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this section shall comply with the earth station antenna performance verification requirements in §25.132, and the antenna gain pattern requirements in §25.209(a) and (b). In addition, 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; 82 FR 59986, Dec. 18, 2017; 85 FR 43735, July 20, 2020]

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

(a) This section applies to applications for fixed and temporary-fixed FSS earth stations transmitting to geostationary space stations in the conventional C-band, extended C-band, conventional Ku-band, extended Ku-band, conventional Ka-band, or 24.75–25.25 GHz and applications for ESIMs transmitting in the conventional C-band, conventional Ku-band, or conventional Ka-band, except for applications proposing transmission of analog command signals at a band edge with bandwidths greater than 1 MHz or transmission of any other type of analog signal with bandwidths greater than 200 kHz.

(b) Earth station applications subject to this section may be routinely processed if they meet the applicable off-axis EIRP density envelopes set forth in this section.

(c) *Analog earth station operation in the conventional or extended C-bands.* (1) For co-polarized transmissions in the plane tangent to the GSO arc, as defined in §25.103:

29.5–25log ₁₀ θ	dBW/4 kHz	for 1.5° ≤ θ ≤ 7°.
8.5	dBW/4 kHz	for 7° < θ ≤ 9.2°.
32.5–25log ₁₀ 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 a line from the earth station antenna to the assigned orbital location of the target satellite. The EIRP density levels specified for θ > 7° may be exceeded by up to 3 dB in up to 10% of the range of

theta (θ) angles from ±7–180°, and by up to 6 dB in the region of main reflector spillover energy.

(2) For co-polarized transmissions in the plane perpendicular to the GSO arc, as defined in §25.103:

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

Where θ is as defined in paragraph (c)(1) of this section. These EIRP density levels may be exceeded by up to 6

dB in the region of main reflector spillover energy and in up to 10% of the range of θ angles not included in that

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region, on each side of the line from the earth station to the target satellite.

(3) For cross-polarized transmissions in the plane tangent to the GSO arc and in the plane perpendicular to the GSO arc:

19.5–25log ₁₀ θ	dBW/4 kHz	for 1.5° ≤ θ ≤ 7°.
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Where θ is as defined in paragraph (c)(1) of this section.

For co-polarized transmissions in the plane tangent to the GSO arc:

(d) *Digital earth station operation in the conventional or extended C-bands.* (1)

26.3–25log ₁₀ θ	dBW/4 kHz	for 1.5° ≤ θ ≤ 7°.
5.3	dBW/4 kHz	for 7° < θ ≤ 9.2°.
29.3–25log ₁₀ θ	dBW/4 kHz	for 9.2° < θ ≤ 48°.
– 12.7	dBW/4 kHz	for 48° < θ ≤ 180°.

Where θ is as defined in paragraph (c)(1) of this section. The EIRP density levels specified for θ > 7° may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from ±7–180°,

and by up to 6 dB in the region of main reflector spillover energy.

(2) For co-polarized transmissions in the plane perpendicular to the GSO arc:

29.3–25log ₁₀ θ	dBW/4 kHz	for 3° ≤ θ ≤ 48°.
– 12.7	dBW/4 kHz	for 48° < θ ≤ 180°.

Where θ is as defined in paragraph (c)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of θ angles not included in that region, on each side of the line from

the earth station to the target satellite.

(3) For cross-polarized transmissions in the plane tangent to the GSO arc and in the plane perpendicular to the GSO arc:

16.3–25log ₁₀ θ	dBW/4 kHz	for 1.5° ≤ θ ≤ 7°.
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Where θ is as defined in paragraph (c)(1) of this section.

neously to the same target satellite receiving beam, not resulting from colliding data bursts transmitted pursuant to a contention protocol, will not exceed the off-axis EIRP density limits permissible for a single earth station, as specified in paragraphs (d)(1) through (d)(3) of this section.

