

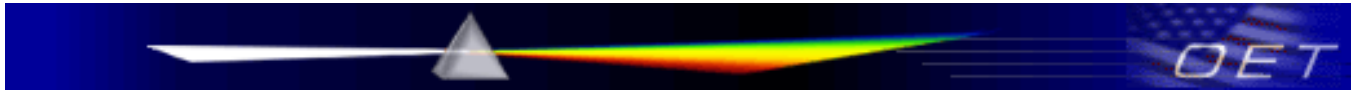
Equipment Authorization Guidance for Part 25 Transceivers

Introduction

This publication provides guidance for equipment authorization for certain Part 25 transceivers. In the cases of ancillary terrestrial components (ATC) devices, the applicable technical standards may be different if the responsible party has not received a license for operation from the FCC. Appendix A describes additional technical requirements for ATCs when equipment authorization is granted prior to the grant of FCC license; Appendix B describes additional technical requirements when equipment authorization is granted after the specific conditions of license are defined. For ATC devices designed with any protocols not listed in one of the appendices, the applicant must coordinate the requirements with the FCC's International Bureau. Please note that the equipment may be subject to other technical requirements not specifically listed here. This may include any RF Exposure requirements applicable for a specific device.

Guidance

1. Certification (Part 2, Subpart J) is required for Part 25 portable earth-station transceivers, e.g., handsets, body-worn devices, antenna-in-keyboard notebook computers, per 47 CFR Section 25.129.
2. Certification is optional (allowed) for Part 25 mobile earth-station transceivers that do not fall in the portable category (see 1 above), i.e., transceivers designed to be used in other than fixed locations and operated at 20 cm or more from persons' bodies by end users of satellite communication services, per FCC-03-283, DA-02-1578. See 47 CFR Sections 2.1091(b), 25.129(b)(2), and 25.201. Certification shall be in accordance with 47 CFR Sections 2.1091, 25.129(c), 25.129(d), 25.136(h), and related sections.
3. Certification is neither applicable nor optional for Part 25 earth-station network infrastructure components, such as feeder-link amplifiers or transmitters, amplifiers or transmitters used for tracking and command uplinks, and amplifiers or transmitters used for system calibration (per FCC-03-283).
4. Certification is required for Part 25 ancillary terrestrial component (ATC) base stations and mobile transceivers, per 47 CFR Section 25.149(c).
5. ATC devices: (pre-licensing) Certification may be requested in advance of licensing by the FCC for ATC devices that operate in the forward-band mode, as defined in 47 CFR Section 25.149(a)(1). It should be emphasized that all pre-licensing testing, including equipment certification, is at the applicant's risk and expense. Certification of unlicensed ATC devices must be based on testing for compliance with the requirements of 47 CFR Sections 2.1091, 2.1093, 25.143(k), 25.202(f) and the band-specific requirements in Appendix A. Devices that transmit in the 2000-2100 MHz band or the 2190-2200 MHz band with the WCDMA protocol must not be certified before the Commission grants an ATC license to TerreStar.
6. ATC devices: (post-licensing) If an operating license has been granted by the FCC for the ATC devices in question, certification must be based on testing for compliance with the specific technical parameters prescribed by the license order plus any applicable requirements of 47 CFR Sections 2.1091, 2.1093, 25.143(k), 25.202(f), 25.252, 25.253, and 25.254 that have not been waived. Additional post-licensing requirements or guidance requirements are in Appendix B.



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7. There is no provision in the Commission's rules for certification of Satellite Digital Audio Radio Service (SDARS) repeaters or Global Positioning System (GPS) boosters, and certification of such devices is not appropriate.



Appendix A

Additional Technical Requirements for ATC Devices (pre-licensing).

