Intermittent Control Signals	2 250 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	1 000 $\mu\text{V/m}$ @ 3 m	A or Q
	Any	1 000 $\mu\text{V/m}$ @ 3 m	Q
	Perimeter Protection Systems	500 $\mu\text{V/m}$ @ 3 m	A
54-70 MHz	Exclusively Non-Residential Perimeter Protection Systems	100 $\mu\text{V/m}$ @ 3 m	Q
	Wireless microphone	50 mW	
	Telemetry Devices	50 mW	
70-72 MHz	Intermittent Control Signals	1 250 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	500 $\mu\text{V/m}$ @ 3 m	A or Q

	Non-Residential Perimeter Protection Systems	100 $\mu\text{V/m}$ @ 3 m	Q
	Wireless microphone	50 mW	
72-73 MHz	Intermittent Control Signals	1 250 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	500 $\mu\text{V/m}$ @ 3 m	A or Q
74.6-74.8 MHz	Intermittent Control Signals	1 250 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	500 $\mu\text{V/m}$ @ 3 m	A or Q
75.2-76 MHz	Intermittent Control Signals	1 250 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	500 $\mu\text{V/m}$ @ 3 m	A or Q
76-88 MHz	Intermittent Control Signals	1 250 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	500 $\mu\text{V/m}$ @ 3 m	A or Q
	Non-Residential Perimeter Protection Systems	100 $\mu\text{V/m}$ @ 3 m	Q
	Wireless microphone	50 mW	
88-108 MHz	Intermittent Control Signals	1 250 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	500 $\mu\text{V/m}$ @ 3 m	A or Q
	Wireless microphone	250 mW	
121.94-123 MHz	Intermittent Control Signals	1 250 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	500 $\mu\text{V/m}$ @ 3 m	A or Q
138-149.9 MHz	Intermittent Control Signals	$(625/11) \times f(\text{MHz}) - (67500/11)$ $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	$(250/11) \times f(\text{MHz}) - (27000/11)$ $\mu\text{V/m}$ @ 3 m	A or Q
150.05-156.52475 MHz	Intermittent Control Signals	$(625/11) \times f(\text{MHz}) - (67500/11)$ $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	$(250/11) \times f(\text{MHz}) - (27000/11)$ $\mu\text{V/m}$ @ 3 m	A or Q
156.52525-156.7 MHz	Intermittent Control Signals	$(625/11) \times f(\text{MHz}) - (67500/11)$ $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	$(250/11) \times f(\text{MHz}) - (27000/11)$ $\mu\text{V/m}$ @ 3 m	A or Q
156.9-162.0125 MHz	Intermittent Control Signals	$(625/11) \times f(\text{MHz}) - (67500/11)$ $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	$(250/11) \times f(\text{MHz}) - (27000/11)$ $\mu\text{V/m}$ @ 3 m	A or Q
167.17-167.72 MHz	Intermittent Control Signals	$(625/11) \times f(\text{MHz}) - (67500/11)$ $\mu\text{V/m}$ @ 3 m	A or Q