(4) A license application for earth station operation in a network using variable power density control of earth stations transmitting simultaneously in shared frequencies to the same target satellite receiving beam may be routinely processed if the applicant certifies that the aggregate off-axis EIRP density from all co-frequency earth stations transmitting simulta-

(e) *Analog earth station operation in the conventional Ku-band.* (1) For co-polarized transmissions in the plane tangent to the GSO arc:

21–25log ₁₀ θ	dBW/4 kHz	for 1.5° ≤ θ ≤ 7°.
0	dBW/4 kHz	for 7° < θ ≤ 9.2°.
24–25log ₁₀ θ	dBW/4 kHz	for 9.2° < θ ≤ 19.1°.
– 8	dBW/4 kHz	for 19.1° < θ ≤ 180°.

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Where θ is as defined in paragraph (c)(1) of this section. The EIRP density levels specified for $\theta > 7^\circ$ may be exceeded by up to 3 dB in up to 10% of the range of θ angles from ± 7 – 180° ,

and by up to 6 dB in the region of main reflector spillover energy.

(2) For co-polarized transmissions in the plane perpendicular to the GSO arc:

24–25log ₁₀ θ	dBW/4 kHz	for $3^\circ \leq \theta \leq 19.1^\circ$.
–8	dBW/4 kHz	for $19.1^\circ < \theta \leq 180^\circ$.

Where θ is as defined in paragraph (c)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of θ angles not included in that region, on each side of the line from

the earth station to the target satellite.

(3) For cross-polarized transmissions in the plane tangent to the GSO arc and in the plane perpendicular to the GSO arc:

11–25log ₁₀ θ	dBW/4 kHz	for $1.5^\circ \leq \theta \leq 7^\circ$.
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Where θ is as defined in paragraph (c)(1) of this section.

ized transmissions in the plane tangent to the GSO arc:

(f) *Digital earth station operation in the conventional Ku-band.* (1) For co-polar-

15–25log ₁₀ θ	dBW/4 kHz	for $1.5^\circ \leq \theta \leq 7^\circ$.
–6	dBW/4 kHz	for $7^\circ < \theta \leq 9.2^\circ$.
18–25log ₁₀ θ	dBW/4 kHz	for $9.2^\circ < \theta \leq 19.1^\circ$.
–14	dBW/4 kHz	for $19.1^\circ < \theta \leq 180^\circ$.

Where θ is as defined in paragraph (c)(1) of this section. The EIRP density levels specified for $\theta > 7^\circ$ may be exceeded by up to 3 dB in up to 10% of the range of θ angles from ± 7 – 180° ,

and by up to 6 dB in the region of main reflector spillover energy.

(2) For co-polarized transmissions in the plane perpendicular to the GSO arc:

18–25log ₁₀ θ	dBW/4 kHz	for $3^\circ \leq \theta \leq 19.1^\circ$.
–14	dBW/4 kHz	for $19.1^\circ < \theta \leq 180^\circ$.

Where θ is as defined in paragraph (c)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of θ angles not included in that region, on each side of the line from

the earth station to the target satellite.

(3) For cross-polarized transmissions in the plane tangent to the GSO arc and in the plane perpendicular to the GSO arc:

5–25log ₁₀ θ	dBW/4 kHz	for $1.5^\circ \leq \theta \leq 7^\circ$.
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Where θ is as defined in paragraph (c)(1) of this section.

variable power density control of earth stations transmitting simultaneously in shared frequencies to the same target satellite receiving beam may be

(4) A license application for earth station operation in a network using

routinely processed if the applicant certifies that the aggregate off-axis EIRP density from all co-frequency earth stations transmitting simultaneously to the same target satellite receiving beam, not resulting from colliding data bursts transmitted pursuant to a contention protocol, will not

exceed the off-axis EIRP density limits permissible for a single earth station, as specified in paragraphs (f)(1) through (f)(3) of this section.

(g) *Analog earth station operation in the extended Ku-band.* (1) For co-polarized transmissions in the plane tangent to the GSO arc:

21-25log ₁₀ θ	dBW/4 kHz	for 1.5° ≤ θ ≤ 7°.
0	dBW/4 kHz	for 7° < θ ≤ 9.2°.
24-25log ₁₀ θ	dBW/4 kHz	for 9.2° < θ ≤ 48°.
-18	dBW/4 kHz	for 48° < θ ≤ 180°.

