

(3) The peak power shall be measured with a detection bandwidth that encompasses the entire occupied bandwidth within the intended band of operation, *e.g.*, 116–123 GHz, 174.8–182 GHz, 185–190 GHz or 244–246 GHz. The average emission levels shall be measured over the actual time period during which transmission occurs.

(4) Transmitters with an emission bandwidth of less than 100 MHz must limit their peak radiated power to the product of the maximum permissible radiated power (in milliwatts) times their emission bandwidth divided by 100 MHz. For the purposes of this paragraph (b)(4), emission bandwidth is defined as the instantaneous frequency range occupied by a steady state radiated signal with modulation, outside which the radiated power spectral density never exceeds 6 dB below the maximum radiated power spectral density in the band, as measured with a 100 kHz resolution bandwidth spectrum analyzer. The center frequency must be stationary during the measurement interval, even if not stationary during normal operation (*e.g.*, for frequency hopping devices).

(c) Spurious emissions shall be limited as follows:

(1) The power density of any emissions outside the band of operation, *e.g.*, 116–123 GHz, 174.8–182 GHz, 185–190 GHz or 244–246 GHz, shall consist solely of spurious emissions.

(2) Radiated emissions below 40 GHz shall not exceed the general limits in §15.209.

(3) Between 40 GHz and the highest frequency specified in §15.33, the level of these emissions shall not exceed 90 pW/cm<sup>2</sup> at a distance of 3 meters.

(4) The levels of the spurious emissions shall not exceed the level of the fundamental emission.

(d) Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range –20 to + 50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

(e) Regardless of the power density levels permitted under this section, de-

vices operating under the provisions of this section are subject to the radio-frequency 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.

(f) Any transmitter that has received the necessary FCC equipment authorization under the rules of this chapter may be mounted in a group installation for simultaneous operation with one or more other transmitter(s) that have received the necessary FCC equipment authorization, without any additional equipment authorization. However, no transmitter operating under the provisions of this section may be equipped with external phase-locking inputs that permit beam-forming arrays to be realized.

(g) Measurement procedures that have been found to be acceptable to the Commission in accordance with §2.947 of this chapter may be used to demonstrate compliance.

[84 FR 25691, June 4, 2019]

### Subpart D—Unlicensed Personal Communications Service Devices

SOURCE: 58 FR 59180, Nov. 8, 1993, unless otherwise noted.

#### § 15.301 Scope.

This subpart sets out the regulations for unlicensed personal communications services (PCS) devices operating in the 1920–1930 MHz band.

[69 FR 77949, Dec. 29, 2004]

#### § 15.303 Definitions.

*Asynchronous devices.* Devices that transmit RF energy at irregular time intervals, as typified by local area network data systems.

*Emission bandwidth.* For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency

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and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Compliance with the emissions limits is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

*Isochronous devices.* Devices that transmit at a regular interval, typified by time-division voice systems.

*Peak transmit power.* The peak power output as measured over an interval of time equal to the frame rate or transmission burst of the device under all conditions of modulation. Usually this parameter is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used.

*Personal Communications Services (PCS) Devices [Unlicensed].* Intentional radiators operating in the frequency band 1920–1930 MHz that provide a wide array of mobile and ancillary fixed communication services to individuals and businesses.

*Spectrum window.* An amount of spectrum equal to the intended emission bandwidth in which operation is desired.

*Thermal noise power.* The noise power in watts defined by the formula  $N = kTB$  where  $N$  is the noise power in watts,  $k$  is Boltzmann's constant,  $T$  is the absolute temperature in degrees Kelvin (e.g., 295 °K) and  $B$  is the emission bandwidth of the device in hertz.

*Time window.* An interval of time in which transmission is desired.

[58 FR 59180, Nov. 8, 1993, as amended at 59 FR 32852, June 24, 1994; 60 FR 13073, Mar. 10, 1995; 69 FR 62620, Oct. 27, 2004; 69 FR 77949, Dec. 29, 2004; 77 FR 43013, July 23, 2012]

### § 15.305 Equipment authorization requirement.

PCS devices operating under this subpart shall be certified by the Commission under the procedures in subpart J of part 2 of this chapter before marketing. The application for certification must contain sufficient infor-

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mation to demonstrate compliance with the requirements of this subpart.

### § 15.307 [Reserved]

### § 15.309 Cross reference.

(a) The provisions of subpart A of this part apply to unlicensed PCS devices, except where specific provisions are contained in subpart D.

(b) The requirements of subpart D apply only to the radio transmitter contained in the PCS device. Other aspects of the operation of a PCS device may be subject to requirements contained elsewhere in this chapter. In particular, a PCS device that includes digital circuitry not directly associated with the radio transmitter also is subject to the requirements for unintentional radiators in subpart B.

### § 15.313 Measurement procedures.

Measurements must be made in accordance with subpart A, except where specific procedures are specified in subpart D. If no guidance is provided, the measurement procedure must be in accordance with good engineering practice.

### § 15.315 Conducted limits.

An unlicensed PCS device that is designed to be connected to the public utility (AC) power line must meet the limits specified in § 15.207.

### § 15.317 Antenna requirement.

An unlicensed PCS device must meet the antenna requirement of § 15.203.

### § 15.319 General technical requirements.

(a) [Reserved]

(b) All transmissions must use only digital modulation techniques. Both asynchronous and isochronous operations are permitted within the 1920–1930 MHz band.

(c) Peak transmit power shall not exceed 100 microwatts multiplied by the square root of the emission bandwidth in hertz. Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for