Devices that operate in the 2000-2020/2180-2200 MHz bands

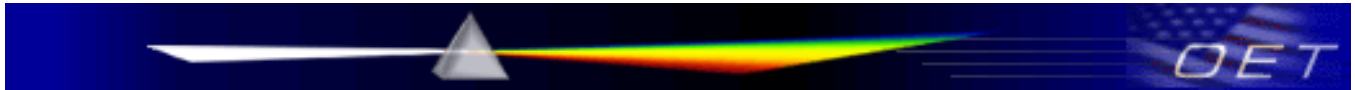
- a) ATC base stations that transmit in a portion of the 2180-2200 MHz band using the CDMA2000 air interface protocol must be tested for compliance with the limits in 47 CFR Section 25.252(a) pertaining to out-of-channel emissions, peak EIRP, EIRP toward the horizon, emissions in the 1559-1610 MHz band, peak antenna gain, and overhead antenna gain.
- b) ATC mobile terminals that transmit in a portion of the 2000-2020 MHz band using the CDMA2000 protocol must be tested for compliance with the limits in 47 CFR Section 25.252(b) and (c) pertaining to peak EIRP, out-of-channel emissions, emissions in the 1559-1610 MHz band, out-of-band emissions in the 2000-2020 MHz band, emissions in frequencies below 1995 MHz and above 2025 MHz, and emissions in the 1995-2000 MHz and 2020-2025 MHz bands.
- c) ATC devices that transmit in a portion of the 2180-2200 MHz band or the 2000-2020 MHz band with an air interface protocol other than CDMA2000 must not be certified in advance of licensing.

Devices that operate in the 1525-1559/1626.5-1660.5 MHz bands

- a) ATC base stations that transmit in portions of the 1626.5-1660.5 MHz band must be tested for compliance with the limit on out-of-channel emissions in 47 CFR Section 25.253(b) and the limits in 47 CFR Section 25.253(d) and (e) pertaining to peak EIRP per sector, EIRP toward the horizon, peak antenna gain, overhead antenna gain, emissions in the 1559-1605 MHz and 1605-1610 MHz bands, and polarization.
- b) ATC mobile terminals that transmit in portions of the 1525-1559 MHz band must be tested for compliance with the limits in 47 CFR Section 25.253(g) pertaining to peak EIRP, out-of-channel emissions, and emissions in the 1559-1605 MHz and 1605-1610 MHz bands.

Devices that operate in the 1610-1626.5/2483.5-2495 MHz bands

- a) ATC base stations that transmit in a portion of the 2483.5-2495 MHz band using the CDMA2000 or IS-95 air interface protocol must be tested for compliance with the limits in 47 CFR Section 25.254(a) pertaining to peak EIRP, out-of-channel emissions, and emissions in the 1559-1610 MHz band and the upper-band-edge attenuation requirement in 47 CFR Section 25.254(d)(1).
- b) ATC mobile terminals that transmit in a portion of the 1610-1626.5 MHz band using the CDMA2000 or IS-95 air interface protocol must be tested for compliance with the limits in 47 CFR Section 25.254(b) pertaining to peak EIRP, out-of-channel emissions, and emissions in the 1559-1605 MHz and 1605-1610 MHz bands.
- c) ATC devices that transmit in a portion of the 1610-1626.5 MHz or 2483.5-2495 MHz band with an air interface protocol other than CDMA2000 or IS-95 must not be certified in advance of licensing.



Appendix B

Additional Technical Requirements for ATC Devices (post-licensing)

Terminals that transmit in the 2010-2020 MHz band and base stations that transmit in the 2180-2190 MHz band:

These devices must be certified based on the requirements set forth in *Order and Authorization*, DA 09-38 (released Jan. 15, 2009), para. 57, para. 65, and para. 69, subparagraphs b, c, e, and f, 47 C.F.R. Section 25.252(c)(1), 47 C.F.R. Section 25.252(c)(2) (except as provided in DA 09-38, para. 61).

