Part 15 rulemaking updates

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Overview

Part 15 Rulemaking updates
- Modification of Parts 2 and 15 of the Commission's Rules for unlicensed devices and equipment approval.
  - Smart Antenna Systems
    - aka Advanced antenna technologies
  - Third R&O Review of Part 15 and other Parts of the Commission’s Rules
    - 433 MHz RF ID systems
    - R&O UNII with DFS devices
Miscellaneous part 15 issues
- Part 15 Implant transmitters
RO&O Modification of Parts 2 and 15

New Rules in ET Docket No.03-201
Effective date October 7, 2004

1) Smart Antenna Systems, i.e. Advanced antenna technologies
- Sectorized antennas. Switched beam devices.
- Beam-forming phased array systems.
- MIMO systems. Short for Multiple Input Multiple Output. Communication systems with multiple antennas at the transmitter or receiver side.
- Space time coding. Transmitted signals from different antennas at different times.

Not designated as point-to-point (P2P) or point-to-multipoint (P2MP)
- Allows point to point power in any direction
- Allows communications with mobile units

Smart Antenna Systems

TCB’s cannot approve systems such as MIMO and Space time coding.
- Need new testing and filing guidance.

TCB’s can only approve Phased array systems and Sectorized systems ONLY with prior guidance from FCC.
- TCB must contact and provide FCC with operational description. Include description of compliance with the rules.
- Guidance on testing and filing requirements will be provided.
Smart Antenna Systems

- Applies ONLY to Section 15.247 devices in the 2.4 GHz band. i.e. Does not apply to 5 GHz devices!
- Must comply with all requirements in Section 15.247(c)2i-iv.
  - Different information to each receiver
  - Aggregate power to antenna/array for a Single Beam must not exceed appropriate limit for single system.
    - Array gain needs to be calculated
  - Aggregate power to antenna/array for simultaneous beams must not exceed single-beam limit by >8 dB
  - Overlapping beams cannot exceed appropriate limit for a single system.

Beams
- Beamwidth not specified.
- Multiple beams allowed.
- Each beam cannot exceed limits for single P2P system.
- Each beam must send different information to different receivers.
- Broadcasting not allowed. i.e. Communicating the same information intended for multiple receivers at the same time. *Broadcast of incidental control messages (e.g., ARP) to multiple receivers simultaneously is permitted.*
- Aggregate power on all beams ≤8 dB above limit.
  - 6 beams at full power can be formed
- Overlapping beams cannot exceed P2P limit.
Smart Antenna Systems

Examples (must satisfy all requirements, e.g., no broadcasting)
- Multi-beam system with up to 6 sectors—same or different channels
  - P2P limit for each beam. (Less if beams overlap and can transmit simultaneously)
- Multi-beam system with more than 6 sectors—same or different channels
  - P2P limit for each beam. (Less if beams overlap and can transmit simultaneously)
  - In addition, aggregate power is limited to P2P limit + 8 dB

A system with a single antenna or a single transmit beam falls under the old rules

RO&O Modification of Parts 2 and 15 (continued)

2) Replacement of Part 15 antennas
- Second Party (i.e. end user or second manufacturer) can replace equal or lower gain antennas of the same type that was authorized
  - No testing or filing is required.
  - Antenna must be the same type
    - Similar in-band and out-of-band patterns
  - List of antenna types must be in filing
  - Compliance tested with highest gain of each type.
    - Test at maximum output power.
    - Section 15.15 still applies.

Integral antenna requirement in Section 15.407(d) removed.
- Devices in 5.2 GHz band still restricted to indoor use
RO&O Modification of Parts 2 and 15 (continued)

3) Marketing of Part 15 amplifiers
   – Certain amplifiers can now be sold separately if authorized with specific system(s).
     • Applies only to amplifiers in 900 MHz, 2.4 GHz and 5.8 GHz devices in Section 15.247 and 5.8 GHz in Section 15.407.
     • Designed to connect only to authorized system.
     • FCC identifier of authorized system is listed on outside packaging.

RO&O Modification of Parts 2 and 15 (continued)

4) New Digital Modulation Transmission Systems test procedures for devices in Section 15.247
   – Power Output
   – Power Spectral Density
   – Website……..
RO&O Modification of Parts 2 and 15 (continued)

5) Modify the channel spacing requirements for hoppers in the 2.4 GHz band to allow wider bandwidth hoppers.
   • 25 kHz or Two-thirds of 20 dB BW
   • Power limited to 125 mW

6) Partitioned modular approval requirements
   • Will be addressed in future commission action

RO&O Modification of Parts 2 and 15 (continued)

7) Make other changes to update or correct Parts 2 and 15 of our rules.
   • Delete STA provisions under 15.7
     • Need is met via Part 5 experimental license
   • Mandatory Electronic filing of applications or Grantee code.
   • Reassess test labs every two years by Accrediting Body.
   • Re-accredit and Reassess TCB’s every two years.
Third R&O Review of Part 15 and other Parts of the Commission’s Rules

New rules ET Docket No. 01-278
Effective date June 23, 2004

RF ID systems in 433.5-434.5 MHz band.
– Restricted RF ID systems that identify contents of commercial shipping containers
– Increased maximum field strength
  • 11,000 uV/m Average, 55,000 uV/m Peak
– Increased transmission duration
  • From 5 seconds to 60 seconds

(continued)

– Associated powered tags may be approved with system (one FCC identifier, one fee, two separate measurement data) or separately authorized.
– One way and two way communications allowed.
– May not operate within 40 km of DoD Radar sites
– User manual must inform user of operational restrictions
– Grantee must furnish Experimental Licensing Branch, OET with location of installations.
R&O UNII devices

- New Rules in ET Docket No. 03-122,
  - Effective date, February 19, 2004
- New technology
  - TCB cannot approve any device operating under the new rules.
- Test procedures will be updated in the near future
- Transition dates; equipment operating in 5.25-5.35 GHz
  - Will be addressed once test procedure is finalized.

Part 15 implant transmitters

- Must be filed with the FCC. Contact FCC for guidance.
- For radiated EMC only at 900 MHz use:
  - ANSI C63.4 tabletop test in open air, OR Part-95-like in-liquid phantom setup.
  - Maximum 2 cm from phantom wall at closest points.
  - Phantom. i.e. Human torso simulator (phantom). § 95.639(2)(i) cites a 30 cm inside-diameter (circular) by 76 cm height liquid-filled (6.35 cm thick Plexiglas.
Questions and Answers

Thanks!