

# Federal Communications Commission

# § 25.218

earth station licensees authorized to operate with one or more space stations described in paragraph (c)(1) of this paragraph in frequency bands shared with terrestrial wireless services shall comply with the requirements in § 25.203(c).

(4) In addition to the requirements set forth in paragraph (c)(3) of this section, earth station licensees with a gain equivalent or higher than the gain of a 1.2 meter antenna operating in the 14.0–14.5 GHz band, authorized to operate with one or more space stations described in paragraph (c)(1) of this paragraph in frequency bands greater than 14.5 GHz shall be required to comply with the antenna input power density requirements set forth in § 25.212(c).

(d) [Reserved]

(e) In the event that the Commission adopts frequency band-specific service rules for a particular frequency band after it has granted one or more space station or earth station licenses for operations in that frequency band, those licensees will be required to come into compliance with the frequency band-specific service rules within 30 days of the effective date of those rules, unless

otherwise specified by either Commission or Bureau Order.

[68 FR 51508, Aug. 27, 2003, as amended at 70 FR 59277, Oct. 12, 2005; 79 FR 8323, Feb. 12, 2014]

## § 25.218 Off-axis EIRP density envelopes for FSS earth stations transmitting in certain frequency bands.

(a) This section applies to all applications for Fixed-Satellite Service earth stations transmitting to geostationary space stations in the C band, Ku band, or extended Ku band, except for:

(1) ESV, VMES, and ESAA applications, and

(2) Analog video earth station applications.

(b) Earth station applications subject to this section are eligible for routine processing if they meet the applicable off-axis EIRP density envelope set forth in this section below. The terms “conventional Ku band” and “extended Ku band” are defined in § 25.103.

(c) *C-band analog earth station operations.* (1) In the plane of the geostationary satellite orbit as it appears at the particular earth station location:

29.5–25log <sub>10</sub> θ .....	dBW/4 kHz .....	For .....	1.5° ≤ θ ≤ 7°
8.5 .....	dBW/4 kHz .....	For .....	7° < θ ≤ 9.2°
32.5–25log <sub>10</sub> θ .....	dBW/4 kHz .....	For .....	9.2° < θ ≤ 48°
– 9.5 .....	dBW/4 kHz .....	For .....	48° < θ ≤ 180°

where θ is the angle in degrees from the line connecting the focal point of the antenna to the target satellite, and the geostationary orbit plane is determined by the focal point of the antenna and the line tangent to the arc of the geostationary satellite orbit at the position of the target satellite. For the purposes of this section, the peak EIRP density of an individual sidelobe may not exceed the envelope defined above for θ between 1.5° and

7.0°. For θ greater than 7.0°, the envelope may be exceeded by no more than 10% of the sidelobes, provided no individual sidelobe exceeds the envelope given above by more than 3 dB.

(2) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths:

32.5–25log <sub>10</sub> θ .....	dBW/4 kHz .....	For .....	3° ≤ θ ≤ 48°
– 9.5 .....	dBW/4 kHz .....	For .....	48° < θ ≤ 180°

where θ is the angle in degrees from the line connecting the focal point of the antenna to the target satellite, within any plane that includes that line, with the exception of the plane determined by the focal point of the antenna and the line tangent to the arc of the geostationary satellite orbit at the posi-

tion of the target satellite. For the purposes of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the envelope given above by more than 6 dB. The region of the main reflector spillover energy

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is to be interpreted as a single lobe and shall not exceed the envelope by more than 6 dB.

(d) *C-band digital earth station operations.* (1) In the plane of the geo-

stationary satellite orbit as it appears at the particular earth station location:

26.3–10log <sub>10</sub> (N)–25log <sub>10</sub> θ .....	dBW/4 kHz .....	For .....	1.5° ≤θ ≤7°
5.3–10log <sub>10</sub> (N) .....	dBW/4 kHz .....	For .....	7° <θ ≤9.2°
29.3 – 10log <sub>10</sub> (N) – 25log <sub>10</sub> θ .....	dBW/4 kHz .....	For .....	9.2° <θ ≤48°
– 12.7–10log <sub>10</sub> (N) .....	dBW/4 kHz .....	For .....	48° <θ ≤180°

where θ and the plane of the geostationary satellite orbit are defined in paragraph (c)(1) of this section, and N is defined below. For the purposes of this section, the peak EIRP density of an individual sidelobe may not exceed the envelope defined above for θ between 1.5° and 7.0°. For θ greater than 7.0°, the envelope may be exceeded by no more than 10% of the sidelobes, provided no individual sidelobe exceeds the envelope given above by more than 3 dB. For digital SCPC using frequency division multiple access

(FDMA) or time division multiple access (TDMA) technique, N is equal to one. For digital SCPC using code division multiple access (CDMA) technique, N is the maximum number of co-frequency simultaneously transmitting earth stations in the same satellite receiving beam.