Where θ is as defined in paragraph (c)(1) of this section, and N is as defined in paragraph (d)(1) of this section. The EIRP density levels specified for θ > 7° may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) an-

gles from ±7-180°, and by up to 6 dB in the region of main reflector spillover energy.

(2) For co-polarized transmissions in the plane perpendicular to the GSO arc:

24-25log ₁₀ θ	dBW/4 kHz	for 3° ≤ θ ≤ 48°.
-18	dBW/4 kHz	for 48° < θ ≤ 180°.

Where θ is as defined in paragraph (c)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of θ angles not included in that region, on each side of the line from

the earth station to the target satellite.

(3) For cross-polarized transmissions in the plane tangent to the GSO arc and in the plane perpendicular to the GSO arc:

11-25log ₁₀ θ	dBW/4 kHz	for 1.5° ≤ θ ≤ 7°.
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Where θ is as defined in paragraph (c)(1) of this section.

ized transmissions in the plane tangent to the GSO arc:

(h) *Digital earth station operation in the extended Ku-band.* (1) For co-polar-

15-25log ₁₀ θ	dBW/4 kHz	for 1.5° ≤ θ ≤ 7°.
-6	dBW/4 kHz	for 7° < θ ≤ 9.2°.
18-25log ₁₀ θ	dBW/4 kHz	for 9.2° < θ ≤ 48°.
-24	dBW/4 kHz	for 48° < θ ≤ 180°.

Where θ is as defined in paragraph (c)(1) of this section. The EIRP density levels specified for θ > 7° may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from ±7-180°,

and by up to 6 dB in the region of main reflector spillover energy.

(2) For co-polarized transmissions in the plane perpendicular to the GSO arc:

18-25log ₁₀ θ	dBW/4 kHz	for 3° ≤ θ ≤ 48°.
-24	dBW/4 kHz	for 48° < θ ≤ 85°.

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Where θ is as defined in paragraph (c)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spill-over energy and in up to 10% of the range of θ angles not included in that region, on each side of the line from

the earth station to the target satellite.

(3) For cross-polarized transmissions in the plane tangent to the GSO arc and in the plane perpendicular to the GSO arc:

5–25log ₁₀ θ	dBW/4 kHz	for $1.5^\circ \leq \theta \leq 7^\circ$.
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Where θ is as defined in paragraph (c)(1) of this section.

(4) A license application for earth station operation in a network using variable power density control of earth stations transmitting simultaneously in shared frequencies to the same target satellite receiving beam may be routinely processed if the applicant certifies that the aggregate off-axis EIRP density from all co-frequency earth stations transmitting simulta-

neously to the same target satellite receiving beam, not resulting from colliding data bursts transmitted pursuant to a contention protocol, will not exceed the off-axis EIRP density limits permissible for a single earth station, as specified in paragraphs (h)(1) through (h)(3) of this section.

(i) *Digital earth station operation in the conventional Ka-band.* (1) For co-polarized transmissions in the plane tangent to the GSO arc:

32.5–25log(θ)	dBW/MHz	for	$2.0^\circ \leq \theta \leq 7^\circ$.
11.5	dBW/MHz	for	$7^\circ \leq \theta \leq 9.2^\circ$.
35.5–25log(θ)	dBW/MHz	for	$9.2^\circ \leq \theta \leq 19.1^\circ$.
3.5	dBW/MHz	for	$19.1^\circ < \theta \leq 180^\circ$.

where θ is as defined in paragraph (c)(1) of this section.

(2) For co-polarized transmissions in the plane perpendicular to the GSO arc:

35.5–25log(θ)	dBW/MHz	for	$3.5^\circ \leq \theta \leq 7^\circ$.
14.4	dBW/MHz	for	$7^\circ < \theta \leq 9.2^\circ$.
38.5–25log(θ)	dBW/MHz	for	$9.2^\circ < \theta \leq 19.1^\circ$.
6.5	dBW/MHz	for	$19.1^\circ < \theta \leq 180^\circ$.

where θ is as defined in paragraph (c)(1) of this section.

