

RE: Johnson Controls Interiors L.L.C.

FCC ID: CB2UCONN2

The following is in response to comments made on the above application.

1) The test report states that the DUT antenna was rotated about all possible ways and the maximum emissions recorded. Please note that spurious emissions are not always radiated strictly by the antenna. Many times they may radiate off the device/chassis. Was the device itself also rotates sufficiently to ensure worst case emissions were determined. Note that ANSI C63.4 mentions rotating at 22.5 degree rotations when a turntable is not present.

The antenna is part of the DUT PCB, and thus both were rotated together. See internal photographs.

2) FYI.....Please note that it is acceptable for Bluetooth to be > 20 dB for peak to average emissions (sections 6.5). However, because of the nature of the transmissions, it is considered a pulsed emissions that should be calculated not measured. Additionally, even if average measurements were applicable, the VBW must be $\geq 1/T_{on}$ time, or > 335 Hz in this case.

Please adjust this section of the report as necessary. Please note that the Duty Cycle presented in the report was based on your measurements. However Bluetooth has different packet lengths that may be used in modes with longer packets. The theory of operation for Bluetooth states that there may be 1, 3, or 5 slots used per transmit depending on the mode of operation. For a DH1 packet the TX is on 0.625 μ s per 49 μ s per channel, while for a DH5 packet the TX is on 0.625×5 per 247 μ s per channel. These duty cycles equal the following: $20 \log (.625/49) = -37.9$ dB or $20 \log (3.125/100) = -30$ dB. All are greater than the 20 dB difference between the peak and average limits.

In a previous filing we were asked to provide measured verification that the DUT duty factor is greater than 20 dB below the peak emission, even though the Bluetooth protocol in its design has a duty factor greater than 20 dB.