(2) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths:

29.3–10log <sub>10</sub> (N)–25log <sub>10</sub> θ .....	dBW/4 kHz .....	For .....	3° ≤θ ≤48°
– 12.7–10log <sub>10</sub> (N) .....	dBW/4 kHz .....	For .....	48° <θ ≤180°

where θ is defined in paragraph (c)(2) of this section, and N is defined in paragraph (d)(1) of this section. For the purposes of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be

interpreted as a single lobe and shall not exceed the envelope by more than 6 dB.

(e) *Conventional Ku-band analog earth station operations.* (1) In the plane of the geostationary satellite orbit as it appears at the particular earth station location:

21–25log <sub>10</sub> θ .....	dBW/4 kHz .....	For .....	1.5° ≤θ ≤7°
0 .....	dBW/4 kHz .....	For .....	7° <θ ≤9.2°
24–25log <sub>10</sub> θ .....	dBW/4 kHz .....	For .....	9.2° <θ ≤48°
– 18 .....	dBW/4 kHz .....	For .....	48° <θ ≤85°
– 8 .....	dBW/4 kHz .....	For .....	85° <θ ≤180°

where θ and the plane of the geostationary satellite are defined in paragraph (c)(1) of this section. For the purposes of this section, the peak EIRP density of an individual sidelobe may not exceed the envelope defined above for θ between 1.5° and 7.0°. For θ greater than 7.0°, the envelope may be exceeded by no more than 10% of the sidelobes, provided

no individual sidelobe exceeds the envelope given above by more than 3 dB.

(2) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths:

24–25log <sub>10</sub> θ .....	dBW/4 kHz .....	For .....	3° ≤θ ≤48°
– 18 .....	dBW/4 kHz .....	For .....	48° <θ ≤85°
– 8 .....	dBW/4 kHz .....	For .....	85° <θ ≤180°

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where  $\theta$  is defined in paragraph (c)(2) of this section. For the purposes of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted

as a single lobe and shall not exceed the envelope by more than 6 dB.

(f) *Conventional Ku-band digital earth station operations.* (1) In the plane of the geostationary satellite orbit as it appears at the particular earth station location:

15–10log <sub>10</sub> (N)–25log <sub>10</sub> θ	dBW/4 kHz	For	1.5° ≤ θ ≤ 7°
– 6–10log <sub>10</sub> (N)	dBW/4 kHz	For	7° < θ ≤ 9.2°
18–10log <sub>10</sub> (N)–25log <sub>10</sub> θ	dBW/4 kHz	For	9.2° < θ ≤ 48°
– 24–10log <sub>10</sub> (N)	dBW/4 kHz	For	48° < θ ≤ 85°
– 14–10log <sub>10</sub> (N)	dBW/4 kHz	For	85° < θ ≤ 180°

where  $\theta$  and the plane of the geostationary satellite orbit are defined in paragraph (c)(1) of this section, and N is defined below. For the purposes of this section, the peak EIRP density of an individual sidelobe may not exceed the envelope defined above for  $\theta$  between 1.5° and 7.0°. For  $\theta$  greater than 7.0°, the envelope may be exceeded by no more than 10% of the sidelobes, provided no individual sidelobe exceeds the envelope given above by more than 3 dB. For digital SCPC using frequency division multiple access

(FDMA) or time division multiple access (TDMA) technique, N is equal to one. For digital SCPC using code division multiple access (CDMA) technique, N is the maximum number of co-frequency simultaneously transmitting earth stations in the same satellite receiving beam.

(2) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths:

18–10log <sub>10</sub> (N)–25log <sub>10</sub> θ	dBW/4 kHz	For	3° ≤ θ ≤ 48°
– 24–10log <sub>10</sub> (N)	dBW/4 kHz	For	48° < θ ≤ 85°
– 14–10log <sub>10</sub> (N)	dBW/4 kHz	For	85° < θ ≤ 180°

where  $\theta$  is defined in paragraph (c)(2) of this section, and N is defined in paragraph (f)(1) of this section. For the purposes of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be

interpreted as a single lobe and shall not exceed the envelope by more than 6 dB.