(3) The EIRP density levels specified in paragraphs (i)(1) and (2) of this section may be exceeded by up to 3 dB, for values of $\theta > 7^\circ$, over 10% of the range of theta (θ) angles from 7–180° on each

side of the line from the earth station to the target satellite.

(4) For cross-polarized transmissions in the plane tangent to the GSO arc and in the plane perpendicular to the GSO arc:

22.5–25log(θ)	dBW/MHz	for	$2.0^\circ < \theta \leq 7.0^\circ$.
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where θ is as defined in paragraph (c)(1) of this section.

(5) A license application for earth station operation in a network using variable power density control of earth

stations transmitting simultaneously in shared frequencies to the same target satellite receiving beam may be routinely processed if the applicant certifies that the aggregate off-axis

EIRP density from all co-frequency earth stations transmitting simultaneously to the same target satellite receiving beam, not resulting from colliding data bursts transmitted pursuant to a contention protocol, will not exceed the off-axis EIRP density limits permissible for a single earth station, as specified in paragraphs (i)(1) through (4) of this section.

(j) Applications for authority for fixed earth station operation in the conventional C-band, extended C-band, conventional Ku-band, extended Ku-band, conventional Ka-band, or 24.75–25.25 GHz that do not qualify for routine processing under relevant criteria in this section, §25.211, or §25.212 are subject to the requirements in §25.220.

[81 FR 55339, Aug. 18, 2016, as amended at 84 FR 53656, Oct. 8, 2019; 85 FR 44787, July 24, 2020]

§ 25.219 [Reserved]

§ 25.220 Non-routine transmit/receive earth station operations.

(a) The requirements in this section apply to applications for, and operation of, earth stations transmitting in the conventional or extended C-bands, the conventional or extended Ku-bands, or the conventional Ka-band that do not qualify for routine licensing under relevant criteria in §25.211, §25.212, or §25.218.

(b) Applications filed pursuant to this section must include the information required by §25.115(g)(1).

(c) [Reserved]

(d)(1) The applicant must submit the certifications listed in paragraphs (d)(1)(i) through (d)(1)(iv) of this section. The applicant will be authorized to transmit only to the satellite systems included in the coordination agreements referred to in the certification required by paragraph (d)(1)(ii) of this section. The applicant will be granted protection from receiving interference only with respect to the satellite systems included in the coordination agreements referred to in the certification required by paragraph (d)(1)(ii) of this section, and only to the extent that protection from receiving interference is afforded by those coordination agreements.

(i) [Reserved]

(ii) A statement from the satellite operator that it has coordinated the operation of the subject non-conforming earth station accessing its satellite(s), including its required downlink power density based on the information contained in the application, with all adjacent satellite networks within 6° of orbital separation from its satellite(s), and the operations will operate in conformance with existing coordination agreement for its satellite(s) with other satellite systems, except as set forth in paragraph (d)(4) of this section.

(iii) A statement from the satellite operator that it will include the subject non-conforming earth station operations in all future satellite network coordinations, and

(iv) A statement from the earth station applicant certifying that it will comply with all coordination agreements reached by the satellite operator(s).

(2) Unless the non-routine uplink transmission levels are permitted under a coordination agreement with the space station operator, or unless coordination with the operator is not required pursuant to §25.140(d)(3) or (d)(4), the operator of an earth station licensed pursuant to this section must reduce its transmitted EIRP density to levels at or within relevant routine limits:

(i) Toward the part of the geostationary orbit arc within one degree of a subsequently launched, two-degree-compliant space station receiving in the same uplink band at an orbital location within six degrees of the earth station's target satellite, and

(ii) Toward a two-degree-compliant space station receiving in the same uplink band at an orbital location more than six degrees away from the target satellite if co-frequency reception by the space station is adversely affected by the non-routine earth station transmission levels.

(3) In the event that a coordination agreement discussed in paragraph (d)(1)(ii) of this section is reached, but that coordination agreement does not address protection from interference for the earth station, that earth station will be protected from interference to the same extent that an