	Periodic Transmissions	$(250/11) \times f(\text{MHz}) - (27000/11) \mu\text{V/m @ 3 m}$	A or Q
173.2-174 MHz	Intermittent Control Signals	$(625/11) \times f(\text{MHz}) - (67500/11) \mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	$(250/11) \times f(\text{MHz}) - (27000/11) \mu\text{V/m @ 3 m}$	A or Q
174-216 MHz	Intermittent Control Signals	3 750 $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	1 500 $\mu\text{V/m @ 3 m}$	A or Q
	Wireless microphone	50 mW	
216-225 MHz	Intermittent Control Signals	3 750 $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	1 500 $\mu\text{V/m @ 3 m}$	A or Q
225-240 MHz	Intermittent Control Signals	3 750 $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	1 500 $\mu\text{V/m @ 3 m}$	A or Q
	Indoor Sound System	580000 $\mu\text{V/m @ 3 m}$	
240-242.95 MHz	Indoor Sound System	580000 $\mu\text{V/m @ 3 m}$	
243-270 MHz	Indoor Sound System	580000 $\mu\text{V/m @ 3 m}$	
285-322 MHz	Intermittent Control Signals	$(125/3) \times f(\text{MHz}) - (21250/3) \mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	$(50/3) \times f(\text{MHz}) - (8500/3) \mu\text{V/m @ 3 m}$	A or Q
335.4-399.9 MHz	Intermittent Control Signals	$(125/3) \times f(\text{MHz}) - (21250/3) \mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	$(50/3) \times f(\text{MHz}) - (8500/3) \mu\text{V/m @ 3 m}$	A or Q
402-405 MHz	Medical Implant Communication Systems (MICS)	25 $\mu\text{W}$ (e.i.r.p.) per 300 kHz Bandwidth	
410-462.53 MHz	Intermittent Control Signals	$(125/3) \times f(\text{MHz}) - (21250/3) \mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	$(50/3) \times f(\text{MHz}) - (8500/3) \mu\text{V/m @ 3 m}$	A or Q
433-435 MHz	Intermittent Control Signals	$(125/3) \times f(\text{MHz}) - (21250/3) \mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	$(50/3) \times f(\text{MHz}) - (8500/3) \mu\text{V/m @ 3 m}$	A or Q
	Any	10 mW (e.i.r.p.)	
462.53-462.74 MHz	Intermittent Control Signals	$(125/3) \times f(\text{MHz}) - (21250/3) \mu\text{V/m @ 3 m}$	A or Q

	Periodic Transmissions	$(50/3) \times f(\text{MHz}) - (8500/3) \mu\text{V/m @ 3 m}$	A or Q
	General Usage Radio Equipment	500 mW (e.r.p.)	
462.74-467.53 MHz	Intermittent Control Signals	$(125/3) \times f(\text{MHz}) - (21250/3) \mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	$(50/3) \times f(\text{MHz}) - (8500/3) \mu\text{V/m @ 3 m}$	A or Q
	Intermittent Control Signals	$(125/3) \times f(\text{MHz}) - (21250/3) \mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	$(50/3) \times f(\text{MHz}) - (8500/3) \mu\text{V/m @ 3 m}$	A or Q
	General Usage Radio Equipment	500 mW (e.r.p.)	
470-512 MHz	Intermittent Control Signals	12 500 $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m @ 3 m}$	A or Q
	Wireless Microphone	250 mW	
512-566 MHz	Intermittent Control Signals	12 500 $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m @ 3 m}$	A or Q
	Biomedical Telemetry Devices for Hospitals	200 $\mu\text{V/m @ 3 m}$	Q
	Wireless Microphone	250 mW	
566-608 MHz	Intermittent Control Signals	12 500 $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m @ 3 m}$	A or Q
	Wireless Microphone	250 mW	
614-806 MHz	Intermittent Control Signals	12 500 $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m @ 3 m}$	A or Q
	Wireless Microphone	250 mW	
806-864 MHz	Intermittent Control Signals	12 500 $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m @ 3 m}$	A or Q
	Intermittent Control Signals	12 500 $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m @ 3 m}$	A or Q
	Wireless PABX System	250 mW	
868-890 MHz	Intermittent Control Signals	12 500 $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m @ 3 m}$	A or Q
	Intermittent Control Signals	12 500 $\mu\text{V/m @ 3 m}$	A or Q

	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A or Q
	Signals Used to Measure the Characteristics of a Material	500 $\mu\text{V/m}$ @ 30 m	A
902-907.5 MHz	Signals Used to Measure the Characteristics of a Material	500 $\mu\text{V/m}$ @ 30 m	A
	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A or Q
915-928 MHz	Signals Used to Measure the Characteristics of a Material	500 $\mu\text{V/m}$ @ 30 m	A
	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A or Q
928-940 MHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A or Q
	Signals Used to Measure the Characteristics of a Material	500 $\mu\text{V/m}$ @ 30 m	A
940-944 MHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A or Q
944-948 MHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A or Q
	Wireless PABX System	250 mW	
948-960 MHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A or Q
1.24-1.3 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
1.427-1.435 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
1.6265-1.6455 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
1.6465-1.66 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
1.71-1.7188 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A

