

(b) *Center frequency.* The center frequency,  $f_c$ , equals  $(f_H + f_L)/2$ .

(c) *Fractional bandwidth.* The fractional bandwidth equals  $2(f_H - f_L)/(f_H + f_L)$ .

(d) *Ultra-wideband (UWB) transmitter.* An intentional radiator that, at any point in time, has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.

(e) *Imaging system.* A general category consisting of ground penetrating radar systems, medical imaging systems, wall imaging systems through-wall imaging systems and surveillance systems. As used in this subpart, imaging systems do not include systems designed to detect the location of tags or systems used to transfer voice or data information.

(f) *Ground penetrating radar (GPR) system.* A field disturbance sensor that is designed to operate only when in contact with, or within one meter of, the ground for the purpose of detecting or obtaining the images of buried objects or determining the physical properties within the ground. The energy from the GPR is intentionally directed down into the ground for this purpose.

(g) *Medical imaging system.* A field disturbance sensor that is designed to detect the location or movement of objects within the body of a person or animal.

(h) *Wall imaging system.* A field disturbance sensor that is designed to detect the location of objects contained within a "wall" or to determine the physical properties within the "wall." The "wall" is a concrete structure, the side of a bridge, the wall of a mine or another physical structure that is dense enough and thick enough to absorb the majority of the signal transmitted by the imaging system. This category of equipment does not include products such as "stud locators" that are designed to locate objects behind gypsum, plaster or similar walls that are not capable of absorbing the transmitted signal.

(i) *Through-wall imaging system.* A field disturbance sensor that is designed to detect the location or movement of persons or objects that are located on the other side of an opaque

structure such as a wall or a ceiling. This category of equipment may include products such as "stud locators" that are designed to locate objects behind gypsum, plaster or similar walls that are not thick enough or dense enough to absorb the transmitted signal.

(j) *Surveillance system.* A field disturbance sensor used to establish a stationary RF perimeter field that is used for security purposes to detect the intrusion of persons or objects.

(k) *EIRP.* Equivalent isotropically radiated power, i.e., the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna. The EIRP, in terms of dBm, can be converted to a field strength, in dBuV/m at 3 meters, by adding 95.2. As used in this subpart, EIRP refers to the highest signal strength measured in any direction and at any frequency from the UWB device, as tested in accordance with the procedures specified in §15.31(a) and 15.523 of this chapter.

(l) *Law enforcement, fire and emergency rescue organizations.* As used in this subpart, this refers to those parties eligible to obtain a license from the FCC under the eligibility requirements specified in §90.20(a)(1) of this chapter.

(m) *Hand held.* As used in this subpart, a hand held device is a portable device, such as a lap top computer or a PDA, that is primarily hand held while being operated and that does not employ a fixed infrastructure.

#### § 15.505 Cross reference.

(a) Except where specifically stated otherwise within this subpart, the provisions of subparts A and B and of §§15.201 through 15.204 and 15.207 of subpart C of this part apply to unlicensed UWB intentional radiators. The provisions of §15.35(c) and 15.205 do not apply to devices operated under this subpart. The provisions of Footnote US 246 to the Table of Frequency Allocations contained in §2.106 of this chapter does not apply to devices operated under this subpart.

(b) The requirements of this subpart apply only to the radio transmitter, i.e., the intentional radiator, contained in the UWB device. Other aspects of the

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operation of a UWB device may be subject to requirements contained elsewhere in this chapter. In particular, a UWB device that contains digital circuitry not directly associated with the operation of the transmitter also is subject to the requirements for unintentional radiators in subpart B of this part. Similarly, an associated receiver that operates (tunes) within the frequency range 30 MHz to 960 MHz is subject to the requirements in subpart B of this part.

**§ 15.507 Marketing of UWB equipment.**

In some cases, the operation of UWB devices is limited to specific parties, e.g., law enforcement, fire and rescue organizations operating under the auspices of a state or local government. The marketing of UWB devices must be directed solely to parties eligible to operate the equipment. The responsible party, as defined in § 2.909 of this chapter, is responsible for ensuring that the equipment is marketed only to eligible parties. Marketing of the equipment in any other manner may be considered grounds for revocation of the grant of certification issued for the equipment.

**§ 15.509 Technical requirements for ground penetrating radars and wall imaging systems.**

(a) The UWB bandwidth of an imaging system operating under the provisions of this section must be below 10.6 GHz.

(b) Operation under the provisions of this section is limited to GPRs and wall imaging systems operated for purposes associated with law enforcement, fire fighting, emergency rescue, scientific research, commercial mining, or construction.

(1) Parties operating this equipment must be eligible for licensing under the provisions of part 90 of this chapter.

(2) The operation of imaging systems under this section requires coordination, as detailed in § 15.525.

(c) A GPR that is designed to be operated while being hand held and a wall imaging system shall contain a manually operated switch that causes the transmitter to cease operation within 10 seconds of being released by the operator. In lieu of a switch located on the imaging system, it is permissible

to operate an imaging system by remote control provided the imaging system ceases transmission within 10 seconds of the remote switch being released by the operator.

(d) The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in § 15.209. The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

Frequency in MHz	EIRP in dBm
960–1610 .....	–65.3
1610–1990 .....	–53.3
1990–3100 .....	–51.3
3100–10600 .....	–41.3
Above 10600 .....	–51.3

(e) In addition to the radiated emission limits specified in the table in paragraph (d) of this section, UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz:

Frequency in MHz	EIRP in dBm
1164–1240 .....	–75.3
1559–1610 .....	–75.3

(f) For UWB devices where the frequency at which the highest radiated emission occurs,  $f_M$ , is above 960 MHz, there is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on  $f_M$ . That limit is 0 dBm EIRP. It is acceptable to employ a different resolution bandwidth, and a correspondingly different peak emission limit, following the procedures described in § 15.521.

[68 FR 19749, Apr. 22, 2003]

**§ 15.510 Technical requirements for through D-wall imaging systems.**

(a) The UWB bandwidth of an imaging system operating under the provisions of this section must be below 960 MHz or the center frequency,  $f_C$ , and the frequency at which the highest radiated emission occurs,  $f_M$ , must be contained between 1990 MHz and 10600 MHz.