

## § 2.1093

## 47 CFR Ch. I (10–1–23 Edition)

should also be submitted. Holders of grants for mobile devices to be used in occupational settings are encouraged, but not required, to coordinate with end-user organizations to ensure appropriate RF safety training.

(4) In some cases, e.g., modular or desktop transmitters, the potential conditions of use of a device may not allow easy classification of that device as either mobile or portable (also see § 2.1093). In such cases, applicants are responsible for determining minimum distances for compliance for the intended use and installation of the device based on evaluation of either specific absorption rate (SAR), field strength or power density, whichever is most appropriate.

[61 FR 41017, Aug. 7, 1996, as amended at 62 FR 4655, Jan. 31, 1997; 62 FR 9658, Mar. 3, 1997; 62 FR 47966, Sept. 12, 1997; 68 FR 38638, June 30, 2003; 69 FR 3264, Jan. 23, 2004; 70 FR 24725, May 11, 2005; 78 FR 21559, Apr. 11, 2013; 78 FR 29062, May 17, 2013; 78 FR 33651, June 4, 2013; 80 FR 36221, June 23, 2015; 81 FR 79936, Nov. 14, 2016; 82 FR 43870, Sept. 20, 2017; 84 FR 25689, June 4, 2019; 85 FR 38739, June 26, 2020; 85 FR 18146, Apr. 1, 2020]

### **§ 2.1093 Radiofrequency radiation exposure evaluation: portable devices.**

(a) Requirements of this section are a consequence of Commission respon-

sibilities under the National Environmental Policy Act to evaluate the environmental significance of its actions. See subpart I of part 1 of this chapter, in particular § 1.1307(b).

(b) For purposes of this section, the definitions in § 1.1307(b)(2) of this chapter shall apply. A portable 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 the RF source's radiating structure(s) is/are within 20 centimeters of the body of the user.

(c)(1) Evaluation of compliance with the exposure limits in § 1.1310 of this chapter, and preparation of an EA if the limits are exceeded, is necessary for portable devices having single RF sources with more than an available maximum time-averaged power of 1 mW, more than the ERP listed in Table 1 to § 1.1307(b)(3)(i)(C), or more than the  $P_{th}$  in the following formula, whichever is greater. The following formula shall only be used in conjunction with portable devices not exempt by § 1.1307(b)(3)(i)(C) at distances from 0.5 centimeters to 20 centimeters and frequencies from 0.3 GHz to 6 GHz.

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

$d$  = the minimum separation distance (cm) in any direction from any part of the device antenna(s) or radiating structure(s) to the body of the device user.

(2) For multiple mobile or portable RF sources within a device operating in the same time averaging period, evaluation is required if the formula in § 1.1307(b)(3)(ii)(B) of this chapter is applied to determine the exemption ratio and the result is greater than 1.

(3) Unless otherwise specified in this chapter, any other single portable or multiple mobile and portable RF source(s) associated with a device is exempt from routine environmental evaluation for RF exposure prior to equipment authorization or use, except as specified in § 1.1307(c) and (d) of this chapter.

(d)(1) Applications for equipment authorization of portable RF sources subject to routine environmental evaluation must contain a statement confirming compliance with the limits specified in § 1.1310 of this chapter as part of their application. Technical information showing the basis for this statement must be submitted to the Commission upon request. The SAR

limits specified in § 1.1310(a) through (c) of this chapter shall be used for evaluation of portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz shall be evaluated in terms of the MPE limits specified in Table 1 to § 1.1310(e)(1) of this chapter. A minimum separation distance applicable to the operating configurations and exposure conditions of the device shall be used for the evaluation. In general, maximum time-averaged power levels must be used for evaluation. All unlicensed personal communications service (PCS) devices and unlicensed NII devices shall be subject to the limits for general population/uncontrolled exposure.

(2) Evaluation of compliance with the SAR limits can be demonstrated by either laboratory measurement techniques or by computational modeling. The latter must be supported by adequate documentation showing that the numerical method as implemented in the computational software has been fully validated; in addition, the equipment under test and exposure conditions must be modeled according to

protocols established by FCC-accepted numerical computation standards or available FCC procedures for the specific computational method. Guidance regarding SAR measurement techniques can be found in the Office of Engineering and Technology (OET) Laboratory Division Knowledge Database (KDB). The staff guidance provided in the KDB does not necessarily represent the only acceptable methods for measuring RF exposure or RF emissions, and is not binding on the Commission or any interested party.

(3) For purposes of analyzing portable RF sources under the occupational/controlled SAR criteria specified in § 1.1310 of this chapter, time averaging provisions of the limits may be used in conjunction with the maximum duty factor to determine maximum time-averaged exposure levels under normal operating conditions.

(4) The time averaging provisions for occupational/controlled SAR criteria, based on maximum duty factor, may not be used in determining typical exposure levels for portable devices intended for use by consumers, such as cellular telephones, that are considered to operate in general population/uncontrolled environments as defined in § 1.1310 of this chapter. However, “source-based” time averaging based on an inherent property of the RF source is allowed over a time period not to exceed 30 minutes. An example of this would be the determination of exposure from a device that uses digital technology such as a time-division multiple-access (TDMA) scheme for transmission of a signal.

(5) Visual advisories (such as labeling, embossing, or on an equivalent electronic display) on portable devices designed only for occupational use can be used as part of an applicant’s evidence of the device user’s awareness of occupational/controlled exposure limits. Such visual advisories shall be legible and clearly visible to the user from the exterior of the device. Visual advisories must indicate that the device is for occupational use only, refer the user to specific information on RF exposure, such as that provided in a user manual and note that the advisory and its information is required for FCC RF exposure compliance. Such instruc-

tional material must provide users with information on how to use the device and to ensure users are *fully aware* of and able to *exercise control* over their exposure to satisfy compliance with the occupational/controlled exposure limits. A sample of the visual advisory, illustrating its location on the device, and any instructional material intended to accompany the device when marketed, shall be filed with the Commission along with the application for equipment authorization. Details of any special training requirements pertinent to mitigating and limiting RF exposure should also be submitted. Holders of grants for portable devices to be used in occupational settings are encouraged, but not required, to coordinate with end-user organizations to ensure appropriate RF safety training.

(6) General population/uncontrolled exposure limits defined in § 1.1310 of this chapter apply to portable devices intended for use by consumers or persons who are exposed as a consequence of their employment and may not be fully aware of the potential for exposure or cannot exercise control over their exposure. No communication with the consumer including either visual advisories or manual instructions will be considered sufficient to allow consumer portable devices to be evaluated subject to limits for occupational/controlled exposure specified in § 1.1310 of this chapter.

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## Subpart K—Importation of Devices Capable of Causing Harmful Interference

### § 2.1201 Purpose.

(a) In order to carry out its responsibilities under the Communications Act and the various treaties and international regulations, and in order to