1.7222-2.2 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
1.91-1.93 GHz	Wireless PABX System	250 mW	
2.3-2.31 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
2.39-2.4 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
2.4-2.4835 GHz	Spread Spectrum or OFDM Transmitters	1 Watt e.i.r.p. <sup>2</sup>	
2.5-2.655 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
2.9-3.26 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
3.267-3.332 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
3.339-3.3458 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
3.358-3.6 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
4.4-4.5 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
5.15-5.25 GHz	Indoor RLAN	200 mW e.i.r.p.	A
5.25-5.35 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
	Indoor RLAN <sup>3</sup>	200 mW e.i.r.p.	A
5.46-5.47 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
5.47-5.725 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
	RLAN	1 Watt e.i.r.p.	A
5.875-7.25 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A

<sup>2</sup> Limited to 400 mW e.i.r.p. when used in cities with population greater than 500,000 habitants.

<sup>3</sup> In accordance with Resolution 229 (WRC-03).

7.75-8.025 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
8.5-9 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
9.2-9.3 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
9.5-10.5 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
10.5-10.55 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
10.55-10.6 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
12.7-13.25 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
13.4-14.47 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
14.5-15.35 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
16.2-17.7 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
19.156-19.635 GHz	Any P-MP Radio System	100 mW output power	
21.4-22.01 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
23.12-23.6 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
24.25-31.2 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
31.8-36.43 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
36.5-38.6 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
46.7-46.9 GHz	Vehicle mounted field disturbance sensors	Varies	
76-77 GHz	Vehicle mounted field	Varies	

	disturbance sensors		
--	---------------------	--	--



## ATTACHMENT 2

### Canada

#### Some specific exceptions

1. The bands listed below are also considered restricted for operation of low power radicomunication devices in Canada:

**Table 1: Restricted Bands**

MHz	MHz
3.020-3.026	4500-4800
5.677-5.683	7250-7750
121.94-123	11700-12200
240-242.95	17700-20200
243-285	21260-21400
1215-1300	46700-46900
2310-2390	59000-64000
3352.5-3358	76000-77000
3500-4200	

2. Besides those listed in the Annex, the following table contains other exceptions or exclusions to the general limits in Canada.

**Table 2: Exception or exclusions from the General Limits**

Frequency Band	Type of Use	Emission Limit	Detector A- Average Q-Quasi- peak
Any frequency except restricted frequencies	Underground and tunnel radio	< 110 W Tx power	A or Q
Any frequency	Any	# 6 nW total input power – battery consumption	A or Q
0-9 kHz	Any	N/A	-
9 - 45 kHz	Cable Locating Equipment	10 W peak output power	A or Q
45-490 kHz	Cable locating equipment	1 Watt peak output power	A or Q
160 - 190 kHz	Any	1 W final stage	Q
510-1705 kHz	Any	100 mW final stage or	Q

