## B.7 RF Exposure

## **Limits**

under the provisions of this section are subject to the radiofrequency radiation exposure requirements specified in §§1.1307(b), 2.1091 and 2.1093 of this chapter as appropriate. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.  (b) For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.  (c)(2) Unlicensed personal communications service devices, unlicensed millimeter wave devices and unlicensed NII devices authorized under §§15.253(f), 15.255(g), 15.257(g), 15.319(i), and 15.407(f) of this chapter are also subject to routine	FCC part	Limits								
designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.  (c)(2) Unlicensed personal communications service devices, unlicensed millimete wave devices and unlicensed NII devices authorized under §§15.253(f), 15.255(g), 15.257(g), 15.319(i), and 15.407(f) of this chapter are also subject to routing environmental evaluation for RF exposure prior to equipment authorization or use in their ERP is 3 watts or more or if they meet the definition of a portable device as specified in §2.1093(b) requiring evaluation under the provisions of that section.  (e) Table 1 below sets forth limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields.  Trace 1—Limits for Maximum Permissible Exposure (MPE)    Trequency range   Electric field strength   Magnetic field strength   Power density (minutes)   minutes)   minutes   min	15.255 (g)	Regardless of the power density levels permitted under this section, devices operating under the provisions of this section are subject to the radiofrequency radiation exposure requirements specified in §§1.1307(b), 2.1091 and 2.1093 of this chapter, as appropriate. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon								
(e) Table 1 below sets forth limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields.    Table 1—Limits for Maximum Permissible Exposure (MPE)	2.1091	(b) For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.  (c)(2) Unlicensed personal communications service devices, unlicensed millimeter wave devices and unlicensed NII devices authorized under §§15.253(f), 15.255(g), 15.257(g), 15.319(i), and 15.407(f) of this chapter are also subject to routine environmental evaluation for RF exposure prior to equipment authorization or use if								
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30-300 27.5 0.073 0.2 30 300-1,500 f/1500 30	1.1310	(c)(2) Unlicensed wave devices and 15.257(g), 15.31s environmental evaluation their ERP is 3 was specified in §2.10s (e) Table 1 belowed radiofrequency electric (MHz)  6.3-3.0	d unlicensed NII of 9(i), and 15.407(i) aluation for RF ex atts or more or if 93(b) requiring evaluation sets forth limits extromagnetic field TABLE 1—LIMITS (A) Limits for 61.  (B) Limits for General (B) L	devices authorized f) of this chapter posure prior to equ they meet the defi illuation under the p s for Maximum Pe s. FOR MAXIMUM PERMISSIBLE EXPOS  Magnetic field strength ((A/m)  4 89 4 0.16	under §§15 are also s sipment auth inition of a p rovisions of t ermissible Ex  Power density (mWcm²) osure 3 *100 fr300 Exposure 3 *100	253(f), 15.255(g subject to routin norization or use portable device a that section. exposure (MPE) t				
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RSS part			Limits		
	3. Evaluation Methods () Devices operating undergo an RF exposu  4. Exposure Limits For the purpose of this strength limits establish 6.  Table 4: RI	g above 6 G re evaluation standard, Ind hed in Health	dustry Canada	has adopted exposure g	the SAR and uideline, Safe
RSS-102	Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m²)	Reference Period (minutes)
	0.003-10 <sup>21</sup>	83	90		Instantaneous*
	0.1-10	-	0.73/ f	- 4	6**
	1.1-10	87/ f 0.5			6**
	10-20	27,46	0.0728	2	6
	20-48	58.07/ f 0.25	0.1540/ f n.25	8.944/ f 0.5	6
	48-300	22.06	0.05852	1,291	6
	300-6000	3.142 f 0.3417	0.008335 f 0.3417	$0.02619f^{0.6834}$	6
	6000-15000	61.4	0.163	10	6
	15000-150000	61.4	0.163	10	616000/ f 1.2
	13000-130000	0.158 f 0.5	4.21 x 10 <sup>-4</sup> f 0.5		

## Test procedure

For the purpose of this evaluation, a minimum distance of 20cm was used to calculate the equivalent plan wave power density based on the Average EIRP values obtained in B.2, to be compared with the power density limit, according to following formula:

$$S_{eq} = \frac{P_{avg} \cdot G}{4 \cdot \pi \cdot R^2} \Rightarrow S_{eq} = \frac{EIRP}{4 \cdot \pi \cdot R^2}$$

Where:

 $S_{eq}$  = Equivalent Plane Wave Power Density, in Watts per square meter.

 $P_{avg}$  = Source-Based Average Power at antenna terminals, in Watts.

EIRP = Equivalent Isotropically Radiated Power, in Watts.

G = Gain of the Transmitting Antenna.

R = Distance from the Transmitting Antenna, in meters.

## **Results**

	Power Density Calculation								
М	ode	MCS	Frequency (GHz)	Average EIRP (dBm)	Average EIRP (W)	Separation Distance (m)	Power Density (W/m²)	Limit (W/m <sup>2</sup> )	
W	/iGig	1	58.32	21.63	0.146	0.2	0.290	10	
W	/iGig	1	60.48	21.27	0.134	0.2	0.267	10	
W	/iGig	1	62.64	21.71	0.148	0.2	0.295	10	