Part 90Z -3650-3700 MHz Band Review of Transmitter Devices using Contention Based Protocol

TCB Workshop
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Part 90 Subpart Z—Wireless Broadband Services in the 3650–3700 MHz Band

- Channels in this band are available on a shared basis.

- Operating in the band must employ a contention-based protocol.

- Equipment incorporating unrestricted contention-based protocol may operate throughout the 50 megahertz.

- Equipment incorporating a restricted contention-based protocol may operate in, and shall only tune over, the lower 25 megahertz of this frequency band.

- Contention based protocol description is required as an operational description exhibit.

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Contention Based Protocol Questions
General

- The following questions are not intended to be exhaustive and may be modified in the future. There may be follow-up questions based on the responses provide by the applicant for authorization.

- There are no required answers, functions or specific equipment properties for the individual questions. The objective of the questions is to understand how the equipment permits the spectrum to be shared with similar (restricted) or with any other type (unrestricted) system.

1. Restricted Certification

- 1.1 Protocol Description: Address the key requirements for operation using restricted contention based protocol opportunities for other transmitters to operate. lease note that this requires recognizing like systems (similar to yours) that permit operation on a co-channel.

- 1.2 Describe the method to permit occupancy.

- 1.3 Describe action taken if two or more transmitters simultaneously access the same channel by the master and the client devices.

- 1.4 Describe opportunities for other similar systems to operate Address how or if a different system operator using the same technology can operate in the same band.

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2 Unrestricted Certification

- 2. 1 Unrestricted Protocol Description
  - Address the key requirements for operation using unrestricted contention based protocol. Please note that this requires recognizing other systems (both similar to yours and different from yours) that operate on a co-channel. Indicate the strategy for sharing the spectrum in terms of:
    - Does the system use spectrum sensing to determine if the other devices are
    - transmitting and then find ways to share the bandwidth, or
  - Have some other strategy

2 Unrestricted Certification

- 2.2 Threshold detection to determine occupancy

    - 2.2.1 Describe how your system determines if another system is using the spectrum. At what detection level – relative to 0 dBi receive antenna gain (busy channel threshold) does the device determine if another system is operating on the spectrum?

    - 2.2.2 How long does the system observe to determine if the channel is busy – at the initial time and in between communications?

    - 2.2.3 What is the bandwidth being monitored versus bandwidth occupied for all modes of operation?

    - 2.2.4 How much variability is provided to the system operator to adjust busy channel detection threshold?

    - Threshold detection continued next slide.

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● 2.2 Threshold detection to determine occupancy (continued)

– 2.2.5 What is the operating system threshold (receive threshold) compared to the monitoring threshold (busy channel threshold)?

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– 2.2.6 What additional checks does the system perform to determine if the spectrum is being used before initiating a transmission?

– 2.2.7 Does the master and the client perform the threshold detection? If master only perform the detection how does it determine if the client may interfere with the other system (hidden node detection mechanism)?

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- 2.3 Action taken when occupancy is determined

  - 2.3.1 What action does your system take when it determines occupancy? Does it vacate the channel or does it have some back-off and retry strategy? What is the impact of traffic on the spectrum sensing or avoidance performance?

  - 2.3.3 If you use other means please describe how the device determines the existence of other systems and what steps it takes to either share the channel or avoid its use.

  - 2.3.4 Describe any mechanism that would limit a transmission from a remote station if only the master detects occupancy (hidden node avoidance mechanism).

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- 2.4 Opportunities for other transmitters to operate

  - 2.4.1 When describing occupancy profile, clarify any differences between start-up acquisition mode of spectrum and operational modes.

  - 2.4.2 In operational mode, how long does the system transmit before stopping giving others a reasonable time to transmit before continuing?

  - 2.4.3 Does the system (master and / or client) listen prior to every transmission? If no, explain.

  - Opportunities for other transmitters to operate continued next slide.

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2 Unrestricted Certification

- 2.4 Opportunities for other transmitters to operate (continued)

  – 2.4.4 Describe how the operational spectrum usage (on air time) is dependant on system load conditions (no load, typical and overload). For example, if a station does not have any information to transmit describe any regular or recurring transmission that may take place?

  – 2.4.5 Describe if there are any limitations imposed by the contention protocol on what applications are used (ie limitations on Quality of Service).

  – 2.4.6 Describe how applications or configuration of services can affect spectrum usage. To describe your occupancy sharing capability you can assume that two systems on a co-channel are the same (your systems being described). How would they share the spectrum?

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Additional Review Considerations

- Applications for mobile transmitters must identify the base stations with which they are designed to communicate and describe how the requirement to positively receive and decode an enabling signal is incorporated .

- RF Power listed as EIRP on Certification Grant.

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Permit But Ask Procedure
The following should be submitted with the PBA request

- Manuals and operational descriptions to allow the reviewer to understand the product and its function.

- Provide information based on the CBP questions presented today which will also be available in Draft KDB 552295 (CBP for 3650-3700 Band)

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