		250 $\mu\text{V/m}$ @ 30 m	
1.705 - 10 MHz	Any	100 $\mu\text{V/m}$ @ 30 m	A
0 - 30 MHz	AC Wire Carrier Current Devices	N/A	N/A
1.705-37 MHz	Swept frequency devices	100 $\mu\text{V/m}$ @ 30 m for <10 MHz 30 $\mu\text{V/m}$ @ 30 m for >10 MHz and < 30 MHz 100 $\mu\text{V/m}$ @ 3 m for >30 MHz	Q
6.765-6.795 MHz	Any	15 500 $\mu\text{V/m}$ @ 30 m	Q
13.110 - 14.010 MHz	Any	15.484 $\mu\text{V/m}$ @ 30 m (13.533 - 13.567 MHz)	
		334 $\mu\text{V/m}$ @ 30 m (13.567 - 13.710 MHz)	
		106 $\mu\text{V/m}$ @ 30 m (13.110 - 13.410 and 13.567 - 14.010 MHz)	
		30 $\mu\text{V/m}$ @ 30 m (outside the 13.110- 14.010 MHz band)	
13.553-13.567 MHz	Any	15 500 $\mu\text{V/m}$ @ 30 m	Q
26.96-27.41 MHz	General Radio Service	4-6 W Tx power	Q
26.96 - 27.28 MHz	Any	10 $\mu\text{V/m}$ @ 30 m	A
26.99-27.20 MHz <sup>4</sup>	Momentary remote control	2.5-4 W peak Tx power	A or Q
40.66-40.70 MHz	Any	10 000 $\mu\text{V/m}$ @ 3 m	A
		233 000 $\mu\text{V/m}$ @ 3 m	Q
44/49 MHz	Cordless telephones	10 000 $\mu\text{V/m}$ @ 3 m	A
47 MHz <sup>5</sup>	Road traffic controllers	100 mW	-
49.82-49.90	Any	10 000 $\mu\text{V/m}$ @ 3 m	Q
70-130 MHz	Any momentary	500 $\mu\text{V/m}$ @ 3 m	A or Q
72-73 MHz	Momentary model aircraft	0.75 W peak Tx power	A or Q
	Wireless microphone	80 000 $\mu\text{V/m}$ @ 3 m	A
74.6-74.8 MHz	Wireless microphone	80 000 $\mu\text{V/m}$ @ 3 m	A
75.2-76.0 MHz	Wireless microphone	80 000 $\mu\text{V/m}$ @ 3 m	A
75.4-76.0 MHz <sup>6</sup>	Momentary remote control	0.75 W peak Tx power	A or Q

<sup>4</sup> Only the following channel carrier frequencies are permitted: 26.995; 27.045; 27.095; 27.145; 27.195 MHz.

<sup>5</sup> One-way communication only

<sup>6</sup> Voice modulation is permitted for emergency use if it is of the push-to-talk type.

88 - 108 MHz	Any	250 $\mu\text{V/m}$ @ 3 m	A
121.5 MHz	Radiobeacon	25 000 $\mu\text{V/m}$ @ 3 m	Q
130-174 MHz	Any momentary	500 $\mu\text{V/m}$ to 1 500 $\mu\text{V/m}$ @ 3m	A or Q
174-216 MHz	Medical telemetry	1 500 $\mu\text{V/m}$ @ 3m	A
174-260 MHz	Any momentary	3 750 $\mu\text{V/m}$ @ 3m	A or Q
216-216.450 MHz; 216.500-217 MHz <sup>7</sup>	Auditory assistance, medical telemetry, goods tracking	100 mW Tx power	Q
216.45-216.50 MHz	Law enforcement	100 mW Tx power	Q
243 MHz	Radiobeacon	25 mW to 50 mW min Tx power	Q
260-470 MHz	Any momentary	1 500 $\mu\text{V/m}$ to 5 000 $\mu\text{V/m}$ @ 3m	A or Q
402 – 405 MHz	Active Medical Implants	25 $\mu\text{W}$ e.i.r.p.	A
406-406.1 MHz	Radiobeacon	25 mW to 50 mW min Tx power	Q
433.5 - 434.5 MHz	RFID	11 mV/m @ 3m	A
462 and 467 MHz	FRS	0.5 W e.r.p. output power	Q
	GMRS	2.0W e.r.p. output power	Q
Above 470 MHz	Any momentary	5 000 $\mu\text{V/m}$ @ 3m	A or Q
608-614 MHz	Medical telemetry	200 $\mu\text{V/m}$ @ 3 m	Q
902 - 928 MHz	Any	1 W Tx power (hopset $\geq$ 50 channels hopset)	A
	Spread Spectrum (frequency hopping and digital modulated system)	0.25 W Tx power (hopset < 50 channels)	
		Digital Modular Systems: 1W Tx power	
	Field Disturbance Sensors	500 mV/m @ 30 m	A
902-902.1 MHz / - 927.9-928 MHz	Rural radiophones	0.5 W Tx power	Q
944-948.5 MHz	CT2+ Cordless telephones (private/commercial use)	10 mW	Q
1910-1920 MHz	Personal Communication Service Device	112 mW Tx power	A