(g) *Extended Ku-band analog earth station operations.* (1) In the plane of the geostationary satellite orbit as it appears at the particular earth station location:

21–25log <sub>10</sub> θ	dBW/4 kHz	For	1.5° ≤ θ ≤ 7°
0	dBW/4 kHz	For	7° < θ ≤ 9.2°
24–25log <sub>10</sub> θ	dBW/4 kHz	For	9.2° < θ ≤ 48°
– 18	dBW/4 kHz	For	48° < θ ≤ 180°

where  $\theta$  and the plane of the geostationary satellite orbit are defined in paragraph (c)(1) of this section. For the purposes of this section, the peak EIRP density of an individual sidelobe may not exceed the envelope defined above for  $\theta$  between 1.5° and 7.0°. For  $\theta$  greater than 7.0°, the envelope may be exceeded by no more than 10% of the sidelobes, provided

no individual sidelobe exceeds the envelope given above by more than 3 dB.

(2) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths:

24–25log <sub>10</sub> θ	dBW/4 kHz	For	3° ≤ θ ≤ 48°
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– 18 .....	dBW/4 kHz .....	For .....	48° <θ ≤180°
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where θ is defined in paragraph (c)(2) of this section. For the purposes of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted

as a single lobe and shall not exceed the envelope by more than 6 dB.

(h) *Extended Ku-band digital earth station operations.* (1) In the plane of the geostationary satellite orbit as it appears at the particular earth station location:

15–10log <sub>10</sub> (N)–25log <sub>10</sub> θ	dBW/4 kHz .....	For .....	1.5° ≤θ ≤7°
– 6–10log <sub>10</sub> (N) .....	dBW/4 kHz .....	For .....	7° <θ ≤9.2°
18–10log <sub>10</sub> (N)–25log <sub>10</sub> θ	dBW/4 kHz .....	For .....	9.2° <θ ≤48°
– 24–10log <sub>10</sub> (N) .....	dBW/4 kHz .....	For .....	48° <θ ≤180°

where θ and the plane of the geostationary satellite orbit are defined in paragraph (c)(1) of this section, and N is defined below. For the purposes of this section, the peak EIRP density of an individual sidelobe may not exceed the envelope defined above for θ between 1.5° and 7.0°. For θ greater than 7.0°, the envelope may be exceeded by no more than 10% of the sidelobes, provided no individual sidelobe exceeds the envelope given above by more than 3 dB. For digital SCPC using frequency division multiple access

(FDMA) or time division multiple access (TDMA) technique, N is equal to one. For digital SCPC using code division multiple access (CDMA) technique, N is the maximum number of co-frequency simultaneously transmitting earth stations in the same satellite receiving beam.

(2) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths:

18–10log <sub>10</sub> (N)–25log <sub>10</sub> θ	dBW/4 kHz .....	For .....	3° ≤θ ≤48°
– 24–10log <sub>10</sub> (N) .....	dBW/4 kHz .....	For .....	48° <θ ≤85°

where θ is defined in paragraph (c)(2) of this section and N is defined in paragraph (h)(1) of this section. For the purposes of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted as a single lobe and shall not exceed the envelope by more than 6 dB.

[73 FR 70902, Nov. 24, 2008, as amended at 74 FR 57099, Nov. 4, 2009; 78 FR 8429, Feb. 6, 2013; 78 FR 14927, Mar. 8, 2013; 79 FR 8324, Feb. 12, 2014]

EFFECTIVE DATE NOTE: At 74 FR 9962, Mar. 9, 2009, § 25.218, which contains information collection and recordkeeping requirements, became effective with approval by the Office of Management and Budget for a period of 3 years.

**§ 25.219 [Reserved]**

**§ 25.220 Non-conforming transmit/receive earth station operations.**

(a)(1) The requirements in this section apply to earth station applications of the types to which § 25.218 applies but that propose operation outside of relevant off-axis EIRP density envelopes specified in § 25.218. This section also applies to applications for full-transponder analog video earth stations that are ineligible for routine licensing under § 25.211(d).

(2) The requirements for petitions to deny applications filed pursuant to this section are set forth in § 25.154.

(b) If an antenna proposed for use by the applicant does not comply with the antenna performance standards contained in § 25.209(a) and (b), the applicant must provide, as an exhibit to its FCC Form 312 application, the antenna gain patterns specified in § 25.132(b).