Open Range TDD-WiMAX ATC devices:

1. Terminals must meet the following requirements:
 - a) OOBE limits specified in para. 35 of the *Order and Authorization*, FCC 08-254 (released Oct. 31, 2008) and the peak EIRP and out-of-channel limits in 47 CFR Section 25.254(b).
 - b) EIRP density: 1.0 dBW/1.25 MHz
 - c) Band-edge EIRP: -57.1 dBW/30 kHz
 - d) Antenna gain, max power, max EIRP, and max EIRP density: See table B1d below

The ATC Terminal Transmitter Performance Requirements

Phone Type and Mode	Max Tx Power Available (dBW)	Peak Antenna Gain (dBic or dBi)	Max EIRP (dBW)	Max EIRP Density (dBW/1.25 MHz)	Max EIRP Density (dBW/4 kHz)
Handheld ATC	-7	2	-5	-5	-29.9
Fixed ATC (external or internal antenna)	-2	12	10	1	-23.9

Table B1d

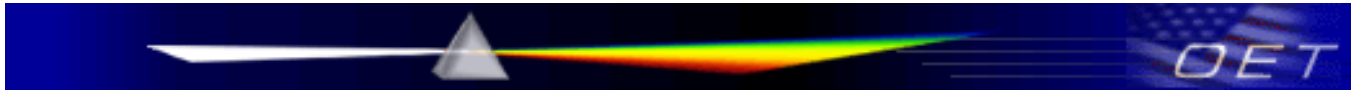
2. Base stations must meet the following requirements:
 - a. OOBE limits specified in para. 36 of the Oct. 31, 2008 order.
 - b. Peak EIRP spectral density: 32 dBW in 1.25 MHz
 - c. Out-of-channel emissions: -44.1 dBW/30 kHz at the edges of the 2483.5-2495 MHz band, -43 dBW/1% of carrier bandwidth at the band edge, and -43 dBW/MHz at 1 MHz outside the band edge for any size carrier. See additional emission limits in table B2c below.

Emissions limit for 10 MHz WiMAX operating in the ATC

Offset from center frequency	Level	Measurement bandwidth
5-6 MHz	-13 dBm	100 kHz (1% of WiMAX bandwidth)
6-10 MHz	-13 dBm	1 MHz

Beyond 10 MHz offset, the ITU Category A limits apply, i.e., -13 dBm/MHz for Frequencies above 1 GHz.

Table B2c

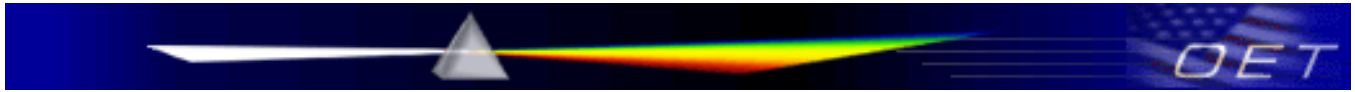


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LightSquared ATC Devices

Applicants intending to seek approval for terminals designed to transmit according to the grant of waiver and license issued to LightSquared terms of which are set forth in *Order and Authorization, DA 11-133 (released on Jan 26, 2011)* and *Order and Authorization, DA 10-534 (released on March 26, 2010)* must seek guidance from the Commission on specific test procedures. The applicant can submit a request under our Permit-but-Ask procedure (KDB Publication 388624). The request for guidance must include description of the device, the proposed operating parameters and any specific test procedures contemplated to demonstrate compliance with the rules.





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Change Notice:

273109 D01 Equip Auth Guide Part 25 TXReceiver v01 has been updated to 273109 D01 Equip Auth Guide Part 25 TXReceiver v02:

1. The values in Appendix B, Table B1d have been corrected.
2. Appendix B.2 values (d),(e) and (f) have been deleted.

09/02/2010: 273109 D01 Equip Auth Guide Part 25 TXReceiver v02: is changed to 273109 D01 Equip Auth Guide Part 25 TXReceiver v02r01
Changed document properties title. No changes have been made to the document text.

02/03/2011: 273109 D01 Equip Auth Guide Part 25 TXReceiver v02r01: is changed to 273109 D01 Equip Auth Guide Part 25 TXReceiver v02r02
Additional Language added to appendix B for LightSquared ATC Devices