<sup>7</sup> These bands are channelized and available for voice or data transmission b not two-way voice.

	(asynchronous)		
1920-1930 MHz	Personal Communication Service Device (isochronous)	112 mW Tx power	A
2400 - 2483.5 MHz	Any	50 mV/m @ 3 m	A
	Spread Spectrum (frequency hopping and digital modulated systems)	0.125W Tx power (hopset < 75 channels)	A
		Digital Modulated Systems: 1W Tx power	A
2435 - 2465 MHz	Field Disturbance Sensors	500 mV/m @ 3 m	A
2900 - 3260; 3267 - 3332; 3339 - 3345.8 and 3358 - 3600 MHz	Vehicle Identification	3 mV/m per 1 MHz beamwidth @ 3m in antenna main beam	A
		400 µV/m @ 3 m per 1 MHz beamwidth @ 3m over ± 10 degrees of horizontal plane of antenna	A
5150-5250 MHz <sup>8</sup>	Local area network	200 mW	A
5250-5350 MHz	Local area network	250 mW Tx power	A
5470 - 5725 MHz	Local area network	250 mW Tx power	A
5725-5825 MHz	Local area network	(4 W) 1 W Tx power	A
5725-5850 MHz	Any	50 000 µV/m @ 3 m	A
8.5-10.55 GHz	Inside metal container	8 mW peak Tx power	A
10.5-10.55 GHz	Field Disturbance Sensors	2500 mW/m @3m	A
17.15 GHz	Any	300 mW e.i.r.p	A
24.075 - 24.175GHz	Field Disturbance Sensors	2500 mW/m @ 3m	A

---

<sup>8</sup> For indoors use only.

46.7 - 46.9 and 76 - 77 GHz	Vehicle-Mounted Field Disturbance Sensors	200 nW/cm <sup>2</sup> if the vehicle is moving less than 1 km/hour.	A
		60 µW/cm <sup>2</sup> for forward-looking vehicle-mounted field disturbance sensors, if the vehicle is in motion.	A
		30 µW/cm <sup>2</sup> for side-looking or rear-looking vehicle-mounted field disturbance sensors; if the vehicle is in motion.	
57 - 64 GHz	Any	Average power density ≤ 9 µW/cm <sup>2</sup> ; Peak power density ≤ 18 µW/cm <sup>2</sup> (@ 3 metres)	A
	Field Disturbance Sensors for fixed operation	Occupy 500 MHz or less of bandwidth within 61.0-61.5 GHz; Average power density ≤ 9 µW/cm <sup>2</sup> ; Peak power density ≤ 18 µW/cm <sup>2</sup> (@ 3 metres)	A
	Field Disturbance Sensors for fixed operation	Emission outside 61.0-61.5 GHz but within the 57-64 GHz; Average power density ≤ 9 nW/cm <sup>2</sup> ; Peak power density ≤ 18 nW/cm <sup>2</sup> (@ 3 metres)	A
	Field Disturbance Sensors for fixed operation	Sensors other than those operating under subsection A13.2.2(i)(b) of RSS-210, the peak Tx ≤ 0.1 mW; Peak power density ≤ 9 nW/cm <sup>2</sup> (@ 3 metres)	A
94 GHz	Any	400 mW	A

### ATTACHMENT 3

#### United States of America

#### Some specific exceptions

1. The bands listed below are also considered restricted for operation of low power radicomunication devices in the United States of America:

**Table 1: Restricted Bands**

MHz	MHz
0.495-0.505	2483.5-2500
149.9-150.5	3352.5-3358
162.0125-167.17	3600-4200
167.72-173.2	4500-4800
240-242.95	7250-7750
243-285	11700-12200
1215-1240	17700-20200
2310-2390	21260-21400

2. Besides those listed in the Annex, the following table contains other exceptions or exclusions to the general limits in the United States of America.

