



Exhibit: Frequency Stability and Automatic Discontinue of Transmission

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Client	Ecobee Inc.	
Product	ECB601/ECB501	
Standard(s)	RSS 247 Issue 2:2017 FCC Part 15 Subpart C/E	

Automatically Discontinue Transmission

Limit of Automatically Discontinue Transmission

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information, or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

Automatically Discontinue Transmission

The EUT can automatically discontinue transmission when the EUT is not transmitting any information and goes into standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

Frequency Stability

Limit of Frequency Stability

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

Frequency Stability Analysis


The crystal used in this design has the following relevant specifications:

Frequency Tolerance: ± 7 ppm

Frequency Stability (over temperature): ± 10 ppm

Assuming worst case scenario for a crystal at the edge of the temperature range and the edge of initial tolerance (± 17 ppm), the devices will see the following frequency deviations for the edge channels on UNII1 and UNII3:

WiFi Channels	Channel Center Frequency (MHz)	Frequency Deviation (MHz)
CH36	5180	0.13986
CH48	5240	0.14148

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CH149	5745	0.155115
CH165	5825	0.157275

For UNII-1, the closest 99% BW to UNII-2A band is 802.11A. The margin is 0.88 MHz to 5250 MHz.

802.11A-20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	29.780	18.08
Mid	5220	29.100	18.08
High	5240	29.380	18.06
F _H (26 dB BW) = 5255.42 MHz F _H (99% BW) = 5249.12 MHz			

For UNII-3, the closest 99% BW to UNII-2C is 7.97 MHz.

802.11N-40MHz				
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5755	35.653	73.900	43.65
High	5795	35.710	73.233	43.81
F _L (26 dB BW) = 5718.0 MHz F _L (99% BW) = 5732.97 MHz				

According to the margin, the device should operate within it's allow band during normal operation.