**Table 2: Exception or Exclusions from the General Limits**

Frequency Band	Type of Use	Emission Limit	Detector A-Average Q-Quasi-peak
101.4 kHz	Telephone company electronic marker detectors	23.7 $\mu$ V/m @ 300 m	A
160-190 kHz	Any	1 Watt input to final RF stage	
510-525 kHz	Any	100 mW input to final RF stage	
525-1 705 kHz	Any	100 mW input to final RF stage	
	Transmitters on grounds of educational institutions	24 000/f(kHz) $\mu$ V/m @ 30 m outside of campus boundary	Q
	Carrier current and leaky coax systems	15 $\mu$ V/m @ 47 715/f(kHz) m from cable	Q

1.705-10 MHz	Any, when 6 dB bandwidth $\geq 10\%$ of centre frequency	100 $\mu\text{V/m}$ @ 30 m	A
	Any, when 6 dB bandwidth $< 10\%$ of centre frequency	15 $\mu\text{V/m}$ @ 30 m or bandwidth in (kHz)/f(MHz)	A
13.110-13.410 MHz	Any	106 $\mu\text{V/m}$ @ 30 m	Q
13.410-13.553 MHz	Any	334 $\mu\text{V/m}$ @ 30 m	Q
13.553-13.567 MHz	Any	15 848 $\mu\text{V/m}$ @ 30 m	Q
13.567-13.710 MHz	Any	334 $\mu\text{V/m}$ @ 30 m	Q
13.710-14.010 MHz	Any	106 $\mu\text{V/m}$ @ 30 m	Q
40.66-40.7 MHz	Intermittent Control Signals	2 250 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	1 000 $\mu\text{V/m}$ @ 3 m	A or Q
	Any	1 000 $\mu\text{V/m}$ @ 3 m	Q
	Perimeter Protection Systems	500 $\mu\text{V/m}$ @ 3 m	A
54-70 MHz	Exclusively Non-Residential Perimeter Protection Systems	100 $\mu\text{V/m}$ @ 3 m	Q
70-72 MHz	Exclusively either Intermittent Control Signals	1 250 $\mu\text{V/m}$ @ 3 m	A or Q
	Or Periodic Transmissions	500 $\mu\text{V/m}$ @ 3 m	A or Q
	Or Non-Residential Perimeter Protection Systems	100 $\mu\text{V/m}$ @ 3 m	Q
72-73 MHz	Intermittent Control Signals	1 250 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	500 $\mu\text{V/m}$ @ 3 m	A or Q
74.6-74.8 MHz	Intermittent Control Signals	1 250 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	500 $\mu\text{V/m}$ @ 3 m	A or Q
75.2-76 MHz	Intermittent Control Signals	1 250 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	500 $\mu\text{V/m}$ @ 3 m	A or Q
76-88 MHz	Exclusively either Intermittent Control Signals	1 250 $\mu\text{V/m}$ @ 3 m	A or Q
	Or Periodic Transmissions	500 $\mu\text{V/m}$ @ 3 m	A or Q
	Or Non-Residential Perimeter Protection Systems	100 $\mu\text{V/m}$ @ 3 m	Q
88-108 MHz	Any ( $\leq 200$ kHz bandwidth)	250 $\mu\text{V/m}$ @ 3 m	A

121.94-123 MHz	Intermittent Control Signals	1 250 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	500 $\mu\text{V/m}$ @ 3 m	A or Q
138-149.9 MHz	Intermittent Control Signals	$(625/11) \times f(\text{MHz})$ - (67500/11) $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	$(250/11) \times f(\text{MHz})$ - (27000/11) $\mu\text{V/m}$ @ 3 m	A or Q
150.05-156.52475 MHz	Intermittent Control Signals	$(625/11) \times f(\text{MHz})$ - (67500/11) $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	$(250/11) \times f(\text{MHz})$ - (27000/11) $\mu\text{V/m}$ @ 3 m	A or Q
156.52525-156.7 MHz	Intermittent Control Signals	$(625/11) \times f(\text{MHz})$ - (67500/11) $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	$(250/11) \times f(\text{MHz})$ - (27000/11) $\mu\text{V/m}$ @ 3 m	A or Q
156.9-162.0125 MHz	Intermittent Control Signals	$(625/11) \times f(\text{MHz})$ - (67500/11) $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	$(250/11) \times f(\text{MHz})$ - (27000/11) $\mu\text{V/m}$ @ 3 m	A or Q
167.17-167.72 MHz	Intermittent Control Signals	$(625/11) \times f(\text{MHz})$ - (67500/11) $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	$(250/11) \times f(\text{MHz})$ - (27000/11) $\mu\text{V/m}$ @ 3 m	A or Q
173.2-174 MHz	Intermittent Control Signals	$(625/11) \times f(\text{MHz})$ - (67500/11) $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	$(250/11) \times f(\text{MHz})$ - (27000/11) $\mu\text{V/m}$ @ 3 m	A or Q
174-216 MHz	Exclusively either Intermittent Control Signals	3 750 $\mu\text{V/m}$ @ 3 m	A or Q
	Or Periodic Transmissions	1 500 $\mu\text{V/m}$ @ 3 m	A or Q
216-240 MHz	Periodic Transmissions	1 500 $\mu\text{V/m}$ @ 3 m	A or Q
	Intermittent Control Signals	3 750 $\mu\text{V/m}$ @ 3 m	A or Q
285-322 MHz	Intermittent Control Signals	$(125/3) \times f(\text{MHz})$ - (21250/3) $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	$(50/3) \times f(\text{MHz})$ - (8500/3) $\mu\text{V/m}$ @ 3 m	A or Q
335.4-399.9 MHz	Intermittent Control Signals	$(125/3) \times f(\text{MHz})$ - (21250/3) $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	$(50/3) \times f(\text{MHz})$ - (8500/3) $\mu\text{V/m}$ @ 3 m	A or Q



410-433.5 MHz	Intermittent Control Signals	$(125/3) \times f(\text{MHz}) - (21250/3)$ $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	$(50/3) \times f(\text{MHz}) - (8500/3)$ $\mu\text{V/m @ 3 m}$	A or Q
433.5-434.5 MHz	Devices to identify the contents of commercial shipping containers	11 000 $\mu\text{V/m @ 3 m}$	A
	Intermittent Control Signals	$(125/3) \times f(\text{MHz}) - (21250/3)$ $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	$(50/3) \times f(\text{MHz}) - (8500/3)$ $\mu\text{V/m @ 3 m}$	A or Q
434.5-470 MHz	Intermittent Control Signals	$(125/3) \times f(\text{MHz}) - (21250/3)$ $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	$(50/3) \times f(\text{MHz}) - (8500/3)$ $\mu\text{V/m @ 3 m}$	A or Q
470-512 MHz	Exclusively either Intermittent Control Signals	12 500 $\mu\text{V/m @ 3 m}$	A or Q
	Or Periodic Transmissions	5 000 $\mu\text{V/m @ 3 m}$	A or Q
512-566 MHz	Exclusively either Intermittent Control Signals	12 500 $\mu\text{V/m @ 3 m}$	A or Q
	Or Periodic Transmissions	5 000 $\mu\text{V/m @ 3 m}$	A or Q
566-608 MHz	Exclusively either Intermittent Control Signals	12 500 $\mu\text{V/m @ 3 m}$	A or Q
	Or Periodic Transmissions	5 000 $\mu\text{V/m @ 3 m}$	A or Q
614-806 MHz	Exclusively either Intermittent Control Signals	12 500 $\mu\text{V/m @ 3 m}$	A or Q
	Or Periodic Transmissions	5 000 $\mu\text{V/m @ 3 m}$	A or Q
806-890 MHz	Intermittent Control Signals	12 500 $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m @ 3 m}$	A or Q
890-902 MHz	Intermittent Control Signals	12 500 $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m @ 3 m}$	A or Q
	Signals Used to Measure the Characteristics of a Material	500 $\mu\text{V/m @ 30 m}$	A
902-928 MHz	Signals Used to Measure the Characteristics of a Material	500 $\mu\text{V/m @ 30 m}$	A
	Intermittent Control Signals	12 500 $\mu\text{V/m @ 3 m}$	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m @ 3 m}$	A or Q
	Frequency hopping systems	1 W output power (if $\geq 50$ )	A

		hopping channels) 0.25 W output power (if $\geq 25$ hopping channels but less than 50)	
	Digital modulation	1 W output power	A
928-940 MHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A or Q
	Signals Used to Measure the Characteristics of a Material	500 $\mu\text{V/m}$ @ 30 m	A
940-960 MHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A or Q
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A or Q
1.24-1.3 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
1.427-1.435 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
1.6265-1.6455 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
1.6465-1.66 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
1.71-1.7188 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
1.7222-2.2 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
1.92-1.93 GHz	Isocronous PCS devices	Varies	
2.3-2.31 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
2.39-2.4 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Asynchronous PCS devices	Varies	
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
2.4-2.4835 GHz	Frequency hopping system	1 W output power (if $\geq 75$ non-overlapping hopping channels); otherwise, 0.125 W output power	A
	Digital modulation	1 W output power	A
2.5-2.655 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A

2.9-3.26 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
3.267-3.332 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
3.339-3.3458 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
3.358-3.6 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
4.4-4.5 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
5.15-5.25 GHz	National Information Infrastructure devices	Indoor only. Output power: lesser of 50 mW or 4 dBm + 10 log B (where B = 26 dB bandwidth in MHz)	A
5.25-5.35 GHz	National Information Infrastructure devices	Output power: lesser of 250 mW or 11 dBm + 10 log B (where B = 26 dB bandwidth in MHz)	A
	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
5.46-5.47 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
5.47-5.725 GHz	National Information Infrastructure devices	Output power: lesser of 250 mW or 11 dBm + 10 log B (where B = 26 dB bandwidth in MHz)	A
	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
5.725-5.825 GHz	National Information Infrastructure devices	Output power: lesser of 1 W or 17 dBm + 10 log B (where B = 26 dB bandwidth in MHz)	A
5.725-5.85 GHz	Frequency hopping or digital modulation system	1 W output power	A
5.875-7.25 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
7.75-8.025 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
8.5-9 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A

	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
9.2-9.3 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
9.5-10.5 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
10.5-10.55 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
10.55-10.6 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
12.7-13.25 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
13.4-14.47 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
14.5-15.35 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
16.2-17.7 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
21.4-22.01 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
23.12-23.6 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
24.25-31.2 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
31.8-36.43 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
36.5-38.6 GHz	Intermittent Control Signals	12 500 $\mu\text{V/m}$ @ 3 m	A
	Periodic Transmissions	5 000 $\mu\text{V/m}$ @ 3 m	A
46.7-46.9 GHz	Vehicle mounted field disturbance sensors	Varies	
57-64 GHz	Not aircraft, not satellite, not field disturbance sensors (with a qualified fixed exception)	Varies	
76-77 GHz	Vehicle mounted field disturbance sensors	Varies	

92-95 GHz	Indoor use, not permitted on aircraft or satellite	Varies	
-----------	--	--------	--